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

For the

Soma Networks
CPE-300-2C0 (SOMAport Subscriber Terminal)

Tested under

FCC Certification Rules
Title 47 of the CFR, Part 27 C and Part 15 Subpart B for a Class B

MET Report: EMCS20137-FCC27

June 29, 2006

Prepared For:

Soma Networks
185 Berry Street, Suite 4600
San Francisco, CA 94107

Prepared By:
MET Laboratories, Inc.
4855 Patrick Henry Dr., Building 6
Santa Clara, CA 95054

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MET Report: EMCS20137-FCC

Shawn McMillen
Project Engineer, Electromagnetic Compatibility Lab

Boonmanus Seelapasay
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 27 C & D and Part 15 Subpart B of the FCC Rules under normal use and maintenance.

Tony Permsombut,
Manager, Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	June 29, 2006	Initial Issue.

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List of Terms and Abbreviations

AC	Alternating Current
ACF	Antenna Correction Factor
Cal	Calibration
d	Measurement Distance
dB	Decibels
dBµV	dB micro Volts
dBµV/m	dB micro Volt per meter
DC	Direct Current
DCF	Distance Correction Factor
E	Electric Field
EUT	Equipment Under Test
EIRP	Effective Isotropic Radiated Power
f	Frequency
FCC	Federal Communications Commission
GHz	Giga Hertz
Hz	Hertz
IEC	International Electro-technical Commission
kHz	kilohertz
kV	kilo Volt
LISN	Line Impedance Stabilization Network
MHz	Mega Hertz
RF	Radio Frequency
RMS	Root-Mean-Square
SNF	Spectrum Analyzer Noise Floor
V/m	Volts per meter

1. Testing Summary

Name of Test	FCC Rule Part/Section	Results
RF Power Output	2.1046; 27.50(c)	Compliant
Modulation Characteristics	2.1047	N/A (EUT has Digital Modulation Only)
Occupied Bandwidth	2.1049	Compliant
Spurious Emissions at Antenna Terminals	2.1051; 27.53(f)	Compliant
Radiated Spurious Emissions	2.1053	Compliant
Frequency Stability over Temperature Variations	2.1055; 27.54	Compliant
Conducted Emission, Class B	15.107 (a)	Compliant
Radiated Emission Class B	15.109 (a)	Compliant

Table 1. Summary of Test Results

2. Equipment Configuration

2.1. Overview

MET Laboratories, Inc. was contracted by Soma Networks to perform testing on theCPE-300-2C0 (SOMAport Subscriber Terminal), under Soma Networks purchase order number 405048.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Soma Networks, CPE-300-2C0 (SOMAport Subscriber Terminal).

In accordance with §2.955(a) (3), the following data is presented in support of the verification of the Soma Networks, CPE-300-2C0 (SOMAport Subscriber Terminal).

Soma Networks should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the CPE-300-2C0 (SOMAport Subscriber Terminal) has been **permanently** discontinued, as per §2.955(b).

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

Model(s) Tested:	CPE-300-2C0 (SOMAport Subscriber Terminal)	
Model(s) Covered:	CPE-300-2C0 (SOMAport Subscriber Terminal)	
EUT Specifications:	Primary Power: 110-240V,50-60Hz, to 12V DC	
	FCC ID: POZCPE700006553D	
	Emission Designators:	4M16D7D
	Peak and Average Output Power:	Peak 30.52dBm, Average 27.06dBm
	Equipment Code:	DTS
	EUT Frequency Ranges:	701-713MHz
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:	Shawn McMillen	
Date(s):	June 29, 2006	

2.2. Test Site

All testing was performed at MET Laboratories, Inc., 4855 Patrick Henry Drive, 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. In accordance with §2.948(a) (3), a complete site description is contained at MET Laboratories. In accordance with §2.948(d), MET Laboratories has been accredited by the National Voluntary Laboratory Accreditation Program (Lab Code: 100273-0).

2.3. Description of Test Sample

The CPE-300-2C0 (SOMAport Subscriber Terminal) Equipment Under Test (EUT), is a wireless terminal that is designed to provide wireless network access in a residence as well as two phone line.

Photograph 1. Photograph of EUT

2.4. Equipment Configuration

The EUT was set up as outlined in Figure 1 and Figure 2. All equipment incorporated as part of the EUT is included in the following list.

Ref. ID	Name / Description	Model Number	Part Number	Serial Number	Revision
A	Wireless Router (Digital board/ RF Module)	CPE-300-2C0	N/A (999371A-200-04/ 999394B-225-01)	0006220001 (111061400SQ/ 1506200004)	N/A
E	AC-DC Power Supply (Li Shin International Enterprise Corp)	LSE9901B1250	N/A	A30601173617	N/A

Table 2. Equipment Configuration

2.5. Support Equipment

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

Ref. ID	Name / Description	Manufacturer	Model Number
B	Laptop	IBM	TYPE 2644
C	Power Meter	Anritsu	ML 2488A (1S2430)
D	Spectrum Analyzer	HP	8564E (1S2293)
F	AC-DC Power Supply	IBM	02K6557
G	Coupler	Krytar	101020020(1S2034)
H	WCDMA Sensor	Anritsu	MA 2491A (1S2432)
J	Variac	Staco	3PN2210 (1S2060)

Table 3. Support Equipment

2.6. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty.	Length (m)	Shielded (Y/N)	Termination Box ID & Port ID
1	A, 10/100 Ethernet	RJ45,10/100 Ethernet Cable	1	2	No	B, Ethernet port
2	A, Antenna Port	SMA coax	1	0.3	Yes	G-1, Kytar Coupler
3	A, DC Power Input	16 AWG cable	1	2	No	E , AC-DC Power Supply

Table 4. Ports and Cabling Information

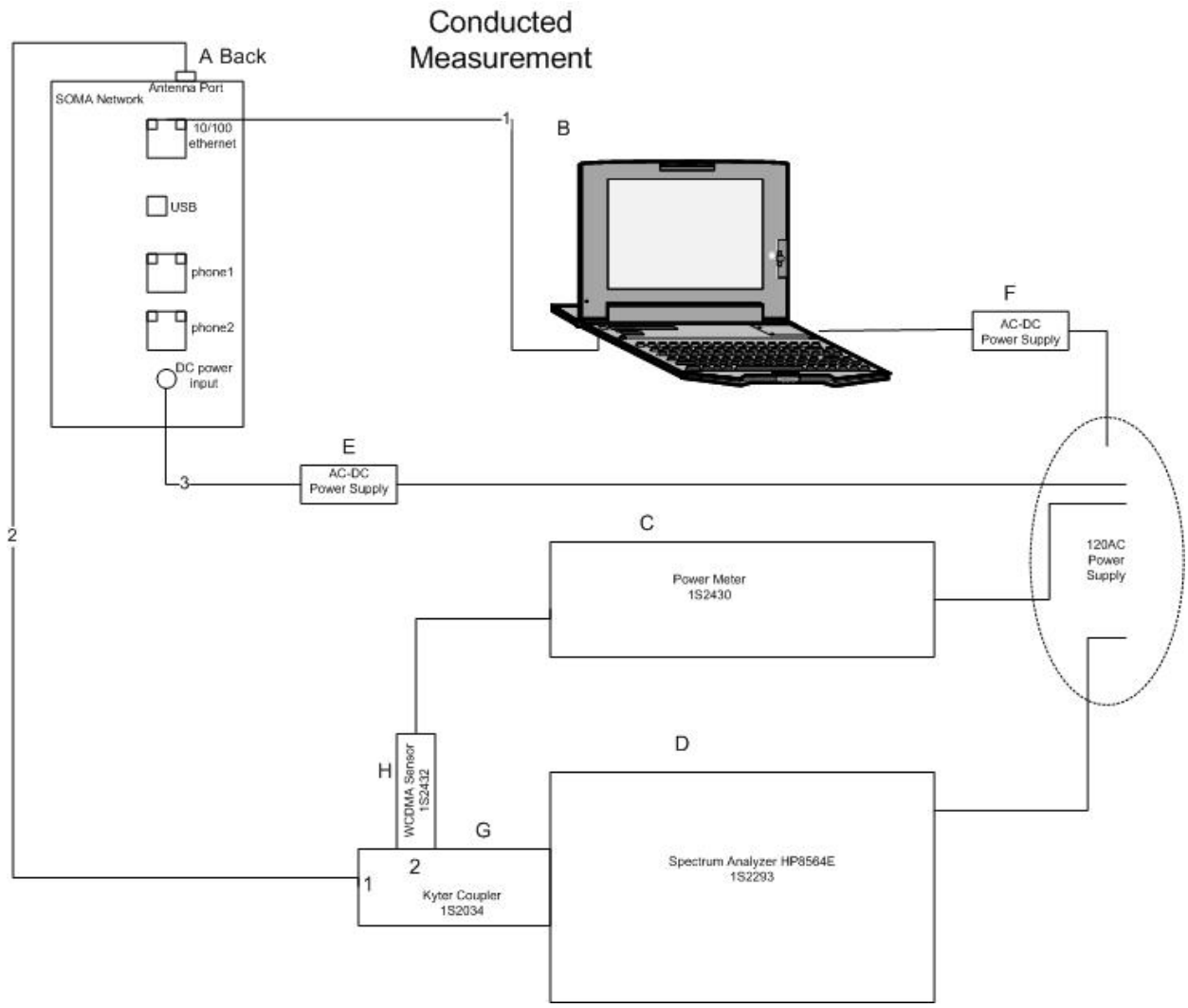

Figure 1: Block Diagram of Test Configuration (Conducted Measurement – Intentional)

