



**FCC 47 CFR PART 15 SUBPART E**

**CERTIFICATION TEST REPORT**

**FOR**

**CDMA/LTE Phone + Bluetooth & DTS/UNII a/b/g/n + NFC**

**MODEL NUMBER: LG-VS880, VS880, LGVS880**

**FCC ID: ZNFVS880**

**REPORT NUMBER: 14U17222-5**

**ISSUE DATE: April 11, 2014**

*Prepared for*

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

*Prepared by*

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



**NVLAP LAB CODE 200065-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
-	04/11/14	Initial Issue	P. Kim

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS</b> .....	<b>6</b>
<b>2. TEST METHODOLOGY</b> .....	<b>7</b>
<b>3. FACILITIES AND ACCREDITATION</b> .....	<b>7</b>
<b>4. CALIBRATION AND UNCERTAINTY</b> .....	<b>7</b>
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i> .....	7
4.2. <i>SAMPLE CALCULATION</i> .....	7
4.3. <i>MEASUREMENT UNCERTAINTY</i> .....	7
<b>5. EQUIPMENT UNDER TEST</b> .....	<b>8</b>
5.1. <i>DESCRIPTION OF EUT</i> .....	8
5.2. <i>MAXIMUM OUTPUT POWER</i> .....	8
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i> .....	8
5.4. <i>WORST-CASE CONFIGURATION AND MODE</i> .....	9
5.5. <i>DESCRIPTION OF TEST SETUP</i> .....	10
<b>6. TEST AND MEASUREMENT EQUIPMENT</b> .....	<b>12</b>
<b>7. SUMMARY TABLE</b> .....	<b>13</b>
<b>8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS</b> .....	<b>14</b>
8.1. <i>ON TIME AND DUTY CYCLE RESULTS</i> .....	14
8.2. <i>DUTY CYCLE PLOTS</i> .....	14
<b>9. MEASUREMENT METHOD</b> .....	<b>16</b>
<b>10. ANTENNA PORT TEST RESULTS</b> .....	<b>17</b>
10.1. <i>26 dB BANDWIDTH</i> .....	17
10.1.1. 802.11a MODE IN THE 5.2 GHz BAND.....	17
10.1.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND.....	17
10.1.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND.....	17
10.1.1. 802.11a MODE IN THE 5.3 GHz BAND.....	18
10.1.1. 802.11n HT20 MODE IN THE 5.3 GHz BAND.....	18
10.1.2. 802.11n HT40 MODE IN THE 5.3 GHz BAND.....	18
10.1.3. 802.11a MODE IN THE 5.5 GHz BAND.....	18
10.1.4. 802.11n HT20 MODE IN THE 5.5 GHz BAND.....	18
10.1.5. 802.11n HT40 MODE IN THE 5.5 GHz BAND.....	19
10.2. <i>99% BANDWIDTH</i> .....	26
10.2.1. 802.11a MODE IN THE 5.2 GHz BAND.....	26
10.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND.....	26
10.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND.....	26
10.2.4. 802.11a MODE IN THE 5.3 GHz BAND.....	26
10.2.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND.....	27

10.2.6.	802.11n HT40 MODE IN THE 5.3 GHz BAND.....	27
10.2.7.	802.11a MODE IN THE 5.5 GHz BAND.....	27
10.2.8.	802.11n HT20 MODE IN THE 5.5 GHz BAND.....	27
10.2.9.	802.11n HT40 MODE IN THE 5.5 GHz BAND.....	27
10.3.	<b>AVERAGE POWER.....</b>	<b>33</b>
10.3.1.	802.11a MODE IN THE 5.2 GHz BAND.....	33
10.3.2.	802.11n HT20 MODE IN THE 5.2 GHz BAND.....	33
10.3.3.	802.11n HT40 MODE IN THE 5.2 GHz BAND.....	33
10.3.4.	802.11a MODE IN THE 5.3 GHz BAND.....	34
10.3.5.	802.11n HT20 MODE IN THE 5.3 GHz BAND.....	34
10.3.6.	802.11n HT40 MODE IN THE 5.3 GHz BAND.....	34
10.3.7.	802.11a MODE IN THE 5.5 GHz BAND.....	34
10.3.8.	802.11n HT20 MODE IN THE 5.5 GHz BAND.....	34
10.3.9.	802.11n HT40 MODE IN THE 5.5 GHz BAND.....	35
10.4.	<b>OUTPUT POWER AND PPSD.....</b>	<b>36</b>
10.4.1.	802.11a MODE IN THE 5.2 GHz BAND.....	37
10.4.2.	802.11n HT20 MODE IN THE 5.2 GHz BAND.....	38
10.4.3.	802.11n HT40 MODE IN THE 5.2 GHz BAND.....	39
10.4.4.	802.11a MODE IN THE 5.3 GHz BAND.....	40
10.4.5.	802.11n HT20 MODE IN THE 5.3 GHz BAND.....	41
10.4.6.	802.11n HT40 MODE IN THE 5.3 GHz BAND.....	42
10.4.7.	802.11a MODE IN THE 5.5 GHz BAND.....	43
10.4.8.	802.11n HT20 MODE IN THE 5.5 GHz BAND.....	44
10.4.9.	802.11n HT40 MODE IN THE 5.5 GHz BAND.....	45
10.5.	<b>PEAK EXCURSION.....</b>	<b>46</b>
10.5.1.	802.11a MODE IN THE 5.2 GHz BAND.....	46
10.5.1.	802.11n HT20 MODE IN THE 5.2 GHz BAND.....	47
10.5.1.	802.11n HT40 MODE IN THE 5.2 GHz BAND.....	48
<b>11.</b>	<b>TRANSMITTER ABOVE 1 GHz.....</b>	<b>49</b>
11.1.	<b>5.2 GHz.....</b>	<b>50</b>
11.1.1.	TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND.....	50
11.1.2.	TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND.....	61
11.1.3.	TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND.....	72
11.2.	<b>5.3 GHz.....</b>	<b>80</b>
11.2.1.	TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND.....	80
11.2.3.	TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND.....	91
11.2.4.	TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND.....	102
11.3.	<b>5.5-5.6 GHz.....</b>	<b>110</b>
11.3.1.	TX ABOVE 1 GHz 802.11a MODE IN THE 5.5 GHz BAND.....	110
11.3.3.	TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.5 GHz BAND.....	123
11.3.5.	TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.5 GHz BAND.....	136
<b>12.</b>	<b>WORST-CASE BELOW 1 GHz (in the 5.2 GHz Band).....</b>	<b>149</b>
<b>13.</b>	<b>AC POWER LINE CONDUCTED EMISSIONS.....</b>	<b>152</b>
<b>14.</b>	<b>DYNAMIC FREQUENCY SELECTION.....</b>	<b>156</b>
14.1.	<b>OVERVIEW.....</b>	<b>156</b>

---

14.1.1.	LIMITS.....	156
14.1.2.	TEST AND MEASUREMENT SYSTEM.....	159
14.1.3.	SETUP OF EUT .....	162
14.1.4.	DESCRIPTION OF EUT.....	163
14.2.	<i>RESULTS FOR 20 MHz BANDWIDTH.....</i>	<i>165</i>
14.2.1.	TEST CHANNEL.....	165
14.2.2.	RADAR WAVEFORM AND TRAFFIC.....	165
14.2.3.	OVERLAPPING CHANNEL TESTS.....	167
14.2.4.	MOVE AND CLOSING TIME .....	167
14.3.	<i>RESULTS FOR 40 MHz BANDWIDTH.....</i>	<i>171</i>
14.3.1.	TEST CHANNEL.....	171
14.3.2.	RADAR WAVEFORM AND TRAFFIC.....	171
14.3.3.	OVERLAPPING CHANNEL TESTS.....	173
14.3.4.	MOVE AND CLOSING TIME .....	173
14.3.5.	NON-OCCUPANCY PERIOD .....	177
<b>15.</b>	<b>SETUP PHOTOS.....</b>	<b>178</b>

# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** LG ELECTRONICS MOBILECOMM U.S.A., INC  
**EUT DESCRIPTION:** CDMA/LTE Phone + Bluetooth & DTS/UNII a/b/g/n + NFC  
**MODEL:** LG-VS880, VS880, LGVS880  
**SERIAL NUMBER:** 1838501 (Conducted), 1838500 (Radiated)  
**DATE TESTED:** MARCH 21- APRIL 7, 2014

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

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

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

Approved & Released For  
UL Verification Services Inc. By:

Tested By:



---

PHILIP KIM  
CONSUMER TECHNOLOGY DIVISION  
PROGRAM MANAGER  
UL Verification Services Inc.

---

CHARLES VERGONIO  
CONSUMER TECHNOLOGY DIVISION  
LAB TECHNICIAN  
UL Verification Services Inc.

## 2. TEST METHODOLOGY

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

## 3. FACILITIES AND ACCREDITATION

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

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

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

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

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

### 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 18000 MHz	4.94 dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a CDMA/LTE Phone + Bluetooth & DTS/UNII a/b/g/n + NFC.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180-5240	802.11a	11.26	13.37
5180-5240	802.11n HT20	11.18	13.12
5190-5230	802.11n HT40	10.72	11.80
5260-5320	802.11a	11.02	12.65
5260-5320	802.11n HT20	10.95	12.45
5270-5310	802.11n HT40	10.4	10.96
5500-5700	802.11a	10.98	12.53
5500-5700	802.11n HT20	10.78	11.97
5510-5670	802.11n HT40	10.36	10.86

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -4.27 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 the X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in the X orientation.

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

802.11a mode: 6 Mbps

802.11n HT20mode: MCS0

802.11n HT40mode: MCS0

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	LG Electronics	MCS-01WD	DB3Y0094683	N/A
Earphone	LG Electronics	N/A	N/A	N/A

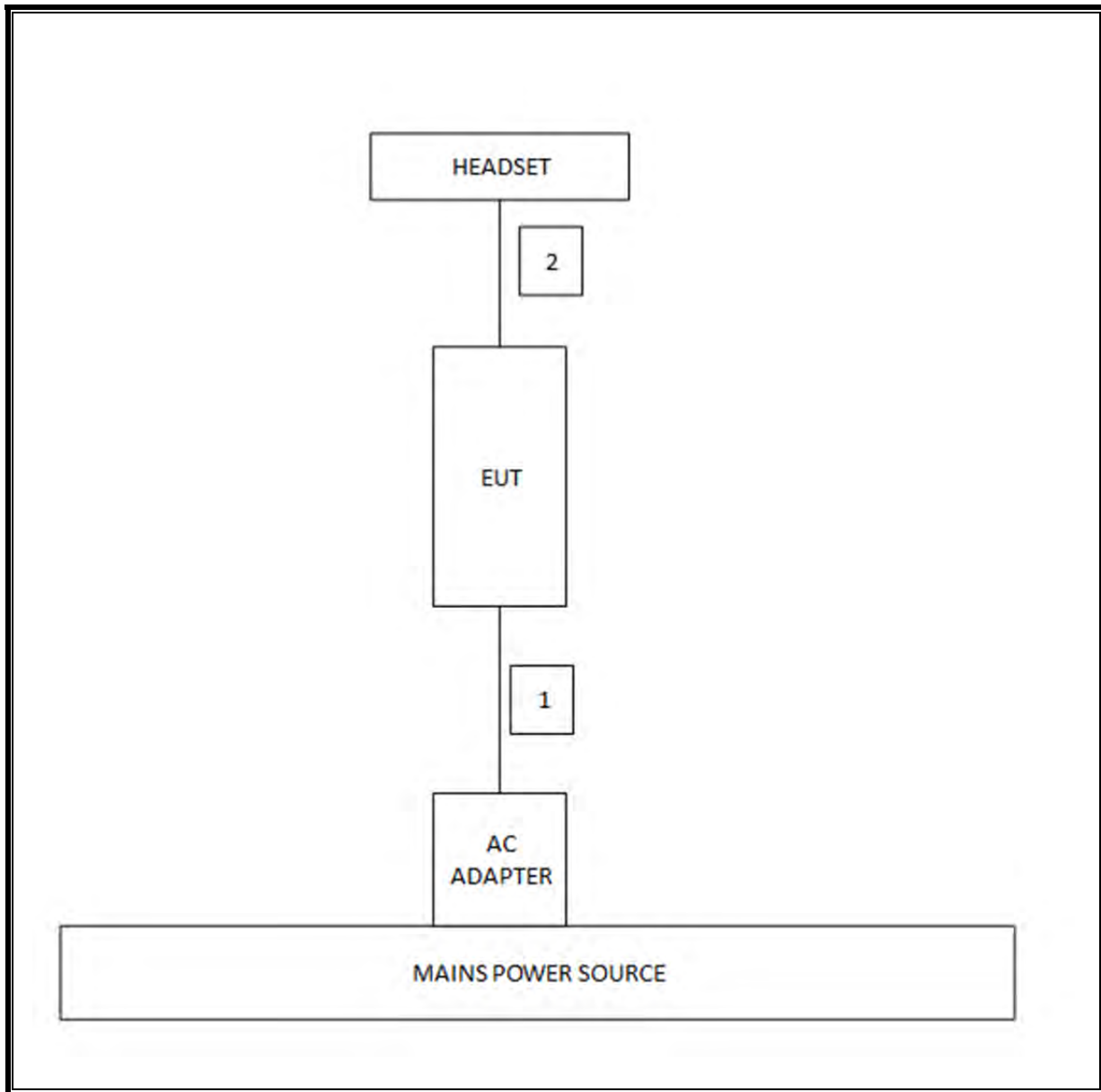
### I/O CABLES

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	1.0m	N/A

### TEST SETUP

The EUT is setup as a stand-alone device.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/14
Spectrum Analyzer,9KHz-40GHz	HP	8564E	C00986	04/01/15
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	08/13/14
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/18/14
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/14
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/14
Antenna, Horn, 1-18 GHz	ETS	3117	C01022	02/21/15
Antenna, Horn,18- 26 GHz	ARA	MWH-1826/B	C00946	11/12/14
Antenna, Horn, 26-40 GHz	ARA	MWH-2640	C00891	06/28/14
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	03/06/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/14
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/15
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/14
AC Power Supply, 2,500VA 45-500Hz	Elgar-Ametek	CW2501M	F00013	CNR
RF Preamplifier, 1GHz - 40GHz	Miteq	NSP4000-SP2	C00990	08/20/14
Attenuator / Switch driver	HP	11713A	F00204	CNR
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	F00219	05/23/14
High Pass Filter 5GHz	Micro-Tronics	HPS17542	F00222	05/22/14
High Pass Filter 6GHz	Micro-Tronics	HPM17543	F00224	05/22/14

## 7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)	Occupied Band width (26dB)	N/A	Conducted	Pass	45.6MHz
15.407 (a)(1)	TX Cond. Power 5.15-2.25	<17dBm or 4+10Log(OBW)		Pass	11.26dBm
15.407 (a)(2)	TX Cond. Power 5.25-5.35 & 5.47-5.725	<24dBm or 11+10Log(OBW)		Pass	11.02dBm
15.407 (a)(5)	PSD	<4dBm for 5.2GHz <11dBm for 5.3,5.5GHz		Pass	1.56dBm
15.407 (a)(6)	Peak Excursion Ratio	13dB		Pass	8.68dBm
15.207 (a)	AC Power Line conducted emissions	Section 10		Radiated	Pass
15.407 (b) & 15.209	Radiated Spurious Emission	< 54dBuV/m	Pass		47.4dBuV/m
15.407 (h)(2)	Dynamic Frequency Selection	N/A	Radiated / Condcuted	Pass	N/A

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

### LIMITS

None; for reporting purposes only.

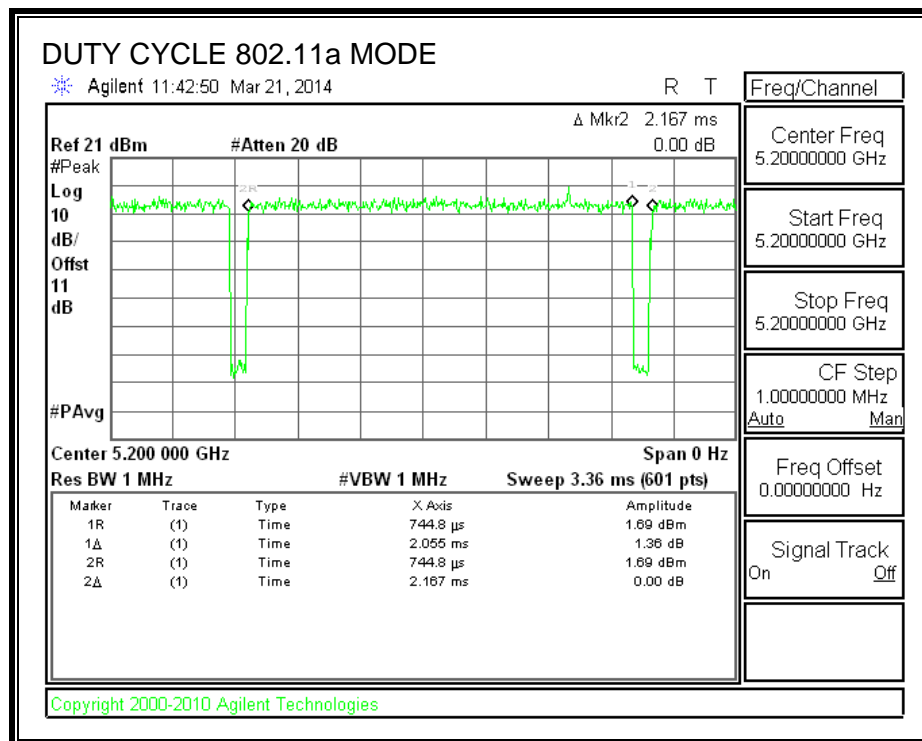
### PROCEDURE

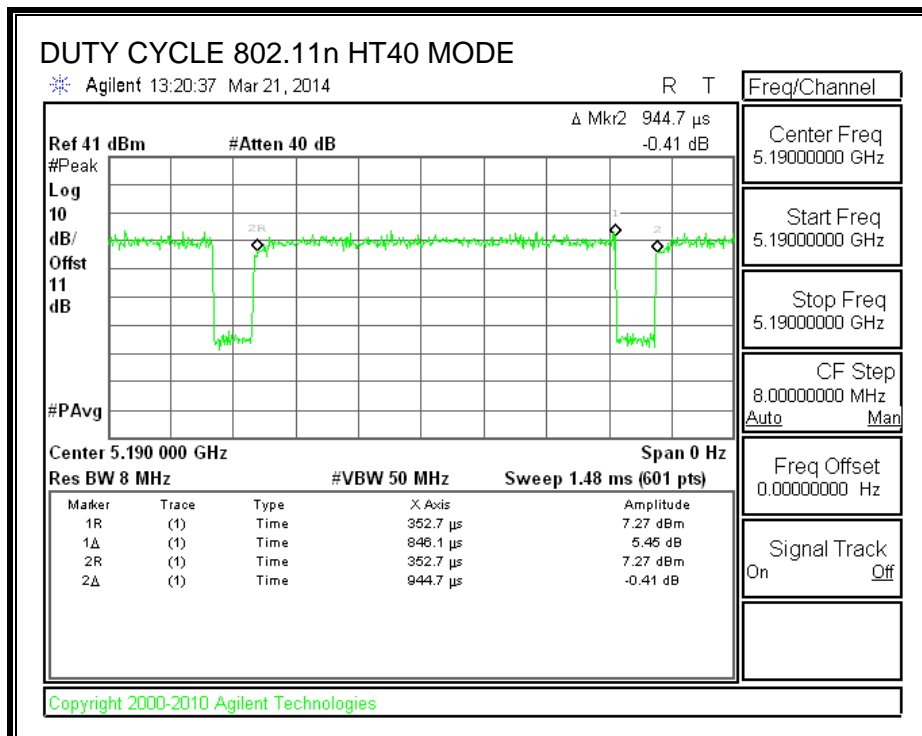
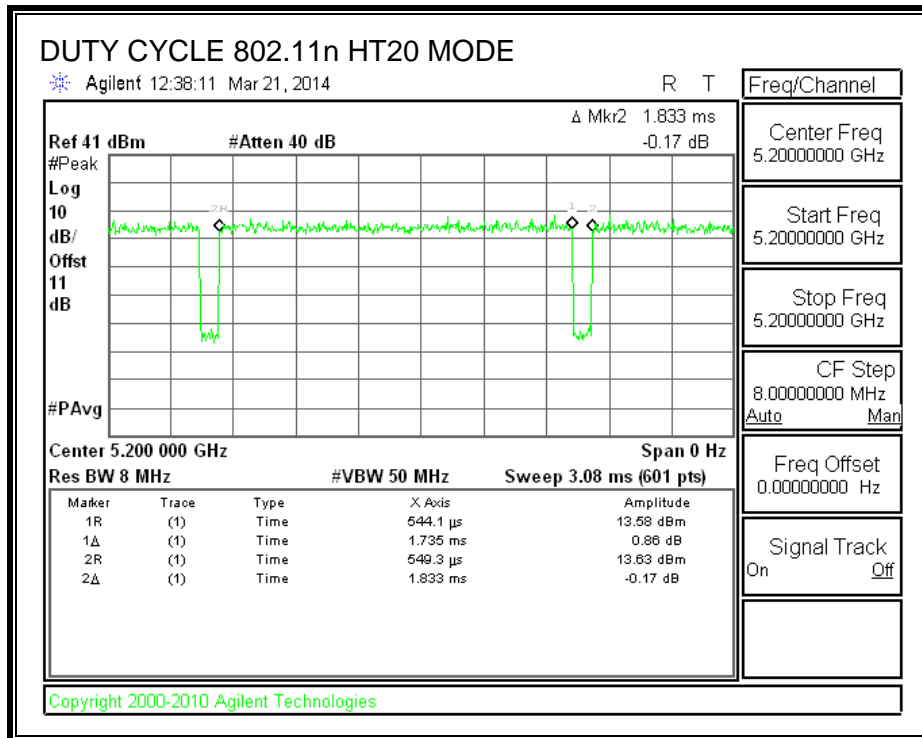
KDB 789033 Zero-Span Spectrum Analyzer Method.

### 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/T Minimum VBW (kHz)
802.11a	2.06	2.17	0.948	94.8%	0.23	0.487
802.11n HT20	1.74	2	0.947	94.7%	0.24	0.576
802.11n HT40	0.85	1	0.896	89.6%	0.48	1.182

### 8.2. DUTY CYCLE PLOTS





## 9. MEASUREMENT METHOD

The Duty Cycle is less than 98% and consistent therefore KDB 789033 Method SA-2 is used for power and PPSD

The Duty Cycle is less than 98% and consistent, KDB 789033 Method AD with Power RMS Averaging and duty cycle correction is used.



## 10. ANTENNA PORT TEST RESULTS

### 10.1. 26 dB BANDWIDTH

#### LIMITS

None; for reporting purposes only.

#### RESULTS

##### 10.1.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	19.10
Mid	5200	19.00
High	5240	19.00
Worst		19.10

##### 10.1.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	19.35
Mid	5200	19.40
High	5240	19.40
Worst		19.40

##### 10.1.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	44.300
Mid	5230	44.500
Worst		44.500

**10.1.1. 802.11a MODE IN THE 5.3 GHZ BAND**

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	18.90
Mid	5300	18.90
High	5320	18.90
Worst		18.90

**10.1.1. 802.11n HT20 MODE IN THE 5.3 GHZ BAND**

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	19.35
Mid	5300	19.35
High	5320	19.35
Worst		19.35

**10.1.2. 802.11n HT40 MODE IN THE 5.3 GHZ BAND**

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5270	44.7
High	5310	44.6
Worst		44.7

**10.1.3. 802.11a MODE IN THE 5.5 GHZ BAND**

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	18.700
Mid	5580	18.750
High	5700	18.800
Worst		18.800

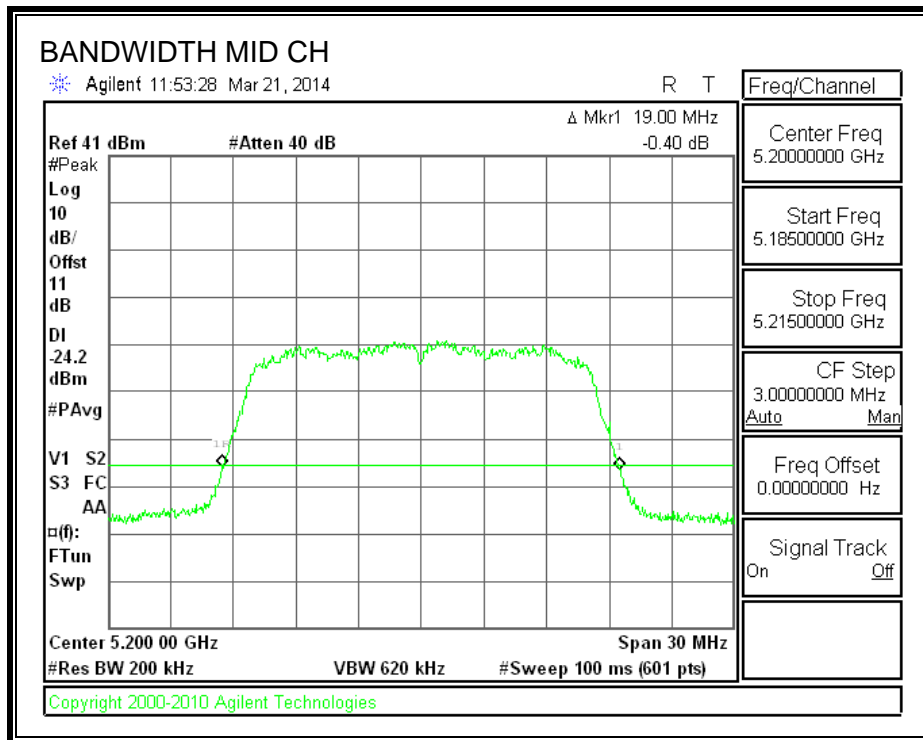
**10.1.4. 802.11n HT20 MODE IN THE 5.5 GHZ BAND**

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	19.050
Mid	5580	19.150
High	5700	19.200
Worst		19.200

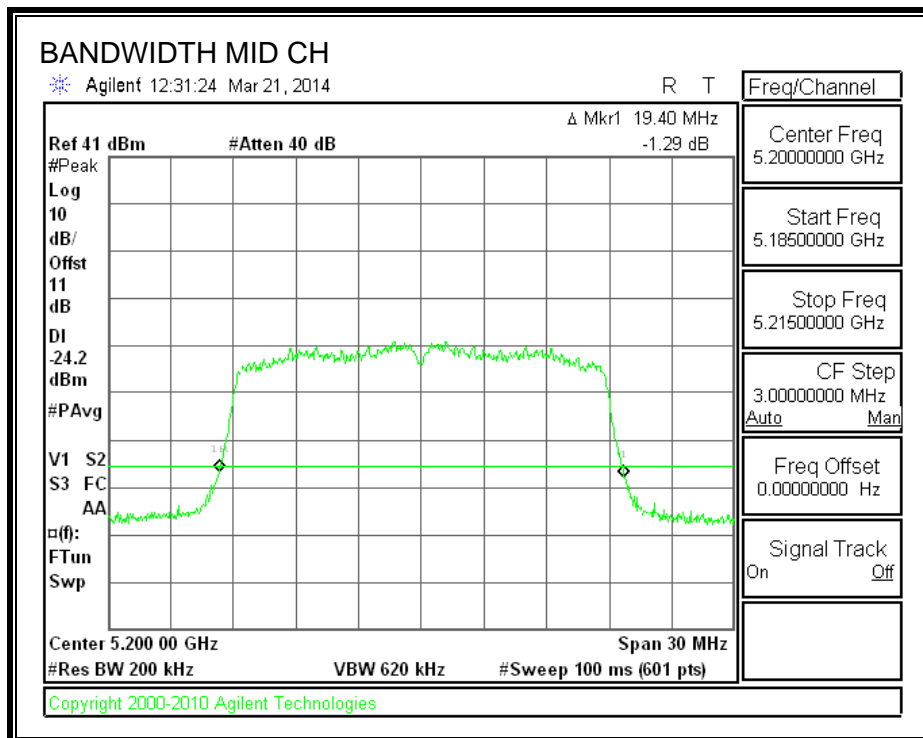
**10.1.5. 802.11n HT40 MODE IN THE 5.5 GHz BAND**

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	44.5
Mid	5550	44.8
High	5670	45.6
Worst		45.6

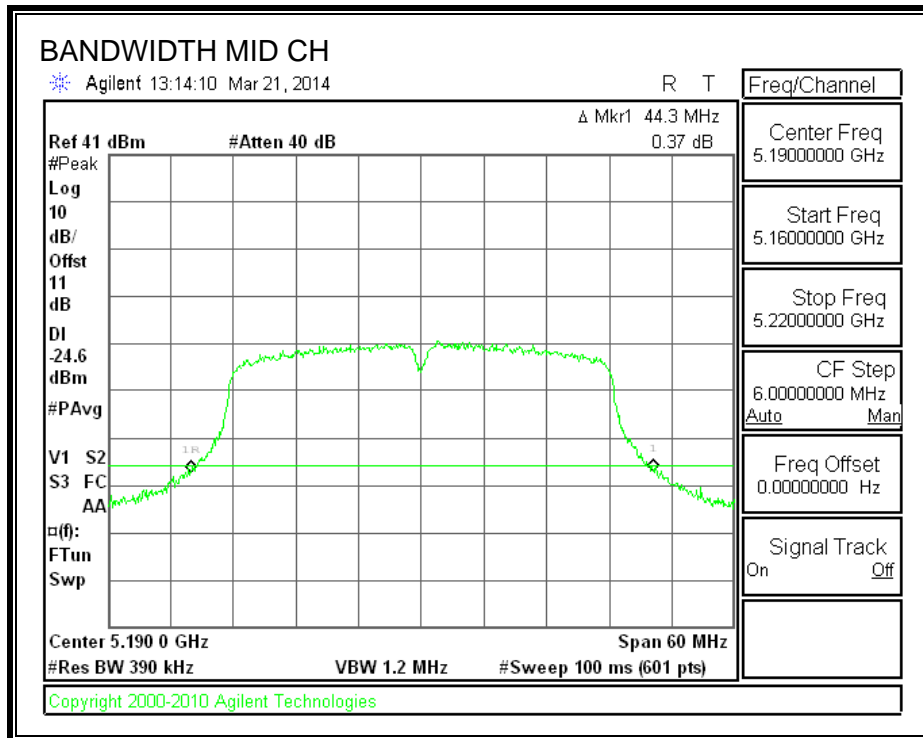
**802.11a 5.2G 26 dB BANDWIDTH**



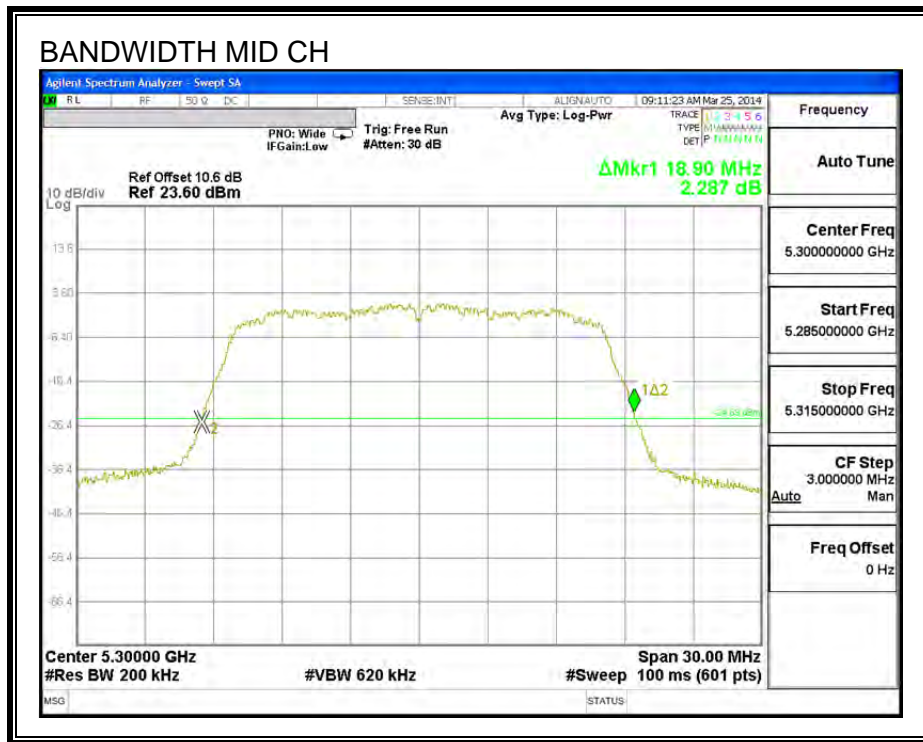
**802.11n HT20 5.2G 26 dB BANDWIDTH**



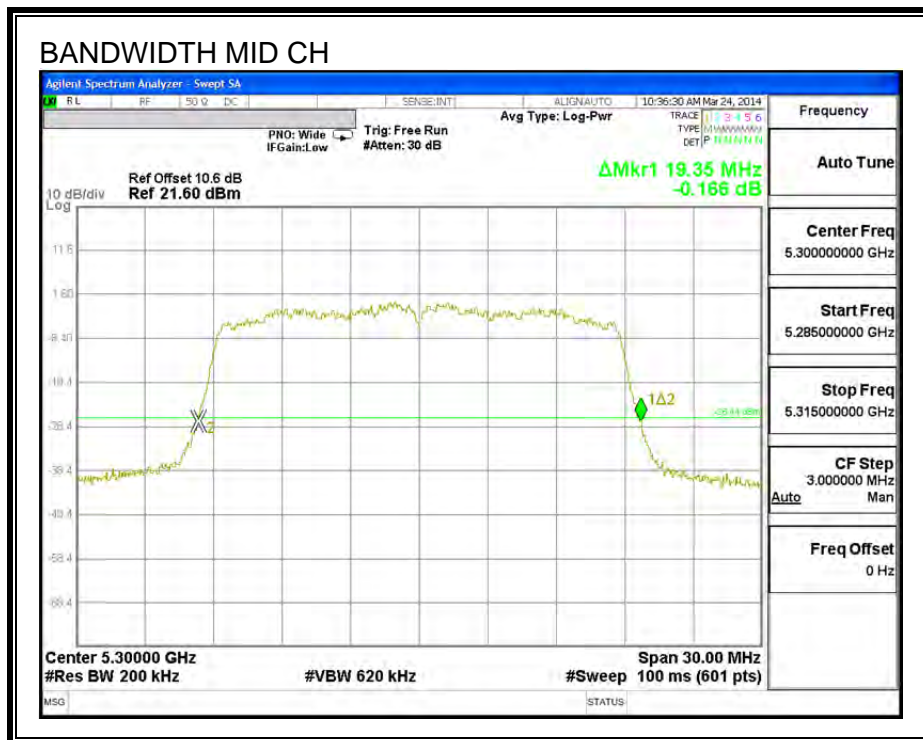
**802.11n HT40 5.2G 26 dB BANDWIDTH**



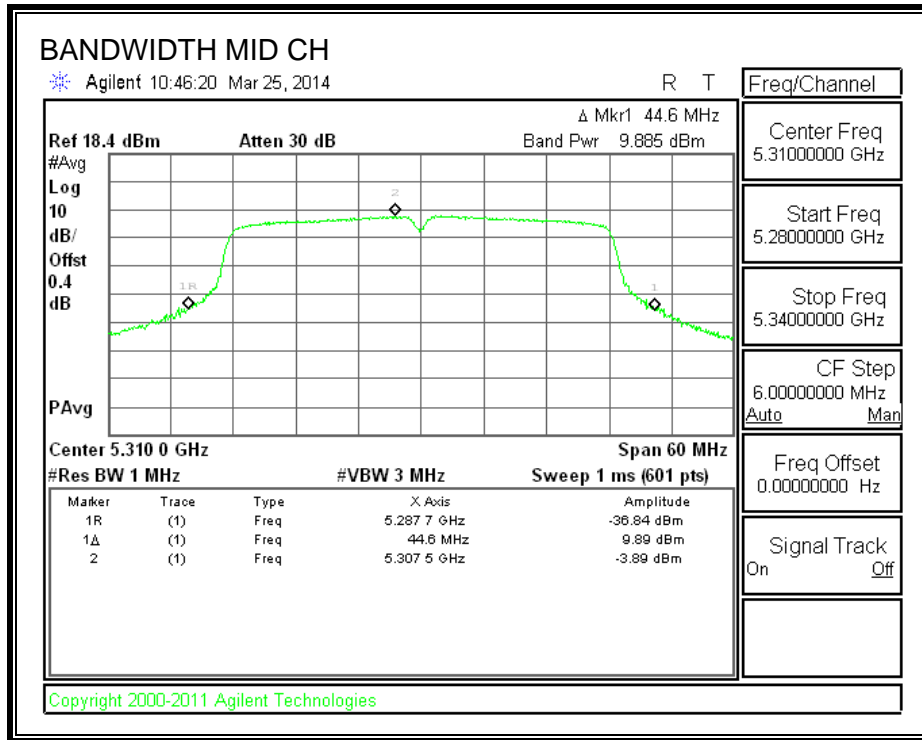
**802.11a 5.3G 26 dB BANDWIDTH**



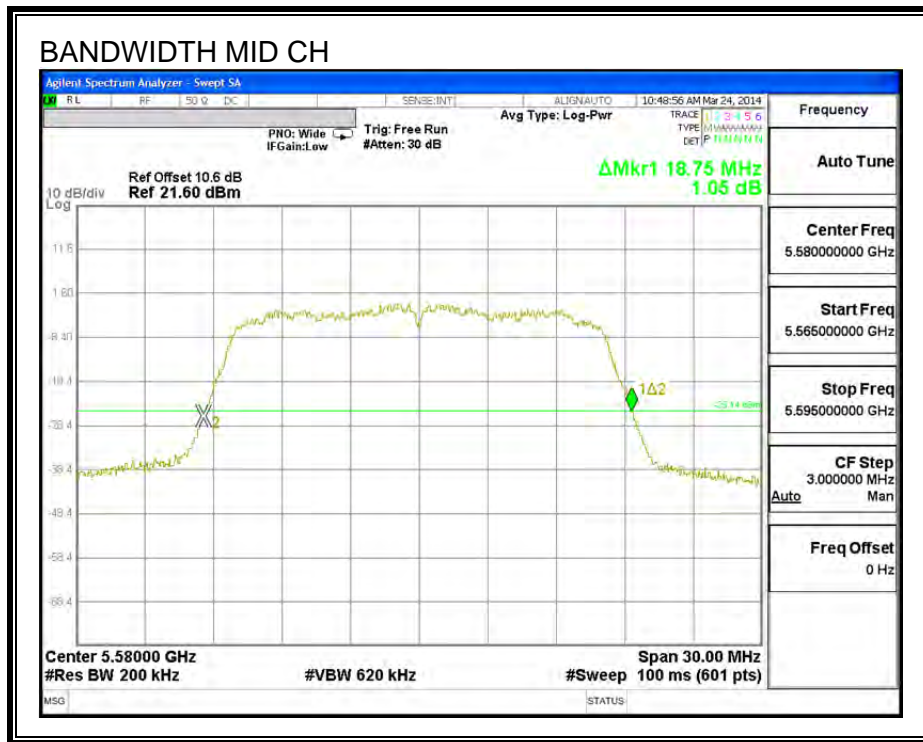
**802.11n HT20 5.3G 26 dB BANDWIDTH**



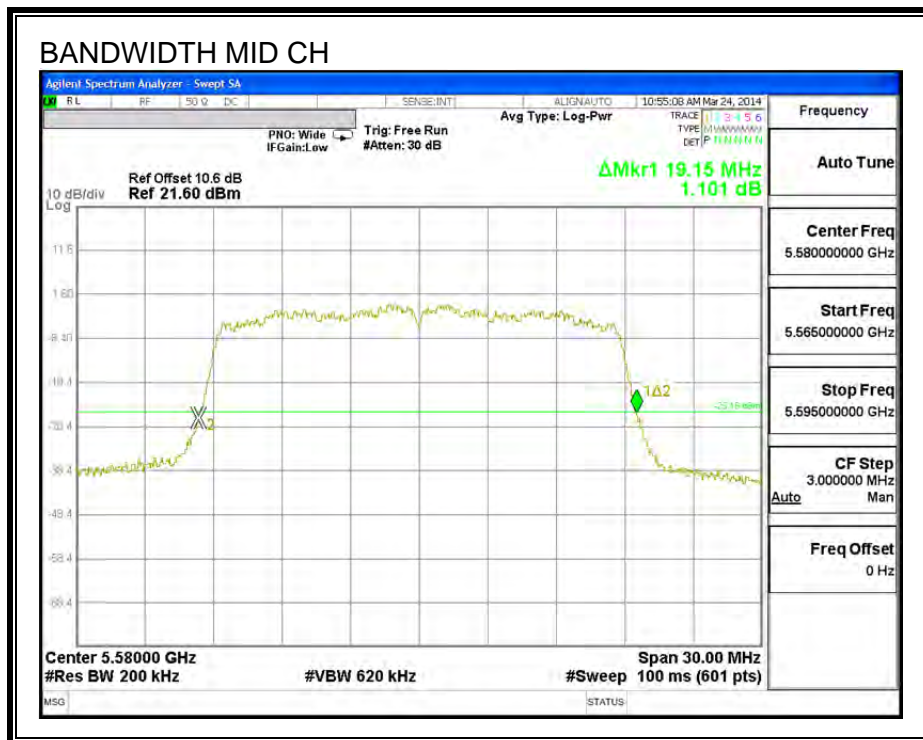
**802.11n HT40 5.3G 26 dB BANDWIDTH**



**802.11a 5.5G 26 dB BANDWIDTH**

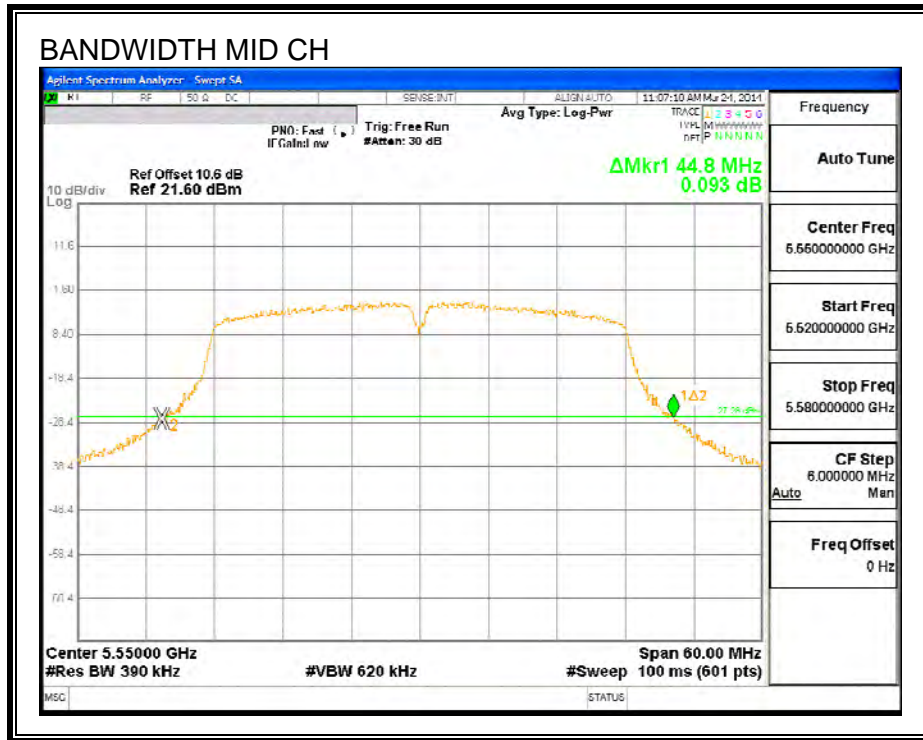


**802.11n HT20 5.5G 26 dB BANDWIDTH**





**802.11n HT40 5.5G 26 dB BANDWIDTH**



## 10.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

### RESULTS

#### 10.2.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.41
Mid	5200	16.47
High	5240	16.39
Worst		16.47

#### 10.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.62
Mid	5200	17.61
High	5240	17.70
Worst		17.70

#### 10.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.044
Mid	5230	36.025
Worst		36.044

#### 10.2.4. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.45
Mid	5300	16.47
High	5320	16.53
Worst		16.53

**10.2.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.67
Mid	5300	17.58
High	5320	17.76
Worst		17.76

**10.2.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	35.5
High	5310	35.9
Worst		35.9

**10.2.7. 802.11a MODE IN THE 5.5 GHz BAND**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.508
Mid	5580	16.413
High	5700	16.554
Worst		16.554

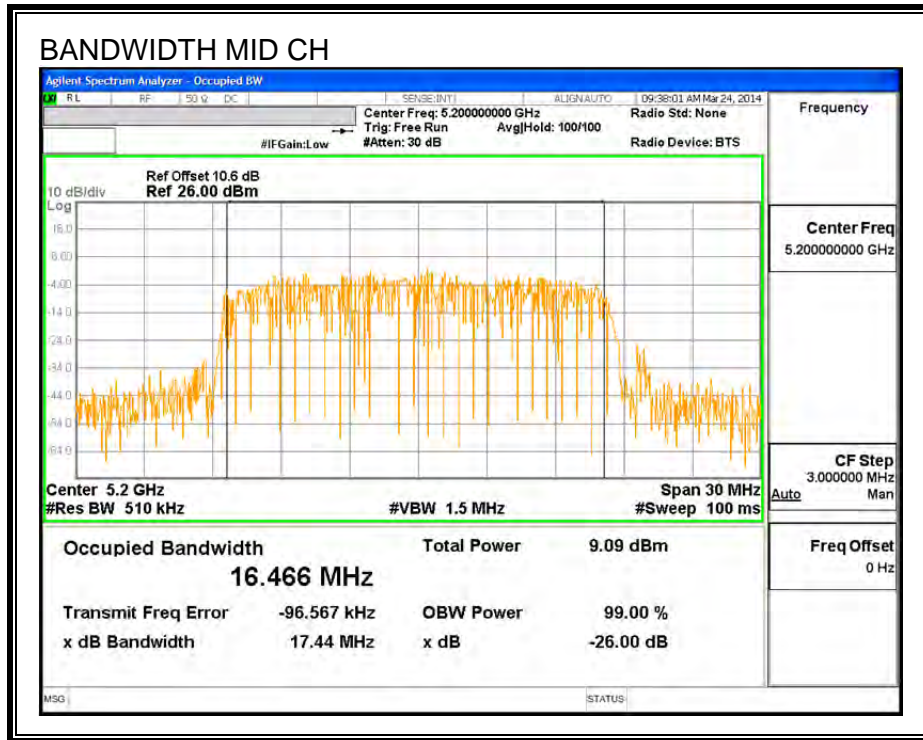
**10.2.8. 802.11n HT20 MODE IN THE 5.5 GHz BAND**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.575
Mid	5580	17.537
High	5700	17.717
Worst		17.717

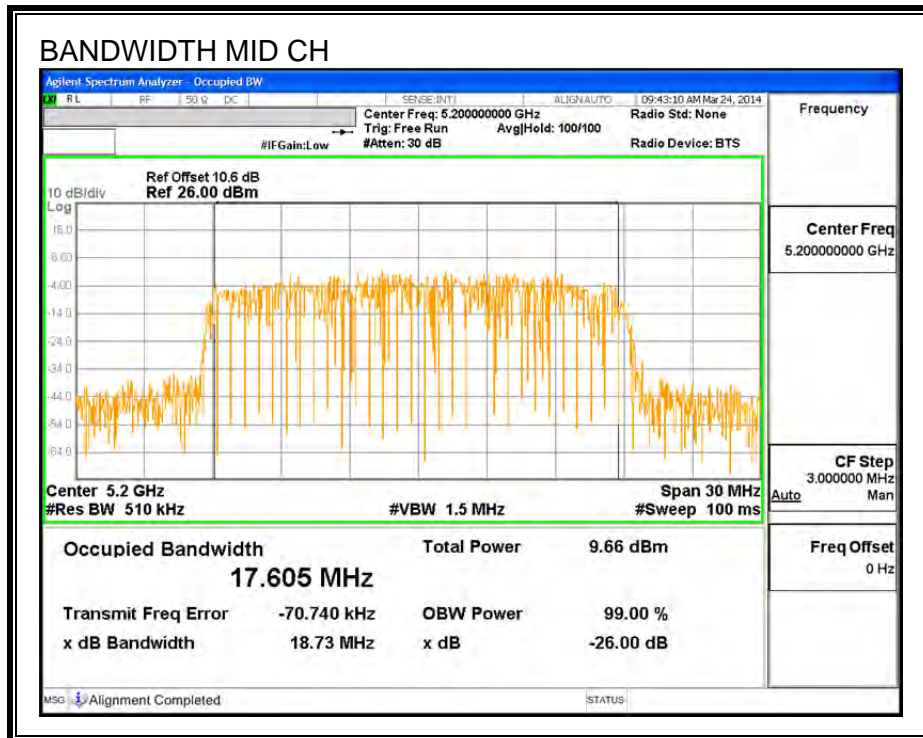
**10.2.9. 802.11n HT40 MODE IN THE 5.5 GHz BAND**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	35.9
Mid	5550	35.8
High	5670	36.0
Worst		36.0

