



# **WiMAX Forum<sup>®</sup> Air Interface Specifications**

WiMAX Forum<sup>®</sup> Mobile Radio Specification

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# 1. Introduction

The purpose of this document is to provide WiMAX Forum® mobile radio specifications.

## 1.1 Scope

The present document specifies the WiMAX Forum® Mobile Radio specifications for Mobile Stations and Base Stations for Mobile WiMAX® Release 1.0 and 1.5 Band Classes Groups as listed in **Table 1**.

**Table 1. List of Band Class Groups**

Band Class Group	Uplink MS Transmit Frequency (MHz)	Downlink MS Receive Frequency (MHz)	Channel Bandwidth (MHz)	Duplex Mode	Air Interface Release
1.A	2300-2400	2300-2400	8.75	TDD	1.0
1.B	2300-2400	2300-2400	5 and 10	TDD	1.0
2.D	2305-2320, 2345-2360	2305-2320, 2345-2360	3.5 and 5 and 10	TDD	1.0
2.E	2345-2360	2305-2320	2x3.5 and 2x5 and 2x10	FDD	1.5
2.F	2345-2360	2305-2320	5 Uplink, 10 Downlink	FDD	1.5
3.A	2496-2690	2496-2690	5 and 10	TDD	1.0
3.B	2496-2572	2614-2690	2x5 and 2x10	FDD	1.5
4.A	3300-3400	3300-3400	5	TDD	1.0
4.B	3300-3400	3300-3400	7	TDD	1.0
4.C	3300-3400	3300-3400	10	TDD	1.0
5L.A	3400-3600	3400-3600	5	TDD	1.0
5L.B	3400-3600	3400-3600	7	TDD	1.0
5L.C	3400-3600	3400-3600	10	TDD	1.0
5.D	3400-3500	3500-3600	2x5 and 2x7 and 2x10	FDD	1.5
5H.A	3600-3800	3600-3800	5	TDD	1.0
5H.B	3600-3800	3600-3800	7	TDD	1.0
5H.C	3600-3800	3600-3800	10	TDD	1.0
6.A	1710-1770	2110-2170	2x5 and 2x10	FDD	1.5
6.B	1920-1980	2110-2170	2x5 and 2x10 (20 MHz optional)	FDD	1.5
6.C	1710-1785	1805-1880	2x5 and 2x10	FDD	1.5
7.A	698-862	698-862	5 and 7 and 10	TDD	1.0

7.B	776-787	746-757	2x5 and 2x10	FDD	1.5
7.C	788-793, 793-798	758-763, 763-768	2x5	FDD	1.5
7.D	788-798	758-768	2x10	FDD	1.5
7.E	698-862	698-862	5 and 7 and 10 (TDD) 2x5 and 2x7 and 2x10 (FDD)	TDD/FDD	1.5
7.G	880-915	925-960	2x5 and 2x10	FDD	1.5
7.x*	730-770 MHz , 890-903 MHz, 915-950 MHz	730-770 MHz , 890-903 MHz, 915-950 MHz	5 and 10 MHz	TDD	1.5
8.A	1785-1805, 1880-1920, 1910-1930, 2010-2025, 1900-1920	1785-1805, 1880-1920, 1910-1930, 2010-2025, 1900-1920	5 and 10	TDD	1.5
8.G	1800-1830 MHz	1800-1830 MHz	5 AND 10 MHz	TDD	1.0
9.D	170 -202.5	170-202.5	5 MHz	TDD	1.0
10.A	5000-5150 MHz	5000-5150 MHz	5 AND 10 MHz	TDD	1.0

[\*Note: The details of Band Class Group 7.x including ACLR specifications are under development pending finalization of Japanese regulations.]

## 1.2 References

The following documents contain provisions that, through reference in this text, constitute provisions of the present document.

References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific. For a specific reference, subsequent revisions do not apply. For a non-specific reference, subsequent revisions do apply.

- [1] **WMF-T23-001-R010v09**, WiMAX Forum® Mobile System Profile, Release 1
- [2] **WMF-T23-007-R010v02**, WiMAX Forum® Mobile System Profile, Release 1 – IMT-2000 Edition
- [3] **WMF-T23-001-R015v01**, WiMAX Forum® Mobile System Profile, Release 1.5 Common Part
- [4] **WMF-T23-003-R015v01**, WiMAX Forum® Mobile System Profile Specification, Release 1.5 FDD Specific Part
- [5] **WMF-T23-002-R015v01**, WiMAX Forum® Mobile System Profile Specification, Release 1.5 TDD Specific Part

## 1.3 Definitions, Symbols and Acronyms

### 1.3.1 Definitions

This section provides the list of definitions used throughout the document.

**Integration Bandwidth:** Integration Bandwidth refers to the frequency range over which the emission power is integrated.

### 1.3.2 Symbols

This section provides the list of symbols used throughout the document along with their descriptions.

$f$	frequency in MHz unless specified otherwise
$f_c$	center frequency in MHz unless specified otherwise
$\Delta f$	absolute value of frequency offset of frequency $f$ from the center frequency of the channel ( $ f_c - f $ ). The offset is in MHz unless specified otherwise
$\Delta F_c$	center frequency step
$F_{start}$	start frequency for a specific band
$N_{range}$	range values for the $n$ parameter
$PTx$	measured transmit power into antenna in dBm
$PTx,max$	measured maximum transmit power into antenna in dBm
$RFChannel_n$	center frequency of RF Channel $n$
$F_{UL-le}$	Lower edge of uplink portion of the band
$F_{UL-ue}$	Upper edge of uplink portion of the band
$F_{ue}$	Upper edge of the band (either uplink or downlink whichever larger)
$F_{DL-le}$	Lower edge of downlink portion of the band
$F_{DL-ue}$	Upper edge of downlink portion of the band

### 1.3.3 Acronyms

This section provides the list of acronyms and abbreviations used throughout the document.

ACLR	Adjacent Channel Leakage Ratio
ACR	Adjacent Channel Rejection
BCG	Band Class Group
BS	Base Station
BW	Channel bandwidth in MHz
ChBW	Channel Bandwidth

MS	Mobile Station
RF	Radio Frequency
Pnom	transmitter nominal maximum output power
oi	qualified option – for mutually exclusive or selectable options from a set. One or more of the options from the set shall be supported

## 2. Radio Specifications

### 2.1 Mobile Station

The purpose of this section is to provide radio specification for Mobile Station. The receiver characterization specified in this section is optional and not required for WiMAX certification of Mobile Stations. The receiver specifications may need to be met to conform with regulatory requirements in some territories.

#### 2.1.1 Center frequency step size

The center frequency step size is 250 KHz for Release 1.0 BCGs and 100 KHz for Release 1.5 BCGs.

#### 2.1.2 RF Profile

Table 2 provides the set of RF channel center frequency numbers for various Band Class Groups. From Table 2, the RF channel center frequencies can be derived as a function of RF channel center frequency numbers using the following equation.

$$f_c = 0.05 \times f_{cN}$$

Here the RF channel center frequency ( $f_c$ ) is in MHz. The RF channel center frequency number ( $f_{cN}$ ) is a number between 3450 and 102950 corresponding to 172.5 MHz and 5147.5 MHz RF channel center frequencies respectively.

In Table 2, for each combination of Band Class Group and channel bandwidth size, the RF Channel Center Frequency Number Sets are specified using the following triple

$$(f_{cNstart}, f_{cNstop}, step)$$

where  $f_{cNstart}$  is the starting RF channel center frequency number assigned to the first RF channel center frequency in the BCG,  $f_{cNstop}$  is the ending RF channel center frequency number assigned to the last RF channel center frequency in the BCG and  $step$  is the RF channel center frequency number step size between  $f_{cNstart}$  and  $f_{cNstop}$ .

**Table 2. RF Channel Center Frequency Numbers**

Band Class Group	Channel BW (MHz)	Frequency Range (MHz)		RF Channel Center Frequency Number Set	
		Uplink	Downlink	Uplink	Downlink
1.A	8.75	2300-2400	2300-2400	(46090, 47910, 5)	(46090, 47910, 5)
1.B	5	2300-2400	2300-2400	(46050, 47950, 5)	(46050, 47950, 5)
	10	2300-2400	2300-2400	(46100, 47900, 5)	(46100, 47900, 5)

2.D	3.5	2305-2320, 2345-2360	2305-2320, 2345-2360	(46135, 46365, 5), (46935, 47165, 5)	(46135, 46365, 5), (46935, 47165, 5)
	5	2305-2320, 2345-2360	2305-2320, 2345-2360	(46150, 46350, 5), (46950, 47150, 5)	(46150, 46350, 5), (46950, 47150, 5)
	10	2305-2320, 2345-2360	2305-2320, 2345-2360	(46200, 46300, 5), (47000, 47100, 5)	(46200, 46300, 5), (47000, 47100, 5)
2.E	2x3.5	2345-2360	2305-2320	(46935, 47165, 2)	(46135, 46365, 2)
	2x5	2345-2360	2305-2320	(46950, 47150, 2)	(46150, 46350, 2)
	2x10	2345-2360	2305-2320	(47000, 47100, 2)	(46200, 46300, 2)
2.F	5UL/10DL	2345-2360	2305-2320	(46950, 47150, 2)	(46200, 46300, 2)
3.A	5	2496-2690	2496-2690	(49970, 53750, 5)	(49970, 53750, 5)
	10	2496-2690	2496-2690	(50020, 53700, 5)	(50020, 53700, 5)
3.B	2x5	2496-2572	2614-2690	(49970, 51390, 2)	(52330, 53750, 2)
	2x10	2496-2572	2614-2690	(50020, 51340, 2)	(52380, 53700, 2)
4.A	5	3300-3400	3300-3400	(66050, 67950, 5)	(66050, 67950, 5)
4.B	7	3300-3400	3300-3400	(66070, 67930, 5)	(66070, 67930, 5)
4.C	10	3300-3400	3300-3400	(66100, 67900, 5)	(66100, 67900, 5)
5L.A	5	3400-3600	3400-3600	(68050, 71950, 5)	(68050, 71950, 5)
5L.B	7	3400-3600	3400-3600	(68070, 71930, 5)	(68070, 71930, 5)
5L.C	10	3400-3600	3400-3600	(68100, 71900, 5)	(68100, 71900, 5)
5.D	2x5	3400-3500	3500-3600	(68050, 69950, 2)	(70050, 71950, 2)
	2x7	3400-3500	3500-3600	(68070, 69930, 2)	(70070, 71930, 2)
	2x10	3400-3500	3500-3600	(68100, 69900, 2)	(70100, 71900, 2)
5H.A	5	3600-3800	3600-3800	(72050, 75950, 5)	(72050, 75950, 5)
5H.B	7	3600-3800	3600-3800	(72070, 75930, 5)	(72070, 75930, 5)
5H.C	10	3600-3800	3600-3800	(72100, 75900, 5)	(72100, 75900, 5)
6.A	2x5	1710-1770	2110-2170	(34250, 35350, 2)	(42250, 43350, 2)
	2x10	1710-1770	2110-2170	(34300, 35300, 2)	(42300, 43300, 2)
6.B	2x5	1920-1980	2110-2170	(38450, 39550, 2)	(42250, 43350, 2)
	2x10	1920-1980	2110-2170	(38500, 39500, 2)	(42300, 43300, 2)
7.A	5	698-862	698-862	(14010, 17190, 5)	(14010, 17190, 5)
	7	698-862	698-862	(14030, 17170, 5)	(14030, 17170, 5)
	10	698-862	698-862	(14060, 17140, 5)	(14060, 17140, 5)
7.B	2x5	776-787	746-757	(15570, 15690, 2)	(14970, 15090, 2)
	2x0	776-787	746-757	(15620, 15640, 2)	(15020, 15040, 2)

7.C	2x5	788-793, 793-798	758-763, 763-768	(15810, 15810, 2)	(15210, 15210, 2)
7.D	2x10	788-798	758-768	(15910, 15910, 2)	(15310, 15310, 2)
7.E	5	698-862	698-862	(15860, 15860, 2)	(15260, 15260, 2)
	7	698-862	698-862	(14010, 17190, 2)	(14010, 17190, 2)
	10	698-862	698-862	(14030, 17170, 2)	(14030, 17170, 2)
	2x5	698-862	698-862	(14060, 17140, 2)	(14060, 17140, 2)
	2x7	698-862	698-862	(14010, 17190, 2)	(14010, 17190, 2)
	2x10	698-862	698-862	(14030, 17170, 2)	(14030, 17170, 2)
8.A	5	1785-1805, 1880-1920, 1910-1930, 2010-2025, 1900-1920	1785-1805, 1880-1920, 1910-1930, 2010-2025, 1900-1920	(35750, 36050, 2), (37650, 38350, 2), (38250, 38550, 2), (40250, 40450, 2), (38050, 38350, 2)	(35750, 36050, 2), (37650, 38350, 2), (38250, 38550, 2), (40250, 40450, 2), (38050, 38350, 2)
	10	1785-1805, 1880-1920, 1910-1930, 2010-2025, 1900-1920	1785-1805, 1880-1920, 1910-1930, 2010-2025, 1900-1920	(35800, 36000, 2), (37700, 38300, 2), (38300, 38500, 2), (40300, 40400, 2), (38100, 38300, 2)	(35800, 36000, 2), (37700, 38300, 2), (38300, 38500, 2), (40300, 40400, 2), (38100, 38300, 2)
8.G	5	1800-1830	1800-1830	(36050, 36550, 5)	(36050, 36550, 5)
	10	1800-1830	1800-1830	(36100, 36500, 5)	(36100, 36500, 5)
9.D	5	170-202.5	170-202.5	(3450, 4000, 5)	(3450, 4000, 5)
10.A	5	5000-5150	5000-5150	(100050, 102950, 5)	(100050, 102950, 5)
	10	5000-5150	5000-5150	(100200, 102900, 5)	(100200, 102900, 5)

Note: that comprehensive RF raster of Table 3 is only for interoperability purposes and not a basis for any performance testing on RF channel scanning and synchronization to network. RF preferred sets need to be developed to be considered as basis for scanning time performance specifications.

### 2.1.3 Power Class Profile

The Power Classes listed in following table are developed to cover the complete target range of power levels while different interpretation of applicable modulation levels are addressed through a dual range specification for QPSK and 16-QAM per Power Class.

**Table 3. Power Classes**

Class Identifier	Transmit Power (dBm) for 16-QAM	Transmit Power (dBm) for QPSK	MS Required
Power Class 1	$18 \leq PT_{x,max} < 21$	$20 \leq PT_{x,max} < 23$	Oioi
Power Class 2	$21 \leq PT_{x,max} < 25$	$23 \leq PT_{x,max} < 27$	Oioi
Power Class 3	$25 \leq PT_{x,max} < 30$	$27 \leq PT_{x,max} < 30$	Oioi
Power Class 4	$30 \leq PT_{x,max}$	$30 \leq PT_{x,max}$	Oioi

Note: The maximum MS output power may be limited by the value included in a MS Maximum Transmission Power Limitation Control TLV that may be included in the UCD.

## 2.1.4 Default Specifications

### 2.1.4.1 Default Channel Spectral Mask

Unless otherwise specified in sub sections of Section 2.1 for specific bands, the spectrum masks of Table 4 and Table 5 are applicable.

**Table 4. Channel Mask for 5 MHz Bandwidth**

No	$\Delta f$ , offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 3.5$	50	-13
2	$3.5 \leq \Delta f \leq 12.5$	1000	-13

Note: The first measurement position with a 50 kHz filter is at  $\Delta f$  equals to 2.525 MHz; the last is at  $\Delta f$  equals to 3.475 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 4.0 MHz; the last is at  $\Delta f$  equals to 12.0 MHz.

**Table 5. Channel Mask for 10 MHz Bandwidth**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 6$	100	-13
2	$6 \leq \Delta f \leq 25$	1000	-13

Note: The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.550 MHz; the last is at  $\Delta f$  equals to 5.950 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 6.5 MHz; the last is at  $\Delta f$  equals to 24.5 MHz.

### 2.1.4.2 Default Spurious Emission

Unless otherwise specified in sub sections of Section 2.1 for specific bands, the default spurious emission specifications of Table 6 are applicable.



**Table 6. Default Spurious Emissions; Relevant to  $F_{UL-le} + ChBW/2 \leq f_c \leq F_{UL-ue} - ChBW/2$**

No	Spurious frequency (f) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 5 \times F_{ue}$	30 kHz If $2.5 \times ChBW \leq \Delta f < 10 \times ChBW$ 300 kHz If $10 \times ChBW \leq \Delta f < 12 \times ChBW$ 1 MHz If $12 \times ChBW \leq \Delta f$	-30

### 2.1.4.3 Default Receiver Adjacent Channel Selectivity

The receiver adjacent and alternate channel selectivity (ACS) is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the interferer power level (in dB) relative to thermal noise (Nth)

To reference the receiver adjacent and alternate channel selectivity values properly, a sensitivity level is defined as the signal level for Bit Error Ratio (BER)  $\leq 10^{-6}$  (or equivalent PER) performance for AWGN channel, over the channel bandwidth (5 MHz or 10 MHz), corresponding to the most robust modulation and coding rate supported by the technology.

Nth is the receiver thermal noise of the equipment as declared by the manufacturer and is equal to  $kTBwF$  with Bw is the bandwidth of the equipment and F is the receiver noise figure.

Table 7 specifies the limits and the test parameters for the receiver ACS in the first adjacent channel and 2<sup>nd</sup> adjacent channels. For an assigned channel bandwidth BW, the interferer channel bandwidth of the same size is used. All the measurements are done over 95 % of the channel. The compliant systems meet a Bit Error Ratio (BER)  $< 10^{-6}$  (or equivalent PER) with the interference levels specified in the tables. Please note that depending on some assumed packet sizes, equivalent Packet Error Ratio (PER) criteria can be used alternatively.

Specific numbers for specific band supersedes these default numbers.

**Table 7. Limits and test parameters for receiver adjacent channel selectivity**

Description	In-channel	Interferer on 1 <sup>st</sup> adjacent channel	Interferer on 2 <sup>nd</sup> adjacent channel
ACS limits (dB)		33	47
Power (dBm)	$P_{SENS} + 3$	Nth +33	Nth +47
Centre frequency (MHz)	$f_c$	$f_c \pm BW$	$f_c \pm 2 \times BW$

### 2.1.4.4 Default Receiver Blocking Specification

Unless otherwise specified in sub sections of Section 2.1 for specific bands, the receiver blocking specifications of this clause are applicable.

The blocking characteristic is a performance measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interfering signal on frequencies other than those of the adjacent channels. The blocking performance specification applies to interfering signals with center frequencies within the ranges specified in the tables below, using a 1MHz step size. The blocking performance shall apply to all frequencies except those at which a spurious response occurs.

