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
33439 WESTERN AVENUE ● UNION CITY, CALIFORNIA 94587 ● PHONE (510) 489-6300 ● FAX (510) 489-6372
3162 BELICK STREET ● SANTA CLARA, CA 95054-2401 ● PHONE (408) 748-3585 ● FAX (510) 489-6372

May 26, 2009

WAY Systems, Inc
200 Unicorn Park Drive-2nd Fl
Woburn, MA 01801

Dear Dale Robertson,

Enclosed is the EMC Wireless test report for compliance testing of the WAY Systems, Inc, Way5000 as tested to the requirements of the FCC Certification rules under Title 47 of the CFR Part 22 Subpart H for Cellular Devices and FCC Part 24 Subpart E for Broadband PCS 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 contact me.

Sincerely yours,
MET LABORATORIES, INC.

Jennifer Sanchez
Documentation Department

Reference: (\WAY Systems,Inc\26033-FCC22_24)

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Electromagnetic Compatibility Criteria
Test Report

for the

WAY Systems, Inc
Model Way5000

Tested under
FCC Certification Rules
Title 47 of the CFR,
Part 22 Subpart H for Cellular Devices
&
Part 24 Subpart E for Broadband PCS Devices

MET Report: EMC26033-FCC22_24

May 26, 2009

Prepared For:

WAY Systems, Inc
200 Unicorn Park Drive-2nd Fl
Woburn, MA 01801

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

Electromagnetic Compatibility Criteria
Test Report

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WAY Systems, Inc
Model Way5000

Tested Under
FCC Certification Rules
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Part 22 Subpart H for Cellular Devices
&
Part 24 Subpart E for Broadband PCS Devices

Anderson Soungpanya, Project Engineer
Electromagnetic Compatibility Lab

Jennifer Sanchez
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 capable of operation in accordance with the requirements of Part 22 Subpart H and Part 15 Subpart B of the FCC Rules under normal use and maintenance.

Shawn McMillen, Manager
Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	May 27, 2009	Initial Issue & Final Issue

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List of Terms and Abbreviations

AC	**A**lternating **C**urrent
ACF	**A**ntenna **C**orrection **F**actor
Cal	**Cal**ibration
d	**M**easurement **D**istance
dB	**D**eci**b**els
dBµA	**D**eci**b**els above one **micro**amp
dBµV	**D**eci**b**els above one **micro**volt
dBµA/m	**D**eci**b**els above one **micro**amp **per m**eter
dBµV/m	**D**eci**b**els above one **micro**volt **per m**eter
DC	**D**irect **C**urrent µ
E	**E**lectric Field
DSL	**D**igital **S**ubscriber **L**ine
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
GR-1089-CORE	***(GR)*** **G**eneral **R**equirement(s) imposed by the NEBS standard, **(*CORE*) C**entral **O**ffice **R**ecovery **E**xpress (AT&T), ***(1089)*** specifies various parts of the General Requirements under Bellcore Technical Standard, Requirements for Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment
GRP	**G**round **R**eference **P**lane
H	Magnetic Field
HCP	**H**orizontal **C**oupling **P**lane
Hz	**H**ert**z**
IEC	**I**nternational **E**lectrotechnical **C**ommission
kHz	**k**ilo**h**ert**z**
kPa	**k**ilo**pa**scal
kV	**k**ilo**v**olt
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
MHz	**M**ega**h**ertz
µH	**micro**henry
µ	**micro**farad
µs	**micros**econds
NEBS	**N**etwork **E**quipment-**B**uilding **S**ystem
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
TWT	**T**raveling **W**ave **T**ube
V/m	**V**olts **per m**eter
VCP	**V**ertical **C**oupling **P**lane

I. Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the WAY Systems, Inc.Way5000, with the requirements of Part 22 Subpart H and Part 24 Subpart E. 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 Way5000. WAY Systems, Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Way5000, has been **permanently** discontinued

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 22 Subpart H and Part 24 Subpart E, in accordance with WAY Systems, Inc, purchase order number 1805.

Reference	Description	Compliance
§2.1046; §22.913 Part 24 Subpart E §24.232 (a), (c)	RF Power Output	Compliant
§2.1047	Modulation Characteristics	N/A
§2.1049	Occupied Bandwidth	N/A
§2.1051; §22.917; 24.238 (b); 24.238 (a)	Spurious Emissions at Antenna Terminals	N/A
§2.1053; §22.917 24.238 (a)	Radiated Spurious Emissions	Compliant
§2.1055; §22.355	Frequency Stability	N/A
2-11-04/EAB/RF	Out of Band Rejection	N/A

Table 1 Executive Summary of EMC ComplianceTesting

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by WAY Systems, Inc. to perform testing on the Way5000, under WAY Systems, Inc's purchase order number 1805.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the WAY Systems, Inc, Way5000.