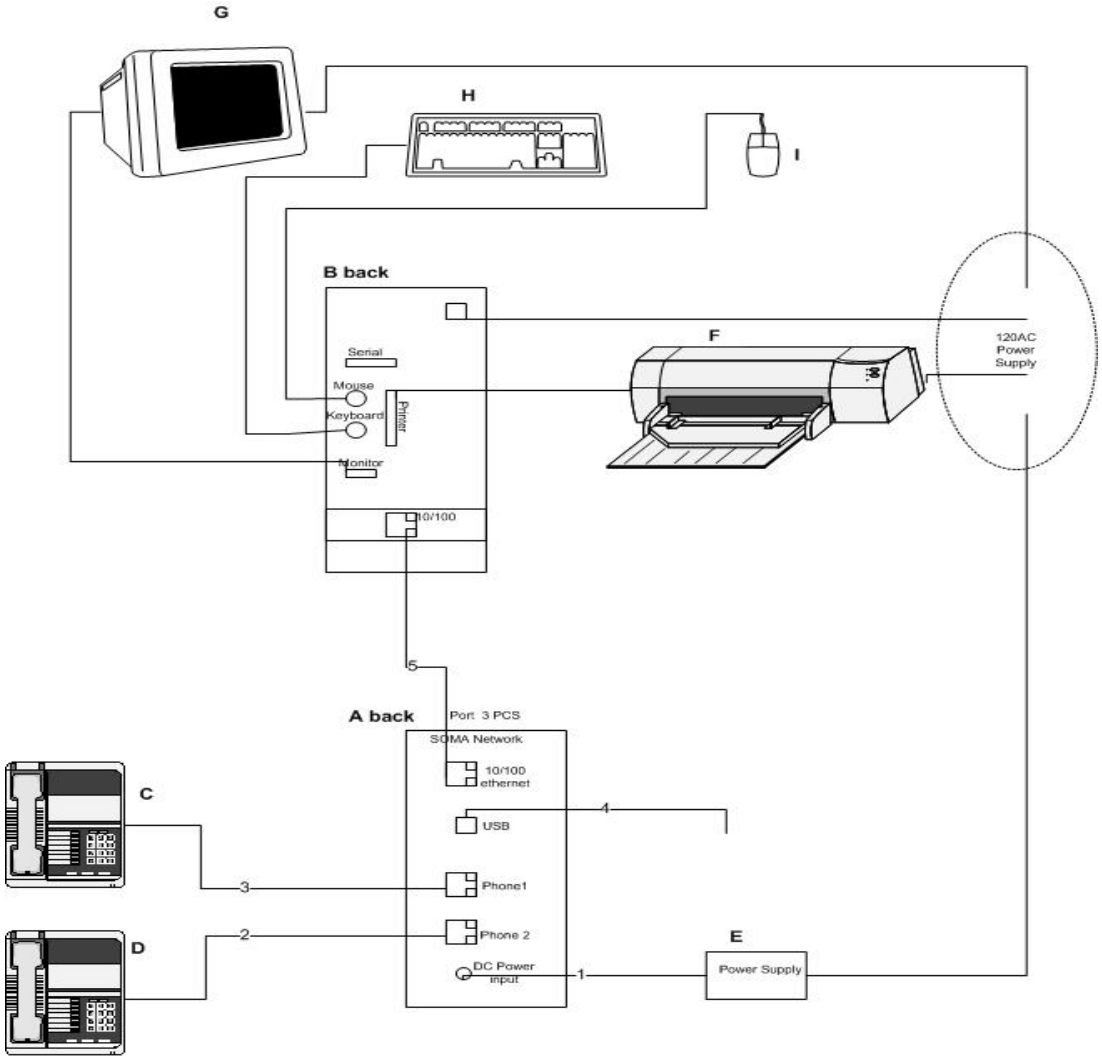

Figure 2: Block Diagram of Test Configuration (Unintentional)

2.7. Mode of Operation

SOMAport is normally placed close to a computer connected via Ethernet or USB. It provides wireless access from a nearby base station.

2.8. Method of Monitoring EUT Operation

SOMAport has two tri-color LED to display network connection and other status.

2.9. Modifications

2.9.1) Modifications to the EUT

No modifications were made to the EUT.

2.9.2) Modifications to the Test Standard

No modifications were made to the test standard.

2.10 Disposition of EUT

The test sample including all support equipment (if any), submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Soma Networks upon completion of testing.

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3. Electromagnetic Compatibility Unintentional Radiators

3.1. Conducted Emission 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 5. 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 5. 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 1 — The lower limit shall apply at the transition frequencies.				
Note 2 — The limit decreases linearly with the logarithm if the frequency in the range 0.15 MHz to 0.5 MHz.				

Table 5. 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 remeasured using a quasi-peak and/or average detector as appropriate.

Test Results: The EUT was found Compliant with the Class B requirement(s) of this section.

Test Engineer(s): Elijah Garcia

Test Date(s): June 29, 2006

Conducted Emissions - Voltage, AC Power, Line 120 VAC, 60 Hz

FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Pass/Fail QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Pass/Fail AVG	Margin (dB) AVG
0.181	48.39	64.44	PASS	-16.05	36.34	54.44	PASS	-18.1
0.6	35.79	56	PASS	-20.21	33.68	46	PASS	-12.32
8.32	28.11	60	PASS	-31.89	18.77	50	PASS	-31.23

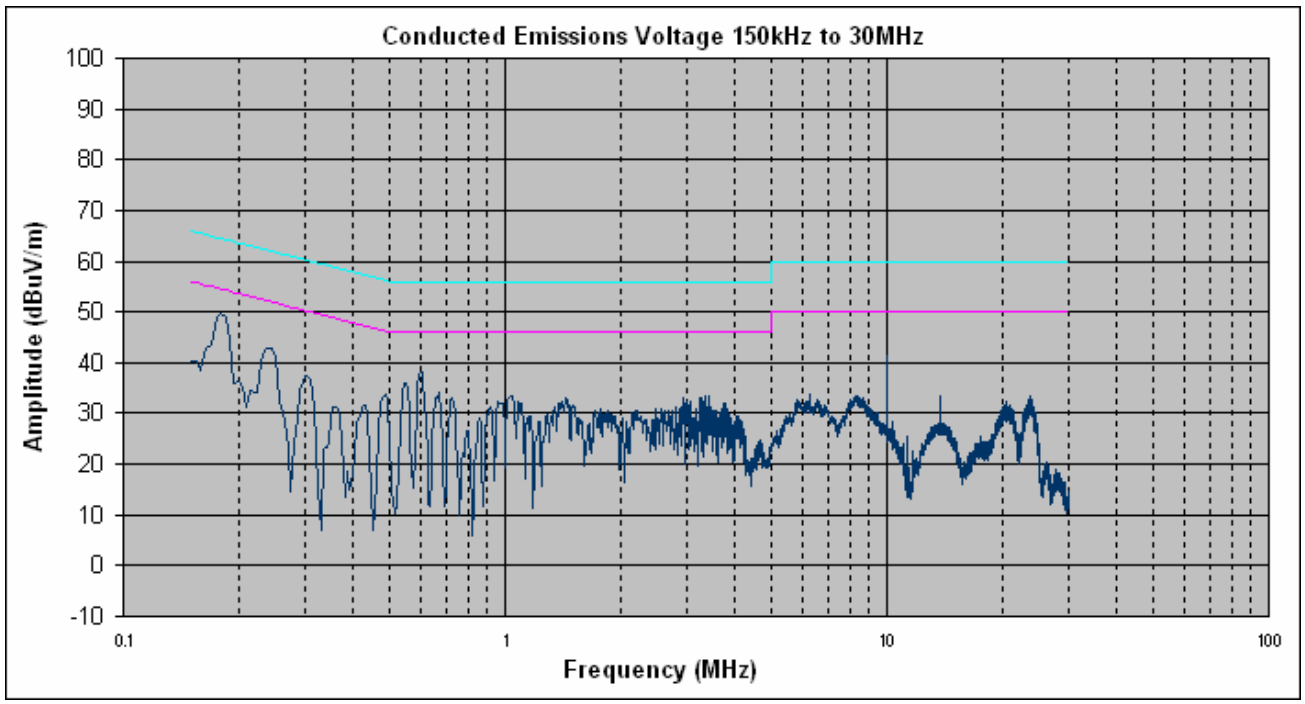
Table 6. Conducted Emissions - Voltage, AC Power, Line 120 VAC, 60 Hz

Conducted Emissions - Voltage, AC Power, Neutral 120 VAC, 60 Hz

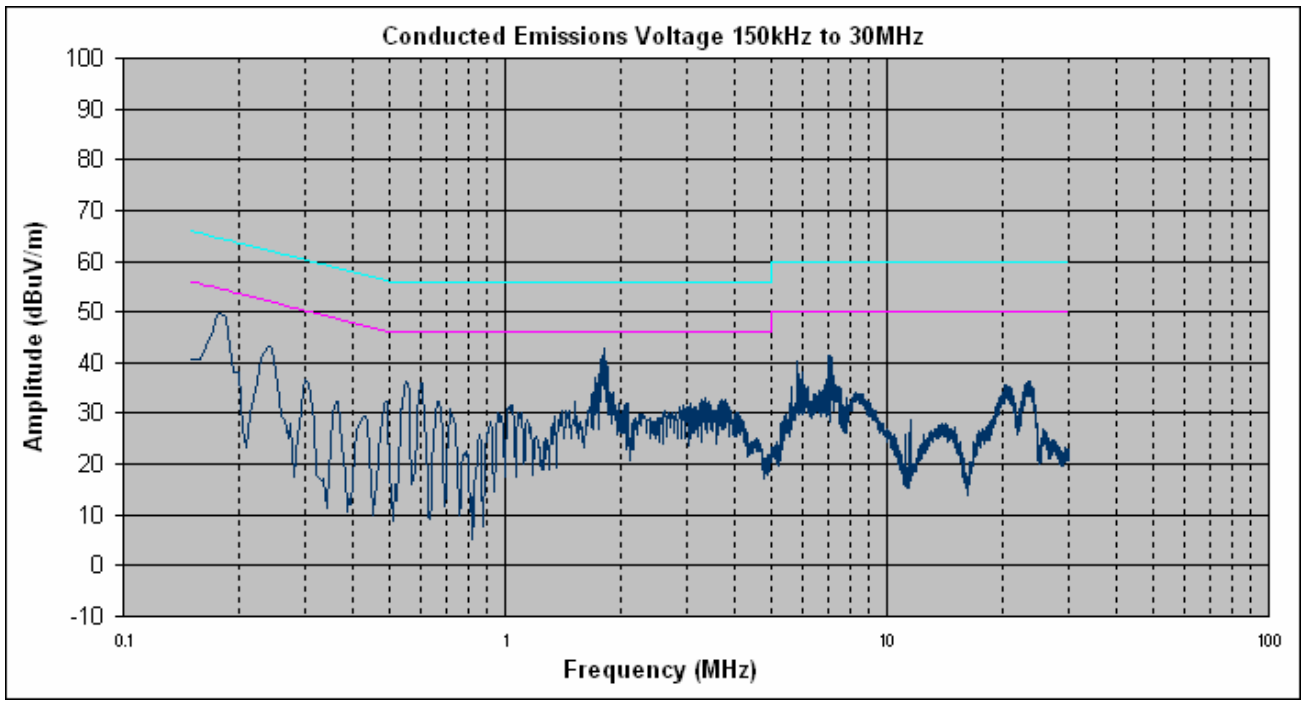
FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Results QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Results AVG	Margin (dB) AVG
0.18	48.35	64.49	PASS	-16.14	34.96	54.49	PASS	-19.53
1.81	31.66	56	PASS	-24.34	10.32	46	PASS	-35.68
7.195	25.67	60	PASS	-34.33	6.02	50	PASS	-43.98

