MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*
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Electromagnetic Compatibility Criteria Test Report

For the

Firetide
Model 6100 Indoor Unit

Tested under

The FCC Verification Rules
Contained in Title 47 of the CFR, Part 90, Subpart Y
for Private Land Mobile Radio Services
and Part 15, Subpart B for a Class A Digital Device

MET Report: EMCS21543A FCC90

March 6, 2007

Prepared For:
Firetide
16795 Lark Ave, Suite 200
Los Gatos, CA 95032

Prepared By:
MET Laboratories, Inc.
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Shawn McMillen
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 / is not capable of operation in accordance with the requirements of Part 90, Subpart Y and Part 15, Subpart B of the FCC Rules under normal use and maintenance.

Tony Permsombut, Lab Manager
Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	March 6, 2007	Initial Issue.

Table of Contents

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

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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 Y. All tests were conducted using measurement procedure ANSI TIA/EIA-603-A-2004.

Title 47 of the CFR, Part 90, Subpart Y, and FCC 04-265 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; 90.1215(a) Peak Power Output	√			Measured emissions below applicable limits.
2.1046; 90.1215(a) Peak Power Spectral Density	√			Measured emissions below applicable limits.
2.1047(a) Modulation Characteristics			√	EUT is non-voice, data only.
2.1049; 90.210(M) Occupied Bandwidth (Emission Mask)	√			Measured emissions below applicable limits.
2.1051; 90.210(M) Spurious Emissions at Antenna Terminals	√			Measured emissions below applicable limits.
2.1053; 90.210(M) Radiated Spurious Emissions	√			Measured emissions below applicable limits.
2.1055(a) (1); 90.213 Frequency Stability over Temperature Variations	√			Measured emissions below applicable limits.
2.1055(d) (2) Frequency Stability over Voltage Variations	√			Measured emissions below applicable limits.
90.214 Transient Frequency Behavior			√	EUT operating frequency is at 4.9 GHz.
15.107	√			AC Power Line Conducted Emissions for intentional radiators
15.109	√			Radiated Spurious Emissions for unintentional radiators

Equipment Configuration

2. Equipment Configuration

2.1. Overview

MET Laboratories, Inc. was contracted by Firetide to perform testing on the 6100 Indoor Unit under purchase order number 032306_01.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Firetide., 6100 Indoor Unit.

An EMC evaluation to determine compliance of the TB 4.9 with the requirements of Part 90, Subpart Y, 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. Firetide. 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:	6100 Indoor Unit	
Model(s) Covered:	6100 Indoor Unit	
EUT Specifications:	Primary Power Source: Laptop 110V/60Hz	
	FCC ID: REP-6100-1 IC: 4988A-6100	
	Type of Modulations:	OFDM
	Emission Designators:	7M3G7D
		15M3G7D
		27M7G7D
	Peak Output Power:	23.5dBm @ 5MHz BW
		26.8dBm @ 10MHz BW
		27.2dBm @ 20MHz BW
	Equipment Code:	TNB
	EUT Frequency Ranges:	4940-4990MHz
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:	Shawn McMillen	
Date(s):	March 6, 2007	

2.2. Test Site

All testing was performed at MET Laboratories, Inc., 4855 Patrick Henry Dr., Building 6, Santa Clara, CA 95054. 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. In accordance with §2.948(d), MET Laboratories has been accredited by A2LA (Certificate Number 591.02)

2.3. Description of Test Sample

The Firetide Hotport Wireless Mesh Node Router, Model 6100, Equipment Under Test (EUT) for the remainder of this document, is a wireless communications system operating in the 4940 to 4990 GHz spectrum.

Photograph 1. Firetide 6100 Indoor Unit

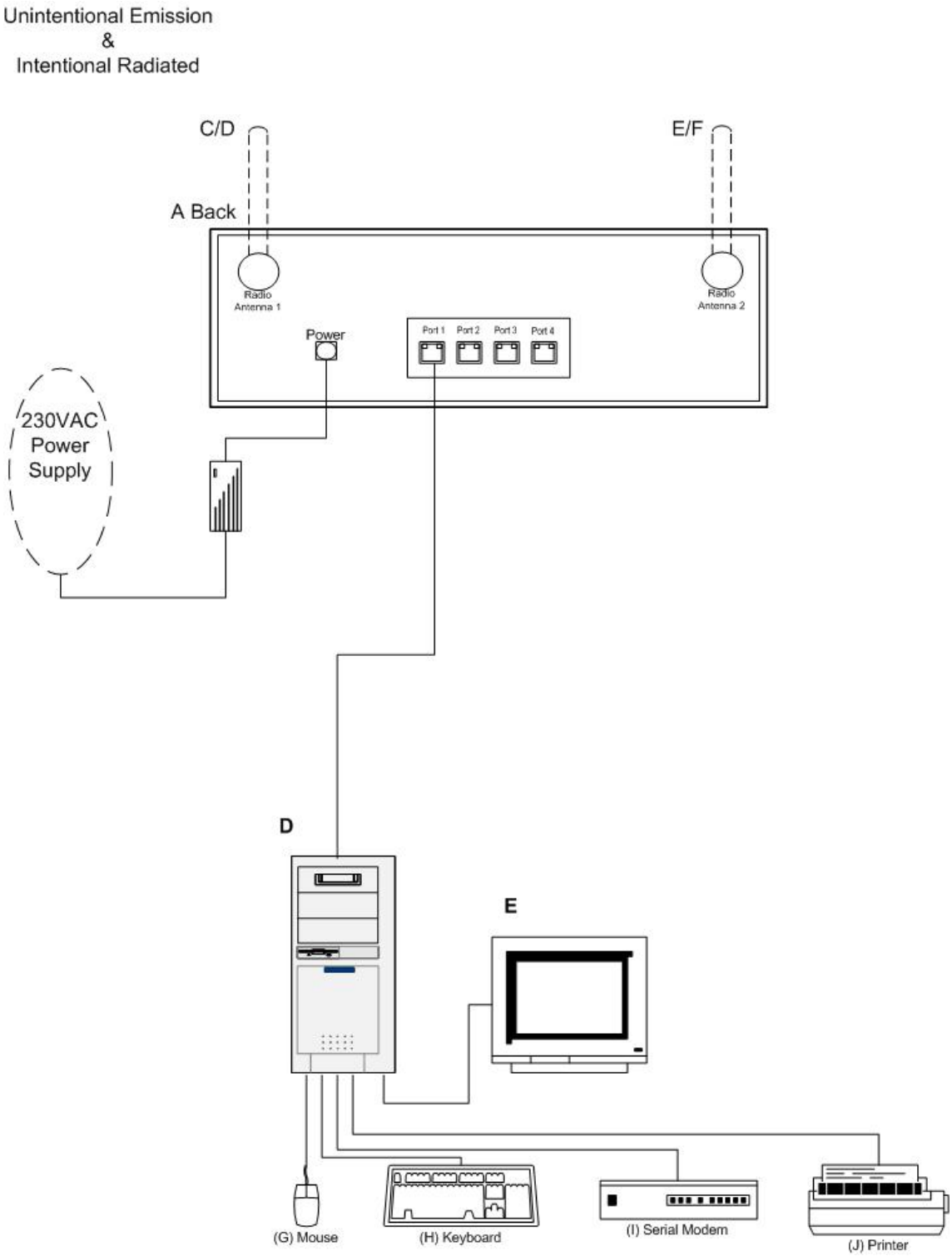


Figure 1. Block Diagram of Test Configuration (Radiated Emissions)

Indoor Conducted Measurement

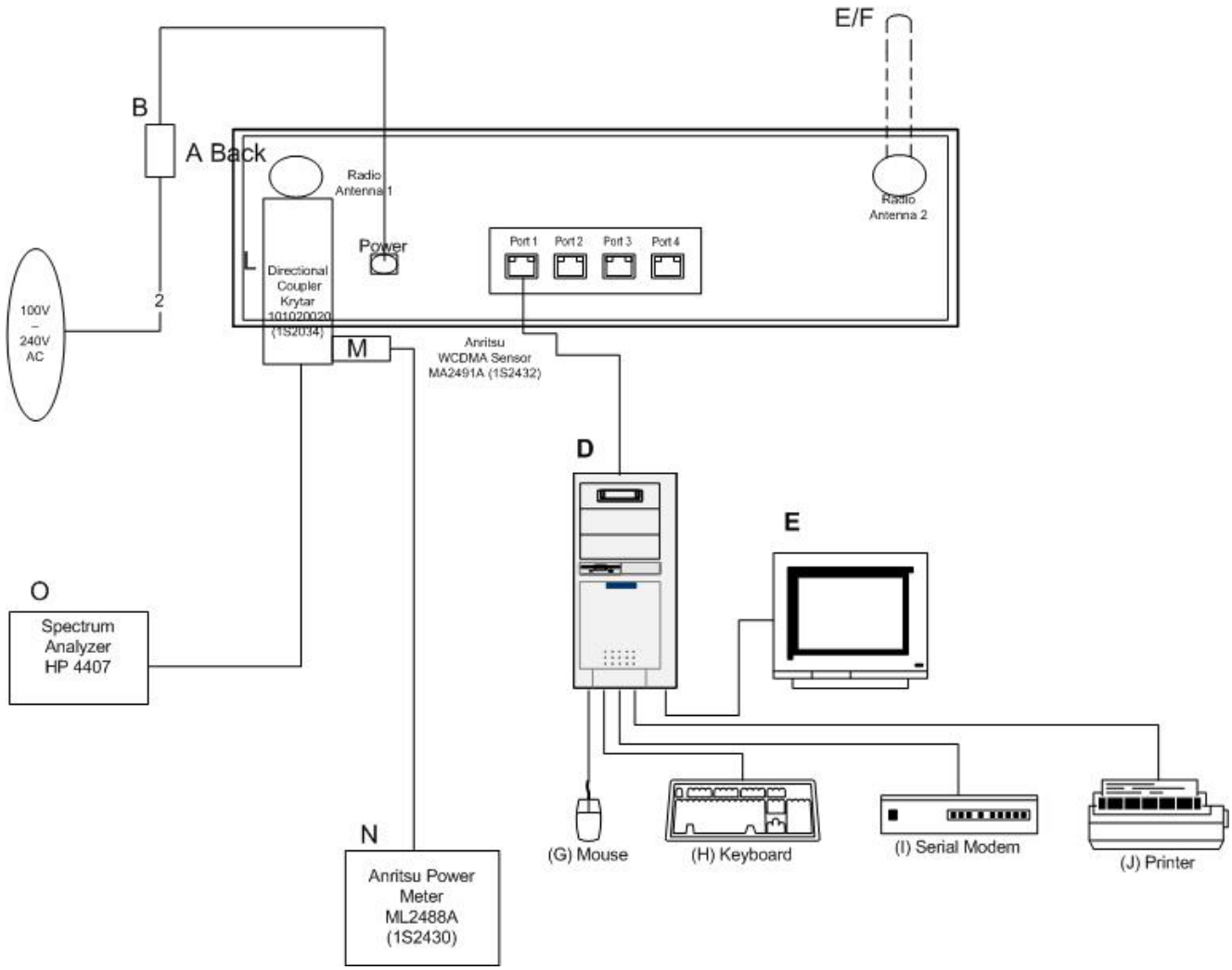


Figure 2. Block Diagram of Test Configuration (Conducted Measurement)

Indoor Frequency Stability

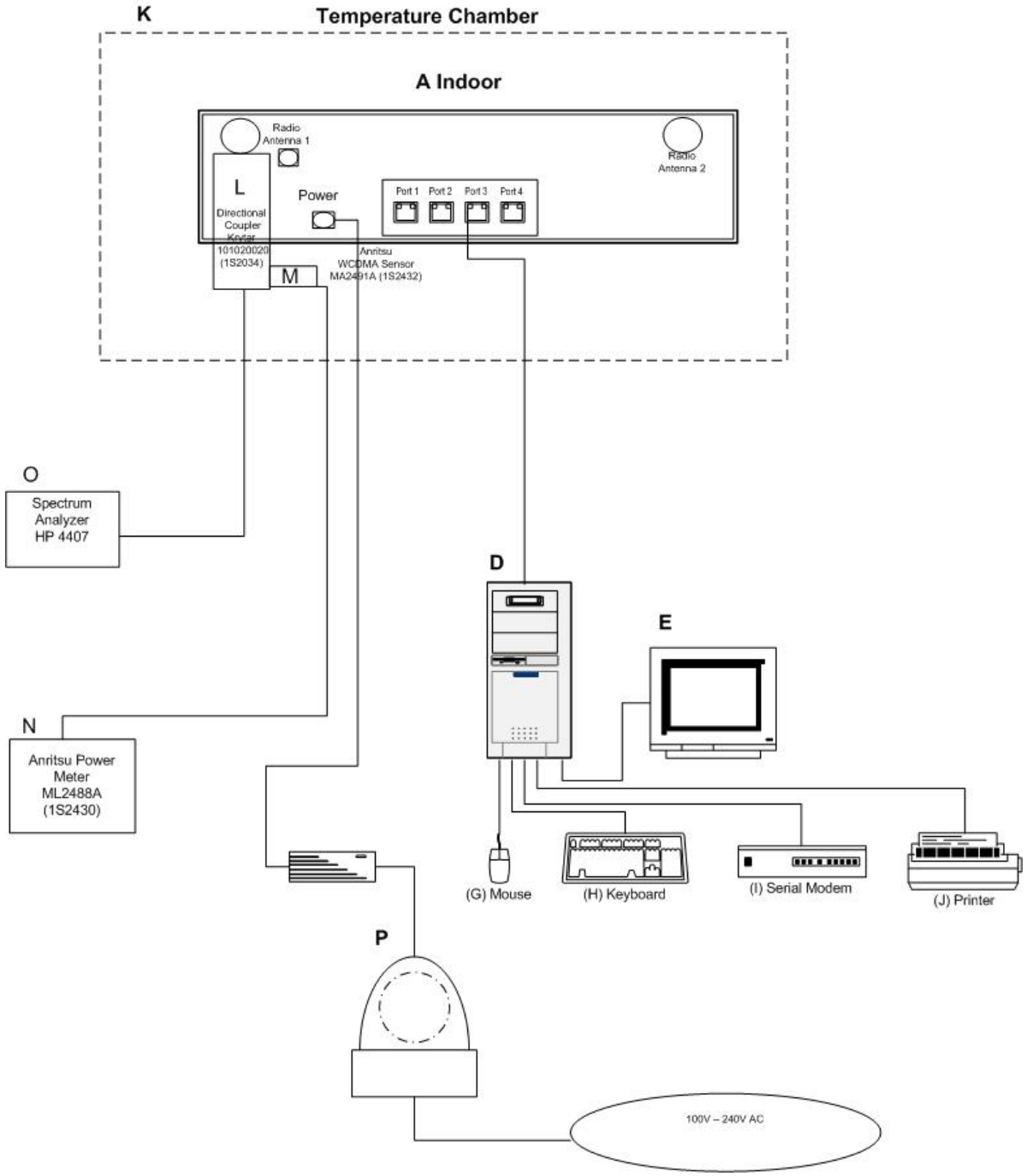


Figure 3. Block Diagram of Test Configuration (Frequency Stability)

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 Indoor	6100 Indoor Unit (FireTide)	6100	N/A
A Indoor, Antenna 3 &4	5dBi OMNI 5.1-5.8 GHz	N/A	2000037-001
B	AC Adapter (Cycon.)	TR45A15	45150-0003071

Table 1. Equipment Configuration

2.5. Support Equipment

Firetide supplied support equipment necessary for the operation and testing of the 6100 Indoor Unit. All support equipment supplied is listed in the following Support Equipment List.

Ref. ID	Name / Description	Manufacturer	Model Number	Serial Number
D	Computer	Dell	Optiplex GX100	N/A
E	Monitor	Dell	E551	N/A
F	Spectrum Analyzer	HP	8591E	N/A
G	Mouse	Microsoft	WheelMouse 3.0	N/A
H	Keyboard	Dell	RT7D5JTW	N/A
I	Serial Modem	Ramp Networks	WebRamp 200FX	N/A
J	Printer	HP	Deskjet 895Cse	N/A
K	Temperature Chamber	Tenny Engineering	T630	N/A
L	Directional Coupler	Krytar	101020020	N/A
M	WCDMA Sensor	Aritsu	MA2491A	N/A
N	Power Meter	Aritsu	ML2488A	N/A
O	Spectrum Analyzer	HP	4407	N/A
P	VariAC	Staco	3PN2210	N/A

Table 2. 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.

2.6. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty.	Length (m)	Shielded (Yes/No)	Termination Box ID & Port ID
Conducted Measurement						
1	A Indoor, Ethernet	CAT5	1	2.5	Yes	D
2	A Indoor, Power Input	AC	1	1	No	B
3	B	AC	1	1	No	110-240VAC Power Supply
4	A Indoor, Antenna 1	Direct Connect	1	N/A	N/A	L
Frequency Satiability						
1	A Indoor, Ethernet	CAT5	1	2.5	Yes	D
2	A Indoor, Power Input	AC	1	1	No	B
3	B	AC	1	1	No	P
4	P	AC	1	1	No	110-240VAC Power Supply
5	A Indoor, Antenna 1	Direct Connect	1	N/A	N/A	L
Radiated Emissions						
1	A Indoor, Ethernet	CAT5	1	2.5	Yes	D
2	A Indoor, Power Input	AC	1	1	No	B
3	B	AC	1	1	No	110-240VAC Power Supply

Table 3. Ports and Cabling Information

2.7. Method of Monitoring EUT Operation

A Spectrum Analyzer and a Power Meter was use to monitor the EUT's transmitter channel and power output

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 Firetide upon completion of testing.

III. Electromagnetic Compatibility Criteria for Unintentional Radiators

3. Electromagnetic Compatibility Criteria for Unintentional Radiators

3.1. Conducted Emissions Limits

Test Requirement(s): **15.107 (a)** "Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in Table 4. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals."

15.107 (b) "For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in Table 4. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals. The lower limit applies at the band edges."

Frequency range (MHz)	15.107(b), Class A Limits (dBµV)		15.107(a), Class B Limits (dBµV)	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15- 0.5	79	66	66 - 56	56 - 46
0.5 – 5.0	73	60	56	46
5.0 - 30	73	60	60	50
Note — The lower limit shall apply at the transition frequencies.				

Table 4. Conducted Limits for Radio Frequency Devices calculated from FCC Part 15 Section 15.107(a) (b)

Test Procedures: The EUT was placed on a 0.8m-high wooden table inside a semi-anechoic chamber. The method of testing, test conditions, and test procedures of ANSI C63.4 were used. The EUT was powered through a 50Ω/50µH LISN. An EMI receiver, connected to the measurement port of the LISN, scanned the frequency range from 150 kHz to 30 MHz in order to find the peak conducted emissions. All peak emissions within 6 dB of the limit were re-measured using a quasi-peak and/or average detector as appropriate.