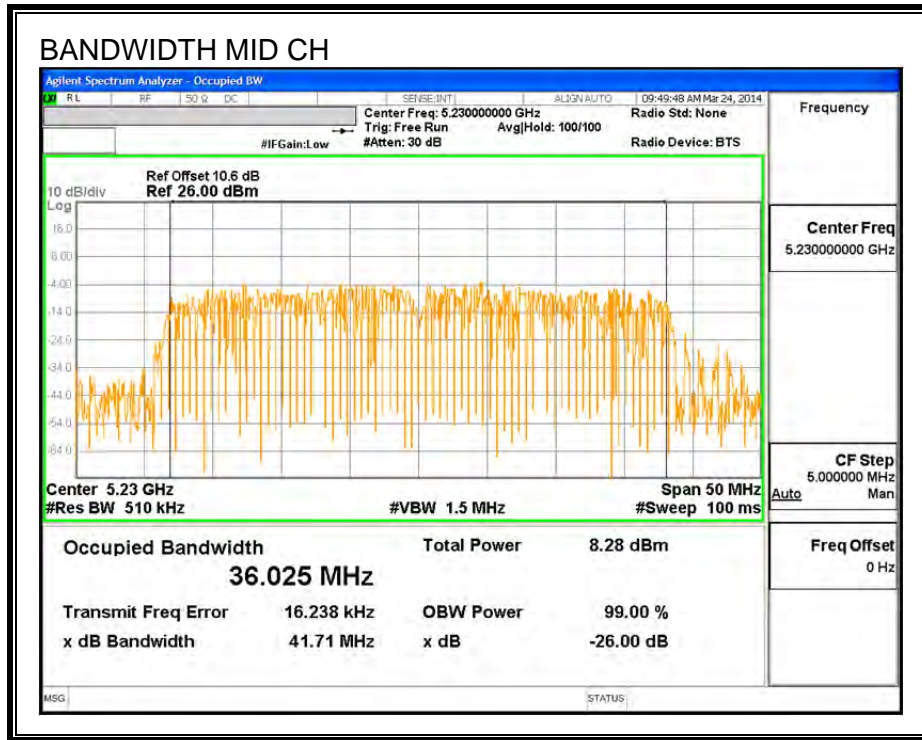
**802.11a 5.2G 99% BANDWIDTH**



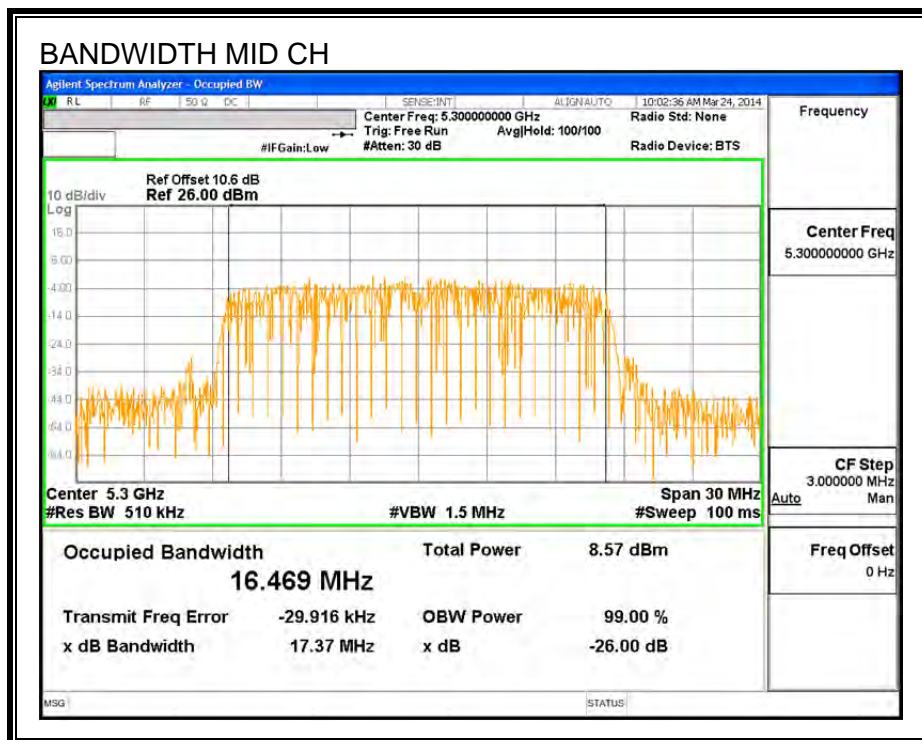
**802.11n HT20 5.2G 99% BANDWIDTH**



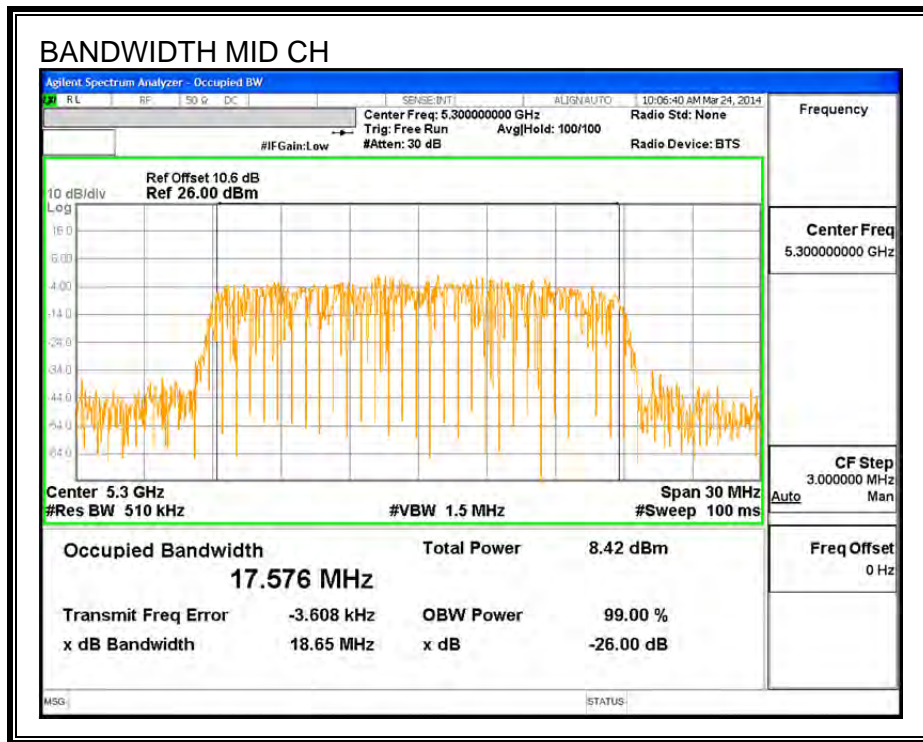
**802.11n HT40 5.2G 99% BANDWIDTH**



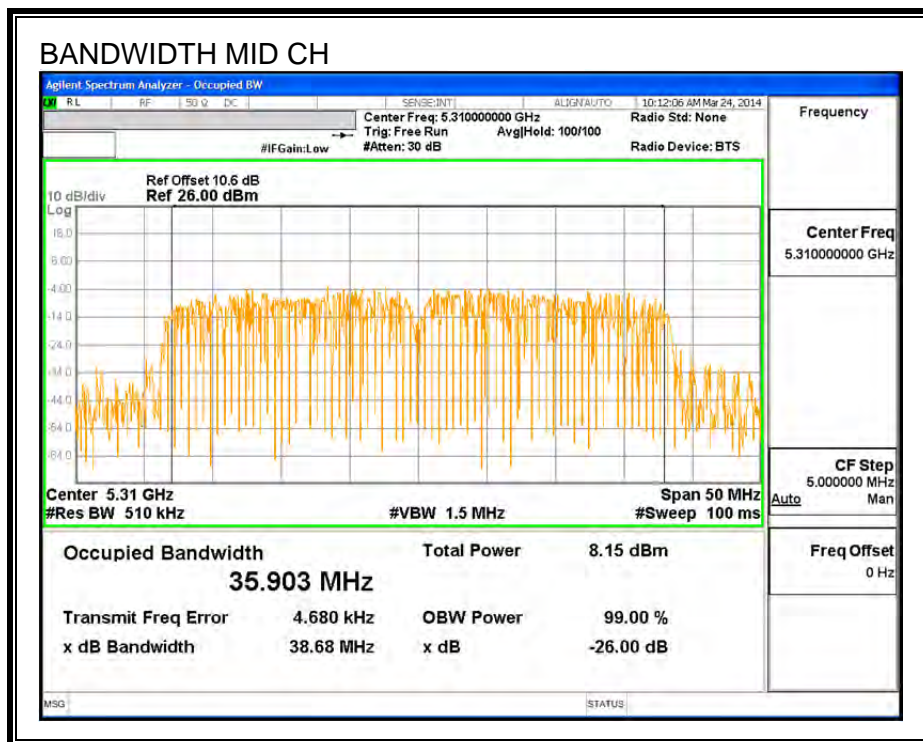
**802.11a 5.3G 99% BANDWIDTH**



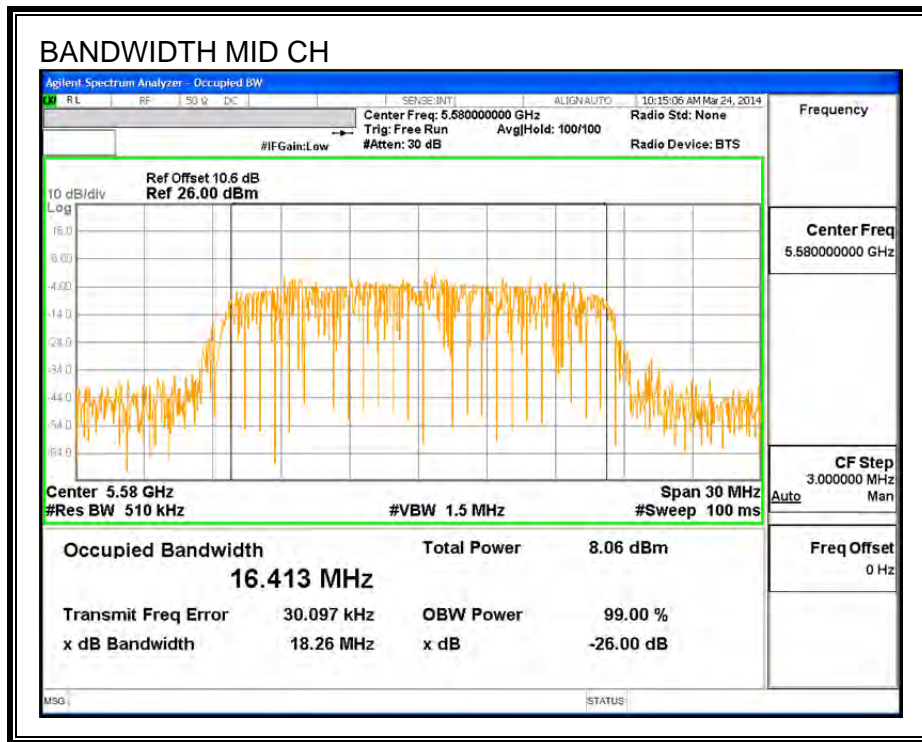
**802.11n HT20 5.3G 99% BANDWIDTH**



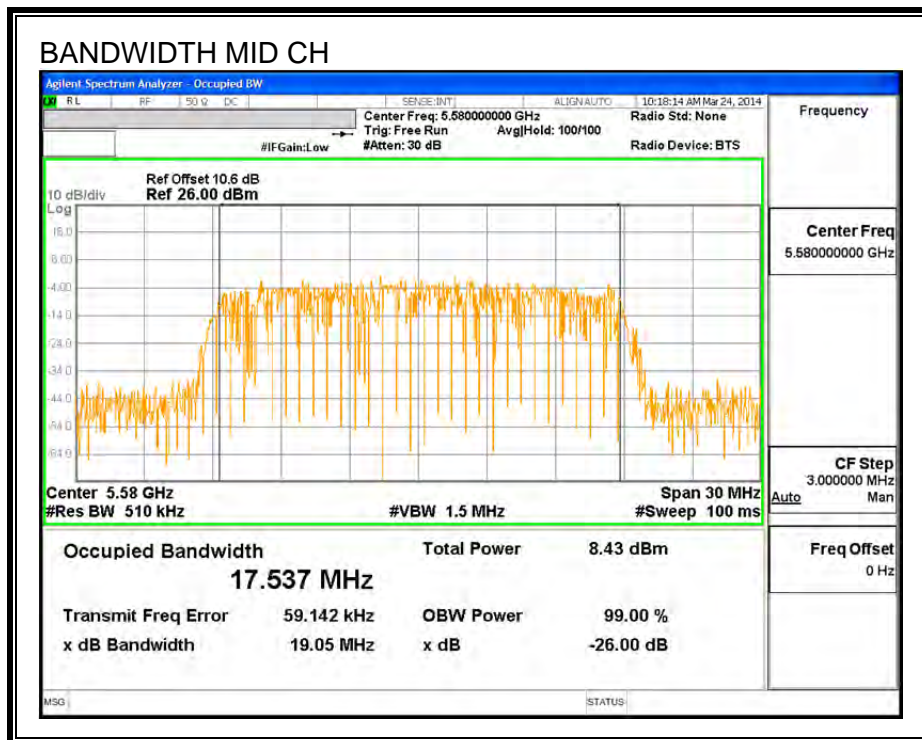
**802.11n HT40 5.3G 99% BANDWIDTH**



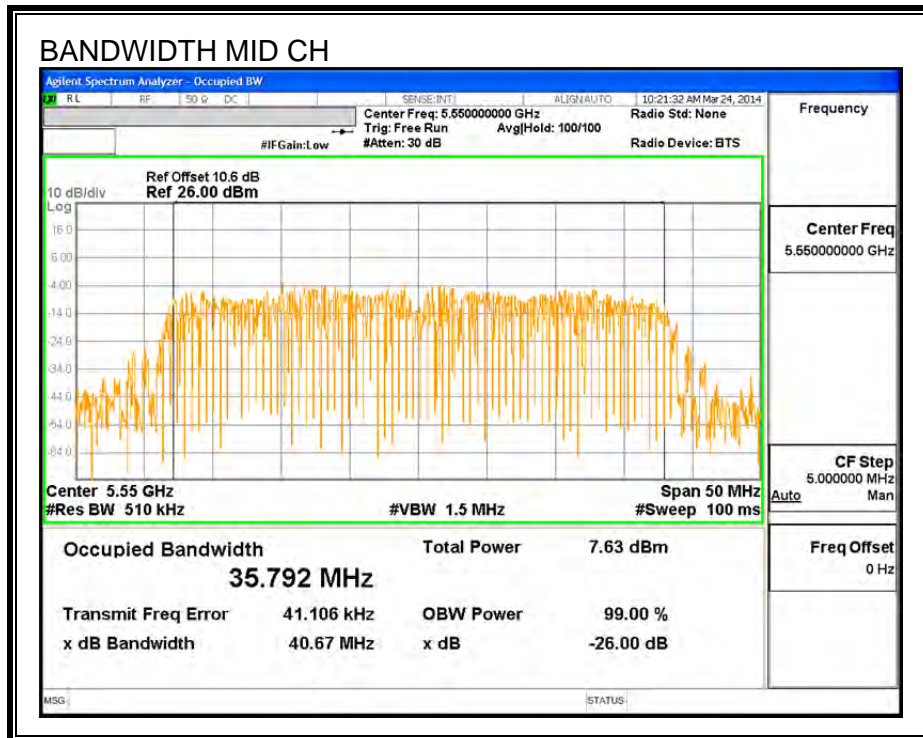
**802.11a 5.5G 99% BANDWIDTH**



**802.11n HT20 5.5G 99% BANDWIDTH**



**802.11n HT40 5.5G 99% BANDWIDTH**





### 10.3. AVERAGE POWER

#### LIMITS

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 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.

#### RESULTS

##### 10.3.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	10.00
Mid	5200	10.00
High	5240	10.10
Worst		10.10

##### 10.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	10.00
Mid	5200	10.00
High	5240	10.10
Worst		10.10

##### 10.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5190	9.700
Mid	5230	9.700
Worst		9.700

**10.3.4. 802.11a MODE IN THE 5.3 GHZ BAND**

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	10.20
Mid	5300	10.30
High	5320	10.30
Worst		10.30

**10.3.5. 802.11n HT20 MODE IN THE 5.3 GHZ BAND**

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	10.20
Mid	5300	10.30
High	5320	10.30
Worst		10.30

**10.3.6. 802.11n HT40 MODE IN THE 5.3 GHZ BAND**

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5270	9.7
High	5310	9.7
Worst		9.7

**10.3.7. 802.11a MODE IN THE 5.5 GHZ BAND**

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	10.300
Mid	5580	10.200
High	5700	9.800
Worst		10.300

**10.3.8. 802.11n HT20 MODE IN THE 5.5 GHZ BAND**

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	10.200
Mid	5580	10.000
High	5700	9.700
Worst		10.200

**10.3.9. 802.11n HT40 MODE IN THE 5.5 GHz BAND**

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5510	9.7
Mid	5550	9.6
High	5670	9.3
Worst		9.7

## **10.4. OUTPUT POWER AND PPSD**

### **LIMITS**

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or  $4 \text{ dBm} + 10 \log B$ , where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

### **DIRECTIONAL ANTENNA GAIN**

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

### **Test Methodology**

**RESULTS**

**10.4.1. 802.11a MODE IN THE 5.2 GHz BAND**

**Bandwidth and Antenna Gain**

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	19.100	16.414	-4.27
Mid	5200	19.000	16.466	-4.27
High	5240	19.000	16.391	-4.27

**Limits**

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	16.81	22.15	26.42	16.81	4.00	10.00	4.00
Mid	5200	16.79	22.17	26.44	16.79	4.00	10.00	4.00
High	5240	16.79	22.15	26.42	16.79	4.00	10.00	4.00

<b>Duty Cycle CF (dB)</b>	0.23	<b>Included in Calculations of Corr'd Power &amp; PPSD</b>
---------------------------	------	--

**Output Power Results**

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	10.885	11.12	16.81	-5.70
Mid	5200	11.029	11.26	16.79	-5.53
High	5240	10.255	10.49	16.79	-6.30

**PPSD Results**

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	1.010	1.24	4.00	-2.76
Mid	5200	1.330	1.56	4.00	-2.44
High	5240	-0.260	-0.03	4.00	-4.03

**10.4.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND**

**Bandwidth and Antenna Gain**

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	19.350	17.619	-4.27
Mid	5200	19.400	17.605	-4.27
High	5240	19.400	17.699	-4.27

**Limits**

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	16.87	22.46	26.73	16.87	4.00	10.00	4.00
Mid	5200	16.88	22.46	26.73	16.88	4.00	10.00	4.00
High	5240	16.88	22.48	26.75	16.88	4.00	10.00	4.00

<b>Duty Cycle CF (dB)</b>	0.24	<b>Included in Calculations of Corr'd Power &amp; PPSD</b>
---------------------------	------	--

**Output Power Results**

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	10.745	10.99	16.87	-5.88
Mid	5200	10.863	11.10	16.88	-5.78
High	5240	10.944	11.18	16.88	-5.69

**PPSD Results**

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	0.250	0.49	4.00	-3.51
Mid	5200	0.500	0.74	4.00	-3.26
High	5240	0.670	0.91	4.00	-3.09

**10.4.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND**

**Bandwidth and Antenna Gain**

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	44.3	36.044	-4.27
Mid	5230	44.5	36.025	-4.27

**Limits**

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5190	17.00	23.00	27.27	17.00	4.00	10.00	4.00
Mid	5230	17.00	23.00	27.27	17.00	4.00	10.00	4.00
<b>Duty Cycle CF (dB)</b>		0.48	<b>Included in Calculations of Corr'd Power &amp; PSD</b>					

**Output Power Results**

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	10.145	10.63	17.00	-6.38
Mid	5230	10.240	10.72	17.00	-6.28

**PPSD Results**

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-3.680	-3.20	4.00	-7.20
Mid	5230	-3.440	-2.96	4.00	-6.96

**10.4.4. 802.11a MODE IN THE 5.3 GHZ BAND**

**Bandwidth and Antenna Gain**

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	18.90	16.445	-4.27
Mid	5300	18.90	16.469	-4.27
High	5320	18.90	16.530	-4.27

**Limits**

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	23.76	23.16	29.16	23.16	11.00	11.00	11.00
Mid	5300	23.76	23.17	29.17	23.17	11.00	11.00	11.00
High	5320	23.76	23.18	29.18	23.18	11.00	11.00	11.00

<b>Duty Cycle CF (dB)</b>	0.23	<b>Included in Calculations of Corr'd Power &amp; PPSD</b>
---------------------------	------	--

**Output Power Results**

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	10.546	10.78	23.16	-12.38
Mid	5300	10.672	10.90	23.17	-12.26
High	5320	10.786	11.02	23.18	-12.17

**PPSD Results**

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	0.100	0.33	11.00	-10.67
Mid	5300	0.250	0.48	11.00	-10.52
High	5320	0.540	0.77	11.00	-10.23



### 10.4.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

#### Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	19.35	17.673	-4.27
Mid	5300	19.35	17.576	-4.27
High	5320	19.35	17.759	-4.27

#### Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	23.87	23.47	29.47	23.47	11.00	11.00	11.00
Mid	5300	23.87	23.45	29.45	23.45	11.00	11.00	11.00
High	5320	23.87	23.49	29.49	23.49	11.00	11.00	11.00

<b>Duty Cycle CF (dB)</b>	0.24	<b>Included in Calculations of Corr'd Power &amp; PPSD</b>
---------------------------	------	--

#### Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	10.575	10.82	23.47	-12.66
Mid	5300	10.585	10.83	23.45	-12.62
High	5320	10.709	10.95	23.49	-12.55

#### PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	0.460	0.70	11.00	-10.30
Mid	5300	0.180	0.42	11.00	-10.58
High	5320	0.460	0.70	11.00	-10.30

**10.4.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND**

**Bandwidth and Antenna Gain**

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	44.7	35.5	-4.27
High	5310	44.6	35.9	-4.27

**Limits**

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5310	24.00	24.00	30.00	24.00	11.00	11.00	11.00

<b>Duty Cycle CF (dB)</b>	0.48	<b>Included in Calculations of Corr'd Power &amp; PSD</b>
---------------------------	------	---

**Output Power Results**

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	9.92	10.40	24.00	-13.60
High	5310	9.89	10.37	24.00	-13.64

**PPSD Results**

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	-3.64	-3.16	11.00	-14.16
High	5310	-3.89	-3.41	11.00	-14.41

### 10.4.7. 802.11a MODE IN THE 5.5 GHz BAND

#### Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	18.70	16.508	-4.27
Mid	5580	18.75	16.413	-4.27
High	5700	18.80	16.554	-4.27

#### Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	23.72	23.18	29.18	23.18	11.00	11.00	11.00
Mid	5580	23.73	23.15	29.15	23.15	11.00	11.00	11.00
High	5700	23.74	23.19	29.19	23.19	11.00	11.00	11.00

<b>Duty Cycle CF (dB)</b>	0.23	<b>Included in Calculations of Corr'd Power &amp; PSD</b>
---------------------------	------	---

#### Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	10.732	10.96	23.18	-12.21
Mid	5580	10.752	10.98	23.15	-12.17
High	5700	10.062	10.29	23.19	-12.90

#### PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	0.630	0.86	11.00	-10.14
Mid	5580	0.710	0.94	11.00	-10.06
High	5700	-0.090	0.14	11.00	-10.86

### 10.4.8. 802.11n HT20 MODE IN THE 5.5 GHz BAND

#### Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	19.05	17.575	-4.27
Mid	5580	19.15	17.537	-4.27
High	5700	19.20	17.717	-4.27

#### Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	23.80	23.45	29.45	23.45	11.00	11.00	11.00
Mid	5580	23.82	23.44	29.44	23.44	11.00	11.00	11.00
High	5700	23.83	23.48	29.48	23.48	11.00	11.00	11.00

<b>Duty Cycle CF (dB)</b>	0.24	<b>Included in Calculations of Corr'd Power &amp; PSD</b>
---------------------------	------	---

#### Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	10.544	10.78	23.45	-12.66
Mid	5580	10.427	10.67	23.44	-12.77
High	5700	9.929	10.17	23.48	-13.31

#### PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	0.290	0.53	11.00	-10.47
Mid	5580	-0.040	0.20	11.00	-10.80
High	5700	-0.470	-0.23	11.00	-11.23

### 10.4.9. 802.11n HT40 MODE IN THE 5.5 GHz BAND

#### Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	44.5	35.949	-4.27
Mid	5550	44.8	35.792	-4.27
High	5670	45.6	35.980	-4.27

#### Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5510	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5550	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5670	24.00	24.00	30.00	24.00	11.00	11.00	11.00

<b>Duty Cycle CF (dB)</b>	0.48	<b>Included in Calculations of Corr'd Power &amp; PPSD</b>
---------------------------	------	--

#### Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	9.823	10.30	24.00	-13.70
Mid	5550	9.882	10.36	24.00	-13.64
High	5670	9.487	9.97	24.00	-14.03

#### PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-3.770	-3.29	11.00	-14.29
Mid	5550	-3.920	-3.44	11.00	-14.44
High	5670	-4.350	-3.87	11.00	-14.87

## 10.5. PEAK EXCURSION

### LIMITS

FCC §15.407 (a) (6)

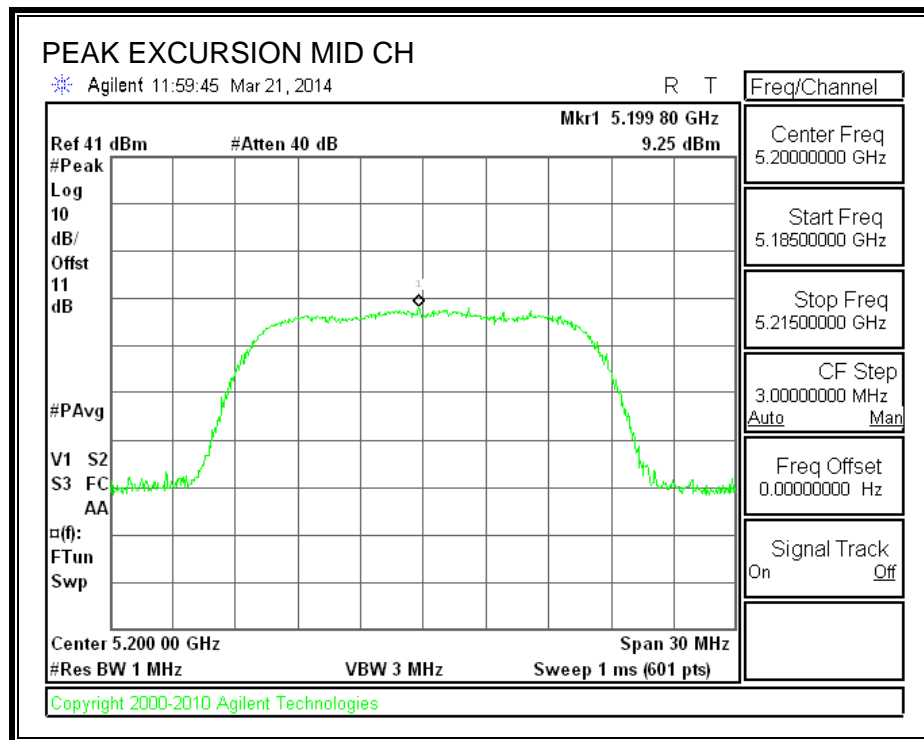
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### RESULTS

#### 10.5.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	9.250	1.33	0.23	7.69	13	-5.31

### PEAK EXCURSION

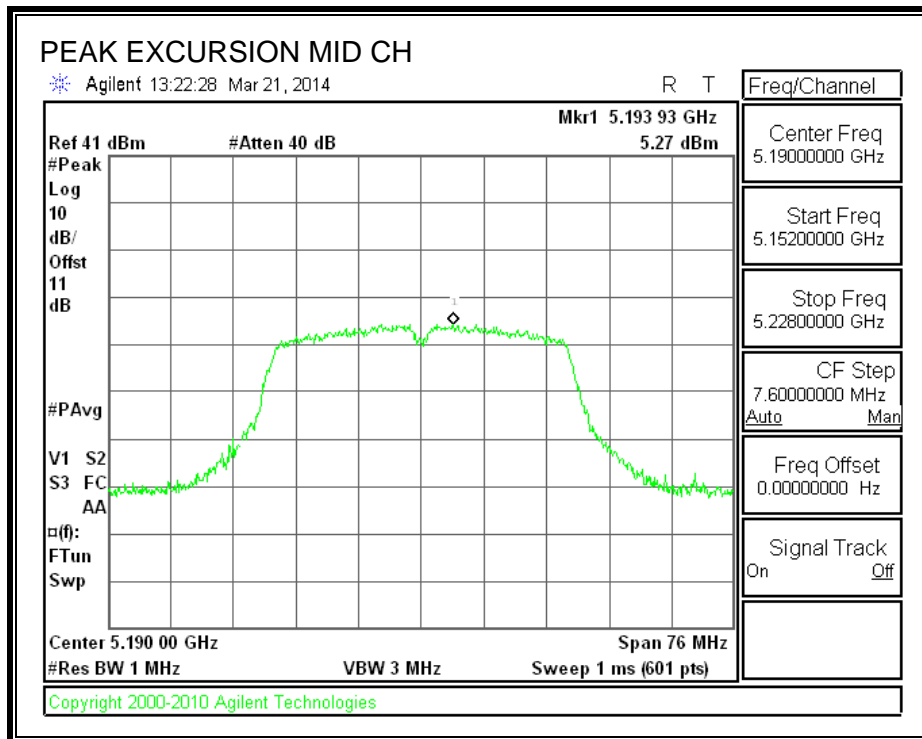




**10.5.1. 802.11n HT40 MODE IN THE 5.2 GHz BAND**

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5190	5.270	-3.68	0.48	8.47	13	-4.53

**PEAK EXCURSION**





## 11. TRANSMITTER ABOVE 1 GHz

### 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.

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.

Reference to KDB 789033 UNII part H) 6) d) Method VB:

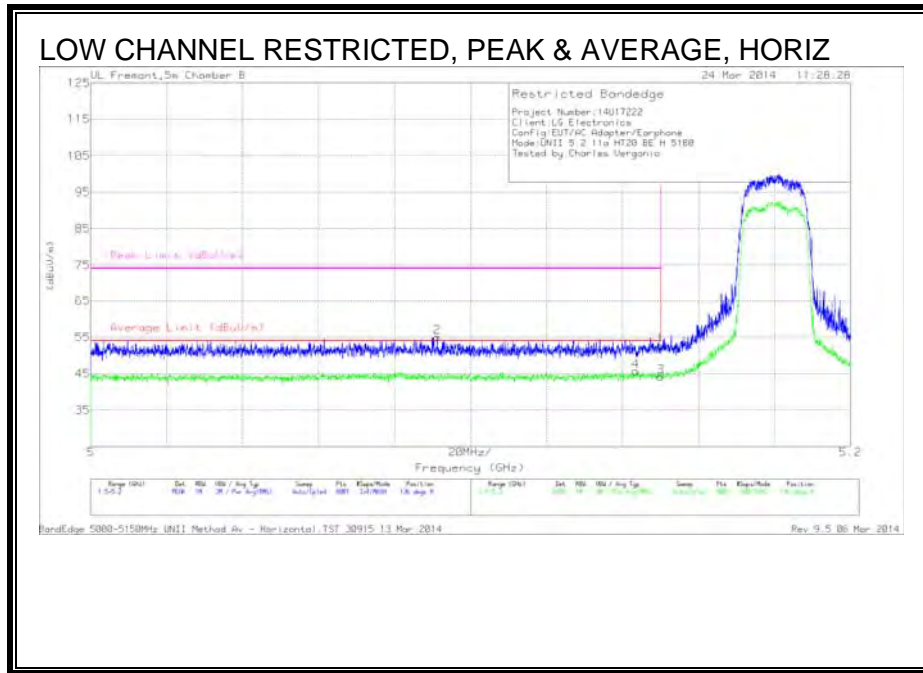
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor to the reading offset for average measurements.

The spectrum from 1GHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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

## 11.1. 5.2 GHz

### 11.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

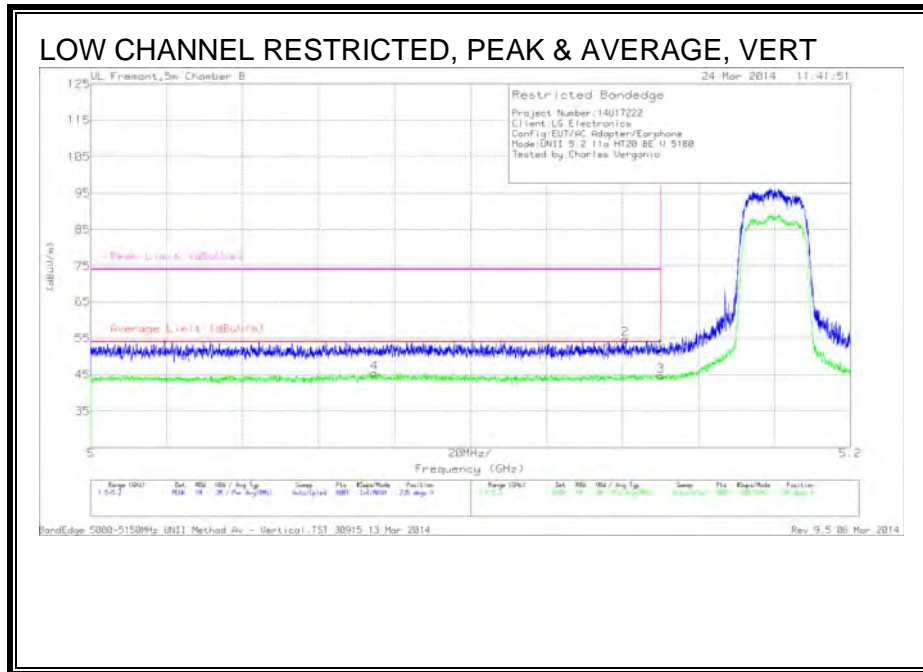


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	38.55	PK	34.3	-20.2	0	52.65	-	-	74	-21.35	136	111	H
2	* 5.091	40.87	PK	34.2	-20.1	0	54.97	-	-	74	-19.03	136	111	H
3	* 5.15	29.92	RMS	34.3	-20.2	.2	44.22	54	-9.78	-	-	136	111	H
4	* 5.144	31.37	RMS	34.3	-20.2	.2	45.67	54	-8.33	-	-	136	111	H

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

PK - Peak detector

RMS - RMS detection



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.21	PK	34.3	-20.2	0	51.31	-	-	74	-22.69	235	100	V
2	* 5.141	40.7	PK	34.3	-20.2	0	54.8	-	-	74	-19.2	235	100	V
3	* 5.15	30.35	RMS	34.3	-20.2	.2	44.65	54	-9.35	-	-	235	100	V
4	* 5.075	31.14	RMS	34.2	-20.1	.2	45.44	54	-8.56	-	-	235	100	V

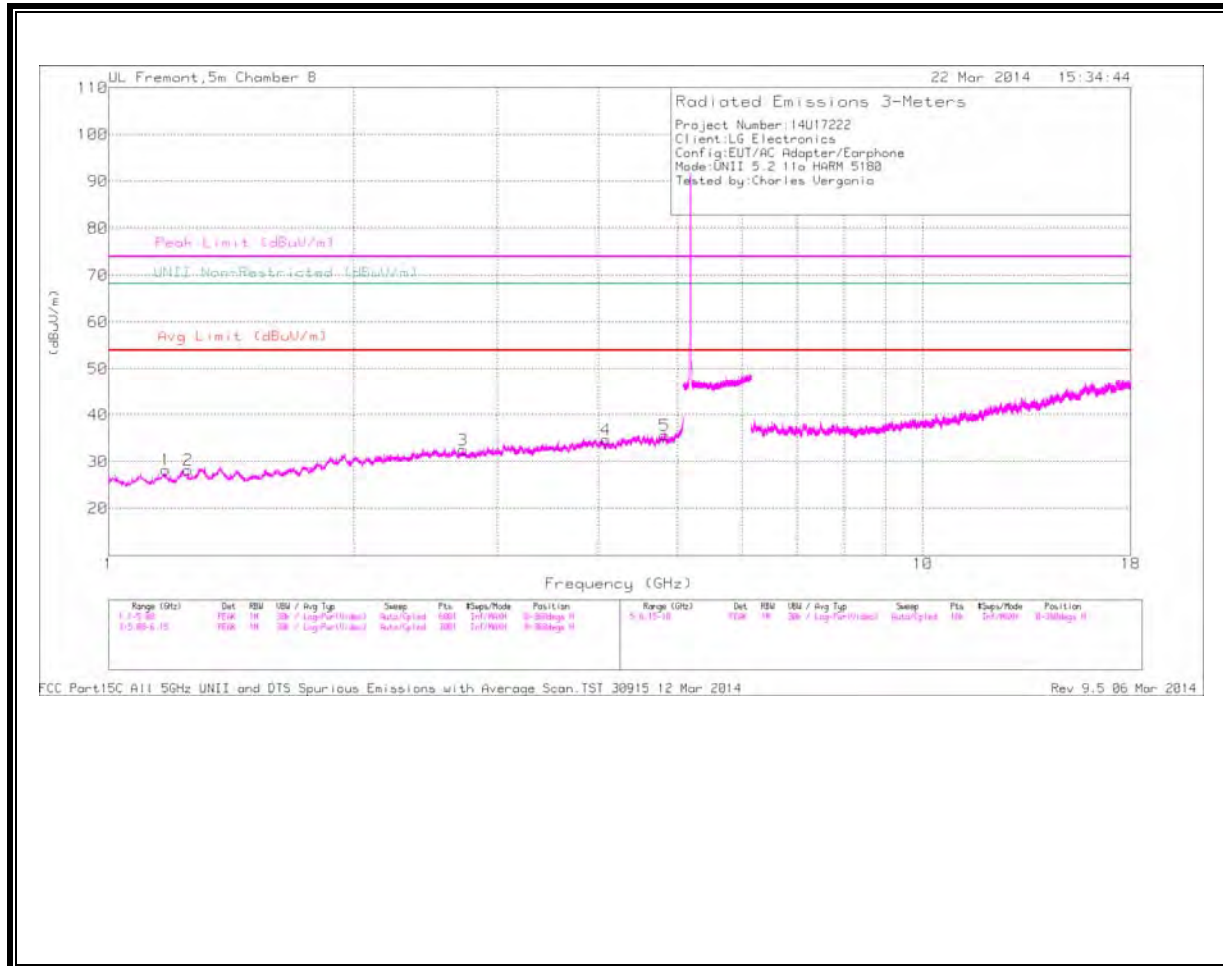
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

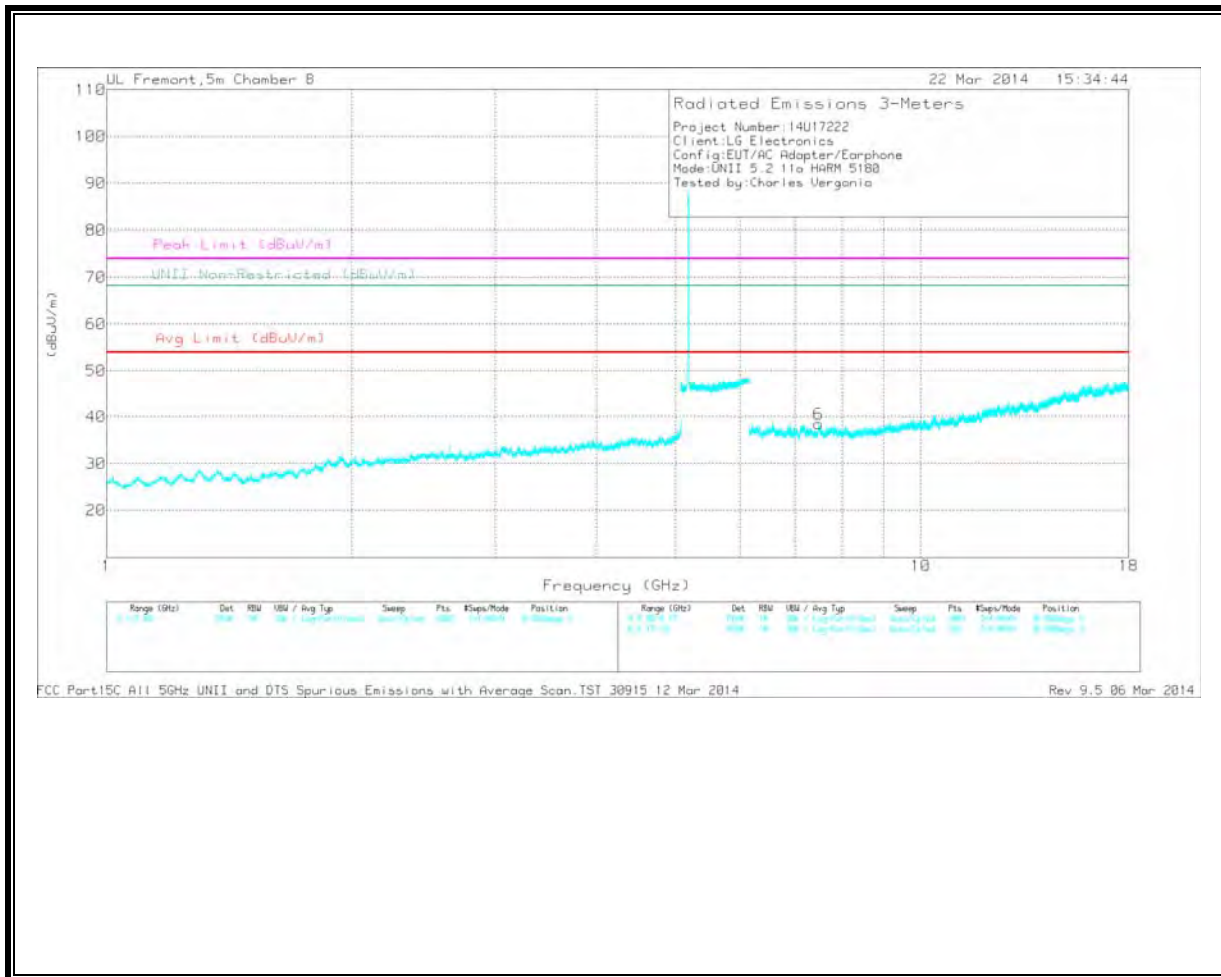
### HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



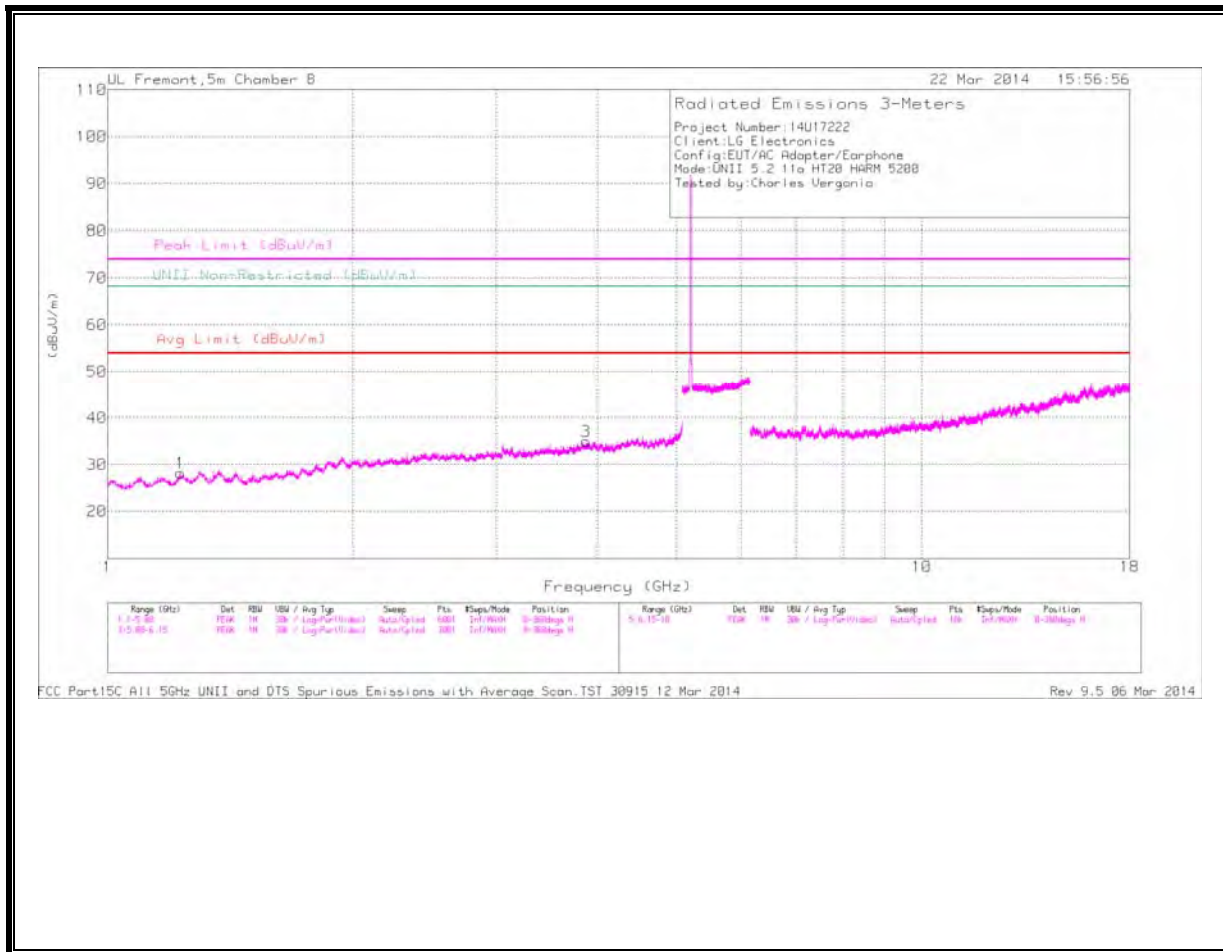
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.175	43.46	PK1	28	-34.7	36.76	54	-17.24	74	-37.24	-	-	360	100	H
* 1.253	42.01	PK1	28.5	-34.6	35.91	54	-18.09	74	-38.09	-	-	360	100	H
* 2.723	40.87	PK1	32.2	-31.8	41.27	54	-12.73	74	-32.73	-	-	360	100	H
* 4.081	39.52	PK1	33.6	-30.6	42.52	54	-11.48	74	-31.48	-	-	360	100	H
* 4.819	40.56	PK1	34.2	-29.5	45.26	54	-8.74	74	-28.74	-	-	360	100	H
* 7.489	36.77	PK1	35.6	-25.7	46.67	54	-7.33	74	-27.33	-	-	360	100	V

