

## RF exposure

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/cm <sup>2</sup> )	Average time
(A) Limits for Occupational /Control Exposures				
300 – 1500	--	--	f/300	6
1500 - 100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300 – 1500	--	--	f/1500	6
1500 - 100000	--	--	1	30

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/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

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

$P_d$  the limit of MPE, f/300 mW/cm<sup>2</sup>. 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

Channel	Frequency (MHz)	Peak output power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
Low	450.025	19.10	-4.888	0.00523	1.50
Middle	457.575	18.92	-4.888	0.00502	1.53
High	469.975	18.52	-4.888	0.00458	1.57