



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

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January 25, 2012

Digital Receiver Technology, Inc.  
20250 Century Blvd., Suite 500  
Germantown, MD 20874

Dear Steve Hudson,

Enclosed is the EMC Wireless test report for testing of the Digital Receiver Technology, Inc., DRT1183C (Base Station), tested to the requirements of Title 47 of the Code of Federal Regulations (CFR), Part 90 for Land Mobile Radio Services.

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.

Jennifer Warnell  
Documentation Department

Reference: (\Digital Receiver Technology, Inc.\EMC31505B-FCC90 Rev. 2)

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## **Electromagnetic Compatibility Criteria Test Report**

For the

**Digital Receiver Technology, Inc.  
DRT1183C (Base Station)**

Tested under

**The FCC Verification Rules  
Contained in Title 47 of the CFR, Part 90  
for Private Land Mobile Radio Services**

**MET Report: EMC31505B-FCC90 Rev. 2**

January 25, 2012

**Prepared For:  
Digital Receiver Technology, Inc.  
20250 Century Blvd., Suite 500  
Germantown, MD 20874**

**Prepared By:  
MET Laboratories, Inc.  
914 W. Patapsco Ave.  
Baltimore, MD 21230**

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**MET Report: EMC31505B-FCC90 Rev. 2**



Len Knight, Project Engineer  
Electromagnetic Compatibility Lab



Jennifer Warnell  
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 limits applicable. 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 / is not capable of operation in accordance with the requirements of Part 90 of the FCC Rules under normal use and maintenance.



Shawn McMillen,  
Wireless Manager, Electromagnetic Compatibility Lab

## Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	November 17, 2011	Initial Issue.
1	January 18, 2012	Revised to reflect engineer corrections.
2	January 25, 2012	Revised to reflect customer corrections.

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## List of Terms and Abbreviations

<b>AC</b>	<b>Alternating Current</b>
<b>ACF</b>	<b>Antenna Correction Factor</b>
<b>Cal</b>	<b>Calibration</b>
<b><i>d</i></b>	<b>Measurement Distance</b>
<b>dB</b>	<b>Decibels</b>
<b>dB<math>\mu</math>A</b>	<b>Decibels above one microamp</b>
<b>dB<math>\mu</math>V</b>	<b>Decibels above one microvolt</b>
<b>dB<math>\mu</math>A/m</b>	<b>Decibels above one microamp per meter</b>
<b>dB<math>\mu</math>V/m</b>	<b>Decibels above one microvolt per meter</b>
<b>DC</b>	<b>Direct Current</b>
<b>E</b>	<b>Electric Field</b>
<b>DSL</b>	<b>Digital Subscriber Line</b>
<b>ESD</b>	<b>Electrostatic Discharge</b>
<b>EUT</b>	<b>Equipment Under Test</b>
<b><i>f</i></b>	<b>Frequency</b>
<b>FCC</b>	<b>Federal Communications Commission</b>
<b>GRP</b>	<b>Ground Reference Plane</b>
<b>H</b>	<b>Magnetic Field</b>
<b>HCP</b>	<b>Horizontal Coupling Plane</b>
<b>Hz</b>	<b>Hertz</b>
<b>IEC</b>	<b>International Electrotechnical Commission</b>
<b>kHz</b>	<b>kilohertz</b>
<b>kPa</b>	<b>kilopascal</b>
<b>kV</b>	<b>kilovolt</b>
<b>LISN</b>	<b>Line Impedance Stabilization Network</b>
<b>MHz</b>	<b>Megahertz</b>
<b><math>\mu</math>H</b>	<b>microhenry</b>
<b><math>\mu</math></b>	<b>microfarad</b>
<b><math>\mu</math>s</b>	<b>microseconds</b>
<b>NEBS</b>	<b>Network Equipment-Building System</b>
<b>PRF</b>	<b>Pulse Repetition Frequency</b>
<b>RF</b>	<b>Radio Frequency</b>
<b>RMS</b>	<b>Root-Mean-Square</b>
<b>TWT</b>	<b>Traveling Wave Tube</b>
<b>V/m</b>	<b>Volts per meter</b>
<b>VCP</b>	<b>Vertical Coupling Plane</b>



# Executive Summary



## 1. Testing Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 90. All tests were conducted using measurement procedure ANSI TIA/EIA-603-A-2004.

Title 47 of the CFR, Part 90 Reference and Test Description	Conformance			Comments
	Yes	No	N/A	
	Yes - Equipment complies with the Requirement No - Equipment does not comply with the Requirement N/A - Not applicable to the equipment under tests			
	2.1046; 90.635 Peak Power Output	✓		
2.202 Occupied Bandwidth	✓			Measured emissions below applicable limits.
90.210 Emission Mask	✓	✓		Measurements completed.*
2.1051; 90.210 Spurious Emissions at Antenna Terminals	✓			Measured emissions below applicable limits.
2.1053; 90.210 Field Strength of Spurious Emissions	✓			Measured emissions below applicable limits.
90.213 Frequency Stability	✓			Measured emissions below applicable limits.

Note: \* - For the Frequency Range of 851 – 854 MHz, the equipment did not meet the requirements of §90.210.  
For the Frequency Range of 854 – 869 MHz, the equipment met the requirements of §90.210.



# Equipment Configuration



## 2. Equipment Configuration

### 2.1. Overview

MET Laboratories, Inc. was contracted by Digital Receiver Technology, Inc. to perform testing on the DRT1183C (Base Station) under quote number 045620.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Digital Receiver Technology, Inc., DRT1183C (Base Station).

An EMC evaluation to determine compliance of the TB 4.9 with the requirements of Part 90 was conducted. (All references are to the most current version of Title 47 of the Code of Federal Regulations in effect). In accordance with §2.1033, the following data is presented in support of the Certification of the TB4.9. Digital Receiver Technology, Inc. should retain a copy of this document and it should be kept on file for at least five years after the manufacturing of the EUT has been **permanently** discontinued. The results obtained relate only to the item(s) tested.

<b>Model(s) Tested:</b>	DRT1183C (Base Station)		
<b>Model(s) Covered:</b>	DRT1183C (Base Station)		
<b>EUT Specifications:</b>	Primary Power Source: 120 VAC, 60 Hz		
	FCC ID: XLM1183C		
	Type of Modulations:	TDMA	
	Max Output Power:	12.33 dBm	
	Equipment Code:	TNB	
	EUT Frequency Ranges:	851 – 869 MHz	
<b>Analysis:</b>	The results obtained relate only to the item(s) tested.		
<b>Environmental Test Conditions:</b>	Temperature (15-35° C):		
	Relative Humidity (30-60%):		
	Barometric Pressure (860-1060 mbar):		
<b>Evaluated by:</b>	Len Knight		
<b>Report Date(s):</b>	January 25, 2012		



## 2.2. References

<b>CFR 47, Part 90</b>	Private Land Mobile Radio Services
<b>ANSI C63.4:2003</b>	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
<b>ANSI/NCSL Z540-1-1994</b>	Calibration Laboratories and Measuring and Test Equipment - General Requirements
<b>ANSI/ISO/IEC 17025:2000</b>	General Requirements for the Competence of Testing and Calibration Laboratories
<b>EIA/TIA-603-A-2001</b>	Land Mobile FM or PM Communication Equipment Measurement and Performance Standards
<b>FCC Publication 935210</b>	Amplifier, Booster, and Repeater Guidance Document

## 2.3. Test Site

All testing was performed at MET Laboratories, Inc., 914 W, Patapsco Ave., 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 (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

## 2.4. Description of Test Sample

The Digital Receiver Technology, Inc. DRT1183C (Base Station), Equipment Under Test (EUT), is a mobile base station.

## 2.5. Equipment Configuration

The DRT1183C was configured with 4 RFT Digital Tuners, 4 WPM Processors, 1 REF Reference Generator, and 1 CTL Computer Control.

## 2.6. Support Equipment

Digital Receiver Technology, Inc. supplied support equipment necessary for the operation and testing of the DRT1183C (Base Station). All support equipment supplied is listed in the following Support Equipment List.

