



EMISSION TEST REPORT

Report Number: 100216049BOX-002d

Project Number: G100216049

Report Issue Date: 11/29/2010

Product Designation: Igeacare Wireless Pendant

Standards: FCC Part 15 Subpart C Section 15.231
CFR47 FCC Part15, Subpart B:2009

Tested by:
Intertek Testing Services NA, Inc.
70 Codman Hill Road
Boxborough, MA 01719

Client:
IGEACare Solutions Inc
163 Rivalda Road
North York M9M 2M7

Report prepared by

Vathana F. Ven, Senior Project Engineer

Report reviewed by

Michael F. Murphy/EMC Staff Engineer

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2 Test Summary

| Section | Test full name | Result |
|---------|---|--------|
| 3 | Client Information | |
| 4 | Description of Equipment Under Test | |
| 5 | System Setup and Method | |
| 6 | 15.231(b) – Fundamental Field Strength | Pass |
| 7 | 15.231(b) – Harmonics and Spurious Field Strength | Pass |
| 8 | 15.231(c) – 20 dB Bandwidth | Pass |
| 9 | 15.231(a)(2) – 5 Seconds Off | Pass |
| 10 | Revision History | |

3 Client Information

This EUT was tested at the request of:

Company: IGEACare Solutions Inc
163 Rivalda Road
North York M9M 2M7

Contact: Mike Mahoney
Telephone: (416) 745-4608 ext. 251
Fax: N/A
Email: mmahoney@igeacare.com

4 Description of Equipment Under Test

| Equipment Under Test | | | |
|---------------------------|------------------------|--------------|---------------|
| Description | Manufacturer | Model Number | Serial Number |
| Igeacare Wireless Pendant | IGEACare Solutions Inc | 3001001 | A4 |
| | | | |
| | | | |
| | | | |

| | |
|---------------------|------------|
| Receive Date: | 09/27/2010 |
| Received Condition: | Good |
| Type: | Production |

Description of Equipment Under Test (provided by client)

The EUT is a transmitter. It runs on 3VDC battery.

| Equipment Under Test Power Configuration | | | |
|--|---------------|-----------------|------------------|
| Rated Voltage | Rated Current | Rated Frequency | Number of Phases |
| 3 VDC | N/A | N/A | N/A |

Operating modes of the EUT:

| No. | Descriptions of EUT Exercising |
|-----|--|
| 1 | The EUT was programmed to transmit continuously. |
| 2 | |

5 System Setup and Method

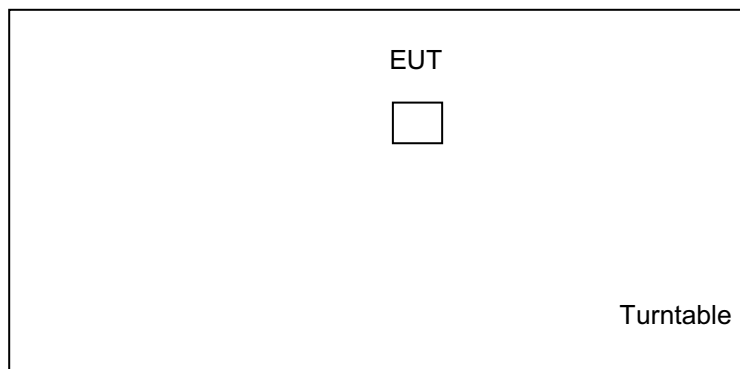
| Cables | | | | | |
|--------|-------------|------------|-----------|----------|-------------|
| ID | Description | Length (m) | Shielding | Ferrites | Termination |
| | None | | | | |
| | | | | | |

| Support Equipment | | | |
|-------------------|--------------|--------------|---------------|
| Description | Manufacturer | Model Number | Serial Number |
| None | | | |
| | | | |

5.1 Method:

Configuration as required by Section 15.231(a) to 15.231(c) of Standard taking Precedence.

