



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

**CERTIFICATION TEST REPORT**

**FOR**

**TABLET DEVICE**

**MODEL: A1599**

**FCC ID: BCGA1599**

**IC: 579C-A1599**

**REPORT NUMBER: 14U17895-E6 Revision A**

**ISSUE DATE: AUGUST 28, 2014**

*Prepared for*

**APPLE, INC.**

**1 INFINITE LOOP**

**CUPERTINO, CA 95014, 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

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
---	08/11/14	Initial Issue	F. de Anda
A	08/28/14	Updated section 3	F. de Anda

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS .....</b>	<b>4</b>
<b>2. TEST METHODOLOGY .....</b>	<b>5</b>
<b>3. FACILITIES AND ACCREDITATION .....</b>	<b>5</b>
<b>4. CALIBRATION AND UNCERTAINTY .....</b>	<b>5</b>
<b>5. EQUIPMENT UNDER TEST .....</b>	<b>6</b>
5.1. DESCRIPTION OF EUT .....	6
5.2. MAXIMUM OUTPUT POWER .....	6
5.3. DESCRIPTION OF AVAILABLE ANTENNAS .....	6
5.4. SOFTWARE AND FIRMWARE.....	6
5.5. WORST-CASE CONFIGURATION AND MODE.....	6
5.6. DESCRIPTION OF TEST SETUP.....	7
<b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>11</b>
<b>7. MEASUREMENT METHODS .....</b>	<b>12</b>
<b>8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS .....</b>	<b>13</b>
8.1. ON TIME AND DUTY CYCLE RESULTS.....	13
<b>9. ANTENNA PORT TEST RESULTS .....</b>	<b>14</b>
9.1. 6 dB BANDWIDTH.....	14
9.2. 99% BANDWIDTH.....	17
9.3. OUTPUT POWER .....	20
9.4. AVERAGE POWER.....	23
9.5. POWER SPECTRAL DENSITY .....	24
9.6. CONDUCTED SPURIOUS EMISSIONS.....	27
<b>10. RADIATED TEST RESULTS.....</b>	<b>31</b>
10.1. LIMITS AND PROCEDURE.....	31
10.2. TRANSMITTER ABOVE 1 GHz.....	32
10.3. WORST-CASE ABOVE 18 GHz .....	42
10.4. WORST-CASE BELOW 1 GHz.....	43
<b>11. AC POWER LINE CONDUCTED EMISSIONS.....</b>	<b>45</b>
<b>12. SETUP PHOTOS.....</b>	<b>49</b>

# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** APPLE, INC.  
1 INFINITE LOOP  
CUPERTINO, CA 95014, U.S.A.

**EUT DESCRIPTION:** TABLET DEVICE

**MODEL:** A1599

**SERIAL NUMBER:** F4KMV00EG535

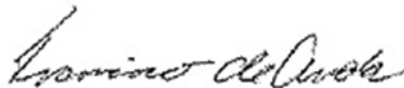
**DATE TESTED:** July 2-July 14, 2014

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	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 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.

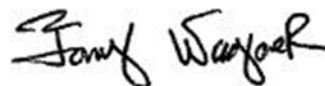
**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services and all revisions are duly noted in the revisions section.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



FRANCISCO DEANDA  
PROJECT LEAD  
UL Verification Services Inc.

Tested By:



Tony Wagoner  
EMC TEST 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, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 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	<input type="checkbox"/> Chamber D
<input type="checkbox"/> Chamber B	<input type="checkbox"/> Chamber E
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F
	<input checked="" type="checkbox"/> Chamber G
	<input checked="" type="checkbox"/> Chamber H

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:

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

### 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 1000 MHz	4.94 dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a tablet with IEEE 802.11a/b/g/n (MIMO 2x2) and Bluetooth radio. The rechargeable battery is not user accessible.

### 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	9.38	8.67

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PiFA antenna, with a maximum gain of 0.81dBi.

### 5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 12.1.729.874

The test utility software used during testing was Bluetool 1.8.5

### 5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was including headset, AC charger and the mode and channel with the highest output power.

The worst-position was the EUT with highest emissions. To determine the worst-case, the EUT is a portable device that has three orientations; therefore X, Y and Z orientations have been investigated with AC adapter and Headset, and the worst case was found to be at X (Flatbed) position without AC adapter and headset.

There are two vendors of the WiFi/Bluetooth radio modules: variant 1 and variant 2. They have the same mechanical outline, same on board antenna, matching circuit, antenna structure and same specification. Baseline testing was performed on the two variants to determine the worst case on all conducted power and radiated emissions.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC adapter	Apple	A1357	N/A	NA
Earphone	Apple	NA	NA	NA
Laptop	Apple	A1278	C02HJ0A7DTY4	NA
DC power supply	Sorensen	XT 15-4	1319A02780	NA

### I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	SMA	Un-Shielded	0.2	To spectrum Analyzer
2	USB	1	USB	Shielded	1	N/A
3	DC	1	DC	Un-shielded	0.8	N/A

### I/O CABLES (RADIATED ABOVE 1 GHZ)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
None used						

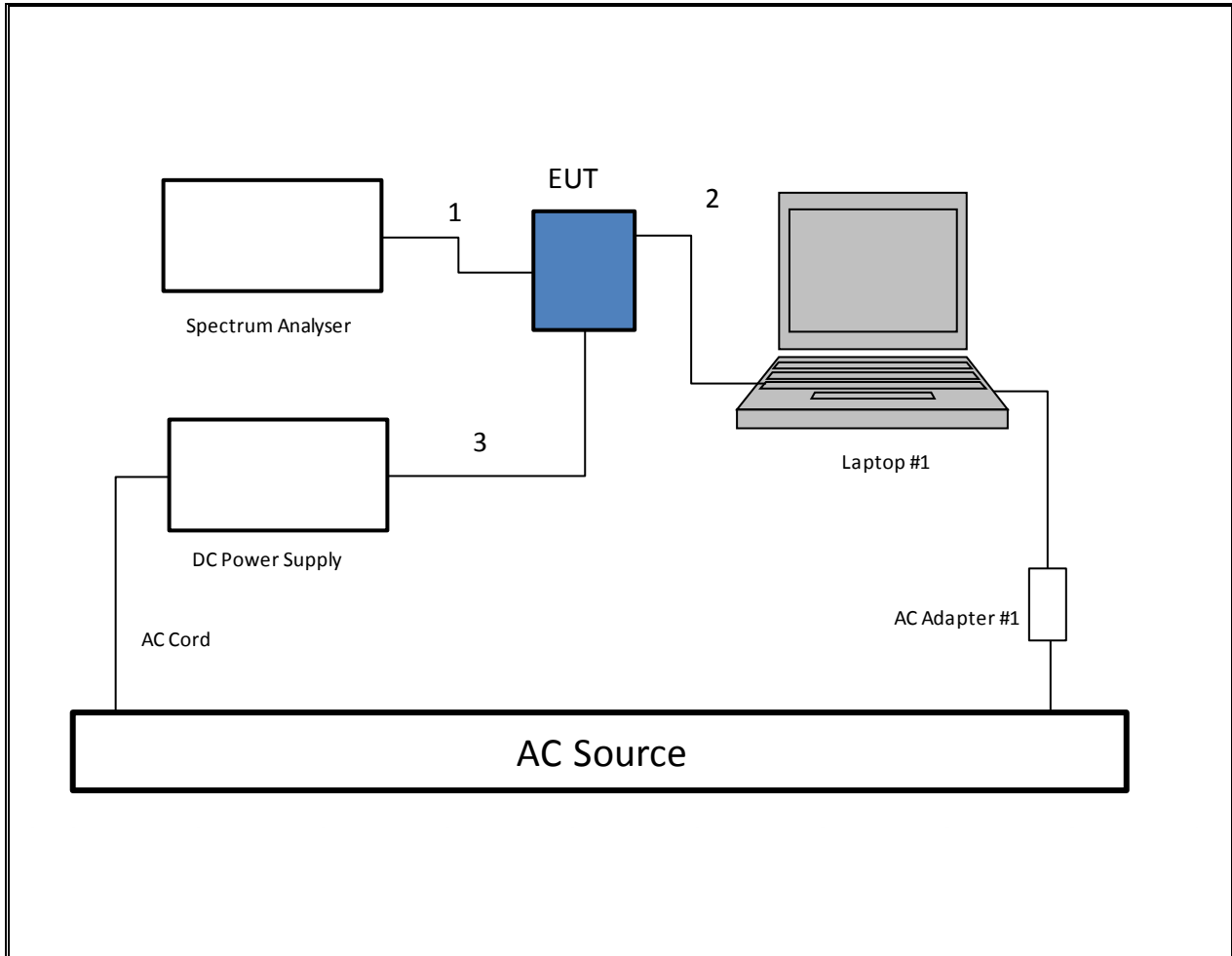
### I/O CABLES (AC POWER CONDUCTED TEST and below 1 GHZ)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US115	Un-Shielded	0.8	NA
2	DC	1	lightning	Un-Shielded	1	NA
3	Audio	1	Jack	Un-Shielded	0.5	NA

**TEST SETUP- CONDUCTED PORT**

The EUT was tested connected to a host Laptop via USB cable adapter and spectrum analyzer to antenna port. Test software exercised the EUT.

**SETUP DIAGRAM**

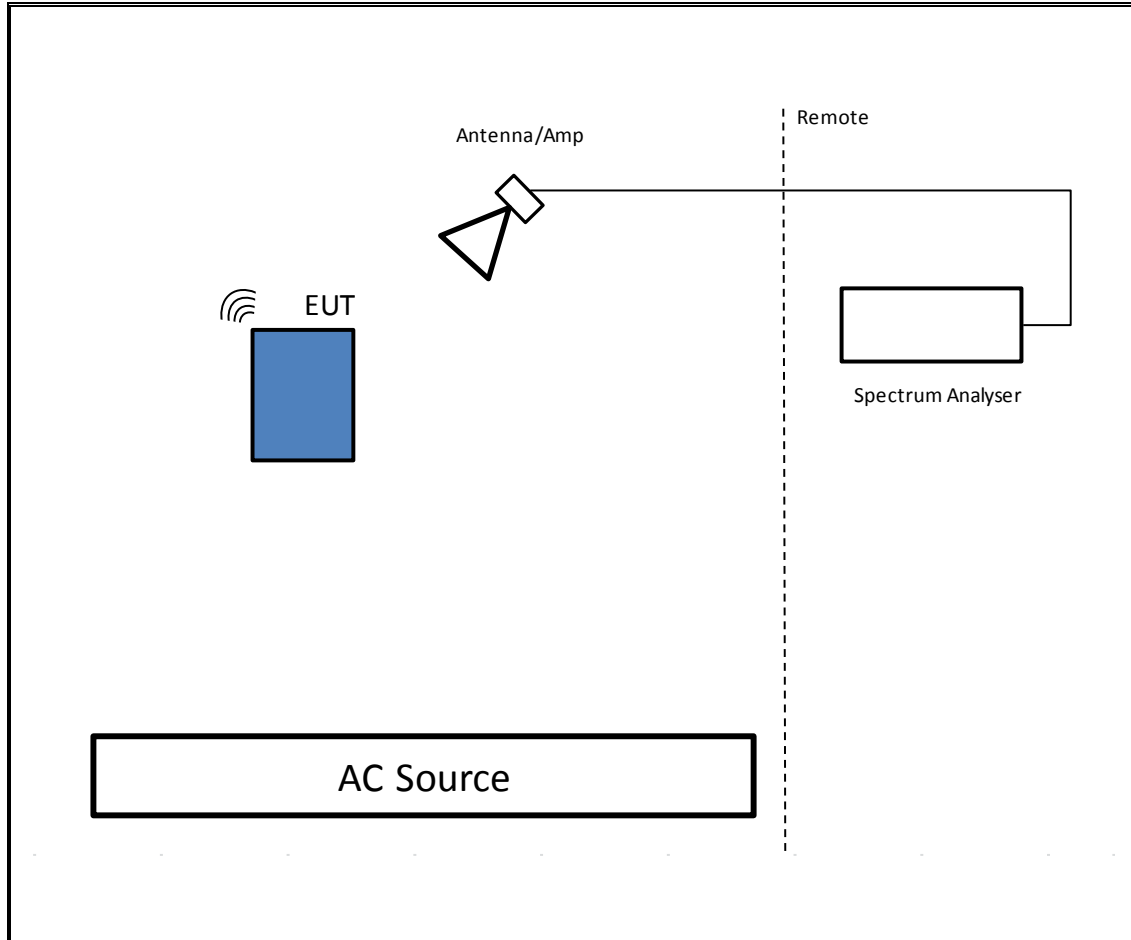




**TEST SETUP- RADIATED-ABOVE 1 GHZ**

The EUT was tested battery powered. Test software exercised the EUT.

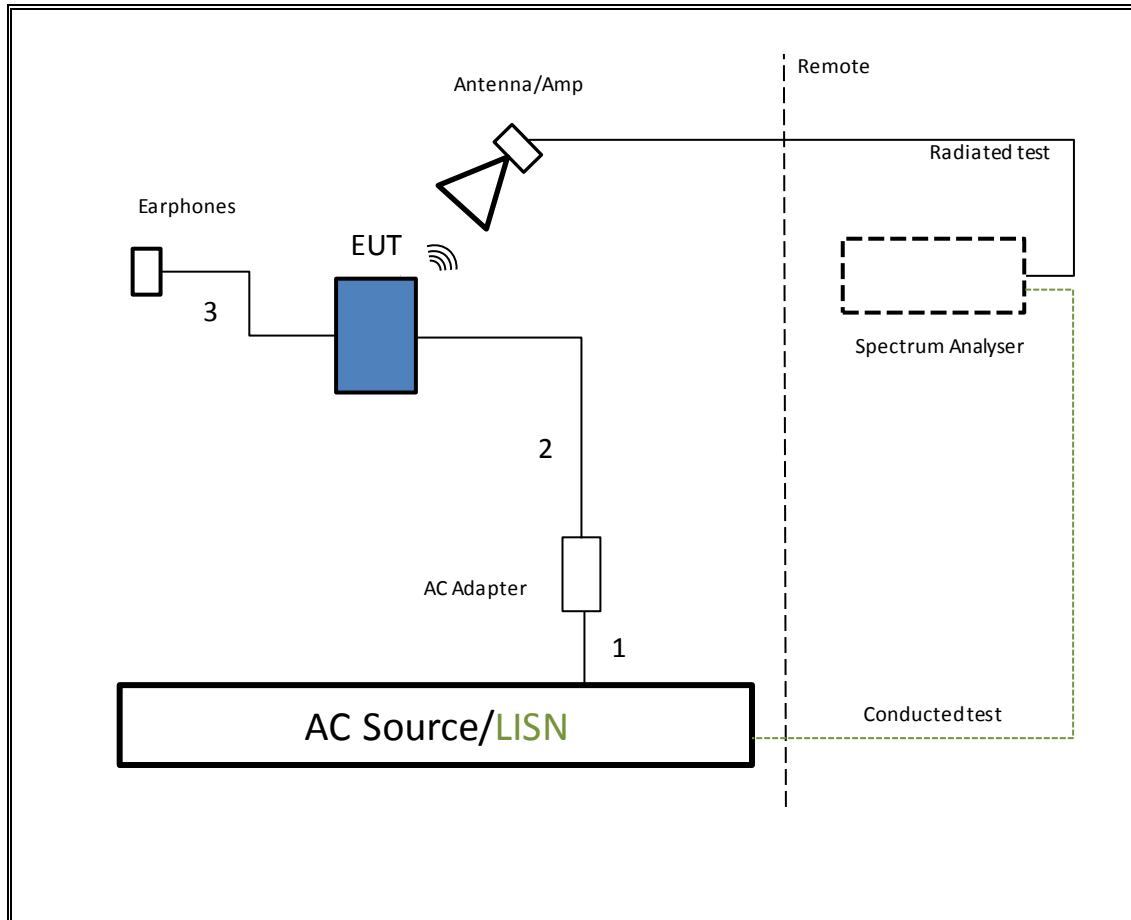
**SETUP DIAGRAM**



**TEST SETUP- BELOW 1GHZ & AC LINE CONDUCTED TESTS**

The EUT was tested with earphones connected and powered by AC adapter. Test software exercised the EUT.