Ref. ID	Name / Description	Manufacturer	Model Number	Customer Supplied Calibration Data
CF-19	Toughbook PC	Panasonic	CF-19	CF-19KDRAX6M

**Table 1. Support Equipment**

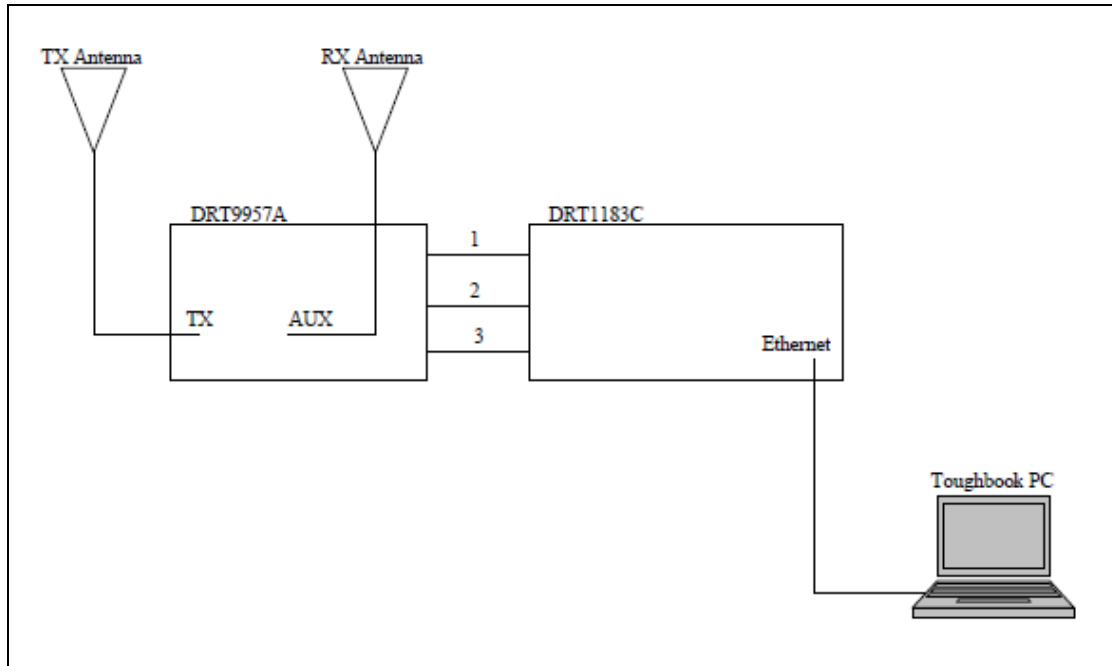


Figure 1. Block Diagram of Equipment Configuration

## 2.7. Mode of Operation

Operating as a mobile base station in GSM and CDMA in the Cellular and PCS bands and TDMA in the 800MHz band.

## 2.8. Method of Monitoring EUT Operation

Running control software on a connected PC.

## 2.9. Modifications

### 2.9.1. Modifications to EUT

No modifications were made to the EUT.

### 2.9.2. Modifications to Test Standard

No modifications were made to the test standard.

## 2.10. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Digital Receiver Technology, Inc. upon completion of testing.

### **III. Electromagnetic Compatibility Criteria for Intentional Radiators**

### 3. Electromagnetic Compatibility RF Power Output Requirements

#### 3.1. RF Power Output

**Test Requirement(s):** §2.1046 and §90.635

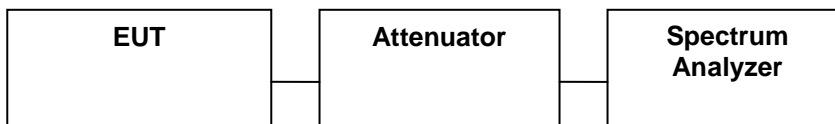
**Test Procedures:** As required by 47 CFR 2.1046, *RF power output measurements* were made at the RF output terminals using a Spectrum Analyzer.

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer via an attenuator to measure the power. The “channel power” measurement feature of the spectrum analyzer was used. Measurements were made at the low, mid and high channels.

**Test Results:** Equipment complies with 47CFR 2.1046 and 90.635.

**Test Engineer(s):** Len Knight

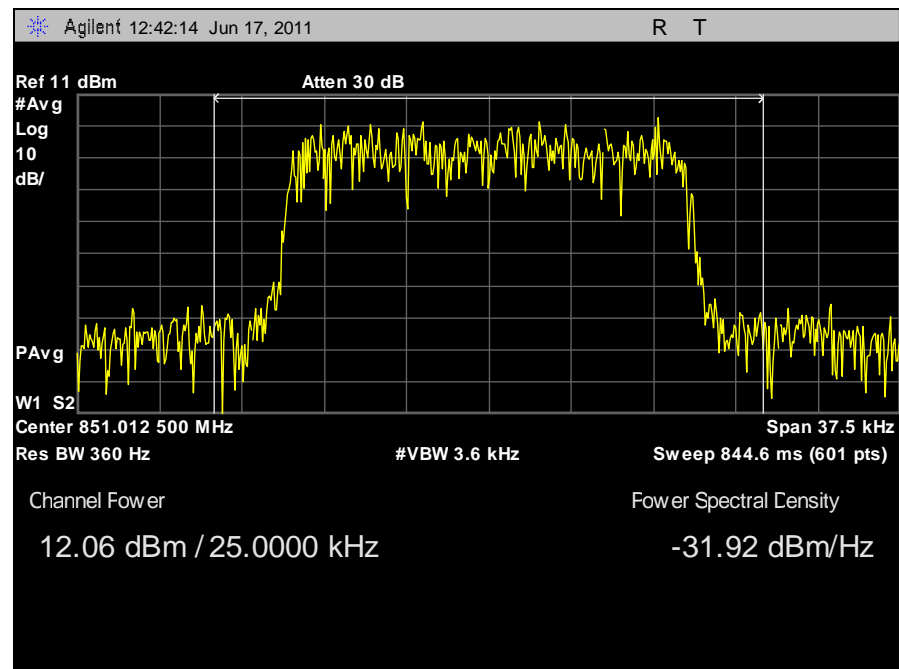
**Test Date(s):** 06/17/11



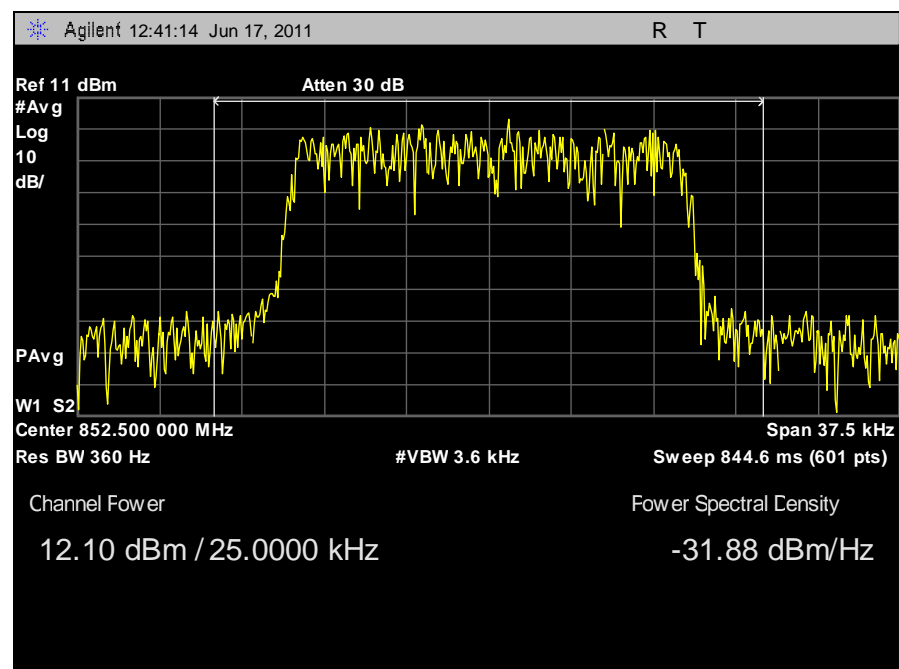
**Figure 2. RF Power Output Test Setup**

