Exhibit 8 Manual - Confidential

Radio Frequency Electromagnetic Exposure

CDMA/GSM/LTE/NR/WCDMA

SAFETY INSTRUCTION

5/124 46-LZA 701 6001 Uen Rev DF

Contents

1 Introduction

This document provides information on Radio Frequency (RF) Electromagnetic Field (EMF) exposure from antennas either integrated in or connected to a radio base station (RBS) or a radio unit in the RBS 6000 family.

2 Compliance Boundaries for Electromagnetic Exposure

The compliance boundary defines the minimum separations that should be kept between the antenna and a person to ensure that the ICNIRP [1], FCC [2] and Innovation, Science and Economic Development Canada [3] RF exposure limits are not exceeded.

Ericsson has performed advanced numerical or experimental RF exposure assessments in accordance with international and regional standards and regulations [4] – [8] in order to determine compliance boundaries for minimum and maximum power configurations of the RBS product with recommended antennas. The resulting dimensions, in meters, for a compliance boundary for both general public and occupational exposure are shown in the sections below for macro, micro, and pico RBS products as well as for the radio dot system.

The compliance boundary is defined as a cylinder or as a box surrounding the antenna/equipment. For configurations employing sector coverage antennas, the antenna/equipment is not located at the center of the compliance boundary. Instead it is located almost at the edge, facing towards the center of the cylinder/box. Figures illustrating the employed compliance boundaries for different configurations are provided in the subsections below.

2.1 Macro RBS

For the macro case, both cylindrical and box-shaped compliance boundaries are used as illustrated in Figure 1 and Figure 2. Box-shaped compliance boundaries are used for AIR configurations and for multicolumn MIMO configurations.

The distance between the back of the antenna and the cylinder/box is the "Distance behind antenna". The height of the cylinder/box is the antenna height plus a certain, equal distance above and below the antenna. For a box-shaped compliance boundary the ‘Width’ represents the width of the box.

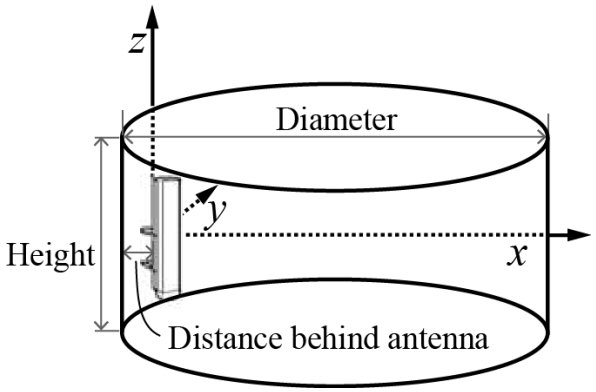

Figure 1. Cylindrical Compliance Boundary.

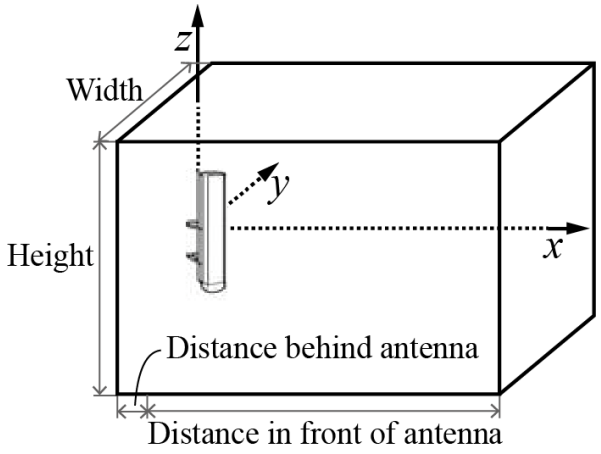

Figure 2. Box-shaped Compliance Boundary.

The resulting compliance boundary dimensions, in meters, for both general public and occupational exposure are shown in Table 1-1, Table 1-2, and Table 1-3 for RU (internal radio unit), Tables 2-1, 2-2, 2-3, 2-4, 2-5, 2-6 and 2-7 for RRU (external radio unit), and Tables 3-1 and 3-2 for AIR (antenna integrated radio unit).

It should be noted that Table 1 through Table 3 show examples for specified typical antennas and for minimum and maximum power levels, including the power tolerances and assumed transmission losses. As the antenna field distributions will differ for other antennas and power levels, calculations or measurements may be necessary to establish the compliance boundary for other configurations chosen by the customer. Other calculations or measurements may also be required if exposure limits other than [1] or [2] are specified in national regulations. For further information on RF exposure assessment methods, see [9].

The expanded uncertainty (k=2) is less than ±3 dB for the underlying calculations used for assessment of the compliance boundary dimensions listed in Table 1 through Table 3.

Characteristics of the antennas recommended and tested for macro RBS 6000 configurations are listed in Table 4.

The total powers fed to the antennas (including tolerance and assumed transmission loss) are given in Table 5 for using RU, Table 6-1, Table 6-2 and Table 6-3 for using RRU and Table 7-1 and 7-2 for using AIR.

Table 1-1 Cylindrical Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Output Powers using RU (Internal Radio Unit) with 0.6 dB Tolerance and Assumed 3 dB Transmission Loss.

Mode and output power for RU (internal radio unit)			**Dimensions of the cylindrical compliance boundary (m)**					
			Diameter		**Height**		**Distance behind antenna**	
Band	Standard[1]	Nominal output power from the radio	**GP**	**O**	**GP**	**O**	**GP**	**O**
B0 (900P)	G/W/L	20 W	0.9	0.4	2.6	2.6	<0.1	<0.1
		100 W	5.4	1.0	2.7	2.6	<0.1	<0.1
B1 (2100)	W/L	20 W	0.9	0.3	1.4	1.4	<0.1	<0.1
		100 W	4.8	0.9	1.6	1.4	<0.1	<0.1
B2 (1900)	G/W/L/C	20 W	0.9	0.3	1.4	1.4	<0.1	<0.1
	C	80 W	4.1	0.8	1.5	1.4	<0.1	<0.1
	G/W/L	100 W	4.9	0.9	1.6	1.4	<0.1	<0.1
B3 (1800)	G/W/L	20 W	1.1	0.3	1.4	1.4	<0.1	<0.1
		100 W	5.0	1.1	1.5	1.4	<0.1	<0.1
B4 (17/2100)	W/L/C	20 W	0.9	0.3	1.4	1.4	<0.1	<0.1
		80 W	4.0	0.8	1.6	1.4	<0.1	<0.1
B5 (850)	G/W/L/C	20 W	2.5	0.6	1.4	1.3	<0.1	<0.1
		100 W	5.7	2.5	1.6	1.4	<0.1	<0.1
B7 (2600)	L	20 W	1.0	0.3	1.4	1.4	<0.1	<0.1
		60 W	3.2	0.6	1.4	1.4	<0.1	<0.1
B8 (900E)	W/L	20 W	2.4	0.6	1.3	1.3	<0.1	<0.1
		100 W	5.6	2.5	1.6	1.3	<0.1	<0.1
	G	20 W	0.9	0.4	2.6	2.6	<0.1	<0.1
		100 W	5.4	1.0	2.7	2.6	<0.1	<0.1
B11 (1500)	W	20 W	1.5	0.4	1.5	1.4	<0.1	<0.1
		60 W	4.6	1.0	1.6	1.4	<0.1	<0.1
B12 (700_{12})	L	20 W	2.7	0.6	2.0	1.9	<0.1	<0.1
		60 W	5.7	1.5	2.2	2.0	<0.1	<0.1
B13 (700_{13})	L	20 W	2.7	0.6	2.0	1.9	<0.1	<0.1
		60 W	5.6	1.5	2.2	2.0	<0.1	<0.1
B14 (700_{14})	L	20 W	2.6	0.6	2.0	1.9	<0.1	<0.1
		60 W	5.6	1.4	2.2	2.0	<0.1	<0.1
B20 (800DD)	L	20 W	2.6	0.7	1.4	1.3	<0.1	<0.1
		80 W	5.2	2.3	1.6	1.3	<0.1	<0.1
B28 (700)	L	20 W	2.5	0.6	1.4	1.4	<0.1	<0.1
		100 W	5.7	2.5	2.0	1.4	<0.1	<0.1

[1] The standards are abbreviated in the tables of this document: G/W/L/C/VTF/NR = GSM/WCDMA/LTE/CDMA/Verizon Technical Forum/New Radio.

Table 1-2 Box Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Output Power Configurations with MIMO using RU (Internal Radio Unit) with 0.6 dB Tolerance and Assumed 3 dB Transmission Loss.

Mode and output power for RU (internal radio unit) using MIMO antenna and 0.6 dB tolerance				Dimensions of the box-shaped compliance boundary (m)							
				Distance in front of antenna		Width		Height		Distance behind antenna	
Band	**Standard**	**Number of Tx/Rx**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B13 (700)	L	4	240 W	16	7.1	12.6	5.4	3.2	2.2	0.1	0.1

Table 1-3 Box Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Output Power Configurations with MIMO using more than one RU (Internal Radio Unit) with 0.6 dB Tolerance and Assumed 3 dB Transmission Loss.

Mode and output power for configurations with more than one RRU (external radio unit) with 0.6 dB tolerance and 0.5 dB transmission loss					Dimensions of the box-shaped compliance boundary (m)							
					Distance in front of antenna		Width		Height		Distance behind antenna	
Product name	**Band**	**Standard**	**Nominal output power from the radios**	**IEC 62232 installation class**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
4 x RUS 01	B4 (2100)	L	4 x 60 W	E+	11.7	4.8	9.1	3.2	3.3	1.5	<0.1	<0.1
4 x RUS 02	B2 (1900)	L	4 x 80 W	E+	12.6	5.4	10.1	4.5	3.7	1.7	<0.1	<0.1
4 x RUS 02	B5 (800)	L	4 x 100 W	E+	17.9	8.0	13.8	6.2	3.2	2.0	<0.2	<0.1

Table 2-1 Cylindrical Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Output Powers using RRU (External Radio Unit) with 0.6 dB Tolerance and Assumed 0.5 dB Transmission Loss.

Mode and output power for RRU (external radio unit)			**Dimensions of the cylindrical compliance boundary (m)**					
			Diameter		**Height**		**Distance behind antenna**	
Band	Standard	Nominal output power from the radio	**GP**	**O**	**GP**	**O**	**GP**	**O**
B0 (900P)	G/W/L	20 W	1.6	0.4	2.6	2.6	<0.1	<0.1
		120 W	9.8	2.0	2.9	2.6	<0.1	<0.1
B1 (2100)[2]	W/L	20 W	1.5	0.4	1.4	1.4	<0.1	<0.1
		120 W	9.3	2.3	1.8	1.5	<0.1	<0.1
B1 (2100)[3]	W/L	40 W	4.3	0.9	1.5	1.5	<0.1	<0.1
		160 W	9.4	3.7	1.6	1.5	<0.1	<0.1
B2 (1900)	G/W/L	20 W	1.7	0.4	1.4	1.4	<0.1	<0.1
		160 W	8.9	2.3	1.7	1.5	<0.1	<0.1
B3 (1800)[4]	G/W/L	20 W	1.8	0.4	1.4	1.4	<0.1	<0.1
		160 W	9.3	3.5	1.7	1.5	<0.1	<0.1
B3 (1800)[5]	G/L	40 W	4.3	1.0	1.5	1.5	<0.1	<0.1
		160 W	9.1	3.9	1.6	1.5	<0.1	<0.1
B1 (2100) / B3 (1800)[6]	W, G/L	160 W	9.2	3.8	1.6	1.5	<0.1	<0.1
B4 (17/2100)	W/L/C	20 W	1.5	0.4	1.4	1.4	<0.1	<0.1
		120 W	7.8	2.0	1.7	1.4	<0.1	<0.1
B5 (850)	G/W/L/C	20 W	3.4	1.2	1.4	1.3	<0.1	<0.17
		160 W	9.7	4.4	2.0	1.5	<0.2	<0.1
B7 (2600)	L	20 W	1.9	0.4	1.4	1.4	<0.1	<0.1
		160 W[7]	10.3	3.7	1.6	1.5	<0.2	<0.1
B8 (900E)	G/W/L[8]	20 W	3.3	1.2	1.4	1.3	<0.1	<0.1
		160 W	9.5	4.3	2.0	1.4	<0.1	<0.1
	G[9]	20 W	1.6	0.4	2.6	2.6	<0.1	<0.1
		120 W	9.9	2.0	2.9	2.6	<0.1	<0.1
B9 (17/1800)	W/L	20 W	1.8	0.4	1.4	1.4	<0.1	<0.1
		60 W	5.2	1.2	1.6	1.4	<0.1	<0.1
B11 (1500)	W/L	20 W	3.0	0.6	1.6	1.4	<0.1	<0.1
		80 W	7.4	1.9	1.8	1.6	<0.1	<0.1
B12 (700_{12})	L	20 W	4.2	0.9	2.0	1.9	<0.1	<0.1
		80 W	9.0	3.8	2.4	2.0	<0.1	<0.1
B13 (700_{13})	L	20 W	4.1	0.9	2.0	1.9	<0.1	<0.1
		120 W	10.8	4.7	2.5	2.1	<0.1	<0.1
B20 (800DD)	L	20 W	3.5	1.4	1.4	1.3	<0.1	<0.1

[2] This row shows results for the KRE 101 1985/1 antenna
[3] This row shows results for the KRE 101 2085/1 v02 antenna.
[4] This row shows results for the KRE 101 1985/1 antenna
[5] This row shows results for the KRE 101 2085/1 v02 antenna.
[6] KRE 101 2085/1 v02 transmits simultaneously on B1 and B3 with the power divided equally among the two bands
[7] This row shows results for the KRE 101 2085/1 v02 antenna.
[8] This row shows the compliance boundary obtained with the X-pol macro RBS directional antenna (KRE 101 2021/1).
[9] This row shows the compliance boundary obtained with the X-pol macro RBS directional antenna (KRE 101 2057/1).

