



**FCC CFR47 PART 15 SUBPART C**

**BLUETOOTH LOW ENERGY**

**CERTIFICATION TEST REPORT**

**FOR**

**GSM Phone + Bluetooth & WLAN 2.4GHz b/g/n**

**MODEL NUMBER: SM-G316HU/DD**

**FCC ID: A3LSMG316HU**

**REPORT NUMBER: 14I19012-E3 Revision A**

**ISSUE DATE: NOVEMBER 10, 2014**

*Prepared for*

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**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Date	Revisions	Revised By
--	10/3/14	Initial Issue	P. Zhang
A	11/10/14	Revised Page 41	P. Zhang

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SAMSUNG ELECTRONICS CO., LTD.  
**EUT DESCRIPTION:** GSM Phone + Bluetooth & WLAN 2.4GHz b/g/n  
**MODEL:** SM-G316HU/DD  
**SERIAL NUMBER:** RV1F91D0Z7A (conducted) RV1F91CWY6Y (radiated)  
**DATE TESTED:** OCTOBER 1-2, 2014

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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LAB ENGINEER  
UL Verification Services Inc.

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, and FCC CFR 47 Part 15.

## 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 checked="" 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 type="checkbox"/> Chamber C(IC: 2324B-3)	<input type="checkbox"/> Chamber F(IC: 2324B-6)
	<input 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 Phone + Bluetooth, and WLAN 2.4GHz b/g/n.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402-2480	BLE	8.13	6.50

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an LDS antenna, with a maximum gain of -0.7 dBi.

## **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	Samsung	ETA0U10IBE	N/A	N/A
Earphone	Samsung	GH59	N/A	N/A

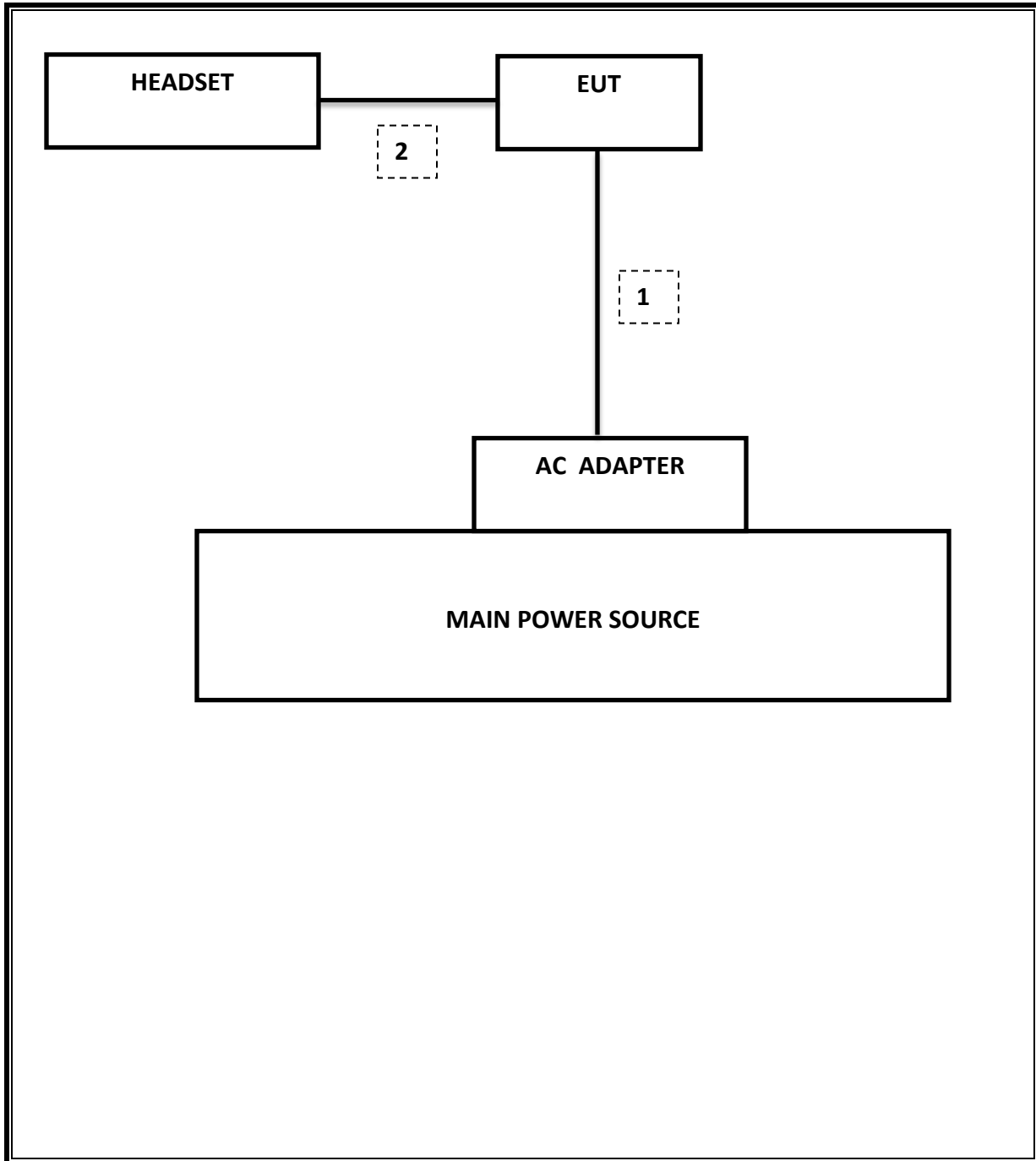
### I/O CABLES

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.

**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 Date	Cal Due
Antenna, Biconolog, 30MHz-100MHz	Sunol Sciences	JB1	C01171	03/23/13	02/13/15
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/13	10/25/14
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/13	11/14/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	01/28/13	01/28/15
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/13	10/22/14
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/13	12/20/14
CBT Bluetooth Tester	R & S	CBT	None	07/12/13	07/12/15
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/13	12/13/14
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/13	12/13/14
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/13	01/14/15
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR	CNR

## 7. SUMMARY

8	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	0.688 MHz
	2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-34.58 dBm
	15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	8.129 dBm
	15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-6.14dBm
	15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	43.37 dBuV(AV)
	15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	44.59 dBuV/m

## ANTENNA PORT TEST RESULTS

### 8.1. 6 dB BANDWIDTH

#### LIMITS

FCC §15.247 (a) (2)

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

#### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

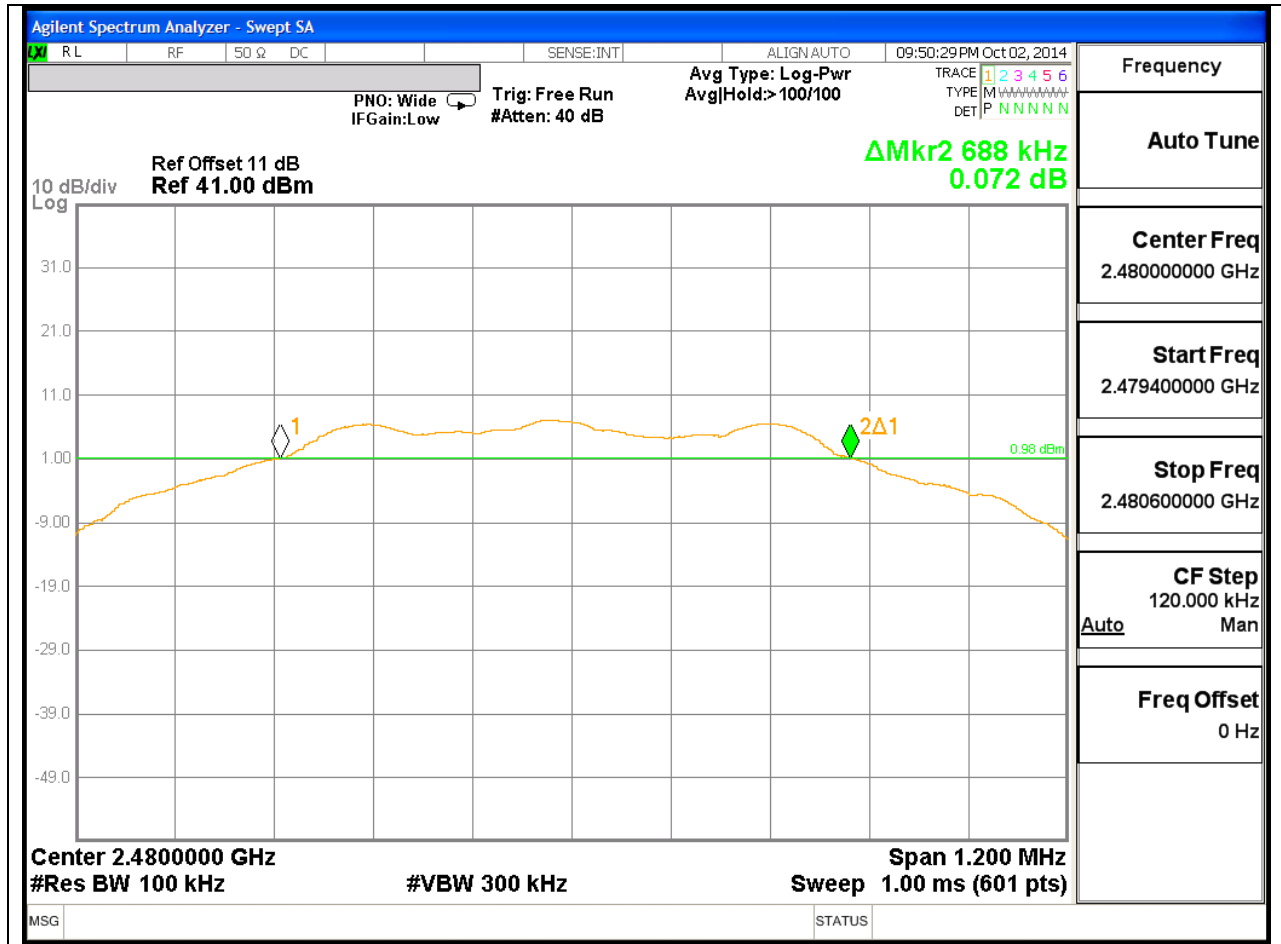
#### RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.7020	0.5
Middle	2440	0.7060	0.5
High	2480	0.6880	0.5





### HIGH CHANNEL



## 8.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

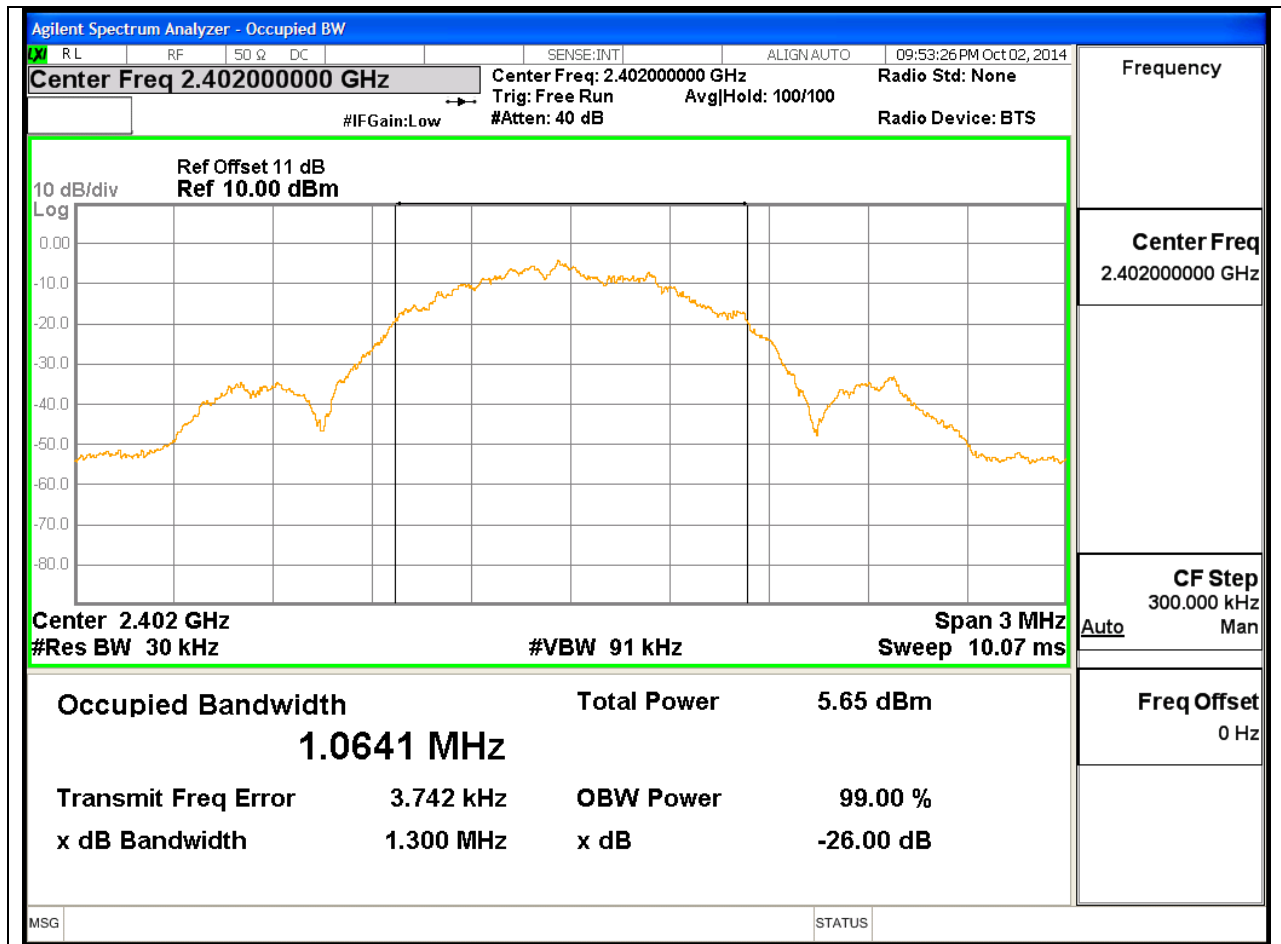
Reference to KDB558074 D01 DTS Meas Guidance v03r01: The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

