FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

LTE PHONE BLUETOOTH AND WLAN

MODEL NUMBER: LG-MS659

FCC ID: ZNFMS659

REPORT NUMBER: 13U14916-5

ISSUE DATE: APRIL 16, 2013

Prepared for
LG ELECTRONICS MOBILECOMM U.S.A., INC.
1000 SYLVAN AVENUE
ENGLEWOOD CLIFFS, NEW JERSEY 07632

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	03/12/13	Original	T. LEE

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC.
1000 SYLVAN AVENUE
ENGLEWOOD CLIFFS, NEW JERSEY 07632

EUT DESCRIPTION: LTE PHONE BLUETOOTH AND WLAN

MODEL: LG-MS659

SERIAL NUMBER: 302KPTM334913

DATE TESTED: MARCH 12, 2013

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass

UL CCS tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

TIM LEE
WiSE PROJECT LEADER
UL CCS

Tested By:

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WiSE LAB TECH III
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2003, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an LTE Phone with Bluetooth and WLAN capability that is manufactured by LG Electronics.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	19.43	87.70
2412 - 2462	802.11g	22.84	192.31
2412 - 2462	802.11n HT20	20.73	118.30

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an INTEGRATED antenna, with a maximum gain of -0.5 dBi.
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5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was MS795_LAP8930JR130304.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y, and Z, it was determined that Z-orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z-orientation.

Based on the baseline scan, the worst-case data rates were:

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20mode: MCS0

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	LG	MCS-01WR	RB310020452	DoC
Headset	Cresyn	EAB62410801	NA	NA

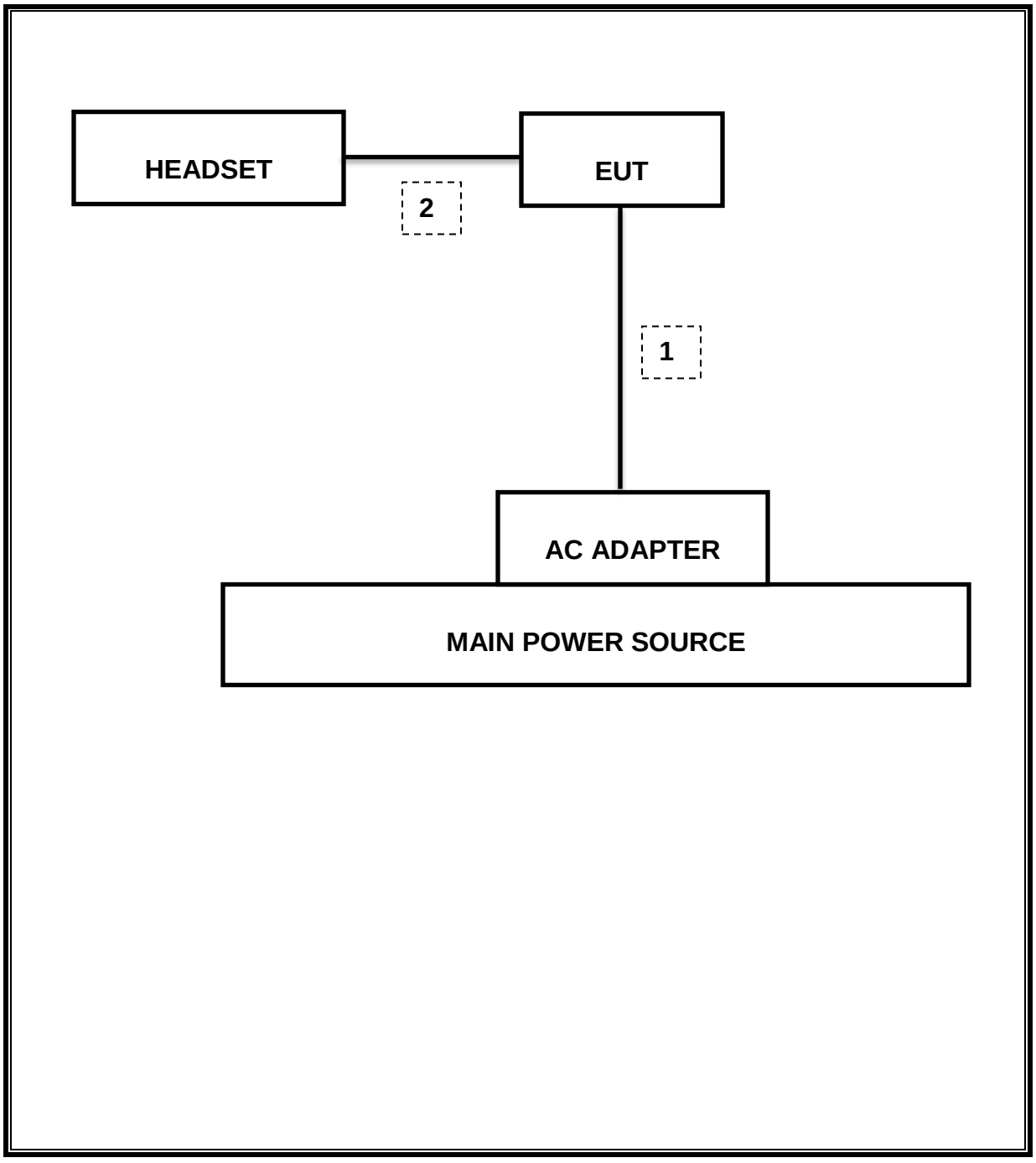
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1m	N/A

TEST SETUP

The EUT is a stand-alone unit during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01016	08/14/13
Antenna, Horn, 18 GHz	ETS	3117	C01006	12/11/13
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/16/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/13
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/13
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/14
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR

7. MEASUREMENT METHODS

KDB 558074 Measurement Procedure PK2 is used for power and PKPSD is used for power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

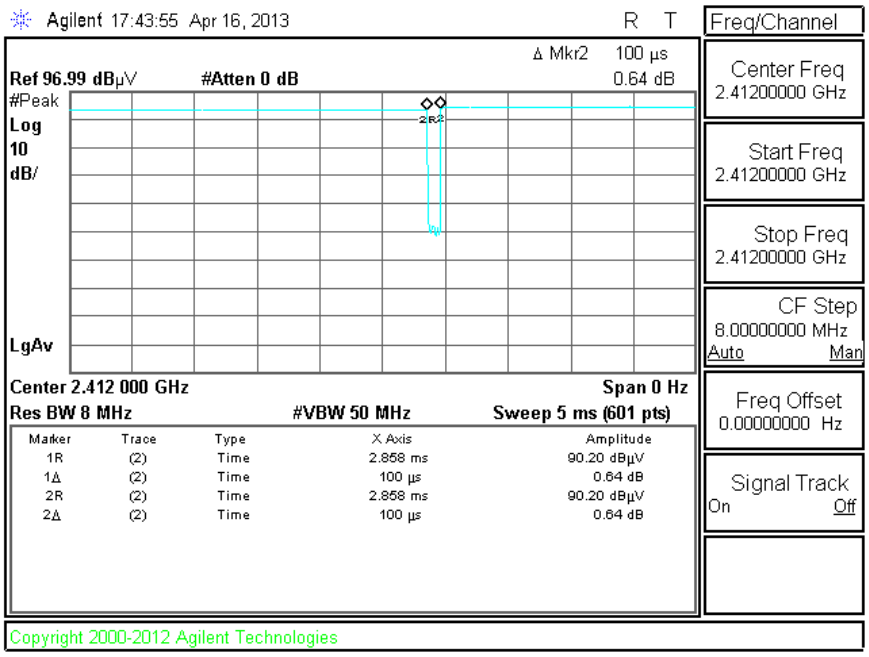
LIMITS

None; for reporting purposes only.

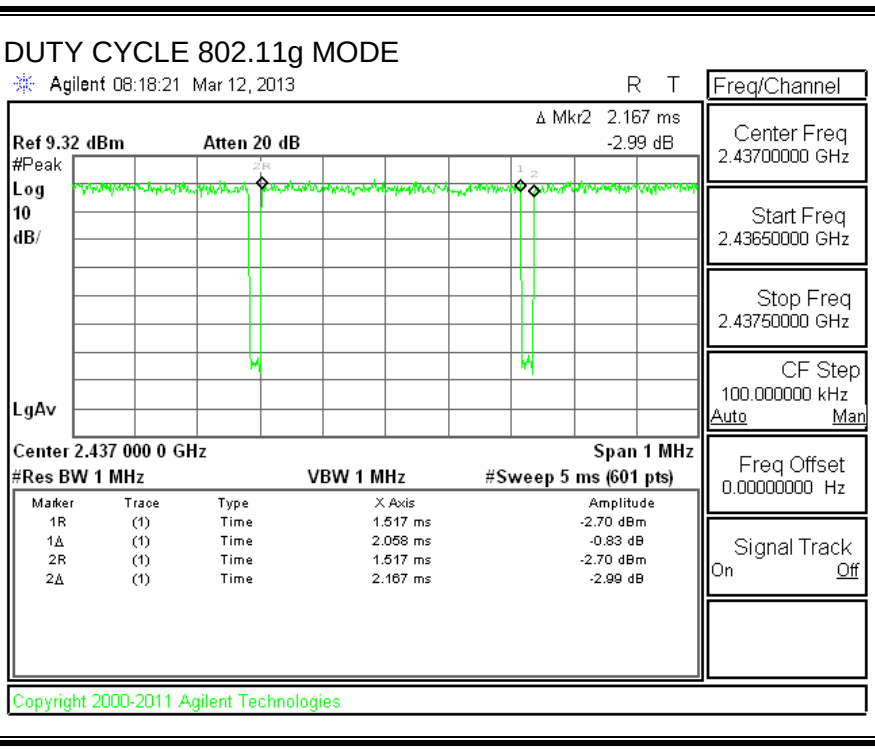
8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11b	1.00	1	1.000	100.0%	0.00
802.11g	2.058	2.167	0.950	95.0%	0.22
802.11n HT20	1.908	2.025	0.942	94.2%	0.26

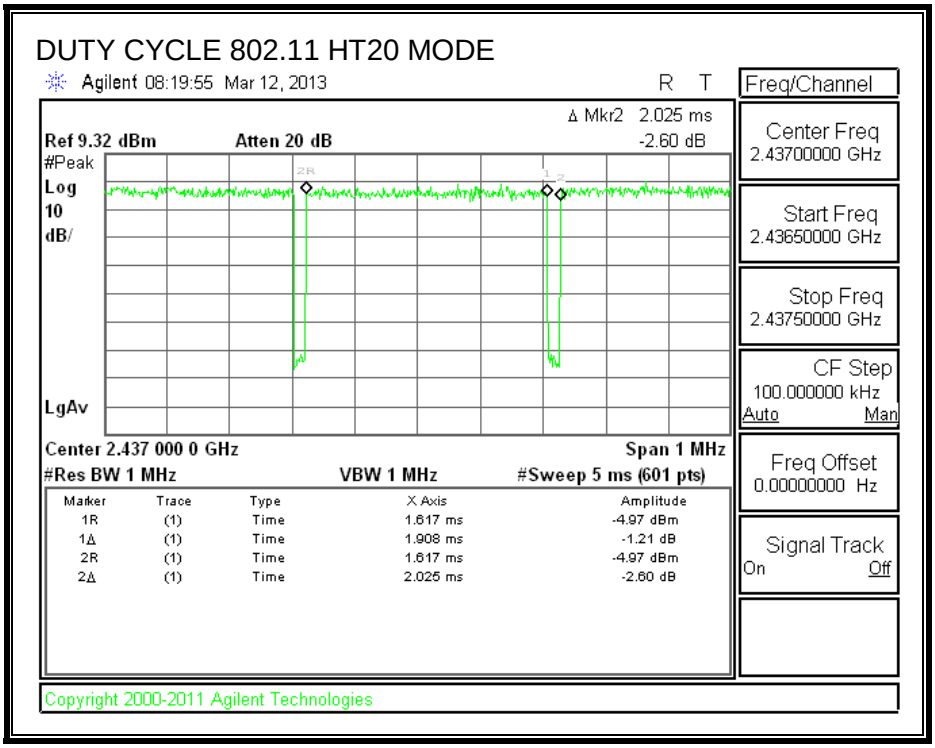
DUTY CYCLE 802.11b MODE



DUTY CYCLE 802.11g MODE



DUTY CYCLE 802.11 HT20 MODE



9. ANTENNA PORT TEST RESULTS

9.1. 802.11b MODE IN THE 2.4 GHz BAND

9.1.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

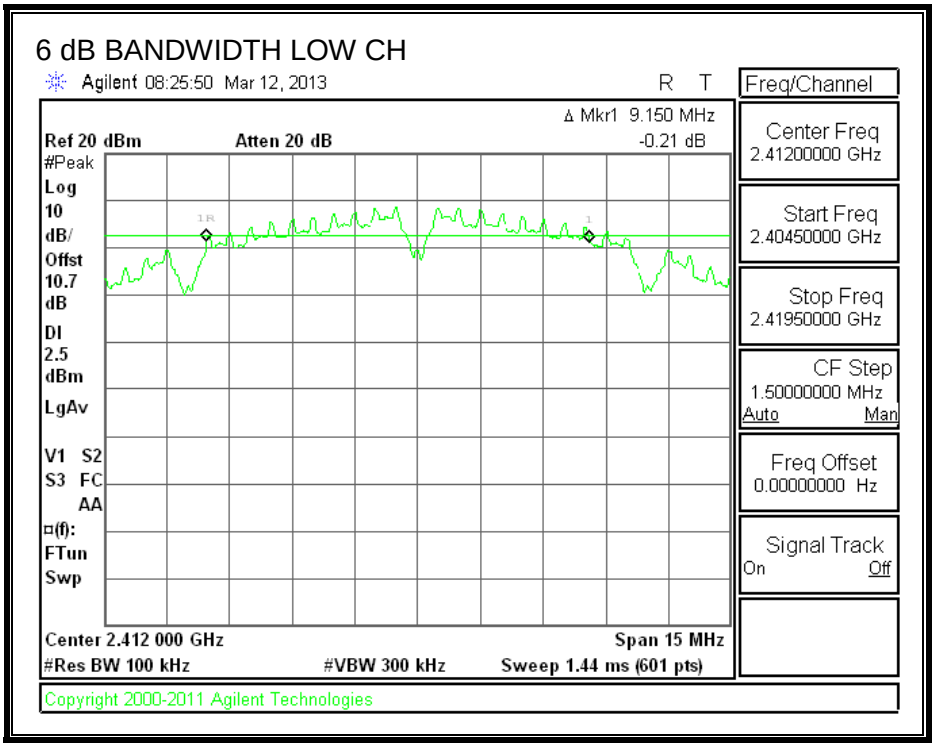
TEST PROCEDURE

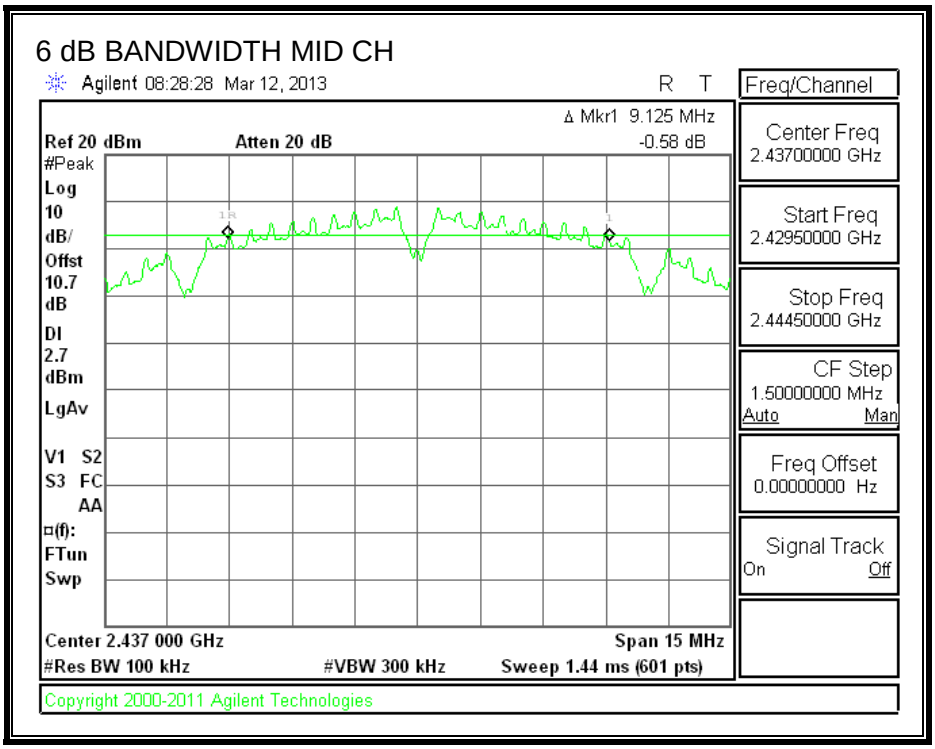
The transmitter output is connected to a spectrum analyzer with the RBW set between 1% and 5% of the EBW, the VBW >= 3 x RBW, peak detector and max hold.

RESULTS

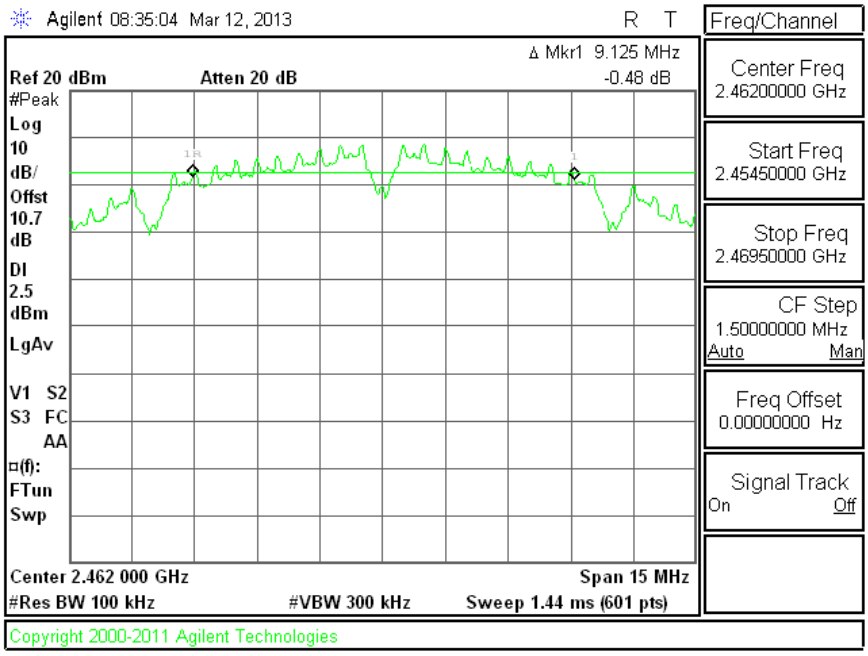
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	9.150	0.5
Mid	2437	9.125	0.5
High	2462	9.125	0.5

6 dB BANDWIDTH





6 dB BANDWIDTH HIGH CH



9.1.2. 99% BANDWIDTH

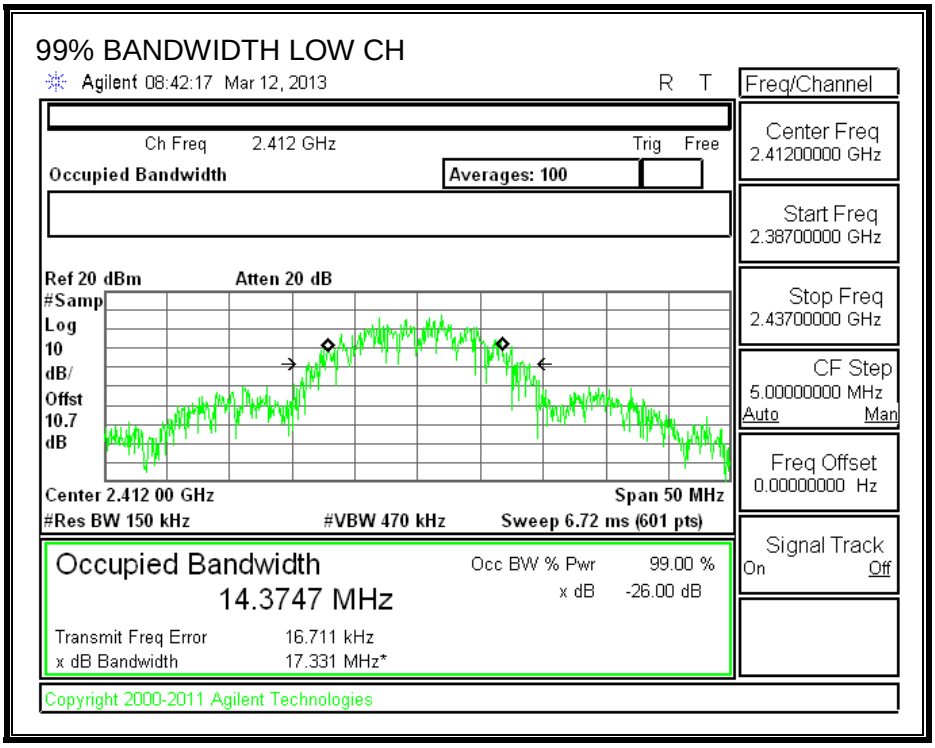
LIMITS

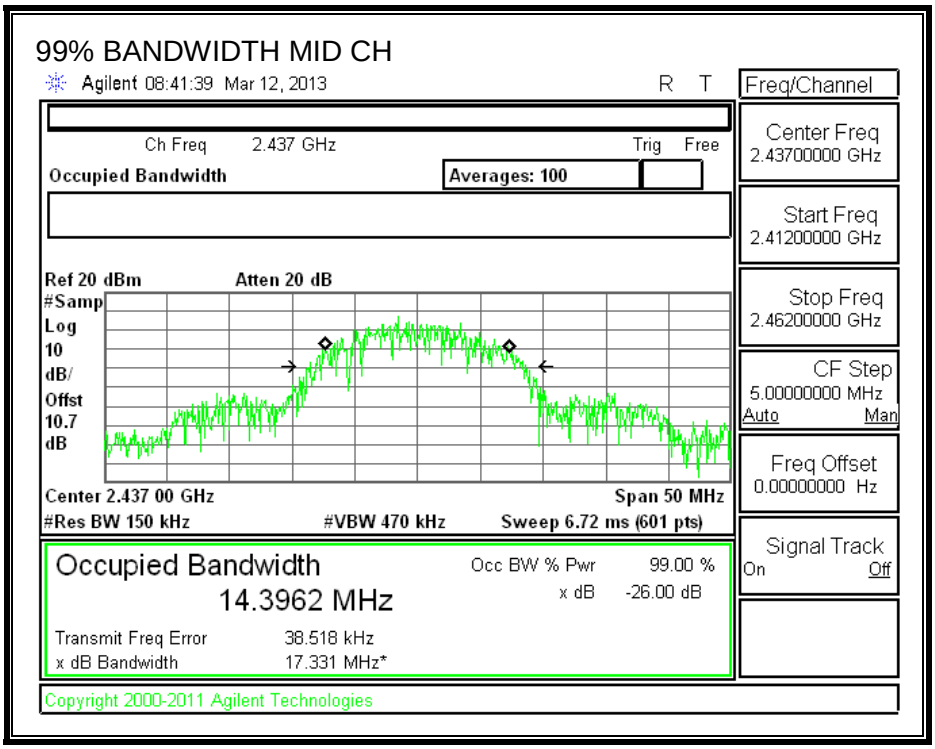
None; for reporting purposes only.

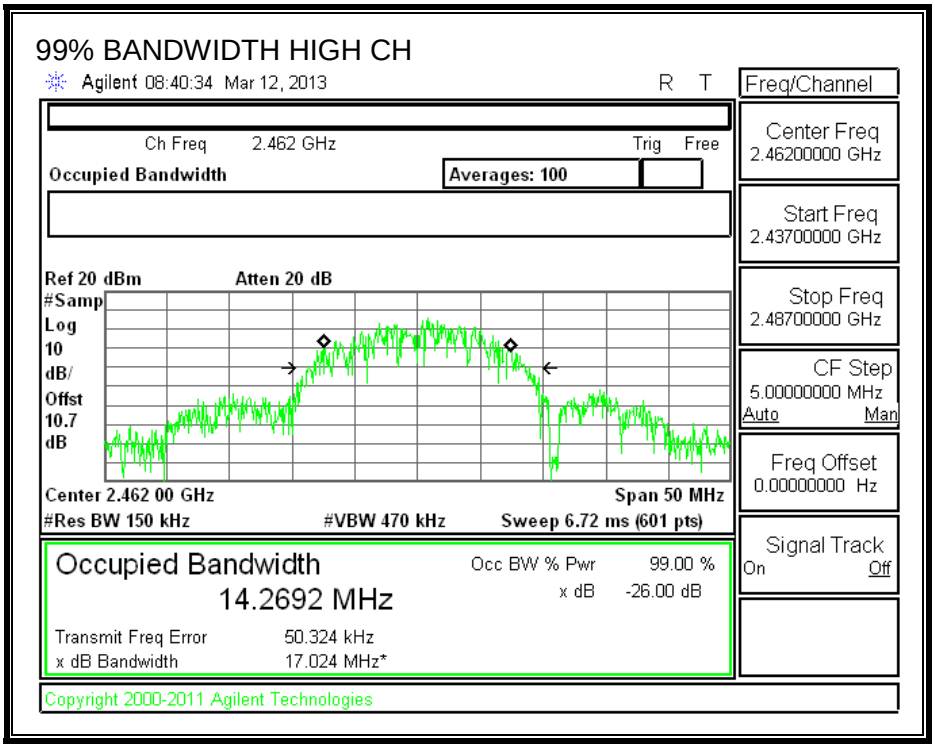
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	14.3747
Mid	2437	14.3962
High	2462	14.2692

99% BANDWIDTH







9.1.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10 dB (including 10 dB pad and 0.68 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2412	17.50
Mid	2437	17.50
High	2462	17.30

9.1.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

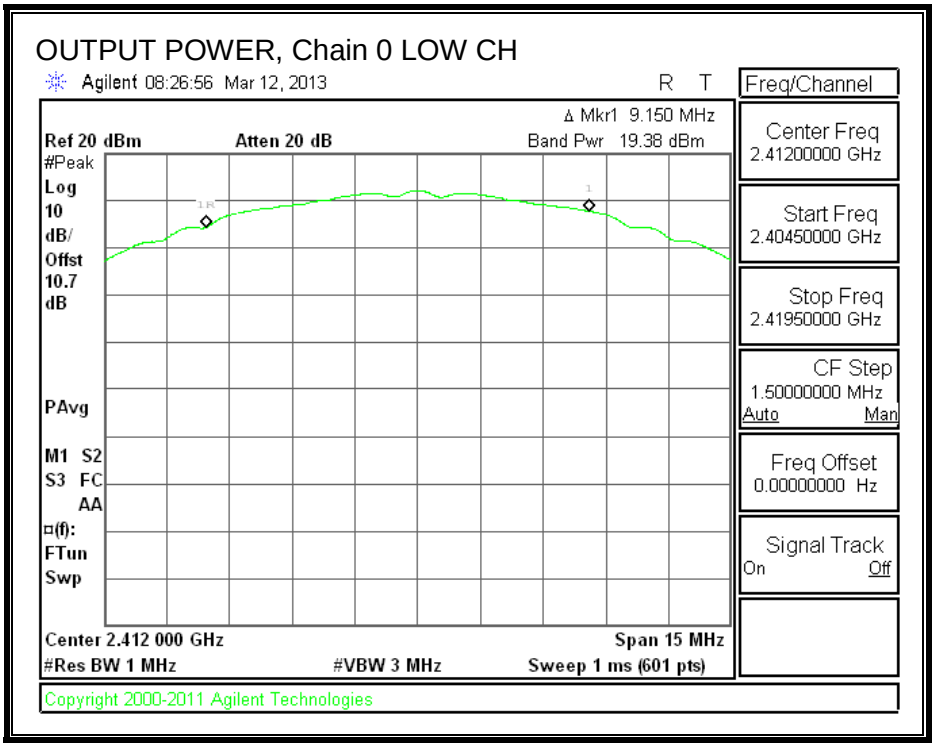
Limits

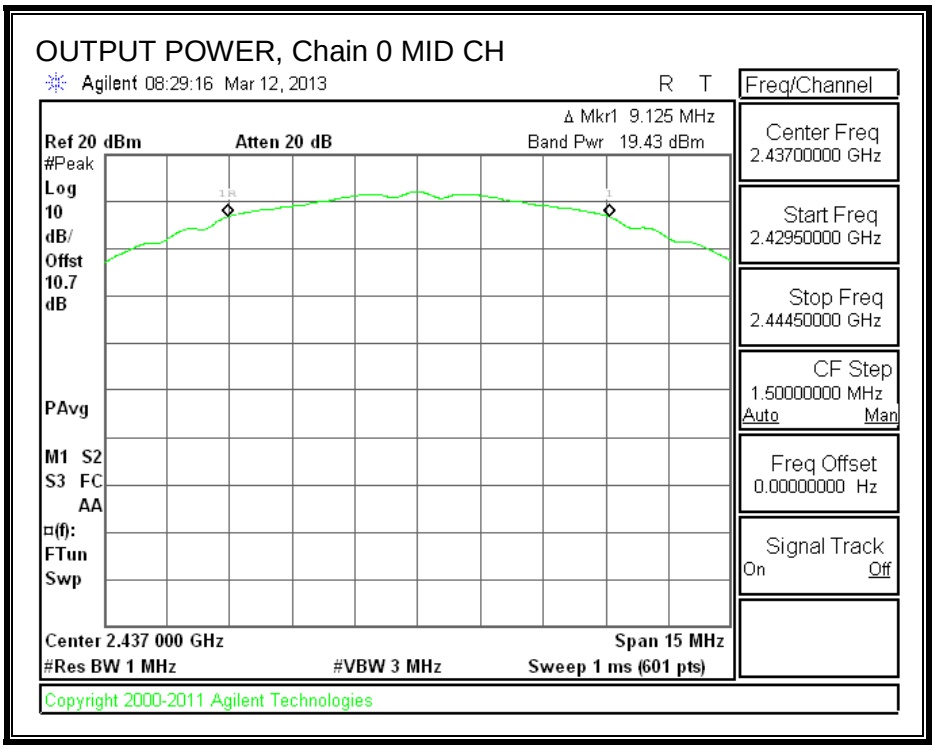
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.00	30.00	30	36	30.00
Mid	2437	1.00	30.00	30	36	30.00
High	2462	1.00	30.00	30	36	30.00

Results

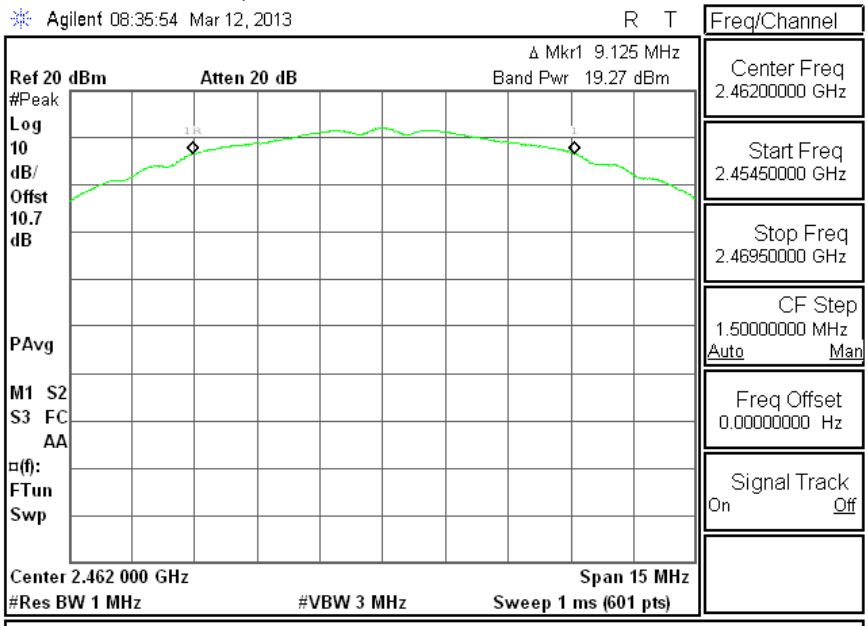
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	19.38	19.38	30.00	-10.62
Mid	2437	19.43	19.43	30.00	-10.57
High	2462	19.27	19.27	30.00	-10.73

OUTPUT POWER, Chain 0





OUTPUT POWER, Chain 0 HIGH CH



9.1.5. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

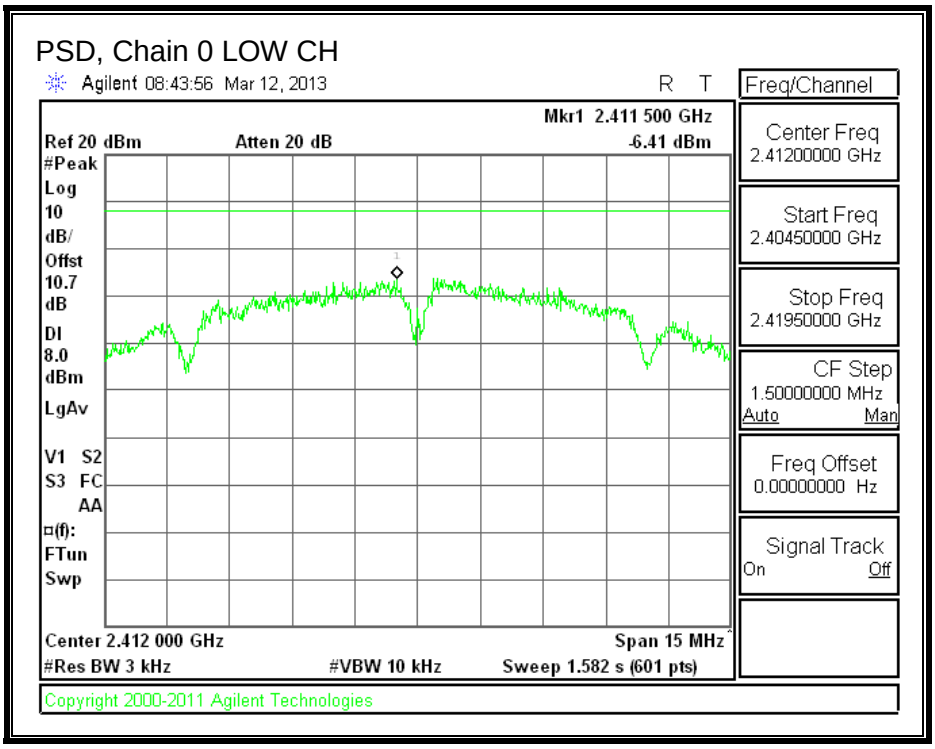
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