Mode and output power for RRU (external radio unit)			Dimensions of the cylindrical compliance boundary (m)					
			Diameter		Height		Distance behind antenna	
Band	Standard	Nominal output power from the radio	GP	O	GP	O	GP	O
		80 W	7.0	3.2	1.8	1.4	<0.1	<0.1
B25 (1900G)	L/C	20 W	1.7	0.4	1.4	1.4	<0.1	<0.1
		80 W	6.0	1.3	1.6	1.4	<0.1	<0.1
B25 (1900G)	W/L	160 W	8.9	2.3	1.7	1.5	<0.1	<0.1
B26 (850)	L/C	20 W	3.4	1.2	1.4	1.3	<0.1	<0.1
		80 W	6.8	3.1	1.7	1.4	<0.1	<0.1
B28 (700)	L	20 W	3.4	1.2	1.6	1.4	<0.1	<0.1
		80 W	6.8	3.0	2.2	1.5	<0.1	<0.1
		160 W	9.6	4.4	2.9	1.8	0.2	<0.1
B29 (700)	L	20 W	3.4	1.2	1.6	1.4	<0.1	<0.1
		80 W	7.0	3.0	2.3	1.6	<0.1	<0.1
B31 (450)	L	20 W	4.7	1.2	2.3	2.0	<0.1	<0.1
		80 W	9.5	4.2	2.9	2.2	<0.1	<0.1
B32 (1500)	L	20 W	3.0	0.6	1.6	1.4	<0.1	<0.1
		160 W	10.6	4.5	2.0	1.6	<0.1	<0.1
B38 (2600)	L	20 W	1.9	0.4	1.4	1.4	<0.1	<0.1
		80 W	6.4	1.4	1.4	1.4	<0.1	<0.1
B39 (1900)	L	20 W	1.8	0.4	1.4	1.4	<0.1	<0.1
		80 W	6.1	1.3	1.6	1.4	<0.1	<0.1
B40 (2300)	L	20 W	1.6	0.4	1.4	1.4	<0.1	<0.1
		100 W	7.0	1.5	1.5	1.4	<0.1	<0.1
B41 (2500)	L	20 W	1.9	0.4	1.4	1.4	<0.1	<0.1
		120 W	8.0	2.1	1.4	1.4	<0.1	<0.1
B42 (3500)	L	20 W	3.3	1.6	1.2	1.2	<0.1	<0.1
		80 W	6.4	3.0	1.2	1.2	<0.1	<0.1
B66 (17/2100)	W/L	20 W	1.5	0.4	1.4	1.4	<0.1	<0.1
		160 W	9.2	2.3	1.8	1.5	0.1	<0.1

Table 2-2 Cylindrical Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Output Powers using RRU (External Radio Unit) operating on multiple bands with 0.6 dB Tolerance and Assumed 0.5 dB Transmission Loss.

Mode and output power for RRU (external radio unit)			Dimensions of the cylindrical compliance boundary (m)					
			Diameter		Height		Distance behind antenna	
Band	Standard	Nominal output power from the radio	GP	O	GP	O	GP	O
B18 / B28[10]	L	10 W	2.3	0.6	1.4	1.4	<0.1	<0.1
		100 W	7.6	3.4	2.2	1.5	<0.1	<0.1
B3[11]	L	2 W	0.3	0.2	1.4	1.4	<0.1	<0.1
		20 W	1.8	0.4	1.4	1.4	<0.1	<0.1

[10] This row shows the result for RRU 22F2 with operation on B18 and B28 with power ratios of 60 % and 40 % on these bands, respectively.
[11] This row shows the results for RRU 22F1.

Table 2-3 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Power Configurations with MIMO Multi-Column Antennas using RRU (External Radio Unit) with 1 dB Tolerance and Assumed 0.5 dB Transmission Loss.

Mode and output power for RRU (external radio unit) using MIMO antenna and 1 dB tolerance				**Dimensions of the box-shaped compliance boundary (m)**							
				Distance in front of antenna		**Width**		**Height**		**Distance behind antenna**	
Band	**Standard**	**Number of Tx/Rx**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B38 (2600)	L	8	40 W	11.2	2.7	9.4	2.0	2.1	1.6	<0.1	<0.1
			120 W	20.2	8.3	17.1	6.5	2.8	1.8	0.2	<0.1
B39 (1900)	L	8	40 W	7.8	2.9	9.0	2.2	1.6	1.4	<0.1	<0.1
			80 W	11.2	4.8	13.2	5.2	1.9	1.4	0.3	<0.1
B41 (2500)	L	8	40 W	11.2	2.7	9.4	2.0	2.1	1.6	<0.1	<0.1
			240 W	28.8	12.4	24.4	10.1	3.6	2.1	0.2	<0.1

Table 2-4 Cylindrical Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Power Configurations with RRU (External Radio Unit) with 1 dB Tolerance and Assumed 0.5 dB Transmission Loss.

Mode and output power for RRU (external radio unit) with 1 dB tolerance			**Dimensions of the cylindrical compliance boundary (m)**					
			Diameter		**Height**		**Distance behind antenna**	
Band	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B38 (2600)	L	20 W	2.0	0.5	1.4	1.4	<0.1	<0.1
		80 W	6.7	1.5	1.4	1.4	<0.1	<0.1
B40 (2300)	L	20 W	1.6	0.4	1.4	1.4	<0.1	<0.1
		40 W	3.9	0.7	1.4	1.4	<0.1	<0.1

Table 2-5 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Power Configurations with MIMO Multi-Column Antennas using RRU (External Radio Unit) with 0.6 dB Tolerance and Assumed 0.5 dB Transmission Loss.

Mode and output power for RRU (external radio unit) using MIMO antenna and 0.6 dB tolerance				**Dimensions of the box-shaped compliance boundary (m)**							
				Distance in front of antenna		**Width**		**Height**		**Distance behind antenna**	
Band	**Standard**	**Number of Tx/Rx**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100)[22]	L	4	160 W	12.7	5.3	9.9	3.6	3.5	1.6	<0.1	<0.1
B1 (2100) / B3 (1800)[12]	L/W/G	4	160 W	12.1	5.0	9.1	3.0	1.8	1.5	<0.1	<0.1
B1 (2100) / B3 (1800)[13]	W/L, G/L	4	80 W	8.6	3.4	6.9	2.1	2.0	1.5	0.1	0.1
B1 (2100) / B3 (1800)[14]	W/L, G/L	4	320 W	17.4	7.6	13.7	6.2	4.0	1.8	0.1	0.1
B1 (2100) / B3 (1800)[15]	W/L, G/L	4	320 W	17.4	7.6	13.7	6.1	4.6	2.1	0.1	0.1
B1 (2100) / B3 (1800)[16]	W/L, G/L	4	320 W	17.7	7.7	13.9	6.3	4.6	2.1	0.1	0.1
B1 (2100) / B3 (1800)[17]	W/L, G/L	4	320 W	17.6	7.7	13.9	6.2	4.3	2.0	0.1	0.1
B1 (2100) / B3 (1800)[18]	W/L, G/L	4	320 W	17.4	7.6	13.7	6.2	4.2	1.9	0.1	0.1
B2 (1900)	G/W/L	4	40 W	7.2	1.4	4.6	0.7	1.6	1.5	<0.1	<0.1
			160 W	15.4	6.4	11.7	3.8	2.0	1.6	0.1	<0.1
B2 (1900) / B66A (2100)[19]	L	8	320 W	17.2	7.4	13.5	6.1	4.2	1.9	0.3	0.1
B2 (1900) / B66A (2100)[20]	L	8	320 W	17.5	7.6	13.7	6.2	4.6	2.1	0.3	0.1
B2 (1900) / B66A (2100)[21]	L	4	280 W	11.2	4.7	9.2	3.2	3.0	1.5	0.3	0.1

[12] KRE 101 2294/1 transmits simultaneously on B1 and B3 with the power divided equally among the two bands

[13] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power divided equally among the two bands

[14] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power divided equally among the two bands

[15] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power distributed as 25 % and 75 % over the two bands, respectively.

[16] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power distributed as 75 % and 25 % over the two bands, respectively.

[17] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power distributed as 37.5 % and 62.5 % over the two bands, respectively.

[18] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power distributed as 62.5 % and 37.5 % over the two bands, respectively.

[19] Two KRE 101 2294/1 (4 Tx) antennas transmit on B2 (4 Tx) and B66A (4 Tx) with the power distributed equally among the two bands

[20] Two KRE 101 2294/1 (4 Tx) antennas transmit on B2 (4 Tx) and B66A (4 Tx) with power distributed as 25 % and 75 % over the two bands, respectively.

[21] KRE 101 2294/1 (4 Tx) antenna transmits on B2 (2 Tx) and B66A (2 Tx) with power distributed as 43 % and 57 % over the two bands, respectively.

Mode and output power for RRU (external radio unit) using MIMO antenna and 0.6 dB tolerance				Dimensions of the box-shaped compliance boundary (m)							
				Distance in front of antenna		Width		Height		Distance behind antenna	
Band	**Standard**	**Number of Tx/Rx**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B3 (1800)	L	4	20 W	4.6	0.8	2.3	0.4	1.6	1.5	<0.1	<0.1
	G/L	4	40 W	7.1	1.7	4.9	0.9	1.6	1.5	<0.1	<0.1
			160 W	15.0	6.4	11.6	4.2	2.1	1.6	<0.1	<0.1
B3 (1800)[22]	G/L	4	160 W	12.1	5.1	9.6	4.3	3.8	2.0	<0.1	<0.1
B4 (17/2100)	W/L	4	40 W	7.3	1.4	5.0	0.8	1.5	1.5	<0.1	<0.1
			160 W	15.3	6.3	11.7	4.1	1.9	1.5	0.1	<0.1
B5 (850)	W/L	4	160 W	15.2	6.8	11.6	5.2	2.7	2.0	<0.1	<0.1
B7 (2600)	L	4	40 W	7.9	1.1	4.2	0.7	1.6	1.5	<0.1	<0.1
			160 W	17.3	6.7	13.1	2.9	2.1	1.6	0.3	<0.1
B8 (900E)	G/W/L	4	160 W	14.7	6.6	11.5	5.2	2.5	2.0	<0.1	<0.1
B14 (700)	L	4	160 W	17.4	7.8	13.6	5.9	3.3	2.3	0.1	0.1
B25 (1900G)	L/C	4	40 W	5.6	1.3	3.8	0.9	2.0	1.8	<0.1	<0.1
			160 W	13.6	4.5	11.8	2.9	3.4	1.9	<0.2	<0.1
B30 (2300)	L	4	25 W	5.9	0.9	2.9	0.5	1.6	1.5	<0.1	<0.1
			100 W	13.7	4.7	9.4	2.1	1.7	1.5	<0.1	<0.1
B38 (2600)	L	4	40 W	7.9	1.1	4.5	0.7	1.6	1.5	<0.1	<0.1
			160 W	17.3	6.7	12.0	3.5	2.0	1.6	<0.3	<0.1
B40 (2300)	L	4	20 W	4.8	0.6	2.2	0.4	1.6	1.5	<0.1	<0.1
			160 W	17.4	7.0	12.2	3.9	1.9	1.6	<0.1	<0.1
B41 (2500)	L	4	20 W	3.2	0.6	1.9	0.4	1.6	1.5	<0.1	<0.1
			160 W	17.3	6.7	12.0	3.5	2.0	1.6	<0.3	<0.1
B41 (2500)	L	8	40 W	10.6	2.5	8.8	1.7	1.9	1.5	<0.1	<0.1
			160 W	22.1	9.2	19.2	7.5	3.0	1.8	<0.2	<0.1
B66 (17/2100)	W/L	4	40 W	7.3	1.4	5.0	0.8	1.5	1.5	<0.1	<0.1
			240 W	15.3	6.6	12.2	5.5	4.4	2.0	<0.1	<0.1
B70 (2000)[22]	L	4	160 W	12.4	5.2	9.9	4.5	3.5	1.6	<0.3	<0.1
B71 (600)	L	4	160 W	17.9	7.8	16.3	6.3	3.6	2.7	<0.3	<0.1
B71 (600) / B85A (700)[23]	L	4	320 W	18.0	8.1	14.0	6.3	3.9	2.5	0.6	0.3
B71 (600) / B85A (700)[24]	L	4	320 W	19.7	8.8	15.4	6.9	3.0	2.5	0.6	0.3
B71 (600) / B85A (700)[23]	L	4	240 W	15.6	7.0	12.1	5.5	3.4	2.5	0.5	0.3
B71 (600) / B85A (700)[24]	L	4	240 W	17.1	7.6	13.4	6.0	2.6	2.5	0.5	0.3
B71 (600) / B85A (700)[23]	L	4	160 W	12.7	5.7	9.9	4.5	2.8	2.5	0.4	0.2
B71 (600) / B85A (700)[24]	L	4	160 W	13.9	6.1	10.9	4.9	2.5	2.5	0.5	0.2
B71 (600) / B85A (700)[23]	L	4	80 W	9.0	4.0	7.0	3.2	2.5	2.5	0.3	0.2
B71 (600) / B85A (700)[24]	L	4	80 W	9.8	4.2	7.7	3.5	2.5	2.5	0.3	0.2
B71 (600) / B85A (700)[23]	L	4	32 W	5.7	2.4	4.5	1.5	2.5	2.5	0.2	0.1
B71 (600) / B85A (700)[24]	L	4	32 W	6.1	2.4	4.9	1.4	2.5	2.5	0.2	0.1

[22] This row shows the compliance boundary obtained with the X-pol macro RBS directional antenna (KRE 101 2294/1).
[23] This row shows results for RFS APXVAARR18_43-U-NA20.
[24] This row shows results for RFS APXVAARR24_43-U-NA20.

Table 2-6 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Power Configurations with MIMO Multi-Column Antennas using RRU (External Radio Unit) with time-division duplexing (TDD), 0.6 dB Tolerance and Assumed 0.5 dB Transmission Loss.

Mode and output power for RRU (external radio unit) using MIMO antenna and 0.6 dB tolerance					**Dimensions of the box-shaped compliance boundary (m)**							
					Distance in front of antenna		**Width**		**Height**		**Distance behind antenna**	
Band	**Standard**	**Nominal output power from the radio**	**IEC 62232 installation class**	**TDD factor**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B34, B39A[25]	L	80 W	E+	0.8	7.3	3.3	8.6	3.8	1.5	1.5	<0.1	<0.1
		240 W	E+	0.8	12.6	5.7	14.8	6.7	2.4	1.5	<0.1	<0.1
B38[24]	L	160 W	E+	0.74	11.9	4.8	8.2	2.8	2.9	1.5	<0.1	<0.1
B40[26]	L	160 W	E+	0.74	11.0	4.5	8.0	2.8	3.8	1.7	<0.1	<0.1
B40[27]	L	40 W	E+	0.9	5.7	1.5	5.2	1.1	1.5	1.1	<0.1	<0.1
		160 W	E+	0.9	12	5.1	11.7	4.4	2.2	1.4	<0.1	<0.1
B42[28]	L	160 W	E+	0.75	11.1	4.7	10.4	4.0	1.4	1.1	<0.1	<0.1
				0.9	12.1	5.3	11.4	4.6	1.5	1.1	<0.1	<0.1

[25] This row shows results for the Tongyu TYDA-2015/2616DE4-BCv01 antenna
[26] This row shows results for the KRE 101 2294/1 antenna.
[27] This row shows results for the ATD4516R5-27 antenna.
[28] This row shows results for the ATD4516R8.

Table 2-7 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Power Configurations with MIMO Multi-Column Antennas using more than one RRU (External Radio Unit) with 0.6 dB Tolerance and Assumed 0.5 dB Transmission Loss.

