

FCC ID:2BENG-MP019

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

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.

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

Antenna gain: 2.499 dBi;

R=20cm

BT

Operation Frequency: 2402MHz-2480MHz;

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	0.76	0.00±1	1.00	1.78	0.000421337	1
2441		1.23	1.00±1	2.00	1.78	0.000469493	1
2480		2.15	2.00±1	3.00	1.78	0.000580269	1
2402	π/4-DQPSK	1.04	1.00±1	2.00	1.78	0.000449396	1
2441		1.39	1.00±1	2.00	1.78	0.000487112	1
2480		2.51	2.00±1	3.00	1.78	0.000630419	1
2402	8DPSK	1.53	1.00±1	2.00	1.78	0.000503071	1
2441		1.94	1.00±1	2.00	1.78	0.000552878	1
2480		2.97	2.00±1	3.00	1.78	0.000700857	1

Evaluate the condition of different modules work simultaneously

The requirement of Simultaneous Transmission evaluation has also been considered and has complied with the following conditions of the worst case:

$MPE1/Limit1 + MPE2/Limit2 + \dots \leq 1$

Thus,

$0.0007/1 + 0.269/1.63$

(BT) (WPT)

$= 0.1657 \leq 1$

The worst-case situation is 0.1657, which is less than "1". This confirmed that the device comply with FCC KDB 447498 D04 Power limit.

----- The End -----