



**FCC CFR47 PART 15 SUBPART C  
CLASS II PERMISSIVE CHANGE**

**CERTIFICATION TEST REPORT**

**FOR**

**802.11ag/Draft 802.11n WLAN PCI-E Minicard  
(Installed inside HP Tablets HSTNN-I77C & HSTNN-W75C)**

**MODEL NUMBER: BCM943224HMS**

**FCC ID: QDS-BRCM1041**

**REPORT NUMBER: 09U12939-1**

**ISSUE DATE: JANUARY 13, 2010**

*Prepared for*

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**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Issue Date	Revisions	Revised By
---	01/13/10	Initial Issue	T. Chan

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** BROADCOM CORPORATION  
190 MATHILDA PLACE  
SUNNYVALE, CA 94086, U.S.A.

**EUT DESCRIPTION:** 802.11ag/Draft 802.11n WLAN PCI-E Minicard  
(Installed inside HP Tablets HSTNN-I77C & HSTNN-W75C)

**MODEL:** BCM943224HMS

**SERIAL NUMBER:** 002682254022 and 002682258B7F

**DATE TESTED:** DECEMBER 21-28 2009

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

Compliance Certification Services, Inc. (CCS) 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 CCS 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS 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 CCS By:



THU CHAN  
EMC MANAGER  
COMPLIANCE CERTIFICATION SERVICES

Tested By:



CHIN PANG  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, and FCC CFR 47 Part 15.

## 3. FACILITIES AND ACCREDITATION

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

CCS 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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) +  
Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a Broadcom 802.11ag/Draft 802.11n WLAN PCI-E Minicard and installed inside HP tablet laptops. The radio module is manufactured by Broadcom.

### 5.2. MAXIMUM OUTPUT POWER

In order to pass Bandedge measurement, g-mode low channel must be reduced the peak output power as table shown below:

MODE / CHANNEL	Measured Peak Output Power (dBm)
<b>2.4GHz Band</b>	
<b>11g</b>	
Low Ch, 2412MHz	22.00

### 5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding portable platform, HP HSTNN-I77C & HSTNN-W75C.

## 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes with the maximum gain @ 2.4GHz in Luke tablet and 5.8GHz in Omega tablet as table below:

Antenna Type	Peak gain (dBi)	
	2.4 GHz Band	5.8 GHz Band
802.11abgn WLAN Antenna - TX1 (Main)	-0.35	2.81
802.11abgn WLAN Antenna - TX2 (Aux)	1.62	1.75

The highest gains of each type of antennas for all legacy / SISO modes test.

Band	TX1 (Main) Antenna Gain (dBi)	TX2 (Aux) Antenna Gain (dBi)
2.4 GHz	-0.35	<b>1.62</b>
5.8 GHz	<b>2.81</b>	1.75

The antennas combinations for 2x2 (CCD) modes test.

Frequency Band	TX1 (Main) Antenna Gain (dBi)	TX2 (Aux) Antenna Gain (dBi)	$10^{(\text{Ant Main}/10)}$	$10^{(\text{Ant Aux}/10)}$	$10^{(\text{ant main}/10)} + 10^{(\text{ant aux}/10)}$	$10 \cdot \log[10^{(\text{ant main}/10)} + 10^{(\text{ant aux}/10)}]$ (dBm)
2.4 GHz HT20 & HT40	-0.35	1.62	0.923	1.452	2.375	3.76
5.8 GHz HT20 & HT40	2.81	1.75	1.910	1.496	3.406	5.32

## **5.5. SOFTWARE AND FIRMWARE**

The EUT driver software installed during testing was Broadcom, rev. 5.60.51  
The test utility software used during testing was wl\_tool, rev. 5.60.51

## **5.6. WORST-CASE CONFIGURATION AND MODE**

Worst-Case data rates were utilized from preliminary testing of the chipset, worst-case data rates used during the testing are as follows:

802.11b Mode (20 MHz BW operation): 1 Mbps, CCK.  
802.11g Mode (20 MHz BW operation): 6 Mbps, OFDM.  
802.11n HT20 Mode: MCS0, 6.5 Mbps, 1 Spatial Stream.  
802.11n HT40 Mode: MCS0, 13.5 Mbps, 1 Spatial Stream.

The tests were performed on worst-case channel with highest antennas gain (Wistron) of Luke laptop @ 2.4GHz and Omega laptop @ 5.8GHz bands.

Worst-case mode and channel used for 30-1000 MHz radiated emissions was the mode and channel with the highest output power that was determined to be 11b mode, mid channel for Luke laptop, and 11a, mid channel for Omega laptop.

The tablet laptop was investigated under normal (mobile) and potable positions (X, Y, Z) to determine the worst case and the mobile position was the worse case to test.



## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMEN

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	HP	HSTNN-177C	79913S034	DoC
Laptop	HP	HSTNN-W75C	79816SI07J	DoC
AC Adapter	HP	PPP-009H	F1-09083224330A	N/A

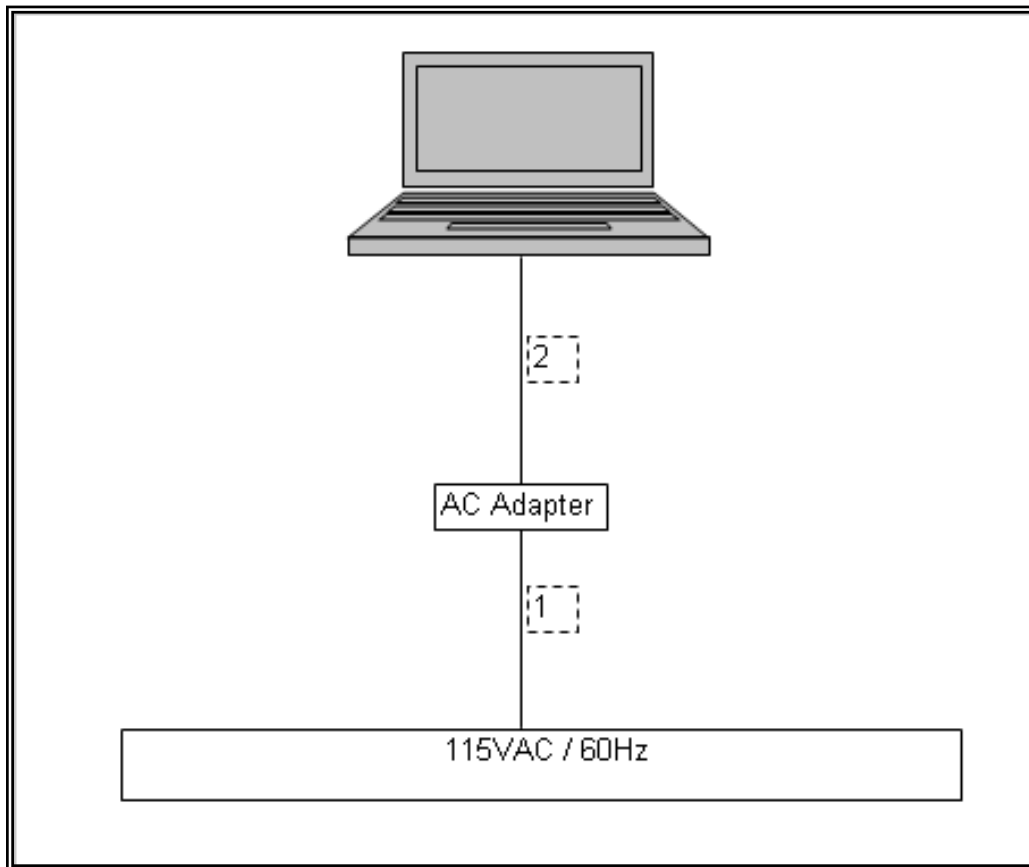
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US115V	Unshielded	1.5m	N/A
2	DC	1	DC	Unshielded	1.5m	N/A

### TEST SETUP

The EUT is installed inside a host laptop computer during the tests. Test software exercised the radio card.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	01/05/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/10
Antenna, Horn, 18 GHz	EMCO	3115	C00945	04/22/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	03/31/10
Preamplifier, 1-26GHz	Agilent / HP	8449B	C01052	07/05/10
Peak Power Meter	Boonton	4541	C01186	01/19/10
Peak Power Sensor	Boonton	57318	NA	02/02/10
Highpass Filter, 7.6 GHz	Micro-Tronics	HPM13195	N02601	CNR
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	01/29/10
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	02/03/10

## 7. ANTENNA PORT TEST RESULTS

### 7.1. 802.11g MODE IN THE 2.4 GHz BAND

#### 7.1.1. OUTPUT POWER

##### LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

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

##### TEST PROCEDURE

The transmitter output is connected to a Boonton Power Meter

##### RESULTS

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

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	22.00	30	-8.00

## 8. RADIATED TEST RESULTS

### 8.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

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

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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

