

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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

π =3.1416

R= distance between observation point and center of the radiator in 20cm

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

11.2 Measurement Result

WIFI 5G:

Antenna gain:3dBi

modulation	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
11a	14.26	14dBm to 16dBm	16	39.81	2	0.0158	<1
11n(VHT20)	14.13	14dBm to 16dBm	16	39.81	2	0.0158	<1
11ac(VHT20)	14.14	14dBm to 16dBm	16	39.81	2	0.0158	<1
11n(VHT40)	13.70	13dBm to 15dBm	15	31.62	2	0.0126	<1
11ac(VHT40)	13.87	13dBm to 15dBm	15	31.62	2	0.0126	<1
11ac(VHT80)	13.53	13dBm to 15dBm	15	31.62	2	0.0126	<1

WIFI 2.4G:

Antenna gain:2dBi

modulation	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
11b	23.64	23dBm to 25dBm	25	316.23	1.58	0.0994	<1
11g	21.03	21dBm to 23dBm	23	199.53	1.58	0.0627	<1
11n HT20	20.82	20dBm to 22dBm	22	158.49	1.58	0.0498	<1
11n HT40	19.80	19dBm to 21dBm	21	125.89	1.58	0.0396	<1

BT DTS

Antenna gain:2dBi

Channel Freq. (MHz)	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
2402	2.16	2dBm to 4dBm	4	2.51	1.58	0.0008	<1
2440	1.58	1dBm to 3dBm	3	2.00	1.58	0.0006	<1
2480	1.41	1dBm to 3dBm	3	2.00	1.58	0.0006	<1

WIFI 5G +WIFI 2.4G+BT MAX RF EXPOSURE EVALUATION

Max WIFI 2.4G band Evaluation result (mW/cm2)	Max WIFI 5G band Evaluation result (mW/cm2)	Max BT Evaluation result (mW/cm2)	Summation of Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
0.0994	0.0158	0.0008	0.116	<1