FCC CFR47 PART 15 SUBPART E
CLASS II PERMISSIVE CHANGE

CERTIFICATION TEST REPORT

FOR

802.11ag/Draft 802.11n WLAN PCI-E Minicard
(Installed inside HP Laptop HSTNN-W82C)

MODEL NUMBER: BCM943224HMS

FCC ID: QDS-BRCM1041
IC: 4324A-BRCM1041

REPORT NUMBER: 10U13561-2

ISSUE DATE: MARCH 31, 2011

Prepared for

BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A.

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	03/31/2011	Initial Issue	T. Chan

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	BROADCOM CORPORATION 190 MATHILDA PLACE SUNNYVALE, CA 94086, USA
EUT DESCRIPTION:	802.11ag/Draft 802.11n WLAN PCI-E Minicard (Installed inside of HP Tablet HSTNN-W82C)
MODEL:	BCM943224HMS
SERIAL NUMBER:	ABC04490071
DATE TESTED:	JANUARY 08 TO MARCH 28, 2011

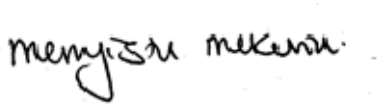
APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass

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

Tested By:



MENGISTU MEKURIA
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, and FCC 06-96.

3. FACILITIES AND ACCREDITATION

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

UL 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 an 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, 5.6GHz band low and high channels must be reduced from the peak output powers as table shown below:

Frequency Channel (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5500	802.11a	15.41	34.75
5700	802.11a	14.09	25.64
5500	802.11n HT20	13.77	23.82
5700	802.11n HT20	13.08	20.32
5510	802.11n HT40	10.38	10.91
5670	802.11n HT40	14.29	26.85

5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding portable platform, HSTNN-W82C.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an 802.11a WLAN antenna, with a maximum gain of 3.4 dBi.

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, wl_tool, ver. 5.100.RC82.34.

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:

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

The tests were performed on worst-case channel with highest antennas gain on HP laptop @ 2.4GHz and 5GHz Bands.

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

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	HP	OUTFIELD SI-2	ABC0490071	DoC
Adapter Board	HP	PPP-009H	F1-09083224330A	N/A

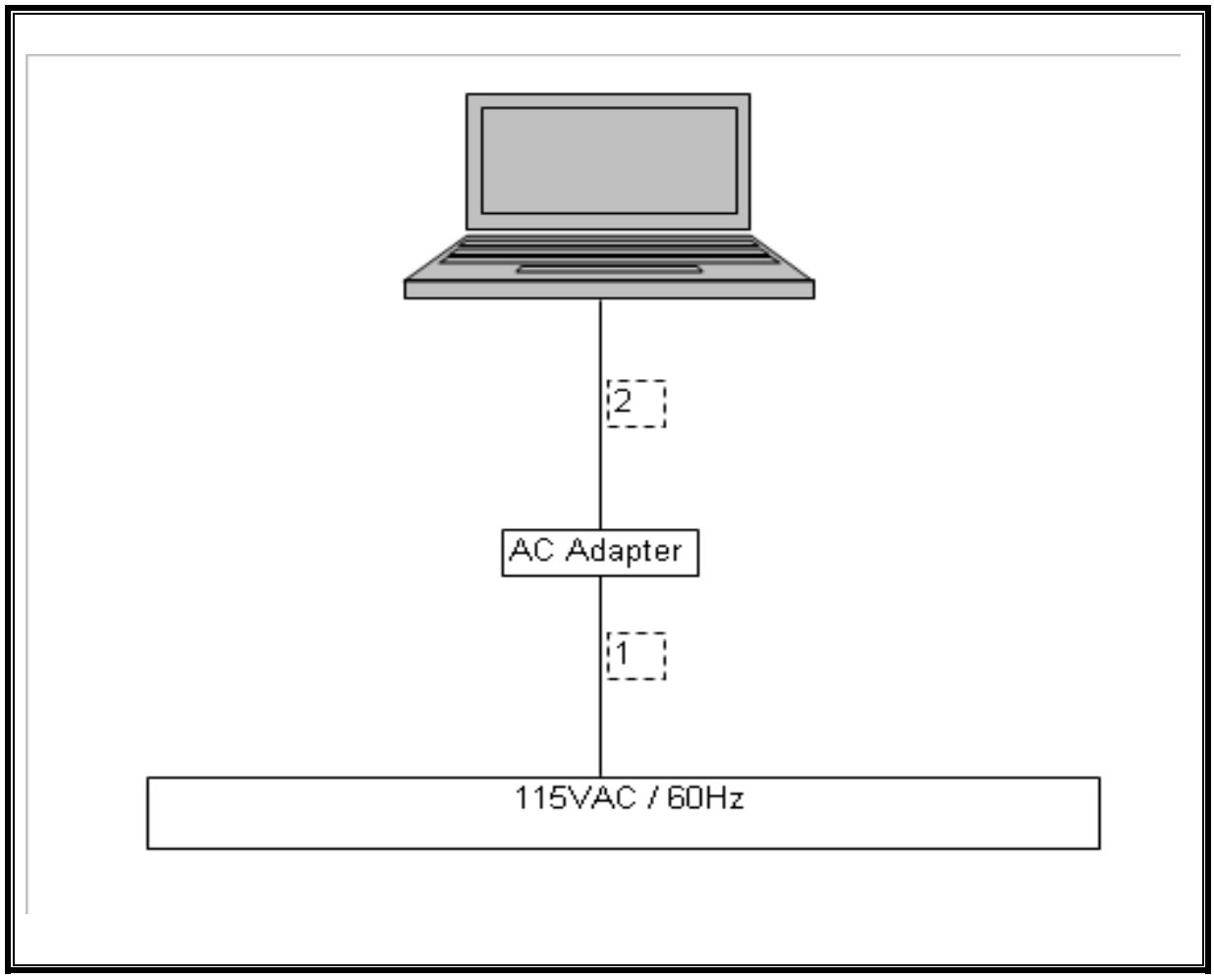
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	AC	Unshielded	2.0 m	N/A
2	DC	1	DC	Unshielded	2.0 m	N/A

TEST SETUP

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

SETUP DIAGRAM



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	08/10/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01171	07/12/11
Antenna, Horn, 18 GHz	EMCO	3115	C00872	06/29/11
Antenna, Horn, 26.5 GHz	ARA	SWH-28	C01015	06/25/11
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/08/11
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	07/15/11
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	01/27/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	07/14/11
Power Meter	Agilent / HP	437B	N02778	08/11/12
Power Senser	Agilent / HP	8481A	N02784	07/28/11

7. ANTENNA PORT TEST RESULTS

7.1. 802.11a MODE IN THE 5.6 GHz BAND

7.1.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

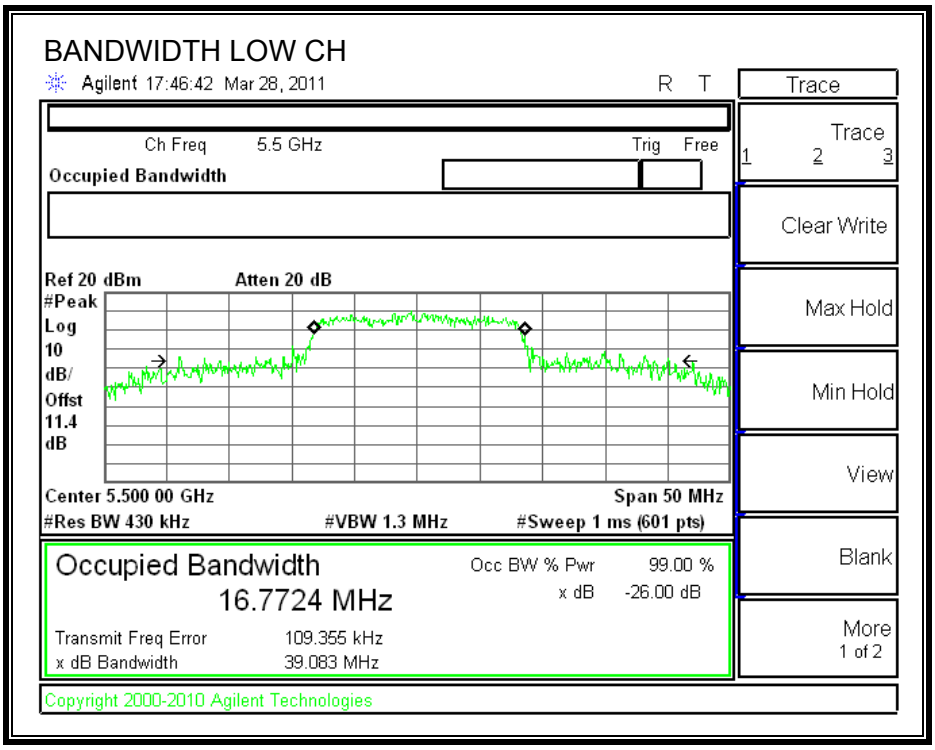
TEST PROCEDURE

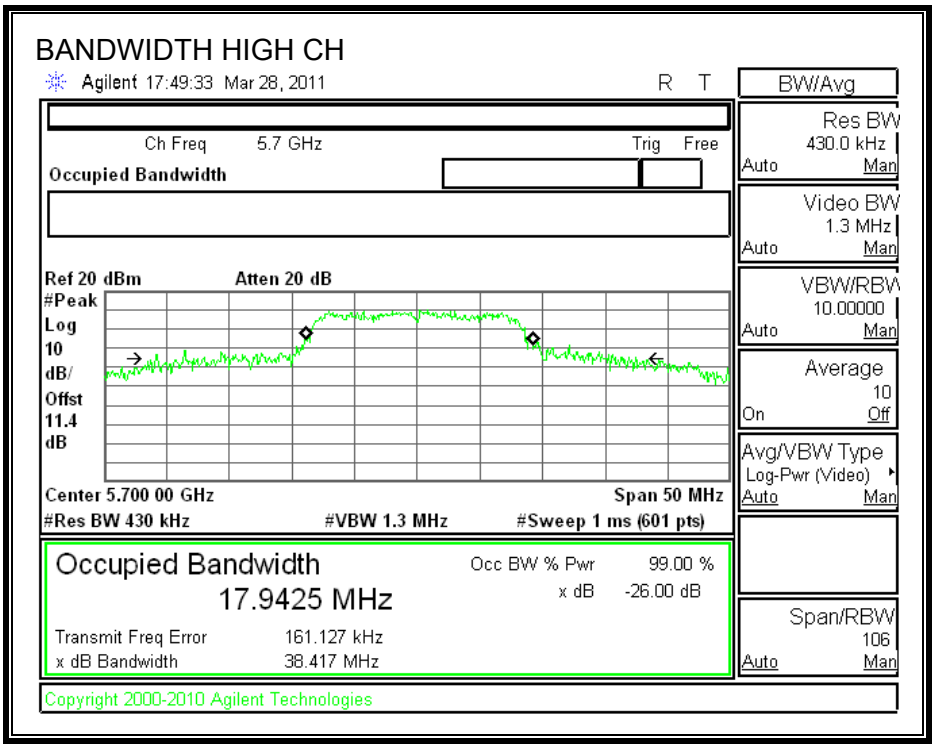
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	39.083
High	5700	38.417

26 dB BANDWIDTH





7.1.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.47-5.725 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