PSENS5 and PSENS10 are the sensitivity levels at  $BER \leq 10^{-6}$ , for 5 MHz and 10 MHz channels respectively, corresponding to the most robust modulation and coding rate supported by the user equipment. The wanted signal with the most robust modulation and coding supported by the Mobile Station shall be used.

For blocking performance specification, the wanted signal with the most robust modulation and coding supported by the Mobile Station shall be used.

BER performance requirement at  $BER \leq 10^{-6}$  (or equivalent PER) shall be met when the following signals are coupled to Mobile Station antenna input:

- A wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS5.
- Interfering signal needs to use the parameters of Table 8.

**Table 8. Blocking for 5 MHz channel bandwidth**

Center Frequency of Wanted Signal	Centre Frequency of Interfering Signal	Interfering Signal Mean Power (dBm)	Minimum Offset of Interfering Signal from the channel edge (MHz)	Type of Interfering Signal
According to Table 2 Uplink Channel Center Frequencies	According to Table 2 Uplink Channel Center Frequencies excluding first and second adjacent channels and spurious response frequencies	-49	12.5	Modulation and coding equal to those of the wanted signal

BER performance requirement at  $BER \leq 10^{-6}$  (or equivalent PER) shall be met when the following signals are coupled to Mobile Station antenna input:

- A wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS10.
- Interfering signal needs to use the parameters of Table 9.

**Table 9. Blocking for 10 MHz channel bandwidth**

Center Frequency of Wanted Signal	Centre Frequency of Interfering Signal	Interfering Signal Mean Power (dBm)	Minimum Offset of Interfering Signal from the channel edge (MHz)	Type of Interfering Signal
According to Table 2 Uplink Channel Center Frequencies	According to Table 2 Uplink Channel Center Frequencies excluding first and second adjacent channels and spurious response frequencies	-49	25	Modulation and coding equal to those of the wanted signal

### 2.1.4.5 Default receiver Intermodulation specification

Unless otherwise specified in sub sections of Section 2.1 for specific bands, the receiver Intermodulation specification of this clause are applicable.

Nonlinear mixing of the third and higher order of two interfering signals can produce an interfering signal in the band of the wanted signal. Intermodulation response rejection characteristic is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

BER performance requirement at  $BER \leq 10^{-6}$  (or equivalent PER) shall be met when the following signals are coupled to Mobile Station antenna input.

- A wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS5.
- Two interfering signals need to use the parameters of Table 10.

**Table 10. Receiver intermodulation characteristics for 5 MHz channel bandwidth**

Interfering Signal Mean Power (dBm)	Offset of Interfering Signal center frequency from the channel edge (MHz)	Type of Interfering Signal
-55	7.5	Carrier Wave
-55	17.5	Modulation and coding equal to those of the wanted signal

BER performance requirement at  $BER \leq 10^{-6}$  (or equivalent PER) shall be met when the following signals are coupled to Mobile Station antenna input.

- A wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS10.
- Two interfering signals need to use the parameters of Table 11.

**Table 11. Receiver intermodulation characteristics for 10 MHz channel bandwidth**

Interfering Signal Mean Power (dBm)	Offset of Interfering Signal center frequency from the channel edge (MHz)	Type of Interfering Signal
-55	15	Carrier Wave
-55	35	Modulation and coding equal to those of the wanted signal

### 2.1.4.6 Default receiver spurious response specification

Spurious response is a performance measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted Carrier Wave interfering signal at any other frequency at which a response is obtained (i.e. for which the blocking limits as specified in Table 8 and Table 9 are not met).

BER performance requirement at  $BER \leq 10^{-6}$  (or equivalent PER) shall be met when a wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS5, coupled to Mobile Station antenna input.

**Table 12. Receiver spurious response for 5 MHz channel bandwidth**

Center Frequency of Wanted Signal	Centre Frequency of Interfering Signal	Interfering Signal Mean Power (dBm)	Type of Interfering Signal
<ul style="list-style-type: none"> <li>According to Table 2 Downlink Channel Center Frequencies</li> </ul>	<ul style="list-style-type: none"> <li>Spurious response frequencies within the range of Table 2 Downlink Channel Center Frequency</li> </ul>	<ul style="list-style-type: none"> <li>-49</li> </ul>	<ul style="list-style-type: none"> <li>Carrier Wave</li> </ul>

BER performance requirement at  $BER \leq 10^{-6}$  (or equivalent PER) shall be met when a wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS10, coupled to Mobile Station antenna input.

**Table 13. Receiver spurious response for 10 MHz channel bandwidth**

Center Frequency of Wanted Signal	Centre Frequency of Interfering Signal	Interfering Signal Mean Power (dBm)	Type of Interfering Signal
<ul style="list-style-type: none"> <li>According to Table 2 Downlink Channel Center Frequencies</li> </ul>	<ul style="list-style-type: none"> <li>Spurious response frequencies within the range of Table 2 Downlink Channel Center Frequency</li> </ul>	<ul style="list-style-type: none"> <li>-49</li> </ul>	<ul style="list-style-type: none"> <li>Carrier Wave</li> </ul>

## 2.1.5 Band Class 1

### 2.1.5.1 Band Class Group 1.A

#### 2.1.5.1.1 Channel Spectral Mask

The channel mask for 8.75 MHz bandwidth is specified in Table 14 and

Table 15 depending the transmit power level.

**Table 14. Channel Mask for MS with  $PTx \leq 23$  dBm (BCG 1.A)**

No	Frequency offset ( $\Delta f$ ) in MHz	Maximum Emission Level (dB)	Integration Bandwidth (KHz)
1	$4.77 \leq \Delta f < 9.27$	$-[26+7\{(\Delta f-4.77)/4.5\}]$	100
2	$9.27 \leq \Delta f < 13.23$	$-[33+4\{(\Delta f-9.27)/3.96\}]$	100
3	$13.23 \leq \Delta f < 17.73$	$-[37+2\{(\Delta f-13.23)/4.5\}]$	100
4	$17.73 \leq \Delta f$	-39	100

**Table 15. Channel Mask for MS with PTx > 23 dBm (BCG 1.A)**

No	Frequency offset ( $\Delta f$ ) in MHz	Maximum Emission Level (dB)	Integration Bandwidth (KHz)
1	$4.77 \leq \Delta f < 9.27$	$-[\{(PTx-23)+26\}+7\{(\Delta f-4.77)/4.5\}]$	100
2	$9.27 \leq \Delta f < 13.23$	$-[\{(PTx-23)+33\}+4\{(\Delta f-9.27)/3.96\}]$	100
3	$13.23 \leq \Delta f < 17.73$	$-[\{(PTx-23)+37\}+2\{(\Delta f-13.23)/4.5\}]$	100
4	$17.73 \leq \Delta f$	$-[(PTx-23)+39]$	100

Note: Protection specification beyond 17.73 MHz is specified in the spurious emissions specification.

### 2.1.5.1.2 Spurious Emission Specification

Minimum required conducted transmit Spurious Emissions are specified in Table 16. The limits shown in Table 16 are for frequency offsets, ( $\Delta f$ ), that are greater than 17.73 MHz. Here,  $f$  is the frequency of the spurious domain emissions.

**Table 16. Spurious Emissions for 8.75 MHz Channel Bandwidth (BCG 1.A)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-13
2	$1 \text{ GHz} \leq f \leq 12 \text{ GHz}$	1 MHz	-13

**Table 17. Additional Spurious Emissions for 5 MHz Channel Size; Relevant to  $2302.5 \leq f_c \leq 2397.5$  (BCG 1.B)**

No	Spurious frequency ( $f$ ) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$2110 \leq f < 2170$	1	-50
2	$1805 \leq f < 1880$	1	-50
3	$2496 \leq f < 2690$	1	-50
4	$925 \leq f < 960$	1	-50
5	$1900 \leq f < 1920$	1	-50
6	$2010 \leq f < 2025$	1	-50
7	$2570 \leq f < 2620$	1	-50
8	$791 \leq f < 821$	1	-50

**Table 18. Additional Spurious Emissions for 10 MHz Channel Size; Relevant to  $2305 \leq f_c \leq 2395$  (BCG 1.B)**

No	Spurious frequency ( $f$ ) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$2110 \leq f < 2170$	1	-50
2	$1805 \leq f < 1880$	1	-50
3	$2496 \leq f < 2690$	1	-50
4	$925 \leq f < 960$	1	-50
5	$1900 \leq f < 1920$	1	-50
6	$2010 \leq f < 2025$	1	-50
7	$2570 \leq f < 2620$	1	-50
8	$791 \leq f < 821$	1	-50

## 2.1.5.2 Band Class Group 1.B

### 2.1.5.2.1 Channel Spectral Mask

The channel mask for 10 MHz bandwidth is specified in Table 19.

**Table 19. Channel Mask for 10 MHz Bandwidth (BCG 1.B)**

No	$\Delta f$ offset from channel center (MHz)	Integration Bandwidth (kHz)	Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 6$	100	-13
2	$6 \leq \Delta f < 10$	1000	-13
3	$10 \leq \Delta f < 11$	1000	$-13-12(\Delta f-10)$
4	$11 \leq \Delta f < 15$	1000	-25
5	$15 \leq \Delta f < 20$	1000	-25
6	$20 \leq \Delta f \leq -25$	1000	-25

The channel mask for 5 MHz bandwidth is specified in Table 20.

**Table 20. Channel Mask for 5 MHz Bandwidth (BCG 1.B)**

No	$\Delta f$ offset from channel center (MHz)	Integration Bandwidth (kHz)	Allowed Emission Level (dBm/integration BW) at the antenna port.
1	$2.5 \leq \Delta f < 3.5$	50	-13
2	$3.5 \leq \Delta f < 7.5$	1000	-13

3	$7.5 \leq \Delta f < 8$	500	-16
4	$8 \leq \Delta f < 10.4$	1000	-25
5	$10.4 \leq \Delta f < 12.5$	1000	-25

For all combination of transmit power and center frequencies, the spectral mask measurements shall not exceed the limits specified in Table 19 and Table 20 for 10 and 5 MHz channel bandwidth sizes respectively.

### 2.1.5.2.2 Spurious Emission Specification

The limits shown in Table 21 and Table 22 are for frequency offsets which are greater than 2.5 times the channel bandwidth (5 and 10 MHz respectively). In the tables,  $f$  is the frequency of the spurious domain emissions. All spurious emission specifications are of conducted type.

**Table 21. Spurious Emissions for 5 MHz Channel Size; Relevant to  $2302.5 \leq f_c \leq 2397.5$  (BCG 1.B)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 12 \text{ GHz}$	30 kHz If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz If $60 \text{ MHz} \leq \Delta f$	-30

**Table 22. Spurious Emissions for 10 MHz Channel Size; Relevant to  $2305 \leq f_c \leq 2395$  (BCG 1.B)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 1000 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 12 \text{ GHz}$	30 kHz If $25 \text{ MHz} \leq \Delta f < 100 \text{ MHz}$ 300 kHz If $100 \text{ MHz} \leq \Delta f < 120 \text{ MHz}$ 1 MHz If $120 \text{ MHz} \leq \Delta f$	-30

### 2.1.5.2.3 Adjacent Channel Leakage Ratio (ACLR)

For 5 and 10 MHz BW Band Class Group 1.B, the ACLR shall be equal to or greater than the limits specified in Table 34 below.

**Table 23. ACLR Specification for 5 MHz Channel BW MS (BCG 1.B)**

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	MS channel centre frequency $\pm$ 5 MHz	30
2	MS channel centre frequency $\pm$ 10 MHz	44

**Table 24. ACLR Specifications for 10 MHz Channel BW MS (BCG 1.B)**

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	MS channel centre frequency $\pm$ 10 MHz	30
2	MS channel centre frequency $\pm$ 20 MHz	44

Note: In Table 23 and Table 24, 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.

## 2.1.6 Band Class 3

### 2.1.6.1 Band Class Group 3.A

#### 2.1.6.1.1 Additional Transmit Power Level Specifications

The operational maximum power level ( $PTx,max$ ) for mobile equipment is in the range of 18 to 24 dBm in the band. Exceptionally, non-handheld equipment with higher operational maximum power levels of up to 33 dBm is also supported by the system, subject to relevant regulation.

#### 2.1.6.1.2 Channel Spectral Mask

The minimum specifications mask for WiMAX® systems is considered to be the minimum necessary required to meet the regulatory conditions for the majority of the addressable market for WiMAX® products and the mask that devices shall comply with to obtain WiMAX® certification. The channel mask for 10 and 5 MHz channel bandwidths are specified in Table 25 and Table 26.

**Table 25. Channel Mask for 10 MHz Bandwidth (BCG 3.A)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 6$	100	-13
2	$6 \leq \Delta f < 10$	1000	-13
3	$10 \leq \Delta f < 11$	1000	$-13-12(\Delta f - 10)$
4	$11 \leq \Delta f < 15$	1000	-25



5	$15 \leq \Delta f < 20$	1000	If $PTx \leq +23$ dBm and $(2550 \leq f_c \leq 2620)$ then $-21 - 32(\Delta f - 10.5)/19$ else $-25$
6	$20 \leq \Delta f \leq -25$	1000	If $PTx \leq +23$ dBm and $(2550 \leq f_c \leq 2620)$ then $-37$ else $-25$

Note: Protection specification beyond 25 MHz (250% of the bandwidth) is specified in the spurious emissions requirement.

**Table 26. Channel Mask for 5 MHz Bandwidth (BCG 3.A)**

No	Offset from channel centre (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/integration BW) at the antenna port.
1	$2.5 \leq \Delta f < 3.5$	50	-13
2	$3.5 \leq \Delta f < 7.5$	1000	-13
3	$7.5 \leq \Delta f < 8$	500	If $PTx \leq +23$ and $(2547.5 \leq f_c \leq 2622.5)$ then $-23 - 2.28(\Delta f - 7.5)$ else $-16.00$
4	$8 \leq \Delta f < 10.4$	1000	-25
5	$10.4 \leq \Delta f < 12.5$	1000	If $PTx \leq +23$ and $(2547.5 \leq f_c \leq 2622.5)$ then $-21 - 1.68(\Delta f - 8)$ else $-25$

### 2.1.6.1.3 Transmitter Spurious Emission (conducted)

The limits shown in the following tables are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency. In the table,  $f$  is the frequency of the spurious domain emissions.

In all of the following tables, measurement uncertainty (as defined in ITU-R M.1545) values corresponding to spurious emission limits have not been included here.

**Table 27. Spurious Emissions for 5 MHz Channel Size; Relevant to  $2498.5 \leq f_c \leq 2687.5$  (BCG 3.A)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 14.34 \text{ GHz}$	30 kHz If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz If $60 \text{ MHz} \leq \Delta f$	-30

**Table 28. Additional Spurious Emissions for 5 MHz Channel Size; Relevant to  $2547.5 \leq f_c \leq 2622.5$  (BCG 3.A)**

No	Spurious frequency ( $f$ ) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$2505 \leq f < 2530$	1	-37
2	$2530 \leq f < 2535$	1	$1.7f - 4338$
3	$2535 \leq f < 2630$	1	-21-1.68( $\Delta f$ -8) 12.5 MHz < $\Delta f$ < 17.5 MHz -37 17.5 MHz < $\Delta f$ < 22.5 MHz -18 22.5 MHz < $\Delta f$
4	$2630 \leq f < 2630$	1	$-13 - 8(f - 2627)/3.5$
5	$2630.5 \leq f < 2640$	1	$-21 - 16(f - 2630.5)/9.5$
6	$2640 \leq f < 2655$	1	-37

**Table 29. Additional Spurious Emissions for 5 MHz Channel size; Relevant to  $2498.5 \leq f_c \leq 2687.5$  (BCG 3.A)**

No	Spurious frequency ( $f$ ) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$2620 \leq f < 2690$	1	-40

Notes:

1. In Table 27, Table 28 and Table 29 the allowed emission level shall be applied for the frequency range greater than 2.5 times the channel size from the centre frequency.
2. With respect to Table 16, for each RF channel used, up to five measurements in 2620-2635.84 and 2655-2690 MHz are exempt from the -40 dBm specification of Row 1 where a relaxed level of -30 dBm of Row 4 of Table 27 is applicable.

**Table 30. Spurious Emissions for 10 MHz Channel Size; Relevant to  $2501 \leq f_c \leq 2685$  (BCG 3.A)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30\text{MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000\text{MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 13.45 \text{ GHz}$	30 kHz If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz If $60 \text{ MHz} \leq \Delta f$	-30

**Table 31. Additional Spurious Emissions for 10 MHz Channel Size, Relevant to  $2550 \leq f_c \leq 2620$  (BCG 3.A)**

No	Spurious frequency ( $f$ ) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$2505 \leq f < 2530$	1	-37
2	$2530 \leq f < 2535$	1	$1.7f - 4338$
3	$2535 \leq f < 2630$	1	-18 $25 \text{ MHz} < \Delta f$
4	$2 \text{ 630} \leq f < 2 \text{ 630.5}$	1	$-13 - 8(f - 2 \text{ 627})/3.5$
5	$2 \text{ 630.5} \leq f < 2 \text{ 640}$	1	$-21 - 16(f - 2 \text{ 630.5})/9.5$
6	$2 \text{ 640} \leq f < 2 \text{ 655}$	1	-37

**Table 32. Spurious Emissions for 10 MHz Channel Size; Relevant to  $2501 \leq f_c \leq 2685$  (BCG 3.A)**

No	Spurious frequency ( $f$ ) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$2620 \leq f < 2690$	1	-40

Notes:

1. In Table 30, Table 31 and Table 32 the allowed emission level shall be applied for the frequency range greater than 2.5 times the channel size from the centre frequency.
2. With respect to Table 19, for each RF channel used, up to five measurements in 2620-2635.84 and 2655-2690 MHz are exempt from the -40 dBm specification of Row 1 where a relaxed level of -30 dBm of Row 4 of Table 30 is applicable.

#### 2.1.6.1.4 Receiver Spurious Emission (conducted)

The power of any narrow-band spurious emission should not exceed the maximum level specified in the following table.

Table 33 specifies Receiver spurious emissions specifications applicable to 5 and 10 MHz channel bandwidth sizes.

