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

March 23, 2011

Fiber-Span
3434 Rt. 22 W. Suite 140
Branchburg, New Jersey 08876

Dear David Thomson,

Enclosed is the EMC Wireless test report for compliance testing of the Fiber-Span, FS42R-IDEN-2, tested to the requirements of Title 47 of the Code of Federal Regulations (CFR), Part 15 Subpart B, Subpart B, ICES-003, Issue 4 February 2004 for a Class A Digital Device and FCC Part 90 Subpart for Land Mobile Radio Services, RSS-119, Issue 9, June 2007.

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: (\Fiber-Span\EMC30864D-FCC90 Rev. 1)

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Electromagnetic Compatibility Criteria
Test Report

For the

Fiber-Span
Model FS42R-IDEN-2

Tested under

The FCC Verification Rules
Contained in Title 47 of the CFR, Part 90
for Private Land Mobile Radio Services,
Part 15, Subpart B and RSS-119, Issue 9, June 2007 for a Class A Digital Device

MET Report: EMC30864D-FCC90 Rev. 1

March 23, 2011

Prepared For:
Fiber-Span
3434 Rt. 22 W. Suite 140
Branchburg, New Jersey 08876

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

Electromagnetic Compatibility Criteria
Test Report

For the

Fiber-Span
Model FS42R-IDEN-2

Tested under

The FCC Verification Rules
Contained in Title 47 of the CFR, Part 90
for Private Land Mobile Radio Services
Part 15, Subpart B and RSS-119, Issue 9, June 2007 for a Class A Digital Device

MET Report: EMC30864D-FCC90 Rev. 1

Dusmantha Tennakoon
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, Part 15, Subpart B of the FCC Rules and RSS-119, Issue 9, June 2007 under normal use and maintenance.

Shawn McMillen, Wireless Manager
Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	March 7, 2011	Initial Issue.
1	March 23, 2011	Revised to reflect correct EUT name and add FCC ID.

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
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
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. All tests were conducted using measurement procedure from ANSI TIA/EIA-603-A-2004 and ANSI C63.4-2003 as appropriate.

Title 47 of the CFR, Part 90	IC Reference	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; 90.205 Peak Power Output	RSS-119, Section 5.4	✓			Measured emissions below applicable limits.
2.1047(a) Modulation Characteristics	RSS-119, Section 5.2			✓	EUT is non-voice, data only.
2.1049; 90.210 Occupied Bandwidth	RSS-GEN	✓			Measured emissions below applicable limits.
2.1051; 90.210 Spurious Emissions at Antenna Terminals	RSS-119, Section 5.8	✓			Measured emissions below applicable limits.
2.1053; 90.210 Radiated Spurious Emissions	RSS-119, Section 5.8	✓			Measured emissions below applicable limits.
2.1055(a) (1); 90.213 Frequency Stability over Temperature Variations	RSS-119, Section 5.3			✓	Measured values below applicable limits.
2.1055(d) Frequency Stability over Voltage Variations	RSS-119, Section 5.3			✓	Measured values below applicable limits.
90.214 Transient Frequency Behavior	RSS-119, Section 5.9			✓	EUT does not operate in the 150-174 MHz or 421-512 MHz bands
47 CFR Part 15.107 (a) Conducted Emission Limits for a Class A Digital Device	ICES-003 Issue 4 February 2004	✓			AC Power Line Conducted Emissions for intentional radiators
47 CFR Part 15.109 (a) Radiated Emission Limits for a Class A Digital Device	ICES-003 Issue 4 February 2004	✓			Radiated Spurious Emissions for unintentional radiators
2-11-04/EAB/RF Out of Band Rejection	N/A	✓			Compliant
2-11-04/EAB/RF Filter Response	N/A	✓			Compliant

Equipment Configuration

2. Equipment Configuration

2.1. Overview

MET Laboratories, Inc. was contracted by Fiber-Span to perform testing on the FS42R-IDEN-2 under purchase order number 5861.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Fiber-Span., FS42R-IDEN-2.

An EMC evaluation to determine compliance of the MASV-800M1 with the requirements of Part 90 was conducted. (All references are to the most current version of Title 47 of the Code of Federal Regulations in effect). In accordance with §2.1033, the following data is presented in support of the Certification of the MASV-800M1. Fiber-Span. 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:	FS42R-IDEN-2				
EUT Specifications:	Primary Power Source: 120 VAC, 60 Hz				
	FCC ID: Q4VFS42R-IDEN-2				
	Type of Modulations:	QAM			
	Average Output Power	**Down Link**		**Up Link**	
		Band 1	0.218 W	Band 1	0.0001 W
		Band 2	0.257 W	Band 2	0.00003 W
	Equipment Code:	TNB			
	EUT Frequency Ranges:	**Down Link (MHz)**		**Up Link (MHz)**	
		Band 1	862.013 - 868.987	Band 1	817.013 - 823.987
		Band 2	935.013 - 940.987	Band 2	896.013 – 901.987
Analysis:	The results obtained relate only to the item(s) tested.				
Environmental Test Conditions:	Temperature (15-35º C):				
	Relative Humidity (30-60%):				
	Barometric Pressure (860-1060 mbar):				
Evaluated by:	Dusmantha Tennakoon				
Report Date(s):	March 23, 2011				

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 EUT is a 800/900 MHz iDEN module. This module is part of the RFN system. The RFN has three (3) antenna ports. The RF from the iDEN module is split between the 3 ports as follows:

1. Antenna port 1: full power
2. Antenna port 2: full power – 6 dB
3. Antenna port 3: full power

The Fiber-Span Remote Fiber Node (RFN), model FS47R consists of a chassis mainframe with up to six (6) optional plug-in service modules. Each Service Module provides dedicated support for one of the following wireless services:

- 700 MHz commercial band
- 800/900 MHz iDEN
- 850 MHz Cellular
- 1.9GHz PCS
- 2.1GHz AWS
- GHz WiFi

A seventh module (shown in the attached block diagram) will be available for future WiMAX support.
The RFN is intended for use with associated Headend equipment, including the FTU-RF, and RIS units which provide the necessary signal feed for all wireless services via optical fiber.
The RFN and associated Headend Equipment are intended to provide, via optical fiber links, a means of extending the reach of a Wireless Service Provider's BTS to areas otherwise obscured from their signal, such as subways, underground shopping areas, etc.
The output of the RFN is common to all Service Modules, and terminates in three antenna ports. Except for signal level, all signals appear at all three ports.
Operation is bi-directional in nature, and varies somewhat, depending on the requirements of the particular technology supported by the specific plug-in Service Module.

2.4. Equipment Configuration

Ref. ID	Name / Description	Model Number	Serial Number
1c	Service Module, iDEN, 800_900, 2W, SBY1	FS42R-iDEN-2	2656-05

Table 1. Equipment Configuration

2.5. Support Configuration

Ref. ID	Name / Description	Manufacturer	Model Number	Serial Number
2	FTU-RF	Fiber-Span	N/A	2656-20
3	OMU	Fiber-Span	N/A	2656-27
4	FTU-E	IMC Networks	856-1047	N/A
7	Laptop PC (w/CAN Tools S/W)	N/A	N/A	N/A
8	Router	N/A	N/A	N/A

Table 2. Support Configuration

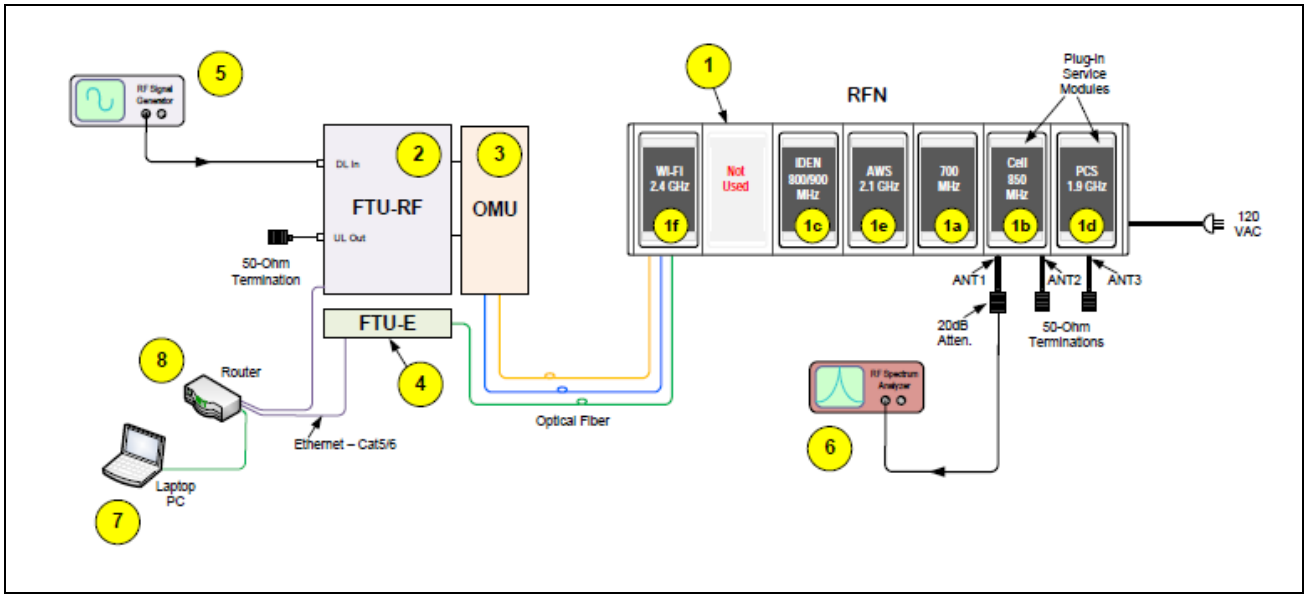


Figure 1. Block Diagram of Test Configuration

2.6. Ports and Cabling Information

Ref. ID	Port Name on EUT	Cable Description	Qty.	Length (m)	Shielded (Y/N)	Termination Point
1	ANT 1	RF Coaxial cable	1	1	Y	6
1	ANT 2	50-Ohm Termination	1	N/A	Y	N/A
1	ANT 3	50-Ohm Termination	1	N/A	Y	N/A

Table 3. Ports and Cabling Information

2.7. Method of Monitoring EUT Operation

RFN is normally connected to the associated Headend Equipment – the FTU-RF and RIS units, via optical fiber.

Each optional wireless service supported operates independently, and may be removed without affecting the others installed in the mainframe option chassis.

The RFN receives an RF input signal in the downlink direction from an associated BTS (normally supplied by Wireless Service Provider). This connection is made via coaxial cable and connector at the RIS unit.

2.9 Modifications

2.9.1 Modifications to EUT

No modifications were made to the EUT.

2.9.2 Modifications to Test Standard

No modifications were made to the test standard.

2.10 Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Fiber-Span 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 shielded 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. Multiple scans were performed with various loading. 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 compliant with the Class A requirement(s) of this section.

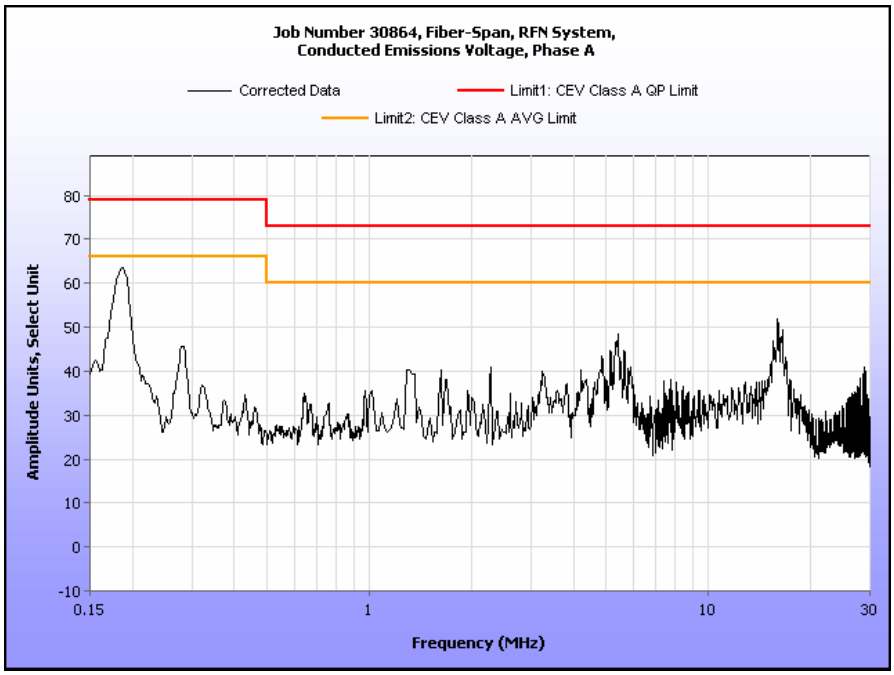
Test Engineer(s): Jeffrey Pratt

Test Date(s): 02/24/11

Conducted Emissions - Voltage, AC Power

Frequency (MHz)	Uncorrected Meter Reading (dBuV) QP	Cable Loss (dB)	Corrected Measurement (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBuV) Avg.	Cable Loss (dB)	Corrected Measurement (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
0.325	39.04	0	39.04	79	-39.96	35.08	0	35.08	66	-30.92
1.27	22.37	0	22.37	73	-50.63	19.83	0	19.83	60	-40.17
5.22	34.17	0.06	34.23	73	-38.77	29.51	0.06	29.57	60	-30.43
7.91	20.7	0	20.7	73	-52.3	13.56	0	13.56	60	-46.44
15.86	31.51	0	31.51	73	-41.49	18.16	0	18.16	60	-41.84
16.41	42.43	0	42.43	73	-30.57	39.17	0	39.17	60	-20.83

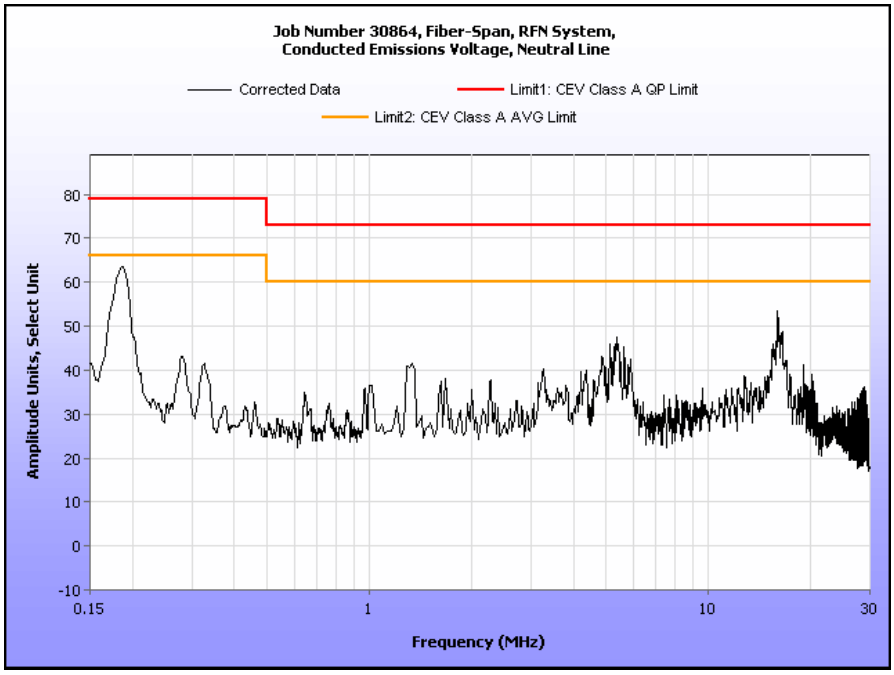
Table 5. Conducted Emissions - Voltage, AC Power, Phase Line, 120 VAC, 60 Hz



Plot 1. Conducted Emissions, Phase Line

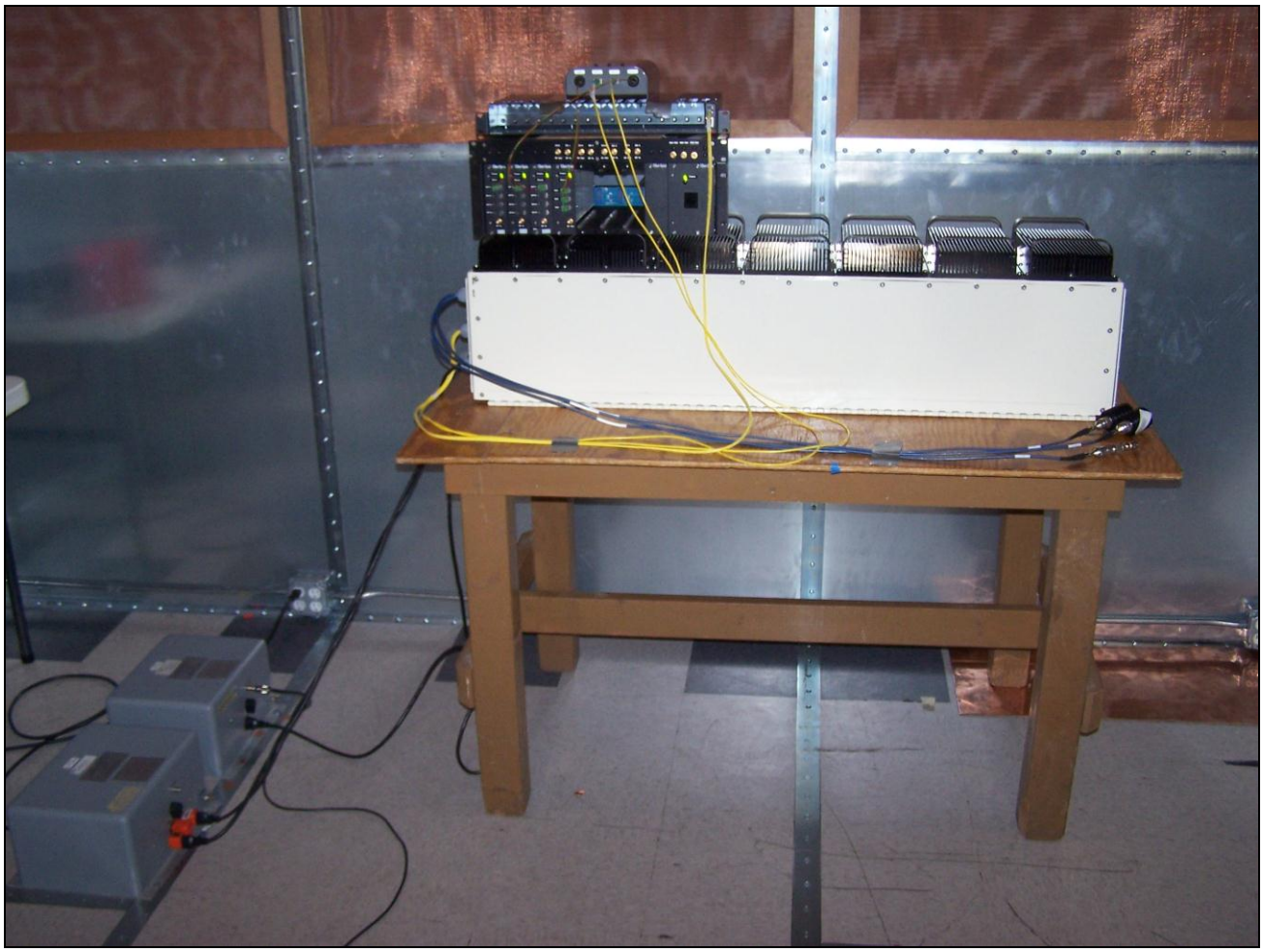
Frequency (MHz)	Uncorrected Meter Reading (dBuV) QP	Cable Loss (dB)	Corrected Measurement (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBuV) Avg.	Cable Loss (dB)	Corrected Measurement (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
0.323	40.94	0	40.94	79	-38.06	38.59	0	38.59	66	-27.41
1.32	35.36	0	35.36	73	-37.64	32.94	0	32.94	60	-27.06
4.8	26.64	0.05	26.69	73	-46.31	20.34	0.05	20.39	60	-39.61
5.1	33.75	0.06	33.81	73	-39.19	22.88	0.06	22.94	60	-37.06
16.38	37.59	0	37.59	73	-35.41	23.8	0	23.8	60	-36.2
16.79	34.54	0	34.54	73	-38.46	21.49	0	21.49	60	-38.51

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



Plot 2. Conducted Emissions, Neutral Line

Conducted Emission Limits Test Setup



Photograph 1. 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 A 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 non-conductive table inside a semi-anechoic chamber. The method of testing and test conditions of ANSI C63.4 were used. An antenna was located 3 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.

