

FCC RF Exposure Analysis

Revision	Report Date	Reason for Revision
Ø	August 15, 2021	Initial Issue.

FCC RF Exposure Evaluation of Devices

RF Exposure Requirements: §1.1307(b)(1) and §1.1307(b)(2): Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission’s guidelines.

RF Radiation Exposure Limit: §1.1310: As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
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
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

RF Exposure Limits

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (mW/cm²)
 P = Power Input to antenna (mW)
 G = Antenna Gain (numeric value)
 R = Distance (cm)

For Antenna Gain → dBi = 10log(Numeric)

Test Results:

Band	Frequency	Maximum Conducted Power	Conducted Power	Antenna Gain	Antenna Gain	Power Density	Limit	Margin	Distance	Result
	(MHz)	(dBm)	(mW)	(dBi)	(Numeric)	(mW/cm ²)	(mW/cm ²)		(cm)	
GSM 850	831.5	30.0	1000.00	1.00	1.259	0.251	0.554	0.304	20	Pass
GSM 1900	1880.0	31.0	1258.93	1.00	1.259	0.315	1	0.685	20	Pass
LTE B2	1880.0	26.0	398.11	1.00	1.259	0.100	1	0.900	20	Pass
LTE B4	1732.5	25.0	316.23	1.00	1.259	0.079	1	0.921	20	Pass
LTE B5	836.5	27.0	501.19	1.00	1.259	0.126	0.558	0.432	20	Pass
LTE B12	707.5	24.0	251.19	1.00	1.259	0.063	0.472	0.409	20	Pass
LTE B13	782.0	25.0	316.23	1.00	1.259	0.079	0.521	0.442	20	Pass
LTE B26	836.5	26.0	398.11	1.00	1.259	0.100	0.558	0.458	20	Pass

There is no condition of simultaneous transmission since there is only one radio in the device.