



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

CDMA/LTE PHONE + BLUETOOTH, DTS/b/g/n

MODEL NUMBER: LGLS751, LG-LS751, LS751

FCC ID: ZNFLS751

REPORT NUMBER: 15I20232-E4 REVISION B

ISSUE DATE: APRIL 13, 2015

Prepared for

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

Prepared by

**UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888**



NVLAP LAB CODE 200065-0

Revision History

Issue			
Rev.	Date	Revisions	Revised By
---	03/23/15	Initial Issue	D. Corona
A	04/06/15	Updated limit information page 22-23	D. Corona
B	04/13/15	Added Appendix A-Geo-location Validation Data	L. Nguyen

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	6
4.1. MEASURING INSTRUMENT CALIBRATION	6
4.2. SAMPLE CALCULATION	6
4.3. MEASUREMENT UNCERTAINTY.....	7
5. EQUIPMENT UNDER TEST	8
5.1. DESCRIPTION OF EUT	8
5.2. MAXIMUM OUTPUT POWER.....	8
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	8
5.4. WORST-CASE CONFIGURATION AND MODE.....	9
5.5. DESCRIPTION OF TEST SETUP.....	10
6. TEST AND MEASUREMENT EQUIPMENT	12
7. MEASUREMENT METHODS	13
8. SUMMARY TABLE	14
9. ANTENNA PORT TEST RESULTS	15
9.1. 6 dB BANDWIDTH.....	15
9.1.1. 802.11b MODE IN THE 2.4 GHz BAND	16
9.1.2. 802.11g MODE IN THE 2.4 GHz BAND	16
9.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND	16
9.1.4. 6 dB BANDWIDTH MID CH PLOTS.....	17
9.2. 99% BANDWIDTH.....	18
9.2.1. 802.11b MODE IN THE 2.4 GHz BAND	19
9.2.2. 802.11g MODE IN THE 2.4 GHz BAND	19
9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND	19
9.2.4. 99% BANDWIDTH MID CH PLOTS.....	20
9.3. OUTPUT POWER.....	21
9.3.1. 802.11b MODE IN THE 2.4 GHz BAND	22
9.3.2. 802.11g MODE IN THE 2.4 GHz BAND	22
9.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND	23
9.4. PSD	24
9.4.1. 802.11b MODE IN THE 2.4 GHz BAND	25
9.4.2. 802.11g MODE IN THE 2.4 GHz BAND	25

9.4.3.	802.11n HT20 MODE IN THE 2.4 GHz BAND	25
9.4.4.	PSD Chain 0 MID CH PLOTS.....	26
9.5.	<i>OUT-OF-BAND EMISSIONS</i>	27
9.5.1.	802.11b MODE IN THE 2.4 GHz BAND	28
9.5.2.	802.11g MODE IN THE 2.4 GHz BAND	34
9.5.3.	802.11n HT20 MODE IN THE 2.4 GHz BAND	40
10.	RADIATED TEST RESULTS	46
10.1.	<i>LIMITS AND PROCEDURE</i>	46
10.2.	<i>TRANSMITTER ABOVE 1 GHz</i>	47
10.2.1.	TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND.....	47
10.2.2.	TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND.....	60
10.2.3.	TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND	73
10.3.	<i>TRANSMITTER BELOW 1 GHz</i>	86
11.	AC POWER LINE CONDUCTED EMISSIONS	88
12.	APPENDIX A GEO-LOCATION VALIDATION DATA.....	91
14.	SETUP PHOTOS	94

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC
EUT DESCRIPTION: CDMA/LTE PHONE + BLUETOOTH, DTS/b/g/n
MODEL: LGLS751, LG-LS751, LS751
SERIAL NUMBER: 2067407 (Radiated), 206740 (Conducted)
DATE TESTED: MARCH 3 – 5, 2015

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

UL Verification Services Inc. 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 Verification Services Inc. 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.

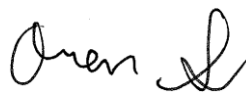
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 Verification Services Inc. By:



DAN CORONIA
CONSUMER TECHNOLOGY DIVISION
WISE PROJECT LEAD
UL VERIFICATION SERVICES INC

Tested By:



OREN STOELTING
CONSUMER TECHNOLOGY DIVISION
WISE LAB TECHNICIAN
UL VERIFICATION SERVICES INC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2009, FCC CFR 47 Part 2, and FCC CFR 47 Part 15C.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address.

The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☒ Chamber A(IC: 2324B-1)	☐ Chamber D(IC: 2324B-4)
☐ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 2324B-5)
☒ Chamber C(IC: 2324B-3)	☐ Chamber F(IC: 2324B-6)
	☒ Chamber G(IC: 2324B-7)
	☐ Chamber H(IC: 2324B-8)

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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:

$$\begin{aligned}\text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable} \\ &\text{Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m}\end{aligned}$$

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 18000 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 a CDMA/LTE PHONE + BLUETOOTH, DTS/b/g/n.

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	16.4	43.65
2412 - 2462	802.11g	13.3	21.38
2412 - 2462	802.11n HT20	12.5	17.78

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -2.9dBi.

5.4. 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, Z it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X 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

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	LG	MCS-02WR	RA4Y1031433	N/A
Earphone	LG	N/A	N/A	N/A

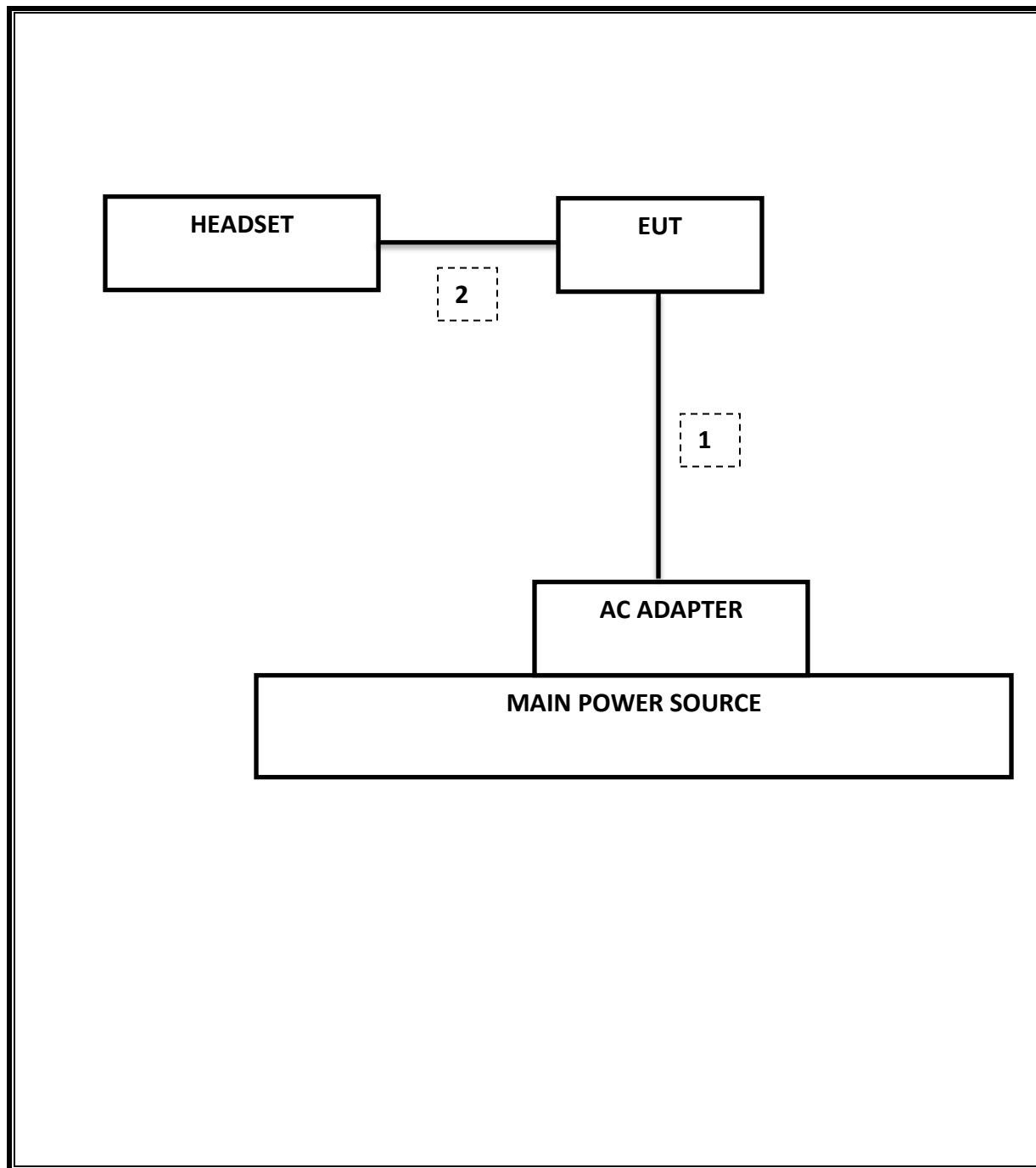
I/O CABLES

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
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
Spectrum Analyzer, 9KHz-40GHz	HP	8564E	C00986	04/01/15
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	08/13/15
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/18/15
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
Antenna, Horn, 1-18 GHz	ETS	3117	C01022	02/10/16
Antenna, Horn, 18- 26 GHz	ARA	MWH-1826/B	C00946	11/12/15
Antenna, Horn, 26-40 GHz	ARA	MWH-2640	C00891	06/28/15
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	12/08/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/15
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/15
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/15
AC Power Supply, 2,500VA 45-500Hz	Elgar-Ametek	CW2501M	F00013	CNR
RF Preamplifier, 1GHz - 40GHz	Miteq	NSP4000-SP2	C00990	03/23/15
Attenuator / Switch driver	HP	11713A	F00204	CNR
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	F00219	05/23/15
High Pass Filter 5GHz	Micro-Tronics	HPS17542	F00222	05/22/15
High Pass Filter 6GHz	Micro-Tronics	HPM17543	F00224	05/22/15
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014	
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012	
CLT Software	UL	UL RF	Ver 1.0, Feb 2 2015	
Antenna Port Software	UL	UL RF	Ver 2.1.1.1, Jan 20 2015	

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r02: Measurement Procedure AVGPM-G is used for power and AVGPS-3 is used for power spectral density.

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

Band edge emissions within Restricted Bands are measured using RMS with duty cycle factor offset method.

8. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	RSS-210 A8.2(a)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	7.06 MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-28.84 dBm
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	16.40 dBm
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-12.77 dBm
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	-27.27 dB
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	43.54 dBuV/m

9. ANTENNA PORT TEST RESULTS

9.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

TEST PROCEDURE

Reference to KDB 558074 D01 DTS Meas Guidance v03r02: The transmitter output is connected to a spectrum analyzer with the RBW set to 100KHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

9.1.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	7.55	0.5
Mid	2437	8.03	0.5
High	2462	7.06	0.5
Worst		7.06	

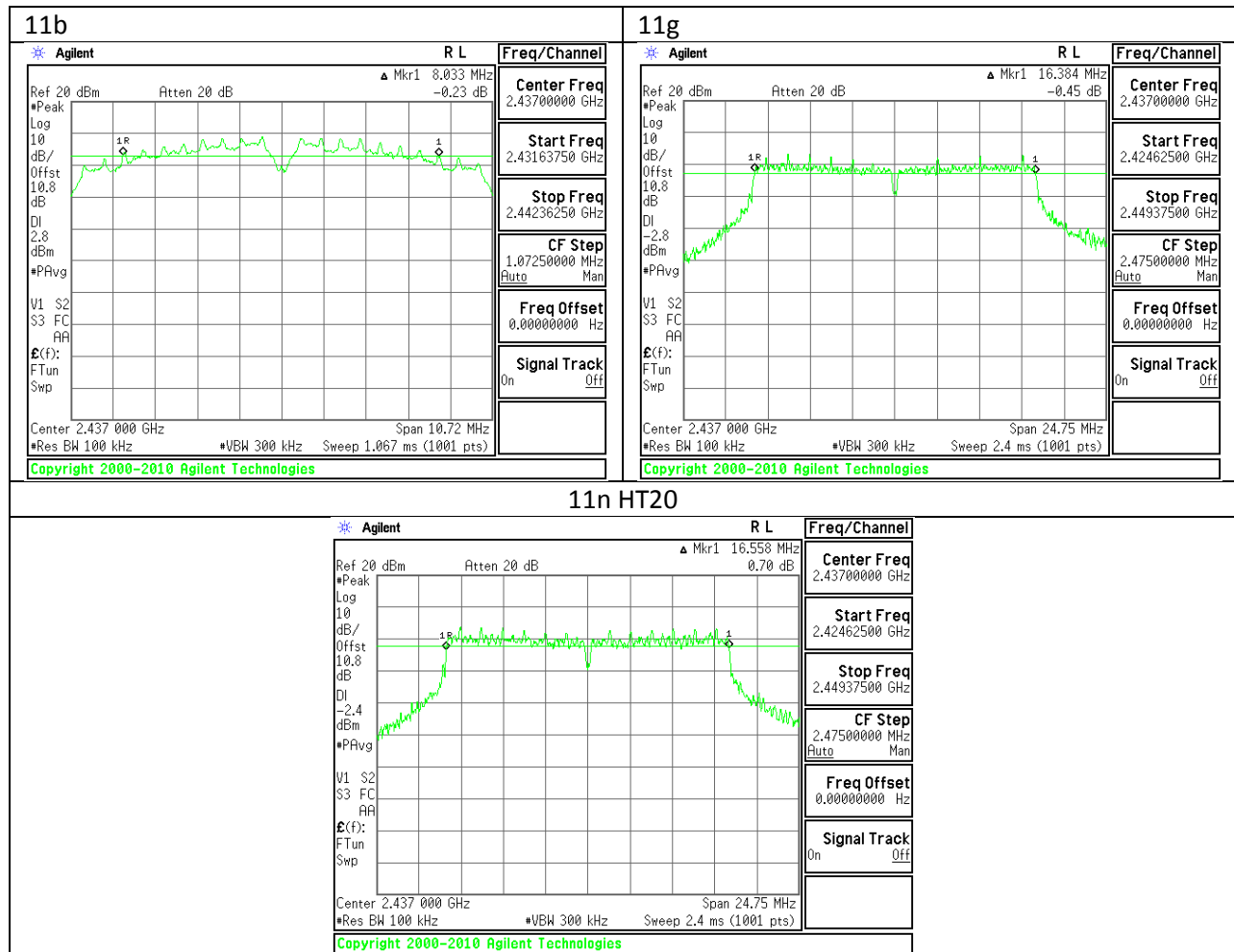
9.1.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.31	0.5
Mid	2437	16.38	0.5
High	2462	16.09	0.5
Worst		16.09	

9.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.21	0.5
Mid	2437	16.56	0.5
High	2462	15.76	0.5
Worst		15.76	

9.1.4. 6 dB BANDWIDTH MID CH PLOTS



9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

9.2.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	12.68
Mid	2437	12.77
High	2462	12.10
Worst		12.77

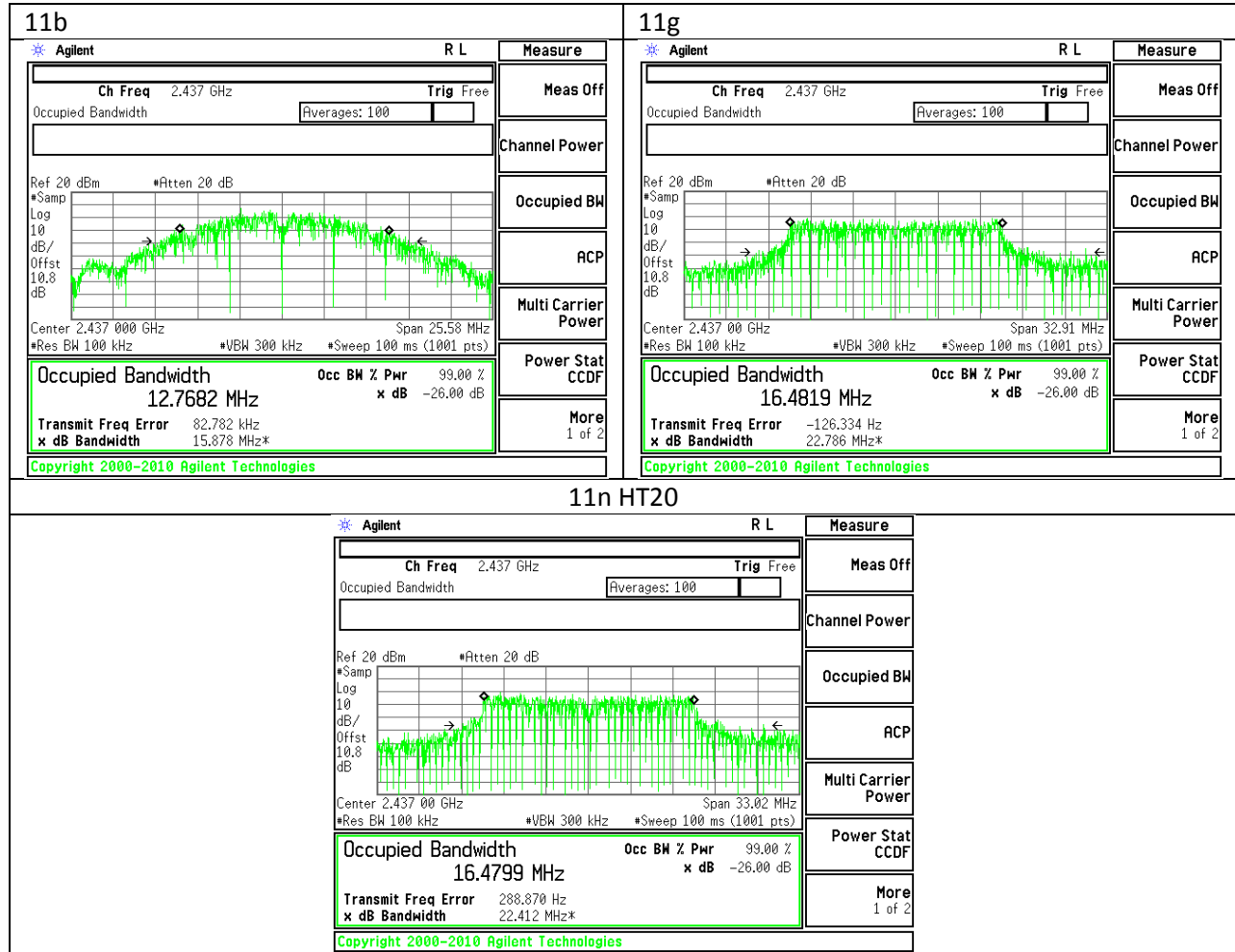
9.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.41
Mid	2437	16.48
High	2462	16.38
Worst		16.48

9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.42
Mid	2437	16.48
High	2462	16.38
Worst		16.48

9.2.4. 99% BANDWIDTH MID CH PLOTS



9.3. OUTPUT POWER

LIMITS

FCC §15.247

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.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.5 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.

DIRECTIONAL ANTENNA GAIN

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

RESULTS

9.3.1. 802.11b MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-2.90	30.00	30	36	30.00
Mid	2437	-2.90	30.00	30	36	30.00
High	2462	-2.90	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	16.30	16.30	30.00	-13.70
Mid	2437	16.30	16.30	30.00	-13.70
High	2462	16.40	16.40	30.00	-13.60
Worst			16.40		

9.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-2.90	30.00	30	36	30.00
Mid	2437	-2.90	30.00	30	36	30.00
High	2462	-2.90	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	13.30	13.30	30.00	-16.70
Mid	2437	13.30	13.30	30.00	-16.70
High	2462	13.30	13.30	30.00	-16.70
Worst			13.30		

9.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-2.90	30.00	30	36	30.00
Mid	2437	-2.90	30.00	30	36	30.00
High	2462	-2.90	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	12.50	12.50	30.00	-17.50
Mid	2437	12.50	12.50	30.00	-17.50
High	2462	12.40	12.40	30.00	-17.60
Worst			12.50		

9.4. PSD
LIMITS

FCC §15.247

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

9.4.1. 802.11b MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-13.01	8.0	-21.0
Mid	2437	-13.03	8.0	-21.0
High	2462	-12.77	8.0	-20.8

9.4.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

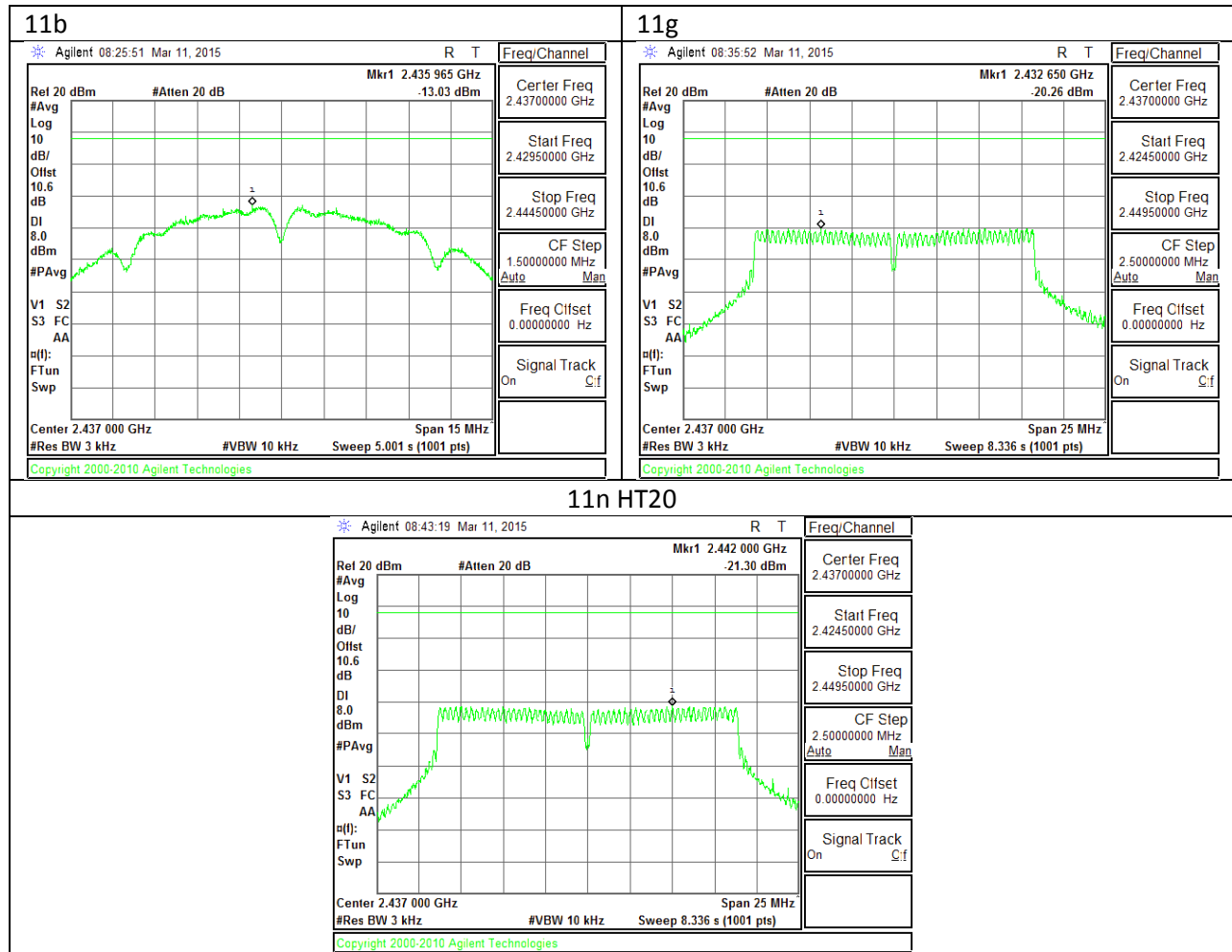
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-19.54	8.0	-27.5
Mid	2437	-20.26	8.0	-28.3
High	2462	-19.17	8.0	-27.2

9.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-20.83	8.0	-28.8
Mid	2437	-21.30	8.0	-29.3
High	2462	-20.58	8.0	-28.6

9.4.4. PSD Chain 0 MID CH PLOTS



9.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

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.

