



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 : PIFA Antenna

Max Conducted Power for 802.11n 20MHz Ant. A : 20.30dBm

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
2.68	1.8535	20.3000	107.1519	0.039532	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11n 20MHz Ant. A + Ant. B : 23.90 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
2.68	1.8535	23.9000	245.4709	0.090563	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11n 40MHz Ant. A : 20.23dBm

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
2.68	1.8535	20.2300	105.4387	0.038900	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11n 40MHz Ant. A + Ant. B : 22.47 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
2.68	1.8535	22.4700	176.6038	0.065155	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11b 20MHz Ant. A : 19.58 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
2.68	1.8535	19.5800	90.7821	0.033493	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11b 20MHz Ant. A + Ant. B: 18.40dBm

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
2.68	1.8535	18.4000	69.1831	0.025524	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11b 40MHz Ant. A : 15.65dBm

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
2.68	1.8535	15.6500	36.7282	0.013550	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11b 40MHz Ant. A + Ant. B: 17.70dBm

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
2.68	1.8535	17.7000	58.8844	0.021725	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11g 20MHz Ant. A : 20.74dBm

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
2.68	1.8535	20.7400	118.5769	0.043747	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11g 20MHz Ant. A + Ant. B: 24.19dBm

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
2.68	1.8535	24.1900	262.4219	0.096817	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11g 40MHz Ant. A : 16.40dBm

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
2.68	1.8535	16.4000	43.6516	0.016105	1	Complies

Antenna Type : PIFA Antenna

Max Conducted Power for 802.11g 40MHz Ant. A + Ant. B: 17.95dBm

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
2.68	1.8535	17.9500	62.3735	0.023012	1	Complies