MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*
33439 WESTERN AVENUE ! UNION CITY, CALIFORNIA 94587 ! PHONE (510) 489-6300 ! FAX (510) 489-6372

June 14, 2006

LGC Wireless
2540 Junction Avenue
San Jose, CA 95134

Dear Tom Macall,

Enclosed is the EMC test report for compliance testing of the LGC Wireless, FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU as tested to the requirements of the FCC Certification rules under Title 47 of the CFR Part 24 Subpart E for Broadband PCS Devices and Part 15 Subpart B for Unintentional Radiators.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please contact me.

Sincerely yours,
MET LABORATORIES, INC.

Boonmanus Seelapasay
Documentation Department

Reference: (\LGC Wireless\EMCS20025-FCC24E)

Electromagnetic Compatibility Criteria
Test Report

for the

LGC Wireless
FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU

Verified under
FCC Certification Rules
Title 47 of the CFR, Part 24 Subpart E
for Broadband PCS Devices

MET Report: EMCS20025-FCC24E

June 14, 2006

Prepared For:

LGC Wireless
2540 Junction Avenue
San Jose, CA 95134

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

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Title 47 of the CFR, Part 24 Subpart E
for Broadband PCS Devices

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 24 Subpart E 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 14, 2006	Initial Issue.

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List of Terms and Abbreviations

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

I. Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the LGC Wireless FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU, with the requirements of Part 24 Subpart E and Part 15 Subpart B. 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 FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU. LGC Wireless should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 24 Subpart E and Part 15 Subpart B, in accordance with LGC Wireless, purchase order number 717037.

Reference	Description	Compliance
Part 15 Subpart B §15.109(a)	Conducted Emissions	None
Part 15 Subpart B §15.107(a)	Radiated Emissions	None
§2.1046; §24.232	RF Power Output	None
§2.1047	Modulation Characteristics	Not Applicable
§2.1049	Occupied Bandwidth	None
§2.1051; §24.238	Spurious Emissions at Antenna Terminals	None
§2.1053; §24.238	Radiated Spurious Emissions	None
§2.1055; §24.135	Frequency Stability	None
2-11-04/EAB/RF	Out of Band Rejection	None

Table 1 Executive Summary of EMC ComplianceTesting

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by LGC Wireless to perform testing on the FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU, under LGC Wireless's purchase order number 717037.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the LGC Wireless, FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU.

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

Model(s) Tested:	FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU	
Model(s) Covered:	FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU	
EUT Specifications:	Primary Power: 120 VAC	
	FCC ID: NOOFSN-809019-1	
	Type of Modulations:	CDMA
		TDMA
		GSM
	Equipment Class:	PCB
	Max RF Output Power:	CDMA: 28.30 dBm
		TDMA: 27.15 dBm
		GSM: 25.22 dBm
	EUT Frequency Ranges:	Downlink: 1930-1995 MHz
		Uplink: 1850-1915 MHz
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 14, 2006	

B. References

CFR 47, Part 24, Subpart E	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 24: Rules and Regulations for Personal Communications Services
CFR 47, Part 15, Subpart B	Electromagnetic Compatibility: Criteria for Radio Frequency Devices
ANSI C63.4:2003	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI/NCSL Z540-1-1994	Calibration Laboratories and Measuring and Test Equipment - General Requirements
ANSI/ISO/IEC 17025:2000	General Requirements for the Competence of Testing and Calibration Laboratories
EIA/TIA-603-A-2004	Land Mobile FM or PM Communication Equipment Measurement and Performance Standards

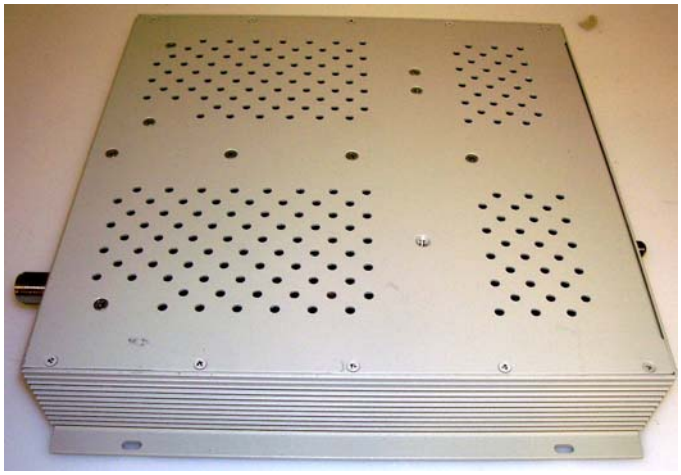
C. Test Site

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 (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories. In accordance with §2.948(d), MET Laboratories has been accredited by the National Voluntary Laboratory Accreditation Program (Lab Code: 100273-0).

D. Description of Test Sample

The LGC Wireless FSN-1-MH-1Main Hub, FSN-EH-1 Expansion Hub, and FSN809019-1 RAU, is an RF amplification and distribution system. In the downlink direction, the Main Hub (MH) unit receives an RF signal, from a base station or antenna system, which is then converted to IF signal. The IF signal is sent to the Expansion Hub (EH) via fiber link. The expansion hub distributes the IF signal to the remote access unit (RAU) via coax cable. The RAU then converts the IF to RF signal which is outputted to an antenna. In the Uplink direction the signal is received from the antenna by the RAU, which is processed back to the base station via the expansion and main hubs. The coax connection from expansion hub to remote unit also carries 54VDC power the remote unit.



Photograph 1. LGC Wireless FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU

