

# 1 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

## 1.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission’s guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
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 <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

\* = Plane-wave equipment power density

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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## 1.2 Maximum Permissible Exposure (MPE) Evaluation

BLE mode:

CH	Frequency (MHz)	Peak Power Output (dBm)	Required Limit
0	2402	-9.52	1 Watt = 30 dBm
20	2442	-11.34	1 Watt = 30 dBm
39	2480	-12.96	1 Watt = 30 dBm

BLE mode:

CH	Frequency (MHz)	Max. Avg. Output include tune up tolerance Power (dBm)	Required Limit
0	2402	-11.37	1 Watt = 30 dBm
20	2442	-13.23	1 Watt = 30 dBm
39	2480	-14.97	1 Watt = 30 dBm

\*Note: Measured by power meter, cable loss as 0.6 dB that offsets on the power meter in Peak

\*Note: Measured by power meter, as cable loss+ Duty cycle factor that offsets on the power

\*Note: Max. Output include tune up tolerance Power is average power

### MPE Prediction (BLE 2402~2480)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Max. output power including tune-up tolerancel:	-11.37	(dBm)
Max. output power including tune-up tolerancel:	0.0729458	(mW)
Duty cycle:	31.04	(%)
Maximum Pav :	0.0226424	(mW)
Peak Antenna gain (Maximum):	1.12	(dBi)
Peak Antenna gain (linear):	1.2941958	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2402	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm) distance	0.000006	(mW/cm <sup>2</sup> )
<b>Measurement Result</b>		
The predicted power density level at 20 cm is 0.000006 mW/cm <sup>2</sup> .		
This is below the uncontrolled exposure limit of 1 mW/cm <sup>2</sup> at 2402MHz.		

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