MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*
914 WEST PATAPSCO AVENUE ● BALTIMORE, MARYLAND 21230 ● PHONE (410) 354-3300 ● FAX (410) 354-3313

June 5, 2009

LigoWave LLC
1440 Dutch Valley Place, Ste 1155
Atlanta, GA 30324

Dear Matt Hardy,

Enclosed is the EMC test report for compliance testing of the LigoWave LLC, LigoPTP-3 R2, tested to the requirements of Title 47 of the Code of Federal Regulations (CFR), Part 90 Subpart Z 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: (\LigoWave LLC\EMC26993-FCC90 Rev. 1)

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

Electromagnetic Compatibility Criteria Test Report

For the

LigoWave LLC
Model LigoPTP-3 R2

Tested under

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

MET Report: EMC26993-FCC90 Rev. 1

June 5, 2009

Prepared For:
LigoWave LLC
1440 Dutch Valley Place, Ste 1155
Atlanta, GA 30324

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

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MET Report: EMC26993-FCC90 Rev. 1

Jeffrey Hazen
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, Subpart Z of the FCC Rules under normal use and maintenance.

Shawn McMillen, Wireless Lab Manager
Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	June 3, 2009	Initial Issue.
1	June 5, 2009	Editorial corrections.

Table of Contents

All references to section numbers are taken directly from the standard/specification used. Only sections requiring testing or evaluation are included.

List of Tables

List of Figures

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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	**microh**enry
µ	**microf**arad
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

Executive Summary

1. Testing Summary

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

Title 47 of the CFR, Part 90, Subpart Z, 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*			
90.1319(b) Policies governing the use of the 3650–3700 MHz band.	✓			See FCC ID: SWX-XR3B
2.1046; 90.1321(a) RF Power Output	✓			Compliant
2.1046; 90.1321(a) Peak Power Spectral Density	✓			Compliant
2.1049 Occupied Bandwidth	✓			See FCC ID: SWX-XR3B
2.1051; 90.1323(a) Spurious Emissions at Antenna Terminals	✓			See FCC ID: SWX-XR3B
2.1053; 15.209 Radiated Spurious Emissions	✓			See FCC ID: SWX-XR3B
RF exposure 90.1335	✓			See FCC ID: SWX-XR3B
Frequency Stability §2.1055, 90.213	✓			See FCC ID: SWX-XR3B

Equipment Configuration

2. Equipment Configuration

2.1. Overview

MET Laboratories, Inc. was contracted by LigoWave LLC to perform testing on the LigoPTP-3 R2.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the LigoWave LLC., LigoPTP-3 R2.

An EMC evaluation to determine compliance of the TB 4.9 with the requirements of Part 90, Subpart Z, 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. LigoWave LLC. 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.

Model(s) Tested:	LigoPTP-3 R2			
Model(s) Covered:	LigoPTP-3 R2			
EUT Specifications:	Primary Power Source: 18VDC			
	FCC ID: V2V-PT3-R2			
	Type of Modulations:	OFDM		
	Emission Designators:	**5MHz**	**10MHz**	**20MHz**
		4M24D7D	8M44D7D	17M2D7D
	RF Output Power:	18.73dBm	18.79dBm	18.46dBm
	Equipment Code:	TNB		
	EUT Frequency Ranges:	3650–3675MHz		
Analysis:	The results obtained relate only to the item(s) tested.			
Environmental Test Conditions:	Temperature: 15-35° C			
	Relative Humidity: 30-60%			
	Barometric Pressure: 860-1060 mbar			
Evaluated by:	Jeffrey Hazen			
Report Date(s):	June 5, 2009			

Table 1. EUT Specifications

2.2. 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.

2.3. Description of Test Sample

The LigoWave LLC LigoPTP-3 R2, is an outdoor radio unit operating from 3.650 GHz – 3.675 GHz. The intended use of this product is fixed point to point and fixed point to multi-point wireless applications.

2.4. 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	Serial Number
A	LIGOWAVE PTP	LigoPTP 3 - R2	00247829

Table 2. Equipment Configuration

2.5. Support Equipment

LigoWave LLC supplied support equipment necessary for the operation and testing of the LigoPTP-3 R2. All support equipment supplied is listed in the following Support Equipment List.

Ref. ID	Name / Description	Manufacturer	Model Number	Serial Number
B	18V POE INJECTOR	EV	A5-S20S18-V	R00081101368
C	LAPTOP	DELL	PP04X	CN-OXM006-48643-7CF-1825

Table 3. Support Equipment

2.6. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or Reason for No Cable	Qty.	Length (m)	Shielded? (Y/N)	Termination Box ID & Port ID
1	ANTENNA	50 OHM TERMINATION	NA	NA	NA	NA
2	POE	RJ45	1	1	N	B

