

2.4GHz Telepath MPE Calculation

The following calculation is provided to determine the minimum distance that a person can be from the antenna so as not to exceed the Maximum Permissible Exposure (MPE) regulation of FCC 1.1310.

Table 1(B) - General Population/Uncontrolled Exposure gives the MPE limit in the 2.4GHz MHz ISM band as follows:

MPE = 1.0 where MPE is in units of $[mW/cm^2]$ regardless of frequency (1)

The power output of our radio device was measured and found to be always less than 100 mW. (2)

Antenna gain is 8 dBi. (3)

The antenna gain (3) can be applied to the maximum output power (2) to yield an effective isotropic radiated output power as follows:

$$P_{iso} = 100 \text{ mW} * 10^{(8/10)} \quad (4)$$

$$P_{iso} = 631 \text{ mW} \quad (5)$$

The minimum distance permissible can be computed based on the surface area of the isotropic sphere:

$$A_{iso} = 4 * \pi * r^2 \text{ where } A_{iso} \text{ is the area } [cm^2] \text{ and } r \text{ is the radius of the sphere } [cm] \quad (6)$$

$$MPE * A_{iso} = P_{iso} \quad (7)$$

$$r = (P_{iso} / (MPE * 4 * \pi))^{(1/2)} \quad (8)$$

$$r = (631 [mW] / (1.0 [mW/cm^2] * 4 * \pi))^{(1/2)} \quad (9)$$

$$\mathbf{r = 7 \text{ cm or } 2\text{-}3/4 \text{ in}} \quad (10)$$

The following statement is included in the Installation Manual:

“To comply with FCC requirements for RF exposure, antennas must be installed such that no persons will be closer than 20cm (8”) from any part of the antenna while operational.”

Jeff Hehn
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