

## **TEKTRONIX PROJECT: 02U1135**

### **MPE CALCULATION for 2.52 dBi PCB ANTENNA**

Formula used in the MPE Calculations:

$$E^2/3770 = S, \text{ mW/cm}^2$$

$$P_{\text{watts}} * G_{\text{gain}} = 10^{(P_{\text{dBm}} - 30 + G_{\text{dBi}})/10}$$

$$E, \text{ V/m} = (P_{\text{watts}} * G_{\text{gain}} * 30)^{.5} / d, \text{ meters}$$

$$d = ((P_{\text{watts}} * G * 30) / 3770 * S)^{.5} \text{ ----- (A)}$$

Since

$$S (\text{mW/cm}^2) = 1.00 \quad \text{from 1.1310 Table 1}$$

$$P (\text{dBm}) = 17.66 \quad \text{EUT output power}$$

$$G (\text{dBi}) = 2.52 \quad \text{EUT antenna gain}$$

Substitute these parameters into the A above, we have

$$\text{MPE safe distance } d (\text{cm}) = 2.9$$

### **MPE CALCULATION for 2.17 dBi PATCH ANTENNA**

Formula used in the MPE Calculations:

$$E^2/3770 = S, \text{ mW/cm}^2$$

$$P_{\text{watts}} * G_{\text{gain}} = 10^{(P_{\text{dBm}} - 30 + G_{\text{dBi}})/10}$$

$$E, \text{ V/m} = (P_{\text{watts}} * G_{\text{gain}} * 30)^{.5} / d, \text{ meters}$$

$$d = ((P_{\text{watts}} * G * 30) / 3770 * S)^{.5} \text{ ----- (A)}$$

Since

$$S (\text{mW/cm}^2) = 1.00 \quad \text{from 1.1310 Table 1}$$

$$P (\text{dBm}) = 17.66 \quad \text{EUT output power}$$

$$G (\text{dBi}) = 2.17 \quad \text{EUT antenna gain}$$

Substitute these parameters into the A above, we have

$$\text{MPE safe distance } d (\text{cm}) = 2.8$$

NOTE: For mobile or fixed location transmitters, minimum separation distance is 20 cm, even if calculations indicate MPE distance is less