Maximum Permissible Exposure calculations

The MPE distance will be calculated for the worst case of a 100% transmitter duty cycle. For an isotropic radiator the surface area of a sphere can be used to determine the area over which the transceiver energy is radiated.

*Surface area of a sphere = 4 * π * radius^2*

In the case where there is an antenna gain, the worst case energy density is increased by the antenna gain. In this case, the exposure level for a controlled environment can be calculated as follows:

*MPE distance =((output power*duty cycle*10*(antenna gain/10))/(4*π*Exposure Limit [mW/cm^2]))$^{1/2}$*

In the case of -2.0 dBi trace antenna
FCC Requirement of 1mW/cm2
*MPE distance = ((163 mW * 1 * 0.63) /(4 * 3.14 * 1))$^{1/2}$*
= 2.9 cm

IC Requirement per RSS-102 of 2.7mW/cm2
*MPE distance = ((163 mW * 1 * 0.63) /(4 * 3.14 * 2.7))$^{1/2}$*
= 1.7 cm