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EMF Test Report: Ericsson AIR 3283 B25 B66 LTE (FCC)

Document number:	GFTL-23:001737 Uen Rev B	**Date of report:**	2024-03-18
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Tests performed by:	Paramananda Joshi	**Dates of tests:**	2023-11-14 – 2023-11-24
Manufacturer and market name(s) of device:	Ericsson AIR 3283 B25 B66		
Testing has been performed in accordance with:	FCC OET Bulletin 65 IEC 62232:2022		
Test results:	RF exposure compliance boundaries (exclusion zones) in conformity with FCC 47 CFR 1.1310 to be included in the Customer Product Information (CPI) for Ericsson AIR 3283 B25 B66 .		
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Summary of EMF Test Report[1]

Equipment under test (EUT)

Product name	AIR 3283 B25 B66		
Product number	KRD 901 892/11, KRD 901 892/1		
Supported bands, Tx frequency range (MHz) and standards	B25 B66	1930 - 1995 2110 - 2200	LTE LTE
Duplexing technology	FDD		

Results

RF exposure compliance boundaries, outside of which the exposure is below the general public (GP) and occupational (O) exposure limits, are listed below.

Dimensions of the box-shaped compliance boundary for general public (GP) and occupational (O) exposure for AIR 3283 B25 B66 applicable in the USA and markets employing the FCC RF exposure limits. The compliance boundaries are determined for maximum nominal output power with output power tolerance and TDD downlink duty cycle included.

Mode and output power for AIR 3283			
Band	**Standard**	**IEC 62232 installation class**	**Power tolerance**
B25 + B66	LTE	E+	1 dB

Maximum nominal output power from the radio[2]	**Exposure condition**	**Sector shape**	**Electrical tilt (deg)**	**Dimensions of the box-shaped compliance boundary (m)**							
				Distance in front of EUT		**Width**		**Height**		**Distance behind EUT**	
				GP	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
80 W (B25) + 240 W (B66)	Theoretical maximum	2DS Left, 2DS Right	2	10.4	4.7	10.9	4.9	2.6	1.6	0.2	0.2
			7	11.0	4.9	11.5	5.1	3.0	1.6	0.2	0.2
			12	9.9	4.4	10.6	4.8	4.4	2.0	0.2	0.2
		3DS Left, 3DS Right	2	12.7	5.7	15.9	7.1	3.0	1.6	0.2	0.2
			7	13.2	5.9	16.7	7.5	3.6	1.6	0.2	0.2
			12	11.8	5.3	15.5	6.9	5.3	2.4	0.2	0.2
		3DS Middle	2	13.2	5.9	4.3	2.0	3.4	1.6	0.2	0.2
			7	14.0	6.3	4.6	2.1	3.9	1.8	0.2	0.2
			12	12.7	5.7	4.3	2.0	5.7	2.6	0.2	0.2
		Macro	2	16.7	7.5	13.0	5.9	4.3	1.9	0.2	0.2
			7	17.6	7.9	13.8	6.2	4.8	2.2	0.2	0.2
			12	16.0	7.2	12.8	5.7	7.2	3.2	0.2	0.2
		Macro Narrow	2	24.2	10.9	9.3	4.2	6.2	2.8	0.2	0.2
			7	25.7	11.5	9.8	4.4	7.0	3.2	0.2	0.2
			12	23.2	10.4	9.2	4.1	10.4	4.7	0.2	0.2
		Macro Wide	2	15.0	6.7	14.5	6.5	3.9	1.8	0.2	0.2
			7	15.8	7.1	15.2	6.8	4.3	2.0	0.2	0.2
			12	14.4	6.5	14.1	6.3	6.5	2.9	0.2	0.2
		Narrow Beam	2	23.4	10.5	17.4	7.8	6.0	2.7	0.2	0.2
			7	24.8	11.1	18.3	8.2	6.8	3.1	0.2	0.2
			12	22.4	10.0	17.0	7.6	10.0	4.5	0.2	0.2
160 W (B25) + 160 W (B66)	Theoretical maximum	2DS Left, 2DS Right	2	10.2	4.6	10.6	4.8	2.6	1.6	0.2	0.2
			7	10.7	4.8	11.2	5.0	3.0	1.6	0.2	0.2
			12	9.7	4.4	10.4	4.7	4.4	2.0	0.2	0.2
		3DS Left, 3DS Right	2	12.5	5.6	15.5	6.9	2.8	1.6	0.2	0.2
			7	12.9	5.8	16.2	7.3	3.6	1.6	0.2	0.2
			12	11.7	5.2	15.1	6.8	5.2	2.4	0.2	0.2
		3DS Middle	2	13.1	5.9	4.2	1.9	3.4	1.6	0.2	0.2

[1] This page contains a summary of the test results. The full report provides a complete description of all test details and results.

[2] The sector shapes 2DS Left and 2DS Right operate with half of the maximum nominal output power from the radio, while the sector shapes 3DS Left, 3DS Middle and 3DS Right operate with one third of the maximum nominal power. EMF compliance distances for the sector shape 2DS are obtained as the maximum of those obtained for 2DS Left and 2DS Right, while EMF compliance distances for the sector shape 3DS are obtained as the maximum of those obtained for 3DS Left, 3DS Middle and 3DS Right.

			7	13.8	6.2	4.4	2.0	3.8	1.7	0.2	0.2
			12	12.5	5.6	4.1	1.9	5.6	2.5	0.2	0.2
		Macro	2	16.5	7.4	13.0	5.8	4.2	1.9	0.2	0.2
			7	17.3	7.8	13.6	6.1	4.8	2.2	0.2	0.2
			12	15.8	7.1	12.7	5.7	7.1	3.2	0.2	0.2
		Macro Narrow	2	23.9	10.7	9.3	4.2	6.1	2.7	0.2	0.2
			7	25.2	11.3	9.8	4.4	6.9	3.1	0.2	0.2
			12	22.8	10.2	9.2	4.1	10.2	4.6	0.2	0.2
		Macro Wide	2	14.9	6.7	14.4	6.5	3.8	1.7	0.2	0.2
			7	15.6	7.0	15.1	6.8	4.3	1.9	0.2	0.2
			12	14.3	6.4	14.0	6.3	6.4	2.9	0.2	0.2
		Narrow Beam	2	23.0	10.3	17.4	7.8	5.9	2.7	0.2	0.2
			7	24.3	10.9	18.3	8.2	6.7	3.0	0.2	0.2
			12	22.0	9.9	17.0	7.6	9.8	4.4	0.2	0.2
240 W (B25) + 80 W (B66)	Theoretical maximum	2DS Left, 2DS Right	2	10.1	4.5	10.4	4.7	2.6	1.6	0.2	0.2
			7	10.5	4.7	10.9	4.9	2.9	1.6	0.2	0.2
			12	9.5	4.3	10.2	4.6	4.3	1.9	0.2	0.2
		3DS Left, 3DS Right	2	12.2	5.5	15.1	6.8	2.8	1.6	0.2	0.2
			7	12.6	5.7	15.8	7.1	3.5	1.6	0.2	0.2
			12	11.5	5.2	14.7	6.6	5.1	2.3	0.2	0.2
		3DS Middle	2	13.0	5.8	4.0	1.8	3.4	1.6	0.2	0.2
			7	13.6	6.1	4.2	1.9	3.8	1.7	0.2	0.2
			12	12.4	5.6	3.9	1.8	5.6	2.5	0.2	0.2
		Macro	2	16.4	7.3	12.9	5.8	4.2	1.9	0.2	0.2
			7	17.0	7.6	13.5	6.1	4.7	2.1	0.2	0.2
			12	15.6	7.0	12.6	5.7	7.0	3.1	0.2	0.2
		Macro Narrow	2	23.5	10.5	9.4	4.2	6.0	2.7	0.2	0.2
			7	24.6	11.0	9.8	4.4	6.8	3.1	0.2	0.2
			12	22.4	10.0	9.3	4.2	10.0	4.5	0.2	0.2
		Macro Wide	2	14.7	6.6	14.3	6.4	3.8	1.7	0.2	0.2
			7	15.3	6.9	14.9	6.7	4.3	1.9	0.2	0.2
			12	14.1	6.3	13.9	6.3	6.3	2.9	0.2	0.2
		Narrow Beam	2	22.7	10.2	17.4	7.8	5.8	2.6	0.2	0.2
			7	23.7	10.6	18.2	8.2	6.6	3.0	0.2	0.2
			12	21.6	9.7	17.0	7.7	9.7	4.3	0.2	0.2