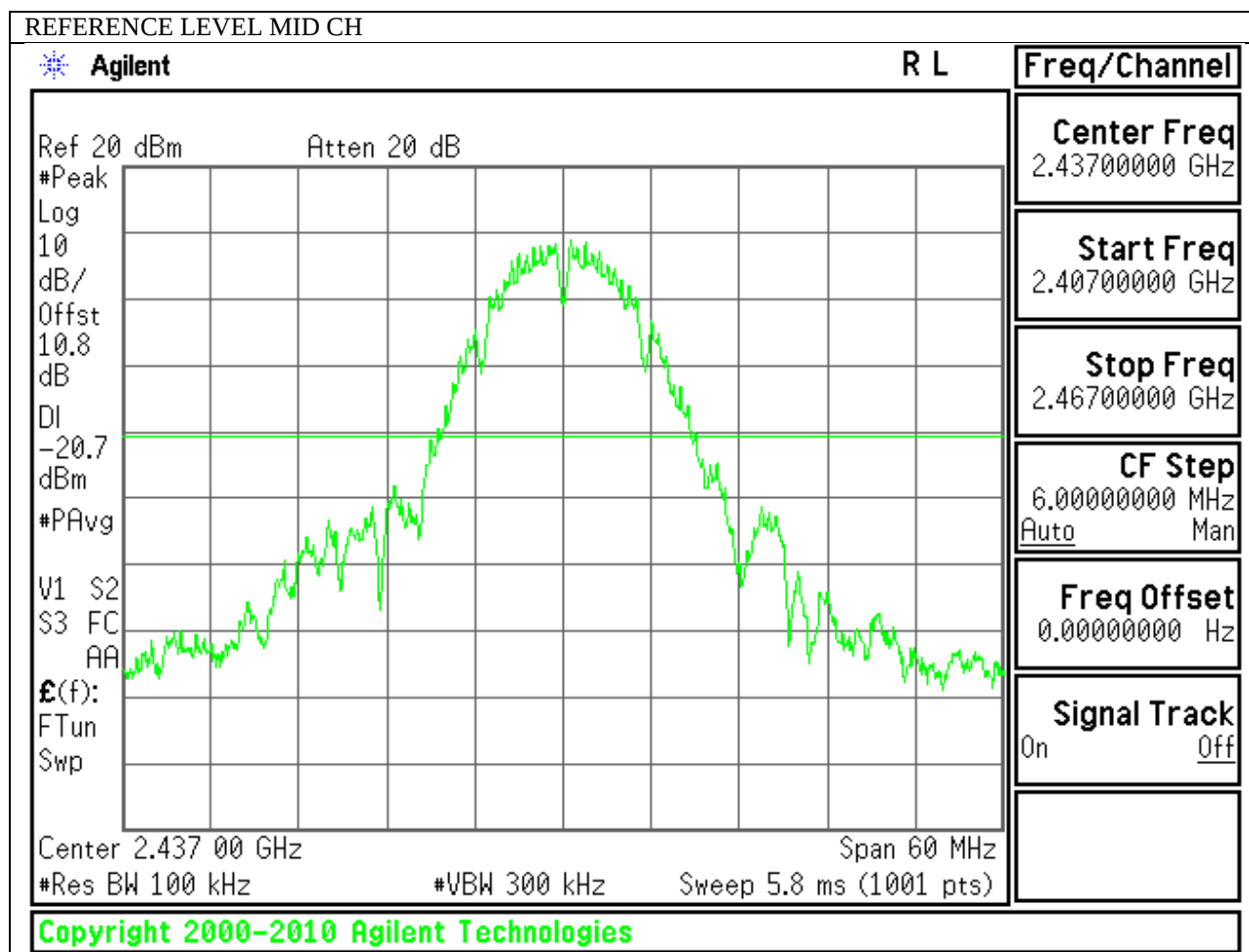
TEST PROCEDURE

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.

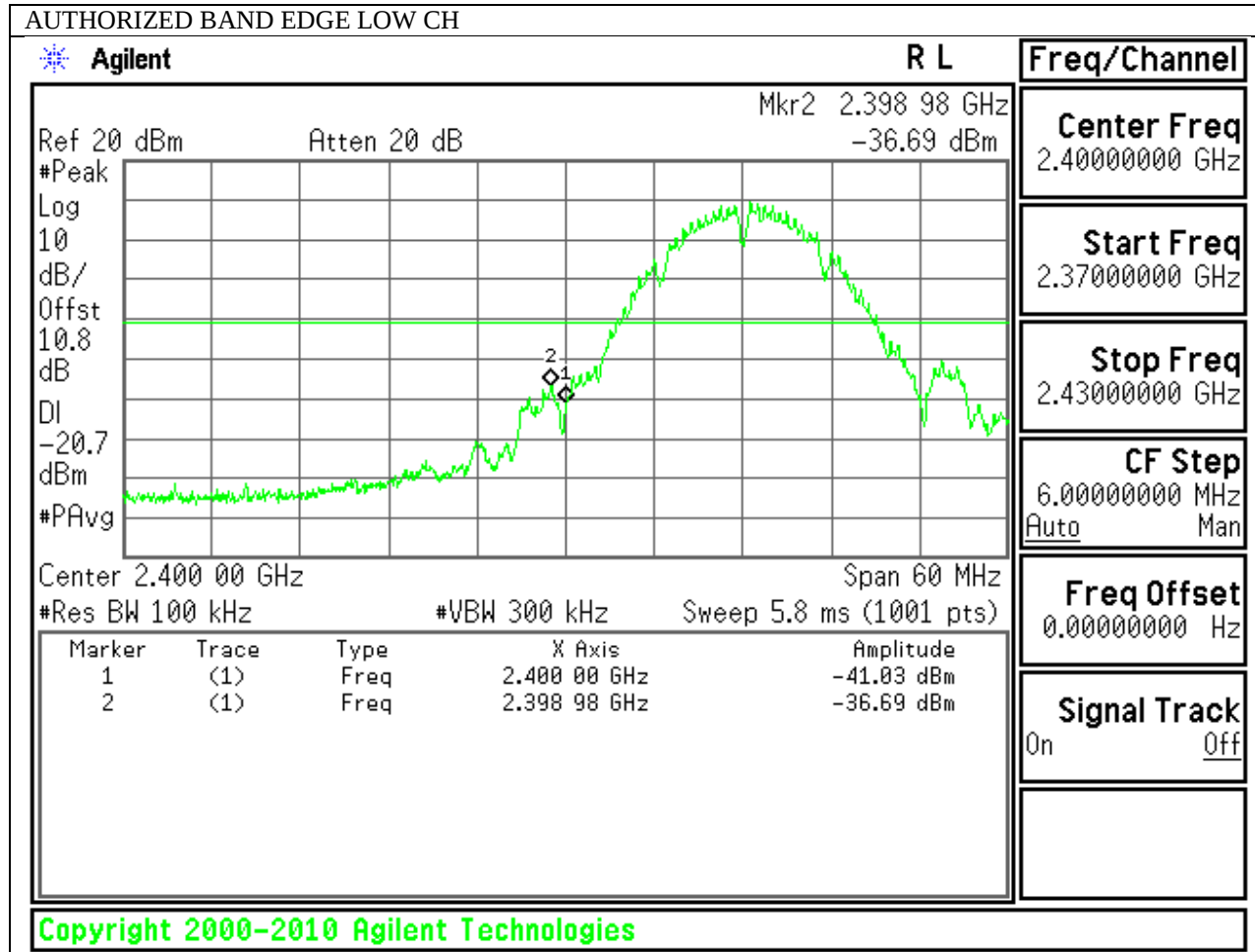
RESULTS

9.5.1. 802.11b MODE IN THE 2.4 GHz BAND

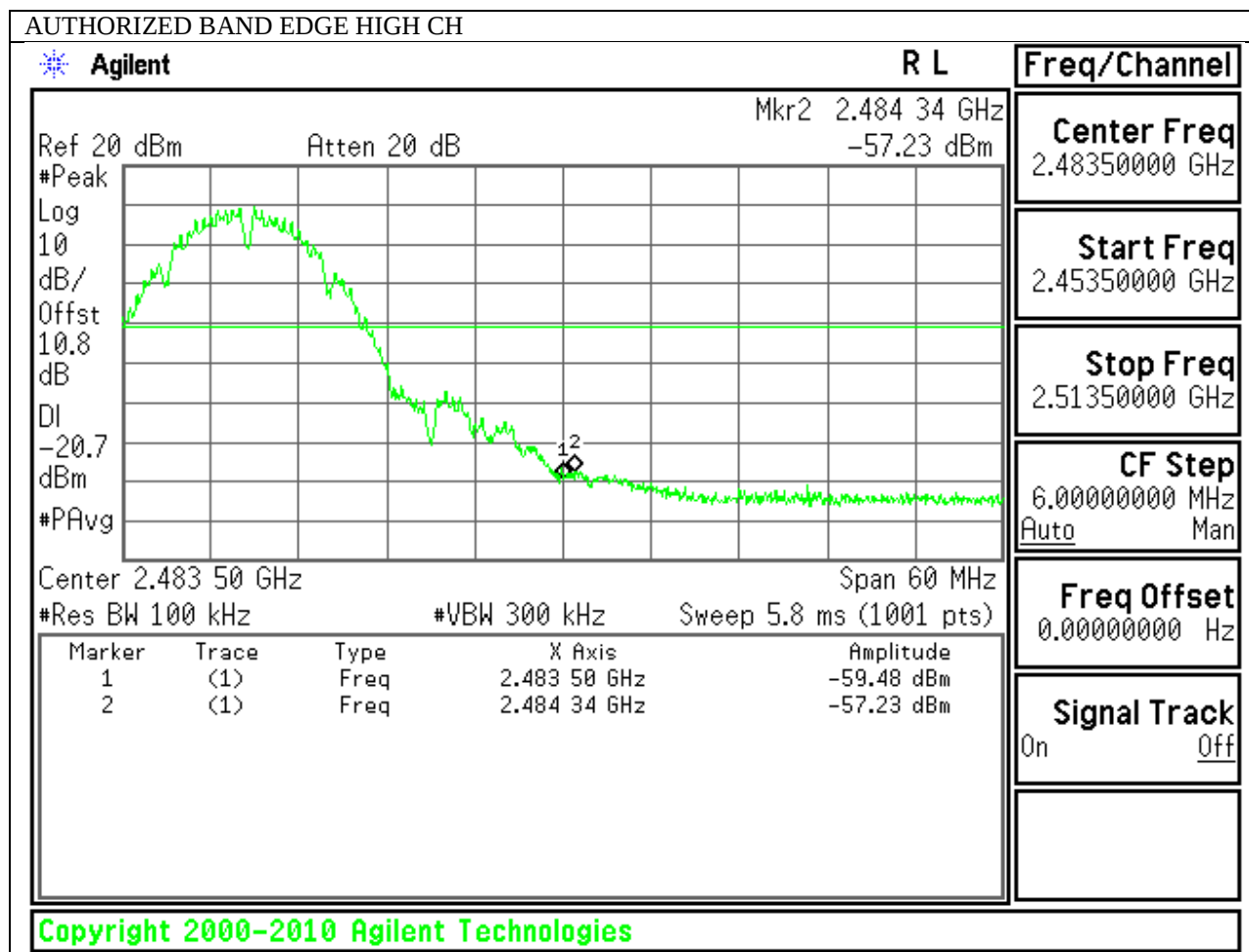
IN-BAND REFERENCE LEVEL



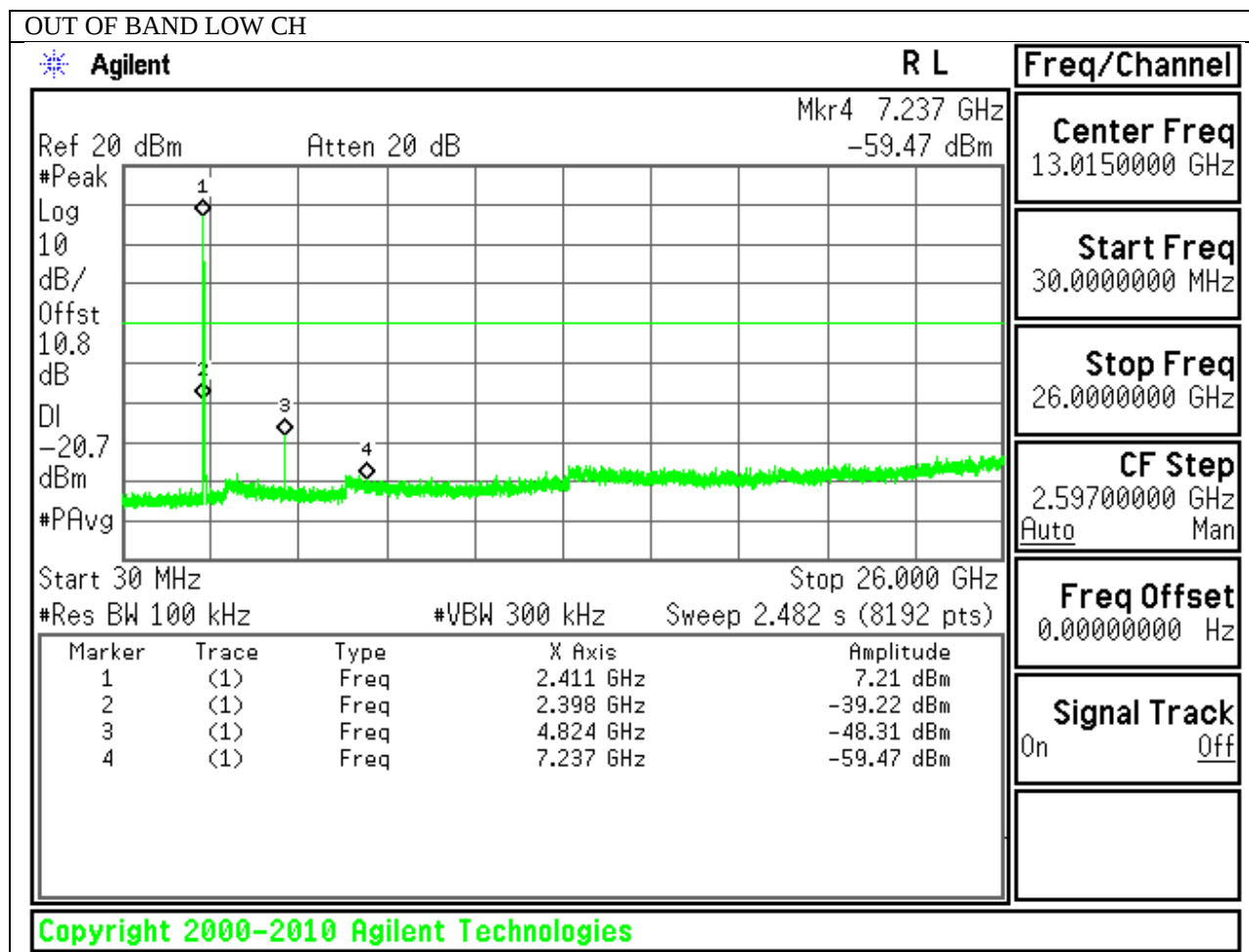
LOW CHANNEL BANDEDGE

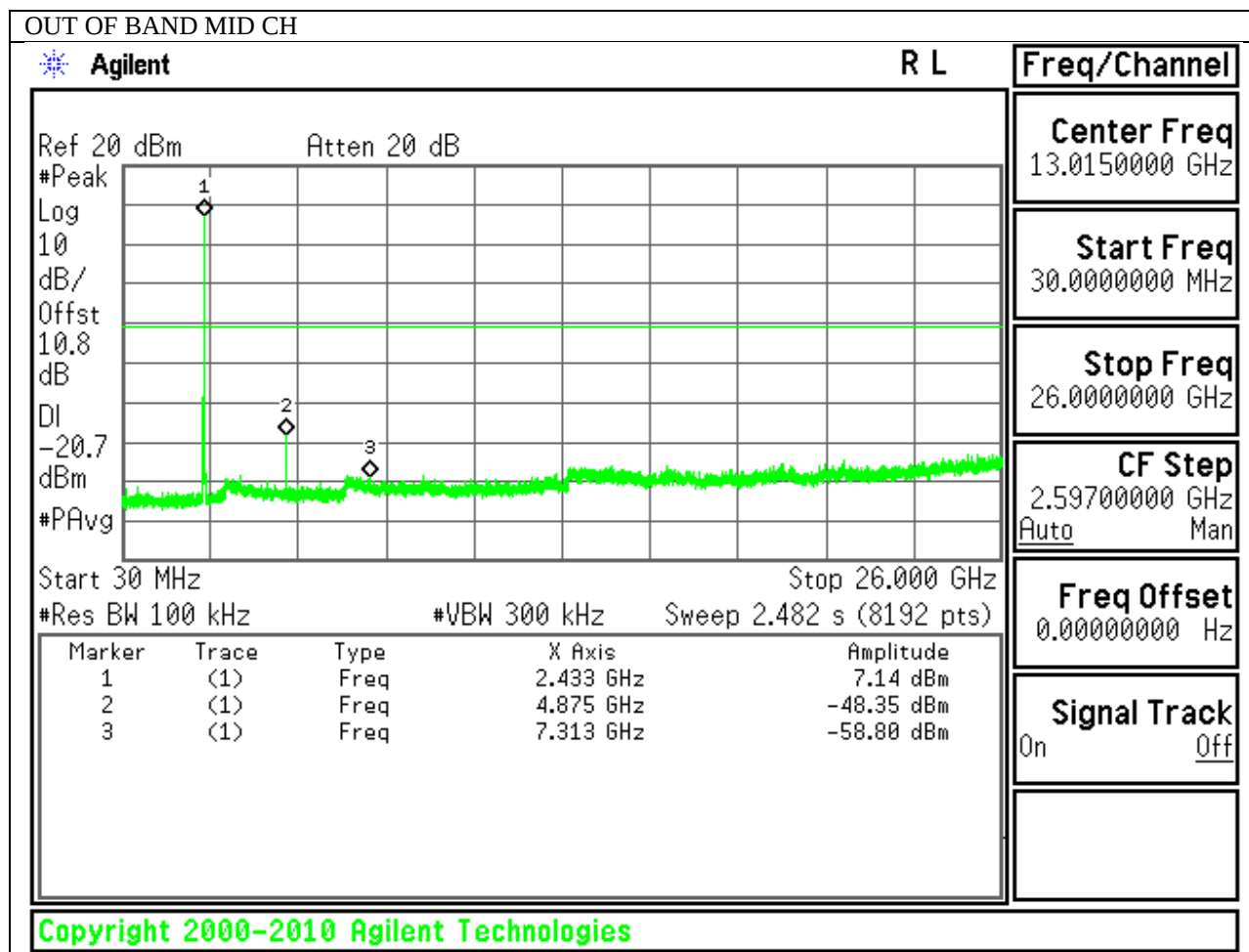


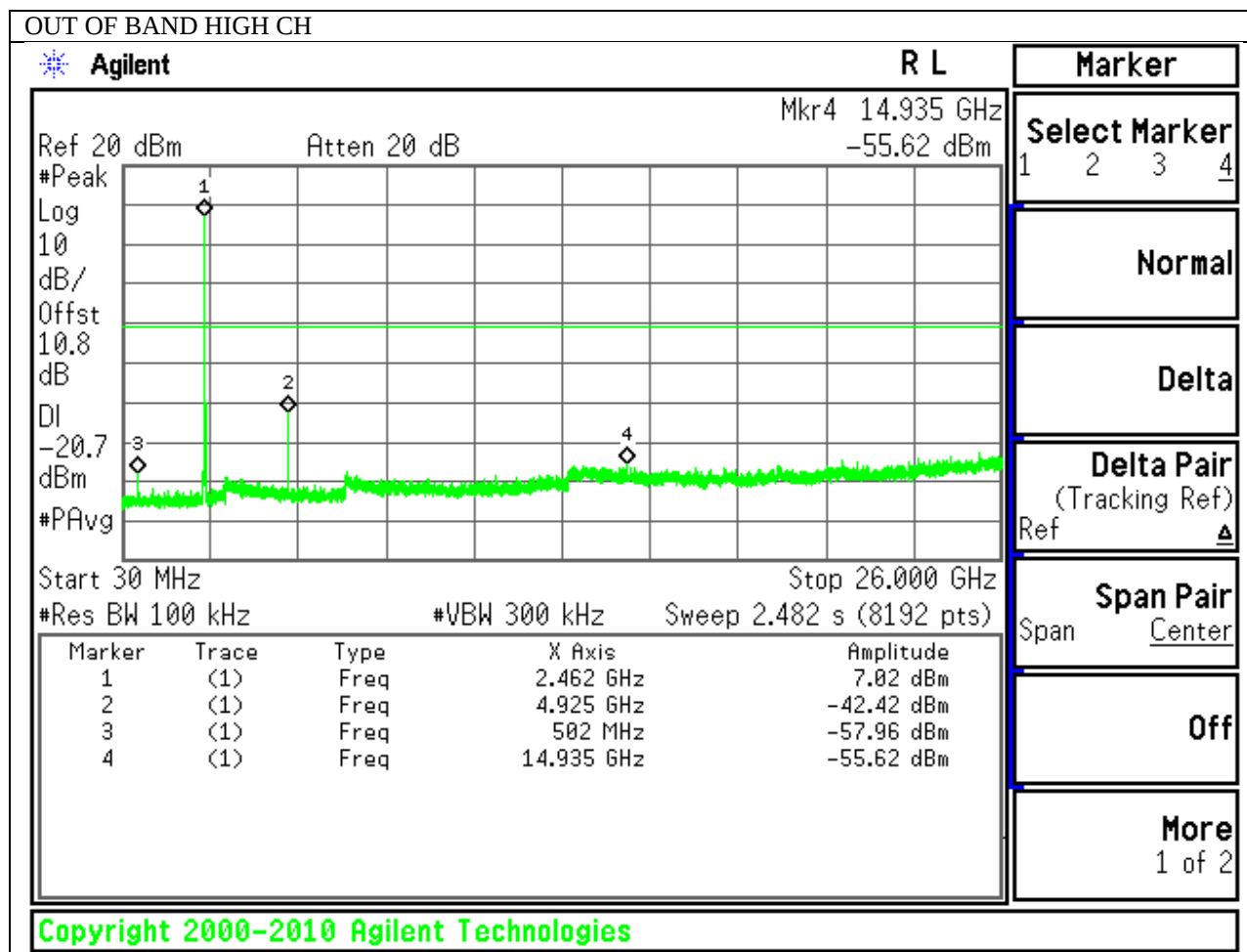
HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS

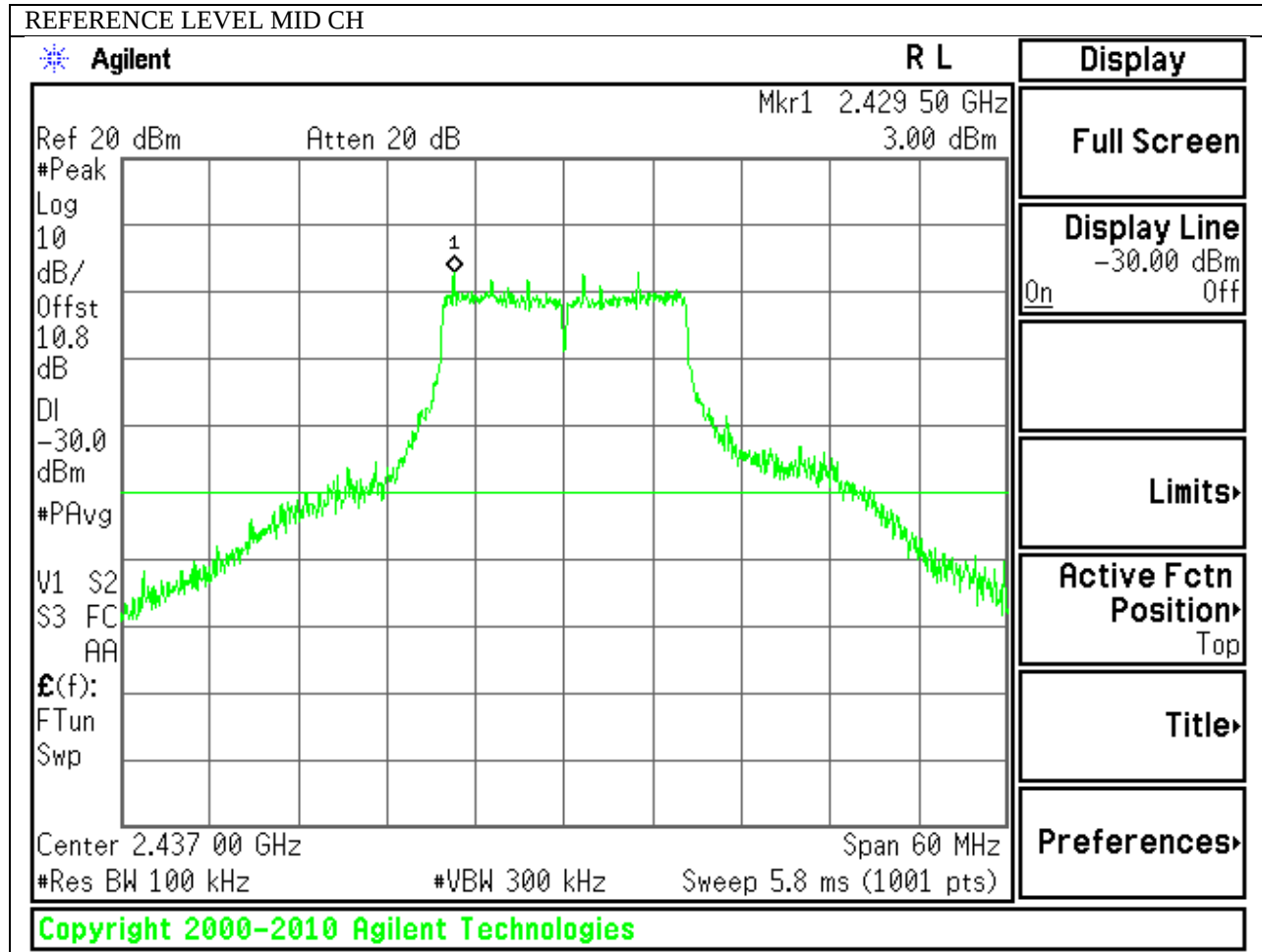




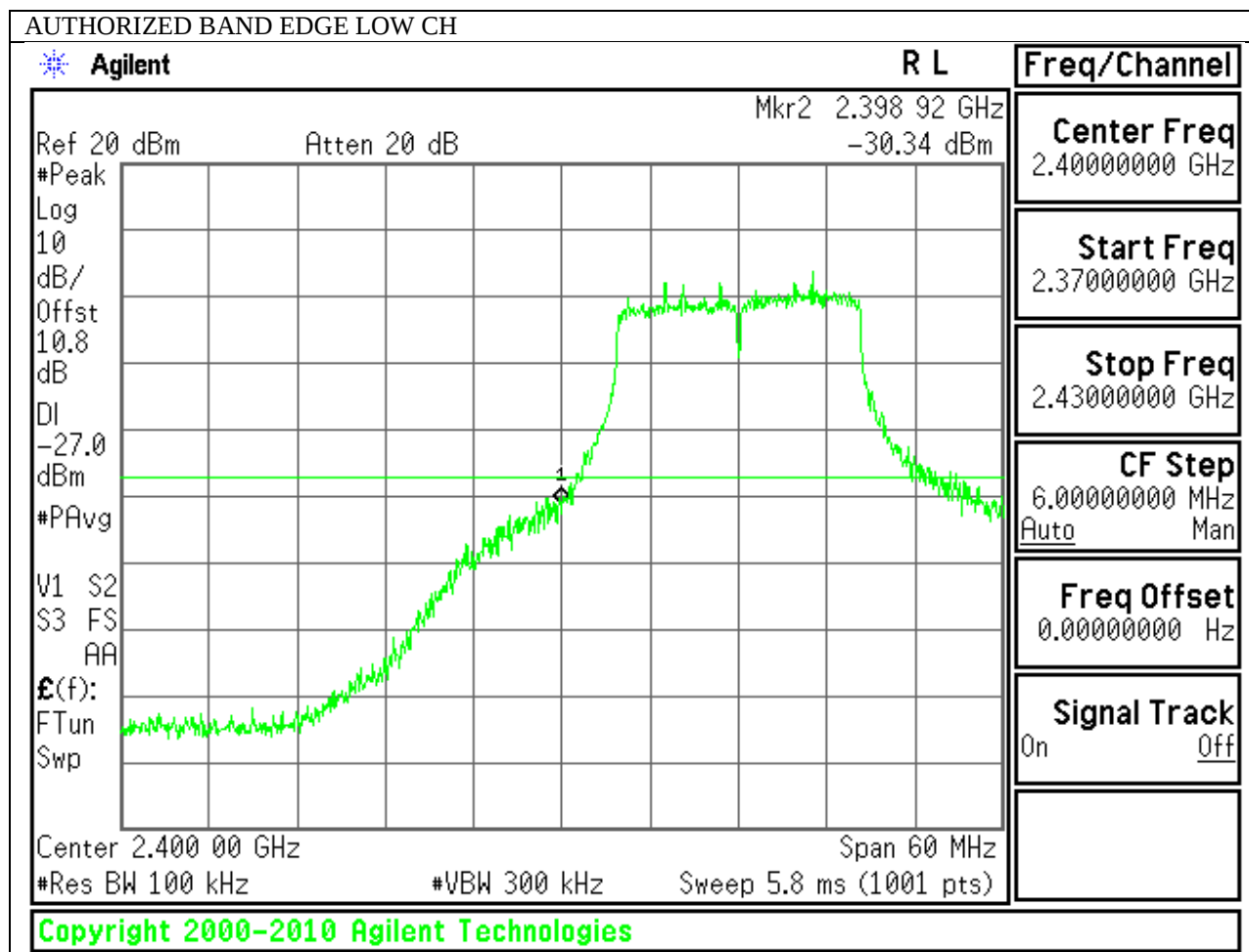


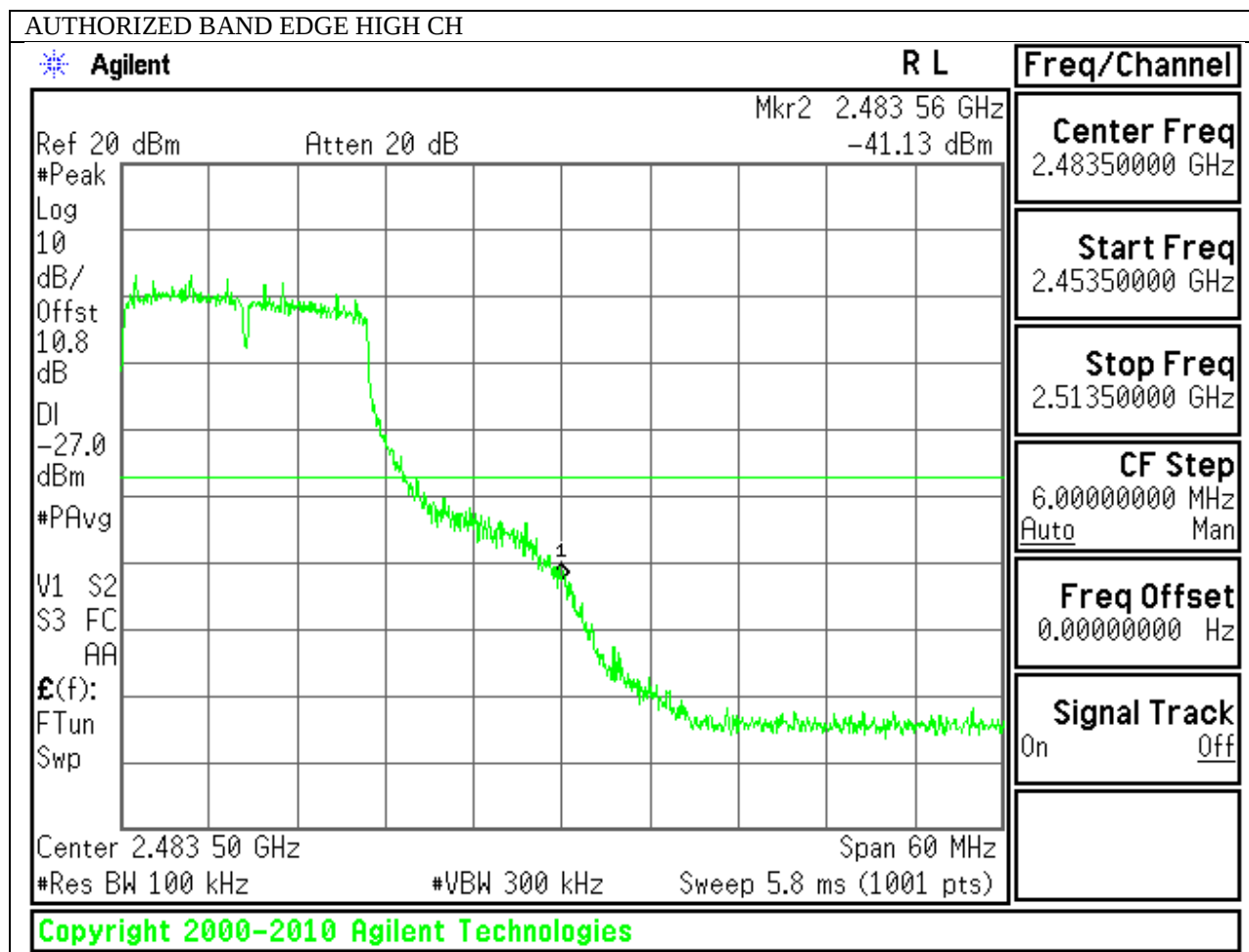
9.5.2. 802.11g MODE IN THE 2.4 GHz BAND

IN-BAND REFERENCE LEVEL

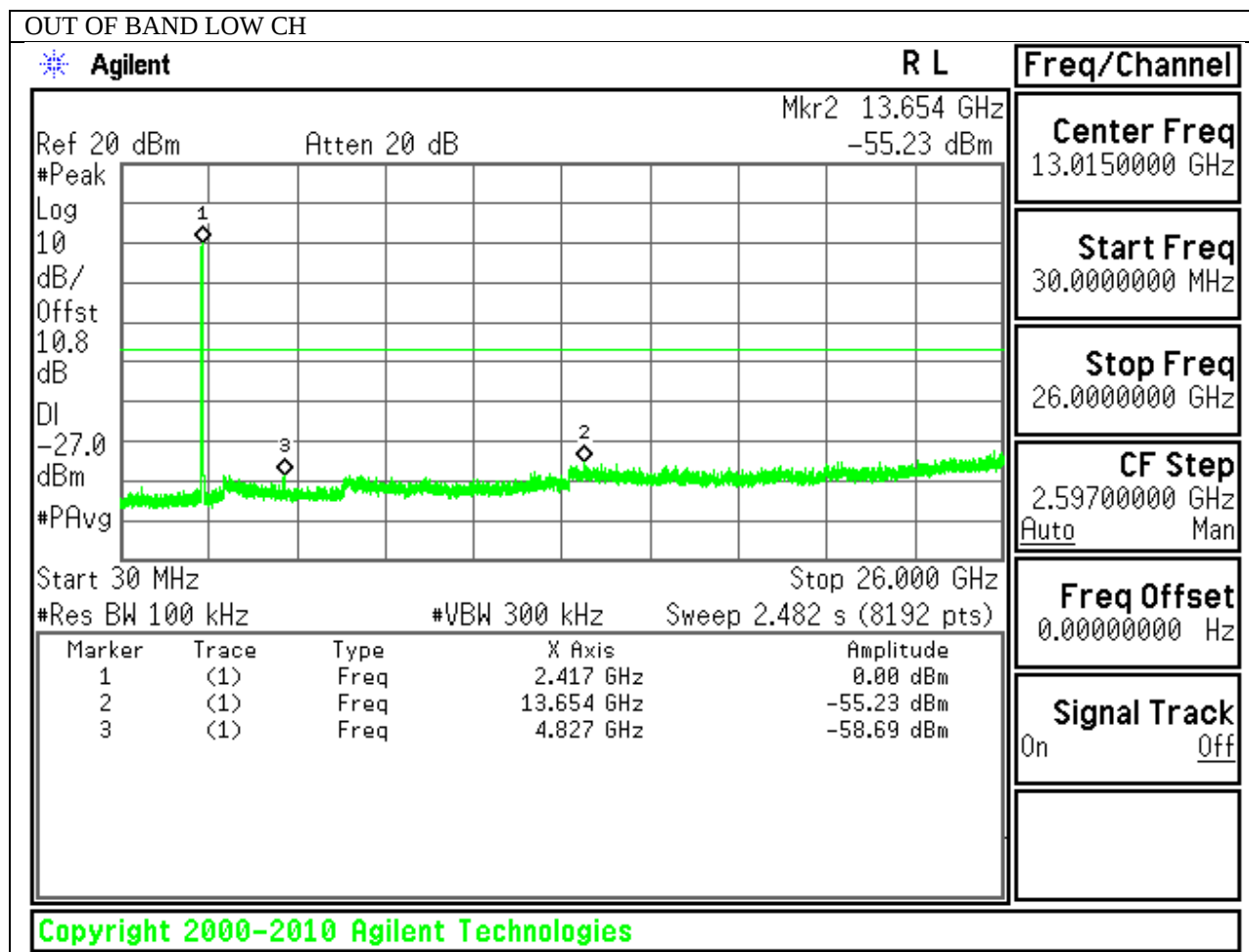


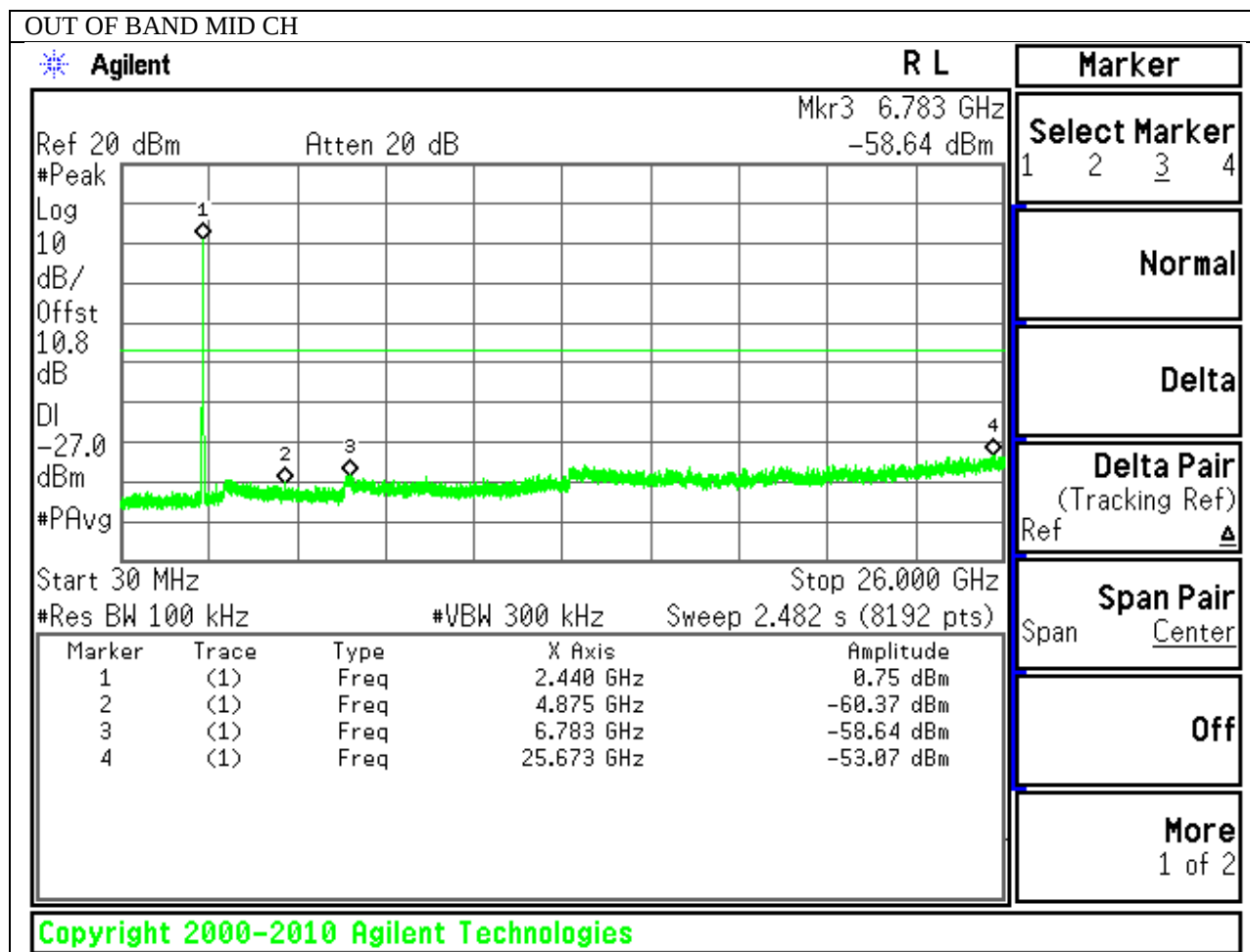
LOW CHANNEL BANDEDGE

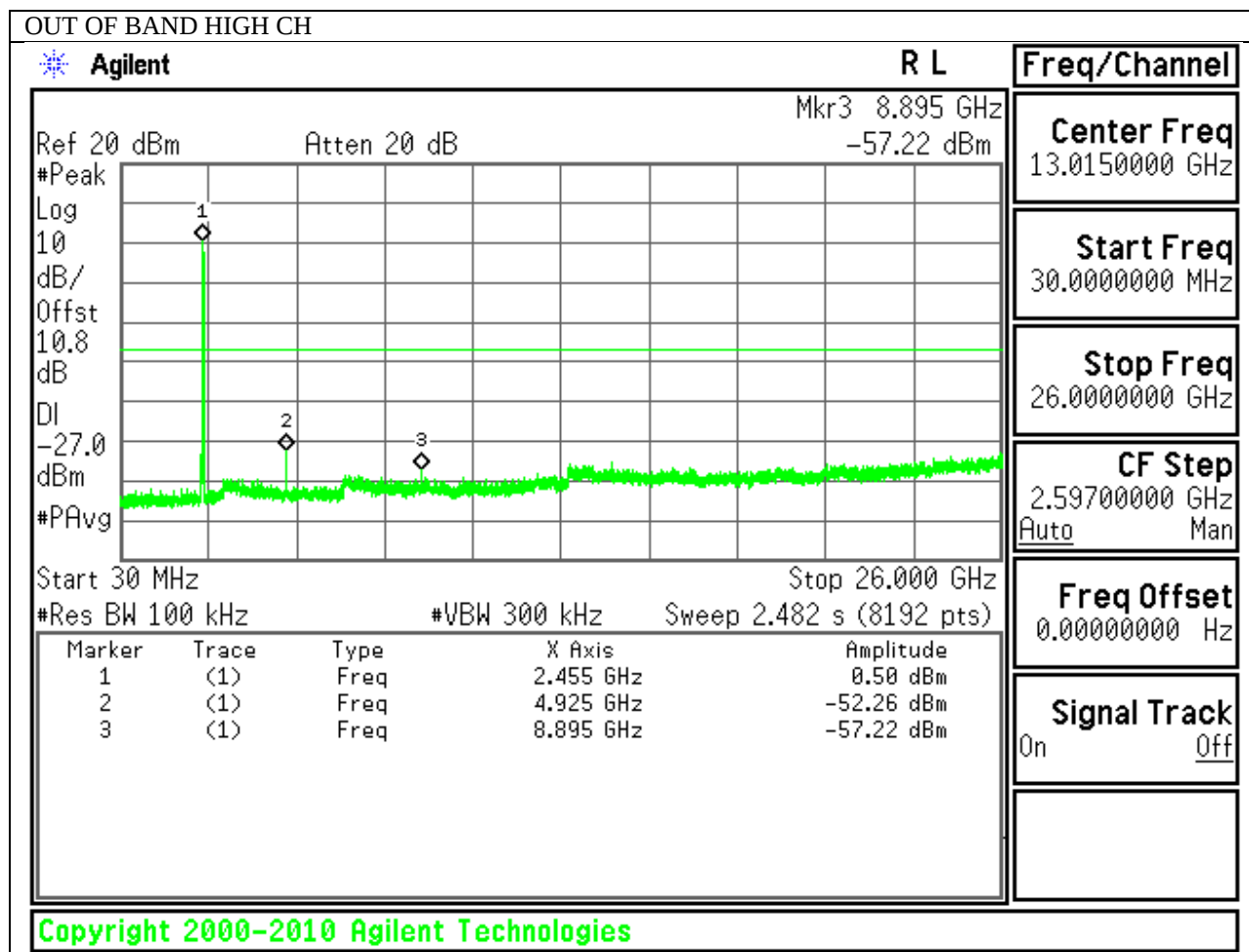




OUT-OF-BAND EMISSIONS

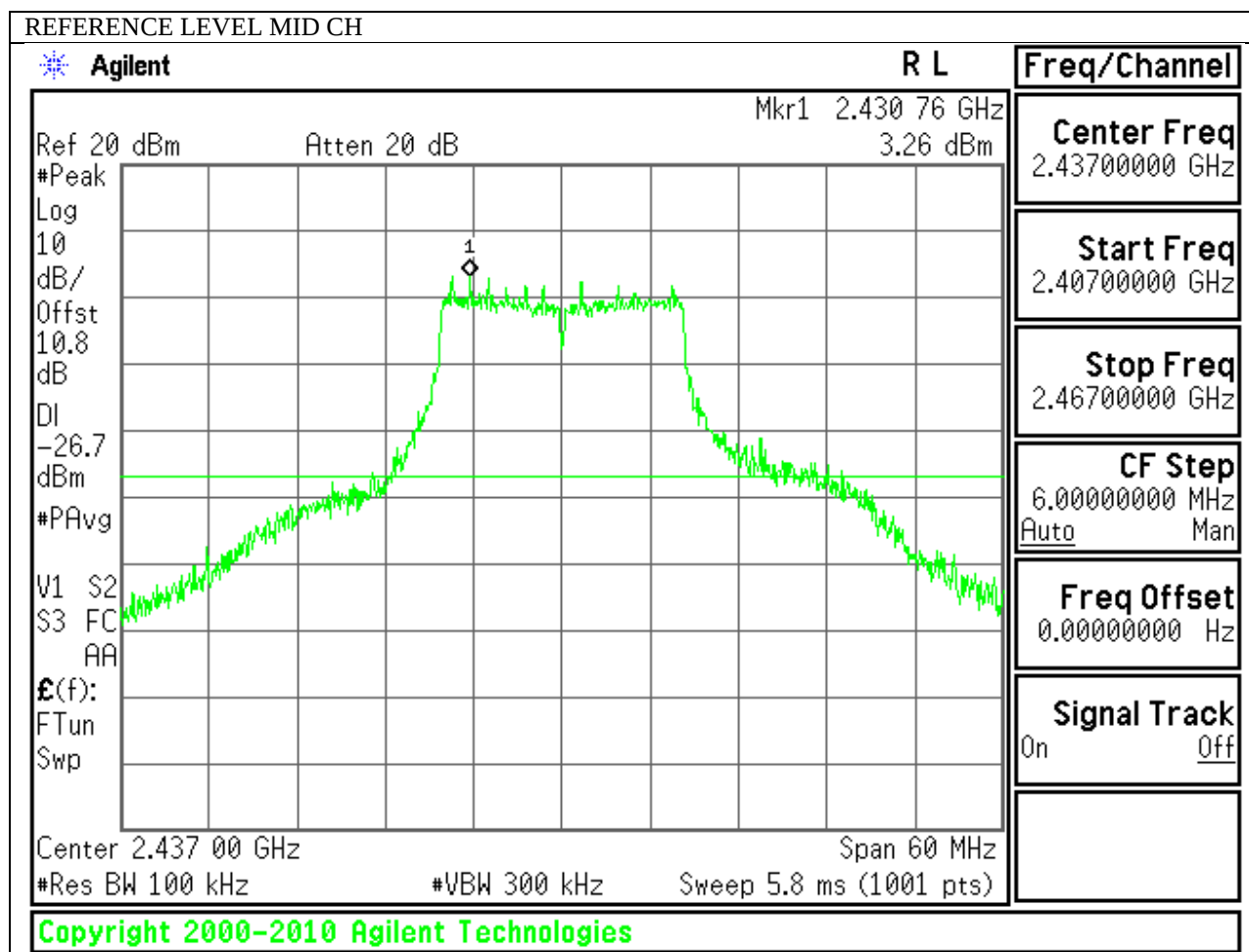




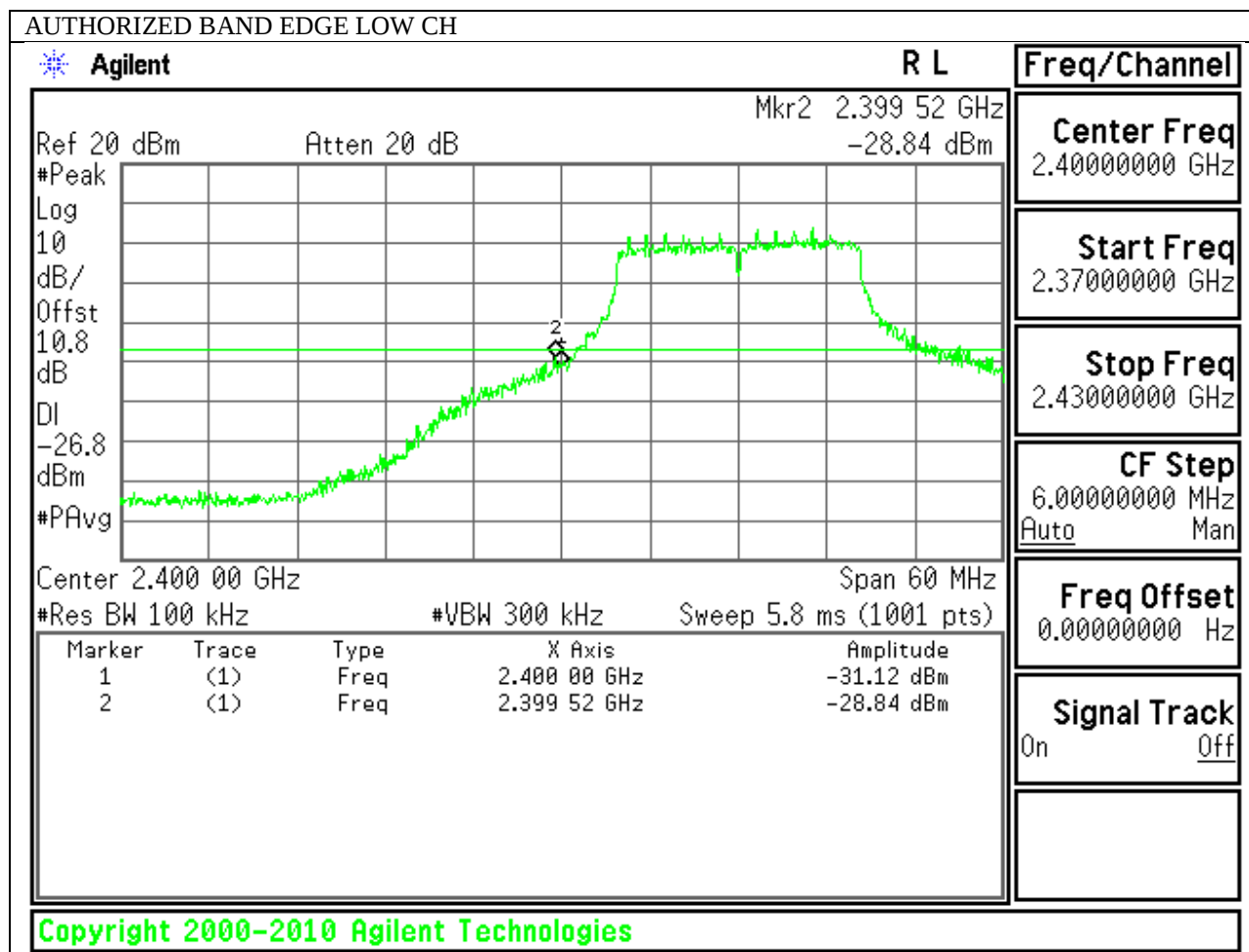


9.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

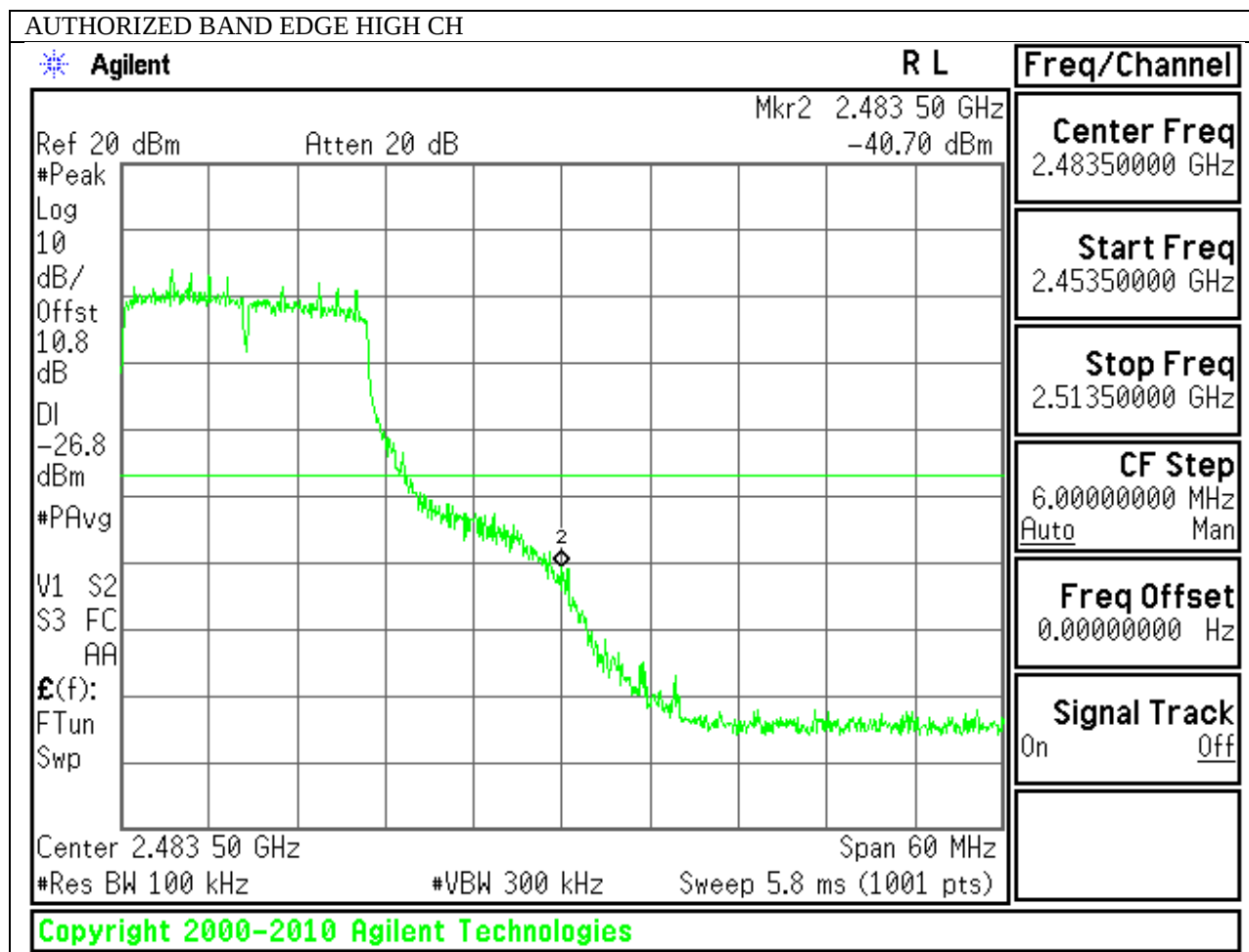
IN-BAND REFERENCE LEVEL



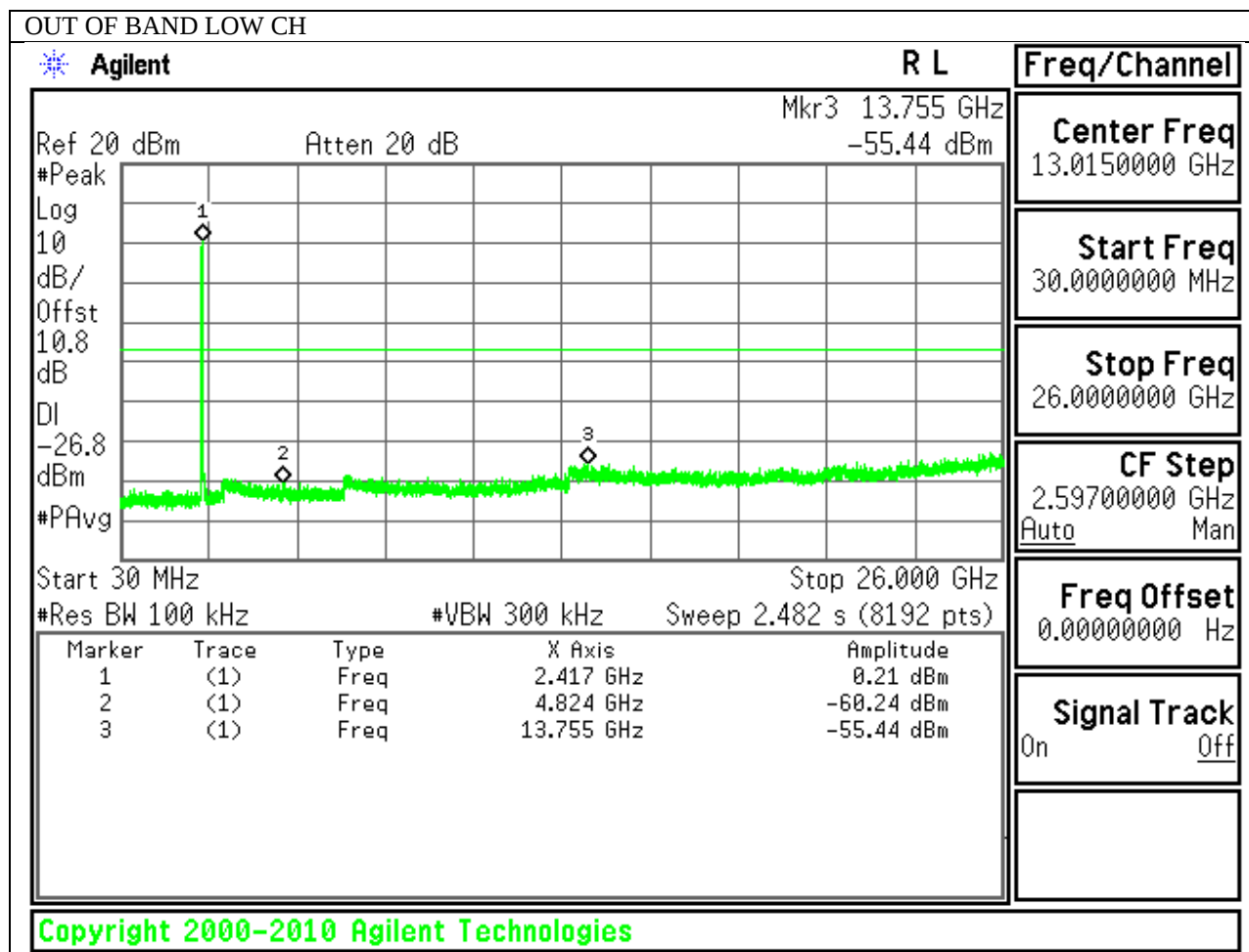
LOW CHANNEL BANDEDGE

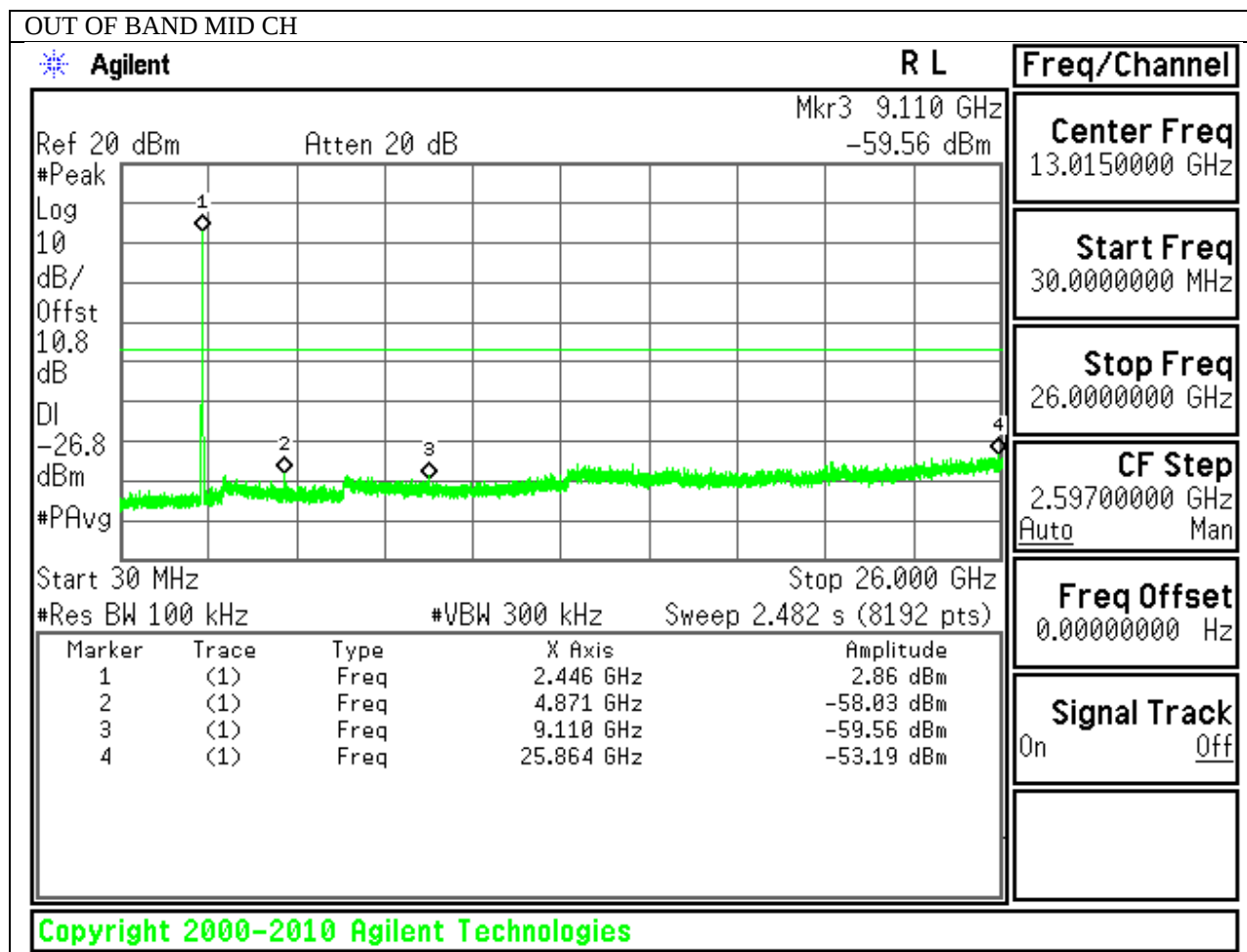


HIGH CHANNEL BANDEDGE

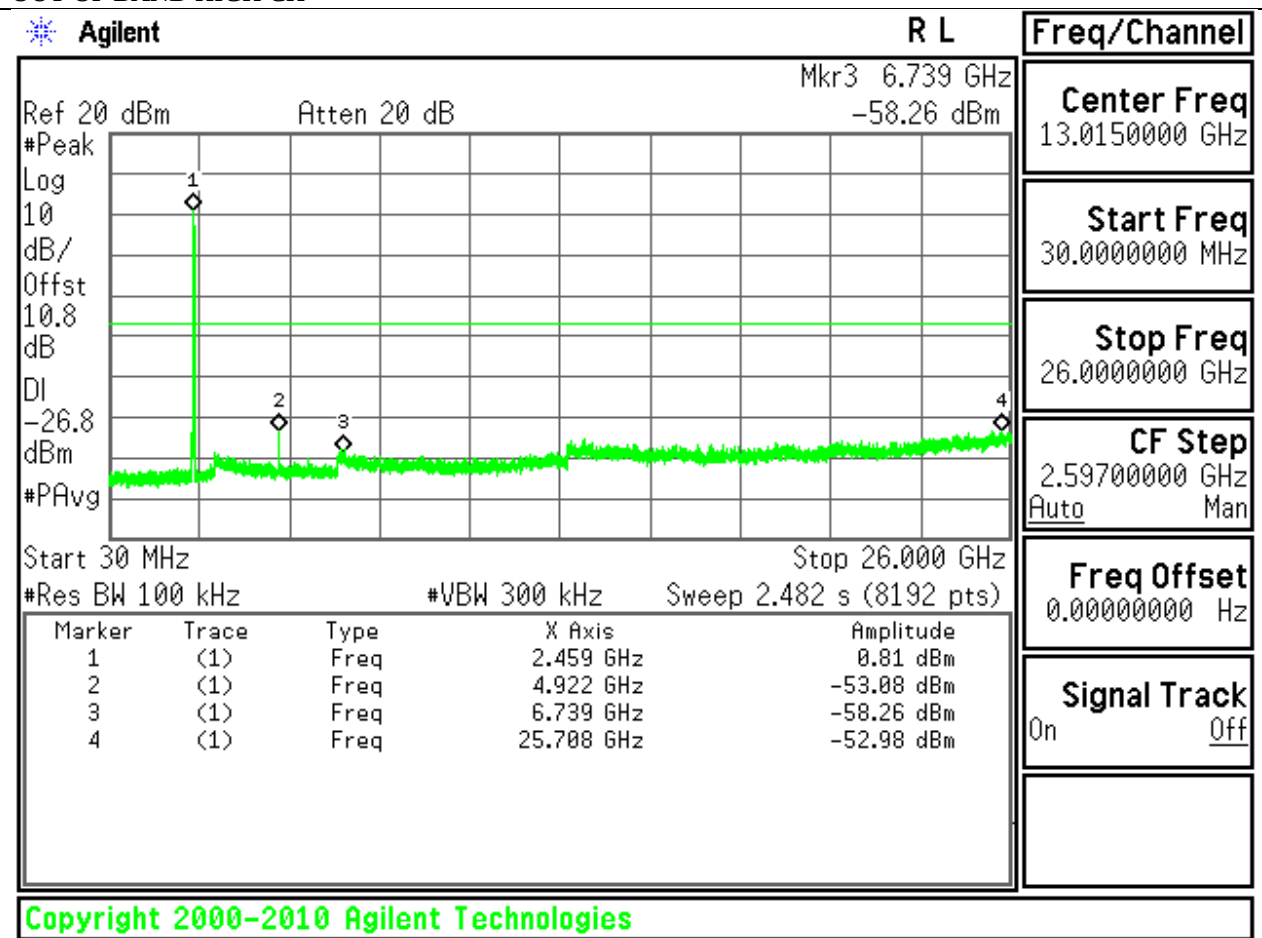


OUT-OF-BAND EMISSIONS





OUT OF BAND HIGH CH



10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit ($\mu\text{V}/\text{m}$) at 3 m	Field Strength Limit (dB $\mu\text{V}/\text{m}$) 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 3 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor = $10\log(1/x)$ For this sample B mode = 0dB (duty cycle >98%); G mode = 0.2dB; N mode = 0.32dB.