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

#### RESULTS

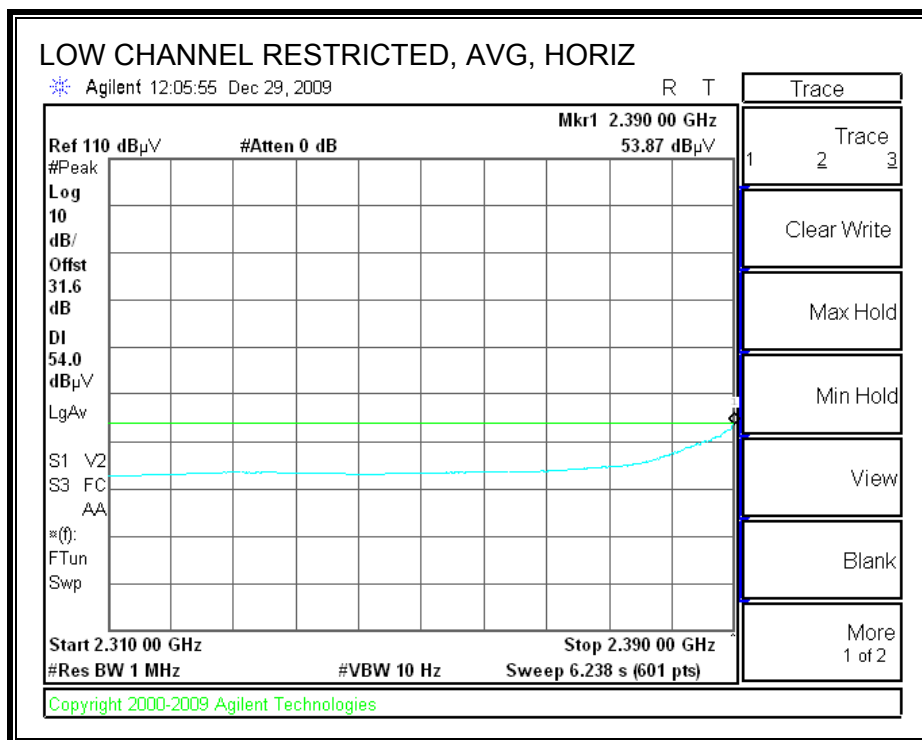
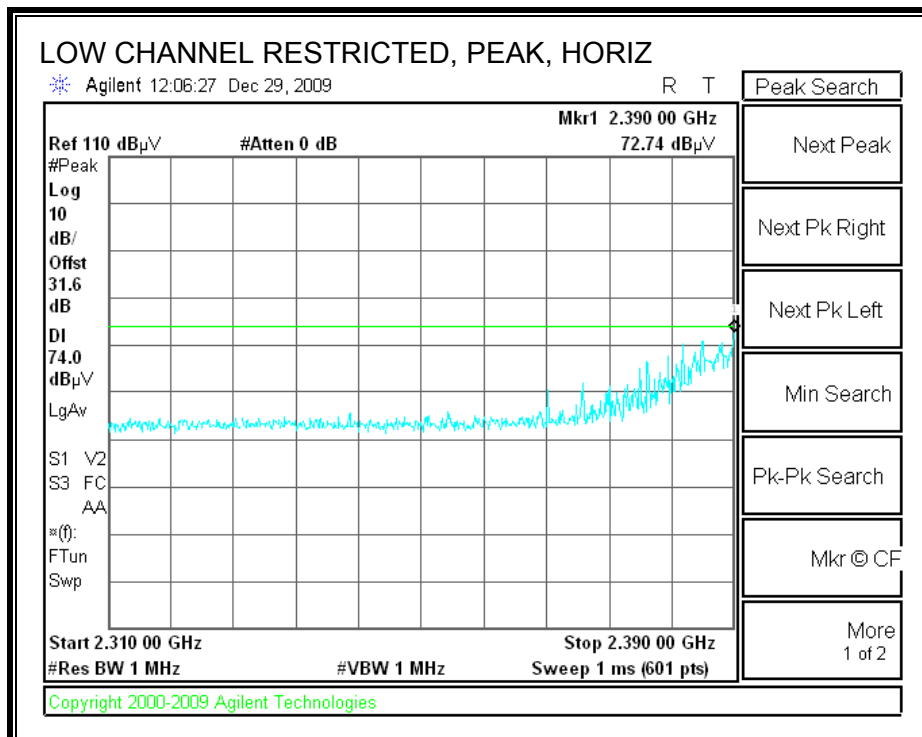
## 8.2. TRANSMITTER ABOVE 1 GHz

### HARMONICS AND SPURIOUS EMISSIONS, 11b Mode

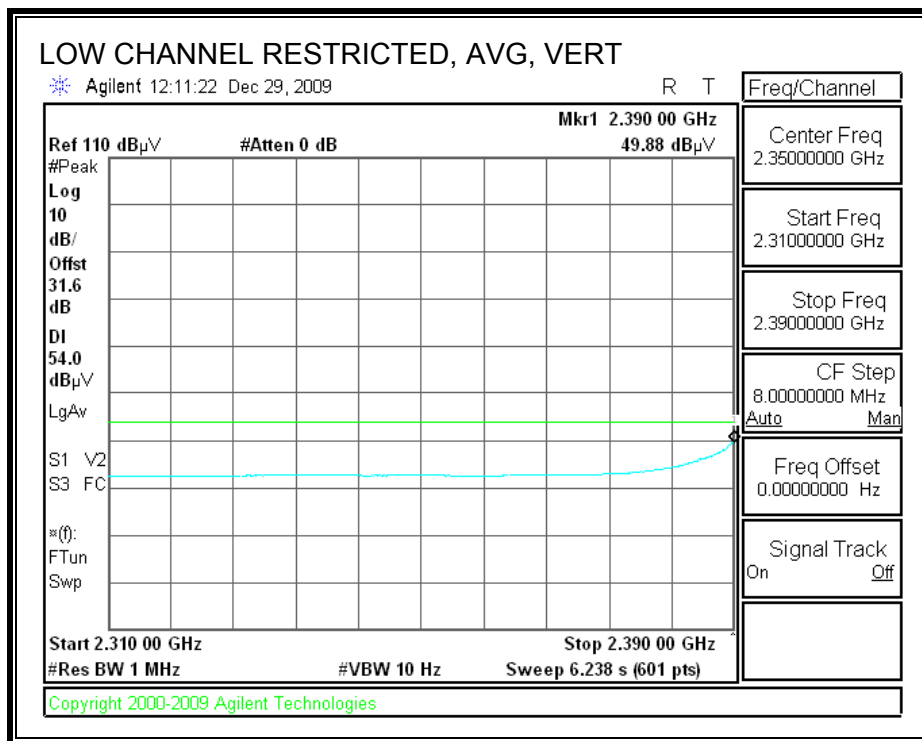
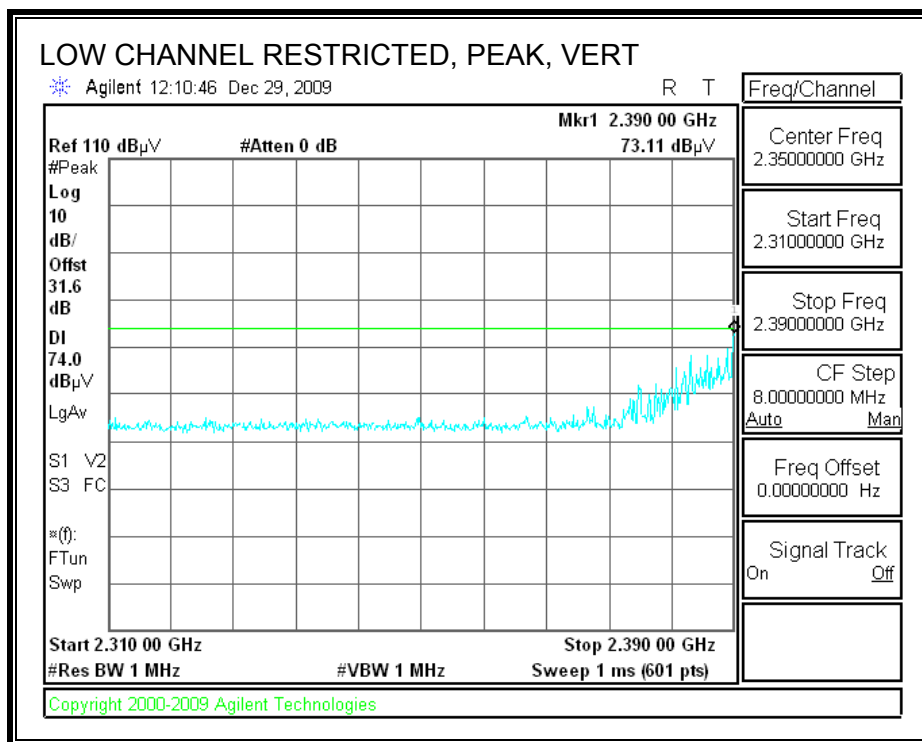
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		Chin Pang											
Date:		12/21/09											
Project #:		09U12939											
Company:		Broadcom											
EUT Description:		802.11ag/Draft 802.11n WLAN PCI-E Minicard											
EUT M/N:		BCM943224HMS											
Test Target:		FCC 15.247											
Mode Oper:		TX, b mode											
f	Measurement Frequency	Amp	Preamp Gain	Average Field Strength Limit									
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Peak Field Strength Limit									
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Margin vs. Average Limit									
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Margin vs. Peak Limit									
CL	Cable Loss	HPF	High Pass Filter										
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fldr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
<b>Low Ch</b>													
4.824	3.0	40.8	32.7	5.8	-34.8	0.0	0.0	44.4	74.0	-29.6	V	P	
4.824	3.0	36.8	32.7	5.8	-34.8	0.0	0.0	40.4	54.0	-13.6	V	A	
4.824	3.0	39.7	32.7	5.8	-34.8	0.0	0.0	43.4	74.0	-30.6	H	P	
4.824	3.0	35.5	32.7	5.8	-34.8	0.0	0.0	39.1	54.0	-14.9	H	A	
<b>Mid Ch</b>													
4.874	3.0	39.4	32.7	5.8	-34.8	0.0	0.0	43.1	74.0	-30.9	V	P	
4.874	3.0	35.7	32.7	5.8	-34.8	0.0	0.0	39.5	54.0	-14.5	V	A	
7.311	3.0	35.5	35.5	7.3	-34.1	0.0	0.0	44.2	74.0	-29.8	V	P	
7.311	3.0	26.0	35.5	7.3	-34.1	0.0	0.0	34.7	54.0	-19.3	V	A	
4.874	3.0	39.7	32.7	5.8	-34.8	0.0	0.0	43.4	74.0	-30.6	H	P	
4.874	3.0	35.9	32.7	5.8	-34.8	0.0	0.0	39.7	54.0	-14.3	H	A	
7.311	3.0	33.2	35.5	7.3	-34.1	0.0	0.0	41.9	74.0	-32.1	H	P	
7.311	3.0	21.6	35.5	7.3	-34.1	0.0	0.0	30.2	54.0	-23.8	H	A	
<b>High Ch</b>													
4.924	3.0	38.8	32.7	5.9	-34.8	0.0	0.0	42.6	74.0	-31.4	V	P	
4.924	3.0	34.3	32.7	5.9	-34.8	0.0	0.0	38.1	54.0	-15.9	V	A	
7.386	3.0	36.0	35.6	7.3	-34.1	0.0	0.0	44.8	74.0	-29.2	V	P	
7.386	3.0	28.4	35.6	7.3	-34.1	0.0	0.0	37.2	54.0	-16.8	V	A	
4.924	3.0	40.5	32.7	5.9	-34.8	0.0	0.0	44.3	74.0	-29.7	H	P	
4.924	3.0	36.1	32.7	5.9	-34.8	0.0	0.0	39.9	54.0	-14.1	H	A	
7.386	3.0	34.1	35.6	7.3	-34.1	0.0	0.0	42.9	74.0	-31.1	H	P	
7.386	3.0	23.9	35.6	7.3	-34.1	0.0	0.0	32.7	54.0	-21.3	H	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

