



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

January 8, 2009

JDSU
430 N. McCarthy Blvd.
Milpitas, CA 95035

Dear Prasad Ramakrishna,

Enclosed is the EMC test report for JDSU, Remote Cellular Test Node/AMP. The measured ERP/EIRP data are included for the 850 MHz and 1900 MHz band.

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.

Angela D. Kekovski
Documentation Department

Reference: (\JDSU\ EMC25692-FCC22/24)

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Electromagnetic Compatibility Criteria Test Report

For the

**JDSU
Remote Cellular Test Node/AMP**

MET Report: 25692-FCC22/24

January 8, 2009

Prepared For:

**JDSU
430 N. McCarthy Blvd.
Milpitas, CA 95035**

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



Electromagnetic Compatibility Criteria Test Report

For the

JDSU
Remote Cellular Test Node/AMP

Shawn McMillen
Wireless Manager

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Len Knight
Electromagnetic Compatibility Lab



Report Status Sheet

Revision	Report Date	Reason for Revision
∅	December 16, 2008	Initial Issue.
1	January 8, 2009	Corrections per engineer.



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1.0 Requirements Summary

Reference	Description	Compliance
Part 24 and Part 22	ERP/EIRP	Meets criteria for original Sanyo grant (FCC ID: AEZSCP-PRO700)

Table 1. Summary of EMC Testing



Equipment Configuration

1.1 Overview

An EMC evaluation to determine compliance of the JDSU Remote Cellular Test Node/AMP with the ERP/EIRP requirements of the original Sanyo grant (FCC ID: AEZSCP-PRO700) was performed. An external antenna was added to the Sanyo cell phone internal to the Remote Cellular Test Node/AMP. JDSU should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Remote Cellular Test Node/AMP has been **permanently** discontinued.

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with the RF Power Output (Radiated) requirements of the original Sanyo grant, in accordance with JDSU, purchase order number 3749. All tests were conducted using measurement procedure *ANSI/TIA/EIA-603-C (2004)*.

Type of Submission/Rule:	ERP/EIRP Measurements
Model(s) Tested:	Remote Cellular Test Node/AMP
EUT Specifications:	Primary Power: 120 Vac, 60 Hz
	Equipment Frequency Range: 850 MHz and 1900 MHz
Analysis:	The results obtained relate only to the item(s) tested.
Evaluated by:	Len Knight
Date(s):	November 7, 2008



1.2 Test Site

All testing was performed at MET Laboratories, Inc., 914 W. 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 shielded enclosure. 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).

1.3 Description of Test Sample

The RTP (Remote Test Probe) enables wireless service providers to actively monitor and improve the quality of services they deliver. The RTP tests voice, data and messaging services from a subscriber perspective within GPRS and GSM networks. It is a self contained, rack-mountable unit that can be deployed throughout the network.