Mode and output power for configurations with more than one RRU (external radio unit) with 0.6 dB tolerance and 0.5 dB transmission loss					Dimensions of the box-shaped compliance boundary (m)							
					Distance in front of antenna		Width		Height		Distance behind antenna	
Product name	**Band**	**Standard**	**Nominal output power from the radios**	**IEC 62232 installation class**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
2 x RRUS 11	B2	L	4 x 30 W	E+	10.3	4.3	8.3	2.9	3.1	1.5	<0.1	<0.1
			4 x 40 W	E+	11.9	5.0	9.5	4.3	3.5	1.5	<0.1	<0.1
2 x RRUS 11	B4	L	4 x 30 W	E+	10.7	4.4	8.6	2.9	3.1	1.5	<0.1	<0.1
			4 x 40 W	E+	12.4	5.2	9.9	4.5	3.5	1.6	<0.1	<0.1
2 x RRUS 11	B5	L	4 x 30 W	E+	13.1	5.8	10.1	4.6	2.4	2.0	<0.1	<0.1
			4 x 40 W	E+	15.1	6.7	11.6	5.2	2.7	2.0	<0.1	<0.1
2 x RRUS 11	B13	L	4 x 40 W	E+	14.9	6.7	11.6	5.2	3.5	2.0	<0.1	<0.1
2 x RRUS 12	B2	L	4 x 60 W	E+	14.7	6.3	11.7	5.3	4.3	2.0	<0.1	<0.1
2 x RRUS 12	B4	L	4 x 60 W	E+	15.3	6.6	12.2	5.5	4.4	2.0	<0.1	<0.1
2 x RRUS 12	B5	L	4 x 60 W	E+	18.5	8.3	14.3	6.4	3.3	2.0	<0.2	<0.1

Table 3-1 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Minimum and Maximum Power Configurations using AIR (Antenna Integrated Radio) with 0.6 dB Tolerance and Assumed 0 dB Transmission Loss.

Mode and output power for AIR (antenna integrated radio)			Dimensions of the box-shaped compliance boundary (m)							
			Distance in front of antenna		Width		Height		Distance behind antenna	
Band	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100)[29]	W/L	20 W	1.9	0.5	1.2	0.4	1.5	1.5	0	0
		60 W	5.5	1.1	4.0	0.7	1.5	1.5	0	0
B1 (2100)[30]	W/L	20 W	1.7	0.5	1.2	0.5	2.0	2.0	0	0
		60 W	5.4	1.1	3.3	0.8	2.0	2.0	0	0
B2 (1900)[31]	G/W/L	20 W	2.7	0.6	1.3	0.4	1.5	1.5	0	0
		60 W	5.9	1.6	4.1	0.9	1.7	1.5	0	0
B2 (1900)[32]	G/W/L	20 W	1.8	0.5	1.0	0.4	2.5	2.5	0	0
		60 W	5.1	1.0	3.3	0.6	2.6	2.5	0	0
B2 (1900)[33]	G/W/L	20 W	1.3	0.5	1.2	0.4	2.0	2.0	0	0
		60 W	5.4	1.2	3.6	0.9	2.0	2.0	0	0
B2 (1900)[34]	G/W/L	120 W	14.2	6.1	10.4	3.4	1.9	1.6	< 0.1	0
B2 (1900)[35]	G/W/L	120 W	11.1	4.7	8.0	3.0	2.5	2.0	0	0

[29] This row shows the compliance boundary dimensions of the KRE 101 2144/1 antenna.
[30] This row shows the compliance boundary dimensions of the KRE 101 2168/1 antenna.
[31] This row shows the compliance boundary dimensions of the KRE 101 2132/1 antenna.
[32] This row shows the compliance boundary dimensions of the KRE 101 2174/1 antenna.
[33] This row shows the compliance boundary dimensions of the KRE 101 2170/1 antenna.
[34] This row shows the compliance boundary dimensions of the KRE 105 244/1 antenna.
[35] This row shows the compliance boundary dimensions of the KRE 101 241/1 antenna.

Mode and output power for AIR (antenna integrated radio)			Dimensions of the box-shaped compliance boundary (m)							
			Distance in front of antenna		Width		Height		Distance behind antenna	
Band	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B3 (1800)[36]	G/W/L	20 W	2.6	1.0	1.8	0.6	1.5	1.5	0	0
		60 W	5.6	1.9	3.6	1.4	1.5	1.5	0	0
B3 (1800)[37]	G/W/L	20 W	1.9	0.5	1.3	0.5	2.5	2.5	0	0
		60 W	5.2	1.1	4.1	1.0	2.5	2.5	0	0
B3 (1800)[38]	G/L	120 W	12.8	4.8	11.5	3.1	2.8	2.0	0	0
B4 (17/2100)[39]	W/L	20 W	2.0	0.6	1.4	0.4	1.5	1.5	0	0
		60 W	5.7	1.4	4.2	0.8	1.6	1.5	0	0
B4 (17/2100)[40]	W/L	20 W	1.8	0.5	1.2	0.4	2.5	2.5	0	0
		60 W	5.3	1.1	3.5	0.7	2.6	2.5	0	0
B4 (17/2100)[41]	W/L	20 W	1.7	0.5	1.2	0.5	2.0	2.0	0	0
		60 W	5.4	1.1	3.3	0.8	2.0	2.0	0	0
B4 (17/2100)[42]	W/L	120 W	15.2	6.1	10.5	3.0	1.8	1.5	0	0
B7 (2600)	L	20 W	1.2	0.4	0.9	0.4	1.5	1.5	0	0
		60 W	3.3	0.9	2.4	0.5	1.5	1.5	0	0
B7 (2600)[43]	L	120 W	10.8	2.6	7.0	1.5	5.7	2.5	0	0
B3 (1800), B7 (2600)[44]	G/L, L	240 W	16.7	6.9	13.6	4.0	5.8	2.6	0	0
B8 (900E)	G/W	20 W	3.6	0.8	1.7	0.4	2.0	2.0	0	0
		60 W	7.0	1.9	4.8	1.2	2.0	2.0	0	0
B20 (800DD)[45]	L	20 W	3.6	0.7	1.8	0.4	2.1	2.0	0	0
		60 W	7.2	1.9	5.4	1.1	2.3	2.0	0	0
B20 (800DD)[46]	L	20 W	3.5	1.2	2.5	0.6	1.5	1.5	0	0
		60 W	6.2	2.8	4.8	1.8	1.8	1.5	0	0
B66 (17/2100)[32]	W/L	120 W	15.1	6.1	10.7	3.2	1.9	1.6	0	0
B66 (17/2100)[47]	W/L	120 W	9.8	2.6	12.2	2.8	2.6	2.0	0	0
B2 (1900), B66 (17/2100) [48]	G/W, W/L	240 W	20.9	9.1	15.4	6.0	2.2	1.6	< 0.1	0
B7 (2600), B66 (17/2100)[49]	L, W/L	240 W	14.2	5.3	14.1	3.5	5.9	2.6	0	0

Note: The distance behind antenna given in Table 3 is measured from the back of the AIR radio unit.

[36] This row shows the compliance boundary dimensions of the KRE 101 2148/1 antenna.
[37] This row shows the compliance boundary dimensions of the KRE 101 2166/1 antenna.
[38] This row shows the compliance boundary dimensions of the KRE 105 241/1 antenna.
[39] This row shows the compliance boundary dimensions of the KRE 101 2133/1 antenna.
[40] This row shows the compliance boundary dimensions of the KRE 101 2149/1 antenna.
[41] This row shows the compliance boundary dimensions of the KRE 101 2167/1 antenna.
[42] This row shows the compliance boundary dimensions of the KRE 105 216/1 antenna.
[43] This row shows the compliance boundary dimensions of the KRE 105 237/1 antenna.
[44] KRE 105 245/1 transmits simultaneously on B3 and B7 with the power divided equally among the two bands.
[45] This row shows the compliance boundary dimensions of the KRE 101 2087/1 antenna.
[46] This row shows the compliance boundary dimensions of the KRE 101 2131/1 antenna.
[47] This row shows the compliance boundary dimensions of the KRE 105 241/1 antenna.
[48] KRE 105 244/1 transmits simultaneously on B2 and B66 with equal power ratios.
[49] KRE 105 245/1 transmits simultaneously on B7 and B66 with equal power ratios.

Table 3-2 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Maximum Power Configurations using AIR 6468 (Antenna Integrated Radio) with time-division duplexing (TDD) and Assumed 0 dB Transmission Loss.

Mode and output power for AIR 6468 (antenna integrated radio)							Dimensions of the box-shaped compliance boundary (m)							
							Distance in front of antenna		Width		Height		Distance behind antenna	
Band	**Standard**	**Nominal EIRP per beam[50]**	**IEC 62232 Installation class**	**Output power tolerance**	**TDD factor**	**Fraction of output power for traffic beams[51]**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B38A (2600)	L	69.5 dBm	E+	1.5 dB	0.75	75 %	11.2	5.0	13.1	5.9	6.2	2.8	0	0
B40 (2300)	L	70.0 dBm	E+	1.5 dB	0.75	75 %	12.5	5.6	14.8	6.6	7.4	3.3	0	0
B41E (2600)	L	72.1 dBm	E+	1.5 dB	0.75	75 %	13.7	6.1	16.0	7.2	7.4	3.4	0	0
B41 (2600)	L	71.3 dBm	E+	1.0 dB	0.75	75 %	12.9	5.8	15.2	6.8	7.1	3.2	0	0
B42 (3500)	L	71.8 dBm	E+	1.5 dB	0.75	75 %	13.8	6.2	16.2	7.3	7.4	3.3	0	0

Table 3-3 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Maximum Power Configurations using AIR (Antenna Integrated Radio) with Assumed 0 dB Transmission Loss.

Mode and output power for AIR (antenna integrated radio)							Dimensions of the box-shaped compliance boundary (m)							
							Distance in front of antenna		Width		Height		Distance behind antenna	
Product name	**Band**	**Standard**	**Nominal EIRP per beam[52]**	**IEC 62232 Installation class**	**Output power tolerance**	**TDD factor**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
AIR 5121	n257 (28000)	VTF	46 dBm	E+[53]	1.5 dB	0.89	1.8	0.8	2.3	1.0	1.0	0.5	0	0
AIR 6488	B42F (3500)	L, NR	74 dBm	E+	1.5 dB	0.75	20.6	9.3	24.0	10.8	10.8	4.9	0	0
	B78B (3500)	NR	74 dBm	E+	1.5 dB	0.75	20.6	9.3	24.0	10.8	10.8	4.9	0	0

[50] The stated EIRP value is the peak beam EIRP without power tolerance included.
[51] The AIR 6468 broadcast beam can be configured to handle three different UE distribution scenarios, denoted Macro, Hotspot and High-rise. Each of these configurations is characterized by different gain values, beamwidths and electrical tilt angles. The assessment in this report is based on the Macro configuration which is the one providing the maximum gain and therefore the largest front compliance distance.
[52] The stated EIRP value is the peak beam EIRP without power tolerance included.
[53] The total EIRP for 8 beams is equal to 55 dBm i.e, above E+ power limit.

Table 4 Characteristics for the tested antennas

Antenna specifications	X-pol macro RBS directional antenna (BXA-70063/6CF)	X-pol macro RBS directional antenna (KRE 101 1985/1)	X-pol macro RBS directional antenna (KRE 101 2085/1 v01)	X-pol macro RBS directional antenna (KRE 101 2085/1 v02)
Antenna dimensions	Height: 1.8 m	Height: 1.3 m	Height: 1.4 m	Height: 1.45 m
Half-power beam width	63 degrees	64-68 degrees	60-61 degrees	63, 68, 58 degrees
Antenna gain	17 dBi	18.2 dBi	18 dBi	18.2,17.6,19 dBi
Down tilt	0 degrees	0 degrees	0 degrees	0 degrees
Tested bands	B12, B13, B14	B1, B2, B3, B4, B9, B25, B39	B7, B38, B40, B41	B1, B3, B7
Antenna specifications	X-pol macro RBS directional 8-branch antenna (TYDA-202415D4T0)	X-pol macro RBS directional 8-branch antenna (ODS-090R15NV06(F))	X-pol macro RBS directional antenna (KRE 101 2057/1)	X-pol macro RBS directional antenna
Antenna dimensions	Height: 1.4 m	Height: 1.4 m	Height: 2.6 m	Height: 1.4 m
Half-power beam width	29 degrees	≤25 degrees	65-66 degrees	67 degrees
Antenna gain	20 dBi	22 dBi	17 dBi	18 dBi
Down tilt	0 degrees	0 degrees	0 degrees	0 degrees
Tested bands	B39 (MIMO only)	B38, B41 (MIMO only)	B0, B8	B11, B32
Antenna specifications	X-pol macro RBS directional antenna (KRE 101 2087/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2132/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2133/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2146/1), Integrated in AIR
Antenna dimensions	Height: 2.0 m	Height: 1.4 m	Height: 1.4 m	Height: 2.0
Half-power beam width	66 degrees	62 degrees	62 degrees	63 degrees
Antenna gain	16 dBi	18 dBi	18 dBi	16 dBi
Down tilt	0 degrees	0 degrees	0 degrees	0 degrees
Tested bands	B20 (AIR only)	B2 (AIR only)	B4 (AIR only)	B8 (AIR only)
Antenna specifications	X-pol macro RBS directional antenna (KRE 101 2149/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2144/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2148/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2166/1), Integrated in AIR
Antenna dimensions	Height: 2.3 m	Height: 1.4 m	Height: 1.4 m	Height: 2.4 m
Half-power beam width	60 degrees	65 degrees	65 degrees	63 degrees
Antenna gain	17 dBi	18 dBi	18 dBi	17.2 dBi
Down tilt	0 degrees	0 degrees	0 degrees	0 degrees
Tested bands	B4 (AIR only)	B1 (AIR only)	B3 (AIR only)	B3 (AIR only)

Antenna specifications	X-pol macro RBS directional antenna (KRE 101 2163/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2131/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2174/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2170/1), Integrated in AIR
Antenna dimensions	Height: 1.4 m	Height: 1.4 m	Height: 2.4 m	Height: 2.0 m
Half-power beam width	55 degrees	67 degrees	60 degrees	63 degrees
Antenna gain	18.1 dBi	14.2 dBi	16.8 dBi	17.9 dBi
Down tilt	0 degrees	0 degrees	0 degrees	0 degrees
Tested bands	B7 (AIR only)	B20 (AIR only)	B2 (AIR only)	B2 (AIR only)
Antenna specifications	X-pol macro RBS directional antenna (KRE 101 2224/1)	X-pol macro RBS directional antenna (RFS APXVSPP18-C)	X-pol macro RBS directional antenna (KRE 101 2167/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 101 2168/1), Integrated in AIR
Antenna dimensions	Height: 1.4 m	Height: 1.8 m	Height: 2.0 m	Height: 2.0 m
Half-power beam width	65-68 degrees	65 degrees	63 degrees	63 degrees
Antenna gain	14.2-14.8 dBi	18 dBi[54]	18.1 dBi	18.1 dBi
Down tilt	0 degrees	0 degrees	0 degrees	0 degrees
Tested bands	B18, B28, B29	B25	B4 (AIR only)	B1 (AIR only)
Antenna specifications	X-pol macro RBS directional antenna (KRE 101 2092/1)	X-pol macro RBS directional antenna (KRE 105 216/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 105 237/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 105 245/1), Integrated in AIR
Antenna dimensions	Height: 1.5 m	Height: 1.4 m	Height: 2.0 m	Height: 2.0 m
Half-power beam width	57-67 degrees	61 degrees	62/58 degrees	62/64 degrees (B3), 63/58 degrees (B7) 59/63 degrees (B66)
Antenna gain	17.5 -18.9 dBi[52]	18.4[52]	17.1/17.9[55]	17 / 16.9 (B3), 17.5 / 17.9 (B7)[56] 17.5 / 17.3 (B66)
Down tilt	0 degrees	0 degrees	2.5 degrees	2.5 degrees
Tested bands	B2, B3, B4, B7, B30, B38, B40, B41, B66	B4	B7	B3, B7, B66
Antenna specifications	X-pol macro RBS directional antenna (KRE 101 1902/1)	X-pol macro RBS directional antenna (KRE 101 2260/1)	X-pol macro RBS directional antenna (KRE 105 244/1), Integrated in AIR	X-pol macro RBS directional antenna (KRE 105 241/1), Integrated in AIR
Antenna dimensions	Height: 2 m	Height: 1.0 m	Height: 1.4 m	Height: 2.0 m
Half-power beam width	65 degrees	70.6 degrees	62 degrees (B2), 61 degrees (B66)	59 / 65 degrees (B2), 62 / 64 degrees (B3), 59 / 63 degrees (B66)
Antenna gain	15 dBi	17.7 dBi	17.8 (B2), 18.3 (B66)[52]	17.5 / 16.9 (B2), 17.0 / 16.9 (B3), 17.5 / 17.3 (B66)[53]
Down tilt	0 degrees	2 - 12 degrees	2 degrees	2 degrees
Tested bands	B31	B42	B2, B66	B2, B3, B66

[54] The far-field properties for this antenna are given for one of the ports excited.
[55] The far-field properties for this antenna correspond to values for the two array columns (broadside beam excitation).
[56] The far-field properties for this antenna correspond to values for the two array columns (broadside beam excitation).

