

Part 1.1310 - Exposure of humans to RF fields

As per FCC KDB 447498 D01 and Section 2.1091 radio frequency transmitters are required to be operated in a manner that ensures the public is not exposed to RF energy levels.

Calculations have been made using the General Public/Uncontrolled Exposure limits that are defined in Section 1.1310.

Minimum safe distances have been calculated below

- General Population /Uncontrolled exposure = 0.62 mW/cm^2 ($f/1500 = 932.5 \text{ MHz}/1500$)

As Part 101 certification is being sought for a number of bands between 932.5 - 944 MHz band this assessment has been carried out at 932.5 MHz which will give a worst case assessment.

$$\text{Power Density} = E^2/3770 = 0.62 \text{ mW/cm}^2$$

Therefore:

$$E = \sqrt{0.62 \times 3770}$$

$$E = 48.3 \text{ V/m}$$

The minimum distance from the antenna at which the MPE is met is calculated from the equation relating field strength in V/m, transmit power in watts, transmit antenna gain, transmitter duty cycle and separation distance in metres:

$$V/m = (\sqrt{(30 \times P \times G)}) / d$$

The rated maximum transmitter power = 5 watts.

The transmitter would typically be operated using number of antennas.

The highest gain antenna is a yagi antenna with a gain of 11 dBi (12.6).

It has been assumed that the transmitter can be used with a duty cycle of 100%.

Therefore

$$d = \sqrt{(30 \times P \times G \times DC)} / E$$

$$d = \sqrt{(30.0 \times 5.0 \times 12.6 \times 1.0)} / 48.3$$

$$d = 0.90 \text{ metres or } 90 \text{ cm}$$

Result: Transmitter will comply if the safe distance calculated above is applied..