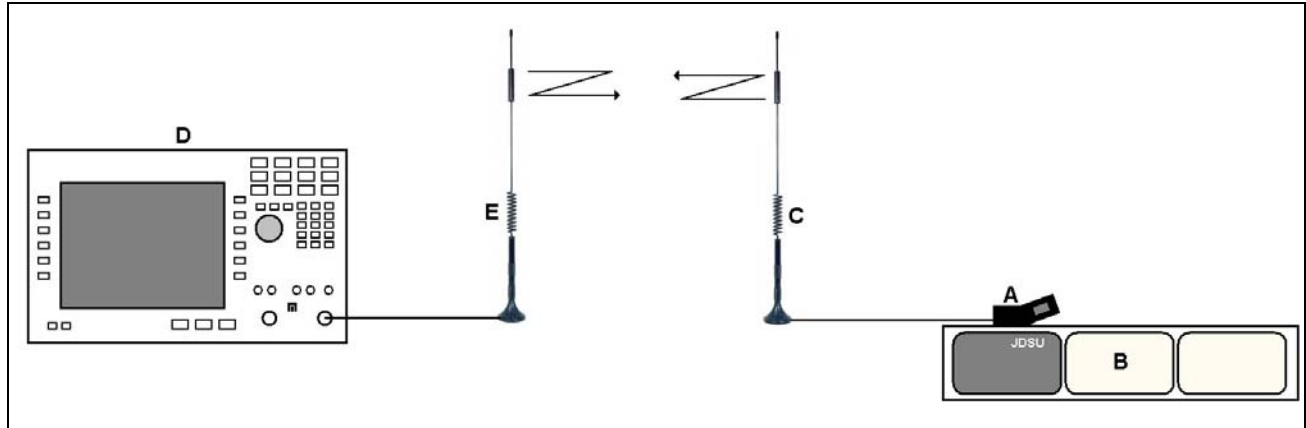


Figure 1. Block Diagram of Test Configuration



2.0 Equipment Configuration

The EUT was set up as outlined in Figure 1.

Ref. ID	Name / Description	Manufacturer	Model Number	Part Number	FCC ID
A	MOBILE PHONE	SANYO	PRO-700	N/A	AEZSCP-PRO700
B	RCATS/AMP	JDSU	N/A	N/A	N/A
C	MAGNETIC MOUNT CELLULAR ANTENNA	WILSON ELECTRONICS	N/A	301125	N/A

Table 2. Equipment Configuration


2.1 Support Equipment

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

Ref. ID	Name / Description	Manufacturer	Model Number	Part Number	Serial Number
D	COMMUNICATIONS TEST SET	AGILENT	E5515C	SERIES 10	JDSU 14662
E	MAGNETIC MOUNT CELLULAR ANTENNA	WILSON ELECTRONICS	N/A	301125	N/A

Table 3. Support Equipment

2.2 Antenna Information

A vertical antenna assembly consisting of a black SMA male connector at the bottom, a black coaxial cable, a spring, and a stainless steel whip antenna at the top.

Specifications

Part Number	301125
Frequency Range	806-894 MHz / 1850-1990 MHz
Impedance	50 ohms
Antenna Gain	5.12 dBi 806-894MHz / 6.12 dBi 1850-1990 MHz
Radiation	Omni
Polarization	Vertical
Wavelength	0.9 Wavelength 806-894 MHz / 2.0 Wavelength 1850-1990 MHz
Ground Plane	Metal ground plane required
Connector	SMA Male
Material	Whip - Stainless Steel
Coax Cable	RG174 - 10 feet / 3.05 meters
Height	12.25 inches / 31.12 cm
Mount	Rare earth magnet



2.3 Mode of Operation

The Sanyo Cell Phone received power through the Remote Cellular Test Node/AMP as it would during normal operation.

A call box was used to initiate and establish a call with the cell phone. The device was configured with “All Up” power control bits. Testing was performed in both the cellular and the PCS band.

2.4 Modifications

2.4.1 Modifications to EUT

No modifications were made to the EUT.

2.4.2 Modifications to Test Standard

No modifications were made to the test standard.

2.5 Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to JDSU upon completion of testing.

3.0 Electromagnetic Compatibility Criteria

RF Power Output

Test Requirement(s): The intent of these measurements is to measure the ERP/EIRP of the transmitter at the 850 MHz and 1900 MHz band.

- Test Procedures:**
- a) The EUT was located in a 3 m semi anechoic chamber.
 - b) ERP/EIRP power measurements were made by antenna substitution method in accordance with ANSI/TIA/EIA-603-C-2004.
 - c) For measuring the CDMA signal, a peak detector was used with a RBW=VBW=3 MHz.