**Table 33. Receiver Spurious Emission Limits (BCG 3.A)**

No	Frequency Band	Measurement Bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 KHz	-57
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 KHz	-57
3	$30 \text{ MHz} \leq f < 1 \text{ GHz}$	100 KHz	-57
4	$1000 \text{ MHz} \leq f < 2500 \text{ MHz}$	$30 \text{ KHz}$ If $2.5 \cdot \text{ChBW} \leq \Delta f < 10 \cdot \text{ChBW}$	-47
		$300 \text{ KHz}$ If $10 \cdot \text{ChBW} \leq \Delta f < 12 \cdot \text{ChBW}$	
		$1 \text{ MHz}$ If $12 \cdot \text{ChBW} \leq \Delta f$	
5	$2500 \text{ MHz} \leq f < 2690 \text{ MHz}$	5 MHz	-59
6	$2690 \text{ MHz} \leq f < 13.45 \text{ GHz}$	$30 \text{ KHz}$ If $2.5 \cdot \text{ChBW} \leq \Delta f < 10 \cdot \text{ChBW}$	-47
		$300 \text{ KHz}$ If $10 \cdot \text{ChBW} \leq \Delta f < 12 \cdot \text{ChBW}$	
		$1 \text{ MHz}$ If $12 \cdot \text{ChBW} \leq \Delta f$	

#### 2.1.6.1.5 Adjacent Channel Leakage Ratio (ACLR)

This annex contains the ACLR specifications for mobile station and user device operating in Band Class Group 3.A. The ACLR is defined as the ratio of the on-channel transmitted power to the out of channel power leaking into adjacent channels and as measured at the output of the receiver filter. The first-adjacent and second-adjacent channel-centre frequency offsets relative to the assigned channel's centre frequency are 5 MHz and 10 MHz, when the nominal occupied channel bandwidth is 5 MHz. These offsets are 10 MHz and 20 MHz respectively when the nominal occupied channel bandwidth is 10 MHz. 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 Table 21 and Table 22, the ACLR specifications are shown. Measurement uncertainty (as defined in ITU-R M.1545) values corresponding to the ACLR limits have not been included.

#### 2.1.6.1.5.1 ACLR specifications for 5 MHz Bandwidth

For 5 MHz BW Band Class Group 3.A, the ACLR shall be equal to or greater than the limits specified in Table 34 below and as specified in ITU-R M.1581-2.

**Table 34. ACLR Specification for 5 MHz Channel BW MS (BCG 3.A)**

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

#### 2.1.6.1.5.2 ACLR specifications for 10 MHz Bandwidth

For 10 MHz BW Band Class Group 3.A, the ACLR shall be equal to or greater than the limits specified in Table 35 below and as specified in ITU-R M.1581-2.

**Table 35. ACLR Specifications for 10 MHz Channel BW MS (BCG 3.A)**

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

### 2.1.6.1.6 First and Second Adjacent Channel Rejection

The first and second adjacent channel rejection shall be measured by setting the desired signal's strength 3 dB above the rate dependent receiver sensitivity (Table 36) and raising the power level of the interfering signal (at first or second adjacent channel) until the specified error rate is obtained. The power difference between the interfering signal and the desired channel is the corresponding adjacent channel rejection.

**Table 36. Receiver Sensitivity Levels (BCG 3.A)**

No	Channel Bandwidth	Sub-carrier Allocation Mode	Modulation and Coding Level	Sensitivity Level (dBm)
1	5 MHz	PUSC	CTC-QPSK 1/2	-91.0
		FUSC	CTC-QPSK 1/2	-91.1
		AMC	CTC-QPSK 1/2	-91.0
2	10 MHz	PUSC	CTC-QPSK 1/2	-88.0
		FUSC	CTC-QPSK 1/2	-88.1
		AMC	CTC-QPSK 1/2	-88.0

The first and second adjacent channel rejection specifications are listed in Table 37.

**Table 37. First and Second Adjacent Channel Rejection (BCG 3.A)**

No	Description	Modulation and Coding Level	Sub-carrier Allocation Mode	Value (dB)
1	Min first adjacent channel rejection at BER=10 <sup>-6</sup> for 3 dB degradation C/I	CTC-QPSK 1/2	PUSC	21.6
			FUSC	21.8
			AMC	21.7
2	Min second adjacent rejection at BER=10 <sup>-6</sup> for 3 dB degradation C/I	CTC-QPSK 1/2	PUSC	35.6
			FUSC	35.8
			AMC	35.7

### 2.1.6.2 Band Class Group 3.B

#### 2.1.6.2.1 Channel Spectral Mask

The WiMAX® minimum specifications mask is considered to be the minimum necessary required to meet the regulatory conditions for the majority of the addressable market for WiMAX products and the mask that devices shall comply with to obtain WiMAX certification.

The channel mask for 10 MHz bandwidth is specified in Table 38.

**Table 38. Channel Mask for 10 MHz Bandwidth (BCG 3.B)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 6$	100	-13
2	$6 \leq \Delta f < 10$	1000	-13
3	$10 \leq \Delta f < 11$	1000	$-13-12(\Delta f-10)$
4	$11 \leq \Delta f < 15$	1000	-25
5	$15 \leq \Delta f < 20$	1000	-25
6	$20 \leq \Delta f \leq -25$	1000	-25

Note: Protection specification beyond 25 MHz (250% of the bandwidth) is specified in the spurious emissions specification.

The channel mask for 5 MHz bandwidth is specified in Table 39.

**Table 39. Channel Mask for 5 MHz Bandwidth (BCG 3.B)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/integration BW) at the antenna port.
1	$2.5 \leq \Delta f < 3.5$	50	-13
2	$3.5 \leq \Delta f < 7.5$	1000	-13
3	$7.5 \leq \Delta f < 8$	500	-16
4	$8 \leq \Delta f < 10.4$	1000	-25
5	$10.4 \leq \Delta f < 12.5$	1000	-25

### 2.1.6.2.2 Transmitter Spurious Emission (conducted)

The limits shown in the Table 40, Table 41, Table 42 and Table 43 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency. In the table,  $f$  is the frequency of the spurious domain emissions.

In all of the following tables, measurement uncertainty (as defined in ITU-R M.1545) values corresponding to spurious emission limits have not been included here.

**Table 40. Spurious Emissions for 5 MHz Channel Size; Relevant to  $2498.5 \leq f_c \leq 2687.5$  (BCG 3.B)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36

2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 13.45 \text{ GHz}$	30 kHz If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz If $60 \text{ MHz} \leq \Delta f$	-30

**Table 41. Spurious Emissions for 10 MHz Channel Size; Relevant to  $2501 \leq f_c \leq 2685$  (BCG 3.B)**

No	Spurious frequency (f) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 13.45 \text{ GHz}$	30 kHz If $25 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz If $60 \text{ MHz} \leq \Delta f$	-30

**Table 42. Additional Spurious Emissions for 5 MHz Channel Size; Relevant to  $2498.5 \leq f_c \leq 2687.5$  (BCG 3.B)**

No	Spurious frequency (f) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	2110-2170	1	-50
2	1805-1880	1	-50
3	2620-2690	1	-50
4	925-960	1	-50
5	1900-1920	1	-50
6	2010-2025	1	-50
7	2570-2620	1	-50

**Table 43. Additional Spurious Emissions for 10 MHz Channel Size; Relevant to  $2498.5 \leq f_c \leq 2687.5$  (BCG 3.B)**



No	Spurious frequency ( <i>f</i> ) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	2110-2170	1	-50
2	1805-1880	1	-50
3	2620-2690	1	-50
4	925-960	1	-50
5	1900-1920	1	-50
6	2010-2025	1	-50
7	2570-2620	1	-50

## 2.1.7 Band Class 5

### 2.1.7.1 Band Class Group 5.A

#### 2.1.7.1.1 Channel Spectral Mask

The spectrum emission mask of the MS applies to frequency offsets between 2.5 MHz and 12.5 MHz on both sides of the MS center 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 MS carrier measured in the 5 MHz channel.

The MS emission shall not exceed the levels specified in Table 44. Assuming specific power classes, relative specifications of Table 44 can be converted to absolute values for testing purposes.

In additions, for center carrier frequencies within 3650-3700 MHz range, all emission levels shall not exceed -13 dBm/MHz.

**Table 44. Channel Mask for 5 MHz Channel Bandwidth (BCG 5.A)**

No	Frequency offset $\Delta f$ (MHz)	Maximum Emission Level (dBc)	Measurement bandwidth
1	$2.5 \leq \Delta f < 3.5$	$-33.5-15(\Delta f-2.5)$	30 kHz
2	$3.5 \leq \Delta f < 7.5$	$-33.5-1(\Delta f-3.5)$	1 MHz
3	$7.5 \leq \Delta f < 8.5$	$-37.5-10(\Delta f-7.5)$	1 MHz
4	$8.5 \leq \Delta f \leq 12.5$	-47.5	1 MHz

Notes:

- $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
- The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 2.515 MHz; the last is at  $\Delta f$  equals to 3.485 MHz.
- The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 4 MHz; the last is at  $\Delta f$  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 that equivalent PSD type mask can be derived by applying  $10 \cdot \log((5 \text{ MHz})/(30 \text{ kHz})) = 22.2 \text{ dB}$  and  $10 \cdot \log((5 \text{ MHz})/(1 \text{ MHz})) = 7 \text{ dB}$  scaling factor for 30 kHz and 1 MHz measurement bandwidth respectively.

### 2.1.7.1.2 Spurious Emission Specification

The limits shown in Table 45 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency (i.e. 12.5 MHz). In the table,  $f$  is the frequency of the spurious domain emissions. All spurious emission specifications are of conducted type.

**Table 45. Spurious Emissions for 5 MHz Channel Size; Relevant to  $3402.5 \leq f_c \leq 3797.5$  (BCG 5.A)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 19 \text{ GHz}$	30 kHz If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz If $60 \text{ MHz} \leq \Delta f$	-30

## 2.1.7.2 Band Class Group 5.B

### 2.1.7.2.1 Channel Spectral Mask

The spectrum emission mask of the MS applies to frequency offsets between 3.5 MHz and 17.5 MHz on both sides of the MS center 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 MS carrier measured in the 7 MHz channel.

The MS emission shall not exceed the levels specified in Table 40. Assuming specific power classes, relative specifications of Table 40 can be converted to absolute values for testing purposes.

In additions, for center carrier frequencies within 3650-3700 MHz range, all emission levels shall not exceed -13 dBm/MHz.

**Table 46. Channel Mask for 7 MHz Channel Bandwidth (BCG 5.B)**

No	Frequency offset $\Delta f$ (MHz)	Maximum Emission Level (dBc)	Measurement bandwidth
1	$3.5 \leq \Delta f < 4.75$	$-33.5-13.5(\Delta f-3.5)$	30 kHz
2	$4.75 \leq \Delta f < 10.5$	$-35.5-0.7(\Delta f-4.75)$	1 MHz
3	$10.5 \leq \Delta f < 11.9$	$-39.0-7(\Delta f-10.5)$	1 MHz
4	$11.9 \leq \Delta f \leq 17.5$	-49.0	1 MHz

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 3.515 MHz; the last is at  $\Delta f$  equals to 4.735 MHz.
3. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 5.25 MHz; the last is at  $\Delta f$  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.
4. Note that equivalent PSD type mask can be derived by applying  $10 \cdot \log((7 \text{ MHz})/(30 \text{ kHz})) = 23.7 \text{ dB}$  and  $10 \cdot \log((7 \text{ MHz})/(1 \text{ MHz})) = 8.5 \text{ dB}$  scaling factor for 30 kHz and 1 MHz measurement bandwidth respectively.

### 2.1.7.2.2 Spurious Emission Specification

The limits shown in Table 47 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency (i.e. 17.5 MHz). In the table,  $f$  is the frequency of the spurious domain emissions. All spurious emission specifications are of conducted type.

**Table 47. Spurious Emissions for 7 MHz Channel Size; Relevant to  $3403.5 \leq f_c \leq 3796.5$  (BCG 5.B)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 19 \text{ GHz}$	30 kHz    If $17.5 \text{ MHz} \leq \Delta f < 70 \text{ MHz}$ 300 kHz    If $70 \text{ MHz} \leq \Delta f < 84 \text{ MHz}$ 1 MHz    If $84 \text{ MHz} \leq \Delta f$	-30

**2.1.7.3 Band Class Group 5.C**

**2.1.7.3.1 Channel Spectral Mask**

The spectrum emission mask of the MS applies to frequency offsets between 5.0 MHz and 25.0 MHz on both sides of the MS center 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 MS carrier measured in the 10 MHz channel.

The MS emission shall not exceed the levels specified in

Table 48. Assuming specific power classes, relative specifications of

Table 48 can be converted to absolute values for testing purposes.

In additions, for center carrier frequencies within 3650-3700 MHz range, all emission levels shall not exceed -13 dBm/MHz.

**Table 48. Channel Mask for 10 MHz Channel Bandwidth (BCG 5.C)**

No	Frequency offset $\Delta f$ (MHz)	Maximum Emission Level (dBc)	Measurement bandwidth
1	$5.0 \leq \Delta f < 7.0$	$-33.5-9(\Delta f-5.0)$	30 kHz
2	$7.0 \leq \Delta f < 15.0$	$-36.5-0.5(\Delta f-7.0)$	1 MHz
3	$15.0 \leq \Delta f < 17.0$	$-40.5-5(\Delta f-15.0)$	1 MHz
4	$17.0 \leq \Delta f \leq 25.0$	-50.5	1 MHz

Notes:

- $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
- The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 510.015 MHz; the last is at  $\Delta f$  equals to 6.985 MHz.
- The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 7.5 MHz; the last is at  $\Delta f$  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.
- Equivalent PSD type mask can be derived by applying  $10 \cdot \log((10 \text{ MHz})/(30 \text{ kHz})) = 25.2 \text{ dB}$  and  $10 \cdot \log((10 \text{ MHz})/(1 \text{ MHz})) = 10 \text{ dB}$  scaling factor for 30 kHz and 1 MHz measurement bandwidth respectively.

### 2.1.7.3.2 Spurious Emission Specification

The limits shown in Table 30 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency (i.e. 25.0 MHz). In the table,  $f$  is the frequency of the spurious domain emissions. All spurious emission specifications are of conducted type.

**Table 49. Spurious Emissions for 10 MHz Channel Size; Relevant to  $3405 \leq f_c \leq 3795$  (BCG 5.C)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 19 \text{ GHz}$	30 kHz If $25 \text{ MHz} \leq \Delta f < 100 \text{ MHz}$ 300 kHz If $100 \text{ MHz} \leq \Delta f < 120 \text{ MHz}$ 1 MHz If $120 \text{ MHz} \leq \Delta f$	-30

## 2.1.8 Band Class 6

### 2.1.8.1 Band Class Group 6.A

#### 2.1.8.1.1 Channel Spectral Mask

Table 50 and Table 51 specify the spectrum emission for FDD Mobile Stations with 10 and 5 MHz channel bandwidths.

**Table 50. Channel Mask for 10 MHz Bandwidth (BCG 6.A)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 6$	100	-13
2	$6 \leq \Delta f \leq 25$	1000	-13

**Table 51. Channel Mask for 5 MHz Bandwidth (BCG 6.A)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/integration BW) at the antenna port
1	$2.5 \leq \Delta f < 3.5$	50	-13
2	$3.5 \leq \Delta f \leq 12.5$	1000	-13

Note:

1. Protection specification beyond 25 MHz (250% of the bandwidth) is specified in the spurious emissions specification.

#### 2.1.8.1.2 Spurious Emission Specifications

Table 52 and Table 53 specify the spurious emission limits for 5 and 10 MHz channel bandwidth respectively. The limits shown in the tables are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency. In the table,  $f$  is the frequency of the spurious domain emissions.

In Table 52 and Table 53, measurement uncertainty (as defined in ITU-R M.1545) values corresponding to spurious emission limits have not been included.

**Table 52. Spurious Emissions for 5 MHz Channel Size; Relevant to  $1712.5 \leq f_c \leq 1767.5$  (BCG 6.A)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} \leq f < 8.775 \text{ GHz}, 12.5 \text{ MHz} \leq \Delta f$	1	-13

**Table 53. Spurious Emissions for 10 MHz Channel Size; Relevant to  $1715 \leq f_c \leq 1765$  (BCG 6.A)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} \leq f < 8.775 \text{ GHz}, 25 \text{ MHz} \leq \Delta f$	1	-13

### 2.1.8.2 Band Class Group 6.B

#### 2.1.8.2.1 Channel Spectral Mask

Table 54 and Table 55 specify the spectrum emission for FDD Mobile Stations with 5 and 10 MHz channel bandwidths.

**Table 54. Channel Mask for 5 MHz Bandwidth (BCG 6.B)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 3.5$	30	-15
2	$3.5 \leq \Delta f < 5.0$	1000	-10
3	$5.0 \leq \Delta f < 7.5$	1000	-10
4	$7.5 \leq \Delta f < 8.5$	1000	-13
5	$8.5 \leq \Delta f \leq 12.5$	1000	-25

Notes:

1. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 2.515 MHz; the last is at  $\Delta f$  equals to 3.485 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 4.0 MHz; the last is at  $\Delta f$  equals to 12.0 MHz.

**Table 55. Channel Mask for 10 MHz Bandwidth (BCG 6.B)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.0 \leq \Delta f < 6.0$	30	-18
2	$6.0 \leq \Delta f < 7.5$	1000	-10
3	$7.5.0 \leq \Delta f < 10.0$	1000	-10



4	$10.0 \leq \Delta f \leq 11.0$	1000	-13
5	$11.0 \leq \Delta f < 15.0$	1000	-13
6	$15.0 \leq \Delta f \leq 25.0$	1000	-25

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 5.015 MHz; the last is at  $\Delta f$  equals to 5.985 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 6.5 MHz; the last is at  $\Delta f$  equals to 24.5 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

Table 56 specifies the spectrum emission mask for FDD Mobile Stations with 20 MHz channel bandwidth.

**Table 56. Channel Mask for 20 MHz (BCG 6.B)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$10 \leq \Delta f < 11$	200	-13
2	$11 \leq \Delta f < 15$	1000	-10
3	$15 \leq \Delta f < 30$	1000	-13
4	$30 \leq \Delta f \leq 50$	1000	-25

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 10.05 MHz; the last is at  $\Delta f$  equals to 19.95 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 20.5 MHz; the last is at  $\Delta f$  equals to 49.5 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

#### 2.1.8.2.2 Transmitter Spurious Emission Specification (conducted)

Table 57 and Table 58 specify the spurious emission limits for 5 and 10 MHz channel bandwidth respectively while Table 59 and Table 60 specify the additional spurious emission limits for 5 and 10 MHz channel bandwidth. The limits shown in the tables are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency. In the table,  $f$  is the frequency of the spurious domain emissions.

In Table 57, Table 58, Table 59 and Table 60 measurement uncertainty (as defined in ITU-R M.1545) values corresponding to spurious emission limits have not been included.

