

**** MPE Calculations ****

The MPE calculation for this exposure is shown below.

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

$EIRP = P + G$	Where,
$EIRP = 6.82\text{dBm} + 4.75\text{ dBi}$	$P = \text{Power input to the antenna (mW)}$
$EIRP = 11.57\text{ dBm}$	$G = \text{Power gain of the antenna (dBi)}$

Power density at the specific separation:

$S = PG/(4R^2 \pi)$	Where,
$S = (14.35 * 2.99) / (4 * 20^2 * \pi)$	$S = \text{Maximum power density (mW/cm}^2\text{)}$ $P = \text{Power input to the antenna (mW)}$ $G = \text{Numeric power gain of the antenna}$
$S = 0.0085\text{ mW/cm}^2$	$R = \text{Distance to the center of the radiation of the antenna}$ (20 cm = limit for MPE)

The Maximum permissible exposure (MPE) for the general population is 1 mW/cm².

The power density does not exceed the 1 mW/cm² limit.

Therefore, the exposure condition is compliant with FCC rules.

Estimated safe separation:

$R = \sqrt{(PG / 4\pi)}$	Where,
$R = \sqrt{(14.35 * 2.99 / 4\pi)}$	$P = \text{Power input to the antenna (mW)}$ $G = \text{Numeric power gain of the antenna}$
$R = 1.85\text{ cm}$	$R = \text{Distance to the center of the radiation of the antenna}$ (20 cm = limit for MPE)

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

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

$$G = \log^{-1} (4.75 / 10)$$

$$G = 2.99$$