

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 ²)	Average time
(A) Limits for Occupational / Control Exposures				
300 – 1 500	--	--	f/300	6
1 500 - 100 000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300 – 1 500	--	--	f/1500	30
1 500 – 100 000	--	--	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/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, $\frac{1 \text{ mW}}{\text{cm}^2}$. 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

Test mode	Frequency (MHz)	Peak output power (dBm)	Antenna gain (dBi)	Power density at 20 cm (mW/cm ²)	Limit (mW/cm ²)
11b	2 412	13.67	7.01	0.023 27	1
	2 442	13.76		0.023 75	
	2 462	11.84		0.015 27	
11g	2 412	17.09	7.01	0.051 14	1
	2 442	16.44		0.044 03	
	2 462	14.41		0.027 59	
11n_HT20	2 412	15.88	7.01	0.038 70	1
	2 442	15.52		0.035 62	
	2 462	14.07		0.025 51	
11n_HT40	2 422	15.10	7.01	0.032 34	1
	2 442	14.47		0.027 97	
	2 452	14.80		0.030 18	