Frequency (MHz)	Power (dBm)
851.0125	12.06
852.5	12.10
860	12.33
868.9875	11.82

**Table 2. RF Power Output, Test Results**

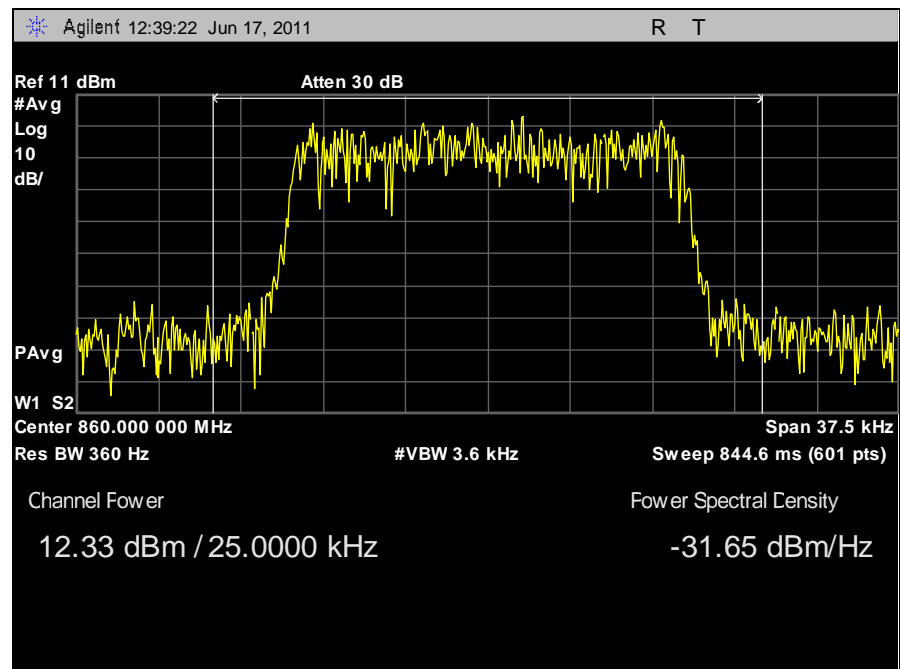


**Plot 1. RF Power Output, 851.0125 MHz**

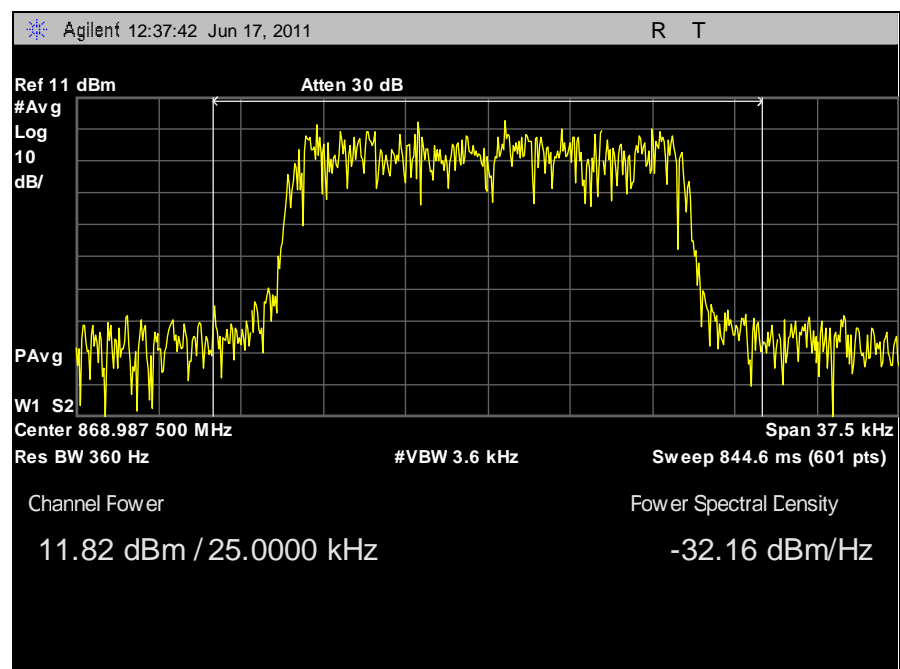


**Plot 2. RF Power Output, 852.5 MHz**





**Plot 3. RF Power Output, 860 MHz**



**Plot 4. RF Power Output, 868.9875 MHz**

## 4. Electromagnetic Compatibility Occupied Bandwidth Requirements

### 4.1. Occupied Bandwidth

**Test Requirement(s):** §2.1049

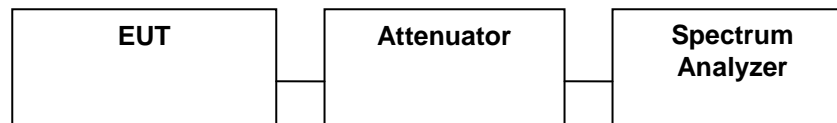
**Test Procedures:** As required by 47 CFR 2.1049, *occupied bandwidth measurements* were made at the RF output terminals using a Spectrum Analyzer.

A laptop was connected to EUT to control the RF frequency channel. The EUT was connected to a Spectrum Analyzer via attenuator. The RBW of the Spectrum Analyzer was set to at least 1% of the channel bandwidth. Measurements were carried out at the low, mid and high channels of the TX band.

**Test Results:** Equipment complies with Section 2.1049 and 90.210. The EUT does not exceed the Emission Masks limit.

**Test Engineer(s):** Len Knight

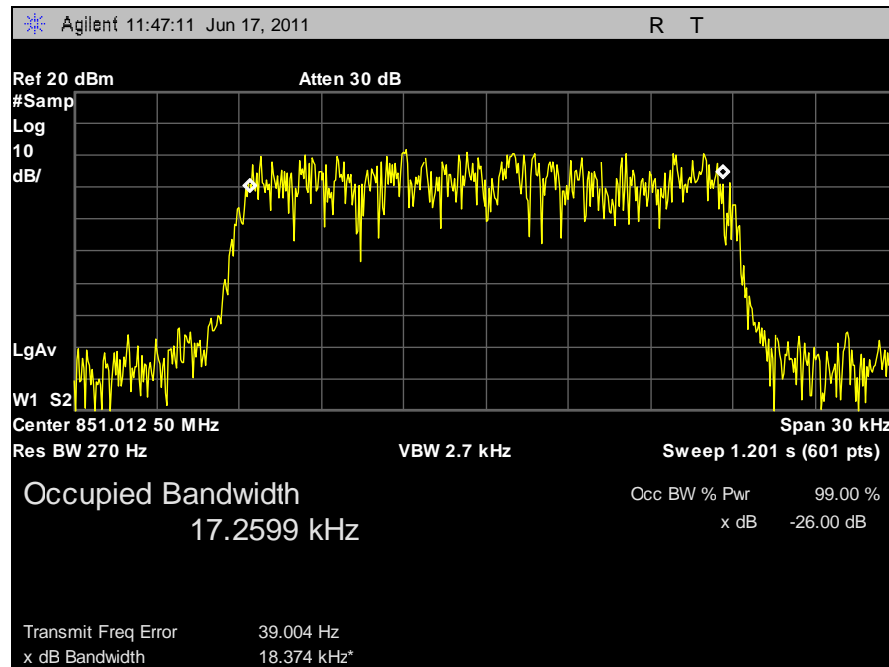
**Test Date(s):** 07/25/11



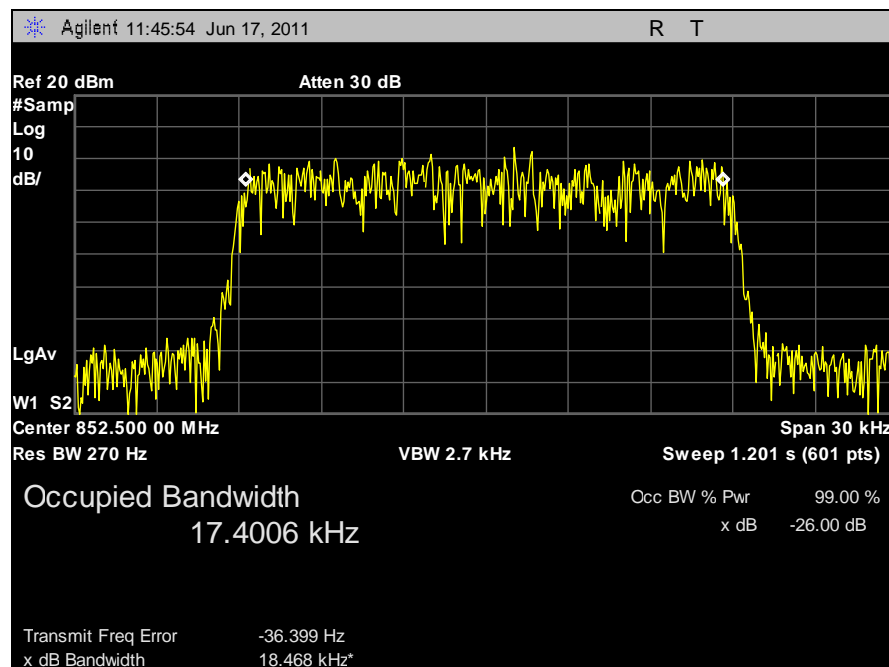
**Figure 3. Occupied Bandwidth (Emission Mask) Test Setup**

Frequency (MHz)	Bandwidth (kHz)
851.0125	17.2599
852.5	17.4006
860	17.1159
868.9875	17.2931

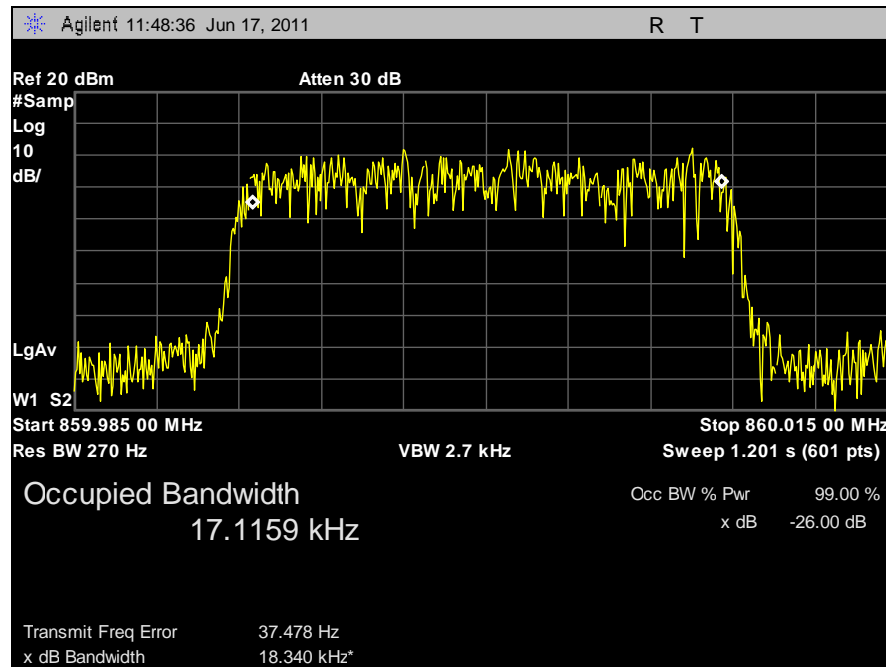
**Table 3. Occupied Bandwidth, Test Results**