## 8.2.1. 802.11g MODE

### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

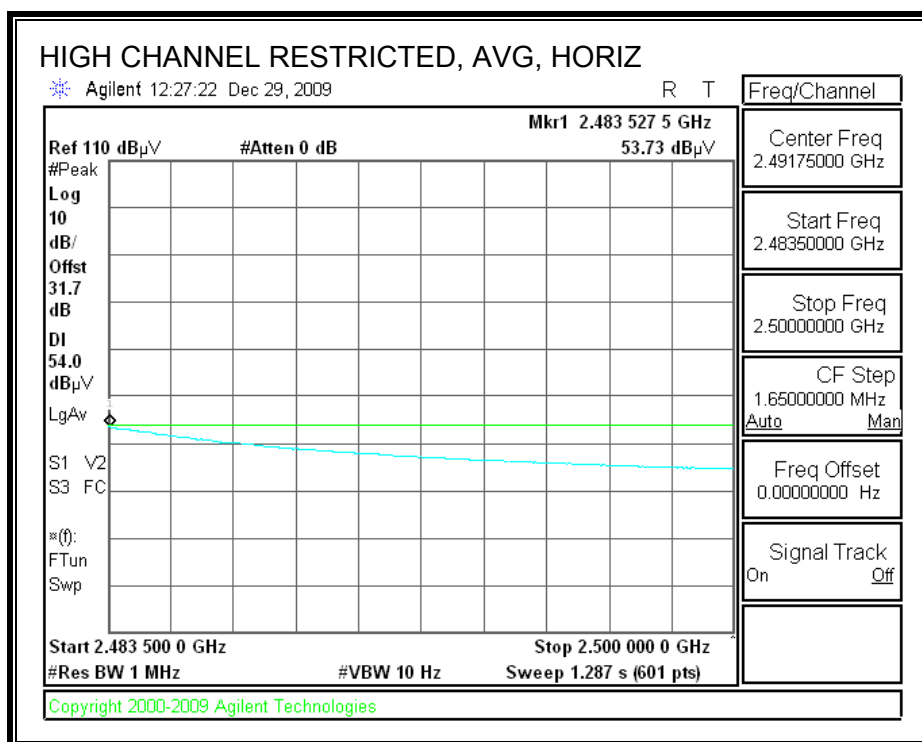
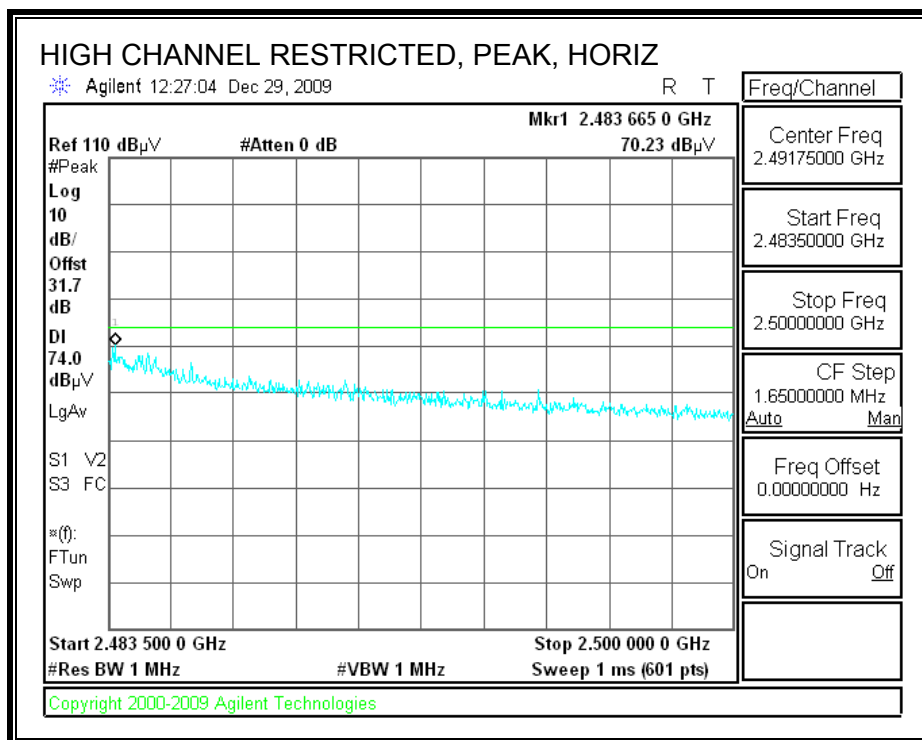


**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

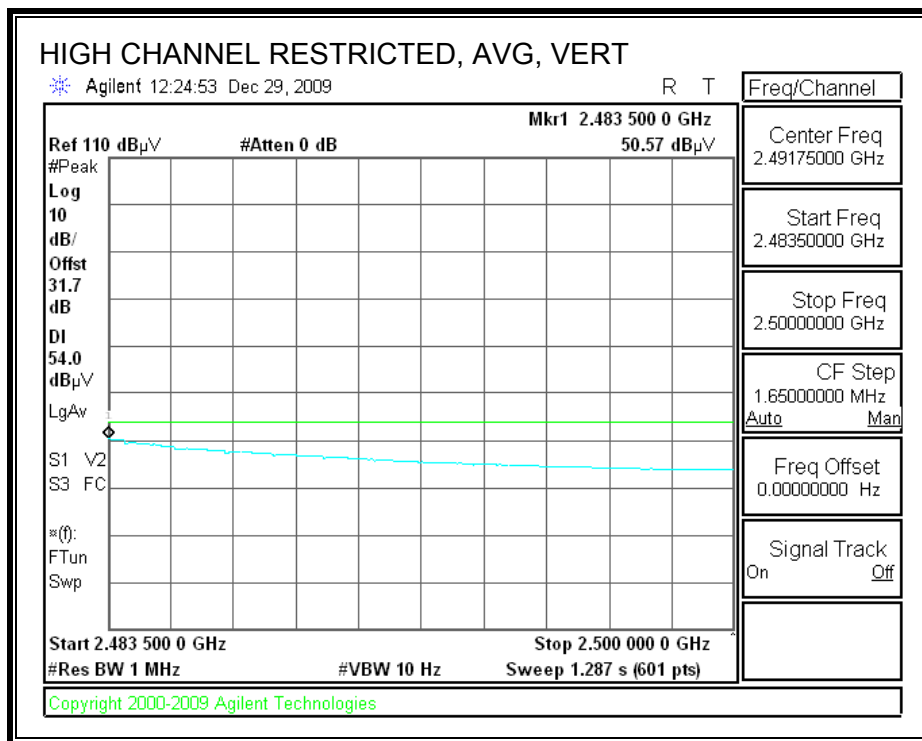
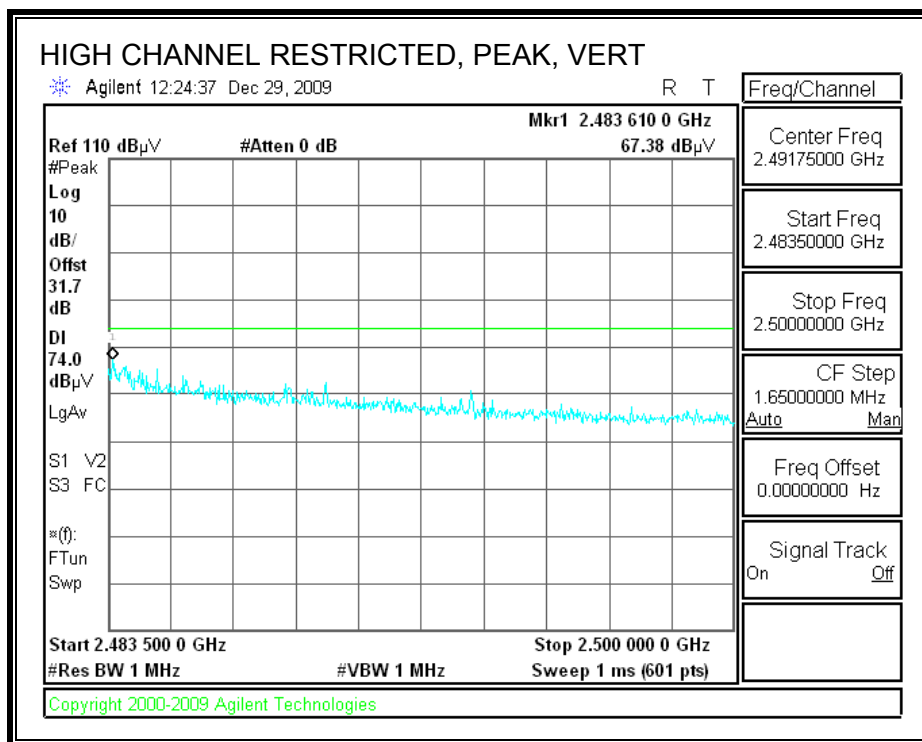




