Appendix A: RF Exposure Compliance

Please refer to the following page for the MPE calculation.

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MPE Calculation

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

The M/A-COM 4.9 GHz VIDA B510 Base Station 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 Base Station RF port.

Basic M/A-COM 4.9 GHz B510 Base Station specifications:

P: Maximum Peak Conducted Power = 27 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:

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

$P_d = 0.5\ W * 7.94 / (4 * 3.1415926 * 0.2^2) = 7.9\ W / m^2 < 10\ W / m^2$

The calculation indicates that the minimum 0.2 meter distance between user and the omni-directional antenna (directly mounted to the Base Station RF port) is required when operating the M/A-COM 4.9 GHz VIDA B510 Base Station.

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 B510 Base Station specifications:

P: Maximum Peak Conducted Power = 27 dBm;

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

Frequency Range = 4.94 to 4.99 GHz;

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

Equation from FCC:

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

$R_{min} = SQRT(0.5\ W * G_N / (4 * 3.1415926 * 10\ W/m^2))$

$R_{min} = 1.26$ m, for G =26 (i.e., $G_N = 398$)