For the power levels specified in the table with tolerances added, and the upward rounding of compliance boundary dimensions to the nearest decimeter, the specified results are conservative.

1 General information

The test results presented in this report define compliance boundaries for AIR 3283 B25 B66 LTE. Outside of these compliance boundaries the radio frequency (RF) exposure levels are below the exposure limits specified the Federal Communications Commission (FCC) [1]. The tests were performed by calculations in accordance with the Ericsson RF exposure calculation procedure for base stations [2], which is in conformity with the FCC OET Bulletin 65 [3] and IEC 62232:2022 [4].

It should be noted that the test results presented in this test report are valid for the frequency range specified in Table 1, for the antenna properties specified in Table 2, and for the power level, the power tolerance, and TDD downlink duty cycle specified in Table 3. These data as well as the applied antenna pattern files were supplied by the client and may affect the validity of the results.

Proposed EMF health and safety information for inclusion in the Customer Product Information (CPI) is provided in Appendices A, B and C.

2 Equipment under test

Table 1 and Table 2 below summarize the technical data for the equipment under test (EUT) and the properties of the integrated antenna. Table 3 lists the maximum nominal output power from the radio unit and the total time-averaged power delivered to the antenna. The total time-averaged power delivered to the antenna includes the output power tolerance.

The EUT related data in Tables 1-3 were supplied by the client.

Maximum nominal total output power from the radio is 320 W, out of which maximum 240 W (75% of the total power) can be allocated to one band and the rest to the other band. Therefore, EMF compliance tests have been conducted for three power combinations – the total output power from the radio divided as 1) 25% for B25 and 75% B66, 2) 50% for B25 and 50% B66, and 3) 75% for B25 and 25% B66.

The radio can be configured in different sector shapes, namely, Macro, Macro Narrow, Macro Wide, Narrow Beam, 2DS Left, 2DS Right, 3DS Left, 3DS Middle, and 3DS Right. Out of these sector shapes, some are configured simultaneously, e.g., 2DS Left and 2DS Right, and 3DS Left, 3DS Middle and 3DS Right. Each of the 2DS sector shapes can be configured with up to half of the maximum total output power from the radio, while each of the 3DS sector shapes can be configured with up to one third of the maximum total output power.

The product supports LTE, NR and LTE+NR mixed mode. This report is applicable only for LTE. For LTE+NR mixed mode, the report for NR [8] is applicable.

Table 1 Technical data for the EUT.

Product name and product number	AIR 3283 B25 B66		KRD 901 892/11, KRD 901 892/1
Supported bands, Tx frequency range (MHz), and standards	B25 B66	1930 - 1995 2110 - 2200	LTE LTE
Antenna	KRE 105 469		
Dimensions, H × W × D (mm)	1200 × 508 × 317		
Duplexing technology	FDD		
Exposure environment	General public/uncontrolled, Occupational/controlled		
IEC 62232 installation class[3]	E+		

[3] The stated IEC 62232 installation class was determined based on the total EIRP without power tolerance included and considering the TDD downlink duty cycle. The total EIRP was obtained using the antenna patterns provided by the client.

Table 2 Properties of the antenna.

Product number	KRE 105 469
Type	Internal AAS
Number of polarizations	2
Gain[4] (dBi)	23.1 (B25) 23.9 (B66)
Antenna configuration (no. of subarray rows, subarray columns and polarizations)	2×8×2
Subarray configuration	6×1
Electrical downtilt (degrees)	2 – 12
Antenna pattern files	1/15570-KRD901892
Maximum scan range in horizontal plane (degrees)	± 60
Maximum scan range in vertical plane (degrees)	92 – 102

Table 3 EUT configurations with the maximum nominal output power level and the total time-averaged power level including the output power tolerance.

Band	Standard	Maximum nominal output power from the radio	Power tolerance (dB)	Total time-averaged power delivered to antenna (dBm/W)
B25 + B66	LTE	55.1 dBm / 320 W	1 dB	56.1 dBm / 402.9 W

3 Exposure conditions

The EUT is intended to be used outdoor and installed on poles, walls, masts, towers, and similar structures making it possible to ensure that the general public has no access to the EMF compliance boundary. Other installation related exposure conditions are not reasonably foreseeable for the EUT.

Factors such as beam scanning in elevation and azimuth, RBS utilization, and scheduling time are reasonably foreseeable and will significantly reduce the time-averaged power and the RF exposure. A theoretical maximum exposure condition assessment was conducted, in which these factors were not considered, which makes the obtained compliance boundaries very conservative.

4 EMF compliance boundary calculations

The RF exposure was evaluated using calculations performed according to the Ericsson RF Exposure Calculation Procedure for Base Stations [2], which conforms to FCC OET Bulletin 65 [3] and IEC 62232 [4]. The calculations were made using the Ericsson in-house MATLAB-based tool called MSI compliance analyzer (release 2022-02) [5]. The first step in calculating the compliance boundary was to use the spherical far-field formula to estimate power density:

$$S_{\mathrm{sph}}(\theta,\phi) = \frac{P_{\mathrm{a}} G(\theta,\phi)}{4\pi r^2},$$

[4] The stated gain value is the maximum gain of the antenna within the frequency band(s) supported by the product and obtained using the antenna patterns provided by the client. The patterns used are based on theoretical modelling of the antenna and may differ slightly from the measured ones.

where S,P_a, G, r, θ, and ϕ denote the power density, the total time-averaged power accepted by the antenna, the antenna gain, the distance from the antenna, and the angular variables in a spherical coordinate system, respectively. The total time-averaged power delivered to the antenna includes the output power tolerance.

Part of the transmit power, corresponding to 25% of P_a is used for the broadcast beam whereas the remaining 75% is used for traffic:

$$S_{\text{sph,broadcast}}(\theta,\phi) = \frac{0.25P_a G_{\text{broadcast}}(\theta,\phi)}{4\pi r^2},$$

$$S_{\text{sph,traffic}}(\theta,\phi) = \frac{0.75P_a G_{\text{traffic}}(\theta,\phi)}{4\pi r^2},$$

where $G_{\text{broadcast}}$ and G_{traffic} denote the antenna gain for the broadcast and envelope traffic beams. While the beam for the broadcast channel is fixed[5], the traffic beam is steered in different directions depending on the location of the users requesting service. Therefore, G_{traffic} in the equation above corresponds to the envelope of the antenna gain for all possible beams. For the actual maximum exposure condition assessment, the power allocated for the traffic beams is therefore scaled with the power reduction factor.