1900 MHz band per FCC Part 24

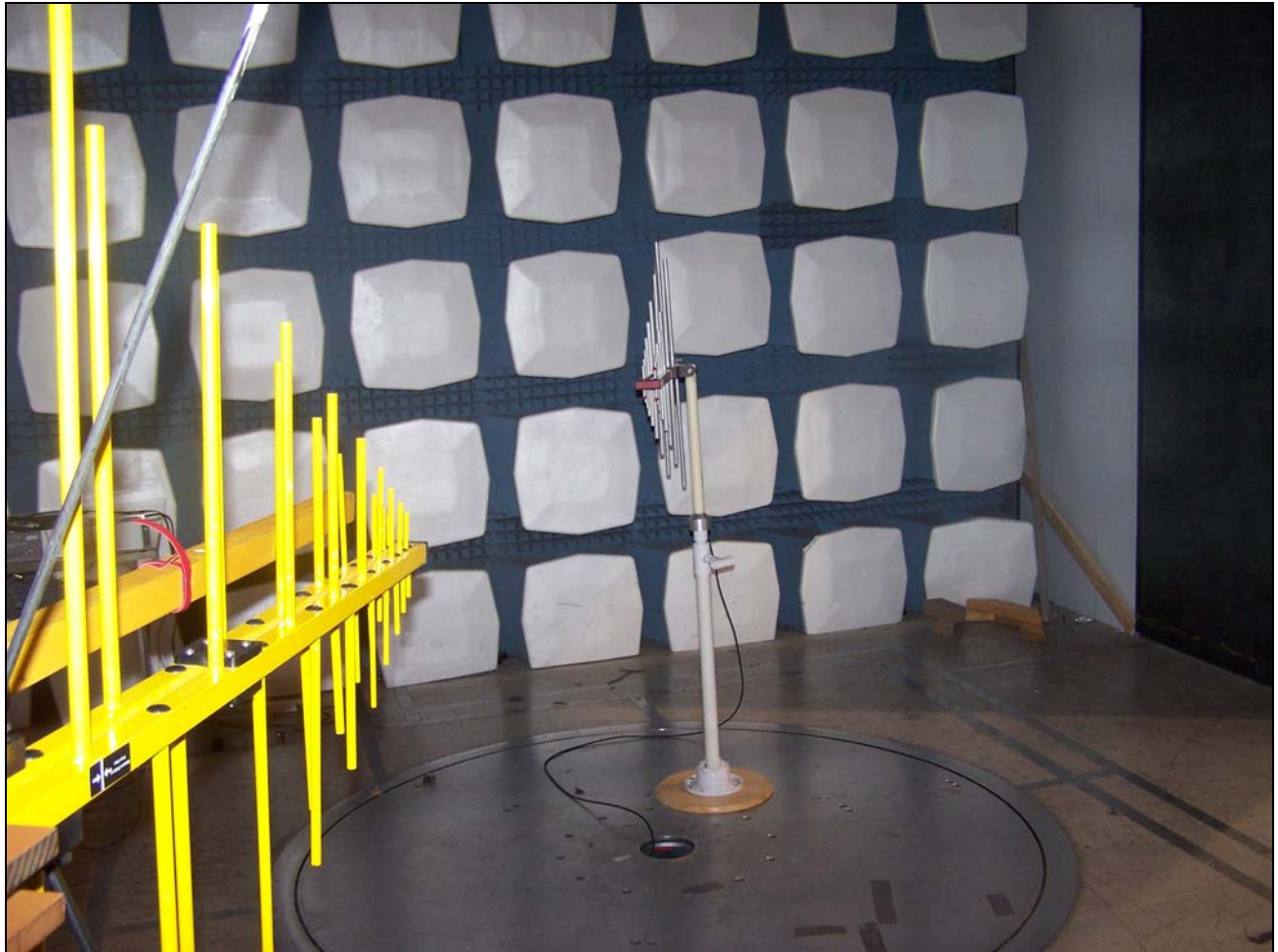
Frequency (MHz)	Channel	Measured Peak Amplitude (dBuV/m)	Power into substituted antenna (dBm)	Gain of Antenna (dBi)	EIRP	
					dBm	Watts
1851.25	25	99.56	15.24	8.1	23.34	0.216
1880.0	600	101.2	17.42	8.1	25.52	0.356
1908.75	1175	98.22	15.52	8.1	23.62	0.230