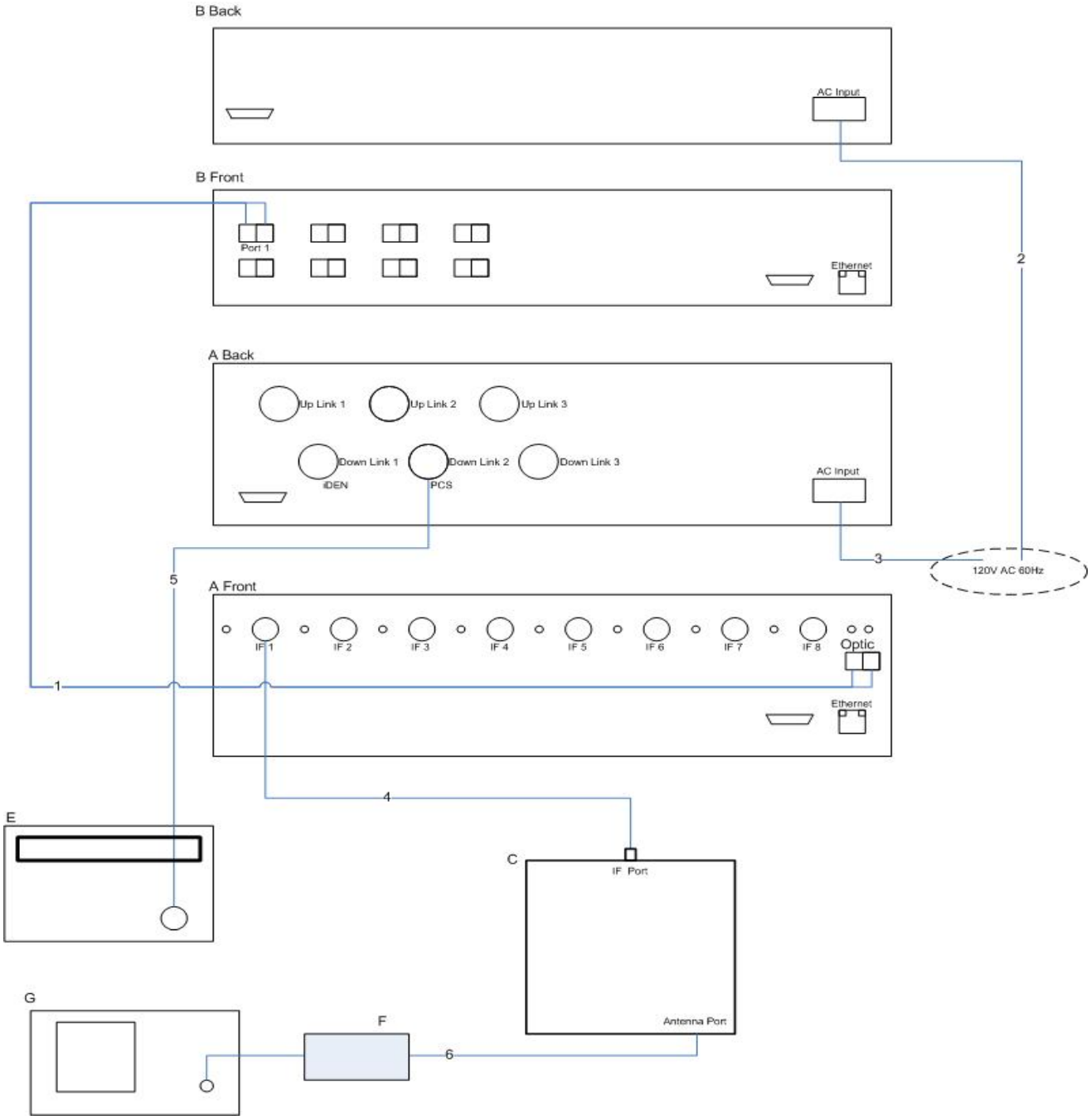


Figure 1. Block Diagram of Test Configuration, Downlink Conducted Measurement

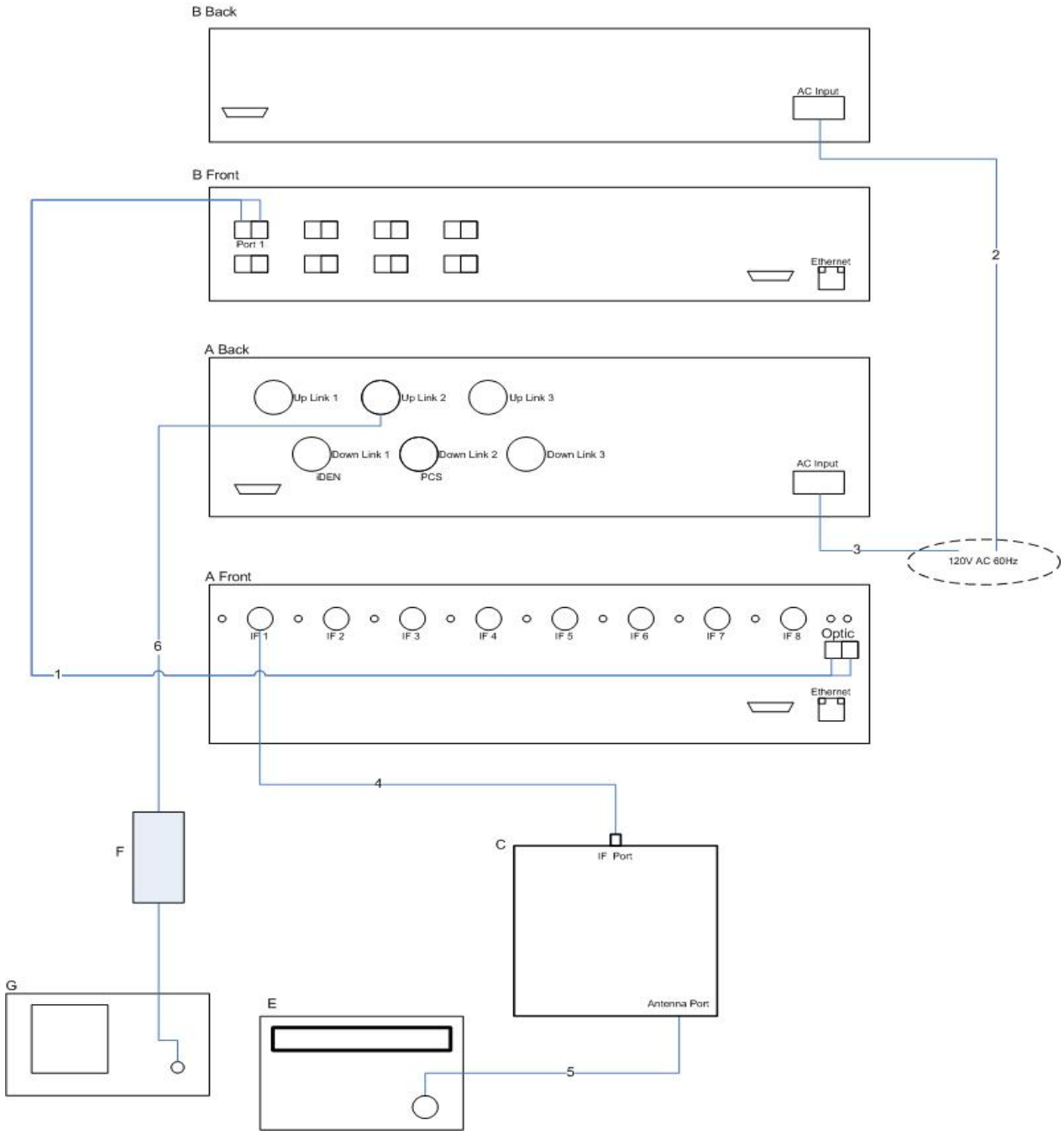


Figure 2. Block Diagram of Test Configuration, Uplink Conducted Measurement

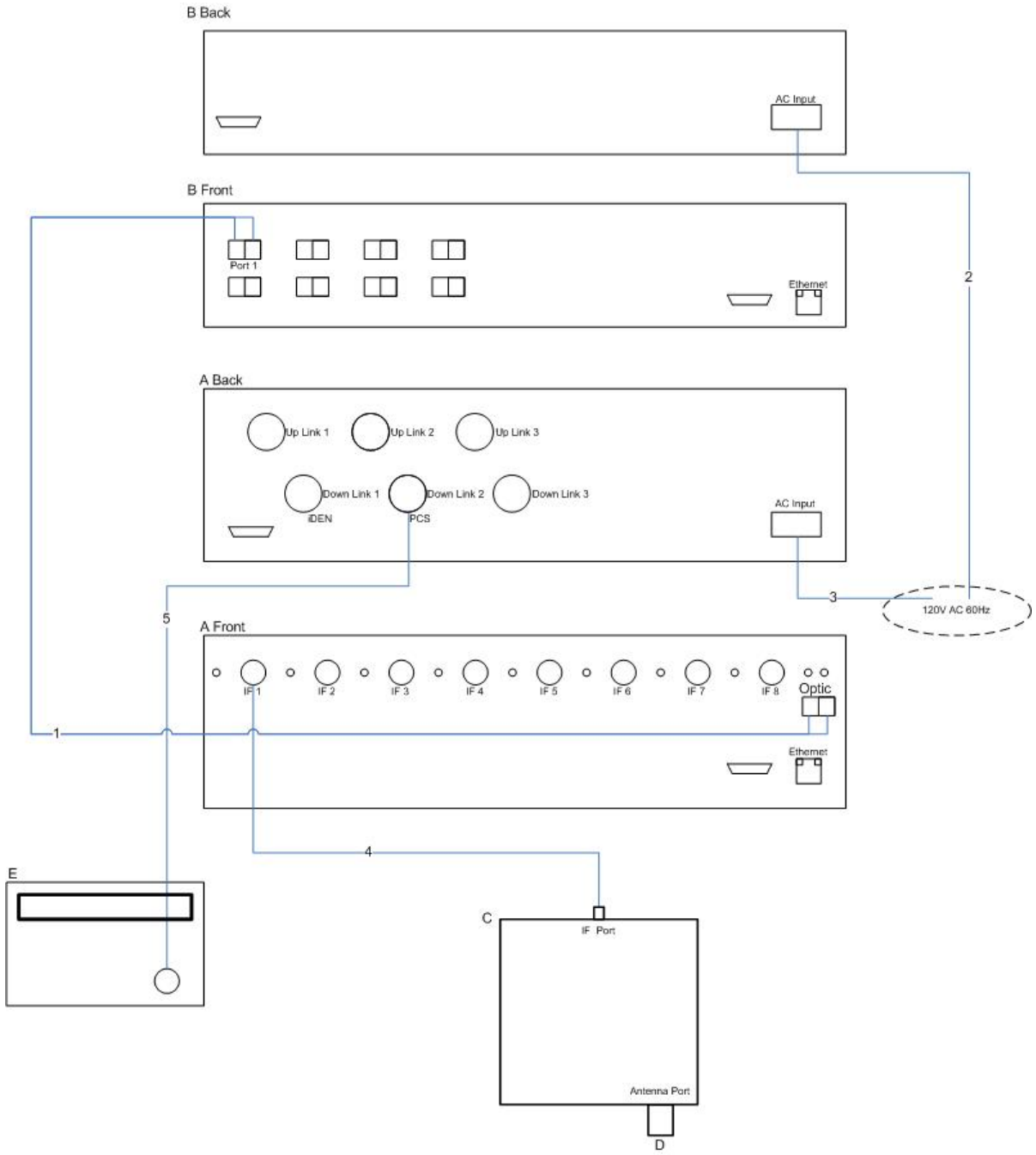


Figure 3. Block Diagram of Test Configuration, Downlink Spurious Measurement

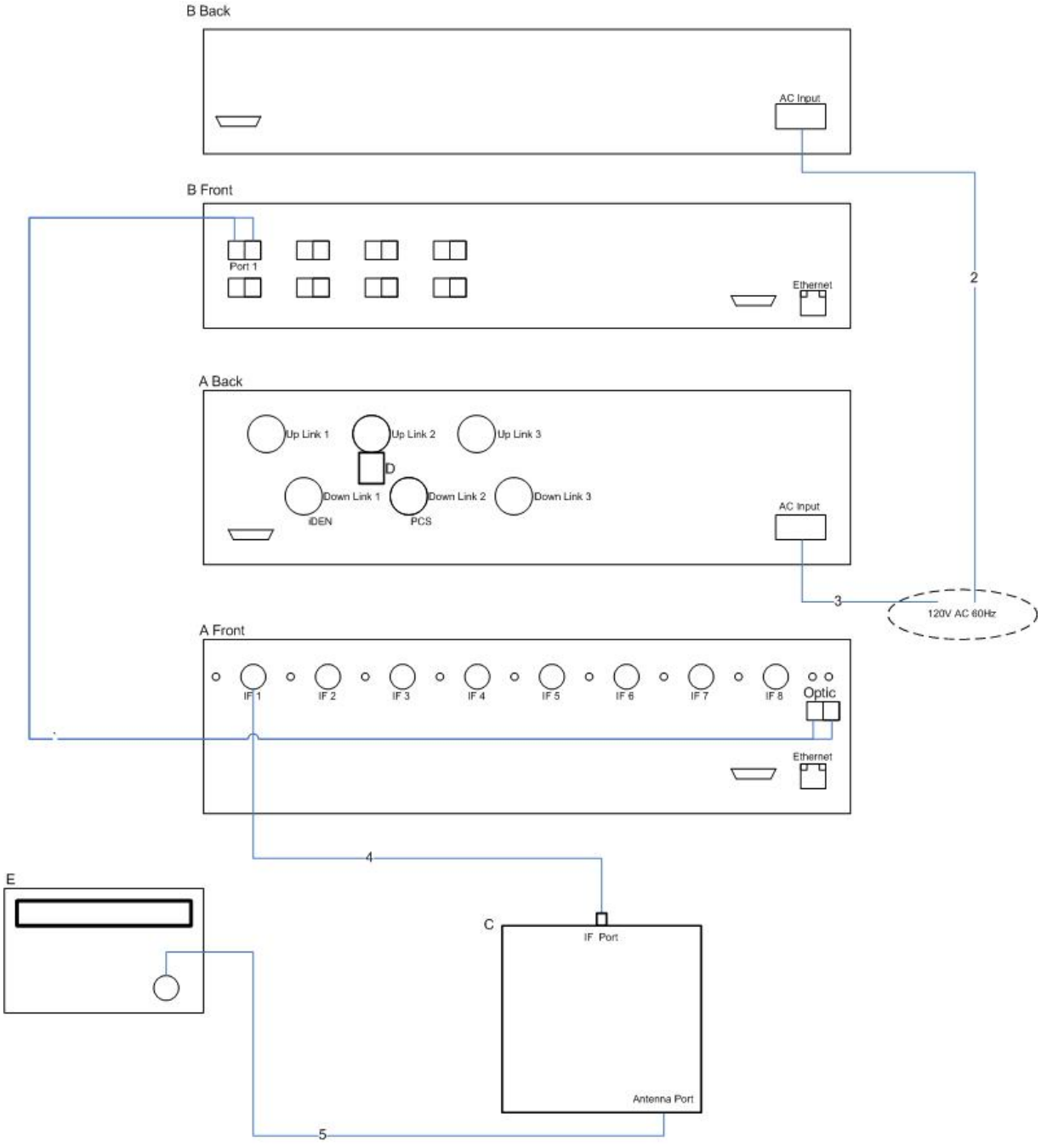


Figure 4. Block Diagram of Test Configuration, Uplink Spurious Measurement

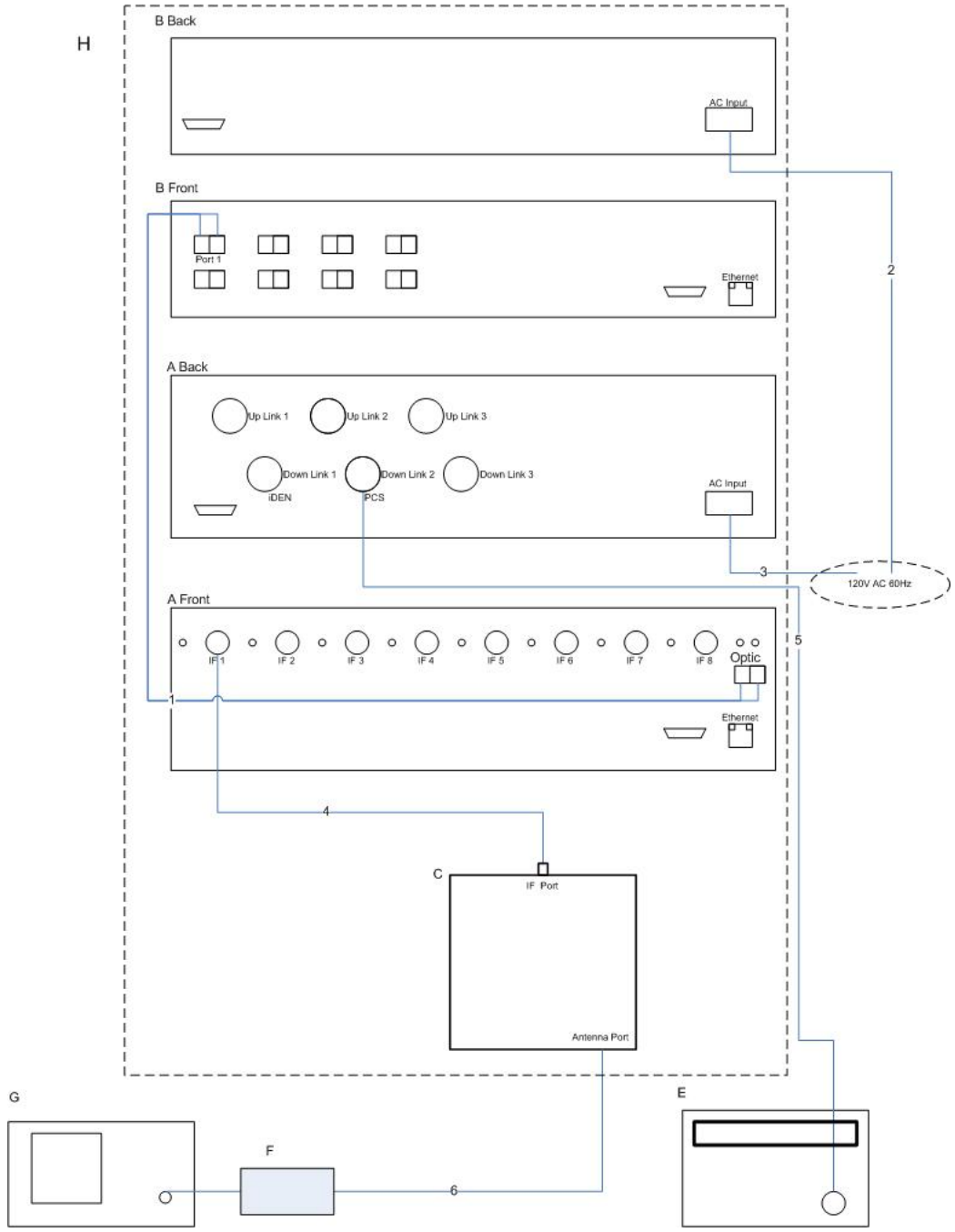


Figure 5. Block Diagram of Test Configuration Downlink Frequency Stability Measurement

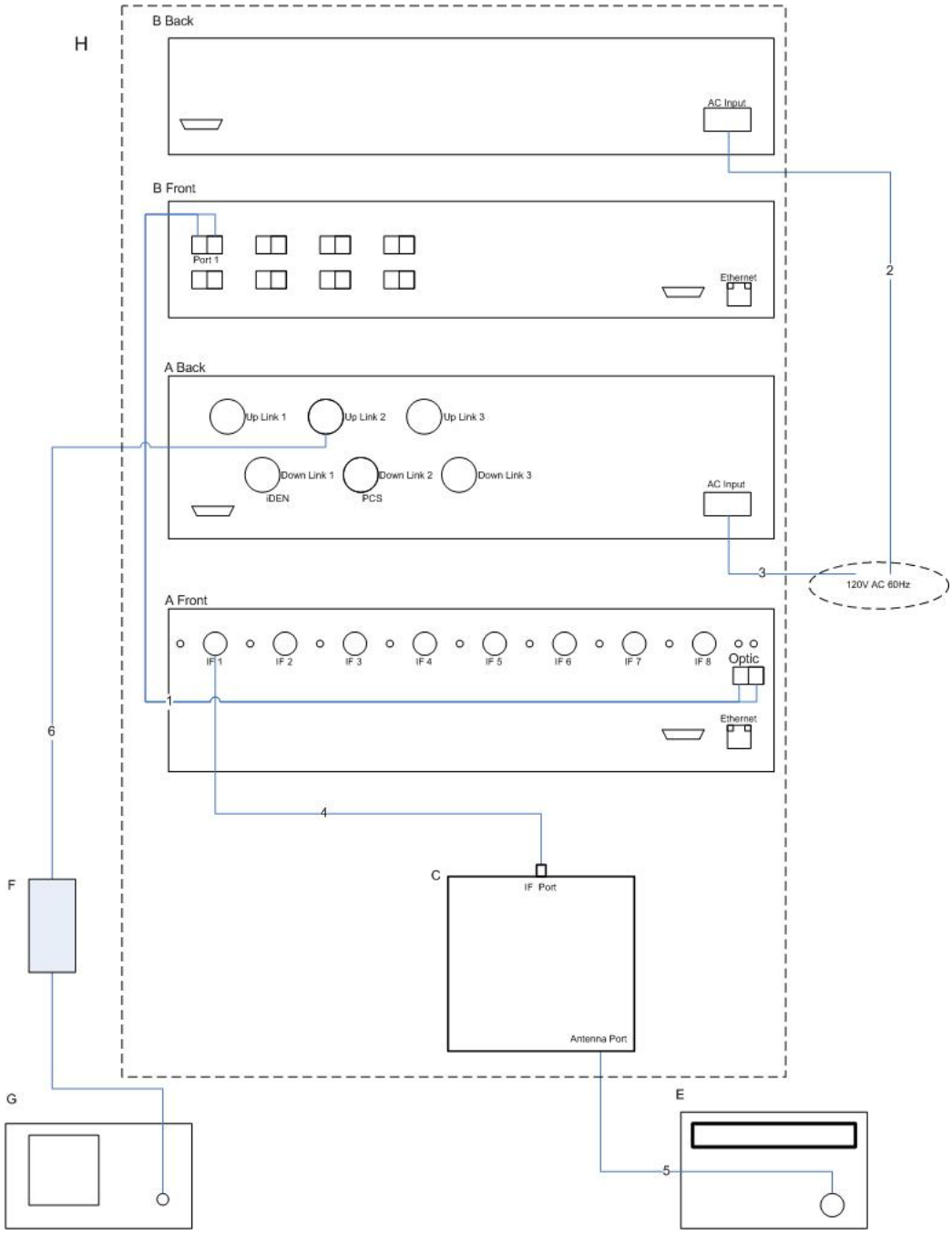


Figure 6. Block Diagram of Test Configuration Uplink Frequency Stability Measurement

E. Equipment Configuration

The EUT was set up as outlined in Figure 1, Figure 2, Figure 3, Figure 4, Figure 5, and Figure 6. All cards, racks, etc., incorporated as part of the EUT is included in the following list.

Ref. ID	Name / Description	Model Number	Part Number	Serial Number
A	Expansion Hub	710612-0	F0100HX8	A
B	Main Hub	710610-0 710612-0	F0100HX0 F0100HWR	B
C	RAU (Main board)	710690-0	F0100ZX0	C

Table 2. Equipment Configuration

F. Support Equipment

LGC Wireless supplied support equipment necessary for the operation and testing of the FSN-1-MH-1 Main Hub, FSN-EH-1 Expansion Hub and FSN 809019-1 RAU. All support equipment supplied is listed in the following Support Equipment List.

Ref. ID	Name / Description	Manufacturer	Model Number	Serial Number
D	Signal Generator	HP	E4432B	US38080117
E	50 Ohms Terminator	Narda	375BNB	07
F	Amplifier	Mini-Circuit	ZHL-4240W	D111903#8
G	Spectrum Analyzer	HP	E4407B	MY45102898
H	Temperature Chamber	Tenny Engineering	T630	11939-5

Table 3. Support Equipment

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

G. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty.	Length (m)	Shielded (Y/N)	Termination Box ID & Port ID
Spurious, Radiated & Conducted Emission (Down-Link)						
1	A Front, Optic Tx Rx	Single Mode Optic	2	2	No	B, Port 1 Rx Tx
2	B Back, AC Input	AC PWR Cord	1	2	No	AC PWR Outlet
3	A Back, AC Input	AC PWR Cord	1	2	No	AC PWR Outlet
4	A Front, IF 1	Coax	1	30	Yes	C, IF Port
