



FCC CFR47 PART 15 SUBPART E
INDUSTRY CANADA RSS-210 ISSUE 7
CLASS II PERMISSIVE CHANGE

CERTIFICATION TEST REPORT

FOR

802.11ABGN INTEL® CENTRINO ULTIMATE-N 6200
(TESTED INSIDE OF TOSHIBA PORTEGE M780 TABLET)

MODEL NUMBER: PA3795U-1MPC

FCC ID: CJ6UPA3795WL
IC: 248H-DPA3795W

REPORT NUMBER: 09U12972-2

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Prepared for
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: TOSHIBA AMERICA INFORMATION SYSTEMS, INC
9740 IRVINE BLVD
IRVINE BLVD., CA 92618-1697, U.S.A.

EUT DESCRIPTION: 802.11ABGN INTEL® CENTRINO ULTIMATE-N6200
(TESTED INSIDE OF TOSHIBA PORTEGE M780 TABLET)

FCC MODEL NUMBER: PA3795U-1MPC

SERIAL NUMBER: 0015005EE3CC

DATE TESTED: DECEMBER 16-24, 2009

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-210 Issue 7 Annex 9	Pass
INDUSTRY CANADA RSS-GEN Issue 2	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, FCC CFR 47 Part 15, RSS-GEN Issue 2, and RSS-210 Issue 7.

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:

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 2x2 WLAN 802.11 abgn Intel® Centrino Ultimate-N 6200

The radio module is manufactured by Intel Corporation.

5.2. MAXIMUM OUTPUT POWER

The test measurement passed within $\pm 0.5\text{dBm}$ of the original output power.

In order to pass the bandedge measurements, some frequency bands and channels have to be reduced the output powers as table shown below, and the manufacturer states that this change will be incorporated in the EEPROM, no change on other channel or other UNII bands.

Frequency Band	Mode	Frequency (MHz)	Antenna Chain	Reduced Output Power (dBm)
5.2GHz	HT40	5190	A	12.66
			B	13.49
5.3GHz	HT40	5310	A	14.33
			B	14.03
5.5GHz	HT20	5700	A	15.44
			B	15.32
5.5GHz	HT40	5510	A	14.42
			B	14.60

5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding portable tablet Toshiba Portege M780 Tablet Series.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna with a model TBN003 of maximum gain 0.58dBi for 2.4GHz band and -2.45dBi gain for 5 GHz band.

5.5. SOFTWARE AND FIRMWARE

The test utility software used during testing was CRTU version 5.15.36.0.

5.6. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

The worst-case also investigated for X, Y, Z, and mobile orientation of the support laptop. Y-position was turned out as worst-case orientation.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
LAPTOP	Toshiba	Prot? ?M780	Y9065716H	DoC
AC/DC Adaptor	Toshiba	PA3755U-1ACA	G71C000A5210	DoC

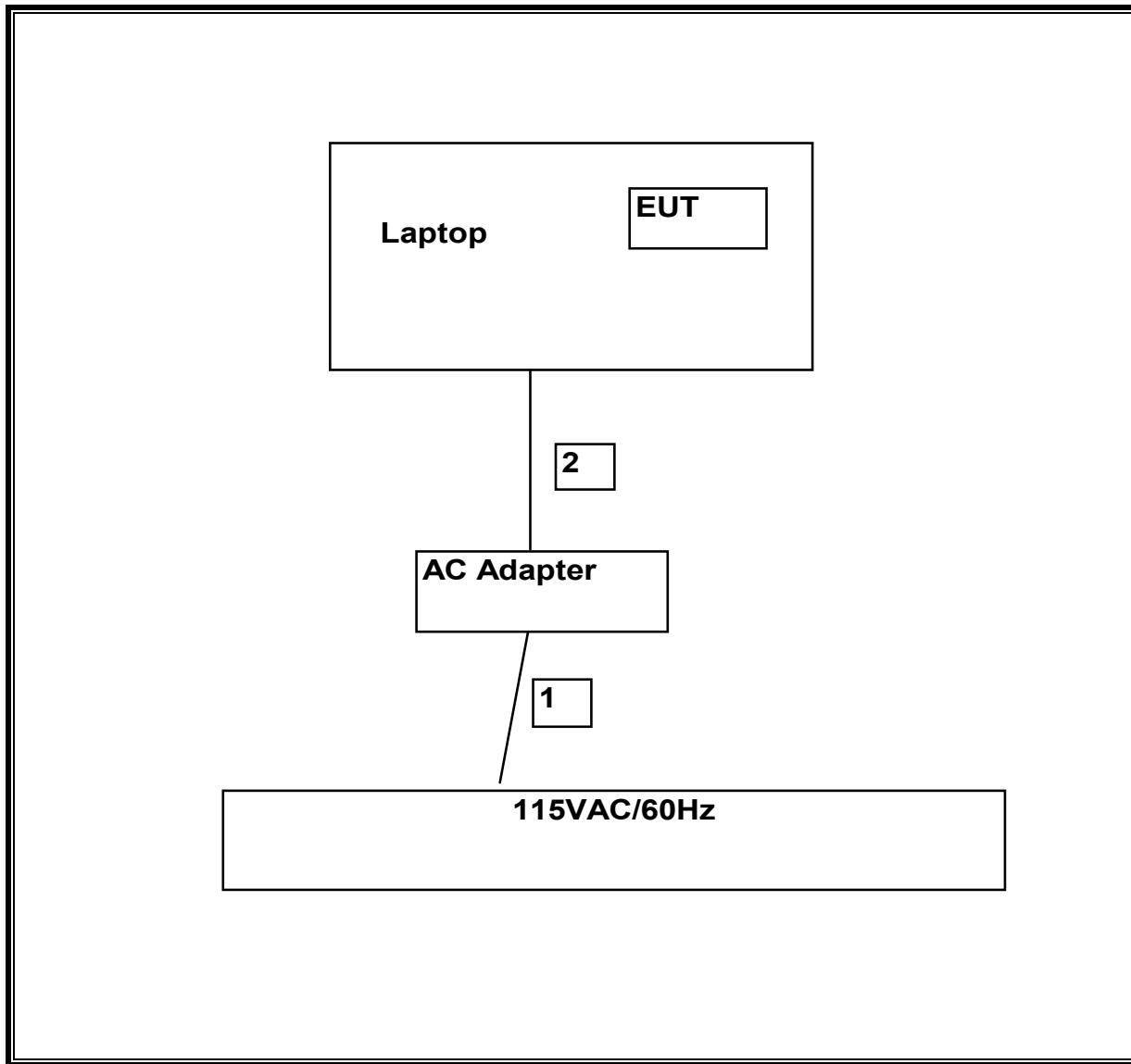
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	AC	Un-Shielded	1.0 m	N/A
2	DC	1	DC	Un-Shielded	2.0 m	Ferrite at one End

TEST SETUP

The EUT is installed in 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, 26.5 GHz	Agilent / HP	E4440A	C01178	08/31/10
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	02/04/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00778	01/06/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/10
Antenna, Horn, 18 GHz	EMCO	3115	C00783	01/29/10
Peak Power Meter	Boonton	4541	C01186	01/19/10
Peak Power Sensor	Boonton	57318		02/02/10
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/06/10
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	05/06/11
Highpass Filter, 7.6 GHz	Micro-Tronics	HPM13195	N02682	N/A

7. ANTENNA PORT TEST RESULTS

7.1. 7.1. 802.11n HT40 MODE IN THE 5.2 GHz BAND

7.1.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, 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. 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

CHAIN A

Limit

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5190	17	37.368	19.72	-2.45	17.00

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5190	12.66	17.00	-4.34

CHAIN B

Limit

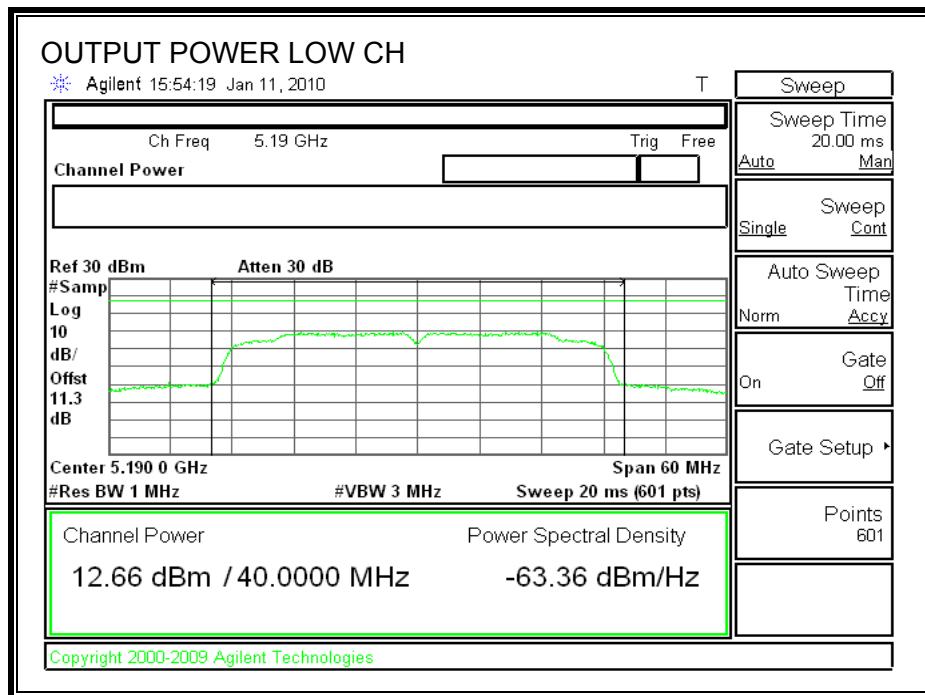
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5190	17	37.485	19.74	-2.45	17.00

Results

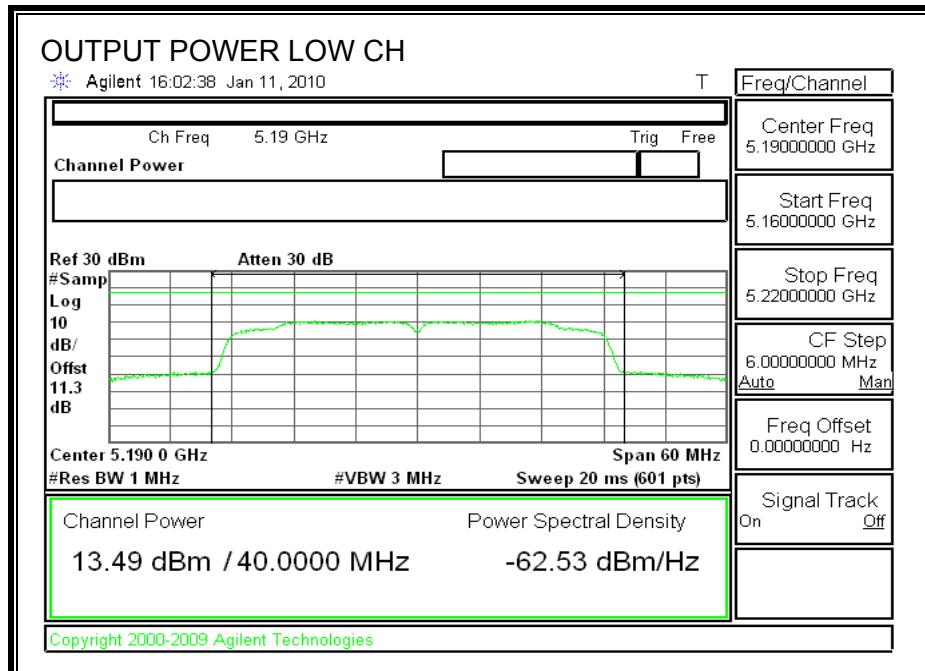
Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5190	13.49	17.00	-3.51

OUTPUT POWER (HT40)

CHAIN A



CHAIN B



7.2. 7.1. 802.11n HT40 MODE IN THE 5.3 GHz BAND

7.1.1. OUTPUT POWER

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25-5.35 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, 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

CHAIN A

Limit

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
High	5310	24	37.214	26.71	-2.45	24.00

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
High	5310	14.33	24.00	-9.67

CHAIN B

Limit

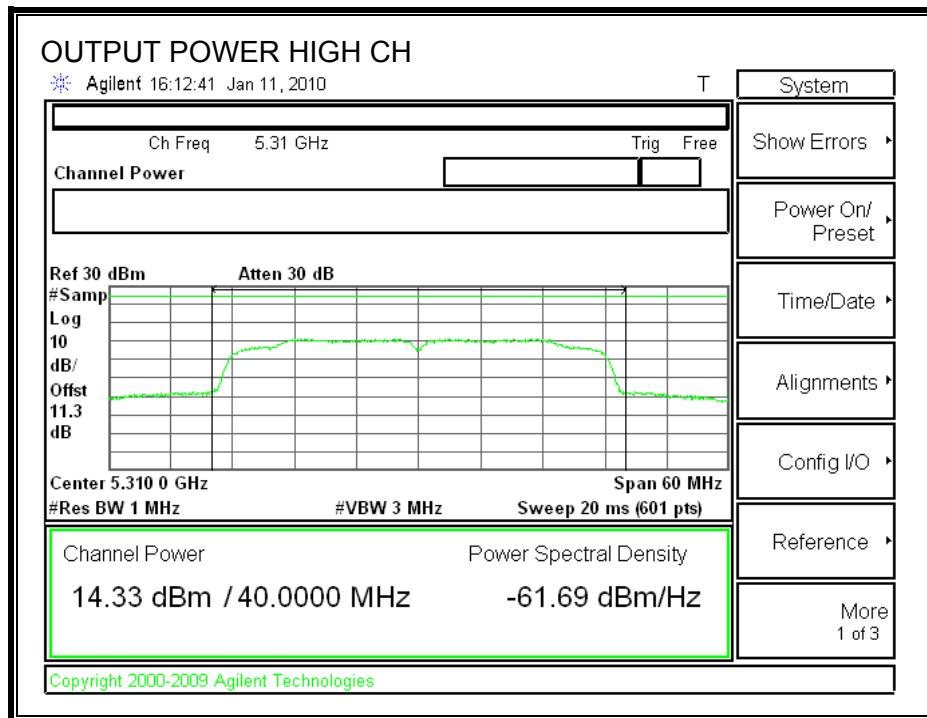
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
High	5310	24	37.684	26.76	-2.45	24.00

Results

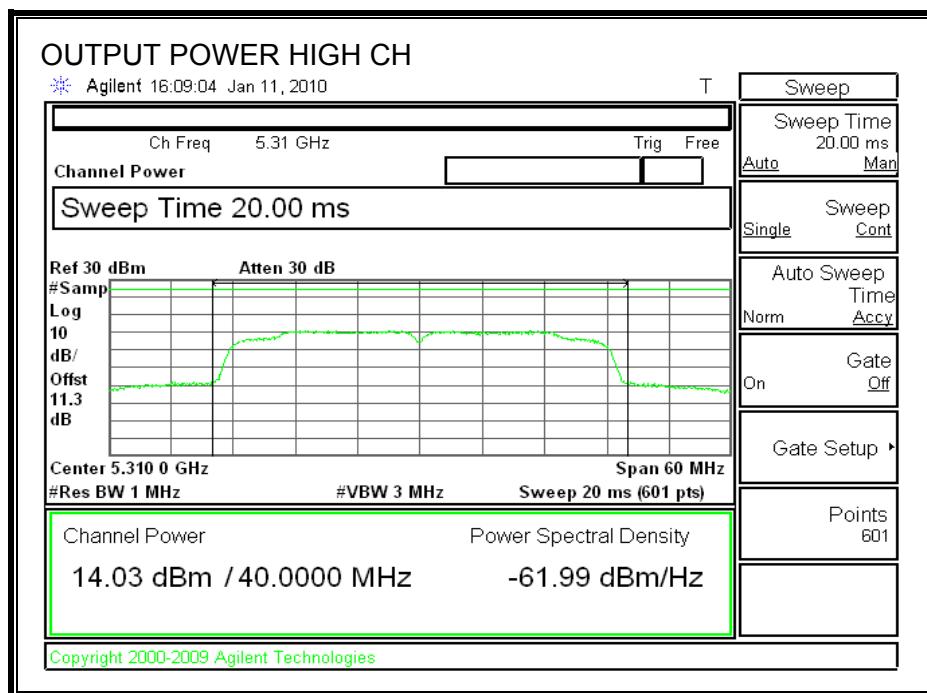
Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
High	5310	14.03	24.00	-9.97

OUTPUT POWER (HT40)

CHAIN A



CHAIN B



7.3. 802.11n HT20 MODE IN THE 5.6 GHz BAND

7.3.1. 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 $11 \text{ dBm} + 10 \log B$, 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.

The composite antenna gain is 9.10dBi.

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

CHAIN A

Limit

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
High	5700	24	23.286	24.67	-2.45	24.00

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
High	5700	15.44	24.00	-8.56

CHAIN B

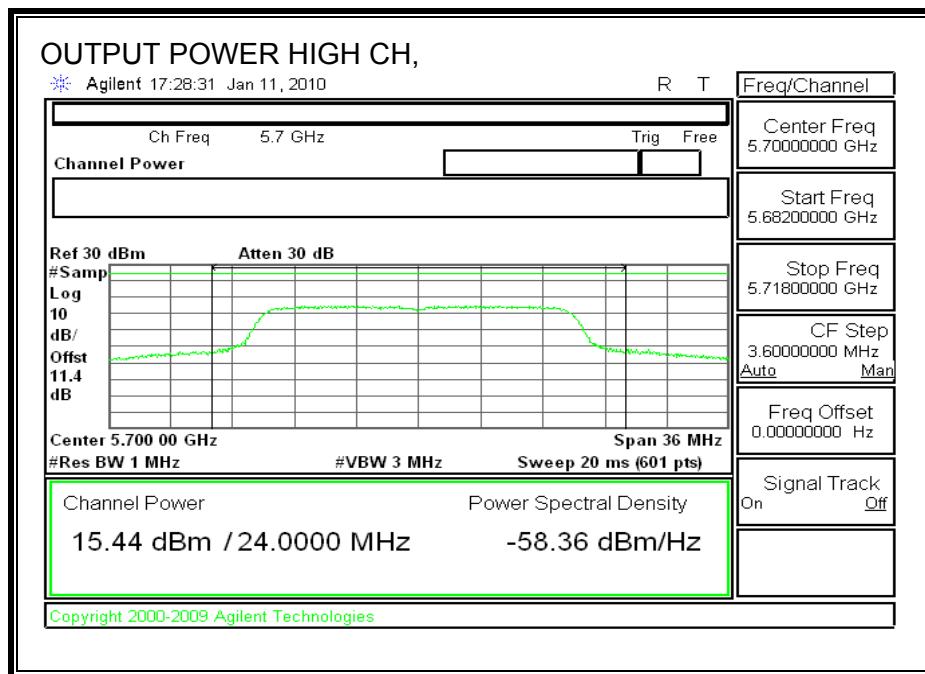
Limit

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
High	5700	24	23.191	24.65	-2.45	24.00

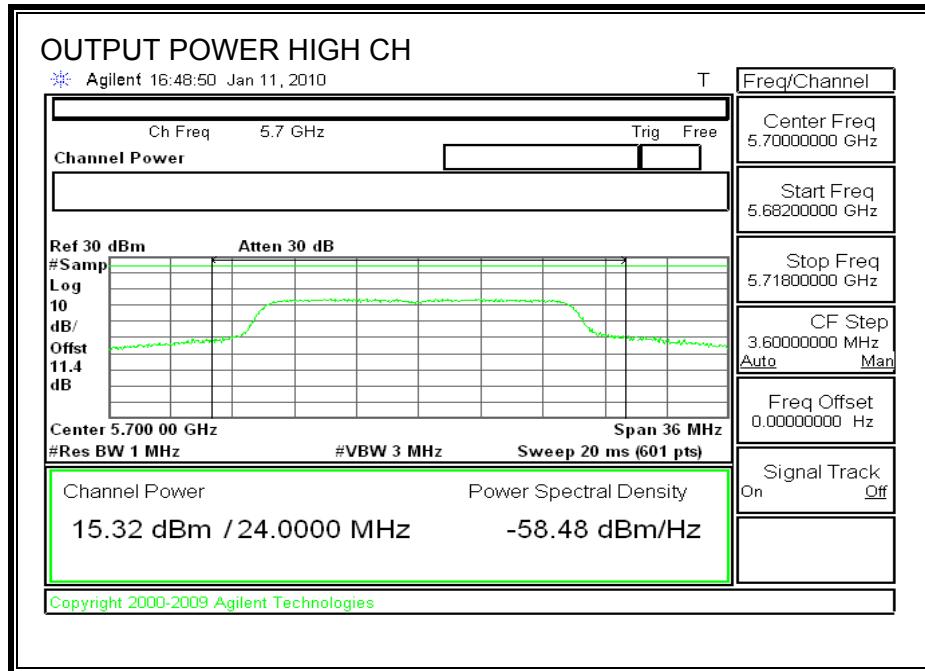
Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
High	5700	15.32	24.00	-8.68

CHAIN A OUTPUT POWER



CHAIN B OUTPUT POWER



7.4. 802.11n HT40 MODE IN THE 5.6 GHz BAND

7.4.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

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 $11 \text{ dBm} + 10 \log B$, 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

CHAIN A

Limit

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5510	24	37.367	26.72	-2.45	24.00

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5510	14.42	24.00	-9.58

CHAIN B

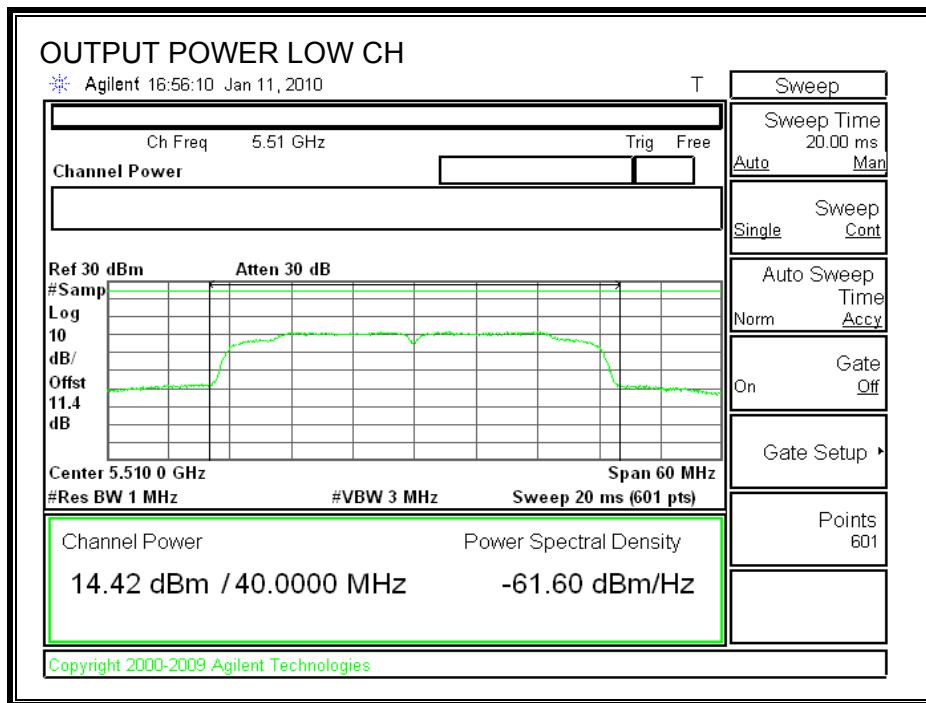
Limit

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5510	24	38.698	26.88	-2.45	24.00

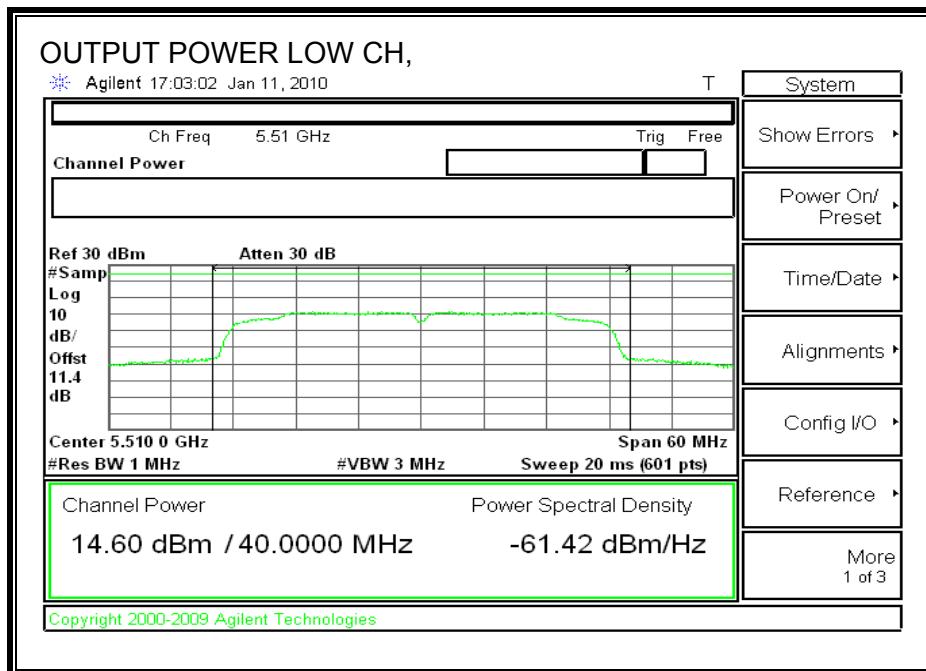
Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5510	14.60	24.00	-9.40

CHAIN A OUTPUT POWER



CHAIN B 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, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

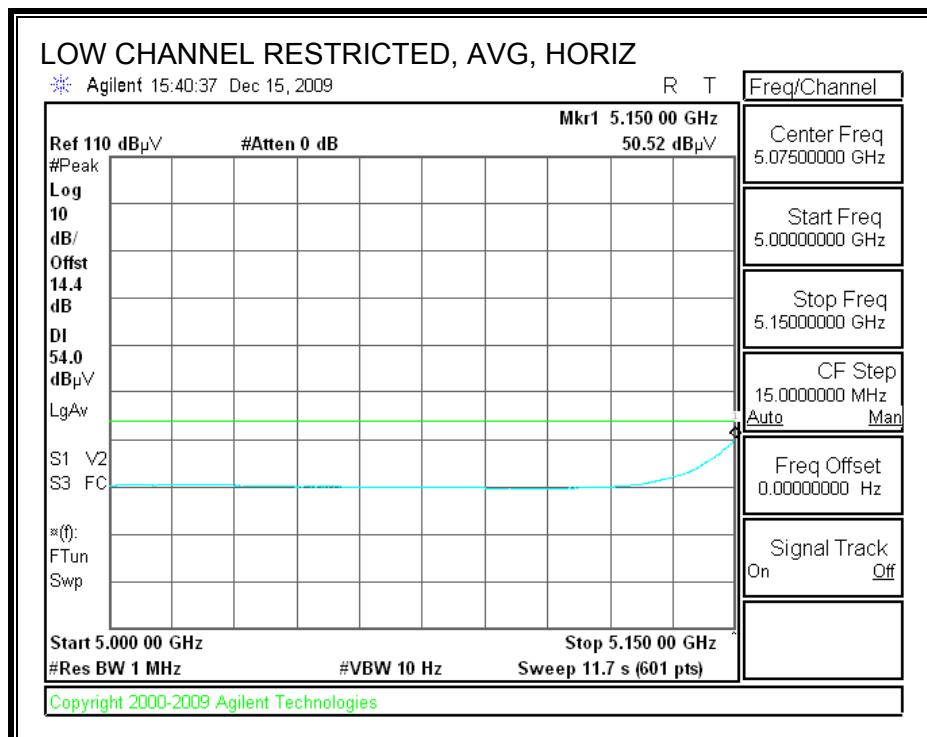
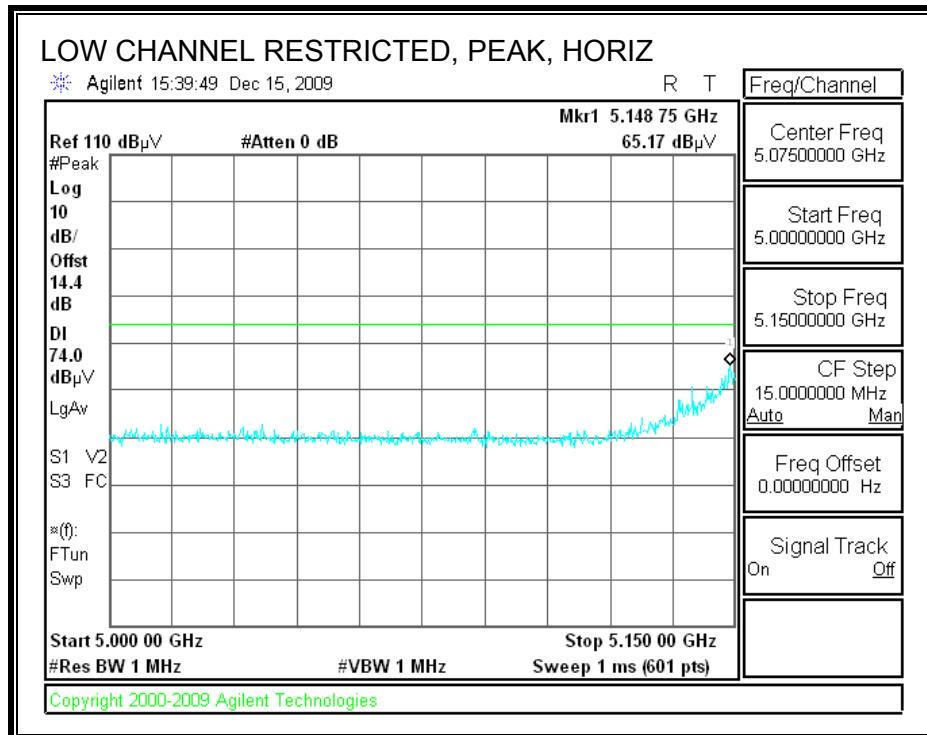
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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.