Table 7. Conducted Emissions - Voltage, AC Power, Neutral 120 VAC, 60 Hz

Conducted Emissions - Voltage, Worst Case Emissions, AC Power, 120 VAC, 60 Hz



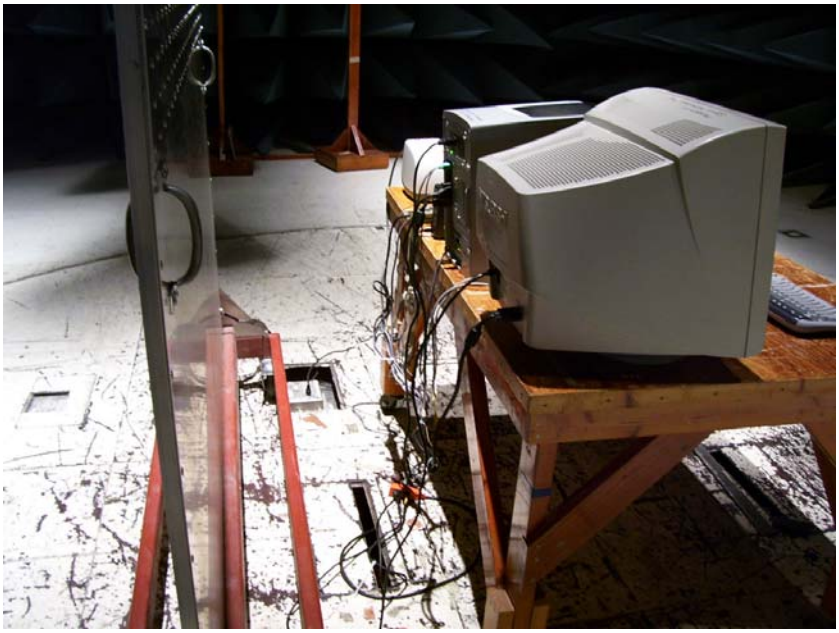
Conducted Emission, Line Plots



Conducted Emission, Neutral Plots

Conducted Emission Limits Test Setup

Photograph 2. Conducted Emissions Test Setup, Front View



Photograph 3. Conducted Emissions Test Setup, Back View

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 8.

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 8.

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

Test Procedures: The EUT was installed in a standard Telco rack 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.

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

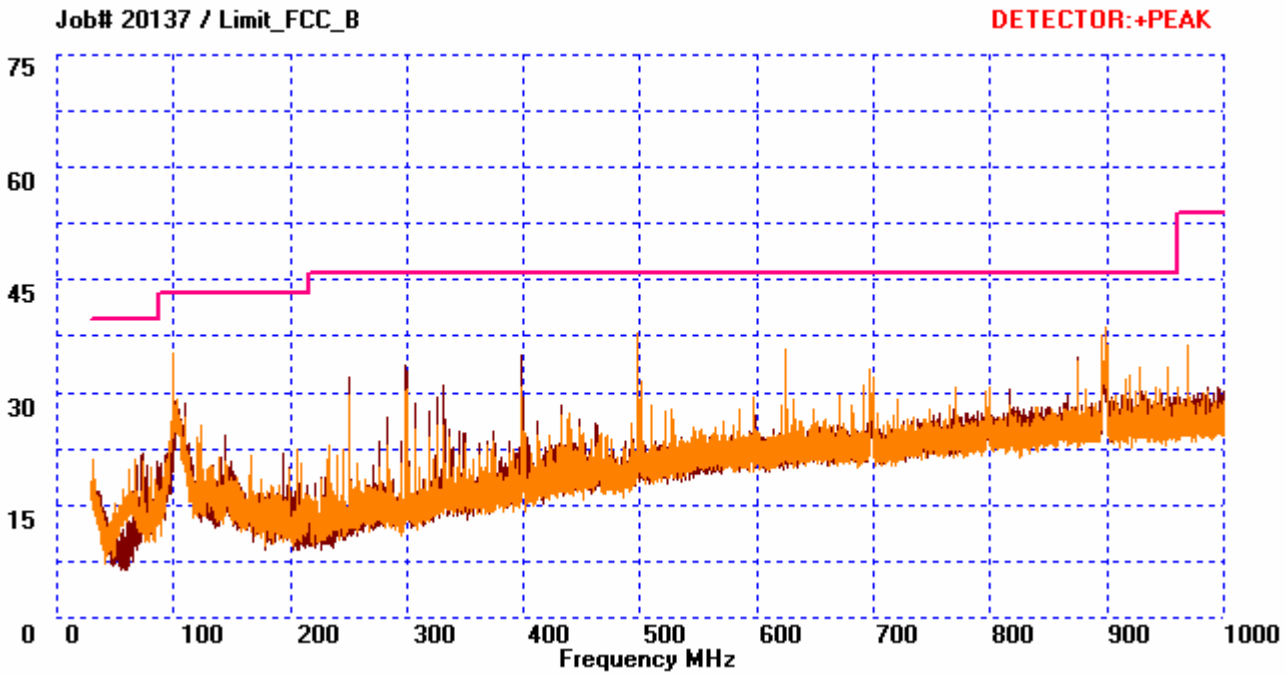
Test Engineer(s): Elijah Garcia

Test Date(s): June 29, 2006

Radiated Emissions Limits Test Results, 30 MHz to 1 GHz, Class B

Frequency (MHz)	Antenna Polarity (H/V)	EUT Azimuth (Degrees)	Antenna Height (m)	Uncorrected Amplitude QP Detector (dBuv)	Antenna Correction Factor (dB/m) (+)	Cable Loss (dB) (+)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
99.86	V	169	1	21.39	11.97	1.74	35.10	43.50	-8.40
298.6	H	0	1	21.86	13.96	2.92	38.74	46.00	-7.26
396.14	H	284	1.96	16.16	16.36	3.48	36.00	46.00	-10.00
497.68	V	262	1	16.07	17.98	4.02	38.07	46.00	-7.93
625.04	V	181	1	14.06	19.65	4.70	38.41	46.00	-7.59
895.04	V	177	1.78	12.85	21.00	5.89	39.74	46.00	-6.26

Table 9. Radiated Emissions Limits Test Results, 30 MHz to 1 GHz, Class B



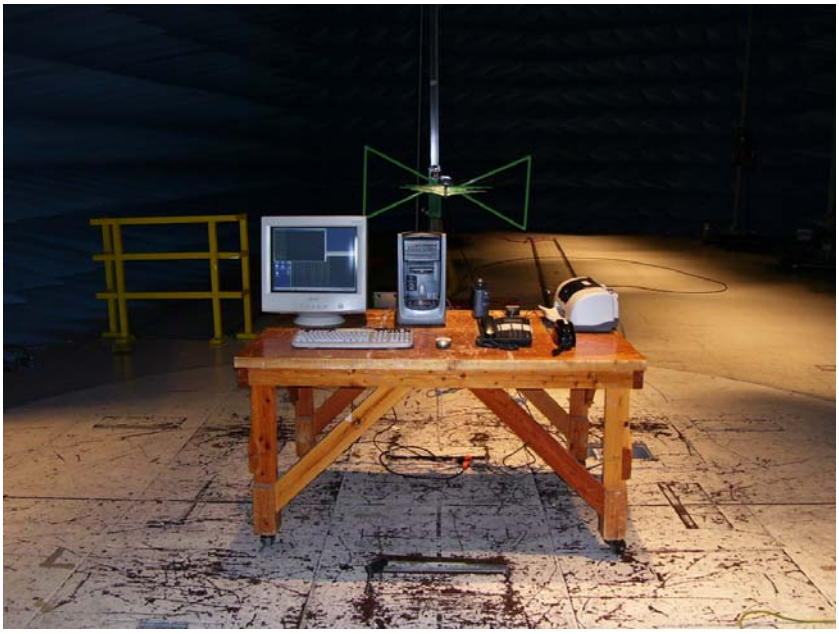
Radiated Emissions Limits Test Setup

Radiated Emissions Limits Test Results, 1 GHz to 2 GHz, Class B

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)	EUT Field Strength Final Amp. (dBuV/m)	Limit per FCC pt 15 @ 3m	Delta (dB)
1.104	201	H	1.01	46.67	35.20	24.34	2.20	38.02	54	-15.98
1.104	180	V	2.13	48.01	35.20	24.24	2.20	39.25	54	-14.75
1.296	192	V	1	43.5	35.23	24.63	2.35	35.25	54	-18.75
1.392	33	H	2.02	40.17	35.18	24.97	2.44	32.40	54	-21.60

Table 10. Radiated Emissions Limits Test Results, 1 GHz to 2 GHz

Radiated Emission Limits Test Setup

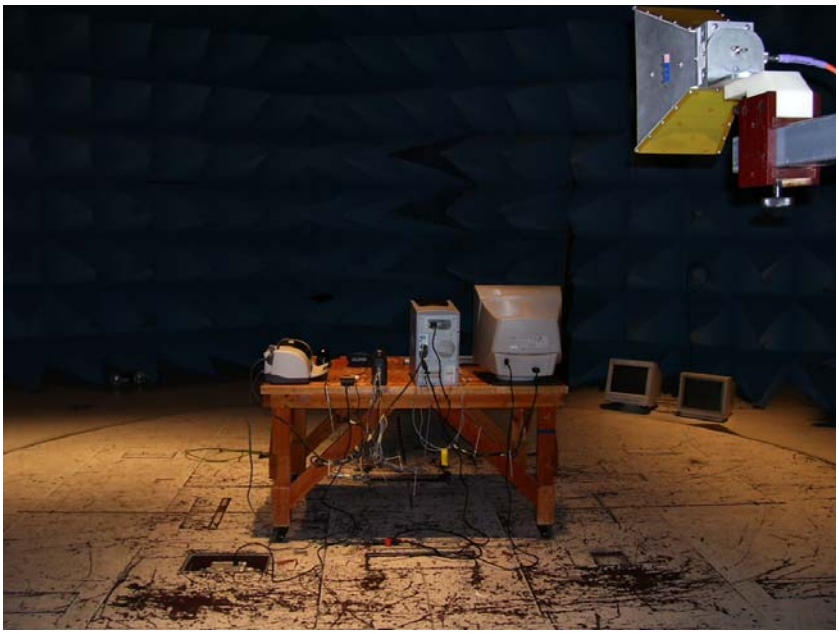


Photograph 4. Radiated Emission Limits Test Setup, 30 MHz to 1 GHz, Front View

Photograph 5. Radiated Emission Limits Test Setup, 30 MHz to 1 GHz, Back View

Radiated Emission Limits Test Setup

Photograph 6. Radiated Emission Limits Test Setup, 1 GHz to 2 GHz, Front View



Photograph 7. Radiated Emission Limits Test Setup, 1 GHz to 2 GHz, Back View

4. Electromagnetic Compatibility Criteria Intentional Radiators

4.1. RF Power Output

Test Requirement(s): §2.1046 and §27.50(c)

Test Procedures: As required by 47 CFR 2.1046, *RF power output measurement* was made at the RF output terminal using a Power Meter with a Power Sensor capable of measuring a modulated carrier.