### RESULTS

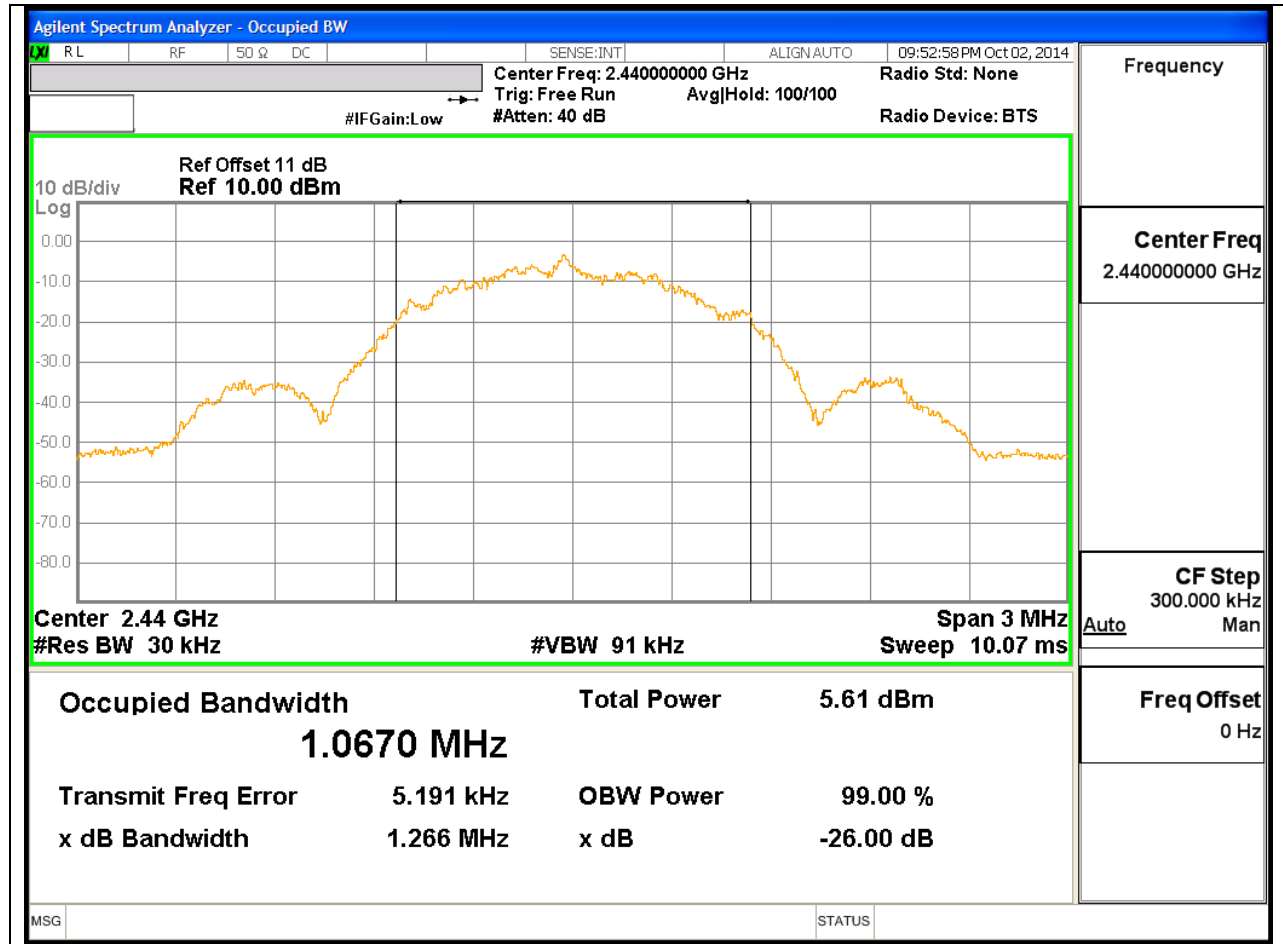
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0641
Middle	2440	1.0670
High	2480	1.0633

**99% BANDWIDTH PLOTS**

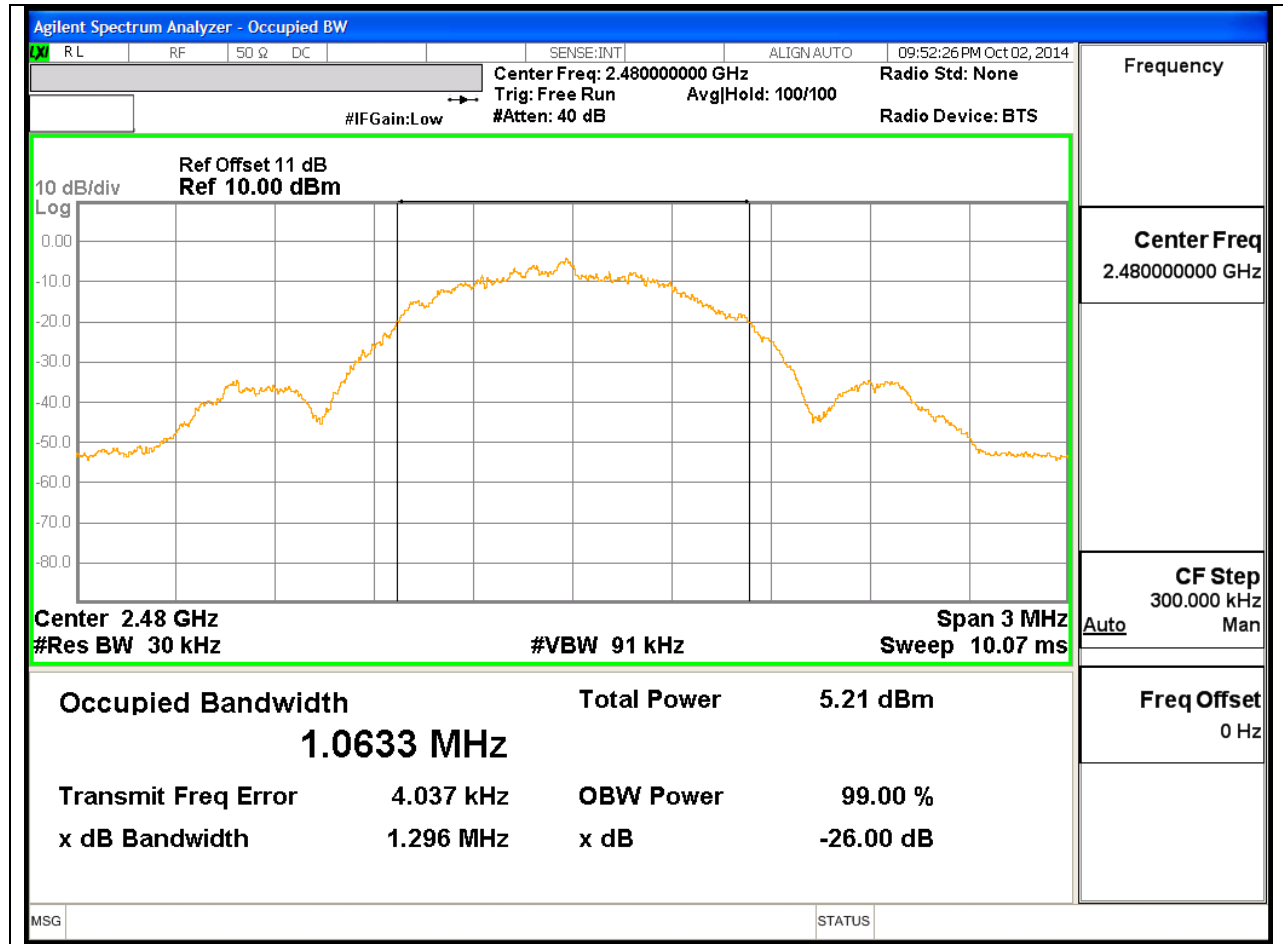
**LOW CHANNEL**



**MID CHANNEL**



### HIGH CHANNEL



### 8.3. OUTPUT POWER

#### LIMITS

FCC §15.247 (b)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

#### TEST PROCEDURE

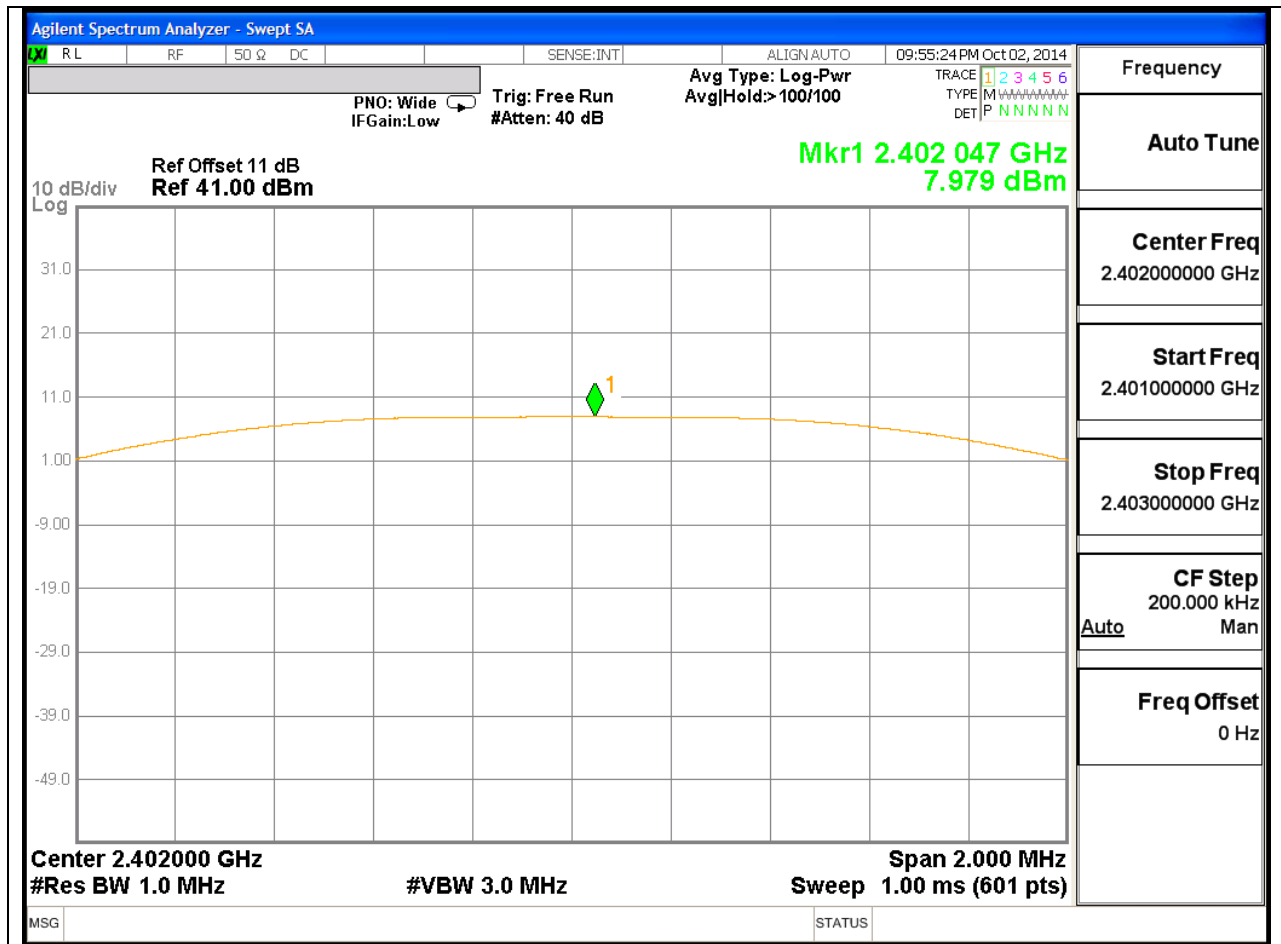
Peak power is measured using KDB558074 D01 DTS Meas Guidance v03r01 April 9, 2013 under section 9.1.1 utilizing spectrum analyzer.