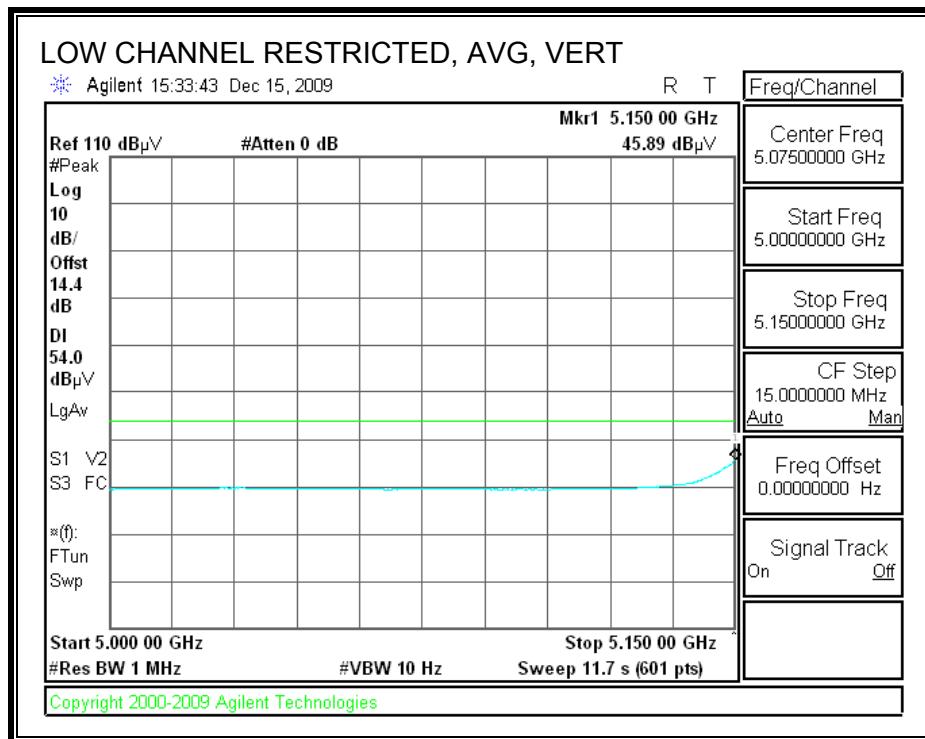
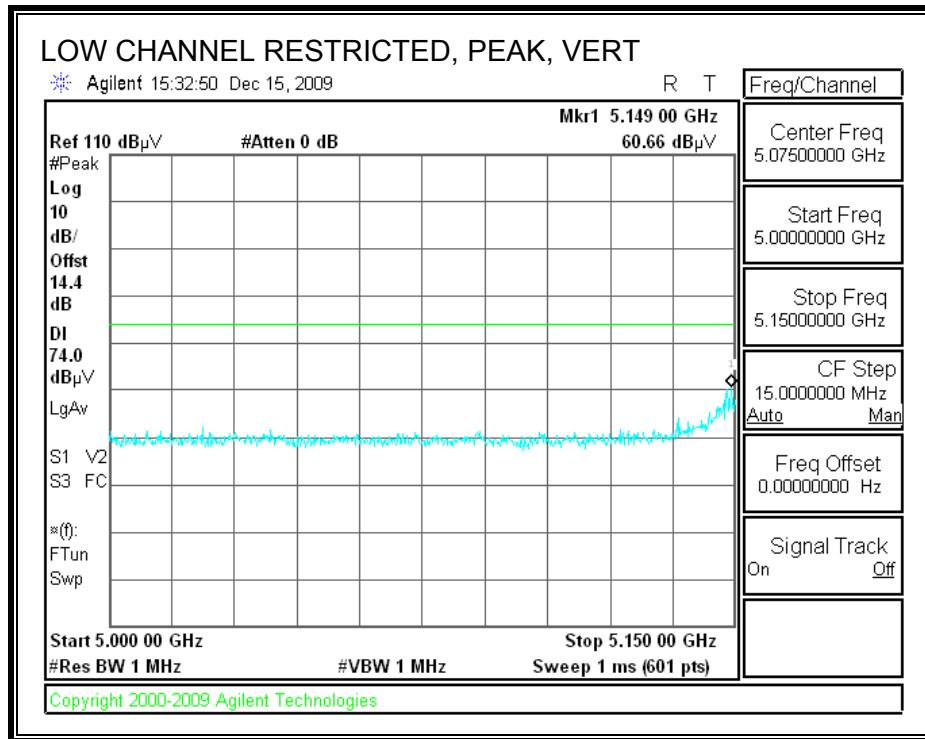
TRANSMITTER ABOVE 1 GHz

8.1.1. 802.11a MODE IN THE LOWER 5.2 GHz BAND_CHAIN A

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

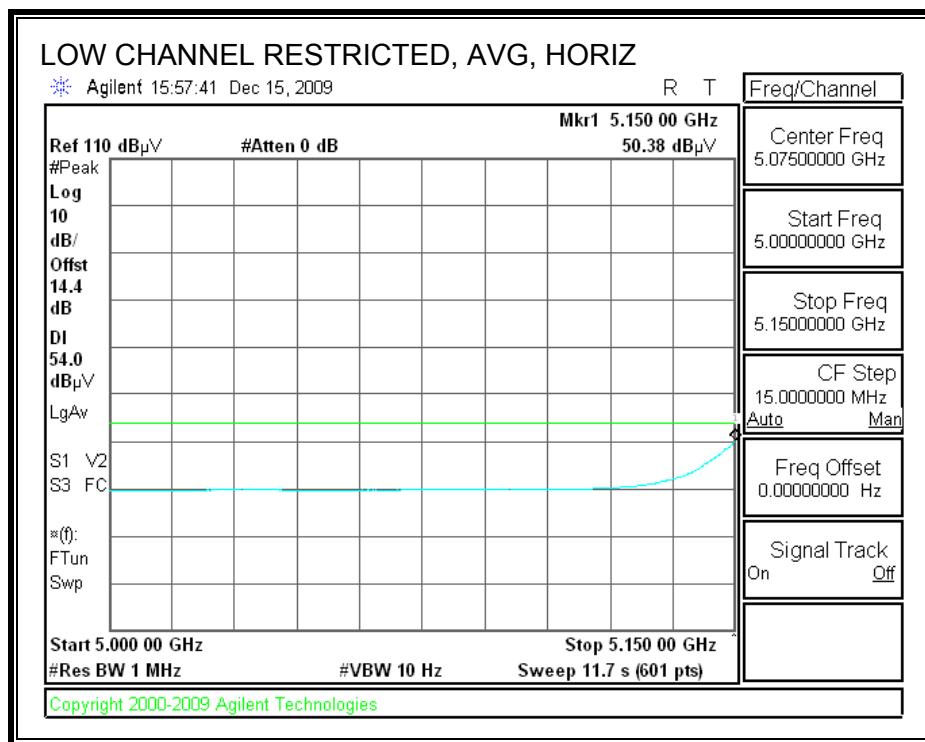
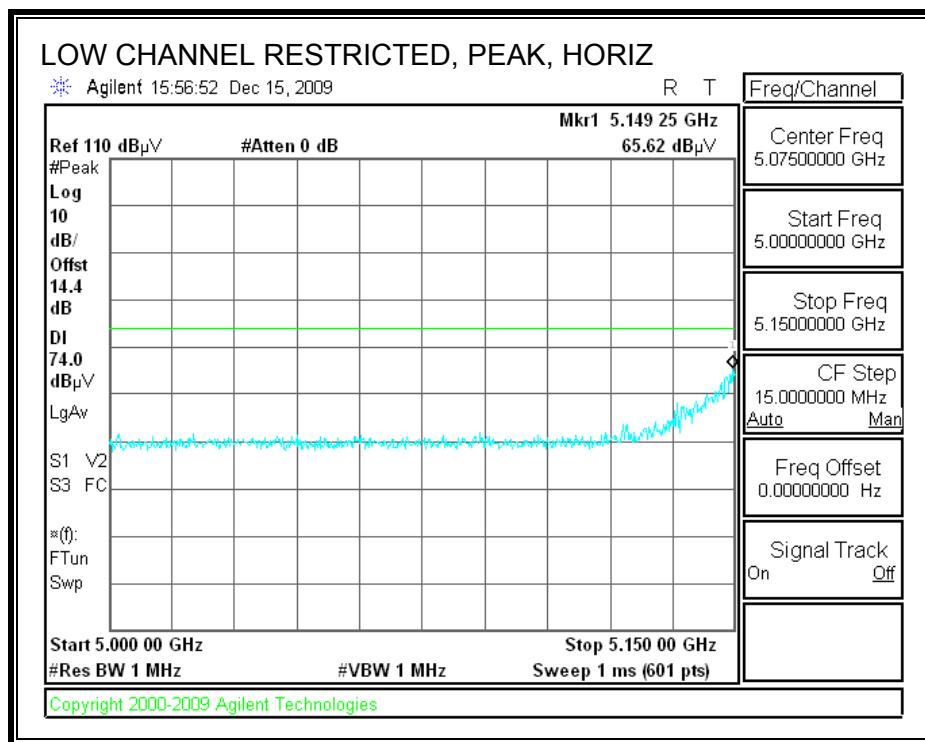


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

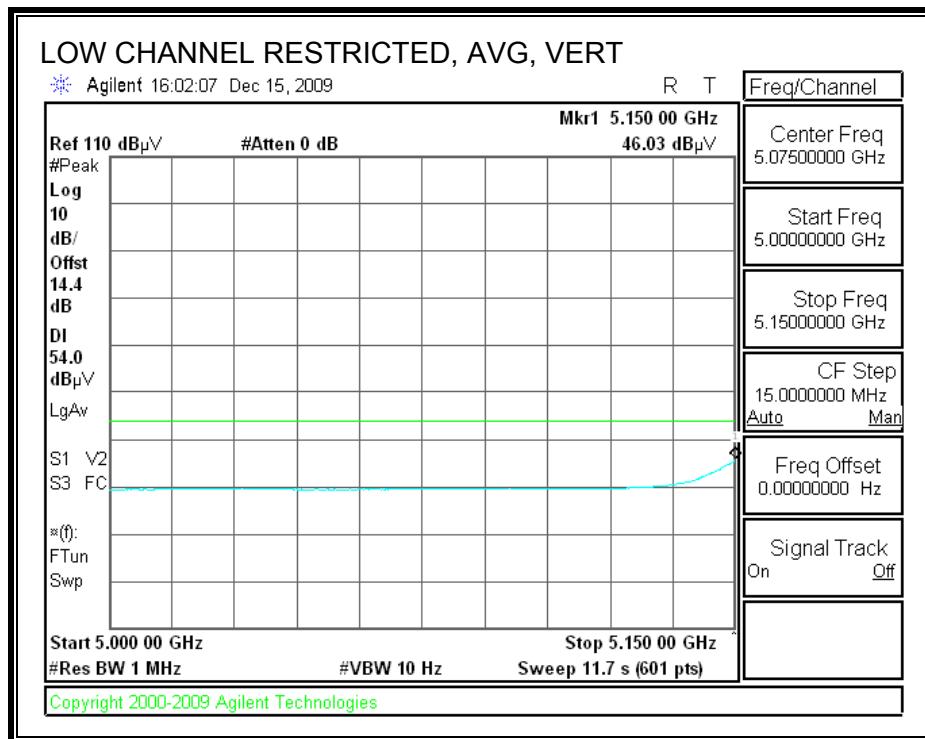
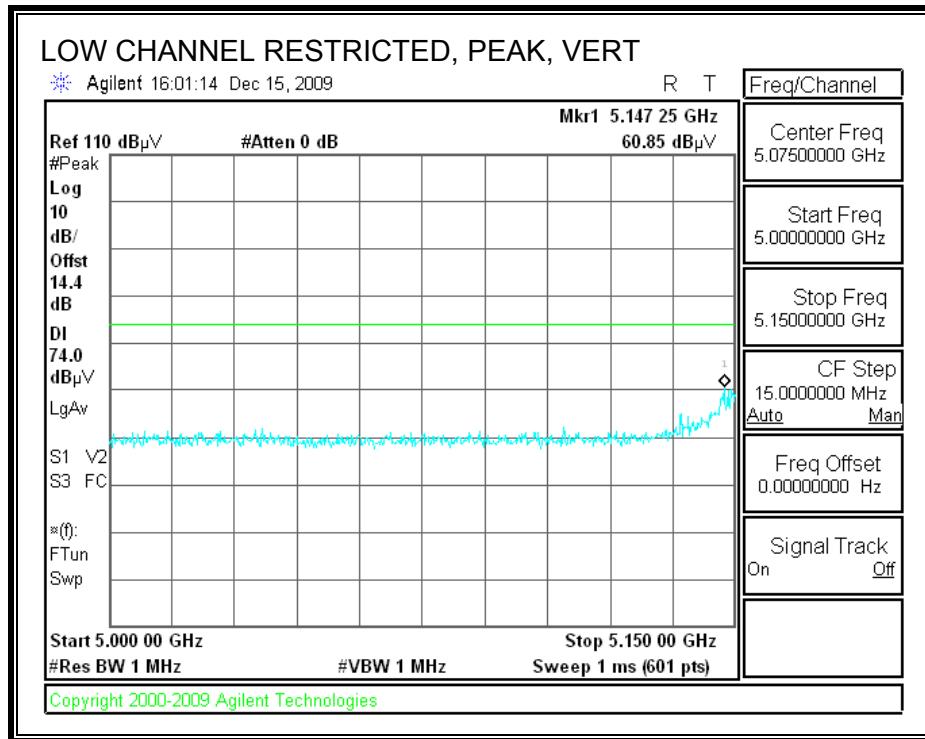


8.1.2. 802.11a MODE IN THE LOWER 5.2 GHz BAND_CHAIN B

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

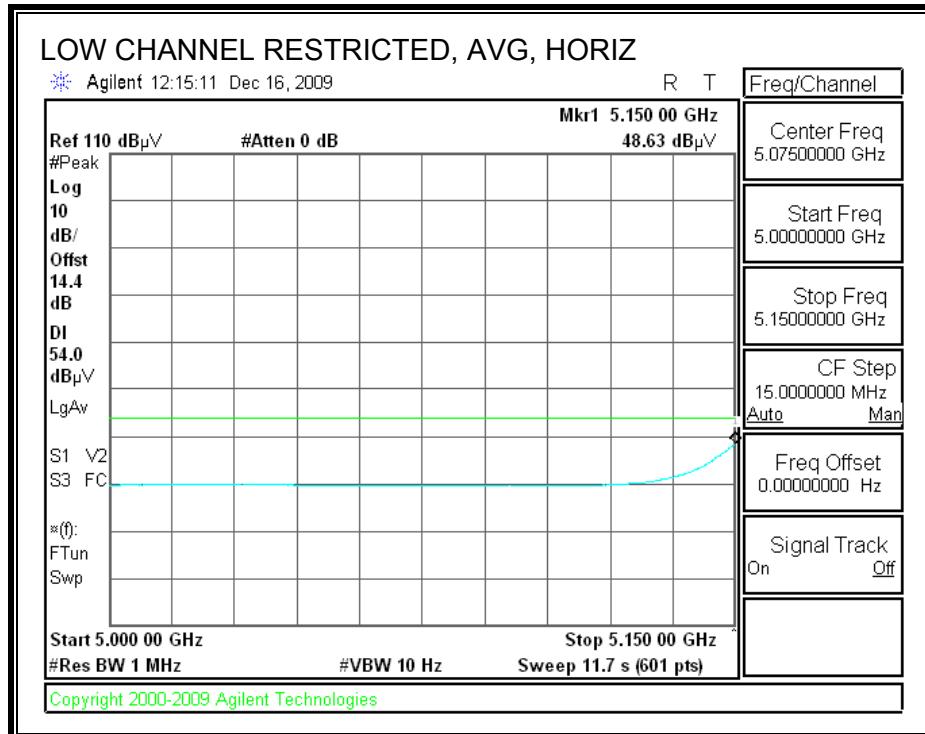
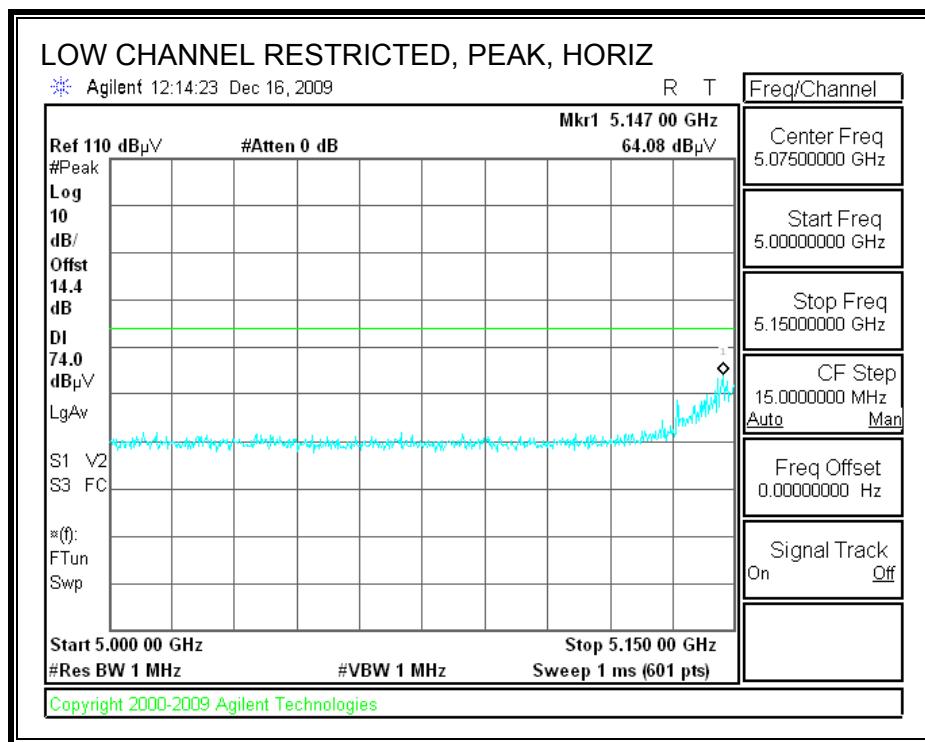


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

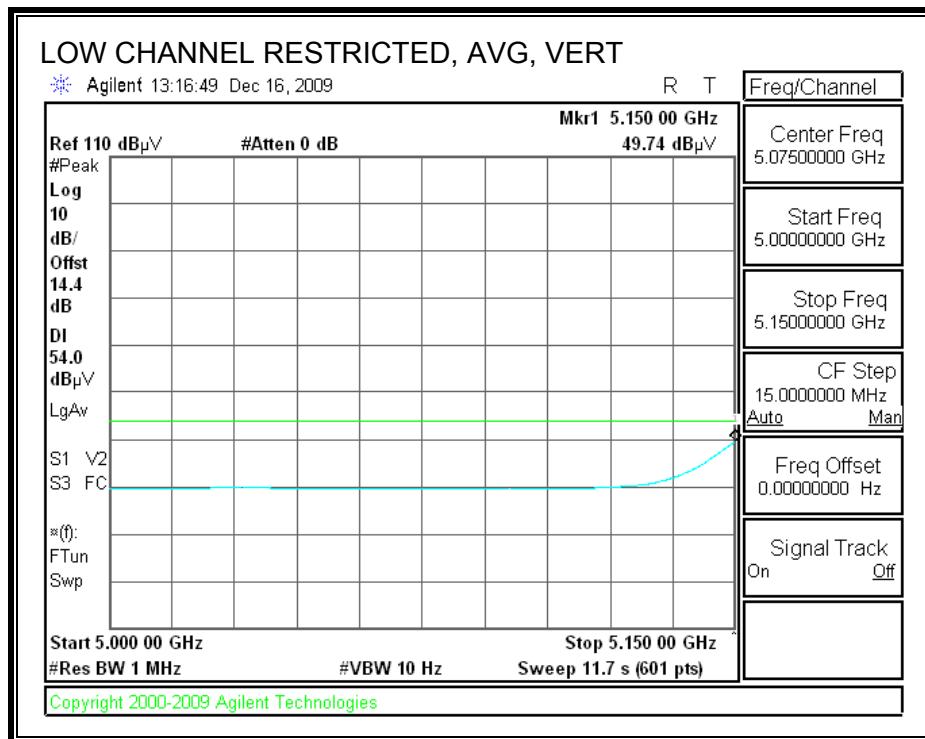
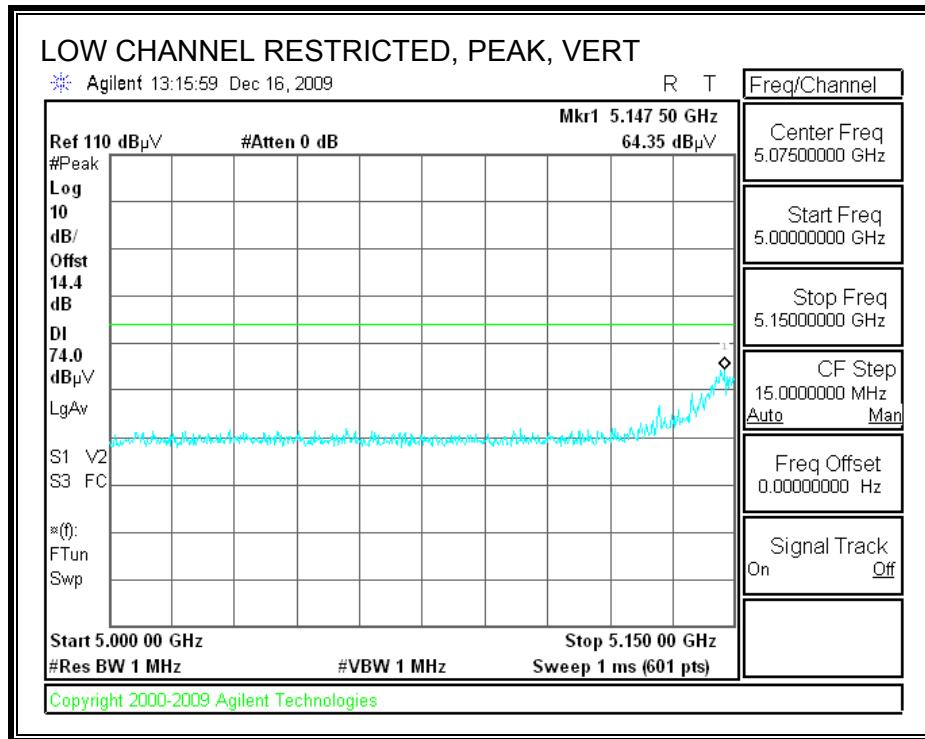


8.1.3. 802.11n HT20 MODE IN THE LOWER 5.2 GHz BAND_CHAIN A

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

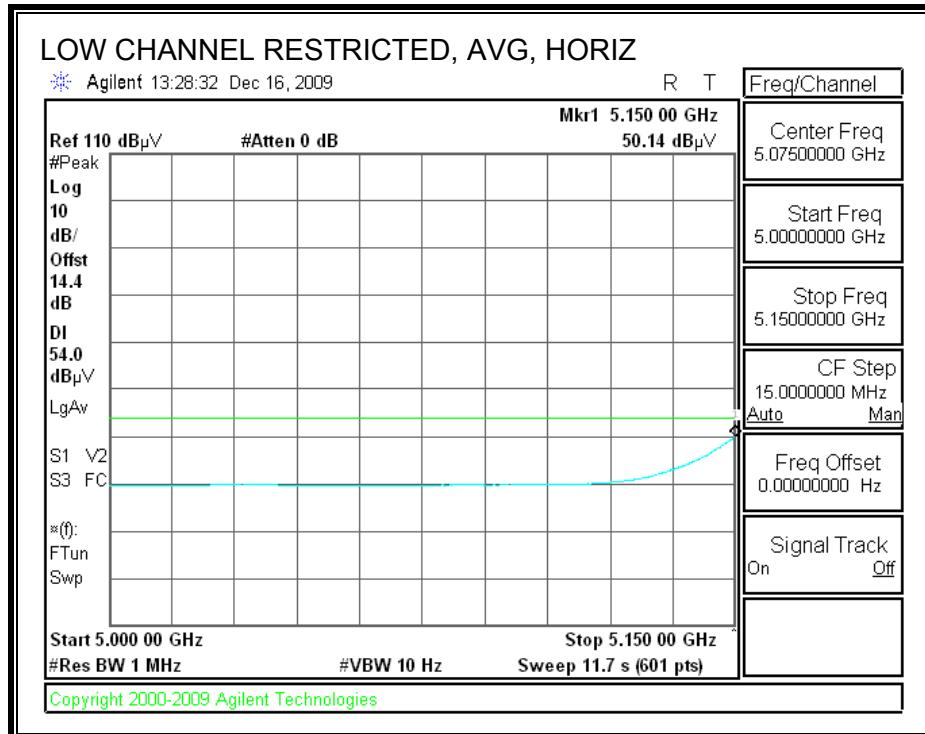
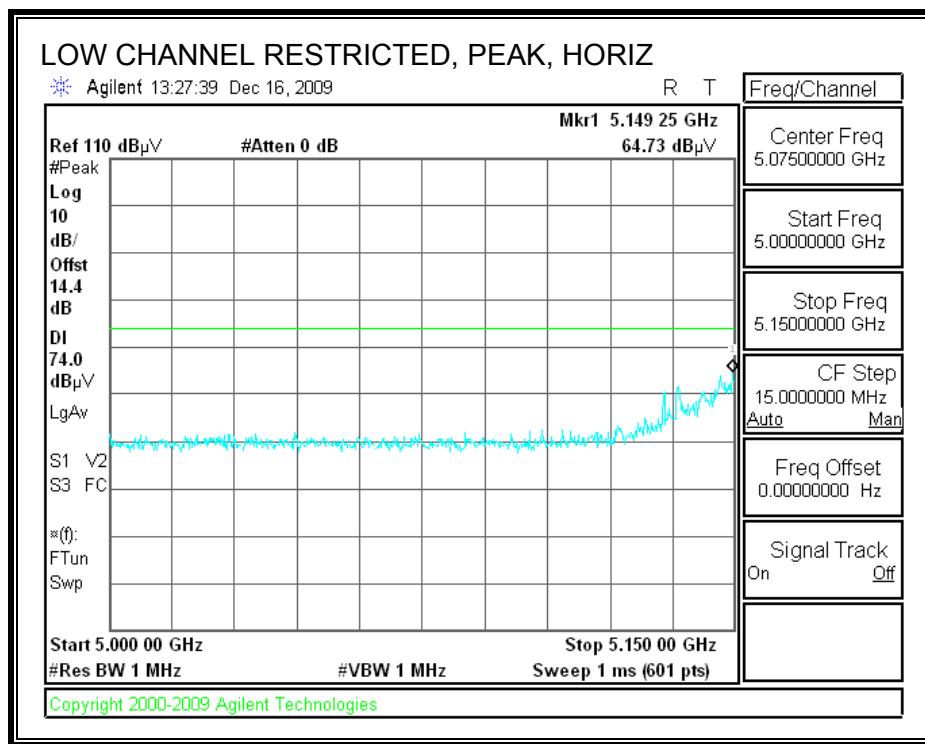


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

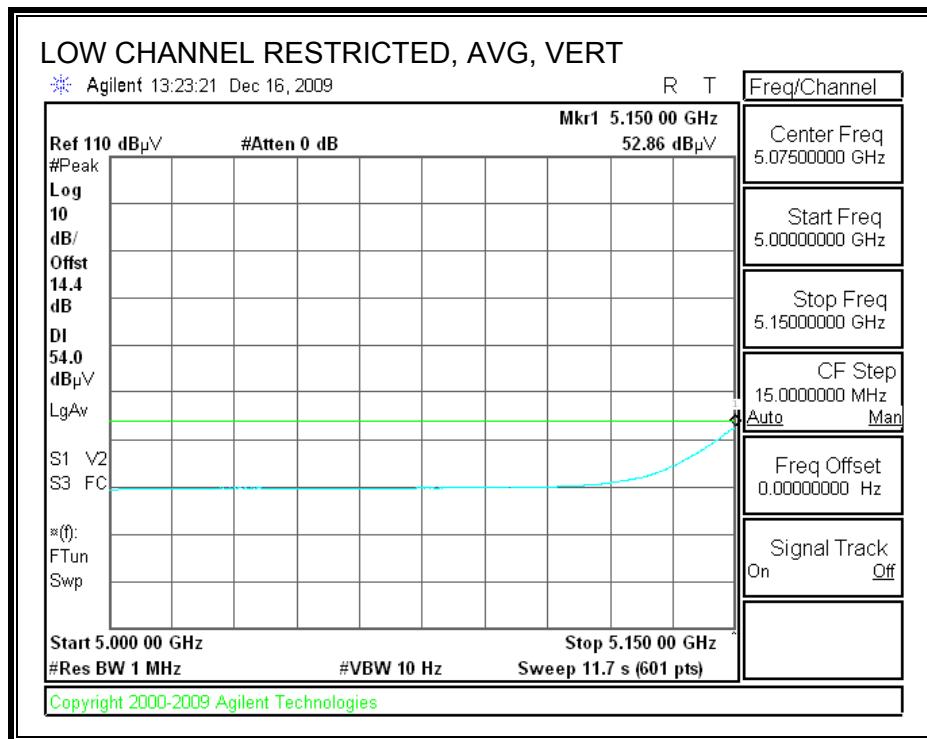
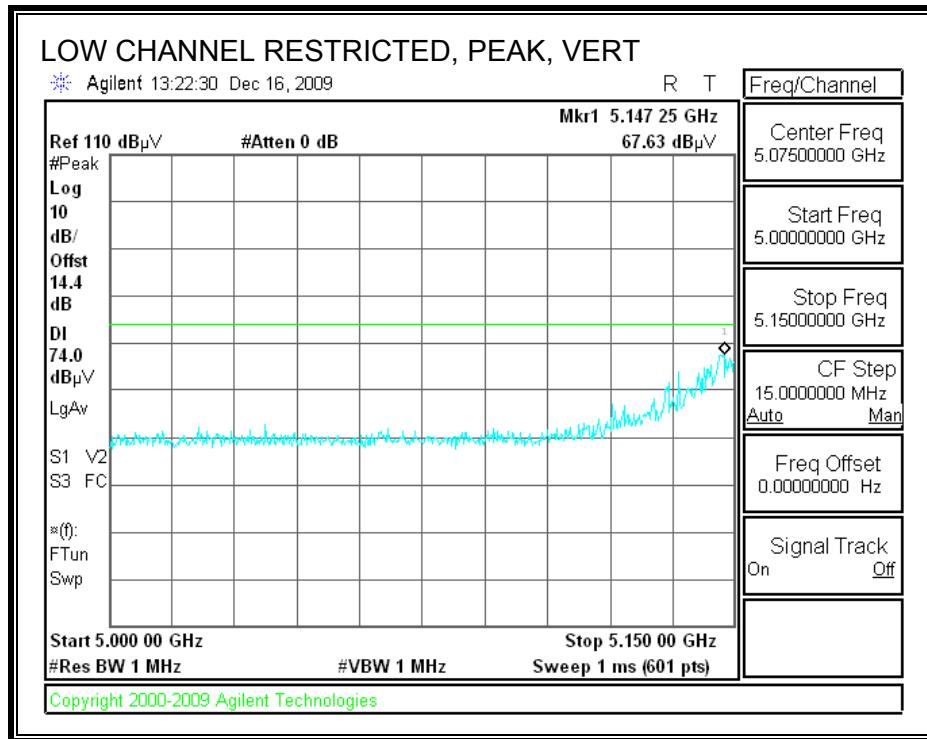


8.1.4. 802.11n HT20 MODE IN THE LOWER 5.2 GHz BAND_CHAIN B

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

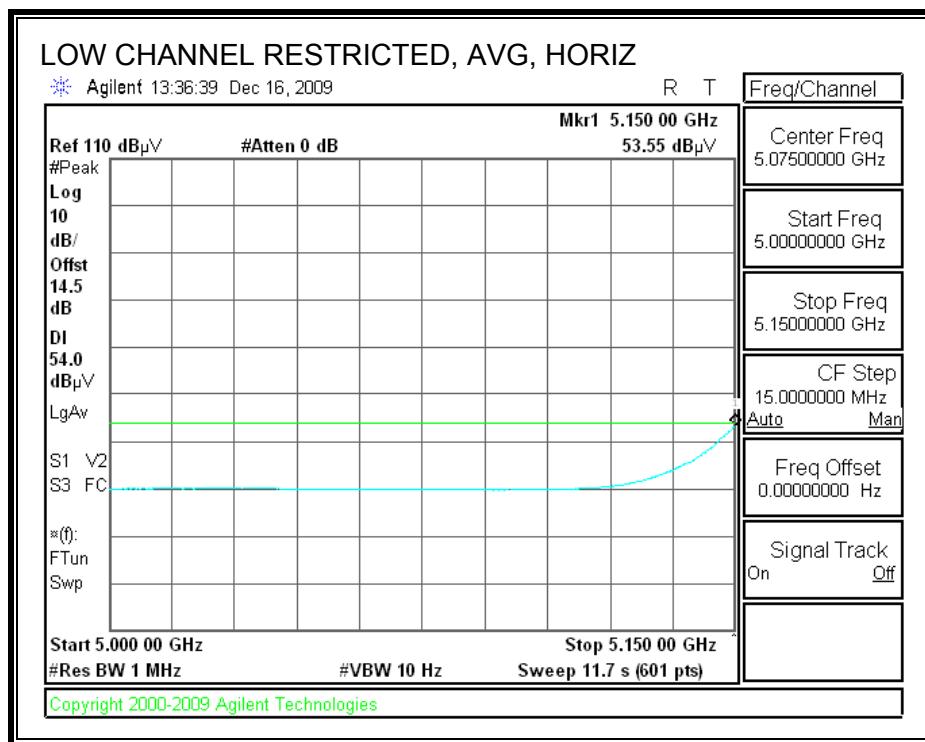
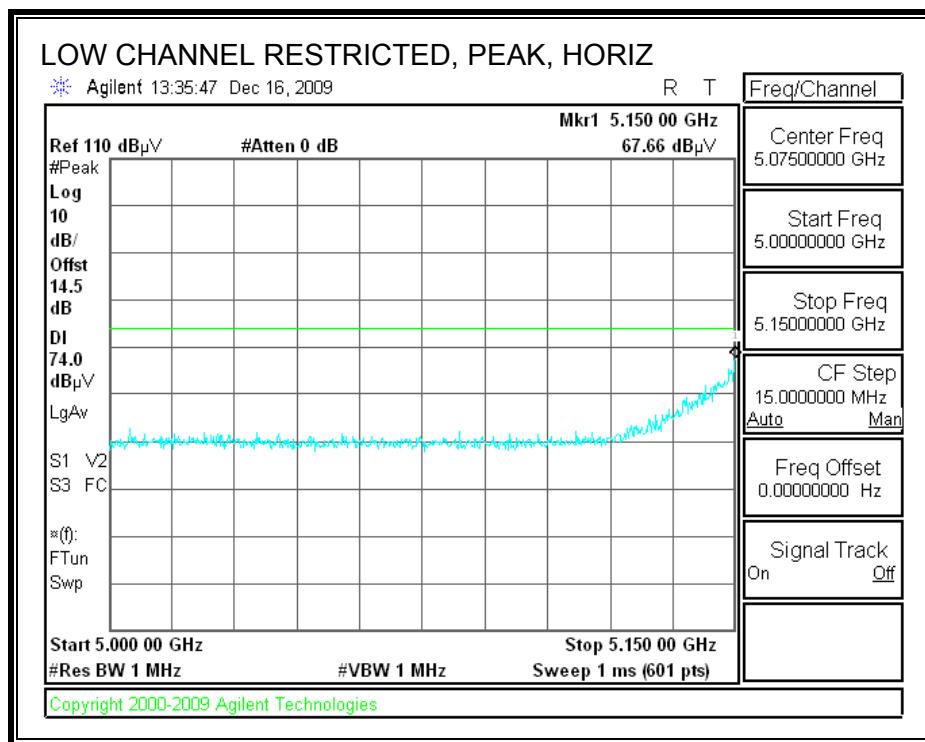


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

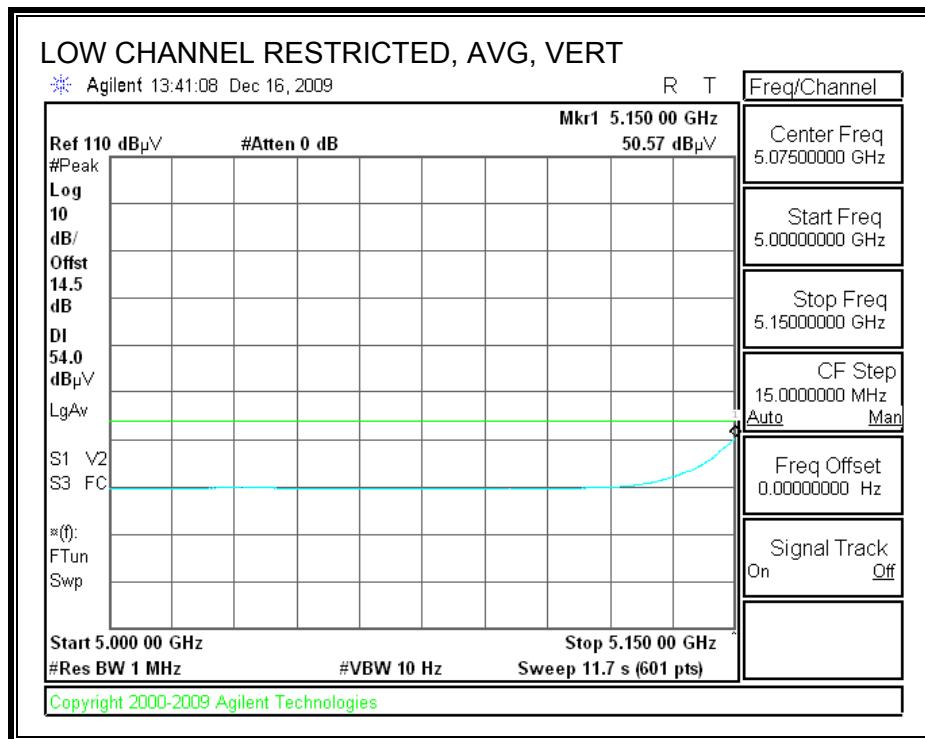
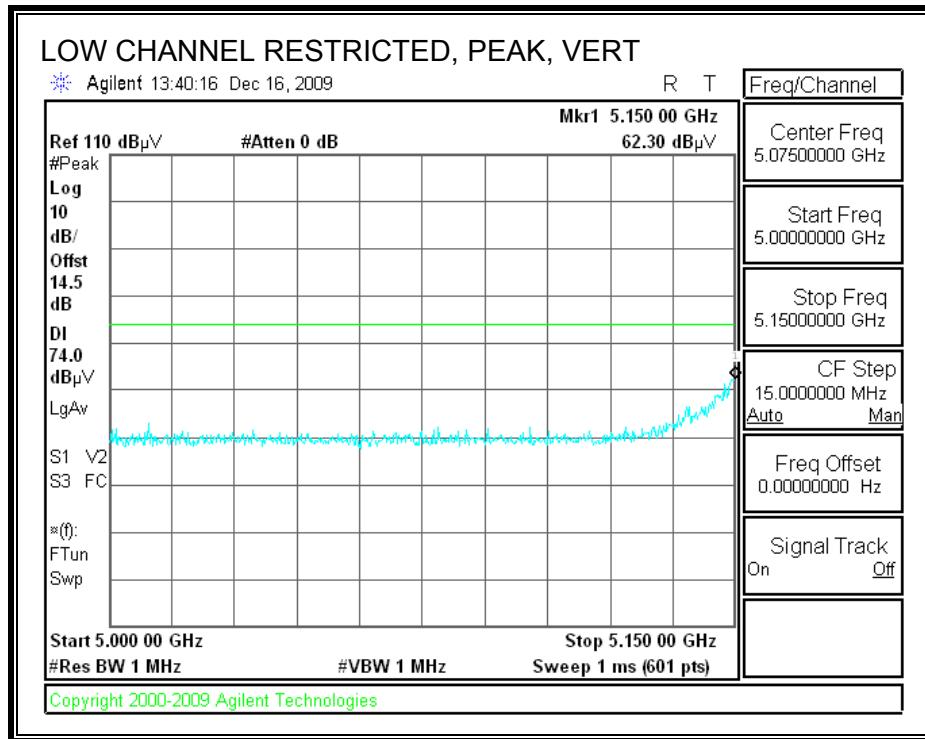


