



MET Laboratories, Inc. Safety Certification - EMI - Telecom Environmental Simulation

914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230-3432 • PHONE (410) 354-3300 • FAX (410) 354-3313

Tridium
3951 Westerre Parkway, Suite 350
Richmond, VA 23233

June 8, 2009

Dear Jim Triplett,

Enclosed is the EMC test report for compliance testing of the Tridium, Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000, tested to the requirements of Title 47 of the CFR, Ch. 1 Part 18 Subpart C for Industrial, Scientific, and Medical (ISM) Equipment, Ultrasonic Devices.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Roseline Onyeagwu
Documentation Department

Reference: (\Tridium\EMC26131-FCC18 Rev. 1)

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MET Laboratories, Inc.

Safety Certification - EMI - Telecom Environmental Simulation

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**Electromagnetic Compatibility
Test Report**

For the

Tridium

Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000

Tested under

**Title 47 of the CFR, Part 18 Subpart C
for Industrial, Scientific, and Medical (ISM) Equipment, Ultrasonic Devices**

MET Report: EMC26131-FCC18

June 8, 2009

Prepared For:

**Tridium
3951 Westerre Parkway, Suite 350
Richmond, VA 23233**

**Prepared By:
MET Laboratories, Inc.
914 West Patapsco Avenue
Baltimore, MD 21230**



Electromagnetic Compatibility Test Report

For the

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MET Report: EMC26131-FCC18

A handwritten signature in blue ink, appearing to read "D. Tennakoon".

Dusmantha Tennakoon
Project Engineer, Electromagnetic Compatibility Lab

A handwritten signature in blue ink, appearing to read "Roseline Onyeagwu".

Roseline Onyeagwu
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the applicable limits. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Title 47 of the CFR, Part 15, Subpart B for a Class A Digital Device under normal use and maintenance.

A handwritten signature in blue ink, appearing to read "Shawn McMillen".

Shawn McMillen,
Wireless Manager, Electromagnetic Compatibility Lab



Report Status Sheet

| Revision | Report Date | Reason for Revision |
|----------|-------------------|------------------------|
| Ø | February 03, 2009 | Initial Issue. |
| 1 | June 8, 2009 | Editorial corrections. |



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List of Terms and Abbreviations

| | |
|------------------------------|---|
| AC | Alternating Current |
| ACF | Antenna Correction Factor |
| ANSI | American National Standards Institute |
| Cal | Calibration |
| d | Measurement Distance |
| dB | Deci Bels |
| dBμV | Deci-Bels above one micro Volt |
| dBμV/m | Deci-Bels above one micro Volt per meter |
| DC | Direct Current |
| DCF | Distance Correction Factor |
| E | Electric Field |
| EUT | Equipment Under Test |
| f | Frequency |
| FCC | Federal Communications Commission |
| GHz | Giga Hertz |
| Hz | Hertz |
| kHz | kilohertz |
| kPa | kilopascal |
| kV | kilo Volt |
| LISN | Line Impedance Stabilization Network |
| MHz | MegaHertz |
| μH | micro Henry |
| μF | micro Farad |
| μs | micro seconds |
| RF | Radio Frequency |
| RMS | Root-Mean-Square |



1.0 Testing Summary

| Reference and Test Description | Results | Comments |
|--|-----------|--|
| Title 47 of the CFR, Part 18 Subpart C - 18.307 (a) Conducted Emission Limits for Industrial, Scientific, and Medical (ISM) Equipment, Ultrasonic Devices | Compliant | Measured emissions were below applicable limits. |
| Title 47 of the CFR, Part 18 Subpart C - 18.305 (b) Radiated Emission Limits for Industrial, Scientific, and Medical (ISM) Equipment, Ultrasonic Devices | Compliant | Measured emissions were below applicable limits. |

Table 1. Summary of Test Results



2.0 Equipment Configuration

2.1 Overview

MET Laboratories, Inc. was contracted by Tridium to perform testing on the Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000, under Tridium purchase order number 40003582.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Tridium, Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000.

In accordance with §2.1075(a) (3), the following data is presented in support of the Declaration of Conformity of the Tridium, Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000. Tridium should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000 have been **permanently** discontinued, as per §2.1075 (c). (All references are to the most current version of Title 47 of the Code of Federal Regulations in effect).

The results obtained relate only to the item(s) tested.

| | |
|--|---|
| Model(s) Tested: | Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000 |
| Model(s) Covered: | Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000 |
| Primary Power as Tested: | 120 VAC, 60 Hz |
| Ultrasonic Operating Frequency: | 40 KHz |
| Evaluated by: | Dusmantha Tennakoon |
| Report Date: | June 8, 2009 |

Table 2. EUT Overview



2.2 Test Site

All testing was performed at MET Laboratories, Inc., 914 West Patapsco Avenue, Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a semi-anechoic chamber. In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories. In accordance with §2.948(d), MET Laboratories has been accredited by the National Voluntary Laboratory Accreditation Program (Lab Code: 100273-0).

2.3 Description of Test Sample

The Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000, Equipment Under Test (EUT), is referred to as EUT for the remainder of this document.