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

Test Engineer(s): Billy Kwan

Test Date(s): January 18, 2007

Conducted Emissions - Voltage, AC Power

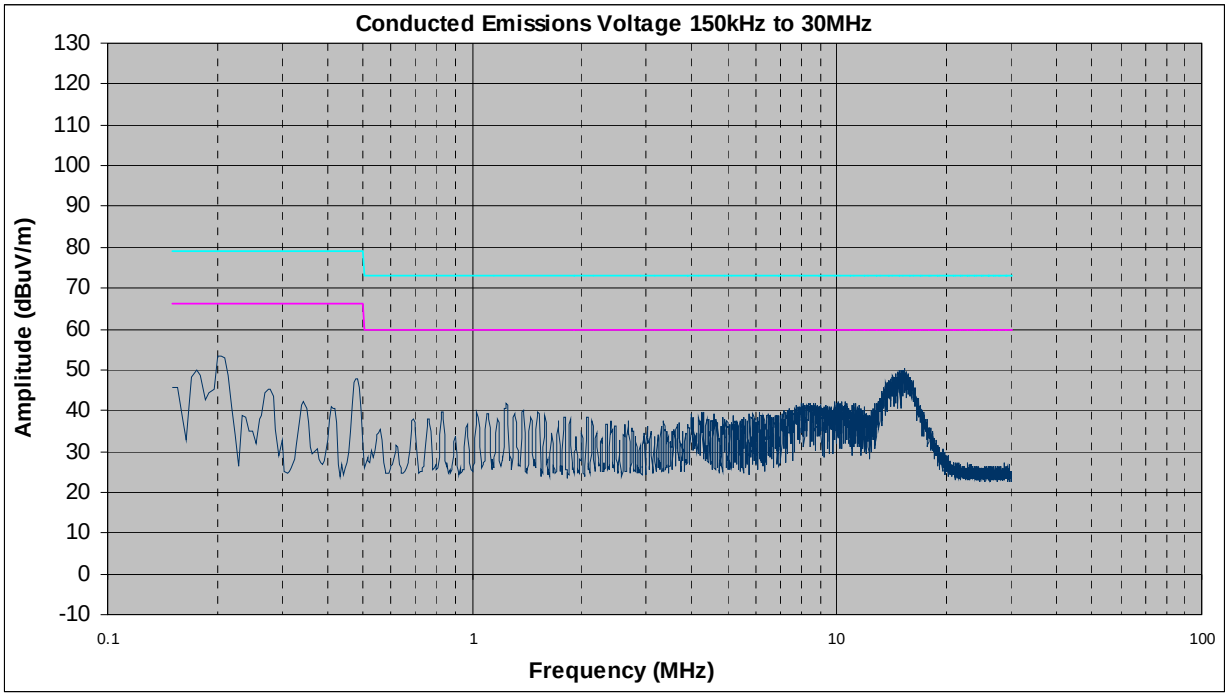
FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Results QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Results AVG	Margin (dB) AVG
0.205	51.79	79	PASS	-27.21	39.05	66	PASS	-26.95
0.479	46.52	79	PASS	-32.48	45.72	66	PASS	-20.28
14.82	47.12	73	PASS	-25.88	35.77	60	PASS	-24.23

Table 5. Conducted Emissions - Voltage, AC Power, Phase Line 120V/60Hz

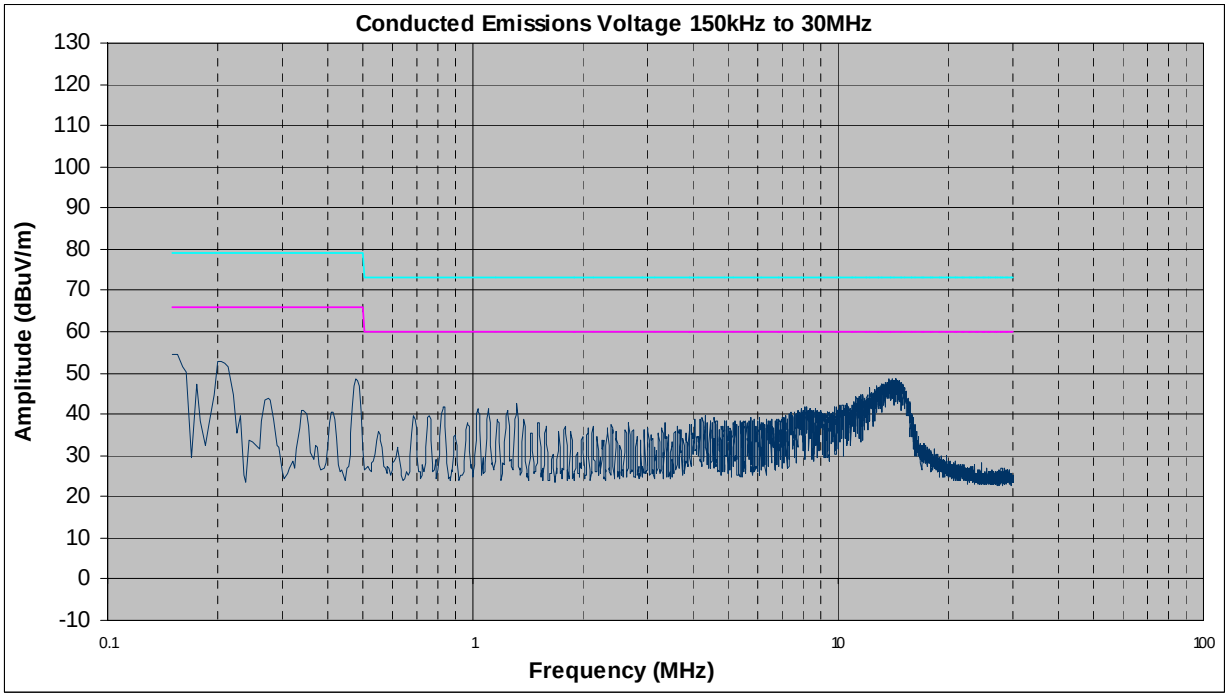
FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Results QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Results AVG	Margin (dB) AVG
0.205	51.25	79	PASS	-27.75	38.23	66	PASS	-27.77
0.479	46.91	79	PASS	-32.09	46.13	66	PASS	-19.87
14.34	45.75	73	PASS	-27.25	31.52	60	PASS	-28.48

Table 6. Conducted Emissions - Voltage, AC Power, Neutral Line 120V/60Hz

Conducted Emissions - Voltage, Worst Case Emissions, AC Power

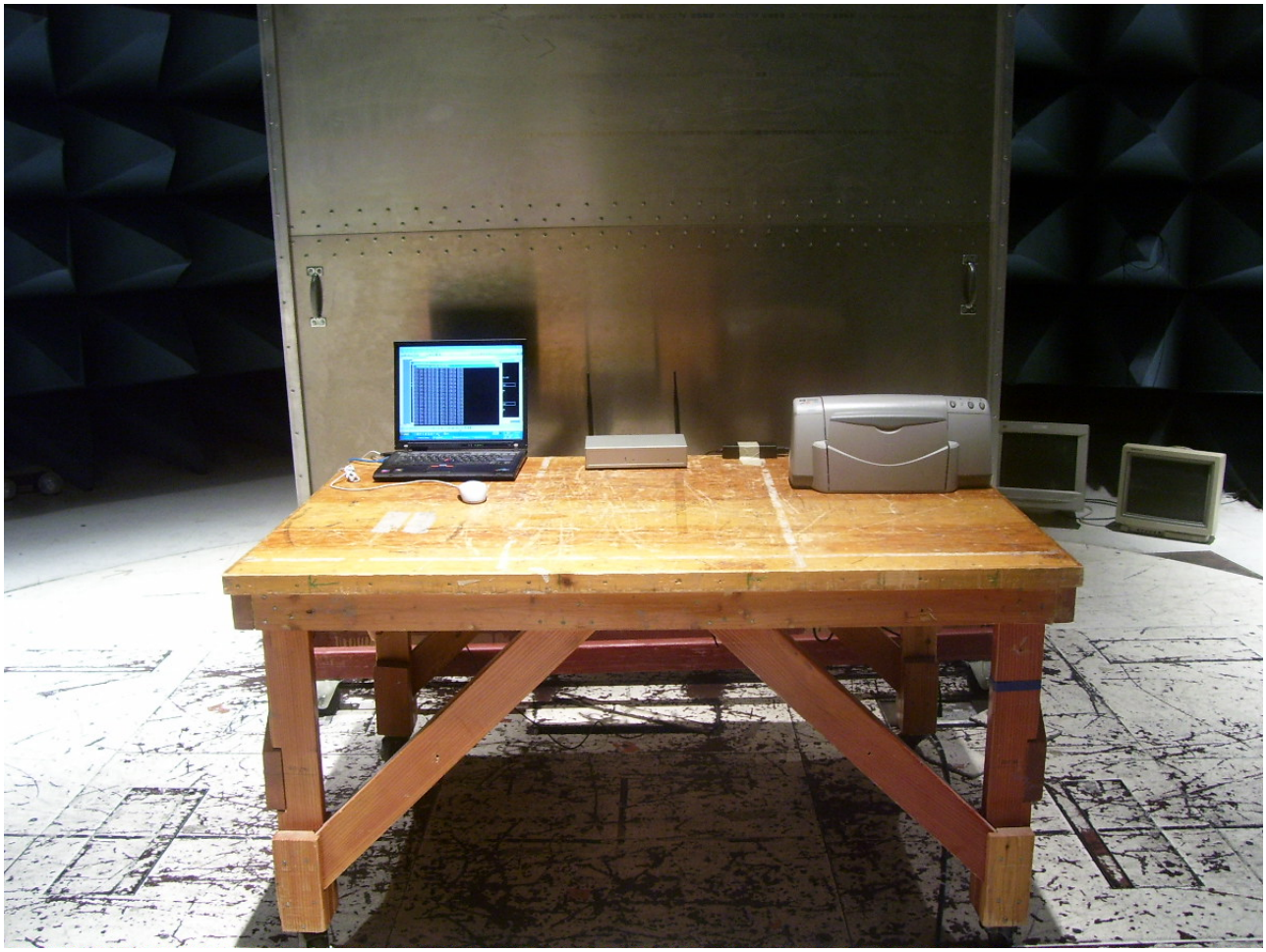


Conducted Emission, Phase Line Plots



Conducted Emission, Neutral Line Plots

Conducted Emission Limits Test Setup



Photograph 2.Conducted Emissions Test Setup

3.2. Radiated Emissions Limits

Test Requirement(s): **15.109 (a)** Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the Class B limits expressed in Table 7.

15.109 (b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the Class A limits expressed in Table 7.

Frequency (MHz)	Field Strength (dBµV/m)	
	§15.109 (b), Class A Limit (dBµV) @ 10m	§15.109 (a),Class B Limit (dBµV) @ 3m
30 - 88	39.00	40.00
88 - 216	43.50	43.50
216 - 960	46.40	46.00
Above 960	49.50	54.00

Table 7. Radiated Emissions Limits calculated from FCC Part 15, §15.109 (a) (b)

Test Procedures: The EUT was placed on a 0.8m-high wooden table inside a semi-anechoic chamber. The method of testing and test conditions of ANSI C63.4 were used. An antenna was located 10 m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. Unless otherwise specified, measurements were made using a quasi-peak detector with a 120 kHz bandwidth.

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

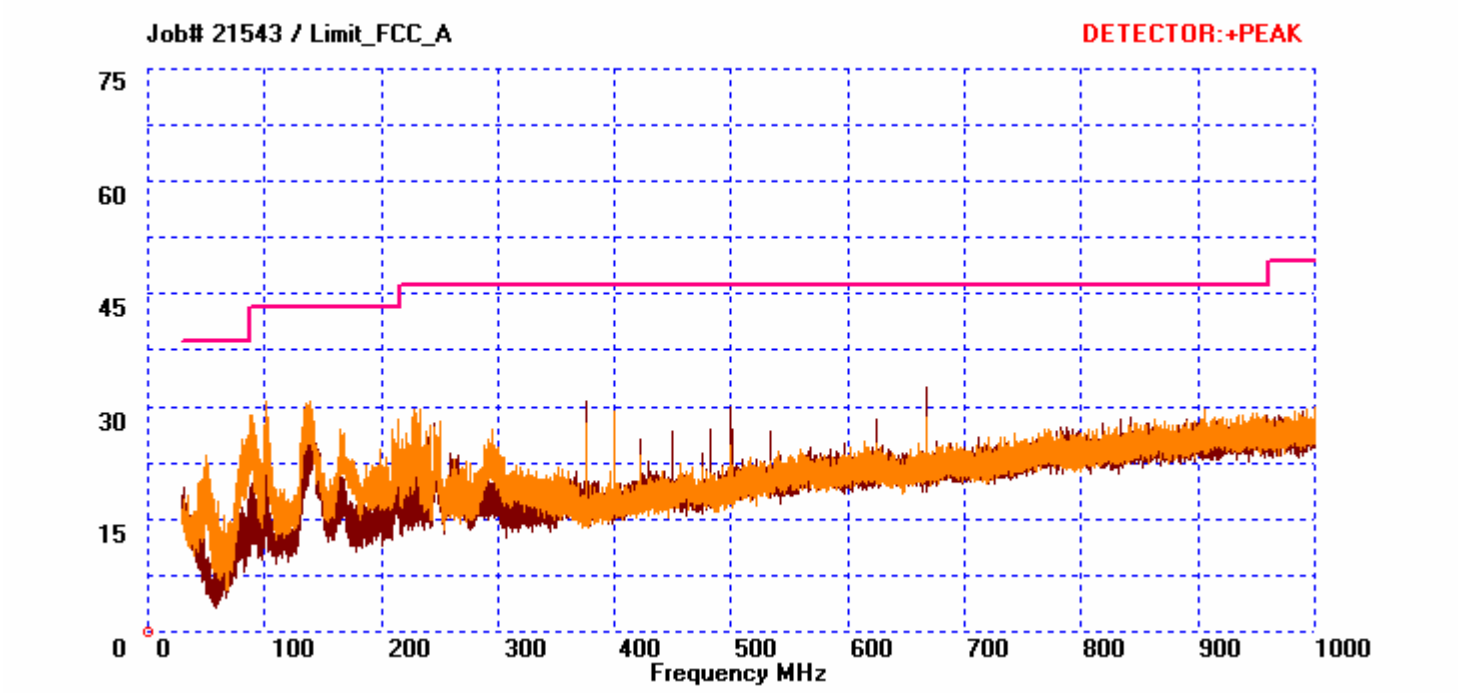
Test Engineer(s): Billy Kwan

Test Date(s): January 18, 2007

Radiated Emissions Limits Test Results, Class A

Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna Height (m)	Uncorrected Amplitude (dBuv)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Corrected Amplitude (dBuv)	Limit (dBuv)	Margin (dB)
87.64	V	333	1.41	18.45	8.63	1.55	28.63	39.00	-10.37
100.68	V	0	1.27	18.53	11.05	1.75	31.33	43.50	-12.17
138.8	V	228	1	15.40	11.90	2.13	29.42	43.50	-14.08
375	H	225	2.6	14.08	15.20	3.35	32.63	46.40	-13.77
400	V	224	1	7.30	16.10	3.50	26.90	46.40	-19.50
499.96	H	139	1.98	8.11	17.80	4.03	29.94	46.40	-16.46

Table 8. Radiated Emissions Limits Test Results



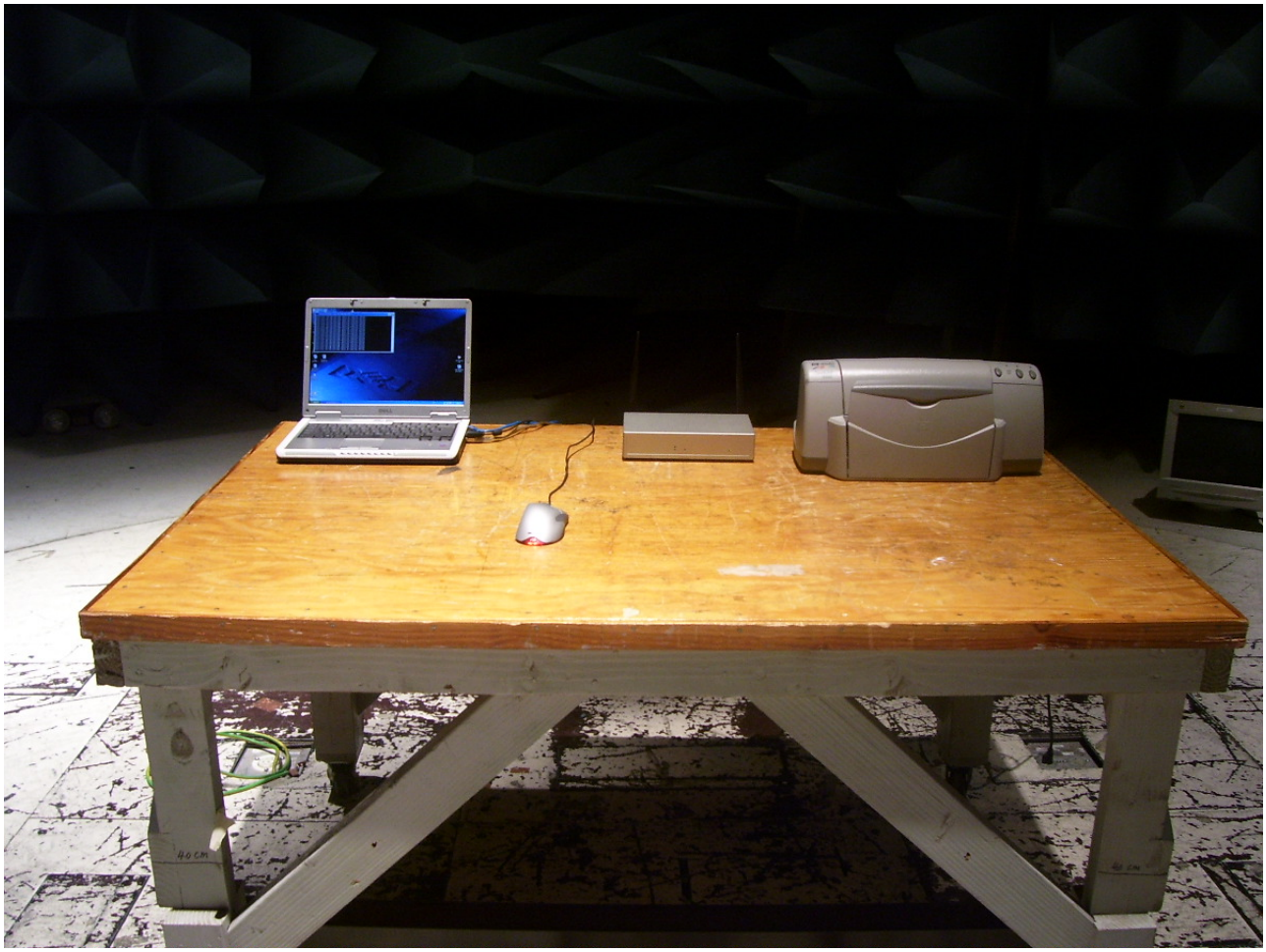
Radiated Emissions Limits Test Results, Class A, 1GHz – 5GHz

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (m)	Raw Amp.@ 3m(Avg)	P.Amp (dB)	Ant.Cor. Factor (dB/m)	Cable Loss (dB)	Dist.Cor Factor (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit per FCC pt 15 @ 3m (dBuV/m)	Delta (dB)
1.07	15	H	1	47.96	35.18	24.53	2.18	10.46	29.04	49.5	-20.46
1.08	190	V	1.15	53.27	35.18	25.03	2.19	10.46	34.84	49.5	-14.66
1.374	168	H	1	48.97	35.19	25.30	2.42	10.46	31.04	49.5	-18.46
1.595	317	H	1	44.67	35.17	26.06	2.67	10.46	27.78	49.5	-21.72
1.965	308	H	1	44.3	35.15	27.68	3.21	10.46	29.58	49.5	-19.92
4.09	302	V	1	40.14	35.17	33.87	4.79	10.46	33.17	49.5	-16.33
5	0	H	1	34.01	35.07	34.70	5.34	10.46	28.52	49.5	-20.98
5	0	V	1	34.5	35.07	34.90	5.34	10.46	29.21	49.5	-20.29

Table 9. Radiated Emissions from 1 GHz to 5 GHz

Note: When transmit mode or receive mode were activated, there are no differences to emissions. For above 1 GHz measurement up to 5th harmonic of the highest operating frequency, emissions are noise floor during receive mode.

Radiated Emission Limits Test Setup



Photograph 3. Radiated Emission Limits Test Setup

IV. Electromagnetic Compatibility Criteria for Intentional Radiators

4. Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.203 Antenna Requirement

Test Requirement: **§ 15.203:** An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

a.) Antenna must be permanently attached to the unit.

b.) Antenna must use a unique type of connector to attach to the EUT.

c.) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Results: The EUT as tested meets the criteria of this rule by virtue of having professionally installed. The EUT is therefore compliant with §15.203.

Antennas		
Model No. / Gain	**Frequency Band**	**Vendor**
C812-510012-A / 5dBi	4.9 - 5.0	Wha Yu

Test Engineer(s): Shawn McMillen

5. Electromagnetic Compatibility RF Power Output Requirements

5.1. RF Power Output

Test Requirement(s): **§2.1046 and §90.1215(a) with FCC 04-265**

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

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected through a Directional Coupler to a Spectrum Analyzer to monitor the frequency and to a Power Meter to measure the Peak and Average power. The EUT power was adjusted enough to produce maximum output power as specified in the owner's manual. The output power was then recorded with peak and average reading. Measurements were made at the low, mid and high channels.

Test Results: Equipment complies with 47CFR 2.1046 and 90.1215(a) with FCC 04-265.

All RF Power output measurements were direct connection to RF output Terminal of EUT from a Power Meter.

RF Power Output		
Frequency (MHz)	**Peak Power (dBm)**	**Average Power (dBm)**
5 MHz		
4945.0	23.5	15.6
4965.0	23.5	15.8
4985.0	23.4	15.6
10 MHz		
4945.0	26.6	20.4
4965.0	26.8	21.0
4985.0	26.6	20.6
20 MHz		
4950.0	27.1	20.6
4965.0	27.2	21.3
4980.0	27.1	21.3

Test Engineer(s): Shawn McMillen

Test Date(s): January 19, 2007

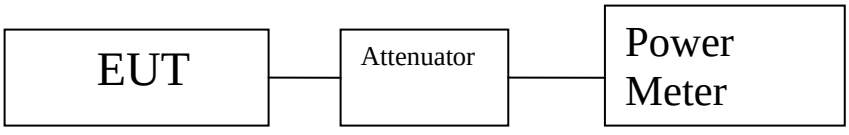


Figure 4. RF Power Output Test Setup

5.2. Peak Power Spectral Density

Test Requirement(s): **§90.1215(a) with FCC 04-265**

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

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer in order to measure the power level. The Spectrum Analyzer was set to a RBW = VBW = 1 MHz. The EUT power was adjusted at the maximum output power level. The max hold key from the Spectrum Analyzer was activated capturing the modulated envelope of the EUT. The Peak Power Spectral Density was then recorded. Measurements were made at the low, mid and high channels.