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

Model(s) Tested:	Way5000		
Model(s) Covered:	Way5000		
EUT Specifications:	Primary Power: 3.7V 1100mAh Rechargeable Li-ion Battery		
	FCC ID: VLNWAY5000-1		
	Type of Modulations:	GSM 850/1900	
	Equipment Code:	TNB	
	ERP/EIRP	GSM 850MHz	GSM 1900MHz
		33.97 dBm	32.46 dBm
	EUT Frequency Ranges:	824 – 849MHz	1850– 1910MHz
Analysis:	The results obtained relate only to the item(s) tested.		
Environmental Test Conditions:	Temperature: 15-35º C		
	Relative Humidity: 30-60%		
	Barometric Pressure: 860-1060 mbar		
Evaluated by:	Anderson Soungpanya		
Date(s):	May 21, 2009 & May 26, 2009		

B. References

CFR 47, Part 22, Subpart H	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 22: Rules and Regulations for Cellular Devices.
CFR 47, Part 24, Subpart E	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 24: Rules and Regulations for Personal Communications Services
ANSI C63.4:2003	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI/NCSL Z540-1-1994	Calibration Laboratories and Measuring and Test Equipment - General Requirements
ANSI/ISO/IEC 17025:2000	General Requirements for the Competence of Testing and Calibration Laboratories
EIA/TIA-603-A-2001	Land Mobile FM or PM Communication Equipment Measurement and Performance Standards

C. 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 10 meter 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.

D. Description of Test Sample

The Way5000, Equipment Under Test (EUT), is a battery powered hand held mobile (GSM) Point of Sale Terminal.