#### RESULTS

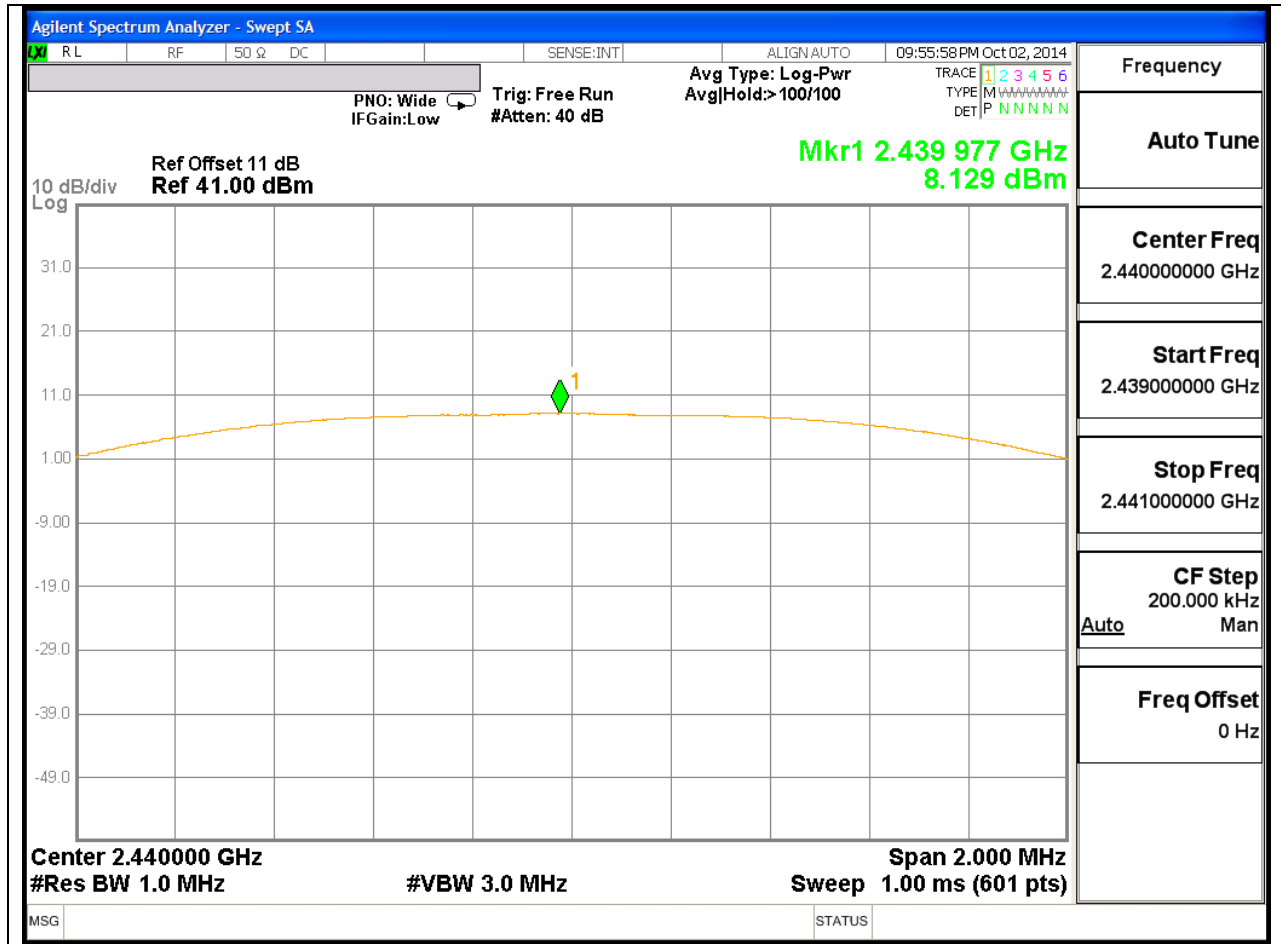
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.979	30	-22.021
Middle	2440	8.129	30	-21.871
High	2480	7.845	30	-22.155

**OUTPUT POWER PLOTS**

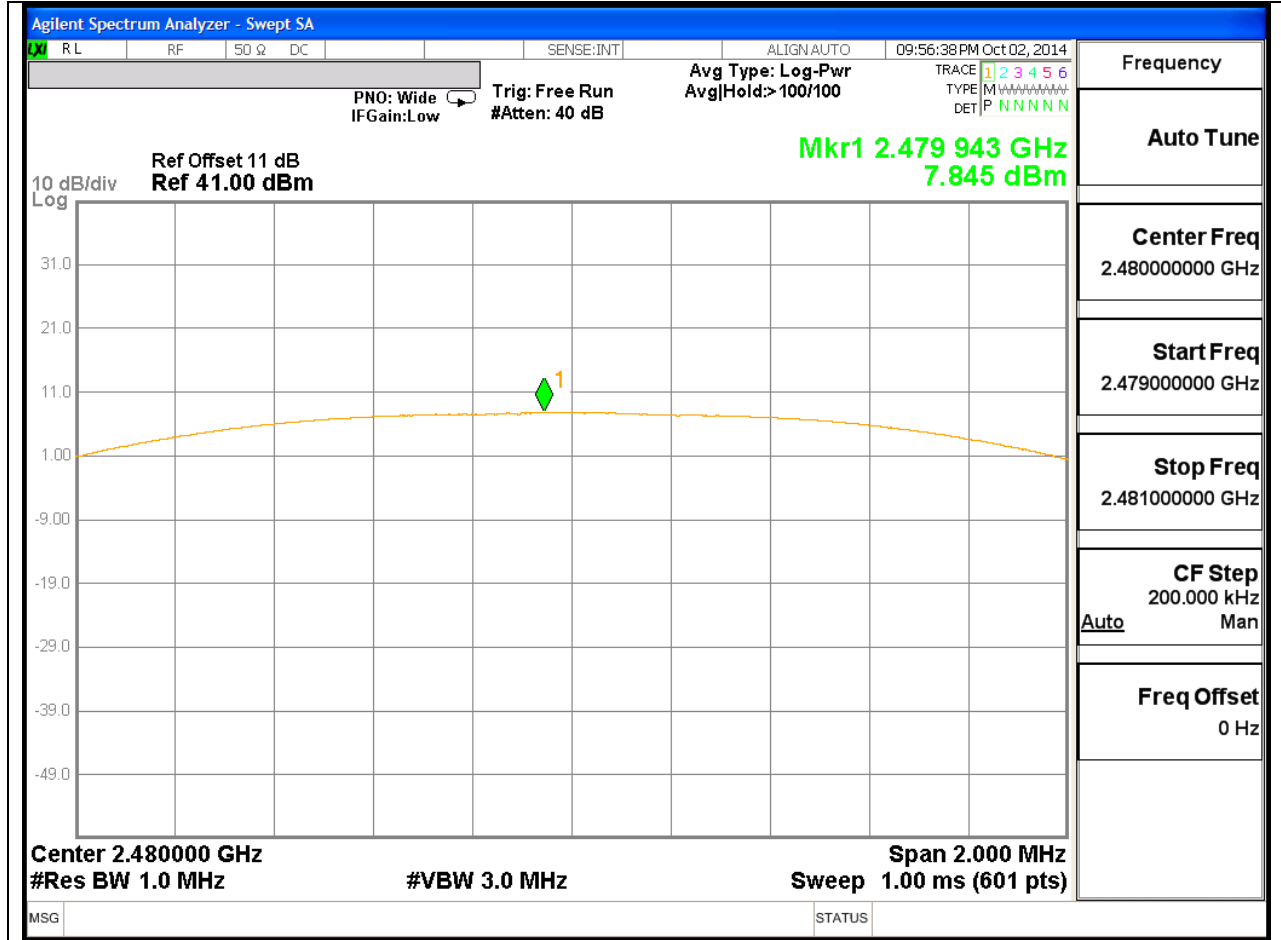
**LOW CHANNEL**



### MID CHANNEL



### HIGH CHANNEL



## 8.4. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a power meter.

### RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	7.9
Middle	2440	8.0
High	2480	7.5

## 8.5. POWER SPECTRAL DENSITY

### LIMITS

FCC §15.247 (e)

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.

### TEST PROCEDURE

Power Spectral Density was performed utilizing the “Method PKPSD (Peak PSD)” under KDB558074 D01 DTS Meas Guidance v03r01, April 9, 2013

### RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-6.14	8	-14.14
Middle	2440	-6.23	8	-14.23
High	2480	-6.54	8	-14.54