The AIR 3283 B25 B66 DL beams can be configured to handle different sector shapes, namely 2DS Left, 2DS Right, 3DS Left, 3DS Middle, 3DS Right, Macro, Macro Narrow and Macro Wide in Transmission Mode 4 and Narrow Beam in Transmission Mode 9. The sector shapes can have different electrical downtilt angles ranging from 2 degree to 12 degrees. In the report, the compliance boundary dimensions are provided for three tilt conditions: minimum, mid, and maximum.

The envelopes of antenna gains for all possible traffic and broadcast beams were provided by the client based on theoretical modelling of the antenna. The use of these antenna gain patterns, together with the applied tolerance, provides an upper bound for the compliance boundary. The broadcast beam patterns and the envelope traffic beam patterns were provided for six frequencies, specifically 1930 MHz, 1962 MHz, and 1995MHz (B25), and 2110 MHz, 2155 MHz, and 2200MHz (B66). Maximum gain values corresponding to the maximum of all the broadcast beam patterns and envelope traffic beam patterns, respectively, were used in the above equations to estimate power density. The maximum gain values of the envelope of all possible broadcast and traffic beams with different electrical downtilt angles are given in Table 4.

[5] The AIR 3283 B25 B66 broadcast beam can be configured to handle different UE distribution scenarios, denoted 2DS Left, 2DS Right, 3DS Left, 3DS Middle, 3DS Right, Macro, Macro Narrow and Macro Wide in Transmission Mode 4 and Narrow Beam in Transmission Mode 9. Each of these configurations is characterized by different gain values, beamwidths and electrical tilt angles. The assessment in this report is based on all possible broadcast beam patterns.

Table 4 Maximum gain values for broadcast and envelope traffic beams as provided by the client within Band 25 and Band 66.

Band	Sector Shape	Electrical Downtilt (deg)	$G_{\mathrm{broadcast,max}}$ (dBi)	$G_{\mathrm{traffic,max}}$ (dBi)
B25	2DS Left, 2DS Right	2	17.7	17.9
		7	18.0	18.3
		12	17.3	17.6
	3DS Left, 3DS Right	2	21.1	21.3
		7	21.4	21.6
		12	20.8	20.9
	3DS Middle	2	21.4	22.1
		7	21.8	22.4
		12	21.1	21.8
	Macro	2	16.6	19.7
		7	16.9	20.1
		12	16.3	19.4
	Macro Narrow	2	19.9	22.8
		7	20.2	23.1
		12	19.6	22.5
	Macro Wide	2	15.4	18.8
		7	15.7	19.2
		12	15.2	18.6
	Narrow Beam	2	17.1	22.8
		7	17.4	23.1
		12	16.8	22.5
B66	2DS Left, 2DS Right	2	17.9	18.5
		7	18.4	19.1
		12	17.6	18.3
	3DS Left, 3DS Right	2	21.6	22.0
		7	22.0	22.4
		12	21.2	21.6
	3DS Middle	2	20.7	22.6
		7	21.3	23.2
		12	20.5	22.4
	Macro	2	17.0	20.0
		7	17.5	20.6
		12	16.8	19.9
	Macro Narrow	2	20.4	23.3
		7	21.1	23.9
		12	20.3	23.1
	Macro Wide	2	16.0	19.1
		7	16.5	19.7
		12	15.8	19.0
	Narrow Beam	2	17.7	23.3
		7	18.3	23.9
		12	17.5	23.1

The total power density as estimated by the spherical far-field formula is thus given by:

$$S_{\text{sph}} = S_{\text{sph,broadcast}} + S_{\text{sph,traffic}}.$$

The compliance distance for the spherical model, $CD_{\text{sph}}(\theta, \phi)$ was obtained by solving the following equation for r:

$$\sum_{j=1}^{2} \frac{S_{\text{total,sph,Band}_j}(r, \theta, \phi)}{S^{\text{lim}}_{\text{gp,o,Band}_j}} = 1,$$

Where $S^{\text{lim}}_{\text{gp,o}}$ denotes the FCC power density limits for general public and occupational exposure and $\text{Band}_j \in \{\text{B25 and B66}\}$. The limits for the frequency bands of interest are given in Table 5.

Table 5 RF EMF exposure limits on power density for the frequency band used by the EUT.

Band	$S^{\text{lim}}_{\text{gp}}$ (W/m^2)	$S^{\text{lim}}_{\text{o}}$ (W/m^2)
B25 B66	10.0 10.0	50.0 50.0

Based on the calculated compliance distances, a box-shaped compliance boundary was determined. To comply with the FCC requirement of a minimum test separation distance for a non-portable device of 20 cm, the minimum distance from the antenna to the compliance boundary was set to 20 cm.

5 Results

A box-shaped compliance boundary is used, characterized by its width, height, and the compliance distances behind and in front of the EUT, see Figure 1. Outside of this box, the RF exposure is below the exposure limits.

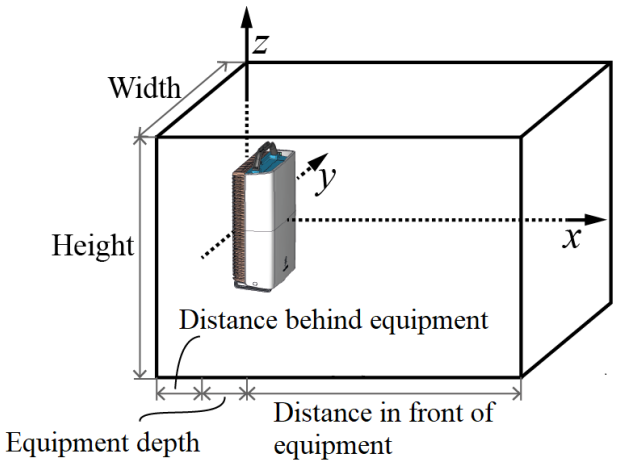

Figure 1 Box-shaped structure specifying the compliance boundary for the tested RBS product.

When applied in the near field, for instance behind the antenna, the spherical far-field formula provides very conservative results. Given the relatively large distance from the antenna array elements to the back of the antenna, and based on extensive experience from a large set of numerical EMF tests for products and antennas with similar geometrical configurations and power levels, it is possible to state that the compliance distance behind the antenna measured from its back plane is 20 cm. From measurements of a typical mid-band AAS radio with nominal total output power of 320 W and configured with TDD DL duty cycle of 75%, the maximum power density at 20 cm distance behind the radio was found to be 4.2 W/m^2 [6]. For a nominal total output power of 320 W, a power tolerance of 1 dB and FDD configuration as considered in this test, the power density value scales to 7.1 W/m^2 which is below the general public and occupational limits listed in Table 5.

In Figure 2 through Figure 4, compliance distance results for general public exposure (blue line) and occupational exposure (red line) are given for some of the tested configurations leading to the largest compliance boundary for theoretical maximum exposure condition. Also shown are the resulting compliance boundaries (black lines, solid for general public, dashed for occupational exposure). The resulting compliance boundary dimensions are given in Table 5 rounded upwards to the nearest decimeter.