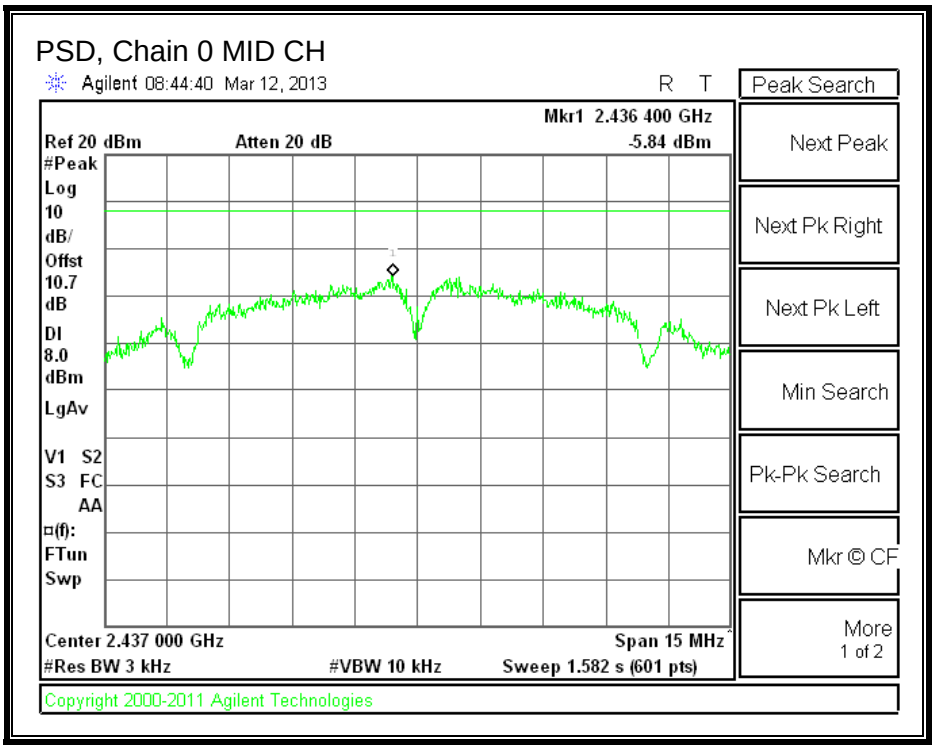
RESULTS

PSD Results

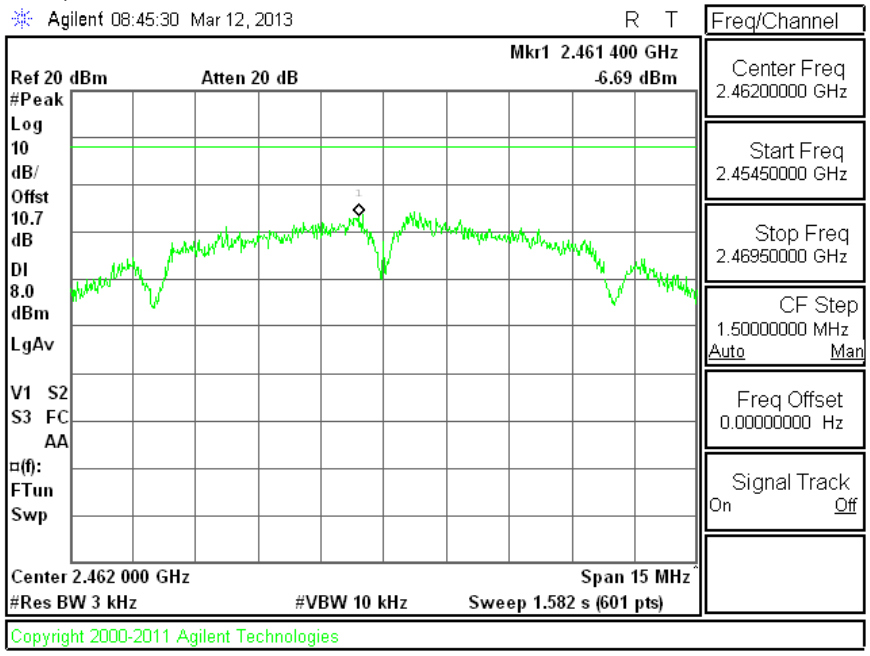
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.41	8.0	-14.4
Mid	2437	-5.84	8.0	-13.8
High	2462	-6.69	8.0	-14.7

PSD, Chain 0





PSD, Chain 0 HIGH CH



9.1.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

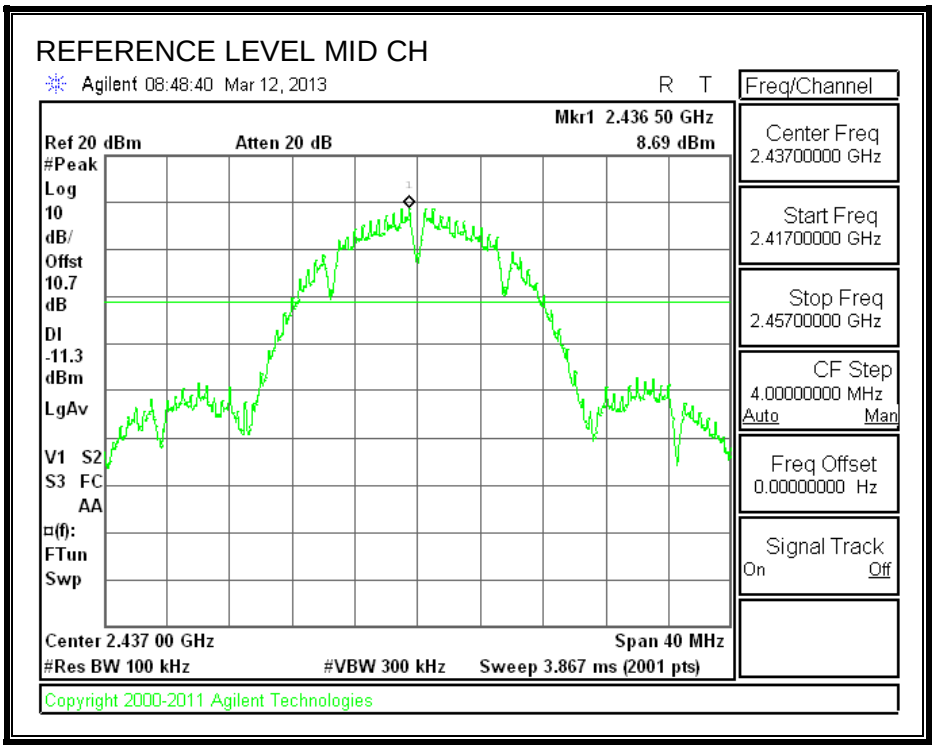
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

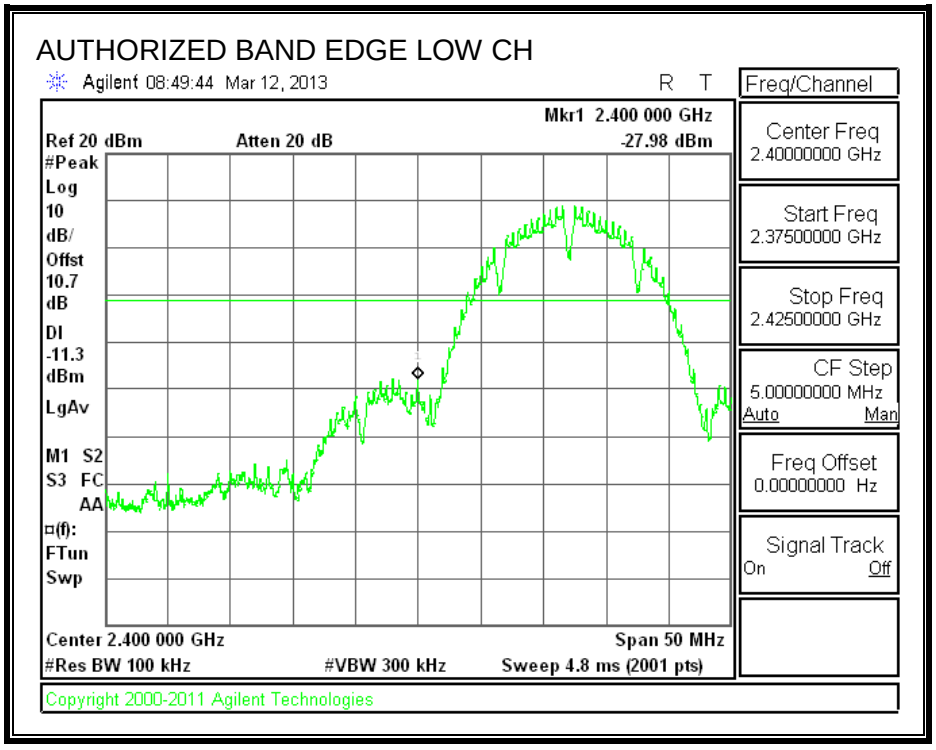
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

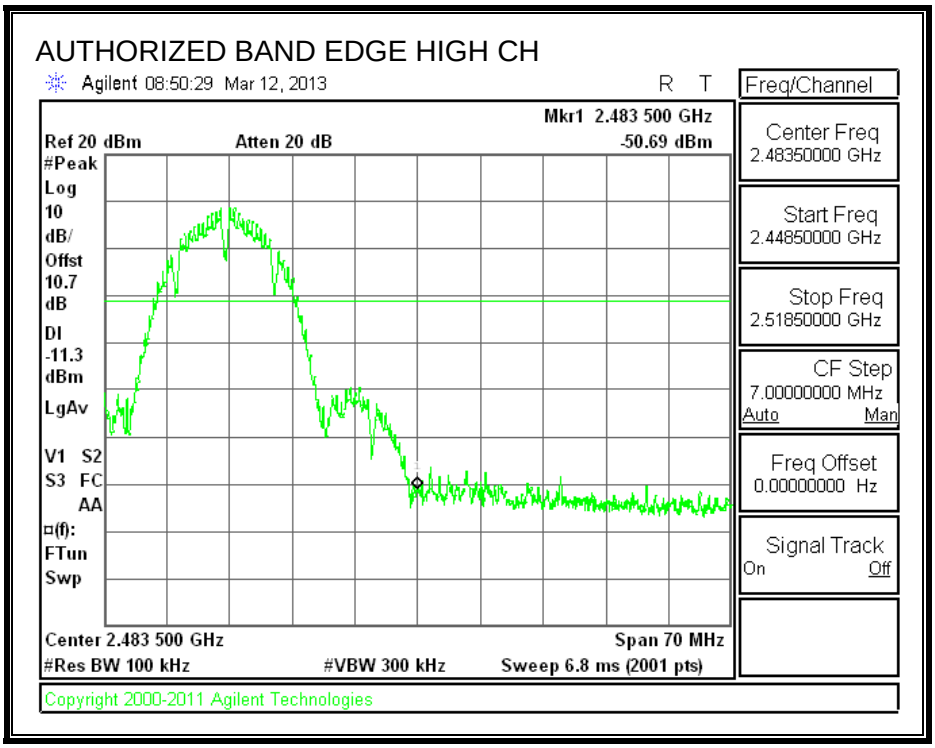
IN-BAND REFERENCE LEVEL



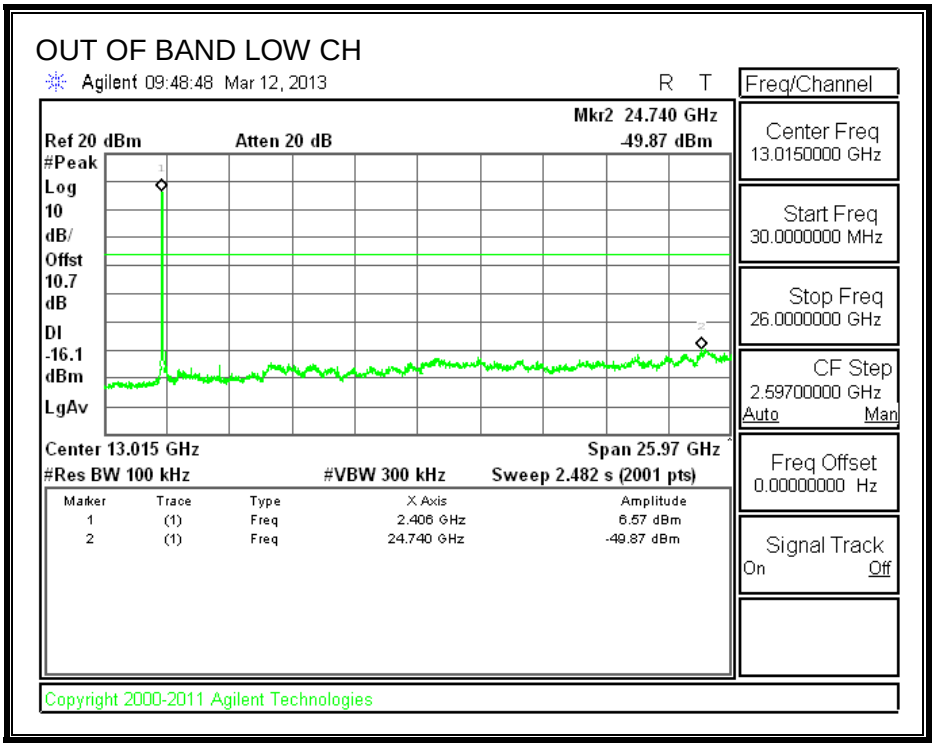
LOW CHANNEL BANDEDGE

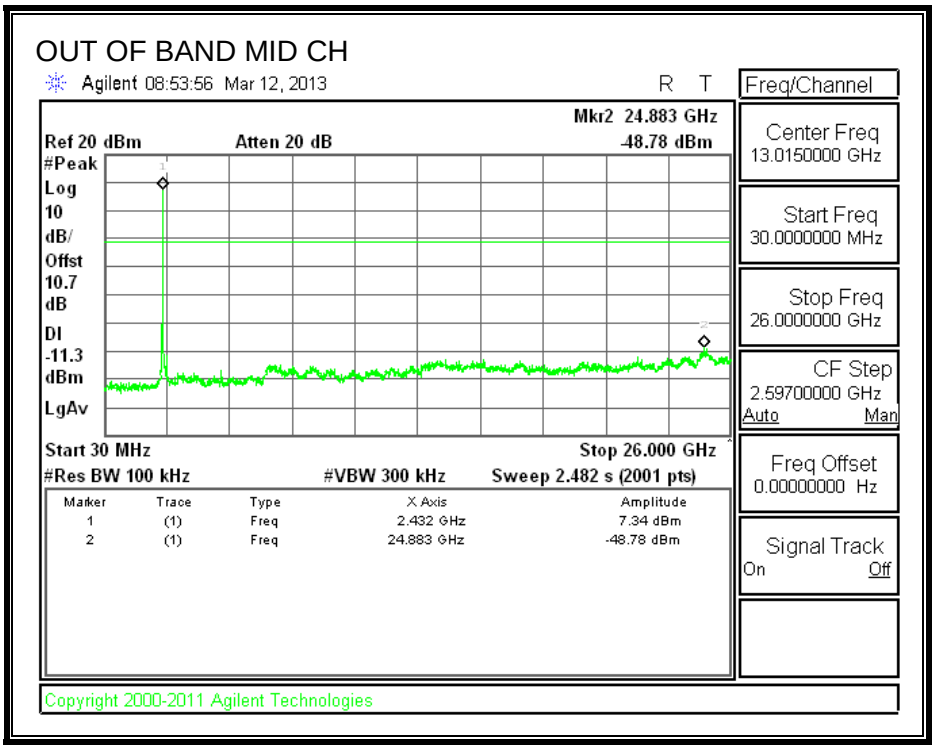


HIGH CHANNEL BANDEDGE

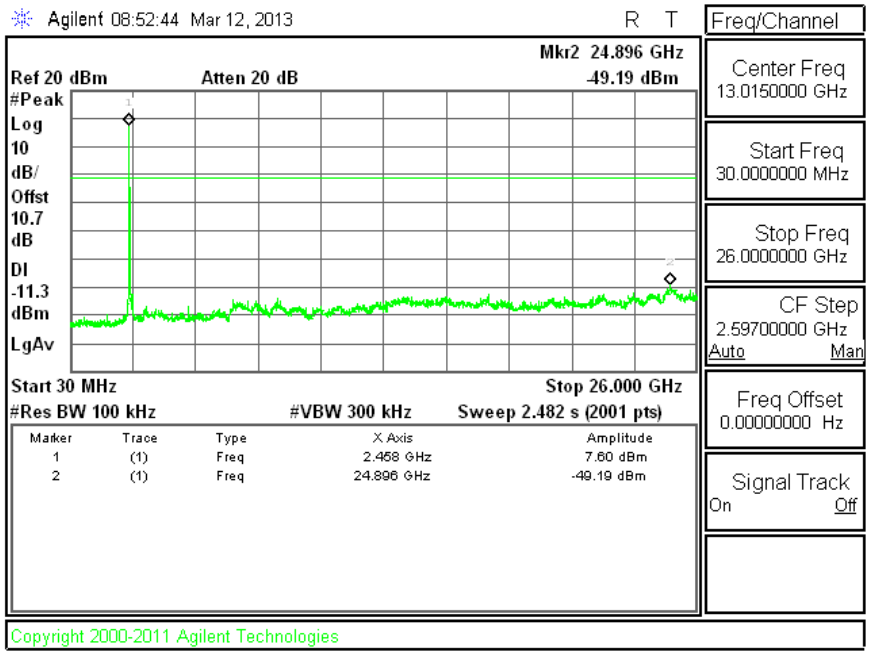


OUT-OF-BAND EMISSIONS





OUT OF BAND HIGH CH



9.2. 802.11g MODE IN THE 2.4 GHz BAND

9.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

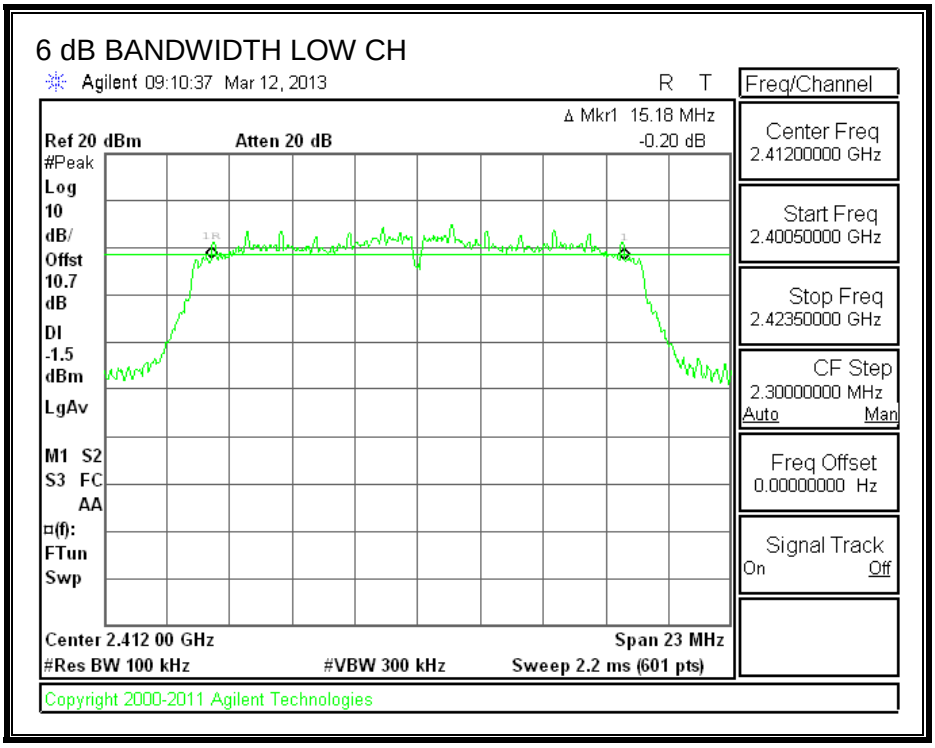
TEST PROCEDURE

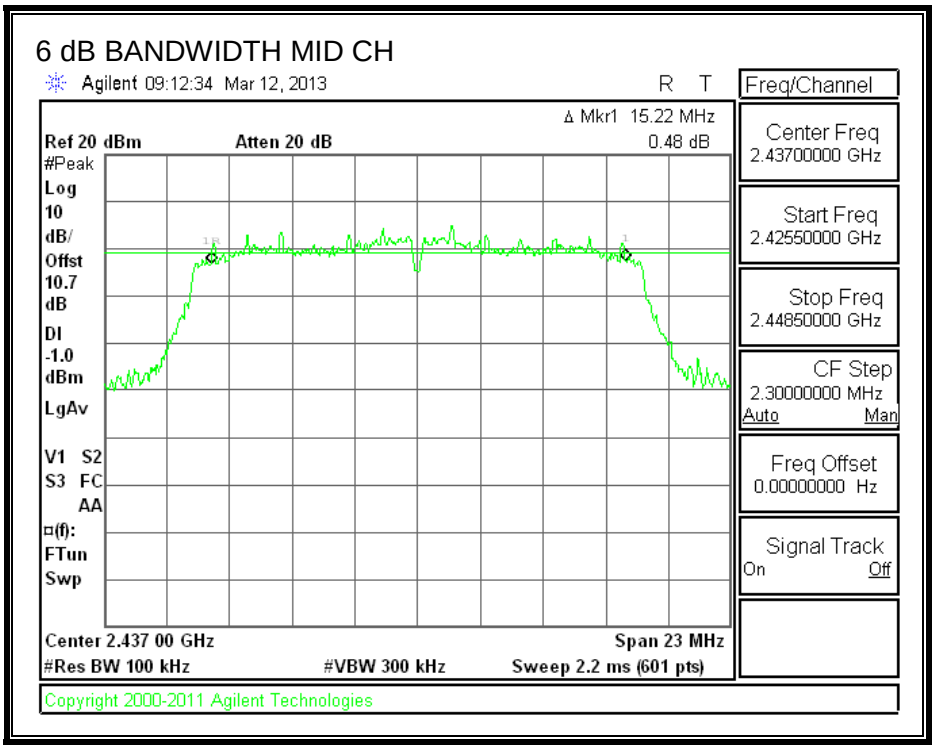
The transmitter output is connected to a spectrum analyzer with the RBW set between 1% and 5% of the EBW, the VBW >= 3 x RBW, peak detector and max hold.

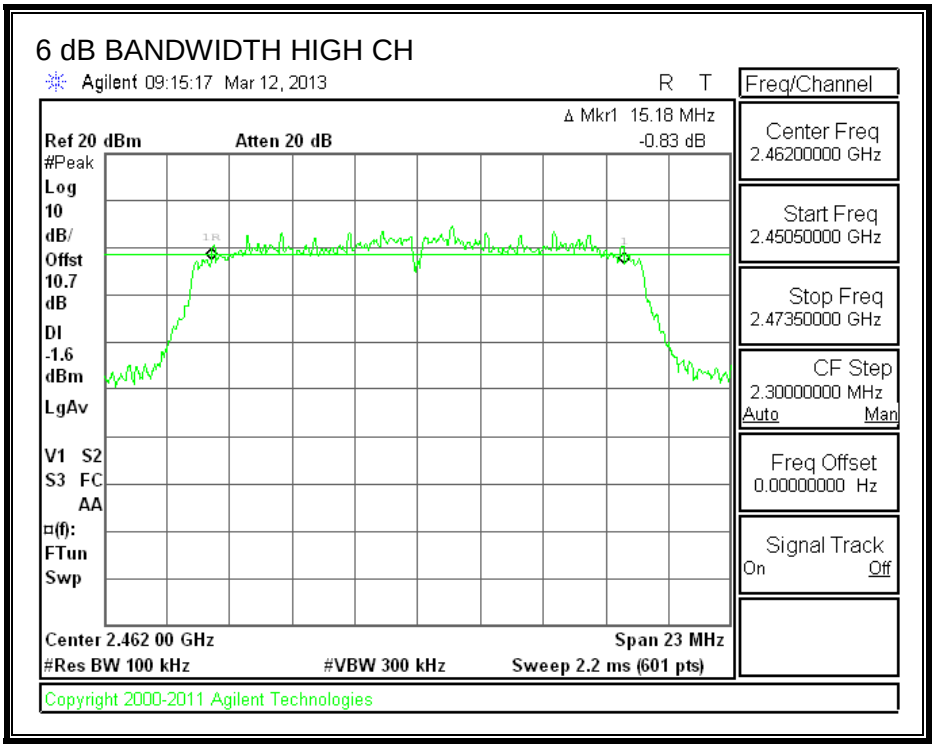
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.180	0.5
Mid	2437	15.220	0.5
High	2462	15.180	0.5

6 dB BANDWIDTH







9.2.2. 99% BANDWIDTH

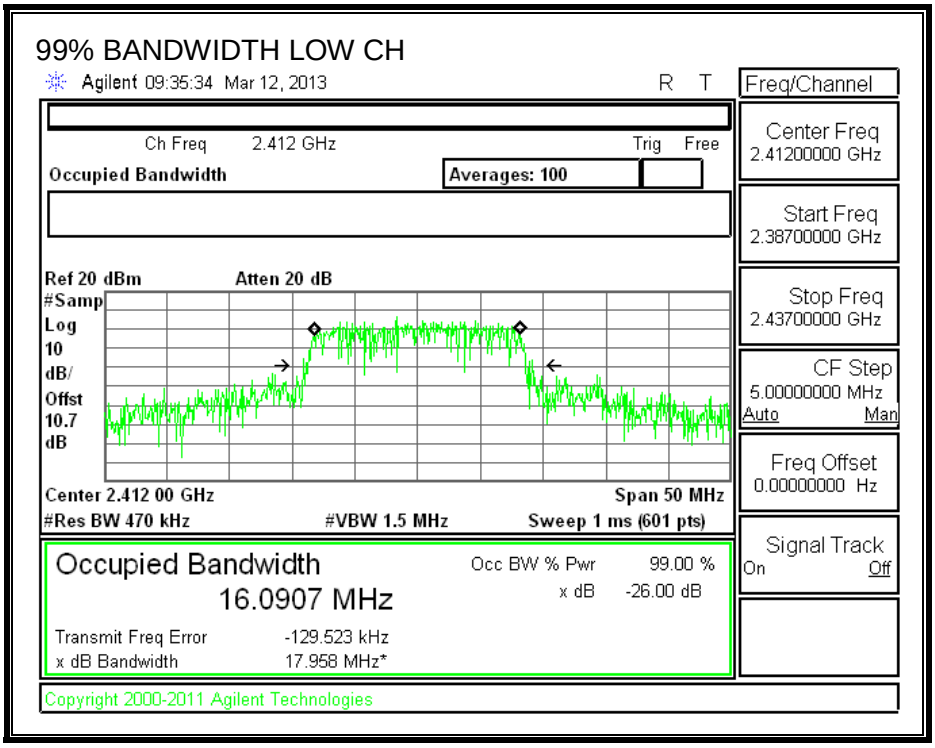
LIMITS

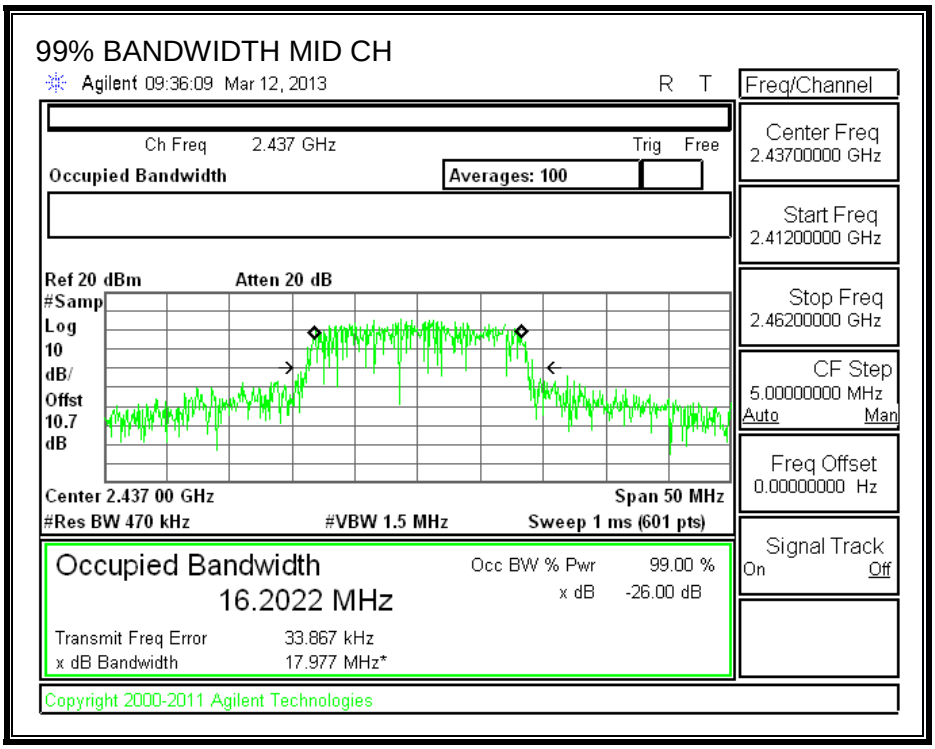
None; for reporting purposes only.