**SETUP DIAGRAM**



## 6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Horn, 18 GHz	ETS Lindgren	3117	F00131	02/18/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	11/26/14
Peak / Average Power Sensor	Agilent / HP	N1911A	F00153	03/06/15
Wideband Power Sensor	Agilent	N1921A	F00361	10/02/14
Peak Power Meter	Agilent / HP	E9323A	F00025	04/03/15
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	F00129	02/22/15
Spectrum Analyzer, 40 GHz	Agilent	8564E	C00951	07/29/14
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	F00168	03/28/15
Preamplifier, 1300 MHz	Sonoma	310	F00008	05/27/15
Preamplifier, 26.5 GHz	Agilent / HP	8449B	F00165	03/25/15
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	F00092	09/05/14

---

## 7. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01.

Output Power: KDB 558074 D01.

Power Spectral Density: KDB 558074 D01.

Out-of-band emissions in non-restricted bands: KDB 558074 D01.

Out-of-band emissions in restricted bands: KDB 558074 D01.

## 8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

### LIMITS

None; for reporting purposes only.

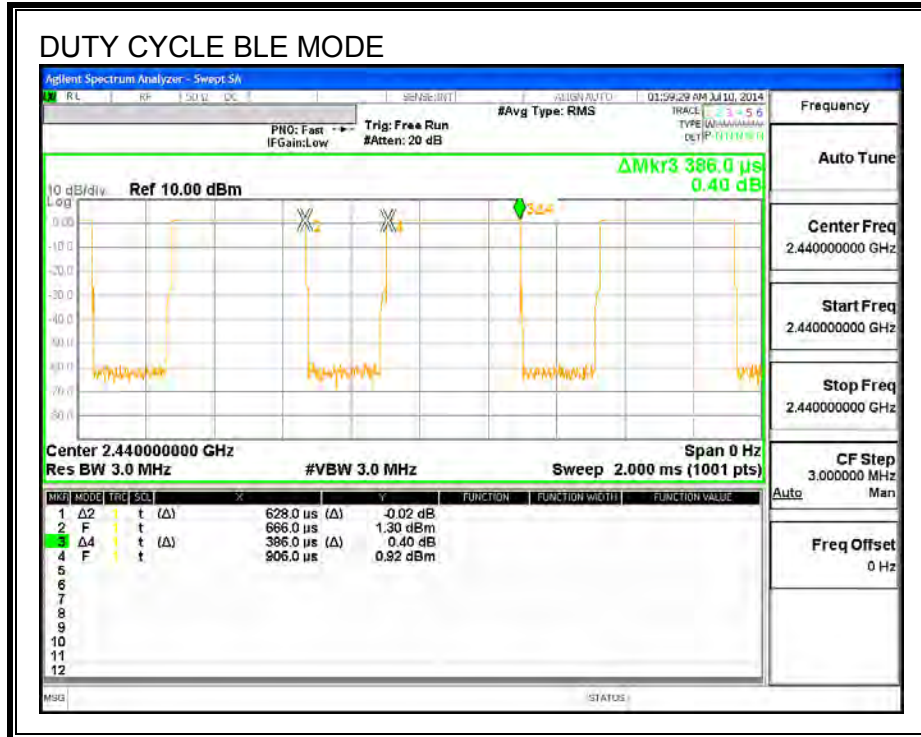
### PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

### 8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
BLE	0.386	0.628	0.615	61.5%	2.114	2.591

### DUTY CYCLE PLOT



## 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.

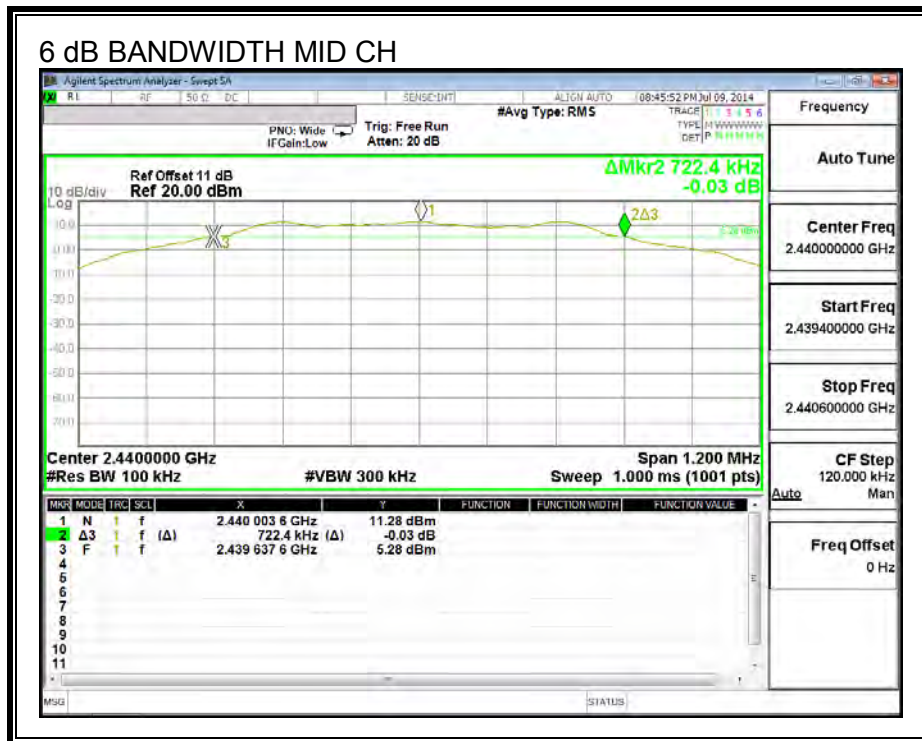
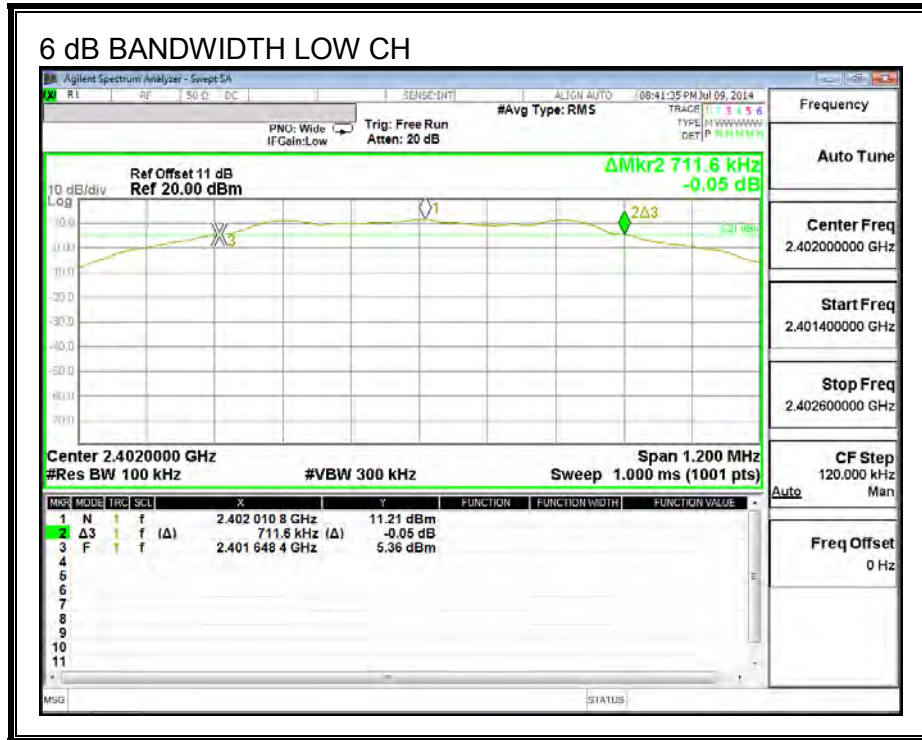
#### TEST PROCEDURE

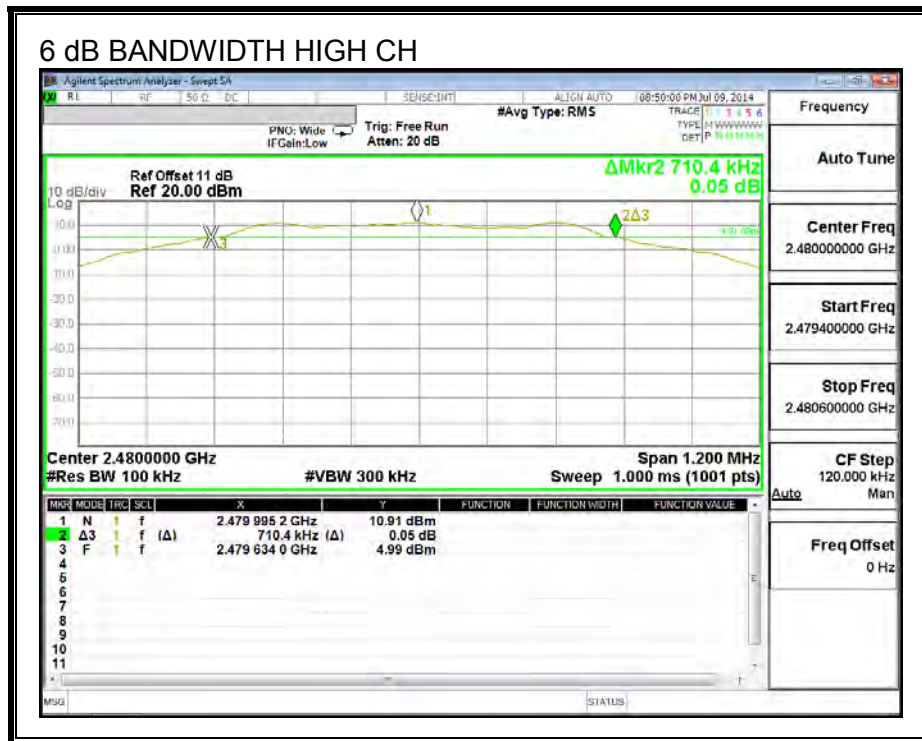
KDB 558074 D01 v03r01 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247".

#### RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (KHz)	Minimum Limit (KHz)
Low	2402	711.600	500.0
Middle	2440	722.400	500.0
High	2480	710.140	500.0

**6 dB BANDWIDTH**







## 9.2. 99% BANDWIDTH

### LIMIT

None; for reporting purposes only.

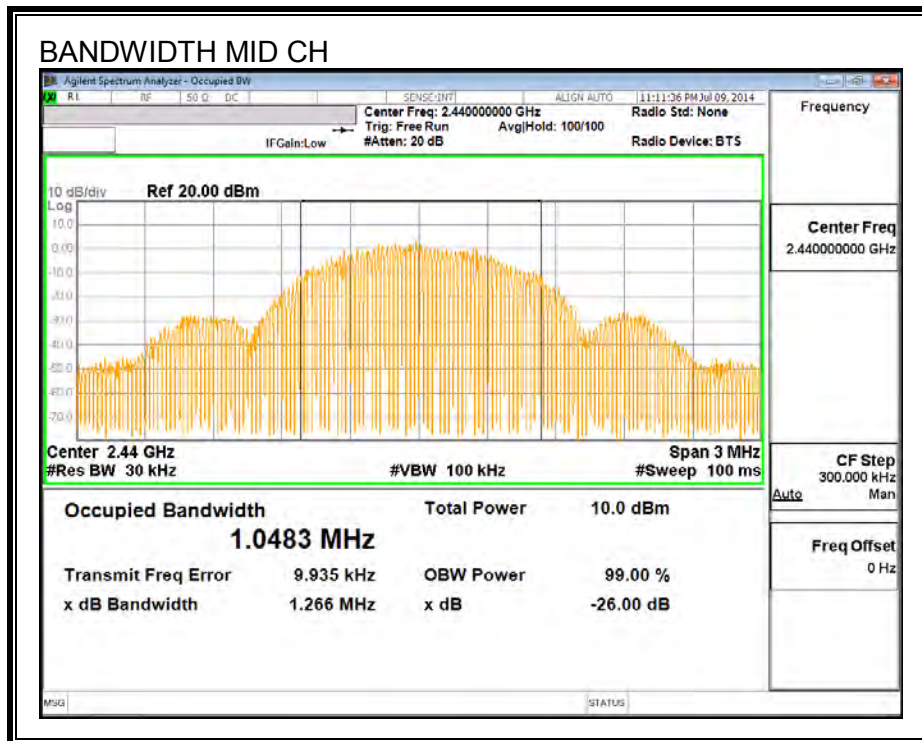
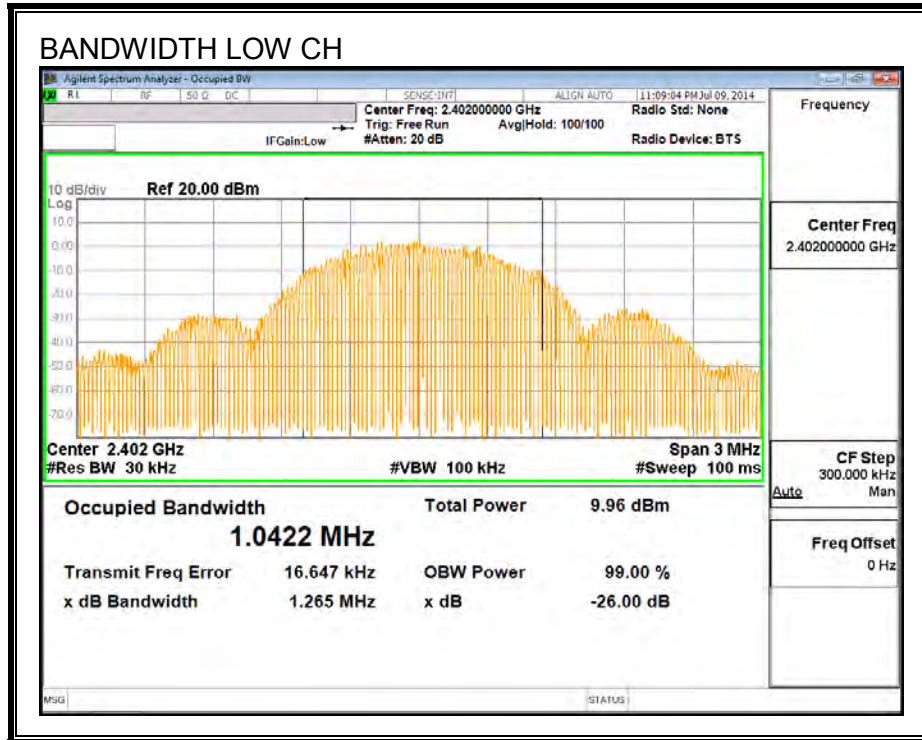
### TEST PROCEDURE

