

## Maximum Permissible Exposure

### Applicable Standard

According to §1.1307(b), 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.

Remark: 1) **For BT:** The maximum output power for antenna is 7.07dBm (5.09mW) at 2402MHz, 2dBi antenna gain(with 1.58 numeric antenna gain.)

**For BLE:** The maximum output power for antenna is -2.23dBm (0.60mW) at 2480MHz, 2dBi antenna gain(with 1.58 numeric antenna gain.)

**For 2.4G WIFI:** The maximum output power for antenna is 17.98dBm (62.81mW) at 2462MHz, 5.01dBi antenna gain(with 7 numeric antenna gain.)

**For Band 1:** The maximum output power for antenna is 17.32dBm (53.95mW) at 5180MHz, 5.01dBi antenna gain(with 7 numeric antenna gain.)

**For Band 2A:** The maximum output power for antenna is 17.07dBm (50.93mW) at 5300MHz, 5.01dBi antenna gain(with 7 numeric antenna gain.)

**For Band 2C:** The maximum output power for antenna is 16.90dBm (48.98mW) at 5500MHz, 5.01dBi antenna gain(with 7 numeric antenna gain.)

**For Band 3:** The maximum output power for antenna is 16.95dBm (49.55mW) at 5825MHz, 5.01dBi antenna gain(with 7 numeric antenna gain.)

2) For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20cm, even if the calculation indicate that the MPE distance would be lesser.

### Calculation

$$\text{Given } E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

Where  $E$  = Field Strength in Volts / meter

$P$  = Power in Watts

$G$  = Numeric antenna gain

$d$  = Distance in meters

$S$  = Power Density in milliwatts / square centimeter

Substituting the MPE safe distance using  $d=20\text{cm}$  into above equation.

Yields:  $S=0.000199 \times P \times G$

Maximum Emissions Level					
Mode	Power( <i>mW</i> )	numeric antenna gain	Power density ( <i>mW/cm<sup>2</sup></i> )	Limit ( <i>mW/cm<sup>2</sup></i> )	Result
BT	5.09	1.58	0.001600	1.0	PASS
BLE	0.60	1.58	0.000189		
2.4G WIFI	62.81	7	0.087494		
Band 1	53.95	7	0.075152		
Band 2A	50.93	7	0.070945		
Band 2C	48.98	7	0.068229		
Band 3	49.55	7	0.069023		