

Advanced  
Compliance Laboratory

6 Randolph Way  
Hillsborough, NJ 08844  
Tel: (908) 927 9288  
Fax: (908) 927 0728

## ELECTROMAGNETIC EMISSION COMPLIANCE REPORT of

PAVS TAG  
MODEL: PAVSTAG  
FCC ID: QJZPAVSTAG

June 11, 2008

This report concerns (check one): Original grant  Class II change   
Equipment type: Low Power Intentional Radiator

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes  no   
If yes, defer until: \_\_\_\_\_ (date)  
Company agrees to notify the Commission by \_\_\_\_\_ (date)  
of the intended date of announcement of the product so that the grant can be  
issued on that date.

Transition Rules Request per 15.37? yes  no   
If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR  
[10-1-90 Edition] provision.

Report prepared for: Avante International Technology, Inc.  
Report prepared by: Advanced Compliance Lab  
Report number: 0048-080602-01



The test result in this report IS supported and covered by the NVLAP accreditation

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## 1. GENERAL INFORMATION

### 1.1 Verification of Compliance

EUT: PAVS TAG  
 Model: PAVSTAG  
 Applicant: AVANTE INTERNATIONAL TECHNOLOGY, INC.  
 Test Type: FCC Part 15C CERTIFICATION (15.231)  
 Result: PASS  
 Tested by: ADVANCED COMPLIANCE LABORATORY  
 Test Date: June 11, 2008  
 Report Number: 0048-080602-01

The above equipment was tested by Compliance Laboratory, Advanced Technologies, Inc. for compliance with the requirement set forth in the FCC rules and regulations Part 15 subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

|                                 | Prob. Dist. | Uncertainty(dB) | Uncertainty(dB) | Uncertainty(dB) |
|---------------------------------|-------------|-----------------|-----------------|-----------------|
|                                 |             | 30-1000MHz      | 1-6.5GHz        | Conducted       |
| Combined Std. Uncertainty $u_c$ | norm.       | ±2.36           | ±2.99           | ±1.83           |




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Wei Li  
 Lab Manager  
 Advanced Compliance Lab

Date: June 11, 2008

## **1.2 Equipment Modifications**

N/A

### 1.3 Product Information

#### System Configuration

| ITEM            | DESCRIPTION                     | FCC ID     | CABLE |
|-----------------|---------------------------------|------------|-------|
| Product         | PAVS TAG PAVSTAG <sup>(1)</sup> | QJZPAVSTAG |       |
| Housing         | PLASTICS                        |            |       |
| Power Supply    | 3V DC Battery                   |            |       |
| Operation Freq. | 439.4MHz                        |            |       |
| Device Type     | Periodic Operation              |            |       |
| Receiver        | SENSOR Receiver                 | DoC        |       |

(1) EUT submitted for grant.

### 1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2003 at an antenna to EUT distance of 3 meters.

### 1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Hillsborough, New Jersey. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated May 19, 1997 (Refer to: 31040/PRV 1300F2). The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

