Mobile Power Density Calculation
for
FCC ID: QTZ1200W
IC: 4518A-1200W

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 mW/cm^2

Power density is calculated from the following equation

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

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 13dBi
The maximum allowed external antenna gain on 5 GHz is 14dBi (with some power reduction in the UNII bands)

2.4GHz ISM Band MPE distance Calculation
Using the highest power measured on the 2.4 GHz ISM band.
MAX Pout: 18.97dBm (78.89 mW) MAX Ant Gain 13 dBi (19.95x)
EIRP: 31.97 dBm (1573.98 mW EIRP)

5GHz Band MPE distance Calculation
Using the highest power measured on the 5 GHz band.
MAX Pout: 19.69 dBm (93.11 mW) MAX Ant Gain 14 dBi (25.11x)
EIRP: 33.69 dBm (2338.83 mW EIRP)

Note: Even though the transmit power in the test report is specified as high as 20.81dBm in the initial report (17.81 dBm into the antenna), if used with the 14 dBi antenna there is a required transmit power reduction at that frequency. The power level above (for the ISM band) combined with the 14 dBi antenna creates the highest EiRP

Total EIRP (mw)
1573.98 + 2338.83 = 3912.81 mW

Calculating power density at a distance of 20 cm yields:

$$\text{Power Density} = \frac{3912.81 * 1}{4 * Pi * 20^2} \Rightarrow \frac{3912.81}{5026.54} \Rightarrow .7784 \text{ mw/cm}^2$$

$$\text{Delta} = \text{specification} - \text{result}$$
$$1 \text{ mW/cm}^2 - .7784 \text{ mw/cm}^2 = .2215 \text{ mw/cm}^2$$
$$= -1.0879 \text{ dB below limit}$$