

Mobile Power Density Calculation for FCC ID: RUT1200ABG

The Alcatel Access Point (AP) is an IEEE802.11 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 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

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

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 6.8dBi

The maximum allowed external antenna gain on 5 GHz is 7.4dBi

2.4GHz ISM Band MPE distance Calculation

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

MAX Pout: 20.4 dBm (109.65 mW)

MAX Ant Gain 6.8 dBi (4.78x)

EIRP: 27.2 dBm (524.80 mW EIRP)

5GHz Band MPE distance Calculation

Using the highest power measured on the 5 GHz band.

MAX Pout: 17.9 dBm (61.65 mW)

MAX Ant Gain 10.4 dBi (10.96x)

EIRP: 28.3 dBm (676.08 mW EIRP)

Calculating power density at a distance of 20 cm yields:

$$\text{Power Density} = \frac{1200.88 * 1}{4 * \pi * 20^2} \Rightarrow \frac{1200.88}{5026.54} \Rightarrow .2389 \text{ mw/cm}^2$$

$$\begin{aligned} \text{Delta} &= \text{specification} - \text{result} \\ 1 \text{ mW/cm}^2 - .2389 \text{ mw/cm}^2 &= .7610 \text{ mw/cm}^2 \\ &= -6.217 \text{ dB below limit} \end{aligned}$$