### 1.6 Test Equipment

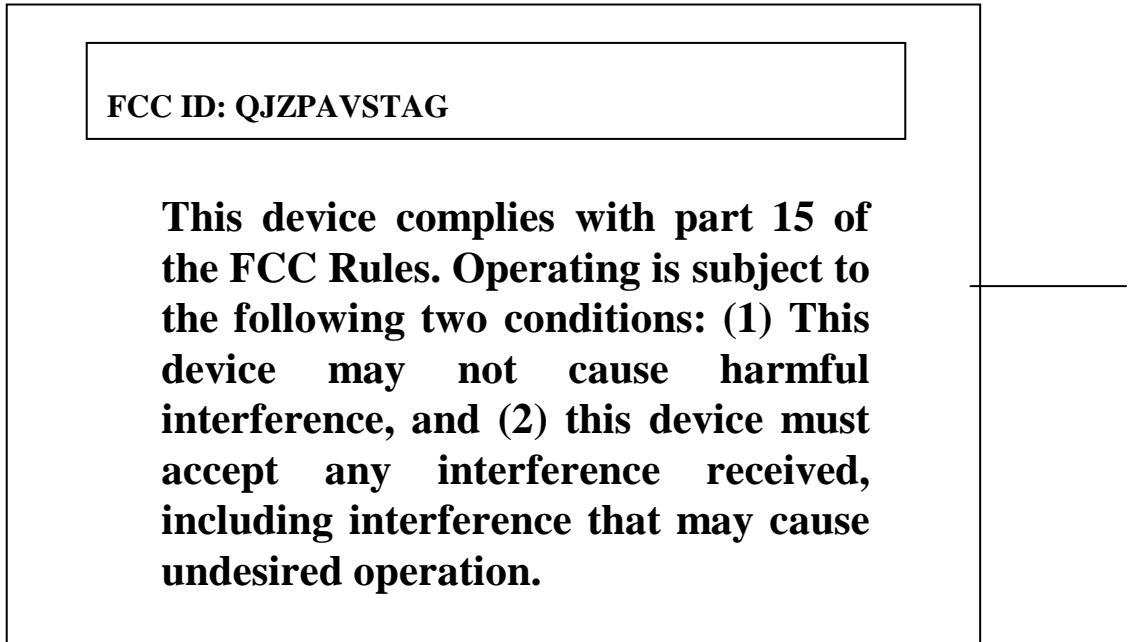
| Manufacture     | Model   | Serial No. | Description                           | Last Cal dd/mm/yy | Cal Due dd/mm/yy |
|-----------------|---------|------------|---------------------------------------|-------------------|------------------|
| Hewlett-Packard | HP8546A | 3448A00290 | EMI Receiver                          | 12/01/08          | 12/01/09         |
| EMCO            | 3104C   | 9307-4396  | 20-300MHz Biconical Antenna           | 12/02/08          | 12/02/09         |
| EMCO            | 3146    | 9008-2860  | 200-1000MHz Log-Periodic Antenna      | 09/02/08          | 09/02/09         |
| Fischer Custom  | LISN-2  | 900-4-0008 | Line Impedance Stabilization Networks | 28/08/07          | 28/08/08         |
| Fischer Custom  | LISN-2  | 900-4-0009 | Line Impedance Stabilization Networks | 28/08/07          | 28/08/08         |
| EMCO            | 6502    | 2665       | 10KHz-30MHz Active Loop Antenna       | 27/02/08          | 27/02/09         |
| EMCO            | 3115    | 4945       | Double Ridge Guide Horn Antenna       | 18/08/07          | 18/08/08         |

All Test Equipment Used are Calibrated Traceable to NIST Standards.

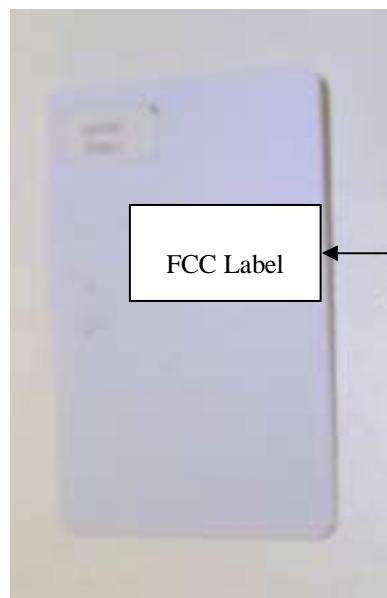
### **1.7 Statement for the Document Use**

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

## 2. PRODUCT LABELING



**Figure 2.1 FCC ID Label ( Statement shown in the manual)**



**Figure 2.2 FCC ID Label Location**

### **3. SYSTEM TEST CONFIGURATION**

#### **3.1 Justification**

The system was configured for testing in a typical fashion (as a customer would normally use it). Its antenna is integrated with PCB. The minimum transmission interval is greater than 10s. Each transmission duration is 0.3ms with max. 0.5ms.