As the sector shapes 2DS Left and 2DS Right generally operate simultaneously and are spatially well separated as can be seen in Figure 2 and Figure 3, EMF compliance distances for the sector shape 2DS are obtained as the maximum of those obtained for 2DS Left and 2DS Right. For the same reason, EMF compliance distances for the sector shape 3DS are obtained as the maximum of those obtained for 3DS Left, 3DS Middle and 3DS Right.

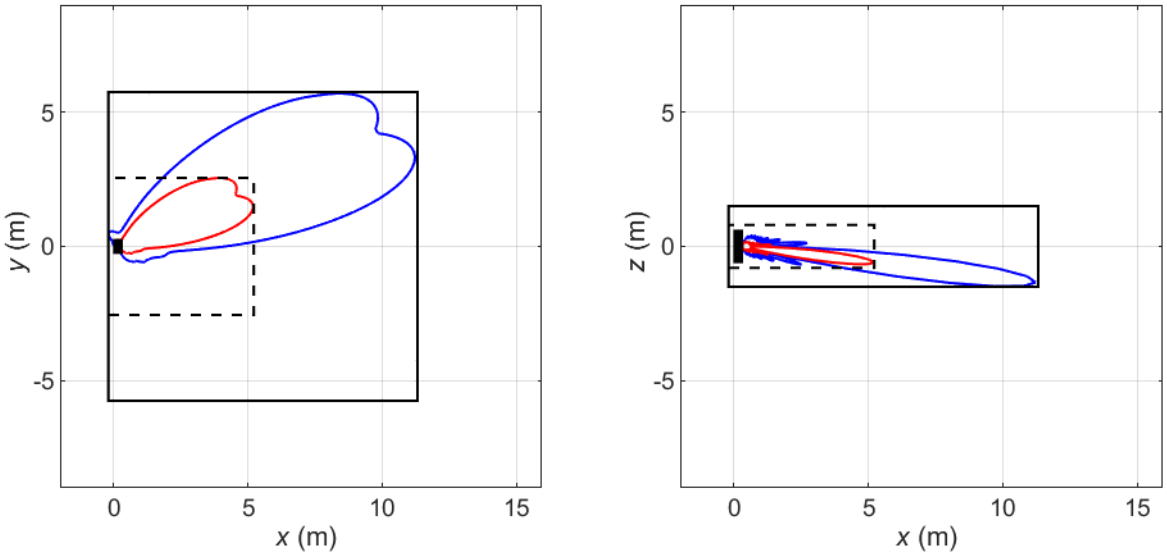

Figure 2 Compliance boundaries for general public exposure (black solid line) and occupational exposure (black dashed line) for the markets where the FCC limits apply. The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The red solid lines indicate the corresponding compliance distance results for occupational exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B25 (LTE) + B66 (LTE). Total time-averaged power delivered to the antenna: half of 56.1 dBm / 402.9 W (25% for B25, 75% for B66). Electrical tilt: 7 degrees. Sector shape: 2DS Left.

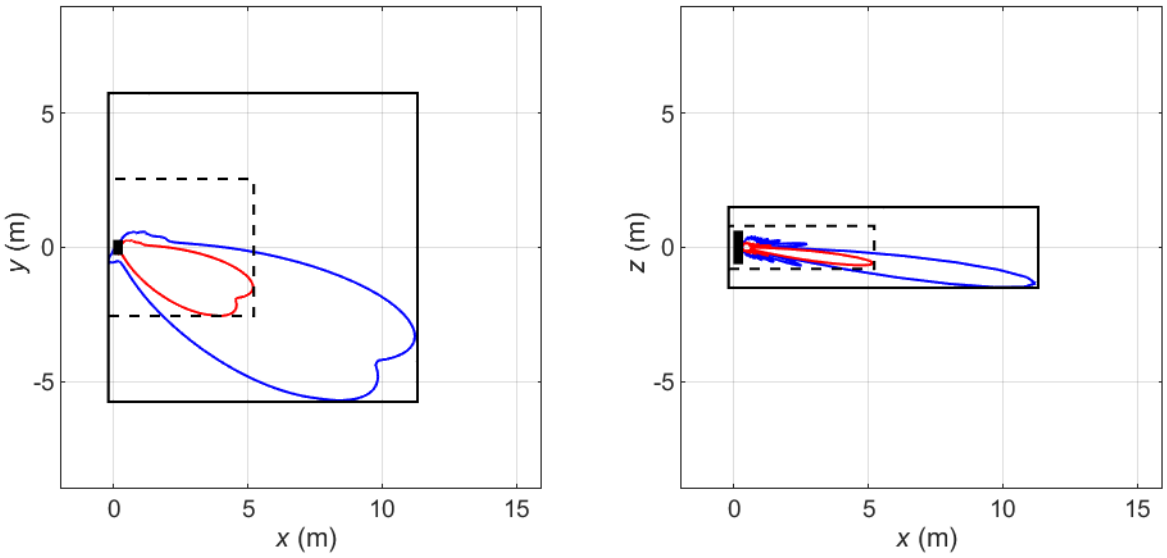

Figure 3 Compliance boundaries for general public exposure (black solid line) and occupational exposure (black dashed line) for the markets where the FCC limits apply. The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The red solid lines indicate the corresponding compliance distance results for

occupational exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B25 (LTE) + B66 (LTE). Total time-averaged power delivered to the antenna: half of 56.1 dBm / 402.9 W (25% for B25, 75% for B66). Electrical tilt: 7 degrees. Sector shape: 2DS Right.

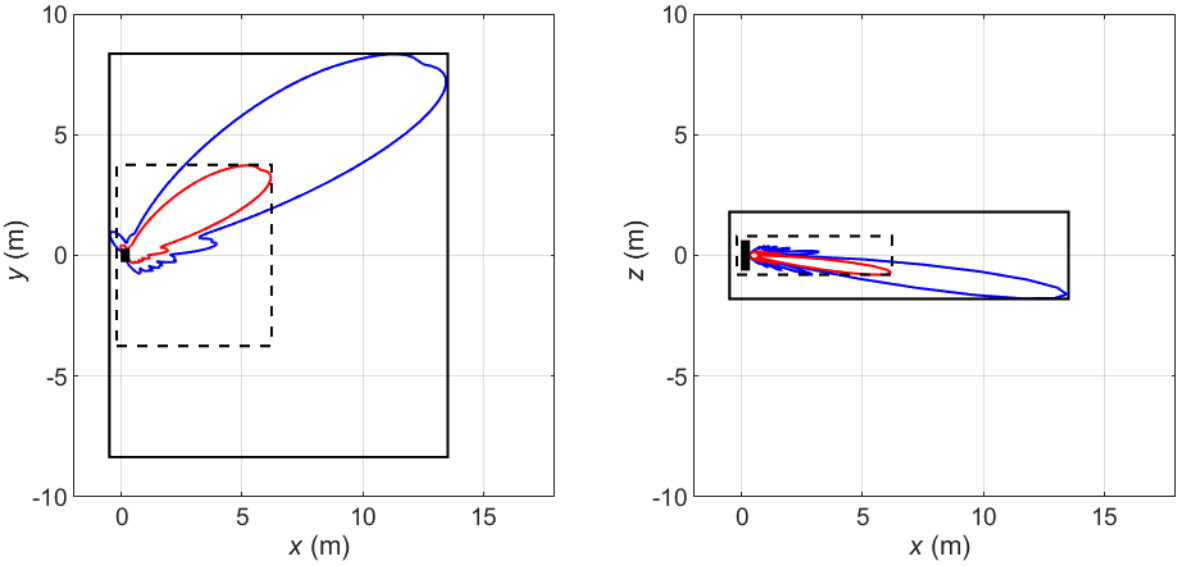

Figure 4 Compliance boundaries for general public exposure (black solid line) and occupational exposure (black dashed line) for the markets where the FCC limits apply. The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The red solid lines indicate the corresponding compliance distance results for occupational exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B25 (LTE) + B66 (LTE). Total time-averaged power delivered to the antenna: one third of 56.1 dBm / 402.9 W (25% for B25, 75% for B66). Electrical tilt: 7 degrees. Sector shape: 3DS Left.