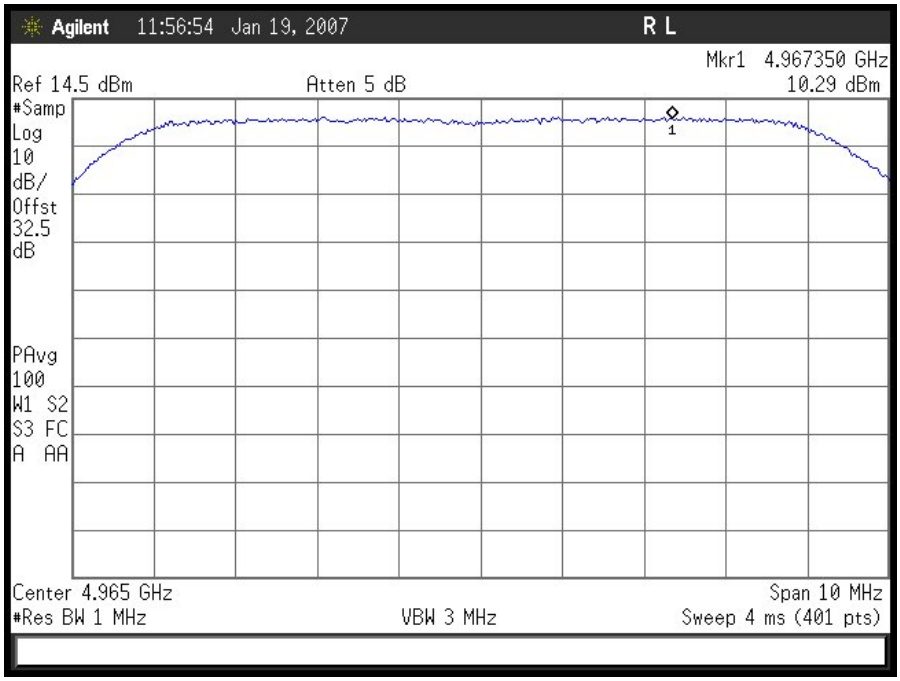
Test Results: Equipment complies with 47 CFR 2.1046 and 90.1215(a) with FCC 04-265 (High Power devices). The EUT does not exceed 21dBm/MHz peak power spectral density at the carrier frequency.

The following pages show measurements of Peak Power Spectral Density plots which is recorded below:

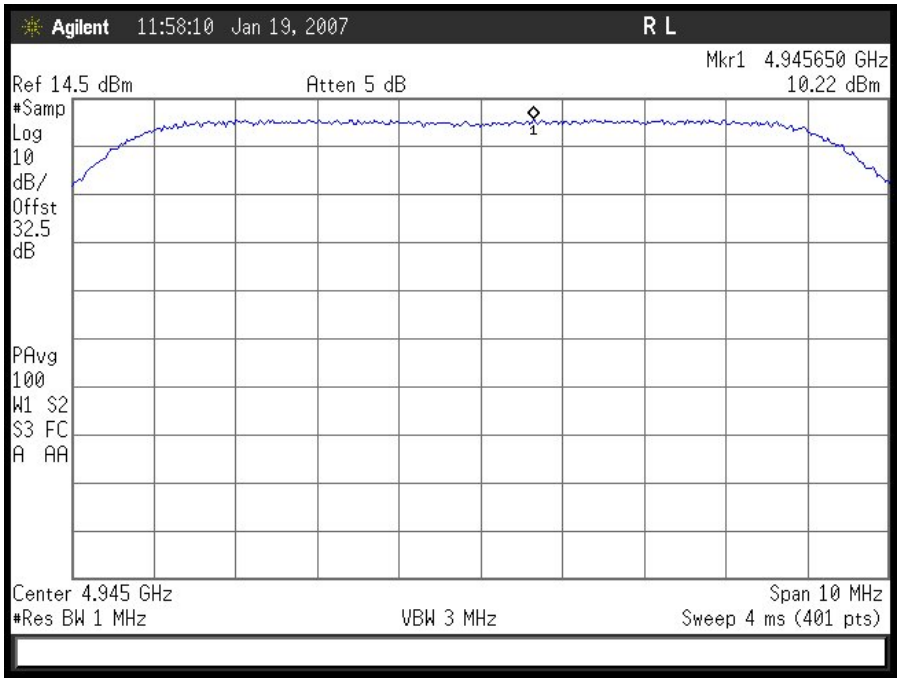
Peak Power Spectral Density				
Plot #	**Frequency (MHz)**	**EUT Channel Bandwidth (MHz)**	**Measured Power Spectral Density (dBm)**	**Limit (dBm)**
1	4965.0	5 MHz	10.29	21
2	4945.0	10 MHz	10.22	21
3	4965.0		10.29	21
4	4985.0		10.54	21
5	4950.0	20 MHz	7.176	21
6	4965.0		7.545	21
7	4980.0		8.078	21

Test Engineer(s): Shawn McMillen

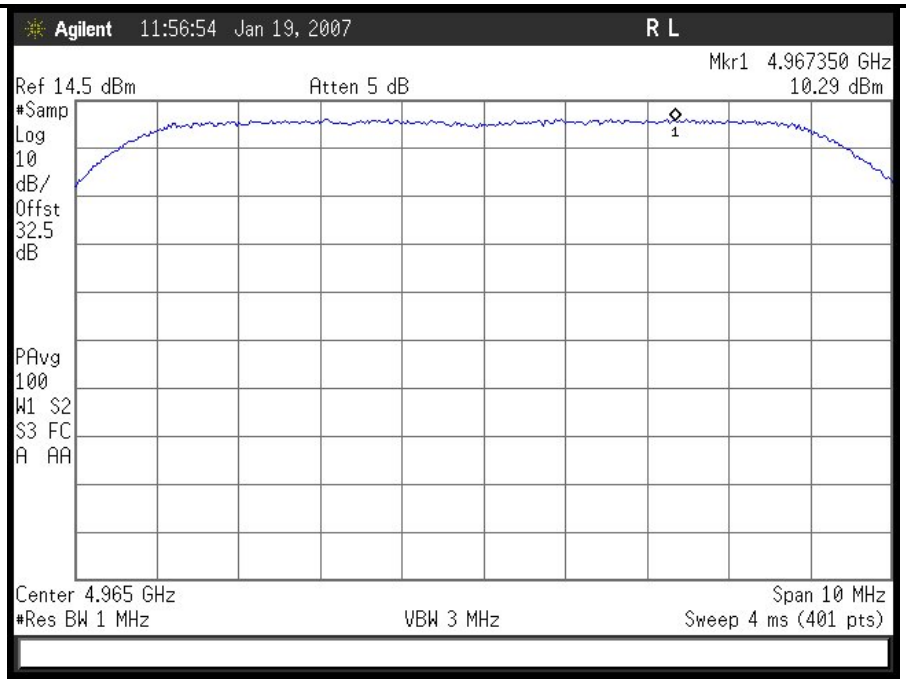
Test Date(s): January 19, 2007



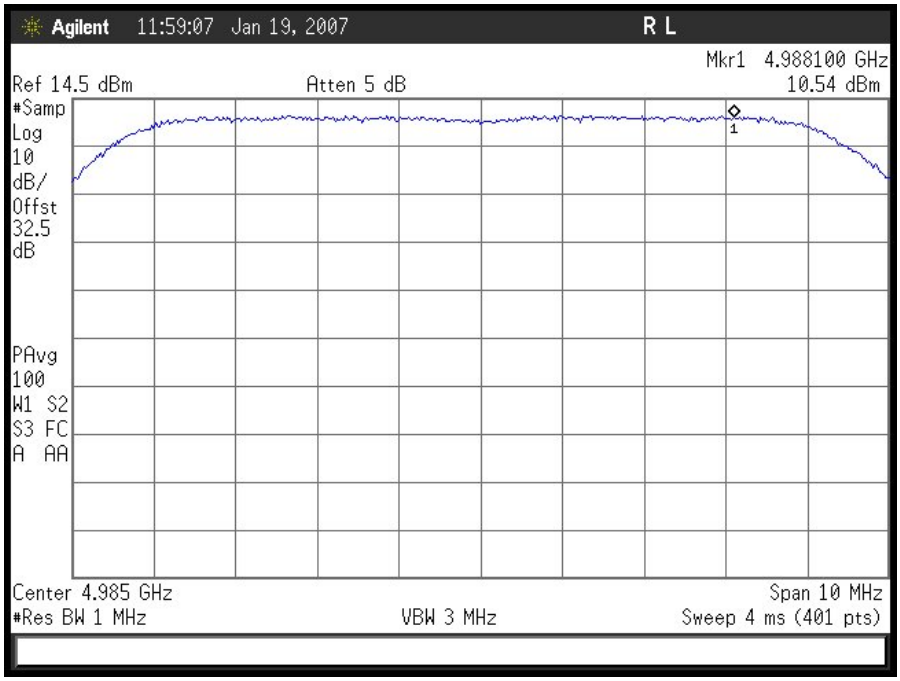
Plot 1. PPSD 5 MHz Mid Ch



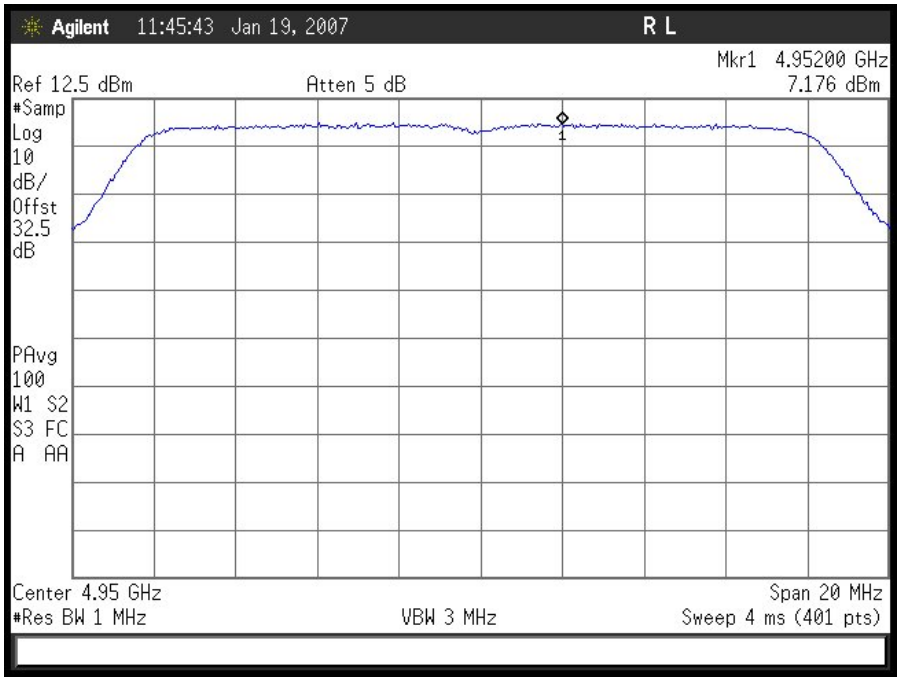
Plot 2. PPSD 10 MHz Low Ch



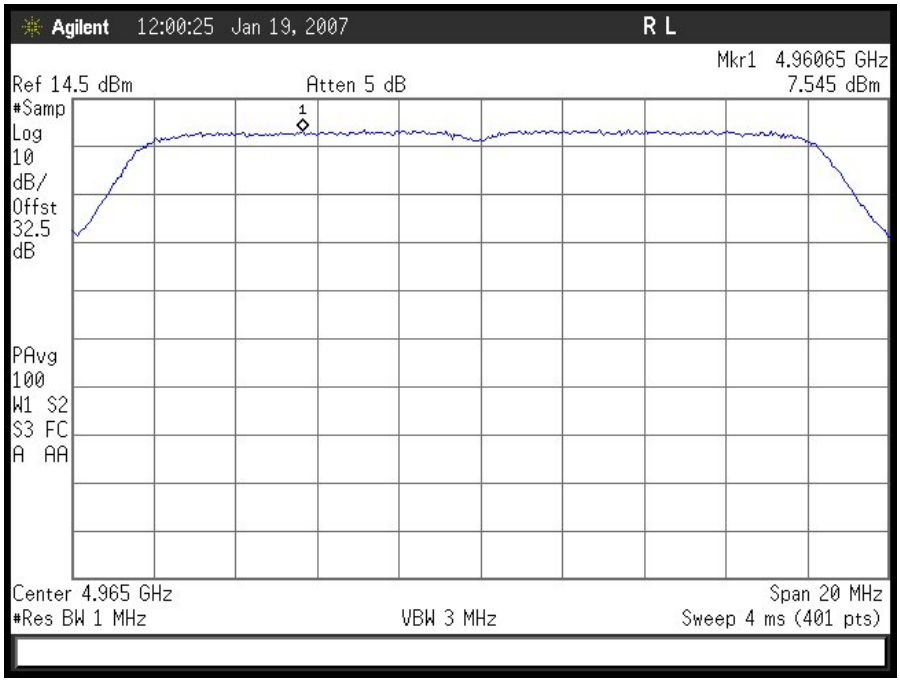
Plot 3. PPSD 10 MHz Mid Ch



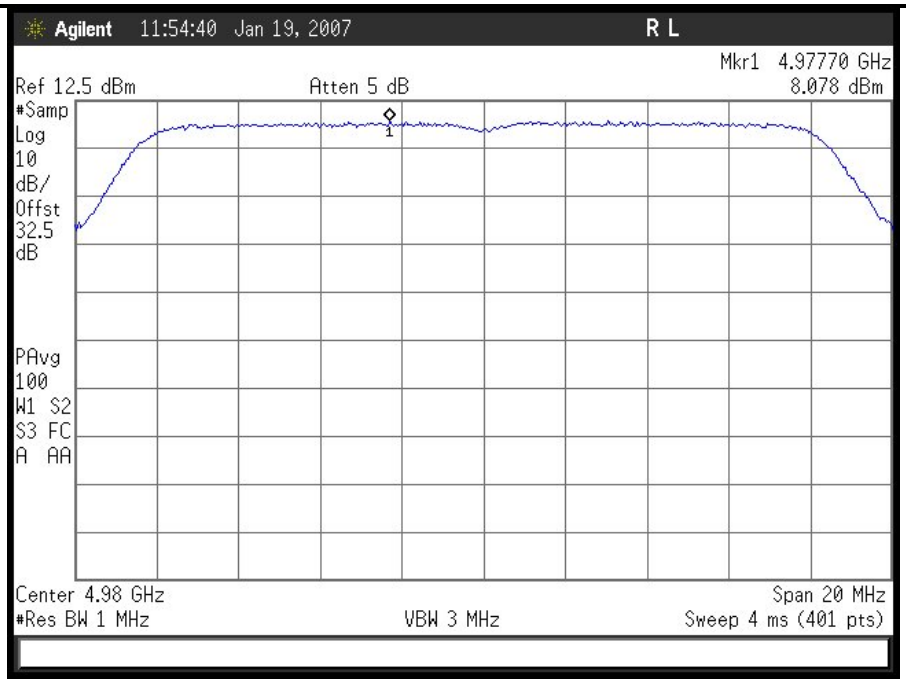
Plot 4. PPSD 10 MHz High Ch



Plot 5. PPSD 20 MHz Low Ch



Plot 6. PPSD 20 MHz Mid Ch



Plot 7. PPSD 20 MHz High Ch

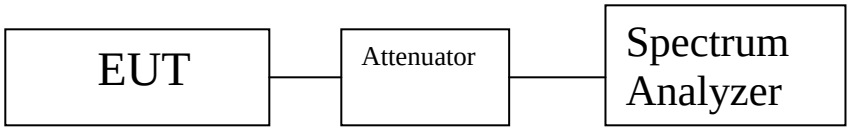


Figure 5. PPSD Test Setup

6. Electromagnetic Compatibility Occupied Bandwidth Requirements

6.1. Occupied Bandwidth (Emission Mask)

Test Requirement(s): **§2.1049 and §90.210 (M) with FCC 04-265 (Emissions Mask M)**

Test Procedures: As required by 47 CFR 2.1049, *occupied bandwidth measurements* were made at the RF output terminals using a Directional Coupler through a Spectrum Analyzer and Power Meter monitoring the power output level.

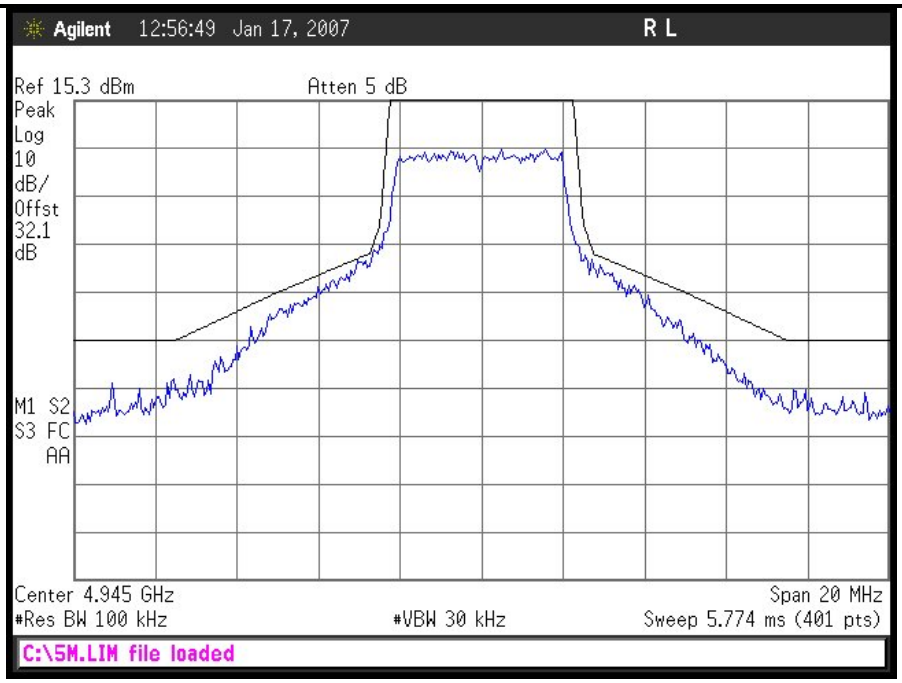
A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer and a Power Meter to monitor the output power level. The measured highest Average Power was set relative to zero dB reference. The RBW of the Spectrum Analyzer was set to at least 1% of the channel bandwidth. The EUT power was adjusted at the maximum output power level. 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(M) with FCC 04-265 (Emission Mask M). The EUT does not exceed the Emission Masks limit.