## **8.6. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

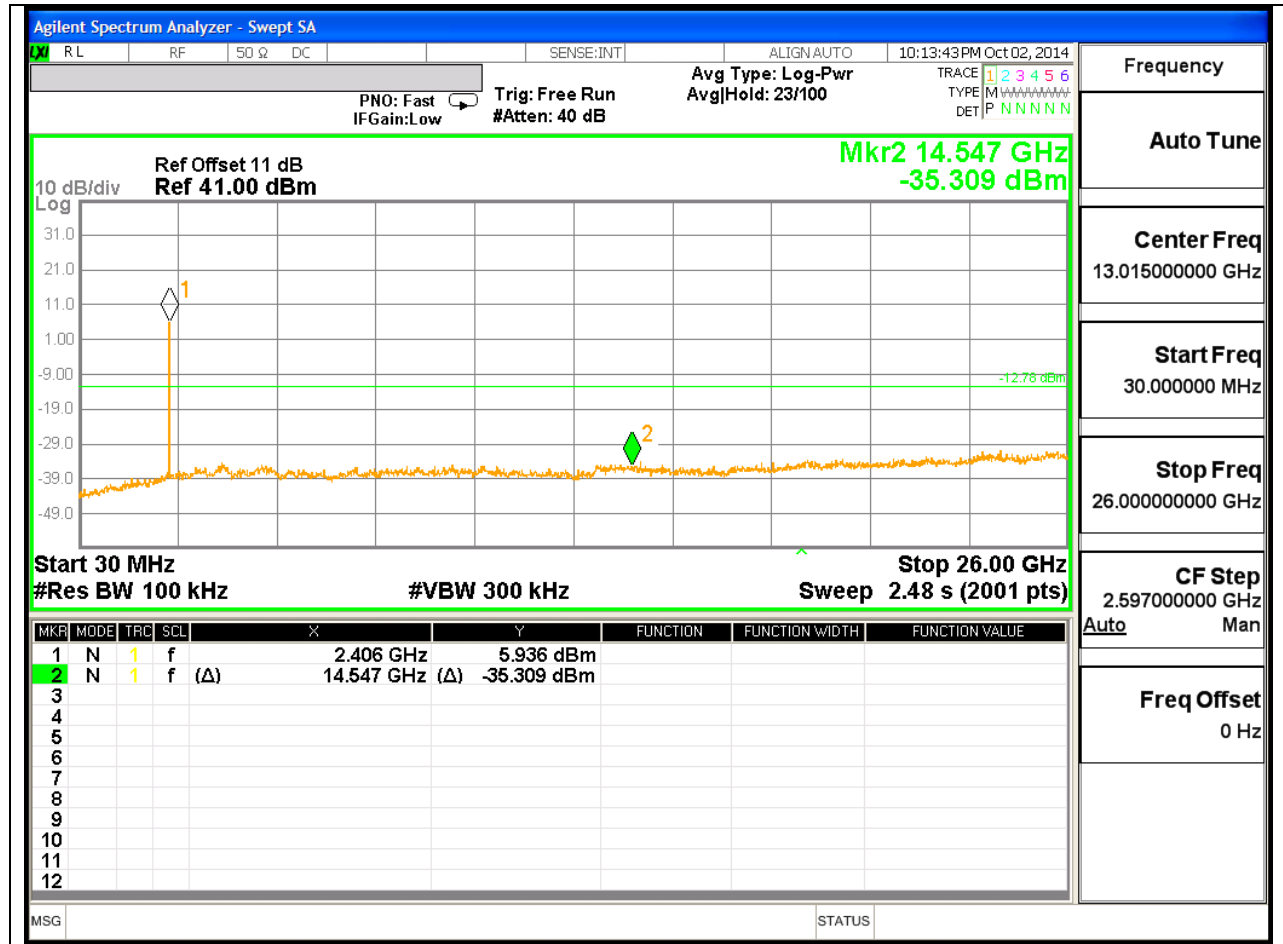
### **TEST PROCEDURE**

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

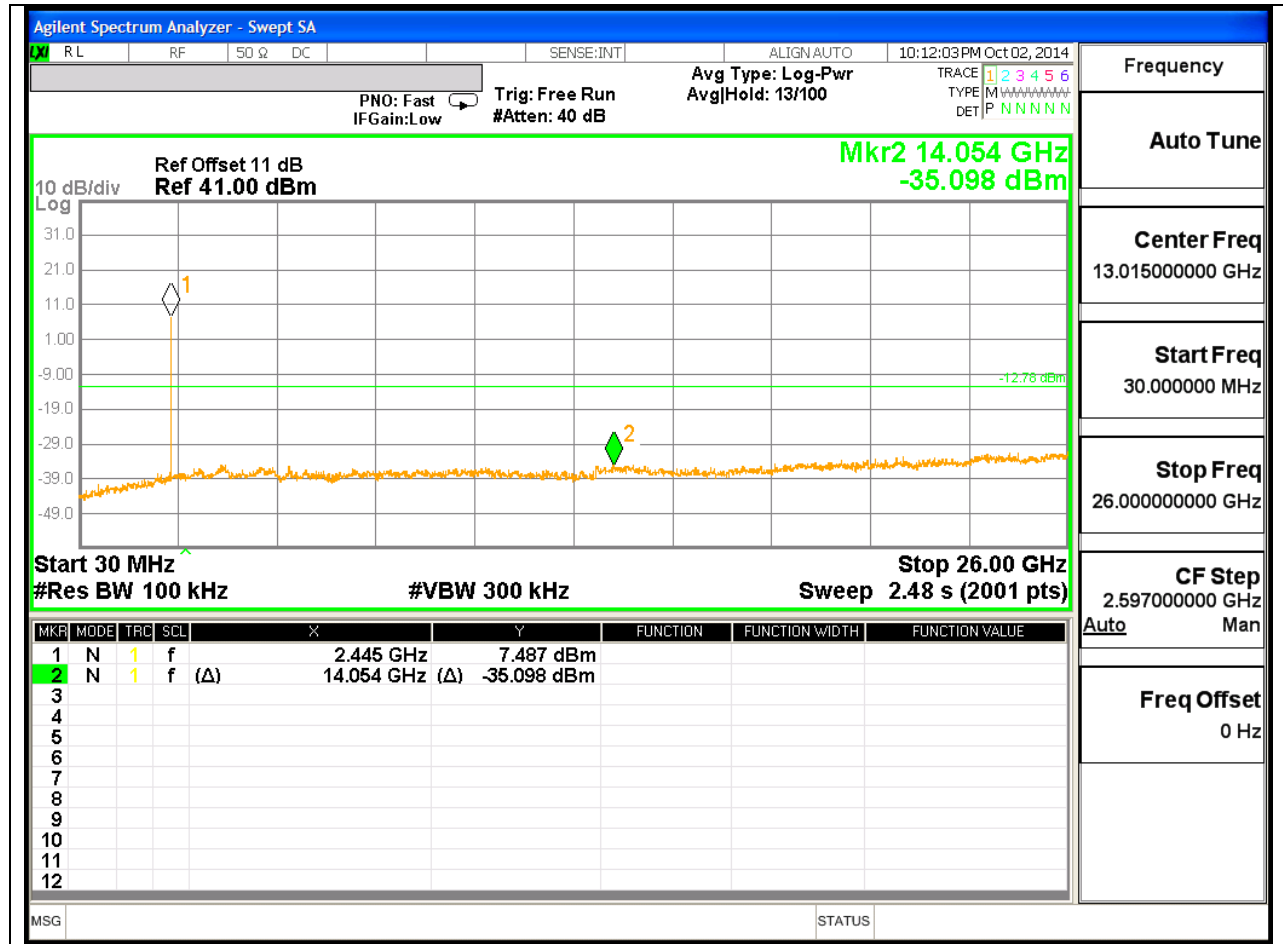


### LOW CHANNEL SPURIOUS



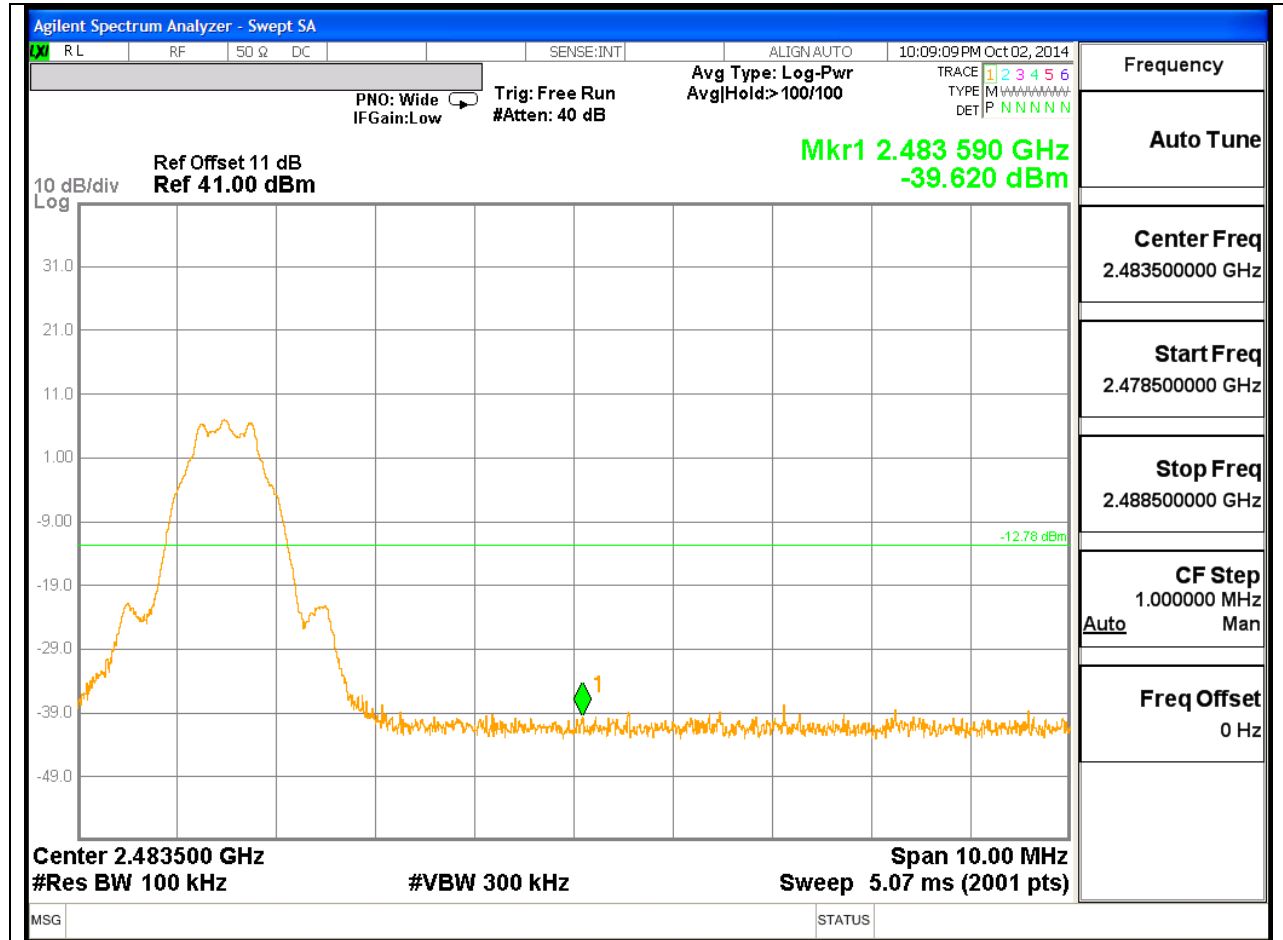


### MID CHANNEL SPURIOUS

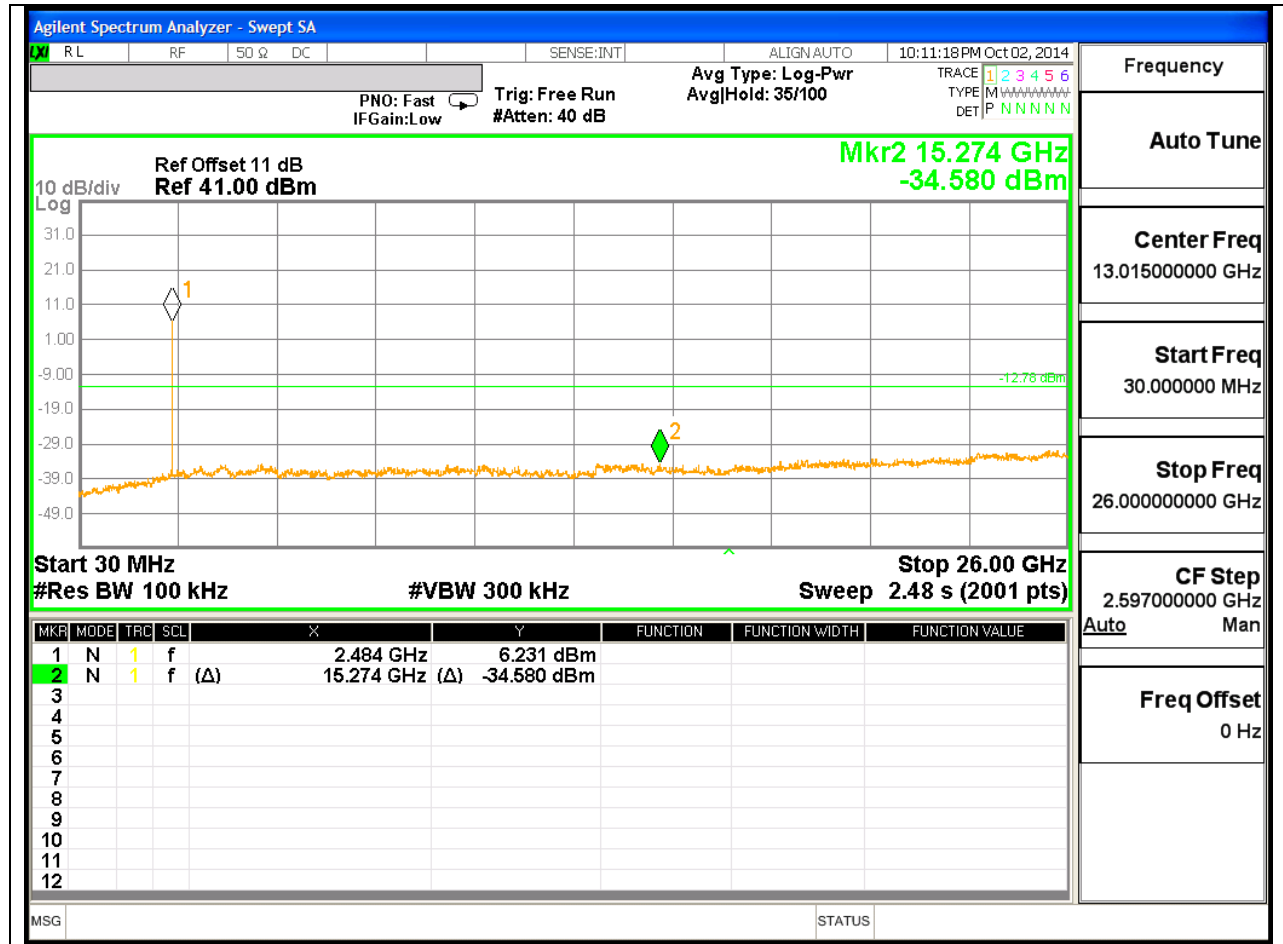


**SPURIOUS EMISSIONS, HIGH CHANNEL**

**HIGH CHANNEL BANDEDGE**



### HIGH CHANNEL SPURIOUS



## 9. RADIATED TEST RESULTS

### 9.1. 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 - 2009. 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.

