

## §90.1217 and 1.1310 – RF EXPOSURE (MPE)

### Applicable Standard

According to §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.

Radio frequency radiation exposure was calculated based on § 1.1310 limits.

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
<b>Limits for General Population/Uncontrolled Exposures</b>				
0.3 - 1.34	614	1.63	*(100)	30
1.34 - 30	842/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

### Test Data

Predication of MPE limit at a given distance

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

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, the power gain factor, is normally numeric gain.

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

Two antennas are available for the EUT, one is Omni directional antenna with 11 dBi Gain, the other is directional antenna with 15 dBi Gain.

**For Omni-Directional Antenna:**

Maximum peak output power at antenna input terminal: 32.6 (dBm)

Maximum peak output power at antenna input terminal: 1819.7 (mW)

Prediction distance: 45 (cm)

Predication frequency: 4965 (MHz)

Antenna Gain (typical): 11 (dBi)

Antenna Gain (typical): 12.59 (numeric)

The worst case is power density at predication frequency at 45 cm: 0.90 (mW/cm<sup>2</sup>)

MPE limit for general polulation/uncontrolled exposure at prediction frequency: 1.0 (mW/cm<sup>2</sup>)

**For Directional Antenna:**

Maximum peak output power at antenna input terminal: 32.6 (dBm)

Maximum peak output power at antenna input terminal: 1819.7 (mW)

Prediction distance: 70 (cm)

Predication frequency: 4965 (MHz)

Antenna Gain (typical): 15 (dBi)

Antenna Gain (typical): 31.62 (numeric)

The worst case is power density at predication frequency at 70 cm: 0.935 (mW/cm<sup>2</sup>)

MPE limit for general polulation/uncontrolled exposure at prediction frequency: 1.0 (mW/cm<sup>2</sup>)

**Result:** This MPE level is below the 1 mW/cm<sup>2</sup> MPE at 70 cm distance for General Population / Uncontrolled Exposure as stated in OET BULLETIN 65 Edition 97-01. The precautions are outlined in the User's Manual to prevent exposure to high levels of RF energy.

**\*\*\*END OF REPORT \*\*\***