

## RADIO FREQUENCY RADIATION EXPOSURE

The carrier power field strength of 89.33μV/m @ 30m operating at a frequency of 13.56MHz is the worst case peak level measured as reported in TRL test report RU13258271. An ERP can be calculated using the formula below.

### Formula:

$$ERP = (E \cdot d / 7.02)^2$$

E = Field Strength (V/m)

D = Test Distance

ERP = Radiated power (dBm)

### Calculation:

$$ERP = (89.33 \mu \cdot 10 / 7.02)^2 \text{ W}$$

$$ERP = 0.0000162 \text{ mW}$$

$$ERP = -47.91 \text{ dBm}$$

This calculation gives us an ERP of -47.91 dBm or 0.0000162nW.

### MPE calculation:

#### Formula:

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

S = Power Density (mW/cm<sup>2</sup>)

EIRP = Radiated power (mW)

R = distance for body (cm)

#### Calculation:

$$S = 0.0000162 / 4 \pi 0.002 \text{ mW/cm}^2$$

$$S = 0.322 \text{ mW/cm}^2$$

#### Notes:

1. The unit will be mounted at least 0.002cm away from the body.
2. The carrier power ERP of 0.0000162 mW was the worst case peak level measured.

### Limit

The limit of Power density for the General Population/ Uncontrolled Exposure is

$$\text{Limit} = 180 / f^2 \text{ mW/cm}^2$$

Where f = Frequency of operation (MHz)

$$\text{Limit} = 180 / 13.56^2 \text{ mW/cm}^2$$

$$\text{Limit} = 0.97 \text{ mW/cm}^2$$

### Result

The EUT meets the 0.97 mW/cm<sup>2</sup> limit.