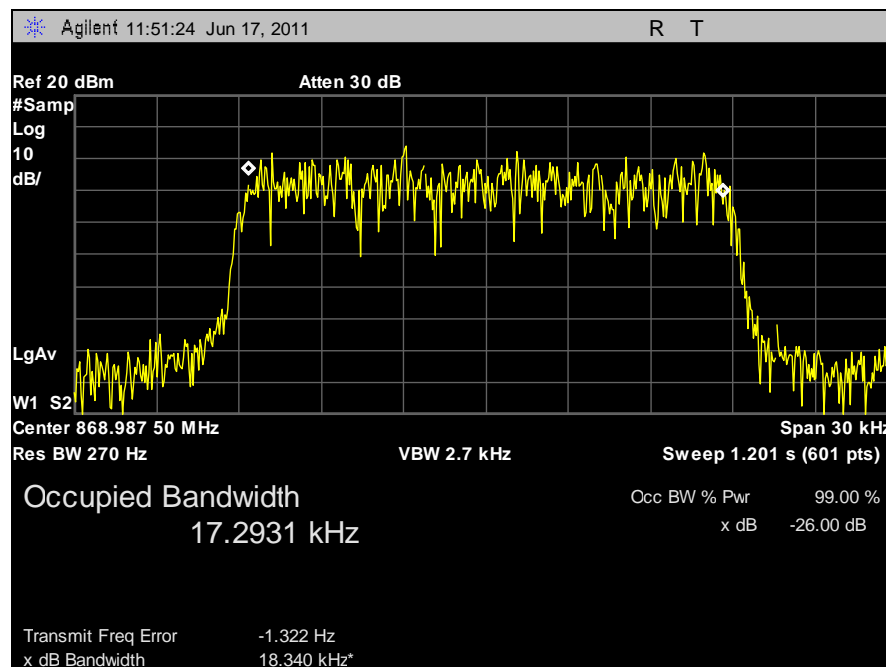
Plot 5. Occupied Bandwidth, 851.0125 MHz



Plot 6. Occupied Bandwidth, 852.5 MHz



Plot 7. Occupied Bandwidth, 860 MHz



Plot 8. Occupied Bandwidth, 868.9875 MHz

## 5. Electromagnetic Compatibility Spurious Emissions at Antenna Terminal Requirements

### 5.1. Spurious Emissions at Antenna Terminals

**Test Requirement(s):** §2.1051 and §90.210

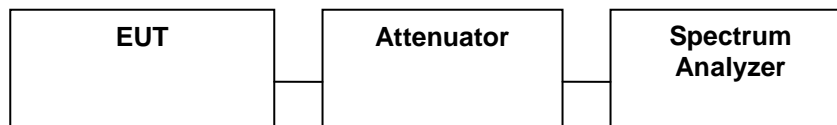
**Test Procedures:** As required by 47 CFR 2.1051, *spurious emissions at antenna terminal measurements* were made at the RF output terminals using a Spectrum Analyzer.

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer. The Spectrum Analyzer was set to sweep 30 MHz and up to 10<sup>th</sup> harmonic of the fundamental or 40GHz whichever is the lesser. Measurements were made at the low, mid and high channels.

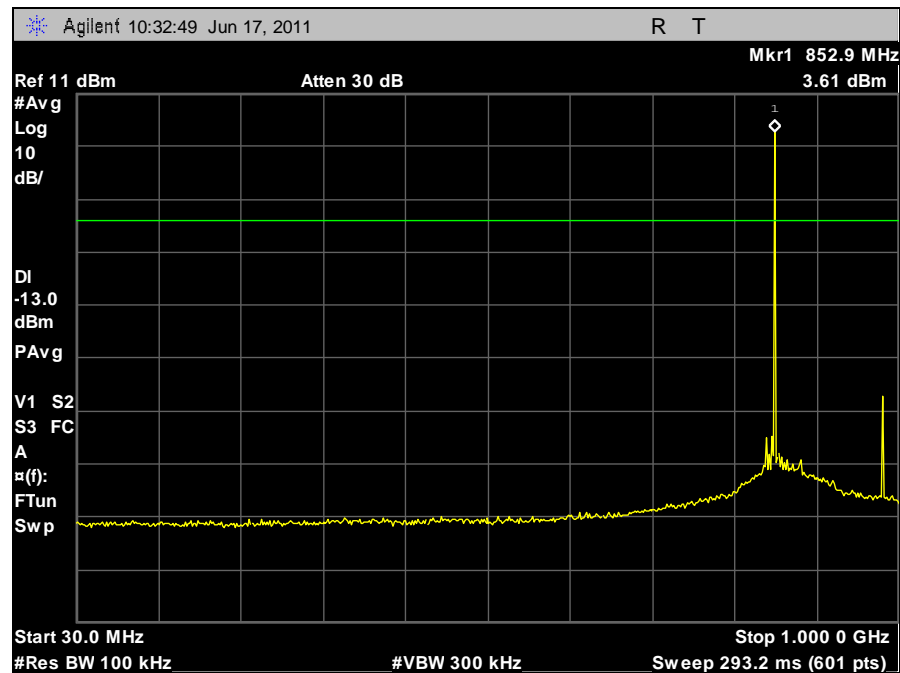
**Test Results:** Equipment complies with Section 2.1051.

**Test Engineer(s):** Len Knight

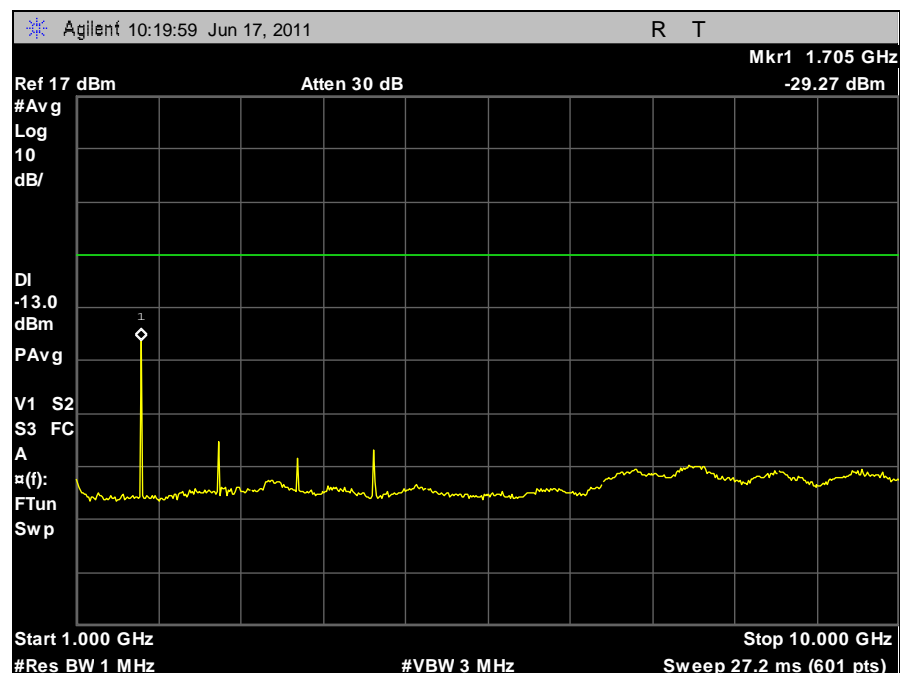
**Test Date(s):** 06/17/11



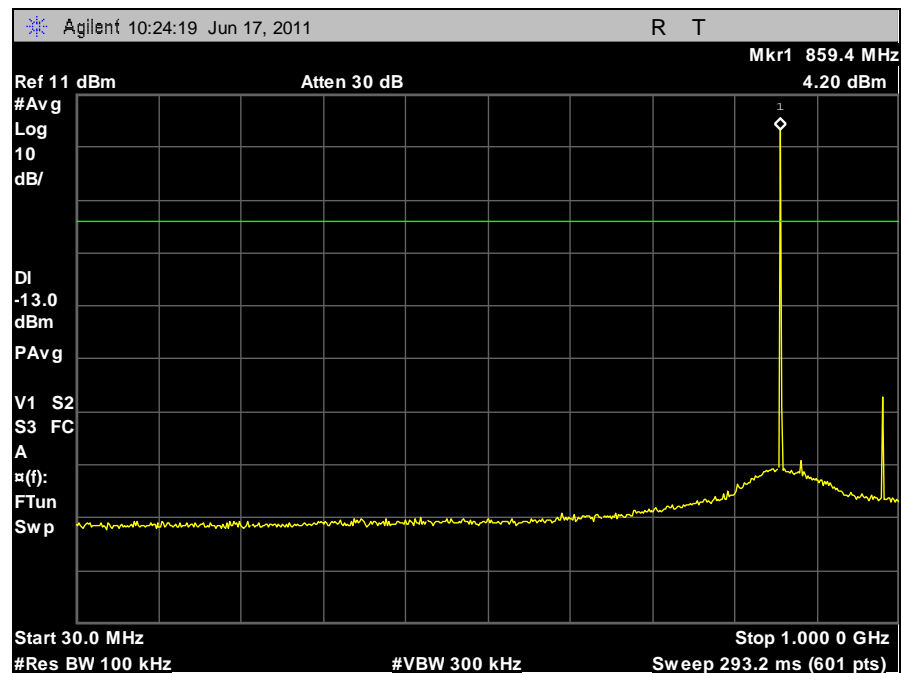
**Figure 4. Spurious Emissions at Antenna Terminals Test Setup**