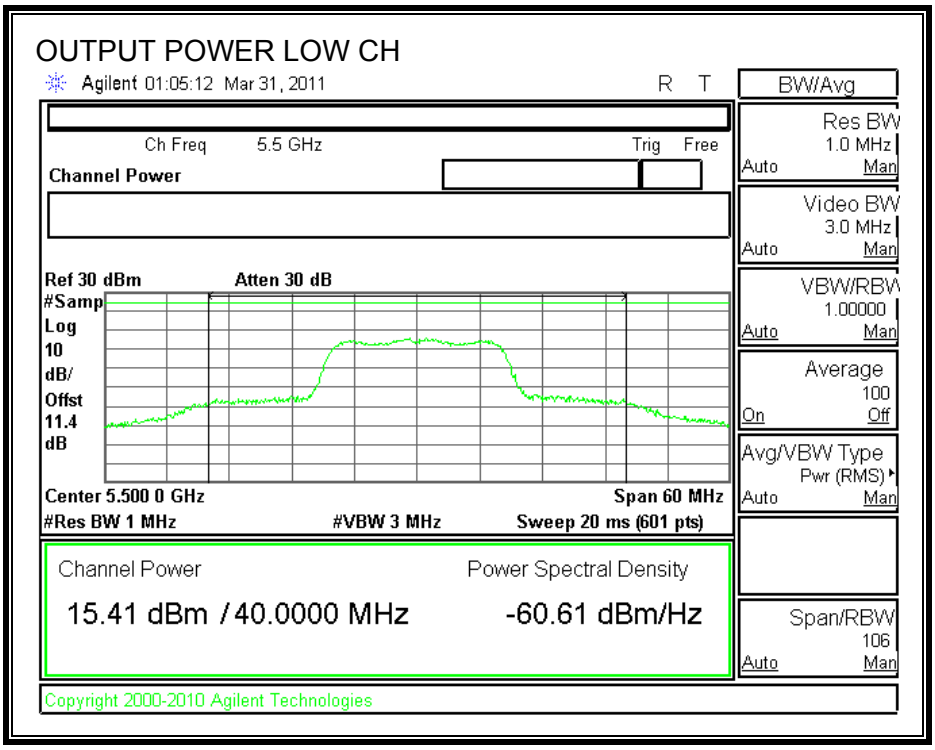
Limit

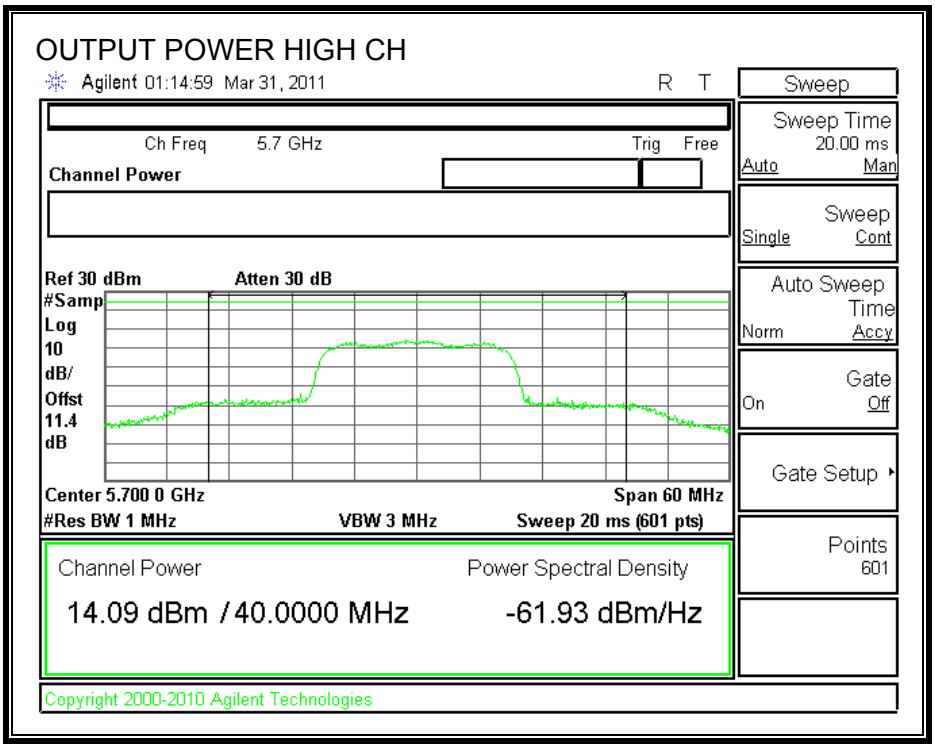
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5500	24	39.083	26.92	3.40	24.00
High	5700	24	38.417	26.85	3.40	24.00

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5500	15.41	24.00	-8.59
High	5700	14.09	24.00	-9.91

OUTPUT POWER





7.2. 802.11a HT20 MODE IN THE 5.6 GHz BAND

7.2.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

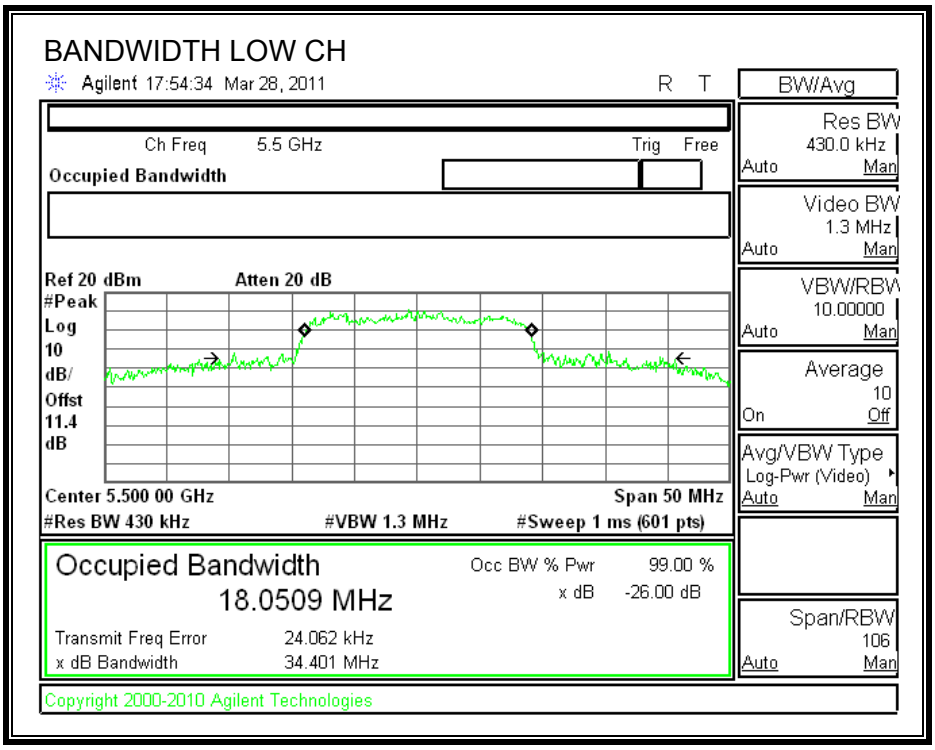
TEST PROCEDURE

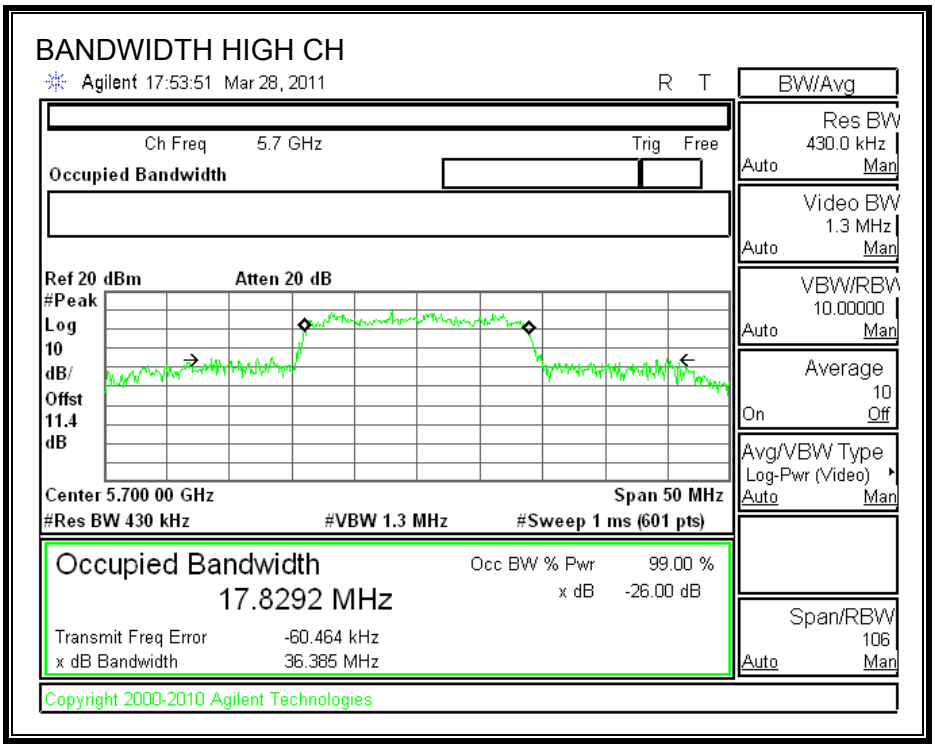
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	34.401
High	5700	36.385

26 dB BANDWIDTH





7.2.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.47-5.725 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

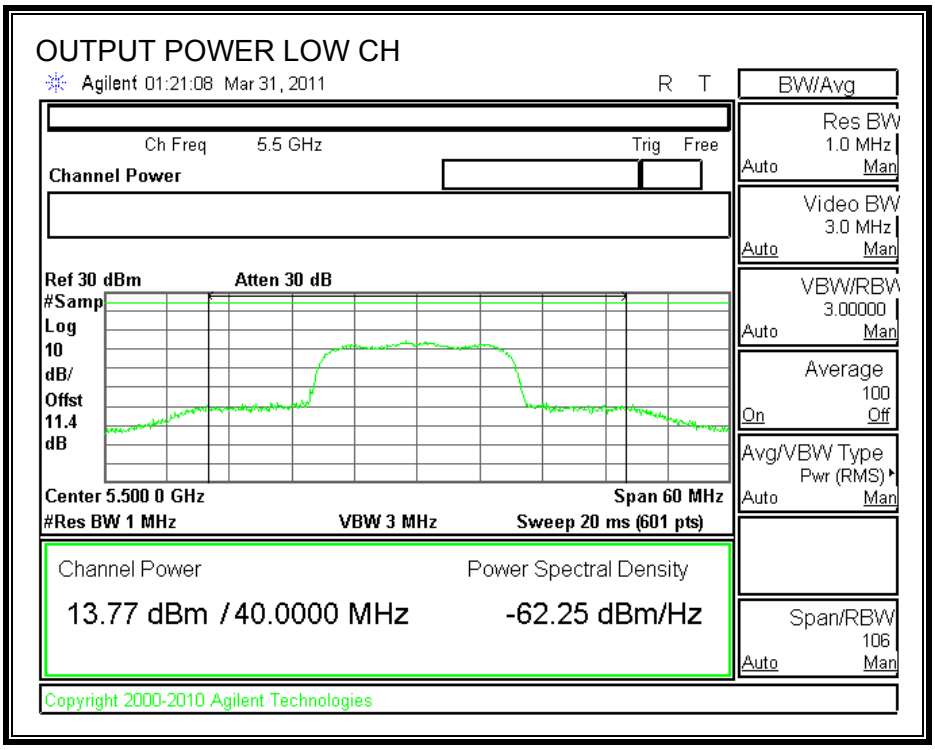
Limit

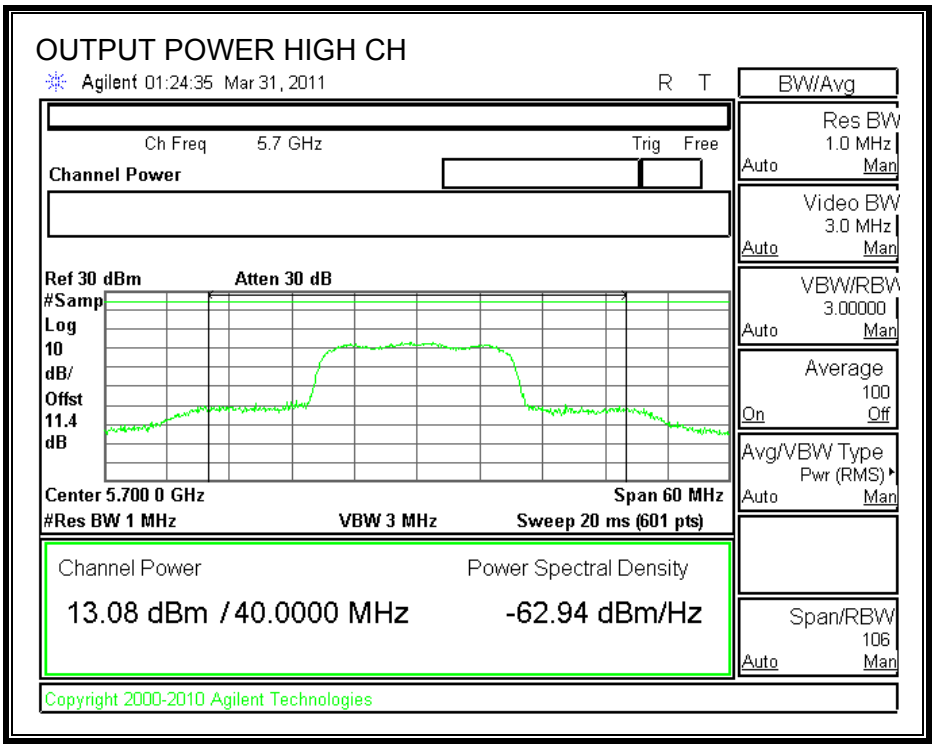
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5500	24	34.401	26.37	3.40	24.00
High	5700	24	36.385	26.61	3.40	24.00

