

## 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) **MIMO MPE:**

**For 2.4G WIFI:** The maximum output power for antenna 0 is 15.03dBm (31.84mW) at 2437MHz, 5.01dBi antenna gain(with 3.17 numeric antenna gain.)

The maximum output power for antenna 1 is 13.42dBm (21.98mW) at 2437MHz, 5.01dBi antenna gain(with 3.17 numeric antenna gain.)

**For Band 1:** The maximum output power for antenna 0 is 9.12dBm (8.17mW) at 5230MHz, 5.01dBi antenna gain(with 3.17 numeric antenna gain.)

The maximum output power for antenna 1 is 9.36dBm (8.63mW) at 5230MHz, 5.01dBi antenna gain(with 3.17 numeric antenna gain.)

**For Band 3:** The maximum output power for antenna 0 is 8.60dBm (7.24mW) at 5825MHz, 5.01dBi antenna gain(with 3.17 numeric antenna gain.)

The maximum output power for antenna 1 is 8.11dBm (6.47mW) at 5825MHz, 5.01dBi antenna gain(with 3.17 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:  $S=0.000199 * P * G$

**MPE 0:**

Mode	Power(mW)	numeric antenna gain	Power density (mW/cm <sup>2</sup> )
2.4G WIFI	31.84	3.17	0.020086
Band 1	8.17	3.17	0.005154
Band 3	7.24	3.17	0.004567

**MPE 1:**

Mode	Power(mW)	numeric antenna gain	Power density (mW/cm <sup>2</sup> )
2.4G WIFI	21.98	3.17	0.013866
Band 1	8.63	3.17	0.005444
Band 3	6.47	3.17	0.004081

**Total MPE:**

Maximum Emissions Level					
Mode	MPE 0	MPE 1	Total MPE	Limit (mW/cm <sup>2</sup> )	Result
2.4G WIFI	0.020086	0.013866	0.033952	1.0	PASS
Band 1	0.005154	0.005444	0.010598		
Band 3	0.004567	0.004081	0.008648		