



FCC CFR47 PART 15 SUBPART E  
INDUSTRY CANADA RSS-210 ISSUE 7

CERTIFICATION TEST REPORT\*

FOR

802.11A/B/G/N MINI-PCI MODULE

MODEL NUMBER: 62009015

FCC ID: UDX-62009015

IC: 6961A-62009015

REPORT NUMBER: 09U12366-1

ISSUE DATE: MARCH 09, 2009

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\* This report only covers partial (Radiated) testing; the rest of the testing is contained in a separate report, number 093S015-RF-US-P05V01.

This report has conditional passing results for a specific antenna, see section 5.2 for details.

Revision History

Rev.	Issue Date	Revisions	Revised By
--	03/09/09	Initial Issue	F. Ibrahim

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** MERAKI, INC.  
99 RHODE ISLAND ST.  
SAN FRANCISCO, CA 94103

**EUT DESCRIPTION:** 802.11A/B/G/N MINI-PCI MODULE

**MODEL NUMBER :** 62009015

**FCC MODULE ID:** UDX-62009015  
**IC MODULE ID:** 6961A-62009015

**SERIAL NUMBER:** Q2AH-4HP3-7fTA

**DATE TESTED:** JANUARY 27 - FEBRUARY 03, 2009

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	PASS (see section 5.2)
INDUSTRY CANADA RSS-210 Issue 7 Annex 9	PASS (see section 5.2)
INDUSTRY CANADA RSS-GEN Issue 2	PASS (see section 5.2)

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. 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. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:



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FRANK IBRAHIM  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

Tested By:



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THANH NGUYEN  
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. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is an 802.11A/B/G/N MINI-PCI MODULE, FCC Module ID: UDX-62009015 IC Module ID: 6961A-62009015.

### 5.2. DESCRIPTION OF ANTENNAS

- 1) Dual-Band Omni-Directional antenna, Manufacturer: Grand-Tek Technology, 2.4GHz 2.5dBi gain; 5GHz 5dBi gain.
- 2) Monopole Omni Low gain antenna for 2.4GHz. Manufacturer: Grand-Tek Technology, Model R-0A24-03-11; 3dBi gain.
- 3) Directional antenna for 2.4GHz. Manufacturer: Grand-Tek Technology, Model 24-SE-001, 11.5dBi gain. Omni-Directional Low Gain Antenna for 5GHz. Manufacturer: Grand-Tek Technology, Model: R-0A-58-04-11; 4dBi gain.
- 4) Flat-Panel Directional Antenna for 2.4 GHz, Laird Technologies, Model PA-19, antenna gain 19dBi gain.  
**(Don't use high channel 2452 MHz for this antenna)**
- 5) Directional Antenna 5GHz. Manufacturer: Grand-Tek Technology, Model: 50-SE-001; 14.5dBi gain.
- 6) High Gain Patch Antenna for 5G. Manufacturer: Mt Wireless Edge, Model: MT-485025/NVH; 23dBi gain.

**Note:**

Power Levels are mentioned in the Separate Report no: 093S015-RF-US-P05V01.

### 5.3. SOFTWARE AND FIRMWARE

The test utility and driver software used during testing was ART Revision 0.7 Build #30 Art\_11n.

### 5.4. WORST-CASE CONFIGURATION AND MODE

802.11a mode on chain 100 was selected as worst-case, data rate is 6 Mbps.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Dell	Latitude D620	C01091	DoC
AC Adapter	Dell	LA65NS0-00	CN-ODF263-71615-72M2925	DoC

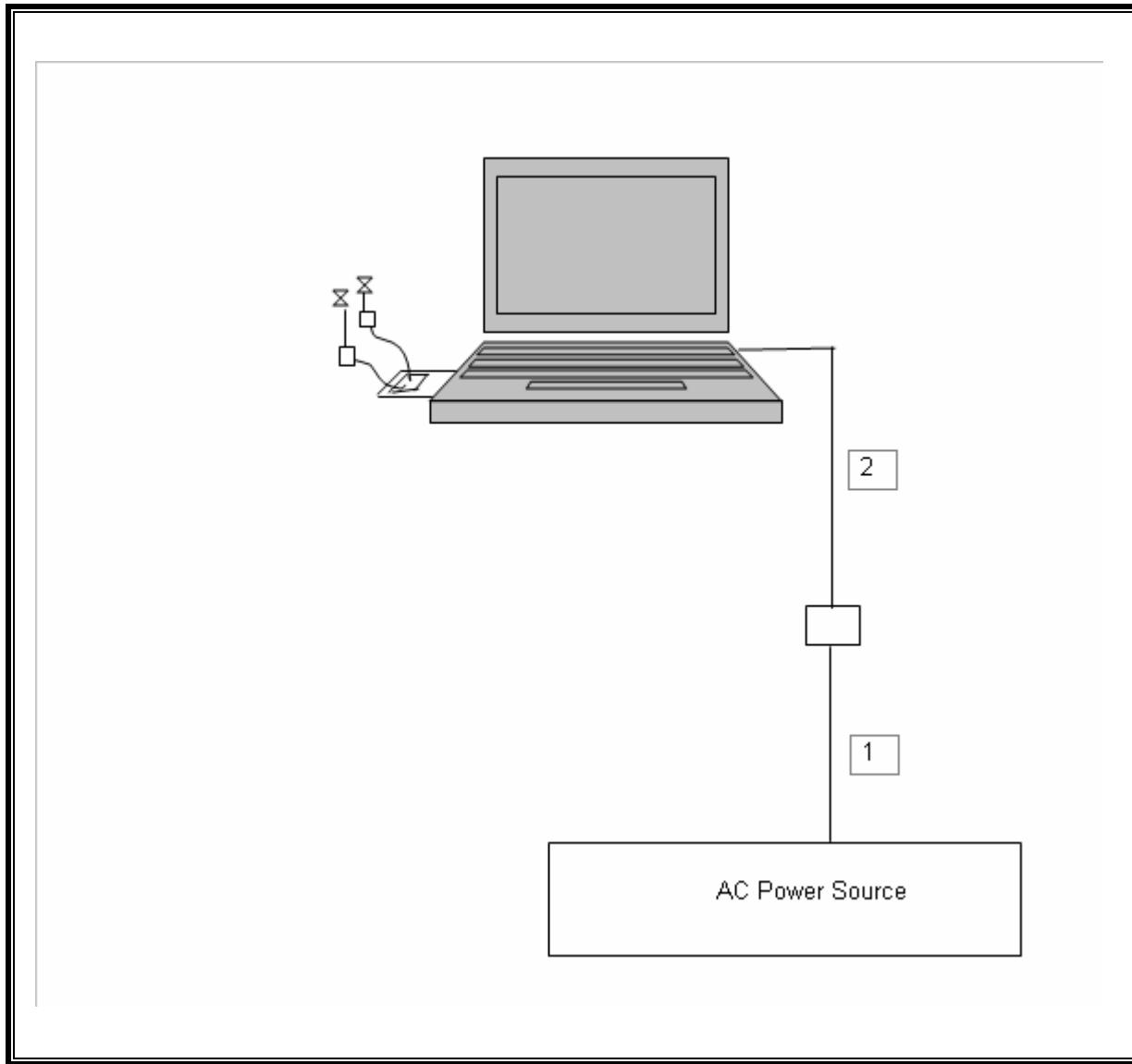
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	1m	NA
2	DC	1	DC	Un-shielded	2m	NA

### TEST SETUP

The EUT is installed in an extender card plug in to the 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 Date	Cal Due
Antenna, Horn, 18 GHz	EMCO	3115	C00945	04/22/08	04/22/09
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	08/05/08	08/05/09
HP Power meter	Agilent / HP	E4416A	C00963	12/04/07	12/04/09
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/07/07	12/07/09
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	10/11/07	10/11/09
Antenna, Horn, 26.5 GHz	ARA	SMH-28	C01015	09/29/07	11/29/09
Spectrum Analyzer, 40 GHz	Agilent / HP	8564E	C00951	12/12/08	06/12/10
EM Receiver, 2.9 GHz	Agilent / HP	8542E	C00957	06/19/08	09/19/09
RF Filter Section, 2.9 GHz	Agilent / HP	85420E	C00958	06/19/08	09/19/09
Antenna, BiLog, 2 GHz	Sund Sciences	JB1	C01011	01/14/09	01/14/10
EM Test Receiver, 30 MHz	R & S	ESHS 20	N02396	02/06/08	08/06/09
Antenna, Horn, 18 GHz	EMCO	3115	C00945	04/22/08	04/22/09
Reject Filter, 5.15-5.35 GHz	Micro-Tronics	BRC13190	N02679	CNR	CNR
Reject Filter, 5.725-5875 GHz	Micro-Tronics	BRC13192	N02678	CNR	CNR

## 7. RADIATED TEST RESULTS

### 7.1. 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.

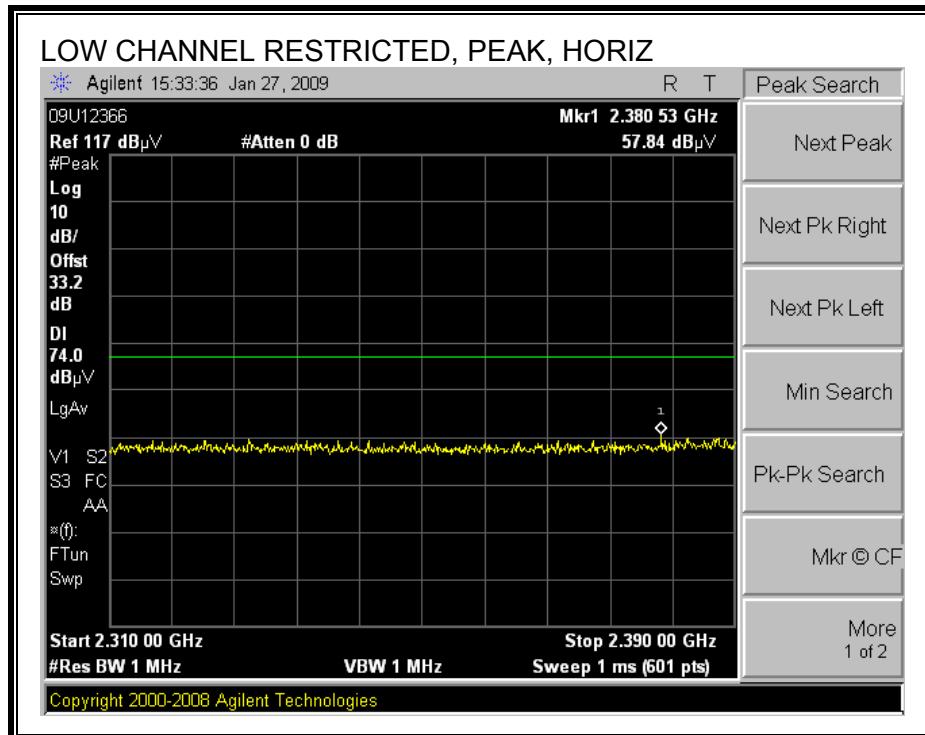
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

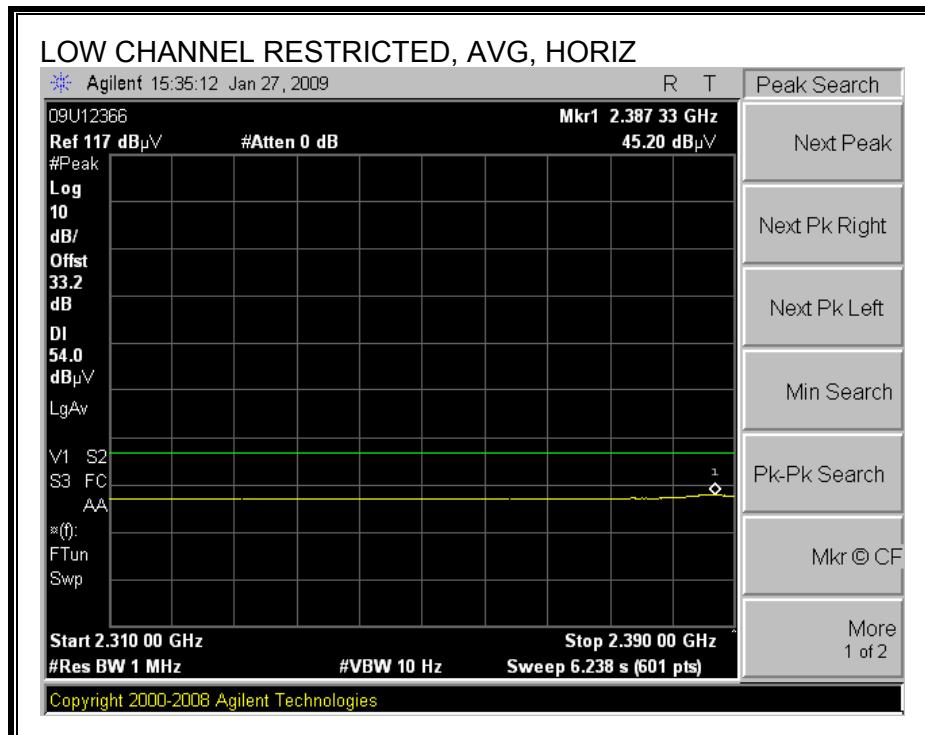
## 7.2. DUAL BAND OMNI - DIRECTIONAL ANTENNA (2.4GHz)

### 7.2.1. TX ABOVE 1 GHz FOR 802.11b

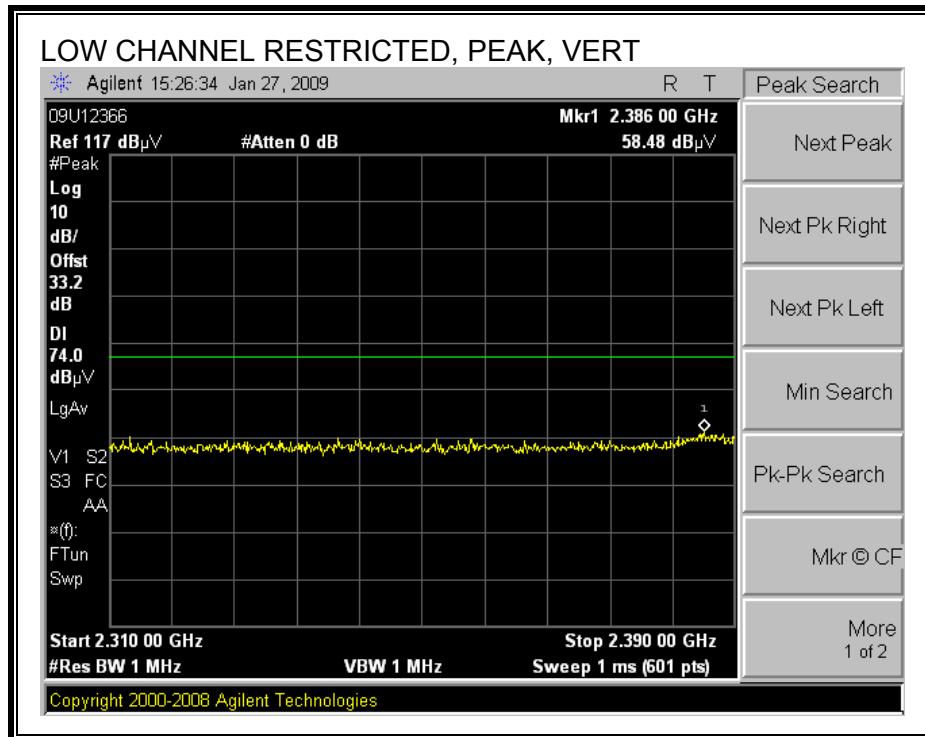
MODE 100:

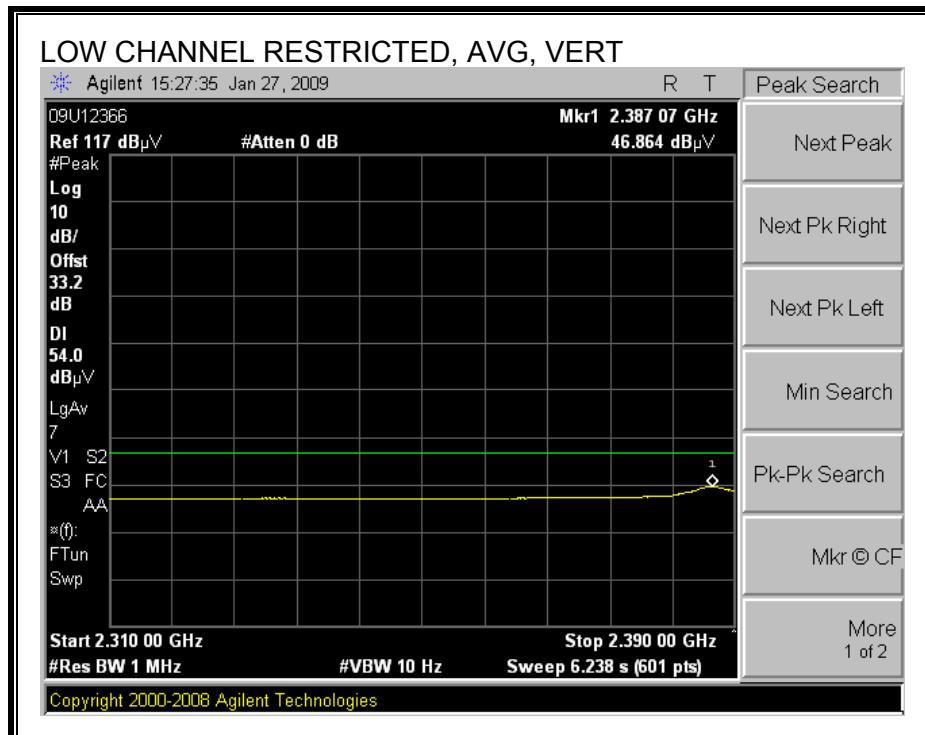
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



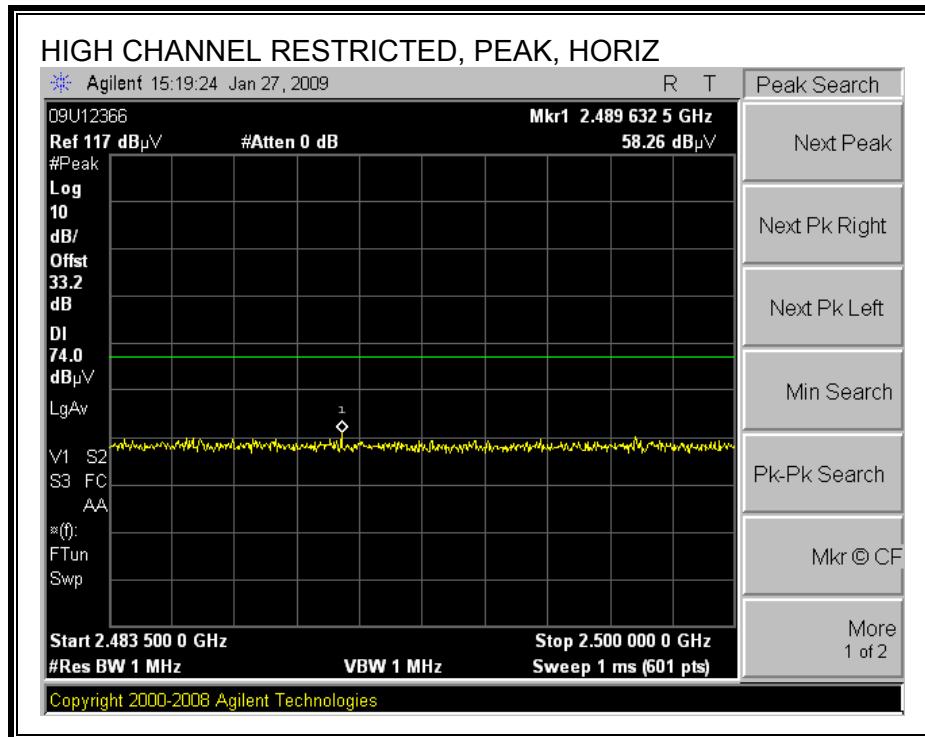


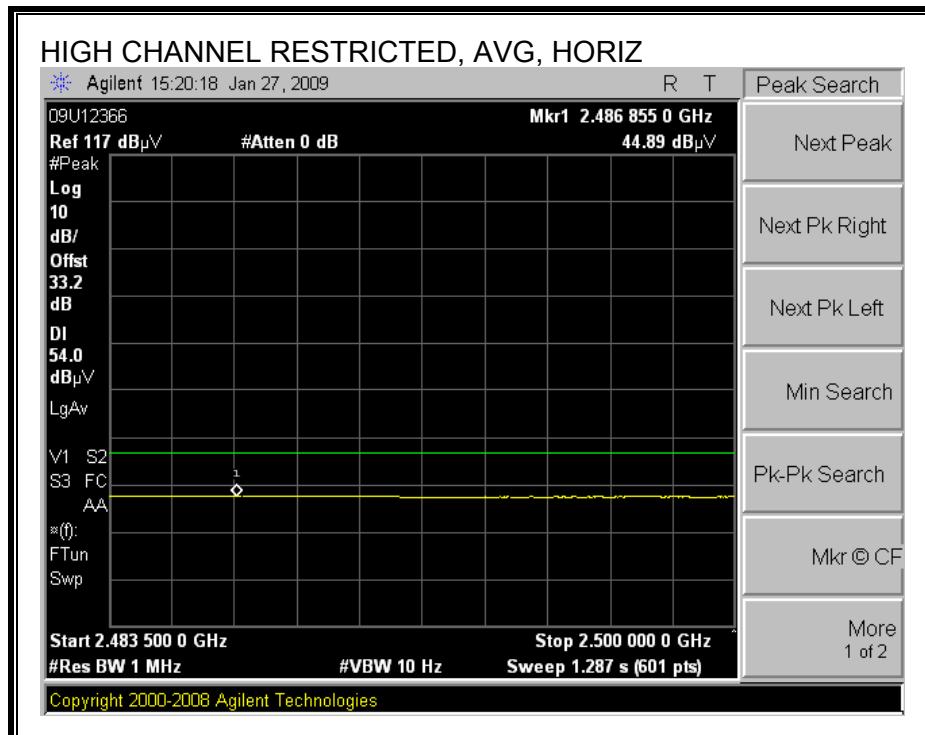
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



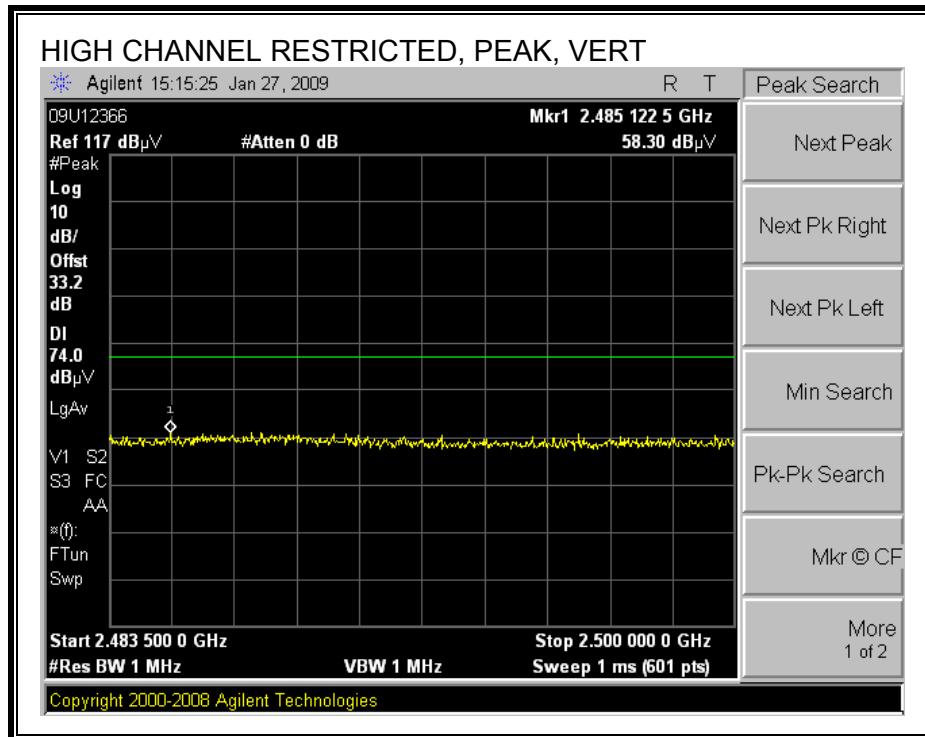


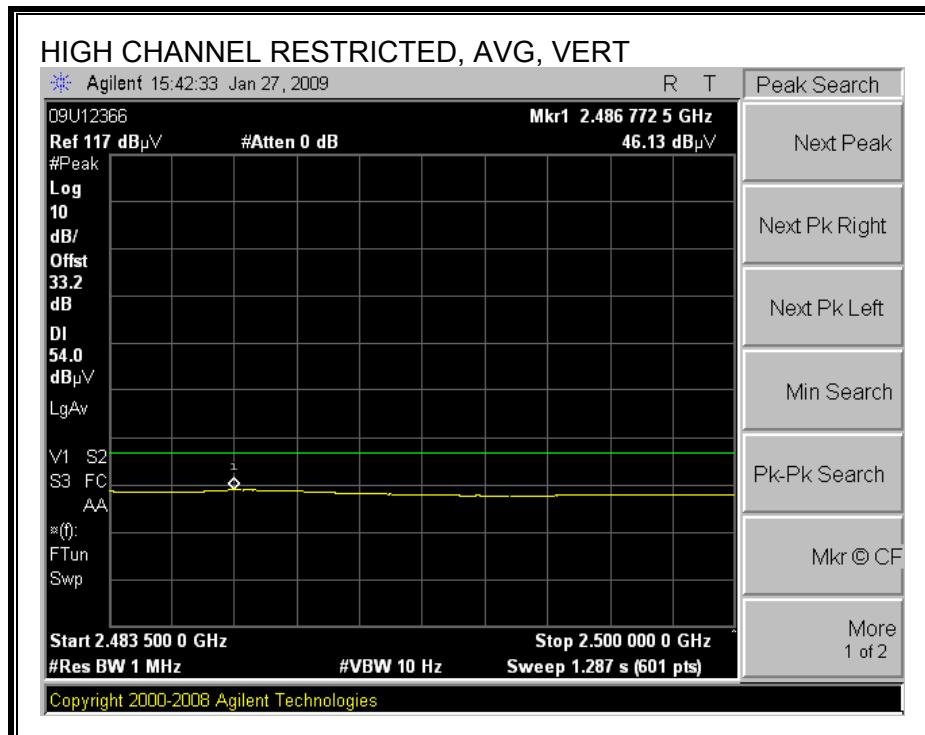
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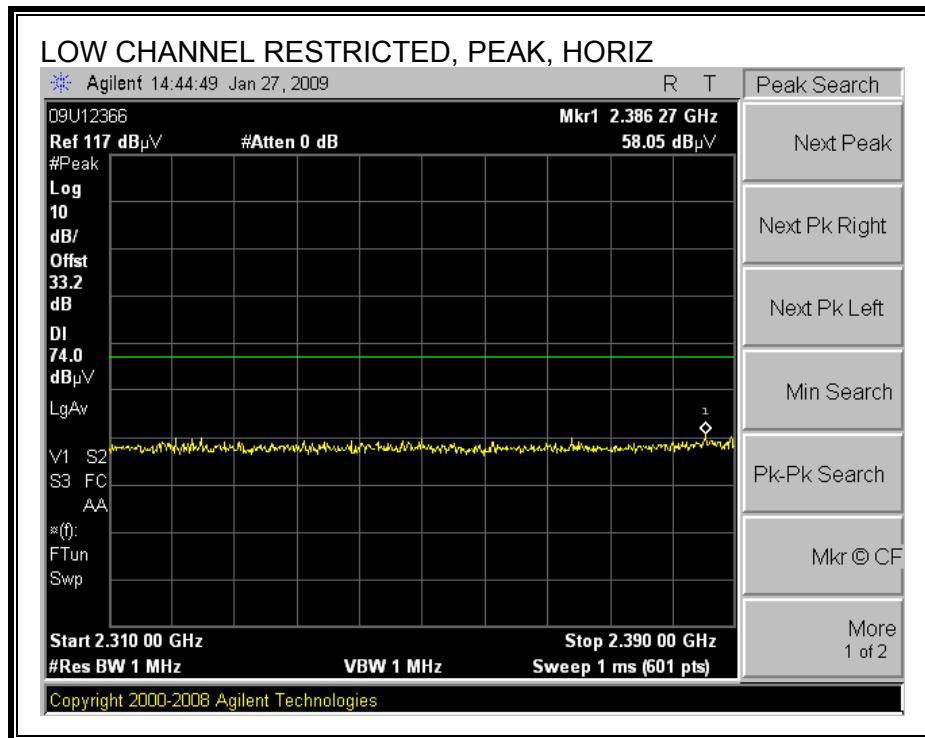
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

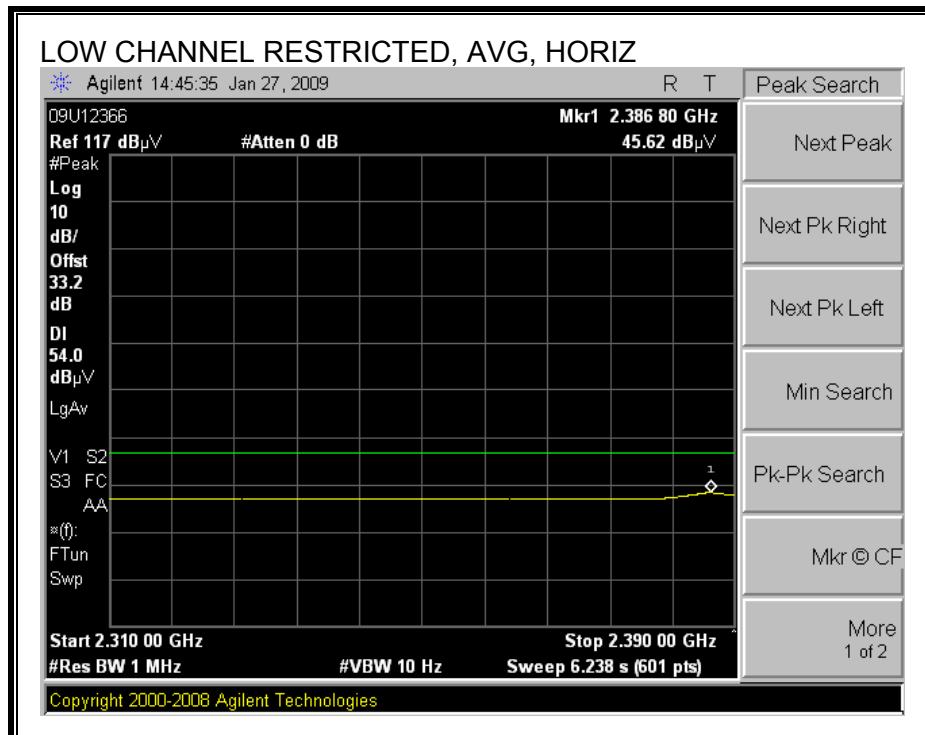




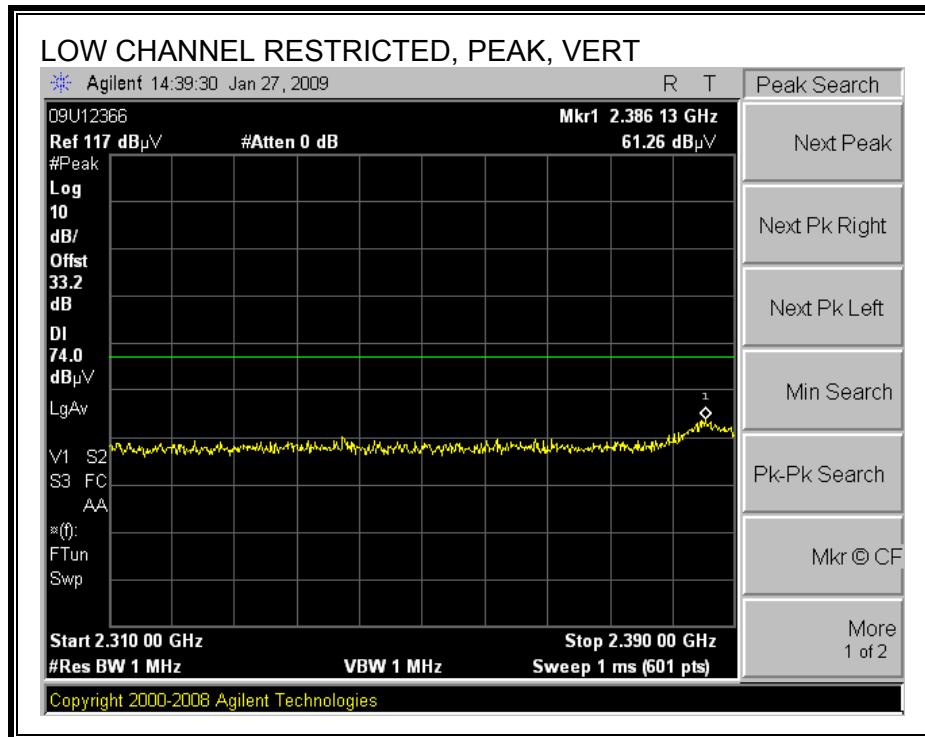
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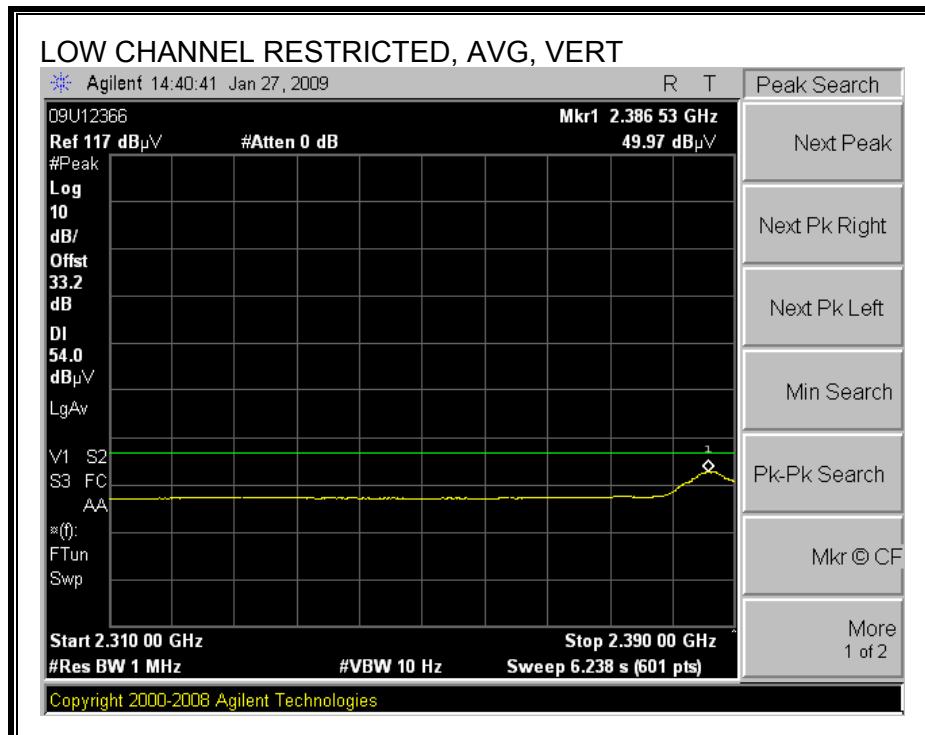
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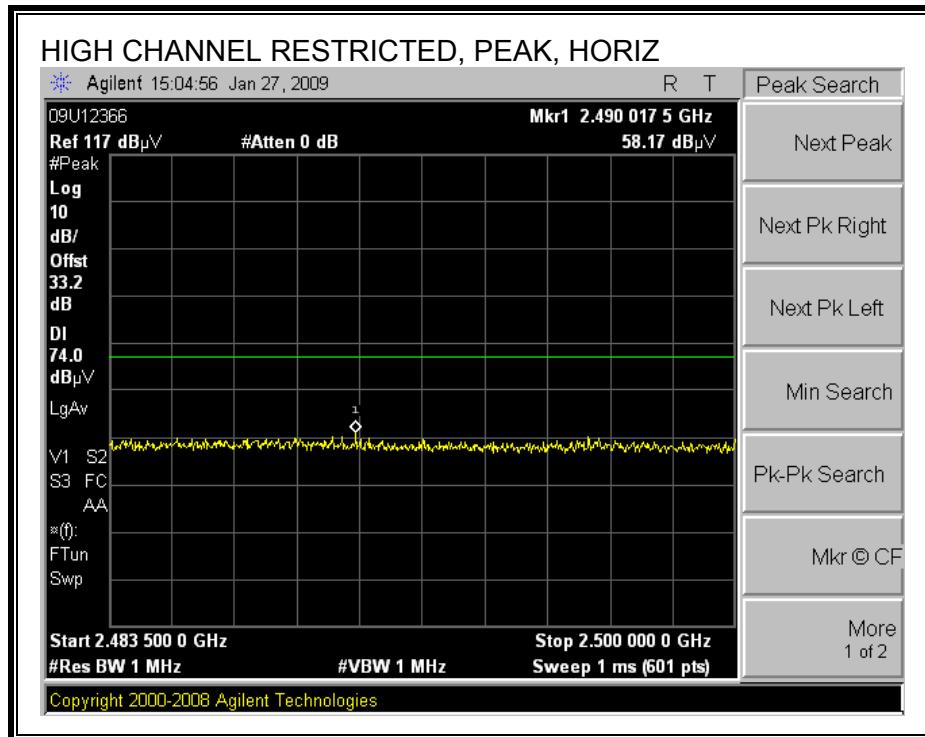


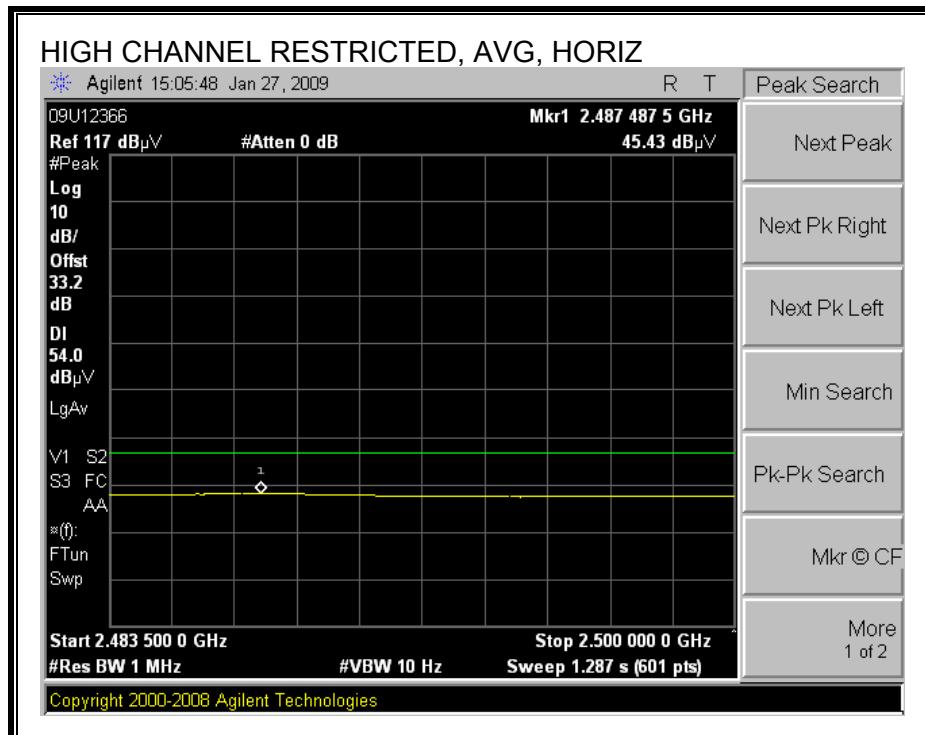
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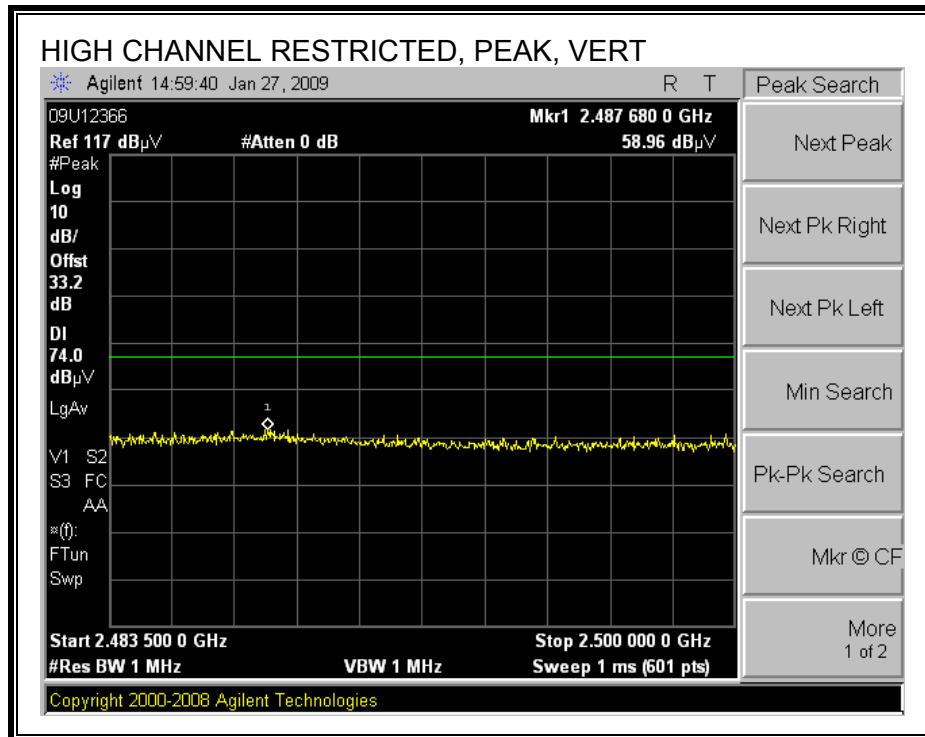


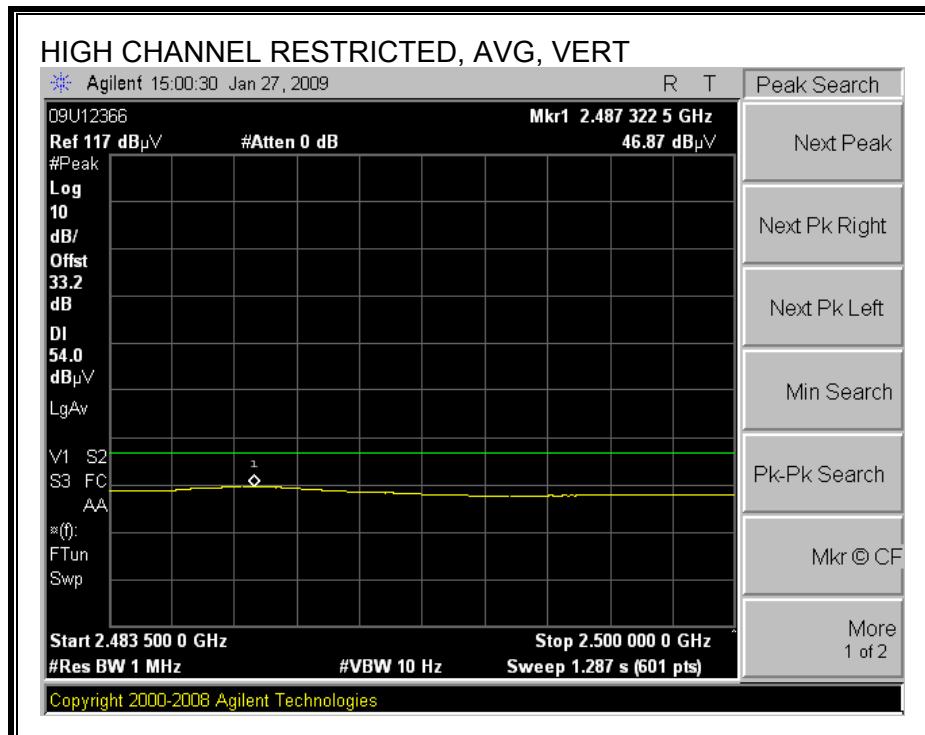
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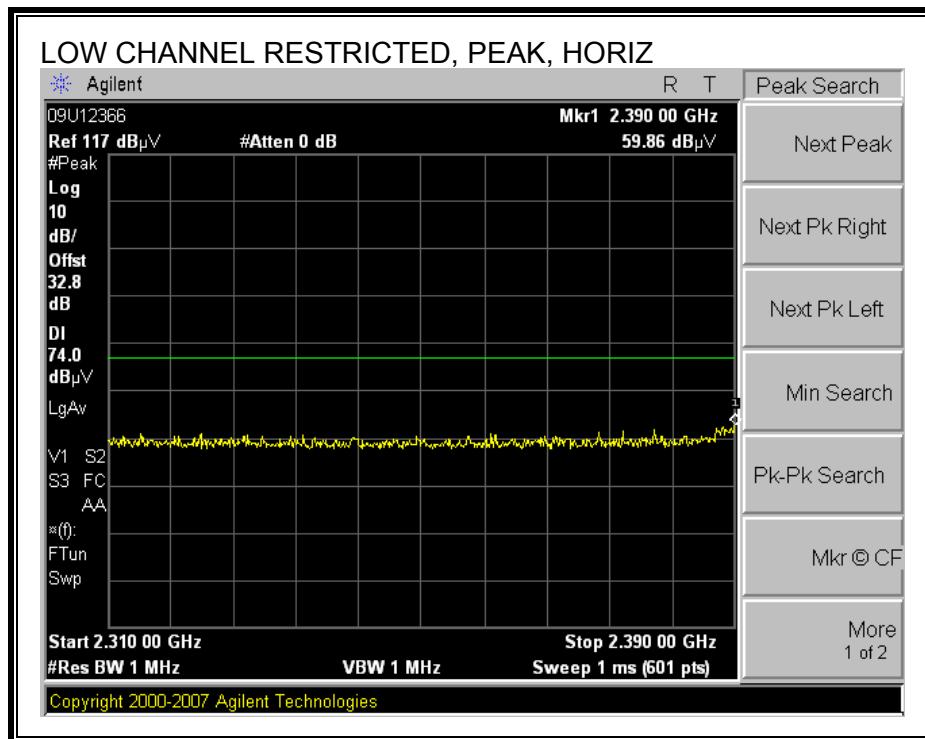
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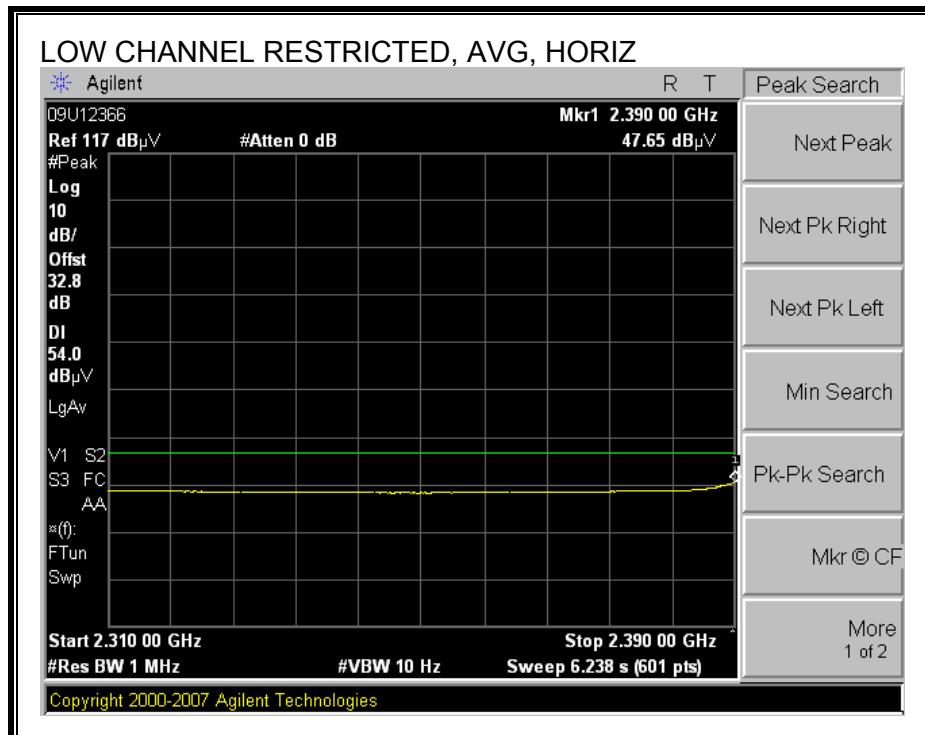




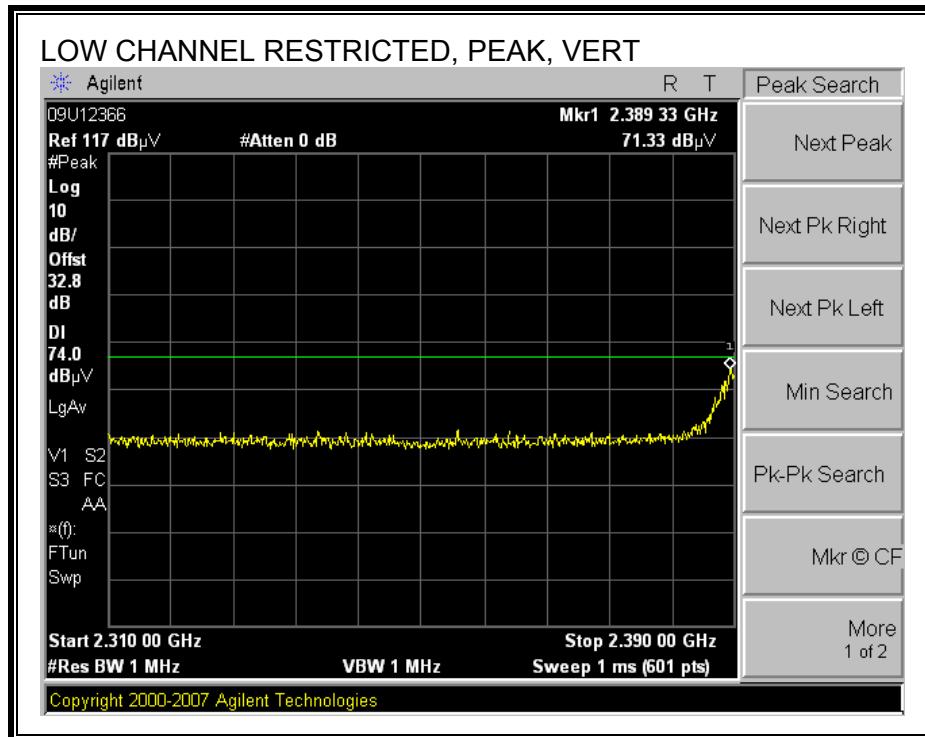
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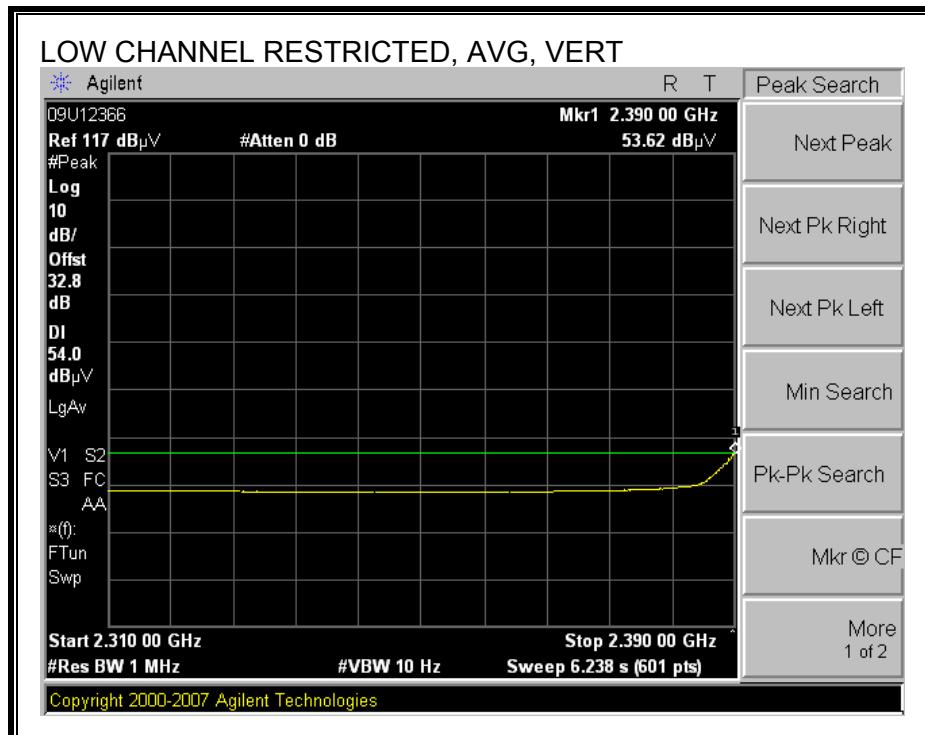
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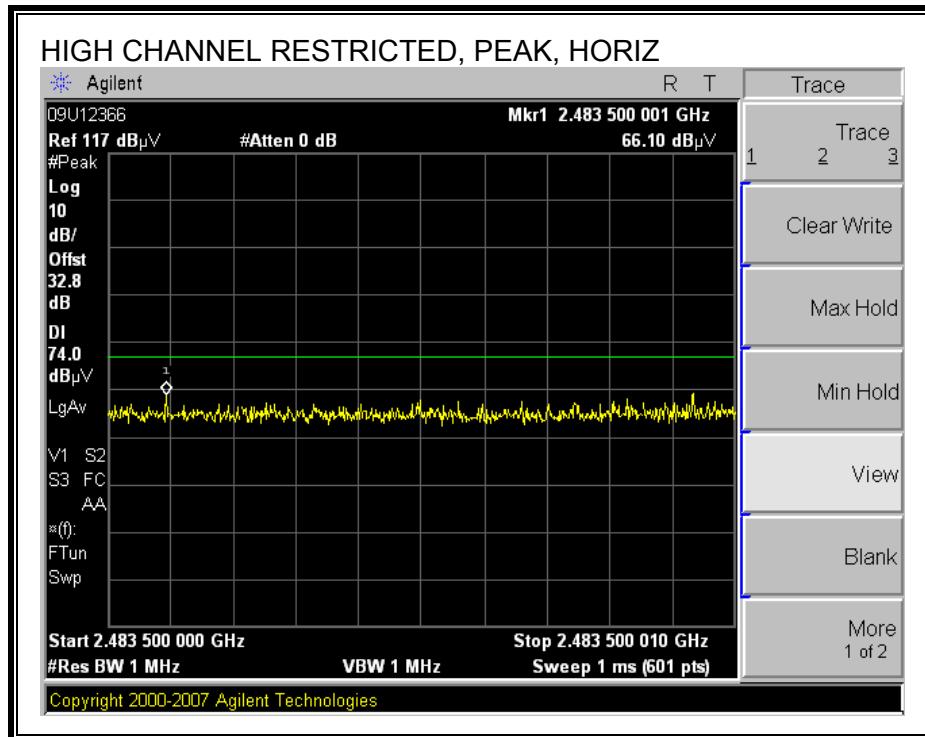


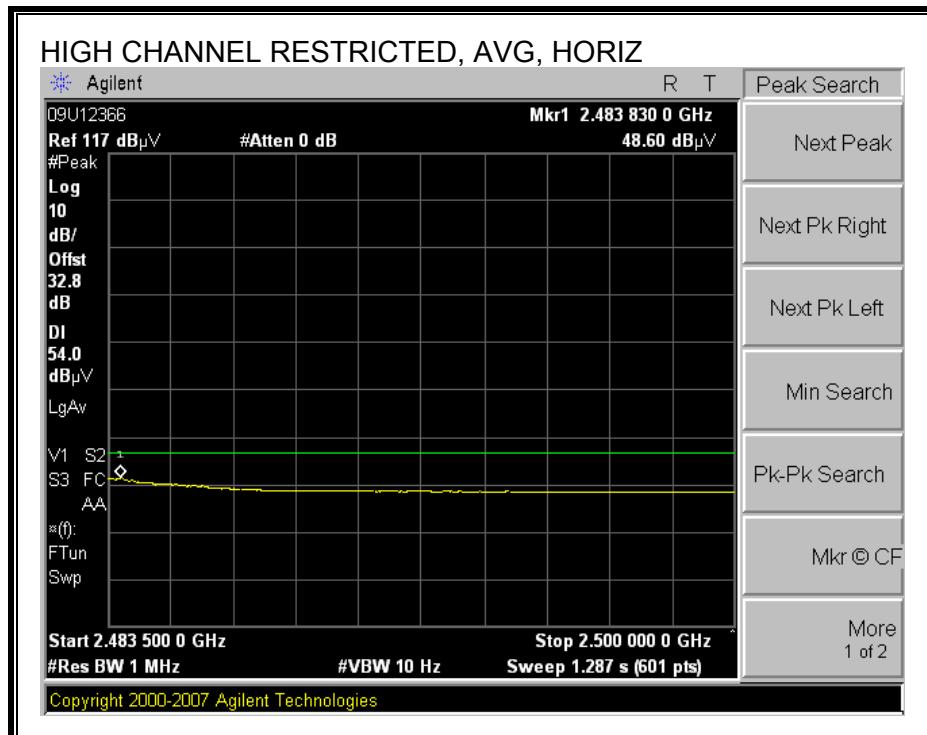
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



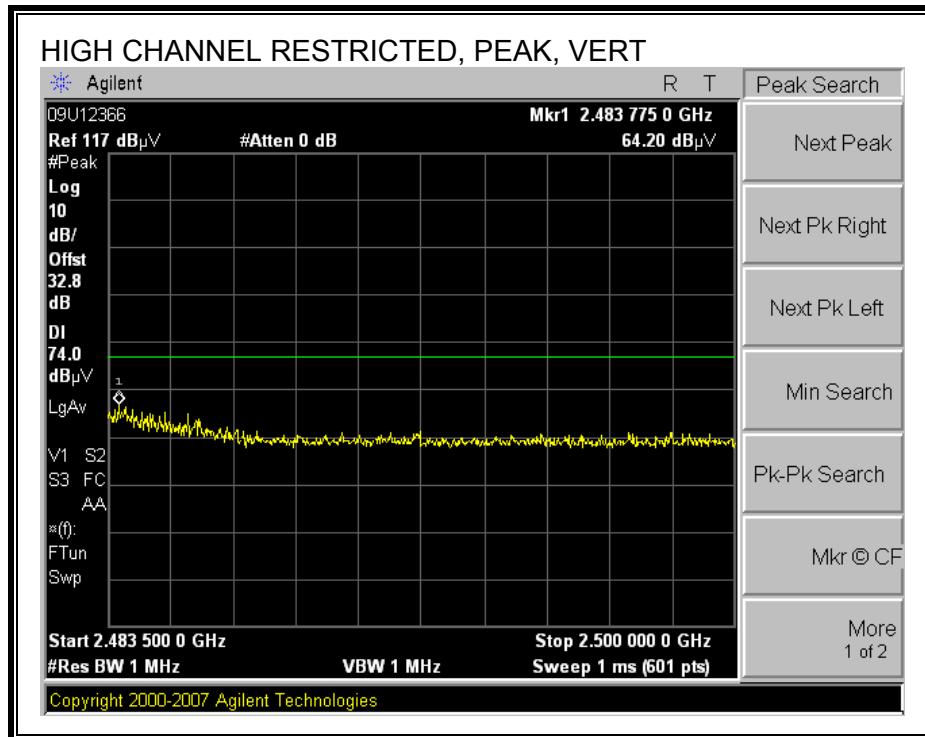


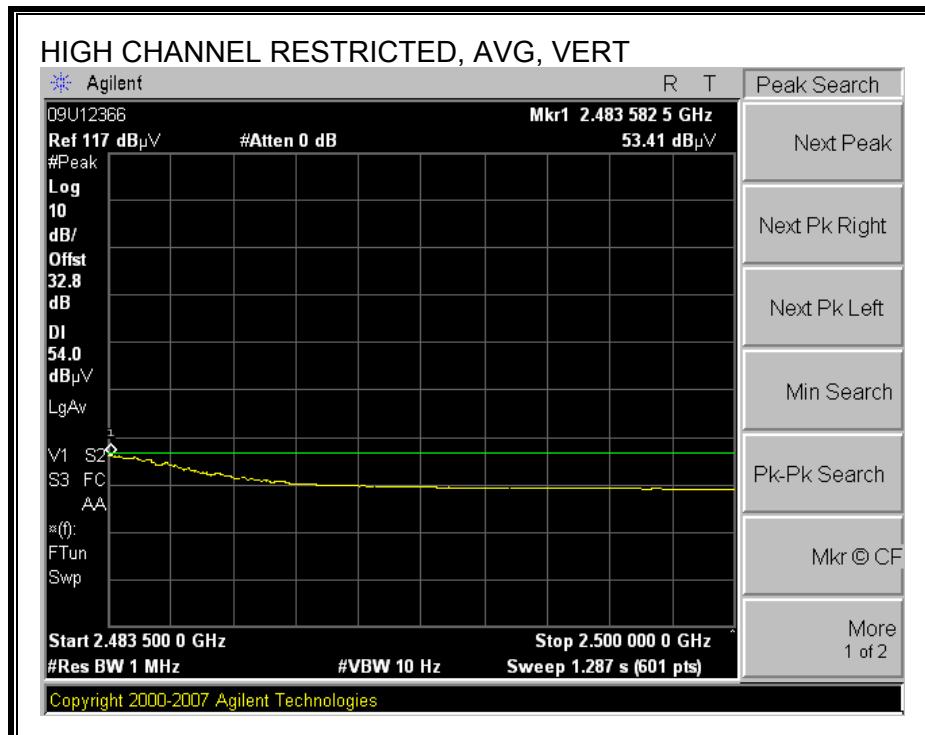
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





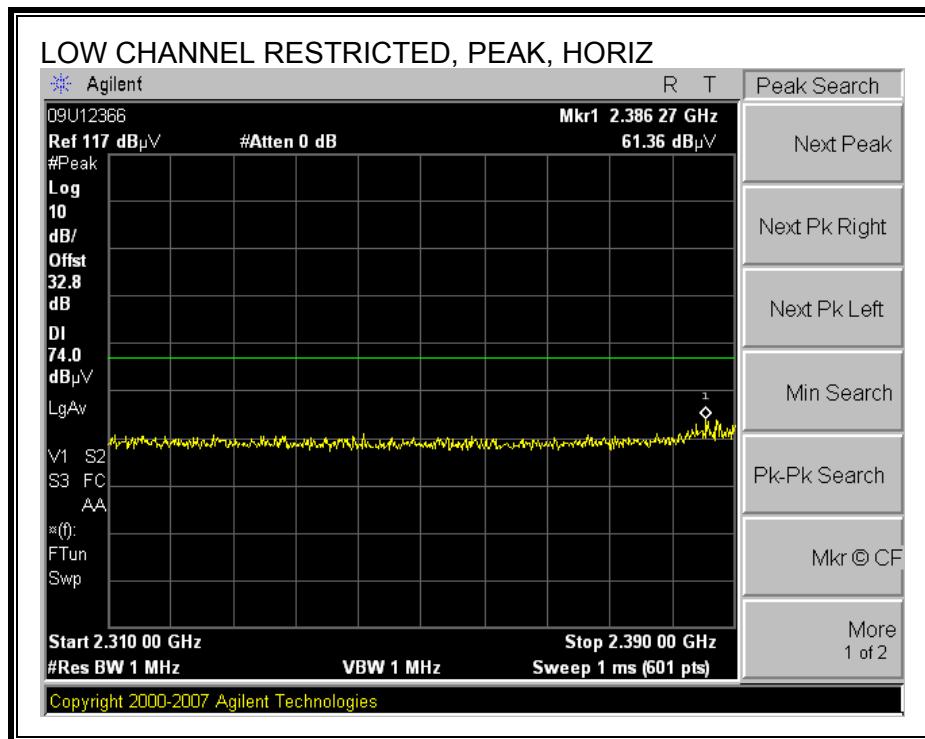
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

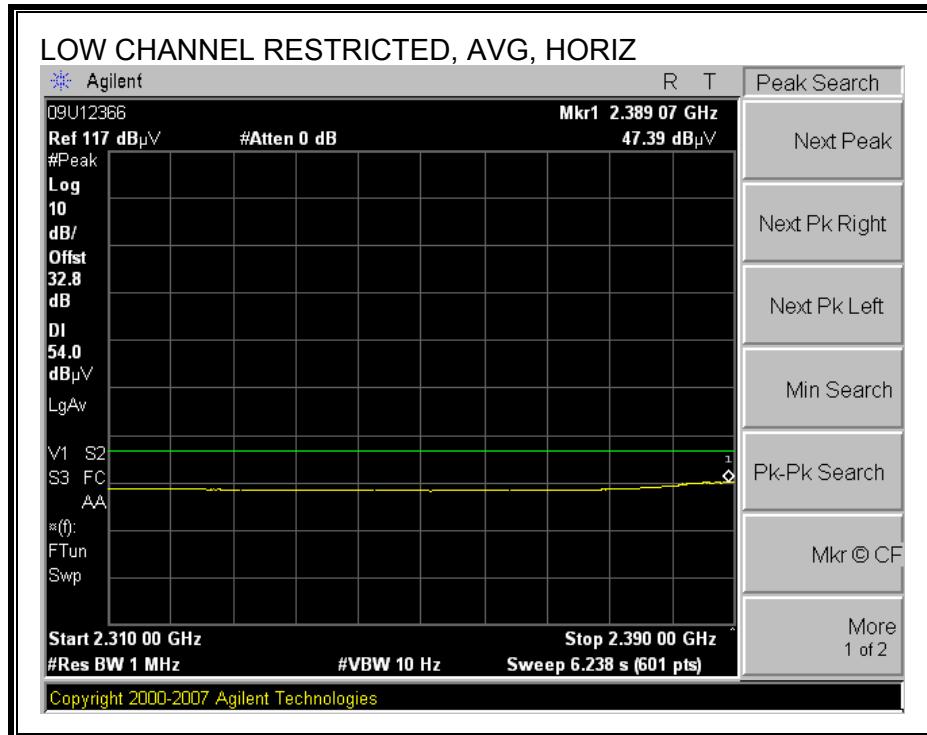




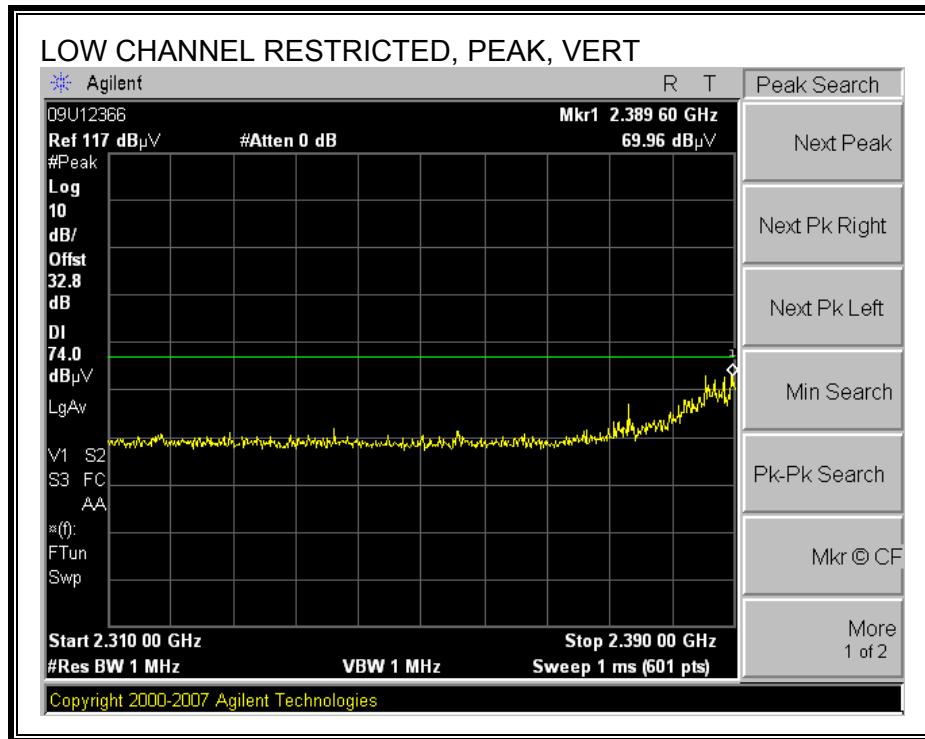
**MODE 110 (HT40):**

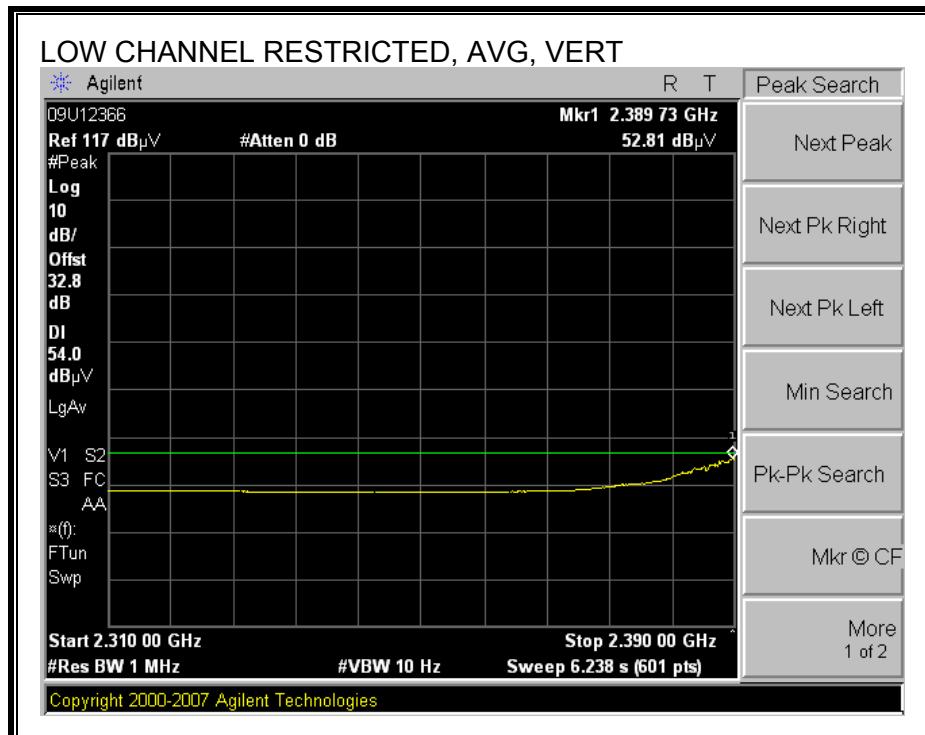
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



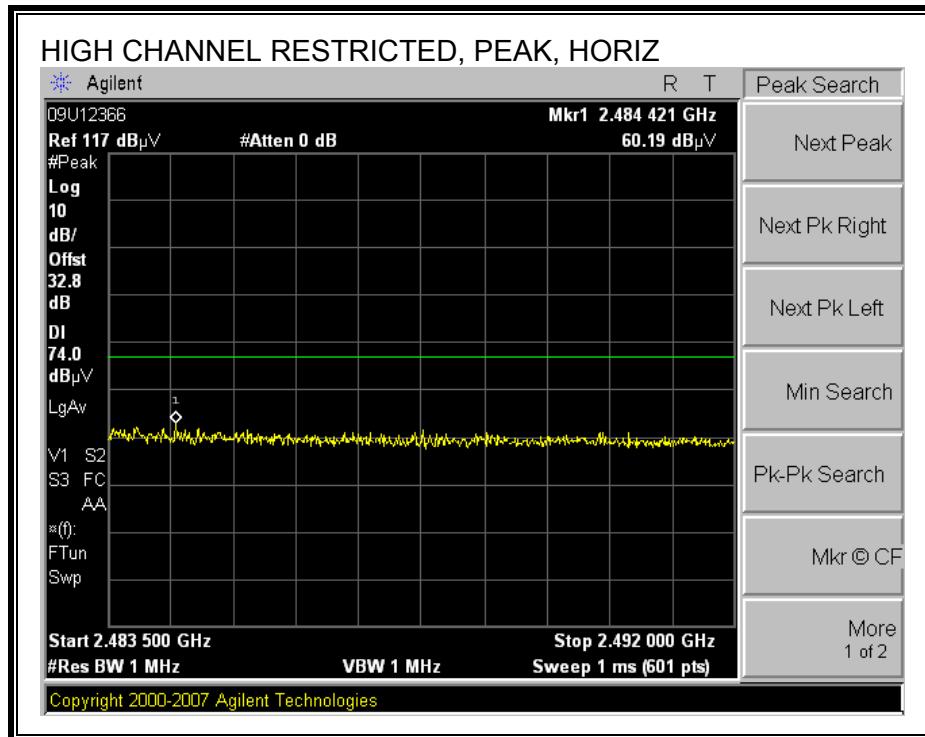


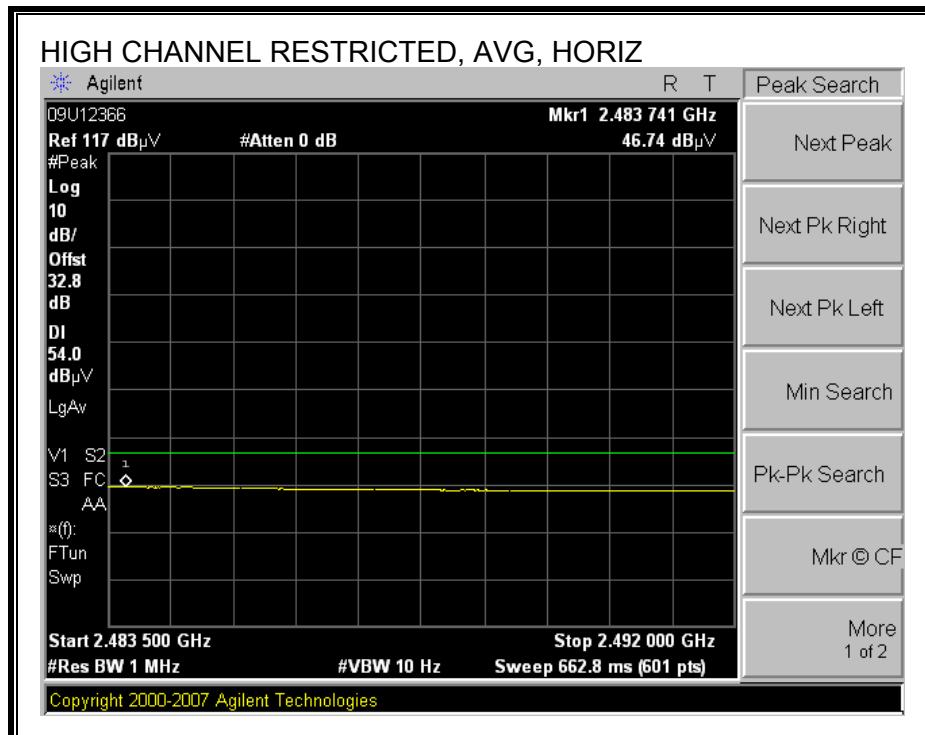
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



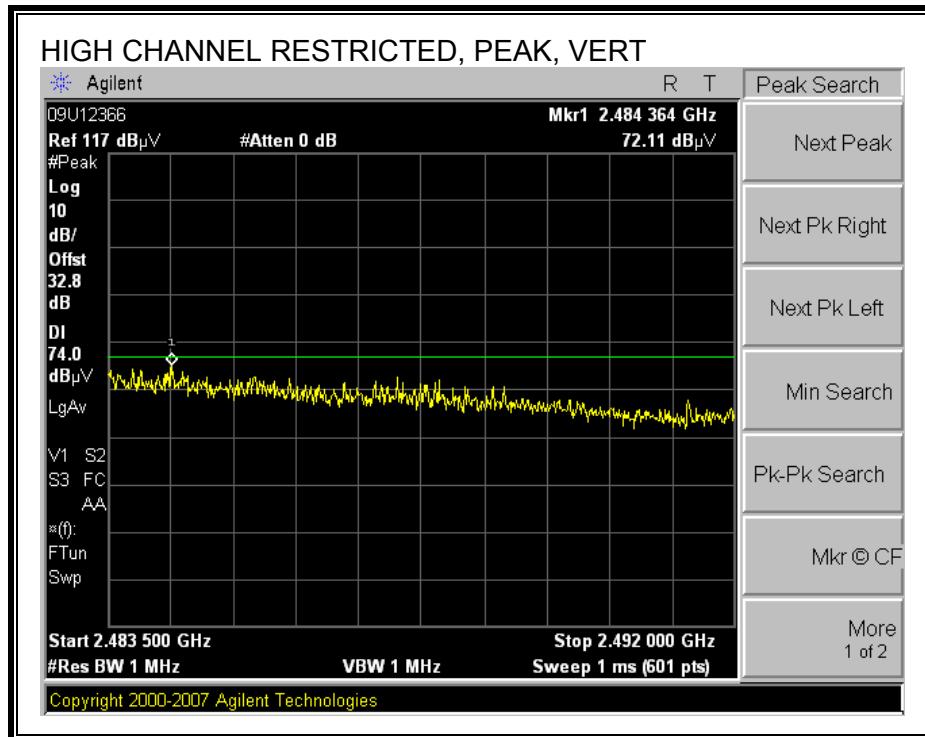


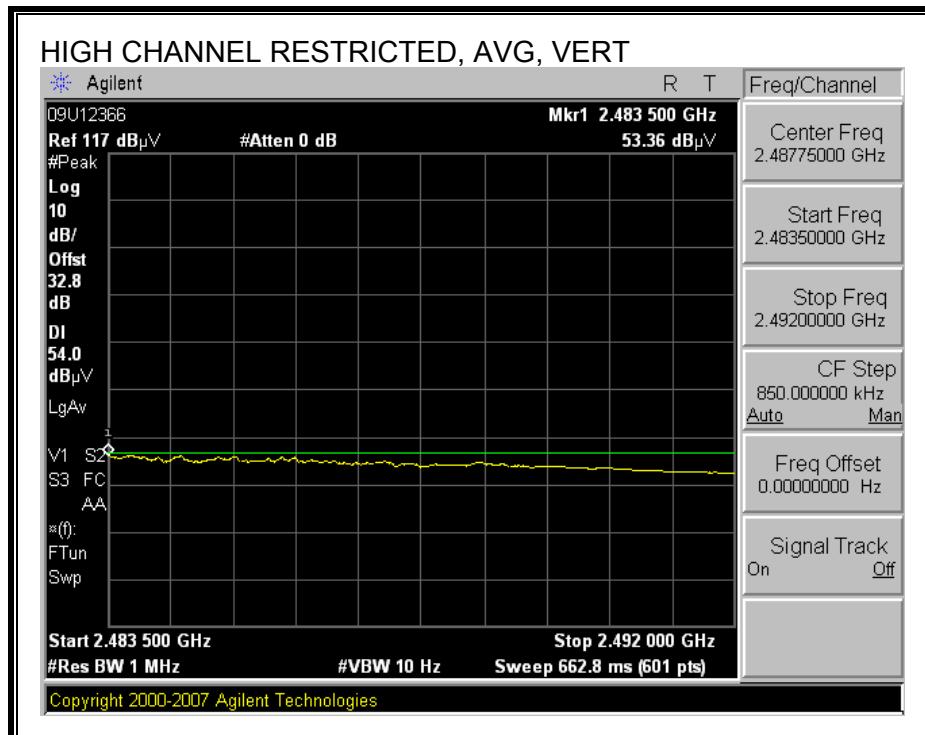
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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

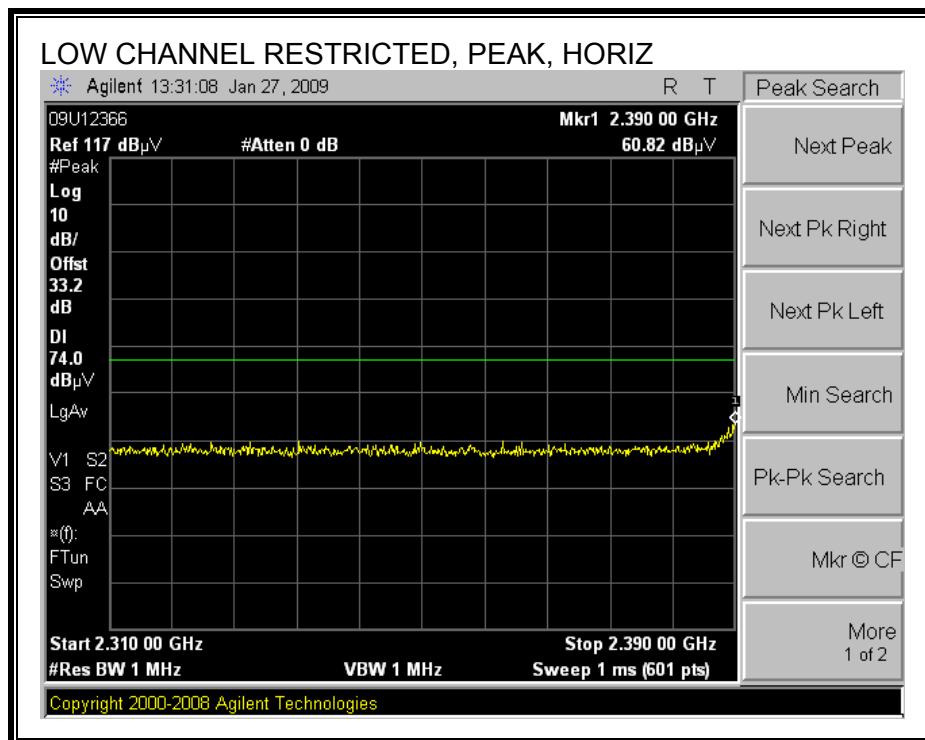


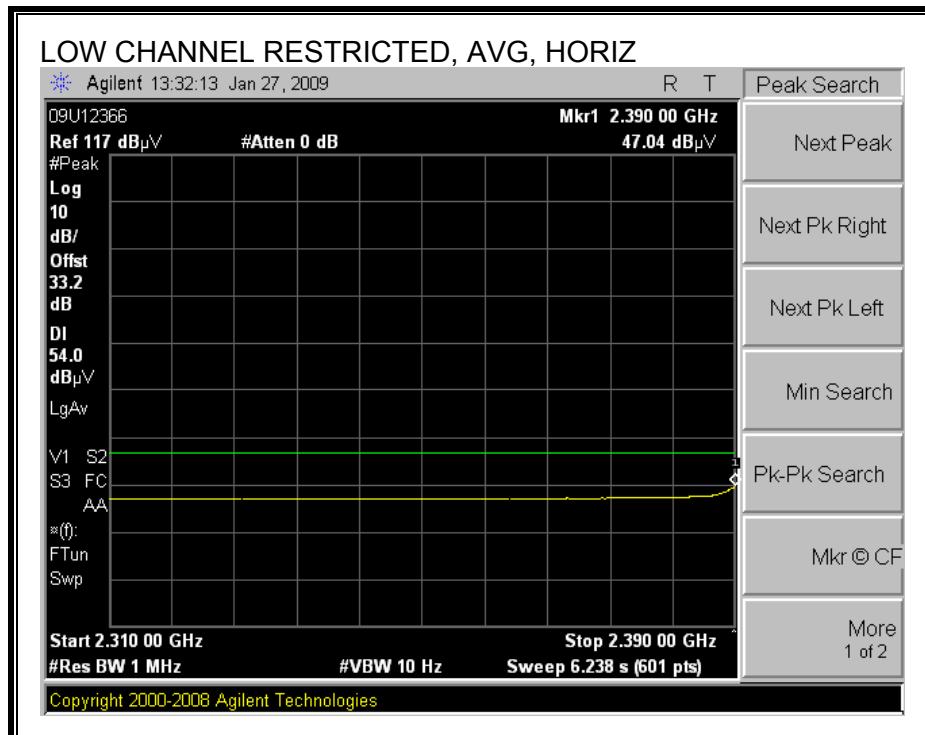


## 7.2.2. TX ABOVE 1 GHz FOR 802.11g

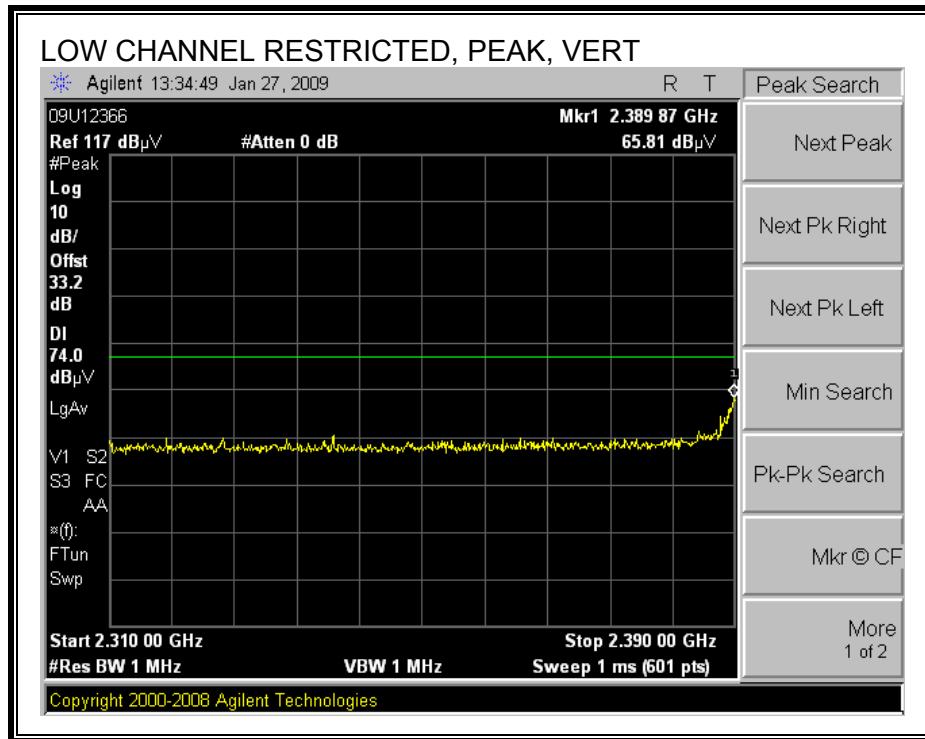
**MODE 100:**

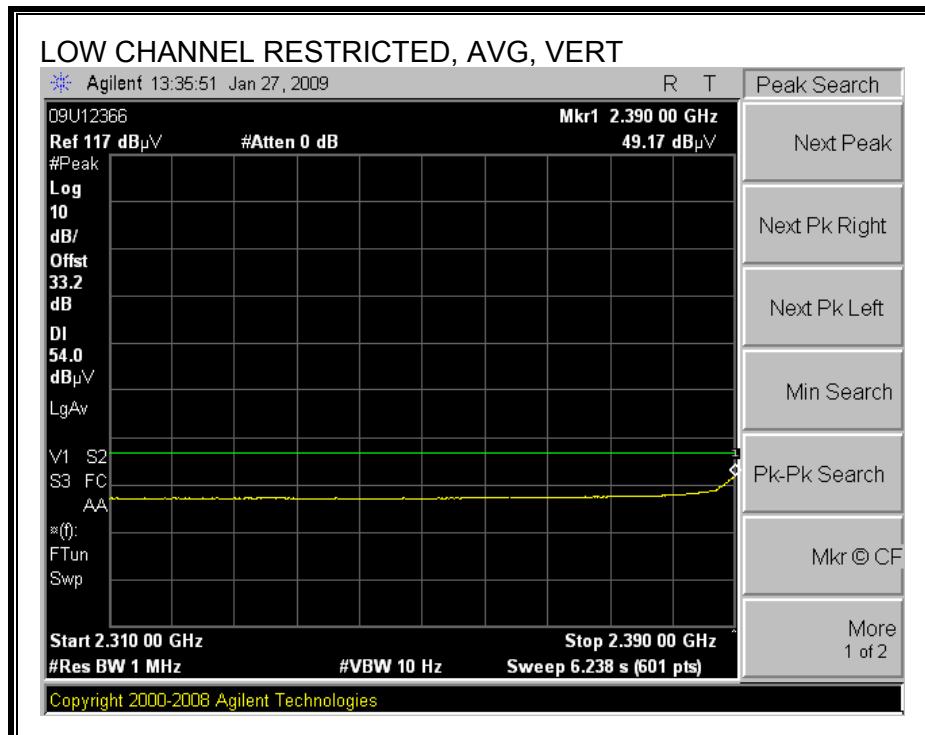
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



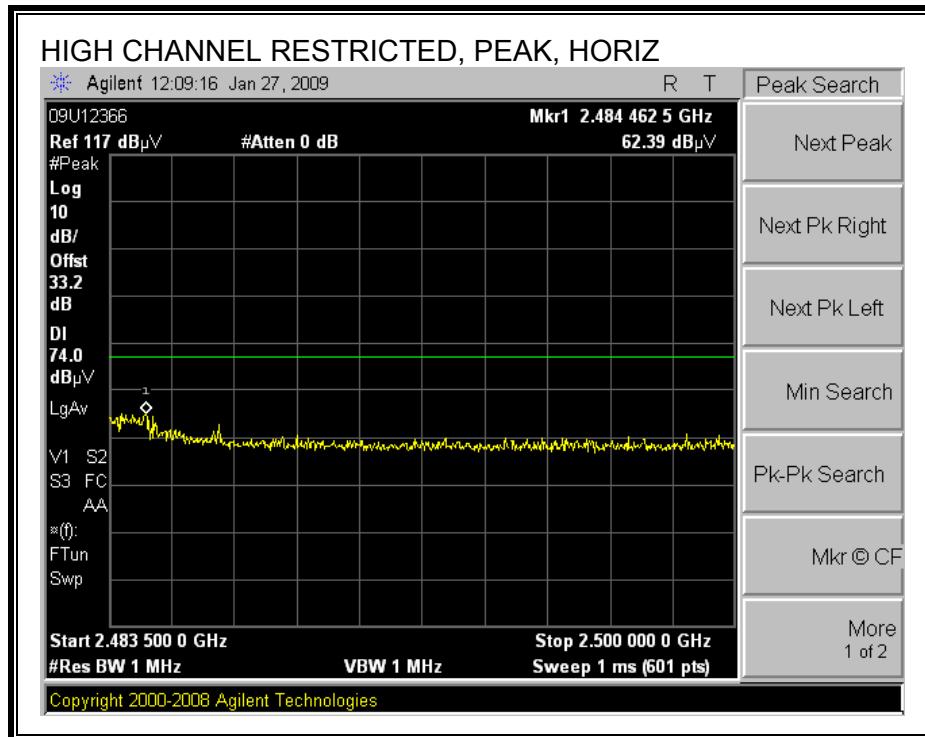


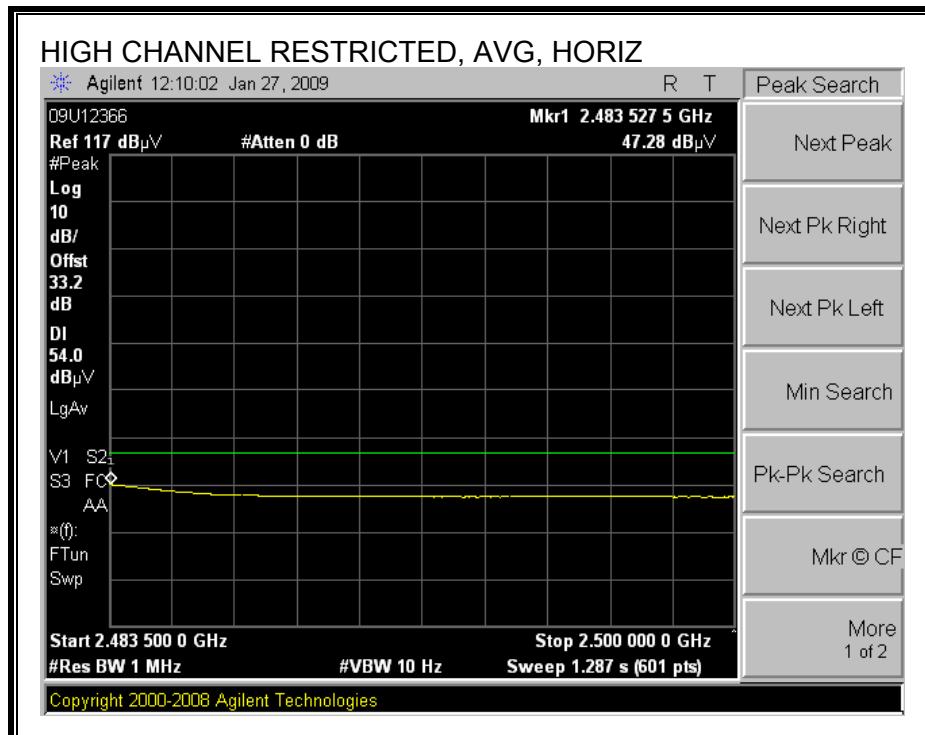
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



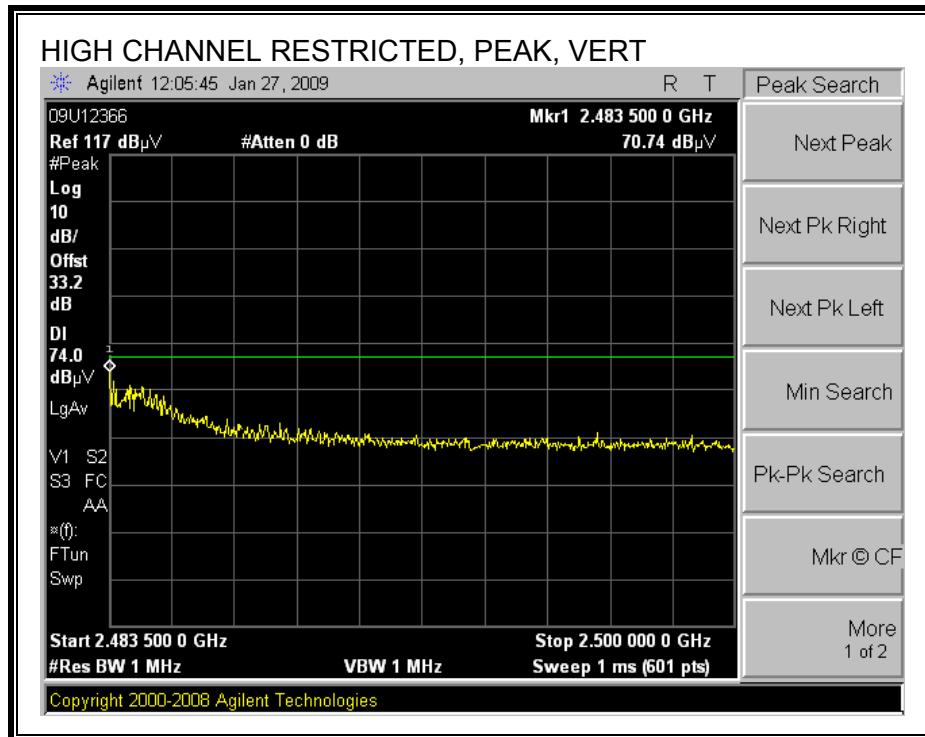


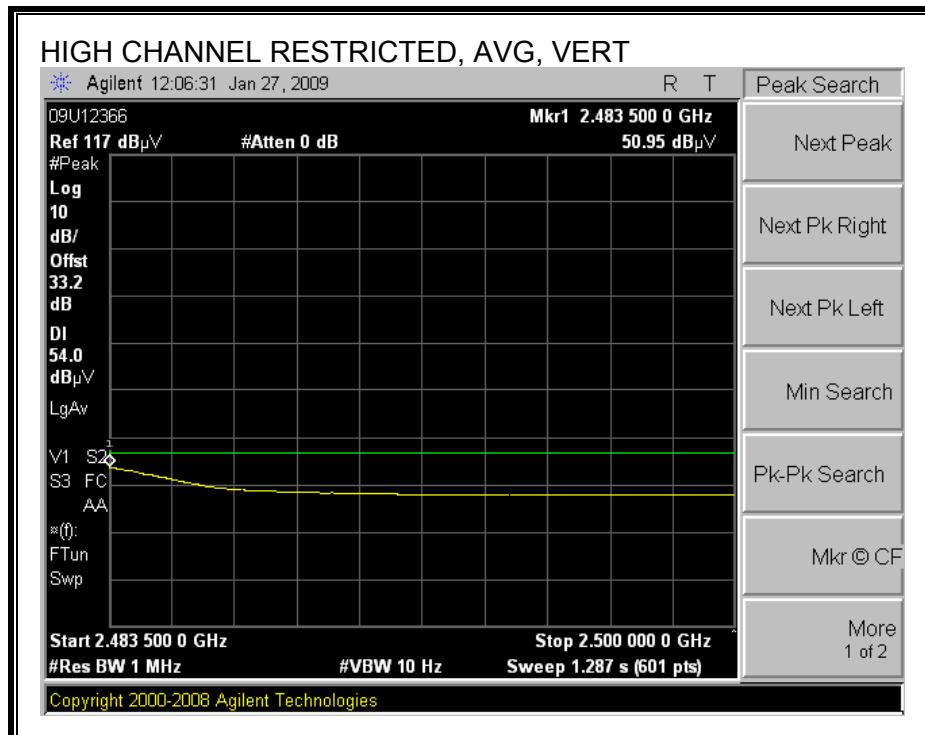
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





