

## 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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz \* = Plane-wave equivalent power density

### MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 * P * G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Average RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 * P * G}{377 * D^2}$$

From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

**MAX OUTPUT POWER**  
BLE

Test Channel	Frequency (MHz)	Power Setting	Peak Output Power (dBm)	LIMIT (dBm)	Verdict
<b>1Mbps</b>					
0	2402	Default	-1.759	30	PASS
19	2440	Default	-1.590	30	PASS
39	2480	Default	-0.510	30	PASS

## Measurement Result

Operation Frequency: BT: 2402-2480MHz

Power density limited:  $1\text{mW}/\text{cm}^2$

Antenna Type: FPCB Antenna

Antenna gain: 1dBi,

R=20cm

BT:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna Gain Numeric	Evaluation result at 20cm Power density(mW/cm2)	Power density Limits (mW/cm2)
				tune-up power				
				(dBm)	(mW)			
2402	(BLE)GFSK	-1.759	-1±1	0	1	1	0.00020	1
2440		-1.59	-1±1	0	1	1	0.00020	1
2480		-0.51	-1±1	0	1	1	0.00020	1

### Conclusion:

For the max result :  $0.00020 \leq 1.0$  for Max Power Density, compliance RF exposure..

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**Signature:**

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