1. The Wall Data Hub Collects patient medical data via IEEE 802.15.4 wireless RF. Used in a hospital room to auto-collect medical data from medical devices connected to a patient.
2. The Powered Beacon Module broadcasts a “beacon” signal via combination of IEEE 802.15.4 wireless RF followed immediately by 40 KHz ultrasonic signal. Devices in the hospital room receive this signal and determine their distance from the Powered Beacon Module.

Note: The IEEE 802.15.4 RF Module is a FCC pre-approved module. FCC ID: TYOJN5139M0



2.4 Equipment Configuration

All equipment incorporated as part of the EUT is included in the following list.

| Name / Description | Model Number | Serial Number | Rev. # |
|-----------------------|---------------|---------------|--------|
| Powered Beacon Module | HR-BAH-PBM000 | 2008110400014 | 1.1 |

Table 3. Equipment Configuration

2.5 Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

| Name / Description | Manufacturer | Model Number |
|--------------------|--------------|---------------|
| Laptop | Dell | Inspiron |
| Broadband Router | Linksys | WRT54GC |
| Wall Data Hub | Tridium | HH-BAH-WDH000 |

Table 4. Support Equipment



2.6 Ports and Cabling Information

| Ref. ID | Port name on EUT | Cable Description or reason for no cable | Qty | Length as tested (m) | Max Length (m) | Shielded? (Y/N) | Termination Box ID & Port Name |
|---------|--|--|-----|----------------------|----------------|-----------------|--------------------------------|
| 1 | WDH AC Input | 3 Conductor, 16 awg | 1 | 2 | 2 | Yes | 120V/60Hz |
| 2 | WDH Ethernet | CAT5 | 1 | 7.62 | 100 | Yes | EN1 |
| 3 | WDH Beacon Power 1 | 154382, 2 conductor | 1 | 4 | 4 | No | J1 |
| 4 | WDH Beacon Power 2 | 154382, 2 conductor | 1 | 4 | 4 | No | J2 |
| 5 | WDH all other ports | All other WDH ports are unused in this application | | | | | |
| 6 | PBM Input Power (Amp Connector) | 154382, 2 conductor | 1 | 4 | 4 | No | J4 |
| 7 | PBM Input Power (Circular DIN Connector) | Alternate Power Input Connector | | | | | J3 |
| 8 | PBM DB9 Port | Used for configuration Only | | | | | J5 |

Table 5. Ports and Cabling Information



Tridium
Wall Data Hub/ HH-BAH-WDH000 and Powered Beacon Module/ HR-BAH-PBM000

Electromagnetic Compatibility
Equipment Configuration
CFR Title 47, Part 18, Subpart C



Photograph 1. External Photo – 1



2.7 Mode of Operation

Ultrasonic Test Mode: The Powered Beacon modules have been programmed so that they continuously transmit the 40KHz Ultrasonic signal.

2.8 Modifications

2.8.1 Modifications to the EUT

No modifications were made to the EUT:

2.8.2 Modifications to the Test Standard

No modifications were made to the test standard.



3.0 Electromagnetic Compatibility Emission Criteria

3.1 Conducted Emission Limits

Test Requirement(s): **18.307 (a)** For the following equipment, when designed to be connected to the public utility (AC) power line the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies shall not exceed the limits in the following tables. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal using a 50 μ H/50 Ohms Line Impedance Stabilization Network (LISN).

All Induction cooking ranges and ultrasonic equipment:

| Frequency of Emission (MHz) | 18.307(a) ISM Conducted Limits (dB μ V) | |
|--------------------------------|---|-----------|
| | Quasi-Peak | Average |
| 0.05- 0.15 | 90 to 80* | -- |
| 0.15 - 0.5 | 66 to 56* | 56 to 46* |
| 0.5 - 5 | 56 | 46 |
| 5 - 30 | 60 | 50 |

Note 1 — The lower limit shall apply at the transition frequencies.

Note 2 — *The limit decreases linearly with the logarithm if the frequency in the range 0.05 MHz to 0.5 MHz.

Table 6. Conducted Limits for ISM (Ultrasonic Equipment) calculated from FCC Part 18 Section 18.307(a)

18.311 The measurement techniques which will be used by the FCC to determine compliance with the technical requirements of this part are set out in FCC Measurement Procedure MP-5, ‘‘Methods of Measurements of Radio Noise Emissions from ISM equipment’’. Although the procedures in MP-5 are not mandated, manufacturers are encouraged to follow the same techniques which will be used by the FCC.



Test Procedures: The EUT was situated such that the back of the EUT was 0.4 m from one wall of the shielded enclosure, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface.

The EUT was powered from a 50 Ω/50 µH Line Impedance Stabilization Network (LISN).

The EMC receiver scanned the frequency range from 9 kHz to 30 MHz.

Test Results: The EUT was compliant with the requirement(s) of this section. Measured emissions were below applicable limits.