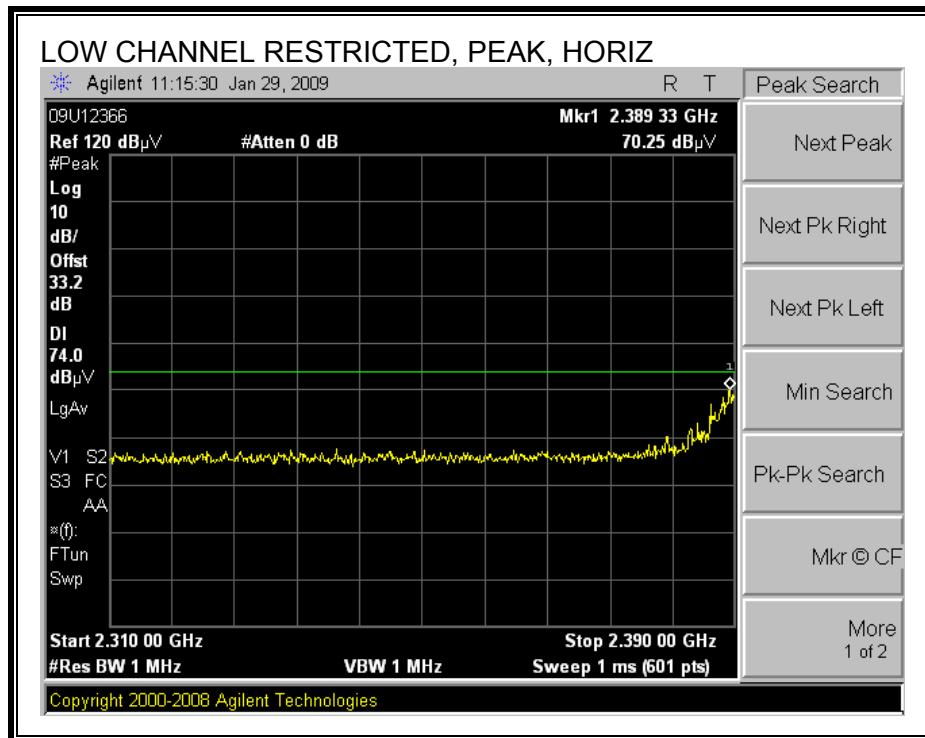
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

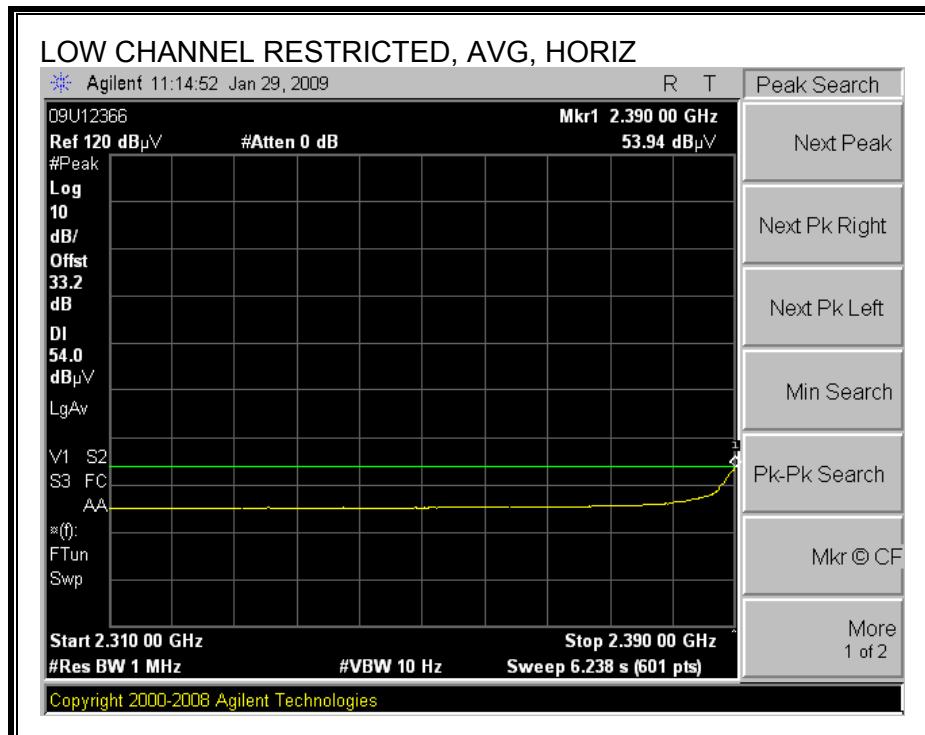




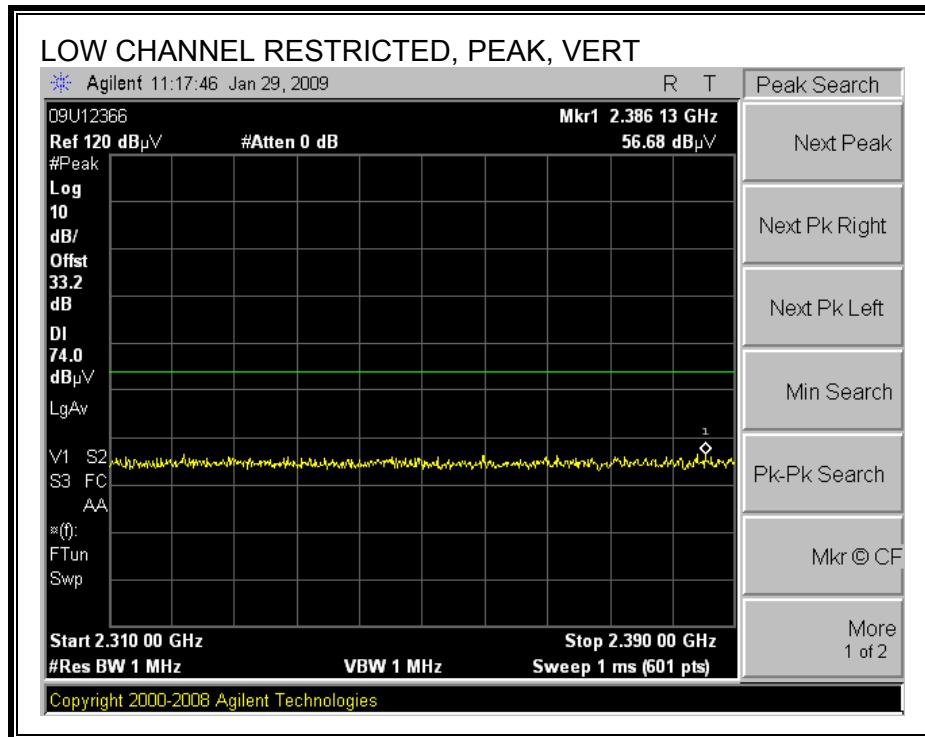
**MODE 010:**

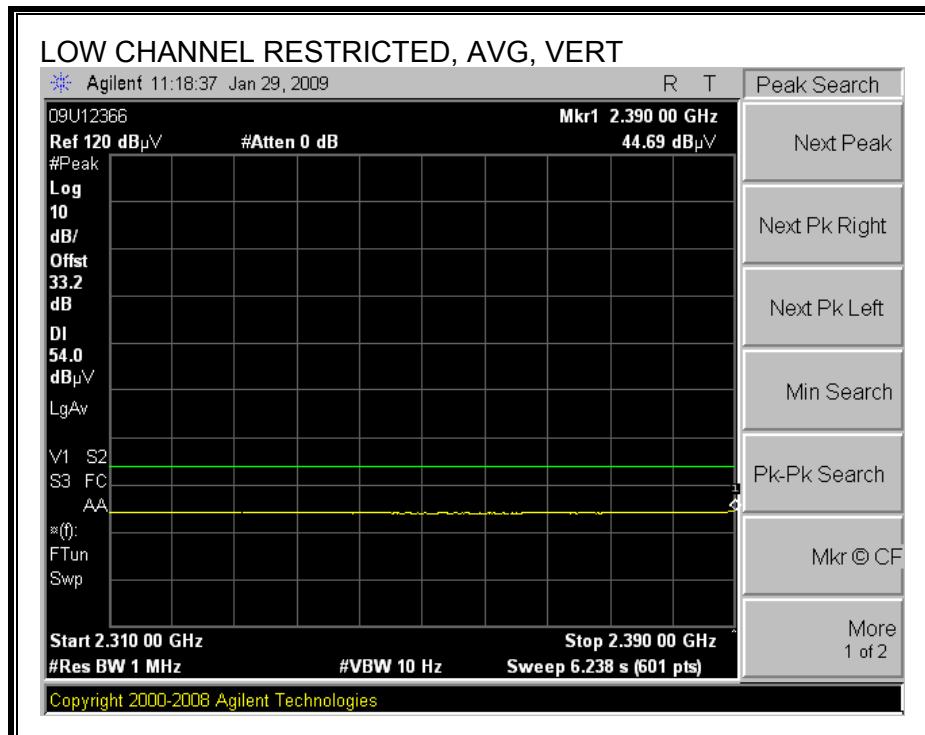
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



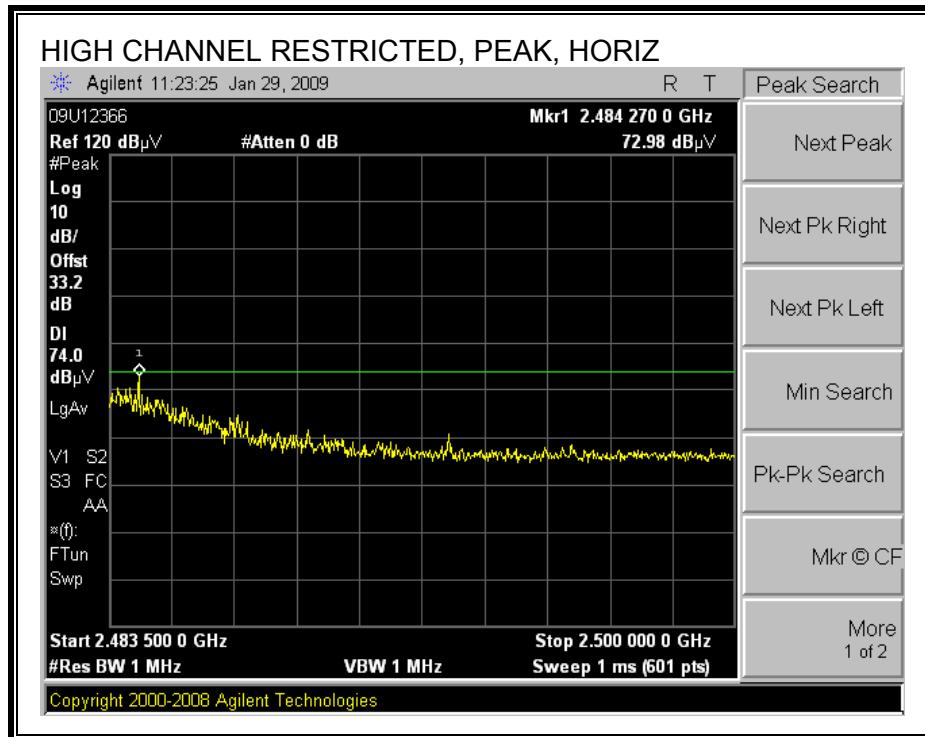


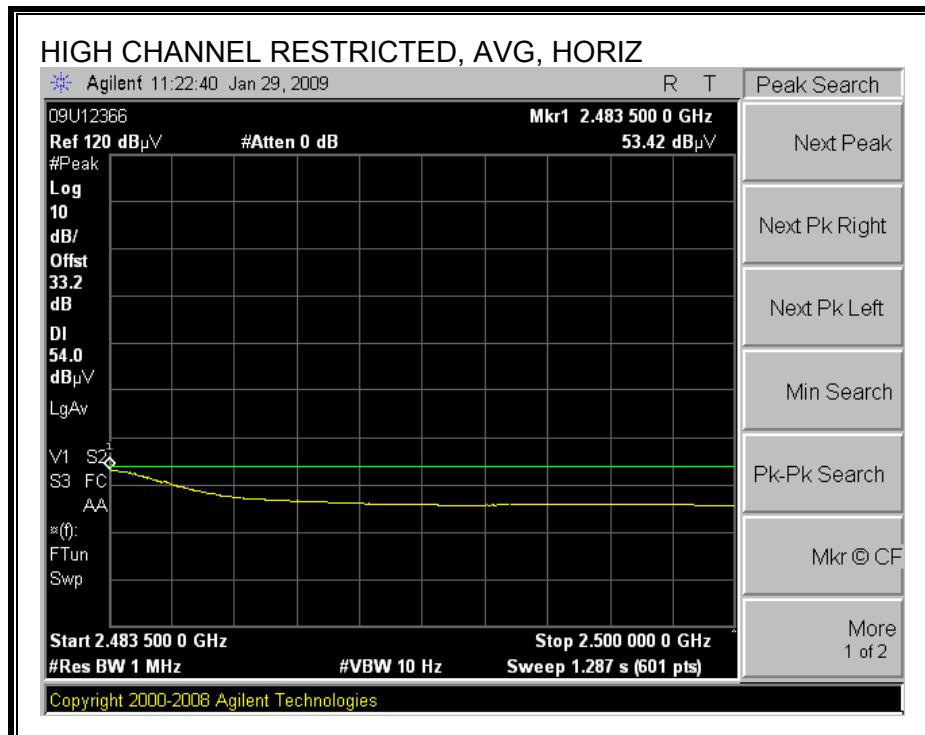
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



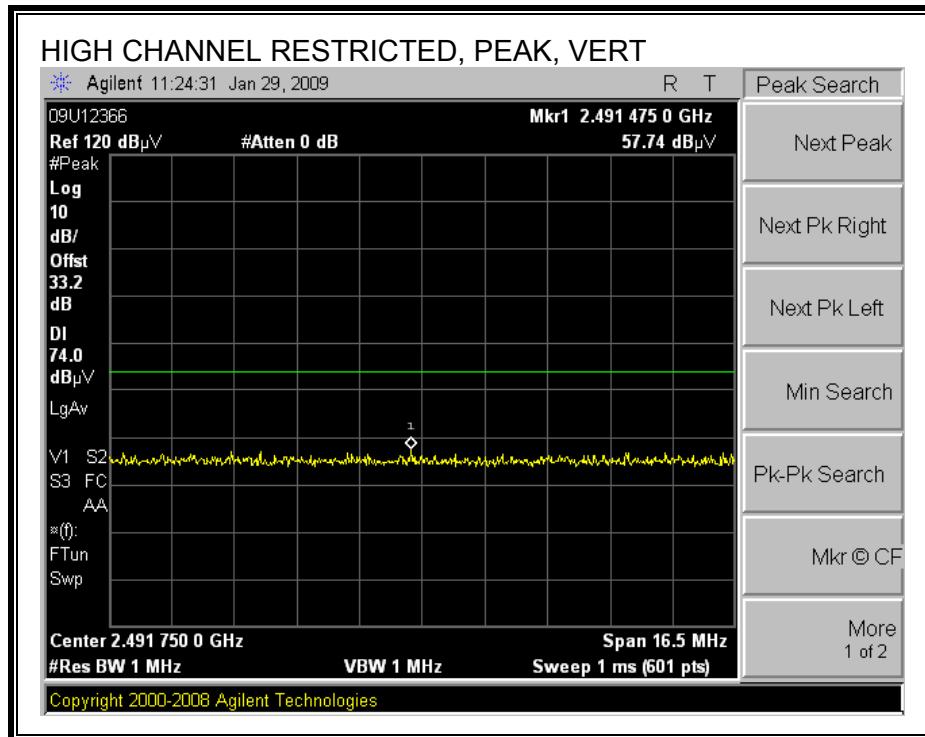


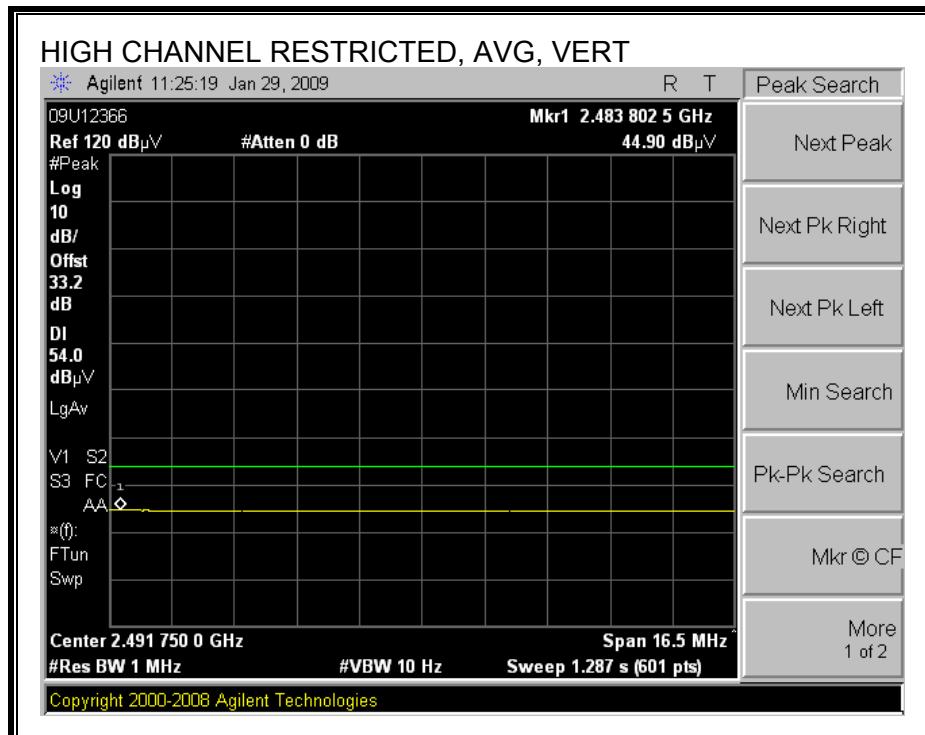
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





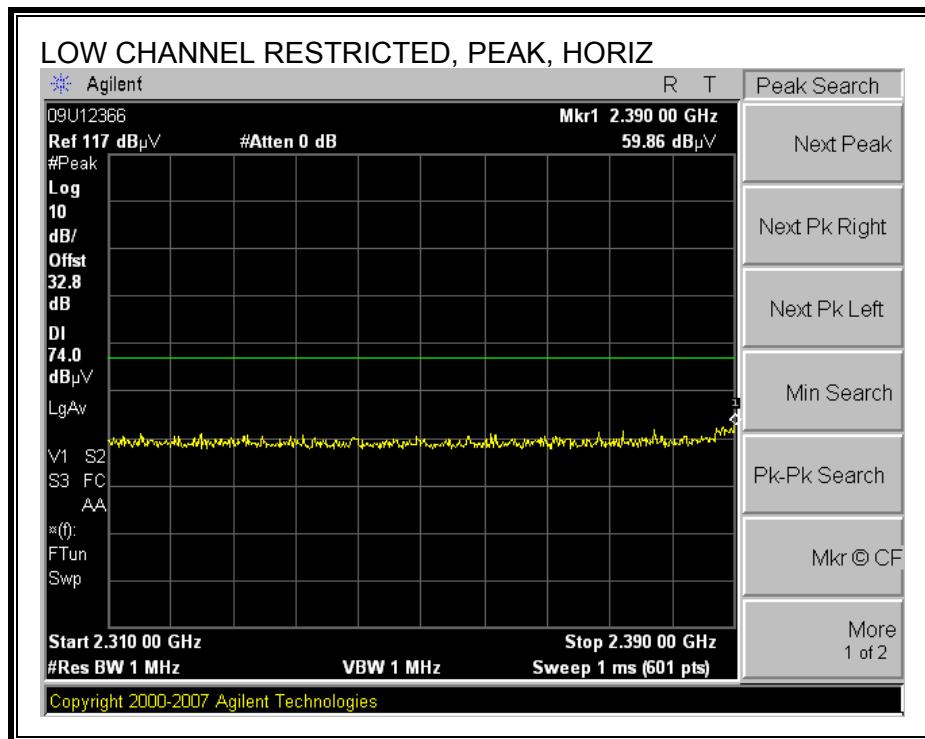
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

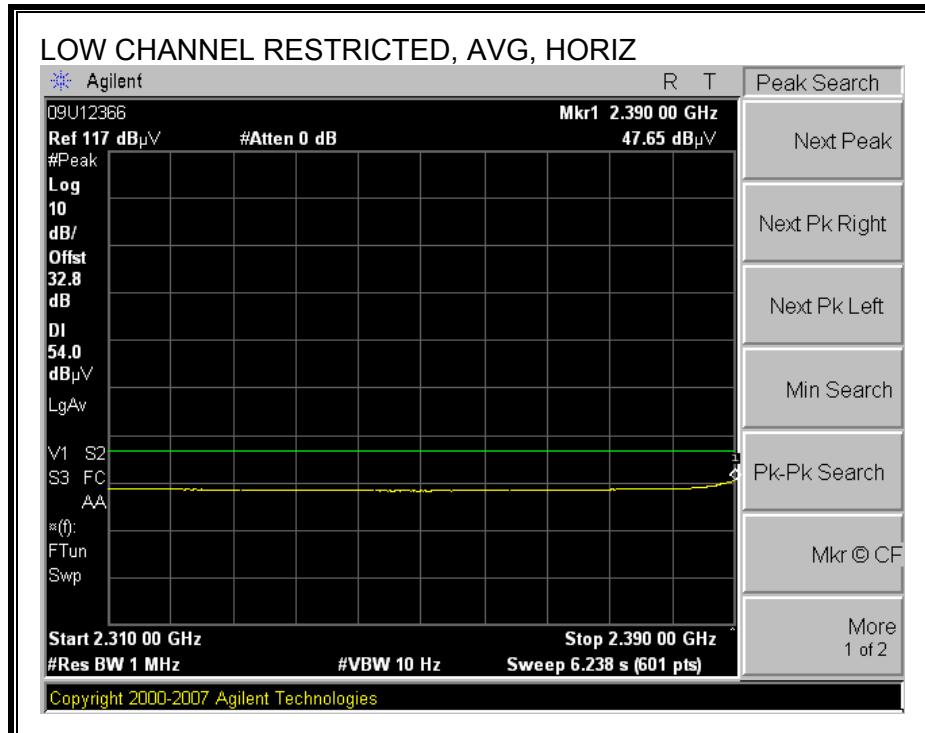




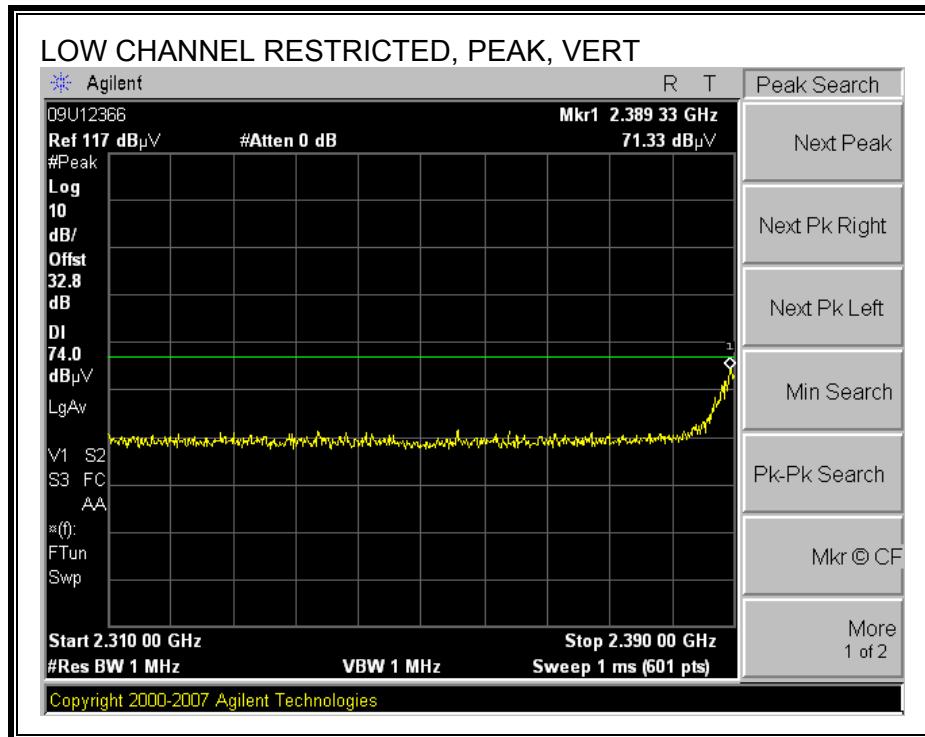
**MODE 110 (HT20):**

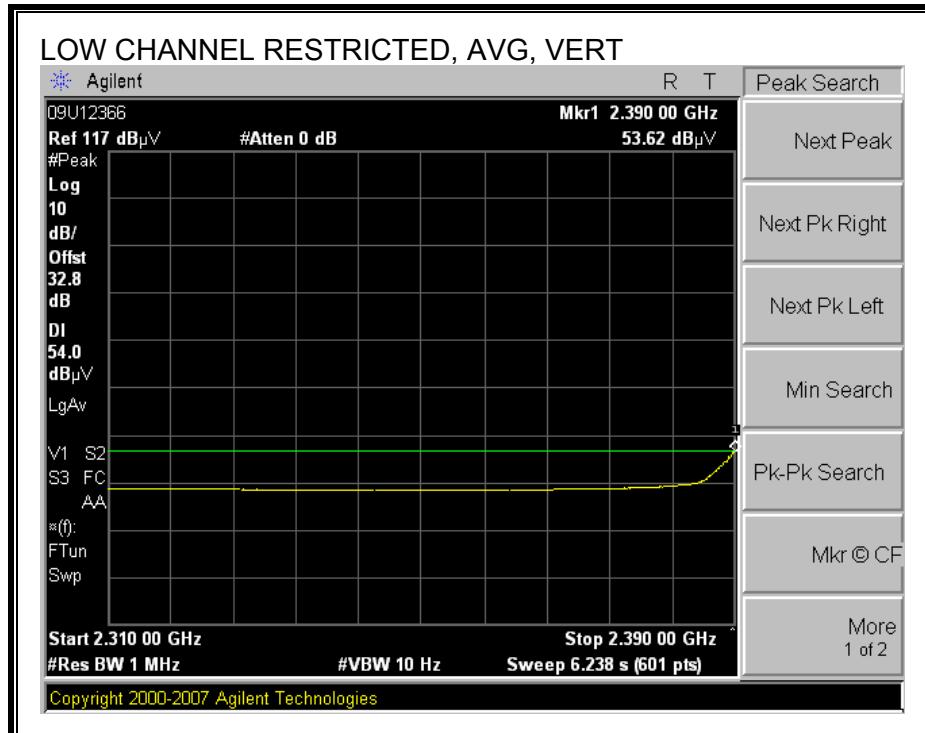
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



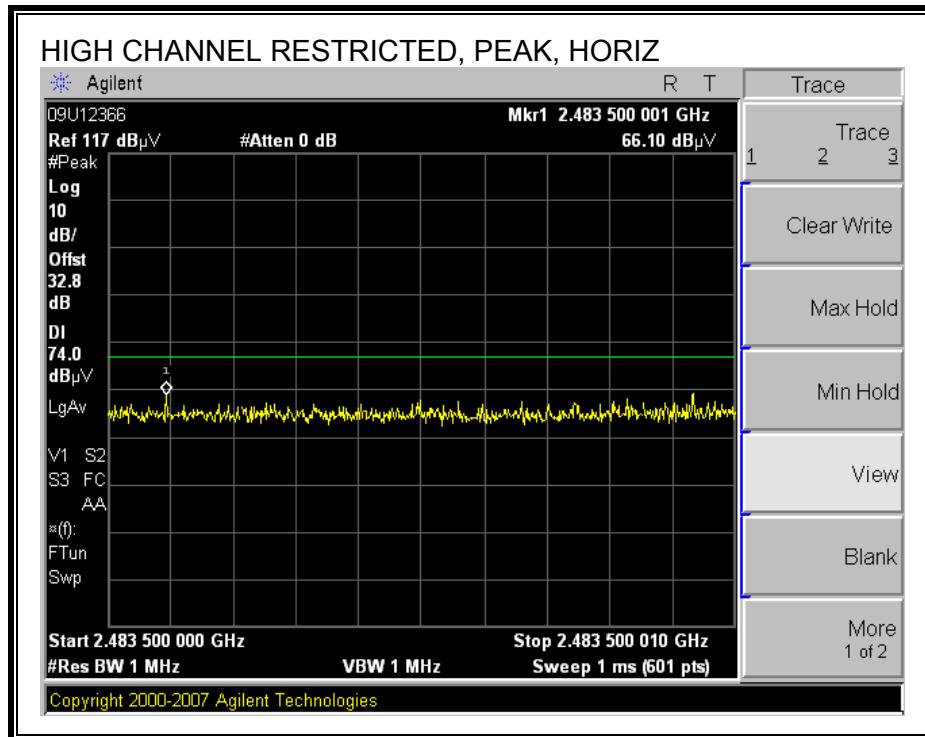


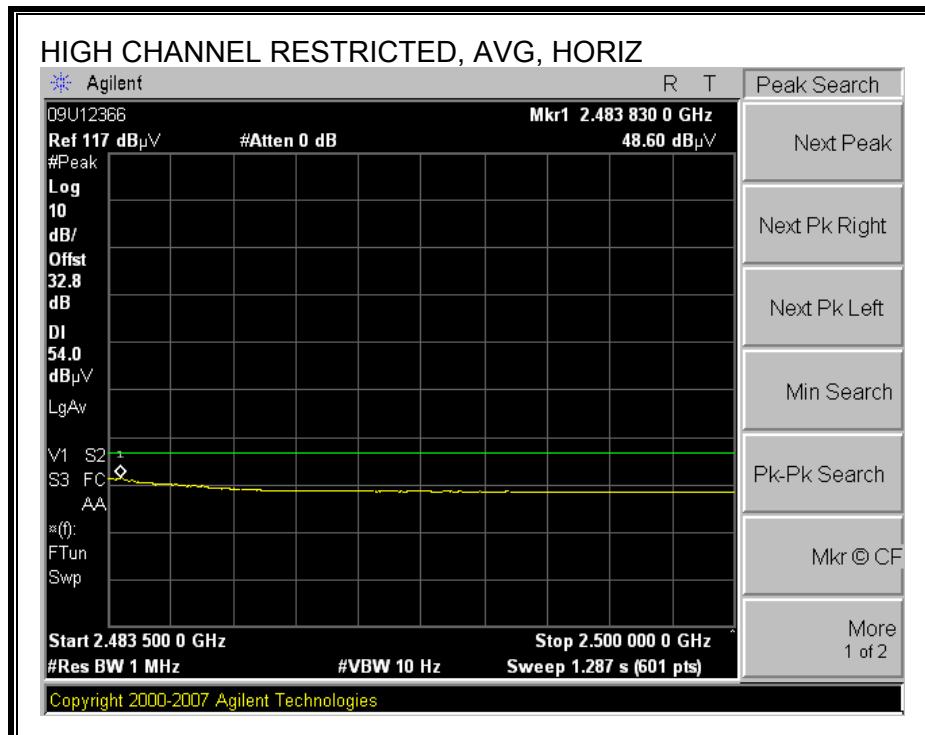
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



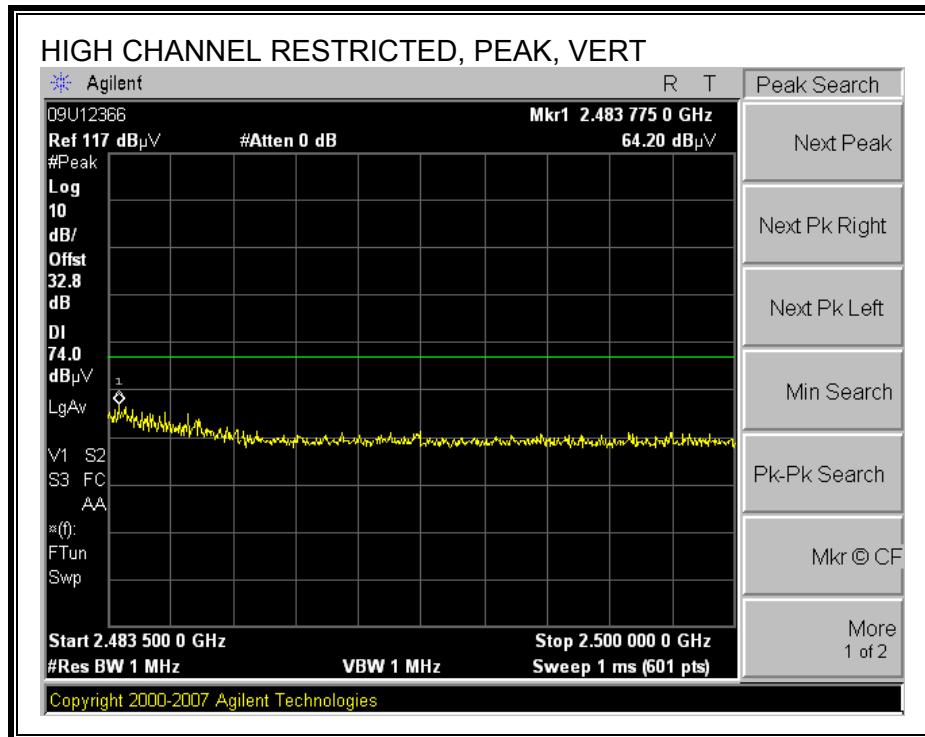


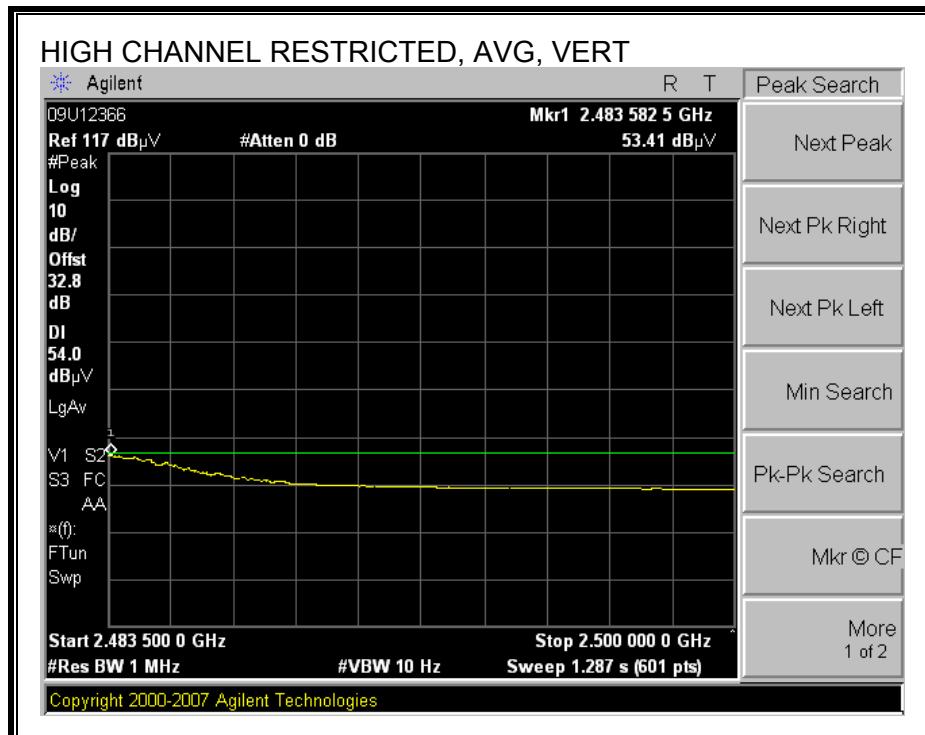
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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





## HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company:	Meraki Inc.														
Project #:	09U12366														
Date:	01/29/09														
Test Engineer:	Thanh Nguyen														
Configuration:	EUT with Dual Band Omni Directional Antenna														
Mode:	Transmit Worst case														
<u>Test Equipment:</u>															
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit			
T73; S/N: 6717 @3m	T34 HP 8449B								T125; ARA 18-26GHz; S/N:1007			FCC 15.209			
Hi Frequency Cables															
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements
3' cable 22807700	12' cable 22807600		20' cable 22807500								R_001			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)
<u>Low channel</u>															
4.824	3.0	41.5	28.3	33.7	5.8	-34.8	0.0	0.0	46.2	33.0	74	54	-27.8	-21.0	V
7.236	3.0	41.2	28.7	36.2	7.2	-34.1	0.0	0.0	50.5	37.9	74	54	-23.5	-16.1	Noise floor
4.824	3.0	40.6	28.0	33.7	5.8	-34.8	0.0	0.0	45.3	32.7	74	54	-28.7	-21.3	H
7.236	3.0	40.9	28.7	36.2	7.2	-34.1	0.0	0.0	50.2	37.9	74	54	-23.8	-16.1	Noise floor
<u>Mid channel</u>															
4.874	3.0	41.2	28.0	33.8	5.8	-34.8	0.0	0.0	46.1	32.8	74	54	-27.9	-21.2	V
7.311	3.0	41.8	28.7	36.2	7.3	-34.1	0.0	0.0	51.2	38.0	74	54	-22.8	-16.0	Noise floor
4.874	3.0	39.7	28.0	33.8	5.8	-34.8	0.0	0.0	44.5	32.8	74	54	-29.5	-21.2	H
7.311	3.0	40.2	28.6	36.2	7.3	-34.1	0.0	0.0	49.6	37.9	74	54	-24.4	-16.1	Noise floor
<u>High channel</u>															
4.924	3.0	40.6	28.6	33.9	5.9	-34.8	0.0	0.0	45.5	33.5	74	54	-28.5	-20.5	V
7.386	3.0	41.3	28.1	36.3	7.3	-34.1	0.0	0.0	50.8	37.6	74	54	-23.2	-16.4	Noise floor
4.924	3.0	40.3	28.0	33.9	5.9	-34.8	0.0	0.0	45.2	33.0	74	54	-28.8	-21.0	H
7.386	3.0	41.9	28.6	36.3	7.3	-34.1	0.0	0.0	51.4	38.1	74	54	-22.6	-15.9	Noise floor
No other emissions were detected above noise floor.															
Rev. 10.15.08															
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											

### 7.2.3. TX ABOVE 1 GHz FOR 802.11a IN THE 5.8GHz BAND MODE 100

#### HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																																																																																																																																																																																																																																																																																																																																												
<p>Company: Meraki Inc. Project #: 09U12366 Date: 01/30/09 Test Engineer: Thanh Nguyen Configuration: EUT with Dual-Band Omni-Directional Antenna Mode: Transmit Worst case a mode A/r=14.5</p>																																																																																																																																																																																																																																																																																																																																												
<p><u>Test Equipment:</u></p> <table border="1"><tr><td>Horn 1-18GHz</td><td>Pre-amplifier 1-26GHz</td><td>Pre-amplifier 26-40GHz</td><td colspan="4">Horn &gt; 18GHz</td><td>Limit</td></tr><tr><td>T73; S/N: 6717 @3m</td><td>T34 HP 8449B</td><td></td><td colspan="4">T125; ARA 18-26GHz; S/N:1007</td><td>FCC 15.209</td></tr><tr><td colspan="16">Hi Frequency Cables</td></tr><tr><td>3' cable 22807700</td><td>12' cable 22807600</td><td>20' cable 22807500</td><td colspan="4">HPF</td><td>Reject Filter</td><td colspan="8">Peak Measurements RBW=VBW=1MHz</td></tr><tr><td>3' cable 22807700</td><td>12' cable 22807600</td><td>20' cable 22807500</td><td colspan="4"></td><td></td><td>R_001</td><td colspan="8">Average Measurements RBW=1MHz, VBW=10Hz</td></tr><tr><th>f GHz</th><th>Dist (m)</th><th>Read Pk dBuV</th><th>Read Avg. dBuV</th><th>AF dB/m</th><th>CL dB</th><th>Amp dB</th><th>D Corr dB</th><th>Fltr dB</th><th>Peak dBuV/m</th><th>Avg dBuV/m</th><th>Pk Lim dBuV/m</th><th>Avg Lim dBuV/m</th><th>Pk Mar dB</th><th>Avg Mar dB</th><th>Notes (V/H)</th></tr><tr><td colspan="16"><b>LOW CHANNEL, 5745 MHz</b></td></tr><tr><td>11.490</td><td>3.0</td><td>41.1</td><td>27.7</td><td>38.6</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.7</td><td>43.3</td><td>74</td><td>54</td><td>-17.3</td><td>-10.7</td><td>V, Noise Floor</td></tr><tr><td>11.490</td><td>3.0</td><td>40.6</td><td>27.7</td><td>38.6</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.2</td><td>43.2</td><td>74</td><td>54</td><td>-17.8</td><td>-10.8</td><td>H, Noise floor</td></tr><tr><td colspan="16"><b>MID CHANNEL, 5785 MHz</b></td></tr><tr><td>11.570</td><td>3.0</td><td>40.3</td><td>27.9</td><td>38.7</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>55.9</td><td>43.6</td><td>74</td><td>54</td><td>-18.1</td><td>-10.4</td><td>V, Noise Floor</td></tr><tr><td>11.570</td><td>3.0</td><td>40.8</td><td>28.0</td><td>38.7</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.5</td><td>43.6</td><td>74</td><td>54</td><td>-17.5</td><td>-10.4</td><td>H, Noise floor</td></tr><tr><td colspan="16"><b>HI CHANNEL, 5825 MHz</b></td></tr><tr><td>11.650</td><td>3.0</td><td>40.7</td><td>28.4</td><td>38.7</td><td>9.6</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.4</td><td>44.1</td><td>74</td><td>54</td><td>-17.6</td><td>-9.9</td><td>V, Noise Floor</td></tr><tr><td>11.650</td><td>3.0</td><td>41.1</td><td>28.3</td><td>38.7</td><td>9.6</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.9</td><td>44.1</td><td>74</td><td>54</td><td>-17.1</td><td>-9.9</td><td>H, Noise floor</td></tr><tr><td colspan="16">No other emissions were detected above noise floor.</td></tr><tr><td colspan="16">Rev. 10.15.08</td></tr><tr><td colspan="4">f Measurement Frequency</td><td colspan="4">Amp Preamp Gain</td><td colspan="4">Avg Lim Average Field Strength Limit</td></tr><tr><td colspan="4">Dist Distance to Antenna</td><td colspan="4">D Corr Distance Correct to 3 meters</td><td colspan="4">Pk Lim Peak Field Strength Limit</td></tr><tr><td colspan="4">Read Analyzer Reading</td><td colspan="4">Avg Average Field Strength @ 3 m</td><td colspan="4">Avg Mar Margin vs. Average Limit</td></tr><tr><td colspan="4">AF Antenna Factor</td><td colspan="4">Peak Calculated Peak Field Strength</td><td colspan="4">Pk Mar Margin vs. Peak Limit</td></tr><tr><td colspan="4">CL Cable Loss</td><td colspan="4">HPF High Pass Filter</td><td colspan="4"></td></tr></table>																Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz				Limit	T73; S/N: 6717 @3m	T34 HP 8449B		T125; ARA 18-26GHz; S/N:1007				FCC 15.209	Hi Frequency Cables																3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF				Reject Filter	Peak Measurements RBW=VBW=1MHz								3' cable 22807700	12' cable 22807600	20' cable 22807500						R_001	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)	<b>LOW CHANNEL, 5745 MHz</b>																11.490	3.0	41.1	27.7	38.6	9.5	-32.5	0.0	0.0	56.7	43.3	74	54	-17.3	-10.7	V, Noise Floor	11.490	3.0	40.6	27.7	38.6	9.5	-32.5	0.0	0.0	56.2	43.2	74	54	-17.8	-10.8	H, Noise floor	<b>MID CHANNEL, 5785 MHz</b>																11.570	3.0	40.3	27.9	38.7	9.5	-32.5	0.0	0.0	55.9	43.6	74	54	-18.1	-10.4	V, Noise Floor	11.570	3.0	40.8	28.0	38.7	9.5	-32.5	0.0	0.0	56.5	43.6	74	54	-17.5	-10.4	H, Noise floor	<b>HI CHANNEL, 5825 MHz</b>																11.650	3.0	40.7	28.4	38.7	9.6	-32.5	0.0	0.0	56.4	44.1	74	54	-17.6	-9.9	V, Noise Floor	11.650	3.0	41.1	28.3	38.7	9.6	-32.5	0.0	0.0	56.9	44.1	74	54	-17.1	-9.9	H, Noise floor	No other emissions were detected above noise floor.																Rev. 10.15.08																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							
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CL Cable Loss				HPF High Pass Filter																																																																																																																																																																																																																																																																																																																																								

### 7.2.4. TX BELOW 1 GHz (WORST-CASE CONFIGURATION)

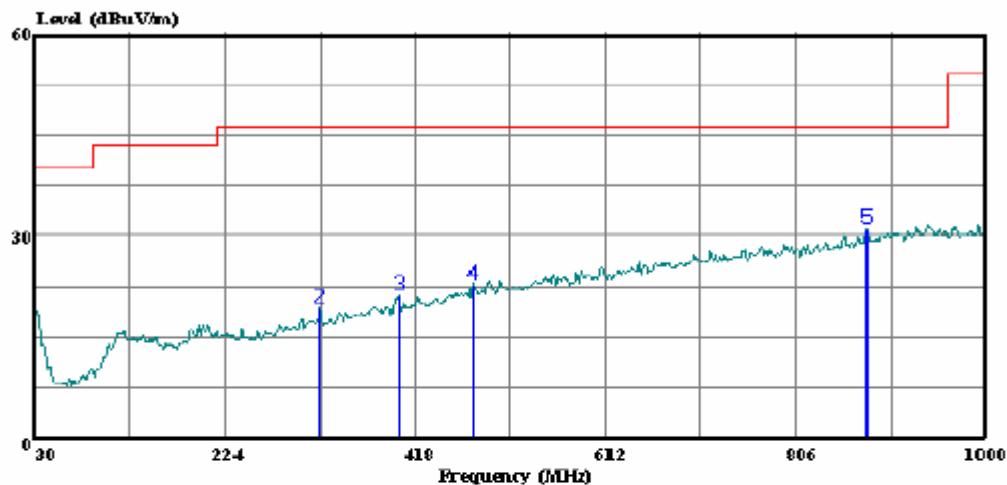
#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

##### HORIZONTAL PLOT& DATA



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 31 File#: 09U12366.EMI Date: 02-02-2009 Time: 16:28:36



(Fremont)

Ref Trace:

Condition: FCC CLASS-B 3m HORIZONTAL  
Test Operator:: Thanh Nguyen  
Project #: : 09U12336  
Company: : Meraki Inc.  
Model: : MR58  
Configuration:: BUT, Laptop, Antenna  
Mode : : BUT Power up with DC PWR Supply  
Target: : FCC Class B  
: BUT w/2452-57-ON Ant  
: DC Power on

Page: 1

Freq	Read Level	Factor	Limit Level	Line	Over Limit	Remark
MHz	dBuV		dB	dBuV/m	dBuV/m	dB
1	30.000	27.97	-7.41	20.56	40.00	-19.44 Peak
2	320.030	29.85	-10.50	19.35	46.00	-26.65 Peak
3	400.540	29.42	-8.23	21.19	46.00	-24.81 Peak
4	476.200	28.49	-5.53	22.97	46.00	-23.03 Peak
5	877.780	28.47	2.43	30.90	46.00	-15.10 Peak

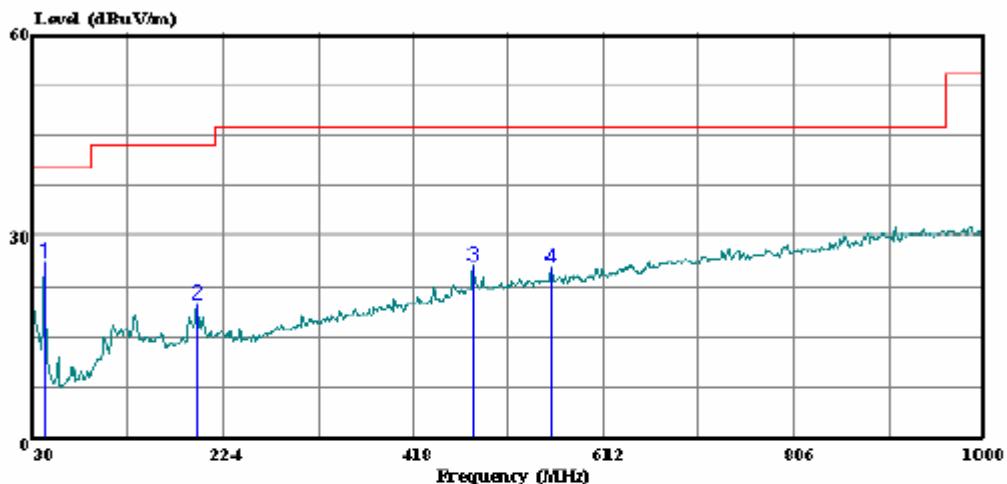
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**

**VERTICAL PLOT& DATA**



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 29 File#: 09U12366.EMI Date: 02-02-2009 Time: 16:25:02



(Fremont)  
Trace: 28

Ref Trace:

Condition: FCC CLASS-B 3m VERTICAL  
Test Operator:: Thanh Nguyen  
Project #: : 09U12336  
Company: : Meraki Inc.  
Model: : MR58  
Configuration:: EUT, Laptop, Antenna  
Mode : : EUT Power up with DC PWR Supply  
Target: : FCC Class B  
: EUT w/2452-57-ON Ant  
: DC Power on

Page: 1

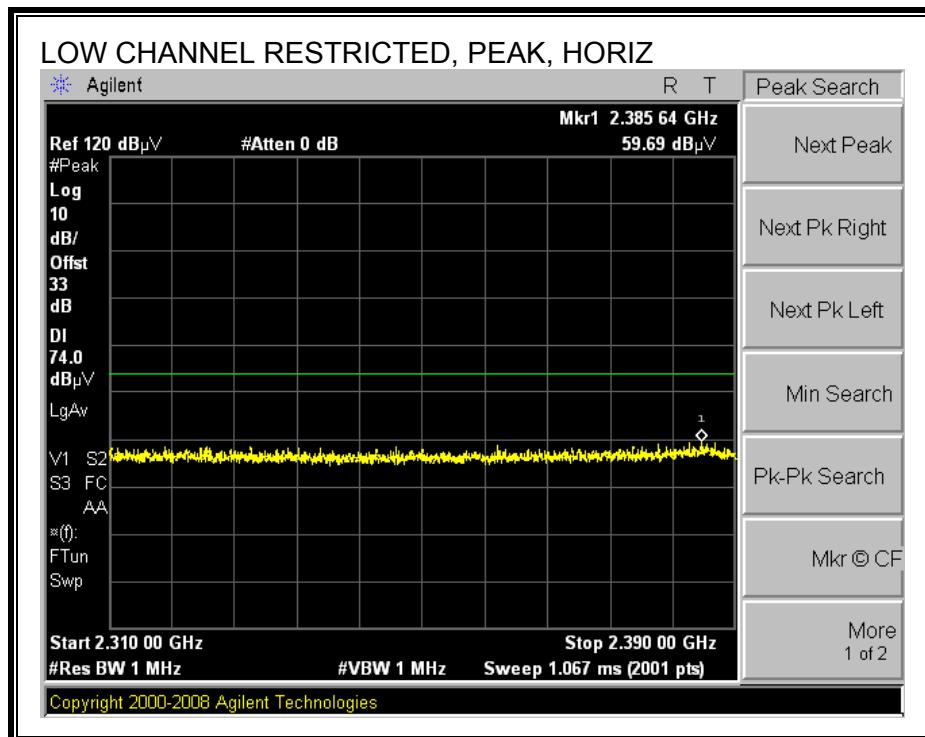
Freq MHz	Read Level dBuV	Factor	Limit Level dB	Over Line dBuV/m	Over Limit dBuV/m	Over Remark	Page: 1
							dB dB dBuV/m dBuV/m dB
1 41.640	42.10	-15.74	26.36	40.00	-13.64	Peak	
2 196.840	32.75	-12.71	20.04	43.50	-23.46	Peak	
3 478.140	31.31	-5.48	25.83	46.00	-20.17	Peak	
4 557.680	29.11	-3.65	25.46	46.00	-20.54	Peak	

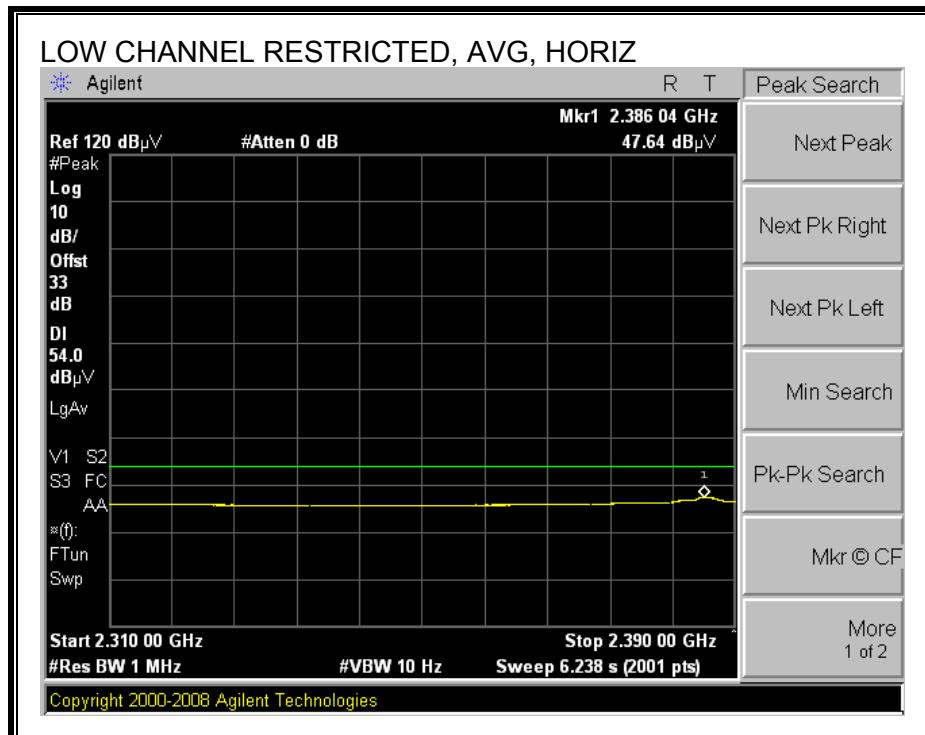
## 7.3. MONOPOLE OMNI 2.4GHZ ANTENNA

### 7.3.1. TX ABOVE 1 GHz FOR 802.11b DUAL CHAIN LEGACY MODE

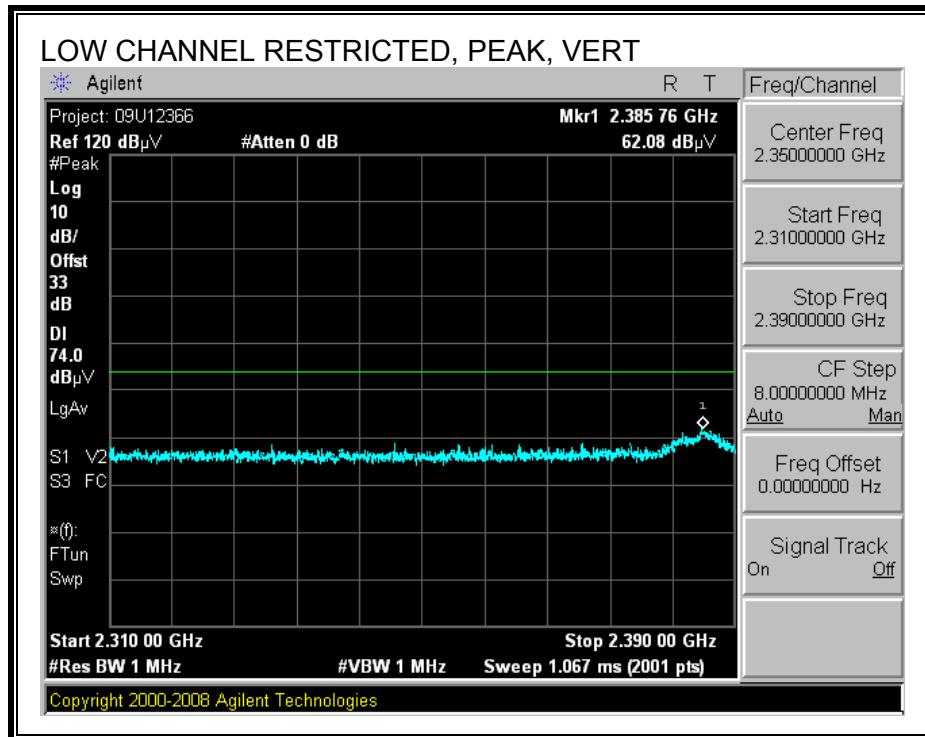
#### MODE 010:

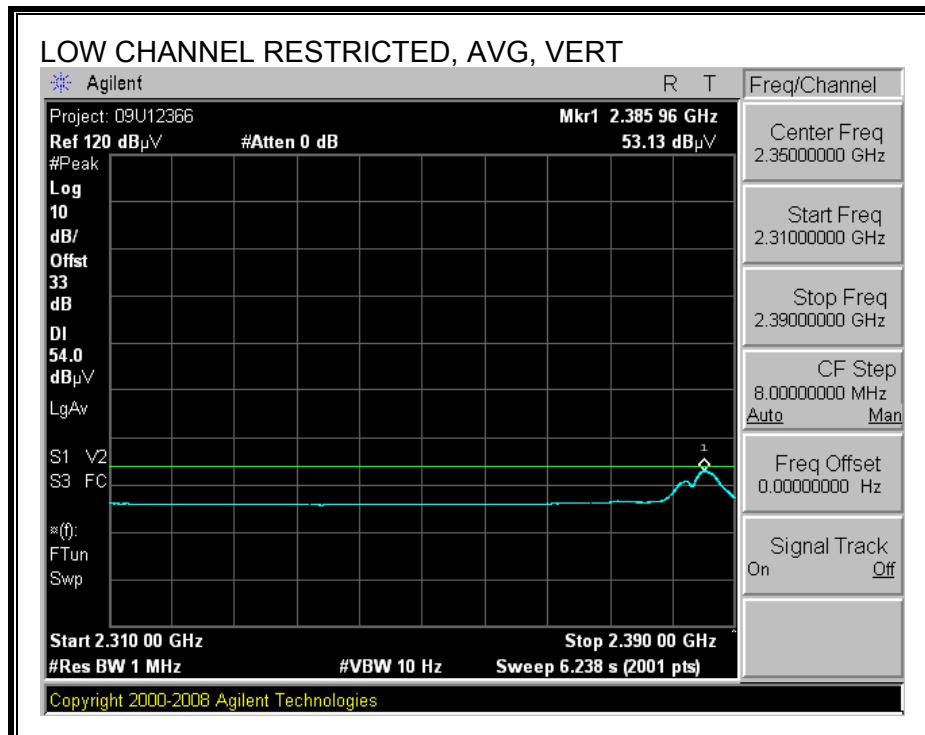
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



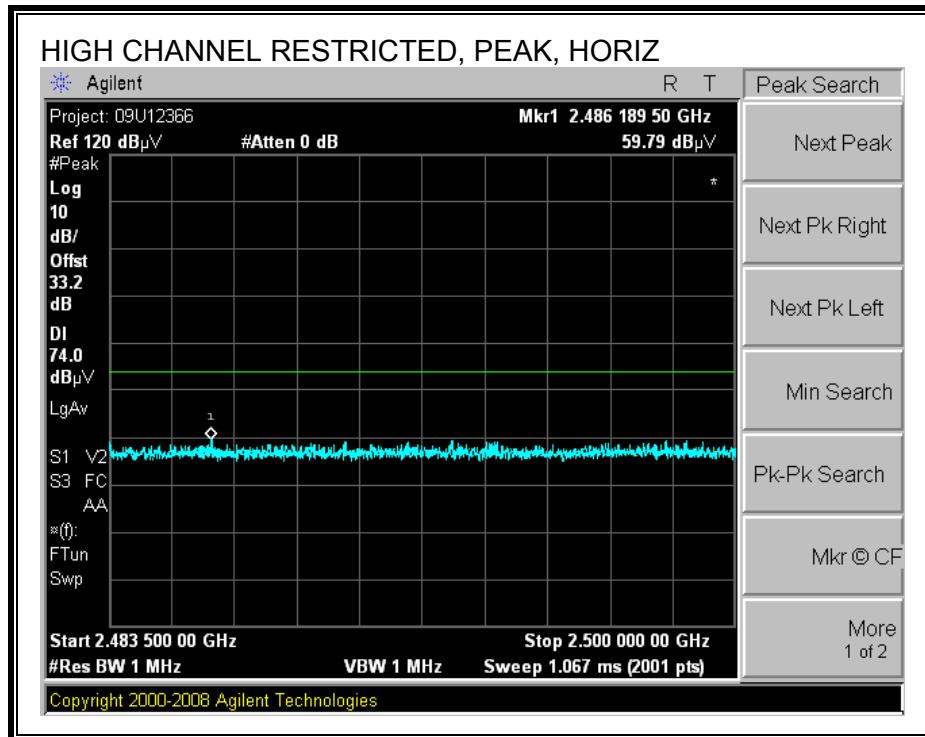


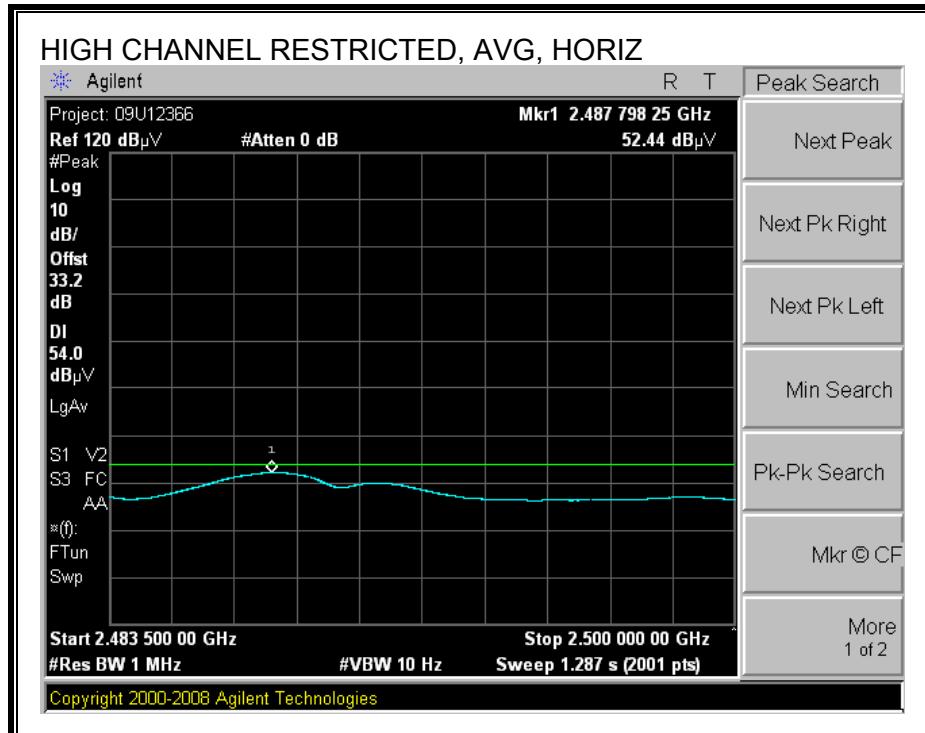
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



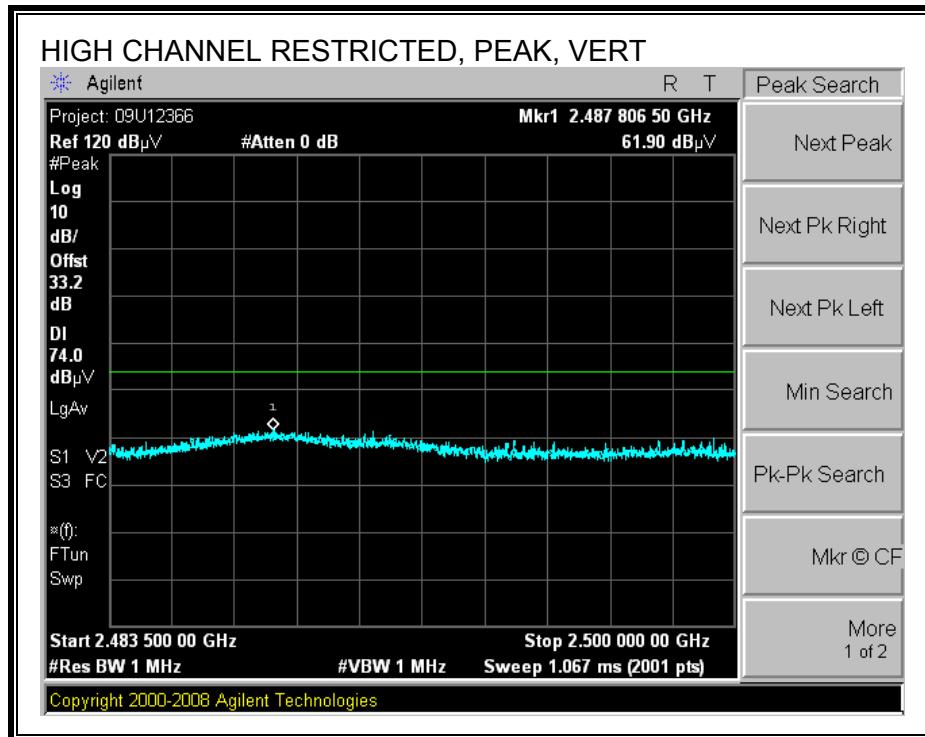


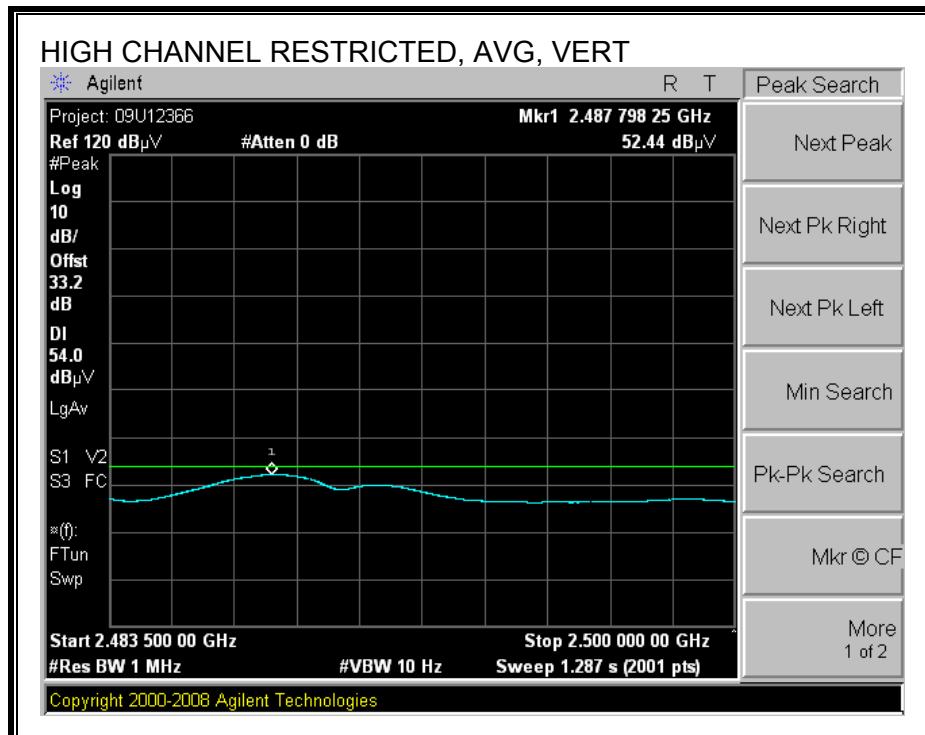
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





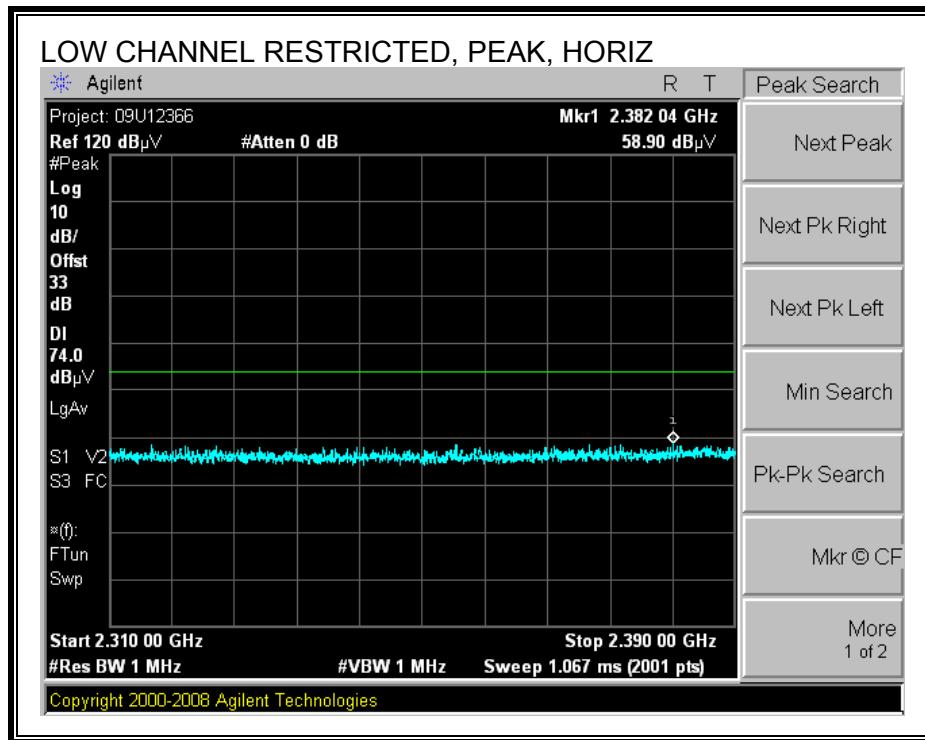
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

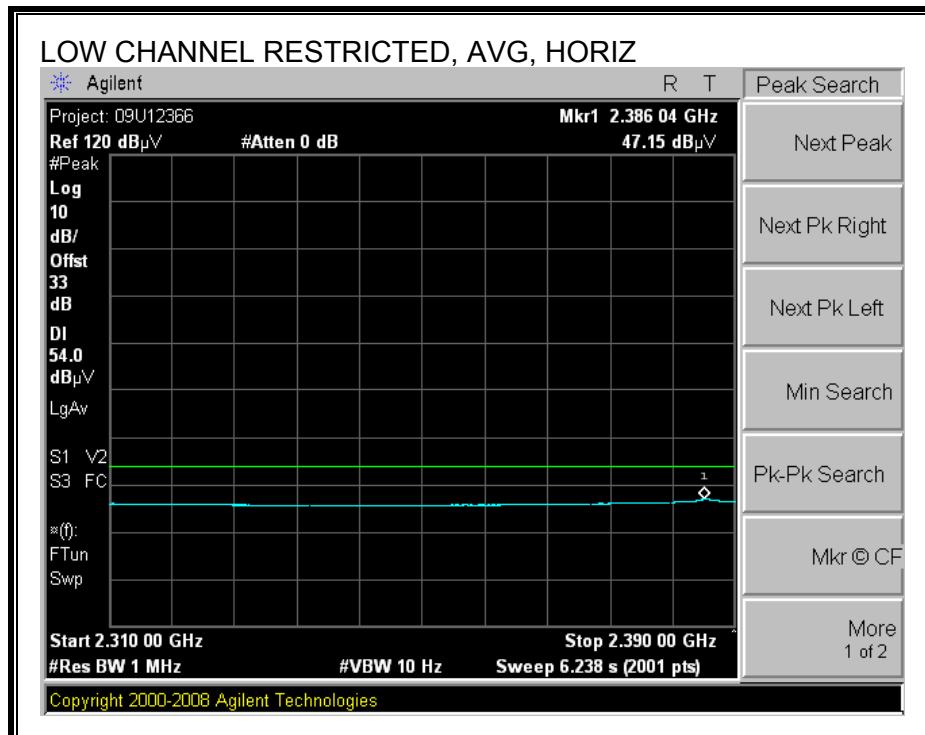




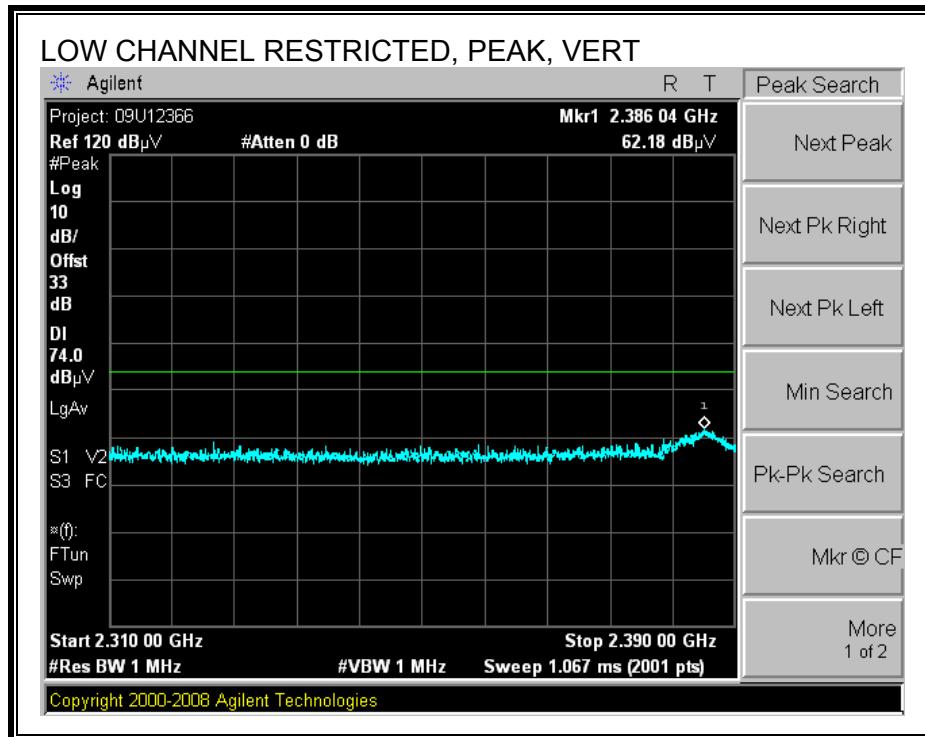
## **MODE 100**

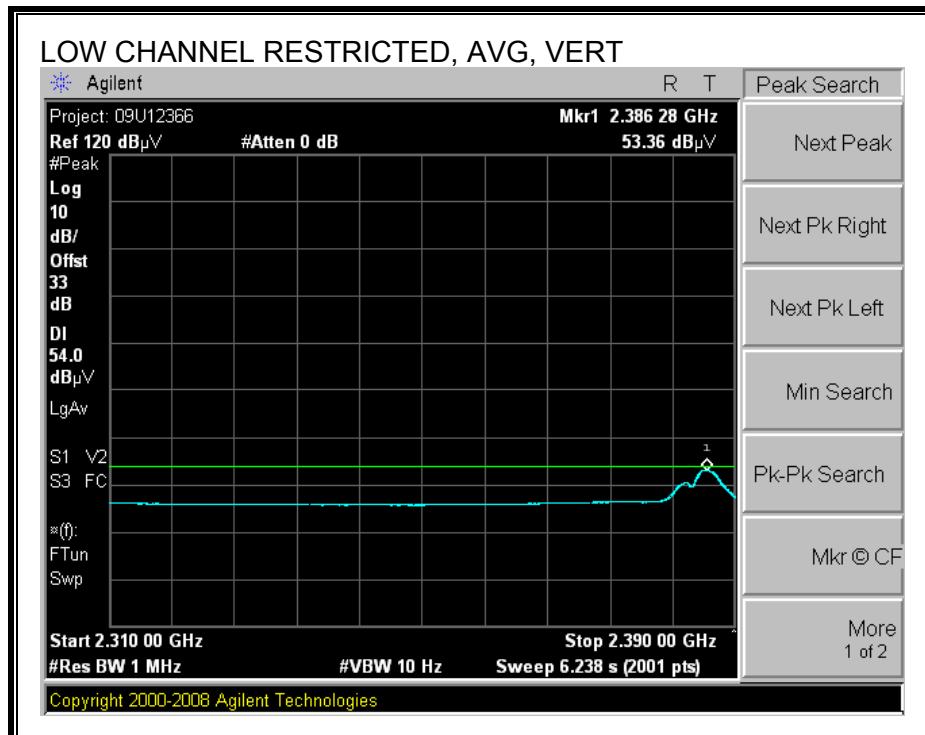
### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



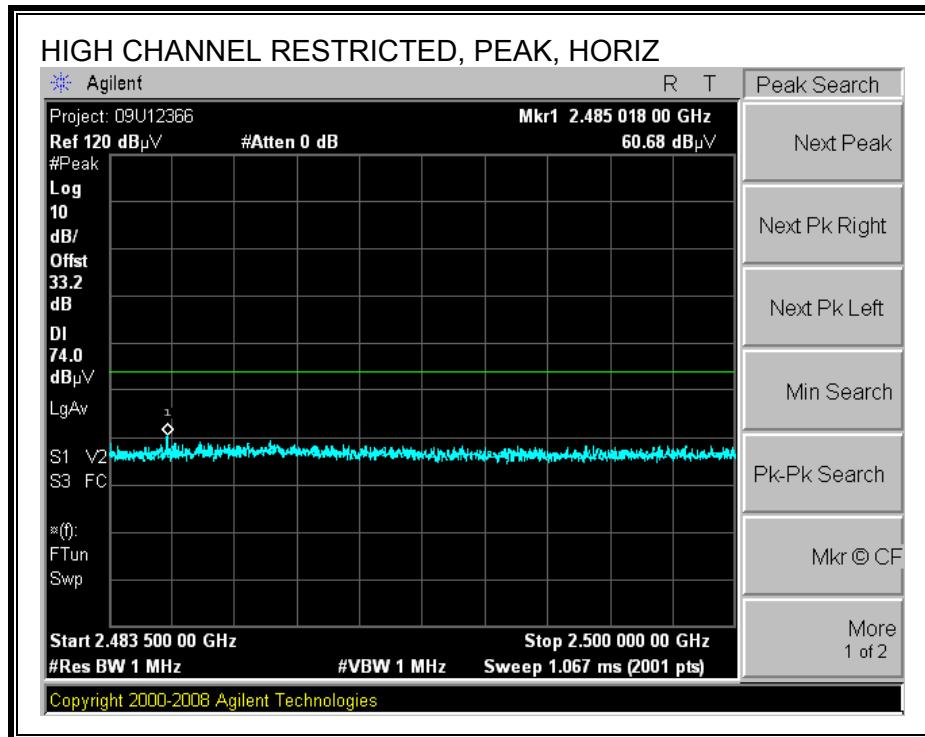


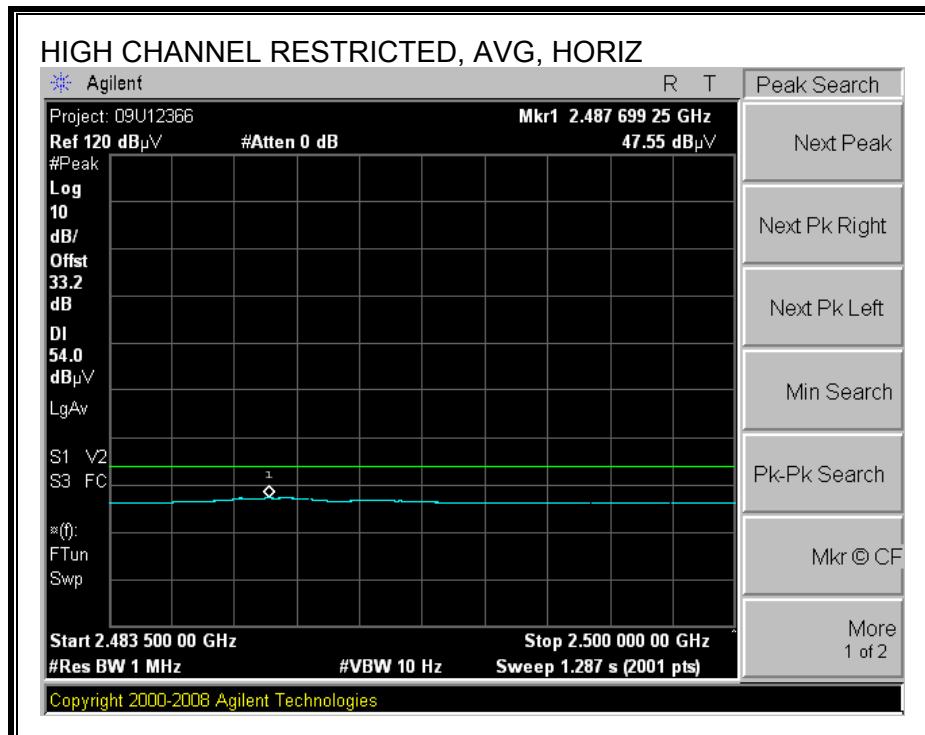
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



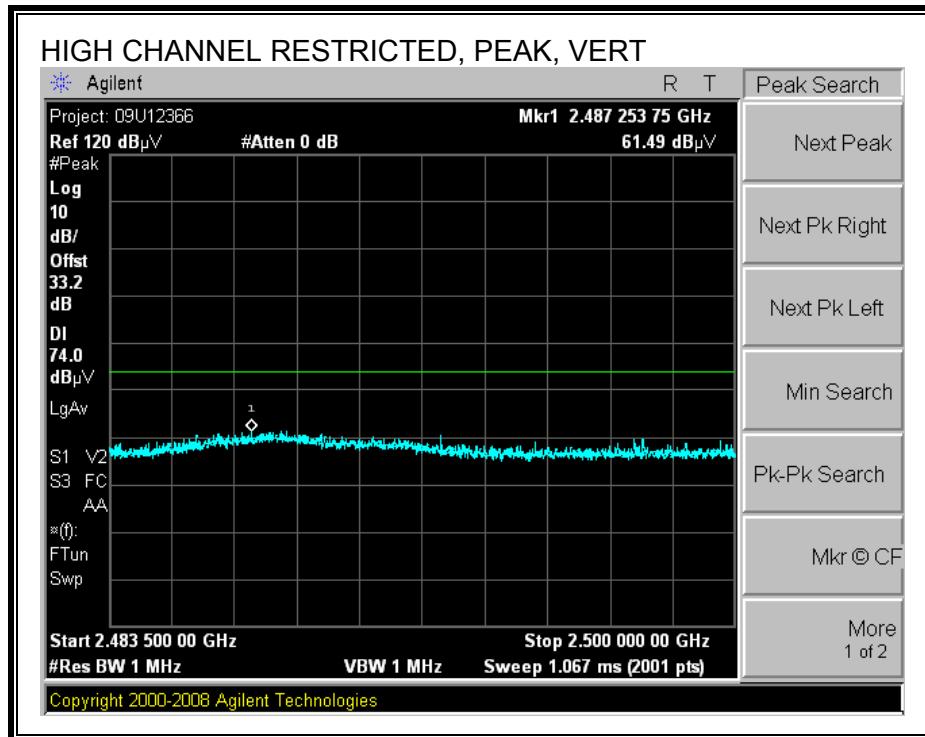


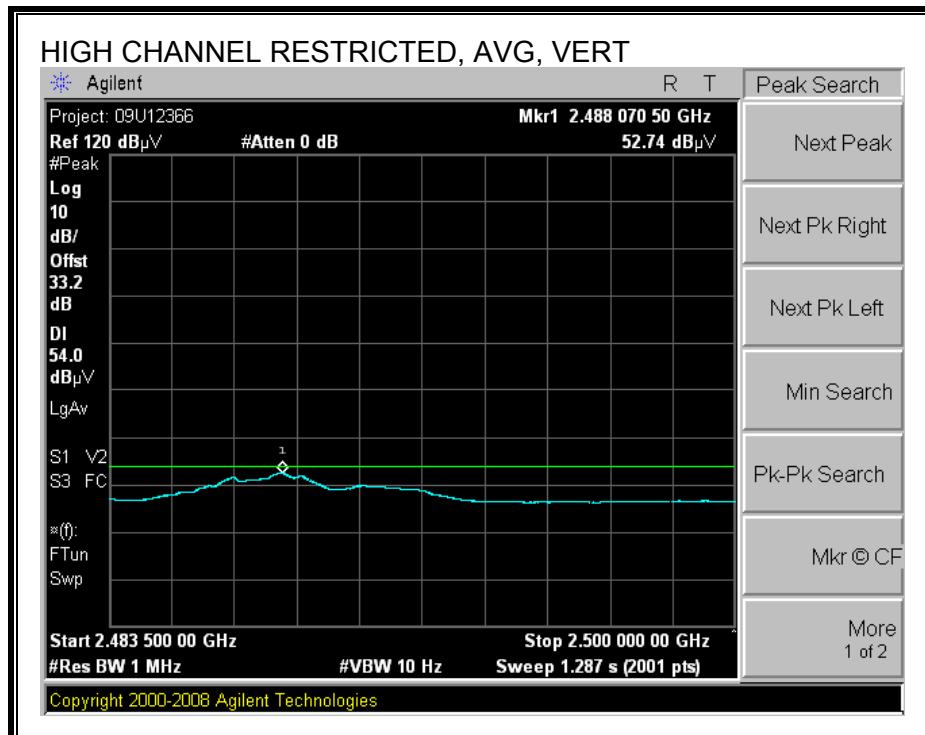
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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

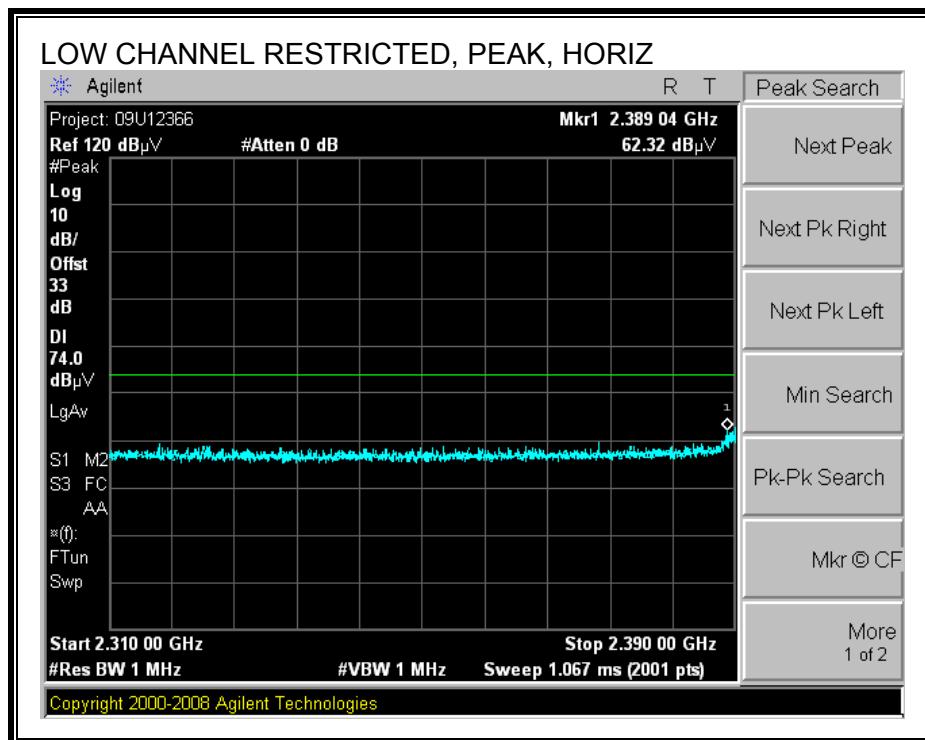


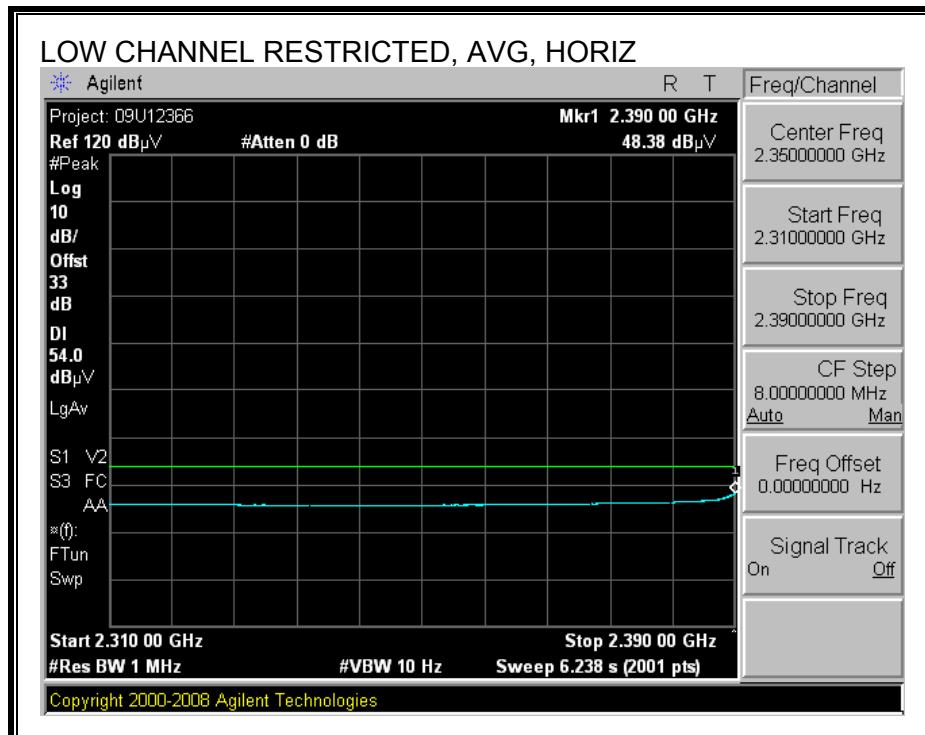


### 7.3.2. TX ABOVE 1 GHz FOR 802.11g DUAL CHAIN LEGACY MODE

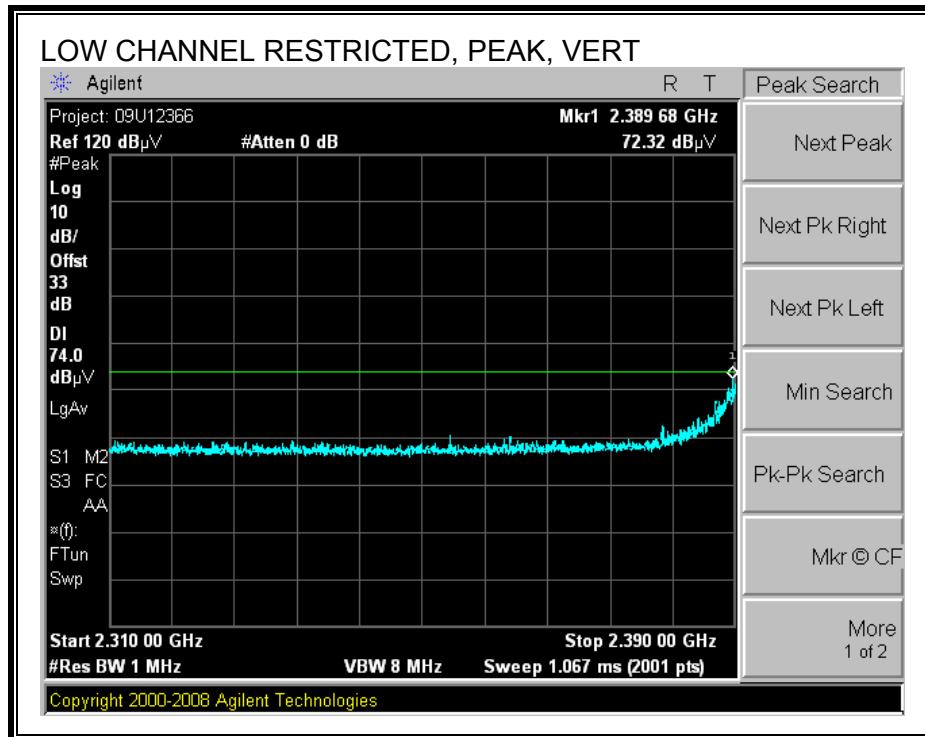
#### **MODE 010:**

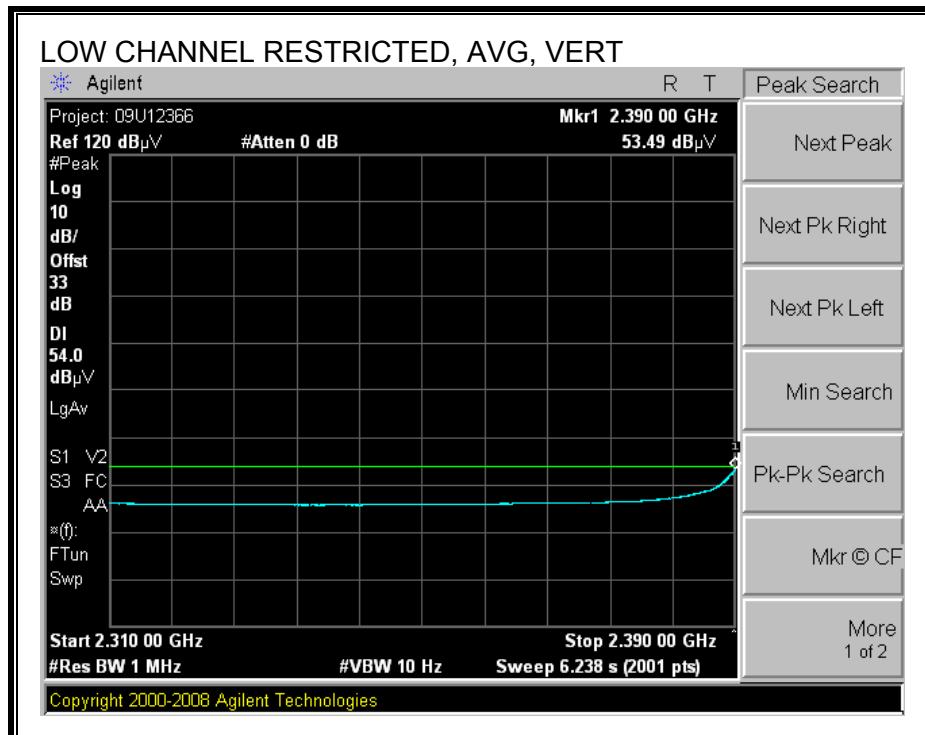
##### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



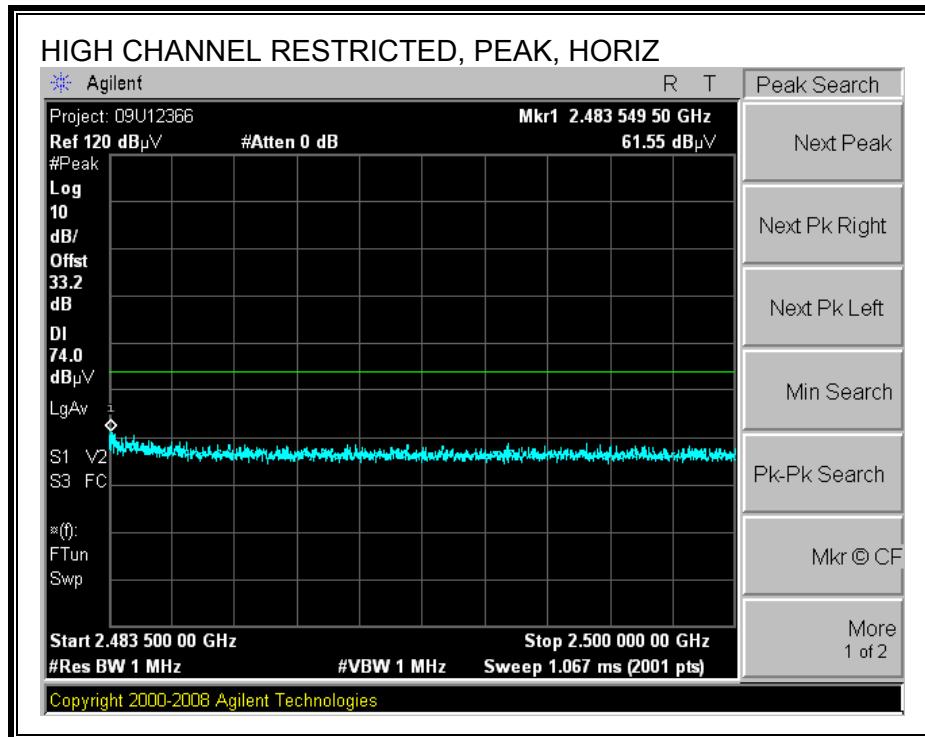


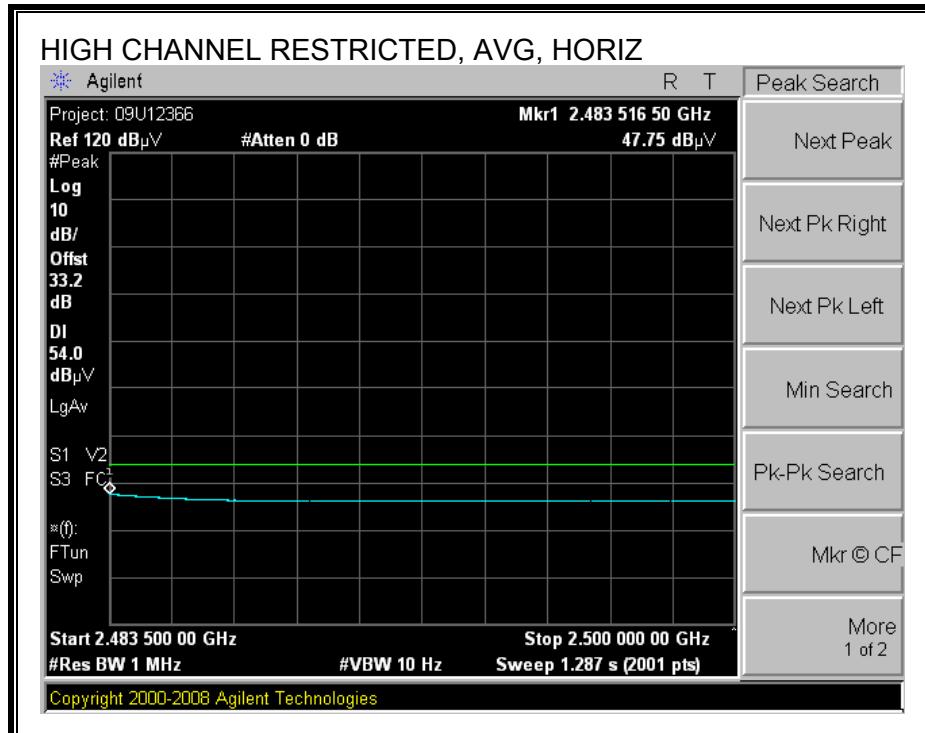
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