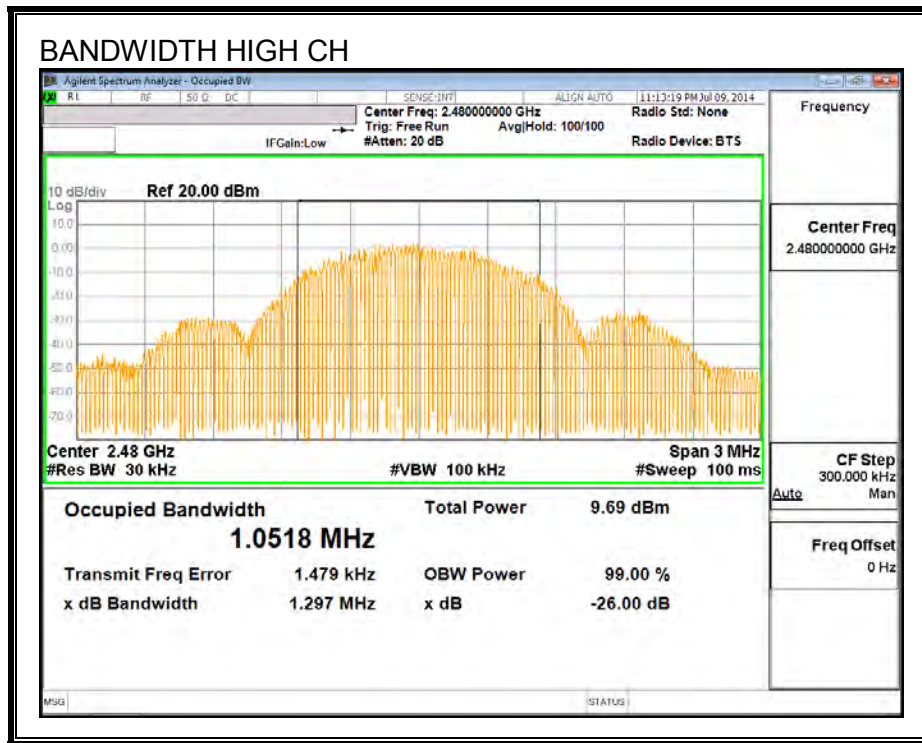
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

### RESULTS

Frequency (MHz)	99% Bandwidth (MHz)
2402	1.0422
2440	1.0483
2480	1.0518

**99% BANDWIDTH**





### 9.3. OUTPUT POWER

#### LIMIT

§15.247 (b) (1)

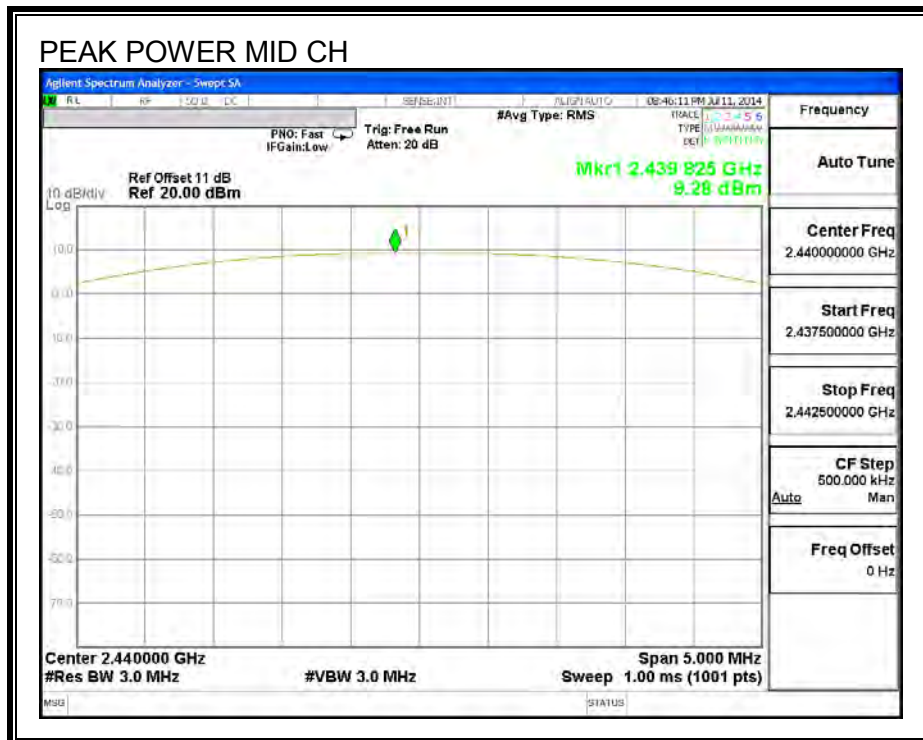
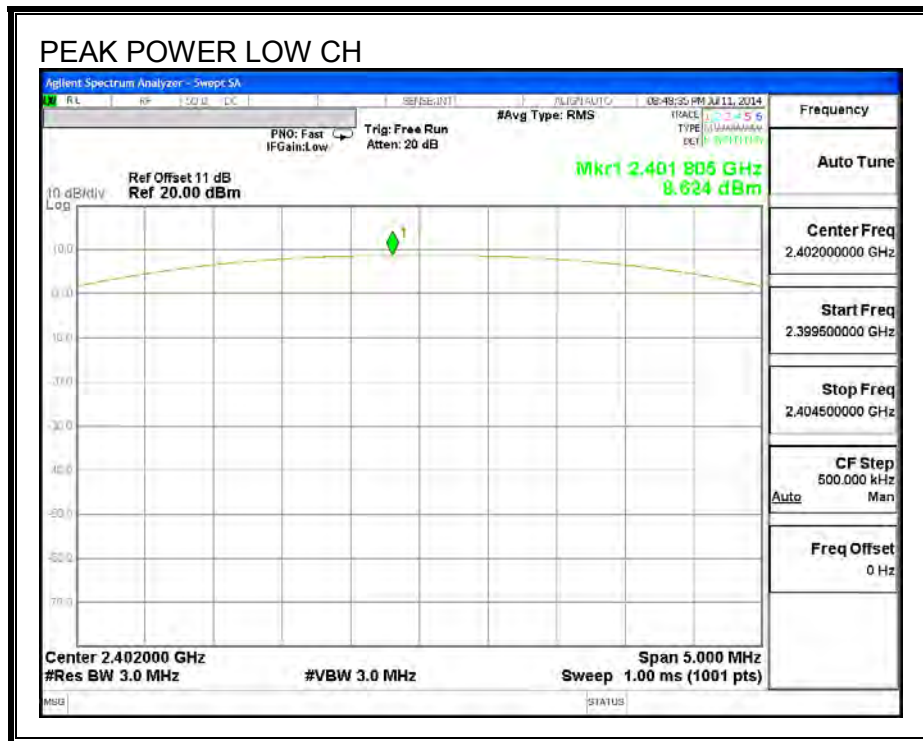
The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

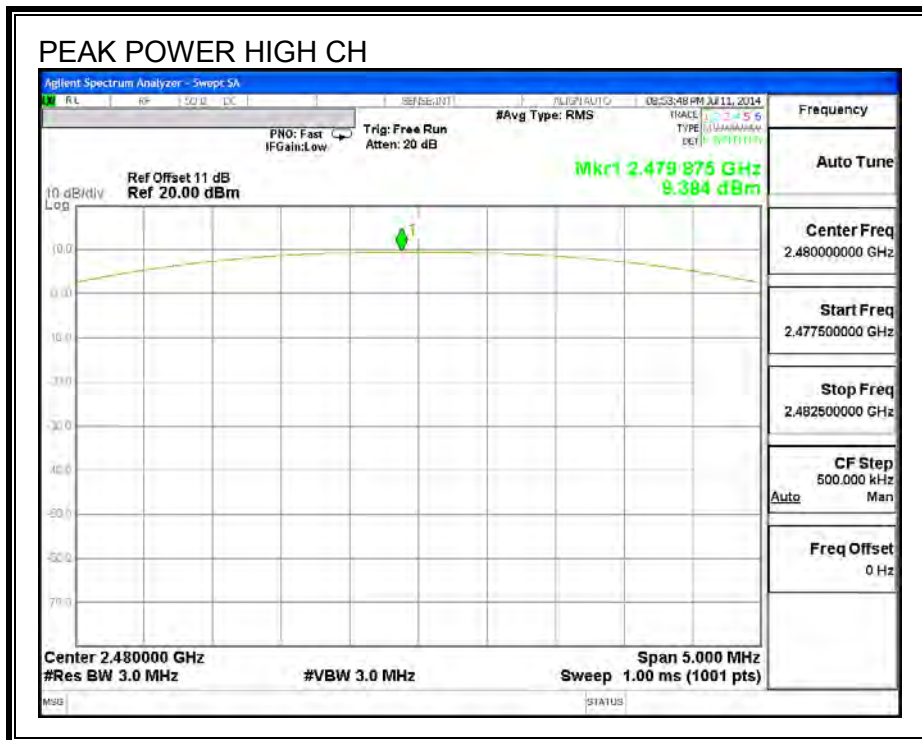
#### TEST PROCEDURE

KDB 558074 D01 v03r01 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247".

#### RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.62	30	-21.38
Middle	2440	9.28	30	-20.72
High	2480	9.38	30	-20.62





## 9.4. AVERAGE POWER

### LIMIT

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.

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Average Power (dBm)</b>
Low	2402	8.26
Middle	2440	8.97
High	2480	8.99

## 9.5. 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

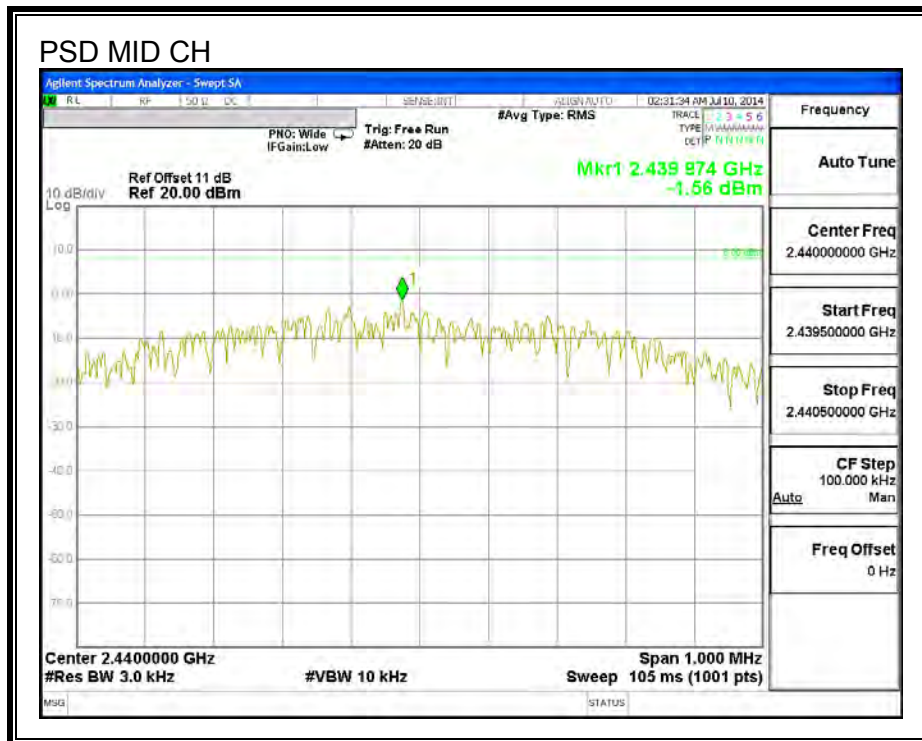
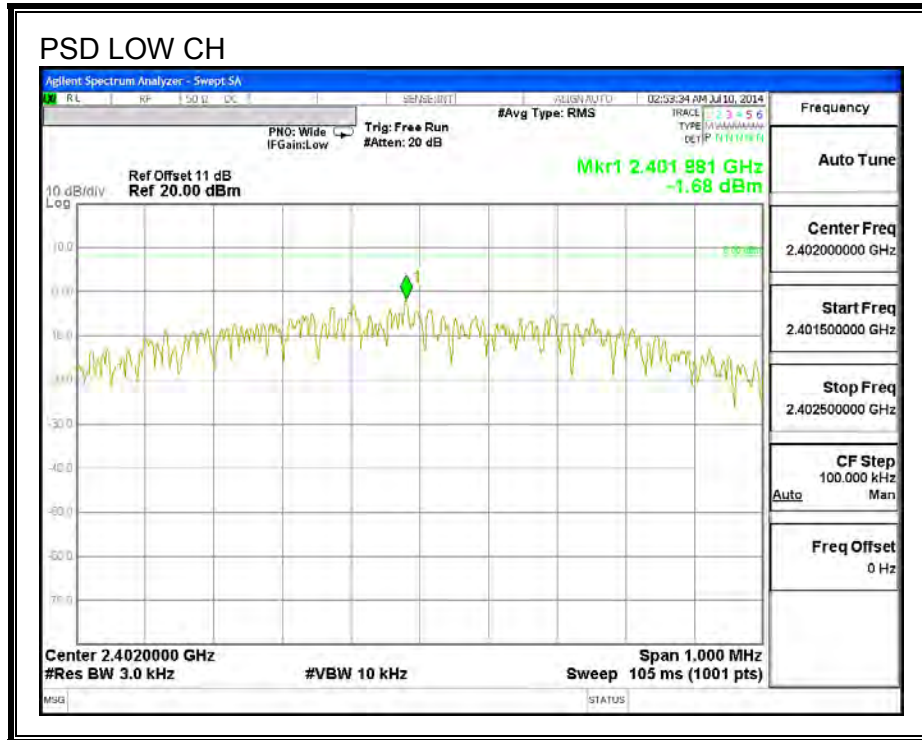
KDB 558074 D01 v03r01 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247".

