

# EMC Technologies (NZ) Ltd

Test Report No 100526.1

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## Exposure of humans to RF fields

Calculations have been made using the General Public/Uncontrolled Exposure limits.

Minimum safe distances have been calculated below.

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

- Occupational / Controlled Exposure limit will be  $1.51 \text{ mW/cm}^2$   
( $f/300 = 454 \text{ MHz}/300$ )
- General Population / Uncontrolled exposure limit will be  $0.3 \text{ mW/cm}^2$   
( $f/1500 = 454 \text{ MHz}/1500$ )

The minimum distance from the antenna at which the MPE is met is calculated from the equation relating field strength in V/m, transmit power in watts, transmit antenna gain, transmitter duty cycle and separation distance in metres:

$$E, \text{ V/m} = (\sqrt{30 * P * G}) / d$$

### Controlled

$$E = 1.51 \text{ W/m}^2 = E^2/3770$$

$$E = \sqrt{1.51 * 3770}$$

$$E = \underline{75.4 \text{ V/m}}$$

### Uncontrolled

$$E = 0.3 \text{ W/m}^2 = E^2/3770$$

$$E = \sqrt{0.3 * 3770}$$

$$E = \underline{33.6 \text{ V/m}}$$

The rated maximum transmitter power = 0.020 watts.

Transmitter is operated using a quarter wave whip antenna with a gain of 5 dBi (3.2).

### Controlled

$$d = \sqrt{30 * P * G * DC} / E$$

$$d = \sqrt{30 * 0.02 * 3.2} / 75.4$$

$$d = \underline{0.018 \text{ metres or } 1.8 \text{ cm}}$$

### Uncontrolled

$$d = \sqrt{30 * 0.02 * 3.2} / 33.6$$

$$d = \underline{0.041 \text{ metres or } 4.1 \text{ cm}}$$

**Result:** Complies if a safe distance of 20 cm is applied