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5500	13.77	24.00	-10.23
High	5700	13.08	24.00	-10.92

OUTPUT POWER





7.3. 802.11a HT40 MODE IN THE 5.6 GHz BAND

7.3.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

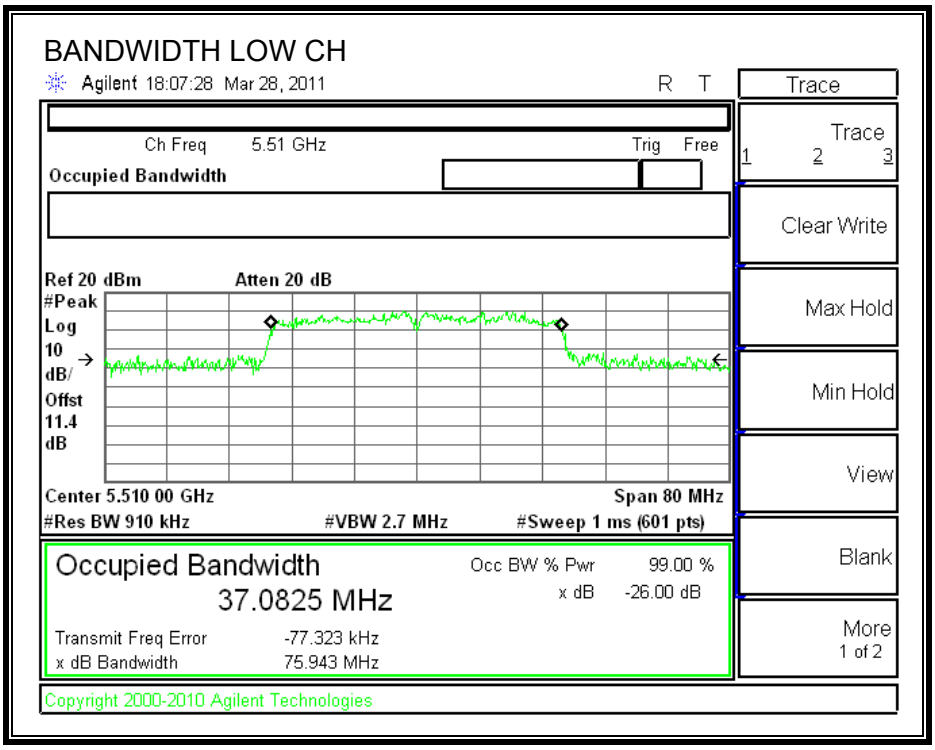
TEST PROCEDURE

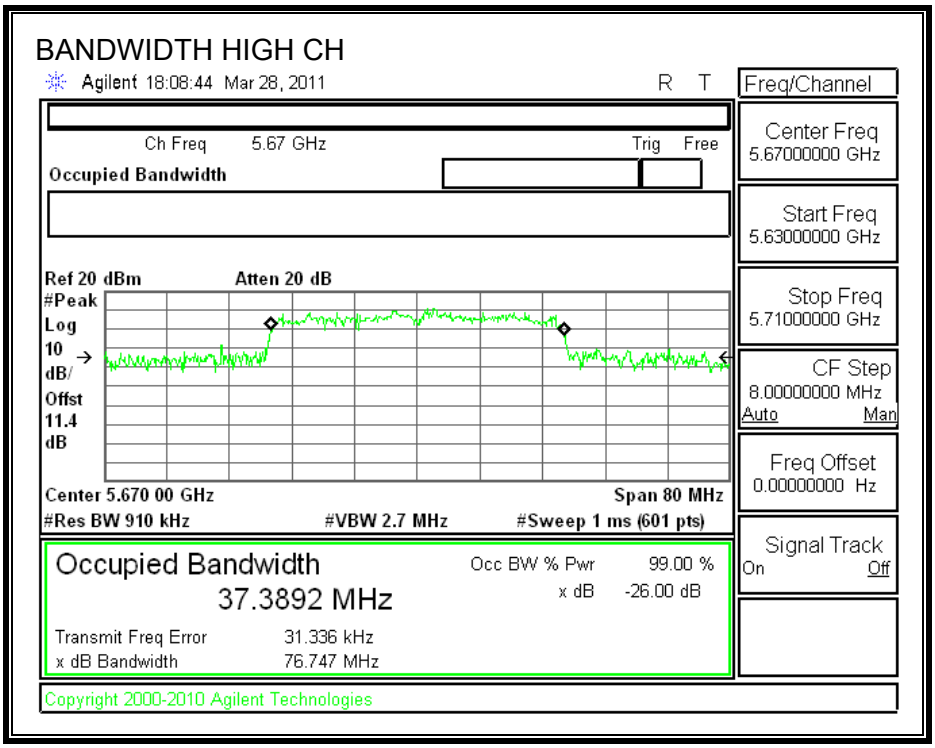
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	75.943
High	5700	76.747

26 dB BANDWIDTH





7.3.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.47-5.725 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

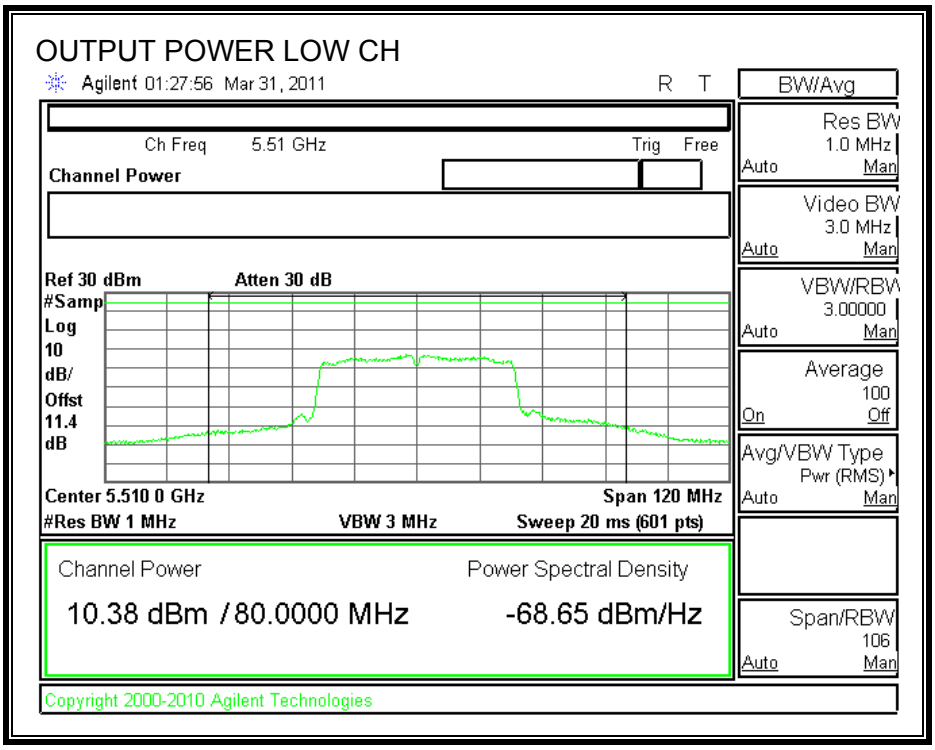
Limit

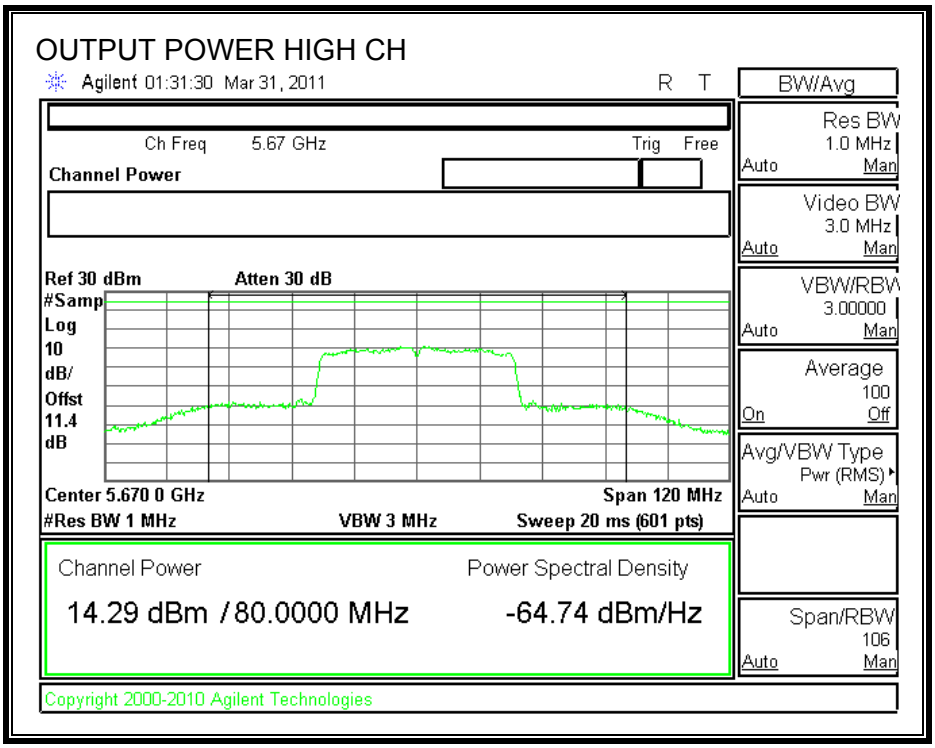
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5510	24	75.943	29.80	3.40	24.00
High	5670	24	76.747	29.85	3.40	24.00

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5510	10.38	24.00	-13.62
High	5670	14.29	24.00	-9.71

OUTPUT POWER





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.

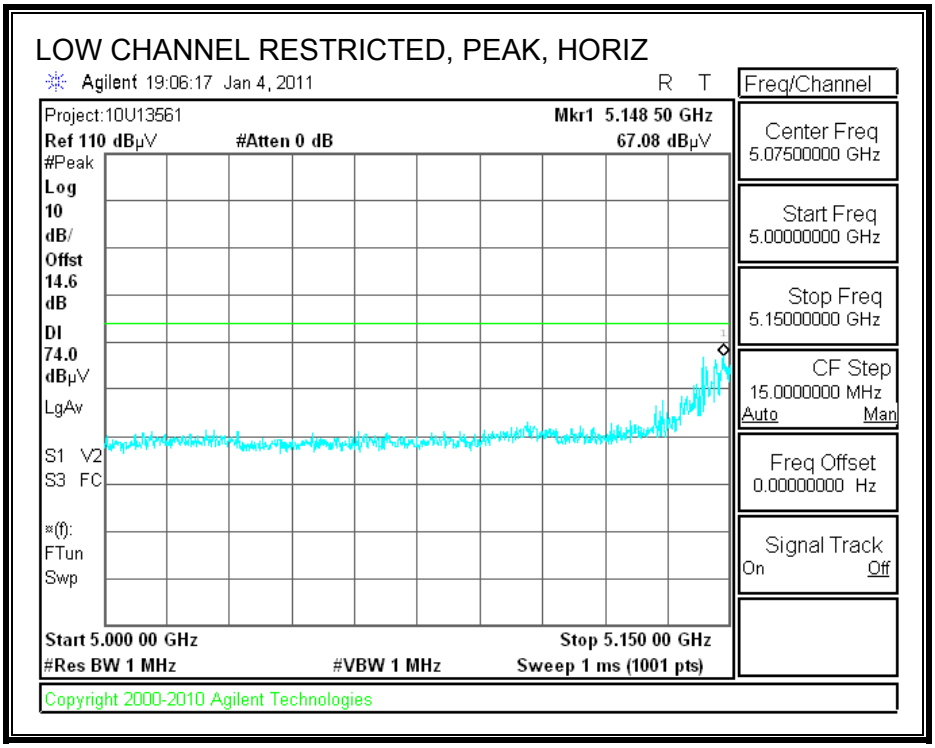
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

