

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 - 100000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300 – 1 500	--	--	f/1500	6
1 500 – 100 000	--	--	<u>1</u>	<u>30</u>

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

Operation mode	Frequency (MHz)	Max Tune-up Average Power(dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm²)	Limit (mW/cm²)
BDR	2 402 ~ 2 480	5.5	2.13	0.001 15	1
LE 1 Mbps	2 402 ~ 2 480	7.5		0.001 83	
802.11n_HT20	2 412 ~ 2 462	10.0		0.003 25	
802.11a	5 180 ~ 5 240	11.5	0.699	0.003 30	
802.11n_HT20		11.0		0.002 94	
802.11ac_VHT20		11.0		0.002 94	
802.11n_HT40	5 190 ~ 5 230	11.0		0.002 94	
802.11ac_VHT40		11.0		0.002 94	
802.11ac_VHT80	5 210	11.0		0.002 94	
802.11a	5 745 ~ 5 825	11.0	1.889	0.003 87	
802.11n_HT20		11.0		0.003 87	
802.11ac_VHT20		11.0		0.003 87	
802.11n_HT40	5 755 ~ 5 795	10.0		0.003 07	
802.11ac_VHT40		10.0		0.003 07	
802.11ac_VHT80	5 775	10.0		0.003 07	
Simultaneous transmission (BDR + LE 1 Mbps + 2.4 GHz Band WLAN + UNII-1 Band WLAN + UNII-3 Band WLAN)				0.013 40	< 1 (Ratio)

Note.

1. When the sum of ratios of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the 1.0 the additional equipment approval is not required.
2. Calculation : (0.001 15 / 1) + (0.001 83 / 1) + (0.003 25 / 1) + (0.003 30 / 1) + (0.003 87 / 1)
= 0.013 40