Table 4. Ports and Cabling Information

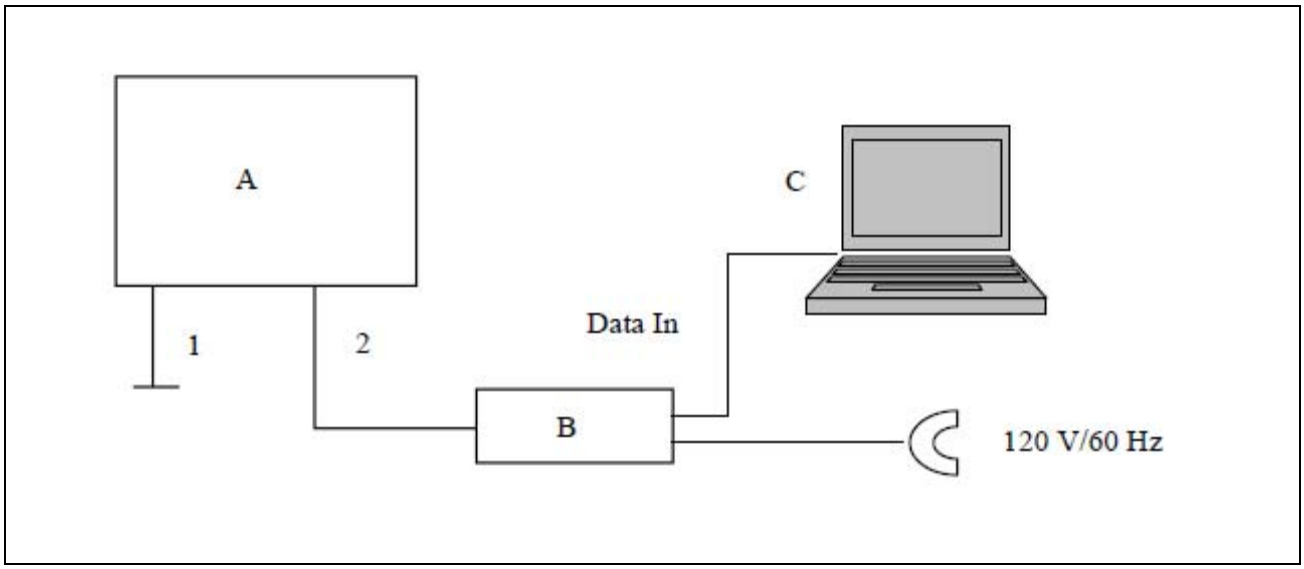


Figure 1. Block Diagram of Test Configuration

2.7. Method of Monitoring EUT Operation

EUT is a 3.65GHz minPCI radio module. This module will be loaded and controlled by an external computer. This device provides seven transmitting speeds, 6, 9, 12, 24, 36, 48 and 54Mbps. The device of RF carrier is BPSK, QPSK, 16QAM and 64QAM.
Operating modes are point to point and point to multipoint.

2.8. Modifications

2.8.1. Modifications to EUT

No modifications were made to the EUT.

2.8.2. Modifications to Test Standard

No modifications were made to the EUT.

2.9. Disposition of EUT

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

Electromagnetic Compatibility Criteria for Intentional Radiators

3. Electromagnetic Compatibility RF Power Output Requirements

3.1. RF Power Output

Test Requirement(s): **§2.1046, §90. 1321 (a) and §90. 1321 (c)**

Test Procedures: The EUT was connected to a Spectrum Analyzer through a Directional Coupler. A calibrated power meter capable of measuring a broad band modulated carrier was connected to the coupling port. The spectrum analyzer's channel power measuring option was used. Both the spectrum analyzer and power meter were compared to insure they both indicated the same output power for the EUT. The EUT power was adjusted to produce maximum output power as specified in the owner's manual. Measurements were performed at the low, mid and high channels for each of the EUT's bandwidths and modulations.

Limits: For Base and Fixed stations the EIRP limit is 25W / 25MHz.

For mobile and portable stations the EIRP limit is 1W / 25MHz.

Test Results: Equipment complies with 90.1321(a) for Base and Fixed Stations. The antenna gain limits provided assume a professional installation of the device to set the minimum channel bandwidth according to the installed antenna gain. If professional installation is not used, then the maximum gain of the device is 18 dBi.

Test Engineer(s): Jeffrey Hazen and Shawn McMillen

Test Date(s): January 21, 2008

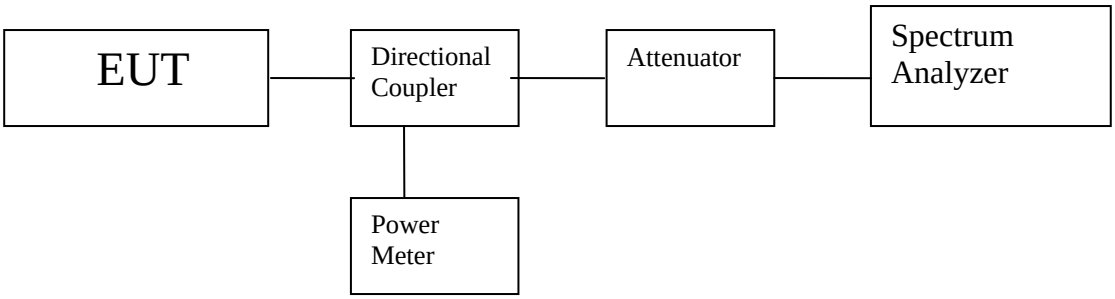
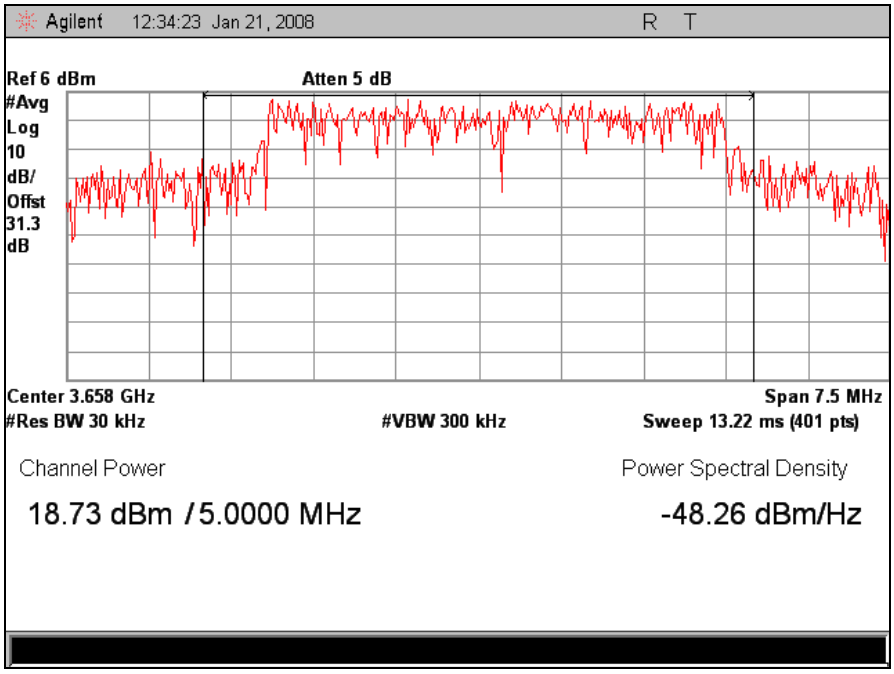


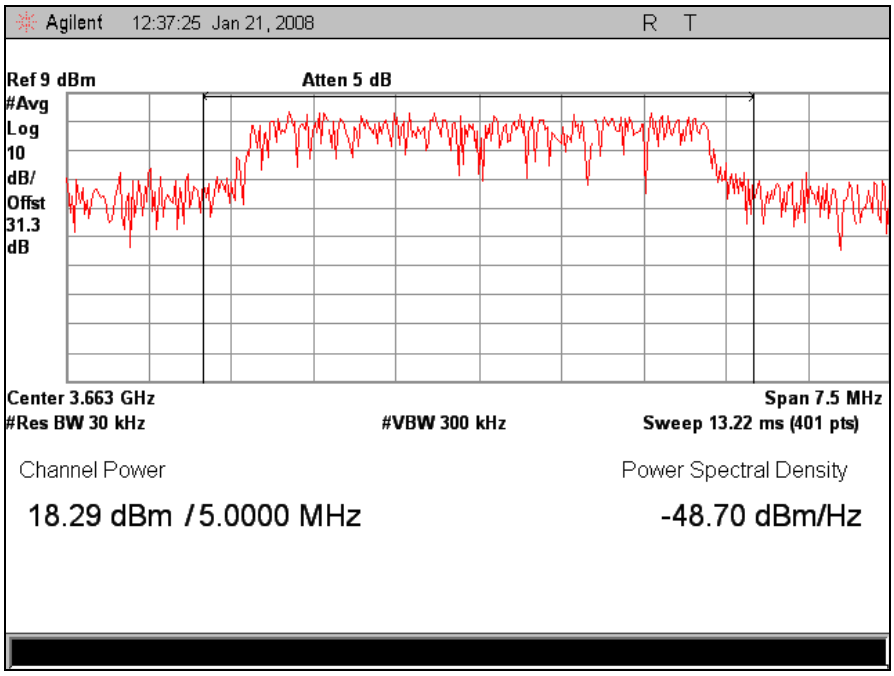
Figure 2. RF Power Output Test Setup

RF Power Output				
Frequency (MHz)	**Channel Bandwidth (MHz)**	**Measured RF Output Power (dBm)**	**Max Antenna Gain (dBi)**	**EIRP (dBm)**
3658.2	5	18.73	18	36.73
3663.2	5	18.29	18	36.29
3668.2	5	17.57	18	35.57
3658.2	10	18.79	20	38.79
3663.2	10	18.49	20	38.49
3668.2	10	17.62	20	37.62
3663.2	20	18.46	23	41.46