8.1.5. 802.11n HT40 MODE IN THE LOWER 5.2 GHz BAND_CHAIN A

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

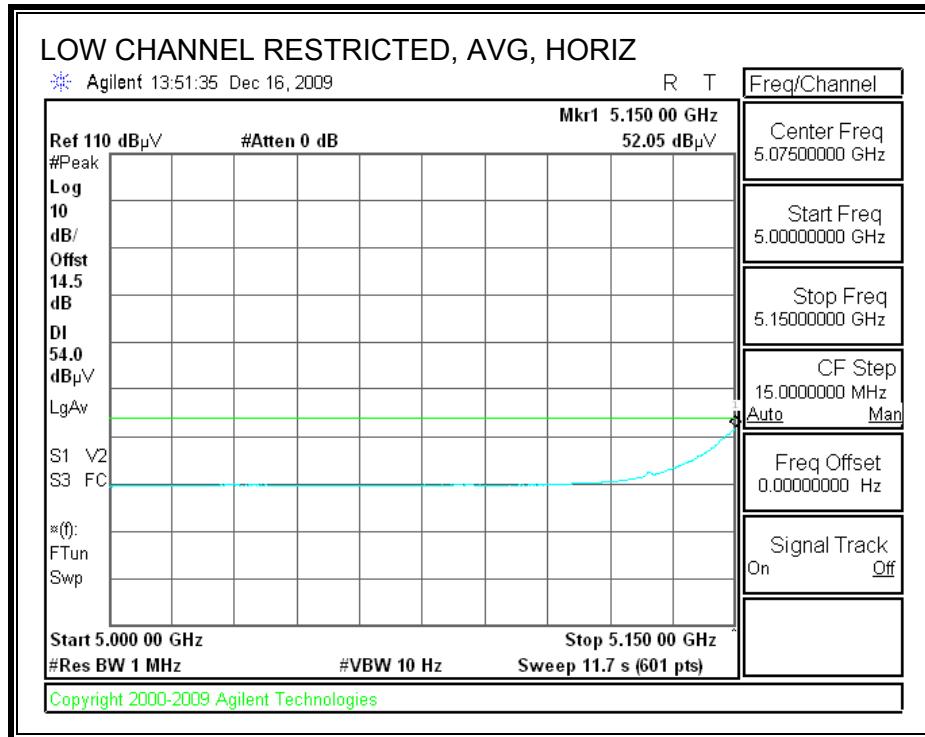
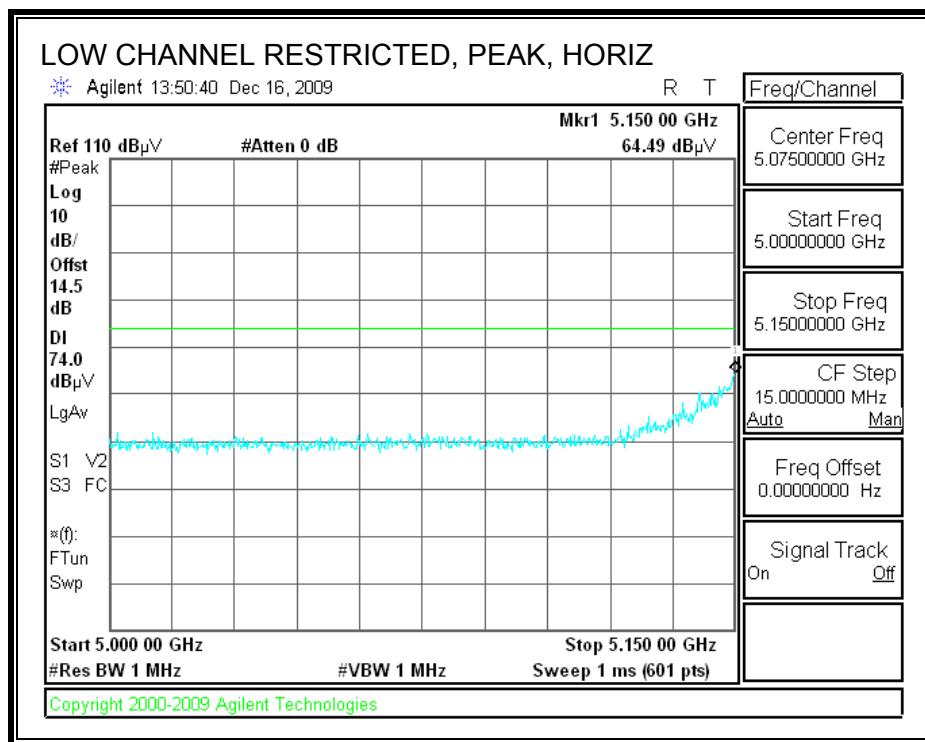


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

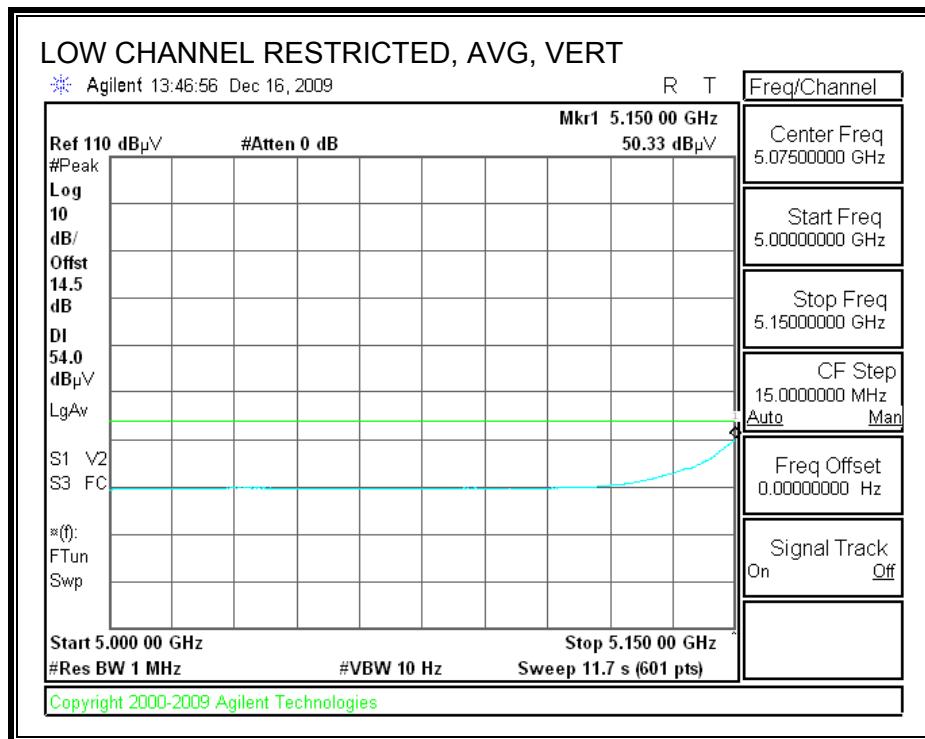
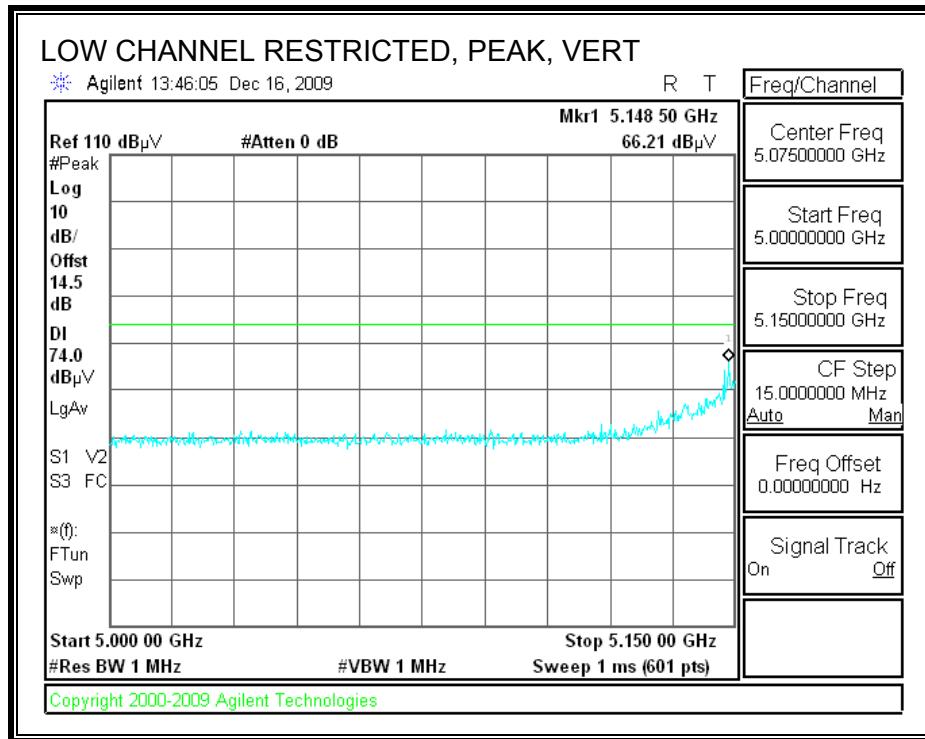


8.1.6. 802.11n HT40 MODE IN THE LOWER 5.2 GHz BAND_CHAIN B

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

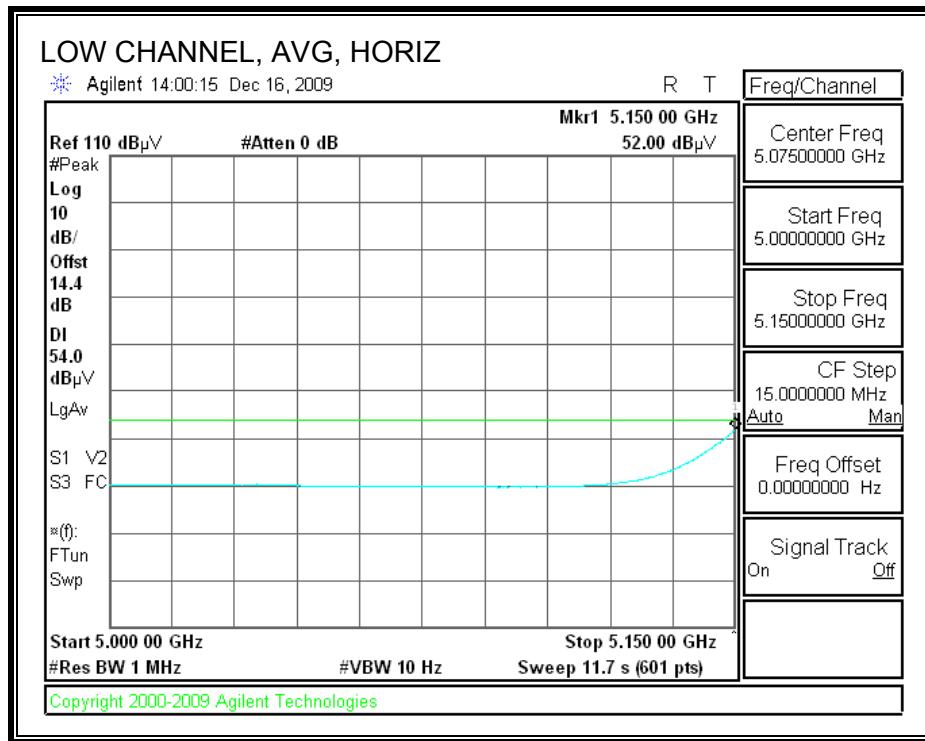
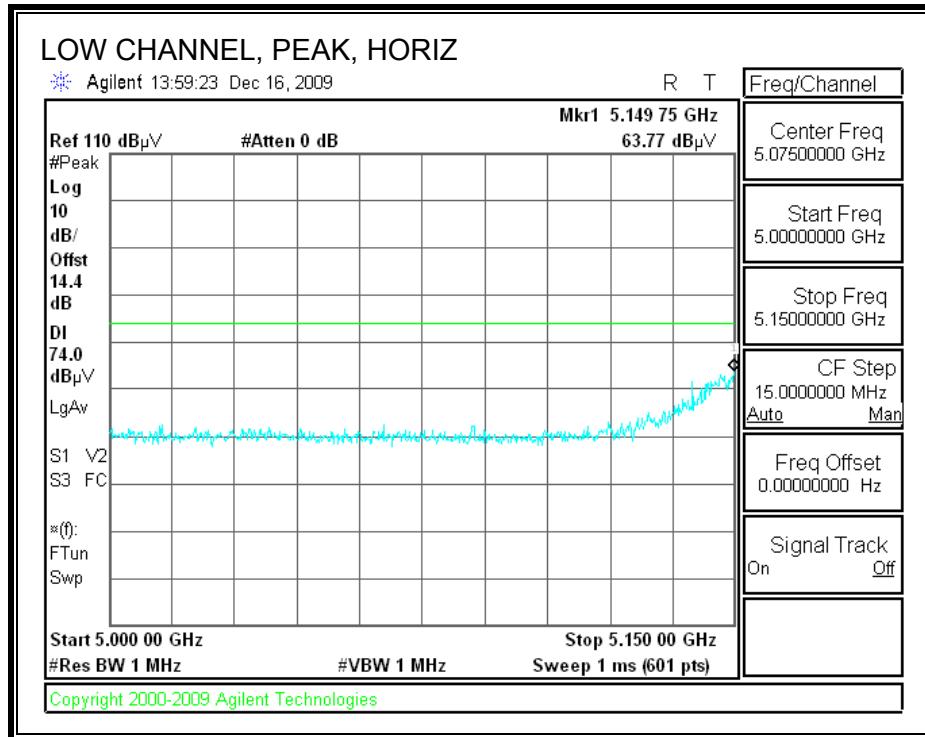


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

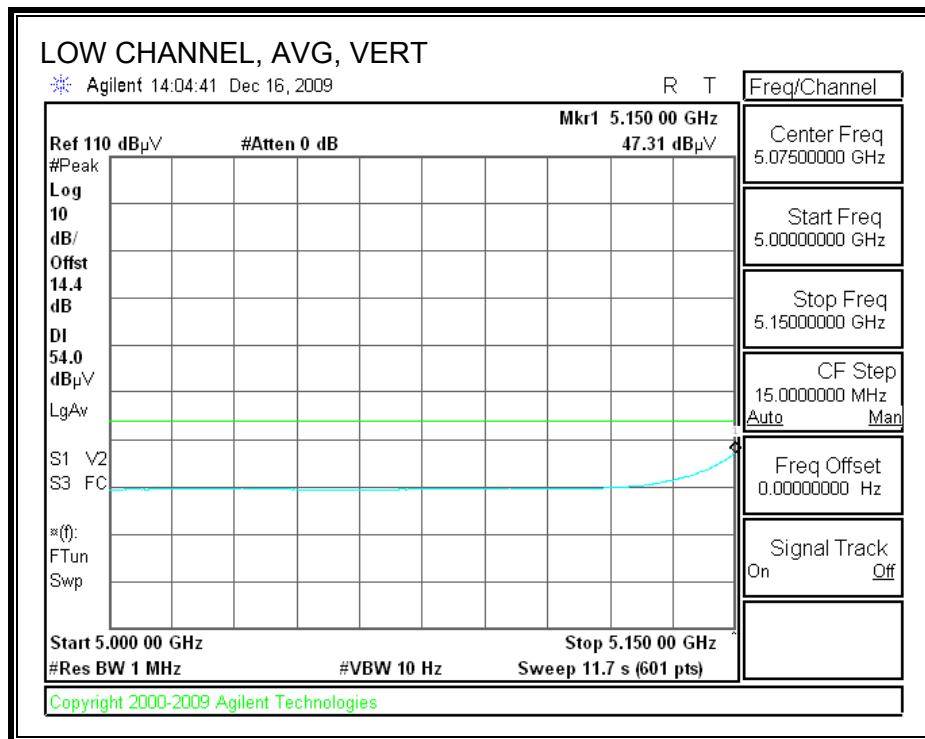
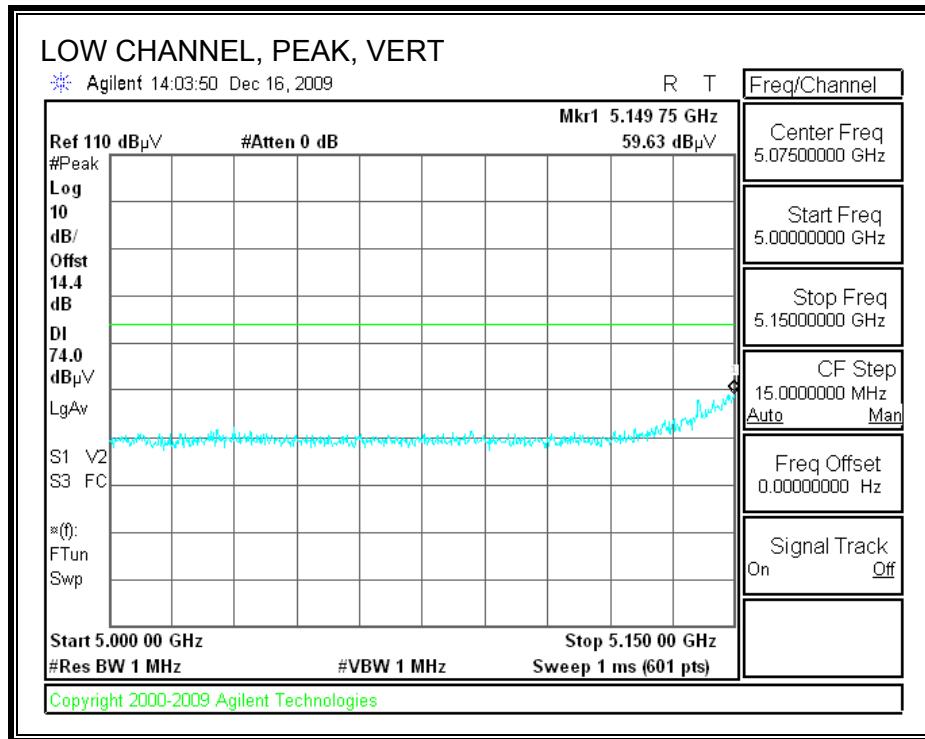


8.1.7. 802.11n HT20 MODE IN THE LOWER 5.2 GHz BAND_CHAIN A+B

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

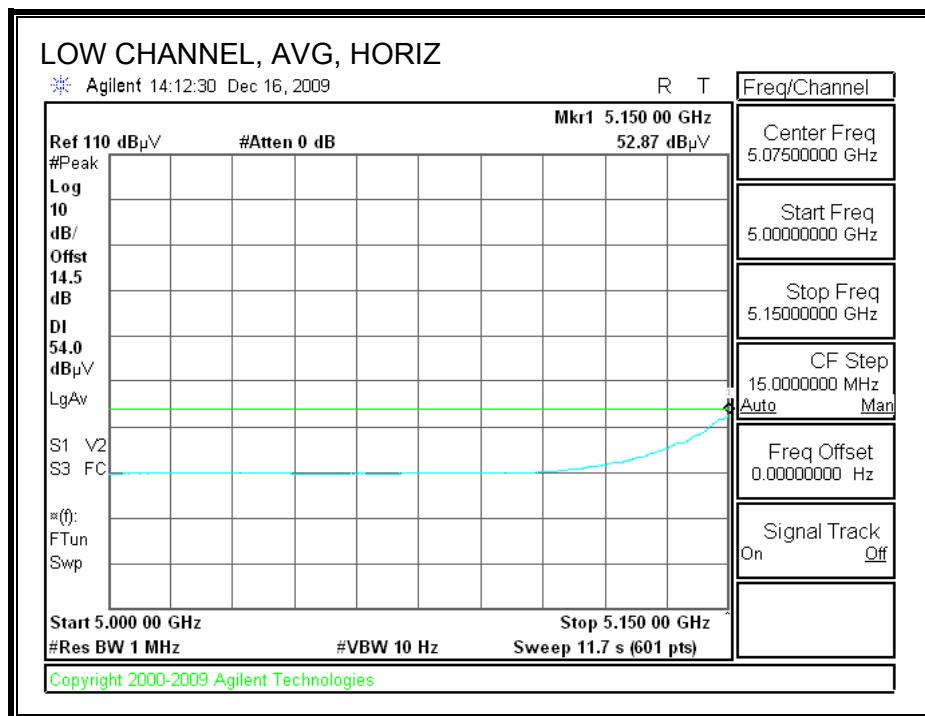
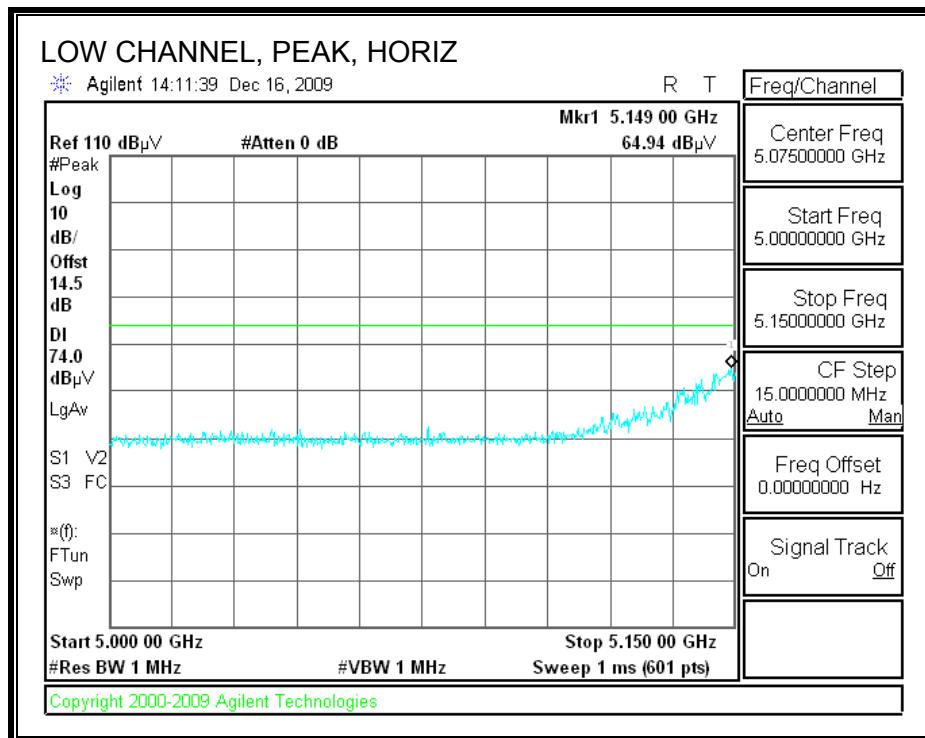


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

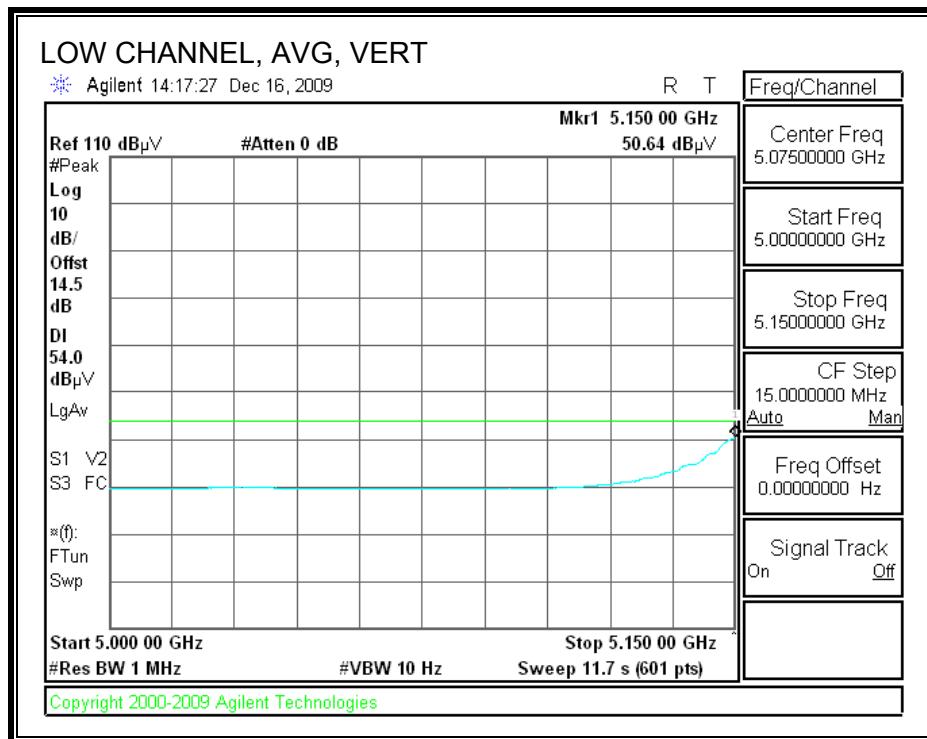
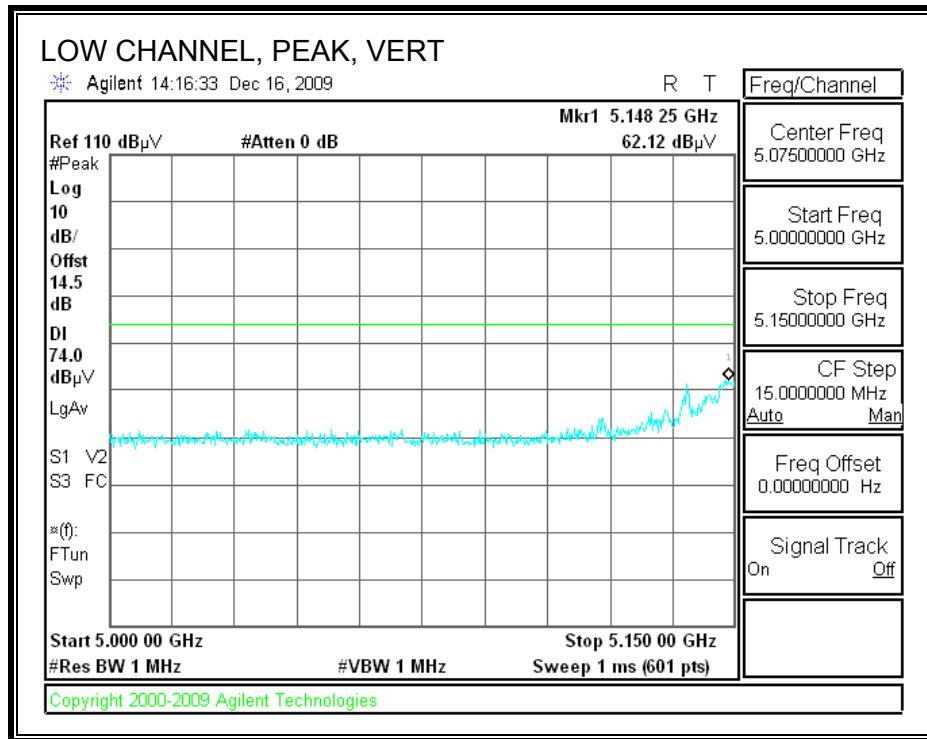


8.1.8. 802.11n HT40 MODE IN THE LOWER 5.2 GHz BAND_CHAIN A+B

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

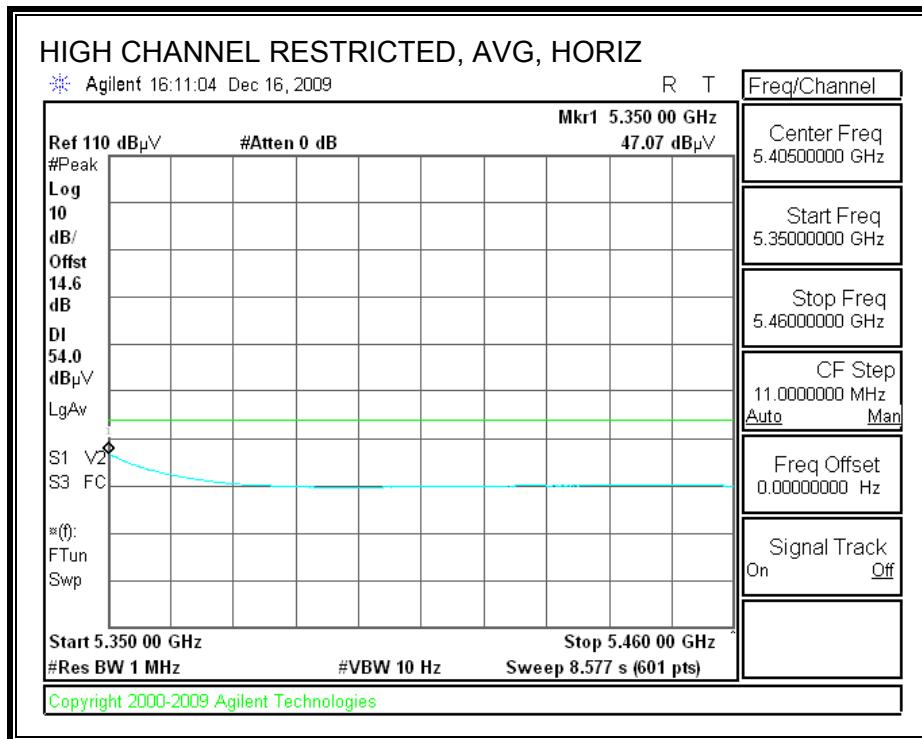
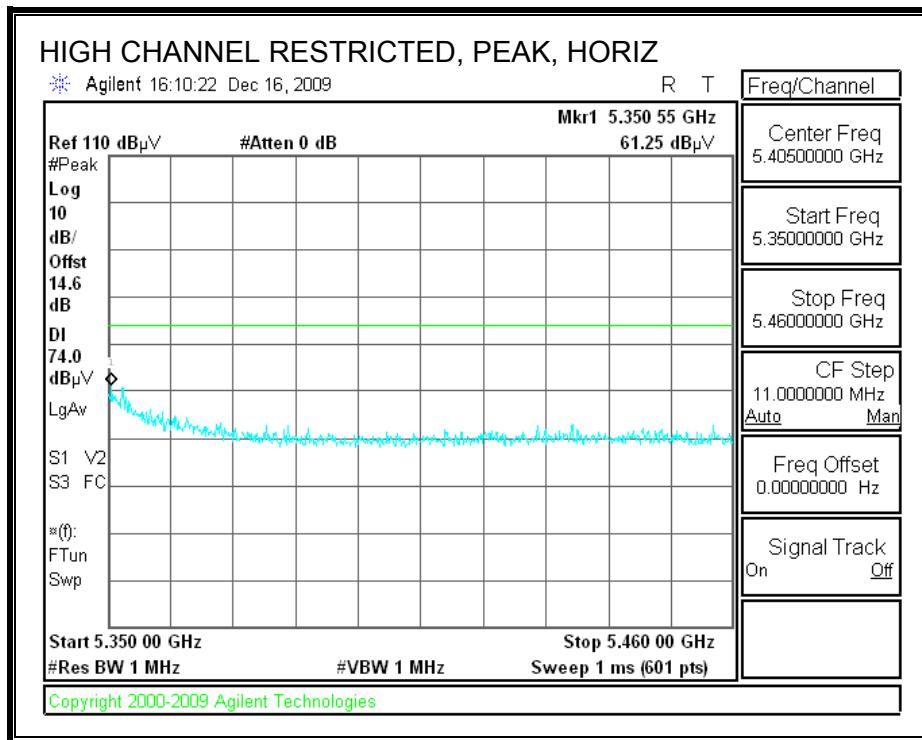


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

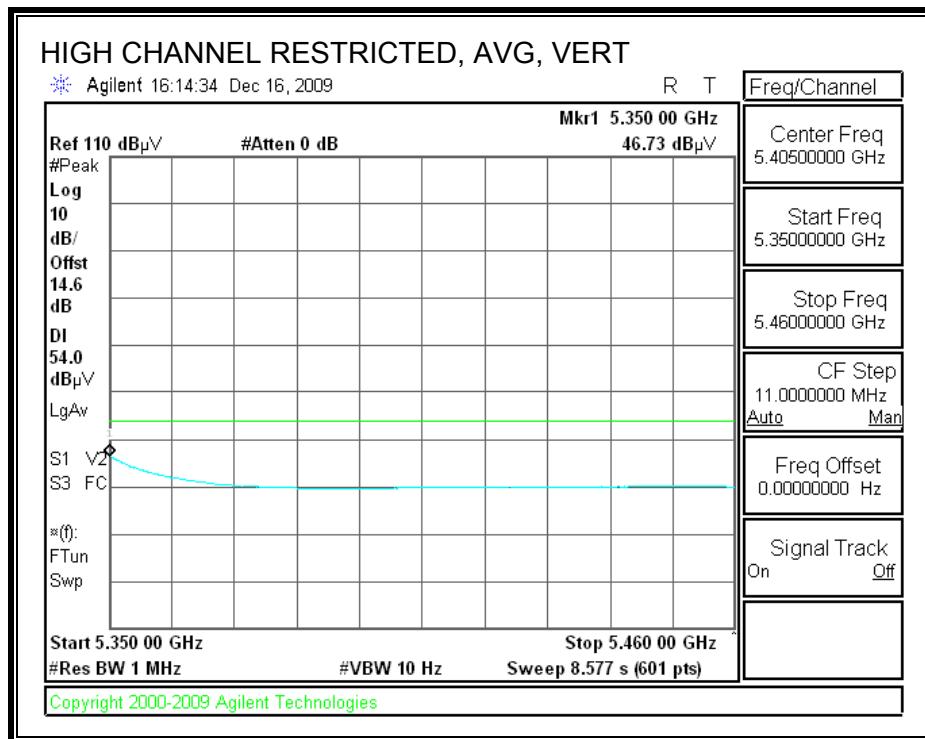
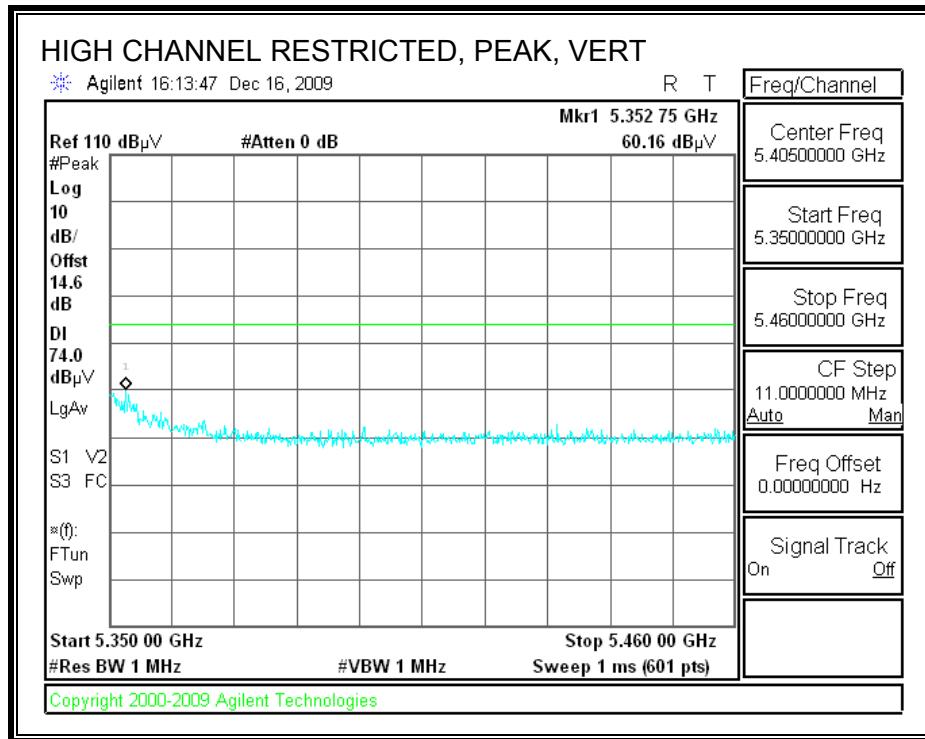


