



**FCC CFR47 PART 15 SUBPART C**

**C2PC CERTIFICATION TEST REPORT**

**FOR**

**GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS b/g/n**

**MODEL NUMBER: LG-H345, LGH345, H345**

**FCC ID: ZNFH345**

**REPORT NUMBER: 15I20243-E2**

**ISSUE DATE: MARCH 24, 2015**

*Prepared for*

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**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Date	Revisions	Revised By
--	03/24/15	Initial Issue	D. Corona

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** LG ELECTRONICS MOBILECOMM U.S.A., INC  
**EUT DESCRIPTION:** GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS b/g/n  
**MODEL:** LG-H345, LGH345, H345  
**SERIAL NUMBER:** 501KPLC818448 (conducted) 501KPED818500 (radiated)  
**DATE TESTED:** MARCH 11 & 24, 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.

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## 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
<input type="checkbox"/> Chamber A(IC: 2324B-1)	<input type="checkbox"/> Chamber D(IC: 2324B-4)
<input checked="" type="checkbox"/> Chamber B(IC: 2324B-2)	<input type="checkbox"/> Chamber E(IC: 2324B-5)
<input checked="" type="checkbox"/> Chamber C(IC: 2324B-3)	<input type="checkbox"/> Chamber F(IC: 2324B-6)
	<input checked="" type="checkbox"/> Chamber G(IC: 2324B-7)
	<input type="checkbox"/> 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 GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS b/g/n

### **5.2. MAXIMUM OUTPUT POWER**

The transmitter has a maximum peak conducted output power as follows:  
See original report for details.

### **5.3. DESCRIPTION OF AVAILABLE ANTENNAS**

The radio utilizes an FPCB antenna, with a maximum gain of 0.46dBi.

### **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.

## 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

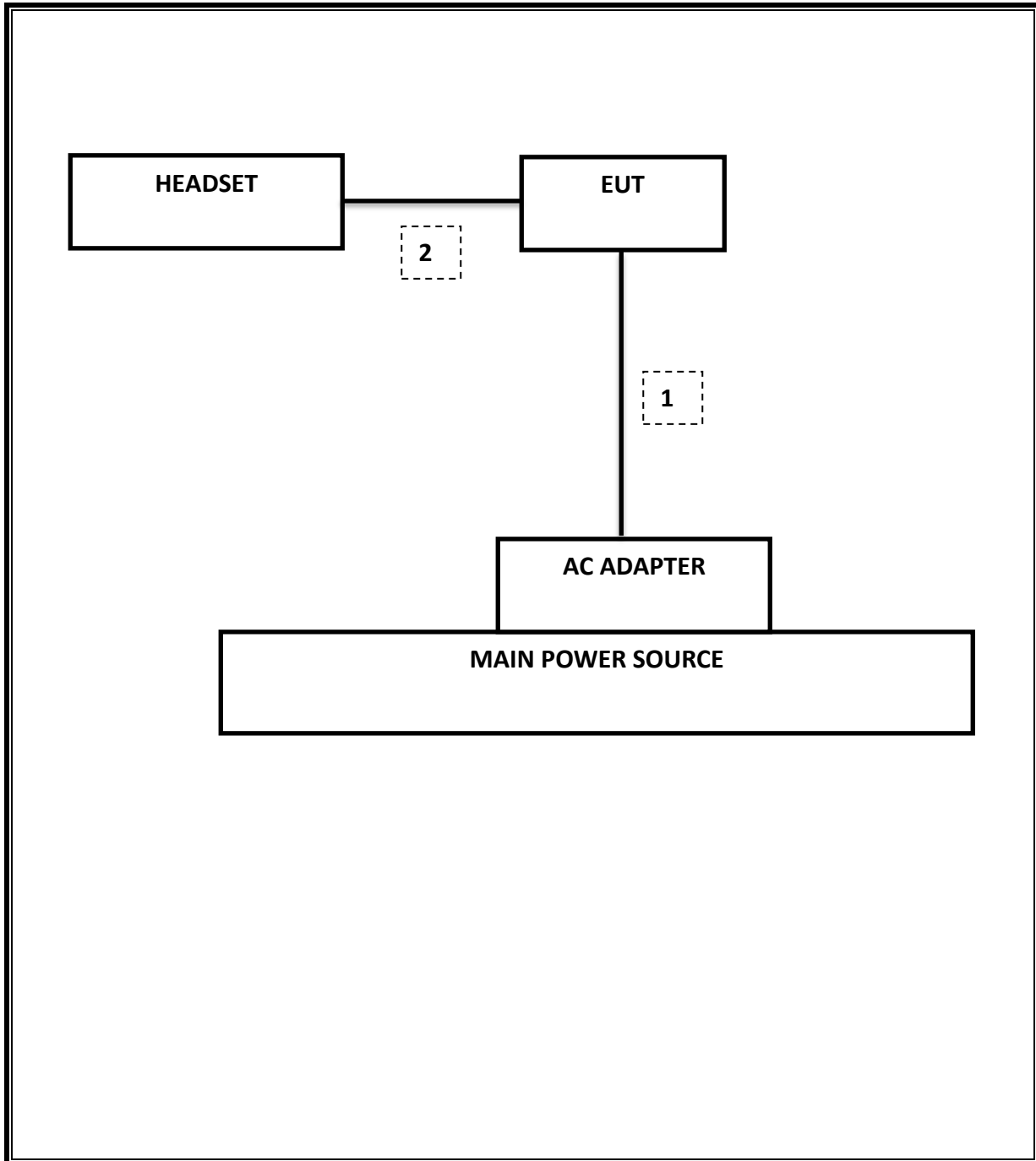
I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1m	N/A

### TEST SETUP

The EUT is continuously communicating to the Bluetooth tester during the tests.  
EUT was set in the Hidden menu mode to enable BT communications.



**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	Tnumber	Cal Due
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	122	02/13/16
Antenna, Horn, 18GHz	EMCO	3115	60	10/25/16
Antenna, Horn, 26.5 GHz	ARA	MWH-1826	89	11/14/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/15
RF Preamplifier, 1GHz - 18GHz	Miteq	AFS42-00101800-25-S-42	740	01/26/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/15
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	123	10/28/15
CBT Bluetooth Tester	R & S	CBT	258	07/08/15
Peak Power Meter	Agilent / HP	E4416A	84	01/26/16
Peak / Average Power Sensor	Agilent / HP	8481A	224	12/10/15
LISN, 30 MHz	FCC	50/250-25-2	24	01/16/16
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR
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. SUMMARY TABLE

C2PC reason: Please see LG FCC Class II Change Description letter for details.

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
2.1049	RSS-GEN 4.6	Occupied Band width (99%)	N/A	Conducted	Pass	See Original
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	See Original
15.247 (b)(1)	RSS-210 A8.4	TX conducted output power	<21dBm		Pass	See Original
15.247 (a)(1)	RSS-210 A8.1(b)	Hopping frequency separation	> 25KHz		Pass	See Original
15.247 (a)(1)(iii)	RSS-210 A8.1(d)	Number of Hopping channels	More than 15 non-overlapping channels		Pass	See Original
15.247 (a)(1)(iii)	RSS-210 A8.1(d)	Avg Time of Occupancy	< 0.4sec		Pass	See Original
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass	See Original
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	42.51 dBuV/m

## 8. RADIATED TEST RESULTS

### 8.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

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. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

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 band edge measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 1/T (on time) for average measurement.  
 $GFSK = 1/T = 1 / 0.00289S = 346Hz.$

The spectrum from 1GHzHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

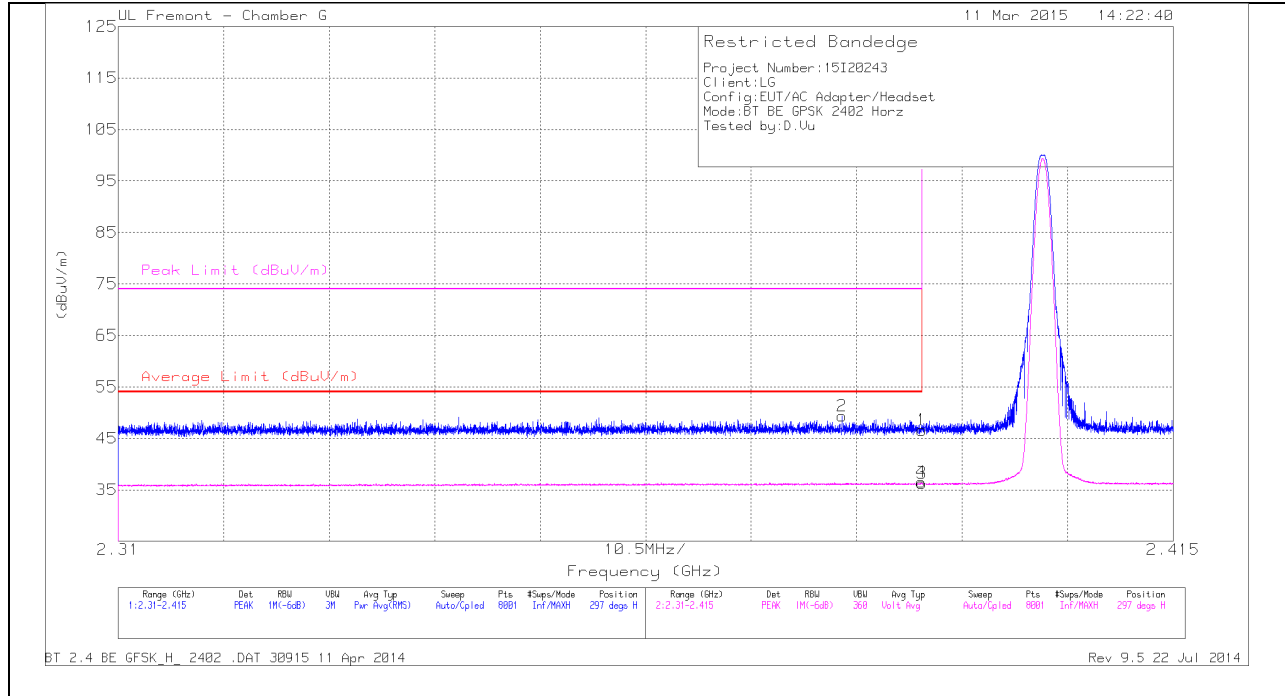
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