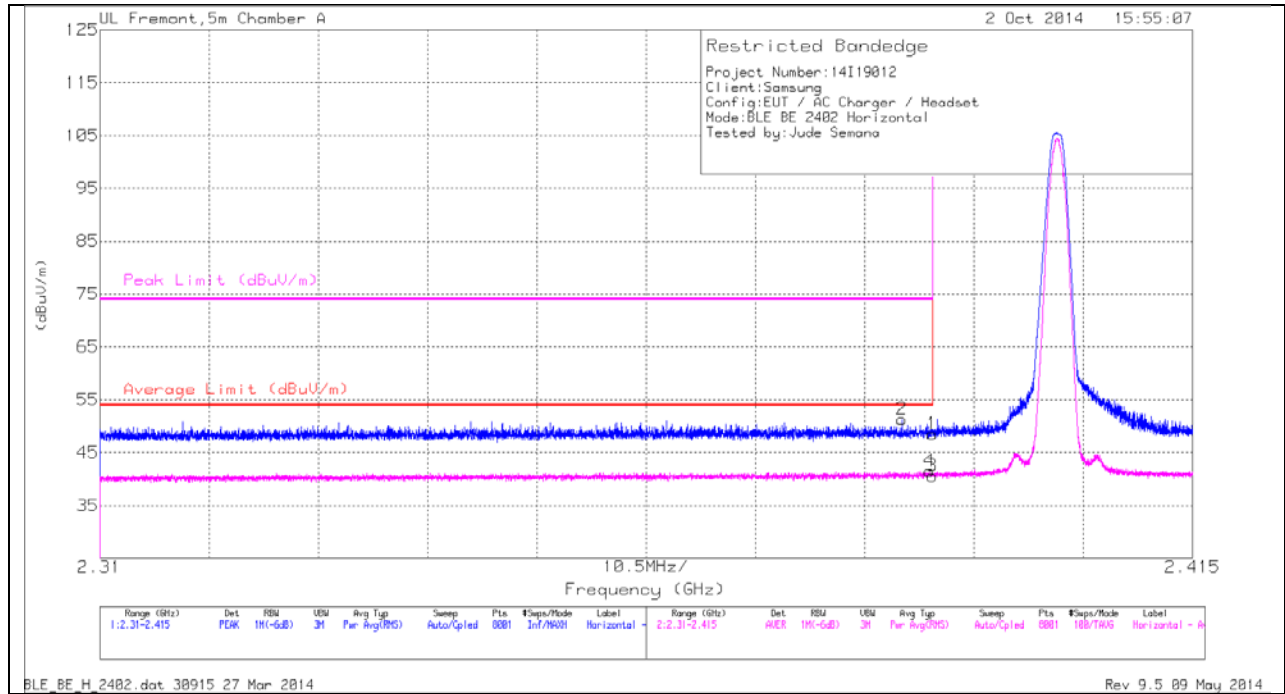
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor =  $10 \log(1/x)$ . For this sample:  $DCF = 10\log(1/0.618)=2.08\text{dB}$  (Spectrum Analyzer round it up to 2.1dB)

The spectrum from 30 MHz 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.

## 9.2. TRANSMITTER ABOVE 1 GHz RESTRICTED BANDEDGE (LOW CHANNEL)

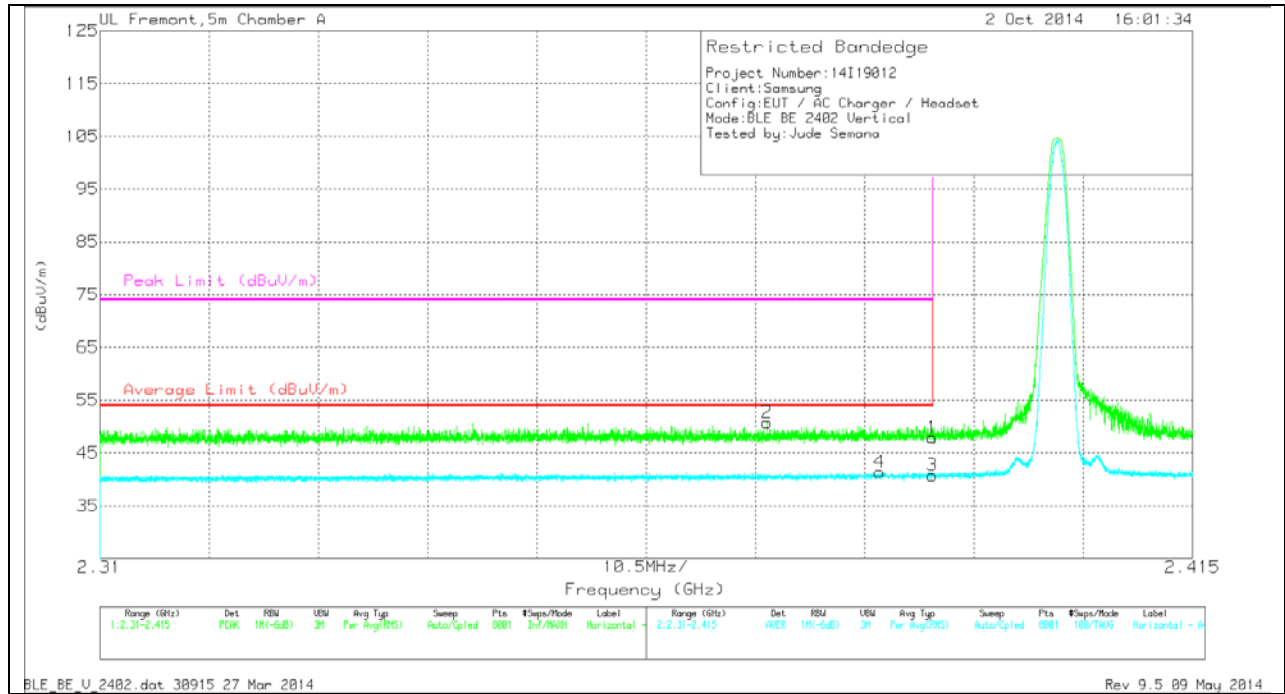
### HORIZONTAL PEAK AND AVERAGE PLOT



### HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fltr/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	39.14	PK	32.1	-22.7	0	48.54	-	-	74	-25.46	101	288	H
2	2.387	41.94	PK	32.1	-22.7	0	51.34	-	-	74	-22.66	101	288	H
3	2.39	29.09	RMS	32.1	-22.7	2.1	40.59	54	-13.41	-	-	101	288	H
4	2.39	30.01	RMS	32.1	-22.7	2.1	41.51	54	-12.49	-	-	101	288	H

**VERTICAL PEAK AND AVERAGE PLOT**

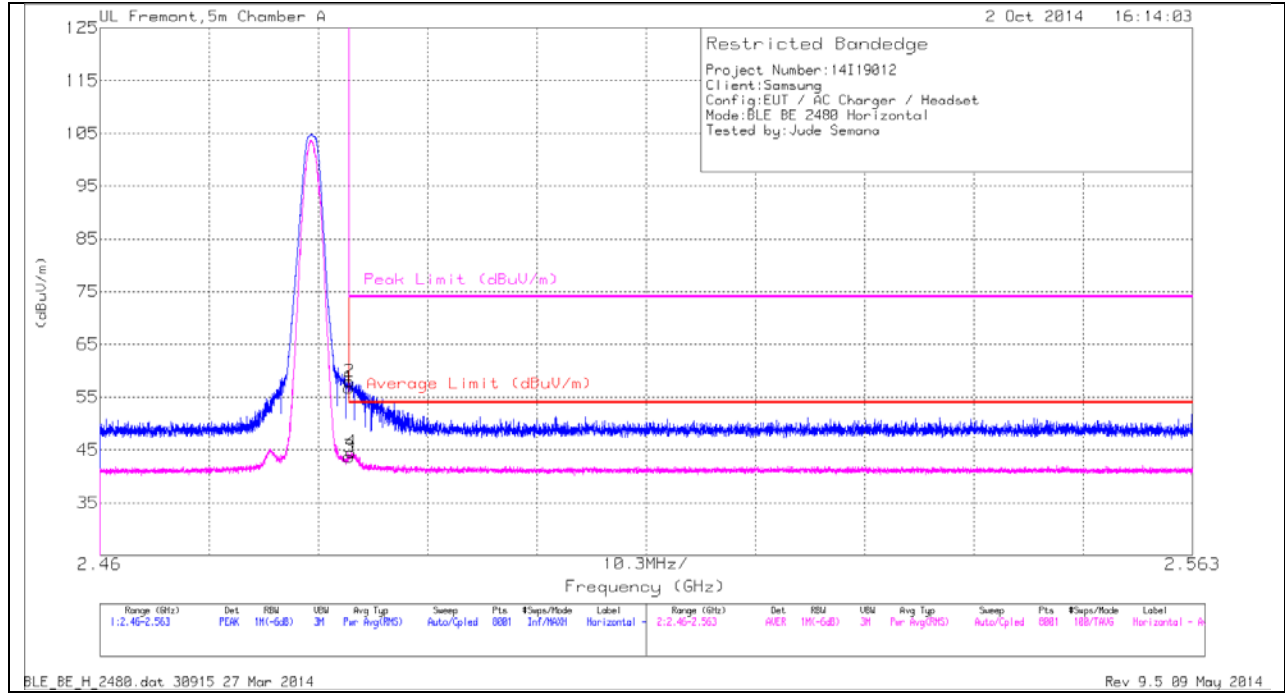


**VERTICAL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr/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	38.53	PK	32.1	-22.7	0	47.93	-	-	74	-26.07	147	354	V
2	2.374	41.56	PK	32	-22.8	0	50.76	-	-	74	-23.24	147	354	V
3	2.39	29.27	RMS	32.1	-22.7	2.1	40.77	54	-13.23	-	-	147	354	V
4	2.385	29.89	RMS	32.1	-22.7	2.1	41.39	54	-12.61	-	-	147	354	V

**AUTHORIZED BANDEDGE (HIGH CHANNEL)**

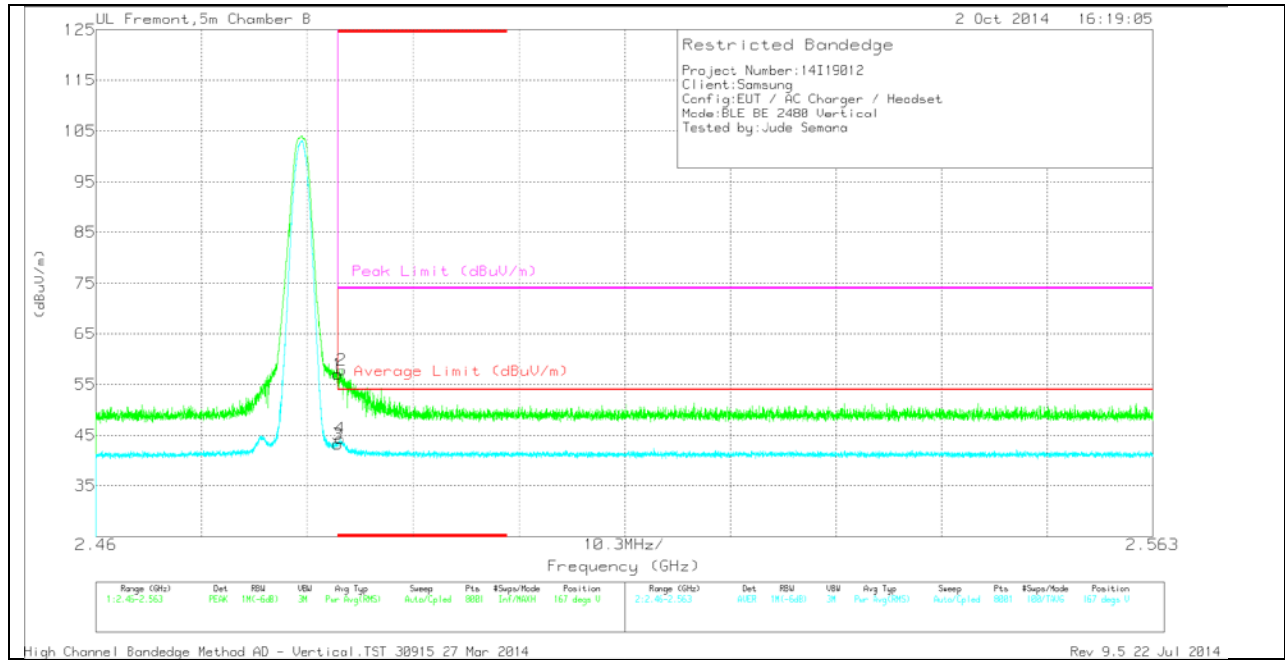
**HORIZONTAL PEAK AND AVERAGE PLOT**



**HORIZONTAL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr/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	46.98	PK	32.4	-22.6	0	56.78	-	-	74	-17.22	106	264	H
2	2.484	48.2	PK	32.4	-22.6	0	58	-	-	74	-16	106	264	H
3	2.484	31.84	RMS	32.4	-22.6	2.1	43.74	54	-10.26	-	-	106	264	H
4	2.484	32.69	RMS	32.4	-22.6	2.1	44.59	54	-9.41	-	-	106	264	H

