

Appendix C. 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 0.2 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 ²)	Averaging Time 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
1500-100,000			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 ²)	Averaging Time 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
1500-100,000			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 : Dipole Antenna

Max Conducted Power for Drafft n 20MHz Ant. A : 13.52dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.00	1.5849	13.5200	22.4905	0.007095	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for Drafft n 20MHz Ant. A + Ant. B : 16.40 dBm

Antenna	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
A	2.00	1.5849	13.5200	22.4905	0.007095	1	Complies
B	2.00	1.5849	13.2700	21.2324	0.006698	1	Complies
A+B					0.013793	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for Drafft n 40MHz Ant. A : 13.47dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.00	1.5849	13.4700	22.2331	0.007014	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for Drafft n 40MHz Ant. A + Ant. B : 16.33 dBm

Antenna	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
A	2.00	1.5849	13.4700	22.2331	0.007014	1	Complies
B	2.00	1.5849	13.1700	20.7491	0.006546	1	Complies
A+B					0.01356	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for 802.11b 20MHz Ant. A : 16.57 dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.00	1.5849	16.5700	45.3942	0.014320	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for 802.11b 20MHz Ant. A + Ant. B: 19.55dBm

Antenna	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
A	2.00	1.5849	16.5700	45.3942	0.014320	1	Complies
B	2.00	1.5849	16.5000	44.6684	0.014091	1	Complies
A+B					0.028411	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for 802.11b 40MHz (Upper) Ant. A : 16.60dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.00	1.5849	16.6000	45.7088	0.014420	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for 802.11b 40MHz (Upper) Ant. A + Ant. B: 19.54dBm

Antenna	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
A	2.00	1.5849	16.6000	45.7088	0.014420	1	Complies
B	2.00	1.5849	16.4700	44.3609	0.013994	1	Complies
A+B					0.028414	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for 802.11g 20MHz Ant. A : 13.55dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.00	1.5849	13.5500	22.6464	0.007144	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for 802.11g 20MHz Ant. A + Ant. B: 16.36dBm

Antenna	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
A	2.00	1.5849	13.5500	22.6464	0.007144	1	Complies
B	2.00	1.5849	13.1500	20.6538	0.006516	1	Complies
A+B					0.01366	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for 802.11g 40MHz Ant. A : 13.47dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.00	1.5849	13.4700	22.2331	0.007014	1	Complies

Antenna Type : Dipole Antenna

Max Conducted Power for 802.11g 40MHz Ant. A + Ant. B: 16.34dBm

Antenna	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
A	2.00	1.5849	13.4700	22.2331	0.007014	1	Complies
B	2.00	1.5849	13.2000	20.8930	0.006591	1	Complies
A+B					0.013605	1	Complies