**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**

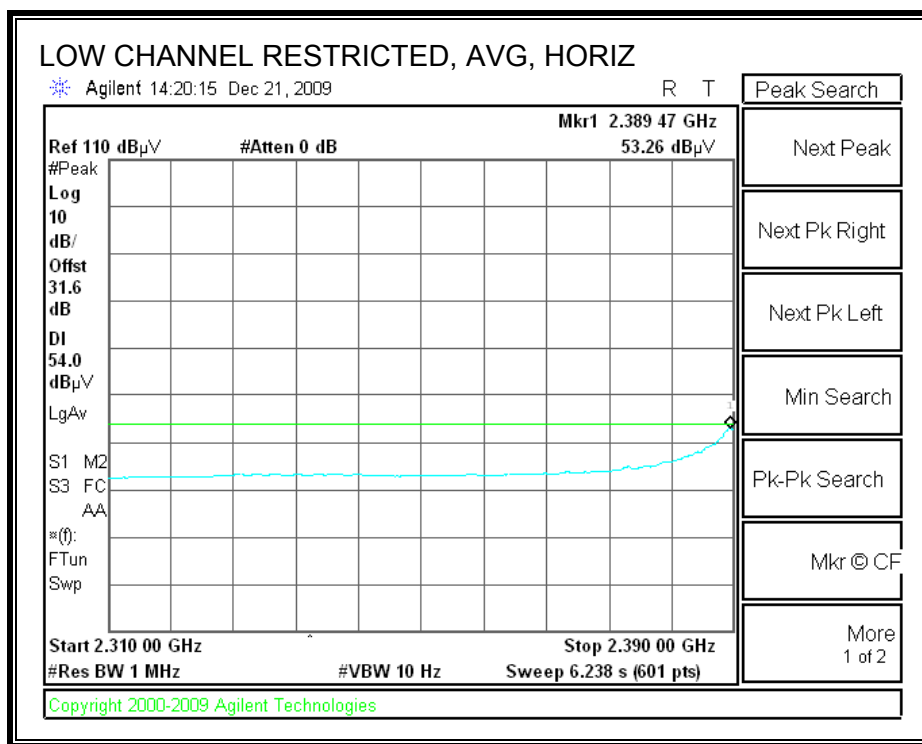
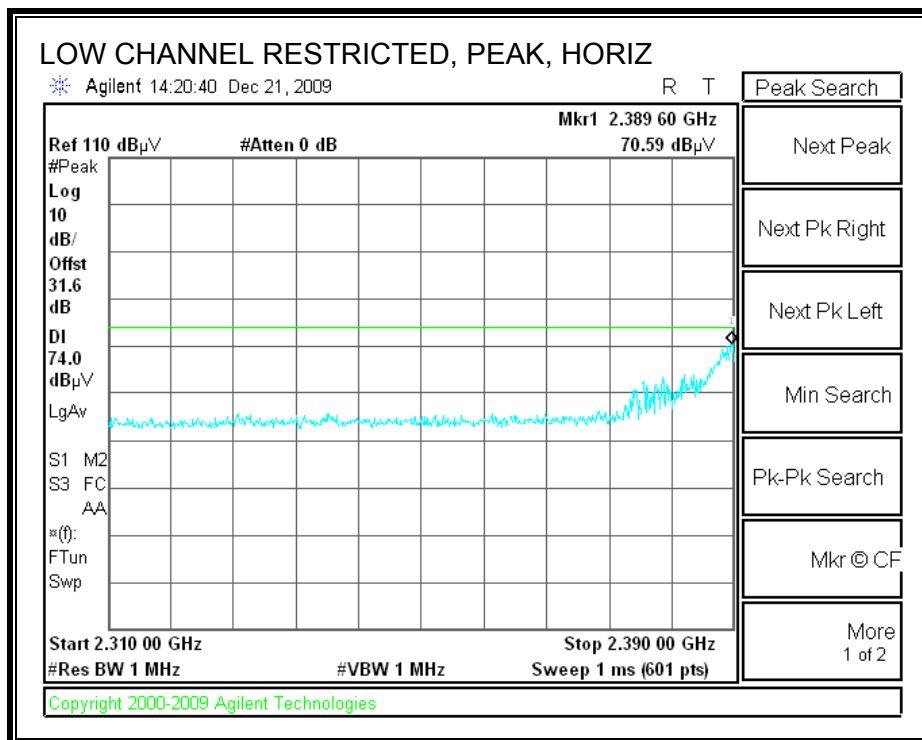


**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

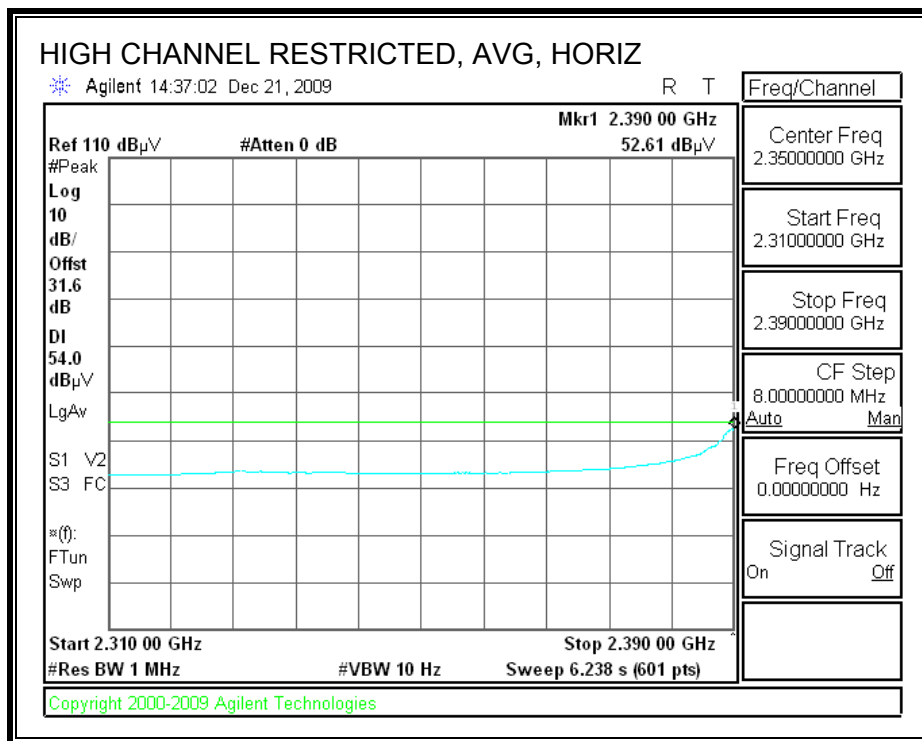
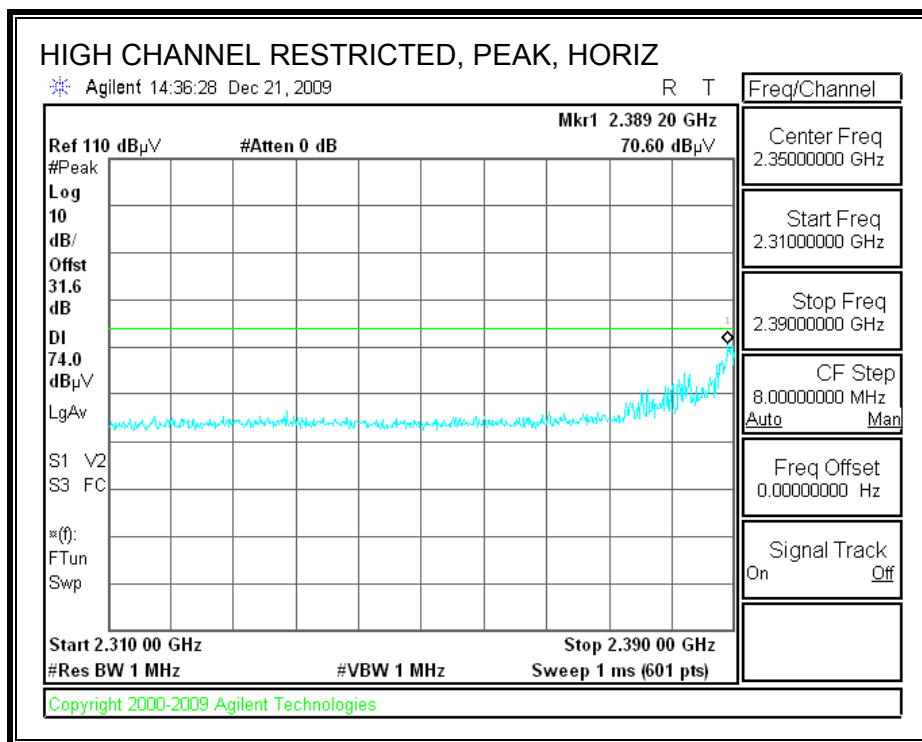