5.2 EUT Block Diagram:



6 Fundamental Field Strength

6.1 Method

Tests are performed in accordance with 15.231(b).

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

Measurement Uncertainty

For radiated emissions, U_{lab} (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

Where

- FS = Field Strength in dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 52.0 dB μ V
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dB μ V/m

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

NF = Net Reading in dB μ V

Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$
$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

6.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---------|--|-------------------|--------------------|--------------|------------|------------|
| 145 106 | Bilog Antenna | Sunol Sciences | JB5 | A111003 | 07/20/2010 | 07/20/2011 |
| 145 003 | Preamplifier (150 KHz to 1.3 GHz) | Hewlett Packard | 8447D | 2443A04077 | 09/16/2010 | 09/16/2011 |
| 145 128 | EMI Test Receiver (20Hz - 40GHz) | Rohde & Schwarz | ESI | 837771/027 | 08/10/2010 | 08/10/2011 |
| 145-410 | Cables 145-400 145-406 145-407 145-405 145-403 | Huber + Suhner | 10m Track A Cables | multiple | 08/31/2010 | 08/31/2011 |
| DAV 003 | Weather Station | Davis Instruments | 7400 | PE80529A39 A | 06/11/2010 | 06/11/2011 |
| 145-416 | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| HORN3 | HORN ANTENNA | EMCO | 3115 | 9610-4980 | 03/22/2010 | 03/22/2011 |

Software Utilized:

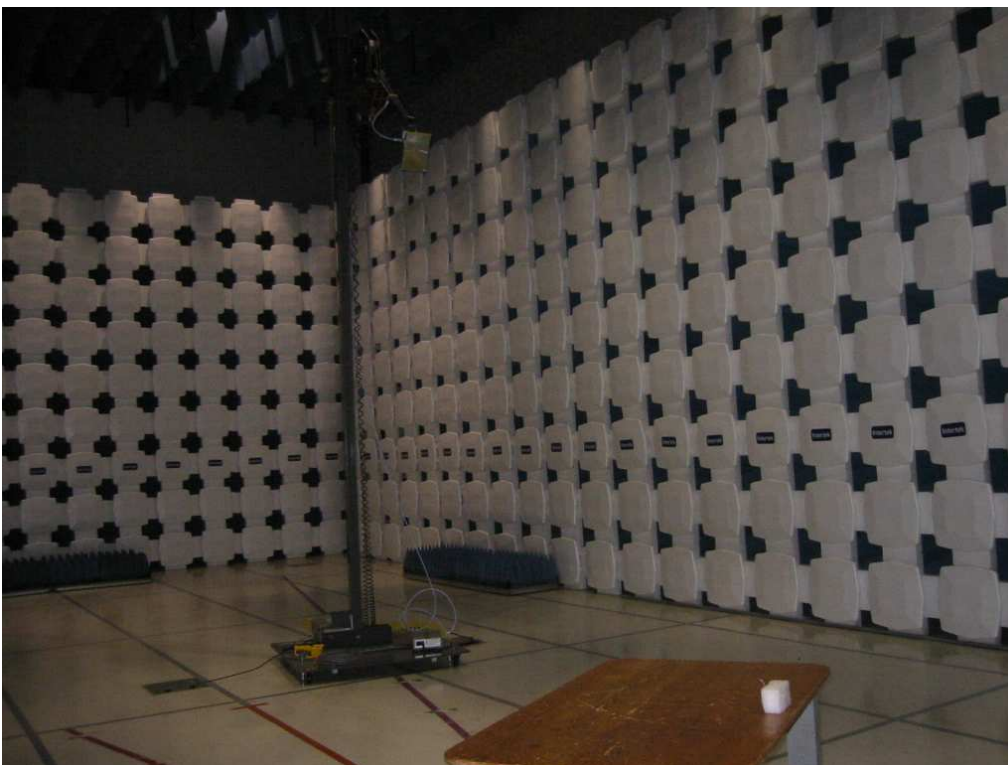
| Name | Manufacturer | Version |
|--------------------|--------------|--------------------|
| Excel 2003 | Microsoft | (11.8231.8221) SP3 |
| EMI Boxborough.xls | Intertek | 4/17/09 |

Note: Your Laptop may use a different version of Excel. Record the version you actually used!

