

**\*\* MPE Calculations (2.4GHz)\*\***

The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

$EIRP = P + G$	Where,
$EIRP = 11.49\text{dBm} + 3.29\text{dBi}$	$P = \text{Power input to the antenna (mW)}$
$EIRP = 14.78 \text{ dBm}$	$G = \text{Power gain of the antenna (dBi)}$

**Power density at the specific separation:**

$S = PG/(4R^2)$	Where,
$S = (14.09 * 2.13) / (4 * 20^2)$	$S = \text{Maximum power density (mW/cm}^2\text{)}$ $P = \text{Power input to the antenna (mW)}$ $G = \text{Numeric power gain of the antenna}$ $R = \text{Distance to the center of the radiation of the antenna}$ (20cm = limit for MPE)
$S = 0.006 \text{ mW/cm}^2$	

The Maximum permissible exposure (MPE) for the general population is  $1 \text{ mW/cm}^2$ .

The power density does not exceed the  $1 \text{ mW/cm}^2$  limit.

Therefore, the exposure condition is compliant with FCC rules.

**Estimated safe separation:**

$R = (PG / 4)$	Where,
$R = (14.09 * 2.13 / 4)$	$P = \text{Power input to the antenna (mW)}$ $G = \text{Numeric power gain of the antenna}$ $R = \text{Distance to the center of the radiation of the antenna}$ (20cm = limit for MPE)
$R = 1.55\text{Cm}$	

The numeric gain(G) of the antenna with a gain specified in dB is determined by:

$$G = \text{Log}^{-1} (\text{dB antenna gain} / 10)$$

$$G = \text{Log}^{-1} (3.29 / 10)$$

$$G = 2.13$$