Antenna specifications	X-pol macro RBS directional antenna (KRE 101 2021/1)	X-pol macro RBS directional antenna[57]	Internal AAS antenna (KRE 105 257/1)[58]	Internal AAS antenna (KRE 105 257/2)[56]
Antenna dimensions	Height: 1.3 m	Height: 1.8m	Height: 0.99m	Height: 0.99m
Half-power beam width	65-67 degrees	32.7 degrees	12±4 degrees	12±4 degrees
Antenna gain	15 dBi	19.5 dBi[59]	24.3[60]	23.5[65]
Down tilt	0 degrees	0 degrees	±60° (azimuth) 73° - 113° (elevation)	±60° (azimuth) 73° - 113° (elevation)
Tested bands	B5, B8, B20, B26	B14	B41E	B38A, B41

Antenna specifications	X-pol macro RBS directional antenna[61]	X-pol macro RBS directional antenna (ODI-065R15I02-Q)	X-pol macro RBS directional antenna (KRE 101 2301/1)	X-pol macro RBS directional antenna (KRE 101 2294/1)
Antenna dimensions	Height: 1.8m	Height: 2.4 m	Height: 2.0 m	Height: 1.5 m
Half-power beam width	33.2	67 degrees	60 degrees	59-68 degrees
Antenna gain	19.4[62]	19[63] dBi	15.6 dBi (B5)[64] 15.8 dBi (B8) [62] 14.8 dBi (B13) [62]	17.9 dBi (B1, B2, B4, B66, B70)[62] 17.3 dBi (B3)[62] 18.6 dBi (B38)[61] 18.3 dBi (B40)[62]
Down tilt	0 degrees	0 degrees	2 degrees	2 degrees
Tested bands	B13	B71	B5, B8, B13 (4TX MIMO)	B1, B2, B3, B4, B40, B66, B70 (4TX MIMO)

Antenna specifications	Internal AAS antenna (PAAM) [56] [65]	Internal AAS antenna (KRE 105 264/1)[56]	X-pol macro RBS directional 8-branch antenna (ATD 4516R5-27)	Internal AAS antenna (KRE 105 272/1)[56]
Antenna dimensions	Height x Width: 0.07 m x 0.07 m per PAAM	Height: 0.99 m	Height: 1.5 m	Height: 0.99m
Half-power beam width	12±2 degrees	12±4 degrees	25.5 degrees	12±4 degrees
Antenna gain	24[66] dBi	24.0[67]	21	22.2[65]
Down tilt	±60° (azimuth) ±15 (elevation)	±60° (azimuth) 73° - 113° (elevation)	2 degrees	±60° (azimuth) 73° - 113° (elevation)
Tested bands	n257	B42	B40	B40

[57] Two 2 Tx antennas based on BXA-70063/6CF were used to create a 4 Tx antenna model for B14 since no real antenna was available
[58] For the internal AAS antennas, the stated gain and half-power beam width correspond to traffic beam gain and half-power beam width
[59] The information specified here is the data obtained for the 2 Tx antenna model based on BXA-70063/6CF
[60] The stated gain value is the peak beam gain.
[61] Two 2 Tx antennas based on BXA-70063/6CF were used to create a 4 Tx antenna model for B13 since no real antenna was available
[62] The information specified here is the data obtained for the 2 Tx antenna model based on BXA-70063/6CF
[63] The far-field properties for this antenna correspond to values for the two array columns (broadside beam excitation).
[64] The far-field properties for this antenna are given for one of the ports excited.
[65] The antenna unit consists of four Phase Array Antenna Modules (PAAM) with 2 active beams per each PAAM.
[66] The stated gain value is the peak beam gain.
[67] The stated gain value is the peak beam gain.

Antenna specifications	X-pol macro RBS directional 8-branch antenna (ATD 4516R8)	X-pol macro RBS directional 8-branch antenna (TYDA-2015/2616DE4-BCv01)	Internal AAS antenna (KRE 105 261)[56]	RFS APXVAARR18_43-U-NA20
Antenna dimensions	Height: 1.1 m	Height: 1.45 m	Height: 0.81m	Height: 2.44 m
Half-power beam width	78 degrees	100° ± 15° (B34) 90° ± 15° (B39A)	22±3 degrees	14.2 ± 0.8 / 14.2 ± 0.8 degrees (B71) 13.0 ± 0.5 / 12.9 ± 0.6 degrees (B85A)
Antenna gain	21 dBi	14.5 dBi (B34) 13.5 dBi (B39A)	24 dBi[65]	14.4 / 14.1 dBi (B71) 14.9 / 14.5 dBi (B85A)
Down tilt	2 degrees	2 degrees	±60° (azimuth) 73° - 113° (elevation)	2 – 12 degrees
Tested bands	B42	B34 and B39A (MIMO only)	B42F, B78B	B71 and B85A
Antenna specifications	RFS APXVAARR24_43-U-NA20			
Antenna dimensions	Height: 2.44 m			
Half-power beam width	11.4 / 11.4 degrees (B71) 10.4 / 10.3 degrees (B85A)			
Antenna gain	15.1 / 14.8 dBi (B71) 15.5 / 15.1 dBi (B85A)			
Down tilt	2 – 12 degrees			
Tested bands	B71 and B85A			

Table 5 Total Power to the Antenna for Minimum and Maximum Power Configurations using RU (Internal Radio Unit) including 0.6 dB Tolerance and 3 dB Transmission Loss.

Band	Standard	Nominal output power from the radio (dBm/W)	Total power delivered to antenna (dBm/W)
B0 (900P)	G/W/L	43.0/20	40.6/11.5
		50.0/100	47.6/57.5
B1 (2100)	W/L	43.0/20	40.6/11.5
		50.0/100	47.6/57.5
B2 (1900)	G/W/L/C	43.0/20	40.6/11.5
	C	49.0/80	46.6/45.7
	G/W/L	50.0/100	47.6/57.5
B3 (1800)	G/W/L	43.0/20	40.6/11.5
		50.0/100	47.6/57.5
B4 (17/2100)	W/L/C	43.0/20	40.6/11.5
		49.0/80	46.6/45.7
B5 (850)	G/W/L/C	43.0/20	40.6/11.5
		50.0/100	47.6/57.5
B7 (2600)	L	43.0/20	40.6/11.5
		47.8/60	45.4/34.7
B8 (900E)	W/L	43.0/20	40.6/11.5
		50.0/100	47.6/57.5
	G	43.0/20	40.6/11.5
		50.0/100	47.6/57.5
B11 (1500)	W	43.0/20	40.6/11.5
		47.8/60	45.4/34.7
B12 (700_{12})	L	43.0/20	40.6/11.5
		47.8/60	45.4/34.7
B13 (700_{13})	L	43.0/20	40.6/11.5
		47.8/60	45.4/34.7
B13 (700_{13})[68]	L	53.8/240	51.4/138
B14 (700_{14})	L	43.0/20	40.6/11.5
		47.8/60	45.4/34.7
B20 (800DD)	L	43.0/20	40.6/11.5
		49.0/80	46.6/45.7
B28 (700)	L	43.0/20	40.6/11.5
		50.0/100	47.6/57.5

[68] These assessments were made for a 4-branch antenna (4 Tx).

Table 6-1 Total Power to the Antenna for Minimum and Maximum Power Configurations using RRU (External Radio Unit) including 0.6 dB Tolerance and 0.5 dB Transmission Loss.

Band	Standard	Nominal output power from the radio (dBm/W)	Total power delivered to antenna (dBm/W)
B0 (900P)	G/W/L	43.0/20	43.1/20.4
		50.8/120	50.9/123
B1 (2100)	W/L	43.0/20	43.1/20.4
		52.0/160	52.1/162.2
B1 (2100)[69]	W/L	52.0/160	52.1/162.2
B1 (2100)[67]	L	52.0/160	52.1/162.2
B2 (1900)	G/W/L	43.0/20	43.1/20.4
		52.0/160	52.1/162.2
B2 (1900)[70]	L	46.0/40	46.1/40.7
		52.0/160	52.1/162.2
B2 (1900) / B66A (2100) [71]	L	55.0/320	55.1/324
B2 (1900) / B66A (2100)[72]	L	55.0/320	55.1/324
B2 (1900) / B66A (2100) [73]	L	54.5/280	54.6/288
B3 (1800)	G/W/L	43.0/20	43.1/20.4
		52.0/160	52.1/162.2
B3 (1800)[68]	L	43.0/20	43.1/20.4
	G/L	46.0/40	46.1/40.7
		52.0/160	52.1/162.2
B3 (1800)[67]	G/L	52.0/160	52.1/162.2
B1 (2100), B3 (1800)[74]	W, G/L	52.0/160	52.1/162.2
B1 (2100) / B3 (1800) [75]	W, L	52.0/160	52.1/162.2
B1 (2100) / B3 (1800)[76]	W/L, G/L	49.0/80	49.1/81.3
B1 (2100) / B3 (1800)[77]	W/L, G/L	55.0/320	55.1/324
B1 (2100) / B3 (1800)[78]	W/L, G/L	55.0/320	55.1/324

[69] These assessments were made for a 4-branch antenna (4 Tx).
[70] These assessments were made for a 4-branch antenna (4 Tx).
[71] These assessments were made for an 8-branch antenna (8Tx). The product is transmitting simultaneously on B2 (4 Tx) and B66A (4Tx) with the power distributed equally.
[72] These assessments were made for an 8-branch antenna (8Tx). The product is transmitting simultaneously on B2 (4 Tx) and B66A (4Tx) with power distributed as 25 % and 75 % over the bands, respectively.
[73] These assessments were made for a 4-branch antenna (4 Tx). The product is transmitting simultaneously on B2 (2 Tx) and B66A (2Tx) with power distributed as 43 % and 57 % over the bands, respectively.
[74] This power level is used in a multi-band product transmitting simultaneously on B1 and B3 with the power distributed equally among the two bands.
[75] These assessments were made for a 4-branch antenna (4 Tx). The product is transmitting simultaneously on B1 and B3 with the power distributed equally.
[76] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power divided equally among the two bands
[77] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power divided equally among the two bands
[78] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power distributed as 25 % and 75 % over the two bands, respectively.

Band	Standard	Nominal output power from the radio (dBm/W)	Total power delivered to antenna (dBm/W)
B1 (2100) / B3 (1800)[79]	W/L, G/L	55.0/320	55.1/324
B1 (2100) / B3 (1800)[80]	W/L, G/L	55.0/320	55.1/324
B1 (2100) / B3 (1800)[81]	W/L, G/L	55.0/320	55.1/324
B4 (17/2100)	W/L/C	43.0/20	43.1/20.4
		50.8/120	50.9/123
B4 (17/2100)[68]	L	46.0/40	46.1/40.7
		52.0/160	52.1/162.2
B5 (850)	G/W/L/C	43.0/20	43.1/20.4
		52.0/160	52.1/162.2
B5 (850)[82]	W/L	52.0/160	52.1/162.2
B7 (2600)	L	43.0/20	43.1/20.4
		50.8/120	50.9/123
B7 (2600)[68]	L	46.0 / 40	46.1 / 40.7
		52.0 / 160	52.1 / 162.2
B8 (900E)	G/W/L	43.0/20	43.1/20.4
		52.0/160	52.1/162.2
	G	43.0/20	43.1/20.4
		50.8/120	50.9/123
B8 (900E)[83]	G/W/L	52.0/160	52.1/162.2
B9 (17/1800)	W/L	43.0/20	43.1/20.4
		47.8/60	47.9/61.7
B11 (1500)	W/L	43.0/20	43.1/20.4
		49.0/80	49.1/81.3
B12 (700_{12})	L	43.0/20	43.1/20.4
		49/80	49.1/81.3
B13 (700_{13})	L	43.0/20	43.1/20.4
		50.8/120	50.9/123
B14 (700)	L	52 / 160	52.1 / 162.2
B18 (800), B28 (700)[84]	L	37.8/6.0 36.0/4.0	37.9/6.2 36.1/4.1
		47.8/60.3 46.0/39.8	47.9/61.7 46.1/40.7
B20 (800DD)	L	43.0/20	43.1/20.4
		49.0/80	49.1/81.3
B25 (1900G)	W/L/C	43.0/20	43.1/20.4
		49.0/80	49.1/81.3
B25 (1900G)[85]	W/L/C	46/40	46.1/40.7
		52/160	52.1/162.2
B26 (850)	L/C	43.0/20	43.1/20.4
		49.0/80	49.1/81.3

[79] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power distributed as 75 % and 25 % over the two bands, respectively.
[80] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power distributed as 37.5 % and 62.5 % over the two bands, respectively.
[81] [81] KRE 101 2294/1 transmits simultaneously on B1 (4 Tx) and B3 (4 Tx) with the power distributed as 62.5 % and 37.5 % over the two bands, respectively.
[82] These assessments were made for a 4-branch antenna (4 Tx).
[83] These assessments were made for a 4-branch antenna (4 Tx).
[84] This power level is used in a multi-band product transmitting simultaneously on B18 and B28 with power distributed as 60 % and 40 % over the bands, respectively.
[85] These assessments were made for a 4-branch antenna (4 Tx).