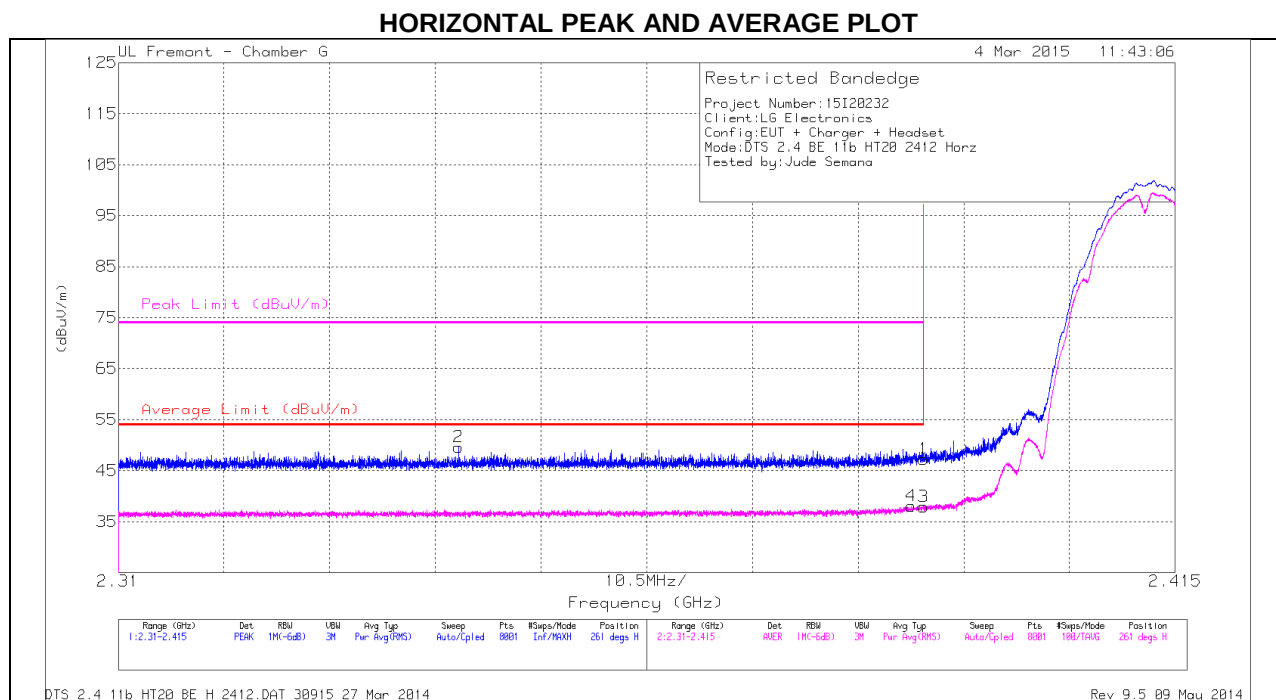
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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. TRANSMITTER ABOVE 1 GHz

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

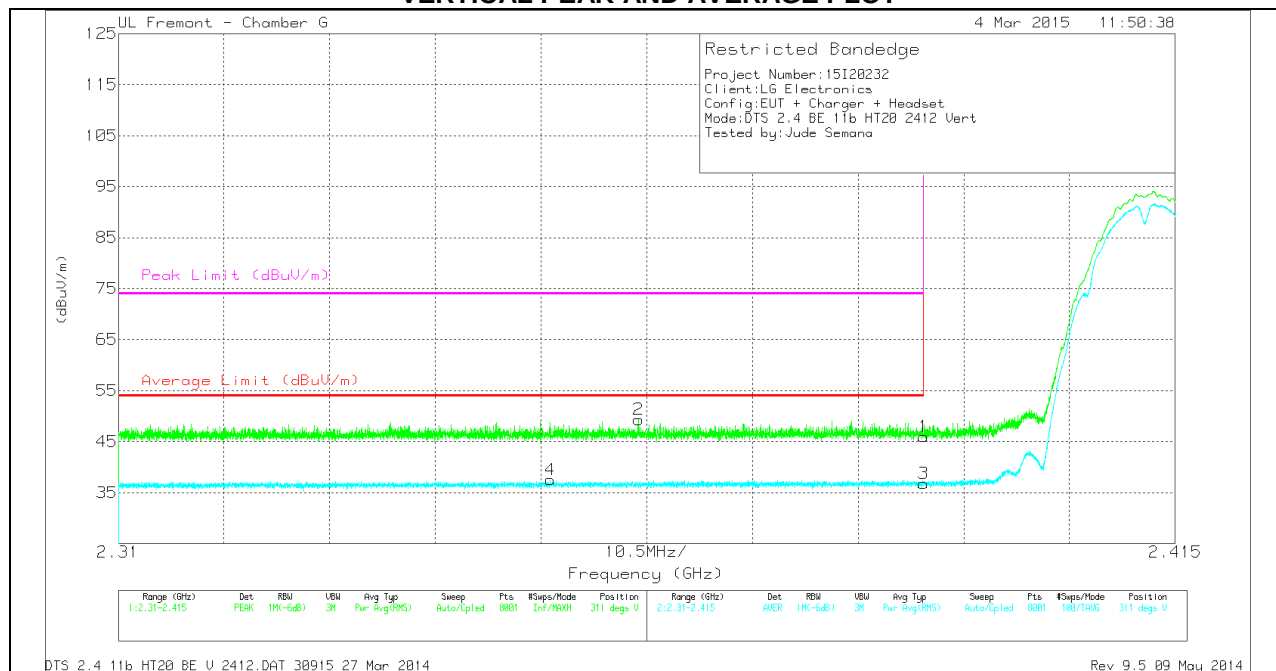
RESTRICTED BANDEDGE (LOW CHANNEL)



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.344	42.91	PK	31.7	-25	0	49.61	-	-	74	-24.39	261	263	H
4	* 2.389	31.21	RMS	31.8	-24.9	0	38.11	54	-15.89	-	-	261	263	H
1	* 2.39	40.41	PK	31.8	-24.9	0	47.31	-	-	74	-26.69	261	263	H
3	* 2.39	31.03	RMS	31.8	-24.9	0	37.93	54	-16.07	-	-	261	263	H

VERTICAL PEAK AND AVERAGE PLOT

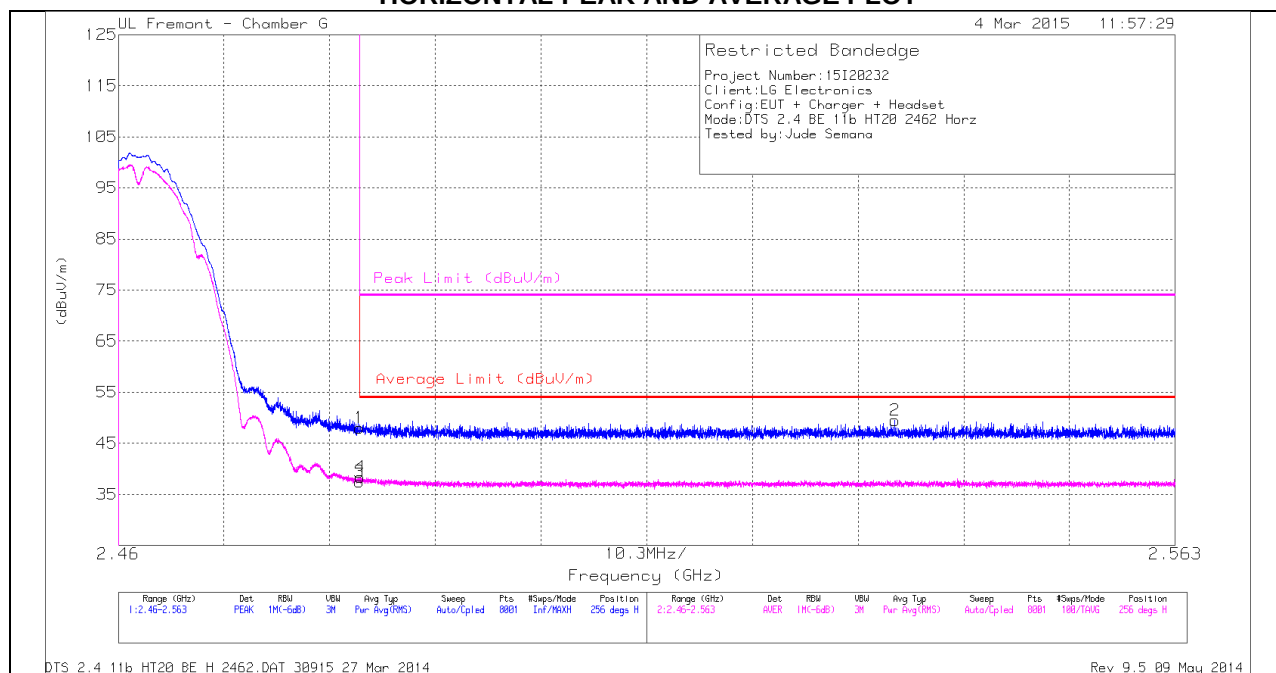


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.353	30.85	RMS	31.7	-25	0	37.55	54	-16.45	-	-	311	315	V
2	* 2.362	42.51	PK	31.7	-24.9	0	49.31	-	-	74	-24.69	311	315	V
1	* 2.39	39.1	PK	31.8	-24.9	0	46	-	-	74	-28	311	315	V
3	* 2.39	29.91	RMS	31.8	-24.9	0	36.81	54	-17.19	-	-	311	315	V

AUTHORIZED BANDEDGE (HIGH CHANNEL)