5	A Back, Down-Link 2	Coax	1	5	Yes	E
Spurious, Radiated & Conducted Emission (Up-Link)						
1	A Front, Optic Tx Rx	Single Mode Optic	2	2	No	B, Port 1 Rx Tx
2	B Back, AC Input	AC PWR Cord	1	2	No	AC PWR Outlet
3	A Back, AC Input	AC PWR Cord	1	2	No	AC PWR Outlet
4	A Front, IF 1	Coax	1	30	Yes	C, IF Port
5	C, Antenna Port	Coax	1	5	Yes	E
Frequency Stability & Conducted Measurement (Up-Link)						
1	A Front, Optic Tx Rx	Single Mode Optic	2	2	No	B, Port 1 Rx Tx
2	B Back, AC Input	AC PWR Cord	1	2	No	AC PWR Outlet
3	A Back, AC Input	AC PWR Cord	1	2	No	AC PWR Outlet
4	A Front, IF 1	Coax	1	30	Yes	C, IF Port
5	C, Antenna Port	Coax	1	5	Yes	E
6	A Back, Up-Link 2	Coax	1	1	Yes	F
Frequency Stability & Conducted Measurement (Down-Link)						
1	A Front, Optic Tx Rx	Single Mode Optic	2	2	No	B, Port 1 Rx Tx
2	B Back, AC Input	AC PWR Cord	1	2	No	AC PWR Outlet
3	A Back, AC Input	AC PWR Cord	1	2	No	AC PWR Outlet
4	A Front, IF 1	Coax	1	30	Yes	C, IF Port
5	A Back, Down-Link 2	Coax	1	5	Yes	E
6	C, Antenna Port	Coax	1	1	Yes	F

Table 4. Ports and Cabling Information

H. Mode of Operation

Uplink mode: Simulation signal is being generated from Signal Generator then feed into Antenna port of RAF. Output is monitored by Spectrum analyzer through Hub's uplink port.

Downlink Mode: Simulation signal is being generated from Signal Generator then feed into Downlink port of hub. Output is monitored by Spectrum analyzer through RAU Antenna port.

I. Method of Monitoring EUT Operation

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

J. Modifications

a.) Modifications to EUT

No modifications were made to the EUT.

b.) Modifications to Test Standard

No modifications were made to the test standard.

K. Disposition of EUT

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

III. Electromagnetic Compatibility Criteria for Unintentional Radiators

Electromagnetic Compatibility Criteria for Unintentional Radiators

§ 15.107(a) 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 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.				

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 measured using a quasi-peak and/or average detector as appropriate.

