**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 / cm2*

**Maximum Permissible Exposure**

And:

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) |
|---|---|---|---|
| -2.39 | 0.577 | 15.36 | 34.36 |

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 / cm2*
The power density = 0.00199·15.36· 0.577*mW / cm2* =0.003944 *mW / cm2*

(For mobile or fixed location transmitters, the maximum power density is 1.0 *mW / cm2* even if the calculation indicates that the power density would be larger.)