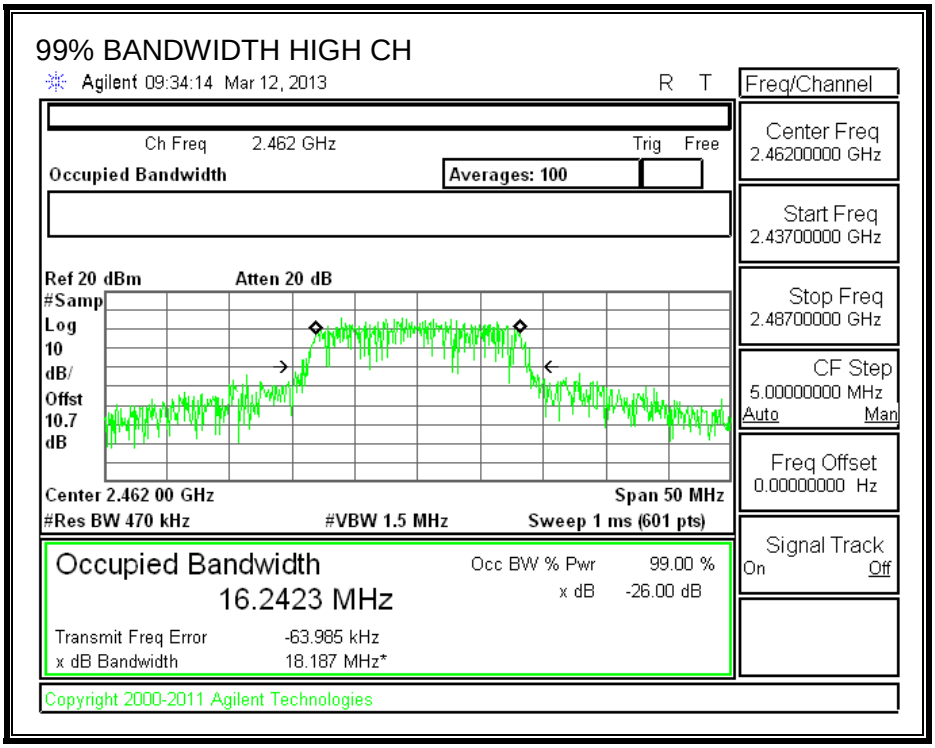
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.0907
Mid	2437	16.2022
High	2462	16.2423

99% BANDWIDTH







9.2.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2412	15.30
Mid	2437	15.20
High	2462	15.20

9.2.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

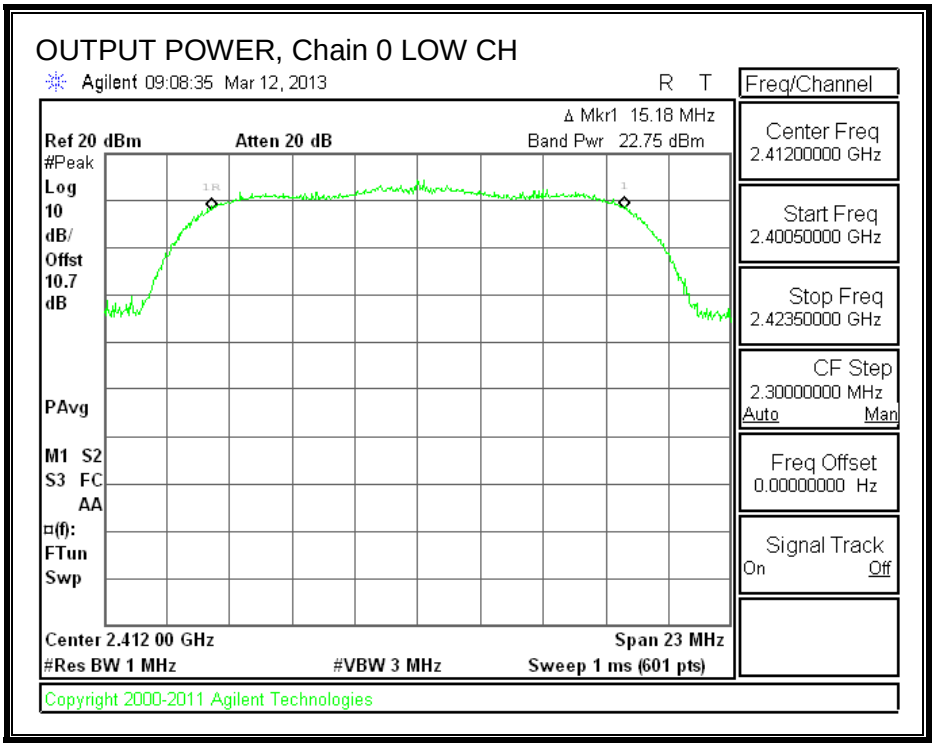
Limits

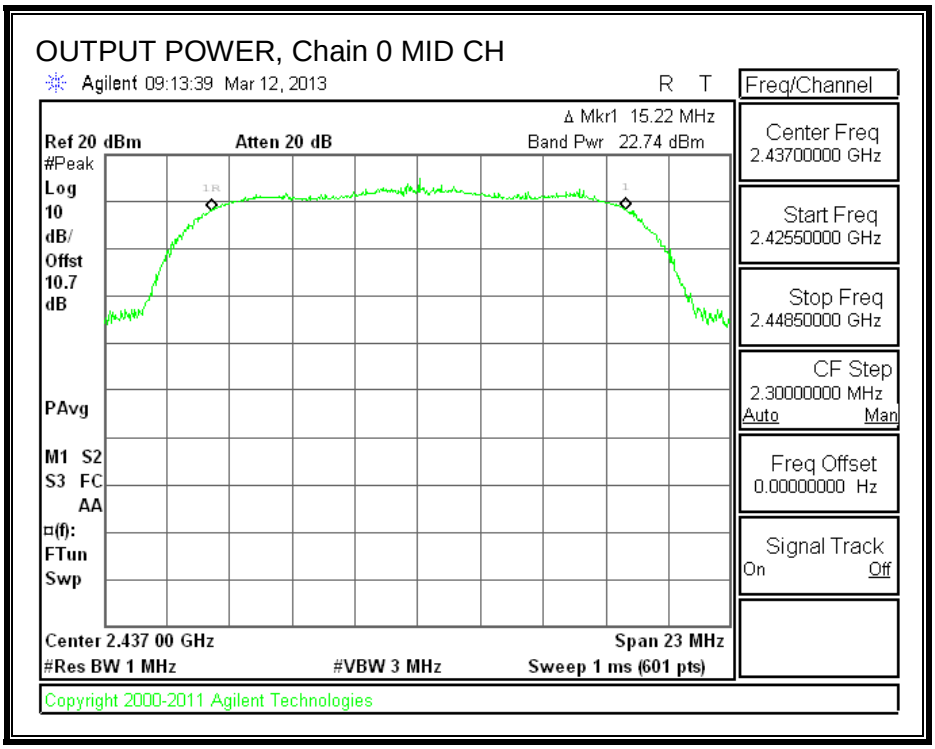
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.00	30.00	30	36	30.00
Mid	2437	1.00	30.00	30	36	30.00
High	2462	1.00	30.00	30	36	30.00

Results

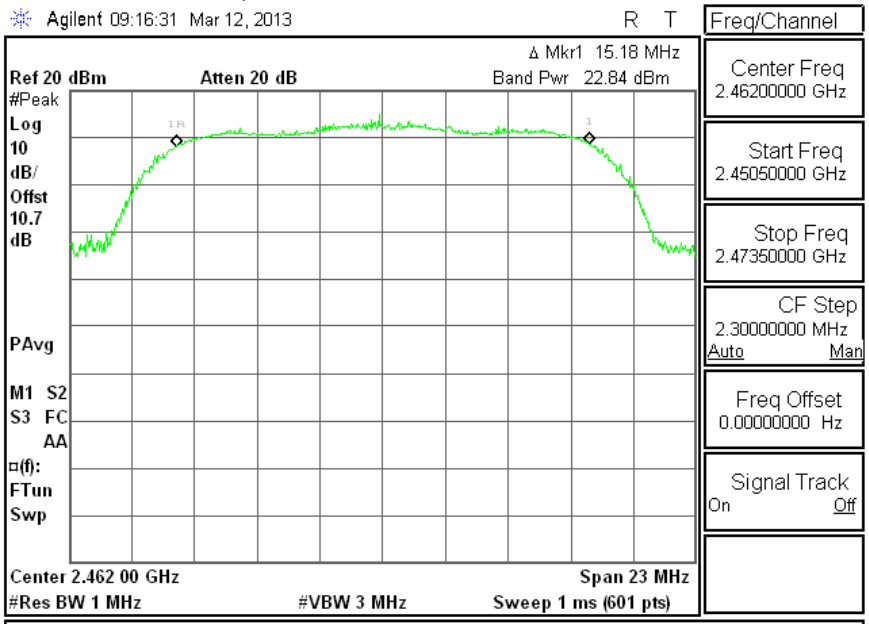
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	22.75	22.75	30.00	-7.25
Mid	2437	22.74	22.74	30.00	-7.26
High	2462	22.84	22.84	30.00	-7.16

OUTPUT POWER, Chain 0





OUTPUT POWER, Chain 0 HIGH CH



9.2.5. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

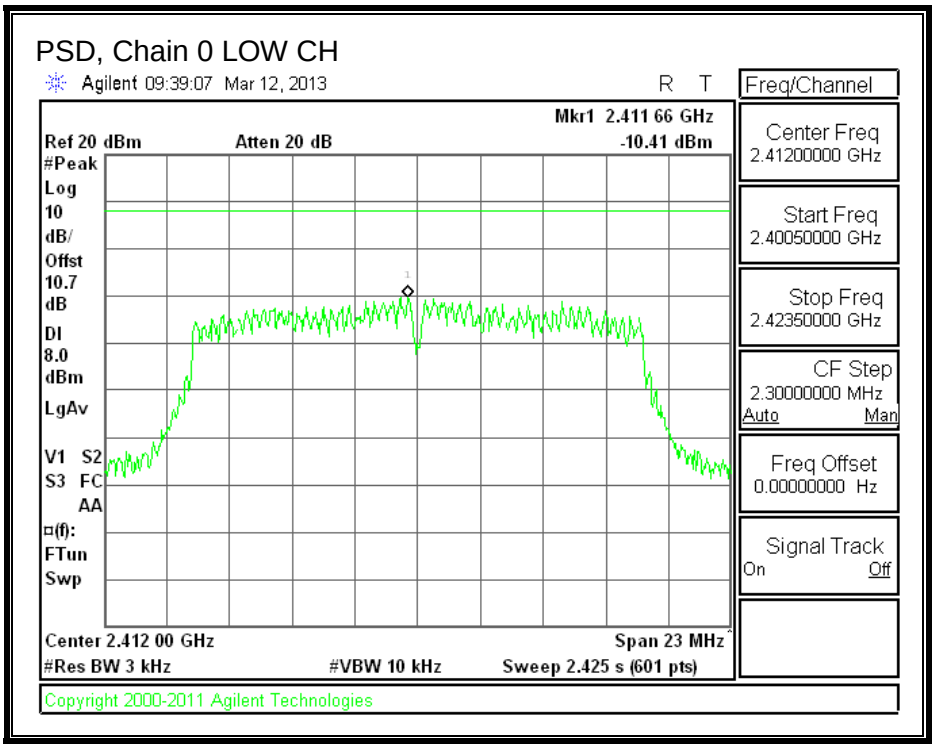
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

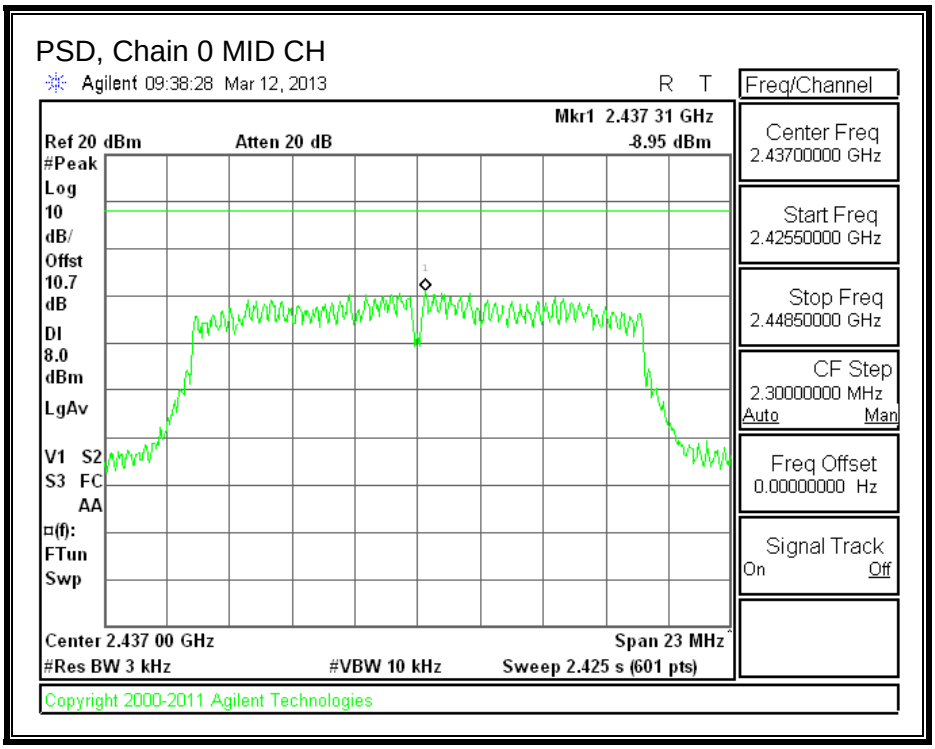
RESULTS

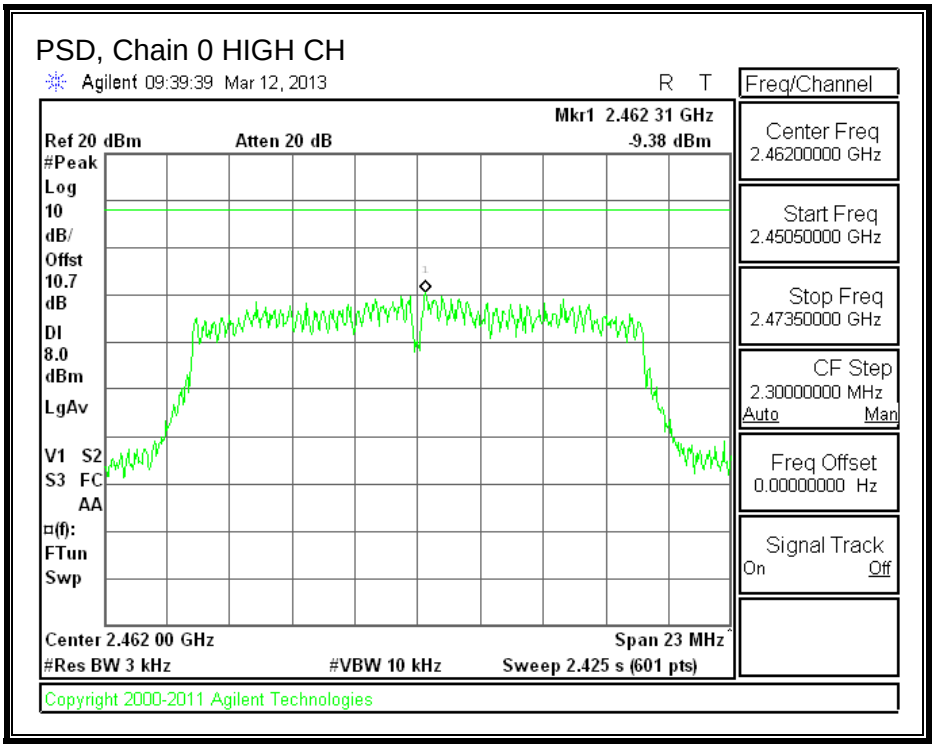
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-10.41	8.0	-18.4
Mid	2437	-8.95	8.0	-17.0
High	2462	-9.38	8.0	-17.4

PSD, Chain 0







9.2.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

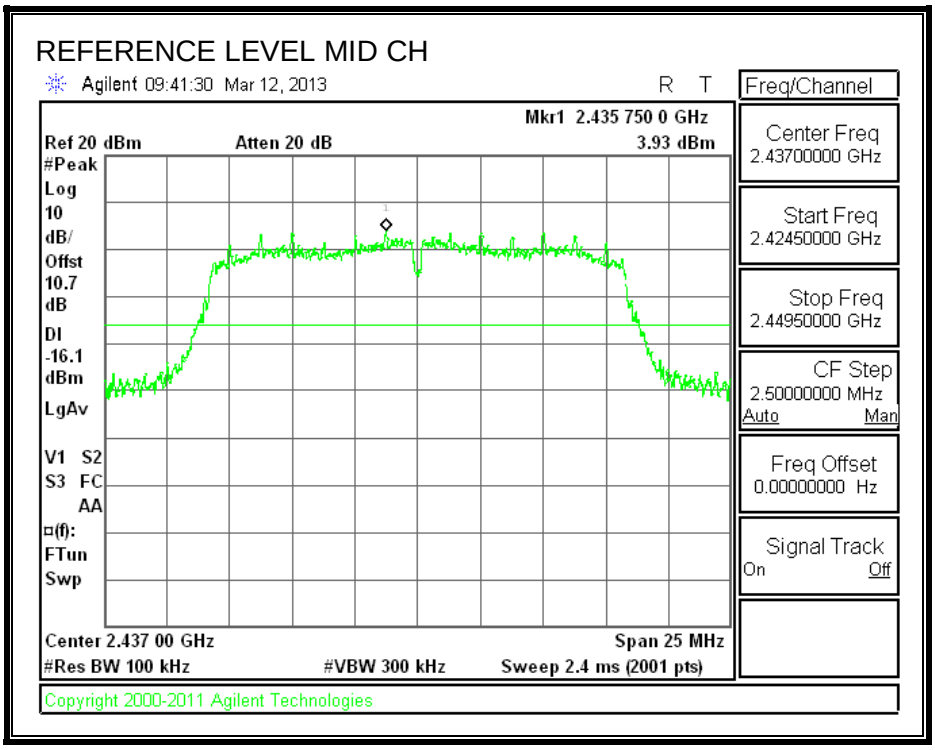
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

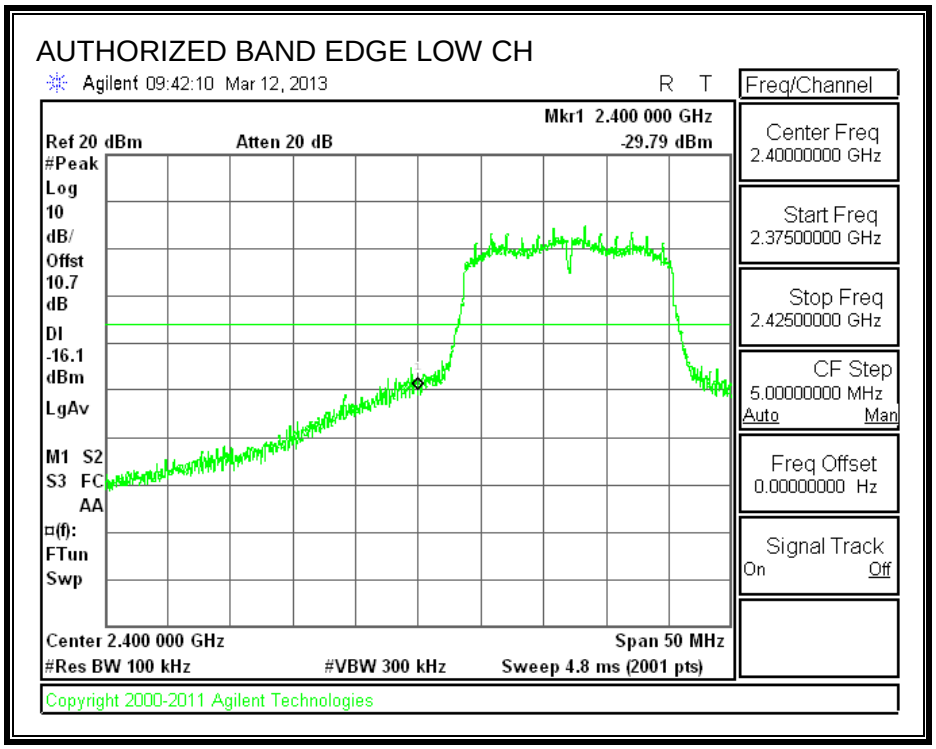
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

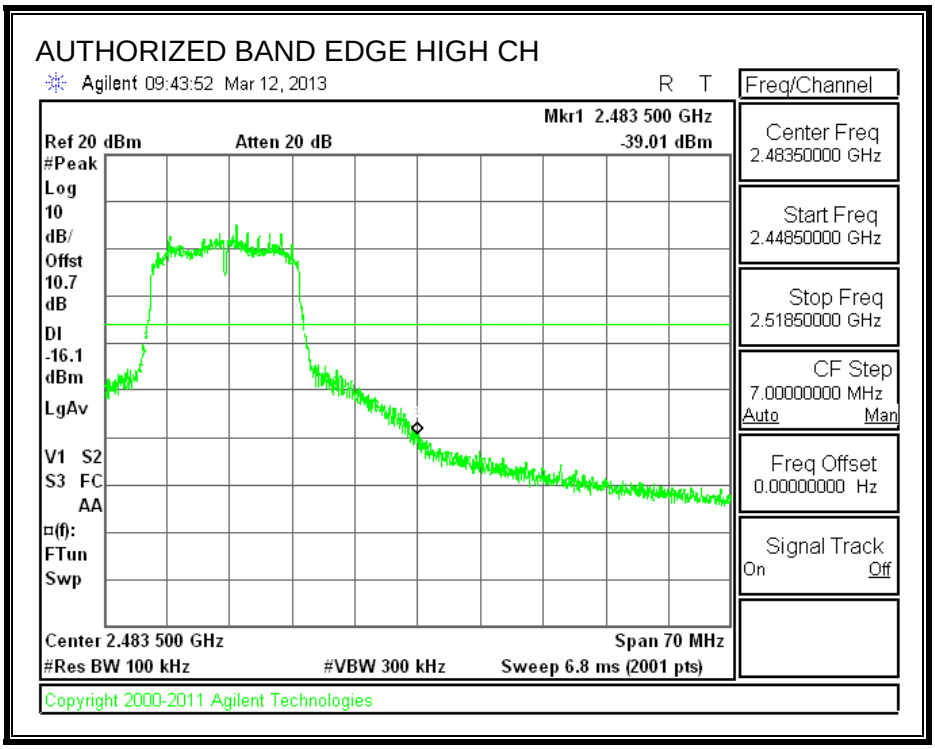
IN-BAND REFERENCE LEVEL



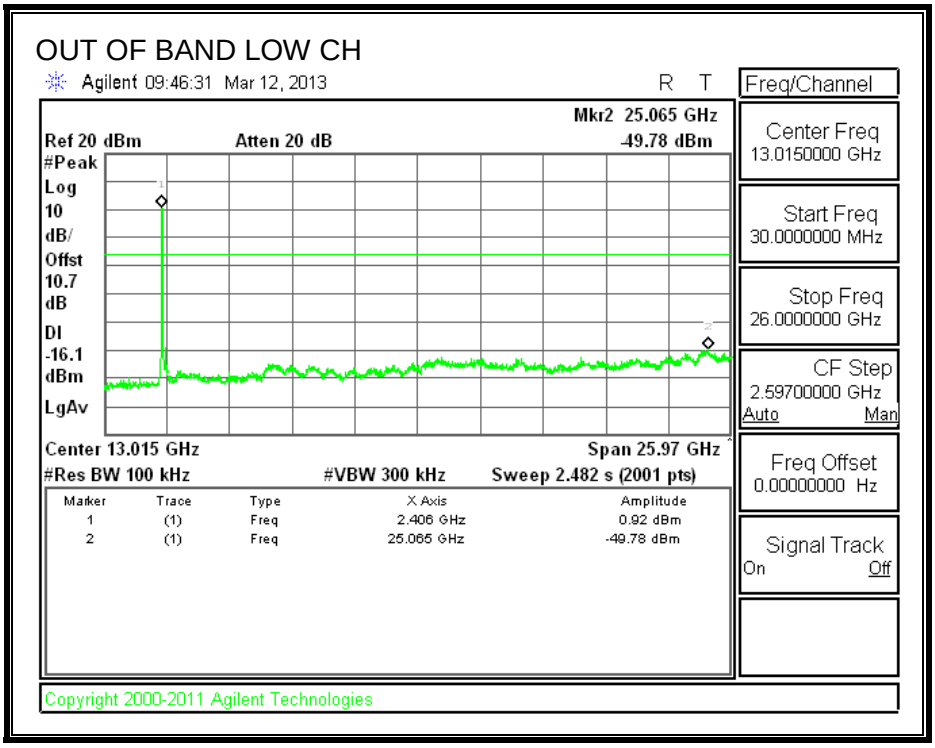
LOW CHANNEL BANDEDGE

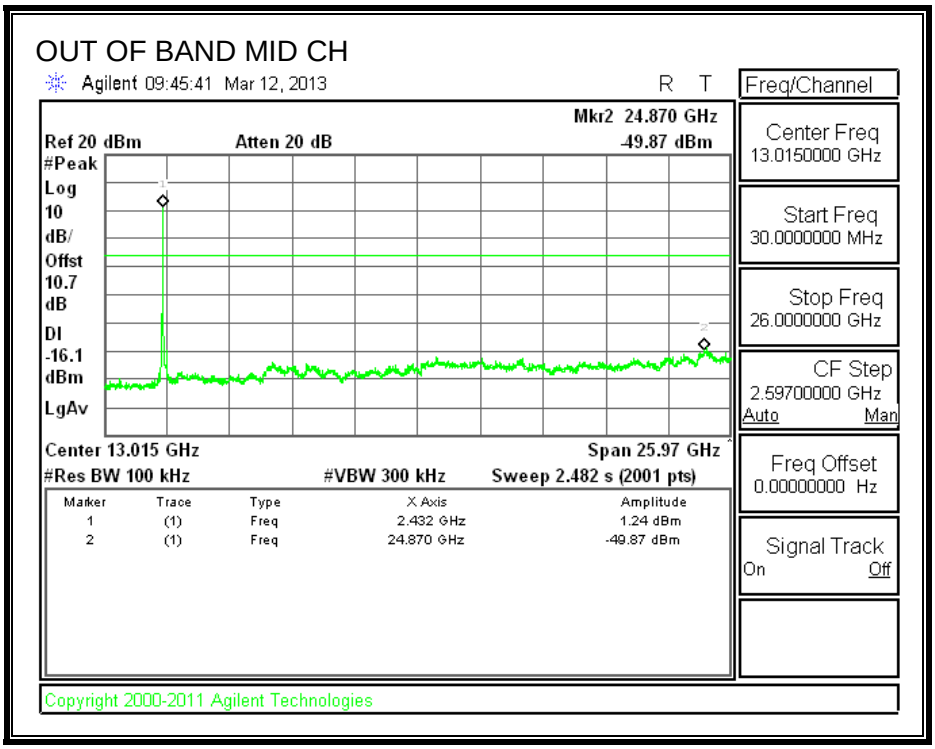


HIGH CHANNEL BANDEDGE

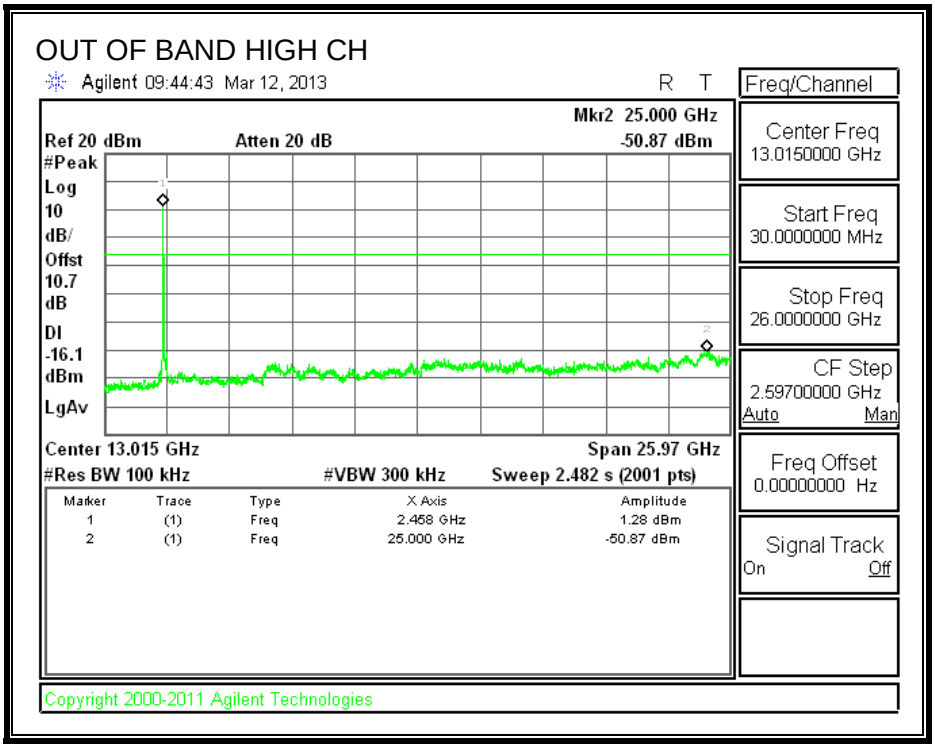


OUT-OF-BAND EMISSIONS





OUT OF BAND HIGH CH



9.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

9.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

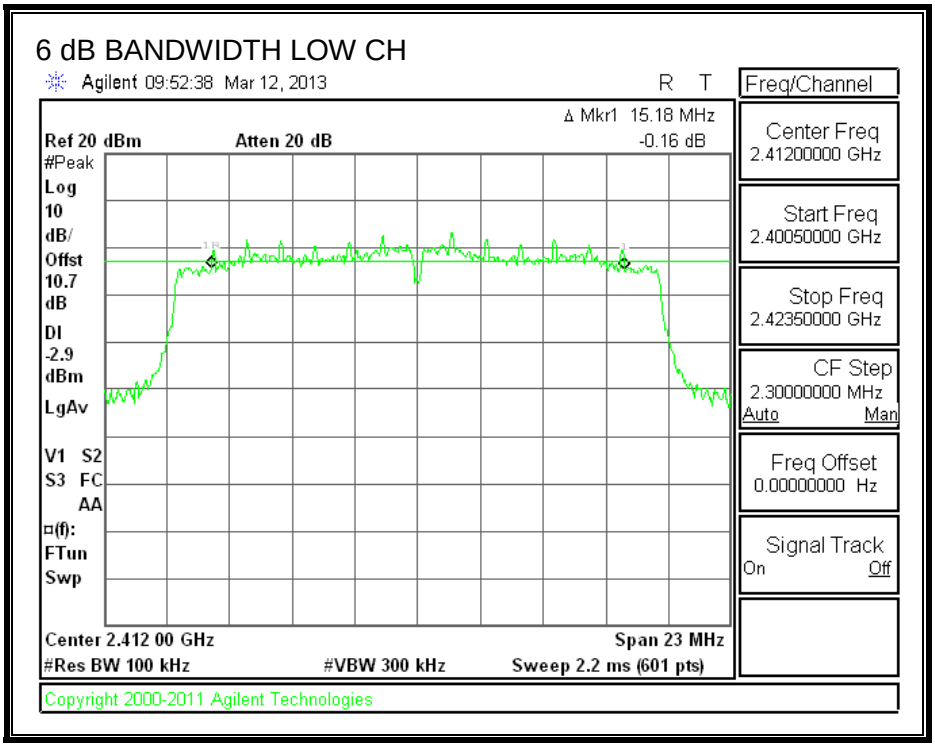
TEST PROCEDURE

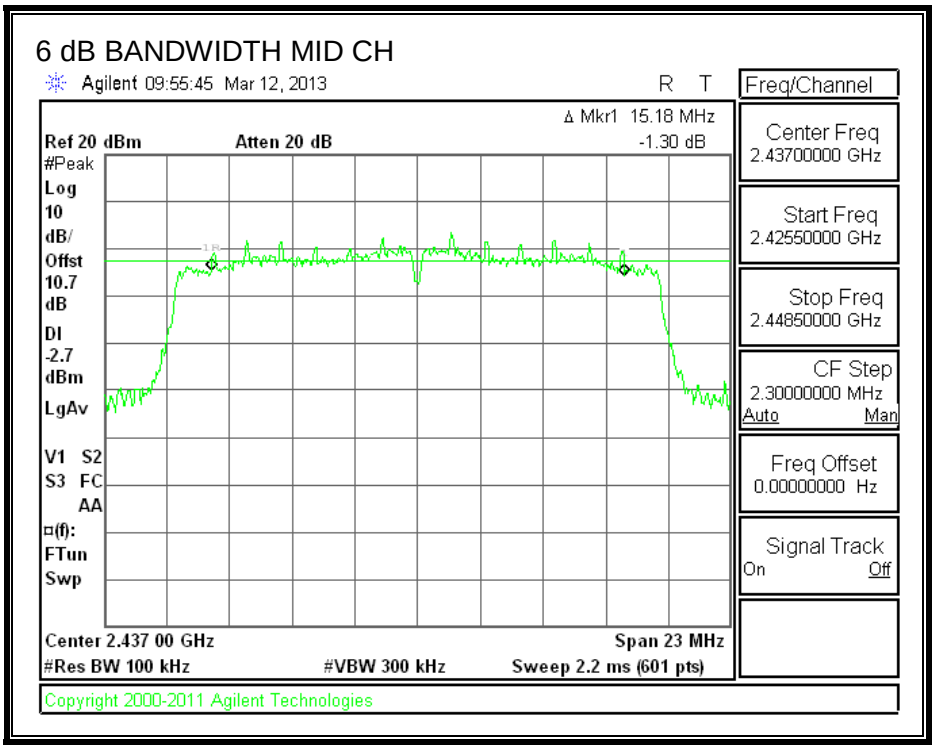
The transmitter output is connected to a spectrum analyzer with the RBW set between 1% and 5% of the EBW, the VBW >= 3 x RBW, peak detector and max hold.

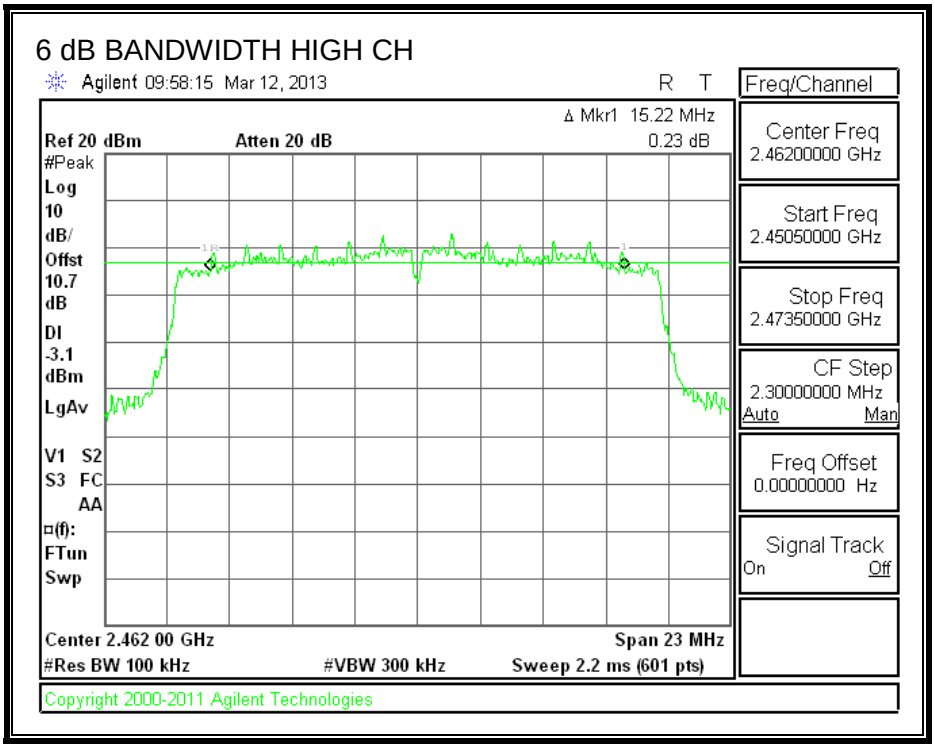
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.180	0.5
Mid	2437	15.180	0.5
High	2462	15.220	0.5

6 dB BANDWIDTH







9.3.2. 99% BANDWIDTH

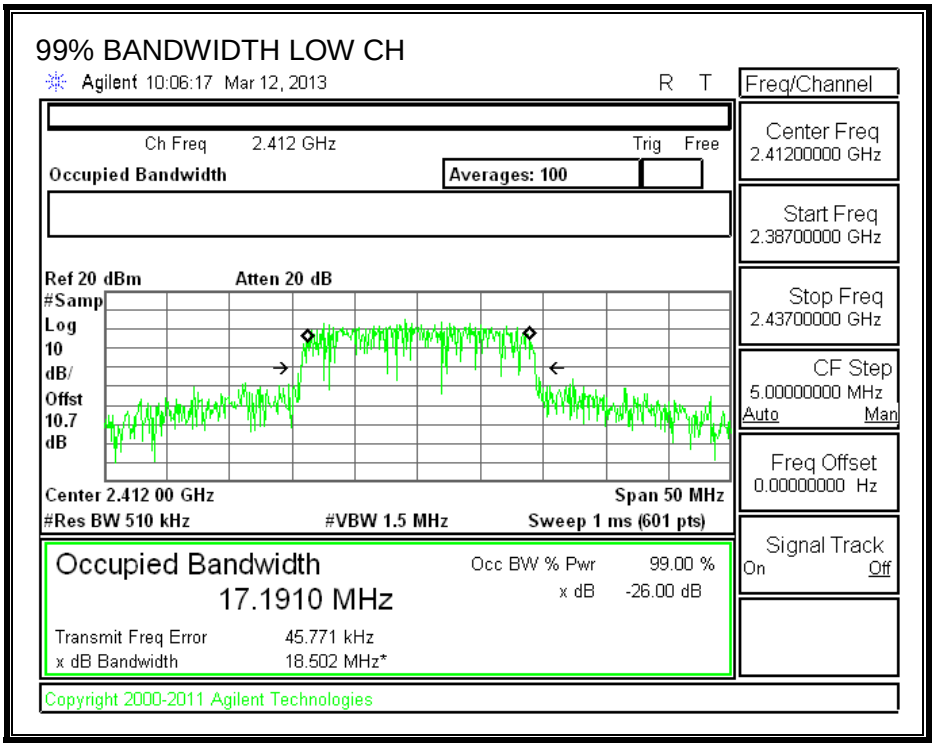
LIMITS

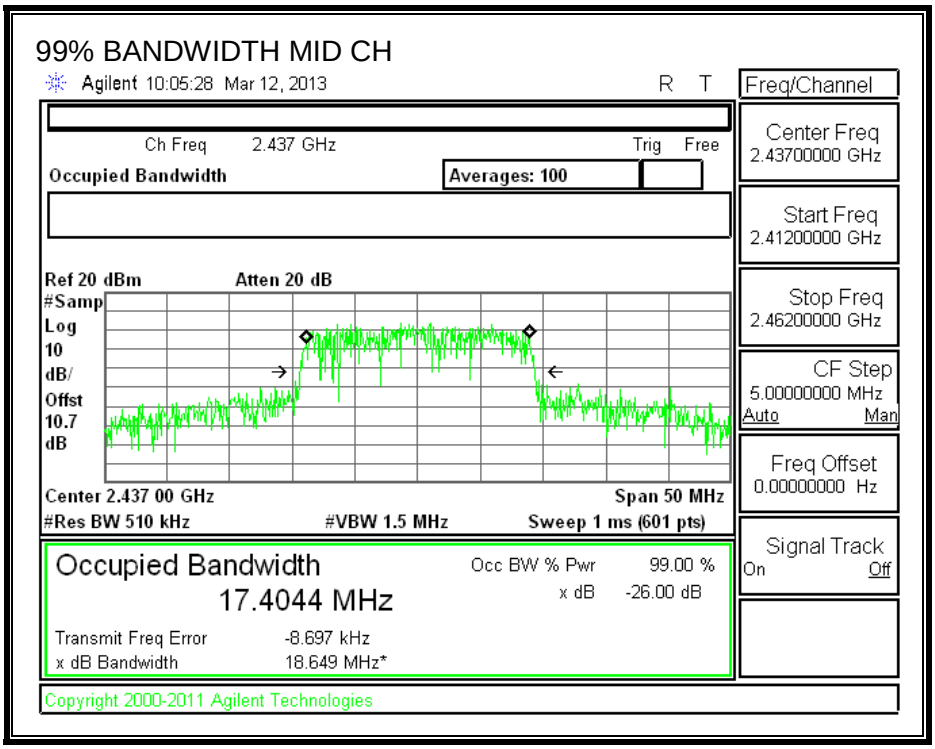
None; for reporting purposes only.