## 8.2.2. 802.11n HT20 MODE

### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

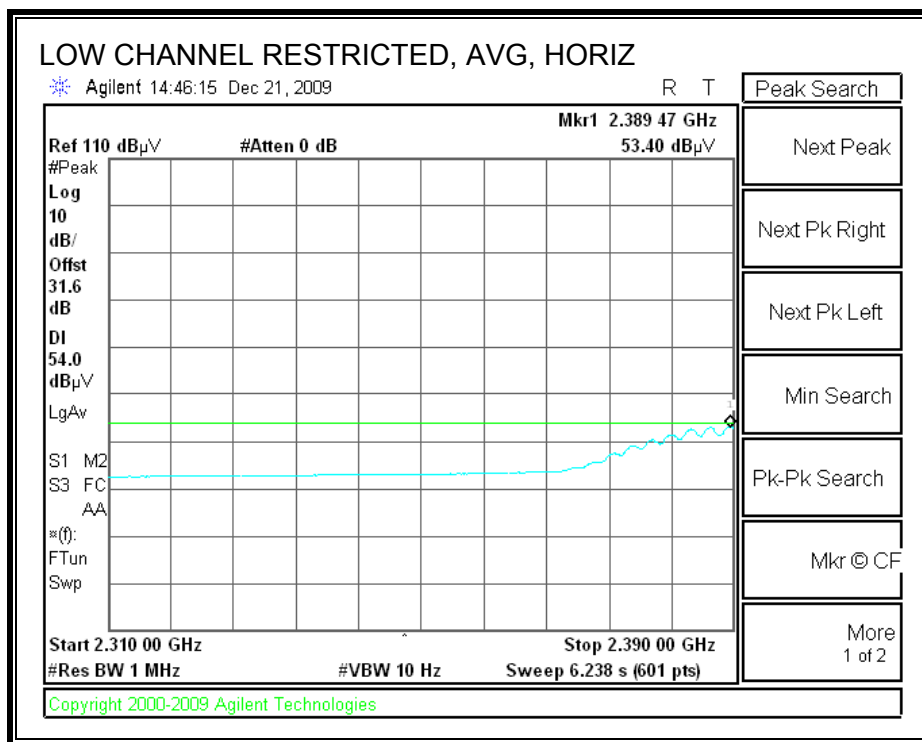
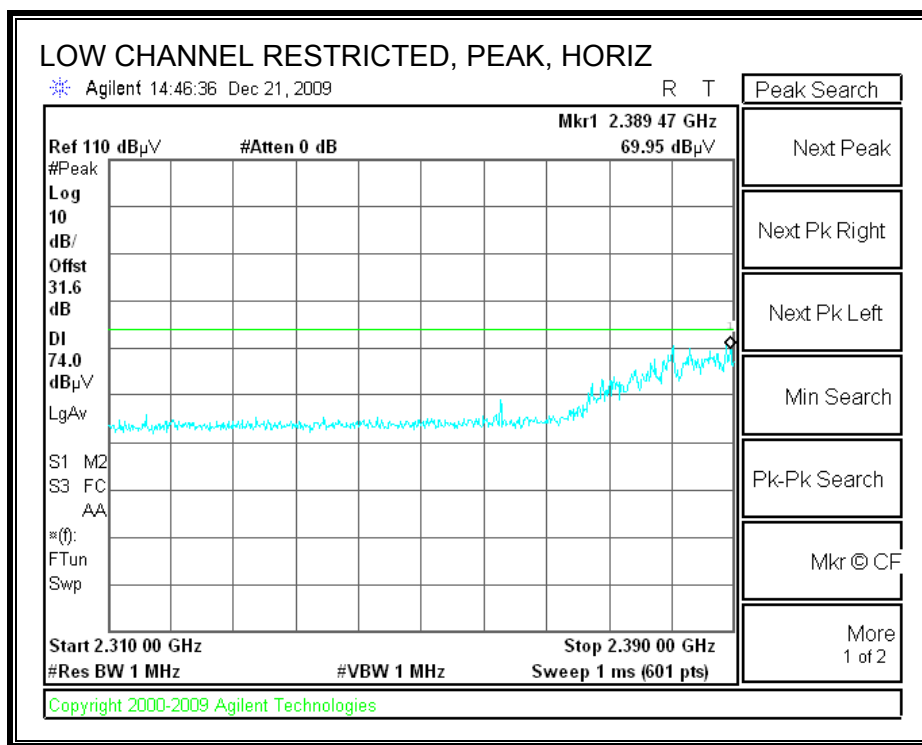


**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**

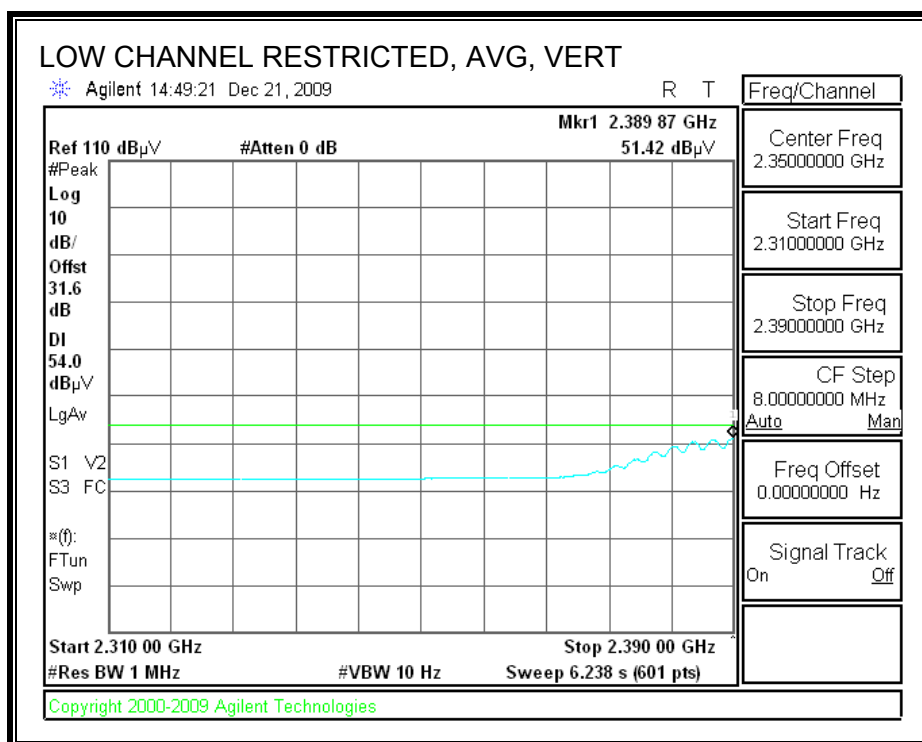
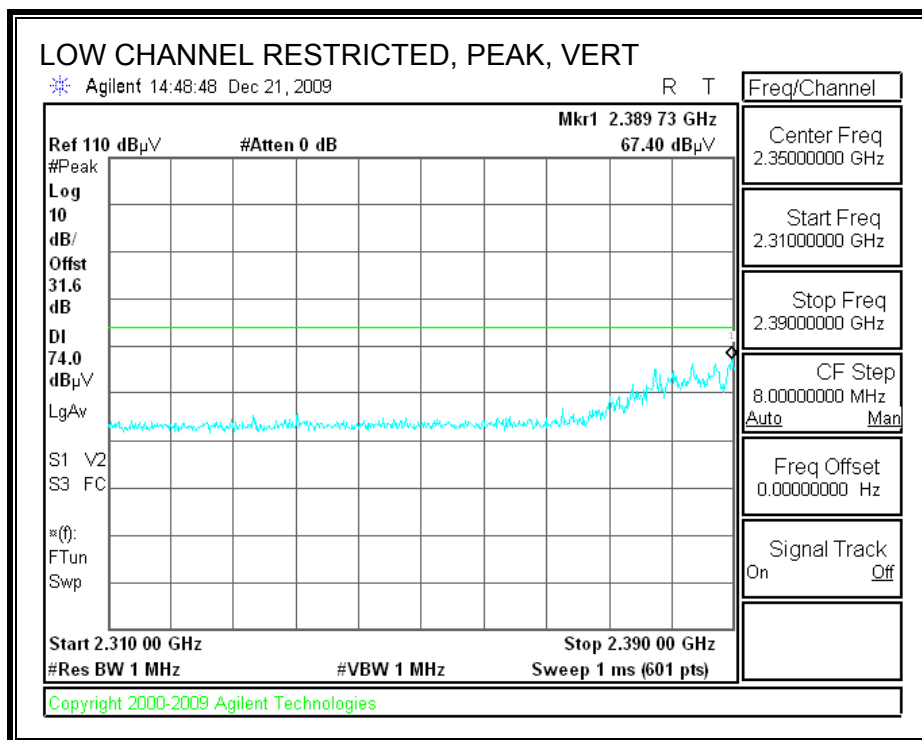