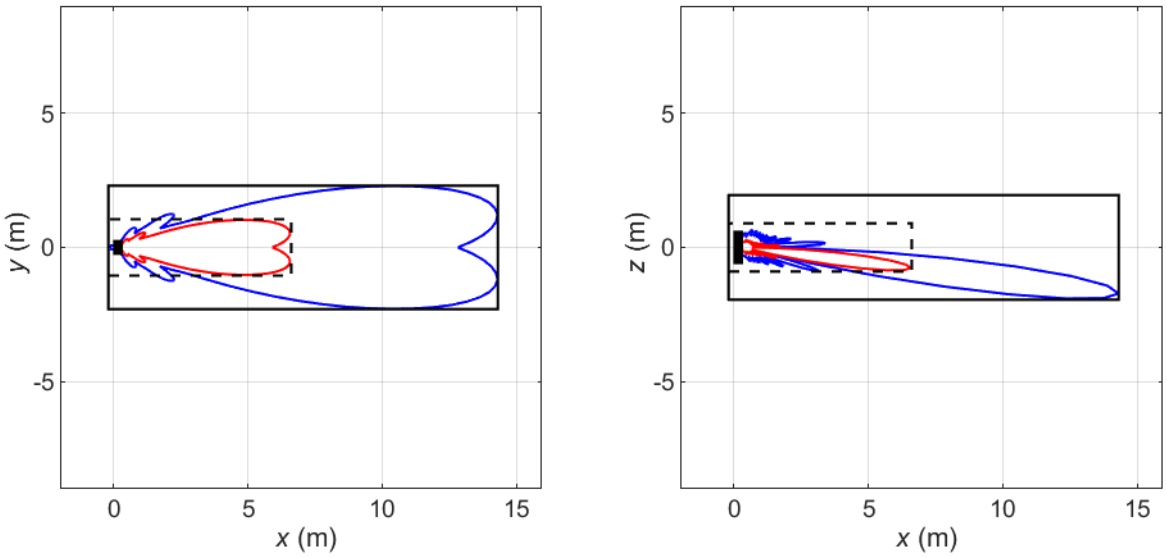

Figure 5 Compliance boundaries for general public exposure (black solid line) and occupational exposure (black dashed line) for the markets where the FCC limits apply. The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The red solid lines indicate the corresponding compliance distance results for occupational exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B25 (LTE) + B66 (LTE). Total time-averaged power delivered to the antenna: one third of 56.1 dBm / 402.9 W (25% for B25, 75% for B66). Electrical tilt: 7 degrees. Sector shape: 3DS Middle.

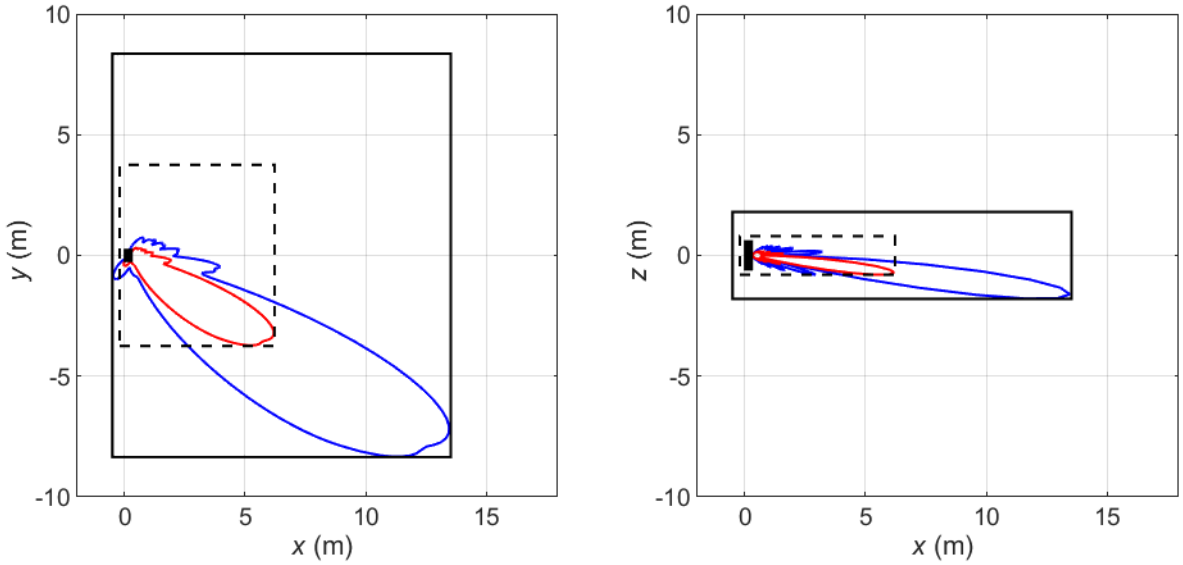

Figure 6 Compliance boundaries for general public exposure (black solid line) and occupational exposure (black dashed line) for the markets where the FCC limits apply. The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The red solid lines indicate the corresponding compliance distance results for occupational exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B25 (LTE) + B66 (LTE). Total time-averaged power delivered to the antenna: one third of 56.1 dBm / 402.9 W (25% for B25, 75% for B66). Electrical tilt: 7 degrees. Sector shape: 3DS Right.

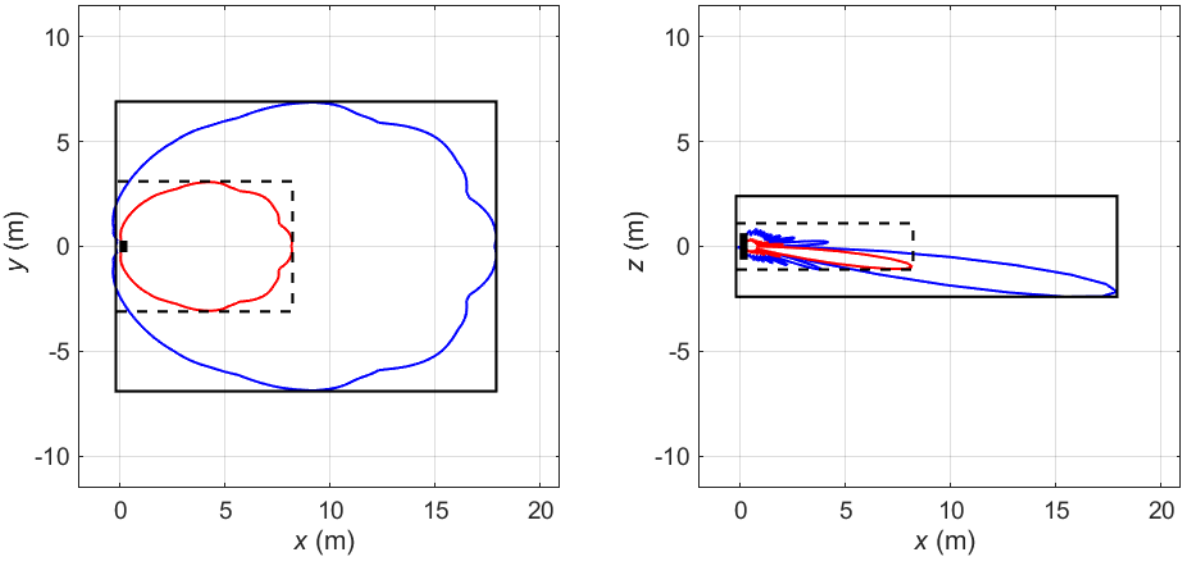

Figure 7 Compliance boundaries for general public exposure (black solid line) and occupational exposure (black dashed line) for the markets where the FCC limits apply. The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The red solid lines indicate the corresponding compliance distance results for occupational exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B25 (LTE) + B66 (LTE). Total time-averaged power delivered to the antenna: 56.1 dBm / 402.9 W (25% for B25, 75% for B66). Electrical tilt: 7 degrees. Sector shape: Macro.