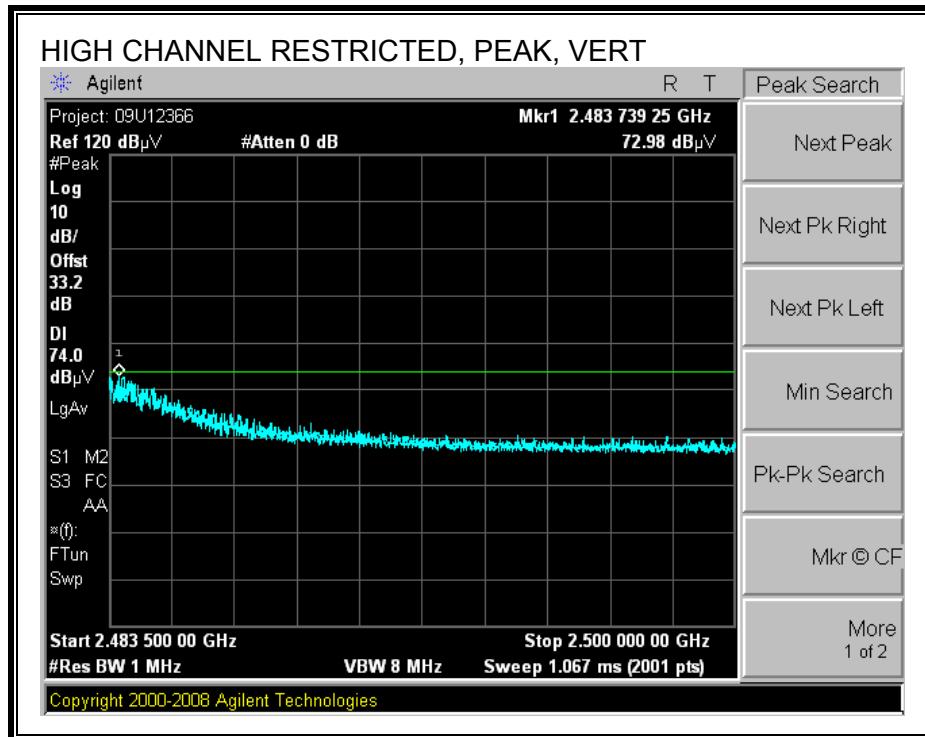


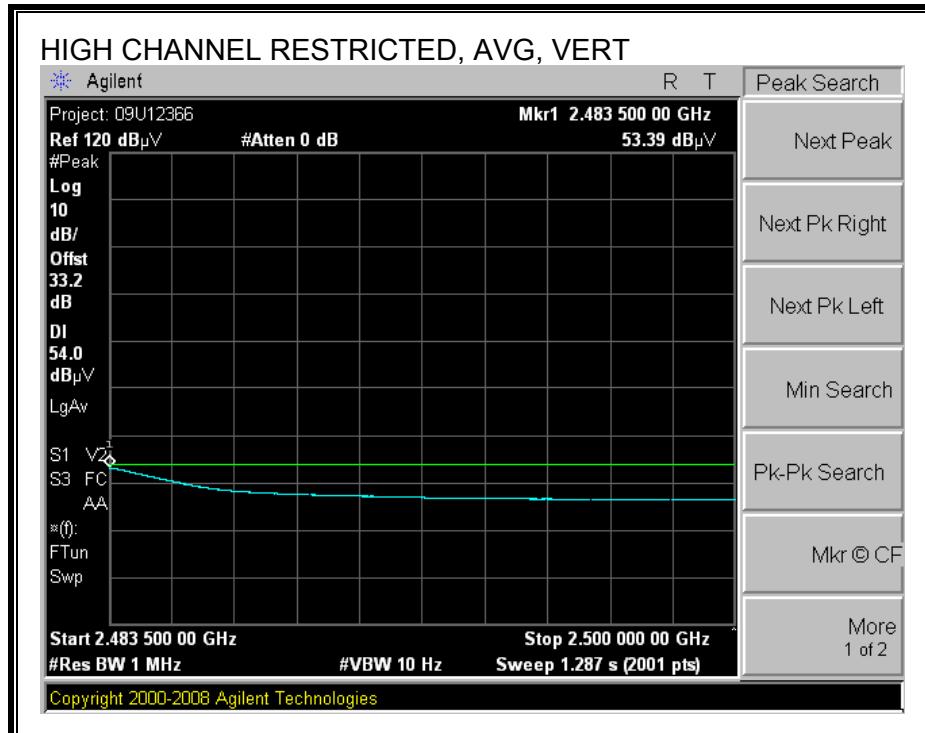
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





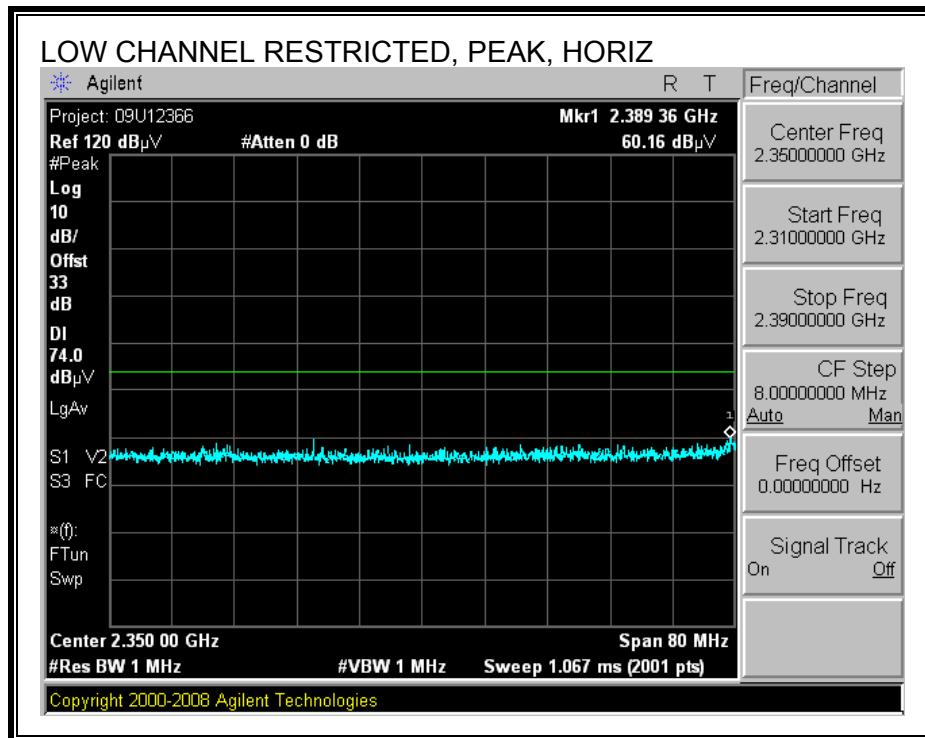
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

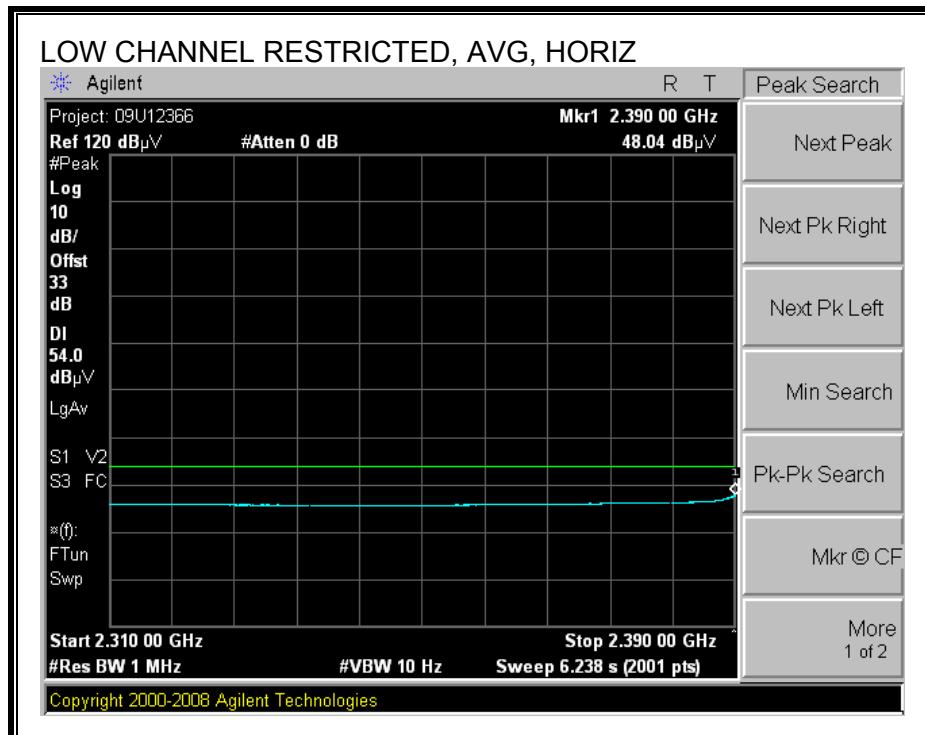




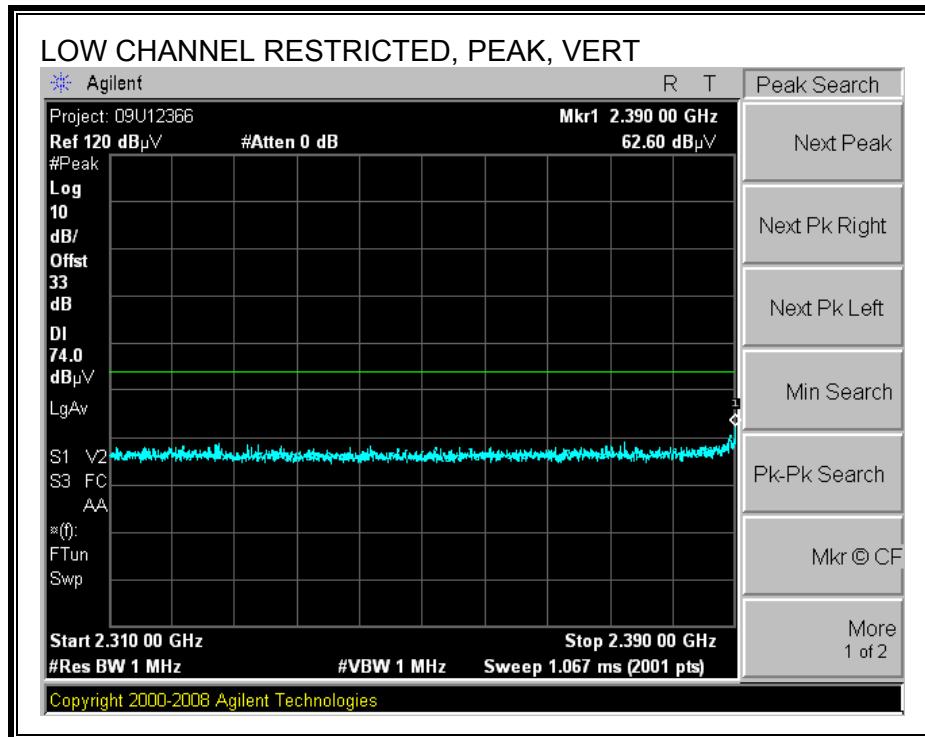
**MODE 100:**

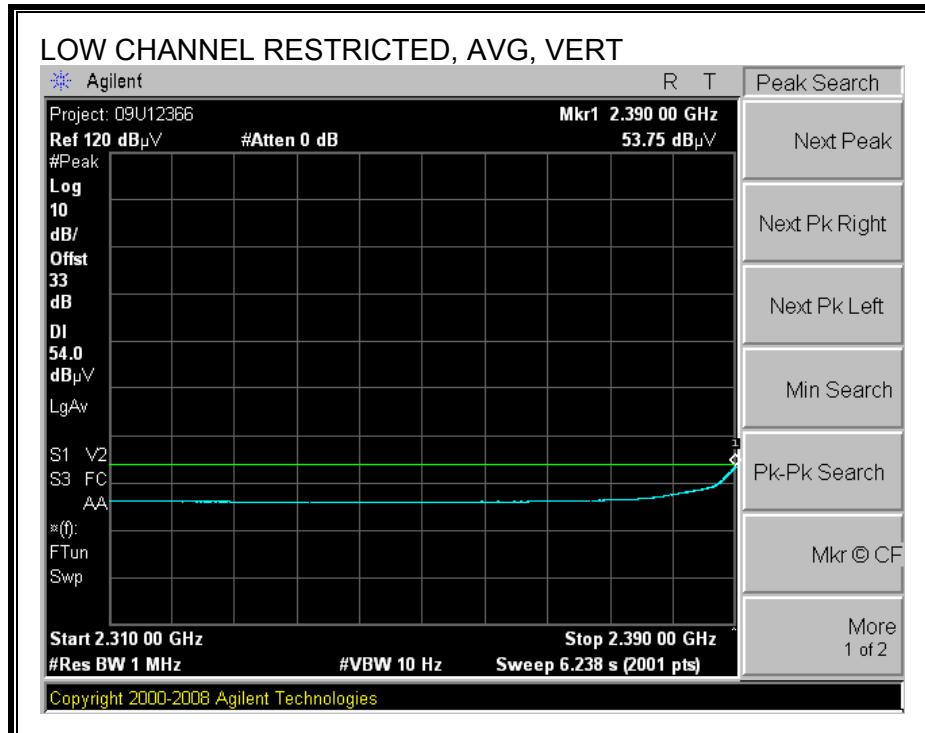
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



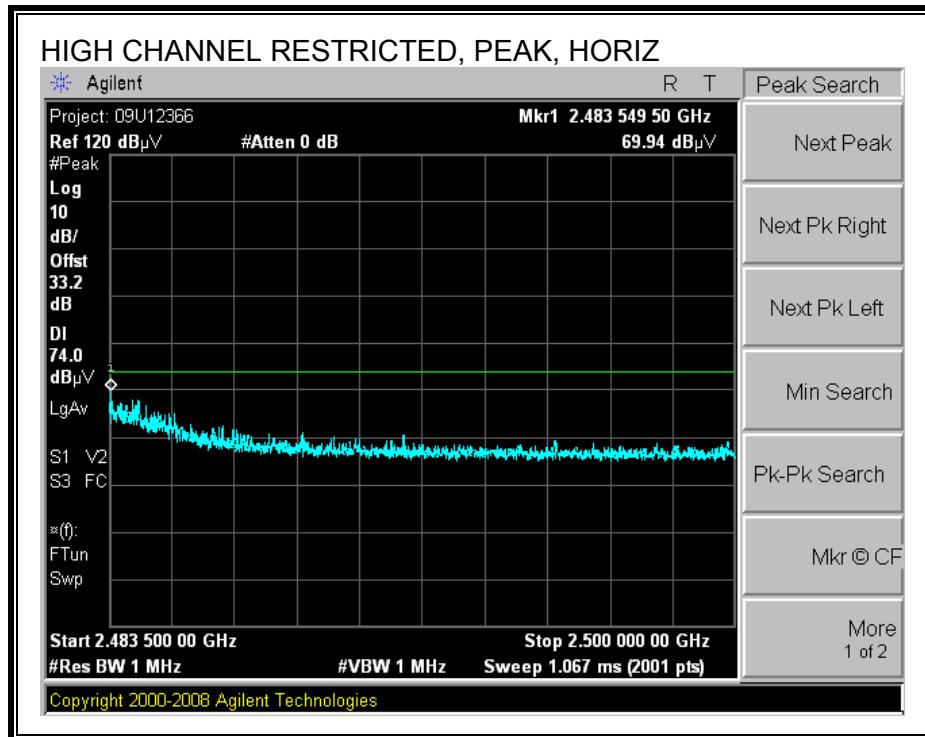


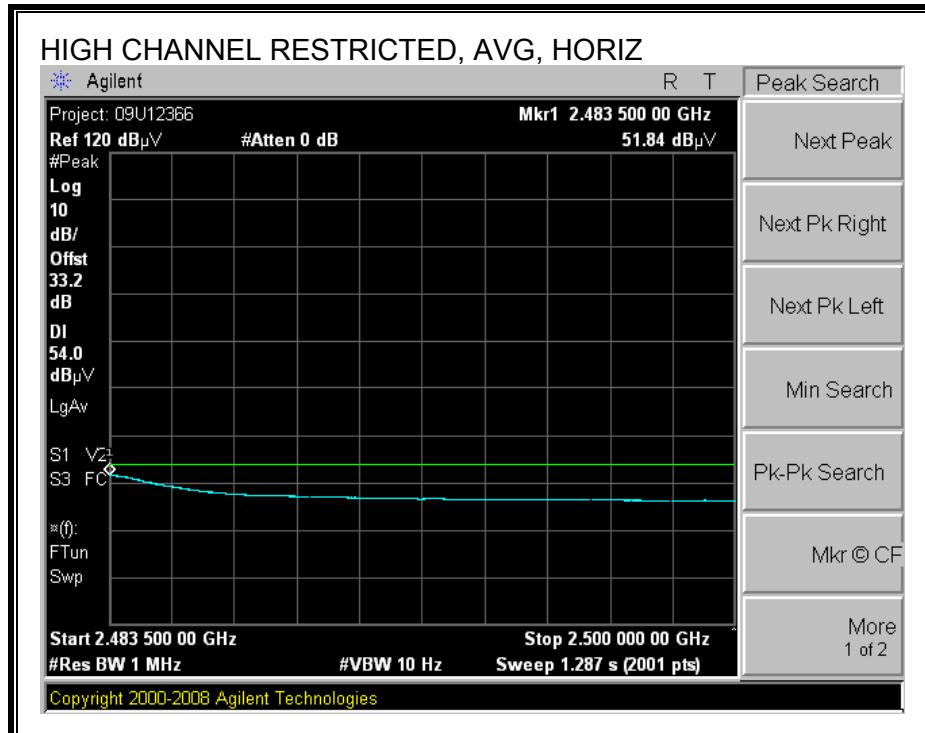
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



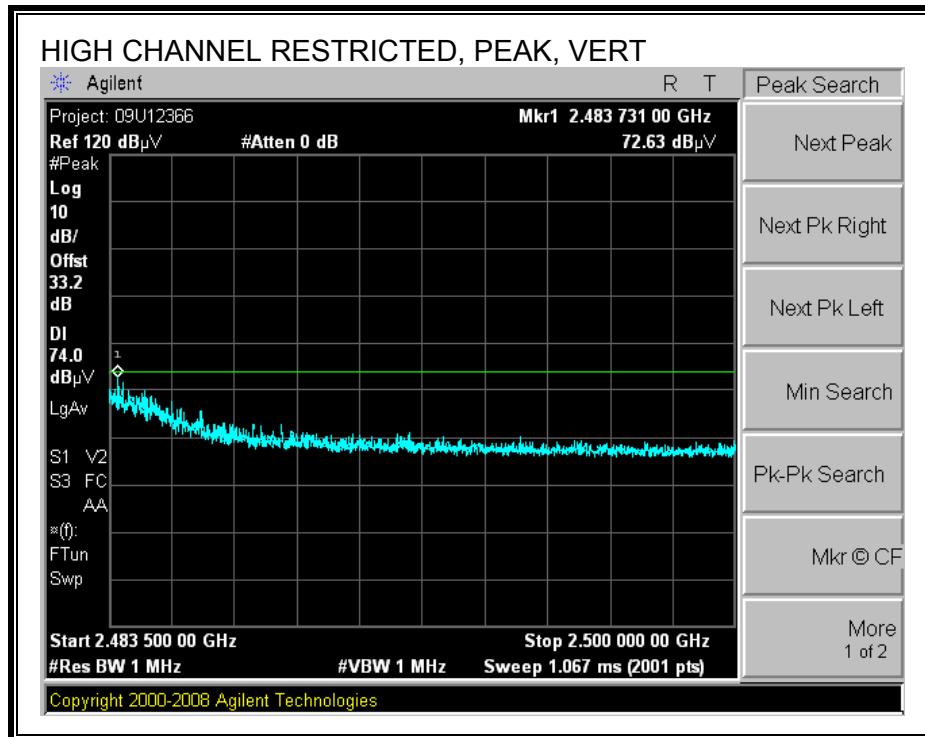


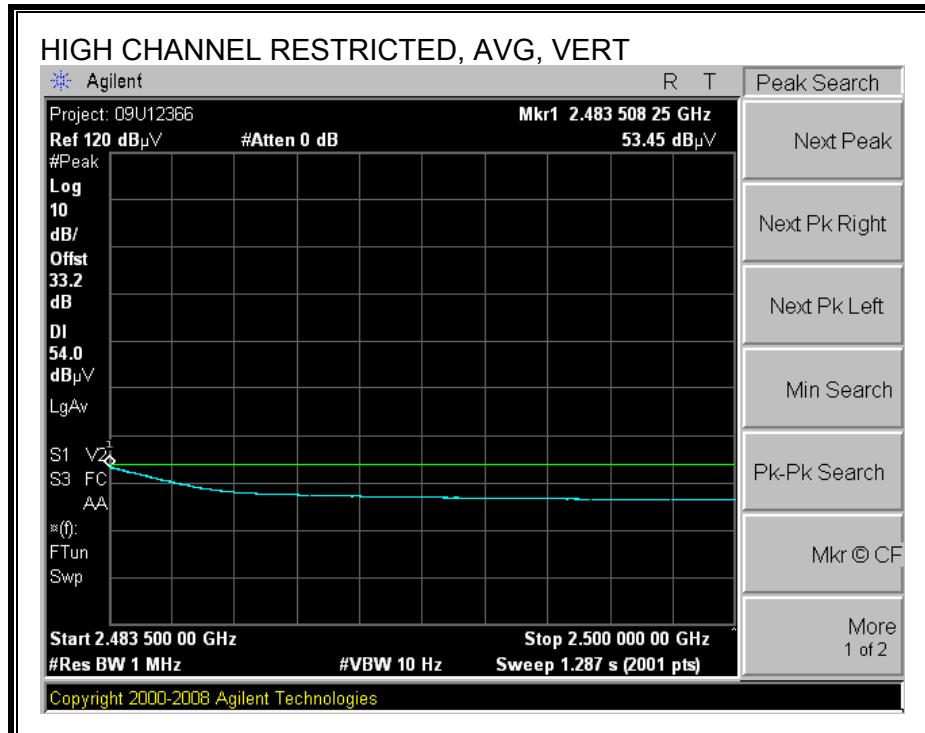
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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

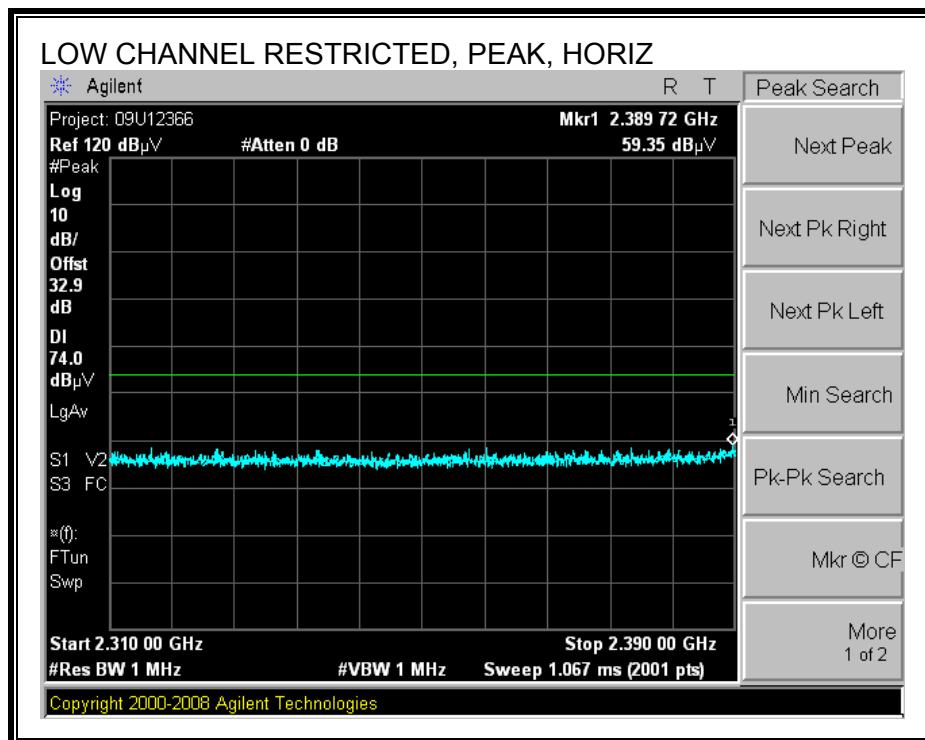


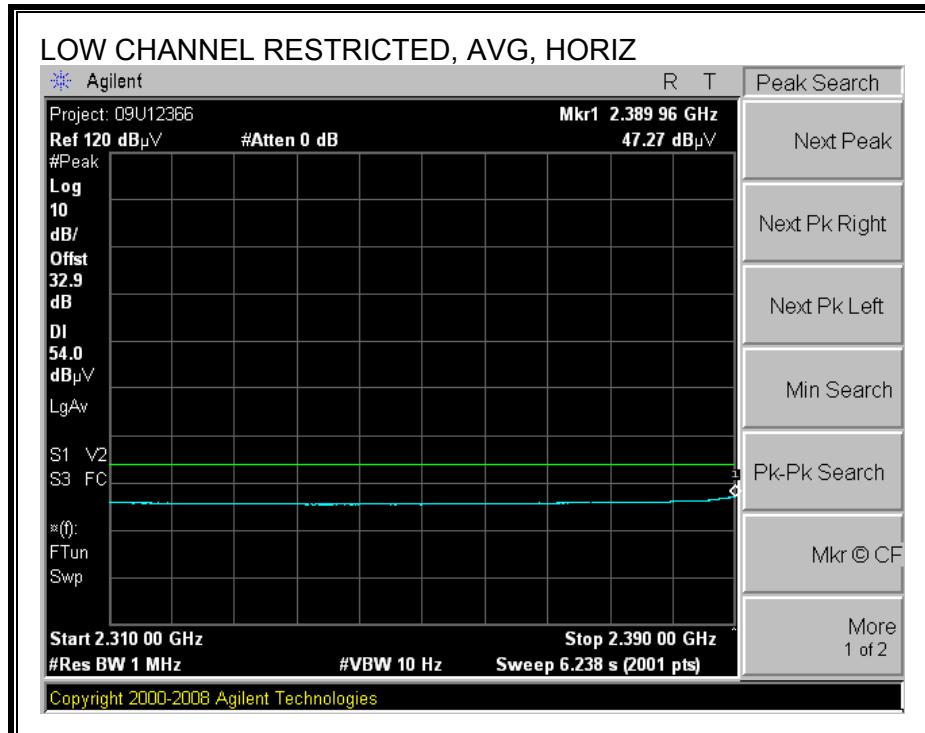


### 7.3.3. TX ABOVE 1 GHz FOR HT20 DUAL CHAIN LEGACY MODE

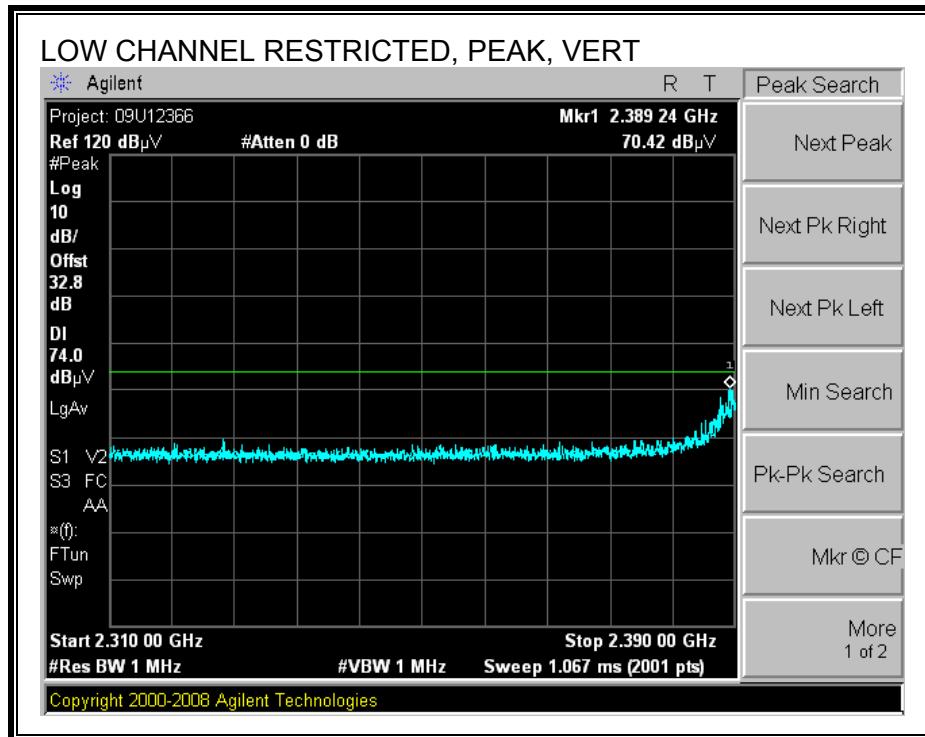
#### **MODE 010:**

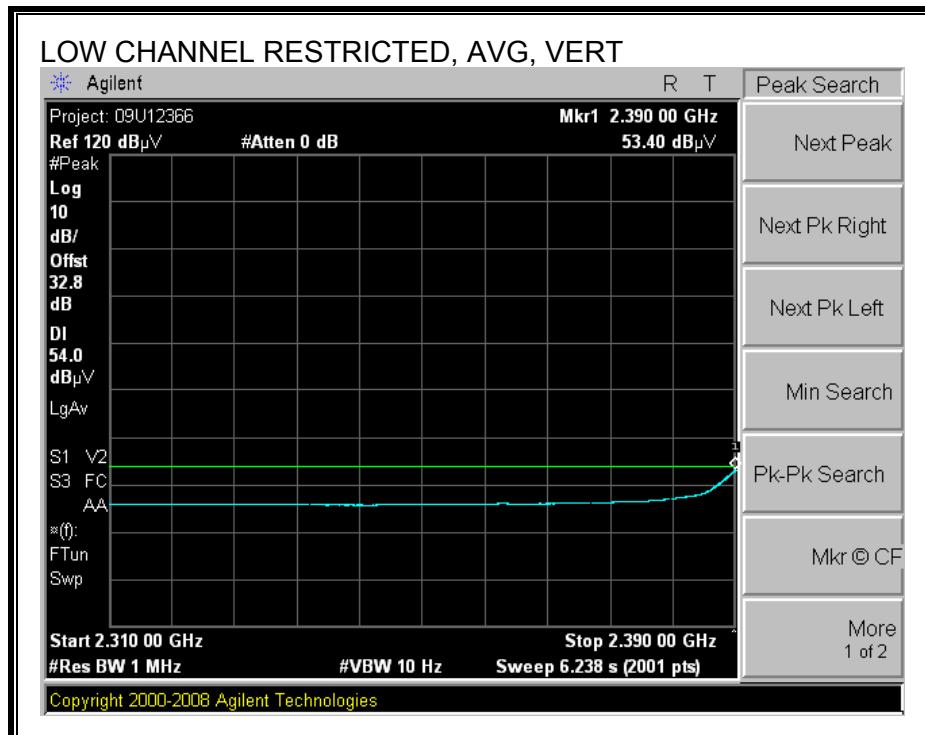
##### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



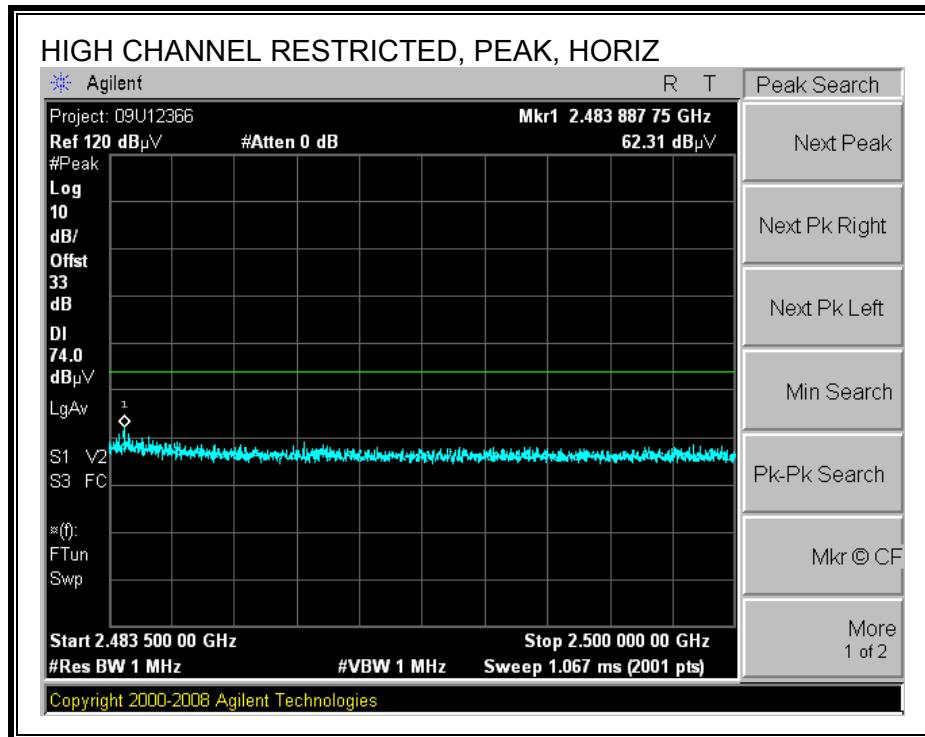


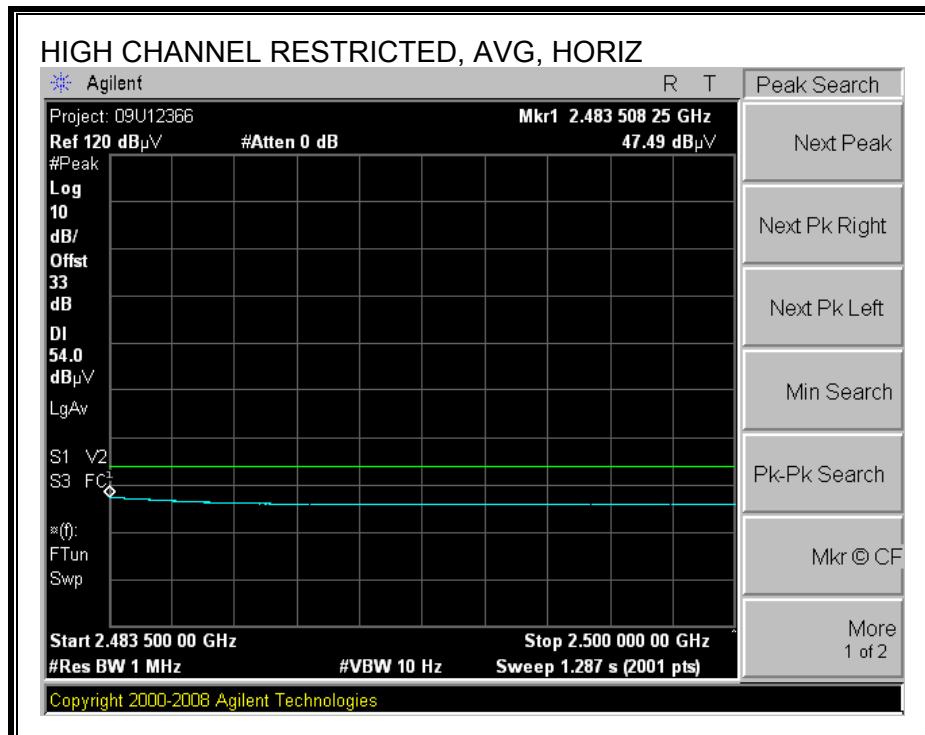
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



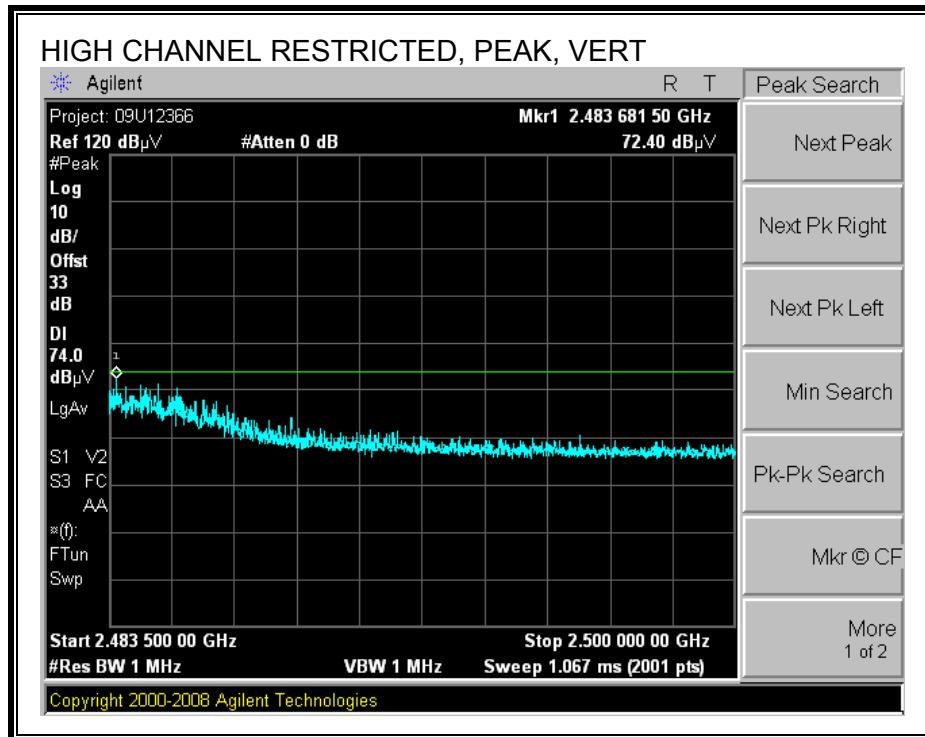


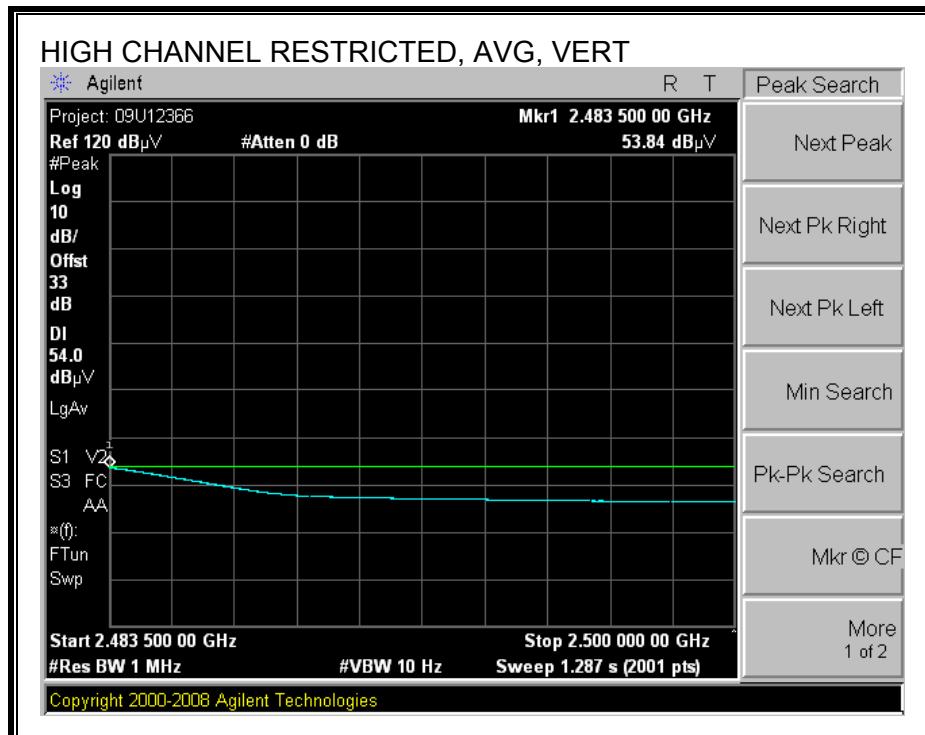
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





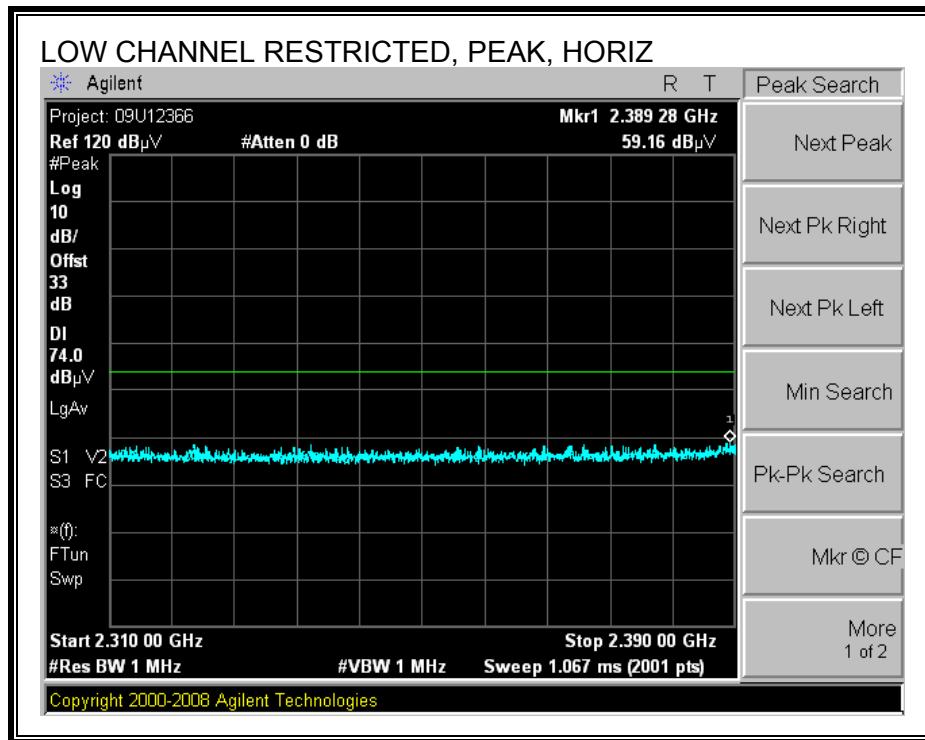
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

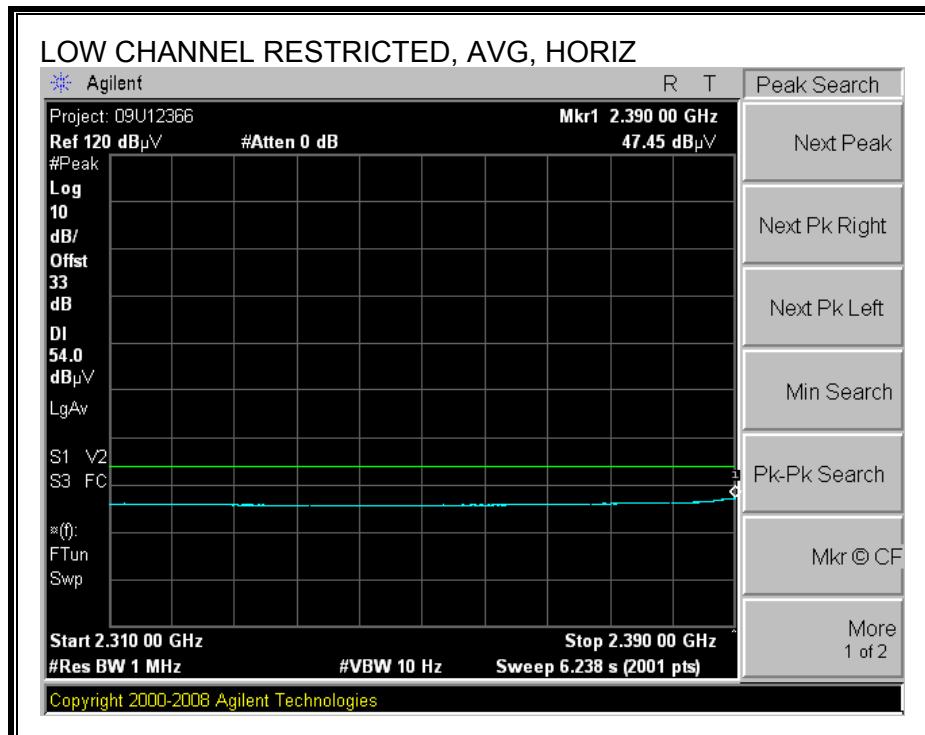




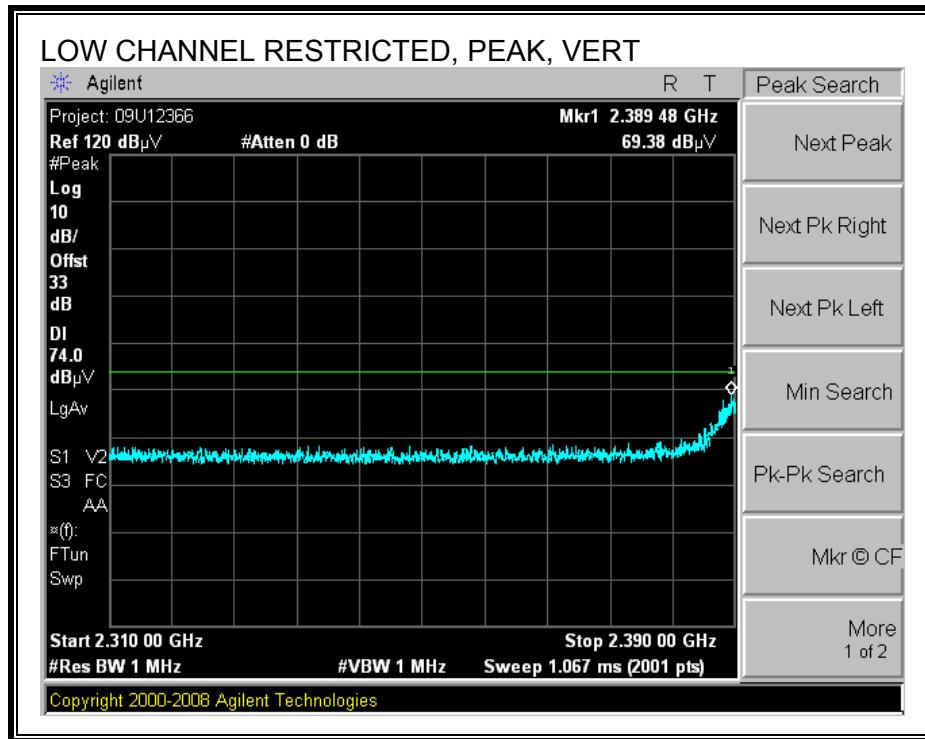
## **MODE 100**

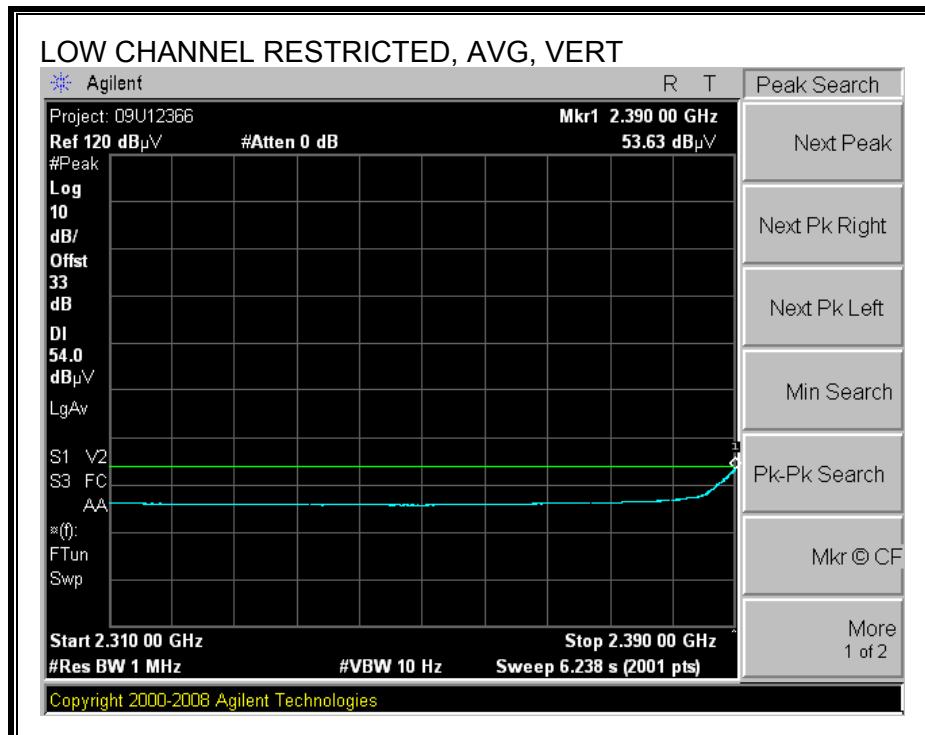
### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



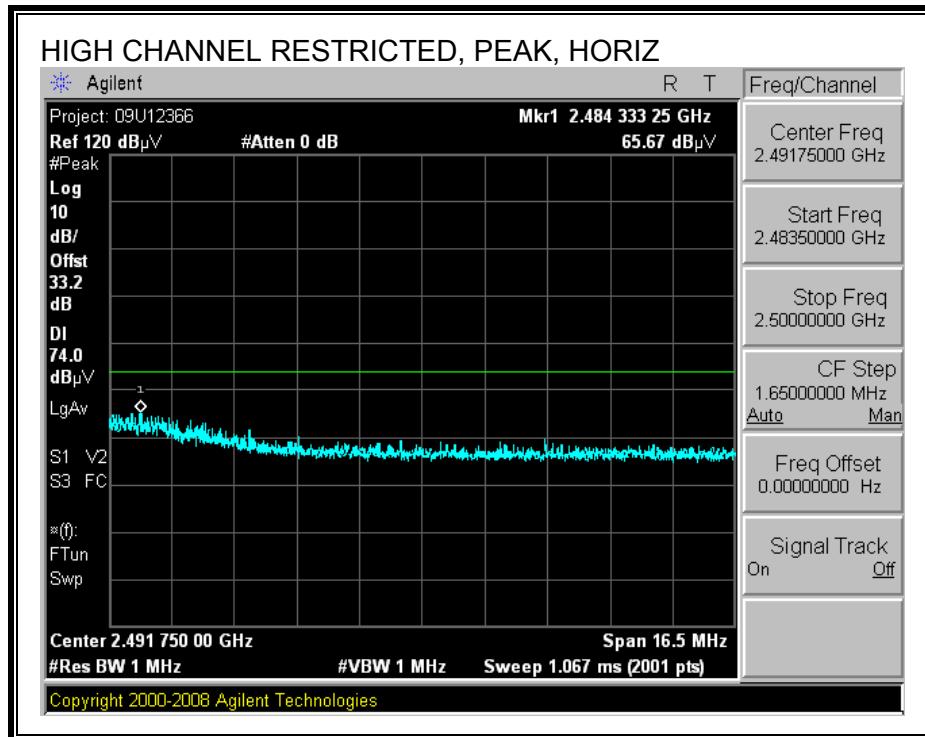


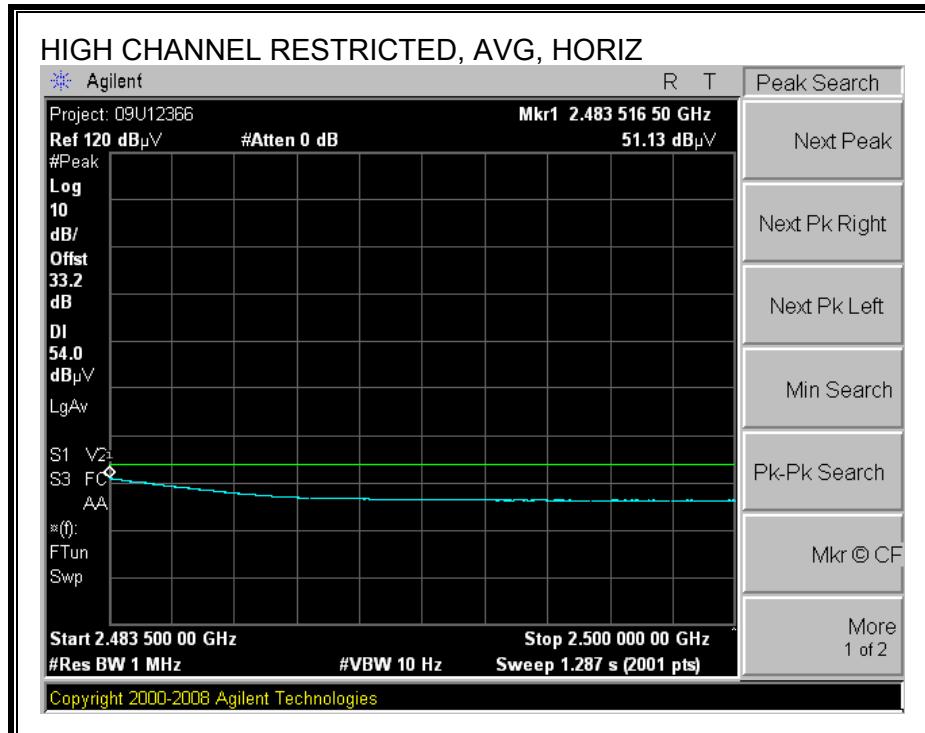
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



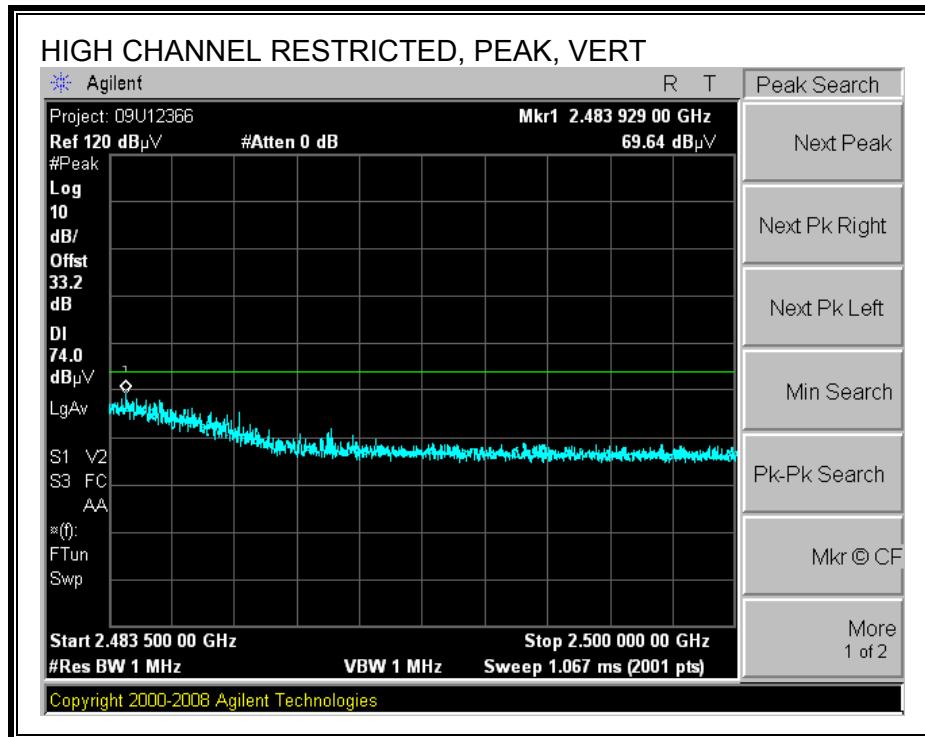


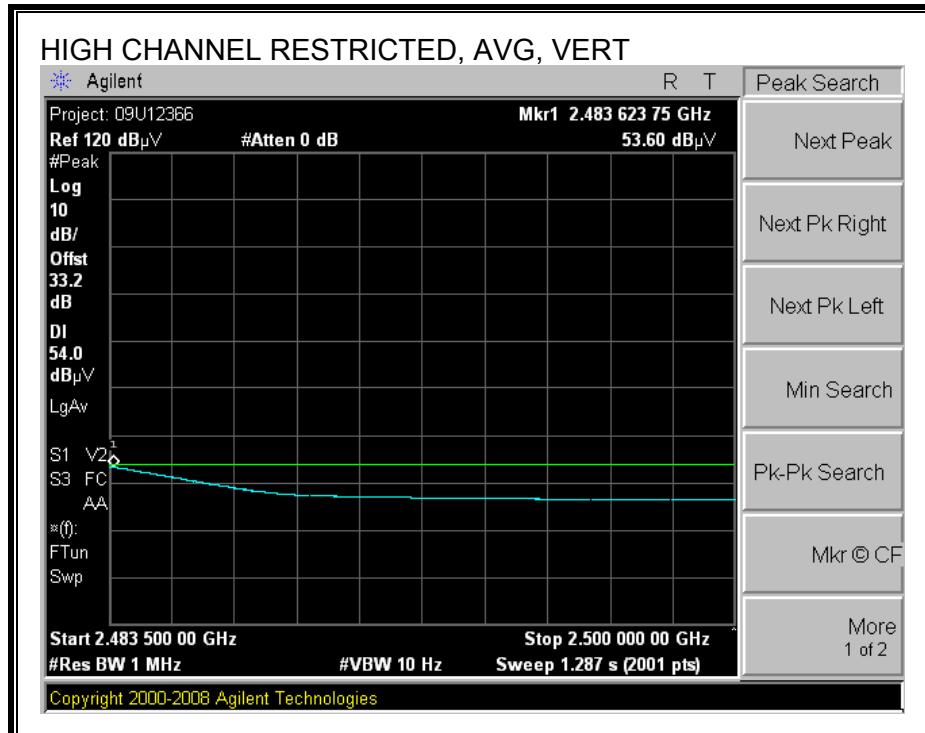
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





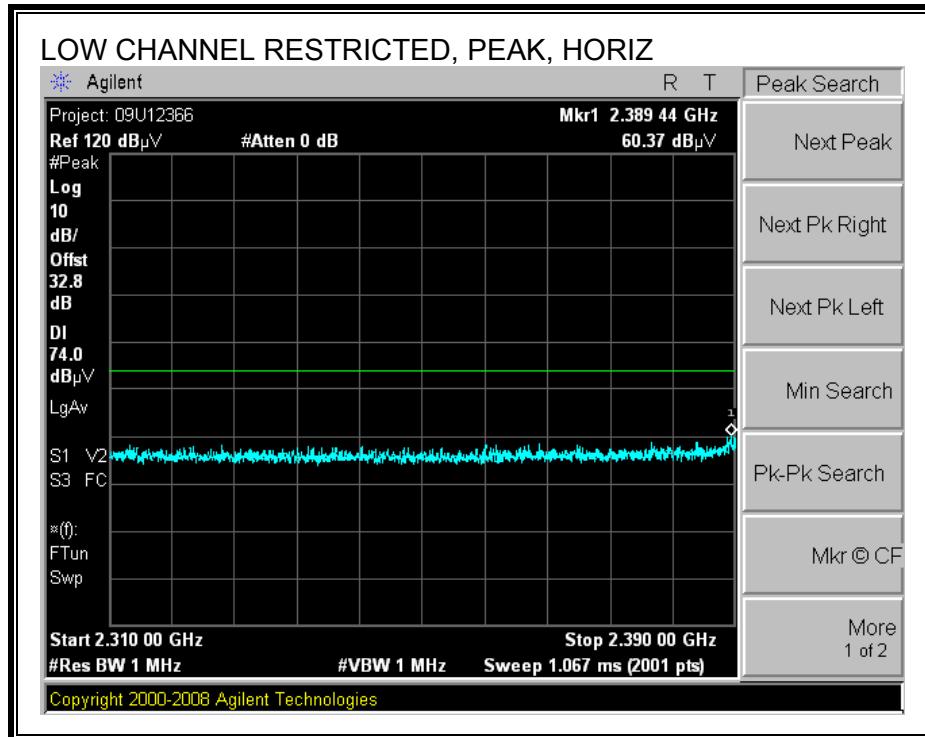
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

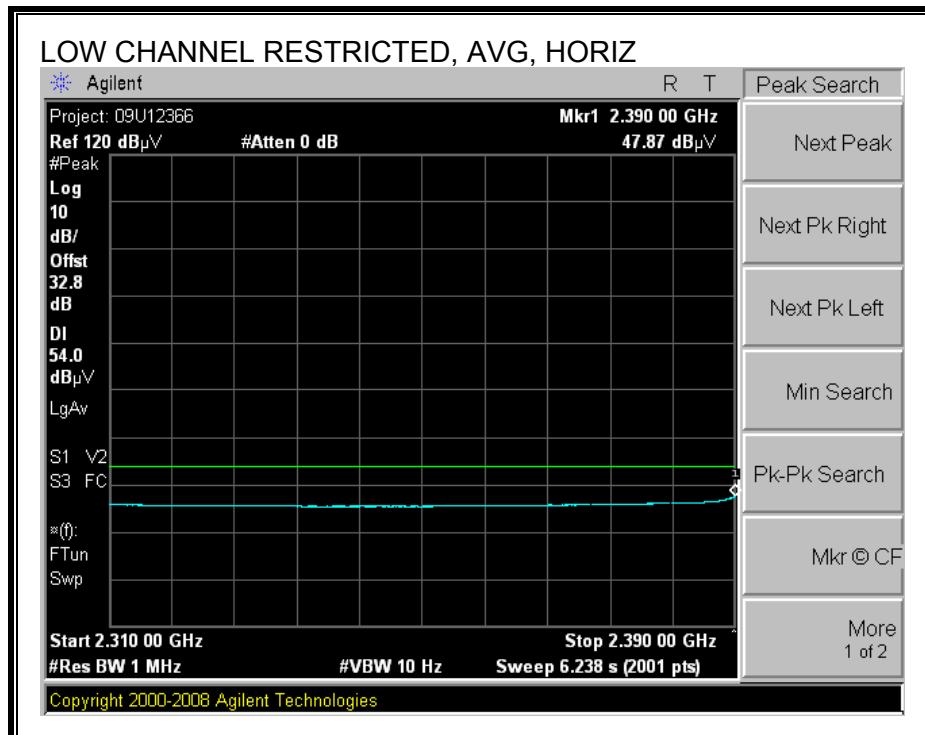




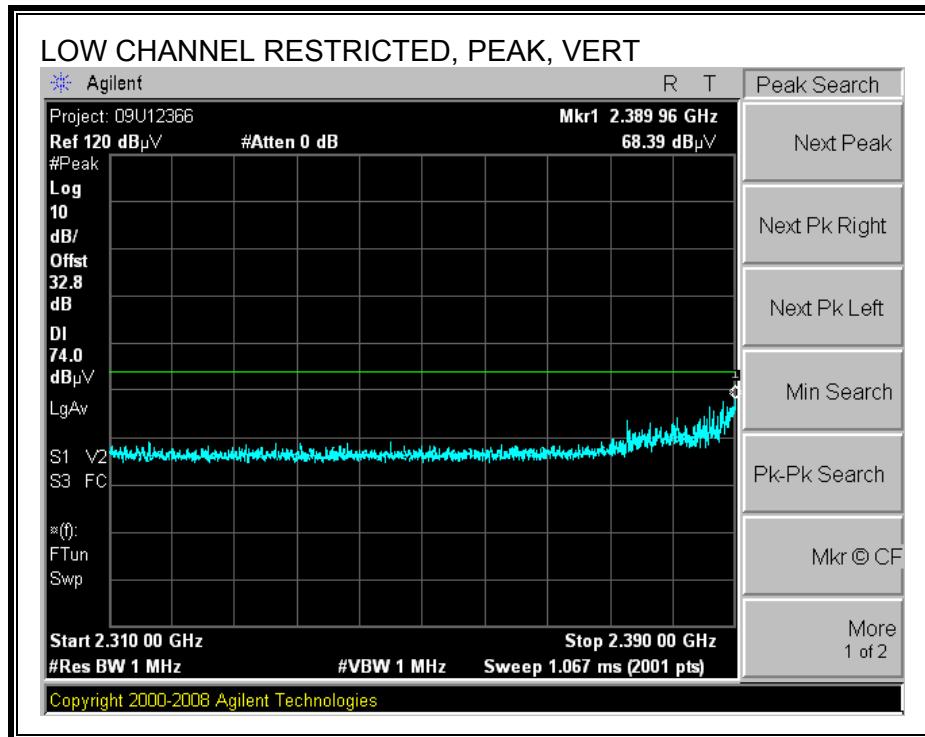
## MODE 110

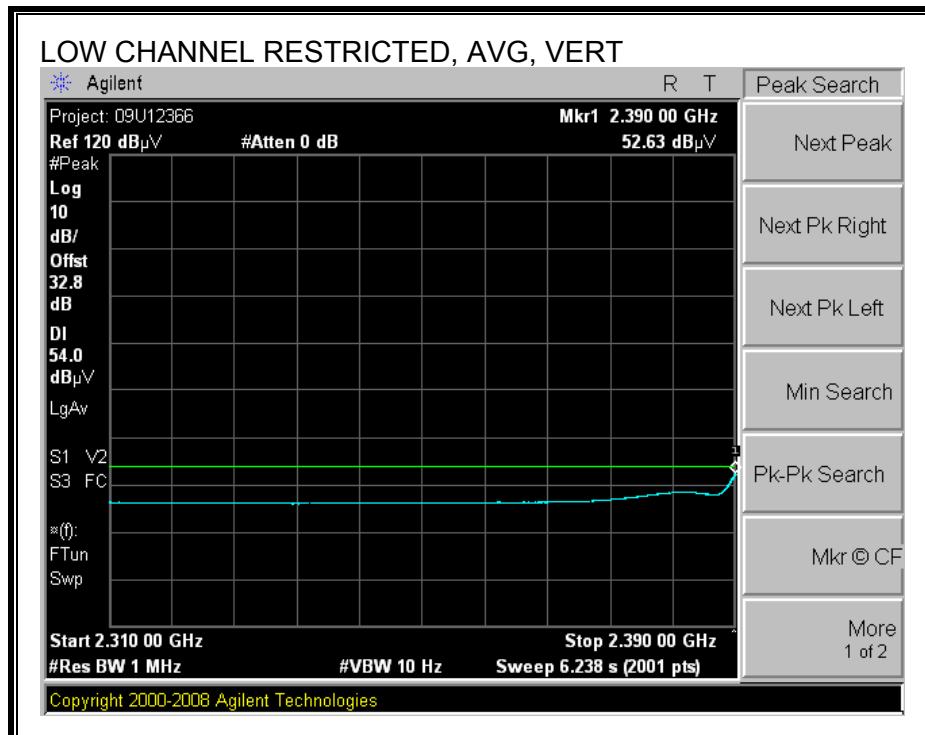
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



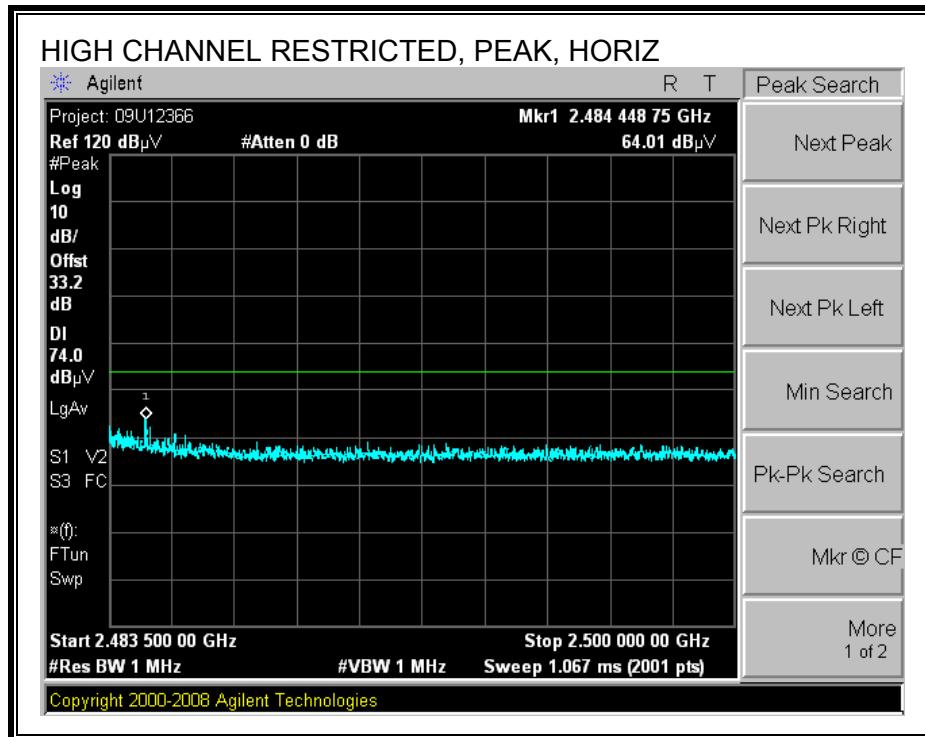


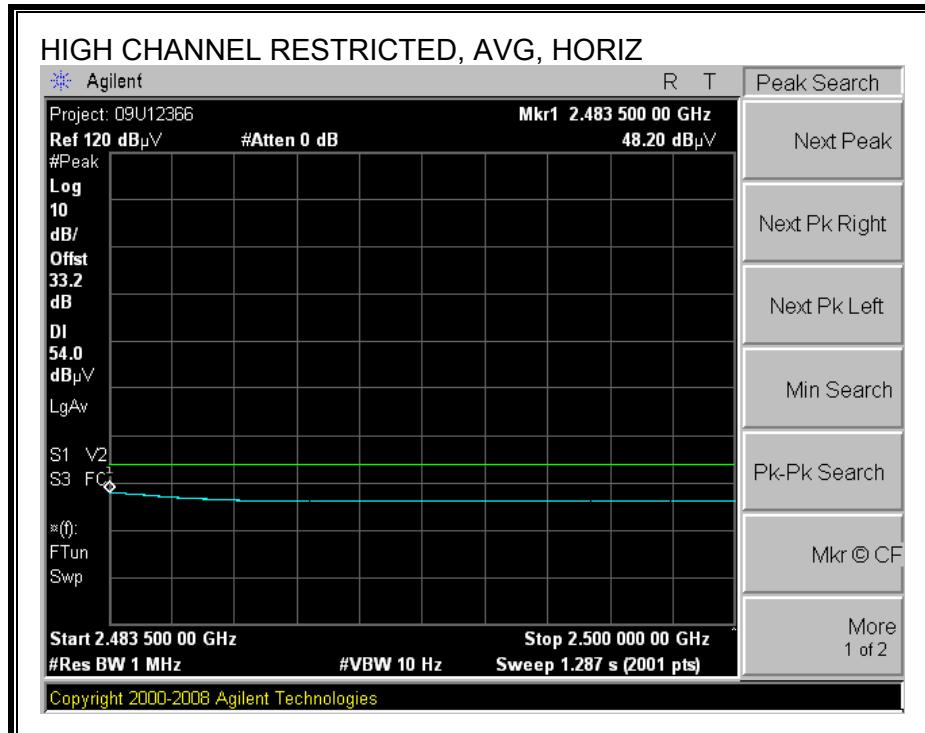
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



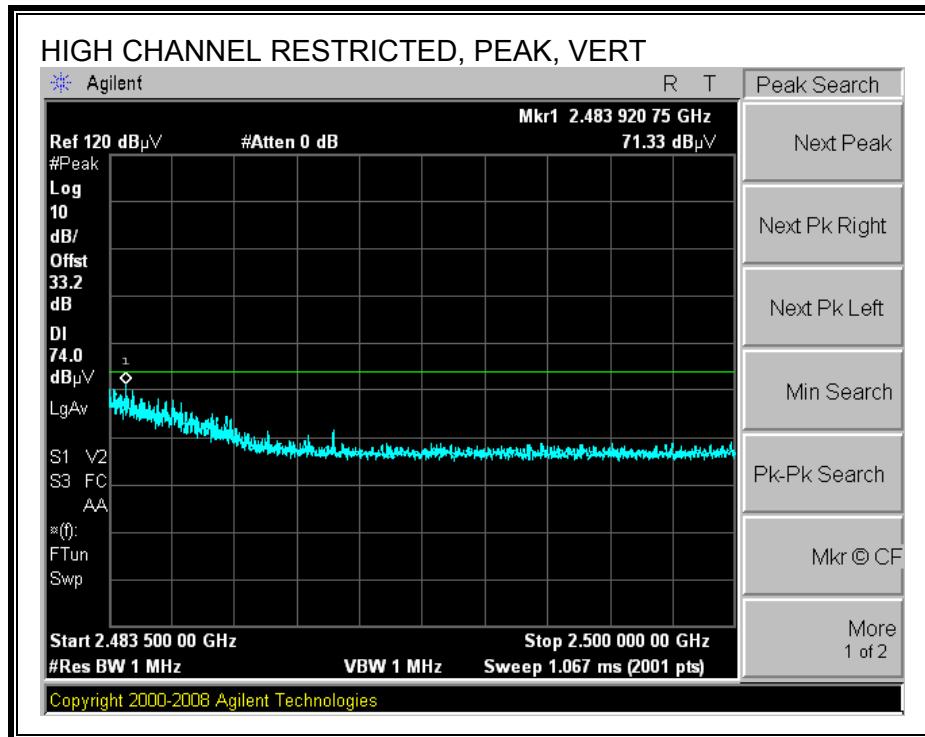


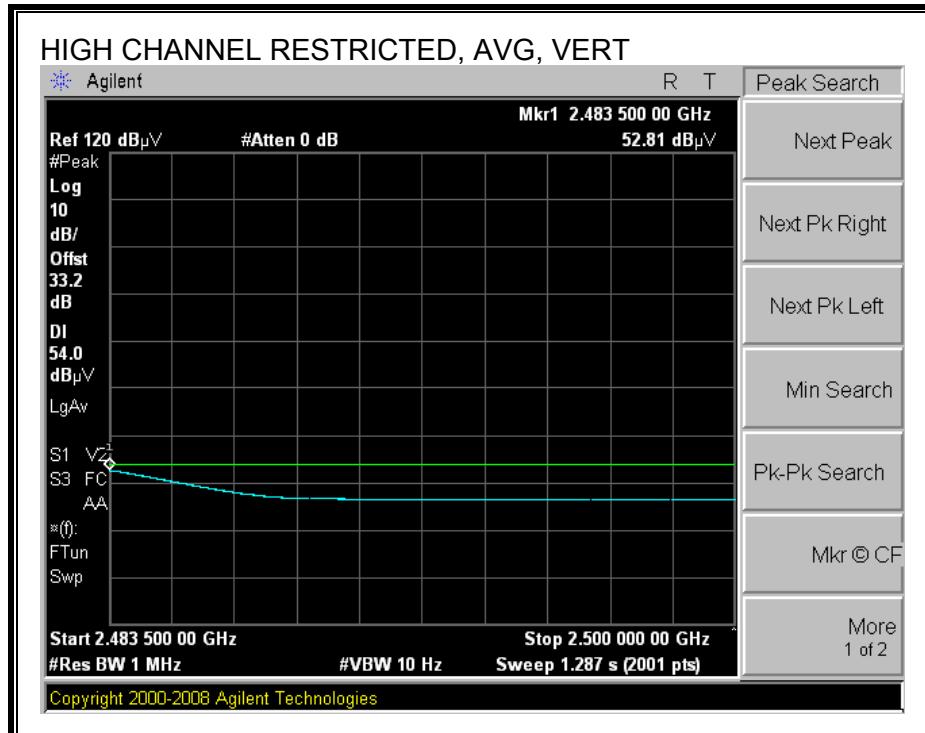
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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

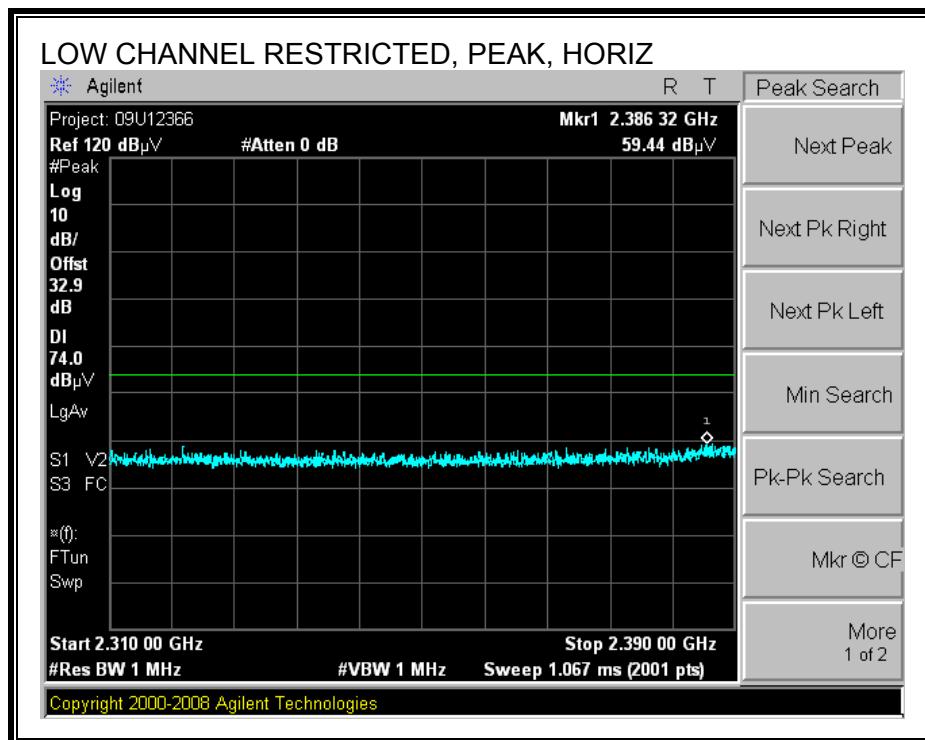


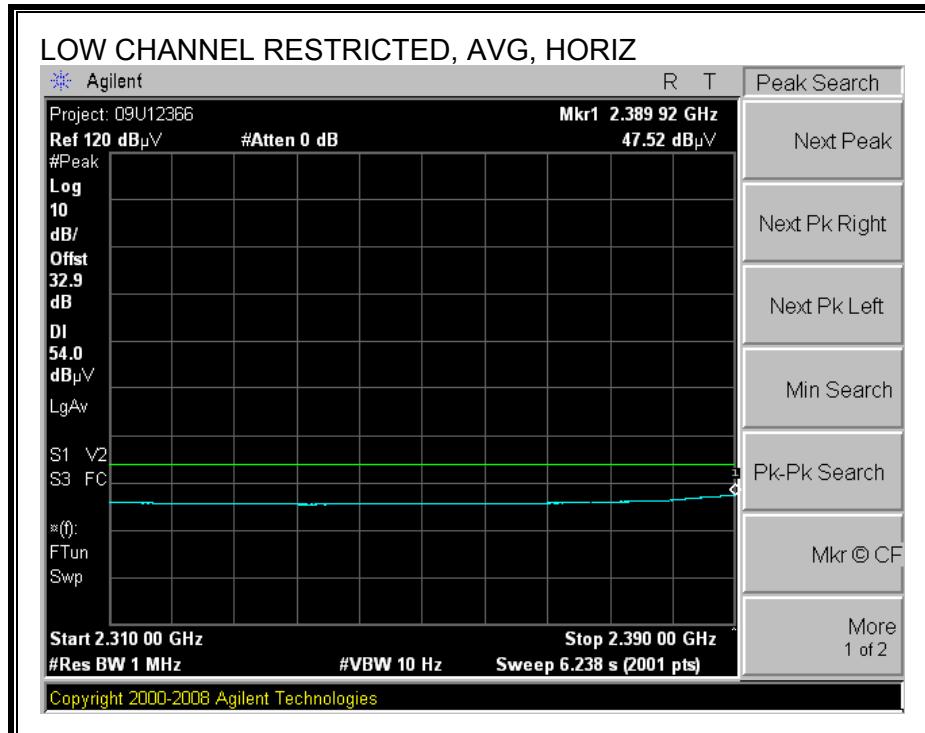


### 7.3.4. TX ABOVE 1 GHz FOR HT 40 DUAL CHAIN LEGACY MODE

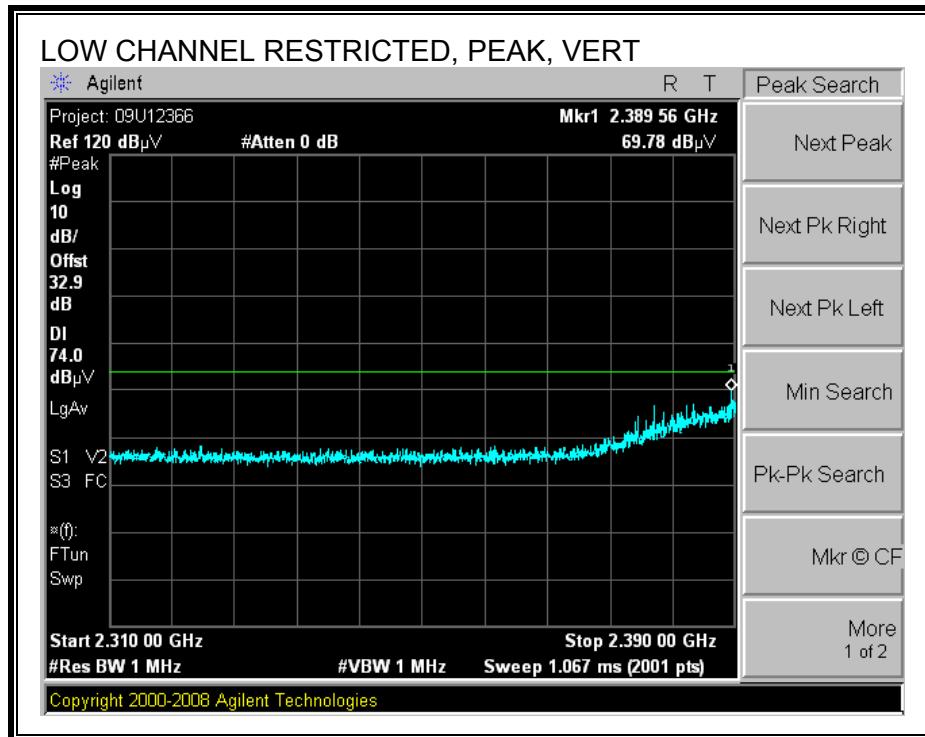
#### **MODE 010:**

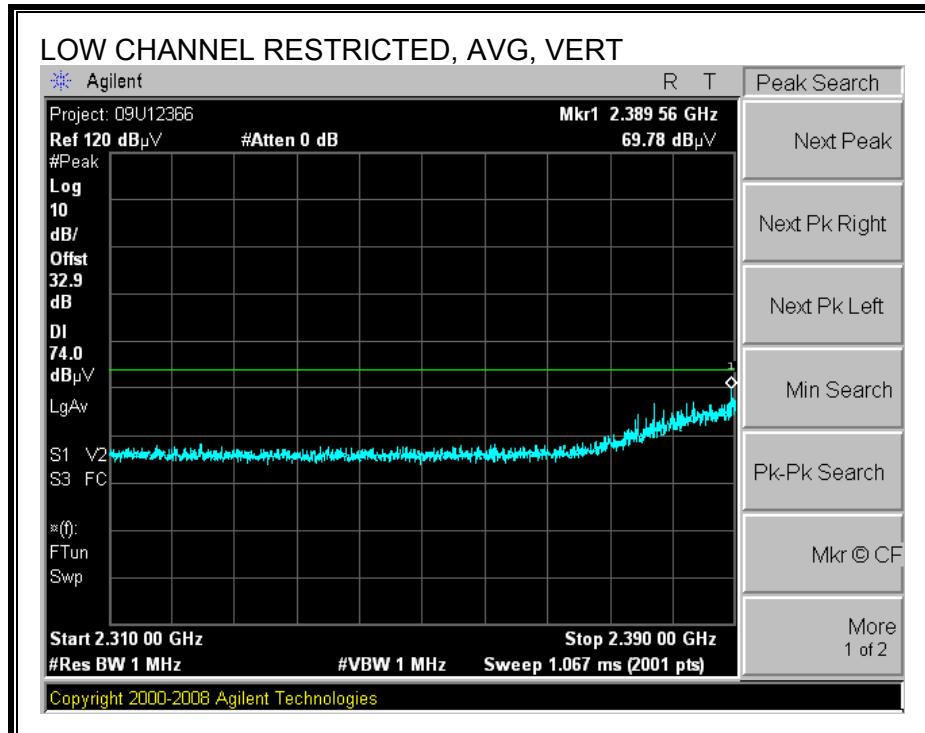
##### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



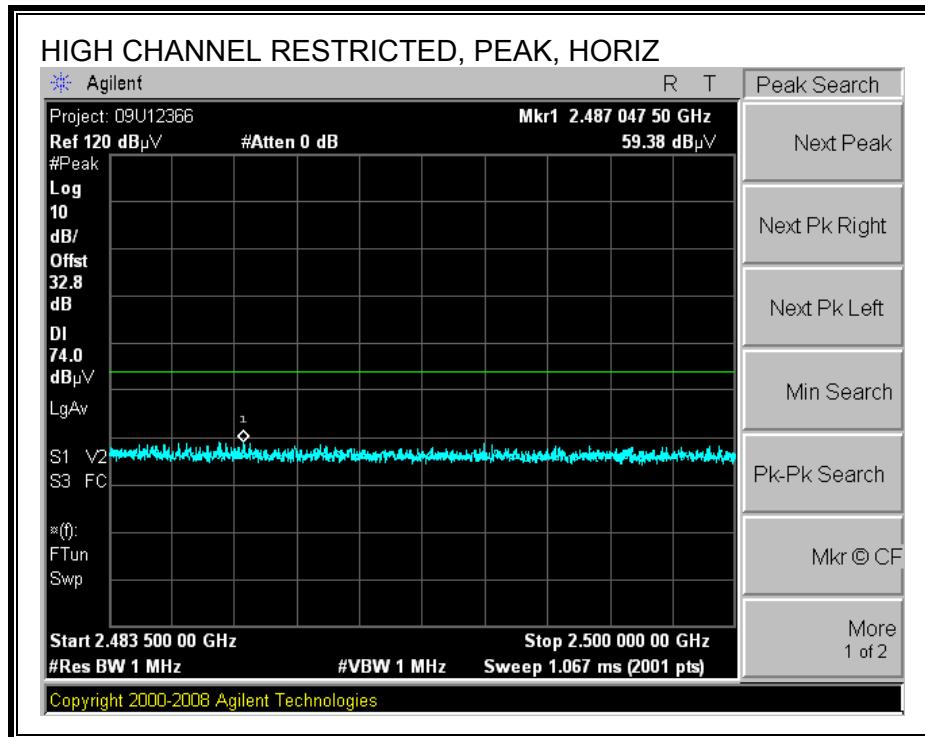


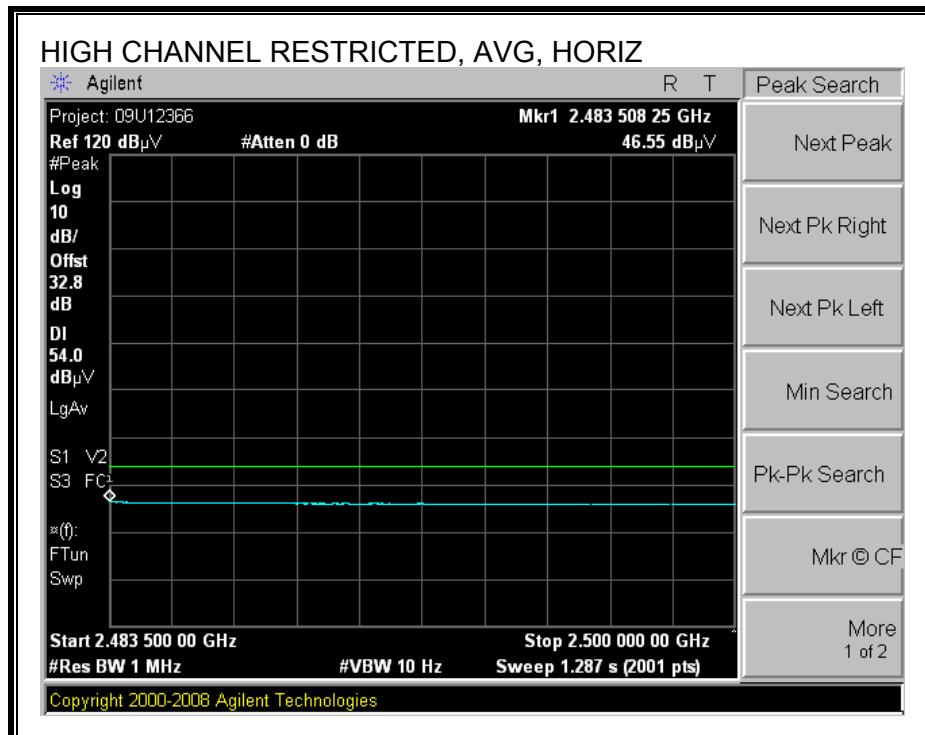
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



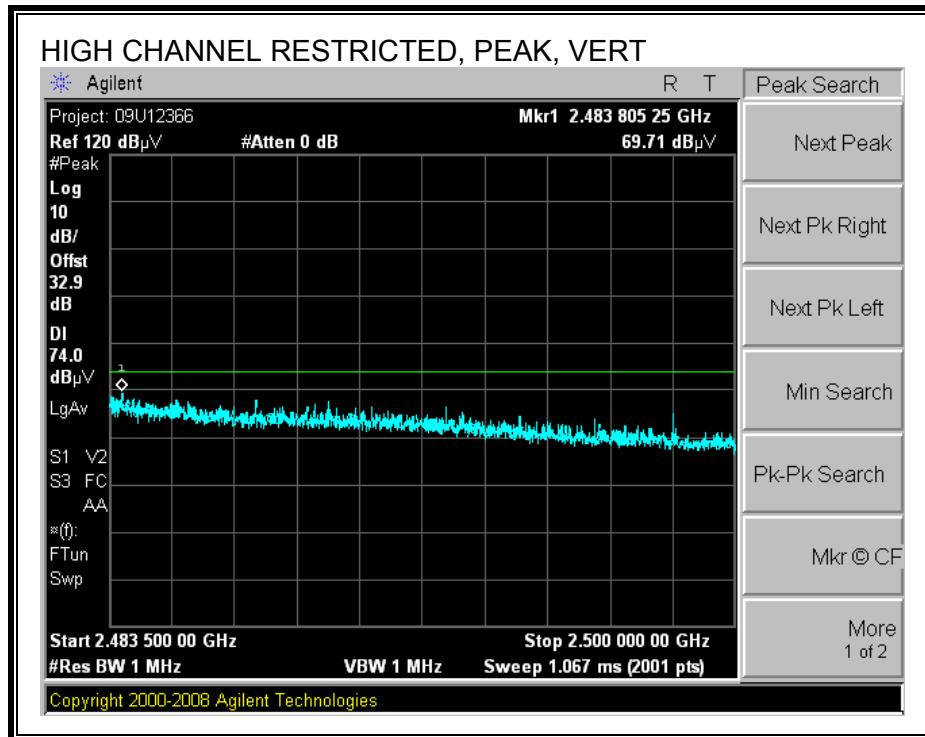


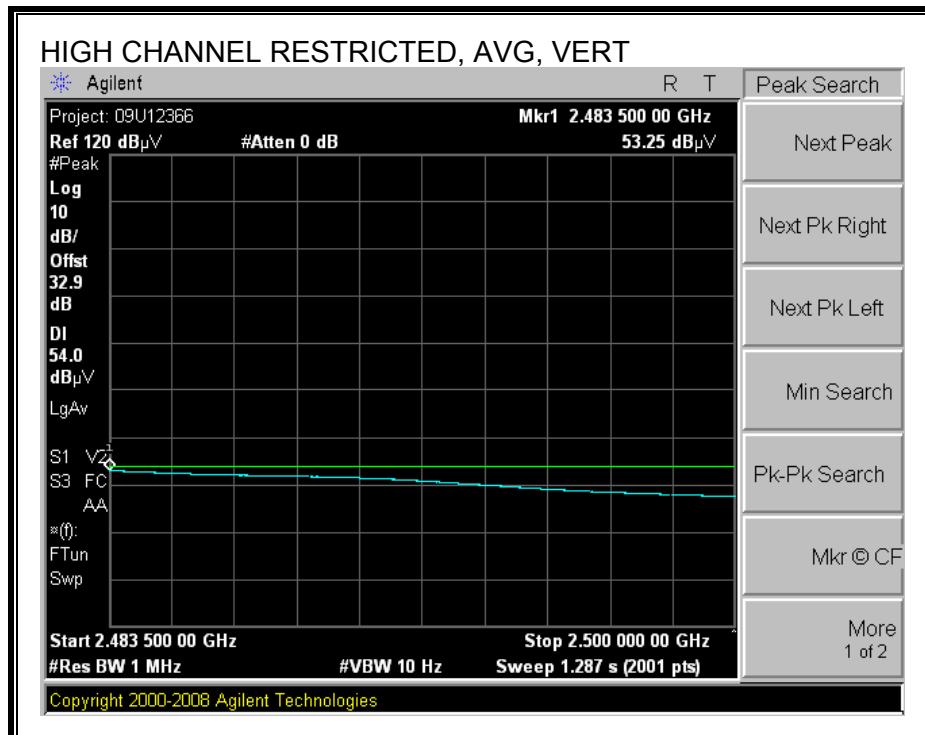
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





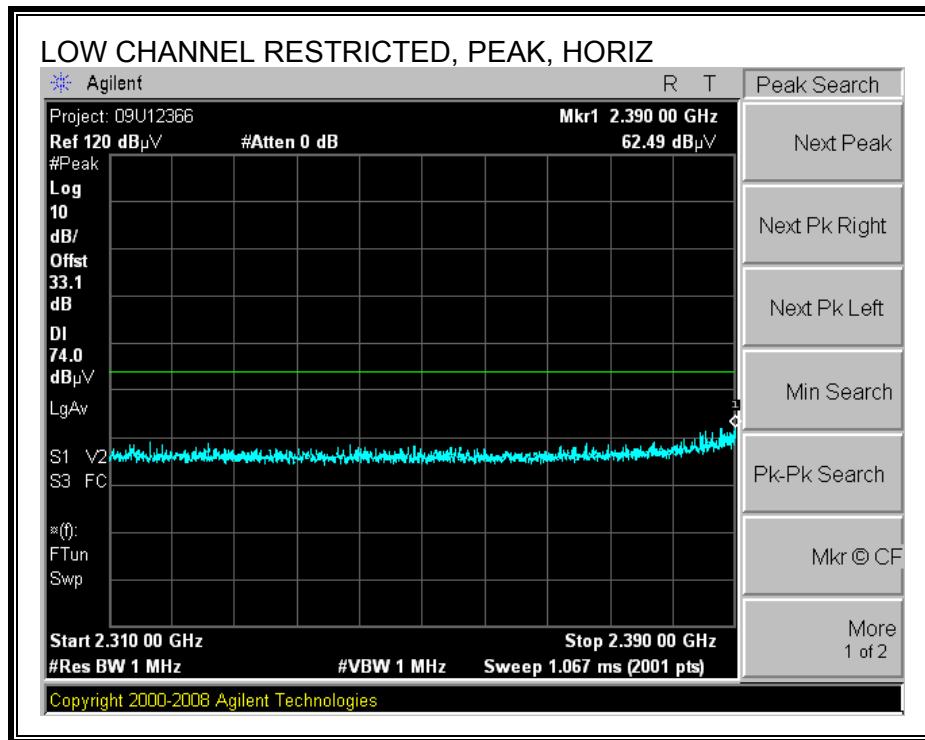
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