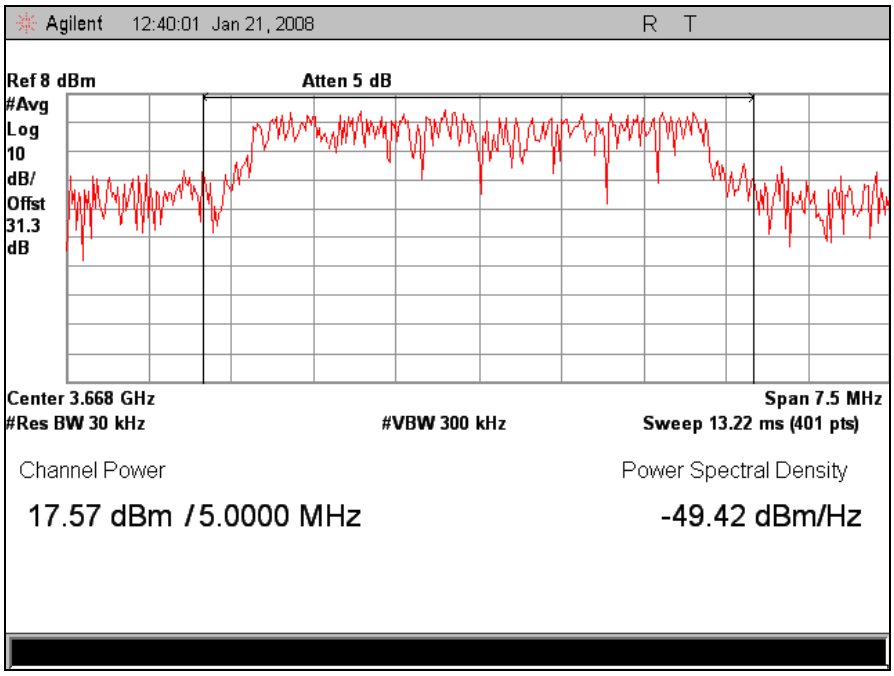
Table 5. RF Output Power, Test Results



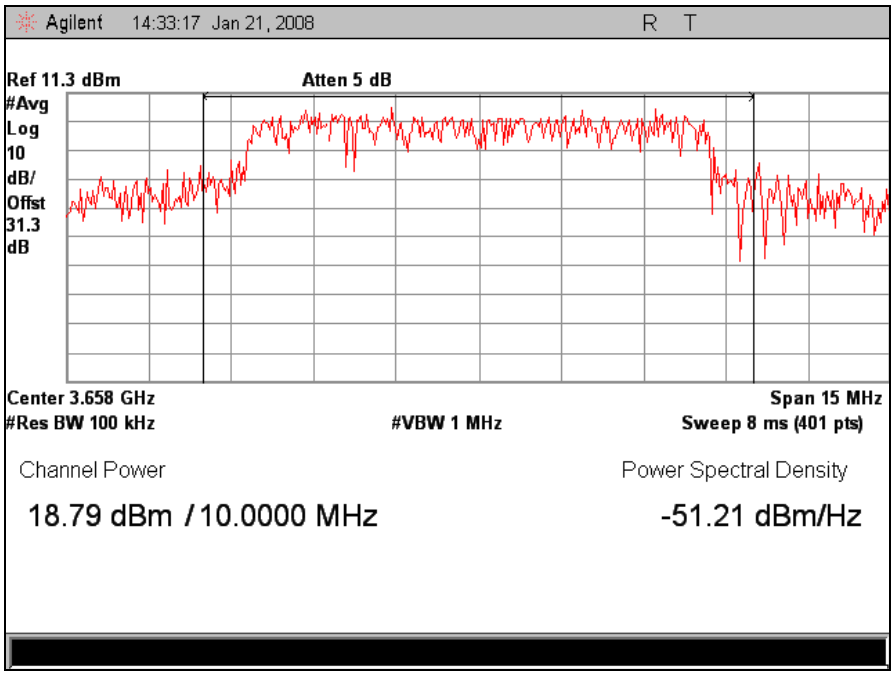
Plot 1. RF Channel Power, 5 MHz BW, Low Channel



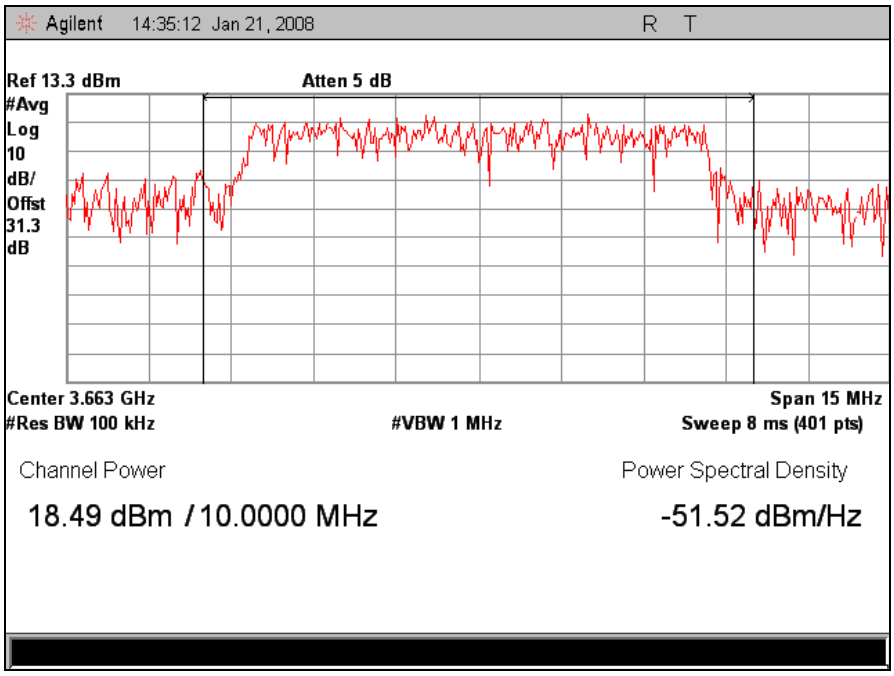
Plot 2. RF Channel Power, 5 MHz BW, Mid Channel



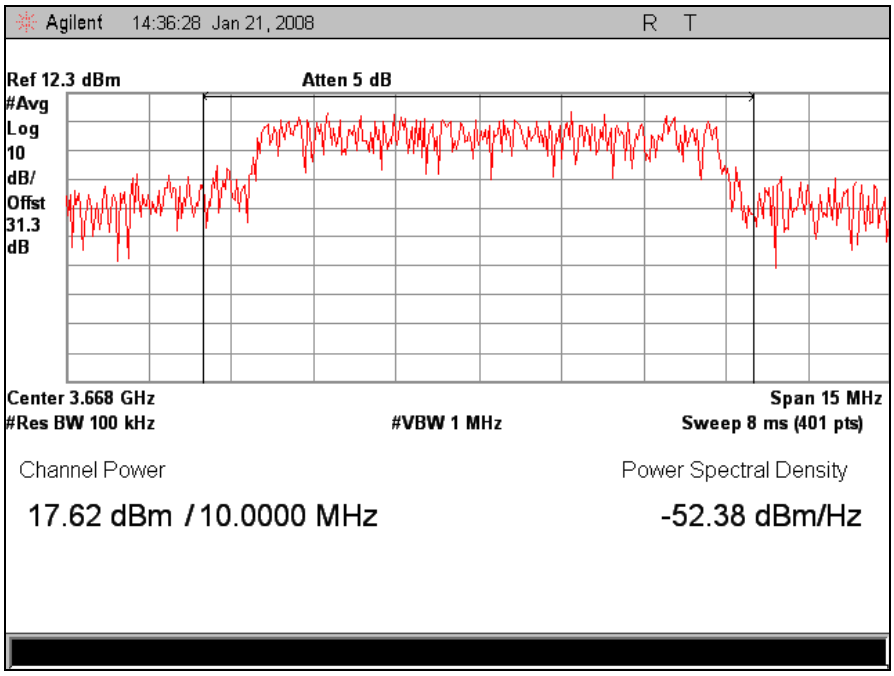
Plot 3. RF Channel Power, 5 MHz BW, High Channel



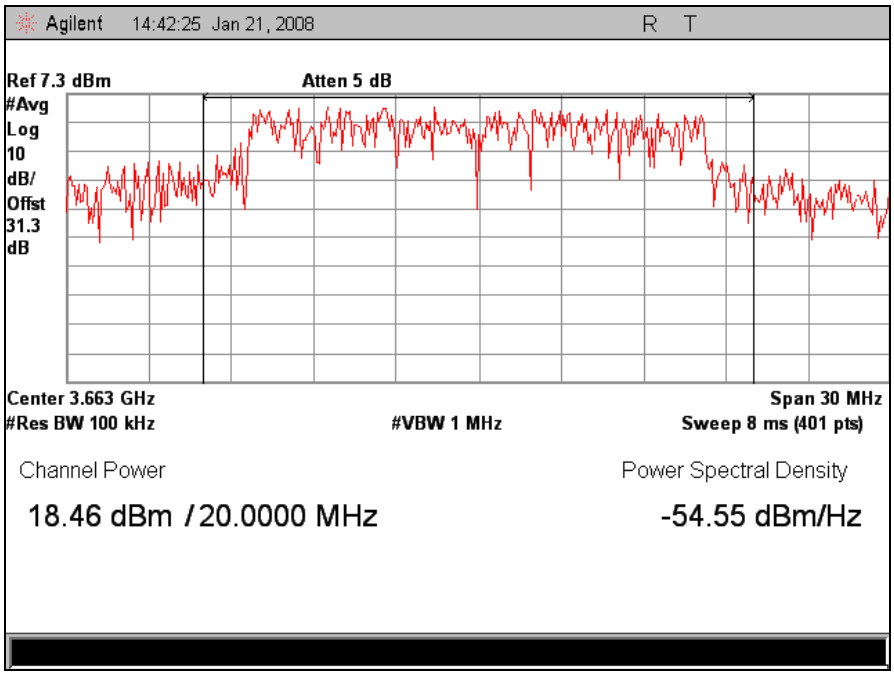
Plot 4. RF Channel Power, 10 MHz BW, Low Channel



Plot 5. RF Channel Power, 10 MHz BW, Mid Channel



Plot 6. RF Channel Power, 10 MHz BW, High Channel



Plot 7. RF Channel Power, 20 MHz BW

3.2. Peak Power Spectral Density

Test Requirement(s): **§90. 1321 (a) and §90. 1321 (c)**

Test Procedures: The EUT was connected to a Spectrum Analyzer though a directional coupler. A calibrated power meter capable of measuring a broad band modulated carrier was connected to the coupling port. The power meter was used to insure the EUT was operating at the required power level for the Spectral Density test. The Spectrum Analyzer was set to a RBW = 1 MHz and a VBW > 1MHz. A sample detector was selected on the spectrum analyzer along with power averaging. The Peak Power Spectral Density was determined by detecting the highest emission within the EUT's occupied bandwidth. Measurements were performed at the low, mid and high channels for each of the EUT's bandwidths and modulations.

Limits: For Base and Fixed stations the radiated Peak Power Spectral Density limit is 30dBm or 1000mW.
For mobile and portable stations the radiated Peak Power Spectral Density limit is 16dBm or 40mW

Test Results: Equipment complies with 90.1321(a) for Base and Fixed Stations. The antenna gain limits provided assume a professional installation of the device to set the minimum channel bandwidth according to the installed antenna gain. If professional installation is not used, then the maximum gain of the device is 18 dBi.

Test Engineer(s): Jeffrey Hazen and Minh Ly

Test Date(s): January 21, 2008

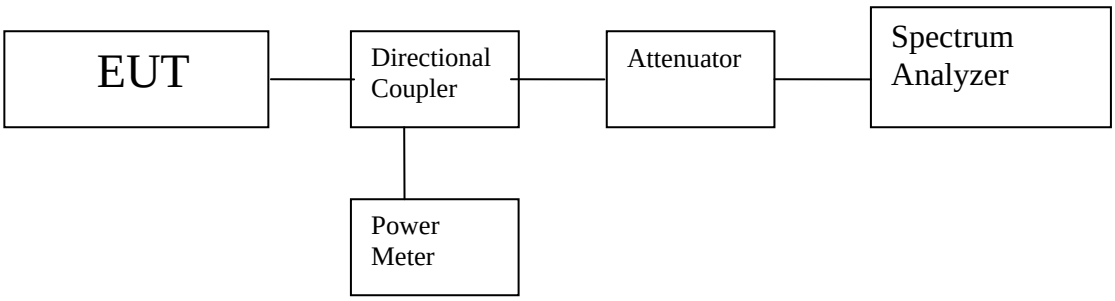
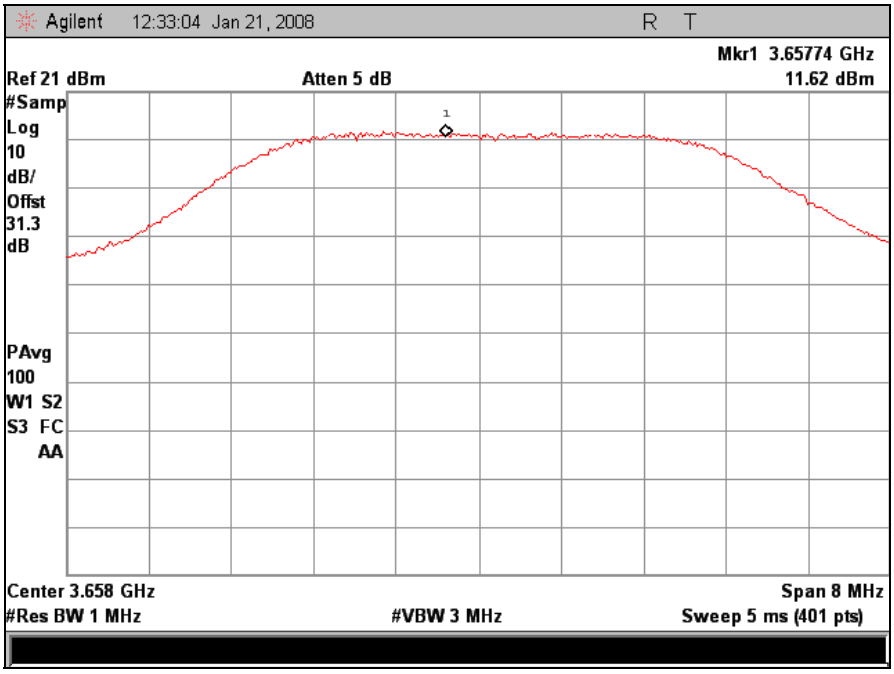


