Co-location MPE Calculation

The EIRP value is used to calculate the MPE limits. FCC part 1.1310, Table 1 limits the power density for uncontrolled exposure to F / 1500. The distance, d(cm) from the antenna at which the power density, Pd (mW/cm^2) is below this limit is calculated from the maximum EIRP, E(mW) using the equation: $Pd = E/(4 * \Pi * d^2)$

Re-arranging to calculate distance gives:

 $d = \sqrt{EIRP/4*} \prod * Pd$

While it is anticipated that the OEM installation would typically consist of a single system. But, there are site-planning considerations that must be accounted for when installing multiple systems at a single site. The following MPE calculation has been modified to reflect the number of antennas that can be installed in a given site before exceeding the 20 cm requirement.

 $d = \sqrt{EIRP * N / 4* \prod * Pd}$

N= Number of antennas at a given location.

The following formula shows what is the maximum number of antennas that can be installed in the same location before exceeding the 20-cm requirement. The worst-case power density of .549 mW/cm^2 was used in the formula ($824 / 1500 = .549 \text{ mW/cm}^2$). The modules maximum conducted output power is 631 mW and the maximum antenna sold with the modules is 2.5 dBi. The EIRP will calculate 1.123 Watts.

For One antenna:

 $d = \sqrt{1123 * 1 / 4* \pi * .549}$ mW/cm² = 12.74 cm

For Two antennas:

$d = \sqrt{1123 * 2 / 4* \prod * .549 \text{ mW/cm}^2} = 18.02 \text{ cm}$

For Three antennas:

 $d = \sqrt{1123 * 3 / 4* \prod * .549 \text{ mW/cm}^2} = 22.07 \text{ cm}$

The calculation shows that two antennas, of the same type and gain, is the maximum that can be installed in a single location.