Photograph 1. WAY Systems, Inc. Way5000

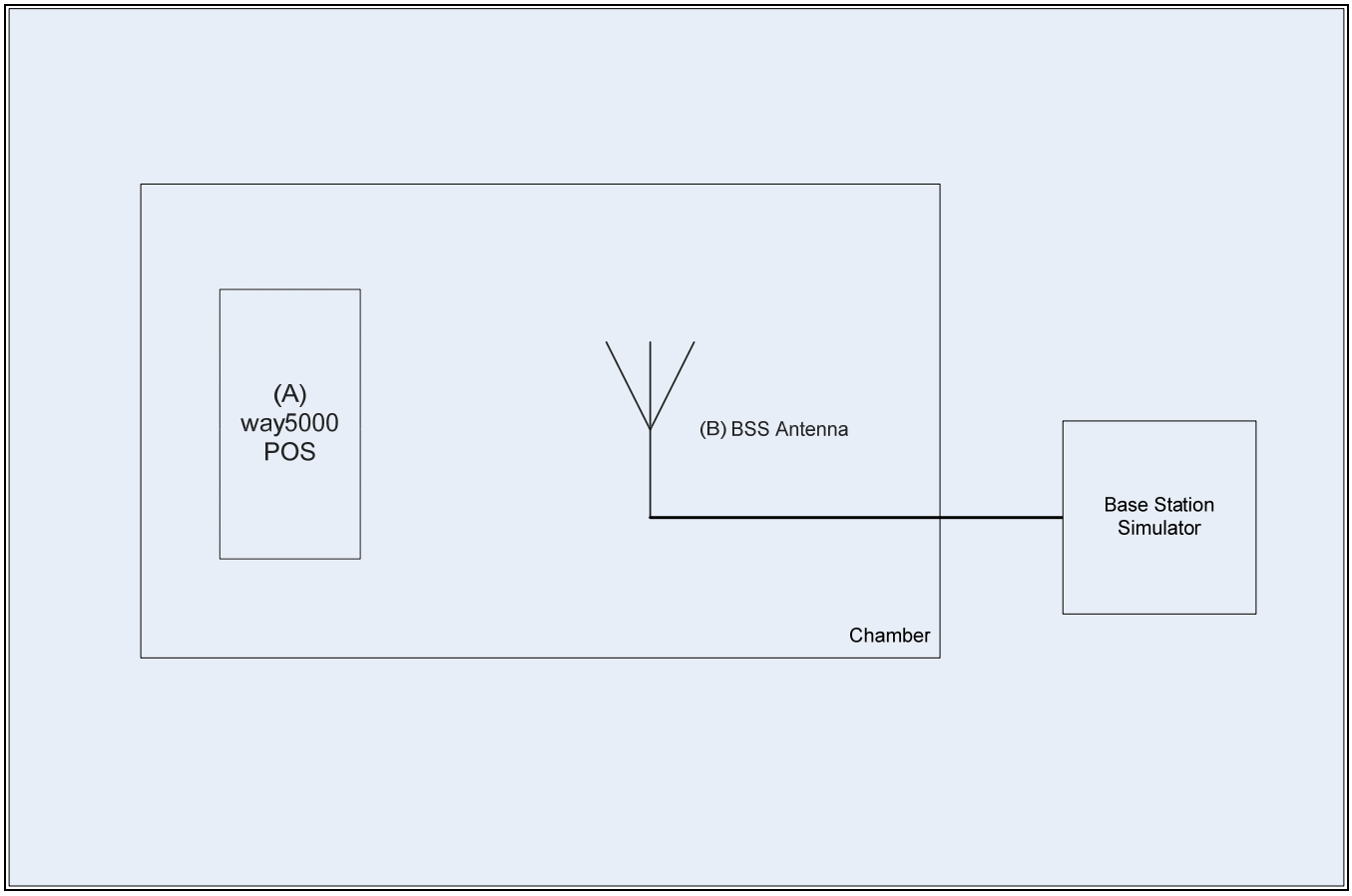


Figure 1. Block Diagram of Test Configuration

E. Equipment Configuration

The EUT was set up as outlined in Figure 1, Block Diagram of Test Setup. All cards, racks, etc., incorporated as part of the EUT is included in the following list.

Ref. ID	Name / Description	Model Number	Part Number	Serial Number	Revision
A	WAY5000 MOBILE POS TERMINAL – CONFIG 2	WAY5000	70-5000-04	17	A
	AC TO DC POWER ADAPTER	PSAA05A-050	P82609922A4	N/A	N/A

Table 2. Equipment Configuration

F. Support Equipment

WAY Systems, Inc. supplied support equipment necessary for the operation and testing of the Way5000. All support equipment supplied is listed in the following Support Equipment List.

Ref. ID	Name / Description	Manufacturer	Model Number
B	BASE STATION SIMULATOR (MET LABS EQUIPT)	ROHDE & SCHWARZ	CMU 200

Table 3. Support Equipment

* The 'Customer Supplied Calibration Data' column will be marked as either not applicable, not available, or will contain the calibration date supplied by the customer.
** The AC/DC Adapter was use to power the EUT for testing purpose only, will not be sold with radio.

G. Ports and Cabling Information

The EUT did not require any ports and cabling information for operation or monitoring.

H. Mode of Operation

The way5000 is operated by establishing a call between a base station simulator and the device.

I. Method of Monitoring EUT Operation

The operation of the unit can be determined by monitoring the status of the call between the base station simulator and the way5000.

J. Modifications

a) Modifications to EUT
No modifications were made to the EUT.

b) Modifications to Test Standard
No modifications were made to the test standard.

K. Disposition of EUT

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

III. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 2.1046 RF Power Output

Test Requirements: **§ 2.1046 Measurements required: RF power output:**

§ 2.1046 (a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8).The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

§ 2.1046 (b) For single sideband, independent sideband, and single channel, controlled carrier radiotelephone transmitters, the procedure specified in paragraph (a) of this section shall be employed and, in addition, the transmitter shall be modulated during the test as specified and as applicable in § 2.1046 (b) (1-5). In all tests, the input level of the modulating signal shall be such as to develop rated peak envelope power or carrier power, as appropriate, for the transmitter.

§ 2.1046 (c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

§ 22.913 Power and antenna height limits.

§ 22.913(a): The Effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 7Watts.

§ 24.232 Power and antenna height limits.

§ 24.232 (b): Mobile/portable stations are limited to 2 watts EIRP. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

Test Results: The EUT complies with the requirements of this section

Test Engineer(s): Anderson Soungpanya

Test Date(s): May 21, 2009

Radiated Emissions (Substitution Method)

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 5 meter semi-anechoic chamber. The EUT was set at a distance of 3m from the receiving antenna. 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 360^0 and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated. The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10^{th} or 40GHz, which ever was the lesser, were investigated.

