

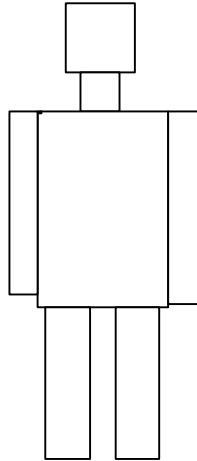
## General

The ITRM91501X04 module is a frequency hopping spread spectrum transmitter operating in the frequency band of 902 MHz to 928 MHz with 1 watt of output power into a 3-dBi gain directional antenna. Per table 1 of 1.1307, paragraphs 1.1310 and 2.1093 of CFR 47, evaluation for this device is as follows. Due to the location of the antenna, normal operating conditions and use, the unit will satisfy the requirements for RF Exposure. Calculations are made here for completeness.

### SPECIFIC ABSORPTION RATE CALCULATION

Calculations per 2.1093 of CFR 47.

These calculations are based upon a typical human figure as approximated below. The height is 5' 8" (173 cm.) and the weight is 160 lbs. (72.6kg).



The calculated absorption cross section for this figure is 143 cm squared.

#### CALCULATED GENERAL POPULATION/ UNCONTROLLED EXPOSURE SAR

Per 1.1310, the requirement for power density in general population/uncontrolled exposure is  $f/1500$ , which equates to  $0.6 \text{ mW/cm}^2$  calculated for 915 MHz. This amount to be averaged over a time period of 30 minutes. The inherent design of this product would require the antenna to be permanently mounted at a distance much greater than the 20 cm used for this calculation. The 20 cm distance was used to show compliance only.

$$S = PG/(4\pi R^2)$$

Where  $S$  = power density in  $\text{mw/cm}^2$ ;  $P$  = input power to antenna in  $\text{mw}$ ;  $G$  = power gain of antenna; and  
 $R$  = distance from antenna in  $\text{cm}$ ;  $\pi = 3.14159$ .

For a minimum distance of 20 centimeters and 1.0 watts (1000 mW) operation with the supplied antenna with a numeric gain of two,  $S$  is calculated as  $0.3979 \text{ mw/cm}^2$ .  $S = 1000(2)/(4\pi (20)^2) = 0.3979 \text{ mw/cm}^2$

Per 2.1093 the limit for general population/Uncontrolled exposure is  $0.08\text{W/kg}$  as averaged over the whole body. For a body cross sectional area of 143 cm squared,  $(0.3979)(143) = 56.898 \text{ mw}$  is absorbed.

For a body mass of 72.6 kg, this is  $56.898/72.6 = 0.783 \text{ mw/kg} = 0.000783 \text{ w/kg}$ .

This is well within the  $0.08 \text{ w/kg}$  limit prescribed for general population/uncontrolled exposure as prescribed by CFR 47 paragraph 2.1093.