

## Appendix B. Maximum Permissible Exposure

# 1. Maximum Permissible Exposure

## 1.1. 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 levels 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 0.25 m 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 <sup>2</sup> )	Averaging Time  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
1500-100,000			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 <sup>2</sup> )	Averaging Time  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
1500-100,000			1.0	30

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

## 1.2. MPE Calculation Method

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

**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

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

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.

### 1.3. Calculated Result and Limit

Antenna Type : OMNI DIRECTIONAL Antenna

Max Conducted AV Power DSSS/OFDM/5M: 25.12dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Output Power (dBm)	Output Power ( mW )	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
8.00	6.3096	25.1500	327.3407	0.411103	1	Complies

Max Conducted AV Power DSSS/OFDM/10M: 25.87dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Output Power (dBm)	Output Power ( mW )	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
8.00	6.3096	25.8700	386.3670	0.485233	1	Complies

Max Conducted AV Power DSSS/OFDM/20M: 25.78dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Output Power (dBm)	Output Power ( mW )	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
8.00	6.3096	25.7800	378.4426	0.475281	1	Complies

Antenna Type : Yagi Antenna

Max Conducted AV Power DSSS/OFDM/5M: 18.88 dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Output Power (dBm)	Output Power ( mW )	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
14.00	25.1189	18.8800	77.2681	0.386323	1	Complies

Max Conducted AV Power DSSS/OFDM/10M: 19.71 dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Output Power (dBm)	Output Power ( mW )	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
14.00	25.1189	19.7100	93.5406	0.467682	1	Complies

Max Conducted AV Power DSSS/OFDM/20M: 19.52 dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Output Power (dBm)	Output Power ( mW )	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
14.00	25.1189	19.5200	89.5365	0.447662	1	Complies