Frequency (MHz)	Mode Band	Channel #	Reference Power (dBm)	Conducted Power into Substitution Antenna (dBm)	Substitution Antenna Gain (dB)	EIRP (dBm)
824.2	GSM 850	128	-3.90	25.98	6.90	32.88
836.5	GSM 850	190	-2.30	26.12	6.90	33.02
848.8	GSM 850	251	-2.90	26.17	6.80	33.97
1850.2	GSM 1900	512	-14.04	21.61	9.10	30.71
1880.0	GSM 1900	661	-16.20	23.36	9.10	32.46
1909.8	GSM 1900	810	-13.70	21.32	9.10	30.42

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 2.1053 Radiated Spurious Emissions

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. For equipment operating on frequencies below 890 MHz, an open field test is normally required with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.

§ 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.

§ 22.917 Emission limitations 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).

§ 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.

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 5 meter semi-anechoic chamber. The EUT was set at a distance of 3m from the receiving antenna. The EUT was set to transmit at the mid channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360^0 and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated. The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10^{th} or 40GHz, which ever was the lesser, were investigated.

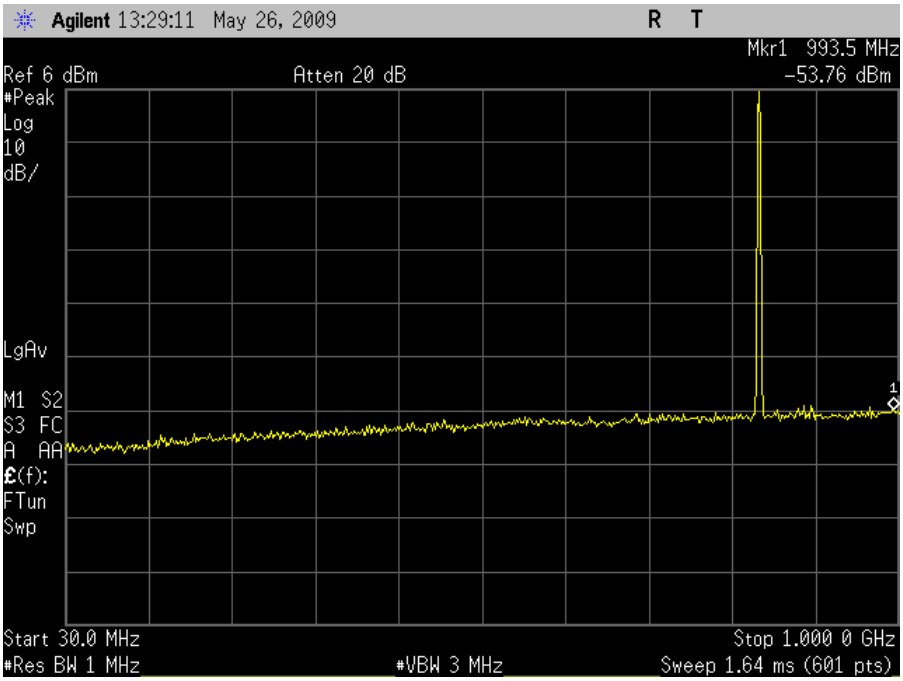
Test Results: The EUT complies with the requirements of this section.