**VERTICAL PEAK AND AVERAGE PLOT**

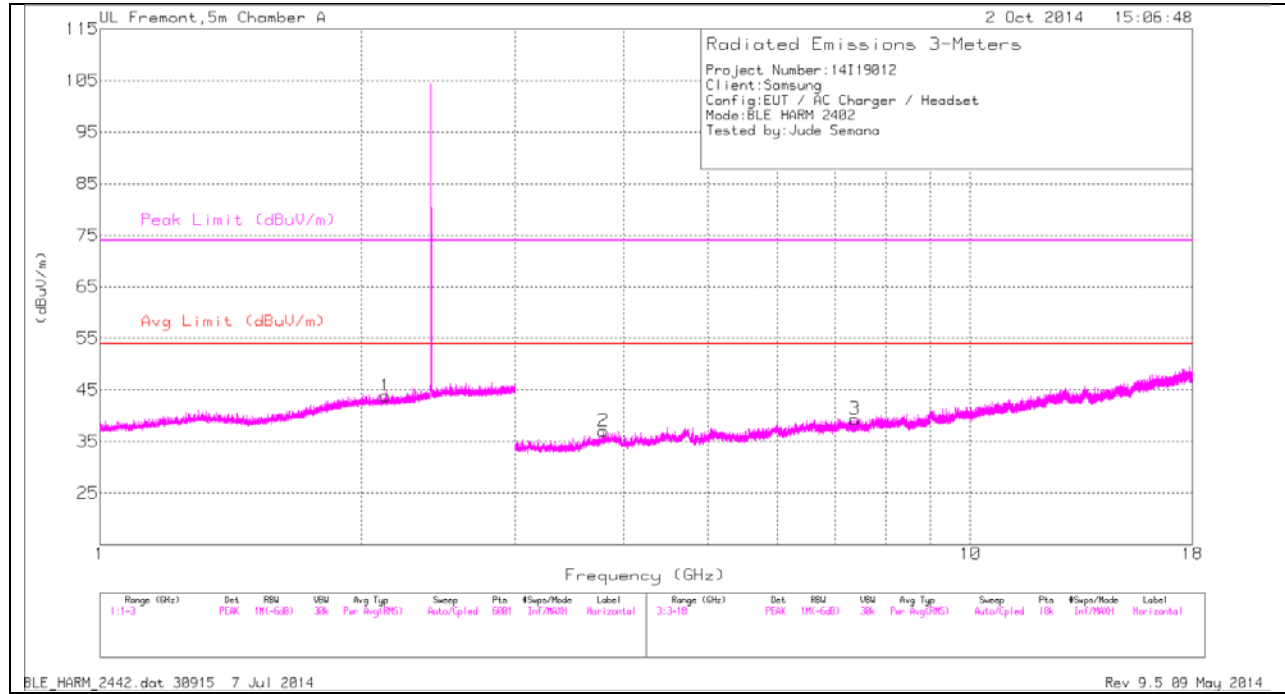


**VERTICAL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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	47.16	PK	32.4	-22.6	0	56.96	-	-	74	-17.04	167	338	V
2	* 2.484	48.12	PK	32.4	-22.6	0	57.92	-	-	74	-16.08	167	338	V
3	* 2.484	31.35	RMS	32.4	-22.6	2.1	43.25	54	-10.75	-	-	167	338	V
4	* 2.484	32.42	RMS	32.4	-22.6	2.1	44.25	54	-9.75	-	-	167	338	V

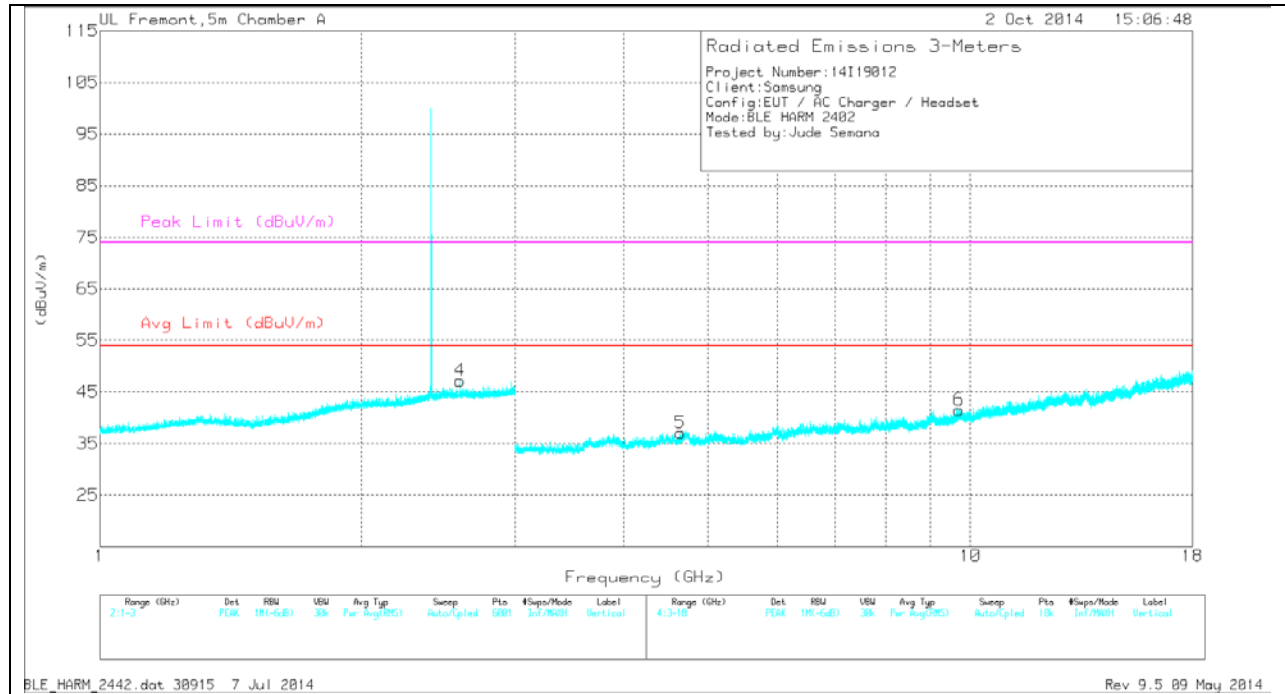
**HARMONICS AND SPURIOUS EMISSIONS**

**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 T345 (dB/m)	Amp/Cb/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	2.13	35.66	PK	31.3	-23.1	0	43.86	-	-	-	-	0-360	100	H
4	2.593	37.33	PK	32.5	-22.6	0	47.23	-	-	-	-	0-360	200	V
2	3.791	34.28	PK	33.6	-30.8	0	37.08	-	-	74	-36.92	0-360	200	H
3	7.369	31.88	PK	35.6	-28.1	0	39.38	-	-	74	-34.62	0-360	200	H
5	4.648	33.6	PK	34.2	-30.7	0	37.1	-	-	74	-36.9	0-360	200	V
6	9.71	28.83	PK	36.9	-24.2	0	41.53	-	-	-	-	0-360	101	V

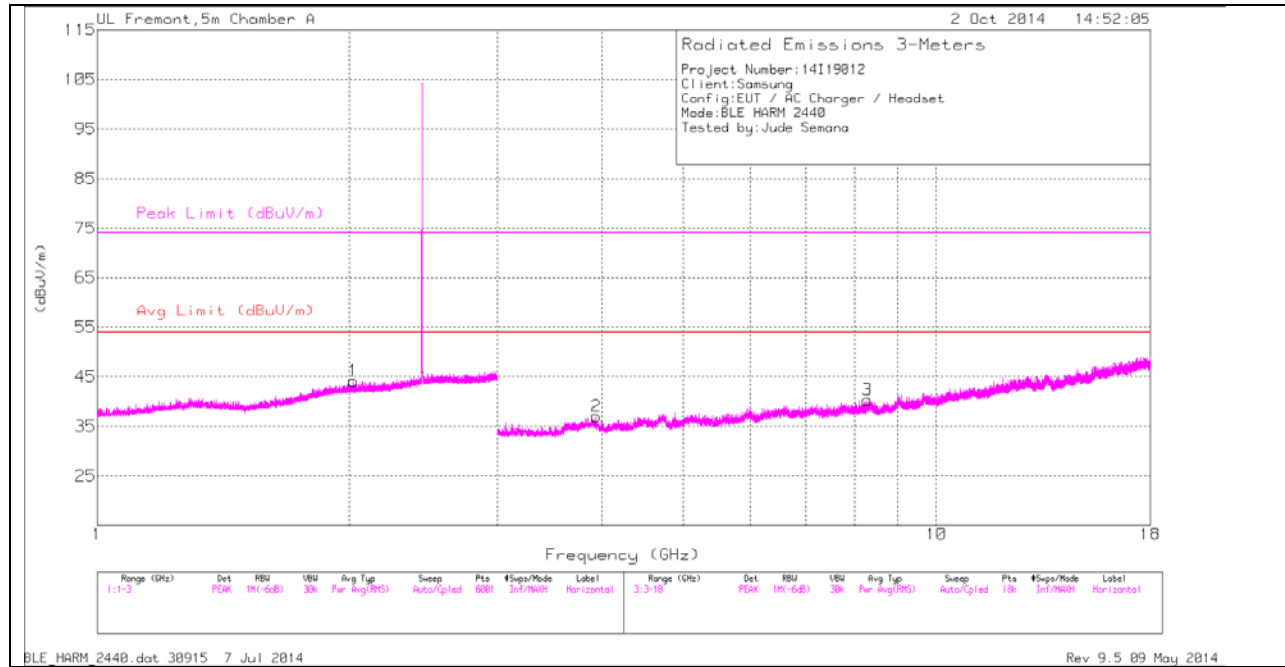
PK - Peak detector

*RADIATED EMISSIONS*

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/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
4.804	42.24	PK2	34.2	-29.6	0	46.84	-	-	74	-27.16	54	195	H
4.804	34.13	MAv1	34.2	-29.6	2.1	40.83	54	-13.17	-	-	54	195	H
11.222	22.48	MAv1	37.9	-23	2.1	39.48	54	-14.52	-	-	193	376	H
4.804	42.98	PK2	34.2	-29.6	0	47.58	-	-	74	-26.42	136	180	V
4.804	35.42	MAv1	34.2	-29.6	2.1	42.12	54	-11.88	-	-	136	180	V
4.804	43.05	PK2	34.2	-29.6	0	47.65	-	-	74	-26.35	146	222	V
4.804	35.51	MAv1	34.2	-29.6	2.1	42.21	54	-11.79	-	-	146	222	V

