

RF exposure

FCC ID : 2BFPP-PBLK100

According to FCC part 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in § 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength(V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Average time
(A) Limits for Occupational / Control Exposures				
0.3 – 3.0	614	1.63	*(100)	6
3.0 – 30	1842/f	4.89/f	*(900/f²)	6
30 - 300	61.4	0.163	1.0	6
300 – 1 500	--	--	f/300	6
1 500 - 100000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
0.3 – 1.34	614	1.63	*(100)	30
1.34 – 30	824/f	2.19/f	*(180/f²)	30
3.0 - 300	27.5	0.073	0.2	30
300 – 1 500	--	--	f/1500	30
1 500 – 100 000	--	--	1	03

f= frequency in MHz

Friis transmission formula: $P_d = (P_{out} \times G) / (4 \times \pi \times R^2)$

Where,

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Results

Frequency (MHz)	Reading at 3 m (dBµV)	Ant.	Correction factor (dB/m)	Result at 3 m (dBµV/m)	Result at 3 m (V/m)	Electric field strength at 5 mm (V/m)	Limit (V/m)
		Pol.					
13.560 MHz	21.80	H	21.55	43.35	0.000 15	55.560 15	60.76
13.560 MHz	19.00	V	21.55	40.55	0.000 11	55.560 11	60.76

Note.

Electric field strength at 5 mm (V/m) = Result at 3 m (V/m) + Distance correction factor*

*Distance correction factor = $20 \times \log(\text{measure distance (3 m)} / \text{evaluate distance (0.005 m = 5 mm)}) = 55.56$