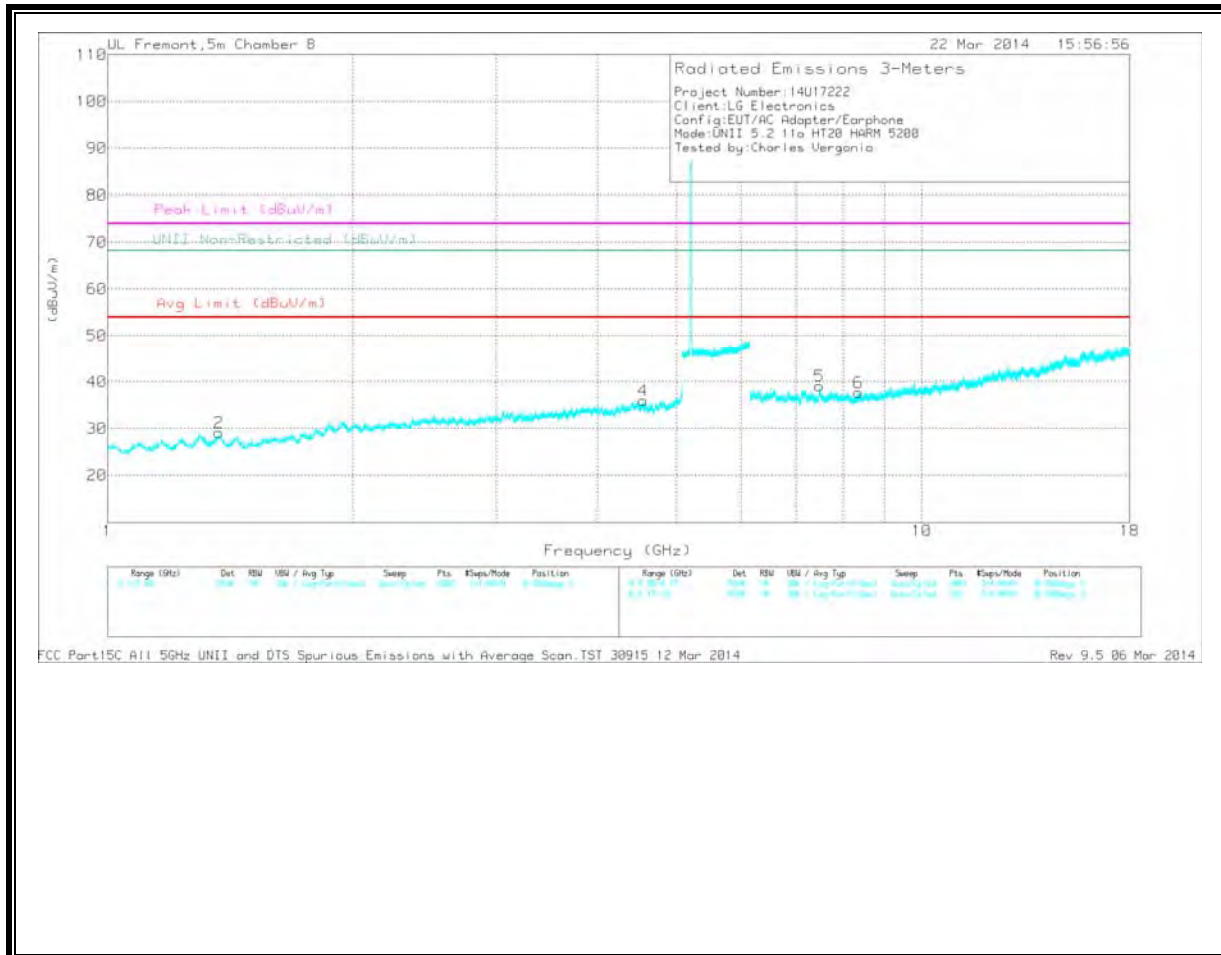
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

MID CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

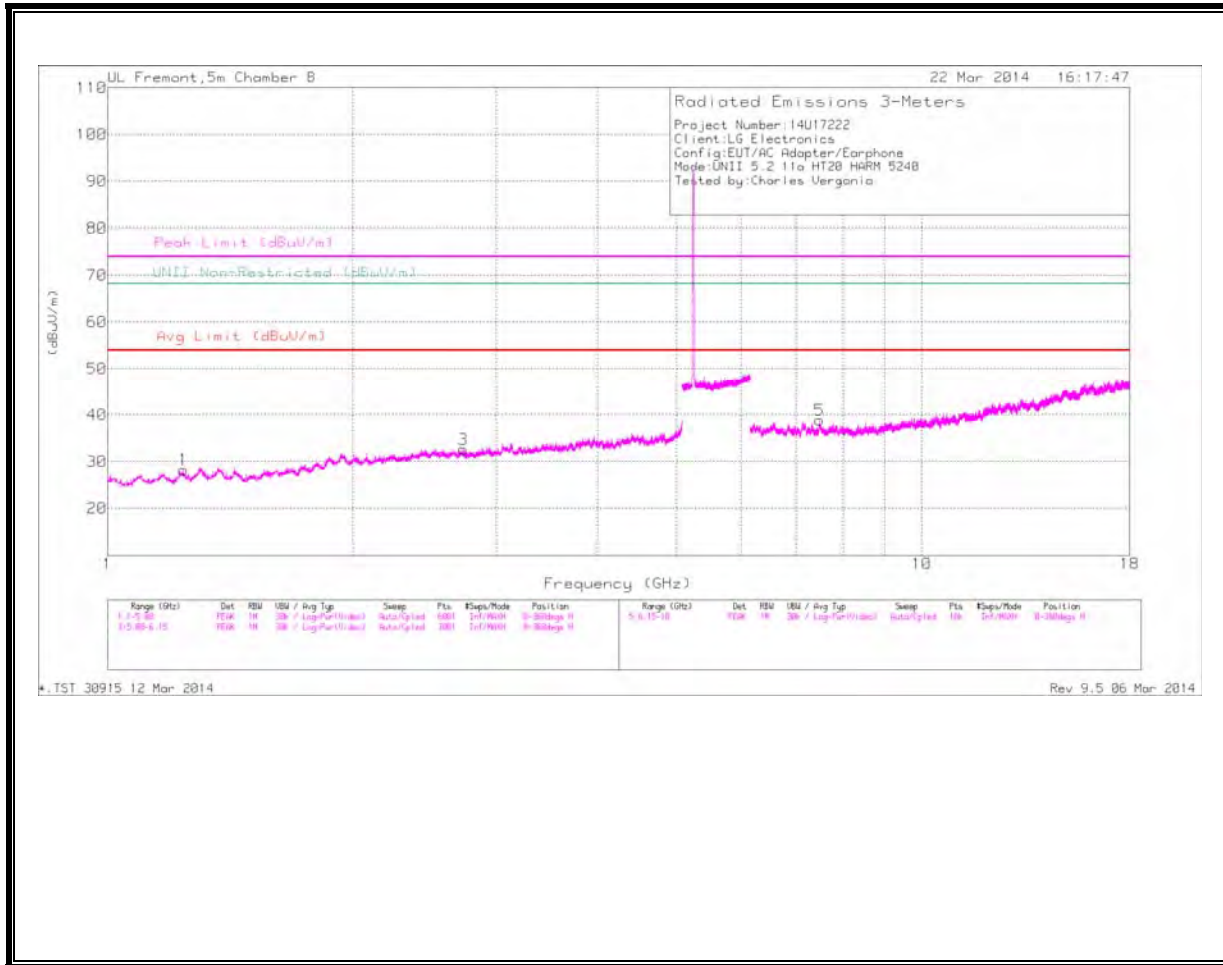


MID CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.228	43.81	PK1	28.4	-34.7	37.51	54	-16.49	74	-36.49	-	-	360	100	H
* 3.868	41.38	PK1	33.7	-31.5	43.58	54	-10.42	74	-30.42	-	-	360	100	H
* 1.37	43.09	PK1	28.6	-33.8	37.89	54	-16.11	74	-36.11	-	-	360	100	V
* 4.548	40.3	PK1	34.1	-30.5	43.9	54	-10.1	74	-30.1	-	-	360	100	V
* 8.361	35.83	PK1	35.7	-26.3	45.23	54	-8.77	74	-28.77	-	-	360	100	V
7.847	37.15	PK1	35.7	-27.3	45.55	-	-	-	-	68.2	-22.65	360	100	V

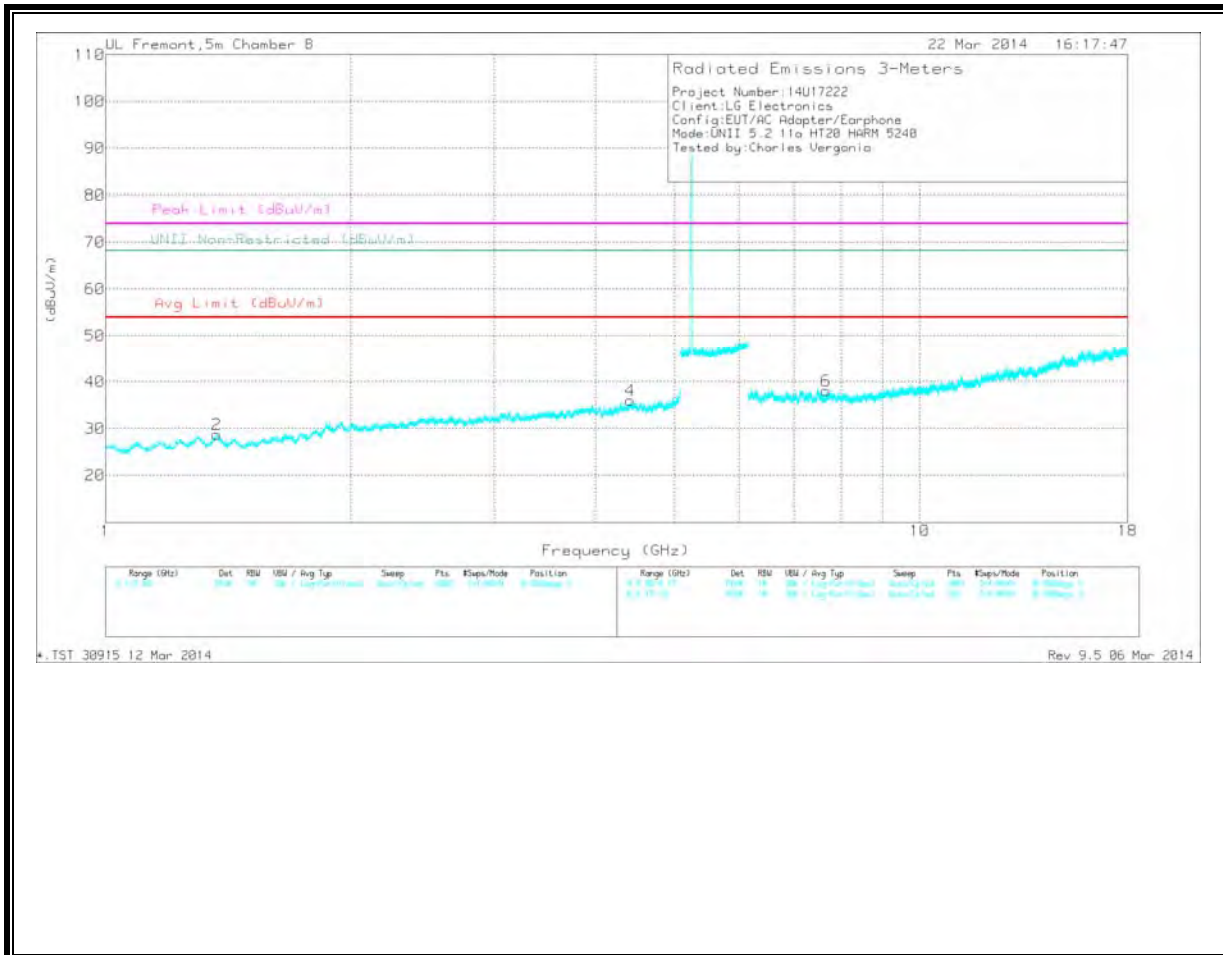
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

HIGH CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



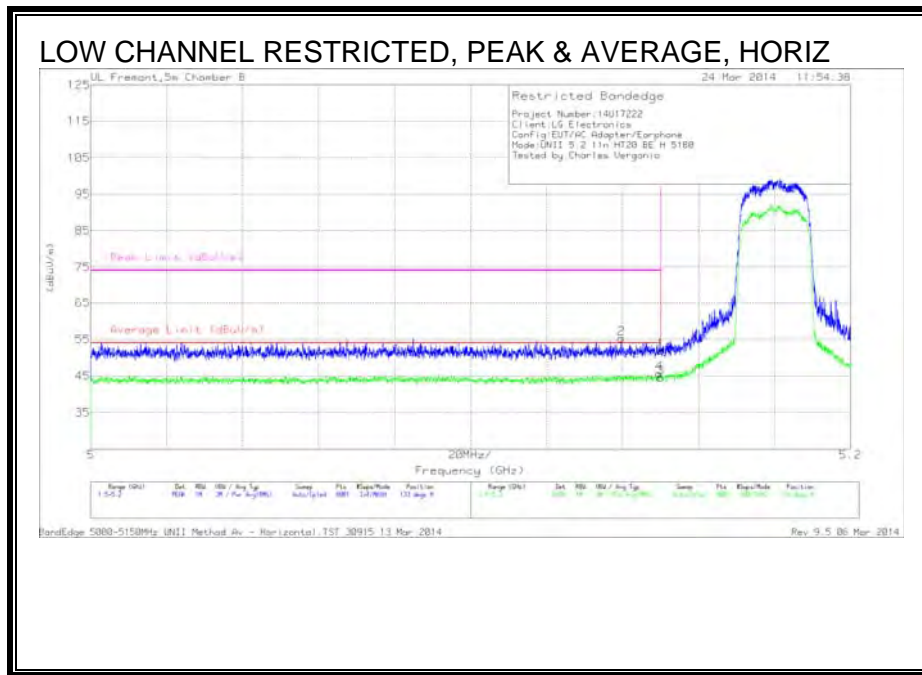
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.237	43.36	PK1	28.4	-34.7	37.06	54	-16.94	74	-36.94	-	-	359	100	H
* 2.732	41.17	PK1	32.2	-32	41.37	54	-12.63	74	-32.63	-	-	359	100	H
* 1.371	42.99	PK1	28.6	-33.8	37.79	54	-16.21	74	-36.21	-	-	359	100	V
* 7.481	37.19	PK1	35.6	-26	46.79	54	-7.21	74	-27.21	-	-	359	100	H
* 7.671	37.46	PK1	35.7	-27.5	45.66	54	-8.34	74	-28.34	-	-	359	100	V
4.406	39.97	PK1	33.8	-30.2	43.57	-	-	-	-	68.2	-24.63	359	100	V

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

### 11.1.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

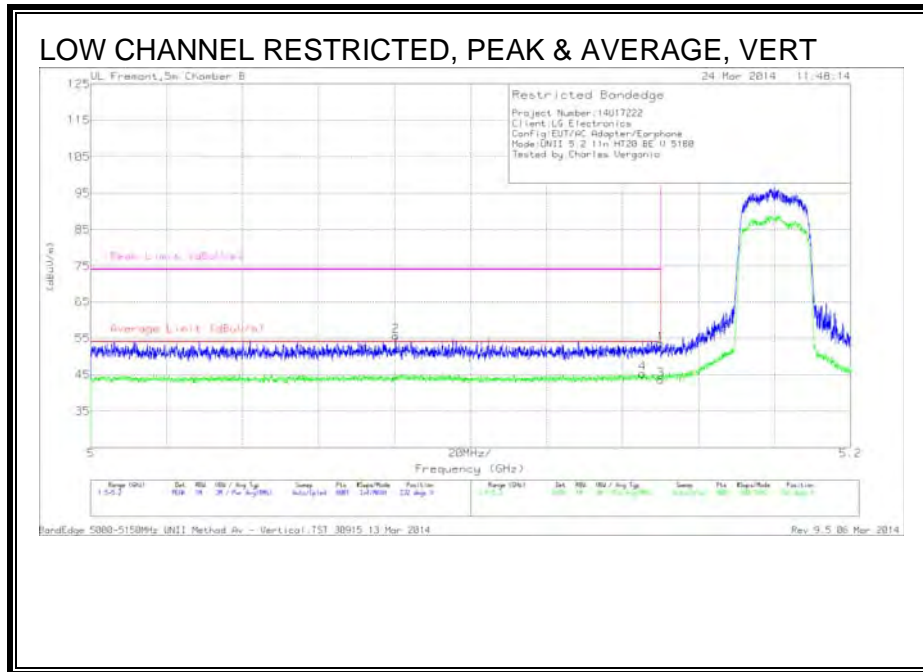


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.81	PK	34.3	-20.2	0	51.91	-	-	74	-22.09	133	215	H
2	* 5.14	41.18	PK	34.3	-20.2	0	55.28	-	-	74	-18.72	133	215	H
3	* 5.15	30.33	RMS	34.3	-20.2	.2	44.63	54	-9.37	-	-	133	215	H
4	* 5.15	31.36	RMS	34.3	-20.2	.2	45.66	54	-8.34	-	-	133	215	H

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

PK - Peak detector

RMS - RMS detection



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	39.47	PK	34.3	-20.2	0	53.57	-	-	74	-20.43	232	178	V
2	* 5.08	41.41	PK	34.2	-20	0	55.61	-	-	74	-18.39	232	178	V
3	* 5.15	29.3	RMS	34.3	-20.2	.2	43.6	54	-10.4	-	-	232	178	V
4	* 5.145	31.06	RMS	34.3	-20.2	.2	45.36	54	-8.64	-	-	232	178	V

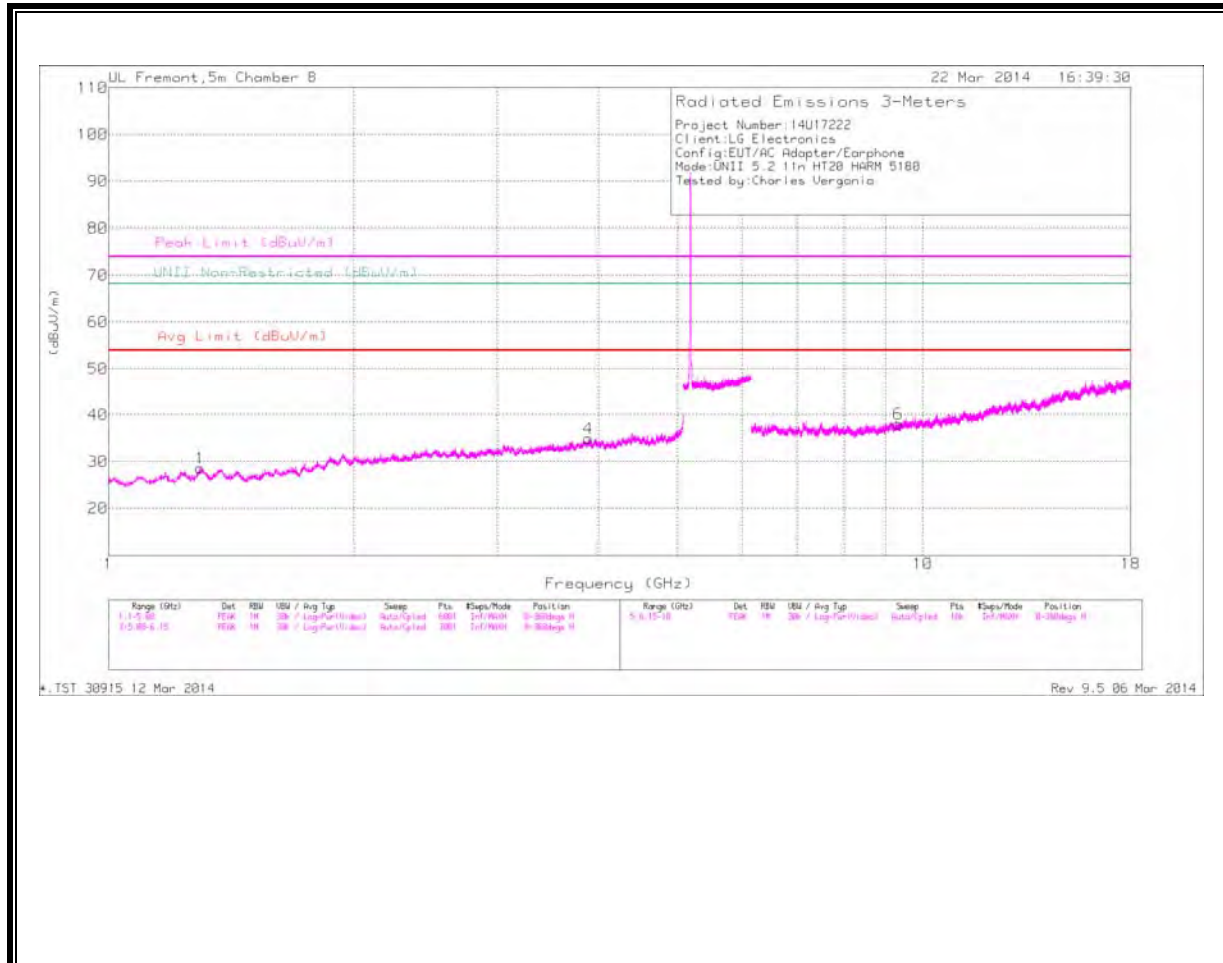
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

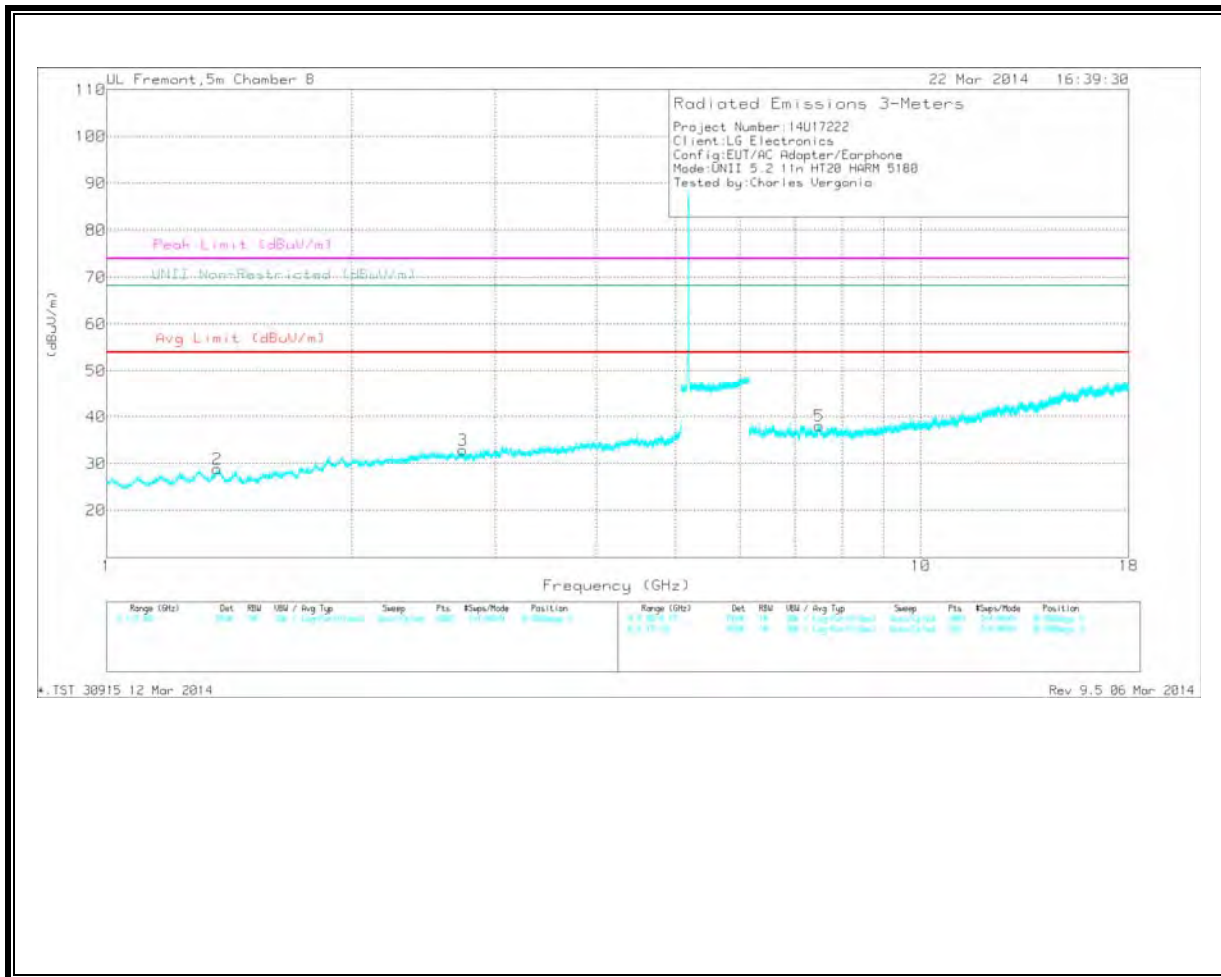
**HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

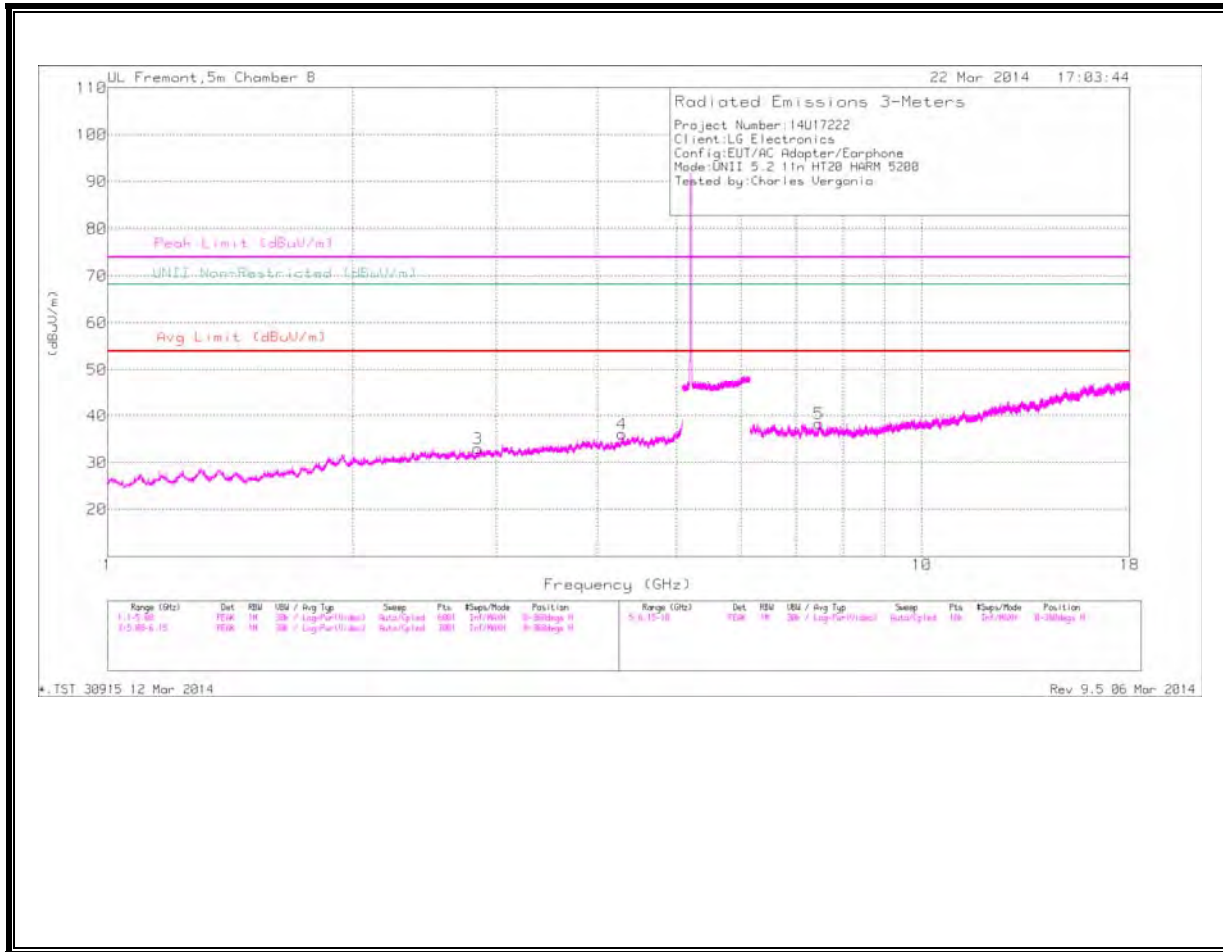


LOW CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.295	43.07	PK1	28.8	-34.3	37.57	54	-16.43	74	-36.43	-	-	360	100	H
* 3.885	41.13	PK1	33.8	-31.7	43.23	54	-10.77	74	-30.77	-	-	360	100	H
* 1.37	42.58	PK1	28.6	-33.8	37.38	54	-16.62	74	-36.62	-	-	360	100	V
* 2.739	41.48	PK1	32.2	-32.1	41.58	54	-12.42	74	-32.42	-	-	360	100	V
* 9.341	35.15	PK1	36.4	-25.1	46.45	54	-7.55	74	-27.55	-	-	360	100	H
* 7.501	37.07	PK1	35.6	-25.9	46.77	54	-7.23	74	-27.23	-	-	360	100	V

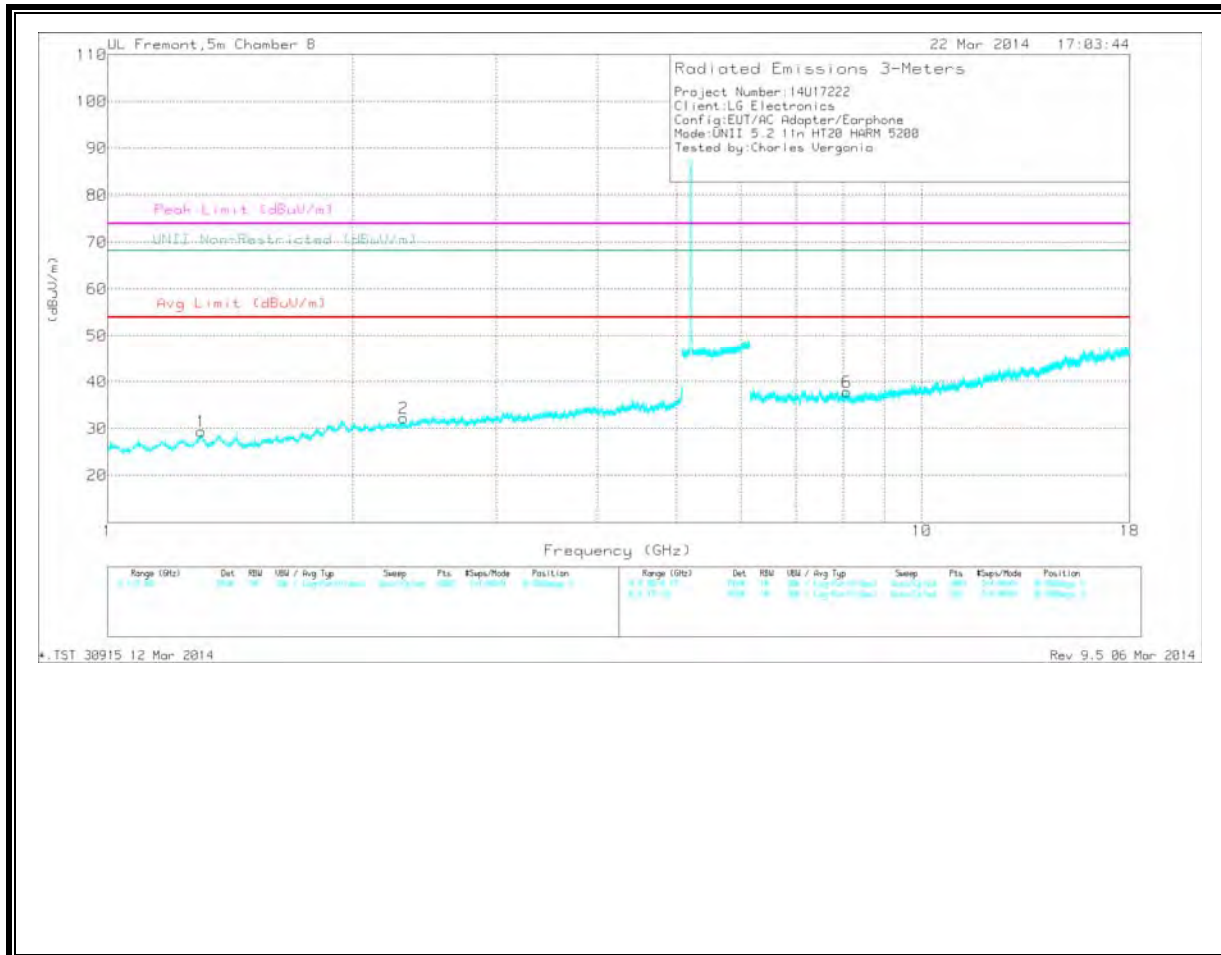
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

MID CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



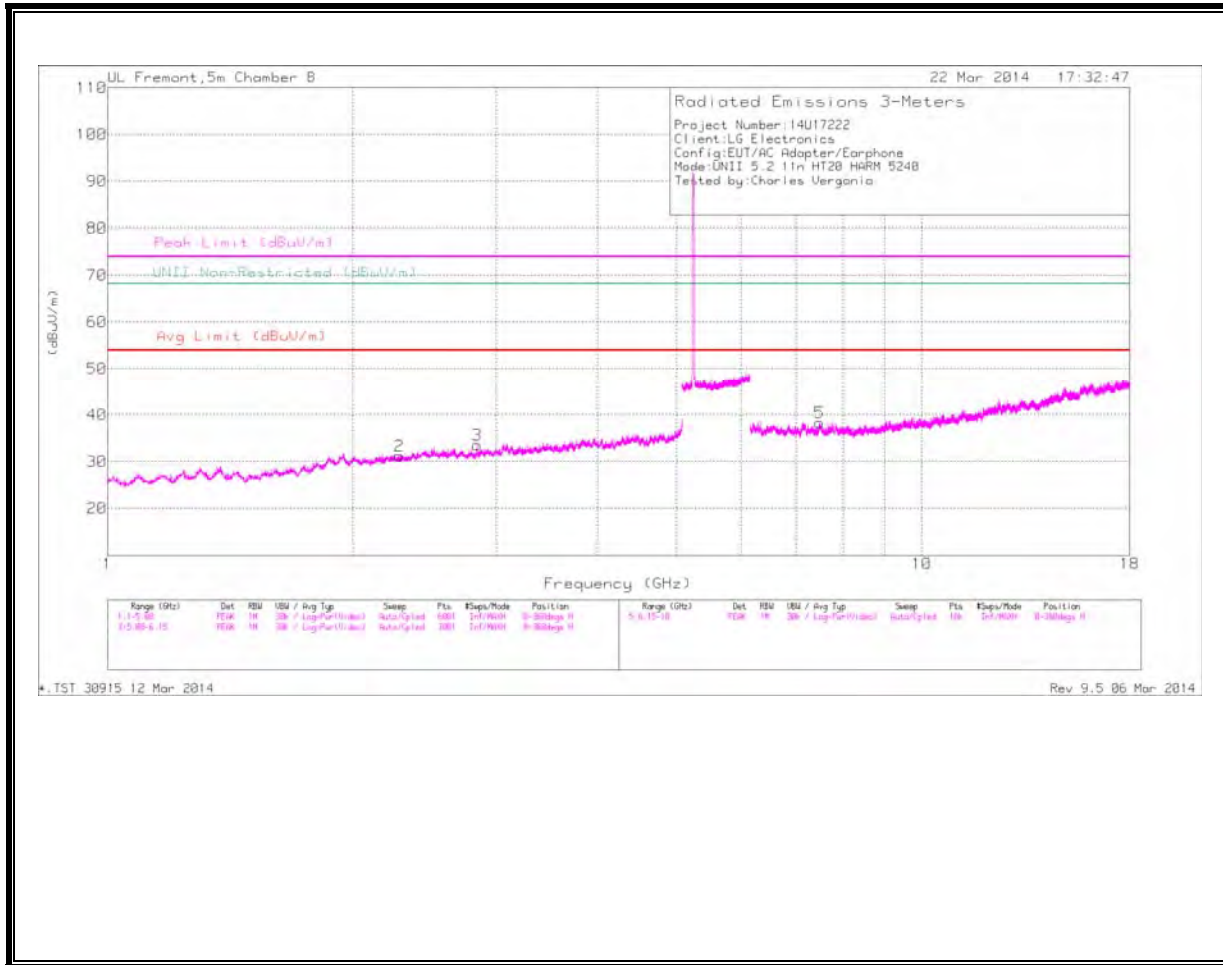
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.85	40.69	PK1	32.5	-32.4	40.79	54	-13.21	74	-33.21	-	-	359	100	H
* 4.283	40.5	PK1	33.7	-30.1	44.1	54	-9.9	74	-29.9	-	-	359	100	H
* 1.303	42.97	PK1	28.8	-34.2	37.57	54	-16.43	74	-36.43	-	-	359	100	V
* 2.31	41.44	PK1	31.7	-33	40.14	54	-13.86	74	-33.86	-	-	359	100	V
* 7.476	37.15	PK1	35.6	-26.3	46.45	54	-7.55	74	-27.55	-	-	359	100	H
* 8.089	36.73	PK1	35.7	-26.4	46.03	54	-7.97	74	-27.97	-	-	359	100	V

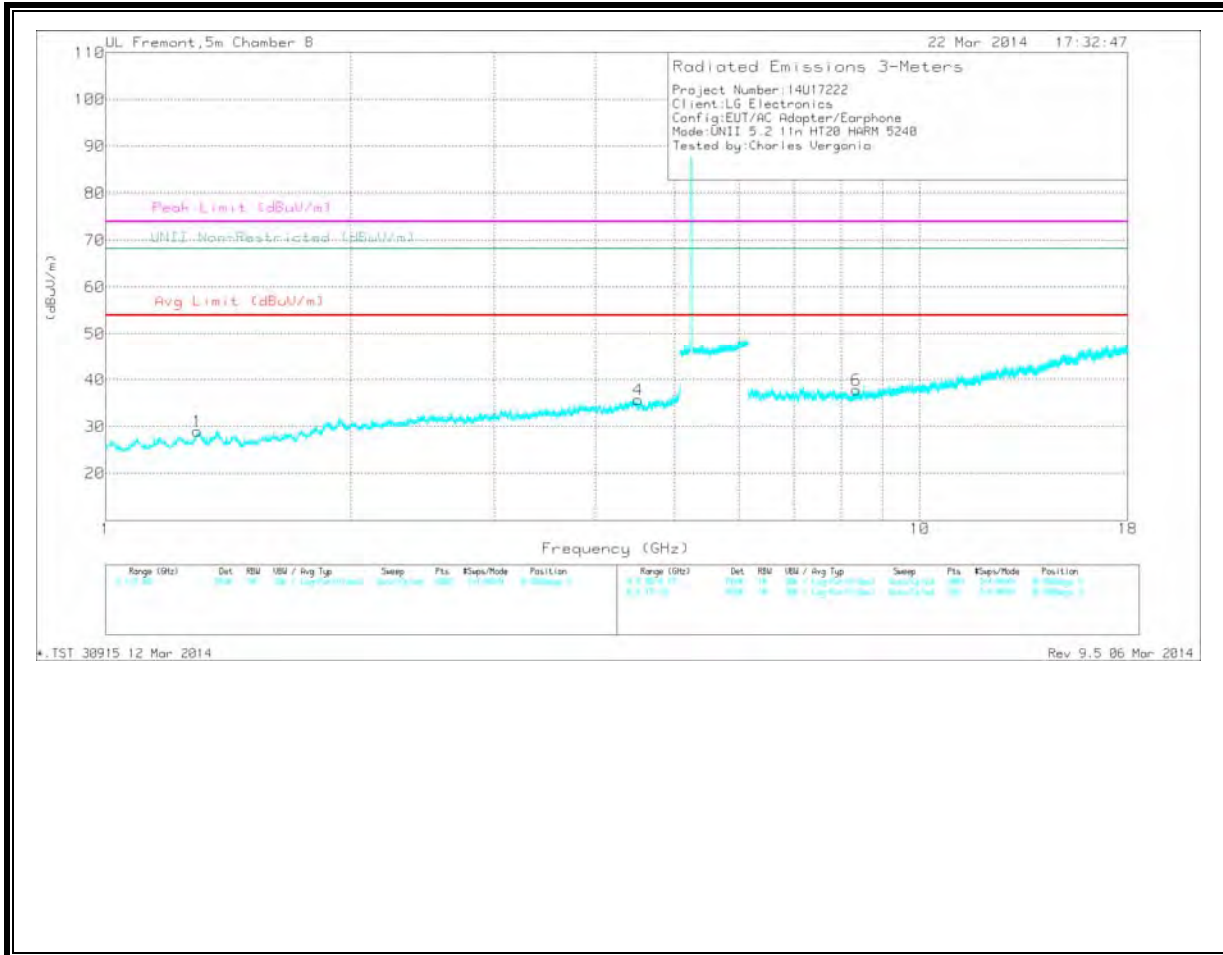
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

HIGH CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



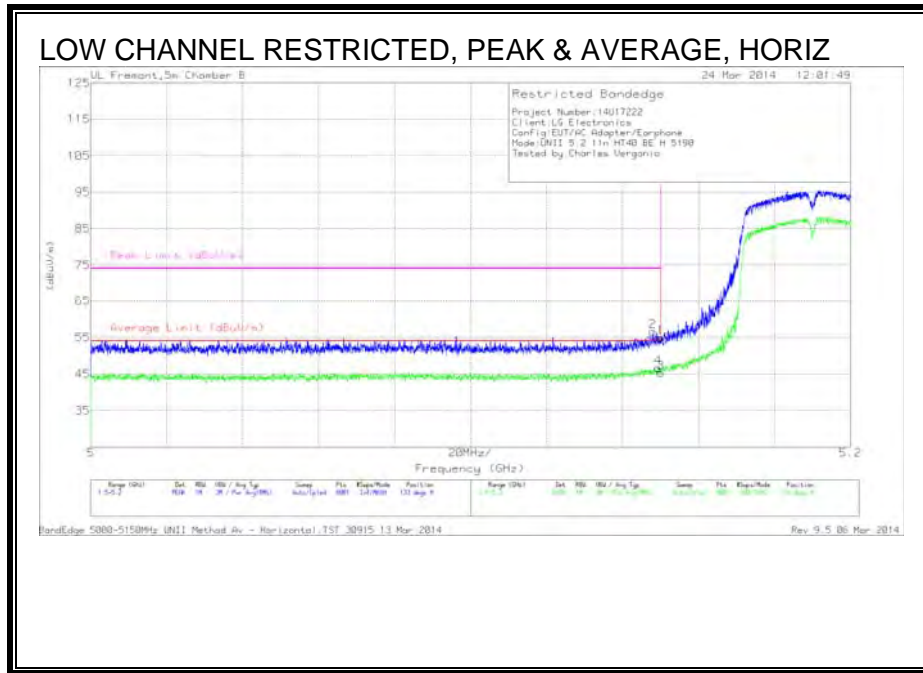
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.28	41.36	PK1	31.6	-32.9	40.06	54	-13.94	74	-33.94	-	-	360	100	H
* 2.848	40.75	PK1	32.5	-32.4	40.85	54	-13.15	74	-33.15	-	-	360	100	H
* 1.299	42.97	PK1	28.9	-34.2	37.67	54	-16.33	74	-36.33	-	-	360	100	V
* 4.51	38.89	PK1	34	-30.3	42.59	54	-11.41	74	-31.41	-	-	360	100	V
* 7.491	37.45	PK1	35.6	-25.7	47.35	54	-6.65	74	-26.65	-	-	360	100	H
* 8.367	36.51	PK1	35.7	-26.3	45.91	54	-8.09	74	-28.09	-	-	360	100	V

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

**11.1.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND  
 RESTRICTED BANDEGE (LOW CHANNEL)**



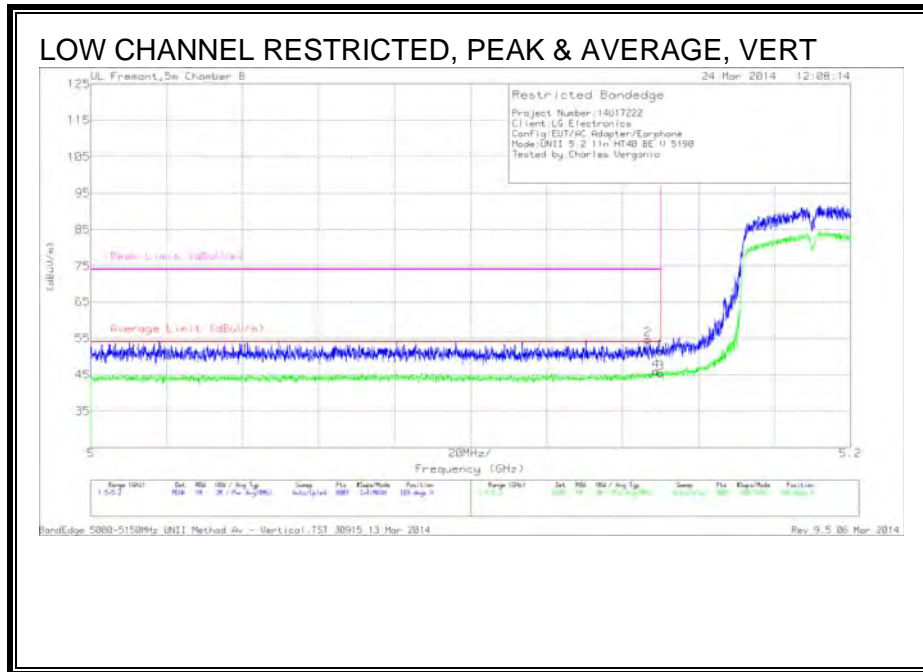
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	40.84	PK	34.3	-20.2	0	54.94	-	-	74	-19.06	133	214	H
2	* 5.148	42.52	PK	34.3	-20.2	0	56.62	-	-	74	-17.38	133	214	H
3	* 5.15	30.78	RMS	34.3	-20.2	.5	45.38	54	-8.62	-	-	133	214	H
4	* 5.149	32.11	RMS	34.3	-20.2	.5	46.71	54	-7.29	-	-	133	214	H

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

PK - Peak detector

RMS - RMS detection





Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.3	PK	34.3	-20.2	0	51.4	-	-	74	-22.6	169	214	V
2	* 5.147	40.5	PK	34.3	-20.2	0	54.6	-	-	74	-19.4	169	214	V
3	* 5.15	30.86	RMS	34.3	-20.2	.5	45.46	54	-8.54	-	-	169	214	V
4	* 5.149	31.33	RMS	34.3	-20.2	.5	45.93	54	-8.07	-	-	169	214	V