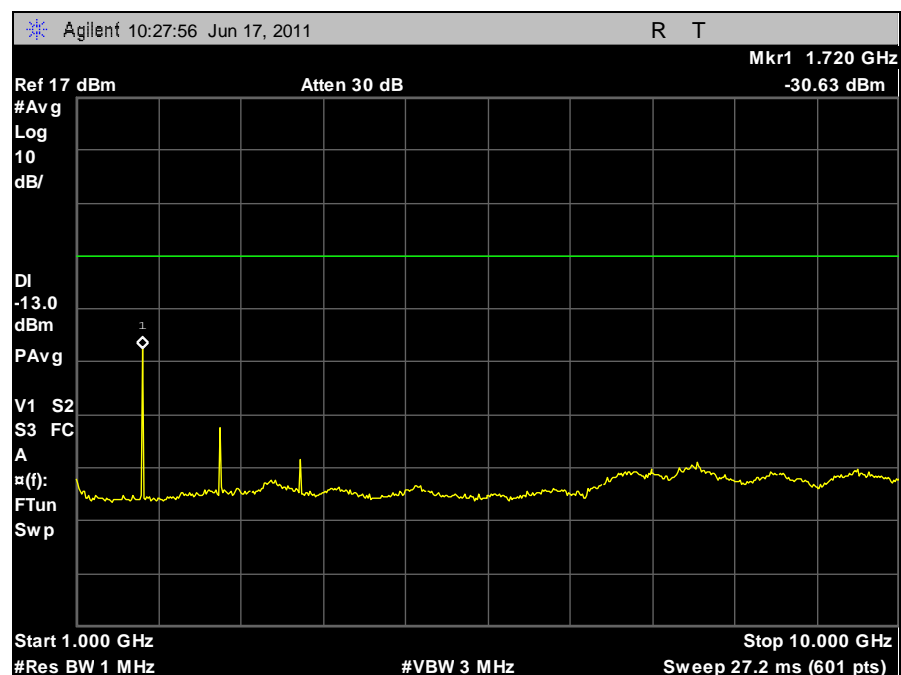
Plot 9. Conducted Spurious Emissions, 852.5 MHz, 30 MHz – 1 GHz



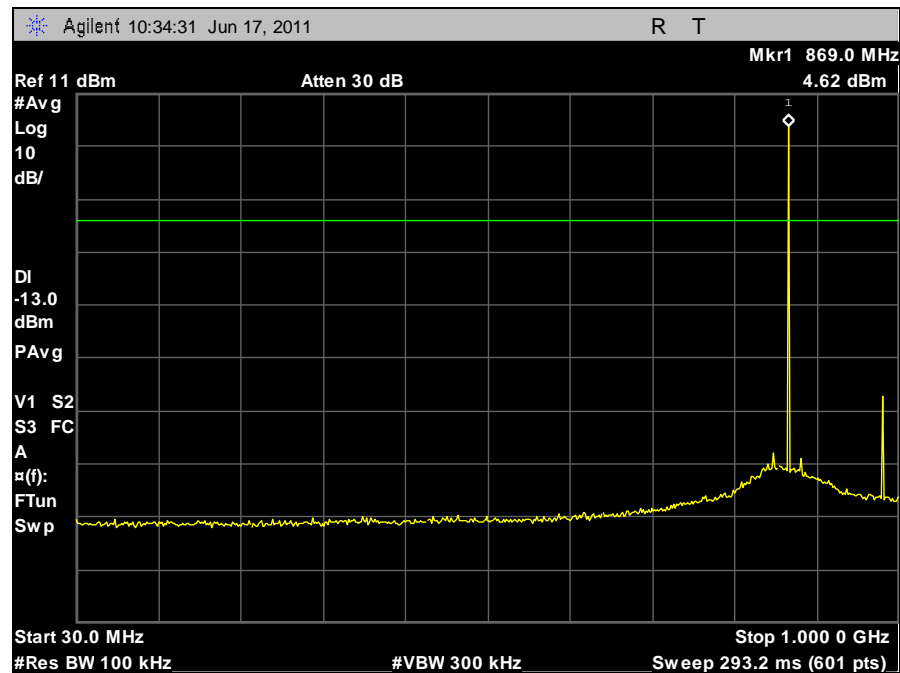
Plot 10. Conducted Spurious Emissions, 852.5 MHz, 1 GHz – 10 GHz



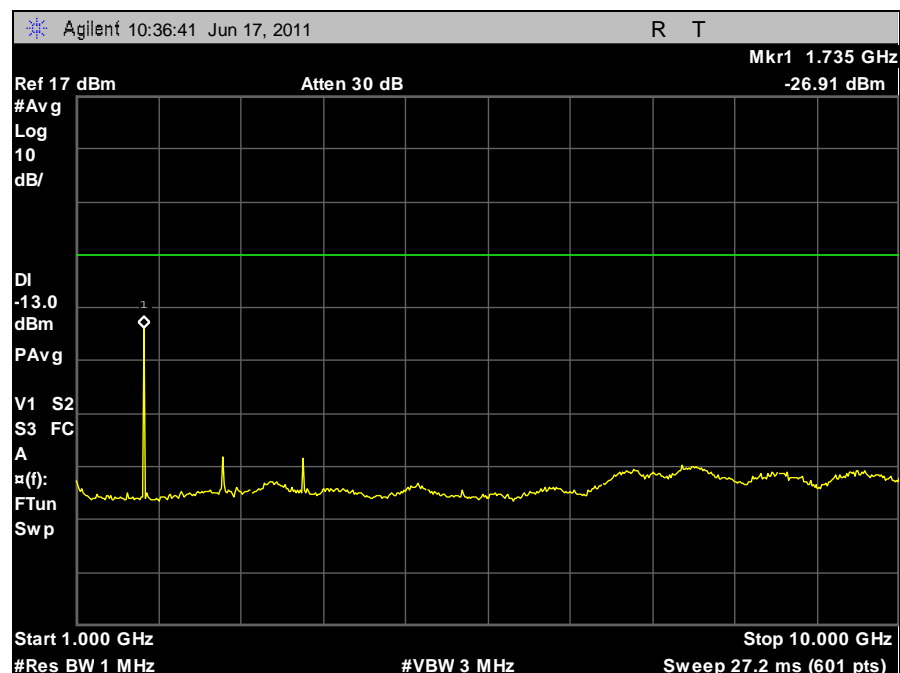
Plot 11. Conducted Spurious Emissions, 860 MHz, 30 MHz – 1 GHz



Plot 12. Conducted Spurious Emissions, 860 MHz, 1 GHz – 10 GHz



Plot 13. Conducted Spurious Emissions, 868.9875 MHz, 30 MHz – 1 GHz



Plot 14. Conducted Spurious Emissions, 868.9875 MHz, 1 GHz – 10 GHz



## 5.2. Emissions Mask

**Test Requirement(s):** §90.210

Frequency Band (MHz)	Mask for Equipment with Audio Low Pass Filter	Mask for Equipment without Audio Low Pass Filter
851 – 854	B	H
854 – 869	B	G

**Test Procedures:** A laptop was connected to the EUT to control the RF output frequency channel. The EUT was connected to a spectrum analyzer. The measured power was set relative to zero dB reference. The RBW of the spectrum analyzer was set to at least 1% of the channel bandwidth.

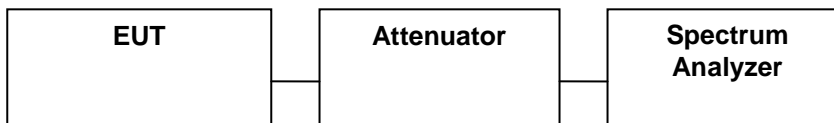
**Test Results:** The 851 – 854 range requires the use of the Mask H for equipment without an Audio Low Pass Filter. For demonstration purposes only, the Mask B was applied to this range, though the EUT does not have an Audio Low Pass Filter.

Again, for demonstration purposes, only the 851 – 854 range was also fitted with the Mask G.

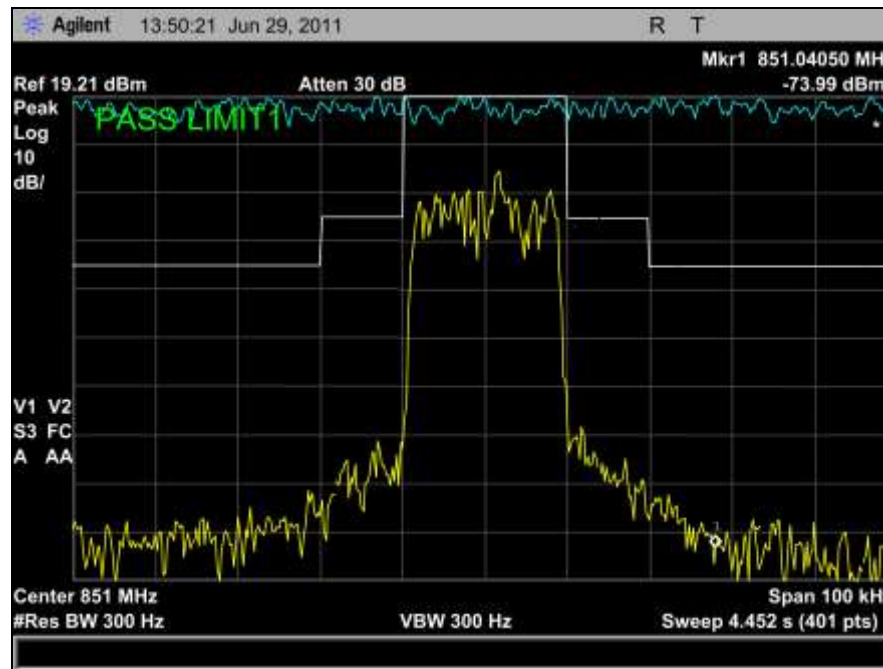
The 854 – 869 range meets requirements of Mask G.