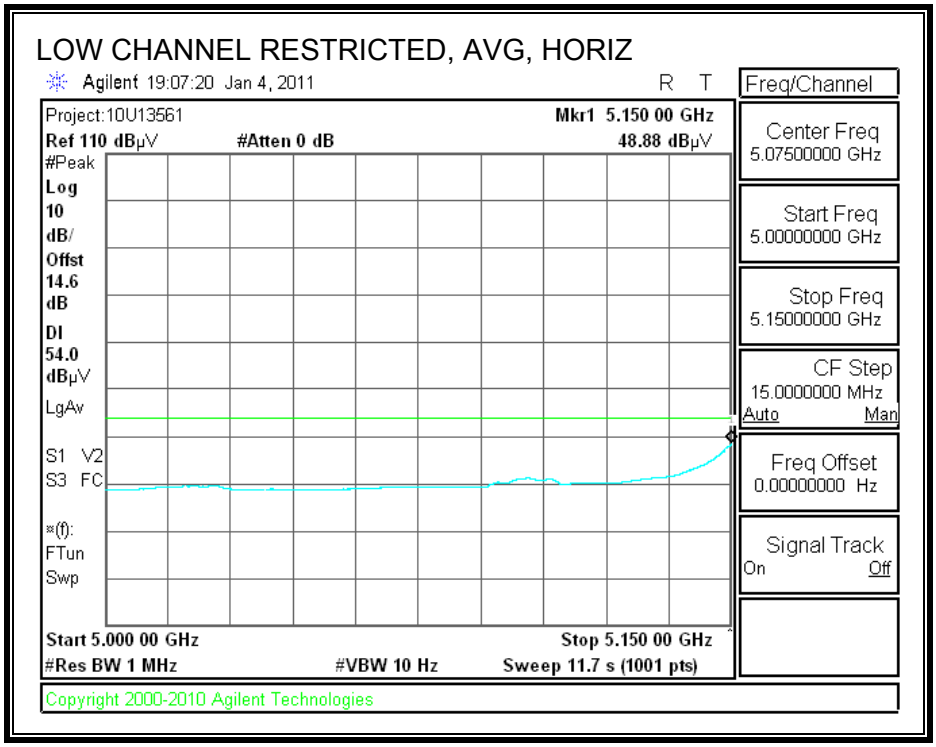
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

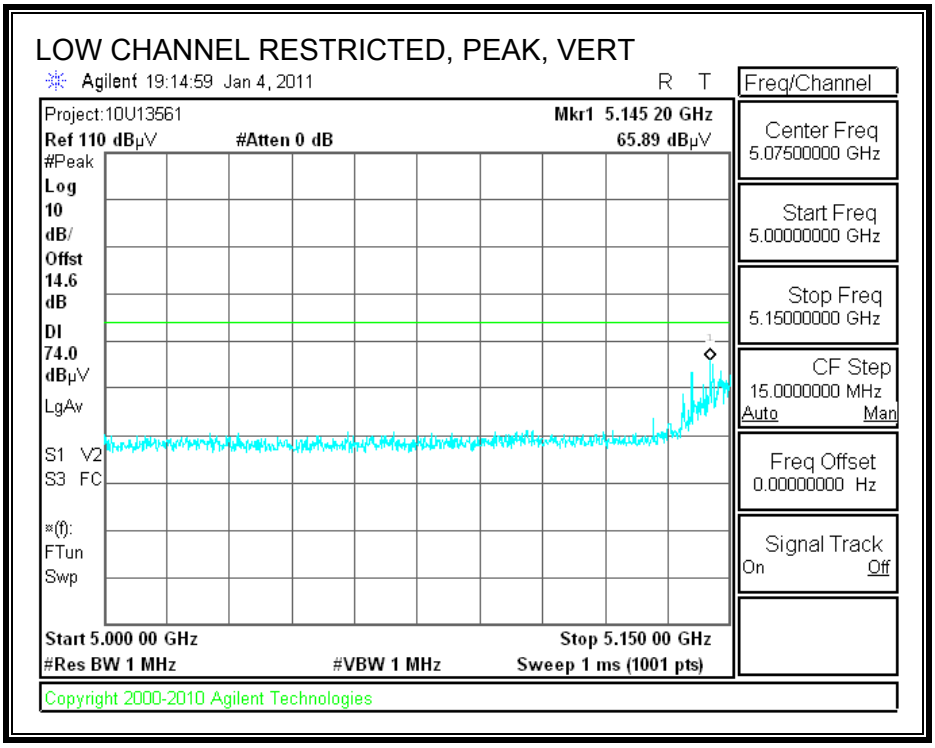
8.2.1. 802.11a MODE IN THE LOWER 5.2 GHz BAND

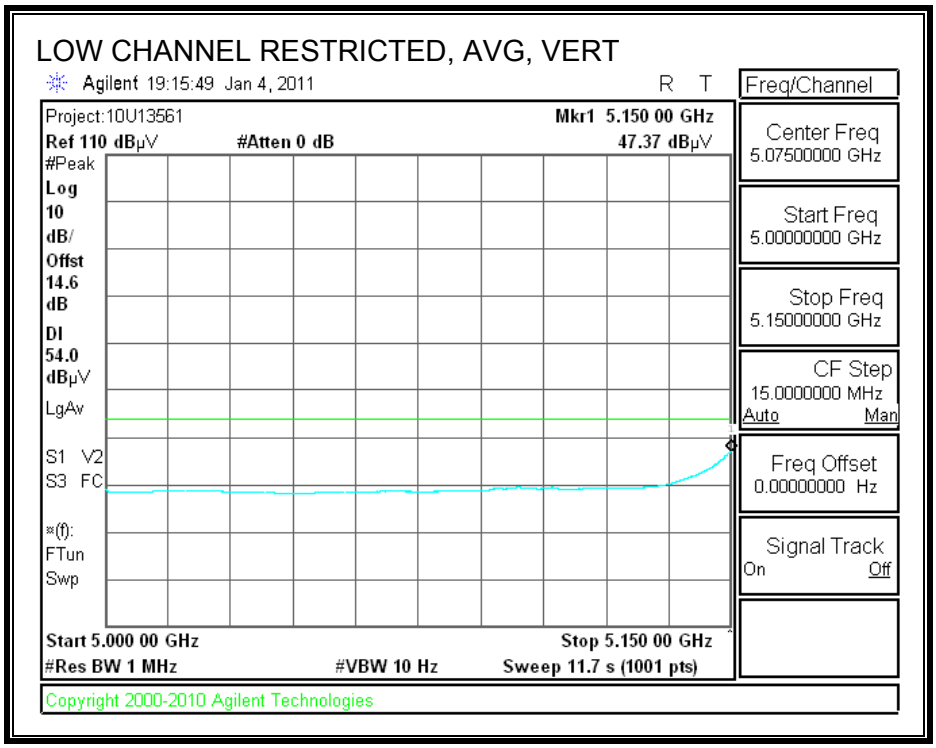
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





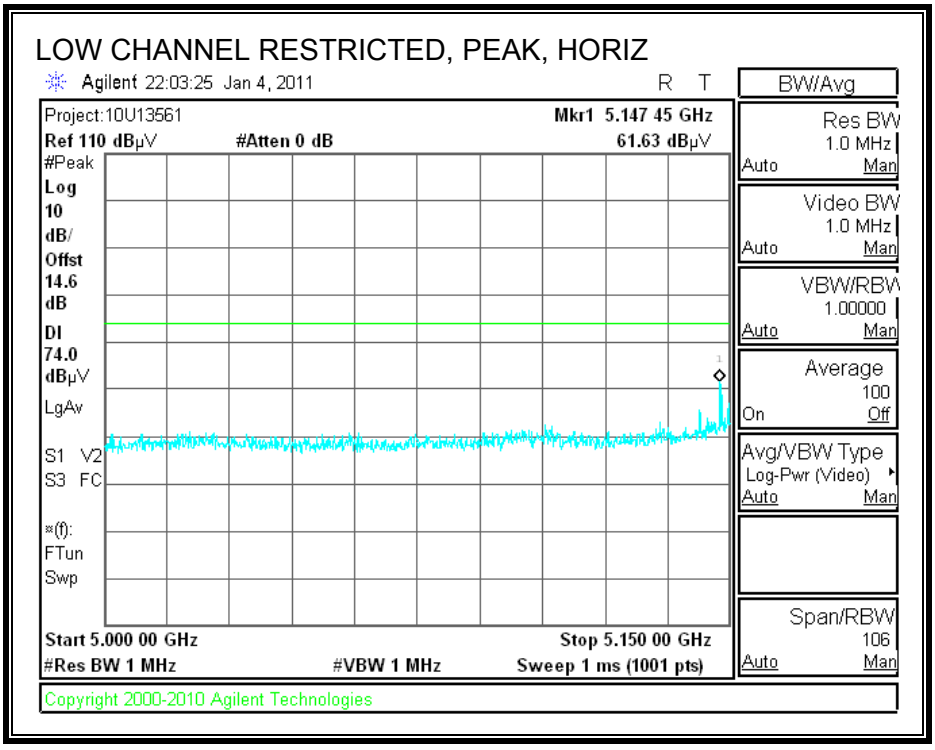
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

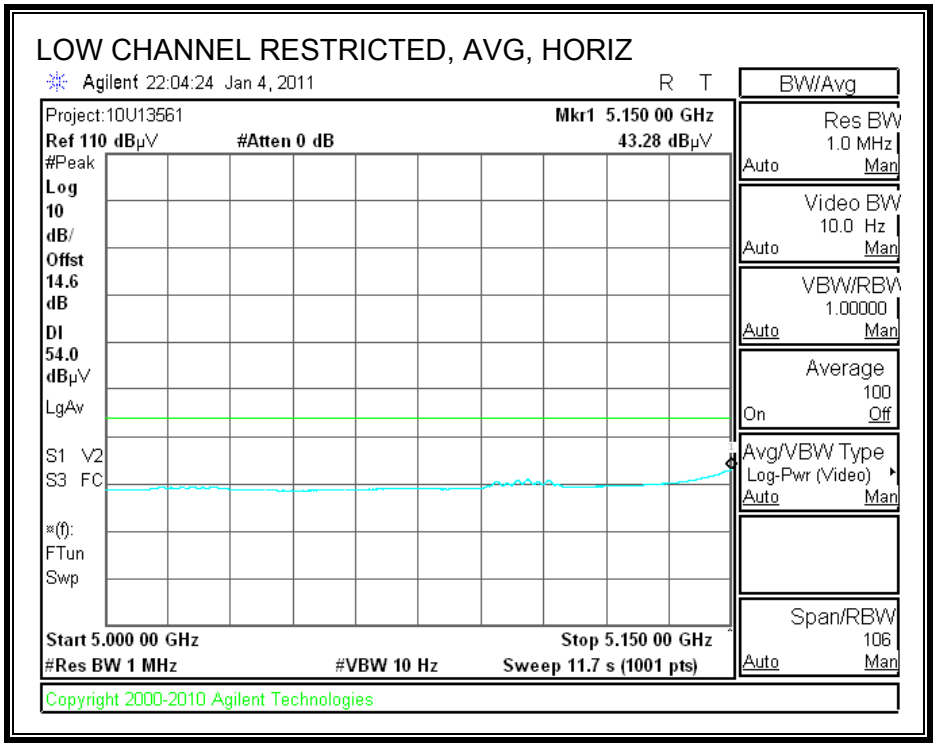




8.2.2. 802.11n HT20 MODE IN THE LOWER 5.2 GHz BAND

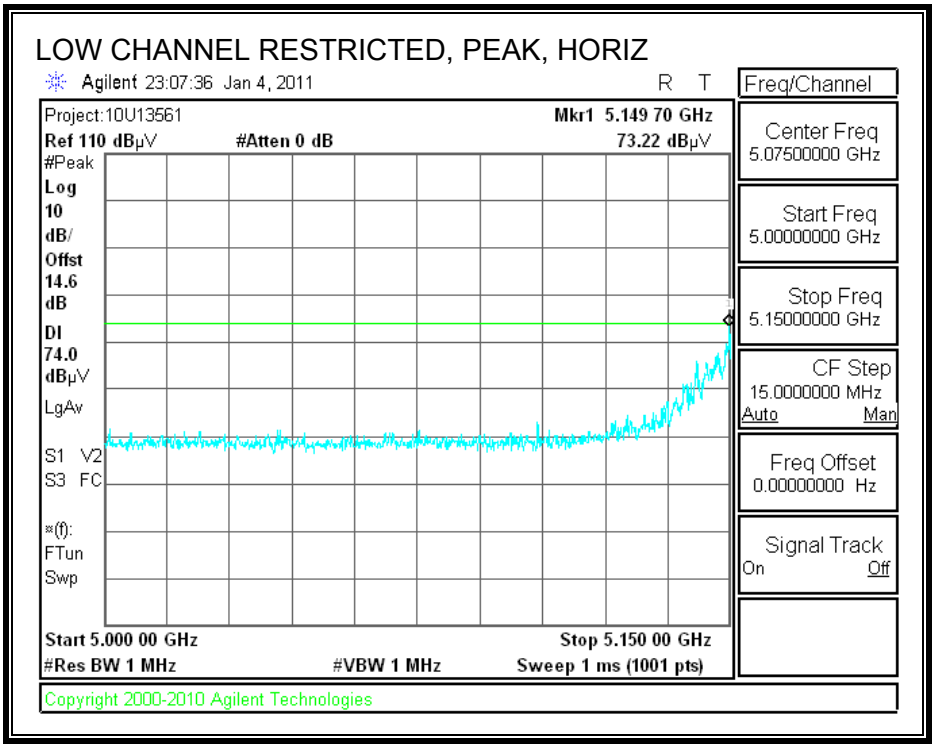
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