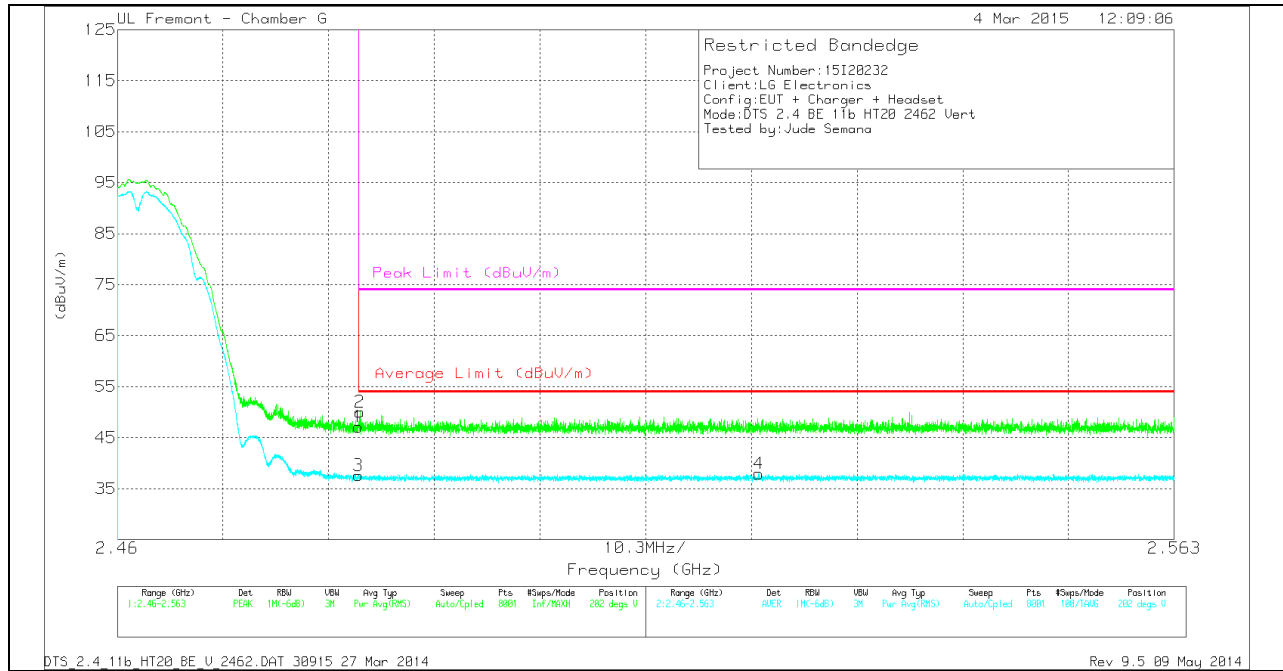
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.91	PK	32	-24.9	0	48.01	-	-	74	-25.99	256	256	H
3	* 2.484	30.34	RMS	32	-24.9	0	37.44	54	-16.56	-	-	256	256	H
4	* 2.484	31.3	RMS	32	-24.9	0	38.4	54	-15.6	-	-	256	256	H
2	2.536	42.37	PK	32	-24.9	0	49.47	-	-	74	-24.53	256	256	H

VERTICAL PEAK AND AVERAGE PLOT

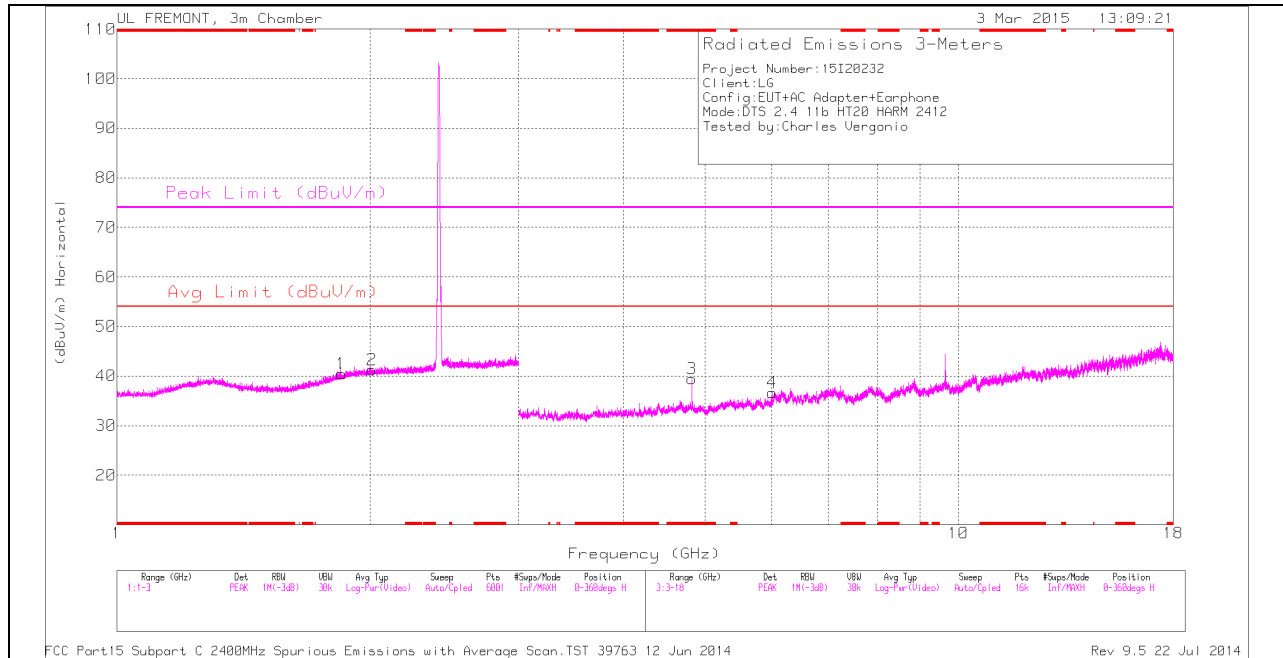


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.04	PK	32	-24.9	0	47.14	-	-	74	-26.86	202	261	V
2	* 2.484	42.92	PK	32	-24.9	0	50.02	-	-	74	-23.98	202	261	V
3	* 2.484	30.49	RMS	32	-24.9	0	37.59	54	-16.41	-	-	202	261	V
4	2.523	30.81	RMS	32	-24.9	0	37.91	54	-16.09	-	-	202	261	V

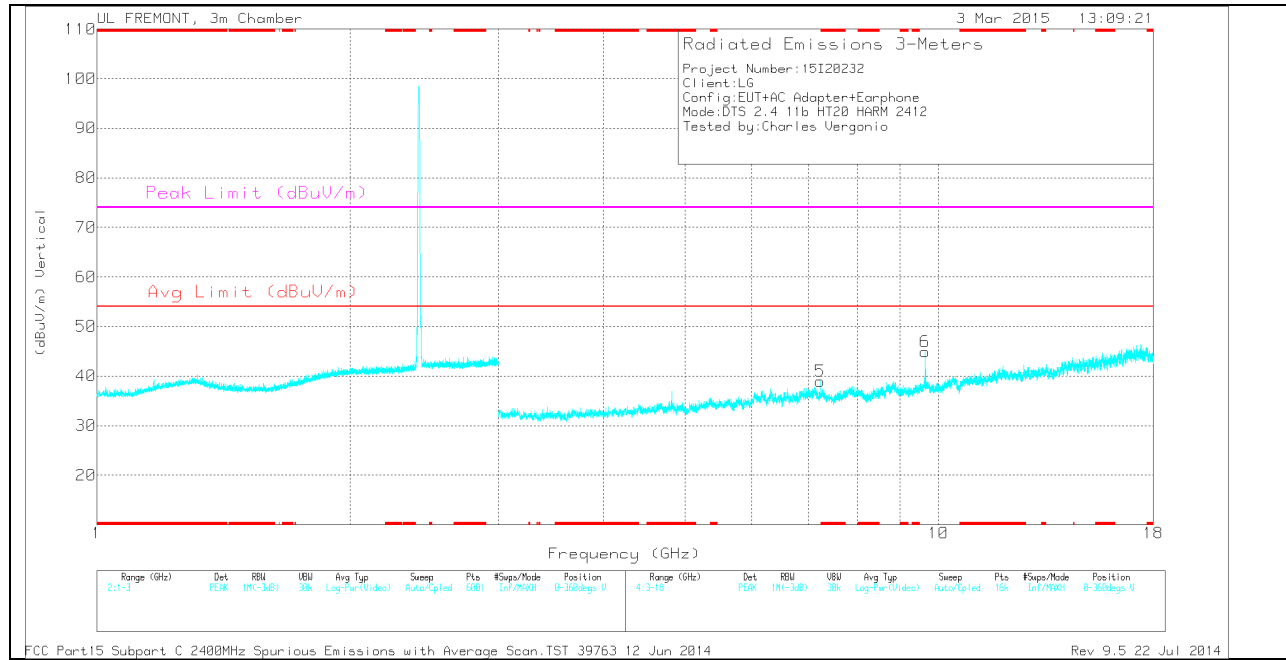
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

TRACE MARKERS

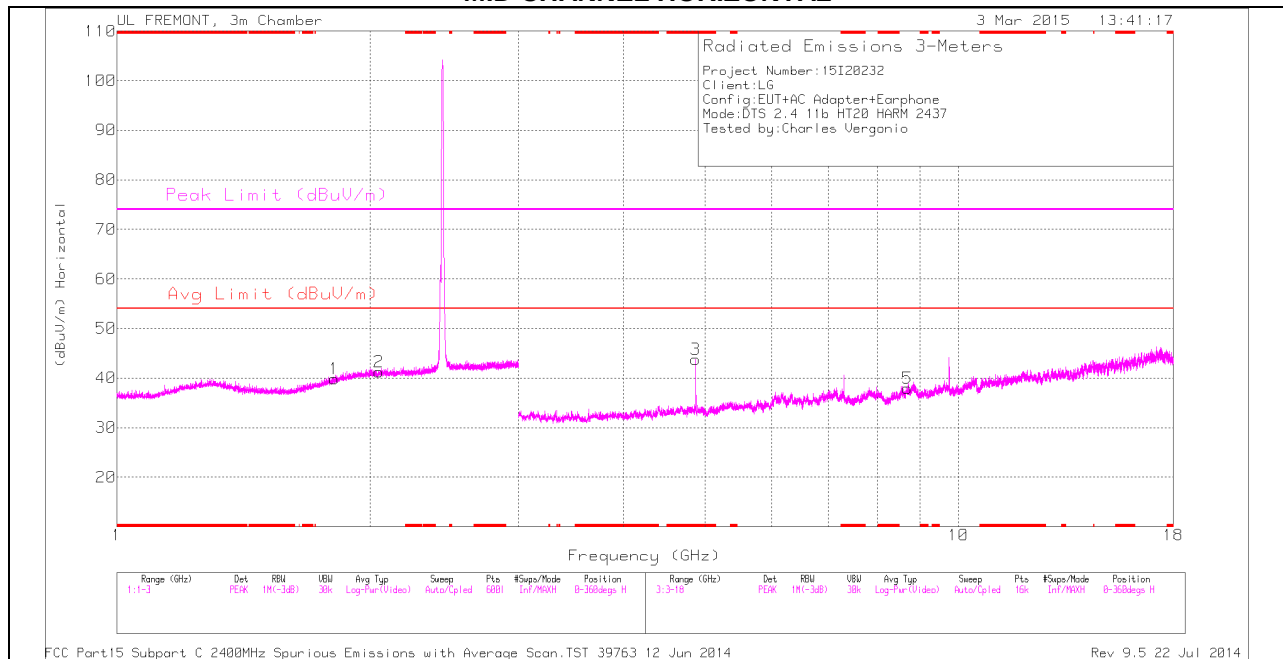
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 4.824	35.62	PK	34	-30.2	39.42	-	-	74	-34.58	0-360	100	H
1	1.849	33.16	PK	30.6	-23.3	40.46	-	-	-	-	0-360	100	H
2	2.011	32.99	PK	31.5	-23.2	41.29	-	-	-	-	0-360	100	H
4	6.008	31.5	PK	35.2	-30	36.7	-	-	-	-	0-360	100	H
5	7.237	33.05	PK	35.6	-29.7	38.95	-	-	-	-	0-360	100	V
6	9.647	33.68	PK	36.8	-25.6	44.88	-	-	-	-	0-360	100	V

PK - Peak detector

RADIATED EMISSIONS

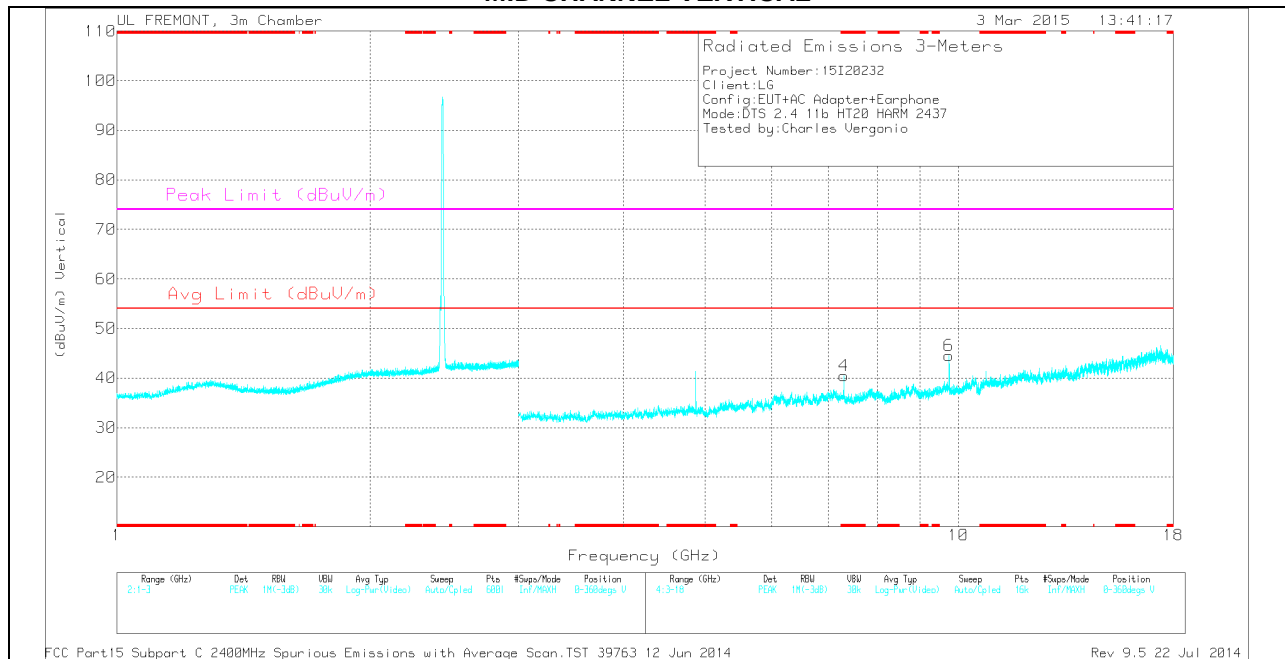
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	44.06	PK2	34	-30.3	47.76	-	-	74	-26.24	3	227	H
* 4.824	36.15	MAV1	34	-30.3	39.85	54	-14.15	-	-	3	227	H
7.237	42.18	PK2	35.6	-29.7	48.08	-	-	-	-	126	227	V
7.237	32.43	MAV1	35.6	-29.7	38.33	-	-	-	-	126	227	V
9.648	39.61	PK2	36.8	-25.6	50.81	-	-	-	-	301	164	V
9.648	32.89	MAV1	36.8	-25.6	44.09	-	-	-	-	301	164	V

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

TRACE MARKERS

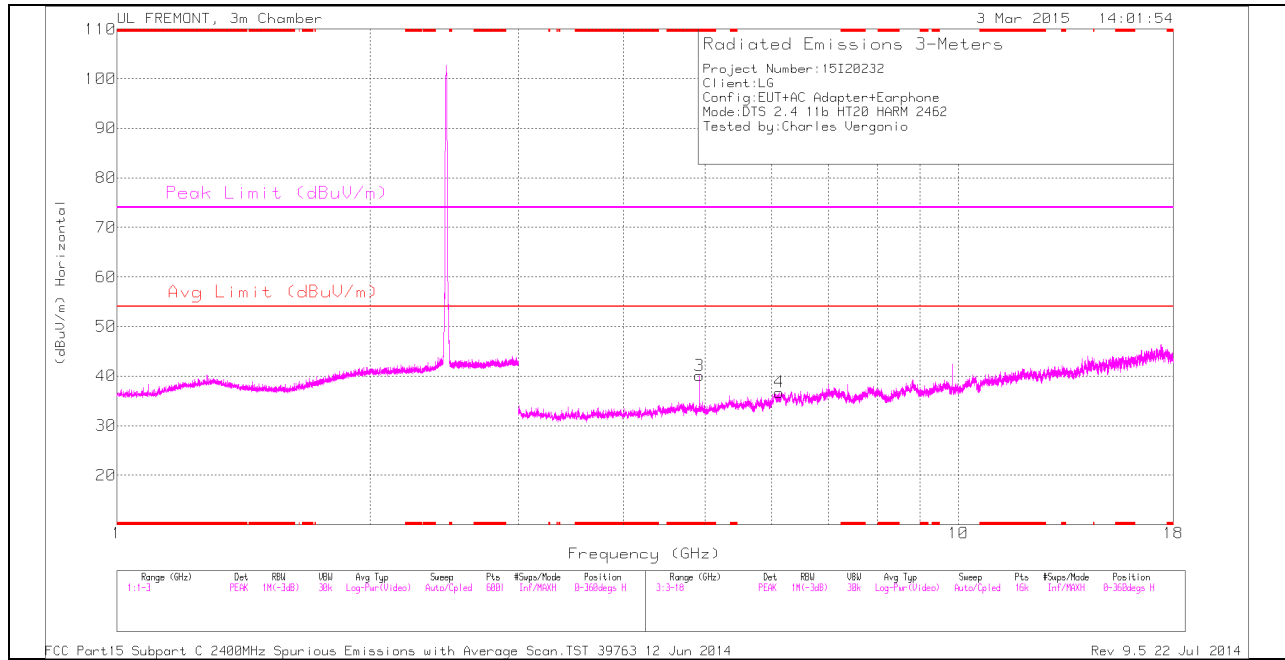
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 4.874	39.83	PK	34	-30.1	43.73	-	-	74	-30.27	0-360	200	H
4	* 7.31	33.42	PK	35.6	-28.6	40.42	-	-	74	-33.58	0-360	100	V
1	1.811	32.99	PK	30.3	-23.4	39.89	-	-	-	-	0-360	100	H
2	2.049	32.82	PK	31.5	-23.1	41.22	-	-	-	-	0-360	100	H
5	8.698	29.53	PK	35.9	-27.5	37.93	-	-	-	-	0-360	100	H
6	9.748	33.32	PK	36.9	-25.7	44.52	-	-	-	-	0-360	200	V

PK - Peak detector

RADIATED EMISSIONS

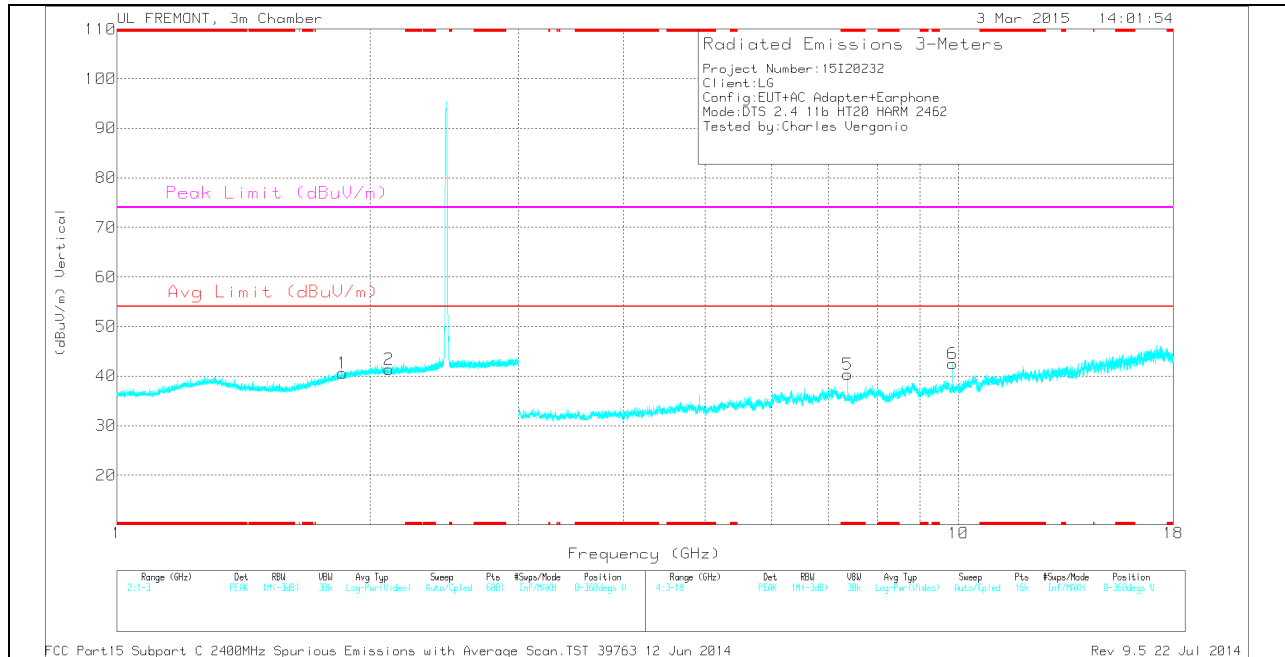
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.874	45.14	PK2	34	-30.1	49.04	-	-	74	-24.96	7	199	H
* 4.874	39.64	MAV1	34	-30.1	43.54	54	-10.46	-	-	7	199	H
* 7.312	43.61	PK2	35.6	-28.6	50.61	-	-	74	-23.39	124	205	V
* 7.31	35.68	MAV1	35.6	-28.6	42.68	54	-11.32	-	-	124	205	V
9.748	39.55	PK2	36.9	-25.7	50.75	-	-	-	-	304	160	V
9.748	32.31	MAV1	36.9	-25.7	43.51	-	-	-	-	304	160	V

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 4.924	36.46	PK	34	-30.4	40.06	-	-	74	-33.94	0-360	200	H
5	* 7.387	33	PK	35.6	-28.3	40.3	-	-	74	-33.7	0-360	200	V
1	1.854	33.22	PK	30.7	-23.3	40.62	-	-	-	-	0-360	200	V
2	2.104	32.86	PK	31.5	-23	41.36	-	-	-	-	0-360	100	V
4	6.118	30.63	PK	35.2	-29.1	36.73	-	-	-	-	0-360	100	H
6	9.848	31.49	PK	36.9	-25.9	42.49	-	-	-	-	0-360	100	V

PK - Peak detector

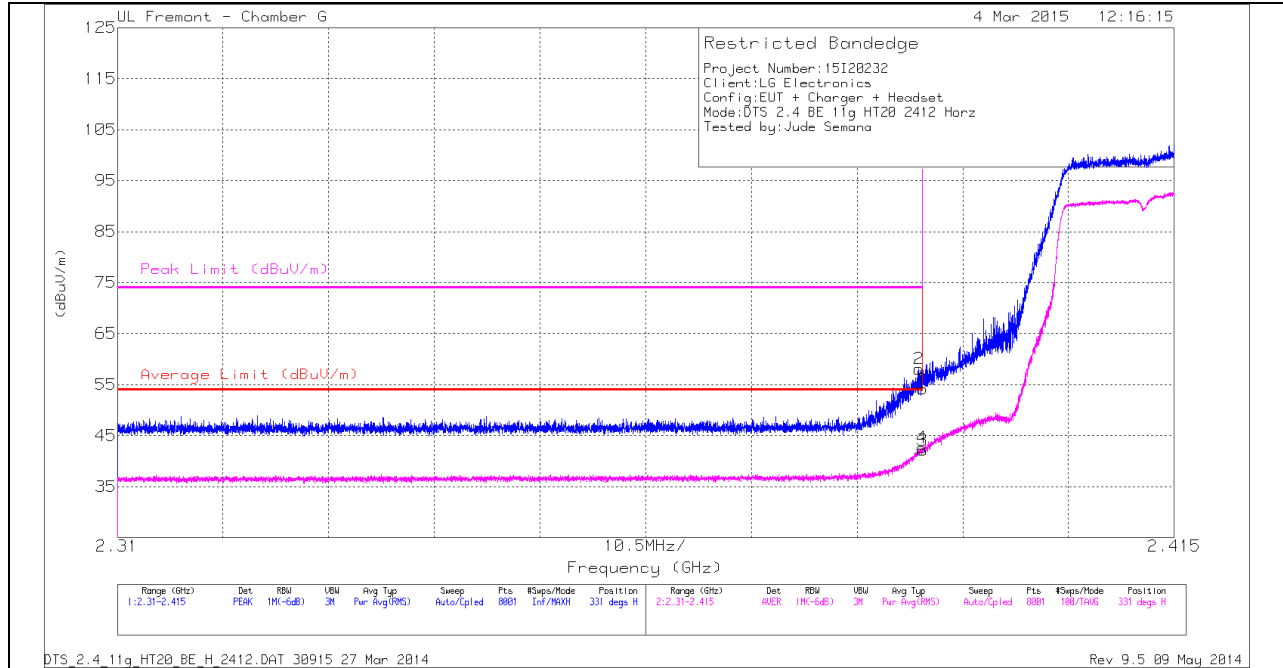
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.924	43.78	PK2	34	-30.4	47.38	-	-	74	-26.62	4	218	H
* 4.924	36.08	MAV1	34	-30.4	39.68	54	-14.32	-	-	4	218	H
* 7.386	42.14	PK2	35.6	-28.3	49.44	-	-	74	-24.56	132	177	V
* 7.387	32.79	MAV1	35.6	-28.3	40.09	54	-13.91	-	-	132	177	V
9.848	39.58	PK2	36.9	-25.9	50.58	-	-	-	-	118	142	V
9.848	31.97	MAV1	36.9	-25.9	42.97	-	-	-	-	118	142	V

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

RESTRICTED BANDEDGE (LOW CHANNEL)

