

## FCC §15.247 (i) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE

### (MPE)

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#### Applicable Standard

According to FCC 15.247(i) and subpart §1.1307(b)(1), 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 of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

<b>(A) Limits for Occupational/Controlled Exposures</b>				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
0.3–3.0	614	1.63	*(100)	6
3.0–30	1824/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300	61.4	0.163	1.0	6
300–1500	/	/	f/300	6
1500–100,000	/	/	5.0	6

  

<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz;

\* = Plane-wave equivalent power density;

#### MPE Calculation

##### Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

**Calculated Data, worst case as below:**

Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
		(dBi)	(numeric)	(dBm)	(mW)			
<b>(A) Limits for Occupational/Controlled Exposures</b>								
802.11a	5825	30	1000	26.10	407.38	119	2.290	5.0
802.11n-HT20	5825	30	1000	29.26	843.33	119	4.741	5.0
802.11n-HT40	5795	30	1000	29.13	818.46	119	4.602	5.0
<b>(B) Limits for General Population/Uncontrolled Exposure</b>								
802.11a	5825	30	1000	26.10	407.38	265	0.462	1.0
802.11n-HT20	5825	30	1000	29.26	843.33	265	0.956	1.0
802.11n-HT40	5795	30	1000	29.13	818.46	265	0.928	1.0

**FCC Radiation Exposure Statement:**

To comply with FCC RF exposure requirements, a minimum separation distance of 3.9 feet (119cm) is required between the antenna and all occupational persons, and a minimum separation distance of 8.7 feet (265cm) is required between the antenna and all public persons.

**Result:** Compliance