Band	Standard	Nominal output power from the radio (dBm/W)	Total power delivered to antenna (dBm/W)
B28 (700)	L	43.0/20	43.1/20.4
		49.0/79.4	49.1/81.3
		52.0/160	52.1/162.2
B29 (700)	L	43.0/20	43.1/20.4
		49.0/80	49.1/81.3
B30 (2300)	L	44.0 / 25	44.1 / 25.7
		50.0 / 100	50.1 / 102.3
B31 (450)	L	43.0/20	43.1/20.4
		49.0/80	49.1/81.3
B32 (1500)	L	43.0/20	43.1/20.4
		52.0/160	52.1/162.2
B38 (2600)	L	43.0/20	43.1/20.4
		49.0/80	49.1/81.3
B38 (2600)[83]	L	46.0/40	46.1/40.7
		52.0/160	52.1/162.2
B39 (1900)	L	43.0/20	43.1/20.4
		49.0/80	49.1/81.3
B40 (2300)	L	43.0/20	43.1/20.4
		50.0/100	50.1/102
B40 (2300) [83]	L	46.0/40	46.1/40.7
		52.0/160	52.1/162.2
B41 (2500)	L	43.0/20	43.1/20.4
		46.0/40	46.1/40.7
		50.8/120	50.9/123
		52.0/160	52.1/162.2
B41 (2500)[83]	L	43.0/20	43.1/20.4
		52.0/160	52.1/162.2
B41 (2500)[86]	L	46.0/40	46.1/40.7
		50.8/120	50.9/123
B42 (3500)	L	43.0/20	43.1/20.4
		49.0/80	49.1/81.3
B66 (17/2100) [83]	W/L	46.0/40	46.1/40.7
		53.8/240	53.9/245.5
B70 (2000)[67]	L	52.0/160	52.1/162.2
B71 (600)	L	52.0/160	52.1/162.2
B71 (600) / B85A (700)	L	55.0 / 320	55.1 / 324
		53.8 / 240	53.9 / 245
		52.0 / 160	52.1 / 162
		49.0 / 80	49.1 / 81
		45.0 / 32	45.1 / 41

[86] These assessments were made for an 8-branch antenna (8 Tx).

Table 6-2 Total Power to the Antenna for Minimum and Maximum Power Configurations using RRU (External Radio Unit) with time-division duplexing (TDD) including 0.6 dB Tolerance, 0.5 dB Transmission Loss and TDD factor.

Band	Standard	Nominal output power from the radio (dBm/W)	TDD factor	Total power delivered to antenna (dBm/W)
B34 (2000), B39A (1900+)	L	49.0 / 80 [87]	0.8	48.1 / 65
		53.8 / 240 Error! Bookmark not defined.	0.8	53.0 / 196
B38 (2600)[81]	L	52.0 / 160	0.74	50.8 / 120
B40 (2300)[24]	L	52 / 160	0.74	50.8 / 120
B40 (2300)	L	46 / 40	0.9	45.6 / 36.7
		52 / 160	0.9	51.6 / 146
B40 (2300)[81]	L	52.0 / 160	0.74	50.8 / 120
B42 (3500)	L	52 / 160[84]	0.9	51.6/146
			0.75	50.9/122

Table 6-3 Total Power to the Antenna for Minimum and Maximum Power Configurations using RRU (External Radio Unit) including 1 dB Tolerance and 0.5 dB Transmission Loss.

Band	Standard	Nominal output power from the radio (dBm/W)	Total power delivered to antenna (dBm/W)
B38 (2600)	L	43.0/20	43.5/22.4
		49.0/80	49.5/89.1
B38 (2600)[88]	L	46.0/40	46.5/44.7
		50.8/120	51.3/134.9
B39 (1900)[86]	L	46.0/40	46.5/44.7
		49.0/80	49.5/89.1

[87] These assessments were made for an 8-branch antenna (8 Tx). This power level is used in a multi-band product transmitting simultaneously on B34 and B39A with power distributed as 33 % and 67 % over the bands, respectively

[88] These assessments were made for an 8-branch antenna (8 Tx).

Band	Standard	Nominal output power from the radio (dBm/W)	Total power delivered to antenna (dBm/W)
B38 (2600)	L	43.0/20	43.5/22.4
B40 (2300)	L	43.0/20	43.5/22.4
		46.0/40	46.5/44.7
B41(2500)[86]	L	46.0/40	46.5/44.7
		53.8/240	54.3/269.2

Table 7-1 Total Power to the Antenna for Minimum and Maximum Power Configurations using AIR (Antenna Integrated Radio Unit) including 0.6 dB Tolerance and 0 dB Transmission Loss.

Band	Standard	Nominal output power from the radio (dBm/W)	Total power delivered to antenna (dBm/W)
B1 (2100)[89]	W/L	43.0/20	43.6/22.9
		47.8/60	48.4/69.2
B2 (1900)[90]	G/W/L	43.0/20	43.6/22.9
		47.8/60	48.4/69.2
		50.8 / 120	51.4 / 138
B3 (1800)[91]	G/W/L	43.0/20	43.6/22.9
		47.8/60	48.4/69.2
	G/L	50.8 / 120	51.4 / 138
B4 (17/2100)[92]	W/L	43.0/20	43.6/22.9
		47.8/60	48.4/69.2
		50.8/120	51.4/138
B7 (2600)[93]	L	43.0/20	43.6/22.9
		47.8/60	48.4/69.2
		50.8/120	51.4/138
B3 (1800), B7 (2600)[94]	G/L, L	53.8 / 240	54.4 / 275
B8 (900E)	G/W	43.0/20	43.6/22.9
		47.8/60	48.4/69.2
B20 (800DD)[95]	L	43.0/20	43.6/22.9
		47.8/60	48.4/69.2
B66 (17/2100)[96]	W/L	50.8 / 120	51.4 / 138
B2 (1900), B66 (17/2100) [97]	G/W, W/L	53.8 / 240	54.4 / 275

[89] B1 has been tested for two different antennas.
[90] B2 has been tested for five different antennas.
[91] B3 has been tested for four different antennas.
[92] B4 has been tested for four different antennas.
[93] B7 has been tested for three different antennas.
[94] This power level is used in a multi-band product transmitting simultaneously on B3 and B7 with the power distributed equally among the two bands.
[95] B20 has been tested for two different antennas.
[96] This power level is applicable to two different products capable of transmission on B66.
[97] This power level is used in a multi-band product transmitting simultaneously on B2 and B66 with the power distributed equally among the two bands.

Band	Standard	Nominal output power from the radio (dBm/W)	Total power delivered to antenna (dBm/W)
B3 (1800), B7 (2600)[98]	L, W/L	53.8 / 240	54.4 / 275

Table 7-2 Total Power to the Antenna for Minimum and Maximum Power Configurations using AIR (Antenna Integrated Radio Unit) AAS including Tolerance, 0 dB Transmission Loss and TDD Factor

Band	Standard	Nominal output power from the radio (dBm/W)	TDD factor	Total power delivered to antenna (dBm/W)
B38A (2600)	L	49.0 / 80	0.75	49.3 / 84
B40 (2300)	L	50.8 / 120	0.75	51.0 / 127
B41E (2600)	L	50.8 / 120	0.75	51.0 / 127
B41 (2600)	L	50.8 / 120	0.75	50.5 / 127
B42 (3500)	L	50.8 / 120	0.75	51.0 / 127
n257 (28000)	VTF	31 / 1.3	0.89	32 / 1.6
B42F (3500)	L, NR	53 / 200	0.75	53.3 / 211
B78B (3500)	NR	53 / 200	0.75	53.3 / 211

[98] This power level is used in a multi-band product transmitting simultaneously on B7 and B66 with the power distributed equally among the two bands.

2.2 Micro RBS

For the micro products, box-shaped compliance boundaries are used. For configurations with internal antennas or external sector coverage antennas, the front and back compliance distances are defined from the equipment/antenna casing as shown in Figure 3. For configurations with external omni-directional antennas, the compliance boundary dimensions are defined with respect to the origin centered between the dipole antenna elements, see Figure 4.

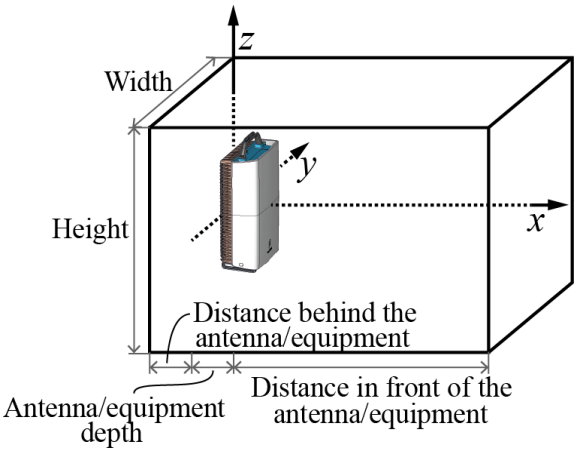

Figure 3. Box-shaped Compliance Boundary used for configurations with internal antennas and for configurations with external sector coverage antennas. The front and back compliance distances are defined from the EUT/antenna casing.

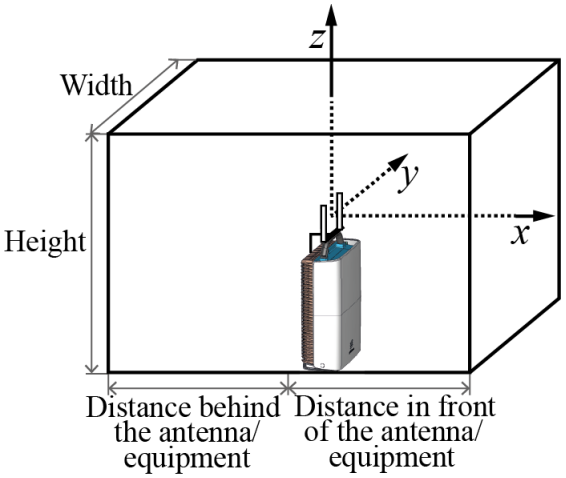

Figure 4. Box-shaped Compliance Boundary used for configurations with external omni-directional antennas. The compliance boundary dimensions are defined with respect to the origin centered between the dipole antenna elements.

The resulting compliance boundary dimensions in meters are shown in Table 8 and Table 9. The power levels used for the assessments include power tolerances and transmission losses. The transmitted field distributions are dependent on the used antenna. Separate calculations or measurements may therefore be necessary to establish compliance boundaries for configurations employing other external antennas chosen by the customer. For further information on RF exposure assessment methods, see [9]. The expanded uncertainty (k=2) is less than ±3 dB for the underlying calculations of the power density used for assessment of the compliance boundary dimensions listed in Table 8.

Characteristics of the antennas recommended are listed in Table 10.

The total powers fed to the antennas (including tolerance and assumed transmission loss) are given in Table 11.

Table 8-1 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for mRRUS 12 with 1 dB tolerance and 0 dB transmission loss (intended markets: Europe/Rest of world).

Mode and output power for the mRRU (external radio unit)			**Dimensions of the box-shaped compliance boundary (m)**							
			Distance in front of antenna/EUT		**Width**		**Height**		**Distance behind antenna/EUT**	
Band, antenna, installation case[99]	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100), KRE 101 2141/1, Vertical	W/L	2 × 5 W	0.9	0.4	0.8	0.4	1.0	0.6	0	0
B3 (1800), KRE 101 2141/1, Vertical	W/L	2 × 5 W	0.8	0.4	0.9	0.4	1.0	0.6	0	0
B7 (2600), KRE 101 2142/1, Vertical	L	2 × 5 W	0.9	0.4	0.8	0.4	1.0	0.6	0	0
B1 (2100), KRE 101 2141/1, Horizontal	W/L	2 × 5 W	0.9	0.4	1.0	0.6	0.8	0.4	0	0
B3 (1800), KRE 101 2141/1, Horizontal	W/L	2 × 5 W	0.8	0.4	1.0	0.6	0.9	0.4	0	0
B7 (2600), KRE 101 2142/1, Horizontal	L	2 × 5 W	0.9	0.4	1.0	0.6	0.8	0.4	0	0
B1 (2100), KRE 101 1985/1, Horizontal/Vertical	W/L	2 × 5 W	0.8	0.2	0.5	0.2	1.4	1.4	<0.1	<0.1
B3 (1800), KRE 101 1985/1, Horizontal/Vertical	W/L	2 × 5 W	1.0	0.2	0.6	0.2	1.4	1.4	<0.1	<0.1
B1 (2100), KRE 101 2024/1, Vertical	W/L	2 × 5 W	0.6	0.3	1.2	0.6	0.6	0.3	0.6	0.3
B3 (1800), KRE 101 2024/1, Vertical	W/L	2 × 5 W	0.7	0.3	1.3	0.7	0.7	0.3	0.7	0.3
B7 (2600), KRE 101 2024/1, Vertical	L	2 × 5 W	0.5	0.3	0.9	0.5	0.4	0.2	0.5	0.3
B1 (2100), KRE 101 2024/1, Horizontal	W/L	2 × 5 W	0.6	0.2	1.3	0.7	0.6	0.3	0.6	0.2
B3 (1800), KRE 101 2024/1, Horizontal	W/L	2 × 5 W	0.7	0.3	1.3	0.8	0.6	0.3	0.7	0.3
B7 (2600), KRE 101 2024/1, Horizontal	L	2 × 5 W	0.5	0.4	1.0	0.7	0.4	0.2	0.5	0.4

[99] The installation case refers to the orientation of the equipment.

Table 8-2 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for mRBS 6501 with 1 dB tolerance and 0 dB transmission loss (intended markets: Europe/Rest of world).