## 8.2. TRANSMITTER ABOVE 1 GHz

### 8.2.1. BASIC DATA RATE GFSK MODULATION

### RESTRICTED BANDEDGE (LOW CHANNEL)

#### HORIZONTAL PEAK AND AVERAGE PLOT

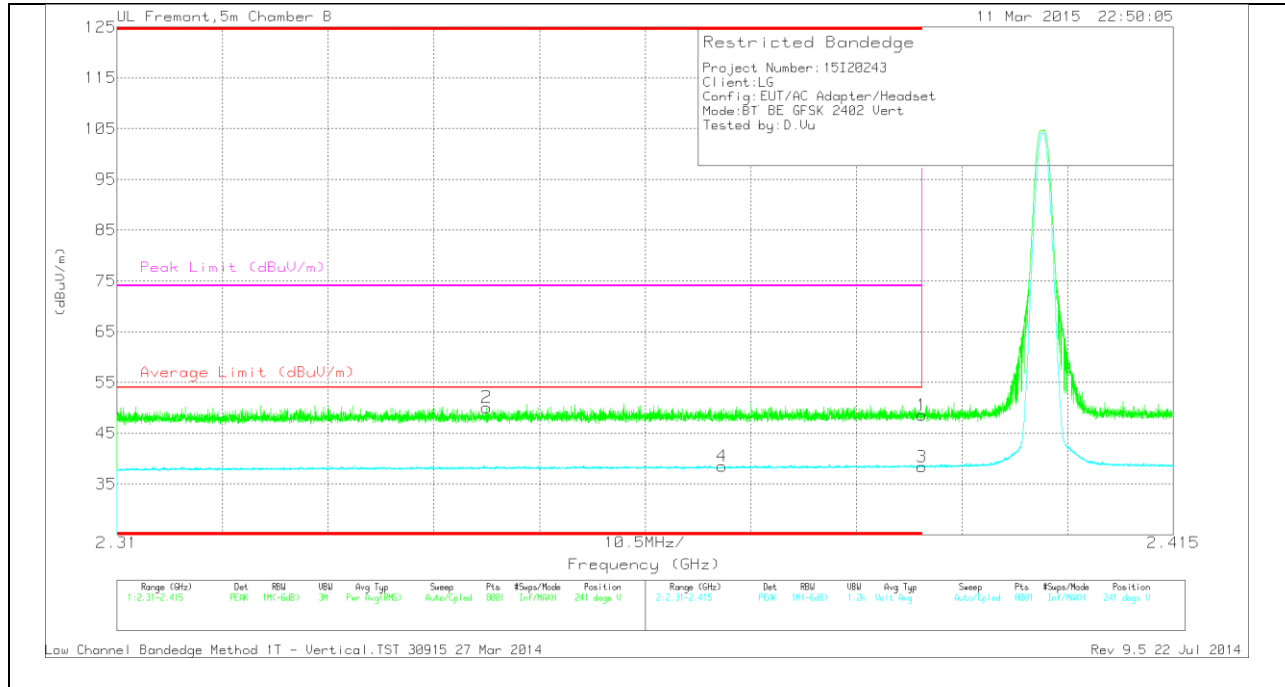


#### HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (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	39.72	PK	31.8	-24.9	46.62	-	-	74	-27.38	297	228	H
2	* 2.382	42.43	PK	31.8	-24.9	49.33	-	-	74	-24.67	297	228	H
3	* 2.39	29.41	VB1T	31.8	-24.9	36.31	54	-17.69	-	-	297	228	H
4	* 2.39	29.62	VB1T	31.8	-24.9	36.52	54	-17.48	-	-	297	228	H

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

**VERTICAL PEAK AND AVERAGE PLOT**



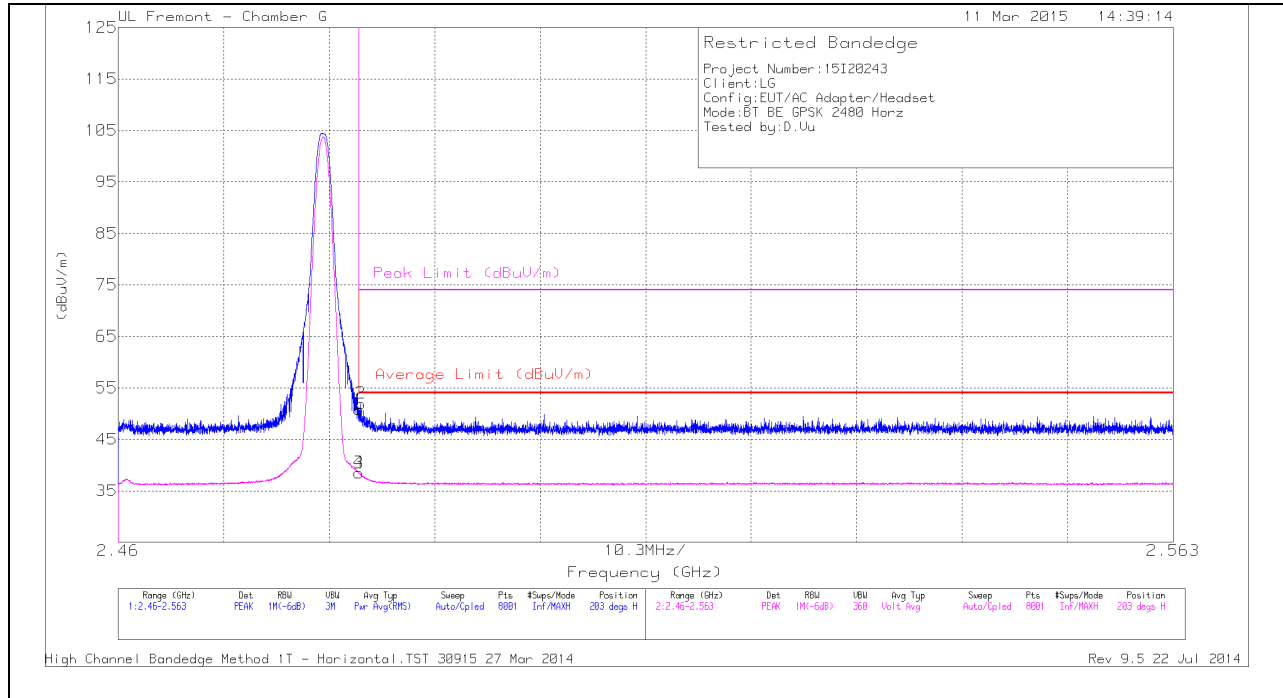
**VERTICAL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (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	39.63	PK	31.8	-24.9	46.53	-	-	74	-27.47	297	228	V
2	* 2.347	43.04	PK	31.7	-25	49.74	-	-	74	-24.26	297	228	V
3	* 2.39	29.27	VB1T	31.8	-24.9	36.17	54	-17.83	-	-	297	228	V
4	* 2.37	29.61	VB1T	31.7	-24.9	36.41	54	-17.59	-	-	297	228	V

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

**AUTHORIZED BANDEDGE (HIGH CHANNEL)**

**HORIZONTAL PEAK AND AVERAGE PLOT**



**HORIZONTAL DATA**

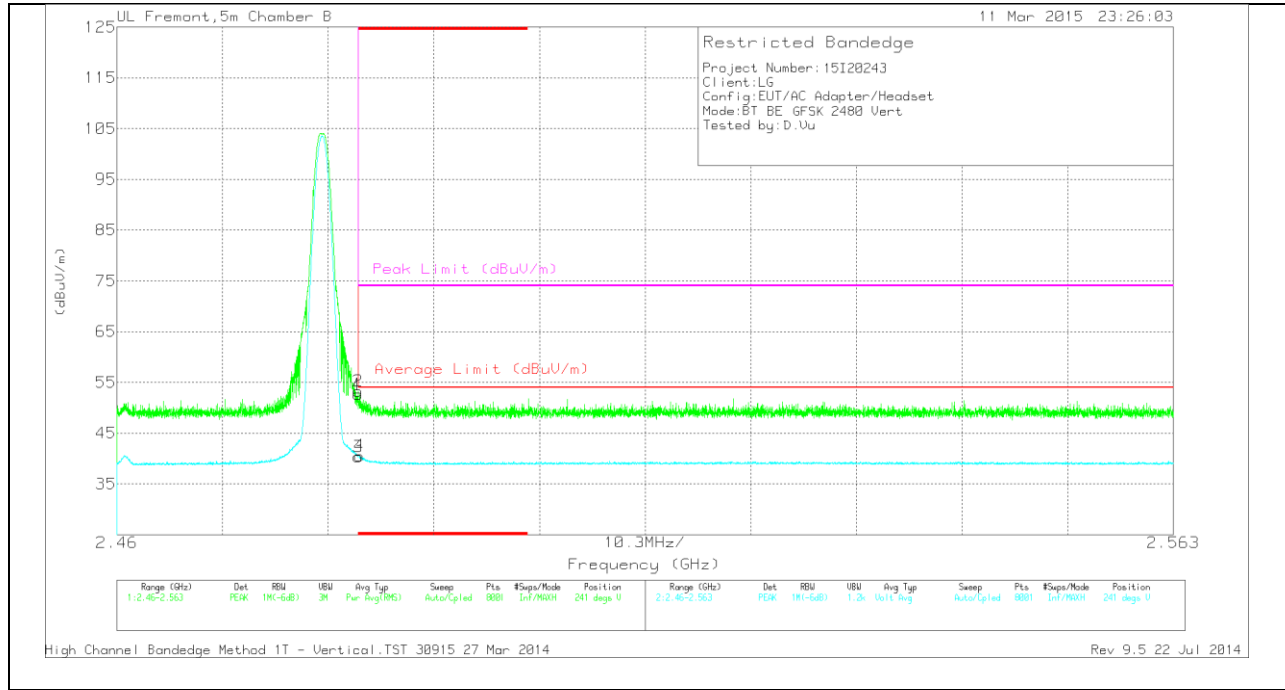
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	43.72	PK	32	-24.9	50.82	-	-	74	-23.18	203	221	H
2	* 2.484	44.88	PK	32	-24.9	51.98	-	-	74	-22.02	203	221	H
3	* 2.484	31.39	VB1T	32	-24.9	38.49	54	-15.51	-	-	203	221	H
4	* 2.484	31.42	VB1T	32	-24.9	38.52	54	-15.48	-	-	203	221	H

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**VERTICAL PEAK AND AVERAGE PLOT**



**VERTICAL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (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	41.49	PK	32	-24.9	48.59	-	-	74	-25.41	203	221	V
3	* 2.484	29.24	VB1T	32	-24.9	36.34	54	-17.66	-	-	203	221	V
2	* 2.484	42.37	PK	32	-24.9	49.47	-	-	74	-24.53	203	221	V
4	* 2.484	29.64	VB1T	32	-24.9	36.74	54	-17.26	-	-	203	221	V