Test Engineer(s): Dusmantha Tennakoon

Test Date(s): 01/12/09

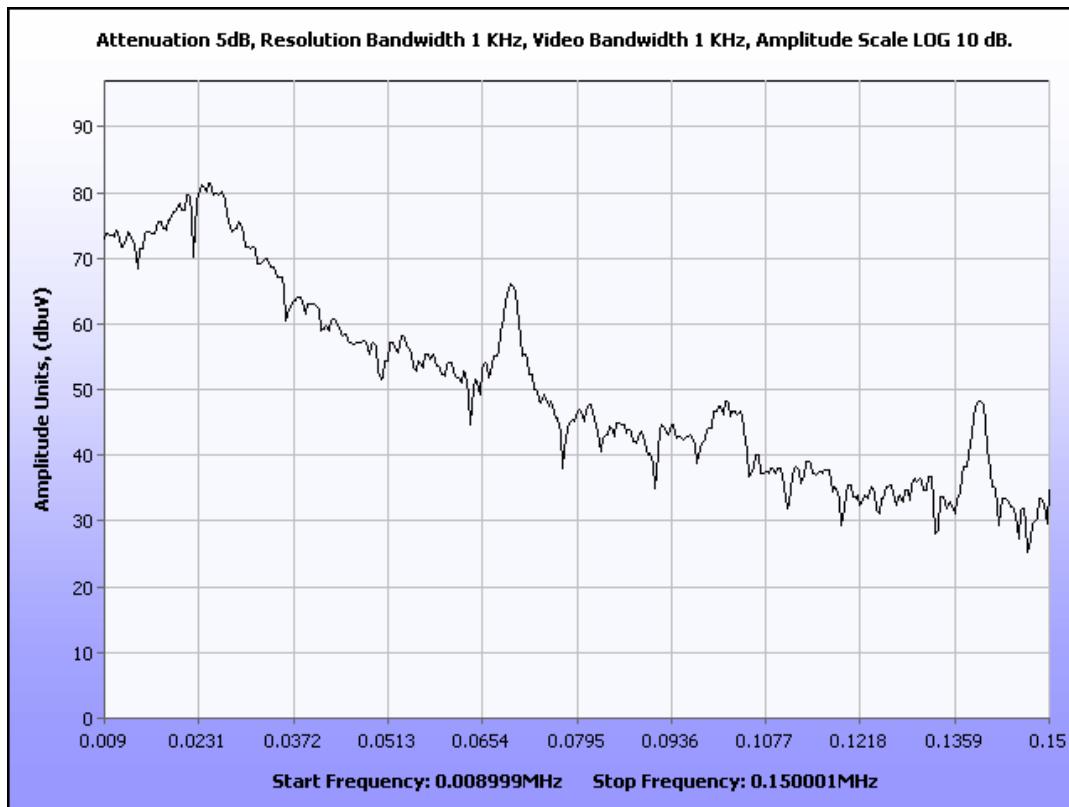


Conducted Emissions - Voltage, AC Power, Phase Line

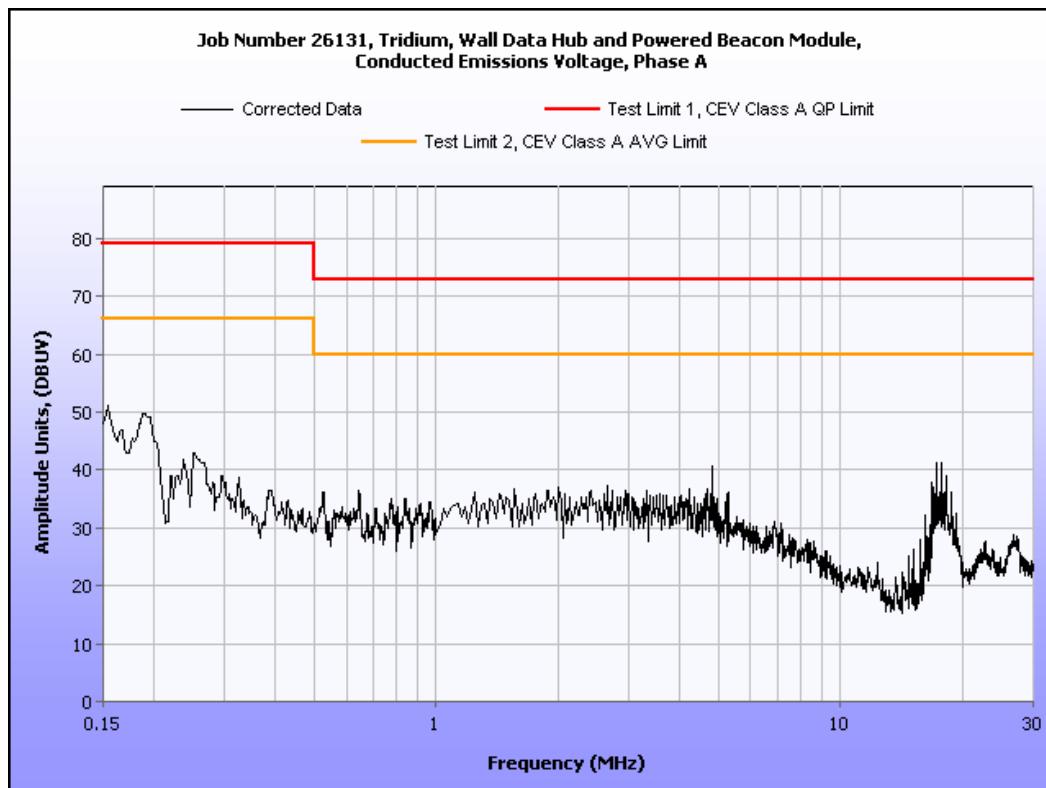
| Frequency (MHz) | Uncorrected Meter Reading (dBuV) QP | Cable Loss (dB) | Corrected Measurement (dBuV) QP | Limit (dBuV) QP | Margin (dB) QP | Uncorrected Meter Reading (dBuV) Avg. | Cable Loss (dB) | Corrected Measurement (dBuV) AVG | Limit (dBuV) AVG | Margin (dB) AVG |
|-----------------|-------------------------------------|-----------------|---------------------------------|-----------------|----------------|---------------------------------------|-----------------|----------------------------------|------------------|-----------------|
| 0.0249 | 62.14 | 0.1 | 62.24 | 110 | -47.76 | | | | | |
| 0.069.5 | 56.29 | 0.1 | 56.39 | 80 | -23.61 | | | | | |
| 0.1394 | 40.63 | 0.1 | 40.73 | 80 | -39.27 | | | | | |
| 0.1518 | 35.3 | 0.08806 | 35.38806 | 65.9 | -30.5119 | 18.2 | 0.08806 | 18.28806 | 55.9 | -37.6119 |
| 0.5038 | 16.84 | 0.17 | 17.01 | 56 | -38.99 | 12.54 | 0.17 | 12.71 | 46 | -33.29 |
| 17.45 | 34.38 | 0.33 | 34.71 | 60 | -25.29 | 19.78 | 0.33 | 20.11 | 50 | -29.89 |

