MPE Calculation Method

E (V/m) $= \frac{\sqrt{30 \times P \times G}}{d}$ Power Density: Pd (W/m²) $= \frac{E^2}{377}$

E = Electric field (V/m)
P = Peak RF output power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)
Pd = Power Density in milliwatts / square centimeter

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained。

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and
*d (cm) =100 * d (m)*

Yields:

$$Pd = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2}$$ ***Equation 1***

Where d = distance in cm
P = Power in mW
G = Numeric antenna gain
Pd=Power Density in mW/cm^2

Maximum Permissible Exposure

And:

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)
-2.39	0.577	15.31	33.96

Substituting the MPE safe distance using d=20 cm into ***Equation 1***
Yields

Pd=0.00199·P·G
Where P = Power in mW
G = Numeric antenna gain
Pd = Power Density in mW/cm^2
The power density = 0.00199·15.31· 0.577mW/cm^2 =0.003898 mW/cm^2

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.)