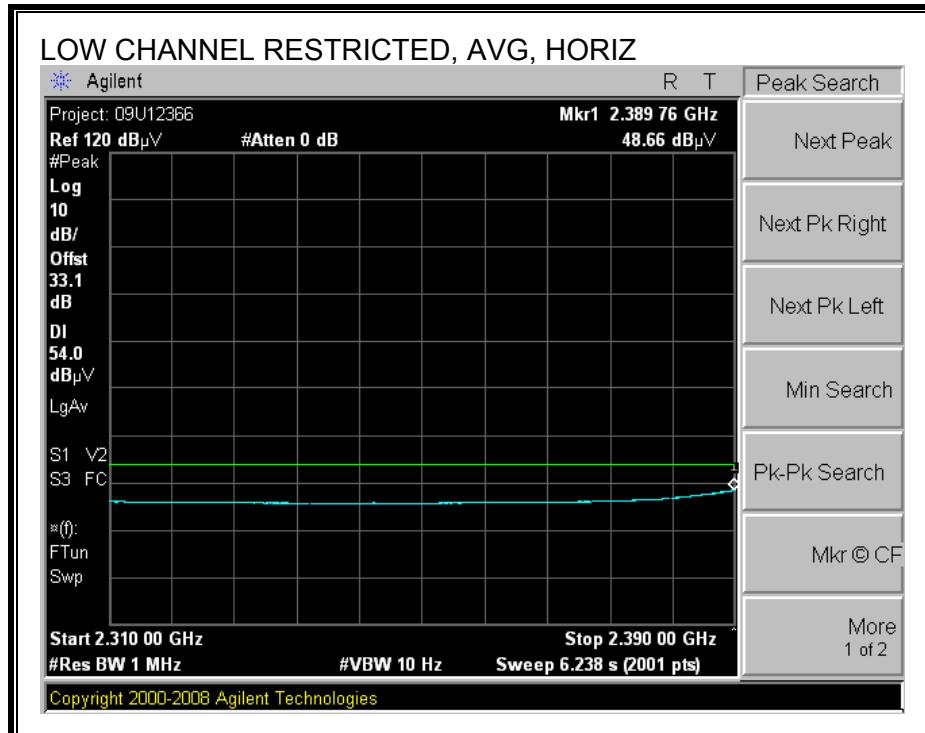




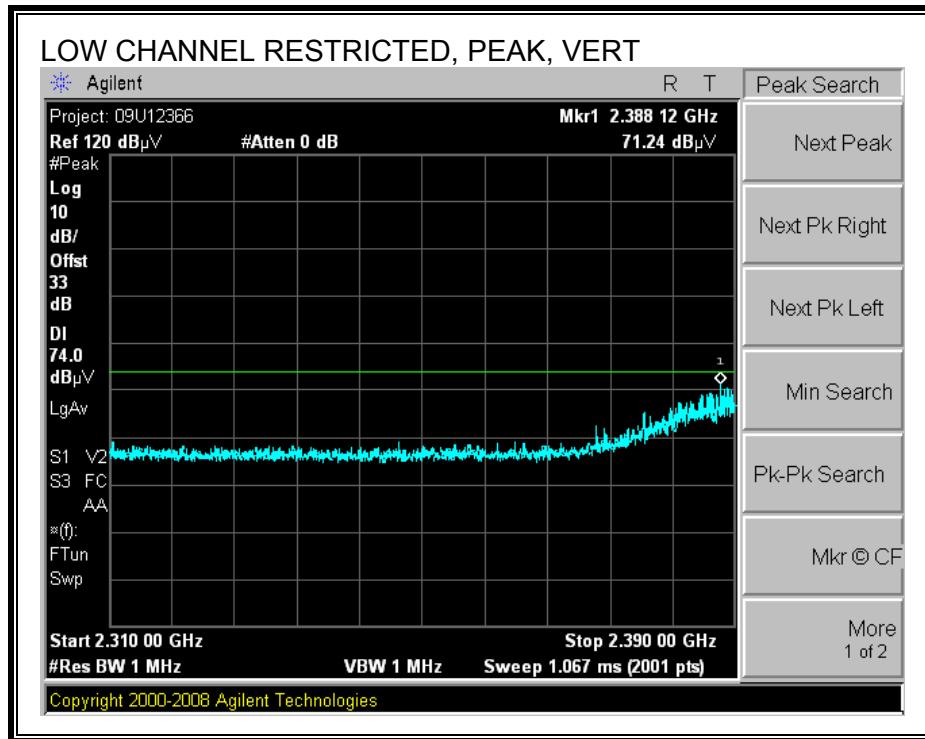
## **MODE 100**

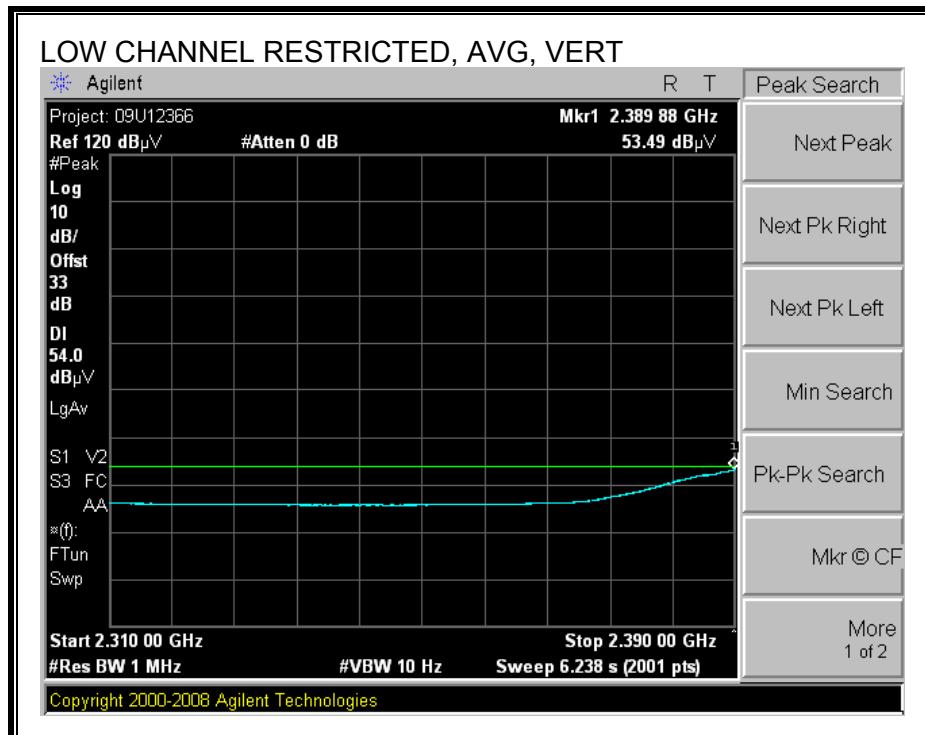
### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



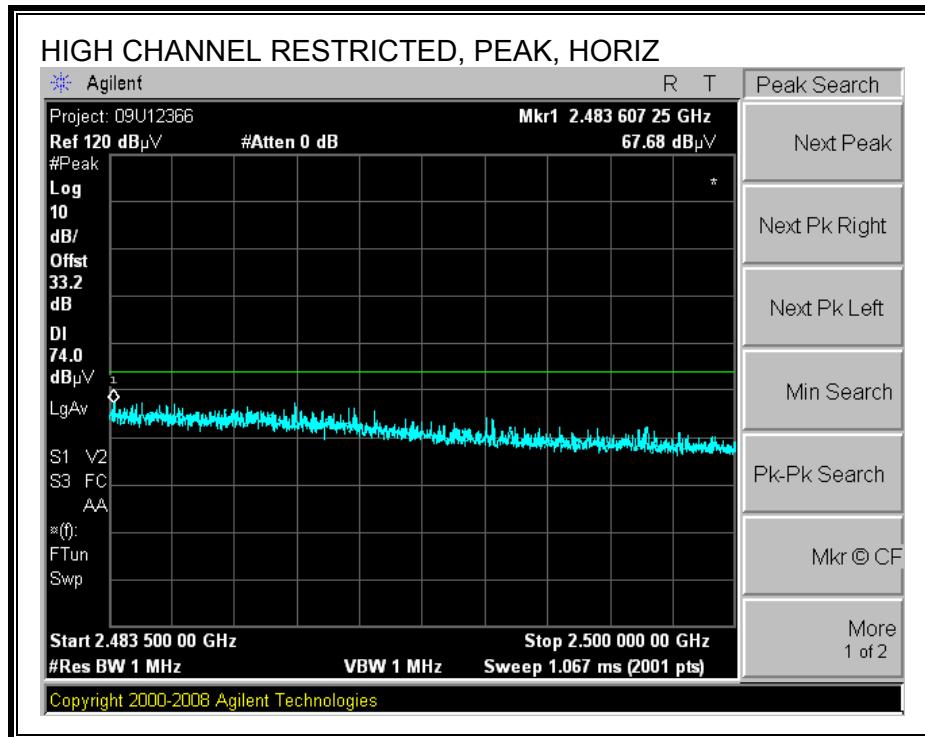


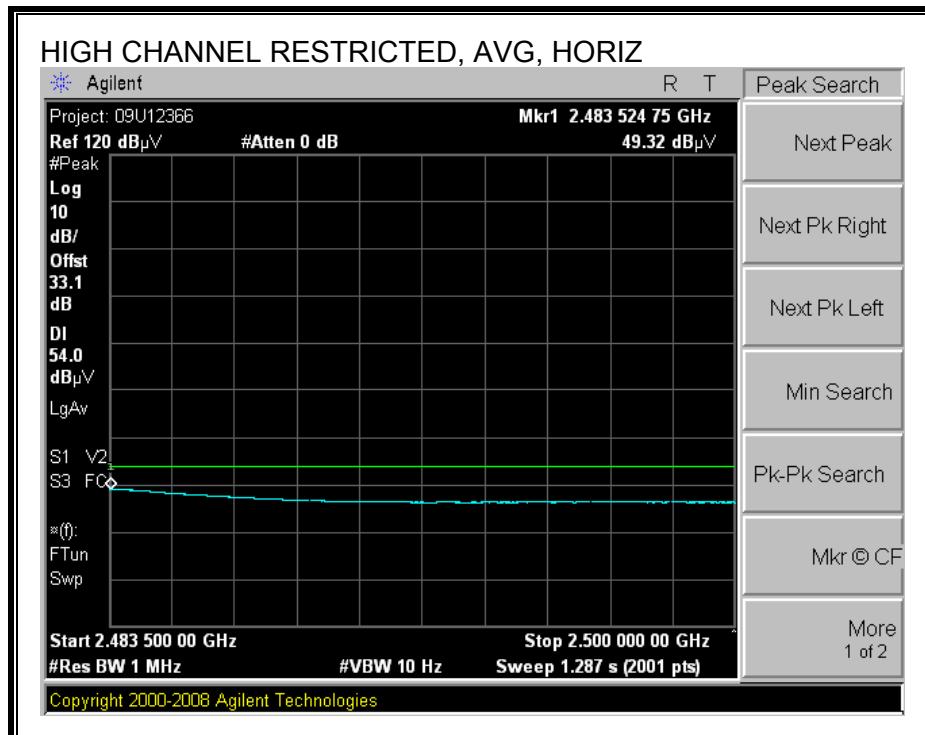
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



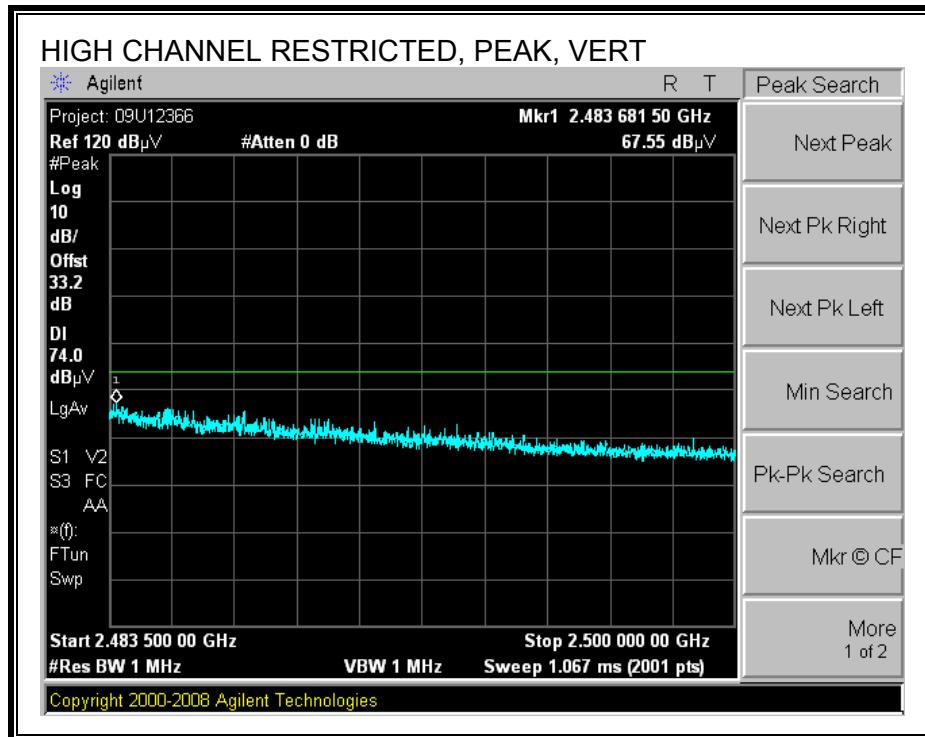


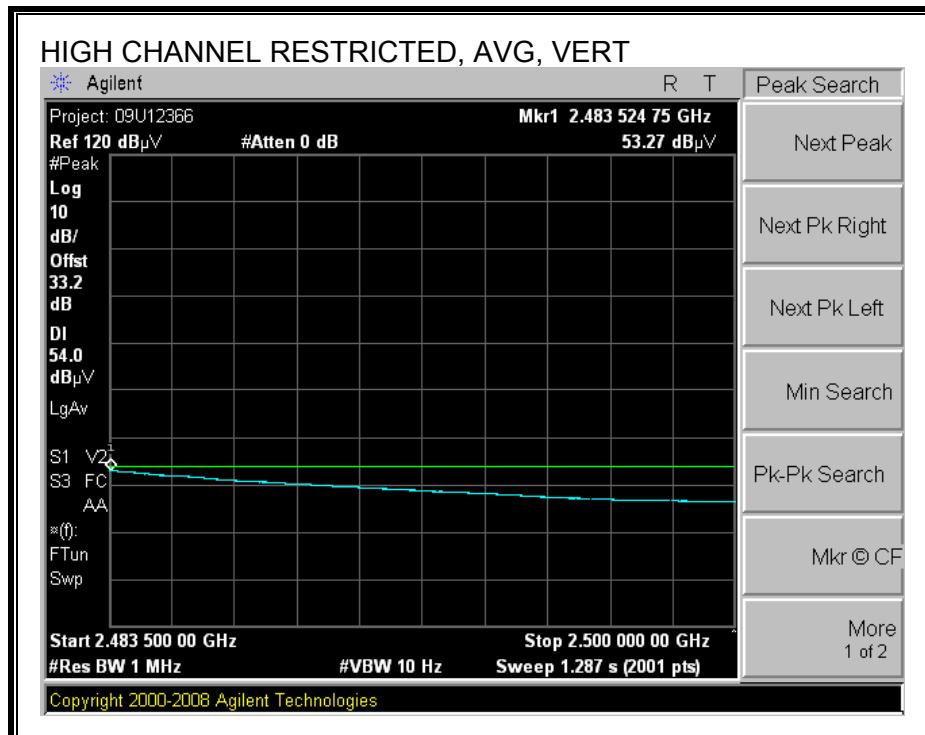
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





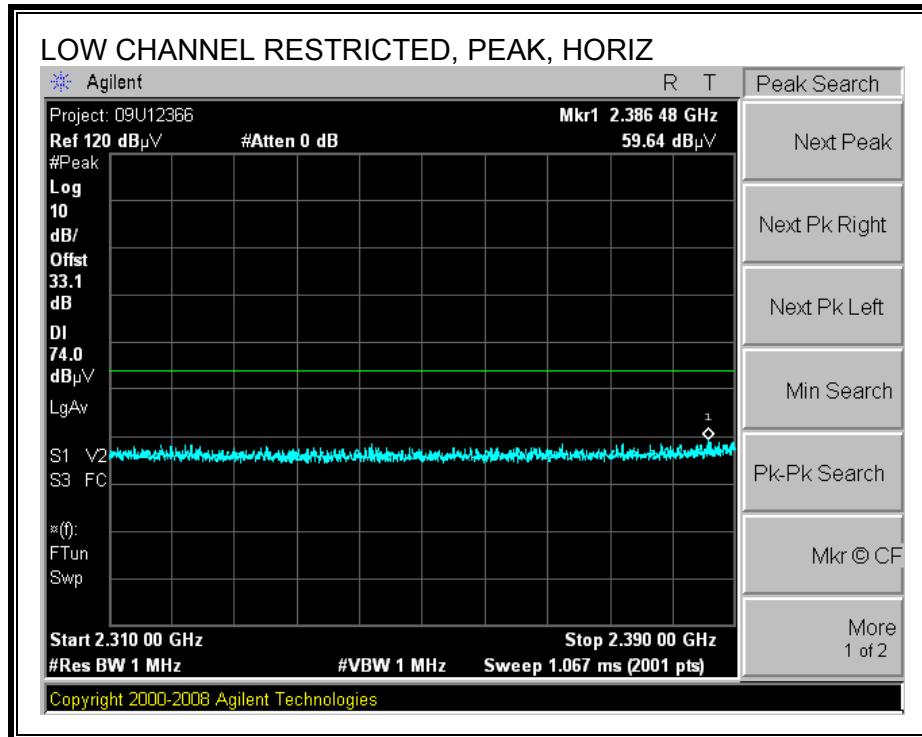
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

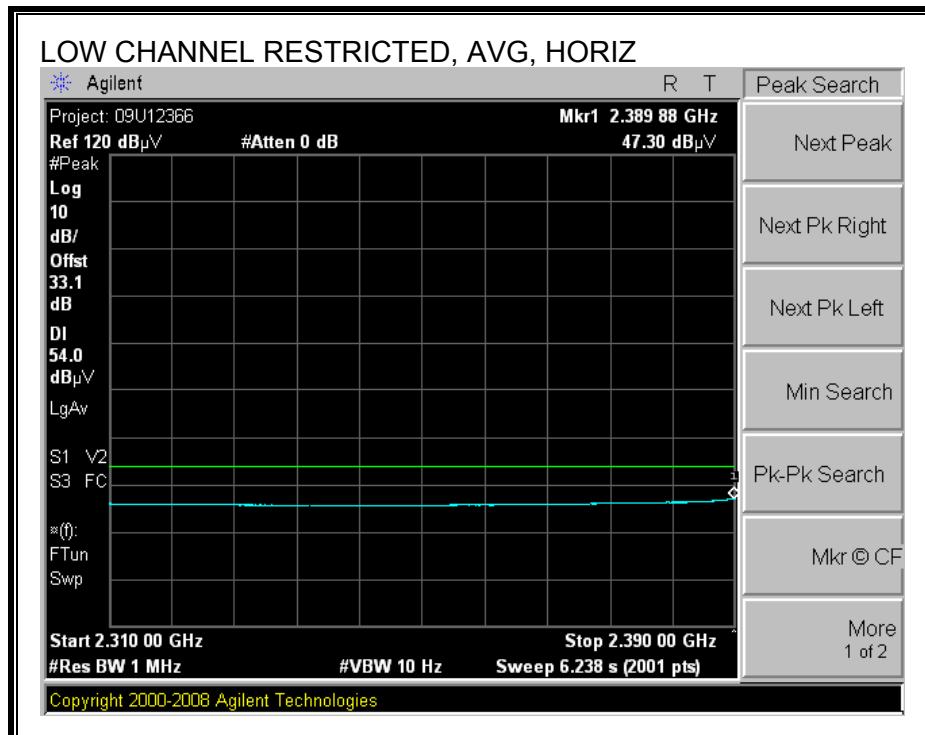




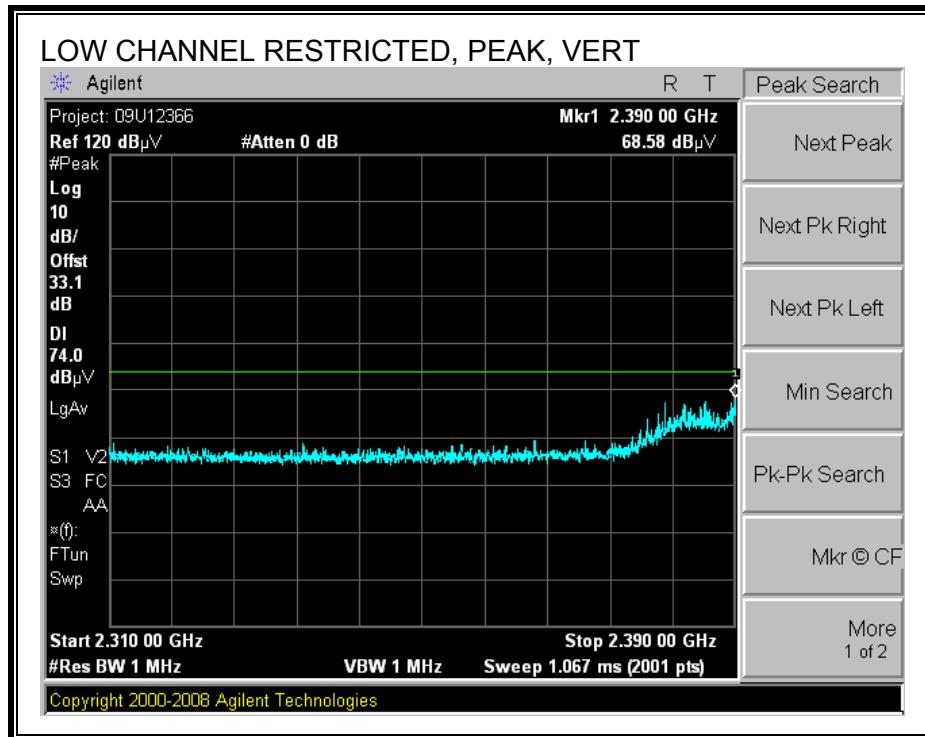
## MODE 110

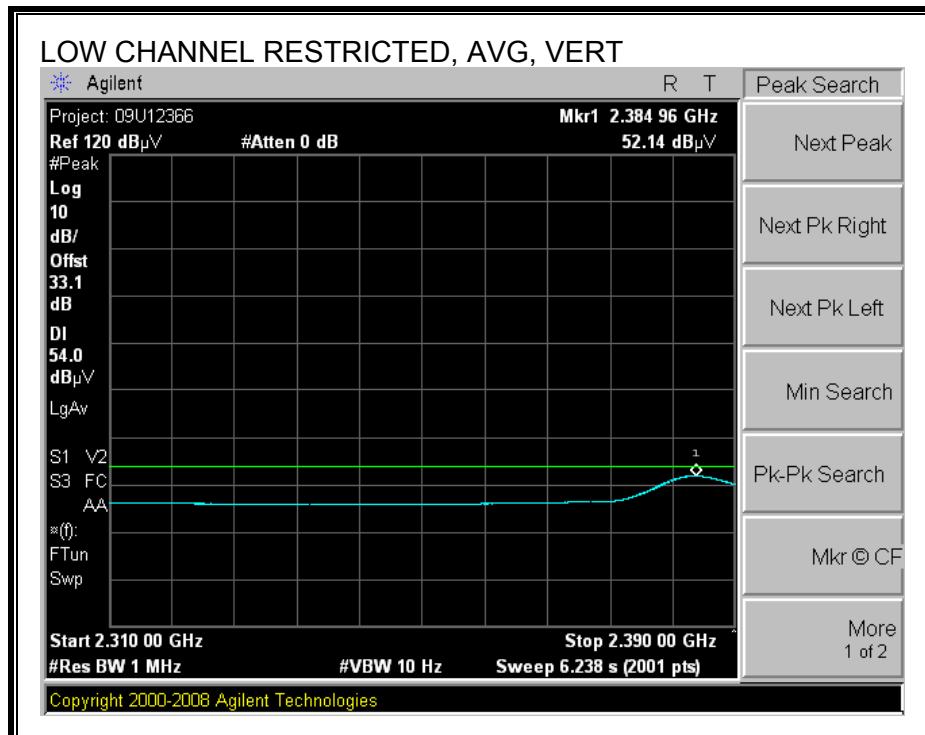
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



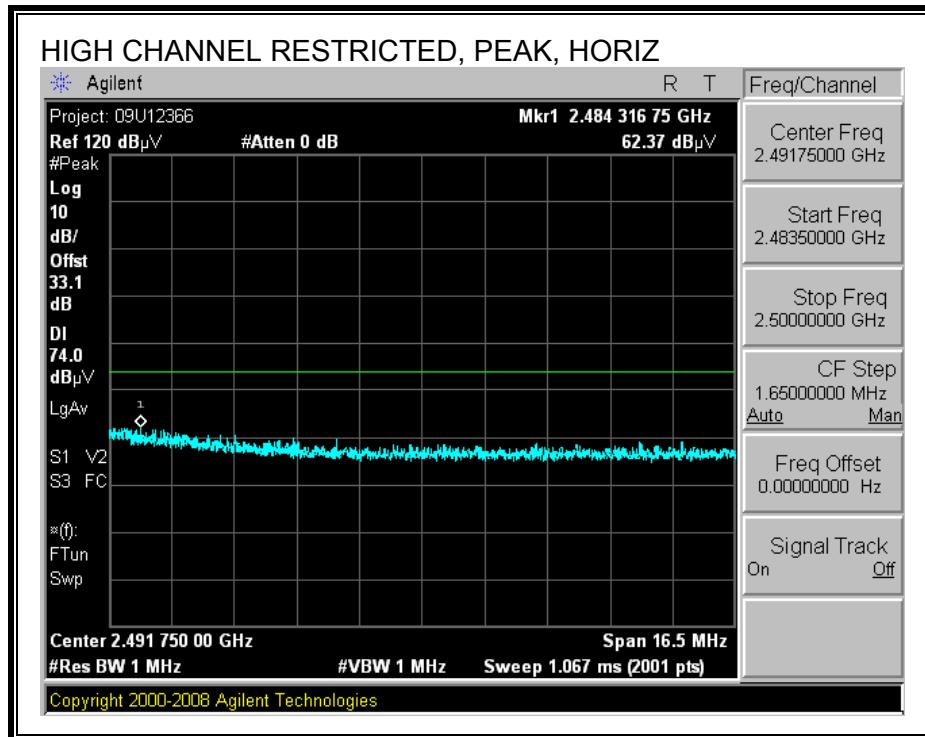


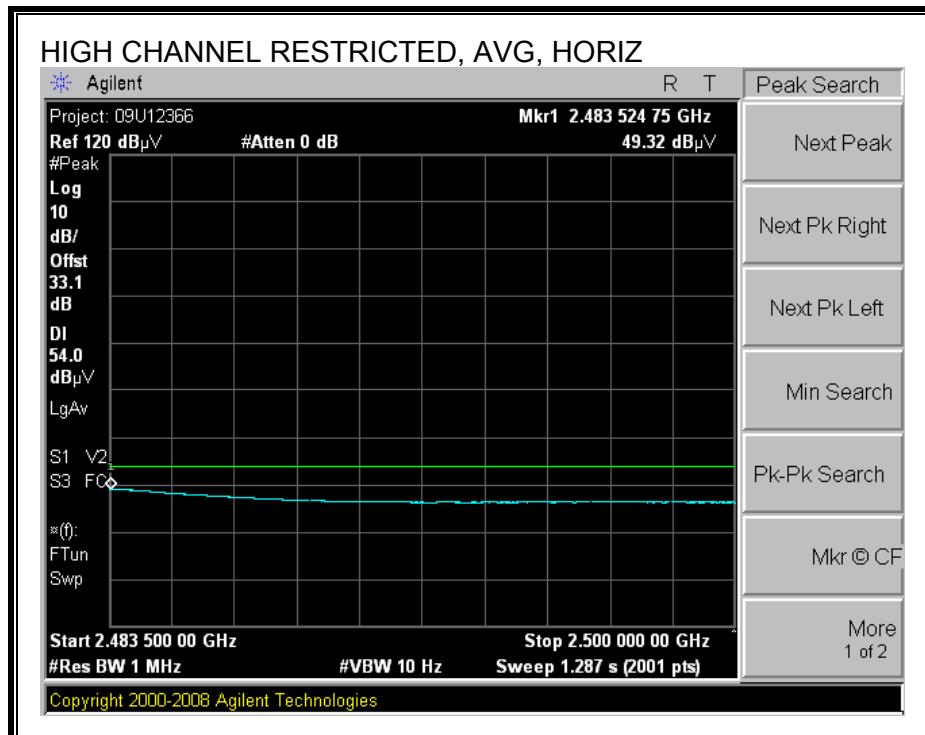
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



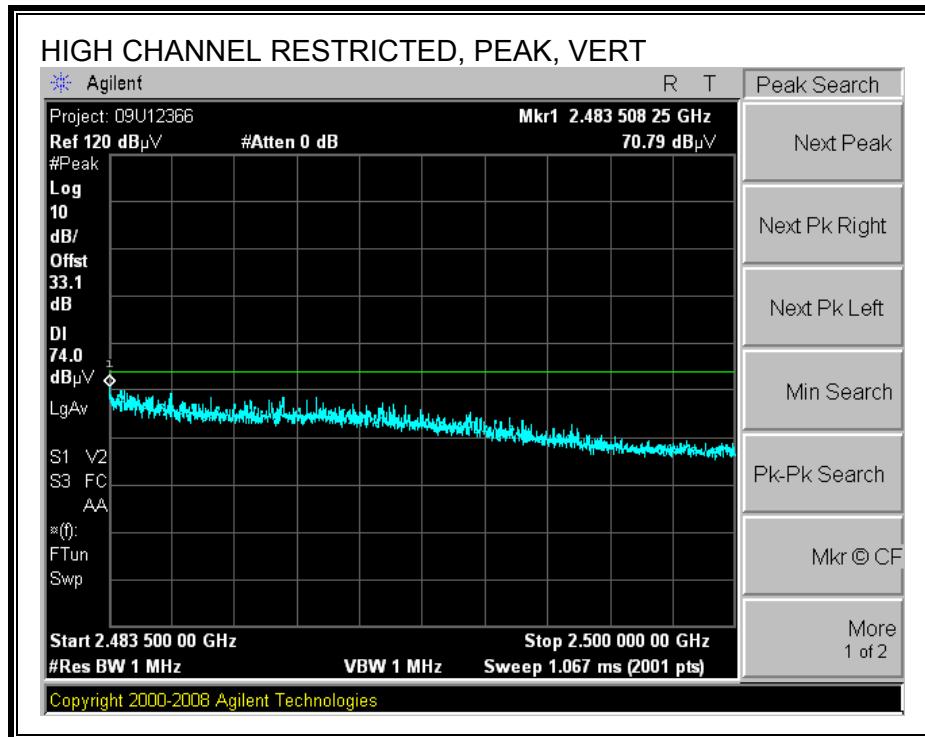


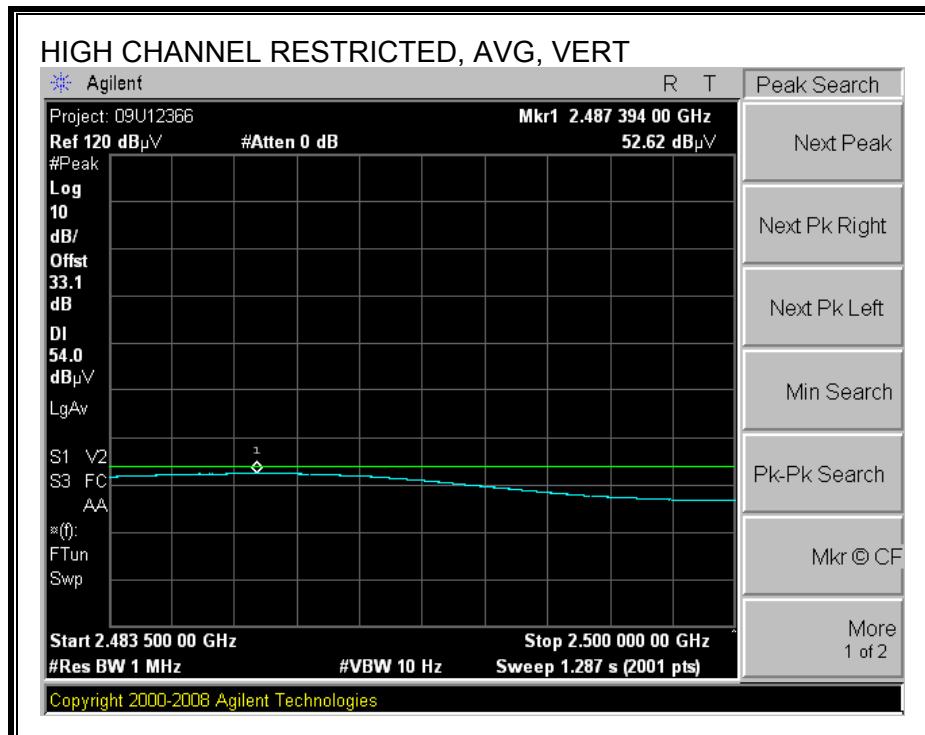
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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





## HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company:	Meraki Inc.														
Project #:	09U12366														
Date:	01/29/09														
Test Engineer:	Thanh Nguyen														
Configuration:	EUT with Monopole Antenna - 3 dBi gain														
Mode:	Transmit Worst case g mode Att=15.5														
<b>Test Equipment:</b>															
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit			
T73; S/N: 6717 @3m			T34 HP 8449B						T125; ARA 18-26 GHz; S/N:1007			FCC 15.209			
Hi Frequency Cables															
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements RBW=VBW=1MHz
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001			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															
4.824	3.0	41.5	28.3	33.7	5.8	-34.8	0.0	0.0	46.2	33.0	74	54	-27.8	-21.0	Noise Floor/V
4.824	3.0	40.6	28.0	33.7	5.8	-34.8	0.0	0.0	45.3	32.7	74	54	-28.7	-21.3	Noise Floor/H
Mid channel															
4.874	3.0	41.2	28.0	33.8	5.8	-34.8	0.0	0.0	46.1	32.8	74	54	-27.9	-21.2	Noise Floor/V
4.874	3.0	39.7	28.0	33.8	5.8	-34.8	0.0	0.0	44.5	32.8	74	54	-29.5	-21.2	Noise Floor/H
High channel															
4.924	3.0	40.6	28.6	33.9	5.9	-34.8	0.0	0.0	45.5	33.5	74	54	-28.5	-20.5	Noise Floor/V
4.924	3.0	40.3	28.0	33.9	5.9	-34.8	0.0	0.0	45.2	33.0	74	54	-28.8	-21.0	Noise Floor/H
No other emissions were detected above noise floor.															
Rev. 10.15.08															
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										

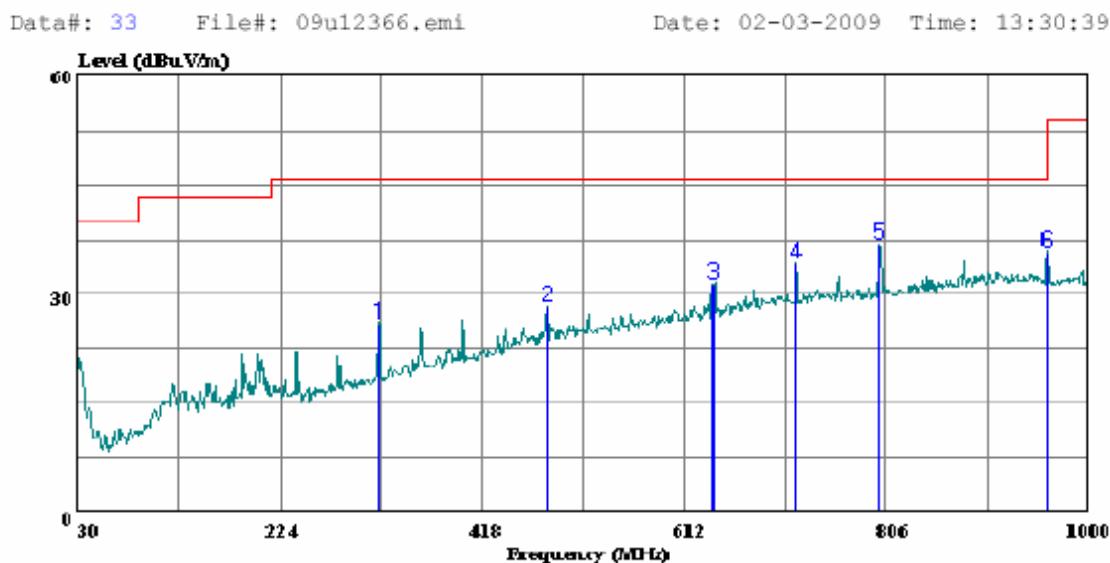
### 7.3.5. TX BELOW 1 GHz (WORST-CASE CONFIGURATION)

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

##### HORIZONTAL PLOT& DATA



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888



Condition: FCC CLASS-B 3m HORIZONTAL  
Test Operator:: Thanh Nguyen  
Project #: : 09U12336  
Company: : Meraki Inc.  
Model: : MR58  
Configuration:: EUT, Laptop, Antenna  
Mode : : EUT Power up with DC PWR Supply  
Target: : FCC Class B  
: EUT w/Flat Panel Antenna  
: DC Power on

Page: 1

Freq	Read Level	Factor	Limit Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	320.030	36.58	-10.50	26.09	46.00	-19.91 Peak
2	481.050	33.67	-5.37	28.29	46.00	-17.71 Peak
3	640.130	33.33	-1.87	31.46	46.00	-14.54 Peak
4	719.670	34.50	-0.23	34.27	46.00	-11.73 Peak
5	799.210	36.00	0.77	36.77	46.00	-9.23 Peak
6	960.230	32.50	3.40	35.90	54.00	-18.10 Peak

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

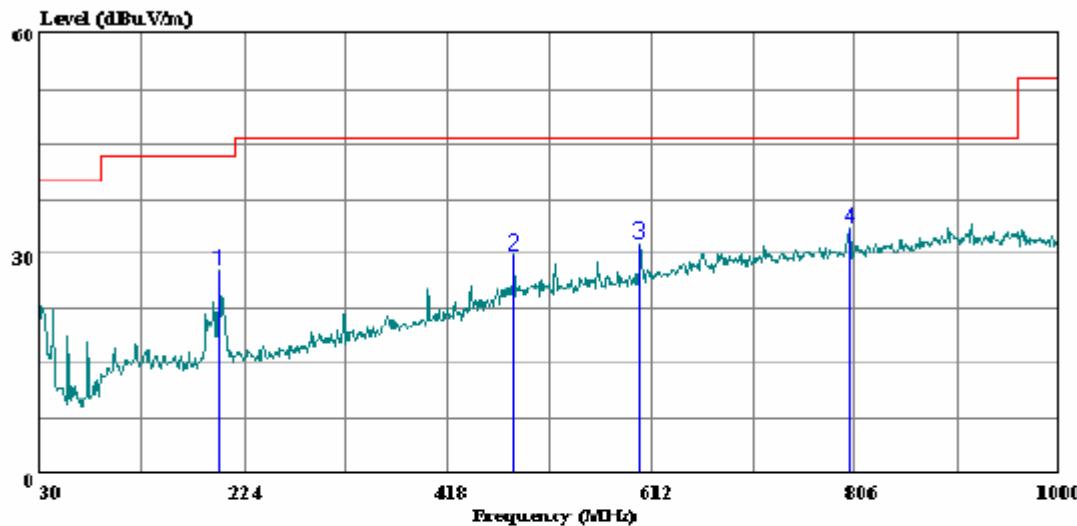
**VERTICAL PLOT & DATA**



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 35 File#: 09u12366.emi

Date: 02-03-2009 Time: 13:38:01



Trace: 34

Ref Trace:

Condition: FCC CLASS-B 3m VERTICAL  
Test Operator:: Thanh Nguyen  
Project #: : 09U12336  
Company: : Meraki Inc.  
Model: : MR58  
Configuration:: EUT, Laptop, Antenna  
Mode : : EUT Power up with DC PWR Supply  
Target: : FCC Class B  
: EUT w/Flat Panel Antenna  
: DC Power on

Page: 1

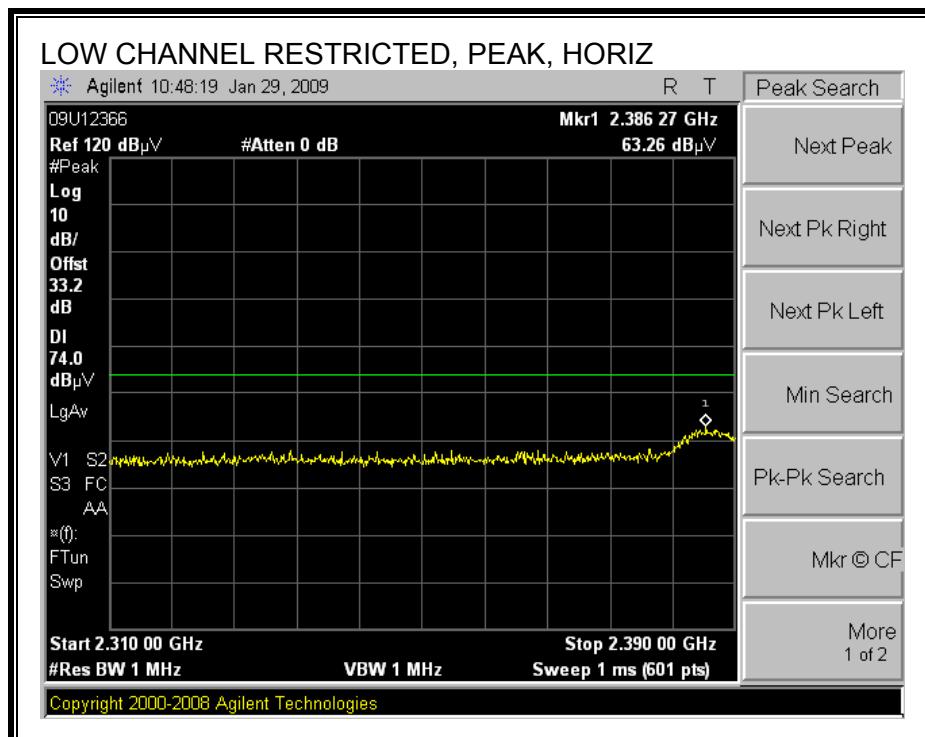
Freq	Read		Limit		Over		Remark
	Level	Factor	Level	Line	Limit	dB	
MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	199.750	40.50	-12.77	27.73	43.50	-15.77	Peak
2	481.050	35.33	-5.37	29.96	46.00	-16.04	Peak
3	600.360	34.33	-2.83	31.50	46.00	-14.50	Peak
4	801.150	32.67	0.73	33.40	46.00	-12.60	Peak

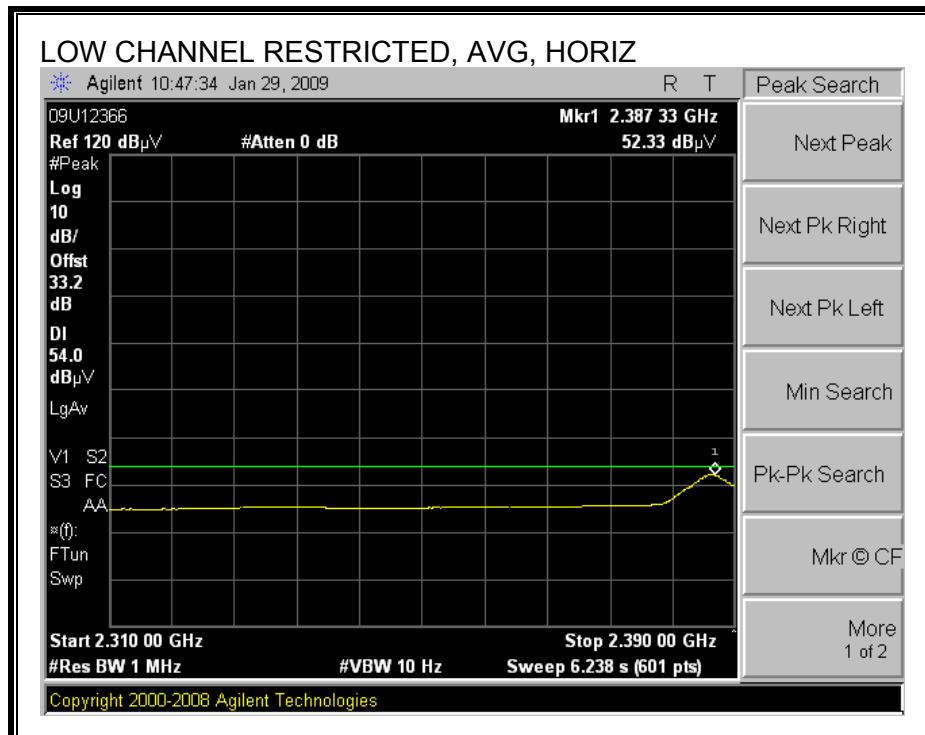
## 7.4. DIRECTIONAL ANTENNA FOR 2.4GHz 11.5dBi

### 7.4.1. TX ABOVE 1 GHz FOR 802.11b

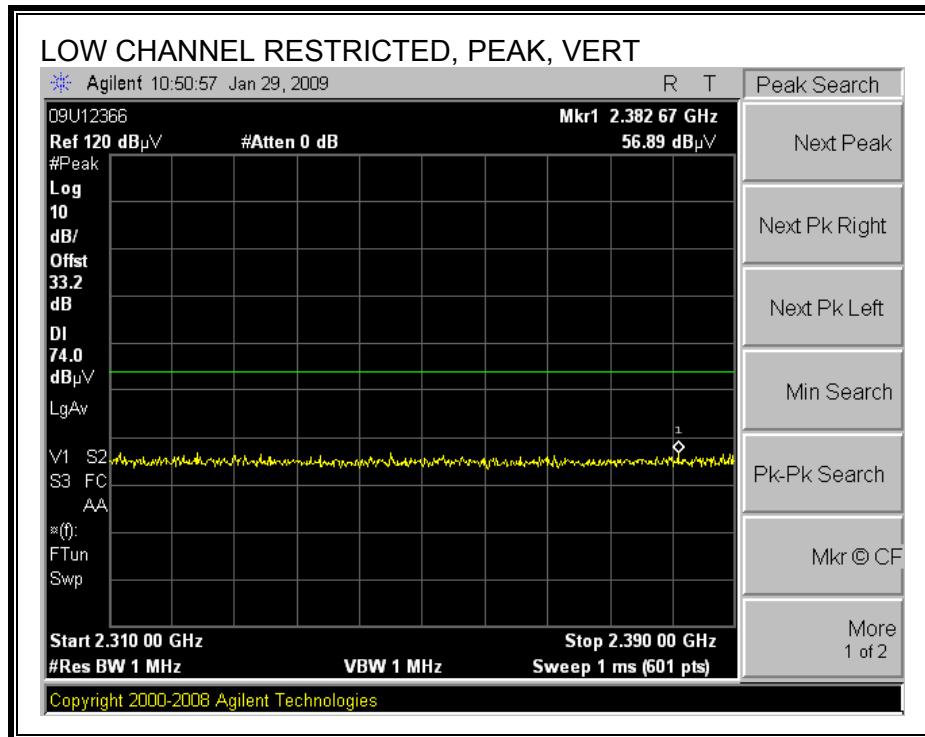
MODE 100:

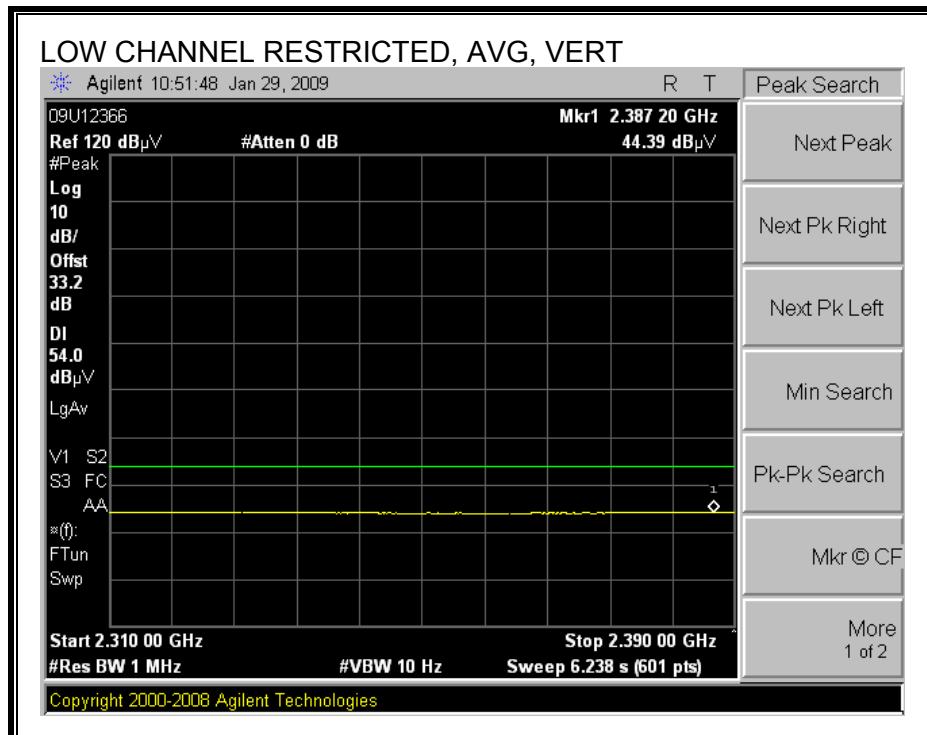
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



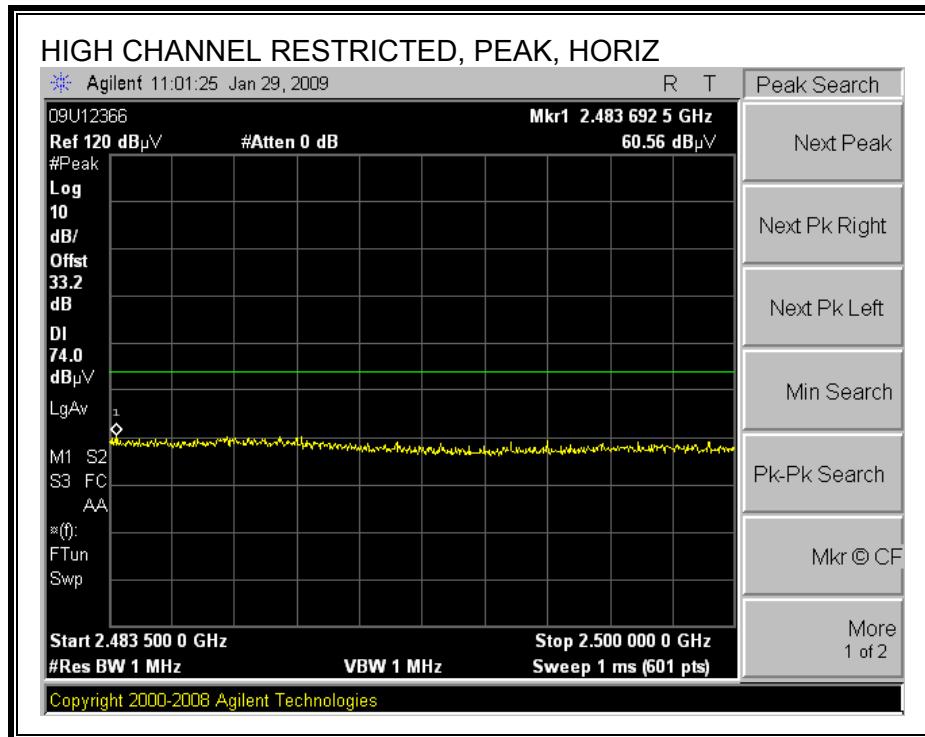


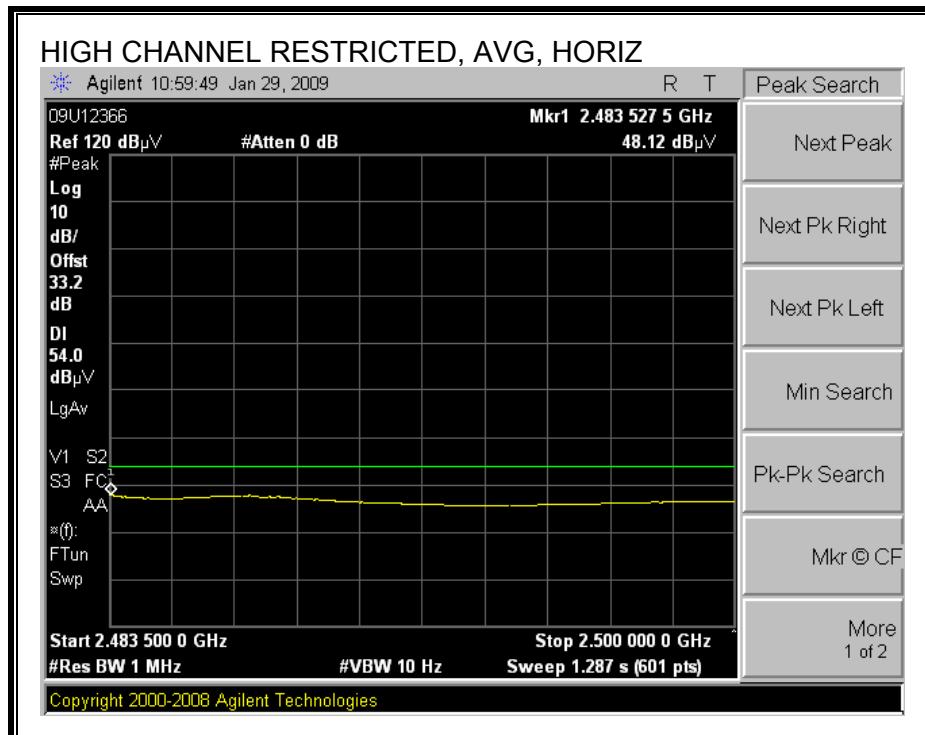
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



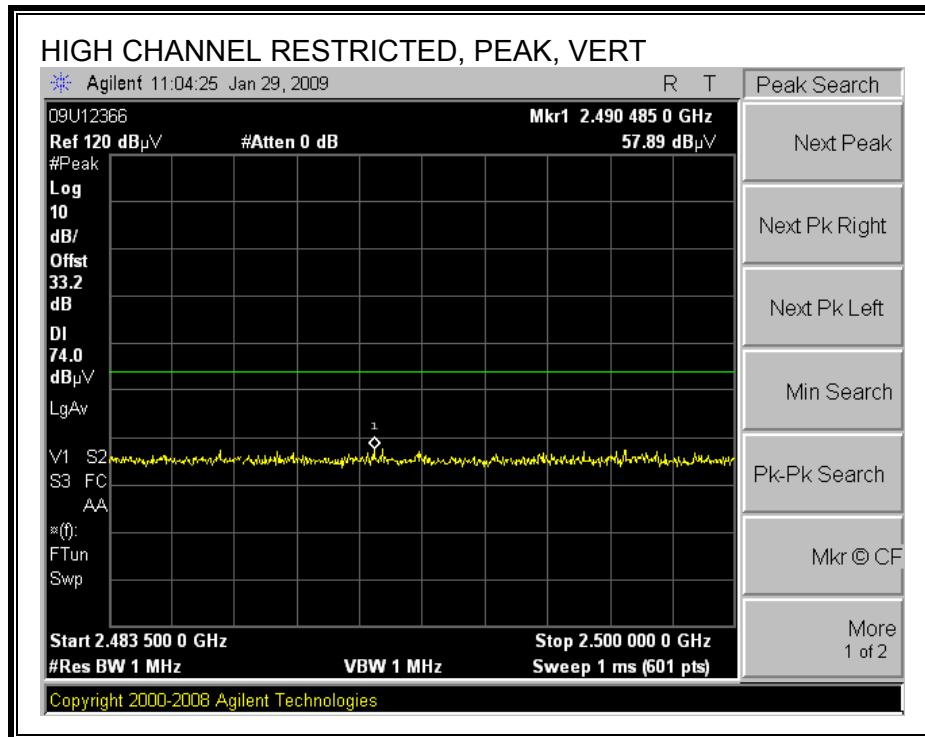


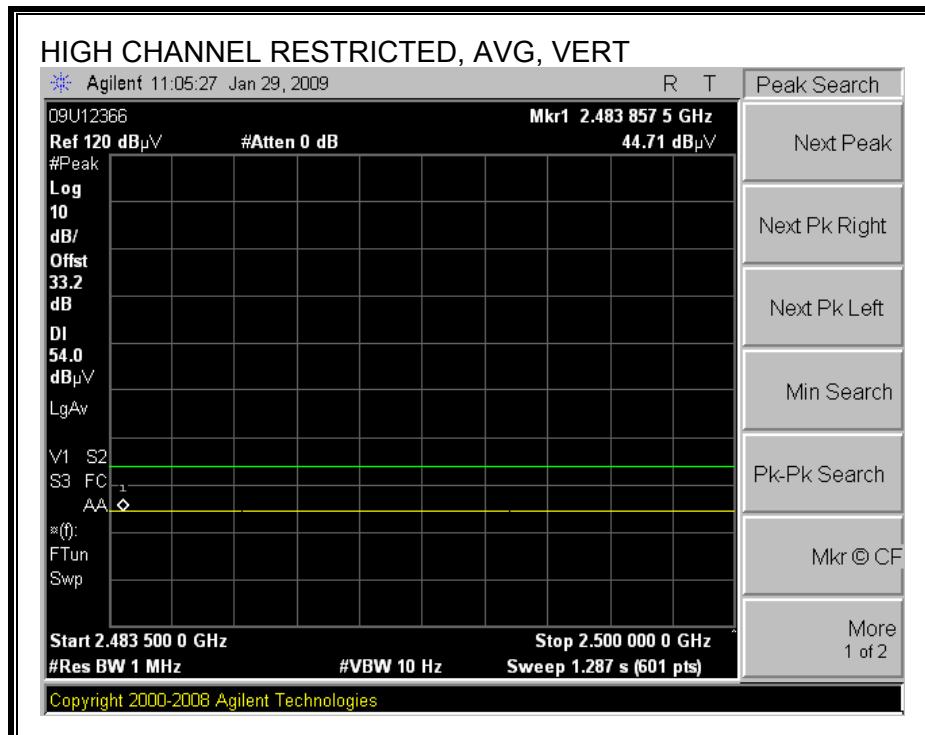
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





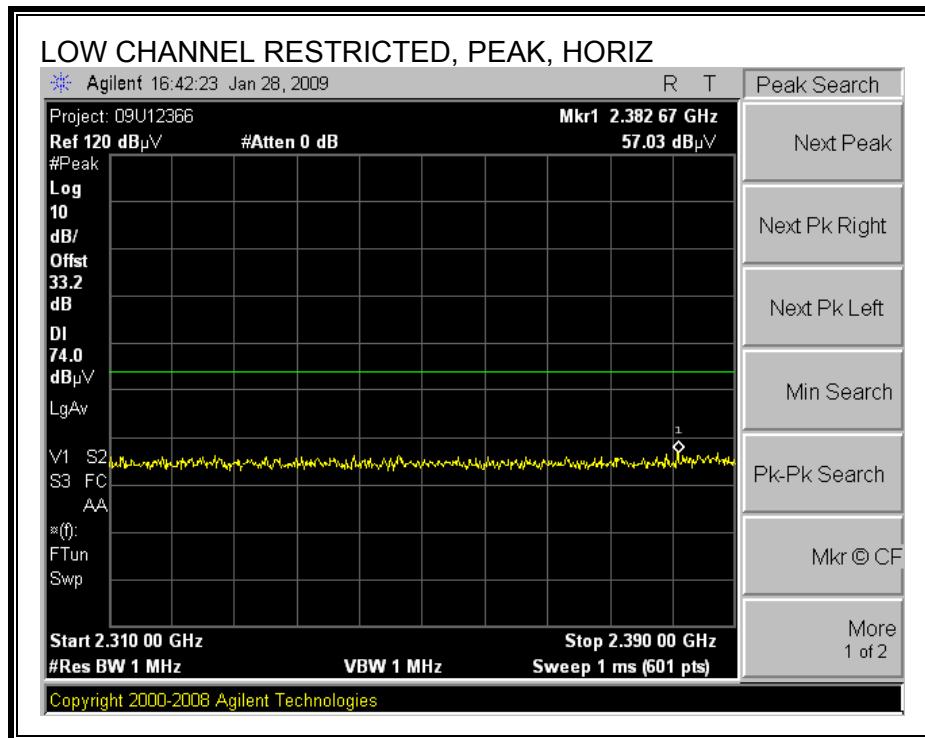
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

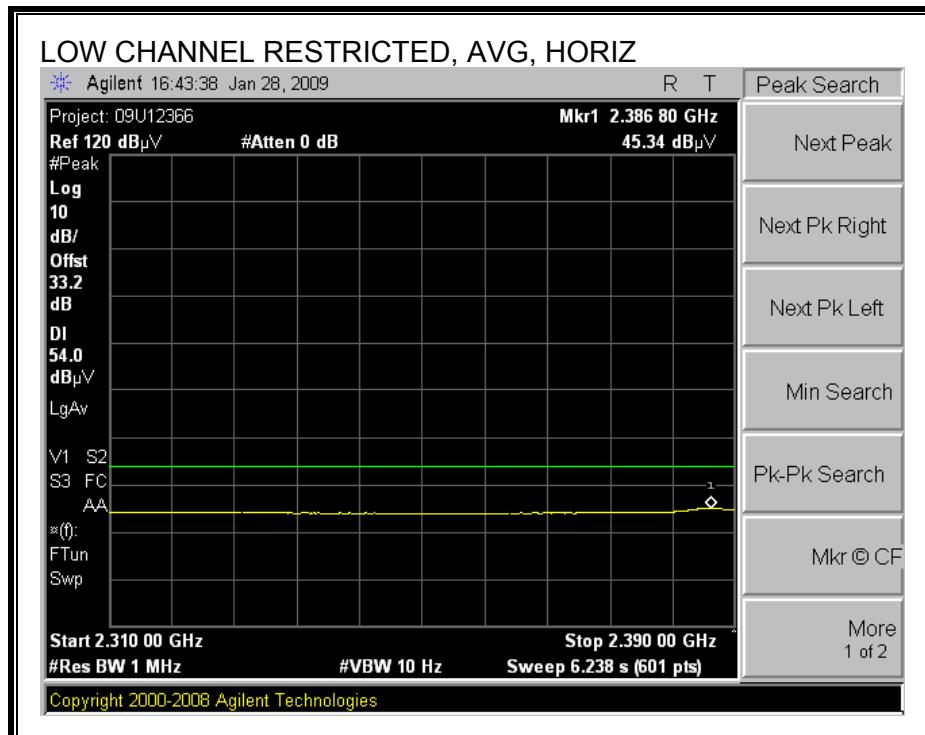




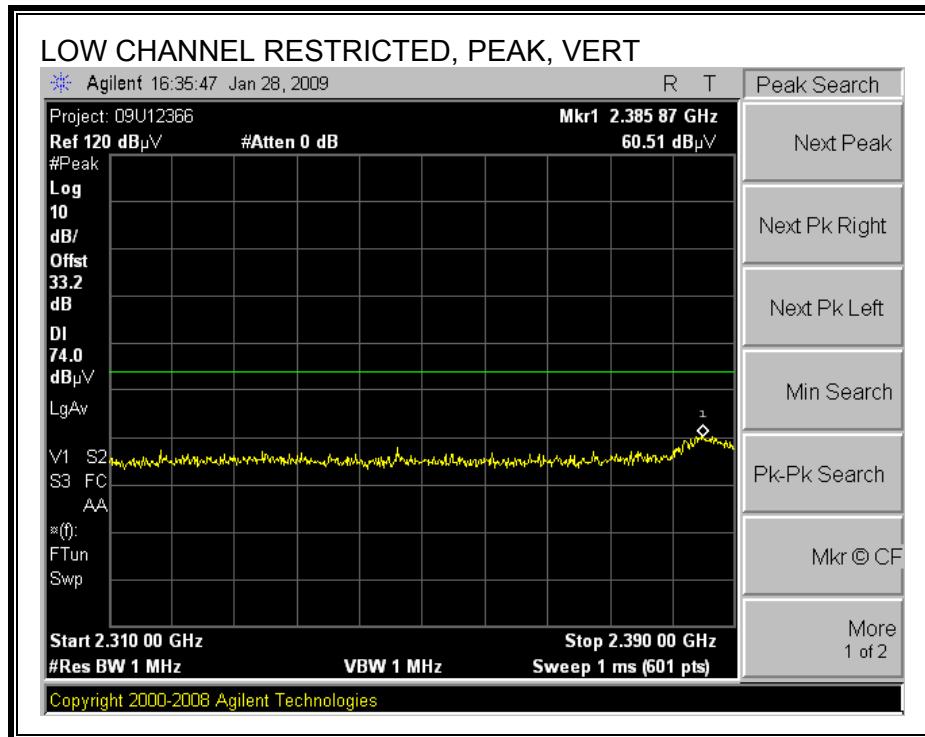
**MODE 010:**

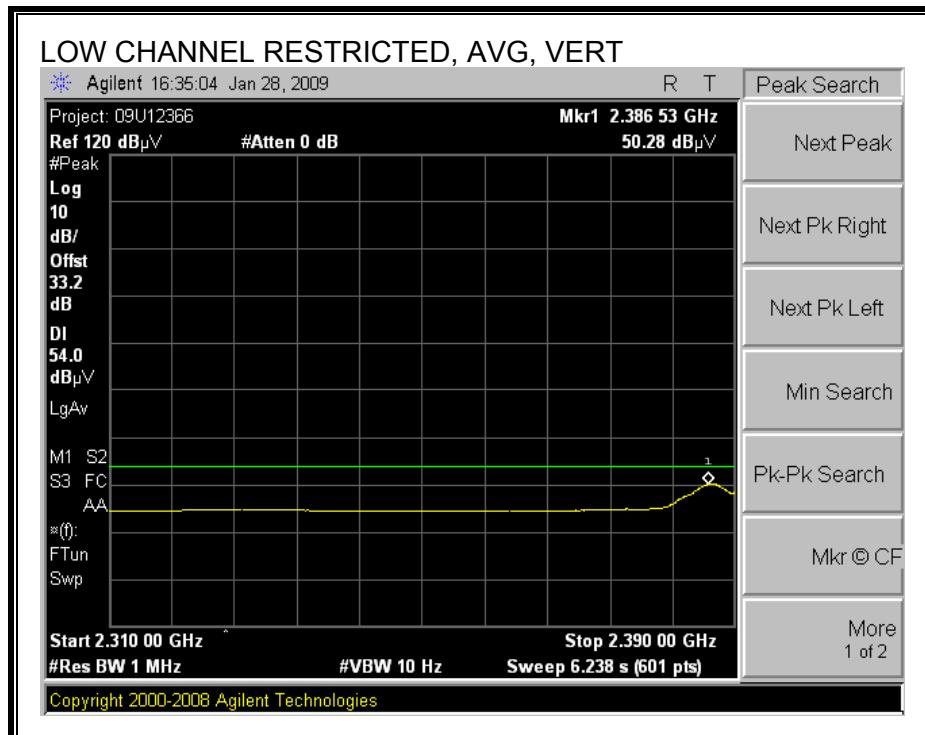
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



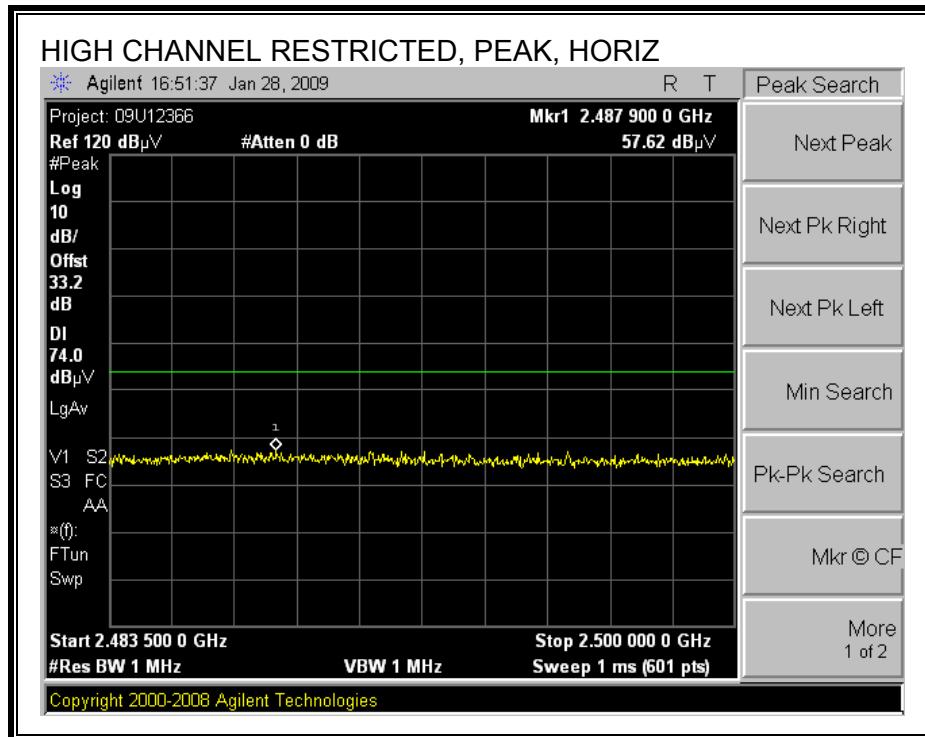


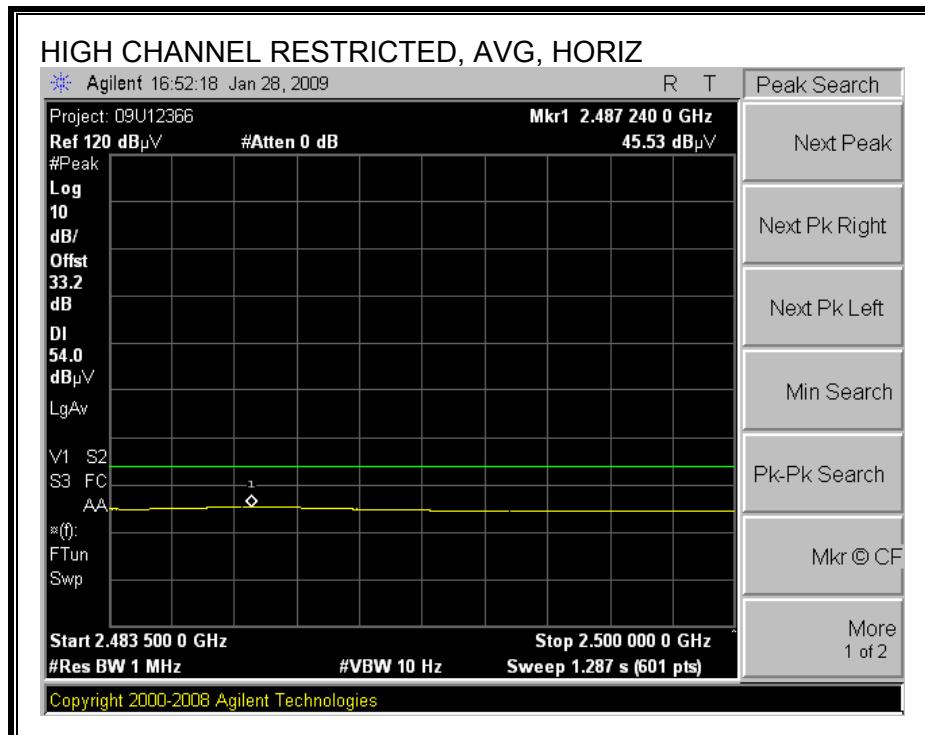
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



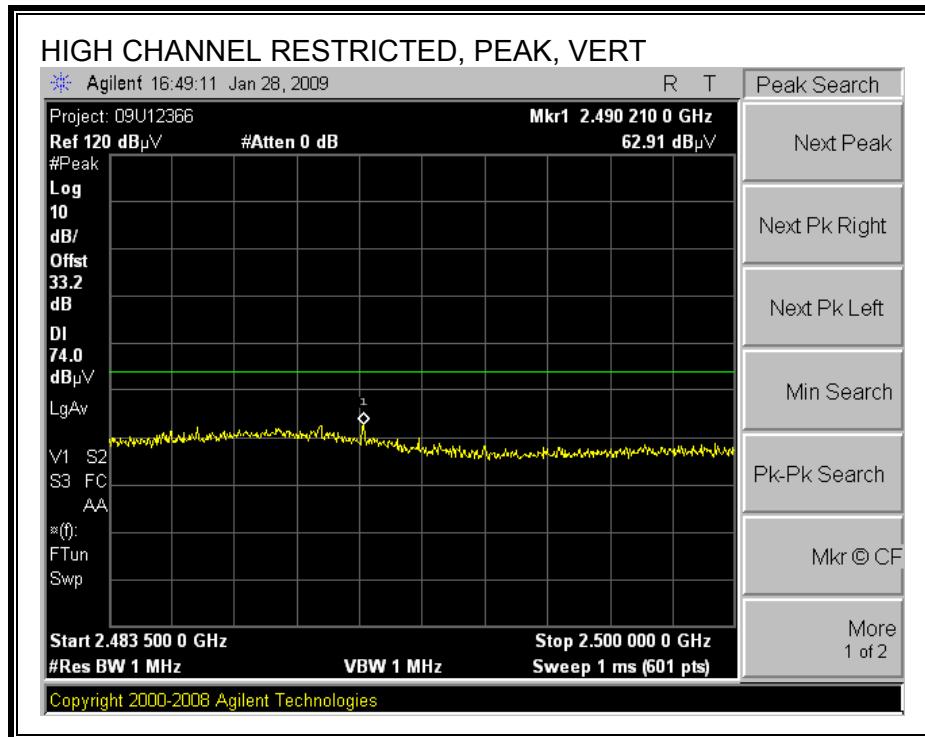


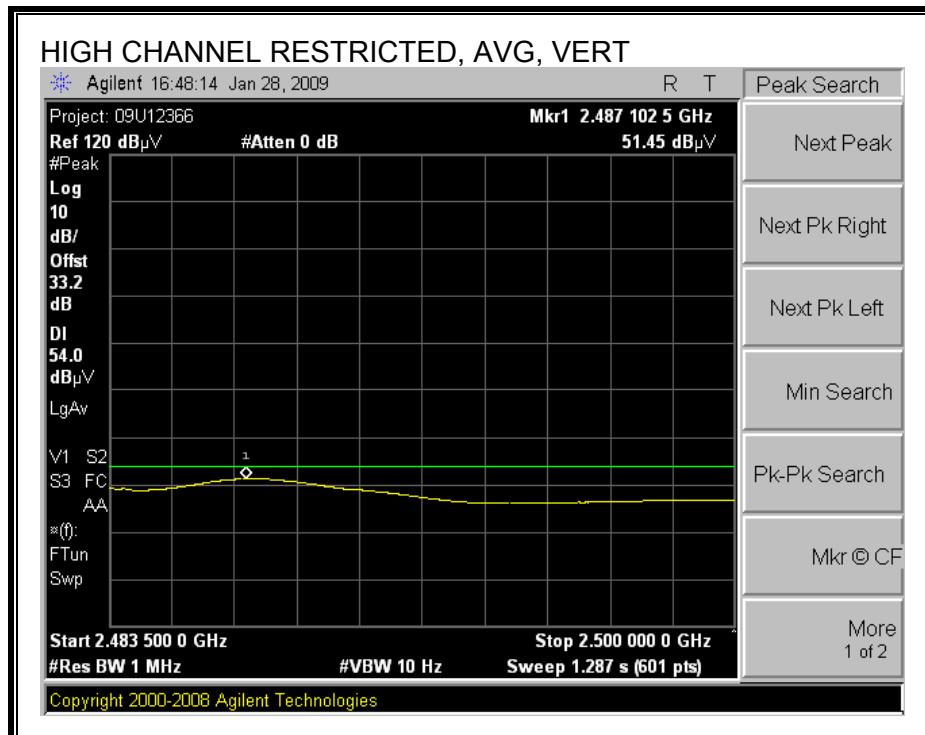
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





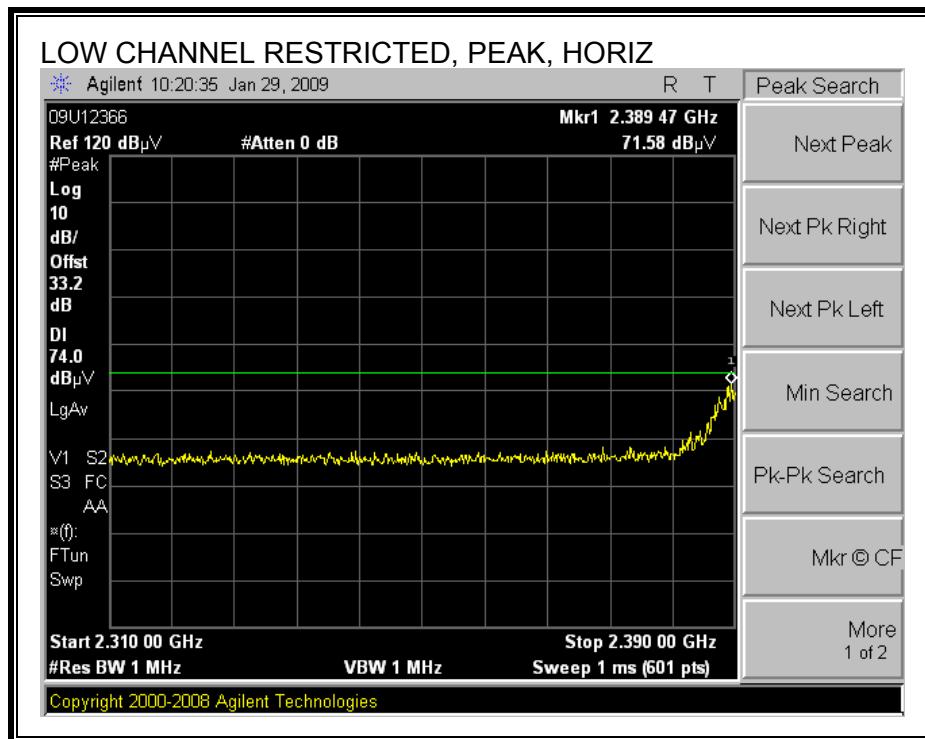
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

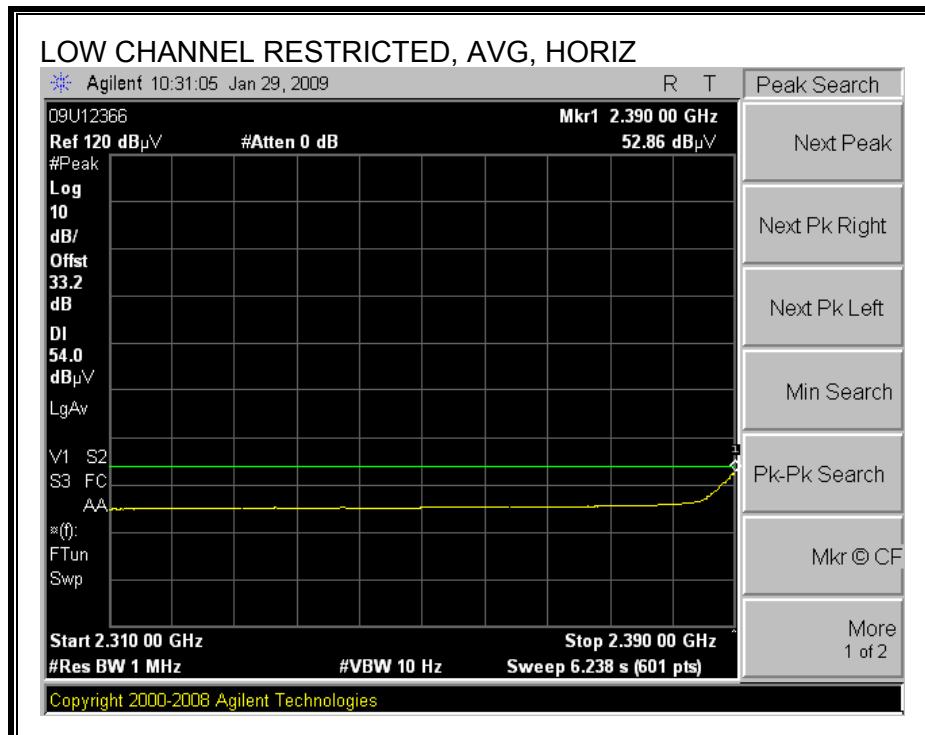




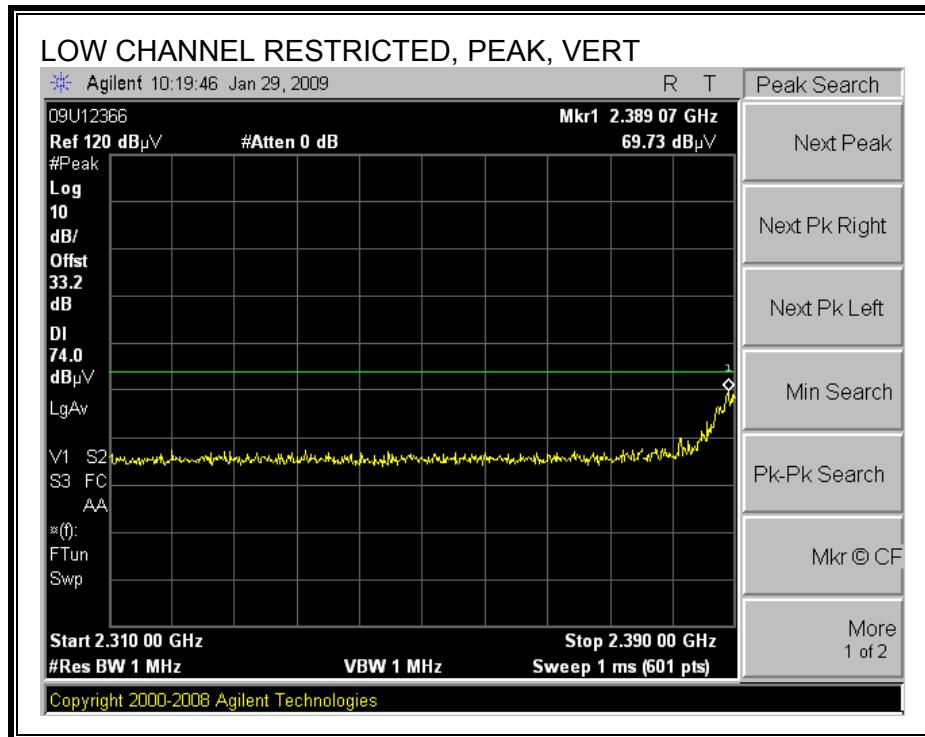
**MODE 110 (HT20):**

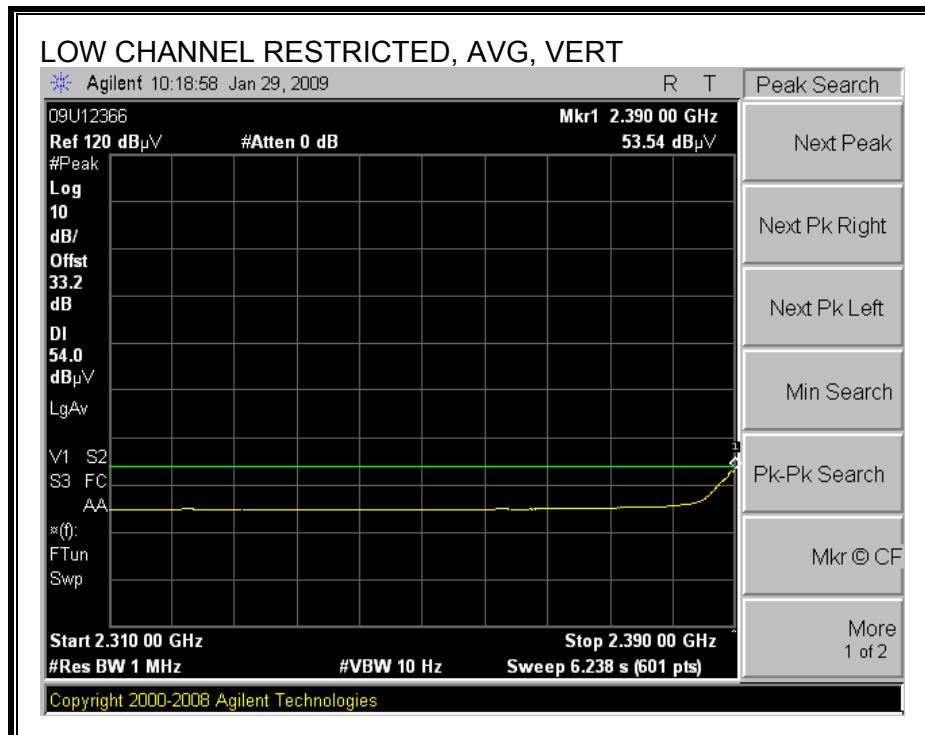
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



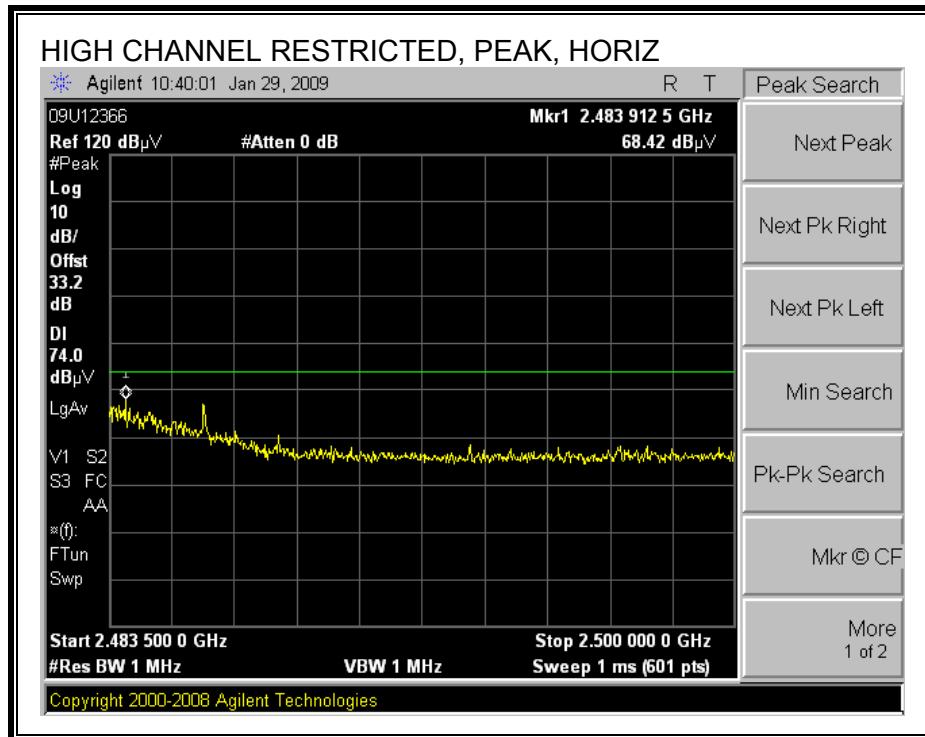


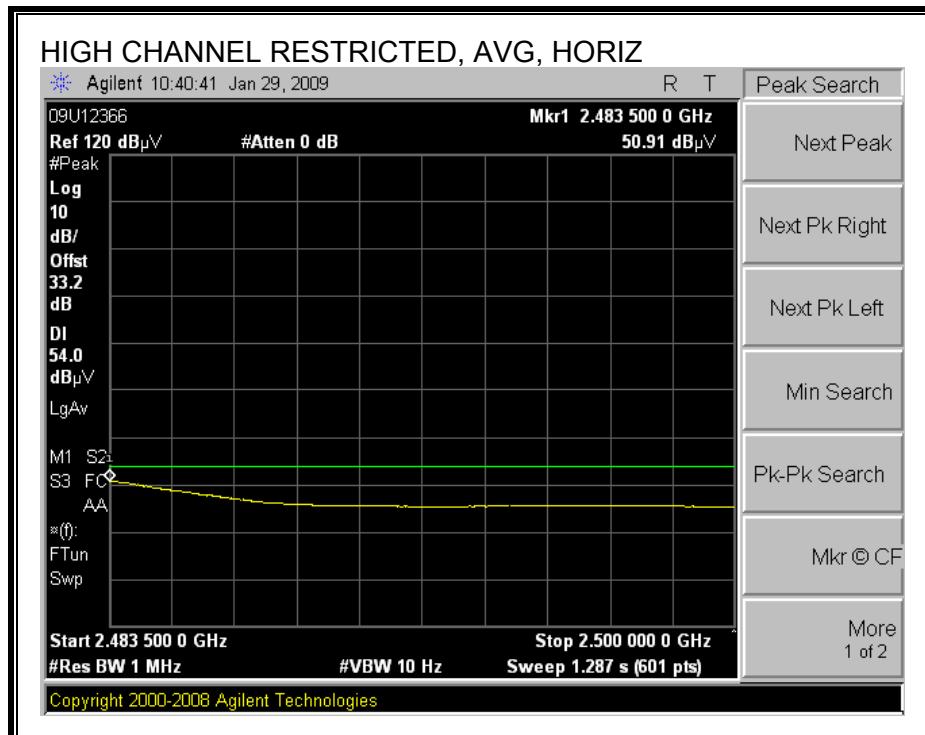
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



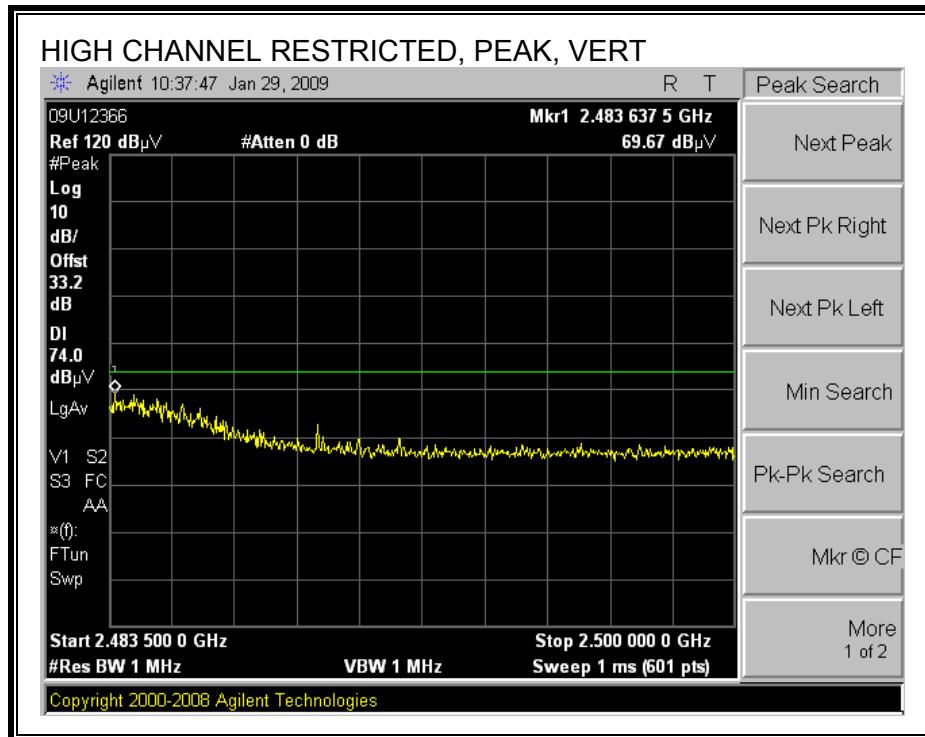


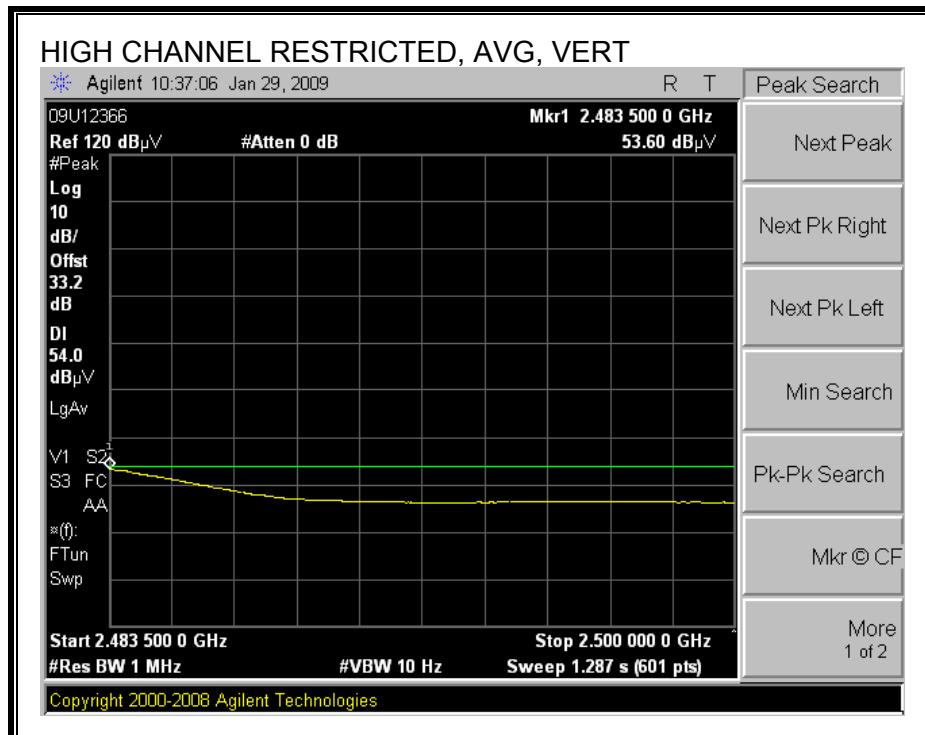
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





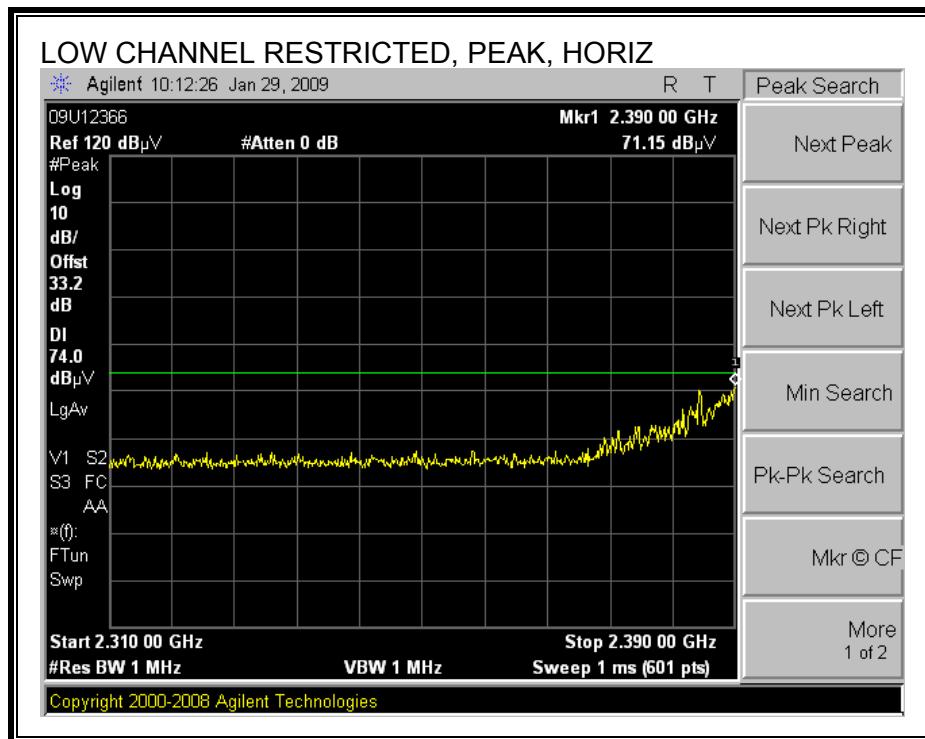
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

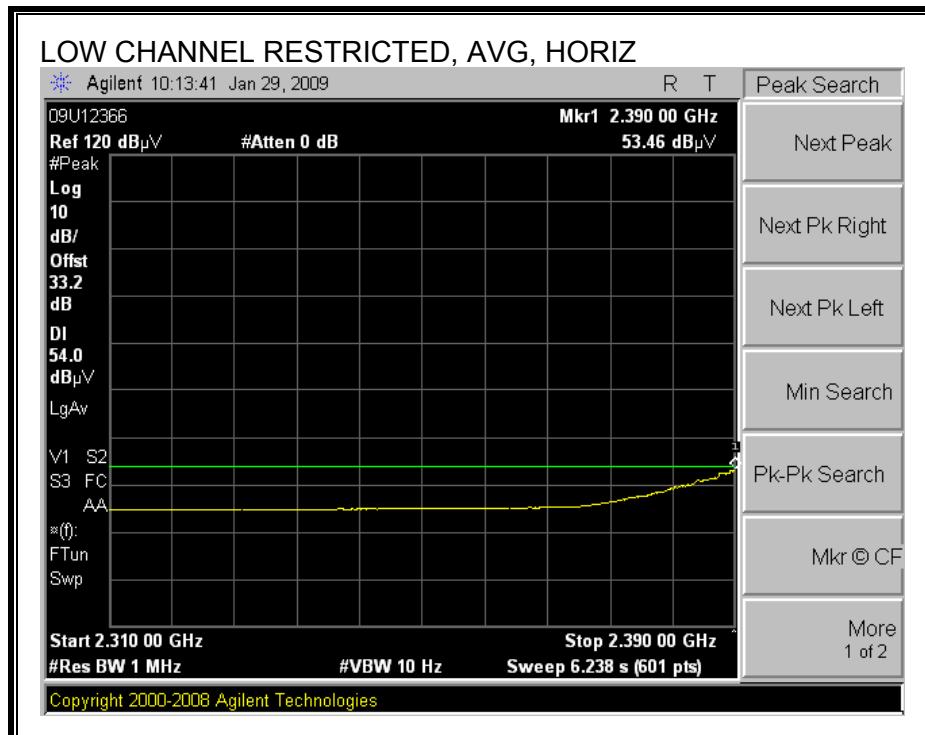




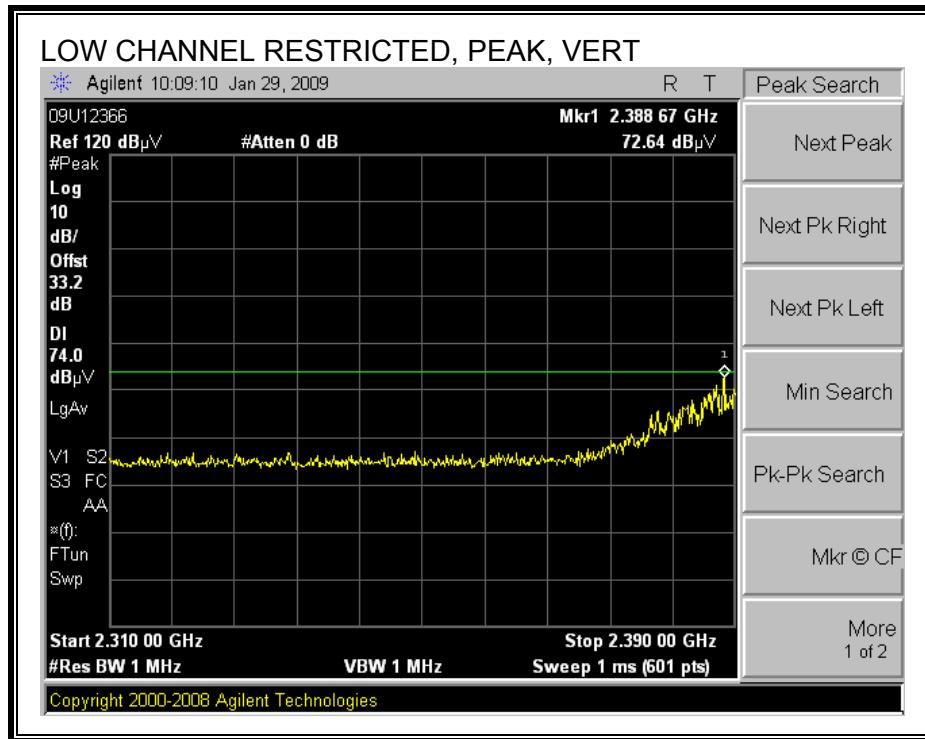
**MODE 110 (HT 40):**

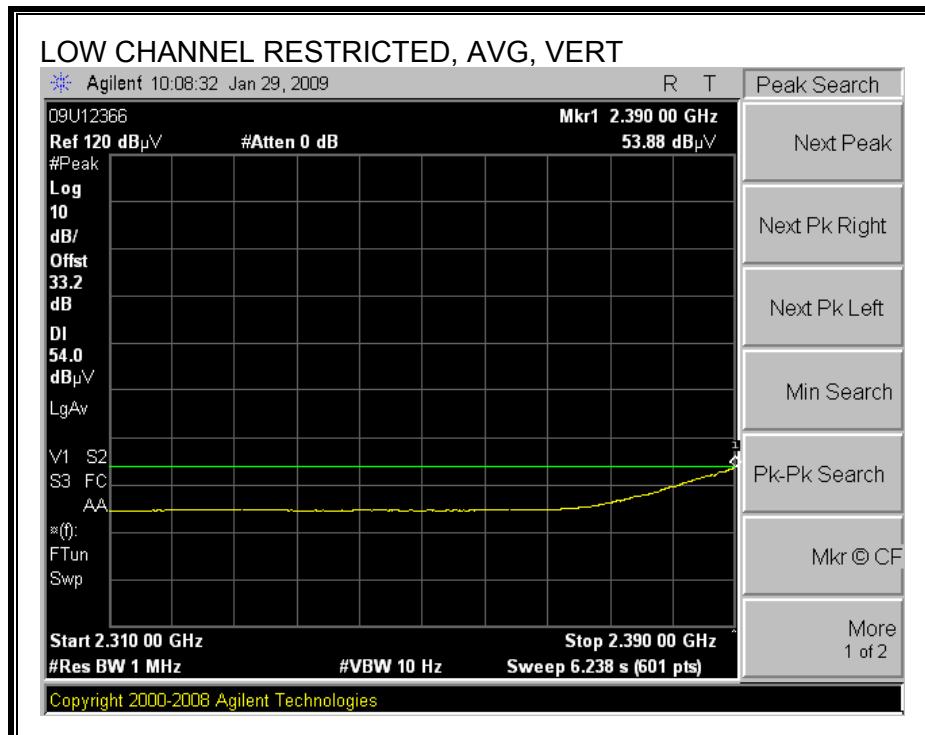
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