Table 7. Conducted Emissions - Voltage, AC Power, Phase Line

Conducted Emissions - Voltage, Worst Case Emissions, AC Power



Plot 1. Conducted Emissions, 9 KHz to 150 KHz, Phase Line Plot



Plot 2. Conducted Emissions, 150 KHz to 30 MHz, Phase Line Plot

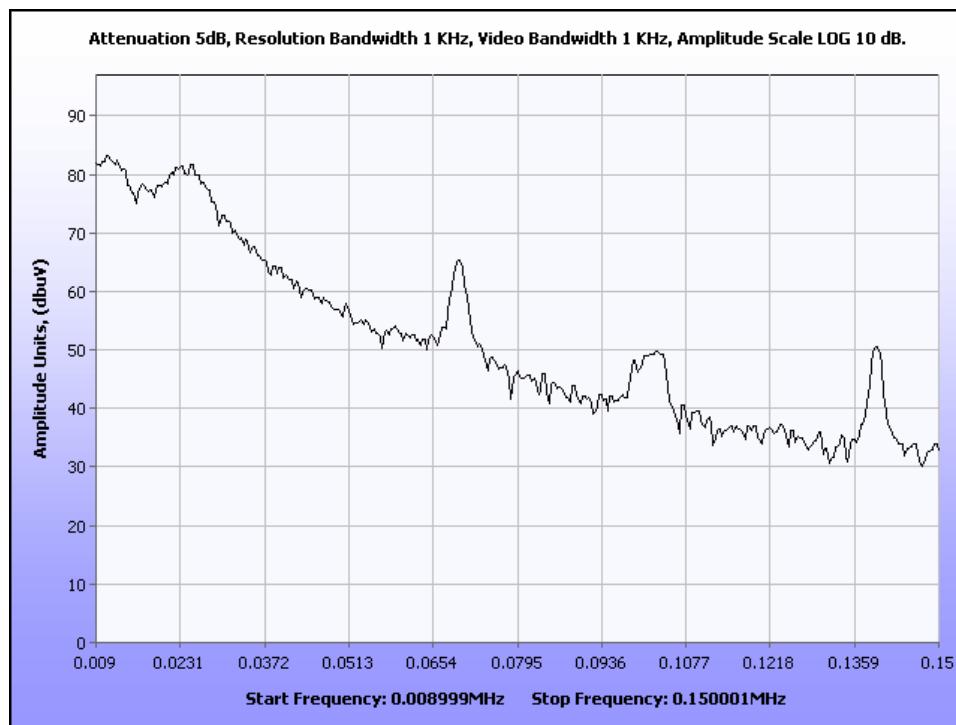


Conducted Emissions - Voltage, AC Power, Neutral Line

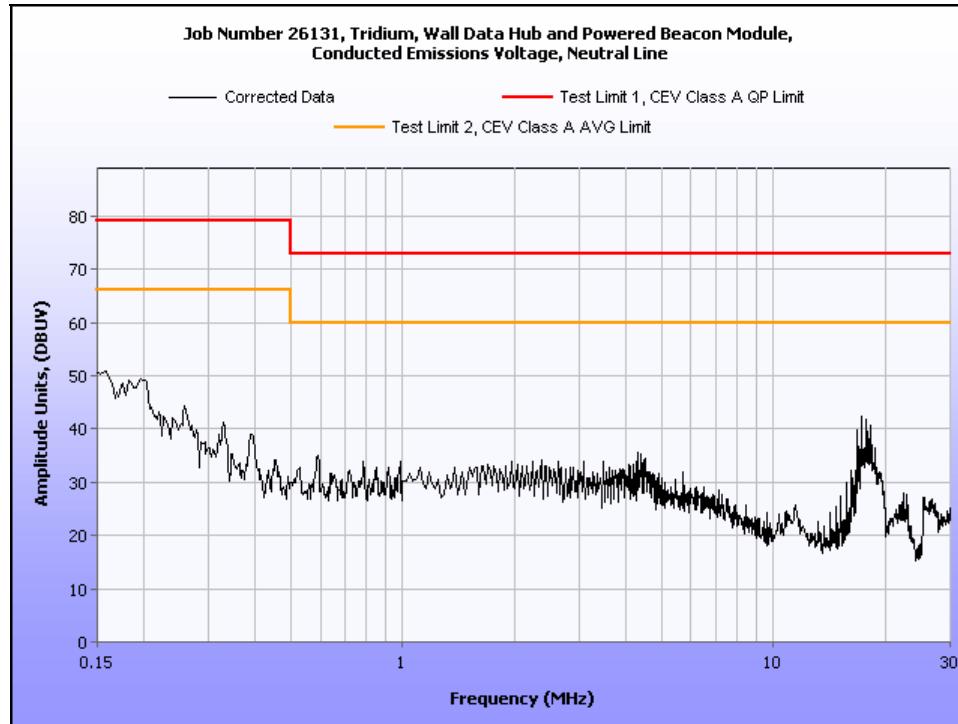
| Frequency (MHz) | Uncorrected Meter Reading (dBuV) QP | Cable Loss (dB) | Corrected Measurement (dBuV) QP | Limit (dBuV) QP | Margin (dB) QP | Uncorrected Meter Reading (dBuV) Avg. | Cable Loss (dB) | Corrected Measurement (dBuV) AVG | Limit (dBuV) AVG | Margin (dB) AVG |
|-----------------|-------------------------------------|-----------------|---------------------------------|-----------------|----------------|---------------------------------------|-----------------|----------------------------------|------------------|-----------------|
| 0.0223 | 78.9 | 0.1 | 79 | 110 | -31 | | | | | |
| 0.0694 | 63.37 | 0.1 | 63.47 | 80 | -16.53 | | | | | |
| 0.1393 | 45.87 | 0.1 | 45.97 | 80 | -34.03 | | | | | |
| 0.1619 | 28.59 | 0.10523 | 28.69523 | 65.37 | -36.6748 | 17.6 | 0.10523 | 17.70523 | 55.37 | -37.6648 |
| 0.5037 | 26.54 | 0.17 | 26.71 | 56 | -29.29 | 18.9 | 0.17 | 19.07 | 46 | -26.93 |
| 17.44 | 40.3 | 0.33 | 40.63 | 60 | -19.37 | 22.31 | 0.33 | 22.64 | 50 | -27.36 |

Table 8. Conducted Emissions - Voltage, AC Power, Neutral Line

Conducted Emissions - Voltage, Worst Case Emissions, AC Power



Plot 3. Conducted Emissions, 9 KHz to 150 KHz, Neutral Line Plot



Plot 4. Conducted Emissions, 150 KHz to 30 MHz, Neutral Line Plot

Conducted Emission Limits Test Setup



Photograph 2. Conducted Emissions, Test Setup