Mode and output power for the mRBS (micro-RBS)			**Dimensions of the box-shaped compliance boundary (m)**							
			Distance in front of antenna/EUT		**Width**		**Height**		**Distance behind antenna/EUT**	
Band, antenna, installation case[100]	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100), KRE 101 2141/1, Vertical	W/L	2 × 5 W	0.9	0.4	0.8	0.4	0.8	0.5	0	0
B3 (1800), KRE 101 2141/1, Vertical	W/L	2 × 5 W	0.8	0.4	0.8	0.4	0.8	0.5	0	0
B7 (2600), KRE 101 2142/1, Vertical	L	2 × 5 W	0.9	0.4	0.8	0.4	0.9	0.5	0	0
B1 (2100), KRE 101 2141/1, Horizontal	W/L	2 × 5 W	0.9	0.4	0.8	0.5	0.8	0.4	0	0
B3 (1800), KRE 101 2141/1, Horizontal	W/L	2 × 5 W	0.8	0.4	0.8	0.5	0.8	0.4	0	0
B7 (2600), KRE 101 2142/1, Horizontal	L	2 × 5 W	0.9	0.4	0.9	0.5	0.8	0.4	0	0
B1 (2100), KRE 101 1985/1, Horizontal/Vertical	W/L	2 × 5 W	0.8	0.2	0.5	0.2	1.4	1.4	<0.1	<0.1
B3 (1800), KRE 101 1985/1, Horizontal/Vertical	W/L	2 × 5 W	1.0	0.2	0.6	0.2	1.4	1.4	<0.1	<0.1
B7 (2600), KRE 101 2085/1, Horizontal/Vertical	L	2 × 5 W	1.0	0.1	0.6	0.2	1.4	1.4	< 0.1	< 0.1
B1 (2100), KRE 101 2024/1, Vertical	W/L	2 × 5 W	0.6	0.3	1.2	0.6	0.6	0.3	0.6	0.3
B3 (1800), KRE 101 2024/1, Vertical	W/L	2 × 5 W	0.7	0.3	1.3	0.7	0.7	0.3	0.7	0.3
B7 (2600), KRE 101 2024/1, Vertical	L	2 × 5 W	0.5	0.3	0.9	0.5	0.4	0.2	0.5	0.3
B1 (2100), KRE 101 2024/1, Horizontal	W/L	2 × 5 W	0.6	0.2	1.3	0.7	0.6	0.3	0.6	0.2
B3 (1800), KRE 101 2024/1, Horizontal	W/L	2 × 5 W	0.7	0.3	1.3	0.8	0.6	0.3	0.7	0.3
B7 (2600), KRE 101 2024/1, Horizontal	L	2 × 5 W	0.5	0.4	1.0	0.7	0.4	0.2	0.5	0.4

[100] For internal antennas and antennas mounted on the equipment, the installation case refers to the orientation of the equipment. For external antennas not mounted on the equipment, the installation case refers to the orientation of the antennas.

Table 8-3 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for Radio 2203 with 1 dB tolerance and 0 dB transmission loss (intended markets: Europe/Rest of world).

Mode and output power for the RRU (micro-RBS)			Dimensions of the box-shaped compliance boundary (m)							
			Distance in front of radio		Width		Height		Distance behind radio	
Band, antenna, installation case[98]	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100) KRE 101 2249/1 Vertical	W/L	2 × 5 W	1.2	0.5	1.0	0.5	0.8	0.4	0	0
B3 (1800) KRE 101 2249/1 Vertical	W/L	2 x 5 W	1.1	0.5	1.0	0.5	0.8	0.4	0	0
B1 (2100), KRE 101 2024/1 Vertical	W/L	2 × 5 W	0.6	0.2	1.4	0.8	0.6	0.2	0.6	0.2
B7 (2600) KRE 101 2250/1 Vertical	W/L	2 x 5 W	1.1	0.5	1.0	0.5	0.7	0.4	0	0
B5 (800) KRE 101 2199/1 Vertical	W/L	2 x 5 W	1.2	0.6	1.1	0.6	1.2	0.6	0	0
B8 (900) KRE 101 2199/1 Vertical	W/L	2 × 5 W	1.2	0.6	1.1	0.5	1.2	0.6	0	0
B1 (2100), KRE 101 2266/1 Vertical	W/L	2 × 5 W	0.6	0.2	1.3	0.8	0.6	0.2	0.6	0.2
B3 (1800) KRE 101 2266/1 Vertical	W/L	2 x 5 W	0.6	0.2	1.4	0.8	0.6	0.3	0.6	0.2
B5 (800) KRE 101 2266/1 Vertical	W/L	2 x 5 W	0.9	0.4	1.8	1.0	0.9	0.4	0.9	0.4
B7 (2600) KRE 101 2266/1 Vertical	W/L	2 x 5 W	0.6	0.2	1.3	0.8	0.6	0.2	0.6	0.2
B8 (900) KRE 101 2266/1 Vertical	W/L	2 × 5 W	0.9	0.4	1.8	1.0	0.8	0.4	0.9	0.4

Table 8-4 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for RRU 2208 with 1 dB tolerance and 0 dB transmission loss (intended markets: Europe/Rest of world).

Mode and output power for the RRU (micro-RBS)			Dimensions of the box-shaped compliance boundary (m)							
			Distance in front of radio		Width		Height		Distance behind radio	
Band, antenna, installation case[101]	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B41 (TD 2500), KRE 101 2250/2 Vertical	L	2 × 1 W	0.5	0.2	0.5	0.2	0.3	0.2	0.0	0.0
		2 × 10 W	1.6	0.7	1.4	0.7	0.8	0.4	0.0	0.0

[101] The installation case refers to the orientation of the equipment.

Table 8-5 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for mRRUS 61 with 1 dB tolerance and 0 dB transmission loss (intended markets: Europe/Rest of world).

Mode and output power for the mRRU (external radio unit)			**Dimensions of the box-shaped compliance boundary (m)**							
			Distance in front of antenna/EUT		**Width**		**Height**		**Distance behind antenna/EUT**	
Band, antenna, installation case[99]	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B38 (2600), KRE 101 2142/2, Vertical	L	2 × 5 W	0.7	0.3	0.7	0.3	0.8	0.5	<0.1	<0.1

Table 8-6 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for RRU 22F3 with 0.6 dB tolerance and 0.2 dB transmission loss (intended markets: Europe/Rest of world).

Mode and output power for the RRU (micro-RBS)			**Dimensions of the box-shaped compliance boundary (m)**							
			Distance in front of antenna		**Width**		**Height**		**Distance behind antenna**	
Band, antenna, installation case[102]	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 / B18 / B28[103], KRE 101 2245/1, Vertical	L	2.8 W (B1: 1.2 W, B18: 0.8 W, B28: 0.8 W)	0.3	0.1	1.3	1.0	0.4	0.3	0.3	0.1
		28 W (B1: 12 W, B18: 8 W, B28: 8 W)	1.2	0.5	2.7	1.5	1.1	0.5	1.2	0.5

The maximum available power to Radio 2205, tested for B46A (5155 MHz – 5250 MHz) for the European market, including output power tolerance of 1 dB and 0 dB transmission loss is 17.8 mW, which is less than the applicable low-power exclusion level of 20 mW specified in [10]. As a consequence, no RF exposure evaluation is required, and the product is inherently in compliance with the appropriate RF exposure standards and recommendations.

[102] For internal antennas and antennas mounted on the equipment, the installation case refers to the orientation of the equipment. For external antennas not mounted on the equipment, the installation case refers to the orientation of the antennas.

[103] This row shows the result for RRU 22F3 with simultaneous operation on B1, B18 and B28 with power ratios of 42.9 %, 28.6 % and 28.6 %, respectively. The orientation of the antennas is independent from the orientation of the RRU.

Table 9-1 Box-Shaped Compliance Boundary Dimensions for General Public/Uncontrolled (GP) Exposure for mRRUS with 1 dB tolerance and 0 dB transmission loss (intended markets: USA/Canada).

Mode and output power for the RRU (external radio unit)			**Dimensions of the box-shaped compliance boundary (m)**			
			Distance in front of antenna/EUT	**Width**	**Height**	**Distance behind antenna/EUT**
Band, antenna, installation case[104]	**Standard**	**Nominal output power from the radio**	**GP**	**GP**	**GP**	**GP**
B2 (1900), KRE 101 2141/1, Vertical	W/L	2 × 5 W	0.8	0.8	0.9	0.2
B2 (1900), KRE 101 2141/1, Horizontal	W/L	2 × 5 W	0.7	0.9	0.8	0.2
B2 (1900), KRE 101 2233/1, Vertical	W/L	2 × 5 W	0.4	0.7	0.7	0.4
B2 (1900), KRE 101 2233/1, Horizontal	W/L	2 × 5 W	0.4	0.9	0.9	0.4
B4 (2100), KRE 101 2141/1, Vertical	W/L	2 × 5 W	1.0	0.9	0.9	0.2
B4 (2100), KRE 101 2141/1, Horizontal	W/L	2 × 5 W	0.8	0.9	0.9	0.2
B4 (2100), KRE 101 2024/1, Vertical	W/L	2 × 5 W	0.4	0.7	0.7	0.4
B4 (2100), KRE 101 2024/1, Horizontal	W/L	2 × 5 W	0.5	0.9	0.9	0.5
B7 (2600), KRE 101 2142/1, Vertical	L	2 × 5 W	0.5	0.7	0.9	0.2
B7 (2600), KRE 101 2142/1, Horizontal	L	2 × 5 W	0.5	0.9	0.7	0.2
B7 (2600), KRE 101 2024/1, Vertical	L	2 × 5 W	0.3	0.7	0.7	0.3
B7 (2600), KRE 101 2024/1, Horizontal	L	2 × 5 W	0.3	0.9	0.9	0.3
B12 (700), KRE 101 2134/1, Vertical	L	2 × 5 W	1.0	0.8	0.9	0.2
B12 (700), KRE 101 2134/1, Horizontal	L	2 × 5 W	1.0	0.9	0.8	0.2
B12 (700), KRE 101 2245/1, Horizontal	L	2 × 5 W	0.5	1.1	1.1	0.5
B13 (750), KRE 101 2135/1, Vertical	L	2 × 5 W	1.1	1.0	1.0	0.2
B13 (750), KRE 101 2135/1, Horizontal	L	2 × 5 W	1.2	1.0	1.0	0.2
B13 (750), KRE 101 2245/1, Horizontal	L	2 × 5 W	0.6	1.2	1.2	0.6

[104] The installation case refers to the orientation of the equipment.

Table 9-2 Box-Shaped Compliance Boundary Dimensions for General Public/Uncontrolled (GP) Exposure for mRBS with 1 dB tolerance and 0 dB transmission loss (intended markets: USA/Canada).

Mode and output power for the mRBS (micro-RBS)			**Dimensions of the box-shaped compliance boundary (m)**			
			Distance in front of antenna/EUT	**Width**	**Height**	**Distance behind antenna/EUT**
Band, antenna, installation case[105]	**Standard**	**Nominal output power from the radio**	**GP**	**GP**	**GP**	**GP**
B2 (1900), KRE 101 2141/1, Vertical	W/L	2 × 5 W	1.0	0.9	1.0	0.2
B2 (1900), KRE 101 2141/1, Horizontal	W/L	2 × 5 W	0.9	1.0	0.9	0.2
B2 (1900), KRE 101 2233/1, Vertical	W/L	2 × 5 W	0.6	0.8	0.8	0.6
B2 (1900), KRE 101 2233/1, Horizontal	W/L	2 × 5 W	0.4	1.0	1.0	0.4
B4 (2100), KRE 101 2141/1, Vertical	W/L	2 × 5 W	0.8	0.9	0.9	0.2
B4 (2100), KRE 101 2141/1, Horizontal	W/L	2 × 5 W	0.8	0.9	0.9	0.2
B4 (2100), KRE 101 2024/1, Vertical	W/L	2 × 5 W	0.4	0.7	0.7	0.4
B4 (2100), KRE 101 2024/1, Horizontal	W/L	2 × 5 W	0.3	0.9	0.9	0.3
B7 (2600), KRE 101 2142/1, Vertical	L	2 × 5 W	0.6	0.8	0.9	0.2
B7 (2600), KRE 101 2142/1, Horizontal	L	2 × 5 W	0.5	0.9	0.8	0.2
B7 (2600), KRE 101 2024/1, Vertical	L	2 × 5 W	0.3	0.8	0.8	0.3
B7 (2600), KRE 101 2024/1, Horizontal	L	2 × 5 W	0.3	0.9	0.9	0.3
B12 (700), KRE 101 2134/1, Vertical	L	2 × 5 W	1.0	0.9	0.9	0.2
B12 (700), KRE 101 2134/1, Horizontal	L	2 × 5 W	1.1	0.9	0.9	0.2
B12 (700), KRE 101 2245/1, Horizontal	L	2 × 5 W	0.5	1.1	1.1	0.5
B13 (750), KRE 101 2135/1, Vertical	L	2 × 5 W	1.0	1.1	0.9	0.2
B13 (750), KRE 101 2135/1, Horizontal	L	2 × 5 W	1.1	0.9	1.1	0.2
B13 (750), KRE 101 2245/1, Horizontal	L	2 × 5 W	0.6	1.2	1.2	0.6
B25 (1900), KRE 101 2141/1, Vertical	L	2 × 5 W	0.9	0.8	0.9	0.2

[105] The installation case refers to the orientation of the equipment.

Mode and output power for the mRBS (micro-RBS)			Dimensions of the box-shaped compliance boundary (m)			
			Distance in front of antenna/EUT	Width	Height	Distance behind antenna/EUT
Band, antenna, installation case[105]	**Standard**	**Nominal output power from the radio**	**GP**	**GP**	**GP**	**GP**
B25 (1900), KRE 101 2141/1, Horizontal	L	2 × 5 W	0.9	0.9	0.8	0.2
B25 (1900), KRE 101 2233/1, Vertical	L	2 × 5 W	0.5	0.9	0.9	0.5
B25 (1900), KRE 101 2233/1, Horizontal	L	2 × 5 W	0.4	1.0	1.0	0.4

Table 9-3 Box-Shaped Compliance Boundary Dimensions for General Public/Uncontrolled (GP) Exposure for Radio 2203 with 0.6 dB tolerance and 0 dB transmission loss (intended market: USA)

Mode and output power for the mRRU (micro-RRU)			Dimensions of the box-shaped compliance boundary (m)			
			Distance in front of antenna/EUT	Width	Height	Distance behind antenna/EUT
Band, antenna, installation case[103]	**Standard**	**Nominal output power from the radio**	**GP**	**GP**	**GP**	**GP**
B2/25 (1900) KRE 101 2249/1, Vertical	W/L	2 × 5 W	0.7	0.6	0.6	0.2
B2/25 (1900) KRE 101 2233/1, Vertical	W/L	2 × 5 W	0.3	0.9	0.9	0.3
B2/25 (1900) KRE 101 2245/1, Vertical	W/L	2 × 5 W	0.3	0.9	0.9	0.3
B5 (850) KRE 101 2199/1, Vertical	W/L	2 × 5 W	0.7	0.6	0.6	0.2
B5 (850) KRE 101 2233/1, Vertical	W/L	2 × 5 W	0.3	1.0	1.0	0.4
B66A (2100) , KRE 101 2249/1 Vertical	W[106]/L	2 × 5 W	0.8	0.6	0.6	0.2
B66A (2100), KRE 101 2233/1, Vertical	W[104]/L	2 × 5 W	0.2	0.9	0.9	0.3
B66A (2100), KRE 101 2245/1, Vertical	W[104]/L	2 × 5 W	0.3	0.9	0.9	0.3

[106] For WCDMA/UMTS the Radio 2203 B66A is limited to B4 frequencies.