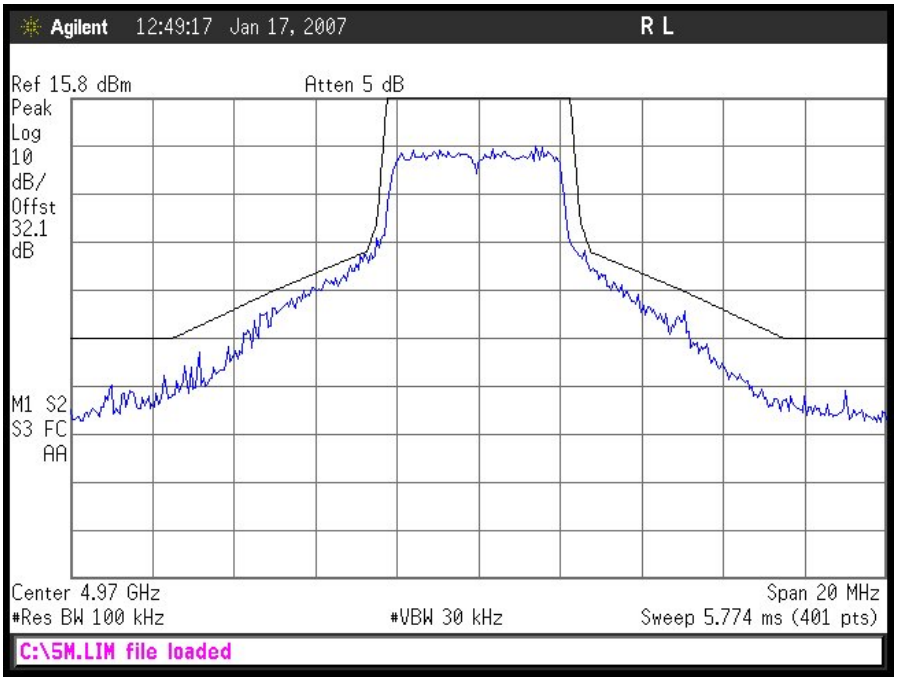
The following pages show measurements of Emission Mask plots:

Test Engineer(s): Shawn McMillen

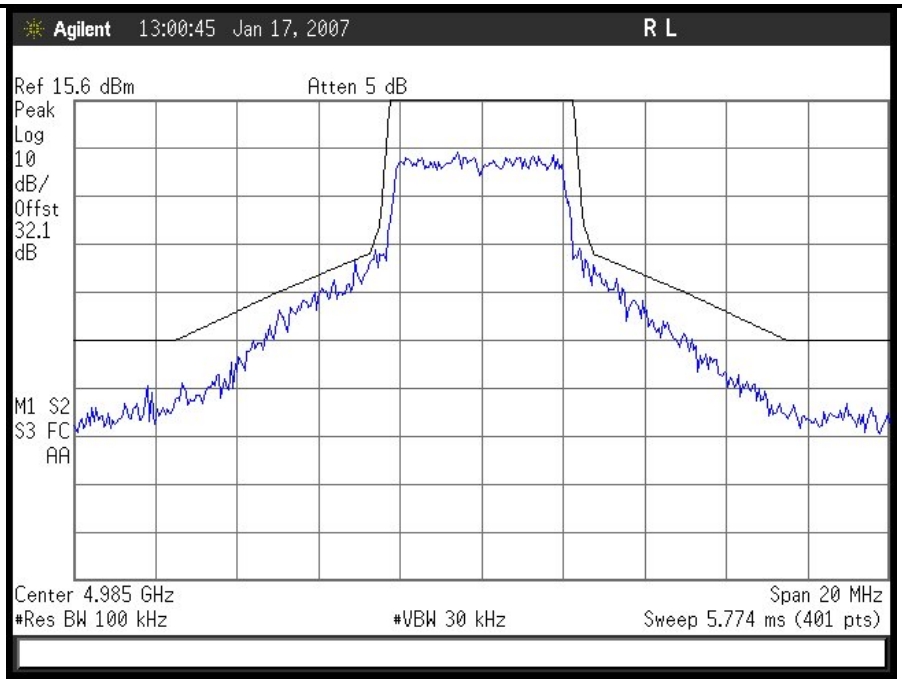
Test Date(s): January 19, 2007



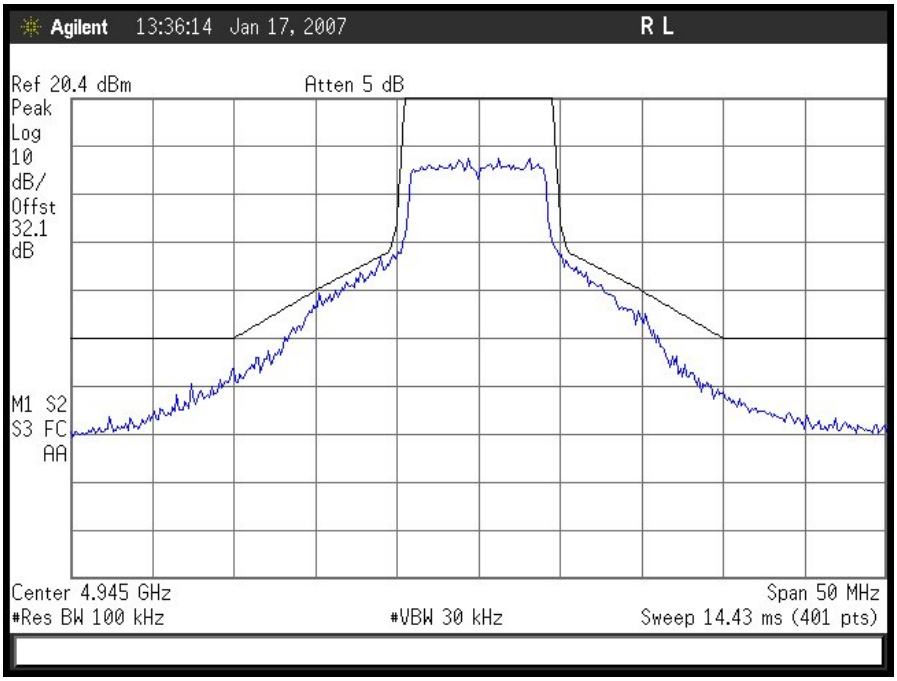
Plot 8. Emission Mask 5 MHz Low Ch



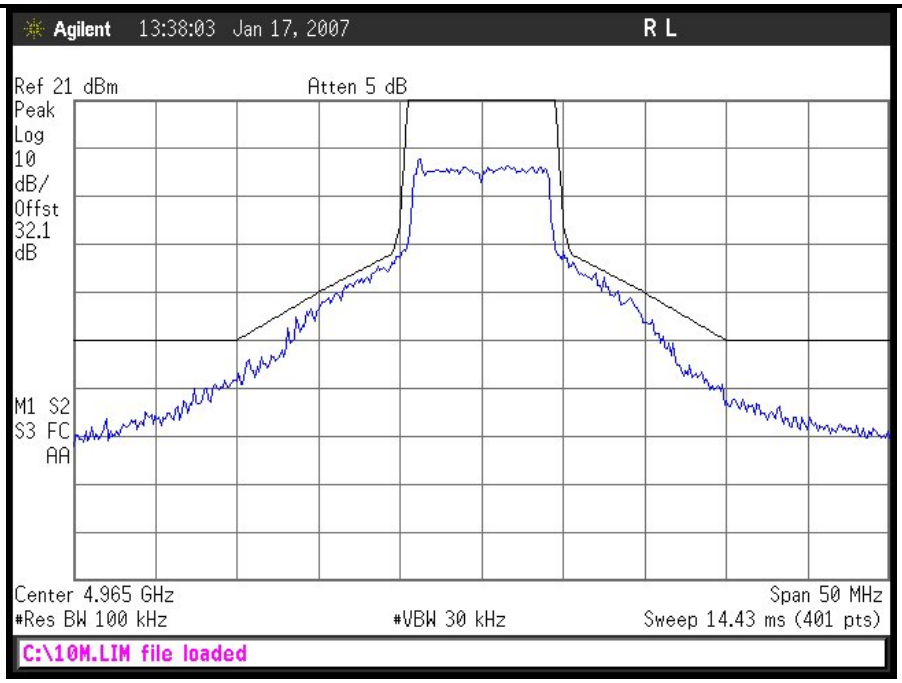
Plot 9. Emission Mask 5 MHz Mid Ch



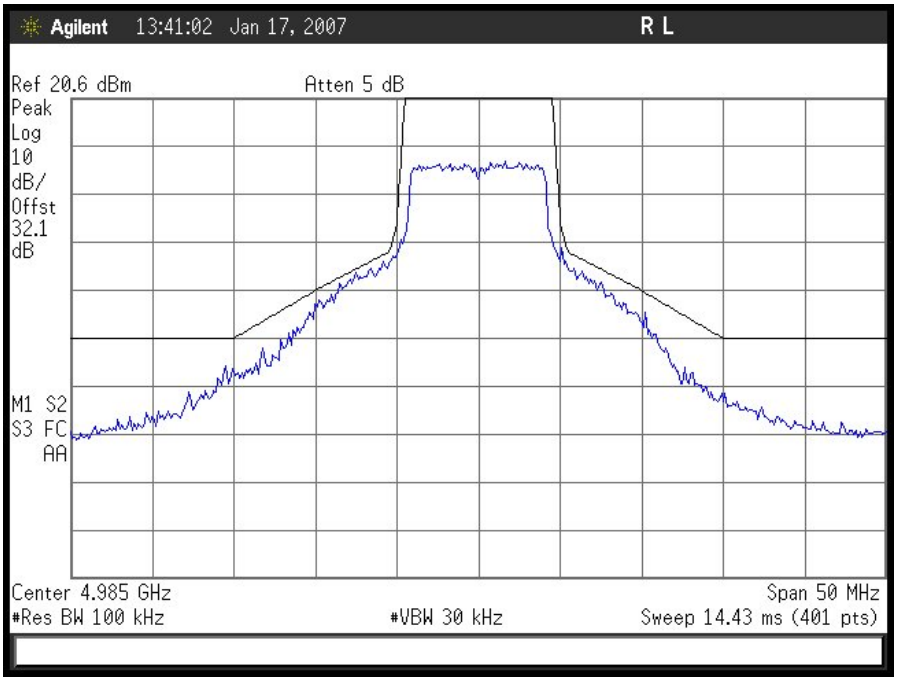
Plot 10. Emission Mask 5 MHz High Ch



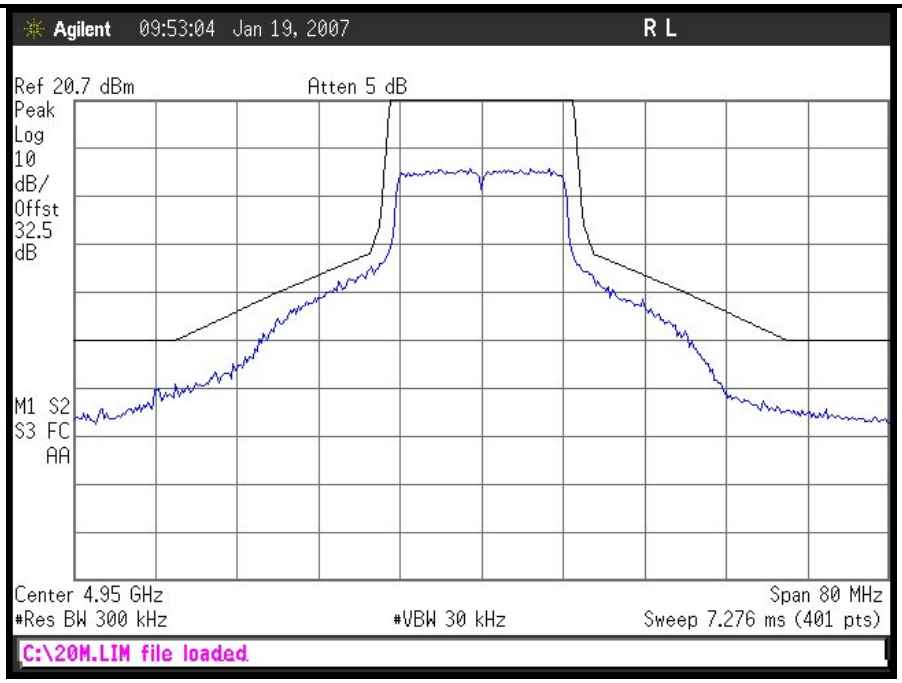
Plot 11. Emission Mask 10 MHz Low Ch



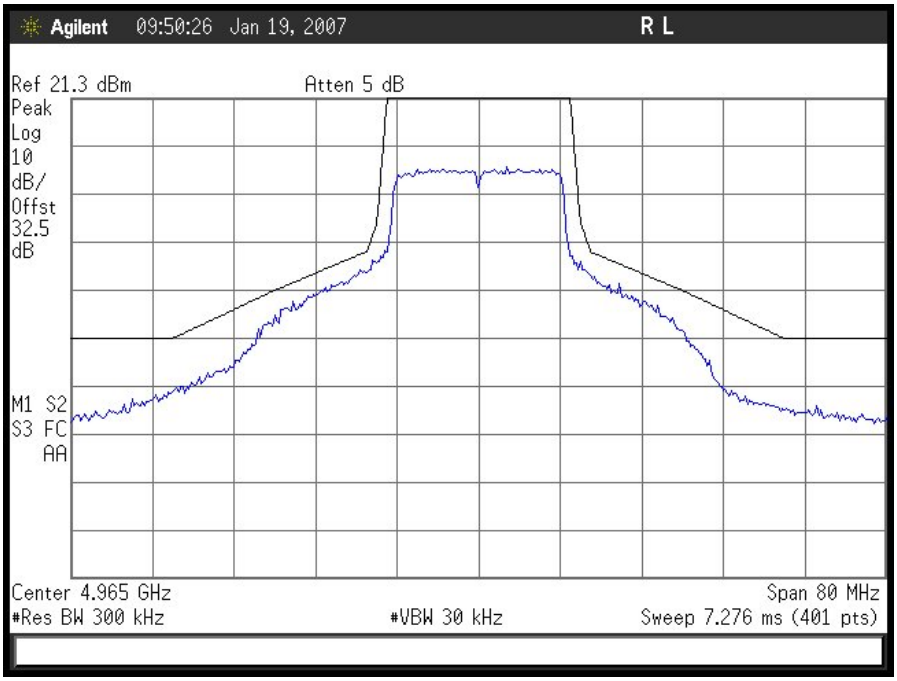
Plot 12. Emission Mask 10 MHz Mid Ch



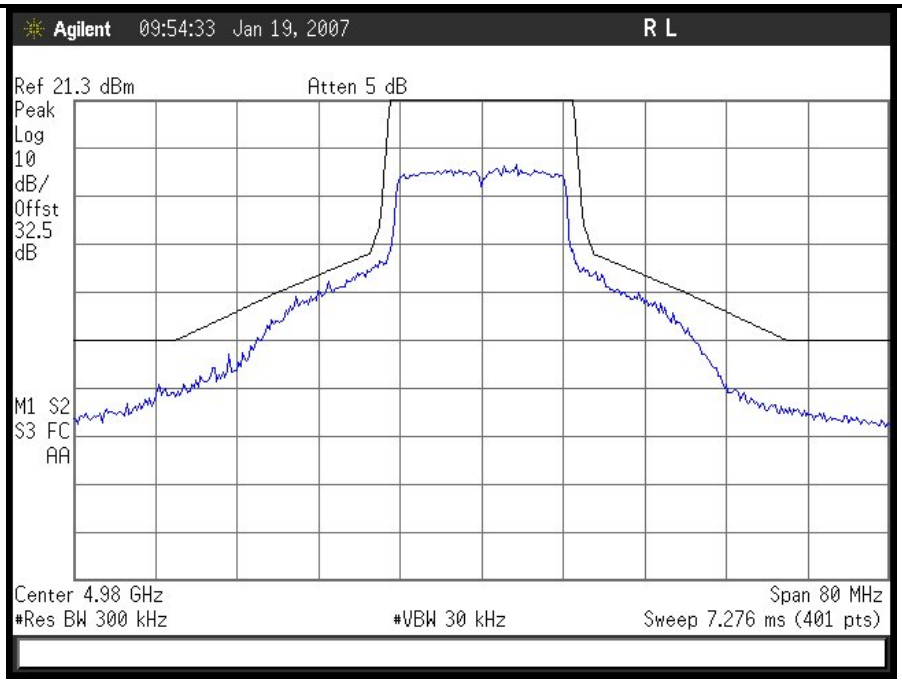
Plot 13. Emission Mask 10 MHz High Ch



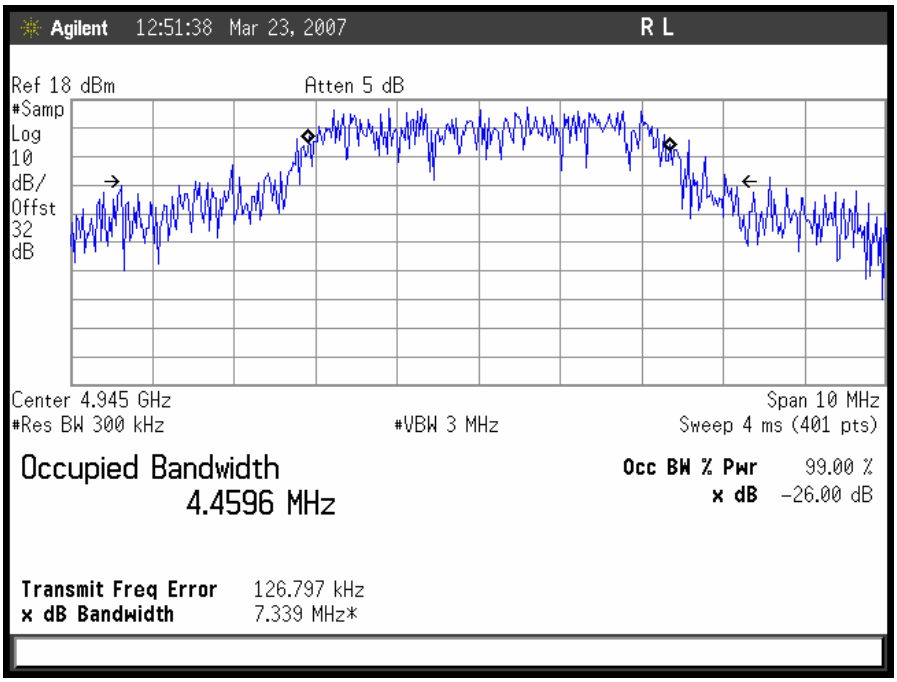
Plot 14. Emission Mask 20 MHz Low Ch



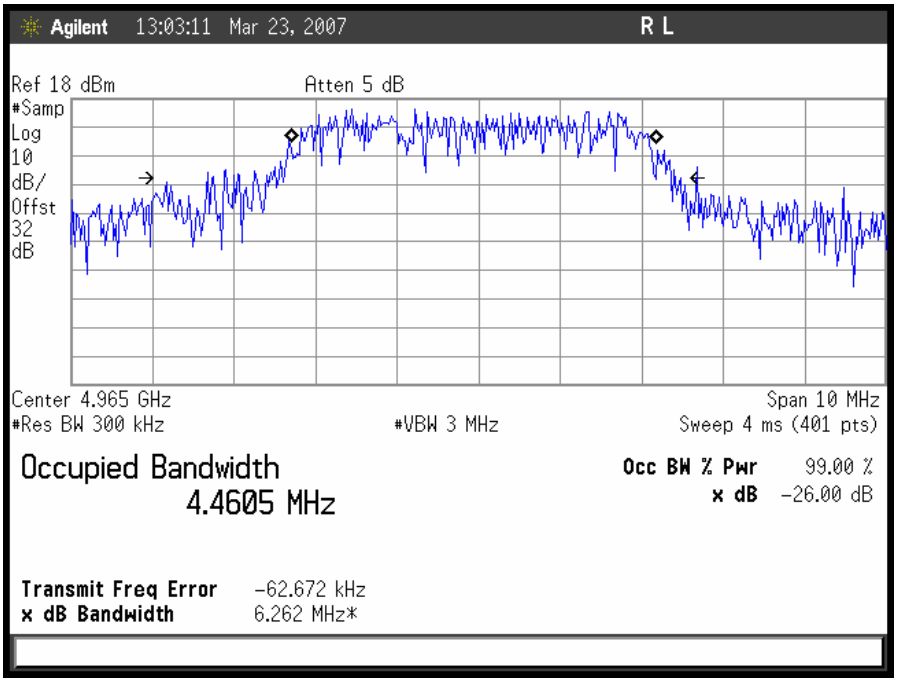
Plot 15. Emission Mask 20 MHz Mid Ch



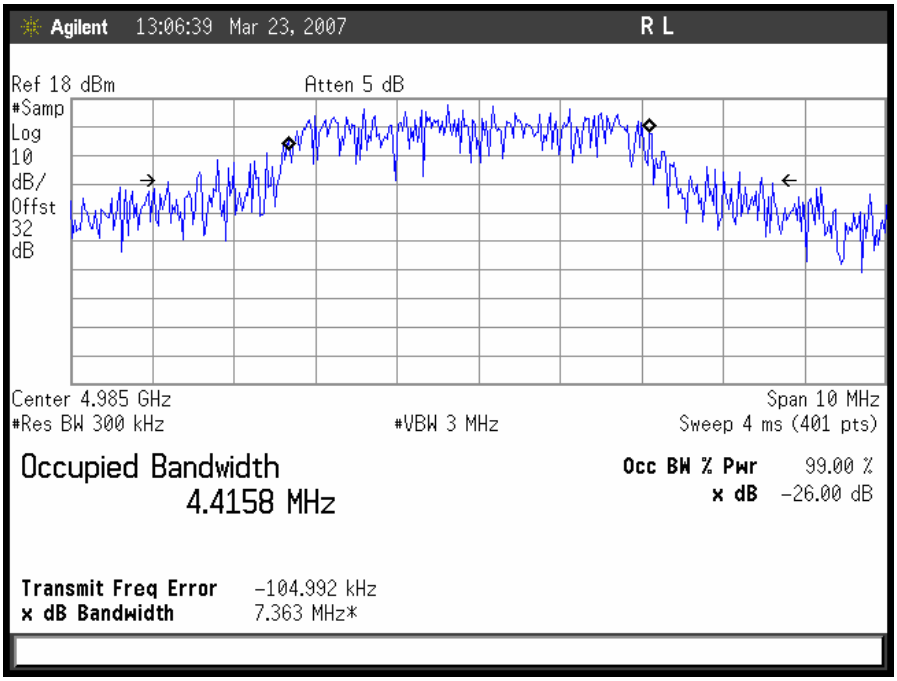
Plot 16. Emission Mask 20 MHz High Ch



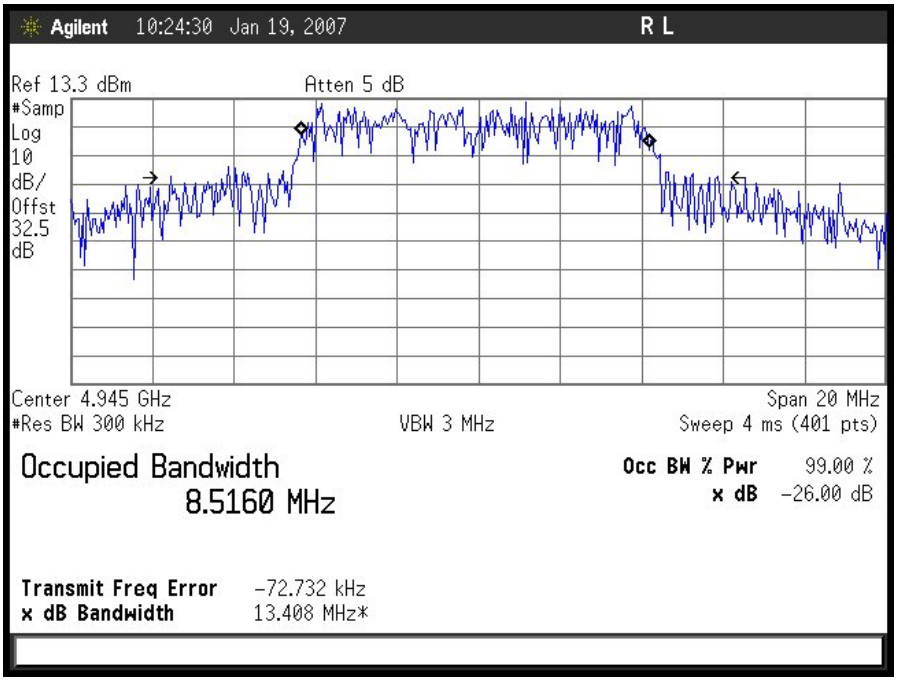
Plot 17. Occupied Bandwidth 5 MHz Low Ch



