

To: Steve Dayhoff
From: Tim Blom
NextNet Wireless, Inc.
Re: RF Exposure

8/12/2002

Dear Mr. Dayhoff,

The information you have requested for the certification of FCC ID: PHX-MMDS-CPE2 is detailed on the following pages.

Regards,
Tim Blom

Question:

From: oetech@fccsun34w.fcc.gov
Sent: Wednesday, August 07, 2002 3:38 PM
To: blomt@nextnetwireless.com
Subject: RF Exposure Issues

To: Tim Blom, NextNet Wireless, Inc.
From: Steve Dayhoff
sdayhoff@fcc.gov
FCC Application Processing Branch

Re: FCC ID PHX-MMDS-CPE2
Applicant: NextNet Wireless, Inc.
Correspondence Reference Number: 23613
731 Confirmation Number: EA590992

- 1) Please provide more details of MPE test: a) was device mounted on wall as in normal use, if not what is expected change in MPE for wall-mount configuration; b) was probe scanned and over what area around device
- 2) Please verify/demonstrate that MPE probe measures pulsed signals correctly

Response:

1a) The Outdoor Subscriber Unit (OSU) product was attached to a wooden stand to facilitate in the measurement of the MPE. From the installation manual: Mount the OSU in a high location on your home, such as under the eaves of your house. The expected change in the MPE for a typical installation would be a measured MPE that is lower than the measured MPE at 20cm or undetectable.

1b) The measurement of the OSU for the MPE requirement was performed at the front, sides, top, bottom and back at 20cm from the case of the product. The only detectable RF energy measured was radiation from the front of the OSU product i.e. main beam of the patch array antenna.

2) NextNet Wireless uses the General Microwave Model 3 Radiation Hazard Meter (RAHAM) for verification of the MPE limits. The Model 3 RAHAM probe design employs three orthogonally oriented thin-film thermoelectric arrays. The technical information from the manufacturer specifies that this device has three 10 dB ranges of $2\text{mW}/\text{cm}^2$, $20\text{mW}/\text{cm}^2$, and $200\text{mW}/\text{cm}^2$. The average power overload is $0.5\text{W}/\text{cm}^2$, the peak power overload is $30\text{W}/\text{cm}^2$. The thermocouple sensor absorbs RF/microwave energy thereby heating the thermocouple junction as a result, thermocouple sensors give the correct average (rms) power for all types of signal formats from continuous wave (CW) to pulsed to complex digital modulation, regardless of the harmonic content, waveshape or distortion of the signal.

To verify the actual measurement performance of the General Microwave Radiation Hazard Meter Model 3, a test utilizing a NextNet Wireless base station and a customer modem vertically polarized antenna was performed. The NextNet Wireless customer modem is hardware limited such that the maximum transmit duty cycle of 14.29% cannot be exceeded. Because of this, a base station which can operate at 100% transmit duty cycle in test mode will be used to transmit a 2 watt signal with the same signal modulation characteristics as used by the customer modem. The base station was calibrated to provide 2 watts at the coax input to the customer antenna. The customer antenna was inserted into an indoor modem case. At 20cm, the measured exposure was $4.3\text{ mW}/\text{cm}^2$. Applying the customer modem 14.29% maximum transmitter duty cycle to the $4.3\text{ mW}/\text{cm}^2$ yields the following result:

$$4.3\text{ mW}/\text{cm}^2 * 0.1429 = .6145\text{ mW}/\text{cm}^2$$

The MPE measurement in the RF Exposure section filed with the FCC indicates a measurement reading of $0.68\text{ mW}/\text{cm}^2$.

NextNet Wireless believes that the General Microwave Radiation Hazard Meter Model 3 measures the MPE of the customer modem signal properly.

Verification Test Setup:

