

Maximum Permissible Exposure

FCC ID: 2A4G812P12S

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.

(a) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² 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

(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 ²)	Averaging Times E ² , H ² 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

$$E \text{ (V/m)} = (30 \cdot P \cdot G)^{0.5} / d \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = E^2 / 377$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = (30 \cdot P \cdot G) / (377 \cdot d^2)$$

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

Mode-BLE-1M

Antenna Gain: 0.31dBi

Assembly Antenna Gain: 1.074

Assembly Antenna Gain (Numeric)	Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
1.074	-0.034	0.992	0.00021	1	Compiles

Mode-BLE-2M

Antenna Gain: 0.31dBi

Assembly Antenna Gain: 1.074

Assembly Antenna Gain (Numeric)	Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
1.074	-0.012	0.997	0.00021	1	Compiles

Mode-WIFI 2.4G Band

Antenna Gain: 0.31dBi

Assembly Antenna Gain: 1.074

Assembly Antenna Gain (Numeric)	Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
1.074	5.02	3.177	0.00068	1	Compiles

Mode-BT**Antenna Gain: 0.31dBi****Assembly Antenna Gain: 1.074**

Assembly Antenna Gain (Numeric)	Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
1.074	0.094	1.022	0.00022	1	Compiles

Mode-WIFI 5G Band 1**Antenna Gain: 4.22dBi****Assembly Antenna Gain: 2.642**

Assembly Antenna Gain (Numeric)	Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.642	1.7	1.479	0.00078	1	Compiles

Mode-WIFI 5G Band 4**Antenna Gain: 4.22dBi****Assembly Antenna Gain: 2.642**

Assembly Antenna Gain (Numeric)	Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.642	4.05	2.541	0.00134	1	Compiles