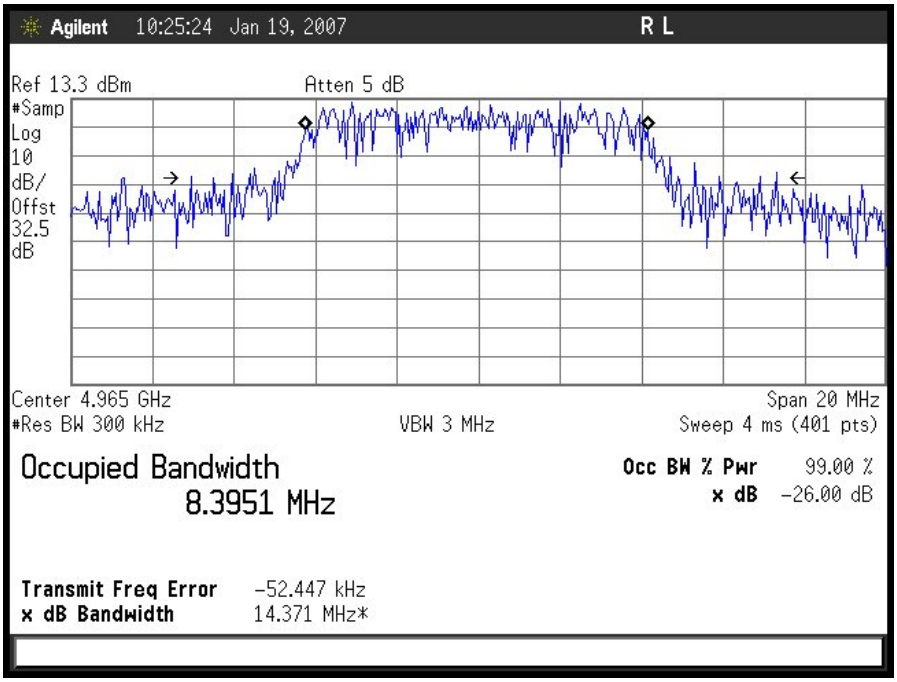
Plot 18. Occupied Bandwidth 5 MHz Mid Ch



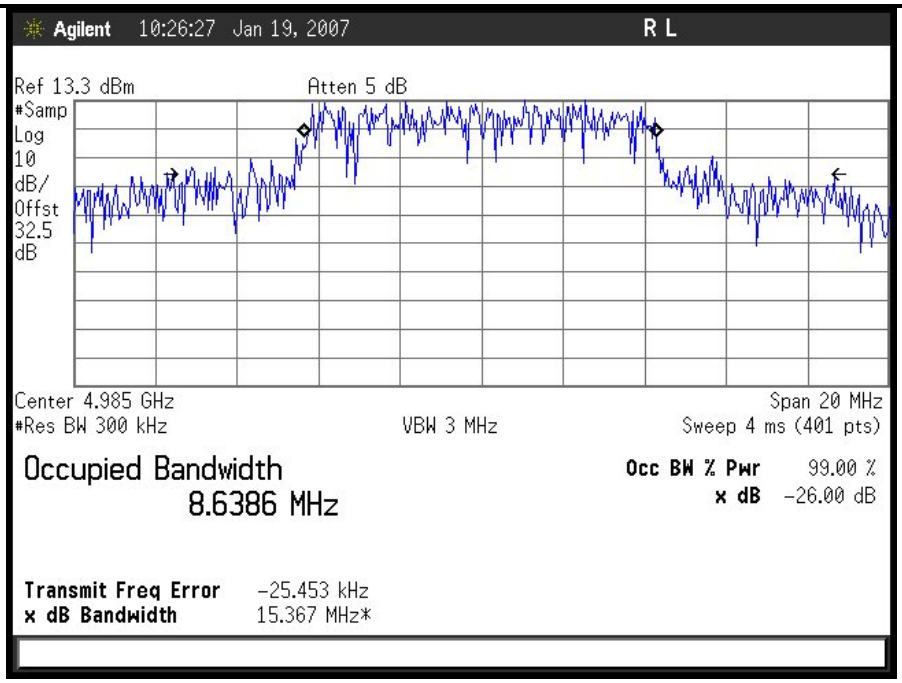
Plot 19. Occupied Bandwidth 5 MHz High Ch



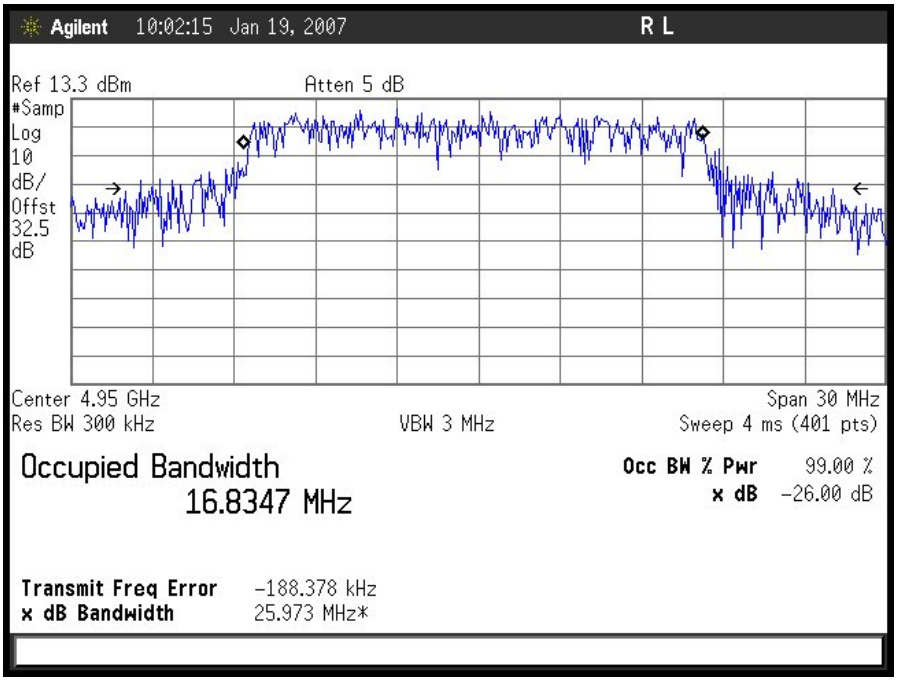
Plot 20. Occupied Bandwidth 10 MHz Low Ch



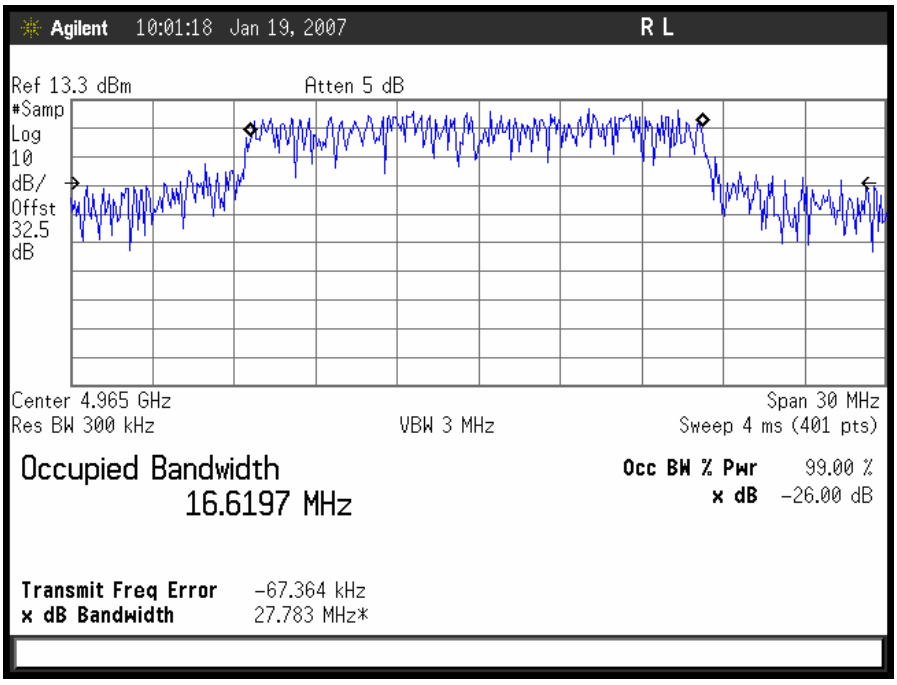
Plot 21. Occupied Bandwidth 10 MHz Mid Ch



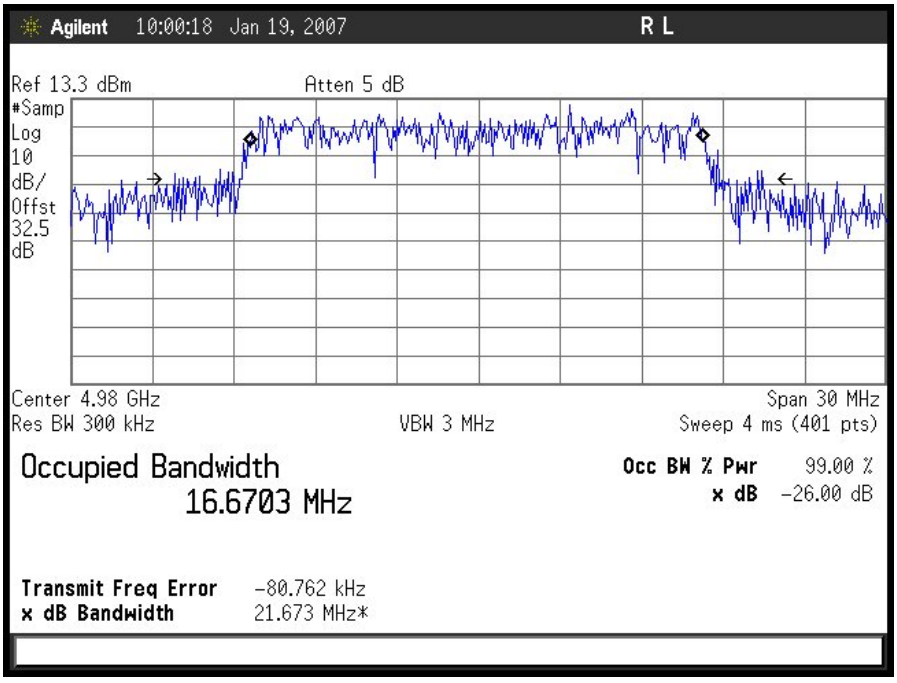
Plot 22. Occupied Bandwidth 10 MHz High Ch



Plot 23. Occupied Bandwidth 20 MHz Low Ch



Plot 24. Occupied Bandwidth 20 MHz Mid Ch



Plot 25. Occupied Bandwidth 20 MHz High Ch

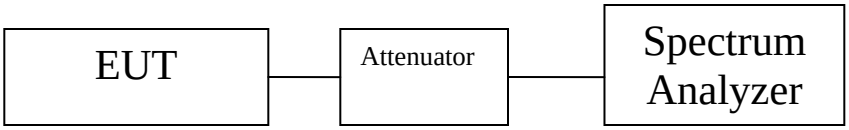


Figure 6. Occupied Bandwidth (Emission Mask) Test Setup

7. Electromagnetic Compatibility Spurious Emissions at Antenna Terminal Requirements

7.1. Spurious Emissions at Antenna Terminals

Test Requirement(s): **§2.1051 and §90.210(M) with FCC 04-265**

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

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer and a Power Meter to monitor the output power level. The Spectrum Analyzer was set to sweep 30 MHz and up to 10th harmonic of the fundamental or 40GHz which ever is the lesser. Measurements were made at the low, mid and high channels.

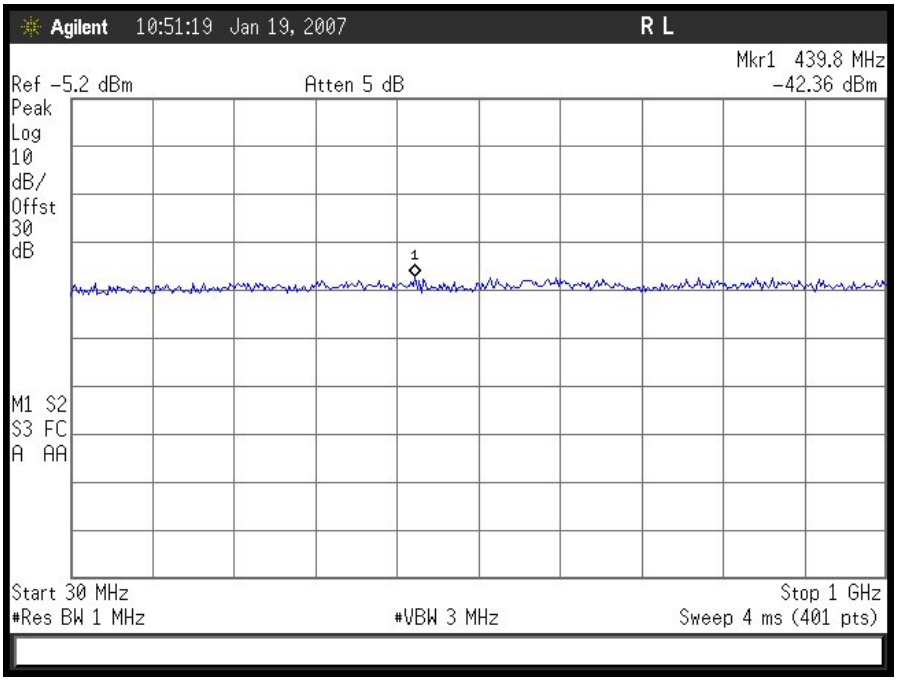
For frequencies 1-18GHz, measurements were made at coupler port of a 20dB directional coupler. The output of the coupler was terminated by a 50Ω load. For frequencies 18-40GHz a HP11970A and HP11970K harmonic mixer was used. Each harmonic mixer was fed with a SMA to wave guide adapter.

The Conducted Spurious Emissions *Limit* is obtained by the following:

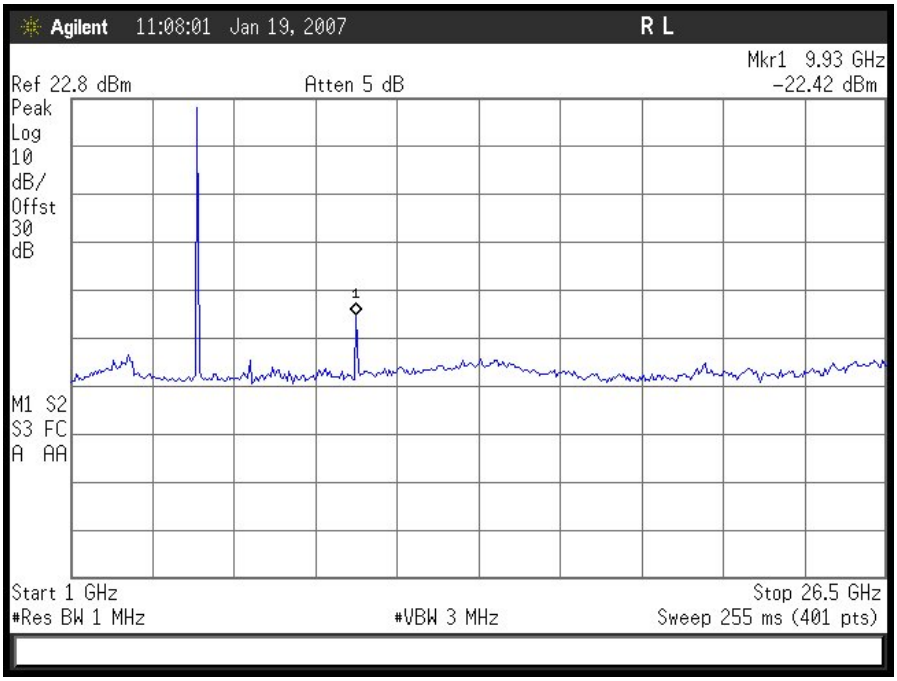
Test Results: Equipment complies with Section 2.1051 and 90.210(M) with FCC 04-265.

