

MPE Evaluation

FCC

Maximum exposure limits from CFR 47, FCC Part 1.1310:

Table 1—Limits for Maximum Permissible Exposure (MPE)

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 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
(B) 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

Table 2 – Power Density Calculations, FCC

Frequency	Antenna Gain	Output power	Output power with antenna +10% for tolerance	Minimum Separation Distance	Power Density	Limit	Verdict
MHz	dBi	mW	mW	cm	mW/cm ²	mW/cm ²	
903.3	1	2.06	2.27	20.00	0.000451	0.0602	PASS
915.0	1	1.83	2.01	20.00	0.000401	0.0610	PASS
926.7	1	1.74	1.91	20.00	0.000381	0.0618	PASS

Note: The user’s manual will stipulate that a 20cm distance from the user is to be maintained.

The power density is calculated as shown below:

$$S = (P \times G) / (4 \times \pi \times d^2) - \text{used to calculate exposure at 20 cm}$$

$$d = \sqrt{(S / (P \times G) \times 4 \times \pi)} - \text{used to calculate minimum distance to meet limits}$$

S= power density

P = transmitter conducted power (in mW)

G = antenna numeric gain

D = distance to radiation center (20 cm)