

Introduction

FCC part 1.1310, Table 1 limits the power density for uncontrolled exposure to $1\text{mW}/\text{cm}^2$. The power density, P_d (mW/cm^2) at a distance d (cm) for an EIRP of P_t (mW) is given in the following equation:

$$P_d = P_t/(4\pi d^2)$$

The AccessPoint is designed to be a mobile device, with a minimum separation from persons of 20cm. The following calculations demonstrate that the device, when installed and operated as intended, will meet the FCC's requirements for uncontrolled exposure at a distance of 20cm:

5GHz MINI PCI:

The 5GHz mini PCI card installed in the AccessPoint can use the internal antennas configured to give either a 1.8dBi omni-pattern or a 5.6 dBi Half-round pattern. The maximum output power for the 5 GHz Mini PCI is 21 dBm.

The EIRPs for these two configurations are, therefore:

$$\begin{aligned} 1.8 \text{ dBi} + 21 \text{ dBm} &= 22.8 \text{ dBm (190 mW EIRP)} \\ 5.6 \text{ dBi} + 21 \text{ dBm} &= 26.6 \text{ dBm (457 mW EIRP)} \end{aligned}$$

The power spectral density at 20cm for the two different antenna configurations are:

$$\begin{aligned} P_d &= 190/(4\pi 20^2) = 0.038 \text{ mW}/\text{cm}^2 \text{ (Omni antenna)} \\ P_d &= 457/(4\pi 20^2) = 0.091 \text{ mW}/\text{cm}^2 \text{ (Half-round antenna)} \end{aligned}$$

2.4 GHz MINI PCI:

The 2.4GHz mini PCI card installed in the AccessPoint uses an internal antenna with a gain of 6.2 dBi. The maximum output power from the 2.4GHz device is 15.3dBm.

The EIRP from the mini PCI card's antenna is, therefore:

$$6.2 \text{ dBi} + 15.3 \text{ dBm} = 21.5 \text{ dBm (141 mW EIRP)}$$

The power spectral density at 20cm for this EIRP is, therefore:

$$P_d = 141/(4\pi 20^2) = 0.028 \text{ mW}/\text{cm}^2$$

Co-located Transmitters:

The total power density at a distance from 20cm from the AccesPoint product with both the 2.4GHz and 5GHz devices operational is the sum of the power densities from each device

The worst-case (highest) power density from the 5GHz device is when it is configured to use the half-round antenna.

The total power spectral density with the 5GHz device operating using the half-round antenna and the 2.4GHz device operational is, therefore:

$$0.091 \text{ mW/cm}^2 + 0.028 \text{ mW/cm}^2 = 0.119 \text{ mW/cm}^2$$

The calculated value for the power spectral density at 20cm is lower than the maximum permitted density of 1 mW/cm².

Note: RF Warning statement in page 15 of 27 has been place in the user manual.