

## FCC§ 15.319 (i) & 2.1091 - RF RADIATION EXPOSURE

### Limit

According to FCC §15.319(i) and §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)

| 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 Exposure</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

### Result

#### Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

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)

| 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)  |                          |                                     |                                 |
| 1921.536        | 0            | 1         | 16.51           | 44.77 | 20                       | 0.0089                              | 1.0                             |

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

### Result: Compliance