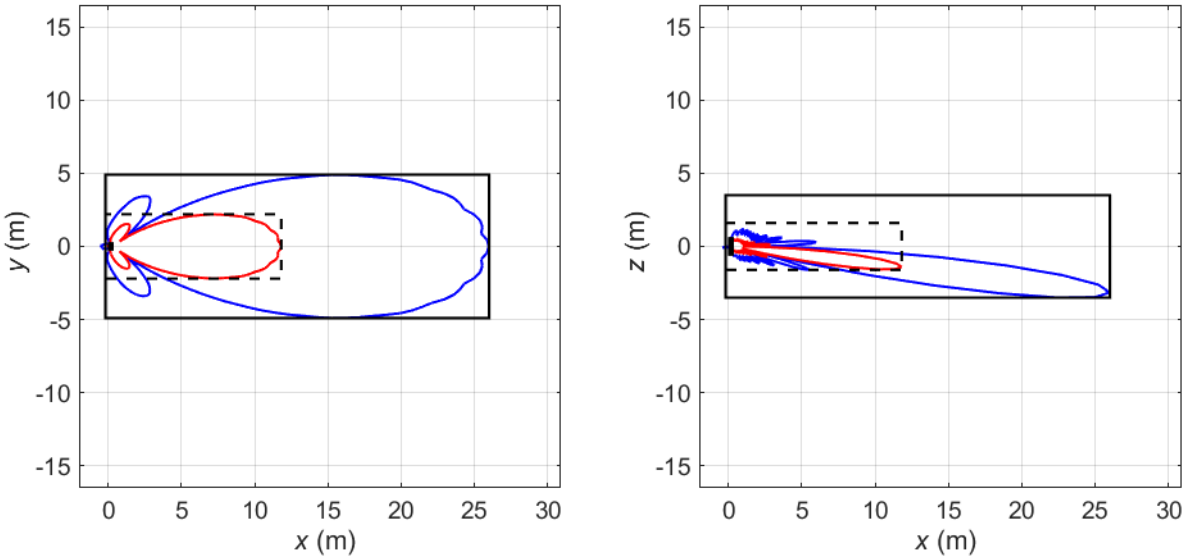

Figure 8 Compliance boundaries for general public exposure (black solid line) and occupational exposure (black dashed line) for the markets where the FCC limits apply. The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The red solid lines indicate the corresponding compliance distance results for occupational exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B25 (LTE) + B66 (LTE). Total time-averaged power delivered to the antenna: 56.1 dBm / 402.9 W (25% for B25, 75% for B66). Electrical tilt: 7 degrees. Sector shape: Macro Narrow.

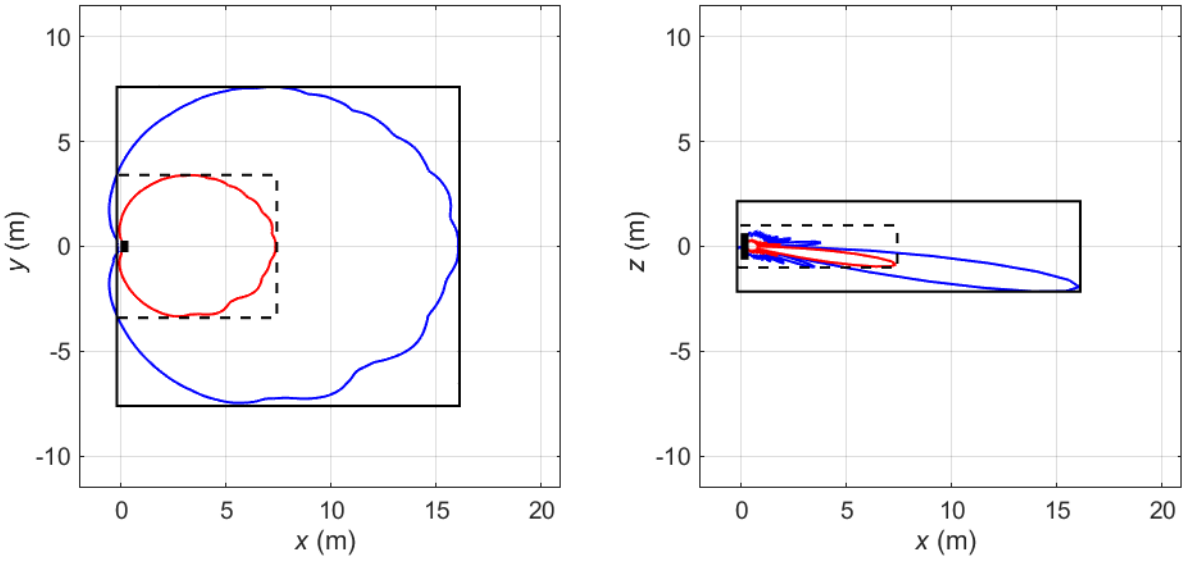

Figure 9 Compliance boundaries for general public exposure (black solid line) and occupational exposure (black dashed line) for the markets where the FCC limits apply. The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The red solid lines indicate the corresponding compliance distance results for occupational exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B25 (LTE) + B66 (LTE). Total time-averaged power delivered to the antenna: 56.1 dBm / 402.9 W (25% for B25, 75% for B66). Electrical tilt: 7 degrees. Sector shape: Macro Wide.