Test Results: Equipment complies with 47CFR 2.1046 and 27.50(c). The CPE-300-2C0 (SOMAport Subscriber Terminal) does not exceed 30 Watts peak (EIRP) at the carrier frequency.

The following page show measurements of RF Power output which is recorded below:

RF Output Power			
Carrier Channel	**Frequency (MHz)**	**Measured Peak Output Power dBm**	**Measured Average Output Power dBm**
Low	701	30.31	27.01
Mid	707	30.52	27.06
High	713	29.96	27.03

Test Engineer(s): Shawn McMillen

Test Date(s): June 29, 2006

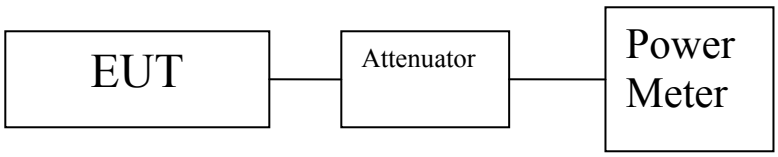


Figure 3. Block Diagram of Maximum Power Output Test setup

4.2. Modulation Characteristics

Test Requirement(s): §2.1047

Test Procedures: As required by 47 CFR 2.1047, Modulation Characteristics measurements were made at the RF output terminals.

Test Results: Not applicable since the EUT has no analog voice.

4.3. Occupied Bandwidth

Test Requirement(s): §2.1049

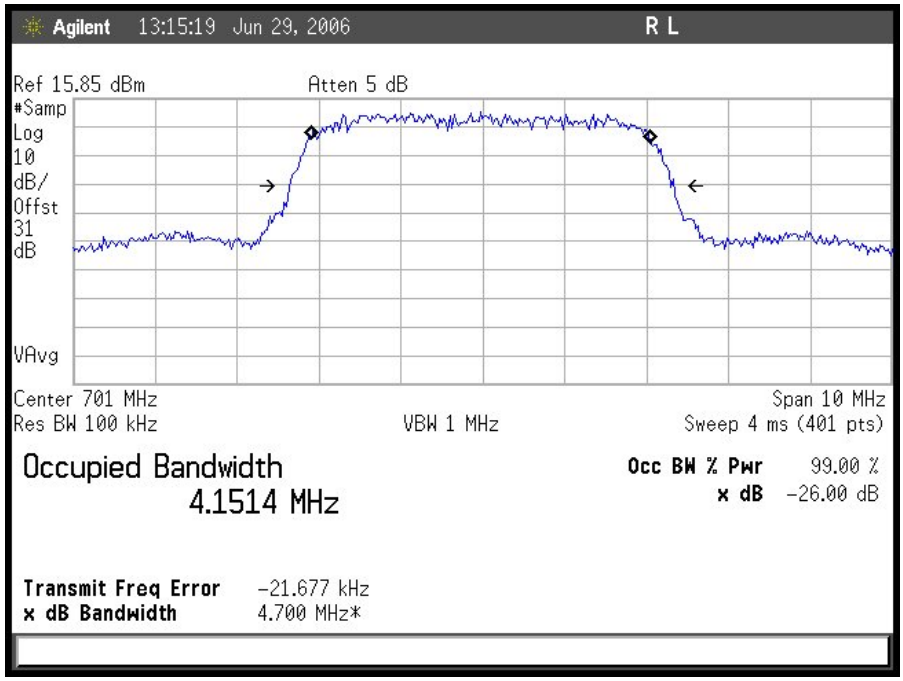
Test Procedures: As required by 47 CFR 2.1049, the occupied bandwidth measurements were made at the RF output terminals using a Spectrum Analyzer.

Test Results: Equipment complies with Section 2.1049. The following pages show measurements of 99% Occupied Bandwidth plots:

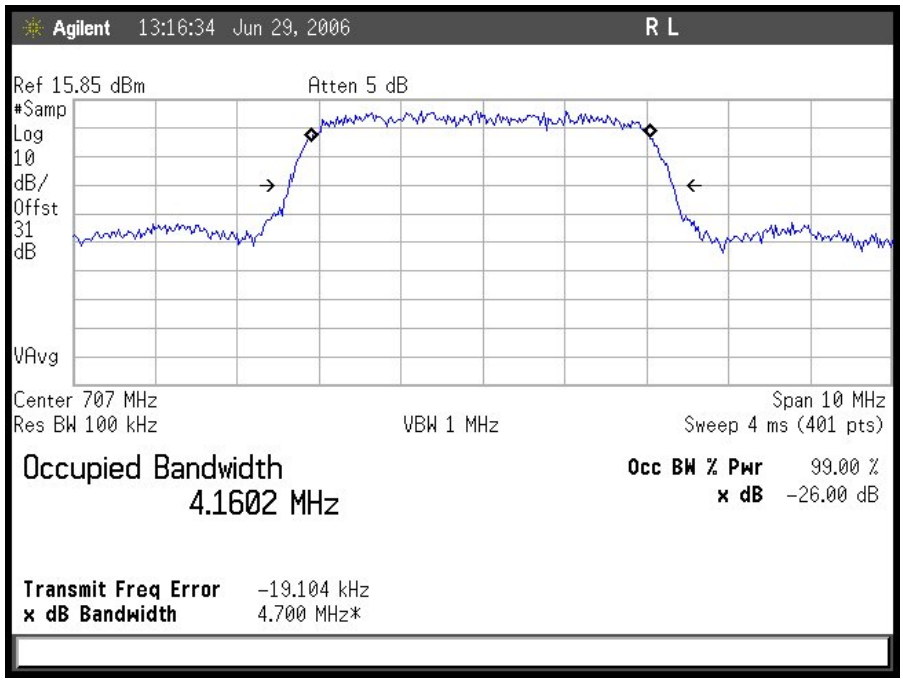
99% Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 99% Bandwidth (MHz)**
Low	701	4.15
Mid	707	4.16
High	713	4.12

Test Engineer(s): Shawn McMillen

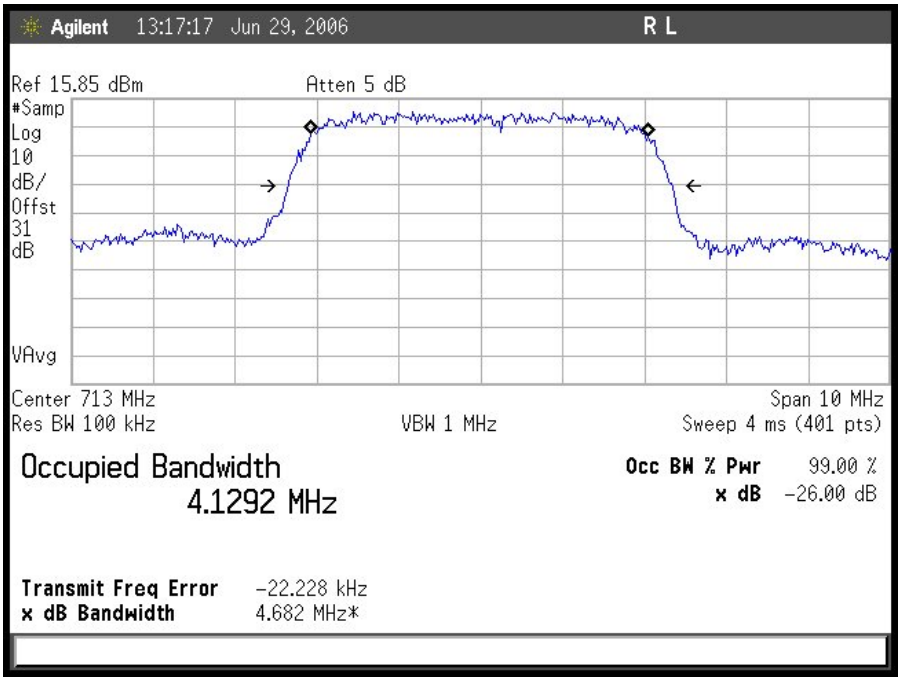
Test Date(s): June 29, 2006



Plot 1. Occupied Bandwidth Low Channel



Plot 2. Occupied Bandwidth Mid Channel



Plot 3. Occupied Bandwidth High Channel

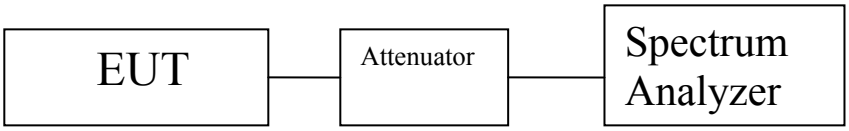


Figure 4. Block Diagram of Occupied Bandwidth Test Setup

4.4. Spurious Emissions at Antenna Terminals

Test Requirement(s): §2.1051 and §27.53(f)

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

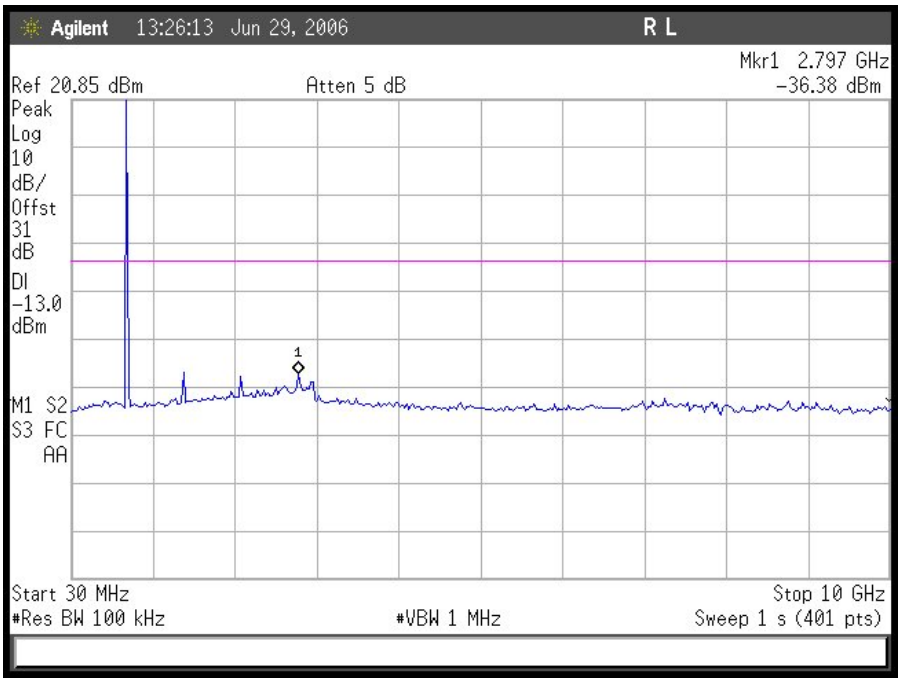
The Spectrum Analyzer was set with a RBW of 100KHz and a VBW of 1MHz. The EUT was set to transmit in the operating frequency range at its maximum rated output power. Frequencies were swept from 30 MHz to the 10^{th} harmonic of the fundamental. Any emission outside the authorized frequency band must be attenuated by 43 + 10log(P) dB where P is the power of the carrier. In the spectrum 100KHz immediately outside the authorized band a 30KHz resolution was employed.

