

## 13 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### 13.1 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 §2.1093 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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SGS Taiwan Ltd.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-2) 2298-0488

[www.tw.sgs.com](http://www.tw.sgs.com)

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### 13.2 Maximum Permissible Exposure (MPE) Evaluation

BLE mode:

CH	Frequency (MHz)	Peak Power Output(dBm)	Measurement Peak Power Output(dBm)	Required Limit
0	2402	0.53	0.53	1 Watt = 30 dBm
20	2442	0.19	0.19	1 Watt = 30 dBm
39	2480	-0.51	-0.51	1 Watt = 30 dBm

CH	Frequency (MHz)	Average Power Output(dBm)	Measurement Average Power Output(dBm)	Required Limit
0	2402	-0.26	-5.49	1 Watt = 30 dBm
20	2442	-0.99	-6.22	1 Watt = 30 dBm
39	2480	-1.71	-6.94	1 Watt = 30 dBm

#### 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:	-5.49	(dBm)
Max. output power including tune-up tolerancel:	0.282488	(mW)
Duty cycle:	30	(%)
Maximum Pav :	0.0847464	(mW)
Peak Antenna gain (Maximum):	0.2	(dBi)
Peak Antenna gain (linear):	1.0471285	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2402	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.000	(mW/cm <sup>2</sup> )

#### Measurement Result

The predicted power density level at 20 cm is 0 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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