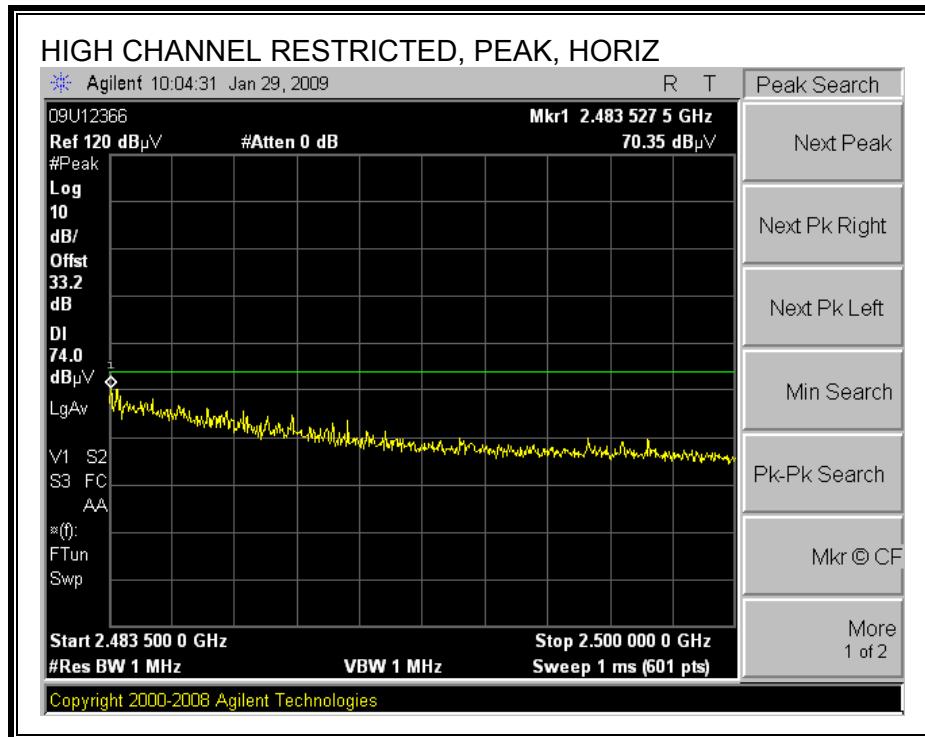


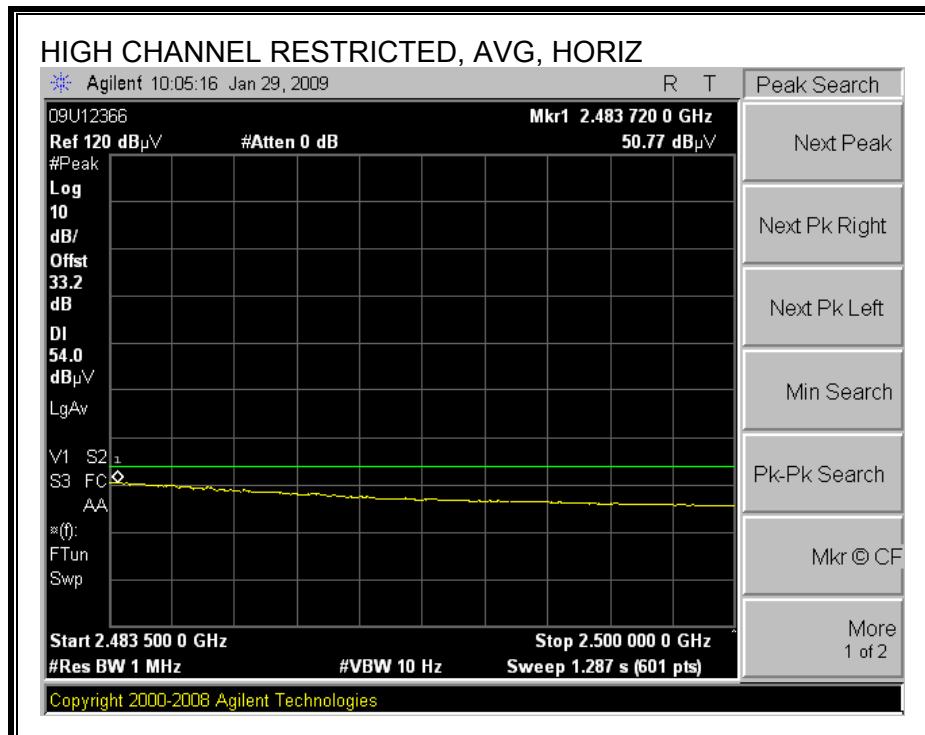
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



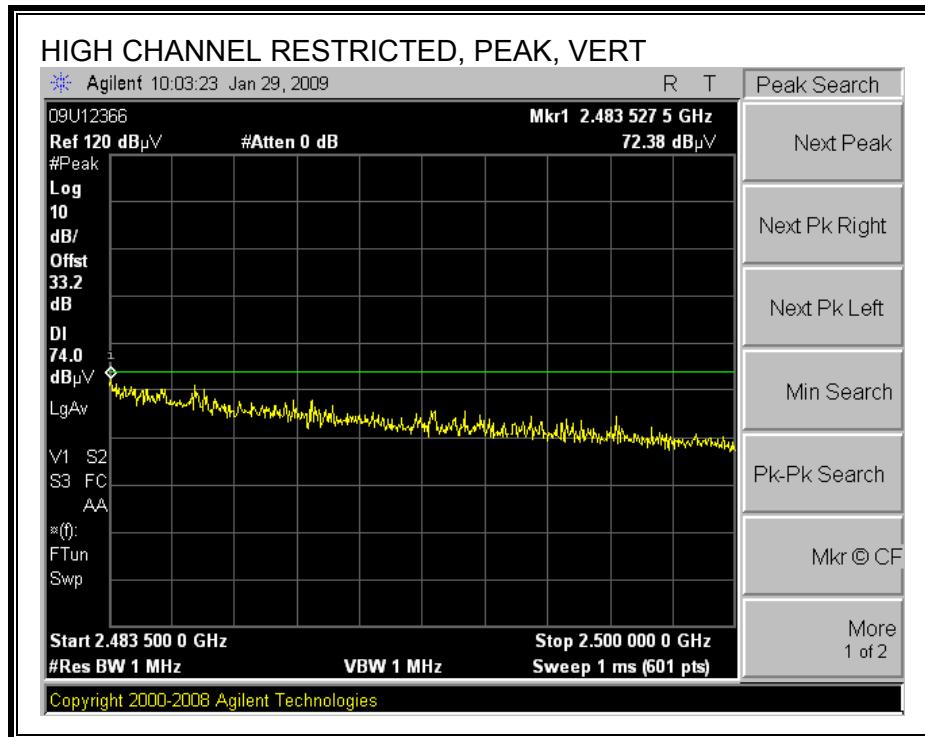


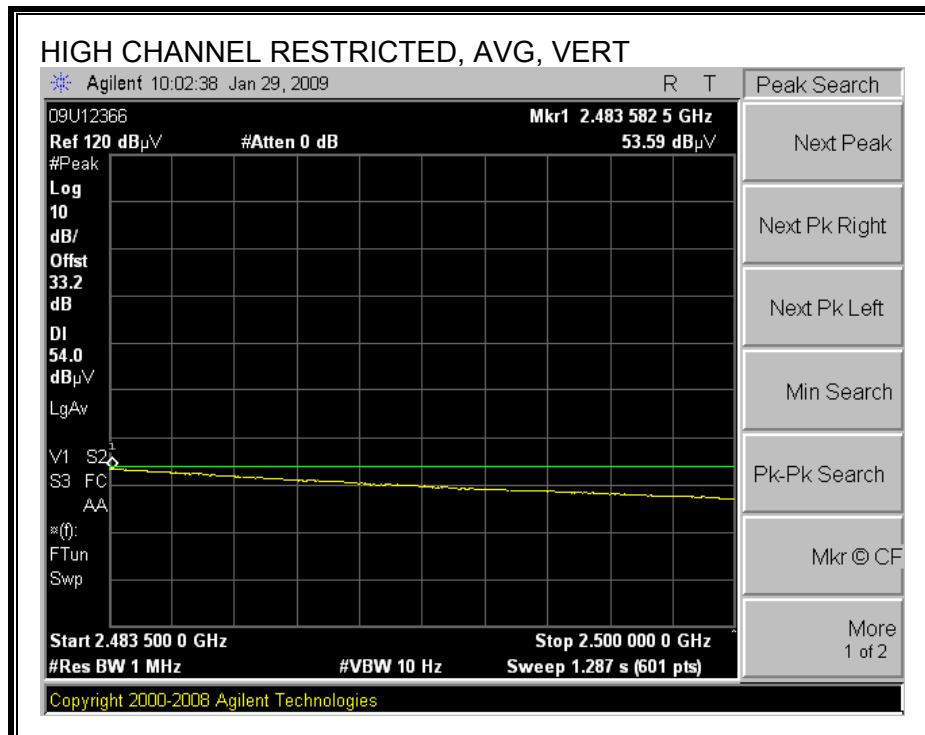
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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

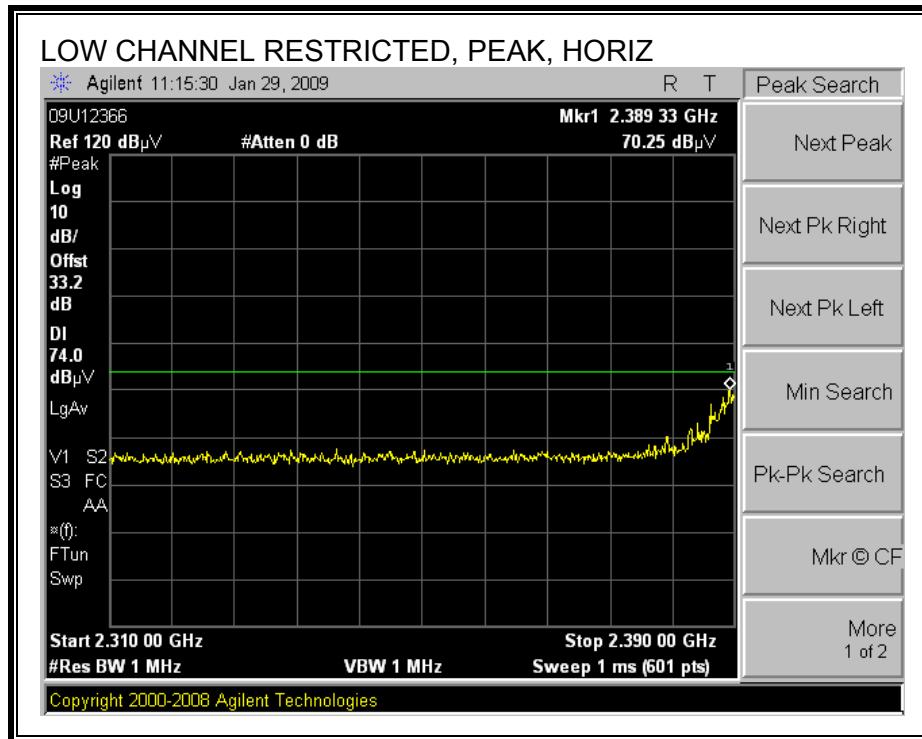


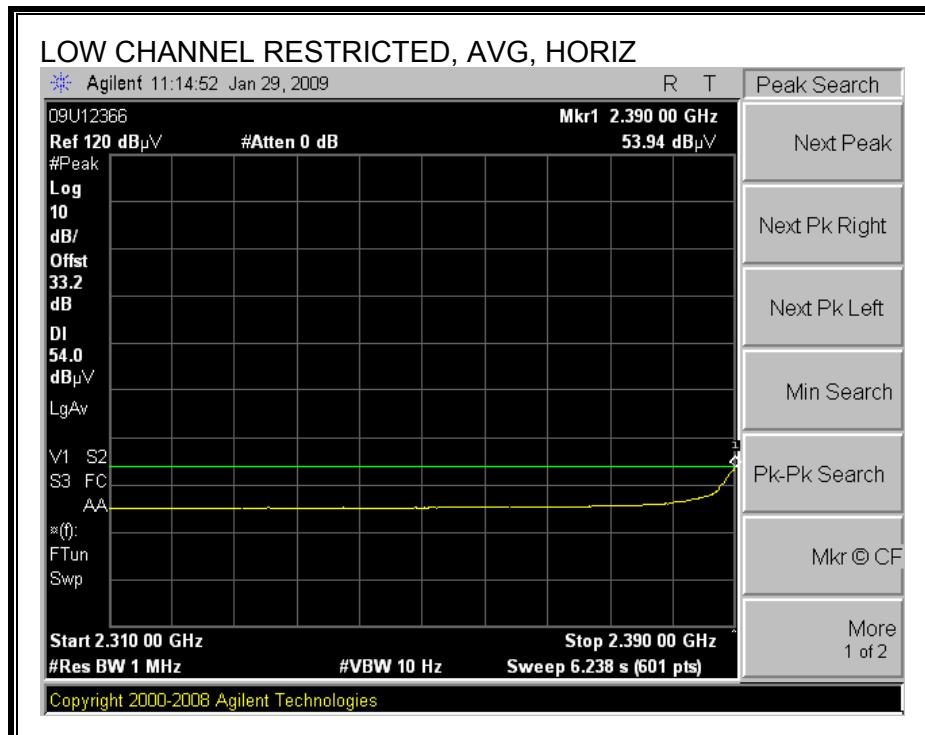


### 7.4.2. TX ABOVE 1 GHz FOR 802.11g

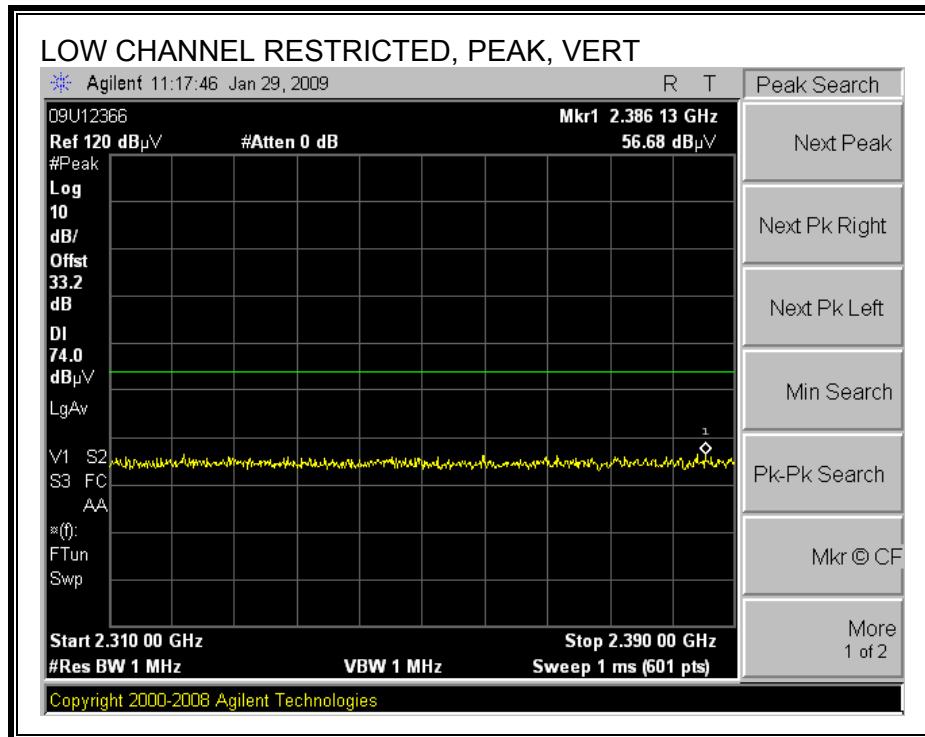
MODE 100:

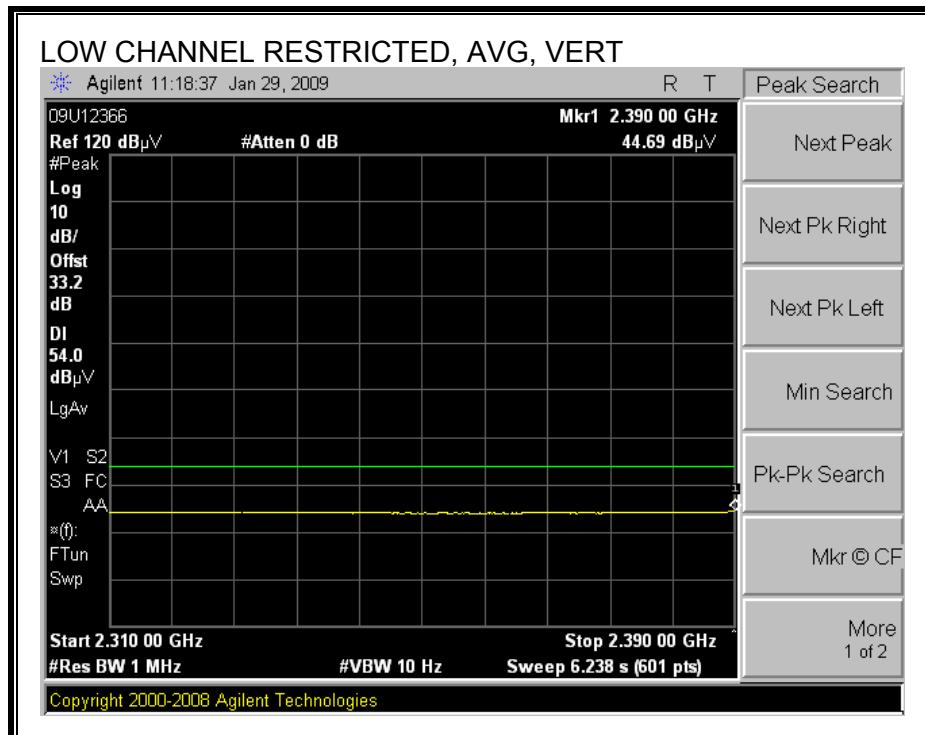
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



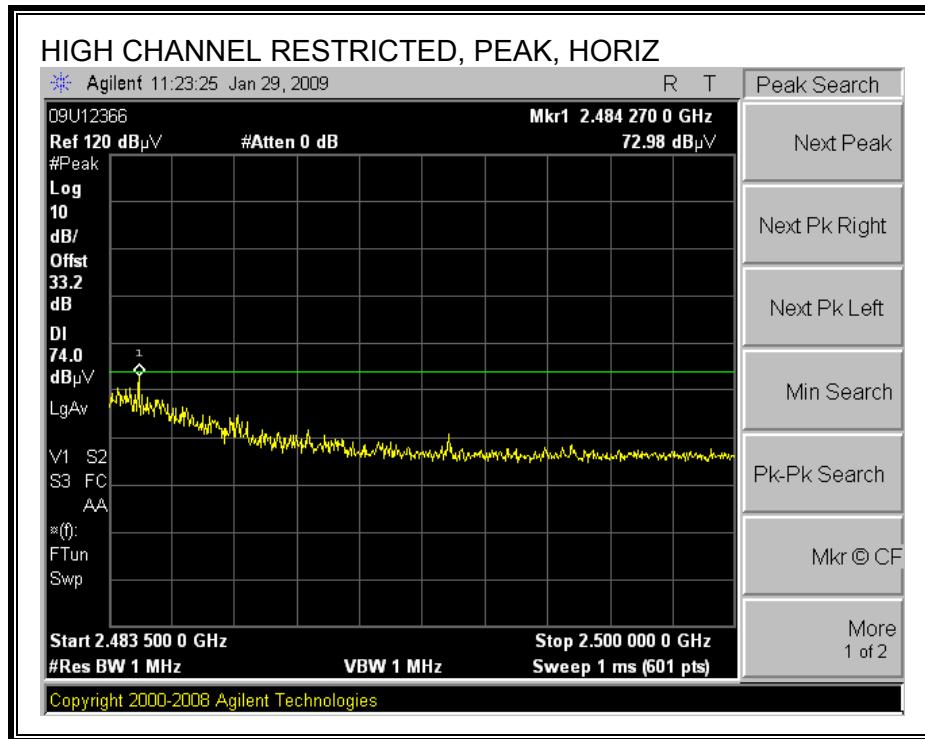


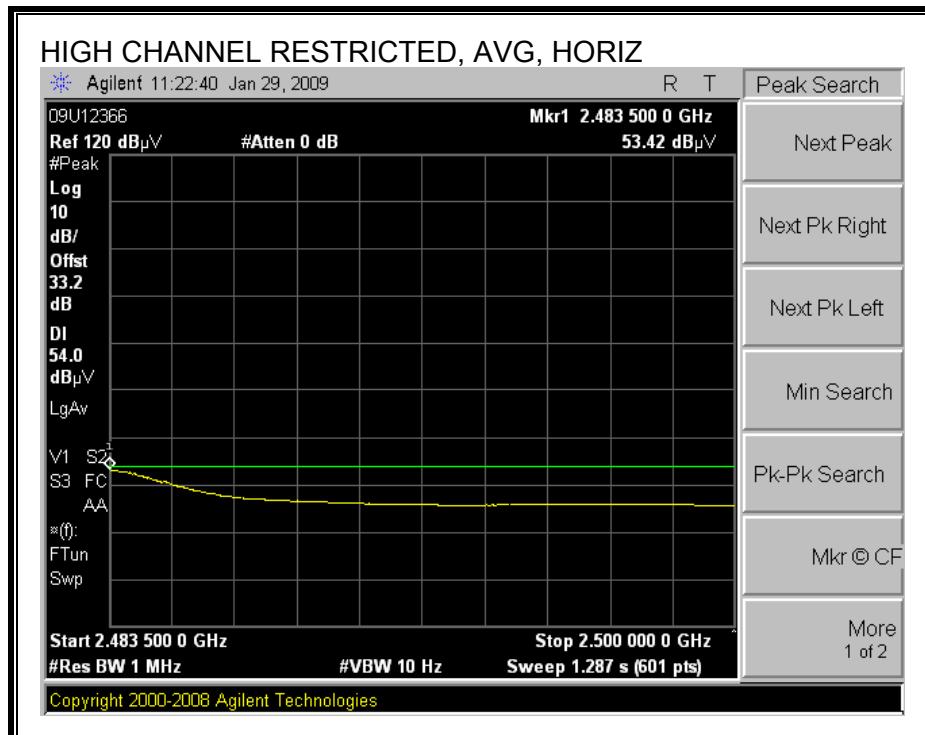
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



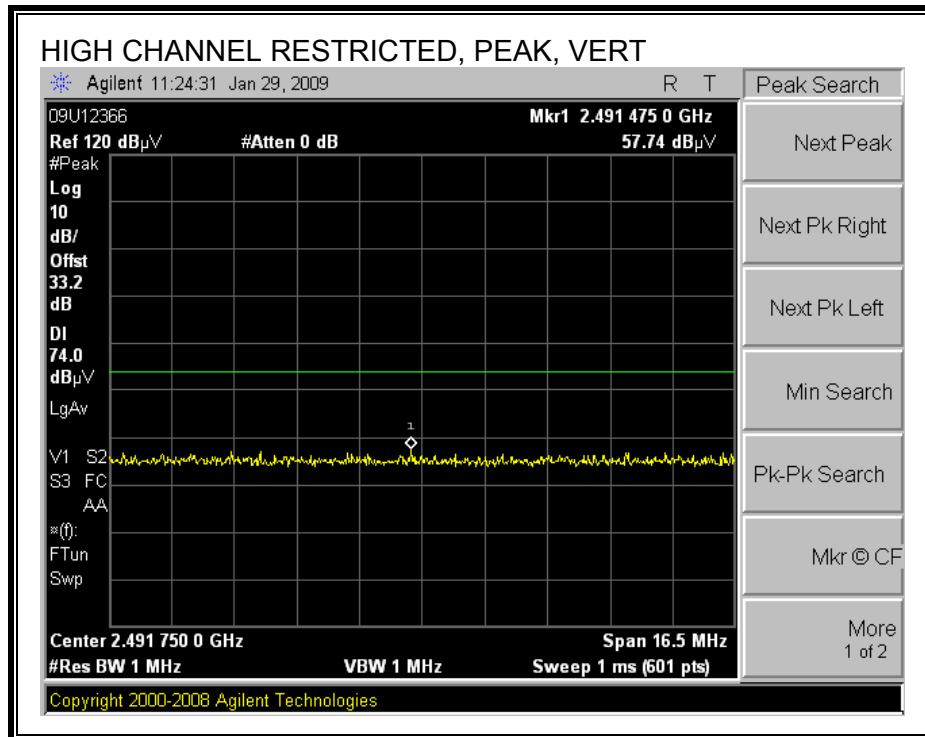


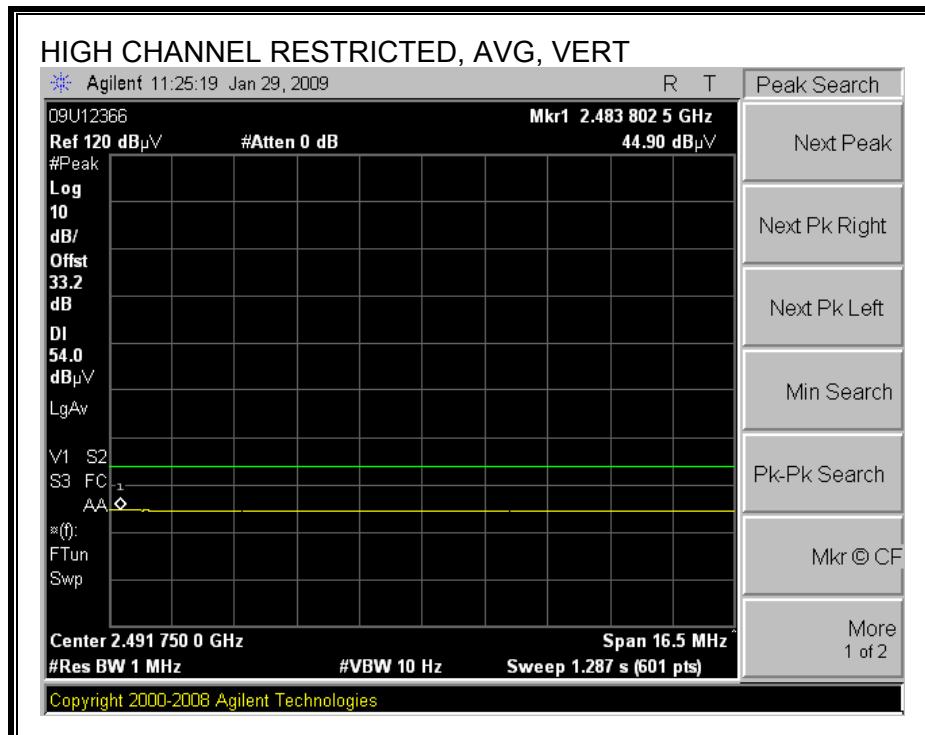
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





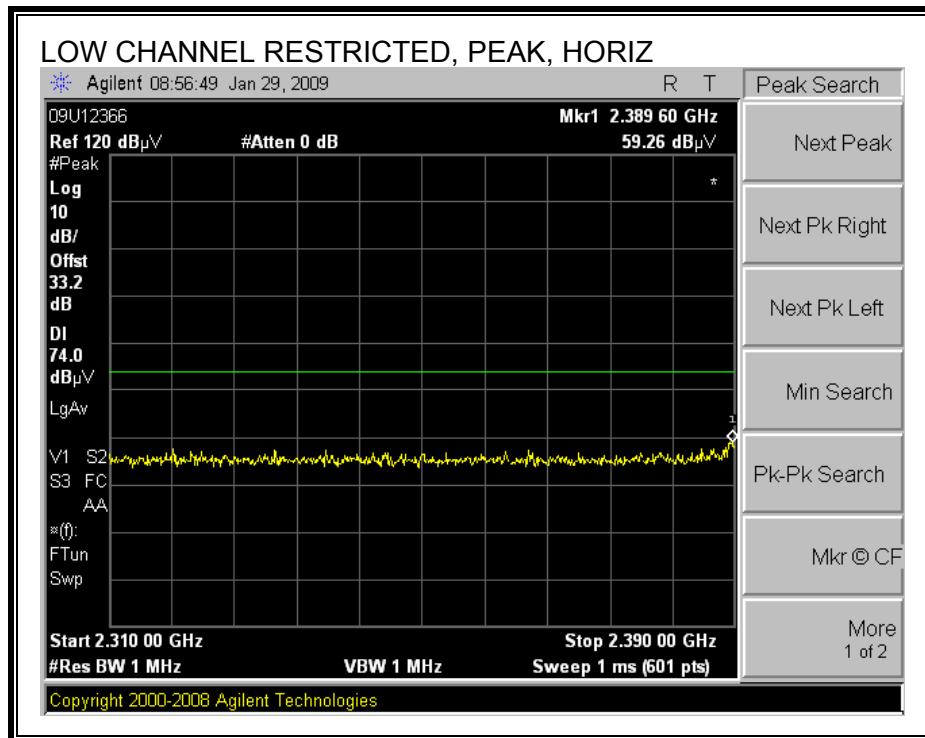
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

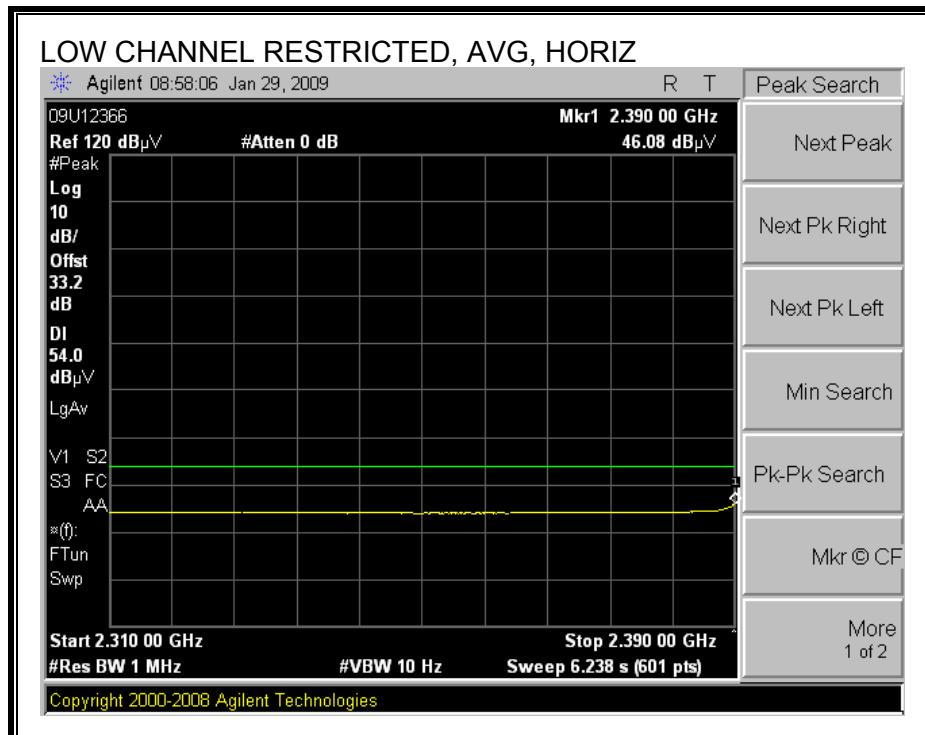




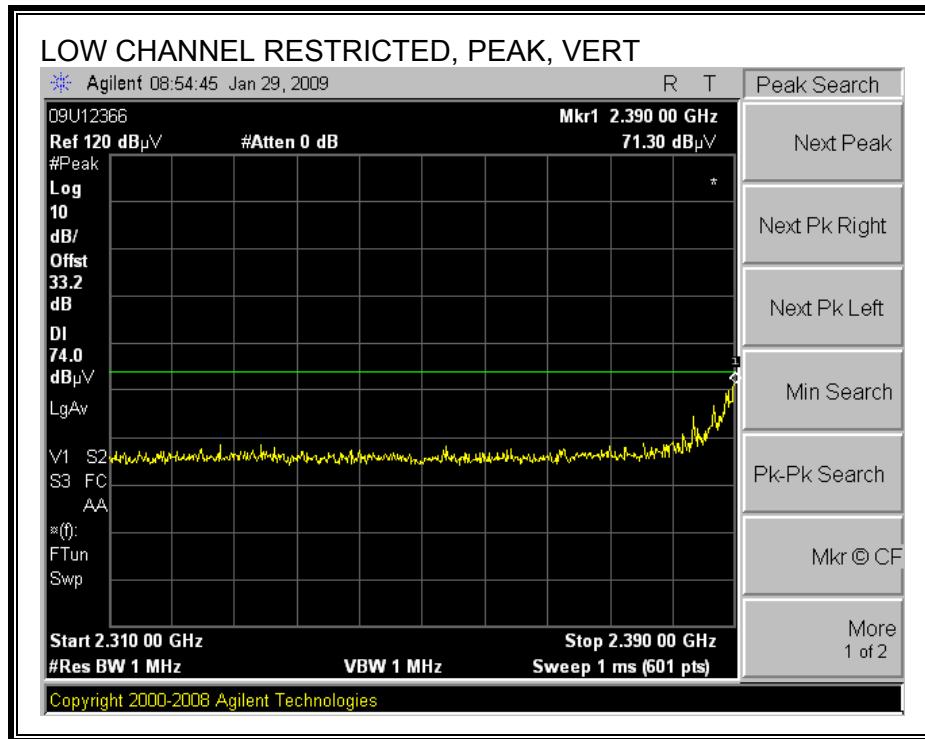
**MODE 010:**

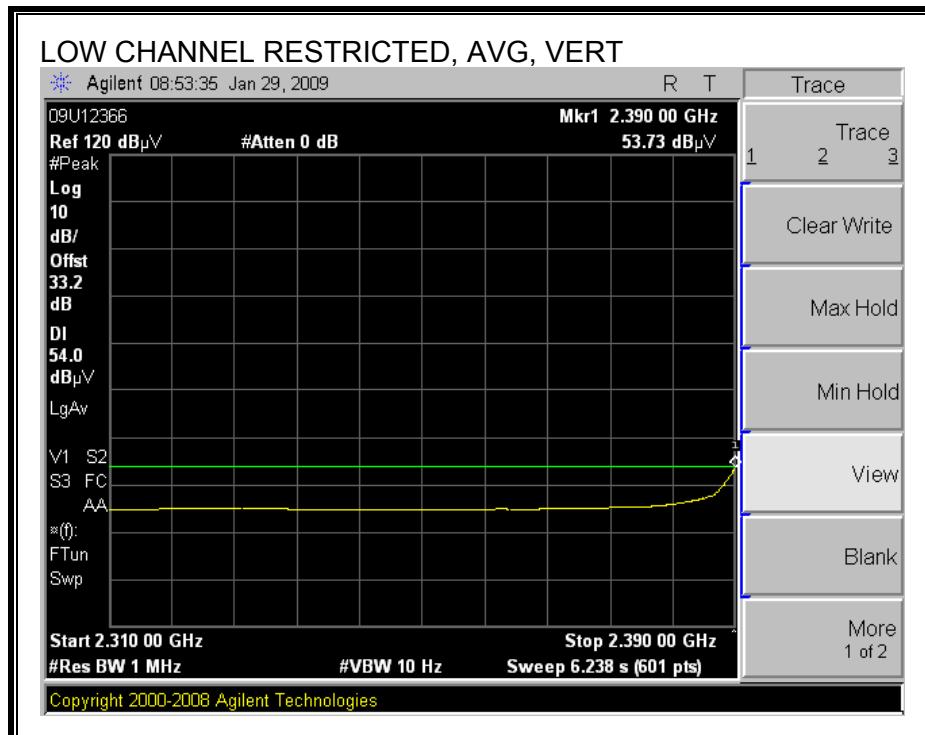
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



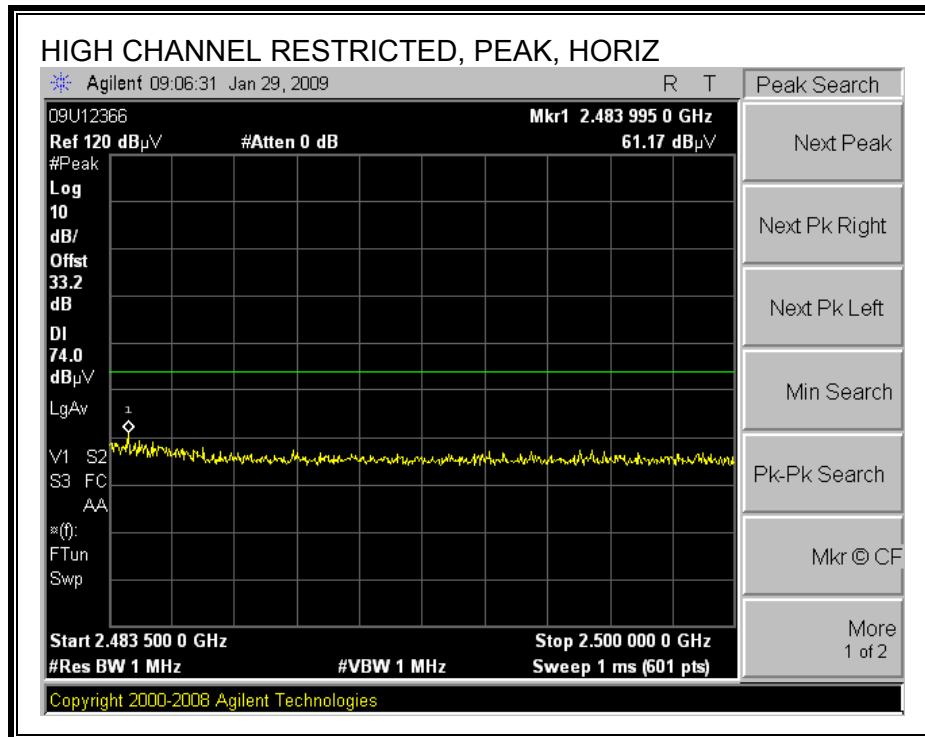


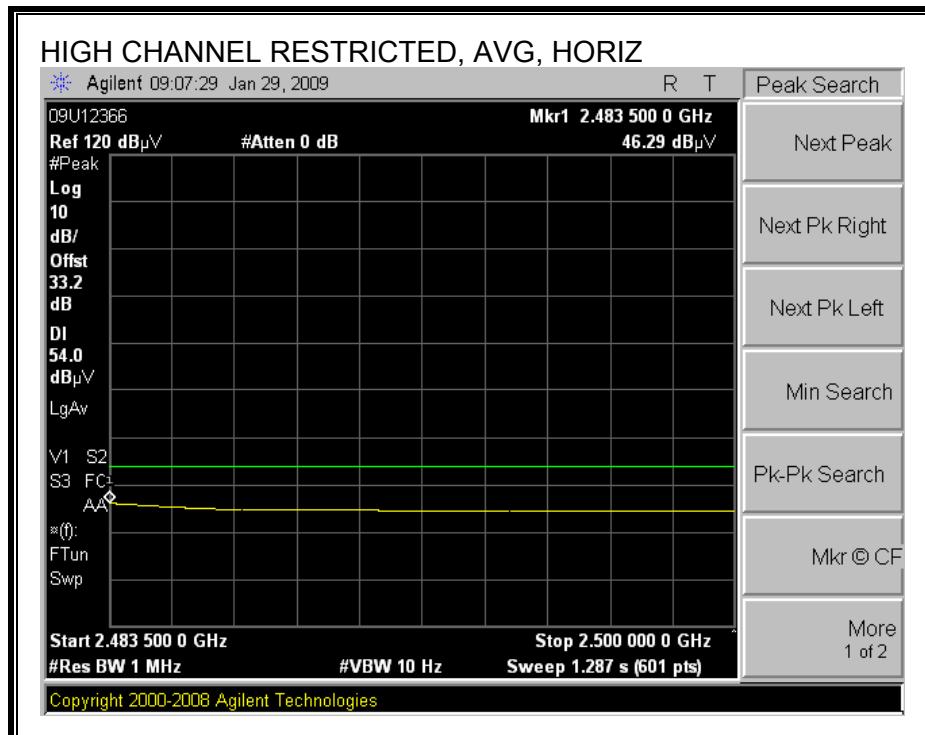
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



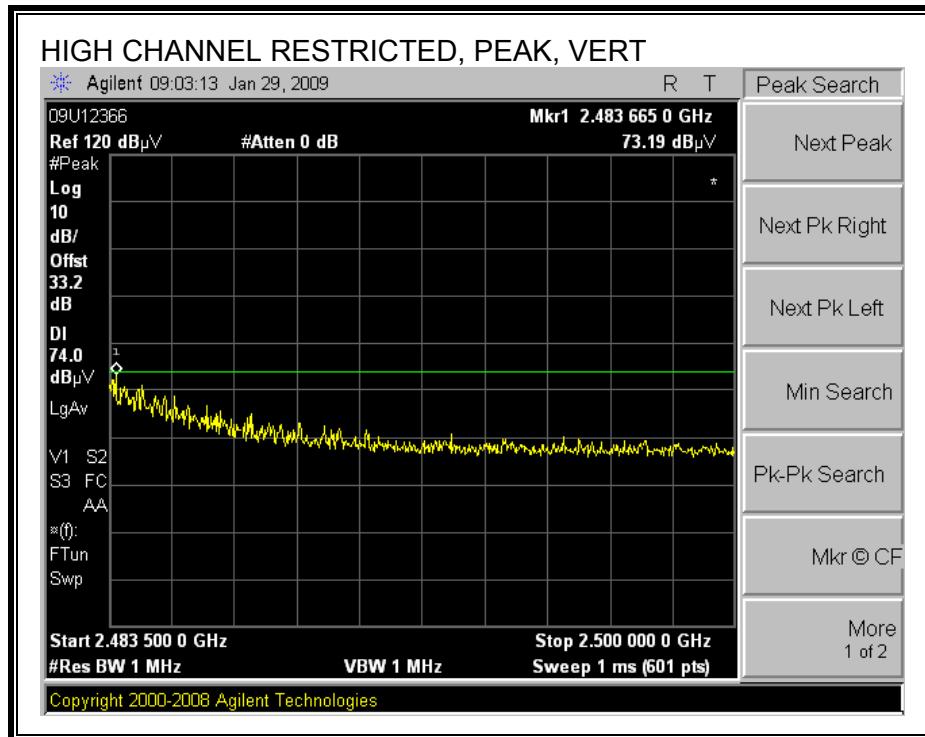


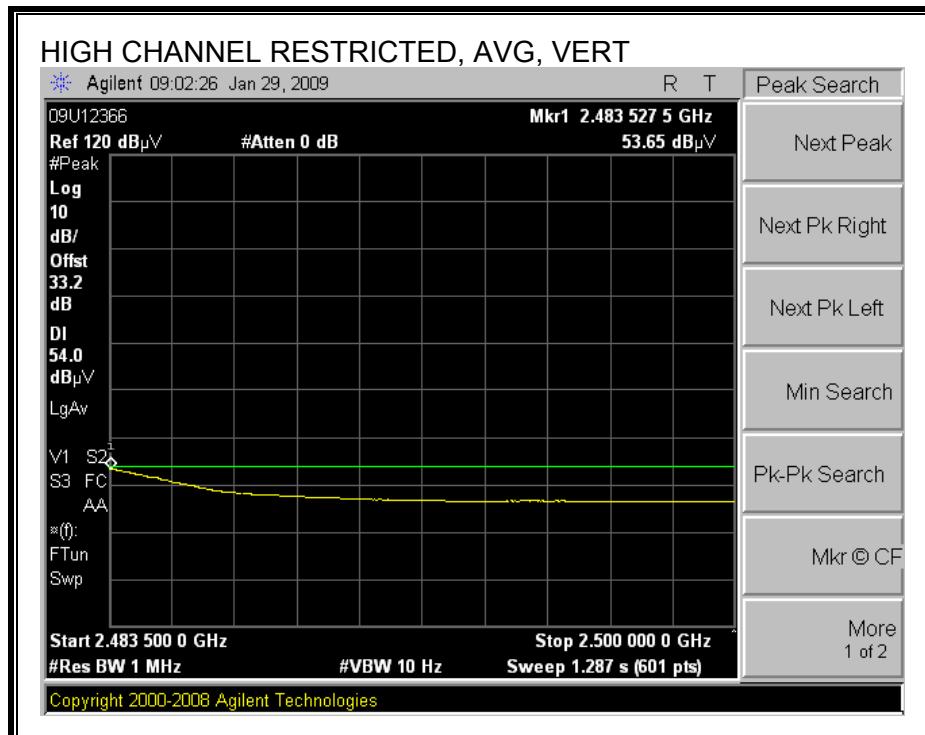
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





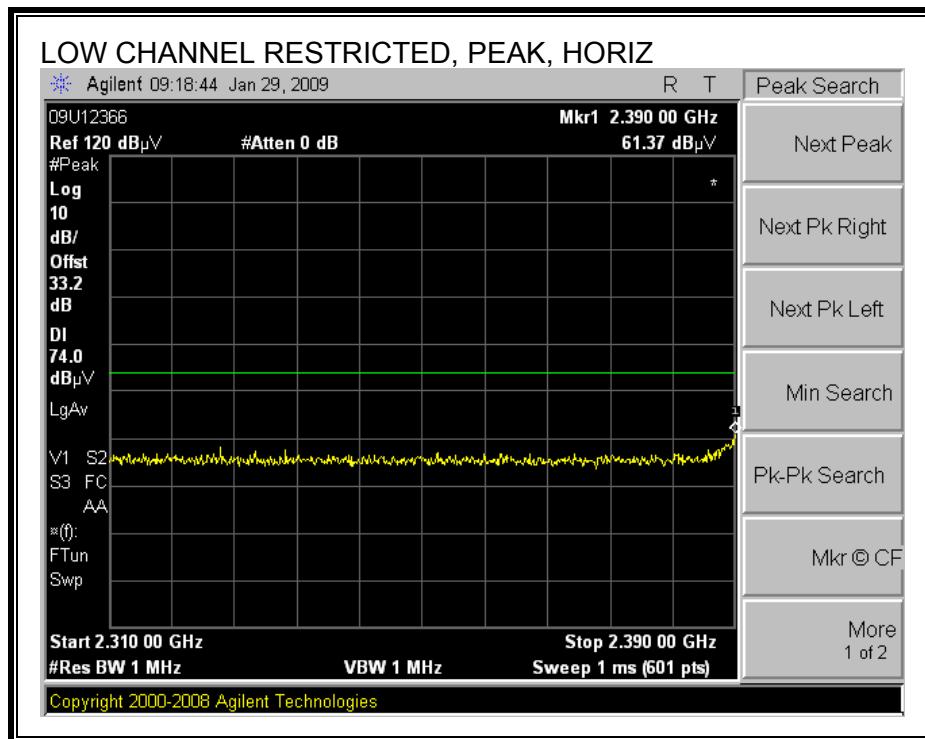
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

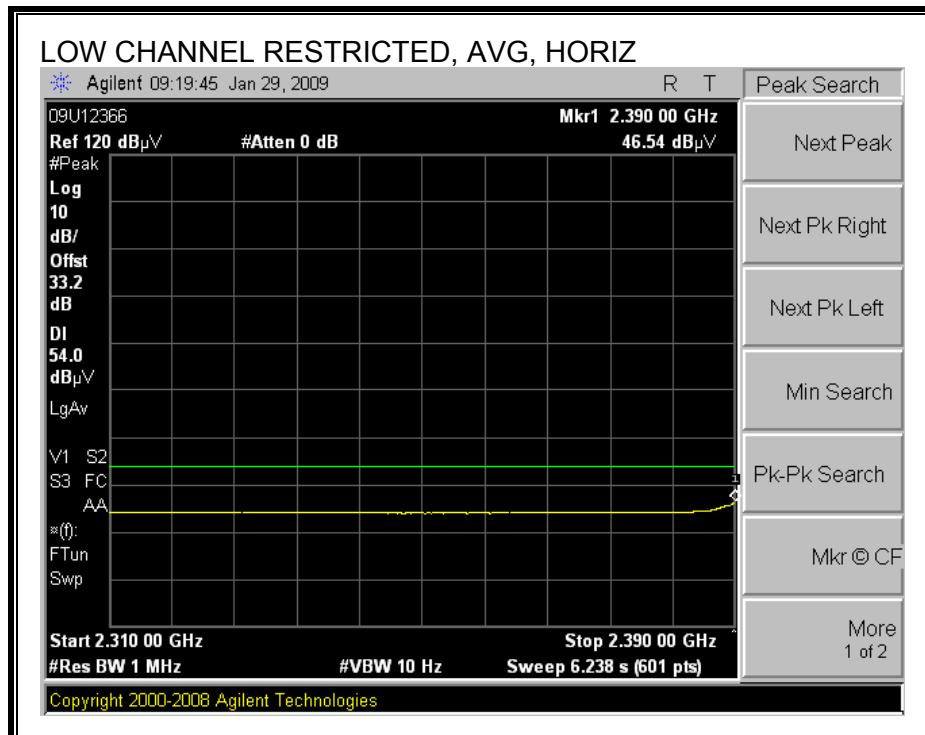




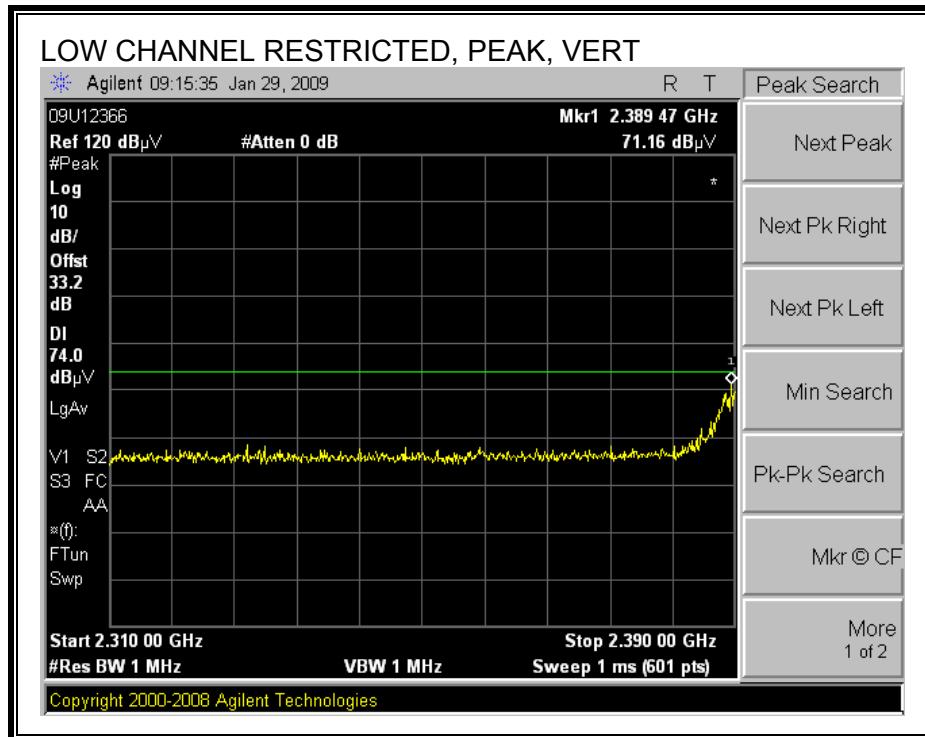
**MODE 110 (HT20):**

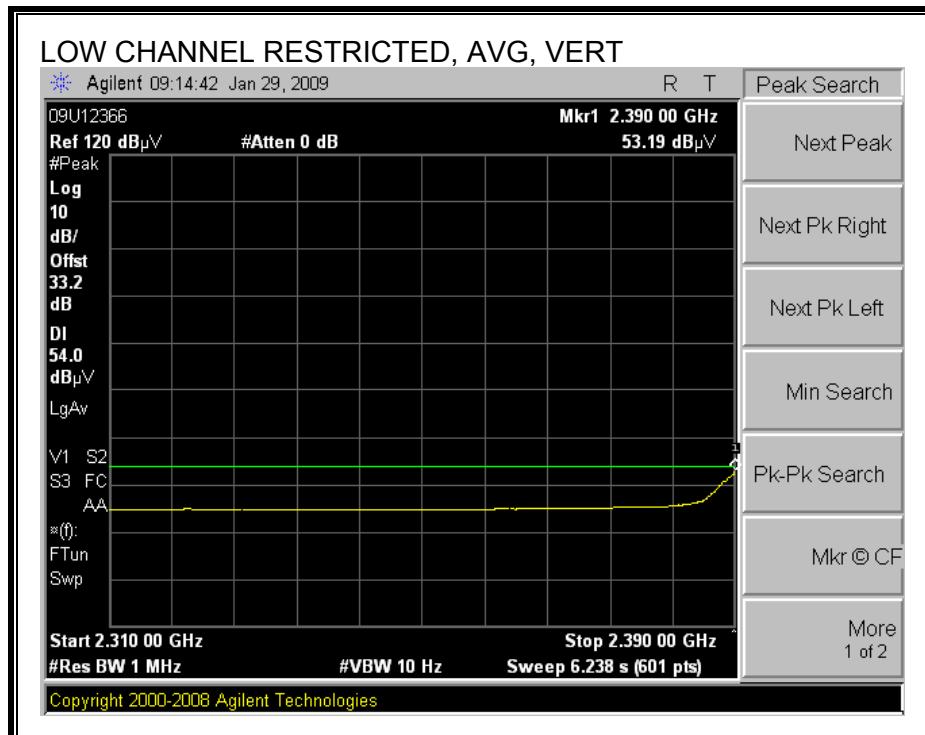
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



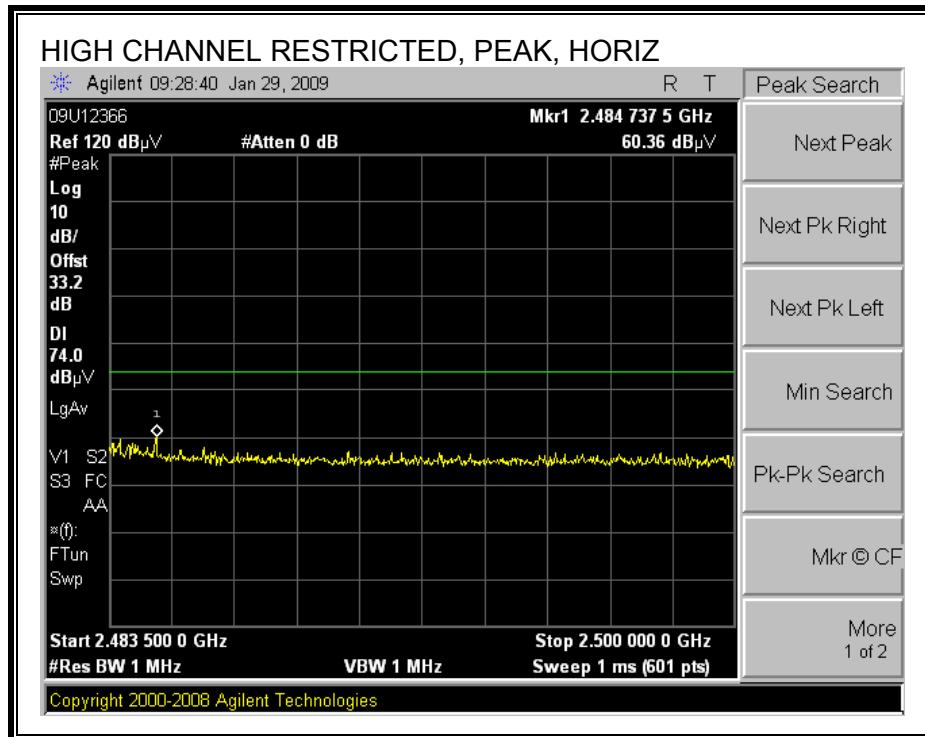


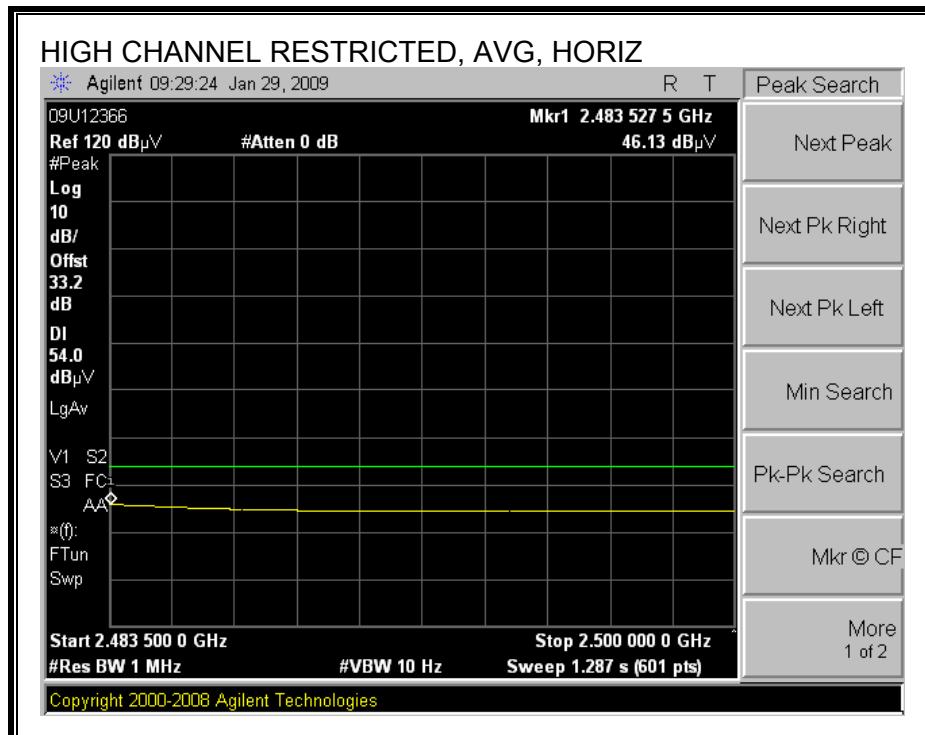
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



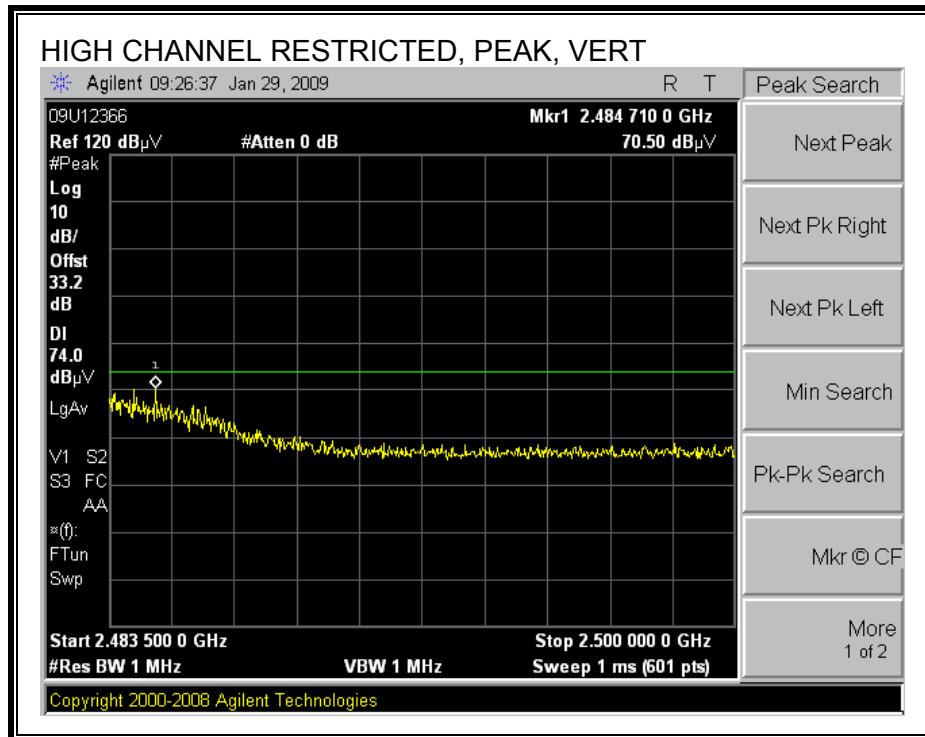


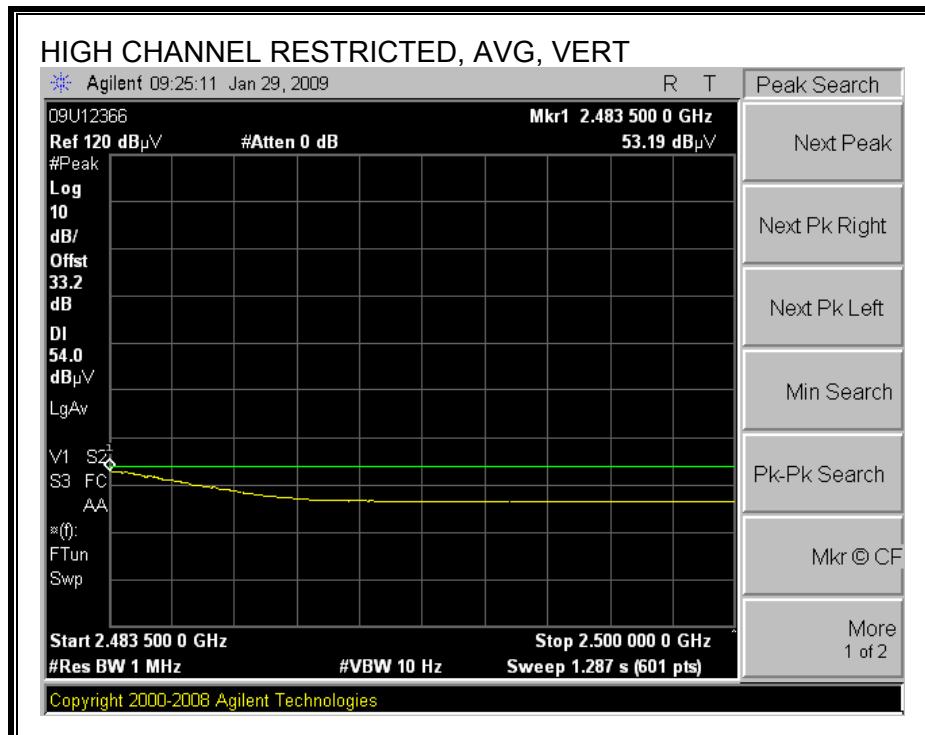
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





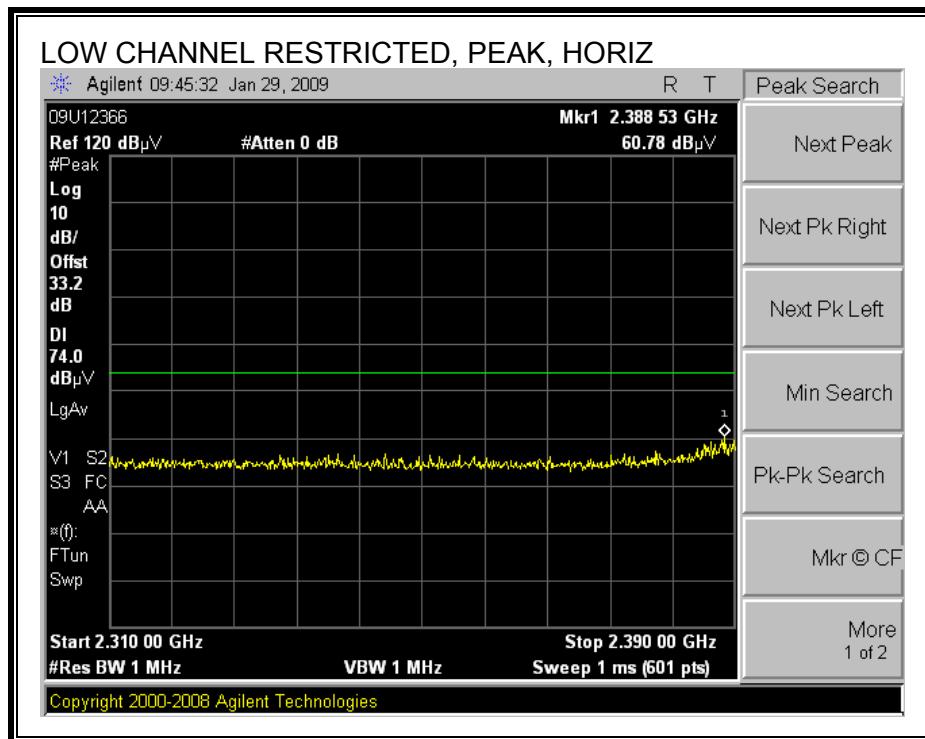
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

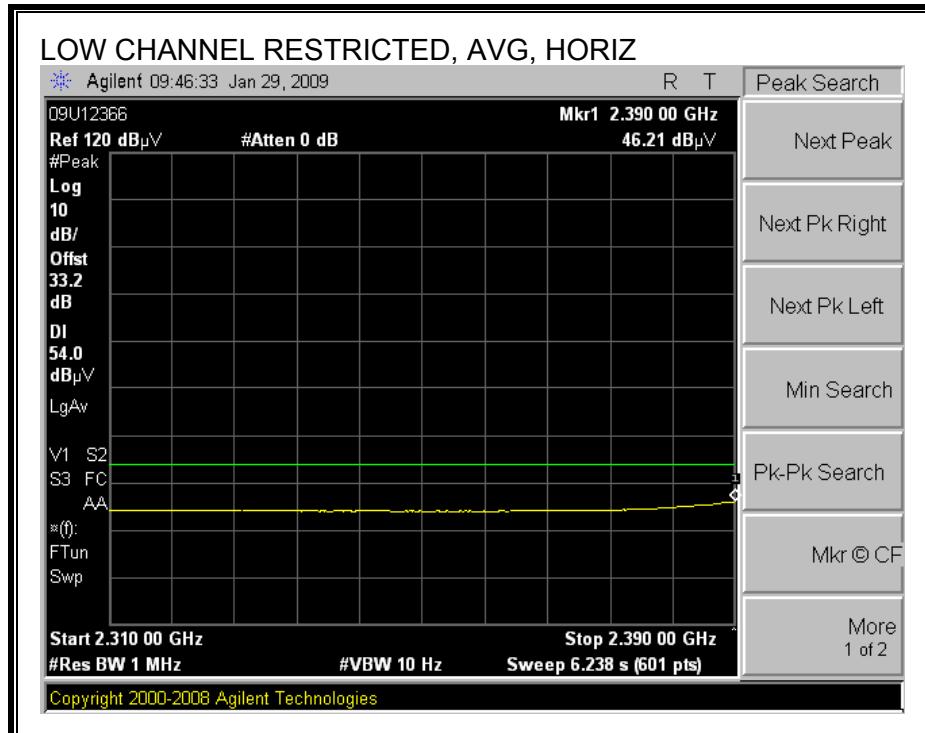




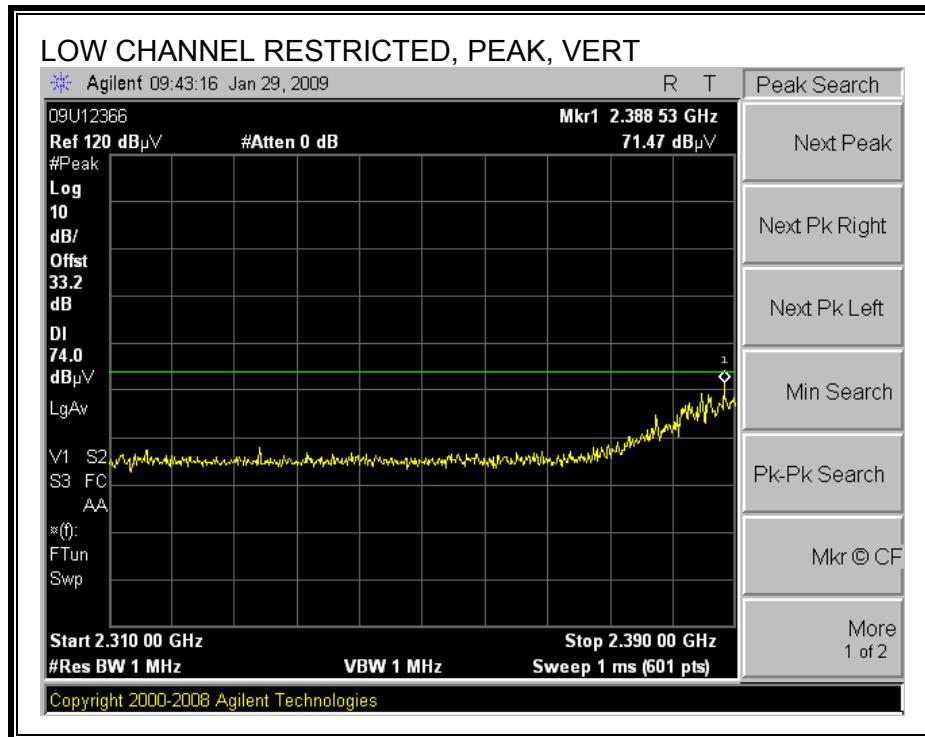
**MODE 110 (HT 40):**

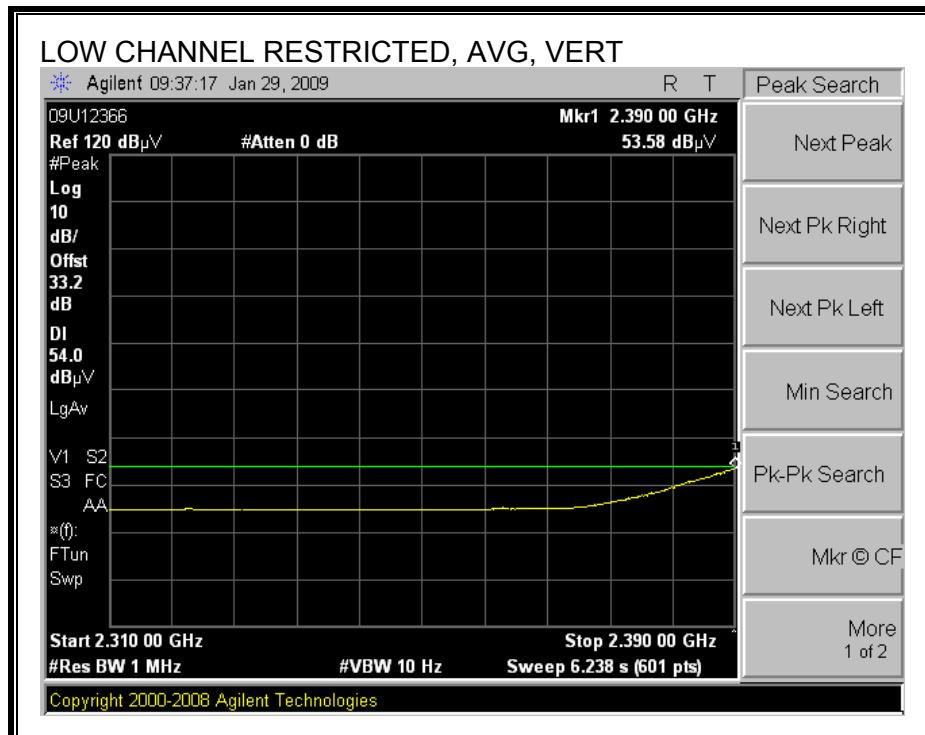
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



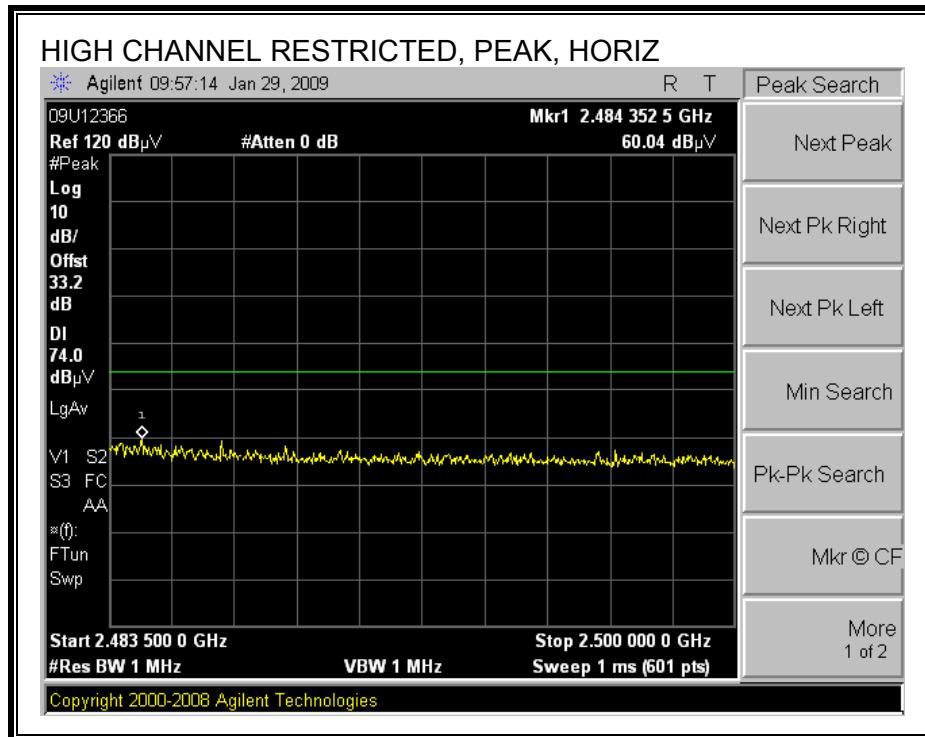


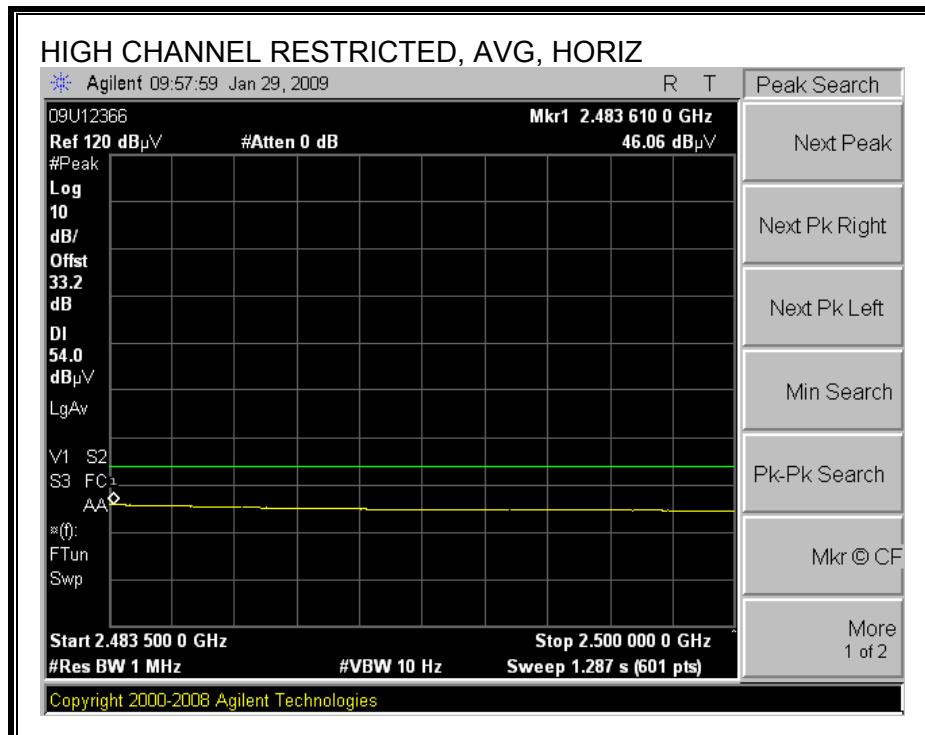
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



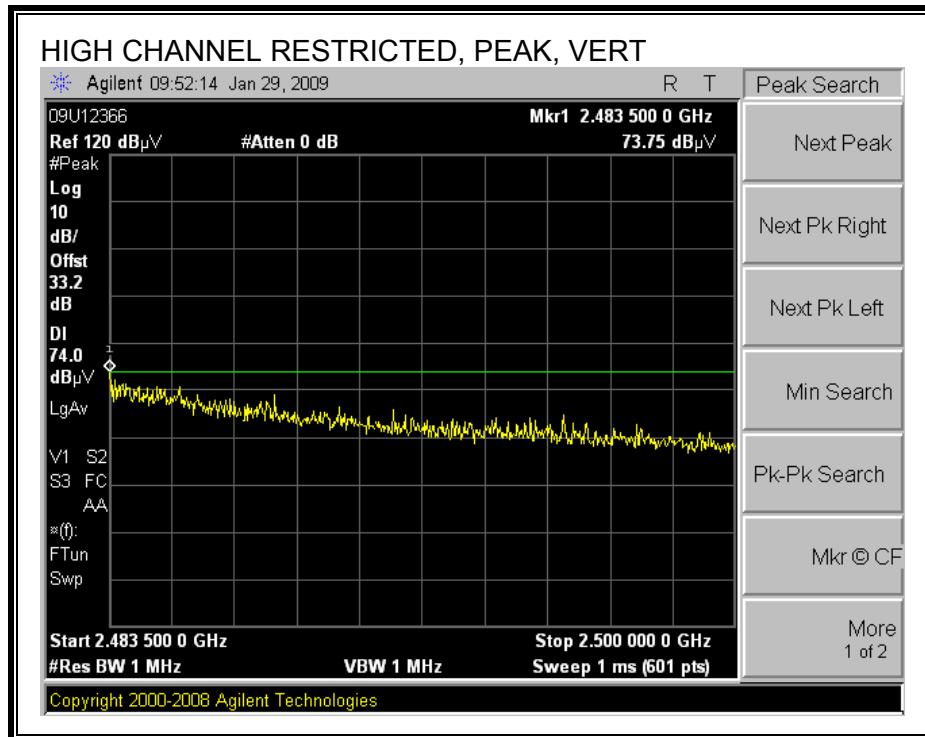


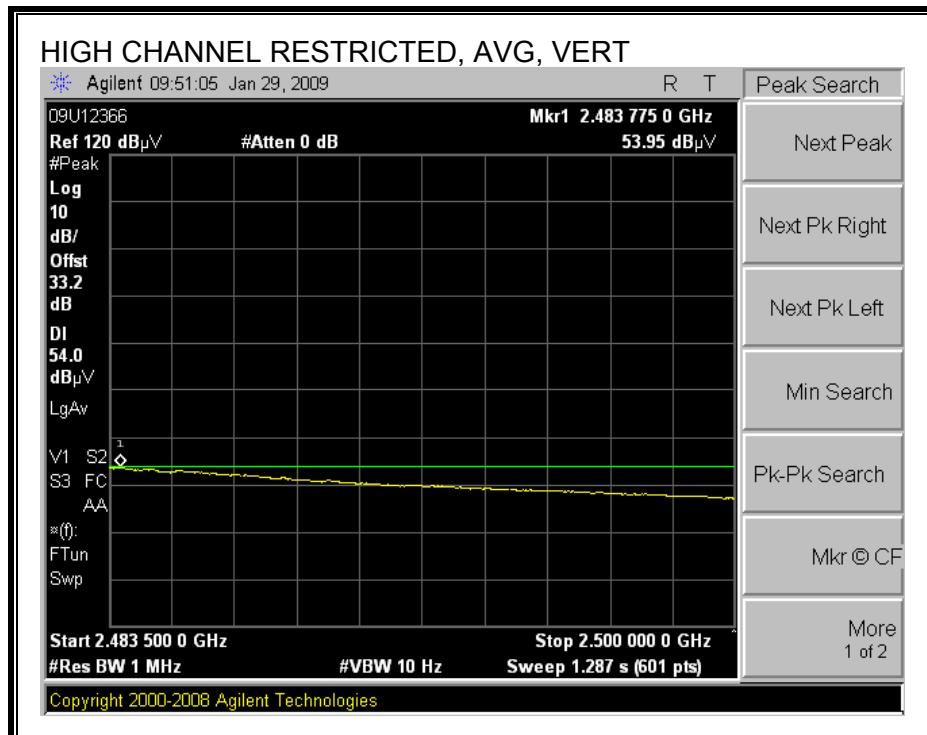
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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





## HARMONICS AND SPURIOUS EMISSIONS (11g Worst-case)

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company:	Meraki Inc.														
Project #:	09U12366														
Date:	01/29/09														
Test Engineer:	Thanh Nguyen														
Configuration:	EUT with Directional Antenna - 11.5dBi														
Mode:	Transmit Worst case g mode Art=13.5														
<b>Test Equipment:</b>															
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit			
T73; S/N: 6717 @3m	T34 HP 8449B								T125; ARA 18-26 GHz; S/N:1007			FCC 15.209			
Hi Frequency Cables															
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements RBW=VBW=1MHz
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001			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)
<b>Low channel</b>															
4.824	3.0	40.4	27.9	33.7	5.8	-34.8	0.0	0.0	45.1	32.6	74	54	-28.9	-21.4	V
7.236	3.0	41.2	28.7	36.2	7.2	-34.1	0.0	0.0	50.5	37.9	74	54	-23.5	-16.1	Noise floor
4.824	3.0	41.4	28.0	33.7	5.8	-34.8	0.0	0.0	46.1	32.7	74	54	-27.9	-21.3	H
7.236	3.0	40.3	28.6	36.2	7.2	-34.1	0.0	0.0	49.6	37.9	74	54	-24.4	-16.1	Noise floor
<b>Mid channel</b>															
4.874	3.0	40.9	27.9	33.8	5.8	-34.8	0.0	0.0	45.8	32.7	74	54	-28.2	-21.3	V
7.311	3.0	41.2	28.4	36.2	7.3	-34.1	0.0	0.0	50.6	37.8	74	54	-23.4	-16.2	Noise floor
4.874	3.0	41.3	28.0	33.8	5.8	-34.8	0.0	0.0	46.1	32.8	74	54	-27.9	-21.2	H
7.311	3.0	41.3	28.4	36.2	7.3	-34.1	0.0	0.0	50.7	37.8	74	54	-23.3	-16.2	Noise floor
<b>High channel</b>															
4.924	3.0	40.6	28.1	33.9	5.9	-34.8	0.0	0.0	45.5	33.1	74	54	-28.5	-20.9	V
7.386	3.0	42.2	28.9	36.3	7.3	-34.1	0.0	0.0	51.7	38.4	74	54	-22.3	-15.6	Noise floor
4.924	3.0	40.2	27.9	33.9	5.9	-34.8	0.0	0.0	45.1	32.9	74	54	-28.9	-21.1	H
7.386	3.0	41.9	28.9	36.3	7.3	-34.1	0.0	0.0	51.4	38.4	74	54	-22.6	-15.6	Noise floor
No other emissions were detected above noise floor.															
Rev. 10.15.08															
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										

### 7.4.3. TX ABOVE 1 GHz FOR 802.11a MODE IN THE 5.8 GHz BAND MODE 100: (DIRECTIONAL ANTENNA – 14.5 dBi)

#### HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																																																																																											
<p>Company: Meraki Inc. Project #: 09U12366 Date: 01/30/09 Test Engineer: Thanh Nguyen Configuration: EUT with Directional Antenna - 14.5dBi Mode: Transmit Worst case a mode.</p>																																																																																											
<p><u>Test Equipment:</u></p> <table border="1"><tr><td>Horn 1-18GHz</td><td>Pre-amplifier 1-26GHz</td><td>Pre-amplifier 26-40GHz</td><td colspan="4">Horn &gt; 18GHz</td><td colspan="4">Limit</td></tr><tr><td>T73; S/N: 6717 @3m</td><td>T34 HP 8449B</td><td></td><td colspan="4">T125; ARA 18-26GHz; S/N:1007</td><td colspan="4">FCC 15.209</td></tr><tr><td colspan="18">Hi Frequency Cables</td></tr><tr><td colspan="3">3' cable 22807700</td><td colspan="3">12' cable 22807600</td><td colspan="3">20' cable 22807500</td><td colspan="2">HPF</td><td colspan="2">Reject Filter</td><td colspan="4">Peak Measurements RBW=VBW=1MHz</td></tr><tr><td colspan="3">3' cable 22807700</td><td colspan="3">12' cable 22807600</td><td colspan="3">20' cable 22807500</td><td colspan="2"></td><td colspan="2">R_002</td><td colspan="4">Average Measurements RBW=1MHz ; VBW=10Hz</td></tr></table>																		Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz				Limit				T73; S/N: 6717 @3m	T34 HP 8449B		T125; ARA 18-26GHz; S/N:1007				FCC 15.209				Hi Frequency Cables																		3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF		Reject Filter		Peak Measurements RBW=VBW=1MHz				3' cable 22807700			12' cable 22807600			20' cable 22807500					R_002		Average Measurements RBW=1MHz ; VBW=10Hz			
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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)																																																																												
<p>LOW CHANNEL, 5745 MHz</p> <table><tr><td>11.490</td><td>3.0</td><td>40.8</td><td>27.5</td><td>38.6</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.3</td><td>43.1</td><td>74</td><td>54</td><td>-17.7</td><td>-10.9</td><td>V, Noise Floor</td></tr><tr><td>11.490</td><td>3.0</td><td>40.4</td><td>28.8</td><td>38.6</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>55.9</td><td>44.3</td><td>74</td><td>54</td><td>-18.1</td><td>-9.7</td><td>H, Noise floor</td></tr></table>																		11.490	3.0	40.8	27.5	38.6	9.5	-32.5	0.0	0.0	56.3	43.1	74	54	-17.7	-10.9	V, Noise Floor	11.490	3.0	40.4	28.8	38.6	9.5	-32.5	0.0	0.0	55.9	44.3	74	54	-18.1	-9.7	H, Noise floor																																										
11.490	3.0	40.8	27.5	38.6	9.5	-32.5	0.0	0.0	56.3	43.1	74	54	-17.7	-10.9	V, Noise Floor																																																																												
11.490	3.0	40.4	28.8	38.6	9.5	-32.5	0.0	0.0	55.9	44.3	74	54	-18.1	-9.7	H, Noise floor																																																																												
<p>MID CHANNEL, 5785 MHz</p> <table><tr><td>11.570</td><td>3.0</td><td>40.2</td><td>27.9</td><td>38.7</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>55.9</td><td>43.6</td><td>74</td><td>54</td><td>-18.1</td><td>-10.4</td><td>V, Noise Floor</td></tr><tr><td>11.570</td><td>3.0</td><td>40.1</td><td>27.9</td><td>38.7</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>55.8</td><td>43.6</td><td>74</td><td>54</td><td>-18.2</td><td>-10.4</td><td>H, Noise floor</td></tr></table>																		11.570	3.0	40.2	27.9	38.7	9.5	-32.5	0.0	0.0	55.9	43.6	74	54	-18.1	-10.4	V, Noise Floor	11.570	3.0	40.1	27.9	38.7	9.5	-32.5	0.0	0.0	55.8	43.6	74	54	-18.2	-10.4	H, Noise floor																																										
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11.570	3.0	40.1	27.9	38.7	9.5	-32.5	0.0	0.0	55.8	43.6	74	54	-18.2	-10.4	H, Noise floor																																																																												
<p>HIGH CHANNEL, 5825 MHz</p> <table><tr><td>11.650</td><td>3.0</td><td>41.4</td><td>28.3</td><td>38.7</td><td>9.6</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>57.1</td><td>44.0</td><td>74</td><td>54</td><td>-16.9</td><td>-10.0</td><td>V, Noise Floor</td></tr><tr><td>11.650</td><td>3.0</td><td>41.0</td><td>28.3</td><td>38.7</td><td>9.6</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.8</td><td>44.1</td><td>74</td><td>54</td><td>-17.2</td><td>-9.9</td><td>H, Noise floor</td></tr></table>																		11.650	3.0	41.4	28.3	38.7	9.6	-32.5	0.0	0.0	57.1	44.0	74	54	-16.9	-10.0	V, Noise Floor	11.650	3.0	41.0	28.3	38.7	9.6	-32.5	0.0	0.0	56.8	44.1	74	54	-17.2	-9.9	H, Noise floor																																										
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<p>f Measurement Frequency Dist Distance to Antenna Read Analyzer Reading AF Antenna Factor CL Cable Loss</p>						<p>Amp Preamp Gain D Corr Distance Correct to 3 meters Avg Average Field Strength @ 3 m Peak Calculated Peak Field Strength HPF High Pass Filter</p>						<p>Avg Lim Average Field Strength Limit Pk Lim Peak Field Strength Limit Avg Mar Margin vs. Average Limit Pk Mar Margin vs. Peak Limit</p>																																																																															

#### 7.4.4. TX ABOVE 1 GHz FOR 802.11a MODE IN THE 5.8 GHz BAND MODE 100 (Worst-case):

##### HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																																																																																			
<p>Company: Meraki Inc. Project #: 09U12366 Date: 01/30/09 Test Engineer: Thanh Nguyen Configuration: EUT with 4dBi gain Omni-Directional Antenna. Mode: Transmit Worst case a mode Att=14.5</p>																																																																																			
<p><u>Test Equipment:</u></p> <table border="1"><tr><td>Horn 1-18GHz</td><td>Pre-amplifier 1-26GHz</td><td>Pre-amplifier 26-40GHz</td><td colspan="4">Horn &gt; 18GHz</td><td colspan="4">Limit</td></tr><tr><td>T73; S/N: 6717 @3m</td><td>T34 HP 8449B</td><td></td><td colspan="4">T125; ARA 18-26GHz; S/N:1007</td><td colspan="4">FCC 15.209</td></tr><tr><td colspan="16"><p>Hi Frequency Cables</p><table border="1"><tr><td>3' cable 22807700</td><td>12' cable 22807600</td><td>20' cable 22807500</td><td colspan="4">HPF</td><td colspan="4">Reject Filter</td><td colspan="4">Peak Measurements RBW=VBW=1MHz</td></tr><tr><td>3' cable 22807700</td><td>12' cable 22807600</td><td>20' cable 22807500</td><td colspan="4"></td><td colspan="4"></td><td colspan="4">Average Measurements RBW=1MHz ; VBW=10Hz</td></tr></table></td></tr></table>																Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz				Limit				T73; S/N: 6717 @3m	T34 HP 8449B		T125; ARA 18-26GHz; S/N:1007				FCC 15.209				<p>Hi Frequency Cables</p> <table border="1"><tr><td>3' cable 22807700</td><td>12' cable 22807600</td><td>20' cable 22807500</td><td colspan="4">HPF</td><td colspan="4">Reject Filter</td><td colspan="4">Peak Measurements RBW=VBW=1MHz</td></tr><tr><td>3' cable 22807700</td><td>12' cable 22807600</td><td>20' cable 22807500</td><td colspan="4"></td><td colspan="4"></td><td colspan="4">Average Measurements RBW=1MHz ; VBW=10Hz</td></tr></table>																3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF				Reject Filter				Peak Measurements RBW=VBW=1MHz				3' cable 22807700	12' cable 22807600	20' cable 22807500									Average Measurements RBW=1MHz ; VBW=10Hz			
Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz				Limit																																																																												
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<p>Hi Frequency Cables</p> <table border="1"><tr><td>3' cable 22807700</td><td>12' cable 22807600</td><td>20' cable 22807500</td><td colspan="4">HPF</td><td colspan="4">Reject Filter</td><td colspan="4">Peak Measurements RBW=VBW=1MHz</td></tr><tr><td>3' cable 22807700</td><td>12' cable 22807600</td><td>20' cable 22807500</td><td colspan="4"></td><td colspan="4"></td><td colspan="4">Average Measurements RBW=1MHz ; VBW=10Hz</td></tr></table>																3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF				Reject Filter				Peak Measurements RBW=VBW=1MHz				3' cable 22807700	12' cable 22807600	20' cable 22807500									Average Measurements RBW=1MHz ; VBW=10Hz																																									
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<p>LOW CHANNEL, 5745 MHz</p> <table border="1"><tr><td>11.490</td><td>3.0</td><td>40.9</td><td>27.7</td><td>38.6</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.5</td><td>43.3</td><td>74</td><td>54</td><td>-17.5</td><td>-10.7</td><td>V, Noise Floor</td></tr><tr><td>11.490</td><td>3.0</td><td>40.5</td><td>29.5</td><td>38.6</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.0</td><td>45.1</td><td>74</td><td>54</td><td>-18.0</td><td>8.9</td><td>H, Noise floor</td></tr></table>																11.490	3.0	40.9	27.7	38.6	9.5	-32.5	0.0	0.0	56.5	43.3	74	54	-17.5	-10.7	V, Noise Floor	11.490	3.0	40.5	29.5	38.6	9.5	-32.5	0.0	0.0	56.0	45.1	74	54	-18.0	8.9	H, Noise floor																																				
11.490	3.0	40.9	27.7	38.6	9.5	-32.5	0.0	0.0	56.5	43.3	74	54	-17.5	-10.7	V, Noise Floor																																																																				
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<p>MID CHANNEL, 5785 MHz</p> <table border="1"><tr><td>11.570</td><td>3.0</td><td>40.8</td><td>28.0</td><td>38.7</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>56.5</td><td>43.6</td><td>74</td><td>54</td><td>-17.5</td><td>-10.4</td><td>V, Noise Floor</td></tr><tr><td>11.570</td><td>3.0</td><td>39.8</td><td>28.0</td><td>38.7</td><td>9.5</td><td>-32.5</td><td>0.0</td><td>0.0</td><td>55.4</td><td>43.6</td><td>74</td><td>54</td><td>-18.6</td><td>10.4</td><td>H, Noise floor</td></tr></table>																11.570	3.0	40.8	28.0	38.7	9.5	-32.5	0.0	0.0	56.5	43.6	74	54	-17.5	-10.4	V, Noise Floor	11.570	3.0	39.8	28.0	38.7	9.5	-32.5	0.0	0.0	55.4	43.6	74	54	-18.6	10.4	H, Noise floor																																				
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<p>No other emissions were detected above noise floor.</p>																																																																																			
<p>Rev. 10.15.08</p>																																																																																			
<p>f Measurement Frequency Dist Distance to Antenna Read Analyzer Reading AF Antenna Factor CL Cable Loss</p>								<p>Amp Preamp Gain D Corr Distance Correct to 3 meters Avg Average Field Strength @ 3 m Peak Calculated Peak Field Strength HPF High Pass Filter</p>								<p>Avg Lim Average Field Strength Limit Pk Lim Peak Field Strength Limit Avg Mar Margin vs. Average Limit Pk Mar Margin vs. Peak Limit</p>																																																																			

### 7.4.5. TX BELOW 1 GHz (WORST-CASE CONFIGURATION)

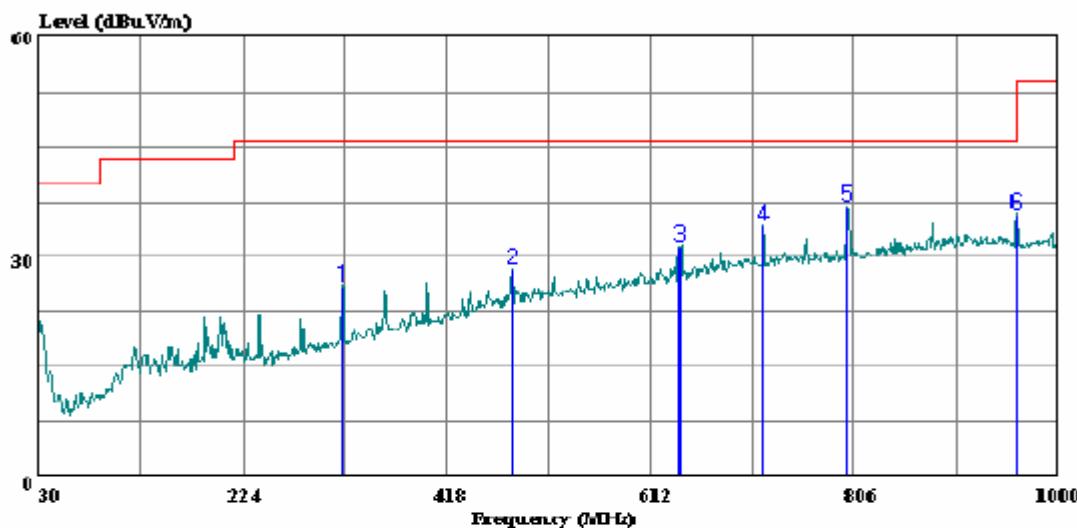
#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

##### HORIZONTAL PLOT& DATA



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 33 File#: 09u12366.emi Date: 02-03-2009 Time: 13:30:39



Trace: 32

Ref Trace:

Condition: FCC CLASS-B 3m HORIZONTAL  
Test Operator:: Thanh Nguyen  
Project #: : 09U12336  
Company: : Meraki Inc.  
Model: : MR58  
Configuration:: EUT, Laptop, Antenna  
Mode : : EUT Power up with DC PWR Supply  
Target: : FCC Class B  
: EUT w/Flat Panel Antenna  
: DC Power on

Page: 1

Freq	Read		Limit Line	Over Limit	Remark
	Level	Factor			
MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	320.030	36.58	-10.50	26.09	46.00 -19.91 Peak
2	481.050	33.67	-5.37	28.29	46.00 -17.71 Peak
3	640.130	33.33	-1.87	31.46	46.00 -14.54 Peak
4	719.670	34.50	-0.23	34.27	46.00 -11.73 Peak
5	799.210	36.00	0.77	36.77	46.00 -9.23 Peak
6	960.230	32.50	3.40	35.90	54.00 -18.10 Peak