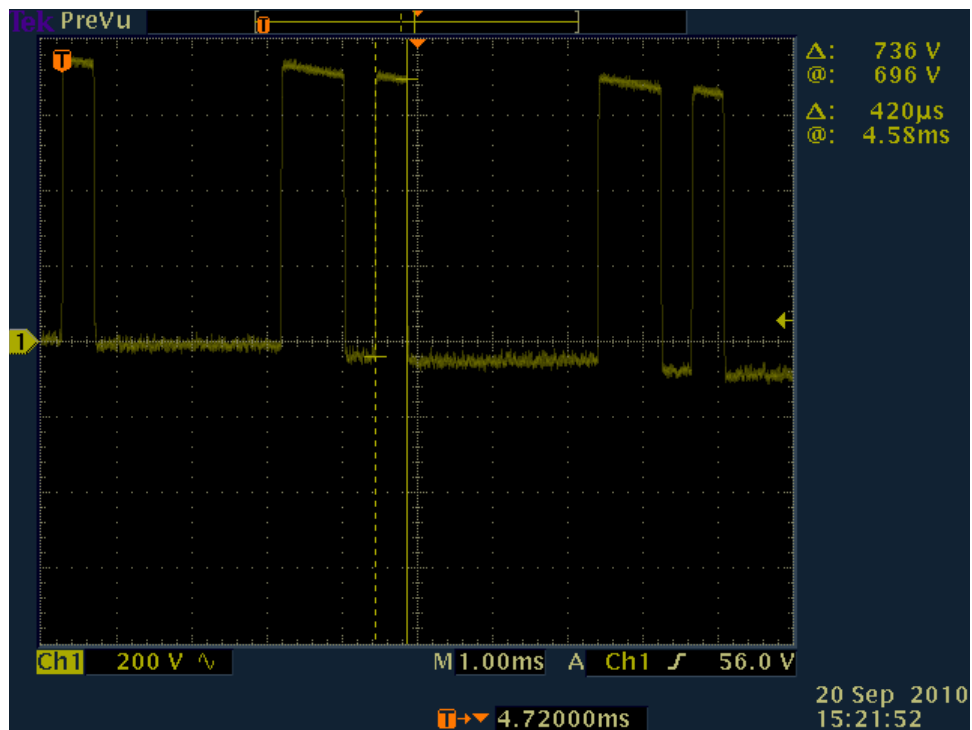
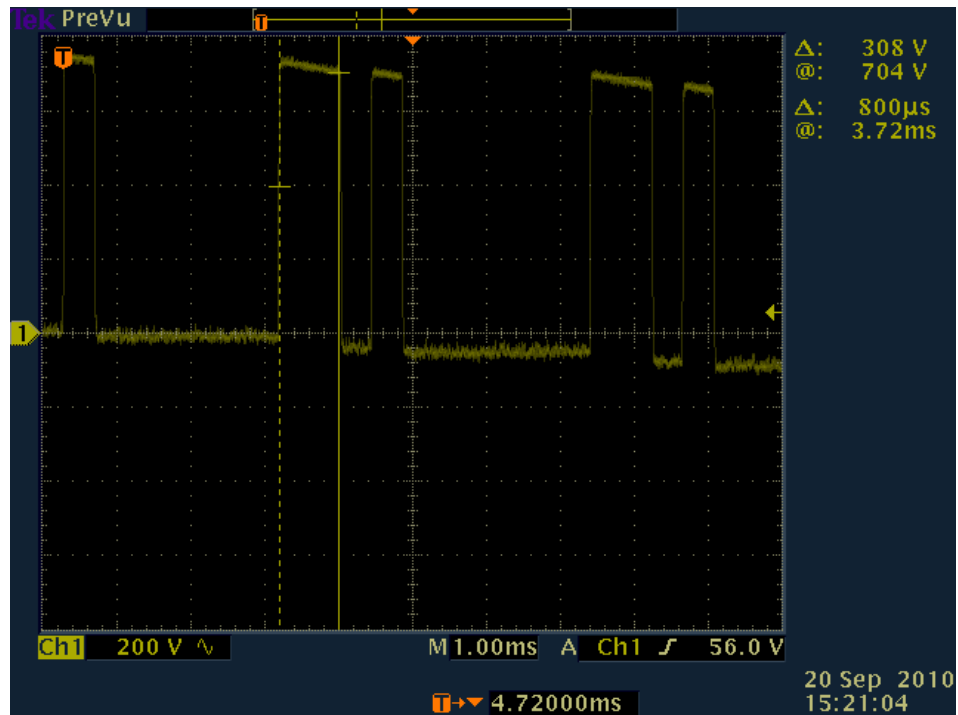
6.3 Results:

The sample tested was found to Comply.

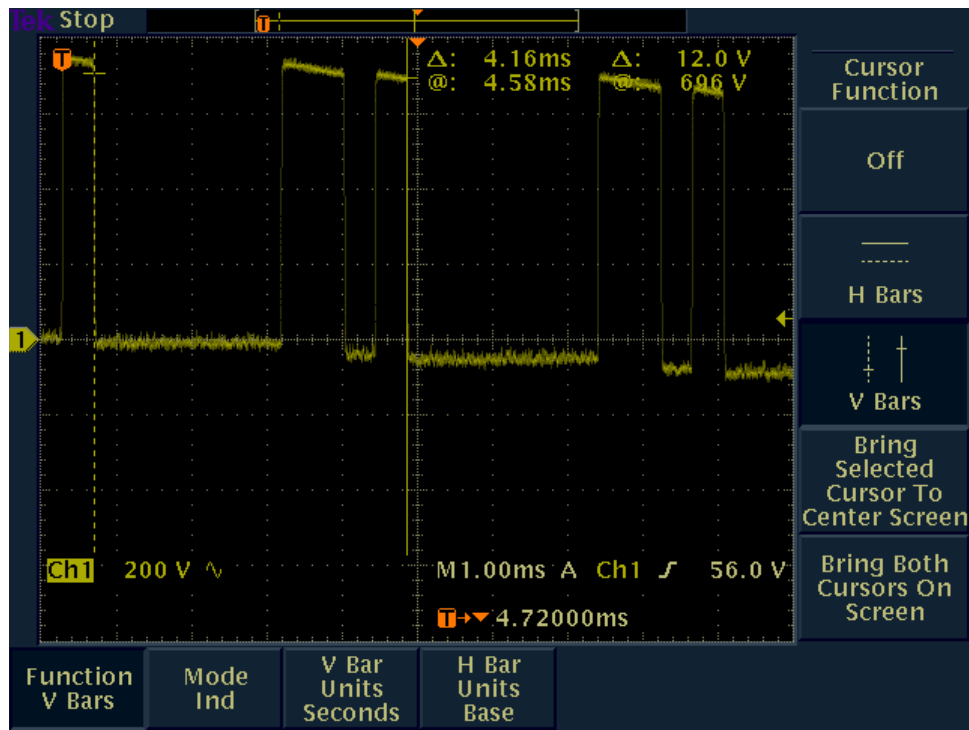
6.4 Setup Photographs:



6.5 Plots and data:



On time



Period

$$\text{Average factor} = 20 \cdot \text{LOG} \left(\frac{(0.420 + 0.800)}{4.16} \right) = 10.7 \text{ dB}$$

Radiated Emissions

Company: IGEACare Solutions Inc

Model #: 3001001

Serial #: A4

Engineers: Vathana Ven

Project #: G100216049

Standard: 15.231

Receiver: R&S ESI (145-128) 07-29-2011

PreAmp: 10mPreamp1145-003 09-16-2010.txt

PreAmp Used? (Y or N): Y

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth |
|---------------|-----------------|---------------|----------------|------------------------|---------------|-------------------|--------------------|--------------|----------------|-----------|-------------|
| PK | H | 433.929 | 67.20 | 16.58 | 3.54 | 28.10 | 0.24 | 58.97 | 80.80 | -21.83 | 120/300 kHz |

FCC

IC

Harmonic?

