

MAXIMUM PERMISSIBLE EXPOSURE FOR SUBPART C 2.4 GHz BAND

Calculations

Power density at the specific separation:

$$\begin{aligned} S &= PG/(4R^2p) \\ S &= (4.009 * 2.24) / (4 * 20^2 * p) \\ S &= 0.00178654607 \text{ mW/cm}^2 \text{ (at 20 cm)} \\ \text{Limit} &= 0.6015 \text{ mW/cm}^2 \text{ (902.2 MHz / 1500)} \end{aligned}$$

where

$$\begin{aligned} S &= \text{Maximum power density (mW/cm}^2\text{)} \\ P &= \text{Power input to the antenna (mW) - 6.03 dBm} \\ G &= \text{Numeric power gain of the antenna} \\ R &= \text{distance to the center of the radiation of the antenna (20 cm or 1 cm = limit for MPE)} \end{aligned}$$

The maximum permissible exposure (MPE) for the general population is 0.6 mW/cm^2 .

The power density at 20 cm does not exceed the 0.6015 mW/cm^2 . Therefore, the exposure condition is compliant with FCC rules.

The numeric gain (G) of the antenna with a gain specified in dB is determined by:

$$\begin{aligned} G &= \text{Log}^{-1} (\text{dB antenna gain}/10) \\ G &= \text{Log}^{-1} (3.50121 \text{ dBi}/10) \\ G &= 2.24 \end{aligned}$$