850 MHz band per FCC Part 22

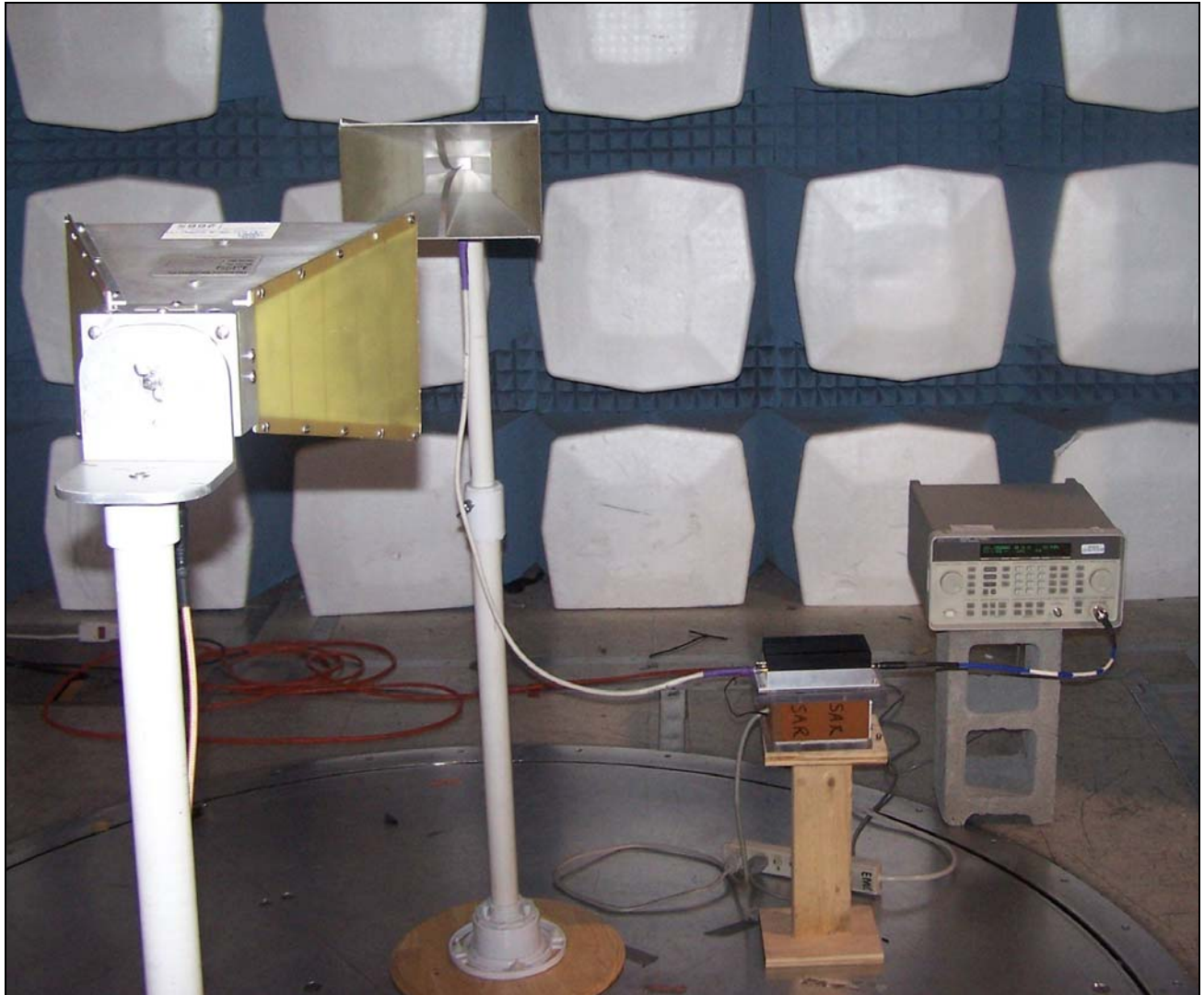
Frequency (MHz)	Channel	Measured Peak Amplitude (dBuV/m)	Power into substituted antenna (dBm)	Gain of Antenna (dBi)	Correction dBi to dBd	ERP	
						dBm	Watts
824.7	1013	93.41	15.05	7.3	-2.14	20.21	0.105
848.31	777	90.68	12.45	7.1	-2.14	17.41	0.055
836.52	384	92.97	14.98	7.2	-2.14	20.04	0.101

