3.10 MPE calculation

These equations are generally accurate in the far field of an antenna but will over predict power density in the near field, where they could be used for making a “worst case” prediction.

$$S = PG/4\pi R^2$$

where S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units e.g. mW)
G = power gain of the antenna in the direction of interest relative to the isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units e.g. cm)

Or

$$S = EIRP/4\pi R^2$$

where EIRP = equivalent isotropically radiated power

Calculation: (Antenna 1)

(Calculated for max. EIRP)

EIRP: 27.3 dBm = 537.0 mW

calculated at distance of 20 cm:

power density = $537.0 /4\pi 20^2 = 0.107$ mW/ cm^2

Calculation: (Antenna 2)

EIRP: 25.1 dBm = 323.6 mW

power density = $323.6/4\pi 20^2 = 0.064$ mW/ cm^2

Calculation: (Antenna 3)

(Calculated for max. EIRP)

EIRP: 36.2 dBm = 4169 mW

calculated at distance of 20 cm:

power density = $4169 /4\pi 20^2 = 0.83$ mW/ cm^2

Limit:

1mW/ cm^2 is the reference level for general public exposure according to the OET Bulletin 65, Edition 97-01 Table 1.