## Maximum Permissible Exposure

## FCCID: WMUHAC-LBEE

#### **Applicable Standard**

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100000			5	6

(a) Limits for Occupational / Controlled Exposure

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100000			1.0	30

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

### **MPE Calculation Method**

 $E(V/m) = (30*P*G)^{0.5}/d$ 

Power Density: Pd  $(W/m^2) = E^2/377$ 

 $\mathbf{E} = \text{Electric Field (V/m)}$ 

 $\mathbf{P}$  = Peak RF output Power (W)

**G** = EUT Antenna numeric gain (numeric)

 $\mathbf{d} = \mathbf{S}\mathbf{e}\mathbf{p}\mathbf{a}\mathbf{r}\mathbf{a}\mathbf{t}\mathbf{o}\mathbf{r}\mathbf{a}\mathbf{t}\mathbf{o}\mathbf{r}\mathbf{a}\mathbf{t}\mathbf{o}\mathbf{t}\mathbf{m}\mathbf{n}$ 

The formula can be changed to

 $\mathbf{Pd} = (30^* \mathrm{P}^* \mathrm{G}) \,/\, (377^* \mathrm{d}^2)$ 

From the peak 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.

# Calculated Result and Limit (Worse Case)

Antenna Gain (Numeric)	Tune up MAX output power(dBm)	Tune up MAX output power( mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1.641	20.2	104.7	0.034	1	Compiles