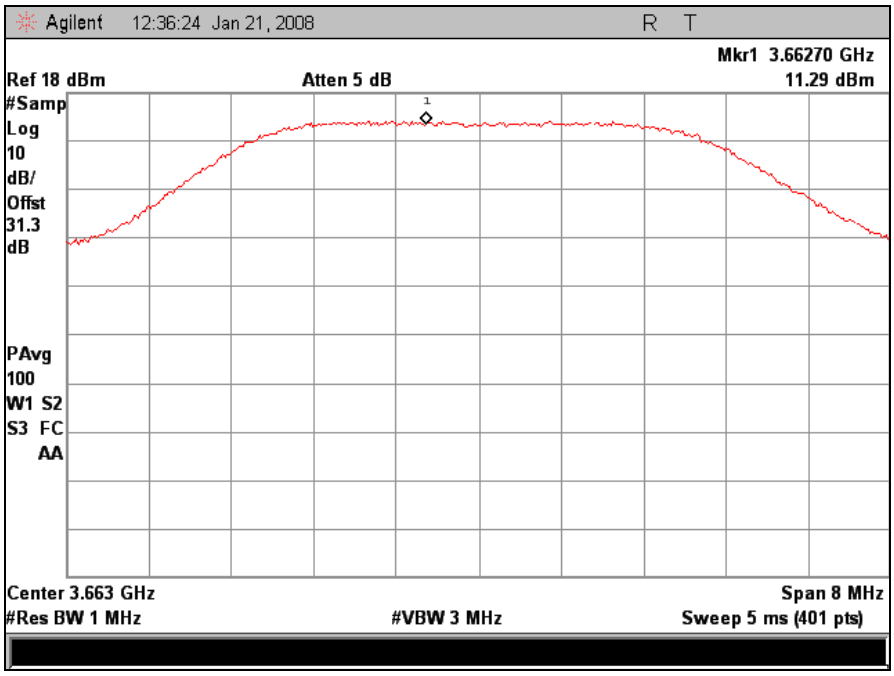
Figure 3. PPSD Test Setup

Peak Power Spectral Density				
Frequency (MHz)	**Channel Bandwidth (MHz)**	**Measured Power Density (dBm)**	**Max Antenna Gain (dBi)**	**EIRP (dBm)**
3658.2	5	11.62	18	29.62
3663.2	5	11.29	18	29.29
3668.2	5	11.37	18	29.37
3658.2	10	9.803	20	29.803
3663.2	10	8.975	20	28.975
3668.2	10	9.085	20	29.085
3663.2	20	6.768	23	29.768

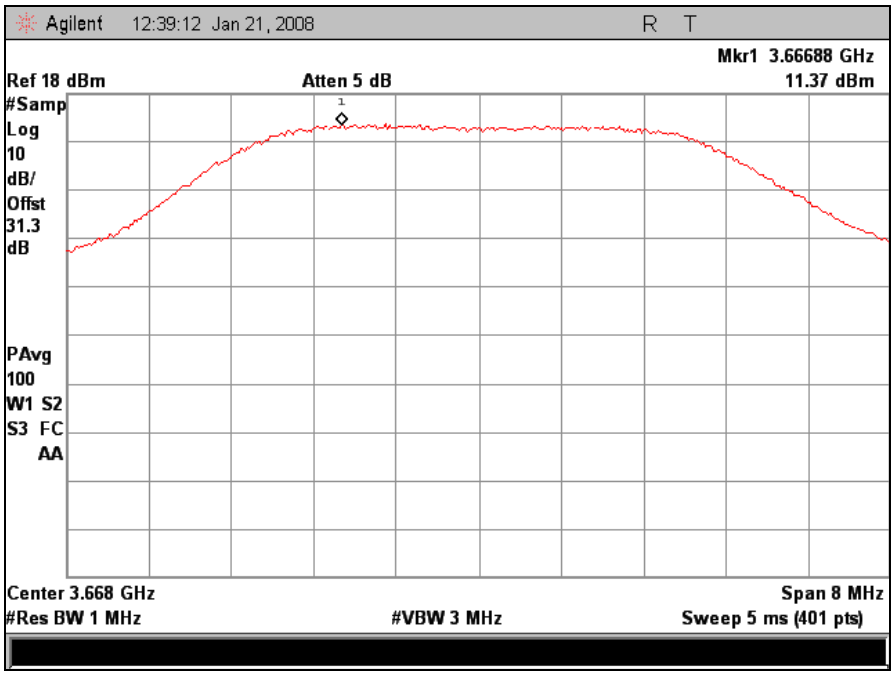
Table 6. Peak Power Spectral Density, Test Results



