

APPLICANT: SIERRA WIRELESS
FCC ID: N7NSB555

MPE CALCULATION FOR MAXIMUM ANTENNA GAIN

Formula used in the MPE Calculations:

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

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

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

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

$$G_{\text{dBi}} = 10 \lg (d^2 * S * 3770 / 30 * P_{\text{watts}}) \text{ ----- (B)}$$

1) 800 MHz

Since

$$S (\text{mW/cm}^2) = 0.50 \quad \text{from 1.1310 Table 1}$$

$$P (\text{dBm}) = 23.50 \quad \text{EUT output power}$$

$$\text{MPE safe distance } d (\text{cm}) = 19.99$$

Substitute these parameters into the A above, we have

$$G (\text{dBi}) = 10.50 \quad \text{EUT antenna gain}$$

To maintain MPE safe distance $d < 20$ cm, the maximum Antenna gain can be up to 10.50 dBi.

2) 1900 MHz

Since

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

$$P (\text{dBm}) = 23.50 \quad \text{EUT output power}$$

$$\text{MPE safe distance } d (\text{cm}) = 19.99$$

Substitute these parameters into the A above, we have

$$G (\text{dBi}) = 13.51 \quad \text{EUT antenna gain}$$

To maintain MPE safe distance $d < 20$ cm, the maximum Antenna gain can be up to 13.51 dBi.

To maintain MPE safe distance $d < 20$ cm, the maximum Antenna gain can be up to 10.50 dBi.