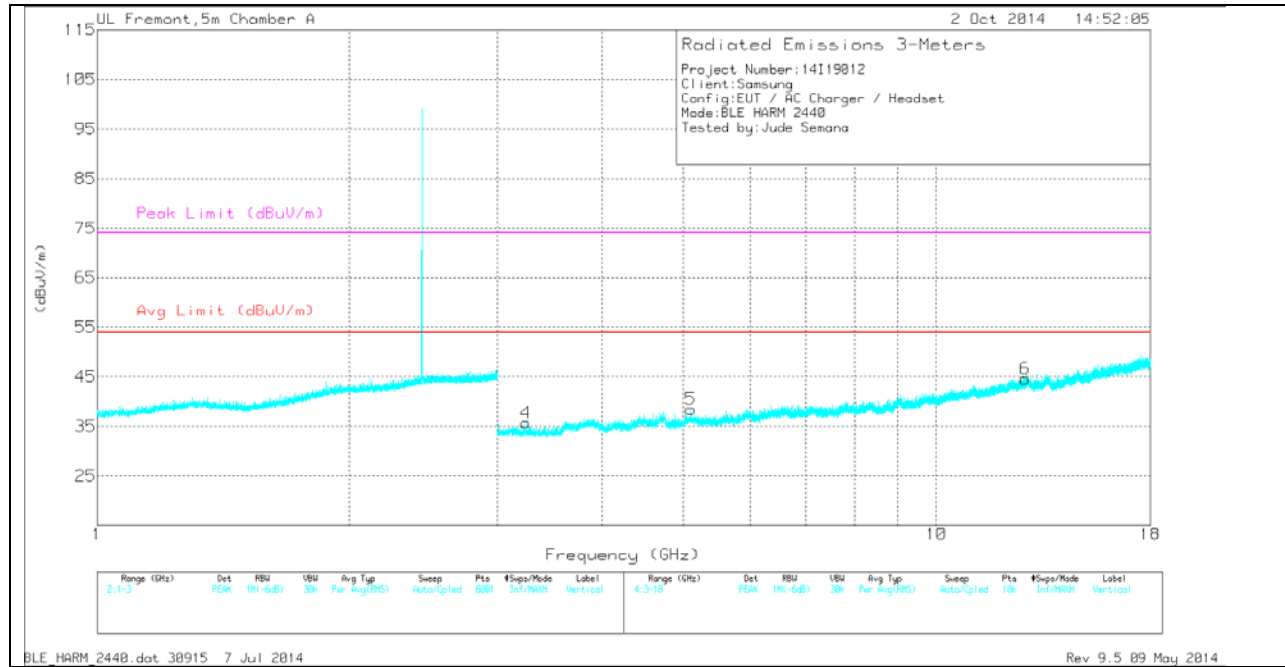
FCC Part15 Subpart C T186 2400MHz Spurious Emissions.TST 12746Rev 9.5 12 Jun 2013

### 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.

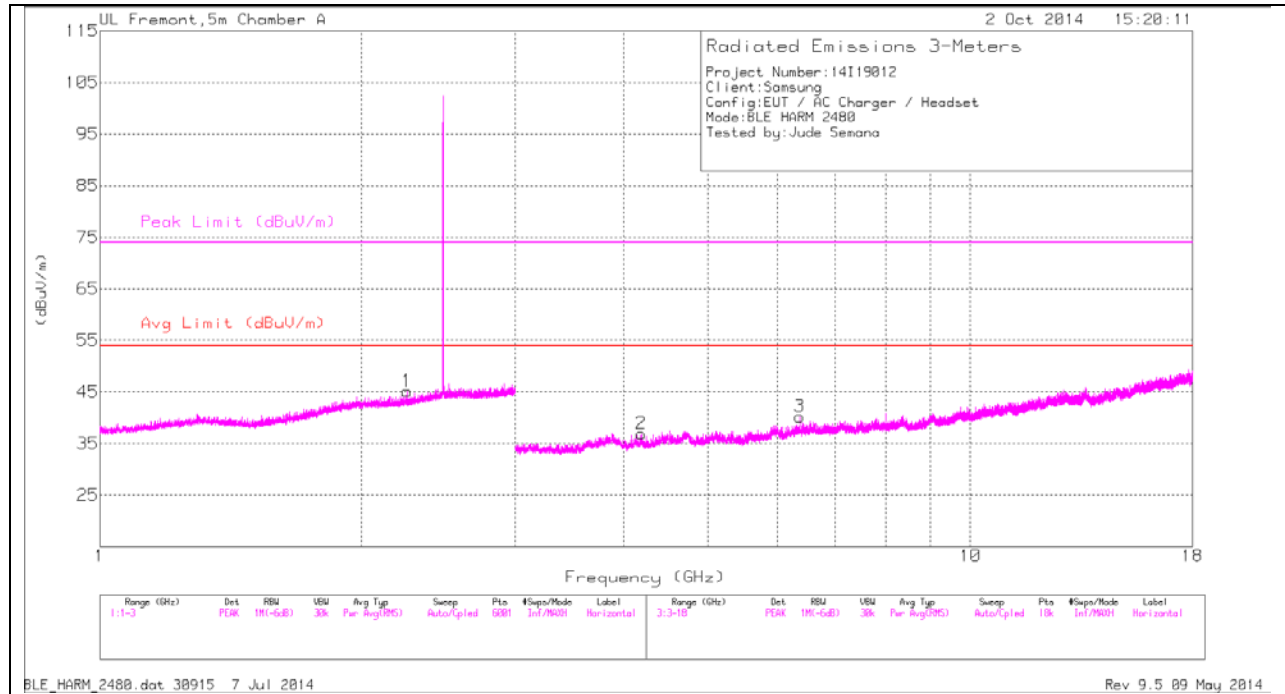
**MID CHANNEL DATA**

*TRACE MARKERS*

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /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	2.021	36.13	PK	31.3	-23.3	0	44.13	-	-	-	-	0-360	199	H
2	3.936	33.82	PK	33.7	-30.5	0	37.02	-	-	74	-36.98	0-360	199	H
3	8.281	31.1	PK	35.7	-26.4	0	40.4	-	-	74	-33.6	0-360	102	H
4	3.245	34.12	PK	32.8	-31.2	0	35.72	-	-	-	-	0-360	101	V
5	5.102	32.99	PK	34.3	-28.8	0	38.49	-	-	74	-35.51	0-360	101	V
6	12.759	27.42	PK	39.2	-22	0	44.62	-	-	-	-	0-360	101	V

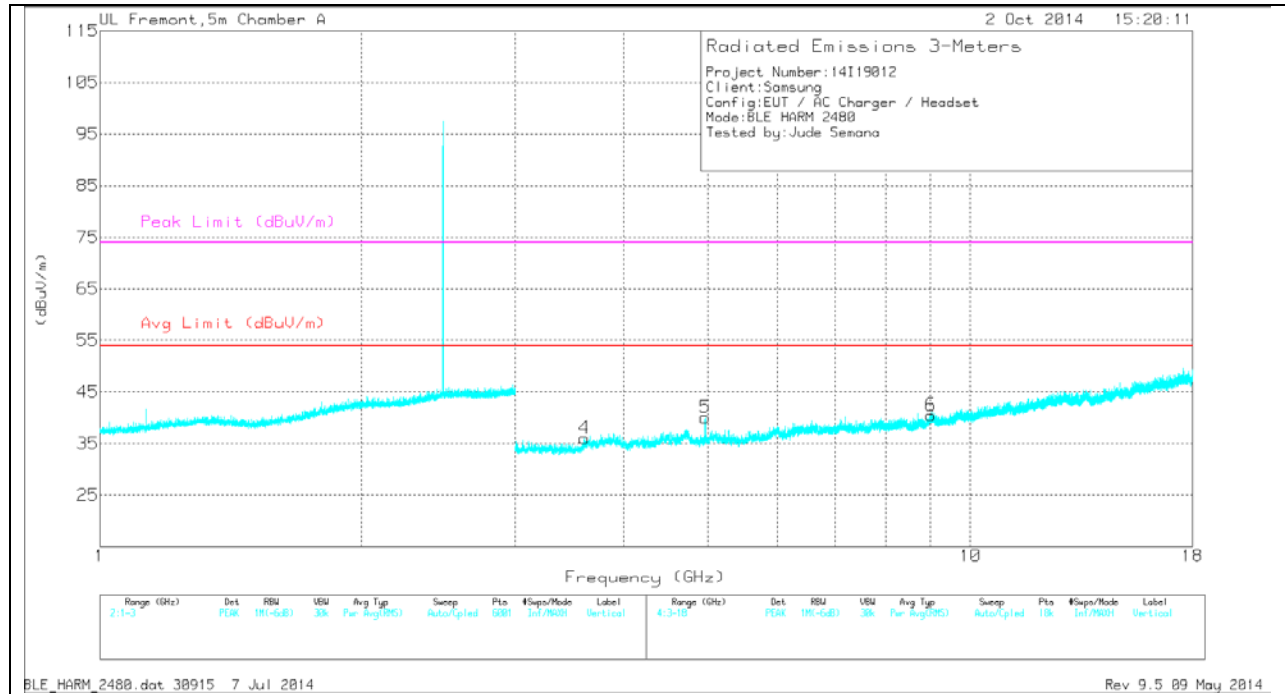
PK - Peak detector

### 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 T345 (dB/m)	Amp/Cb/Ftr/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	2.256	36.65	PK	31.5	-23	0	45.15	-	-	74	-28.85	0-360	200	H
2	4.188	33.54	PK	33.6	-30.2	0	36.94	-	-	74	-37.06	0-360	101	H
3	6.368	33.96	PK	35.6	-29.3	0	40.26	-	-	-	-	0-360	200	H
4	3.606	33.85	PK	33.1	-30.9	0	36.05	-	-	74	-37.95	0-360	101	V
5	4.96	36.5	PK	34.2	-30.6	0	40.1	-	-	74	-33.9	0-360	101	V
6	9.01	28.57	PK	36.2	-24.3	0	40.47	-	-	74	-33.53	0-360	101	V

PK - Peak detector

*RADIATED EMISSIONS*

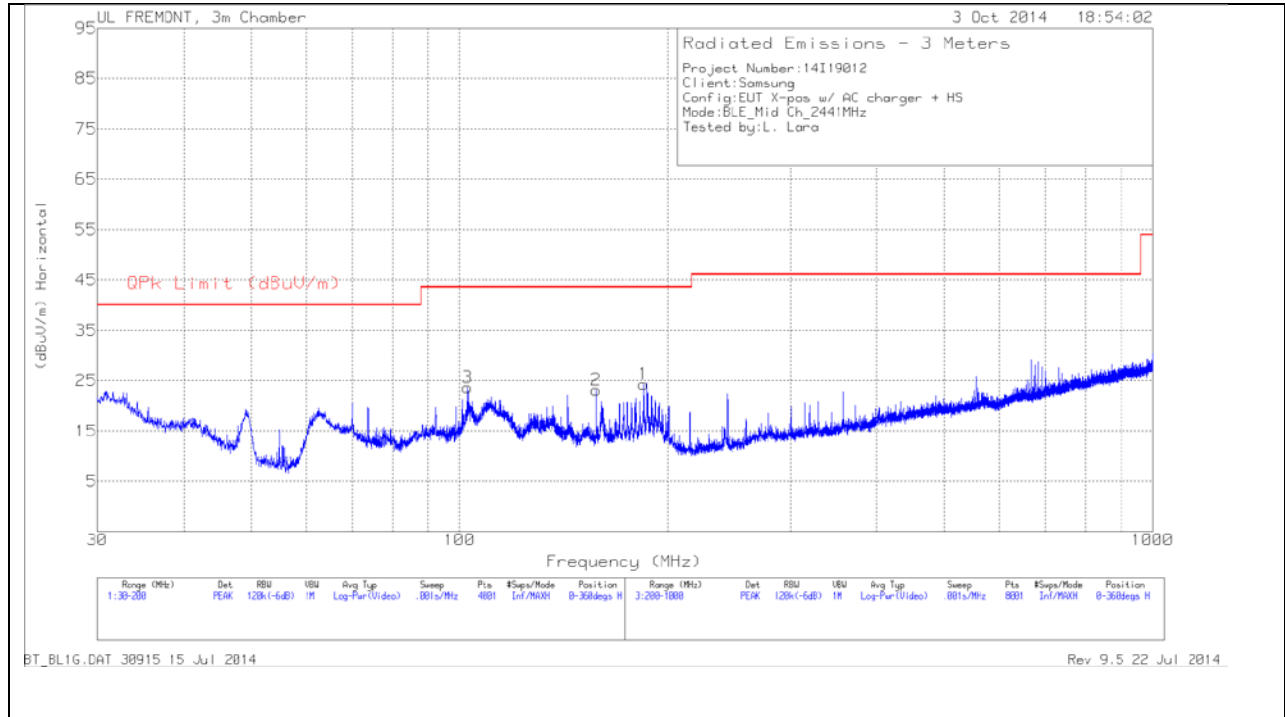
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
.117	27.67	QP	3.2	-2.9	0	27.97	-	-	-	-	1	100	H
4.804	34.13	MAv1	34.2	-29.6	2.1	40.83	54	-13.17	-	-	54	195	H
11.222	22.48	MAv1	37.9	-23	2.1	39.48	54	-14.52	-	-	193	376	H
4.804	42.98	PK2	34.2	-29.6	0	47.58	-	-	74	-26.42	136	180	V
4.804	35.42	MAv1	34.2	-29.6	2.1	42.12	54	-11.88	-	-	136	180	V
4.804	43.05	PK2	34.2	-29.6	0	47.65	-	-	74	-26.35	146	222	V
4.804	35.51	MAv1	34.2	-29.6	2.1	42.21	54	-11.79	-	-	146	222	V