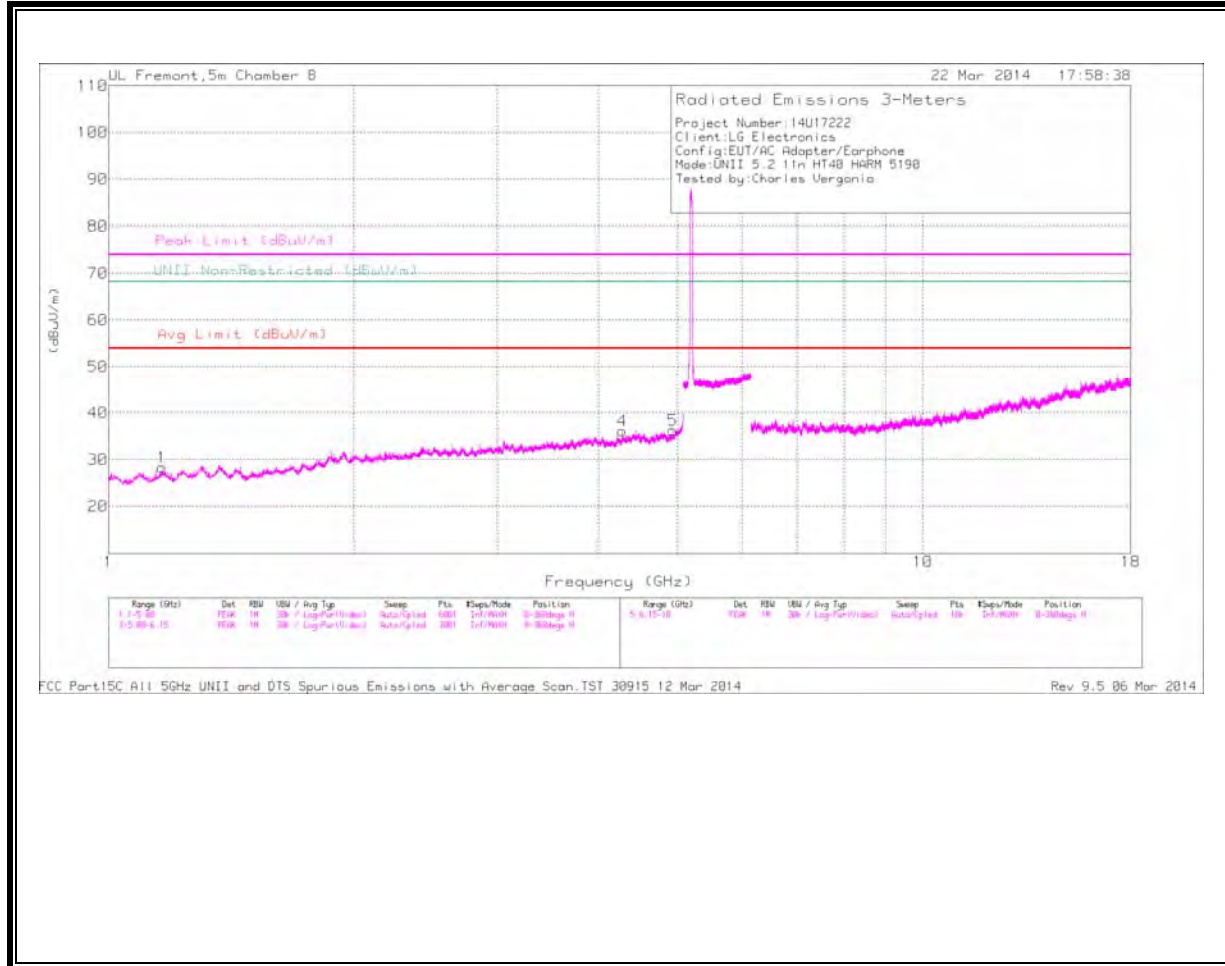
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

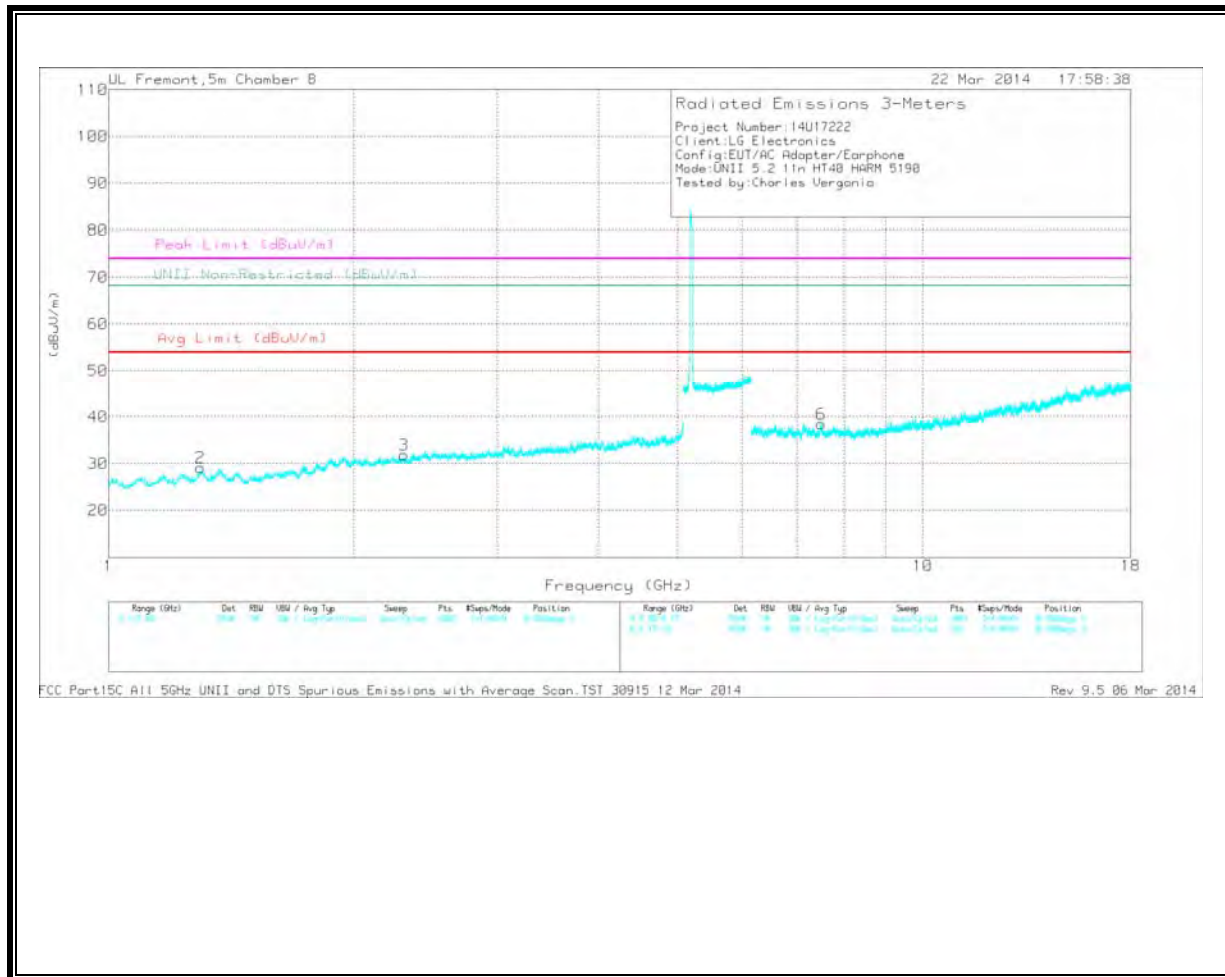
### HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL  
HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



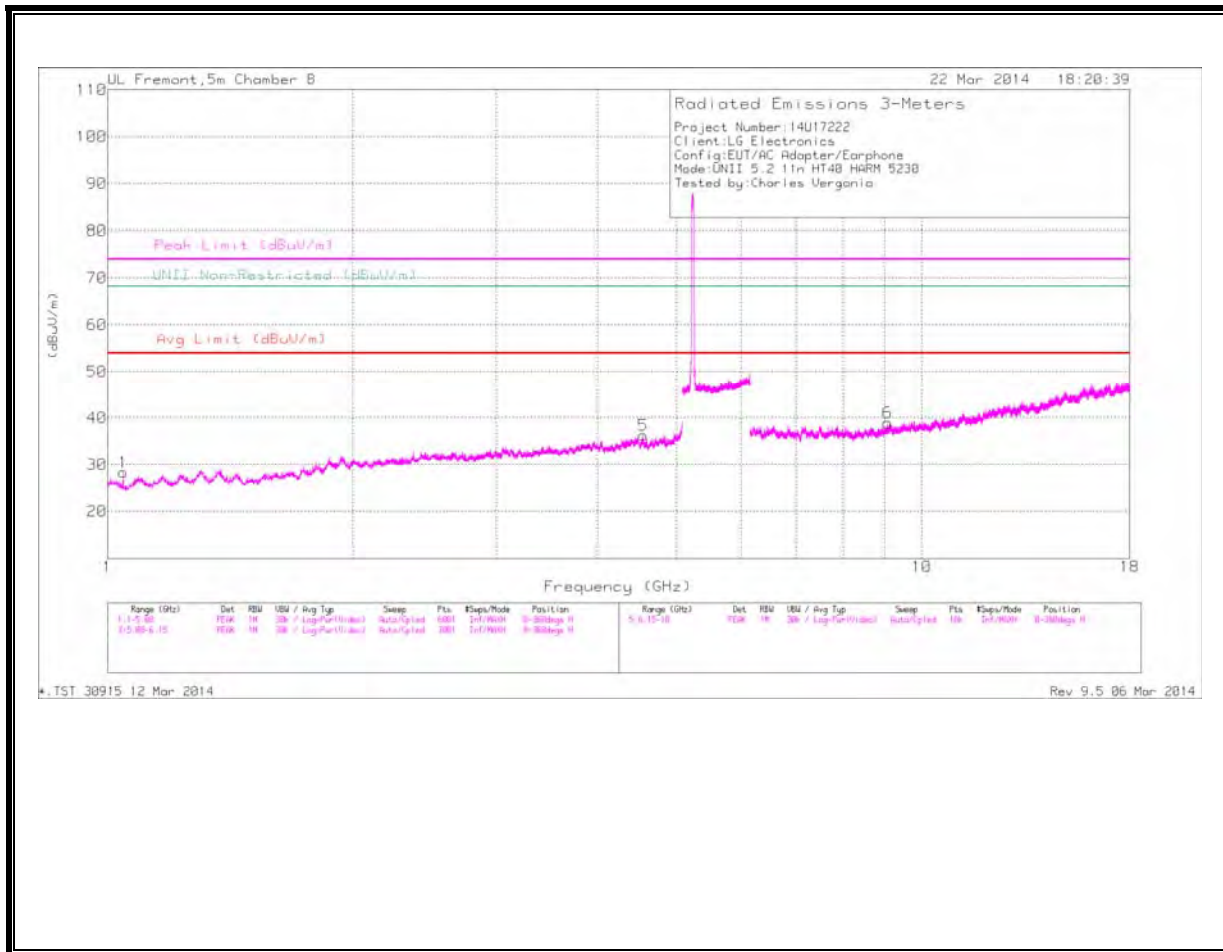
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.165	43.19	PK1	27.9	-34.7	36.39	54	-17.61	74	-37.61	-	-	360	100	H
* 4.271	39.4	PK1	33.6	-30.2	42.8	54	-11.2	74	-31.2	-	-	360	100	H
* 4.929	40.57	PK1	34.2	-29.5	45.27	54	-8.73	74	-28.73	-	-	360	100	H
* 1.294	43.61	PK1	28.8	-34.3	38.11	54	-15.89	74	-35.89	-	-	360	100	V
* 7.496	36.72	PK1	35.6	-25.8	46.52	54	-7.48	74	-27.48	-	-	360	100	V
2.309	41.62	PK1	31.7	-33	40.32	-	-	-	-	68.2	-27.88	360	100	V

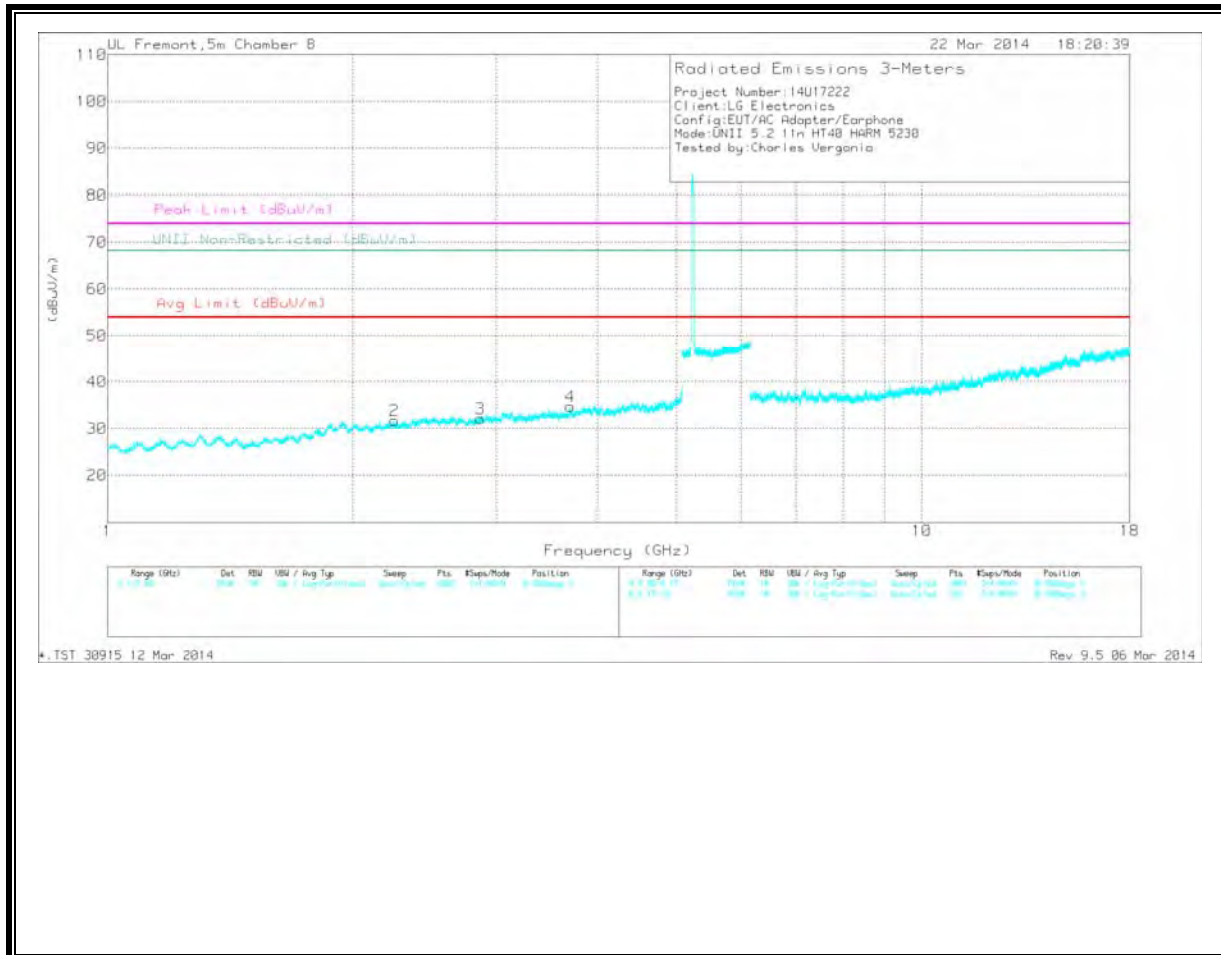
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

HIGH CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

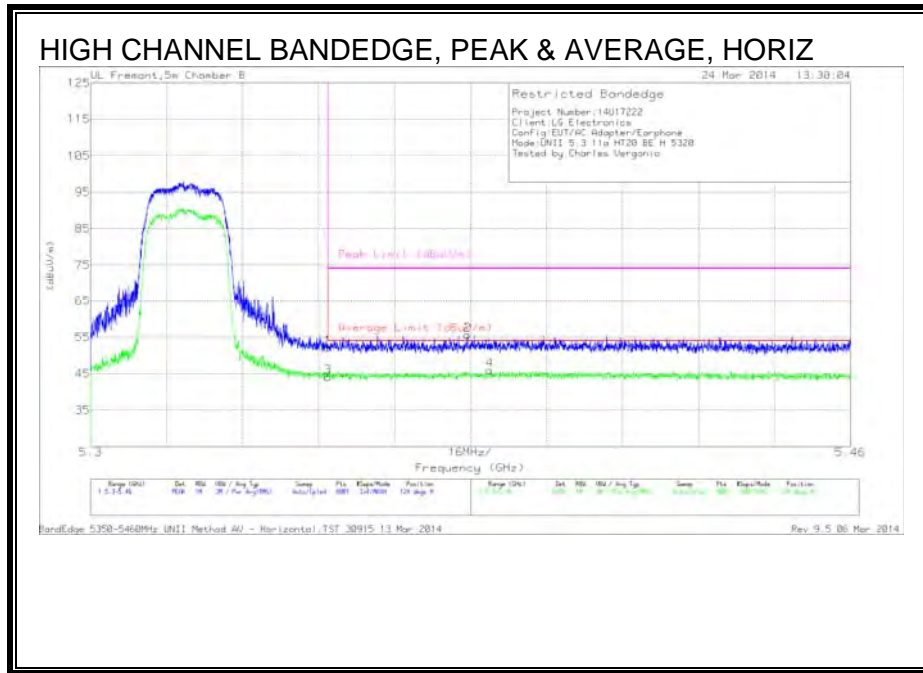
HIGH CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.047	41.72	PK1	27.2	-34.4	34.52	54	-19.48	74	-39.48	-	-	360	100	H
* 4.546	40.41	PK1	34.1	-30.5	44.01	54	-9.99	74	-29.99	-	-	360	100	H
* 2.251	41.89	PK1	31.5	-32.5	40.89	54	-13.11	74	-33.11	-	-	360	100	V
* 2.867	41.32	PK1	32.5	-32.2	41.62	54	-12.38	74	-32.38	-	-	360	100	V
* 3.698	41.77	PK1	33.3	-31.2	43.87	54	-10.13	74	-30.13	-	-	360	100	V
* 9.073	35.44	PK1	36.3	-25.6	46.14	54	-7.86	74	-27.86	-	-	360	100	H

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

## 11.2. 5.3 GHz

### 11.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)



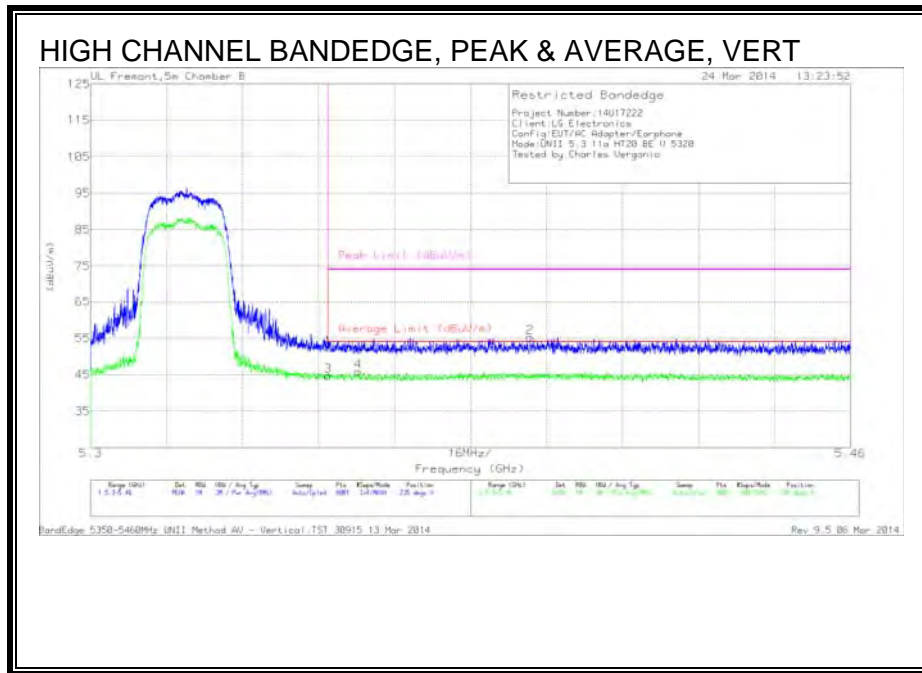
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	37.61	PK	34.5	-19.9	0	52.21	-	-	74	-21.79	124	214	H
2	* 5.379	40.98	PK	34.5	-19.8	0	55.68	-	-	74	-18.32	124	214	H
3	* 5.35	29.27	RMS	34.5	-19.9	.2	44.07	54	-9.93	-	-	124	214	H
4	* 5.384	30.91	RMS	34.5	-19.7	.2	45.91	54	-8.09	-	-	124	214	H

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

PK - Peak detector

RMS - RMS detection





Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT345 (dB/m)	Amp/Cbi/Fitter/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	* 5.35	37.75	PK	34.5	-19.9	0	52.35	-	-	74	-21.65	235	132	V
2	* 5.393	40.4	PK	34.5	-19.7	0	55.2	-	-	74	-18.8	235	132	V
3	* 5.35	29.92	RMS	34.5	-19.9	.2	44.72	54	-9.28	-	-	235	132	V
4	* 5.356	31.07	RMS	34.5	-19.9	.2	45.87	54	-8.13	-	-	235	132	V

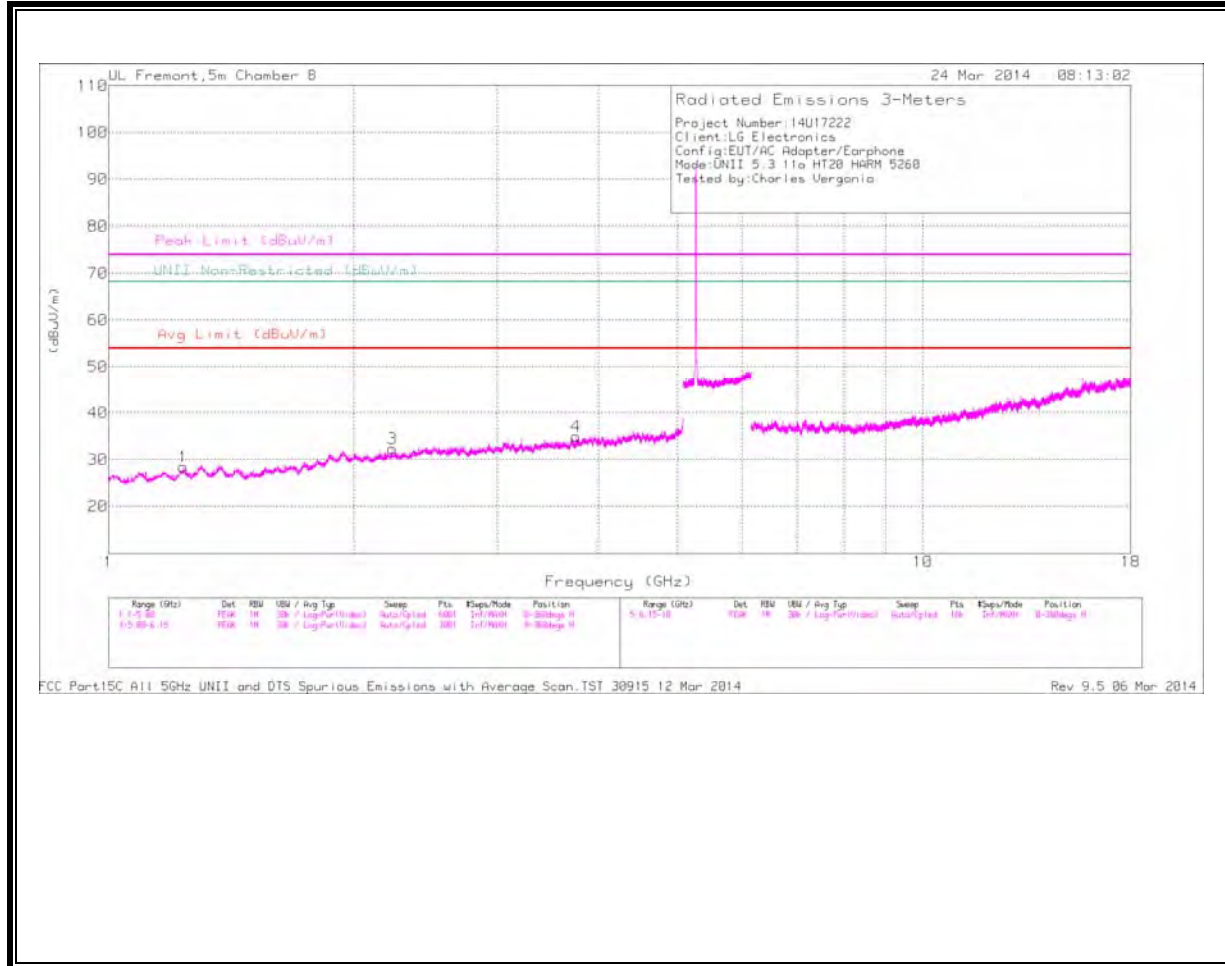
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

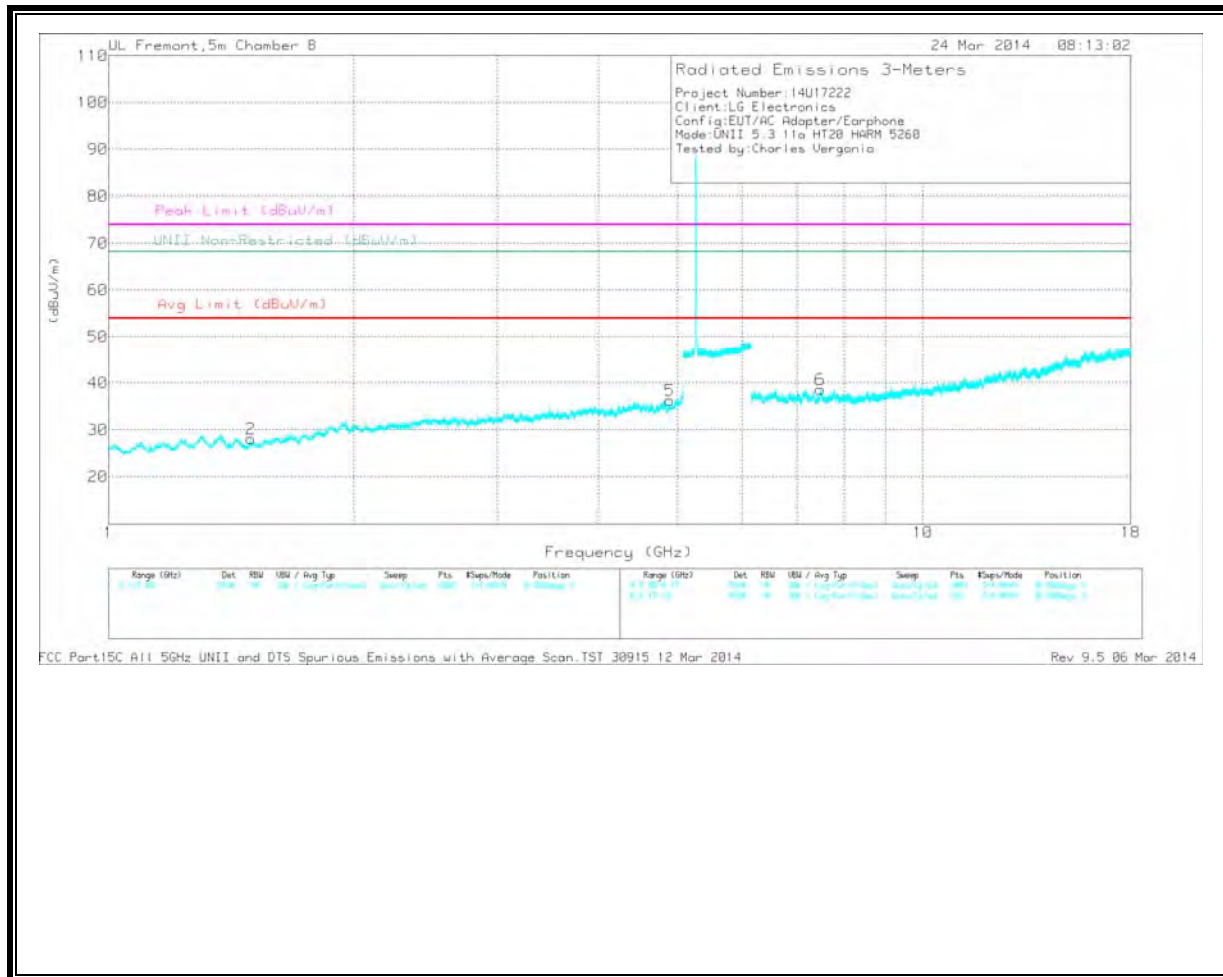
### HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



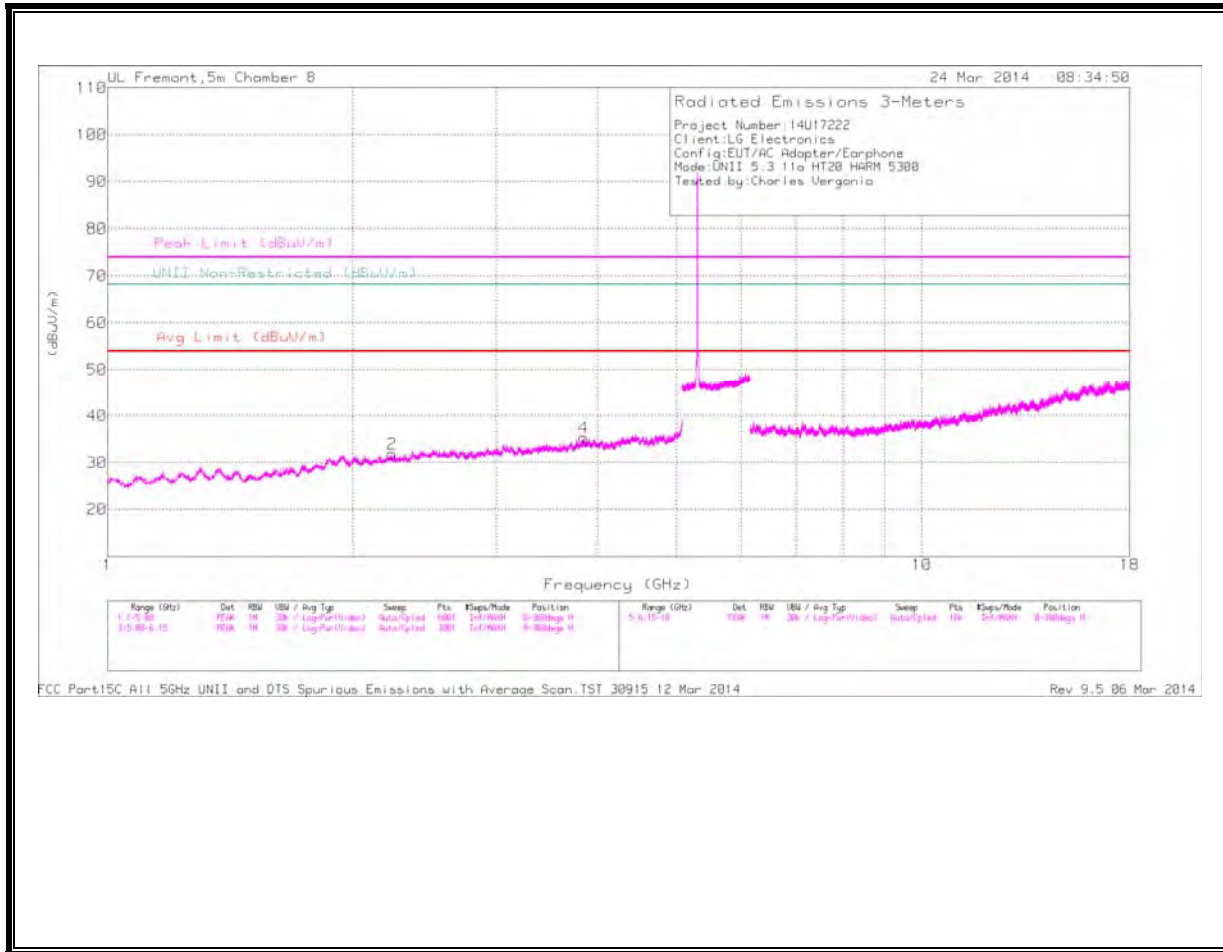
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.235	44.06	PK1	28.4	-34.7	37.76	54	-16.24	74	-36.24	-	-	360	100	H
* 2.231	42.02	PK1	31.4	-32.3	41.12	54	-12.88	74	-32.88	-	-	360	100	H
* 3.75	41	PK1	33.5	-31.3	43.2	54	-10.8	74	-30.8	-	-	360	100	H
* 1.495	42.66	PK1	27.9	-34.5	36.06	54	-17.94	74	-37.94	-	-	360	100	V
* 4.884	40.61	PK1	34.2	-29.8	45.01	54	-8.99	74	-28.99	-	-	360	100	V
* 7.481	37.9	PK1	35.6	-26	47.5	54	-6.5	74	-26.5	-	-	360	100	V

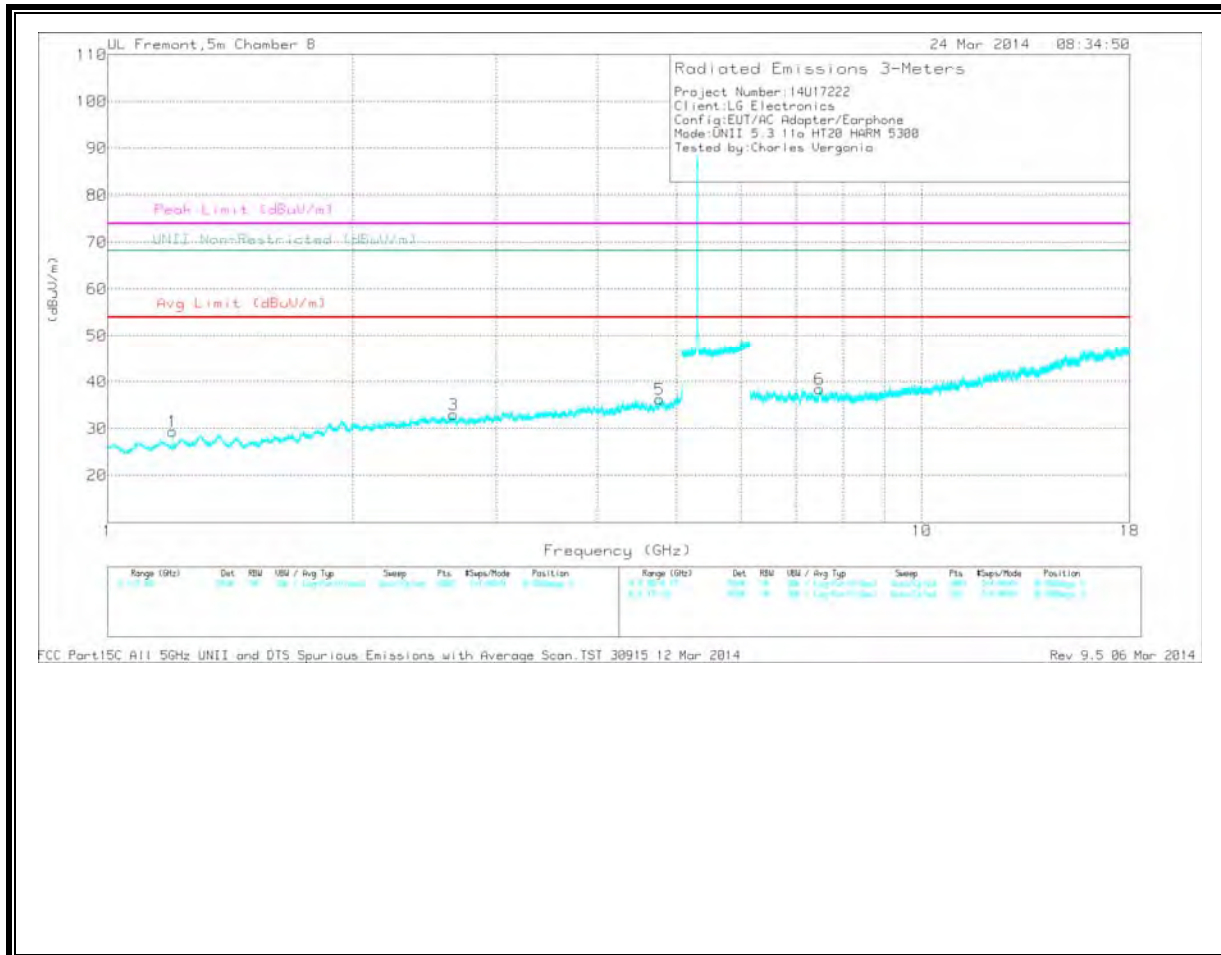
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

MID CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



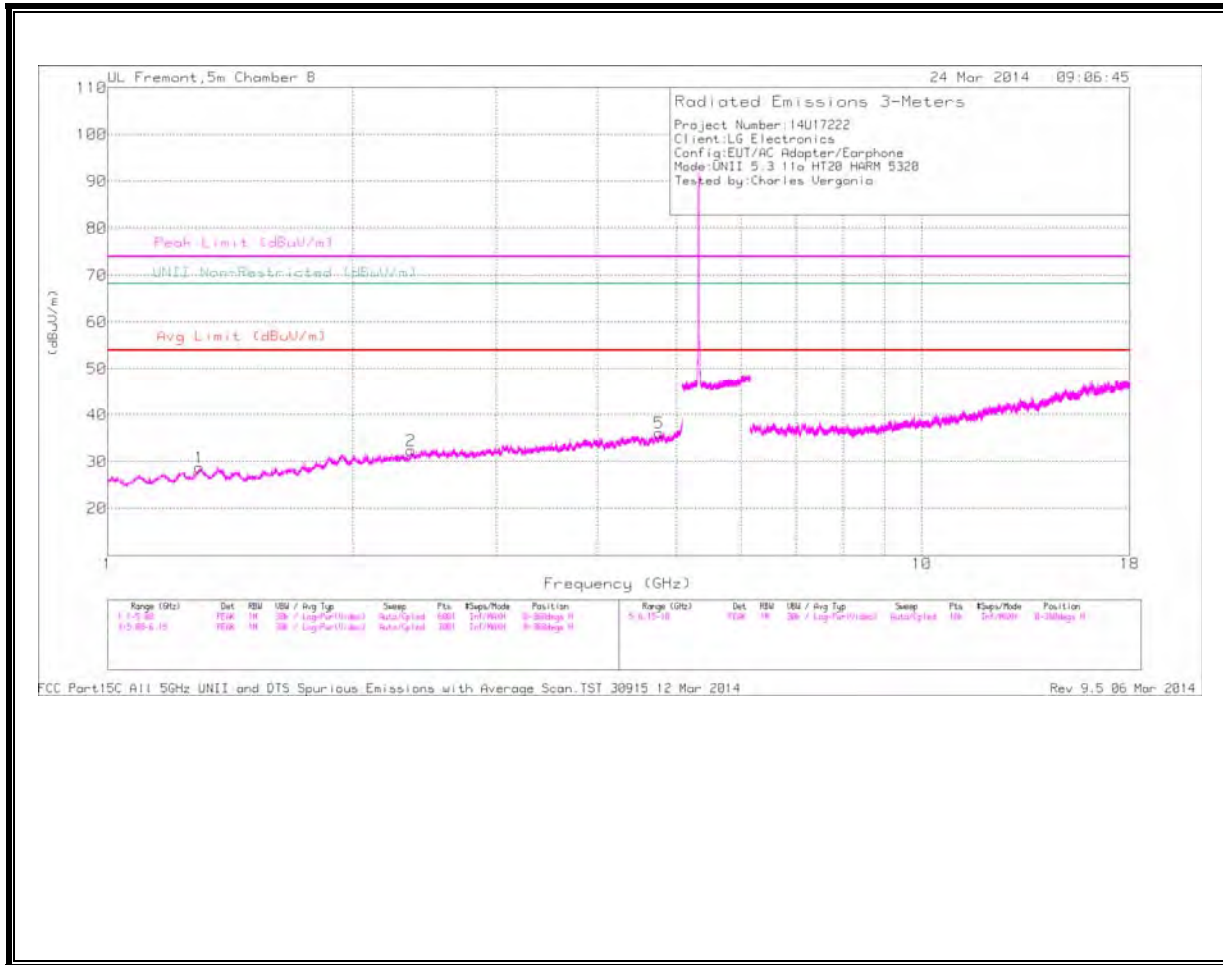
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.236	41.82	PK1	31.4	-32.3	40.92	54	-13.08	74	-33.08	-	-	360	100	H
* 3.839	41.11	PK1	33.7	-31.1	43.71	54	-10.29	74	-30.29	-	-	360	100	H
* 1.203	42.42	PK1	28.2	-34.8	35.82	54	-18.18	74	-38.18	-	-	360	100	V
* 2.659	40.87	PK1	32.3	-31.9	41.27	54	-12.73	74	-32.73	-	-	360	100	V
* 4.767	41.48	PK1	34.2	-29.4	46.28	54	-7.72	74	-27.72	-	-	360	100	V
* 7.487	37.55	PK1	35.6	-25.8	47.35	54	-6.65	74	-26.65	-	-	360	100	V

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

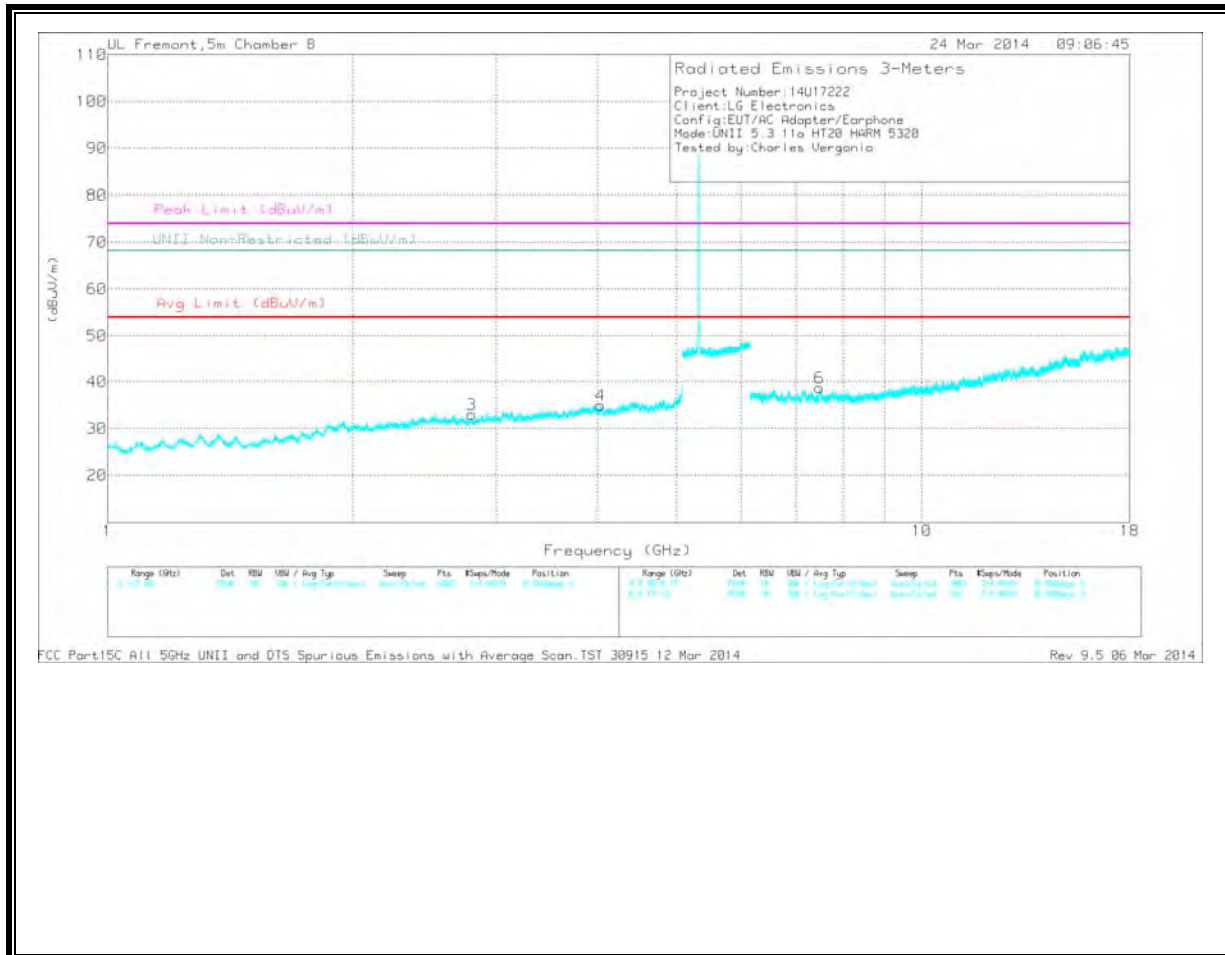
HIGH CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.



