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Maximum Permissible Exposure Test Report

for

Mars Electronics, Inc.
FCC ID: QP8-MEI915WLAN

October 2, 2003

WLL PROJECT #: 7008RFFCC

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for

Mars Electronics, Inc. QP8-MEI915WLAN

1.0 Introduction

This report has been prepared on behalf of Mars Electronics, Inc. (MEI) to show compliance with the RF exposure requirements of FCC Part 15.247 as defined in FCC Part 1.1307(b)(1) for the MEI FHSS Transmitter.

3.8 Radio Frequency Radiation Exposure

In accordance with Section 1.1310 of the FCC rules, the Maximum Permissible Exposure (MPE) limit for the frequency range of 902 to 928MHz is $f/1500\text{mW/cm}^2$ for General Population/Uncontrolled Access. The EUT is designed for use with vending machines for data transmissions and uses an antenna with a gain of 0dBi. A unique connector is used on the card to prevent the use of higher gain antennas. Warnings concerning RF exposure are in the installation manual. These warnings to the installers insure that the general public is not exposed to RF energy.

The MEI FHSS Transmitter Module is designed for a transmit power of 29.35dBm (861mW). Using the intended antenna gain of 0dBi the following power density is calculated at a distance of 20cm.

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

Where,

$$S = \text{Power Density (FCC Limit)} = f/1500 = 928/1500 = 0.619 \text{ mW/cm}^2$$

P = Output Power at the Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

For this device, the calculation is as follows:

$$R = 20\text{cm}$$

$$P = \text{Output Power} = 861\text{mW}$$

$$G = \text{Numeric Gain} = 1$$

Solving for the power spectral density at 20cm.

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

$$S = (861\text{mW})(1) / (12.566)(20\text{cm}^2) = 0.171\text{mW/cm}^2$$

The calculated 0.171mW/cm² power density is under the FCC limit of 0.619mW/cm² at a distance of 20cm. Warnings are provided in the user's manual to limit exposure to the direct beam during the installation and maintenance phase and to ensure that the antenna is installed at distances greater than 20cm cm from people. These warnings ensure that the device is installed properly and does not expose the general public to RF energy hazards.