Test Engineer(s): Len Knight

Test Date(s): November 7, 2008



Photograph 1. Antenna Substitution Test Setup for 850 MHz Band



Photograph 2. Antenna Substitution Test Setup for 1900 MHz Band

Radiated Spurious Emissions

§ 2.1053 Measurements required: Field strength of spurious radiation.

Test Requirement(s): § 2.1053 Measurements required: Field strength of spurious radiation.

§ 2.1053 (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of § 2.1049, as appropriate.

§ 2.1053 (b): The measurements specified in paragraph (a) of this section shall be made for the following equipment:

- (1) Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.
- (2) All equipment operating on frequencies higher than 25 MHz.
- (3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.
- (4) Other types of equipment as required, when deemed necessary by the Commission.

§ 24.238 **Emission limitations for Broadband PCS equipment:** The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

§ 24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

§ 22.917 **Emission Limitations for cellular equipment:** The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

§ 22.917 (a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Procedures:

- a) As required by §2.1053, field strength of spurious radiation measurements were made in accordance with the general procedures of the ANSI/TA/EIA-603-C.
- b) Radiated emission measurements were performed inside a 3 m semi-anechoic chamber.
- c) Instead of antenna substitution, plots were corrected to show EIRP based upon calculation: $EIRP = E_o + 20\text{Log}(D) - 104.8$
- d) The radiated power level of all spurious emissions must be attenuated by at least $43 + 10\text{log}(P_o)$ below P_o .

Test Results:

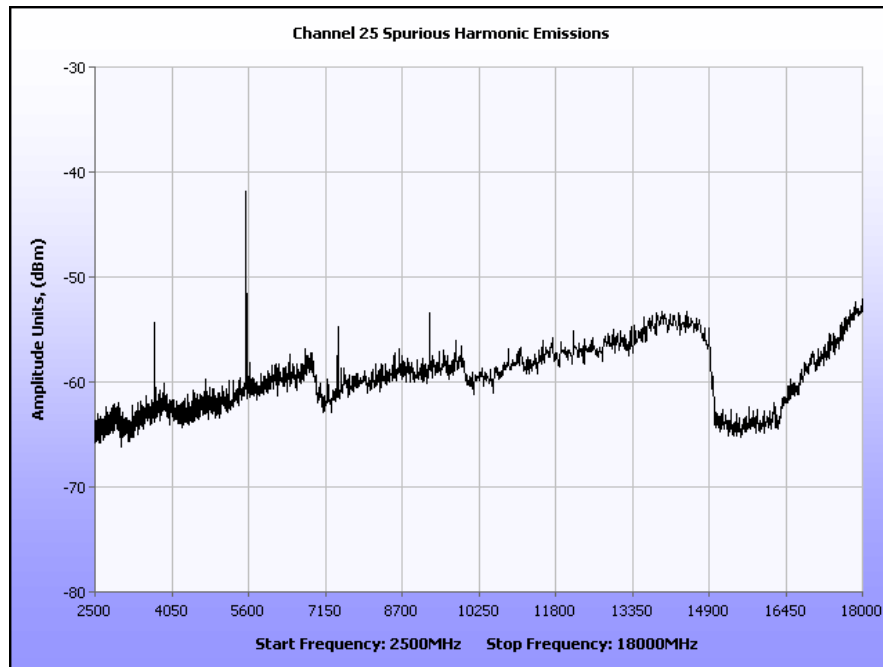
The EUT complies with the requirements of this section.

