airespace

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Maximum Permissible Exposure Calculation
for the
Airespace VAP 1200   FCC ID: QTZVAP1200
Using External 2.4 GHz patch antennas up to 5dBi

The Airespace Access Point (AP) is an IEE802.11 A / B radio. The access point operates on the 2.4 GHz ISM band and the 5GHz UNII band. The MPE distance for the combination of both bands is calculated below. An external antenna of 5 dBi gain is assumed on the 2.4 GHz band.

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"

Fixed, Uncontrolled Environment:
The FCC limit for the power density for uncontrolled exposure to RF devices operation at 2.4GHz and 5GHz is:

1 mW/cm2

Power density is calculated from the following equation:

$$\text{Exposure (mW/cm}^2) = \text{Pout (mW)*Duty Cycle*(Antenna Gain(as a ratio)/(4*PI* Radius}^2\text{(cm)   )   )}$$

Solving the above equation for Radius yields:

$$\text{Radius} = \sqrt{\frac{P_{out}(mw)*Duty\ Cycle*Antenna\ Gain_{(ratio)}}{Exposure(mW/cm^2)\ *\ 4\ *\ Pi}}$$

2.4GHz ISM Band MPE distance Calculation **(External antennas on the 802.11 B band)**
On channels 1 and 11 of this band, the power is reduced to meet other regulatory criteria. On all other channels of the band the transmit power is set to the +17dBm setting.
    MAX Pout: 15.29 dBm (33.81 mW)
    MAX Ant Gain 5 dBi (3.16x)
    EIRP: 20.29 dBm (106.95 mW EIRP)

5 GHz UNII Band MPE distance Calculation
On channels 1 and 11 of this band, the power is reduced to meet other regulatory criteria. On all other channels of the band the transmit power is set to the +17dBm setting.
    MAX Pout: 20.0 dBm (100.00 mW)
    MAX Ant Gain 5.9 dBi (3.89x)
    EIRP: 25.9 dBm (389.045 mW EIRP)

Total EIRP: Assuming the worst case, an in-phase addition of the two signals at the peak of the antenna patterns, yields:
        106.95mW + 389.045 mW = **495.950 mW TOTAL combined EIRP**
Calculating the MPE distance based on this EIRP:

Calculating the radius of the sphere around which the power density is at the FCC limit. This radius is the MPE distance. To calculate the worst case, a 100% duty cycle is also assumed for each band.

$$\textbf{MPE Distance} = \sqrt{\frac{495.950\ *\ 1\ *\ 1}{1\ *\ 4\ *\ Pi}} \Longrightarrow \sqrt{\frac{495.95}{12.56}} \Longrightarrow \textbf{6.28 cm}$$

(Note that antenna gain is simply set to 1 in the equation above since the individual antenna gains are accounted for in the EIRP numbers)

The following RF Exposure statement will appear near the front of the users / installation manual for the VAP 1200

RF Exposure Safety
FCC RF Exposure Requirements
To ensure compliance with FCC RF exposure requirements, this device must be installed in a location such that the antenna of the device that will be greater then 20cm (8 in.) from all persons. Using higher gain antennas and types of antennas not covered under the FCC certification of this product is not allowed.
Installers of the radio and end users of the system must adhere to the installation instructions outlined in this manual.