VERTICAL



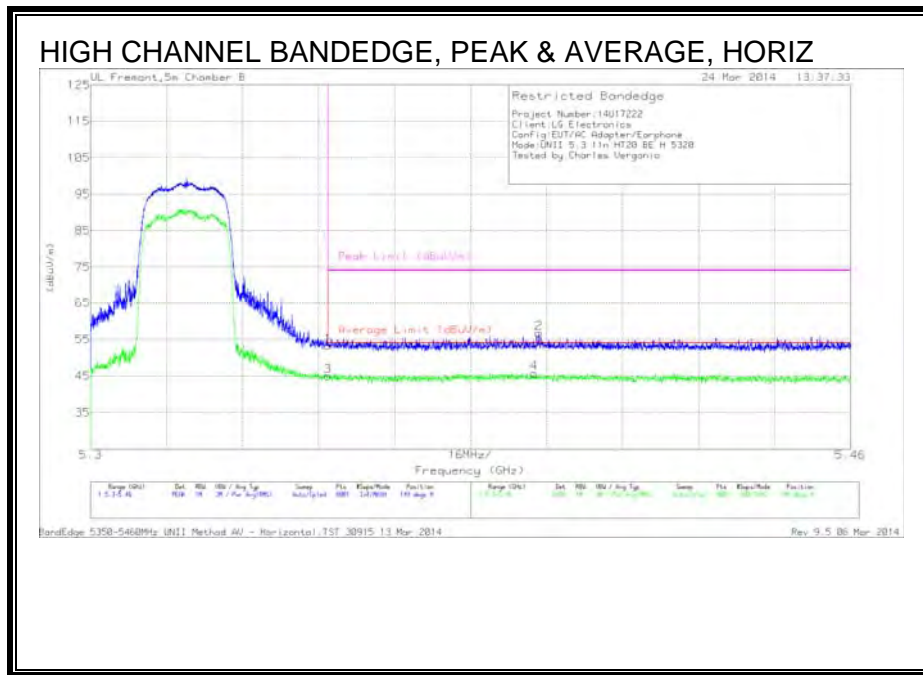
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.298	42.89	PK1	28.8	-34.2	37.49	54	-16.51	74	-36.51	-	-	359	100	H
* 2.358	41.48	PK1	31.9	-32.9	40.48	54	-13.52	74	-33.52	-	-	359	100	H
* 4.756	40.11	PK1	34.2	-29.7	44.61	54	-9.39	74	-29.39	-	-	359	100	H
* 2.801	41.71	PK1	32.3	-32.4	41.61	54	-12.39	74	-32.39	-	-	359	100	V
* 4.034	39.93	PK1	33.6	-30	43.53	54	-10.47	74	-30.47	-	-	359	100	V
* 7.481	37.62	PK1	35.6	-26	47.22	54	-6.78	74	-26.78	-	-	359	100	V

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

### 11.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)

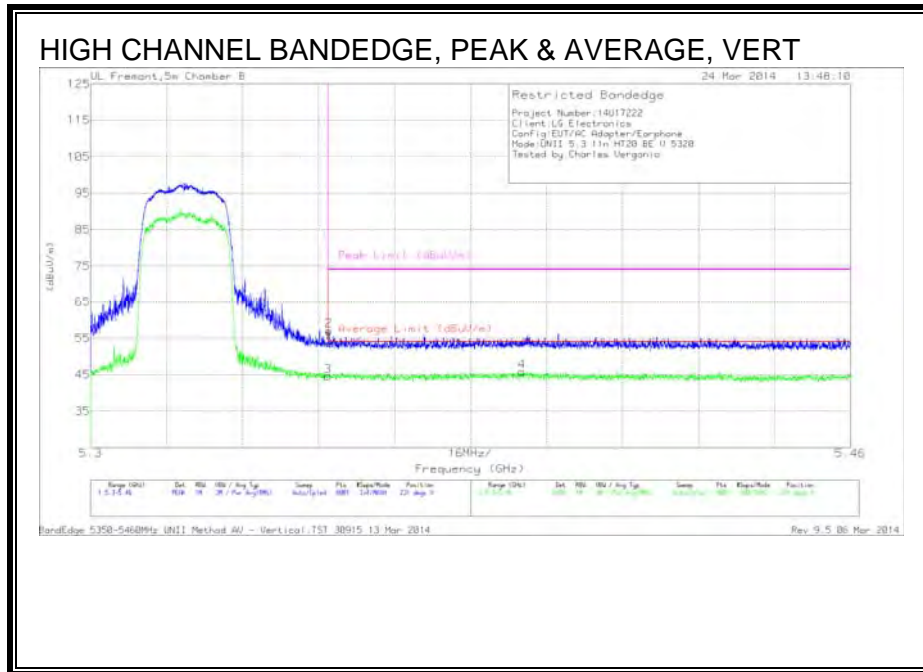


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	38.7	PK	34.5	-19.9	0	53.3	-	-	74	-20.7	149	214	H
2	* 5.394	42.04	PK	34.5	-19.8	0	56.74	-	-	74	-17.26	149	214	H
3	* 5.35	30.12	RMS	34.5	-19.9	.2	44.92	54	-9.08	-	-	149	214	H
4	* 5.393	30.86	RMS	34.5	-19.8	.2	45.76	54	-8.24	-	-	149	214	H

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

PK - Peak detector

RMS - RMS detection



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT345 (dB/m)	Amp/Cbl/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	* 5.35	39.08	PK	34.5	-19.9	0	53.68	-	-	74	-20.32	231	191	V
2	* 5.35	42.46	PK	34.5	-19.9	0	57.06	-	-	74	-16.94	231	191	V
3	* 5.35	29.73	RMS	34.5	-19.9	.2	44.53	54	-9.47	-	-	231	191	V
4	* 5.391	30.86	RMS	34.5	-19.7	.2	45.86	54	-8.14	-	-	231	191	V

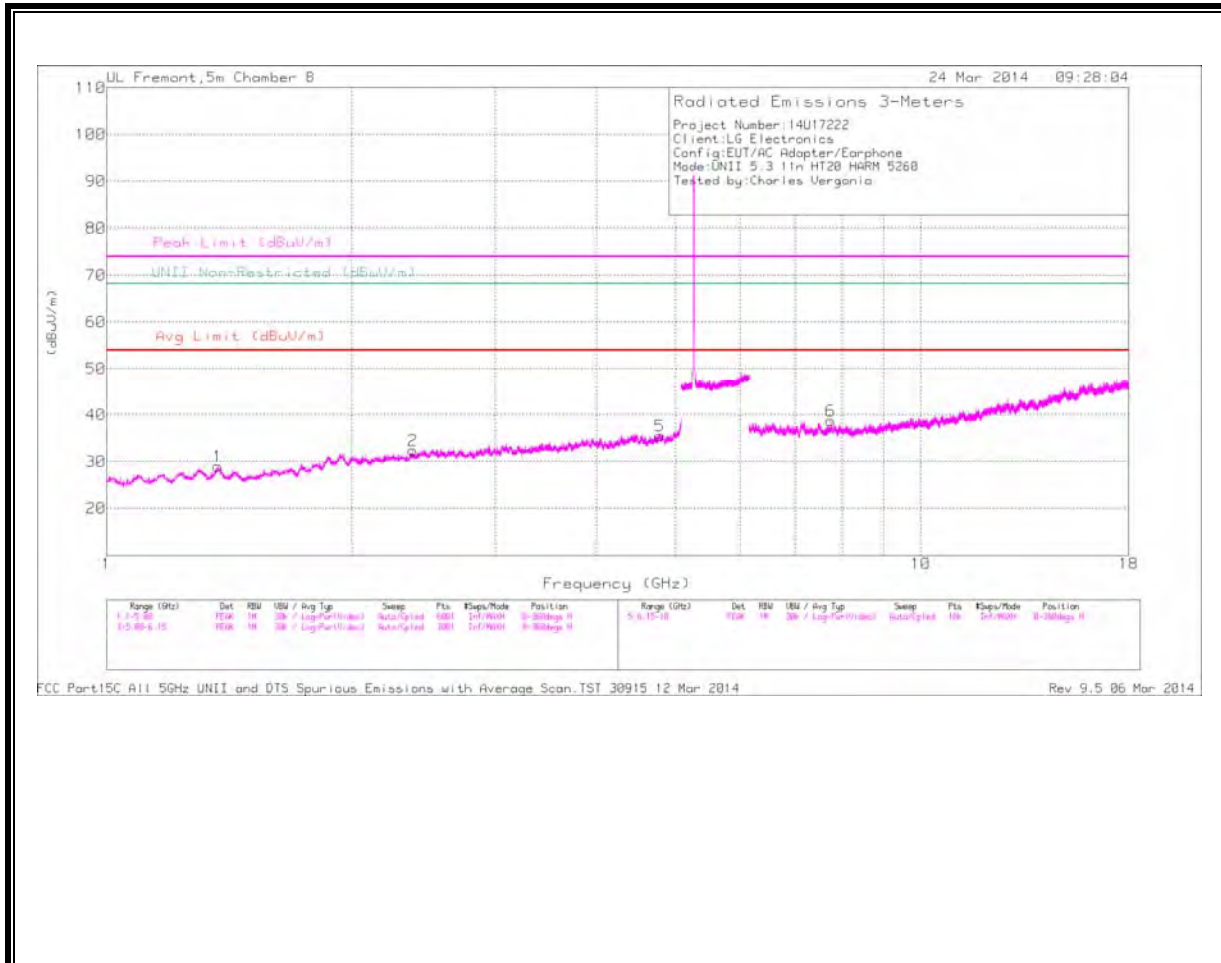
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

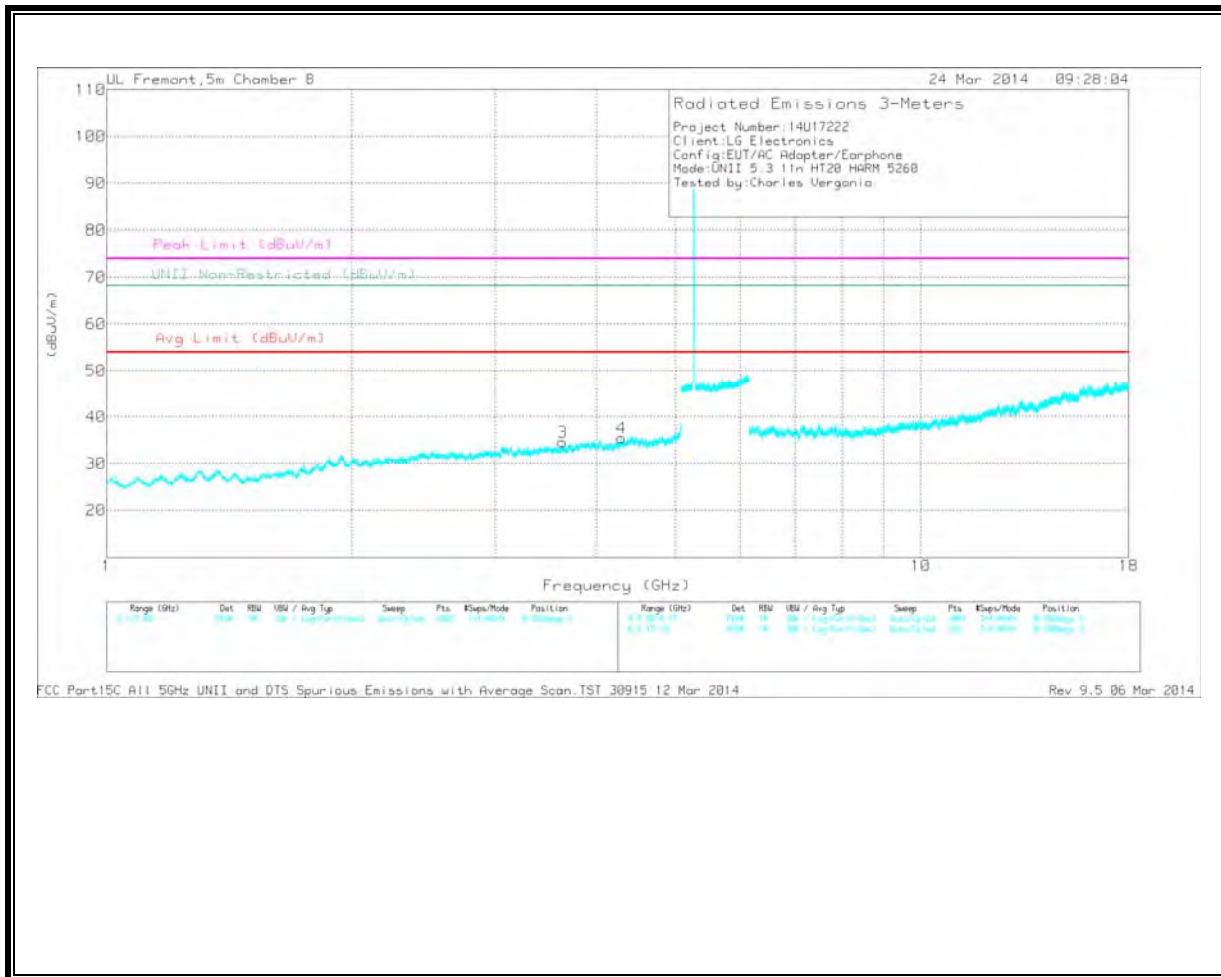
**HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



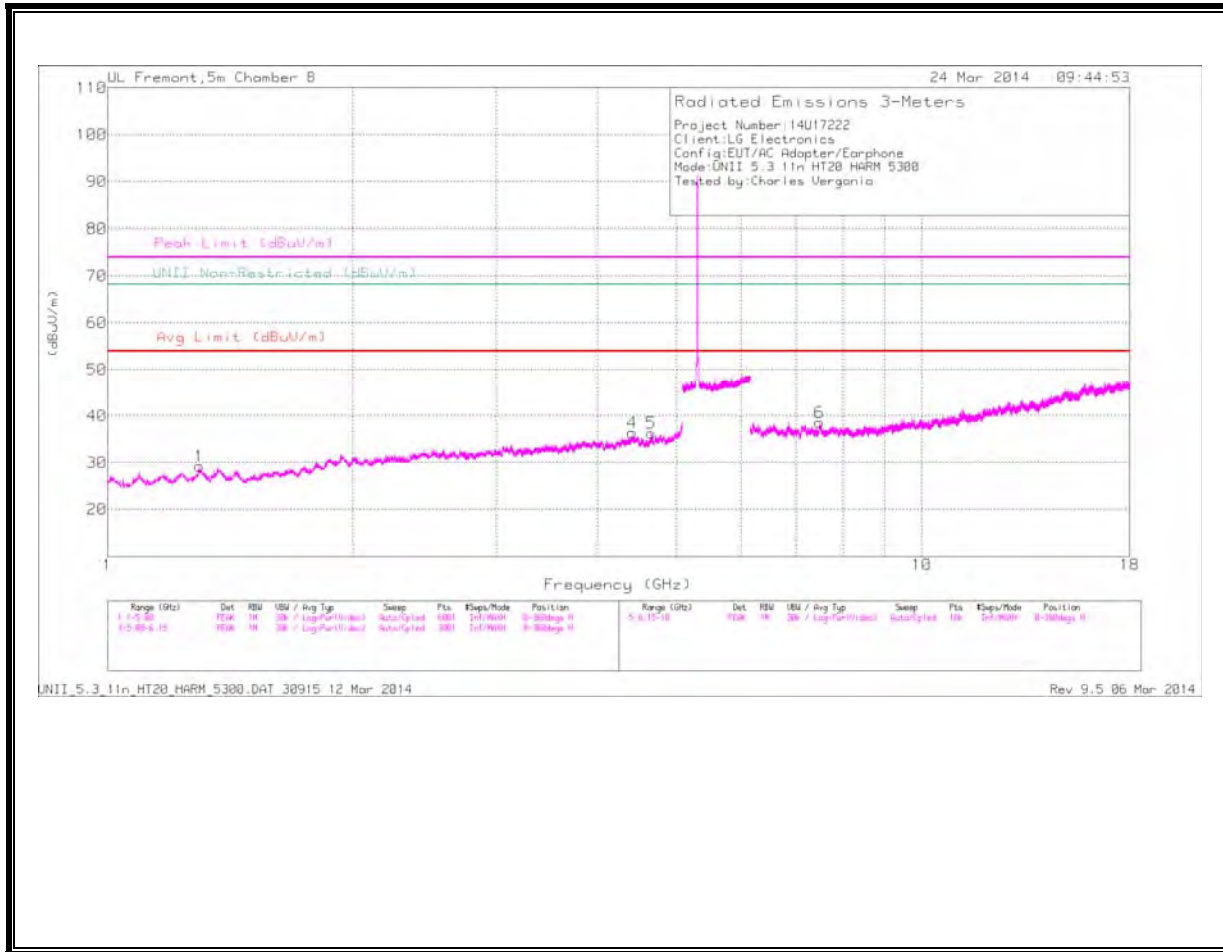
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.37	34.25	PK1	28.6	-33.8	29.05	54	-14.95	74	-44.95	-	-	0-360	202	H
2	* 2.378	33.17	PK1	32	-32.8	32.37	54	-11.63	74	-41.63	-	-	0-360	99	H
5	* 4.783	30.16	PK1	34.2	-28.9	35.46	54	-8.54	74	-38.54	-	-	0-360	99	H
3	* 3.628	32.64	PK1	33.2	-31.3	34.54	54	-9.46	74	-39.46	-	-	0-360	99	V
4	* 4.287	31.88	PK1	33.7	-30.1	35.48	54	-8.52	74	-38.52	-	-	0-360	202	V
6	* 7.748	29.8	PK1	35.7	-26.7	38.8	54	-9.2	74	-35.2	-	-	0-360	99	H

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

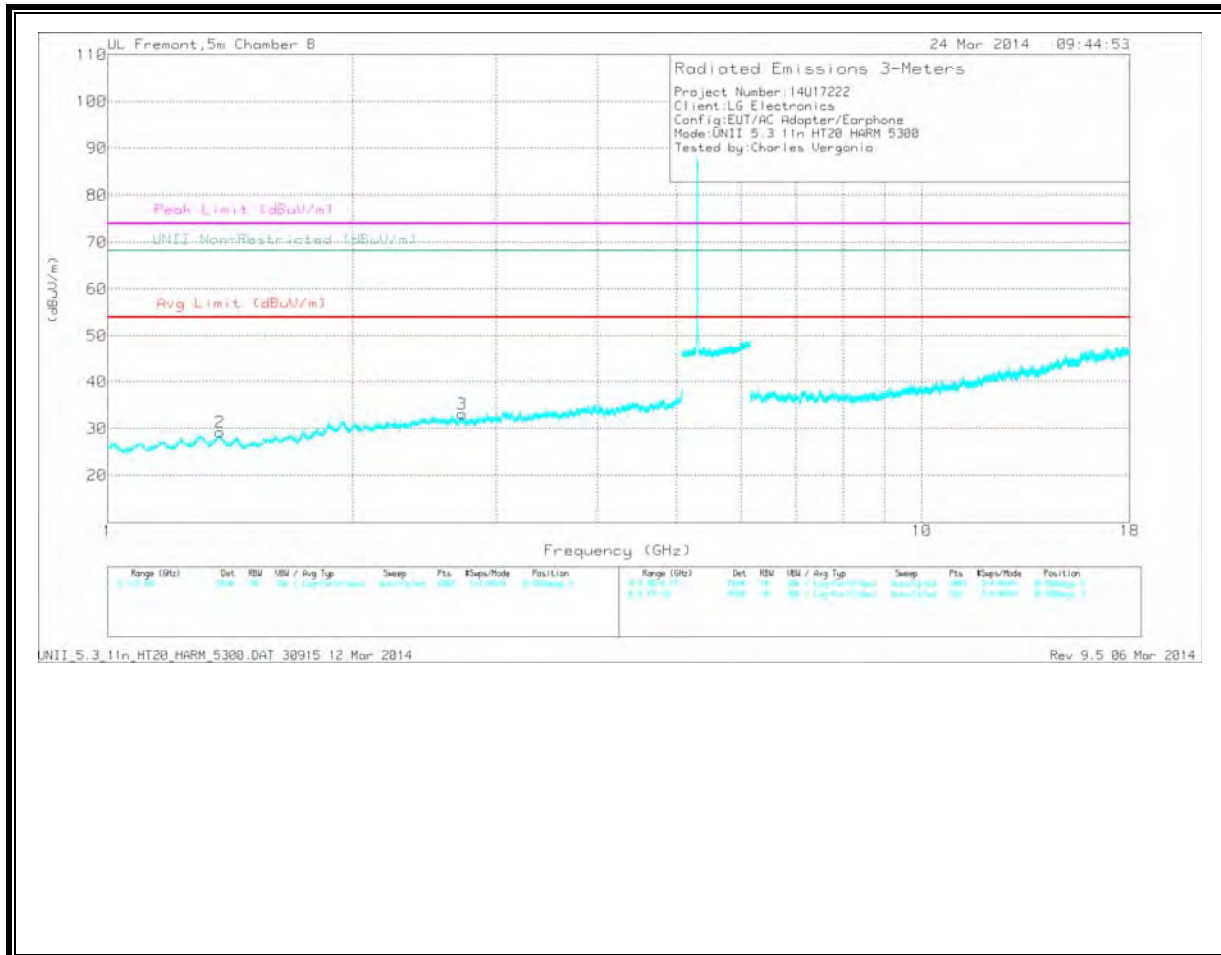
MID CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.



VERTICAL



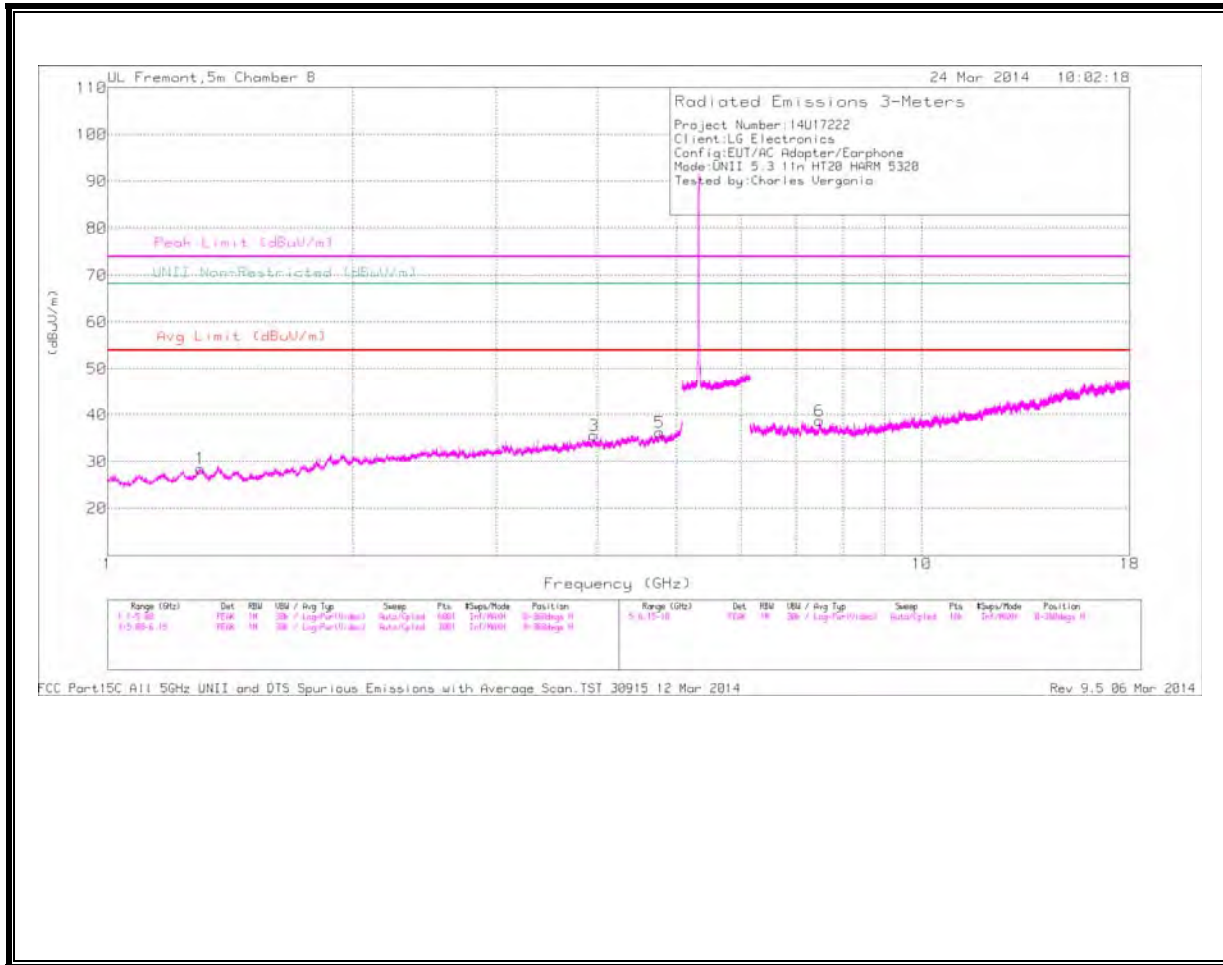
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.296	43.61	PK1	28.8	-34.3	38.11	54	-15.89	74	-35.89	-	-	359	100	H
* 4.652	39.67	PK1	34.2	-29.4	44.47	54	-9.53	74	-29.53	-	-	359	100	H
* 1.374	42.96	PK1	28.6	-33.8	37.76	54	-16.24	74	-36.24	-	-	359	100	V
* 2.723	41.19	PK1	32.2	-31.8	41.59	54	-12.41	74	-32.41	-	-	359	100	V
* 7.493	37.59	PK1	35.6	-25.7	47.49	54	-6.51	74	-26.51	-	-	359	100	H
4.409	40.76	PK1	33.8	-30.2	44.36	-	-	-	-	68.2	-23.84	359	100	H

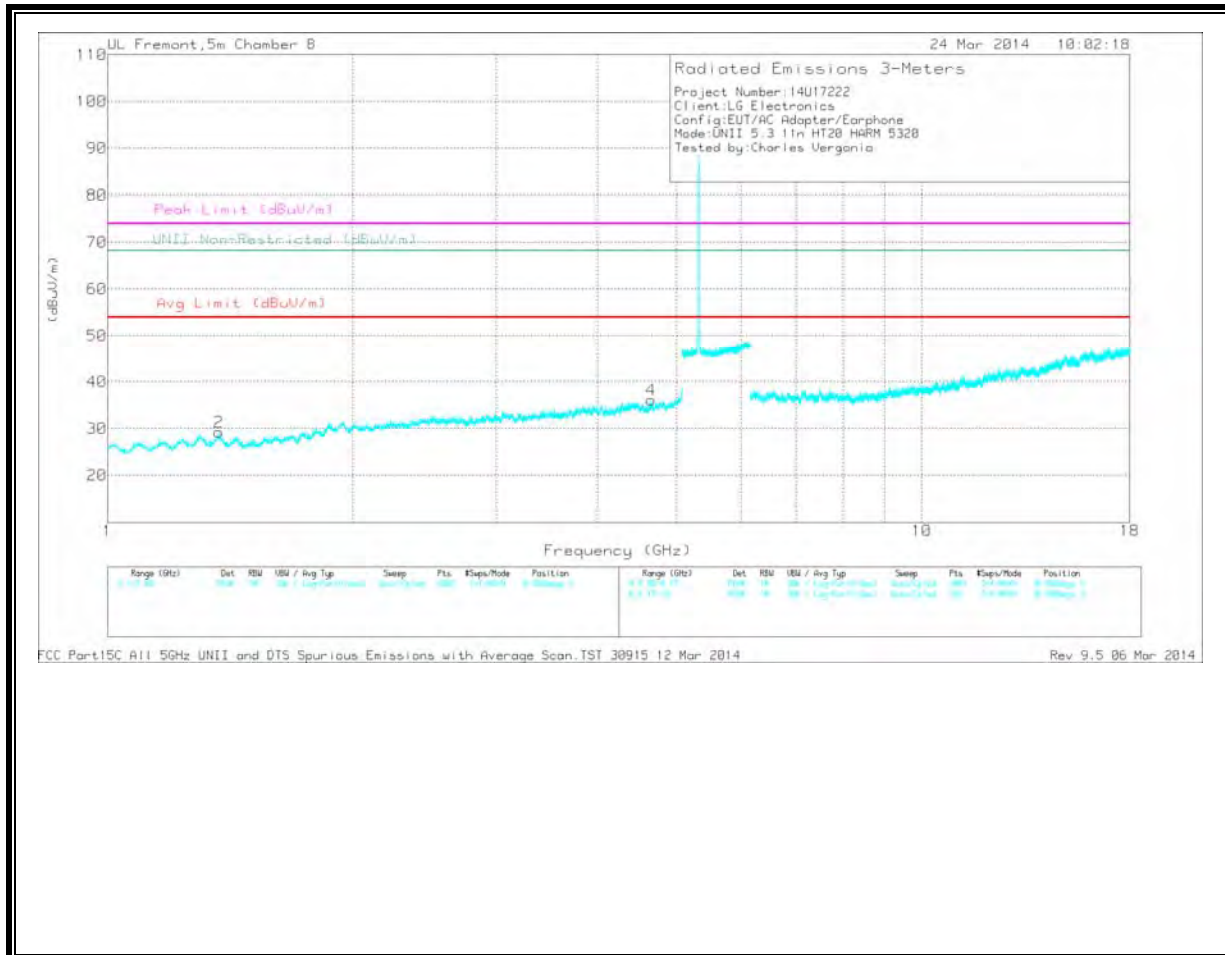
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

HIGH CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



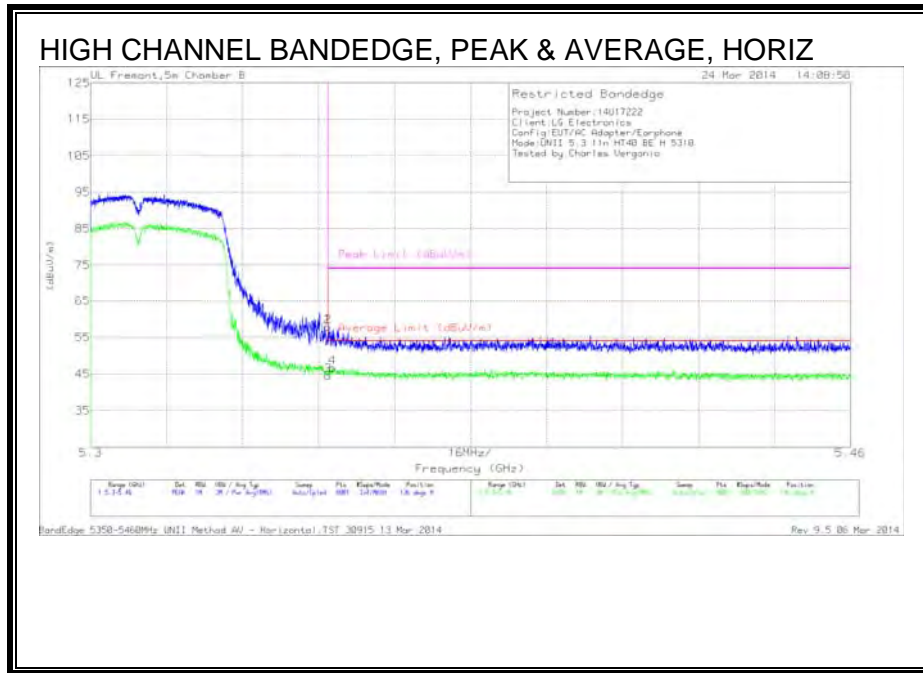
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.3	43.64	PK1	28.9	-34.2	38.34	54	-15.66	74	-35.66	-	-	359	100	H
* 3.956	40.86	PK1	33.7	-30	44.56	54	-9.44	74	-29.44	-	-	359	100	H
* 4.762	40.17	PK1	34.2	-29.6	44.77	54	-9.23	74	-29.23	-	-	359	100	H
* 1.37	42.62	PK1	28.6	-33.8	37.42	54	-16.58	74	-36.58	-	-	359	100	V
* 4.654	39.59	PK1	34.2	-29.4	44.39	54	-9.61	74	-29.61	-	-	359	100	V
* 7.49	37.06	PK1	35.6	-25.7	46.96	54	-7.04	74	-27.04	-	-	359	100	H

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

### 11.2.4. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)

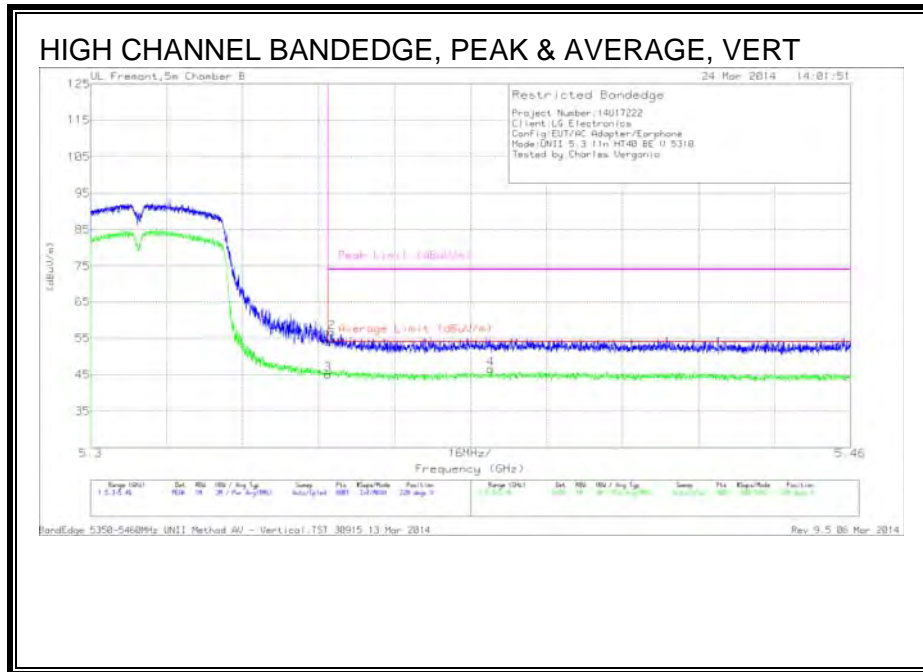


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	43.28	PK	34.5	-19.9	0	57.88	-	-	74	-16.12	136	214	H
2	* 5.35	43.28	PK	34.5	-19.9	0	57.88	-	-	74	-16.12	136	214	H
3	* 5.35	29.47	RMS	34.5	-19.9	.5	44.57	54	-9.43	-	-	136	214	H
4	* 5.351	31.63	RMS	34.5	-19.9	.5	46.73	54	-7.27	-	-	136	214	H

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

PK - Peak detector

RMS - RMS detection



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	39.41	PK	34.5	-19.9	0	54.01	-	-	74	-19.99	228	214	V
2	* 5.351	41.97	PK	34.5	-19.9	0	56.57	-	-	74	-17.43	228	214	V
3	* 5.35	30.01	RMS	34.5	-19.9	.5	45.11	54	-8.89	-	-	228	214	V
4	* 5.384	31.21	RMS	34.5	-19.7	.5	46.51	54	-7.49	-	-	228	214	V

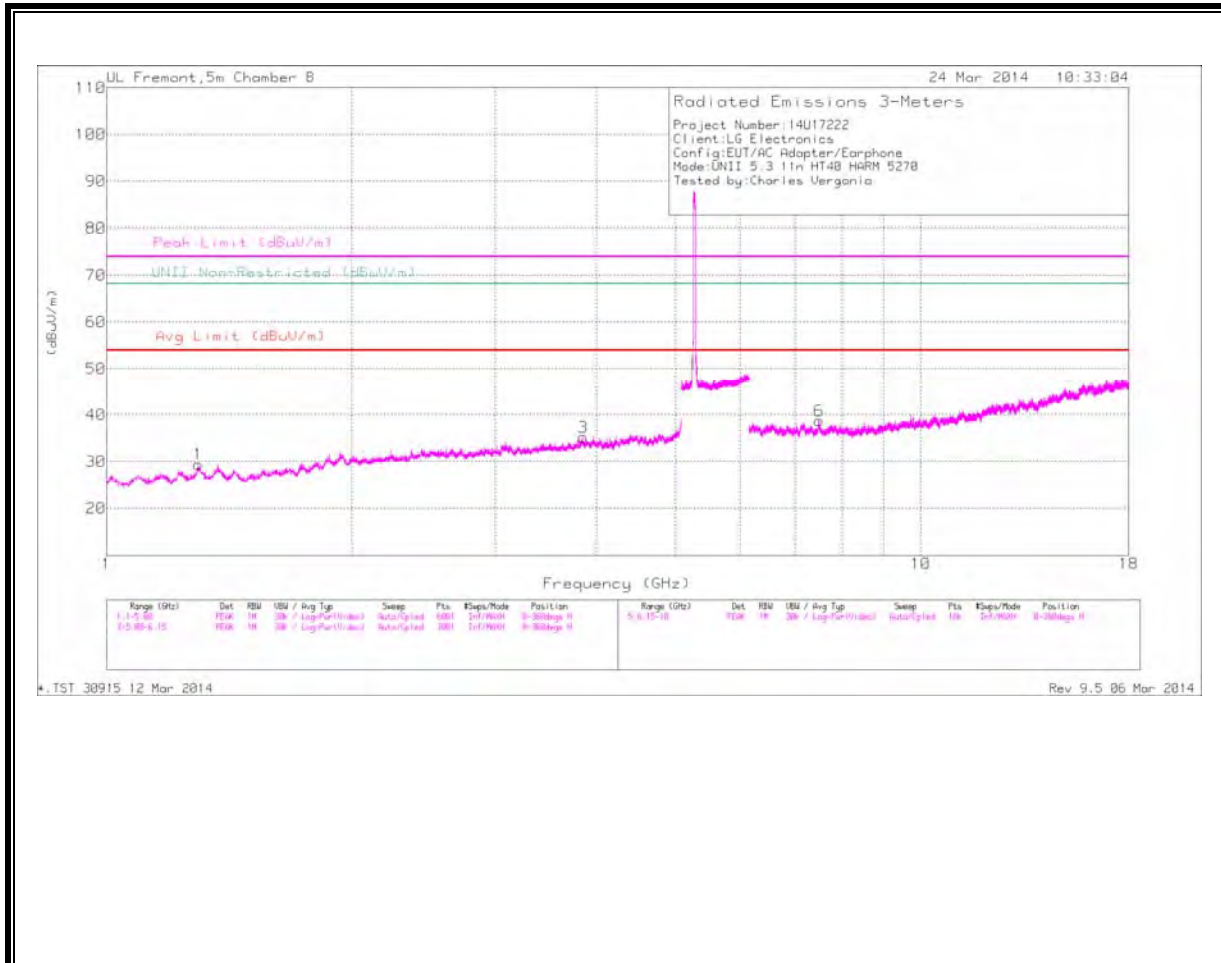
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

**HARMONICS AND SPURIOUS EMISSIONS**

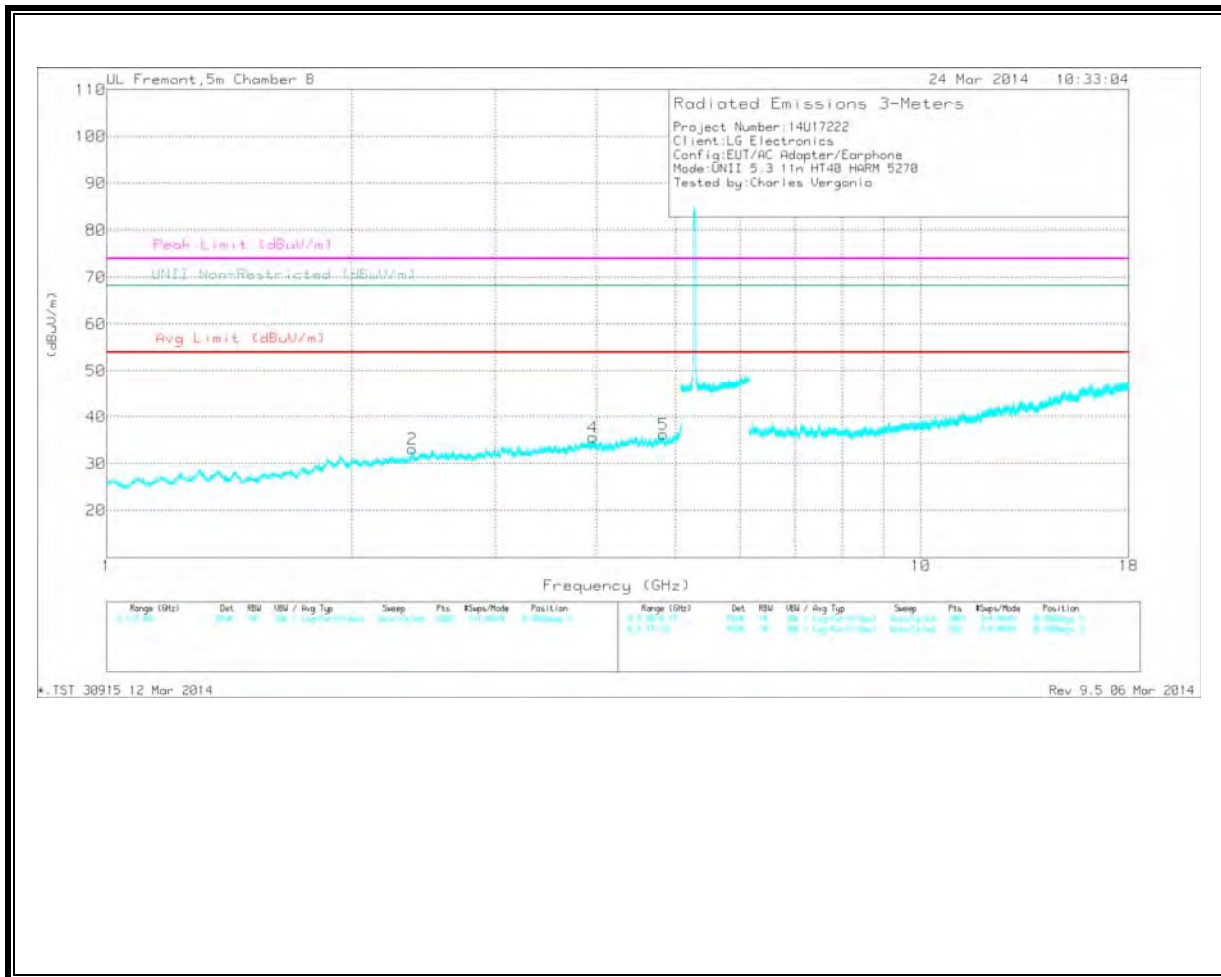
LOW CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.



VERTICAL



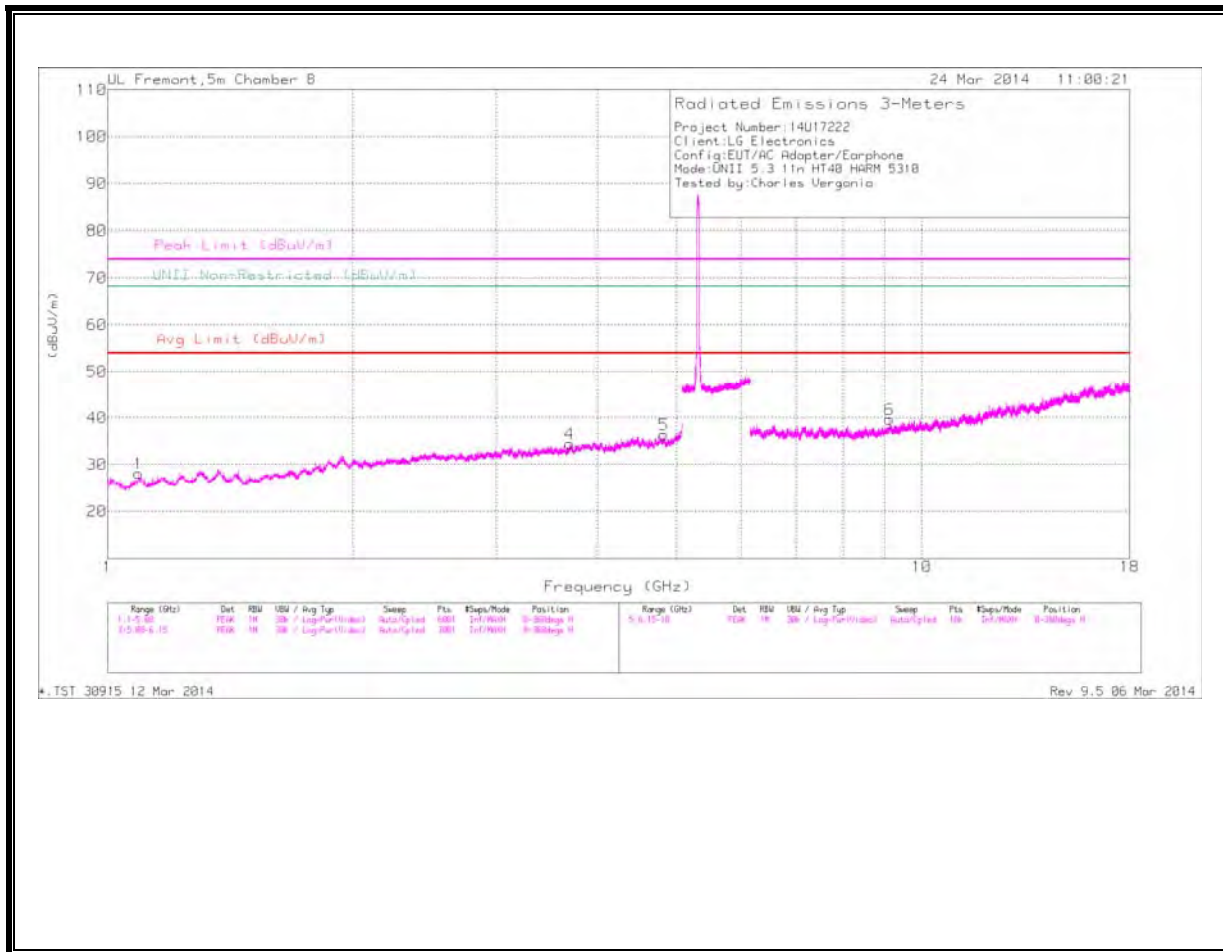
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.296	43.24	PK1	28.8	-34.3	37.74	54	-16.26	74	-36.26	-	-	359	100	H
* 3.849	41.35	PK1	33.7	-31.3	43.75	54	-10.25	74	-30.25	-	-	359	100	H
* 2.374	41.85	PK1	32	-32.7	41.15	54	-12.85	74	-32.85	-	-	359	100	V
* 3.954	41.43	PK1	33.7	-30	45.13	54	-8.87	74	-28.87	-	-	359	100	V
* 4.826	40.71	PK1	34.2	-29.9	45.01	54	-8.99	74	-28.99	-	-	359	100	V
* 7.5	37.05	PK1	35.6	-25.9	46.75	54	-7.25	74	-27.25	-	-	359	100	H

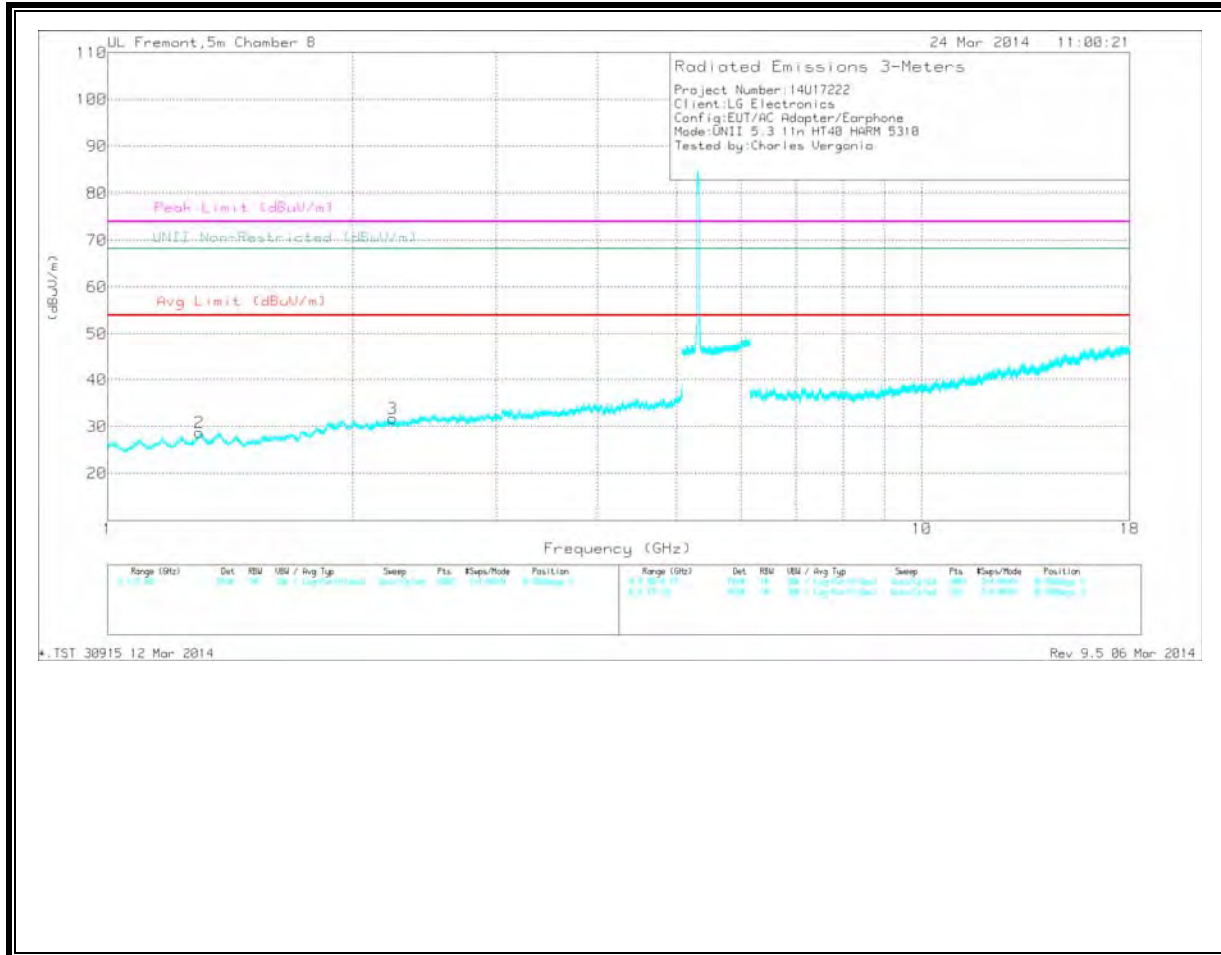
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

HIGH CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

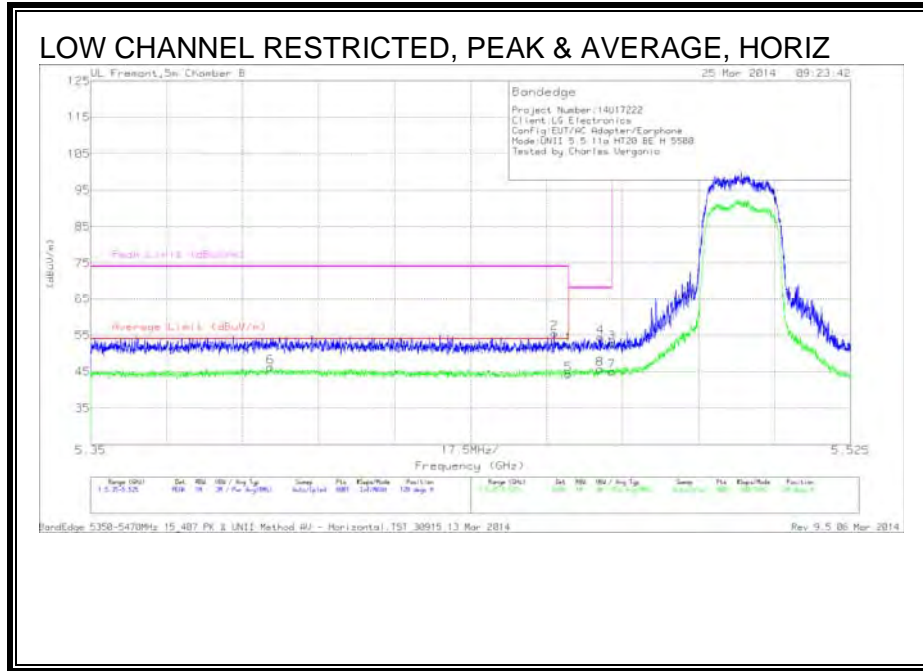
MID CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.093	42.75	PK1	27.3	-34.4	35.65	54	-18.35	74	-38.35	-	-	359	100	H
* 3.692	40.52	PK1	33.3	-31.2	42.62	54	-11.38	74	-31.38	-	-	359	100	H
* 4.817	41.03	PK1	34.2	-29.5	45.73	54	-8.27	74	-28.27	-	-	359	100	H
* 1.294	42.72	PK1	28.8	-34.3	37.22	54	-16.78	74	-36.78	-	-	359	100	V
* 2.239	41.33	PK1	31.4	-32.3	40.43	54	-13.57	74	-33.57	-	-	359	100	V
* 9.13	35.55	PK1	36.3	-25	46.85	54	-7.15	74	-27.15	-	-	359	100	H