**Test Engineer(s):** Len Knight

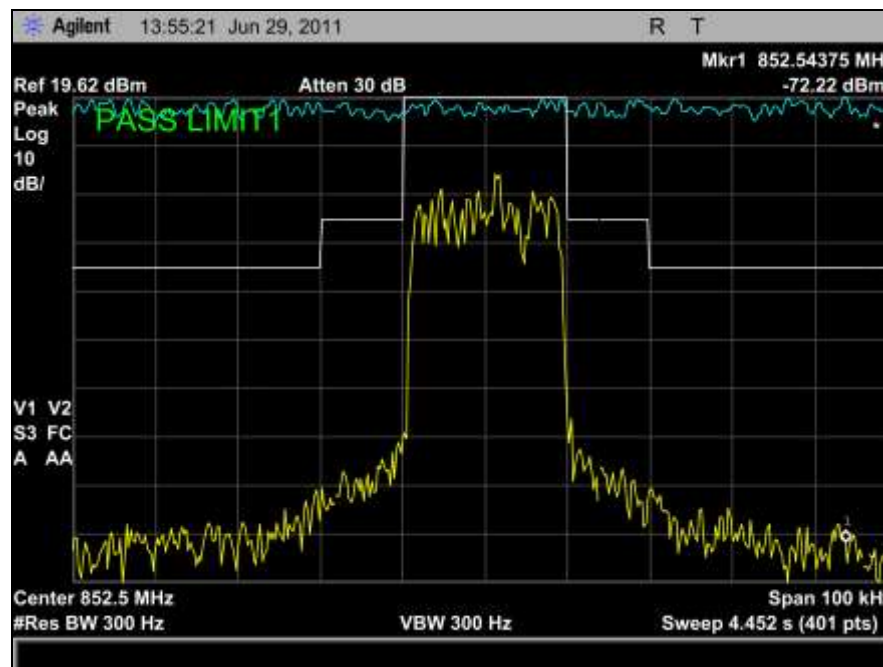
**Test Date(s):** 06/17/11



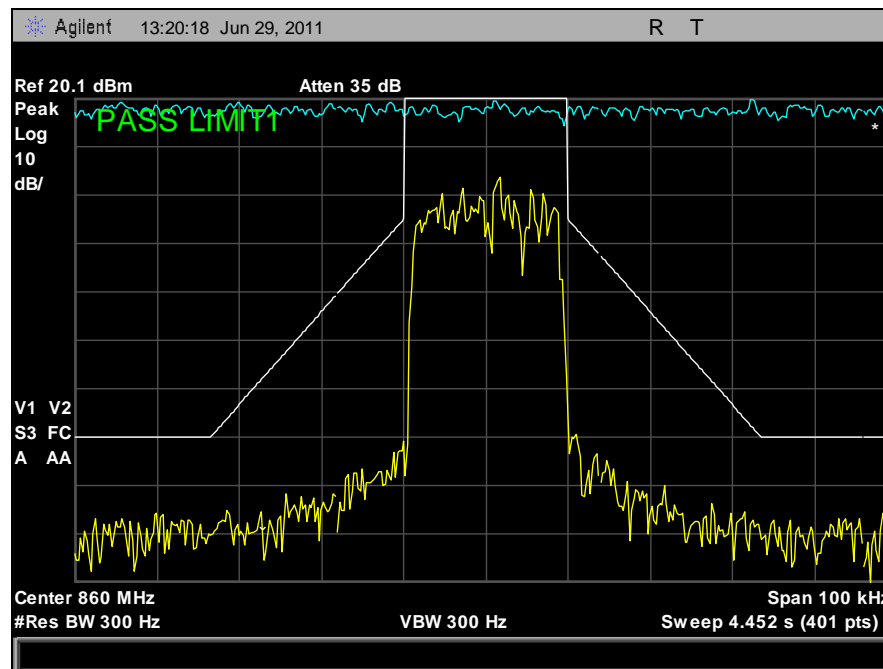
**Figure 5. Spurious Emissions at Antenna Terminals Test Setup**