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

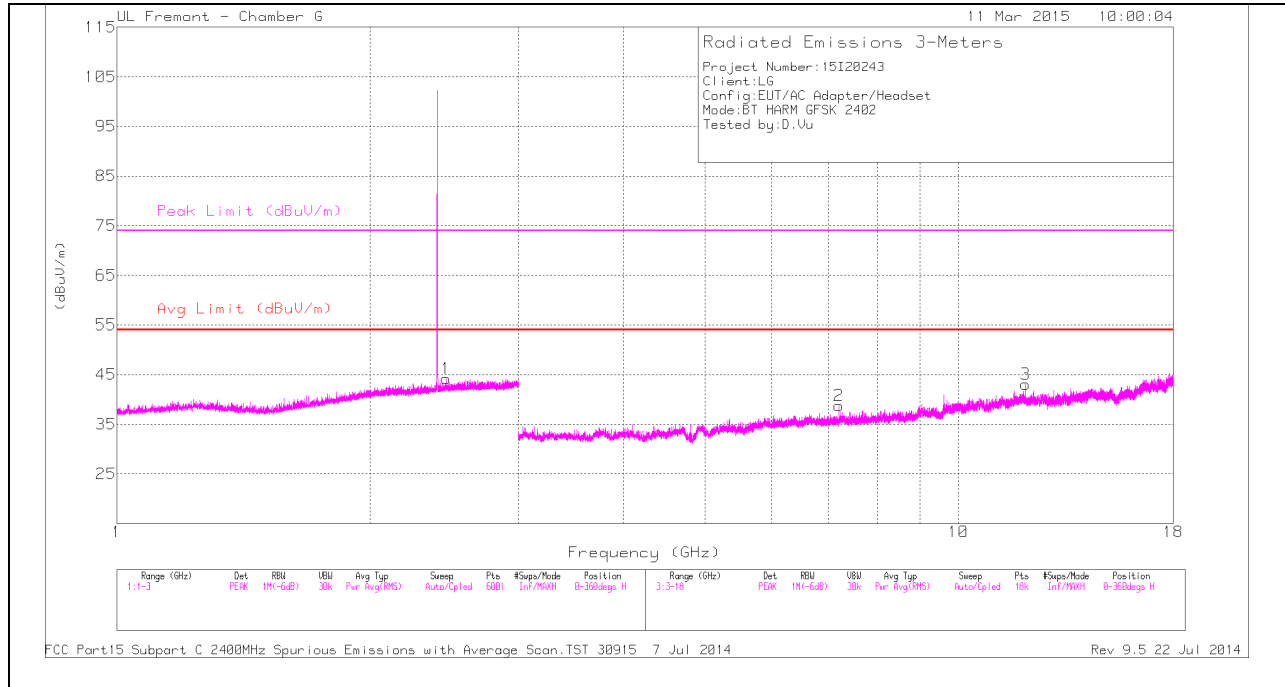
PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet



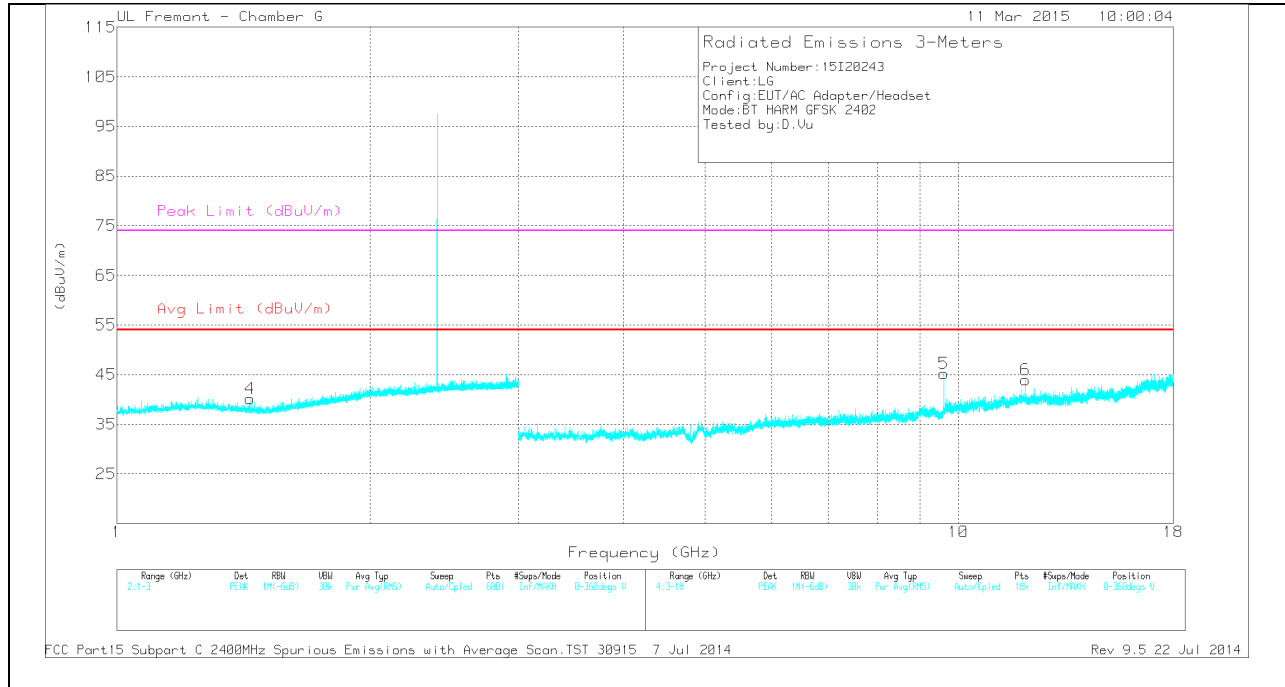
### HARMONICS AND SPURIOUS EMISSIONS

#### 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 T862 (dB/m)	Amp/Cb/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	* 1.438	37.64	PK	28.2	-25.7	40.14	-	-	74	-33.86	0-360	201	V
3	* 12.01	30.59	PK	38.8	-26.3	43.09	-	-	74	-30.91	0-360	201	H
6	* 12.01	31.41	PK	38.8	-26.3	43.91	-	-	74	-30.09	0-360	201	V
1	2.461	37.19	PK	31.9	-24.9	44.19	-	-	-	-	0-360	101	H
2	7.206	34.28	PK	35.6	-31.1	38.78	-	-	-	-	0-360	101	H
5	9.608	36.54	PK	36.8	-28.1	45.24	-	-	-	-	0-360	201	V

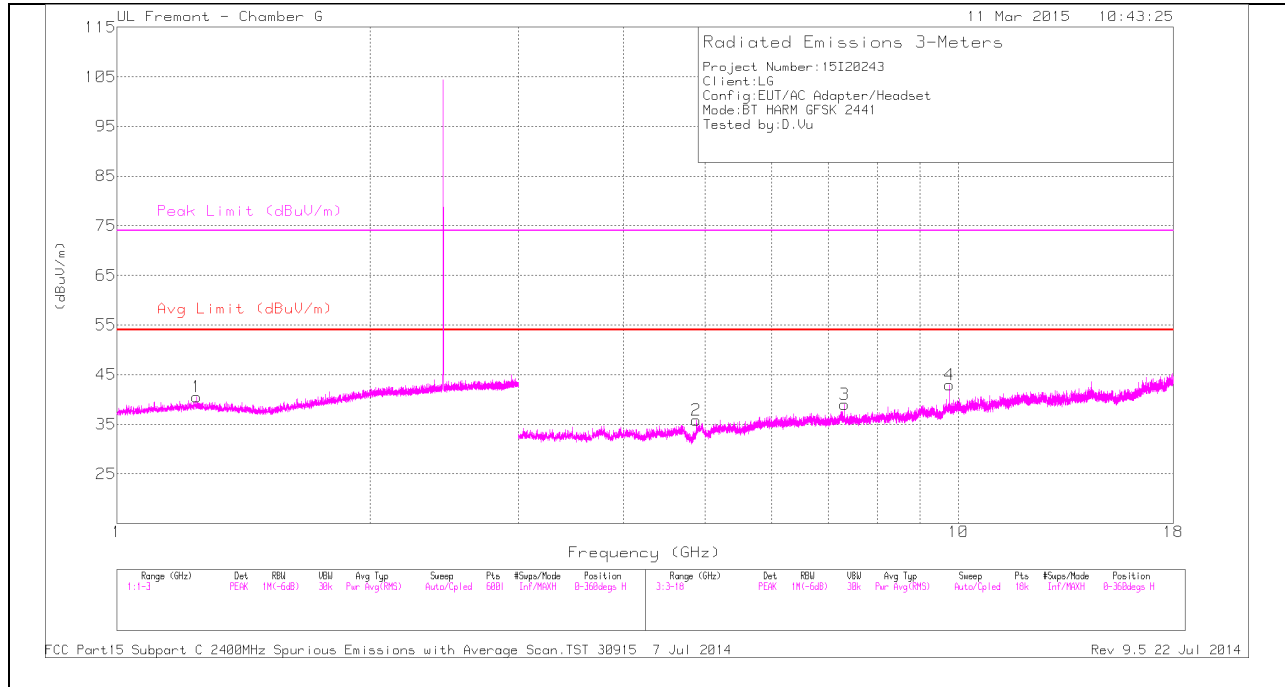
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK - Peak detector

**Radiated Emissions**

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/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
* 1.438	44.17	PK3	28.2	-25.7	46.67	-	-	74	-27.33	186	133	V
* 1.436	30.99	VB1T	28.2	-25.7	33.49	54	-20.51	-	-	186	133	V
* 12.01	38.13	PK3	38.8	-26.3	50.63	-	-	74	-23.37	84	192	H
* 12.01	29.08	VB1T	38.8	-26.3	41.58	54	-12.42	-	-	84	192	H
* 12.01	38.57	PK3	38.8	-26.3	51.07	-	-	74	-22.93	85	228	V
* 12.01	30.01	VB1T	38.8	-26.3	42.51	54	-11.49	-	-	85	228	V

