MPE Calculations

FCC ID:R33C4SR250Z
IC ID: 7848A-C4SR250Z

1.0   SCOPE:

This Report Demonstrates Evaluation and Compliance to the following standards:
1. **Code of Federal Regulations Title 47, Volume 1, Section 1.1310.**
2. **Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) - RSS-102 Issue 3**

2.0   REVISION LEVEL:

DATE	COMMENTS	REVISION
10/10/08	Created.	1.0
08/16/10	Added RSS-102 references	2.0

3.0   REFERANCE DOCUMENTS:

(A) Limits for Maximum Permissible Exposure (MPE). Code of Federal Regulations Title 47, Volume 1, Section 1.1310.
(B) Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. OET Bulletin 67 Edition 97-01.
(C) Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) - RSS-102 Issue 3

4.0   CALCULATIONS:
   The following worst case emissions can be calculated by two methods

Method 1: Based on a PPt (Peak Power Total) measurement of the total power into the antenna and the worst case antenna gain.
   Effective/Equivalent Isotropic Radiated Power [EIRP] dBm = Total power into the antenna [dBm] + antenna gain [dBi]
   To convert the values from dBm to mW
   $$mW = 10^{dBm/10}$$

Method 2: Based on the radiated field strength measurement at 3 meters [at a calibrated OATS site, maximizing the antenna polarity and height]
   The worst case radiated field Strength when measured at 3 meters at the CCL Wanship facility, was 94.8 dBµV/m, peak detection horizontal polarity while remote orientation was Flat on the table and with a power level setting of -1.
   Converting the 94.8 dBµV/m at 3 meters to EIRP = 0.906 mW or 0.000906 W

After obtaining the EIRP, the Power density is calculated and compared against the FCC and IC limits.

   S_{FCC} **= Power density in *mW/ cm²* for FCC**
   S_{FCC} **= EIRP/4π·R²**
   EIRP = Equivalent isotropically radiated power *(mW)*
   R = Distance to the center of radiation of the antenna *(20 cm)*
   S_{FCC} **= 0.00018 mW/cm²**

   S_{IC} **= Power density in *W/ m²* for IC**
   S_{IC} **= EIRP/4π·R²**
   EIRP = Equivalent isotropically radiated power in watts *(W)*
        [1 mW = 0.001W]
   R = Distance to the center of radiation of the antenna *(0.2 m)*
        [20 cm = 0.2 m]
   S_{IC} **= 0.0018 W/m²**

5.0   CONCLUSION:

   1. **Based upon the limits for Maximum Permissible Exposure (MPE) given in Table 1 of reference document (A) as 1mW/cm², this device falls under the required limits.**
   2. **Based upon the limits given in section 4.2 of the reference document (C) as 10W/m², this device falls under the required limits.**