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

Test Engineer(s): Elijah Garcia

Test Date(s): June 7, 2006

Conducted Emissions - Voltage, AC Power, Top Unit

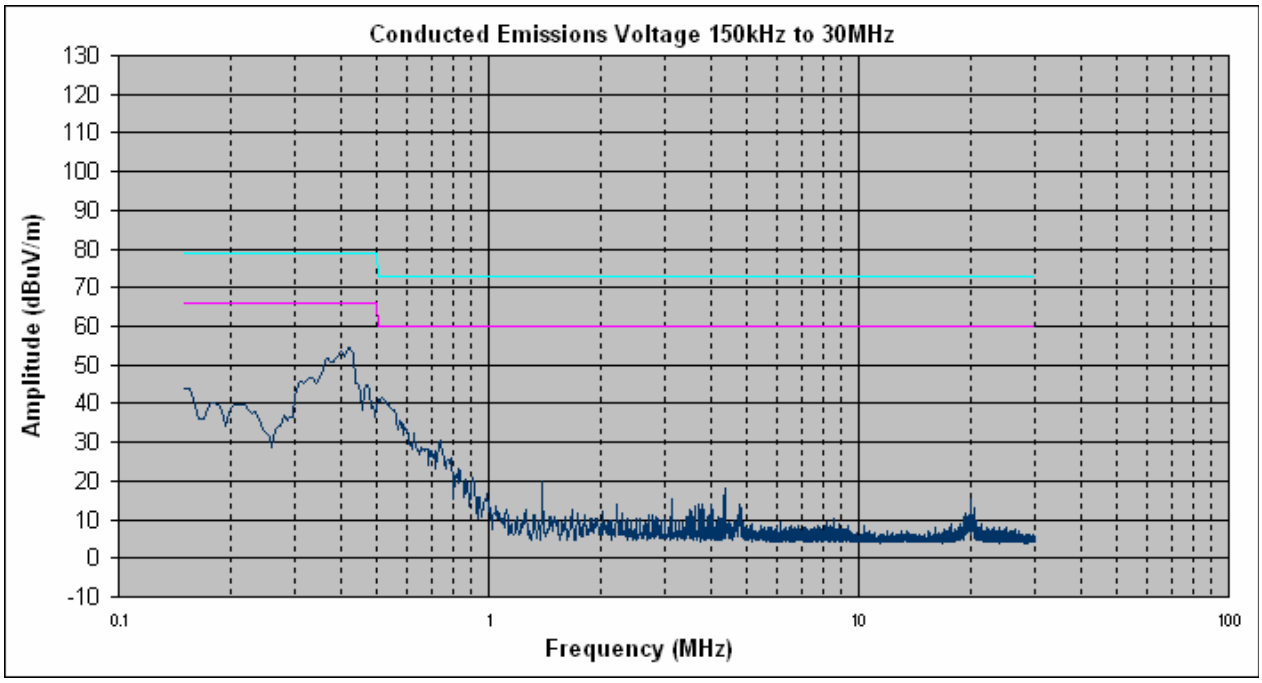
FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Results QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Results AVG	Margin (dB) AVG
0.209	31.83	79	PASS	-47.17	27.11	66	PASS	-38.89
0.412	51.83	79	PASS	-27.17	41.33	66	PASS	-24.67
0.745	26.11	73	PASS	-46.89	16.52	60	PASS	-43.48

Table 6. Conducted Emissions - Voltage, AC Power, Phase Line 120 VAC, Top Unit

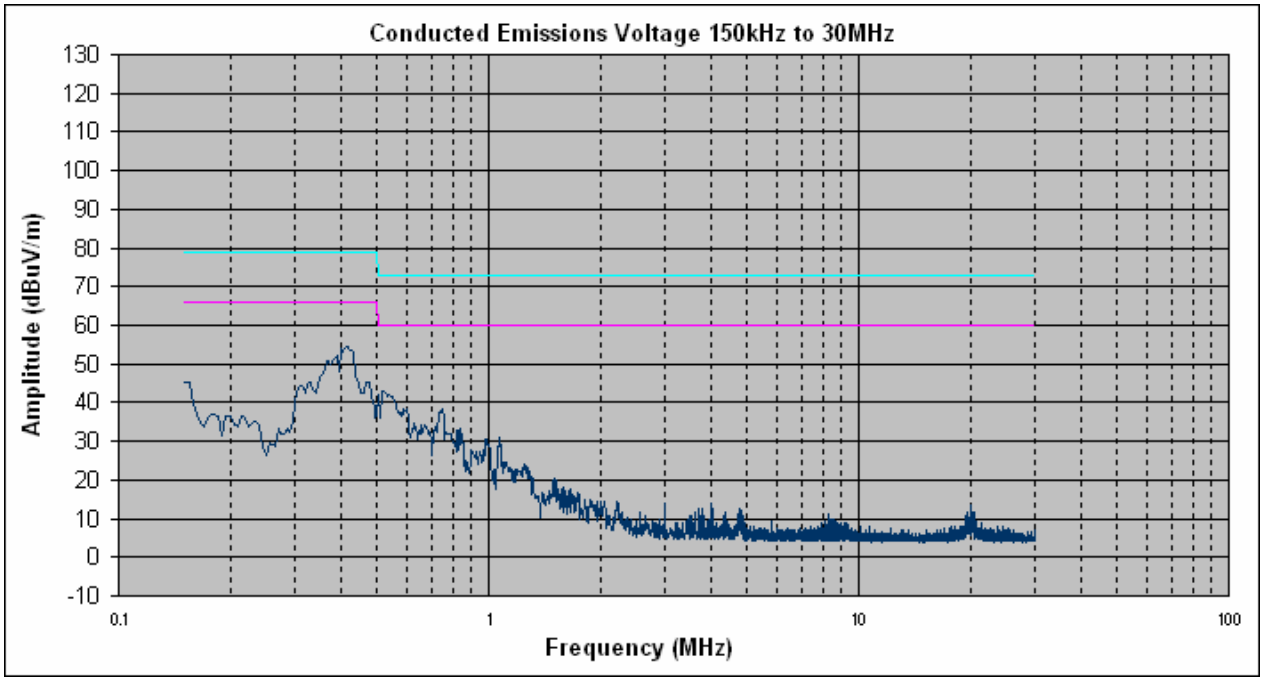
FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Results QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Results AVG	Margin (dB) AVG
0.165	29.58	79	PASS	-49.42	17.81	66	PASS	-48.19
0.208	28.82	79	PASS	-50.18	24.4	66	PASS	-41.6
0.414	51.15	79	PASS	-27.85	41.2	66	PASS	-24.8

Table 7. Conducted Emissions - Voltage, AC Power, Neutral Line 120 VAC, Top Unit

Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Top Unit



Conducted Emission, Phase Line Plots, Top Unit



Conducted Emission, Neutral Line Plots, Top Unit

Conducted Emissions - Voltage, AC Power, Expansion Hub

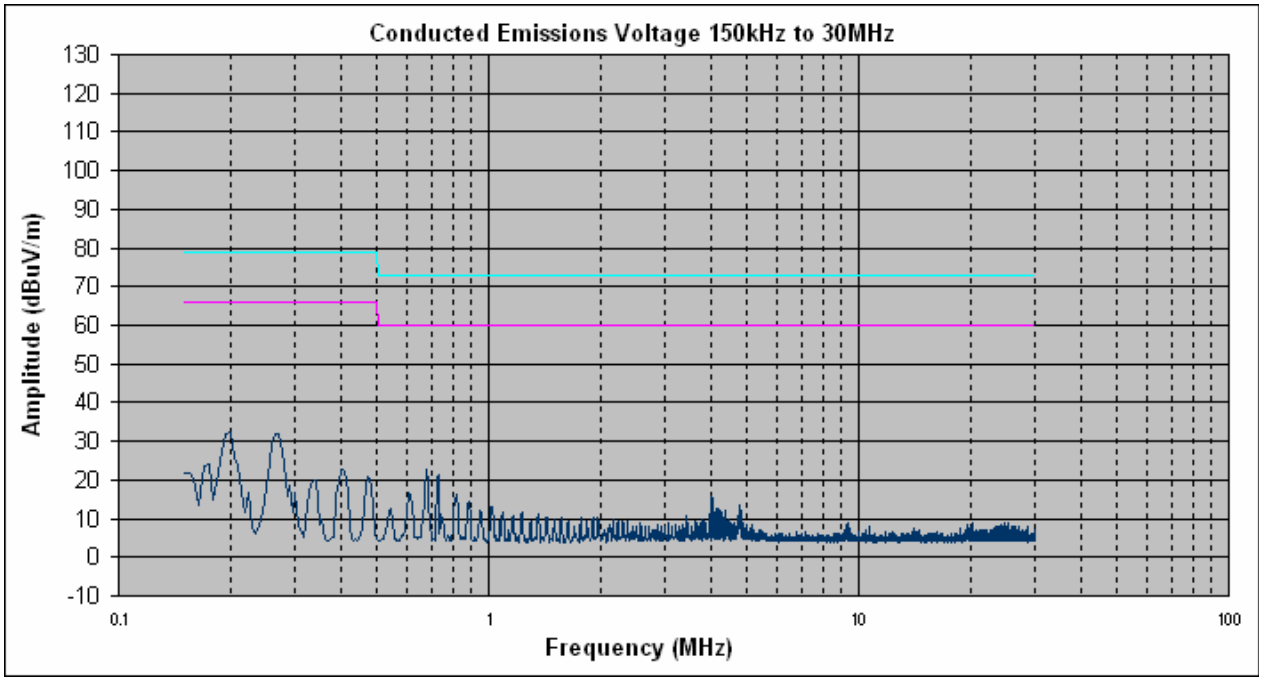
FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Results QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Results AVG	Margin (dB) AVG
0.2	31.71	79	PASS	-47.29	28.57	66	PASS	-37.43
0.271	31.48	79	PASS	-47.52	31.31	66	PASS	-34.69
0.677	17.17	73	PASS	-55.83	15.62	60	PASS	-44.38

Table 8. Conducted Emissions - Voltage, AC Power, Phase Line 120 VAC, Expansion Hub