### 8.2.3. 802.11n HT40 MODE

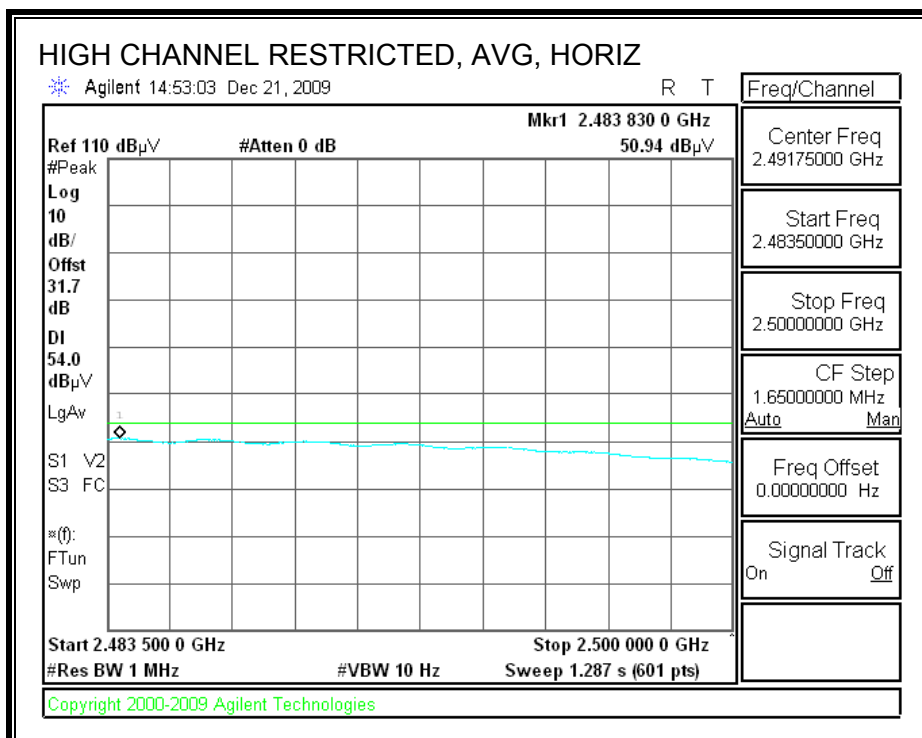
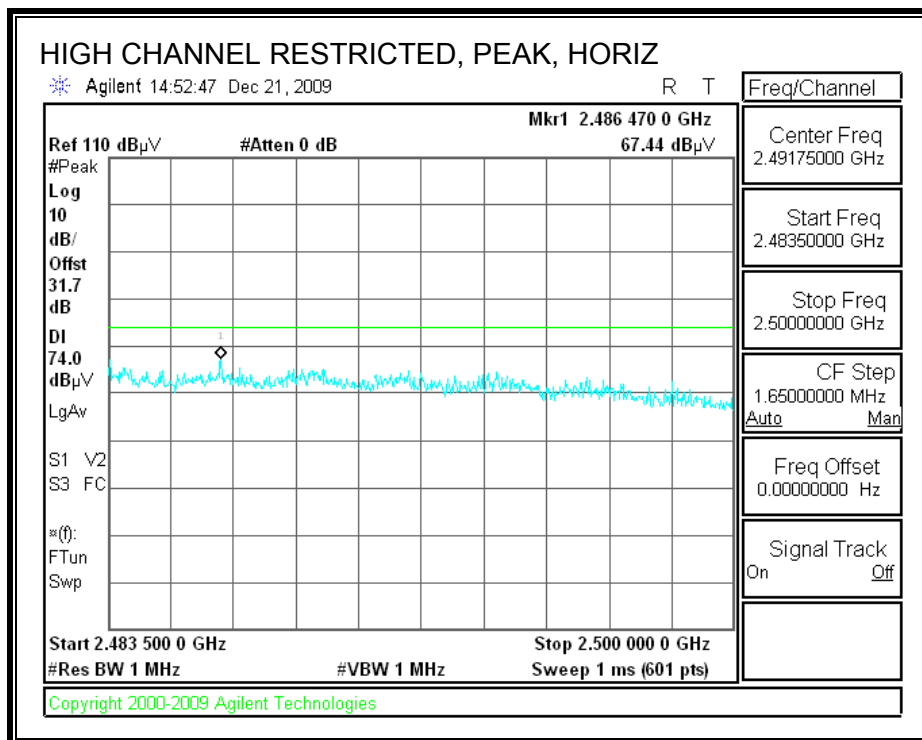
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



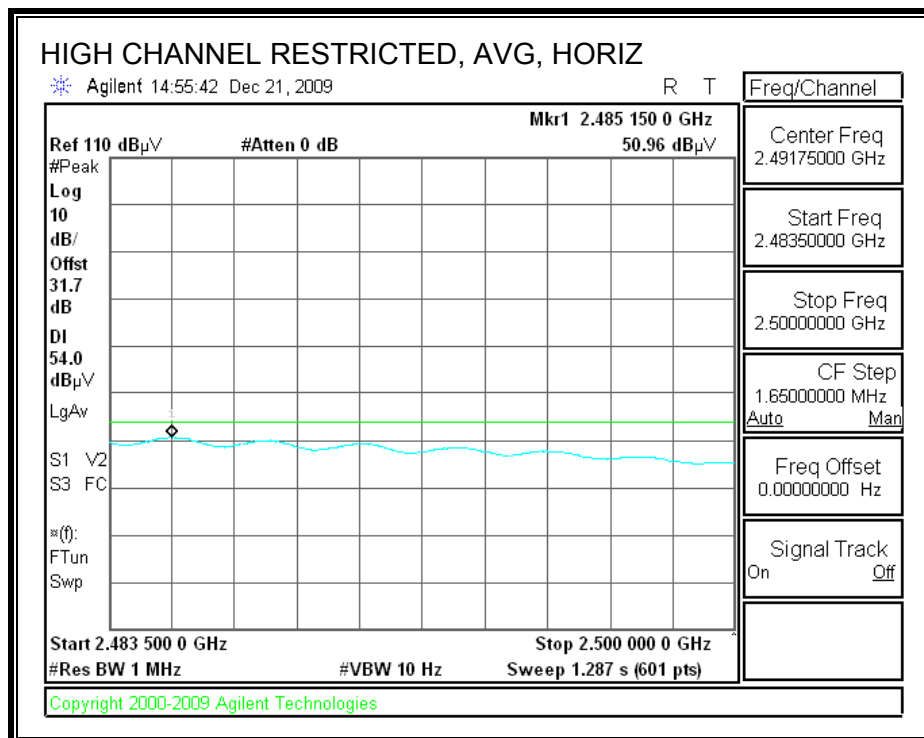
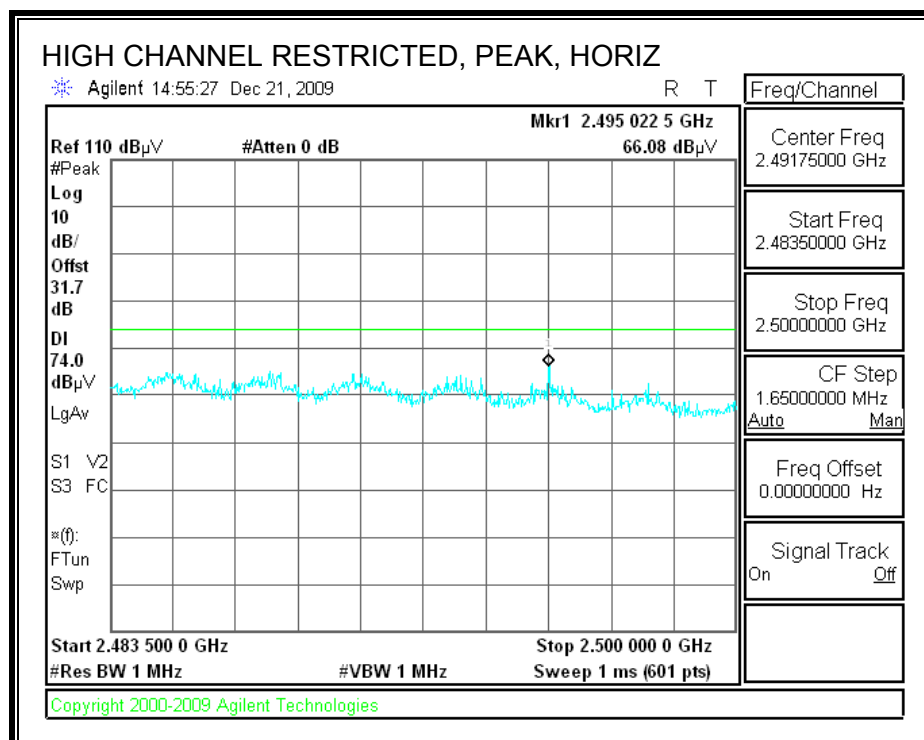
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