3.2 Radiated Emission Limits

Test Requirement(s): **18.305 (b) and 18.309 (a)** The field strength of radiated emissions from Industrial, Scientific, and Medical (ISM) Equipment, Ultrasonic Devices shall meet the limits specified in FCC Part 18 Sections 18.305(b) and 18.309(a).

18.305 (b) The field strength levels of emissions which lie outside the bands specified in § 18.301, unless otherwise indicated, shall not exceed the following:

| Equipment | Operating frequency | RF Power generated by equipment (watts) | Field strength limit (uV/m) | Distance (meters) |
|---|-----------------------|---|---|-------------------------|
| Any type unless otherwise specified (miscellaneous) | Any ISM frequency | Below 500 500 or more | 25 $25 \times \text{SQRT}(\text{power}/500)$ | 300 ¹ 300 |
| | Any non-ISM frequency | Below 500 500 or more | 15 $15 \times \text{SQRT}(\text{power}/500)$ | 300 ¹ 300 |
| Industrial heaters and RF stabilized arc welders | On or below 5,725 MHz | Any | 10 | 1,600 |
| | Above 5,725 MHz | Any | (Note ²) | (Note ²) |
| Medical diathermy | Any ISM frequency | Any | 25 | 300 |
| | Any non-ISM frequency | Any | 15 | 300 |
| Ultrasonic | Below 490 kHz | Below 500 500 or more | $2,400/\text{F(kHz)}$ $2,400/\text{F(kHz)} \times \text{SQRT}(\text{power}/500)$ | 300 ³ 300 |
| Induction cooking ranges | 490 to 1,600 kHz | Any | $24,000/\text{F(kHz)}$ | 30 |
| | Above 1,600 kHz | Any | 15 | 30 |
| | Below 90 kHz | Any | 1,500 | ⁴ 30 |
| | On or above 90 kHz | Any | 300 | ⁴ 30 |

¹ Field strength may not exceed 10 $\mu\text{V}/\text{m}$ at 1600 meters. Consumer equipment operating below 1000 MHz is not permitted the increase in field strength otherwise permitted here for power over 500 watts.