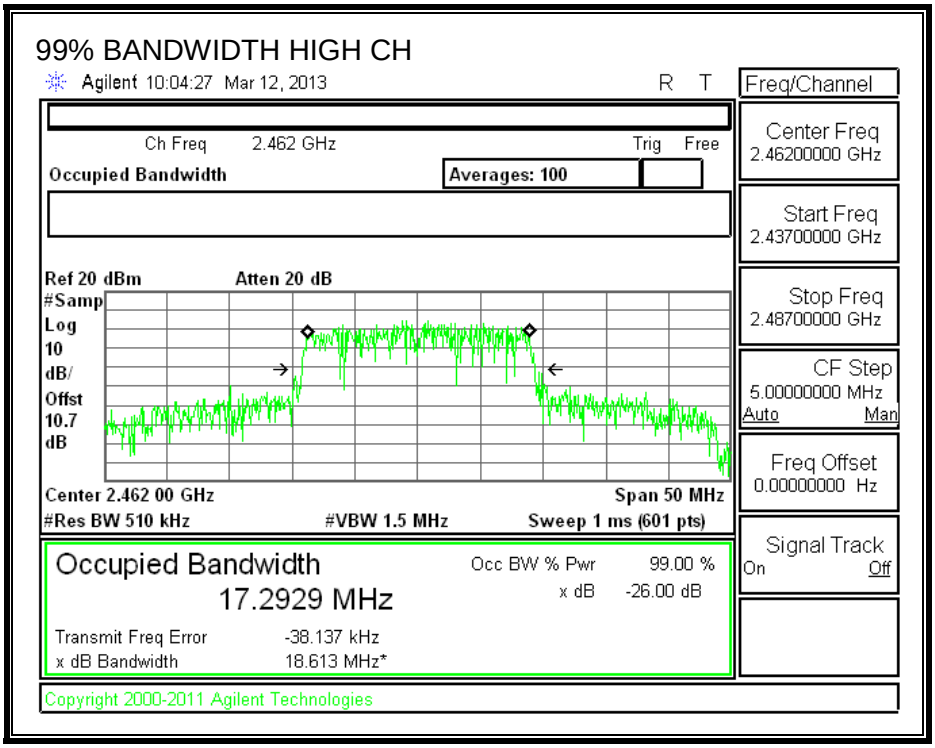
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.1910
Mid	2437	17.4044
High	2462	17.2929

99% BANDWIDTH







9.3.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2412	13.40
Mid	2437	13.40
High	2462	13.40

9.3.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

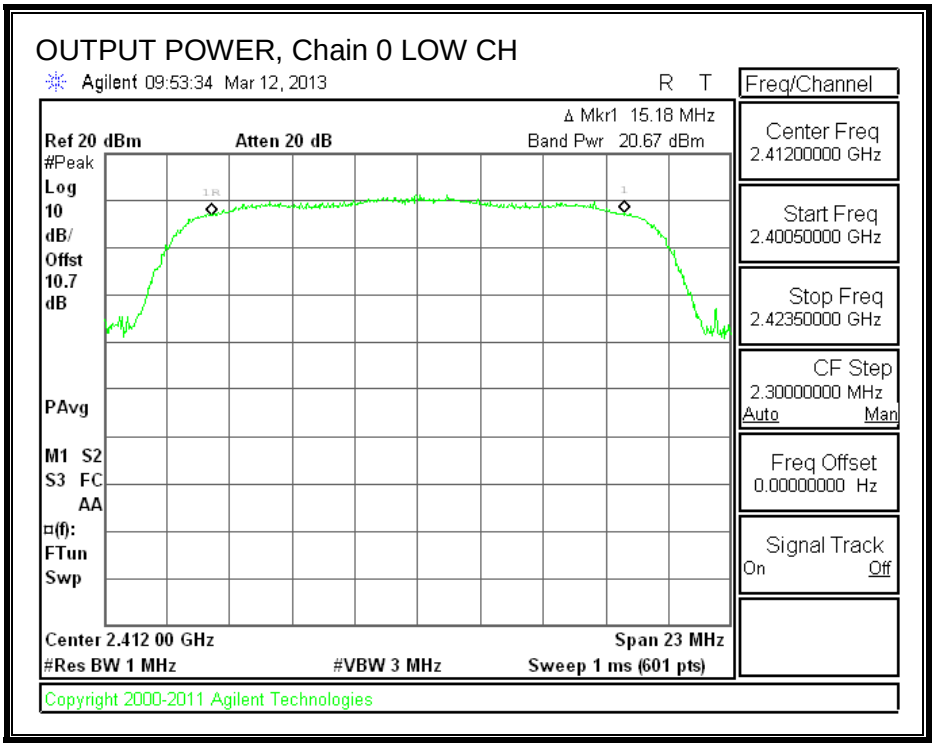
Limits

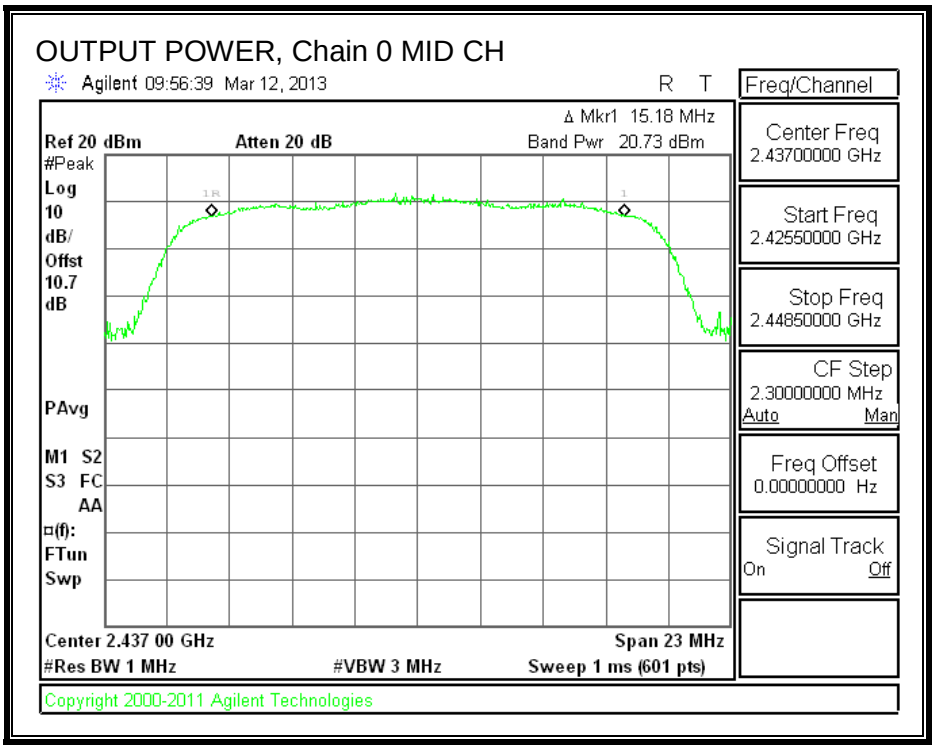
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.00	30.00	30	36	30.00
Mid	2437	1.00	30.00	30	36	30.00
High	2462	1.00	30.00	30	36	30.00

Results

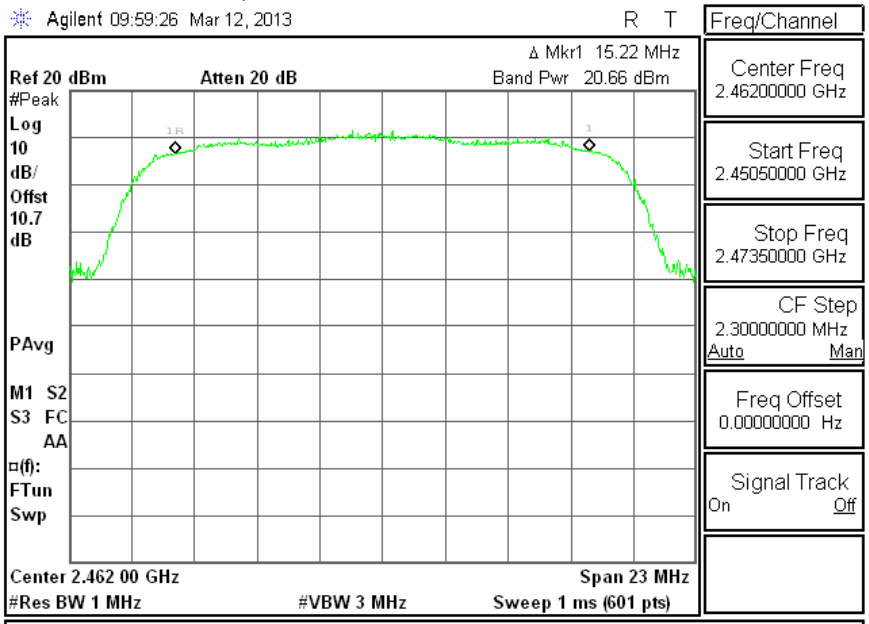
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	20.67	20.67	30.00	-9.33
Mid	2437	20.73	20.73	30.00	-9.27
High	2462	20.66	20.66	30.00	-9.34

OUTPUT POWER, Chain 0





OUTPUT POWER, Chain 0 HIGH CH



9.3.5. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

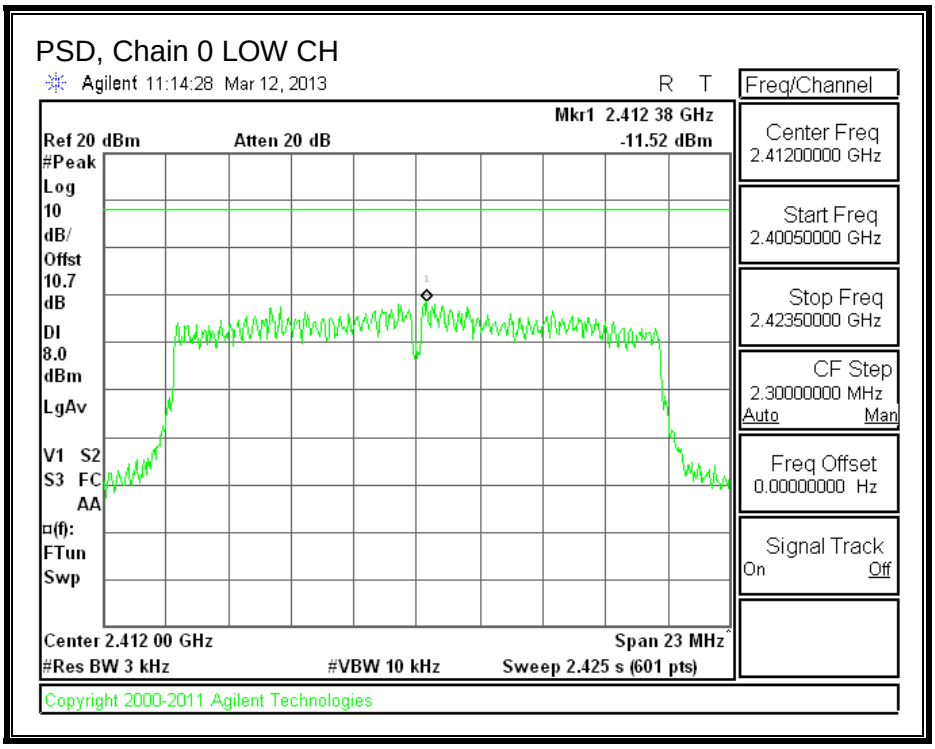
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

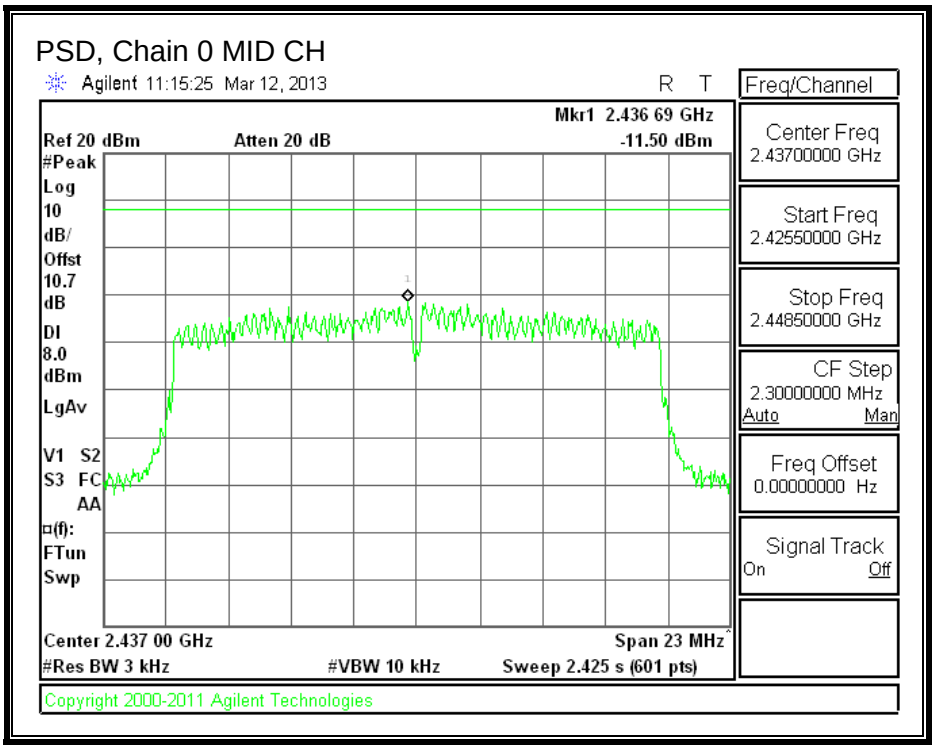
RESULTS

PSD Results

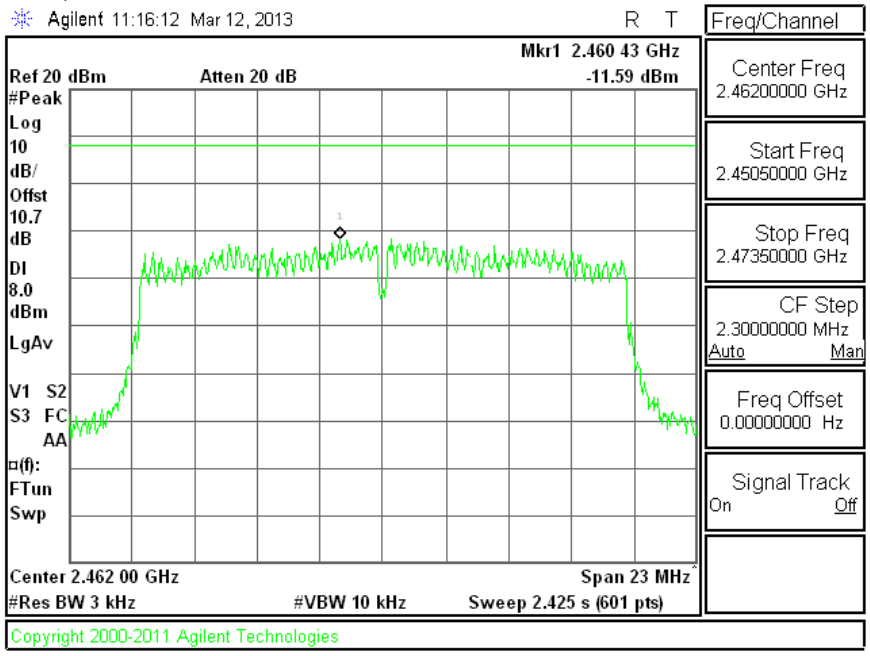
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-11.52	8.0	-19.5
Mid	2437	-11.50	8.0	-19.5
High	2462	-11.59	8.0	-19.6

PSD, Chain 0





PSD, Chain 0 HIGH CH



9.3.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

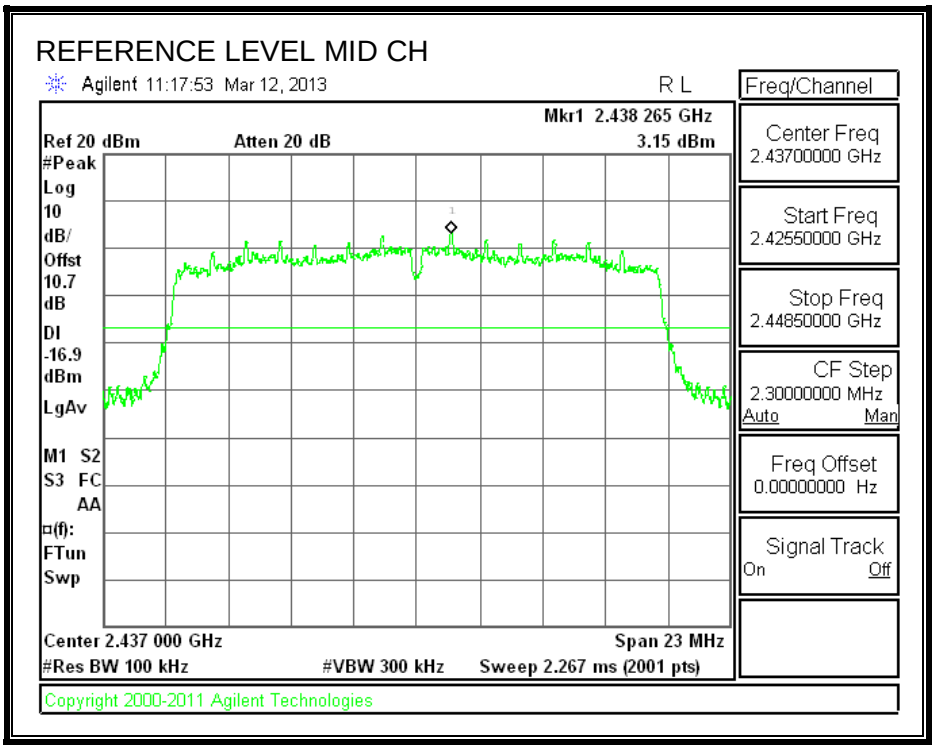
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

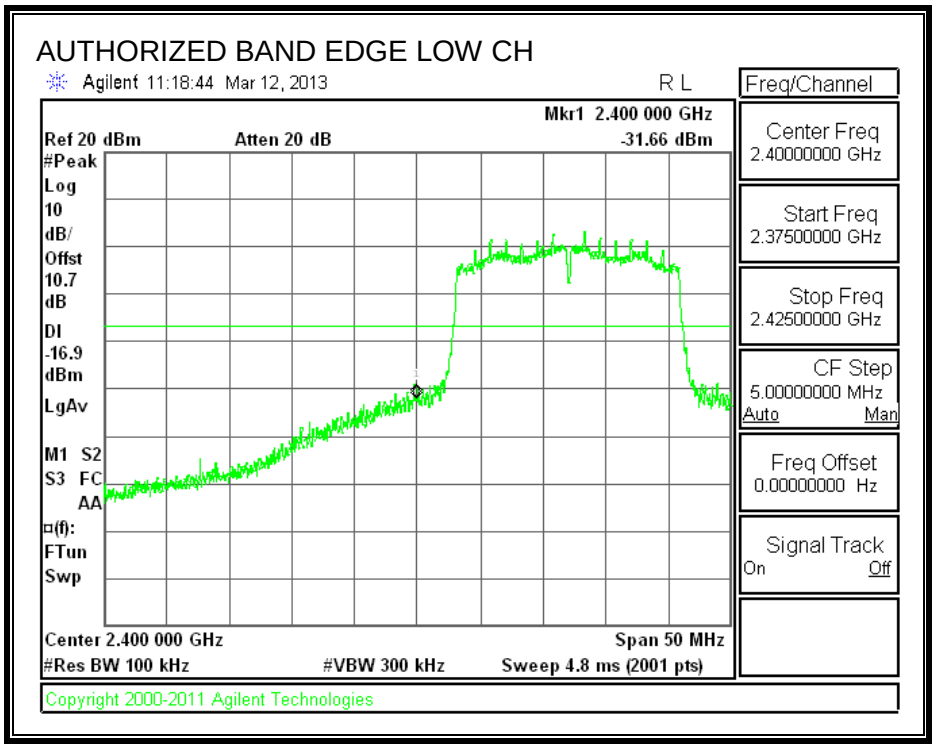
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

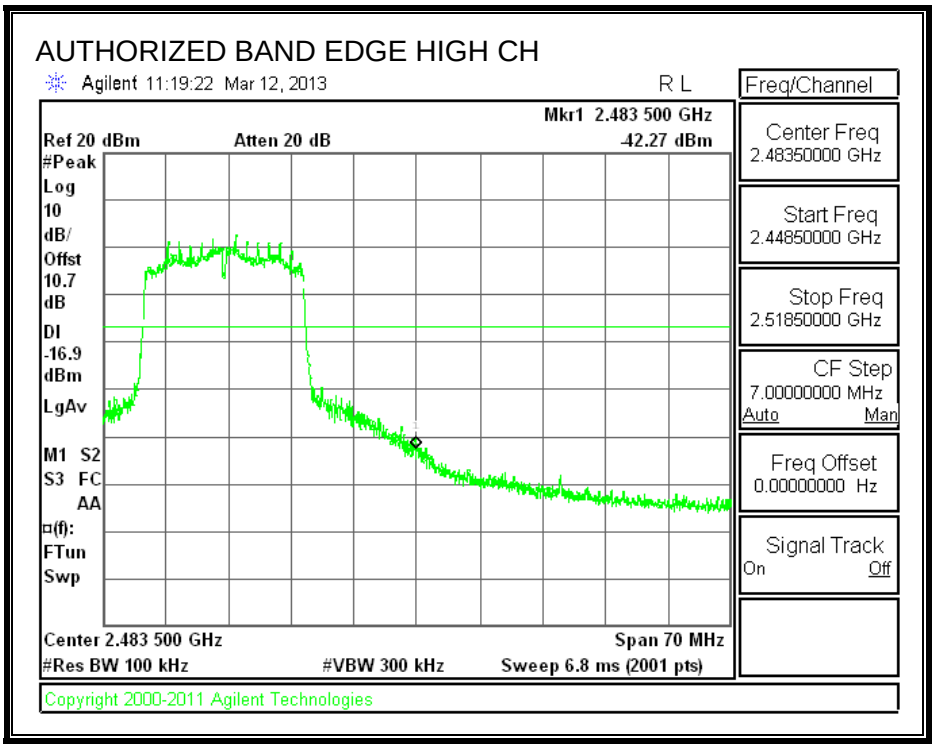
IN-BAND REFERENCE LEVEL



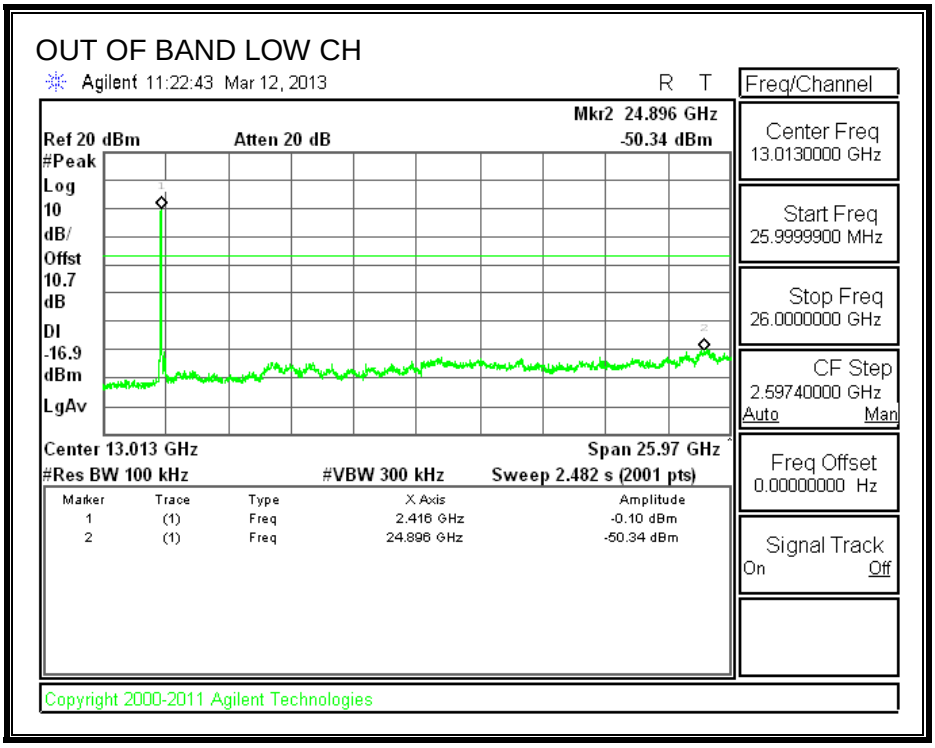
LOW CHANNEL BANDEDGE

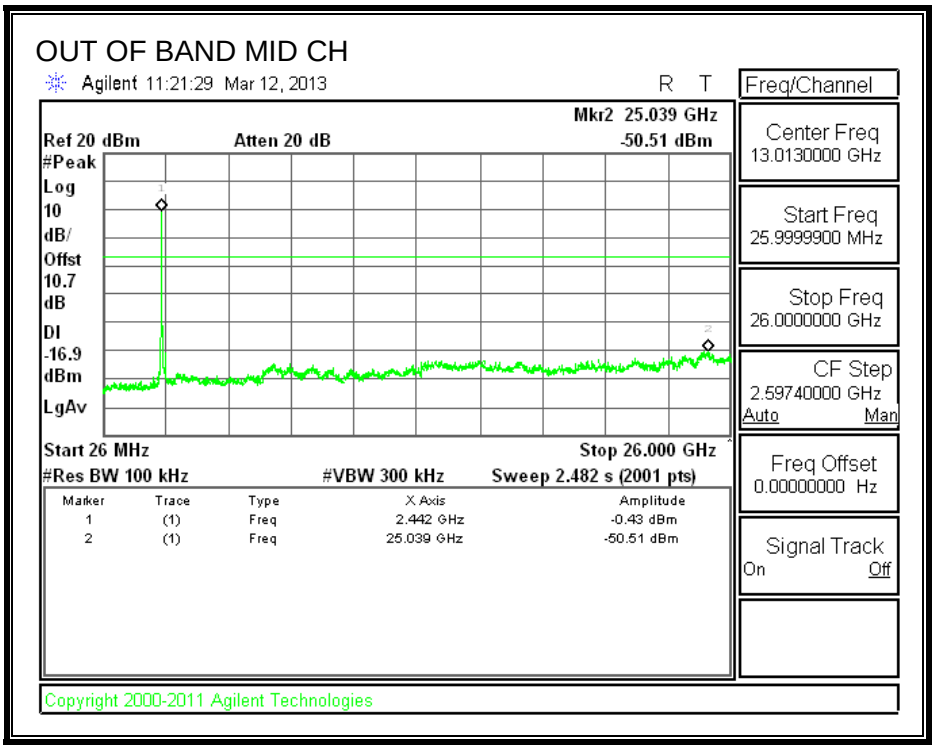


HIGH CHANNEL BANDEDGE

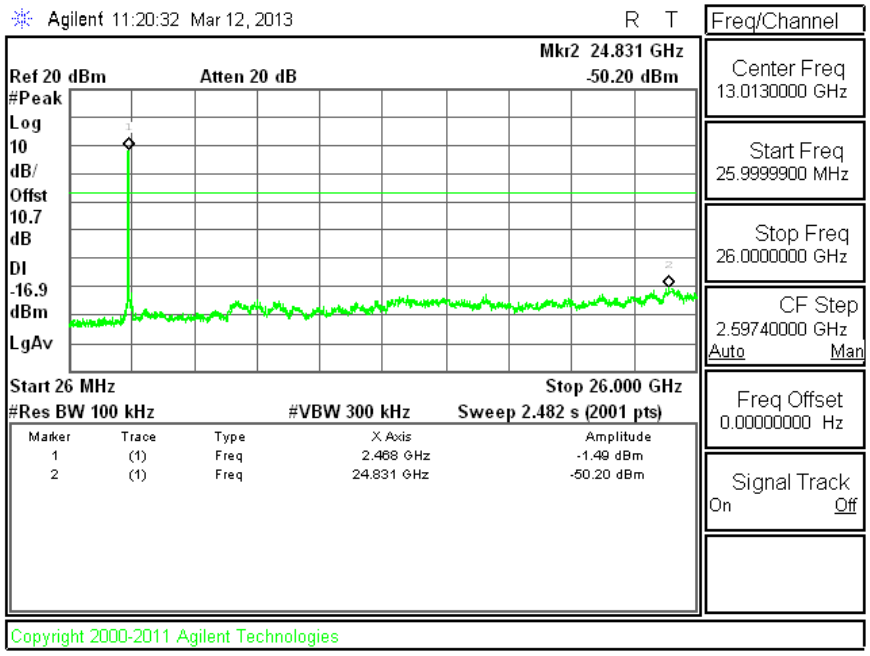


OUT-OF-BAND EMISSIONS





OUT OF BAND HIGH CH



10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

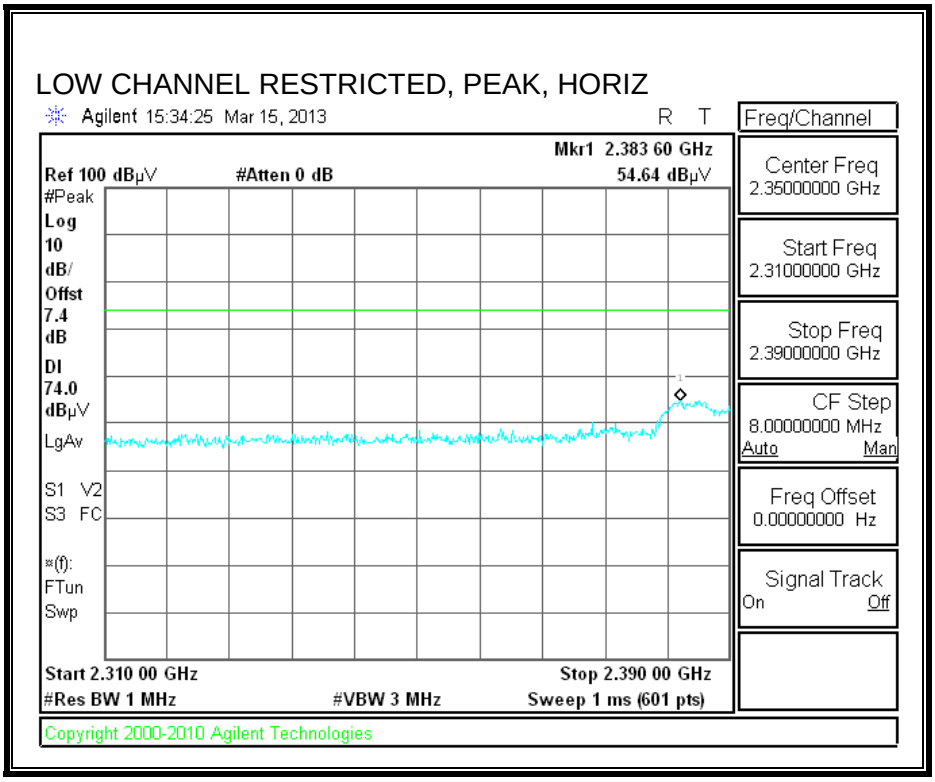
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements.