Scans were performed with the transmitters turned off. After this, scans were performed turning one transmitter on at a time. These scans were used to perform final emissions on frequencies of interest.

Test Results: The EUT was compliant with the Class A requirement(s) of this section.

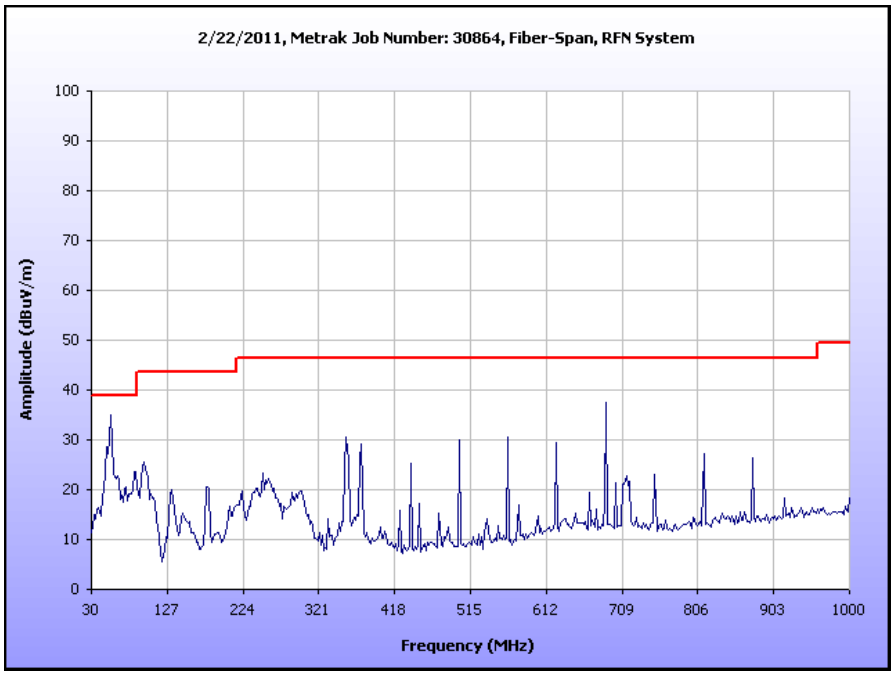
Test Engineer(s): Dusmantha Tennakoon

Test Date(s): 02/22/11

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) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
55.713928	22	H	3.86	25.21	7.46	0.23	10.46	22.44	39.00	-16.56
55.713928	308	V	1.00	31.60	7.46	0.23	10.46	28.83	39.00	-10.17
687.51653	136	H	1.00	25.92	20.50	1.50	10.46	37.46	46.40	-8.94
687.51653	329	V	1.00	22.62	20.50	1.50	10.46	34.16	46.40	-12.24
356.37575	189	H	1.00	27.13	15.33	0.83	10.46	32.83	46.40	-13.57
356.37575	331	V	1.00	25.69	15.33	0.83	10.46	31.39	46.40	-15.01
562.51353	125	H	1.16	21.96	18.80	1.09	10.46	31.39	46.40	-15.01
562.51353	134	V	1.00	21.60	18.80	1.09	10.46	31.03	46.40	-15.37
97.96994	121	H	1.95	22.66	9.79	0.23	10.46	22.22	43.50	-21.28
97.96994	360	V	1.00	25.50	9.79	0.23	10.46	25.06	43.50	-18.44
499.98747	248	H	1.00	19.41	18.00	1.00	10.46	27.95	46.40	-18.45
499.98747	124	V	1.00	23.92	18.00	1.00	10.46	32.46	46.40	-13.94

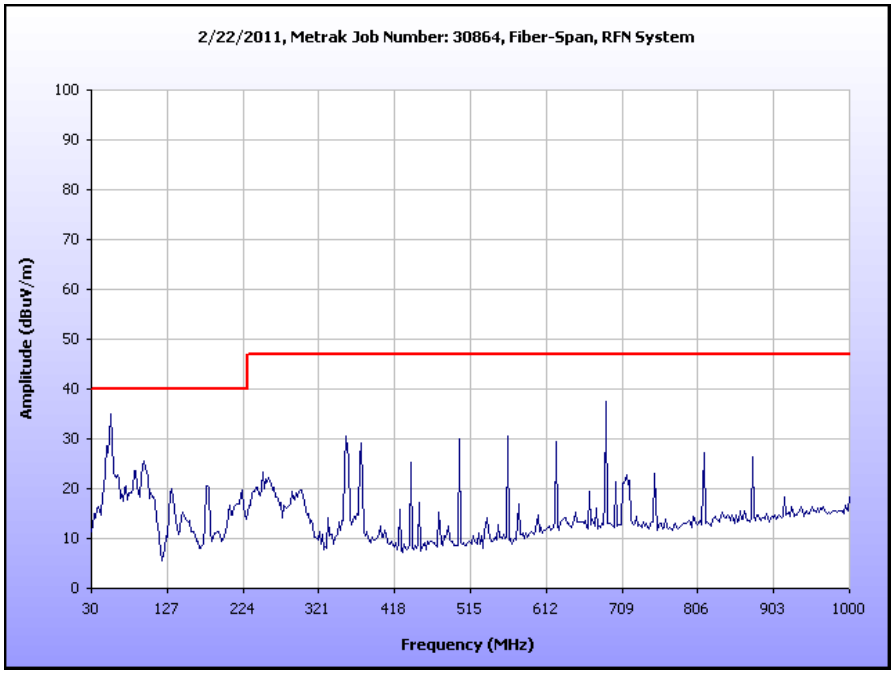
Table 8. Radiated Emissions Limits, Test Results, FCC Limits



Plot 3. Radiated Emissions, Pre-Scan, FCC Limits

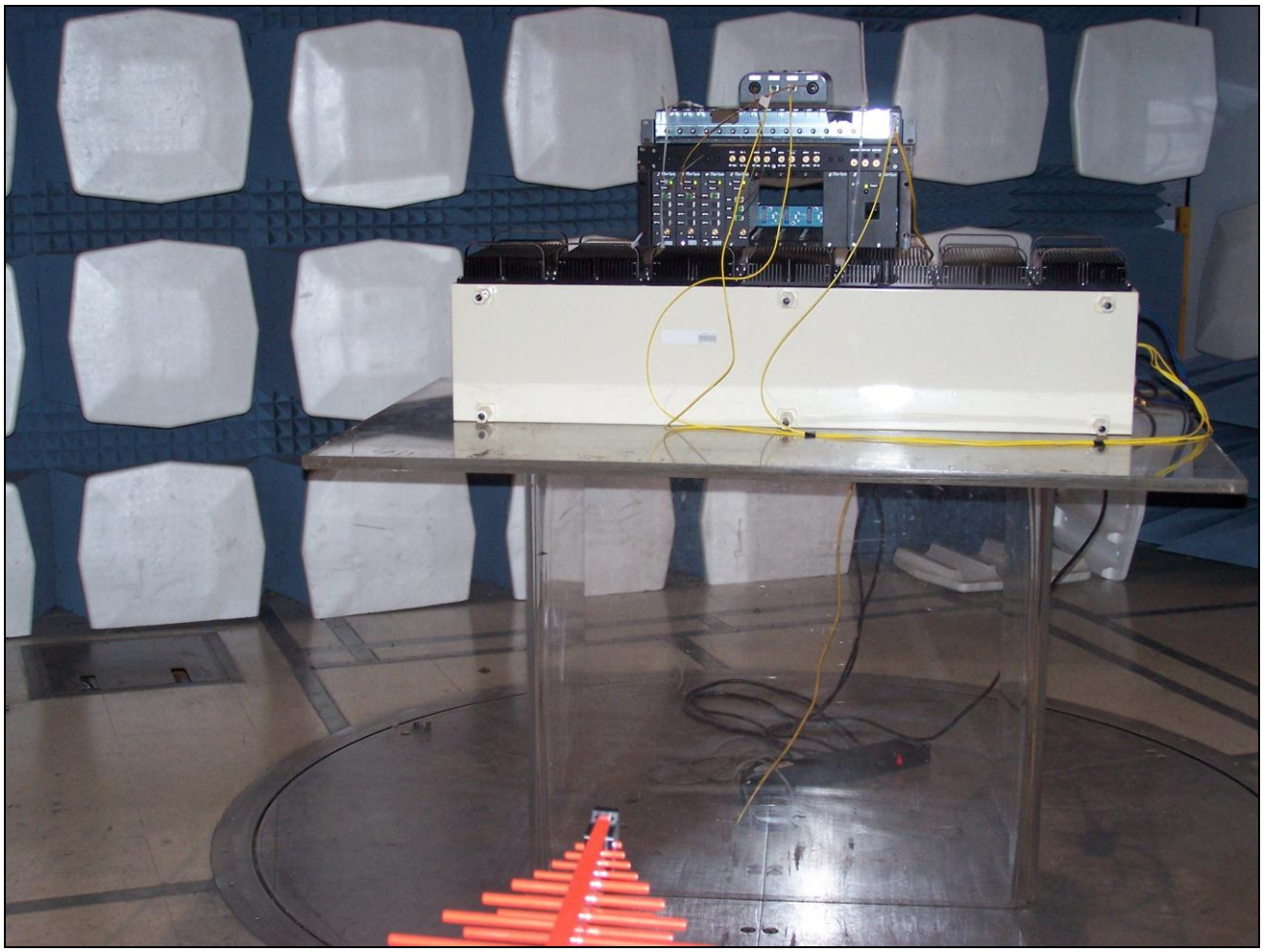
Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna HEIGHT (m)	Uncorrected Amplitude (dBuV)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
55.713928	22	H	3.86	25.21	7.46	0.23	10.46	22.44	40.00	-17.56
55.713928	308	V	1.00	31.60	7.46	0.23	10.46	28.83	40.00	-11.17
687.51653	136	H	1.00	25.92	20.50	1.50	10.46	37.46	47.00	-9.54
687.51653	329	V	1.00	22.62	20.50	1.50	10.46	34.16	47.00	-12.84
356.37575	189	H	1.00	27.13	15.33	0.83	10.46	32.83	47.00	-14.17
356.37575	331	V	1.00	25.69	15.33	0.83	10.46	31.39	47.00	-15.61
562.51353	125	H	1.16	21.96	18.80	1.09	10.46	31.39	47.00	-15.61
562.51353	134	V	1.00	21.60	18.80	1.09	10.46	31.03	47.00	-15.97
97.96994	121	H	1.95	22.66	9.79	0.23	10.46	22.22	40.00	-17.78
97.96994	360	V	1.00	25.50	9.79	0.23	10.46	25.06	40.00	-14.94
499.98747	248	H	1.00	19.41	18.00	1.00	10.46	27.95	47.00	-19.05
499.98747	124	V	1.00	23.92	18.00	1.00	10.46	32.46	47.00	-14.54

Table 9. Radiated Emissions Limits, Test Results, ICES-003 Limits



Plot 4. Radiated Emissions, Pre-Scan, ICES-003 Limits

Radiated Emission Limits Test Setup



Photograph 2. Radiated Emission Limits, Test Setup

IV. Electromagnetic Compatibility Criteria for Intentional Radiators

4. Electromagnetic Compatibility RF Power Output Requirements

4.1. RF Power Output

Test Requirement(s): **§2.1046 and §90.215**

Test Procedures: As required by 47 CFR 2.1046, *RF power output measurements* were made at the RF output terminals of the EUT.

A laptop was connected to EUT to control the RF power output, modulation, and frequency channel. The EUT was connected through an attenuator to a Spectrum Analyzer capable of making power measurements. 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 90.215. Power was measured on port 1 and then the combined power on all 3 ports was calculated. The plots below show the power on port 1.

Test Engineer(s): Dusmantha Tennakoon

Test Date(s): 02/18/11

Band	Link	Modulation	Frequency (MHz)	Power In (dBm)	Avg. Power Out-Port 1 (dBm)	Peak Power Out- Port 1(dBm)	Summed Avg. Power- Port 1+2+3 (dBm)	Gain (dB)
800 MHz	DL	16QAM	862.013	-17	19.87	25.19	23.39	36.9
			865.000	-17	19.86	25.46	23.38	36.9
			868.987	-17	19.55	24.60	23.07	36.6
	UL	16QAM	817.013	-37	-13.01	-7.80	-9.49	24.0
			820.000	-37	-14.09	-8.94	-10.57	22.9
			823.999	-37	-14.91	-9.97	-11.39	22.1
900 MHz	DL	16QAM	935.013	-11	19.87	27.10	23.39	30.9
			938.000	-11	20.58	27.32	24.10	31.6
			940.987	-11	20.13	26.99	23.65	31.1
	UL	16QAM	896.013	-37	-19.62	-12.92	-16.10	17.4
			899.000	-37	-18.55	-12.46	-15.03	18.5
			901.987	-37	-21.17	-15.39	-17.65	15.8

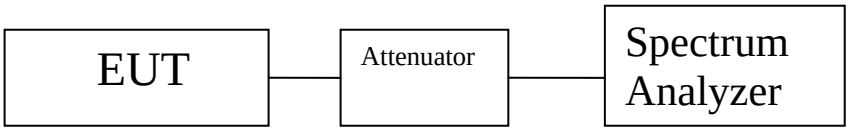
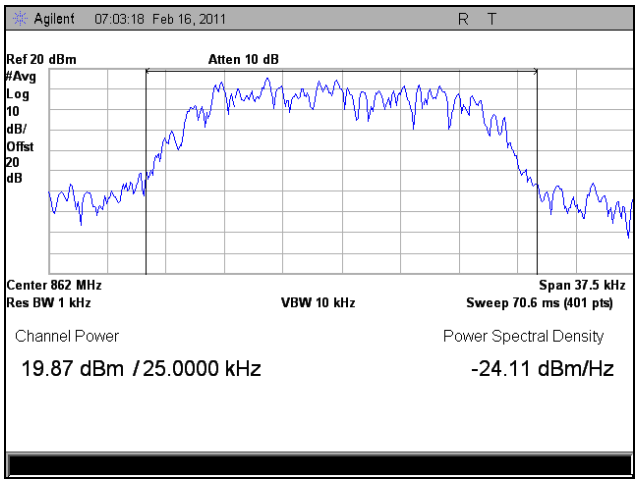
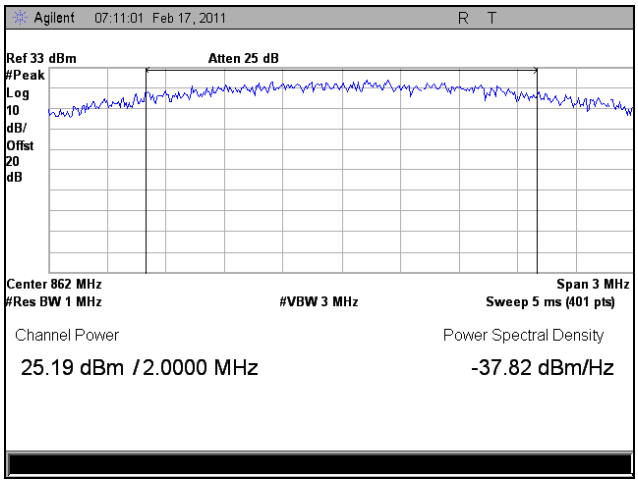


