

RF exposure

FCC ID : 2A9KPNU110SE

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	--	--	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, 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

2.4 GHz

Operation mode	Frequency (MHz)	Maximum Average output power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm ²)	Limit (mW/cm ²)
BDR (1 Mbps)	2 402 MHz ~ 2 480 MHz	6.5	3.0	0.001 77	1
EDR (2 Mbps)		5.5		0.001 41	
EDR (3 Mbps)		5.5		0.001 41	
LE (1 Mbps)		-3.5		0.000 18	
802.11b	2 412 MHz ~ 2 462 MHz	13.5		0.008 89	
802.11g		11.5		0.005 61	
802.11n_HT20		10.5		0.004 45	
802.11n_HT40	2 422 MHz ~ 2 452 MHz	3.0		0.000 79	

UNII-1

Operation mode	Frequency (MHz)	Maximum Average output power (dBm)	Antenna gain (dBi)	Power density at 20 cm (mW/cm ²)	Limit (mW/cm ²)
802.11a	5 180 MHz	12.0	3.3	0.006 74	1
802.11n_HT20	~ 5 240 MHz	12.0		0.006 74	
802.11n_HT40	5 190 MHz ~ 5 230 MHz	12.0		0.006 74	

UNII-2A

Operation mode	Frequency (MHz)	Maximum Average output power (dBm)	Antenna gain (dBi)	Power density at 20 cm (mW/cm ²)	Limit (mW/cm ²)
802.11a	5 260 MHz	11.5	3.3	0.006 01	1
802.11n_HT20	~ 5 320 MHz	11.5		0.006 01	
802.11n_HT40	5 270 MHz ~ 5 310 MHz	13.0		0.008 49	

UNII-2C

Operation mode	Frequency (MHz)	Maximum Average output power (dBm)	Antenna gain (dBi)	Power density at 20 cm (mW/cm ²)	Limit (mW/cm ²)
802.11a	5 500 MHz	12.0	3.3	0.006 74	1
802.11n_HT20	~ 5 720 MHz	12.0		0.006 74	
802.11n_HT40	5 510 MHz ~ 5 710 MHz	13.0		0.008 49	

UNII-3

Operation mode	Frequency (MHz)	Maximum Average output power (dBm)	Antenna gain (dBi)	Power density at 20 cm (mW/cm ²)	Limit (mW/cm ²)
802.11a	5 745 MHz	11.5	3.3	0.006 01	1
802.11n_HT20	~ 5 825 MHz	11.5		0.006 01	
802.11n_HT40	5 755 MHz ~ 5 795 MHz	13.0		0.008 49	