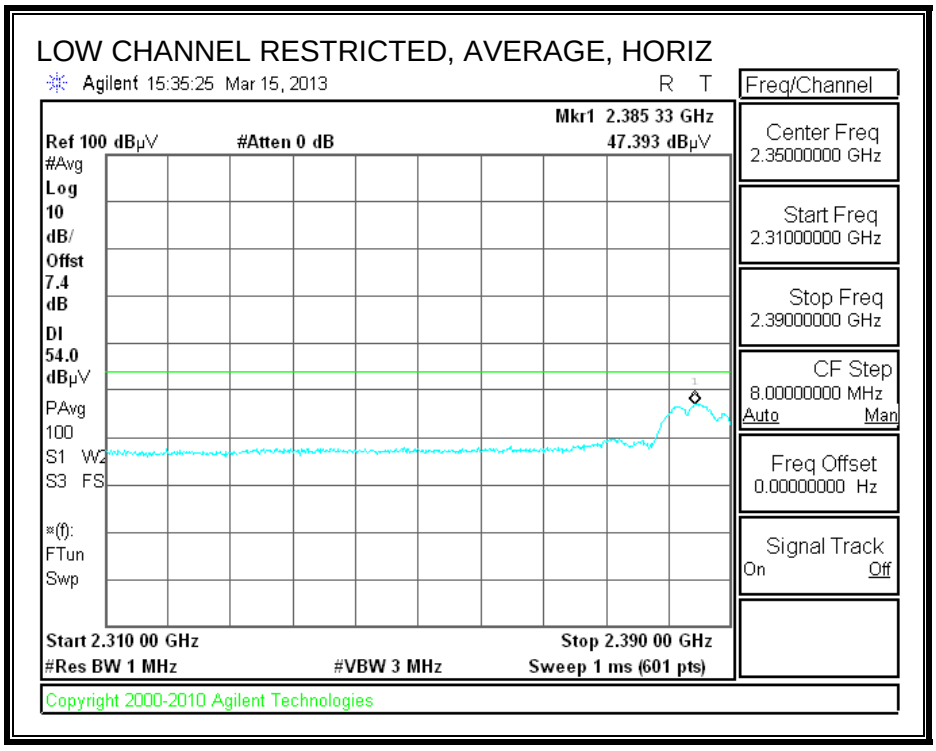
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

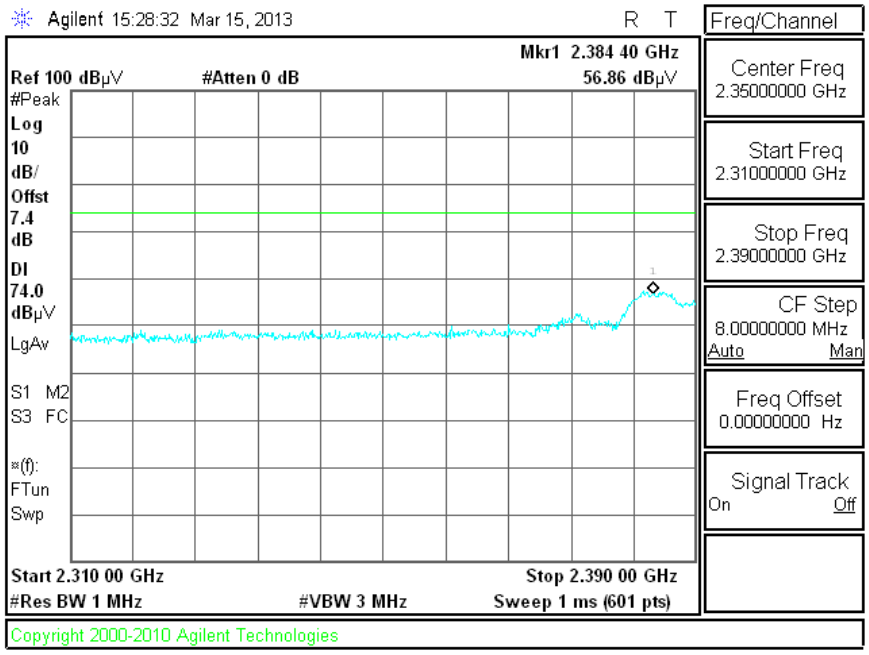
10.2. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

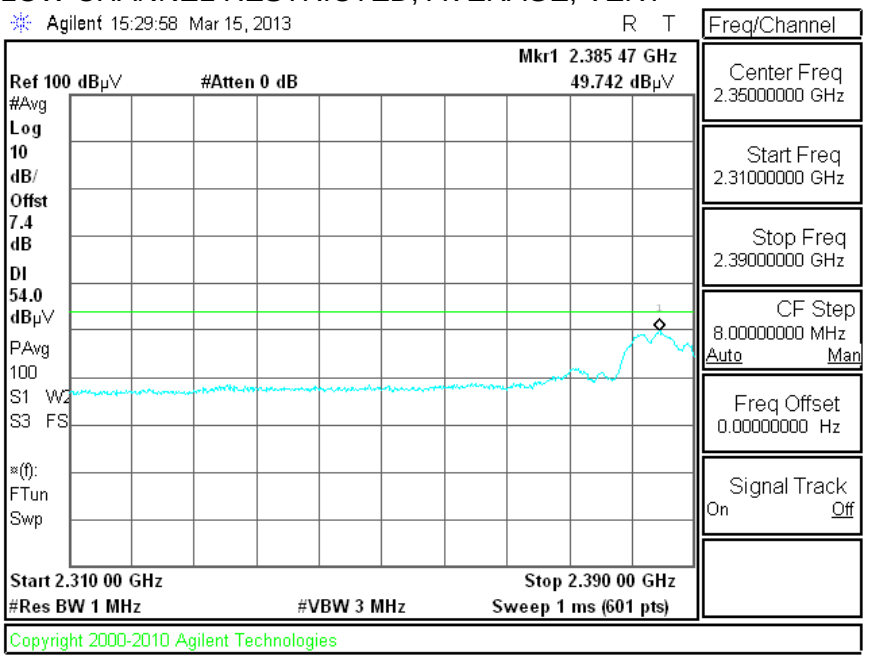




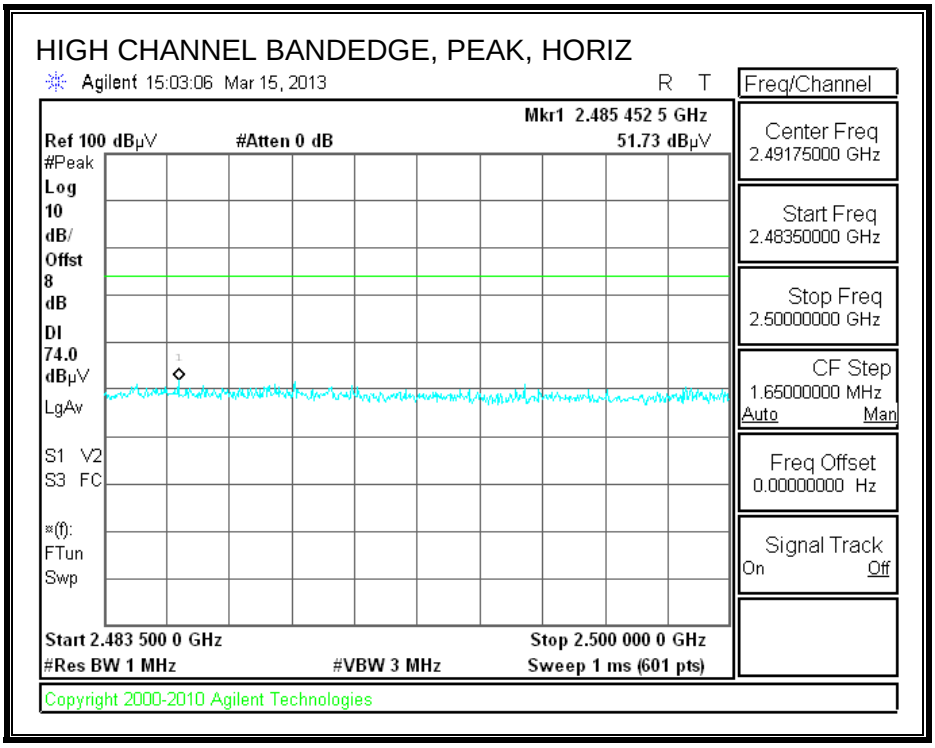
LOW CHANNEL RESTRICTED, PEAK, VERT

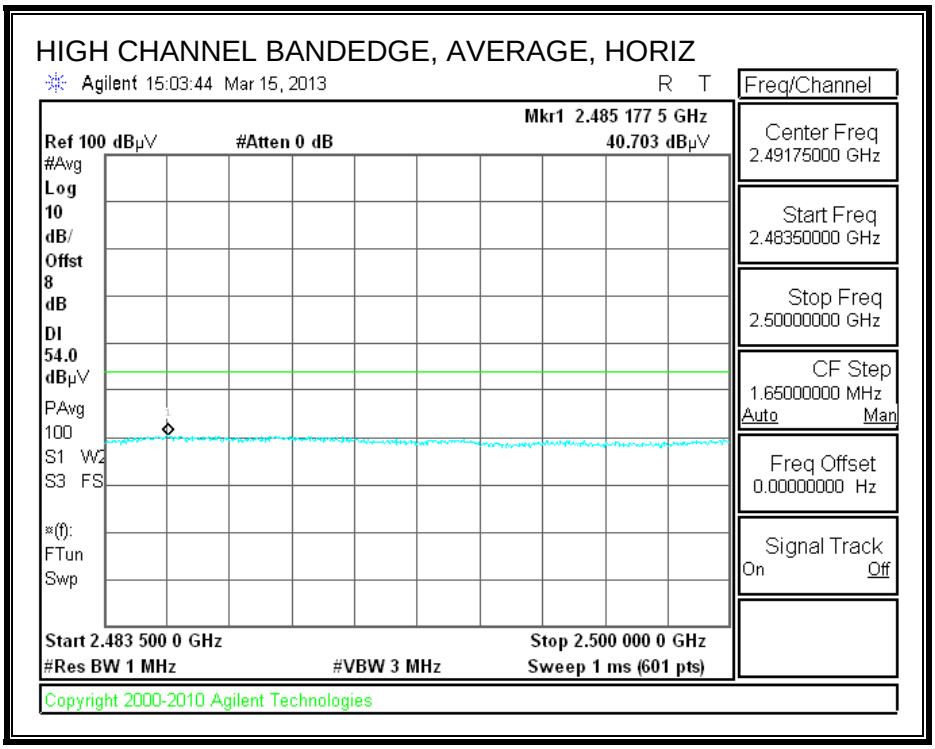


LOW CHANNEL RESTRICTED, AVERAGE, VERT

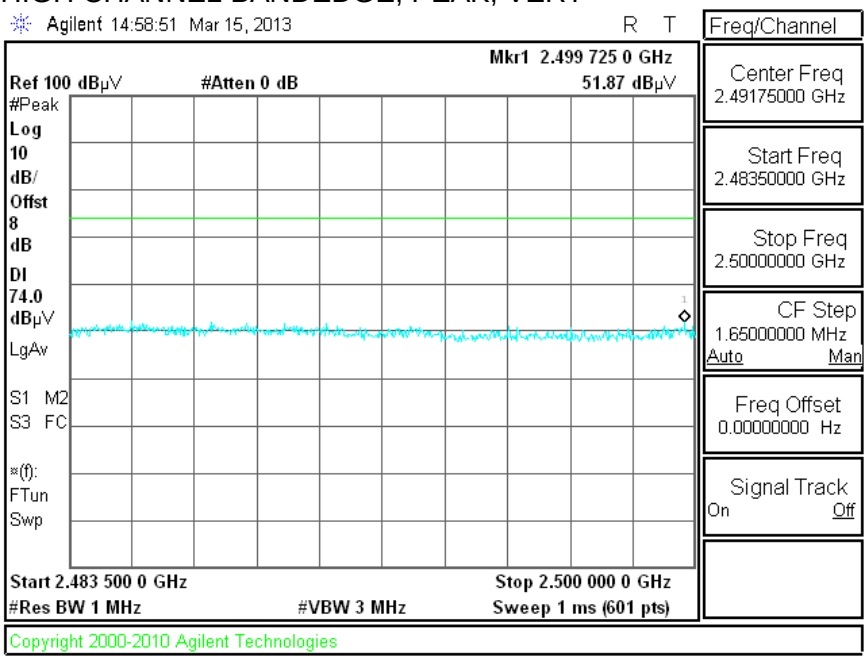


RESTRICTED BANDEDGE (HIGH CHANNEL)

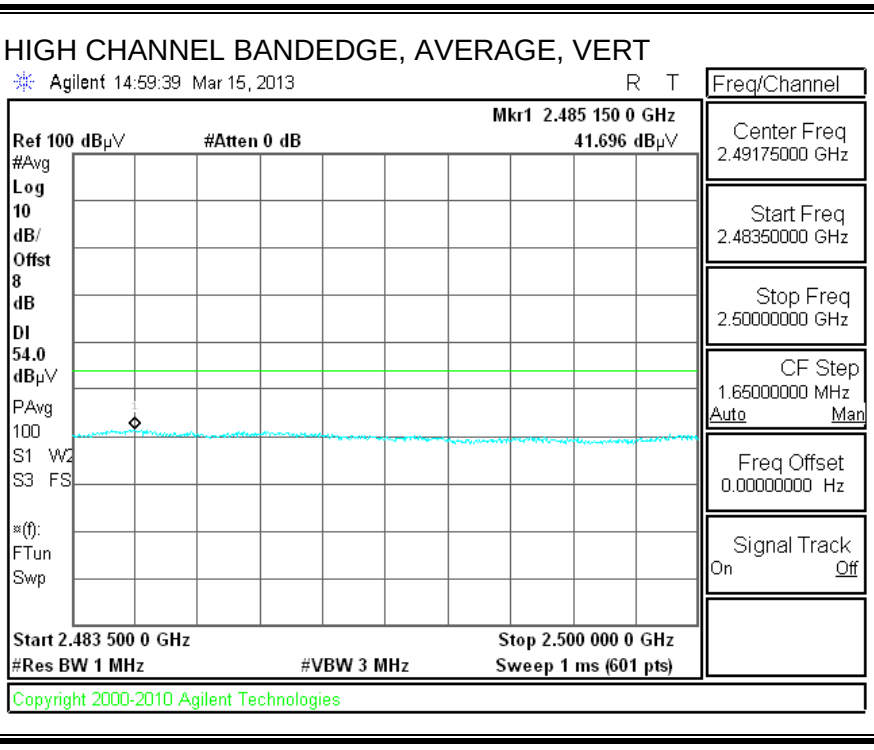




HIGH CHANNEL BANDEDGE, PEAK, VERT

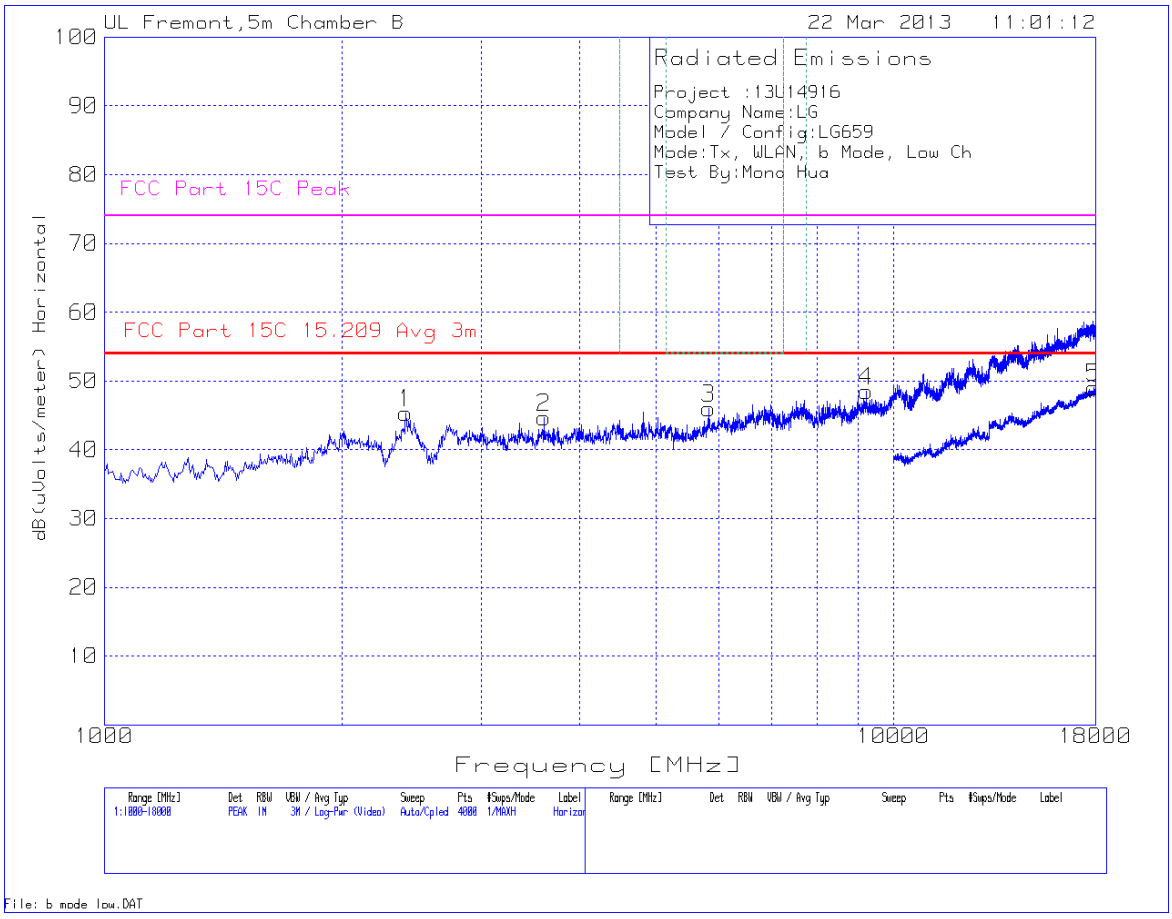


HIGH CHANNEL BANDEDGE, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

HORIZONTAL LOW CHANNEL PLOT



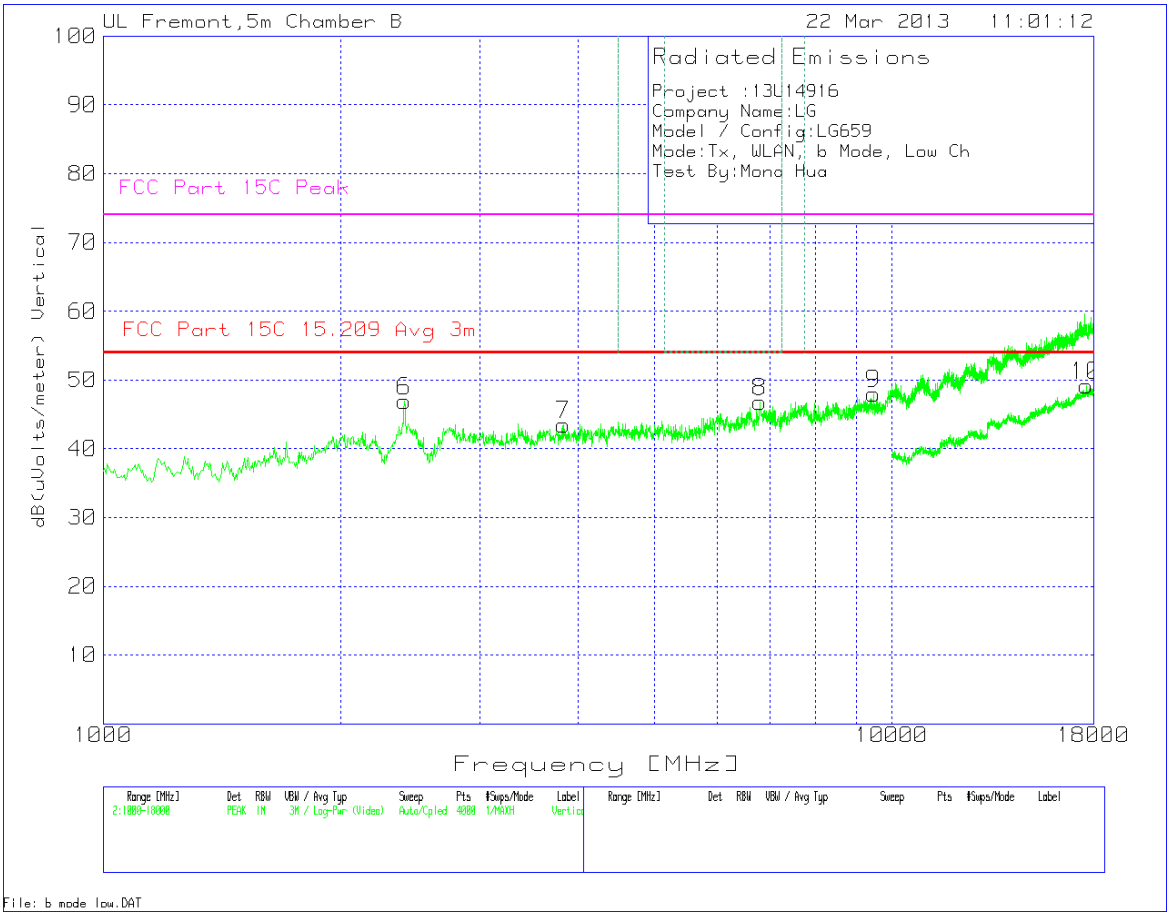
Horizontal 1000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
1	2409.943	42.39	PK	32.4	-35	4.6	0.9	45.29	54	-8.71	74	-28.71	100	Horz
2	3603.298	40.21	PK	33.4	-35	5.8	0.3	44.71	54	-9.29	74	-29.29	200	Horz
3	5832.875	37.55	PK	35.4	-34.9	7.8	0.2	46.05	54	-7.95	74	-27.95	200	Horz
4	9221.834	36.34	PK	36.9	-35.2	10	0.5	48.54	54	-5.46	74	-25.46	100	Horz

Horizontal 10000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
5	17936.032	22.75	PK	42.2	-31.3	14.8	0.6	49.05	54	-4.95	74	-24.95	200	Horz

VERTICAL LOW CHANNEL PLOT



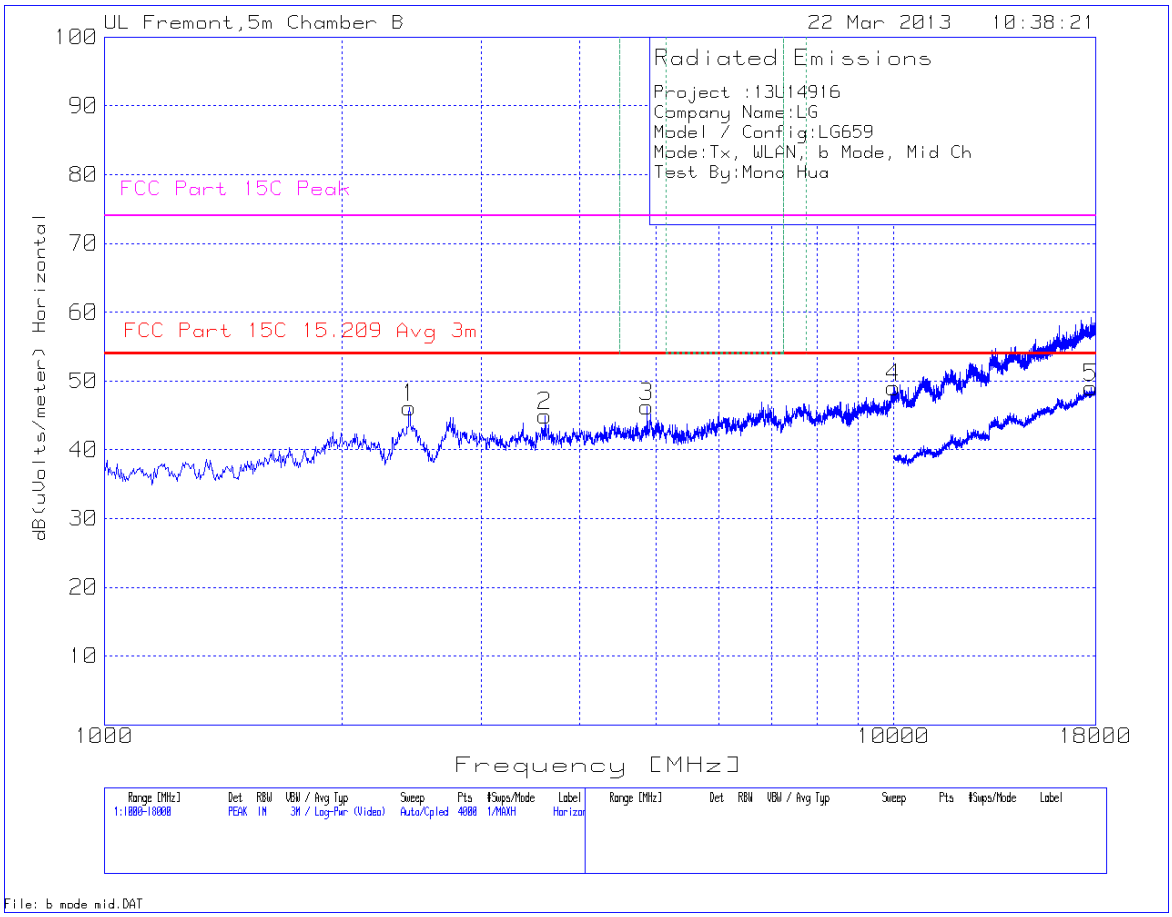
Vertical 1000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/ meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
6	2409.943	43.98	PK	32.4	-35	4.6	0.9	46.88	54	-7.12	74	-27.12	100	Vert
7	3832.626	38.15	PK	33.8	-34.9	6.1	0.4	43.55	54	-10.45	74	-30.45	200	Vert
8	6809.643	37.14	PK	35.8	-35	8.5	0.3	46.74	54	-7.26	74	-27.26	200	Vert
9	9476.643	35.17	PK	37.2	-35.1	10.2	0.5	47.97	54	-6.03	74	-26.03	200	Vert

Vertical 10000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/ meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
10	17640.18	23.43	PK	42.1	-31.5	14.6	0.6	49.23	54	-4.77	74	-24.77	200	Vert

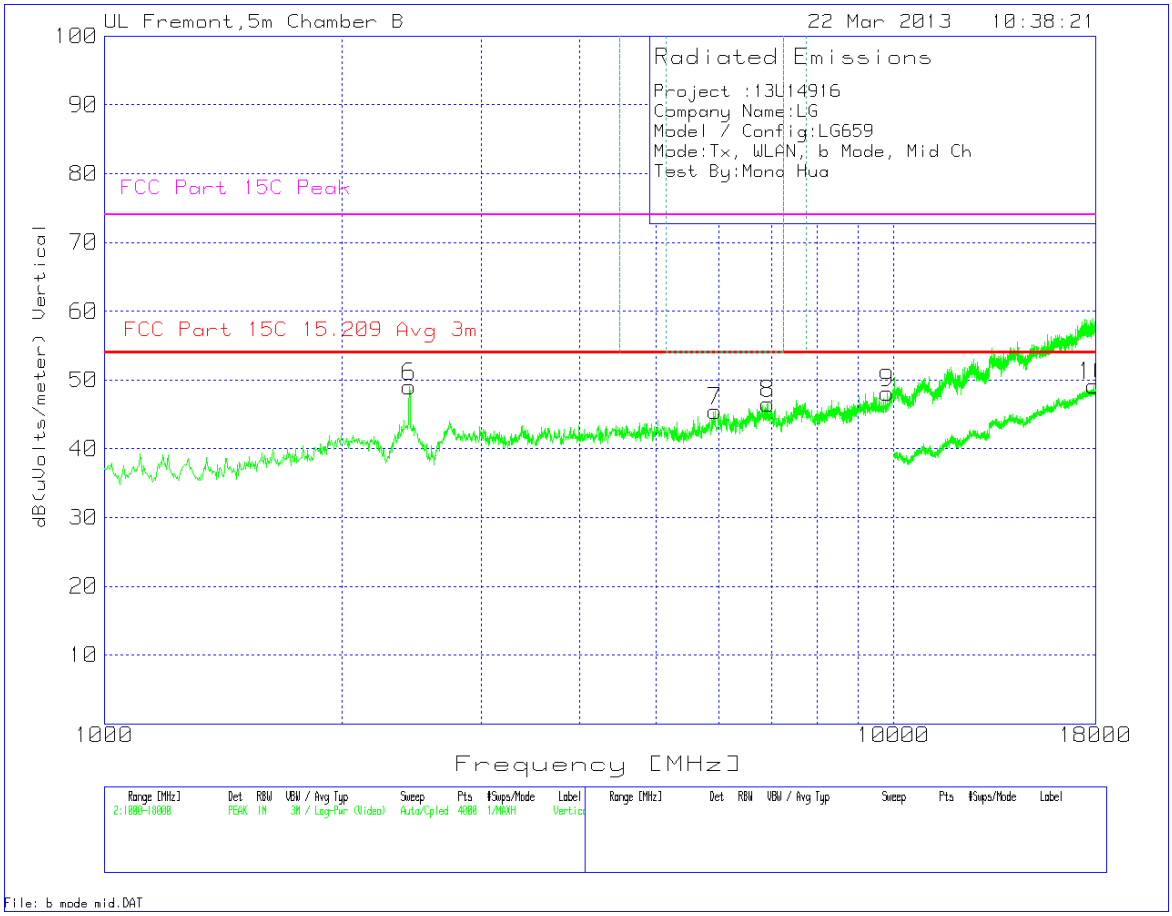
HORIZONTAL MID CHANNEL PLOT



Horizontal 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
1	2435.423	43.18	PK	32.4	-35	4.7	0.9	46.18	54	-7.82	74	-27.82	100	Horz
2	3620.285	40.11	PK	33.5	-35	5.9	0.4	44.91	54	-9.09	74	-29.09	200	Horz
3	4873.095	39.13	PK	34.7	-34.9	7.1	0.2	46.23	54	-7.77	74	-27.77	100	Horz
4	9986.26	35.26	PK	37.8	-34.9	10.4	0.5	49.06	54	-4.94	74	-24.94	100	Horz

Horizontal 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
5	17792.104	23	PK	42.2	-31.4	14.7	0.6	49.1	54	-4.9	74	-24.9	200	Horz

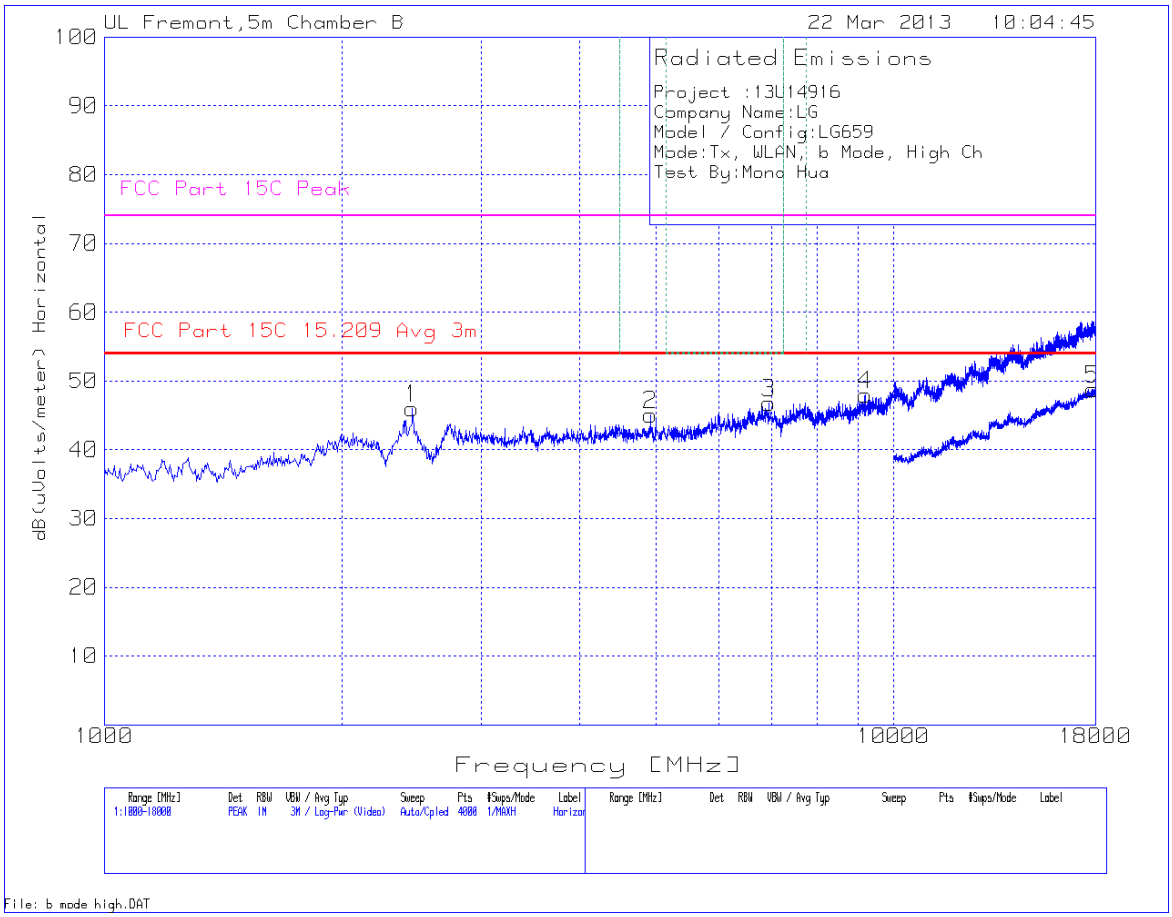
VERTICAL MID CHANNEL PLOT



Vertical 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
6	2435.423	46.09	PK	32.4	-35	4.7	0.9	49.09	54	-4.91	74	-24.91	100	Vert
7	5934.799	36.54	PK	35.7	-34.9	7.9	0.2	45.44	54	-8.56	74	-28.56	100	Vert
8	6932.8	36.69	PK	35.9	-35	8.6	0.3	46.49	54	-7.51	74	-27.51	200	Vert
9	9812.141	34.66	PK	37.6	-34.9	10.4	0.4	48.16	54	-5.84	74	-25.84	200	Vert

Vertical 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
10	17928.036	22.86	PK	42.2	-31.3	14.8	0.6	49.16	54	-4.84	74	-24.84	200	Vert