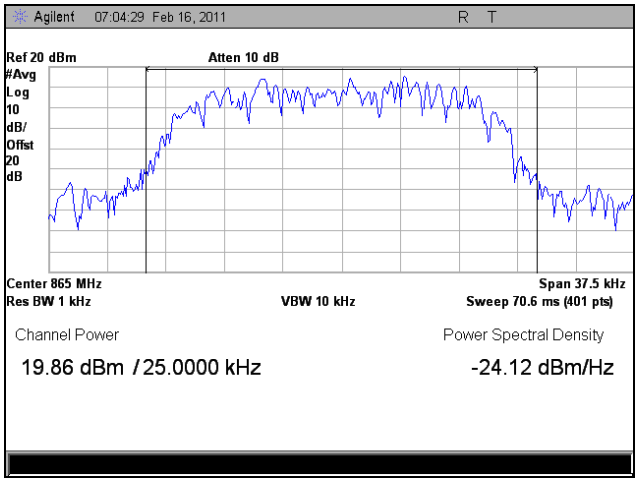
Figure 2. RF Power Output Test Setup



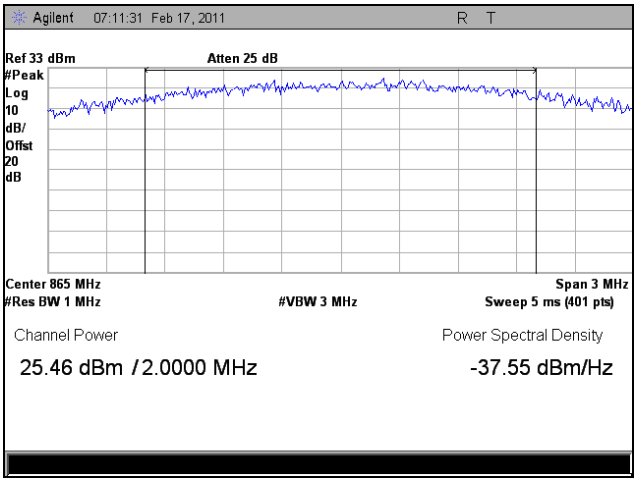
Plot 5. 862.013 MHz, RF Power Output, Downlink, 800 MHz, Average



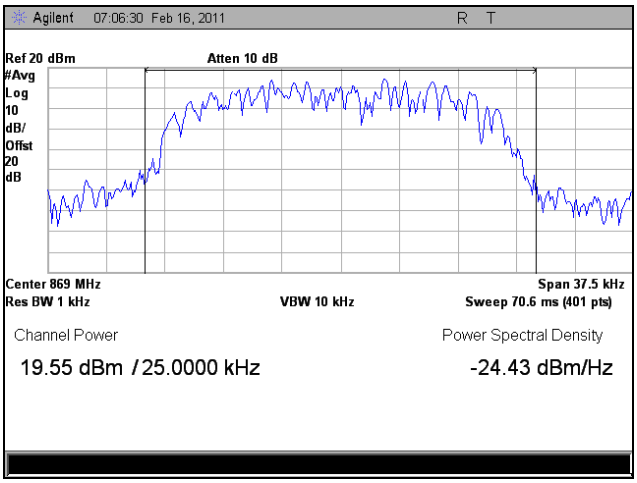
Plot 6. 862.013 MHz, RF Power Output, Downlink, 800 MHz, Peak



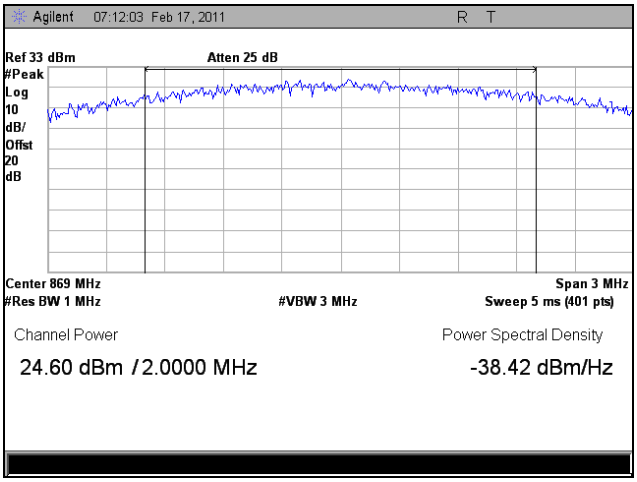
Plot 7. 865 MHz, RF Power Output, Downlink, 800 MHz, Average



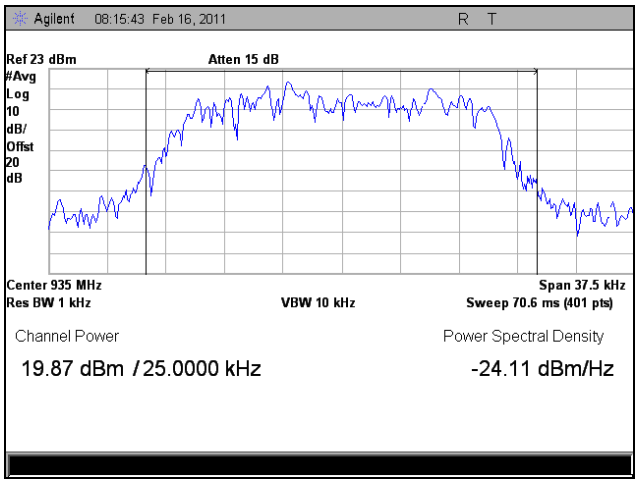
Plot 8. 865 MHz, RF Power Output, Downlink, 800 MHz, Peak



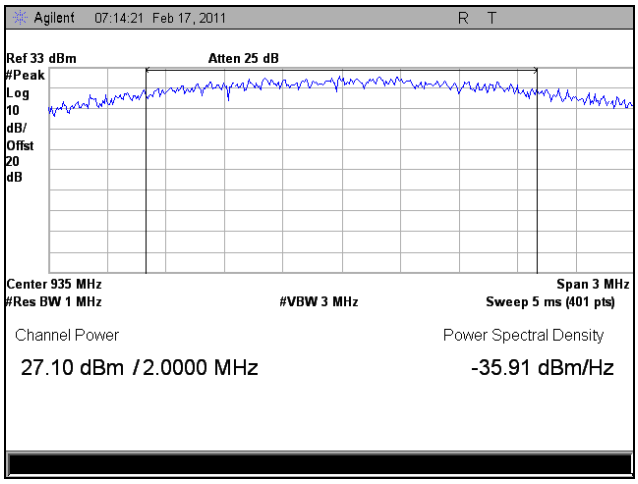
Plot 9. 868.987 MHz, RF Power Output, Downlink, 800 MHz, Average



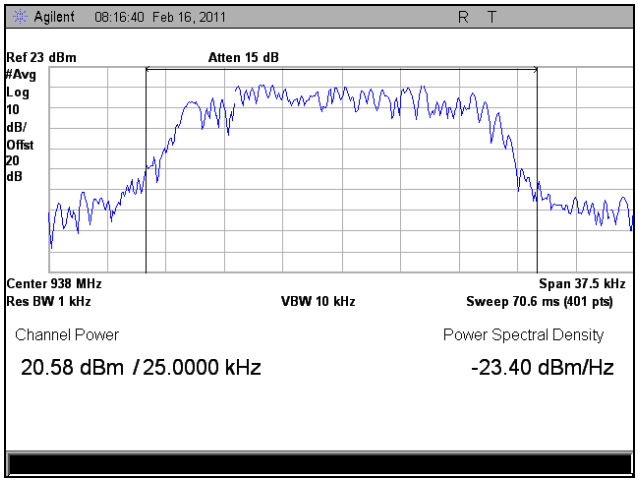
Plot 10. 868.987 MHz, RF Power Output, Downlink, 800 MHz, Peak



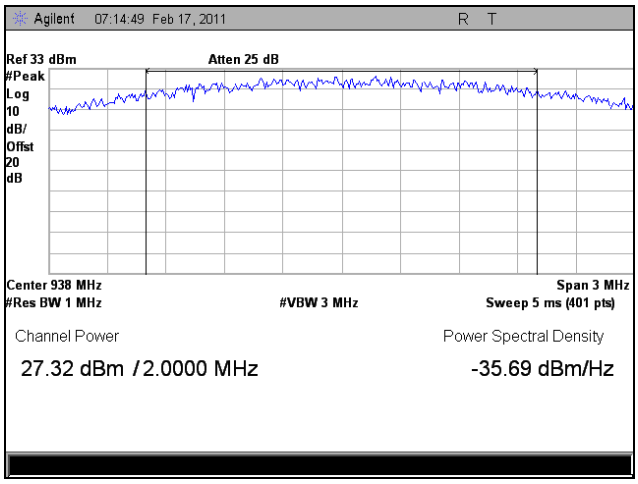
Plot 11. 935.013 MHz, RF Power Output, Downlink, 900 MHz, Average



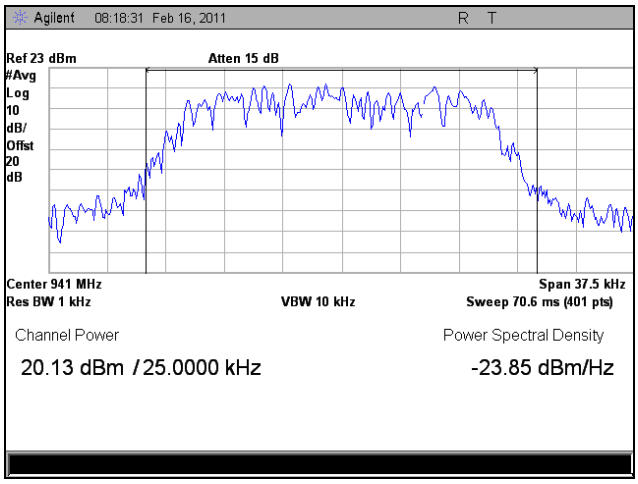
Plot 12. 935.013 MHz, RF Power Output, Downlink, 900 MHz, Peak



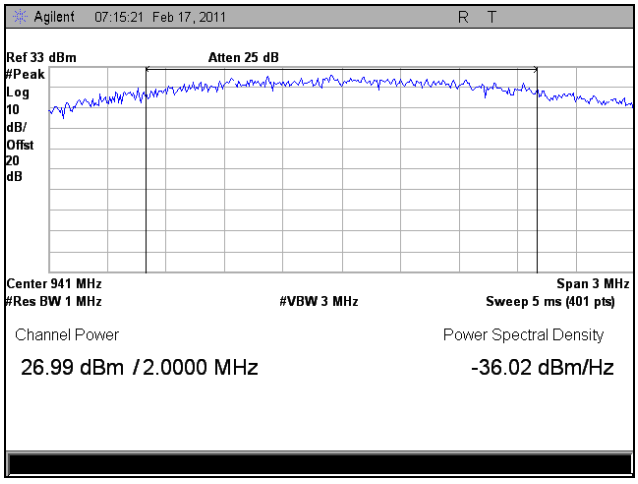
Plot 13. 938 MHz, RF Power Output, Downlink, 900 MHz, Average



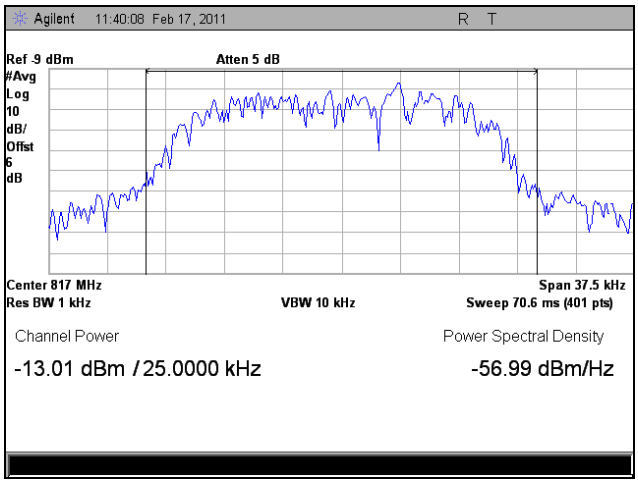
Plot 14. 938 MHz, RF Power Output, Downlink, 900 MHz, Peak



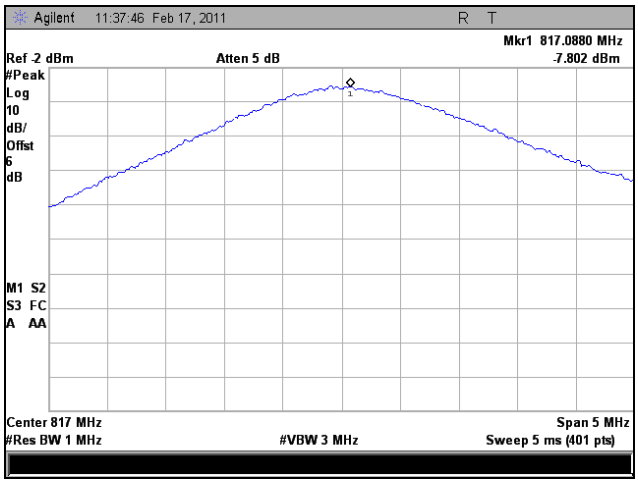
Plot 15. 940.987 MHz, RF Power Output, Downlink, 900 MHz, Average



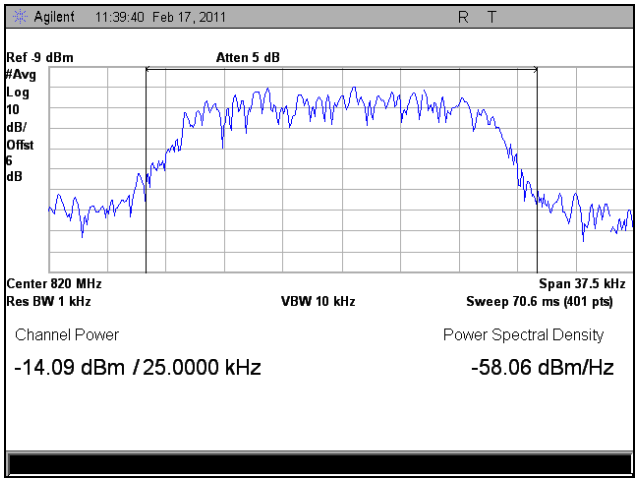
Plot 16. 940.987 MHz, RF Power Output, Downlink, 900 MHz, Peak



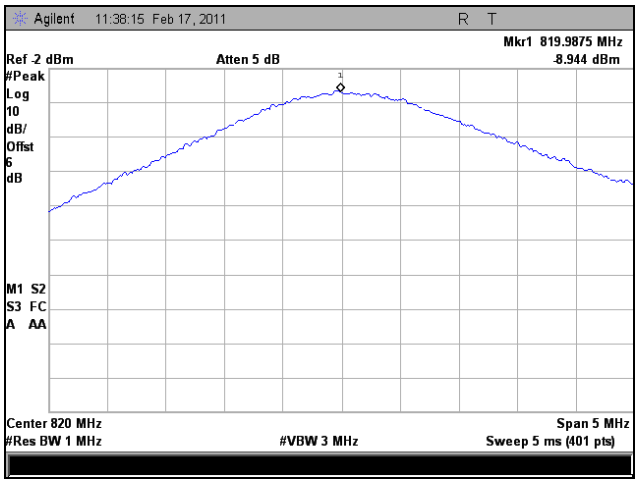
Plot 17. 817.013 MHz, RF Power Output, Uplink, Band 1, 800 MHz, Average



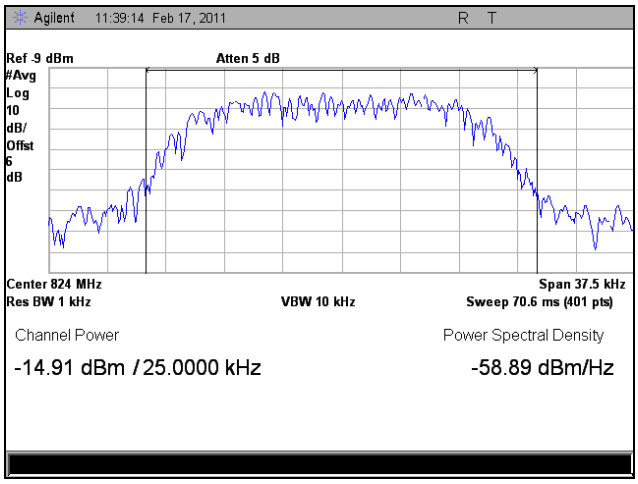
Plot 18. 817.013 MHz, RF Power Output, Uplink, Band 1, 800 MHz, Peak



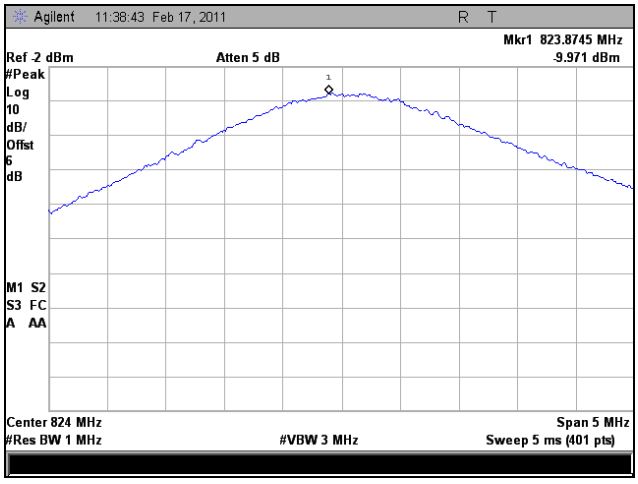
Plot 19. 820 MHz, RF Power Output, Uplink, Band 1, 800 MHz, Average



