

## *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:

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

The device under test is designed to use one of two different antennas – Joy Max with a gain of 3dBi or Atheros with a gain of 4dBi. Both antennas are intended to be integral to the host device housing the module. The maximum output power for the two modes and all channels is 14.9 dBm.

The maximum EIRP is, therefore,  $14.9 \text{ dBm} + 4 \text{ dBi} = 18.9 \text{ dBm}$  (77.6mW):

$$d = \sqrt{77.6 / (4 \pi)} = \underline{\underline{2.49 \text{ cm}}}$$

The distance from the antenna that the power density is  $1\text{mW}/\text{cm}^2$  is, therefore, 2.49 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	18.9 dBm (77.6 mW)	$0.0154 \text{ mW}/\text{cm}^2$	2.49

### **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.