

Appendix A: RF Exposure Compliance

Please refer to the following page.

MPE Calculation

The Limit for **Uncontrolled Exposure Power Density (P_d)** is 10 W/m^2 for fixed mounted device.

The M/A-COM 4.9 GHz VIDA Client is a fixed mounted radio. After installation and commissioning, the safe distance from the 9 dBi omni-directional antenna is greater than 20 cm (8-inches).

MPE calculation for omni-directional antenna

This MPE Minimum Distance Calculation is based on using a 9 dBi gain omni-directional antenna mounted directly to the Client RF port.

Basic M/A-COM 4.9 GHz Client specifications:

P: Maximum Peak Conducted Power = 20 dBm

G: Maximum Omni Antenna Gain = 9 dBi

Frequency Range = 4.94 to 4.99 GHz

R: Minimum Distance between User and Antenna = 0.2 m

Equation from FCC:

$$P_d = P * G / (4 * \pi * R^2)$$

$$P_d = 0.1 \text{ W} * 7.94 / (4 * 3.1415926 * 0.2^2) = 1.58 \text{ W/m}^2 < 10 \text{ W/m}^2$$

The calculation indicates that the minimum 0.2 meter distance between user and the omni-directional antenna (directly mounted to the Client RF port) is required when operating the M/A-COM 4.9 GHz VIDA Client.

MPE Calculation for Directional Antenna

This MPE Minimum Distance Calculation is based on using a directional antenna with more than 9 dBi antenna gain.

Basic M/A-COM 4.9 GHz VIDA Client specifications:

P: Maximum Peak Conducted Power = 20 dBm;

G: Maximum Antenna Gain – Cable Loss = 27 dBi – 1 dB = 26 dBi; (Use numerical G_N value for the calculation): $G_N = 10^{(G/10)}$; For $G = 26 \text{ dBi}$, $G_N = 10^{(26/10)} = 398$

Frequency Range = 4.94 to 4.99 GHz;

R_{min}: Minimum Distance between user and antenna to comply with FCC MPE Level (10 W/m^2);

Equation from FCC:

$$P_d = P * G / (4 * \pi * R_{min}^2)$$

$$R_{min} = \text{SQRT}(0.1 \text{ W} * G_N / (4 * 3.1415926 * 10)) = \text{SQRT}(7.958E-4 * G_N)$$

$$R_{min} = 0.56 \text{ m, for } G = 26 \text{ (i.e., } G_N = 398)$$