8.1.9. 802.11a MODE IN THE UPPER 5.3 GHz BAND_CHAIN A

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

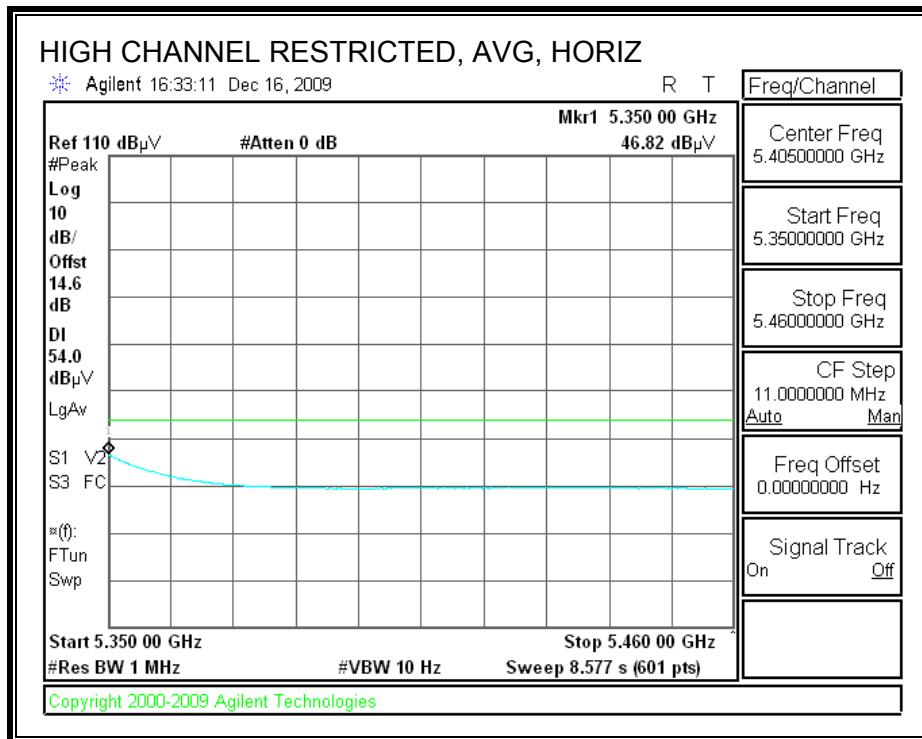
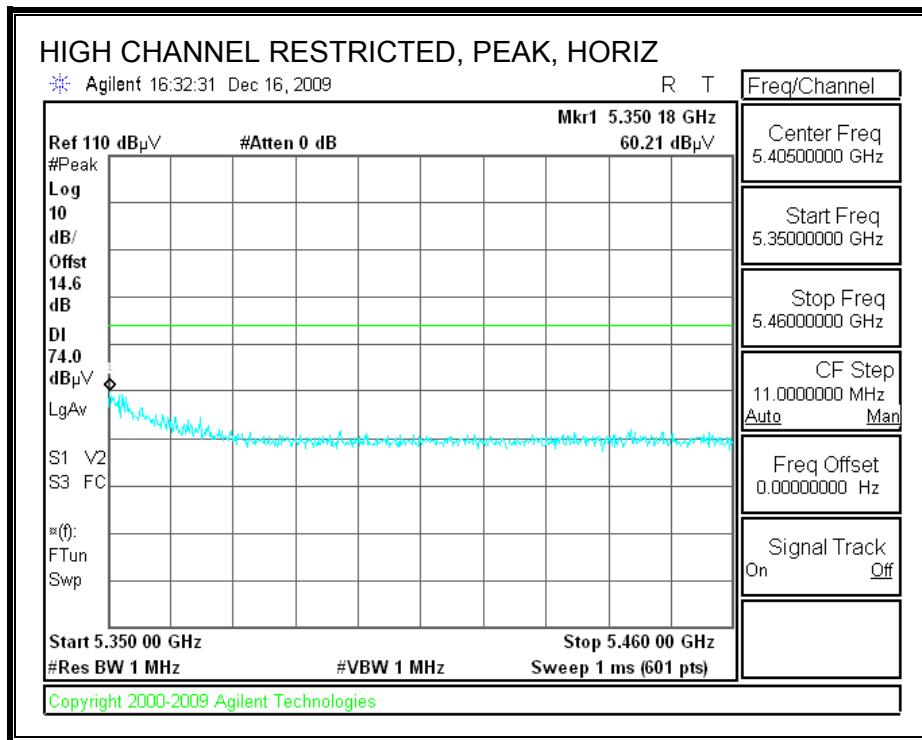


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

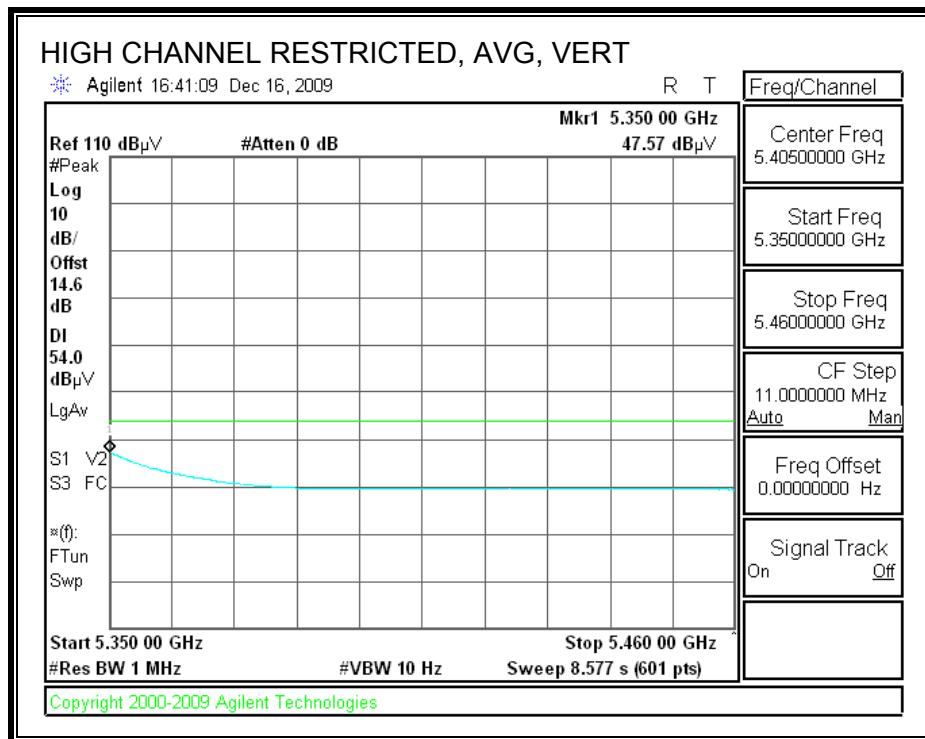
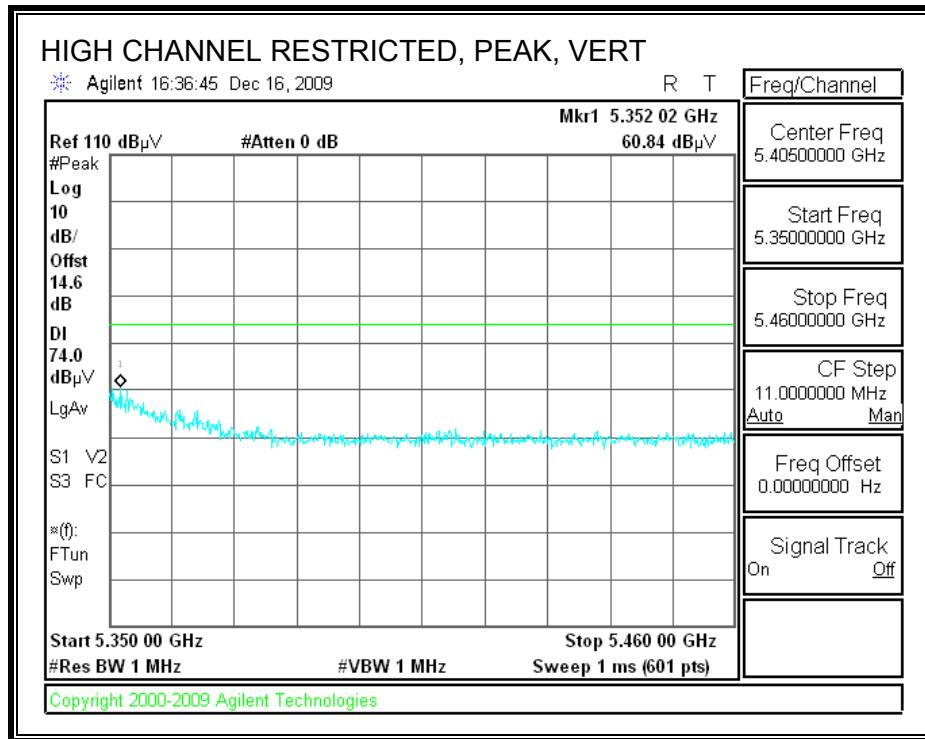


8.1.10. 802.11a MODE IN THE UPPER 5.3 GHz BAND_CHAIN B

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

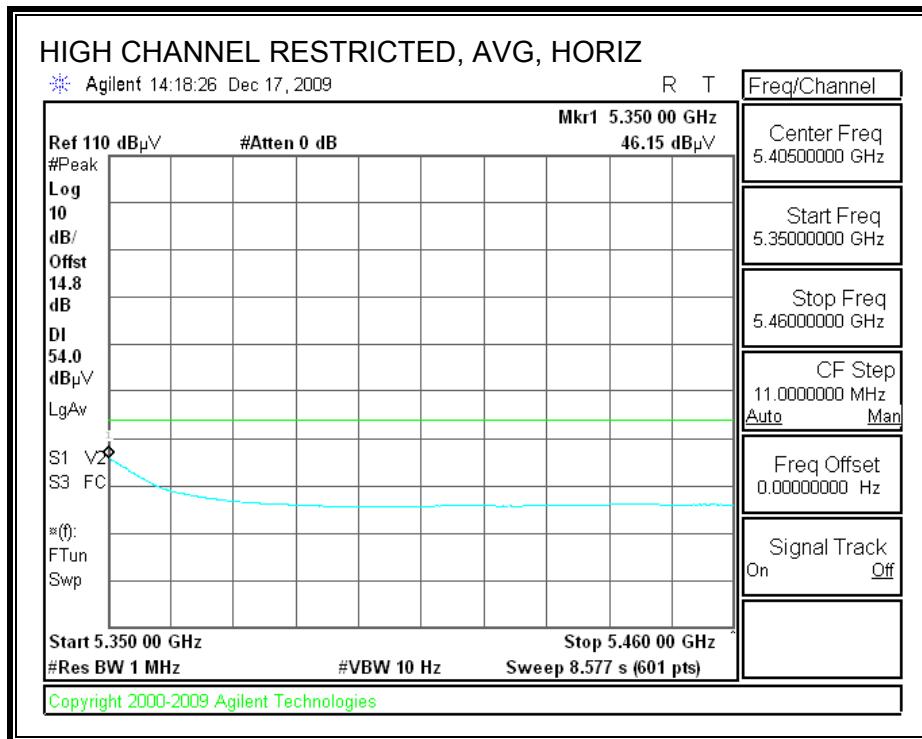
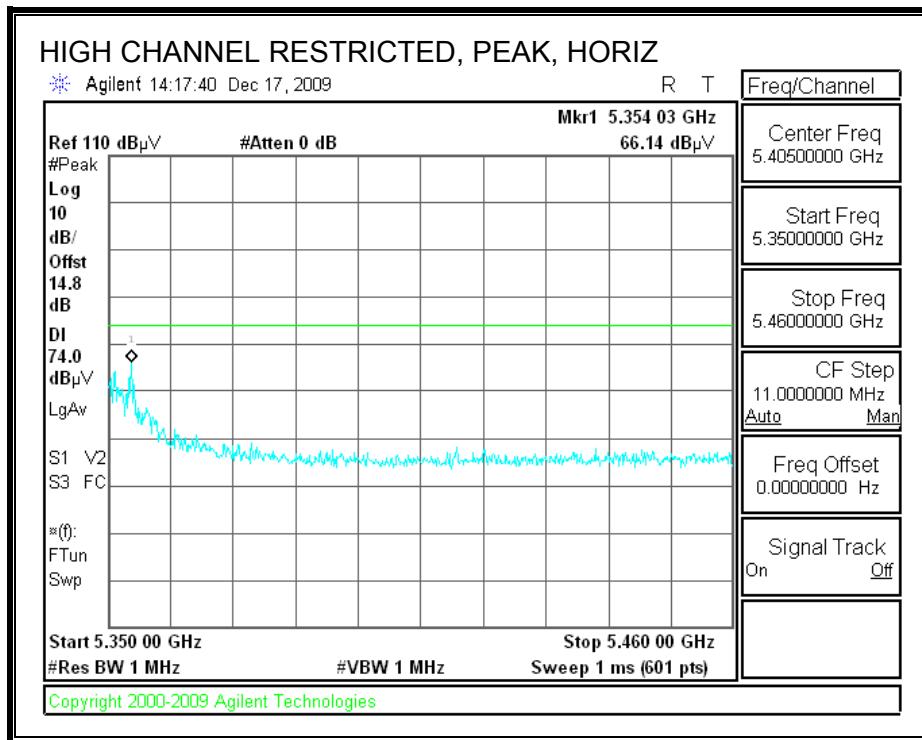


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

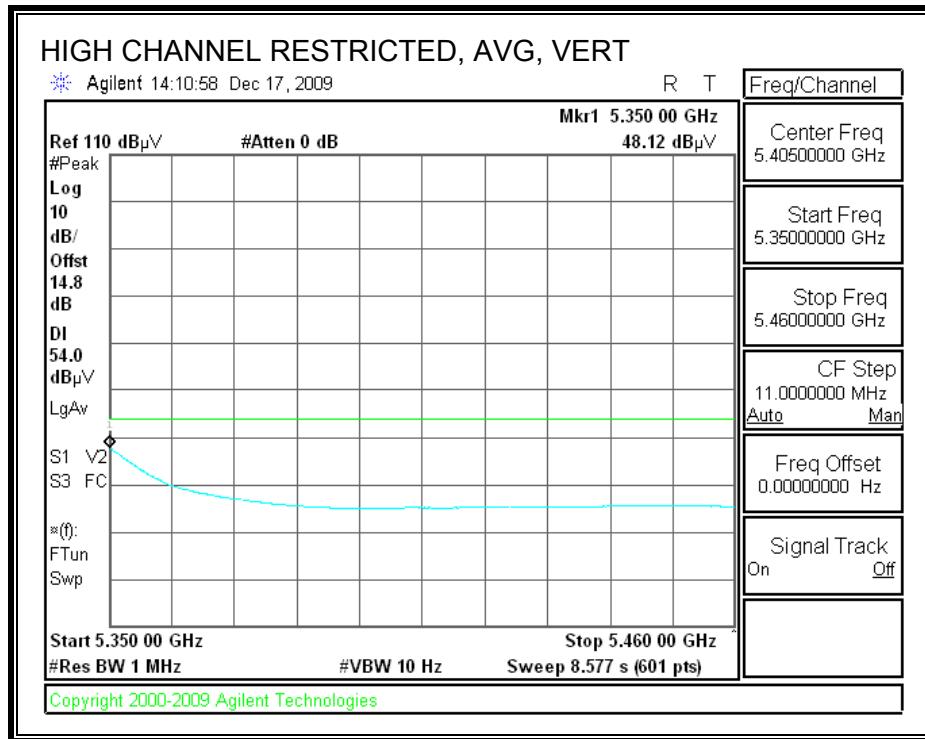
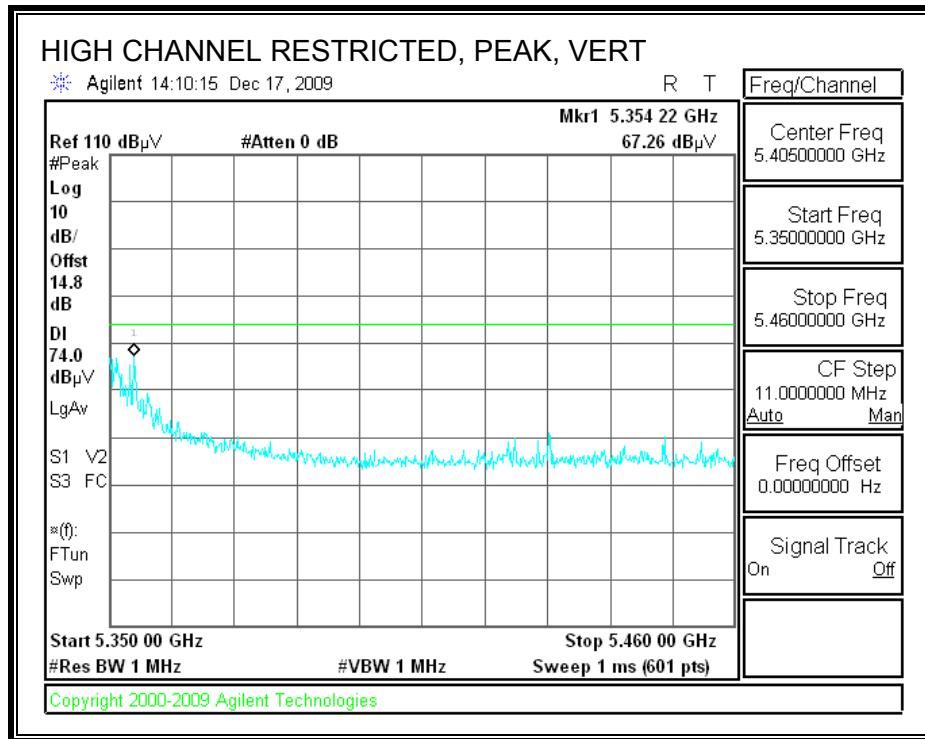


8.1.11. 802.11n HT20 MODE IN THE UPPER 5.3 GHz BAND_CHAIN A

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

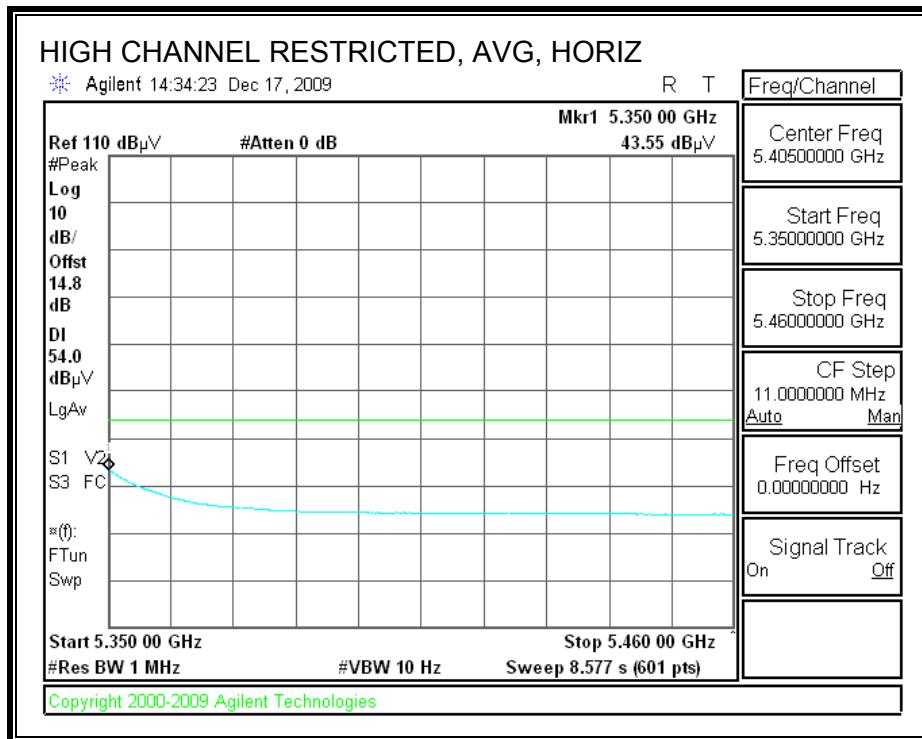
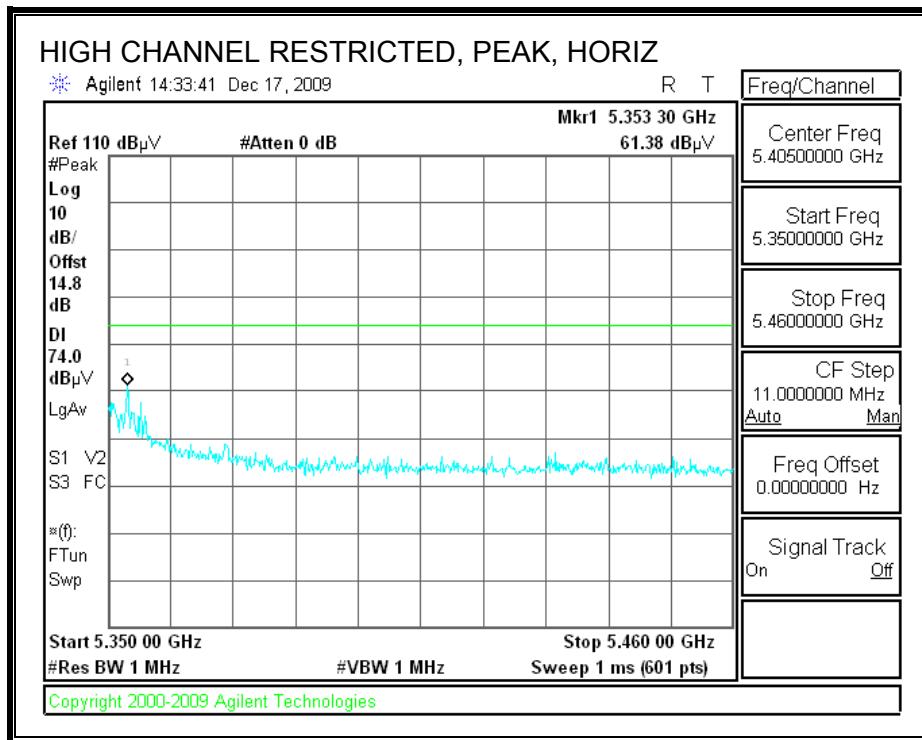


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

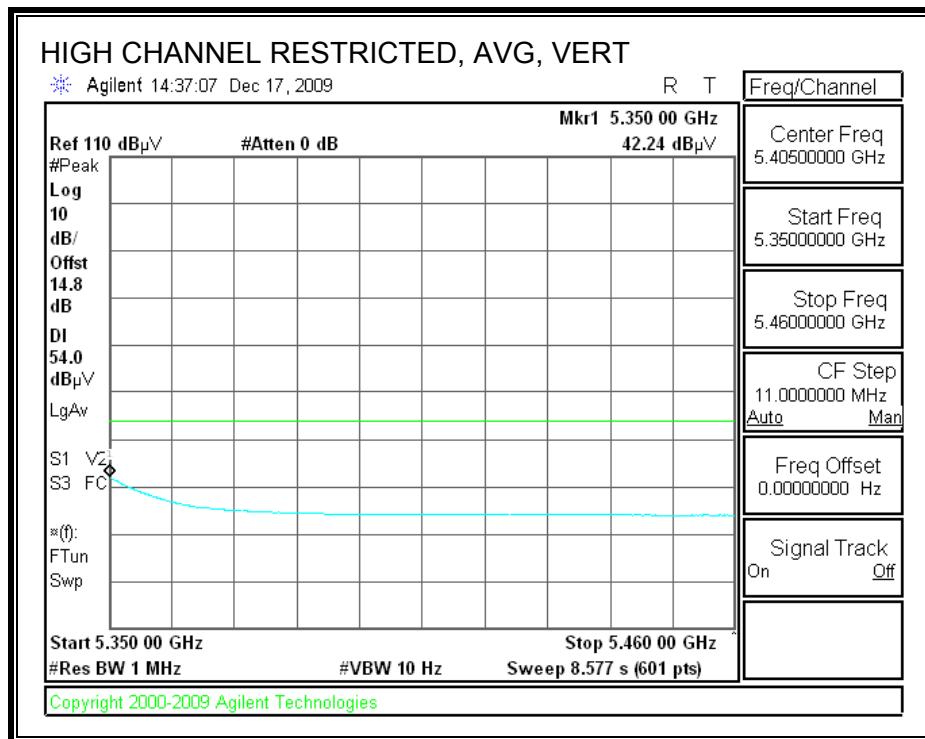
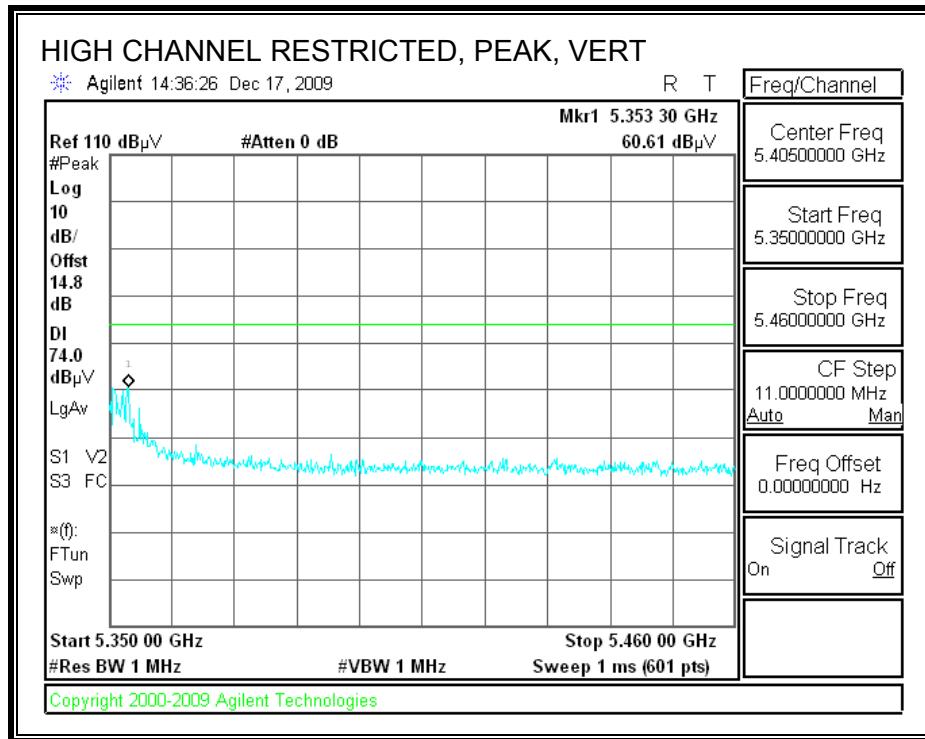


8.1.12. 802.11n HT20 MODE IN THE UPPER 5.3 GHz BAND_CHAIN B

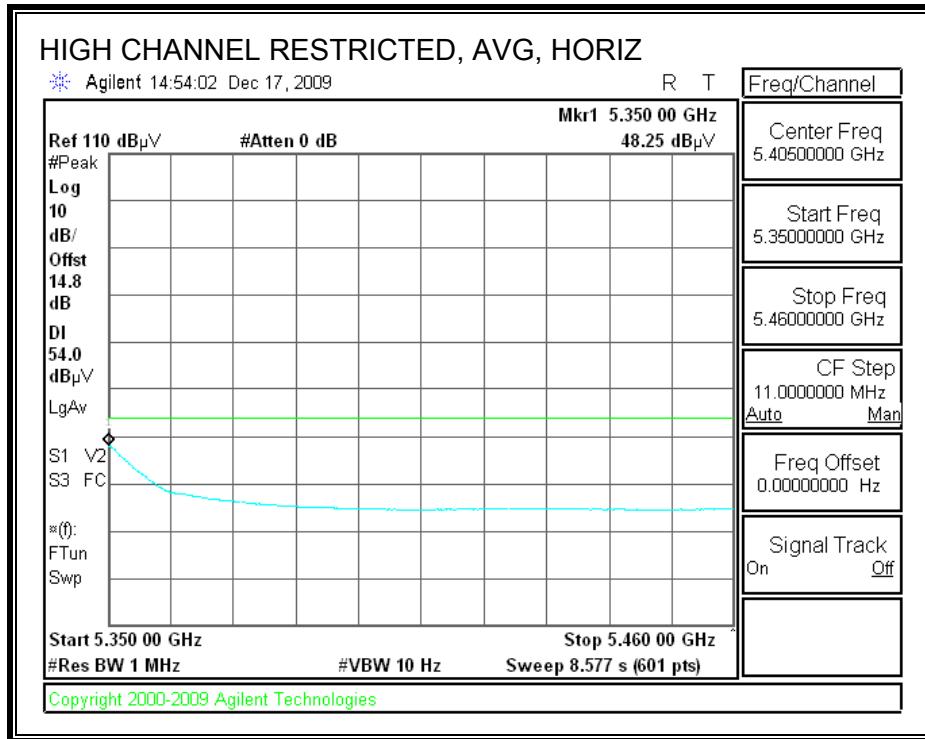
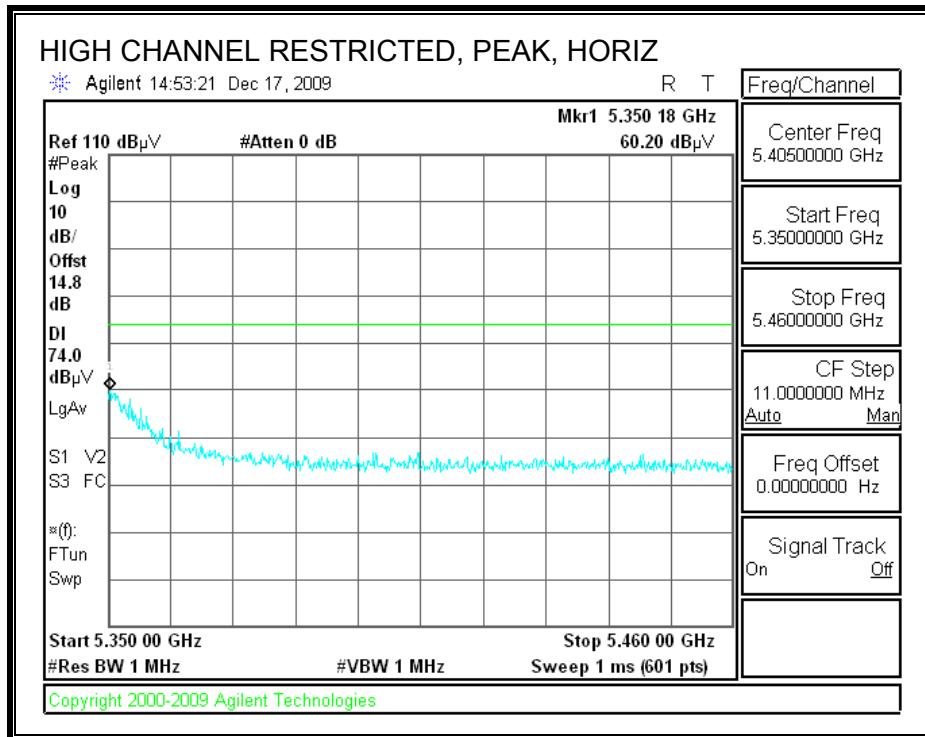
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



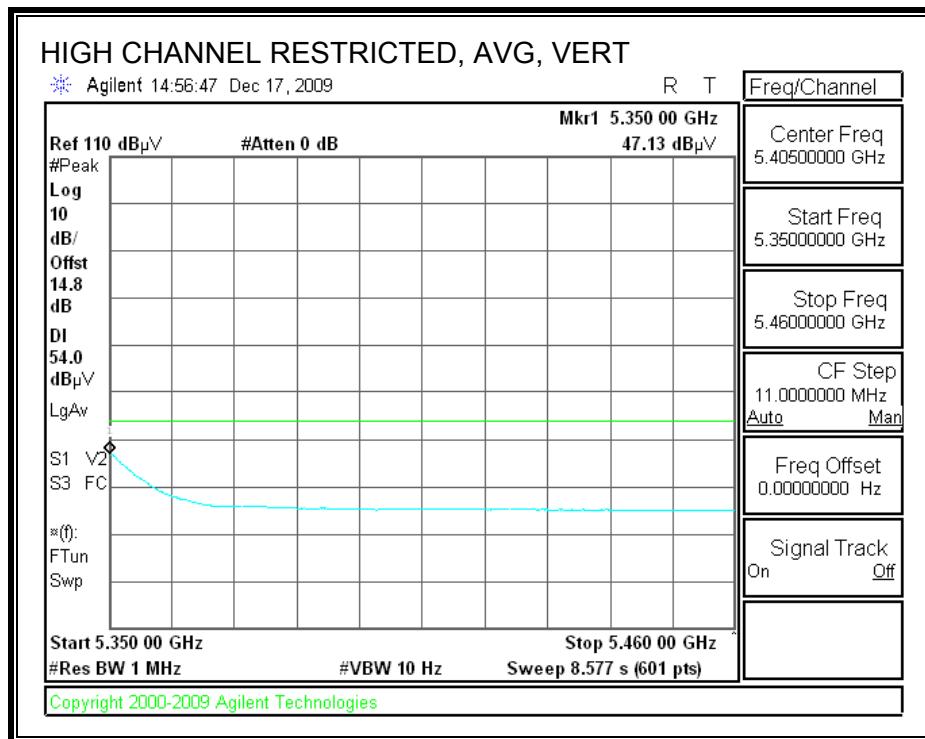
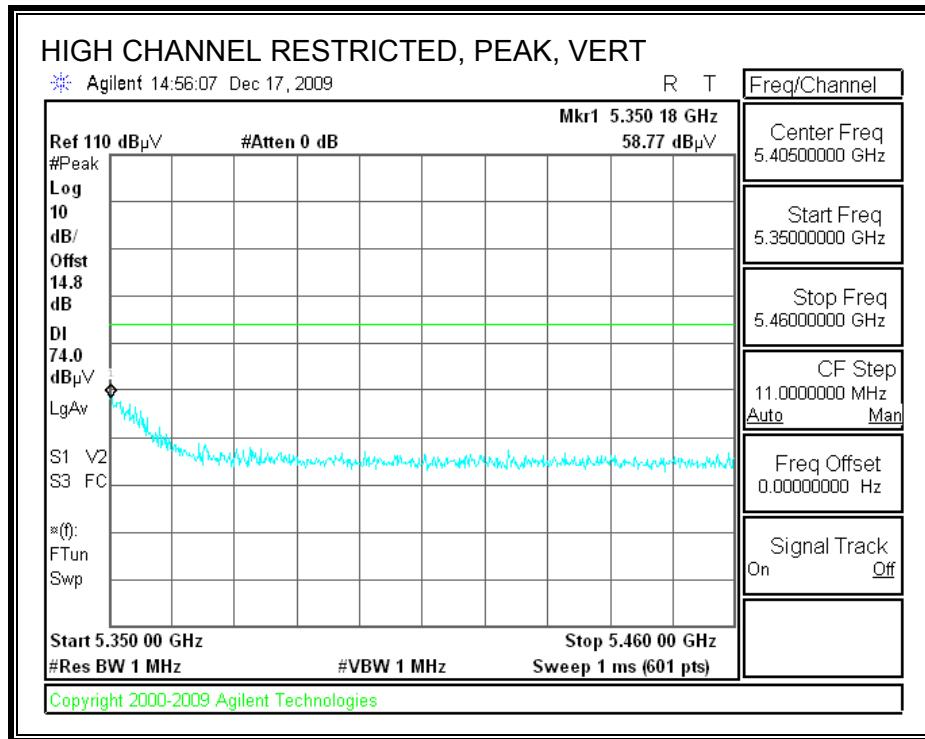
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