Test Engineer: Anderson Soungpanya

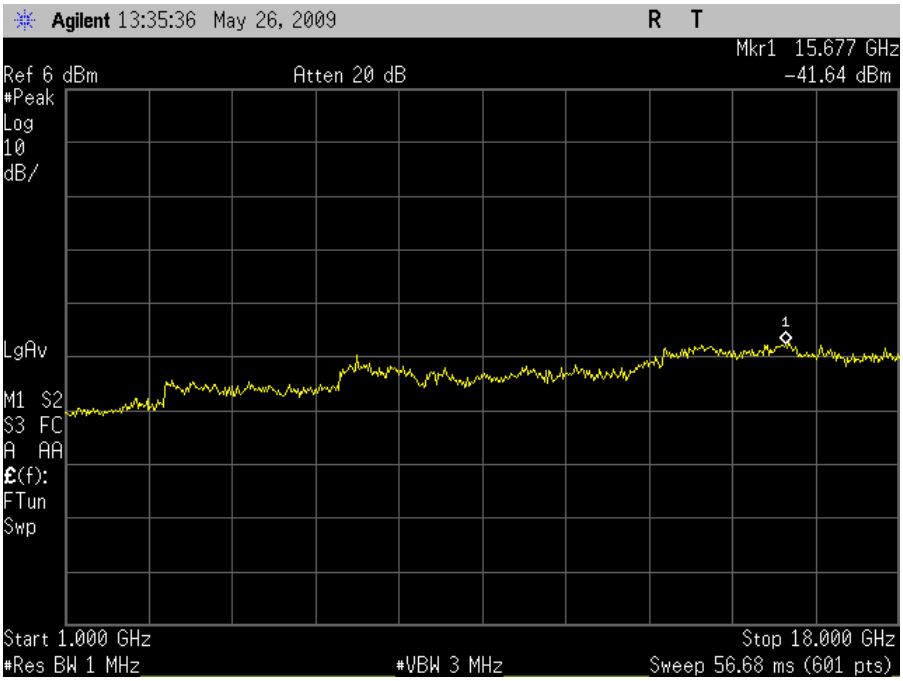
Test Date(s): May 21, 2009

Electromagnetic Compatibility Criteria for Intentional Radiators

Radiated Spurious Emissions – Cellular Band



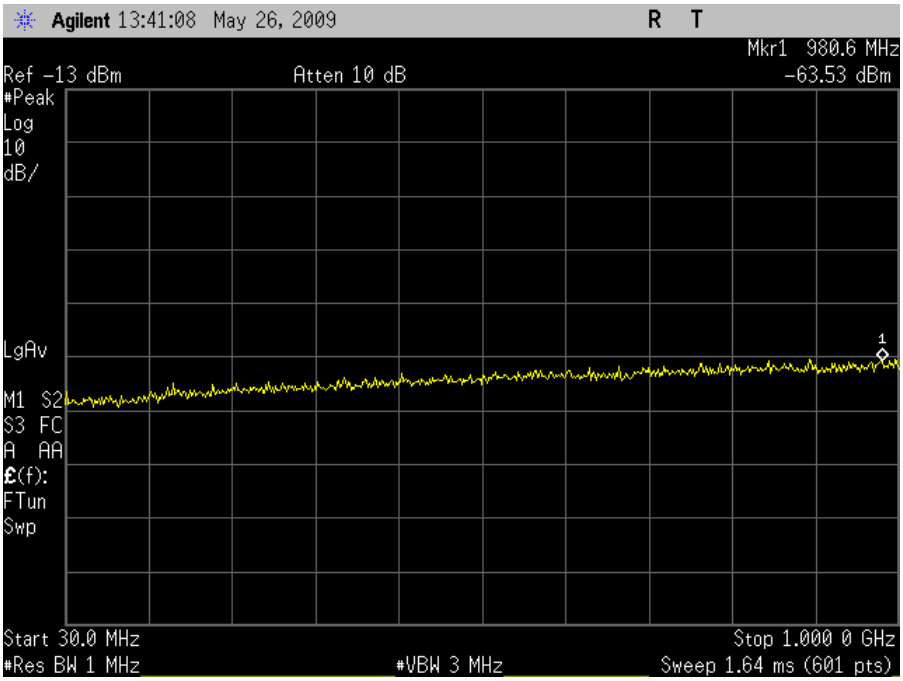
Plot 1. Radiated Spurious Emissions – 30MHz – 1GHz (Cellular Band)



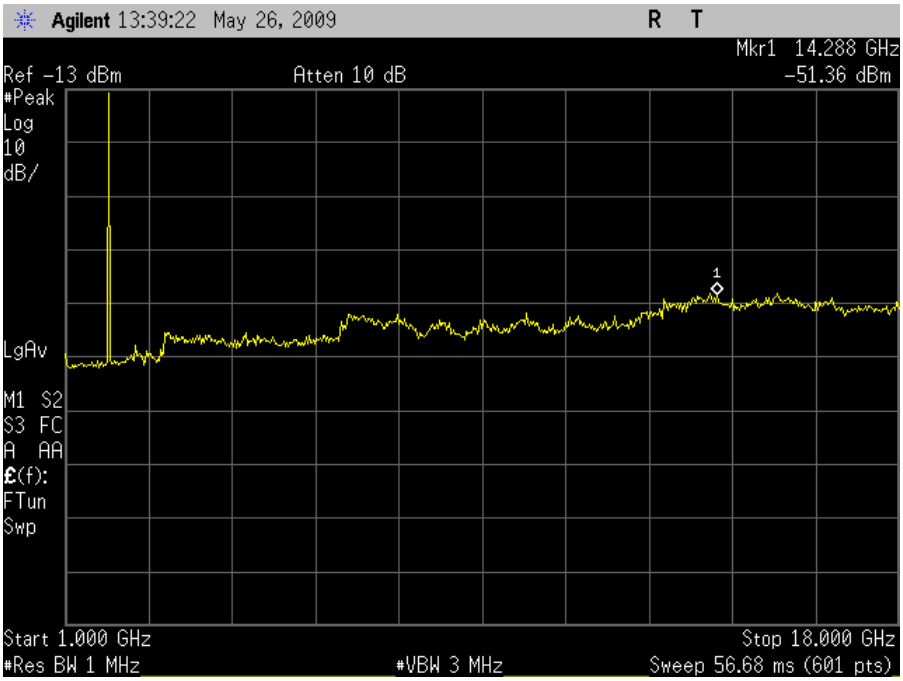
Plot 2. Radiated Spurious Emissions – 1GHz – 18GHz (Cellular Band)