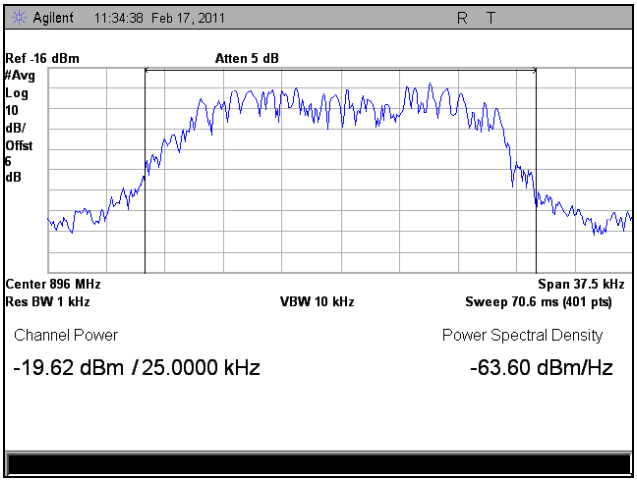
Plot 20. 820 MHz, RF Power Output, Uplink, Band 1, 800 MHz, Peak



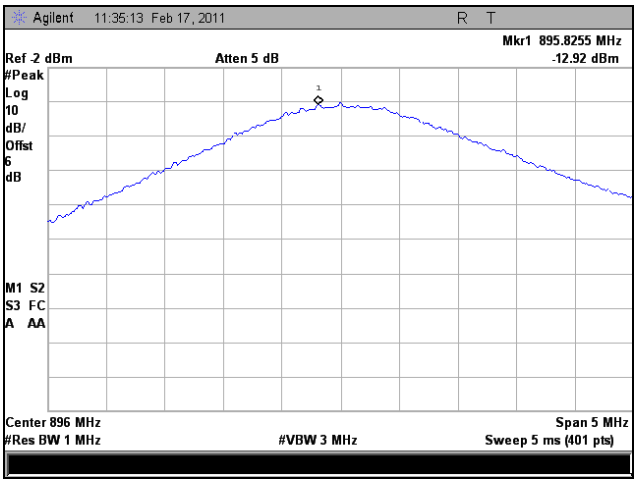
Plot 21. 823.987 MHz, RF Power Output, Uplink, Band 1, 800 MHz, Average



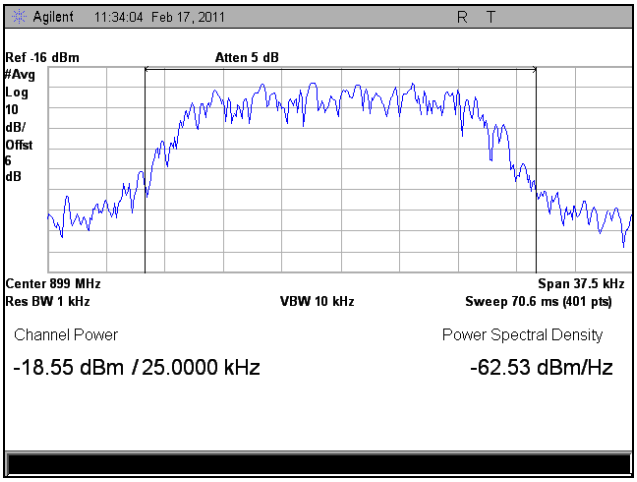
Plot 22. 823.987 MHz, RF Power Output, Uplink, Band 1, 800 MHz, Peak



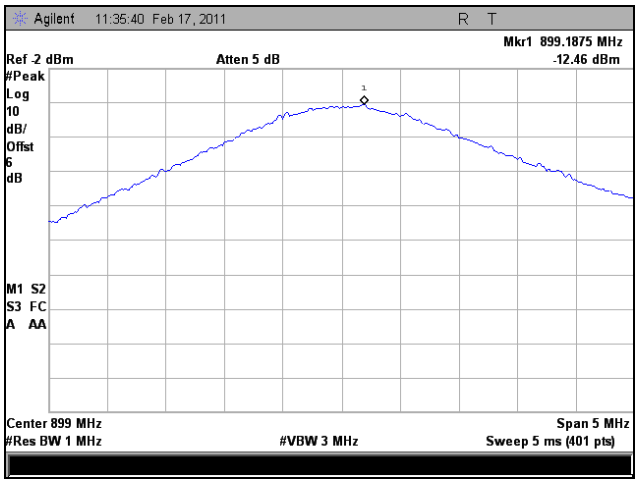
Plot 23. 896.013 MHz, RF Power Output, Uplink, Band 2, 900 MHz, Average



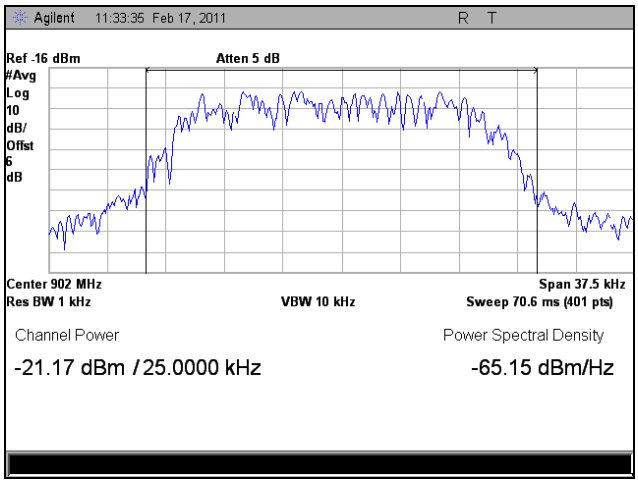
Plot 24. 896.013 MHz, RF Power Output, Uplink, Band 2, 900 MHz, Peak



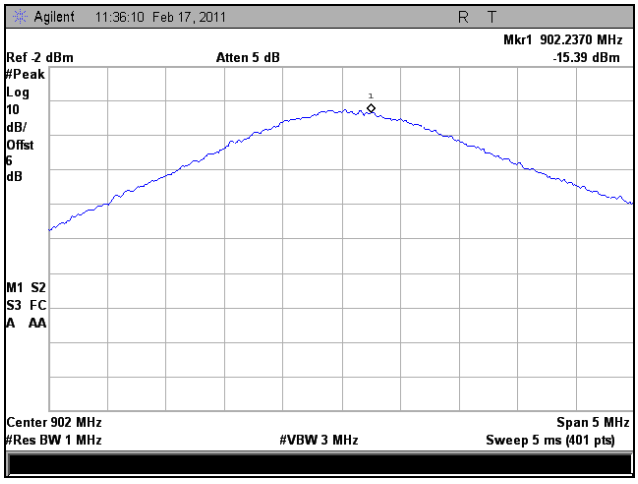
Plot 25. 899 MHz, RF Power Output, Uplink, Band 2, 900 MHz, Average



Plot 26. 899 MHz, RF Power Output, Uplink, Band 2, 900 MHz, Peak



Plot 27. 901.987 MHz, RF Power Output, Uplink, Band 2, 900 MHz, Average



Plot 28. 901.987 MHz, RF Power Output, Uplink, Band 2, 900 MHz, Peak

Photograph 3. RF Power Output, Test Setup

5. Electromagnetic Compatibility Occupied Bandwidth Requirements

5.1. Occupied Bandwidth

Test Requirement(s): **§2.1049**

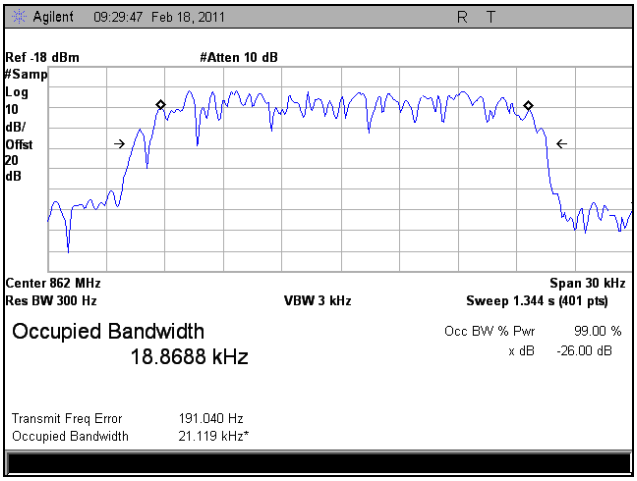
Test Procedures: As required by 47 CFR 2.1049, *occupied bandwidth measurements* were made at the RF output terminals of the EUT.

The modulation characteristics of signal generators carrier was measured first at a maximum RF level prescribed by the OEM. The signal generator was then connected to either the Uplink or Downlink input at the appropriate RF level. The resulting modulated signal through the EUT was measured and compared against the original signal.

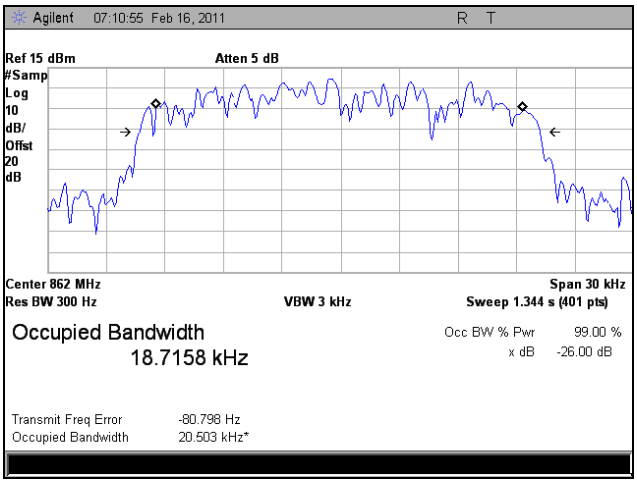
Test Results: Equipment complies with Section 2.1049.

Test Engineer(s): Dusmantha Tennakoon

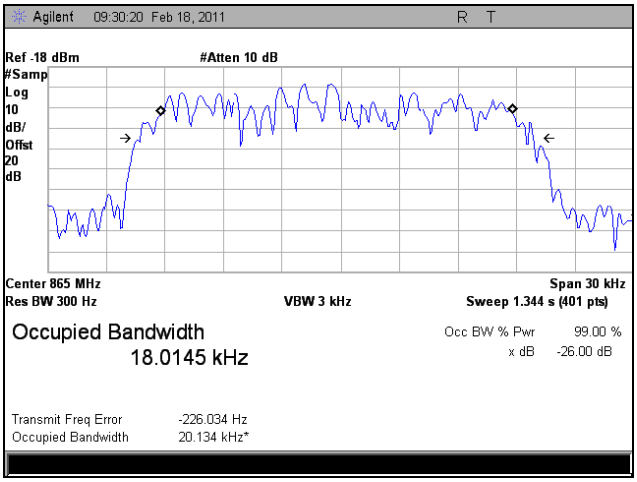
Test Date(s): 02/22/11



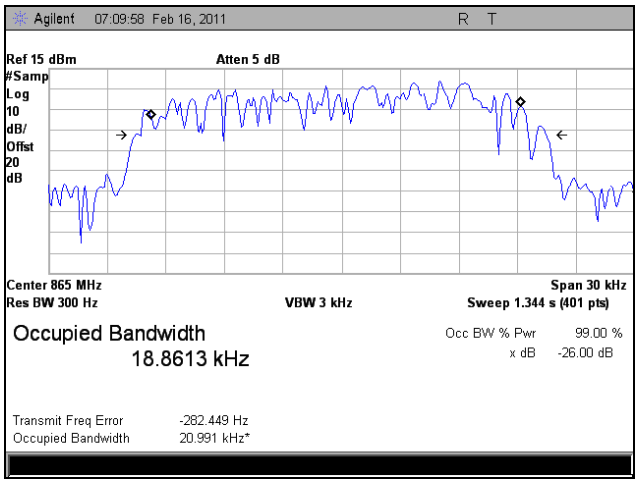
Plot 29. 862.013 MHz, Occupied Bandwidth, Downlink, 800 MHz, In



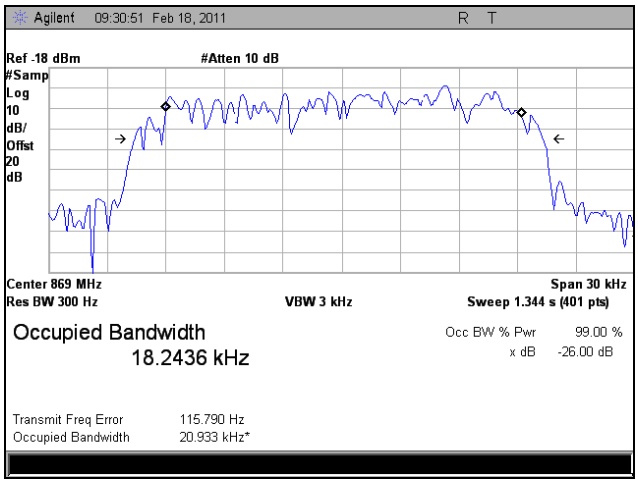
Plot 30. 862.013 MHz, Occupied Bandwidth, Downlink, 800 MHz, Out



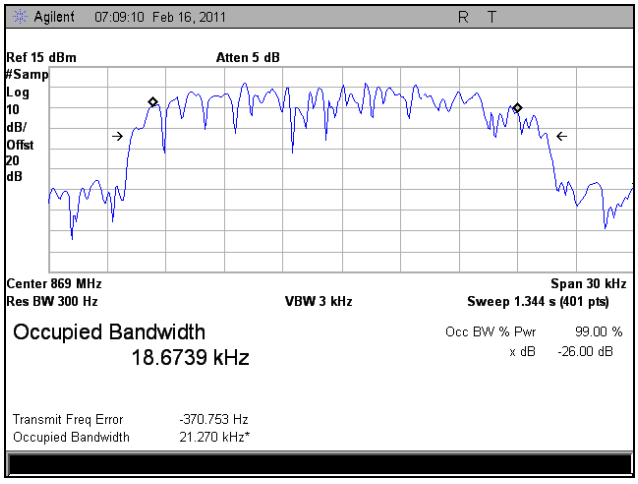
Plot 31. 865 MHz, Occupied Bandwidth, Downlink, 800 MHz, In



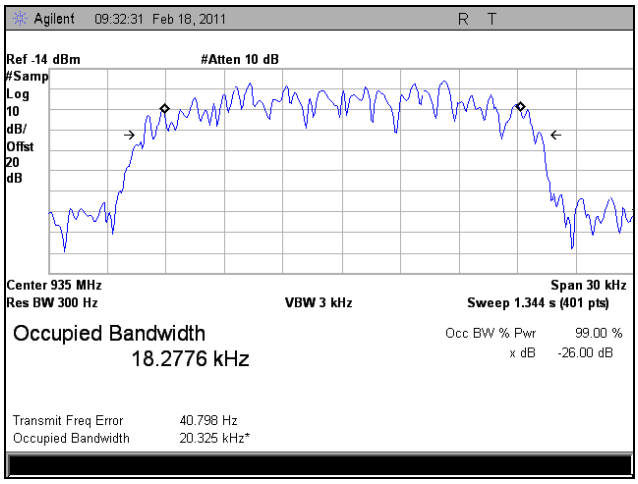
Plot 32. 865 MHz, Occupied Bandwidth, Downlink, 800 MHz, Out



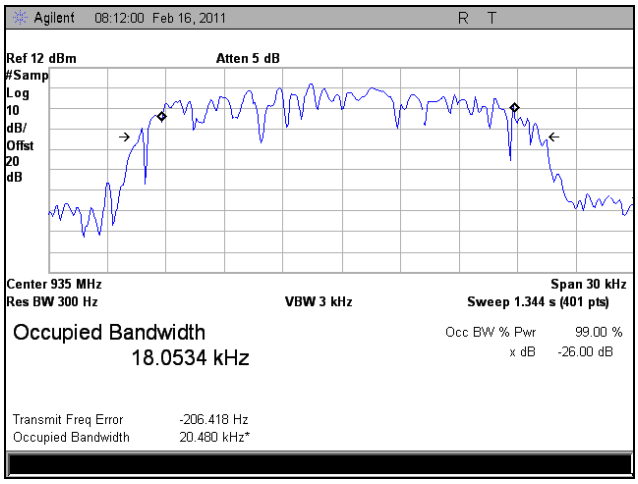
Plot 33. 868.987 MHz, Occupied Bandwidth, Downlink, 800 MHz, In



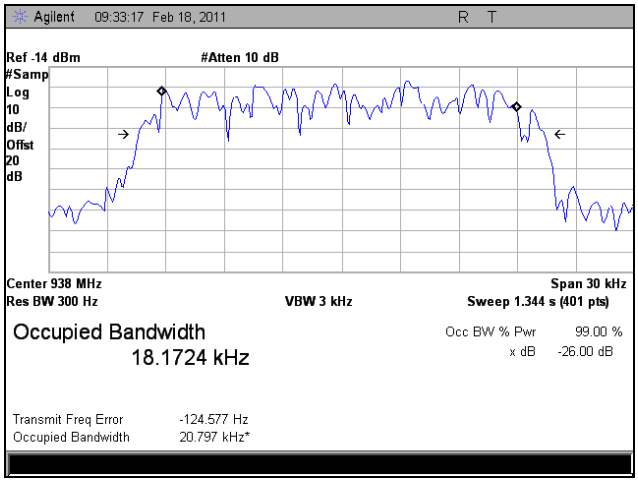
Plot 34. 868.987 MHz, Occupied Bandwidth, Downlink, 800 MHz, Out



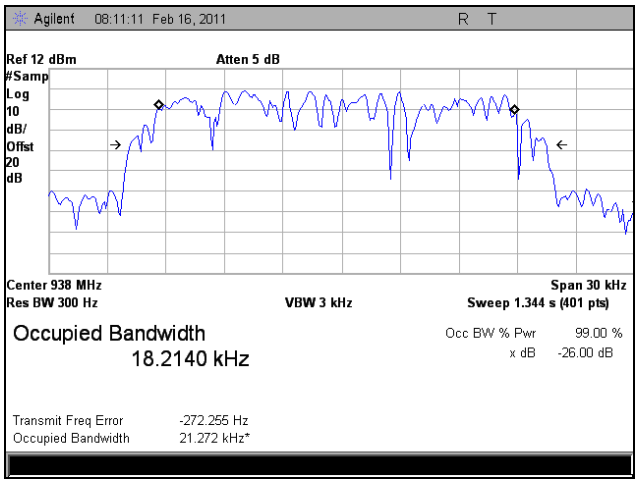
Plot 35. 935.013 MHz, Occupied Bandwidth, Downlink, 900 MHz, In