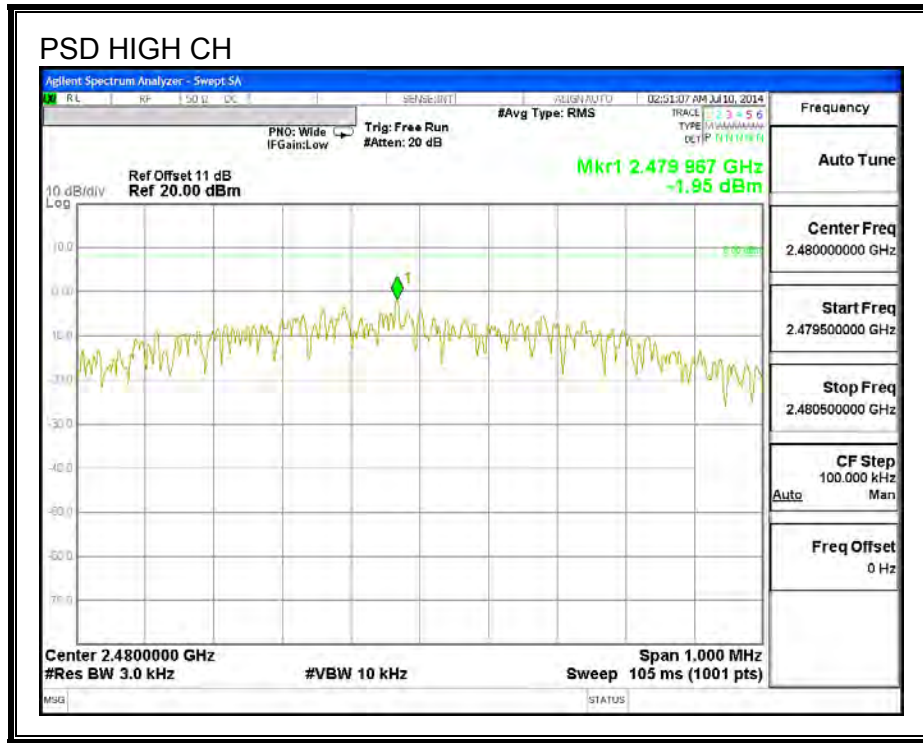
### RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-1.68	8	-9.68
Middle	2440	-1.56	8	-9.56
High	2480	-1.95	8	-9.95



**POWER SPECTRAL DENSITY**





## **9.6. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

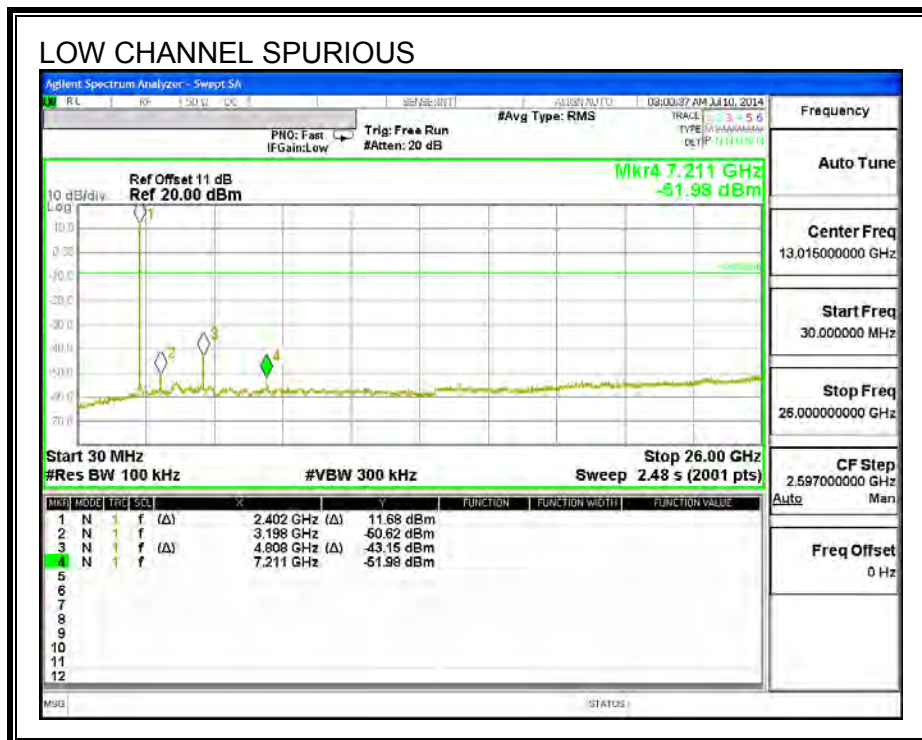
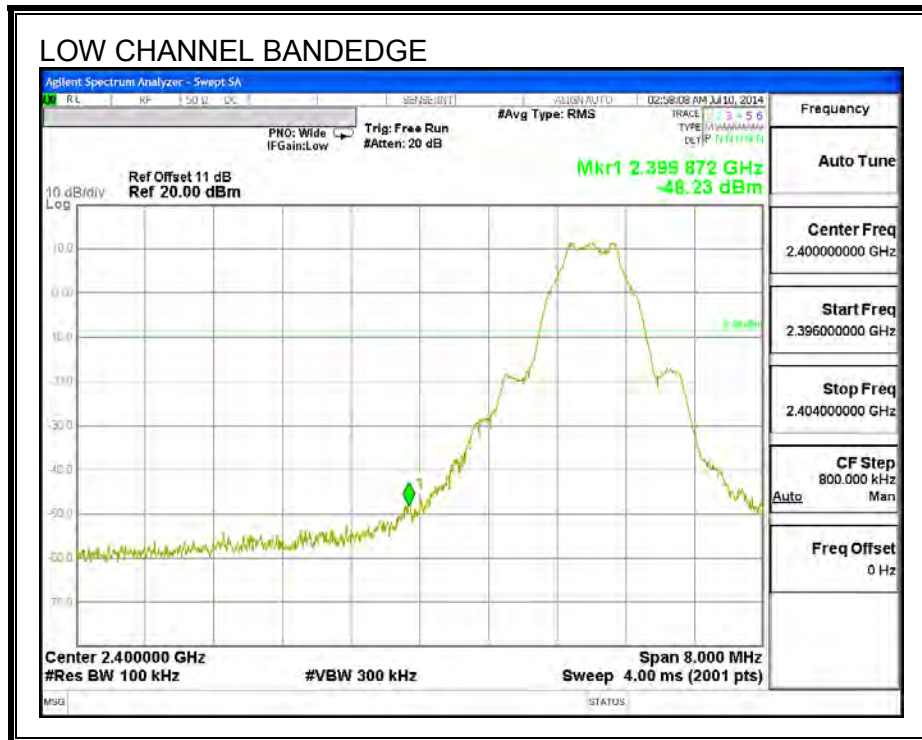
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

### **TEST PROCEDURE**

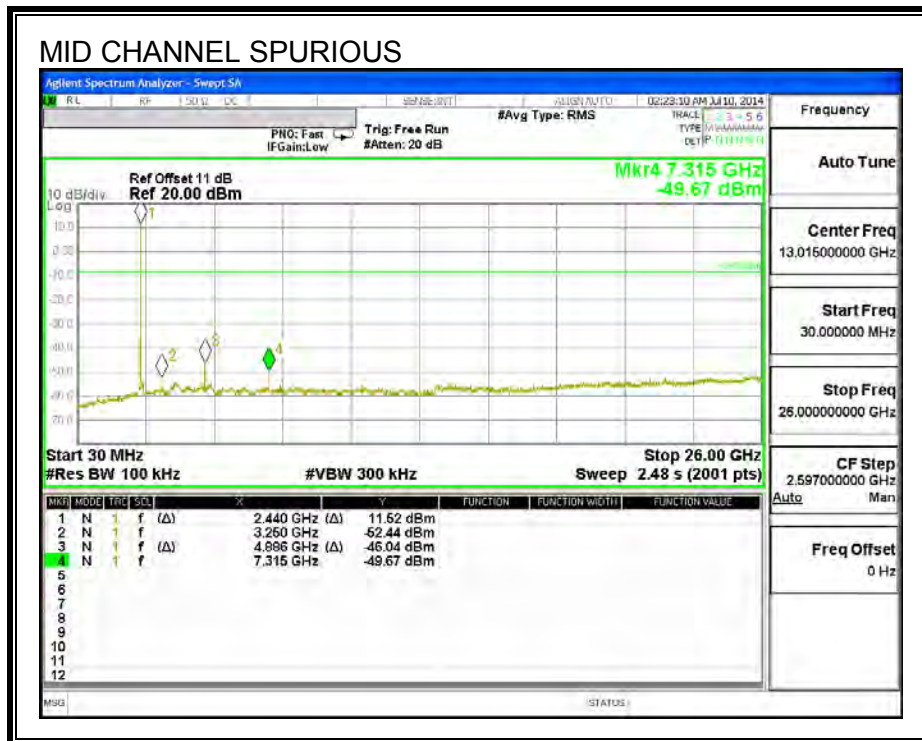
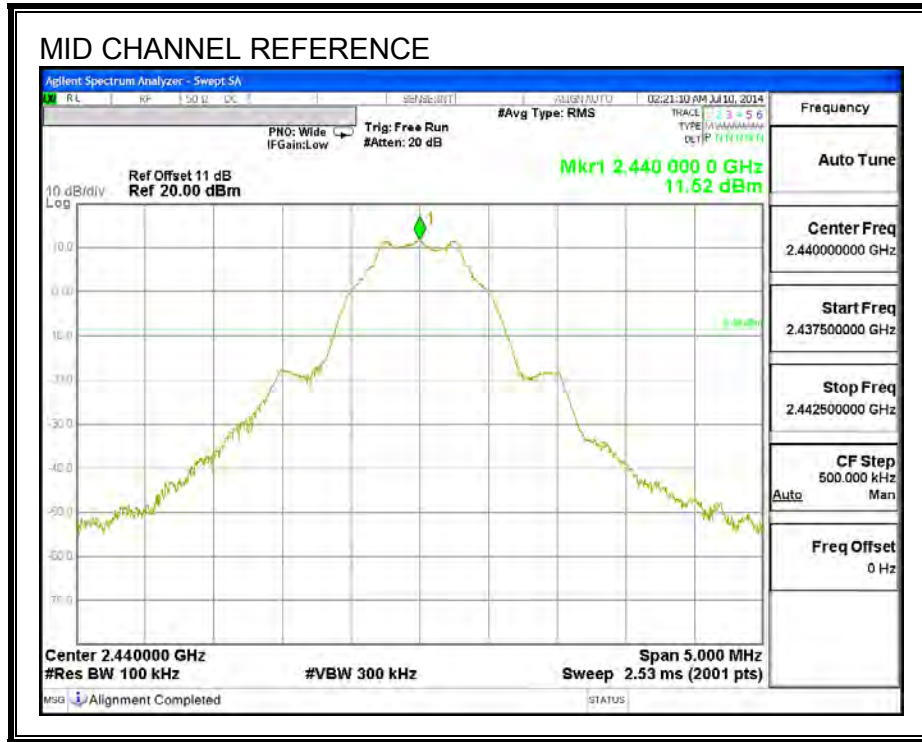
KDB 558074 D01 v03r01 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247".

**RESULTS**

**SPURIOUS EMISSIONS, LOW CHANNEL**

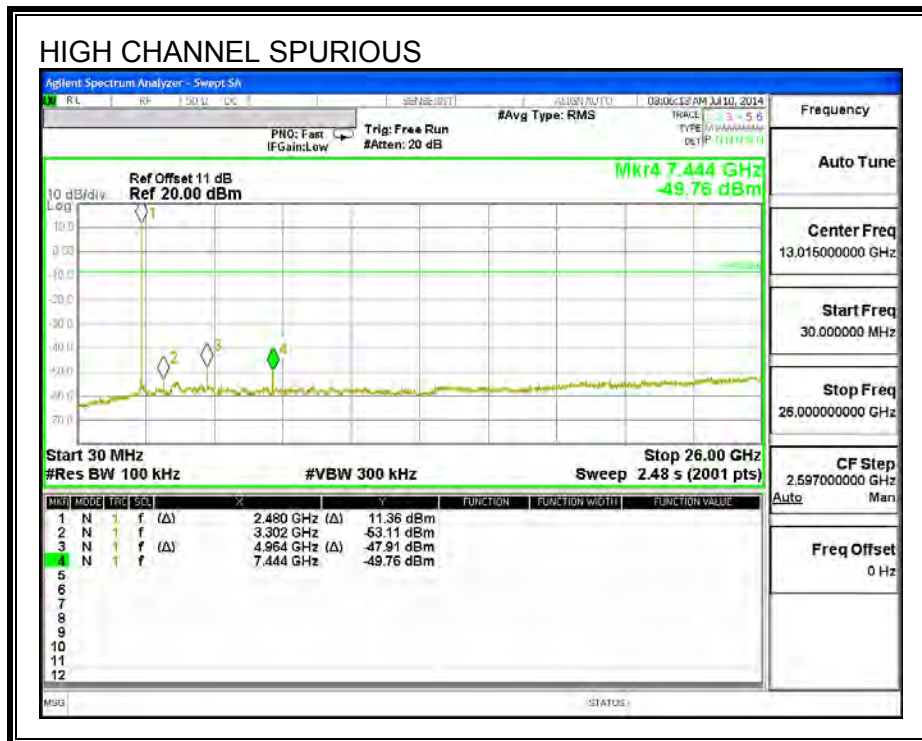
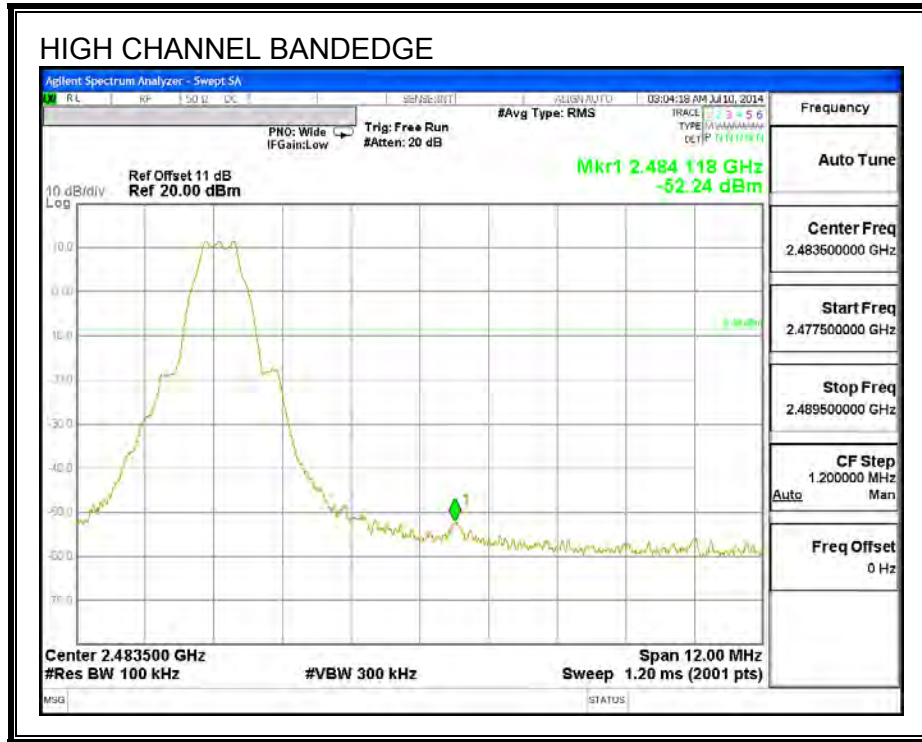