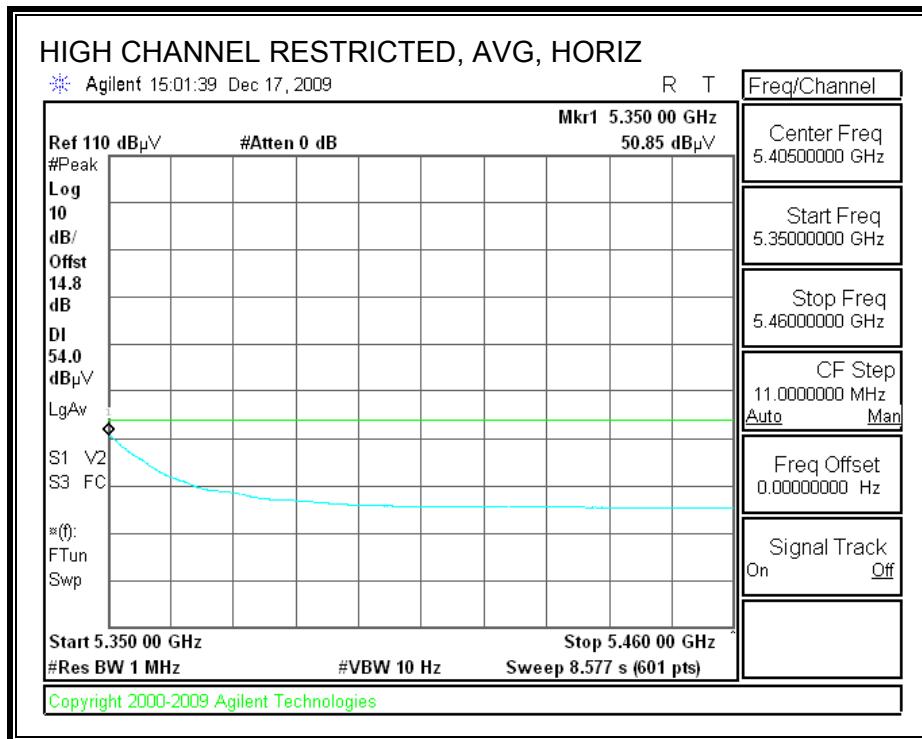
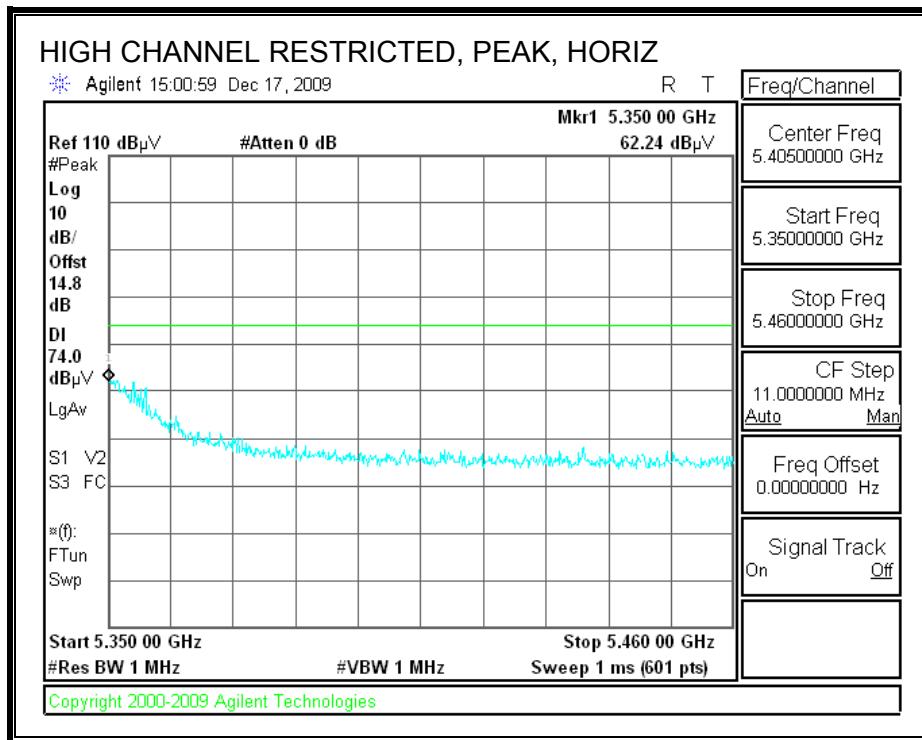


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

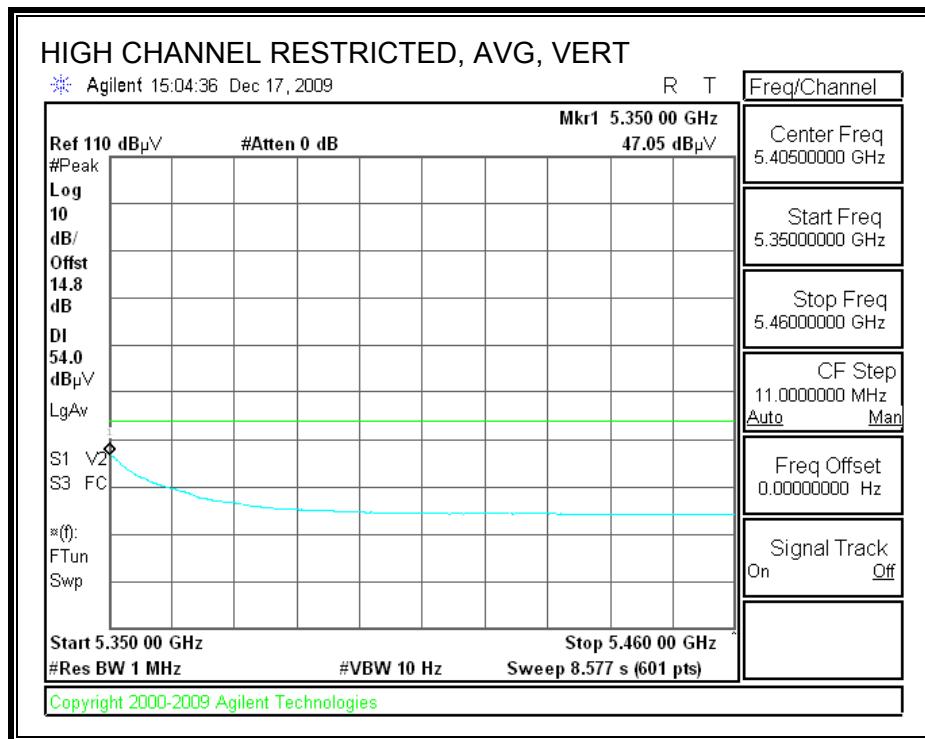
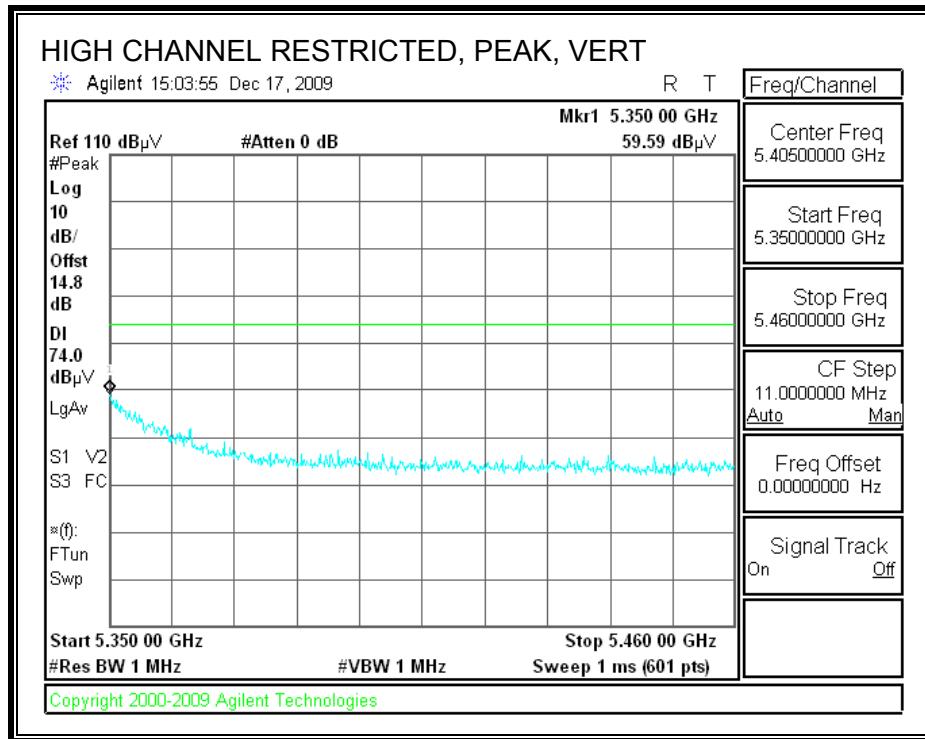


8.1.13. 802.11n HT40 MODE IN THE UPPER 5.3 GHz BAND_CHAIN B

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

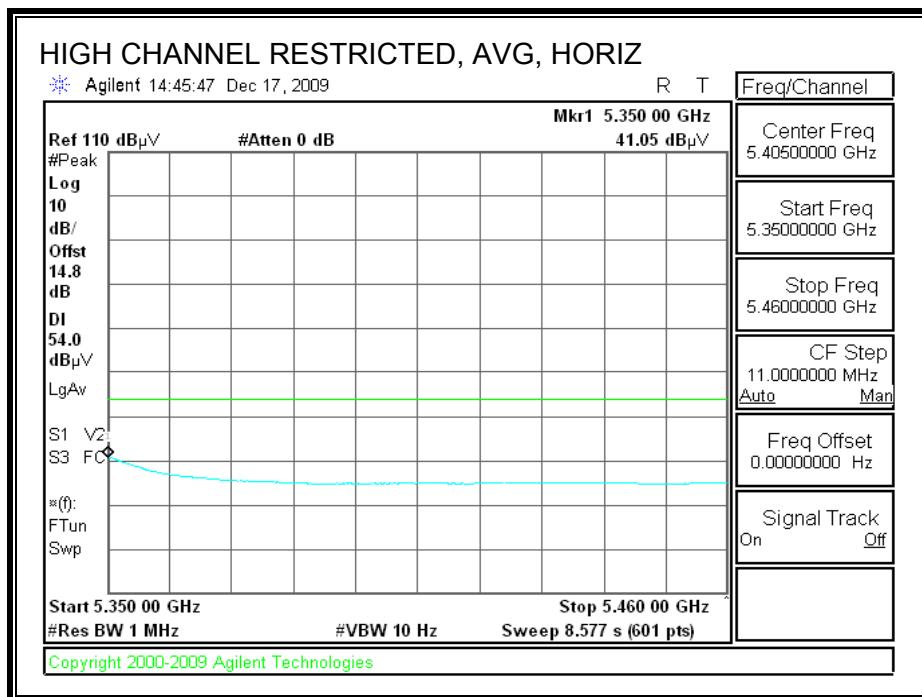
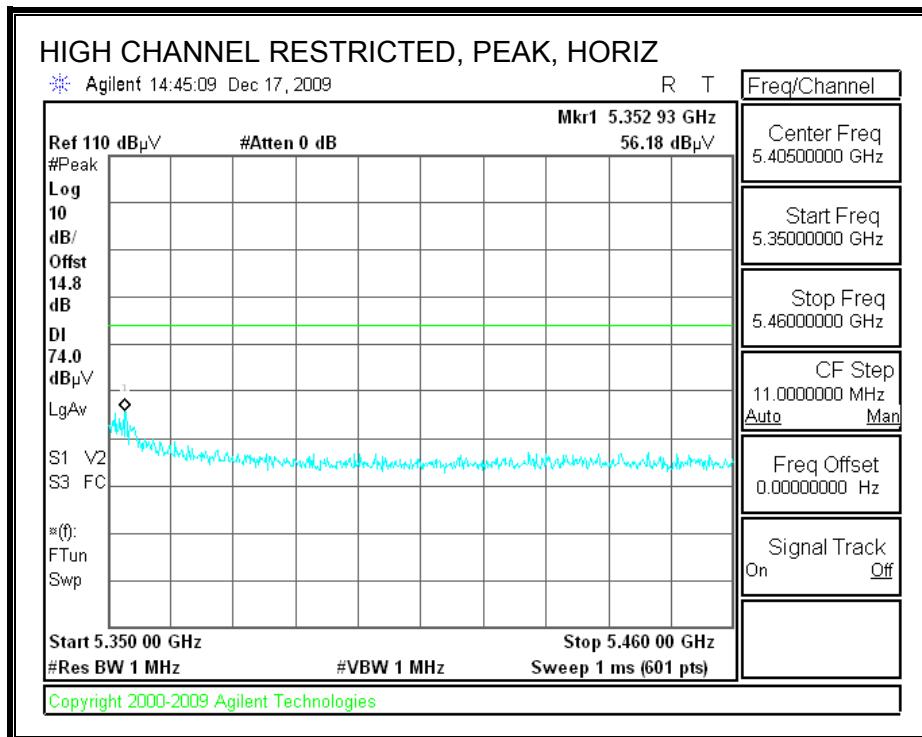


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

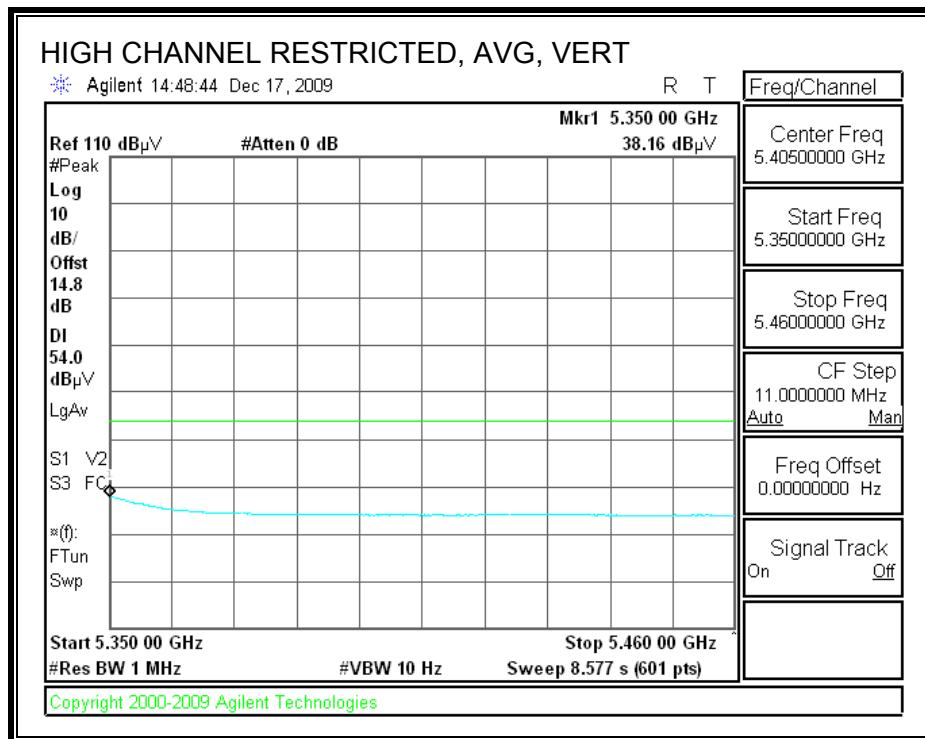
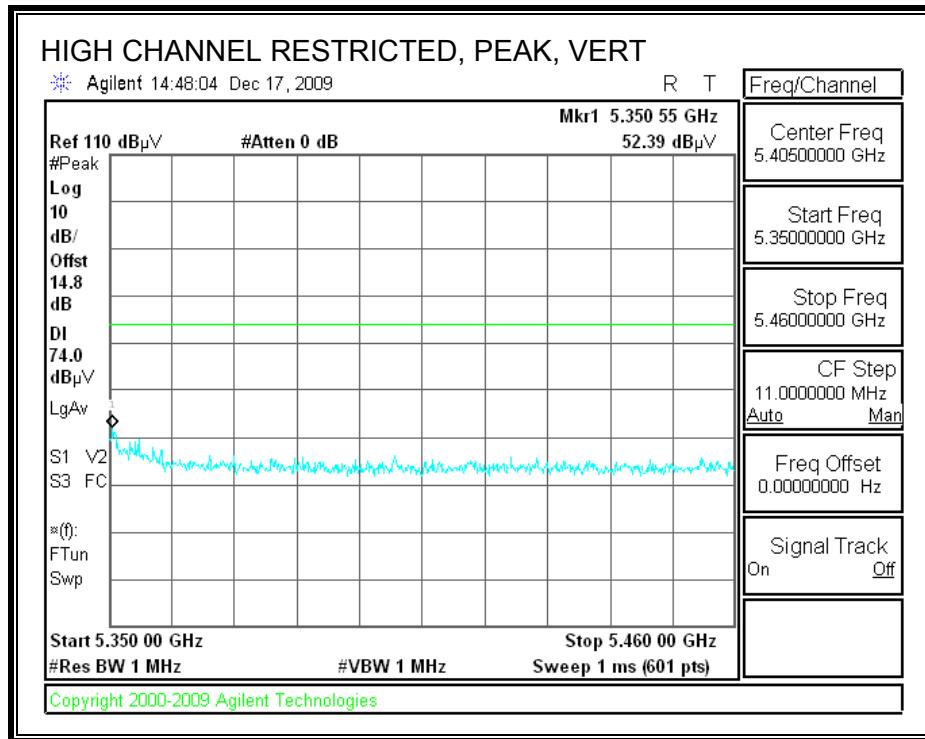


8.1.14. 802.11n HT20 MODE IN THE UPPER 5.3 GHz BAND_CHAIN A+B

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

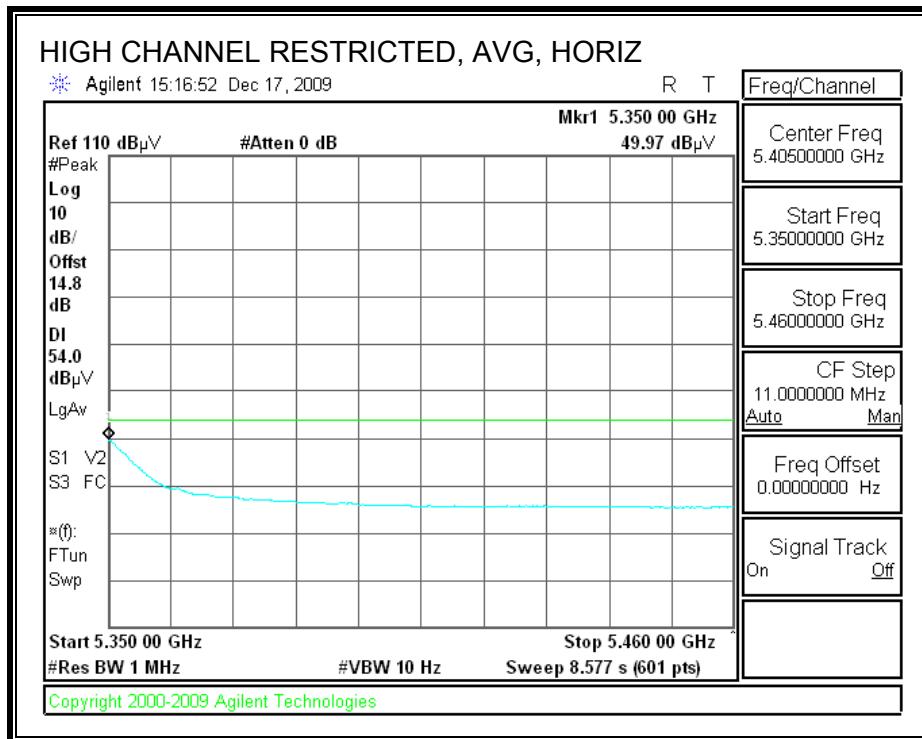
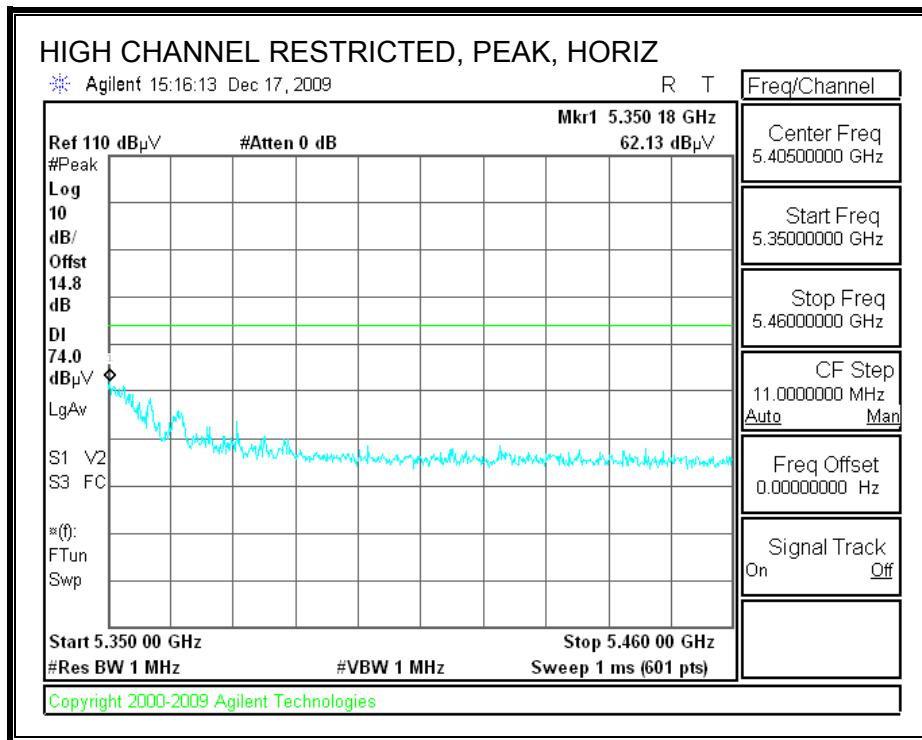


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

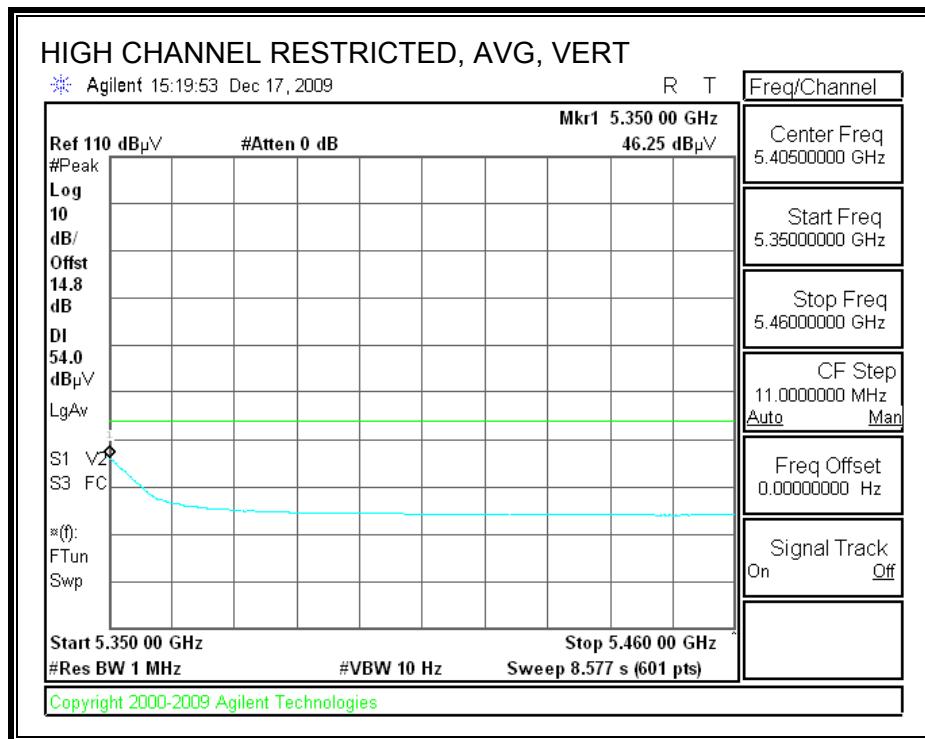
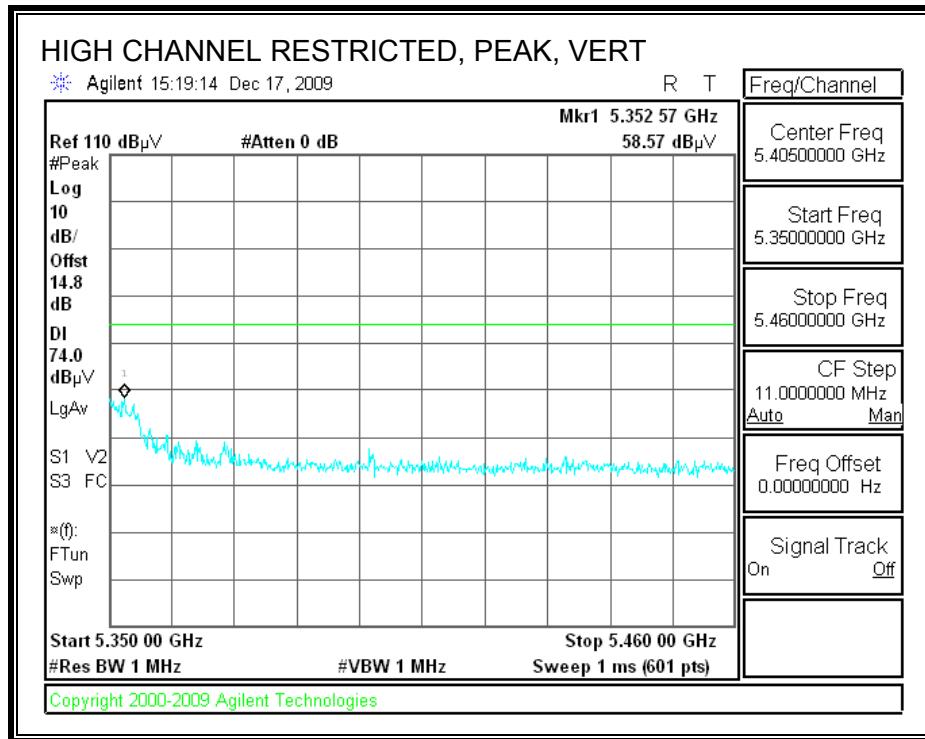


8.1.15. 802.11n HT40 MODE IN THE UPPER 5.3 GHz BAND_CHAIN A+B

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

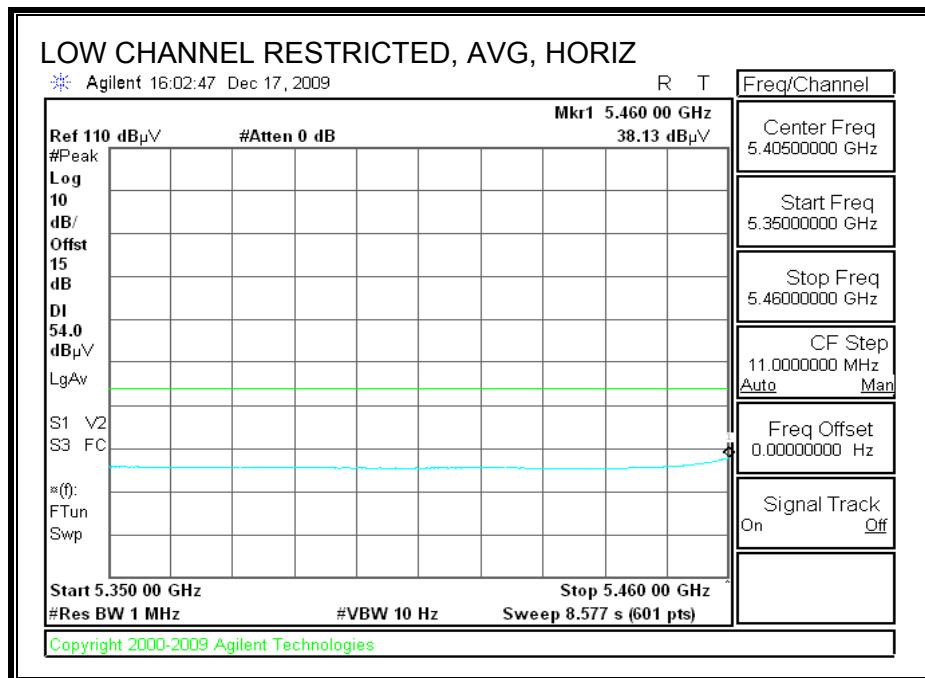
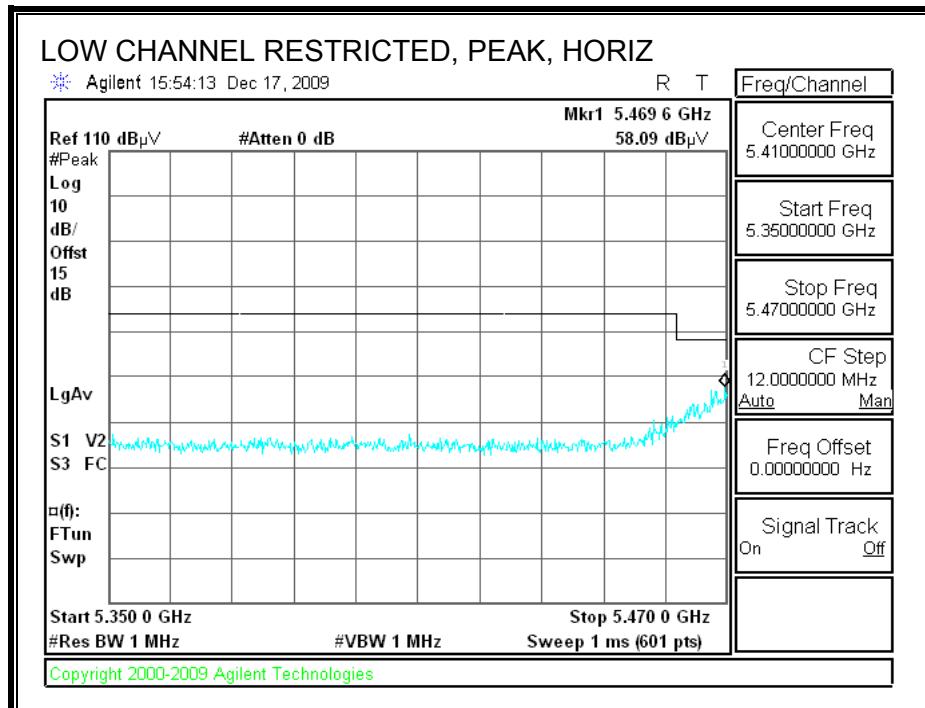