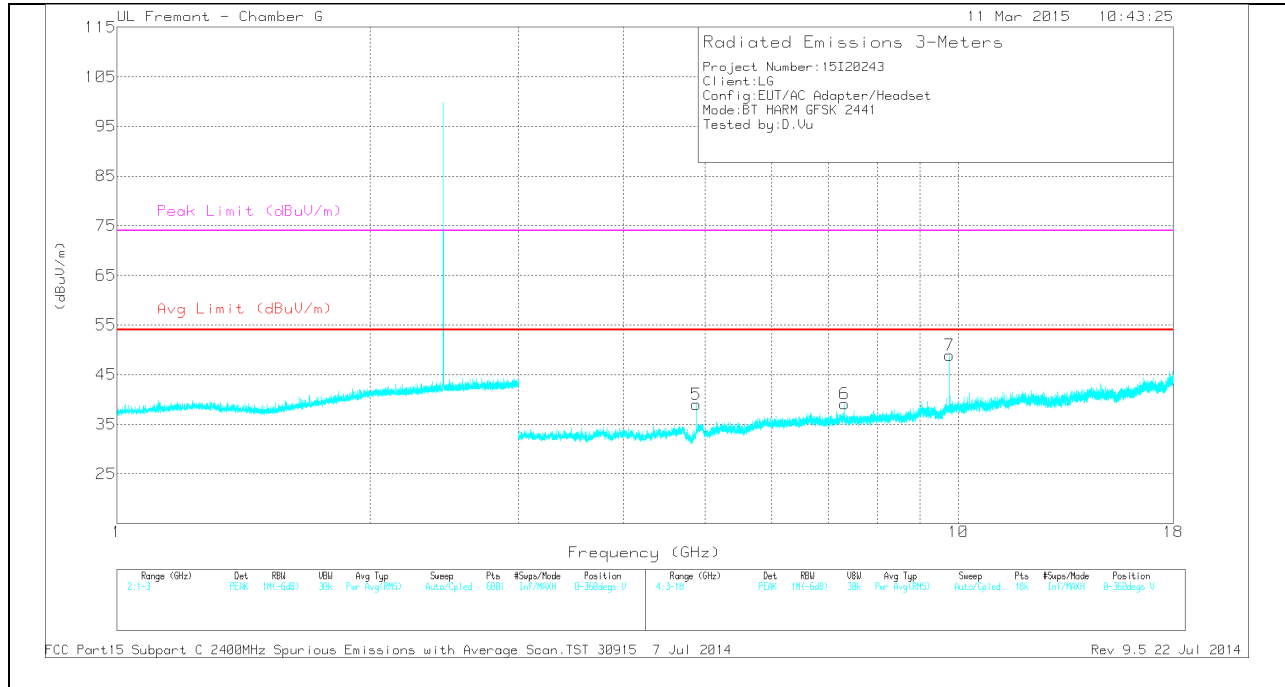
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK3 - FHSS Method: Maximum Peak  
 VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**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 T862 (dB/m)	Amp/Cb/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
1	* 1.244	37.38	PK	29.2	-26.1	40.48	-	-	74	-33.52	0-360	101	H
2	* 4.882	34.67	PK	34.1	-33	35.77	-	-	74	-38.23	0-360	201	H
3	* 7.322	34.54	PK	35.6	-31.1	39.04	-	-	74	-34.96	0-360	101	H
5	* 4.882	37.89	PK	34.1	-33	38.99	-	-	74	-35.01	0-360	101	V
6	* 7.323	34.61	PK	35.6	-31.1	39.11	-	-	74	-34.89	0-360	201	V
4	9.764	34.18	PK	37	-28.3	42.88	-	-	-	-	0-360	201	H
7	9.764	40.24	PK	37	-28.3	48.94	-	-	-	-	0-360	201	V

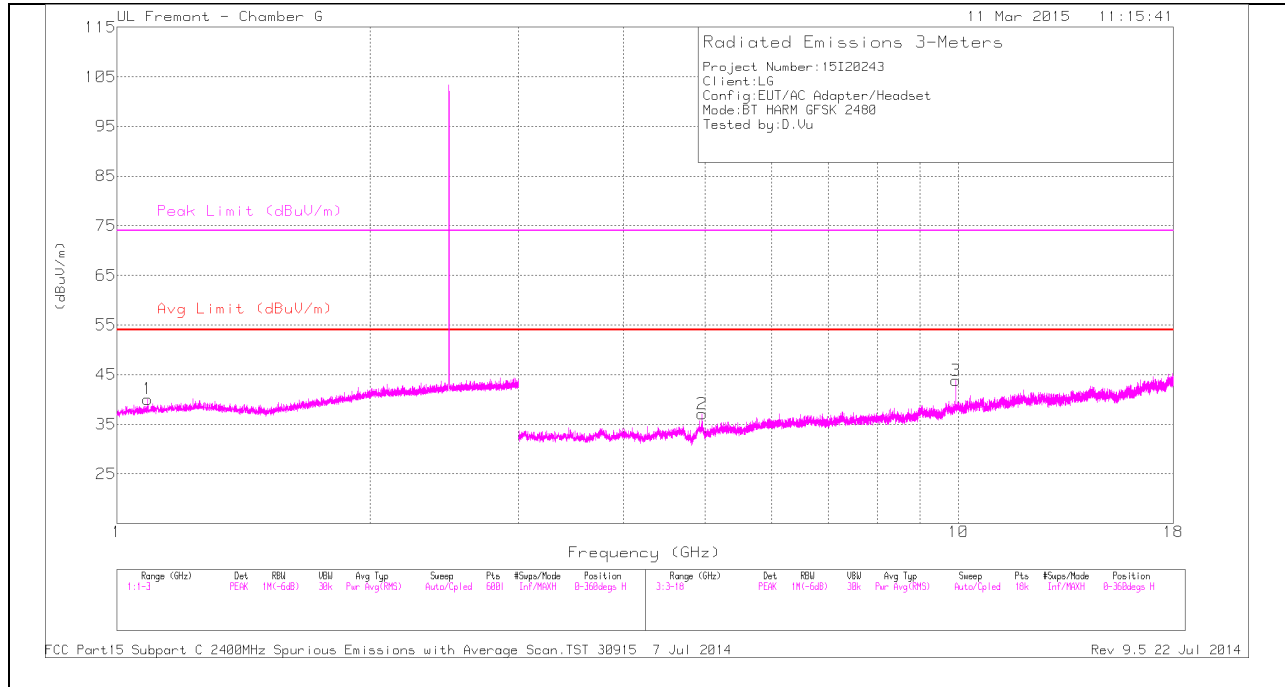
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK - Peak detector

**Radiated Emissions**

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/ 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
* 1.243	44.31	PK3	29.2	-26.1	47.41	-	-	74	-26.59	102	339	H
* 1.242	31.03	VB1T	29.2	-26.1	34.13	54	-19.87	-	-	102	339	H
* 4.882	41.88	PK3	34.1	-33	42.98	-	-	74	-31.02	229	161	H
* 4.882	32.13	VB1T	34.1	-33	33.23	54	-20.77	-	-	229	161	H
* 7.323	41.61	PK3	35.6	-31.1	46.11	-	-	74	-27.89	136	346	H
* 7.323	29.26	VB1T	35.6	-31.1	33.76	54	-20.24	-	-	136	346	H
* 4.882	43.12	PK3	34.1	-33	44.22	-	-	74	-29.78	7	315	H
* 4.882	32.76	VB1T	34.1	-33	33.86	54	-20.14	-	-	7	315	H
* 7.323	41.7	PK3	35.6	-31.1	46.2	-	-	74	-27.8	222	142	V
* 7.323	30.39	VB1T	35.6	-31.1	34.89	54	-19.11	-	-	222	142	V

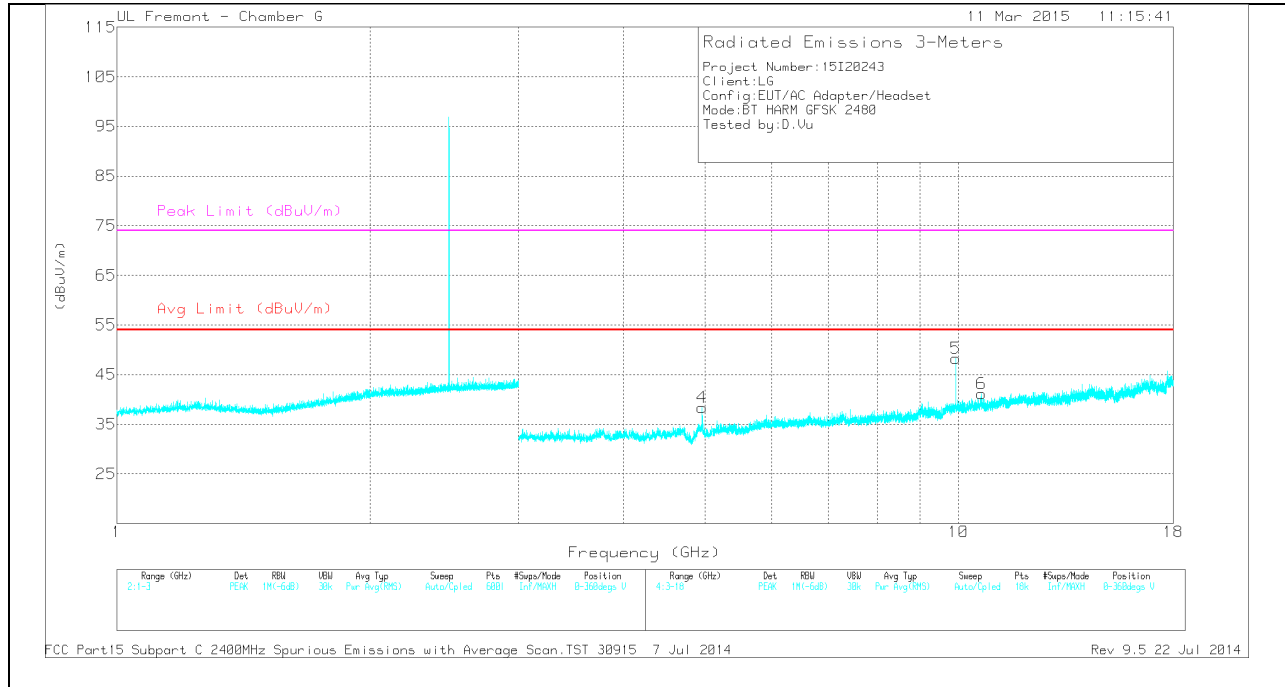
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK3 - FHSS Method: Maximum Peak  
 VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**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 T862 (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
1	* 1.087	37.78	PK	28.4	-26.1	40.08	-	-	74	-33.92	0-360	101	H
2	* 4.96	35.95	PK	34.1	-32.9	37.15	-	-	74	-36.85	0-360	100	H
4	* 4.96	37.18	PK	34.1	-32.9	38.38	-	-	74	-35.62	0-360	101	V
6	* 10.65	30.09	PK	37.7	-26.6	41.19	-	-	74	-32.81	0-360	201	V
3	9.92	34.28	PK	37.3	-27.7	43.88	-	-	-	-	0-360	201	H
5	9.92	38.67	PK	37.3	-27.7	48.27	-	-	-	-	0-360	201	V