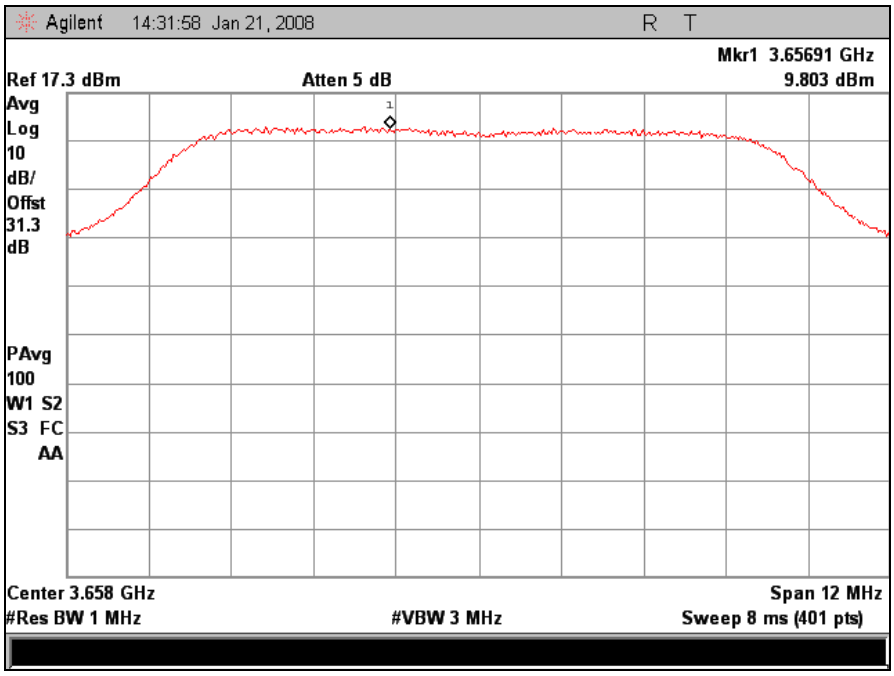
Plot 8. PPSD, 5 MHz BW, Low Channel



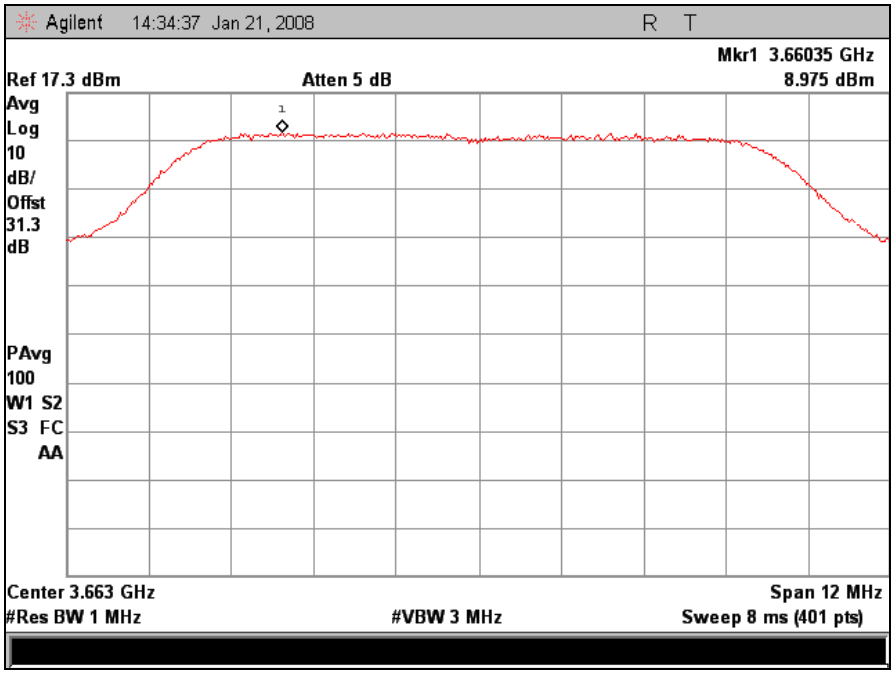
Plot 9. PPSD, 5 MHz BW, Mid Channel



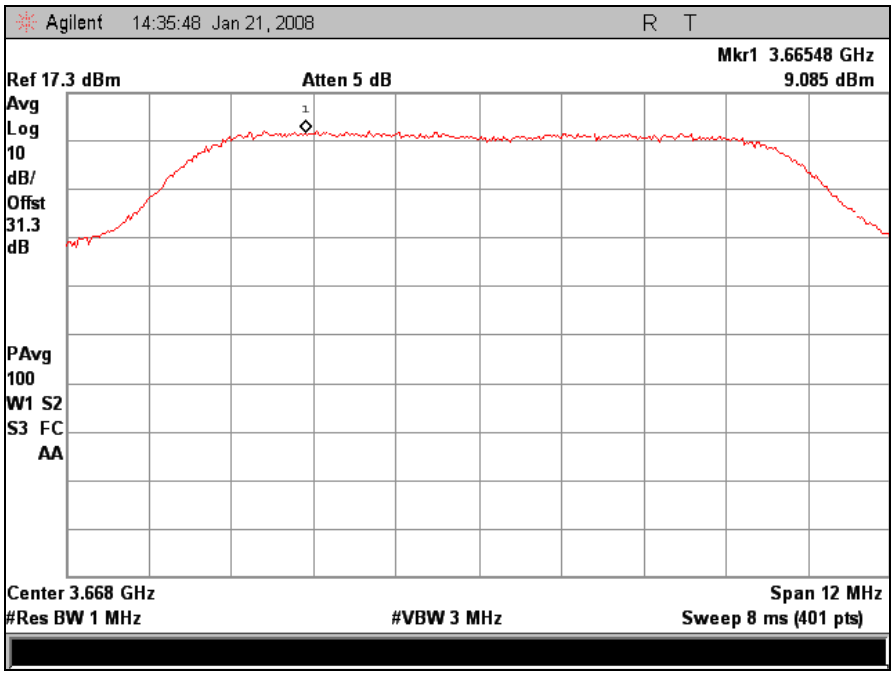
Plot 10. PPSD, 5 MHz BW, High Channel



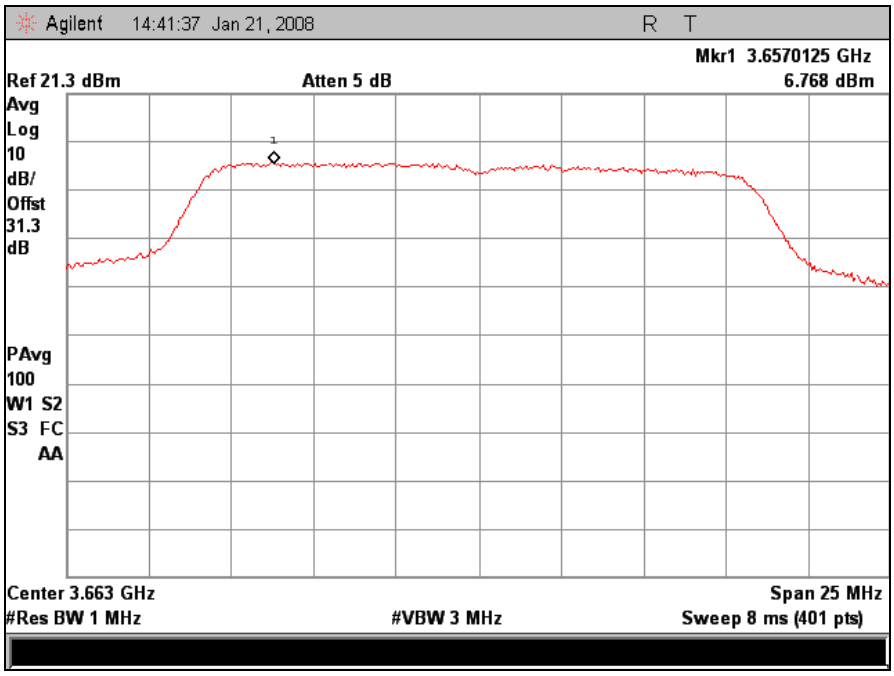
Plot 11. PPSD, 10 MHz, Low Channel



Plot 12. PPSD, 10 MHz, Mid Channel



Plot 13. PPSD, 10 MHz, High Channel



Plot 14. PPSD, 20 MHz, Mid Channel

4. Electromagnetic Compatibility Occupied Bandwidth Requirements

4.1. Occupied Bandwidth

Test Requirement(s): **§2.1049**

Test Procedures: The EUT was connected to a Spectrum Analyzer though a directional coupler. A calibrated power meter capable of measuring a broad band modulated carrier was connected to the coupling port. The power meter was used to insure the EUT was operating at the required power level for the Occupied Bandwidth test. The Spectrum Analyzer's channel bandwidth measurement option was used to measure the EUT's occupied bandwidth. Measurements were performed at the low, mid and high channels for each of the EUT's bandwidths and modulations.

Test Results: See FCC ID: SWX-XR3B.

5. Electromagnetic Compatibility Spurious Emissions at Antenna Terminal Requirements

5.1. Spurious Emissions at Antenna Terminals

Test Requirement(s): **§2.1051 and §90.1323(a)**

Test Procedures: The EUT was connected to a Spectrum Analyzer through a broad band attenuator. The Spectrum Analyzer was set to sweep 30 MHz and up to 10th harmonic of the fundamental or 40GHz which ever is the lesser. The Spectrum Analyzer was set to a RBW = 1 MHz and a VBW > 1MHz. Measurements were made at the low, mid and high channels. Measurement were also carried out at the band edges of the band of operation.

For frequencies 18-40GHz a HP11970A and HP11970K harmonic mixer was used. Each harmonic mixer was fed with a SMA to wave guide adapter.

Limits: The power of any emission outside the licensee's frequency band of operation shall be attenuated below the transmitters power (P) by at least 43 + 10log (P) dB.

Test Results: See FCC ID: SWX-XR3B.

5.2. Radiated Emissions (Substitution Method)

Test Requirement(s): **§2.1053 and TIA/EIA-603-A-2001**

