

4 FCC §2.1091 & IC RSS-102 - RF Exposure Information

4.1 Applicable Standards

FCC §2.1091, (a) Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See subpart I of part 1 of this chapter, in particular §1.1307(b).

Limits for Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	842/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1	30

Before equipment certification is granted, the procedure of IC RSS-102 must be followed concerning the exposure of humans to RF field

According to IC RSS-102 Issue 5 section 4, RF limits used for general public will be applied to the EUT.

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Time Averaging (min)
0.003-10	170	180	-	Instantaneous*
0.1-10	-	1.6/ f	-	6**
1.29-10	193/ f ^{0.5}	-	-	6**
10-20	61.4	0.163	-10	6
20-48	129.8/ f ^{0.25}	0.3444/ f ^{0.25}	44.72/ f ^{0.5}	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 f ^{0.25}	0.04138 f ^{0.25}	0.6455 f ^{0.5}	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/f ^{1.2}
150000-300000	0.354 f ^{0.5}	9.40 x 10 ⁻⁴ f ^{0.5}	3.33 x 10 ⁻⁴ f	616000/f ^{1.2}

f = frequency in MHz

* = Plane-wave equivalent power density

** = Based on specific absorption rate (SAR).

MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>45.70</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>37153.5229</u>
<u>Prediction distance (cm):</u>	<u>120</u>
<u>Prediction frequency (MHz):</u>	<u>472.95</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>0</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>1</u>
<u>Power density of prediction frequency at 120 cm (mW/cm²):</u>	<u>0.2054</u>
<u>FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>0.3153</u>
<u>Power density of prediction frequency at 120 cm (W/m²):</u>	<u>2.0542</u>
<u>IC MPE limit for uncontrolled exposure at prediction frequency (W/m²):</u>	<u>14.038</u>

Conclusion

The device complies with the MPE requirements by providing a safe separation distance of at least 120 cm between the antenna with maximum 0 dBi gain, including any radiating structure, and any persons when normally operated.