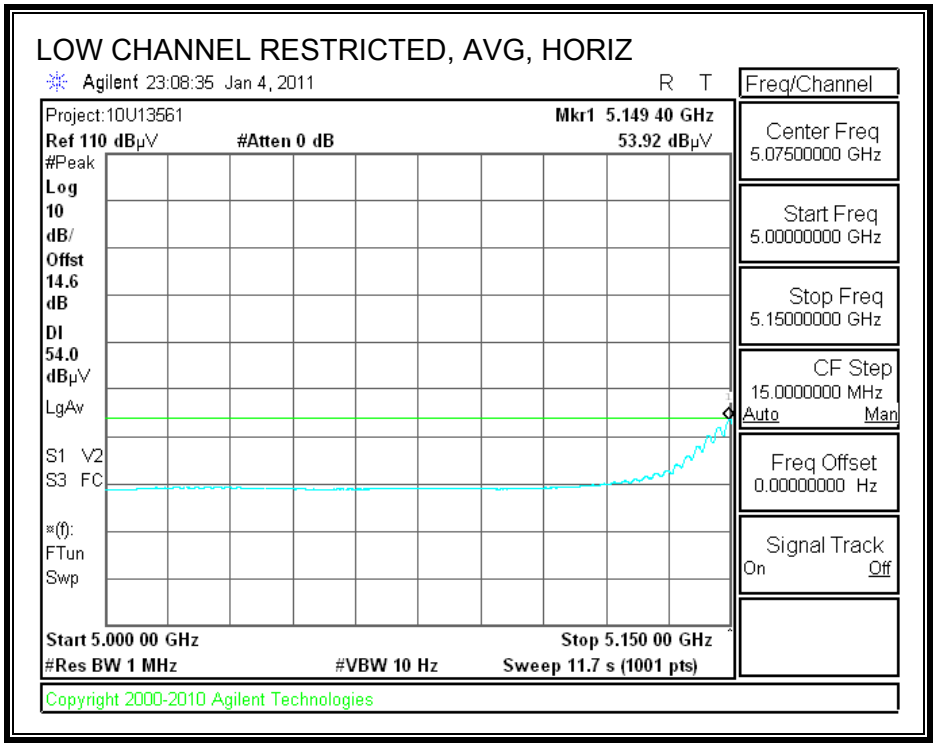




8.2.3. 802.11n HT40 MIMO MCS0 MODE IN THE LOWER 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





WORST CASE - 5.2 GHz BAND - HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: BROADCOM
Project #: 10U13561
Date: 1/9/2011
Test Engineer: MENGISTU MEKURIA
Configuration: EUT INSIDE HP TABLET LAPTOP
Mode: TX, 5.2 GHz, LEGACY MODE

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T59; S/N: 3245 @3m	T145 Agilent 3008A005(		T125; ARA 18-26GHz; S/N:1007	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_002

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

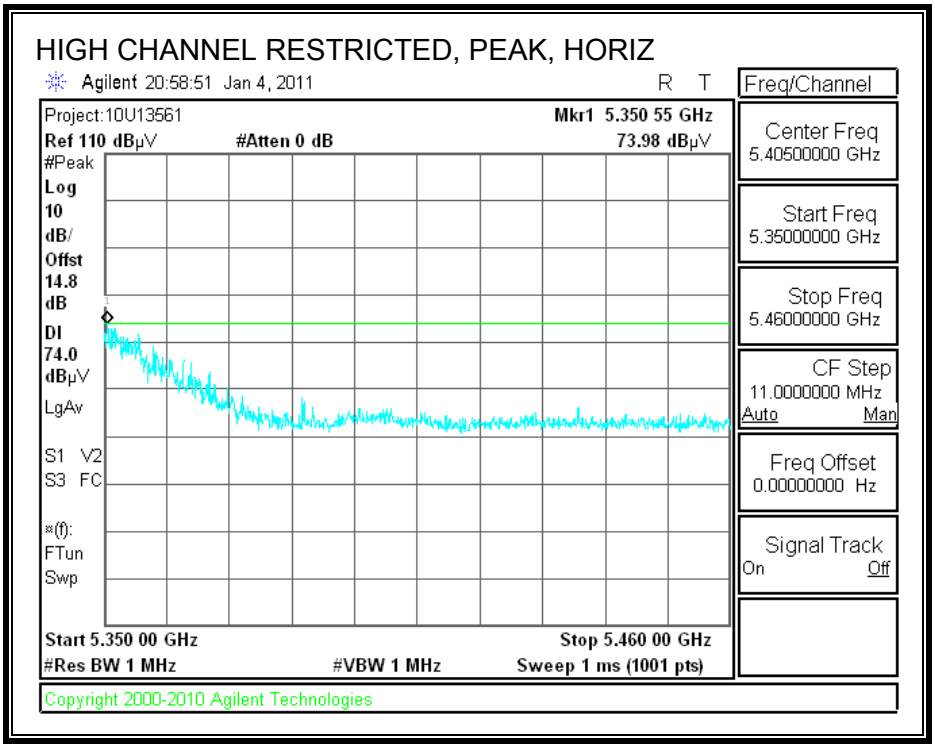
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
LOW CHANNEL (5180.0 MHz)															
15.540	3.0	36.1	23.2	38.9	11.3	-32.3	0.0	0.0	54.0	41.1	74	54	-20.0	-12.9	V
15.540	3.0	37.5	23.1	38.9	11.3	-32.3	0.0	0.0	55.4	41.1	74	54	-18.6	-12.9	H

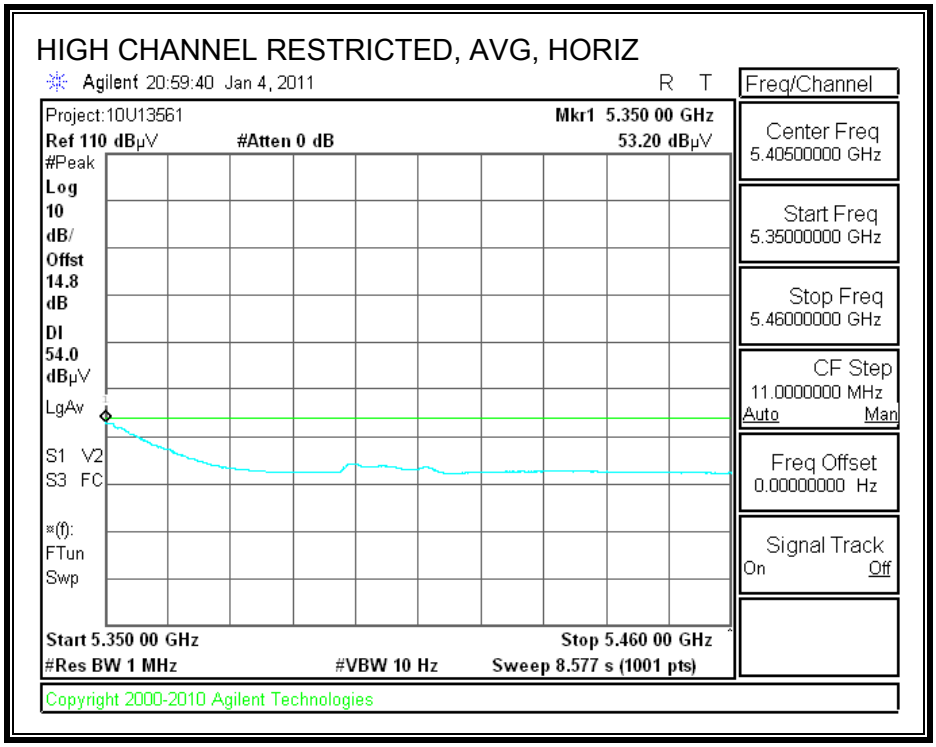
Rev. 07.22.09

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

8.2.4. 802.11a MODE IN THE UPPER 5.3 GHz BAND

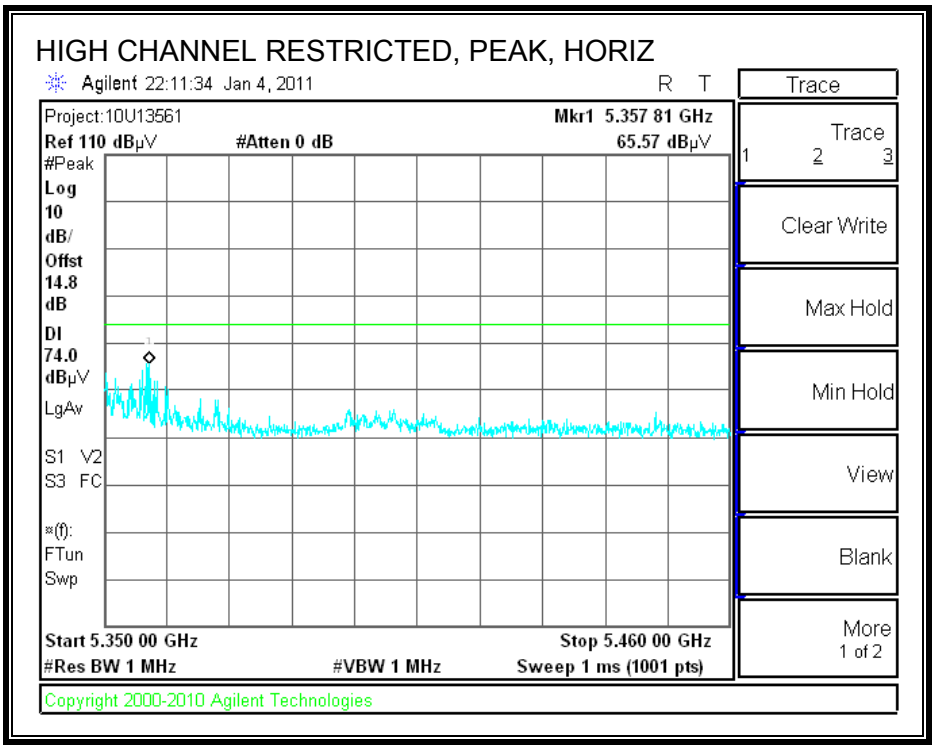
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