Table 9-4 Box-Shaped Compliance Boundary Dimensions for General Public/Uncontrolled (GP) Exposure for Radio 2203 with 0.6 dB tolerance and 0 dB transmission loss (intended market: Canada)

Mode and output power for the mRRU (micro-RRU)			**Dimensions of the box-shaped compliance boundary (m)**			
			Distance in front of antenna/EUT	**Width**	**Height**	**Distance behind antenna/EUT**
Band, antenna, installation case[103]	**Standard**	**Nominal output power from the radio**	**GP**	**GP**	**GP**	**GP**
B2/25 (1900) KRE 101 2249/1, Vertical	W/L	2 × 5 W	1.2	1.0	1.0	0.2
B2/25 (1900) KRE 101 2233/1, Vertical	W/L	2 × 5 W	0.4	1.0	1.0	0.5
B2/25 (1900) KRE 101 2245/1, Vertical	W/L	2 × 5 W	0.4	1.1	1.1	0.5
B5 (850) KRE 101 2199/1, Vertical	W/L	2 × 5 W	1.2	1.0	1.0	0.2
B5 (850) KRE 101 2233/1, Vertical	W/L	2 × 5 W	0.6	1.6	1.6	0.8
B7 (2600) KRE 101 2250/1 Vertical	W/L	2 × 5 W	1.1	0.9	0.9	0.2
B7 (2600) KRE 101 2233/1 Vertical	W/L	2 × 5 W	0.3	0.9	0.9	0.4
B7 (2600) KRE 101 2245/1 Vertical	W/L	2 × 5 W	0.3	0.9	0.9	0.3
B66A (2100), KRE 101 2249/1, Vertical	W[104]/L	2 × 5 W	1.4	1.0	1.0	0.2
B66A (2100), KRE 101 2233/1, Vertical	W[104]/L	2 × 5 W	0.5	1.1	1.1	0.5
B66A (2100), KRE 101 2245/1, Vertical	W[104]/L	2 × 5 W	0.6	1.1	1.1	0.6

Table 10-1 Characteristics for the tested internal antennas used with mRRUS, mRBS, RRU 2208, Radio 2203 and Radio 2205.

Antenna specifications	Internal X-pol sector coverage antenna (KRE 101 2141/1)	Internal X-pol sector coverage antenna (KRE 101 2135/1)	Internal X-pol sector coverage antenna (KRE 101 2142/1)	Internal X-pol sector coverage antenna (KRE 101 2134/1)	Internal X-pol sector coverage antenna (KRE 101 2142/2)
Antenna dimensions (m)	—	—	—	—	—
Half-power beam width (degrees)	68 – 81	79 – 92	93 – 108	86 - 106	76 - 96
Antenna gain (dBi)	5.8 – 7.9	5.3 – 6.6	4.8 – 5.4	5.2 – 6.7	6.8 – 6.1
Down tilt (degrees)	—	—	—	—	—
Tested bands	B1, B2, B3, B4, B25	B13	B7	B12	B38

Antenna specifications	Internal X-pol sector coverage antenna (KRE 101 2150/2)	Internal X-pol sector coverage antenna (KRE 101 2249/1)	Internal X-pol sector coverage antenna (KRE 101 2199/1)	Internal X-pol sector coverage antenna (KRE 101 2250/1)	Internal X-pol sector coverage antenna (KRE 105 259/1)
Antenna dimensions (m)	—	—	—	—	—
Half-power beam width (degrees)	65 ± 10	85	—	82 ± 13	90º ± 10º
Antenna gain (dBi)	> 10	> 7.5	6.9, 6.5	> 7.5	10.5
Down tilt (degrees)	—	8	—	8	—
Tested bands	B41	B1, B2, B3, B25, B66A	B5, B8	B7	B46A

Table 10-2 Characteristics for the tested external antennas used with mRRUS, mRBS, RRU 2208 and Radio 2203.

Antenna specifications	External X-pol sector coverage antenna (KRE 101 2085/1)	External X-pol sector coverage antenna (KRE 101 1985/1)	External V-pol omni-directional antenna (KRE 101 2024/1)	External V-pol omni-directional antenna (KRE 101 2245/1)	External V-pol omni-directional antenna (KRE 101 2233/1)
Antenna dimensions (m)	Height: 1.4	Height: 1.3	Height: 0.12	Height: 0.2	Height: 0.19
Half-power beam width (degrees)	58	64 – 68	omni	omni	omni
Antenna gain (dBi)	19.0	17.7 - 18	2	2	2
Down tilt (degrees)	0	0	—	—	—
Tested bands	B7	B1, B3	B1, B3, B4, B7	B2, B7, B12, B13, B25, B66A	B2, B7, B25, B66A

Antenna specifications	External V-pol omni-directional antenna (KRE 101 2266/1)
Antenna dimensions (m)	Height: 0.19
Half-power beam width (degrees)	Omni
Antenna gain (dBi)	2
Down tilt (degrees)	—
Tested bands	B1, B3, B5, B7, B8

Table 10-3 Characteristics for the tested antennas used with RRU 22F3.

Antenna specifications	External V-pol omni-directional antenna (KRE 101 2245/1)
Antenna dimensions (m)	Height: 0.2
Half-power beam width (degrees)	omni
Antenna gain (dBi)	2
Down tilt (degrees)	—
Tested bands	B1, B18, B28

Table 11-1 Total Power to the mRRUS, mRBS, RRU 2208, Radio 2203, and Radio 2205 antennas.

Band	**Standard**	**Nominal output power from the radio (dBm/W)**	**Upper limit of power delivered to the antenna (dBm/W)**
B1 (2100)	W/L	40 / 10	41 / 12.6
B2 (1900)	W/L	40 / 10	41 / 12.6
B3 (1800)	W/L	40 / 10	41 / 12.6
B4 (2100)	W/L	40 / 10	41 / 12.6

Band	Standard	Nominal output power from the radio (dBm/W)	Upper limit of power delivered to the antenna (dBm/W)
B5 (850)[107]	W/L	40 / 10	41 / 12.6
B5 (850)[108]	W/L	40 / 10	40.6 / 11.5
B7 (2600)	L	40 / 10	41 / 12.6
B8 (900)	W/L	40 / 10	41 / 12.6
B12 (700)	L	40 / 10	41 / 12.6
B13 (750)	L	40 / 10	41 / 12.6
B25 (1900)	W/L	40 / 10	41 / 12.6
B38 (2600)	L	40 / 10	41 / 12.6
B41 (TD 2500)	L	33 / 2.0	34 / 2.5
		43 / 20	44 / 25
B46A (5000)	L	11.5 / 0.014	12.5 / 0.018
B66A (2100)	W/L	40 / 10	40.6 / 11.5

Table 11-2 Total Power to the RRU 22F3 antennas.

Band	Standard	Nominal output power from the radio (dBm/W)	Upper limit of power delivered to the antenna (dBm/W)
B1 (2100)	L	12 / 40.8[109]	13 / 41.2[107]
B18 (800)	L	8.0 / 39.0[107]	8.7 / 39.4[107]
B28 (700)	L	8.0 / 39.0[107]	8.7 / 39.4[107]

[107] For configurations with 1 dB power tolerance and 0 dB transmission loss.
[108] For configurations with 0.6 dB power tolerance and 0 dB transmission loss.
[109] This row shows the result for RRU 22F3 with simultaneous operation on B1, B18 and B28 with power ratios of 42.9 %, 28.6 % and 28.6 %, respectively.

According to FCC and Innovation, Science and Economic Development Canada requirements, of relevance for the USA and Canada, Radio 2205 and Radio 2208 may be classified as mobile devices with an intended separation distance to the user or nearby persons of at least 20 cm. Conducted EMF tests, for Radio 2205, have confirmed that the exposure levels are below the exposure limits at 20 cm separation distance for the internal and external antenna configurations in Table 13. For Radio 2208, measurements were conducted along radials extending from the antenna (axis) that are 30˚ apart, according to FCC requirements. Minimum test separation distances between the equipment and any nearby person complying with FCC limits for general public / uncontrolled (GP) exposure [2] for the internal antenna configuration in Table 14 are provided in Table 12.

Table 12 Minimum test separation distances[110] complying with FCC limits for general public / uncontrolled exposure (GP) for Radio 2208

Radials[111]	Minimum test separation distance (cm)
0^0	55
$\pm 30^0$	35
$\pm 60^0$, $\pm 90^0$, $\pm 120^0$, $\pm 150^0$, 180^0	20

Table 13 Characteristics for the tested configurations of Radio 2205 with compliance confirmed at 20 cm separation distance.

Antenna specifications	Internal X-pol sector coverage antenna (KRE 105 259/1)	External X-pol omni-directional antenna (Galtronics P6480i)
Antenna dimensions (m)	—	Height: 0.63
Horizontal half-power beam width (degrees)	$90^o \pm 10^o$	omni
Vertical half-power beam width (degrees)	$30^o \pm 5^o$	19
Antenna gain (dBi)	10.5	6
Tested bands	B46	B46
Standard	L	L
Nominal output power from the radio (dBm/W)	(24 / 0.25)	(28.5 / 0.71)

[110] Valid for LTE TDD Uplink-downlink configuration 3 and special subframe configuration 8.
[111] The radial labelled 0° corresponds to the direction of the main beam.

Table 14 Characteristics for the tested configurations of Radio 2208 with compliance confirmed at test separation distances provided in Table 12.

Antenna specifications	Internal X-pol sector coverage antenna (KRE 101 2251/2)
Antenna dimensions (m)	—
Horizontal half-power beam width (degrees)	65º ± 10º
Vertical half-power beam width (degrees)	30º ± 5º
Antenna gain (dBi)	11.5±0.5
Tested bands	B48
Standard	L
Nominal output power from the radio (dBm/W)	(40.7 / 11.8)

2.3 Pico RBS

For EU and markets other than US and Canada, box-shaped compliance boundaries have been determined with the front and back compliance distances defined from the equipment casing as shown in Figure 5. The widths and heights are specified including the dimensions of the product.

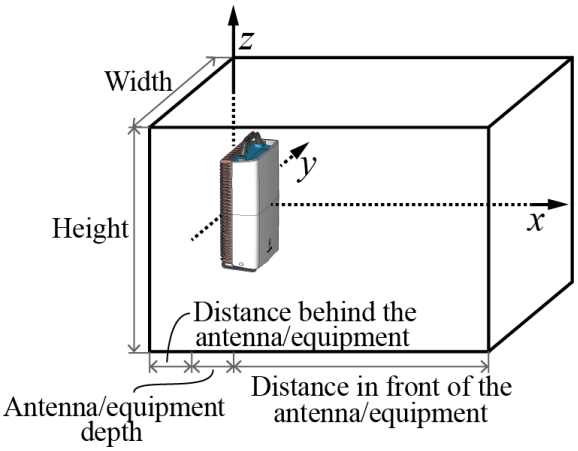

Figure 5. Box-shaped Compliance Boundary. The front and back compliance distances are defined from the equipment casing.

For ceiling mounted external antennas, cylinder-shaped compliance boundaries have been determined with the front, back and radial compliance distances defined relative to the equipment casing as shown in Figure 6.

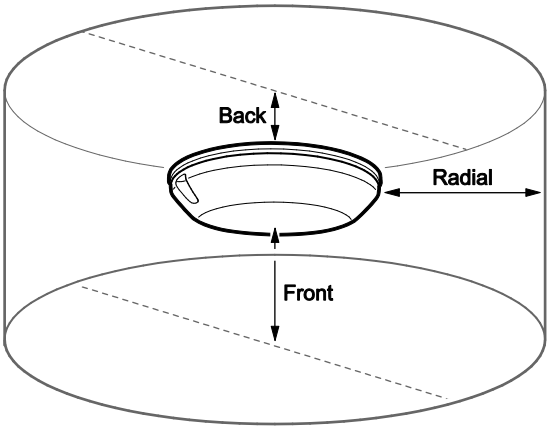

Figure 6. Cylinder-shaped Compliance Boundary. The compliance distances are defined relative to the equipment casing.

The compliance boundary dimensions in meters are shown in Table 15. The power levels used for the assessments include power tolerances and transmission losses where applicable. The expanded uncertainty (k=2) for the underlying specific absorption rate (SAR) and field strength measurements is less than ±30%.

The nominal power levels (excluding tolerances) are given in Table 16.

According to FCC and *Innovation, Science and Economic Development Canada* requirements, of relevance for the USA and Canada, a Pico RBS is to be classified as a *mobile device* with an intended separation distance to the user or nearby persons of at least 20 cm. Conducted EMF tests have confirmed that the exposure levels are below the exposure limits at 20 cm separation distance for the internal and external antennas used individually or combined, see Table 17.

Table 15-1 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for RBS 6401 with the internal antenna KRE 101 2139/1 with 0.6 dB power tolerance and 0 dB transmission loss. (Intended markets: Europe/Rest of world (RoW)).

Mode and output power for the RBS (radio base station)			**Dimensions of the box-shaped compliance boundary (m)**							
			Distance in front of EUT		**Width**		**Height**		**Distance behind EUT**	
3GPP band	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100)	W	2 × 1 W	0.20	0.06	0.26[112]	0.26[110]	0.42[113]	0.42[111]	0	0
B1 (2100)	W	2 × 1 W	0.20	0.06	0.26[110]	0.26[110]	0.42[111]	0.42[111]	0	0
	WiFi 2.4 GHz	0.1 W								
	WiFi 5 GHz	0.25 W								
B1 (2100)	L	2 × 1 W	0.20	0.03	0.26[110]	0.26[110]	0.42[111]	0.42[111]	0	0
B1 (2100)	L	2 × 1 W	0.20	0.03	0.26[110]	0.26[110]	0.42[111]	0.42[111]	0	0
	WiFi 2.4 GHz	0.1 W								
	WiFi 5 GHz	0.25 W								
B2 (1900)	W	2 × 1 W	0.20	0.06	0.26[110]	0.26[110]	0.42[111]	0.42[111]	0	0
B2 (1900)	W	2 × 1 W	0.20	0.06	0.26[110]	0.26[110]	0.42[111]	0.42[111]	0	0
	WiFi FCC-RoW 2.4 GHz	0.1 W								
	WiFi FCC-RoW 5 GHz	0.25 W								
B2 (1900)	L	2 × 1 W	0.20	0.03	0.26[110]	0.26[110]	0.42[111]	0.42[111]	0	0
B2 (1900)	L	2 × 1 W	0.20	0.03	0.26[110]	0.26[110]	0.42[111]	0.42[111]	0	0
	WiFi FCC-RoW 2.4 GHz	0.1 W								
	WiFi FCC-RoW 5 GHz	0.25 W								

[112] Same as product width. This implies that there is no compliance distance to the side of the product.
[113] Same as product height. This implies that there is no compliance distance above or below the product.

Table 15-2 Box-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for RBS 6402 with the internal antenna KRE 105 660/1 with 0.6 dB power tolerance and 0 dB transmission loss. (Intended markets: Europe/Rest of world (RoW)).