Testing was performed as EUT was set to testing mode with continuous operation.

#### **3.2 Special Accessories**

N/A

#### **3.3 Configuration of Tested System**

Figure 3.1 to Figure 3.5 illustrate this system, which is tested standing along.



**Figure 3.1 Radiated Test Setup, position 1-X**



**Figure 3.2 Radiated Test Setup, position 2-Y**



**Figure 3.3 Radiated Test Setup, position 3-Z**

N/A

**Figure 3.4 Conducted Setup- Front**

N/A

**Figure 3.5 Conducted Setup- Rear**

## 4. SYSTEM SCHEMATICS

See Attachment.

**Figure 4.1 System Schematics**

## 5. CONDUCTED EMISSION DATA

### 5.1 Test Methods and Conditions

The EUT was under normal operational mode during the conducted emission test. EMI Receiver was scanned from 150KHz to 30MHz with maximum hold mode for maximum emission. Recorded data was sent to the plotter to generate output in linear format. At the input of the spectrum analyzer, a HP transient limiter is inserted for protective purpose. This limiter has a 10 dB attenuation in the range of 150KHZ to 30MHZ. That factor was automatically compensated by the receiver, so the readings are the corrected readings. The reference of the plot is the CISPR 22 Class B limit in Figure 5.1 through Figure 5.2.

| Conducted Emission Technical Requirements |                    |                 |                    |                 |
|---|--------------------|-----------------|--------------------|-----------------|
| Frequency Range                           | Class A            |                 | Class B            |                 |
|   | Quasi-Peak<br>dBuV | Average<br>dBuV | Quasi-Peak<br>dBuV | Average<br>dBuV |
| 150kHz -0.5MHz                            | 79 (8912uV)        | 66 (1995uV)     | 66-56              | 56-46           |
| 0.5MHz-30MHz                              | 73 (4467uV)        | 60 (1000uV)     | ---                | ---             |
| 0.5MHz- 5MHz                              | ---                | ---             | 56                 | 46 (250uV)      |
| 5MHz-30MHz                                | ---                | ---             | 60                 | 50              |

Emissions that have peak values close to the specification limit (if any) are also measured in the quasi-peak mode to determine compliance.

### 5.2 Test Data

Figure 5.1-5.2 show the neutral and line conducted emissions for the standard operation.

N/A

Test Personnel:



Tester Signature: \_\_\_\_\_

Date: June 11, 2008

Typed/Printed Name: Edward Lee

N/A

Fig. 5.1 Conducted Emission-Line

N/A

Fig. 5.2 Conducted Emission- Neutral

## 6. RADIATED EMISSION DATA

### 6.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dB $\mu$ V/m

RA: Amplitude of EMI Receiver before correction in dB $\mu$ V

AF: Antenna Factor in dB/m

CF: Cable Attenuation Factor in dB

AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

The pulse train timing plots are showed in Figure 6.2.

The pulse train timing plots as follows:

The total transmitting time for each transmission is less than 0.5ms within any 100ms duration. Therefore, the Coeff. =0.5/100=0.005

The maximum average field strength should be 0.005 of the peak field strength measured. So we use peak value minus 46dB as calculated maximum average field strength.

### 6.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range 30MHz - 1GHz, 120KHz IF bandwidth / 120KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. Up to 10<sup>th</sup> harmonics were investigated.