Test Engineer:

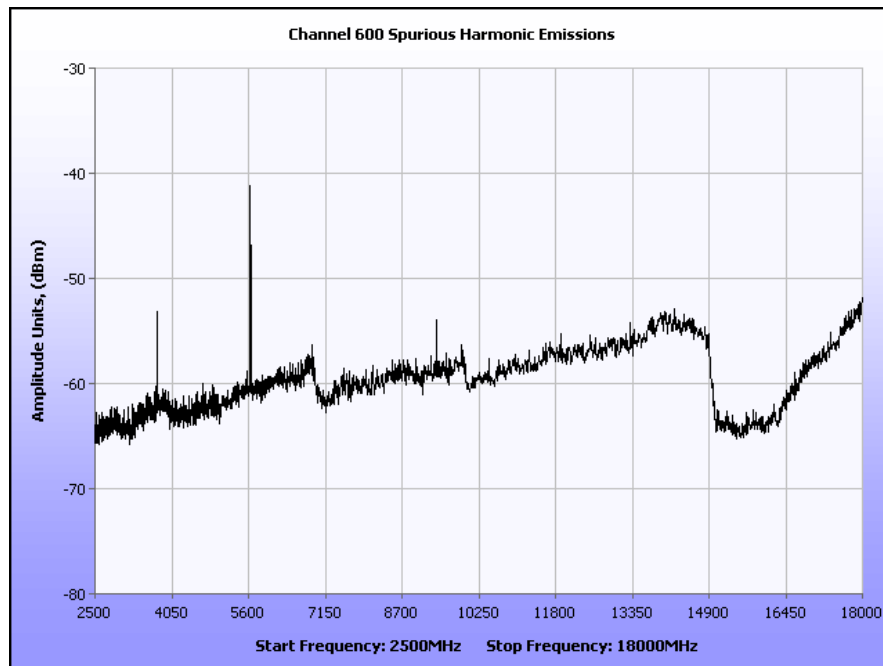
Len Knight

Test Date(s):