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

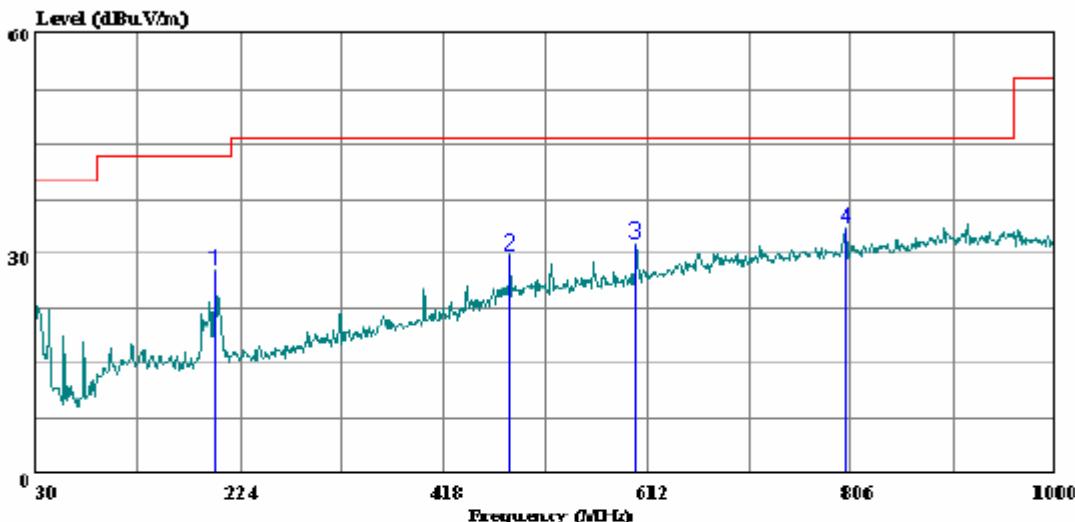
**VERTICAL PLOT& DATA**



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 35 File#: 09u12366.emi

Date: 02-03-2009 Time: 13:38:01



Trace: 34

Ref Trace:

Condition: FCC CLASS-B 3m VERTICAL  
Test Operator::: Thanh Nguyen  
Project #: : 09U12336  
Company: : Meraki Inc.  
Model: : MR58  
Configuration::: EUT, Laptop, Antenna  
Mode : : EUT Power up with DC PWR Supply  
Target: : FCC Class B  
: EUT w/Flat Panel Antenna  
: DC Power on

Page: 1

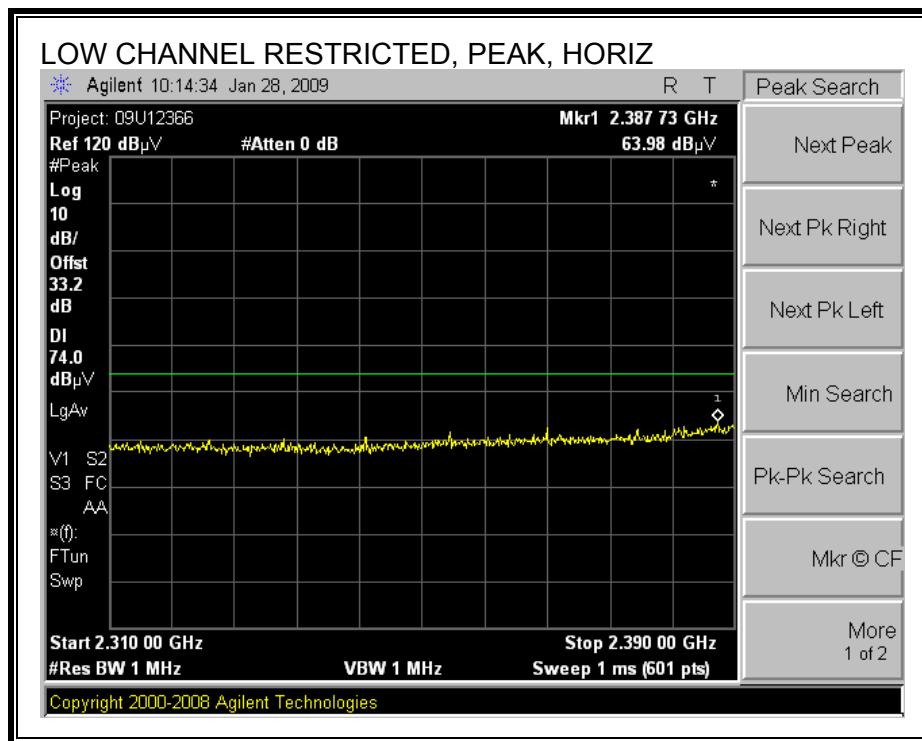
Freq	Read		Limit Line	Over Limit	Remark
	Level	Factor			
MHz	dBuV	dB	dBuV/m	dB	
1	199.750	40.50	-12.77	27.73	43.50 -15.77 Peak
2	481.050	35.33	-5.37	29.96	46.00 -16.04 Peak
3	600.360	34.33	-2.83	31.50	46.00 -14.50 Peak
4	801.150	32.67	0.73	33.40	46.00 -12.60 Peak

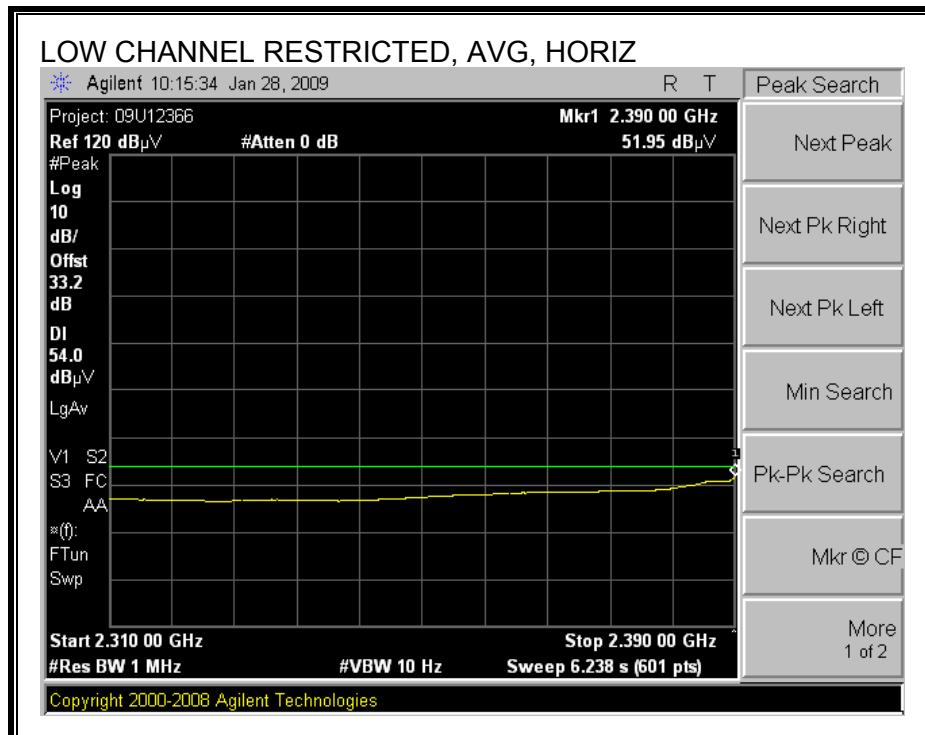
## 7.5. FLAT PANEL ANTENNA 2.4GHz, 19 dBi GAIN

### 7.5.1. TX ABOVE 1 GHz FOR 802.11b

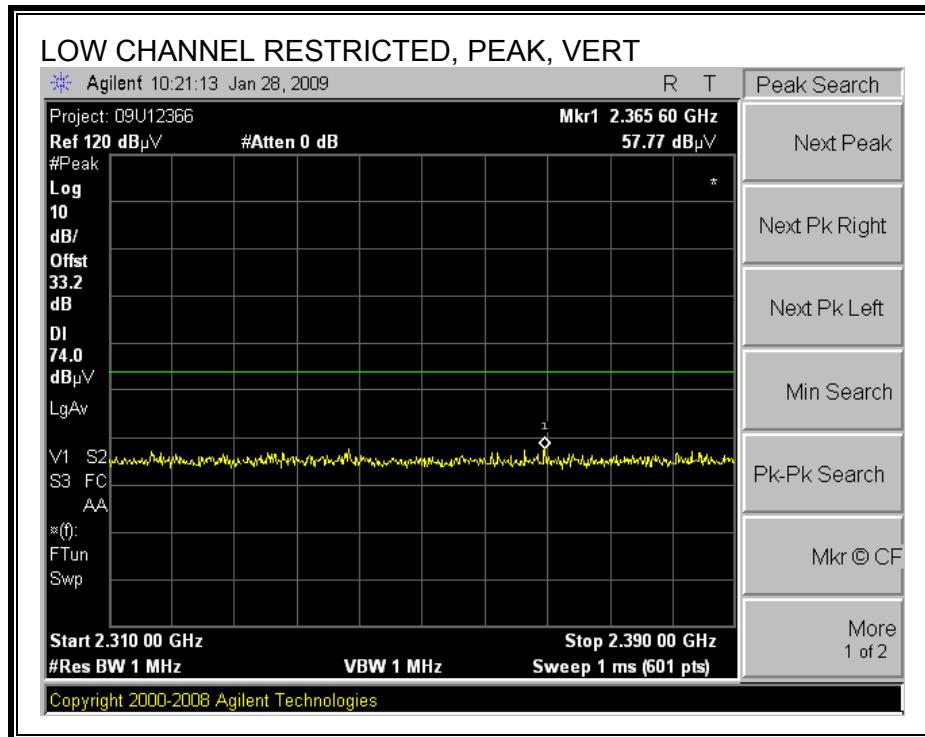
#### MODE 100:

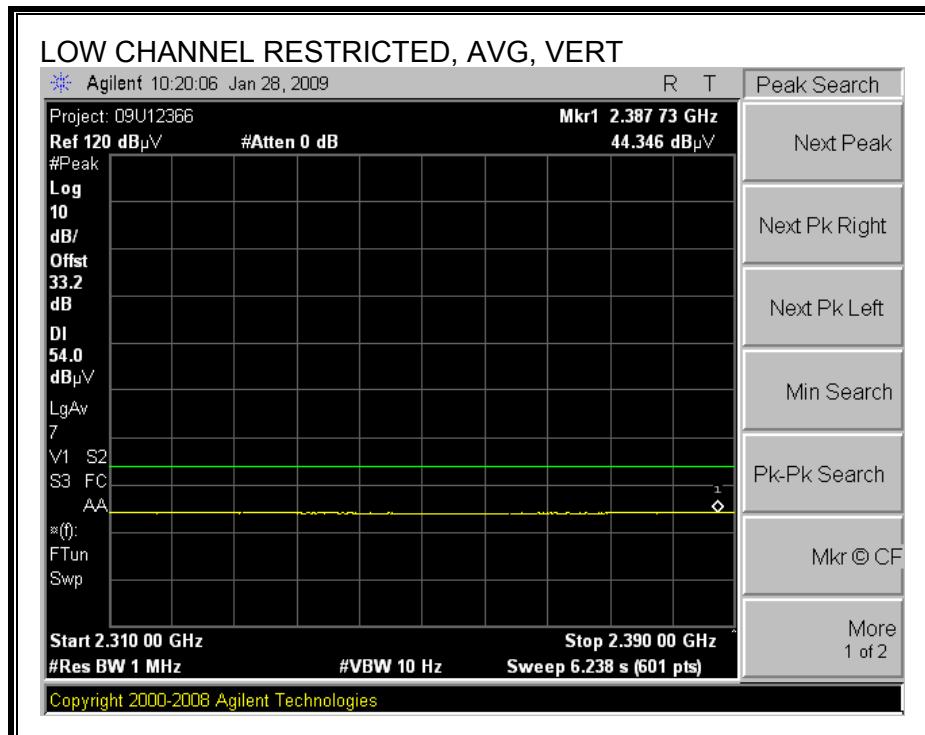
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



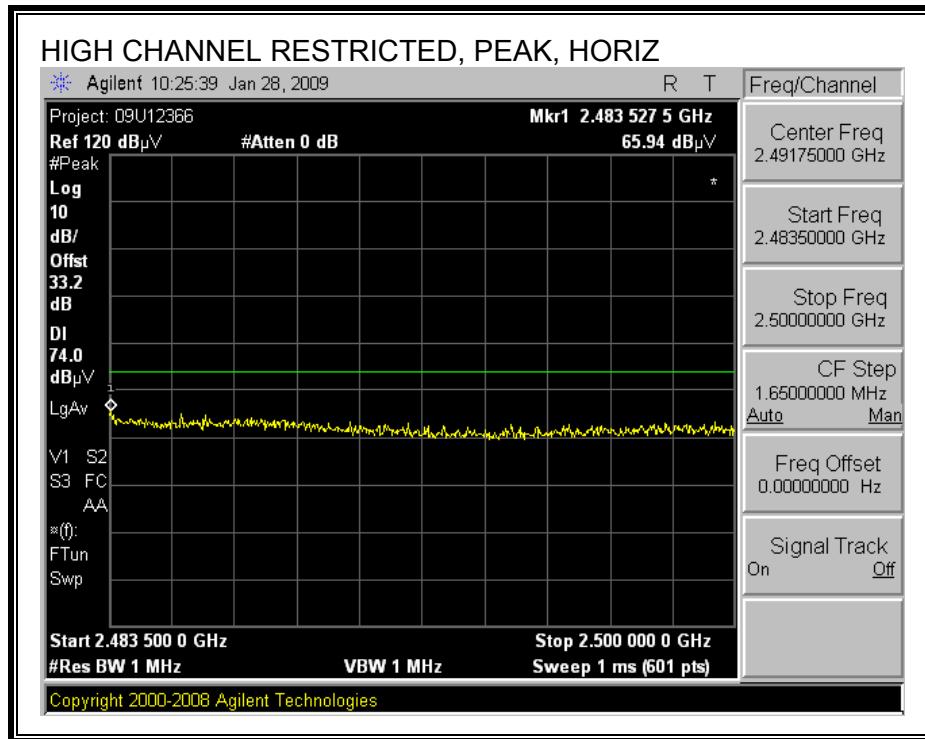


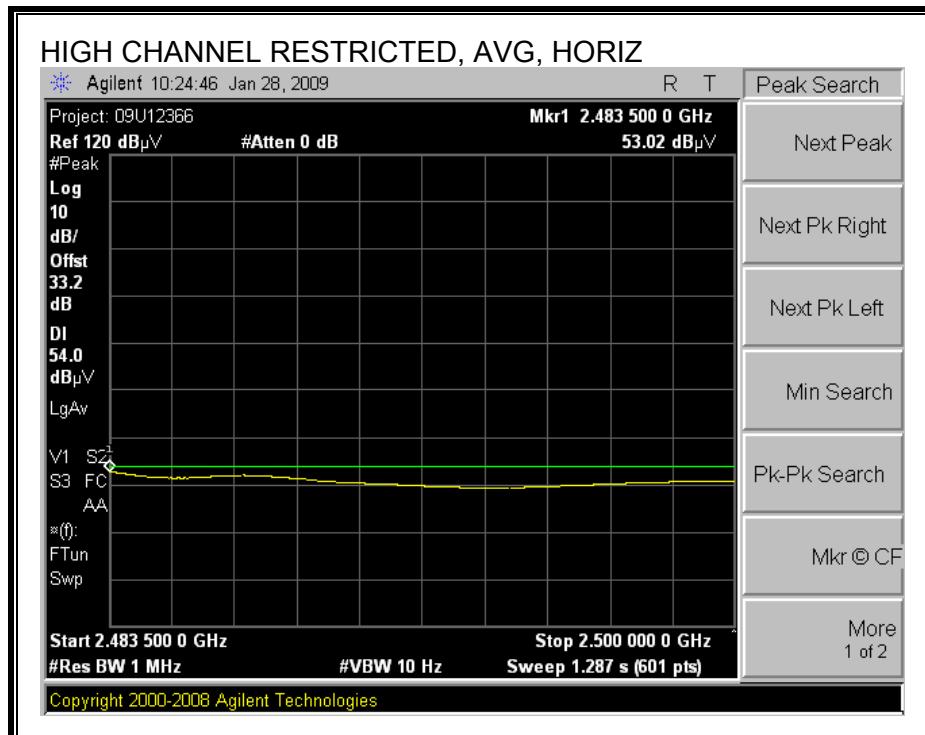
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



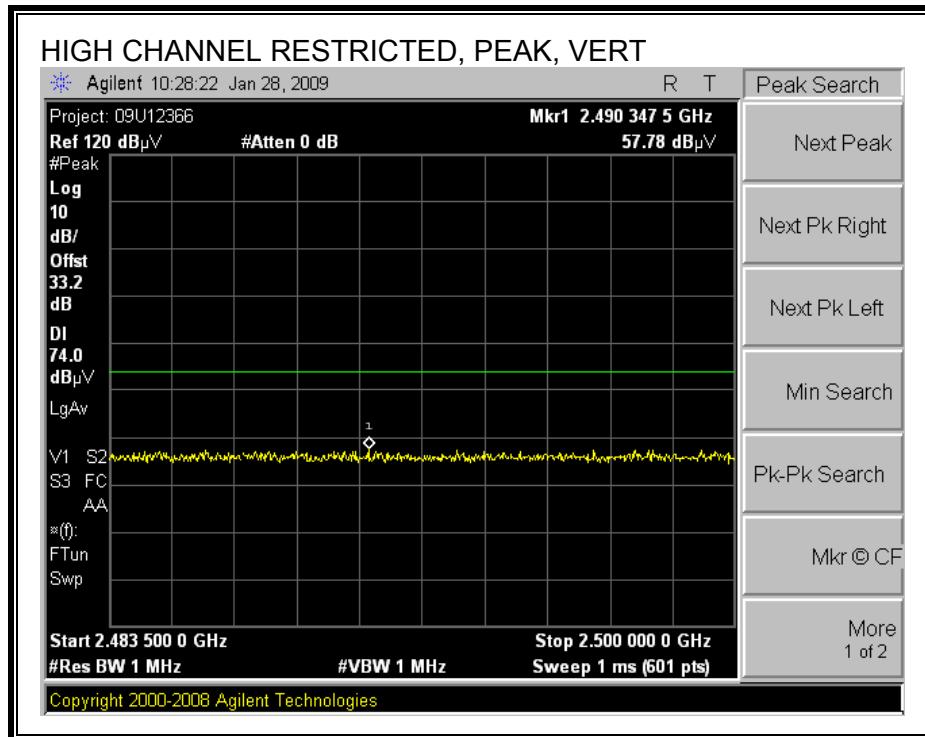


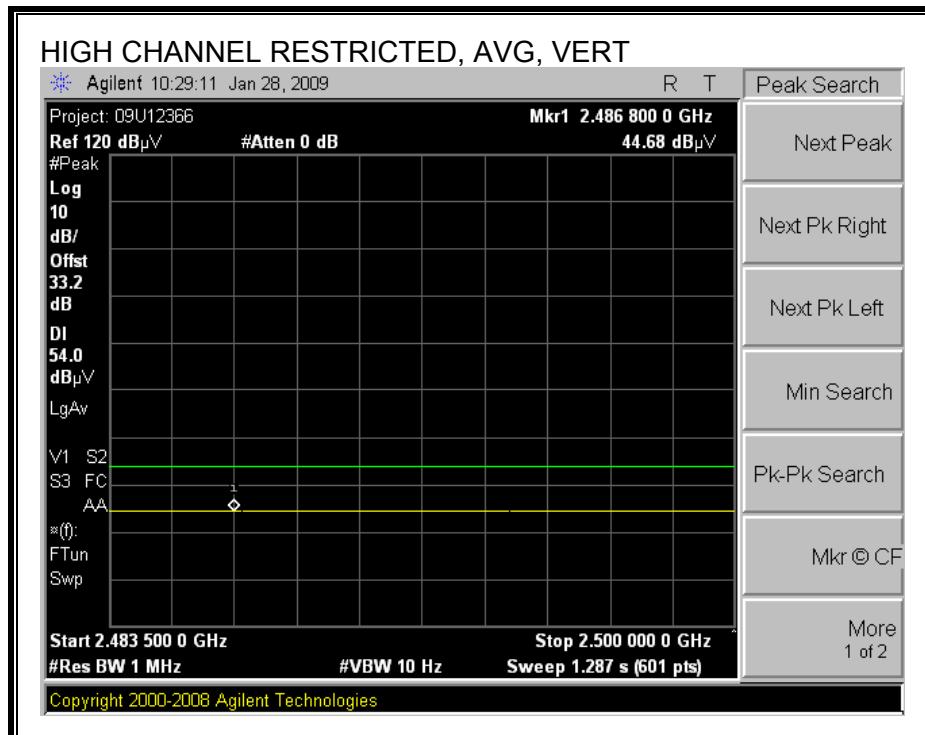
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





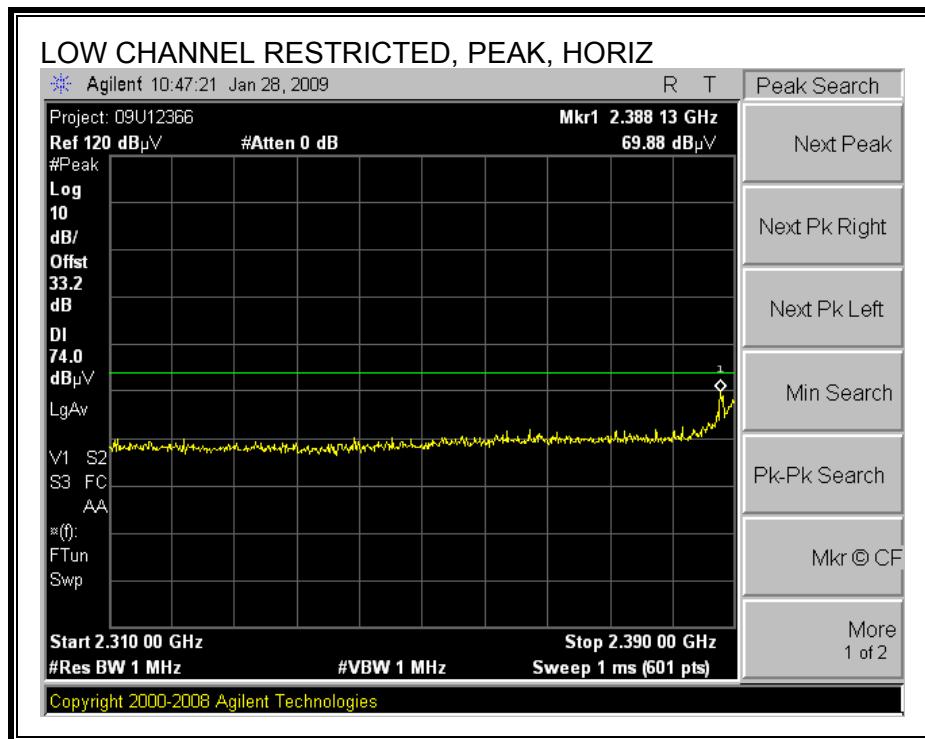
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

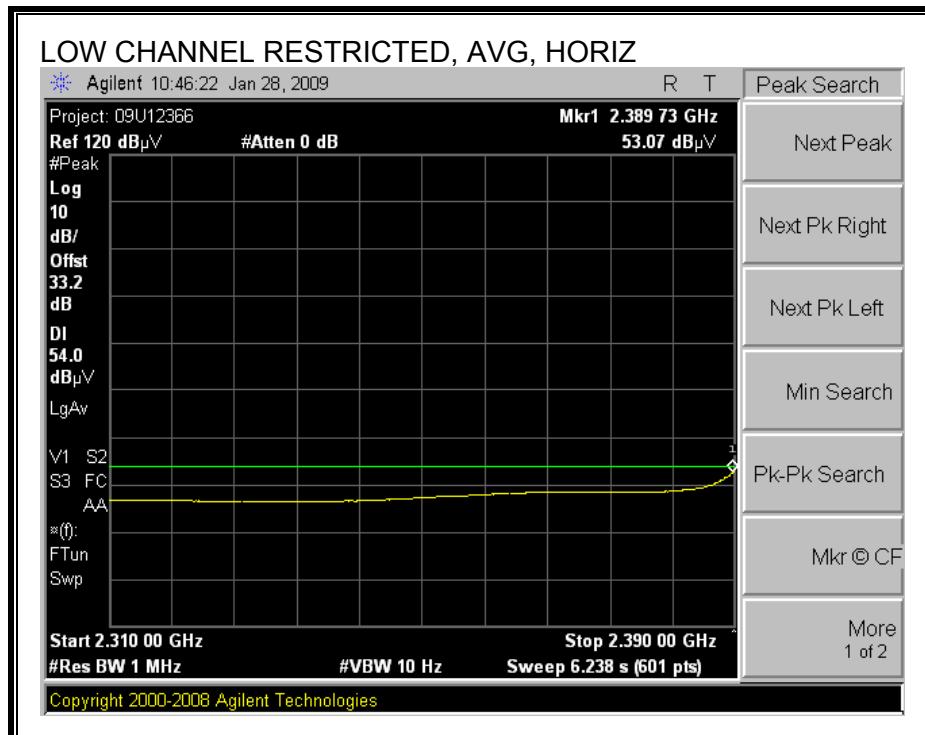




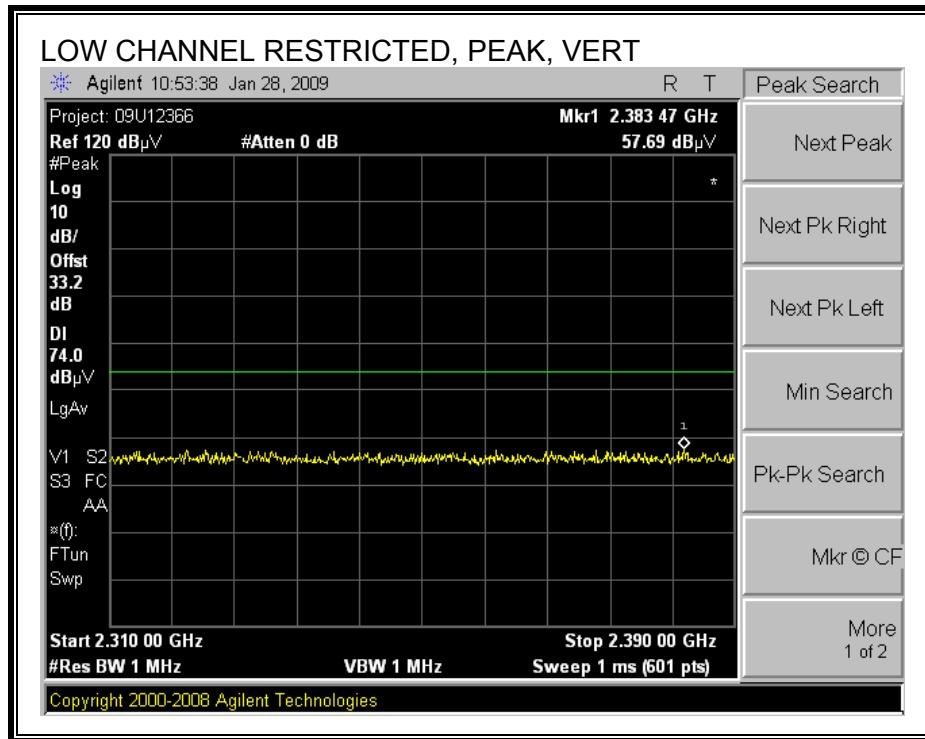
## HT 20MHz

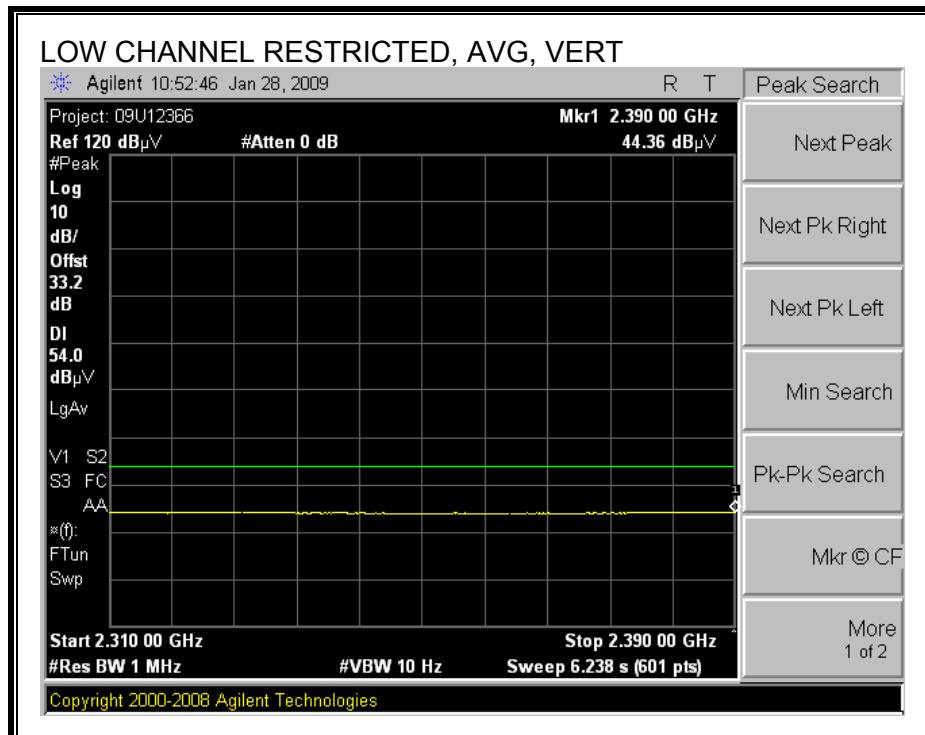
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



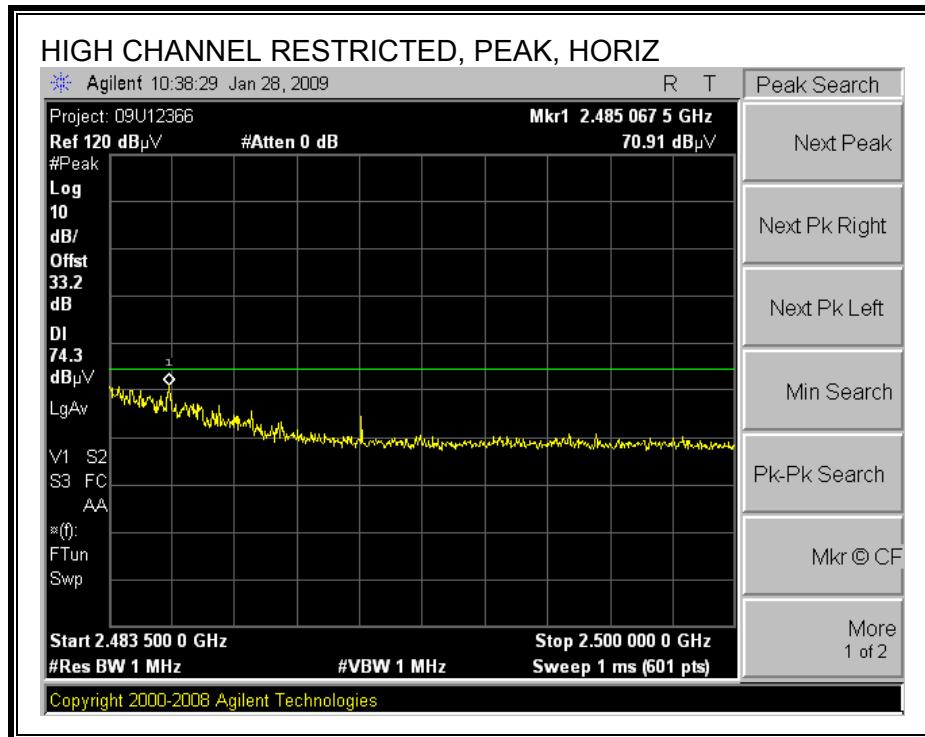


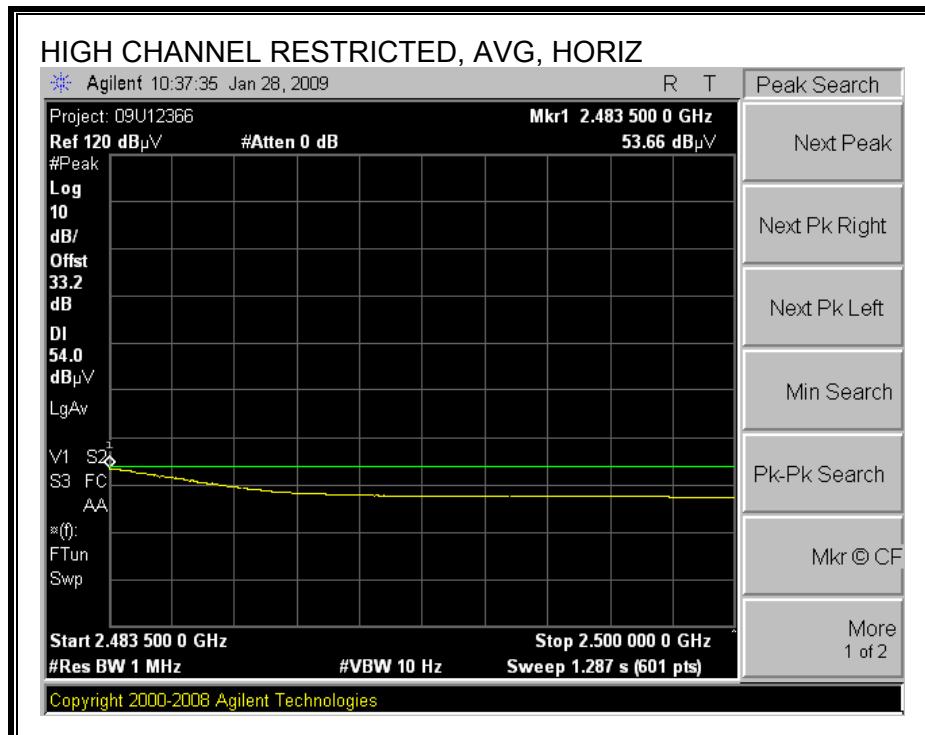
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



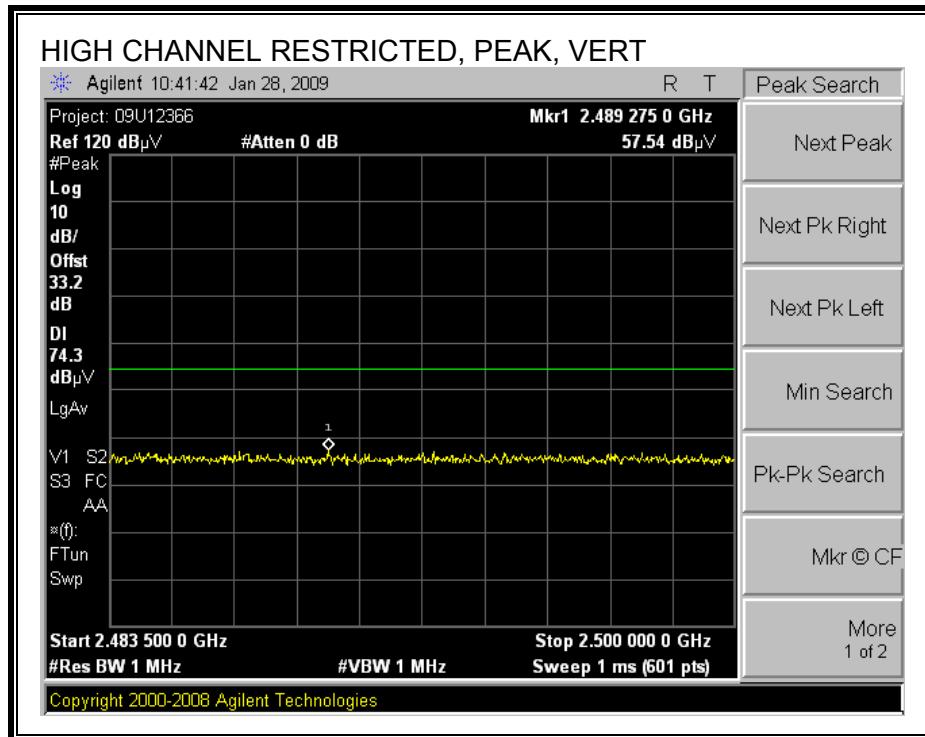


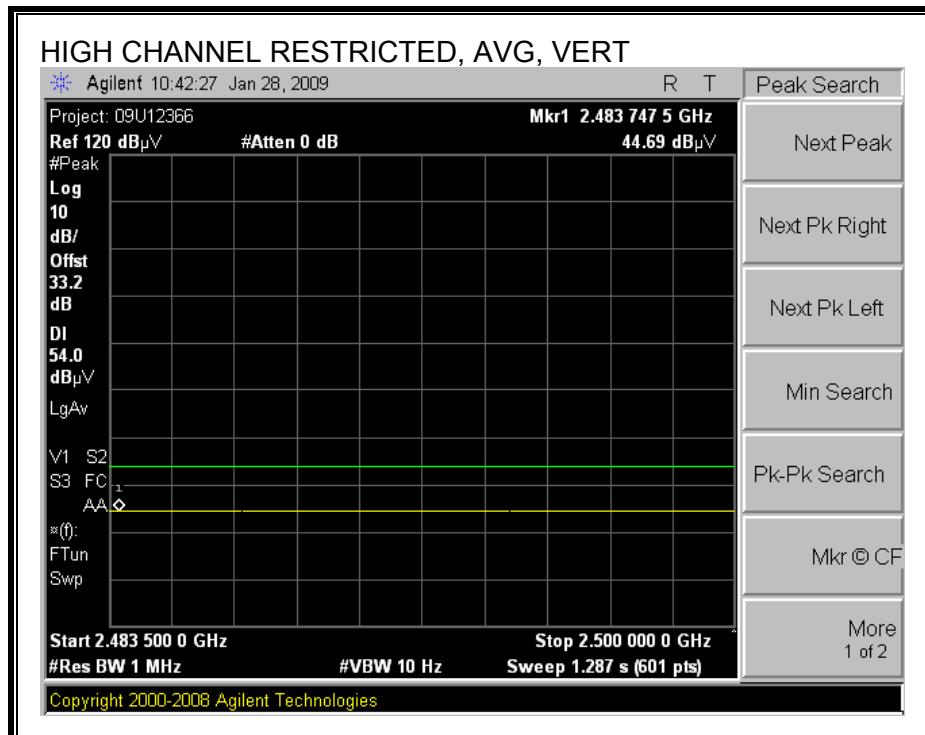
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





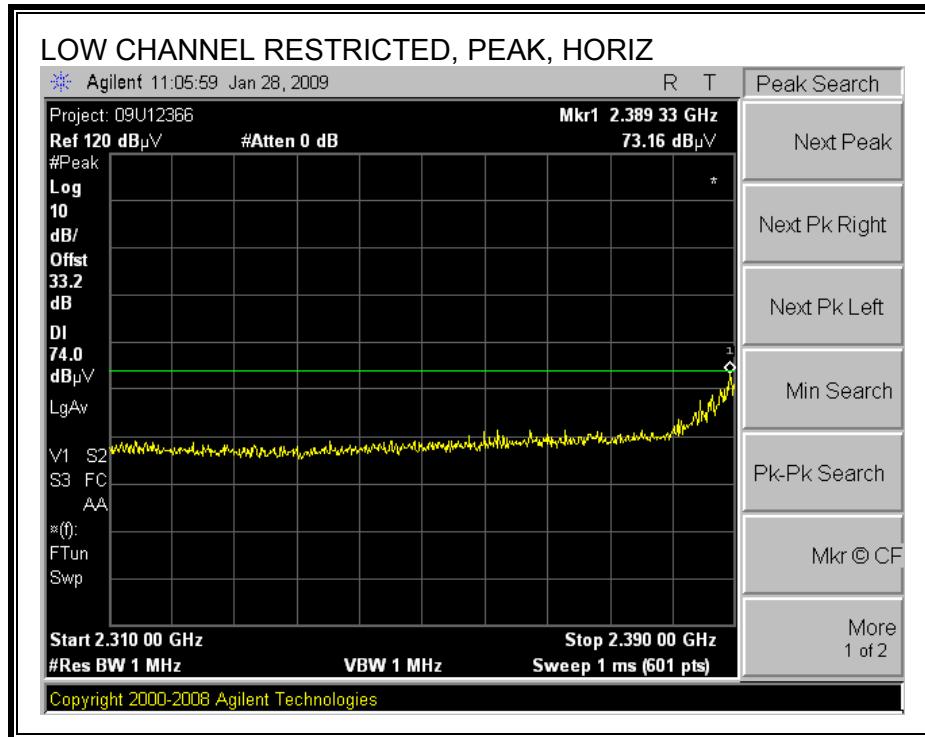
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

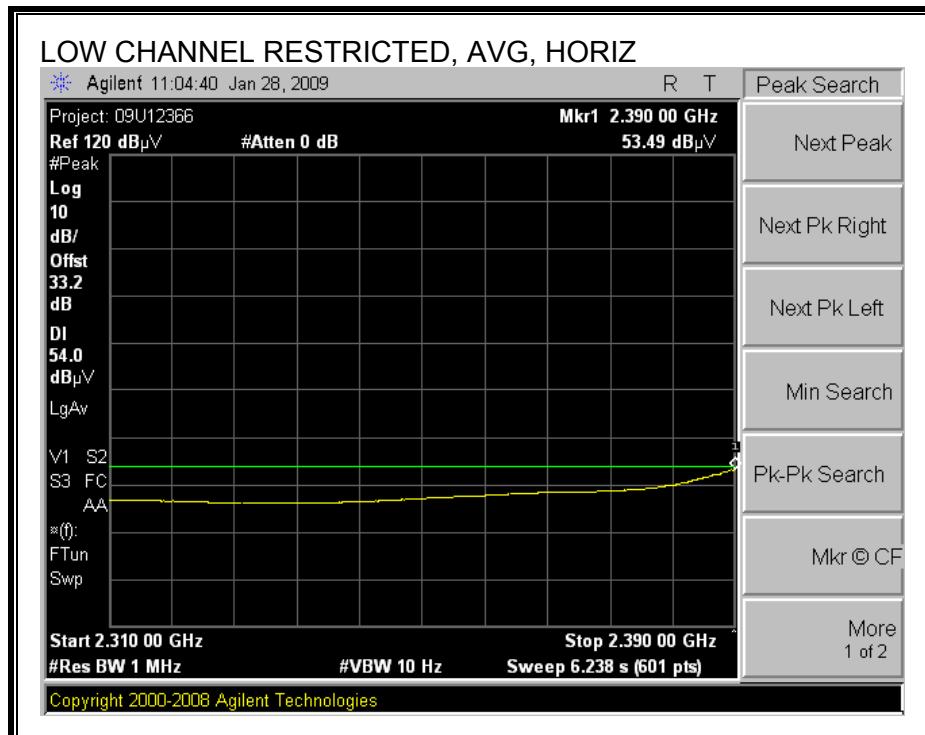




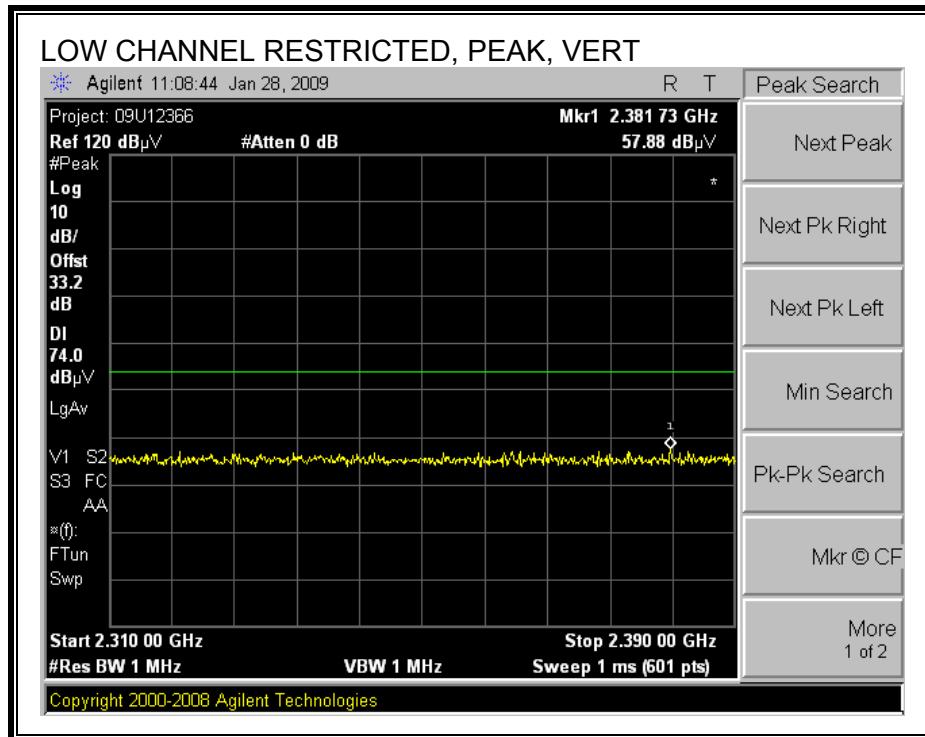
**HT 40 MHz**

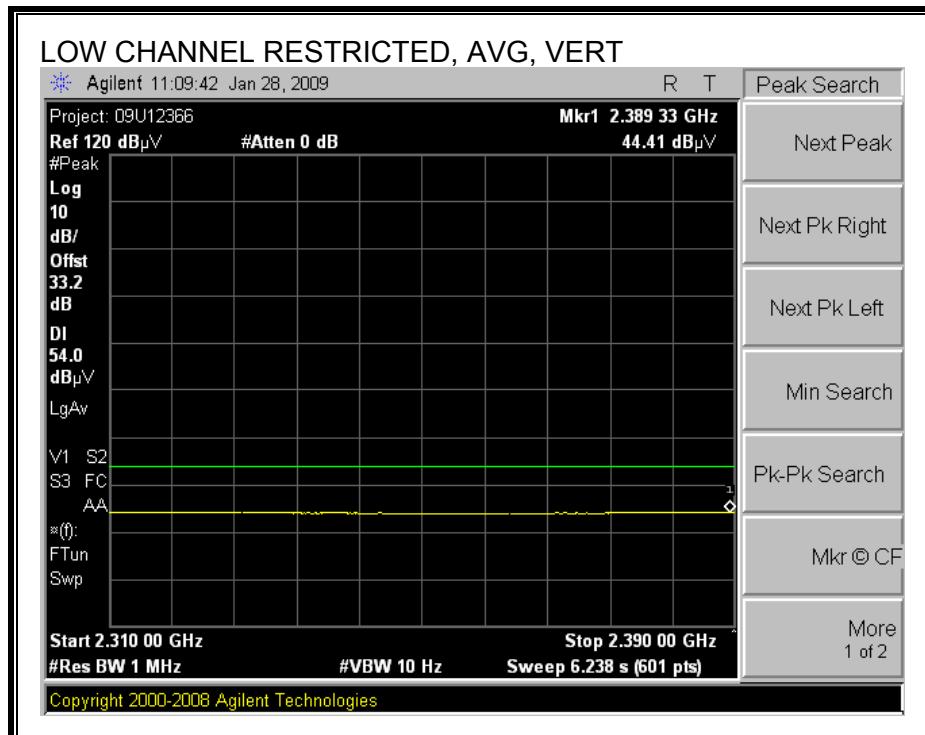
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



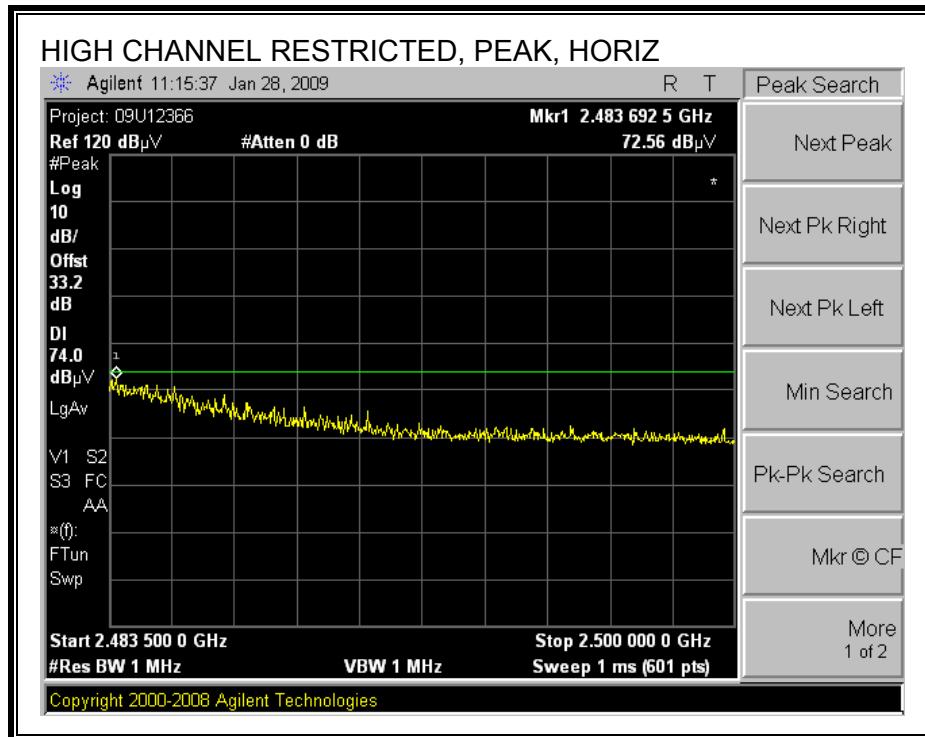


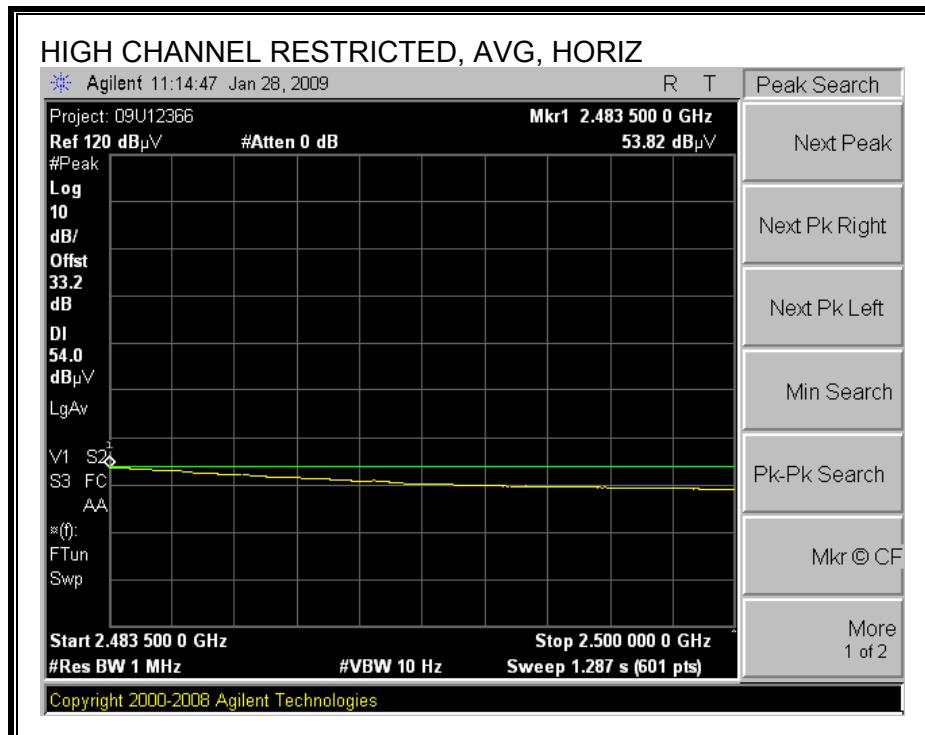
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



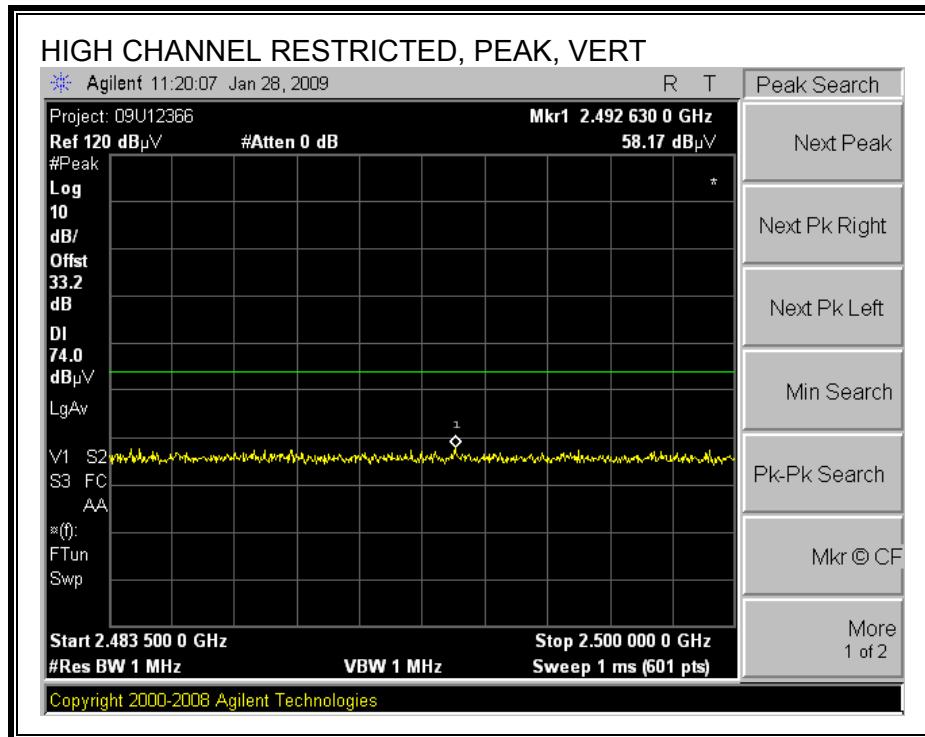


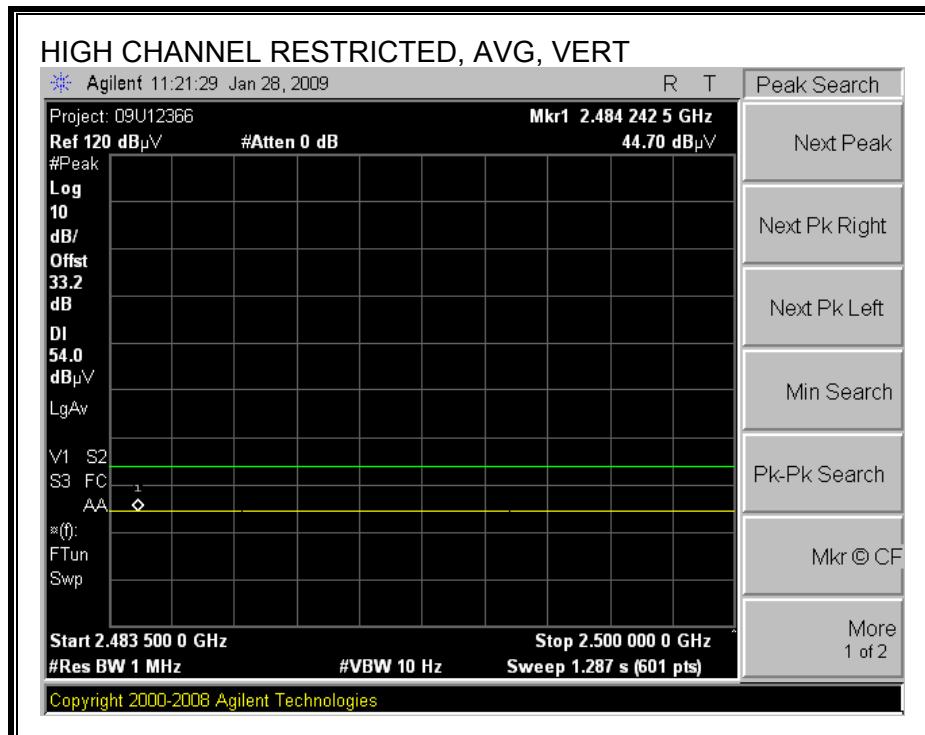
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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



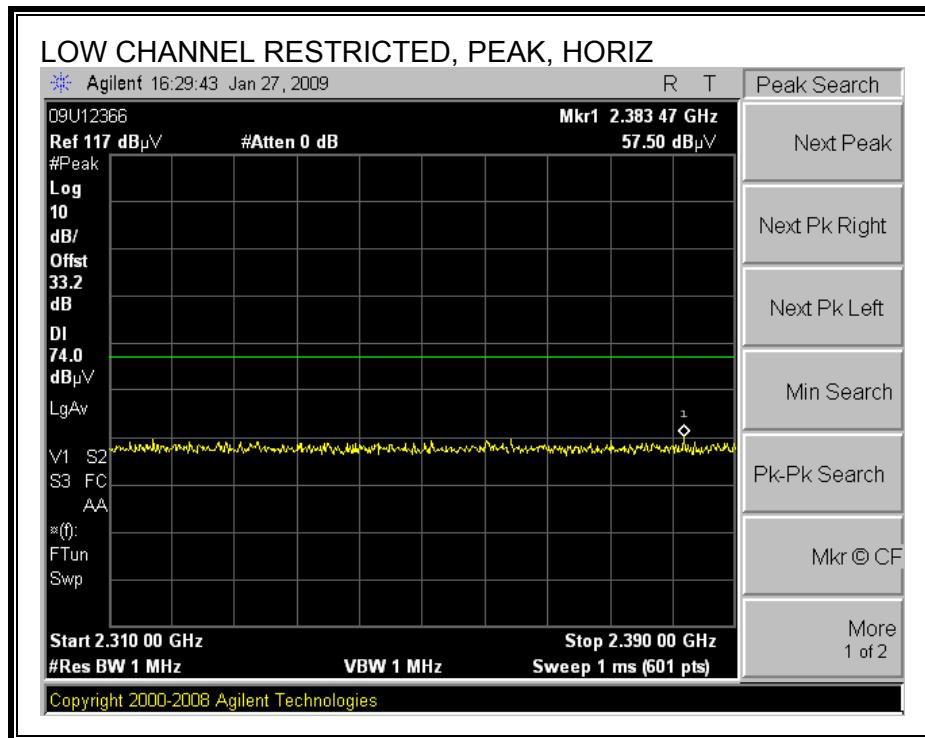


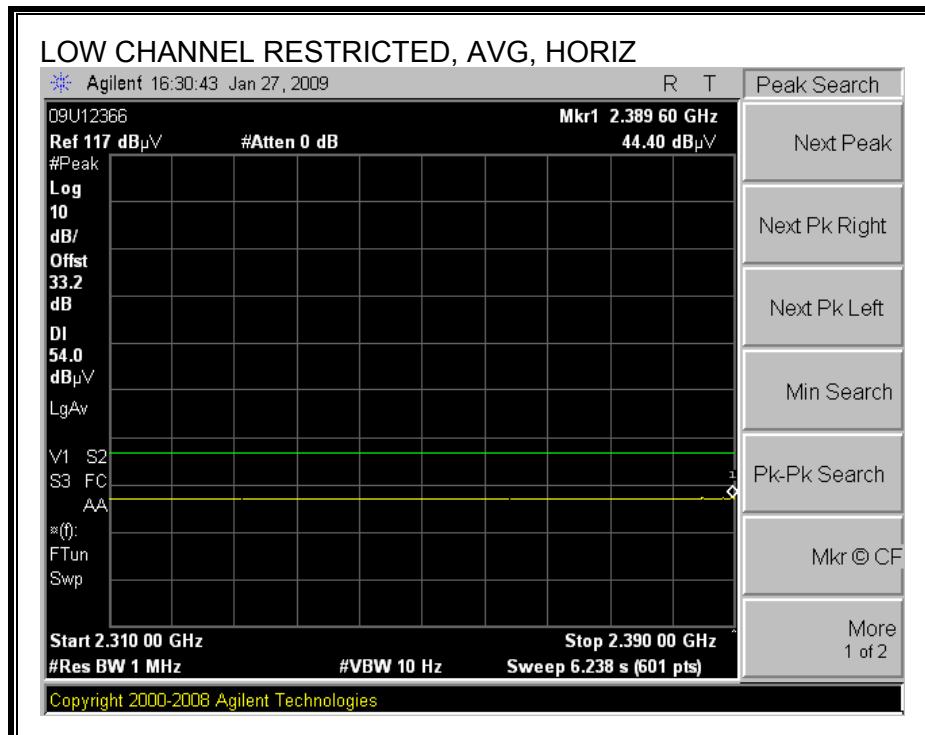
## HARMONICS AND SPURIOUS EMISSIONS (see worst case)

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company:	Meraki Inc.														
Project #:	09U12366														
Date:	01/30/09														
Test Engineer:	Thanh Nguyen														
Configuration:	EUT with flat pannel antenna 19dBi Gain														
Mode:	Transmit Worst case a mode Att=14.5														
<b>Test Equipment:</b>															
Horn 1-18GHz		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz		Limit							
T73; S/N: 6717 @3m		T34 HP 8449B				T125; ARA 18-26GHz; S/N:1007		FCC 15.209							
Hi Frequency Cables															
3' cable 22807700		12' cable 22807600		20' cable 22807500		HPF		Reject Filter		<b>Peak Measurements</b> RBW=VBW=1MHz <b>Average Measurements</b> RBW=1MHz , VBW=10Hz					
f	Dist	Read Pk	Read Avg	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
<b>LOW CHANNEL, 5745 MHz</b>															
11.490	3.0	41.0	27.5	38.6	9.5	-32.5	0.0	0.0	56.6	43.1	74	54	-17.4	-10.9	V, Noise Floor
11.490	3.0	39.7	27.5	38.6	9.5	-32.5	0.0	0.0	55.3	43.0	74	54	-18.7	-11.0	H, Noise floor
<b>MID CHANNEL, 5785 MHz</b>															
11.570	3.0	41.1	27.9	38.7	9.5	-32.5	0.0	0.0	56.8	43.5	74	54	-17.2	-10.5	V, Noise Floor
11.570	3.0	40.7	27.9	38.7	9.5	-32.5	0.0	0.0	56.4	43.5	74	54	-17.6	-10.5	H, Noise floor
<b>HII CHANNEL, 5825 MHz</b>															
11.650	3.0	41.7	29.5	38.7	9.6	-32.5	0.0	0.0	57.5	45.2	74	54	-16.5	8.8	V, Noise Floor
11.650	3.0	41.1	28.3	38.7	9.6	-32.5	0.0	0.0	56.9	44.1	74	54	-17.1	9.9	H, Noise floor
No other emissions were detected above noise floor.															
Rev. 10.15.08															
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										

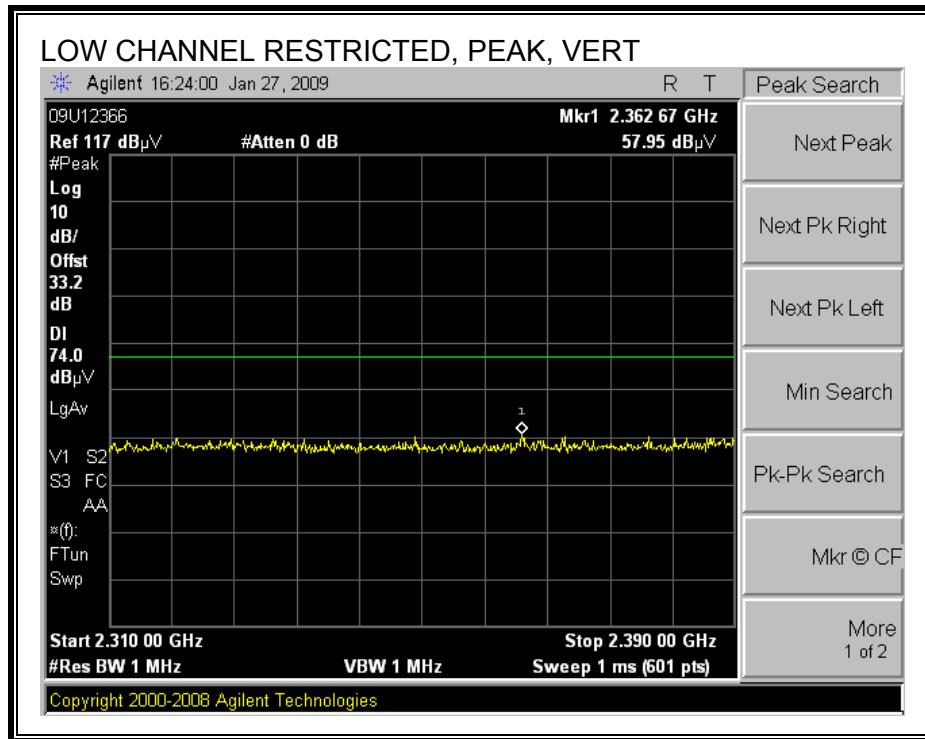
## **MODE 010**

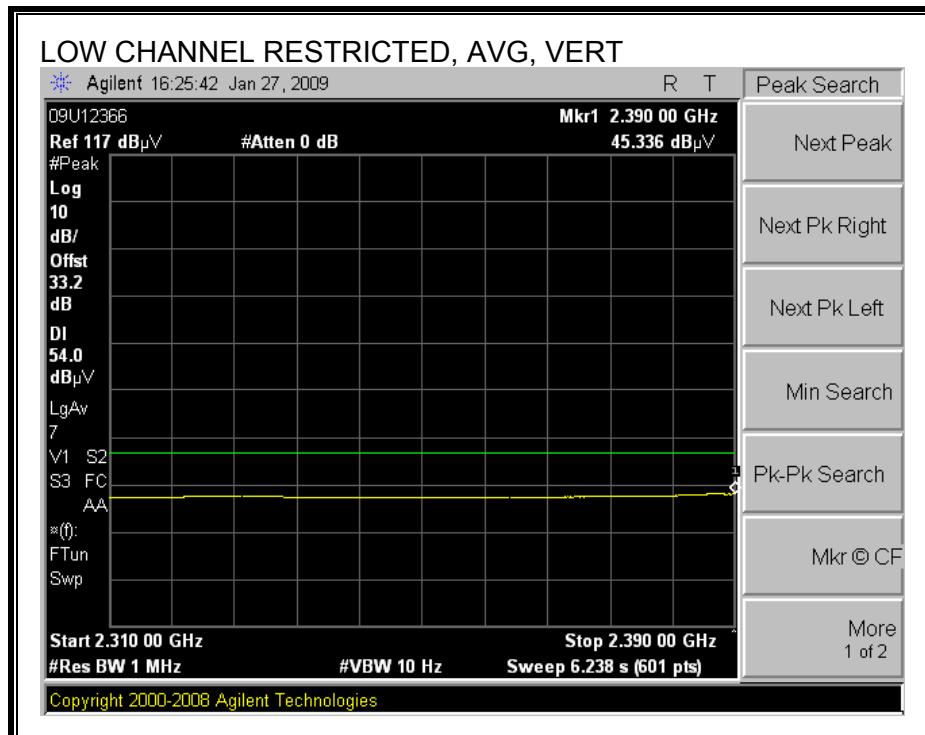
### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



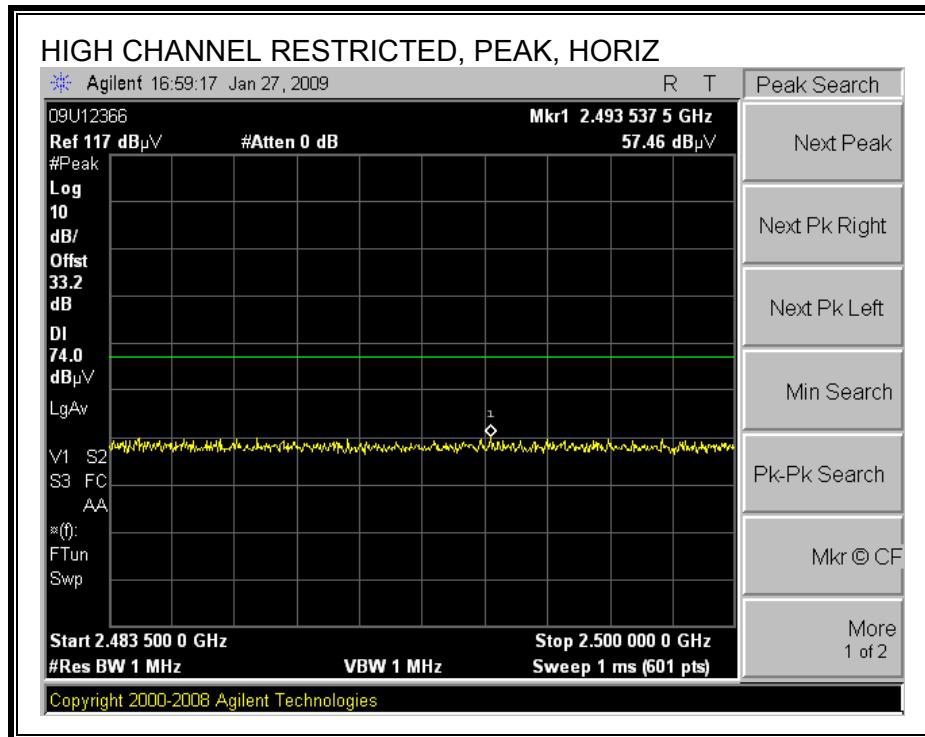


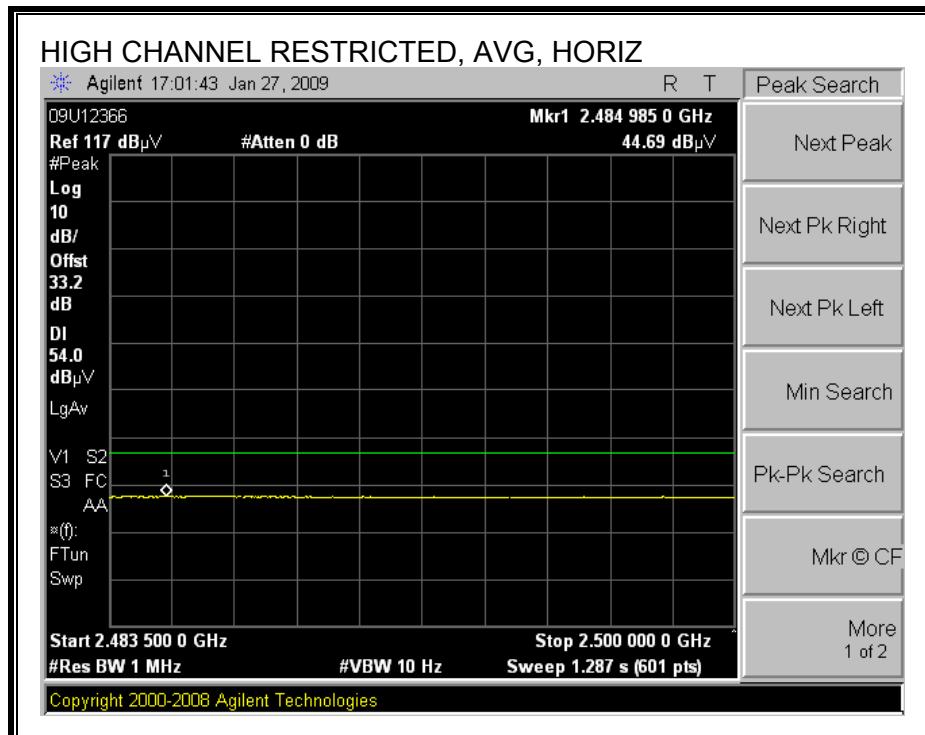
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



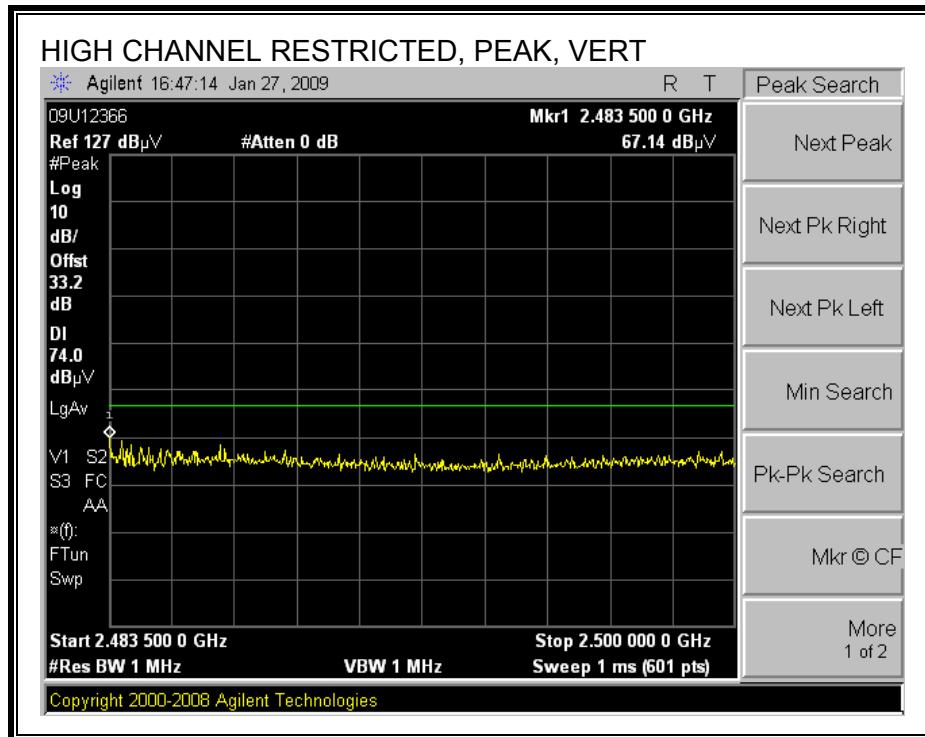


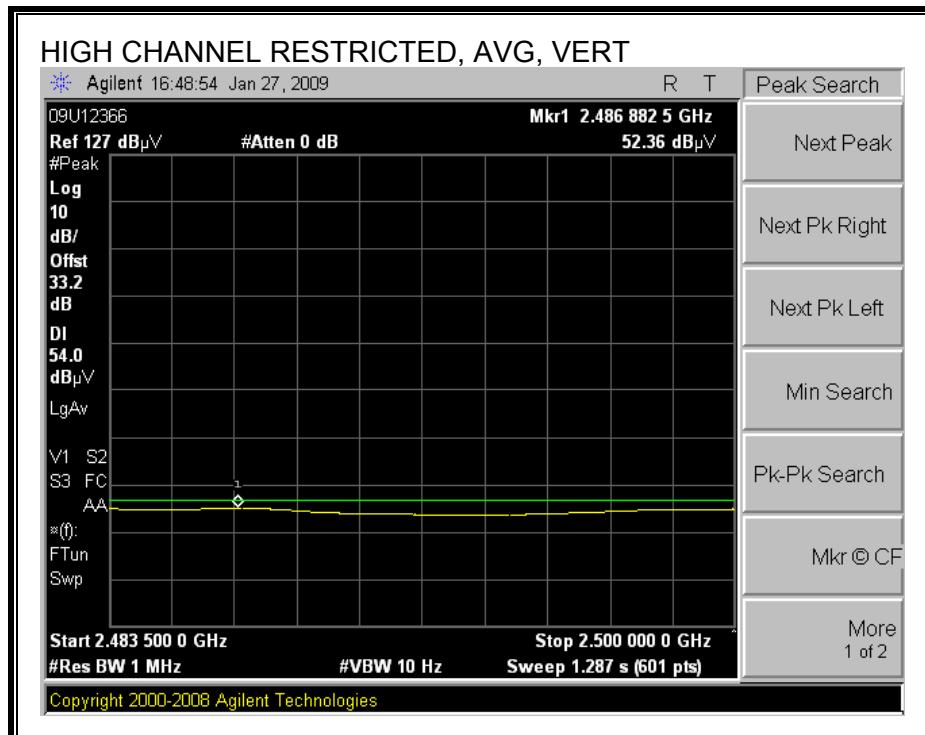
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





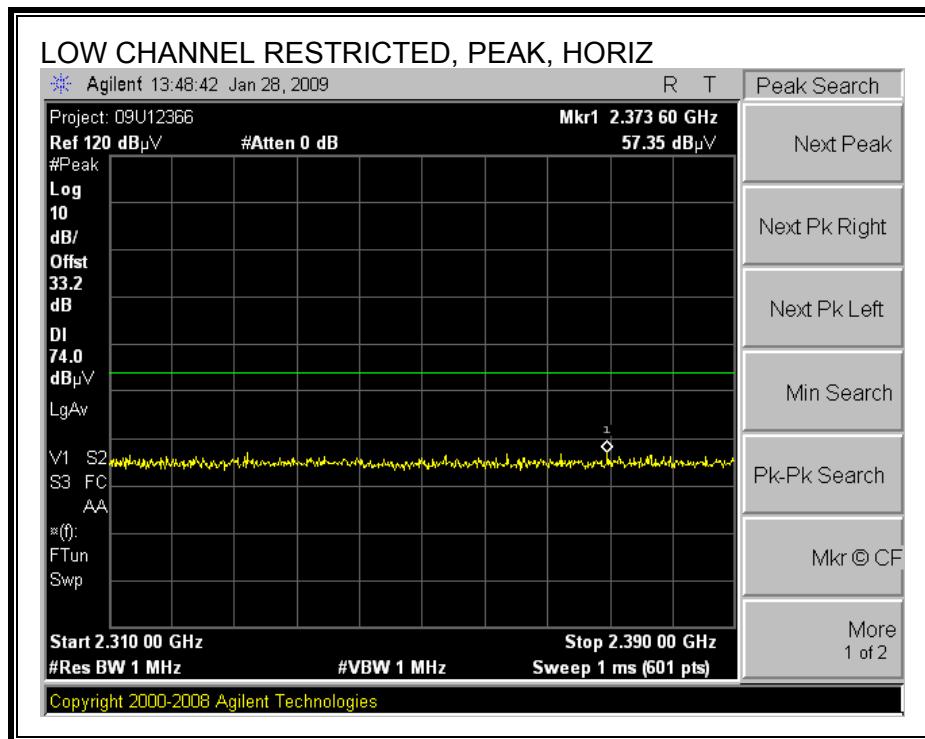
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

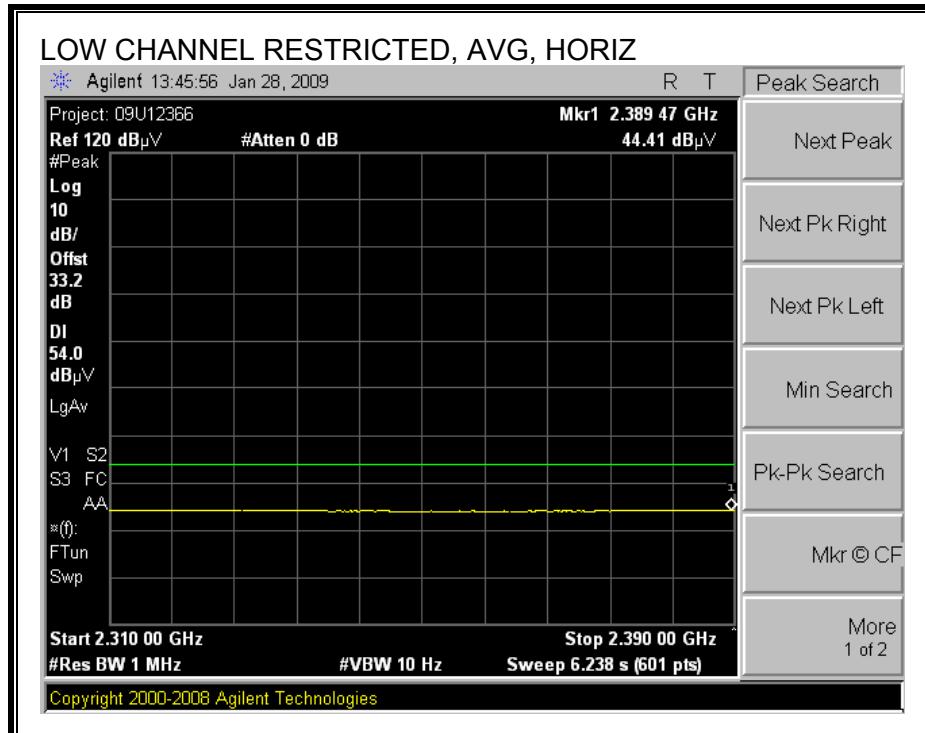




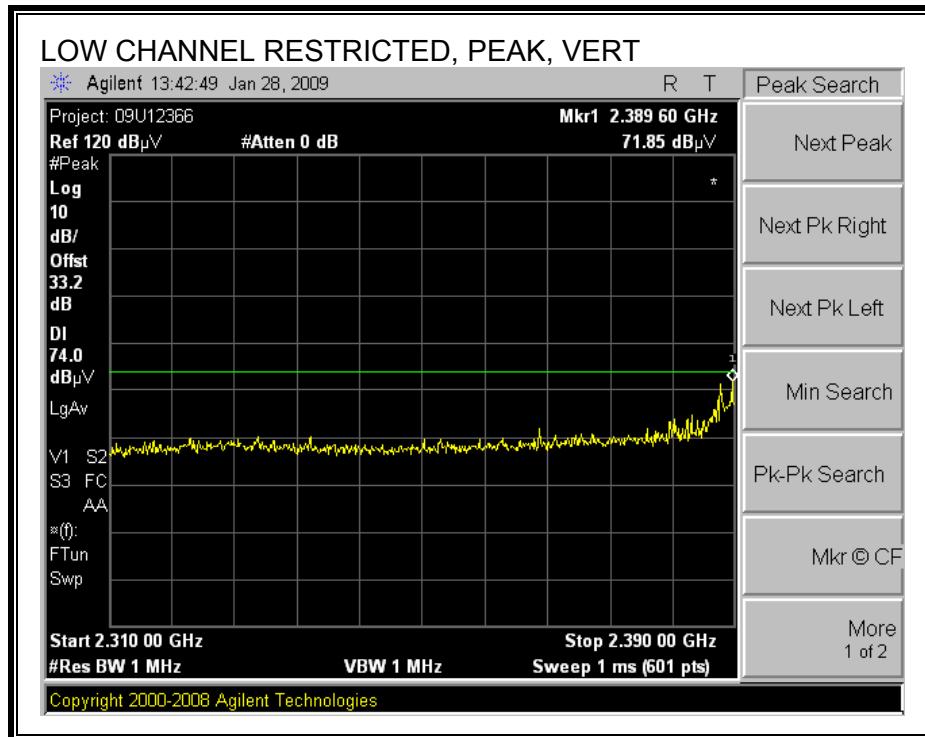
## HT 20MHz

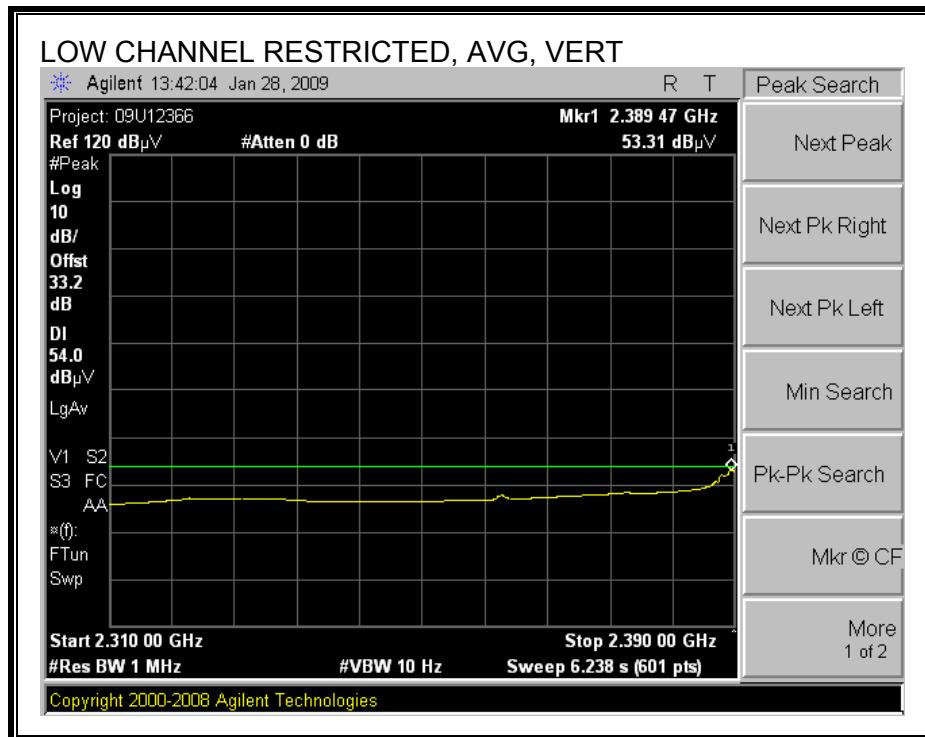
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



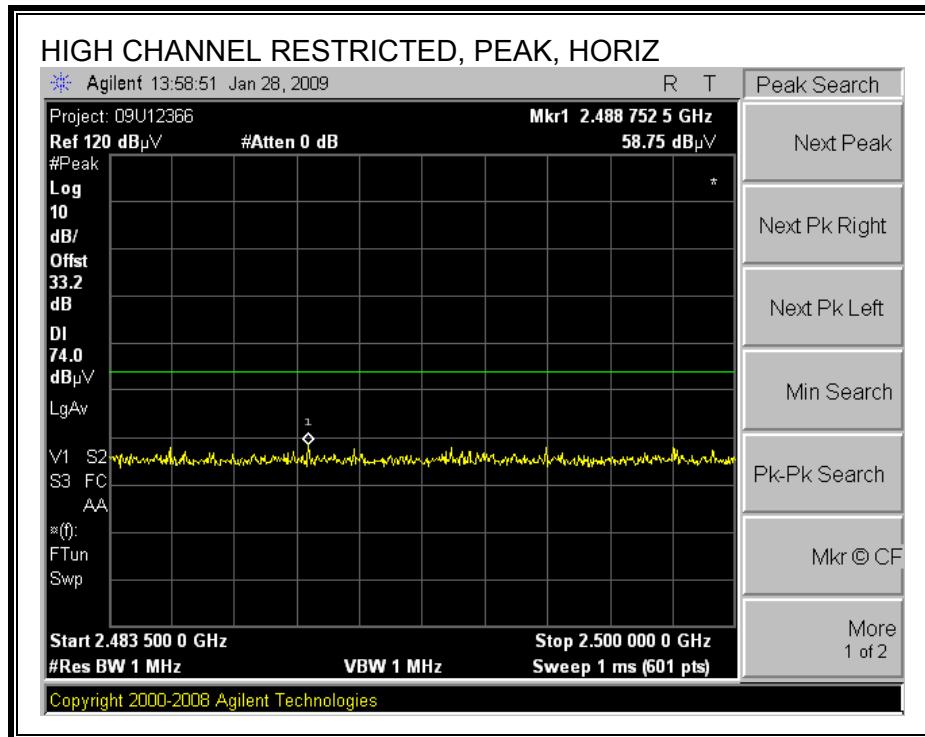


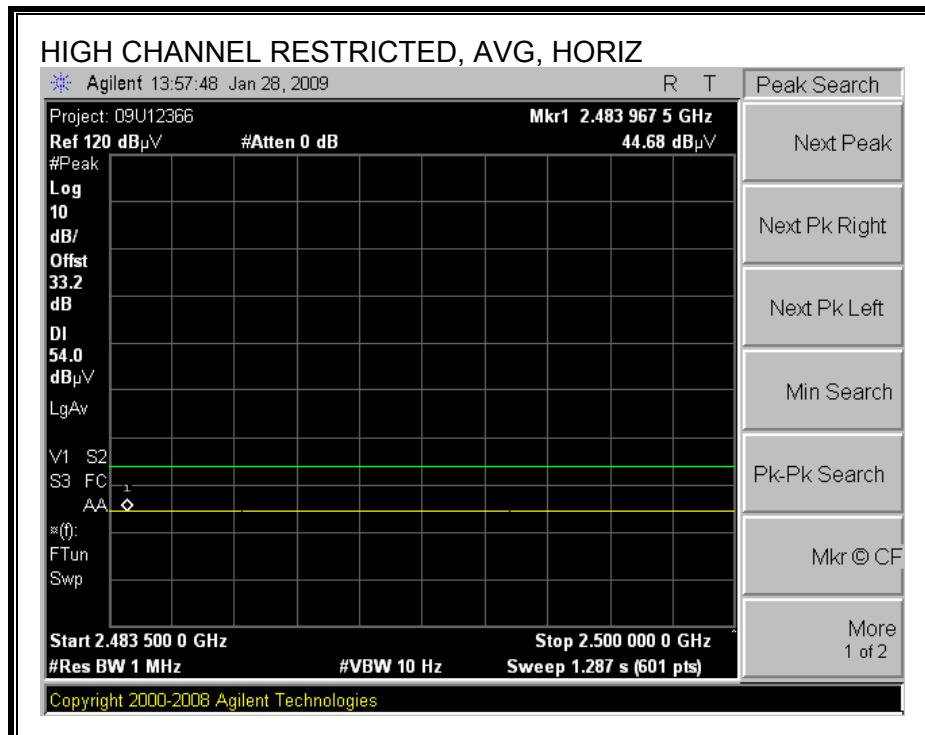
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



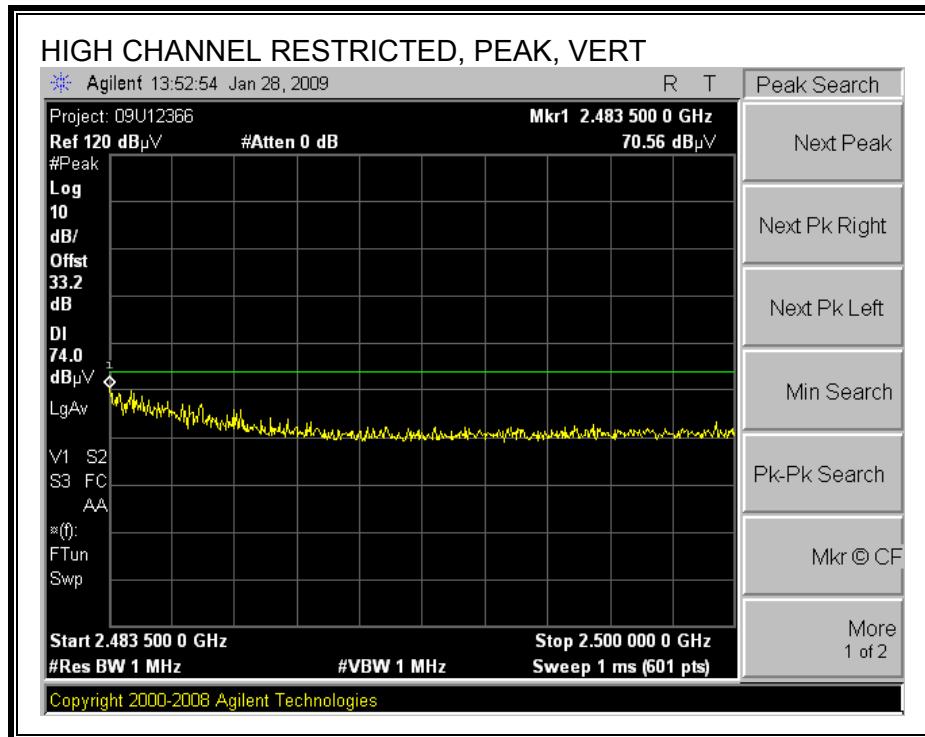


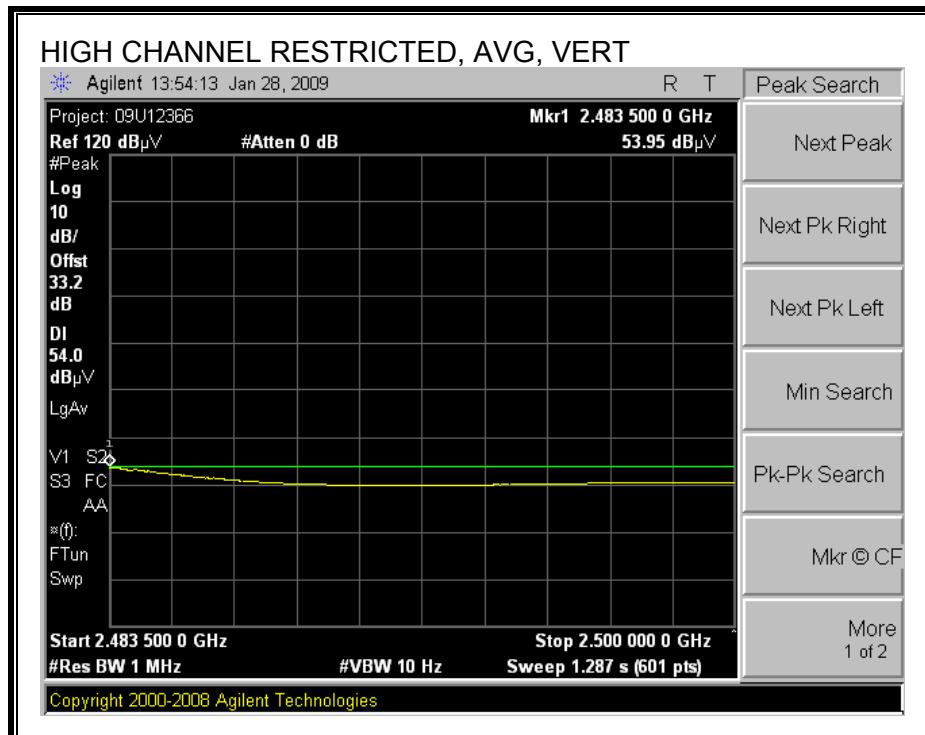
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





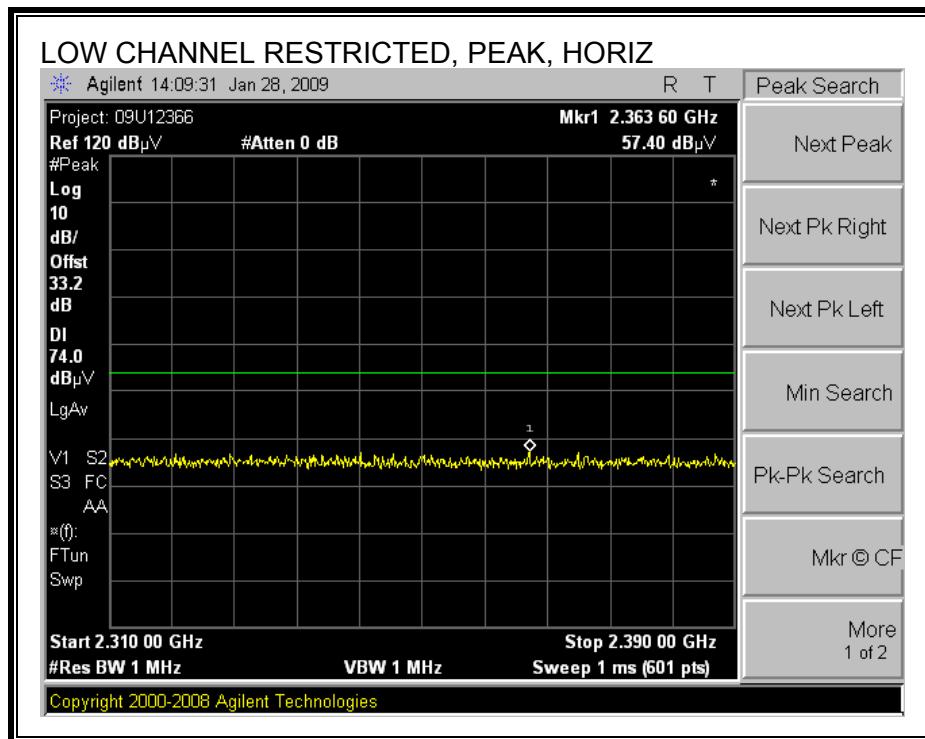
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