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

### 11.3. 5.5-5.6 GHz

#### 11.3.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

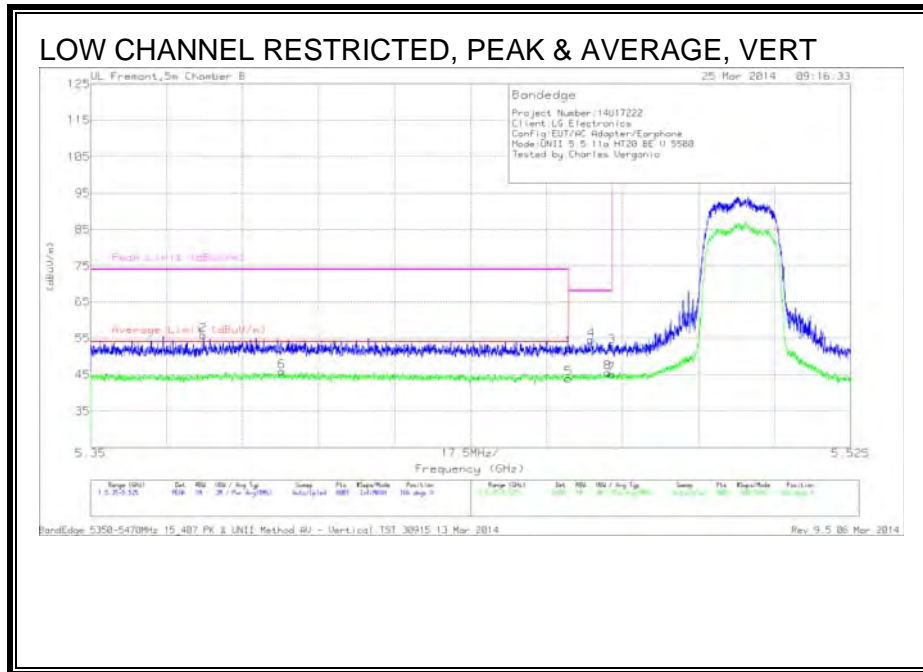


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	37.92	PK	34.5	-20	0	52.42	-	-	74	-21.58	128	177	H
2	* 5.457	41.07	PK	34.5	-20	0	55.57	-	-	74	-18.43	128	177	H
5	* 5.46	29.63	RMS	34.5	-20	.2	44.33	54	-9.67	-	-	128	177	H
6	* 5.391	31.26	RMS	34.5	-19.7	.2	46.26	54	-7.74	-	-	128	177	H
4	5.467	39.95	PK	34.5	-20	0	54.45	-	-	68.2	-13.75	128	177	H
8	5.467	31.05	RMS	34.5	-20	.2	45.75	-	-	-	-	128	177	H
3	5.47	38.27	PK	34.5	-19.9	0	52.87	-	-	68.2	-15.33	128	177	H
7	5.47	30.24	RMS	34.5	-19.9	.2	45.04	-	-	-	-	128	177	H

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

PK - Peak detector

RMS - RMS detection



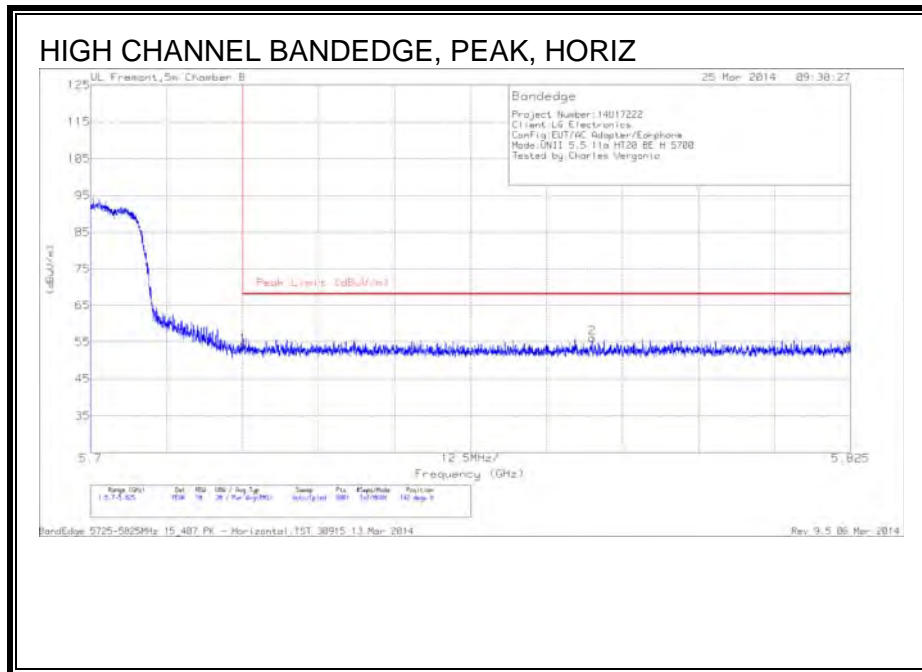
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	37.81	PK	34.5	-20	0	52.31	-	-	74	-21.69	166	214	V
2	* 5.376	41.17	PK	34.5	-19.8	0	55.87	-	-	74	-18.13	166	214	V
5	* 5.46	29.27	RMS	34.5	-20	.2	43.97	54	-10.03	-	-	166	214	V
6	* 5.394	31.04	RMS	34.5	-19.8	.2	45.94	54	-8.06	-	-	166	214	V
4	5.465	39.96	PK	34.5	-20	0	54.46	-	-	68.2	-13.74	166	214	V
8	5.469	30.9	RMS	34.5	-20	.2	45.6	-	-	-	-	166	214	V
3	5.47	38.14	PK	34.5	-19.9	0	52.74	-	-	68.2	-15.46	166	214	V
7	5.47	30.25	RMS	34.5	-19.9	.2	45.05	-	-	-	-	166	214	V

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

PK - Peak detector

RMS - RMS detection

**AUTHORIZED BANDEDGE (HIGH CHANNEL)**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	39.01	PK	34.6	-19.6	0	54.01	68.2	-14.19	142	213	H
2	5.783	41.13	PK	34.7	-19.7	0	56.13	68.2	-12.07	142	213	H

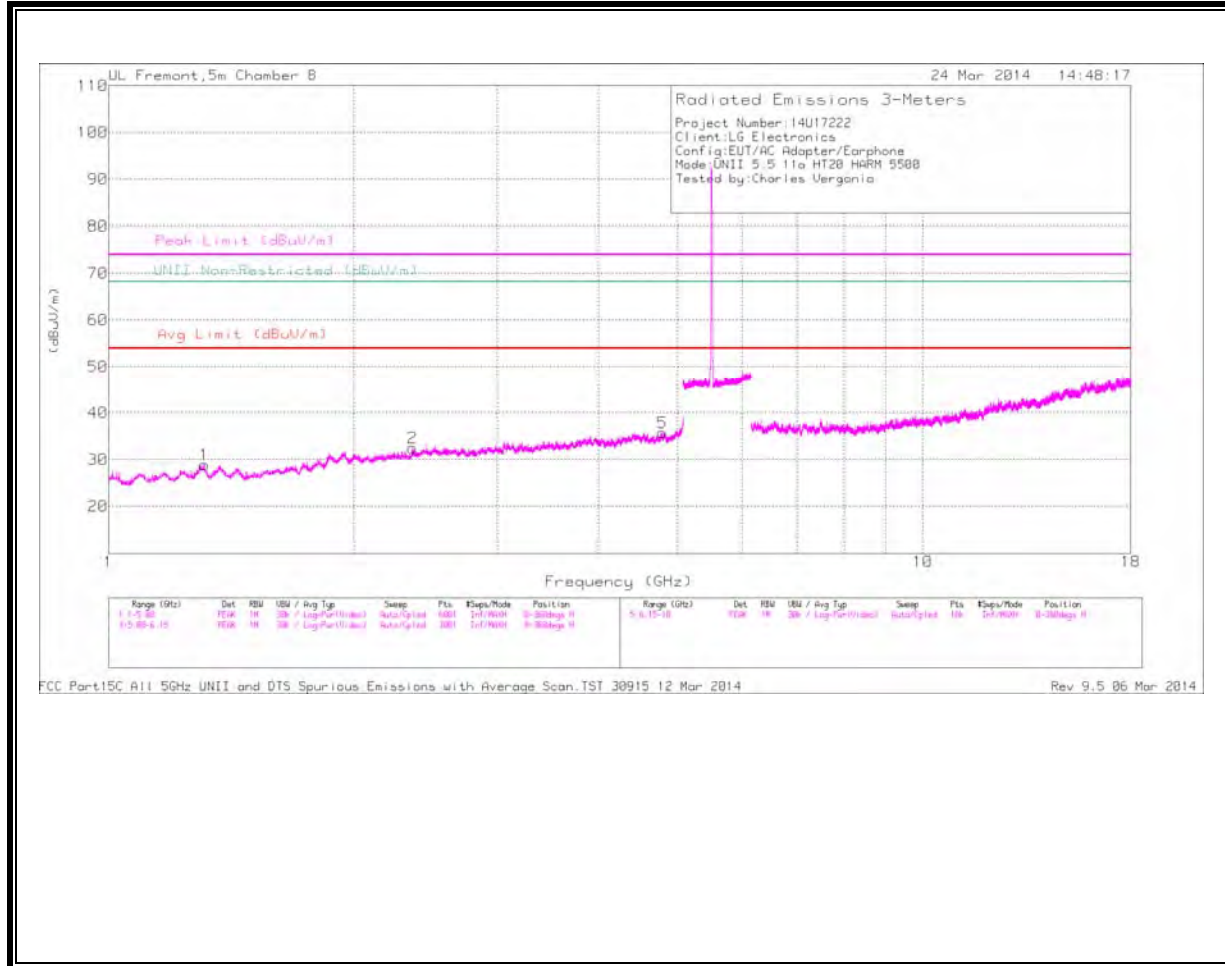
PK - Peak detector





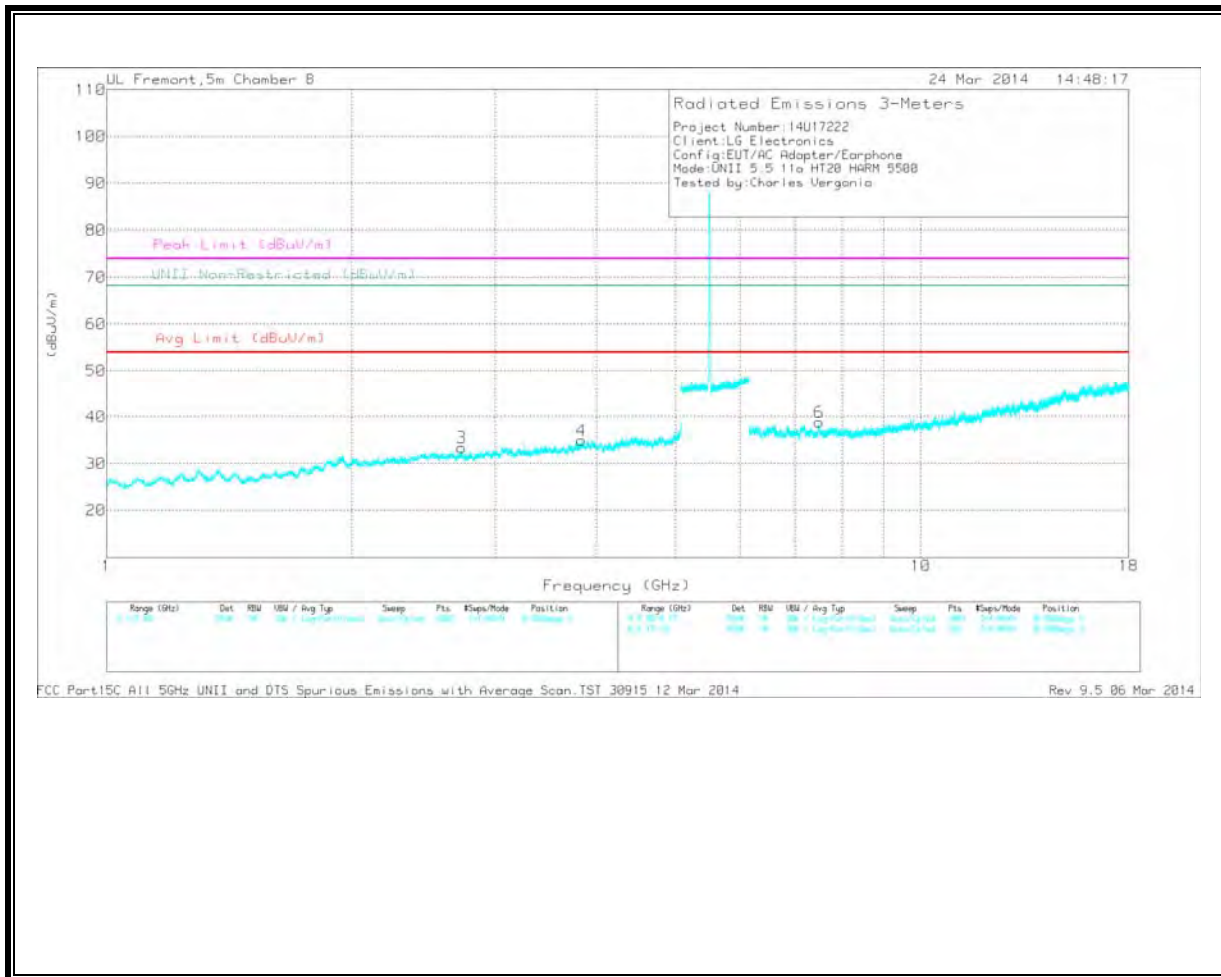
### HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



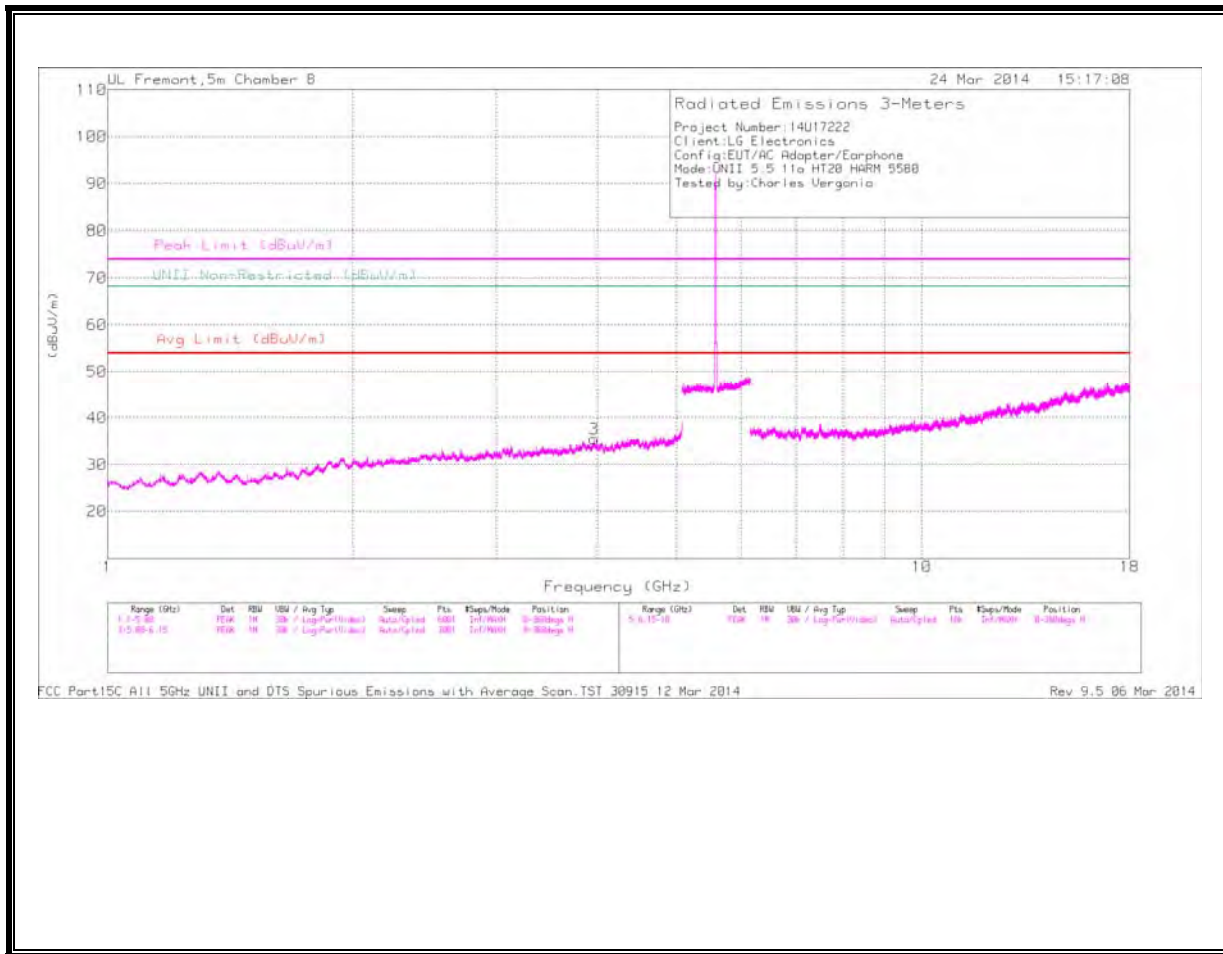
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.312	42.55	PK1	28.8	-34.1	37.25	54	-16.75	74	-36.75	-	-	1	202	H
* 2.363	41.56	PK1	32	-32.8	40.76	54	-13.24	74	-33.24	-	-	1	202	H
* 4.785	38.85	PK1	34.2	-29	44.05	54	-9.95	74	-29.95	-	-	1	202	H
* 2.729	41.19	PK1	32.2	-32	41.39	54	-12.61	74	-32.61	-	-	1	202	V
* 3.828	40.61	PK1	33.7	-31	43.31	54	-10.69	74	-30.69	-	-	1	202	V
* 7.504	36.64	PK1	35.6	-26	46.24	54	-7.76	74	-27.76	-	-	1	202	V

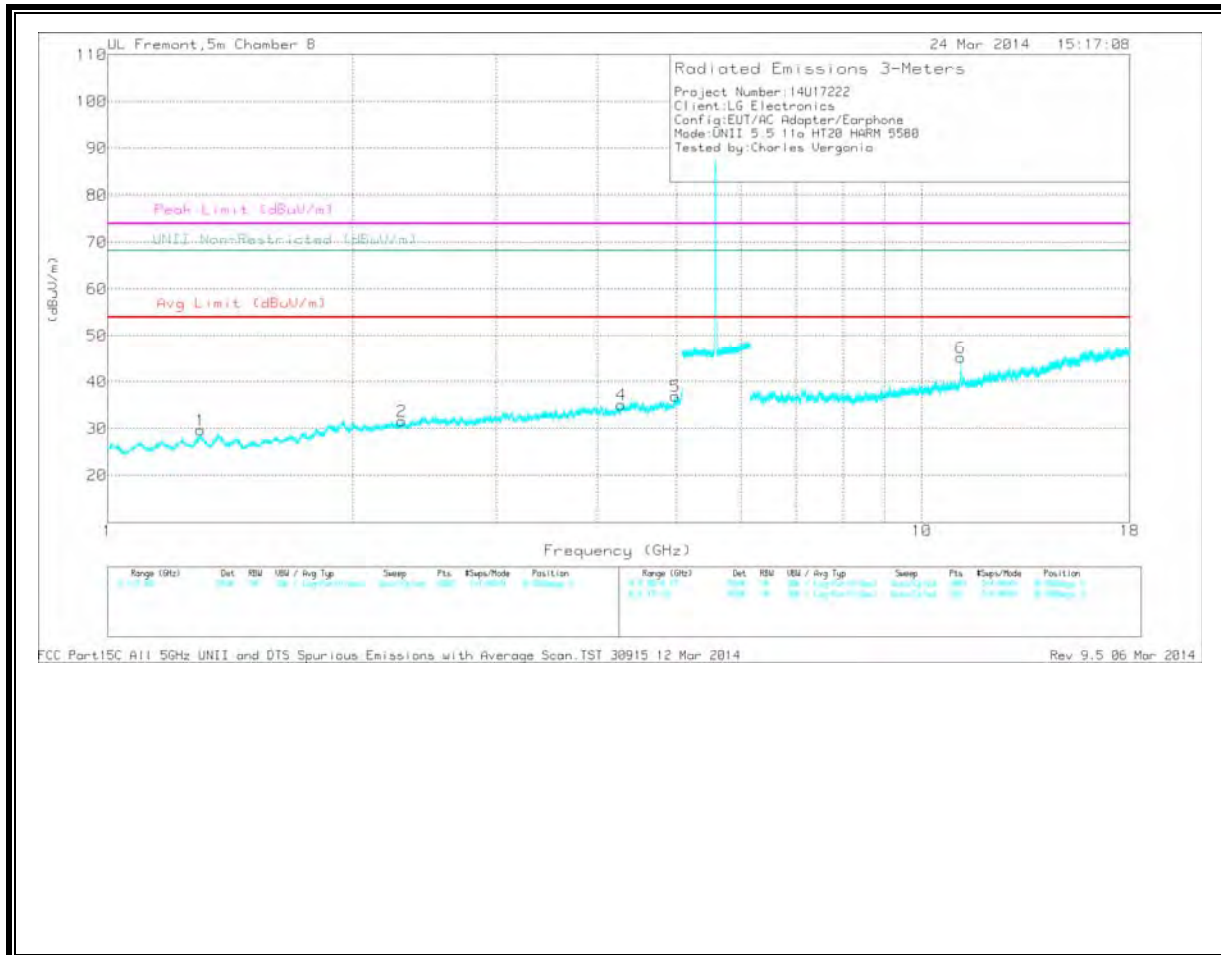
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

MID CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



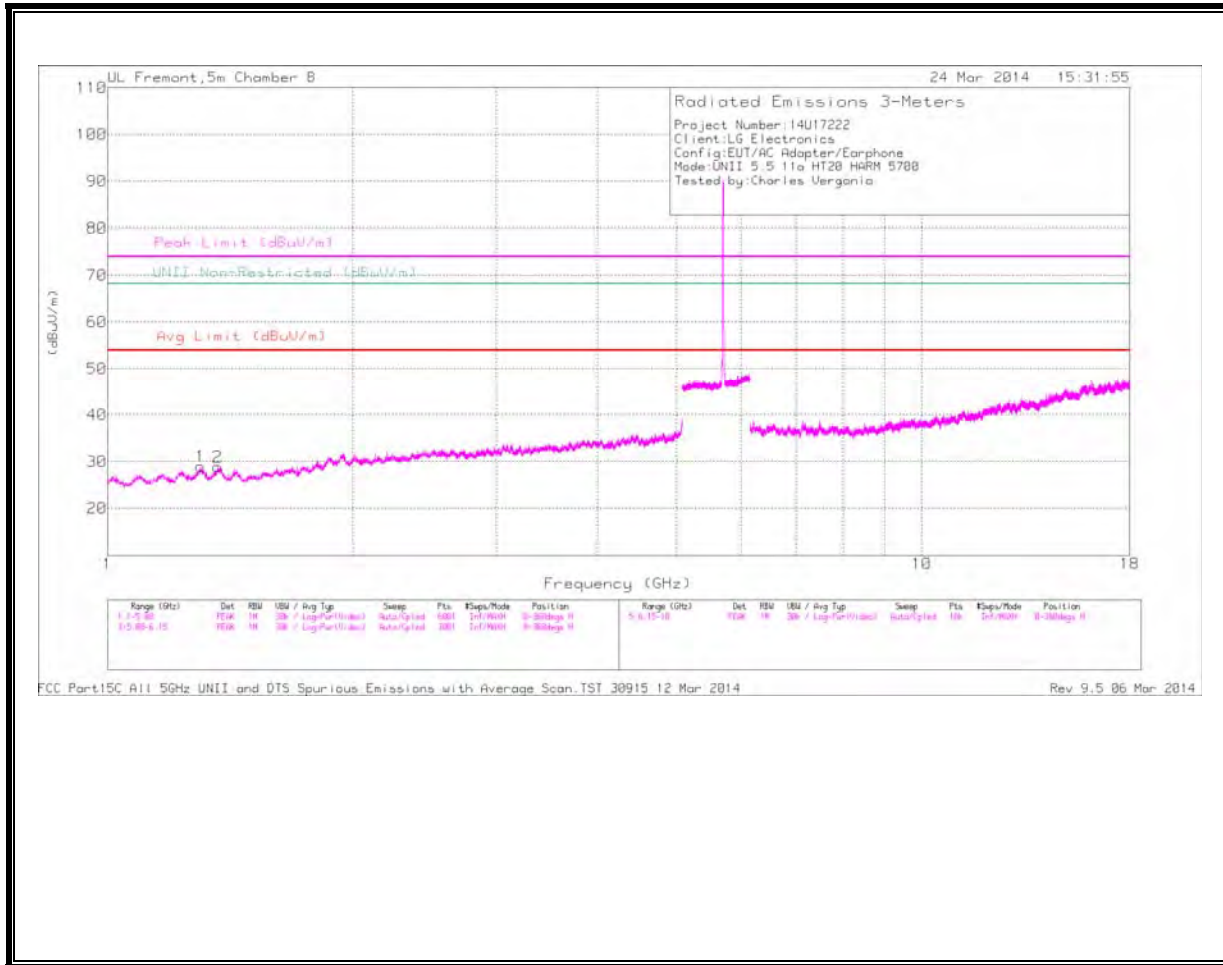
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.956	40.26	PK1	33.7	-30	0	43.96	54	-10.04	74	-30.04	-	-	1	100	H
* 1.301	42.8	PK1	28.9	-34.2	0	37.5	54	-16.5	74	-36.5	-	-	1	100	V
* 2.297	41.4	PK1	31.6	-33	0	40	54	-14	74	-34	-	-	1	100	V
* 4.278	40.26	PK1	33.7	-30.1	0	43.86	54	-10.14	74	-30.14	-	-	1	100	V
* 4.977	39.5	PK1	34.2	-28.4	0	45.3	54	-8.7	74	-28.7	-	-	1	100	V
* 11.161	42.86	PK1	37.9	-23.3	0	57.46			74	-16.54	-	-	89	378	V
* 11.161	31.41	AD1	37.9	-23.3	-2	46.21	54	-7.79	-	-	-	-	89	378	V

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

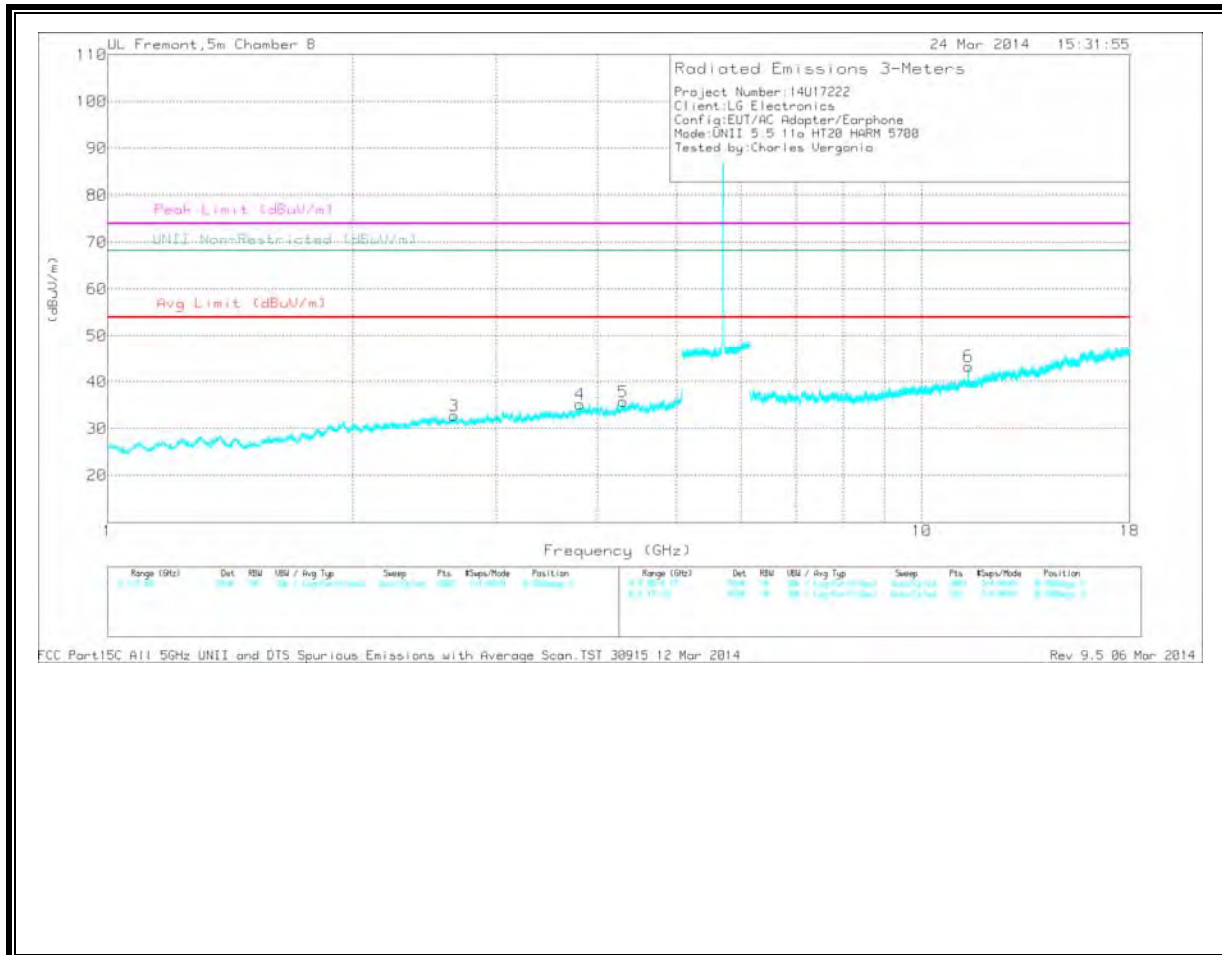
HIGH CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.



VERTICAL



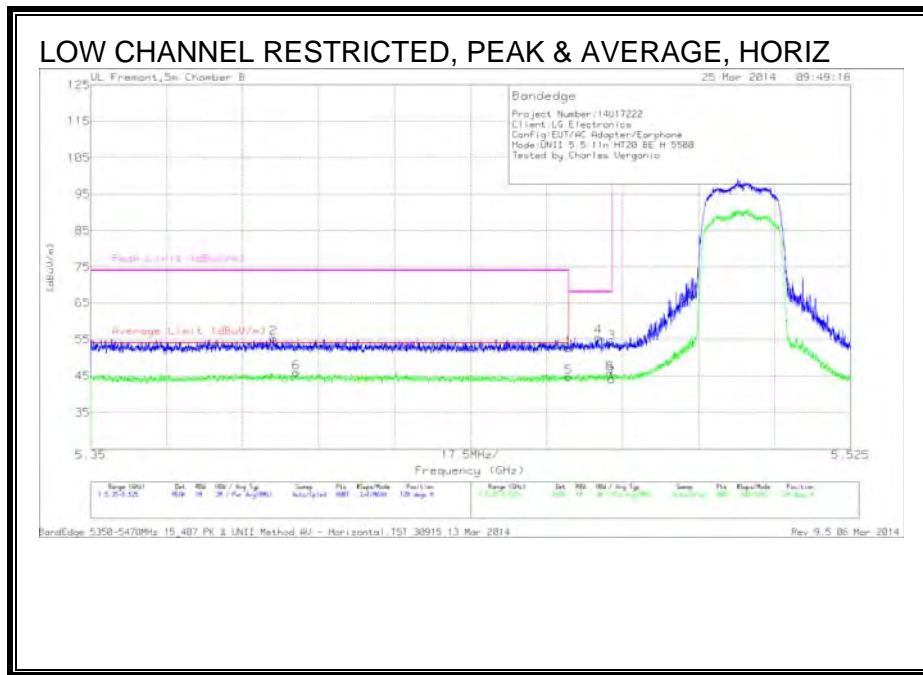
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

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)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.3	43.12	PK1	28.9	-34.2	0	37.82	54	-16.18	74	-36.18	-	-	1	100	H
* 1.368	43.48	PK1	28.6	-33.8	0	38.28	54	-15.72	74	-35.72	-	-	1	100	H
* 2.666	41.08	PK1	32.3	-31.8	0	41.58	54	-12.42	74	-32.42	-	-	1	100	V
* 3.8	40.28	PK1	33.6	-31	0	42.88	54	-11.12	74	-31.12	-	-	1	100	V
* 4.294	40.63	PK1	33.7	-30.1	0	44.23	54	-9.77	74	-29.77	-	-	1	100	V
* 11.4	39.72	PK1	38	-23.3	0	54.42			74	-19.58	-	-	230	103	V
* 11.402	28.29	AD1	38	-23.3	.2	43.19	54	-10.81	-	-	-	-	230	103	V

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

### 11.3.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

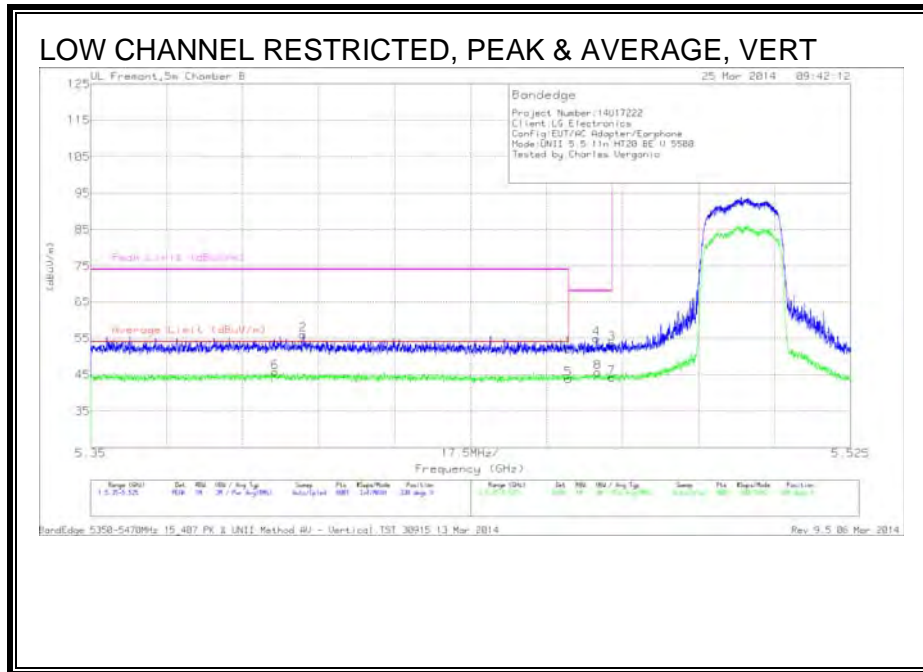


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	38.13	PK	34.5	-20	0	52.63	-	-	74	-21.37	128	214	H
2	* 5.392	40.58	PK	34.5	-19.7	0	55.38	-	-	74	-18.62	128	214	H
5	* 5.46	29.95	RMS	34.5	-20	.2	44.65	54	-9.35	-	-	128	214	H
6	* 5.397	31.08	RMS	34.5	-19.8	.2	45.98	54	-8.02	-	-	128	214	H
4	5.467	41.07	PK	34.5	-20	0	55.57	-	-	68.2	-12.63	128	214	H
3	5.47	39.53	PK	34.5	-19.9	0	54.13	-	-	68.2	-14.07	128	214	H
7	5.47	29.35	RMS	34.5	-19.9	.2	44.15	-	-	-	-	128	214	H
8	5.47	31.03	RMS	34.5	-20	.2	45.73	-	-	-	-	128	214	H

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

PK - Peak detector

RMS - RMS detection



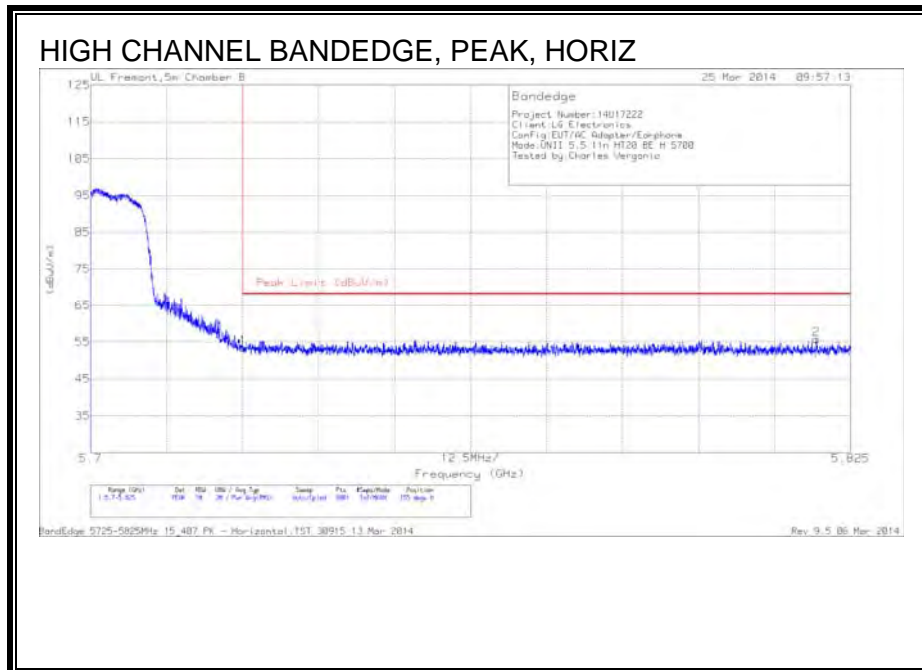
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT345 (dB/m)	Amp/Cbl/Fitter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	37.58	PK	34.5	-20	0	52.08	-	-	74	-21.92	338	214	V
2	* 5.399	41.38	PK	34.5	-19.9	0	55.98	-	-	74	-18.02	338	214	V
5	* 5.46	29.16	RMS	34.5	-20	.2	43.86	54	-10.14	-	-	338	214	V
6	* 5.392	30.68	RMS	34.5	-19.7	.2	45.68	54	-8.32	-	-	338	214	V
4	5.467	40.44	PK	34.5	-20	0	54.94	-	-	68.2	-13.26	338	214	V
8	5.467	30.94	RMS	34.5	-20	.2	45.64	-	-	-	-	338	214	V
3	5.47	38.91	PK	34.5	-19.9	0	53.51	-	-	68.2	-14.69	338	214	V
7	5.47	29.42	RMS	34.5	-19.9	.2	44.22	-	-	-	-	338	214	V

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

PK - Peak detector

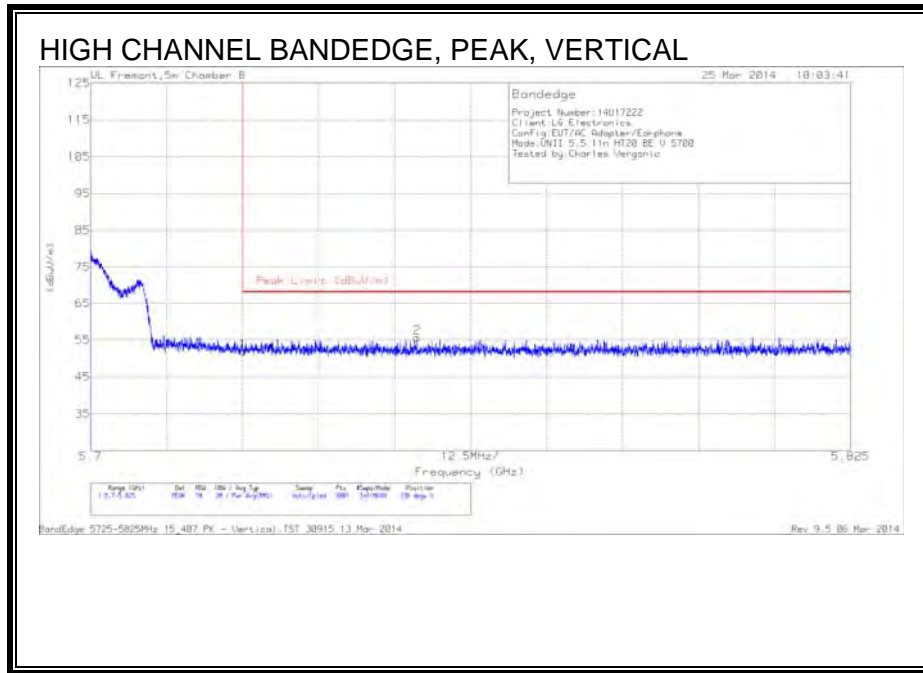
RMS - RMS detection

**AUTHORIZED BANDEDGE (HIGH CHANNEL)**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	38.55	PK	34.6	-19.6	0	53.55	68.2	-14.65	155	206	H
2	5.819	40.68	PK	34.7	-19.6	0	55.78	68.2	-12.42	155	206	H

PK - Peak detector

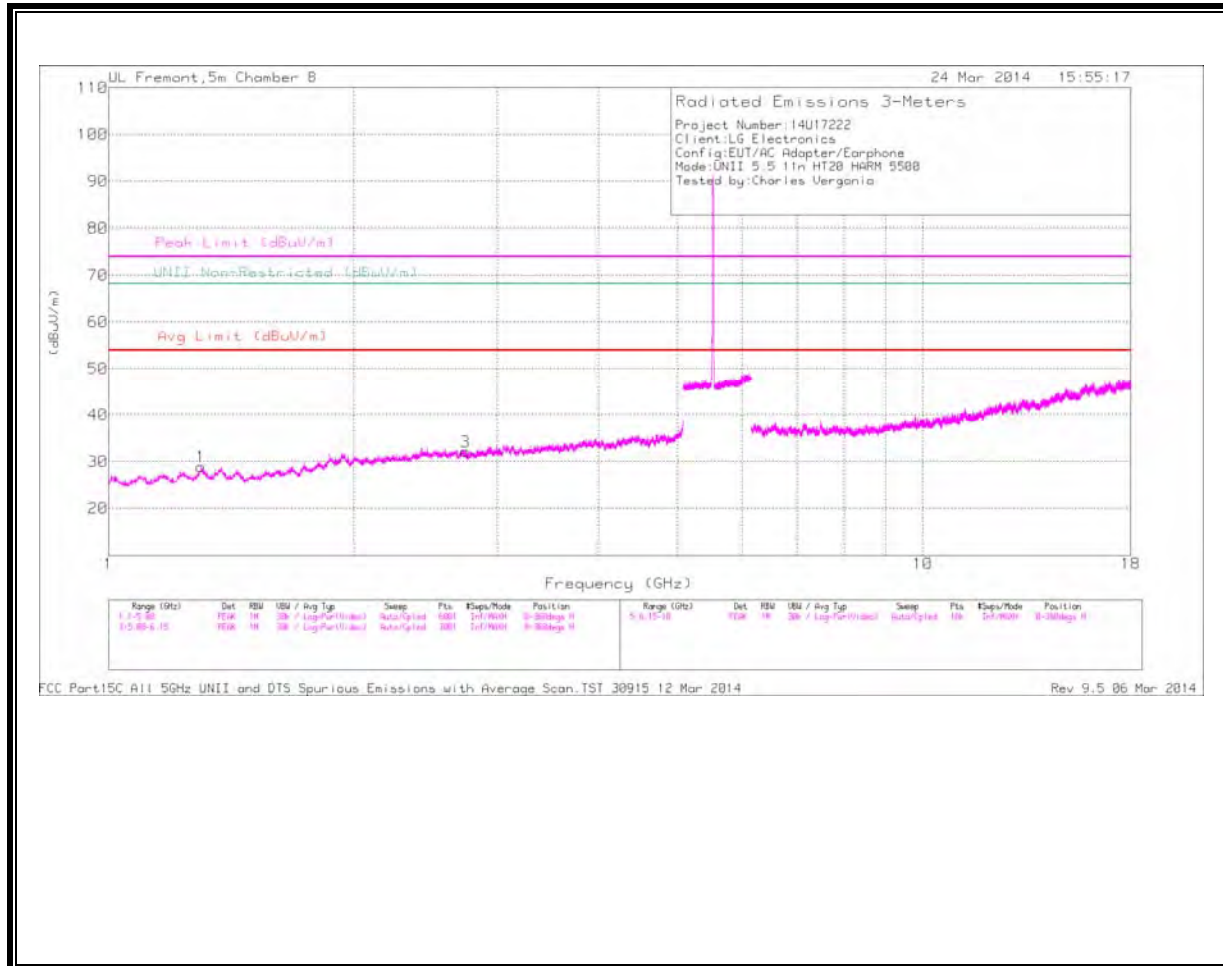


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	36.82	PK	34.6	-19.6	0	51.82	68.2	-16.38	330	213	V
2	5.754	40.58	PK	34.6	-19.5	0	55.68	68.2	-12.52	330	213	V

PK - Peak detector

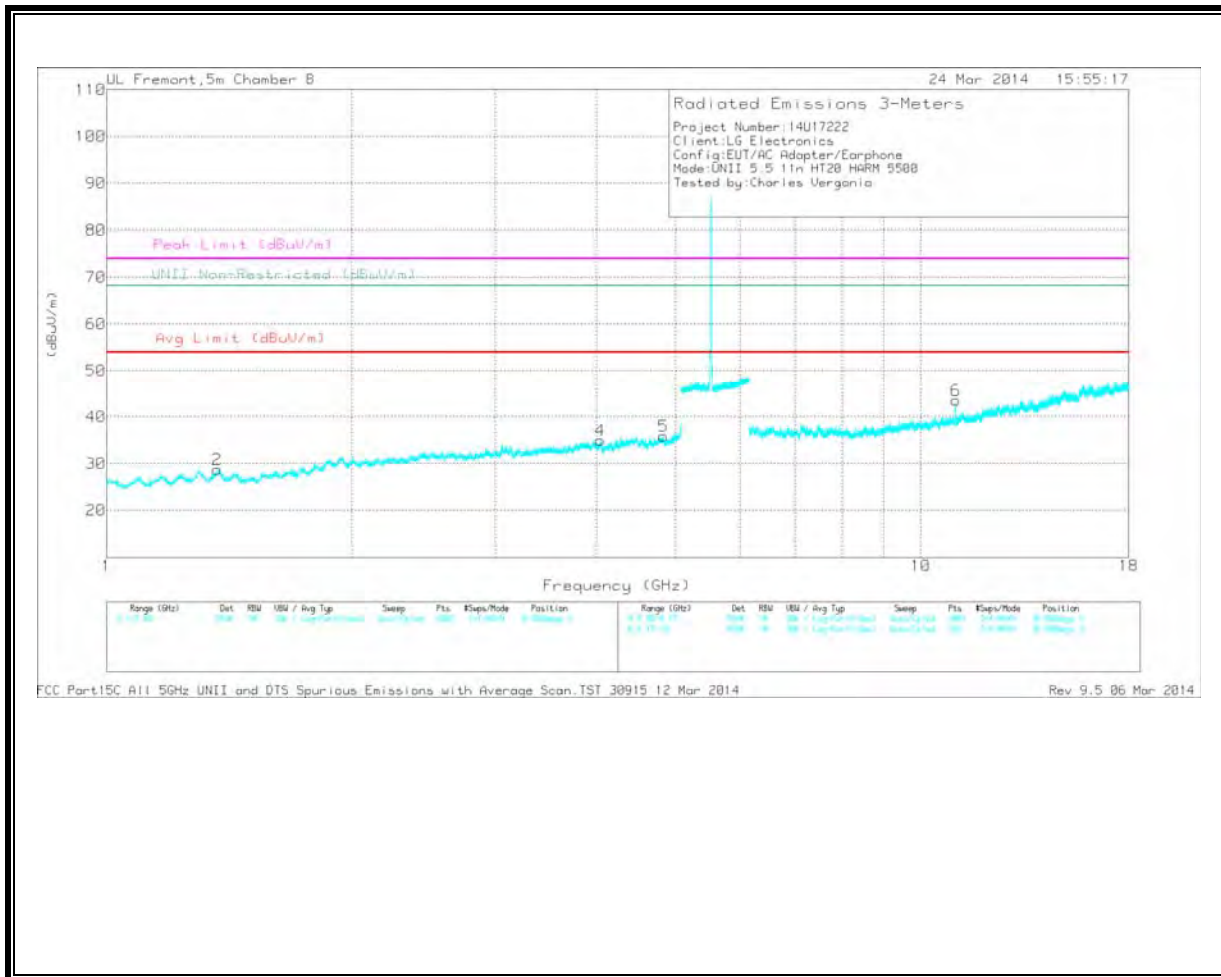
**HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

