

## **RF Exposure Calculation For RF-11000E Repeater**

FCC §2.1091, (a) Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See subpart I of part 1 of this chapter, in particular §1.1307(b).

According to §1.1310 and §2.1091, RF exposure is calculated.

### Limits for Exposure

| Frequency Range (MHz)  | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Averaging Time (minutes) |
|--|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                               |                               |                                     |                          |
| 0.3-   | 614                           | 1.6                           | * (100                              | 6                        |
| 3.0-   | 184                           | 4.8                           | * (900                              | 6                        |
| 30-  | 61.                           | 0.1                           | 1.0                                 | 6                        |
| 300-1500   | /                             | /                             | f/300                               | 6                        |
| 1500-  | /                             | /                             | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3-1.34   | 614                           | 1.6                           | * (100                              | 30                       |
| 1.34-30  | 842/f                         | 2.1                           | * (180                              | 30                       |
| 30-300   | 27.5                          | 0.0                           | 0.2                                 | 30                       |
| 300-1500   | /                             | /                             | f/150                               | 30                       |
| 1500-  | /                             | /                             | 1                                   | 30                       |

*f* = frequency in MHz

\* = Plane-wave equivalent power density

Note 1 to Table 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where

occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Note 2 to Table 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

### **Antenna**

The manufacturer does not specify an antenna. This device has provisions for operation in a fixed location.

### **MPE Prediction**

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

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

Where :

S = Power density.

P = Power input to antenna.

G = Antenna gain .

R = Distance to the center of the antenna.

### **MPE Calculation For Occupational Condition :**

Maximum peak output power at antenna input terminal (dBm): 32

Maximum peak output power at antenna input terminal (mW): 1592

Prediction distance (cm): 1700

Prediction frequency (MHz ) 11000

Maximum Antenna Gain, typical (dBi): 50

Maximum Antenna Gain (numeric): 112201

MPE limit for controlled exposure at 11000 MHz (mW/cm<sup>2</sup>): 5.0

### **MPE Result For Occupational Condition :**

Power density of prediction distance at 17 m = 4.9 mW/cm<sup>2</sup>

The device complies with the MPE requirements by providing a safe separation distance of at least 1700 cm between the antenna ( maximum 50 dBi gain, including any radiating structure ) and persons when normally operated.

**MPE Calculation For General Condition :**

Maximum peak output power at antenna input terminal (dBm): 32  
Maximum peak output power at antenna input terminal (mW): 1592  
Prediction distance (cm): 1700  
Prediction frequency (MHz) 11000  
Maximum Antenna Gain, typical (dBi): 50  
Maximum Antenna Gain (numeric): 112201  
MPE limit for uncontrolled exposure at 11000 MHz (mW/cm<sup>2</sup>): 1.0

**MPE Result For General Condition :**

Power density of prediction distance at 38 m = 0.98 mW/cm<sup>2</sup>

The device complies with the MPE requirements by providing a safe separation distance of at least 3800 cm between the antenna ( maximum 50 dBi gain, including any radiating structure ) and persons for passer-by in general RF exposure condition.