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



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





**2.4GHz BAND - HARMONICS AND SPURIOUS EMISSIONS, HT20 Mode (WORST CASE)**

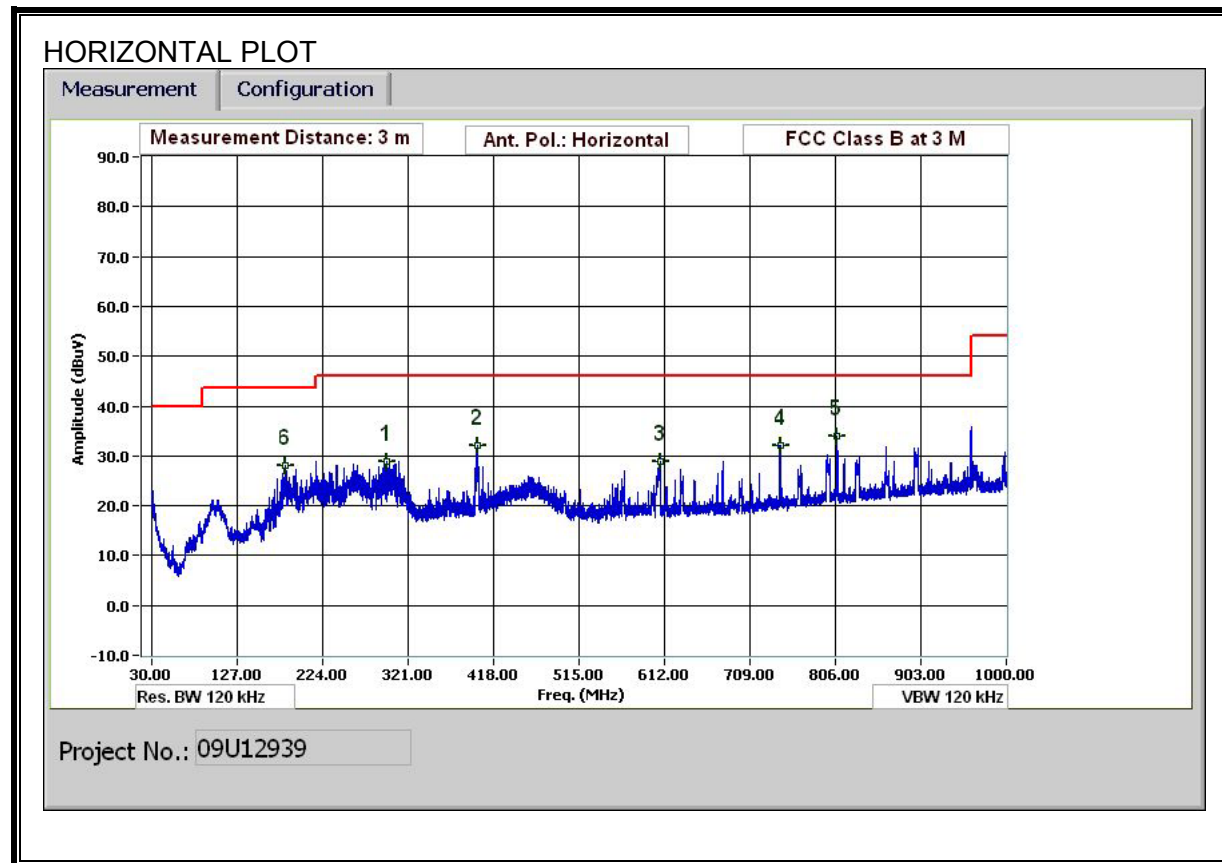
<b>High Frequency Measurement</b> Compliance Certification Services, Fremont 5m Chamber													
<b>Test Engr:</b> Chin Pang <b>Date:</b> 12/21/09 <b>Project #:</b> 09U12939 <b>Company:</b> Broadcom <b>EUT Description:</b> 802.11ag/Draft 802.11n WLAN PCI-E Minicard <b>EUT M/N:</b> BCM943224HMS <b>Test Target:</b> FCC 15.247 <b>Mode Oper:</b> HT20, TX mid Ch ( Worst Case)													
f	Measurement Frequency	Amp	Preamp Gain	Average Field Strength Limit									
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Peak Field Strength Limit									
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Margin vs. Average Limit									
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Margin vs. Peak Limit									
CL	Cable Loss	HPF	High Pass Filter										
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
<b>Mid Ch</b>													
4.874	3.0	42.3	32.7	5.8	-34.8	0.0	0.0	46.0	74.0	-28.0	V	P	
4.874	3.0	30.4	32.7	5.8	-34.8	0.0	0.0	34.1	54.0	-19.9	V	A	
7.311	3.0	34.9	35.5	7.3	-34.1	0.0	0.0	43.6	74.0	-30.4	V	P	
7.311	3.0	22.3	35.5	7.3	-34.1	0.0	0.0	31.0	54.0	-23.0	V	A	
4.874	3.0	43.0	32.7	5.8	-34.8	0.0	0.0	46.7	74.0	-27.3	H	P	
4.874	3.0	30.7	32.7	5.8	-34.8	0.0	0.0	34.4	54.0	-19.6	H	A	
7.311	3.0	33.6	35.5	7.3	-34.1	0.0	0.0	42.2	74.0	-31.8	H	P	
7.311	3.0	21.4	35.5	7.3	-34.1	0.0	0.0	30.0	54.0	-24.0	H	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

**5.8GHz BAND - HARMONICS AND SPURIOUS EMISSIONS, HT20 Mode (WORST CASE)**

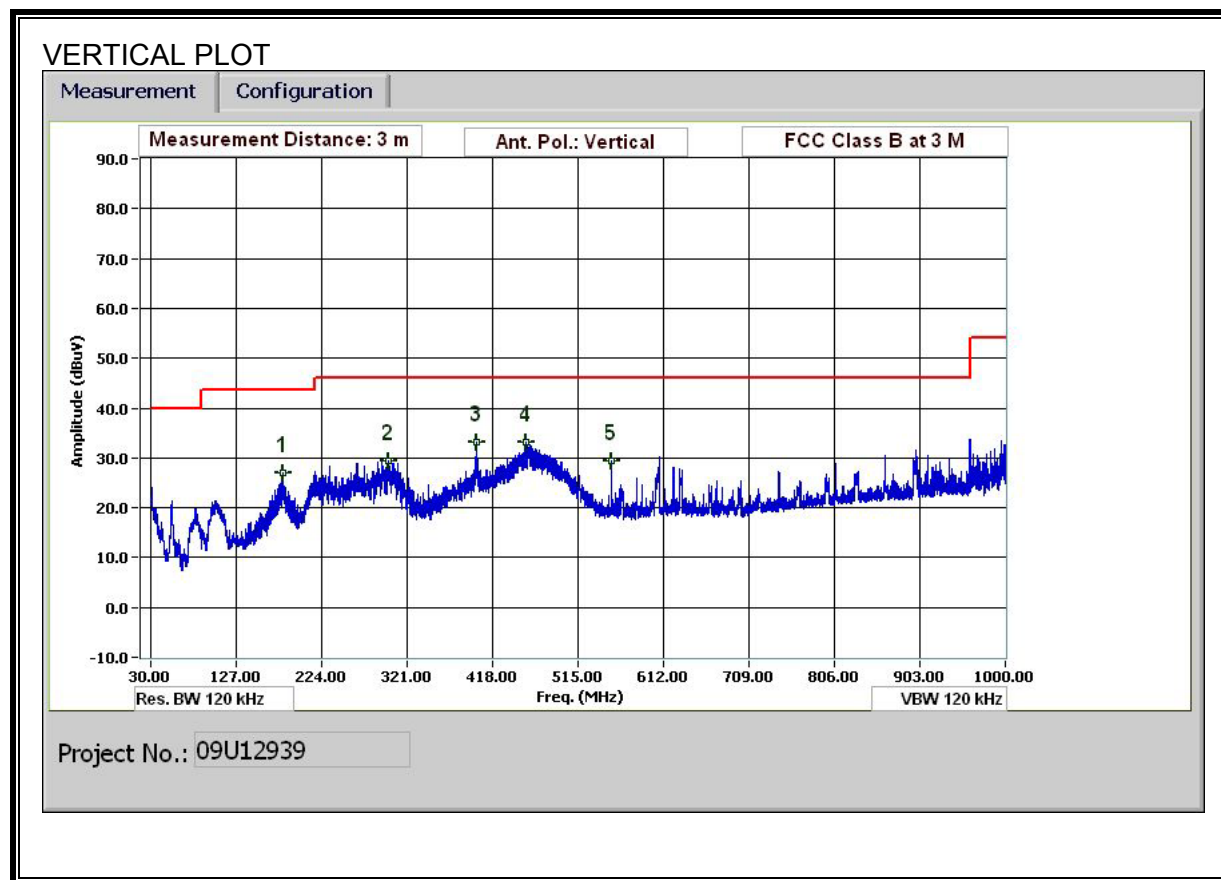
High Frequency Measurement													
Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		Chin Pang											
Date:		12/21/09											
Project #:		09U12939											
Company:		Broadcom											
EUT Description:		802.11ag/Draft 802.11n WLAN PCI-E Minicard											
EUT M/N:		BCM943224HMS											
Test Target:		FCC 15.247											
Mode Oper:		TX, 5.8GHz Band, HT20											
f	Measurement Frequency	Amp	Preamplifier Gain	Average Field Strength Limit									
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Peak Field Strength Limit									
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Margin vs. Average Limit									
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Margin vs. Peak Limit									
CL	Cable Loss	HPF	High Pass Filter										
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Ftr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol V/H	Det. P/A/QP	Notes
<b>Low Ch, 5745MHz</b>													
11.490	3.0	35.6	38.0	9.5	-32.5	0.0	0.0	50.6	74.0	-23.4	V	P	
11.490	3.0	22.3	38.0	9.5	-32.5	0.0	0.0	37.2	54.0	-16.8	V	A	
11.490	3.0	30.6	38.0	9.5	-32.5	0.0	0.0	45.6	74.0	-28.4	H	P	
11.490	3.0	18.7	38.0	9.5	-32.5	0.0	0.0	33.7	54.0	-20.3	H	A	
<b>Mid Ch, 5785MHz</b>													
11.570	3.0	39.4	38.1	9.5	-32.5	0.0	0.0	54.5	74.0	-19.5	V	P	
11.570	3.0	26.9	38.1	9.5	-32.5	0.0	0.0	42.0	54.0	-12.0	V	A	
11.570	3.0	37.8	38.1	9.5	-32.5	0.0	0.0	52.9	74.0	-21.1	H	P	
11.570	3.0	25.0	38.1	9.5	-32.5	0.0	0.0	40.1	54.0	-13.9	H	A	
<b>High Ch, 5825MHz</b>													
11.650	3.0	38.2	38.2	9.6	-32.5	0.0	0.0	53.4	74.0	-20.6	V	P	
11.650	3.0	26.2	38.2	9.6	-32.5	0.0	0.0	41.4	54.0	-12.6	V	A	
11.650	3.0	35.8	38.2	9.6	-32.5	0.0	0.0	51.0	74.0	-23.0	H	P	
11.650	3.0	23.9	38.2	9.6	-32.5	0.0	0.0	39.1	54.0	-14.9	H	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