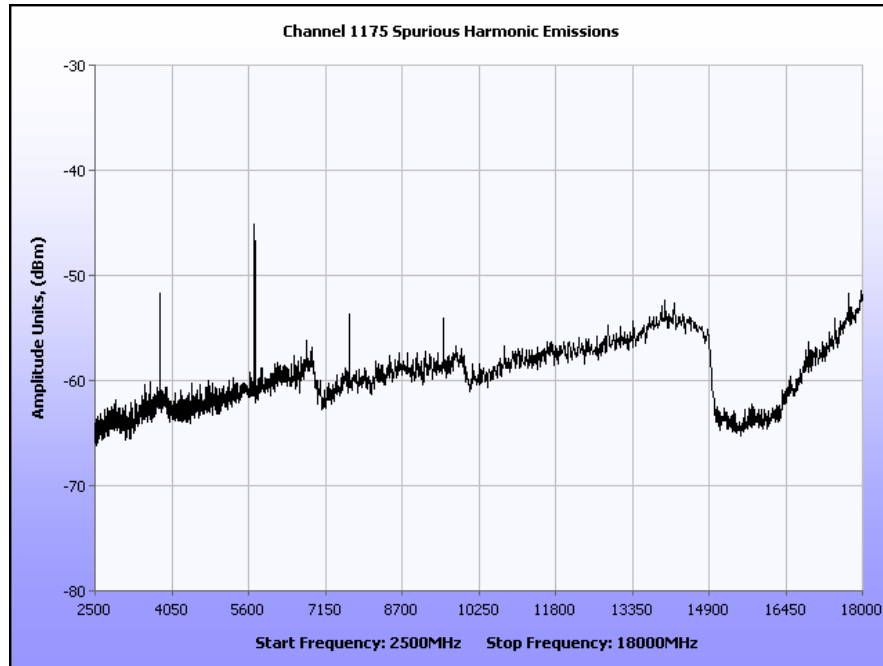
11/30/08



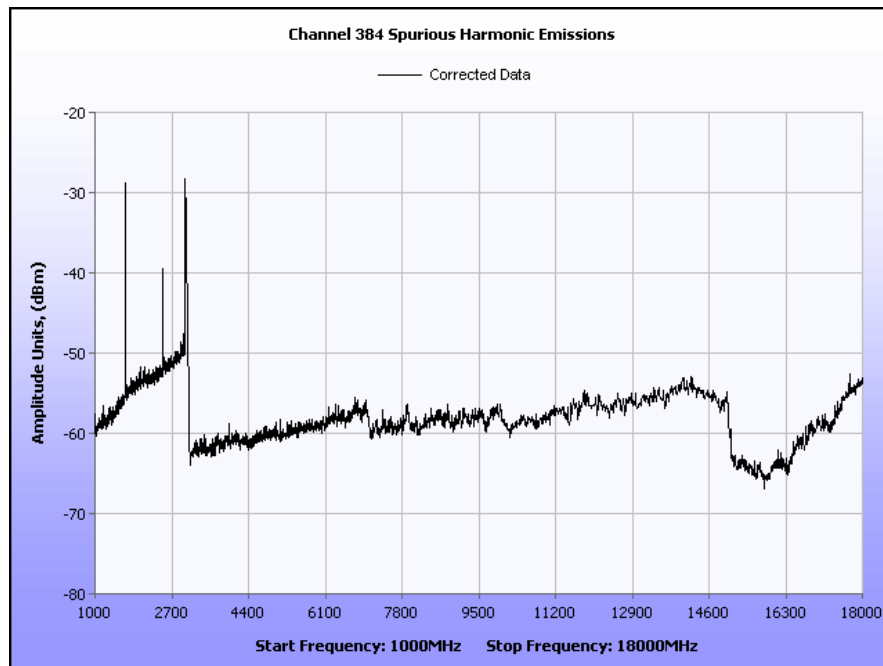
Plot 1. Channel 25, Spurious Harmonic Emissions



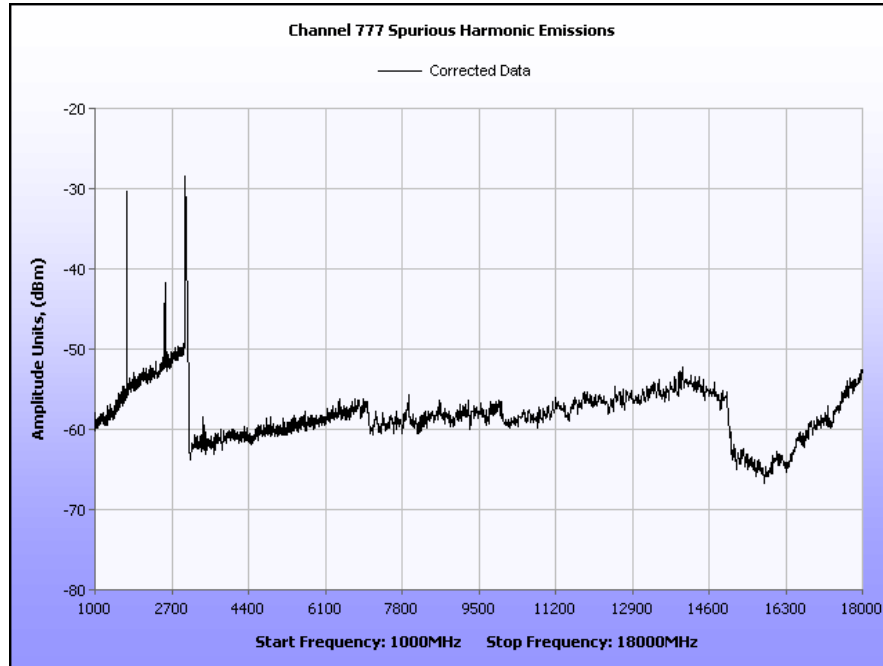
Plot 2. Channel 600, Spurious Harmonic Emissions