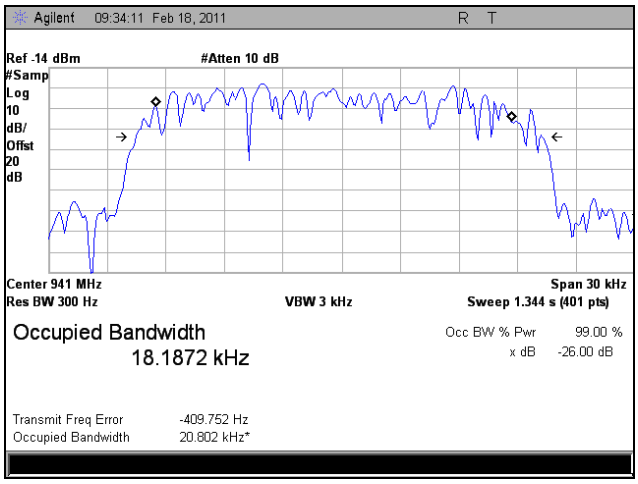
Plot 36. 935.013 MHz, Occupied Bandwidth, Downlink, 900 MHz, Out



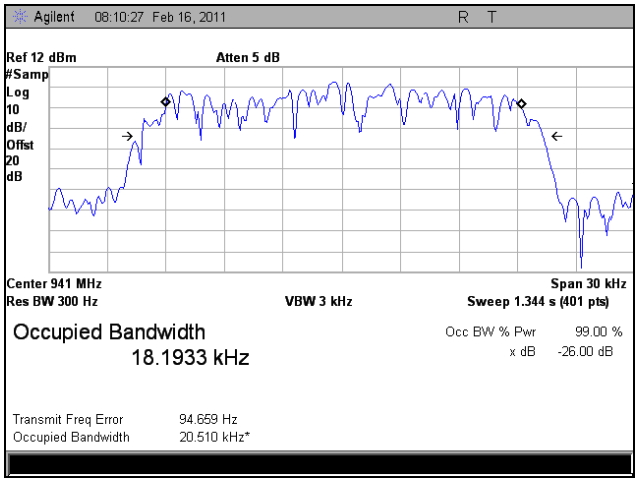
Plot 37. 938 MHz, Occupied Bandwidth, Downlink, 900 MHz, In



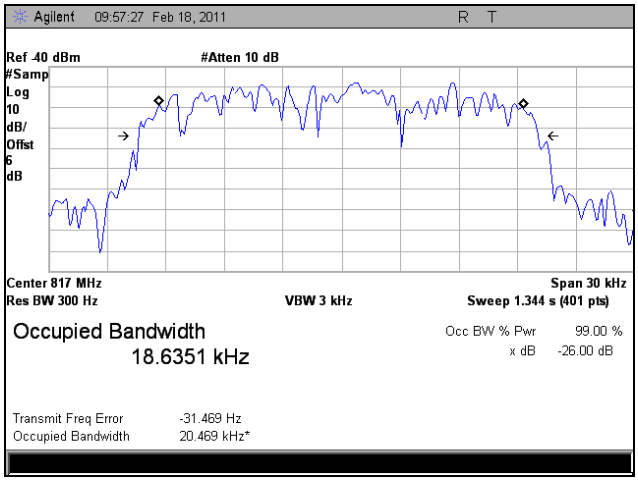
Plot 38. 938 MHz, Occupied Bandwidth, Downlink, 900 MHz, Out



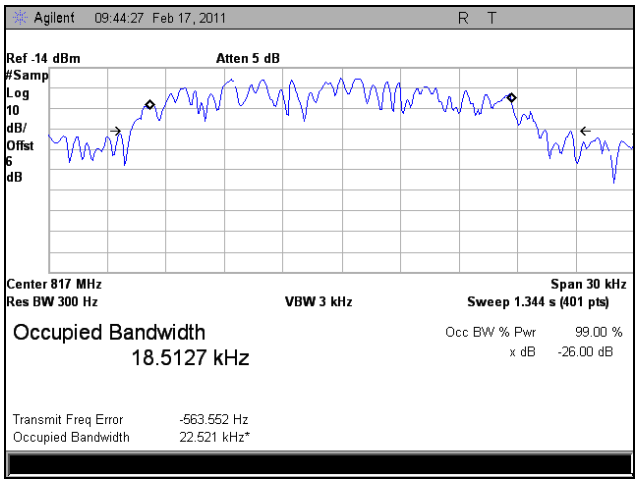
Plot 39. 940.987 MHz, Occupied Bandwidth, Downlink, 900 MHz, In



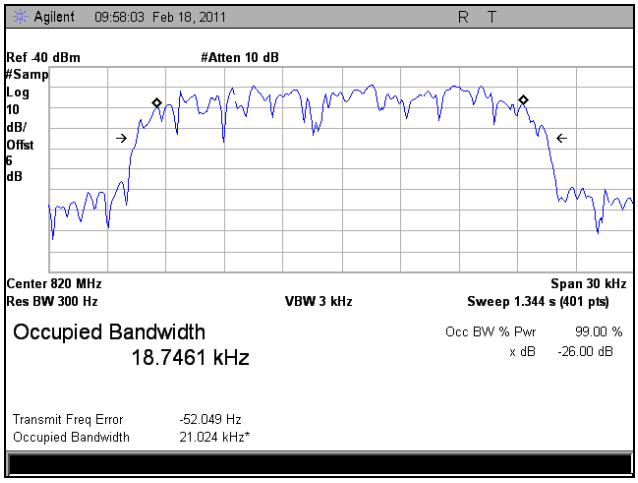
Plot 40. 940.987 MHz, Occupied Bandwidth, Downlink, 900 MHz, Out



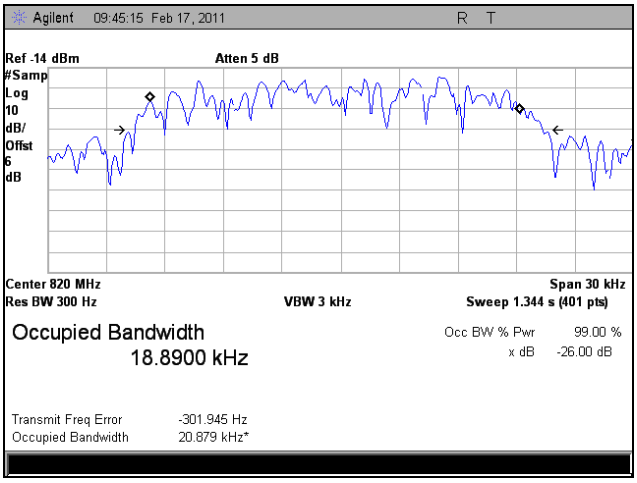
Plot 41. 817.013 MHz, Occupied Bandwidth, Uplink, Band 1, 800 MHz, In



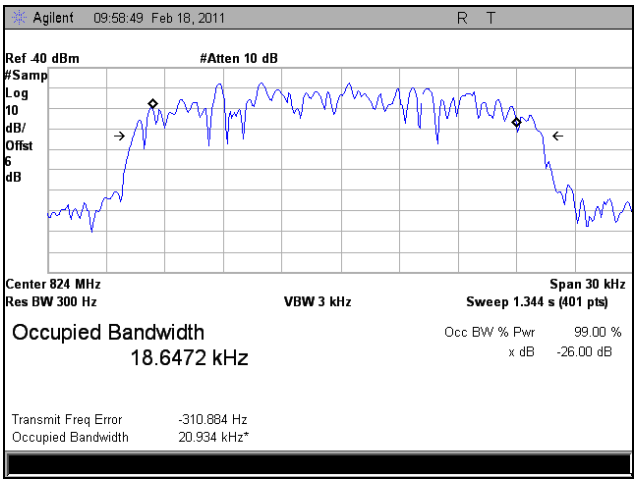
Plot 42. 817.013 MHz, Occupied Bandwidth, Uplink, Band 1, 800 MHz, Out



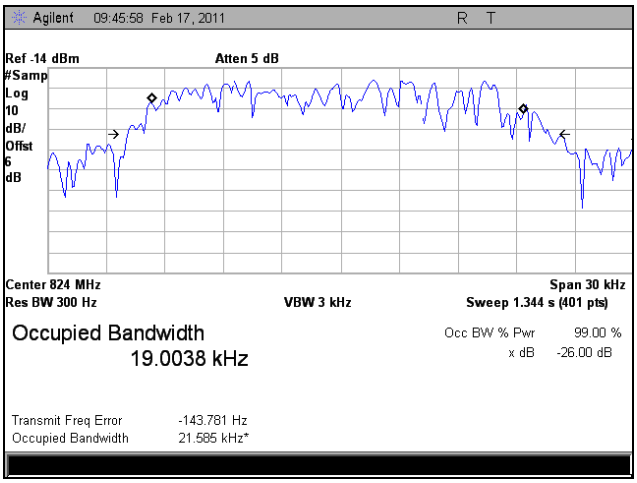
Plot 43. 820 MHz, Occupied Bandwidth, Uplink, Band 1, 800 MHz, In



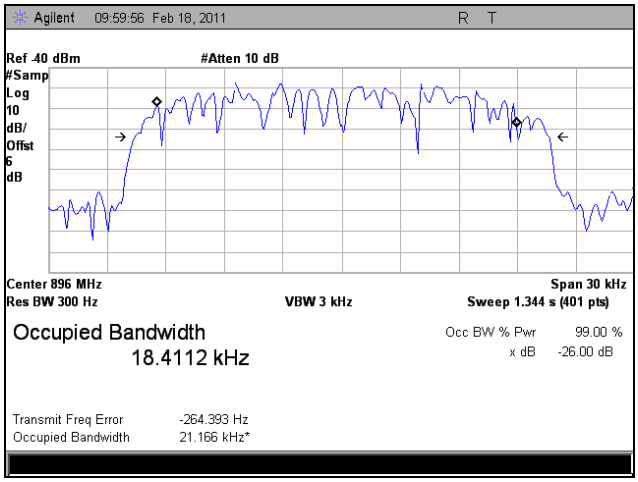
Plot 44. 820 MHz, Occupied Bandwidth, Uplink, Band 1, 800 MHz, Out



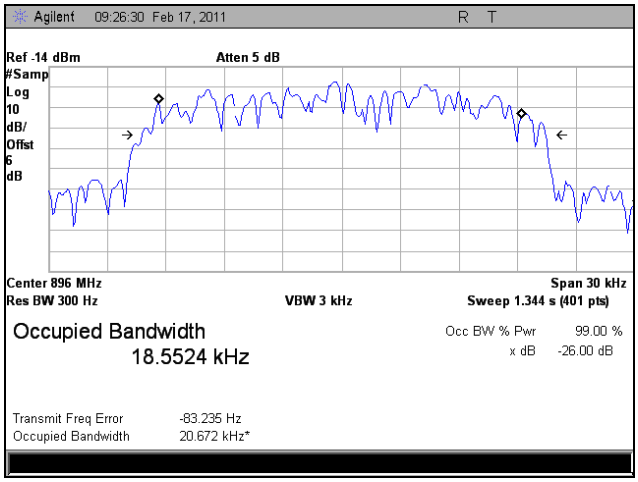
Plot 45. 823.987 MHz, Occupied Bandwidth, Uplink, Band 1, 800 MHz, In



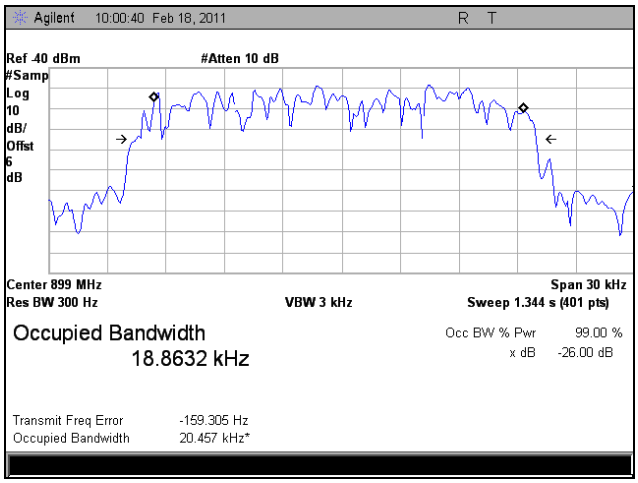
Plot 46. 823.987 MHz, Occupied Bandwidth, Uplink, Band 1, 800 MHz, Out



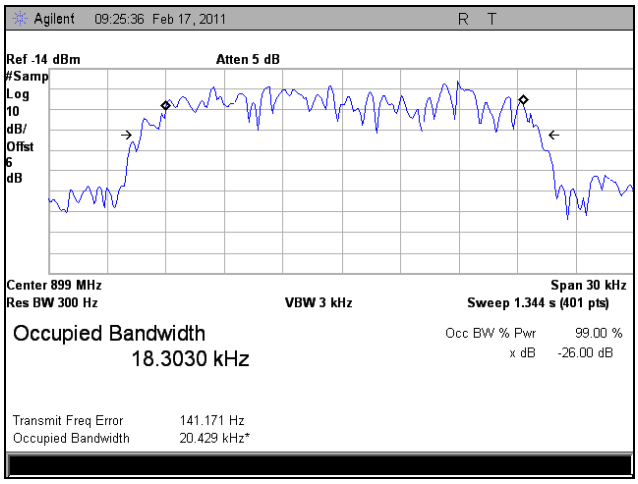
Plot 47. 896.013 MHz, Occupied Bandwidth, Uplink, Band 2, 900 MHz, In



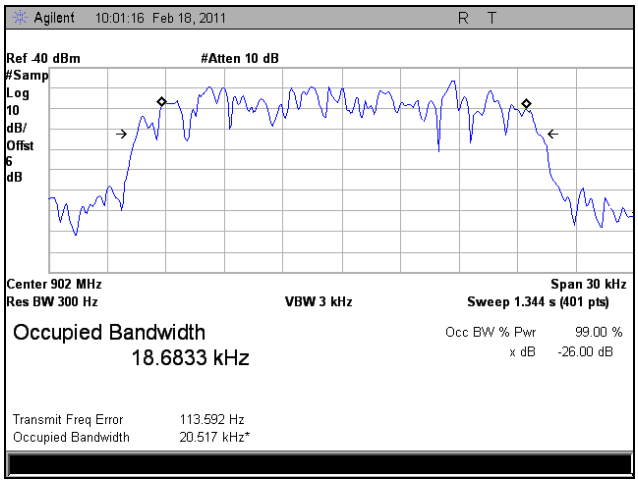
Plot 48. 896.013 MHz, Occupied Bandwidth, Uplink, Band 2, 900 MHz, Out



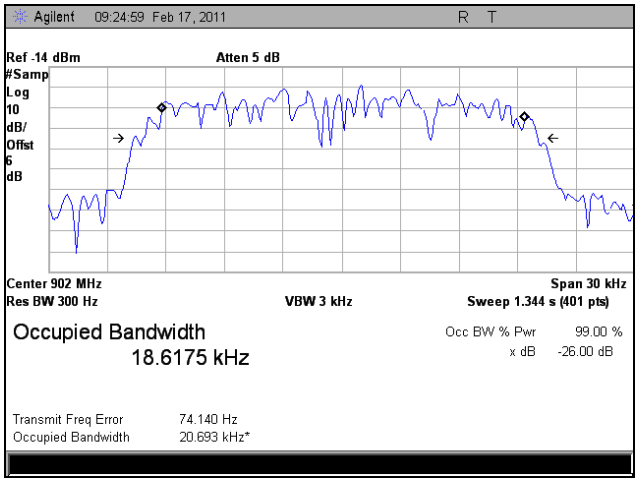
Plot 49. 899 MHz, Occupied Bandwidth, Uplink, Band 2, 900 MHz, In



Plot 50. 899 MHz, Occupied Bandwidth, Uplink, Band 2, 900 MHz, Out



Plot 51. 901.987 MHz, Occupied Bandwidth, Uplink, Band 2, 900 MHz, In



Plot 52. 901.987 MHz, Occupied Bandwidth, Uplink, Band 2, 900 MHz, Out

Photograph 4. Occupied Bandwidth, Test Setup

6. Electromagnetic Compatibility Spurious Emissions at Antenna Terminal Requirements

6.1. Spurious Emissions at Antenna Terminals

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

Test Procedures: As required by 47 CFR 2.1051, *spurious emissions at antenna terminal measurements* were made at the RF output terminals of the EUT.
The emissions outside of the band shall be attenuated below the transmitter power (P) by at least 43 + 10log(P) dB

A laptop was connected to EUT to control the RF power output, modulation, and frequency channel. The EUT was connected through an attenuator to a Spectrum Analyzer. 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.

Test Results: Equipment complies with Section 2.1051 and 90.210.

