

MPE Calculations

Systems operating under the provision of 47 CFR 1.1307(b)(1) shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the FCC guidelines.

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user or nearby persons and can therefore be considered a mobile transmitter per 47 CFR 2.1091(b). The MPE calculation for this exposure is shown below.

Using the Yokowo (Mallow) Antennas @ 2.4 GHz Range with highest output power and gain:

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

$$\text{EIRP} = P + G$$

$$\text{EIRP} = 16.60 \text{ dBm} + 2.48 \text{ dBi}$$

$$\text{EIRP} = 19.08 \text{ dBm (80.91 mW)}$$

Where

P = Power input to the antenna (mW).

G = Power gain of the antenna (dBi)

Estimated safe separation:

$$R = \sqrt{PG/4\pi}$$

$$R = \sqrt{(45.71 \times 1.77) / 4\pi}$$

$$R = 2.54 \text{ cm}$$

Where

P = Power input to the antenna (mW).

G = Numeric power gain of the antenna

R = The safe estimated separation that the user must maintain from the antenna (cm)

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

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

$$G = \text{Log}^{-1} (2.48 \text{ dBi}/10)$$

$$G = 1.77$$