### 8.3. WORST-CASE BELOW 1 GHz

#### 2.4GHz BAND SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)



**2.4GHz BAND SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**



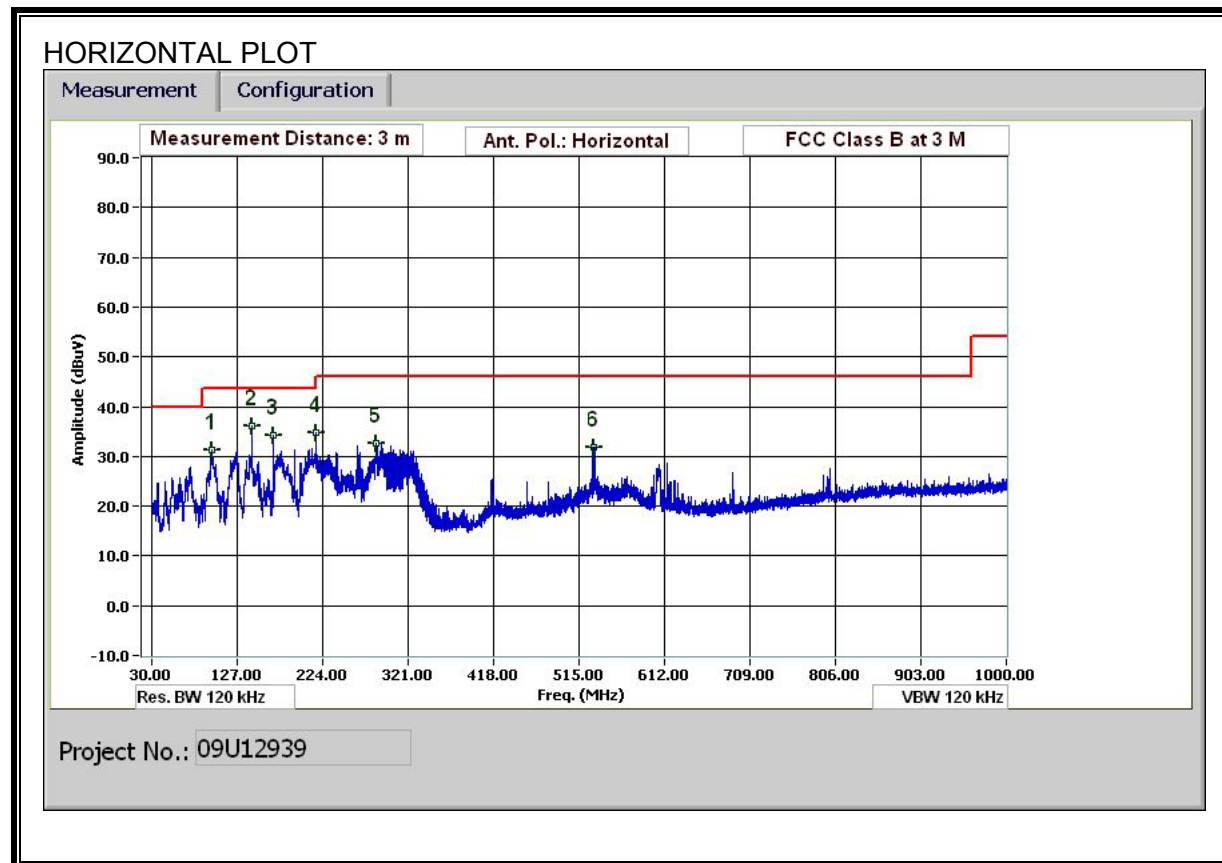
**30-1000MHz Frequency Measurement**  
**Compliance Certification Services, Fremont 5m Chamber**

Test Engr: Chin Pang  
Date: 12/28/09  
Project #: 09U12939  
Company: Broadcom  
EUT Description: 802.11ag/Draft 802.11n WLAN PCI-E Minicard  
EUT M/N: BCM943224HMS  
Test Target: FCC Class B  
Mode Oper: TX, 2.4GHz ( Worst Case)

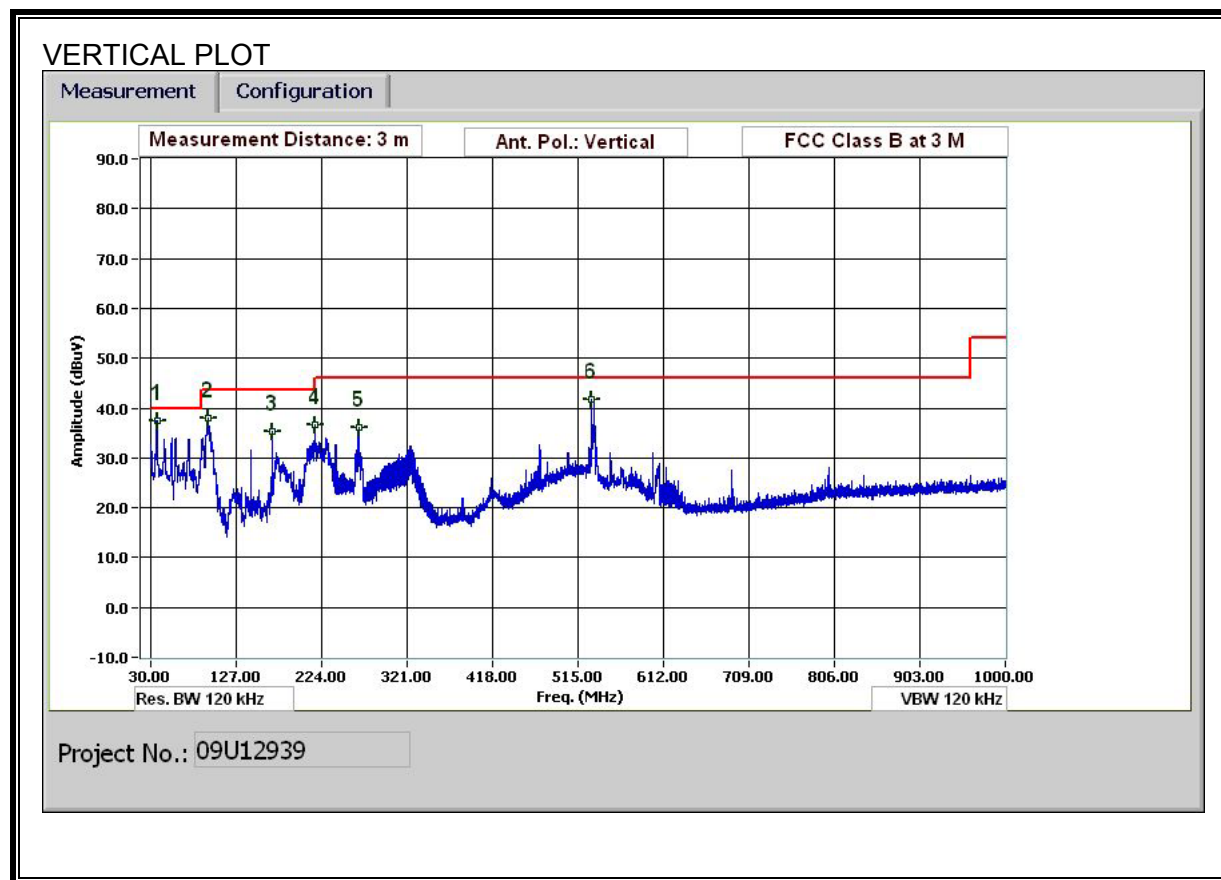
f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filter dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
180.246	3.0	42.7	10.8	1.1	27.5	0.0	0.0	27.1	43.5	-16.4	V	P	
300.491	3.0	41.8	13.5	1.5	27.4	0.0	0.0	29.4	46.0	-16.6	V	P	
399.975	3.0	44.4	15.0	1.7	28.0	0.0	0.0	33.2	46.0	-12.8	V	P	
456.018	3.0	43.5	16.0	1.9	28.4	0.0	0.0	33.0	46.0	-13.0	V	P	
553.102	3.0	38.2	17.7	2.1	28.6	0.0	0.0	29.3	46.0	-16.7	V	P	
181.926	3.0	43.6	10.9	1.1	27.5	0.0	0.0	28.1	43.5	-15.4	H	P	
296.891	3.0	41.5	13.4	1.5	27.4	0.0	0.0	29.0	46.0	-17.0	H	P	
399.975	3.0	43.3	15.0	1.7	28.0	0.0	0.0	32.1	46.0	-13.9	H	P	
606.984	3.0	36.7	18.5	2.2	28.6	0.0	0.0	28.8	46.0	-17.2	H	P	
743.309	3.0	38.2	19.8	2.5	28.4	0.0	0.0	32.0	46.0	-14.0	H	P	
807.872	3.0	38.5	21.0	2.6	28.2	0.0	0.0	33.8	46.0	-12.2	H	P	

**5GHz BAND SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**



**5GHz BAND SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**



**30-1000MHz Frequency Measurement**  
**Compliance Certification Services, Fremont 5m Chamber**

Test Engr: Chin Pang  
Date: 12/28/09  
Project #: 09U12939  
Company: Broadcom  
EUT Description: 802.11ag/Draft 802.11n WLAN PCI-E Minicard  
EUT M/N: BCM943224HMS  
Test Target: FCC Class B  
Mode Oper: TX ( Worsat Case), 5GHz Band

f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f	Dist	Read	AF	CL	Amp	D Corr	Filter	Corr.	Limit	Margin	Ant. Pol.	Det.	Notes
MHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
36.840	3.0	49.3	16.0	0.5	28.4	0.0	0.0	37.4	40.0	-2.6	V	P	
36.840	3.0	47.1	16.0	0.5	28.4	0.0	0.0	34.5	40.0	-5.5	V	QP	
94.803	3.0	57.1	8.3	0.8	28.2	0.0	0.0	38.0	43.5	-5.5	V	P	
168.006	3.0	50.4	11.6	1.1	27.6	0.0	0.0	35.4	43.5	-8.1	V	P	
216.008	3.0	50.9	11.9	1.2	27.4	0.0	0.0	36.7	46.0	-9.3	V	P	
265.810	3.0	49.8	12.3	1.4	27.4	0.0	0.0	36.1	46.0	-9.9	V	P	
530.421	3.0	51.0	17.3	2.0	28.6	0.0	0.0	41.7	46.0	-4.3	V	P	
98.643	3.0	49.6	9.1	0.8	28.2	0.0	0.0	31.2	43.5	-12.3	H	P	
143.885	3.0	49.9	12.9	1.0	27.9	0.0	0.0	36.0	43.5	-7.5	H	P	
168.006	3.0	49.1	11.6	1.1	27.6	0.0	0.0	34.1	43.5	-9.4	H	P	
216.008	3.0	49.2	11.9	1.2	27.4	0.0	0.0	34.9	46.0	-11.1	H	P	
285.371	3.0	45.7	13.0	1.4	27.4	0.0	0.0	32.7	46.0	-13.3	H	P	
531.021	3.0	41.1	17.3	2.0	28.6	0.0	0.0	31.8	46.0	-14.2	H	P	