**SPURIOUS EMISSIONS, MID CHANNEL**





**SPURIOUS EMISSIONS, HIGH CHANNEL**



## 10. RADIATED TEST RESULTS

### 10.1. 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.

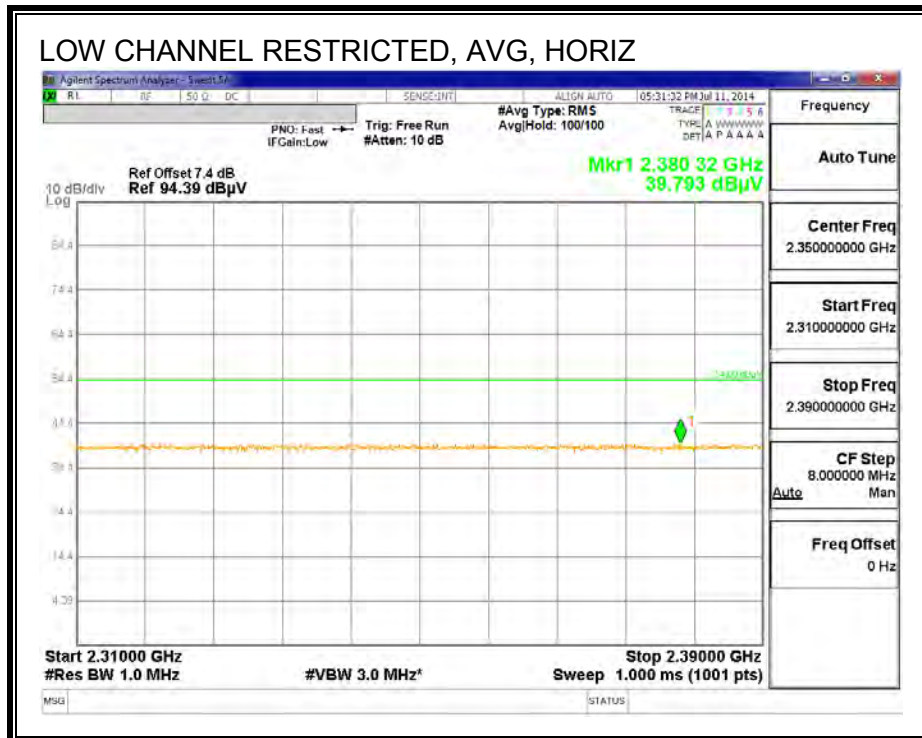
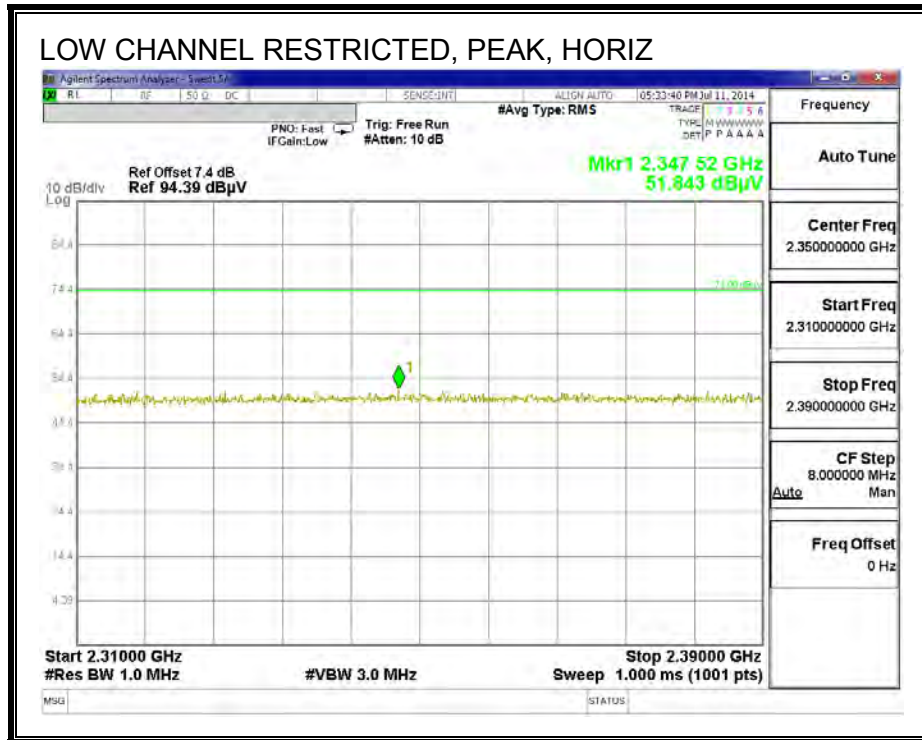
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 10 Hz for average measurements.

For 2.4 GHz band, 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.

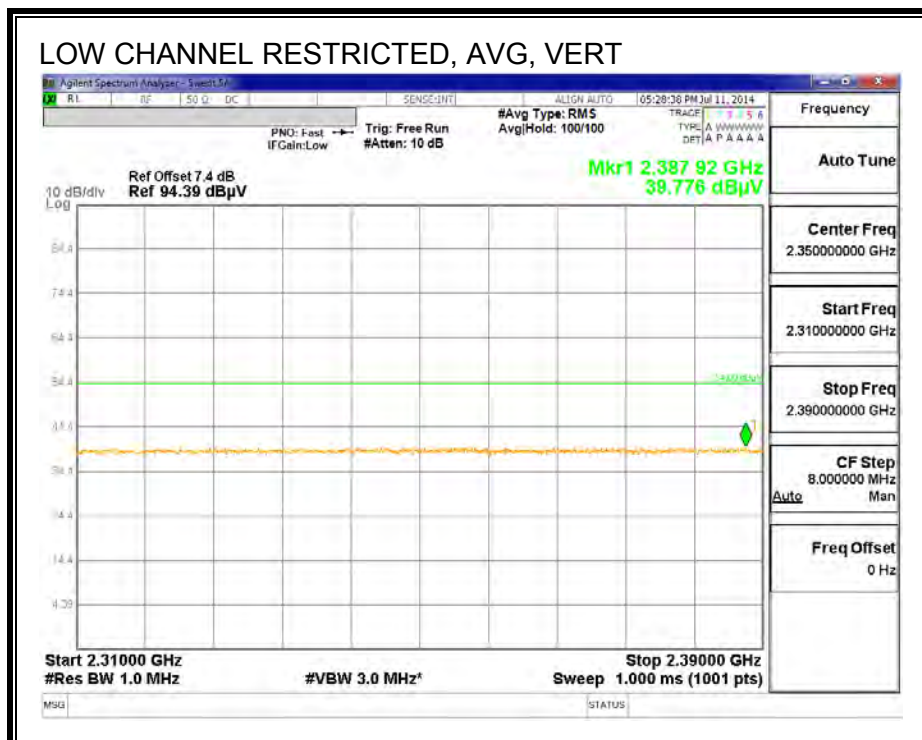
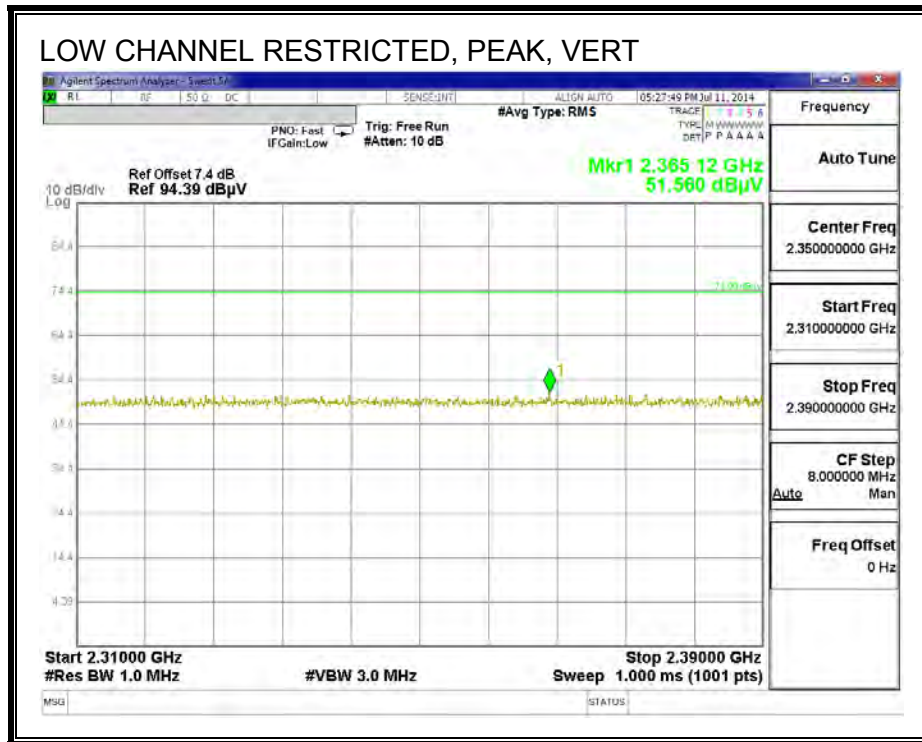
## 10.2. TRANSMITTER ABOVE 1 GHz

### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

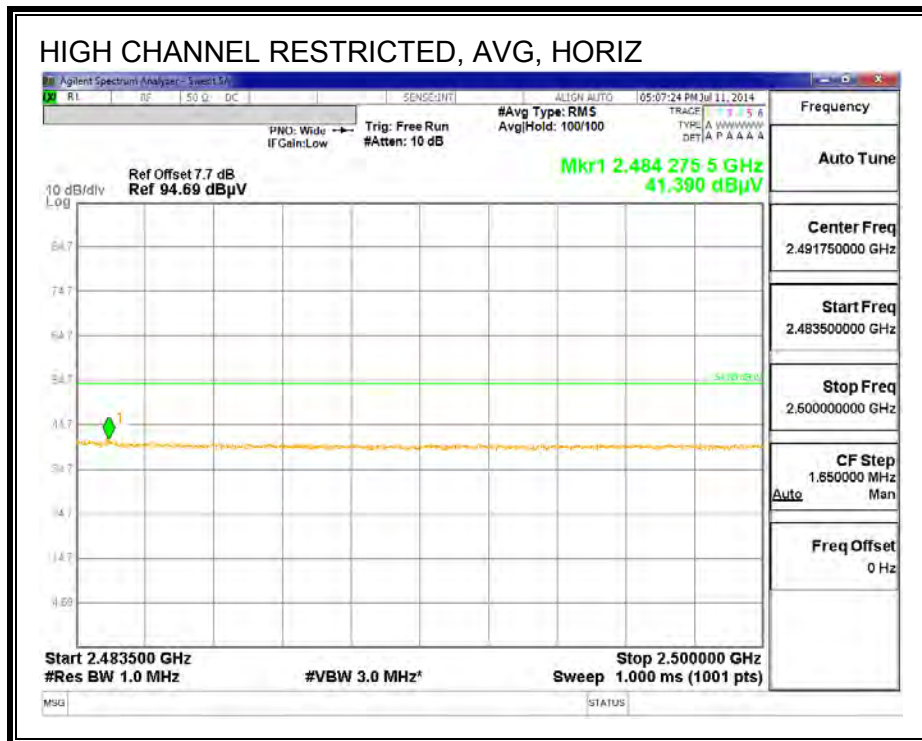
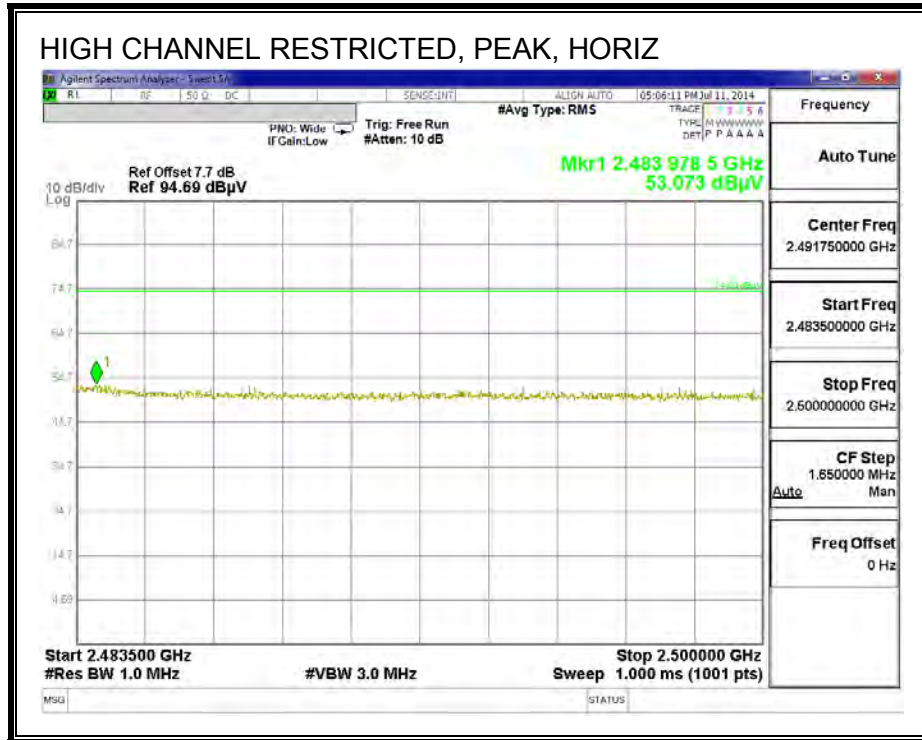