HORIZONTAL HIGH CHANNEL PLOT



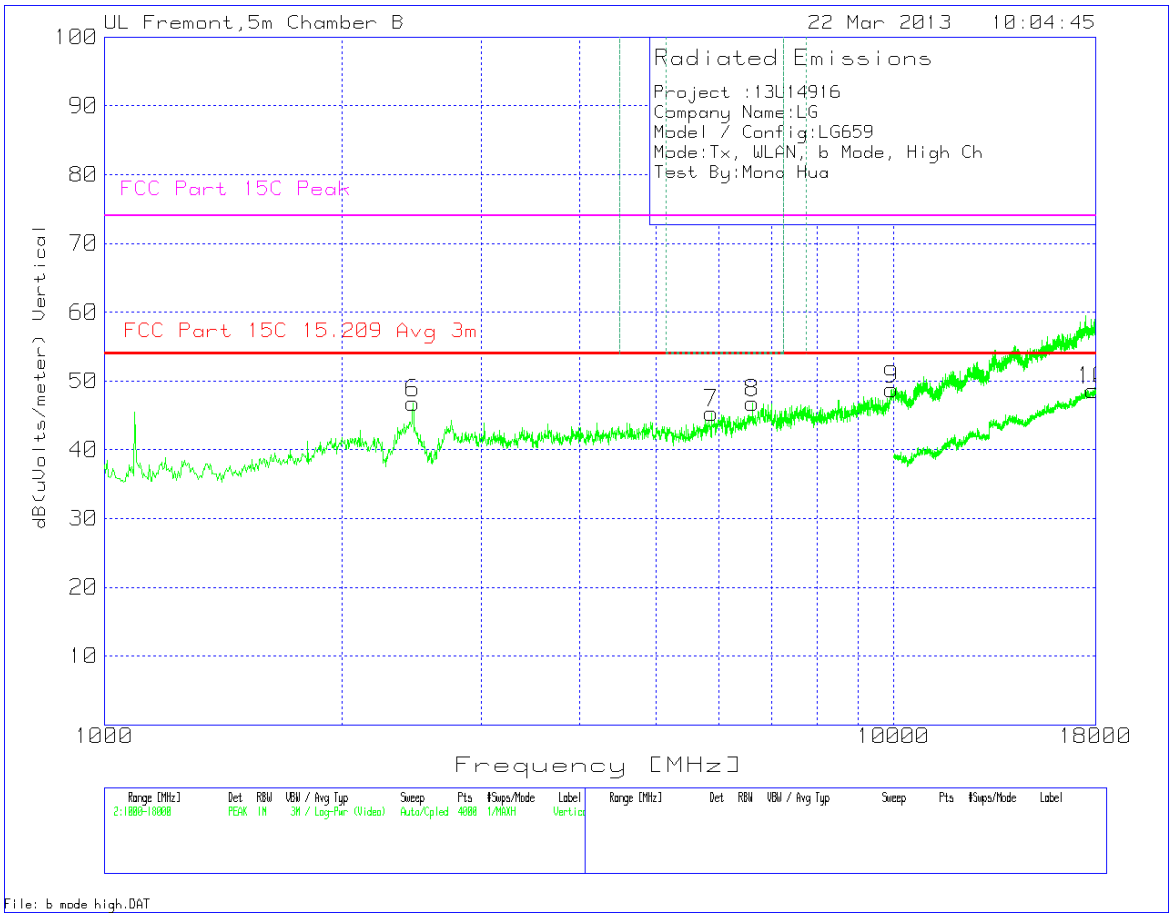
Horizontal 1000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
1	2456.658	43.02	PK	32.4	-35	4.7	0.9	46.02	54	-7.98	74	-27.98	100	Horz
2	4919.81	38.06	PK	34.6	-34.9	7.1	0.2	45.06	54	-8.94	74	-28.94	200	Horz
3	6945.541	37.04	PK	35.9	-35	8.6	0.3	46.84	54	-7.16	74	-27.16	200	Horz
4	9209.093	35.92	PK	36.9	-35.2	10	0.4	48.02	54	-5.98	74	-25.98	200	Horz

Horizontal 10000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
5	17852.074	22.64	PK	42.2	-31.3	14.7	0.6	48.84	54	-5.16	74	-25.16	100	Horz

VERTICAL HIGH CHANNEL PLOT



Vertical 1000 - 18000MHz

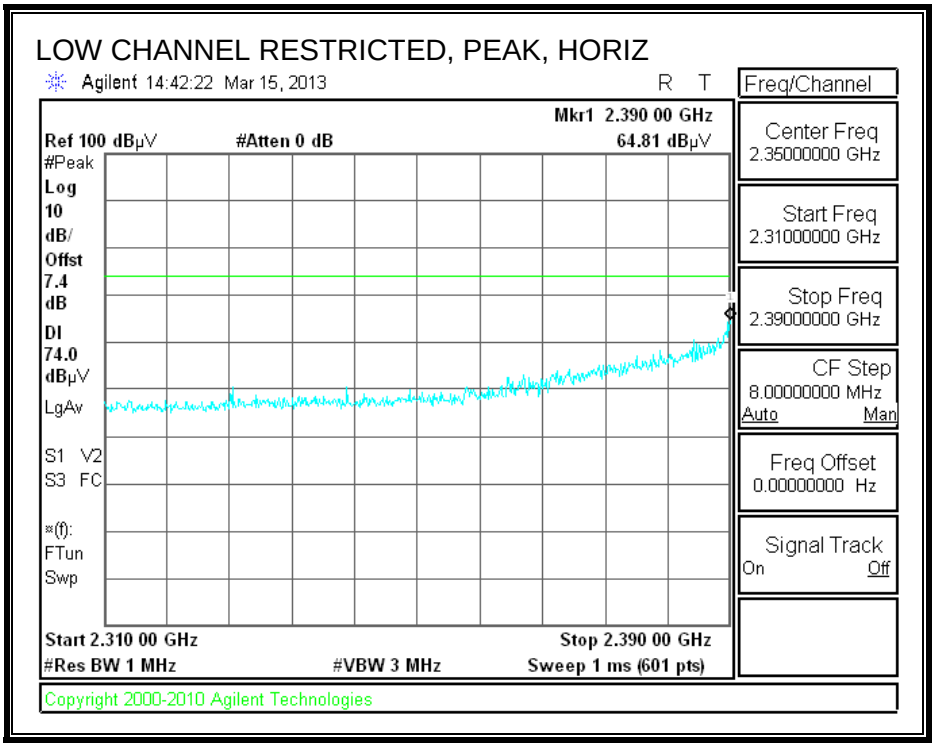
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/ meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
6	2460.904	43.77	PK	32.4	-35	4.7	0.9	46.77	54	-7.23	74	-27.23	100	Vert
7	5875.343	36.56	PK	35.6	-34.9	7.9	0.2	45.36	54	-8.64	74	-28.64	100	Vert
8	6618.536	37.24	PK	35.9	-35	8.4	0.3	46.84	54	-7.16	74	-27.16	100	Vert
9	9948.039	35.03	PK	37.7	-34.9	10.4	0.5	48.73	54	-5.27	74	-25.27	100	Vert

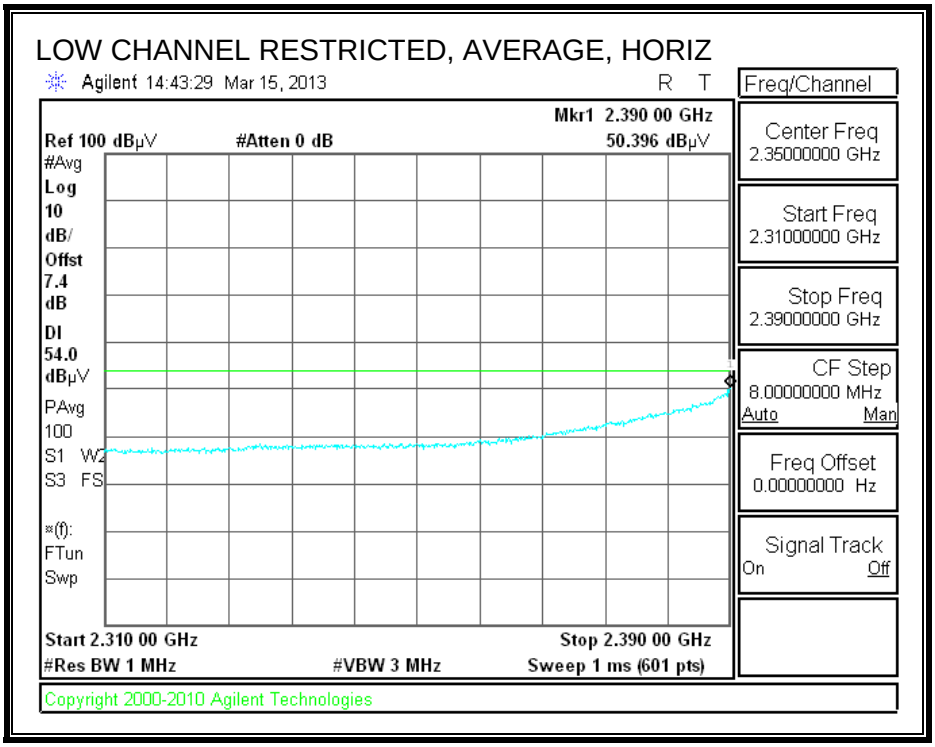
Vertical 10000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/ meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
10	17884.058	22.37	PK	42.2	-31.3	14.8	0.6	48.67	54	-5.33	74	-25.33	200	Vert

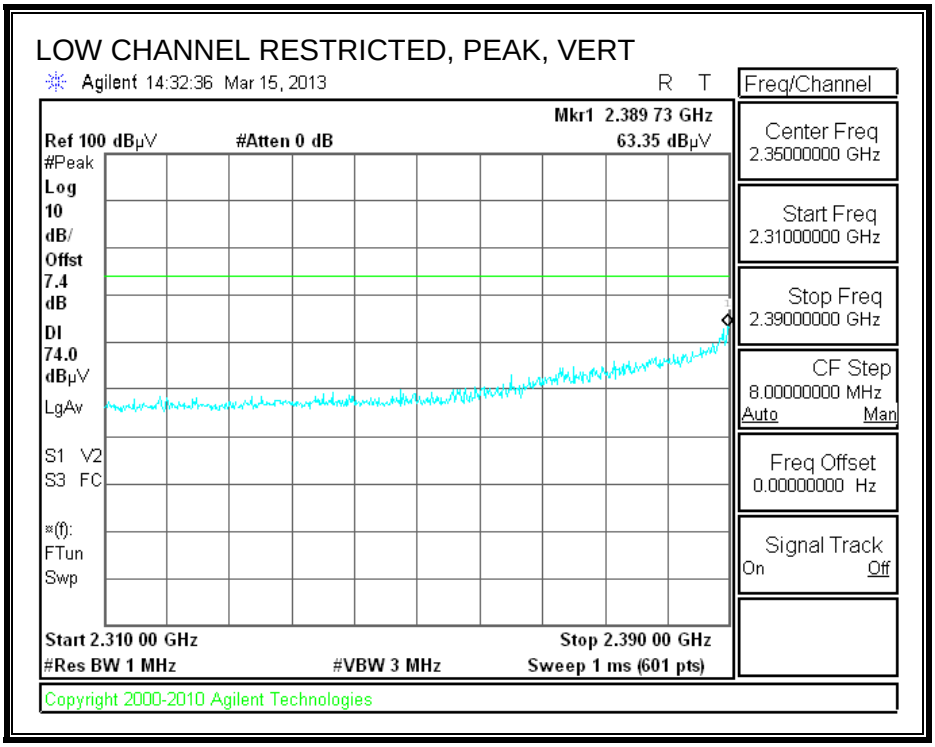
10.3. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

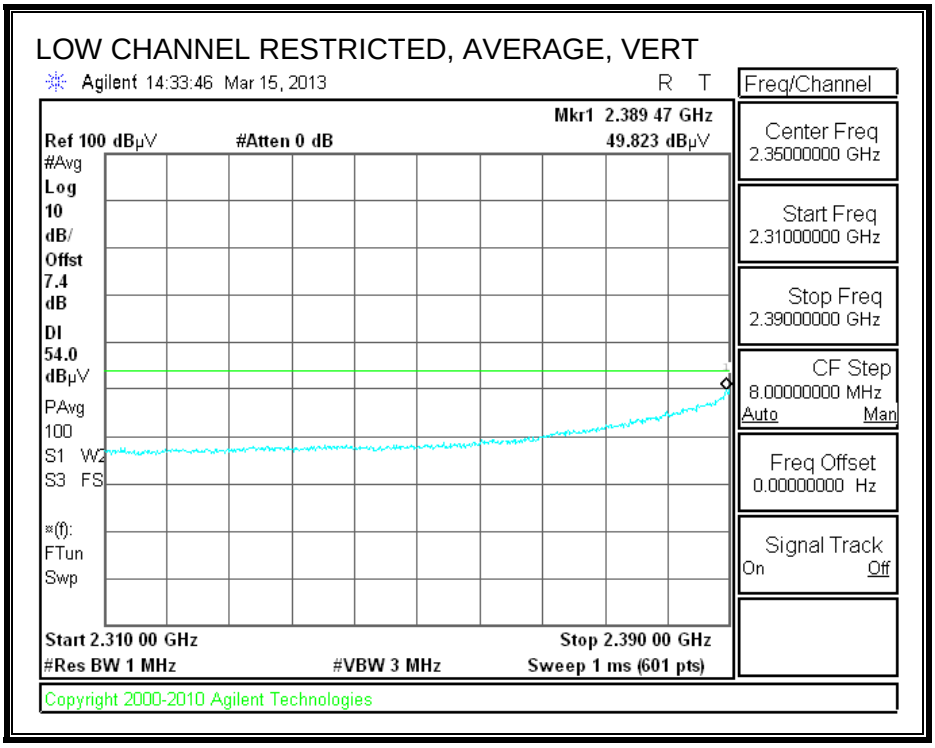
RESTRICTED BANDEDGE (LOW CHANNEL)





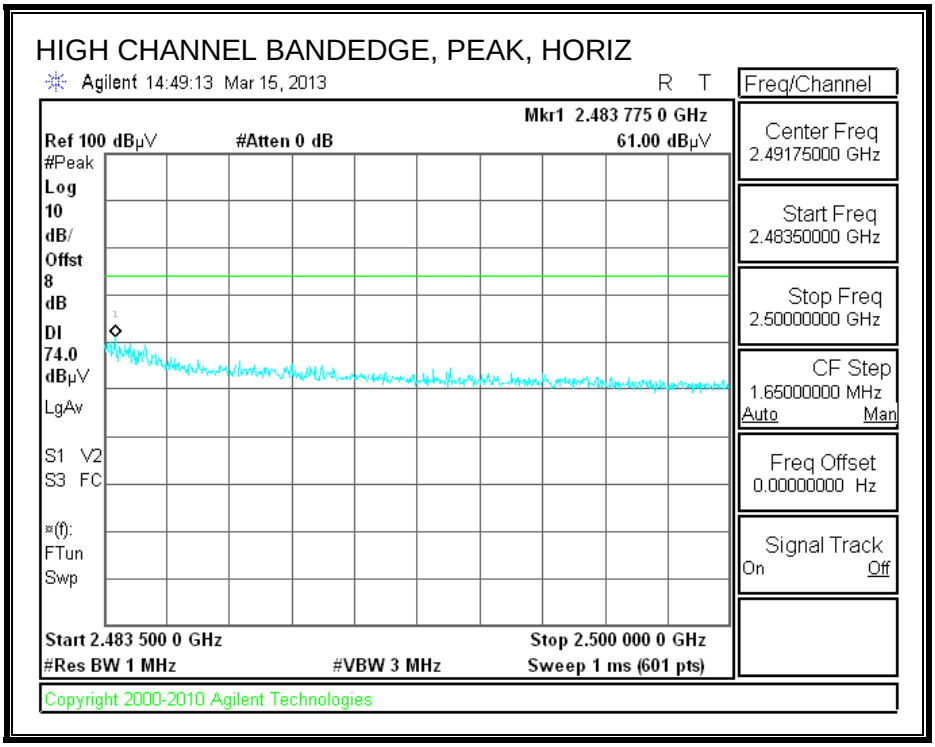
Actual Average = Measured Average + Correction Factor
= 50.296 dBuV + 0.22
= 50.616 dBuV

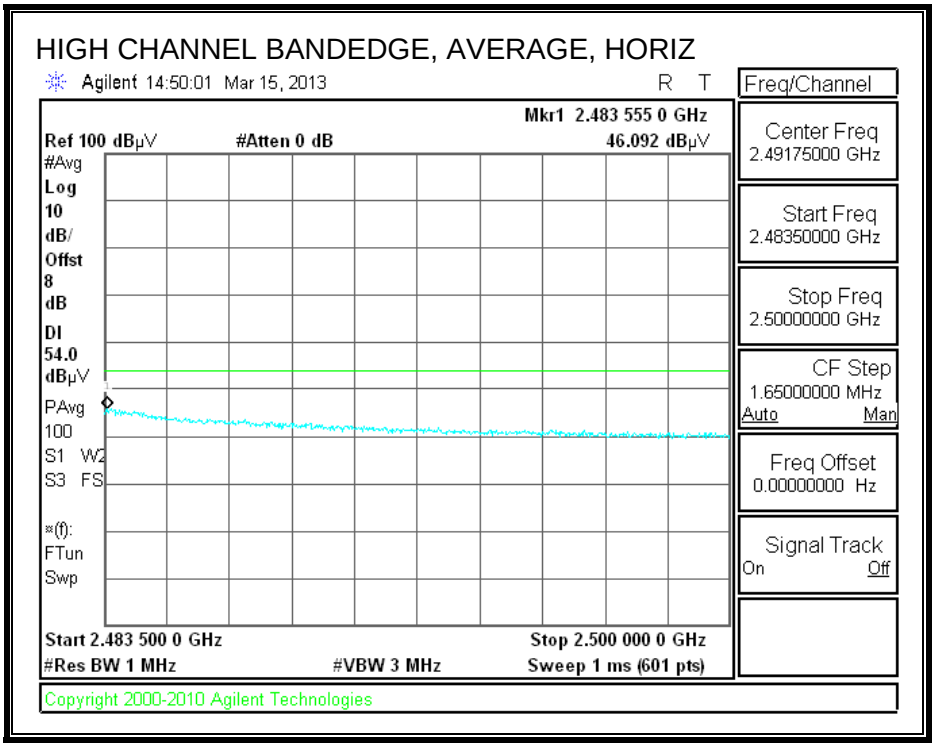




Actual Average = Measured Average + Correction Factor
= 49.823 dBuV + 0.22
= 50.043 dBuV

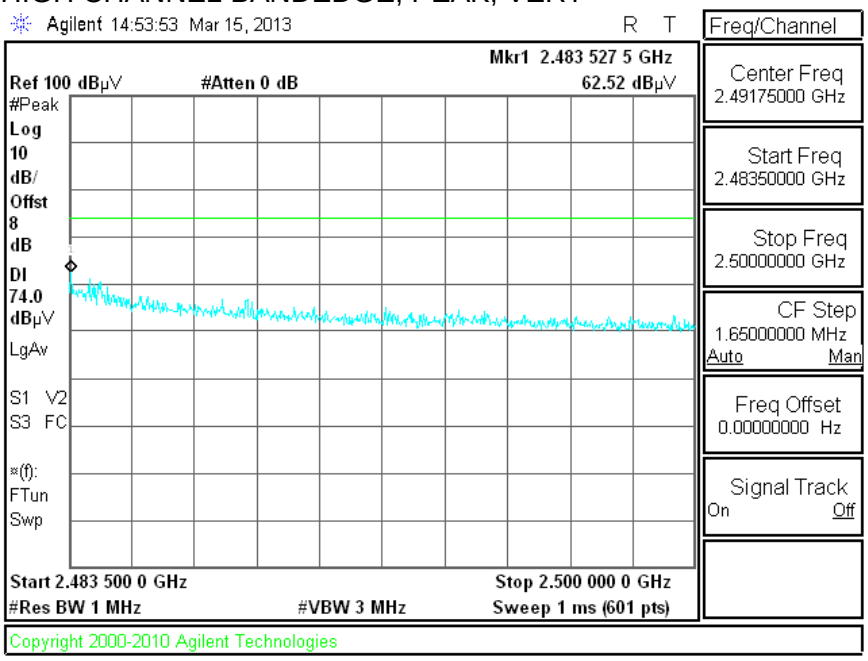
RESTRICTED BANDEDGE (HIGH CHANNEL)

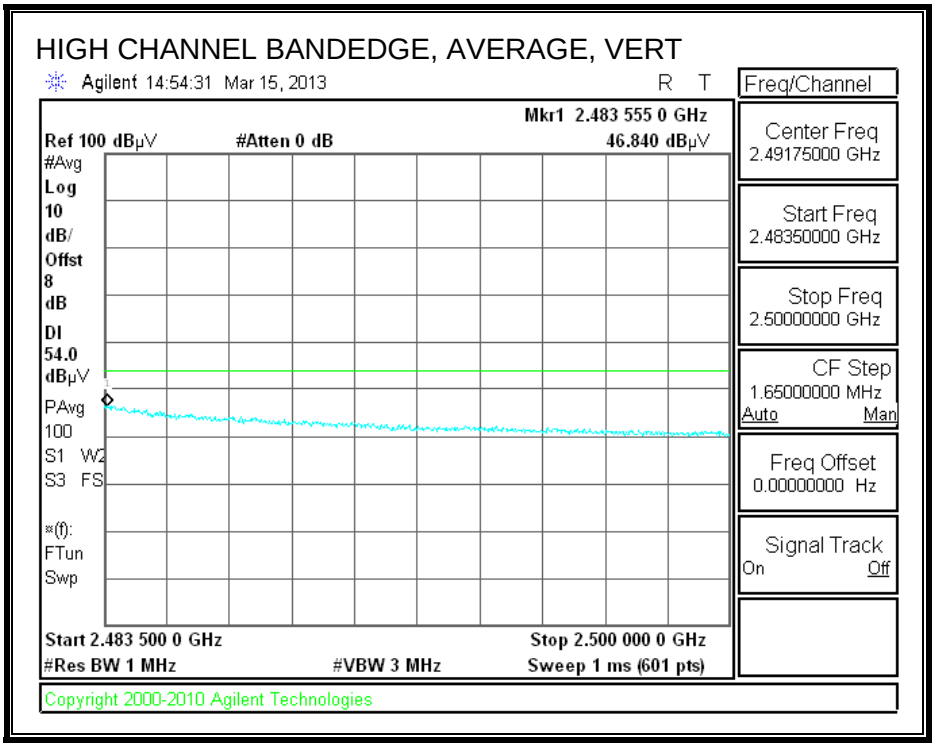




Actual Average = Measured Average + Correction Factor
= 46.092 dBuV + 0.22
= 46.312 dBuV

HIGH CHANNEL BANDEDGE, PEAK, VERT

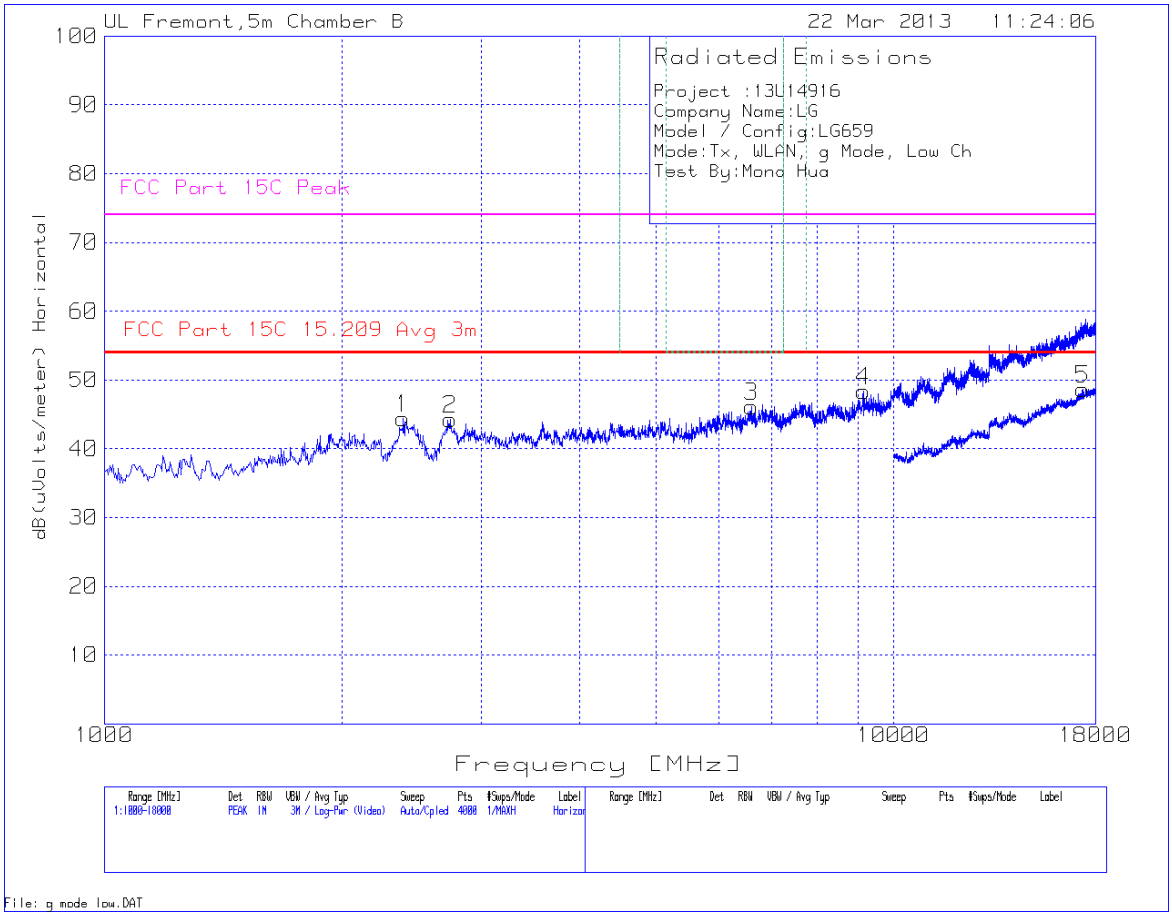




Actual Average = Measured Average + Correction Factor
= 46.840 dBuV + 0.22
= 47.060 dBuV

HARMONICS AND SPURIOUS EMISSIONS

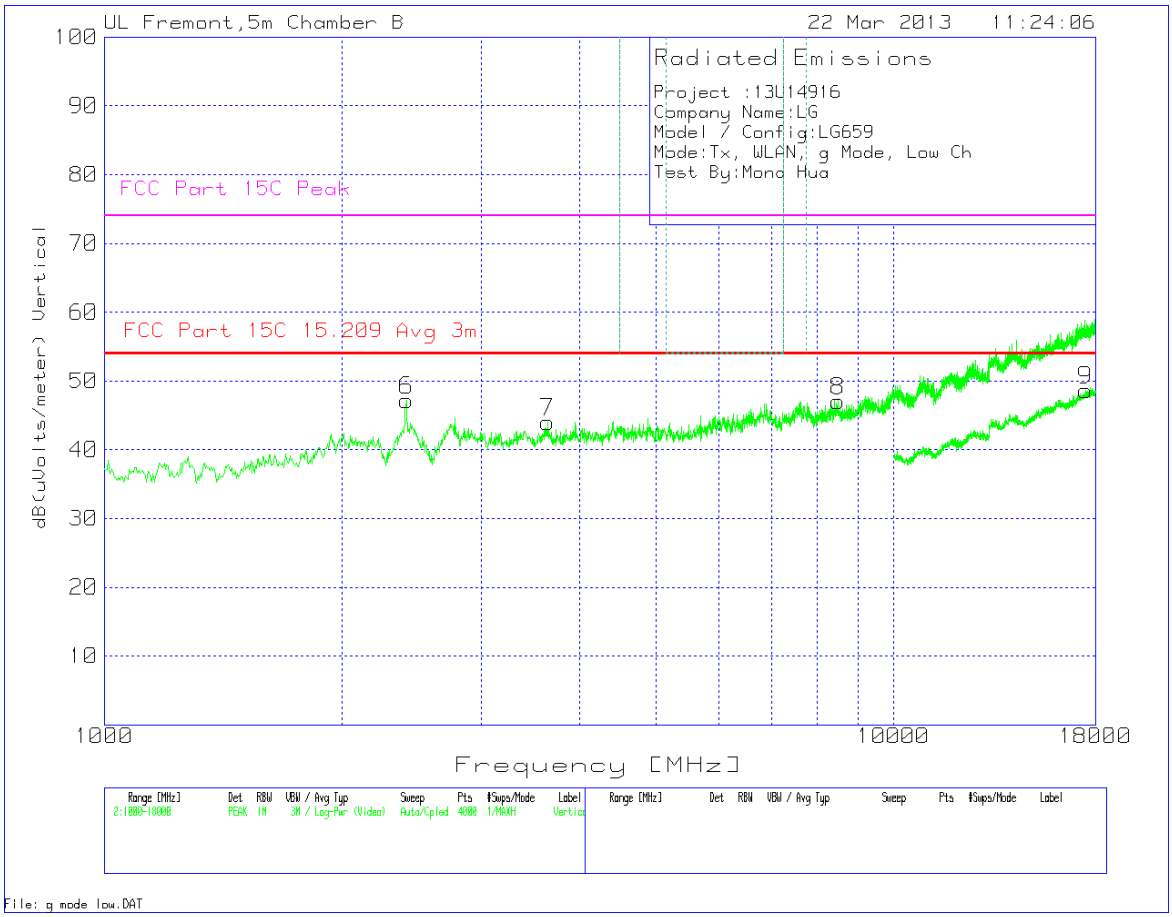
HORIZONTAL LOW CHANNEL PLOT



Horizontal 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
1	2392.955	41.58	PK	32.3	-35	4.6	0.9	44.38	54	-9.62	74	-29.62	200	Horz
2	2741.194	40.72	PK	32.8	-35.1	5	0.9	44.32	54	-9.68	74	-29.68	200	Horz
3	6605.796	36.69	PK	35.9	-35	8.4	0.2	46.19	54	-7.81	74	-27.81	200	Horz
4	9166.625	36.23	PK	36.9	-35.2	10	0.5	48.43	54	-5.57	74	-25.57	200	Horz

Horizontal 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
5	17356.322	23.47	PK	41.8	-31.6	14.5	0.5	48.67	54	-5.33	74	-25.33	200	Horz

VERTICAL LOW CHANNEL PLOT



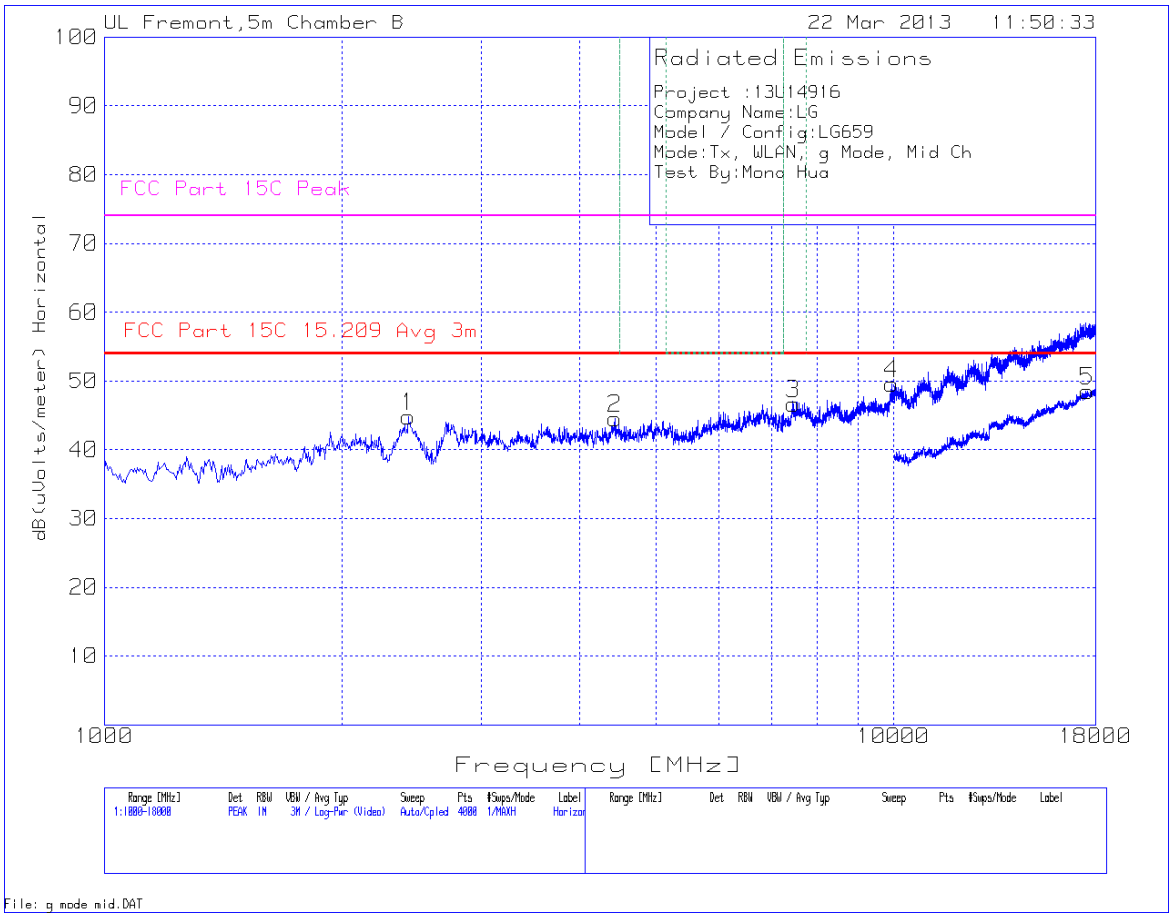
Vertical 1000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
6	2414.189	44.26	PK	32.4	-35	4.6	0.9	47.16	54	-6.84	74	-26.84	100	Vert
7	3645.766	39.17	PK	33.5	-35	5.9	0.4	43.97	54	-10.03	74	-30.03	200	Vert
8	8504.122	36.12	PK	36.2	-35.2	9.6	0.4	47.12	54	-6.88	74	-26.88	200	Vert

Vertical 10000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
9	17492.254	23.08	PK	42	-31.5	14.6	0.5	48.68	54	-5.32	74	-25.32	100	Vert