Test Engineer(s): Dusmantha Tennakoon

Test Date(s): 02/22/11

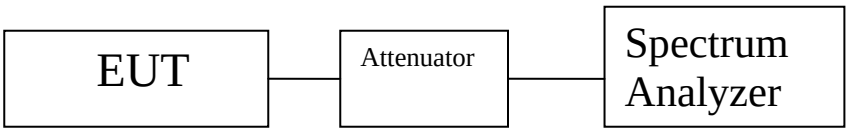
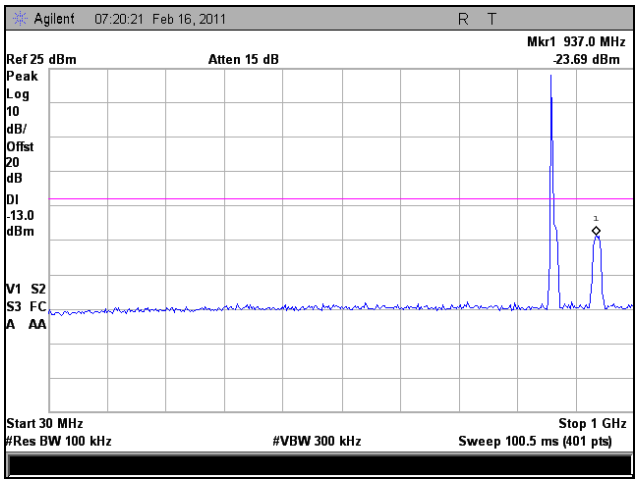
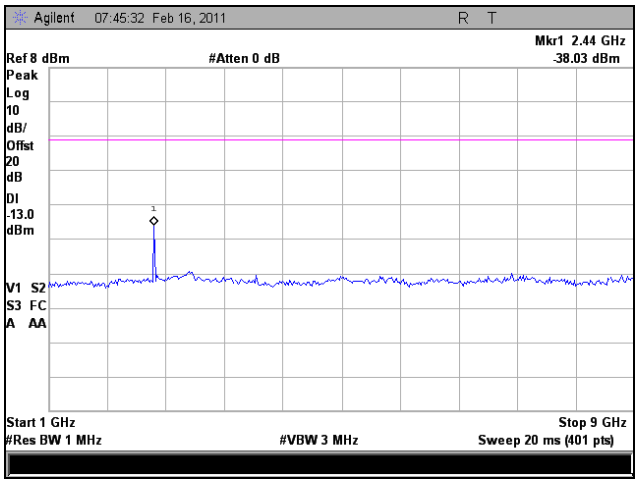


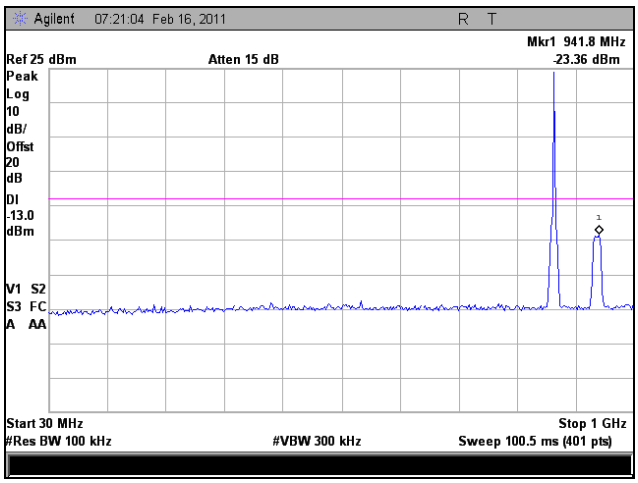
Figure 3. Spurious Emissions at Antenna Terminals Test Setup



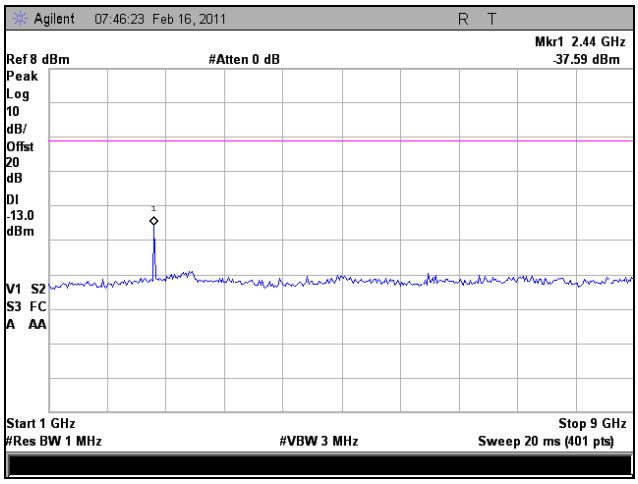
Plot 53. 862.013 MHz, Conducted Spurious Emissions, Downlink, 800 MHz, 30 MHz – 1 GHz



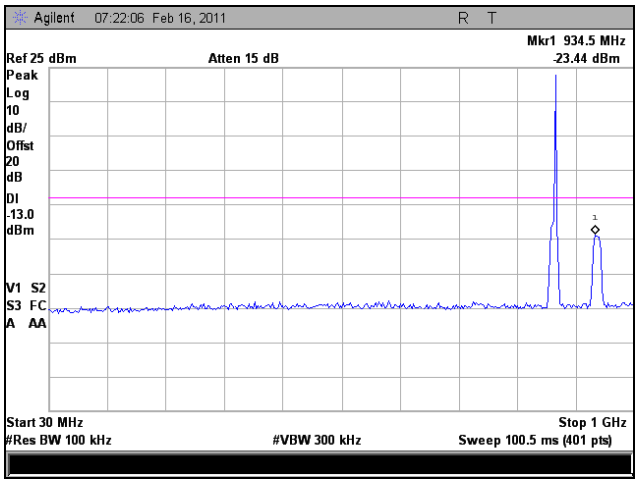
Plot 54. 862.013 MHz, Conducted Spurious Emissions, Downlink, 800 MHz, 1 GHz – 9 GHz



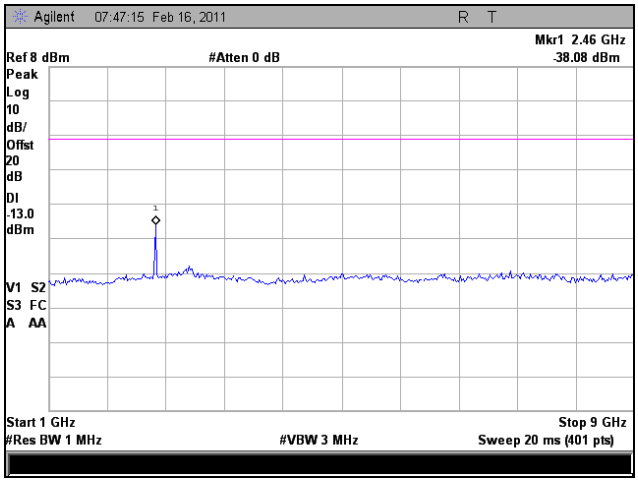
Plot 55. 865 MHz, Conducted Spurious Emissions, Downlink, 800 MHz, 30 MHz – 1 GHz



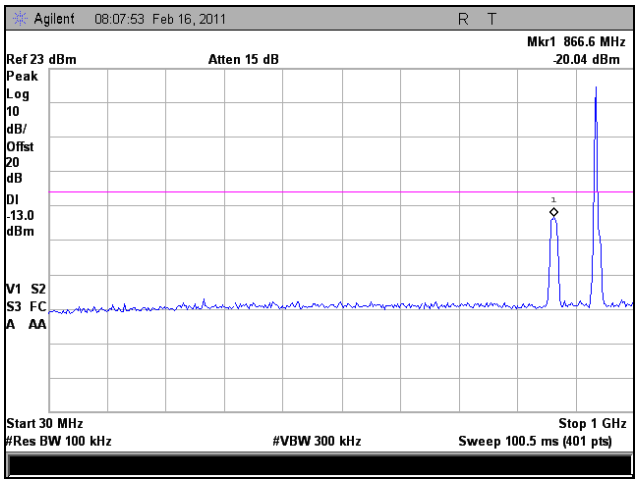
Plot 56. 865 MHz, Conducted Spurious Emissions, Downlink, 800 MHz, 1 GHz – 9 GHz



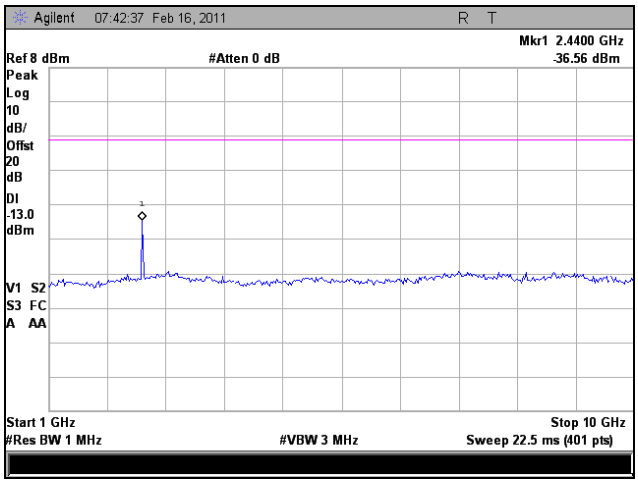
Plot 57. 898.987 MHz, Conducted Spurious Emissions, Downlink, 800 MHz, 30 MHz – 1 GHz



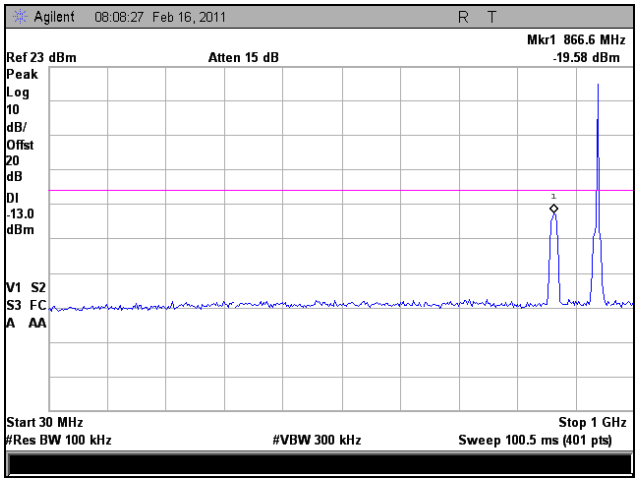
Plot 58. 898.987 MHz, Conducted Spurious Emissions, Downlink, 800 MHz, 1 GHz – 9 GHz



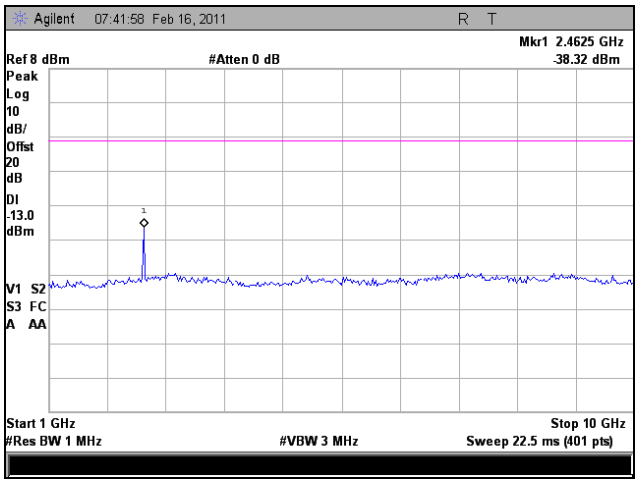
Plot 59. 935.013 MHz, Conducted Spurious Emissions, Downlink, 900 MHz, 30 MHz – 1 GHz



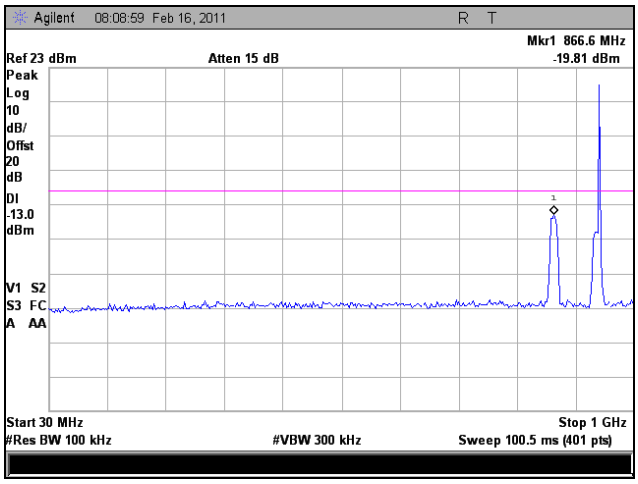
Plot 60. 935.013 MHz, Conducted Spurious Emissions, Downlink, 900 MHz, 1 GHz – 9 GHz



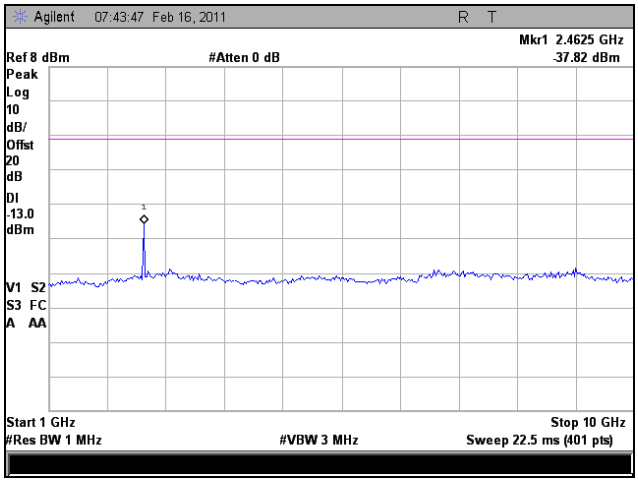
Plot 61. 938 MHz, Conducted Spurious Emissions, Downlink, 900 MHz, 30 MHz – 1 GHz



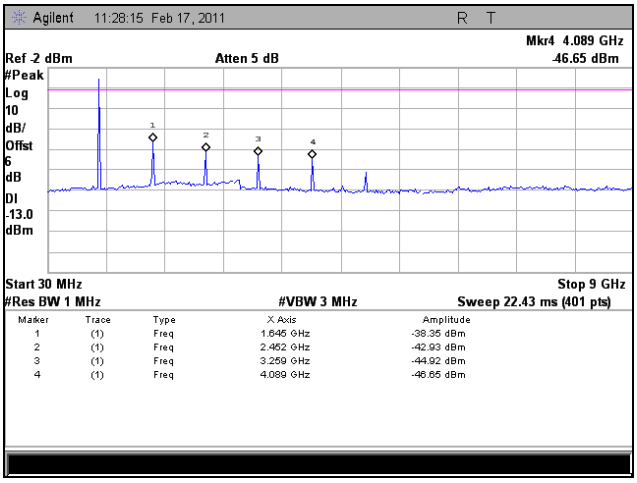
Plot 62. 938 MHz, Conducted Spurious Emissions, Downlink, 900 MHz, 1 GHz – 9 GHz



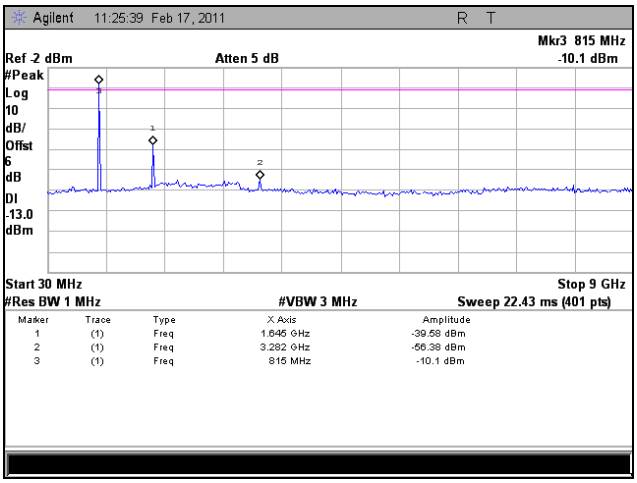
Plot 63. 940.987 MHz, Conducted Spurious Emissions, Downlink, 900 MHz, 30 MHz – 1 GHz



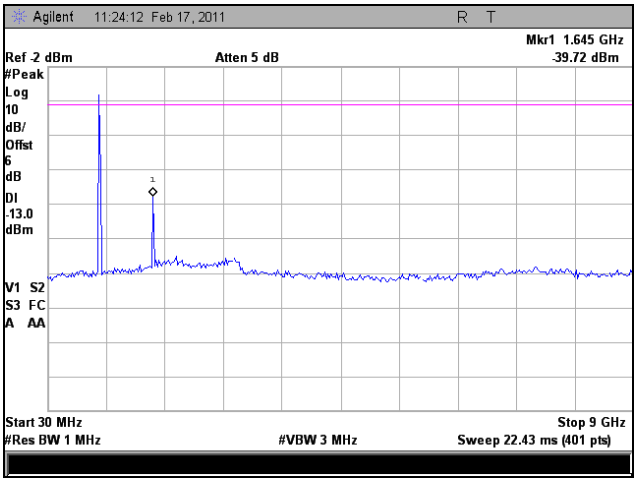
Plot 64. 940.987 MHz, Conducted Spurious Emissions, Downlink, 900 MHz, 1 GHz – 9 GHz



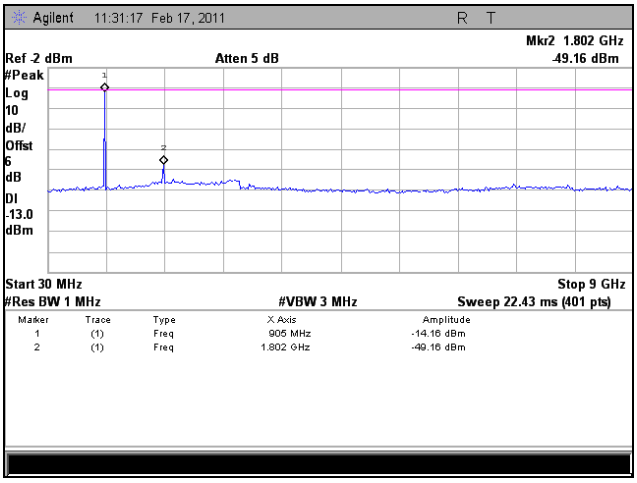
Plot 65. 817.013 MHz, Conducted Spurious Emissions, Uplink, Band 1, 800 MHz, 30 MHz – 9 GHz



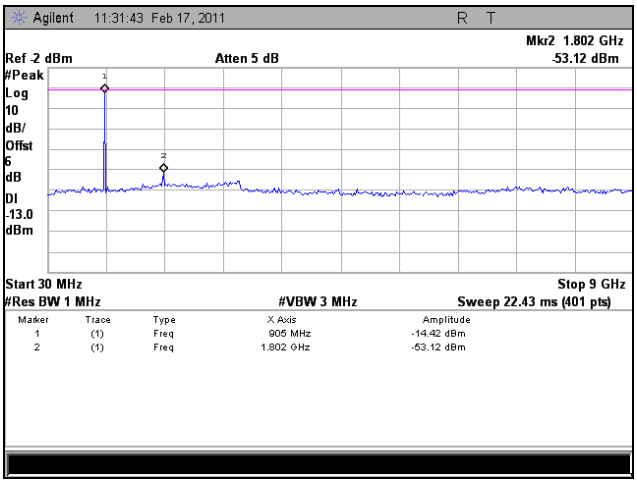
Plot 66. 820 MHz, Conducted Spurious Emissions, Uplink, Band 1, 800 MHz, 30 MHz – 9 GHz