² Reduced to the greatest extent possible.

³ Field strength may not exceed 10 $\mu\text{V}/\text{m}$ at 1600 meters. Consumer equipment is not permitted the increase in field strength otherwise permitted here for over 500 watts.

⁴ Induction cooking ranges manufactured prior to February 1, 1980, shall be subject to the field strength limits for miscellaneous ISM equipment.



18.309 (a) field strength:

| Frequency (MHz) | § 18.309 (a) ISM Limit (dB μ V) |
|-----------------|-------------------------------------|
| 30 - 88 | 30 |
| 88 - 216 | 50 |
| 216 - 1000 | 70 |

Table 9. Radiated Emissions Limits from FCC Part 18 Section 18.309 (a)

18.311 The measurement techniques which will be used by the FCC to determine compliance with the technical requirements of this part are set out in FCC Measurement Procedure MP-5, "Methods of Measurements of Radio Noise Emissions from ISM equipment". Although the procedures in MP-5 are not mandated, manufacturers are encouraged to follow the same techniques which will be used by the FCC.

Test Procedures:

The EUT was installed placed on a non-metallic table, 80 cm above the ground plane (See Photograph 6) inside a semi-anechoic chamber. Measurements were made with a loop antenna.

Radiated Emission measurements were made in accordance with the general procedures of ANSI C63.4-1992 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40 GHz" as well as the procedures delineated in FCC Measurement Procedure MP-5, "Methods of Measurements of Radio Noise Emissions from ISM equipment".

For each point of measurement, the turntable was rotated, the positions of the interface cables were varied, and the antenna height was varied in order to find the maximum radiated emissions.

Measurements were made at 3m. The limit line was corrected for 3m using $40 \log(\frac{d_1}{d_2})$.

Test Results:

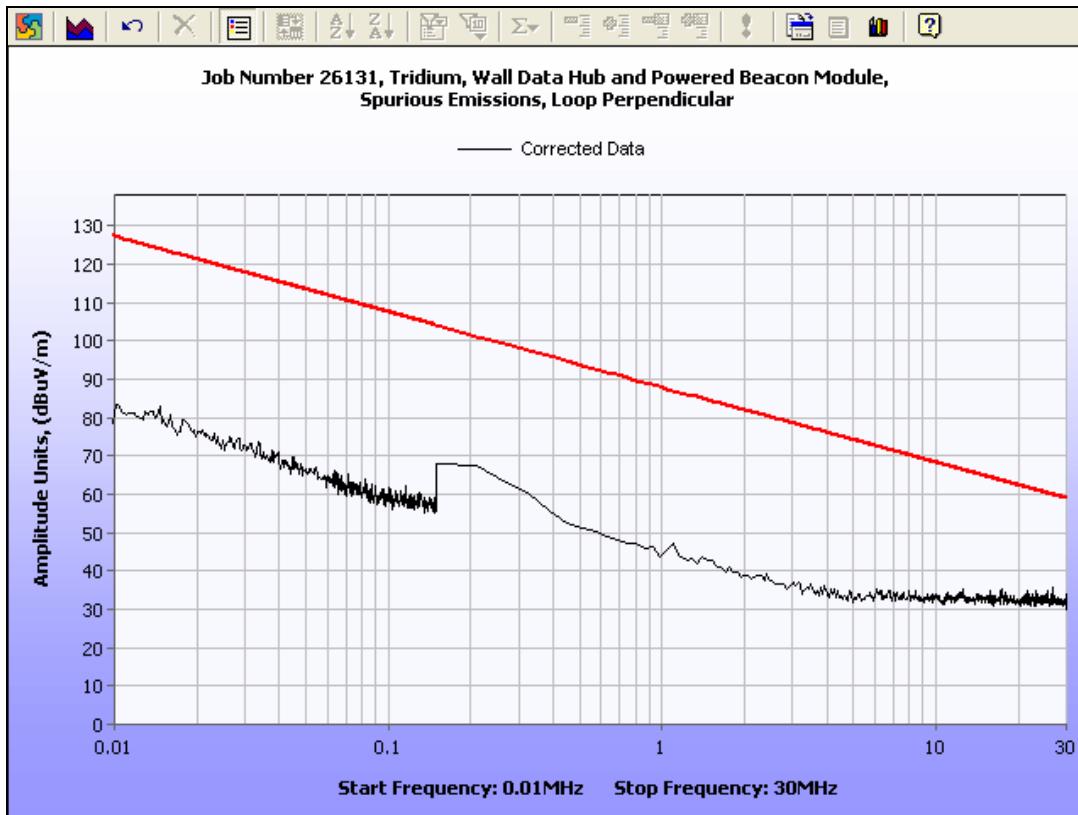
The EUT was compliant with the requirement(s) of this section. Measured emissions were below applicable limits.

