May 20, 2005

FCC Application Processing Branch
Attn: Linda Elliott, Linda.Elliott@fcc.gov, Correspondence Reference # 28690
Stan Lyles, Stanley.Lyles@fcc.gov, Correspondence Reference # 28877
FCC ID: HCQ3B6ETOEMM
731 Confirmation Number: EA559274

Re: **Modular Approval Cover Letter, per FCC Public Notice DA 00-1407**

Dear Ms. Elliott and Mr. Lyles:

In response to the first item in the correspondence I received from both of you that asks us to submit external photographs, let me reiterate that the application we are submitting is for a "module" only. The module will be installed into a housing of some sort by the OEM that buys the module from Inovonics Wireless Corporation. Therefore, we can only provide you with pictures of the module itself. However, the module will bear the FCC ID number and will include instructions for label placement on the exterior of the final product (text of which is included in the body of this letter). Submitted along with this cover letter is a picture of the board showing the placement of the label containing the FCC ID number.

In compliance with FCC Public Notice DA 00-1407, we are submitting this cover letter requesting modular approval, and this letter addresses the eight requirements identified in the Public Notice:

FCC Modular Application

1.) The RF portion of the circuit has its own shield. The module is not dependent on any additional shielding.
2.) This transmitter only accepts a switch closure for data input. The rate at which the input switches affect modulation is controlled by a micro-controller; excessive data rates are not possible.
3.) The modular transmitter has its own voltage regulator, VR2 on the schematic.
4.) The antenna on the modular transmitter is a printed trace on the PCB; it is permanently attached.
5.) The module was tested in a stand-alone configuration. Power was supplied by a 3.2 volt battery.
6.) The modular transmitter will be labeled with its own FCC ID number (see submitted picture), and the modular transmitters will include the following instructions for exterior label requirements:

"FCC Label Requirements for EN1941

Inovonics Wireless has received Federal Communications Commission (FCC) approval to market RF modules. The application integrator is responsible for properly labeling the product containing the RF module. Labels must be placed on the outside of the product, and must include a statement indicating that product contains the module, along with the
FCC number.

Example 1 "Contains RF Module FCC ID: HCQ3B6ETOEMM"
Example 2 "Contains FCC ID: HCQ3B6ETOEMM"

RF Module FCC Registration Number
EN1941

- FCC: HCQ3B6ETOEMM"

7.) The modular transmitter was tested to and conforms with Section15.247.
8.) **RF Exposure Information:**

The device is compliant with both MPE requirements (47CFR2.1091) as well as SAR requirements (47CFR2.1093).

Calculation for compliance with MPE requirements (47CFR2.1091) is done using a worst-case transmitter power of 50 mW, assumption of a unity gain antenna, and an exposure limit of 0.6 mW/cm^2 (f/1500 mW/cm^2 at 20 cm per 47CFR1.1310) for general applications. This device is not carried or worn by the user. It has an extremely low duty cycle and a low rate of transmission that dramatically reduces the average power level that could pose an exposure hazard.

The OEM transmitter initiates a transmission upon sensing a change of state. In addition to these change-of-state transmissions, the transmitter is configured to transmit a supervisory message once every 3 minutes. The maximum message length may occur when the OEM transmitter transmits a serial message consisting of a 12 ms preamble followed by 32 ms of synchronization, identification, payload, and CRC data. The averaging interval specified in Table 1(B) of 47CFR1.1310 is 30 minutes. For the purposes of this calculation, it is assumed that ten supervisory and five change-of-state messages will be sent in the 30-minute interval. Each supervisory message consists of 3 redundant packets, and each change of state message contains 21 packets, for a total of 135 packets in the 30-minute interval. A packet is typically 22.4 ms in length. For this calculation, a maximum packet length of 44 ms will be used.

The worst-case average power density at a distance of 20 cm is then,

$$50mW \times \frac{135\,packets}{30\,\min} \times \frac{44ms}{packet} \times \frac{1\min}{60\times 10^3\,ms} \times \frac{1}{4\pi(20cm)^2} = 32.8\frac{nW}{cm^2}$$

This is well below the 0.6 mW/cm^2 MPE limit.

Calculation for compliance with SAR requirements (47CFR2.1093) is done using a worst-case transmitter power of 50 mW time-averaged by the duty cycle of the transmitter, and the assumption that all RF energy could be absorbed in 1 gram of tissue. The peak exposure limit is 1.6 mW/g (equivalent to 1.6 W/kg per 47CFR2.1093) in any 1 gram of tissue for General Population/Uncontrolled applications.

In any 3-minute interval, worst-case the device may transmit up to 2 alarm messages and a supervision message for a total of 45 packets.

The maximum duty cycle of the device is,

$$\frac{45\,packets}{3\,\min}\times\frac{44ms}{packet}\times\frac{1\,\min}{60\times10^{3}\,ms}=0.011=1.1\%$$

The time-averaged RF transmitted power is then,

$$0.05W\times0.011=0.55mW$$

If all of the transmitted power were absorbed in a 1-gram sample of tissue, the resulting power density is 0.55 mW/gram and is well below the 1.6 mW/gram limit.

Responding to item number 3 in Correspondence Reference Number 28877 from Mr. Lyles, I extracted the Test Set-up Photos from the IA Labs Test Report and am submitting them as a separate file in this re-submission of the application.

Also, we are submitting a revised Operational Description. The fourth line in the last paragraph has been corrected and I highlighted it in red.

Any further communication should be directed to my attention, since I am the person responsible for the FCC application submissions. Please don't hesitate to contact me if you need any further information. Thank you.

Sincerely,

Joni Ripper
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