Test Results: Equipment complies with Section 2.1051 and 27.53(f). The following pages show measurements of Spurious Emission plots

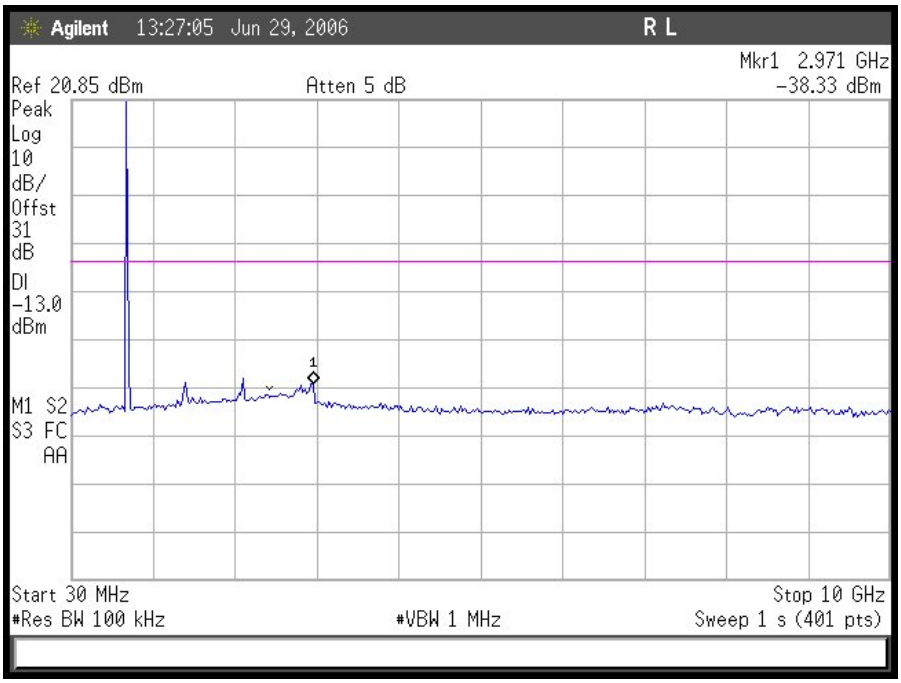
The following analysis and plots are included below to illustrate compliance with the required rule parts.

Test Engineer(s): Shawn McMillen

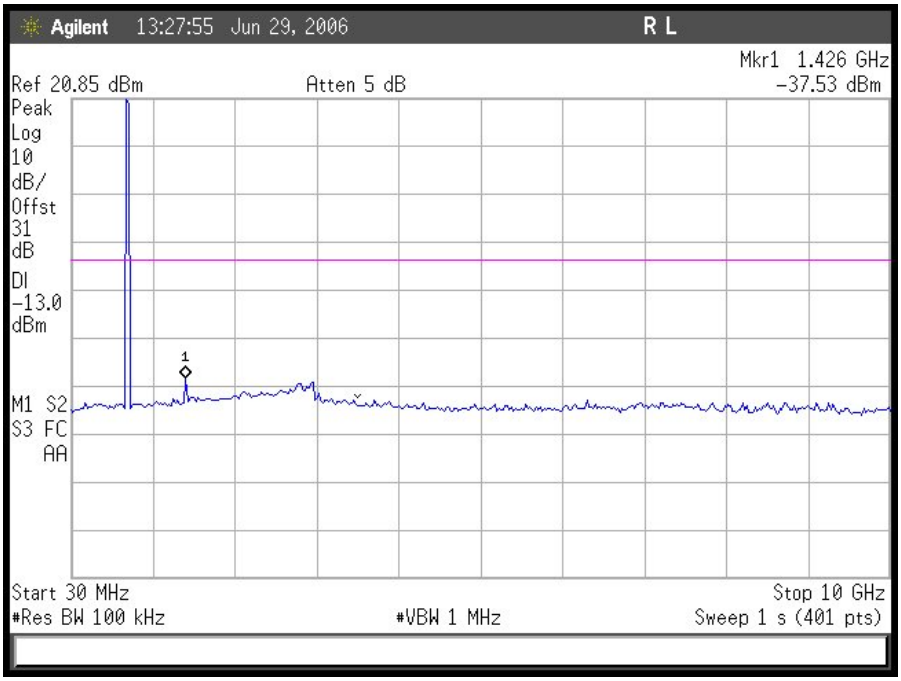
Test Date(s): June 29, 2006



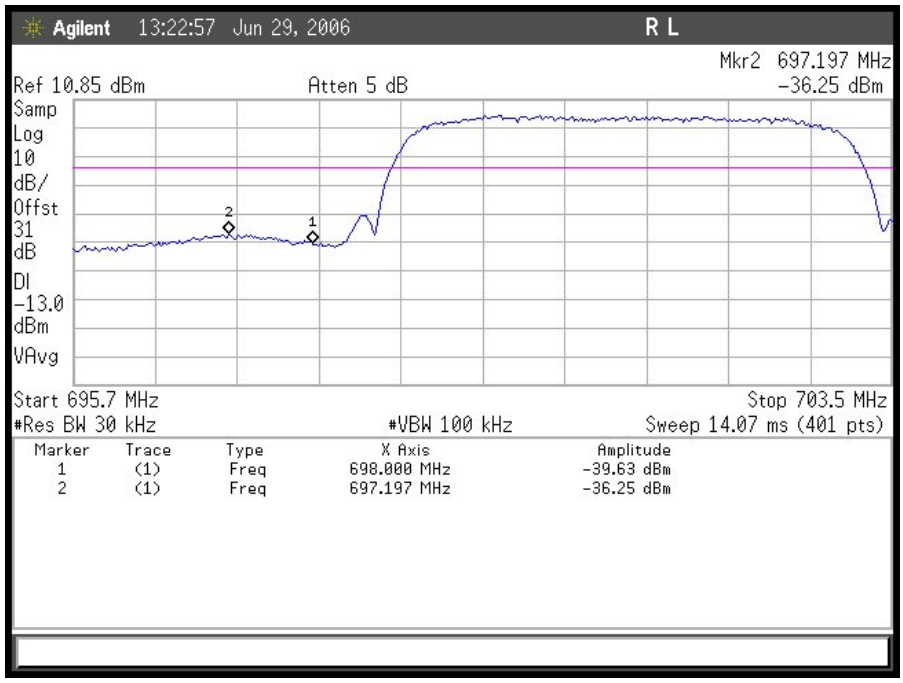
Plot 4: Conducted Spurious Emissions – Low Channel



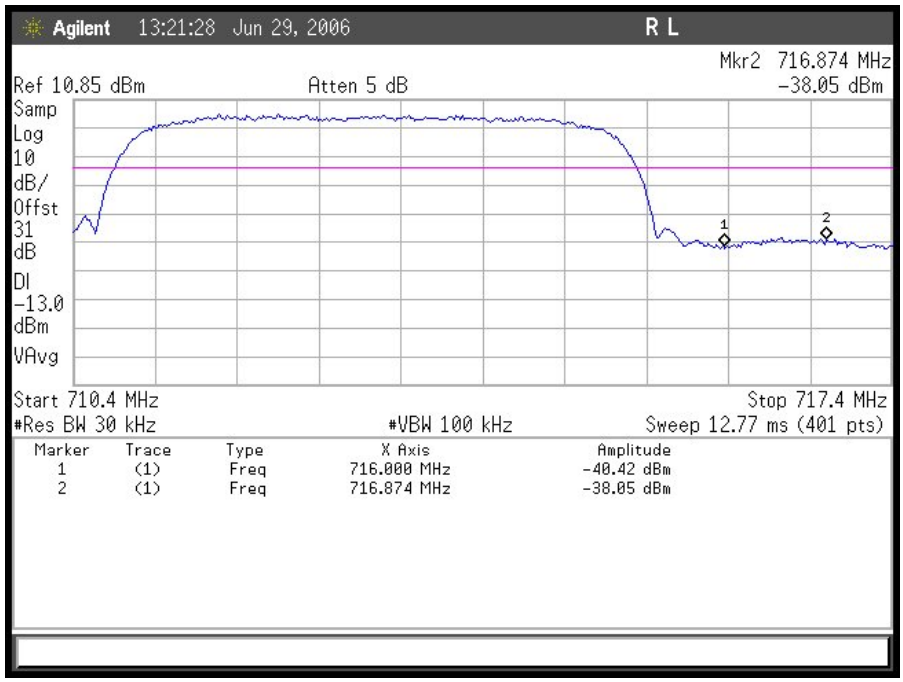
Plot 5: Conducted Spurious Emissions – Mid Channel



Plot 6: Conducted Spurious Emissions – High Channel



Plot 7: Band Edge – Low Channel



Plot 8: Band Edge – High Channel

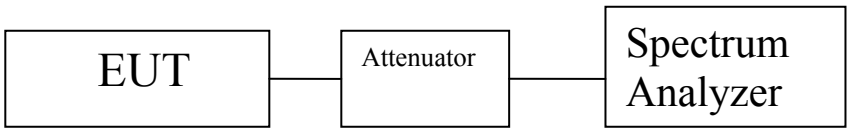


Figure 5. Block Diagram of Spurious Emissions at Antenna Terminals Test Setup

4.5. Radiated Emissions (Substitution Method)

Test Requirement(s): §2.1053

Test Procedures: As required by 47 CFR 2.1053, the *field strengths of radiated spurious emissions* 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 (equivalent to an Open Area Test Site). The distance between the EUT and the test antenna was 3 meter. The EUT's RF port was connected to a dummy load. The EUT was set to transmit at its designated operating frequency range and at its maximum output power level. The intensities of the radiated emissions were maximized by rotating the turntable 360 degrees and varying the receive antenna from 1 to 4m. Measurements were made with the receive antenna in both horizontal and vertical polarizations.