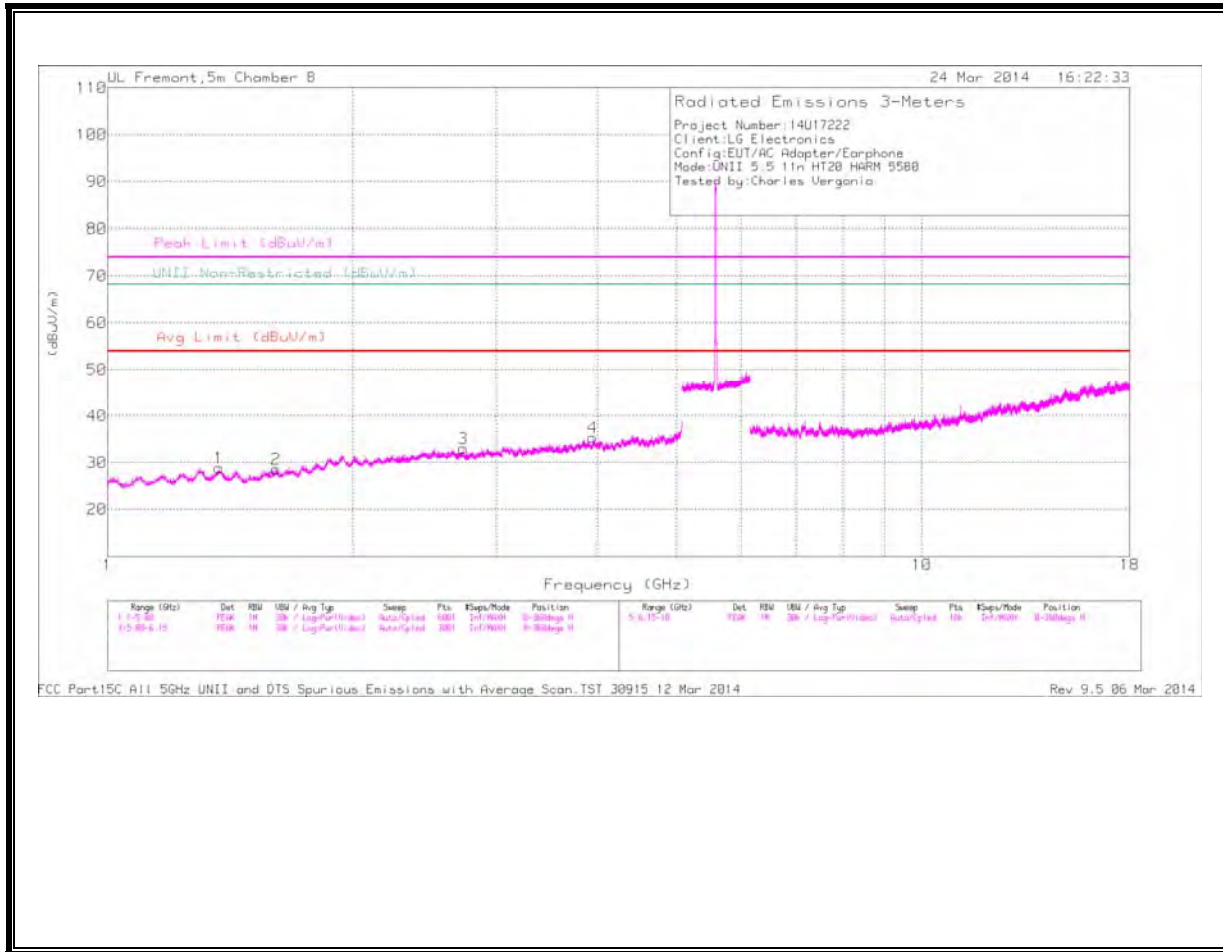


LOW CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.299	43.1	PK1	28.8	-34.2	0	37.7	54	-16.3	74	-36.3	-	-	359	100	H
* 2.742	40.62	PK1	32.2	-32.1	0	40.72	54	-13.28	74	-33.28	-	-	359	100	H
* 1.369	43.04	PK1	28.6	-33.8	0	37.84	54	-16.16	74	-36.16	-	-	359	100	V
* 4.036	40.44	PK1	33.6	-29.9	0	44.14	54	-9.86	74	-29.86	-	-	359	100	V
* 4.826	40.37	PK1	34.2	-29.9	0	44.67	54	-9.33	74	-29.33	-	-	359	100	V
* 11.034	37.52	PK1	37.8	-23.4	0	51.92	54	-2.08	74	-22.08	-	-	2	160	V
* 11.041	27.48	AD1	37.8	-23.4	-2	42.08	54	-11.92	-	-	-	-	2	160	V

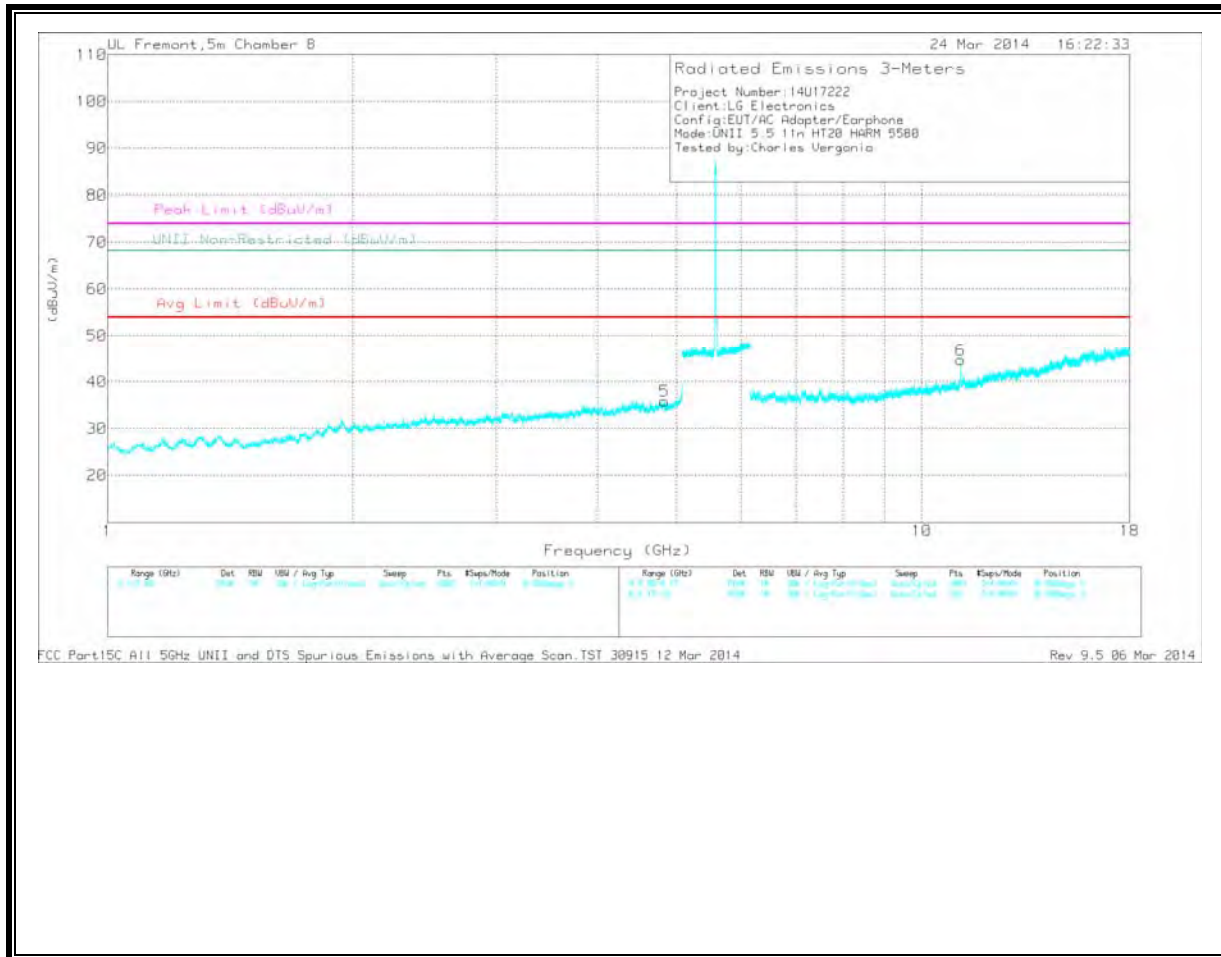
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

MID CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



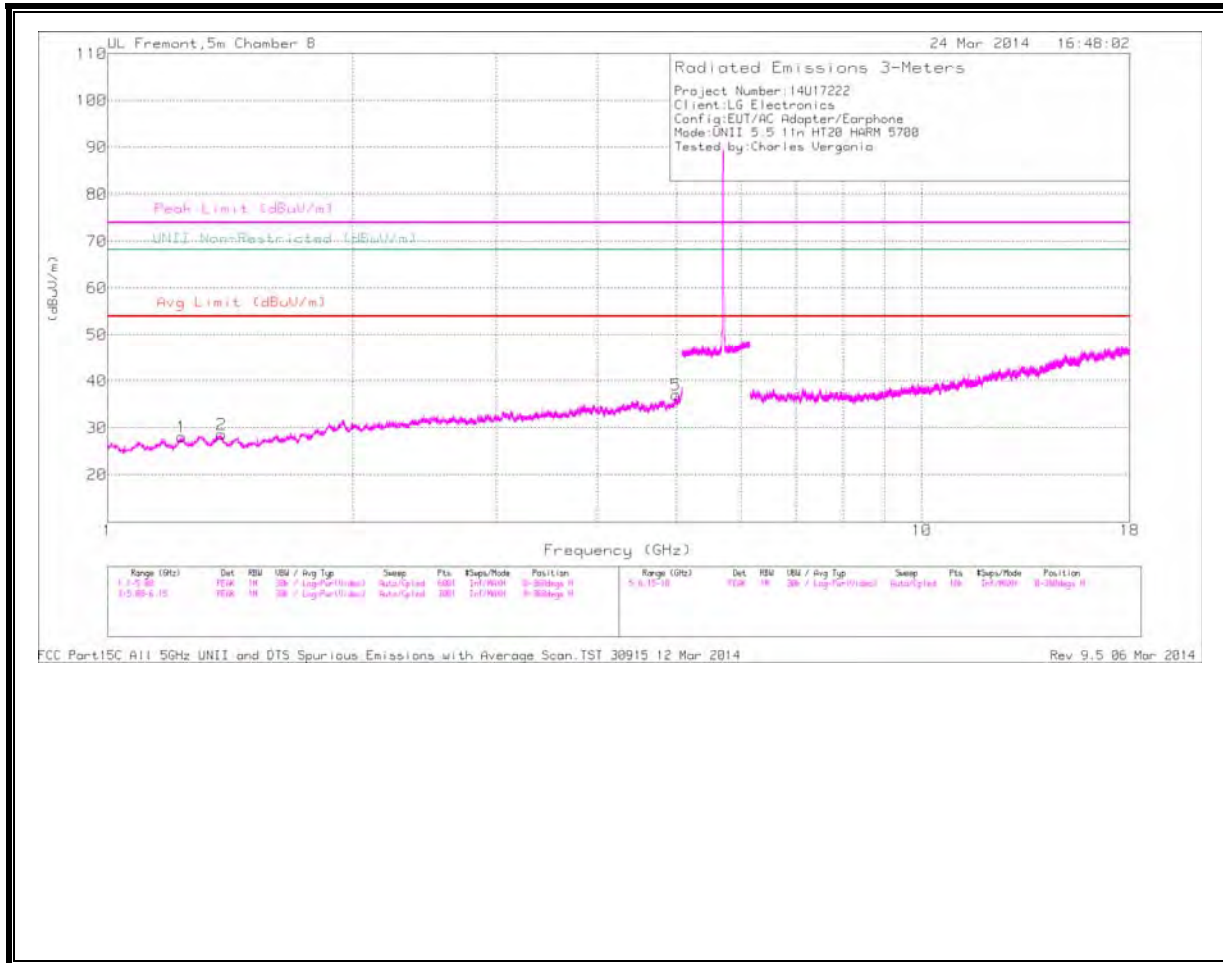
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

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)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.366	42.92	PK1	28.6	-33.8	0	37.72	54	-16.28	74	-36.28	-	-	1	100	H
* 1.607	42.2	PK1	28.5	-33	0	37.7	54	-16.3	74	-36.3	-	-	1	100	H
* 2.731	40.89	PK1	32.2	-32	0	41.09	54	-12.91	74	-32.91	-	-	1	100	H
* 3.945	40.32	PK1	33.7	-30.4	0	43.62	54	-10.38	74	-30.38	-	-	1	100	H
* 4.828	40.84	PK1	34.2	-30	0	45.04	54	-8.96	74	-28.96	-	-	1	100	V
* 11.161	39.38	PK1	37.9	-23.3	0	53.98			74	-20.02	-	-	264	145	V
* 11.161	29.14	AD1	37.9	-23.3	-2	43.94	54	-10.06	-	-	-	-	264	145	V

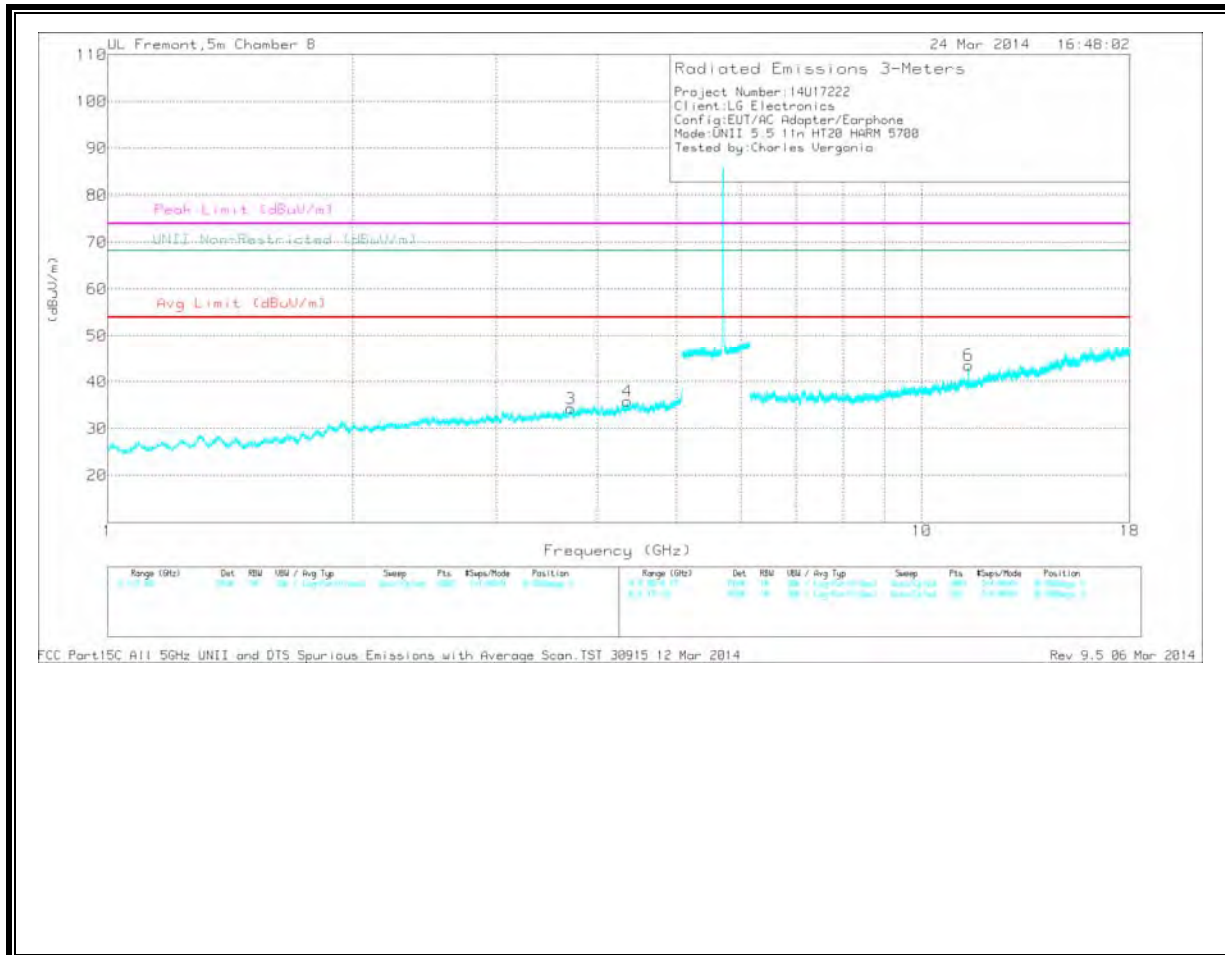
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

HIGH CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

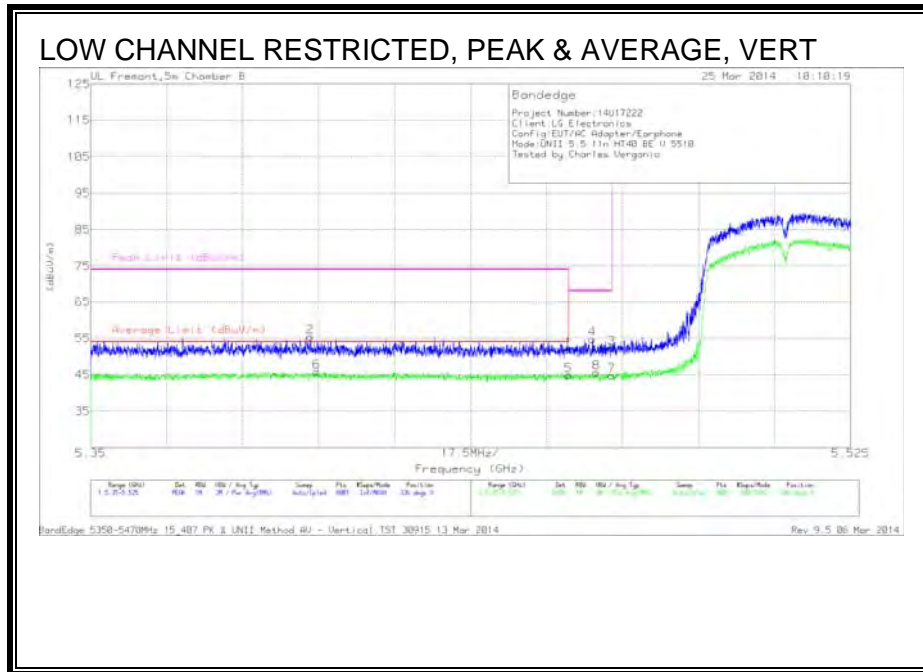
HIGH CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.233	43.72	PK1	28.4	-34.7	0	37.42	54	-16.58	74	-36.58	-	-	359	100	H
* 1.379	42.73	PK1	28.6	-33.8	0	37.53	54	-16.47	74	-36.47	-	-	359	100	H
* 4.986	40.1	PK1	34.2	-28.3	0	46	54	-8	74	-28	-	-	359	100	H
* 3.707	40.73	PK1	33.4	-31.1	0	43.03	54	-10.97	74	-30.97	-	-	359	100	V
* 4.348	41.27	PK1	33.7	-30.8	0	44.17	54	-9.83	74	-29.83	-	-	359	100	V
* 11.401	37.28	PK1	38	-23.3	0	51.98	54	-2.02	74	-22.02	-	-	225	132	V
* 11.399	26.91	AD1	38	-23.3	-2	41.81	54	-12.19	-	-	-	-	225	132	V

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







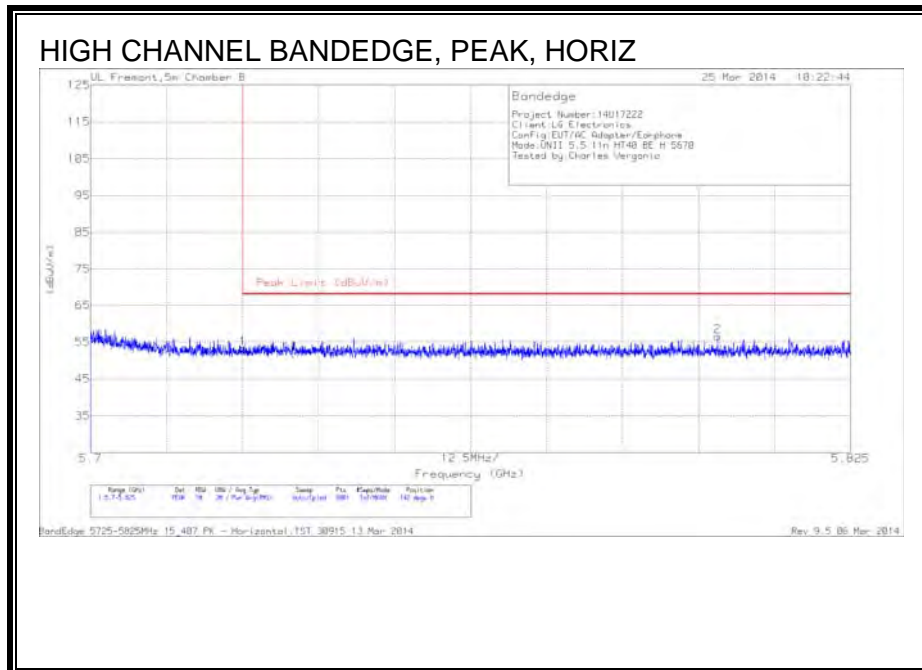
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	37.37	PK	34.5	-20	0	51.87	-	-	74	-22.13	336	214	V
2	* 5.401	40.74	PK	34.5	-19.9	0	55.34	-	-	74	-18.66	336	214	V
5	* 5.46	29.82	RMS	34.5	-20	.5	44.82	54	-9.18	-	-	336	214	V
6	* 5.402	30.68	RMS	34.5	-19.9	.5	45.78	54	-8.22	-	-	336	214	V
4	5.466	40.23	PK	34.5	-20	0	54.73	-	-	68.2	-13.47	336	214	V
8	5.466	30.54	RMS	34.5	-20	.5	45.54	-	-	-	-	336	214	V
3	5.47	37.66	PK	34.5	-19.9	0	52.26	-	-	68.2	-15.94	336	214	V
7	5.47	29.56	RMS	34.5	-19.9	.5	44.66	-	-	-	-	336	214	V

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

PK - Peak detector

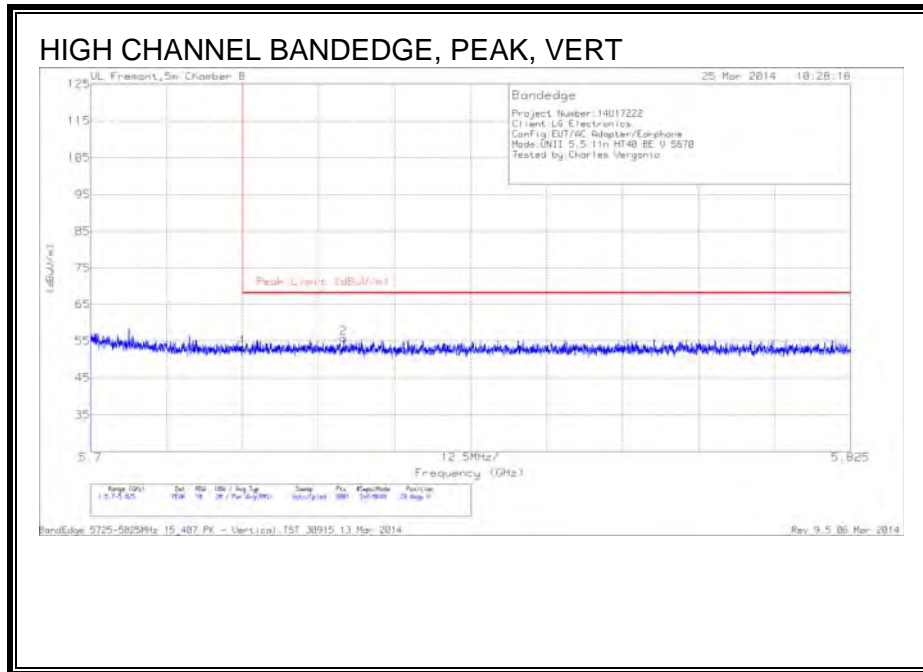
RMS - RMS detection

**AUTHORIZED BANDEDGE (HIGH CHANNEL)**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	38.24	PK	34.6	-19.6	0	53.24	68.2	-14.96	142	214	H
2	5.803	41.45	PK	34.7	-19.6	0	56.55	68.2	-11.65	142	214	H

PK - Peak detector

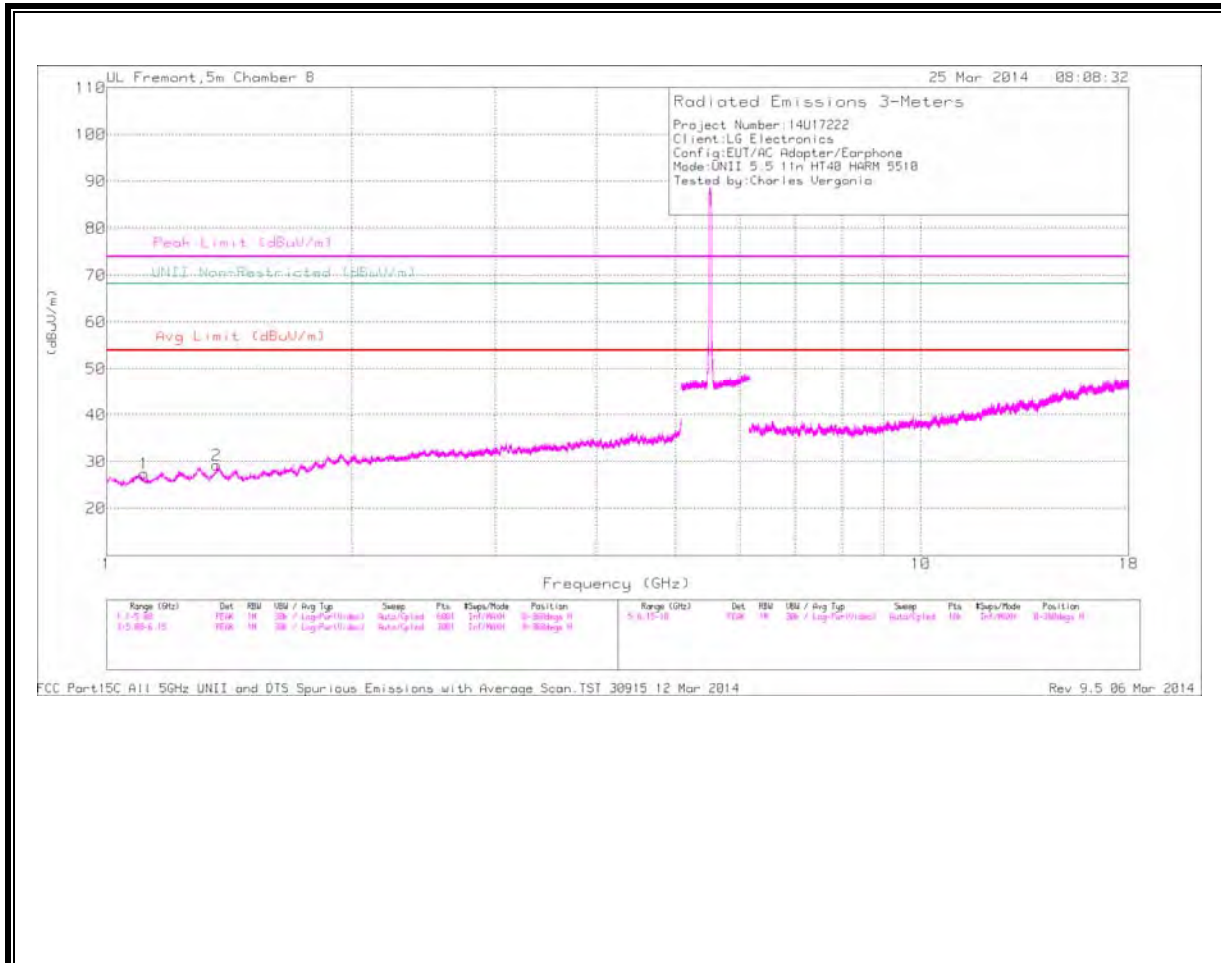


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	38.22	PK	34.6	-19.6	53.22	68.2	-14.98	29	214	V
2	5.742	40.65	PK	34.6	-19.5	55.75	68.2	-12.45	29	214	V

PK - Peak detector

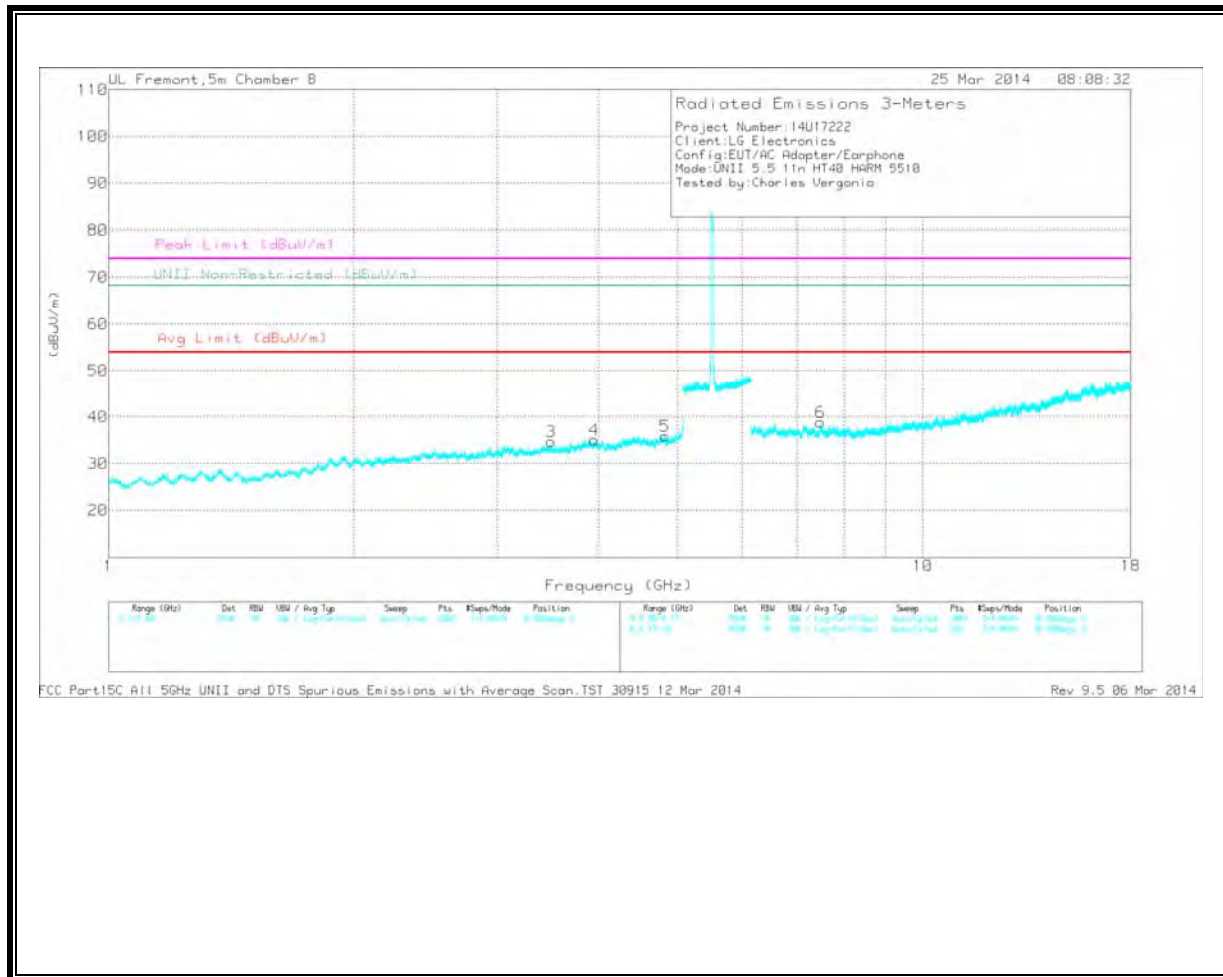
**HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



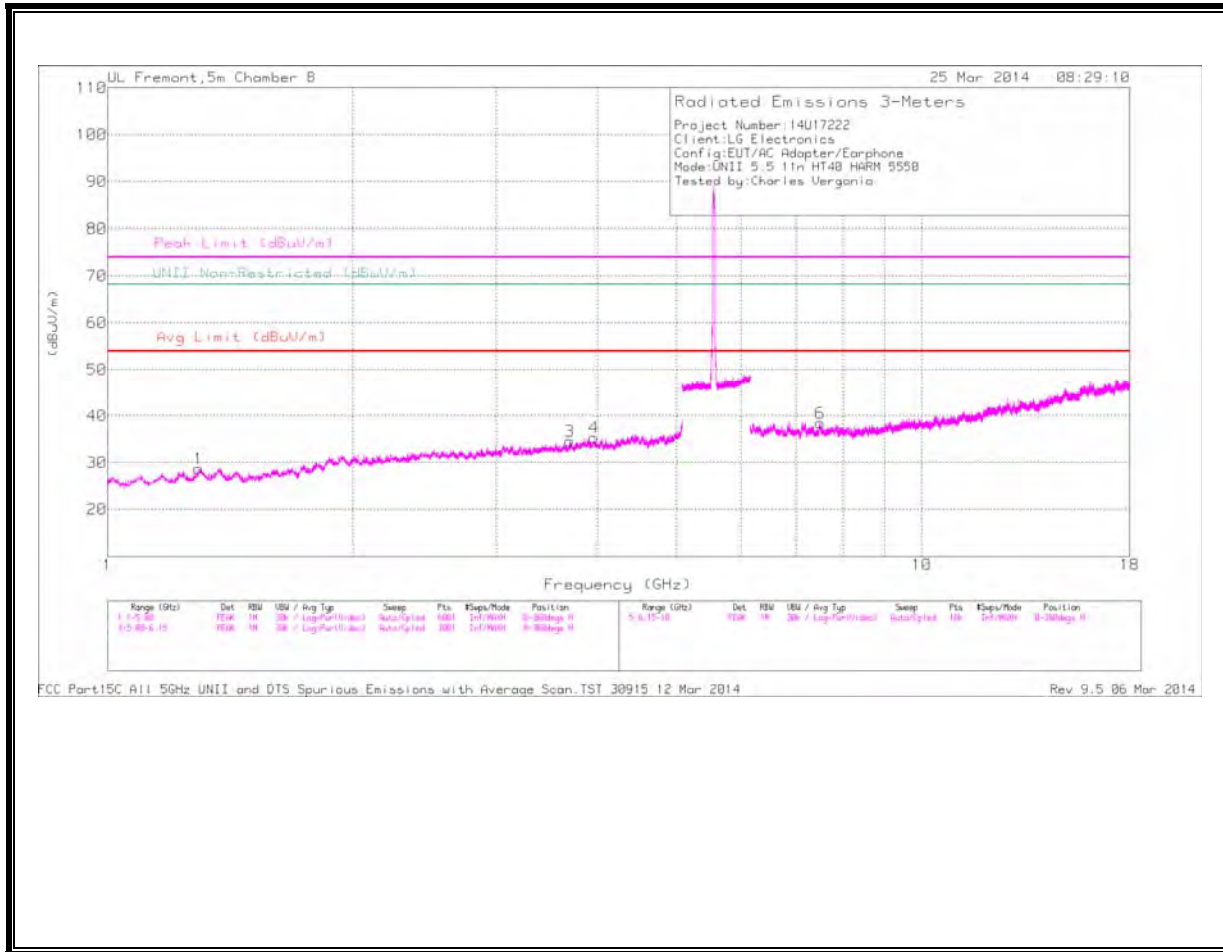
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.112	42.36	PK1	27.5	-34.5	35.36	54	-18.64	74	-38.64	-	-	1	100	H
* 1.366	42.82	PK1	28.6	-33.8	37.62	54	-16.38	74	-36.38	-	-	1	100	H
* 3.953	40.95	PK1	33.7	-30	44.65	54	-9.35	74	-29.35	-	-	1	100	V
* 4.82	40.55	PK1	34.2	-29.6	45.15	54	-8.85	74	-28.85	-	-	1	100	V
* 7.49	37.51	PK1	35.6	-25.7	47.41	54	-6.59	74	-26.59	-	-	1	100	V
3.497	41.64	PK1	32.8	-31.9	42.54	-	-	-	-	68.2	-25.66	1	100	V

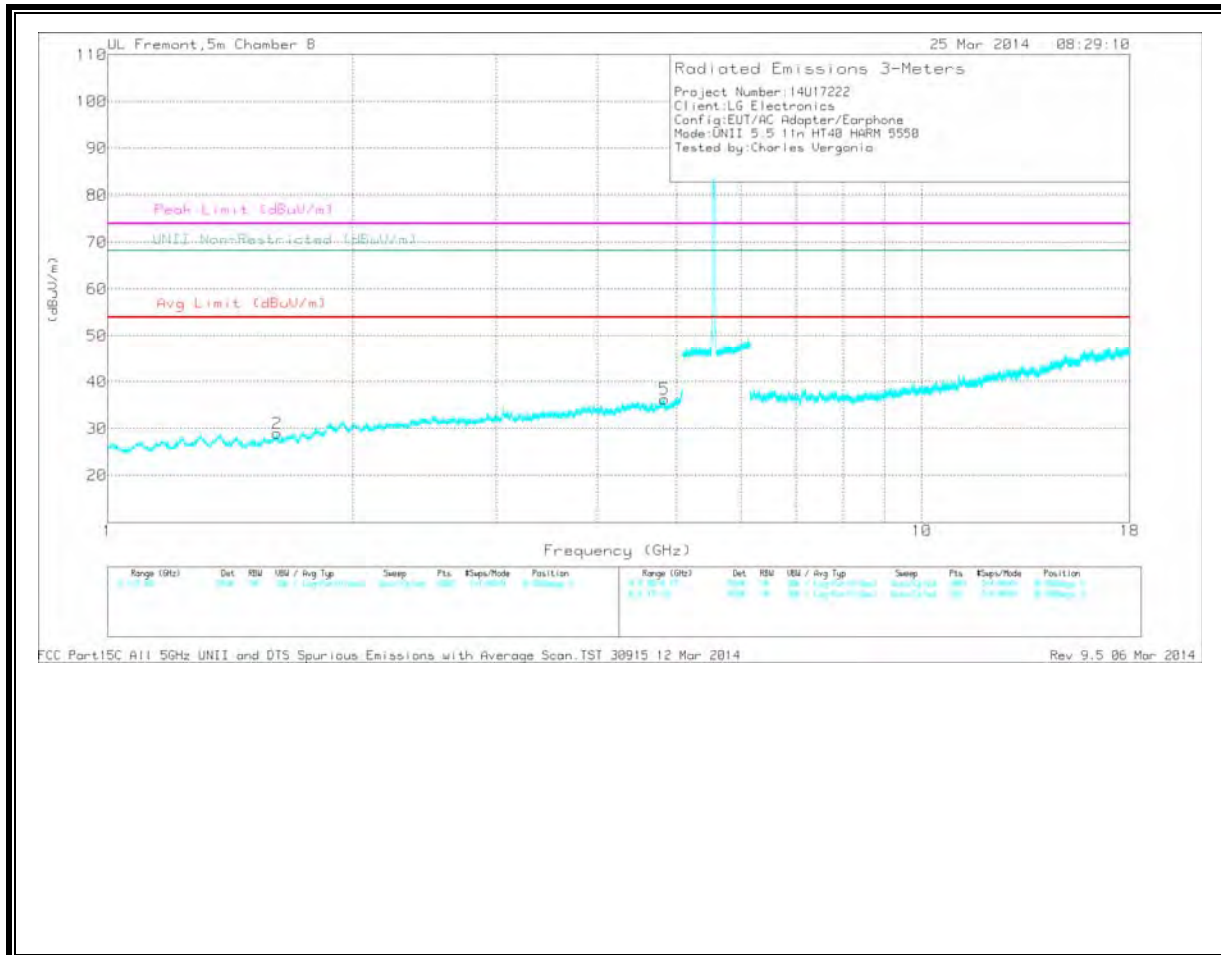
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

MID CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

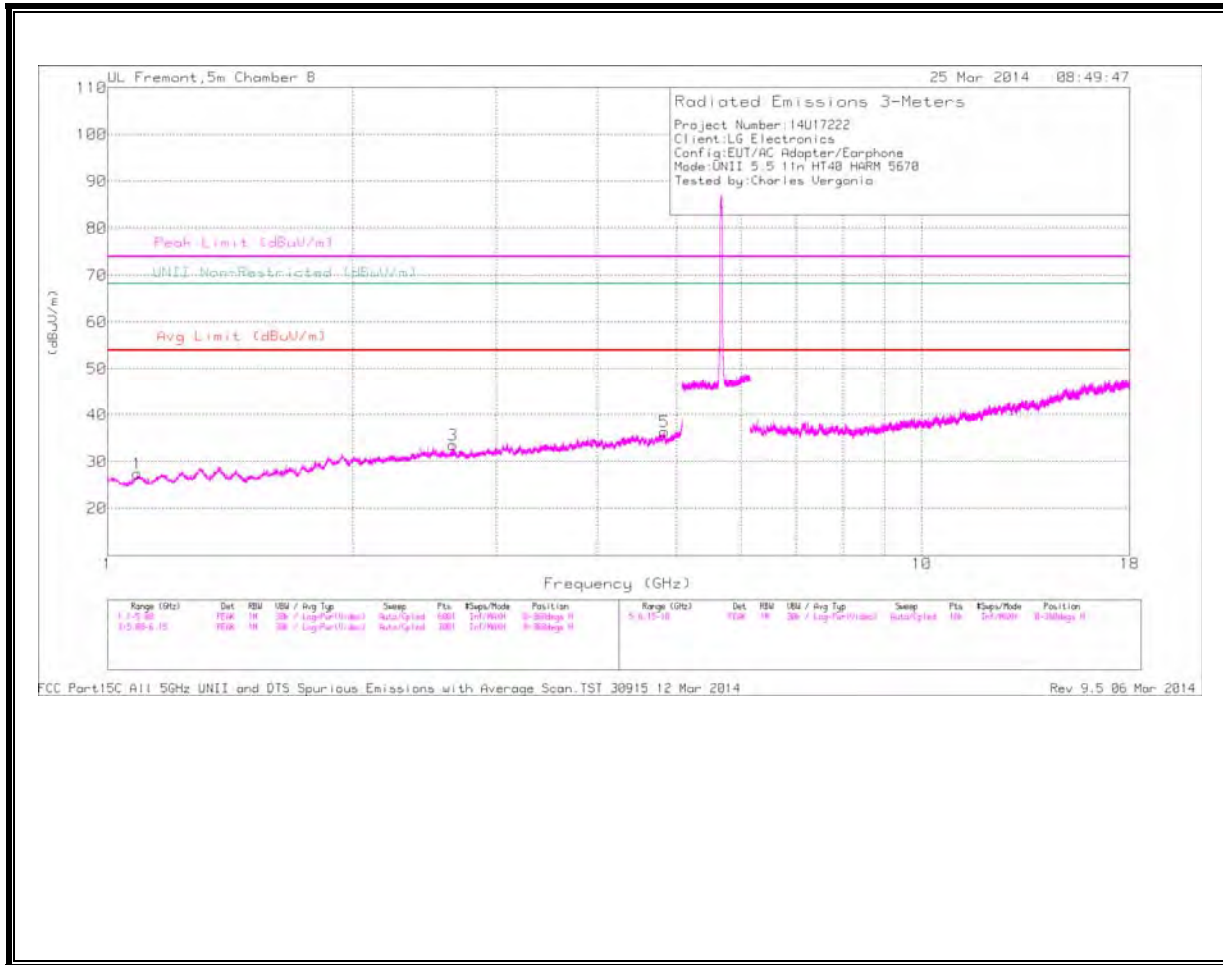


MID CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.295	42.91	PK1	28.8	-34.3	37.41	54	-16.59	74	-36.59	-	-	1	100	H
* 3.693	40.65	PK1	33.3	-31.2	42.75	54	-11.25	74	-31.25	-	-	1	100	H
* 3.959	40.35	PK1	33.7	-30	44.05	54	-9.95	74	-29.95	-	-	1	100	H
* 1.615	41.87	PK1	28.6	-33.1	37.37	54	-16.63	74	-36.63	-	-	1	100	V
* 4.829	40.79	PK1	34.2	-30	44.99	54	-9.01	74	-29.01	-	-	1	100	V
* 7.498	37.03	PK1	35.6	-25.9	46.73	54	-7.27	74	-27.27	-	-	1	100	H

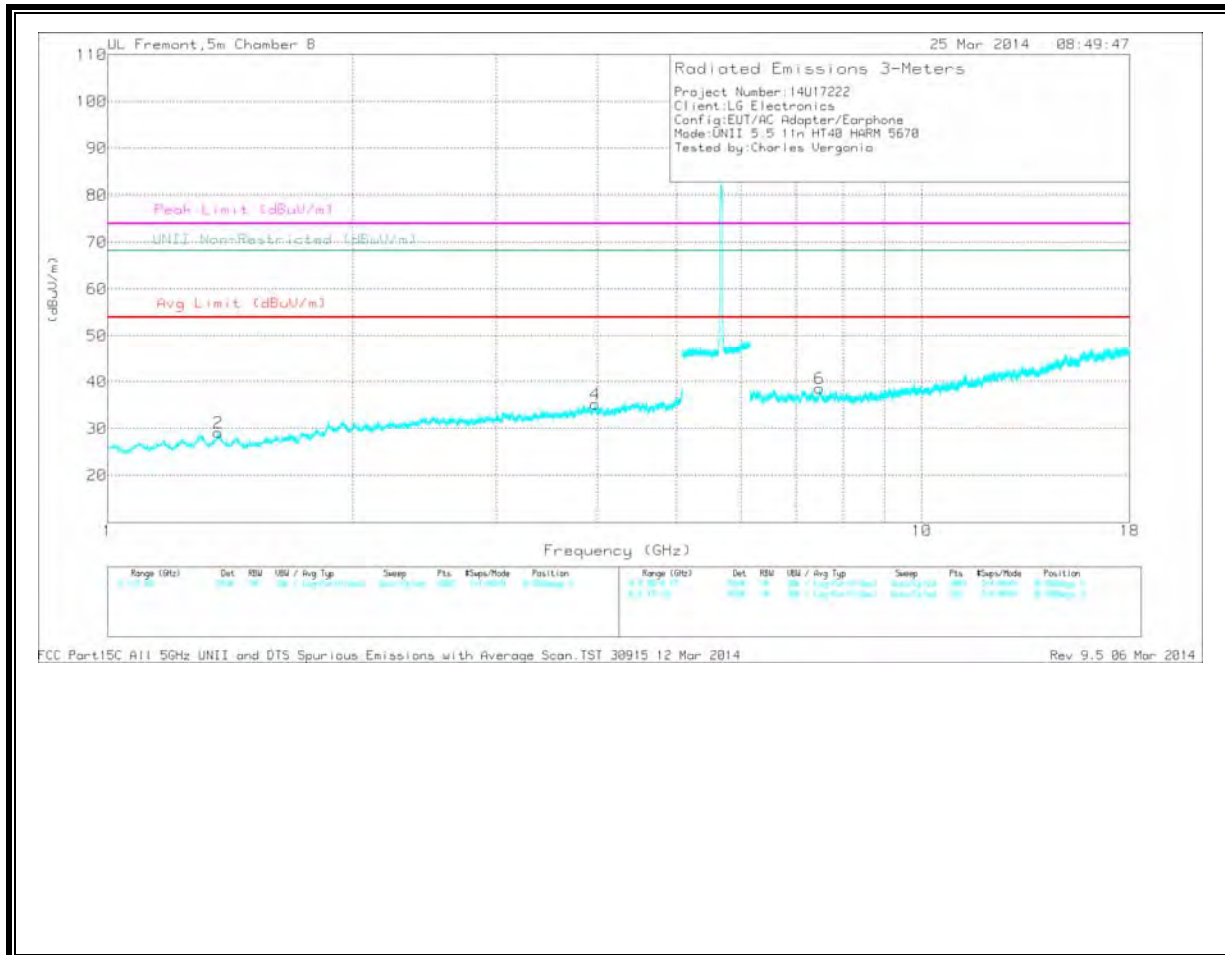
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