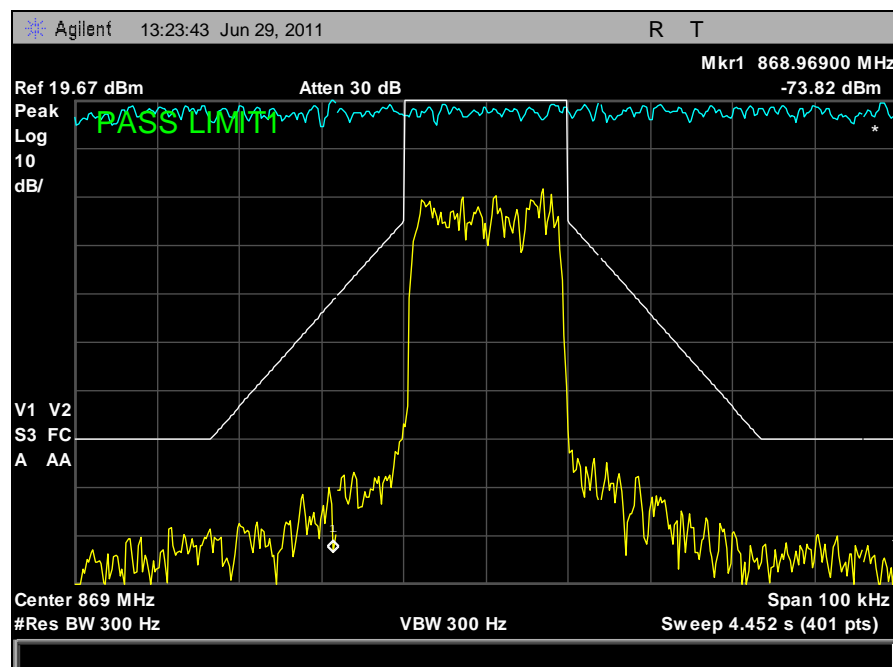
Plot 15. B Mask, 851.0125 MHz



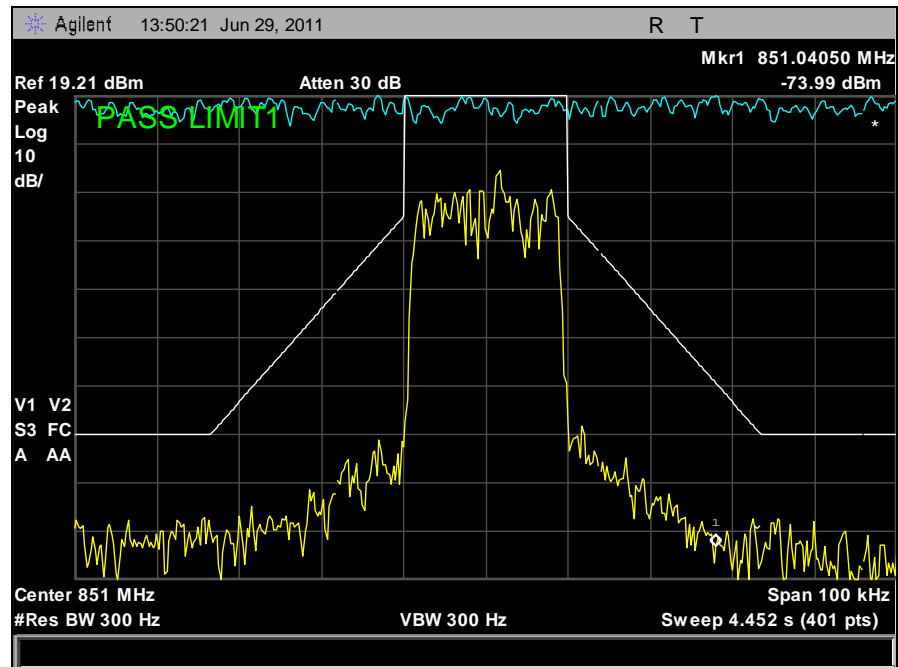
Plot 16. B Mask, 852.5 MHz



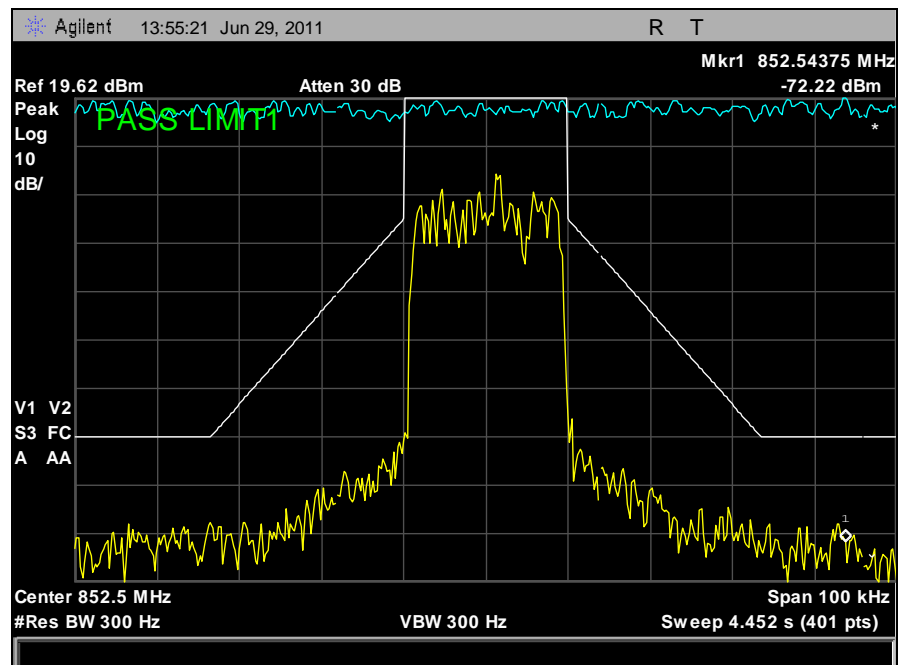
Plot 17. G Mask, 860 MHz



Plot 18. G Mask, 868.9875 MHz



Plot 19. G Mask, 851.0125 MHz



Plot 20. G Mask, 852.5 MHz

## Electromagnetic Compatibility Radiated Emissions Requirements

### 5.3. Radiated Emissions

**Test Requirement(s):** §2.1053 and §90.210

**Test Procedures:** As required by 47 CFR 2.1053, *field strength of radiated spurious measurements* were made in accordance with the procedures of TIA/EIA-603-A-2001 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards".

Radiated emission measurements were performed inside a 3 meter semi-anechoic chamber. The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360<sup>0</sup> and the receiving antenna scanned from 1-4m in order to capture the maximum emission. Harmonic emissions up to the 10<sup>th</sup> or 40GHz, which ever was the lesser, were investigated.

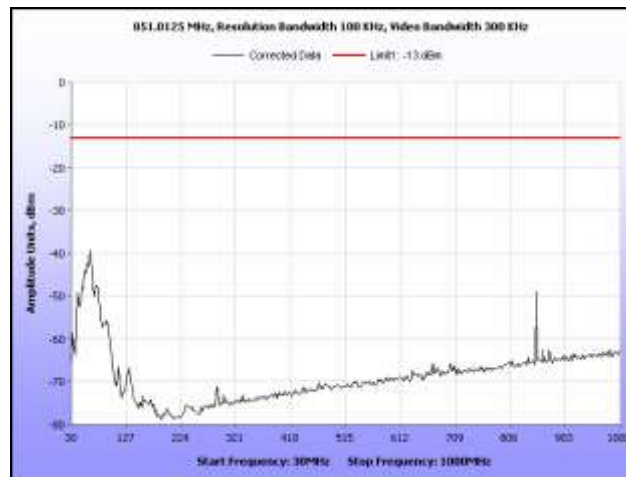
The plots were corrected to show EIRP.

**Test Results:** Equipment complies with Section 2.1053 and 90.210.

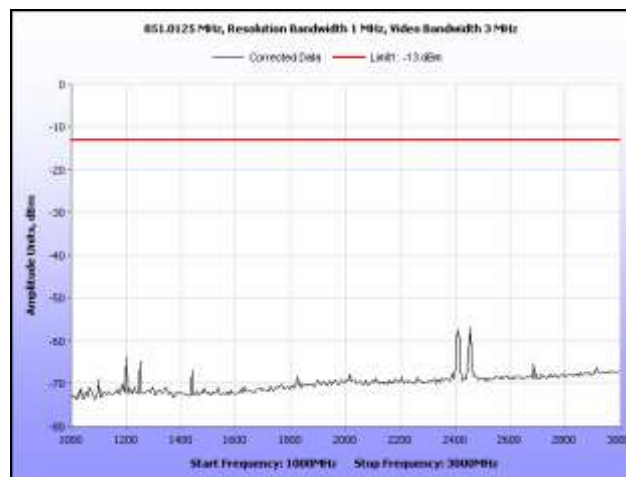
**Test Engineer(s):** Len Knight

**Test Date(s):** 07/25/11

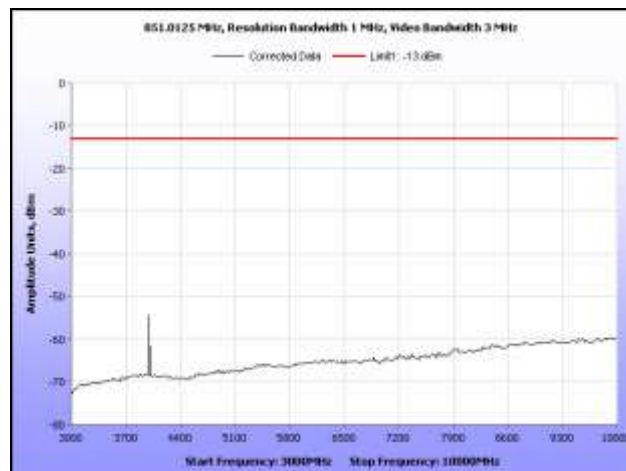
## Radiated Emissions Test Results



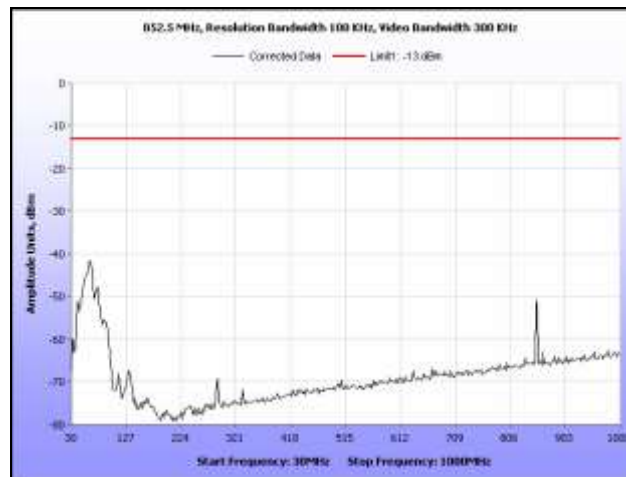
Plot 21. Radiated Spurious Emissions, 851.0125 MHz, 30 MHz – 1 GHz



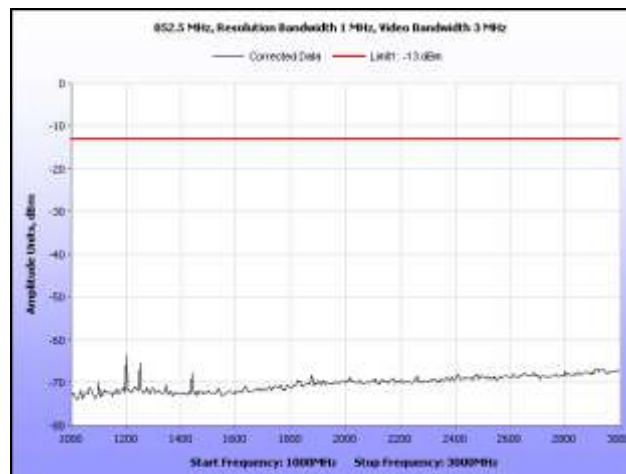
Plot 22. Radiated Spurious Emissions, 851.0125 MHz, 1 GHz – 3 GHz



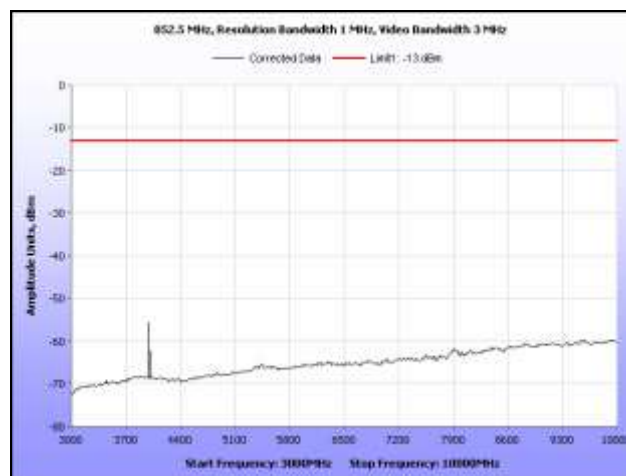
Plot 23. Radiated Spurious Emissions, 851.0125 MHz, 3 GHz – 10 GHz



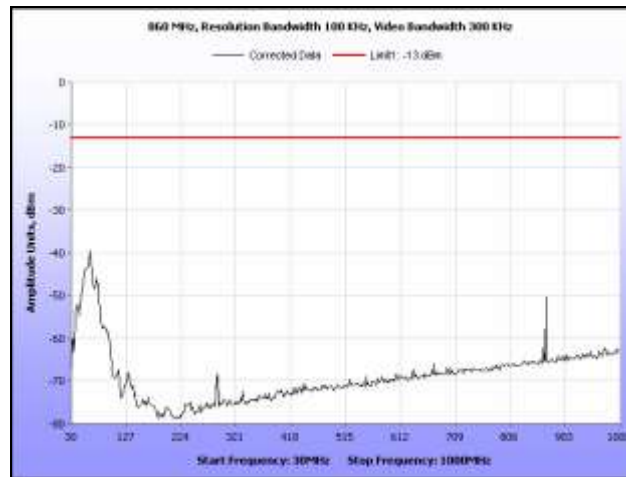
Plot 24. Radiated Spurious Emissions, 852.5 MHz, 30 MHz – 1 GHz