### 6.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 6.1.

Test Personnel:



Typed/Printed Name: Edward Lee

Date: June 11, 2008

### Radiated Test Data

| Frequency (MHz) | Polarity [H or V], Position (X,Y,Z) (1) | Height (m) | Azimuth (Degree) | Peak Reading (dB $\mu$ V/m) | Calculated Average Reading (dB $\mu$ V/m) | FCC 3m Peak Limit (dB $\mu$ V/m) | Margin to Peak Limit | FCC 3m Average Limit (dB $\mu$ V/m) | Margin to Average Limit |
|-----------------|---|------------|------------------|-----------------------------|---|----------------------------------|----------------------|-------------------------------------|-------------------------|
| 439.4           | H,X                                     | 1.5        | 90               | 70.6                        | 24.6                                      | 93                               | -22.4                | 73.0                                | -48.4                   |
| 878.8           | H,X                                     | 1.4        | 80               | 44.0                        | -2  | 73                               | -29                  | 53.0                                | -55                     |
| 1318.2 (2)      | H,X                                     | 1.4        | 80               | 42.1                        | -3.9                                      | 74                               | -31.9                | 54.0                                | -57.9                   |
| 439.4           | V,X                                     | 1.2        | 80               | 64.2                        | 18.2                                      | 93                               | -28.8                | 73.0                                | -54.8                   |
| 878.8           | V,X                                     | 1.2        | 90               | 40.2                        | -5.8                                      | 73                               | -32.8                | 53.0                                | -58.8                   |
| 1318.2          | V,X                                     | 1.2        | 80               | 40.0                        | -6  | 74                               | -34                  | 54.0                                | -60                     |
| 439.4           | H,Y                                     | 2.2        | 20               | 71.2                        | 25.2                                      | 93                               | -21.8                | 73.0                                | -47.8                   |
| 878.8           | H,Y                                     | 1.8        | 10               | 45.8                        | -0.2                                      | 73                               | -27.2                | 53.0                                | -53.2                   |
| 1318.2          | H,Y                                     | 1.4        | 30               | 43.5                        | -2.5                                      | 74                               | -30.5                | 54.0                                | -56.5                   |
| 439.4           | V,Y                                     | 1.0        | 0                | 69.5                        | 23.5                                      | 93                               | -23.5                | 73.0                                | -49.5                   |
| 878.8           | V,Y                                     | 1.2        | 10               | 43.0                        | -3  | 73                               | -30                  | 53.0                                | -56                     |
| 1318.2          | V,Y                                     | 1.2        | 350              | 41.7                        | -4.3                                      | 74                               | -32.3                | 54.0                                | -58.3                   |
| 439.4           | H,Z                                     | 2.2        | 30               | 66.1                        | 20.1                                      | 93                               | -26.9                | 73.0                                | -52.9                   |
| 878.8           | H,Z                                     | 1.9        | 10               | 41.6                        | -4.4                                      | 73                               | -31.4                | 53.0                                | -57.4                   |
| 1318.2          | H,Z                                     | 1.5        | 0                | 40.0                        | -6  | 74                               | -34                  | 54.0                                | -60                     |
| 439.4           | V,Z                                     | 1.2        | 90               | 72.8                        | 26.8                                      | 93                               | -20.2                | 73.0                                | -46.2                   |
| 878.8           | V,Z                                     | 1.3        | 100              | 46.1                        | 0.1                                       | 73                               | -26.9                | 53.0                                | -52.9                   |
| 1318.2          | V,Z                                     | 1.2        | 80               | 43.9                        | -2.1                                      | 74                               | -30.1                | 54.0                                | -56.1                   |

(1) See Figure 3.3 for definition of position Z, which is the typical orientation when EUT is installed.

(2) Restricted band.

(3) Fundamental limit is 1500-5000 microvolts/meter linear interpolations (average reading). Per FCC 15.231(e).

(4) Spurious limit is 150-500 microvolts/meter linear interpolations (average reading). Per 15.231(e).

## 5.4 Occupied Bandwidth

The bandwidth of the emission shall be no wider than 0.25% of the center frequency, in this case, 1.084MHz(433.5x0.25%). Bandwidth is determined at the points 20dB down from the modulated carrier. Figure 5.2 shows the occupied bandwidth plot.