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

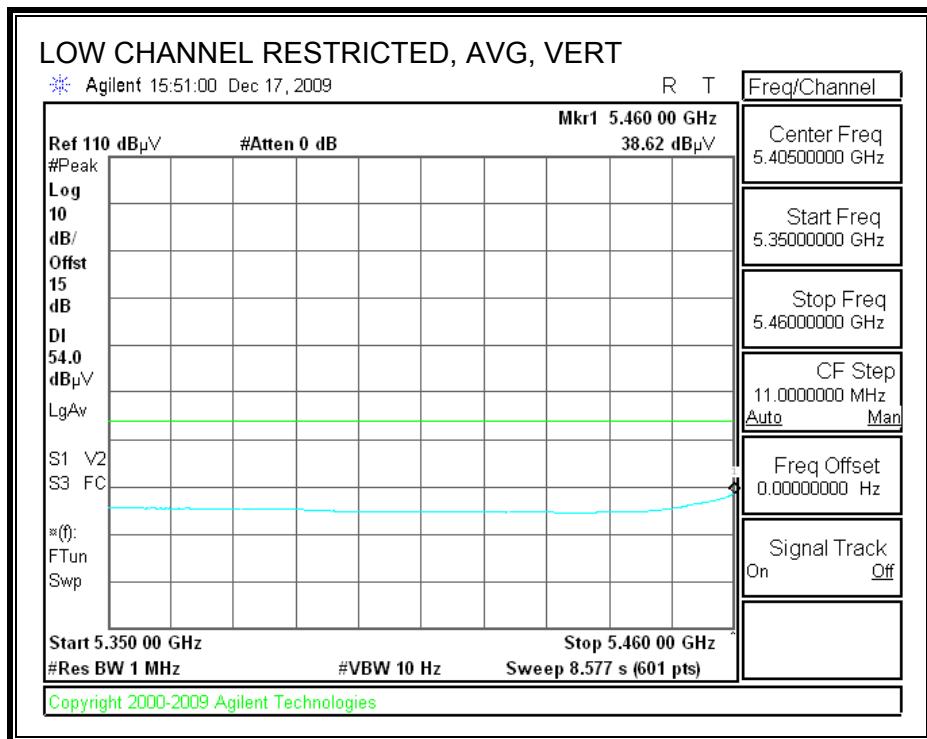
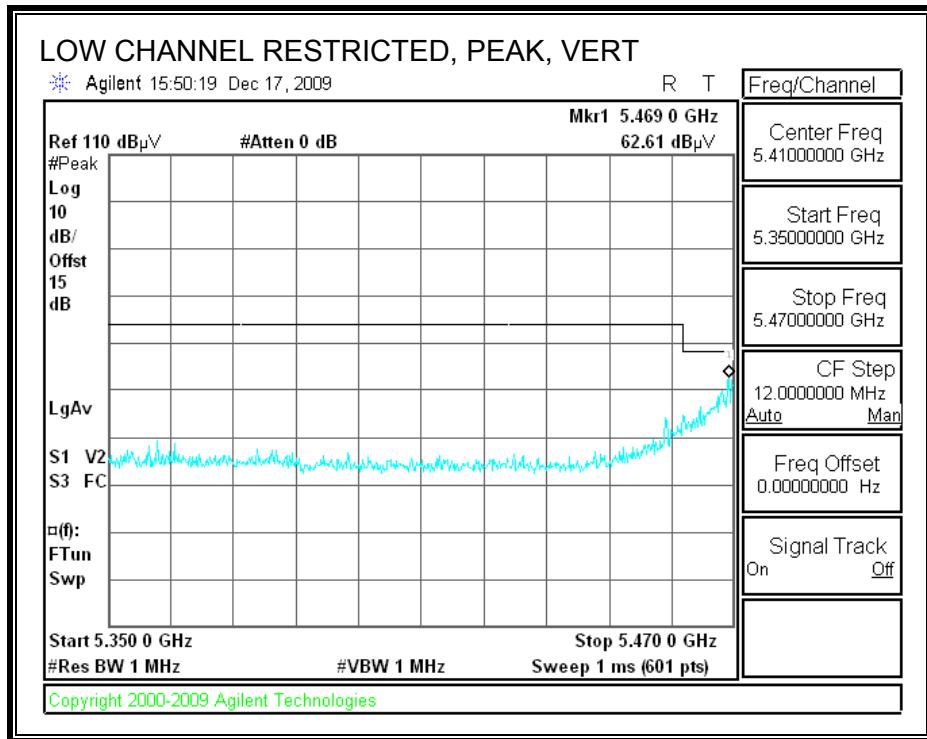


8.1.16. 802.11a MODE IN THE 5.6 GHz BAND_CHAIN A

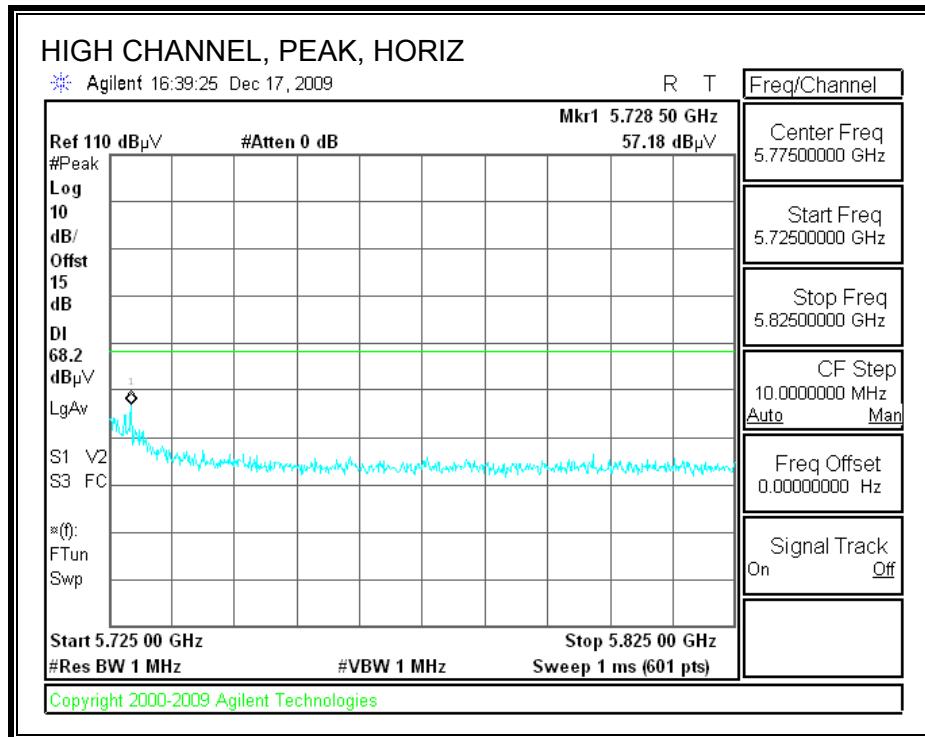
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



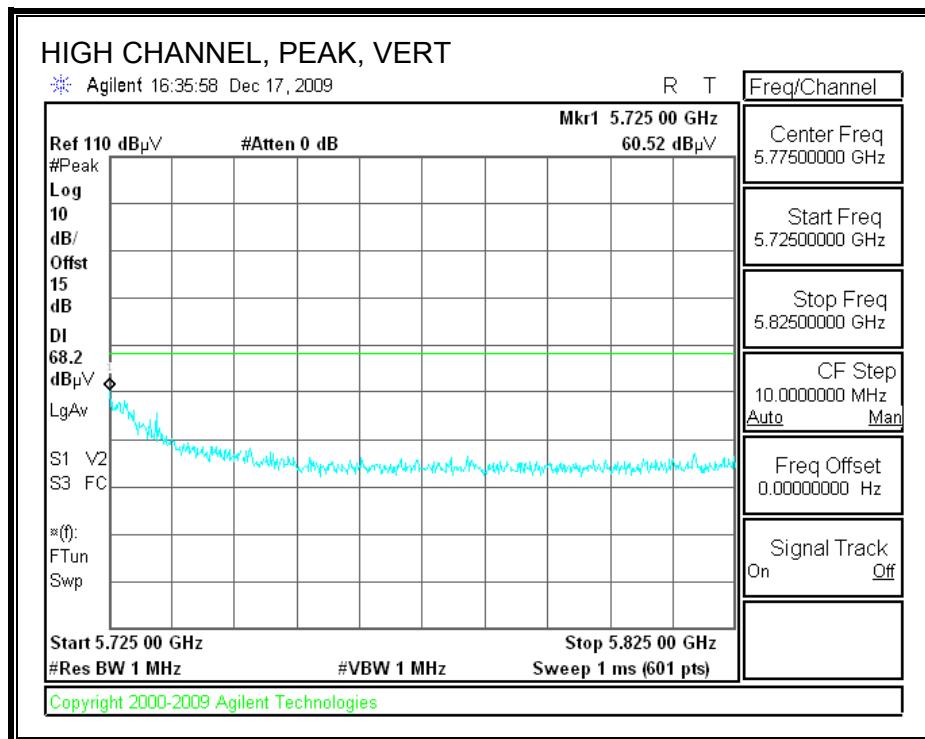
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)



5.2 & 5.3 GHz BANDS - HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber**

Test Engr: Chin Pang
Date: 12/31/09
Project #: 09U12972
Company: Toshiba
EUT Description: 2x2 WLAN 802.11 abgn Intel® Centrino Ultimate-N 6200
EUT M/N: PA3795U-1MPC
Test Target: FCC 15.407
Mode Oper: TX, 5.3GHz Band, HT20 Mid Ch

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

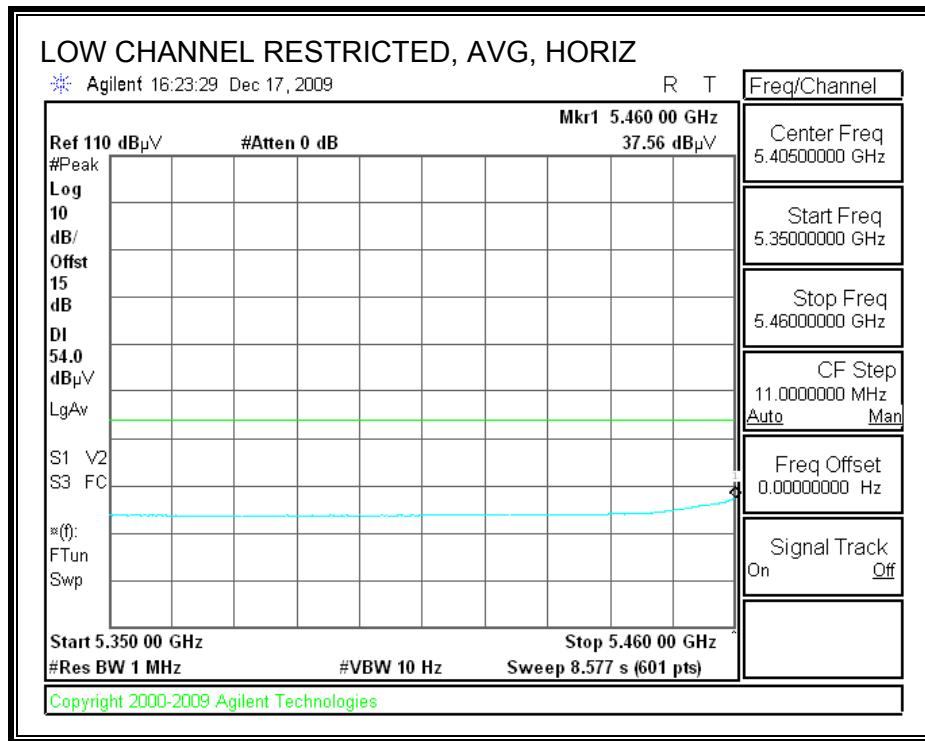
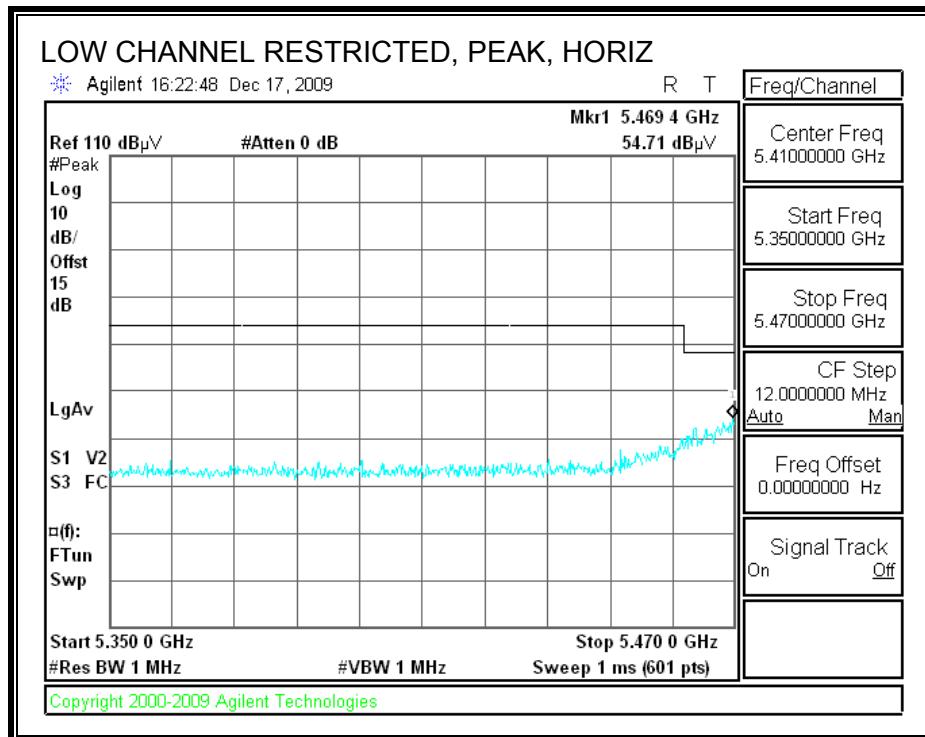
f GHz	Dist (m)	Read dBuV	AF dB/m	CL	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol V/H	Det. P/A/QP	Notes
Mid Ch, 5260MHz, Chain A													
15.780	3.0	42.2	37.8	11.5	-32.2	0.0	0.7	60.1	74.0	-13.9	H	P	
15.780	3.0	29.1	37.8	11.5	-32.2	0.0	0.7	46.9	54.0	-7.1	H	A	
15.780	3.0	41.9	37.8	11.5	-32.2	0.0	0.7	59.7	74.0	-14.3	V	P	
15.780	3.0	28.8	37.8	11.5	-32.2	0.0	0.7	46.6	54.0	-7.4	V	A	
Mid Ch, 5260MHz, Chain B													
15.780	3.0	33.3	37.8	11.5	-32.2	0.0	0.7	51.1	74.0	-22.9	H	P	
15.780	3.0	25.0	37.8	11.5	-32.2	0.0	0.7	42.1	54.0	-11.9	H	A	
15.780	3.0	33.9	37.8	11.5	-32.2	0.0	0.7	51.0	74.0	-23.0	V	P	
15.780	3.0	24.5	37.8	11.5	-32.2	0.0	0.7	41.6	54.0	-12.4	V	A	

Rev. 4.1.2.7

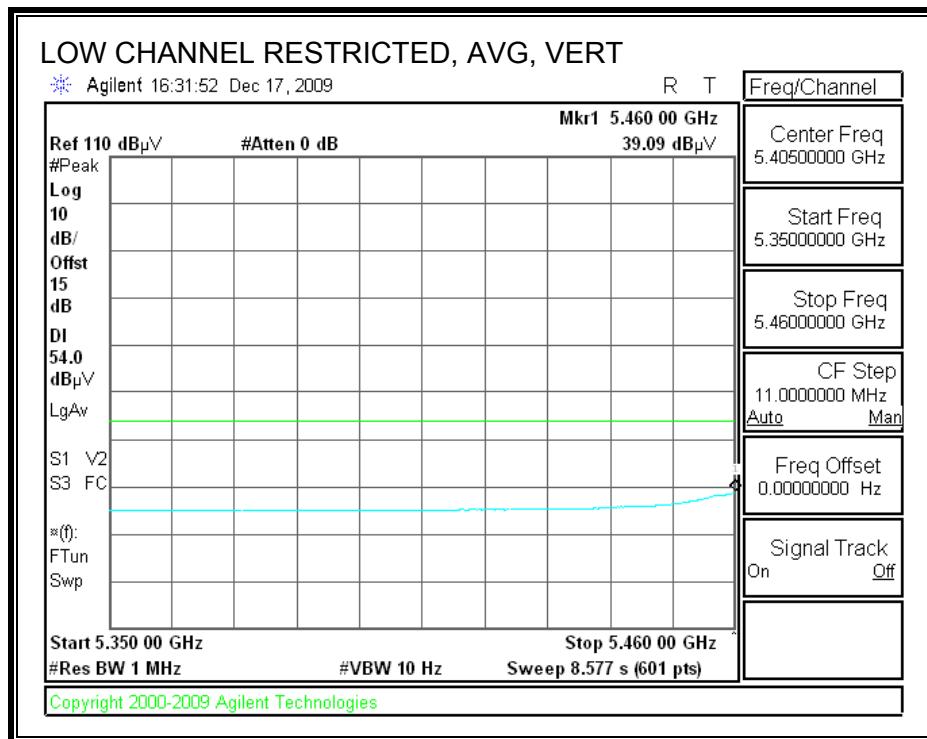
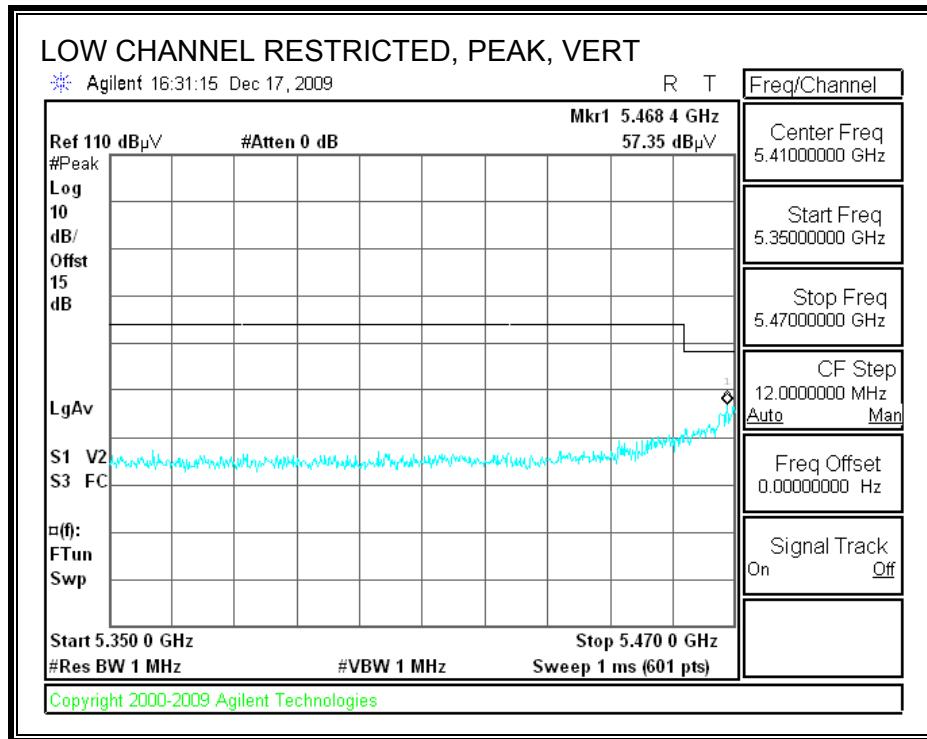
Note: No other emissions were detected above the system noise floor.

8.1.17. 802.11a MODE IN THE 5.6 GHz BAND_CHAIN B

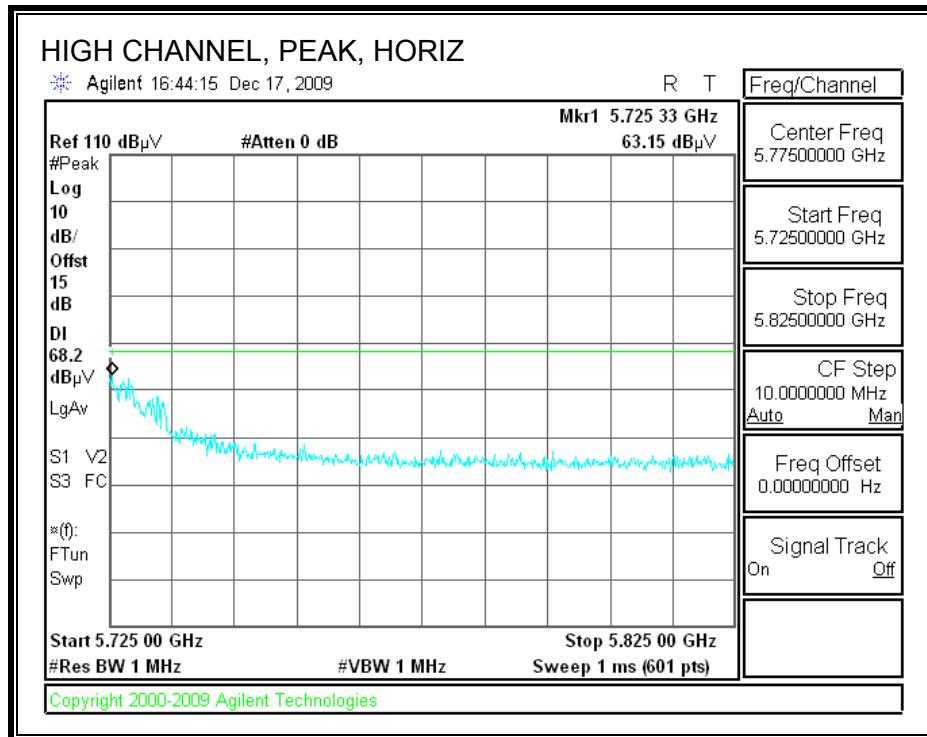
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



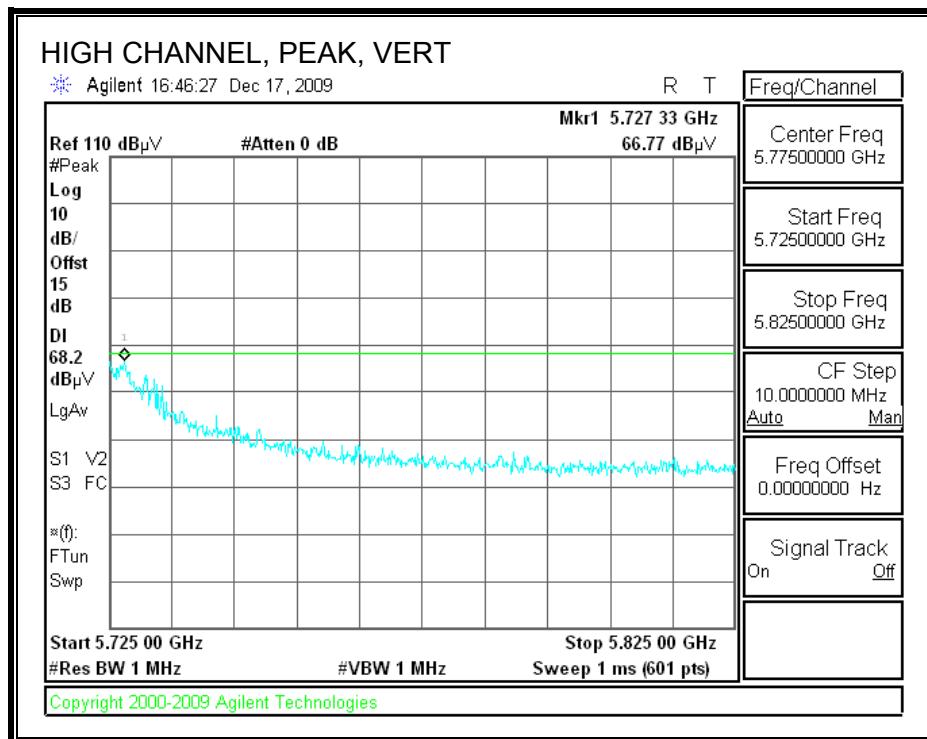
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

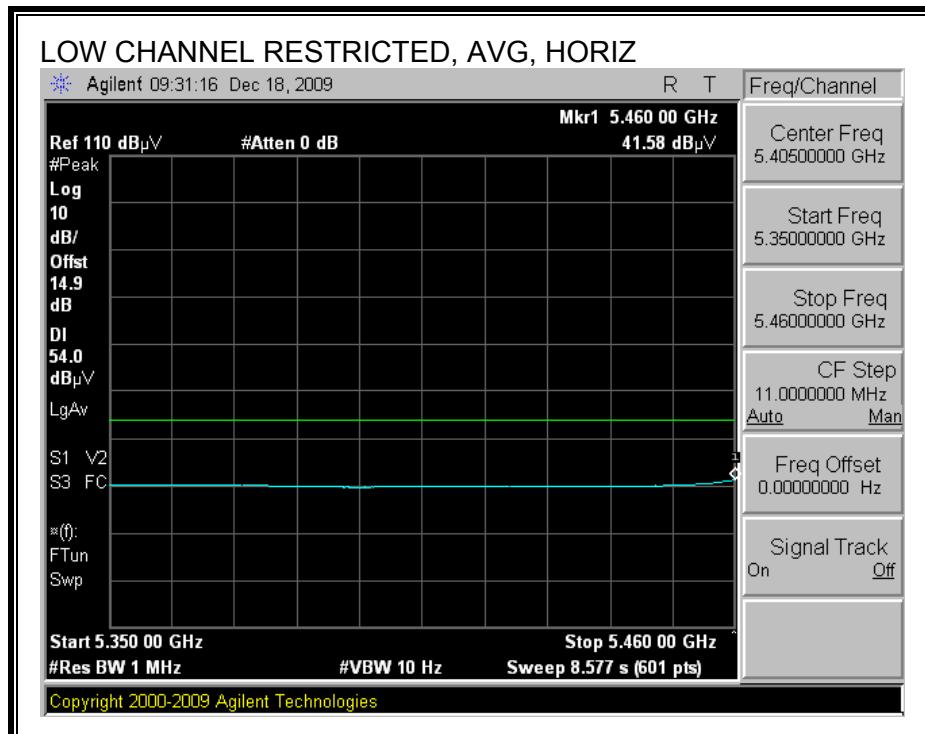
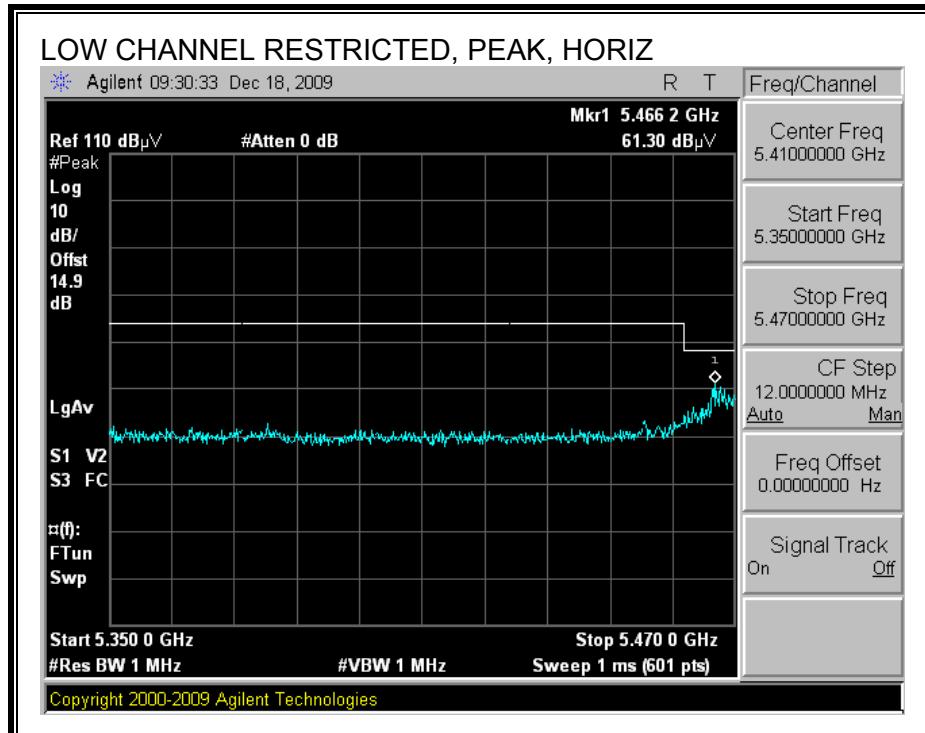


AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)

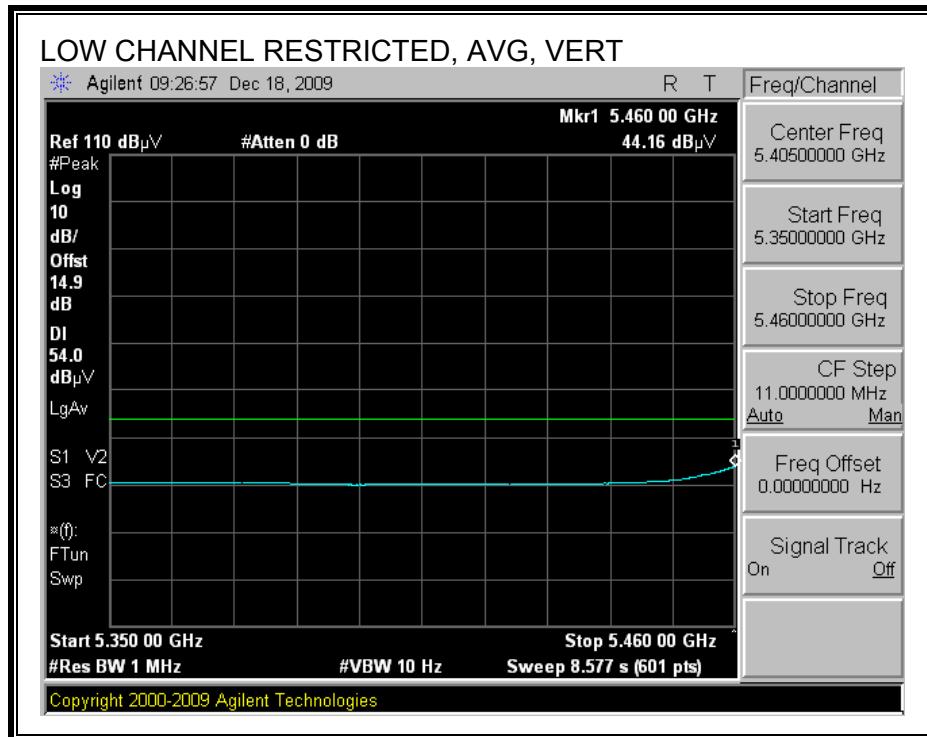
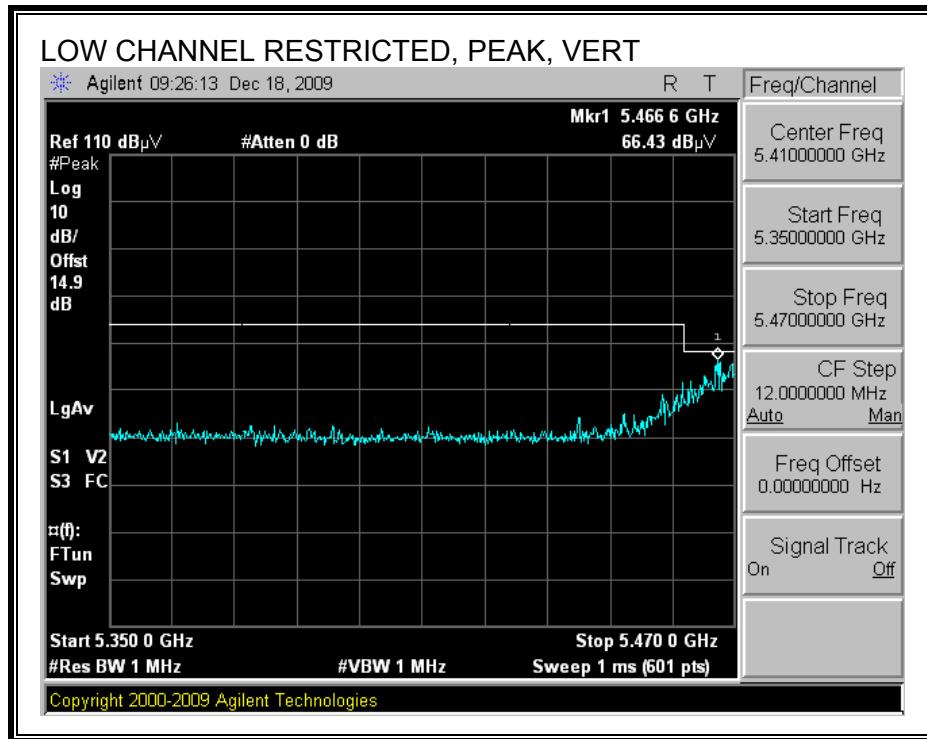


8.1.18. 802.11n HT20 MODE IN THE 5.6 GHz BAND_CHAIN A

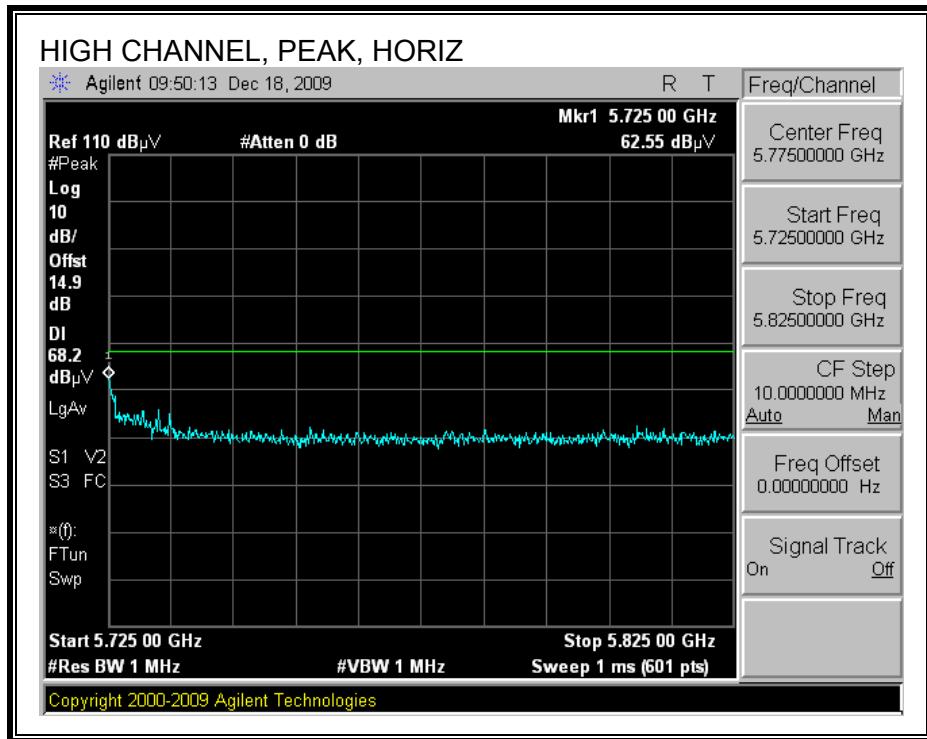
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



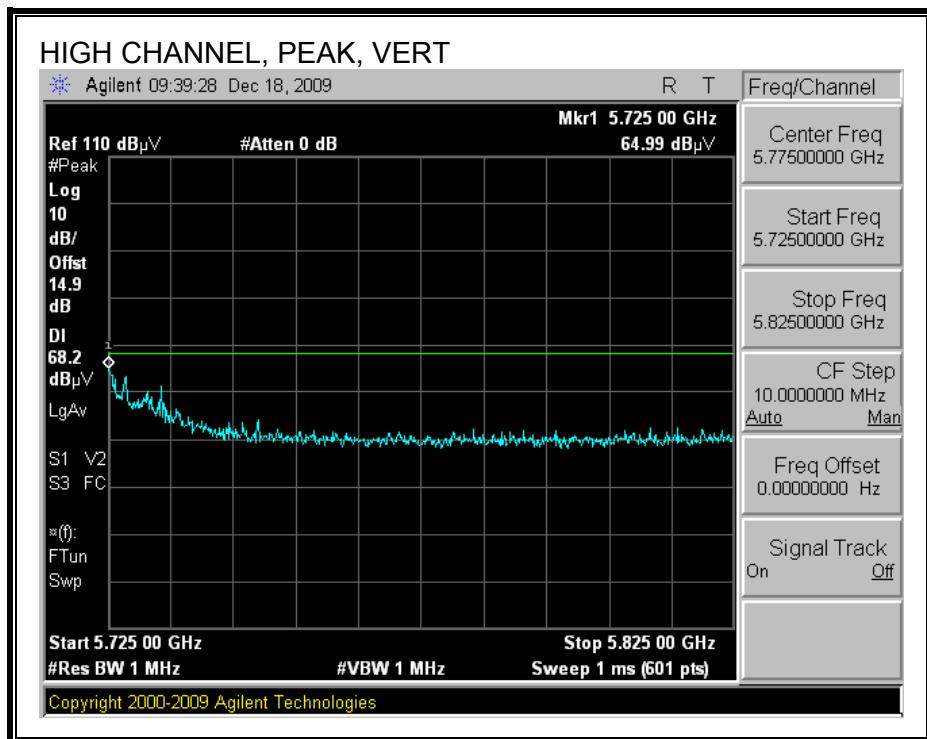
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

