

MPE Calculations

FCC part 1.1310, Table 1 limits the power density for uncontrolled exposure to $1\text{mW}/\text{cm}^2$ for systems operating in the UNII bands. The distance, $d(\text{cm})$ from the antenna at which the power density, $P_d (\text{mW}/\text{cm}^2)$ is below this limit is calculated from the maximum EIRP, $P_t (\text{mW})$ using the equation:

$$P_d = P_t / (4 \pi d^2)$$

Re-arranging for the distance at which the power density is $1\text{mW}/\text{cm}^2$ gives:

$$d = \sqrt{P_t / (4 \pi P_d)}$$

The device under test is designed to use an integral antenna with a gain of 2 dBi. The maximum output power for the two modes and all channels is 21 dBm.

The maximum EIRP is, therefore, $21 \text{ dBm} + 2 \text{ dBi} = 23 \text{ dBm}$ (199.52 mW):

$$d = \sqrt{199.52 / (4 \pi)} = \underline{\underline{3.98 \text{ cm}}}$$

The distance from the antenna that the power density is $1\text{mW}/\text{cm}^2$ is, therefore, 3.98 cm.

The users guide instructs the user to install the device such that it has a separation of at least 20cm from persons (see text below) to comply with the FCC's requirements. This separation of 20cm more than meets the FCC's and Industry Canada RF exposure requirements.

Mode	EIRP	P_d at 20cm	Calculated distance (in cm) where $P_d < 1\text{mW}/\text{cm}^2$
Normal	21 dBm (199.52 mW)	$0.0396 \text{ mW}/\text{cm}^2$	3.98

RF Exposure Requirements

To ensure compliance with FCC RF exposure requirements, the antenna used for this device must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or radio transmitter. Installers and end-users must follow the installation instructions provided in this user guide.

Extract From User's Manual