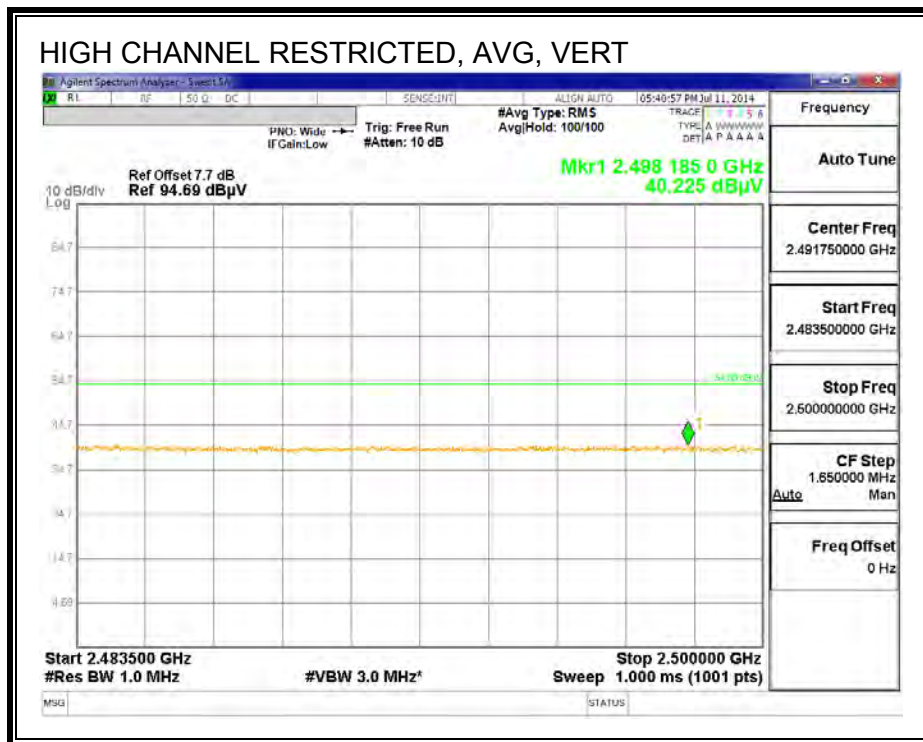
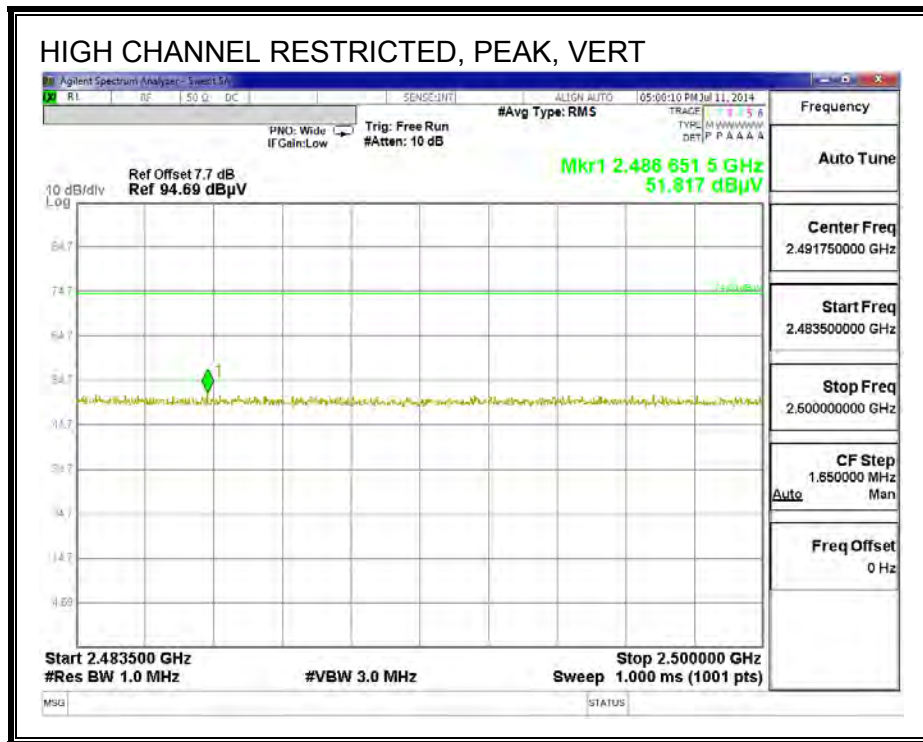
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



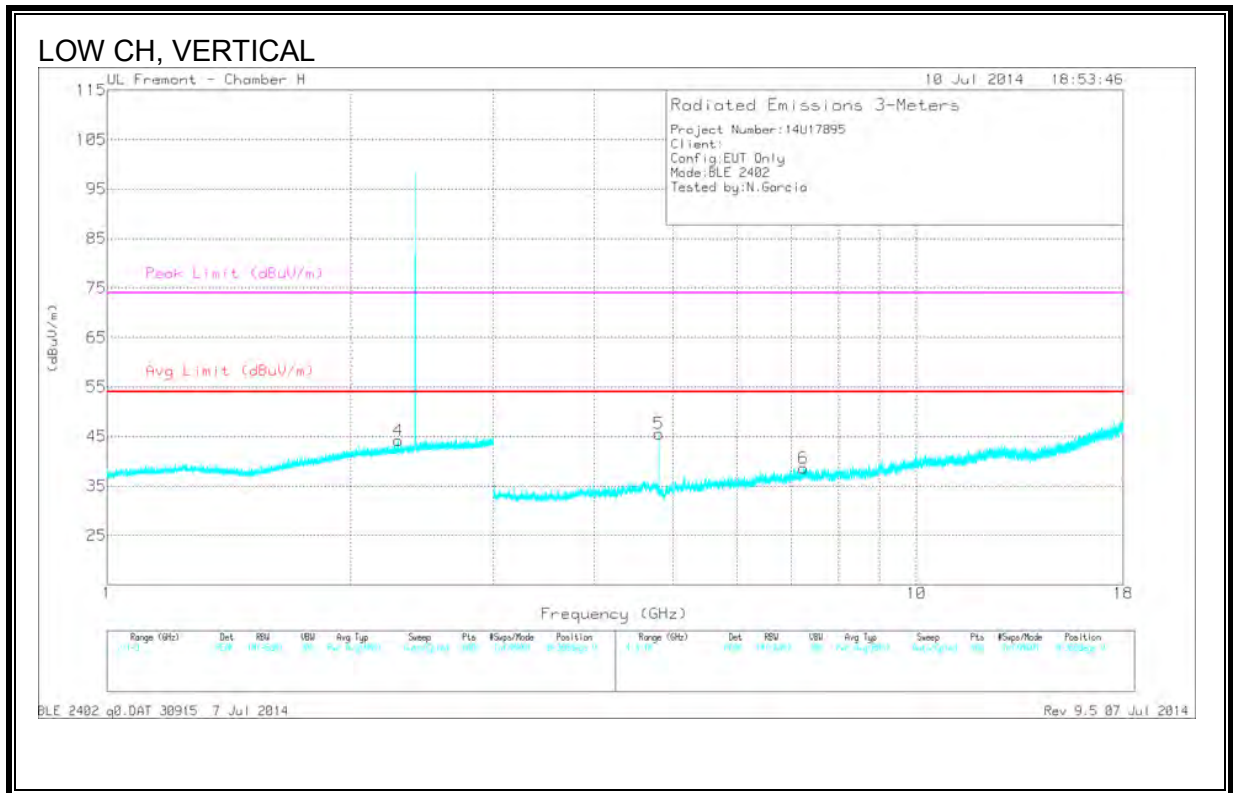
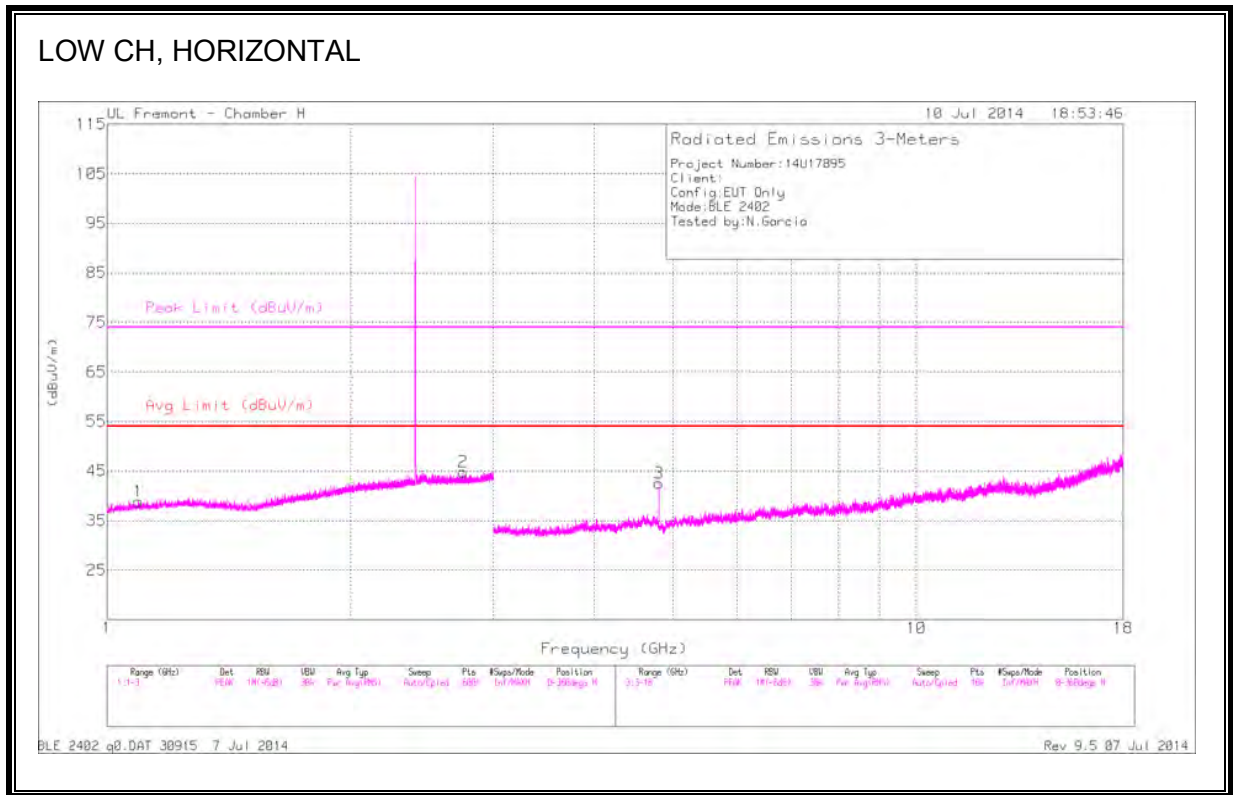
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



**RESTRICTED BANEDGE (HIGH CHANNEL, VERTICAL)**



**LOW CHANNEL HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 1.094	44.55	PK2	28.2	-25.8	0	46.95	-	-	74	-27.05	3	201	H
* 1.096	32.67	MAv1	28.2	-25.8	2.11	37.18	54	-16.82	-	-	3	201	H
* 2.75	43.61	PK2	32.3	-24.3	0	51.61	-	-	74	-22.39	12	102	H
* 2.752	32.16	MAv1	32.3	-24.3	2.11	42.27	54	-11.73	-	-	12	102	H
* 2.291	44.62	PK2	31.8	-24.6	0	51.82	-	-	74	-22.18	12	202	V
* 2.29	32.05	MAv1	31.8	-24.6	2.11	41.36	54	-12.64	-	-	12	202	V
* 4.804	48.02	PK2	34.3	-32.5	0	49.82	-	-	74	-24.18	41	334	H
* 4.804	41.22	MAv1	34.3	-32.5	2.11	45.13	54	-8.87	-	-	41	334	H
* 4.804	48.46	PK2	34.3	-32.5	0	50.26	-	-	74	-23.74	120	100	V
* 4.804	42.16	MAv1	34.3	-32.5	2.11	46.07	54	-7.93	-	-	120	100	V
7.24	39.88	PK2	36.2	-30.3	0	45.78	-	-	-	-	162	142	V
7.243	29.26	MAv1	36.2	-30.3	2.11	37.27	-	-	-	-	162	142	V