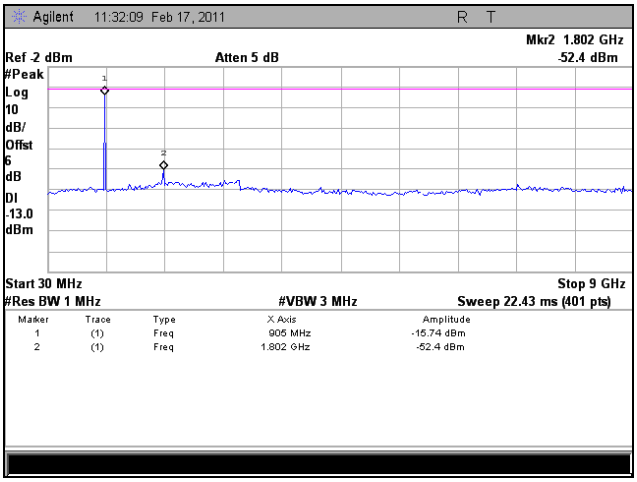
Plot 67. 823.987 MHz, Conducted Spurious Emissions, Uplink, Band 1, 800 MHz, 30 MHz – 9 GHz



Plot 68. 896.013 MHz, Conducted Spurious Emissions, Uplink, Band 2, 900 MHz, 30 MHz – 9 GHz



Plot 69. 899 MHz, Conducted Spurious Emissions, Uplink, Band 2, 900 MHz, 30 MHz – 9 GHz



Plot 70. 901.987 MHz, Conducted Spurious Emissions, Uplink, Band 2, 900 MHz, 30 MHz – 9 GHz

Photograph 5. Conducted Spurious Emissions, Test Setup

Electromagnetic Compatibility Radiated Emissions Requirements

6.2. Radiated Spurious Emissions

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

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

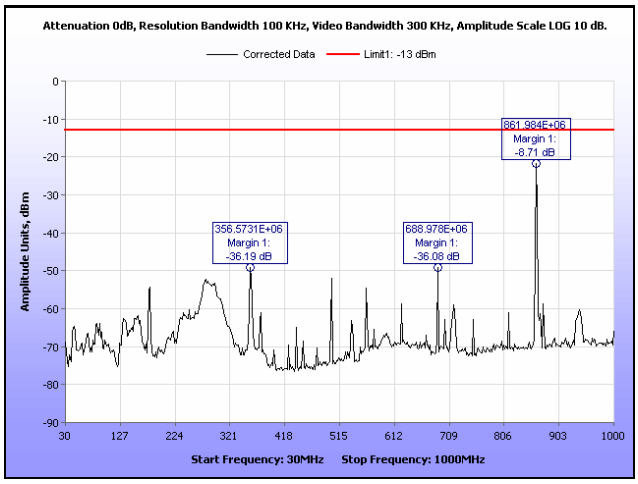
Radiated emission measurements were performed inside a 3 meter semi-anechoic chamber. The EUT was set at a distance of 1m from the receiving antenna. The EUT's RF ports were terminated to 50 ohm loads. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at 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.

Plots were captured and corrected for antenna correction factor and cable loss. The electric field strength was converted to EIRP and graphed against a -13 dBm limit line.

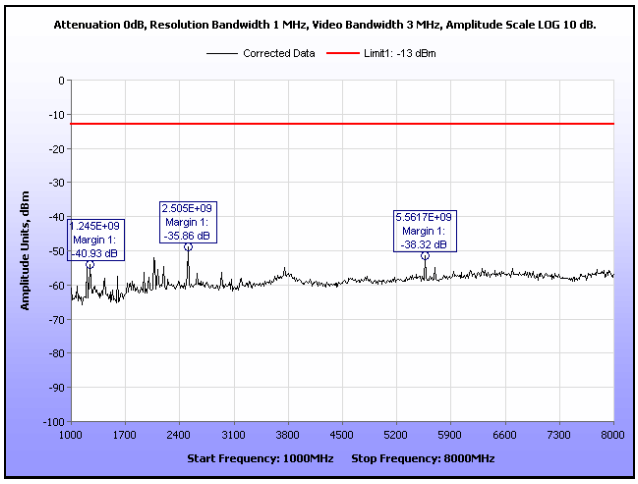
Test Results: Equipment complies with Section 2.1053 and 90.210 for Downlink. Uplink is via fiber optic cable.

Test Engineer(s): Dusmantha Tennakoon

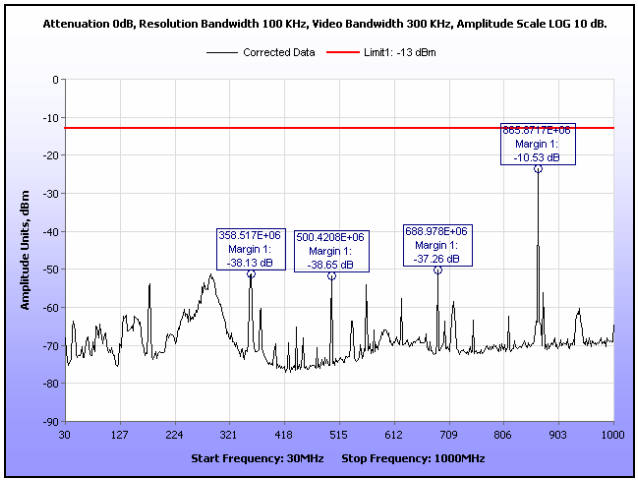
Test Date(s): 02/23/11



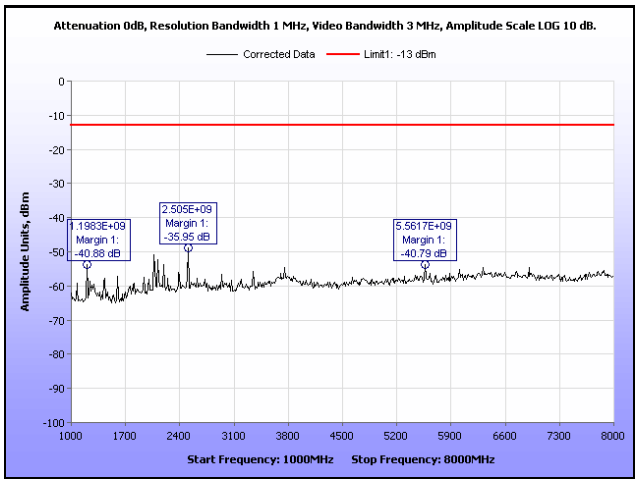
Plot 71. 862.013 MHz, Radiated Spurious Emissions, Downlink, 800 MHz, 30 MHz – 1 GHz



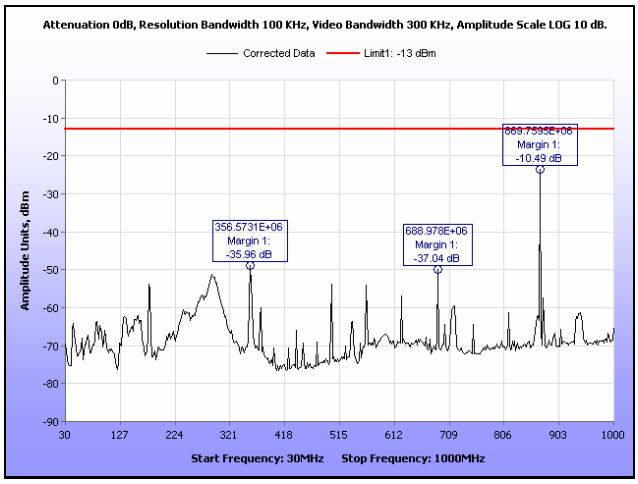
Plot 72. 862.013 MHz, Radiated Spurious Emissions, Downlink, 800 MHz, 1 GHz – 9 GHz



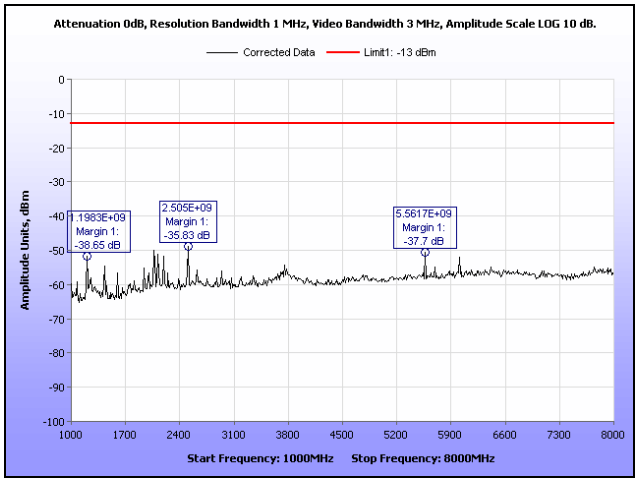
Plot 73. 865 MHz, Radiated Spurious Emissions, Downlink, 800 MHz, 30 MHz – 1 GHz



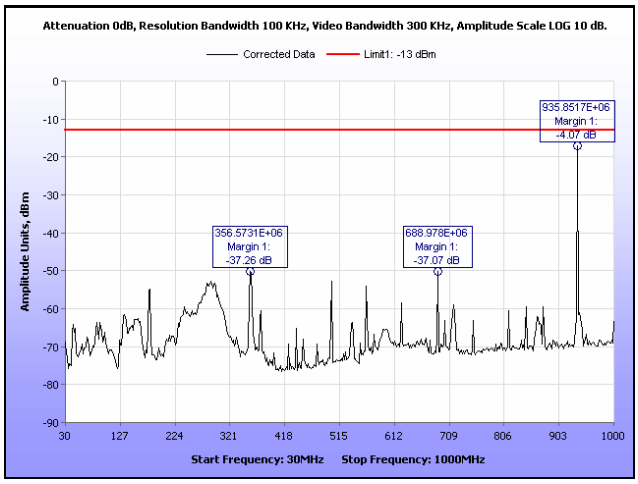
Plot 74. 865 MHz, Radiated Spurious Emissions, Downlink, 800 MHz, 1 GHz – 9 GHz



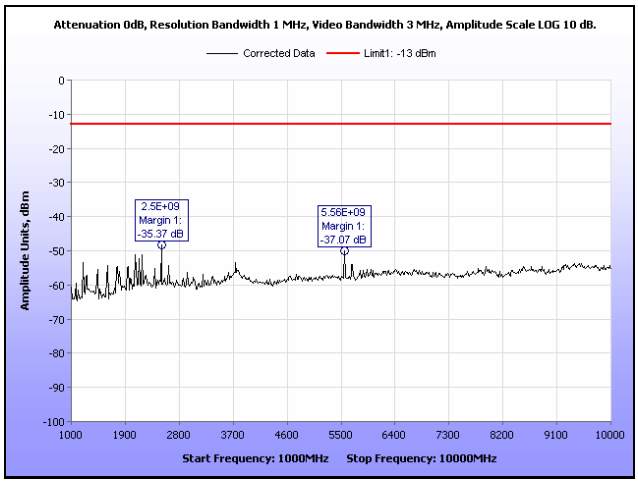
Plot 75. 868.987 MHz, Radiated Spurious Emissions, Downlink, 800 MHz, 30 MHz – 1 GHz



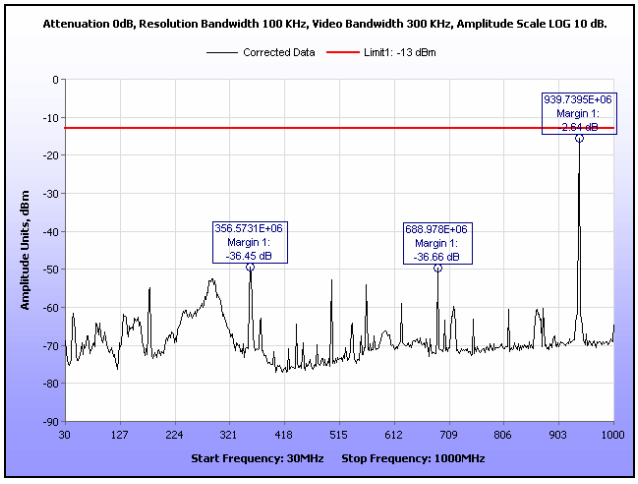
Plot 76. 868.987 MHz, Radiated Spurious Emissions, Downlink, 800 MHz, 1 GHz – 9 GHz



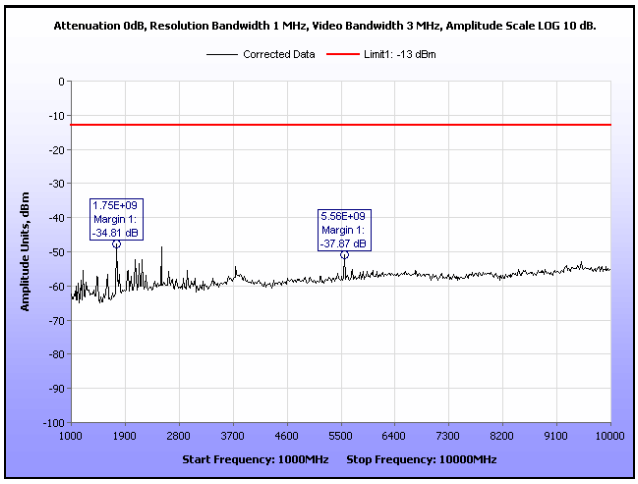
Plot 77. 935.013 MHz, Radiated Spurious Emissions, Downlink, 900 MHz, 30 MHz – 1 GHz



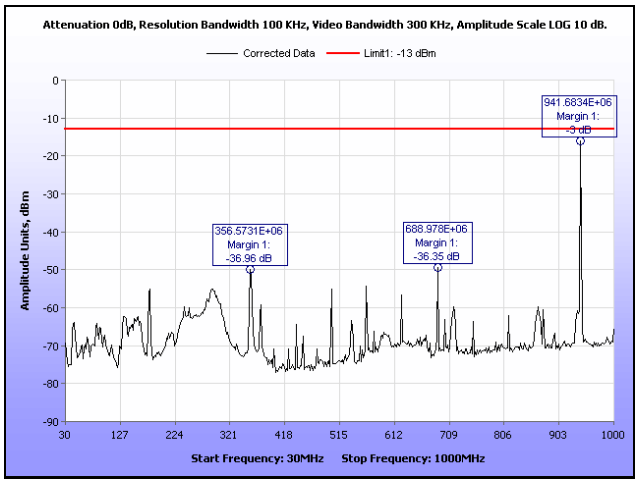
Plot 78. 935.013 MHz, Radiated Spurious Emissions, Downlink, 900 MHz, 1 GHz – 10 GHz



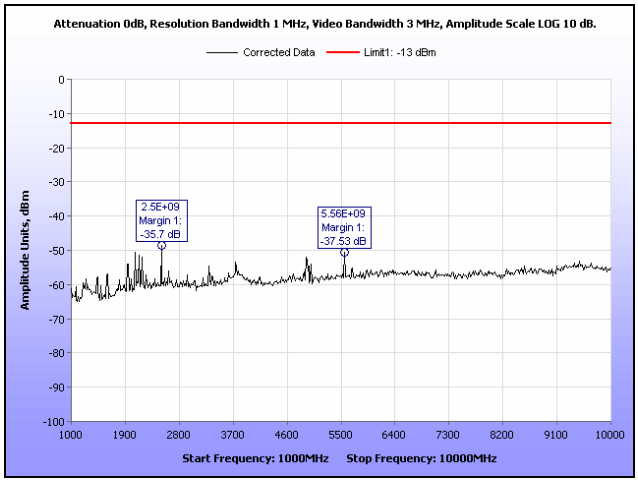
Plot 79. 938 MHz, Radiated Spurious Emissions, Downlink, 900 MHz, 30 MHz – 1 GHz



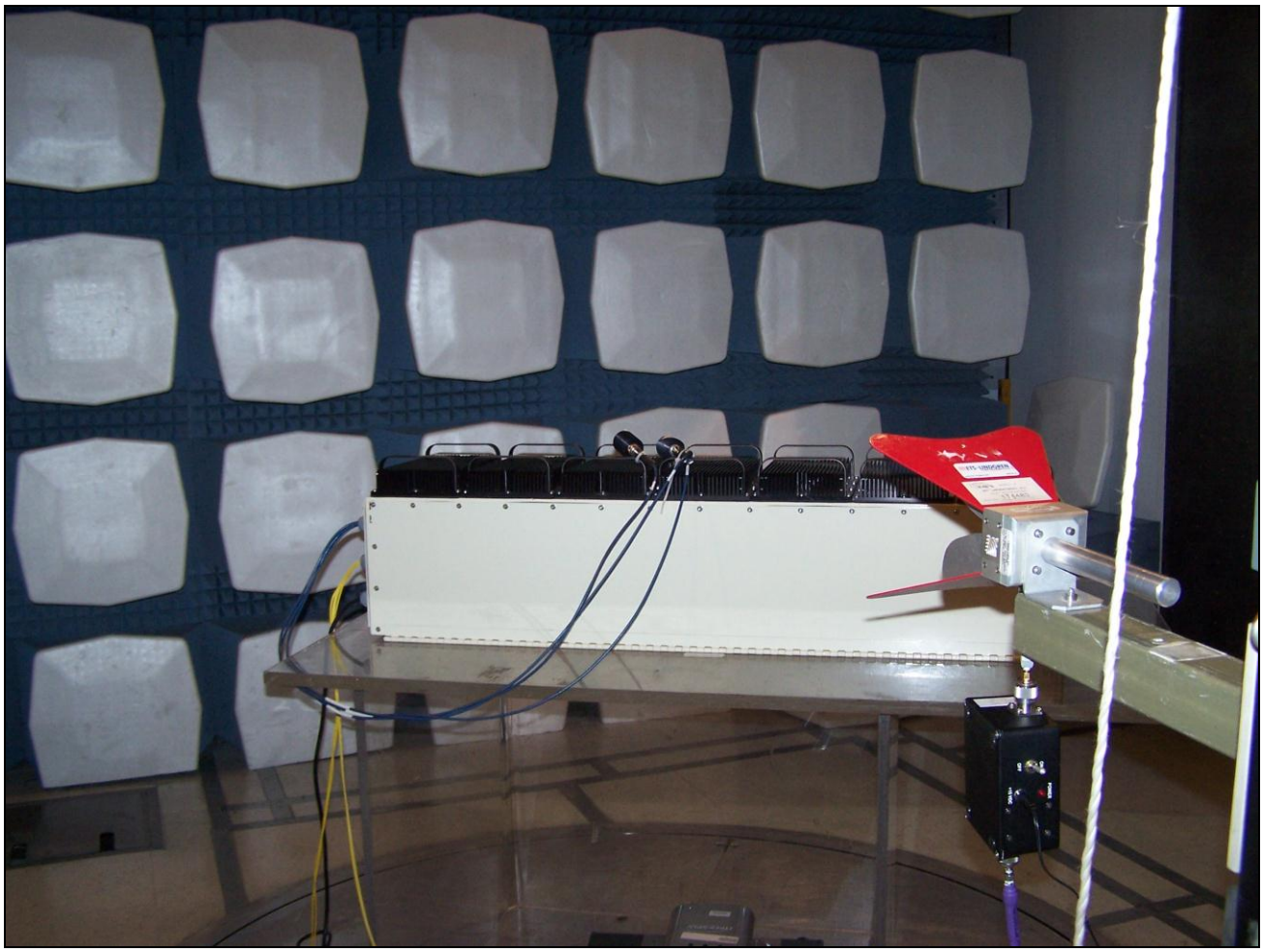
Plot 80. 938 MHz, Radiated Spurious Emissions, Downlink, 900 MHz, 1 GHz – 10 GHz



Plot 81. 940.987 MHz, Radiated Spurious Emissions, Downlink, 900 MHz, 30 MHz – 1 GHz



Plot 82. 940.987 MHz, Radiated Spurious Emissions, Downlink, 900 MHz, 1 GHz – 10 GHz



Photograph 6. Radiated Emissions, Test Setup, Above 1 GHz

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 of the EUT.

