FCC ID : P53-EMC3380

RF EXPOSURE EVALUATION

According to FCC 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				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

11.1 Friis transmission formula: Pd= (Pout*G)\ (4*pi*R^2)

Where

Pd= Power density in mW/cm^2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1416

R= distance between observation point and center of the radiator in cm

Pd the limit of MPE, $1mW/cm^2$,If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

RF Exposure Information: The radiated output power of this device meets the limits of FCC/IC radio frequency exposure limits.This device should be operated with a minimum separation distance of 20cm (8 inches) between the equipment and a person's body.

11.2 Measurement Result

WIFI2.4G and Bluetooth cannot transmit at the same time

BLE
Antenna gain: 2.0 dBi

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
GFSK(1M)	2402	7.109	6 to 8	8	1.58	0.0020	1
	2440	6.708	5 to 7	7	1.58	0.0016	1
	2480	5.545	4 to 6	6	1.58	0.0013	1
GFSK(2M)	2402	7.232	6 to 8	8	1.58	0.0020	1
	2440	6.349	5 to 7	7	1.58	0.0016	1
	2480	6.161	5 to 7	7	1.58	0.0016	1

Wifi 2.4G
Antenna gain: 2.0 dBi

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
802.11b	2412	15.76	14 to 16	16	1.58	0.0125	1
	2437	15.55	14 to 16	16	1.58	0.0125	1
	2462	15.16	14 to 16	16	1.58	0.0125	1
802.11g	2412	16.04	15 to 17	17	1.58	0.0158	1
	2437	16.13	15 to 17	17	1.58	0.0158	1
	2462	15.45	14 to 16	16	1.58	0.0125	1
802.11n (HT20)	2412	16.74	15 to 17	17	1.58	0.0158	1
	2437	16.03	15 to 17	17	1.58	0.0158	1
	2462	15.50	14 to 16	16	1.58	0.0125	1
802.11n (HT40)	2422	13.93	12 to 14	14	1.58	0.0079	1
	2437	14.03	13 to 15	15	1.58	0.0099	1
	2452	13.61	12 to 14	14	1.58	0.0079	1

Wifi 5G
Antenna gain: 2.0 dBi

U-NII – 1

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
802.11a	5180	11.08	10 to 12	12	1.58	0.0050	1
	5200	11.62	10 to 12	12	1.58	0.0050	1
	5240	12.21	11 to 13	13	1.58	0.0063	1
802.11n-HT20	5180	11.24	10 to 12	12	1.58	0.0050	1
	5200	11.59	10 to 12	12	1.58	0.0050	1
	5240	12.16	11 to 13	13	1.58	0.0063	1
802.11n-HT40	5190	10.86	9 to 11	11	1.58	0.0040	1
	5230	11.87	10 to 12	12	1.58	0.0050	1

U-NII – 2A

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
802.11a	5260	12.22	11 to 13	13	1.58	0.0063	1
	5280	12.47	11 to 13	13	1.58	0.0063	1
	5320	12.09	11 to 13	13	1.58	0.0063	1
802.11n-HT20	5260	12.11	11 to 13	13	1.58	0.0063	1
	5280	12.50	11 to 13	13	1.58	0.0063	1
	5320	12.06	11 to 13	13	1.58	0.0063	1
802.11n-HT40	5270	12.40	11 to 13	13	1.58	0.0063	1
	5310	12.15	11 to 13	13	1.58	0.0063	1

U-NII – 3

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
802.11a	5745	10.98	9 to 11	11	1.58	0.0040	1
	5785	10.33	9 to 11	11	1.58	0.0040	1
	5825	10.04	9 to 11	11	1.58	0.0040	1
802.11n-HT20	5745	11.00	10 to 12	12	1.58	0.0050	1
	5785	10.34	9 to 11	11	1.58	0.0040	1
	5825	10.08	9 to 11	11	1.58	0.0040	1
802.11n-HT40	5755	11.05	10 to 12	12	1.58	0.0050	1
	5795	9.71	9 to 10	10	1.58	0.0031	1