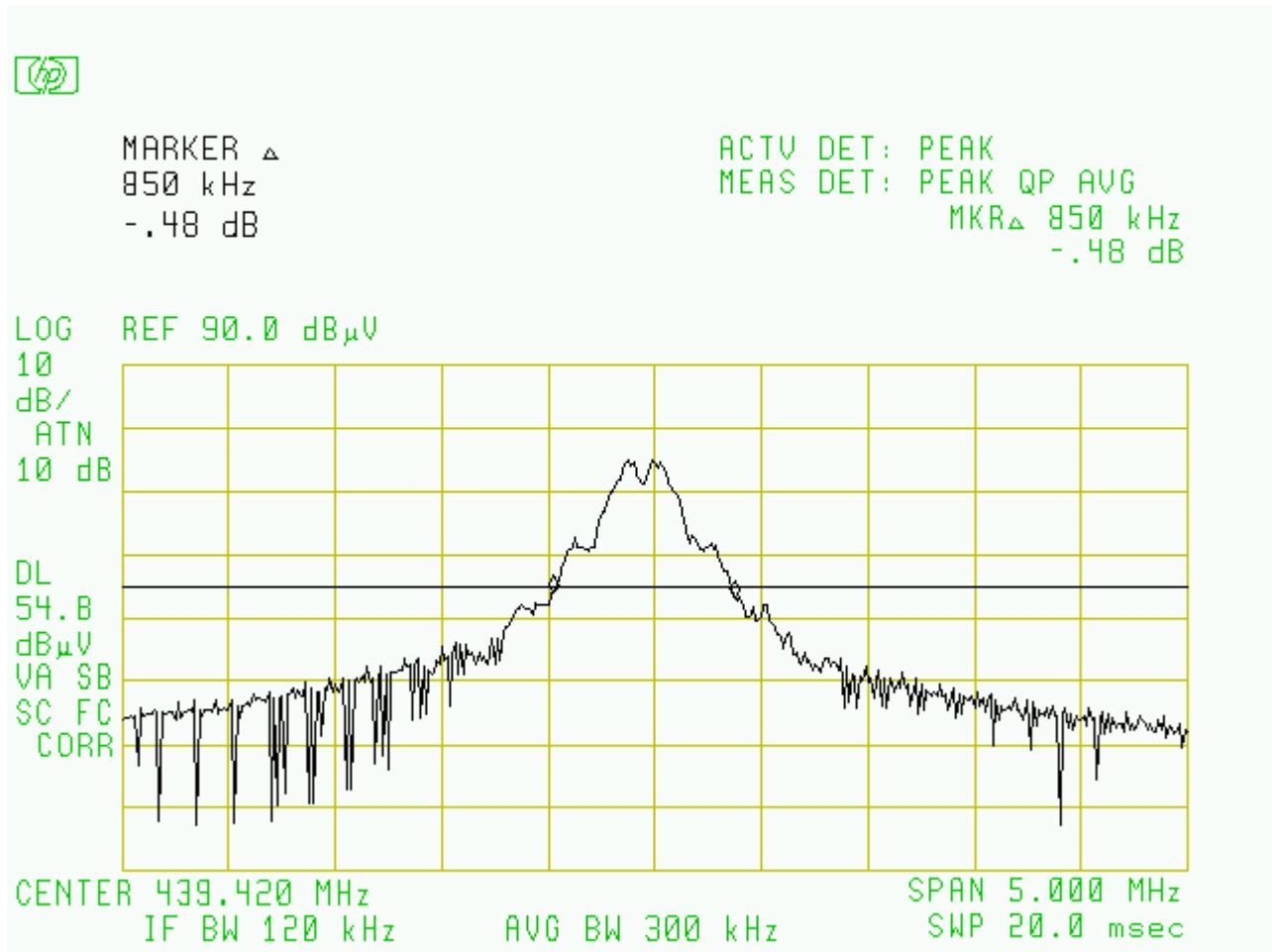


Figure 6.1 Occupied Bandwidth