**Table 57. Spurious Emissions for 5 MHz Channel Size; Relevant to  $1922.5 \leq f_c \leq 1977.5$  (BCG 6.B)**

No	Measurement frequency range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ GHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 9.900 \text{ GHz}$ , $12.5 \text{ MHz} \leq \Delta f$	1 MHz	-30

**Table 58. Spurious Emissions for 10 MHz Channel Size; Relevant to  $1925 \leq f_c \leq 1975$  (BCG 6.B)**

No	Measurement frequency range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ GHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 9.900 \text{ GHz}$ , $25 \text{ MHz} \leq \Delta f$	1 MHz	-30

**Table 59. Additional Spurious Emissions for 5 MHz Channel Size; Relevant to  $1922.5 \leq f_c \leq 1977.5$  (BCG 6.B)**

No	Spurious frequency ( <i>f</i> ) range (MHz)	Measurement bandwidth	Maximum Emission Level (dBm)
1	2110-2170	1 MHz	-50
2	1805-1880	1 MHz	-50
3	2620-2690	1 MHz	-50
4	925-960	1 MHz	-50
5	1844.9-1879.9	1 MHz	-50
6	1475.9-1500.9	1 MHz	-50
7	1900-1920	1 MHz	-50
8	2010-2025	1 MHz	-50
9	2570-2620	1 MHz	-50
11	1880-1920	1 MHz	-50
12	2300-2400	1 MHz	-50
13	860-895	1 MHz	-50
14	1884.5-1919.6	300 KHz	-41

**Table 60. Additional Spurious Emissions for 10 MHz Channel Size; Relevant to  $1925 \leq f_c \leq 1975$  (BCG 6.B)**

No	Spurious frequency ( <i>f</i> ) range (MHz)	Measurement bandwidth	Maximum Emission Level (dBm)
1	2110-2170	1 MHz	-50
2	1805-1880	1 MHz	-50
3	2620-2690	1 MHz	-50
4	925-960	1 MHz	-50
5	1844.9-1879.9	1 MHz	-50
6	1475.9-1500.9	1 MHz	-50
7	1900-1920	1 MHz	-50
8	2010-2025	1 MHz	-50
9	2570-2620	1 MHz	-50
11	1880-1920	1 MHz	-50
12	2300-2400	1 MHz	-50
13	860-895	1 MHz	-50
14	1884.5-1919.6	300 KHz	-41

Table 58 and Table 60 specify the basic and additional spurious emission specifications for FDD Mobile Stations with 20 MHz channel bandwidth.

**Table 61. Spurious Emissions for 20 MHz Channel Size; Relevant to  $1930 \leq f_c \leq 1970$  (BCG 6.B)**

No	Measurement frequency range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 9.900 \text{ GHz}, 25 \text{ MHz} \leq \Delta f$	1 MHz	-30

**Table 62. Additional Spurious Emissions for 20 MHz Channel Size; Relevant to  $1930 \leq f_c \leq 1970$  (BCG 6.B)**

No	Spurious frequency ( $f$ ) range (MHz)	Measurement bandwidth	Maximum Emission Level (dBm)
1	2110-2170	1 MHz	-50
2	1805-1880	1 MHz	-50
3	2620-2690	1 MHz	-50
4	925-960	1 MHz	-50
5	1844.9-1879.9	1 MHz	-50
6	1475.9-1500.9	1 MHz	-50
7	1900-1920	1 MHz	-50
8	2010-2025	1 MHz	-50
9	2570-2620	1 MHz	-50
11	1880-1920	1 MHz	-50
12	2300-2400	1 MHz	-50
13	860-895	1 MHz	-50
14	1884.5-1919.6	300 KHz	-41

### 2.1.8.3 Band Class Group 6.C

#### 2.1.8.3.1 Channel Spectral Mask

Table 63 specifies MS Spectrum Emission Mask for 5 MHz channel bandwidth while Table 64 specifies MS Spectrum Emission Mask for 10 MHz channel bandwidth.

**Table 63. Channel Mask for 5 MHz (BCG 6.C)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 3.5$	50	-13
2	$3.5 \leq \Delta f < 7.5$	1000	-10
3	$7.5 \leq \Delta f < 8.5$	1000	-13
4	$8.5 \leq \Delta f \leq 12.5$	1000	-25

**Table 64. Channel Mask for 10 MHz (BCG 6.C)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.0 \leq \Delta f < 6.0$	50	-13

2	$6.0 \leq \Delta f < 10.0$	1000	-10
3	$10.0 \leq \Delta f < 11.0$	1000	-13
4	$11.0 \leq \Delta f \leq 25.0$	1000	-25

### 2.1.8.3.2 Transmitter Spurious Emission Specification (conducted)

The spurious emission limits specified in Table 65 and Table 66 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency.

**Table 65. Spurious Emission (BCG 6.C)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range	Integration Bandwidth	Maximum Emission Level (dBm)
1.	1710-1785	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2.	1710-1785	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3.	1710-1785	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4.	1710-1785	$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	30 kHz, If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz, If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz, If $60 \text{ MHz} \leq \Delta f$	-30

**Table 66. Additional Spurious Emission (BCG 6.C)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range (MHz)	Measurement Bandwidth (MHz)	Maximum Emission Level (dBm)
1.	1710-1785	925-960	1	-50
2.	1710-1785	1475.9–1500.9	1	-50
3.	1710-1785	1805-1880	1	-50
4.	1710-1785	1844.9–1879.9	1	-50
5.	1710-1785	1900–1920	1	-50
6.	1710-1785	2010–2025	1	-50
7.	1710-1785	2110-2170	1	-50
8.	1710-1785	2570–2620	1	-50
9.	1710-1785	2620-2690	1	-50
10.	1710-1785	2300–2400	1	-50
11.	1710-1785	791-821	1	-50

### 2.1.8.3.3 Adjacent Channel Leakage Ratio (ACLR)

For 5 and 10 MHz BW Band Class Group 6.C, the ACLR shall be equal to or greater than the limits specified in Table 67 and Table 68 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 Table 67 and Table 68, the ACLR specifications are shown. Measurement uncertainty (as defined in ITU-R M.1545) values corresponding to the ACLR limits have not been included.

**Table 67. ACLR Specification for 5 MHz Channel BW MS (BCG 6.C)**

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

**Table 68. ACLR Specifications for 10 MHz Channel BW MS (BCG 6.C)**

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

## 2.1.9 Band Class 7

### 2.1.9.1 Band Class Group 7.A

#### 2.1.9.1.1 Channel Spectral Mask

Table 69 and Table 70 specify the spectrum emission mask with 5 MHz channel bandwidths.

**Table 69. Channel Mask for 5 MHz Bandwidth:  $700.5 \leq f_c \leq 795.5$  (BCG 7.A)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 2.6$	30	-13
2	$2.6 \leq \Delta f < 12.5$	100	-13

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 2.515 MHz; the last is at  $\Delta f$  equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.650 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.

**Table 70. Channel Mask for 5 MHz Bandwidth:  $799.5 \leq f_c \leq 859.5$  (BCG 7.A)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (MHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 7.5$	5	1.6
2	$7.5 \leq \Delta f < 12.5$	2	-10

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The measurement position with a 5 MHz filter is at  $\Delta f$  equals to 5 MHz. The first measurement position with a 2 MHz filter is at  $\Delta f$  equals to 8.5 MHz; the last is at  $\Delta f$  equals to 11.5 MHz.

Table 71 and Table 72 specify the spectrum emission mask with 7 MHz channel bandwidths.

**Table 71. Channel Mask for 7 MHz Bandwidth:  $701.5 \leq f_c \leq 7944.5$  (BCG 7.A)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$3.5 \leq \Delta f < 3.6$	30	-13
2	$3.6 \leq \Delta f < 17.5$	100	-13

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 3.515 MHz; the last is at  $\Delta f$  equals to 3.585 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 3.650 MHz; the last is at  $\Delta f$  equals to 17.450 MHz.

**Table 72. Channel Mask for 7 MHz Bandwidth:  $800.5 \leq f_c \leq 858.5$  (BCG 7.A)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (MHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$3.5 \leq \Delta f < 8.5$	5	1.6
2	$8.5 \leq \Delta f < 17.5$	2	-10

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The measurement position with a 5 MHz filter is at  $\Delta f$  equals to 6 MHz. The first measurement position with a 2 MHz filter is at  $\Delta f$  equals to 9.5 MHz; the last is at  $\Delta f$  equals to 16.5 MHz.



Table 73 and Table 74 specify the spectrum emission mask with 10 MHz channel bandwidths.

**Table 73. Channel Mask for 10 MHz Bandwidth:  $703 \leq f_c \leq 793$  (BCG 7.A)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.0 \leq \Delta f < 5.1$	30	-13
2	$5.1 \leq \Delta f \leq 25.0$	100	-13

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 5.015 MHz; the last is at  $\Delta f$  equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.150 MHz; the last is at  $\Delta f$  equals to 24.950 MHz.

**Table 74. Channel Mask for 10 MHz Bandwidth:  $802 \leq f_c \leq 857$  (BCG 7.A)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (MHz)	Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 10$	5	1.6
2	$10 \leq \Delta f \leq 25$	2	-10

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The measurement position with a 5 MHz filter is at  $\Delta f$  equals to 7.5 MHz. The first measurement position with a 2 MHz filter is at  $\Delta f$  equals to 11 MHz; the last is at  $\Delta f$  equals to 24 MHz.

### 2.1.9.1.2 Transmitter Spurious Emission Specification (conducted)

Table 75, Table 76 and Table 77 specify the spurious emission limits for 5, 7 and 10 MHz channel bandwidth sizes respectively.

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

**Table 75. Spurious Emissions for 5 MHz Channel Size (BCG 7.A)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	698-798	$30 \leq f < 4310$ (12.5 MHz $\leq \Delta f$ )	100	-13
2	746-758, 776-788	$763 \leq f \leq 775, 793 \leq f \leq 805$	6.25	-35
3	758-763, 763-768, 788-793, 793-798	$769 \leq f \leq 775, 799 \leq f \leq 805$	6.25	-35
4	797-862	$797 \leq f \leq 862$ (12.5 MHz $\leq \Delta f$ )	5000	-37
5	797-862	$790 \leq f \leq 791$	1000	-44
6	797-862	$470 \leq f \leq 790$	8000	-65

**Table 76. Spurious Emissions for 7 MHz Channel Size (BCG 7.A)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	698-798	$30 \leq f < 4310$ (17.5 MHz $\leq \Delta f$ )	100	-13
2	746-758, 776-788	$763 \leq f \leq 775, 793 \leq f \leq 805$	6.25	-35
3	758-768, 788-798	$769 \leq f \leq 775, 799 \leq f \leq 805$	6.25	-35
4	797-862	$797 \leq f \leq 862$ (17.5 MHz $\leq \Delta f$ )	5000	-37
5	797-862	$790 \leq f \leq 791$	1000	-44
6	797-862	$470 \leq f \leq 790$	8000	-65

**Table 77. Spurious Emissions for 10 MHz Channel Size (BCG 7.A)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	698-798	$30 \leq f < 4310$ (25 MHz $\leq \Delta f$ )	100	-13
2	746-758, 776-788	$763 \leq f \leq 775, 793 \leq f \leq 805$	6.25	-35
3	758-768, 788-798	$769 \leq f \leq 775, 799 \leq f \leq 805$	6.25	-35
4	797-862	$797 \leq f \leq 862$ (25 MHz $\leq \Delta f$ )	5000	-37
5	797-862	$790 \leq f \leq 791$	1000	-44
6	797-862	$470 \leq f \leq 790$	8000	-65

## 2.1.9.2 Band Class Group 7.B

### 2.1.9.2.1 Channel Spectral Mask

Table 78 and Table 79 specify the spectrum emission mask with 5 and 10 MHz channel bandwidths.

**Table 78. Channel Mask for 5 MHz Bandwidth (BCG 7.B)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 2.6$	30	-13
2	$2.6 \leq \Delta f \leq 12.5$	100	-13

Notes:

- $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
- The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 2.515 MHz; the last is at  $\Delta f$  equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.650 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.

**Table 79. Channel Mask for 10 MHz Bandwidth (BCG 7.B)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.0 \leq \Delta f < 5.1$	30	-13
2	$5.1 \leq \Delta f \leq 25.0$	100	-13

Notes:

- $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
- The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 5.015 MHz; the last is at  $\Delta f$  equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.150 MHz; the last is at  $\Delta f$  equals to 24.950 MHz.

### 2.1.9.2.2 Transmitter Spurious Emission Specification (conducted)

Table 80 and Table 81 specify the spurious emission limits for 5 and 10 MHz channel bandwidth sizes respectively.

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

**Table 80. Spurious Emissions for 5 MHz Channel Size (BCG 7.B)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	776-787	$30 \leq f < 4310$ ( $12.5 \text{ MHz} \leq \Delta f$ )	100	-13
2	776-787	$763 \leq f \leq 775, 793 \leq f \leq 805$	6.25	-35

**Table 81. Spurious Emissions for 10 MHz Channel Size (BCG 7.B)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	776-787	$30 \leq f < 4310$ ( $25 \text{ MHz} \leq \Delta f$ )	100	-13
2	776-787	$763 \leq f \leq 775, 793 \leq f \leq 805$	6.25	-35

### 2.1.9.3 Band Class Group 7.C

#### 2.1.9.3.1 Channel Spectral Mask

Table 82 and Table 83 specify the spectrum emission mask with 5 and 10 MHz channel bandwidths.

**Table 82. Channel Mask for 5 MHz Bandwidth (BCG 7.C)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 2.6$	30	-13
2	$2.6 \leq \Delta f \leq 12.5$	100	-13

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 2.515 MHz; the last is at  $\Delta f$  equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.650 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.

**Table 83. Channel Mask for 10 MHz Bandwidth (BCG 7.C)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.0 \leq \Delta f < 5.1$	30	-13
2	$5.1 \leq \Delta f \leq 25.0$	100	-13

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 5.015 MHz; the last is at  $\Delta f$  equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.150 MHz; the last is at  $\Delta f$  equals to 24.950 MHz.

### 2.1.9.3.2 Transmitter Spurious Emission Specification (conducted)

Table 84 specifies the spurious emission limits for 5 MHz channel bandwidth size. In this section, measurement uncertainty (as defined in ITU-R M.1545) values corresponding to spurious emission limits have not been included.

**Table 84. Spurious Emissions for 5 MHz Channel Size (BCG 7.C)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	788-793, 793-798	$30 \leq f < 4310$ ( $12.5 \text{ MHz} \leq \Delta f$ )	100	-13
2	788-793, 793-798	$769 \leq f \leq 775, 799 \leq f \leq 805$	6.25	-35

### 2.1.9.4 Band Class Group 7.D

#### 2.1.9.4.1 Channel Spectral Mask

Table 85 and Table 86 specify the spectrum emission mask with 5 and 10 MHz channel bandwidths.

**Table 85. Channel Mask for 5 MHz Bandwidth (BCG 7.D)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 2.6$	30	-13
2	$2.6 \leq \Delta f \leq 12.5$	100	-13

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 2.515 MHz; the last is at  $\Delta f$  equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.650 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.

**Table 86. Channel Mask for 10 MHz Bandwidth (BCG 7.D)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.0 \leq \Delta f < 5.1$	30	-13
2	$5.1 \leq \Delta f \leq 25.0$	100	-13

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 5.015 MHz; the last is at  $\Delta f$  equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.150 MHz; the last is at  $\Delta f$  equals to 24.950 MHz.

#### 2.1.9.4.2 Transmitter Spurious Emission Specification (conducted)

Table 87 specifies the spurious emission limits for 10 MHz channel bandwidth size.

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

**Table 87. Spurious Emissions for 10 MHz Channel Size (BCG 7.D)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	788-798	$30 \leq f < 4310$ ( $25 \text{ MHz} \leq \Delta f$ )	100	-13
2	788-798	$769 \leq f \leq 775, 799 \leq f \leq 805$	6.25	-35

### 2.1.9.5 Band Class Group 7.E

#### 2.1.9.5.1 Channel Spectral Mask

Table 88 and Table 89 specify the spectrum emission mask with 5 MHz channel bandwidths.

**Table 88. Channel Mask for 5 MHz Bandwidth:  $700.5 \leq f_c \leq 795.5$  (BCG 7.E)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 2.6$	30	-13
2	$2.6 \leq \Delta f \leq 12.5$	100	-13

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 2.515 MHz; the last is at  $\Delta f$  equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.650 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.

**Table 89. Channel Mask for 5 MHz Bandwidth:  $799.5 \leq f_c \leq 859.5$  (BCG 7.E)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (MHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 7.5$	5	1.6
2	$7.5 \leq \Delta f \leq 12.5$	2	-10

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The measurement position with a 5 MHz filter is at  $\Delta f$  equals to 5 MHz. The first measurement position with a 2 MHz filter is at  $\Delta f$  equals to 8.5 MHz; the last is at  $\Delta f$  equals to 11.5 MHz.

Table 90 and Table 91 specify the spectrum emission mask with 7 MHz channel bandwidths.

**Table 90. Channel Mask for 7 MHz Bandwidth:  $701.5 \leq f_c \leq 7944.5$  (BCG 7.E)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$3.5 \leq \Delta f < 3.6$	30	-13

2	$3.6 \leq \Delta f \leq 17.5$	100	-13
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Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 3.515 MHz; the last is at  $\Delta f$  equals to 3.585 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 3.650 MHz; the last is at  $\Delta f$  equals to 17.450 MHz.

**Table 91. Channel Mask for 7 MHz Bandwidth:  $800.5 \leq f_c \leq 858.5$  (BCG 7.E)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (MHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$3.5 \leq \Delta f < 8.5$	5	1.6
2	$8.5 \leq \Delta f < 13.5$	2	-10
3	$13.5 \leq \Delta f \leq 17.5$	1	-25

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The measurement position with a 5 MHz filter is at  $\Delta f$  equals to 6 MHz. The first measurement position with a 2 MHz filter is at  $\Delta f$  equals to 9.5 MHz; the last is at  $\Delta f$  equals to 12.5 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 14 MHz; the last is at  $\Delta f$  equals to 17 MHz.
3. The emission level of Segment 3 is only applicable when  $835.5 \leq f_c \leq 858.5$

Table 92 and Table 93 specify the spectrum emission mask with 10 MHz channel bandwidths.

**Table 92. Channel Mask for 10 MHz Bandwidth:  $703 \leq f_c \leq 793$  (BCG 7.E)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.0 \leq \Delta f < 5.1$	30	-13
2	$5.1 \leq \Delta f \leq 25.0$	100	-13



Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 5.015 MHz; the last is at  $\Delta f$  equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.150 MHz; the last is at  $\Delta f$  equals to 24.950 MHz.

**Table 93. Channel Mask for 10 MHz Bandwidth:  $802 \leq f_c \leq 857$  (BCG 7.E)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (MHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 10$	5	1.6
2	$10 \leq \Delta f \leq 15$	2	-10
3	$15 \leq \Delta f < 25$	1	-25

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The measurement position with a 5 MHz filter is at  $\Delta f$  equals to 7.5 MHz. The first measurement position with a 2 MHz filter is at  $\Delta f$  equals to 11 MHz; the last is at  $\Delta f$  equals to 14 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 15.5 MHz; the last is at  $\Delta f$  equals to 24.5 MHz.
3. The emission level of Segment 3 is only applicable when  $837 \leq f_c \leq 857$

### 2.1.9.5.2 Transmitter Spurious Emission Specification (conducted)

Table 94, Table 95 and Table 96 specify the spurious emission limits for 5, 7 and 10 MHz channel bandwidth sizes respectively.