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK - Peak detector

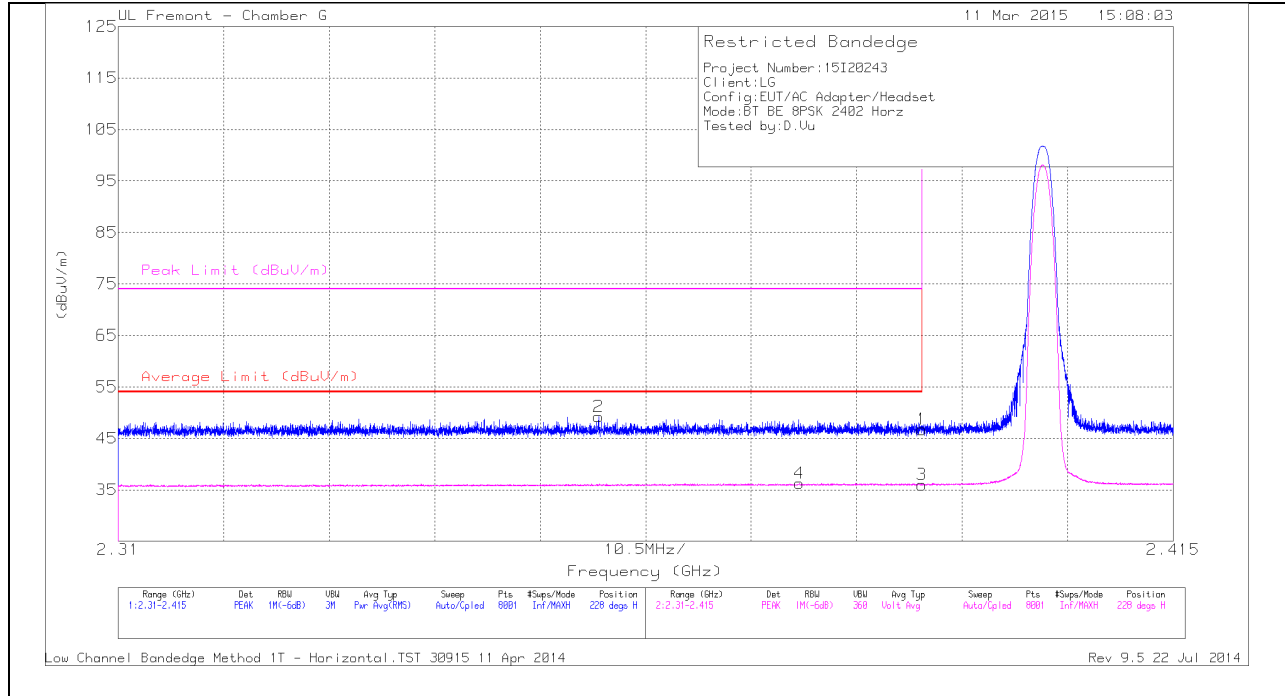
**Radiated Emissions**

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (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
* 1.087	44.25	PK3	28.4	-26.1	46.55	-	-	74	-27.45	187	122	H
* 1.087	31.01	VB1T	28.4	-26.1	33.31	54	-20.69	-	-	187	122	H
* 4.96	44.04	PK3	34.1	-32.9	45.24	-	-	74	-28.76	0	274	V
* 4.96	35.85	VB1T	34.1	-32.9	37.05	54	-16.95	-	-	0	274	V
* 10.65	36.26	PK3	37.7	-26.7	47.26	-	-	74	-26.74	289	381	V
* 10.65	23.66	VB1T	37.7	-26.6	34.76	54	-19.24	-	-	289	381	V

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK3 - FHSS Method: Maximum Peak  
 VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

## 8.2.2. ENHANCED DATA RATE 8PSK MODULATION RESTRICTED BANDEDGE (LOW CHANNEL)

### HORIZONTAL PEAK AND AVERAGE PLOT



### HORIZONTAL DATA

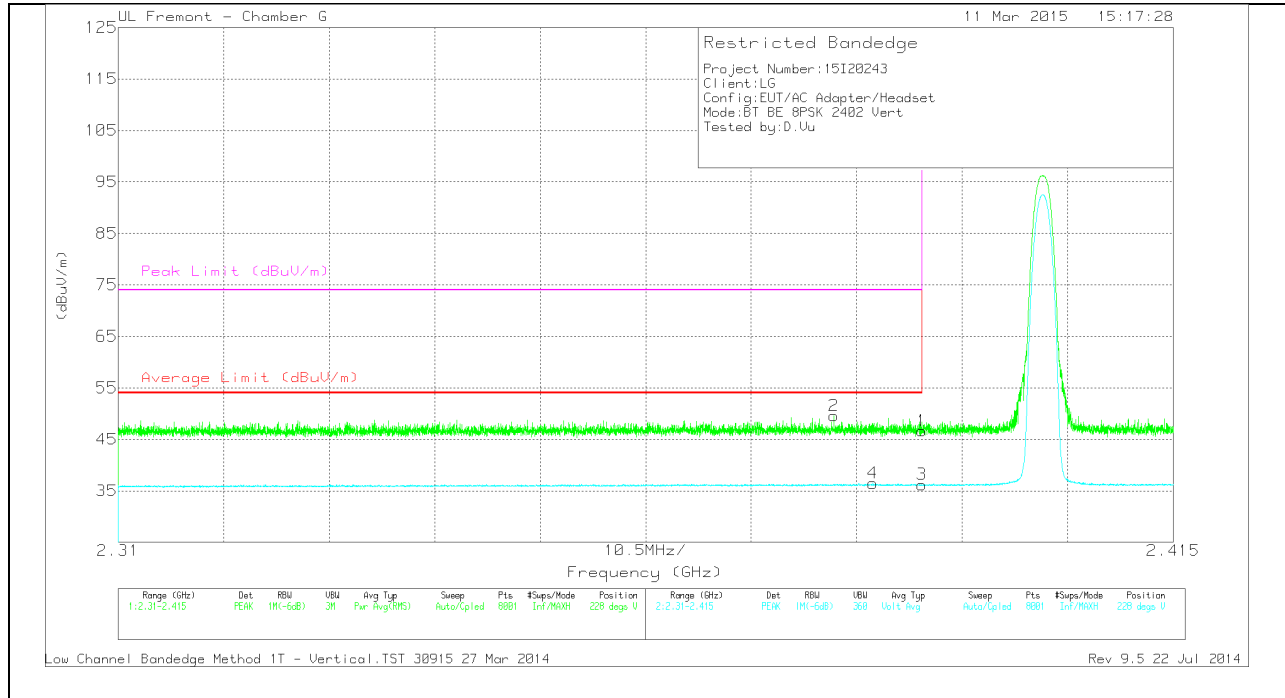
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.84	PK	31.8	-24.9	46.74	-	-	74	-27.26	228	236	H
2	* 2.358	42.53	PK	31.7	-25	49.23	-	-	74	-24.77	228	236	H
3	* 2.39	29.09	VB1T	31.8	-24.9	35.99	54	-18.01	-	-	228	236	H
4	* 2.378	29.36	VB1T	31.8	-24.9	36.26	54	-17.74	-	-	228	236	H

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**VERTICAL PEAK AND AVERAGE PLOT**



**VERTICAL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Fitr/Pad (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	39.73	PK	31.8	-24.9	46.63	-	-	74	-27.37	228	236	V
2	* 2.381	42.66	PK	31.8	-24.9	49.56	-	-	74	-24.44	228	236	V
3	* 2.39	29.31	VB1T	31.8	-24.9	36.21	54	-17.79	-	-	228	236	V
4	* 2.385	29.57	VB1T	31.8	-24.9	36.47	54	-17.53	-	-	228	236	V

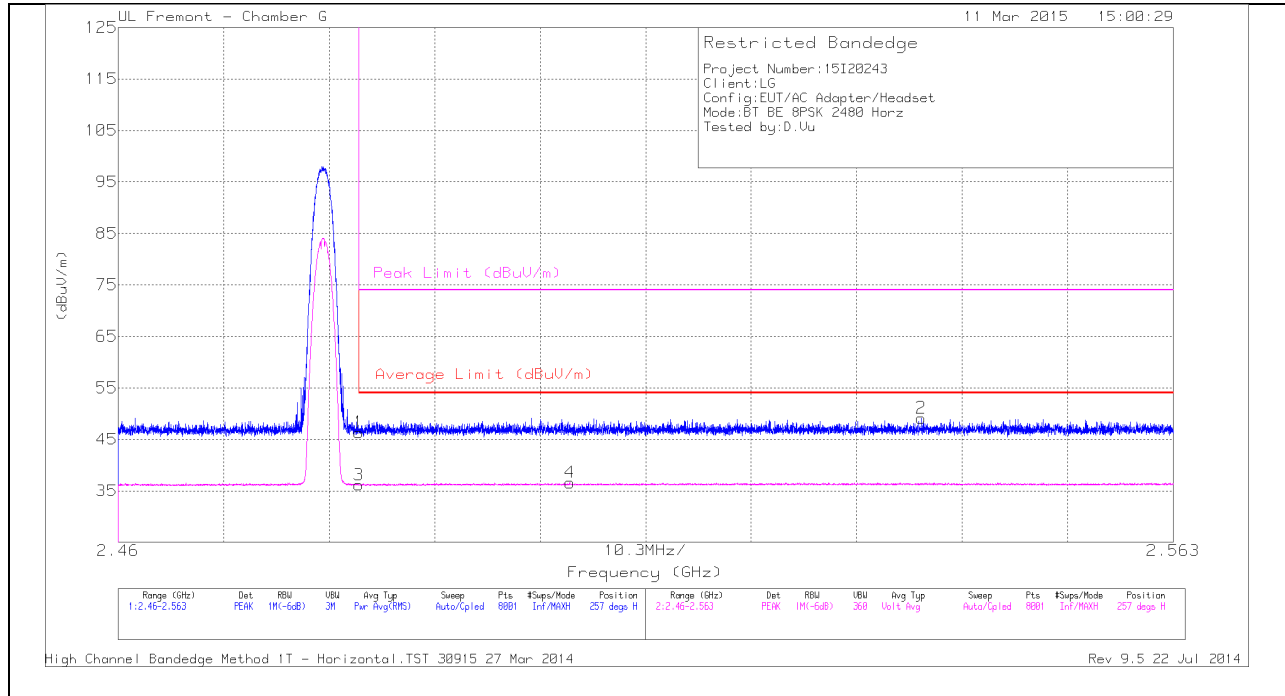
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**AUTHORIZED BANDEDGE (HIGH CHANNEL)**