Electromagnetic Compatibility Criteria for Intentional Radiators

Radiated Spurious Emissions – PCS Band



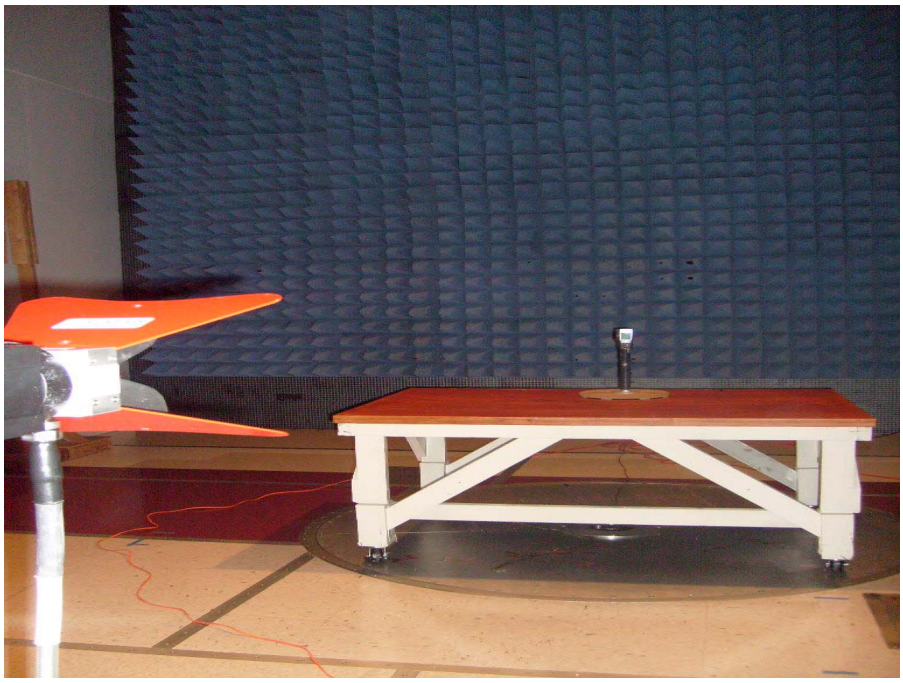
Plot 3. Radiated Spurious Emissions – 30MHz – 1GHz (PCS Band)



Plot 4. Radiated Spurious Emissions – 1GHz – 18GHz (PCS Band)

Electromagnetic Compatibility Criteria for Intentional Radiators

Photograph 2. Test Equipment and setup for various Radiated Measurements – Bilog Antenna



Photograph 3. Test Equipment and setup for various Radiated Measurements – Horn Antenna

IV. Test Equipment

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
1S2198	HORN ANTENNA	EMCO	3115	9/10/08	9/10/09
1S2603	HORN ANTENNA	ETS-LINDGREN	3117	9/10/08	9/10/09
1S2583	SPECTRUM ANALYZER	AGILENT	E4447A	1/12/2009	1/12/2010
1T4310	LOG ANTENNA	ETS-LINDGREN	3148	8/7/07	8/7/09
1S2485	BILOG ANTENNA	CHASE	CBL6112D	1/19/2009	2/13/2010
1S2482	5M CHAMBER	PANASHIELD	5M SEMI-ANECHOIC CHAMBER	11/25/2008	11/25/2009
1S2121	PREAMPLIFIER	HEWLETT PACKARD	8449B	SEE NOTE	
1S2269	SIGNAL GENERATOR	HEWLETT PACKARD	E4432B	5/28/2008	5/28/09

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

End of Report