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 10 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 360^0 and the receiving antenna scanned from 1-4m in order to capture the maximum emission. For harmonic frequencies falling in restricted bands the corrected field strength was performed using antenna factor and cable loss method. For all other notable spurious emissions 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: See FCC ID: SWX-XR3B.

6. RF Exposure Requirements

RF Exposure Requirements: **§90.1335, §1.1307(b), 2.1091, 2.1093:** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

RF Radiation Exposure Limit: **§1.1307:** As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

Test Results: See FCC ID: SWX-XR3B.

7. Electromagnetic Compatibility Frequency Stability Requirements

7.1. 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 output terminals using a Directional Coupler through a Spectrum Analyzer and Power Meter.

The EUT was placed in the Environmental Chamber and support equipments are outside the chamber on a table. The EUT was set to transmitter at a data rate corresponding to 20MHz BW. 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: See FCC ID: SWX-XR3B.

Test Equipment

8. 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
1S2460	Analyzer, Spectrum 9 kHz-40GHz	Agilent	E4407B	07/06/2005	07/06/2008
1S2430	WIDEBAND POWER METER	ANRITSU COMPANY	ML2488A	03/12/2007	03/12/2008
1S2432	WIDEBAND POWER SENSOR	ANRITSU COMPANY	MA2491A	03/12/2007	03/12/2008
1S2034	COUPLER, DIRECTIONAL 1-20 GHz	KRYTAR	101020020	SEE NOTE	

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

Certification & User's Manual Information

9. Certification Label & User's Manual Information

9.1. 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.

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.[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, 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.

[1] 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.

§ 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.

9.2. 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 A 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 A 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 commercial 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

(b) 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