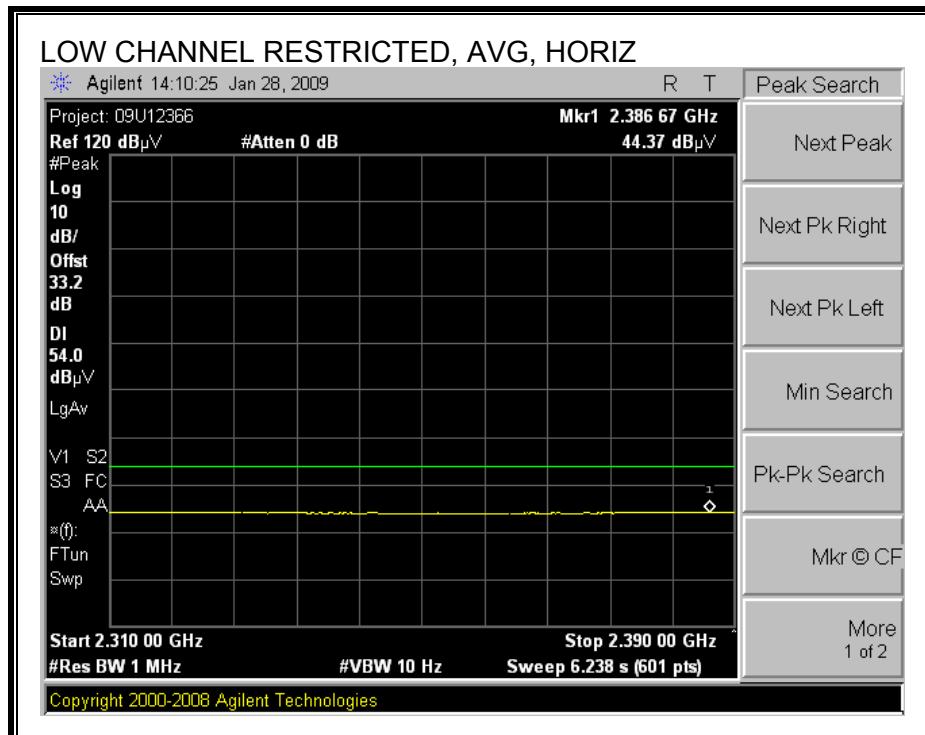




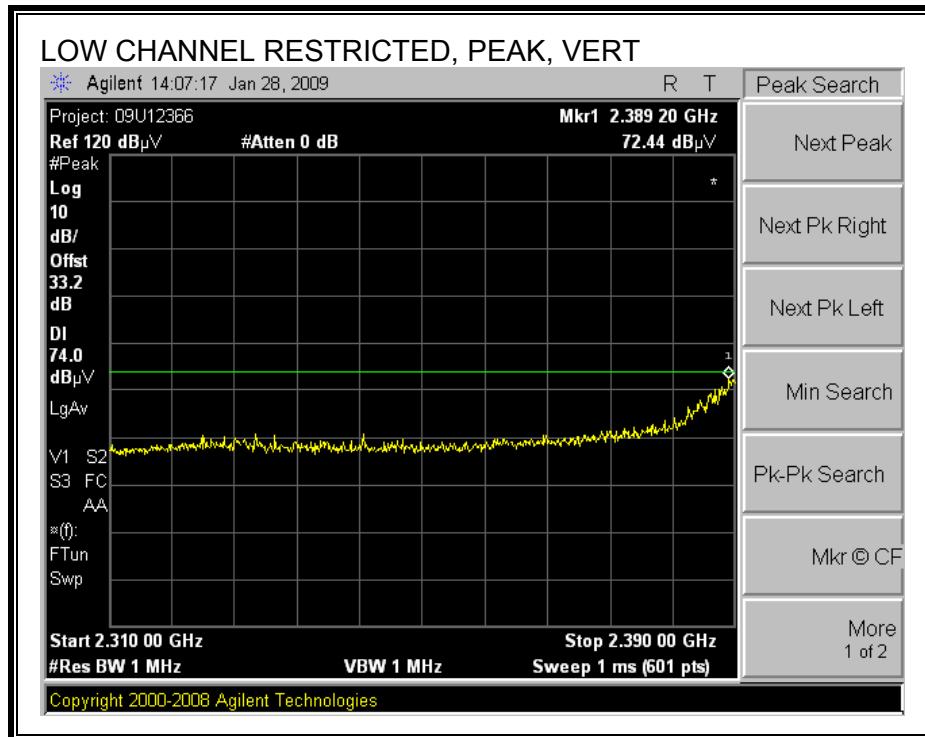
## HT 40MHz

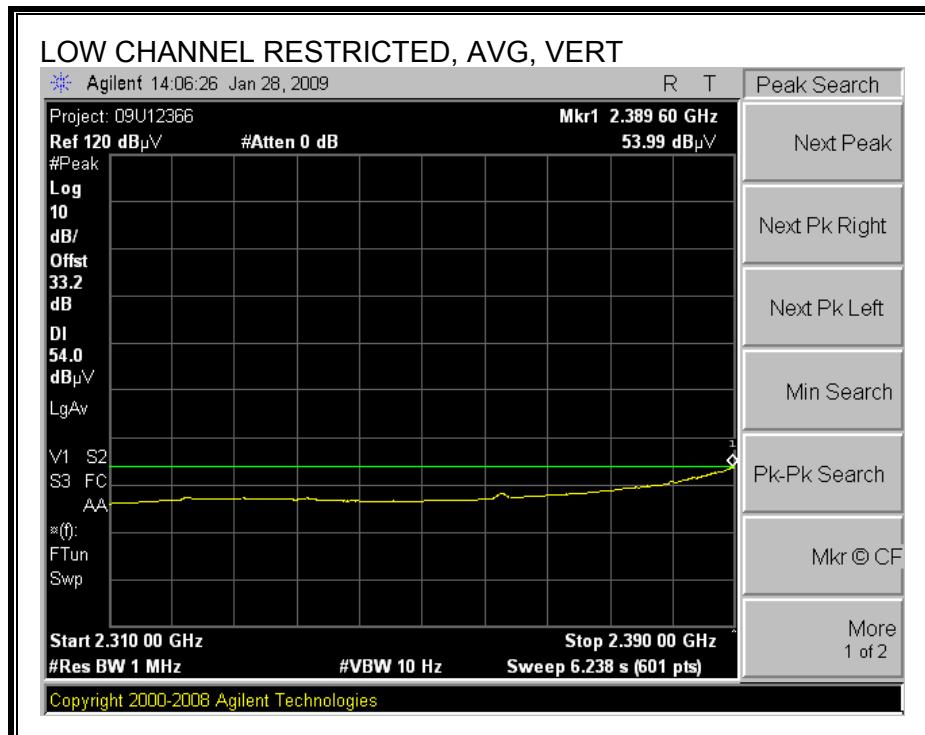
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



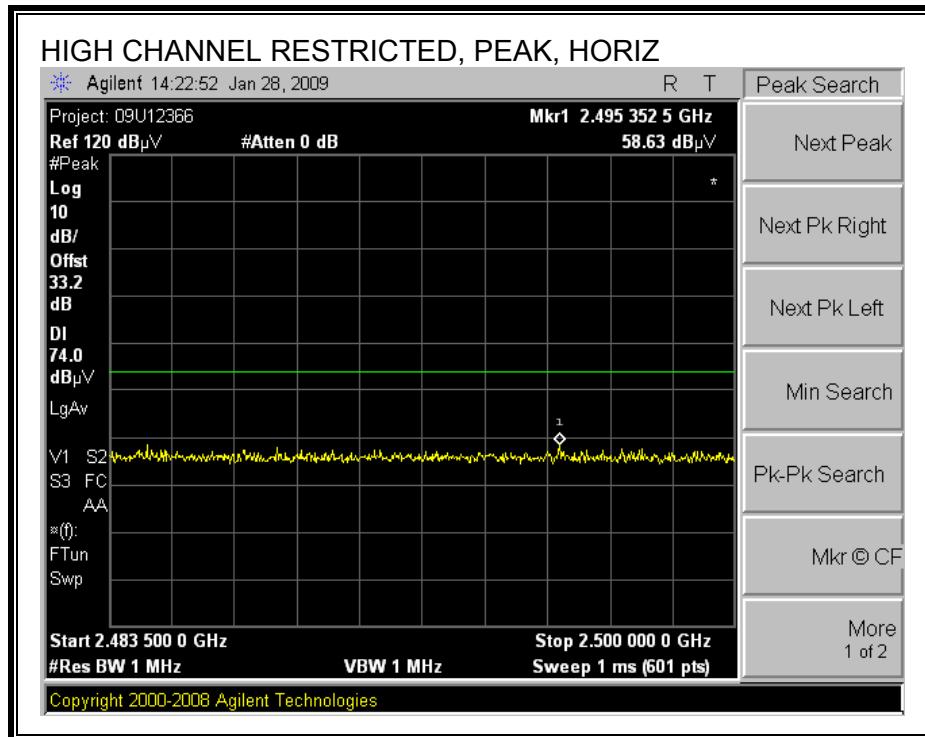


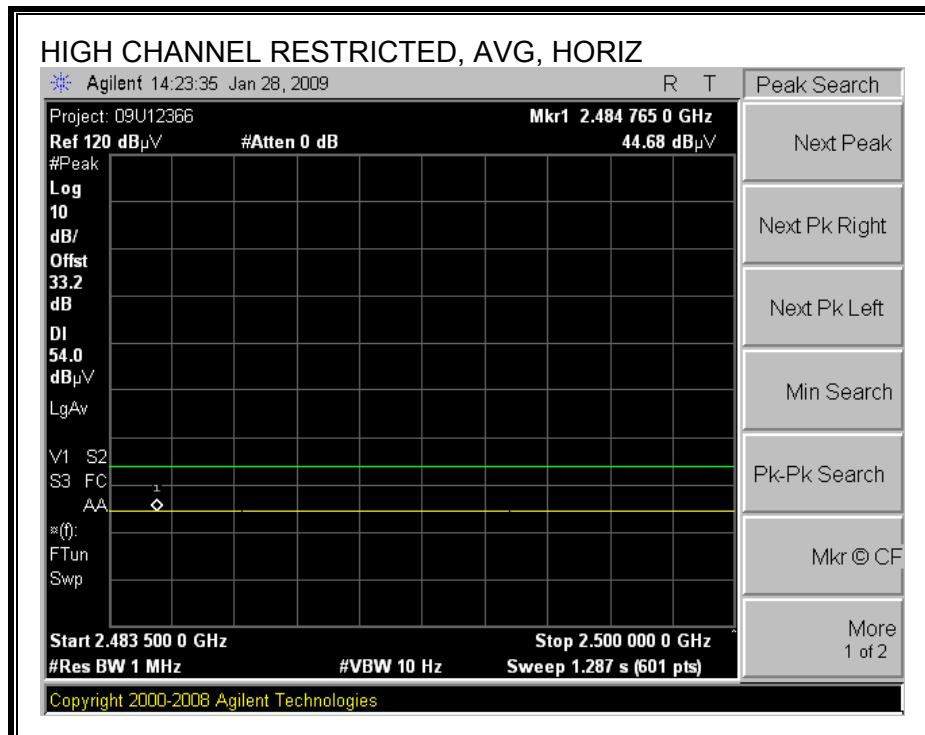
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**





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





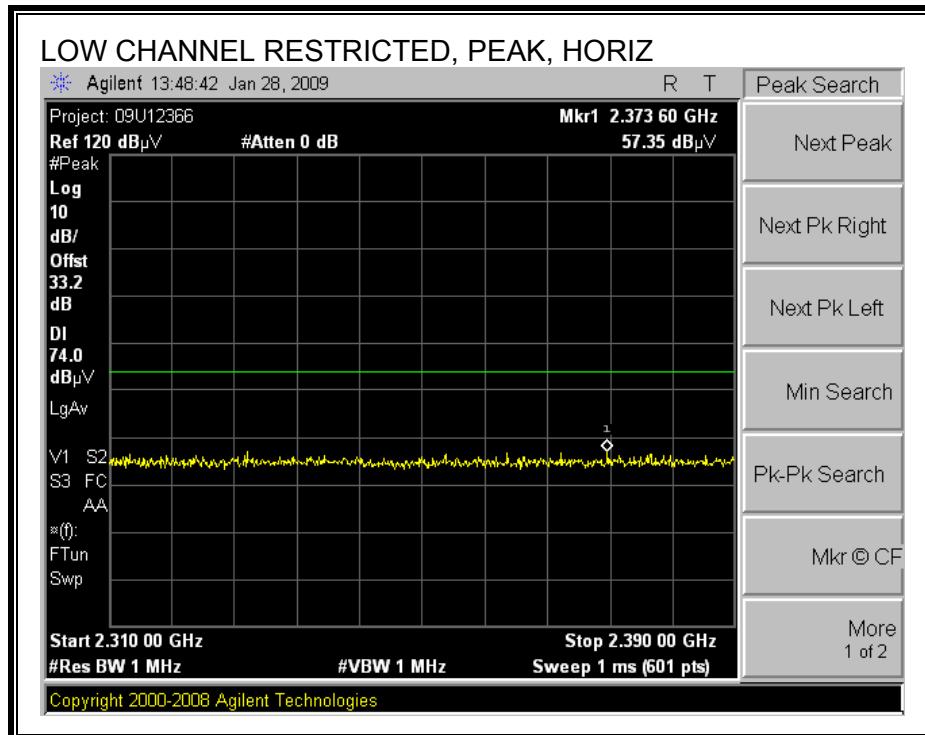
## HARMONICS AND SPURIOUS EMISSIONS

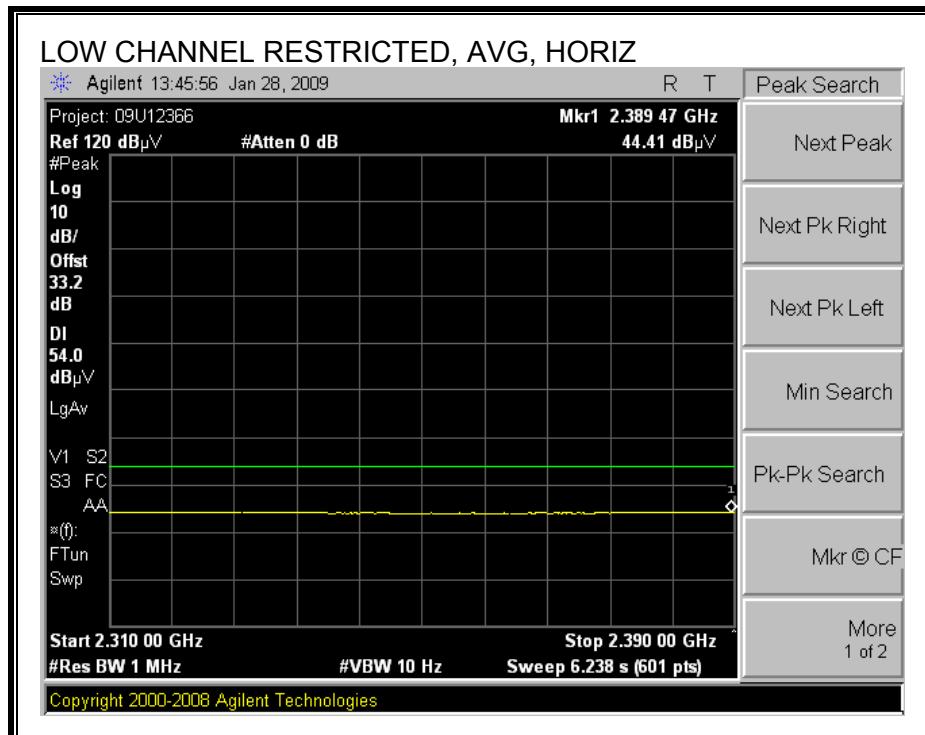
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company:	Meraki Inc.														
Project #:	09U12366														
Date:	01/29/09														
Test Engineer:	Thanh Nguyen														
Configuration:	EUT with Flat Panel Antenna 19dBi														
Mode:	Transmit Worst case g mode Art=13.5														
<b>Test Equipment:</b>															
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit			
T73; S/N: 6717 @3m	T34 HP 8449B								T125; ARA 18-26GHz; S/N:1007			FCC 15.209			
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_001			Peak Measurements	RBW=VBW=1MHz		
Average Measurements															
RBW=1MHz , VBW=10Hz															
<b>f</b>	<b>Dist</b> <b>GHz</b>	<b>Read Pk</b> <b>dBuV</b>	<b>Read Avg</b> <b>dBuV</b>	<b>AF</b> <b>dB/m</b>	<b>CL</b> <b>dB</b>	<b>Amp</b> <b>dB</b>	<b>D Corr</b> <b>dB</b>	<b>Fltr</b> <b>dB</b>	<b>Peak</b> <b>dBuV/m</b>	<b>Avg</b> <b>dBuV/m</b>	<b>Pk Lim</b> <b>dBuV/m</b>	<b>Avg Lim</b> <b>dBuV/m</b>	<b>Pk Mar</b> <b>dB</b>	<b>Avg Mar</b> <b>dB</b>	<b>Notes</b> <b>(V/H)</b>
<b>Low channel</b>															
4.824	3.0	48.4	36.5	33.7	5.8	-34.8	0.0	0.0	53.2	41.2	74	54	-20.8	-12.8	V
7.236	3.0	41.2	28.7	36.2	7.2	-34.1	0.0	0.0	50.5	37.9	74	54	-23.5	-16.1	Noise floor
4.824	3.0	46.8	32.3	33.7	5.8	-34.8	0.0	0.0	51.5	37.0	74	54	-22.5	-17.0	H
7.236	3.0	40.3	28.6	36.2	7.2	-34.1	0.0	0.0	49.6	37.9	74	54	-24.4	-16.1	Noise floor
<b>Mid channel</b>															
4.874	3.0	49.5	37.5	33.8	5.8	-34.8	0.0	0.0	54.4	42.3	74	54	-19.6	-11.7	V
7.311	3.0	41.2	28.4	36.2	7.3	-34.1	0.0	0.0	50.6	37.8	74	54	-23.4	-16.2	Noise floor
4.874	3.0	47.6	34.7	33.8	5.8	-34.8	0.0	0.0	52.4	39.5	74	54	-21.6	-14.5	H
7.311	3.0	41.3	28.4	36.2	7.3	-34.1	0.0	0.0	50.7	37.8	74	54	-23.3	-16.2	Noise floor
<b>High channel</b>															
4.924	3.0	48.7	37.3	33.9	5.9	-34.8	0.0	0.0	53.6	42.2	74	54	-20.4	-11.8	V
7.386	3.0	42.2	28.9	36.3	7.3	-34.1	0.0	0.0	51.7	38.4	74	54	-22.3	-15.6	Noise floor
4.924	3.0	47.4	35.4	33.9	5.9	-34.8	0.0	0.0	52.4	40.4	74	54	-21.6	-13.6	H
7.386	3.0	41.9	28.9	36.3	7.3	-34.1	0.0	0.0	51.4	38.4	74	54	-22.6	-15.6	Noise floor
No other emissions were detected above noise floor.															
Rev. 10.15.08															
<b>f</b>	Measurement Frequency			<b>Amp</b>	Preamp Gain				<b>Avg Lim</b>	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										

## MODE 110

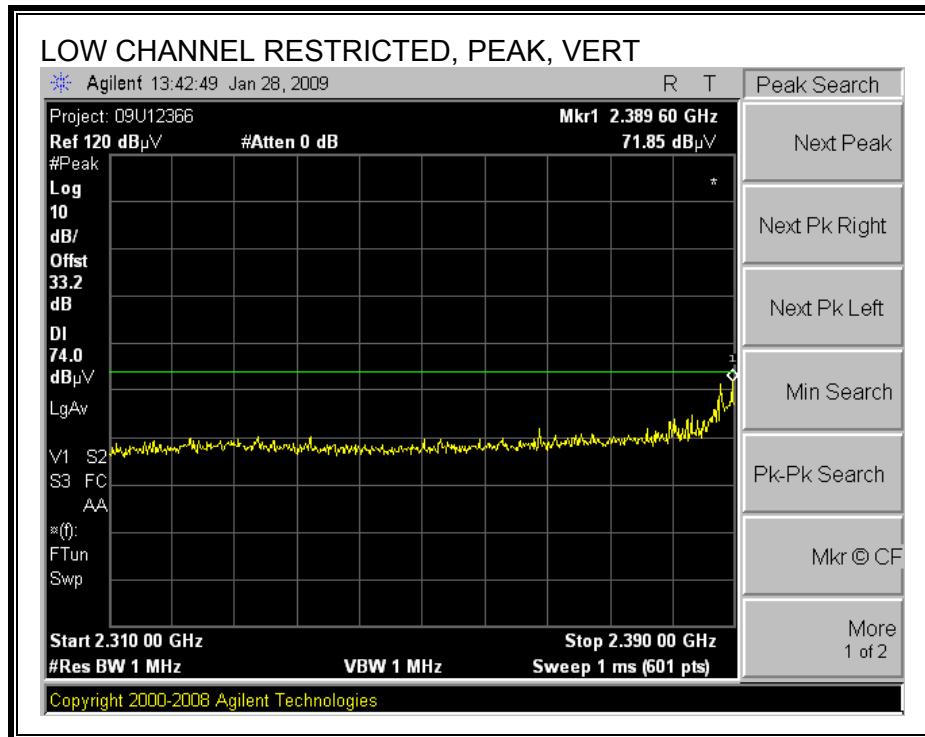
HT 20MHz

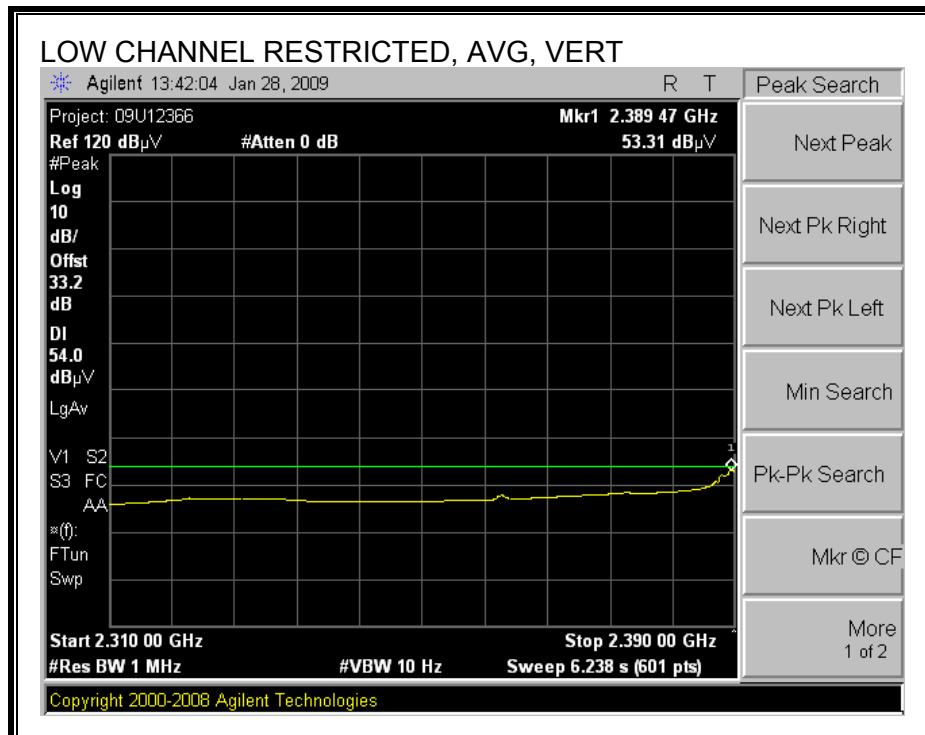
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



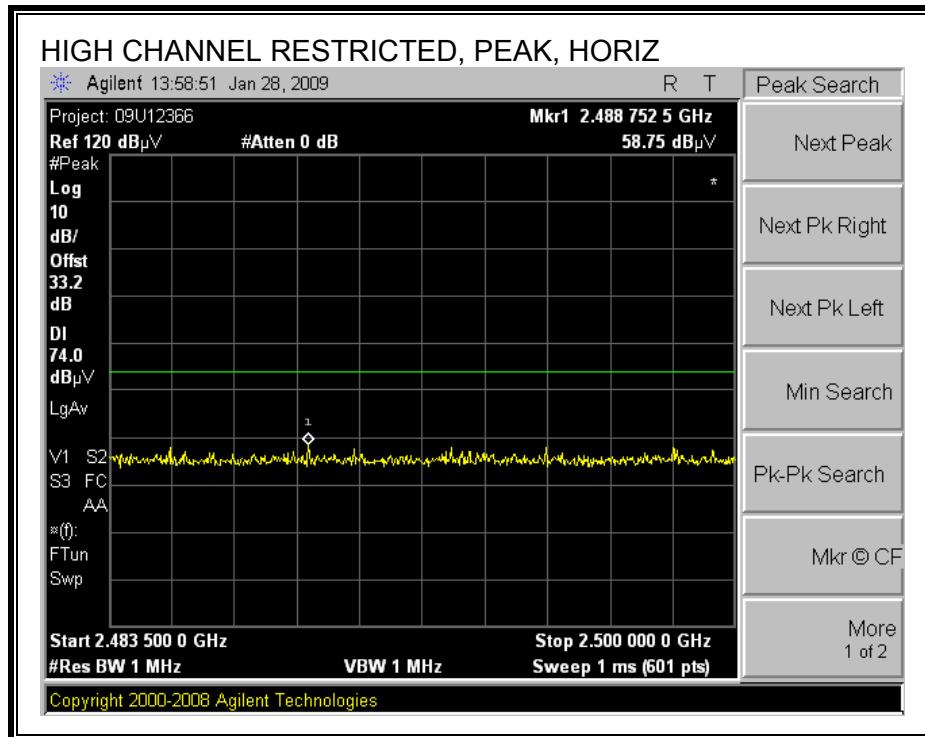


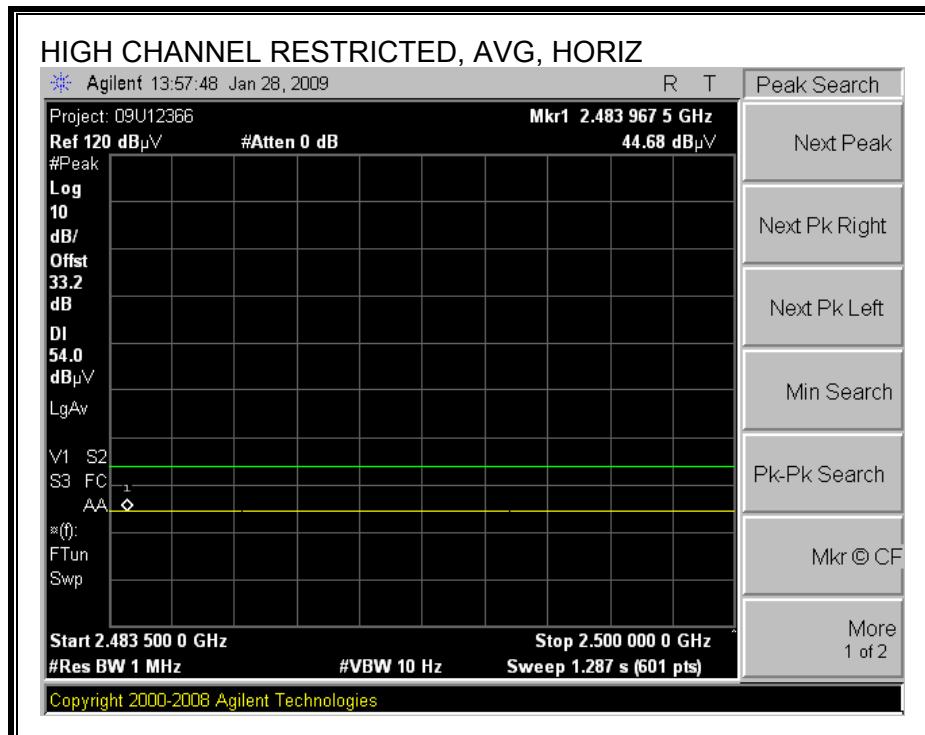
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



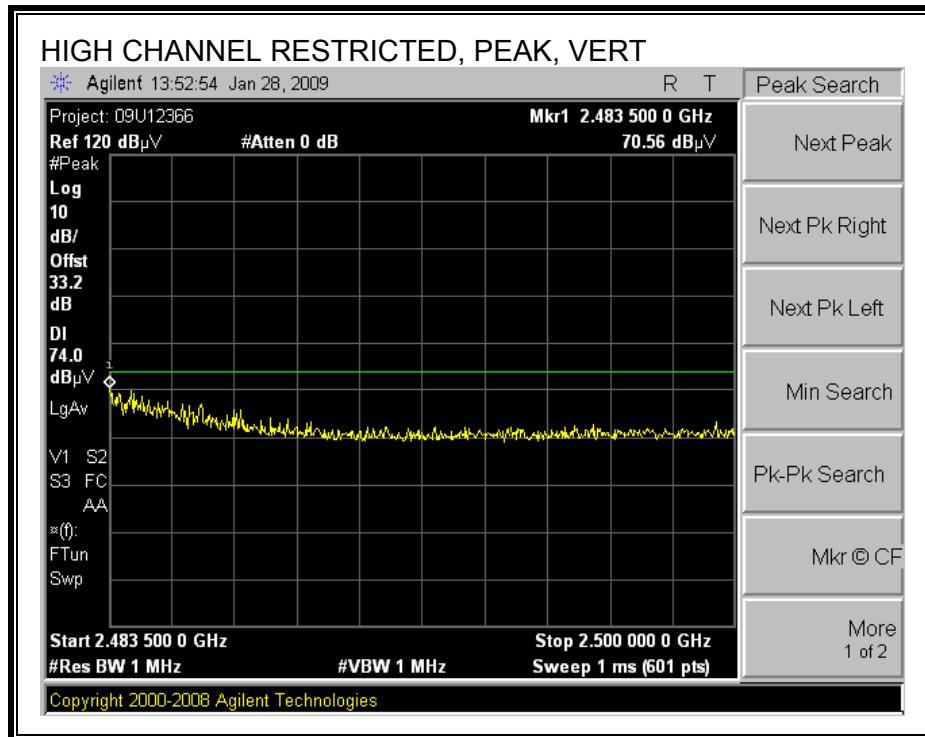


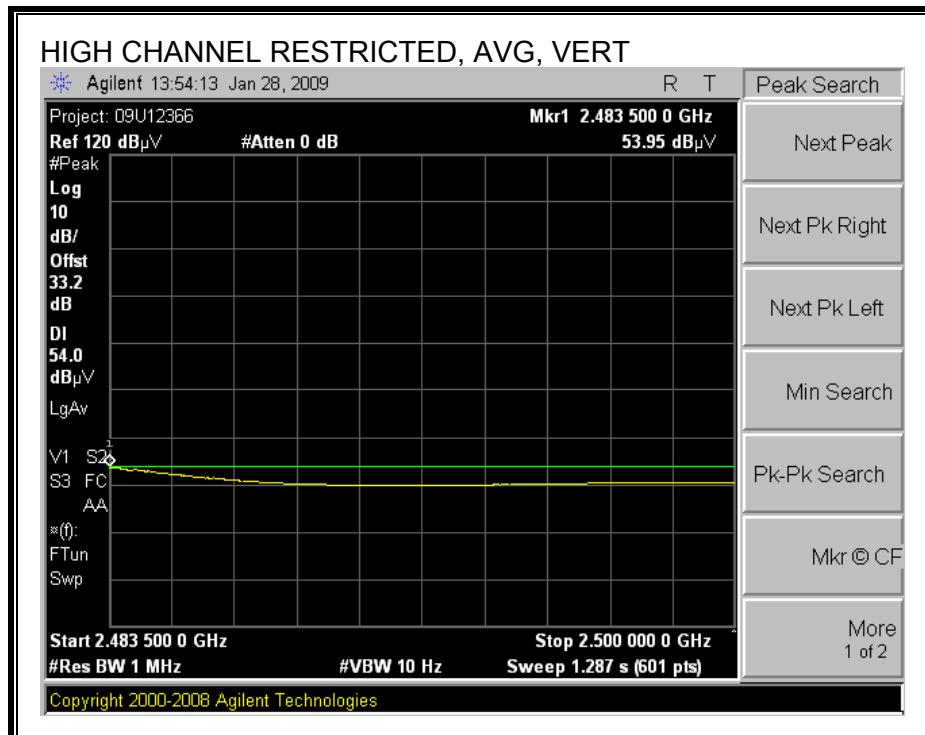
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



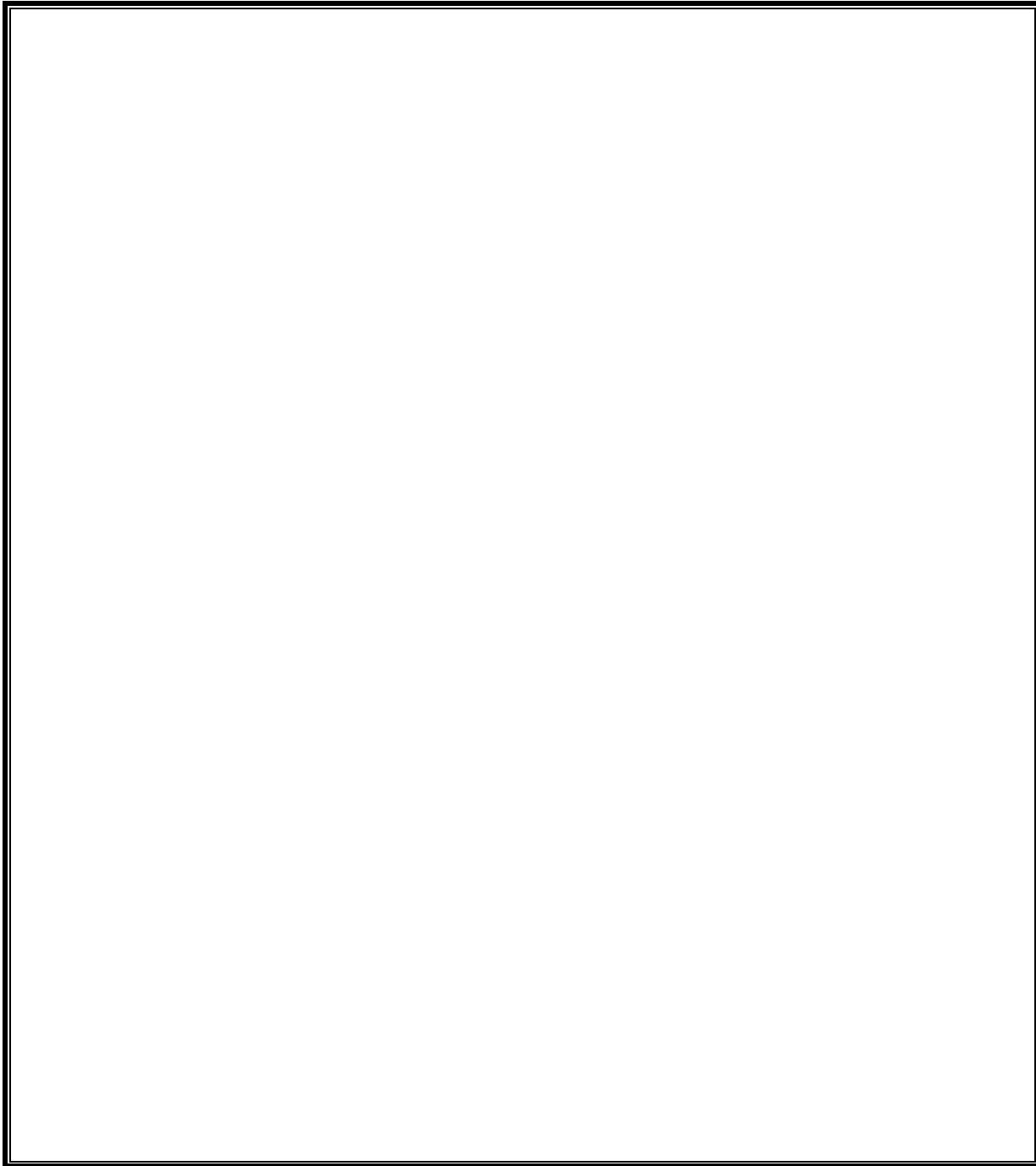


**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



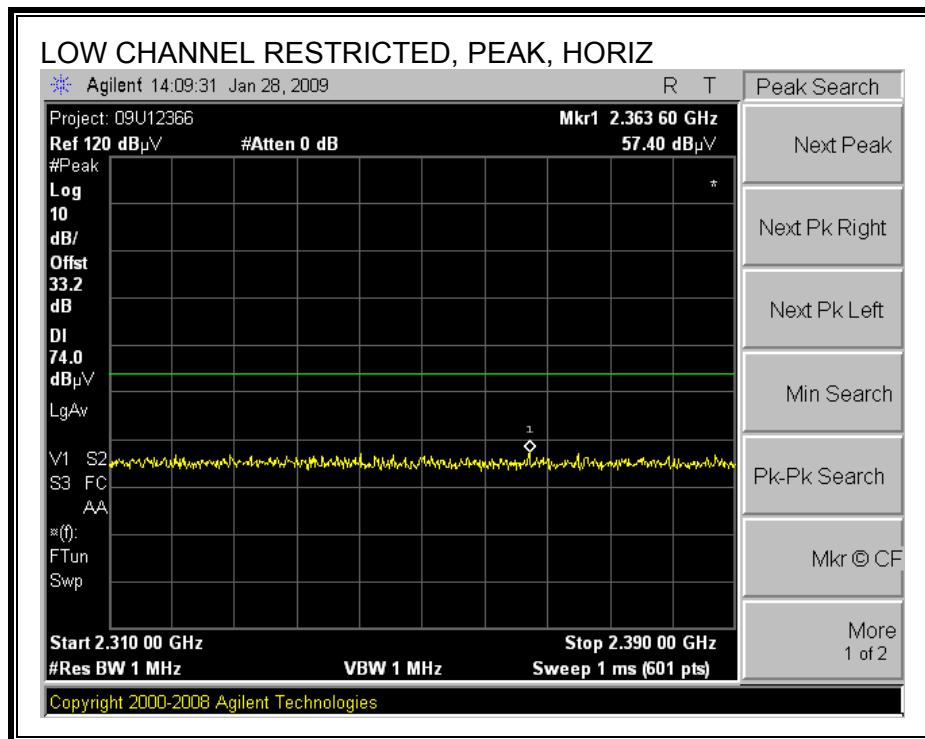


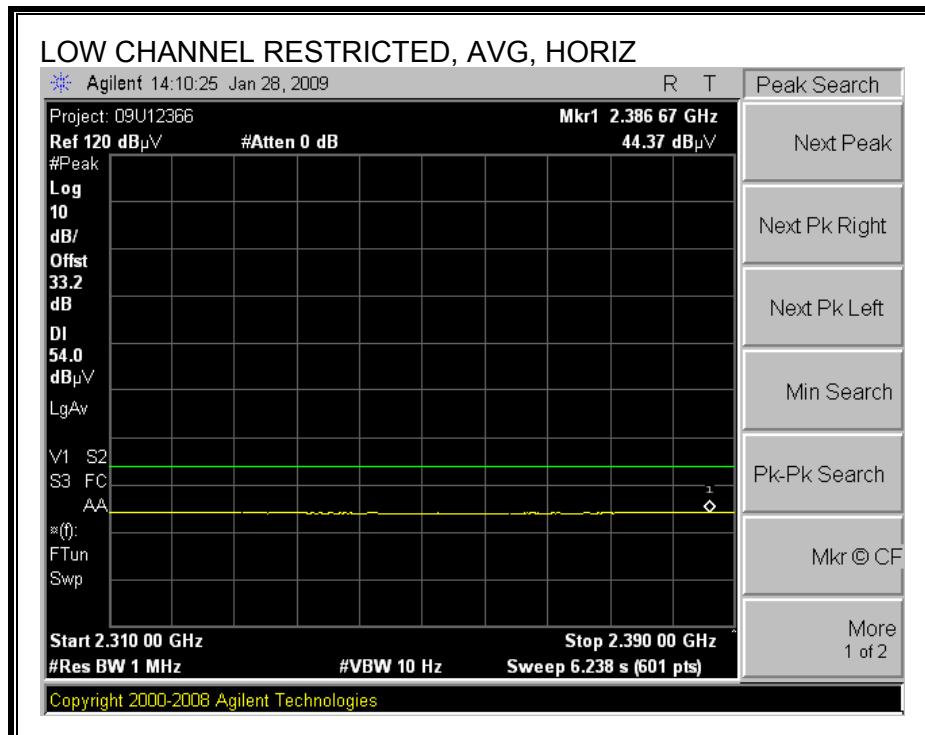
**HARMONICS AND SPURIOUS EMISSIONS**



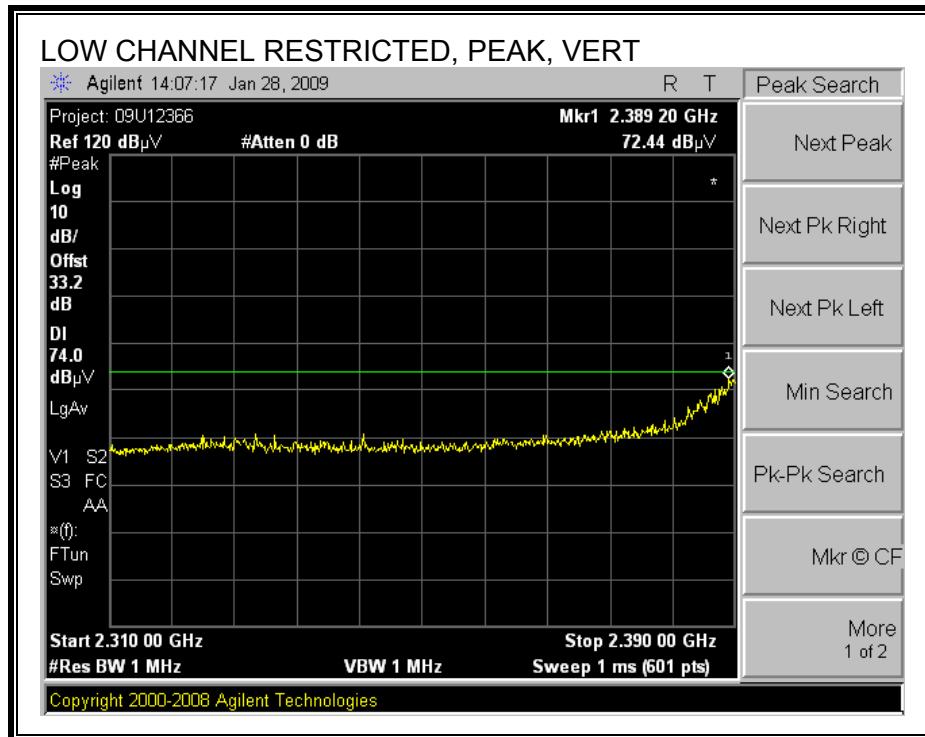
**HT 40 MHz**

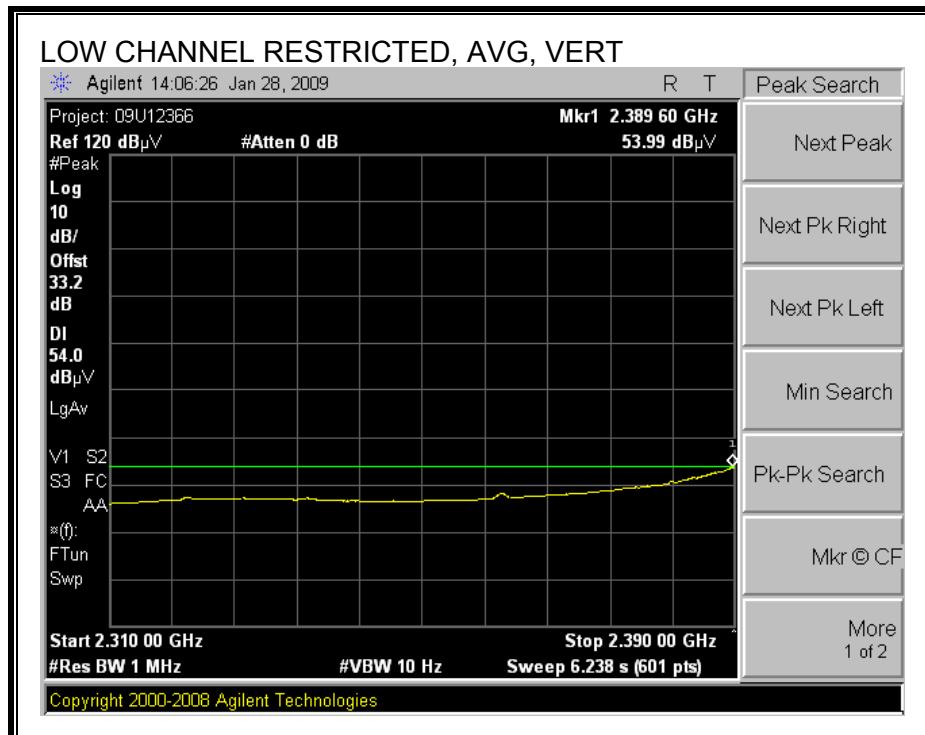
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



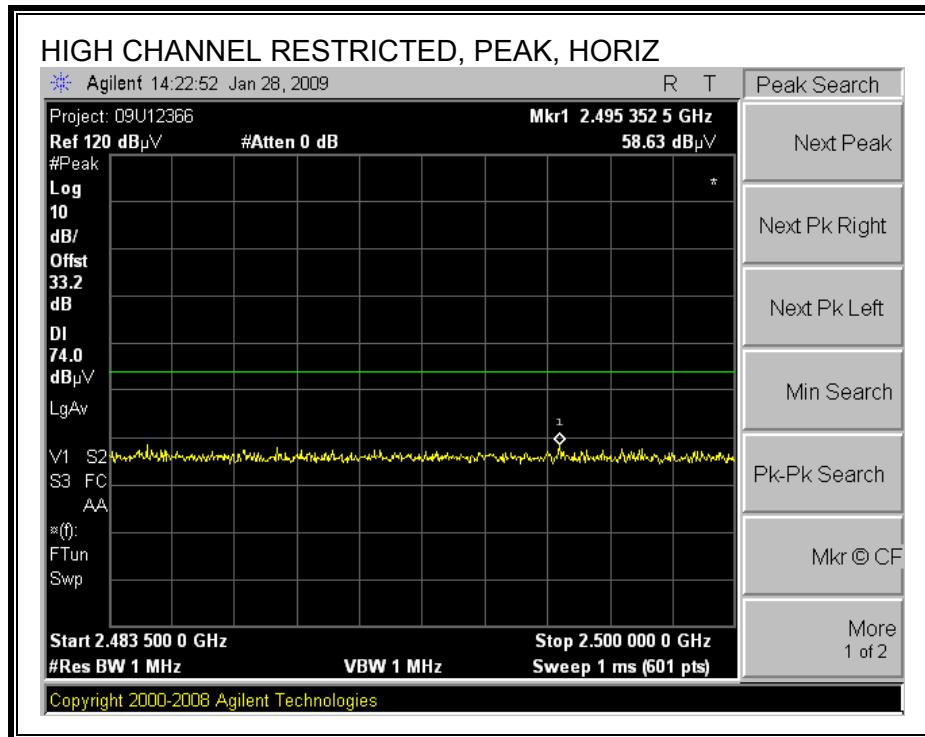


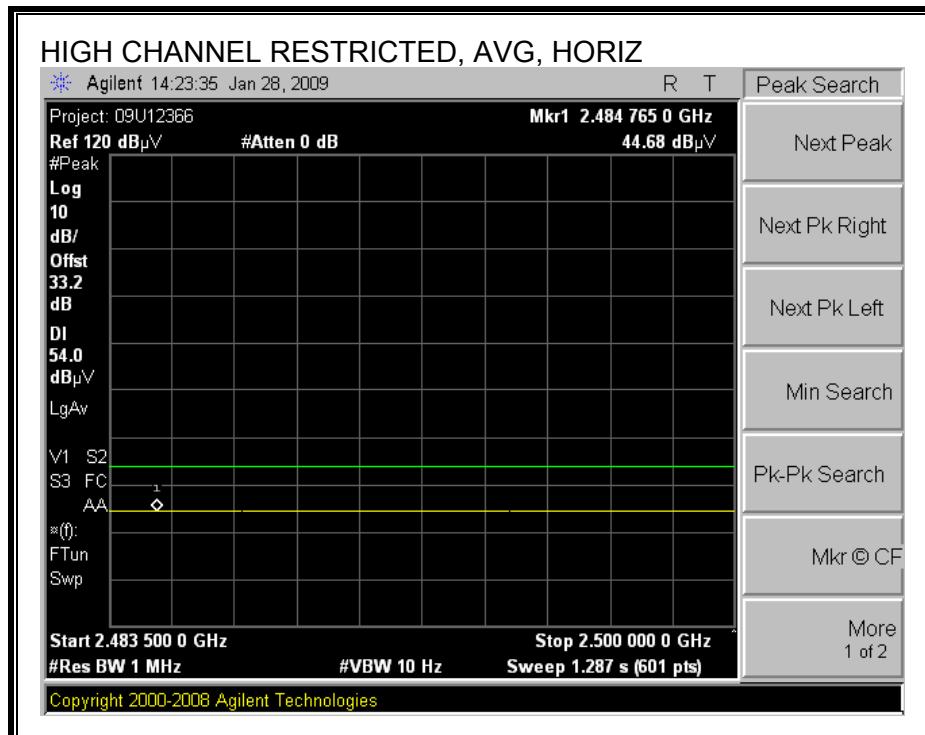
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



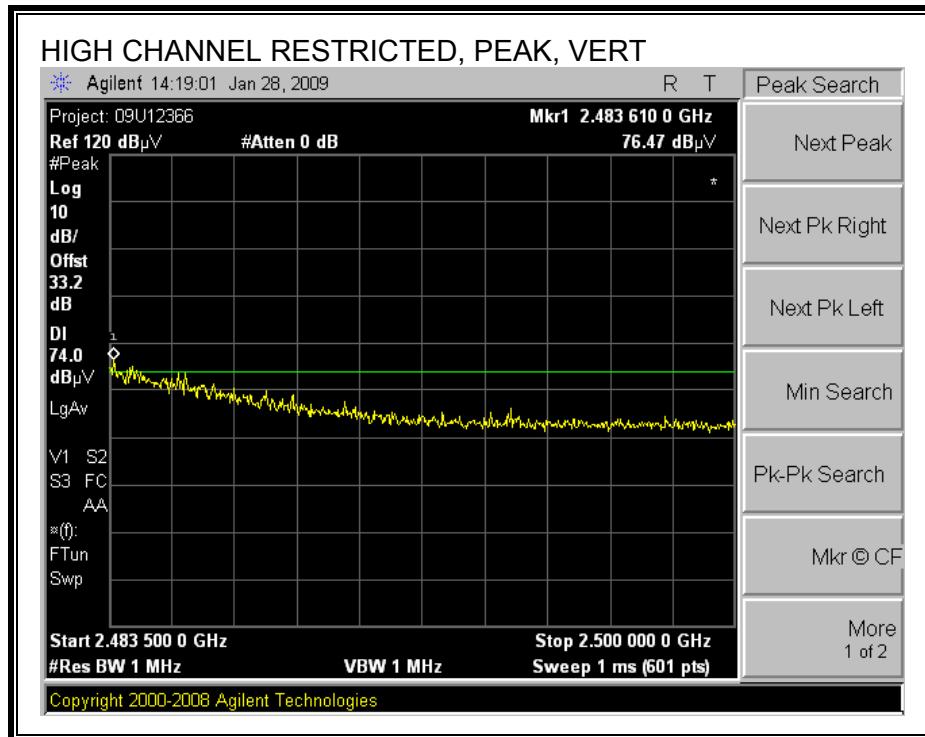


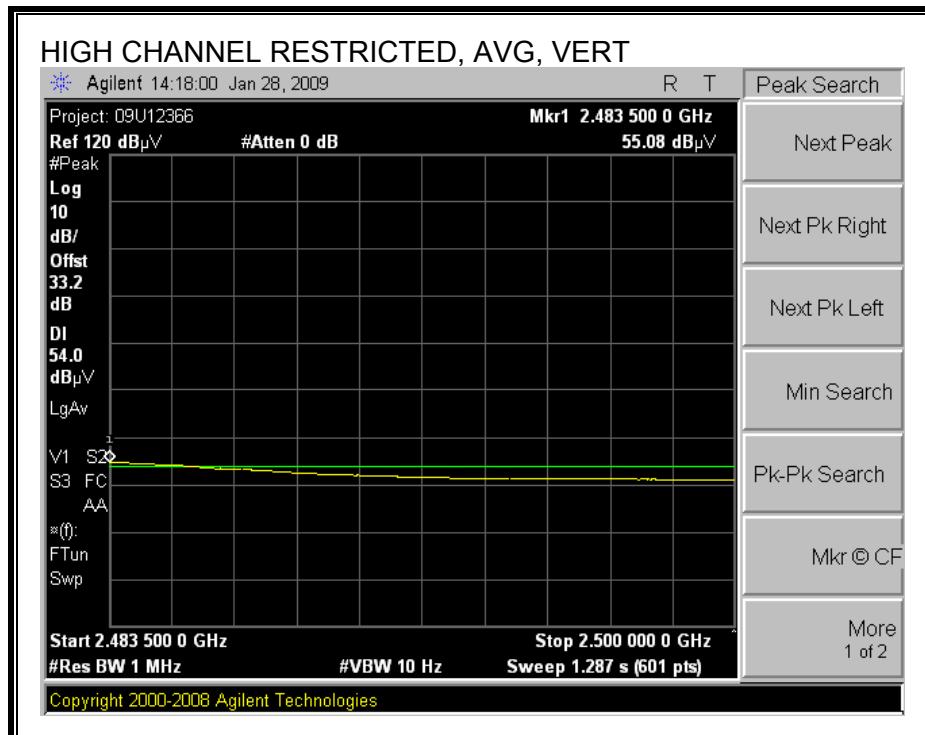
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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





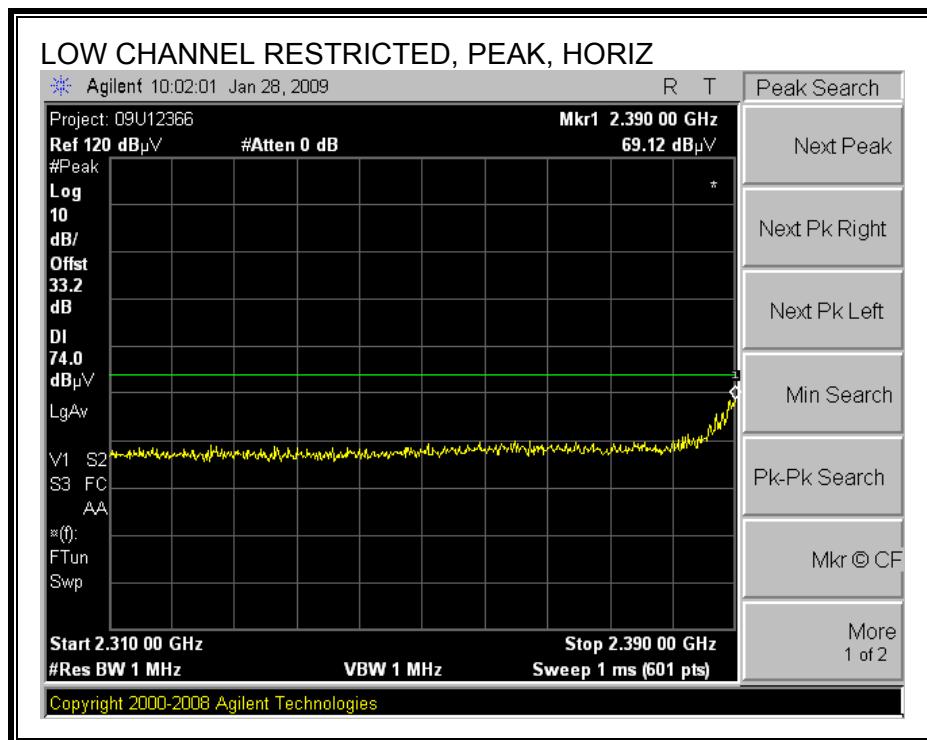
## HARMONICS AND SPURIOUS EMISSIONS

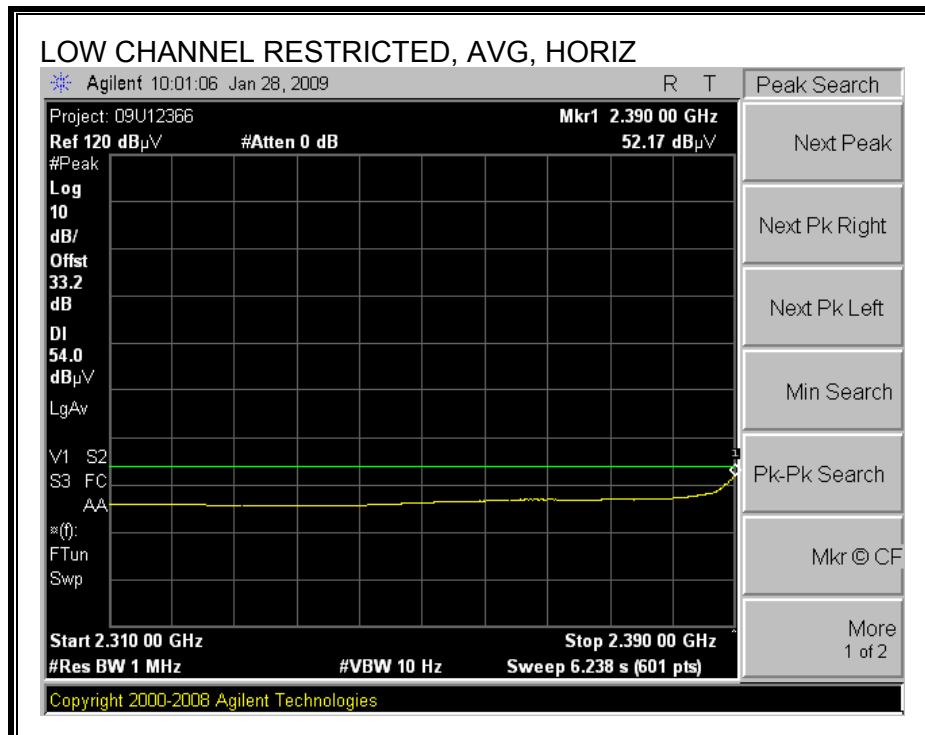
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company:	Meraki Inc.														
Project #:	09U12366														
Date:	01/29/09														
Test Engineer:	Thanh Nguyen														
Configuration:	EUT with Flat Panel Antenna 19dBi														
Mode:	Transmit Worst case g mode Art=13.5														
<b>Test Equipment:</b>															
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit			
T73; S/N: 6717 @3m	T34 HP 8449B								T125; ARA 18-26GHz; S/N:1007			FCC 15.209			
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_001			Peak Measurements	RBW=VBW=1MHz		
Average Measurements															
RBW=1MHz , VBW=10Hz															
<b>f</b>	<b>Dist</b> <b>GHz</b>	<b>Read Pk</b> <b>dBuV</b>	<b>Read Avg</b> <b>dBuV</b>	<b>AF</b> <b>dB/m</b>	<b>CL</b> <b>dB</b>	<b>Amp</b> <b>dB</b>	<b>D Corr</b> <b>dB</b>	<b>Fltr</b> <b>dB</b>	<b>Peak</b> <b>dBuV/m</b>	<b>Avg</b> <b>dBuV/m</b>	<b>Pk Lim</b> <b>dBuV/m</b>	<b>Avg Lim</b> <b>dBuV/m</b>	<b>Pk Mar</b> <b>dB</b>	<b>Avg Mar</b> <b>dB</b>	<b>Notes</b> <b>(V/H)</b>
<b>Low channel</b>															
4.824	3.0	48.4	36.5	33.7	5.8	-34.8	0.0	0.0	53.2	41.2	74	54	-20.8	-12.8	V
7.236	3.0	41.2	28.7	36.2	7.2	-34.1	0.0	0.0	50.5	37.9	74	54	-23.5	-16.1	Noise floor
4.824	3.0	46.8	32.3	33.7	5.8	-34.8	0.0	0.0	51.5	37.0	74	54	-22.5	-17.0	H
7.236	3.0	40.3	28.6	36.2	7.2	-34.1	0.0	0.0	49.6	37.9	74	54	-24.4	-16.1	Noise floor
<b>Mid channel</b>															
4.874	3.0	49.5	37.5	33.8	5.8	-34.8	0.0	0.0	54.4	42.3	74	54	-19.6	-11.7	V
7.311	3.0	41.2	28.4	36.2	7.3	-34.1	0.0	0.0	50.6	37.8	74	54	-23.4	-16.2	Noise floor
4.874	3.0	47.6	34.7	33.8	5.8	-34.8	0.0	0.0	52.4	39.5	74	54	-21.6	-14.5	H
7.311	3.0	41.3	28.4	36.2	7.3	-34.1	0.0	0.0	50.7	37.8	74	54	-23.3	-16.2	Noise floor
<b>High channel</b>															
4.924	3.0	48.7	37.3	33.9	5.9	-34.8	0.0	0.0	53.6	42.2	74	54	-20.4	-11.8	V
7.386	3.0	42.2	28.9	36.3	7.3	-34.1	0.0	0.0	51.7	38.4	74	54	-22.3	-15.6	Noise floor
4.924	3.0	47.4	35.4	33.9	5.9	-34.8	0.0	0.0	52.4	40.4	74	54	-21.6	-13.6	H
7.386	3.0	41.9	28.9	36.3	7.3	-34.1	0.0	0.0	51.4	38.4	74	54	-22.6	-15.6	Noise floor
No other emissions were detected above noise floor.															
Rev. 10.15.08															
<b>f</b>	Measurement Frequency			<b>Amp</b>	Preamp Gain				<b>Avg Lim</b>	Average Field Strength Limit					
<b>Dist</b>	Distance to Antenna			<b>D Corr</b>	Distance Correct to 3 meters				<b>Pk Lim</b>	Peak Field Strength Limit					
<b>Read</b>	Analyzer Reading			<b>Avg</b>	Average Field Strength @ 3 m				<b>Avg Mar</b>	Margin vs. Average Limit					
<b>AF</b>	Antenna Factor			<b>Peak</b>	Calculated Peak Field Strength				<b>Pk Mar</b>	Margin vs. Peak Limit					
<b>CL</b>	Cable Loss			<b>HPF</b>	High Pass Filter										

## 7.5.2. TX ABOVE 1 GHz FOR 802.11g DUAL CHAIN LEGACY MODE

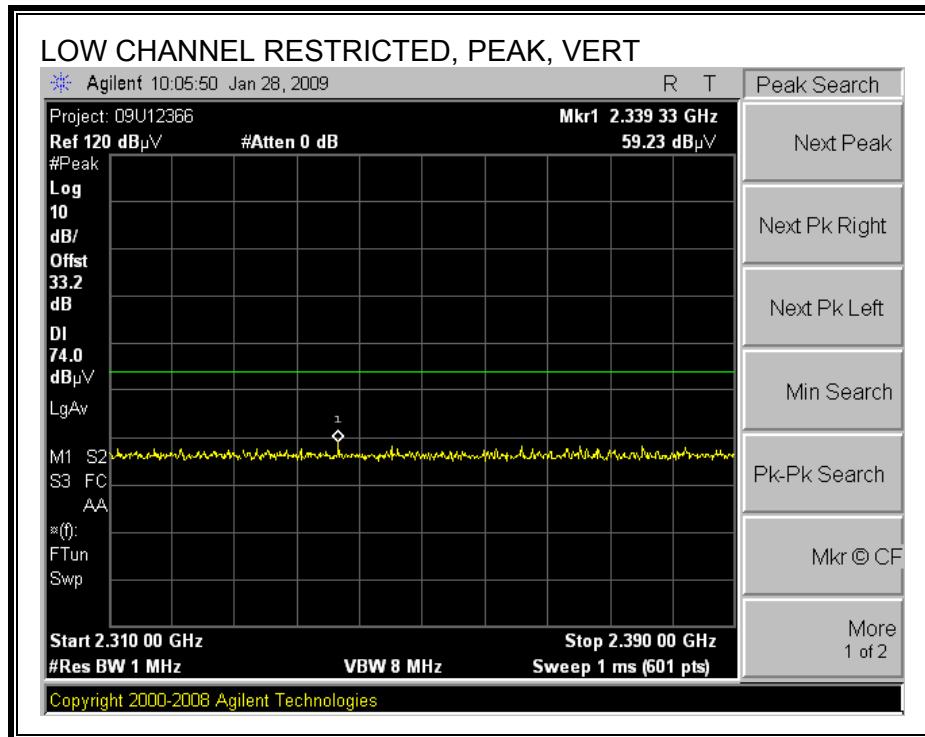
### **MODE 100:**

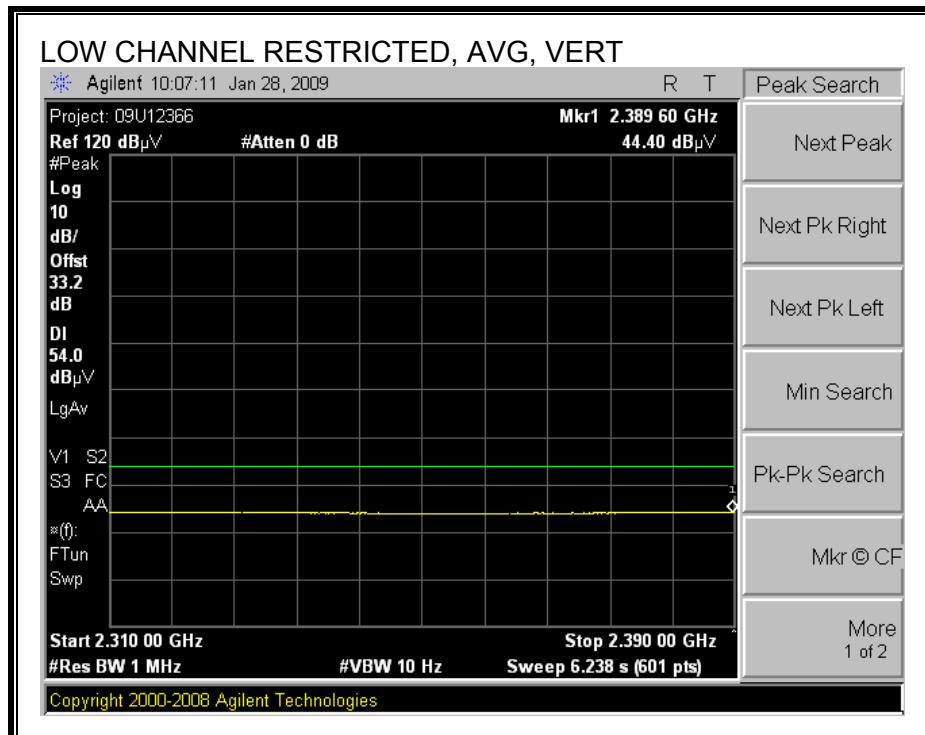
#### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



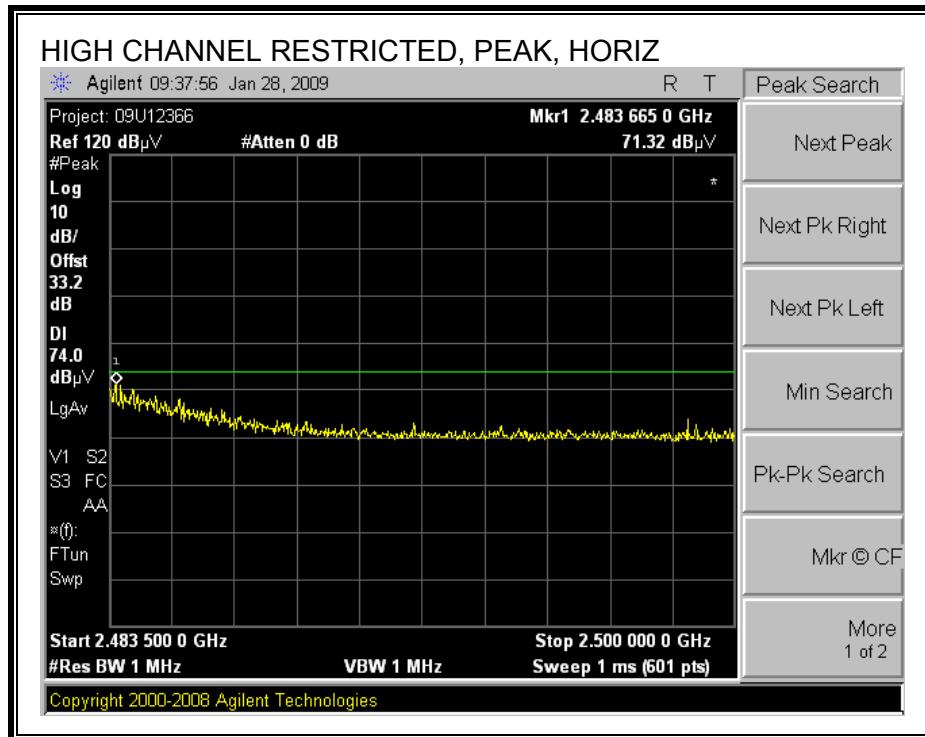


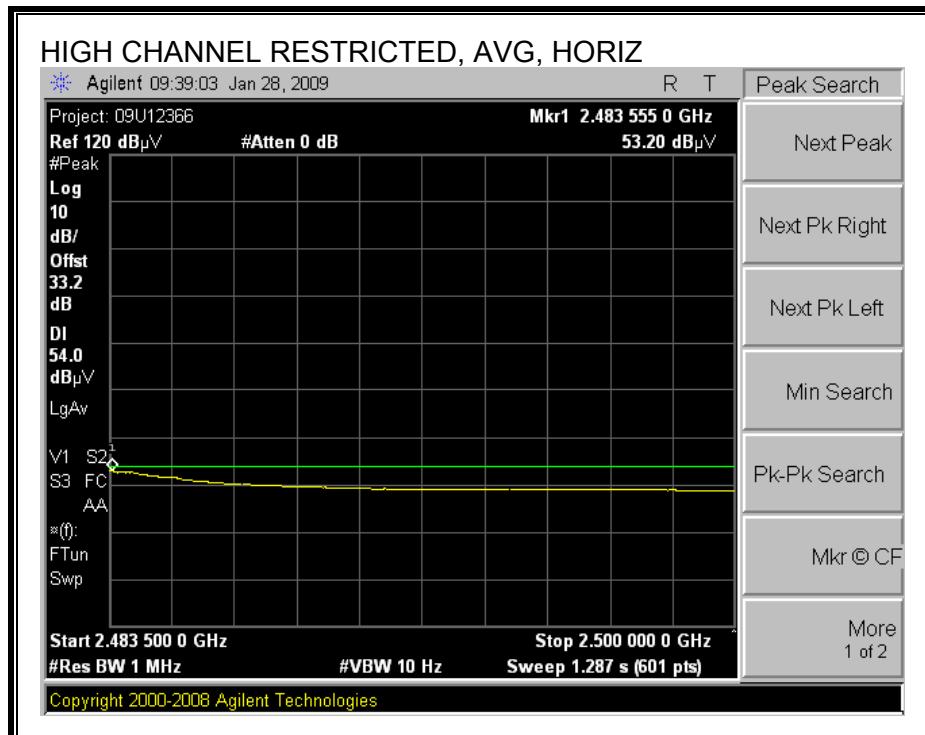
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



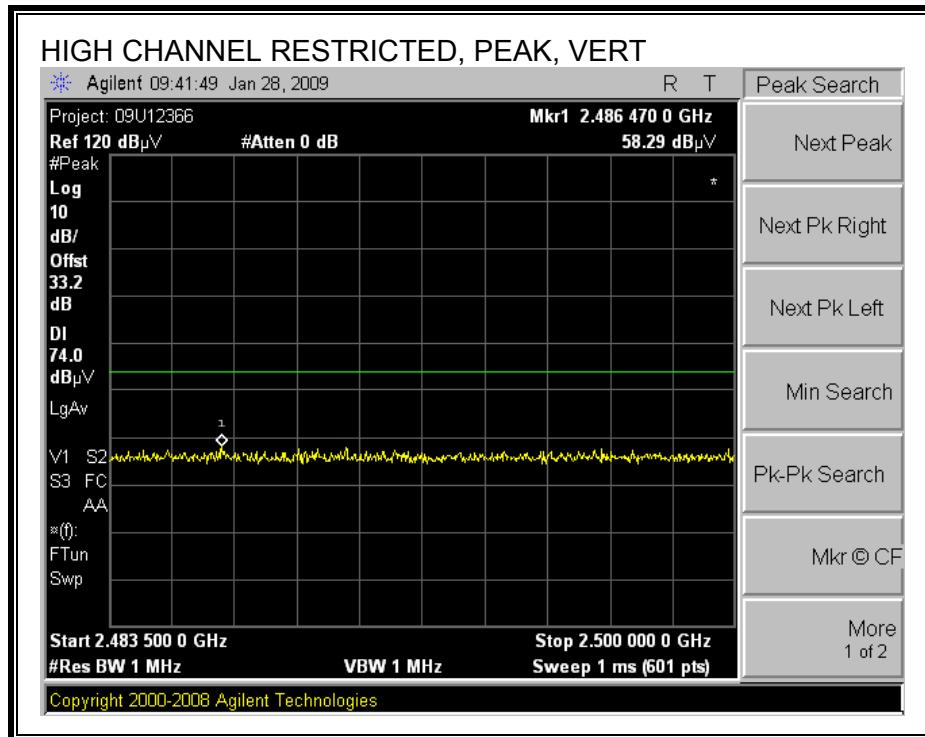


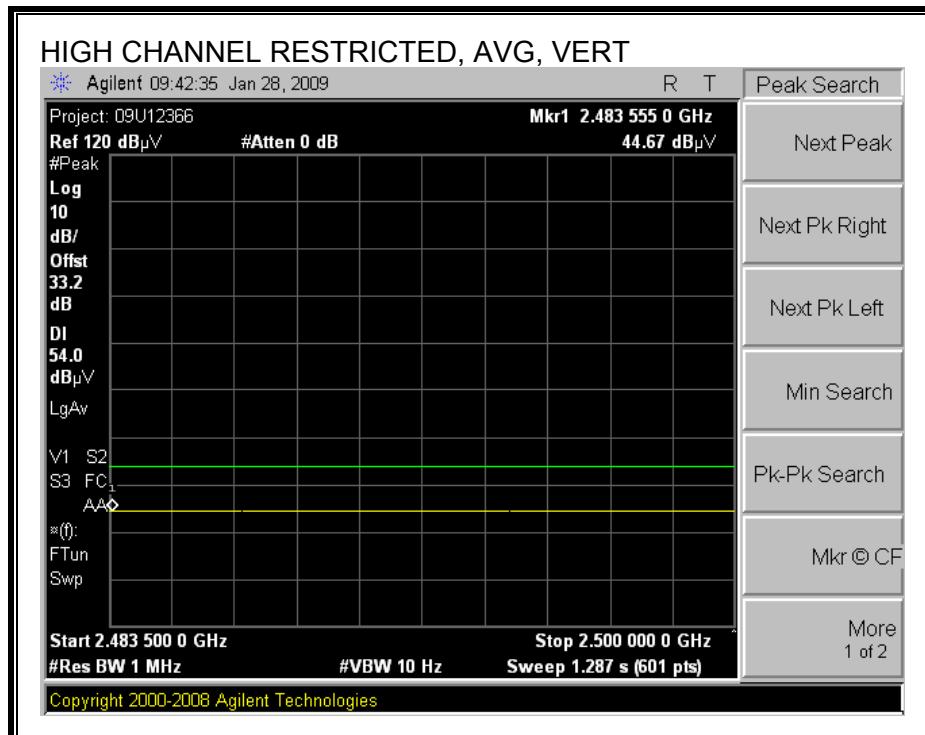
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





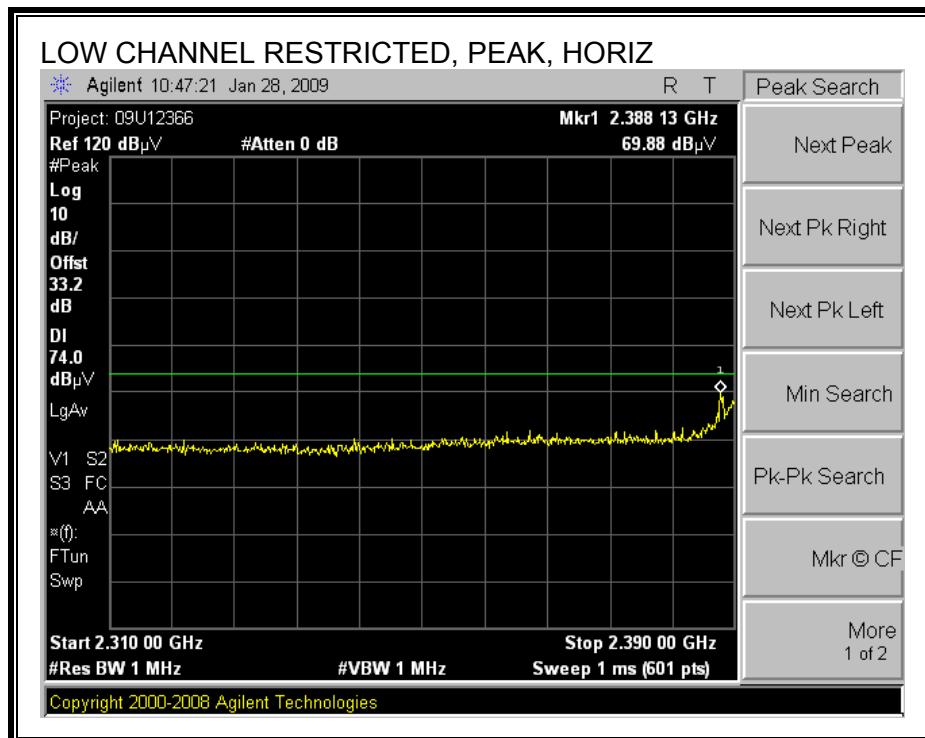
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

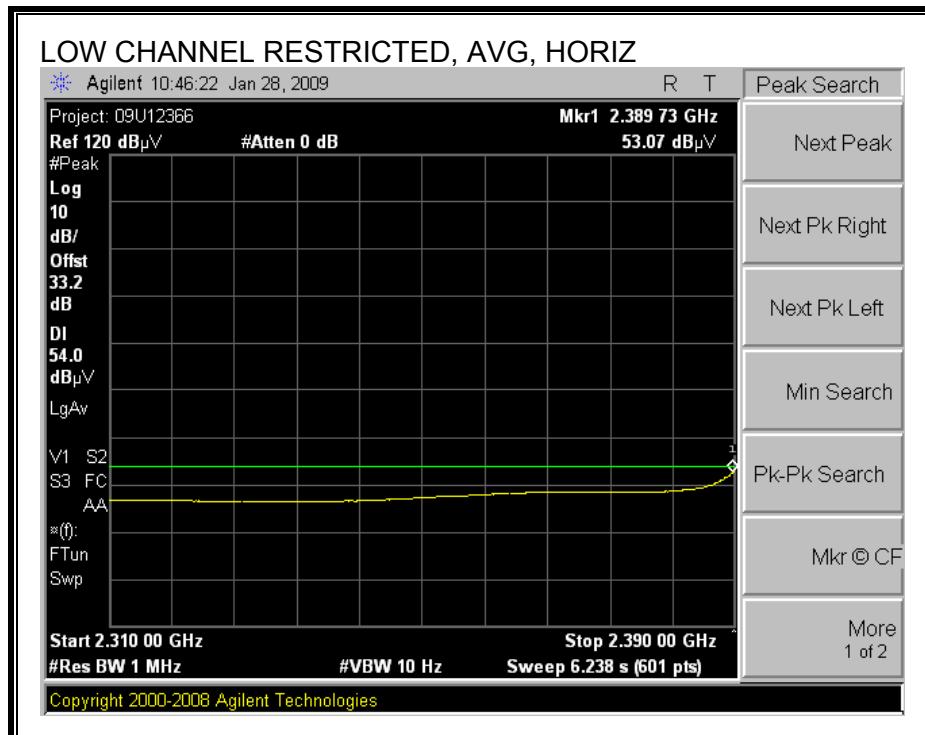




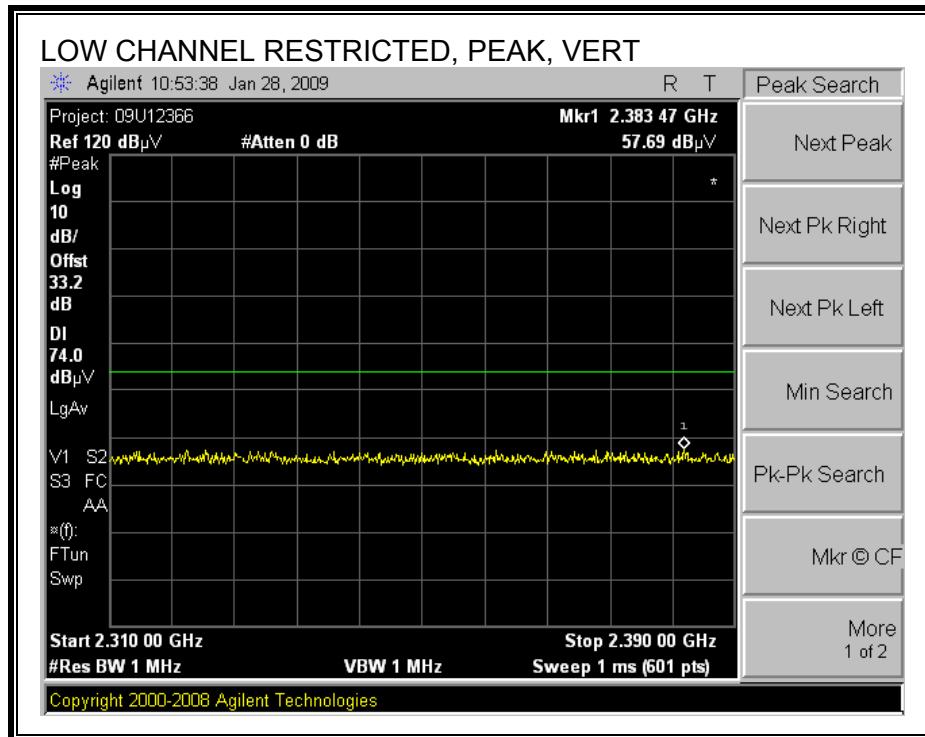
## HT 20MHz

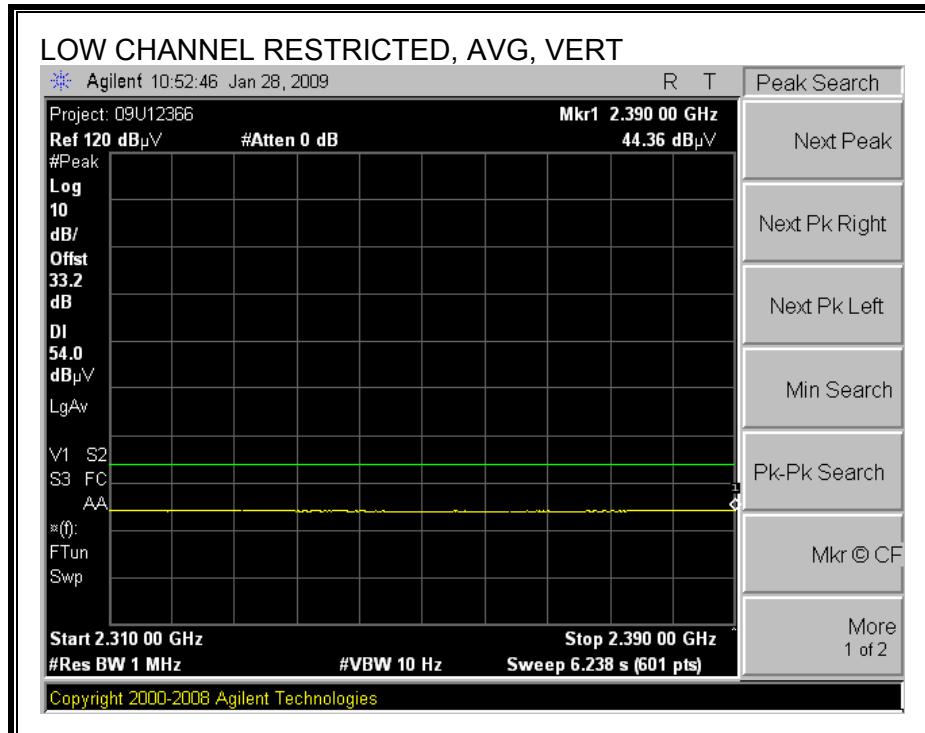
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



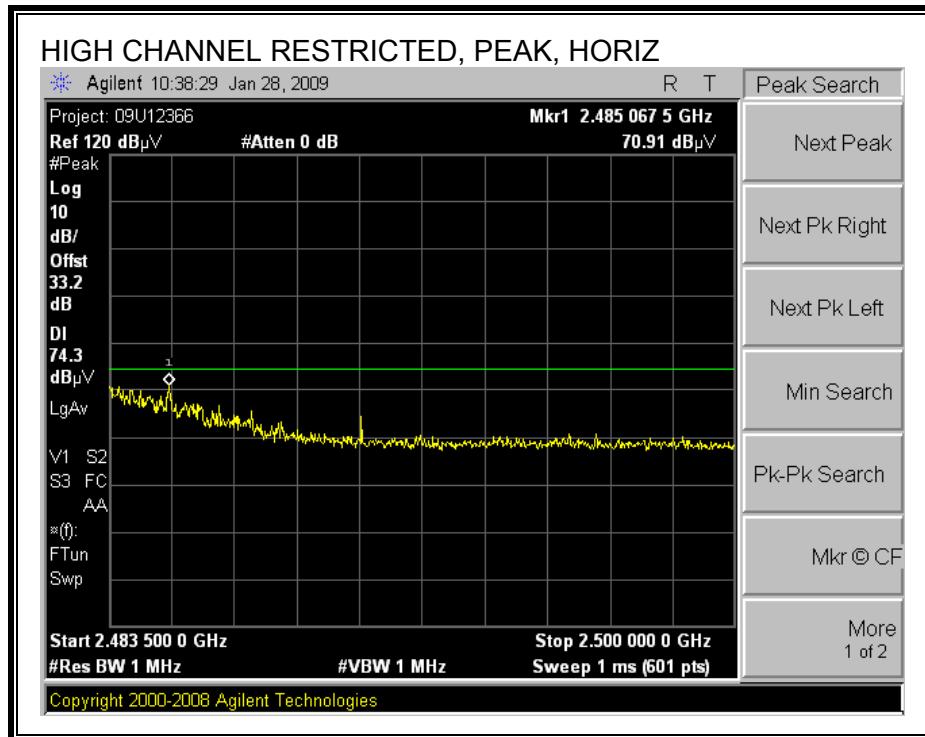


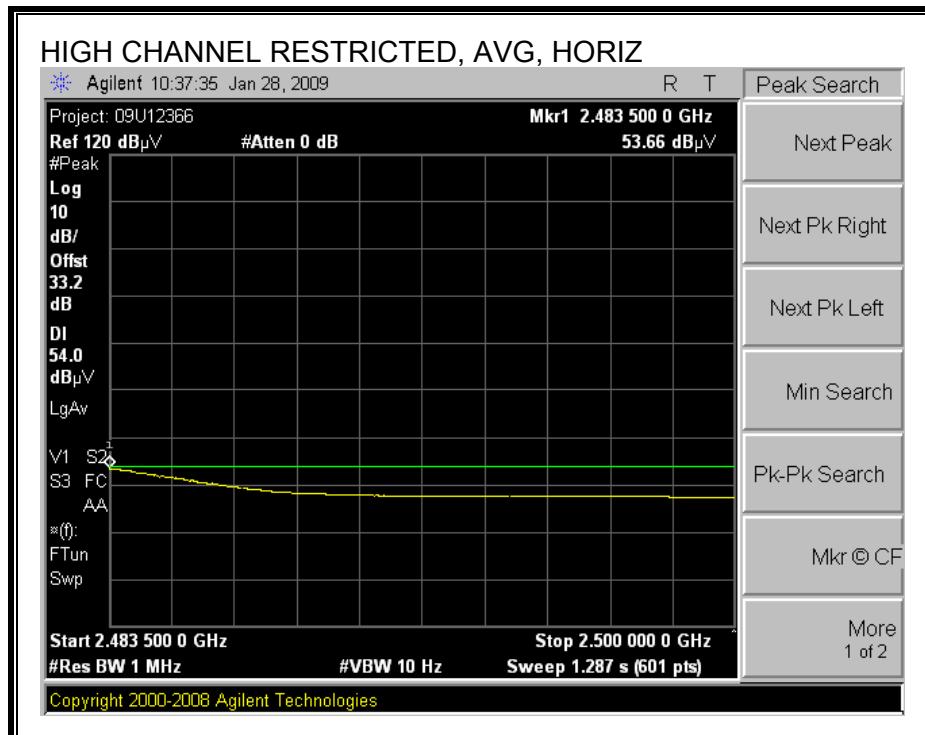
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



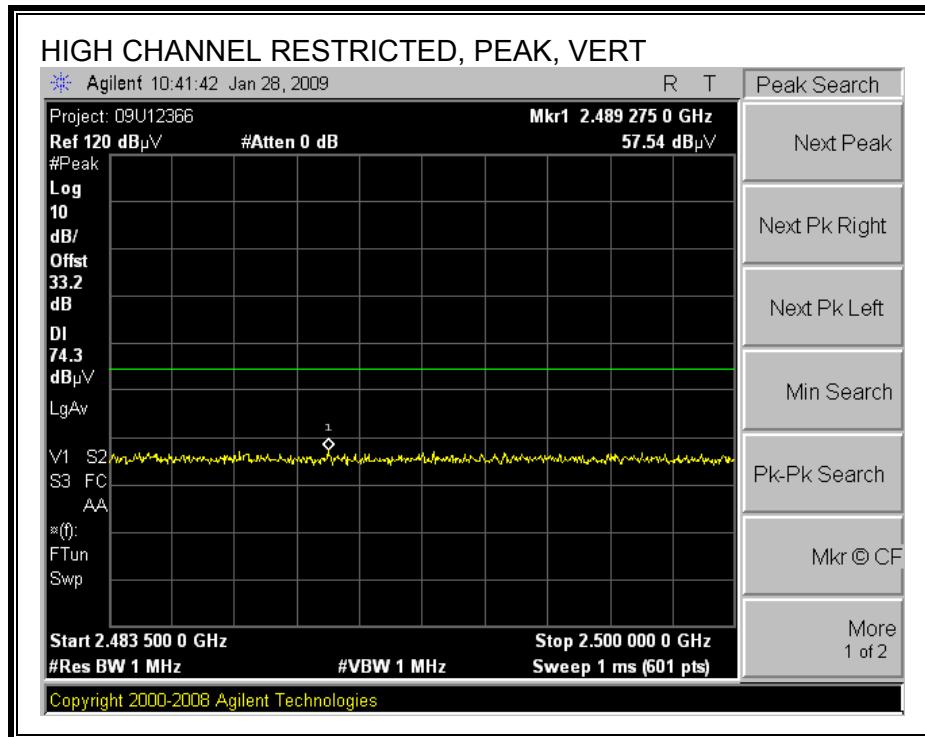


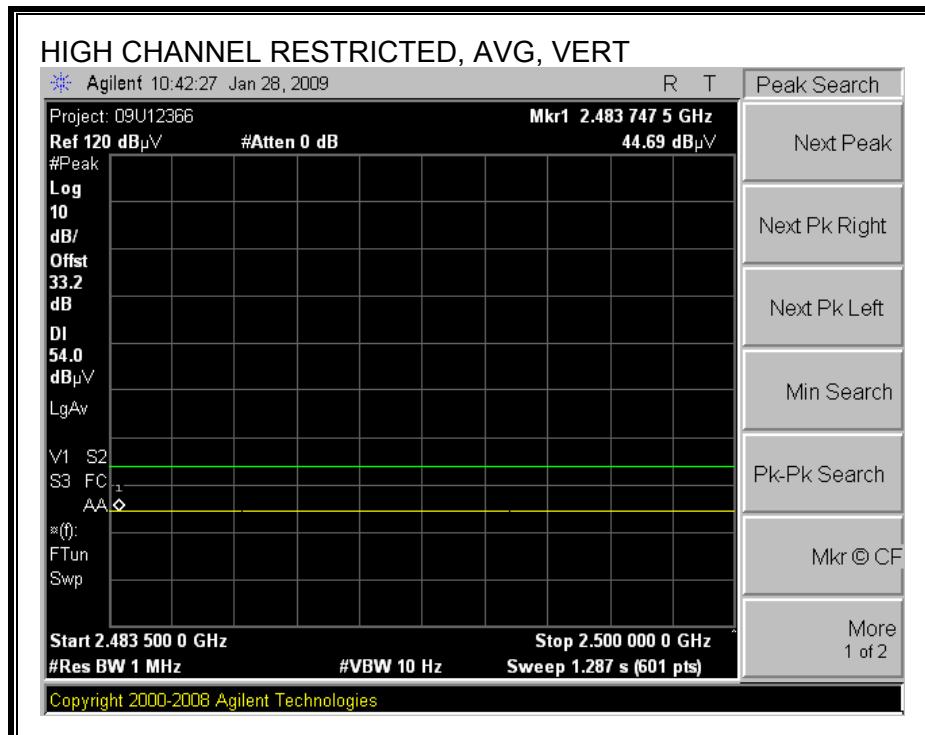
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





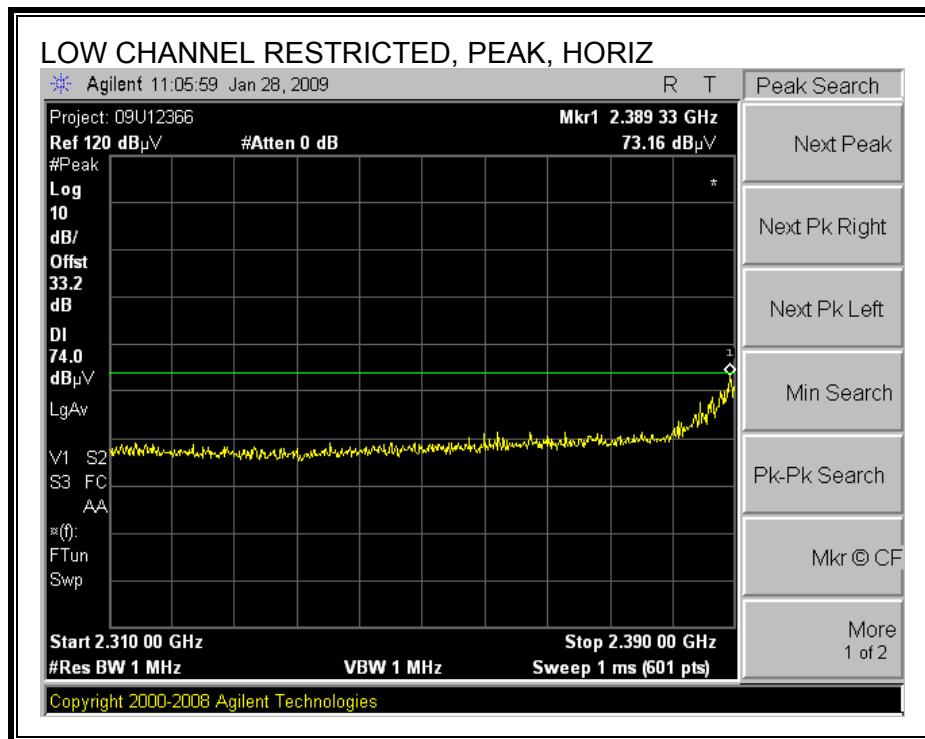
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

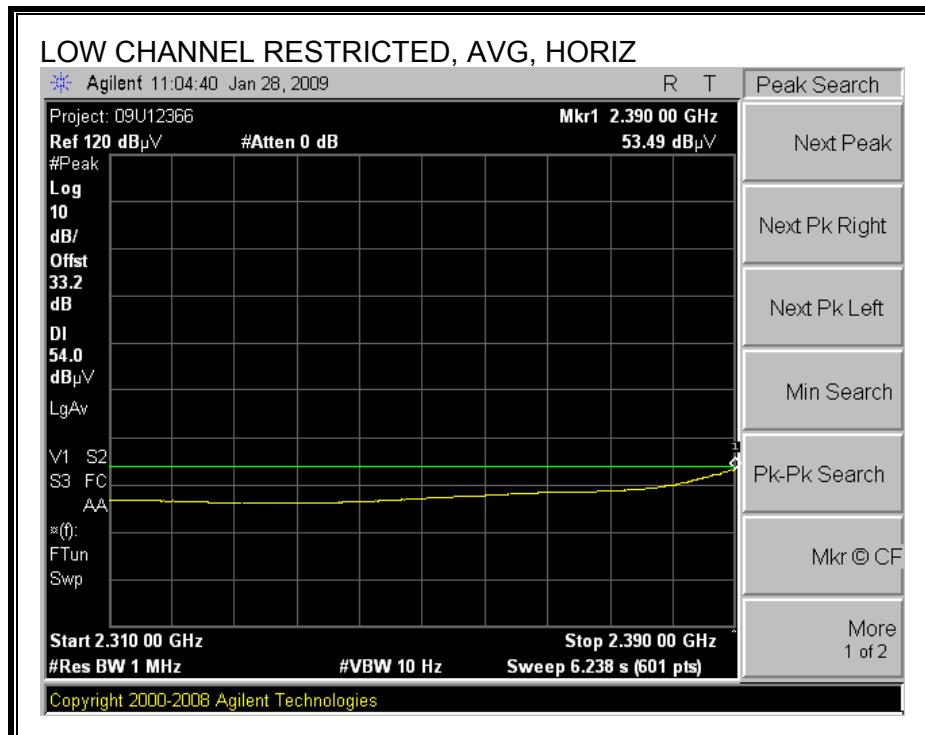




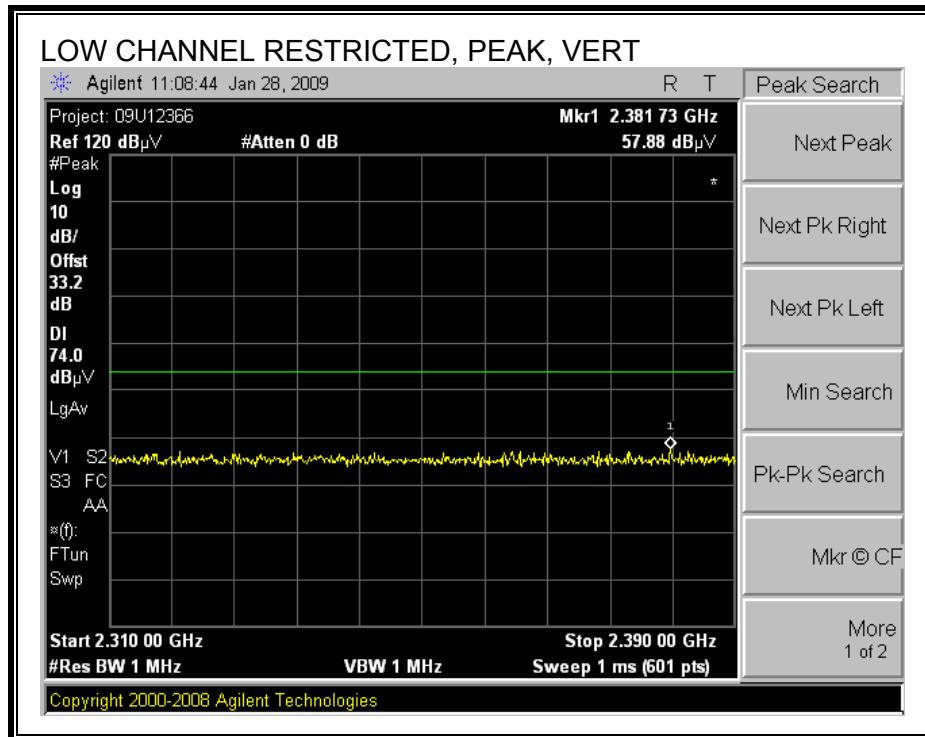
## HT 40MHz

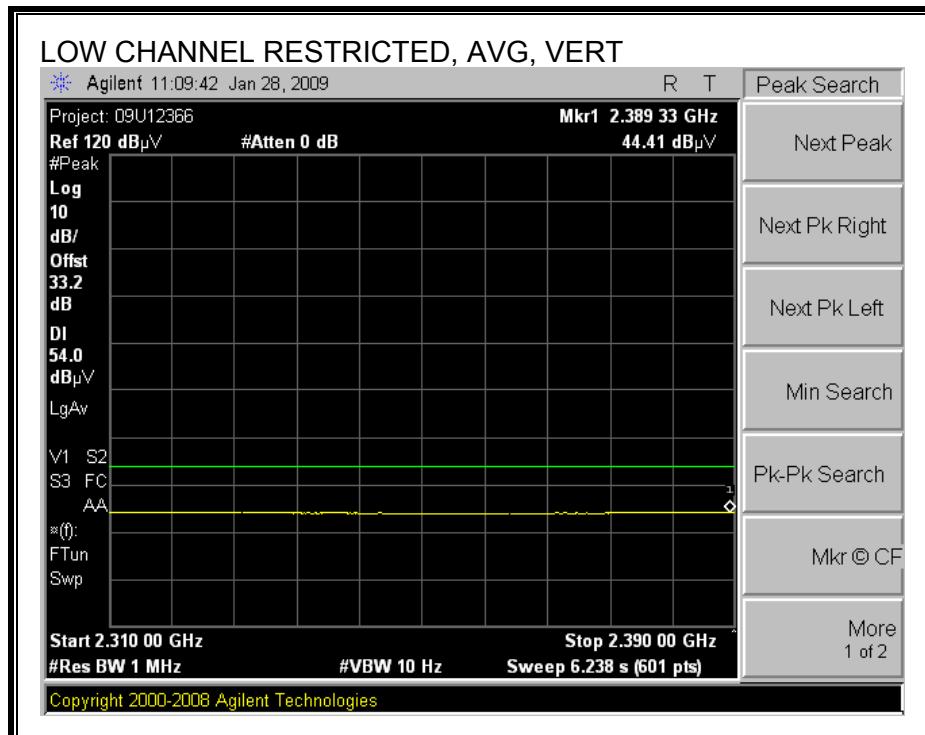
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