Test Engineer(s): Shawn McMillen

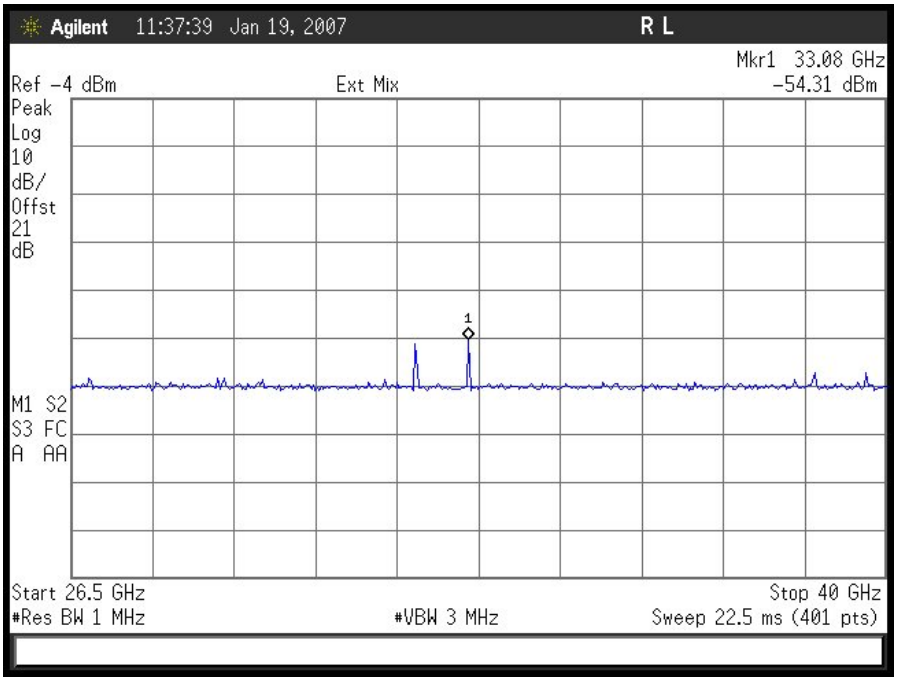
Test Date(s): January 19, 2007



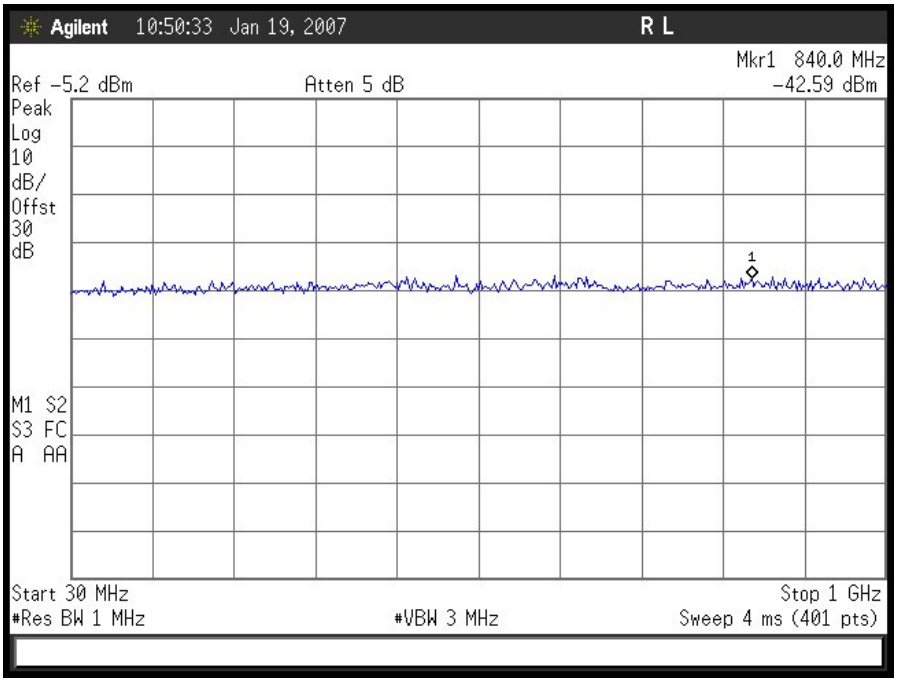
Plot 26. Conducted Spurious Emissions 5 MHz Low Ch (30 MHz - 1GHz)



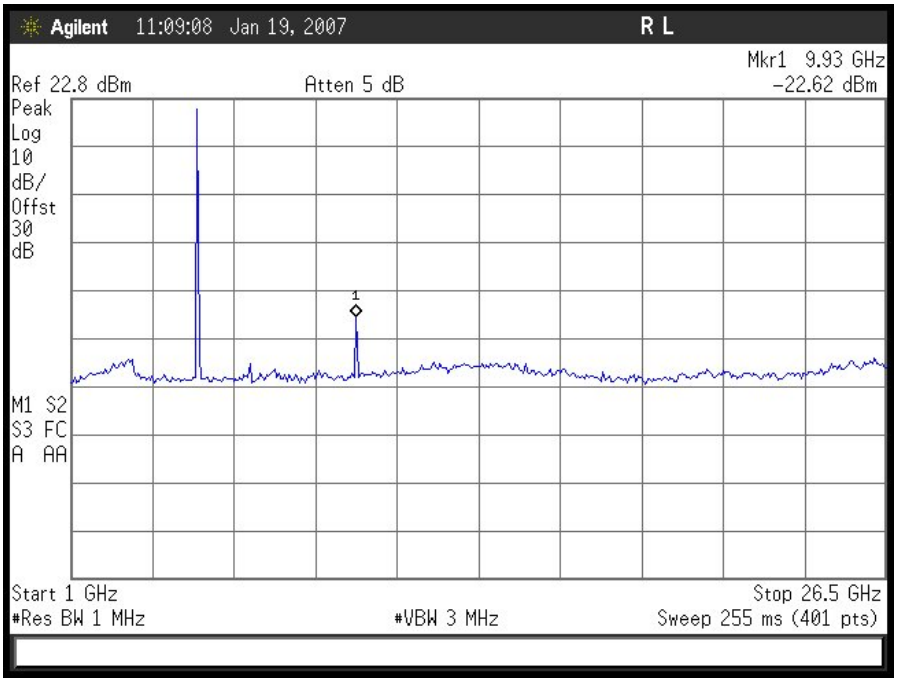
Plot 27. Conducted Spurious Emissions 5 MHz Low Ch (1 GHz – 26.5 GHz)



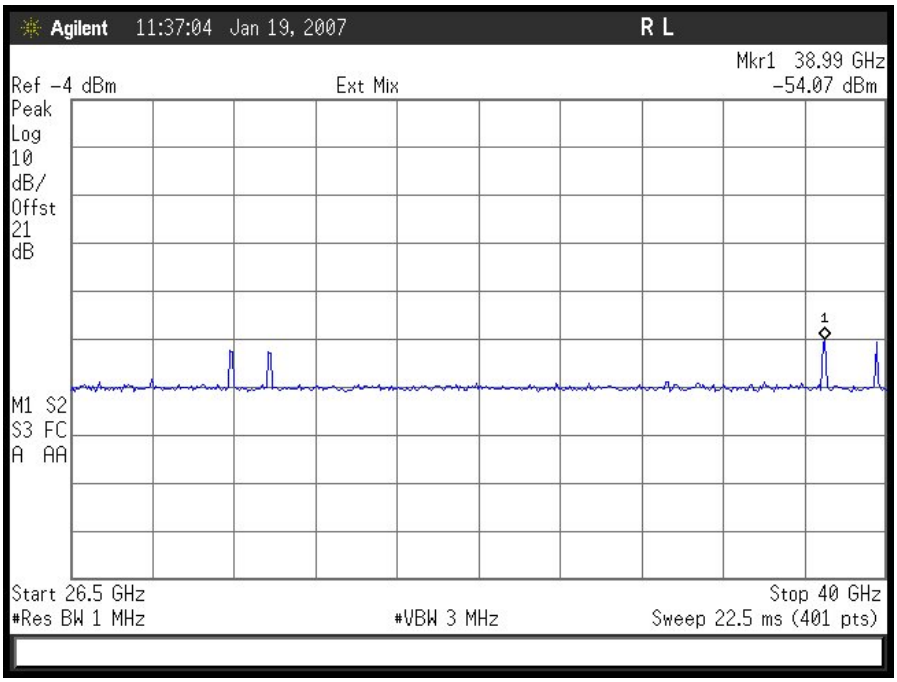
Plot 28. Conducted Spurious Emissions 5 MHz Low Ch (26.5 GHz – 40 GHz)



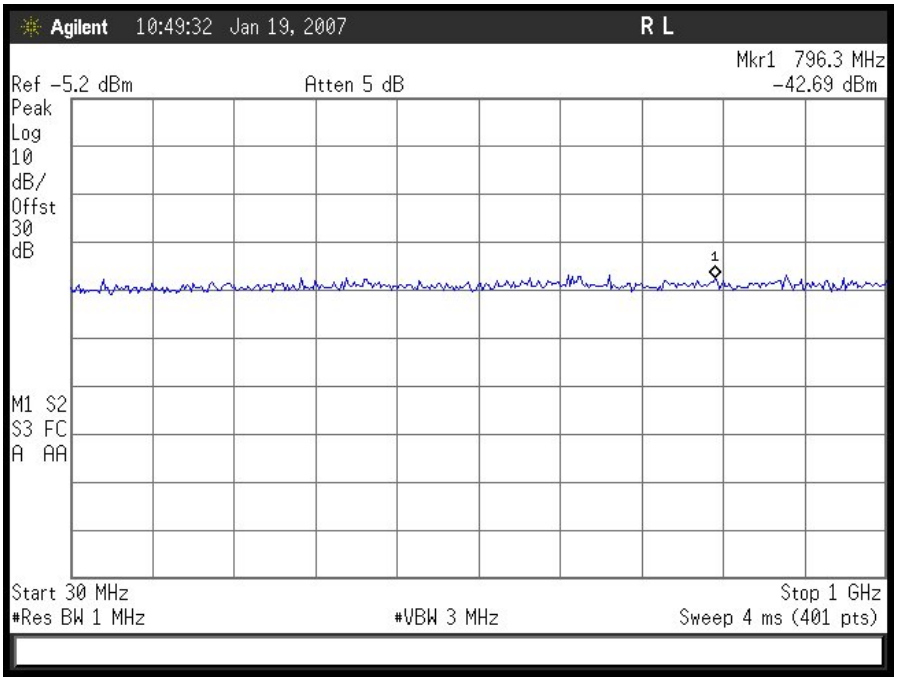
Plot 29. Conducted Spurious Emissions 5 MHz Mid Ch (30 MHz - 1GHz)



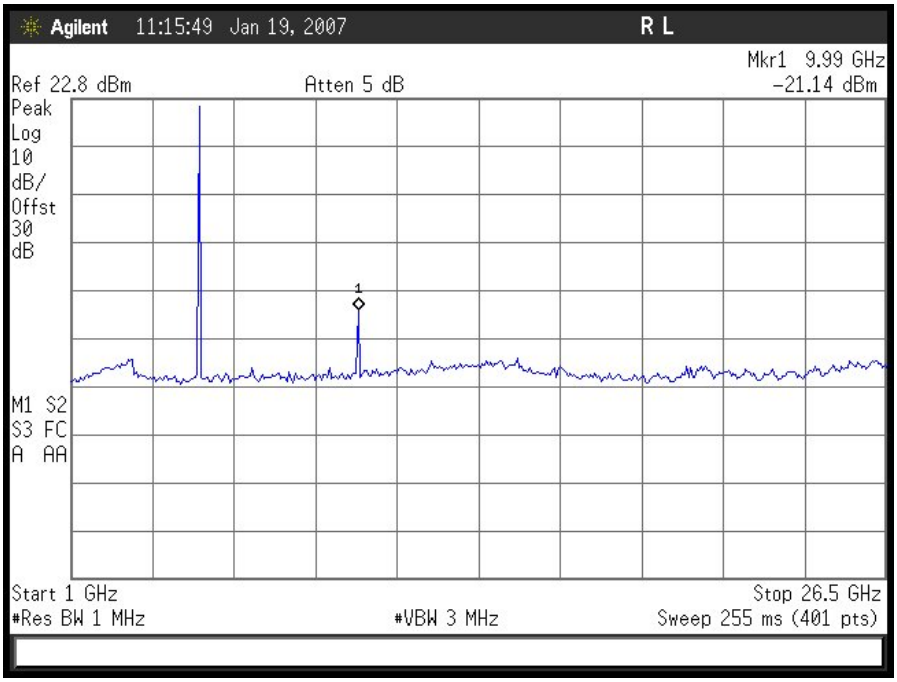
Plot 30. Conducted Spurious Emissions 5 MHz Mid Ch (1 GHz – 26.5 GHz)



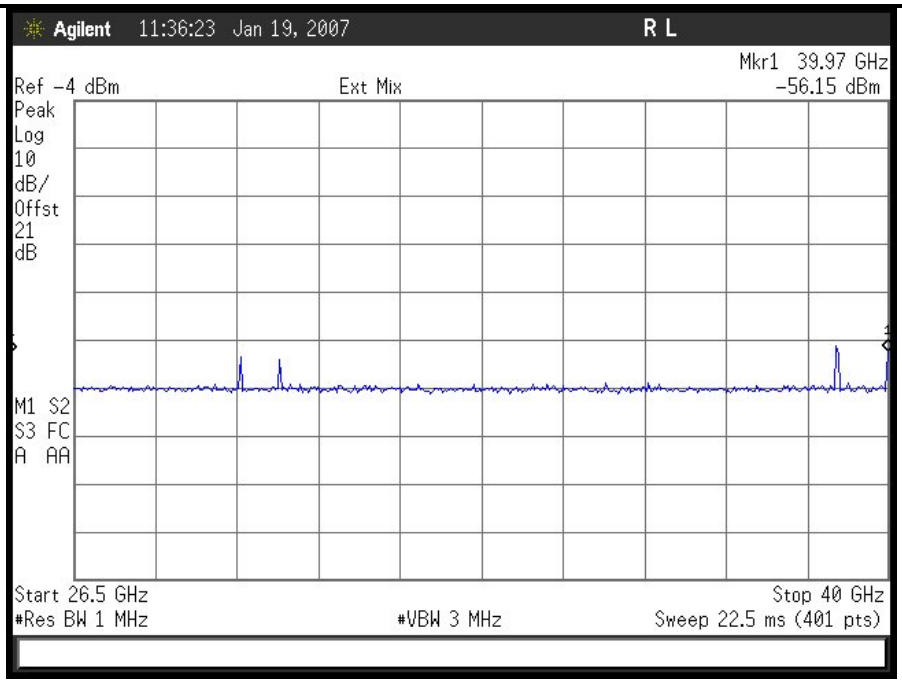
Plot 31. Conducted Spurious Emissions 5 MHz Mid Ch (26.5 GHz – 40 GHz)



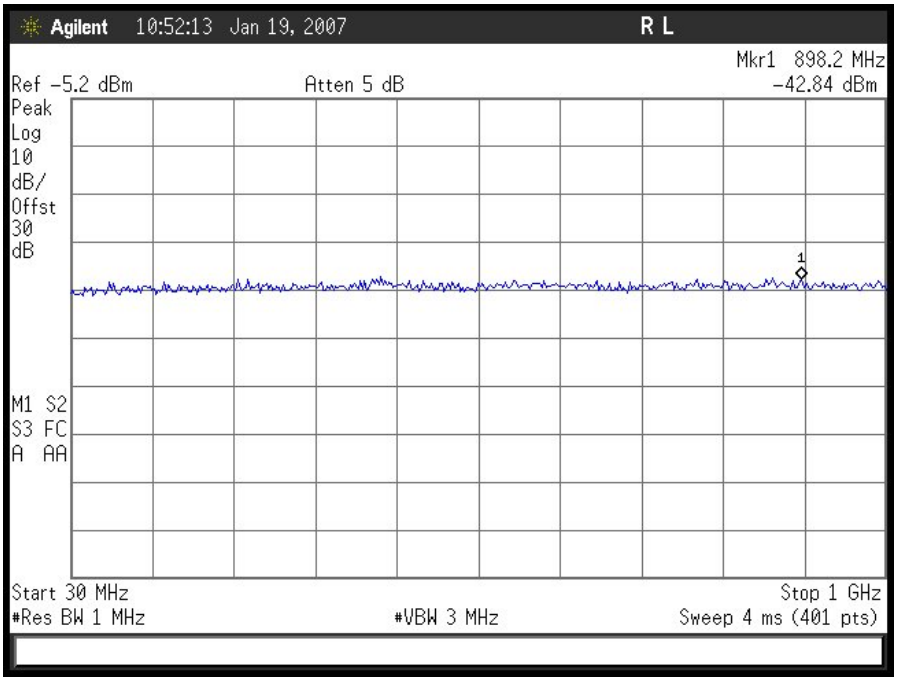
Plot 32. Conducted Spurious Emissions 5 MHz Hi Ch (30 MHz - 1GHz)



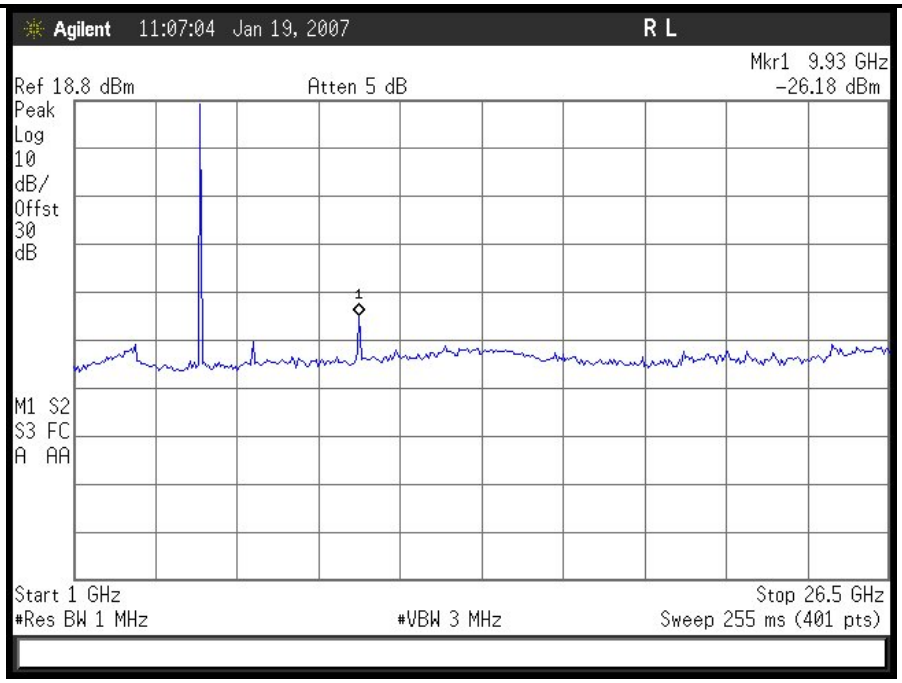
Plot 33. Conducted Spurious Emissions 5 MHz Hi Ch (1 GHz – 26.5 GHz)



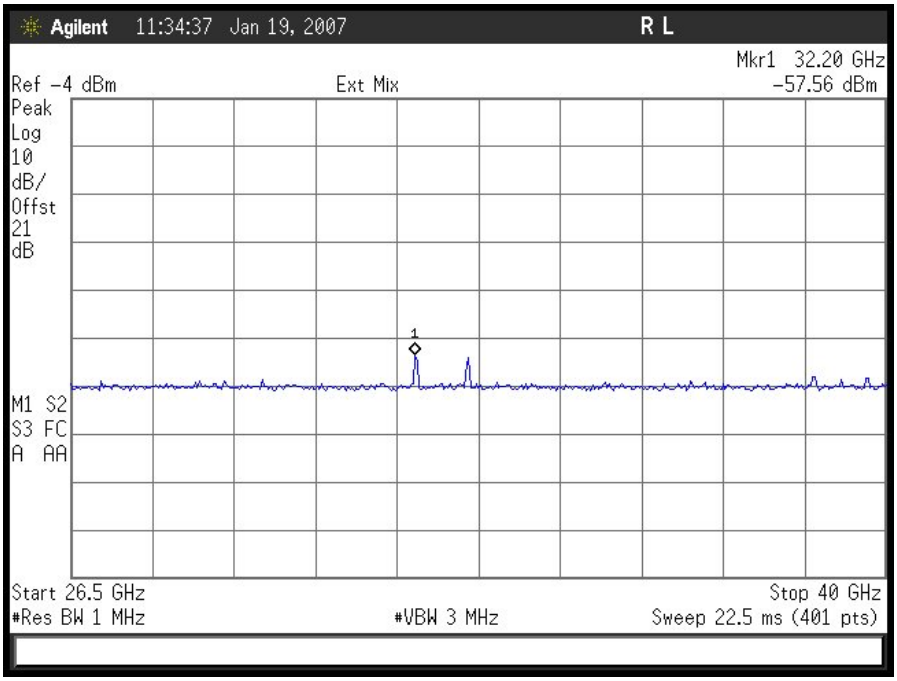
Plot 34. Conducted Spurious Emissions 5 MHz Hi Ch (26.5 GHz – 40 GHz)



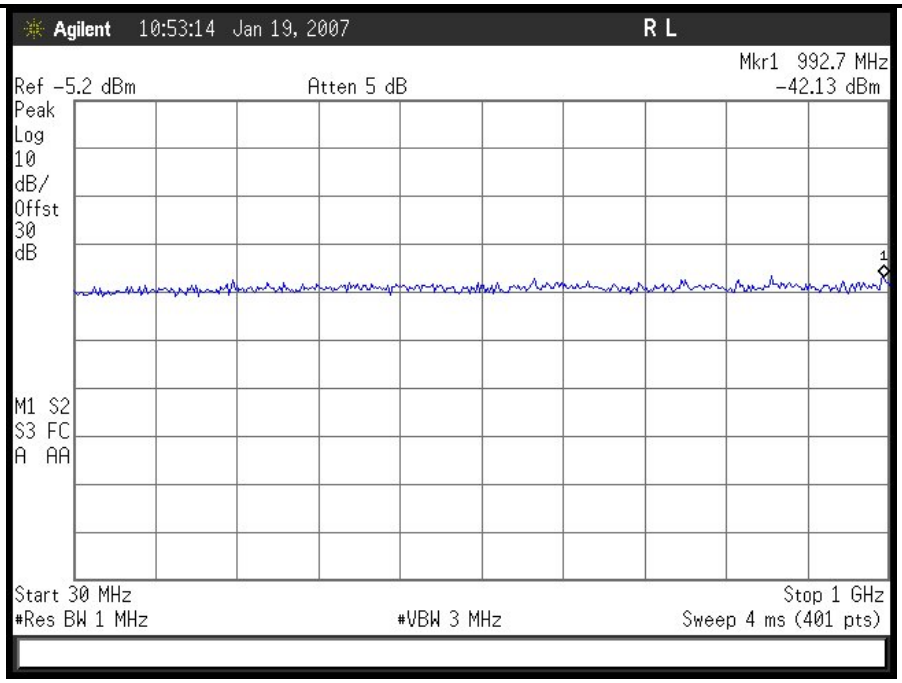
Plot 35. Conducted Spurious Emissions 10 MHz Low Ch (30 MHz - 1GHz)



