

FCC ID: 2BPYM-JT301A

Maximum Permissible Exposure (MPE)

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

$$E \text{ (V/m)} = \frac{\sqrt{30 * P * G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

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.

BLE:

Measurement Result

Operation Frequency: 2402MHz~2480MHz

Power density limited: 1mW/ cm²

Antenna Type: PCB antenna

Antenna gain:1dBi;

R=20cm

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

antenna gain Numeric=10^{^(dBi/10)}= 10^{^(1/10)}=1.26

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Pow er density Limits
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric	(mW/cm2)	(mW/cm2)
2402	BLE 1M	3.05	3.5±1	4.5	2.818	1.00	1.26	0.0007	1
2440		3.12	3.5±1	4.5	2.818	1.00	1.26	0.0007	1
2480		3.01	3.5±1	4.5	2.818	1.00	1.26	0.0007	1
2402	BLE 2M	2.5	3±1	4	2.512	1.00	1.26	0.0006	1
2440		4.01	3.5±1	4.5	2.818	1.00	1.26	0.0007	1
2480		2.25	3±1	4	2.512	1.00	1.26	0.0006	1

Antenna Type:FPC antenna

Antenna gain:

LTE:Band 2: -2.24dBi, Band 4: -0.26dBi, Band 5: -5 dBi, Band 12: -8.71dBi, B66:-0.26dBi

R=20cm

Channel Freq. (MHz)	modulation	conducted pow er	Tune-up pow er (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Pow er density Limits (mW/cm2)
		(dBm)		tune-up pow er		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
1857.5	LTE Band 2	23.74	23±1	24	251.189	-2.24	0.60	0.0298	1
1750	LTE Band 4	23.59	23±1	24	251.189	-0.26	0.94	0.0471	1
846.5	LTE Band 5	23.01	23±1	24	251.189	-5	0.32	0.0158	0.5643
711	LTE Band 12	23.31	23±1	24	251.189	-8.71	0.13	0.0067	0.4740
1770	LTE Band 66	23.42	23±1	24	251.189	-0.26	0.94	0.0471	1

SIMULTANEOUS TRANSMISSIONS

When a number of sources at different frequencies, and/or broadband sources, contribute to the total exposure, it becomes necessary to weigh each contribution relative to the MPE. To comply with the MPE, the fraction of the MPE in terms of E², H² (or power density) incurred within each frequency interval should be determined and the sum of all such fractions should not exceed unity. In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unity. That is

$$\sum_{i=1}^n \frac{S_i}{MPE_i} \leq 1$$

Band	Antenna	tune-up power	Antenna	Separation distance (cm)	Evaluation result	Power density Limits	Evaluation result	Power density Limits	Verdict
		(dBm)	Gain (dBi)		(mW/cm2)	(mW/cm2)			
BLE	Ant1	4.5	1	20	0.000706	1	0.047773	1	PASS
LTE Band2	Ant1	24	-0.26	20	0.047067	1			

Conclusion:
For the max result : 0.047773≤ 1.0 for Max Power Density, compliance RF exposure.

Signature: *Alex*

Date: 2025-06-05

NAME AND TITLE (Please print or type): alex li/Manager
COMPANY (Please print or type): Shenzhen NTEK Testing Technology Co., Ltd./ No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China