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Maximum Permissible Exposure Calculation for the Telemics Verics™ Module FCC ID: QCR-09-MSS1

Telemics has developed a 900 MHz frequency hopping module for use in new products that it is currently developing. The peak measured transmit output power of the radio is **114.28 mW**.

Operating Environment:
The operating environment for the product(s) which will incorporate this module will typically be in a Fixed, Uncontrolled environment, however, to allow some "location flexibility", this estimate assumes the host system into which the module is installed as being a "Mobile" installation.

Operating parameters:
The theoretical maximum transmit duty cycle of the Verics module is approximately 90%, typically the highest operating duty cycle could be around 50%. Currently the module will be certified for use with three antennae, the highest gain being 2 dBi (See antenna data included with this application). **In order to provide a worst case result, a duty cycle of 100% and an antenna gain of 2 dBi has been used in this MPE calculation**

Fixed, Uncontrolled Environment:
FCC rules limit the power density for uncontrolled exposure to RF devices operation at 900 MHz to the following level:

$$(f_{(MHz)} / 1500) \text{ mW/cm2}$$

This equates to:

$$f_{(MHz)}/1500 \text{ mW/cm}^2 = 902/1500 = .601 \text{ mW/cm}^2$$

Power density is calculated from the following equation:

$$\text{Exposure (mW/cm}^2\text{)} = \text{Pout (mW)*Duty Cycle*(Antenna Gain(as a ratio)/(4*PI* Radius}^2\text{(cm)))}$$

Solving the above equation for Radius yields:

$$\text{Radius} = \sqrt{\frac{P_{out}(mw) * \text{Duty Cycle} * \text{Antenna Gain}_{(ratio)}}{\text{Exposure}(mW/cm^2) * 4 * Pi}}$$

900 MHz MPE Distance Calculation:
Calculating the radius of the sphere around which the power density is at the FCC limit. This radius is the MPE distance.

$$\text{MPE Distance} = \sqrt{\frac{114.28 * 1 * 1.58}{.601 * 4 * Pi}} \Rightarrow \sqrt{\frac{180.562}{7.55}} \Rightarrow 4.89 \text{ cm}$$