In order to determine the magnitude of the radiated emissions, a calibrated antenna source was positioned in place of the EUT and fed with a modulated carrier equal to that of the EUT. The effective isotropic radiated power of each emission was determined by adding the forward power to the substitution antenna at the previously recorded amplitude, and adding the gain of the antenna at the given frequency.

Test Results: Equipment complies with Section 2.1053.

Test Engineer(s): Shawn McMillen

Test Date(s): June 29, 2006

Radiated Emissions (Substitution Method) Test Results

Frequency (MHz)	Polarization V/H	Spectrum Analyzer Reading (dBm)	Substitution antenna power input (dBm)	Tx Ant. Gain (dBi)	EIRP (dBm)
1402	H	-67.17	-50.3	8.5	-41.8
2103	H	-70.33	-54.7	8.8	-45.9

***fo* = 701 MHz**

Frequency (MHz)	Polarization V/H	Spectrum Analyzer Reading (dBm)	Substitution antenna power input (dBm)	Tx Ant. Gain (dBi)	EIRP (dBm)
1414	H	-69.50	-51.1	8.5	-42.6
2121	H	-70.06	-57.2	8.8	-48.4

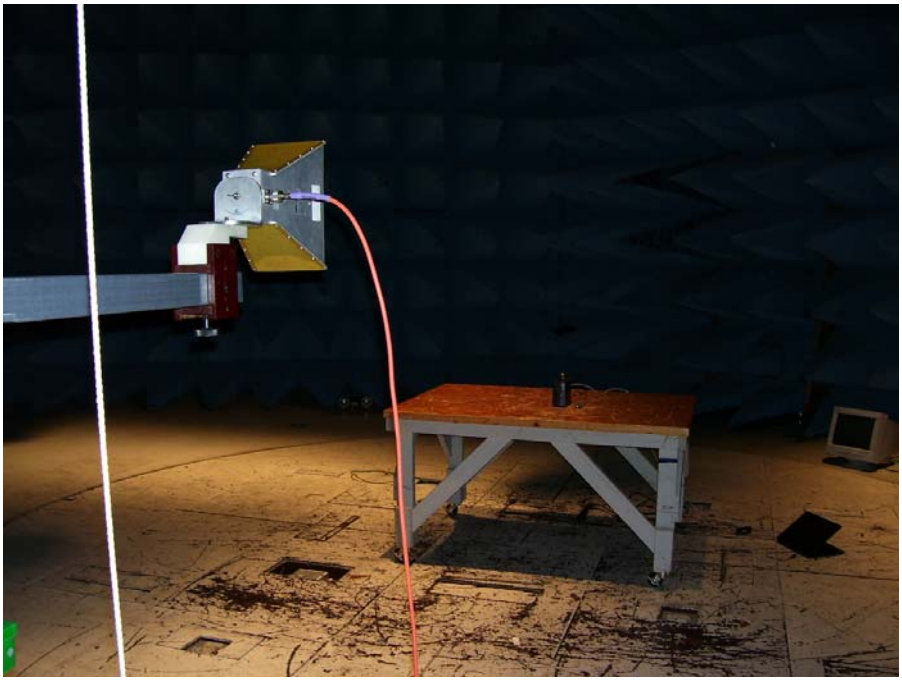
***fo* = 707MHz**

Frequency (MHz)	Polarization V/H	Spectrum Analyzer Reading (dBm)	Substitution antenna power input (dBm)	Tx Ant. Gain (dBi)	EIRP (dBm)
1426	H	-75.00	-50.2	8.5	-41.7
2139	H	-70.67	-55.6	8.8	-46.8

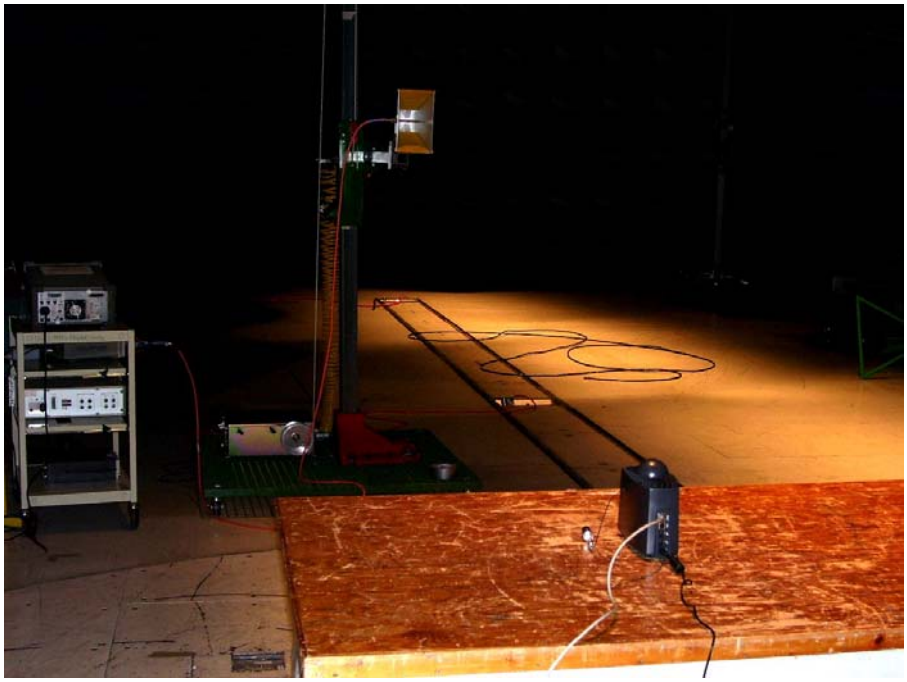
***fo* = 713 MHz**

Note: All other emissions were measured at the noise floor of the spectrum analyzer. The polarization of the receive antenna which produced the highest emission was reported.

Radiated Emissions (Substitution Method) Test Setup



Photograph 8. Radiated Emissions Test Setup, Front View



Photograph 9. Radiated Emissions Test Setup, Back View

4.6. Frequency Stability

Test Requirement(s): §2.1055 and §27.54

Test Procedures: As required by 47 CFR 2.1055, *Frequency Stability measurements* were made at the RF output terminals using a Spectrum Analyzer.

The EUT was incapable of generating a CW signal in order to use a frequency counter. As a result alternative measures were taken in order to demonstrate that the fundamental emissions stayed within the authorized frequency block.

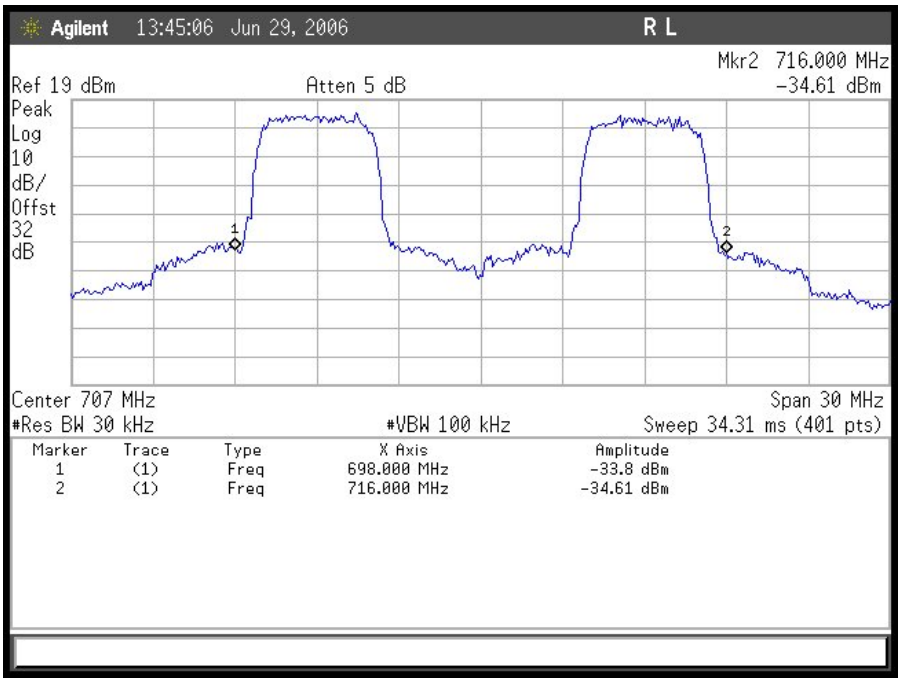
The EUT was placed in the Environmental Chamber and the support equipment was placed outside the chamber. The temperature chamber was set from -30 to 50^{C} in 10^{C} increment. The EUT was allowed sufficient time at each temperature setting in order to stabilize. At each temperature level the transmitter was set to the lowest and highest frequencies to the transmit band. The resulting carriers were captured on a spectrum analyzer in order to detect if fundamental emissions remained within the authorized frequency block.

In addition, the voltage supplied to EUT was varied by ± 15 % of nominal voltage. These tests were carried out at normal room temperatures.

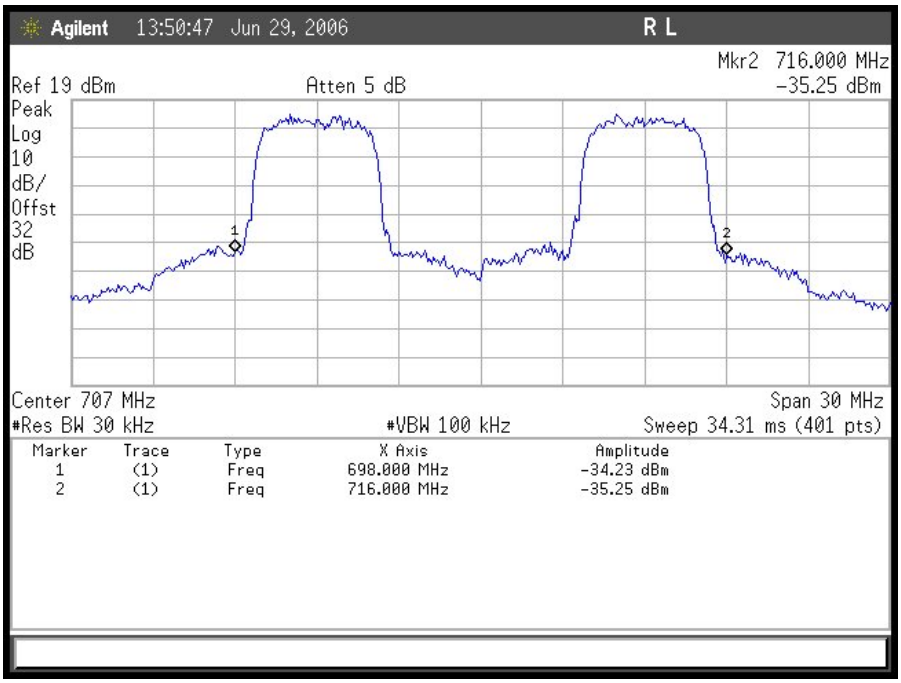
Test Results: Equipment complies with Section 2.1055 and 27.54. The following plots show frequency stability compliance.