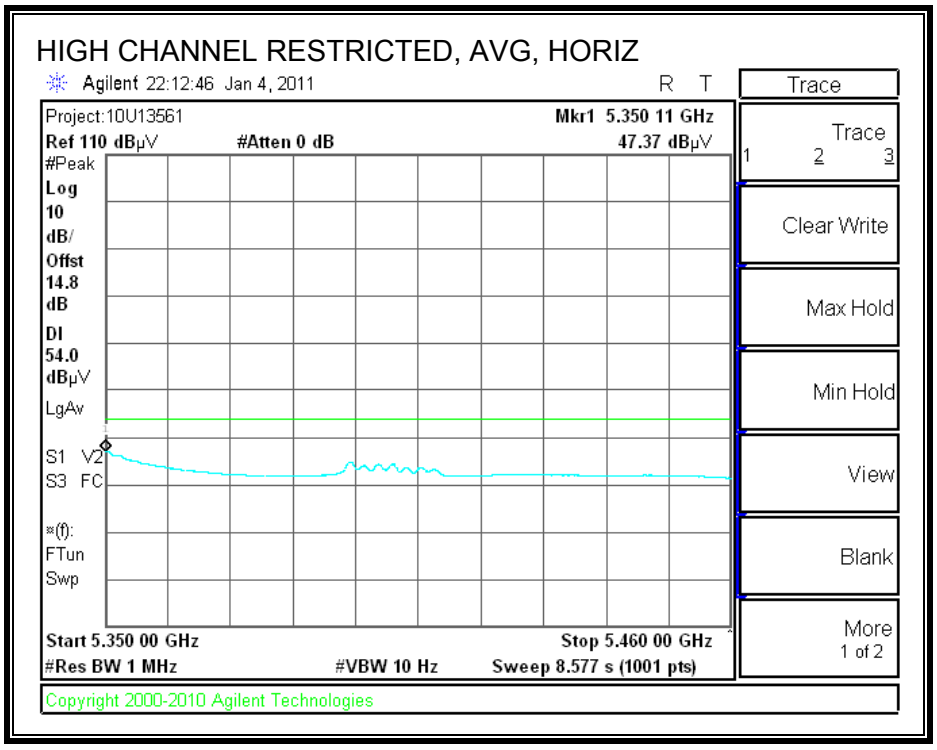




8.2.5. 802.11n HT20 MODE IN THE UPPER 5.3 GHz BAND

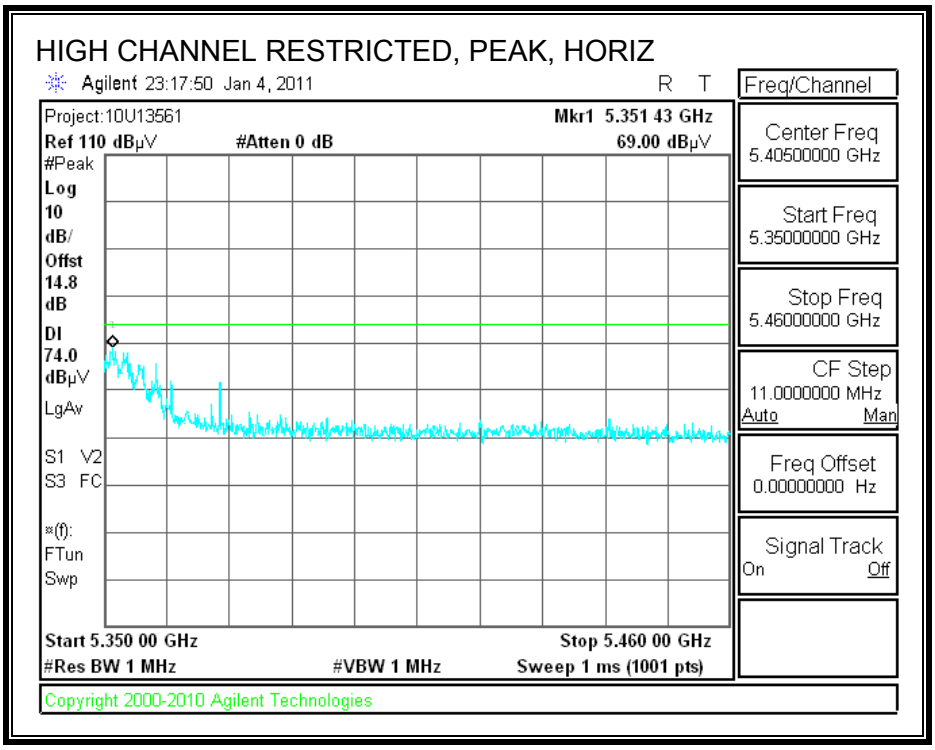
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

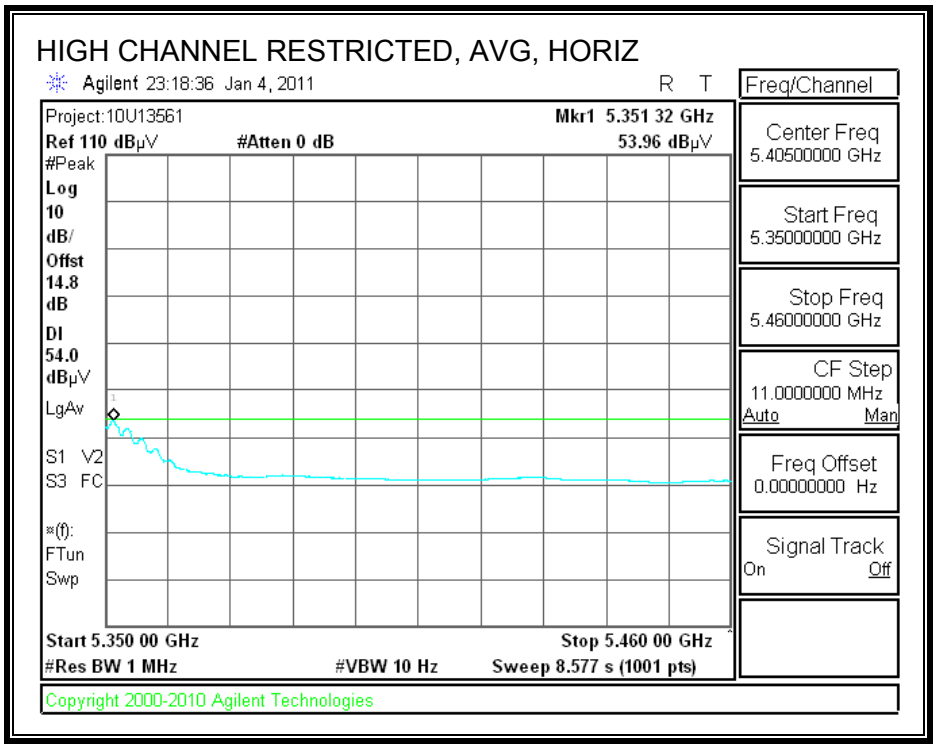




8.2.6. 802.11n HT40 MIMO MCS0 MODE IN THE UPPER 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





WORST CASE - 5.3 GHz BAND - HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: BROADCOM
Project #: 10U13561
Date: 1/9/2011
Test Engineer: MENGISTU MEKURIA
Configuration: EUT INSIDE HP TABLET LAPTOP
Mode: TX, 5.3 GHz, LEGACY MODE

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T59; S/N: 3245 @3m	T145 Agilent 3008A005		T125; ARA 18-26GHz; S/N:1007	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_002

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
LOW CHANNEL (5260.0 MHz)															
15.780	3.0	37.3	25.0	38.2	11.5	-32.2	0.0	0.0	54.7	42.4	74	54	-19.3	-11.6	V
15.780	3.0	36.2	24.2	38.2	11.5	-32.2	0.0	0.0	53.7	41.7	74	54	-20.3	-12.3	H
MID CHANNEL (5300.0 MHz)															
10.600	3.0	43.5	30.5	37.5	9.0	-34.3	0.0	0.0	55.8	42.8	74	54	-18.2	-11.2	V
15.900	3.0	39.6	27.1	37.9	11.5	-32.2	0.0	0.0	56.8	44.3	74	54	-17.2	-9.7	V
10.600	3.0	40.2	26.5	37.5	9.0	-34.3	0.0	0.0	52.5	38.8	74	54	-21.5	-15.2	H
15.900	3.0	36.5	24.5	37.9	11.5	-32.2	0.0	0.0	53.7	41.7	74	54	-20.3	-12.3	H
HI CHANNEL (5320.0 MHz)															
10.640	3.0	42.4	29.5	37.6	9.1	-34.2	0.0	0.0	54.7	41.9	74	54	-19.3	-12.1	V
15.960	3.0	38.3	26.1	37.7	11.5	-32.2	0.0	0.0	55.4	43.2	74	54	-18.6	-10.8	V
10.640	3.0	40.1	26.9	37.6	9.1	-34.2	0.0	0.0	52.4	39.2	74	54	-21.6	-14.8	H
15.960	3.0	36.6	24.3	37.7	11.5	-32.2	0.0	0.0	53.7	41.4	74	54	-20.3	-12.6	H

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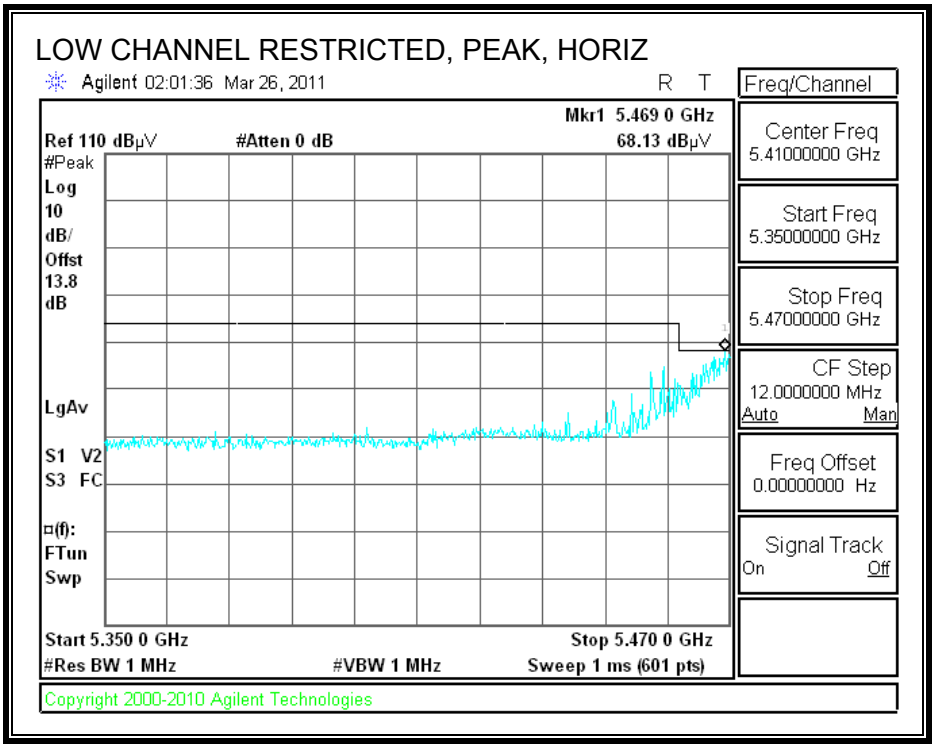
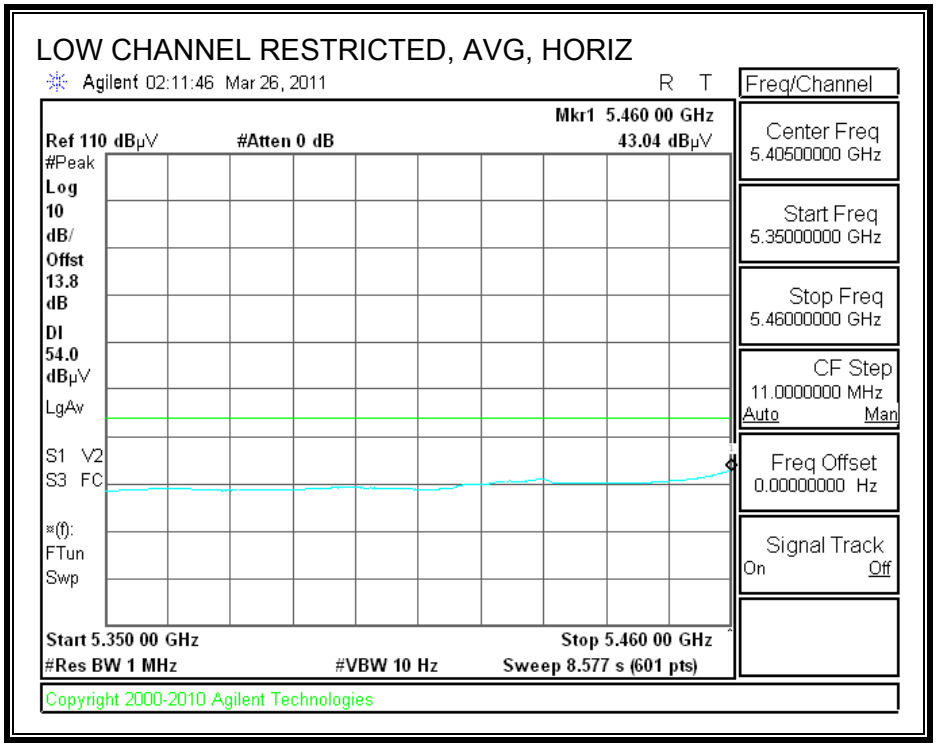
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