**HORIZONTAL PEAK AND AVERAGE PLOT**



**HORIZONTAL DATA**

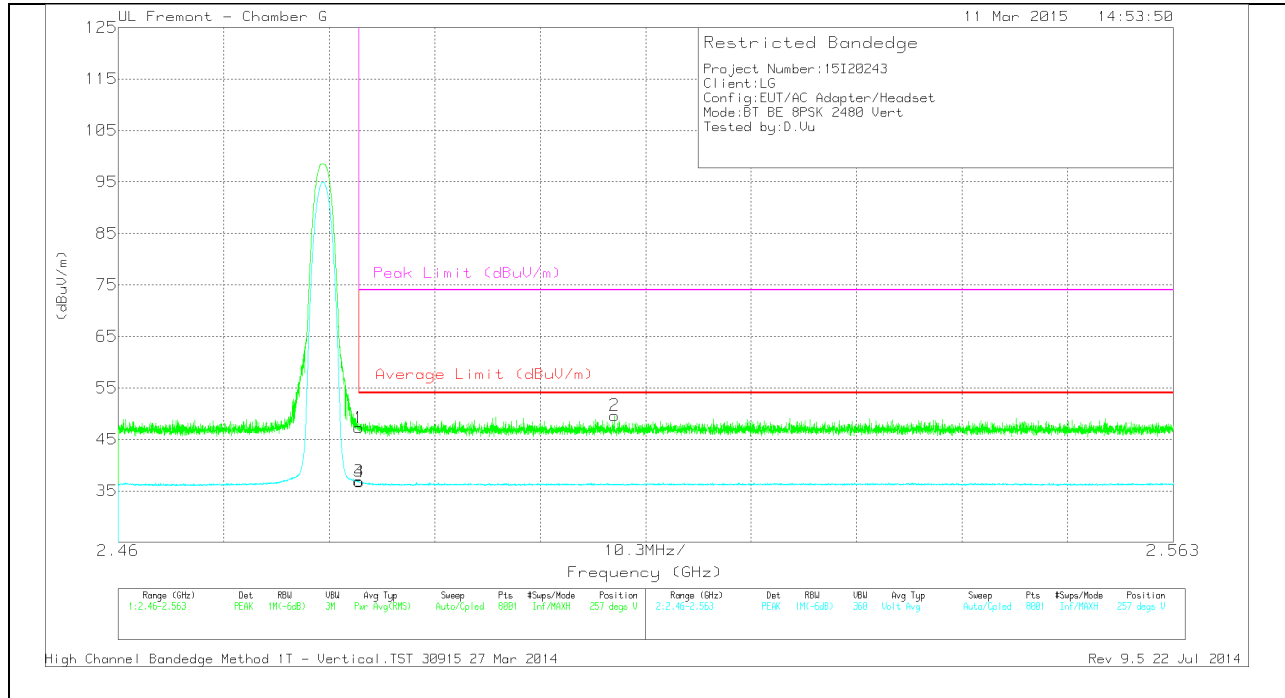
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.25	PK	32	-24.9	46.35	-	-	74	-27.65	257	279	H
3	* 2.484	29.02	VB1T	32	-24.9	36.12	54	-17.88	-	-	257	279	H
4	2.504	29.5	VB1T	32	-24.9	36.6	54	-17.4	-	-	257	279	H
2	2.538	42.03	PK	32	-24.9	49.13	-	-	74	-24.87	257	279	H

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**VERTICAL PEAK AND AVERAGE PLOT**



**VERTICAL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Fitr/Pad (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	40.15	PK	32	-24.9	47.25	-	-	74	-26.75	257	279	V
3	* 2.484	29.78	VB1T	32	-24.9	36.88	54	-17.12	-	-	257	279	V
4	* 2.484	29.67	VB1T	32	-24.9	36.77	54	-17.23	-	-	257	279	V
2	2.508	42.53	PK	32	-24.9	49.63	-	-	74	-24.37	257	279	V

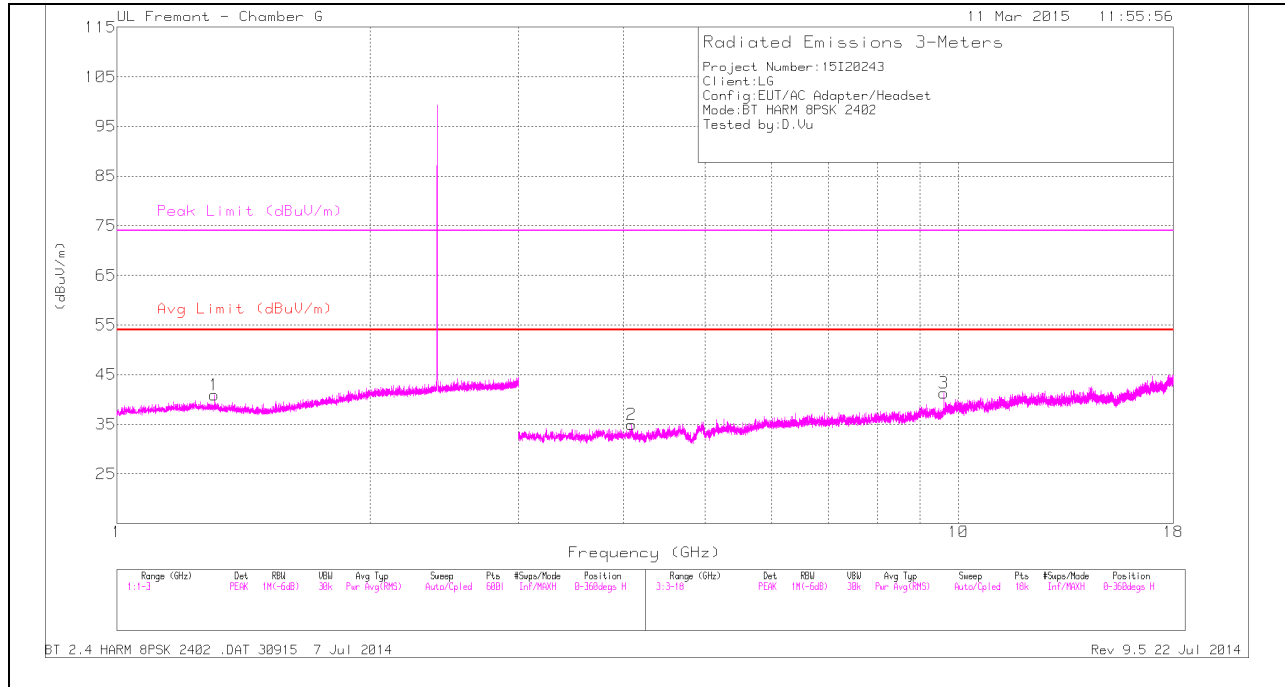
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

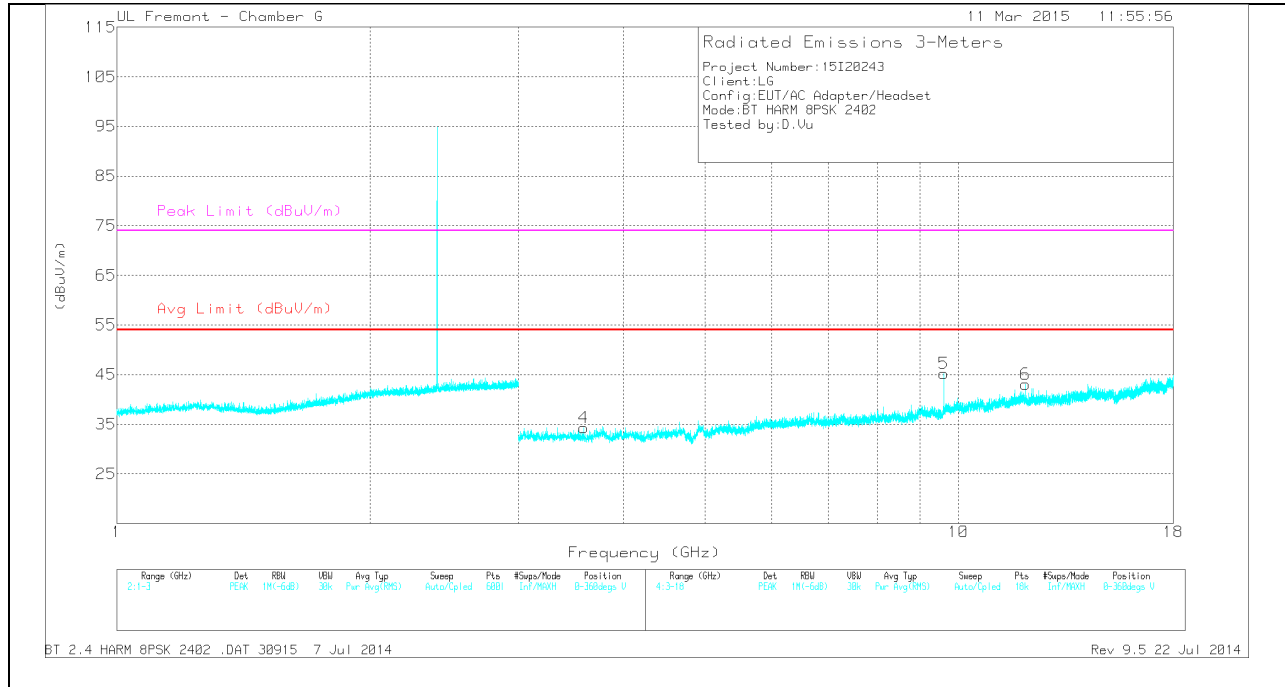
## HARMONICS AND SPURIOUS EMISSIONS

### 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 T862 (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
1	* 1.305	38.06	PK	28.9	-26	40.96	-	-	74	-33.04	0-360	201	H
2	* 4.087	34.51	PK	33.4	-33	34.91	-	-	74	-39.09	0-360	101	H
4	* 3.584	35.44	PK	32.8	-33.9	34.34	-	-	74	-39.66	0-360	201	V
6	* 12.01	30.61	PK	38.8	-26.3	43.11	-	-	74	-30.89	0-360	201	V
3	9.608	32.63	PK	36.8	-28.1	41.33	-	-	-	-	0-360	201	H
5	9.608	36.48	PK	36.8	-28.1	45.18	-	-	-	-	0-360	201	V