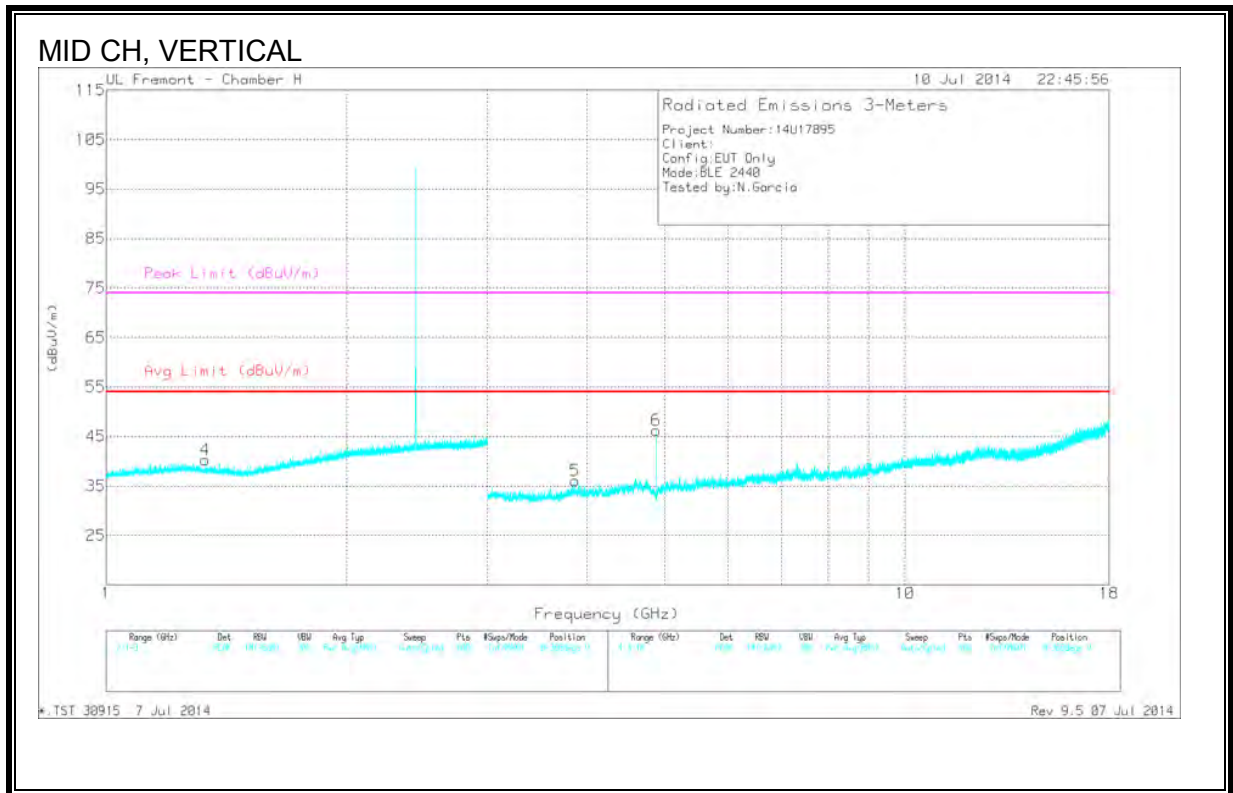
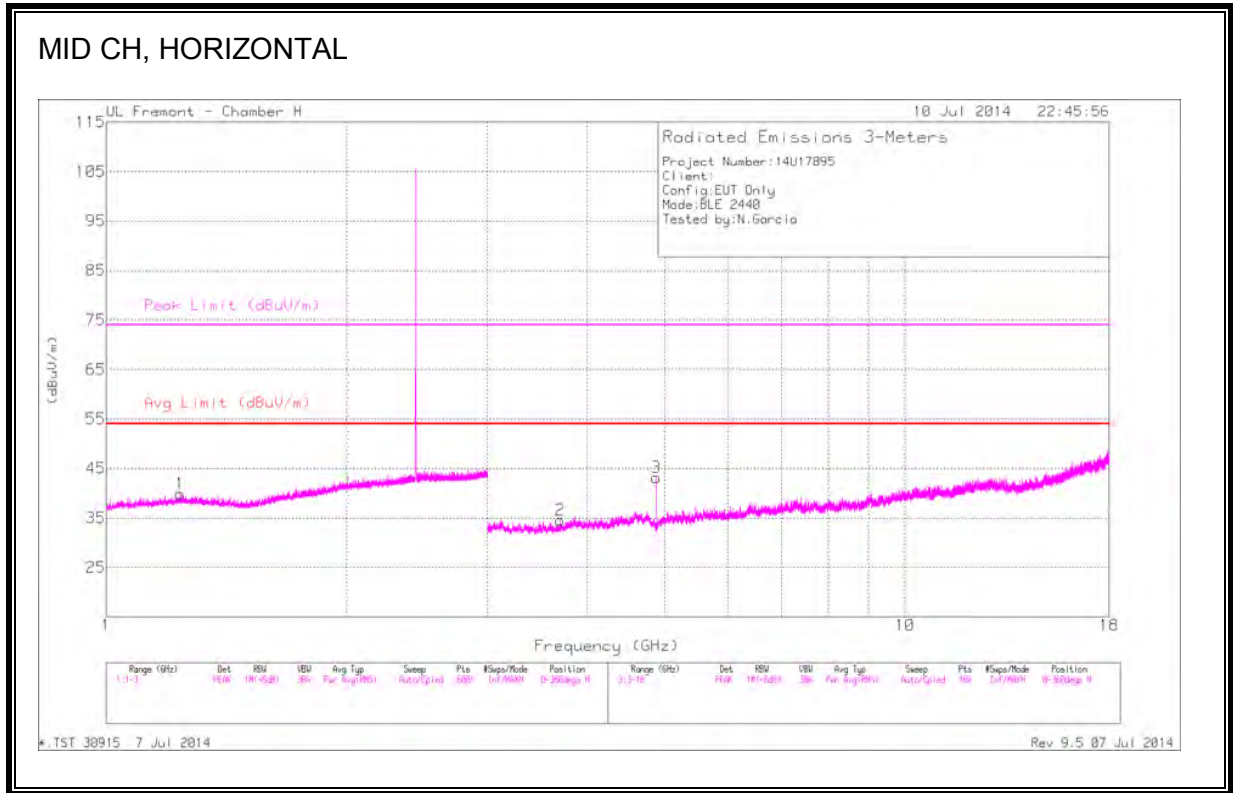
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average



**MID CHANNEL HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

Trace Markers

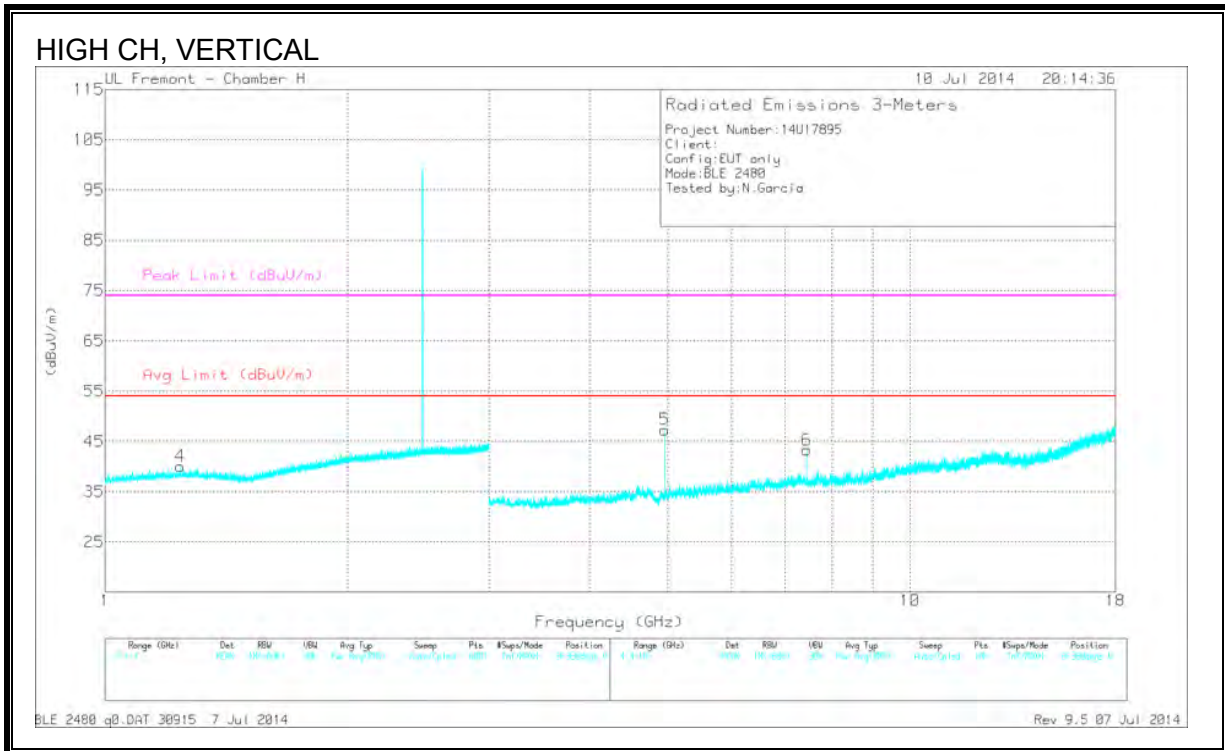
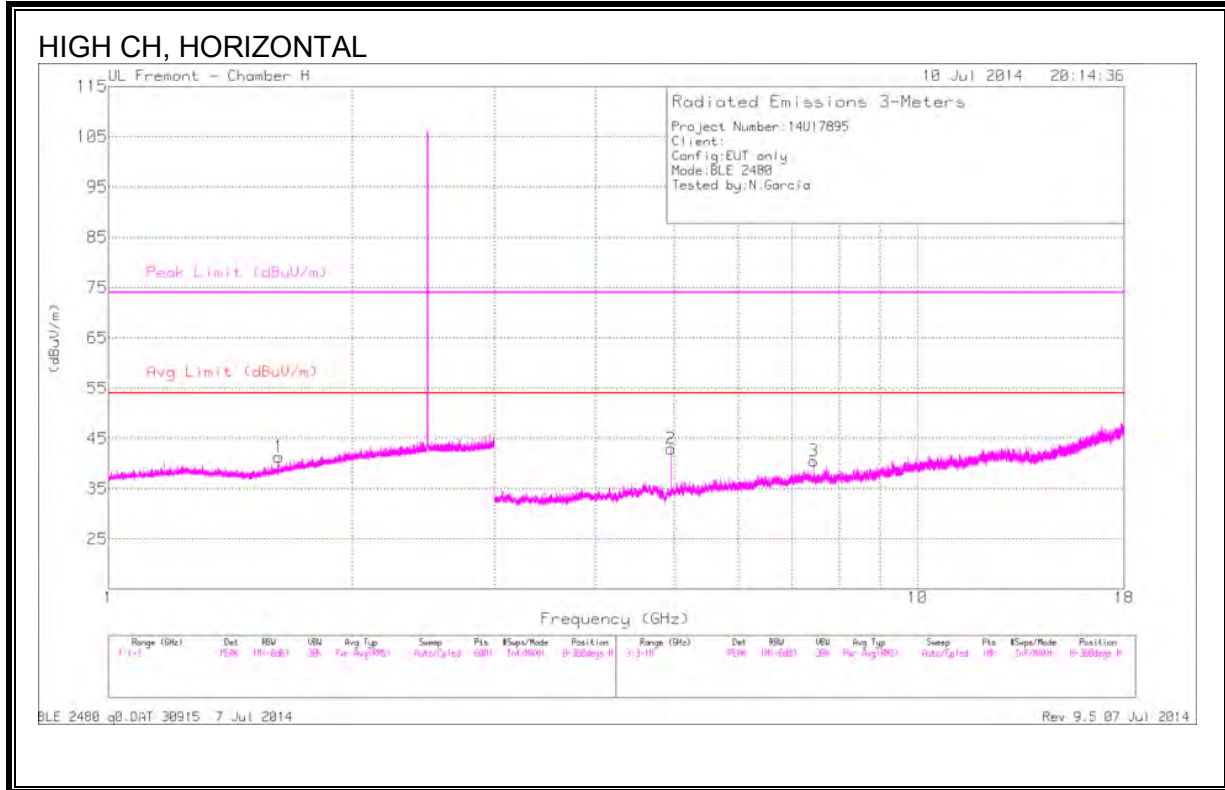
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.24	44.35	PK2	28.9	-25.9	0	47.35	-	-	74	-26.65	328	100	H
* 1.237	32.92	MAV1	28.9	-25.9	2.11	38.03	54	-15.97	-	-	328	100	H
* 1.331	44.02	PK2	28.6	-25.7	0	46.92	-	-	74	-27.08	131	113	V
* 1.328	32.6	MAV1	28.6	-25.7	2.11	37.61	54	-16.39	-	-	131	113	V
* 3.693	41.51	PK2	33.1	-32.7	0	41.91	-	-	74	-32.09	214	197	H
* 3.702	30.92	MAV1	33.1	-32.6	2.11	33.53	54	-20.47	-	-	214	197	H
* 4.881	47.23	PK2	34.3	-32.1	0	49.43	-	-	74	-24.57	284	250	H
* 4.88	40.12	MAV1	34.3	-32.1	2.11	44.43	54	-9.57	-	-	284	250	H
* 3.862	42	PK2	33.3	-32.6	0	42.7	-	-	74	-31.3	291	112	V
* 3.862	31.23	MAV1	33.3	-32.6	2.11	34.04	54	-19.96	-	-	291	112	V
* 4.88	47.53	PK2	34.3	-32.1	0	49.73	-	-	74	-24.27	240	200	V
* 4.88	40.94	MAV1	34.3	-32.1	2.11	45.25	54	-8.75	-	-	240	200	V

\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

**HIGH CHANNEL HARMONICS AND SPURIOUS EMISSIONS**





**DATA**

Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 1.624	38.13	PK2	28.7	-25.1	0	41.73	-	-	74	-32.27	184	207	H
* 1.626	31.87	MAV1	28.7	-25.1	2.11	37.58	54	-16.42	-	-	184	207	H
* 1.25	44.3	PK2	29	-25.9	0	47.4	-	-	74	-26.6	152	127	V
* 1.25	32.42	MAV1	29	-25.9	2.11	37.63	54	-16.37	-	-	152	127	V
* 4.96	46.38	PK2	34.3	-31.8	0	48.88	-	-	74	-25.12	300	297	H
* 4.96	38.99	MAV1	34.3	-31.8	2.11	43.6	54	-10.4	-	-	300	297	H
* 7.441	41.65	PK2	36.1	-29.4	0	48.35	-	-	74	-25.65	269	201	H
* 7.439	31.43	MAV1	36.1	-29.3	2.11	40.34	54	-13.66	-	-	269	201	H
* 4.961	47.91	PK2	34.3	-31.8	0	50.41	-	-	74	-23.59	298	100	V
* 4.96	41.84	MAV1	34.3	-31.8	2.11	46.45	54	-7.55	-	-	298	100	V
* 7.44	42.86	PK2	36.1	-29.3	0	49.66	-	-	74	-24.34	100	202	V
* 7.44	33.2	MAV1	36.1	-29.3	2.11	42.11	54	-11.89	-	-	100	202	V

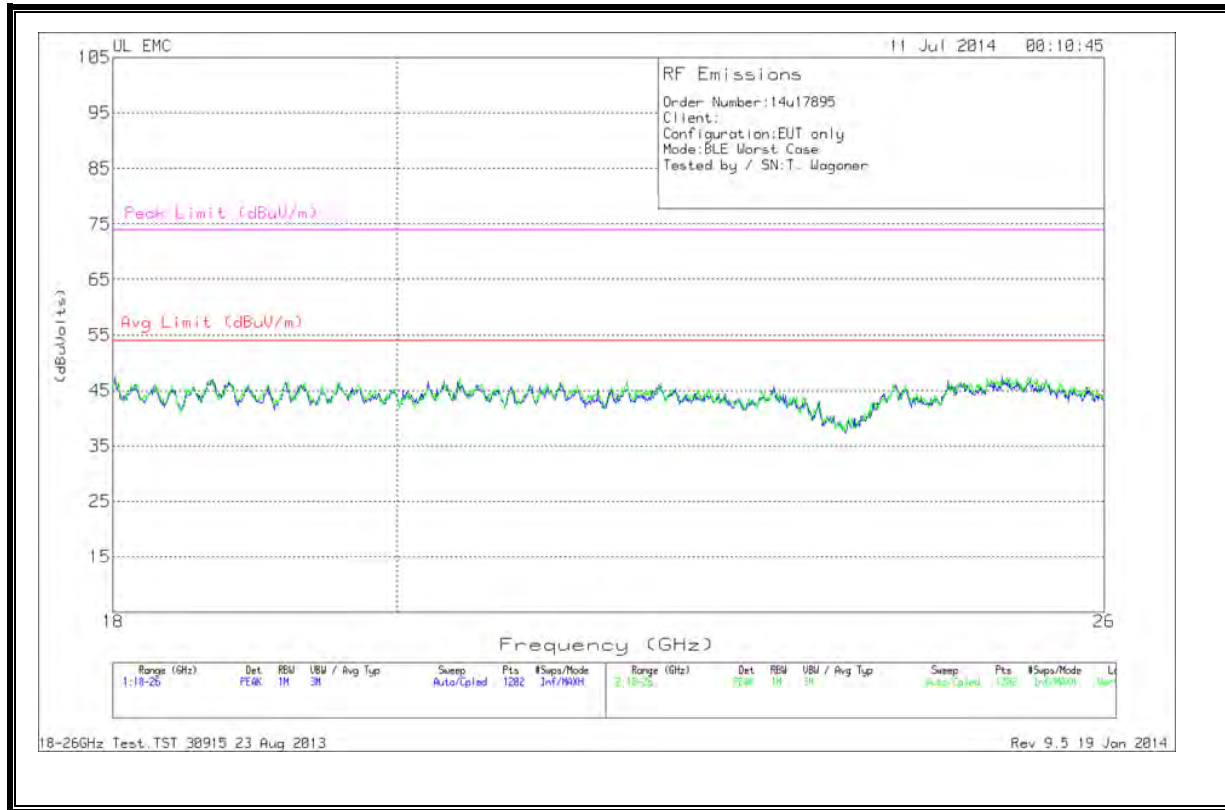
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

