

## **FCC §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

### **Applicable Standard**

According to subpart 1.1310 & 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

<b>Limits for General Population/Uncontrolled Exposure</b>				
<b>Frequency Range (MHz)</b>	<b>Electric Field Strength (V/m)</b>	<b>Magnetic Field Strength (A/m)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>	<b>Averaging Time (minutes)</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
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

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

### **Calculated Formulary:**

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$  = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

### **Calculated Data:**

<b>Radio</b>	<b>Frequency Range (GHz)</b>	<b>EIRP</b>		<b>Evaluation Distance (cm)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>	<b>MPE Limit (mW/cm<sup>2</sup>)</b>
		<b>(dBm)</b>	<b>(mW)</b>			
60G Module 1	58.32-62.64	34.2	2630.27	25	0.3349	1.00
60G Module 2	58.32-62.64	32.0	1584.89	25	0.2018	1.00
60G Module 3	58.32-62.64	35.2	3311.31	25	0.4216	1.00
Bluetooth	2.402-2.48	4.6	2.88	25	0.0004	1.00

**Note:**

The output power was declared by manufacturer (Bluetooth conducted power is -0.3dBm, antenna gain is 4.9dBi)

The three 60GHz radio and Bluetooth can transmit simultaneously:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$$= 0.3349/1.00 + 0.2018/1.00 + 0.4216/1.00 + 0.0004/1.00$$

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$$= 0.9585 < 1.0$$

**Result:** The device complied with the applicable MPE Limit at the 25 cm distance.