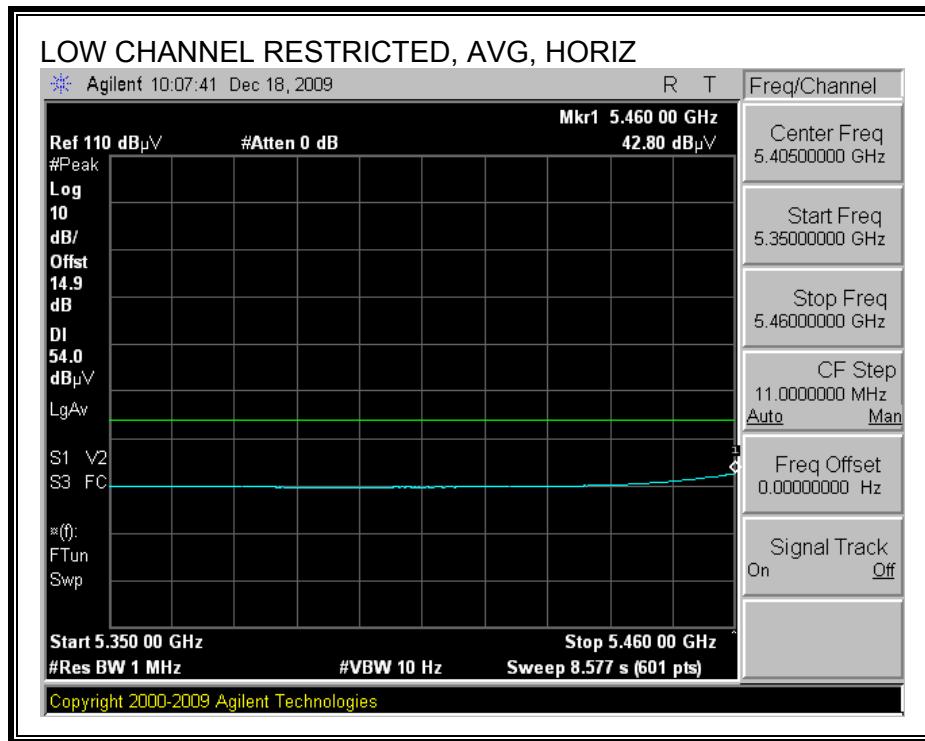
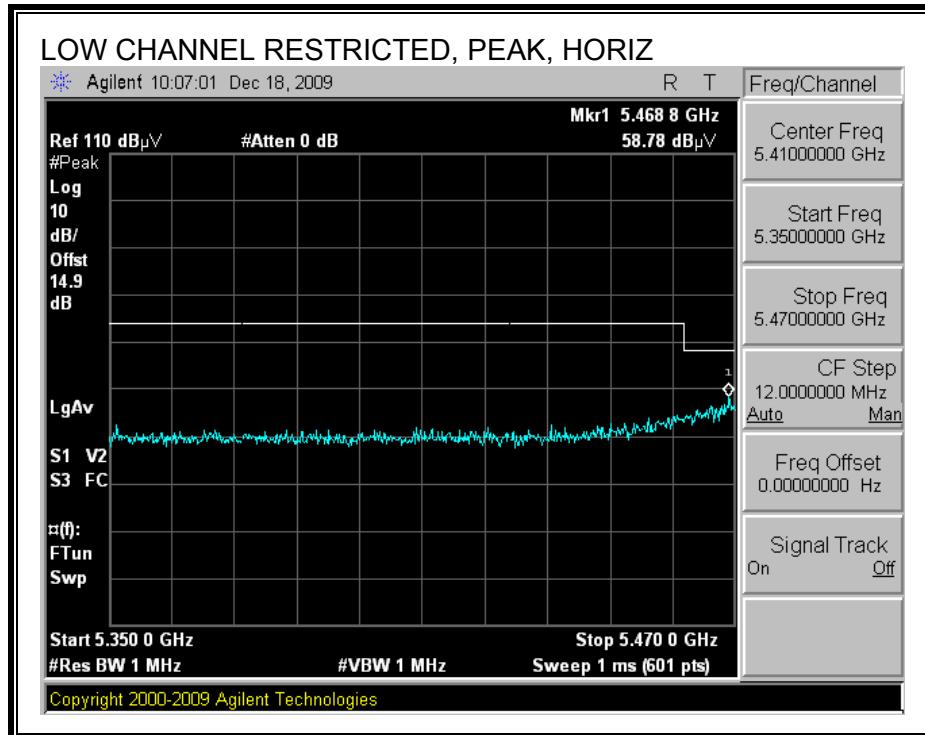


AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)

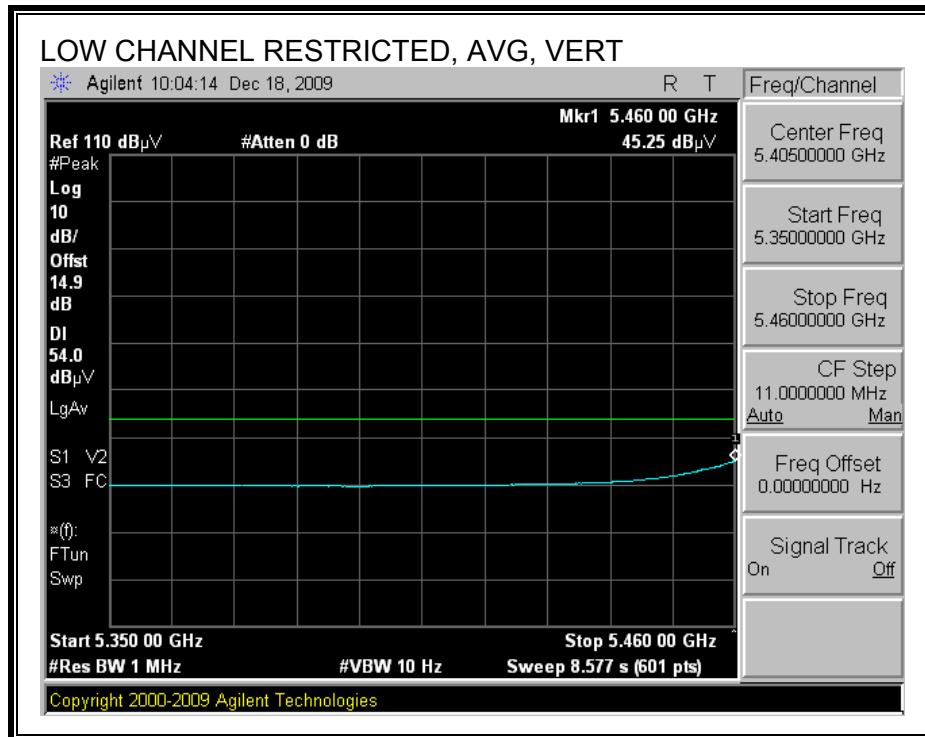
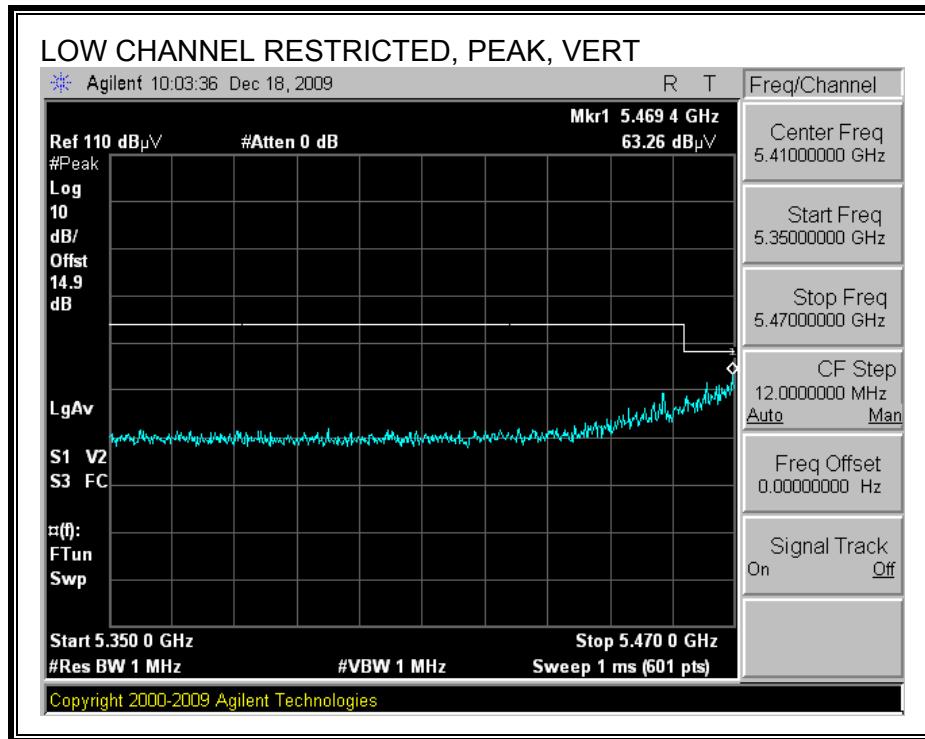


8.1.19. 802.11n HT20 MODE IN THE 5.6 GHz BAND_CHAIN B

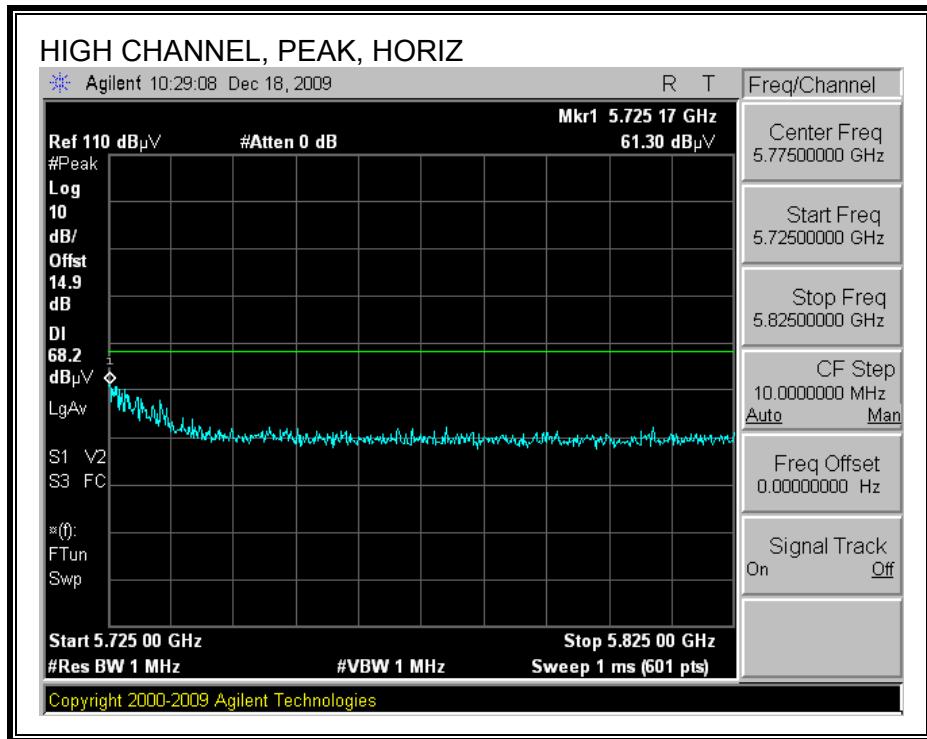
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



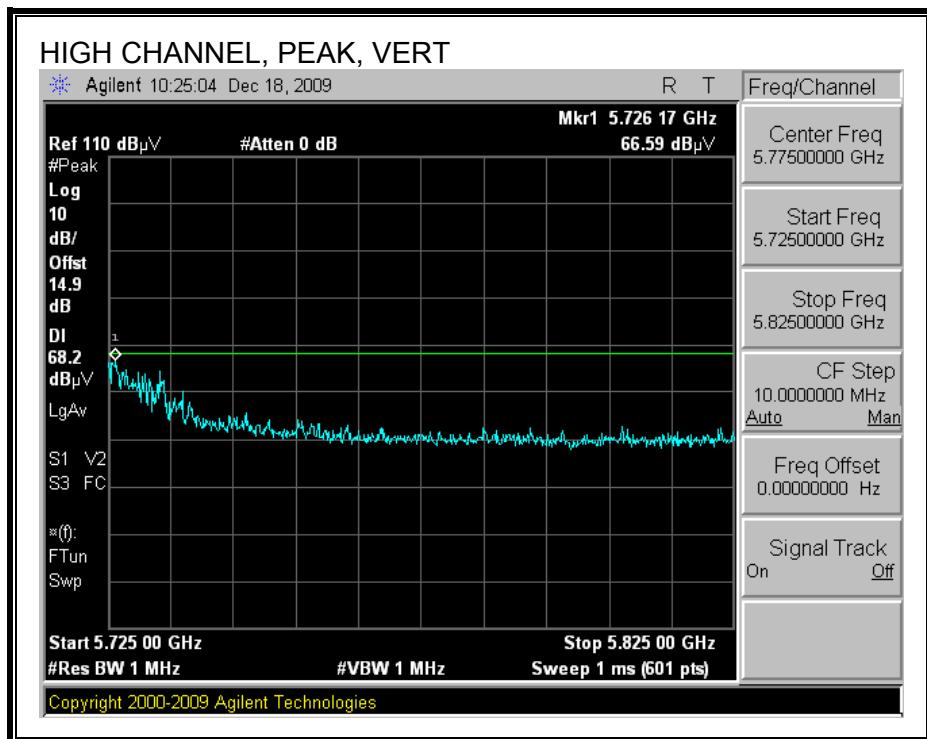
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

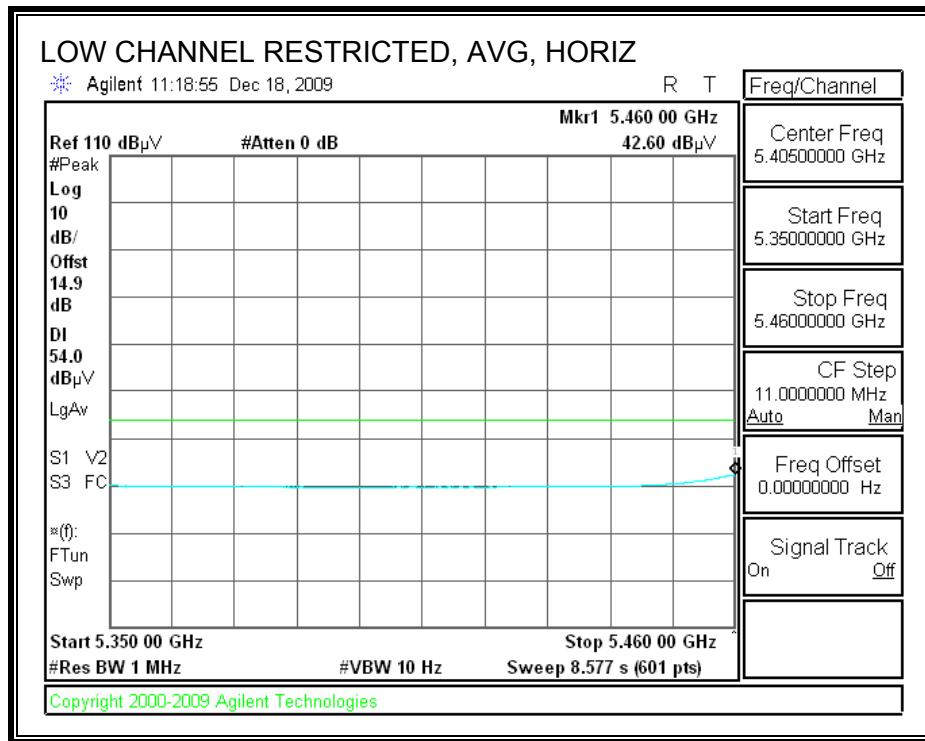
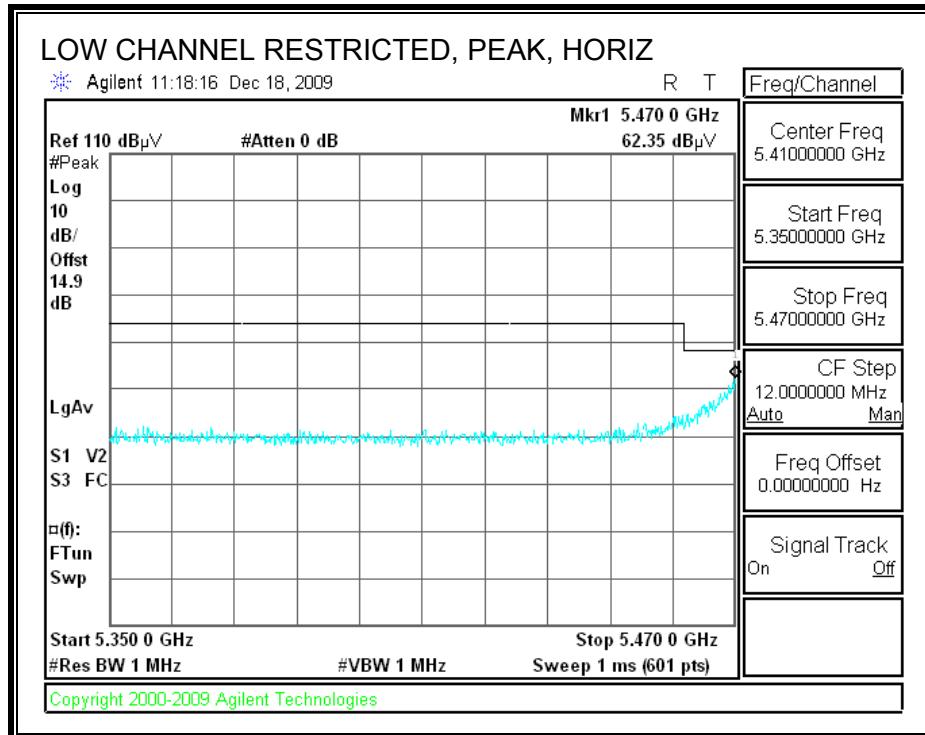


AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)

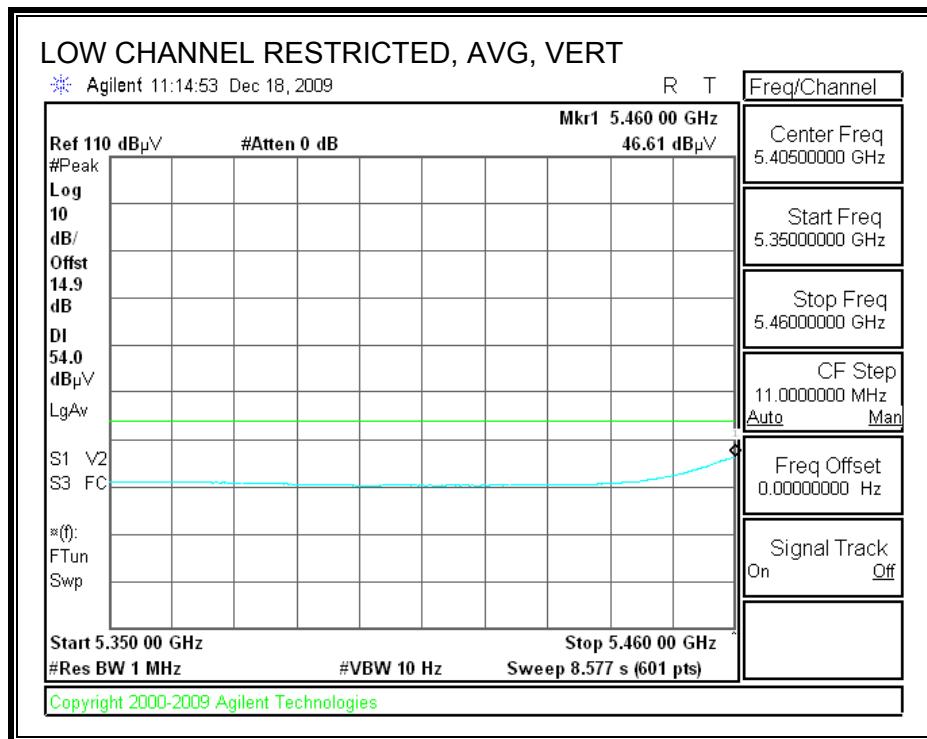
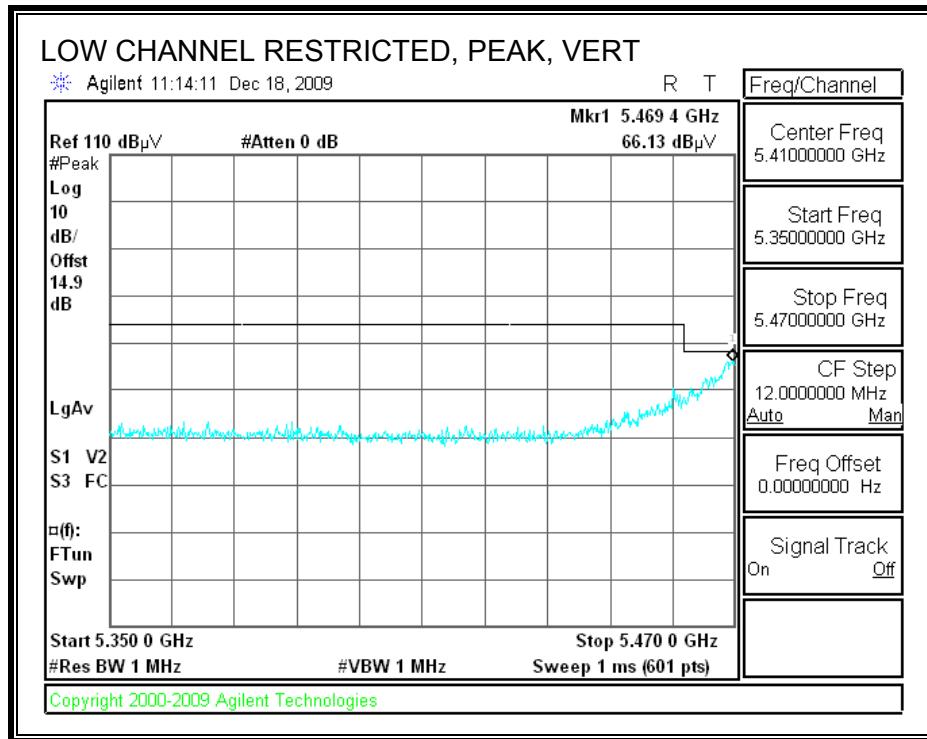


8.1.20. 802.11n HT40 MODE IN THE 5.6 GHz BAND_CHAIN A

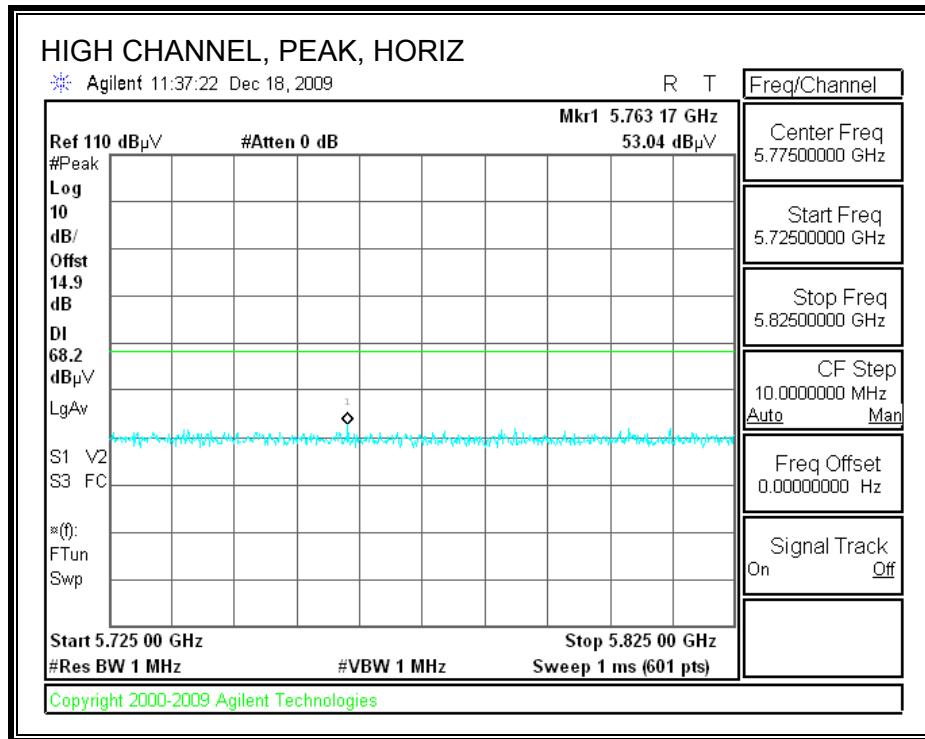
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



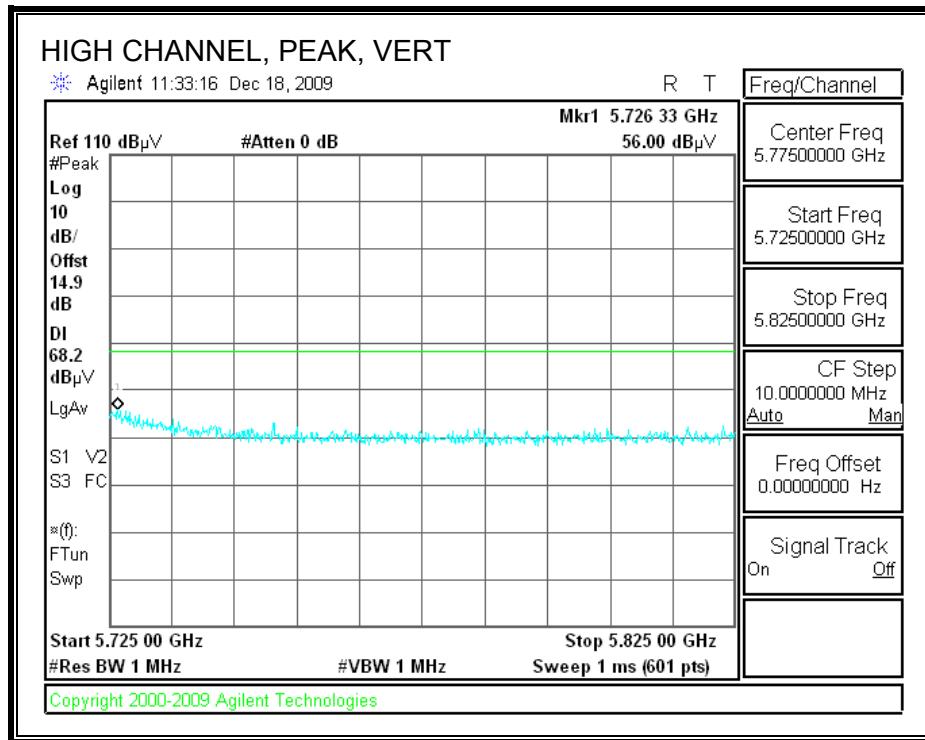
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

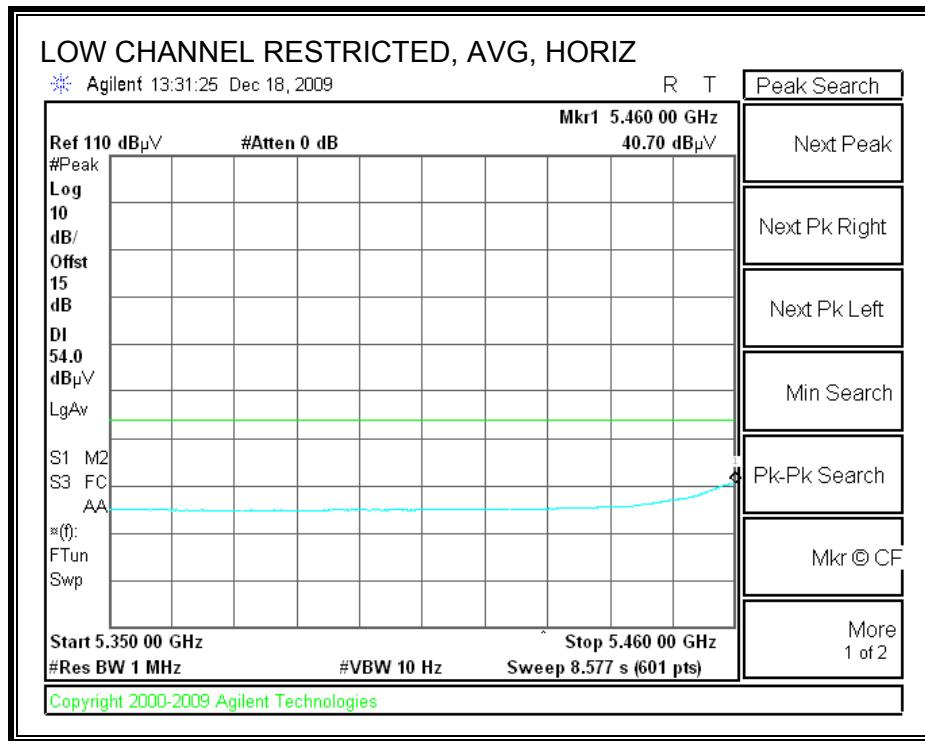
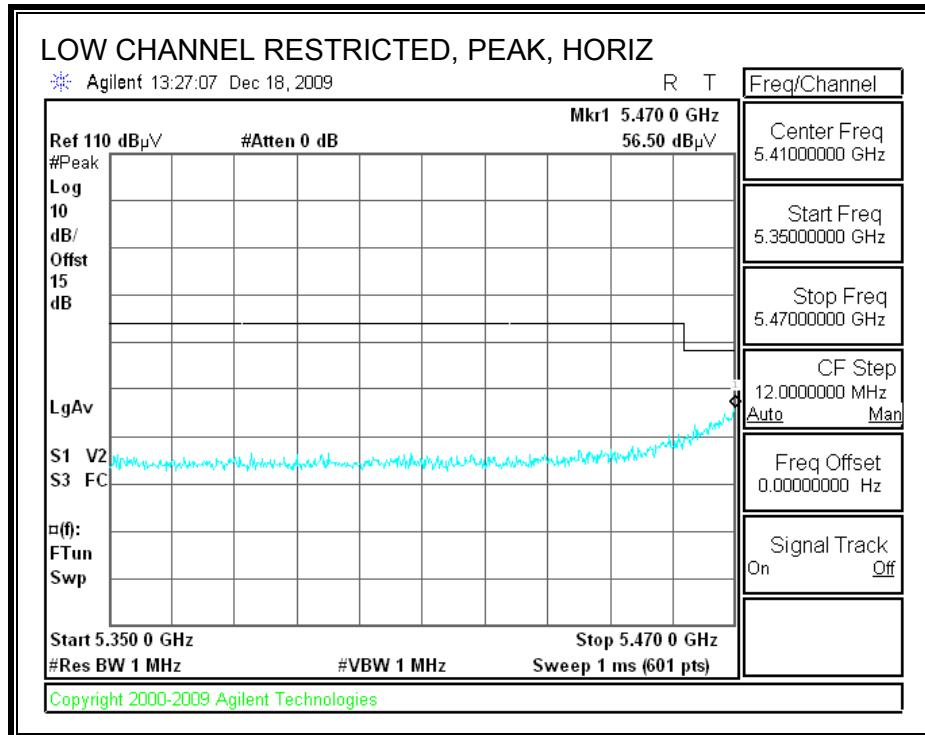


AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)

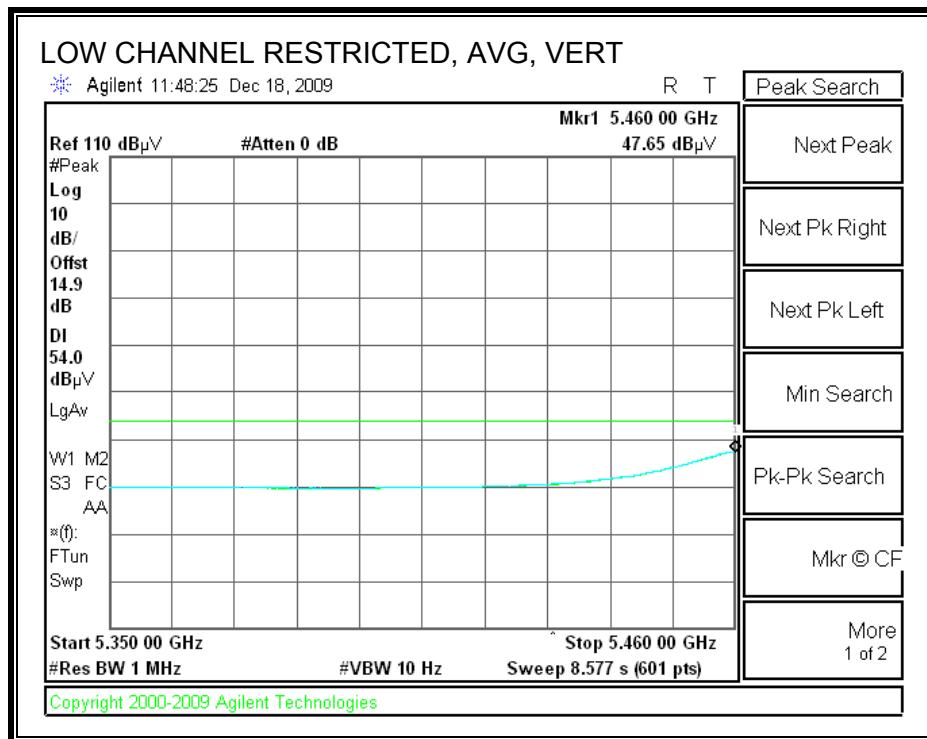
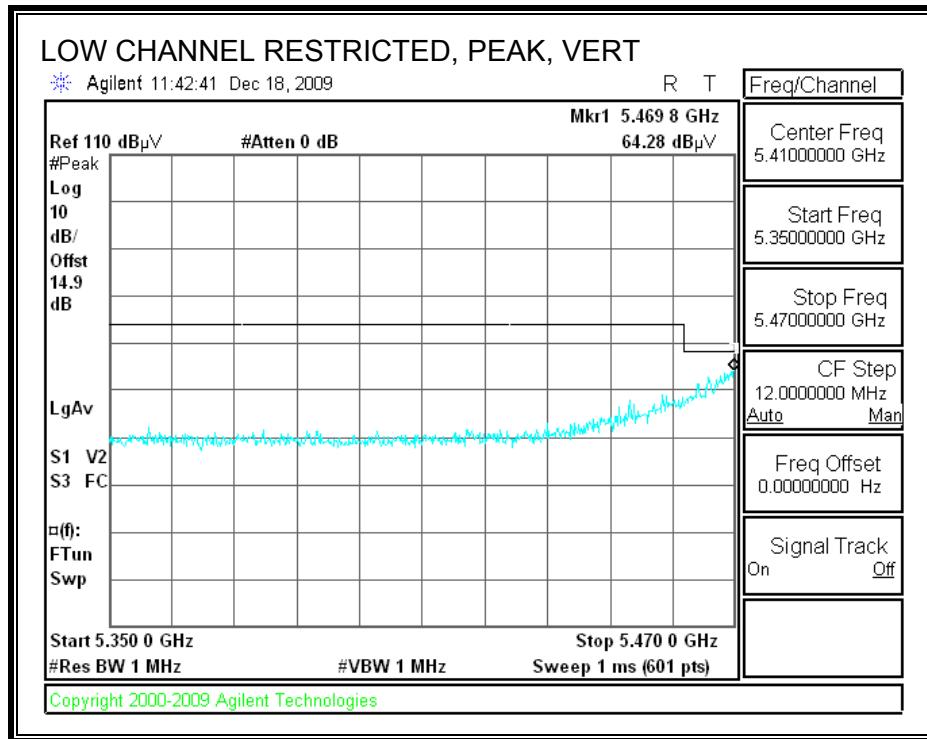