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK - Peak detector

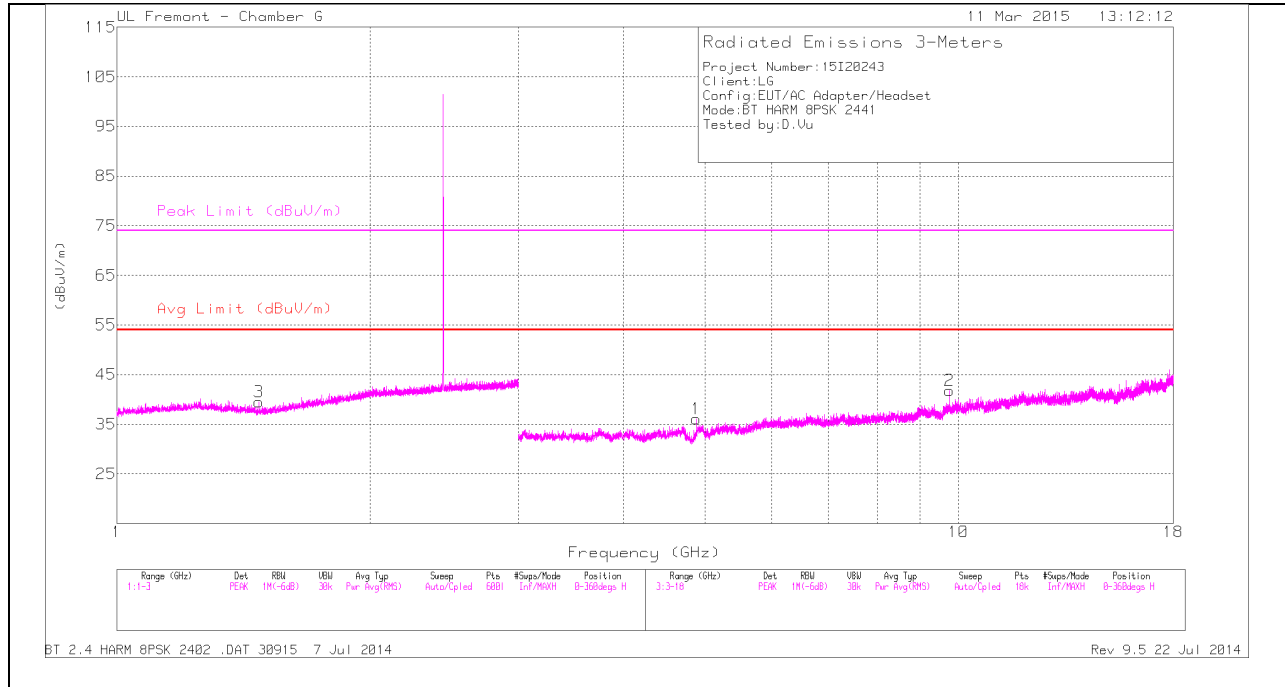
**Radiated Emissions**

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (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
* 1.305	44.09	PK3	28.9	-26	46.99	-	-	74	-27.01	190	105	H
* 1.306	31.37	VB1T	28.9	-26	34.27	54	-19.73	-	-	190	105	H
* 4.089	40.96	PK3	33.4	-33	41.36	-	-	74	-32.64	82	275	H
* 4.086	28.67	VB1T	33.4	-33	29.07	54	-24.93	-	-	82	275	H
* 12.01	38.08	PK3	38.8	-26.4	50.48	-	-	74	-23.52	96	220	V
* 12.01	27.93	VB1T	38.8	-26.3	40.43	54	-13.57	-	-	96	220	V

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK3 - FHSS Method: Maximum Peak  
 VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

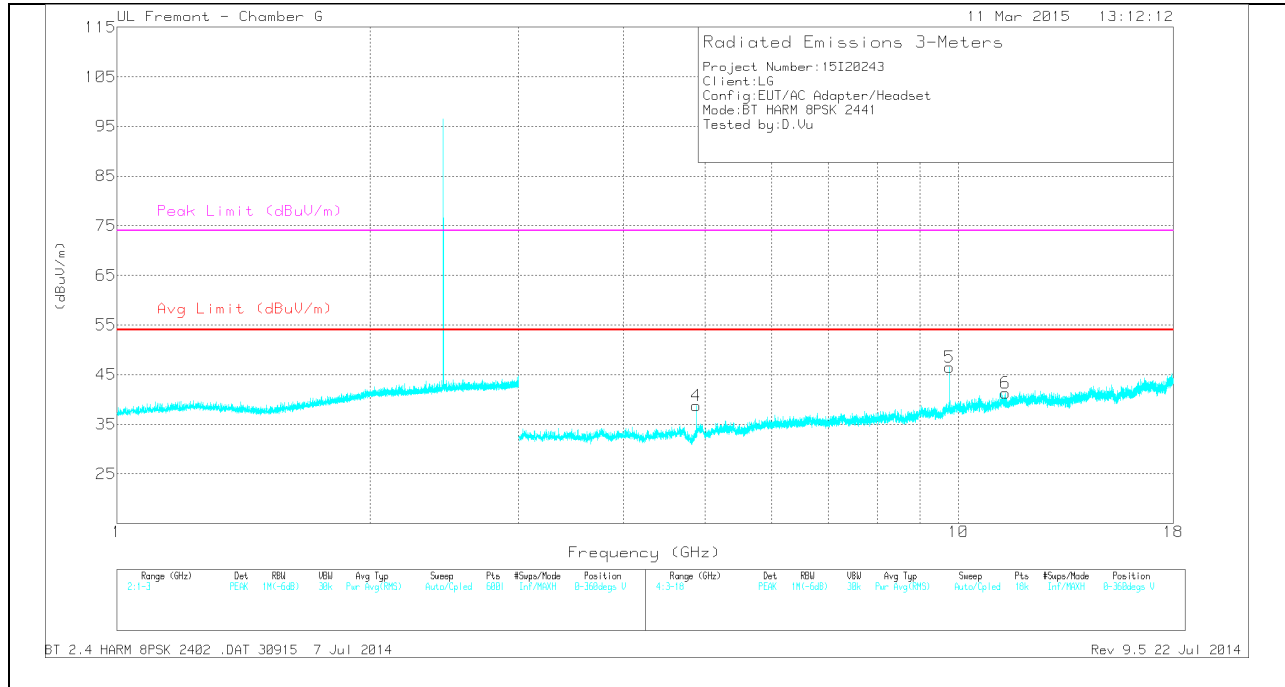


**MID CHANNEL HORIZONTAL**



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 T862 (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
3	* 1.475	37.07	PK	28	-25.6	39.47	-	-	74	-34.53	0-360	101	H
1	* 4.882	34.99	PK	34.1	-33	36.09	-	-	74	-37.91	0-360	101	H
4	* 4.882	37.61	PK	34.1	-33	38.71	-	-	74	-35.29	0-360	101	V
6	* 11.362	29.64	PK	38.1	-26.5	41.24	-	-	74	-32.76	0-360	101	V
2	9.764	33.13	PK	37	-28.3	41.83	-	-	-	-	0-360	101	H
5	9.764	37.77	PK	37	-28.3	46.47	-	-	-	-	0-360	201	V

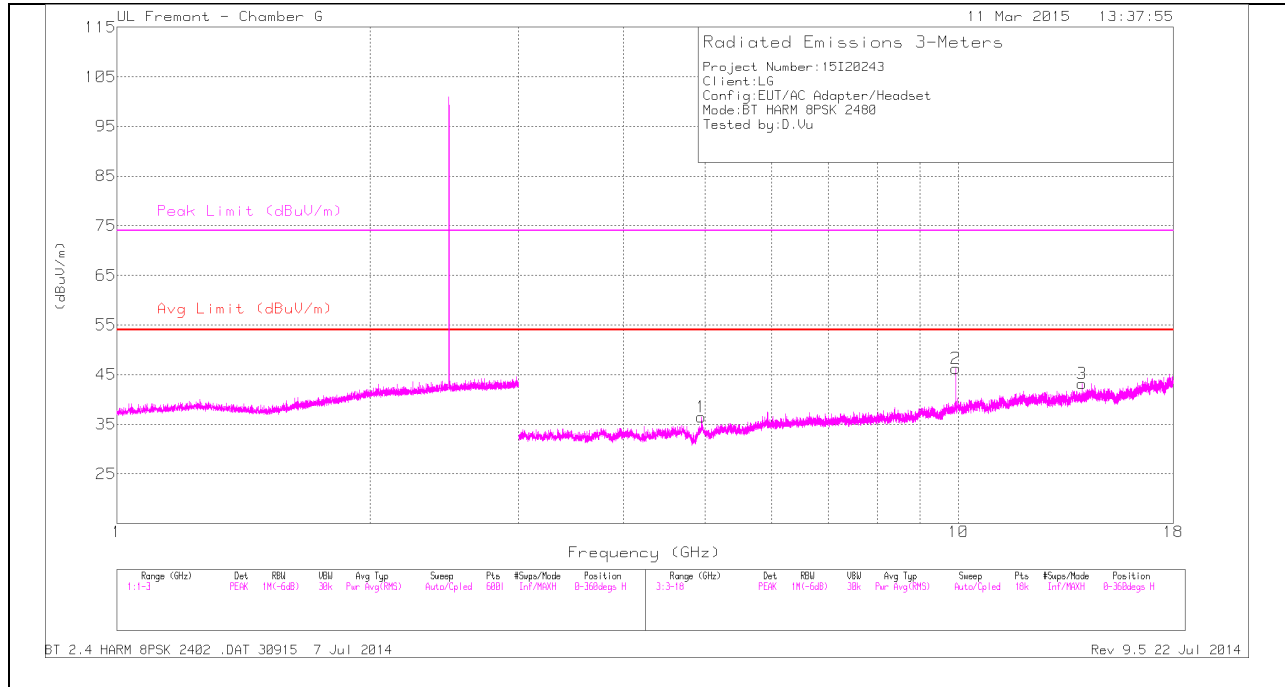
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK - Peak detector

**Radiated Emissions**

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (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
* 1.473	43.59	PK3	28	-25.6	45.99	-	-	74	-28.01	80	221	H
* 1.475	31.22	VB1T	28	-25.6	33.62	54	-20.38	-	-	80	221	H
* 4.882	43.49	PK3	34.1	-33	44.59	-	-	74	-29.41	359	316	V
* 4.882	36.78	VB1T	34.1	-33	37.88	54	-16.12	-	-	359	316	V
* 11.361	35.96	PK3	38.1	-26.5	47.56	-	-	74	-26.44	305	260	V
* 11.362	23.73	VB1T	38.1	-26.5	35.33	54	-18.67	-	-	305	260	V