Test Engineer(s):

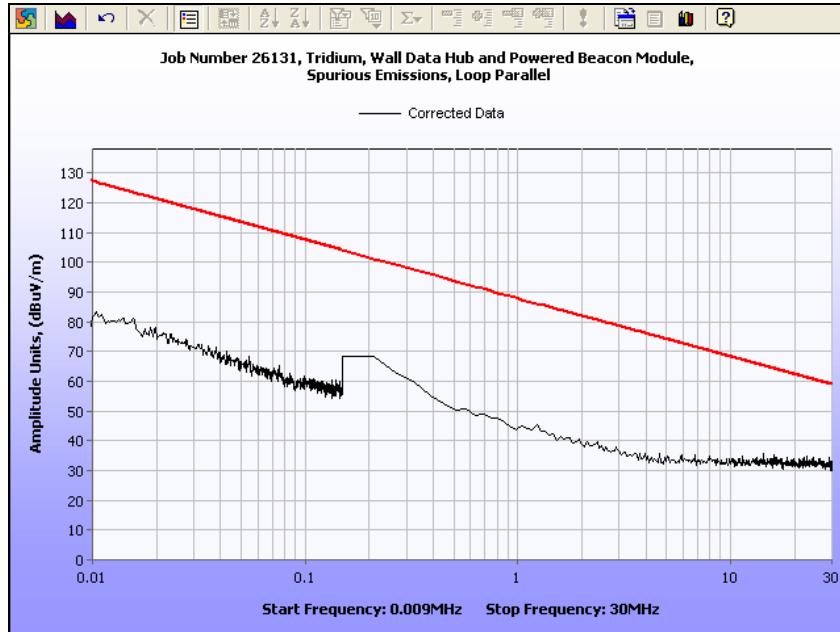
Dusmantha Tennakoon

Test Date(s):