8.1.21. 802.11n HT40 MODE IN THE 5.6 GHz BAND_CHAIN B

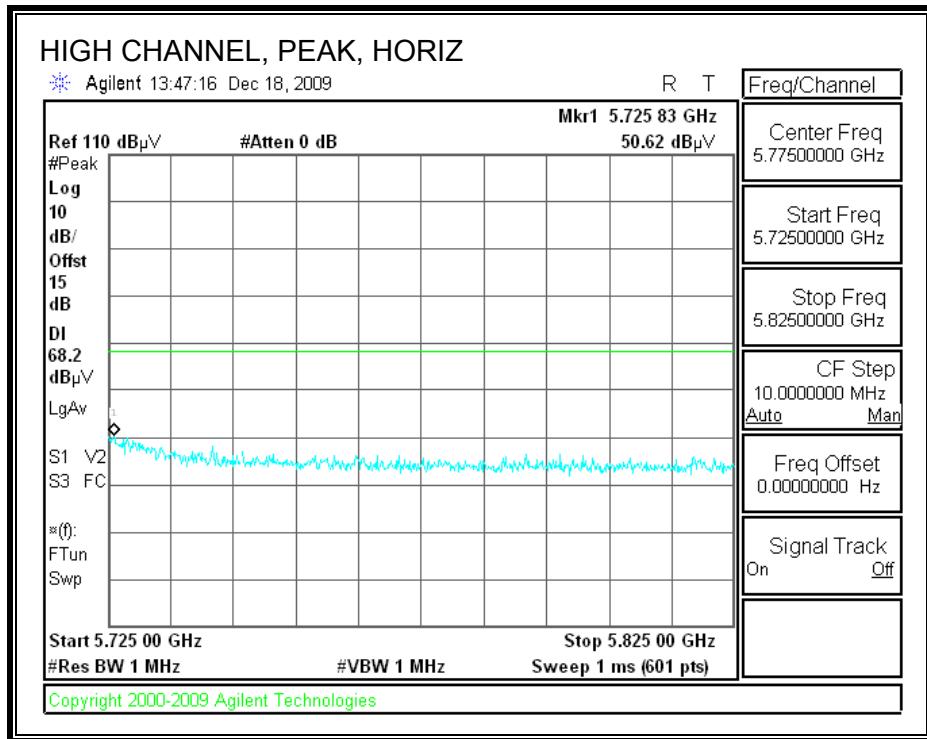
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



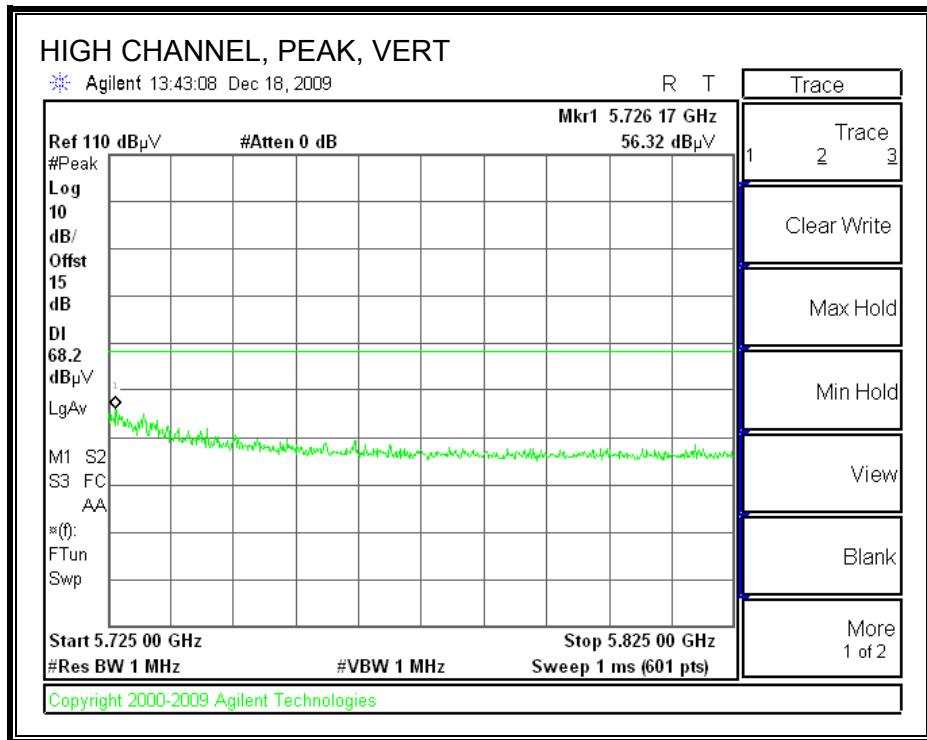
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

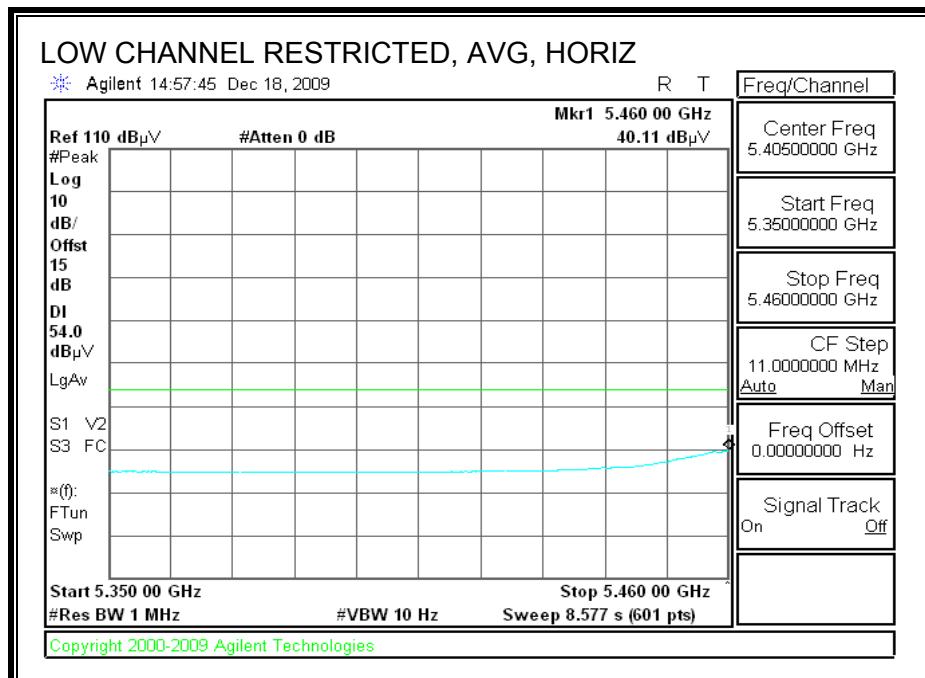
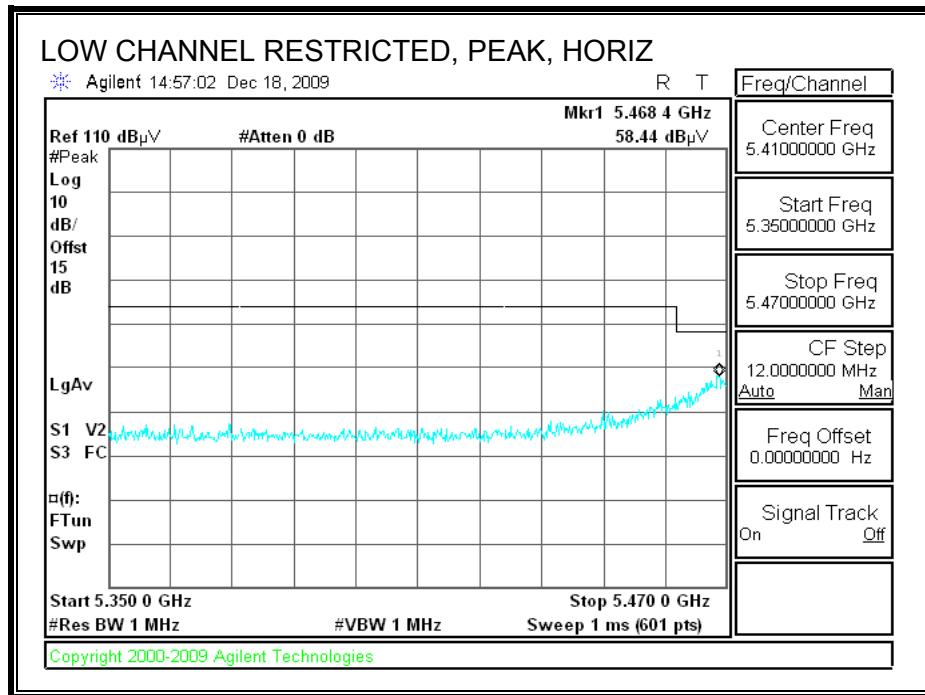


AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)

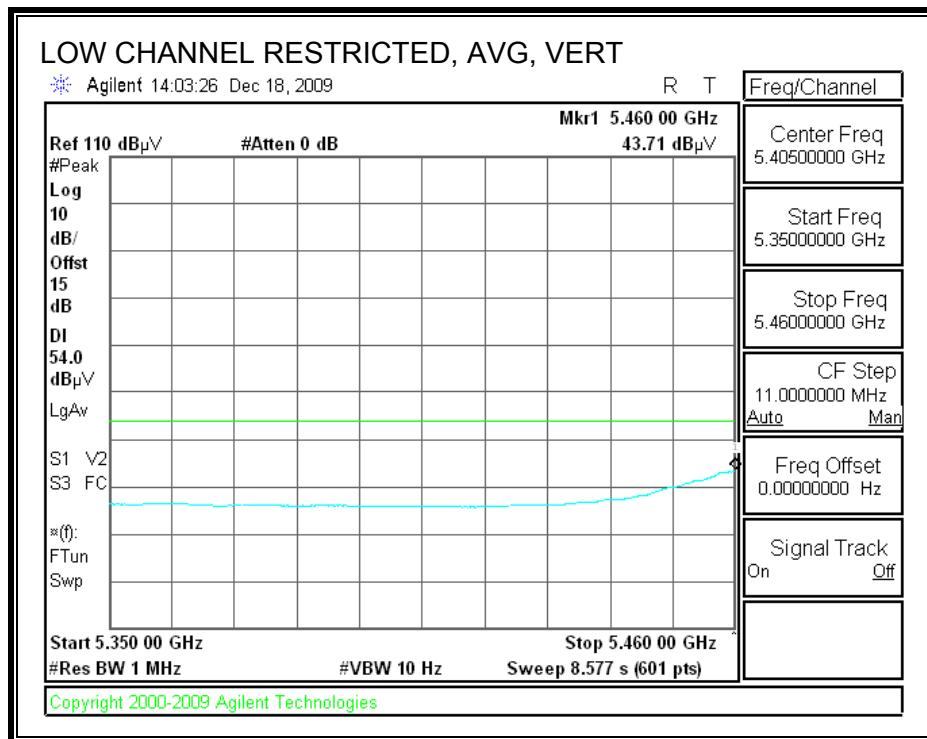
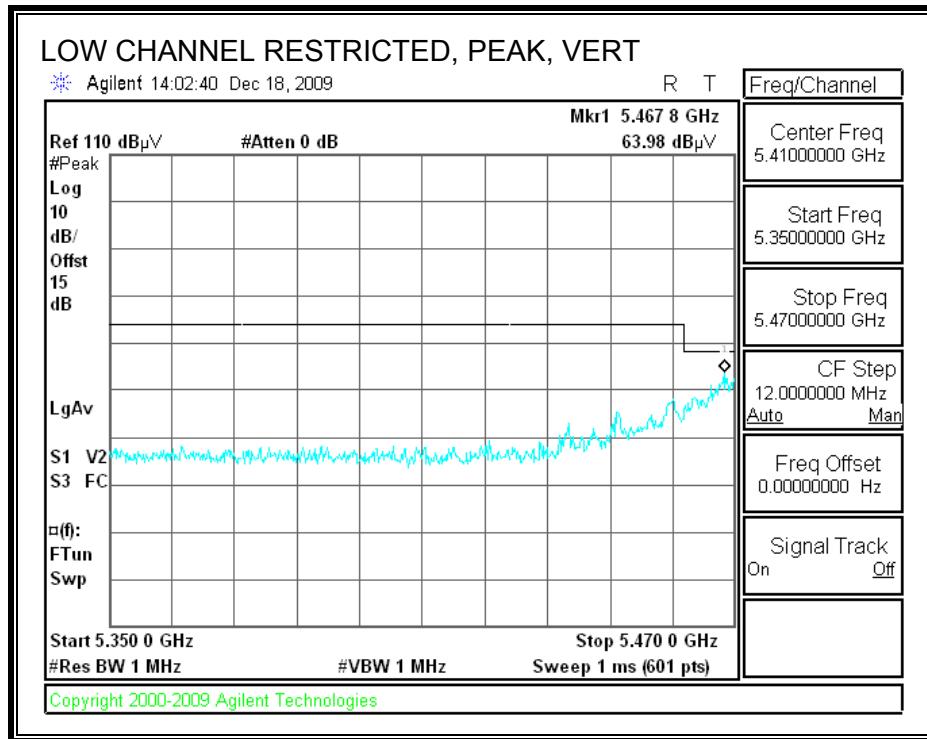


8.1.22. 802.11n HT20 MODE IN THE 5.6 GHz BAND_CHAIN A+B

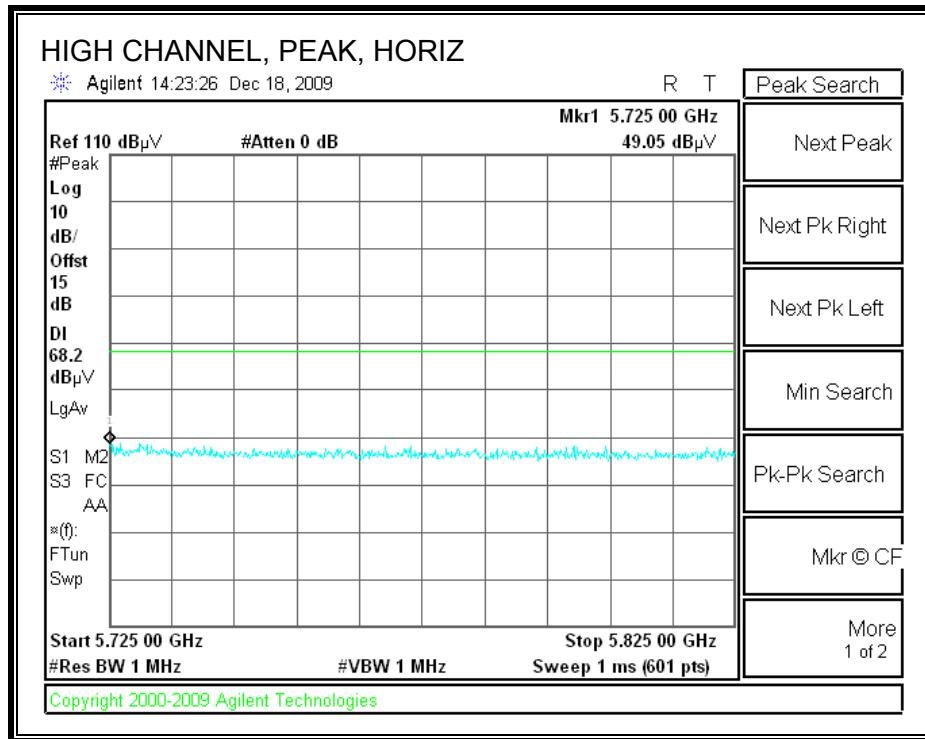
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



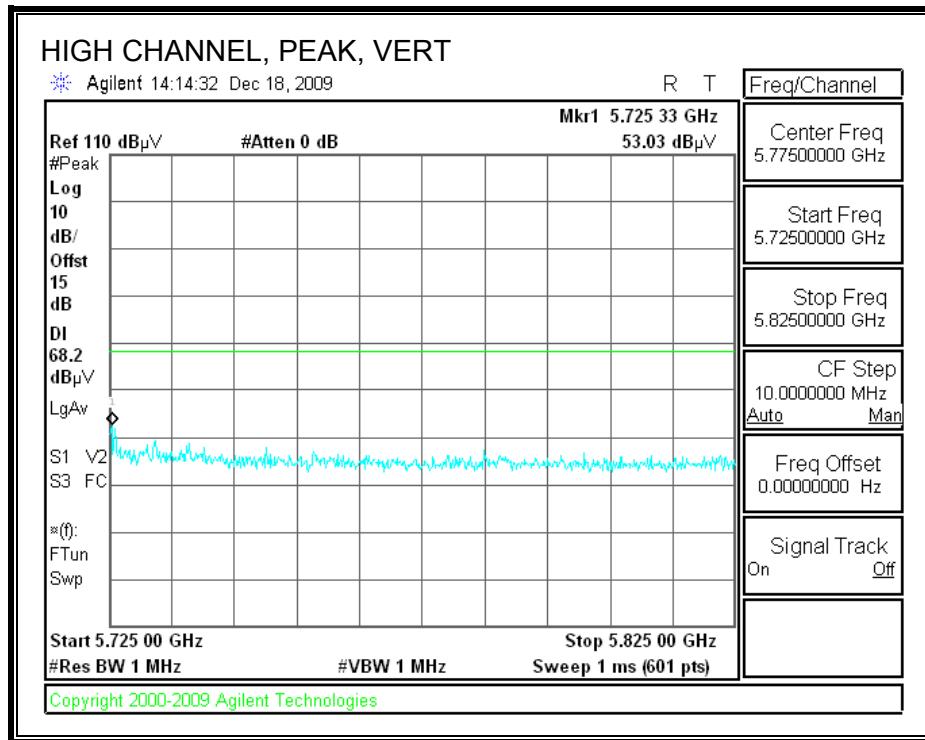
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang
Date: 12/31/09
Project #: 09U12972
Company: Toshiba
EUT Description: 2x2 WLAN 802.11 abgn Intel® Centrino Ultimate-N 6200
EUT M/N: PA3795U-1MPC
Test Target: FCC 15.407
Mode Oper: TX (worst Case), HT20, 5.6GHz
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	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Mid Ch, Chain A													
11.200	3.0	32.7	37.8	9.3	-32.6	0.0	0.7	48.0	74.0	-26.0	H	P	
11.200	3.0	19.8	37.8	9.3	-32.6	0.0	0.7	35.1	54.0	-18.9	H	A	
11.200	3.0	31.1	37.8	9.3	-32.6	0.0	0.7	46.3	74.0	-27.7	V	P	
11.200	3.0	18.3	37.8	9.3	-32.6	0.0	0.7	33.6	54.0	-20.4	V	A	
Mid Ch, Chain B													
11.200	3.0	31.2	37.8	9.3	-32.6	0.0	0.7	46.5	74.0	-27.5	H	P	
11.200	3.0	18.4	37.8	9.3	-32.6	0.0	0.7	33.7	54.0	-20.3	H	A	
11.200	3.0	31.9	37.8	9.3	-32.6	0.0	0.7	47.2	74.0	-26.8	V	P	
11.200	3.0	19.3	37.8	9.3	-32.6	0.0	0.7	34.6	54.0	-19.4	V	A	

Rev. 4.1.2.7

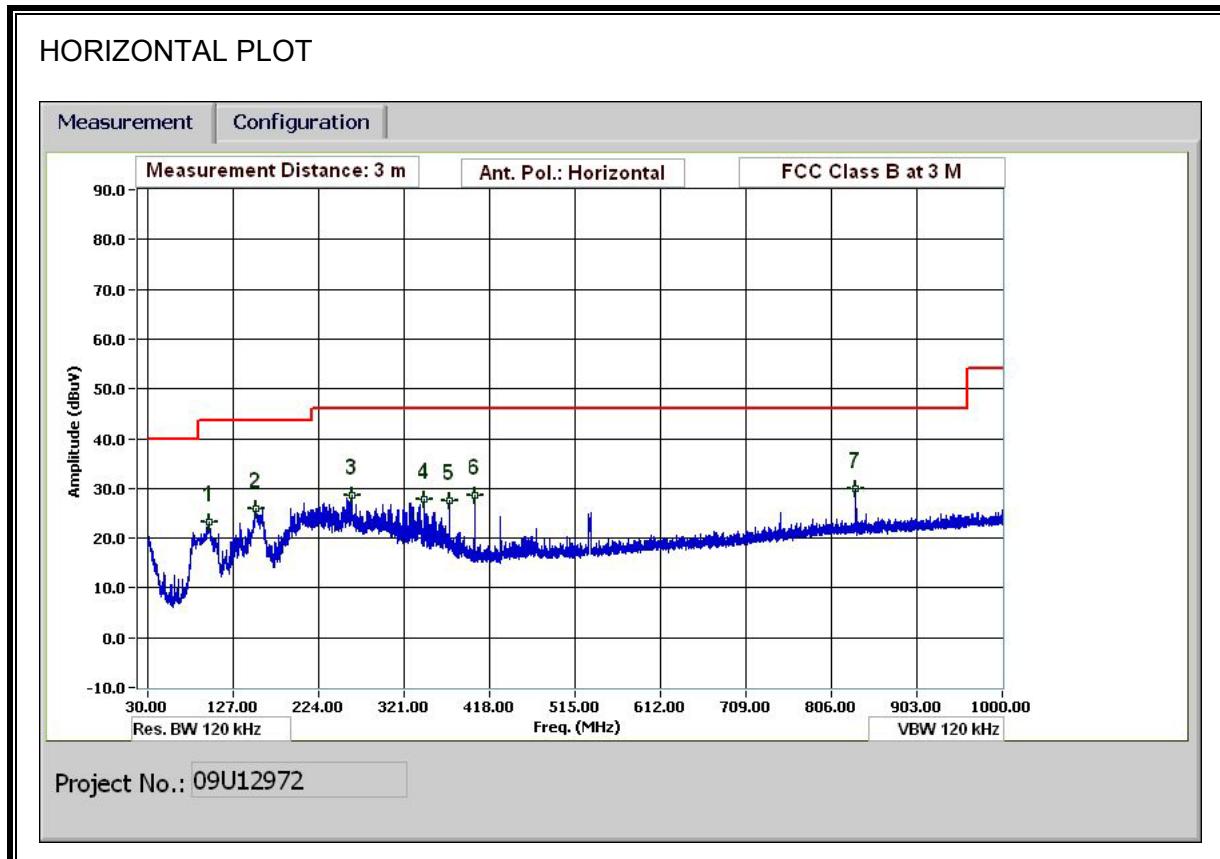
Note: No other emissions were detected above the system noise floor.

8.2. RECEIVER ABOVE 1 GHZ

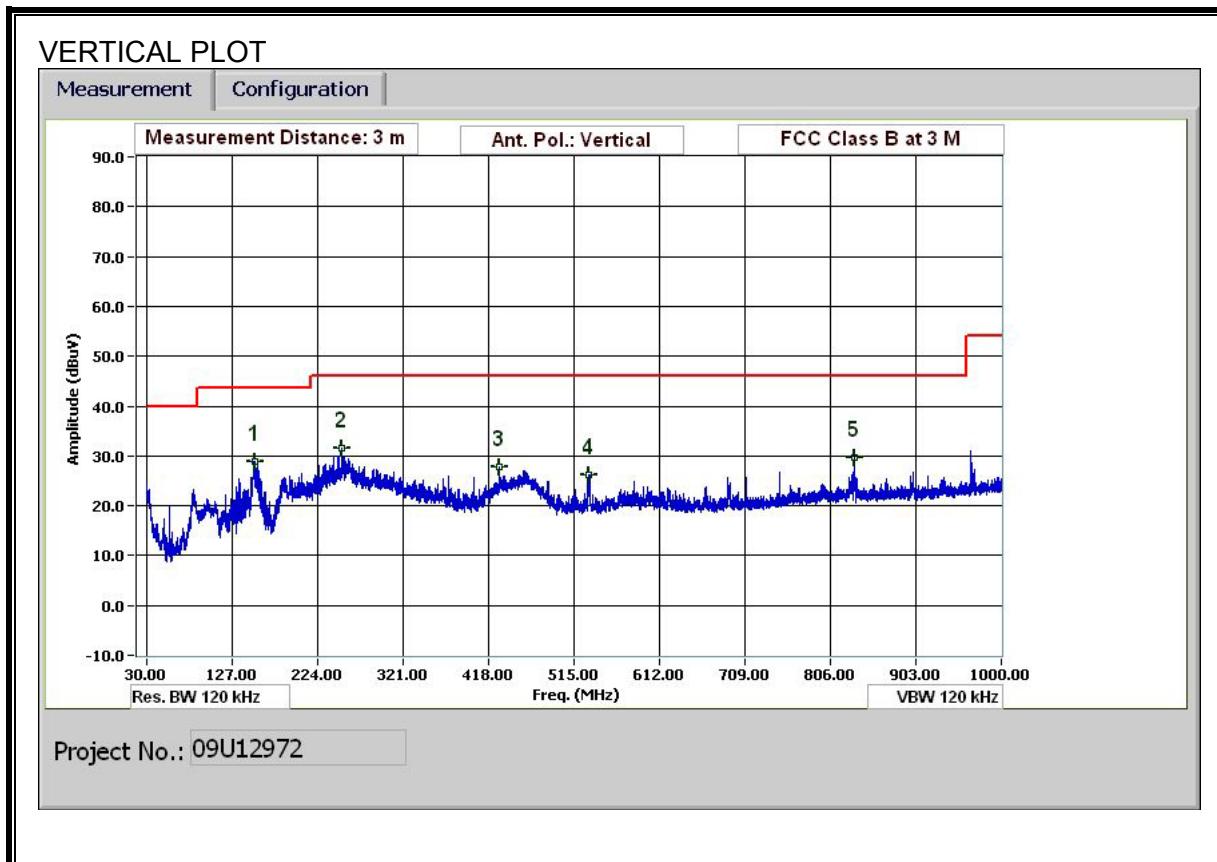
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company: Toshiba Project #: 09U12972 Date: 12/18/2009 Test Engineer: Chin Pang Configuration: EUT/Laptop Mode: RX (Worst Case), 5GHz Band															
<u>Test Equipment:</u>															
Horn 1-18GHz		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz		Limit							
T60; S/N: 2238 @3m		T34 HP 8449B						FCC 15.209							
Hi Frequency Cables															
3' cable 22807700		12' cable 22807600		20' cable 22807500		HPF		Reject Filter		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz, VBW=10Hz					
3' cable 22807700		12' cable 22807600		20' cable 22807500											
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)
Mid Ch															
1.351	3.0	48.0	33.2	25.6	2.8	-37.8	0.0	38.6	23.8	74	54	-35.4	-30.2	V	
1.596	3.0	50.5	30.4	26.5	3.0	-37.4	0.0	42.6	22.5	74	54	-31.4	-31.5	V	
2.660	3.0	43.0	26.5	28.7	4.1	-36.1	0.0	39.7	23.2	74	54	-34.3	-30.8	V	
1.065	3.0	52.0	34.0	24.7	2.4	-36.2	0.0	41.0	23.0	74	54	-33.0	-31.0	H	
1.595	3.0	49.0	31.0	26.5	3.0	-37.4	0.0	41.1	23.1	74	54	-32.9	-30.9	H	
2.660	3.0	43.6	26.0	28.7	4.1	-36.1	0.0	40.3	22.7	74	54	-33.7	-31.3	H	
Rev. 11.10.08															
Note: No other emissions were detected above the system noise floor.															
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. WORST CASE BELOW 1 GHz

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



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



HORIZONTAL AND VERTICAL DATA

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

Test Engr: Chin Pang
Date: 12/18/09
Project #: 09U12972
Company: Toshiba
EUT Description: 2x2 WLAN 802.11 abgn Intel® Centrino Ultimate-N 6200
EUT M/N: PA3795U-1MPC
Test Target: FCC Class B
Mode Oper: TX (Worst 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 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
152.045	3.0	44.8	12.2	1.1	29.3	0.0	0.0	28.8	43.5	-14.7	V	P	
251.049	3.0	47.0	11.8	1.4	28.8	0.0	0.0	31.4	46.0	-14.6	V	P	
429.616	3.0	39.7	15.6	2.0	29.4	0.0	0.0	27.8	46.0	-18.2	V	P	
532.101	3.0	36.3	17.3	2.2	29.7	0.0	0.0	26.1	46.0	-19.9	V	P	
833.913	3.0	34.7	21.2	2.9	29.0	0.0	0.0	29.8	46.0	-16.2	V	P	
99.843	3.0	41.8	10.0	0.9	29.5	0.0	0.0	23.2	43.5	-20.3	H	P	
153.005	3.0	42.1	12.1	1.1	29.3	0.0	0.0	26.0	43.5	-17.5	H	P	
261.490	3.0	43.7	12.1	1.5	28.8	0.0	0.0	28.5	46.0	-17.5	H	P	
343.573	3.0	41.2	14.0	1.7	29.0	0.0	0.0	27.9	46.0	-18.1	H	P	
372.254	3.0	40.4	14.5	1.8	29.2	0.0	0.0	27.6	46.0	-18.4	H	P	
400.935	3.0	40.9	15.0	1.9	29.3	0.0	0.0	28.6	46.0	-17.4	H	P	
833.313	3.0	35.0	21.2	2.9	29.0	0.0	0.0	30.0	46.0	-16.0	H	P	

9. 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

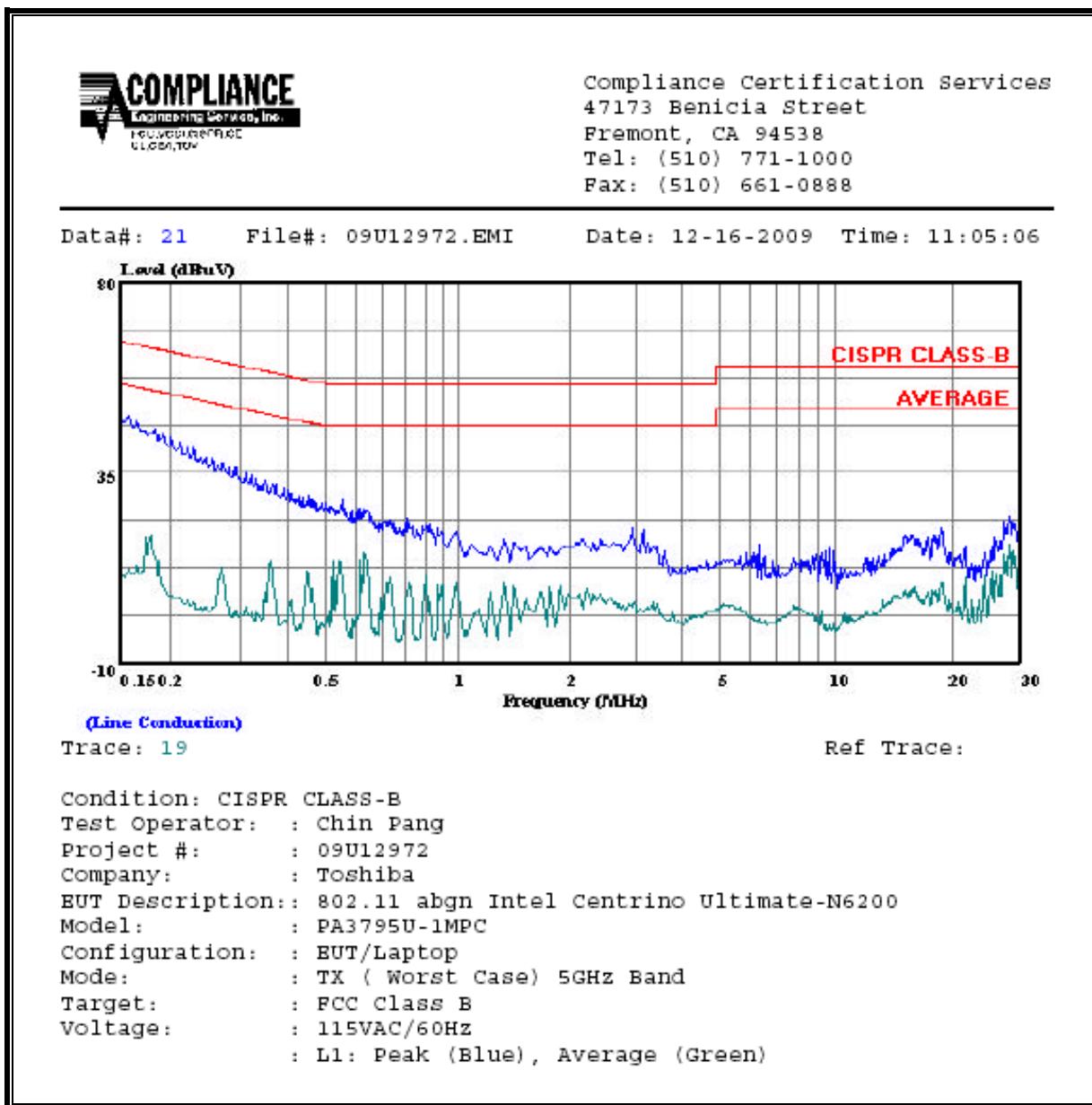
ANSI C63.4

RESULTS

6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq. (MHz)	Reading			Closs	Limit	EN B	Margin		Remark
	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.18	48.30	--	20.25	0.00	64.49	54.49	-16.19	-34.24	L1
0.63	28.43	--	15.94	0.00	56.00	46.00	-27.57	-30.06	L1
28.15	24.04	--	18.08	0.00	60.00	50.00	-35.96	-31.92	L1
0.18	47.75	--	17.71	0.00	64.44	54.44	-16.69	-36.73	L2
0.55	28.14	--	15.61	0.00	56.00	46.00	-27.86	-30.39	L2
18.72	23.95	--	10.51	0.00	60.00	50.00	-36.05	-39.49	L2
6 Worst Data									

LINE 1 RESULTS



LINE 2 RESULTS

