

RF exposure

FCC ID : 2AXRRIRORO2-PCBA

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)	Output Tune-up Average power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm ²)	Limit (mW/cm ²)
BDR 1Mbps	2 402 ~ 2 480	5.00	-0.58	0.000 55	1.00
EDR 2Mbps	2 402 ~ 2 480	2.50	-0.58	0.000 31	1.00
EDR 3Mbps	2 402 ~ 2 480	2.50	-0.58	0.000 31	1.00
LE 1Mbps	2 402 ~ 2 480	5.00	-0.58	0.000 55	1.00
802.11b	2 412 ~ 2 462	12.50	-0.58	0.003 10	1.00
802.11g	2 412 ~ 2 462	12.50	-0.58	0.003 10	1.00
802.11n_HT20	2 412 ~ 2 462	12.50	-0.58	0.003 10	1.00
802.11n_HT40	2 422 ~ 2 452	13.00	-0.58	0.003 47	1.00

Band:UNII-1

Operation mode	Frequency (MHz)	Output Tune-up Average power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm ²)	Limit (mW/cm ²)
802.11a	5 180 ~ 5 240	7.50	0.50	0.001 26	1.00
802.11an_HT20	5 180 ~ 5 240	7.50	0.50	0.001 26	1.00
802.11ac_VHT20	5 180 ~ 5 240	7.50	0.50	0.001 26	1.00
802.11an_HT40	5 190 ~ 5 230	8.00	0.50	0.001 41	1.00
802.11ac_VHT40	5 190 ~ 5 230	8.00	0.50	0.001 41	1.00
802.11ac_VHT80	5 210	8.00	0.50	0.001 41	1.00

Band:UNII-2A

Operation mode	Frequency (MHz)	Output Tune-up Average power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm ²)	Limit (mW/cm ²)
802.11a	5 260 ~ 5 320	8.00	0.06	0.001 27	1.00
802.11an_HT20	5 260 ~ 5 320	8.00	0.06	0.001 27	1.00
802.11ac_VHT20	5 260 ~ 5 320	8.00	0.06	0.001 27	1.00
802.11an_HT40	5 270 ~ 5 310	8.00	0.06	0.001 27	1.00
802.11ac_VHT40	5 270 ~ 5 310	8.50	0.06	0.001 43	1.00
802.11ac_VHT80	5 290	8.50	0.06	0.001 43	1.00

Band:UNII-2C

Operation mode	Frequency (MHz)	Output Tune-up Average power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm ²)	Limit (mW/cm ²)
802.11a	5 500 ~ 5 700	5.00	-1.43	0.000 45	1.00
802.11an_HT20	5 500 ~ 5 700	5.00	-1.43	0.000 45	1.00
802.11ac_VHT20	5 500 ~ 5 700	5.00	-1.43	0.000 45	1.00
802.11an_HT40	5 510 ~ 5 670	5.50	-1.43	0.000 51	1.00
802.11ac_VHT40	5 510 ~ 5 670	5.50	-1.43	0.000 51	1.00
802.11ac_VHT80	5 530 ~ 5 690	6.00	-1.43	0.000 57	1.00

Band:UNII-3

Operation mode	Frequency (MHz)	Output Tune-up Average power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm ²)	Limit (mW/cm ²)
802.11a	5 745 ~ 5 825	3.00	-2.35	0.000 23	1.00
802.11an_HT20	5 745 ~ 5 825	3.00	-2.35	0.000 23	1.00
802.11ac_VHT20	5 745 ~ 5 825	3.00	-2.35	0.000 23	1.00
802.11an_HT40	5 755 ~ 5 795	4.00	-2.35	0.000 29	1.00
802.11ac_VHT40	5 755 ~ 5 795	4.00	-2.35	0.000 29	1.00
802.11ac_VHT80	5 775	4.00	-2.35	0.000 29	1.00