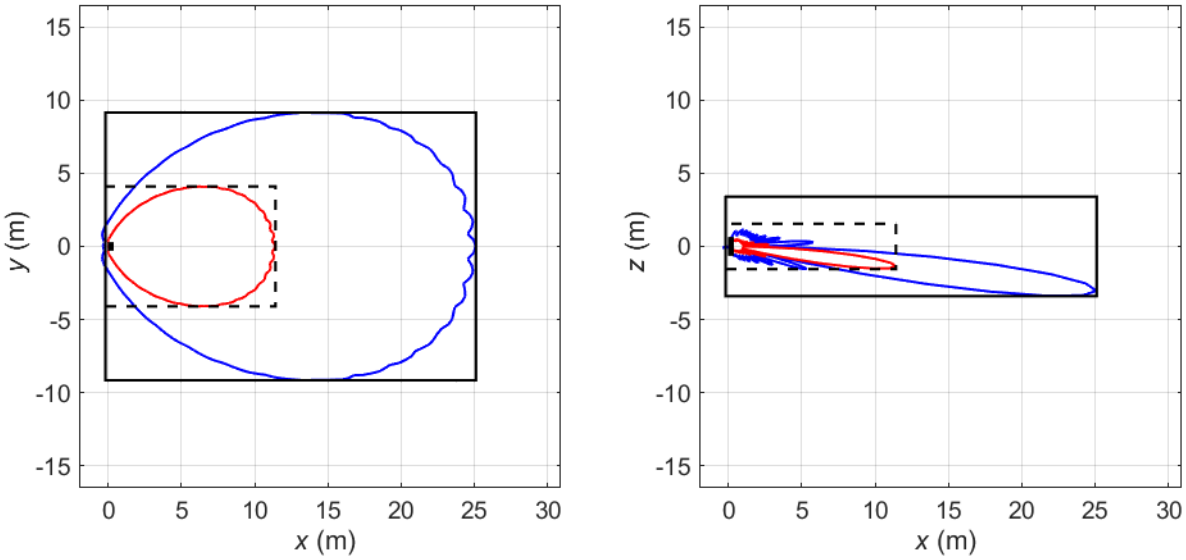

Figure 10Compliance boundaries for general public exposure (black solid line) and occupational exposure (black dashed line) for the markets where the FCC limits apply. The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The red solid lines indicate the corresponding compliance distance results for occupational exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B25 (LTE) + B66 (LTE). Total time-averaged power delivered to the antenna: 56.1 dBm / 402.9 W (25% for B25, 75% for B66). Electrical tilt: 7 degrees. Sector shape: Narrow Beam.

Table 6 Dimensions of the box-shaped compliance boundary for general public (GP) and occupational (O) exposure for AIR 3283 B25 B66 applicable in the USA and markets employing the FCC RF exposure limits. The compliance boundaries are determined for maximum nominal output power with output power tolerance included.

Mode and output power for AIR 3283			
Band	**Standard**	**IEC 62232 installation class**	**Power tolerance**
B25 + B66	LTE	E+	1 dB

Maximum nominal output power from the radio[2]	Exposure condition	Sector shape	Electrical tilt (deg)	Dimensions of the box-shaped compliance boundary (m)							
				Distance in front of EUT		Width		Height		Distance behind EUT	
				GP	O	GP	O	GP	O	GP	O
80 W (B25) + 240 W (B66)	Theoretical maximum	2DS Left, 2DS Right	2	10.4	4.7	10.9	4.9	2.6	1.6	0.2	0.2
			7	11.0	4.9	11.5	5.1	3.0	1.6	0.2	0.2
			12	9.9	4.4	10.6	4.8	4.4	2.0	0.2	0.2
		3DS Left, 3DS Right	2	12.7	5.7	15.9	7.1	3.0	1.6	0.2	0.2
			7	13.2	5.9	16.7	7.5	3.6	1.6	0.2	0.2
			12	11.8	5.3	15.5	6.9	5.3	2.4	0.2	0.2
		3DS Middle	2	13.2	5.9	4.3	2.0	3.4	1.6	0.2	0.2
			7	14.0	6.3	4.6	2.1	3.9	1.8	0.2	0.2
			12	12.7	5.7	4.3	2.0	5.7	2.6	0.2	0.2
		Macro	2	16.7	7.5	13.0	5.9	4.3	1.9	0.2	0.2
			7	17.6	7.9	13.8	6.2	4.8	2.2	0.2	0.2
			12	16.0	7.2	12.8	5.7	7.2	3.2	0.2	0.2
		Macro Narrow	2	24.2	10.9	9.3	4.2	6.2	2.8	0.2	0.2
			7	25.7	11.5	9.8	4.4	7.0	3.2	0.2	0.2
			12	23.2	10.4	9.2	4.1	10.4	4.7	0.2	0.2
		Macro Wide	2	15.0	6.7	14.5	6.5	3.9	1.8	0.2	0.2
			7	15.8	7.1	15.2	6.8	4.3	2.0	0.2	0.2
			12	14.4	6.5	14.1	6.3	6.5	2.9	0.2	0.2
		Narrow Beam	2	23.4	10.5	17.4	7.8	6.0	2.7	0.2	0.2
			7	24.8	11.1	18.3	8.2	6.8	3.1	0.2	0.2
			12	22.4	10.0	17.0	7.6	10.0	4.5	0.2	0.2
160 W (B25) + 160 W (B66)	Theoretical maximum	2DS Left, 2DS Right	2	10.2	4.6	10.6	4.8	2.6	1.6	0.2	0.2
			7	10.7	4.8	11.2	5.0	3.0	1.6	0.2	0.2
			12	9.7	4.4	10.4	4.7	4.4	2.0	0.2	0.2
		3DS Left,	2	12.5	5.6	15.5	6.9	2.8	1.6	0.2	0.2

		3DS Right	7	12.9	5.8	16.2	7.3	3.6	1.6	0.2	0.2
			12	11.7	5.2	15.1	6.8	5.2	2.4	0.2	0.2
		3DS Middle	2	13.1	5.9	4.2	1.9	3.4	1.6	0.2	0.2
			7	13.8	6.2	4.4	2.0	3.8	1.7	0.2	0.2
			12	12.5	5.6	4.1	1.9	5.6	2.5	0.2	0.2
		Macro	2	16.5	7.4	13.0	5.8	4.2	1.9	0.2	0.2
			7	17.3	7.8	13.6	6.1	4.8	2.2	0.2	0.2
			12	15.8	7.1	12.7	5.7	7.1	3.2	0.2	0.2
		Macro Narrow	2	23.9	10.7	9.3	4.2	6.1	2.7	0.2	0.2
			7	25.2	11.3	9.8	4.4	6.9	3.1	0.2	0.2
			12	22.8	10.2	9.2	4.1	10.2	4.6	0.2	0.2
		Macro Wide	2	14.9	6.7	14.4	6.5	3.8	1.7	0.2	0.2
			7	15.6	7.0	15.1	6.8	4.3	1.9	0.2	0.2
			12	14.3	6.4	14.0	6.3	6.4	2.9	0.2	0.2
		Narrow Beam	2	23.0	10.3	17.4	7.8	5.9	2.7	0.2	0.2
			7	24.3	10.9	18.3	8.2	6.7	3.0	0.2	0.2
			12	22.0	9.9	17.0	7.6	9.8	4.4	0.2	0.2
240 W (B25) + 80 W (B66)	Theoretical maximum	2DS Left, 2DS Right	2	10.1	4.5	10.4	4.7	2.6	1.6	0.2	0.2
			7	10.5	4.7	10.9	4.9	2.9	1.6	0.2	0.2
			12	9.5	4.3	10.2	4.6	4.3	1.9	0.2	0.2
		3DS Left, 3DS Right	2	12.2	5.5	15.1	6.8	2.8	1.6	0.2	0.2
			7	12.6	5.7	15.8	7.1	3.5	1.6	0.2	0.2
			12	11.5	5.2	14.7	6.6	5.1	2.3	0.2	0.2
		3DS Middle	2	13.0	5.8	4.0	1.8	3.4	1.6	0.2	0.2
			7	13.6	6.1	4.2	1.9	3.8	1.7	0.2	0.2
			12	12.4	5.6	3.9	1.8	5.6	2.5	0.2	0.2
		Macro	2	16.4	7.3	12.9	5.8	4.2	1.9	0.2	0.2
			7	17.0	7.6	13.5	6.1	4.7	2.1	0.2	0.2
			12	15.6	7.0	12.6	5.7	7.0	3.1	0.2	0.2
		Macro Narrow	2	23.5	10.5	9.4	4.2	6.0	2.7	0.2	0.2
			7	24.6	11.0	9.8	4.4	6.8	3.1	0.2	0.2
			12	22.4	10.0	9.3	4.2	10.0	4.5	0.2	0.2
		Macro Wide	2	14.7	6.6	14.3	6.4	3.8	1.7	0.2	0.2
			7	15.3	6.9	14.9	6.7	4.3	1.9	0.2	0.2
			12	14.1	6.3	13.9	6.3	6.3	2.9	0.2	0.2
		Narrow Beam	2	22.7	10.2	17.4	7.8	5.8	2.6	0.2	0.2
			7	23.7	10.6	18.2	8.2	6.6	3.0	0.2	0.2
			12	21.6	9.7	17.0	7.7	9.7	4.3	0.2	0.2

For the power levels specified in the table with tolerances added, and the upward rounding of compliance boundary dimensions to the nearest decimeter, the specified results are conservative.