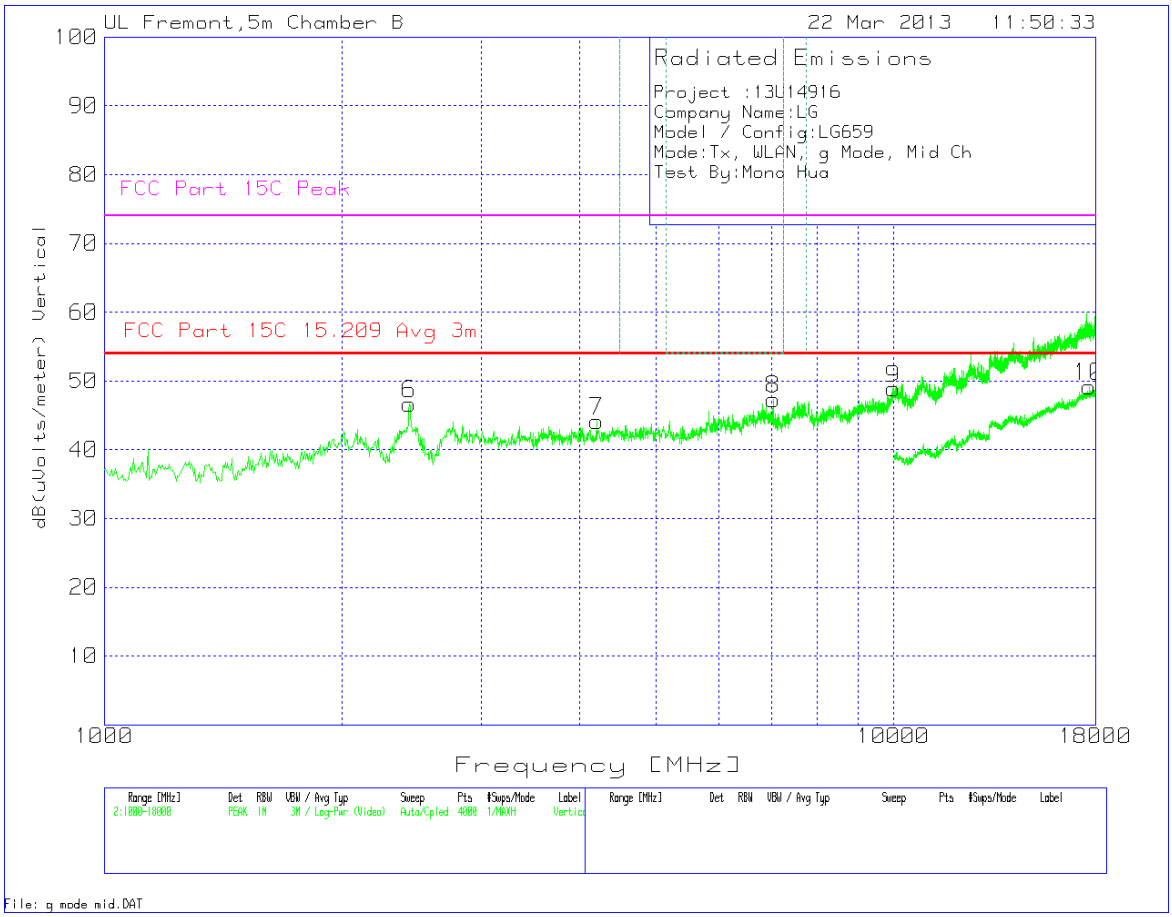
HORIZONTAL MID CHANNEL PLOT



Horizontal 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
1	2426.93	41.81	PK	32.4	-35	4.7	0.9	44.81	54	-9.19	74	-29.19	100	Horz
2	4435.673	38.09	PK	34.4	-34.9	6.7	0.2	44.49	54	-9.51	74	-29.51	100	Horz
3	7472.146	36.49	PK	36	-35	9	0.2	46.69	54	-7.31	74	-27.31	200	Horz
4	9948.039	35.87	PK	37.7	-34.9	10.4	0.5	49.57	54	-4.43	74	-24.43	200	Horz

Horizontal 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
5	17576.212	22.75	PK	42.1	-31.5	14.6	0.6	48.55	54	-5.45	74	-25.45	200	Horz

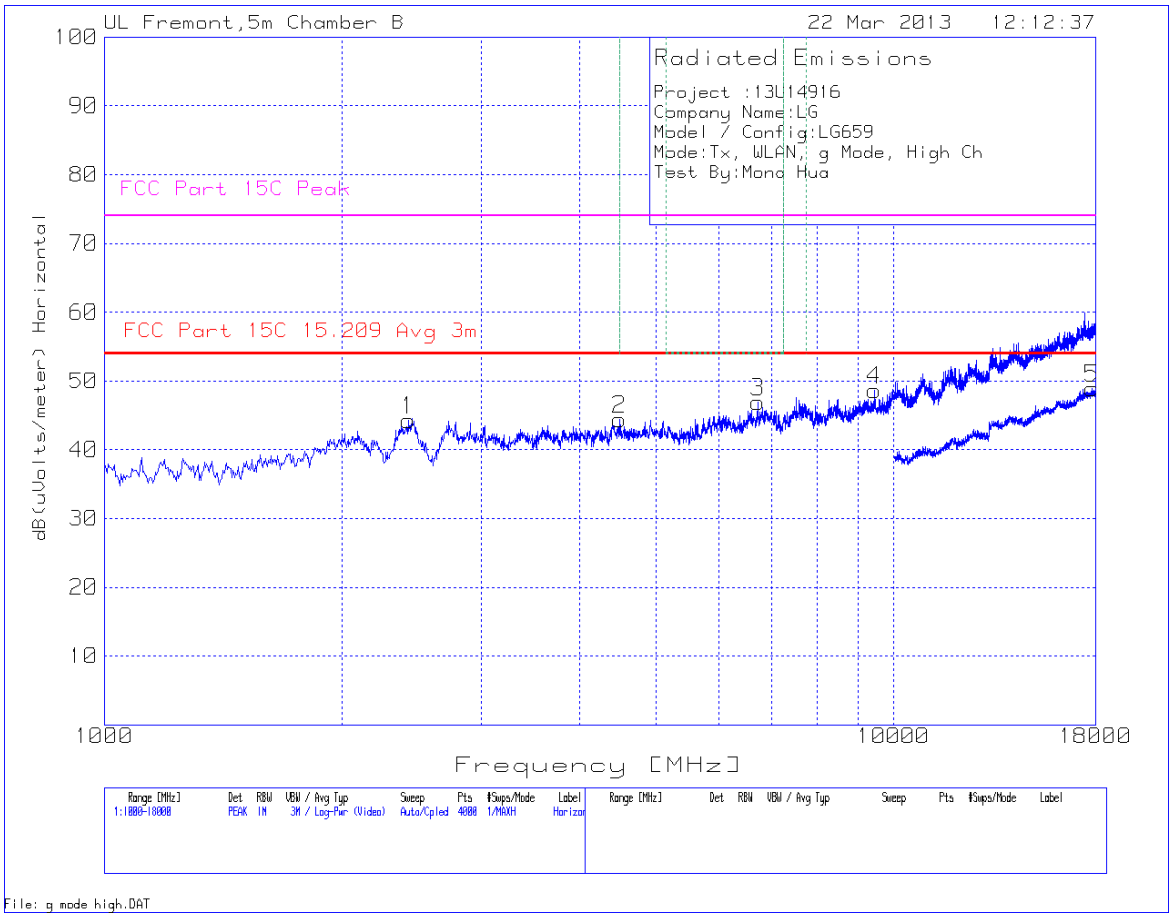
VERTICAL MID CHANNEL PLOT



Vertical 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
6	2435.423	43.61	PK	32.4	-35	4.7	0.9	46.61	54	-7.39	74	-27.39	100	Vert
7	4202.098	38.28	PK	34.1	-34.8	6.4	0.2	44.18	54	-9.82	74	-29.82	200	Vert
8	7034.724	37.48	PK	35.9	-35	8.7	0.2	47.28	54	-6.72	74	-26.72	200	Vert
9	9986.26	35.05	PK	37.8	-34.9	10.4	0.5	48.85	54	-5.15	74	-25.15	100	Vert

Vertical 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
10	17704.148	23.23	PK	42.2	-31.4	14.7	0.5	49.23	54	-4.77	74	-24.77	200	Vert

HORIZONTAL HIGH CHANNEL PLOT



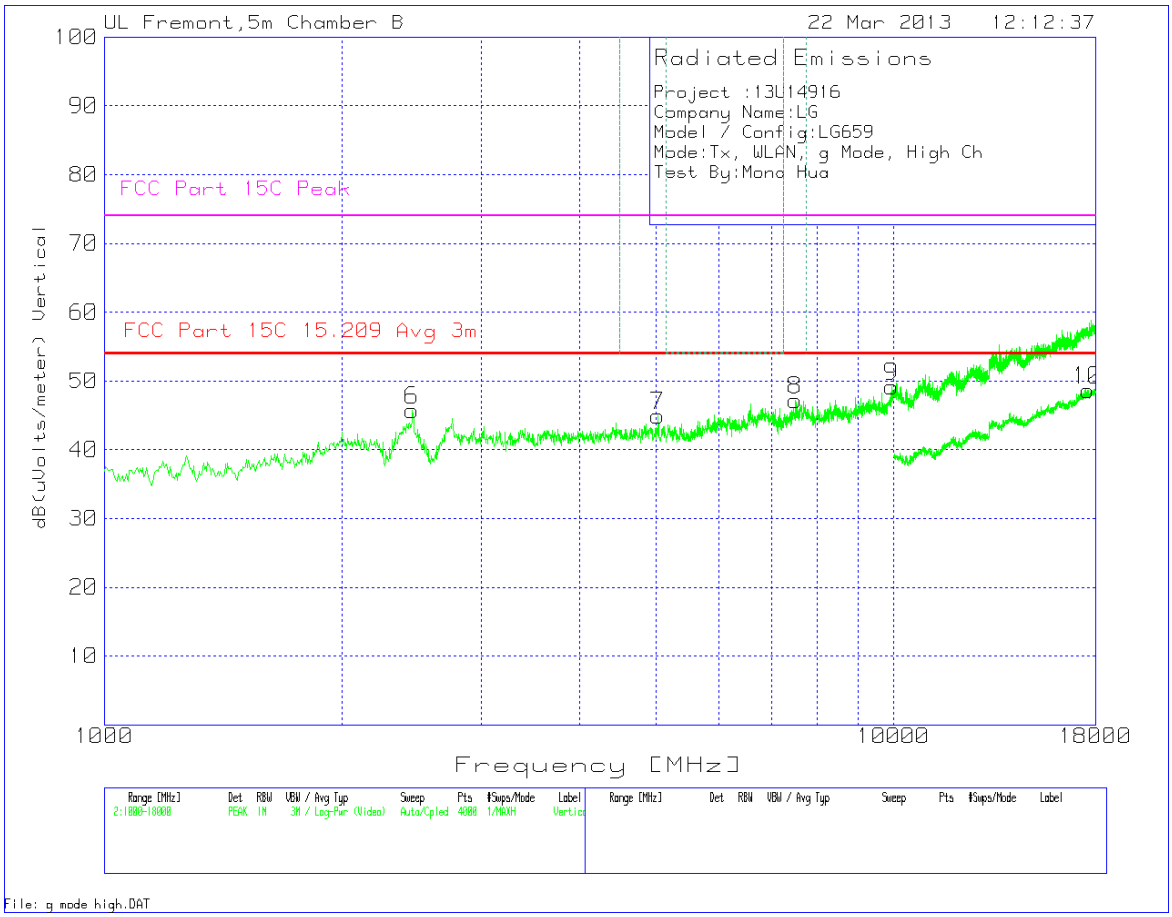
Horizontal 1000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
1	2426.93	41.3	PK	32.4	-35	4.7	0.9	44.3	54	-9.7	74	-29.7	200	Horz
2	4499.375	37.78	PK	34.5	-34.9	6.7	0.3	44.38	54	-9.62	74	-29.62	200	Horz
3	6728.953	37.29	PK	35.8	-35	8.5	0.3	46.89	54	-7.11	74	-27.11	100	Horz
4	9451.162	36.03	PK	37.1	-35.1	10.2	0.4	48.63	54	-5.37	74	-25.37	200	Horz

Horizontal 10000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
5	17840.08	22.87	PK	42.2	-31.3	14.7	0.5	48.97	54	-5.03	74	-25.03	200	Horz

VERTICAL HIGH CHANNEL PLOT

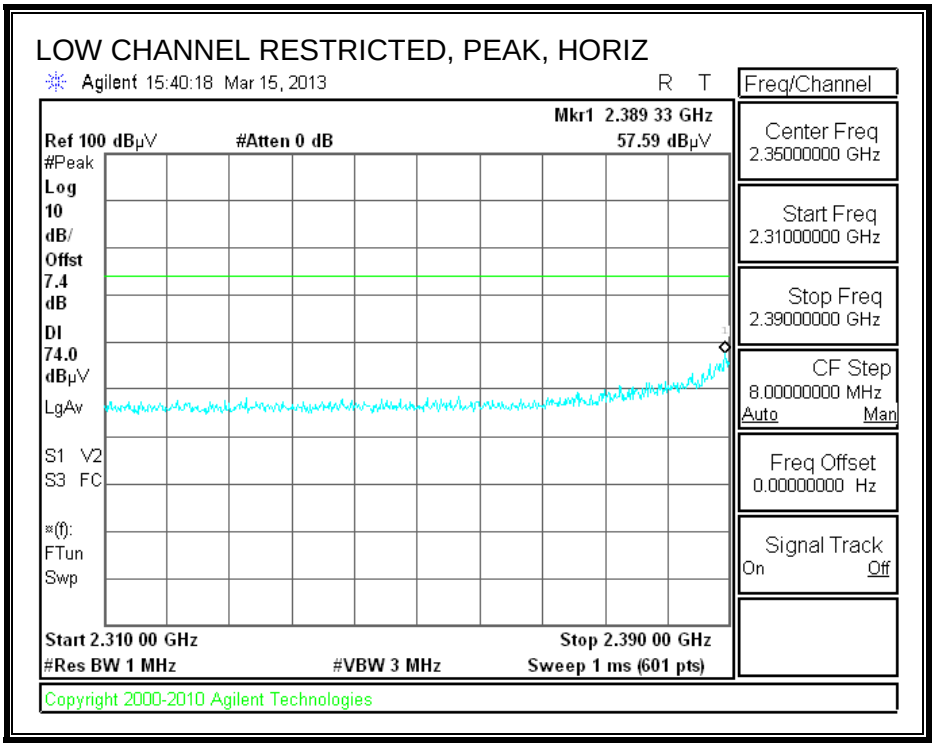


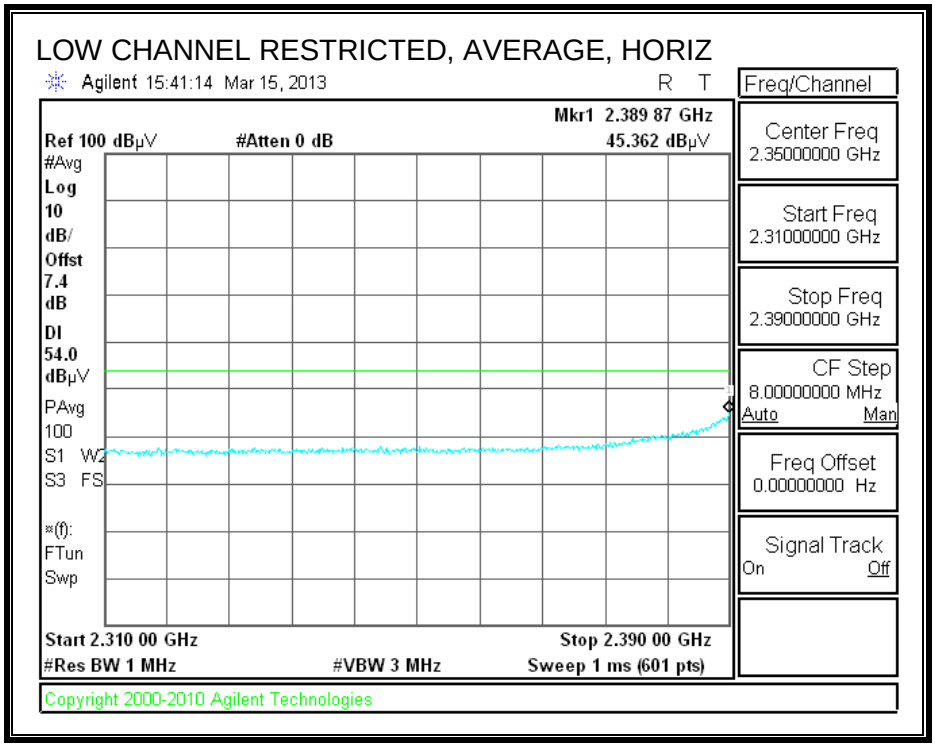
Vertical 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolt s/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
6	2456.658	42.69	PK	32.4	-35	4.7	0.9	45.69	54	-8.31	74	-28.31	100	Vert
7	5030.227	37.83	PK	34.6	-34.9	7.2	0.2	44.93	54	-9.07	74	-29.07	100	Vert
8	7510.367	36.93	PK	36	-35	9	0.3	47.23	54	-6.77	74	-26.77	100	Vert
9	9952.286	35.46	PK	37.7	-34.9	10.4	0.5	49.16	54	-4.84	74	-24.84	100	Vert

Vertical 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolt s/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
10	17612.194	22.98	PK	42.1	-31.5	14.6	0.5	48.68	54	-5.32	74	-25.32	200	Vert

10.4. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

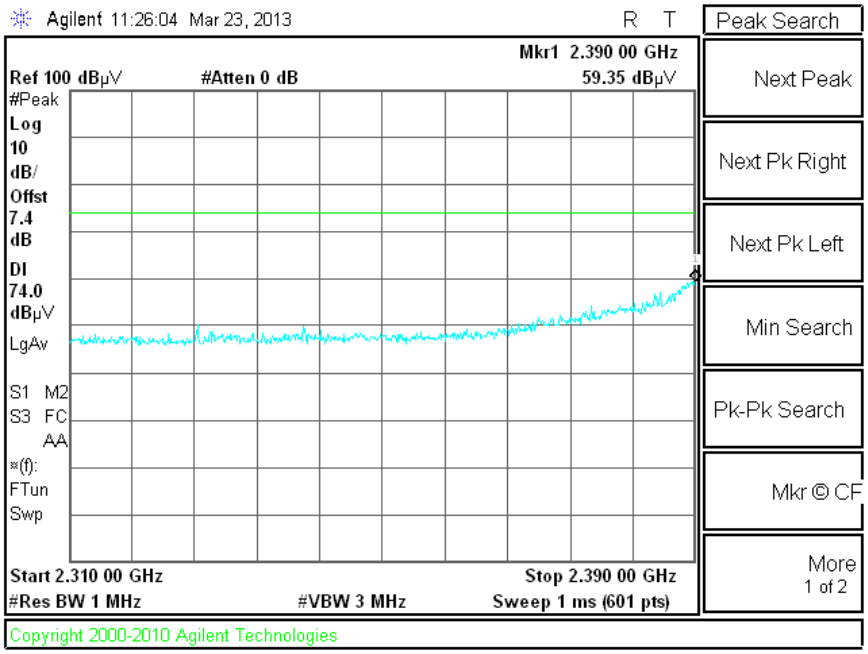
RESTRICTED BANDEDGE (LOW CHANNEL)

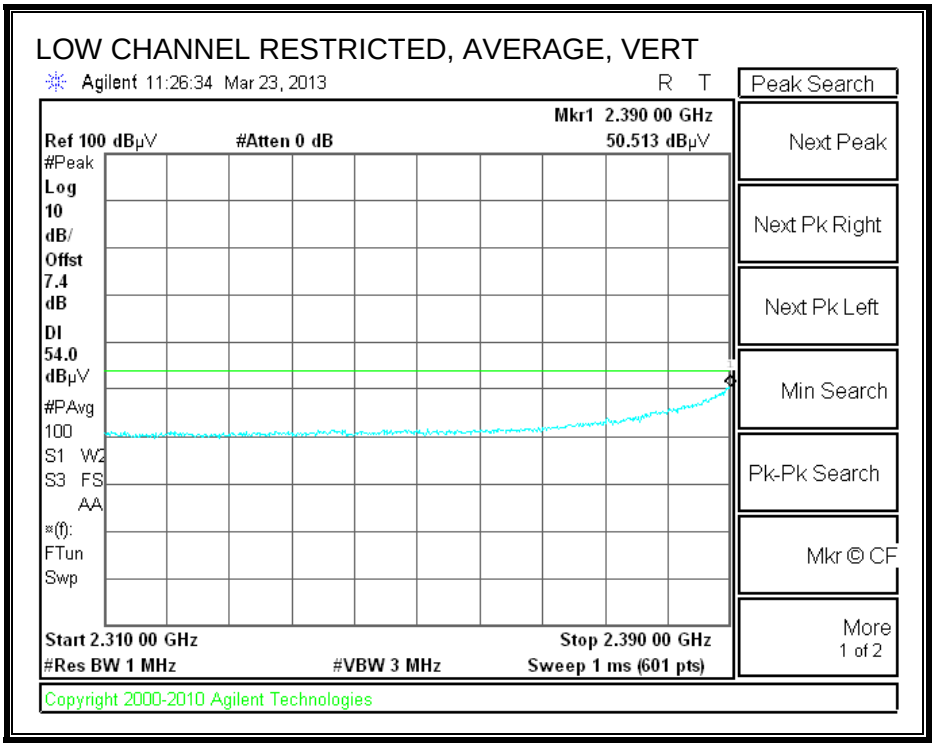




Actual Average = Measured Average + Correction Factor
= 45.362 dBuV + 0.26
= 45.622 dBuV

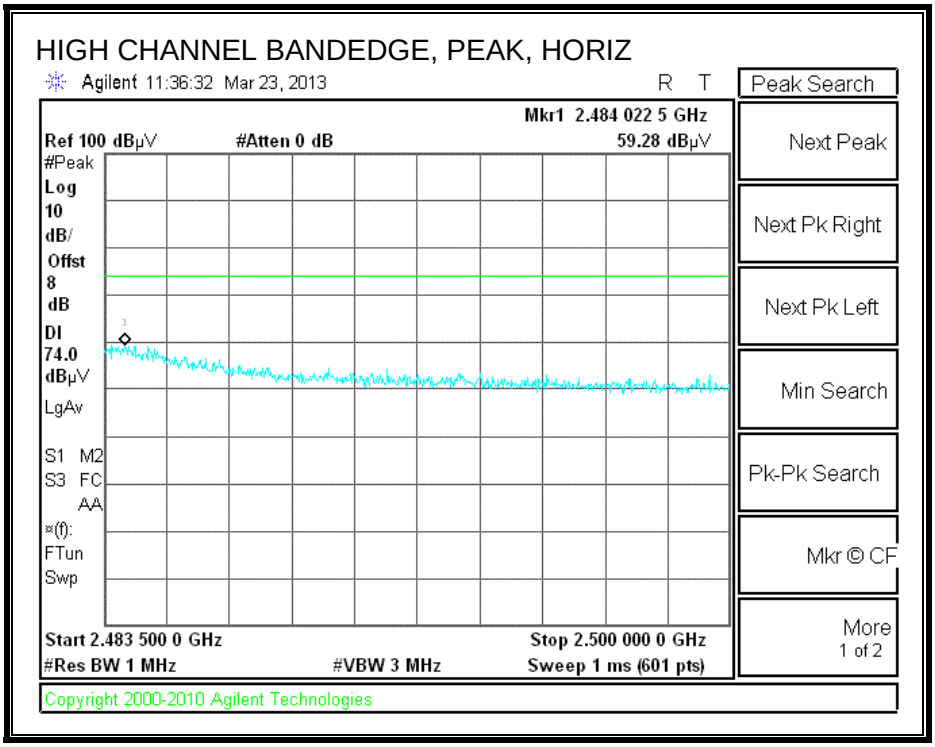
LOW CHANNEL RESTRICTED, PEAK, VERT

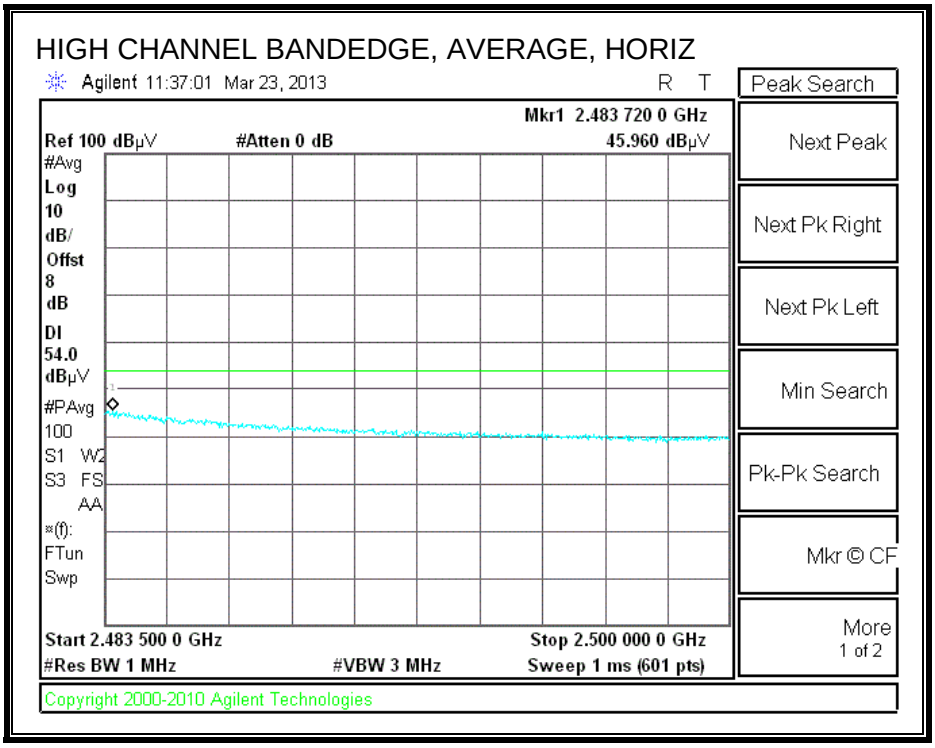




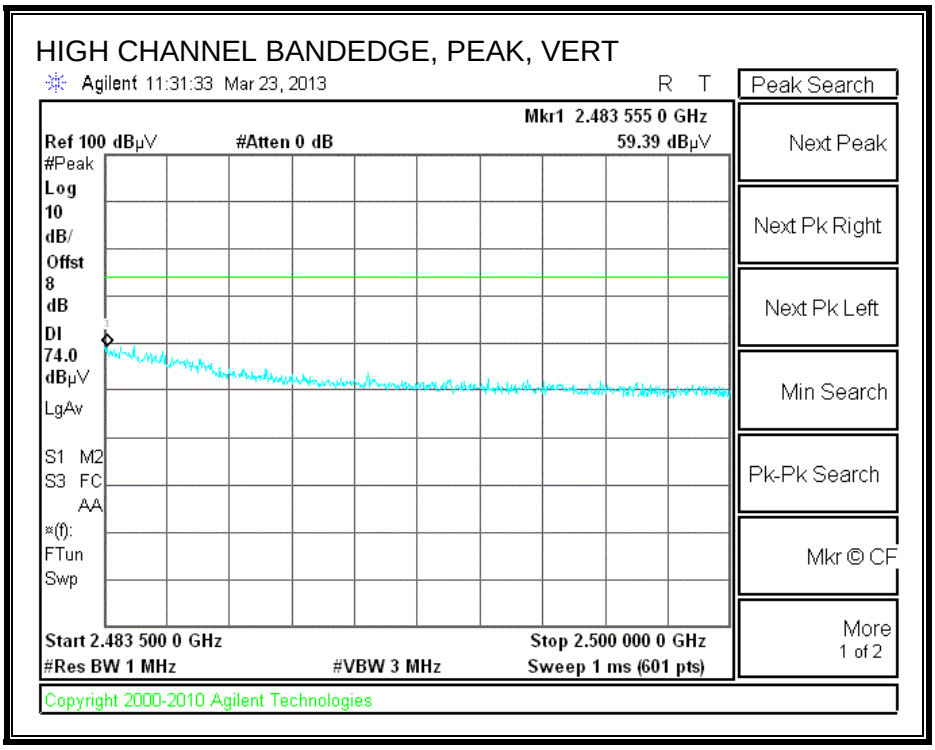
Actual Average = Measured Average + Correction Factor
= 50.513 dBuV + 0.26
= 50.773 dBuV

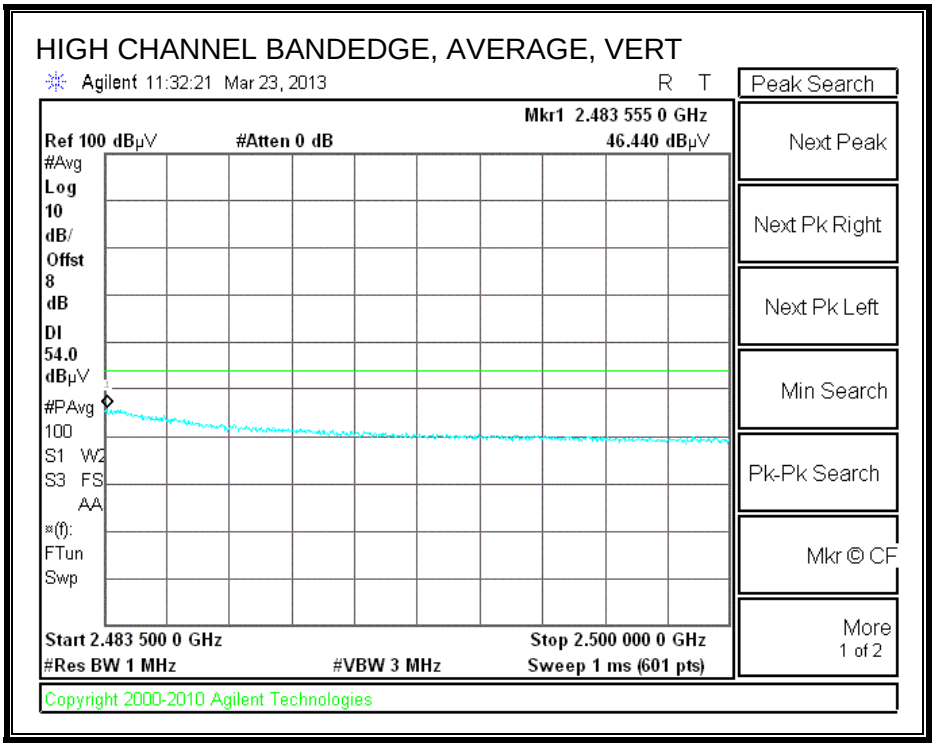
RESTRICTED BANDEDGE (HIGH CHANNEL)





Actual Average = Measured Average + Correction Factor
= 45.960 dBuV + 0.26
= 46.220 dBuV

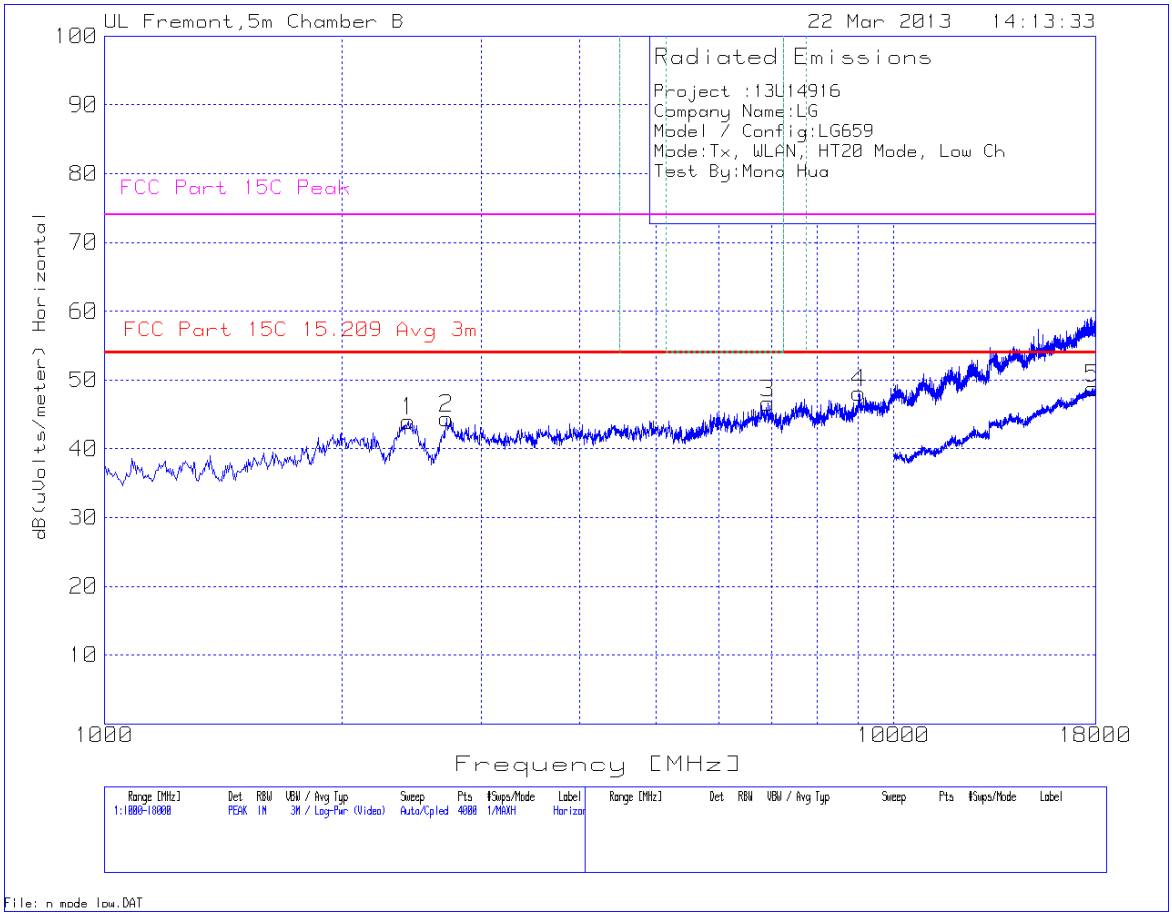




Actual Average = Measured Average + Correction Factor
= 46.440 dBuV + 0.26
= 46.700 dBuV