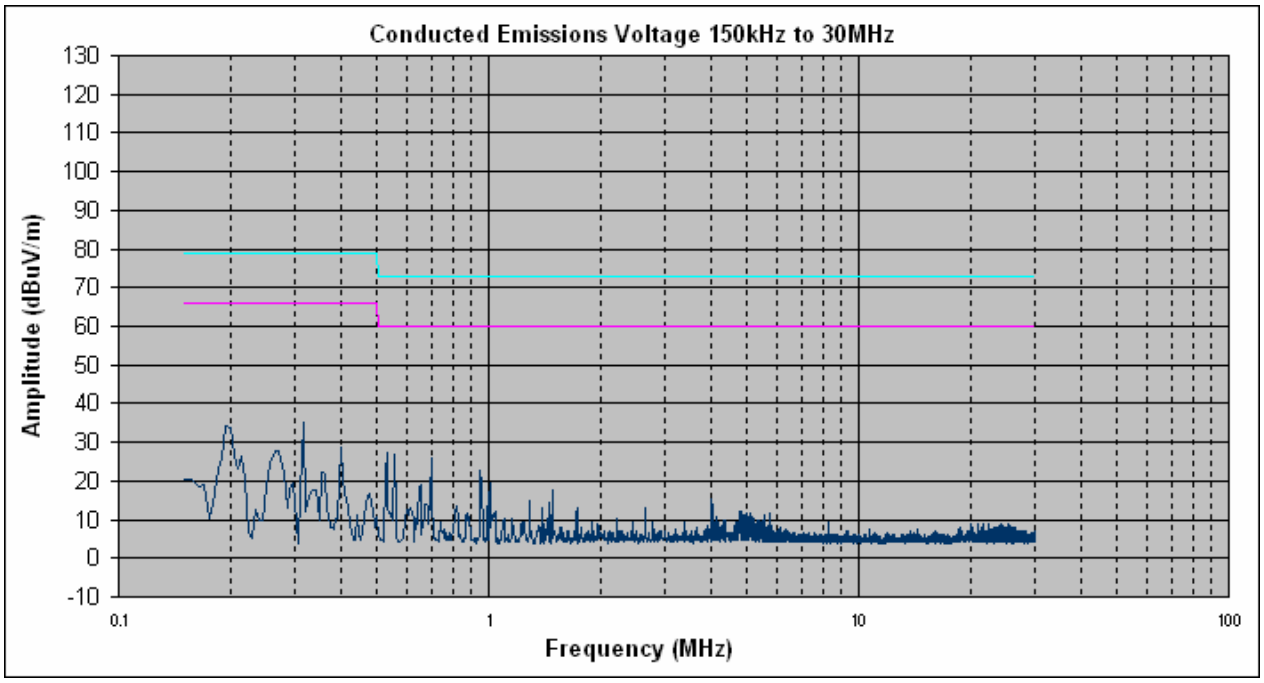
FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	ResultsQP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	ResultsAVG	Margin (dB) AVG
0.202	29.77	79	PASS	-49.23	24.1	66	PASS	-41.9
0.271	26.99	79	PASS	-52.01	25.43	66	PASS	-40.57
0.407	16.51	79	PASS	-62.49	15.33	66	PASS	-50.67

Table 9. Conducted Emissions - Voltage, AC Power, Neutral Line 120 VAC, Expansion Hub

Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Expansion Hub

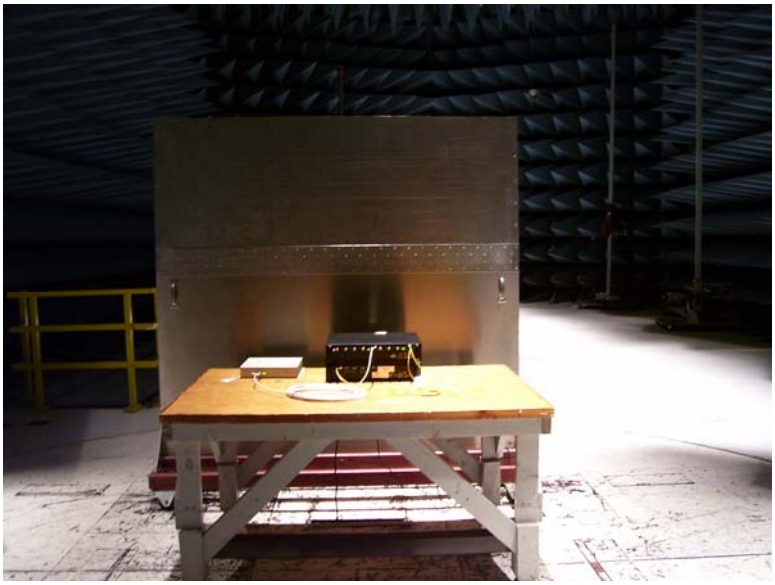


Conducted Emission, Phase Line Plots, Expansion Hub

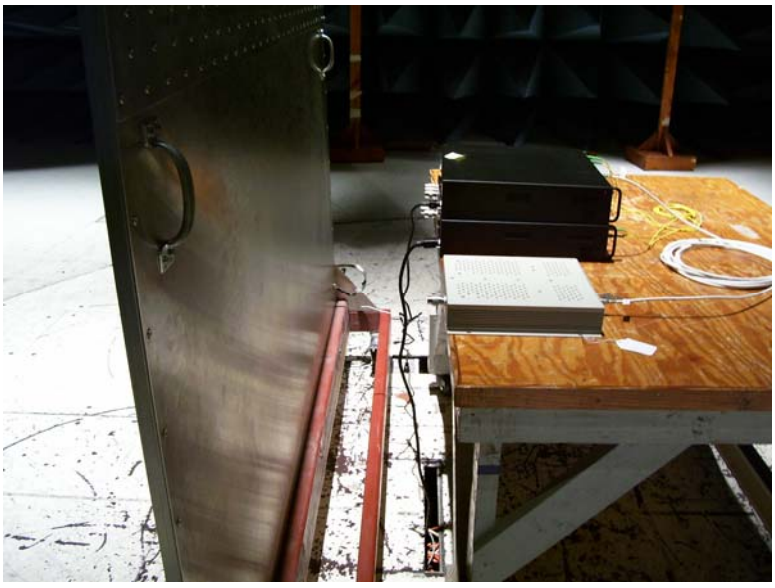


Conducted Emission, Neutral Line Plots, Expansion Hub

Conducted Emission Limits Test Setup



Photograph 2. Conducted Emissions Test Setup, Front View



Photograph 3. Conducted Emissions Test Setup, Back View

Electromagnetic Compatibility Criteria for Unintentional Radiators

§ 15.109(a) 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 10.

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 10.

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

Test Procedures: The EUT was placed on a 0.8m-high wooden table inside a semi-anechoic chamber. The method of testing and test conditions of ANSI C63.4 were used. An antenna was located 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.

(Emissions measured at 3m were normalized using an inverse proportionality factor of 20dB per decade for comparison to the 10 m limit.)

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

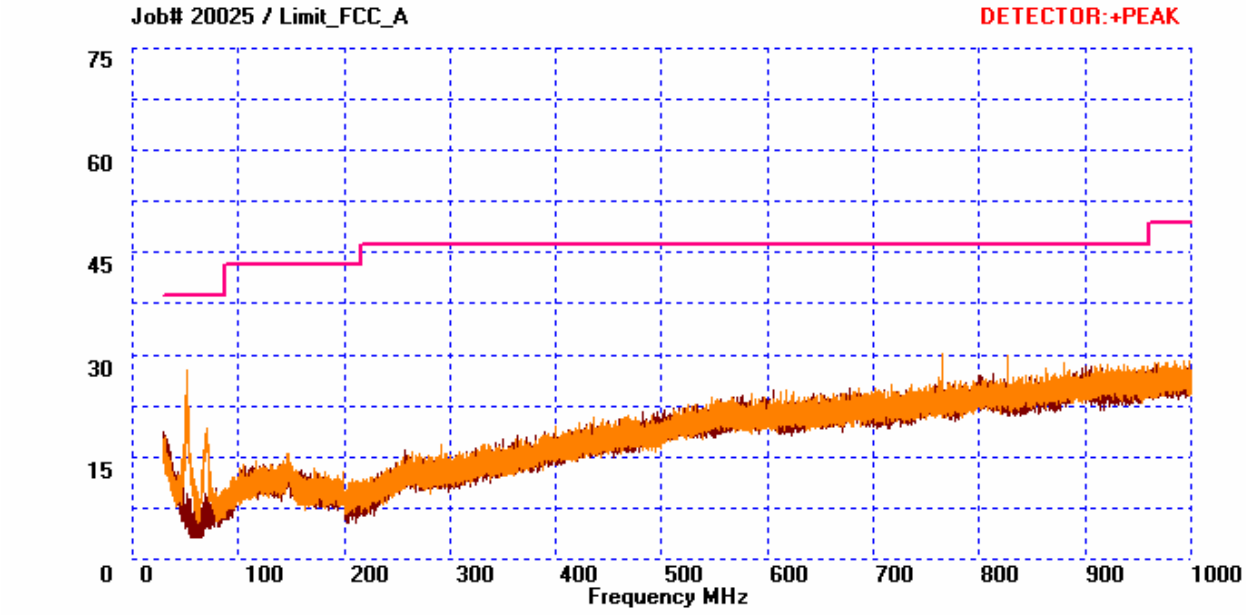
Test Engineer(s): Elijah Garcia

Test Date(s): June 7, 2006

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

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)
32.24	V	360	1	-4.82	15.90	0.94	12.03	39.00	-26.97
33.1	H	0	1.45	-3.20	16.65	0.95	14.40	39.00	-24.60
51.92	V	290	1.63	15.25	7.02	1.18	23.44	39.00	-15.56
69.88	V	211	1	11.62	5.48	1.38	18.48	39.00	-20.53
765.04	V	247	1.94	12.24	19.95	5.27	37.46	46.40	-8.94
826.04	V	219	1	7.63	19.72	5.58	32.92	46.40	-13.48

Table 11. Radiated Emissions Limits Test Results, 30 MHz to 1GHz, Class A



Radiated Emission Limits Test Results, 30 MHz to 1 GHz, Class A

Radiated Emissions Limits Test Results, 1 GHz to 10 GHz, Class A

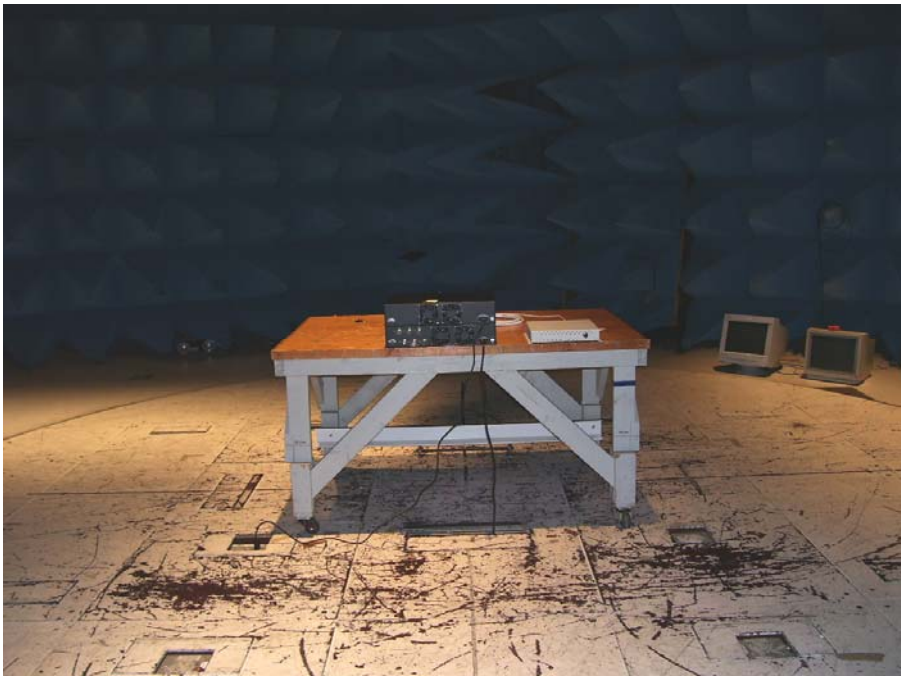
Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (m)	Raw Amp. @ 3m(Avg)	P.Amp (dB)	Ant.Cor. Factor (dB/m)	Cable Loss (dB)	Dist.Cor Factor (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit per FCC pt 15 @ 3m (dBuV/m)	Delta (dB)
1.65	201	H	1	53.82	35.21	25.90	2.75	10.46	36.80	49.5	-12.70
1.65	358	V	1.02	53.23	35.21	25.81	2.75	10.46	36.13	49.5	-13.37
1.72	180	V	2.7	50.02	35.23	26.14	2.85	10.46	33.32	49.5	-16.18
2	275	H	1.3	62.65	35.23	26.25	2.86	10.46	46.07	49.5	-3.43
3.177	357	H	1.05	56.04	35.52	30.61	4.17	10.46	44.84	49.5	-4.66
***3.177**	**2**	**V**	**1.02**	**59.62**	**35.52**	**30.42**	**4.17**	**10.46**	**48.23**	**49.5**	**-1.27**
3.45	300	H	1.42	55.04	35.33	31.18	4.36	10.46	44.78	49.5	-4.72
3.45	192	V	1.5	55.1	35.33	30.97	4.36	10.46	44.64	49.5	-4.86
3.825	200	V	1	43.04	35.15	32.13	4.61	10.46	34.17	49.5	-15.33

