

FCC ID: 2BNDN-EPSENU

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

Antenna gain: 4.16 dBi;

R=20cm

WIFI

Operation Frequency: 2412 MHz-2462 MHz;

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	19.73	19.00±1	20.00	2.61	0.048722451	1
2437		18.86	18.00±1	19.00	2.61	0.039877611	1
2462		17.74	17.00±1	18.00	2.61	0.030812656	1
2412	802.11g	20.31	20.00±1	21.00	2.61	0.055683834	1
2437		19.52	19.00±1	20.00	2.61	0.046422565	1
2462		18.59	18.00±1	19.00	2.61	0.037473920	1
2412	802.11n20	20.24	20.00±1	21.00	2.61	0.054793511	1
2437		19.35	19.00±1	20.00	2.61	0.044640508	1
2462		18.33	18.00±1	19.00	2.61	0.035296296	1
2422	802.11n40	20.29	20.00±1	21.00	2.61	0.055427990	1
2437		20.04	20.00±1	21.00	2.61	0.052327397	1
2452		19.35	19.00±1	20.00	2.61	0.044640508	1

BLE

Operation Frequency: 2402 MHz-2480 MHz;

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_1M	9.97	9.00±1	10.00	2.61	0.005149074	1
2440		10.85	10.00±1	11.00	2.61	0.006305639	1
2480		11.05	11.00±1	12.00	2.61	0.006602815	1
2402	GFSK_2M	9.83	9.00±1	10.00	2.61	0.004985734	1
2440		10.79	10.00±1	11.00	2.61	0.006219123	1
2480		11.13	11.00±1	12.00	2.61	0.006725570	1

*** End of Report ***