Test Engineer(s): Shawn McMillen

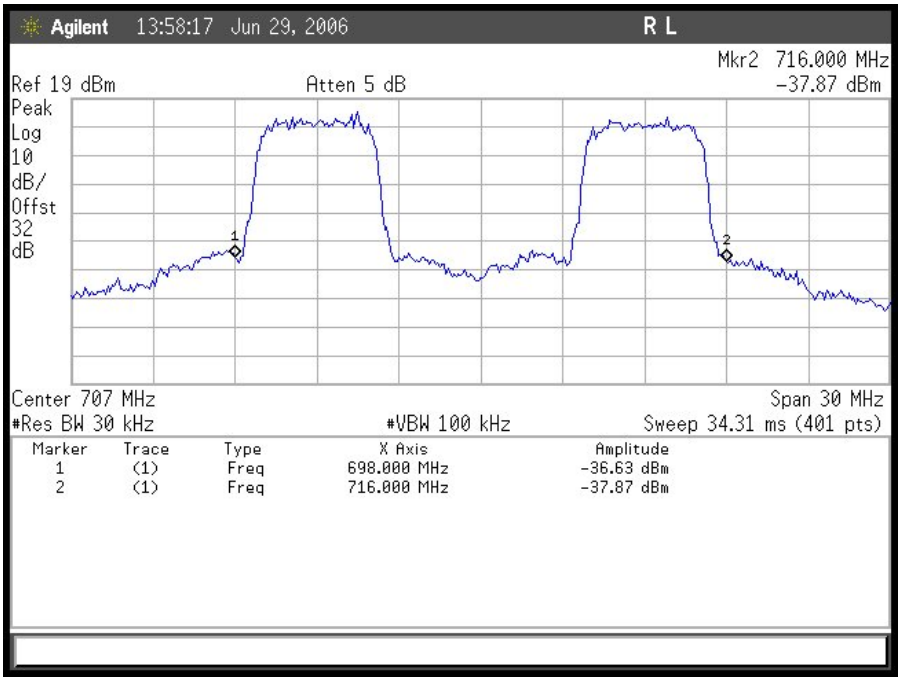
Test Date(s): June 29, 2006



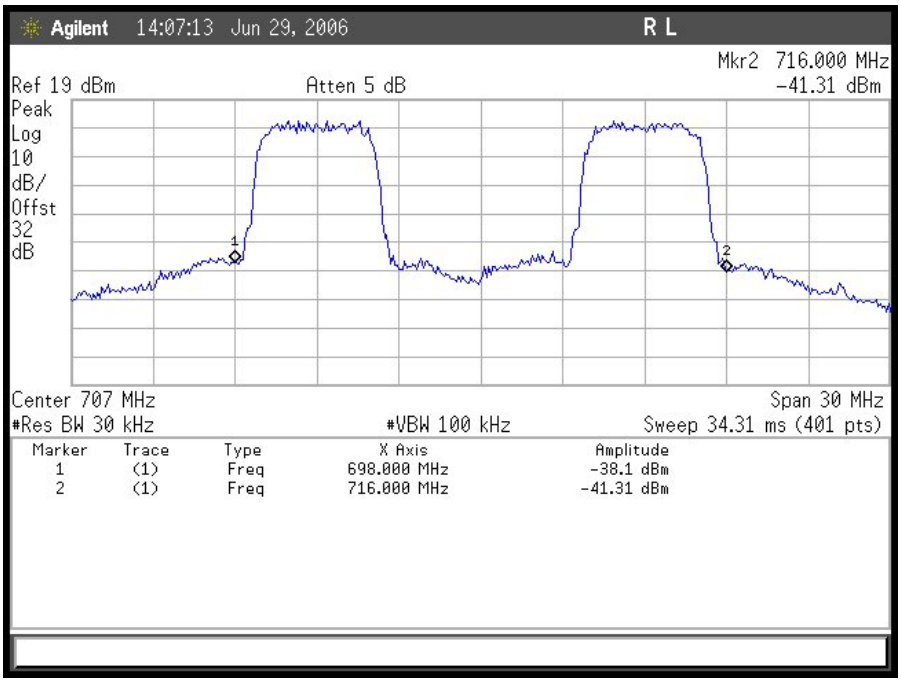
Plot 9. Frequency stability at -30 deg C and normal voltage



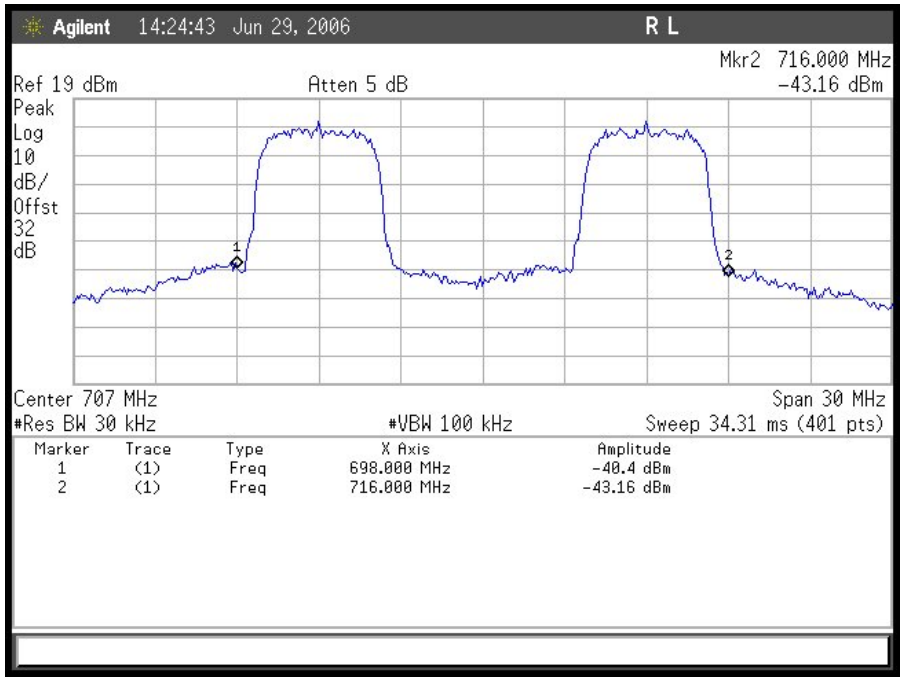
Plot 10. Frequency stability at -20 deg C and normal voltage



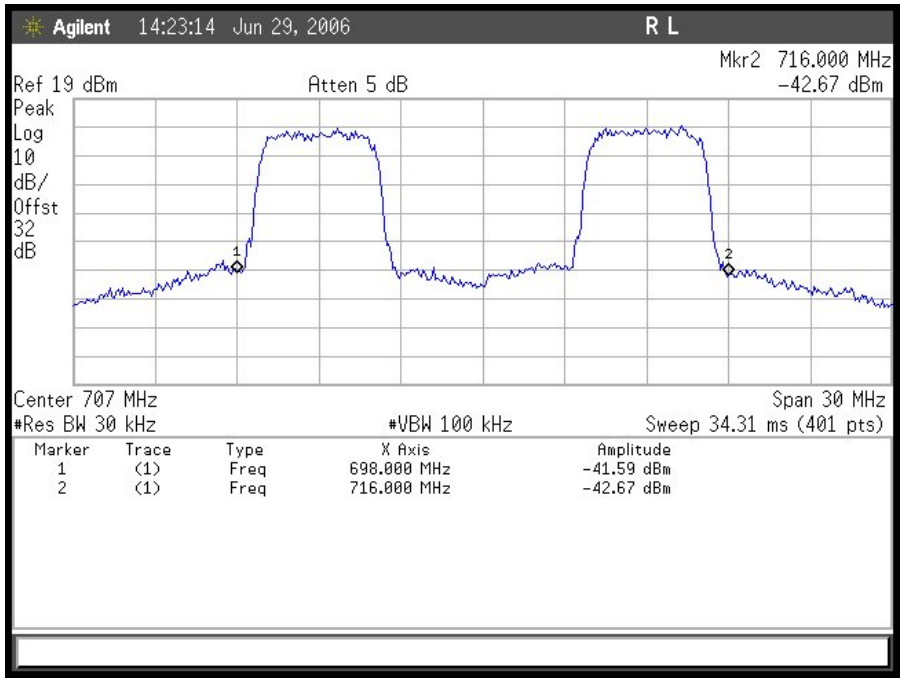
Plot 11. Frequency stability at -10 deg C and normal voltage



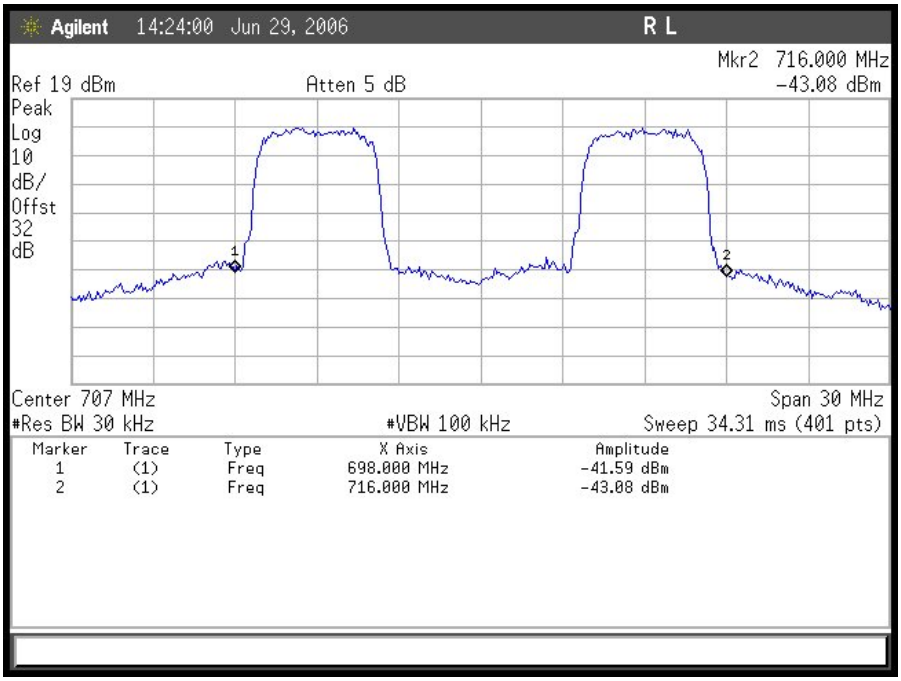
Plot 12. Frequency stability at 0 deg C and normal voltage



