

---

**VeriFone**  
3755 Atherton Road  
Rocklin, CA 95765-3701

Tel: 916/630-0550  
Fax: 916/630-2501



January 11, 2000

Federal Communications Commission  
Office of Engineering Technology  
Equipment Authorization Division

**Subject: Application for Equipment Authorization, FCC ID: B32RF350**

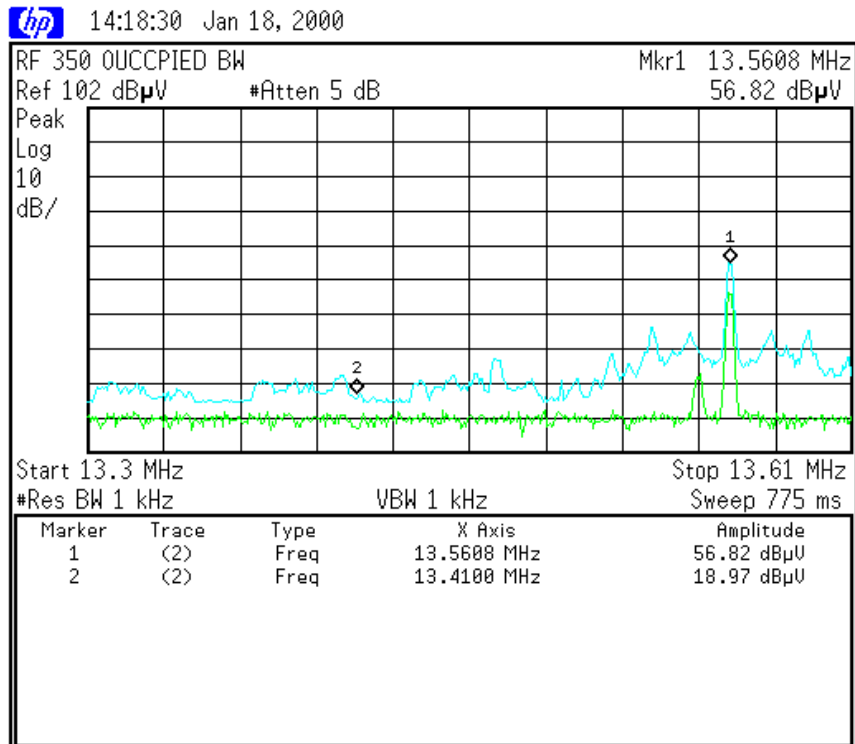
Dear Mr. Dichoso,

Thank you for your help regarding our Application for Equipment Authorization. The following information is in response to your correspondence dated 1/7/2000 and our telephone conversation on 1/11/2000. In your letter you mentioned five items. I have written responses below for items 1 and 5 while responses to items 2, 3 and 4 have been uploaded to the FCC as separate attachments. All attachments have been provided through the OET web site.

- 1) Use of the term "module" in our application was not intended to indicate that we were applying for a modular approval. The "module" referred to is a printed circuit board containing the RF circuitry and is supplied to us by an OEM vendor. This PC board has been approved in other applications but does not have necessary characteristics to qualify for a modular approval.
- 2) Please find the updated letter requesting confidentiality. This letter has no reference to photos as we now understand that these cannot be held confidential. Also, note that we have added the request for confidentiality of our block diagram. The letter has been uploaded with the file name "newcover.doc"
- 3) Digital photographs with mega pixel resolution have been provided of the printed circuit boards. Both sides of each board are shown. The photographs are arranged in a Adobe Acrobat document uploaded with the file name "PBC.pdf"
- 4) As agreed in our phone conversation, we have verified the emission level at the fundamental of the intentional radiator. Additionally, we remeasured emissions from 10kHz to 30MHz with particular attention to the restricted band from 13.36 to 13.41MHz. Several emissions were measurable in this band but were far below the limits of CRF 47 Pt. 15.209. These measurements were done using a magnetic loop antenna in two polarizations and at a maximized angle. Please find the amendment to our measurement report uploaded with the file name "21236.pdf"

5) We understand that operation in the restricted band of 13.36 to 13.41 MHz is not allowed. As demonstration of our compliance please find following requested information.

- Bandwidth plot of the modulated signal:



Please note that the measurement shown in this plot was made with a near field probe. Amplitudes listed are not representative of far field emissions. Additional measurements are included in the measurement report to show that the actual emissions in the restricted band are well below the limits of CFR 47, Pt 15.209.

The follow answers are quoted from email correspondance with the OEM manufacturer of the RF ID circuitry. The Company name is OTI (On Track Innovations)

Your questions:

- Receiver frequency range?
- Modulation type?
- Data rate?

OTI Responses:

Q. #2: Receiver frequency

The receiver detects the envelope of the modulated carrier signal. This envelope is the base band (data signal). The detection is done at the first stage with no amplification of the carrier signal using a diode/capacitor AM demodulation technique. The data signal is then amplified. Note the we do not have a local oscillator for receiving.

---

**VeriFone**  
3755 Atherton Road  
Rocklin, CA 95765-3701

Tel: 916/630-0550  
Fax: 916/630-2501



Q. #3: Modulation type

The Reader Sends data to the Tag by modulating the transmitted RF carrier in an on-off key , 100% amplitude modulation. The Reader receives data from the card by demodulating small variation of the RF carrier amplitude, induced there upon by an on-off key loading mechanism affected in the Tag. The serial data , both way, is bit encoded as pulse width modulation. A reference start bit enables, together with additional spaces between the bytes , timing synchronization of the communication. This scheme was designed to compensate for the nonfixed, conditions depended , resistor controlled clock circuitry of the .P. in the Tag.

Q. #4: Data rate

Byte structure:  
Reference bit: 53uS.  
"1" bit: 33uS.  
"0" bit 73uS.  
Stop bit : "1" bit.  
Space between bytes: 132uS

If any further difficulties arise with this application or attachments, please contact me immediately. I may be reached by telephone at (916) 630-4011 (9am-5pm Pacific Time) or contact me through email at [Russ\\_C1@Verifone.com](mailto:Russ_C1@Verifone.com)

Sincerely,

Russell W. Carlson  
Senior EMC Engineer  
VeriFone, a division of Hewlett-Packard  
Tel 916.630.4011 FAX 916.630.2501