Maximum Permissible Exposure Test Report

for

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FCC ID: HDCTRC4103

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WLL PROJECT #: 6422

1.0 Introduction

This report has been prepared on behalf of Adtran, Inc. to show compliance with the RF exposure requirements of FCC Part 15.247(b)(4) as defined in FCC Part 1.1307(b)(1) for the Adtran TRACER 4103 spread spectrum transmitter.

2.0 Radio Frequency Radiation Exposure

In accordance with Section 1.1310 of the FCC rules, the Maximum Permissible Exposure (MPE) limit for this frequency range is 1mW/cm^2 for General Population/Uncontrolled Access. The EUT is designed for telecommunications transmissions and may use relatively large antennas (12' dish). The transmitter section is designed for mounting on an antenna mast. Only professional technicians are used to install this device, and are limited to installations such as towers and rooftops. Warnings are in the installation manual, which limit the exposure to the direct beam during installation and maintenance. These warnings to the installers insure that the general public is not exposed to RF energy.

The TRACER is designed for a transmit power of 20dBm (100mW). The EUT was evaluated with 3 different types of antennae; Omni (Patch), Yagi, and parabolic dish. Of these antennas the parabolic dish has the highest gain and therefore the MPE will be based on this gain. Per the user manual the highest gain antenna used could be a 37dBi gain antenna. Using this "worst case" gain the following power density is calculated.

$$S = \frac{PtGt}{4pR^2}$$

Where,
S = Power Density
Pt = Output Power at the Antenna Terminals
Gt = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

For this device, the calculation is as follows:
S = FCC Limit = 1mW/cm^2
P = Output Power = 100mW
G = Worst Case Gain = 37 dBi (5012)
R = Based on 4.6 meters (15 feet) (This distance is specified in the User's Manual)

$$S = \frac{(100mW)(5012)}{4p(460cm)^2} = 0.188mW/cm^2$$

This power density is the worst case for maximum beam exposure at the specified distance of 4.6m as stated in the installation manual. This level is below the limit of 1mW/cm^2 MPE for general population/uncontrolled access. The power density for antennas with lower gain will be less than calculated above and the specified distance within the installation manual will be well

within the guidelines. This unit is only installed by professionals and is limited in practice to installations on rooftops or towers. Warnings are provided in the installation manual to limit exposure to the direct beam during the installation and maintenance phase. These warnings ensure that the device is installed properly and does not expose the general public to RF energy hazards.