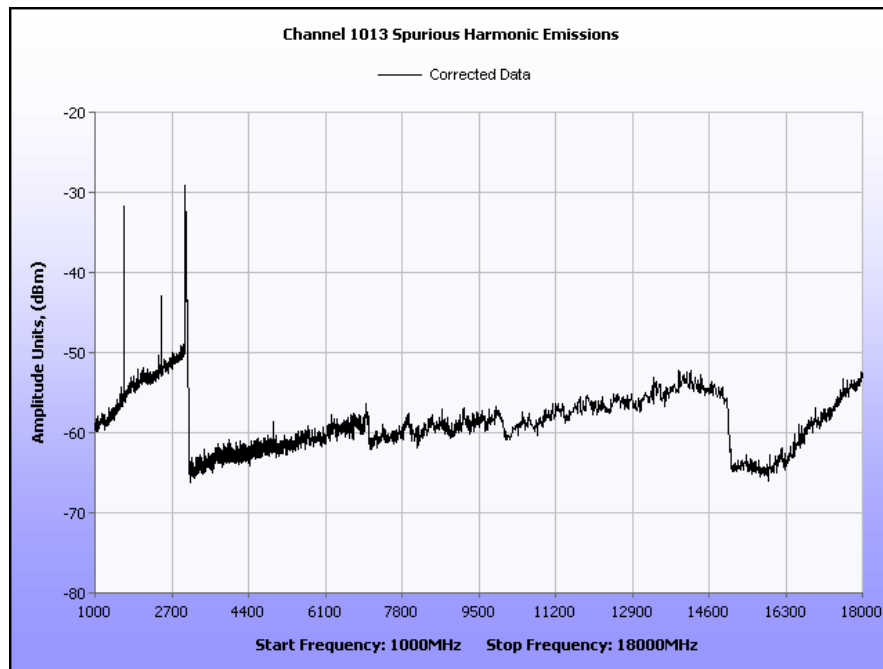
Plot 3. Channel 1175, Spurious Harmonic Emissions



Plot 4. Channel 384, Spurious Harmonic Emissions



Plot 5. Channel 777, Spurious Harmonic Emissions



Plot 6. Channel 1013, Spurious Harmonic Emissions



Photograph 3. Radiated Spurious Test Setup

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: Unintentional Radiated Emissions			Test Date(s): November 7, 2008		
MET Asset #	Nomenclature	Manufacturer	Model	Last Cal Date	Cal Due Date
1T4300	SEMI-ANECHOIC CHAMBER # 1	EMC TEST SYSTEMS	NONE	02/17/2006	01/17/2009
1T4303	ANTENNA; BILOG	SCHAFNER - CHASE EMC	CBL6140A	07/07/2008	07/07/2009
1T4612	ESA-E SERIES SPECTRUM ANALYZER	AGILENT	E4407B	01/04/2008	01/04/2009
1T4442	PRE-AMPLIFIER, MICROWAVE	MITEQ	AFS42-01001800-30-10P	SEE NOTE	
1T2665	HORN ANTENNA	EMCO	3115	05/07/2008	05/07/2009
1T2511	ANTENNA; HORN	EMCO	3115	07/29/2008	07/29/2009
1T4365	AMPLIFIER	MINI CIRCUITS	ZHL-42	SEE NOTE	
1T4271	RF SIGNAL GENERATOR	HP	8648C	06/30/2008	06/30/2009
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	04/18/2008	04/18/2009

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