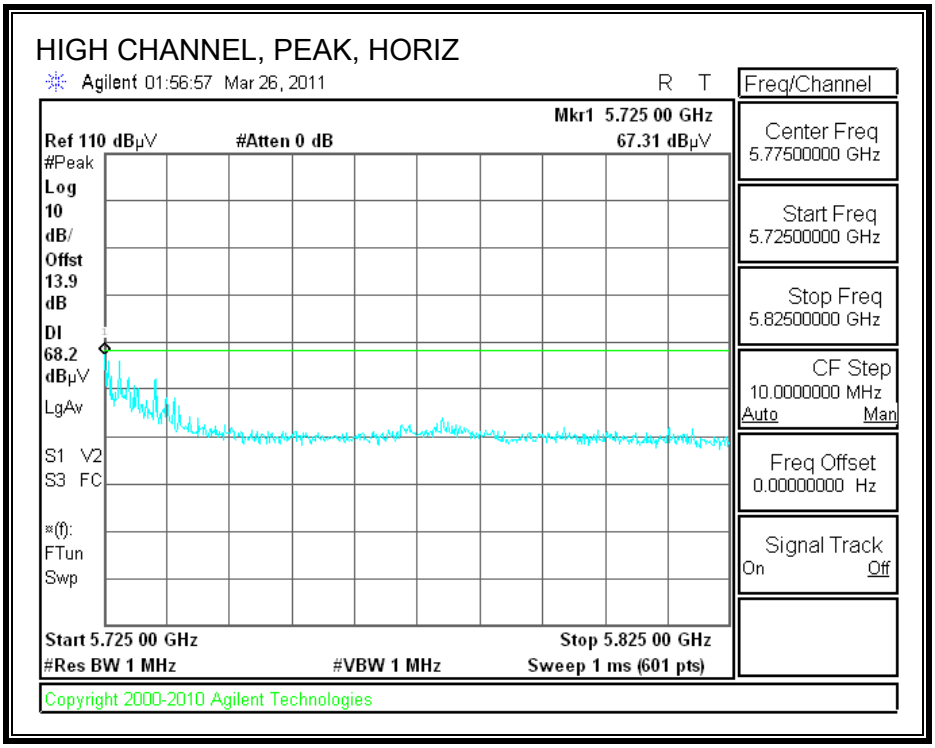
8.2.7. 802.11a MODE IN THE 5.6 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



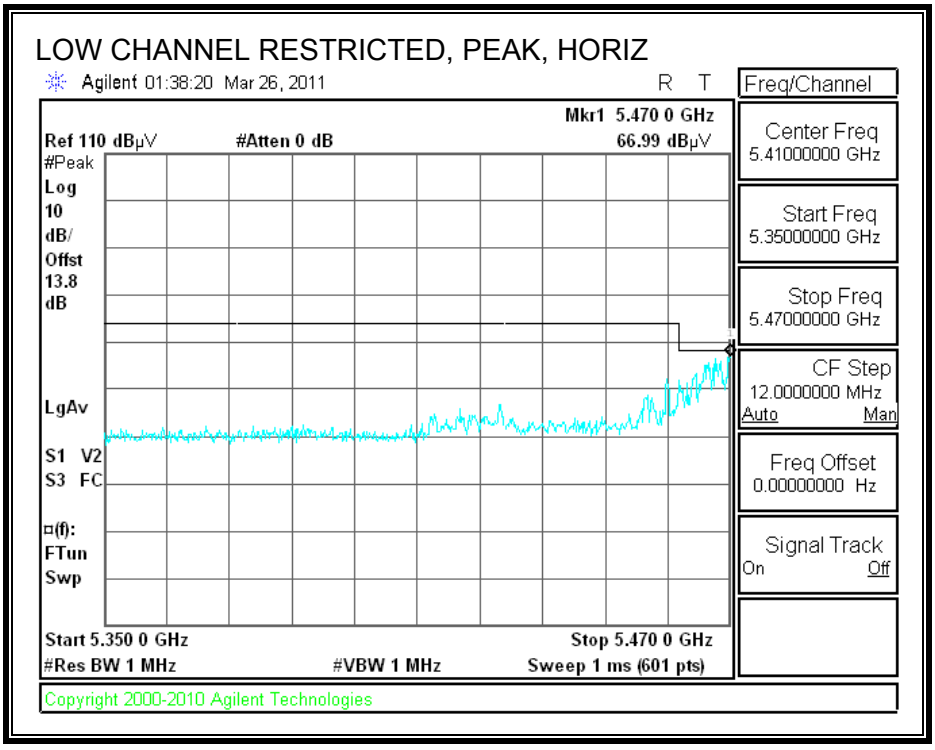


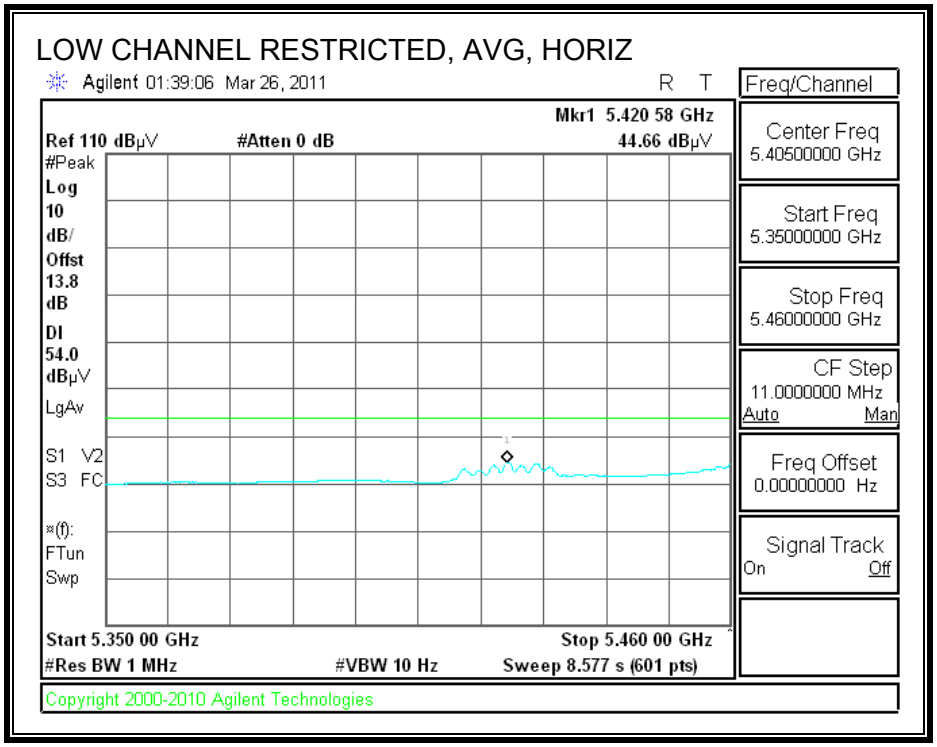
AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



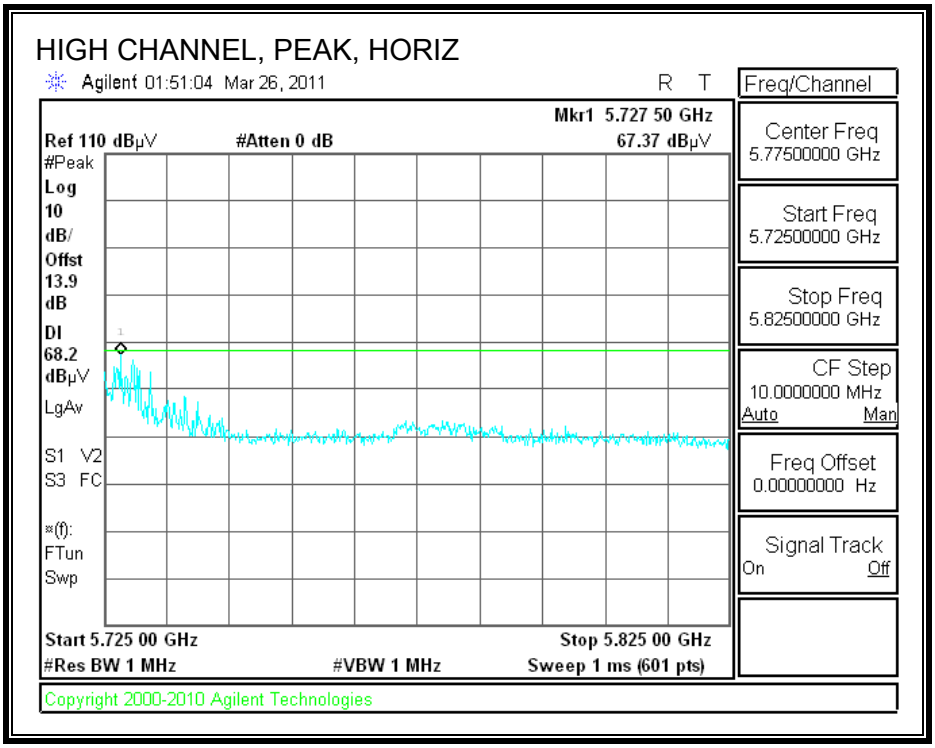
8.2.8. 802.11n HT20 MODE IN THE 5.6 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



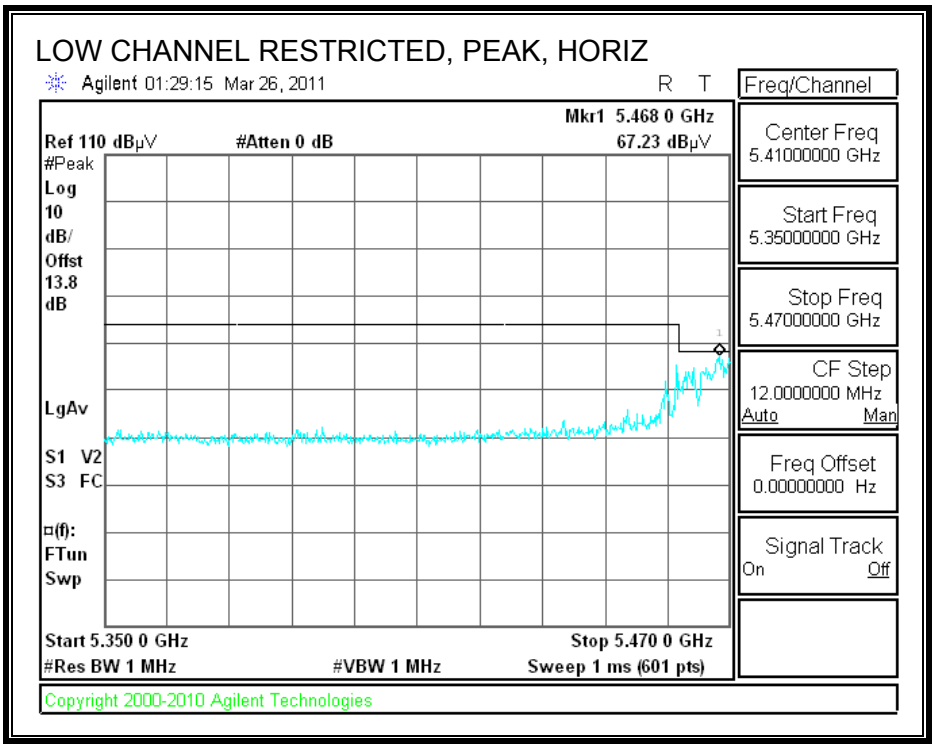


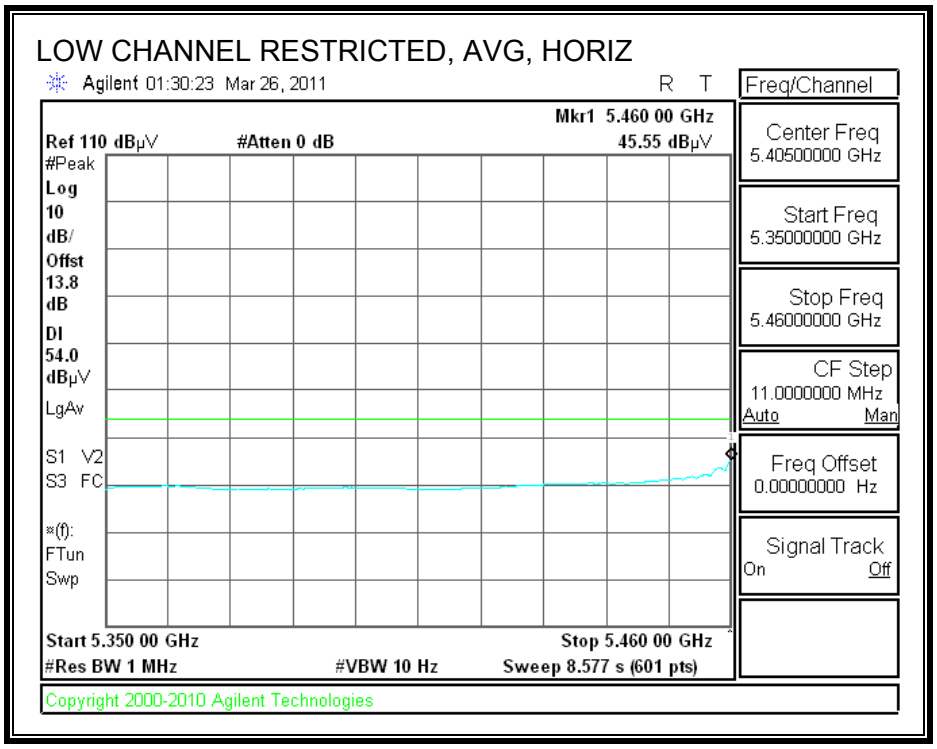
AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