Average factor = 20*LOG ((0.420+0.800)/4.16) = -10.7 dB, average factors were applied to Peak readings to get Net readings

Test Personnel: Vathana Ven
 Product Standard: RSS-210
 Input Voltage: 3VDC

Pretest Verification w/
 BB Source: No

Test Date: 09/29/2010
 Test Levels: Below specified limits

Ambient Temperature: 22 °C
 Relative Humidity: 54 %
 Atmospheric Pressure: 1014 mbars

Deviations, Additions, or Exclusions: None

7 Harmonics and Spurious Field Strength

7.1 Method

Tests are performed in accordance with 15.231(b).

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

Measurement Uncertainty

For radiated emissions, U_{lab} (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

Where

- FS = Field Strength in dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 52.0 dB μ V
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dB μ V/m

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

NF = Net Reading in dB μ V

Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$
$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

7.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---------|--|-------------------|--------------------|--------------|------------|------------|
| 145 106 | Bilog Antenna | Sunol Sciences | JB5 | A111003 | 07/20/2010 | 07/20/2011 |
| 145 003 | Preamplifier (150 KHz to 1.3 GHz) | Hewlett Packard | 8447D | 2443A04077 | 09/16/2010 | 09/16/2011 |
| 145 128 | EMI Test Receiver (20Hz - 40GHz) | Rohde & Schwarz | ESI | 837771/027 | 08/10/2010 | 08/10/2011 |
| 145-410 | Cables 145-400 145-406 145-407 145-405 145-403 | Huber + Suhner | 10m Track A Cables | multiple | 08/31/2010 | 08/31/2011 |
| DAV 003 | Weather Station | Davis Instruments | 7400 | PE80529A39 A | 06/11/2010 | 06/11/2011 |
| 145-416 | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| HORN3 | HORN ANTENNA | EMCO | 3115 | 9610-4980 | 03/22/2010 | 03/22/2011 |

Software Utilized:

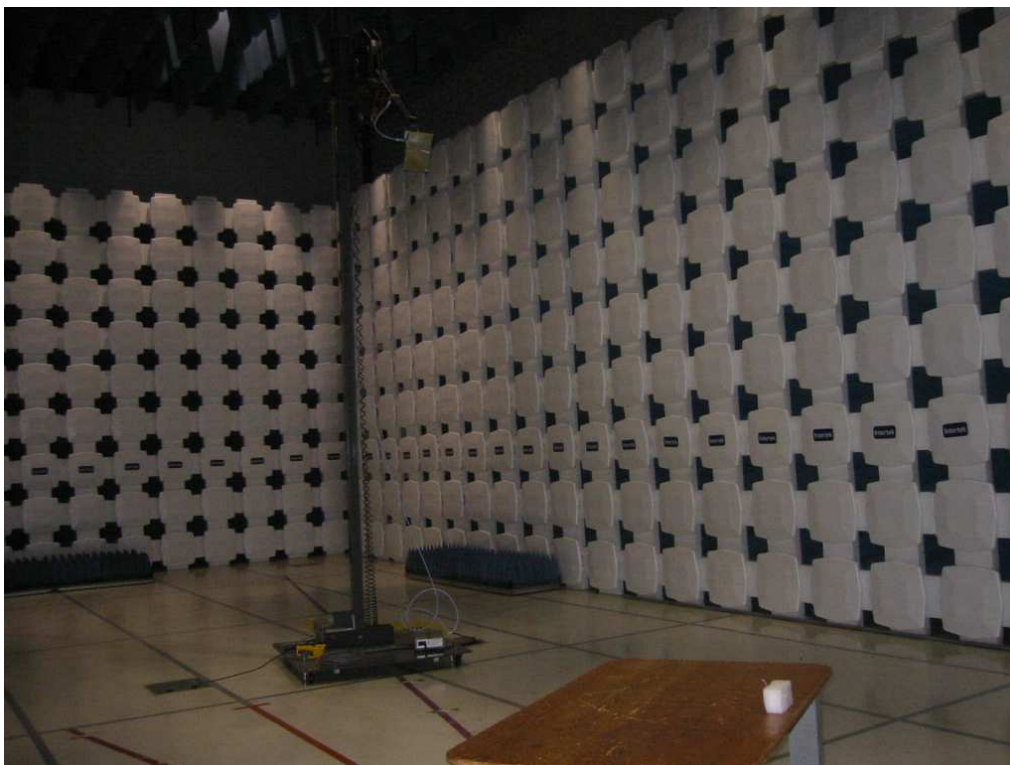
| Name | Manufacturer | Version |
|--------------------|--------------|--------------------|
| Excel 2003 | Microsoft | (11.8231.8221) SP3 |
| EMI Boxborough.xls | Intertek | 4/17/09 |