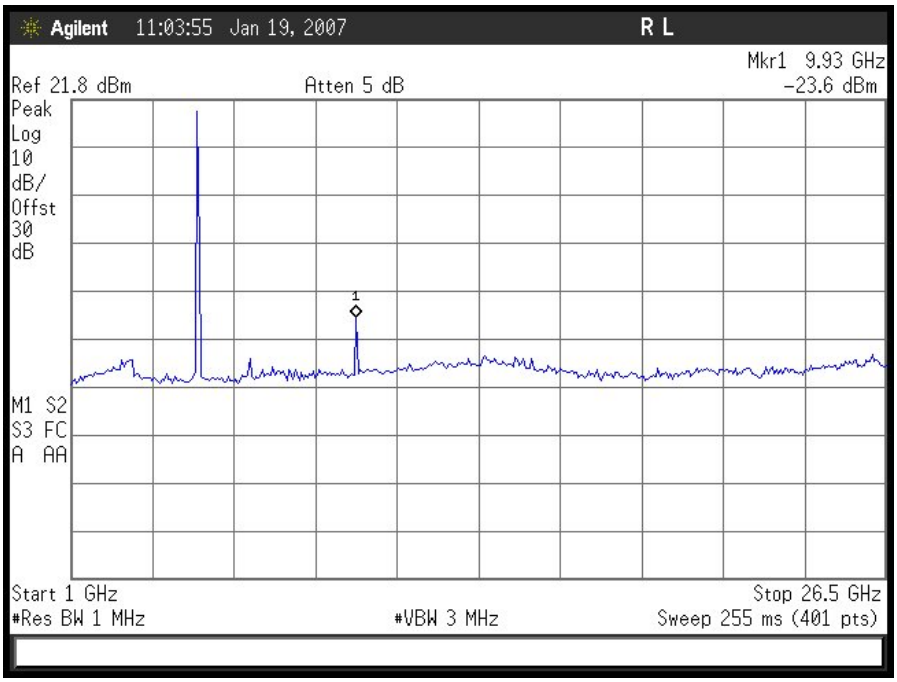
Plot 36. Conducted Spurious Emissions 10 MHz Low Ch (1 GHz – 26.5 GHz)



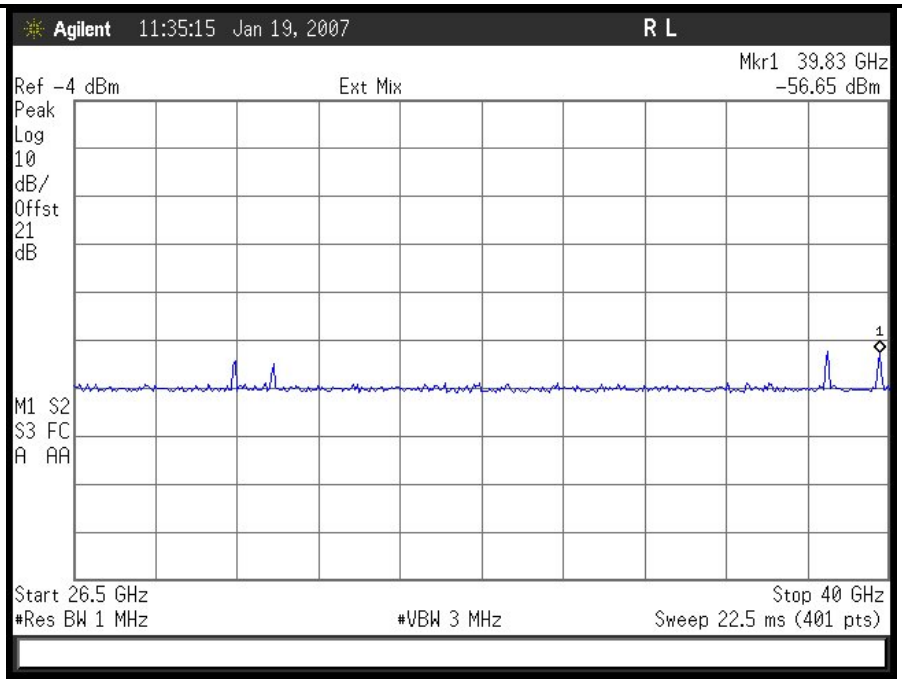
Plot 37. Conducted Spurious Emissions10 MHz Low Ch (26.5 GHz – 40 GHz)



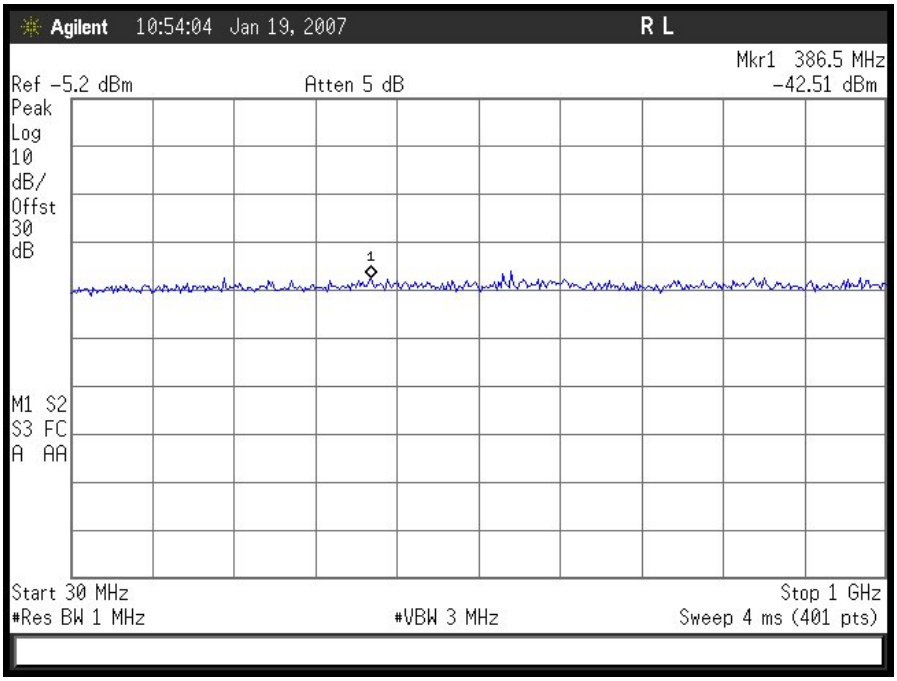
Plot 38. Conducted Spurious Emissions 10 MHz Mid Ch (30 MHz - 1GHz)



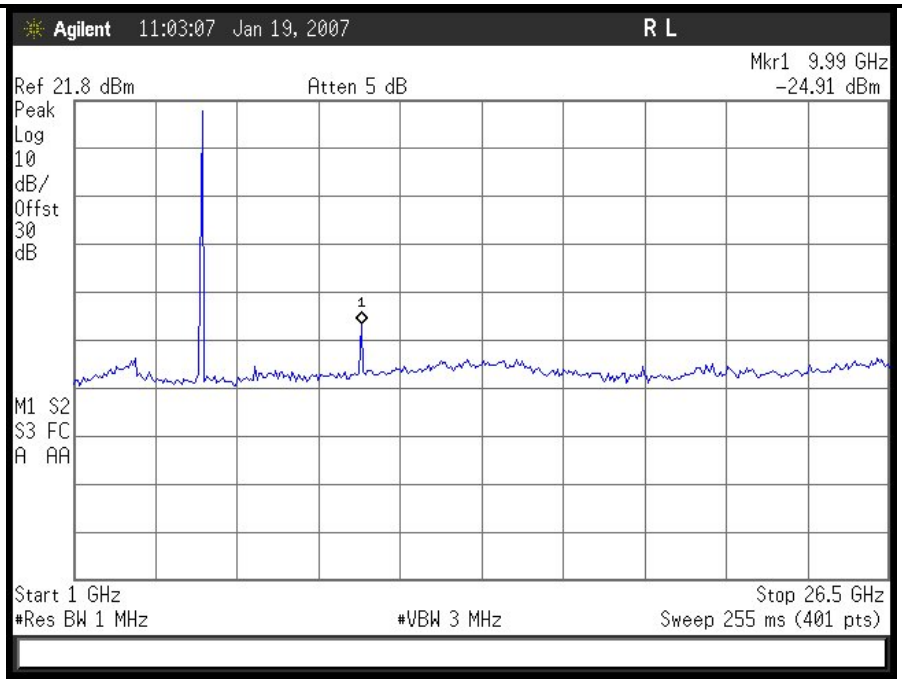
Plot 39. Conducted Spurious Emissions10 MHz Mid Ch (1 GHz – 26.5 GHz)



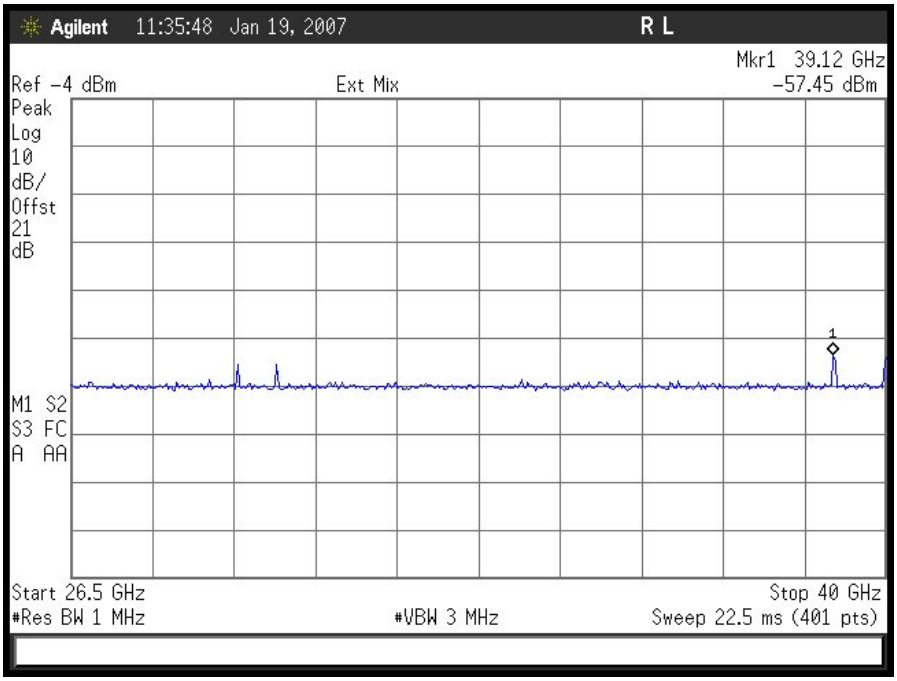
Plot 40. Conducted Spurious Emissions10 MHz Mid Ch (26.5 GHz – 40 GHz)



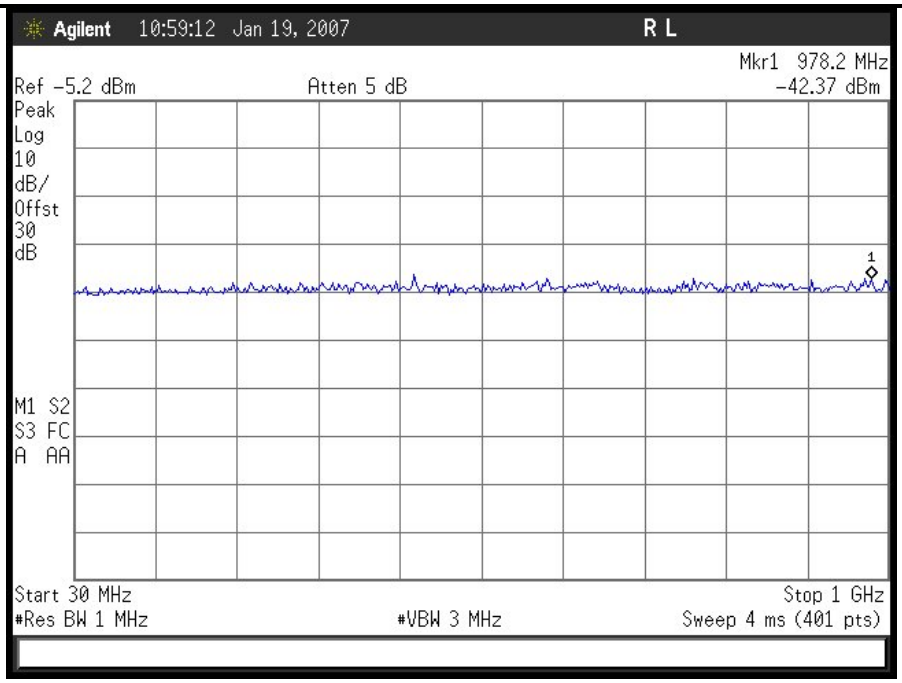
Plot 41. Conducted Spurious Emissions 10 MHz Hi Ch (30 MHz - 1GHz)



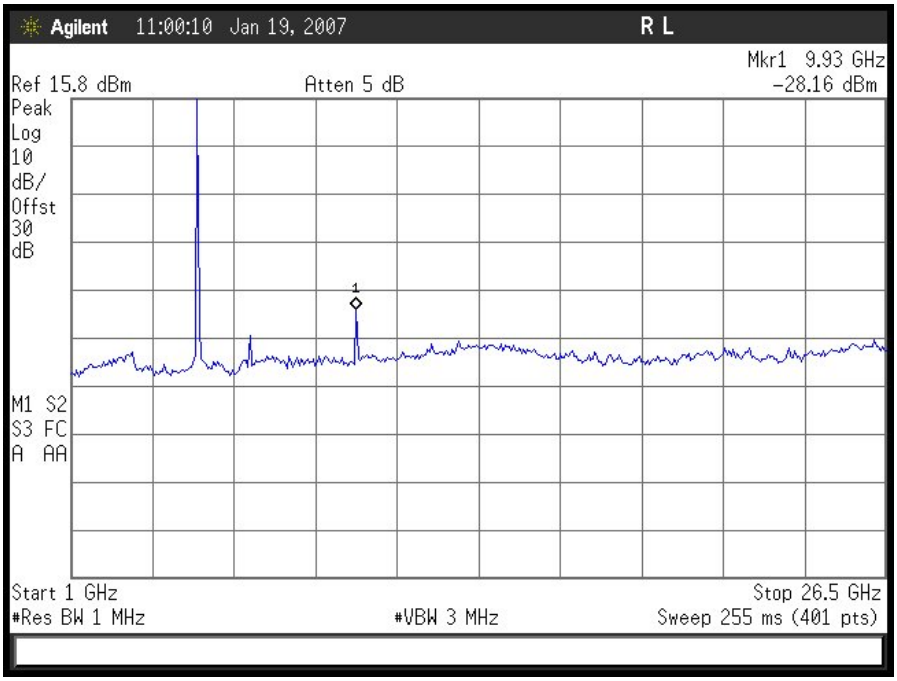
Plot 42. Conducted Spurious Emissions 10 MHz Hi Ch (1 GHz – 26.5 GHz)



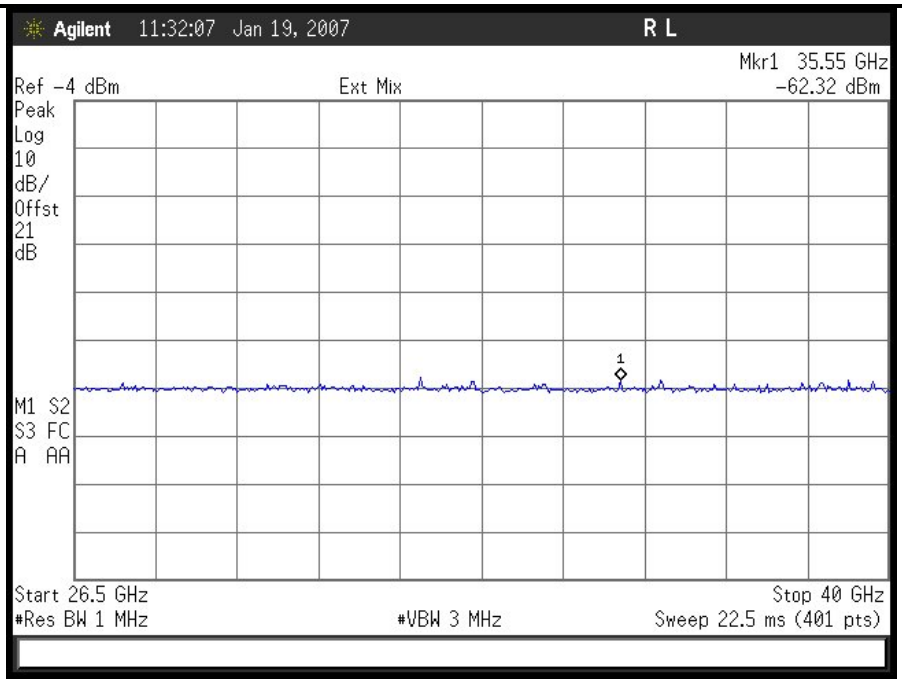
Plot 43. Conducted Spurious Emissions 10 MHz Hi Ch (26.5 GHz – 40 GHz)



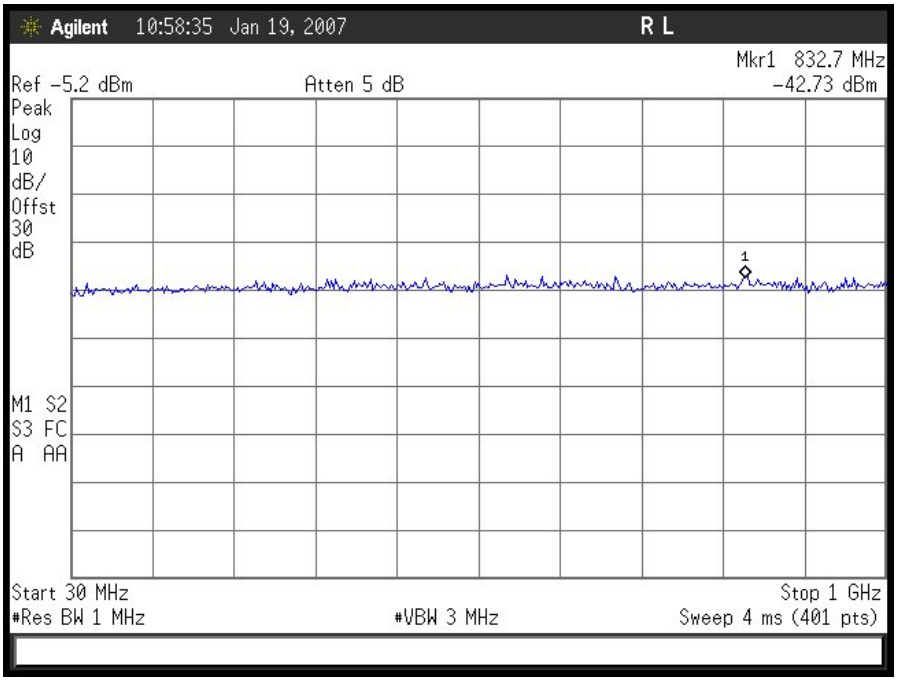
Plot 44. Conducted Spurious Emissions 20 MHz Low Ch (30 MHz - 1GHz)



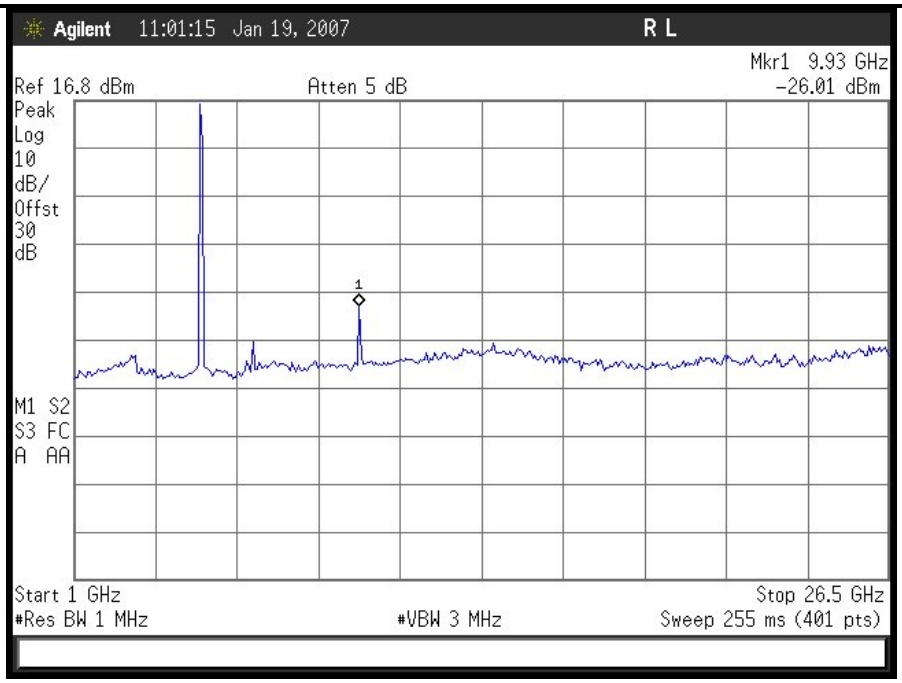
Plot 45. Conducted Spurious Emissions 20 MHz Low Ch (1 GHz – 26.5 GHz)