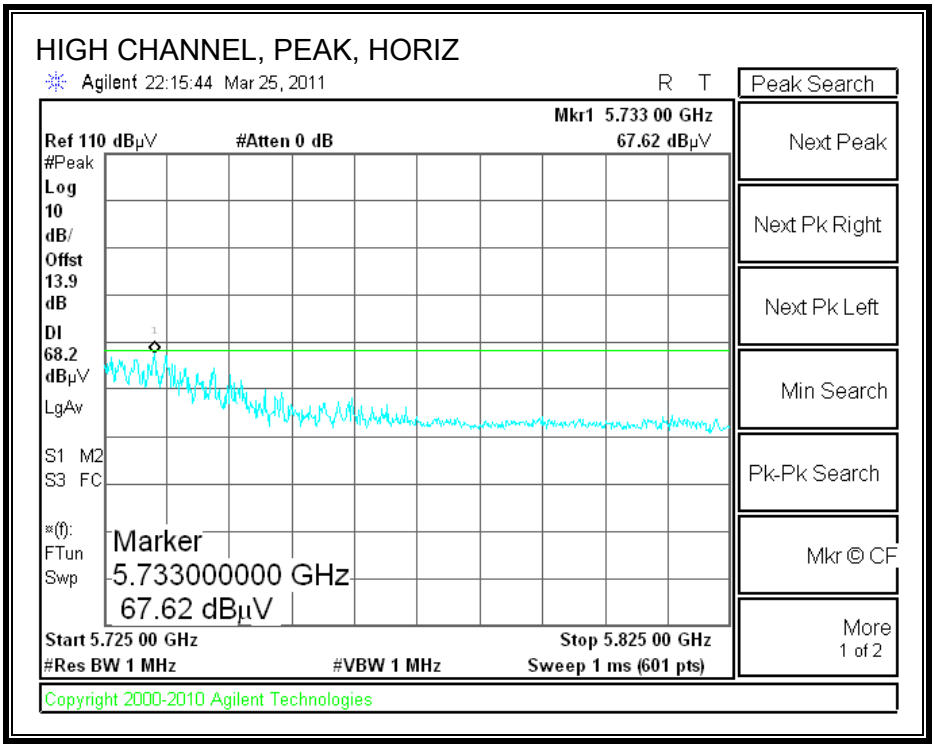
8.2.9. 802.11n HT40 MIMO MCS0 MODE IN THE 5.6 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



WORST CASE - 5.6 GHz BAND - HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: BROADCOM
Project #: 10U13561
Date: 1/9/2011
Test Engineer: MENGISTU MEKURIA
Configuration: EUT INSIDE HP TABLET LAPTOP
Mode: TX, 5.6 GHz, LEGACY MODE

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T59; S/N: 3245 @3m	T145 Agilent 3008A005		T125; ARA 18-26GHz; S/N:1007	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_002

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
LOW CHANNEL (5500.0 MHz)															
11.000	3.0	35.4	22.7	37.7	9.2	-33.8	0.0	0.0	48.6	35.9	74	54	-25.4	-18.1	V
11.000	3.0	35.7	22.6	37.7	9.2	-33.8	0.0	0.0	48.9	35.8	74	54	-25.1	-18.2	H
MID CHANNEL (5600.0 MHz)															
11.200	3.0	38.8	25.7	37.9	9.3	-33.5	0.0	0.0	52.5	39.4	74	54	-21.5	-14.6	V
11.200	3.0	37.3	23.4	37.9	9.3	-33.5	0.0	0.0	51.0	37.1	74	54	-23.0	-16.9	H
HI CHANNEL (5700.0 MHz)															
11.400	3.0	43.9	29.1	38.0	9.4	-33.2	0.0	0.0	58.1	43.3	74	54	-15.9	-10.7	V
11.400	3.0	41.3	26.3	38.0	9.4	-33.2	0.0	0.0	55.6	40.5	74	54	-18.4	-13.5	H

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f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

8.3. RECEIVER ABOVE 1 GHz (WORST-CASE)

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: BROADCOM
Project #: 10U13561
Date: 3/21/2011
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: RX MODE

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T59; S/N: 3245 @3m	T145 Agilent 3008A005(			RX RSS 210

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
1.336	3.0	58.5	34.4	25.2	2.8	-35.9	0.0	0.0	50.6	26.4	74	54	-23.4	-27.6	V
2.491	3.0	55.7	33.5	28.5	3.9	-35.1	0.0	0.0	53.0	30.7	74	54	-21.0	-23.3	V
3.380	3.0	55.0	32.4	30.8	4.7	-35.0	0.0	0.0	55.4	32.9	74	54	-18.6	-21.1	V
1.336	3.0	50.5	31.1	25.2	2.8	-35.9	0.0	0.0	42.6	23.2	74	54	-31.4	-30.8	H

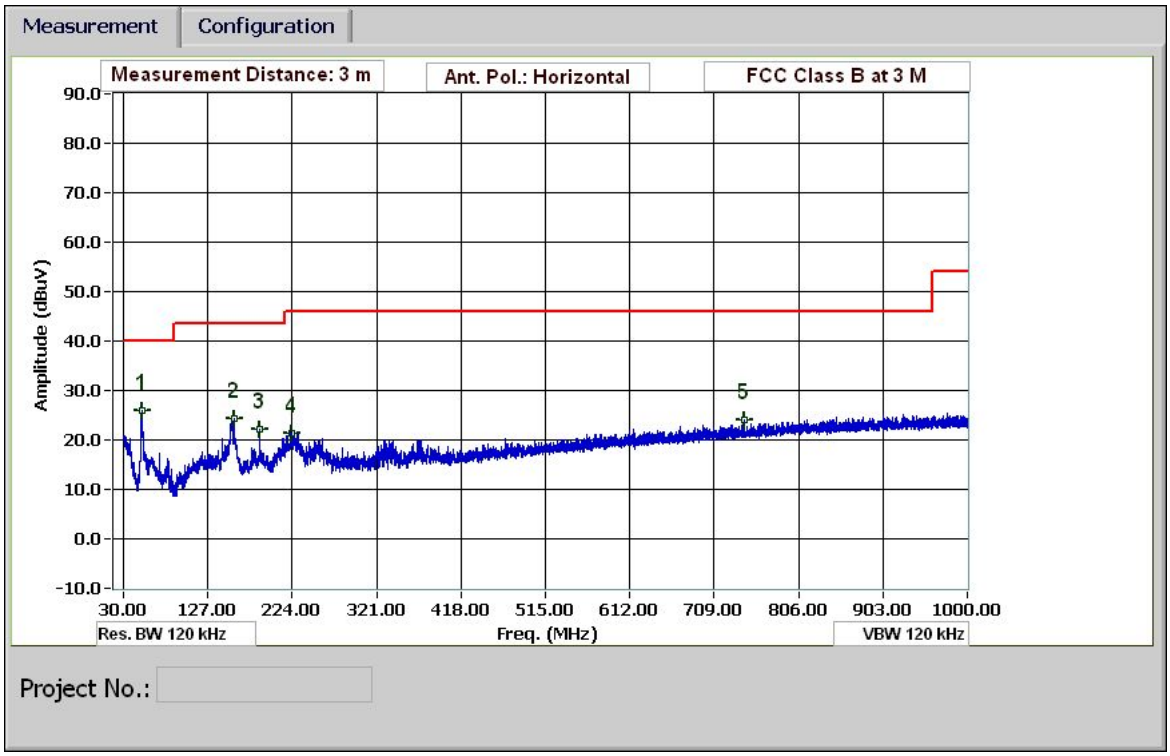
Rev. 07.22.09

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

8.4. WORST-CASE BELOW 1 GHz

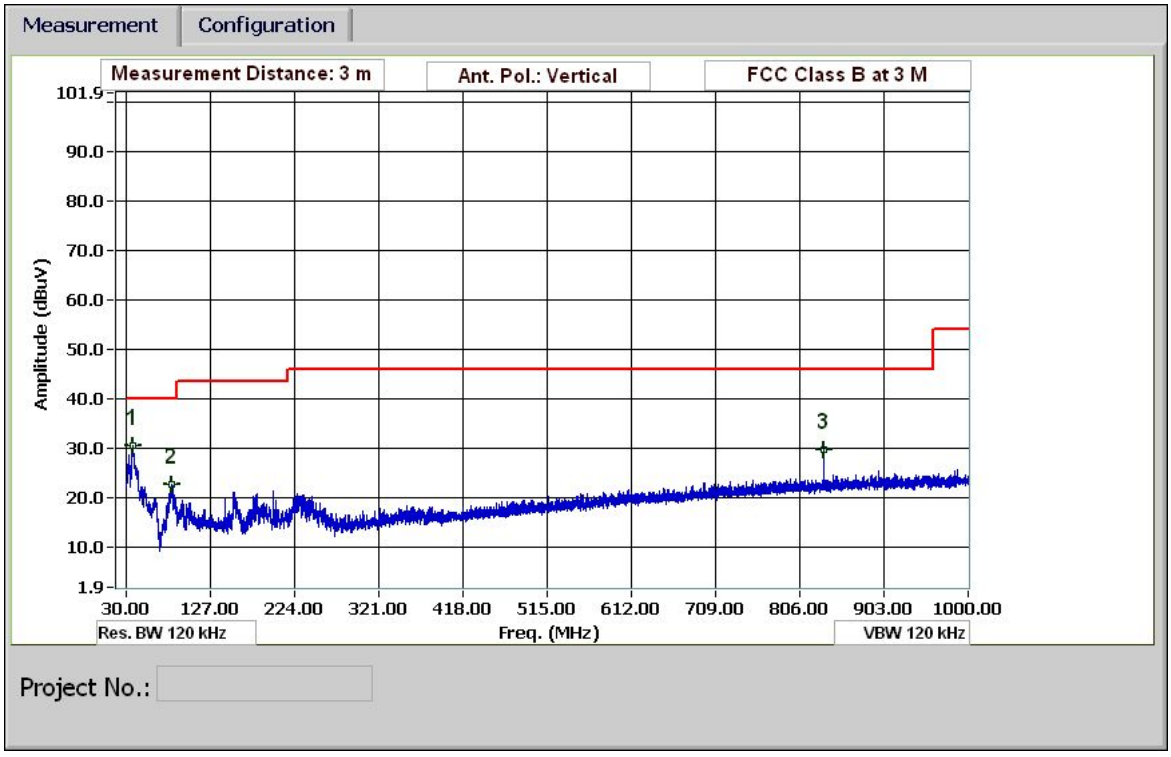
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



HORIZONTAL & VERTICAL DATA

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

Test Engr: Thanh Nguyen
Date: 03/19/11
Project #: 10U13561-1
Company: BroadCom
Test Target: FCC Class B
Mode Oper: Transmit 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	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Tx worst case													
37.08	3.0	42.2	16.3	0.6	28.4	0.0	0.0	30.7	40.0	-9.3	V	P	
81.842	3.0	43.0	7.4	0.8	28.3	0.0	0.0	22.8	40.0	-17.2	V	P	
833.433	3.0	33.3	21.3	2.7	27.6	0.0	0.0	29.7	46.0	-16.3	V	P	
50.881	3.0	45.3	8.3	0.6	28.4	0.0	0.0	25.9	40.0	-14.1	H	P	
157.445	3.0	39.5	11.9	1.1	28.3	0.0	0.0	24.3	43.5	-19.2	H	P	
186.126	3.0	37.8	11.3	1.2	28.2	0.0	0.0	22.0	43.5	-21.5	H	P	
223.328	3.0	36.3	11.9	1.3	28.2	0.0	0.0	21.3	46.0	-24.7	H	P	
744.029	3.0	28.6	20.2	2.5	27.3	0.0	0.0	24.0	46.0	-22.0	H	P	

Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.