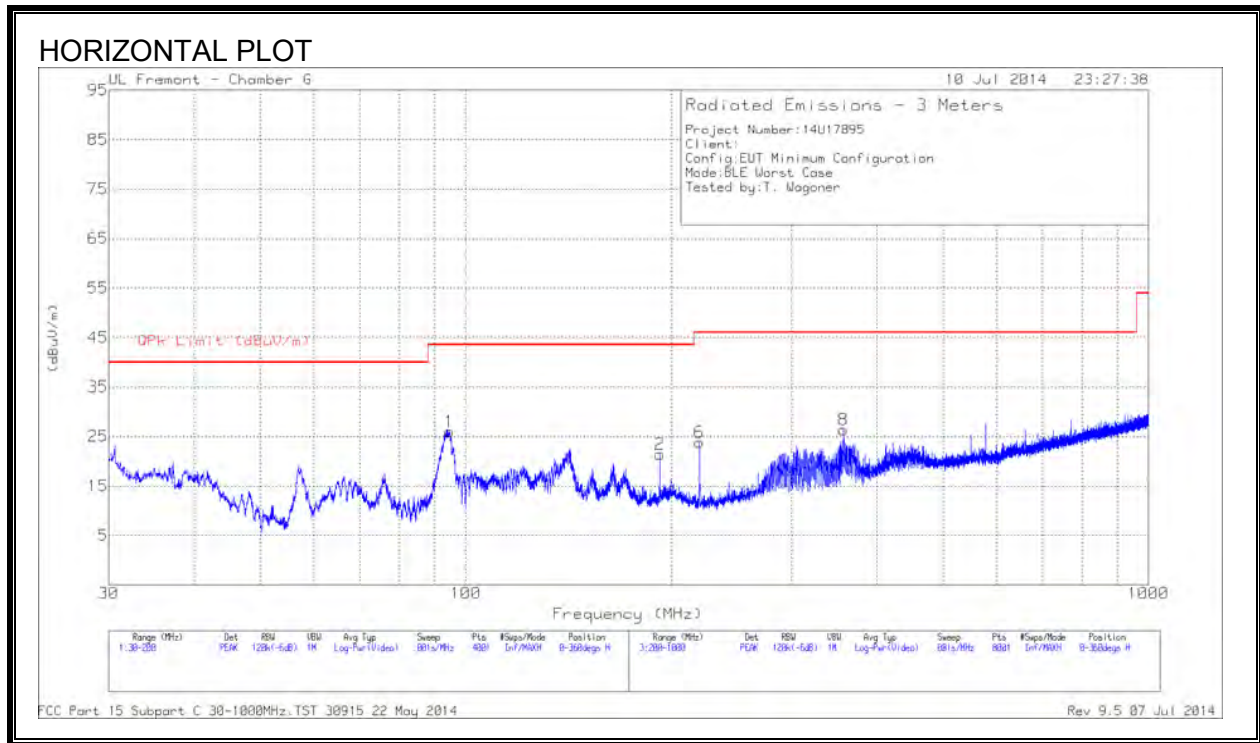
### 10.3. WORST-CASE ABOVE 18 GHz

#### SPURIOUS EMISSIONS 18 TO 26 GHz (WORST-CASE CONFIGURATION, HORIZONTAL & VERTICAL)

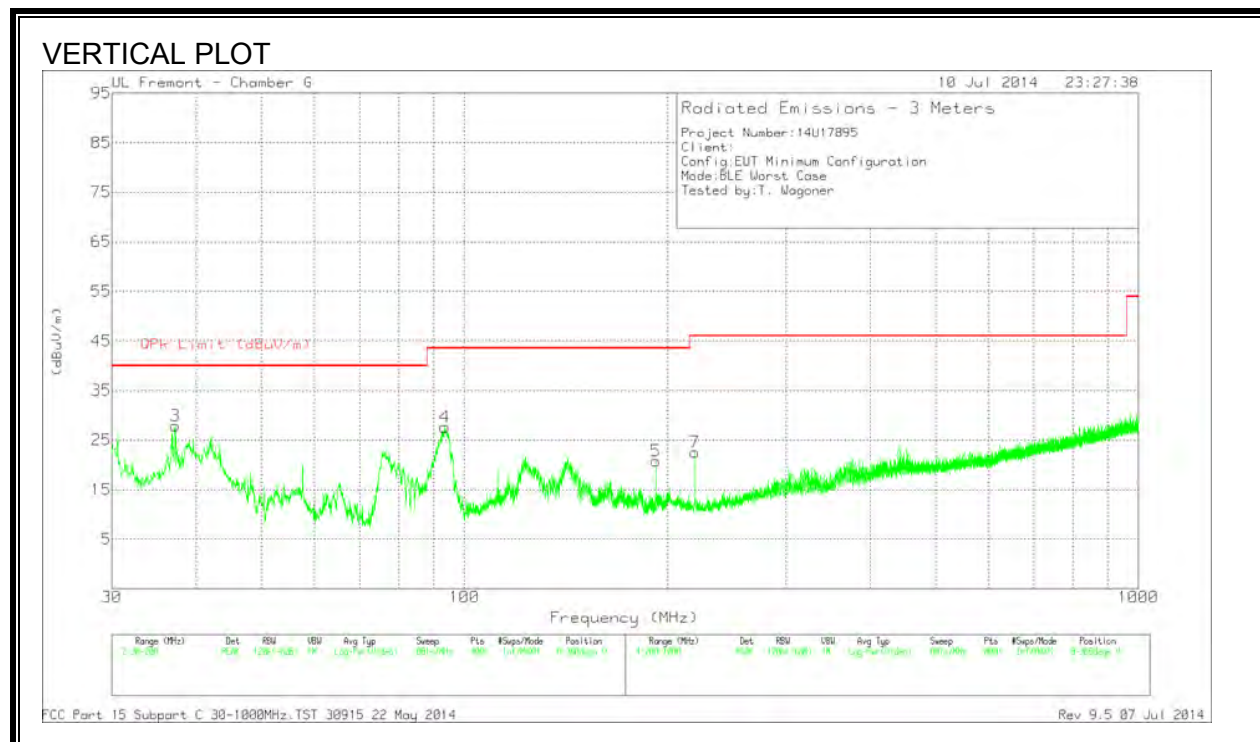


### 10.4. WORST-CASE BELOW 1 GHz

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



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



**DATA**

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Hybrid	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	37.225	39.73	PK	19.1	-30.9	27.93	40	-12.07	0-360	100	V
4	93.58	46.32	PK	11.4	-30.1	27.62	43.52	-15.9	0-360	100	V
1	94.7275	44.53	PK	11.6	-30.2	25.93	43.52	-17.59	0-360	301	H
2	192.3925	36.14	PK	14.5	-29.2	21.44	43.52	-22.08	0-360	103	H
5	192.3925	35.49	PK	14.5	-29.2	20.79	43.52	-22.73	0-360	100	V
7	219.8	38.18	PK	13.5	-29.1	22.58	46.02	-23.44	0-360	100	V
6	219.9	39.41	PK	13.5	-29.1	23.81	46.02	-22.21	0-360	100	H
8	357.8	37.06	PK	17.5	-28.2	26.36	46.02	-19.66	0-360	100	H

PK - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 22 May 2014

Rev 9.5 07 Jul 2014

## 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.

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**

**LINE 1 RESULTS**

**Trace Markers**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin to Limit (dB)	CFR 47 Part 15 Class B Avg	Margin to Limit (dB)
1	.1995	37.67	PK	.9	0	38.57	63.6	-25.03	-	-
2	.1995	30.79	Av	.9	0	31.69	-	-	53.6	-21.91
3	.303	37.5	PK	.6	0	38.1	60.2	-22.1	-	-
4	.303	27.58	Av	.6	0	28.18	-	-	50.2	-22.02
5	.5775	42.8	PK	.3	0	43.1	56	-12.9	-	-
6	.5775	31.4	Av	.3	0	31.7	-	-	46	-14.3
7	1.6845	31.85	PK	.2	.1	32.15	56	-23.85	-	-
8	1.6845	20.76	Av	.2	.1	21.06	-	-	46	-24.94
9	6.954	31.24	PK	.2	.1	31.54	60	-28.46	-	-
10	6.954	21.42	Av	.2	.1	21.72	-	-	50	-28.28
23	29.9715	30.28	PK	.3	.3	30.88	60	-29.12	-	-
24	29.9715	20.98	Av	.3	.3	21.58	-	-	50	-28.42

PK - Peak detector; Av - Average detection

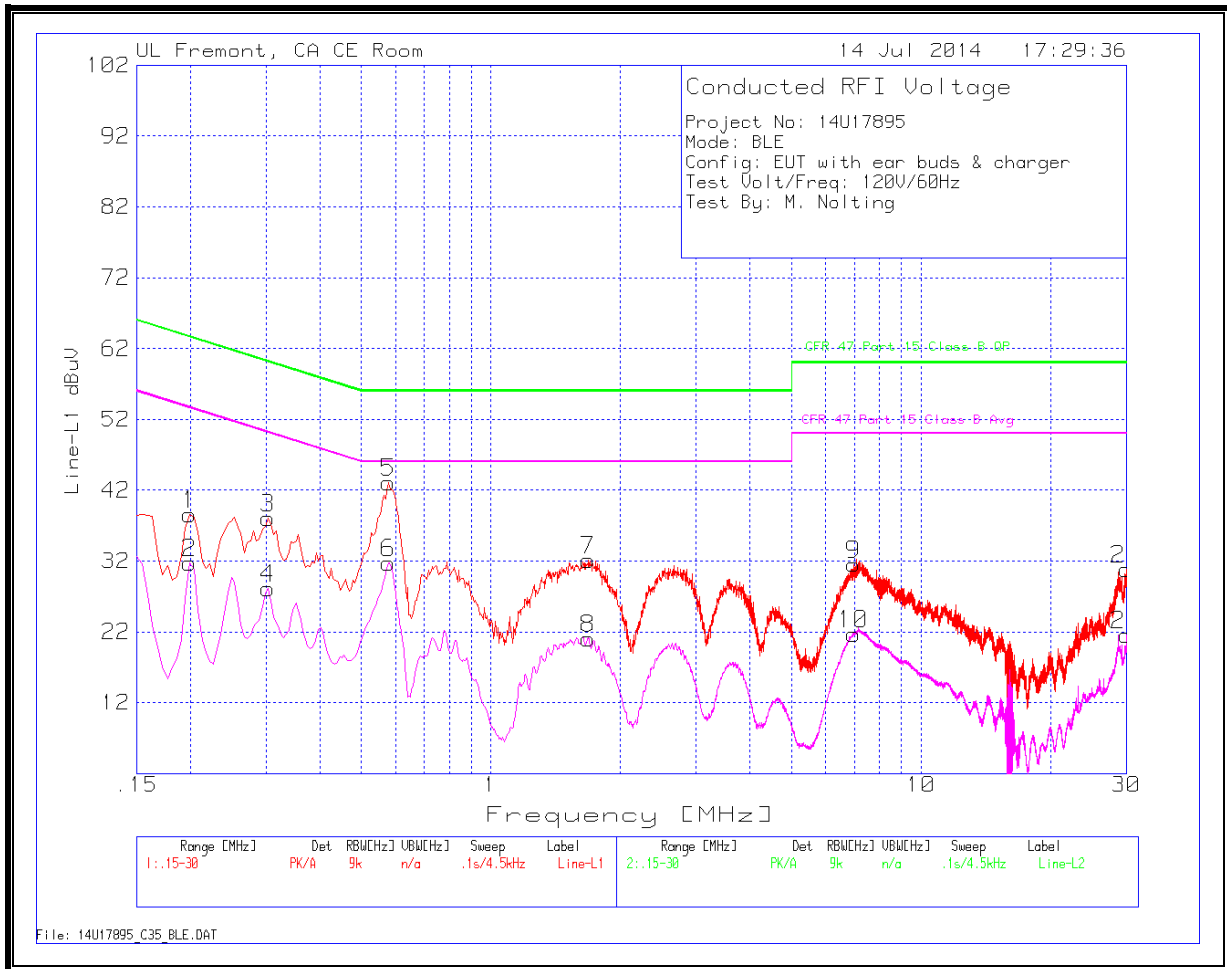
**LINE 2 RESULTS**

**Trace Markers**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin to Limit (dB)	CFR 47 Part 15 Class B Avg	Margin to Limit (dB)
11	.159	36.58	PK	1.4	0	37.98	65.5	-27.52	-	-
12	.159	25.16	Av	1.4	0	26.56	-	-	55.5	-28.94
13	.249	37.75	PK	.7	0	38.45	61.8	-23.35	-	-
14	.249	26.1	Av	.7	0	26.8	-	-	51.8	-25
15	.348	37.14	PK	.5	0	37.64	59	-21.36	-	-
16	.348	21.44	Av	.5	0	21.94	-	-	49	-27.06
17	.591	39.46	PK	.3	0	39.76	56	-16.24	-	-
18	.591	24.16	Av	.3	0	24.46	-	-	46	-21.54
19	1.545	24.49	PK	.2	.1	24.79	56	-31.21	-	-
20	1.545	11.37	Av	.2	.1	11.67	-	-	46	-34.33
21	7.053	34.01	PK	.2	.1	34.31	60	-25.69	-	-
22	7.053	24.42	Av	.2	.1	24.72	-	-	50	-25.28

PK - Peak detector; Av - Average detection

**LINE 1 PLOT**



**LINE 2 PLOT**