Note: Your Laptop may use a different version of Excel. Record the version you actually used!

7.3 Results:

The sample tested was found to Comply.

7.4 Setup Photographs:



8 20 dB Bandwidth

8.1 Method

Tests are performed in accordance with 15.231(c).

TEST SITE: EMC

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

8.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|--------|---------------------------------|-------------------|---------|------------|------------|------------|
| ROS001 | Spectrum Analyzer 20Hz - 40 GHz | Rohde & Schwartz | FSEK-30 | 100225 | 12/04/2009 | 12/04/2010 |
| HORN2 | HORN ANTENNA | EMCO | 3115 | 9602-4675 | 09/24/2010 | 09/24/2011 |
| DAV001 | Weather Station | Davis Instruments | 7400 | PE80519A61 | 06/11/2010 | 06/11/2011 |
| | | | | | | |

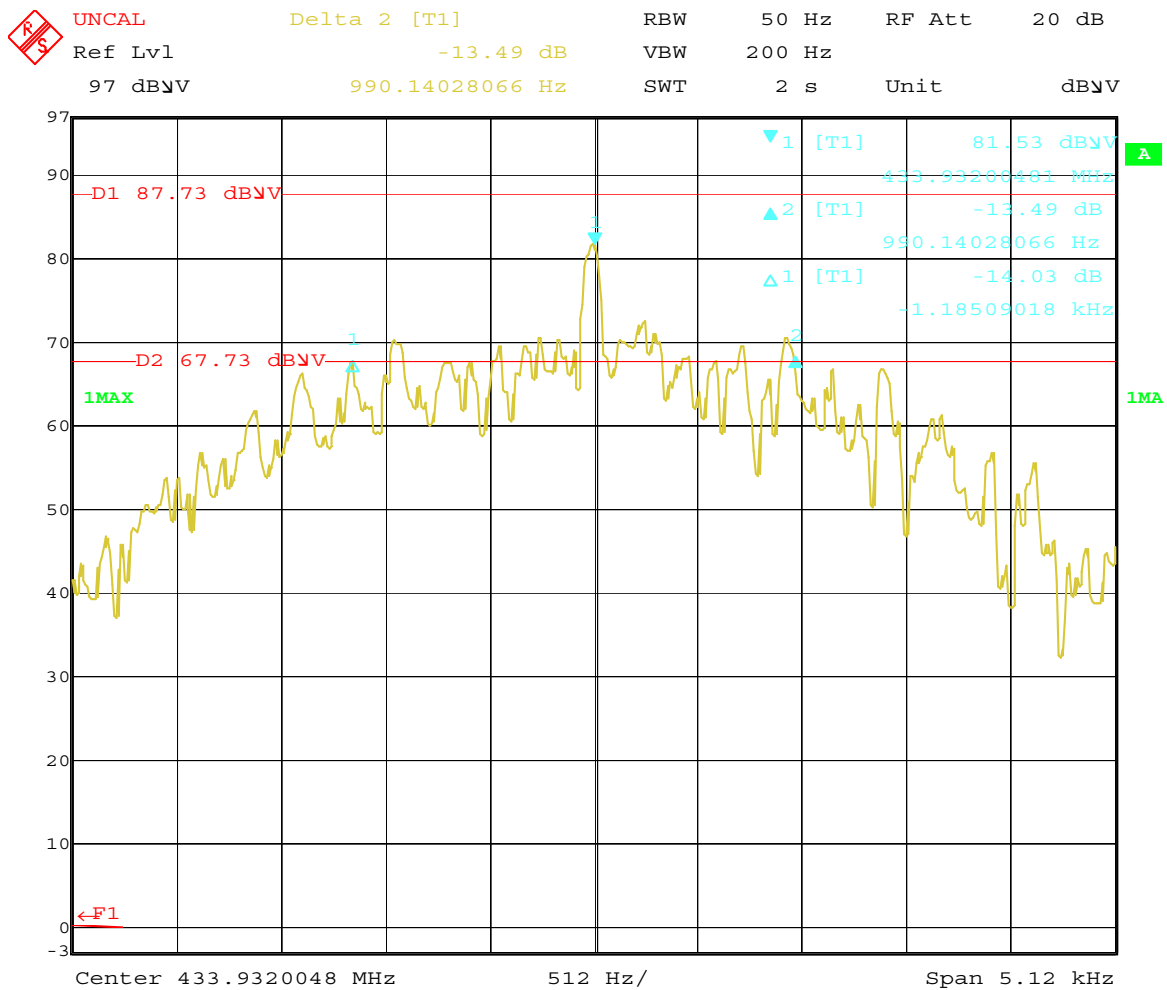
Software Utilized:

| Name | Manufacturer | Version |
|------|--------------|---------|
| None | | |

8.3 Results:

The sample tested was found to Comply.

8.4 Data:



Date: 19.SEP.2010 10:27:35

20 dB Bandwidth is 2.175 kHz

Test Personnel: Vathana Ven
Product Standard: RSS-210
Input Voltage: 3VDC
Pretest Verification w/
BB Source: No

Test Date: 09/19/2010
Test Levels: Below specified limits
Ambient Temperature: 21 °C
Relative Humidity: 58 %
Atmospheric Pressure: 995 mbars

9 5 Seconds Off

9.1 Method

Tests are performed in accordance with 15.231(a)(2).

TEST SITE: EMC

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

9.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|--------|---------------------------------|-------------------|---------|------------|------------|------------|
| ROS001 | Spectrum Analyzer 20Hz - 40 GHz | Rohde & Schwartz | FSEK-30 | 100225 | 12/04/2009 | 12/04/2010 |
| HORN2 | HORN ANTENNA | EMCO | 3115 | 9602-4675 | 09/24/2010 | 09/24/2011 |
| DAV001 | Weather Station | Davis Instruments | 7400 | PE80519A61 | 06/11/2010 | 06/11/2011 |
| | | | | | | |

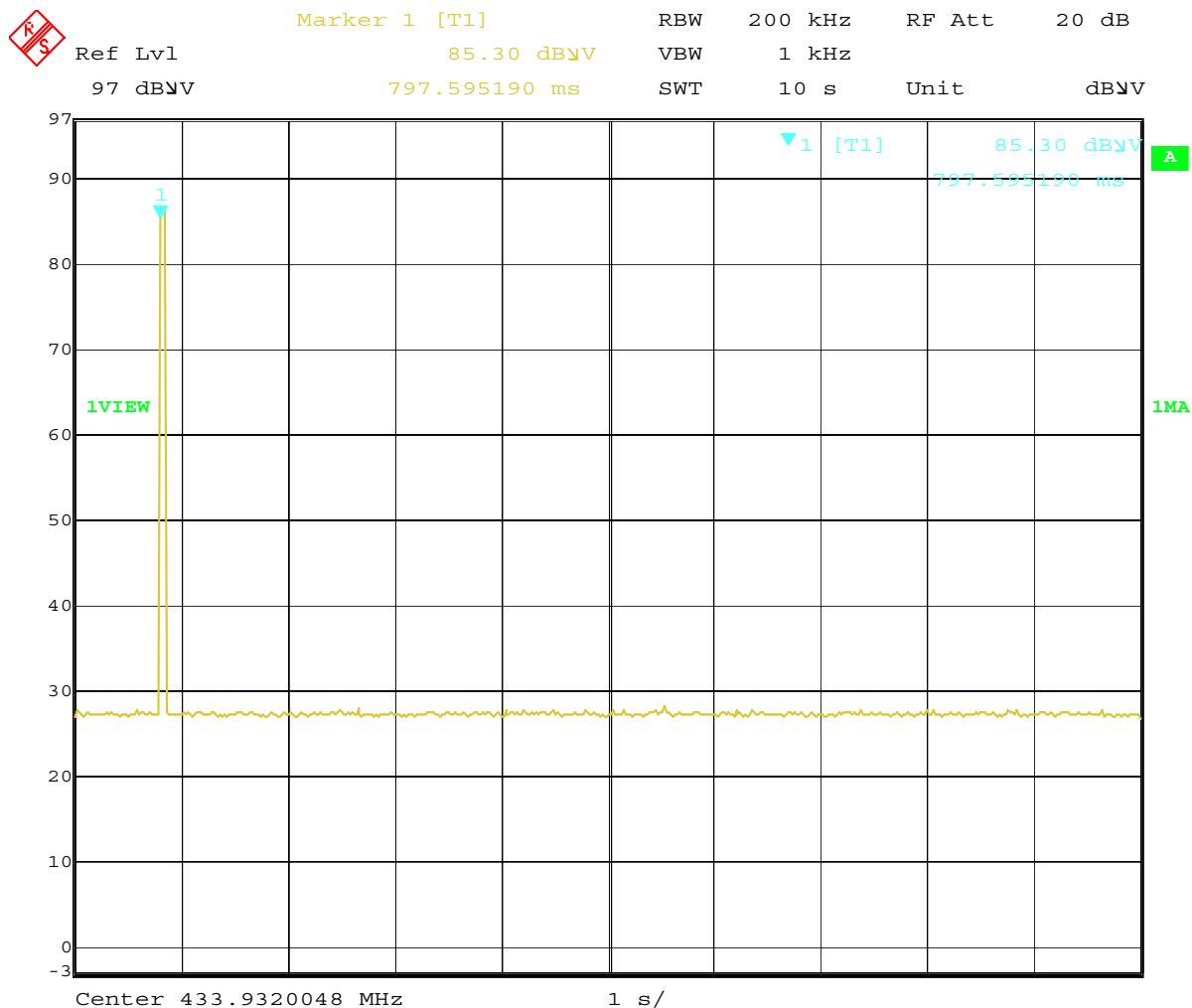
Software Utilized:

| Name | Manufacturer | Version |
|------|--------------|---------|
| None | | |

9.3 Results:

The sample tested was found to Comply.

9.4 Data:



Date: 19.SEP.2010 10:35:58

Test Personnel: Vathana Ven
Product Standard: RSS-210
Input Voltage: 3VDC
Pretest Verification w/
BB Source: No

Test Date: 09/19/2010
Test Levels: Below specified limits
Ambient Temperature: 21 °C
Relative Humidity: 58 %
Atmospheric Pressure: 995 mbars

10 Revision History

| Revision Level | Date | Report Number | Notes |
|----------------|------------|-------------------|-------------------------|
| 0 | 09/30/2010 | 100216049BOX-002b | Original Issue |
| 1 | 11/29/2010 | 100216049BOX-002d | Model number correction |
| | | | |
| | | | |
| | | | |
| | | | |