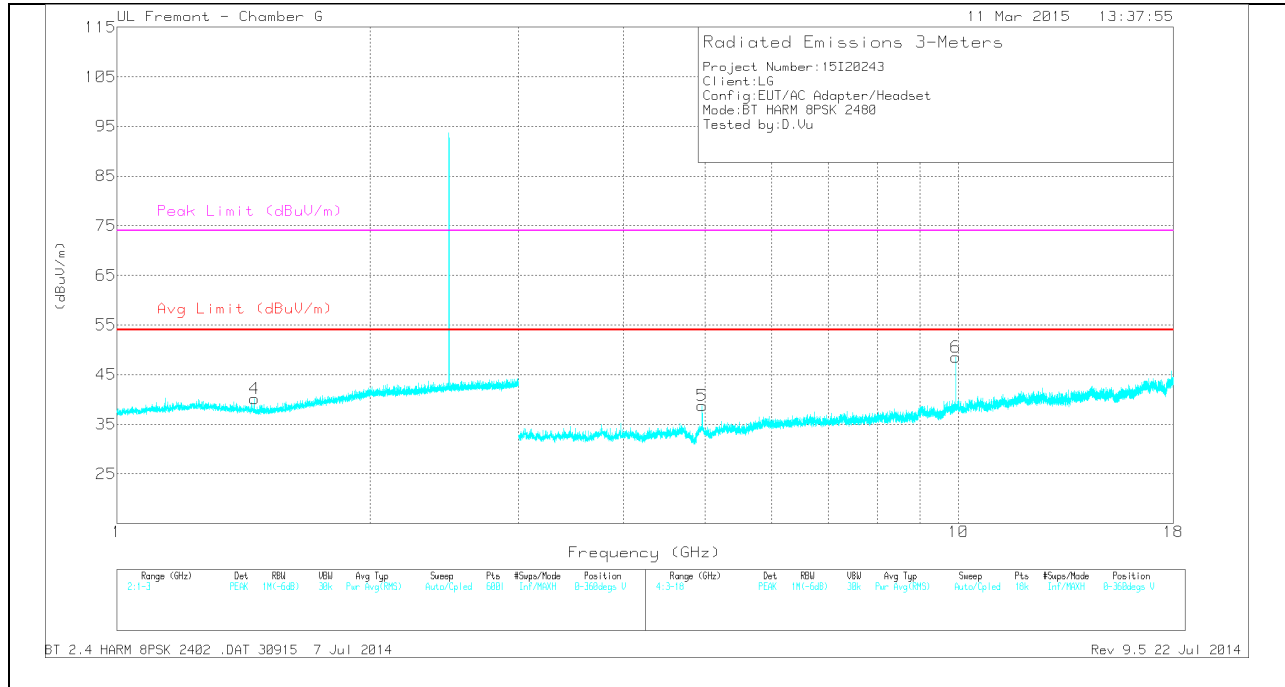
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK3 - FHSS Method: Maximum Peak  
 VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**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 T862 (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	* 1.457	37.64	PK	28.1	-25.6	40.14	-	-	74	-33.86	0-360	101	V
1	* 4.948	35.29	PK	34.1	-32.9	36.49	-	-	74	-37.51	0-360	100	H
5	* 4.96	37.49	PK	34.1	-32.9	38.69	-	-	74	-35.31	0-360	101	V
2	9.92	36.66	PK	37.3	-27.7	46.26	-	-	-	-	0-360	201	H
6	9.92	38.93	PK	37.3	-27.7	48.53	-	-	-	-	0-360	201	V
3	14.024	31.38	PK	39.4	-27.6	43.18	-	-	-	-	0-360	100	H

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK - Peak detector

**Radiated Emissions**

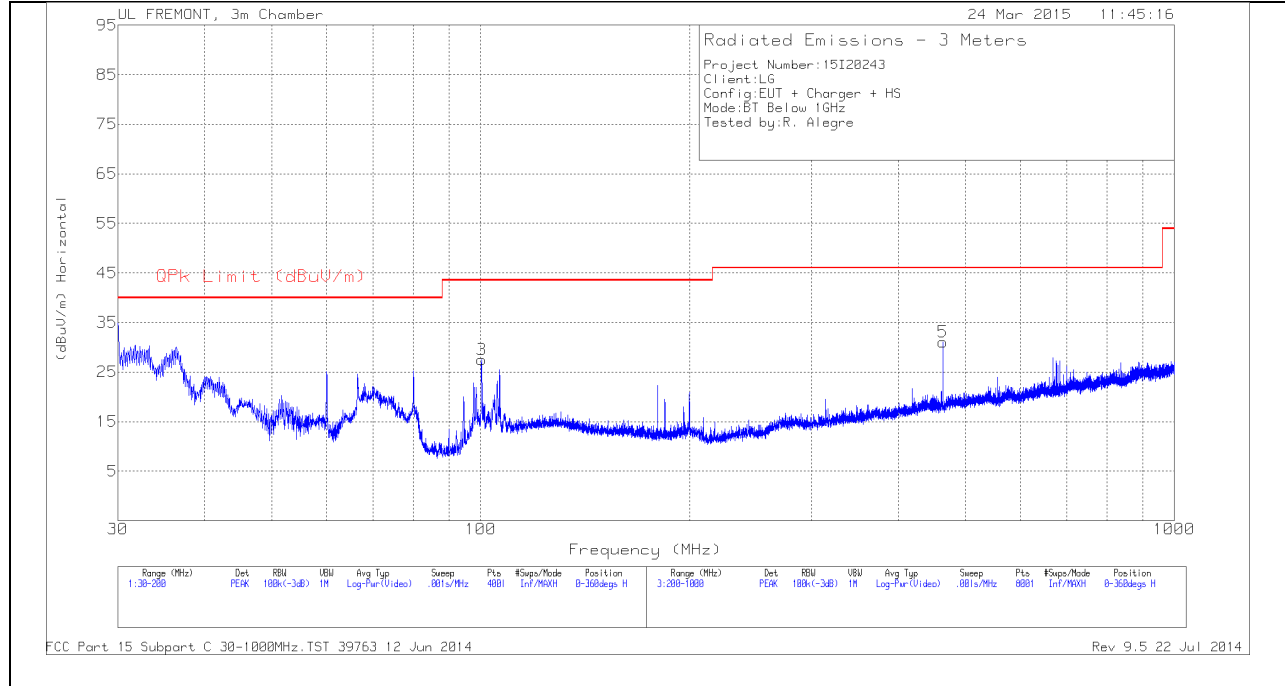
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.458	43.41	PK3	28.1	-25.6	45.91	-	-	74	-28.09	183	264	V
* 1.459	30.99	VB1T	28.1	-25.6	33.49	54	-20.51	-	-	183	264	V
* 4.948	41.61	PK3	34.1	-32.9	42.81	-	-	74	-31.19	208	294	H
* 4.948	28.92	VB1T	34.1	-32.9	30.12	54	-23.88	-	-	208	294	H
* 4.96	44.21	PK3	34.1	-32.9	45.41	-	-	74	-28.59	4	305	V
* 4.96	36.46	VB1T	34.1	-32.9	37.66	54	-16.34	-	-	4	305	V
9.92	43.85	PK3	37.3	-27.7	53.45	-	-	-	-	147	271	V
9.92	39.73	VB1T	37.3	-27.7	49.33	-	-	-	-	147	271	V

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.  
 PK - Peak detector  
 PK3 - FHSS Method: Maximum Peak  
 VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

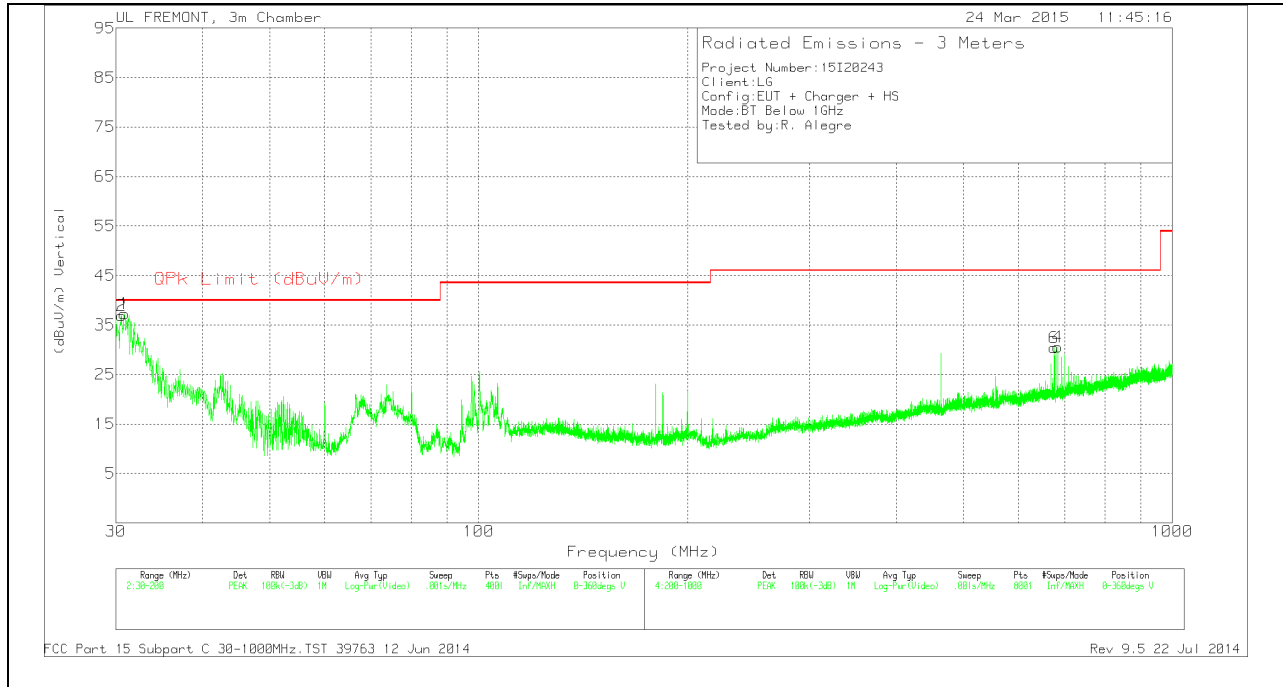
### 8.3. TRANSMITTER BELOW 1 GHz

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

**HORIZONTAL PLOT**



**VERTICAL PLOT**



**BELOW 1 GHz TABLE**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	30.5525	43.14	PK	21.3	-27.5	36.94	40	-3.06	0-360	100	V
1	30.85	43.9	PK	21	-27.6	37.3	40	-2.7	0-360	100	V
3	100.295	44.5	PK	9.8	-26.8	27.5	43.52	-16.02	0-360	300	H
5	463.7	40.23	PK	16.6	-25.8	31.03	46.02	-14.99	0-360	100	H
6	676	36.45	PK	19.3	-25.3	30.45	46.02	-15.57	0-360	200	V
4	684	36.16	PK	19.6	-25.2	30.56	46.02	-15.46	0-360	200	V

PK - Peak detector