HARMONICS AND SPURIOUS EMISSIONS

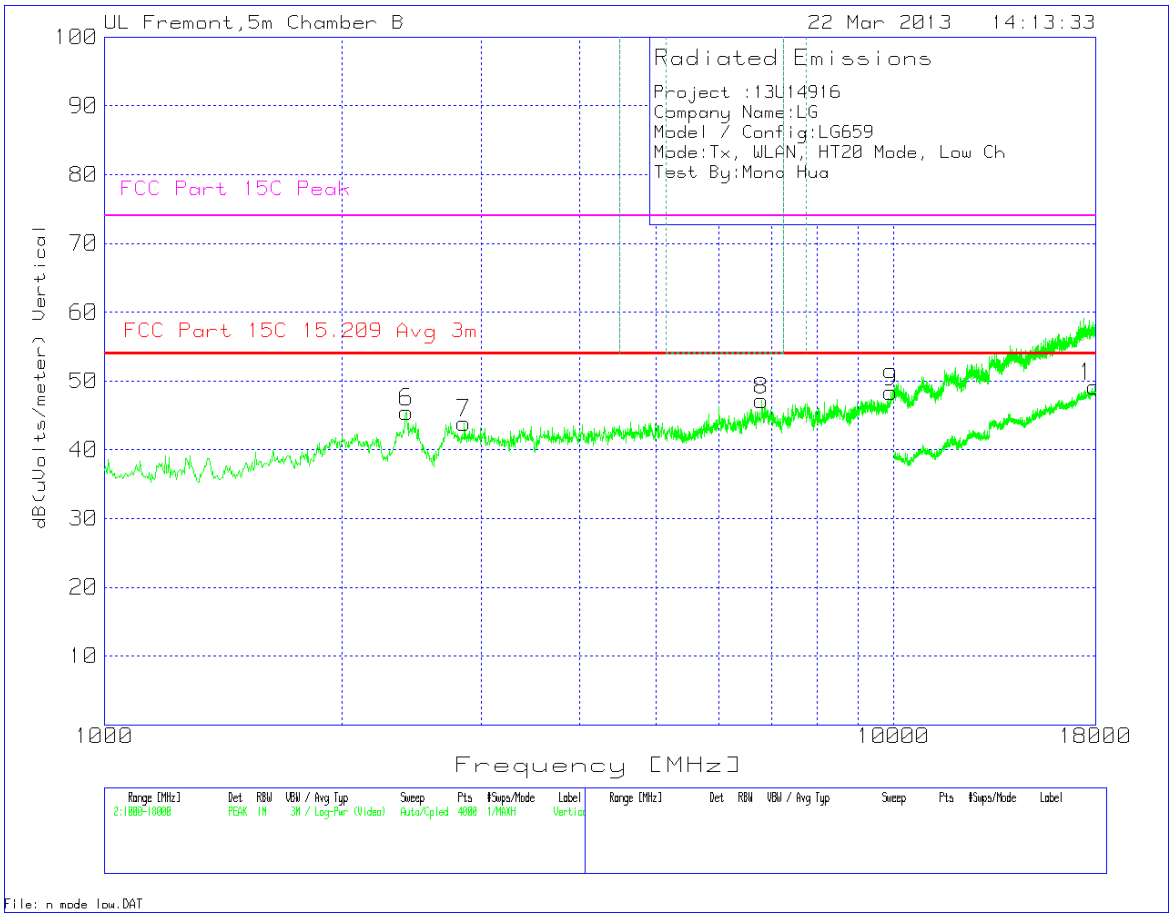
HORIZONTAL LOW CHANNEL PLOT



Horizontal 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
1	2426.93	41.01	PK	32.4	-35	4.7	0.9	44.01	54	-9.99	74	-29.99	100	Horz
2	2711.466	40.87	PK	32.8	-35.1	5	0.9	44.47	54	-9.53	74	-29.53	200	Horz
3	6924.307	36.8	PK	35.9	-35	8.6	0.3	46.6	54	-7.4	74	-27.4	200	Horz
4	9030.727	36.22	PK	36.8	-35.2	9.9	0.4	48.12	54	-5.88	74	-25.88	200	Horz

Horizontal 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
5	17856.072	22.51	PK	42.2	-31.3	14.8	0.6	48.81	54	-5.19	74	-25.19	100	Horz

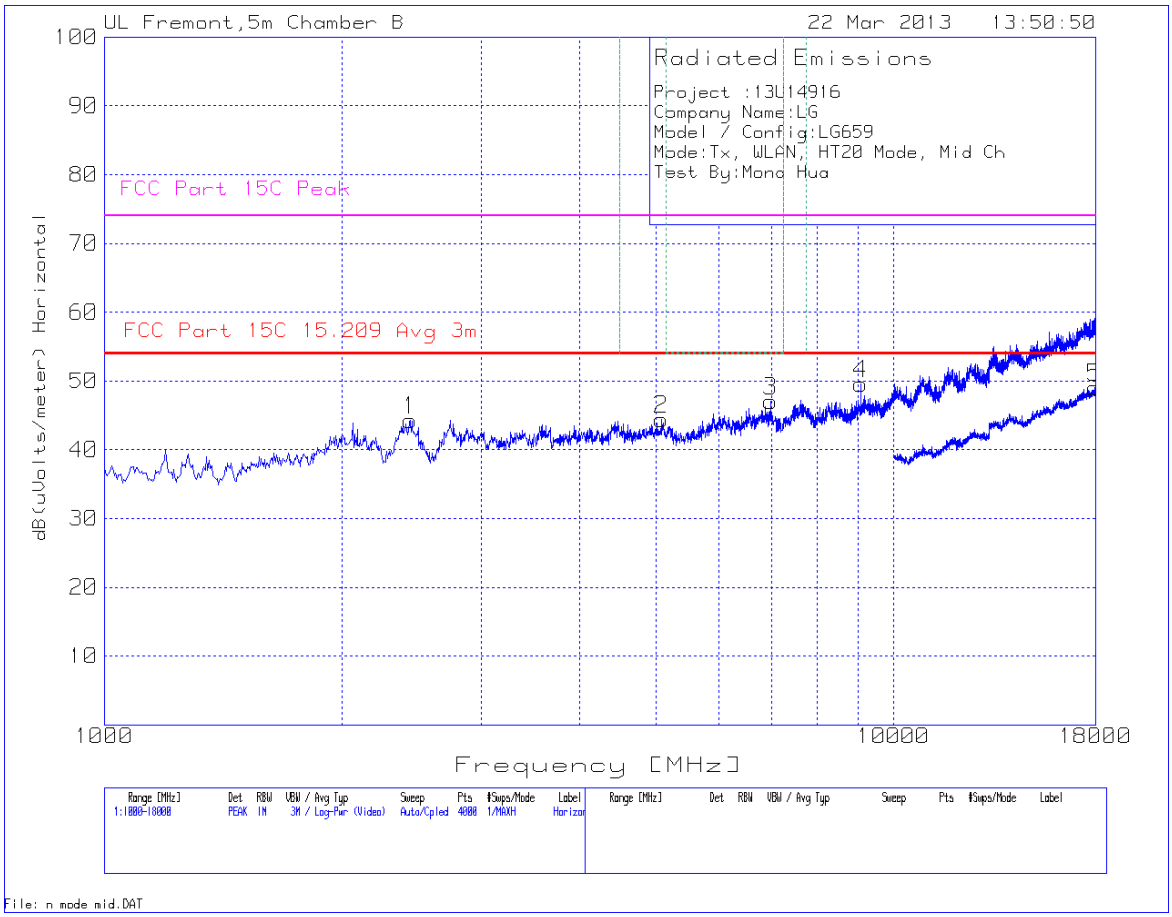
VERTICAL LOW CHANNEL PLOT



Vertical 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
6	2414.189	42.52	PK	32.4	-35	4.6	0.9	45.42	54	-8.58	74	-28.58	100	Vert
7	2855.858	40.3	PK	32.9	-35.2	5.1	0.8	43.9	54	-10.1	74	-30.1	200	Vert
8	6809.643	37.53	PK	35.8	-35	8.5	0.3	47.13	54	-6.87	74	-26.87	200	Vert
9	9909.818	34.72	PK	37.7	-34.9	10.4	0.5	48.42	54	-5.58	74	-25.58	100	Vert

Vertical 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
10	17964.018	22.87	PK	42.2	-31.3	14.8	0.6	49.17	54	-4.83	74	-24.83	100	Vert

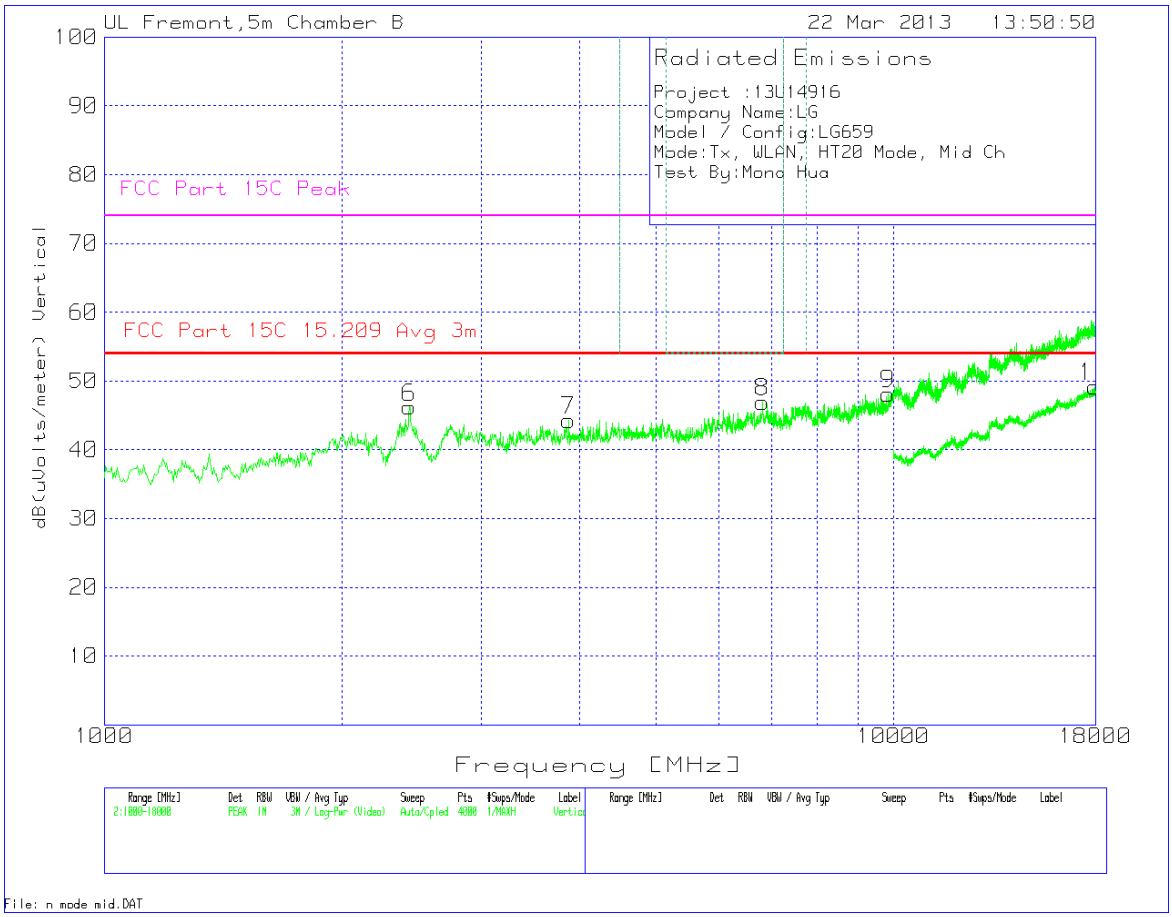
HORIZONTAL MID CHANNEL PLOT



Horizontal 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
1	2439.67	41.29	PK	32.4	-35	4.7	0.9	44.29	54	-9.71	74	-29.71	100	Horz
2	5081.189	37.08	PK	34.7	-34.9	7.3	0.2	44.38	54	-9.62	74	-29.62	100	Horz
3	6988.009	37.19	PK	35.9	-35	8.7	0.3	47.09	54	-6.91	74	-26.91	200	Horz
4	9085.936	37.6	PK	36.8	-35.2	10	0.4	49.6	54	-4.4	74	-24.4	200	Horz

Horizontal 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
5	17948.026	22.77	PK	42.2	-31.3	14.8	0.6	49.07	54	-4.93	74	-24.93	200	Horz

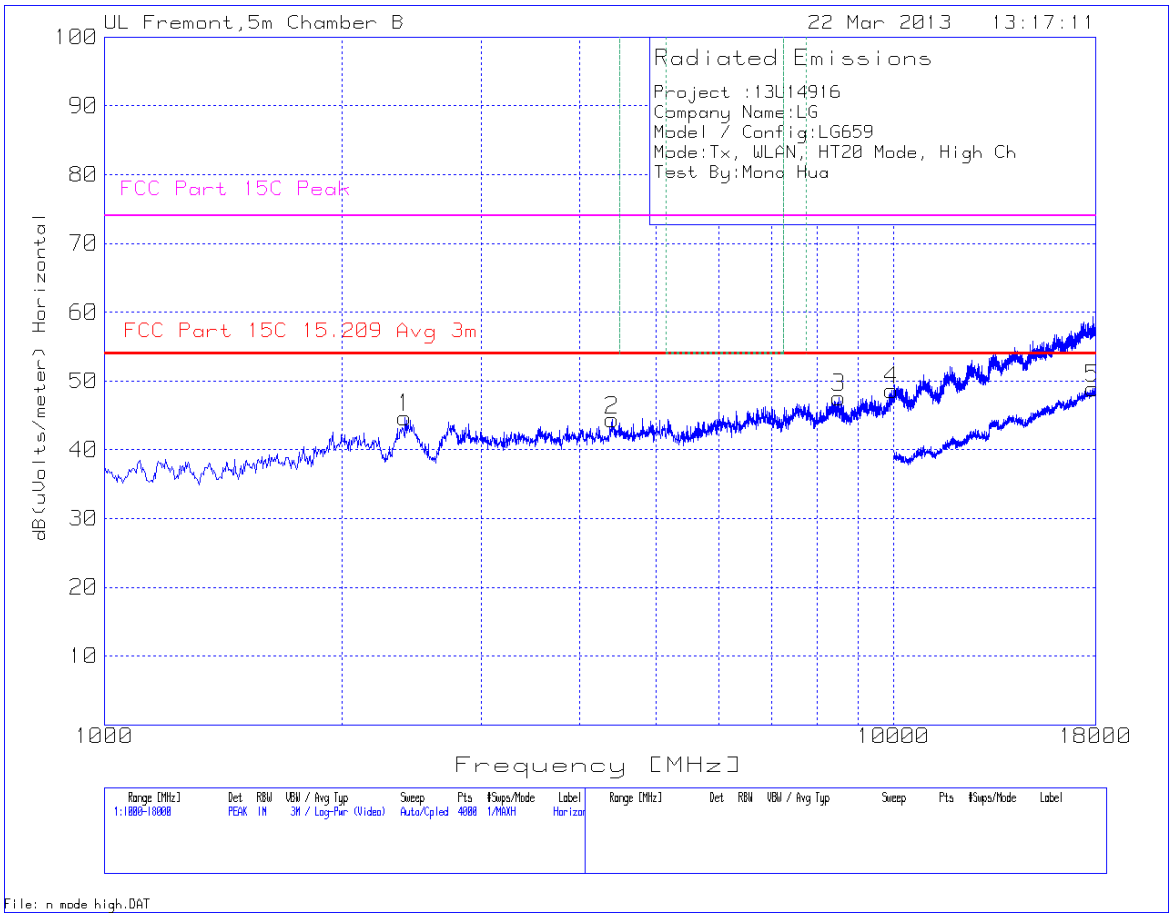
VERTICAL MID CHANNEL PLOT



Vertical 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
6	2435.423	43.2	PK	32.4	-35	4.7	0.9	46.2	54	-7.8	74	-27.8	100	Vert
7	3879.34	38.86	PK	33.9	-34.9	6.1	0.3	44.26	54	-9.74	74	-29.74	100	Vert
8	6822.383	37.3	PK	35.8	-35	8.5	0.3	46.9	54	-7.1	74	-27.1	200	Vert
9	9837.622	34.58	PK	37.6	-34.9	10.4	0.4	48.08	54	-5.92	74	-25.92	100	Vert

Vertical 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
10	17984.008	22.83	PK	42.2	-31.3	14.8	0.6	49.13	54	-4.87	74	-24.87	100	Vert

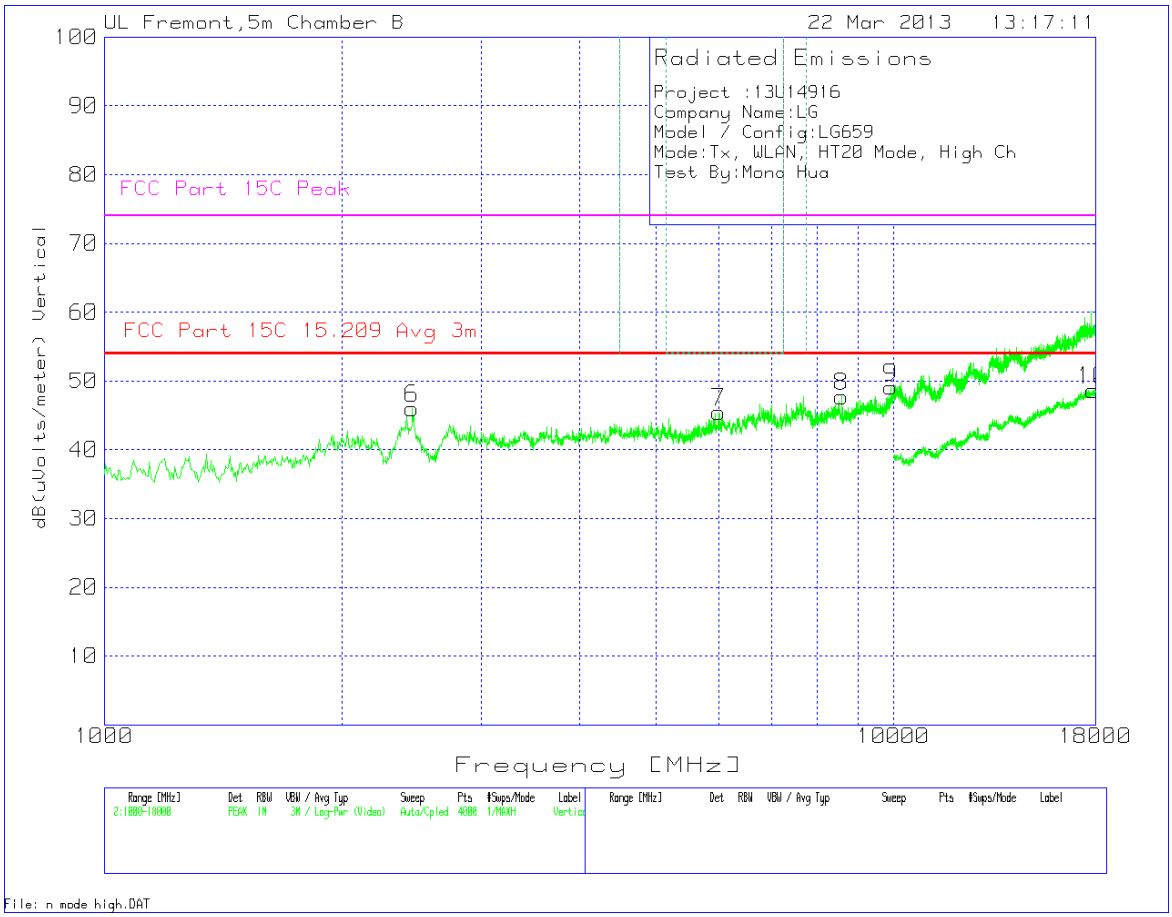
HORIZONTAL HIGH CHANNEL PLOT



Horizontal 1000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
1	2405.696	41.85	PK	32.3	-35	4.6	0.9	44.65	54	-9.35	74	-29.35	200	Horz
2	4401.699	38.05	PK	34.3	-34.9	6.6	0.3	44.35	54	-9.65	74	-29.65	100	Horz
3	8521.109	36.57	PK	36.2	-35.2	9.6	0.4	47.57	54	-6.43	74	-26.43	200	Horz
4	9931.052	35.02	PK	37.7	-34.9	10.4	0.4	48.62	54	-5.38	74	-25.38	200	Horz

Horizontal 10000 - 18000MHz														
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
5	17860.07	22.64	PK	42.2	-31.3	14.8	0.6	48.94	54	-5.06	74	-25.06	100	Horz

VERTICAL HIGH CHANNEL PLOT



Vertical 1000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
6	2456.658	43.04	PK	32.4	-35	4.7	0.9	46.04	54	-7.96	74	-27.96	100	Vert
7	6002.748	36.31	PK	35.9	-34.9	8	0.2	45.51	54	-8.49	74	-28.49	100	Vert
8	8584.811	36.67	PK	36.3	-35.2	9.6	0.4	47.77	54	-6.23	74	-26.23	200	Vert
9	9918.311	35.41	PK	37.7	-34.9	10.4	0.5	49.11	54	-4.89	74	-24.89	200	Vert

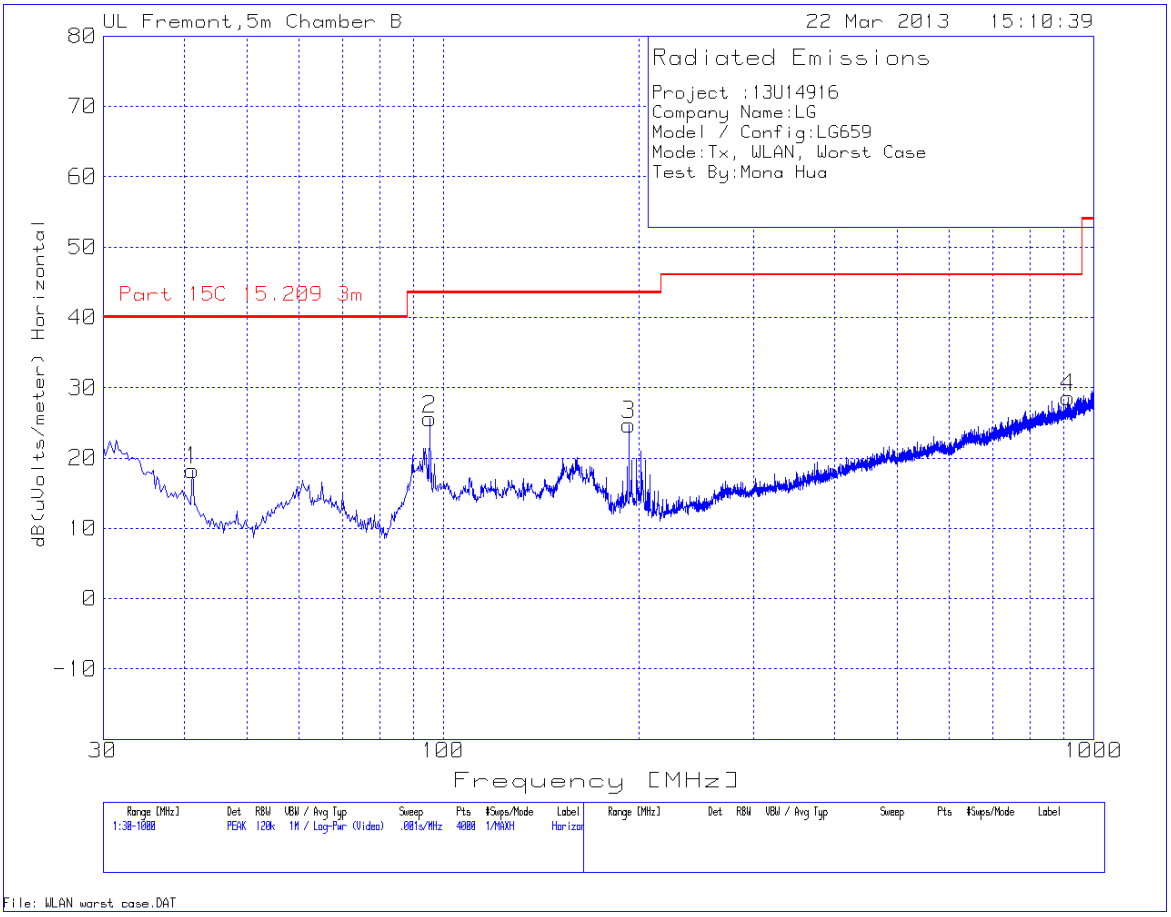
Vertical 10000 - 18000MHz

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Ant Factor [dB/m]	Preamp Gain	Cable Factor	T160 BRF	dB(uVolts/meter)	FCC Part 15C 15.209 Avg 3m	Margin	FCC Part 15C Peak	Margin	Height [cm]	Polarity
10	17852.074	22.48	PK	42.2	-31.3	14.7	0.6	48.68	54	-5.32	74	-25.32	200	Vert

10.5. WORST-CASE BELOW 1 GHz

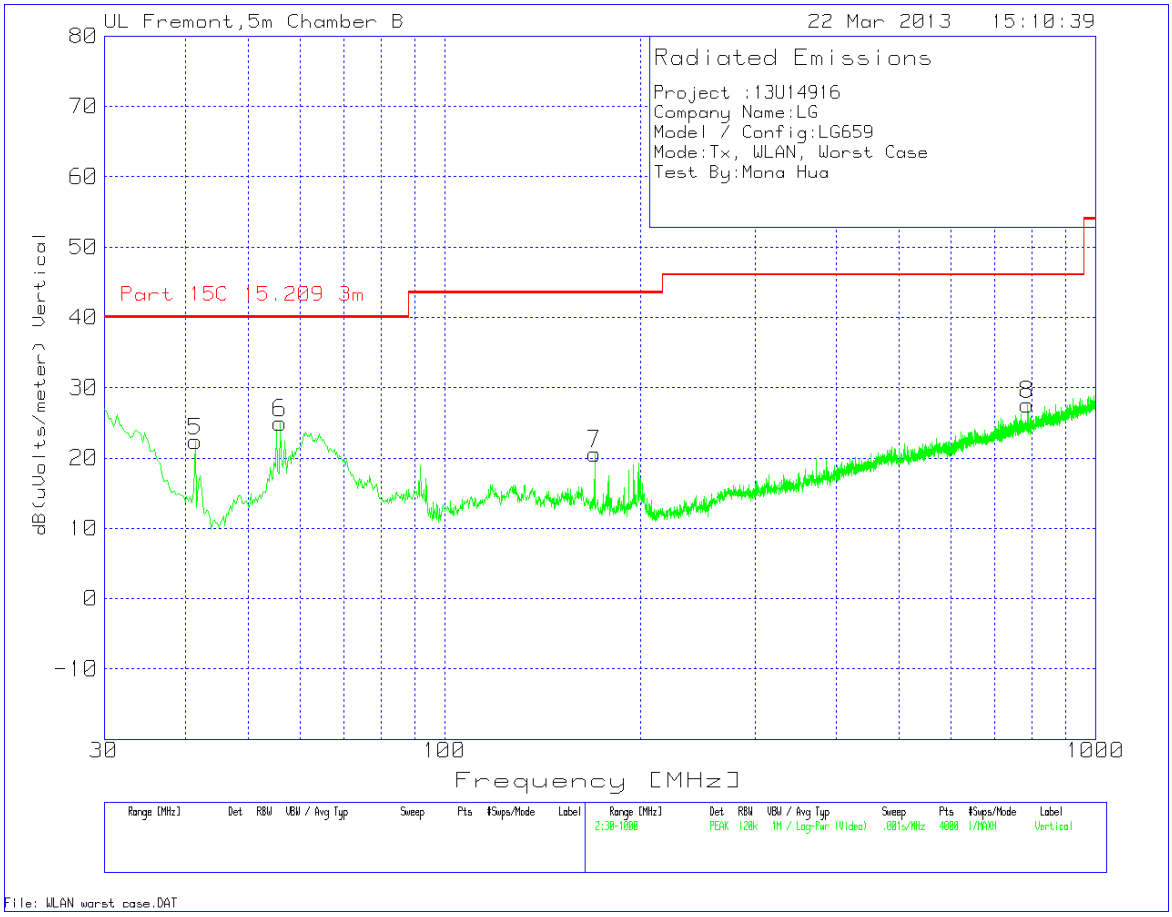
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



Horizontal 30 - 1000MHz										
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	T243 Hybrid	Preamp/Cable loss loop	dB(uVolt s/meter)	Part 15C 15.209 3m	Margin	Height [cm]	Polarity
1	41.1466	34.62	PK	12.6	-29	18.22	40	-21.78	400	Horz
2	95.4259	45.17	PK	8.8	-28.4	25.57	43.5	-17.93	400	Horz
3	193.0802	40.65	PK	11.4	-27.3	24.75	43.5	-18.75	400	Horz
4	914.704	29.86	PK	22.4	-23.7	28.56	46	-17.44	200	Horz

VERTICAL PLOT



Vertical 30 - 1000MHz										
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	T243 Hybrid	Preamp/Cable loss loop	dB(uVolts/meter)	Part 15C 15.209 3m	Margin	Height [cm]	Polarity
5	41.389	38.94	PK	12.4	-29	22.34	40	-17.66	200	Vert
6	55.9281	46.87	PK	6.9	-28.8	24.97	40	-15.03	200	Vert
7	170.06	36.54	PK	11.5	-27.5	20.54	43.5	-22.96	200	Vert
8	787.2446	31.23	PK	21.2	-24.8	27.63	46	-18.37	200	Vert

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

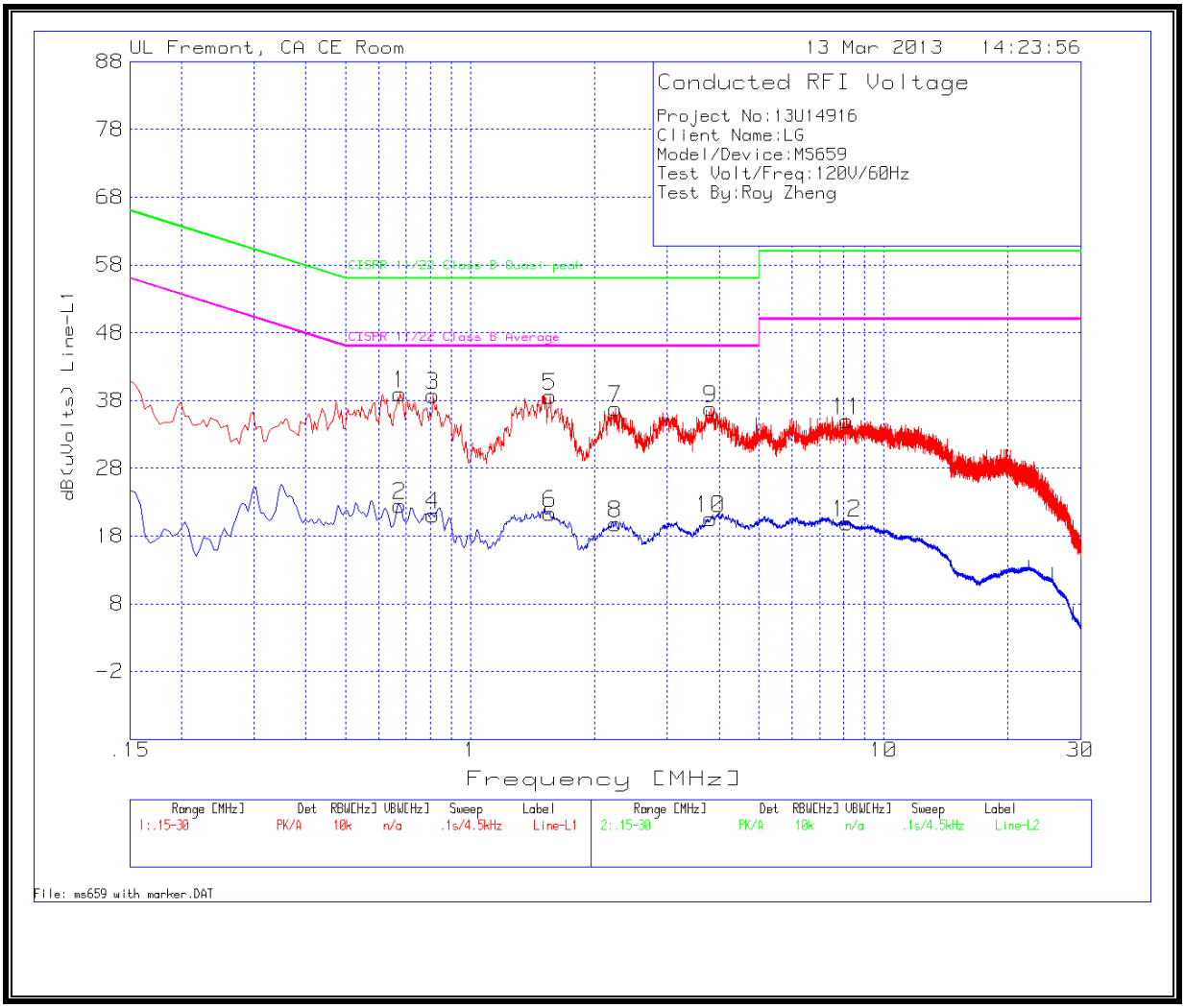
6 WORST EMISSIONS

Project No:	13U14916
Client Name:	LG
Model/Device:	MS659
Test Volt/Freq:	120V/60Hz
Test By:	Roy Zheng

Test Frequency	Meter Reading	Detector	T24 IL L1.TXT (dB)	LC Cables 1&3.TXT (dB)	dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin	CISPR 11/22 Class B Average	Margin
Line-L1 .15 - 30MHz									
0.6765	38.87	PK	0.1	0	38.97	56	-17.03	-	-
0.6765	22.46	Av	0.1	0	22.56	-	-	46	-23.44
0.8115	38.69	PK	0.1	0	38.79	56	-17.21	-	-
0.8115	20.97	Av	0.1	0	21.07	-	-	46	-24.93
1.563	38.47	PK	0.1	0.1	38.67	56	-17.33	-	-
1.563	21.15	Av	0.1	0.1	21.35	-	-	46	-24.65
2.2425	36.66	PK	0.1	0.1	36.86	56	-19.14	-	-
2.2425	19.56	Av	0.1	0.1	19.76	-	-	46	-26.24
3.8175	36.6	PK	0.1	0.1	36.8	56	-19.2	-	-
3.8175	20.32	Av	0.1	0.1	20.52	-	-	46	-25.48
8.151	34.84	PK	0.1	0.1	35.04	60	-24.96	-	-
8.151	19.77	Av	0.1	0.1	19.97	-	-	50	-30.03
Line-L2 .15 - 30MHz									
0.339	38.51	PK	0.1	0	38.61	59.2	-20.59	-	-
0.339	21.08	Av	0.1	0	21.18	-	-	49.2	-28.02
0.9915	33.64	PK	0.1	0	33.74	56	-22.26	-	-
0.9915	14.78	Av	0.1	0	14.88	-	-	46	-31.12
3.075	34.13	PK	0.1	0.1	34.33	56	-21.67	-	-
3.075	17.6	Av	0.1	0.1	17.8	-	-	46	-28.2
6.0315	34.13	PK	0.1	0.1	34.33	60	-25.67	-	-
6.0315	16.97	Av	0.1	0.1	17.17	-	-	50	-32.83
10.7475	34.69	PK	0.2	0.2	35.09	60	-24.91	-	-
10.7475	17.28	Av	0.2	0.2	17.68	-	-	50	-32.32
22.803	35.97	PK	0.4	0.3	36.67	60	-23.33	-	-
22.803	15.98	Av	0.4	0.3	16.68	-	-	50	-33.32

PK - Peak detector
QP - Quasi-Peak detector
Av - Average detector

LINE 1 RESULTS



LINE 2 RESULTS