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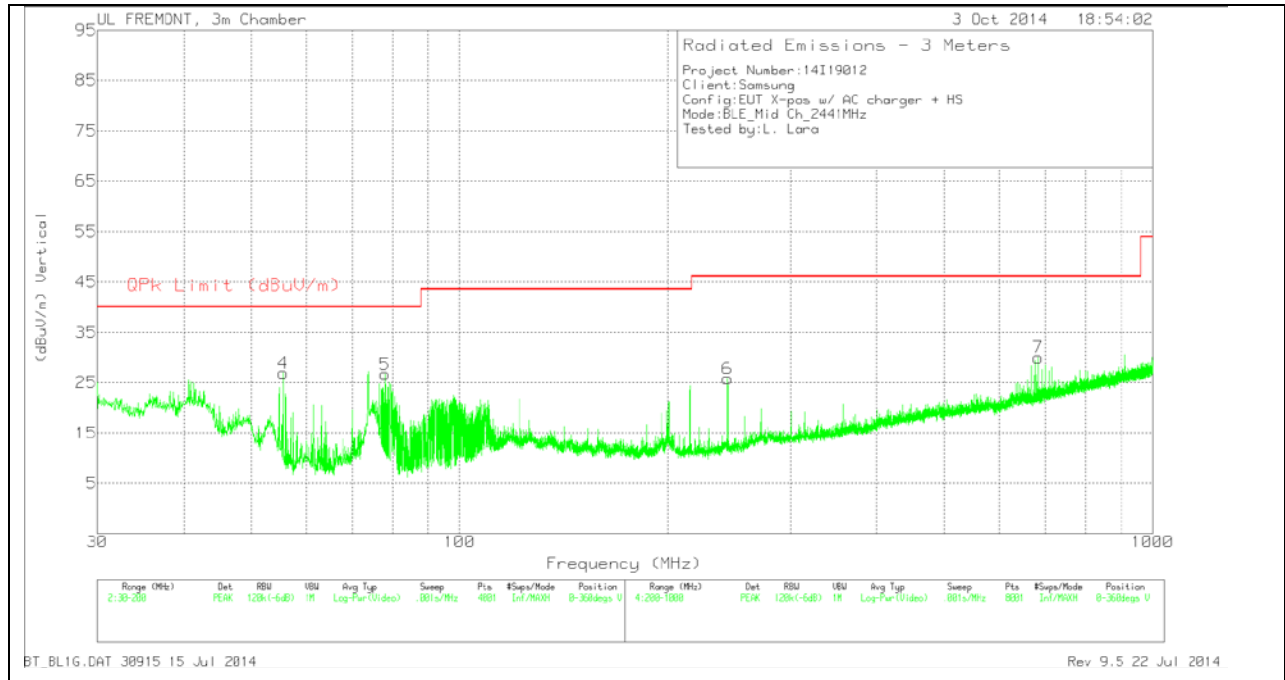
### 9.3. WORST-CASE BELOW 1 GHz

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

#### HORIZONTAL PLOT



### VERTICAL PLOT



### BELOW 1 GHz TABLE

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	55.67	48.16	PK	7.2	-28.5	26.86	40	-13.14	0-360	101	V
5	78.0675	47.15	PK	7.8	-28.3	26.65	40	-13.35	0-360	101	V
3	102.675	40.76	PK	10.9	-28	23.66	43.52	-19.86	0-360	400	H
2	157.5	38.36	PK	12.2	-27.4	23.16	43.52	-20.36	0-360	100	H
1	184.3175	40.53	PK	10.9	-27.1	24.33	43.52	-19.19	0-360	200	H
6	243.4	40.48	PK	11.7	-26.4	25.78	46.02	-20.24	0-360	300	V
7	684	34.97	PK	19.8	-24.8	29.97	46.02	-16.05	0-360	101	V

PK - Peak detector

PK - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 9 Jul 2013 Rev 9.5 12 Jun 2013

## 10. 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 <sup>*</sup>	56 to 46 <sup>*</sup>
0.5-5	56	46
5-30	60	50

<sup>\*</sup> Decreases with the logarithm of the frequency.

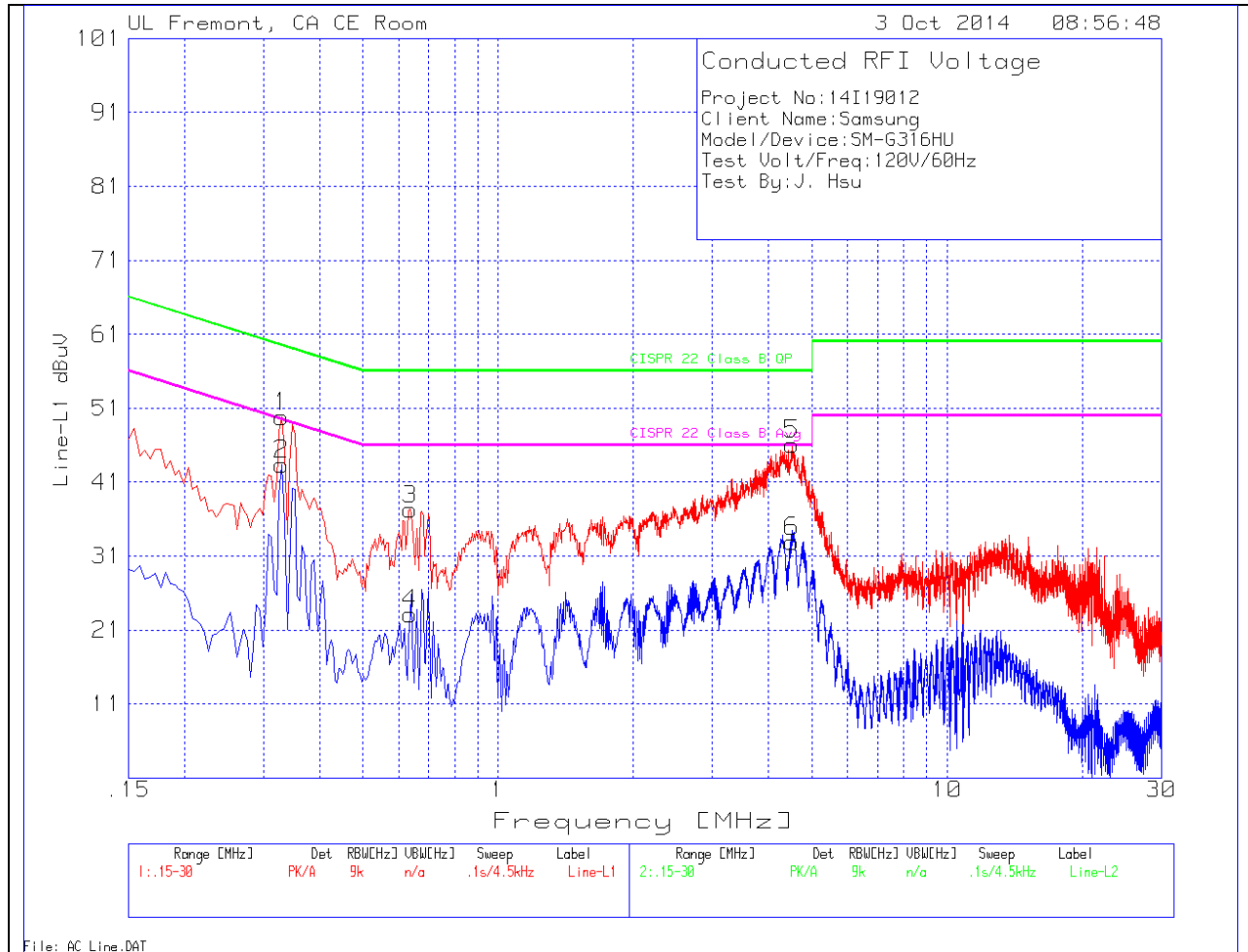
### TEST PROCEDURE

ANSI C63.4 - 2009

**RESULTS**

**6 WORST EMISSIONS**

**LINE 1 PLOT**

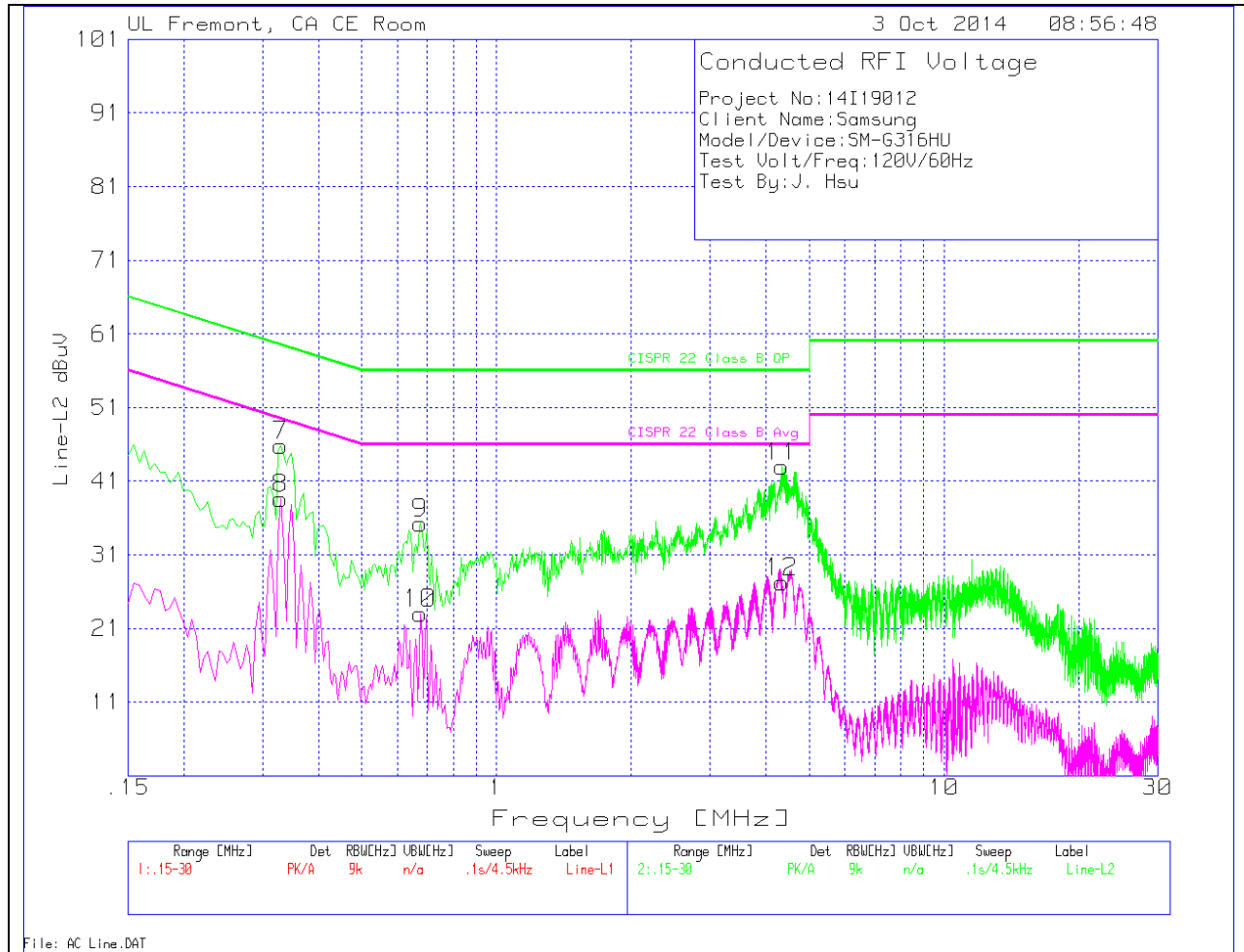


**LINE 1 RESULTS**

**Trace Markers**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.33	49.37	PK	.5	0	49.87	59.5	-9.63	-	-
2	.33	42.87	Av	.5	0	43.37	-	-	49.5	-6.13
3	.636	36.95	PK	.3	0	37.25	56	-18.75	-	-
4	.636	22.83	Av	.3	0	23.13	-	-	46	-22.87
5	4.506	45.82	PK	.2	.1	46.12	56	-9.88	-	-
6	4.506	32.63	Av	.2	.1	32.93	-	-	46	-13.07

### LINE 2 PLOT



### LINE 2 RESULTS

#### Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
7	.33	45.34	PK	.5	0	45.84	59.5	-13.66	-	-
8	.33	38.14	Av	.5	0	38.64	-	-	49.5	-10.86
9	.6765	35	PK	.3	0	35.3	56	-20.7	-	-
10	.6765	22.67	Av	.3	0	22.97	-	-	46	-23.03
11	4.344	42.62	PK	.2	.1	42.92	56	-13.08	-	-
12	4.344	26.92	Av	.2	.1	27.22	-	-	46	-18.78