

## Mobile Power Density Calculation for FCC ID: QTZ1300

The Access Point (AP) is an IEE802.11 A / B /G radio. The access point operates on the 2.4 GHz and 5 GHz ISM bands.

### Operating Environment:

The operating environment for the for the radio in all cases is a fixed, uncontrolled environment, however, the devices are classified as being "Mobile", Therefore the exposure at 20 cm is calculated.

### Fixed, Uncontrolled Environment:

The FCC limit for the power density for uncontrolled exposure to RF devices operation at 2.4GHz and 5GHz at a distance of 20 cm is:

$$1 \text{ mW/cm}^2$$

Power density is calculated from the following equation

$$\text{Exposure (mW/cm}^2\text{)} = \frac{\text{EIRP(mW)} * \text{Duty Cycle}}{4 * \text{PI} * \text{Radius}^2\text{(cm)}}$$

Where:

Radius = 20 cm

Duty Cycle = assumed to be 100% to yield a worst case result.

*The maximum allowed external antenna gain on 2.4 GHz is 8dBi*

*The maximum allowed external antenna gain on 5 GHz is 9dBi*

### 2.4GHz ISM Band MPE distance Calculation

Using the highest power measured on the 2.4 GHz ISM band.

MAX Pout: 24.1dBm (257.04 mW)      MAX Ant Gain 8 dBi (6.31x)

EIRP: 32.1 dBm (1621.81 mW EIRP)

### 5GHz Band MPE distance Calculation

Using the highest power measured on the 5.8 GHz band.

MAX Pout: 25.43 dBm (349.14 mW)      MAX Ant Gain 9 dBi (7.943x)

EIRP: 34.43 dBm (2773.32 mW EIRP)

### Total EIRP (mw)

$$1621.81 + 2773.32 = 4395.73 \text{ mW}$$

Calculating power density at a distance of 20 cm yields:

$$\text{Power Density} = \frac{4395.73 * 1}{4 * \text{Pi} * 20^2} \Rightarrow \frac{4395.73}{5026.54} \Rightarrow .8745 \text{ mw/cm}^2$$

$$\begin{aligned} \text{Delta} &= \text{specification} - \text{result} \\ &= 1 \text{ mW/cm}^2 - .8745 \text{ mw/cm}^2 = .1255 \text{ mw/cm}^2 \\ &= -.5824 \text{ dB below limit} \end{aligned}$$