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

**Table 94. Spurious Emissions for 5 MHz Channel Size (BCG 7.E)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	698-798	$30 \leq f < 4310$ ( $12.5 \text{ MHz} \leq \Delta f$ )	100	-13
2	746-758, 776-788	$763 \leq f \leq 775, 793 \leq f \leq 805$	6.25	-35
3	758-763, 763-768, 788-793, 793-798	$769 \leq f \leq 775, 799 \leq f \leq 805$	6.25	-35
4	791-862	$797 \leq f \leq 862$	5000	-37

		(12.5 MHz ≤ Δf)		
5	797-862	790 ≤ f ≤ 791	1000	-44
6	832-862	821 ≤ f ≤ 862 (12.5 MHz ≤ Δf)	1000	-25
7	832-862	470 ≤ f ≤ 790	8000	-65

**Table 95. Spurious Emissions for 7 MHz Channel Size (BCG 7.E)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	698-798	30 ≤ f < 4310 (17.5 MHz ≤ Δf)	100	-13
2	746-758, 776-788	763 ≤ f ≤ 775, 793 ≤ f ≤ 805	6.25	-35
3	758-763, 763-768, 788-793, 793-798	769 ≤ f ≤ 775, 799 ≤ f ≤ 805	6.25	-35
4	797-862	797 ≤ f ≤ 862 (17.5 MHz ≤ Δf)	5000	-37
5	797-862	790 ≤ f ≤ 791	1000	-44
6	832-862	821 ≤ f ≤ 862 (17.5 MHz ≤ Δf)	1000	-25
7	832-862	470 ≤ f ≤ 790	8000	-65

**Table 96. Spurious Emissions for 10 MHz Channel Size (BCG 7.E)**

No	Transmit frequency range (MHz)	Measurement frequency range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	698-798	30 ≤ f < 4310 (25 MHz ≤ Δf)	100	-13
2	746-758, 776-788	763 ≤ f ≤ 775, 793 ≤ f ≤ 805	6.25	-35
3	758-763, 763-768, 788-793, 793-798	769 ≤ f ≤ 775, 799 ≤ f ≤ 805	6.25	-35
4	797-862	797 ≤ f ≤ 862 (25 MHz ≤ Δf)	5000	-37
5	797-862	790 ≤ f ≤ 791	1000	-44
6	832-862	821 ≤ f ≤ 862 (25 MHz ≤ Δf)	1000	-25
7	832-862	470 ≤ f ≤ 790	8000	-65

### 2.1.9.6 Band Class Group 7.G

#### 2.1.9.6.1 Channel Spectral Mask

Table 63 specifies MS Spectrum Emission Mask for 5 MHz channel bandwidth while Table 64 specifies MS Spectrum Emission Mask for 10 MHz channel bandwidth.

**Table 97. Channel Mask for 5 MHz (BCG 7.G)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 3.5$	50	-13
2	$3.5 \leq \Delta f < 7.5$	1000	-10
3	$7.5 \leq \Delta f < 8.5$	1000	-13
4	$8.5 \leq \Delta f \leq 12.5$	1000	-25

**Table 98. Channel Mask for 10 MHz (BCG 7.G)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.0 \leq \Delta f < 6.0$	50	-13
2	$6.0 \leq \Delta f < 10.0$	1000	-10
3	$10.0 \leq \Delta f < 11.0$	1000	-13
4	$11.0 \leq \Delta f \leq 25.0$	1000	-25

#### 2.1.9.6.2 Transmitter Spurious Emission Specification (conducted)

The spurious emission limits specified in Table 99 and Table 100 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency.

**Table 99. Spurious Emission (BCG 7.G)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range	Integration Bandwidth	Maximum Emission Level (dBm)
1.	880-915	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2.	880-915	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3.	880-915	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4.	880-915	$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	30 kHz, If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz, If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz, If $60 \text{ MHz} \leq \Delta f$	-30

**Table 100. Additional Spurious Emission (BCG 7.G)**

No	Transmitter Center Frequency (f <sub>c</sub> ) (MHz)	Spurious Frequency (f) Range (MHz)	Measurement Bandwidth (MHz)	Maximum Emission Level (dBm)
1.	880-915	925-960	1	-50
2.		1805-1880	1	-50
3.		1880-1920	1	-50
4.		1900-1920	1	-50
5.		2010-2025	1	-50
6.		2110-2170	1	-50
7.		2300-2400	1	-50
8.		2570-2620	1	-50
9.		2620-2690	1	-50
10.		791-821	1	-50

With respect to the spurious frequencies of Item 2 (entire range) and 9 (2640-2690 sub range) (entire range) of Table 100 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/100KHz) of Item 3 Table 99 is applicable.

**2.1.9.6.3 Adjacent Channel Leakage Ratio (ACLR)**

For 5 and 10 MHz BW Band Class Group 7.G, the ACLR shall be equal to or greater than the limits specified in Table 101 and Table 102 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 Table 94 and Table 95, the ACLR specifications are shown. Measurement uncertainty (as defined in ITU-R M.1545) values corresponding to the ACLR limits have not been included.

**Table 101. ACLR Specification for for 5 MHz Channel BW MS (BCG 7.G)**

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

**Table 102. ACLR Specifications for 10 MHz Channel BW MS (BCG 7.G)**

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

## 2.1.10 Band Class 8

### 2.1.10.1 Band Class Group 8.A

#### 2.1.10.1.1 Channel Spectral Mask

The Spectrum Emission Mask for 5 MHz bandwidth is specified in Table 103.

**Table 103. Channel Mask for 5 MHz Bandwidth (BCG 8.A)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/integration BW) at the antenna port
1	$2.5 \leq \Delta f_{to} < 3.5$	50	-13
2	$3.5 \leq \Delta f_{to} < 7.5$	1000	-10
3	$73.5 \leq \Delta f_{to} \leq 8.5$	1000	-13
4	$8.5 \leq \Delta f_{to} \leq 12.5$	1000	-25

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 50 KHz filter is at  $\Delta f$  equals to 2.525 MHz; the last is at  $\Delta f$  equals to 3.475 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 4.0 MHz; the last is at  $\Delta f$  equals to 12 MHz.

The Spectrum Emission Mask for 10 MHz bandwidth is specified in Table 104.

**Table 104. Channel Mask for 10 MHz Bandwidth (BCG 8.A)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 6$	100	-13
2	$6 \leq \Delta f < 10$	1000	-10
3	$106 \leq \Delta f \leq 15$	1000	-13
4	$15 \leq \Delta f \leq 25$	1000	-25

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 100 KHz filter is at  $\Delta f$  equals to 5.050 MHz; the last is at  $\Delta f$  equals to 5.950 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 6.5 MHz; the last is at  $\Delta f$  equals to 24.5 MHz.

**2.1.10.1.2 Transmitter Spurious Emission Specification (conducted)**

The limits shown in the Table 105, Table 41, Table 42, Table 43 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency. In the table,  $f$  is the frequency of the spurious domain emissions.

In all of the following tables, measurement uncertainty (as defined in ITU-R M.1545) values corresponding to spurious emission limits have not been included here.

**Table 105. Spurious Emissions for 5 MHz Channel Size (BCG 8.A)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range	Integration Bandwidth	Maximum Emission Level (dBm)
1.	1787.5-1802.5 1882.5-1917.5 1912.5-1927.5 2012.5-2022.5 1902.5-1917.5	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2.	1787.5-1802.5 1882.5-1917.5 1912.5-1927.5 2012.5-2022.5 1902.5-1917.5	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3.	1787.5-1802.5 1882.5-1917.5 1912.5-1927.5 2012.5-2022.5	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36

	1902.5-1917.5			
4.	1787.5-1802.5 1882.5-1917.5 1912.5-1927.5 2012.5-2022.5 1902.5-1917.5	$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	30 kHz, If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz, If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz, If $60 \text{ MHz} \leq \Delta f$	-30

**Table 106. Spurious Emissions for 10 MHz Channel Size (BCG 8.A)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range	Integration Bandwidth	Maximum Emission Level (dBm)
1.	1790-1800 1885-1915 1915-1925 2015-2020 1905-1915	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2.	1790-1800 1885-1915 1915-1925 2015-2020 1905-1915	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3.	1790-1800 1885-1915 1915-1925 2015-2020 1905-1915	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4.	1790-1800 1885-1915 1915-1925 2015-2020 1905-1915	$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	30 kHz, If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz, If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz, If $60 \text{ MHz} \leq \Delta f$	-30

**Table 107. Additional Spurious Emissions for 5 MHz Channel Size (BCG 8.A)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious frequency ( $f$ ) range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	1882.5-1917.5	2010–2025 2300-2400	1000	-50
2	1902.5-1917.5	925-960 1880-1920 1930-1990 2010-2025 2110-2170 2300-2400 2570-2620	1000	-50

3	2012.5-2022.5	2110-2170	1000	-50
		1805-1880		
		2620-2690		
		925-960		
		1844.9-1879.9		
		1475.9-1500.9		
		1900-1920		
		2570-2620		
		1880-1920		
		2300-2400		
		860-895	1000	-50
		1884.5-1919.6	300	-41

**Table 108. Additional Spurious Emissions for 10 MHz Channel Size (BCG 8.A)**

No	Transmitter Center Frequency (f <sub>c</sub> ) (MHz)	Spurious frequency (f) range (MHz)	Measurement bandwidth (KHz)	Maximum Emission Level (dBm)
1	1885-1915	2010-2025 2300-2400	1000	-50
2	1905-1915	925-960 1880-1920 1930-1990 2010-2025 2110-2170 2300-2400 2570-2620	1000	-50
3	2015-2020	2110-2170 1805-1880 2620-2690 925-960 1844.9-1879.9 1475.9-1500.9 1900-1920 2570-2620 1880-1920 2300-2400	1000	-50
		860-895	1000	-50



		1884.5-1919.6	300	-41
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### 2.1.10.2 Spurious Emission Specifications

Table 109 and Table 110 specify the spurious emission limits for 5 and 10 MHz channel bandwidth respectively. The limits shown in the tables are for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency. In the table,  $f$  is the frequency of the spurious domain emissions.

In Table 109 and Table 110, measurement uncertainty (as defined in ITU-R M.1545) values corresponding to spurious emission limits have not been included.

**Table 109. Spurious Emissions for 5 MHz Channel Size; Relevant to  $1802.5 \leq f_c \leq 1827.5$  (BCG 8.G)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} \leq f < 9.150 \text{ GHz}$ , $12.5 \text{ MHz} \leq \Delta f$	1	-13

**Table 110. Spurious Emissions for 10 MHz Channel Size; Relevant to  $1805 \leq f_c \leq 1825$  (BCG 8.G)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} \leq f < 9.150 \text{ GHz}$ , $25 \text{ MHz} \leq \Delta f$	1	-13

## 2.1.11 Band Class 9

### 2.1.11.1 Band Class Group 9.D

This section treats specification for Mobile Station of the BGC 9.D radio system configuration.

#### 2.1.11.1.1 Channel Spectral Mask

The channel spectral mask for BGC 9.D Mobile Station is effectively specified by the ACLR, which is provided in the Section 2.1.11.1.4.

In the BCG BGC 9.D application, the maximum transmission output power of Mobile Station is as large as +37dBm (5W), and the transmission filter may have to cover the bandwidth as wide as 30MHz to meet the system operation requirement. Considering these matters, the spectral masking level is specified equivalently by ACLR measurement relative to the carrier power of the 5MHz channel.

Note:

- Since the Japan radio ordinance of this VHF Public Safety band does not have article regulating channel spectral masking, it is specified with the ACLR number hereby.
- Protection specification outside the range of 160M - 215MHz (beyond 250% offset from the carrier frequency of the lowest and highest channels with the 5MHz bandwidth) is specified in the spurious emissions requirement.

#### 2.1.11.1.2 Transmitter Spurious Emission (conducted)

The limits shown in Table 111 is for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency. In the table,  $f$  is the frequency of the spurious domain emissions.

**Table 111. Spurious Emission for 5MHz Channel Size Mobile station; Relevant to  $170.0 < f_c < 202.5$  (BCG 9.D)**

No.	Spurious frequency (f) range	Measurement bandwidth	Maximum Emission Level
1	9kHz < f <= 150kHz	1kHz	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
2	150kHz < f <= 30MHz	10k	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
3	30MHz < f <= 160MHz	100k	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
3	160M < f <= 170M	100k	-30dBm (1uW)
4	207.5M < f <=215M	100k	-30dBm (1uW)
5	215MHz < f <= 1GHz	100k	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
6	1GHz < f	1M	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm

### 2.1.11.1.3 Receiver Spurious Emission (conducted)

The power of any narrow-band spurious emission should not exceed the maximum level specified in Table 112.

**Table 112. Receiver Spurious Emission for Mobile station (BCG 9.D)**

No.	Spurious frequency (f) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	9kHz <= f < 150kHz	1kHz	-54
2	150kHz <= f < 30MHz	10kHz	-54
3	30MHz <= f < 1000MHz	100kHz	-54
4	1000MHz <= f < 2505MHz	1MHz	-47
5	2505MHz <= f < 2535MHz	1MHz	-70
6	2535MHz <= f	1MHz	-47

### 2.1.11.1.4 Adjacent Channel Leakage Ratio (ACLR)

The ACLR is defined as the ratio of the on-channel transmitted power to the out of channel power leaking into adjacent channels and as measured at the output of the receiver filter. The first-adjacent and second-adjacent channel-centre frequency offsets relative to the assigned channel's centre frequency are 5 MHz and 10 MHz for the 5 MHz system.

**Table 113. ACLR Specification for 5MHz Channel BW Mobile station (BCG 9.D)**

No.	Adjacent channel frequency	Measurement bandwidth	Minimum required ACLR relative to the carrier power (dBc)
1	+/- 5MHz offset from MS channel center frequency	4.8M (= +/-2.4M)Hz	21
2	+/- 10MHz offset from MS channel center frequency	4.8M (= +/-2.4M)Hz	41

## 2.2 Base Station

The purpose of this section is to provide radio specification recommendations for Base Station. The specifications of this section are recommendations only and are not required or intended to be a basis for certification of Base Stations.

### 2.2.1 Default Specifications

#### 2.2.1.1 Default Channel Spectral Mask

The spectrum masks of Table 114 and Table 115 are applicable to all bands and all regions unless specific mask for a band or a region is specified in a relevant sub section of Section 2.2.

**Table 114. Channel Mask for 5 MHz Bandwidth**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 7.5$	100	$-7-7(\Delta f-2.55)/5$
2	$7.5 \leq \Delta f \leq 12.5$	100	-14

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.550 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

**Table 115. Channel Mask for 10 MHz Bandwidth**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 10$	100	$-7-7(\Delta f-5.05)/5$
2	$10 \leq \Delta f < 15$	100	-14
3	$15 \leq \Delta f \leq 25$	1000	-13

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
1. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.05 MHz; the last is at  $\Delta f$  equals to 14.95 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 15.5 MHz; the last is at  $\Delta f$  equals to 24.5 MHz.
2. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

### 2.2.1.2 Default Spurious Emission

Unless otherwise specified in sub sections of Section 2.2 for specific bands, the default spurious emission specifications of Table 6 are applicable.

**Table 116. Default Spurious Emissions; Relevant to  $F_{DL-le} + ChBW/2 \leq f_c \leq F_{DL-ue} - ChBW/2$**

No	Spurious frequency (f) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30\text{MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 5 \times F_{ue}$	30 kHz If $2.5 \times ChBW \leq \Delta f < 10 \times ChBW$ 300 kHz If $10 \times ChBW \leq \Delta f < 12 \times ChBW$ 1 MHz If $12 \times ChBW \leq \Delta f$	-30

### 2.2.1.3 Default Receiver Adjacent Channel Selectivity

The receiver adjacent and alternate channel selectivity (ACS) is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the interferer power level (in dB) relative to thermal noise (Nth)

To reference the receiver adjacent and alternate channel selectivity values properly, a sensitivity level is defined as the signal level for Bit Error Ratio (BER)  $\leq 10^{-6}$  (or equivalent PER) performance for AWGN channel, over the channel bandwidth (5 MHz or 10 MHz), corresponding to the most robust modulation and coding rate supported by the technology.

Nth is the receiver thermal noise of the equipment as declared by the manufacturer and is equal to  $kTBwF$  with Bw is the bandwidth of the equipment and F is the receiver noise figure.

Table 117 specifies the limits and the test parameters for the receiver ACS in the first adjacent channel and 2<sup>nd</sup> adjacent channels. For an assigned channel bandwidth BW, the interferer channel bandwidth of the same size is used. All the measurements are done over 95 % of the channel. The compliant systems meet a Bit Error Ratio (BER)  $< 10^{-6}$  (or equivalent PER) with the interference levels specified in the tables. Please note that depending on some assumed packet sizes, equivalent Packet Error Ratio (PER) criteria can be used alternatively.

Specific numbers for specific band supersedes these default numbers.

**Table 117. Limits and test parameters for receiver adjacent channel selectivity**

Description	In-channel	Interferer on 1 <sup>st</sup> adjacent channel	Interferer on 2 <sup>nd</sup> adjacent channel
ACS limits (dB)		40	50
Power (dBm)	$P_{\text{SENS}} + 3$	Nth +40	Nth +50
Centre frequency (MHz)	$f_c$	$f_c \pm \text{BW}$	$f_c \pm 2x\text{BW}$

#### 2.2.1.4 Default receiver blocking specification

Unless otherwise specified in sub sections of Section 2.2 for specific bands, the receiver blocking specifications of this clause are applicable.

The blocking characteristic is a performance measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interfering signal on frequencies other than those of the adjacent channels. The blocking performance requirement applies to interfering signals using a 1 MHz step size.

PSENS5 and PSENS10 are the sensitivity levels at  $\text{BER} \leq 10^{-6}$ , for 5 MHz and 10 MHz channels respectively, corresponding to the most robust modulation and coding rate supported by the base station. The wanted signal with the most robust modulation and coding supported by the base station shall be used. BER performance requirement at  $\text{BER} \leq 10^{-6}$  (or equivalent PER) shall be met when the following signals are coupled to the BS antenna input.

BER performance requirement at  $\text{BER} \leq 10^{-6}$  (or equivalent PER) shall be met when the following signals are coupled to the Base Station antenna input:

- A wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS5.
- Interfering signal needs to use the parameters of Table 118.