6 Uncertainty

For the input parameters defined in the test report, the calculated compliance boundary dimensions determined according to the approach described in Section 4 results in an exposure assessment which is conservative. The compliance boundary dimensions were determined by comparing the evaluated RF exposure directly with the limits.

7 Conclusion

The Ericsson AIR 3283 B25 B66 has been tested using methods and procedures specified in FCC OET Bulletin 65 [3] and IEC 62232:2022 [4]. The results in Section 5 show the compliance boundary dimensions of the product to be included in the Customer Product Information (CPI). Outside of these compliance boundaries, the RF exposure is below the limits specified in [1].

8 References

[1] FCC, Code of Federal Regulations CFR title 47, part 1.1310 "Radiofrequency radiation exposure limits", Federal Communications Commission (FCC), April 2020.

[2] Ericsson, GFTE-16:001718 Uen, "Ericsson RF exposure calculation procedure for base stations".

[3] FCC, "Evaluating compliance with FCC guidelines for human exposure to radiofrequency electromagnetic fields. OET Bulletin 65. Edition 97-01." Federal Communications Commission (FCC), Office of Engineering and Technology, August 1997.
[4] IEC 62232 Edition 3.0, “Determination of RF field strength, power density and SAR in the vicinity of base stations for the purpose of evaluating human exposure”, October 2022.
[5] Ericsson, GFTL-19:000424 Uen, "User manual of MSI compliance analyzer".
[6] Ericsson GFTL-23:001011 Uen, " Measurements of EMF exposure levels behind an Ericsson mid-band AAS radio".
[7] Ericsson, LME-12:001904 Uen, "Exposure to radio frequency electromagnetic fields".
[8] Ericsson, GFTL-23:001729 Uen, “EMF Test Report: Ericsson AIR 3283 B25 B66 NR (FCC)”.

9 Revision history

Rev.	Date	Description
A	2023-12-19	First revision.
B	2024-03-20	Product number KRD 901 892/11 added.

Appendix A. Information to be included in the CPI

Table A.1 below lists the compliance boundaries (exclusion zones), outside of which the RF EMF exposure from AIR 3283 is below the limits specified by the FCC, and the limits applicable in:

- USA (47 CFR 1.1310)

Information is provided for the theoretical maximum.

Table A.1 Dimensions of the box-shaped compliance boundary for general public (GP) and occupational (O) exposure applicable in the USA and markets employing the FCC RF exposure limits.

Mode and output power for AIR 3283			
Band	**Standard**	**IEC 62232 installation class**	**Power tolerance**
B25 + B66	LTE	E+	1 dB

Maximum nominal output power from the radio	**Exposure condition**	**Sector shape**	**Electrical tilt (deg)**	**Dimensions of the box-shaped compliance boundary (m)**							
				Distance in front of EUT		**Width**		**Height**		**Distance behind EUT**	
				GP	**O**	**GP**	**O**	**GP**	**O**	**GP**	**O**
320 W	Theoretical maximum	2DS Left, 2DS Right	2	10.4	4.7	10.9	4.9	2.6	1.6	0.2	0.2
			7	11.0	4.9	11.5	5.1	3.0	1.6	0.2	0.2
			12	9.9	4.4	10.6	4.8	4.4	2.0	0.2	0.2
		3DS Left, 3DS Right	2	12.7	5.7	15.9	7.1	3.0	1.6	0.2	0.2
			7	13.2	5.9	16.7	7.5	3.6	1.6	0.2	0.2
			12	11.8	5.3	15.5	6.9	5.3	2.4	0.2	0.2
		3DS Middle	2	13.2	5.9	4.3	2.0	3.4	1.6	0.2	0.2
			7	14.0	6.3	4.6	2.1	3.9	1.8	0.2	0.2
			12	12.7	5.7	4.3	2.0	5.7	2.6	0.2	0.2
		Macro	2	16.7	7.5	13.0	5.9	4.3	1.9	0.2	0.2
			7	17.6	7.9	13.8	6.2	4.8	2.2	0.2	0.2
			12	16.0	7.2	12.8	5.7	7.2	3.2	0.2	0.2
		Macro Narrow	2	24.2	10.9	9.4	4.2	6.2	2.8	0.2	0.2
			7	25.7	11.5	9.8	4.4	7.0	3.2	0.2	0.2
			12	23.2	10.4	9.3	4.2	10.4	4.7	0.2	0.2
		Macro Wide	2	15.0	6.7	14.5	6.5	3.9	1.8	0.2	0.2
			7	15.8	7.1	15.2	6.8	4.3	2.0	0.2	0.2
			12	14.4	6.5	14.1	6.3	6.5	2.9	0.2	0.2
		Narrow Beam	2	23.4	10.5	17.4	7.8	6.0	2.7	0.2	0.2
			7	24.8	11.1	18.3	8.2	6.8	3.1	0.2	0.2
			12	22.4	10.0	17.0	7.7	10.0	4.5	0.2	0.2

(1) The compliance boundaries are determined for maximum output power with power tolerance and TDD downlink duty cycle included, and for theoretical maximum and actual maximum exposure conditions.

(2) The sector shapes 2DS Left and 2DS Right operate with half of the maximum nominal output power from the radio, while the sector shapes 3DS Left, 3DS Middle and 3DS Right operate with one third of the maximum nominal power. EMF compliance distances for the sector shape 2DS are obtained as the maximum of those obtained for 2DS Left and 2DS Right, while EMF compliance distances for the sector shape 3DS are obtained as the maximum of those obtained for 3DS Left, 3DS Middle and 3DS Right.

(3) For NR+LTE mixed mode, the results for NR apply.

Appendix B. Guidelines on how to install the product

The AIR 3283 B25 B66 product (KRD 901 892/11, KRD 901 892/1) shall be installed to make sure that the general public does not have access to the applicable RF EMF compliance boundary. The compliance boundary dimensions were determined for the product transmitting in free space.

Appendix C. Guidelines for workers during installation, maintenance, and repair of the product

For the AIR 3283 B25 B66 product (KRD 901 892/11, KRD 901 892/1), if work needs to be performed within the compliance boundary applicable for workers, the radio equipment shall be powered off, or the power be reduced to a level ensuring that the RF EMF exposure is below the relevant exposure limit for workers.

If work is conducted on behalf of Ericsson, minimum EMF related requirements are provided in [7].

Appendix D. Photograph/Sketch of the EUT