HIGH CHANNEL  
 HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

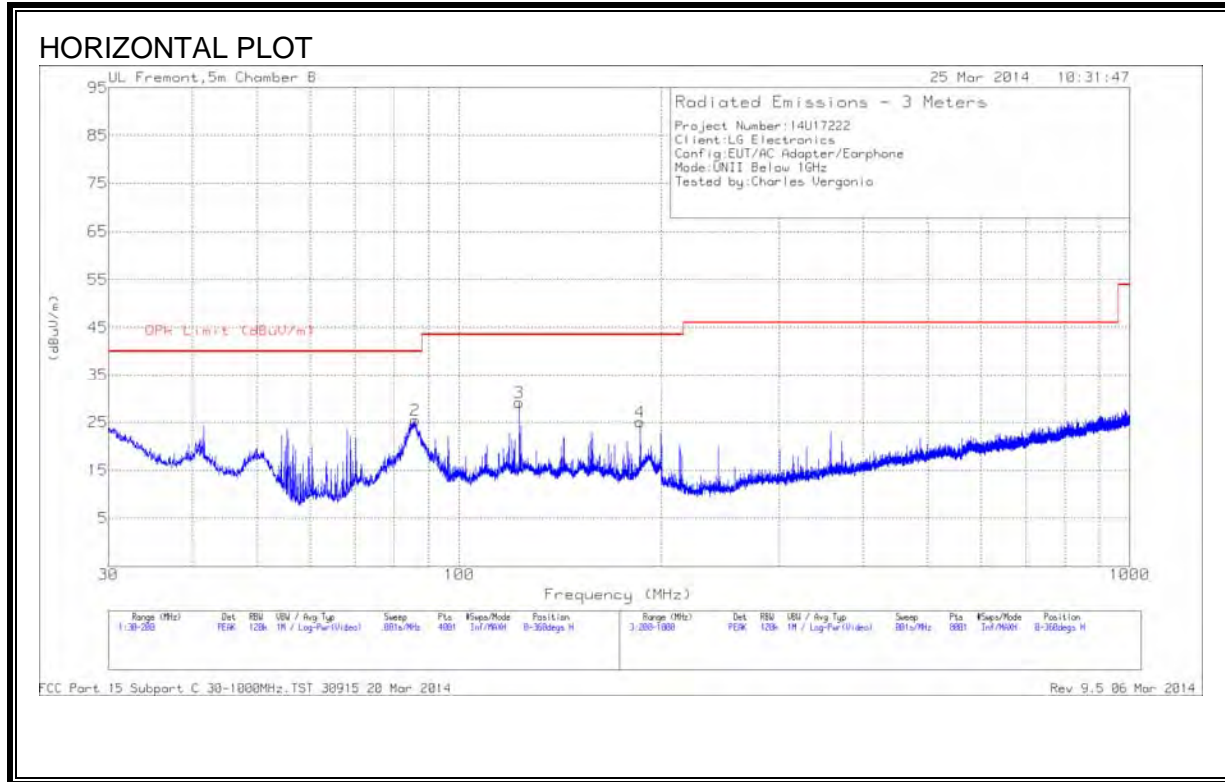
HIGH CHANNEL DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.087	43.79	PK1	27.3	-34.4	36.69	54	-17.31	74	-37.31	-	-	1	100	H
* 2.656	41.21	PK1	32.3	-32	41.51	54	-12.49	74	-32.49	-	-	1	100	H
* 4.827	40.84	PK1	34.2	-29.9	45.14	54	-8.86	74	-28.86	-	-	1	100	H
* 1.369	42.96	PK1	28.6	-33.8	37.76	54	-16.24	74	-36.24	-	-	1	100	V
* 3.972	40.21	PK1	33.6	-30.2	43.61	54	-10.39	74	-30.39	-	-	1	100	V
* 7.485	37.02	PK1	35.6	-25.9	46.72	54	-7.28	74	-27.28	-	-	1	100	V

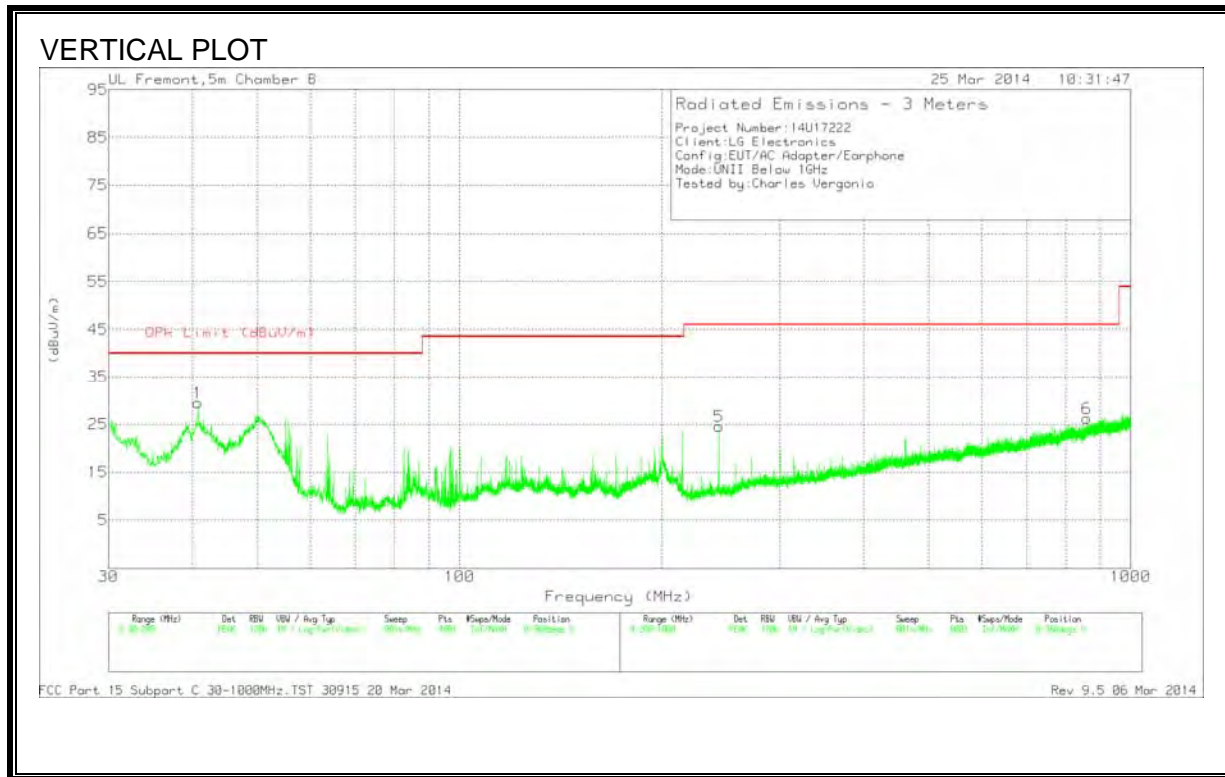
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

## 12. WORST-CASE BELOW 1 GHz (in the 5.2 GHz Band)

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



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



Worst Case Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AFT477 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 122.7775	43.17	PK	13.8	-27.8	29.17	43.52	-14.35	0-360	400	H
5	* 243.4	39.57	PK	11.5	-26.5	24.57	46.02	-21.45	0-360	200	V
1	40.795	45.23	PK	13	-28.7	29.53	40	-10.47	0-360	101	V
2	85.9725	46.35	PK	7.4	-28.3	25.45	40	-14.55	0-360	300	H
4	186.145	40.88	PK	11.3	-27.1	25.08	43.52	-18.44	0-360	101	H
6	860.9	28.38	PK	21.4	-23.5	26.28	46.02	-19.74	0-360	200	V

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

PK - Peak detector

### 13. AC POWER LINE CONDUCTED EMISSIONS

#### LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

\*Decreases with the logarithm of the frequency.

#### TEST PROCEDURE

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

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

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

#### RESULTS



**6 WORST EMISSIONS**

**Line-L1 .15 - 30MHz**

**Trace Markers**

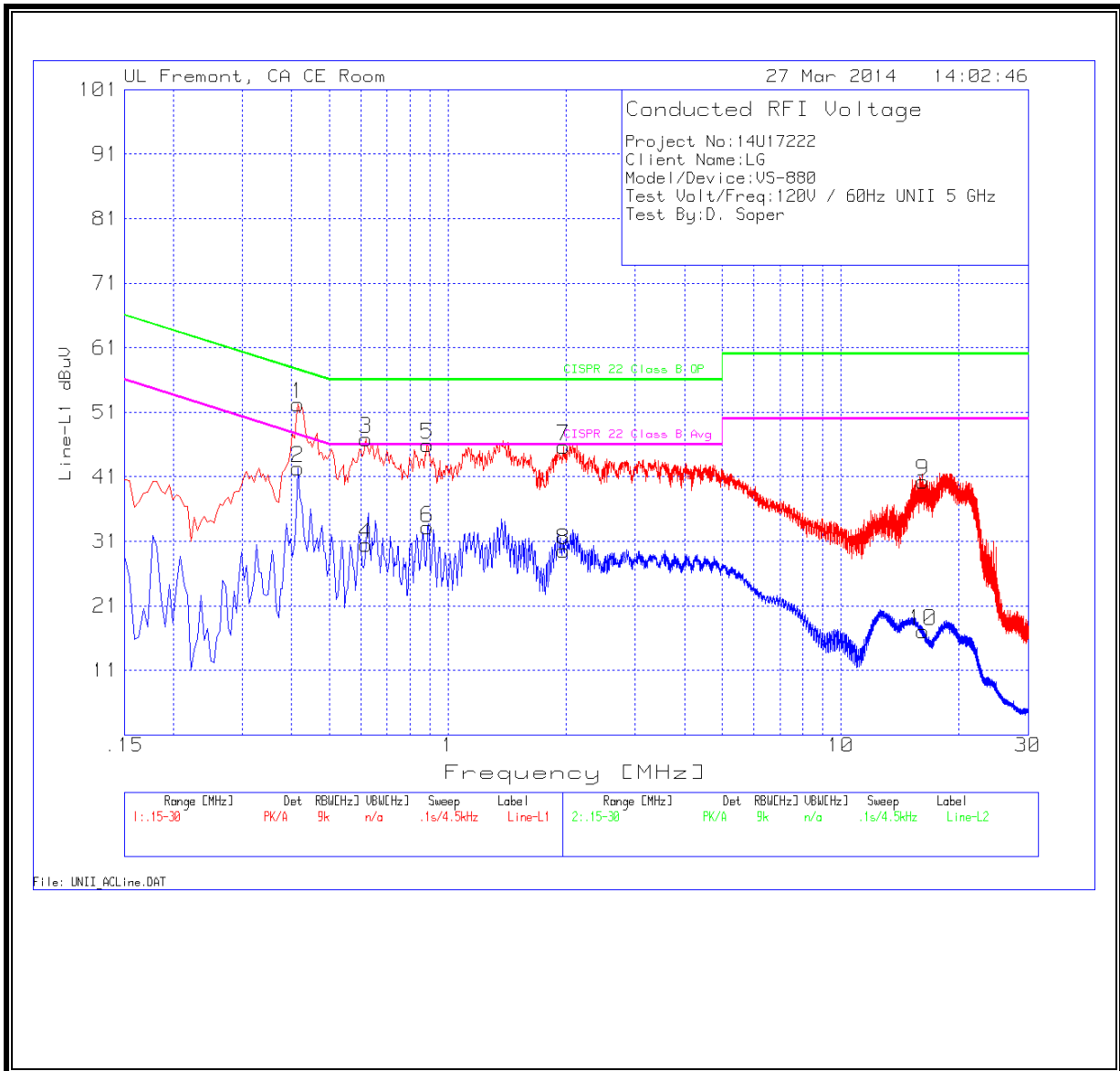
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.4155	51.83	PK	.4	0	52.23	57.5	-5.27	-	-
2	.4155	41.89	Av	.4	0	42.29	-	-	47.5	-5.21
3	.618	46.55	PK	.3	0	46.85	56	-9.15	-	-
4	.618	30.19	Av	.3	0	30.49	-	-	46	-15.51
5	.888	45.64	PK	.3	0	45.94	56	-10.06	-	-
6	.888	32.82	Av	.3	0	33.12	-	-	46	-12.88
7	1.9725	45.36	PK	.2	.1	45.66	56	-10.34	-	-
8	1.9725	29.31	Av	.2	.1	29.61	-	-	46	-16.39
9	16.224	39.73	PK	.3	.2	40.23	60	-19.77	-	-
10	16.224	16.54	Av	.3	.2	17.04	-	-	50	-32.96

**Line-L2 .15 - 30MHz**

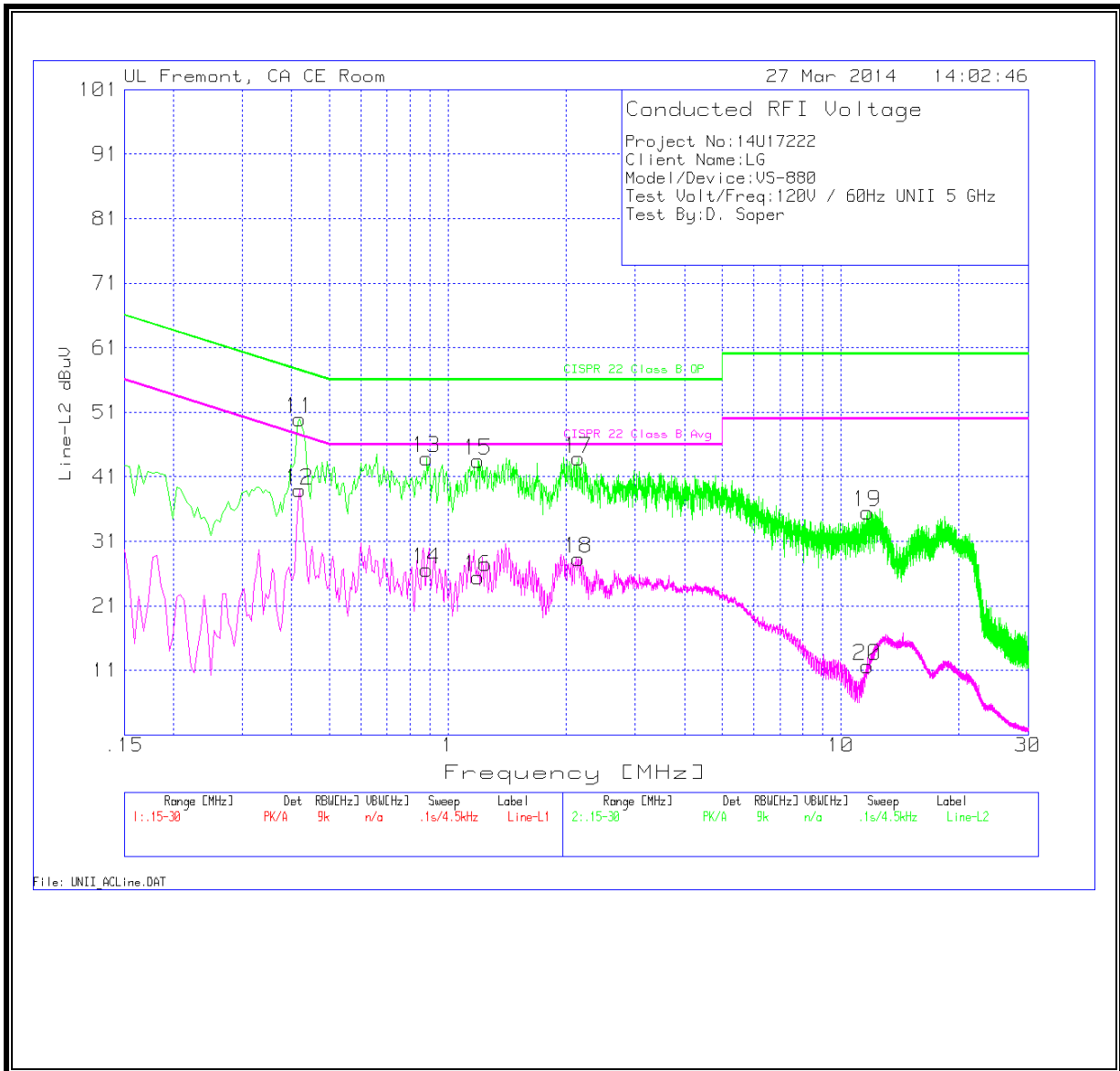
**Trace Markers**

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)
11	.42	49.52	PK	.4	0	49.92	57.4	-7.48	-	-
12	.42	38.52	Av	.4	0	38.92	-	-	47.4	-8.48
13	.8835	43.54	PK	.3	0	43.84	56	-12.16	-	-
14	.8835	26.33	Av	.3	0	26.63	-	-	46	-19.37
15	1.194	43.1	PK	.3	.1	43.5	56	-12.5	-	-
16	1.194	25.01	Av	.3	.1	25.41	-	-	46	-20.59
17	2.148	43.52	PK	.2	.1	43.82	56	-12.18	-	-
18	2.148	27.99	Av	.2	.1	28.29	-	-	46	-17.71
19	11.688	35.11	PK	.2	.2	35.51	60	-24.49	-	-
20	11.688	11.3	Av	.2	.2	11.7	-	-	50	-38.3

**LINE 1 RESULTS**



**LINE 2 RESULTS**



## 14. DYNAMIC FREQUENCY SELECTION

### 14.1. OVERVIEW

#### 14.1.1. LIMITS

##### INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 7 A9.4 (b) (ii) **Channel Availability Check Time:** ...

**Additional requirements for the band 5600-5650 MHz:** Until further notice, devices subject to this Section shall not be capable of transmitting in the band 5600-5650 MHz, so that Environment Canada weather radars operating in this band are protected.

##### FCC

§15.407 (h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

**Table 1: Applicability of DFS requirements prior to use of a channel**

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required

**Table 2: Applicability of DFS requirements during normal operation**

Requirement	Operational Mode		
	Master	Client (without DFS)	Client (with DFS)
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes

**Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring**

Maximum Transmit Power	Value (see note)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

**Table 4: DFS Response requirement values**

Parameter	Value
<i>Non-occupancy period</i>	30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds
<i>Channel Closing Transmission Time</i>	200 milliseconds + approx. 60 milliseconds over remaining 10 second period

The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:  
 For the Short pulse radar Test Signals this instant is the end of the *Burst*.  
 For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated.  
 For the Long Pulse radar Test Signal this instant is the end of the 12-second period defining the radar transmission.  
 The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10-second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

**Table 5 – Short Pulse Radar Test Waveforms**

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

**Table 6 – Long Pulse Radar Test Signal**

Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

**Table 7 – Frequency Hopping Radar Test Signal**

Radar Waveform	Pulse Width (µsec)	PRI (µsec)	Burst Length (ms)	Pulses per Hop	Hopping Rate (kHz)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	300	9	.333	70%	30



## **SYSTEM OVERVIEW**

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from  $F_L$  to  $F_H$  for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

## **SYSTEM CALIBRATION**

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.



**ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL**

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

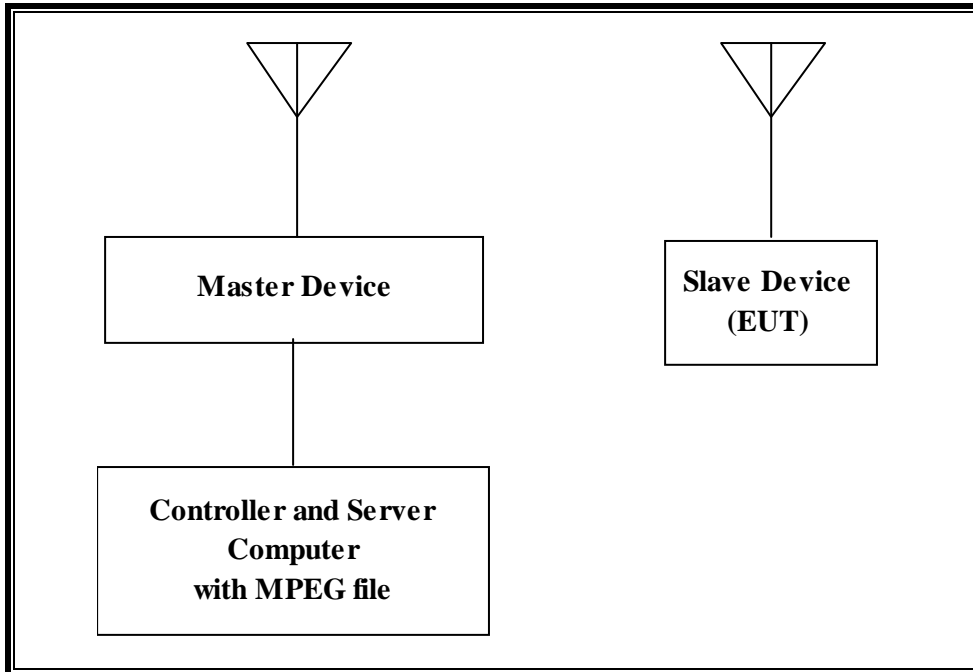
**TEST AND MEASUREMENT EQUIPMENT**

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

<b>TEST EQUIPMENT LIST</b>				
<b>Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Asset Number</b>	<b>Cal Due</b>
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	09/10/14
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	09/12/14

### 14.1.3. SETUP OF EUT

#### RADIATED METHOD EUT TEST SETUP



#### SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Wireless Access Point	Cisco	AIR-AP1252AG-A-K9	FTX120690N2	LDK102061
AC Adapter (AP)	Delta Electronics	EADP-45BB B	DTH112490BD	DoC
Notebook PC (Controller/Server)	Dell	PP18L	10657517725	DoC
AC Adapter (Controller/Server PC)	Dell	LA65SN0-00	CN-ODF263-71615-6AU-1019	DoC

#### **14.1.4. DESCRIPTION OF EUT**

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges excluding the 5600-5650 MHz range.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 11.02 dBm EIRP in the 5250-5350 MHz band and 10.98 dBm EIRP in the 5470-5725 MHz band.

The only antenna assembly utilized with the EUT has a gain of -4.27 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is  $-64 + 1 = -63$  dBm.

The calibrated radiated DFS Detection Threshold level is set to -64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The EUT uses one transmitter/receiver chain connected to an antenna to perform radiated tests.

WLAN traffic is generated by streaming the video file TestFile.mp2 "6 ½ Magic Hours" from the Master to the Slave in full motion video mode using the media player with the V2.61 Codec package.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11a/n architecture. Two nominal channel bandwidths are implemented: 20 MHz and 40 MHz.

The software installed in the access point is revision VS8800LA.

#### **UNIFORM CHANNEL SPREADING**

This requirement is not applicable to Slave radio devices.

---

**OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS**

The Master Device is a Cisco Access Point, FCC ID: LDK102061. The minimum antenna gain for the Master Device is 3.5 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is  $-64 + 1 = -63$  dBm.

The calibrated radiated DFS Detection Threshold level is set to -64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

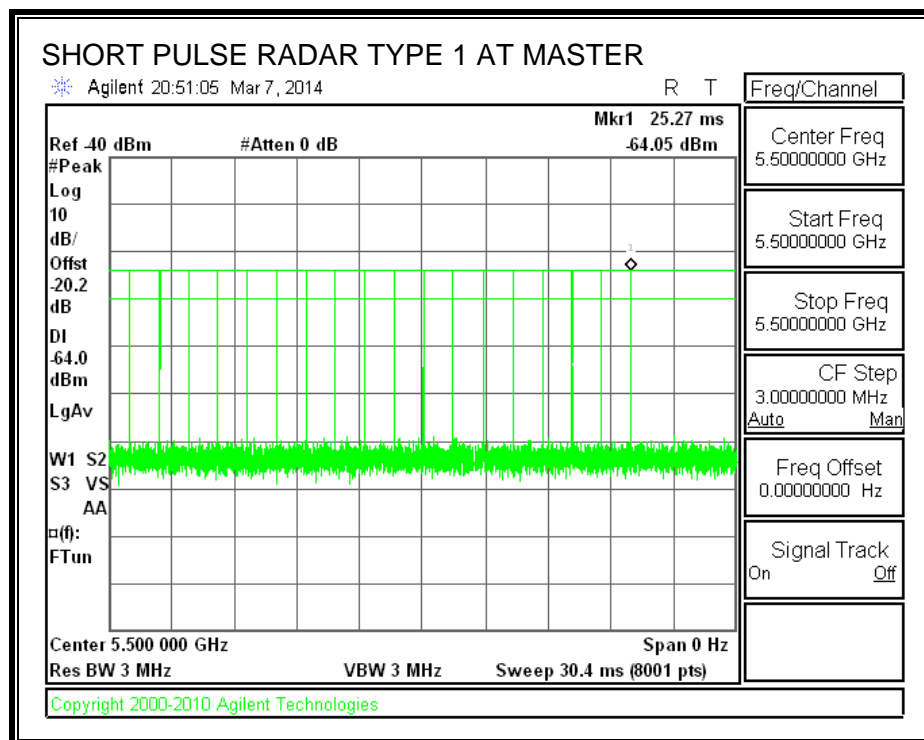
## 14.2. RESULTS FOR 20 MHz BANDWIDTH

### 14.2.1. TEST CHANNEL

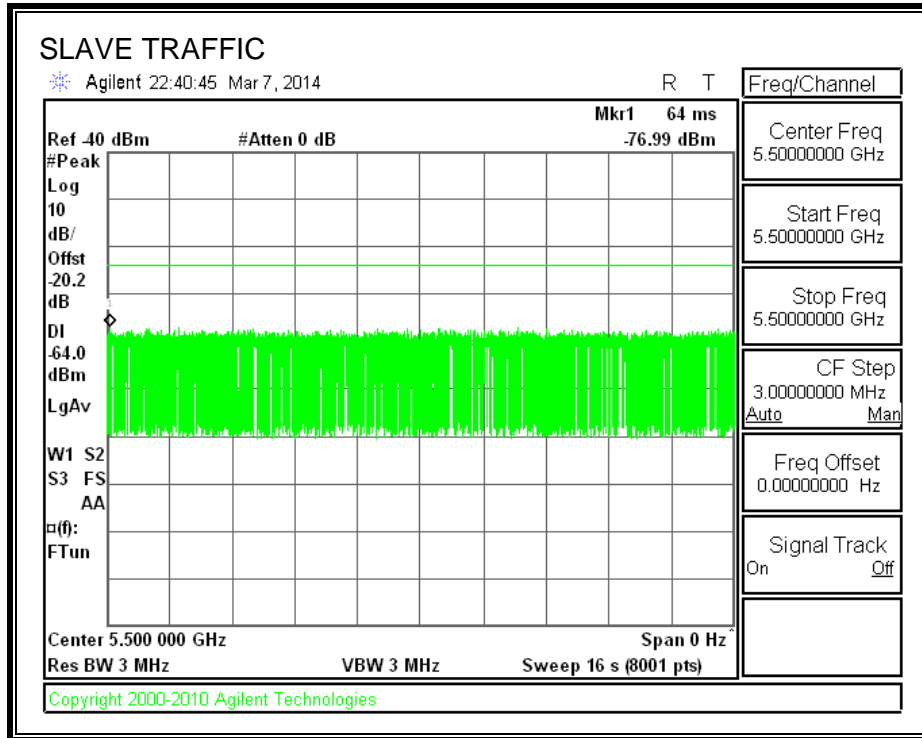
All tests were performed at a channel center frequency of 5500 MHz.

### 14.2.2. RADAR WAVEFORM AND TRAFFIC

#### RADAR WAVEFORM



**TRAFFIC**



### 14.2.3. OVERLAPPING CHANNEL TESTS

#### RESULTS

These tests are not applicable.

### 14.2.4. MOVE AND CLOSING TIME

#### REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =  
(Number of analyzer bins showing transmission) \* (dwell time per bin)

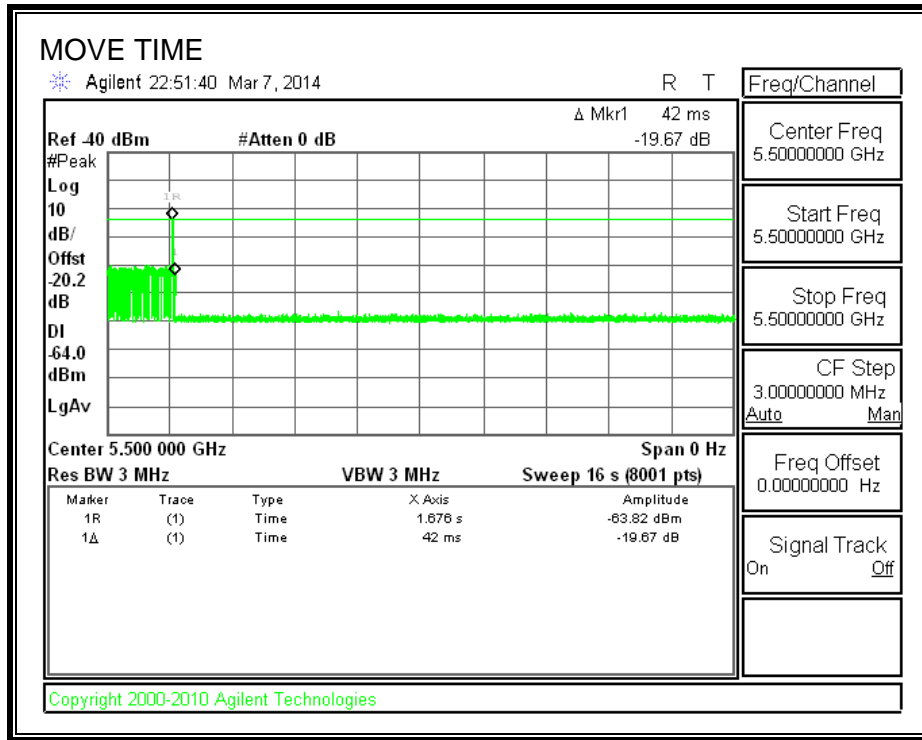
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### RESULTS

<b>Channel Move Time (sec)</b>	<b>Limit (sec)</b>
<b>0.042</b>	<b>10</b>

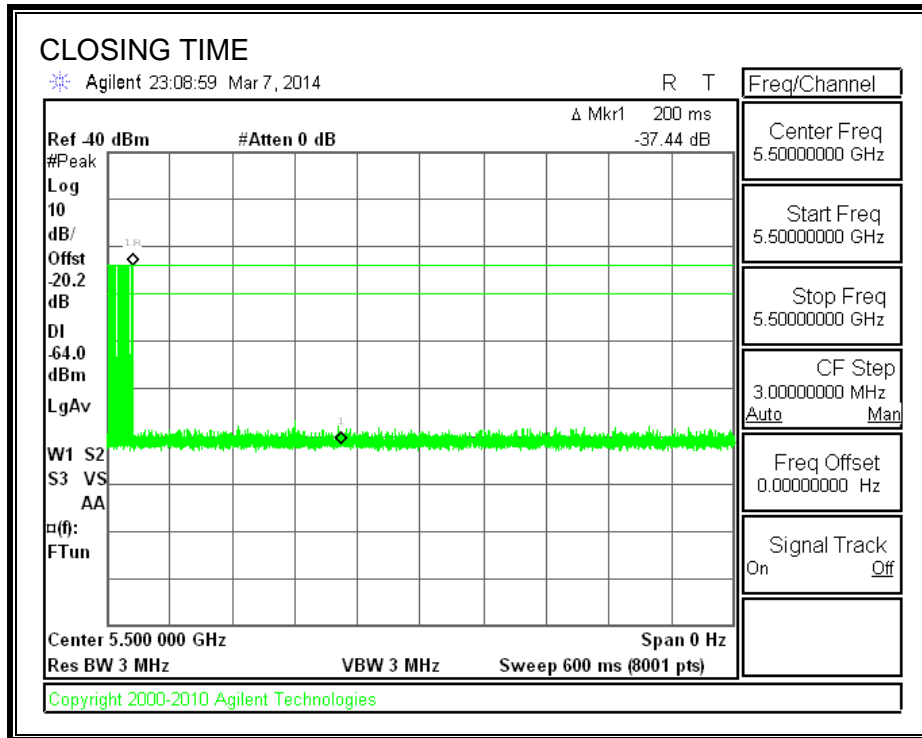
<b>Aggregate Channel Closing Transmission Time (msec)</b>	<b>Limit (msec)</b>
<b>0.0</b>	<b>60</b>

**MOVE TIME**



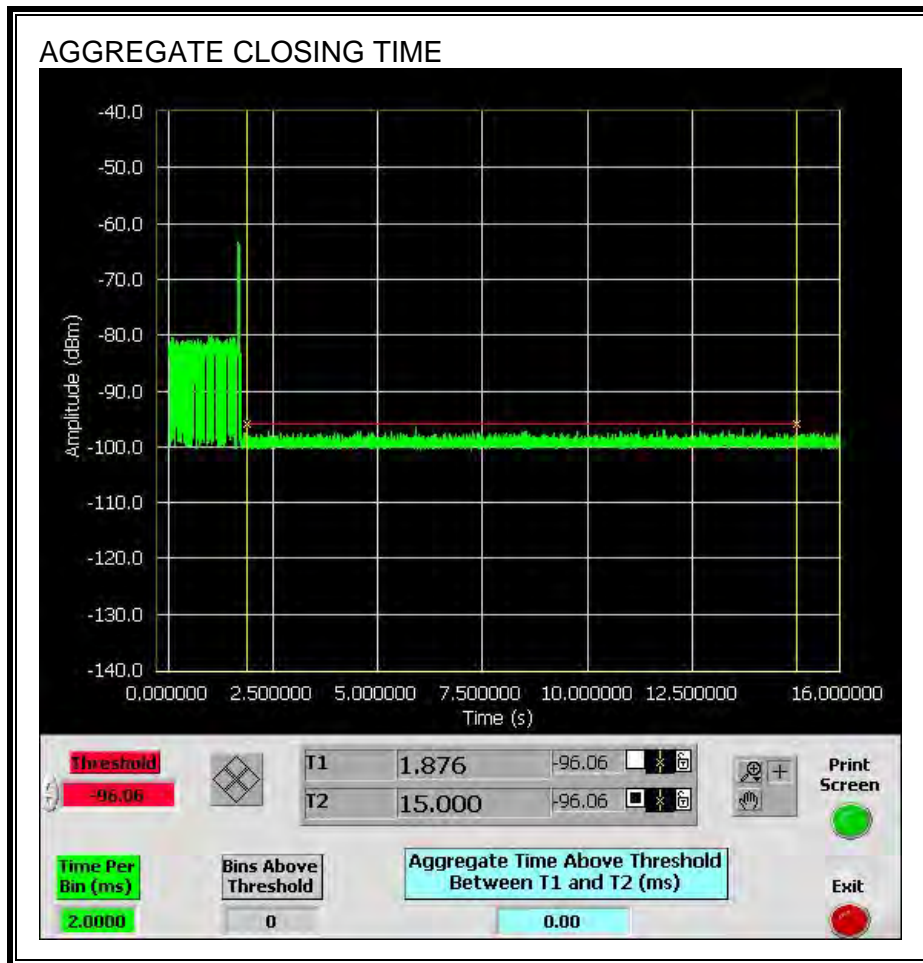


**CHANNEL CLOSING TIME**



**AGGREGATE CHANNEL CLOSING TRANSMISSION TIME**

No transmissions are observed during the aggregate monitoring period.



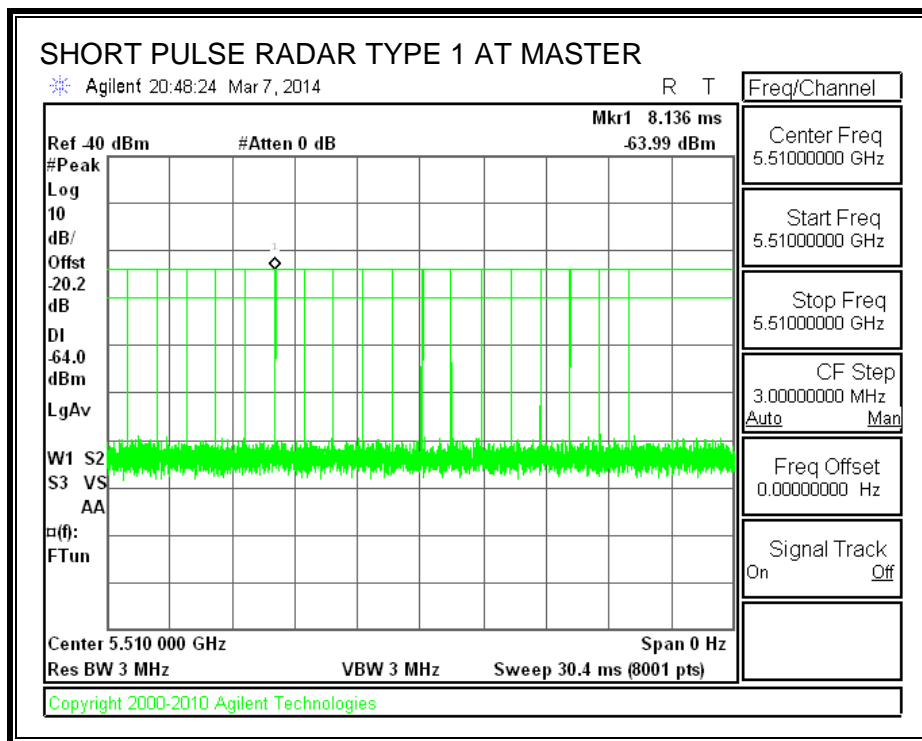
### 14.3. RESULTS FOR 40 MHz BANDWIDTH

#### 14.3.1. TEST CHANNEL

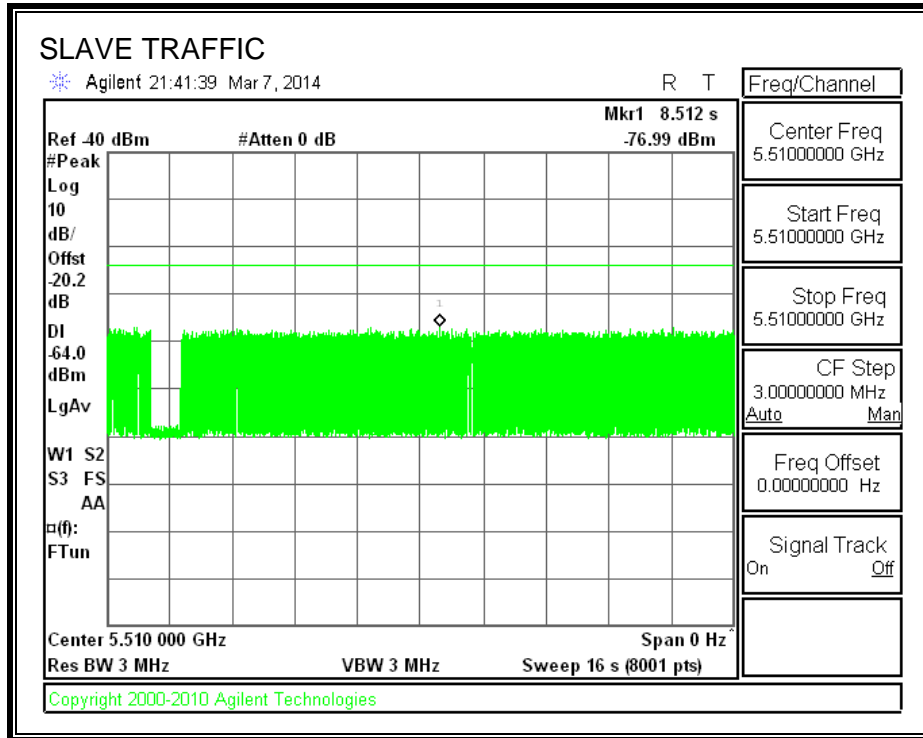
All tests were performed at a channel center frequency of 5510 MHz.

#### 14.3.2. RADAR WAVEFORM AND TRAFFIC

##### RADAR WAVEFORM



**TRAFFIC**



### 14.3.3. OVERLAPPING CHANNEL TESTS

#### RESULTS

These tests are not applicable.

### 14.3.4. MOVE AND CLOSING TIME

#### REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =  
(Number of analyzer bins showing transmission) \* (dwell time per bin)

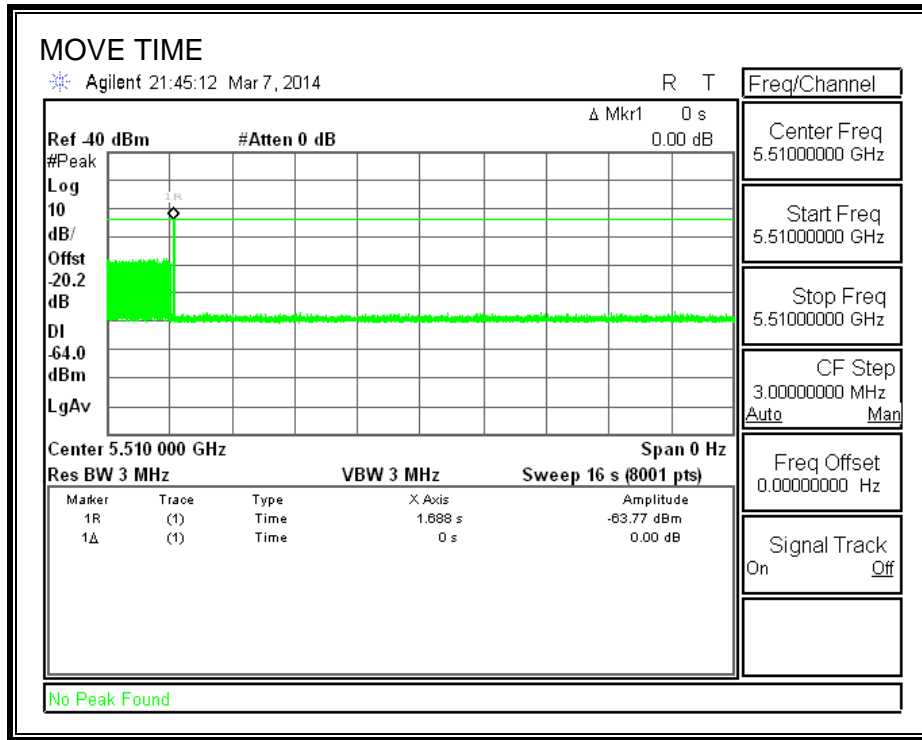
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### RESULTS

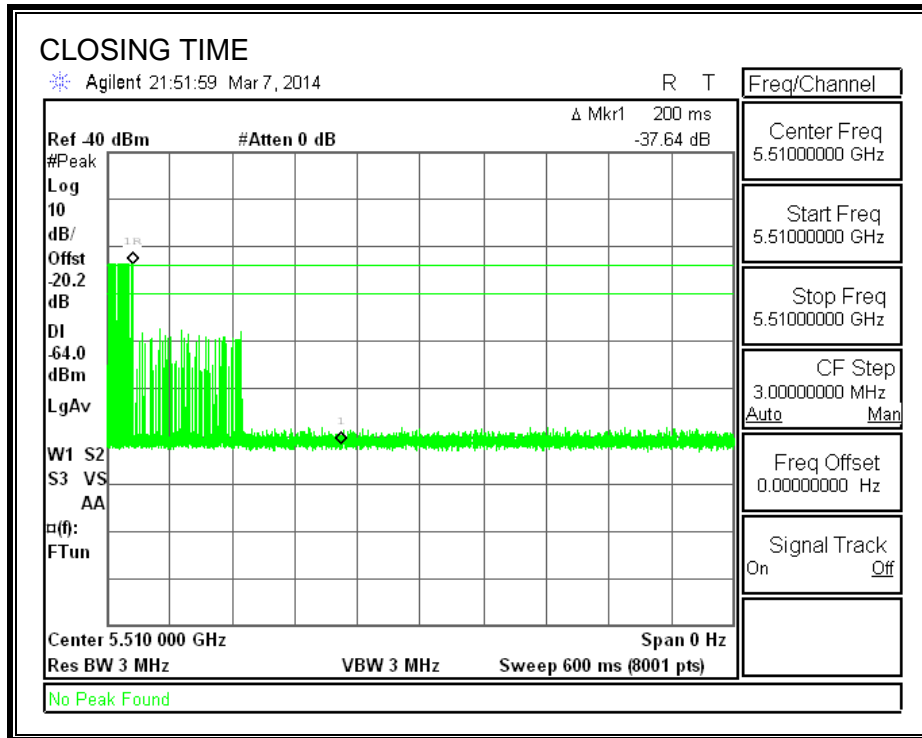
Channel Move Time (sec)	Limit (sec)
0.000	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
0.0	60

**MOVE TIME**

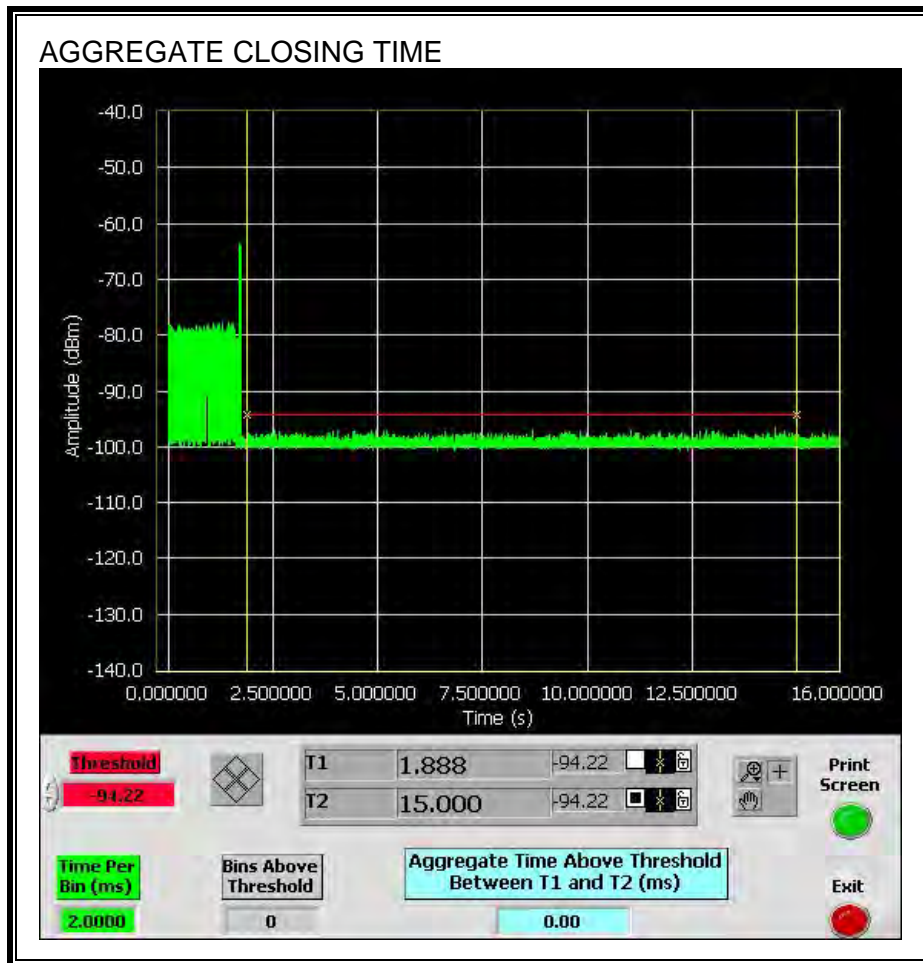


**CHANNEL CLOSING TIME**



**AGGREGATE CHANNEL CLOSING TRANSMISSION TIME**

No transmissions are observed during the aggregate monitoring period.





### 14.3.5. NON-OCCUPANCY PERIOD

#### RESULTS

No EUT transmissions were observed on the test channel during the 30-minute observation time.