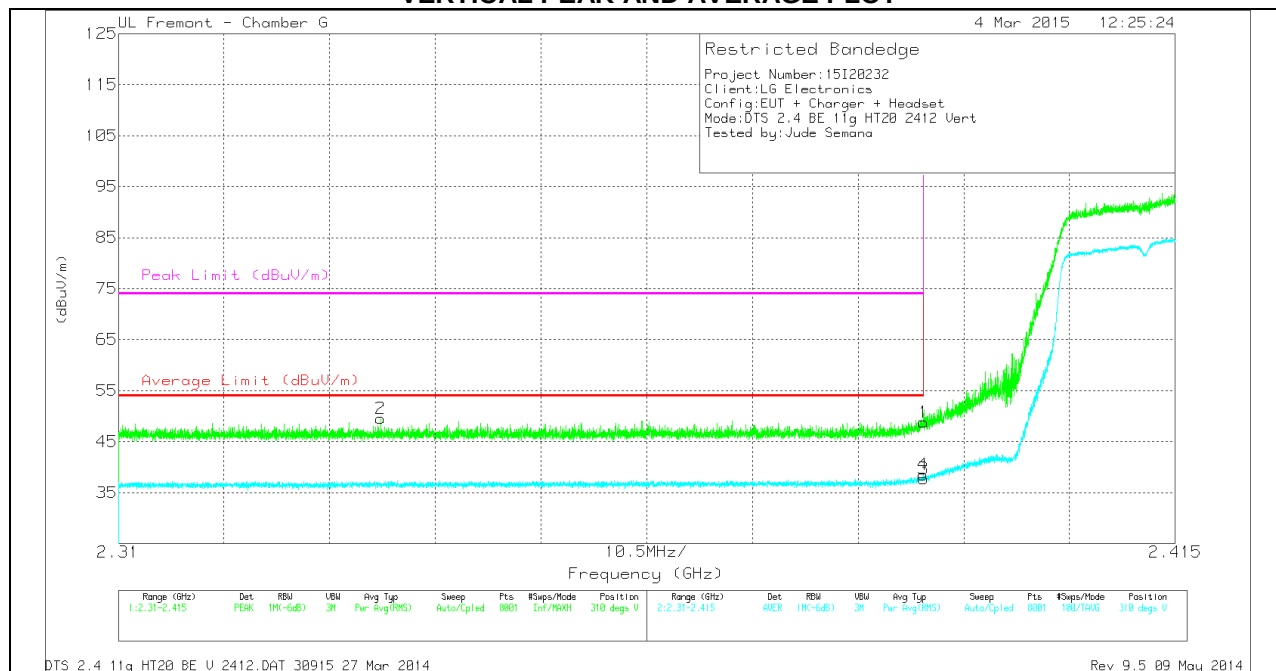
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	47.31	PK	31.8	-24.9	0	54.21	-	-	74	-19.79	331	262	H
2	* 2.39	51.17	PK	31.8	-24.9	0	58.07	-	-	74	-15.93	331	262	H
3	* 2.39	35.23	RMS	31.8	-24.9	0	42.13	54	-11.87	-	-	331	262	H
4	* 2.39	35.7	RMS	31.8	-24.9	0	42.6	54	-11.4	-	-	331	262	H

VERTICAL PEAK AND AVERAGE PLOT

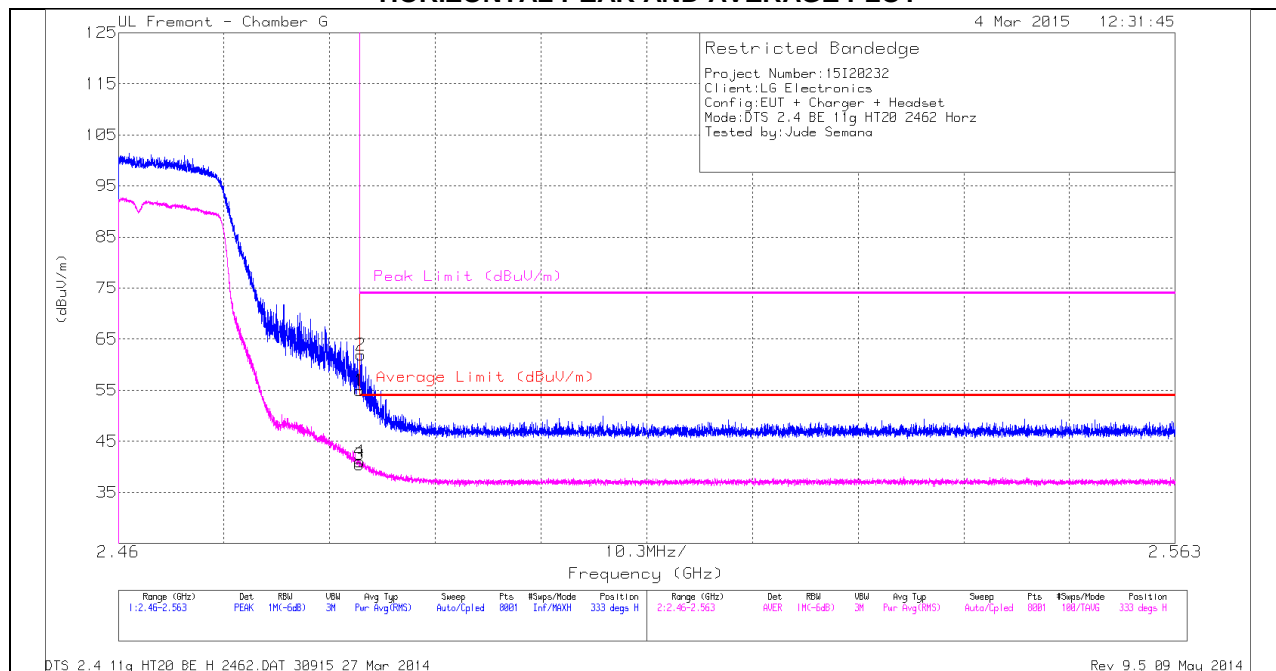


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.336	42.84	PK	31.7	-25	0	49.54	-	-	74	-24.46	310	258	V
1	* 2.39	41.9	PK	31.8	-24.9	0	48.8	-	-	74	-25.2	310	258	V
3	* 2.39	30.83	RMS	31.8	-24.9	0	37.73	54	-16.27	-	-	310	258	V
4	* 2.39	31.62	RMS	31.8	-24.9	0	38.52	54	-15.48	-	-	310	258	V

AUTHORIZED BANDEDGE (HIGH CHANNEL)

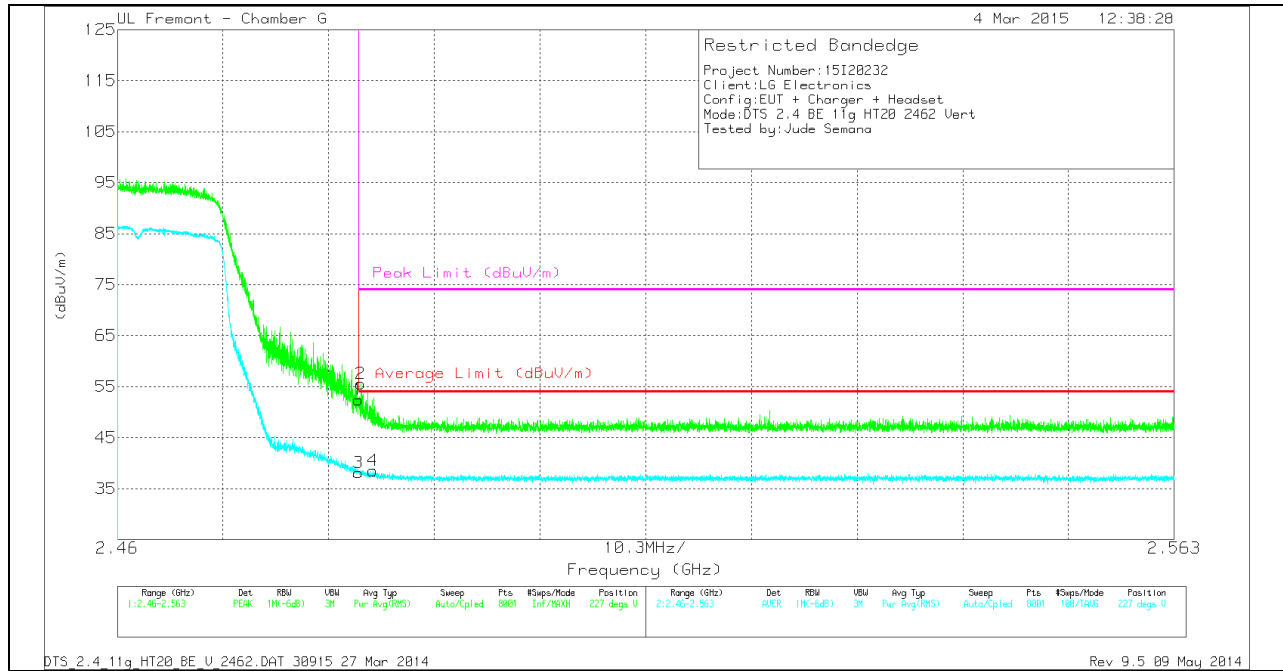
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	47.84	PK	32	-24.9	0	54.94	-	-	74	-19.06	333	212	H
2	* 2.484	54.79	PK	32	-24.9	0	61.89	-	-	74	-12.11	333	212	H
3	* 2.484	33.36	RMS	32	-24.9	0	40.46	54	-13.54	-	-	333	212	H
4	* 2.484	33.98	RMS	32	-24.9	0	41.08	54	-12.92	-	-	333	212	H

VERTICAL PEAK AND AVERAGE PLOT

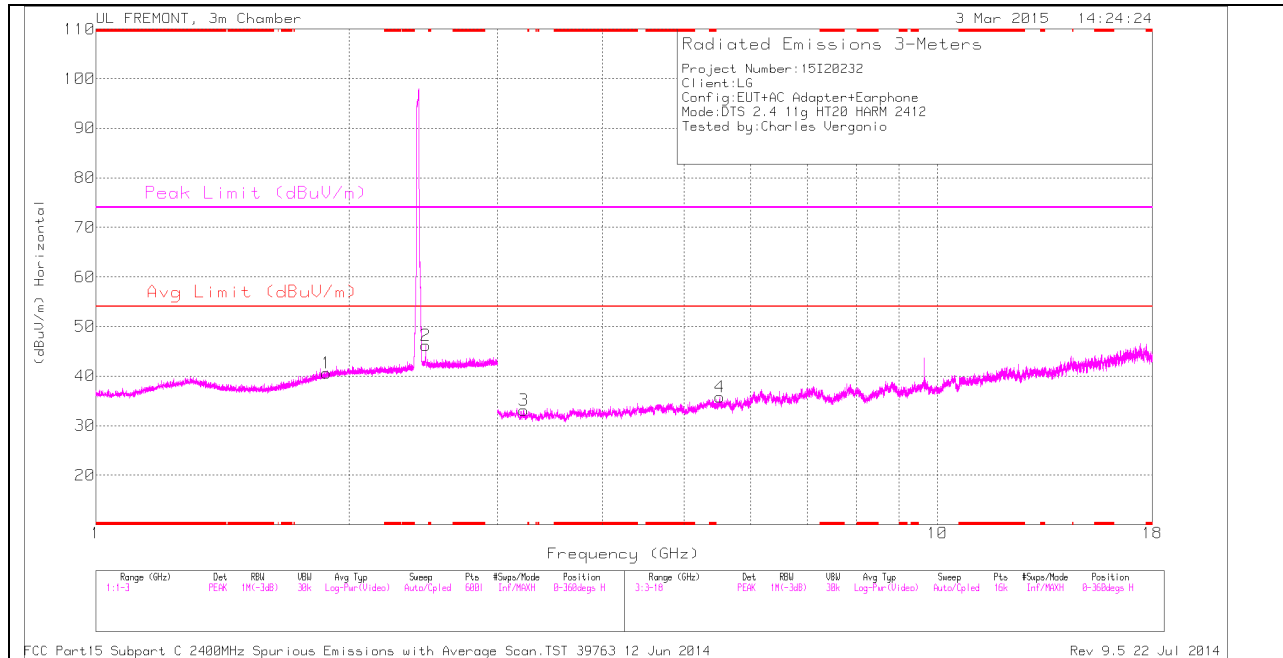


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	45.33	PK	32	-24.9	0	52.43	-	-	74	-21.57	227	218	V
2	* 2.484	48.47	PK	32	-24.9	0	55.57	-	-	74	-18.43	227	218	V
3	* 2.484	31.03	RMS	32	-24.9	0	38.13	54	-15.87	-	-	227	218	V
4	* 2.485	31.45	RMS	32	-24.9	0	38.55	54	-15.45	-	-	227	218	V

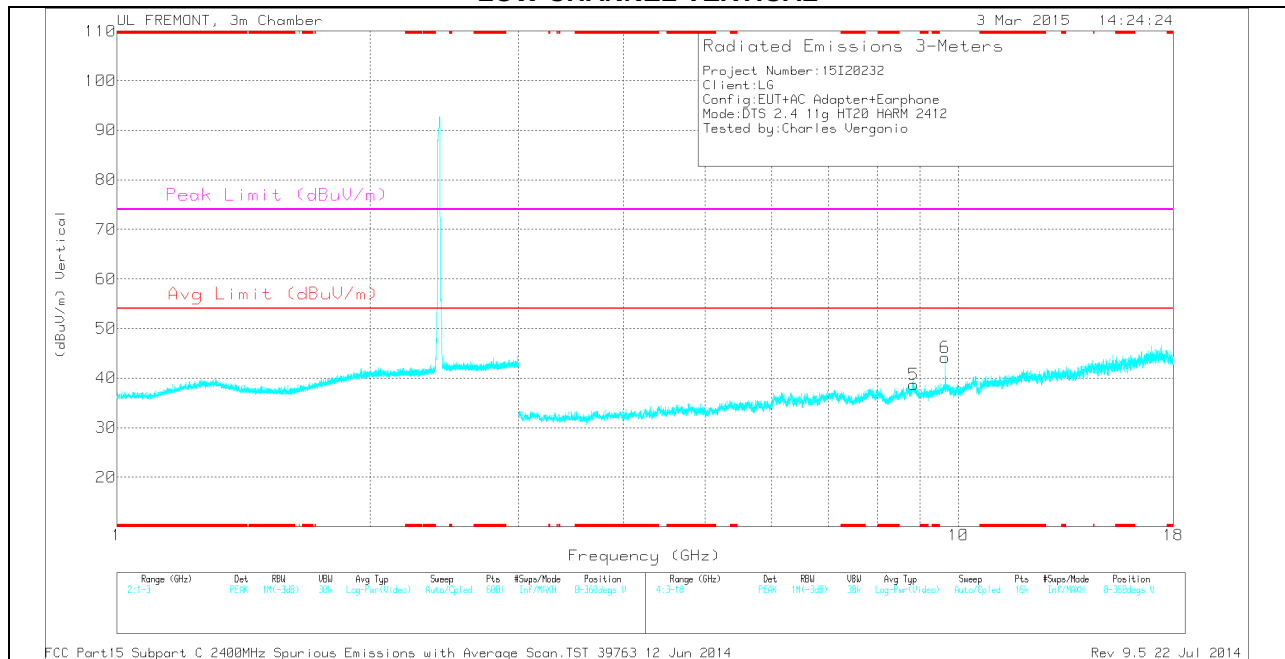
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

TRACE MARKERS

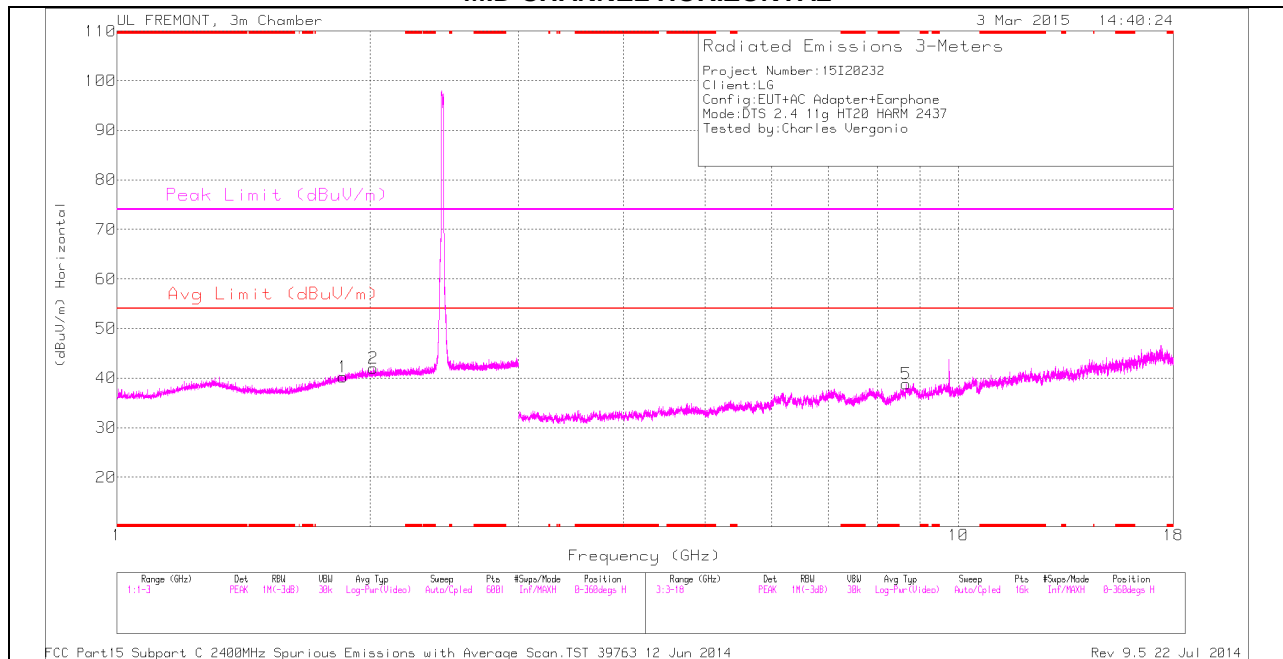
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.881	32.94	PK	30.9	-23.2	0	40.64	-	-	-	-	0-360	100	H
2	2.464	36.86	PK	32.2	-22.9	0	46.16	-	-	-	-	0-360	100	H
3	3.222	31.96	PK	32.6	-31.4	0	33.16	-	-	-	-	0-360	200	H
4	5.51	31.78	PK	34.6	-30.6	0	35.78	-	-	-	-	0-360	200	H
5	8.839	29.43	PK	35.9	-26.6	0	38.73	-	-	-	-	0-360	200	V
6	9.647	32.96	PK	36.8	-25.6	0	44.16	-	-	-	-	0-360	200	V

PK - Peak detector

RADIATED EMISSIONS

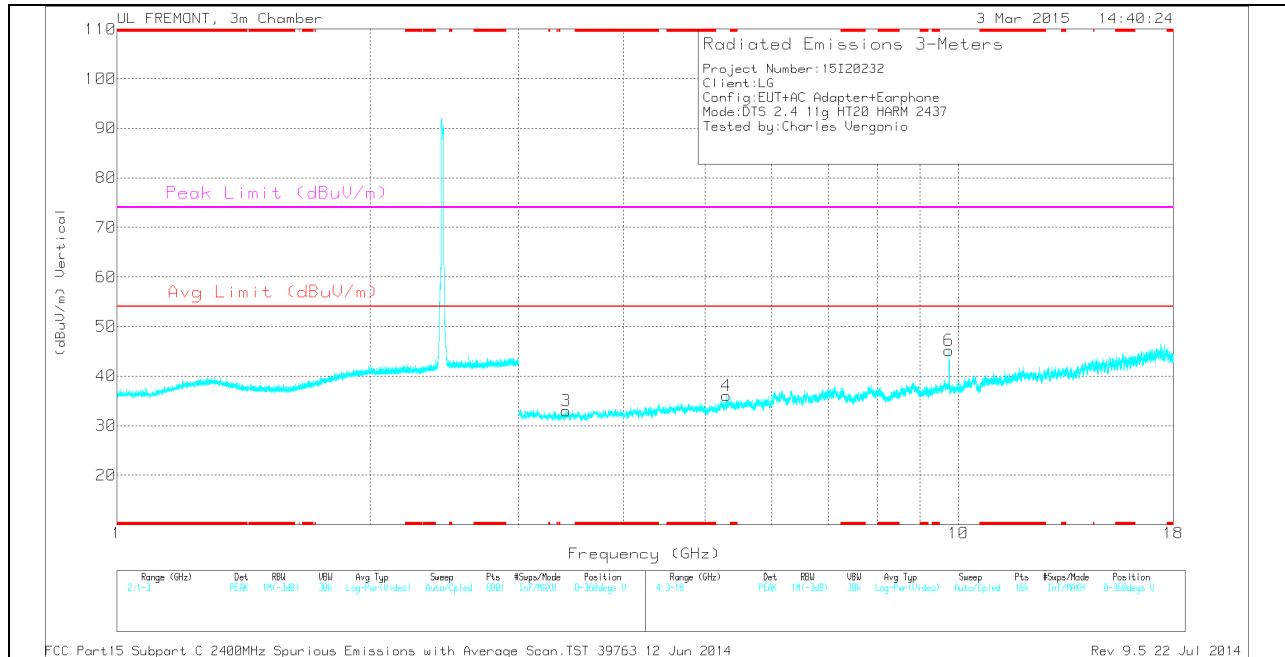
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.464	35.91	MAV1	32.2	-22.9	.21	45.42	-	-	-	-	233	100	H
2.465	46.79	PK2	32.2	-22.9	0	56.09	-	-	-	-	233	100	H
9.648	38.59	PK2	36.8	-25.6	0	49.79	-	-	-	-	233	284	V
9.648	30.5	MAV1	36.8	-25.6	.21	41.91	-	-	-	-	233	284	V

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

TRACE MARKERS

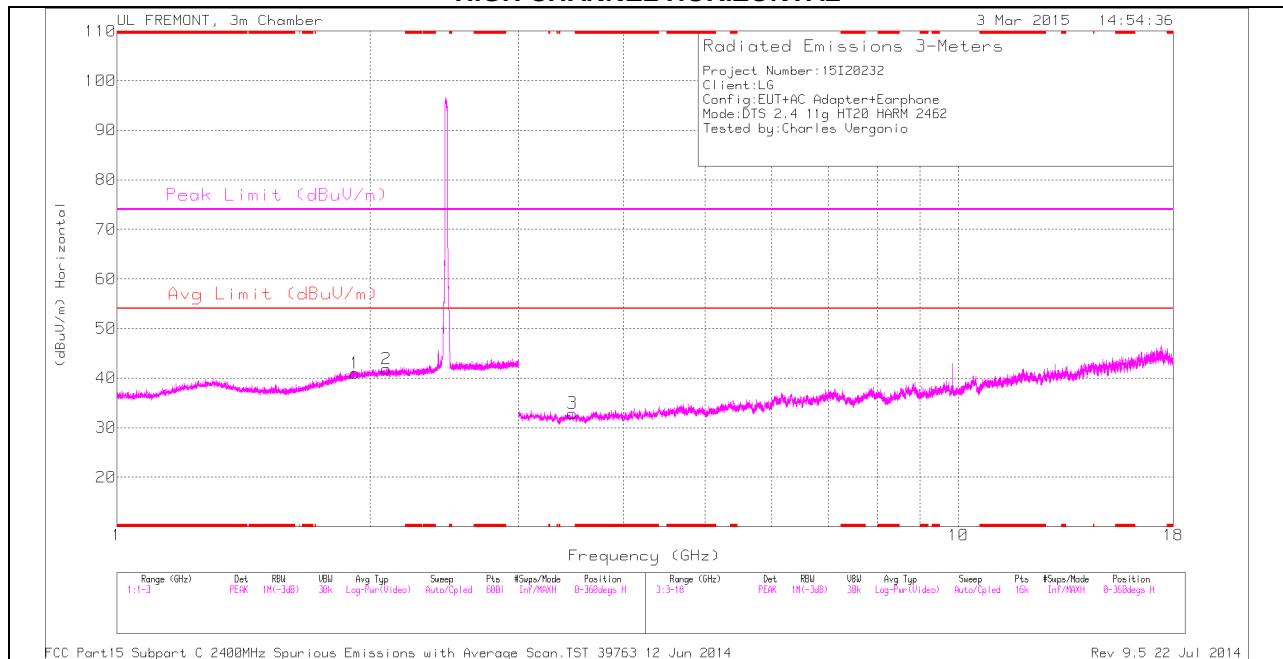
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.858	32.85	PK	30.7	-23.3	0	40.25	-	-	-	-	0-360	100	H
2	2.016	33.7	PK	31.5	-23.2	0	42	-	-	-	-	0-360	100	H
3	3.42	31.89	PK	32.7	-31.6	0	32.99	-	-	-	-	0-360	200	V
4	5.301	31.58	PK	34.4	-30	0	35.98	-	-	-	-	0-360	200	V
5	8.665	29.89	PK	35.9	-27	0	38.79	-	-	-	-	0-360	100	H
6	9.748	33.92	PK	36.9	-25.7	0	45.12	-	-	-	-	0-360	100	V