Table 12. Radiated Emissions Limits Test Results, 1 GHz to 10 GHz, Class A

Note: * - At this frequency, the measured electric-field strength exhibits a margin of compliance that is less than 3 dB below the specification limit. We recommend that every emission measured, have at least a 3 dB margin to allow for deviations in the emission characteristics that may occur during the production process.

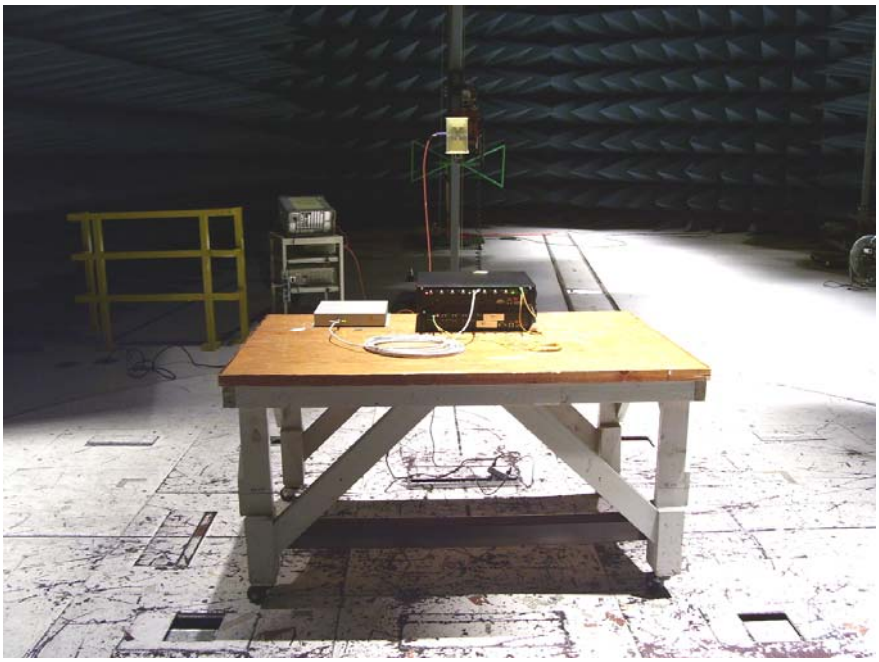
Radiated Emission Limits Test Setup, 30 MHz to 1 GHz

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, 1 GHz to 10 GHz



Photograph 6. Radiated Emission Limits Test Setup, 1 GHz to 10 GHz, Front View

Photograph 7. Radiated Emission Limits Test Setup, 1 GHz to 10 GHz, Back View

IV. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 2.1046 RF Power Output

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

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

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

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

§ 24.232 Power and antenna height limits.

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

Test Procedures: As required by 47 CFR 2.1046, RF power output measurements were made at the RF output terminals using an attenuator and spectrum analyzer or power meter. This test was performed in all applicable modulations.

Test Results: The EUT complies with the requirements of this section. The EUT conducted power does not exceed limit at the carrier frequency.

Down Link				
Modulation	**Frequency (MHz)**	**Input Power (dBm)**	**Peak Output Power (dBm)**	**Modulated Output Power (dBm)**
GSM	1930.0	10dBm	25.22	25.08
GSM	1962.5	10dBm	25.20	25.09
GSM	1995.0	10dBm	25.12	24.99

Down Link				
Modulation	**Frequency (MHz)**	**Input Power (dBm)**	**Peak Output Power (dBm)**	**Modulated Output Power (dBm)**
CDMA	1930.0	10dBm	26.29	23.46
CDMA	1962.5	10dBm	28.30	25.05
CDMA	1995.0	10dBm	26.07	23.92

Down Link				
Modulation	**Frequency (MHz)**	**Input Power (dBm)**	**Peak Output Power (dBm)**	**Modulated Output Power (dBm)**
TDMA	1930.0	10dBm	26.03	25.00
TDMA	1962.5	10dBm	27.15	25.05
TDMA	1995.0	10dBm	25.90	25.03

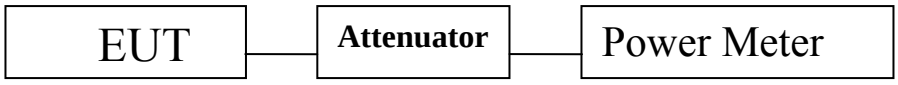
Uplink				
Modulation	**Frequency (MHz)**	**Input Power (dBm)**	**Peak Output Power (dBm)**	**Modulated Output Power (dBm)**
GSM	1850.0	-33dBm	-13.97	-22.05
GSM	1882.5	-33dBm	-13.13	-19.74
GSM	1915.0	-33dBm	-14.03	-22.33

Uplink				
Modulation	**Frequency (MHz)**	**Input Power (dBm)**	**Peak Output Power (dBm)**	**Modulated Output Power (dBm)**
CDMA	1850.0	-33dBm	-14.17	-23.29
CDMA	1882.5	-33dBm	-13.26	-21.55
CDMA	1915.0	-33dBm	-13.70	-22.26

Uplink				
Modulation	**Frequency (MHz)**	**Input Power (dBm)**	**Peak Output Power (dBm)**	**Modulated Output Power (dBm)**
TDMA	1850.0	-33dBm	-13.77	-20.70
TDMA	1882.5	-33dBm	-12.92	-18.01
TDMA	1915.0	-33dBm	-14.77	-22.40

Test Engineer(s): Shawn McMillen

Test Date(s): June 9, 2006



Block Diagram 1. RF Power Output Test Setup

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 2.1047 Modulation Characteristics

Test Requirement(s): **§ 2.1047 Measurements required: Modulation characteristics**

§ 2.1047 (a): Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

Test Procedures: **This EUT does not support the ability to modulate voice.**

Test Results: **N/A**

Test Engineer(s): Shawn McMillen

Test Date(s): June 8, 2006

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 2.1049 Occupied Bandwidth

Test Requirement(s): **§ 2.1049 Measurements required: Occupied bandwidth:** The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the specified conditions of § 2.1049 (a) through (i) as applicable.

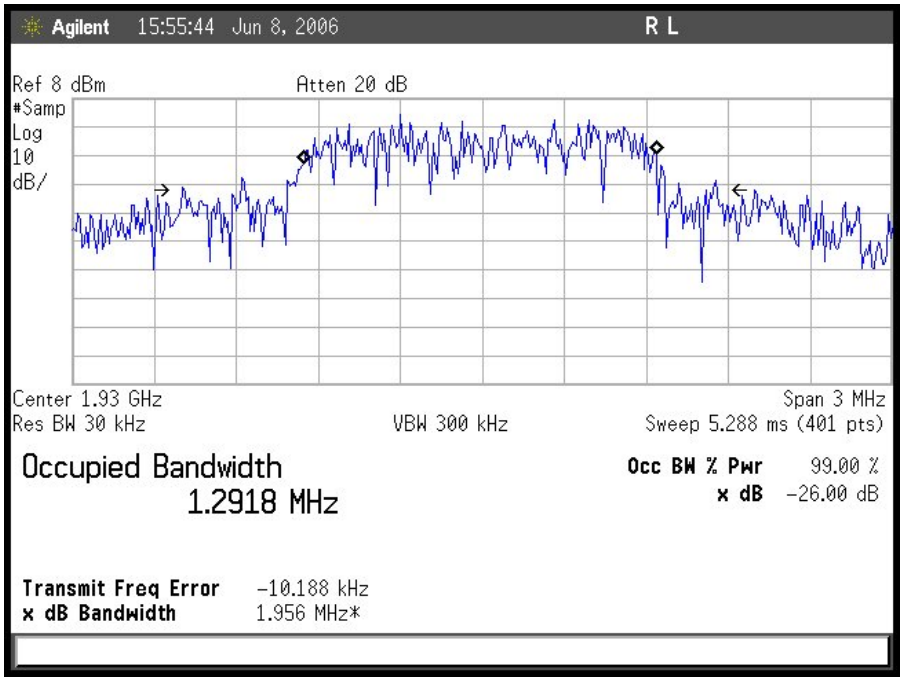
Test Procedures: As required by 47 CFR 2.1049, *occupied bandwidth measurements* were made with a Spectrum Analyzer connected to the RF ports for both Uplink and Downlink.

The modulation characteristics of signal generator's 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.

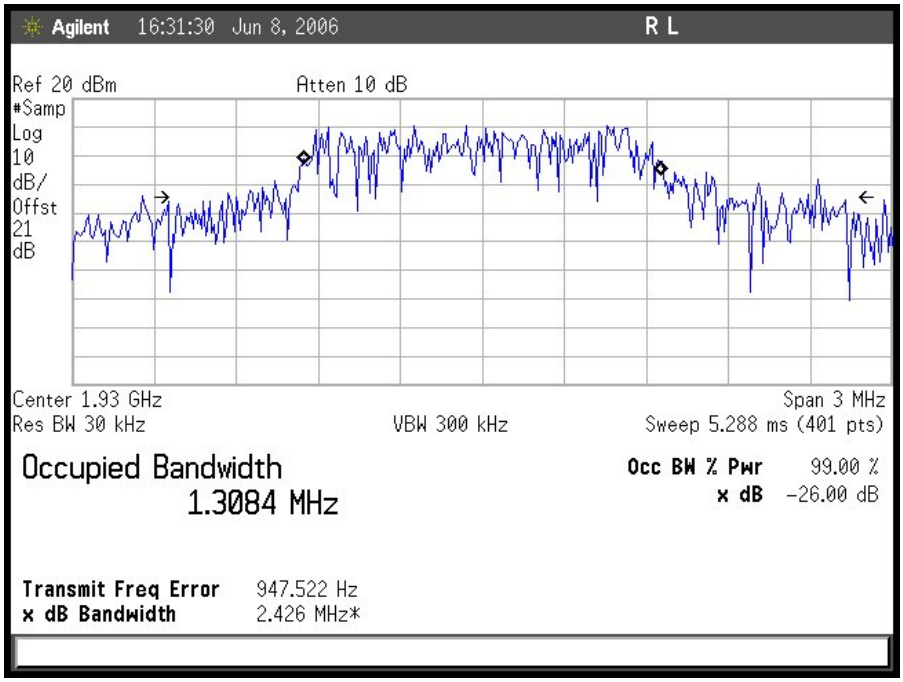
Test Results: The EUT complies with the requirements of this section.

