**47 C.F.R. Part 1, Subpart I, Section 1.1310**
**47 C.F.R. Part 2, Subpart J, Section 2.1091**
**Maximum Permissible Exposure Calculations**

**For Mult-Voice Radio MV-ONE**

EUT Device Category = General Population/Uncontrolled Exposure

EUT consists of one ISM band radio transmitting operating over a range of 902.6 MHz to 926.6 MHz and one transceiver operating over a range of 2402 MHz to 2480 MHz

MPE Summary: See pages 2 for explanation of Antenna Gain and distance

KDB 447498 D01 General RF Exposure Guidance v06 gives the 1-g and 10-g SAR test exclusion thresholds. The limits for 100 MHz to 6 GHz and a test separation distance of ≤50 mm are defined by the following equations:

((max EIRP, mW / (minimum separation, mm) * $\sqrt{F_{GHz}}$ ≤3.0 for 1-g SAR or ≤7.5 for 10-g SAR

EIRP calculations for the 902.8 MHz to 926.6 MHz transmitter are shown below:

| Frequency | Max power to antenna | Antenna Gain | EIRP | EIRP |
|---|---|---|---|---|
| (MHz) | (dBm) | (dBi) | (dBm) | mW |
| 902.8 | 28.17 | -10 | 18.17 | 65.615 |
| 914.4 | 28.33 | -10 | 18.33 | 68.077 |
| 926.6 | 28.36 | -10 | 18.36 | 68.549 |

MPE and Limit for the 902.8 MHz to 926.6 MHz transmitter are calculated as follows:

| EIRP | Separation | Frequency | Full Exposure | Maximum Duty Cycle | Worst-case Exposure | Limit | Result |
|---|---|---|---|---|---|---|---|
| (mW) | (mm) | (GHz) | (mW/mm) | (%) | (mW/mm) | 1-g | |
| 65.615 | 25 | 0.9028 | 2.476 | 12.5 | 0.310 | 3.0 | Exempt |
| 68.077 | 25 | 0.9144 | 2.604 | 12.5 | 0.326 | 3.0 | Exempt |
| 68.549 | 25 | 0.9266 | 2.639 | 12.5 | 0.330 | 3.0 | Exempt |

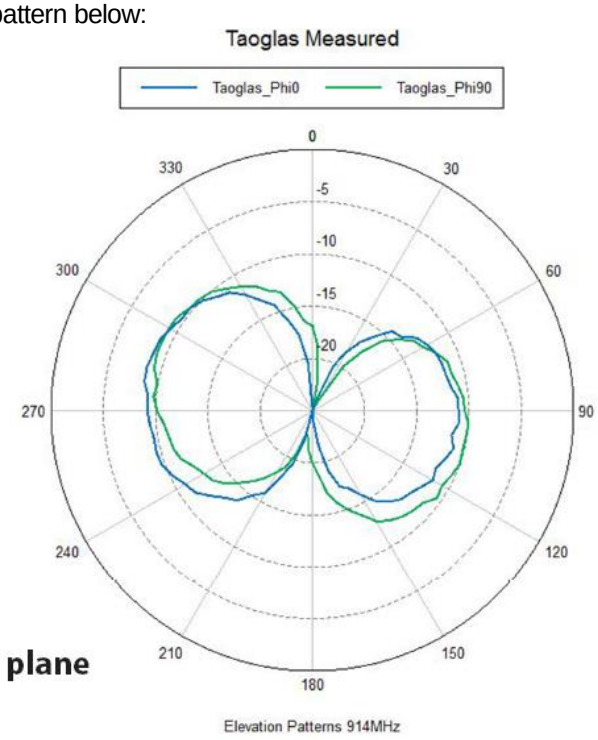
MPE and Limit for the 2402 MHz to 2480 MHz transceiver are calculated as follows:

| EIRP | Separation | Frequency | Full Exposure | Maximum Duty Cycle | Worst-case Exposure | Limit | Result |
|---|---|---|---|---|---|---|---|
| (mW) | (mm) | (GHz) | (mW/mm) | (%) | (mW/mm) | 1-g | |
| 0.03 | 25 | 2.402 | 0.002 | 100 | 0.002 | 3.0 | Exempt |
| 0.02 | 25 | 2.441 | 0.001 | 100 | 0.001 | 3.0 | Exempt |
| 0.01 | 25 | 2.480 | 0.001 | 100 | 0.001 | 3.0 | Exempt |

Adding the maximum worst-case exposure for each transmitter from the tables above (0.33 + 0.002 = 0.332), the total exposure from the device is less than the specified 1-g threshold of 3.0.

***Result:*** The device meets FCC MPE limit for General Population/Uncontrolled Exposure

The antenna was designed to have a minimum attenuation of 10db towards the head. Thus having an effective radiated power of 18.36 dBM. See antenna design pattern below:




**Phi0° = Nose to back of the head plane**
**Phi90° = Ear to ear plane**

**The antenna separation is diagrammed below:**