The EUT was placed in an Environmental Chamber with all support equipments are outside of the chamber on a table. The EUT was set to transmitter an un-modulated carrier. The reference frequency at 20°C was observed and put on 'view' under Trace 1 of the Spectrum Analyzer. As temperature or voltage was varied, the drift in frequency was observed in Trace 2. The frequency error was measured using delta markers between Trace 1 and 2. The frequency drift was investigated for every 10°C increment until the unit was stabilized then recorded the reading in tabular format with the temperature range of -30 to 50^{C}.

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

Test Results: The EUT was not applicable with these requirements.

8. Electromagnetic Compatibility Receiver Spurious Requirements

8.1. RSS-GEN Receiver Spurious Emissions

Test Requirements: The following receiver spurious emission limits shall be complied with:

(a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 10.

Spurious Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

Table 10. Spurious Emission Limits for Receivers

(b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5 nanowatts above 1 GHz.

Test Procedures: Measurements were made radiated.

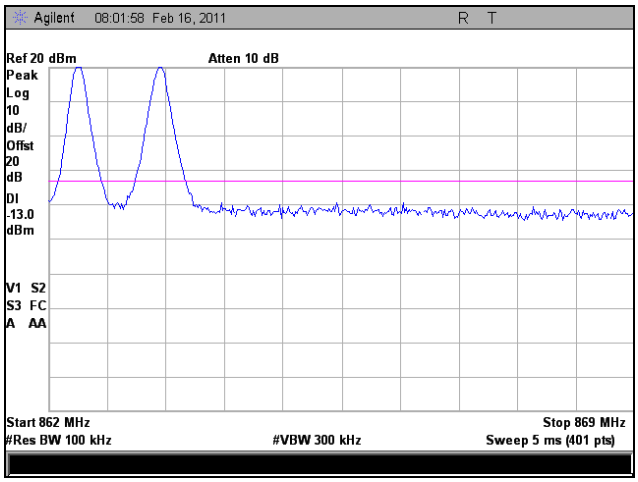
Test Results: Equipment is compliant with the Receiver Spurious Emissions Requirements of RSS-GEN. Measurements were made radiated. Highest measured receiver spurs is 47.92 dBuV/m @ 3m.

Test Engineer(s): Dusmantha Tennakoon

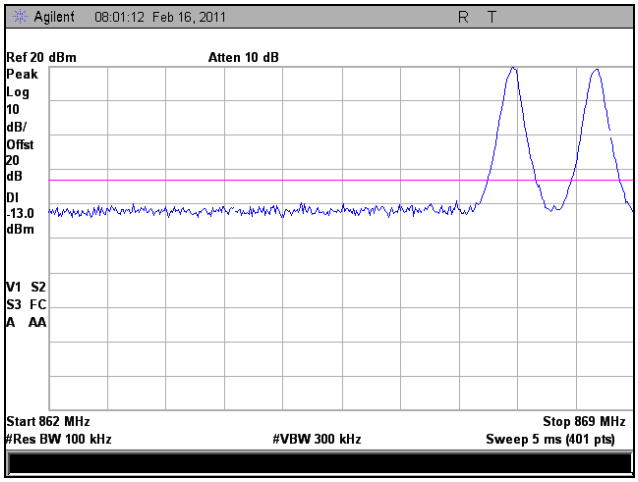
Test Date(s): 02/24/11

9. Electromagnetic Compatibility Requirements

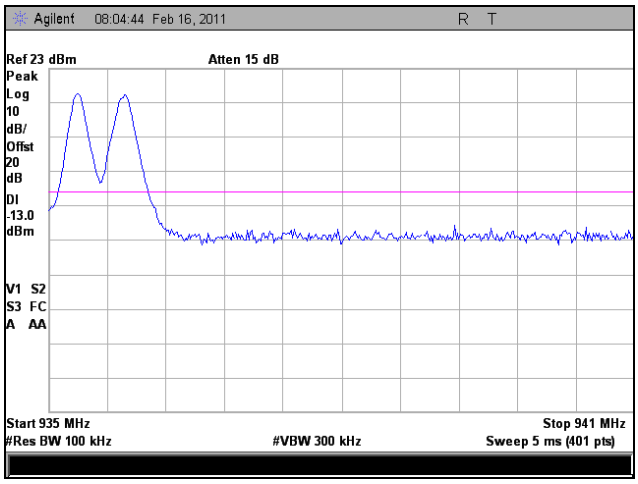
9.1. Intermodulation



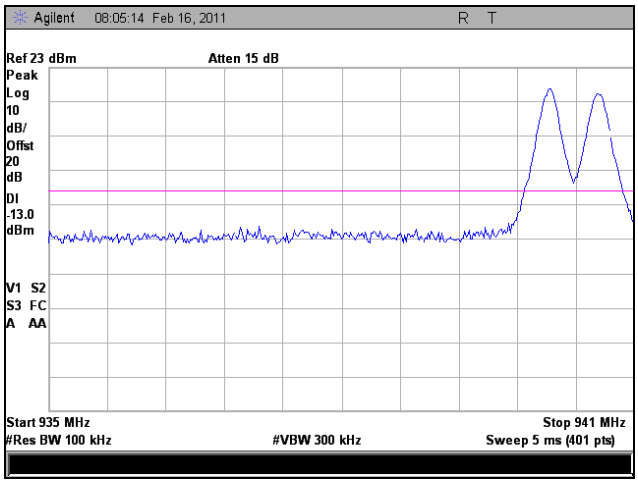
Plot 83. Intermodulation, Downlink, 800 MHz, Low Channel



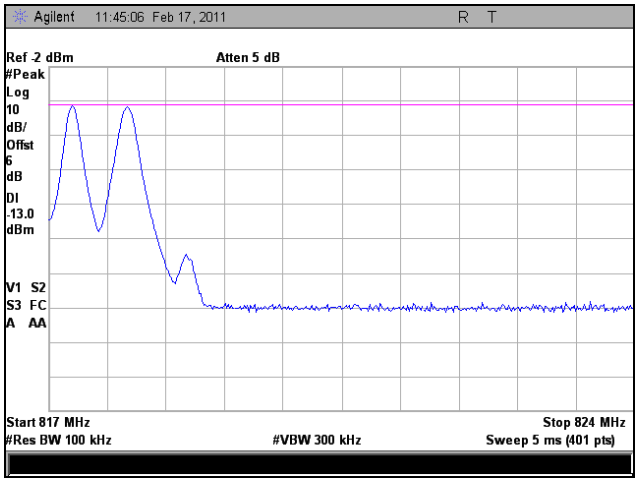
Plot 84. Intermodulation, Downlink, 800 MHz, High Channel



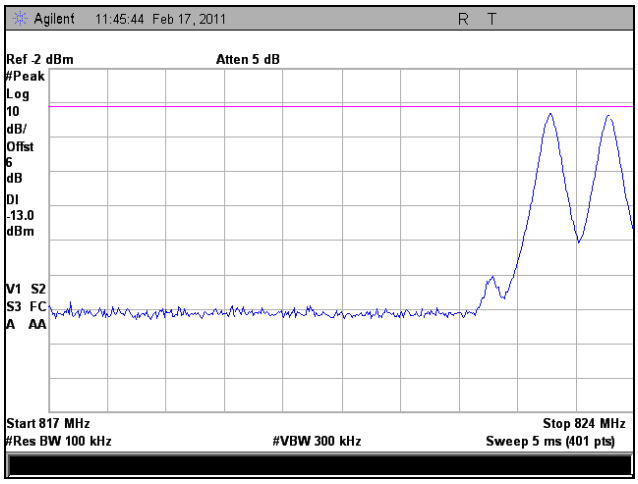
Plot 85. Intermodulation, Downlink, 800 MHz, Low Channel



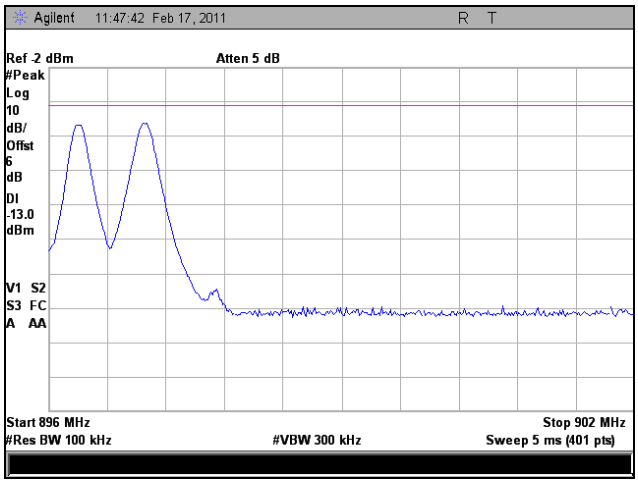
Plot 86. Intermodulation, Downlink, 900 MHz, High Channel



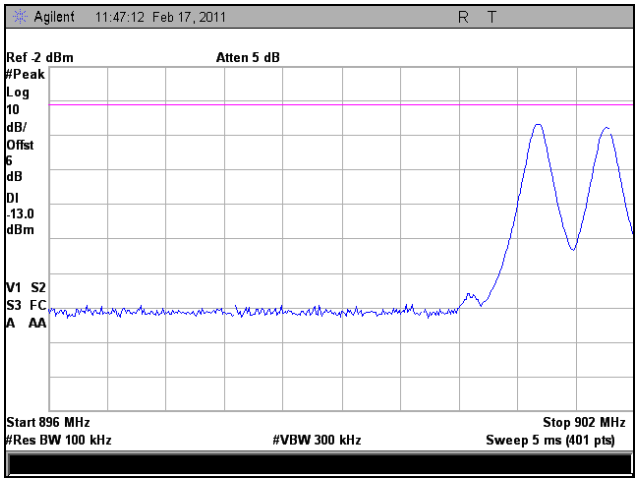
Plot 87. Intermodulation, Uplink, Band 1, 800 MHz, Low Channel



Plot 88. Intermodulation, Uplink, Band 1, 800 MHz, High Channel

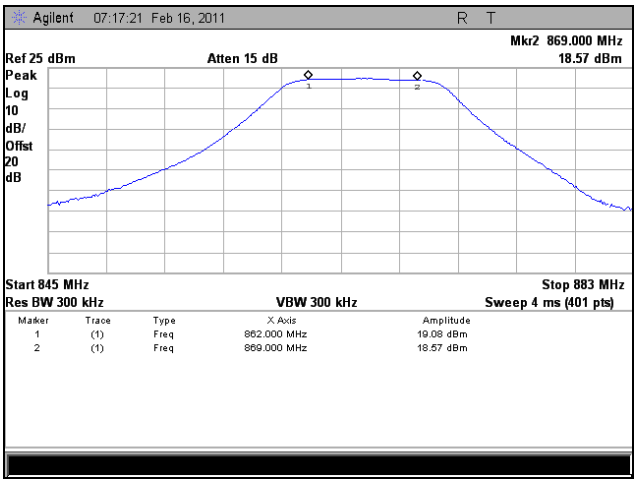


Plot 89. Intermodulation, Uplink, Band 2, 900 MHz, Low Channel

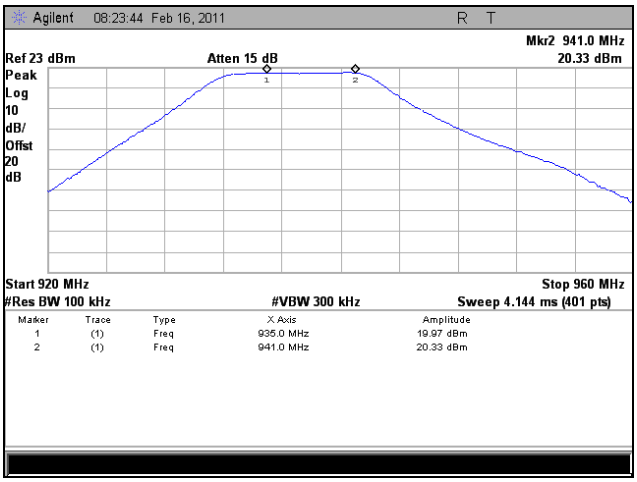


Plot 90. Intermodulation, Uplink, Band 2, 900 MHz, High Channel

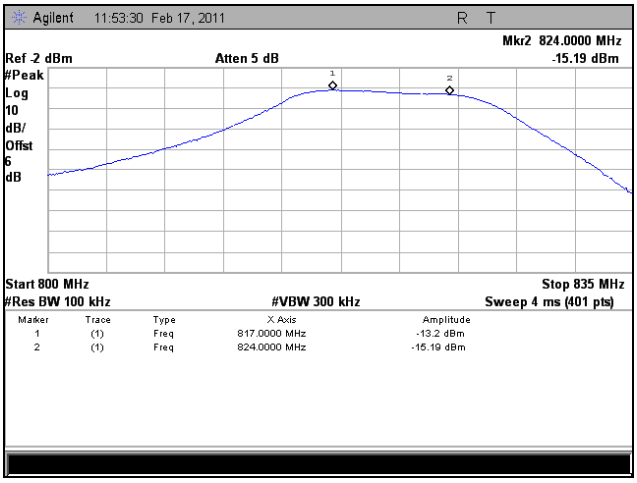
9.2. Filter Response



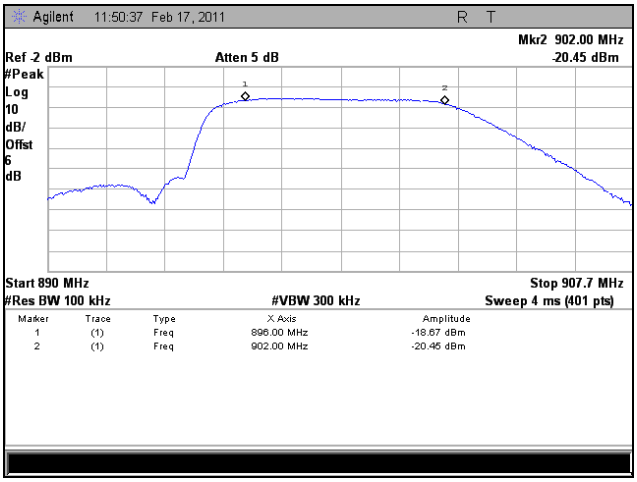
Plot 91. Filter Response, Downlink, 800 MHz



Plot 92. Filter Response, Downlink, 900 MHz



Plot 93. Filter Response, Uplink, Band 1, 800 MHz



Plot 94. Filter Response, Uplink, Band 2, 900 MHz

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
1T4621	ESA-E SERIES SPECTRUM ANALYZER	AGILENT	E4402B	05/10/2010	05/10/2011
1T4592	RF FILTER KIT	VARIOUS	N/A	SEE NOTE	
1T4300	SEMI-ANECHOIC CHAMBER # 1	EMC TEST SYSTEMS	NONE	08/23/2010	08/23/2011
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	05/25/2010	05/25/2011
1T4299	SIGNAL GENERATOR	HEWLETT PACKARD	E4432B	01/04/2011	01/04/2012
1T4483	ANTENNA; HORN	ETS-LINDGREN	3117	06/08/2010	06/08/2011
1T4751	ANTENNA - BILOG	SUNOL SCIENCES	JB6	11/3/2010	11/3/2011
1T4414	MICROWAVE PRE-AMPLIFIER	A.H. SYSTEMS	PAM-0118	SEE NOTE	
1T4354	SIGNAL GENERATOR	HEWLETT PACKARD	83752A	03/11/2010	03/11/2011

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