Test Engineer(s): Shawn McMillen

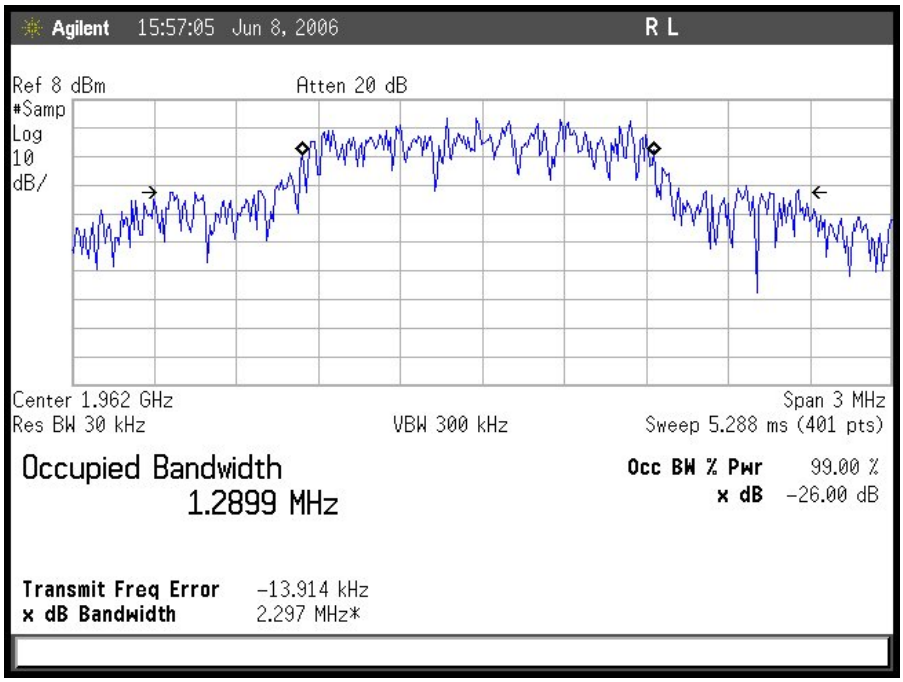
Test Date(s): June 9, 2006



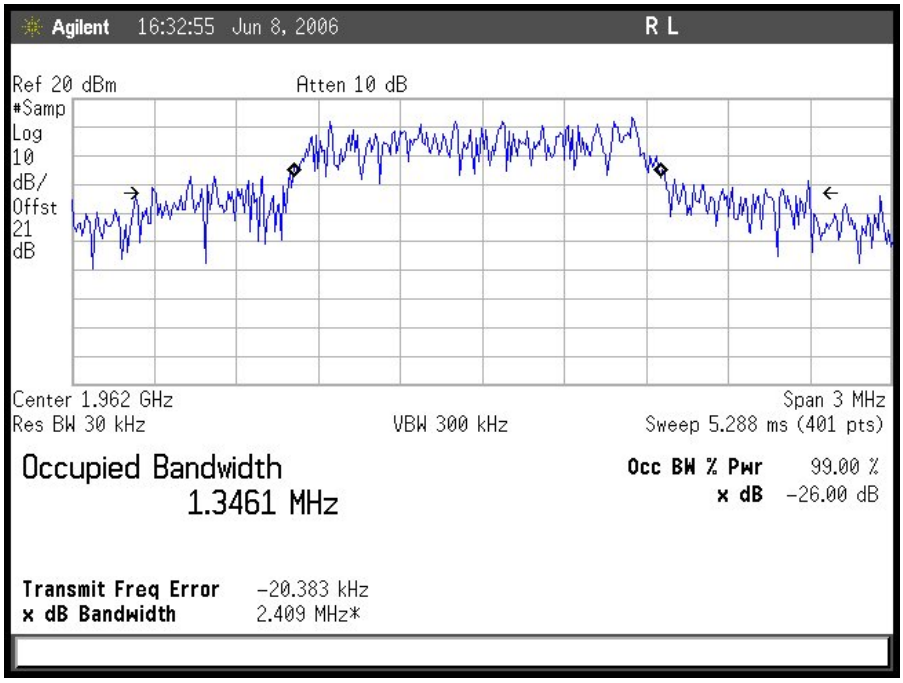
Plot 1. CDMA Downlink Input Low CH



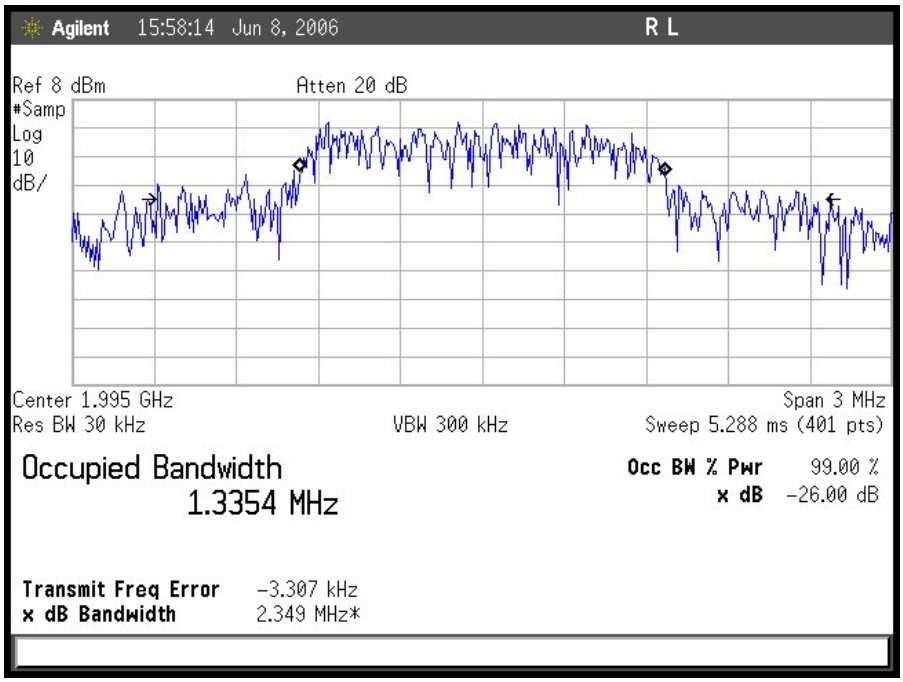
Plot 2. CDMA Downlink Output Low CH



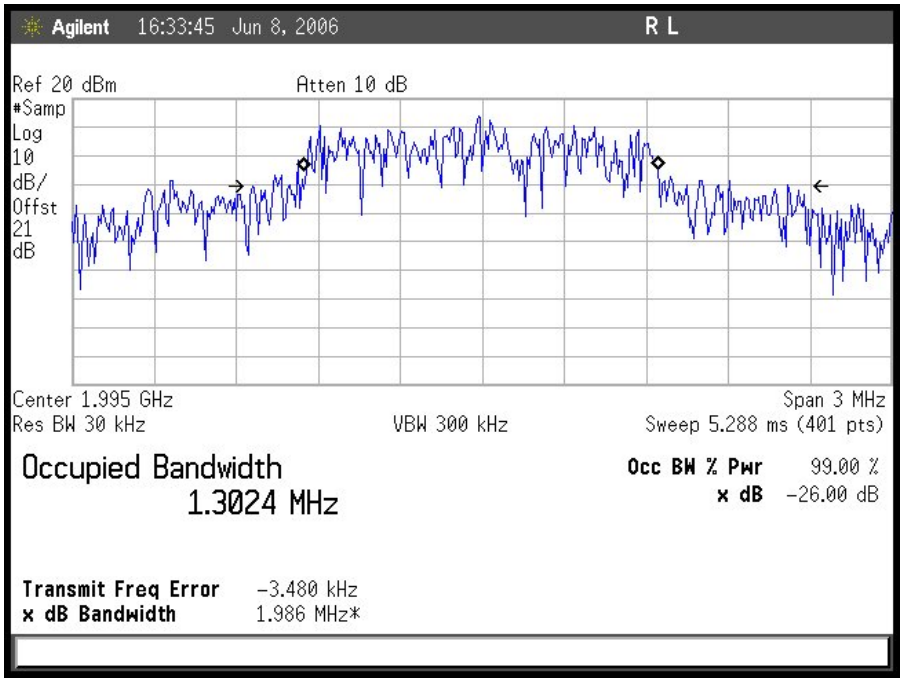
Plot 3. CDMA Downlink Input Mid CH



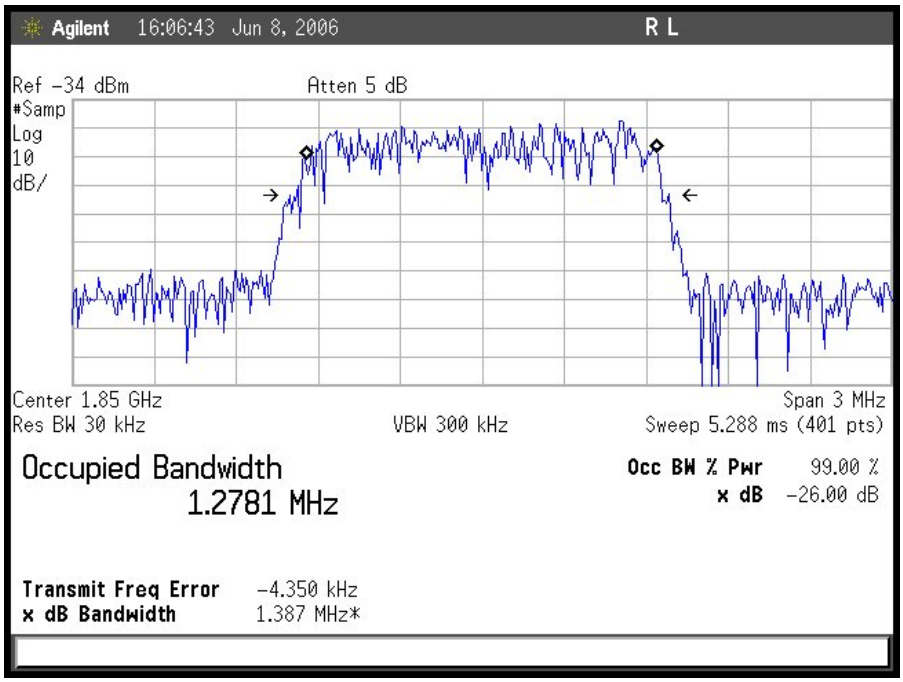
Plot 4. CDMA Downlink Output Mid CH



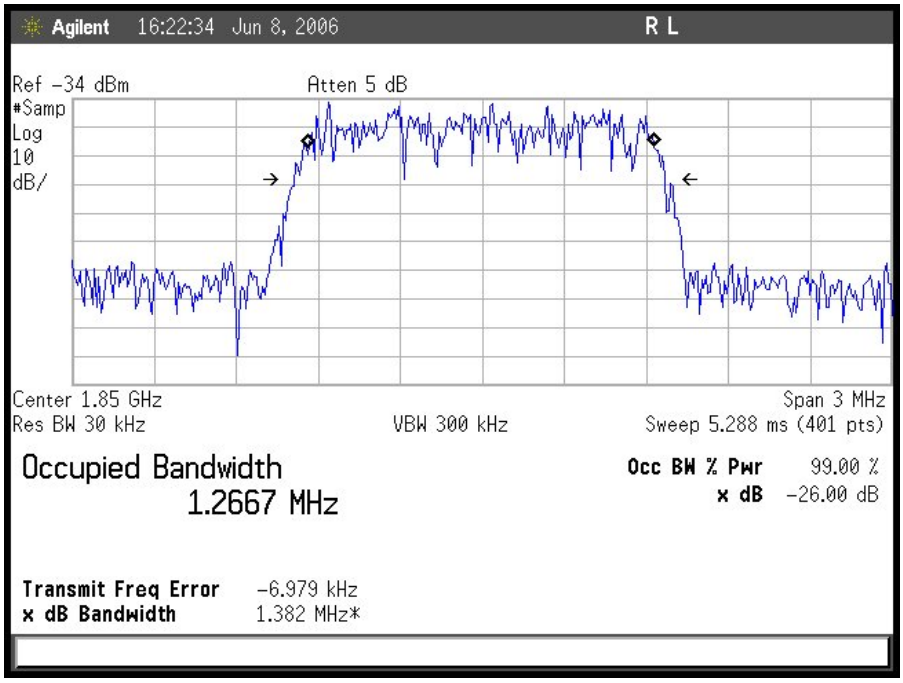
