

Environmental evaluation and exposure limit according to FCC CFR 47part 1, §1.1307, §1.1310

Limit for power density for general population/uncontrolled exposure is $f/1500 \text{ mW/cm}^2$ for 300 – 1500 MHz frequency range:

$$P = 450/1500 = 0.3 \text{ mW/cm}^2$$

The power density $P \text{ (mW/cm}^2\text{)} = P_T / 4\pi r^2$, where P_T is the maximum equivalent isotropically radiated power (EIRP).

To confirm compliance with a safe distance for control system the following calculation was done:

The peak output power of 25.67 dBm with 8.5 dBi antenna gain corresponds to the equivalent isotropically radiated power (EIRP) of

$$25.67 \text{ dBm} + 8.5 \text{ dBi} = 34.17 \text{ dBm, which is equal to } 2612 \text{ mW.}$$

The minimum safe distance “r”, where RF exposure does not exceed FCC permissible limit, is

$$r = \sqrt{P_T / (P \times 4\pi)} = \sqrt{2612 / 0.3 \times 12.56} = 27 \text{ cm} \approx 30 \text{ cm.}$$

A warning about a safe distance provided in the user guide.