**Table 118. Blocking for 5 MHz channel bandwidth**

Centre frequency of interfering signal	Interfering signal mean power (dBm)	Minimum offset of interfering signal from the channel edge (MHz)	Type of interfering signal
<ul style="list-style-type: none"> <li>• According to Table 2 Uplink Channel Center Frequencies excluding first and second adjacent channels in the uplink frequency block (<math>F_{\text{UL}}</math> lower edge to <math>F_{\text{UL}}</math> upper edge)</li> </ul>	-40	12.5	<ul style="list-style-type: none"> <li>• Modulation and coding equal to those of the wanted signal</li> </ul>
<ul style="list-style-type: none"> <li>• <math>F_{\text{UL}}</math> lower edge - 20MHz to <math>F_{\text{UL}}</math> lower edge.</li> <li>• <math>F_{\text{UL}}</math> upper edge to <math>F_{\text{UL}}</math> upper edge + 20MHz.</li> </ul>	-40	12.5	<ul style="list-style-type: none"> <li>• Modulation and coding equal to those of the wanted signal</li> </ul>
<ul style="list-style-type: none"> <li>• 1 MHz to <math>F_{\text{UL}}</math> lower edge - 20MHz,</li> <li>• <math>F_{\text{UL}}</math> upper edge + 20MHz to 12 750 MHz</li> </ul>	-15	—	<ul style="list-style-type: none"> <li>• Carrier Wave</li> </ul>

BER performance requirement at  $BER \leq 10^{-6}$  (or equivalent PER) shall be met when the following signals are coupled to Mobile Station antenna input:

- A wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS10.
- Interfering signal needs to use the parameters of Table 119.

**Table 119. Blocking for 10 MHz channel bandwidth**

Centre frequency of interfering signal	Interfering signal mean power (dBm)	Minimum offset of interfering signal from the channel edge (MHz)	Type of interfering signal
<ul style="list-style-type: none"> <li>• According to Table 2 Uplink Channel Center Frequencies excluding first and second adjacent channels in the uplink frequency block (<math>F_{UL}</math> lower edge to <math>F_{UL}</math> upper edge)</li> </ul>	-40	25	<ul style="list-style-type: none"> <li>• Modulation and coding equal to those of the wanted signal</li> </ul>
<ul style="list-style-type: none"> <li>• <math>F_{UL}</math> lower edge - 20MHz to <math>F_{UL}</math> lower edge.</li> <li>• <math>F_{UL}</math> upper edge to <math>F_{UL}</math> upper edge + 20MHz.</li> </ul>	-40	25	<ul style="list-style-type: none"> <li>• Modulation and coding equal to those of the wanted signal</li> </ul>
<ul style="list-style-type: none"> <li>• 1 MHz to <math>F_{UL}</math> lower edge - 20MHz,</li> <li>• <math>F_{UL}</math> upper edge + 20MHz to 12 750 MHz</li> </ul>	-15	—	<ul style="list-style-type: none"> <li>• Carrier Wave</li> </ul>

### 2.2.1.5 Default receiver Intermodulation specification

Unless otherwise specified in sub sections of Section 2.2 for specific bands, the receiver Intermodulation specification of this clause are applicable.

Nonlinear mixing of the third and higher order of two interfering signals can produce an interfering signal in the band of the wanted signal. Intermodulation response rejection characteristic is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

BER performance requirement at  $BER \leq 10^{-6}$  (or equivalent PER) shall be met when the following signals are coupled to the Base Station antenna input.

- A wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS5.
- Two interfering signals needs to use the parameters of Table 120.

**Table 120. Receiver intermodulation characteristics for 5 MHz channel bandwidth**

Interfering Signal Mean Power (dBm)	Offset of Interfering Signal center frequency from the channel edge (MHz)	Type of Interfering Signal
<ul style="list-style-type: none"> <li>• -48</li> </ul>	<ul style="list-style-type: none"> <li>• 7.5</li> </ul>	<ul style="list-style-type: none"> <li>• Carrier Wave</li> </ul>
<ul style="list-style-type: none"> <li>• -48</li> </ul>	<ul style="list-style-type: none"> <li>• 17.5</li> </ul>	<ul style="list-style-type: none"> <li>• Modulation and coding equal to those of the wanted signal</li> </ul>

BER performance requirement at  $BER \leq 10^{-6}$  (or equivalent PER) shall be met when the following signals are coupled to Mobile Station antenna input.

- A wanted signal at the assigned channel frequency, with mean power 6 dB above PSENS10.
- Two interfering signals needs to use the parameters of Table 121.

**Table 121. Receiver intermodulation characteristics for 10 MHz channel bandwidth**

Interfering Signal Mean Power (dBm)	Offset of Interfering Signal center frequency from the channel edge (MHz)	Type of Interfering Signal
• -48	• 15	• Carrier Wave
• -48	• 35	• Modulation and coding equal to those of the wanted signal

### 2.2.1.6 Default transmitter Intermodulation specification

Unless otherwise specified in sub sections of Section 2.2 for specific bands, the transmitter Intermodulation specification of this clause are applicable.

The transmit intermodulation characteristic is a measure of the capability of the transmitter to mitigate the development of an impairing signal at non linear elements as a result of intermodulation between the wanted signal and an interfering signal reaching the transmitter via the antenna.

The transmit intermodulation level is defined as the power of the intermodulation products when a modulated interference signal is injected into the antenna connector at a mean power level of 30 dB lower than that of the mean power of the wanted signal. The wanted signal bandwidth shall be 5 MHz and 10 MHz depending on the channel bandwidth size of the base station. The interference signal has the same channel bandwidth size as the wanted signal.

For 5 MHz channel bandwidth size, the centre frequency of the interference signal offset from the subject signal carrier centre frequency shall be at  $\pm 5$  MHz,  $\pm 10$  MHz,  $\pm 15$  MHz ( $\pm 10$  MHz,  $\pm 20$  MHz,  $\pm 30$  MHz for 10 MHz channel bandwidth size) but exclude interference frequencies that are partially or completely outside of the declared operating frequency band of the base station.

The base stations need to meet the relevant spectral mask, adjacent channel leakage ratio and spurious emission specifications at the specific 3<sup>rd</sup> and 5<sup>th</sup> order intermodulation product frequencies, (except those overlapping with the interfering signal) when the interference signal is injected.

## 2.2.2 Band Class 1

### 2.2.2.1 Band Class Group 1.A

#### 2.2.2.1.1 Channel Spectral Mask

The Spectrum Emission Mask for 8.75 MHz bandwidth is specified in Table 124.

**Table 122. Channel Mask for 8.75 MHz carrier (BCG 1.A)**  
 (a)  $P_{tx} \geq 40$  dBm

No	Frequency offset from centre	Allowed emission	Measurement bandwidth
1	$4.77 \leq \Delta f < 22.5$ MHz	-56.9 dBc	100 kHz

2	$\Delta f > 22.5$ MHz	-13 dBm	1 MHz
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**(b)  $29 \text{ dBm} \leq P_{tx} < 40 \text{ dBm}$**

No	Frequency offset from centre	Allowed emission	Measurement bandwidth
1	$4.77 \leq \Delta f < 22.5$ MHz	-53.9 dBc	100 kHz
2	$\Delta f > 22.5$ MHz	-13 dBm	1 MHz

**(c)  $P_{tx} < 29 \text{ dBm}$**

No	Frequency offset from centre	Allowed emission	Measurement bandwidth
1	$4.77 \leq \Delta f < 22.5$ MHz	-14.5 dBm	1MHz
2	$\Delta f > 22.5$ MHz	-13 dBm	1 MHz

**2.2.2.1.2 Transmitter Spurious Emission specification (conducted)**

**Table 123. Base station spurious emission limit, Category A (BCG 1.A)**

No	Band	Allowed emission level	Measurement bandwidth	Note
1	30 MHz-1 GHz	-13 dBm	100 kHz	Bandwidth as in Recommendation ITU-R SM.329-10, § 4.1
2	1 GHz-13.45 GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329-10, § 2.5, Table 1

**2.2.2.2 Band Class Group 1.B**

**2.2.2.2.1 Channel Spectral Mask**

The Spectrum Emission Mask for 5 and 10 MHz bandwidth is specified in Table 124 and Table 125.

**Table 124. Channel Mask for 5 MHz (BCG 1.B)**

No	Frequency offset from centre	Allowed emission level	Measurement bandwidth
1	$2.5 \leq \Delta f < 3.5$ MHz	-13 dBm	50 kHz
2	$3.5 \leq \Delta f < 12.5$ MHz	-13 dBm	1 MHz

**Table 125. Channel Mask for 10 MHz (BCG 1.B)**

No	Frequency offset from centre	Allowed emission level	Measurement bandwidth
1	$5 \leq \Delta f < 6$ MHz	-13 dBm	100 kHz



2	$6 \leq \Delta f < 25$ MHz	-13 dBm	1 MHz
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**2.2.2.2.2 Transmitter Spurious Emission specification (conducted)**

**Table 126. Base station spurious emission limit, Category A (BCG 1.B)**

No	Band	Allowed emission level	Measurement bandwidth	Note
1	30 MHz-1 GHz	-13 dBm	100 kHz	Bandwidth as in Recommendation ITU-R SM.329-10, § 4.1
2	1 GHz-13.45 GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329-10, § 2.5, Table 1

**Table 127. Base station spurious emissions limit, Category B (BCG 1.B)**

No	Band	Measurement bandwidth	Allowed emission level
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36 dBm
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36 dBm
3	$30 \text{ MHz} \leq f < 1 \text{ 000 MHz}$	100 kHz	-36 dBm
4	$1 \text{ GHz} \leq f < 13.45 \text{ GHz}$	30 kHz If $2.5 \times BW \leq  f_c - f  < 10 \times BW$ 300 kHz If $10 \times BW \leq  f_c - f  < 12 \times BW$ 1 MHz If $12 \times BW \leq  f_c - f $	-30 dBm

**Table 128. Additional Spurious Emissions for 5 MHz Channel Size; Relevant to  $2302.5 \leq f_c \leq 2397.5$  (BCG 1.B)**

No	Spurious frequency ( <i>f</i> ) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$791 \leq f < 821$	1	-52
2	$831 \leq f < 862$	1	-49
3	$876 \leq f < 915$	1	-51
4	$921 \leq f < 925$	1	-47
5	$925 \leq f < 960$	1	-52
6	$1710 \leq f < 1785$	1	-51
7	$1805 \leq f < 1880$	1	-52
8	$1920 \leq f < 1980$	1	-49
9	$2110 \leq f < 2170$	1	-52
10	$1900 \leq f < 1920$	1	-52
11	$2010 \leq f < 2025$	1	-52
12	$2500 \leq f < 2570$	1	-49

13	$2570 \leq f < 2620$	1	-52
14	$2620 \leq f < 2690$	1	-52

**Table 129. Additional Spurious Emissions for 10 MHz Channel Size; Relevant to  $2305 \leq f_c \leq 2395$  (BCG 1.B)**

No	Spurious frequency ( $f$ ) range (MHz)	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$791 \leq f < 821$	1	-52
2	$831 \leq f < 862$	1	-49
3	$876 \leq f < 915$	1	-51
4	$921 \leq f < 960$	1	-47
5	$925 \leq f < 960$	1	-52
6	$1710 \leq f < 1785$	1	-51
7	$1805 \leq f < 880$	1	-52
8	$1920 \leq f < 1980$	1	-49
9	$2110 \leq f < 2170$	1	-52
10	$1900 \leq f < 1920$	1	-52
11	$2010 \leq f < 2025$	1	-52
12	$2500 \leq f < 2570$	1	-49
13	$2570 \leq f < 2620$	1	-52
14	$2620 \leq f < 2690$	1	-52

### 2.2.2.2.3 Adjacent Channel Leakage Ratio (ACLR)

For 5 and 10 MHz BW Band Class Group 1.B, the ACLR shall be equal to or greater than the limits specified in Table 34 below.

**Table 130. ACLR Specification for 5 MHz Channel BW BS (BCG 1.B)**

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	BS channel centre frequency $\pm$ 5 MHz	45
2	BS channel centre frequency $\pm$ 10 MHz	50

**Table 131. ACLR Specifications for 10 MHz Channel BW BS (BCG 1.B)**

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	BS channel centre frequency $\pm$ 10 MHz	45
2	BS channel centre frequency $\pm$ 20 MHz	50

Note: In Table 130 and Table 131, the measurement bandwidth centered on the adjacent channel is 4.75 MHz for a 5 MHz channelized system and 9.5 MHz for a 10 MHz channelized system.

## 2.2.3 Band Class 3

### 2.2.3.1 Band Class Group 3.A

#### 2.2.3.1.1 Channel Spectral Mask

The Spectrum Emission Mask for 5 MHz bandwidth is specified in Table 132 and Table 133.

**Table 132. Channel Mask for 5 MHz Bandwidth (BCG 3.A)**

No	Frequency offset from centre	Allowed emission level	Measurement bandwidth
1	$2.5 \leq \Delta f < 3.5$ MHz	-13 dBm	50 kHz
2	$3.5 \leq \Delta f < 12.5$ MHz	-13 dBm	1 MHz

**Table 133. Channel Mask for 5 MHz Bandwidth– Japan (BCG 3.A)**

No	Frequency offset from centre	Allowed emission level	Measurement bandwidth
1	$7.5 \text{ MHz} \leq \Delta f < 12.25$	$-15 - 1.4 \times (\Delta f - 7.5)$ dBm	1 MHz
2	$12.25 \leq \Delta f < 22.5$ MHz	-22 dBm	1 MHz

The Spectrum Emission Mask for 10 MHz bandwidth is specified in Table 134 and Table 135.

**Table 134. Channel Mask for 10 MHz Bandwidth (BCG 3.A)**

No	Frequency offset from centre	Allowed emission level	Measurement bandwidth
1	$5 \leq \Delta f < 6$ MHz	-13 dBm	100 kHz
2	$6 \leq \Delta f < 25$ MHz	-13 dBm	1 MHz

**Table 135. Channel Mask for 10 MHz Bandwidth– Japan (BCG 3.A)**

No	Frequency offset from centre	Allowed emission level	Measurement bandwidth
1	$15 \leq \Delta f < 25$ MHz	-22 dBm	1 MHz

### 2.2.3.1.2 Transmitter Spurious Emission specification (conducted)

**Table 136. Base station spurious emission limit, Category A (BCG 3.A)**

No	Band	Allowed emission level	Measurement bandwidth	Note
1	30 MHz-1 GHz	-13 dBm	100 kHz	Bandwidth as in Recommendation ITU-R SM.329-10, § 4.1
2	1 GHz-13.45 GHz		1 MHz	Upper frequency as in Recommendation ITU-R SM.329-10, § 2.5, Table 1

**Table 137. Base station spurious emissions limit, Category B (BCG 3.A)**

No	Band	Measurement bandwidth	Allowed emission level
1	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36 dBm
2	$1 \text{ GHz} \leq f < 13.45 \text{ GHz}$	30 kHz If $2.5 \times \text{BW} \leq  f_c - f  < 10 \times \text{BW}$ 300 kHz If $10 \times \text{BW} \leq  f_c - f  < 12 \times \text{BW}$ 1 MHz If $12 \times \text{BW} \leq  f_c - f $	-30 dBm

Note:

1. In Table 137, BW is the signal channel bandwidth of 5 or 10 MHz.

**Table 138. Base station spurious emission limit, Japan (BCG 3.A)**

No	Frequency bandwidth	Measurement bandwidth	Allowed emission level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-13
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-13
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-13
4	$1 \text{ 000 MHz} \leq f < 2505 \text{ MHz}$	1 MHz	-13
5	$2 \text{ 505 MHz} \leq f < 2 \text{ 535 MHz}$	1 MHz	-42
6	$2 \text{ 535 MHz} \leq f < 2 \text{ 630 MHz}$	1 MHz	-13(1)
7	$2 \text{ 630 MHz} \leq f < 2 \text{ 634.75 MHz}$	1 MHz	$-15 - 7/5 \times (f - 2 \text{ 629.75})$
8	$2 \text{ 634.75 MHz} \leq f < 2 \text{ 655 MHz}$	1 MHz	-22
9	$2 \text{ 655 MHz} \leq f$	1 MHz	-13

Note:

1. The allowed emission level for the frequency band between 2 535 MHz and 2 630 MHz shall be applied for the frequency range greater than 2.5 times the channel size from the centre frequency.

### 2.2.3.1.3 First and Second Adjacent Channel Rejection

The first and second adjacent channel rejection shall be measured by setting the desired signal strength 3 dB above the rate dependent receiver sensitivity (Table 139) and raising the power level of the interfering signal (at first or second adjacent channel) until the specified error rate is obtained. The power difference between the interfering signal and the desired channel is the corresponding adjacent channel rejection.

**Table 139. Receiver Sensitivity Levels (BCG 3.A)**

No	Channel Bandwidth	Sub-carrier Allocation Mode	Modulation and Coding Level	Sensitivity Level (dBm)
1	5 MHz	PUSC	CTC-QPSK 1/2	-91.6
2		AMC	CTC-QPSK 1/2	-91.3
3	10 MHz	PUSC	CTC-QPSK 1/2	-88.5
4		AMC	CTC-QPSK 1/2	-88.3

The first and second adjacent channel rejection recommended specifications are listed in Table 140.

**Table 140. First and Second Adjacent Channel Rejection (BCG 3.A)**

No	Description	Modulation and Coding Level	Sub-carrier Allocation Mode	Class 1	Class 2	Class 3
1	Min first adjacent channel rejection at BER=10 <sup>-6</sup> for 3 dB degradation C/I	CTC-QPSK 1/2	PUSC	22.1 dB	29.1 dB	35.1 dB
2			AMC	22.1 dB	29.1 dB	35.1 dB
3	Min second adjacent channel rejection at BER=10 <sup>-6</sup> for 3 dB degradation C/I	CTC-QPSK 1/2	PUSC	36.1 dB	39.1 dB	45.1 dB
4			AMC	36.1 dB	39.1 dB	45.1 dB

Where:

**ACR Class 1:** This class identifies a level of ACR performance appropriate for Base Stations operating at nominal maximum output power ≤ 25 dBm.

**ACR Class 2:** This class identifies a level of intra-system ACR performance for Base Stations operating at nominal maximum output power > 25 dBm.

**ACR Class 3:** This class identifies a level of inter-system ACR performance for Base Stations operating at nominal maximum output power > 25 dBm for the boundary between FDD Downlink and TDD and for the boundaries between blocks with unsynchronized TDD usage.

### 2.2.3.2 Band Class Group 3.B

#### 2.2.3.2.1 Channel Spectral Mask

The Spectrum Emission Mask of Table 141 and Table 142 apply to US region.

