

## 1. RF Exposure Requirement

### 1.1 Method of Measurement

This device is not exempted from compliance does not exceed the Commission's RF exposure guidelines. Unless a device operates at substantially low power levels, with a low gain antenna(s), supporting information is generally needed to establish the various potential operating configurations and exposure conditions of a transmitter and its antenna(s) in order to determine compliance with the RF exposure guidelines.

In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed:

Calculation that estimates the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits defined for free space.

Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement Any caution statements and/or warning labels that are necessary in order to comply with the exposure limits Any other RF exposure related issues that may affect MPE compliance.

### 1.2 Limits

FCC 1.1310:- The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

Limits for Maximum Permissible Exposure (MPE)

| Frequency range<br>(MHz)                                | Electric Field<br>Strength (V/m) | Magnetic Field<br>Strength (A/m) | Power Density<br>(mW/cm <sup>2</sup> ) | Average Time<br>(minutes) |
|---------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------------|---------------------------|
| (B) Limits for General Population/Uncontrolled Exposure |                                  |                                  |                                        |                           |
| 300-1500                                                | -                                | -                                | $f / 1500$                             | 30                        |

f = frequency in MHz

| Channel | Frequency(MHz) | Power Density (mW/cm <sup>2</sup> ) |
|---------|----------------|-------------------------------------|
| L       | 2 403          | 1.602                               |
| M       | 2 440          | 1.627                               |
| H       | 2 476          | 1.651                               |

## 1.3 Test Results

| Frequency [MHz] | Conducted Power [dBm] | Antenna Gain [dBi] | Calculated EIRP [mW] | Laboratory's Recommended Minimum RF Safety Distance r [Cm] | Power Density in mW/cm <sup>2</sup> at Formula When r=20Cm [mW/cm <sup>2</sup> ] |
|-----------------|-----------------------|--------------------|----------------------|------------------------------------------------------------|----------------------------------------------------------------------------------|
| 2 403           | 16.63                 | 2.29               | 77.98                | 5.57                                                       | 0.015 5                                                                          |
| 2 440           | 16.00                 | 2.73               | 74.64                | 5.45                                                       | 0.014 9                                                                          |
| 2 476           | 15.23                 | 2.35               | 57.28                | 4.77                                                       | 0.011 4                                                                          |

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi r^2} = \frac{EIRP}{4\pi r^2}$$

P : power input to the antenna in mW

EIRP: Equivalent (effective) isotropic radiated power.

S : power density mW/cm<sup>2</sup>

G : numeric gain of antenna relative to isotropic radiator

R : distance to centre of radiation in cm

FCC radio frequency exposure limits may be exceeded at distances closer than r cm from the antenna of this device

$$r = \sqrt{\frac{PG}{4\pi S}} = \sqrt{\frac{EIRP}{4\pi S}}$$