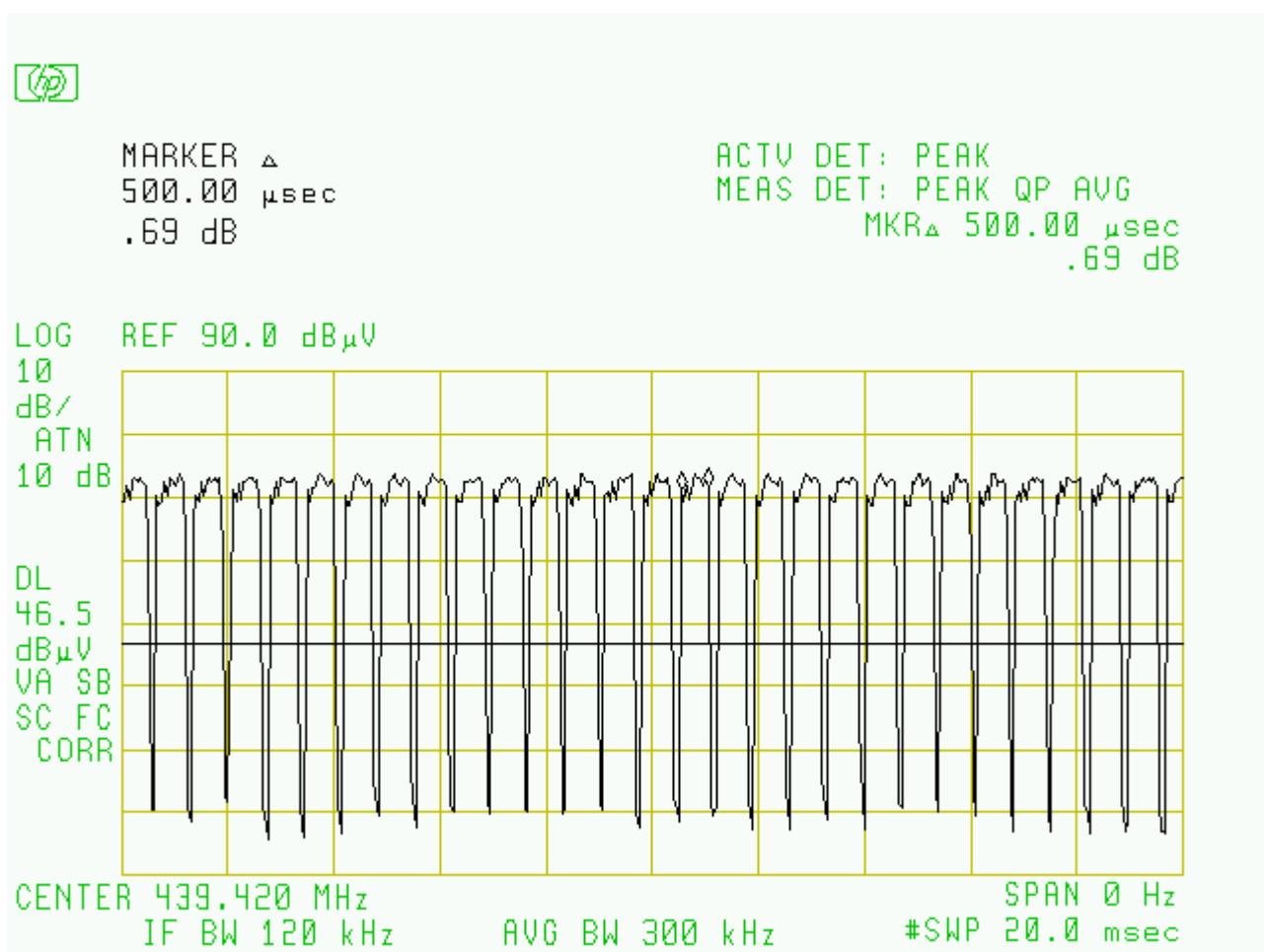


Figure 6.2 Pulse Train Timing