

FCC ID: 2AEDG-P9901

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 cm

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.

$mW = 10^{(dBm/10)}$

11.2 Measurement Result

Bluetooth Operation Frequency: 2402MHz-2480MHz;

WIFI Operation Frequency: 2412-2462MHz

Antenna gain: 3.7dBi;

R=20cm

WIFI

Channel Freq. (MHz)	modulation	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
2412	802.11b	14.55	13 to15	15	2.34	0.014747864	1
2437		14.59	13 to15	15	2.34	0.014747864	1
2462		15.37	14 to16	16	2.34	0.018566461	1
2412	802.11g	14.81	13 to15	15	2.34	0.014747864	1
2437		14.53	13 to15	15	2.34	0.014747864	1
2462		14.35	13 to15	15	2.34	0.014747864	1
2412	802.11n20	13.74	12 to14	14	2.34	0.011714645	1
2437		13.20	12 to14	14	2.34	0.011714645	1
2462		12.96	11 to13	13	2.34	0.009305273	1
2412	802.11n40	12.70	11 to13	13	2.34	0.009305273	1
2437		11.99	10 to12	12	2.34	0.007391441	1
2452		11.97	10 to12	12	2.34	0.007391441	1

BLE

Channel Freq. (MHz)	modulation	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
2412	GFSK	-1.853	-2 to-1	-1	2.34	0.000370450	1
2437		-1.643	-2 to-1	-1	2.34	0.000370450	1
2462		-1.413	-2 to-1	-1	2.34	0.000370450	1

EDR/BR

Channel Freq. (MHz)	modulation	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
2402	GFSK	-1.650	-2 to-1	-1	2.34	0.000370450	1
2441		-1.500	-2 to-1	-1	2.34	0.000370450	1
2480		-1.474	-2 to-1	-1	2.34	0.000370450	1
2402	pi/4-DQPSK	0.701	-1±1	1	2.34	0.000587123	1
2441		0.942	-1±1	1	2.34	0.000587123	1
2480		0.755	-1±1	1	2.34	0.000587123	1
2402	8DPSK	1.154	0±2	2	2.34	0.000739144	1
2441		1.309	0±2	2	2.34	0.000739144	1
2480		1.308	0±2	2	2.34	0.000739144	1

*** End of Report ***