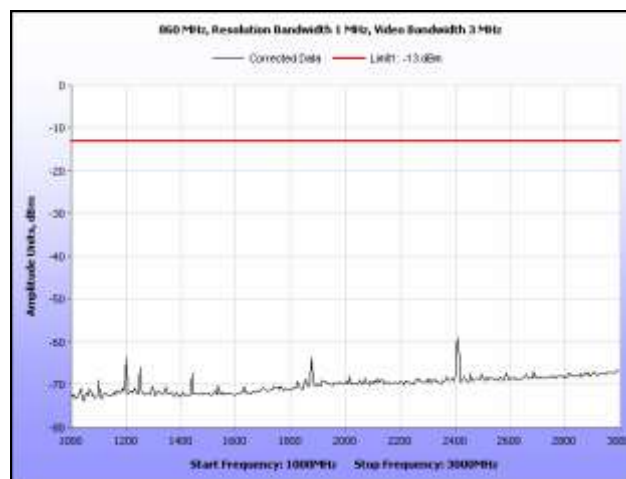
Plot 25. Radiated Spurious Emissions, 852.5 MHz, 1 GHz – 3 GHz



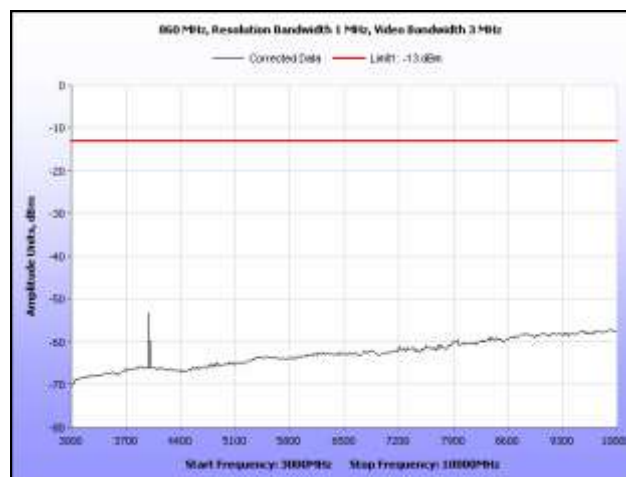
Plot 26. Radiated Spurious Emissions, 852.5 MHz, 3 GHz – 10 GHz



Plot 27. Radiated Spurious Emissions, 860 MHz, 30 MHz – 1 GHz

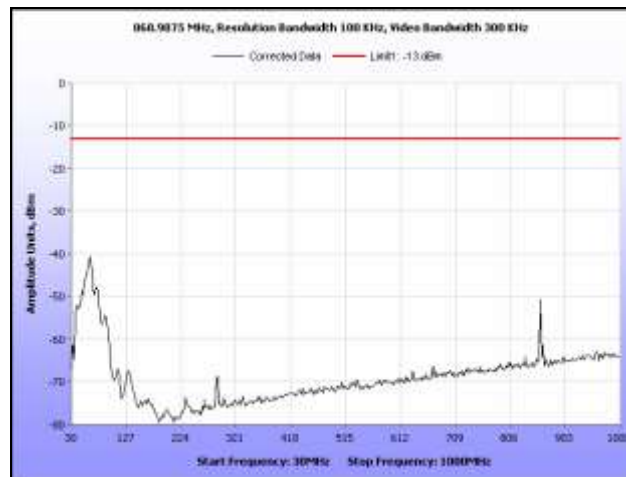


Plot 28. Radiated Spurious Emissions, 860 MHz, 1 GHz – 3 GHz

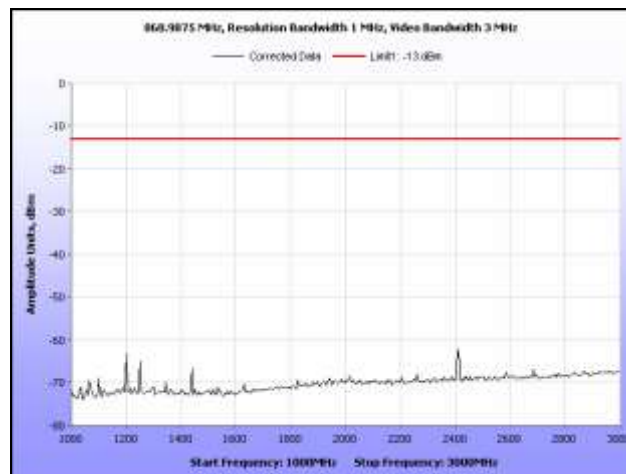


Plot 29. Radiated Spurious Emissions, 860 MHz, 3 GHz – 18 GHz

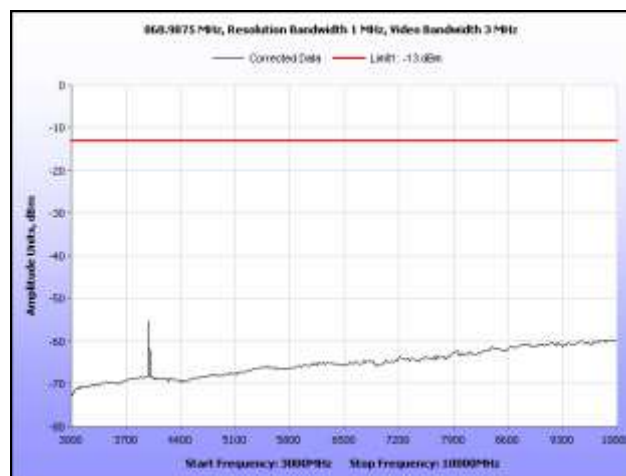




Plot 30. Radiated Spurious Emissions, 868.9875 MHz, 30 MHz – 1 GHz



Plot 31. Radiated Spurious Emissions, 868.9875 MHz, 1 GHz – 3 GHz



Plot 32. Radiated Spurious Emissions, 868.9875 MHz, 3 GHz – 18 GHz

## 6. Electromagnetic Compatibility Frequency Stability

### 6.1. Frequency Stability

**Test Requirement(s):** §2.1055 and §90.213

**Test Procedures:** As required by 47 CFR 2.1055, *Frequency Stability measurements* were made at the RF using the frequency counter function of a Spectrum Analyzer.

The EUT was placed in an Environmental Chamber with the support equipment left outside. The EUT was set to transmit a CW signal. The frequency counter option on the Spectrum Analyzer was used to measure frequency deviations. The frequency drift was investigated for every 10°C increment until the unit is stabilized then recorded the reading in tabular format with the temperature range of -30 to 50°C.

Voltage supplied to EUT is 120 VAC reference temperature was done at 20 °C. The voltage was varied by ± 15 % of nominal

**Test Results:** Equipment is compliant with Section 2.1055 and 90.213.

**Test Engineer(s):** Len Knight

**Test Date(s):** 06/27/11

Temperature (deg C)	Frequency (MHz)	Drift (ppm)
-30	860.000035	0.021
-20	860.000032	0.017
-10	860.000031	0.016
0	860.000028	0.013
10	860.000024	0.008
20	860.000017	ref
30	860.000021	0.005
40	860.000019	0.002
50	860.000018	0.001

Voltage (VAC)	Frequency (MHz)	Drift (ppm)
120	860.000024	ref
102	860.000024	0.000
138	860.000024	0.000

**Table 4. Frequency Stability, Test Results**

## 7. 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.

MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1T4612	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4407B	09/27/2010	09/27/2011
1T4297	TRANSFORMER; ISOLATION	SOLAR ELECTRONICS	6220-4	SEE NOTE	
1T4596	AC POWER SOURCE	CALIFORNIA INSTRUMENTS	2001RP	NOT REQUIRED	
1T4377	TRUE RMS MULTIMETER	FLUKE	189	12/23/2010	12/23/2011
1T4621	ESA-E SERIES SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4402B	05/31/2011	05/31/2012
2T5645	CSZ CHAMBER	CINCINNATI SUBZERO PRODUCTS	Z-32	07/25/2010	07/25/2011
1T4442	PRE-AMPLIFIER, MICROWAVE	MITEQ	AFS42-01001800-30-10P	SEE NOTE	
1T2511	ANTENNA; HORN	EMCO	3115	08/31/2010	08/31/2011
1T4710	SIGNAL GENERATOR	HEWLETT PACKARD	8648D	03/30/2011	03/30/2012
1T4300	SEMI-ANECHOIC CHAMBER # 1	EMC TEST SYSTEMS	NONE	08/23/2010	08/23/2013
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	06/14/2011	06/14/2012
1T4751	ANTENNA - BILOG	SUNOL SCIENCES	JB6	11/03/2010	11/03/2011

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

# Certification & User's Manual Information

## 8. Certification Label & User's Manual Information

### 8.1. 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 provision that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.

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**The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart Y — 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.<sup>1</sup> *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, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant, whichever is applicable.

**§ 2.902 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.

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<sup>1</sup> In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.

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**§ 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.



## 8.2. Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

### § 15.19 Labeling requirements.

(a) *In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:*

- (1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

- (2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

- (3) All other devices shall bear the following statement in a conspicuous location on the device:

*This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

- (4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

- (5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

**§ 15.21 Information to user.**

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

**§ 15.105 Information to the user.**

- (a) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**End of Report**