Plot 5. CDMA Downlink Input Hi CH



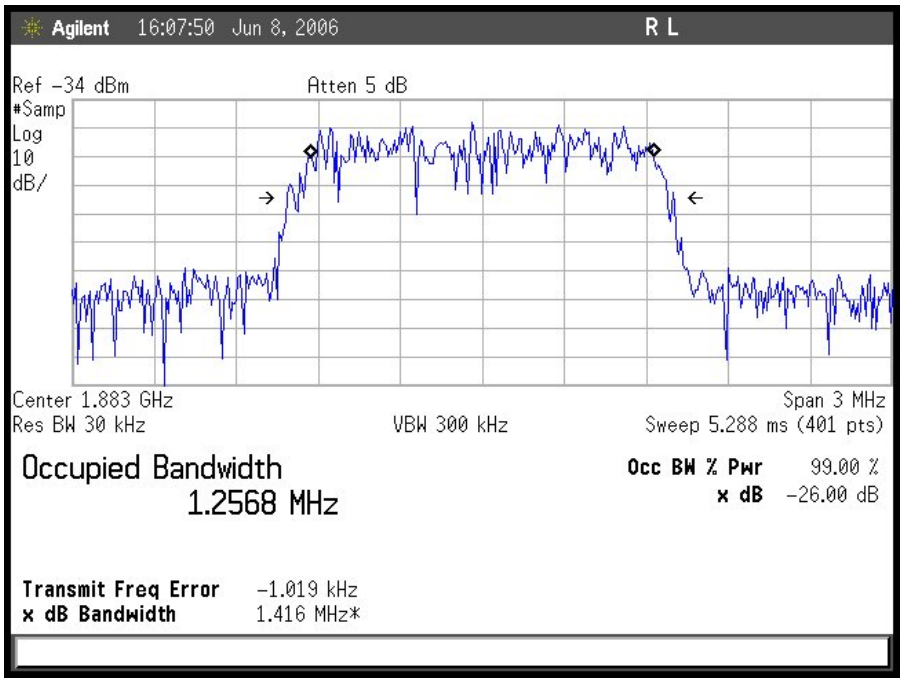
Plot 6. CDMA Downlink Output Hi CH



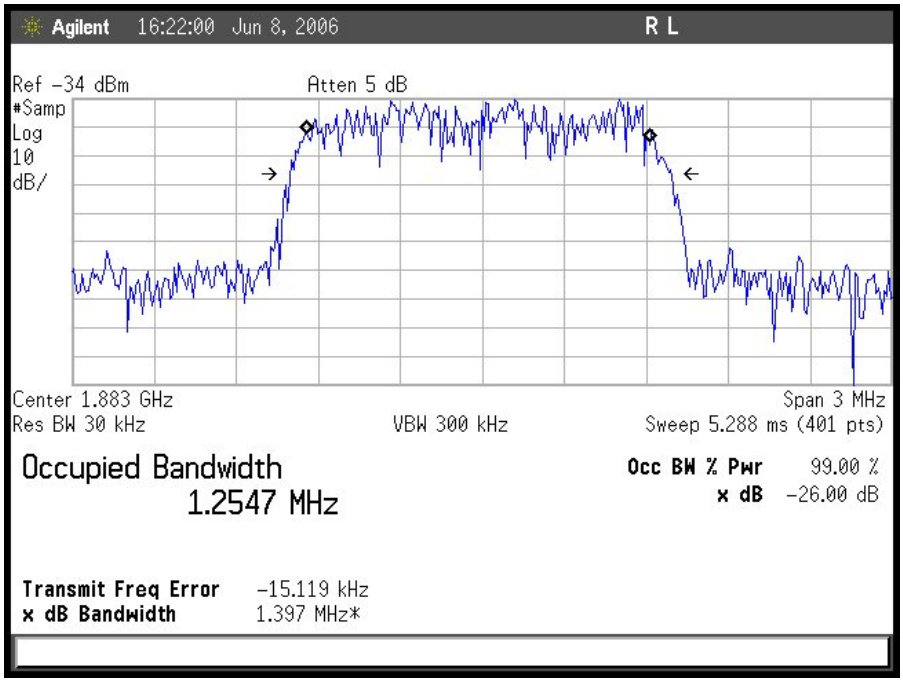
Plot 7. CDMA Uplink Input Low CH



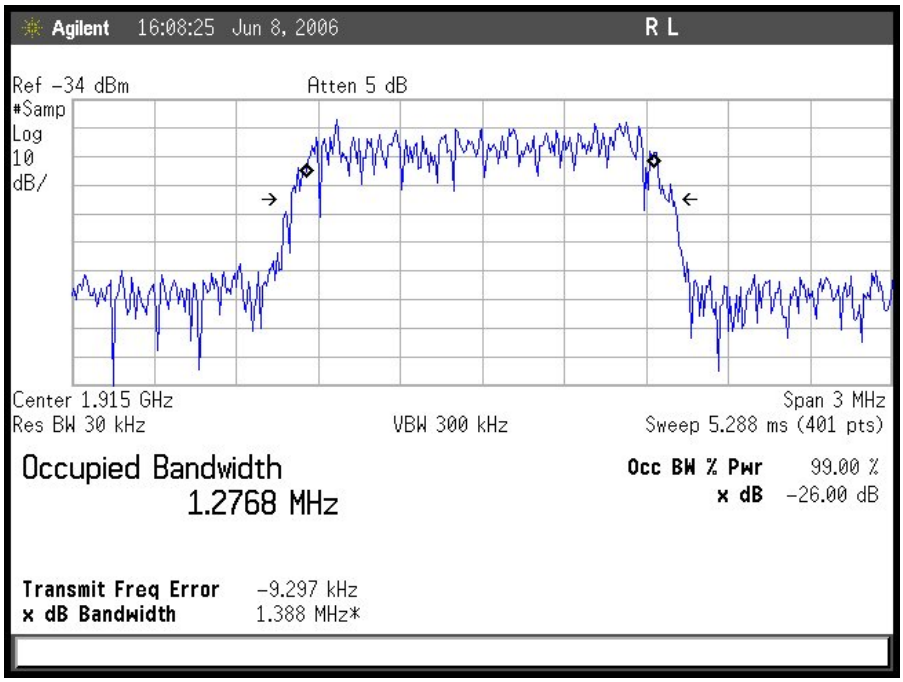
Plot 8. CDMA Uplink Output Low CH



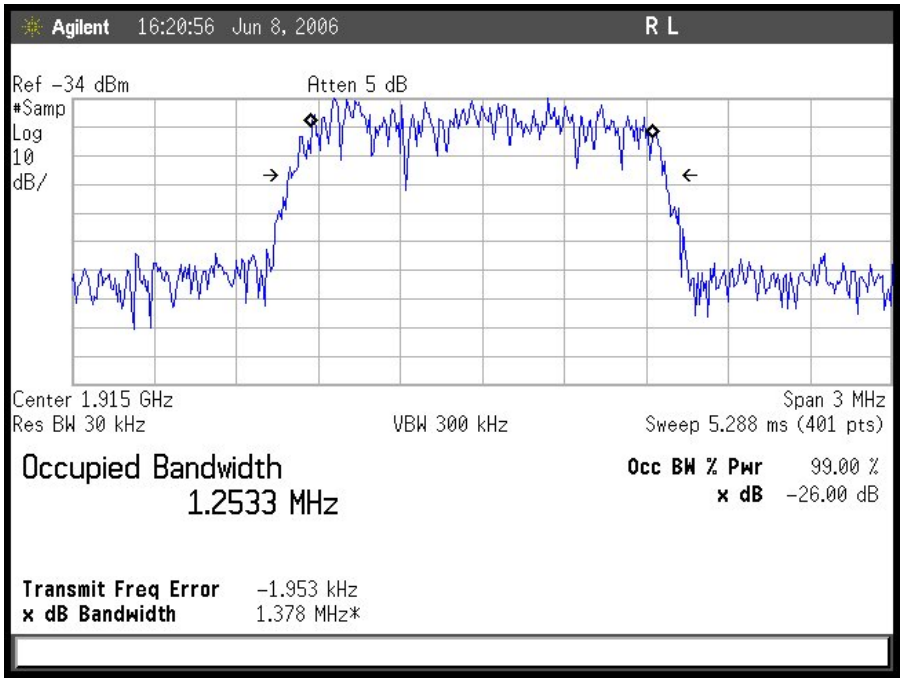
Plot 9. CDMA Uplink Input Mid CH



Plot 10. CDMA Uplink Output Mid CH



Plot 11. CDMA Uplink Input Hi CH



Plot 12. CDMA Uplink Output Hi CH