PK - Peak detector

RADIATED EMISSIONS

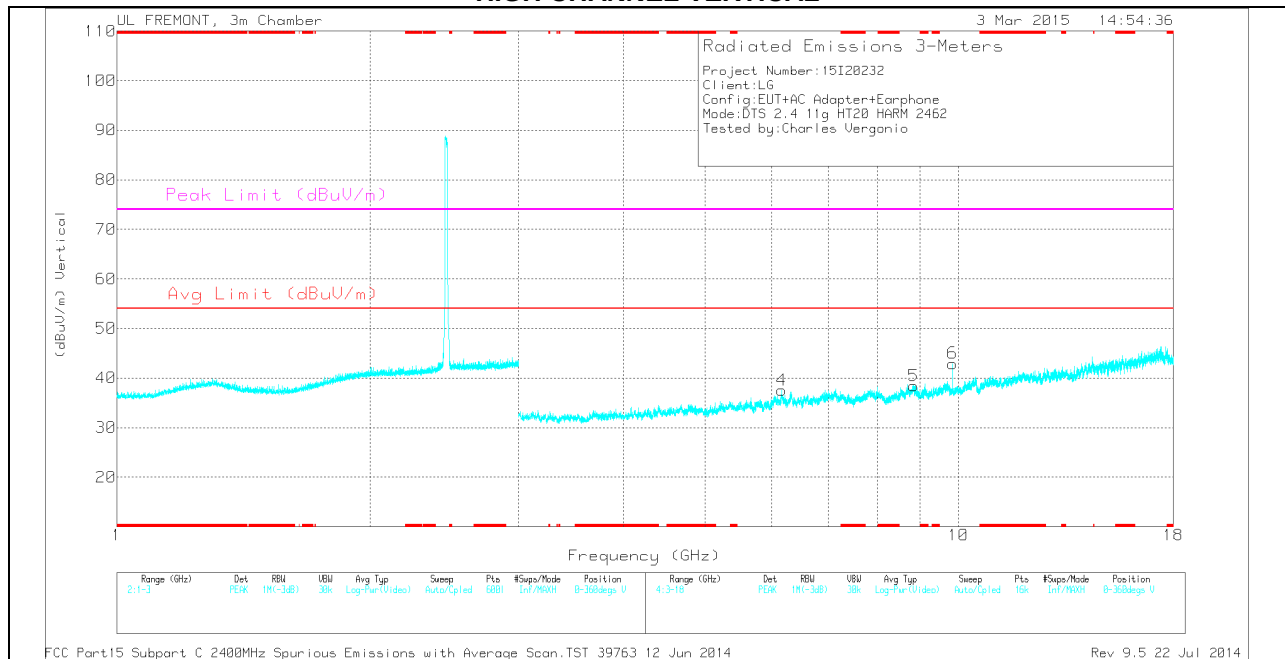
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.748	39.95	PK2	36.9	-25.7	0	51.15	-	-	-	-	304	179	V
9.748	32.66	MAV1	36.9	-25.7	.21	44.07	-	-	-	-	304	179	V

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.918	33.09	PK	31.2	-23.3	0	40.99	-	-	-	-	0-360	200	H
2	2.09	33.51	PK	31.5	-23.1	0	41.91	-	-	-	-	0-360	100	H
3	3.479	31.22	PK	32.8	-31.1	0	32.92	-	-	-	-	0-360	100	H
4	6.168	31.9	PK	35.3	-29.7	0	37.5	-	-	-	-	0-360	100	V
5	8.848	29.15	PK	35.9	-26.6	0	38.45	-	-	-	-	0-360	200	V
6	9.848	31.95	PK	36.9	-25.9	0	42.95	-	-	-	-	0-360	100	V

PK - Peak detector

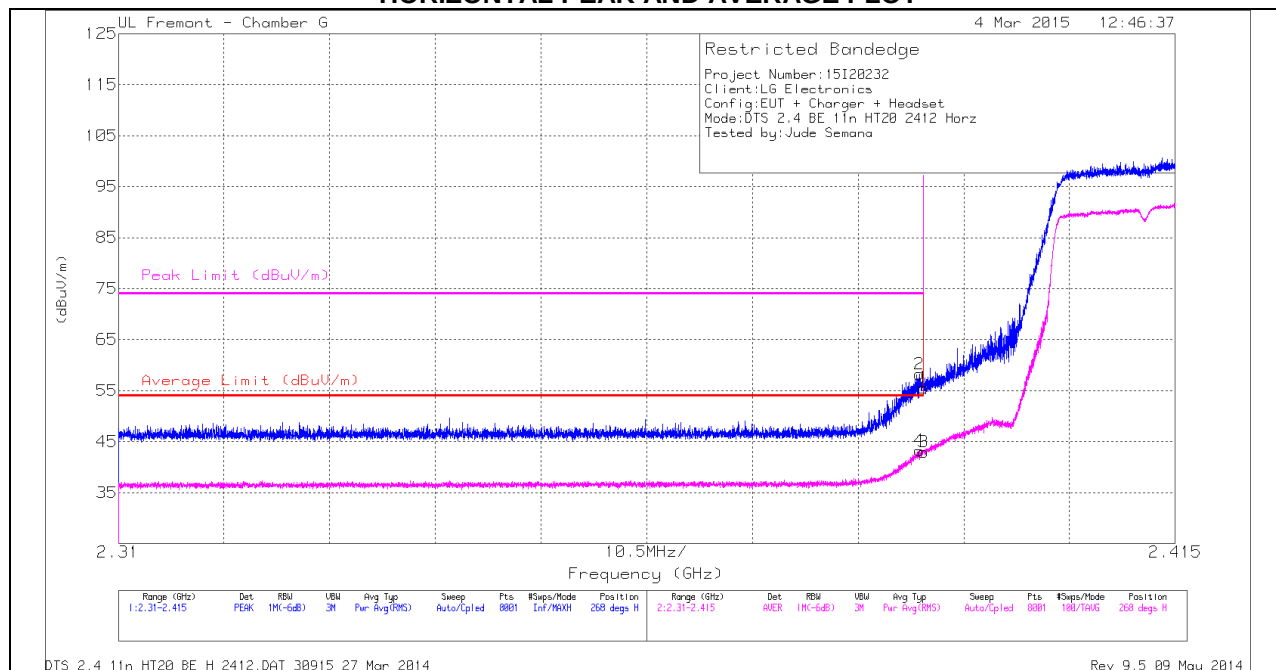
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.848	39.82	PK2	36.9	-25.9	0	50.82	-	-	-	-	120	143	V
9.848	31.97	MAV1	36.9	-25.9	0	42.97	-	-	-	-	120	143	V

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

RESTRICTED BANDEDGE (LOW CHANNEL)

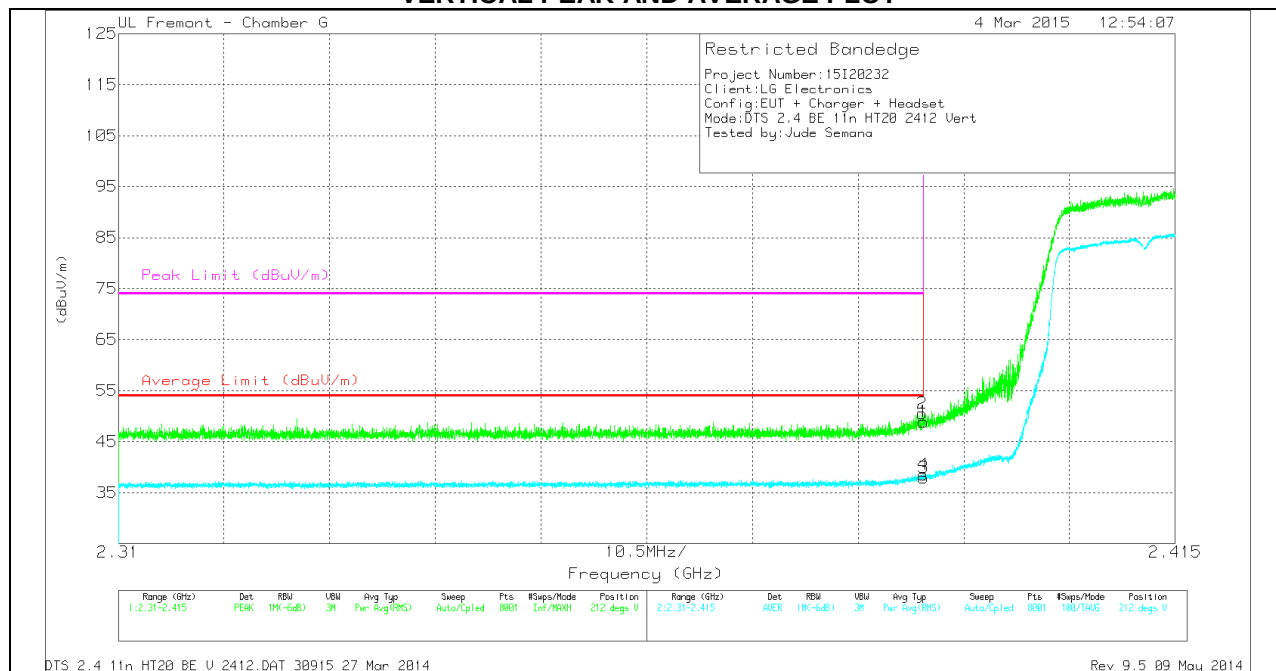
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	48.66	PK	31.8	-24.9	0	55.56	-	-	74	-18.44	268	216	H
2	* 2.39	51.36	PK	31.8	-24.9	0	58.26	-	-	74	-15.74	268	216	H
3	* 2.39	36.09	RMS	31.8	-24.9	0	42.99	54	-11.01	-	-	268	216	H
4	* 2.39	36.33	RMS	31.8	-24.9	0	43.23	54	-10.77	-	-	268	216	H

VERTICAL PEAK AND AVERAGE PLOT

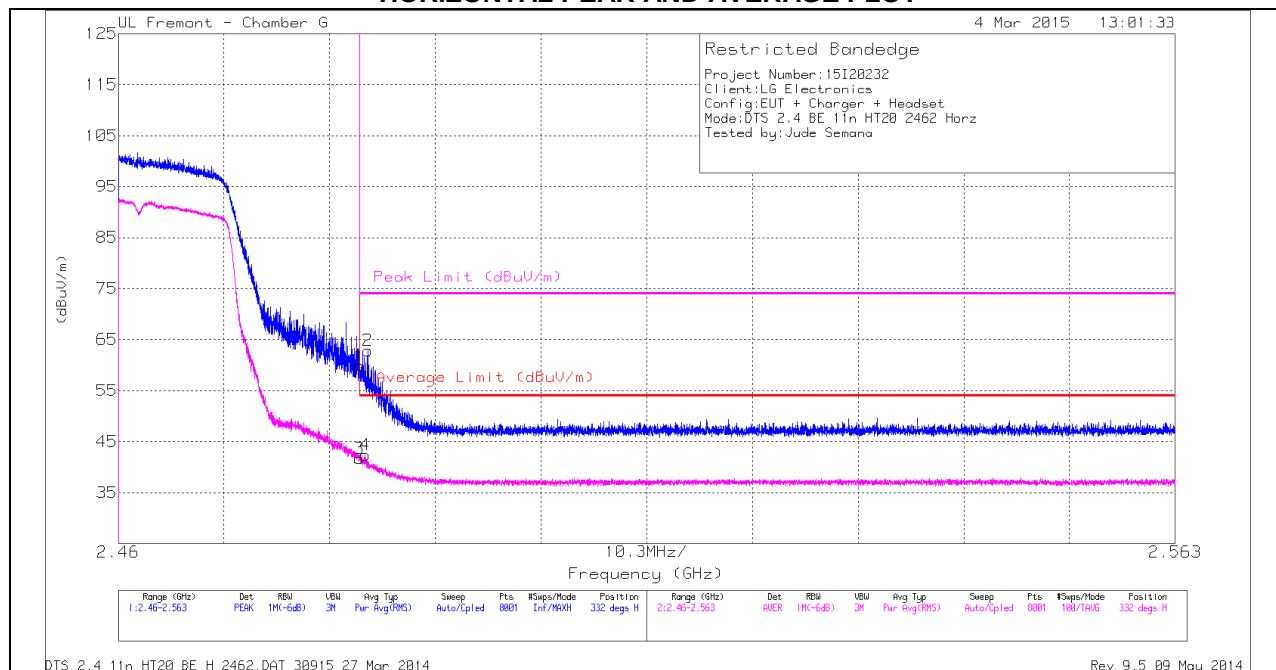


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.98	PK	31.8	-24.9	0	48.88	-	-	74	-25.12	212	228	V
2	* 2.39	43.63	PK	31.8	-24.9	0	50.53	-	-	74	-23.47	212	228	V
3	* 2.39	31.07	RMS	31.8	-24.9	0	37.97	54	-16.03	-	-	212	228	V
4	* 2.39	31.65	RMS	31.8	-24.9	0	38.55	54	-15.45	-	-	212	228	V

AUTHORIZED BANDEDGE (HIGH CHANNEL)

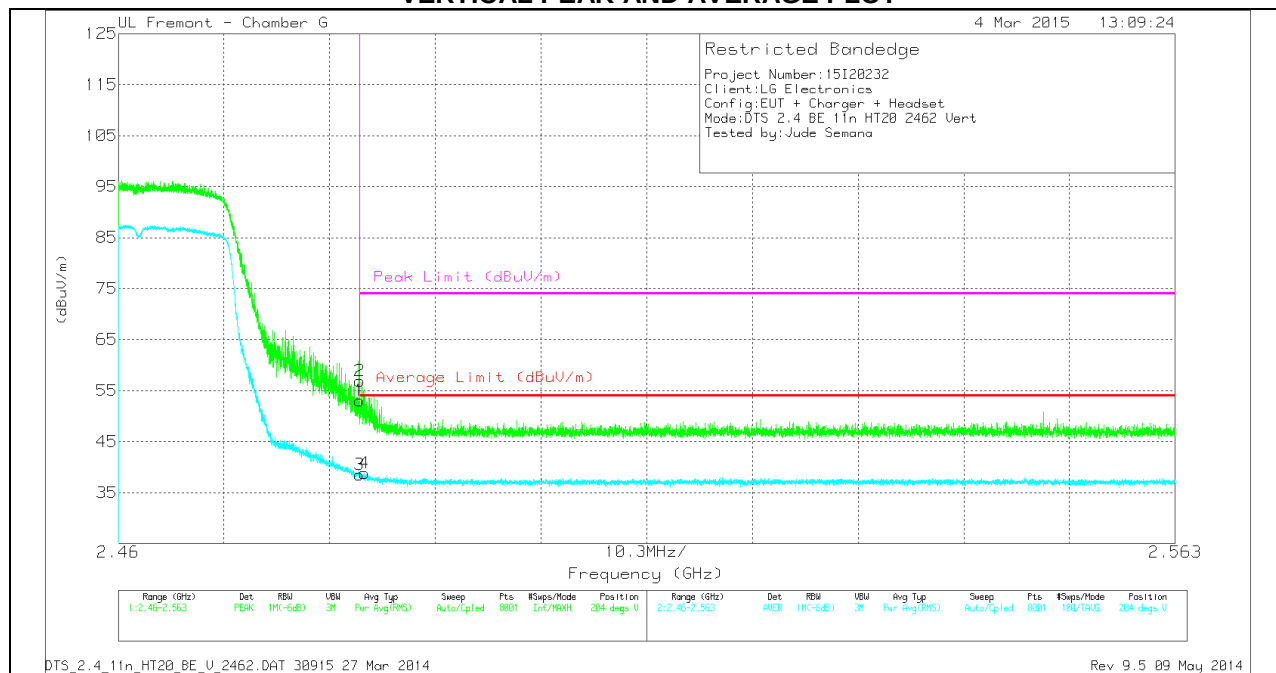
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/Filt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	52.87	PK	32	-24.9	0	59.97	-	-	74	-14.03	332	255	H
2	* 2.484	55.78	PK	32	-24.9	0	62.88	-	-	74	-11.12	332	255	H
3	* 2.484	34.6	RMS	32	-24.9	0	41.7	54	-12.3	-	-	332	255	H
4	* 2.484	35.29	RMS	32	-24.9	0	42.39	54	-11.61	-	-	332	255	H

VERTICAL PEAK AND AVERAGE PLOT

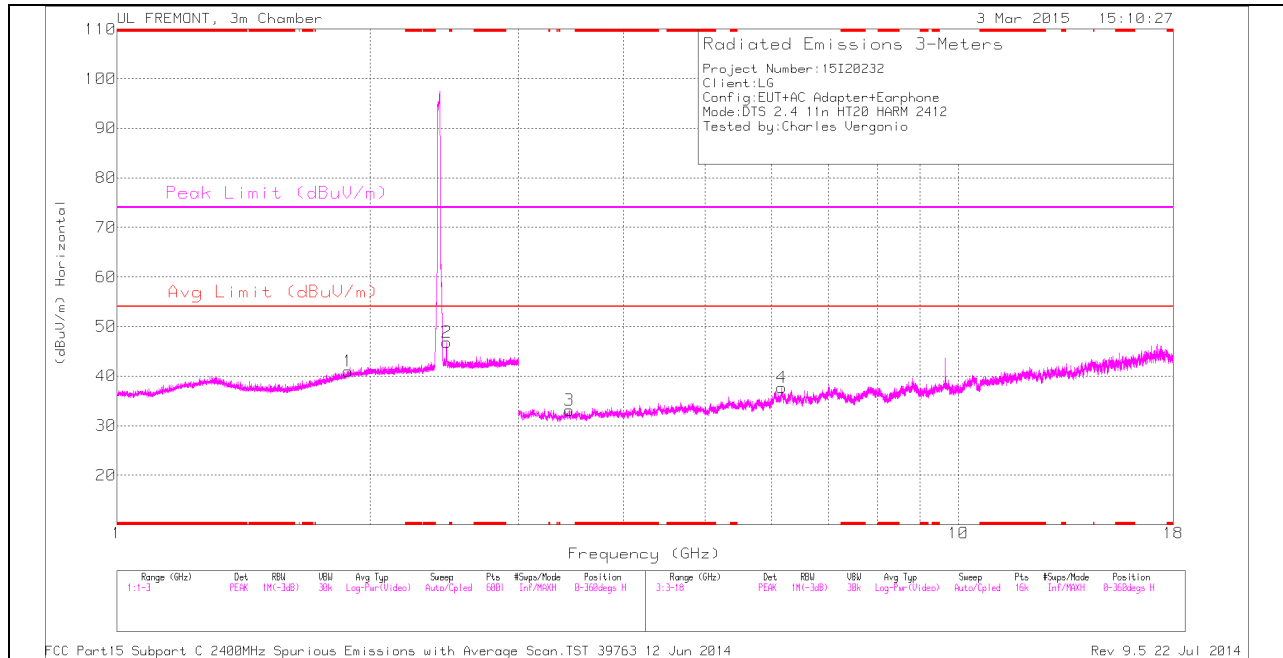


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	45.95	PK	32	-24.9	0	53.05	-	-	74	-20.95	204	261	V
2	* 2.484	49.8	PK	32	-24.9	0	56.9	-	-	74	-17.1	204	261	V
3	* 2.484	31.46	RMS	32	-24.9	0	38.56	54	-15.44	-	-	204	261	V
4	* 2.484	31.71	RMS	32	-24.9	0	38.81	54	-15.19	-	-	204	261	V

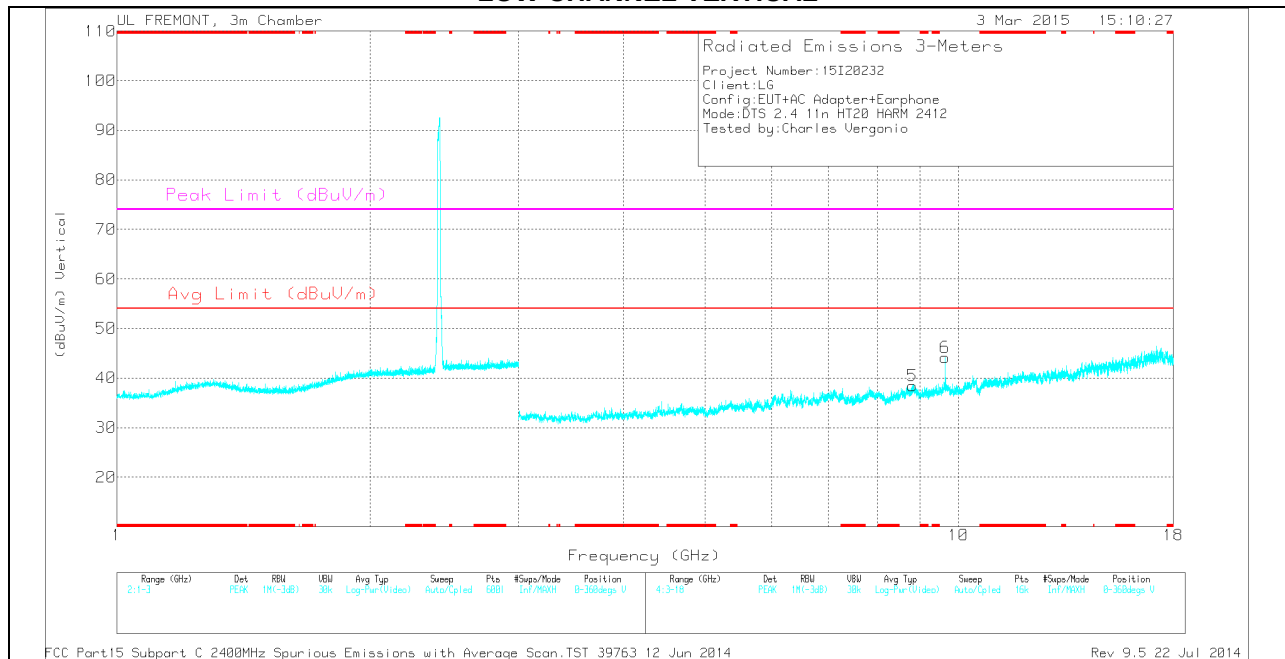
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

TRACE MARKERS

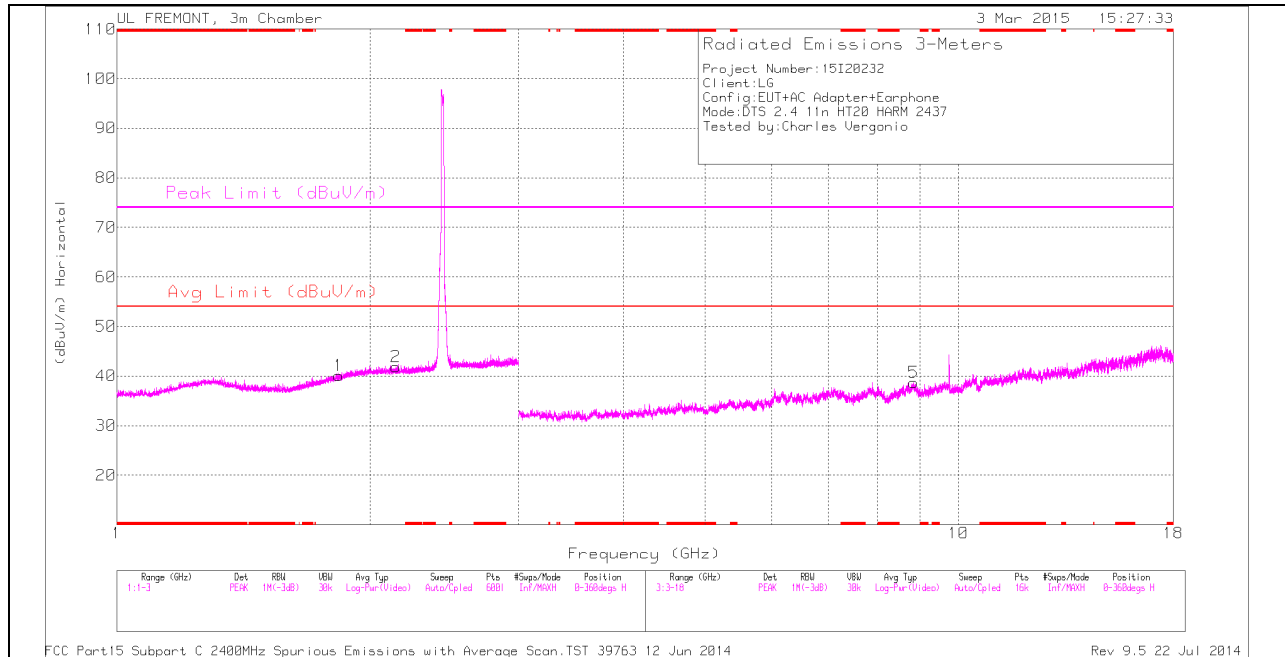
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.883	33.25	PK	31	-23.3	0	40.95	-	-	-	-	0-360	100	H
2	2.464	37.53	PK	32.2	-22.9	0	46.83	-	-	-	-	0-360	200	H
3	3.447	31.75	PK	32.7	-31.3	0	33.15	-	-	-	-	0-360	100	H
4	6.166	32.14	PK	35.3	-29.8	0	37.64	-	-	-	-	0-360	100	H
5	8.82	29.19	PK	35.9	-26.6	0	38.49	-	-	-	-	0-360	200	V
6	9.647	32.95	PK	36.8	-25.6	0	44.15	-	-	-	-	0-360	100	V