**Table 141. Channel Mask for 5 MHz Bandwidth -US (BCG 3.B)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 3.5$	50	-13
2	$3.5 \leq \Delta f \leq 12.5$	1000	-13

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 50 kHz filter is at  $\Delta f$  equals to 2.525 MHz; the last is at  $\Delta f$  equals to 3.475 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 4.0 MHz; the last is at  $\Delta f$  equals to 12.0 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

**Table 142. Channel Mask for 10 MHz Bandwidth -US (BCG 3.B)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f \leq 6$	100	-13
2	$6 \leq \Delta f \leq 25$	1000	-13

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.050 MHz; the last is at  $\Delta f$  equals to 5.950 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 6.5 MHz; the last is at  $\Delta f$  equals to 24.5 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

**Table 143. Channel Mask for 5 MHz Bandwidth-Europe (BCG 3.B)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 7.5$	100	$-7-7(\Delta f-2.55)/5$
2	$7.5 \leq \Delta f \leq 12.5$	100	-14

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.550 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

**Table 144. Channel Mask for 10 MHz Bandwidth-Europe (BCG 3.B)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 10$	100	$-7-7(\Delta f-5.05)/5$
2	$10 \leq \Delta f < 15$	100	-14
3	$15 \leq \Delta f \leq 25$	1000	-13

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.05 MHz; the last is at  $\Delta f$  equals to 14.95 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 15.5 MHz; the last is at  $\Delta f$  equals to 24.5 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

### 2.2.3.2.2 Transmitter Spurious Emission specification (conducted)

**Table 145. Spurious Emissions for 5 MHz Channel Size-US; Relevant to  $2616.5 \leq f_c \leq 2687.5$  (BCG 3.B)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} < f < 13.450 \text{ GHz}, 12.5 \text{ MHz} \leq \Delta f$	1	-13

**Table 146. Spurious Emissions for 10 MHz Channel Size-US; Relevant to  $2619 \leq f_c \leq 2685$  (BCG 3.B)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} < f < 13.450 \text{ GHz}, 25 \text{ MHz} \leq \Delta f$	1	-13

**Table 147. Spurious Emissions for 5 MHz Bandwidth-Europe; Relevant to  $2616.5 \leq f_c \leq 2687.5$  (BCG 3.B)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 13450 \text{ MHz}$	30 kHz If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz If $60 \text{ MHz} \leq \Delta f$	-30

**Table 148. Spurious Emissions for 10 MHz Bandwidth-Europe; Relevant to  $2619 \leq f_c \leq 2685$  (BCG 3.B)**

No	Spurious frequency ( $f$ ) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 13450 \text{ MHz}$	30 kHz If $25 \text{ MHz} \leq \Delta f < 100 \text{ MHz}$ 300 kHz If $100 \text{ MHz} \leq \Delta f < 120 \text{ MHz}$ 1 MHz If $120 \text{ MHz} \leq \Delta f$	-30

Table 149 and Table 150 specify limits to protect BS receivers against its intra-system BS transmit emissions.

**Table 149. BS Spurious Emissions Limits for protection of the BS receiver for 5 MHz-Europe; Relevant to  $2616.5 \leq f_c \leq 2687.5$  (BCG 3.B)**

No	Spurious Frequency ( $f$ ) Range (MHz)	Measurement Bandwidth	Maximum Level
1.	2496-2572	100 kHz	-96 dBm

**Table 150. BS Spurious Emissions Limits for protection of the BS receiver for 10 MHz-Europe; Relevant to  $2619 \leq f_c \leq 2685$  (BCG 3.B)**

No	Spurious Frequency ( $f$ ) Range (MHz)	Measurement Bandwidth	Maximum Level
1.	2496-2572	100 kHz	-96 dBm



**2.2.4 Band Class 5**

**2.2.4.1 Channel Spectral Mask: BCG 5.A, 5.B and 5.C**

The Spectrum Emission Mask for 5, 7 and 10 MHz bandwidth sizes are specified in Table 151 and Table 152. Table 151 specifies breakpoints of the underlying piecewise linear power spectral density mask. This mask is a relative mask and conditionally applicable depending on the base station  $P_{nom}$  power level. Table 152 specifies the emission levels of an underlying piecewise step function applicable conditionally only to some of  $P_{nom}$  power levels.

**Table 151. Relative Transmit Spectral Power Density Channel Mask (BCG 5.B/5.B/5.C)**

No	Power	Frequency Offset				
		0.5*BW	0.71*BW	1.06*BW	2.0*BW	2.5*BW
1	39 dBm < $P_{nom}$	-20 dB	-27 dB	-32 dB	-50dB	-50dB
2	33 dBm < $P_{nom} \leq 39$ dBm	-20 dB	-27 dB	-32 dB	-50 dB + (39 dBm - $P_{nom}$ )	Refer to Table 152

**Table 152. Absolute Spectral Emission Channel Mask (BCG 5.B/5.B/5.C)**

No	Power	Frequency Offset			
		0.50 BW $\leq \Delta f <$ 0.71 BW	0.71 BW $\leq \Delta f <$ 1.06 BW	1.06 BW $\leq \Delta f <$ 2.00 BW	2.00 BW $\leq \Delta f \leq$ 2.50 BW
1	33 dBm < $P_{nom} \leq 39$ dBm	Refer to Table 151	Refer to Table 151	Refer to Table 151	-21 + x dBm/MHz
2	$P_{nom} \leq 33$ dBm	-5.5 dBm/MHz	-5.5 dBm/MHz	-23.5 dBm/MHz	-23.5 dBm/MHz

Notes: In Table 152,  $x = -10 \log(BW/10)$

**2.2.4.2 Adjacent Channel Leakage Ratio (ACLR): BCG 5.A, 5.B and 5.C**

This section contains the ACLR specifications for base stations operating in Band Class Group 5.A, 5.B and 5.C.

Transmitter Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted mean power measured through a filter pass band centered on the assigned channel frequency to the transmitted mean power measured through a bandpass filter centered on a first or second adjacent channel. The first adjacent and second adjacent channel centre offsets relative to the assigned channel centre frequency respectively equal the channel bandwidth and twice the channel bandwidth.

ACLR limits for BCG 5.A are specified in Table 153.

1

**Table 153. BS ACLR limits (BCG 5.B/5.B/5.C)**

No	Adjacent channels	ACLR limit
1	$F_c \pm 5$ MHz	37 dB
2	$F_c \pm 10$ MHz	48 dB

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3 ACLR limits for BCG 5.B are specified in Table 154.

4

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**Table 154. BS ACLR limits (BCG 5.B/5.B/5.C)**

No	Adjacent channels	ACLR limit
1	$F_c \pm 7$ MHz	37 dB
2	$F_c \pm 14$ MHz	48 dB

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7

8 ACLR limits for BCG 5.C are specified in Table 155.

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**Table 155. BS ACLR limits (BCG 5.B/5.B/5.C)**

No	Adjacent channels	ACLR limit
1	$F_c \pm 10$ MHz	37 dB
2	$F_c \pm 20$ MHz	48 dB

11

12

**2.2.5 Band Class 6**

**2.2.5.1 Band Class Group 6.A**

**2.2.5.1.1 Channel Spectral Mask**

16 Table 156 and Table 157 specify the spectrum emission for FDD Base Stations with 10 and 5 MHz  
 17 channel bandwidths.

18

19

**Table 156. Channel Mask for 10 MHz Bandwidth (BCG 6.A)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 6$	100	-13
2	$6 \leq \Delta f \leq 25$	1000	-13

20

1

**Table 157. Channel Mask for 5 MHz Bandwidth (BCG 6.A)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/integration BW) at the antenna port.
1	$2.5 \leq \Delta f < 3.5$	50	-13
2	$3.5 \leq \Delta f \leq 12.5$	1000	-13

2

3 Note:

- 4 1. Protection specification beyond 25 MHz (250% of the bandwidth) is specified in the spurious  
 5 emissions specification.  
 6

7 **2.2.5.1.2 Transmitter Spurious Emission specification (conducted)**

8 Table 158 and Table 159 specified the spurious emission limits for 5 and 10 MHz channel bandwidth  
 9 respectively. The limits shown in the tables are for frequency offsets which are greater than 2.5 times the  
 10 channel bandwidth from the BS center frequency. In the table,  $f$  is the frequency of the spurious domain  
 11 emissions.

12 In Table 158 and Table 159, measurement uncertainty (as defined in ITU-R M.1545) values  
 13 corresponding to spurious emission limits have not been included.

14 **Table 158. Spurious Emissions for 5 MHz Channel Size; Relevant to  $2112.5 \leq f_c \leq 2167.5$  (BCG 6.A)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} < f < 10.775 \text{ GHz}, 12.5 \text{ MHz} \leq \Delta f$	1	-13

15

16 **Table 159. Spurious Emissions for 10 MHz Channel Size; Relevant to  $2115 \leq f_c \leq 2165$  (BCG 6.A)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} < f < 10.775 \text{ GHz}, 25 \text{ MHz} \leq \Delta f$	1	-13

17

18 **2.2.5.2 Band Class Group 6.B**

19 **2.2.5.2.1 Channel Spectral Mask**

20 Table 160 and Table 161 specify the spectrum emission for FDD Base Stations with 5 and 10 MHz  
 21 channel bandwidths.

22 **Table 160. Channel Mask for 5 MHz Bandwidth (BCG 6.B)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 7.5$	100	$-7.0-7(\Delta f-2.55)/5$

2	$7.5 \leq \Delta f < 12.5$	100	-14
---	----------------------------	-----	-----

Notes:

4.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
1. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.550 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.

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

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**Table 161. Channel Mask for 10 MHz Bandwidth (BCG 6.B)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 10$	100	$-7.0-7(\Delta f-5.05)/5$
2	$10 \leq \Delta f < 15$	100	-14
3	$15 \leq \Delta f < 25$	1000	-13

Notes:

2.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
3. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.05 MHz; the last is at  $\Delta f$  equals to 14.95 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 15.5 MHz; the last is at  $\Delta f$  equals to 24.5 MHz.

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

3  
4  
5  
6

Table 161 specifies the spectrum emission mask for FDD Base Stations with 20 MHz channel bandwidth.

**Table 162. Channel Mask for 20 MHz Bandwidth (BCG 6.B)**

No	Frequency offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$10 \leq \Delta f < 15$	100	$-7-7(\Delta f-10.05)/5$
2	$15 \leq \Delta f < 20$	100	-14
3	$20 \leq \Delta f \leq 50$	1000	-13

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 10.05 MHz; the last is at  $\Delta f$  equals to 19.95 MHz. The first measurement position with a 1 MHz filter is at  $\Delta f$  equals to 20.5 MHz; the last is at  $\Delta f$  equals to 49.5 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

**2.2.5.2.2 Transmitter Spurious Emission specification (conducted)**

Table 163 and Table 164 specify the spurious emission limits for 5 and 10 MHz channel bandwidth respectively. Table 165 and Table 166 specify the additional spurious emission limits for 5 and 10 MHz channel bandwidth. The limits shown in the tables are for frequency offsets which are greater than 2.5 times the channel bandwidth from the BS center frequency. In the table,  $f$  is the frequency of the spurious domain emissions.

In Table 163, Table 164, Table 165 and Table 166, measurement uncertainty (as defined in ITU-R M.1545) values corresponding to spurious emission limits have not been included.

**Table 163. Spurious Emissions for 5 MHz Channel Size; Relevant to  $2112.5 \leq f_c \leq 2167.5$  (BCG 6.B)**

No	Measurement frequency range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 10.775 \text{ GHz}, 12.5 \text{ MHz} \leq \Delta f$	1 MHz	-30

**Table 164. Spurious Emissions for 10 MHz Channel Size; Relevant to  $2115 \leq f_c \leq 2165$  (BCG 6.B)**

No	Measurement frequency range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 10.775 \text{ GHz}, 25 \text{ MHz} \leq \Delta f$	1 MHz	-30

1 **Table 165. Additional Spurious Emissions for 5 MHz Channel Size; Relevant to  $2112.5 \leq f_c \leq 2152.5$**   
 2 **(BCG 6.B)**

No	Measurement frequency range (MHz)	Measurement bandwidth	Maximum Emission Level (dBm)
1.	921 - 960	100 kHz	-57
2.	876 - 915	100 kHz	-61
3.	1805 - 1880	100 kHz	-47
4.	1710 - 1785	100 kHz	-61
5.	1930 - 1990	100 kHz	-47
6.	1850 - 1910	100 kHz	-61
7.	869 - 894	100 kHz	-57
8.	824 - 849	100 kHz	-61
9.	1930 - 1990	1 MHz	-52
10.	1850 - 1910	1 MHz	-49
11.	1805 - 1880	1 MHz	-52
12.	1710 - 1785	1 MHz	-49
13.	2110 - 2155	1 MHz	-52
14.	1710 - 1755	1 MHz	-49
15.	869 - 894	1 MHz	-52
16.	824 - 849	1 MHz	-49
17.	860 - 895	1 MHz	-52
18.	815 - 850	1 MHz	-49
19.	2620 - 2690	1 MHz	-52
20.	2500 - 2570	1 MHz	-49
21.	925 - 960	1 MHz	-52
22.	880 - 915	1 MHz	-49
23.	1844.9 - 1879.9	1 MHz	-52
24.	1749.9 - 1784.9	1 MHz	-49
25.	2110 - 2170	1 MHz	-52
26.	1710 - 1770	1 MHz	-49
27.	1475.9 - 1500.9	1 MHz	-52
28.	1427.9 - 1452.9	1 MHz	-49
29.	728 - 746	1 MHz	-52
30.	698 - 716	1 MHz	-49
31.	746 - 756	1 MHz	-52
32.	777 - 787	1 MHz	-49

33.	758 - 768	1 MHz	-52
34.	788 - 798	1 MHz	-49
35.	1900 - 1920	1 MHz	-52
36.	2010 - 2025	1 MHz	-52
37.	1850 – 1910	1 MHz	-52
38.	1930 - 1990	1 MHz	-52
39.	1910 - 1930	1 MHz	-52
40.	2570 – 2620	1 MHz	-52
41.	1880 – 1920	1 MHz	-52
42.	2300 – 2400	1 MHz	-52

1

2

1 **Table 166. Additional Spurious Emissions for 10 MHz Channel Size; Relevant to  $2115 \leq f_c \leq 2150$**   
 2 **(BCG 6.B)**

No	Measurement frequency range (MHz)	Measurement bandwidth	Maximum Emission Level (dBm)
1.	921 - 960	100 kHz	-57
2.	876 - 915	100 kHz	-61
3.	1805 - 1880	100 kHz	-47
4.	1710 - 1785	100 kHz	-61
5.	1930 - 1990	100 kHz	-47
6.	1850 - 1910	100 kHz	-61
7.	869 - 894	100 kHz	-57
8.	824 - 849	100 kHz	-61
9.	1930 - 1990	1 MHz	-52
10.	1850 - 1910	1 MHz	-49
11.	1805 - 1880	1 MHz	-52
12.	1710 - 1785	1 MHz	-49
13.	2110 - 2155	1 MHz	-52
14.	1710 - 1755	1 MHz	-49
15.	869 - 894	1 MHz	-52
16.	824 - 849	1 MHz	-49
17.	860 - 895	1 MHz	-52
18.	815 - 850	1 MHz	-49
19.	2620 - 2690	1 MHz	-52
20.	2500 - 2570	1 MHz	-49
21.	925 - 960	1 MHz	-52
22.	880 - 915	1 MHz	-49
23.	1844.9 - 1879.9	1 MHz	-52
24.	1749.9 - 1784.9	1 MHz	-49
25.	2110 - 2170	1 MHz	-52
26.	1710 - 1770	1 MHz	-49
27.	1475.9 - 1500.9	1 MHz	-52
28.	1427.9 - 1452.9	1 MHz	-49
29.	728 - 746	1 MHz	-52
30.	698 - 716	1 MHz	-49
31.	746 - 756	1 MHz	-52
32.	777 - 787	1 MHz	-49



33.	758 - 768	1 MHz	-52
34.	788 - 798	1 MHz	-49
35.	1900 - 1920	1 MHz	-52
36.	2010 - 2025	1 MHz	-52
37.	1850 – 1910	1 MHz	-52
38.	1930 - 1990	1 MHz	-52
39.	1910 - 1930	1 MHz	-52
40.	2570 – 2620	1 MHz	-52
41.	1880 – 1920	1 MHz	-52
42.	2300 – 2400	1 MHz	-52

1  
 2 Table 164 and Table 166 specify the basic and additional spurious emission specifications for FDD  
 3 Mobile Stations with 20 MHz channel bandwidth.

4  
 5 **Table 167. Spurious Emissions for 20 MHz Channel Size; Relevant to  $2120 \leq f_c \leq 2160$  (BCG 6.B)**

No	Measurement frequency range	Measurement bandwidth	Maximum Emission Level (dBm)
1	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4	$1 \text{ GHz} \leq f < 10.775 \text{ GHz}, 25 \text{ MHz} \leq \Delta f$	1 MHz	-30

6

1 **Table 168. Additional Spurious Emissions for 20 MHz Channel Size; Relevant to  $2120 \leq f_c \leq 2160$**   
 2 **(BCG 6.B)**

No	Measurement frequency range (MHz)	Measurement bandwidth	Maximum Emission Level (dBm)
1.	921 - 960	100 kHz	-57
2.	876 - 915	100 kHz	-61
3.	1805 - 1880	100 kHz	-47
4.	1710 - 1785	100 kHz	-61
5.	1930 - 1990	100 kHz	-47
6.	1850 - 1910	100 kHz	-61
7.	869 - 894	100 kHz	-57
8.	824 - 849	100 kHz	-61
9.	1930 - 1990	1 MHz	-52
10.	1850 - 1910	1 MHz	-49
11.	1805 - 1880	1 MHz	-52
12.	1710 - 1785	1 MHz	-49
13.	2110 - 2155	1 MHz	-52
14.	1710 - 1755	1 MHz	-49
15.	869 - 894	1 MHz	-52
16.	824 - 849	1 MHz	-49
17.	860 - 895	1 MHz	-52
18.	815 - 850	1 MHz	-49
19.	2620 - 2690	1 MHz	-52
20.	2500 - 2570	1 MHz	-49
21.	925 - 960	1 MHz	-52
22.	880 - 915	1 MHz	-49
23.	1844.9 - 1879.9	1 MHz	-52
24.	1749.9 - 1784.9	1 MHz	-49
25.	2110 - 2170	1 MHz	-52
26.	1710 - 1770	1 MHz	-49
27.	1475.9 - 1500.9	1 MHz	-52
28.	1427.9 - 1452.9	1 MHz	-49
29.	728 - 746	1 MHz	-52
30.	698 - 716	1 MHz	-49
31.	746 - 756	1 MHz	-52
32.	777 - 787	1 MHz	-49

33.	758 - 768	1 MHz	-52
34.	788 - 798	1 MHz	-49
35.	1900 - 1920	1 MHz	-52
36.	2010 - 2025	1 MHz	-52
37.	1850 – 1910	1 MHz	-52
38.	1930 - 1990	1 MHz	-52
39.	1910 - 1930	1 MHz	-52
40.	2570 – 2620	1 MHz	-52
41.	1880 – 1920	1 MHz	-52
42.	2300 – 2400	1 MHz	-52

1

2

3 **2.2.5.3 Band Class Group 6.C**

4 **2.2.5.3.1 Channel Spectral Mask**

5 Table 169 specifies BS Spectrum Emission Mask for 5 MHz channel bandwidth while Table 170  
 6 specifies BS Spectrum Emission Mask for 10 MHz channel bandwidth.