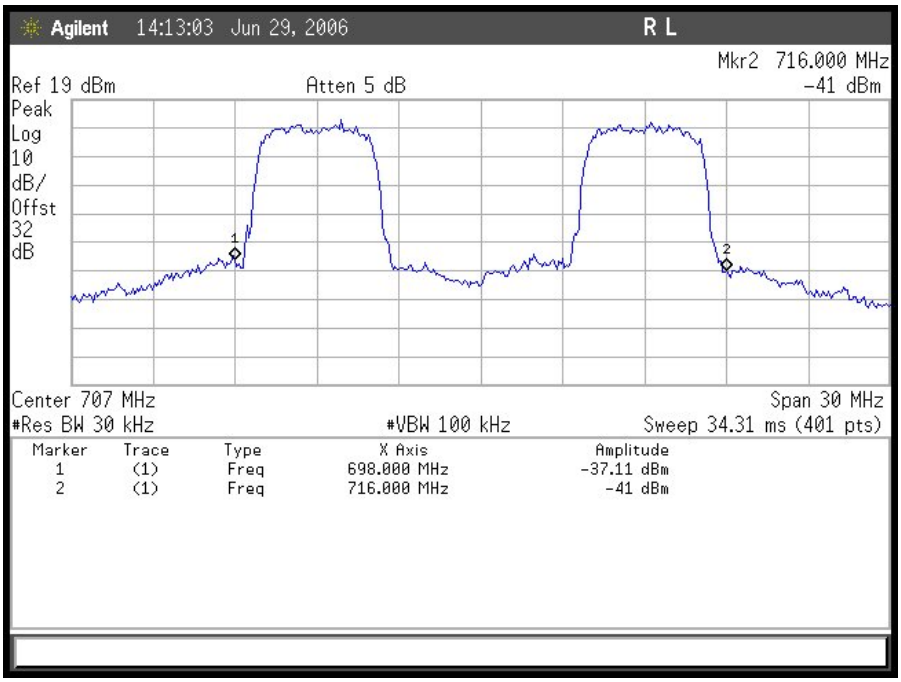
Plot 13. Frequency stability at 20 deg C and minimal voltage



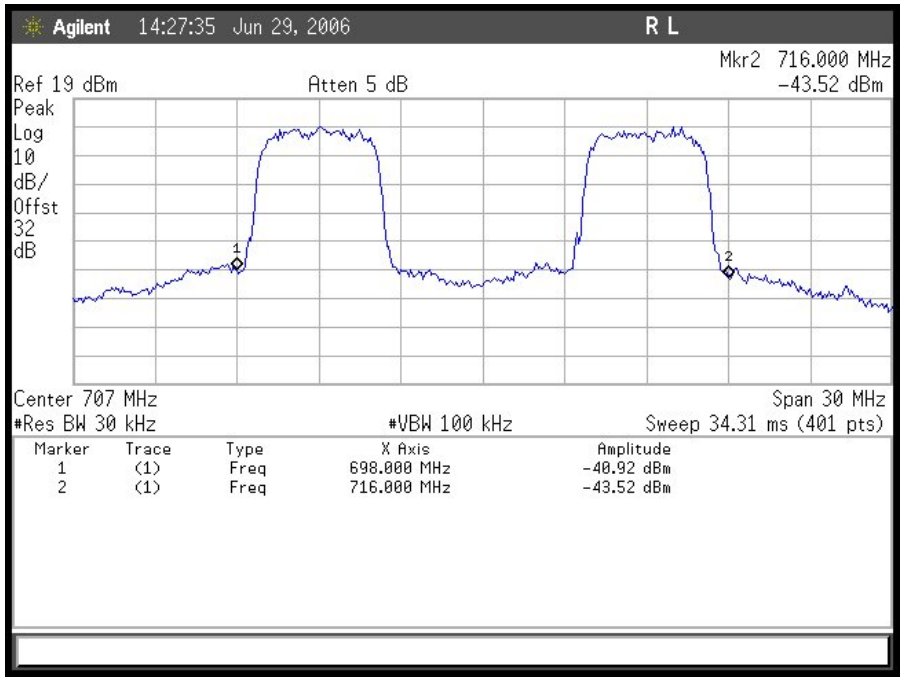
Plot 14. Frequency stability at 20 deg C and normal voltage



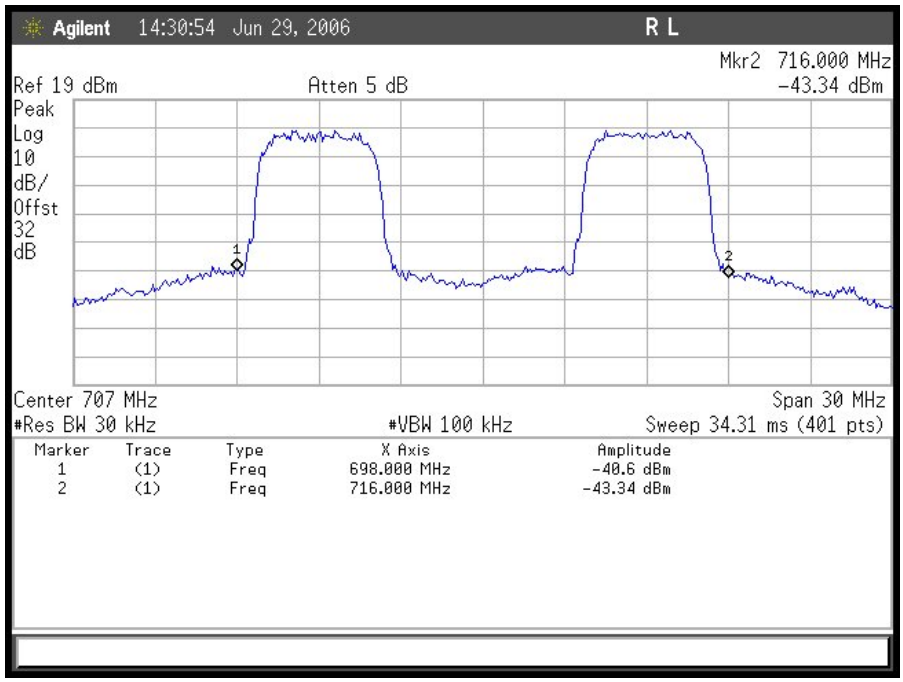
Plot 15. Frequency stability at 20 deg C and maximum voltage



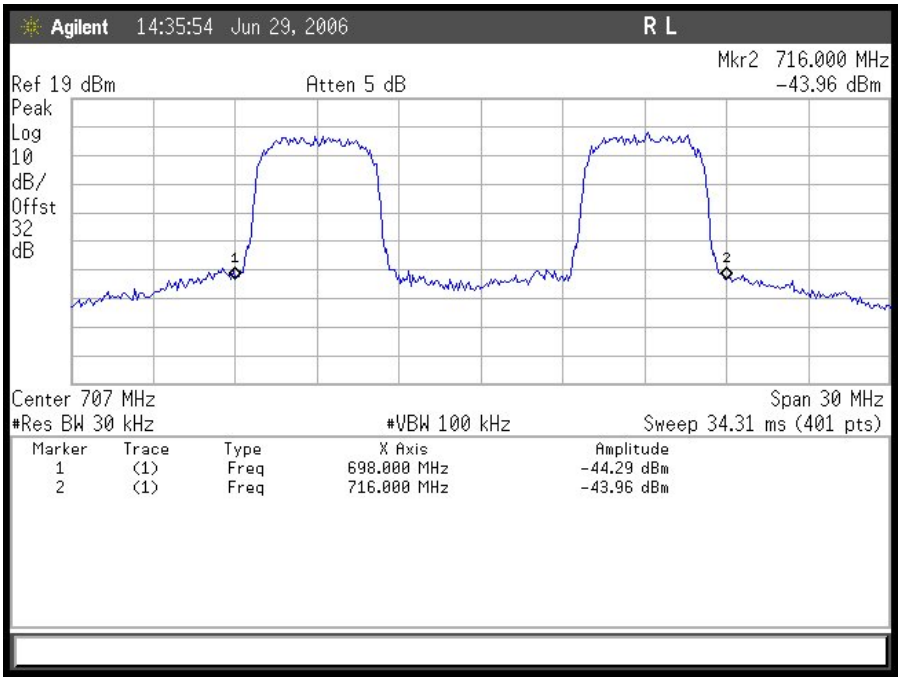
Plot 16. Frequency stability at +10 deg C and normal voltage



Plot 17. Frequency stability at +30 deg C and normal voltage



Plot 18. Frequency stability at +40 deg C and normal voltage



Plot 19. Frequency stability at +50 deg C and normal voltage

5. 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
1S2034	COUPLER, DIRECTIONAL 1-20 GHz	KRYTAR	101020020	SEE NOTE	
1S2041	COUPLER, BI DIRECTIONALCOAXIAL	NARDA	N/A	SEE NOTE	
1S2121	PRE-AMPLIFIER	HEWLETT PACKARD	8449B	10/14/2005	10/14/2006
1S2128	Harmonic Mixer	Hewlett Packard	11970A	10/07/2003	10/07/2006
1S2184	BILOG ANTENNA	CHASE	CBL6112A	1/12/2006	1/12/2007
1S2198	ANTENNA, HORN	EMCO	3115	7/14/2005	7/14/2006
1S2202	ANTENNA, HORN, 1 METER	EMCO	3116	3/23/2004	3/23/2007
1S2263	CHAMBER, 10 METER	RANTEC	N2-14	7/25/2005	7/25/2006
1S2421	EMI RECEIVER	ROHDE&SCHWARZ	ESIB 7	2/9/2006	2/9/2007
1S2430	WIDEBAND POWER METER	ANRITSU COMPANY	ML2488A	1/12/2006	1/12/2007
1S2432	WIDEBAND POWER SENSOR	ANRITSU COMPANY	MA2491A	1/12/2006	1/12/2007
1S2460	Analyzer, Spectrum 9 kHz-40GHz	Agilent	E4407B	07/06/2005	07/06/2008
N/A	HIGH PASS FILTER	MICRO-TRONICS	HPM13146	SEE NOTE	

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

6. Certification Label & User's Manual Information

6.1 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 proviso 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 J — 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, or the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant, whichever is applicable.

§ 2.907 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.

§ 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.

[1] In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart C (of Part 15), which deals with intentional radiators.

(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

6.2. 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:

(ii 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.

(ii 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.

(ii 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.