PK - Peak detector

RADIATED EMISSIONS

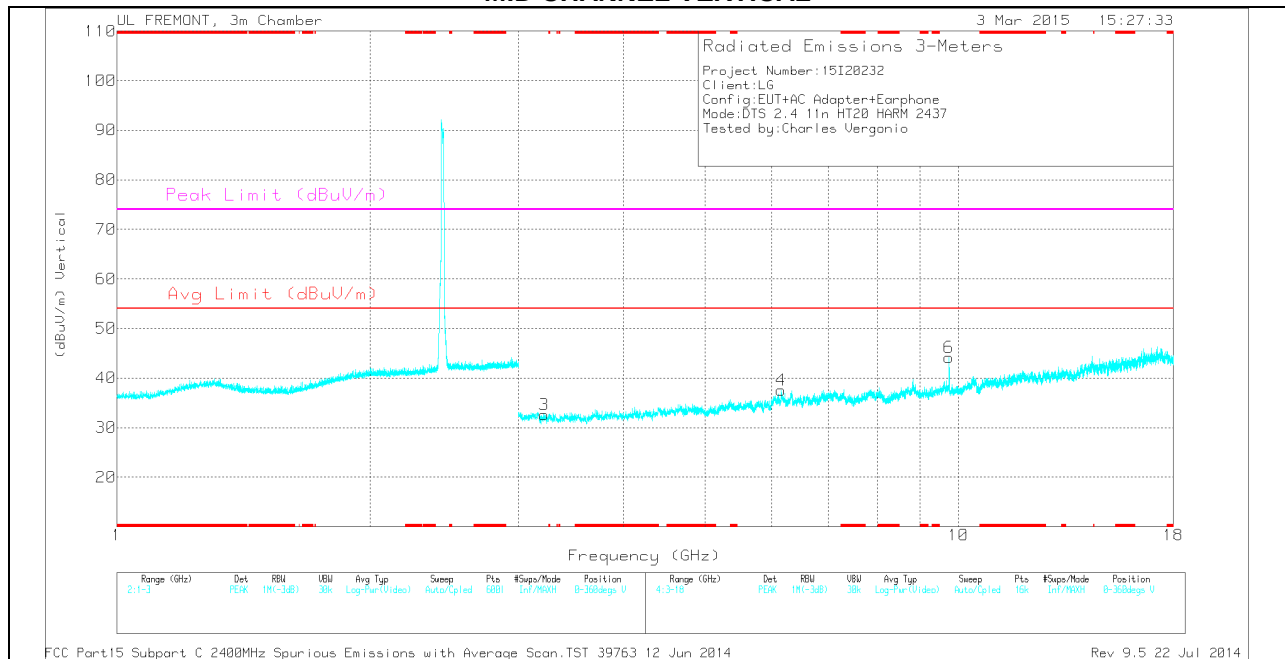
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.464	44.67	PK2	32.2	-22.9	0	53.97	-	-	-	-	0	343	H
2.464	33.56	MAV1	32.2	-22.9	0	42.86	-	-	-	-	0	343	H
9.648	39.53	PK2	36.8	-25.6	0	50.73	-	-	-	-	311	170	V
9.648	32.41	MAV1	36.8	-25.6	0	43.61	-	-	-	-	311	170	V

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

TRACE MARKERS

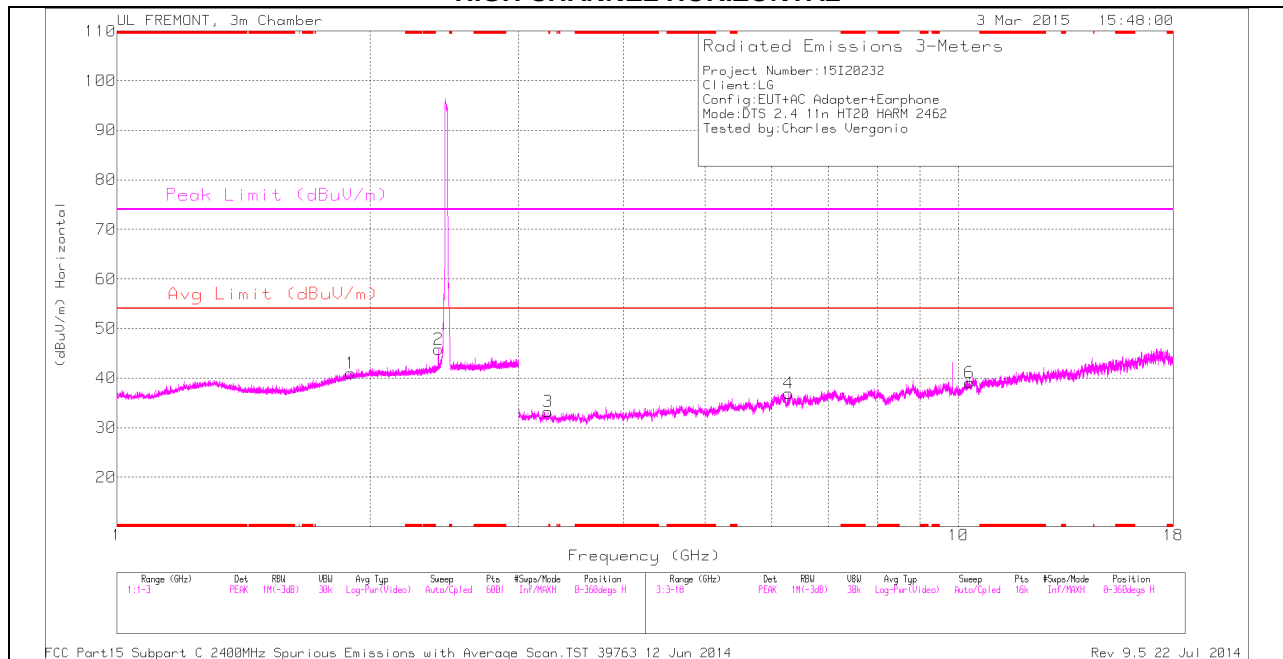
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.835	32.92	PK	30.5	-23.3	0	40.12	-	-	-	-	0-360	200	H
2	2.144	33.37	PK	31.5	-23	0	41.87	-	-	-	-	0-360	200	H
3	3.22	31.45	PK	32.6	-31.4	0	32.65	-	-	-	-	0-360	200	V
4	6.156	31.99	PK	35.3	-29.7	0	37.59	-	-	-	-	0-360	100	V
5	8.849	29.35	PK	35.9	-26.6	0	38.65	-	-	-	-	0-360	100	H
6	9.748	32.98	PK	36.9	-25.7	0	44.18	-	-	-	-	0-360	100	V

PK - Peak detector

RADIATED EMISSIONS

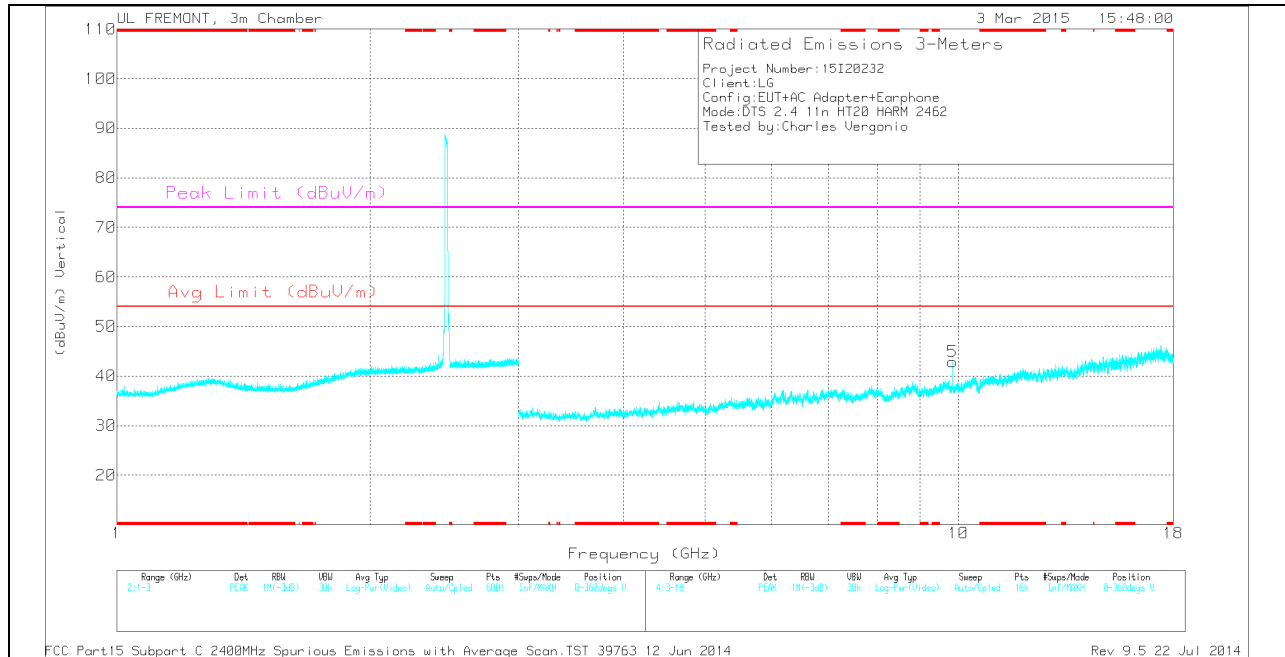
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.748	40.33	PK2	36.9	-25.7	0	51.53	-	-	-	-	306	100	V
9.748	32.14	MAV1	36.9	-25.7	.22	43.56	-	-	-	-	306	100	V

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.894	33.17	PK	31.1	-23.3	0	40.97	-	-	-	-	0-360	100	H
2	2.41	36.77	PK	32.1	-23.1	0	45.77	-	-	-	-	0-360	100	H
3	3.251	32.24	PK	32.6	-31.6	0	33.24	-	-	-	-	0-360	100	H
4	6.285	31.65	PK	35.4	-30.1	0	36.95	-	-	-	-	0-360	100	H
5	9.848	31.92	PK	36.9	-25.9	0	42.92	-	-	-	-	0-360	100	V
6	10.316	27.67	PK	37.1	-25.7	0	39.07	-	-	-	-	0-360	100	H

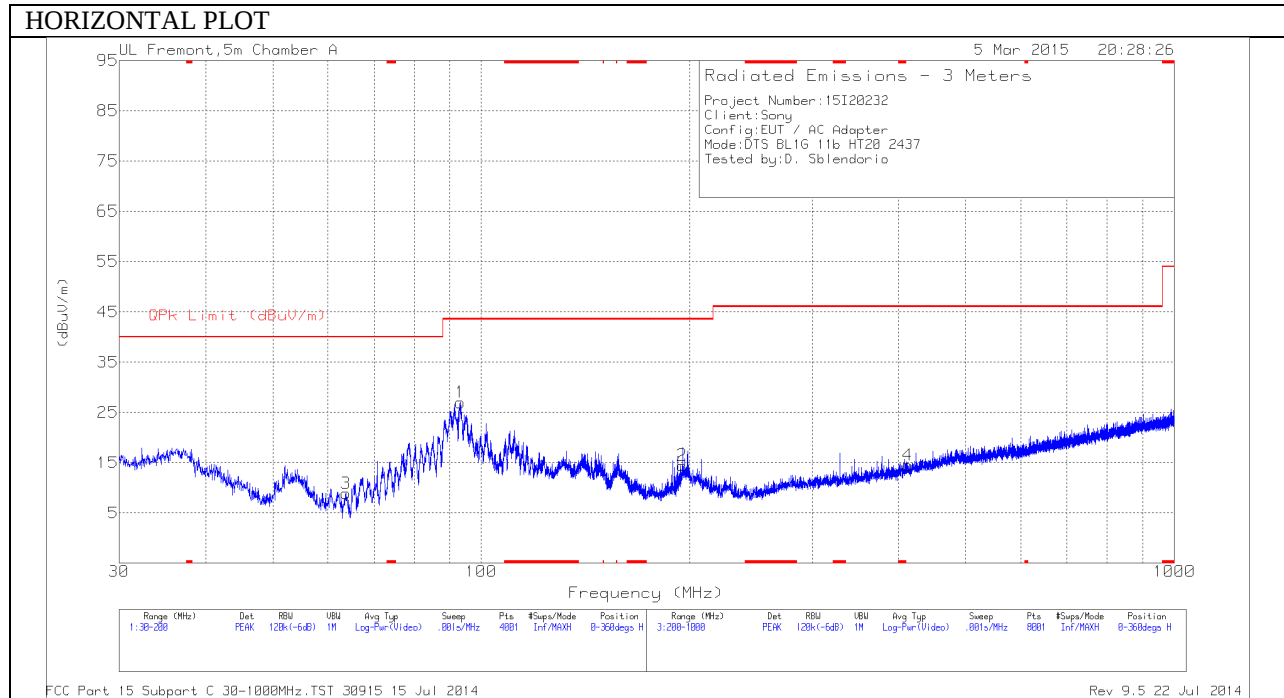
PK - Peak detector

RADIATED EMISSIONS

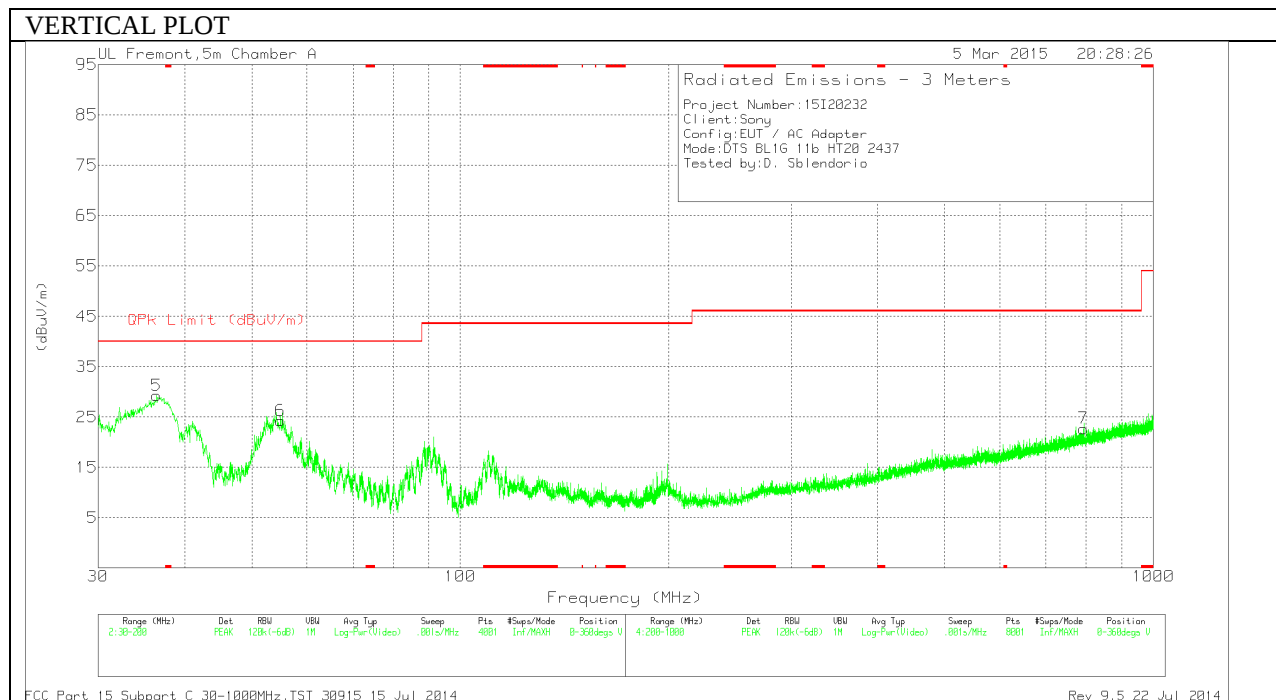
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.848	39.46	PK2	36.9	-25.9	0	50.46	-	-	-	-	122	149	V
9.848	31.43	MAV1	36.9	-25.9	0	42.43	-	-	-	-	122	149	V

10.3. TRANSMITTER BELOW 1 GHz

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



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



Below 1G Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	36.46	43.77	PK	16.7	-31.2	29.27	40	-10.73	0-360	101	V
6	54.9475	48.26	PK	7	-31	24.26	40	-15.74	0-360	101	V
3	63.745	31.88	PK	7.9	-30.9	8.88	40	-31.12	0-360	400	H
1	93.24	49.28	PK	8.3	-30.6	26.98	43.52	-16.54	0-360	200	H
2	194.9425	32.44	PK	12	-30	14.44	43.52	-29.08	0-360	100	H
4	412.6	27.88	PK	15.7	-29.1	14.48	46.02	-31.54	0-360	300	H
7	793	29.61	PK	21.2	-28.1	22.71	46.02	-23.31	0-360	101	V

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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 2009.

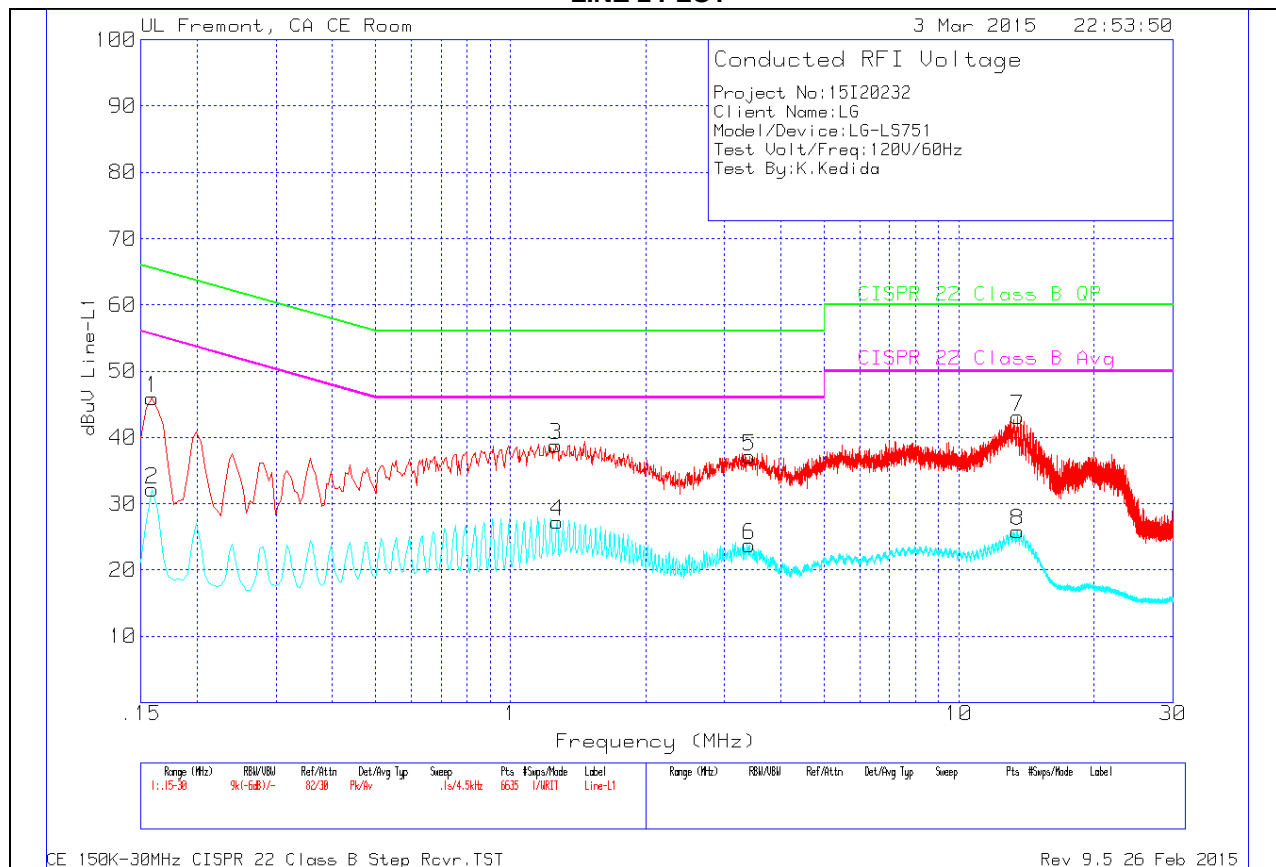
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT

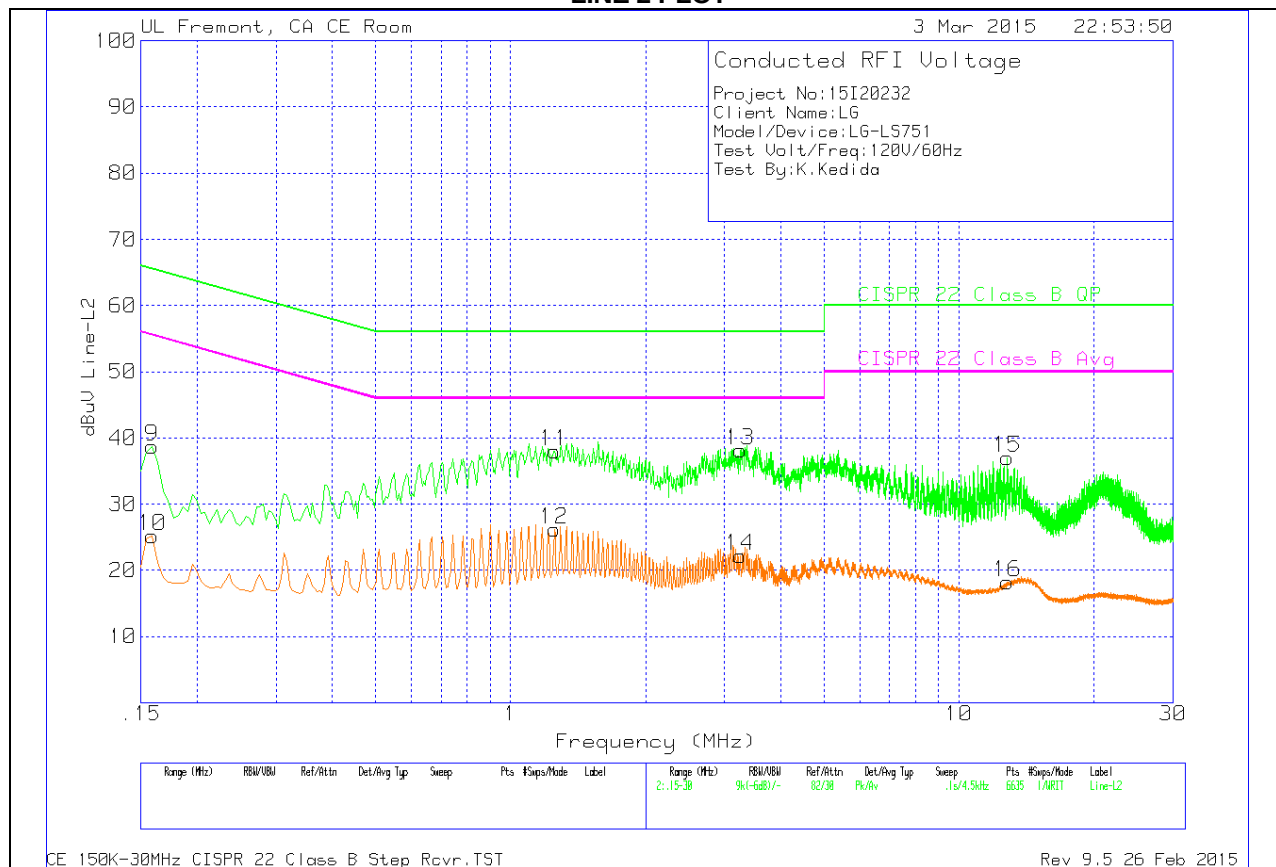


LINE 1 RESULTS

Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	QP Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
1	.159	44.6	Pk	1.3	0	45.9	-	-	-	-
2	.159	30.89	Av	1.3	0	32.19	-	-	55.52	-23.33
3	1.2615	38.5	Pk	.2	.1	38.8	-	-	-	-
4	1.2705	26.97	Av	.2	.1	27.27	-	-	46	-18.73
5	3.408	36.82	Pk	.2	.1	37.12	-	-	-	-
6	3.408	23.44	Av	.2	.1	23.74	-	-	46	-22.26
7	13.506	42.75	Pk	.2	.2	43.15	-	-	-	-
8	13.5105	25.46	Av	.2	.2	25.86	-	-	50	-24.14

LINE 2 PLOT



LINE 2 RESULTS

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CISPR 22 Class B QP	QP Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
9	.159	37.3	Pk	1.4	0	38.7	-	-	-	-
10	.159	23.81	Av	1.4	0	25.21	-	-	55.52	-30.31
11	1.2525	37.83	Pk	.2	0	38.03	-	-	-	-
12	1.2525	25.97	Av	.2	0	26.17	-	-	46	-19.83
13	3.255	37.83	Pk	.2	.1	38.13	-	-	-	-
14	3.2505	21.87	Av	.2	.1	22.17	-	-	46	-23.83
15	12.813	36.58	Pk	.2	.2	36.98	-	-	-	-
16	12.8085	17.82	Av	.2	.2	18.22	-	-	50	-31.78

12. APPENDIX A GEO-LOCATION VALIDATION DATA

The following data is provided for information and is outside the scope of UL's accreditation. The testing was performed by LG to show that the geo-location mechanism correctly enabled or disabled channels 12 and 13 based on the country code sent by the base station simulator.

Wi-Fi Channel setting operation description

Network mode	LG Description	Test Result
No country code received	The device only operates with the default country code(12/13 channels disable)	Please refer to page 2,3
Invalid country code received	The device can't get invalid country code. If the network is connected, the country code is set in US(12/13 channels disable). Otherwise, if the network is not connected, the device operates with the default country code (12/13 channels disable)	
US country code	If the network is connected, the country code is set in US(12/13 channels disable). Otherwise, if the network is not connected, the device operates with the default country code (12/13 channels disable)	
US territories country code (Guam, Puerto Rico)	If the network is connected, the country code is set in US(12/13 channels disable). Otherwise, if the network is not connected, the device operates with the default country code (12/13 channels disable)	
Non-US country code	If the network is connected, the country code is set according to the network service. Otherwise, if the network is not connected, the device operates with the default country code (12/13 channels disable)	
Airplane mode	The device only operates with the default country code(12/13 channels disable)	
On loss of non-US country code (drop the link and verify device returns to default state)	The device only operates with the default country code(12/13 channels disable)	

* Default country code : the default setting of this device does not support WiFi 2.4GHz Channel 12&13.

Wi-Fi Channel setting operation description

◆ How to test?

1. AP Set to 12 or 13 channel
2. Settings -> Wi-Fi -> Wi-Fi On
3. A device could not search the AP

Ex)



Ex)

SSID : "P2KS_2G_DLINK"

Channel : 13

- If a device disabled to 12/13 channel , could not search it.



- If a device enable to 12/13 channel, could search it.



Wi-Fi Channel setting operation description

◆ How to test?

1. Intall "Wifi Analyzer" from PlayStore
2. Settings -> Wi-Fi -> Wi-Fi On
3. Lunch "Wifi Analyzer"

- If a device disabled to 12/13 channel , could not search it 12/13 Channels APs.

- If a device enable to 12/13 channel, could search 12/13 Channels APs.

