

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 (毗)	Electric field strength(V/m)	Magnetic field strength (A/m)	Power density (n₩/c㎡)	Average time			
(A) Limits for Occupational / Control Exposures							
300 – 1 500			f/300	6			
1 500 - 100000			5	6			
(B) Limits for General Population / Uncontrol Exposures							
300 – 1 500			<mark>f/1500</mark>	<mark>6</mark>			
1 500 – 100 000			<u>1</u>	<u>30</u>			

f= frequency in Mb

Friis transmission formula: $Pd = (Pout \times G)/(4 \times pi \times R^2)$

Where,

Pd = power density in mW/cm²

Pout = 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

Pd the limit of MPE, 1 $_{\rm mW/cm}$. 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 - Worst case

WIFI (2	2.4G)
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Operation mode		Max tune-up Average power (dBm)	Antenna gain (dBi)	Power density at 20 cm(nW/cm²)	Limit (n₩/c㎡)
802.11b	SISO	16.00	3.28	0.01686	1
802.11g	SISO	14.00	3.28	0.01063	1
802.11n(HT20)	SISO	13.00	3.28	0.00845	1
802.11n(HT40)	SISO	13.00	3.28	0.00845	1