01/28/09 and 01/29/09

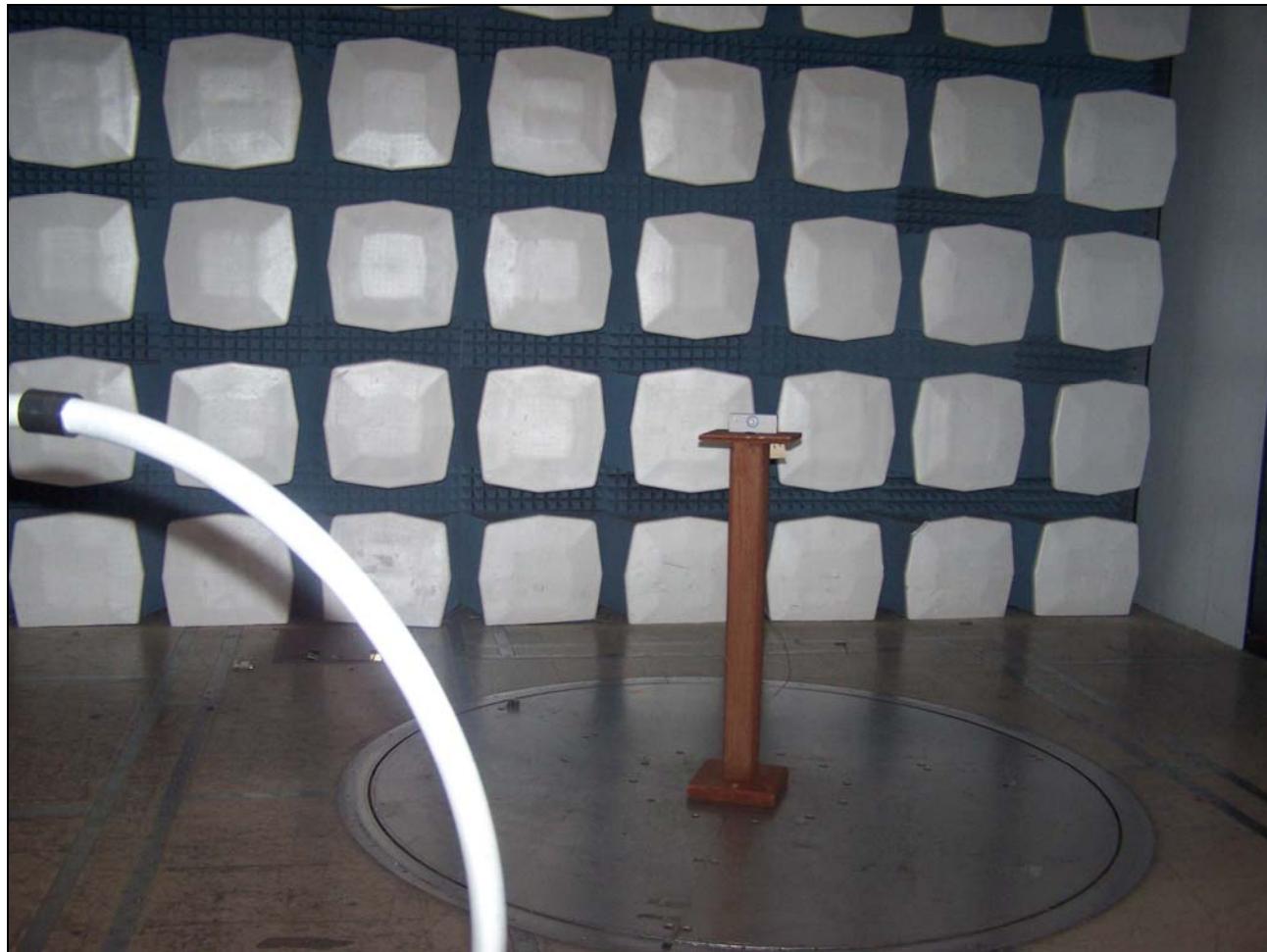


Plot 5. Radiated Emissions, Loop Antenna Perpendicular



Plot 6. Radiated Emissions – Loop Antenna Planar

Radiated Emission Limits Test Setup



Photograph 3. Radiated Emission Limits Test



4.0 Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ANSI/NCSL Z540-1-1994 and ANSI/ISO/IEC 17025:2000.

| Test Name: Spurious Emissions | | | | | Test Date(s): 01/12/09 |
|-------------------------------|---------------------------|------------------|-------|---------------|------------------------|
| MET Asset # | Nomenclature | Manufacturer | Model | Last Cal Date | Cal Due Date |
| 1T4300 | SEMI-ANECHOIC CHAMBER # 1 | EMC TEST SYSTEMS | NONE | 2/17/2006 | 5/17/2009 |
| 1T4409 | EMI Receiver | Rohde & Schwarz | ESIB7 | 4/18/2008 | 4/18/2009 |
| 1T4272 | Antenna; Loop | Emco | 6512 | 3/7/2008 | 3/7/2009 |

| Test Name: Radiated Emissions | | | | | Test Date(s): 01/28/09 & 01/29/09 |
|-------------------------------|---------------------------|----------------------|----------|---------------|-----------------------------------|
| MET Asset # | Nomenclature | Manufacturer | Model | Last Cal Date | Cal Due Date |
| 1T4568 | Radiating Noise Source | MET Laboratories | N/A | See Note | |
| 1T4300 | Semi-Anechoic Chamber # 1 | EMC Test Systems | NONE | 02/17/2006 | 05/17/2009 |
| 1T4303 | Antenna; Bilog | Schafner - Chase EMC | CBL6140A | 07/07/2008 | 07/07/2009 |
| 1T4409 | EMI Receiver | Rohde & Schwarz | ESIB7 | 04/18/2008 | 04/18/2009 |
| 1T4632 | Thermo/Hygrometer | Control Company | S6-627-9 | 09/25/2007 | 09/25/2009 |

Table 10. Test Equipment

Note: Functionally verified test equipment is verified using calibrated instrumentation at the time of testing.



5.0 Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

§ 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of emitting radio-frequency energy by radiation, conduction, or other means. Radio-frequency devices include, but are not limited to:

- (a) The various types of radio communication transmitting devices described throughout this chapter.
- (b) The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.
- (c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.
- (d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

§ 2.803 Marketing of radio frequency devices prior to equipment authorization.

(a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:

- (1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or
- (2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.
- (d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.

(e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:

- (i) Compliance testing;
- (ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;
- (iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;
- (iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or



(v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.

(e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.

(f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart J — Equipment Authorization Procedures:

§ 2.901 Basis and Purpose

(a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.¹ In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.

(b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, or the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant, whichever is applicable.

§ 2.907 Certification.

(a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.

(b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

§ 2.948 Description of measurement facilities.

(a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.

(1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.

(i) If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.



(ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.

(2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.

The following is extracted from Title 47 of the Code of Federal Regulations, Part 18, Industrial, Scientific, and Medical Equipment

- Subpart B
- Applications and Authorizations

Section 18.212 Compliance information.

(a) Equipment authorized under the Declaration of Conformity procedure shall include the following compliance information in lieu of the information required by Sec. 2.1077.

- (1) Identification of the product, e.g., name and model number.
- (2) A statement similar to the following:

This device complies with Part 18 of the FCC Rules.

(3) The name and address of the responsible party as defined in Sec. 2.909 of the rules. This party must be located within the United States.

(b) The compliance information may be placed in the instruction manual, on a separate sheet, or on the packaging. There is no specific format for this information.

[63 FR 36603, July 7, 1998]

Section 18.213 Information to the user.

Information on the following matters shall be provided to the user in the instruction manual or on the packaging if an instruction manual is not provided for any type of ISM equipment:

- (a) The interference potential of the device or system
- (b) Maintenance of the system
- (c) Simple measures that can be taken by the user to correct interference.
- (d) Manufacturers of RF lighting devices must provide an advisory statement, either on the product packaging or with other user documentation, similar to the following: This product may cause interference to radio equipment and should not be installed near maritime safety communications equipment or other critical navigation or communication equipment operating between 0.45-30 MHz. Variations of this language are permitted provided all the points of the statement are addressed and may be presented in any legible font or text style.

[50 FR 36069, Sept. 5, 1985, as amended at 51 FR 17970, May 16, 1986; 64 FR 37419, July 12, 1999]