7

8

**Table 169. Channel Mask - Europe: 5 MHz (BCG 6.C)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.515 \leq \Delta f < 2.715$	30	-14
2	$2.715 \leq \Delta f < 3.515$	30	$-14-15(\Delta f-2.715)$
3	$3.515 \leq \Delta f < 4.0$	30	-26
4	$4.0 \leq \Delta f \leq 12.5$	1000	-13

9

**Table 170. Channel Mask - Europe: 10 MHz (BCG 6.C)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.015 \leq \Delta f < 5.215$	30	-14
2	$5.215 \leq \Delta f < 6.015$	30	$-14-15(\Delta f-5.215)$
3	$6.015 \leq \Delta f < 6.5$	30	-26
4	$6.5 \leq \Delta f < 15.50$	1000	-13
5	$15.50 \leq \Delta f \leq 25.0$	1000	-15

10

**2.2.5.3.2 Transmitter Spurious Emission specification (conducted)**

The spurious emission limits specified in Table 171, Table 149 and Table 173 are for frequency offsets which are greater than 2.5 times the channel bandwidth from the BS center frequency.

**Table 171. Spurious Emission (BCG 6.C)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range	Integration Bandwidth	Maximum Emission Level (dBm)
1.	1805-1880	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2.	1805-1880	$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36
3.	1805-1880	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4.	1805-1880	$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	30 kHz, If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz, If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz, If $60 \text{ MHz} \leq \Delta f$	-30

Table 172 specifies limits to protect BS receivers against its intra-system BS transmit emissions.

**Table 172. Spurious Emissions Limits for protection of the BS receiver (BCG 6.C)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range (MHz)	Measurement Bandwidth	Maximum Level
1.	1805-1880	1710 - 1785	100 kHz	-96 dBm

The spurious emission limits specified in Table 173 may be required by local or regional regulations.

**Table 173. Additional Spurious Emission (BCG 6.C)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range (MHz)	Measurement Bandwidth	Maximum Emission Level (dBm)
1.	1805-1880	791-821	1 MHz	-52
2.		831-862	1 MHz	-49
3.		1805-1880	100 KHz	-47
4.		1710-1785	100 KHz	-61
5.		1805-1880	1 MHz	-52
6.		1710-1785	1 MHz	-49

**2.2.5.3.3 Adjacent Channel Leakage Ratio (ACLR)**

For 5 and 10 MHz BW Band Class Group 6.C, the ACLR shall be equal to or greater than the limits specified in Table 174 and Table 175 below.

ACLR is specified when the receiver channel bandwidth on the adjacent channel is:

- 1 4.75 MHz for a 5 MHz channelized system;
- 2 9.5 MHz for a 10 MHz channelized system.

3

4 The measurement bandwidth for the measurement of on-channel power of the Mobile WiMAX carrier is:

- 5 4.75 MHz for a 5 MHz channelized system, and
- 6 9.5 MHz for a 10 MHz channelized system.

7

8 In here, the transmitted power and the received power are measured with a rectangular filter. In Table 174 and Table  
 9 175, the ACLR specifications are shown. Measurement uncertainty (as defined in ITU-R M.1545) values  
 10 corresponding to the ACLR limits have not been included.

11 **Table 174. ACLR Specification for for 5 MHz Channel BW BS (BCG 6.C)**

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	MS channel centre frequency $\pm$ 5 MHz	45
2	MS channel centre frequency $\pm$ 10 MHz	50

12

13 **Table 175. ACLR Specifications for 10 MHz Channel BW BS (BCG 6.C)**

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	MS channel centre frequency $\pm$ 10 MHz	45
2	MS channel centre frequency $\pm$ 20 MHz	50

14

15 **2.2.6 Band Class 7**

16 **2.2.6.1 Band Class Group 7.A to 7.E**

17 **2.2.6.1.1 Channel Spectral Mask**

18 The Spectrum Emission Mask of Table 176 and Table 177 apply to US region.

19 **Table 176. Channel Mask for 5 MHz Bandwidth -US (BCG 7.A-7.E)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 2.6$	30	-13
2	$2.6 \leq \Delta f \leq 12.5$	100	-13

20

21 Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 2.515 MHz; the last is at  $\Delta f$  equals to 2.585 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.650 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.

**Table 177. Channel Mask for 10 MHz Bandwidth -US (BCG 7.A-7.E)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.0 \leq \Delta f < 5.1$	30	-13
2	$5.1 \leq \Delta f \leq 25.0$	100	-13

Notes:

1.  $\Delta f$  is the separation between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 30 kHz filter is at  $\Delta f$  equals to 5.015 MHz; the last is at  $\Delta f$  equals to 5.085 MHz. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.150 MHz; the last is at  $\Delta f$  equals to 24.950 MHz.

The Spectrum Emission Mask of Table 178 and

Table 179 apply to Europe region.

**Table 178. Channel Mask for 5 MHz Bandwidth -Europe (BCG 7.A-7.E)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.5 \leq \Delta f < 7.5$	100	$-7-7(\Delta f-2.55)/5$
2	$7.5 \leq \Delta f \leq 12.5$	100	-14

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 2.550 MHz; the last is at  $\Delta f$  equals to 12.450 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

**Table 179. Channel Mask for 10 MHz Bandwidth -Europe (BCG 7.A-7.E)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5 \leq \Delta f < 10$	100	$-7-7(\Delta f-5.05)/5$
2	$10 \leq \Delta f < 15$	100	-14
3	$15 \leq \Delta f \leq 25$	1000	-13

Notes:

1.  $\Delta f$  is the absolute value of separation in MHz between the carrier frequency and the centre of the measuring filter.
2. The first measurement position with a 100 kHz filter is at  $\Delta f$  equals to 5.05 MHz; the last is at  $\Delta f$  equals to 24.95 MHz.
3. Integration Bandwidth refers to the frequency range over which the emission power is integrated.

### 2.2.6.2 Band Class Group 7.G

#### 2.2.6.2.1 Channel Spectral Mask

Table 180 specifies MS and BS Spectrum Emission Mask for 5 MHz channel bandwidth while Table 181 specifies MS and BS Spectrum Emission Mask for 10 MHz channel bandwidth.

**Table 180. Channel Mask - Europe: 5 MHz (BCG 7.G)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$2.515 \leq \Delta f < 2.715$	30	-14
2	$2.715 \leq \Delta f < 3.515$	30	$-14-15(\Delta f-2.715)$
3	$3.515 \leq \Delta f < 4.0$	30	-26
4	$4.0 \leq \Delta f \leq 12.5$	1000	-13

**Table 181. Spectrum Emission Mask - Europe: 10 MHz (BCG 7.G)**

No	Offset $\Delta f$ from channel center (MHz)	Integration Bandwidth (kHz)	Maximum Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	$5.015 \leq \Delta f < 5.215$	30	-14
2	$5.215 \leq \Delta f < 6.015$	30	$-14-15(\Delta f-5.2715)$
3	$6.015 \leq \Delta f < 6.5$	30	-26
4	$6.5 \leq \Delta f < 15.50$	1000	-13
5	$15.50 \leq \Delta f \leq 25.0$	1000	-15

At the upper edge of the downlink block (925-960 MHz), the Channel Spectral Mask Emission specification of Table 181 is only applicable up to  $F_{DL-ue} + 10$  (970 MHz). From this point forward ( $> 970$  MHz), the Spurious Emission Specifications of Section 2.2.6.2 are applicable.

**2.2.6.2.2 Transmitter Spurious Emission specification (conducted)**

The spurious emission limits specified in Table 182 and Table 183 for frequency offsets which are greater than 2.5 times the channel bandwidth from the BS center frequency.

**Table 182. Spurious Emission (BCG 7.G)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range	Integration Bandwidth	Maximum Emission Level (dBm)
1.	925 -960	$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36
2.	925 -960	$150 \text{ kHz} \leq f < 30\text{MHz}$	10 kHz	-36
3.	925 -960	$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36
4.	925 -960	$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	30 kHz, If $12.5 \text{ MHz} \leq \Delta f < 50 \text{ MHz}$ 300 kHz, If $50 \text{ MHz} \leq \Delta f < 60 \text{ MHz}$ 1 MHz, If $60 \text{ MHz} \leq \Delta f$	-30

Table 183 specifies limits to protect BS receivers against its intra-system BS transmit emissions.

**Table 183. BS Spurious Emissions Limits for protection of the BS receiver (BCG 7.G)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range (MHz)	Measurement Bandwidth	Maximum Level
1.	925 -960	880-915	100 kHz	-96 dBm

The spurious emission limits specified in Table 183 may be required by local or regional regulations.



1

**Table 184. Additional Spurious Emission (BCG 7.G)**

No	Transmitter Center Frequency ( $f_c$ ) (MHz)	Spurious Frequency ( $f$ ) Range (MHz)	Measurement Bandwidth	Maximum Emission Level (dBm)
1.	925-960	791-821	1 MHz	-52
2.		831-862	1 MHz	-49
3.		880-915	1 MHz	-52
4.		925-960	1 MHz	-49

2

3 **2.2.6.2.3 Adjacent Channel Leakage Ratio (ACLR)**

4 For 5 and 10 MHz BW Band Class Group 6.C, the ACLR shall be equal to or greater than the limits specified in  
 5 Table 185 and Table 186 below.

6

7 ACLR is specified when the receiver channel bandwidth on the adjacent channel is:

8 4.75 MHz for a 5 MHz channelized system;

9 9.5 MHz for a 10 MHz channelized system.

10 The measurement bandwidth for the measurement of on-channel power of the Mobile WiMAX carrier is:

11 4.75 MHz for a 5 MHz channelized system, and

12 9.5 MHz for a 10 MHz channelized system.

13 In here, the transmitted power and the received power are measured with a rectangular filter. In Table 185 and  
 14 Table 186, the ACLR specifications are shown. Measurement uncertainty (as defined in ITU-R M.1545) values  
 15 corresponding to the ACLR limits have not been included.

16

**Table 185. ACLR Specification for for 5 MHz Channel BW BS (BCG 7.G)**

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	MS channel centre frequency $\pm$ 5 MHz	45
2	MS channel centre frequency $\pm$ 10 MHz	50

17

18

**Table 186. ACLR Specifications for 10 MHz Channel BW BS (BCG 7.G)**

No	Adjacent channel centre frequency	Minimum required ACLR relative to assigned channel frequency (dB)
1	MS channel centre frequency $\pm$ 10 MHz	45
2	MS channel centre frequency $\pm$ 20 MHz	50

19

20 **2.2.7 Band Class 8**

21 **2.2.7.1 Band Class Group 8.G**

22 **2.2.7.1.1 Channel Spectral Mask**

23 Table 187 and Table 188 specify the spectrum emission for FDD Base Stations with 5 and 10 MHz channel  
 24 bandwidths.

1

**Table 187. Channel Mask for 5 MHz Bandwidth (BCG 8.G)**

No	Offset from channel center (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	1000	-13

2

**Table 188. Channel Mask for 10 MHz Bandwidth (BCG 8.G)**

No	Offset from channel center (MHz)	Integration Bandwidth (kHz)	Allowed Emission Level (dBm/Integration Bandwidth) as measured at the antenna port
1	5 to < 6	100	-13
2	6 to ≤ 25	1000	-13

3

4 Note:

- 5 1. Protection specification beyond 25 MHz (250% of the bandwidth) is specified in the spurious  
 6 emissions specification.

7

8 **2.2.7.1.2 Transmitter Spurious Emission Specification (conducted)**

9 **Table 189. Spurious Emissions for 5 MHz Channel Size; Relevant to  $1802.5 \leq f_c \leq 1827.5$  (BCG 8.G)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} \leq f < 9.150 \text{ GHz}$ , $12.5 \text{ MHz} \leq \Delta f$	1	-13

10

11 **Table 190. Spurious Emissions for 10 MHz Channel Size; Relevant to  $1805 \leq f_c \leq 1825$  (BCG 8.G)**

No	Measurement frequency range	Measurement bandwidth (MHz)	Maximum Emission Level (dBm)
1	$30 \text{ MHz} \leq f < 9.150 \text{ GHz}$ , $25 \text{ MHz} \leq \Delta f$	1	-13

12

**2.2.8 Band Class 9**

**2.2.8.1 Band Class Group 9.D**

This section treats specification for Fixed type Base Station and Transportable Base Station of the BGC 9.D radio system configuration.

**2.2.8.1.1 Channel Spectral Mask**

The channel spectral mask for BCG 9.D Mobile station is effectively specified by the ACLR, which is given in the Section 2.2.8.1.4.

In the BCG 9.D application, the maximum transmission output powers of Transportable Base Station and Fixed Base Station are as large as +37dBm (5W) and +43dBm (20W) each, and the transmission filter may have to cover the bandwidth as wide as 30MHz to meet the system operation requirement. Considering these matters, the spectral masking level is specified by ACLR measurement relative to the carrier power of the 5MHz channel.

Note:

- Since the Japan radio ordinance of this VHF Public Safety band does not have article regulating channel spectral masking, it is specified with the ACLR number hereby.
- Protection specification outside the range of 160M - 215MHz (beyond 250% offset from the carrier frequency of the lowest and highest channels with the 5MHz bandwidth) is specified in the spurious emissions requirement.

**2.2.8.1.2 Transmitter Spurious Emission (conducted)**

Table 191 and Table 192 provides the Spurious Emission limitations for Fixed and Transportable Base Station for frequency offsets which are greater than 2.5 times the channel bandwidth from the MS center frequency. In the tables,  $f$  is the frequency of the spurious domain emissions.

**Table 191. Spurious Emission for 5MHz Channel Size Fixed Base station; Relevant to 170.0 <  $f_c$  < 202.5 (BCG 9.D)**

No.	Spurious frequency (f) range	Measurement bandwidth	Maximum Emission Level
1	9kHz < f <= 150kHz	1kHz	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
2	150kHz < f <= 30MHz	10k	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
3	30MHz < f <= 160MHz	100k	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
4	160M < f <= 170M	100k	-54dBm (4nW)
5	207.5M < f <=215M	100k	-25dBm (3.2uW)
6	215MHz < f <= 1GHz	100k	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
7	1GHz < f	1M	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm

**Table 192. Spurious Emission for 5MHz Channel Size Transportable Base station; Relevant to 170.0 <  $f_c$  < 202.5 (BCG 9.D)**

No.	Spurious frequency (f) range	Measurement bandwidth	Maximum Emission Level
1	9kHz < f <= 150kHz	1kHz	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm

2	150kHz < f <= 30MHz	10k	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
3	30MHz < f <= 160MHz	100k	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
3	160M < f <= 170M	100k	-30dBm (1uW)
4	207.5M < f <=215M	100k	-30dBm (1uW)
5	215MHz < f <= 1GHz	100k	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm
6	1GHz < f	1M	-16dBm (25uW), if transmission power > 30dBm, -13dBm (50uW), if transmission power <= 30dBm

1

2 **2.2.8.1.3 Receiver Spurious Emission (conducted)**

3 The power of any narrow-band spurious emission should not exceed the maximum level specified in Table 193 and  
 4 Table 194 for Fixed and Transportable Base Stations respectively.

5 **Table 193. Receiver Spurious Emission for Fixed Base station (BCG 9.D)**

No.	Spurious frequency (f) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	9kHz <= f < 150kHz	1kHz	-54
2	150kHz <= f < 30MHz	10kHz	-54
3	30MHz <= f < 1000MHz	100kHz	-54
4	1000MHz <= f < 2505MHz	1MHz	-47
5	2505MHz <= f < 2535MHz	1MHz	-61
6	2535MHz <= f	1MHz	-47

6

7 **Table 194. Receiver Spurious Emission for Transportable Base station (BCG 9.D)**

No.	Spurious frequency (f) range	Measurement bandwidth	Maximum Emission Level (dBm)
1	9kHz <= f < 150kHz	1kHz	-54
2	150kHz <= f < 30MHz	10kHz	-54
3	30MHz <= f < 1000MHz	100kHz	-54
4	1000MHz <= f < 2505MHz	1MHz	-47
5	2505MHz <= f < 2535MHz	1MHz	-70
6	2535MHz <= f	1MHz	-47

8

9 **2.2.8.1.4 Adjacent Channel Leakage Ratio (ACLR)**

10 The ACLR is defined as the ratio of the on-channel transmitted power to the out of channel power leaking into  
 11 adjacent channels and as measured at the output of the receiver filter. The first-adjacent and second-adjacent  
 12 channel-centre frequency offsets relative to the assigned channel's centre frequency are 5 MHz and 10 MHz for the  
 13 5 MHz system.

14 **Table 195. ACLR Specification for 5MHz Channel BW Fixed Base station (BCG 9.D)**

No.	Adjacent channel frequency	Measurement bandwidth	Minimum required ACLR relative to the carrier power (dBc)
1	+/- 5MHz offset from F-BS channel center frequency	4.8M (= +/-2.4M)Hz	30
2	+/- 10MHz offset from F-BS	4.8M (= +/-2.4M)Hz	50

	channel center frequency		
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**Table 196. ACLR Specification for 5MHz Channel BW Transportable Base station (BCG 9.D)**

No.	Adjacent channel frequency	Measurement bandwidth	Minimum required ACLR relative to the carrier power (dBc)
1	+/- 5MHz offset from T-BS channel center frequency	4.8M (= +/-2.4M)Hz	21
2	+/- 10MHz offset from T-BS channel center frequency	4.8M (= +/-2.4M)Hz	41

3

## APPENDIX A. Preferred Channel Center Frequencies

### Preferred Channel Center Frequencies for Band Class Group 10.A

The channel center frequencies of Table 197 represent preferred channel raster for BCG 10.A. Compliance to this list is not sufficient for conformance. The channel center frequencies listed in **Table 2** are the basis for interoperability and conformance purposes.

**Table 197. Preferred Channel Set for BCG 10.A**

Band Class Group	Channel BW (MHz)	Frequency Range (MHz)		RF Channel Center Frequency Number Set	
		Uplink	Downlink	Uplink	Downlink
10.A	5	5000-5150	5000-5150	(100100, 102900, 100)	(100100, 102900, 100)
	10	5000-5150	5000-5150	(100100, 102900, 200)	(100100, 102900, 200)