Mode and output power for the RBS (radio base station)			**Dimensions of the box-shaped compliance boundary (m)**							
			Distance in front of EUT		**Width**		**Height**		**Distance behind EUT**	
3GPP/ Wi-Fi band & hardware configuration type	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100) without fan module	W	2 × 0.25 W	0	0	0.28[110]	0.28[110]	0.17[111]	0.17[111]	0	0
B1 (2100) with fan module	W	2 × 0.25 W	0	0	0.28[110]	0.28[110]	0.19[111]	0.19[111]	0	0
B7 (2600) without fan module	L	2 × 0.25 W	0	0	0.28[110]	0.28[110]	0.17[111]	0.17[111]	0	0
B7 (2600) with fan module	L	2 × 0.25 W	0	0	0.28[110]	0.28[110]	0.19[111]	0.19[111]	0	0
B1 (2100), B3 (1800) or B7 (2600) combined with B1 (2100), B3 (1800) or B7 (2600)	L	4 × 0.25 W	0.02	0.01	0.31	0.30	0.21	0.21	0	0
B1 (2100), B3 (1800) or B7 (2600) combined with B46A (5200), or B46D (5800)	L	2 × 0.25 W (B1, B3, B7) 2 × 0.025 W (B46A) 2 × 0.13 W (B46D)	0.01	0	0.30	0.28[51]	0.19[52]	0.19[52]	0	0
B1 (2100), B3 (1800) or B7 (2600) combined with B1 (2100), B3 (1800) or B7 (2600) and Wi-Fi 2 GHz and Wi-Fi 5GHz	L Wi-Fi 2 GHz Wi-Fi 5 GHz	4 × 0.25 W 3 × 0.40 W 3 × 0.50 W	0.02	0.01	0.30	0.29	0.20	0.20	0	0

Table 15-3 Dimensions of the cylinder-shaped compliance boundary for general public (GP) and occupational (O) exposure for the RBS 6402 with the external cellular antennas with 0.6 dB output power tolerance and connected with the supplied transmission cable. (Intended markets: Europe/Rest of world (RoW)).

Mode and output power for the equipment under test (EUT)			**Dimensions of the cylinder-shaped compliance boundary (m)**					
			Distance in front of EUT		**Distance in radial direction**		**Distance behind EUT**	
3GPP band	**Standard**	**Nominal output power from the radio**	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100)	W/L	2 × 0.25 W	0	0	0	0	0	0
B3 (1800)	L	2 × 0.25 W	0	0	0	0	0	0
B7 (2600)	L	2 × 0.25 W	0	0	0	0	0	0

Table 16-1 RBS 6401 Nominal Power Levels.

Band	Standard	Nominal output power from the radio (dBm/W)
B1 (2100)	W/L	33/2
B2, B25 (1900)	W/L	33/2
B1 (2100)	WiFi, 2.4 GHz FCC- RoW	20/0.1
B1 (2100)	WiFi, 5 GHz FCC- RoW	24/0.25[114]
B2, B25 (1900)	WiFi, 2.4 GHz FCC- RoW	20/0.1
B2, B25 (1900)	WiFi, 5 GHz FCC- RoW	24/0.25[112]

Table 16-2 RBS 6402 Nominal Power Levels.

Band	Standard	Nominal output power from the radio (dBm/W)
B1 (2100)	W/L	27/0.5[115]
B2 (1900)	W	27/0.5[113]
B2,25 (1900)	L	27/0.5[113]
B2,25 (1900)	L	30/1[116]
B3 (1800)	L	27/0.5[117]
B4(2100)	W/L	27/0.5[113]
B4(2100)	L	30/1[114]
B7 (2600)	L	27/0.5[113]
B7 (2600)	L	30/1[114]
B1 (2100), B3 (1800) or B7 (2600) combined with B1 (2100), B3 (1800) or B7 (2600)	L	30/1[114]

[114] The power level provided corresponds to the maximum power among the available bands.
[115] This output power value corresponds to the EUT with one RF card installed or to the configuration with an external antenna.
[116] This output power value corresponds to the EUT with both RF cards installed.
[117] This output power value corresponds to the configuration with an external antenna.

Band	Standard	Nominal output power from the radio (dBm/W)
B2,25 (1900), B4 (2100) or B7 (2600) combined with B46A (5200)	L	28.8/0.75
B2,25 (1900), B4 (2100) or B7 (2600) combined with B46D (5700)	L	28.8/0.75
B1 (2100), B3 (1800) or B7 (2600) combined with B46A (5200)	L	27.4 / 0.55
B1 (2100), B3 (1800) or B7 (2600) combined with B46D (5800)	L	28.8 / 0.75
B1 (2100), B3 (1800) or B7 (2600) combined with B1 (2100), B3 (1800) or B7 (2600) and Wi-Fi 2 GHz and Wi-Fi 5GHz	L + Wi-Fi	31/1.27[118]
B2,25 (1900), B4 (2100) or B7 (2600) combined with B2,25 (1900), B4 (2100) or B7 (2600) and Wi-Fi 2 GHz and Wi-Fi 5GHz	W/L + Wi-Fi	31/1.27[116]

Table 17-1 Characteristics for the tested antennas used with RBS 6401 for the compliance tests with compliance confirmed at 20 cm separation distance.

Antenna specifications	Internal X-pol sector coverage antenna (KRE 101 2139/1)	External V-pol omni-directional antenna (KRE 101 2024/1)
Antenna dimensions (m)	—	Height: 0.12
Half-power beam width (degrees)	62 – 105	omni
Antenna gain (dBi)	6.4-8.3	2
Tested bands	B1, B2, B25	B2, B25

[118] This output power values corresponds to the configuration with two cellular band RF-cards and one Wi-Fi RF-card.

Table 17-2 Characteristics for the tested antennas used with RBS 6402 for the compliance tests with compliance confirmed at 20 cm separation distance.

Antenna specifications	Internal PIFA antenna (KRE 105 660/1)	Internal antenna (KRE 105 211/1)	Internal antenna (KRE 105 211/2)	External H/V linearly polarized antenna (Laird CMD69273)
Antenna dimensions (m)	—	—	—	Diameter 219 mm × Height 94mm / Height extending beneath the ceiling 44 mm
Half-power beam width (degrees)	—	—	—	—
Antenna gain (dBi)	4.5 (Max)	6 (Max)	6 (Max)	5.0 B2/B4/B25 5.6 B7
Tested bands	B2 ,B4, B7, B25	B46A, B46D, Wi-Fi 2.4 GHz, Wi-Fi 5 GHz	Wi-Fi 2.4 GHz, Wi-Fi 5 GHz	B2, B4, B7, B25

2.4 Radio Dot System

For EU and countries other than USA and Canada, cylinder-shaped compliance boundaries are defined with the front, back and radial compliance distances relative to the equipment casing as shown in Figure 7.

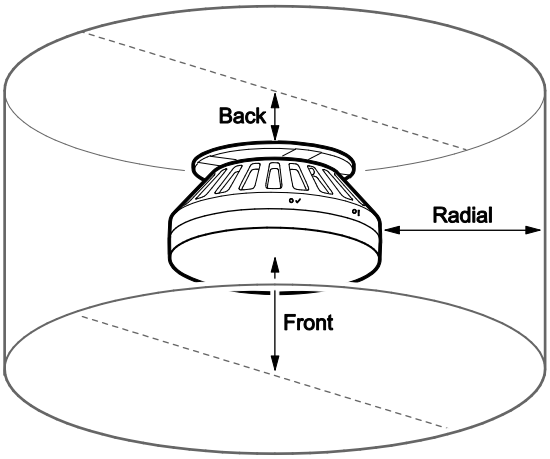

Figure 7. Cylinder-shaped Compliance Boundary. The compliance distances are defined relative to the equipment casing.

The compliance boundary dimensions for the Radio Dot, in meters, are shown in Table 18, Table 19 and Table 20. A distance of zero means that the radio head is compliant at the surface. The power levels used for the assessments include power tolerances and transmission losses. The expanded uncertainty (k=2) for the underlying SAR measurements is less than ±30%. The total power fed to the antennas for RD 2242, RD 4442 and RD 2243 (including tolerance) is given in Table 21, Table 22, and Table 23, respectively.

Table 18 Cylinder-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for RD 2242. A 2 dB power tolerance and 0 dB transmission loss is assumed. (intended markets: Europe/Rest of world (RoW)).

Mode and output power for the RBS (radio base station)			**Dimensions of the cylinder-shaped compliance boundary (m)**					
			Distance in front of radio head		**Radial distance**		**Distance in the back of the radio head**	
3GPP band	Standard	Nominal output power from the radio	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100)	W/L	2 × 0.05 W	0.0	0.0	0.0	0.0	0.0	0.0
B3 (1800)	L	2 × 0.05 W	0.0	0.0	0.0	0.0	0.0	0.0
B7 (2600)	L	2 × 0.05 W	0.0	0.0	0.0	0.0	0.0	0.0
B40 (2300)	L	2 × 0.05 W	0.0	0.0	0.0	0.0	0.0	0.0

Table 19 Cylinder-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for RD 4442. A 2 dB power tolerance and 0 dB transmission loss is assumed. (intended markets: Europe/Rest of world (RoW)).

Mode and output power for the RBS (radio base station)			**Dimensions of the cylinder-shaped compliance boundary (m)**					
			Distance in front of radio head		**Radial distance**		**Distance in the back of the radio head**	
3GPP band	Standard	Nominal output power from the radio[119]	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100) B3 (1800)	B1: W/L B3: L	B1: 2 × 0.05 W B3: 2 × 0.05 W	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
B1 (2100) B7 (2600)	B1: W/L B7: L	B1: 2 × 0.05 W B7: 2 × 0.05 W	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
B3 (1800) B7 (2600)	B3: L B7: L	B3: 2 × 0.05 W B7: 2 × 0.05 W	0.0	0.0	0.0	0.0	0.0	0.0

[119] Simultaneous operation on two radio bands

Table 20 Cylinder-Shaped Compliance Boundary Dimensions for General Public (GP) and Occupational (O) Exposure for RD 2243. A 2 dB power tolerance and 0 dB transmission loss is assumed. (intended markets: China, Europe/Rest of world (RoW)).

Mode and output power for the RBS (radio base station)			**Dimensions of the cylinder-shaped compliance boundary (m)**					
			Distance in front of radio head		**Radial distance**		**Distance in the back of the radio head**	
3GPP band	Standard	Nominal output power from the radio	**GP**	**O**	**GP**	**O**	**GP**	**O**
B1 (2100)	W/L	2 × 0.05 W	0.0	0.0	0.0	0.0	0.0	0.0
B3 (1800)	W/L	2 × 0.05 W	0.0	0.0	0.0	0.0	0.0	0.0
B7 (2600)	L	2 × 0.05 W	0.0	0.0	0.0	0.0	0.0	0.0
B8 (900)	W/L	2 × 0.05 W	0.0	0.0	0.0	0.0	0.0	0.0
B40A (2300)	L	2 x 0.125 W	0.0	0.0	0.01 (H&T)[120] 0.0 (L)[121]	0.0	0.0	0.0

Table 21 RD 2242 Nominal Power Levels.

Band	**Standard**	**Nominal output power from the radio (dBm/W)**	**Upper limit of power delivered to the antennas (dBm/W)**
B1 (2100)	W/L	20 / 0.1	22 / 0.16
B2 (1900)	W/L	20 / 0.1	22 / 0.16
B2 (1900)[122]	L	17 / 0.05	19 / 0.08
B3 (1800)	L	20 / 0.1	22 / 0.16
B4 (2100)	L	20 / 0.1	22 / 0.16
B4 (2100)[123]	L	17 / 0.05	19 / 0.08
B5 (850)	L	20 / 0.1	22 / 0.16
B7 (2600)	L	20 / 0.1	22 / 0.16
B13 (700)	L	20 / 0.1	22 / 0.16
B17a (700)	L	20 / 0.1	22 / 0.16
B40 (2300)	L	20 / 0.1	22 / 0.16

[120] Head and Trunk exposure
[121] Limbs exposure
[122] Power levels with hardened casing
[123] Power levels with hardened casing

Table 22 RD 4442 Nominal Power Levels.

Band	Standard	Nominal output power from the radio (dBm / W)[124]	Upper limit of power delivered to the antennas (dBm / W)[125]
B1 (2100) B3 (1800)	B1: W/L B3: L	23 / 0.2	25 / 0.32
B1 (2100) B7 (2600)	B1: W/L B7: L	23 / 0.2	25 / 0.32
B3 (1800) B7 (2600)	B3: L B7: L	23 / 0.2	25 / 0.32

Table 23 RD 2243 Nominal Power Levels.

Band	Standard	Nominal output power from the radio (dBm / W)	Upper limit of power delivered to the antennas (dBm / W)
B1 (2100)	W/L	20 / 0.1	22 / 0.16
B3 (1800)	W/L	20 / 0.1	22 / 0.16
B7 (2600)	L	20 / 0.1	22 / 0.16
B8 (900)	W/L	20 / 0.1	22 / 0.16
B40A (2300)	L	24 / 0.25	26 / 0.40

According to *FCC* and *Innovation, Science and Economic Development Canada* requirements, of relevance for USA and Canada, a Radio Dot may be classified as a *mobile device* with an intended separation distance to the user or nearby persons of at least 20 cm. Conducted EMF tests have confirmed that the RF exposure levels are below the exposure limits at 20 cm separation from the radio head, see Table 24, Table 25, and Table 26.

[124] Simultaneous operation on two radio bands
[125] Simultaneous operation on two radio bands

Table 24 Characteristics for the tested antennas used with RD 2242 for the compliance tests with compliance confirmed at 20 cm separation distance.

Antenna specifications	Tested bands	Maximum antenna gain (dBi)
Internal sector coverage antenna (KRE 101 2191/2)	B2	3
Internal sector coverage antenna (KRE 101 2191/2)[126]	B2	4.75
Internal sector coverage antenna (KRE 101 2191/2)	B4	2.5
Internal sector coverage antenna (KRE 101 2191/2)[127]	B4	2.7
Internal sector coverage antenna (KRE 101 2187/1)	B5	-0.4
Internal sector coverage antenna (KRE 101 2185/1)	B13	-2.0
Internal sector coverage antenna (KRE 101 2184/2)	B17a	-2.6

Table 25 Characteristics for the tested antennas used with RD 2243 for the compliance tests with compliance confirmed at 20 cm separation distance.

Antenna specifications	Tested bands	Maximum antenna gain (dBi)
Internal sector coverage antenna (KRE 101 2342/1)	B41	3.8
Internal sector coverage antenna (KRE 101 2309/1)	B25	1.8
Internal sector coverage antenna (KRE 101 2309/1)	B66A	2.9

Table 26 Characteristics for the tested antennas used with RD 4442 for the compliance tests with compliance confirmed at 20 cm separation distance.

Antenna specifications	Tested bands	Maximum antenna gain (dBi)
Internal sector coverage antenna (KRE 101 2309/1)	B25, B66A	1.8, 2.9
Internal sector coverage antenna (KRE 101 2311/1)	B48	3

[126] The maximum gain obtained with hardened casing
[127] The maximum gain obtained with hardened casing

References

[1] ICNIRP, “Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)”, International Commission on Non-Ionizing Radiation Protection (ICNIRP), Health Physics, vol. 74, pp 494-522, April 1998.

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