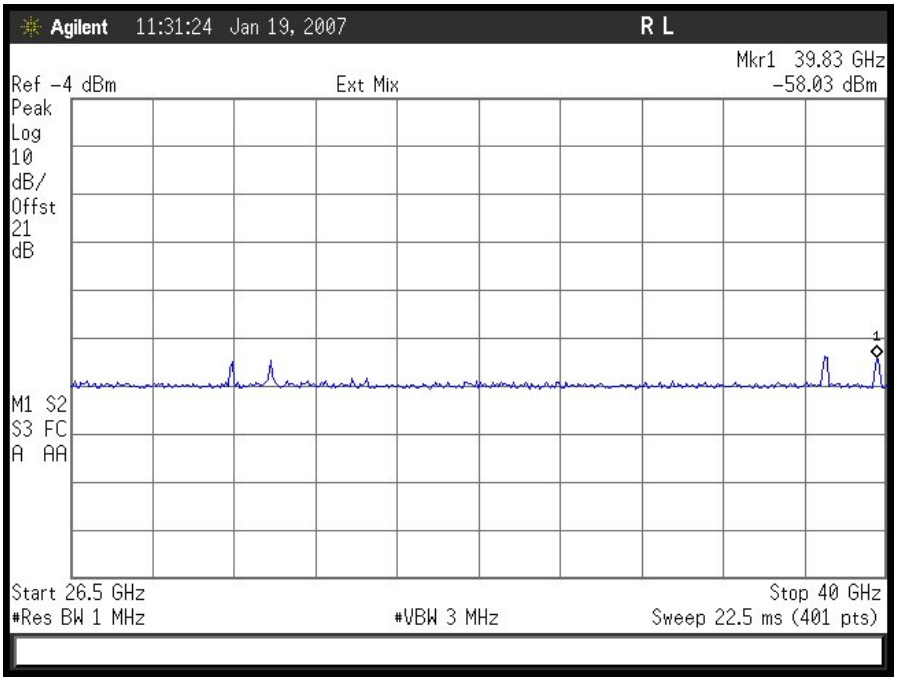
Plot 46. Conducted Spurious Emissions 20 MHz Low Ch (26.5 GHz – 40 GHz)



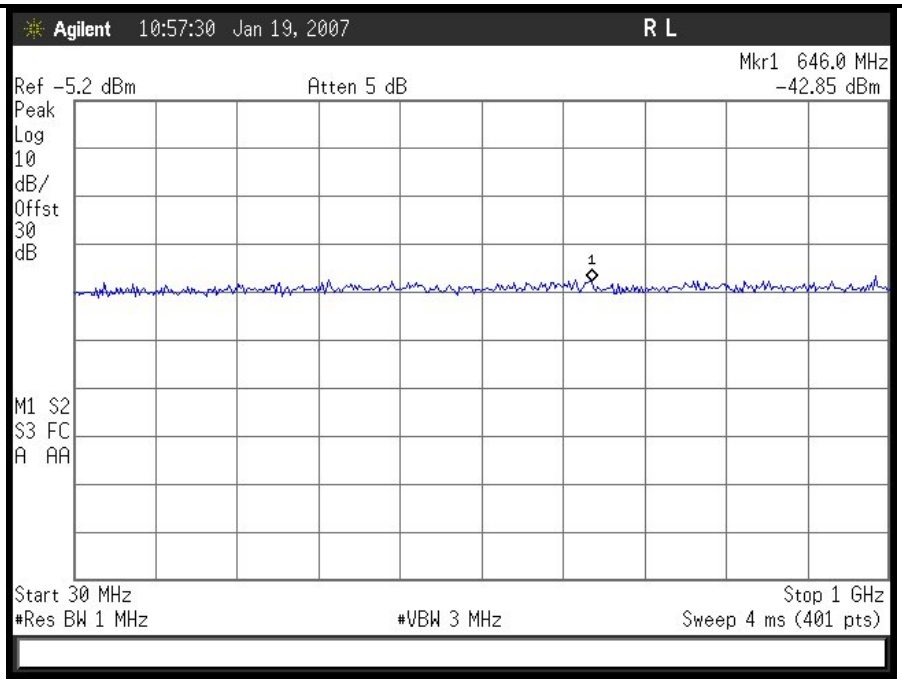
Plot 47. Conducted Spurious Emissions 20 MHz Mid Ch (30 MHz - 1GHz)



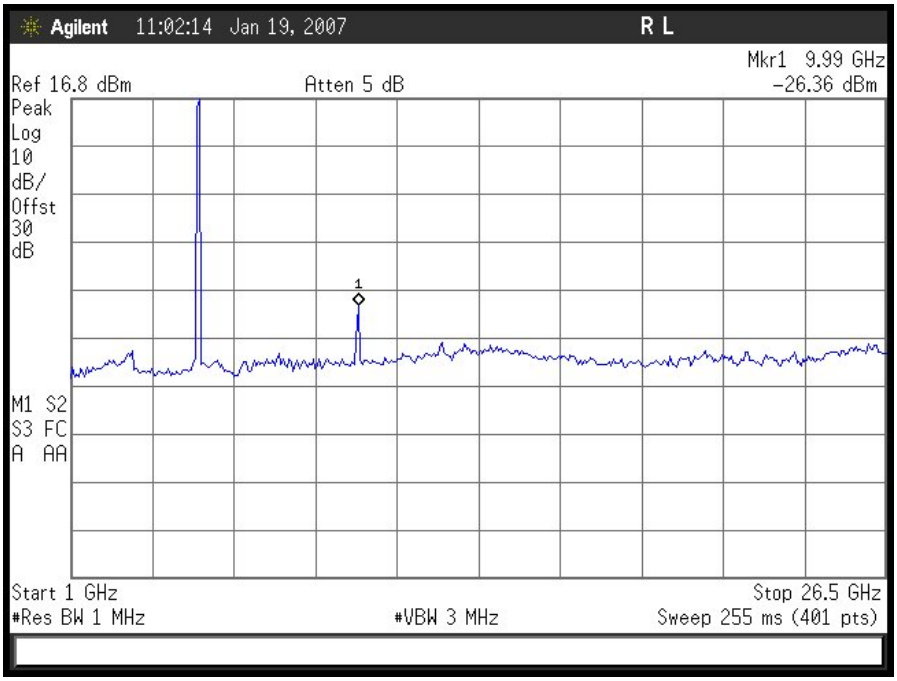
Plot 48. Conducted Spurious Emissions 20 MHz Mid Ch (1 GHz – 26.5 GHz)



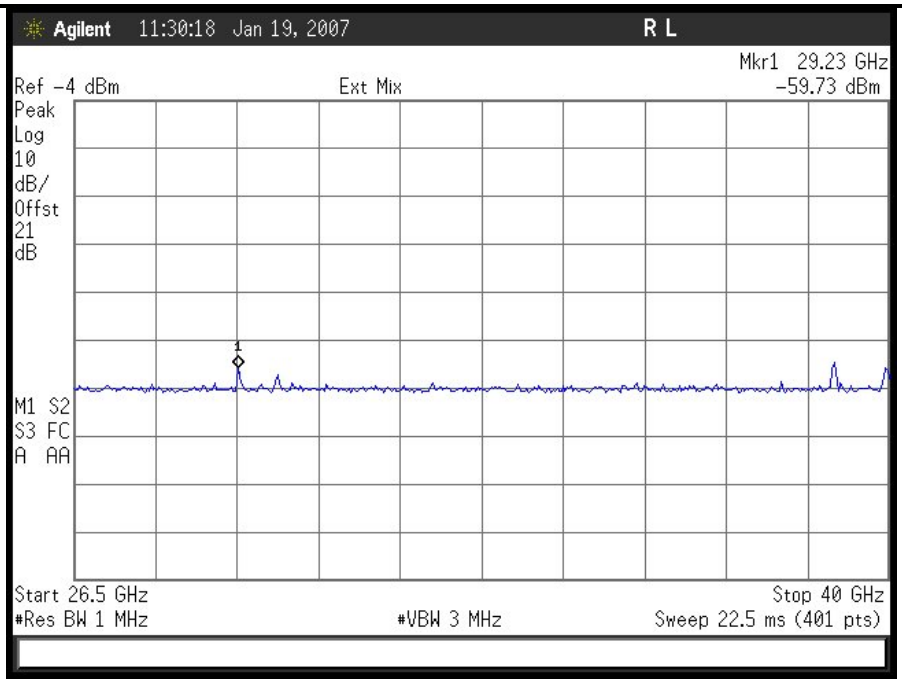
Plot 49. Conducted Spurious Emissions 20 MHz Mid Ch (26.5 GHz – 40 GHz)



Plot 50. Conducted Spurious Emissions 20 MHz Hi Ch (30 MHz - 1GHz)



Plot 51. Conducted Spurious Emissions 20 MHz Hi Ch (1 GHz – 26.5 GHz)



Plot 52. Conducted Spurious Emissions 20 MHz Hi Ch (26.5 GHz – 40 GHz)

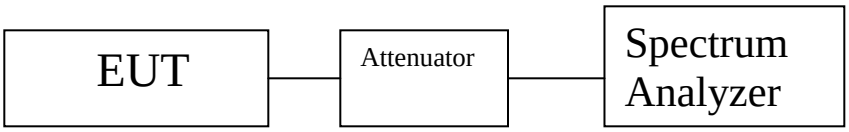


Figure 7. Spurious Emissions at Antenna Terminals Test Setup

Electromagnetic Compatibility Radiated Emissions Requirements

7.2. 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 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. 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: Equipment complies with Section 2.1053 and 90.210.

Test Engineer(s): Shawn McMillen

Test Date(s): January 19, 2007

Radiated Emissions (Substitution Method) Test Results

5 MHz *fo* = 4945.0 MHz					
Frequency (MHz)	**Polarization V/H**	**Spectrum Analyzer Reading (dBm)**	**Substitution antenna power input (dBm)**	**Tx Ant. Gain (dBi)**	**EIRP (dBm)**
9885.0	V	-48.7	-38.2	11.9	-26.3
14827.5	V	-69.9	-53.1	11.8	-41.3

5 MHz *fo* = 4967.5 MHz					
Frequency (MHz)	**Polarization V/H**	**Spectrum Analyzer Reading (dBm)**	**Substitution antenna power input (dBm)**	**Tx Ant. Gain (dBi)**	**EIRP (dBm)**
9930.0	V	-51.5	-40.2	11.9	-28.3
14895.0	V	-72.0	-55.3	11.8	-43.5

5 MHz *fo* = 4985.0MHz					
Frequency (MHz)	**Polarization V/H**	**Spectrum Analyzer Reading (dBm)**	**Substitution antenna power input (dBm)**	**Tx Ant. Gain (dBi)**	**EIRP (dBm)**
9975.0	V	-51.6	-42.3	11.9	-30.4
14962.5	V	-63.7	-54.8	11.8	-43.0

Notes: All other emissions were measured at the noise floor of the spectrum analyzer.

10 MHz *fo* = 4945.0 MHz					
Frequency (MHz)	**Polarization V/H**	**Spectrum Analyzer Reading (dBm)**	**Substitution antenna power input (dBm)**	**Tx Ant. Gain (dBi)**	**EIRP (dBm)**
9890.0	V	-55.8	-40.1	11.9	-28.2
14835.0	V	-75.8	-55.3	11.8	-43.5

10 MHz *fo* = 4965.0 MHz					
Frequency (MHz)	**Polarization V/H**	**Spectrum Analyzer Reading (dBm)**	**Substitution antenna power input (dBm)**	**Tx Ant. Gain (dBi)**	**EIRP (dBm)**
9930.0	V	-54.4	-40.6	11.9	-28.7
14895.0	V	-73.5	-56.1	11.8	-44.3

10 MHz *fo* = 4985 MHz					
Frequency (MHz)	**Polarization V/H**	**Spectrum Analyzer Reading (dBm)**	**Substitution antenna power input (dBm)**	**Tx Ant. Gain (dBi)**	**EIRP (dBm)**
9970.0	V	-57.4	-48.3	11.9	-36.4
14955.0	V	-70.4	-55.7	11.8	-43.9

Notes: All other emissions were measured at the noise floor of the spectrum analyzer.

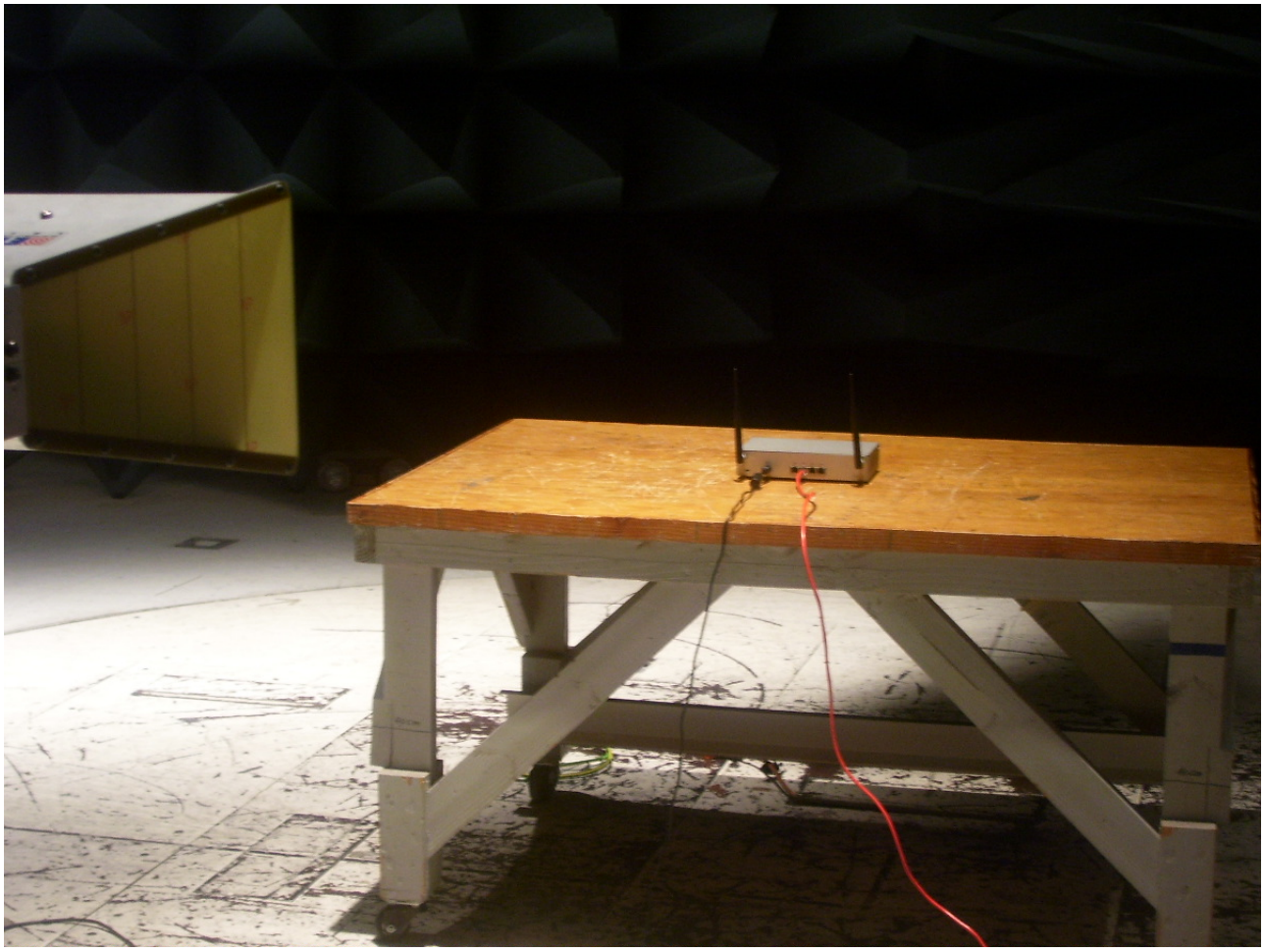
20 MHz *fo* = 4950.0 MHz					
Frequency (MHz)	**Polarization V/H**	**Spectrum Analyzer Reading (dBm)**	**Substitution antenna power input (dBm)**	**Tx Ant. Gain (dBi)**	**EIRP (dBm)**
9900.0	V	-55.7	-39.7	11.9	-27.8
14850.0	V	-74.4	-56.3	11.8	-44.5

20 MHz *fo* = 4965.0 MHz					
Frequency (MHz)	**Polarization V/H**	**Spectrum Analyzer Reading (dBm)**	**Substitution antenna power input (dBm)**	**Tx Ant. Gain (dBi)**	**EIRP (dBm)**
9930.0	V	-57.2	-41.8	11.9	-29.9
14895.0	V	-74.2	-58.2	11.8	-46.4

20 MHz *fo* = 4980.0 MHz					
Frequency (MHz)	**Polarization V/H**	**Spectrum Analyzer Reading (dBm)**	**Substitution antenna power input (dBm)**	**Tx Ant. Gain (dBi)**	**EIRP (dBm)**
9960.0	V	-60.0	-49.3	11.9	-37.4
14940.0	V	-71.4	-54.5	11.8	-42.7

Notes: All other emissions were measured at the noise floor of the spectrum analyzer.

Radiated Emissions Spurious Test Setup



Photograph 4. Radiated Emission Spurious Test Setup

8. Electromagnetic Compatibility Frequency Stability Requirements

8.1. 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: Equipment complies with Section 2.1055 and 90.213

Test Engineer(s): Shawn McMillen

Test Date(s): January 19, 2007

Frequency Stability Test Results

Reference Freq.: 4964.965750MHz at 20°C

Temperature (Celsius)	Measured Freq (MHz)	Drift ppm
50	4964.965250	0.101
40	4964.965541	0.042
30	4964.959560	1.247
20	Ref	
10	4964.974960	-1.855
0	4964.985100	-3.897
-10	4964.954400	2.286
-20	4964.988980	-4.679
-30	4964.997710	-6.437

Table 10. Temperature Vs. Frequency Test Results

Reference: 120Vac at 20°C **Freq.** = 4964.965750MHz

Measured Voltage(dc) +/-15% of nominal	Measured Freq (MHz)	Drift (Hz)
102	4964.955635	2.037
138	4964.954953	2.175

Table 11. Frequency vs. Voltage Test Results

9. RF Exposure Requirements

RF Exposure Requirements: **§90.1217, §1.1307(b)(1) and §1.1307(b)(2):** 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: **§1.1310:** 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.

MPE Limit Calculation: EUT's operating frequencies @ 4940-4990 MHz; highest conducted power = 27.2dBm (peak) therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

EUT maximum antenna gain = 5 dBi.

Equation from page 18 of OET 65, Edition 97-01

EUT with 5dBi Antenna

$S = PG / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$

where, S = Power Density (1 mW/cm^2)
P = Power Input to antenna (524.8mW)
G = Antenna Gain (3.16 numeric)

$R = (1658.38/4*3.14)^{1/2} = (1658.3/12.56)^{1/2}$ = 11.4cm _in order to comply with 1 mW/cm^2

10. 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
1S2421	EMI RECEIVER	ROHDE&SCHWARZ	ESIB 7	2/9/2005	2/9/2007
1S2184	BILOG ANTENNA	CHASE	CBL6112A	1/3/2007	1/3/2008
1S2121	PRE-AMPLIFIER	HEWLETT PACKARD	8449B	11/28/2006	11/28/2007
1S2198	ANTENNA, HORN	EMCO	3115	8/17/2006	8/17/2007
1S2202	ANTENNA, HORN, 1 METER	EMCO	3116	3/23/2005	3/23/2007
N/A	HIGH PASS FILTER	MICRO-TRONICS	HPM13146	SEE NOTE	
1S2263	CHAMBER, 10 METER	RANTEC	N2-14	8/15/2006	8/15/2007
1S2430	WIDEBAND POWER METER	ANRITSU COMPANY	ML2488A	1/12/2006	2/12/2007
1S2432	WIDEBAND POWER SENSOR	ANRITSU COMPANY	MA2491A	1/12/2006	2/12/2007
1S2034	COUPLER, DIRECTIONAL 1-20 GHz	KRYTAR	101020020	SEE NOTE	
1S2041	COUPLER, BI DIRECTIONALCOAXIAL	NARDA	N/A	SEE NOTE	
1S2460	Analyzer, Spectrum 9 kHz-40GHz	Agilent	E4407B	07/06/2005	07/06/2008
1S2034	COUPLER, DIRECTIONAL 1-20 GHz	KRYTAR	101020020	SEE NOTE	
1S2041	COUPLER, BI DIRECTIONALCOAXIAL	NARDA	N/A	SEE NOTE	
1S2128	Harmonic Mixer	Hewlett Packard	11970A	N/A	3/10/2007
1S2129	Harmonic Mixer	Hewlett Packard	11970K	N/A	3/10/2007

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

Certification & User's Manual Information

11. Certification Label & User's Manual Information

11.1. 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.

11.2. 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