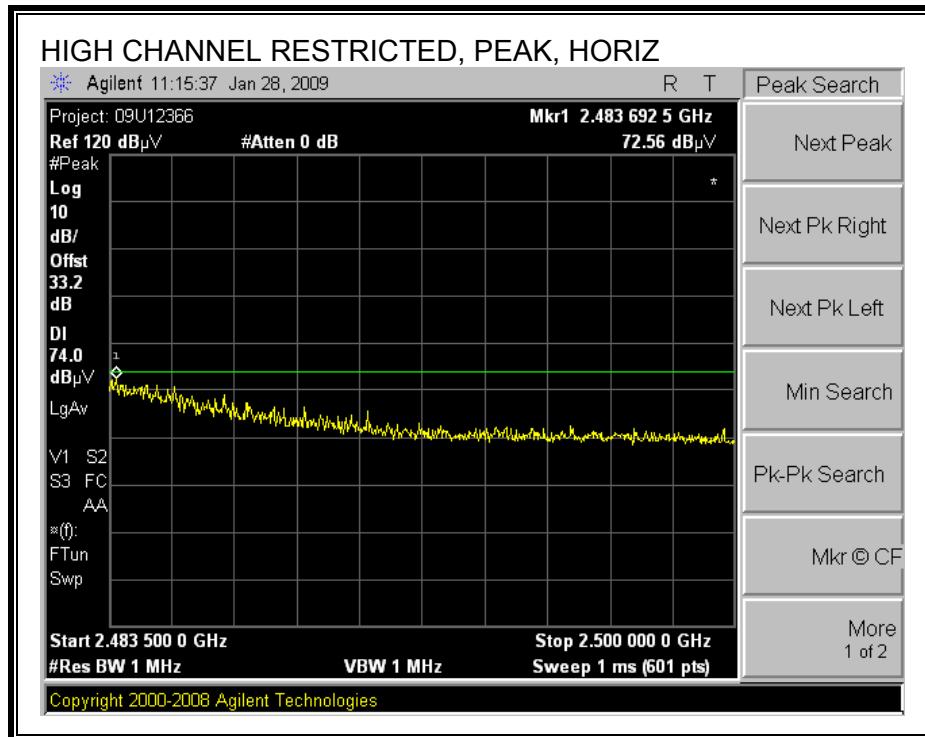


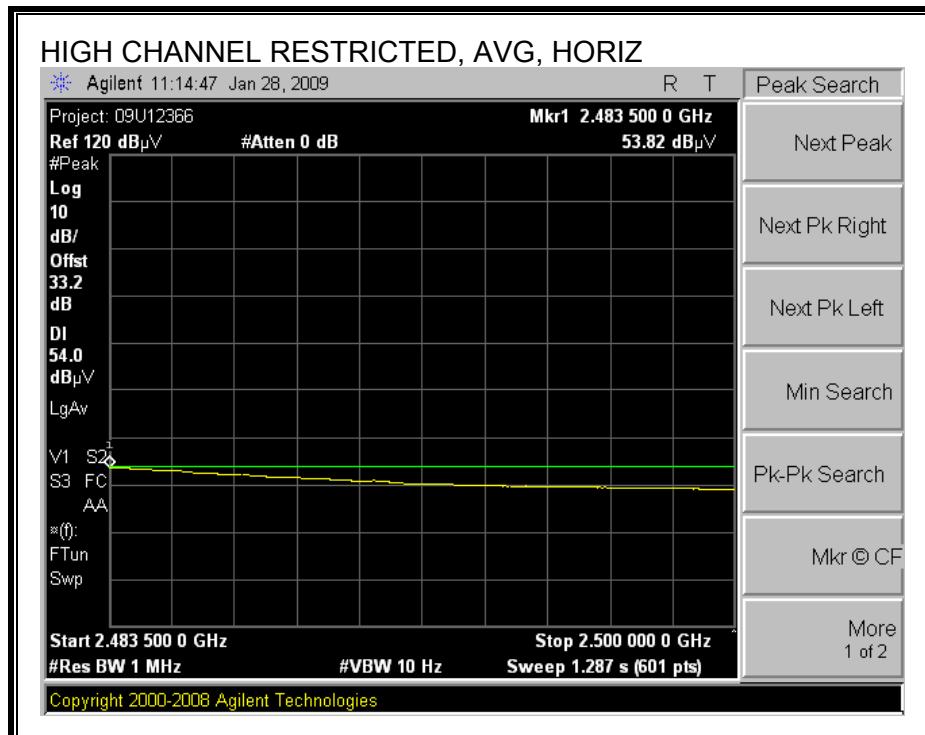
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



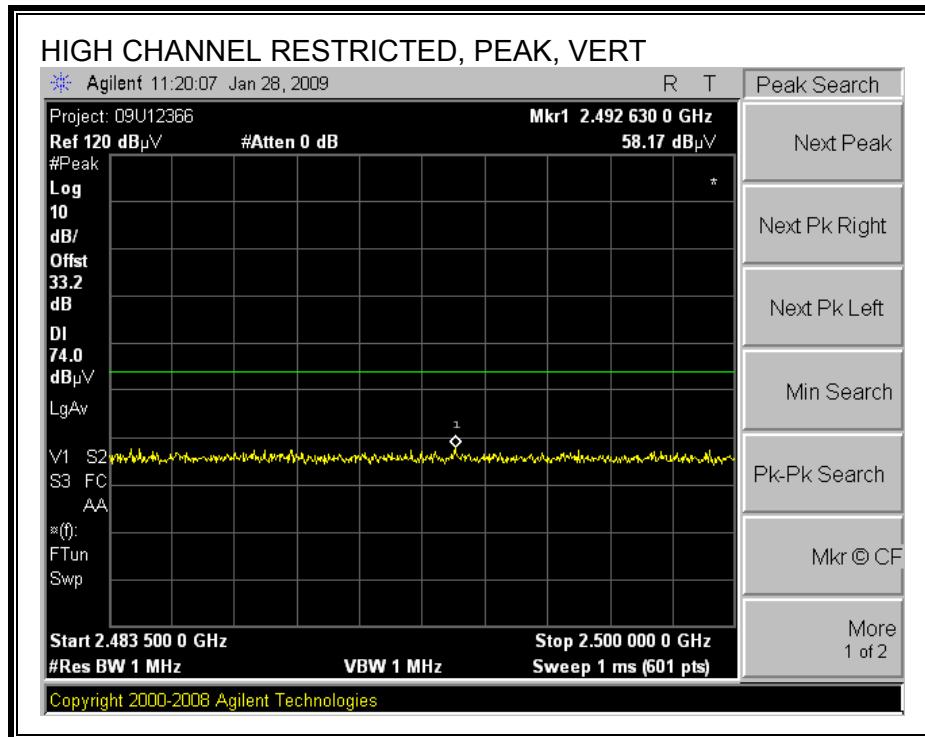


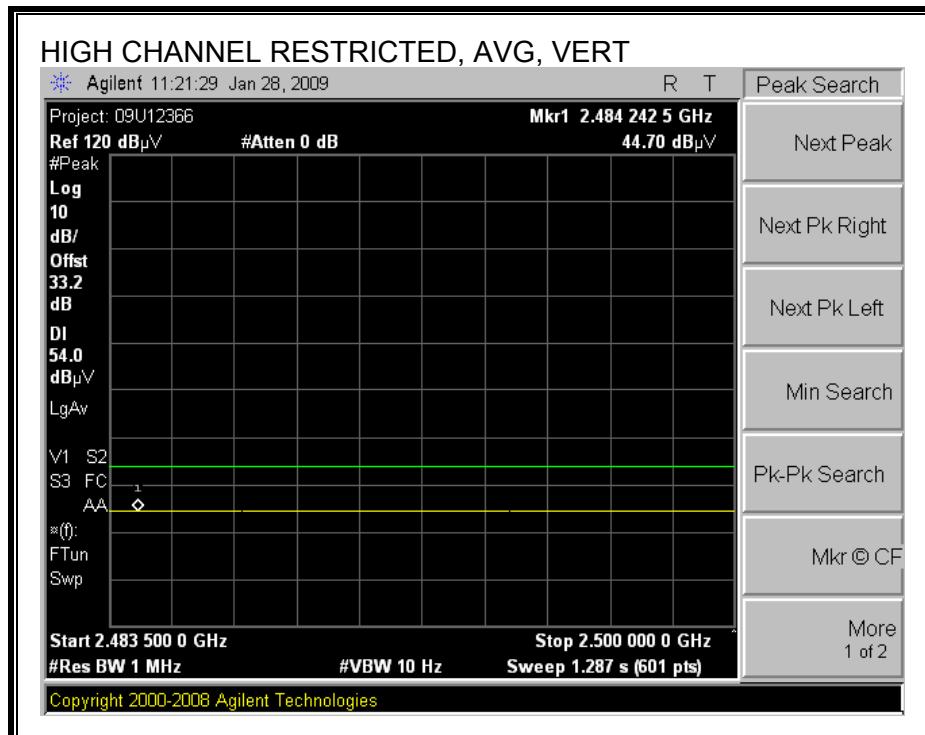
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



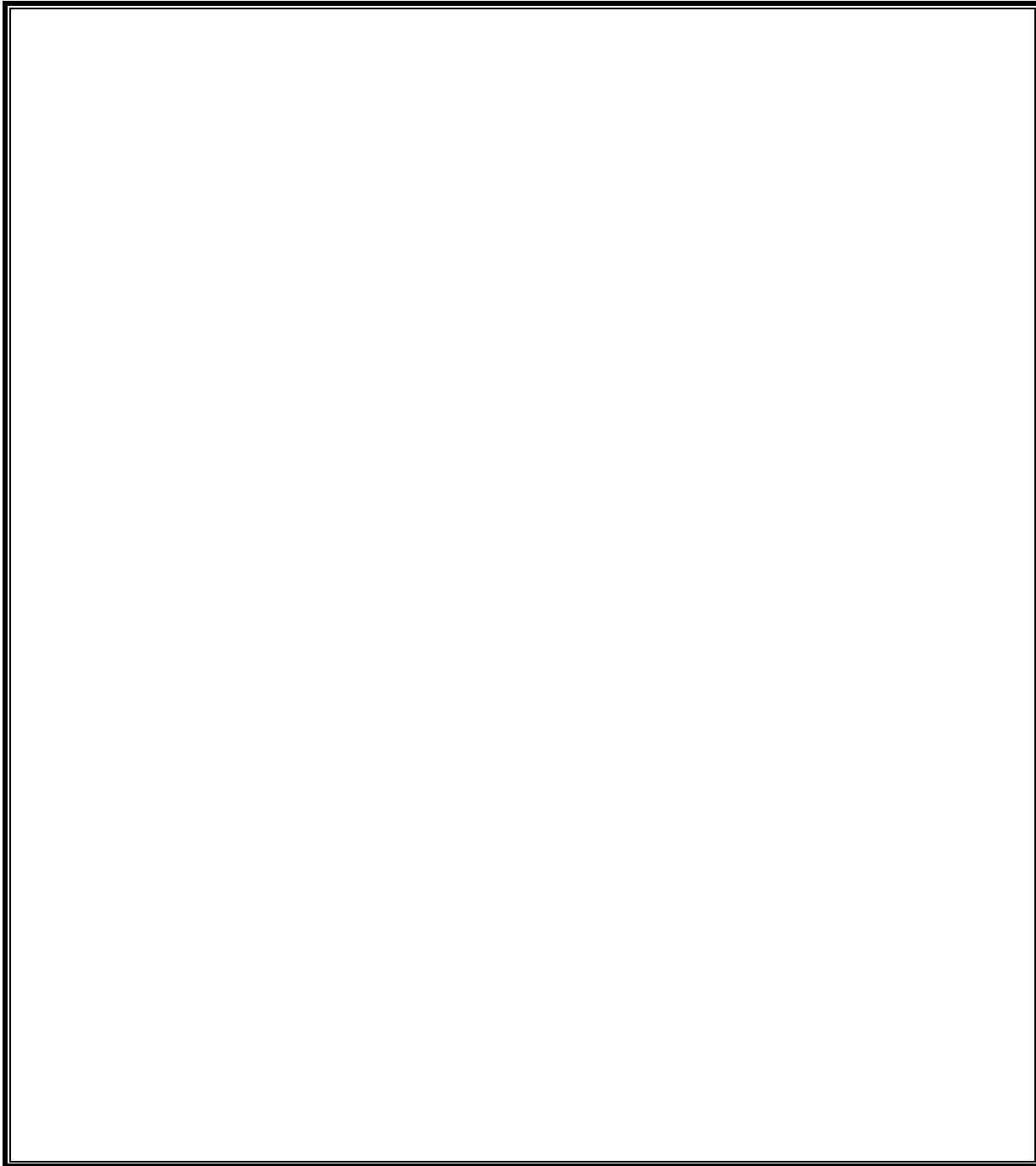


**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



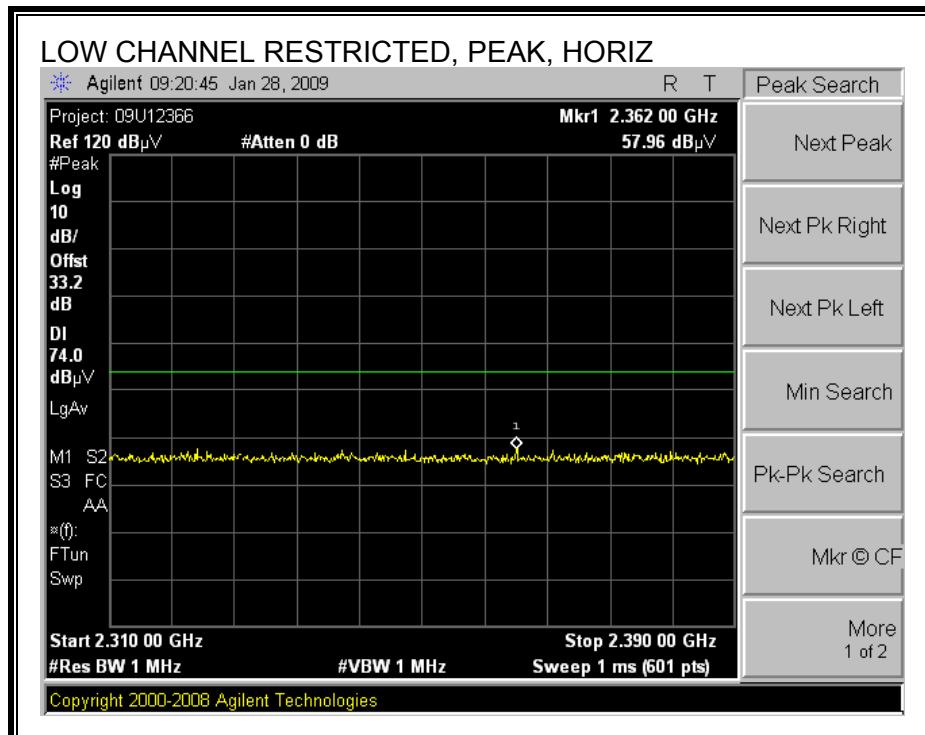


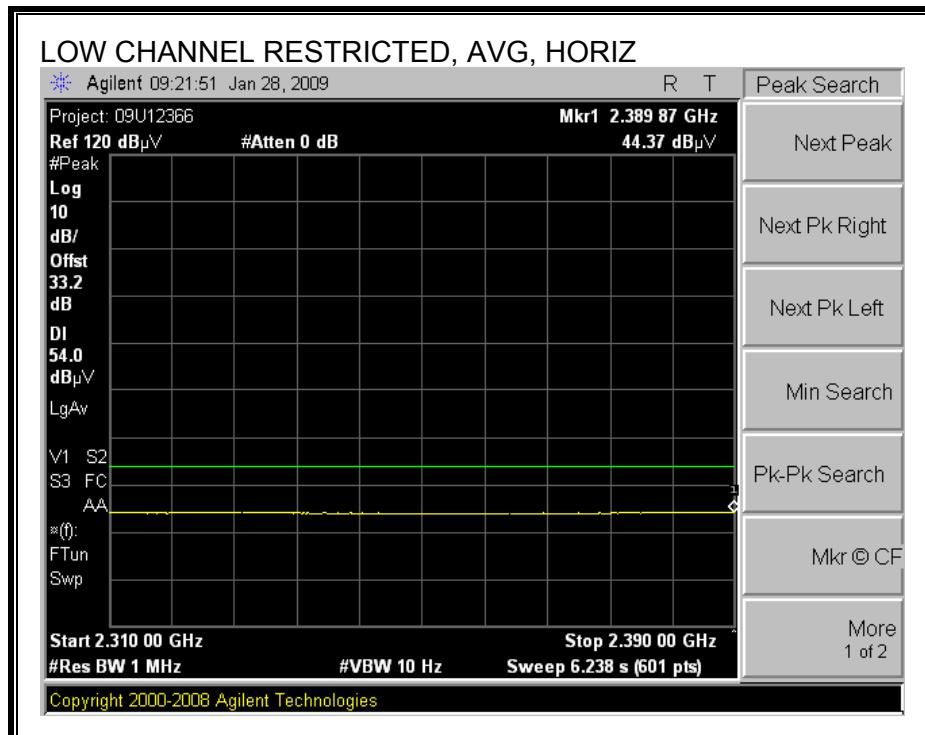
**HARMONICS AND SPURIOUS EMISSIONS (see worst case)**



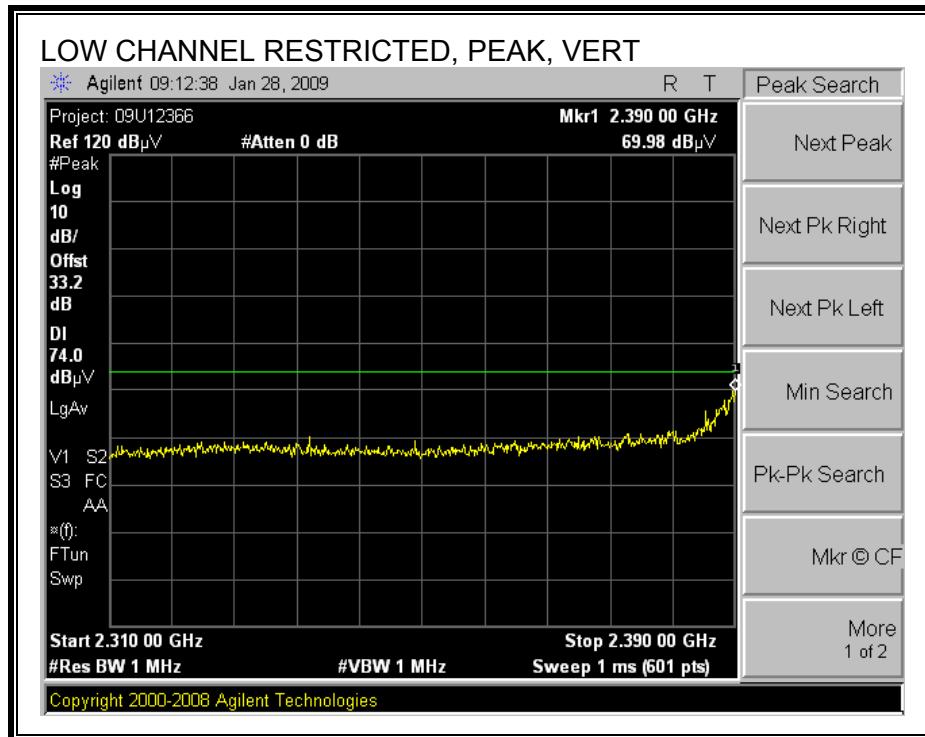
## **MODE 010**

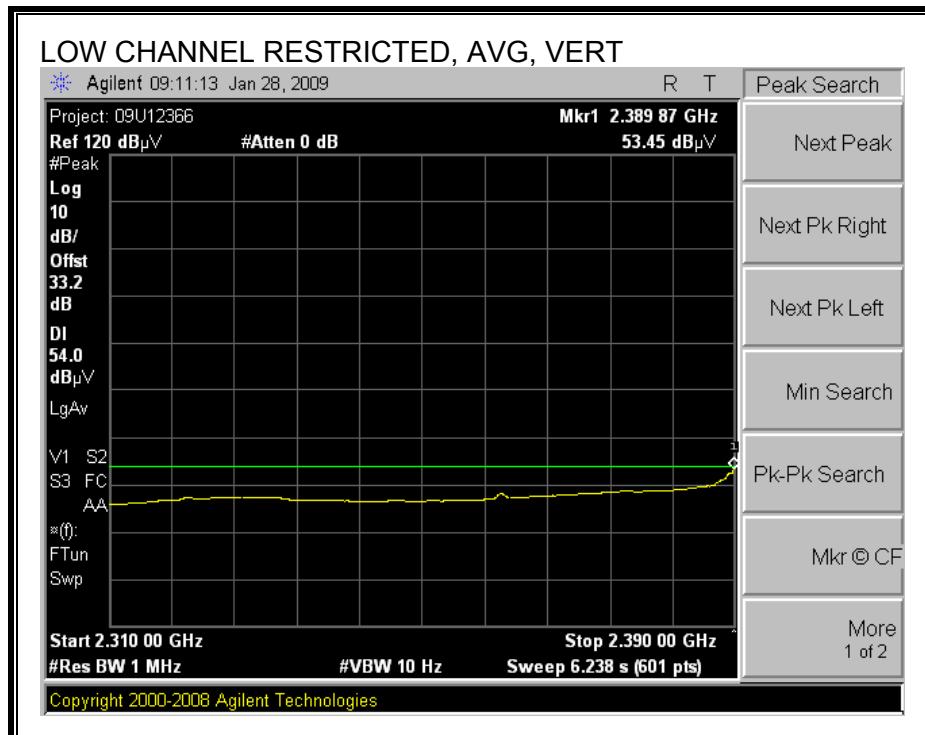
### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



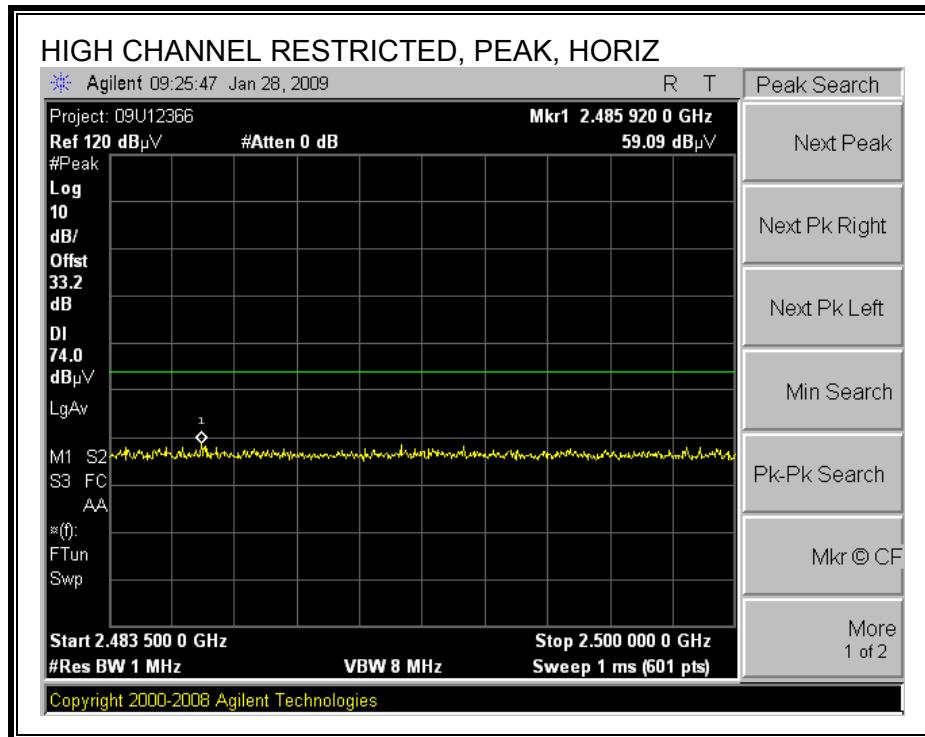


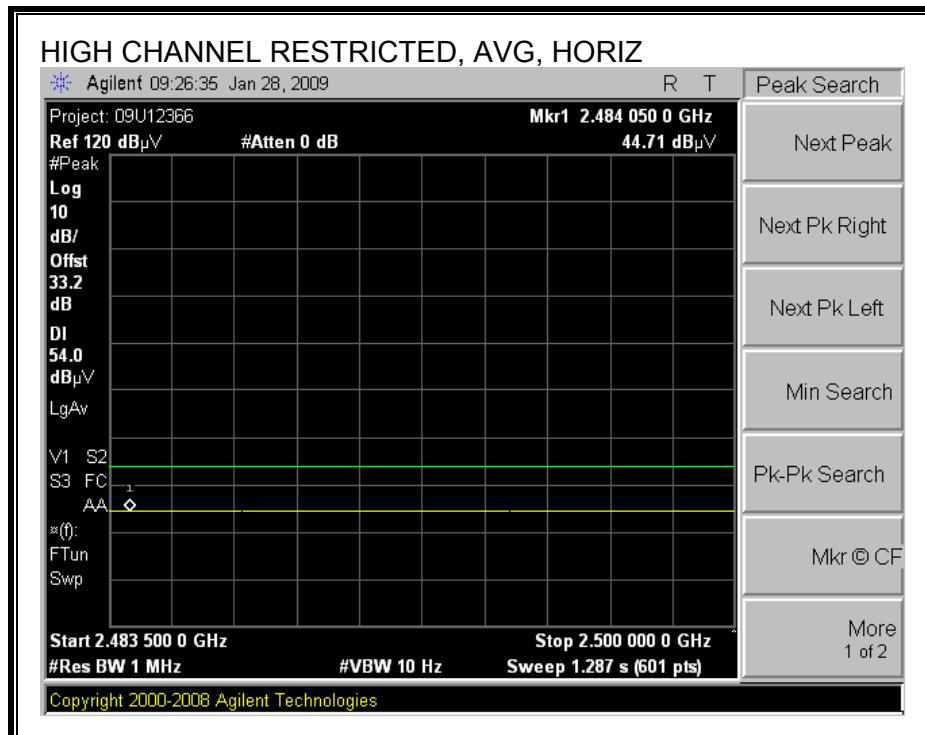
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



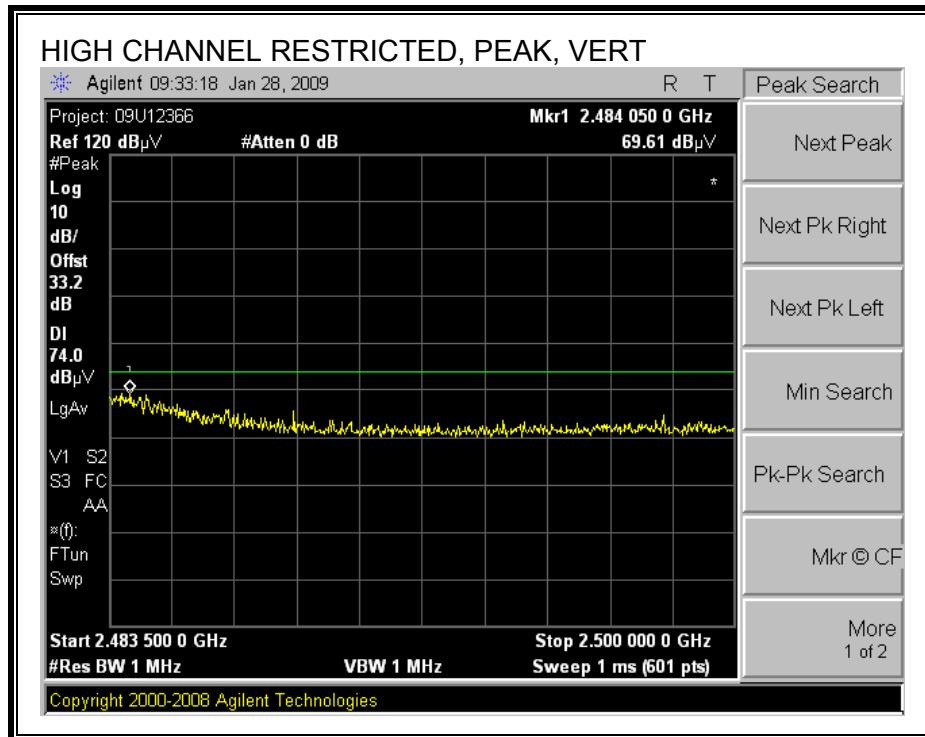


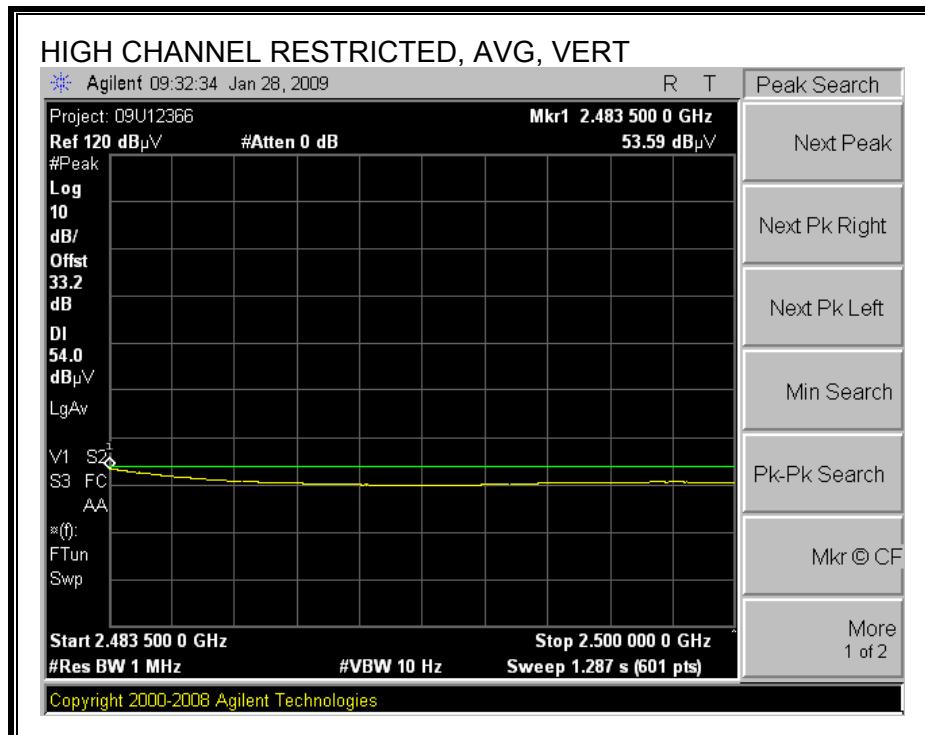
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





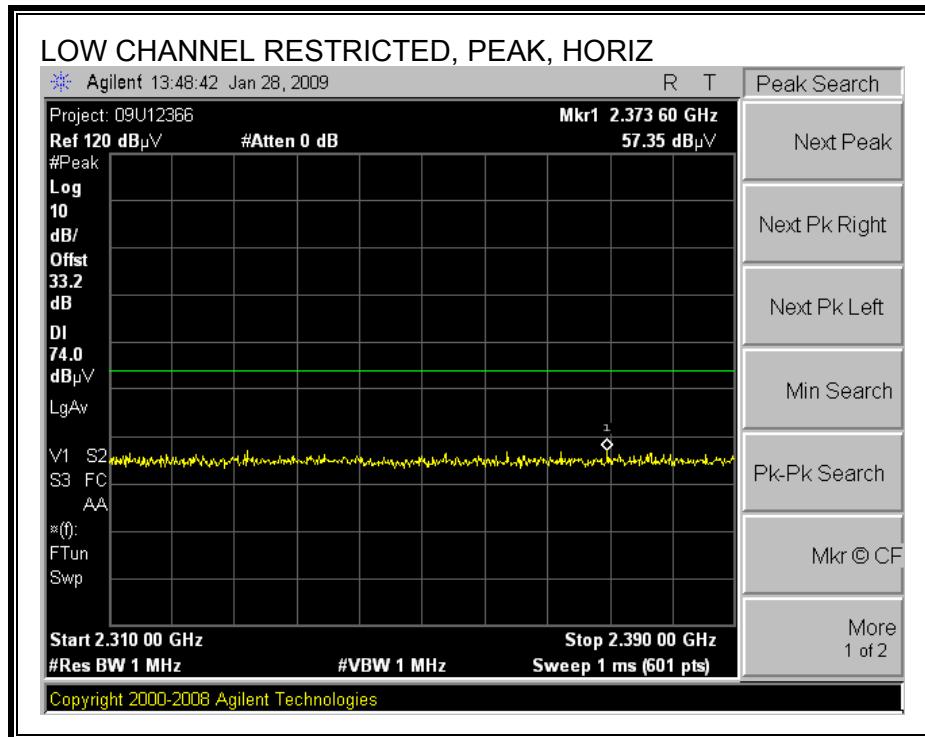
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

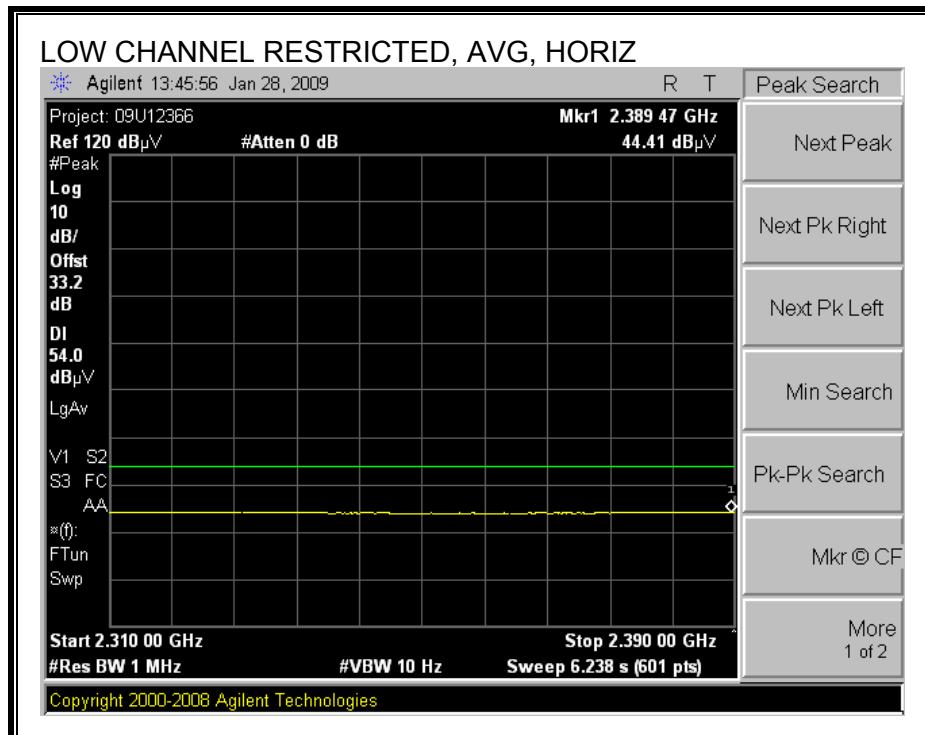




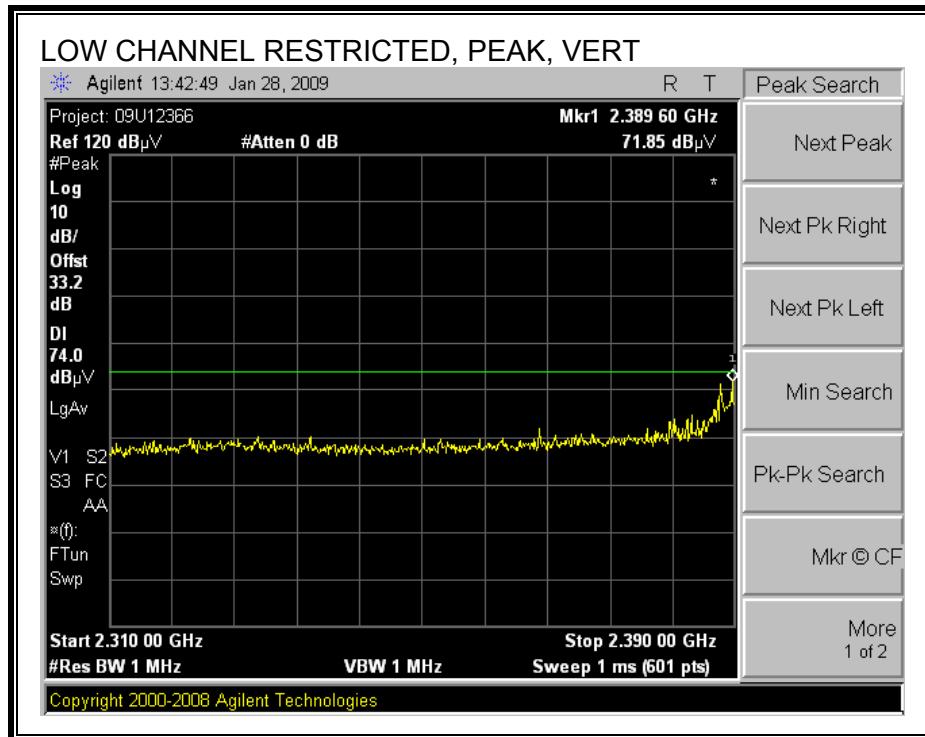
## HT 20MHz

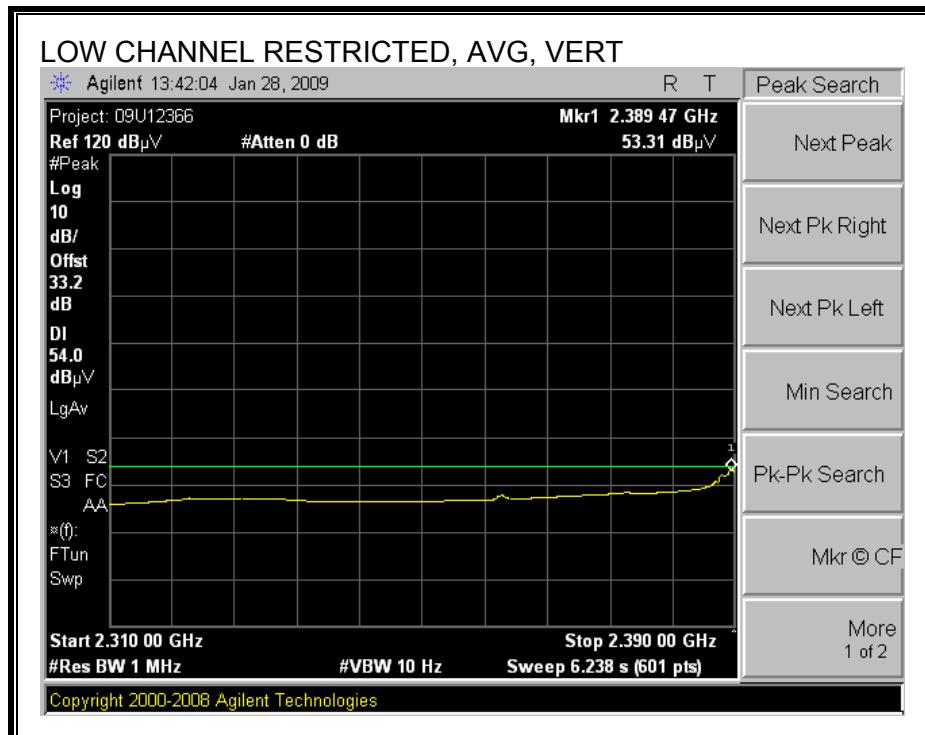
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



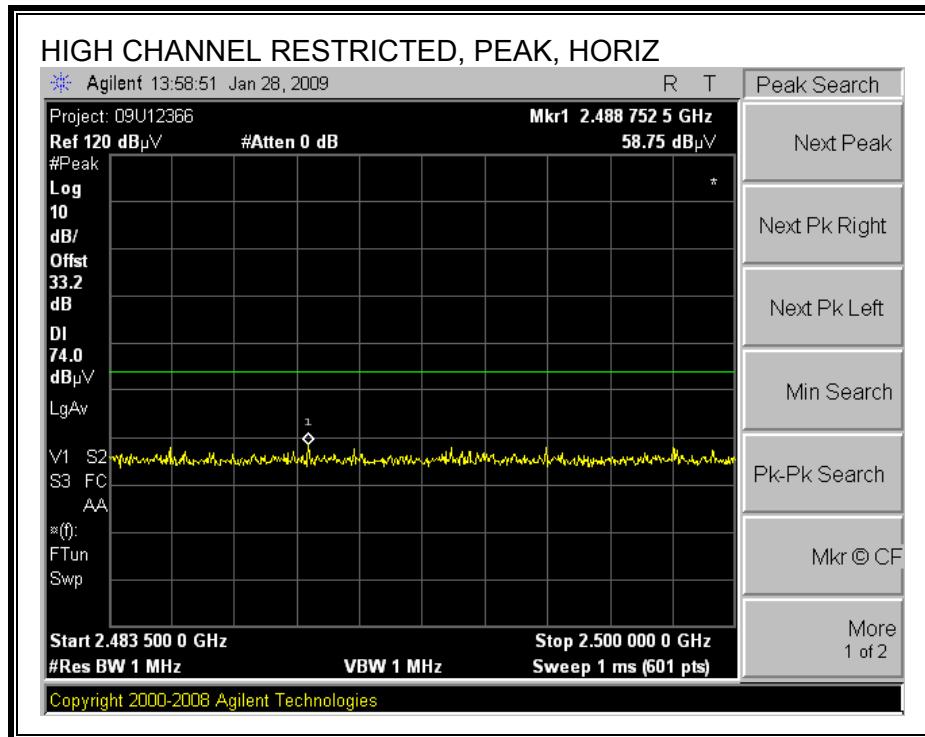


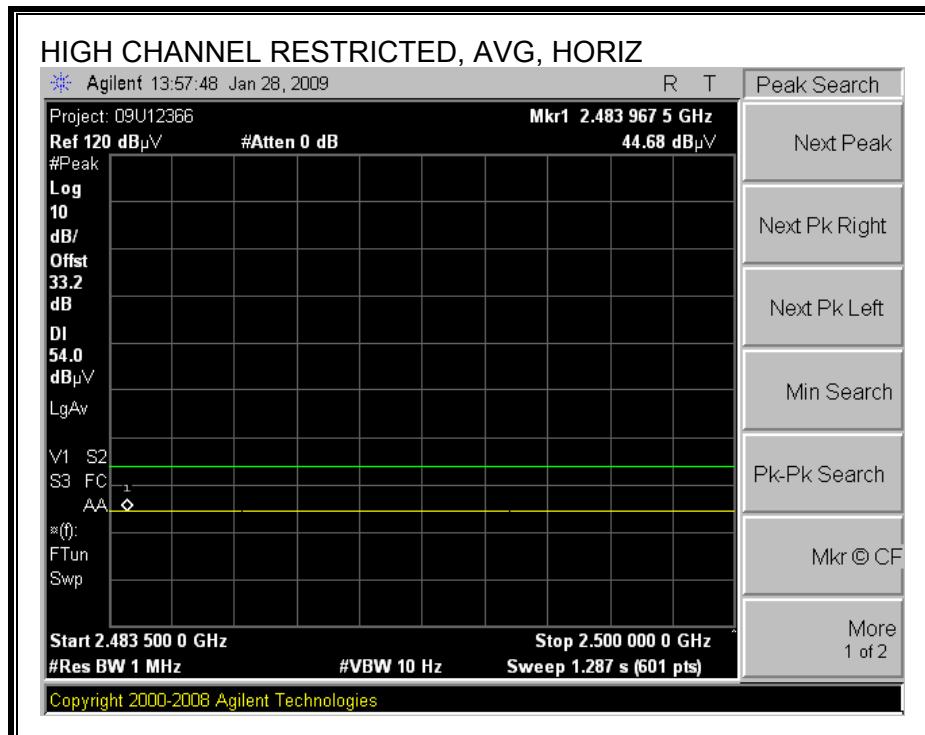
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



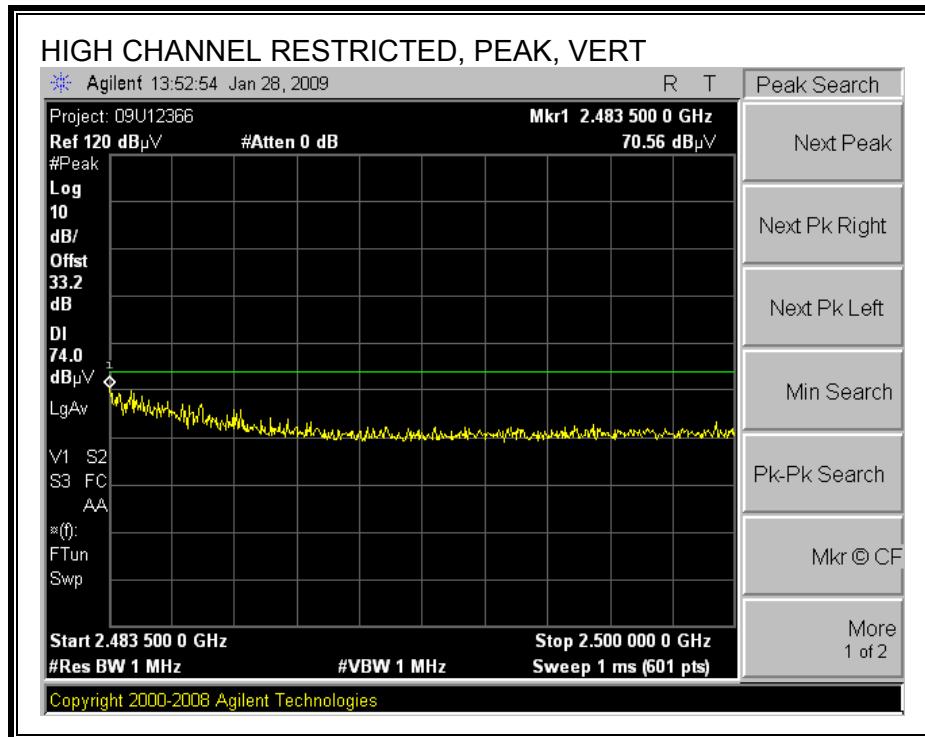


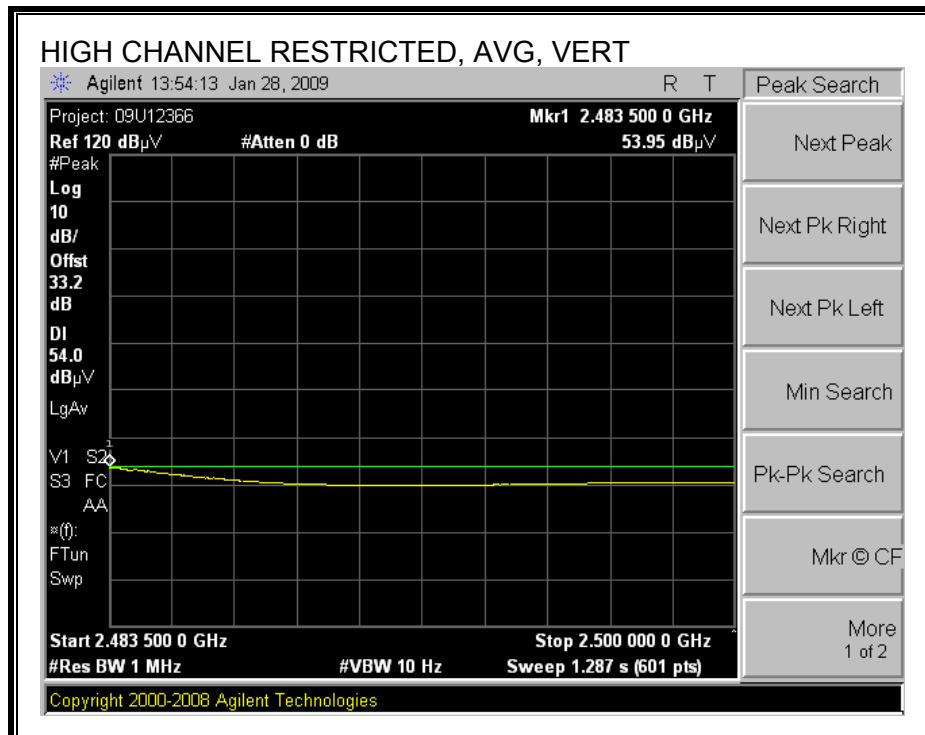
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





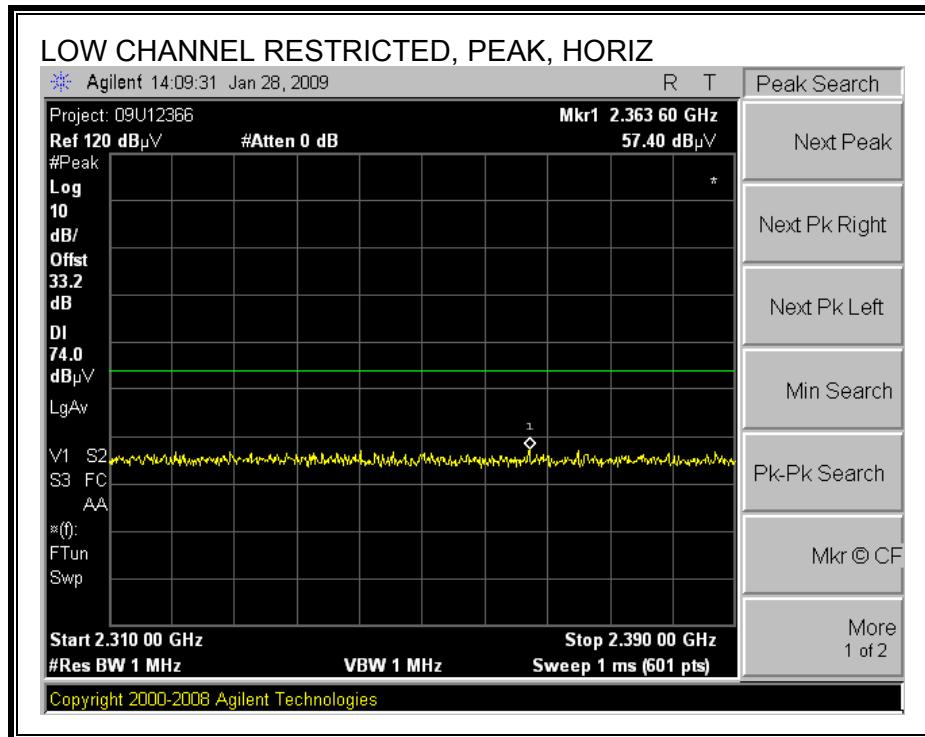
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

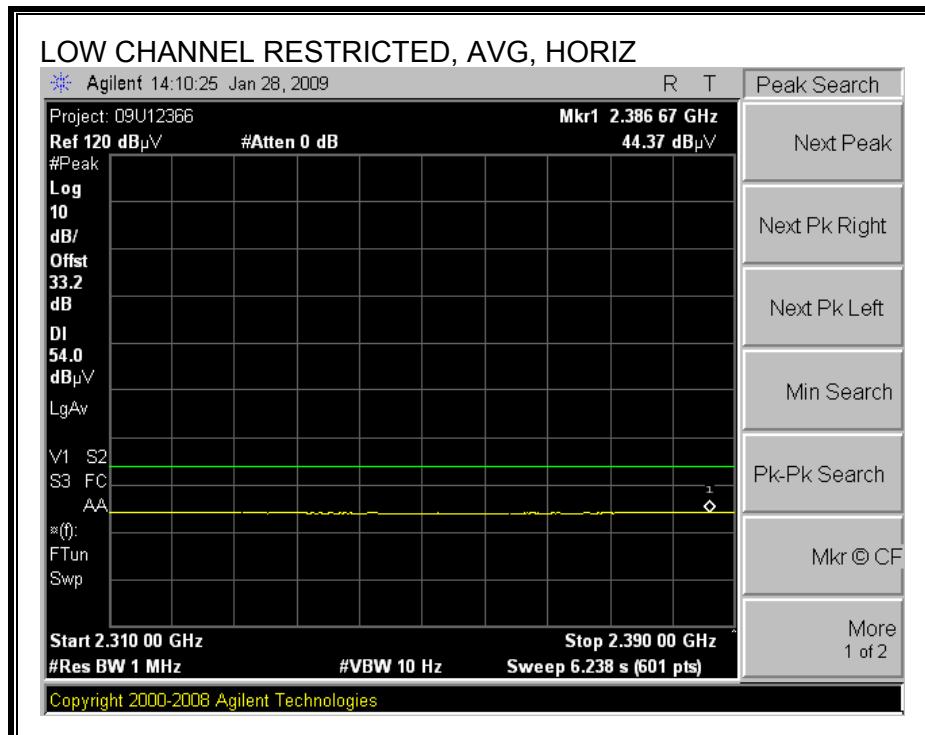




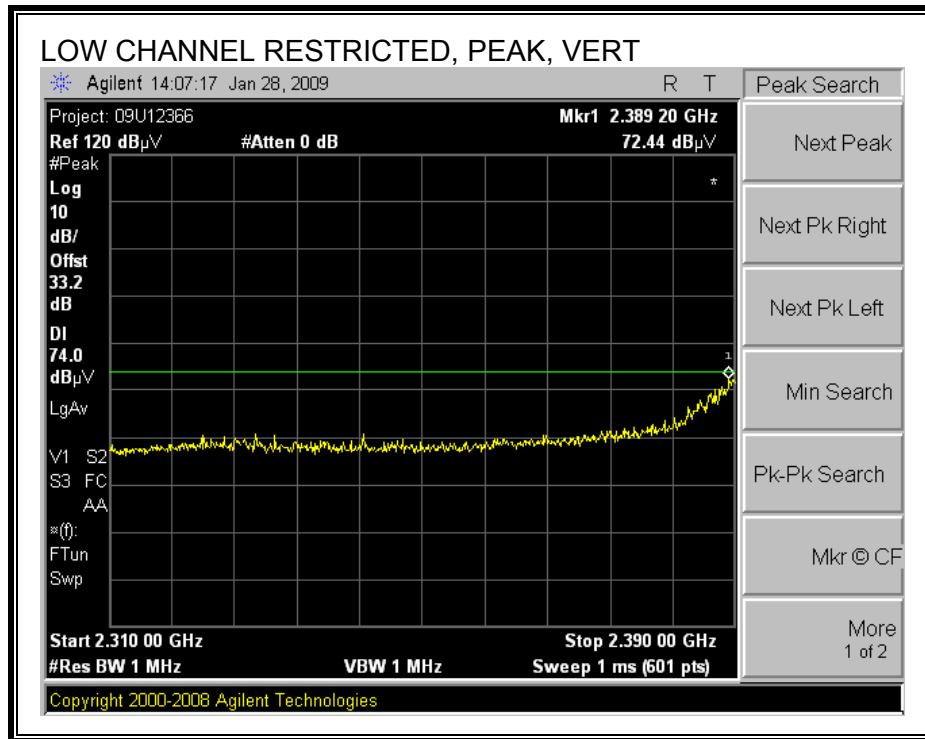
## HT 40MHz

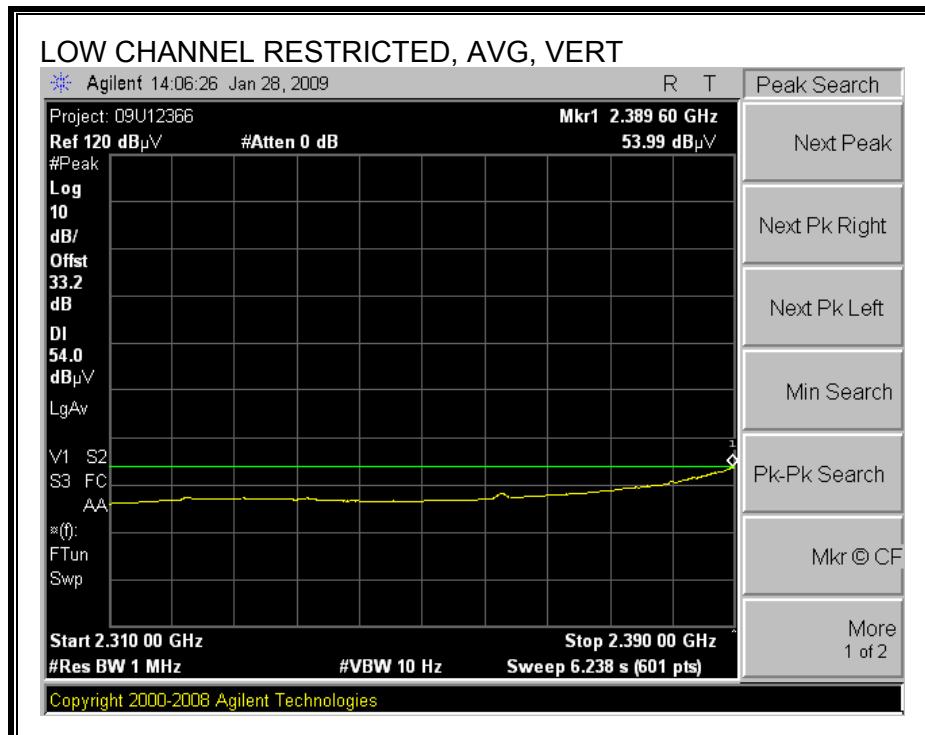
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



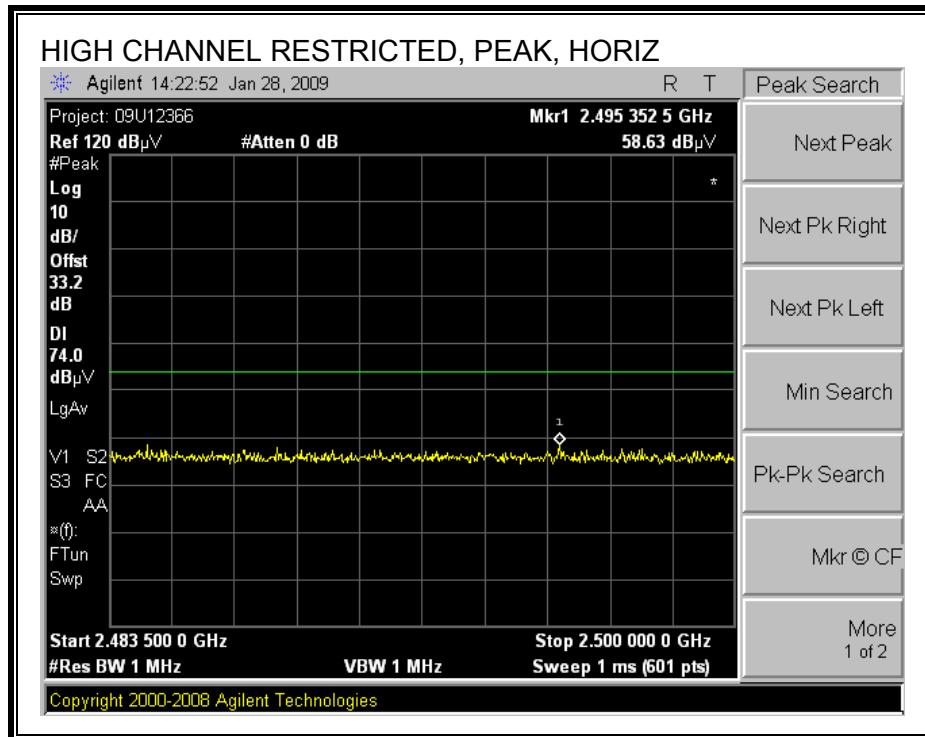


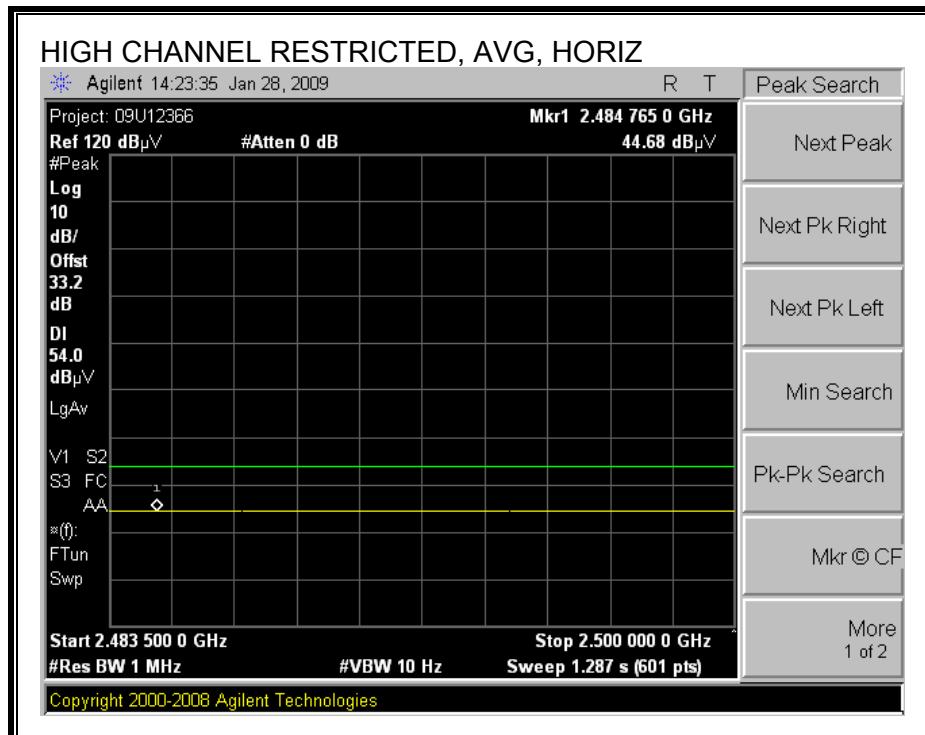
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



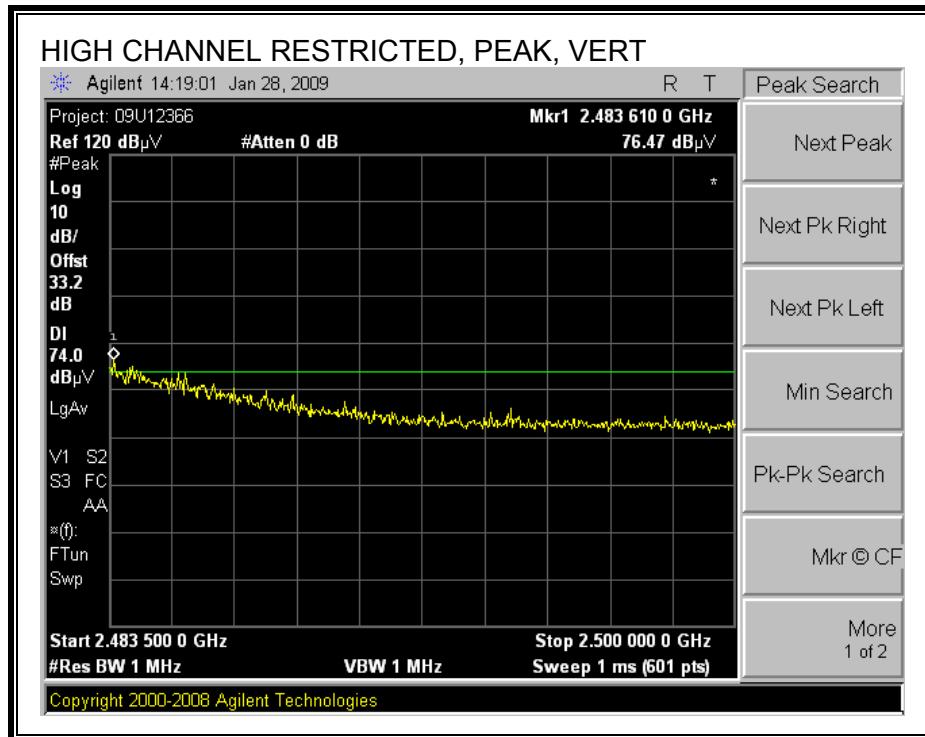


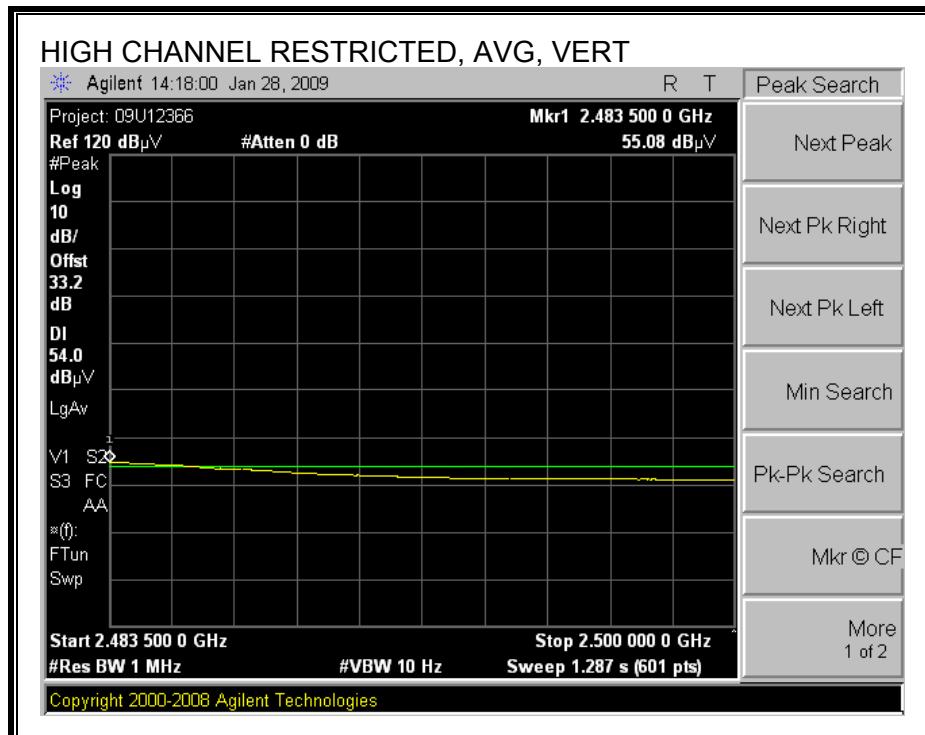
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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





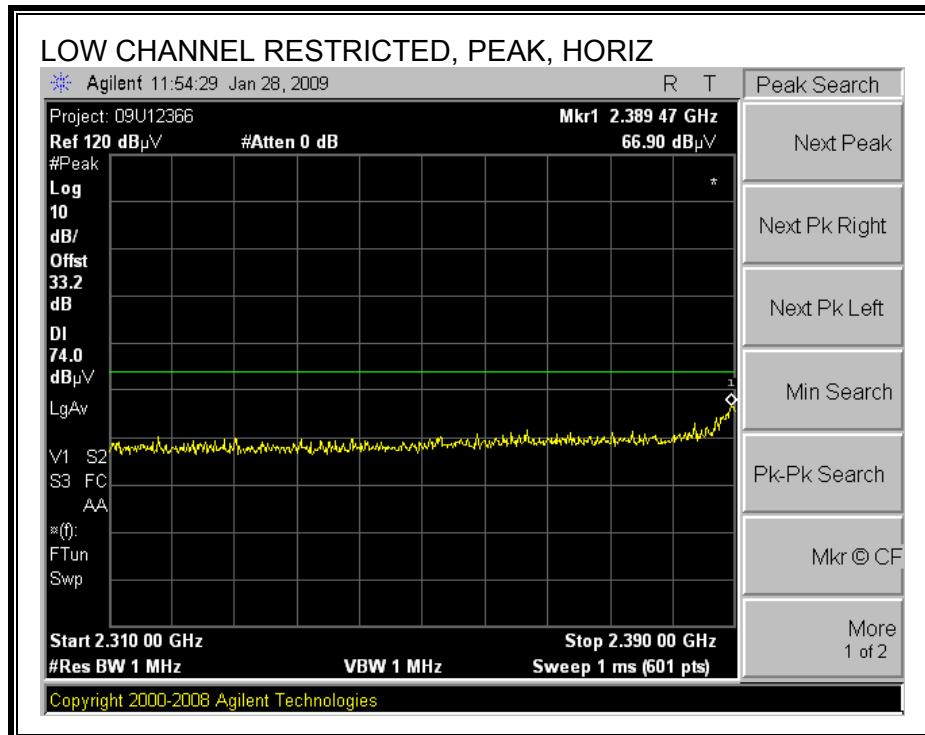
## HARMONICS AND SPURIOUS EMISSIONS (Worst Case)

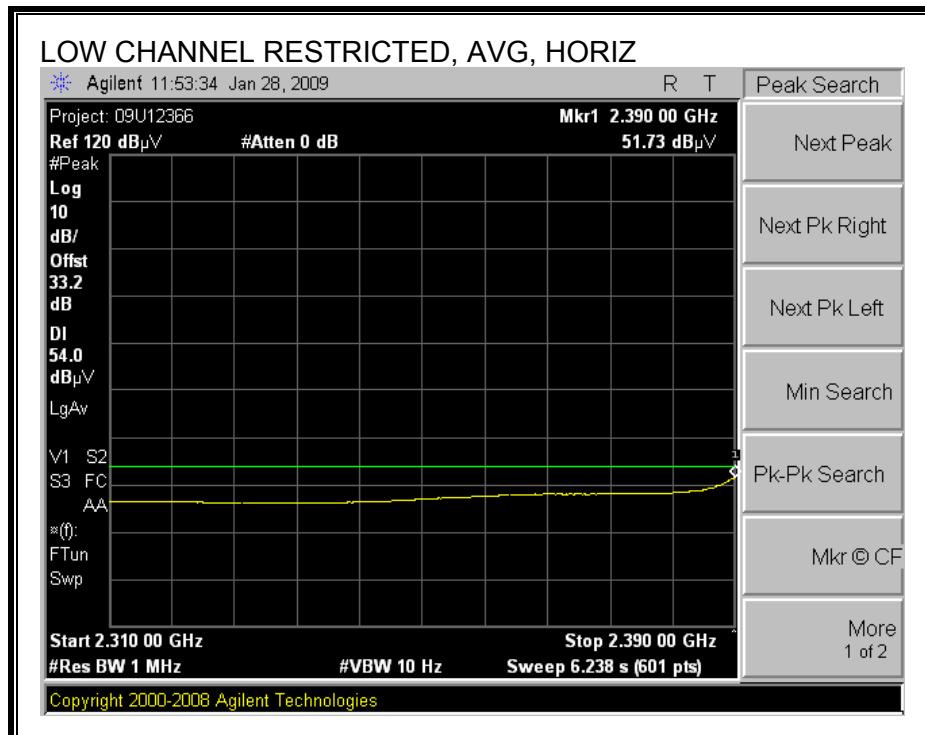
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company:	Meraki Inc.														
Project #:	09U12366														
Date:	01/29/09														
Test Engineer:	Thanh Nguyen														
Configuration:	EUT with Flat Panel Antenna 19dBi														
Mode:	Transmit Worst case g mode Art=13.5														
<b>Test Equipment:</b>															
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit			
T73; S/N: 6717 @3m	T34 HP 8449B								T125; ARA 18-26GHz; S/N:1007			FCC 15.209			
Hi Frequency Cables															
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements RBW=VBW=1MHz
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001			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															
4.824	3.0	48.4	36.5	33.7	5.8	-34.8	0.0	0.0	53.2	41.2	74	54	-20.8	-12.8	V
7.236	3.0	41.2	28.7	36.2	7.2	-34.1	0.0	0.0	50.5	37.9	74	54	-23.5	-16.1	Noise floor
4.824	3.0	46.8	32.3	33.7	5.8	-34.8	0.0	0.0	51.5	37.0	74	54	-22.5	-17.0	H
7.236	3.0	40.3	28.6	36.2	7.2	-34.1	0.0	0.0	49.6	37.9	74	54	-24.4	-16.1	Noise floor
Mid channel															
4.874	3.0	49.5	37.5	33.8	5.8	-34.8	0.0	0.0	54.4	42.3	74	54	-19.6	-11.7	V
7.311	3.0	41.2	28.4	36.2	7.3	-34.1	0.0	0.0	50.6	37.8	74	54	-23.4	-16.2	Noise floor
4.874	3.0	47.6	34.7	33.8	5.8	-34.8	0.0	0.0	52.4	39.5	74	54	-21.6	-14.5	H
7.311	3.0	41.3	28.4	36.2	7.3	-34.1	0.0	0.0	50.7	37.8	74	54	-23.3	-16.2	Noise floor
High channel															
4.924	3.0	48.7	37.3	33.9	5.9	-34.8	0.0	0.0	53.6	42.2	74	54	-20.4	-11.8	V
7.386	3.0	42.2	28.9	36.3	7.3	-34.1	0.0	0.0	51.7	38.4	74	54	-22.3	-15.6	Noise floor
4.924	3.0	47.4	35.4	33.9	5.9	-34.8	0.0	0.0	52.4	40.4	74	54	-21.6	-13.6	H
7.386	3.0	41.9	28.9	36.3	7.3	-34.1	0.0	0.0	51.4	38.4	74	54	-22.6	-15.6	Noise floor
No other emissions were detected above noise floor.															
Rev. 10.15.08															
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										

**MODE 110**

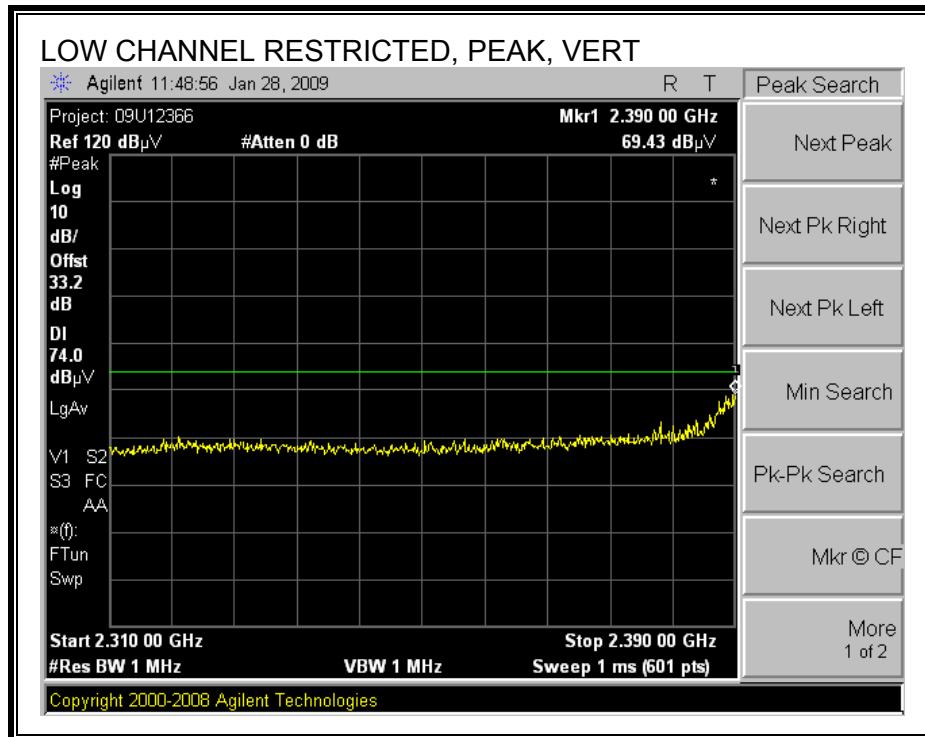
HT 20MHz

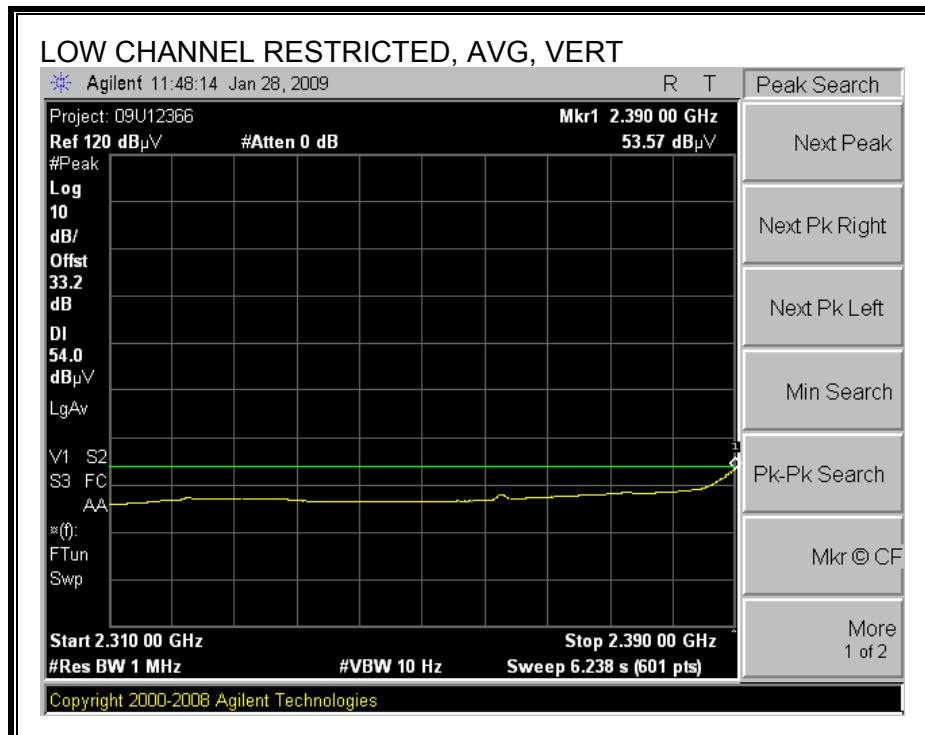
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



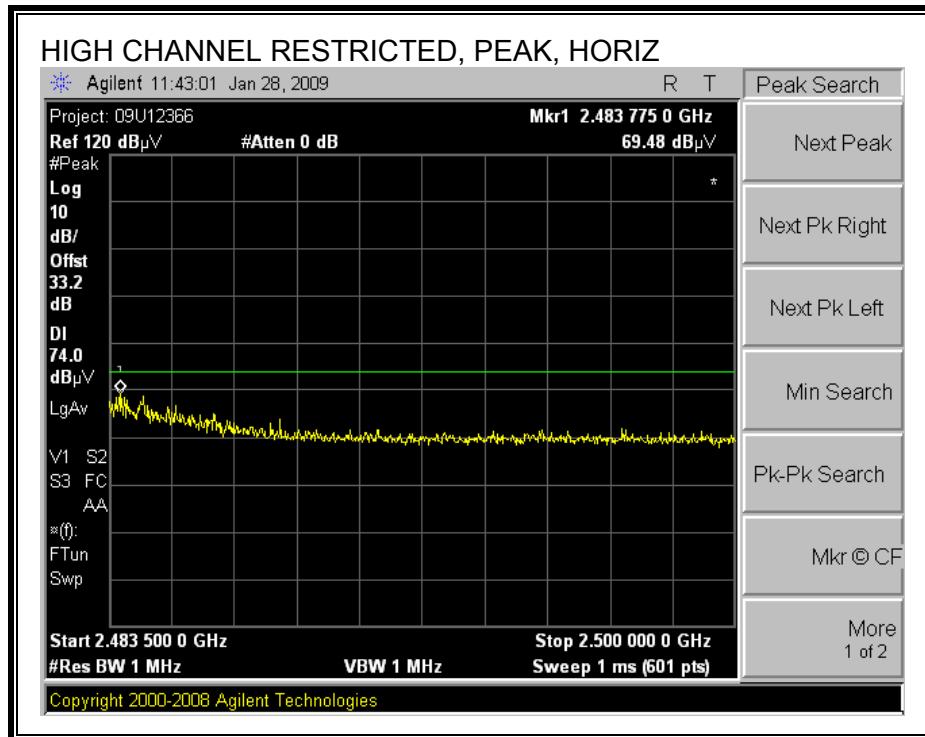


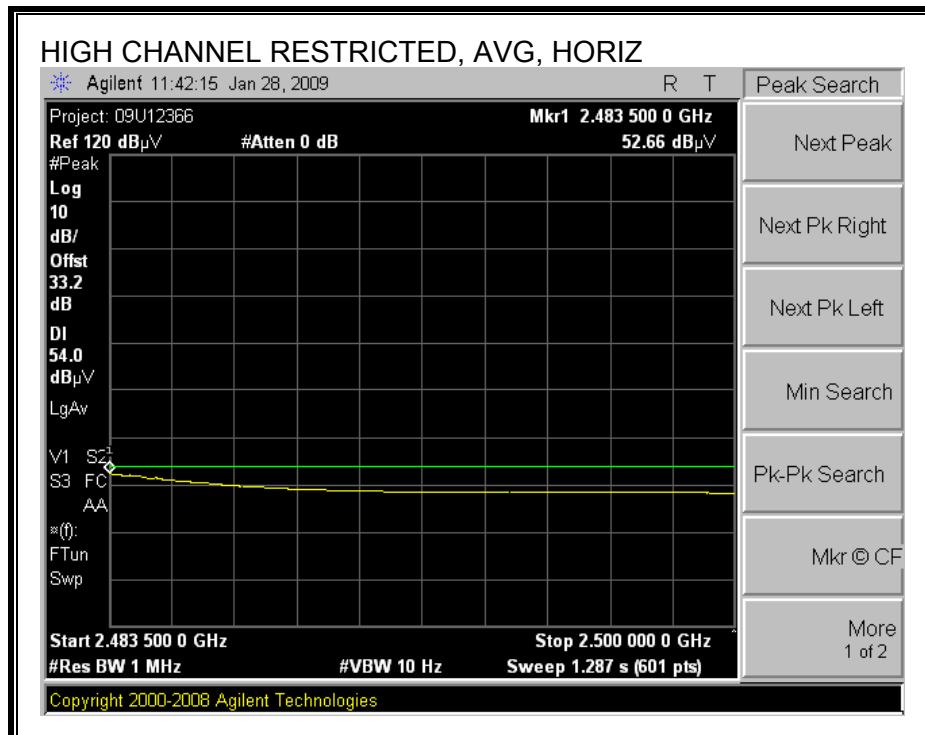
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



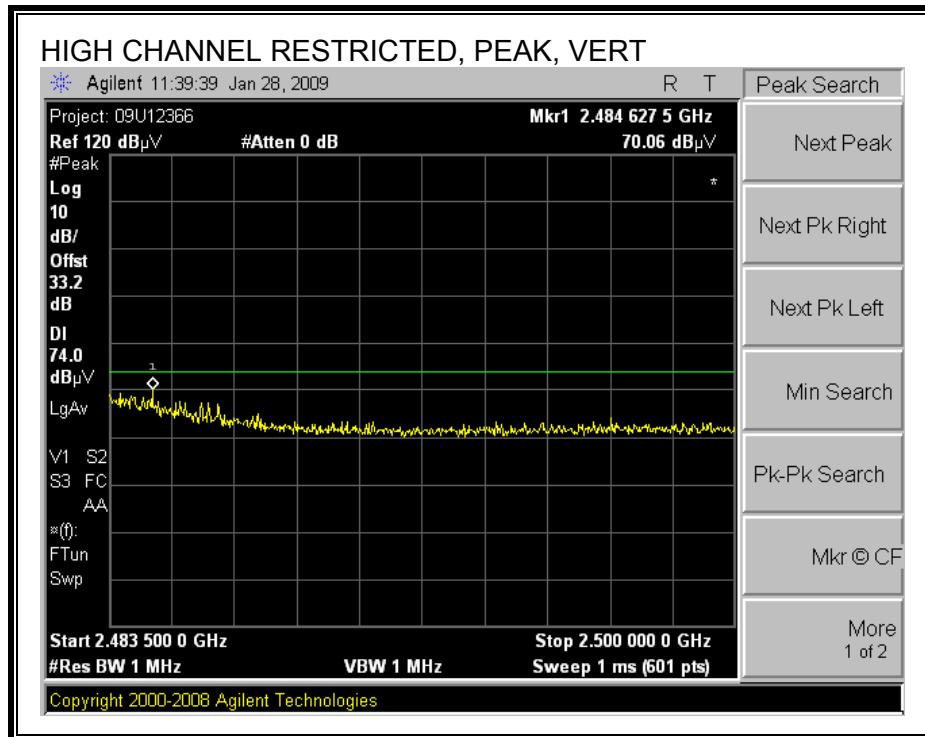


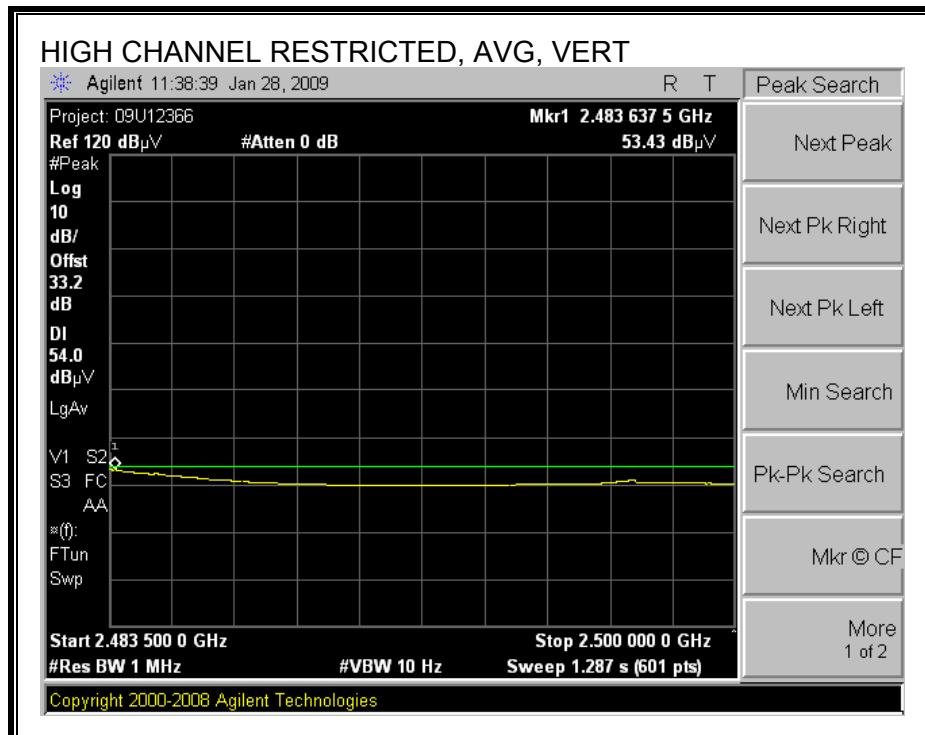
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



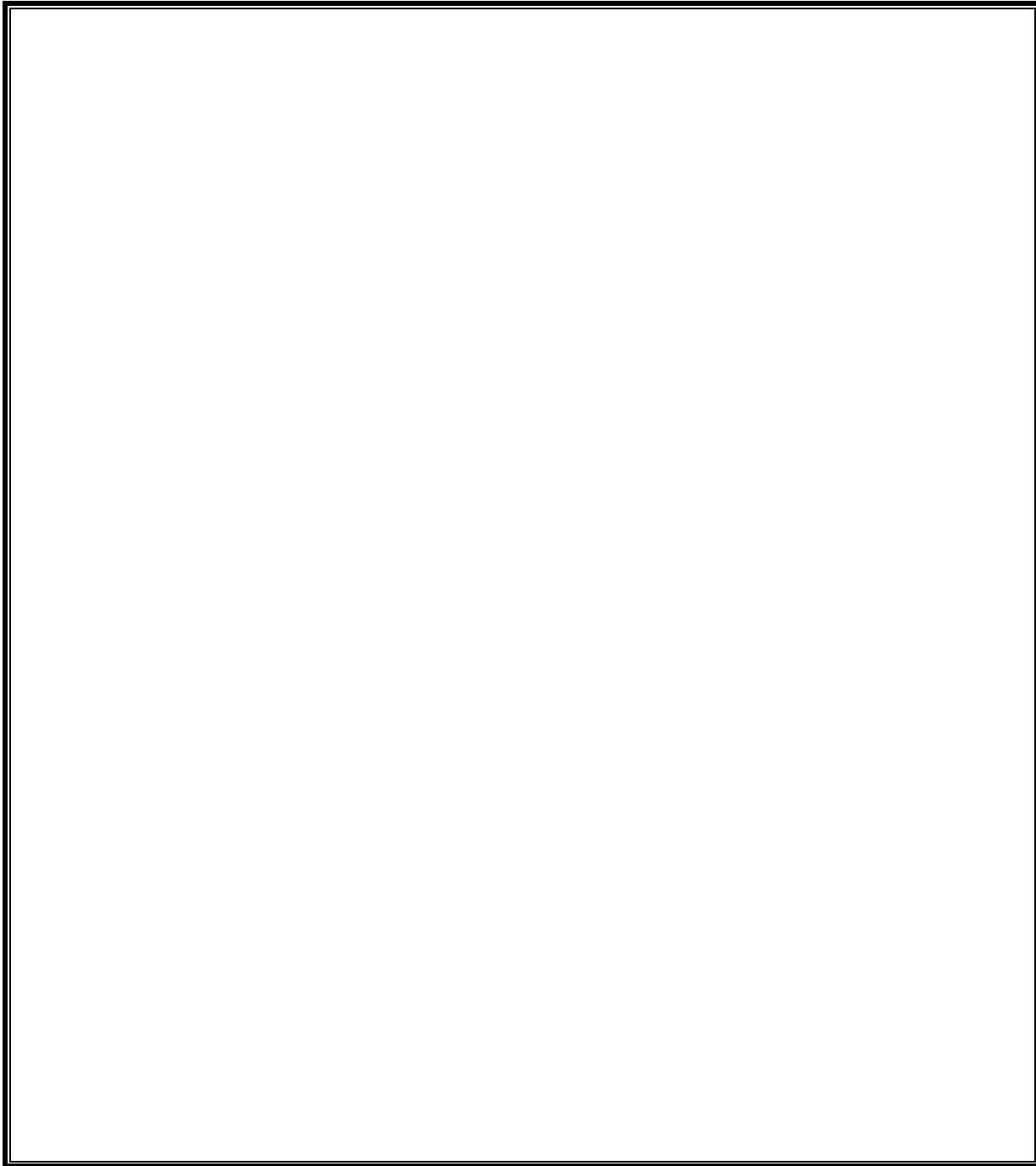


**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



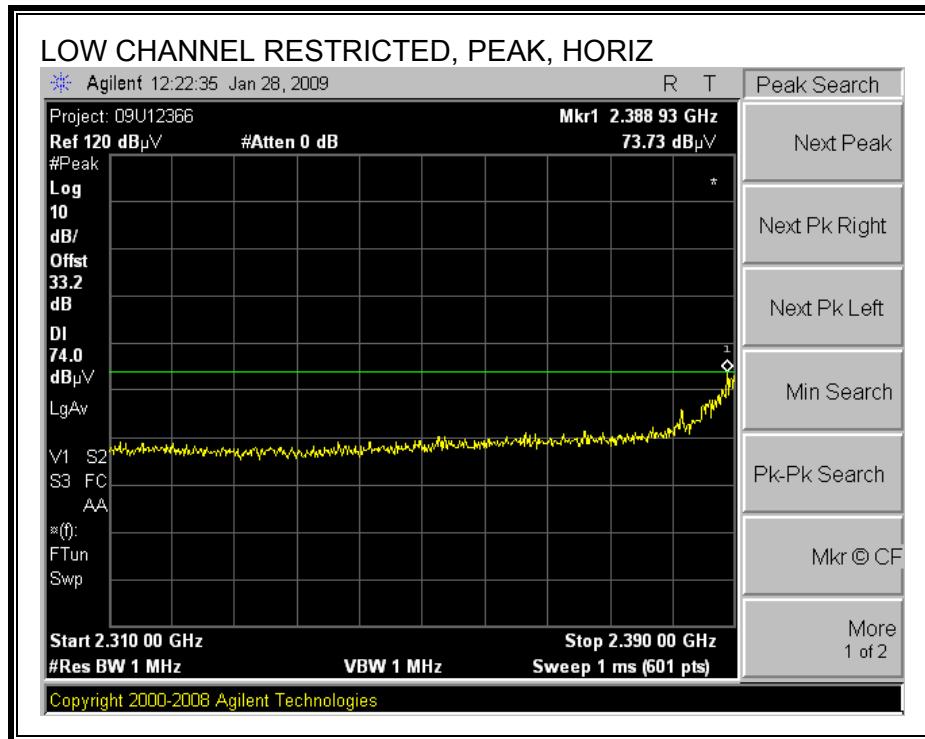


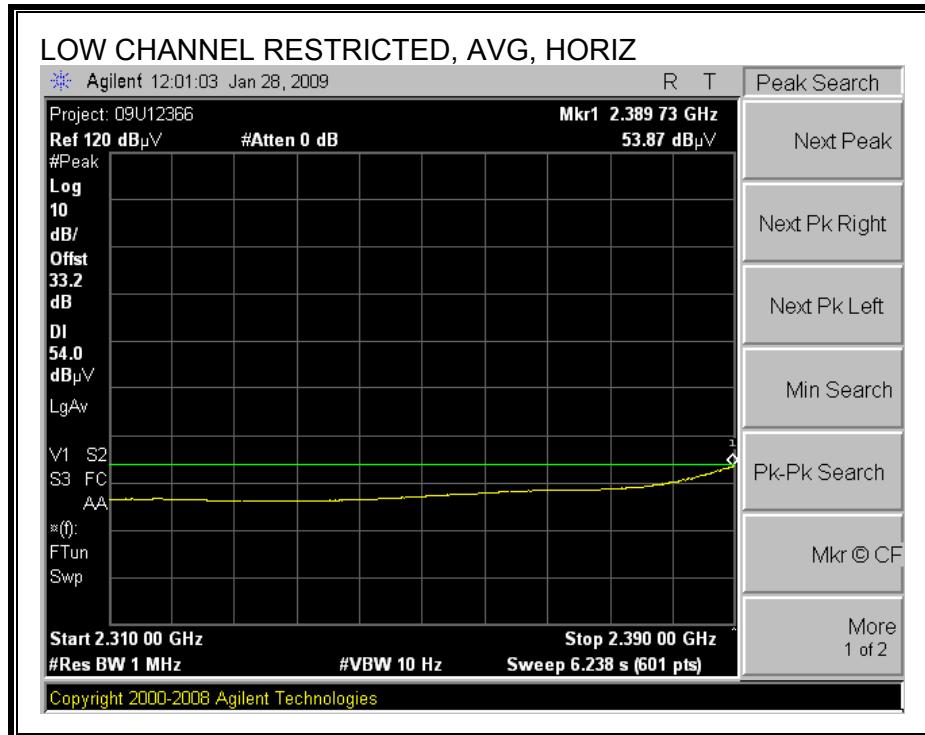
**HARMONICS AND SPURIOUS EMISSIONS (See Worst Case)**



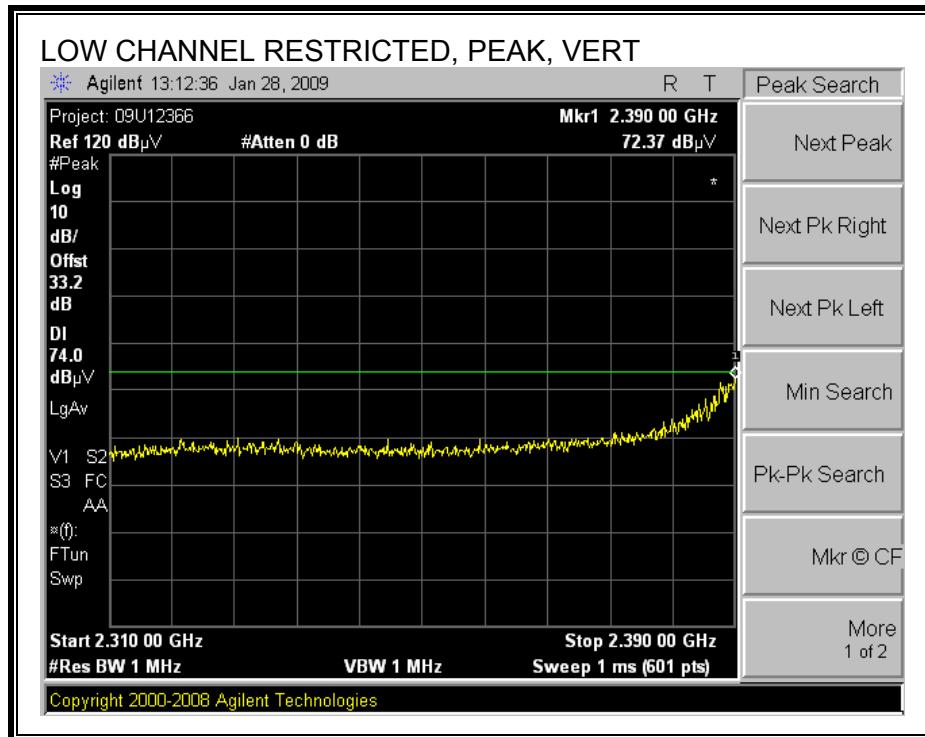
**HT 40 MHz**

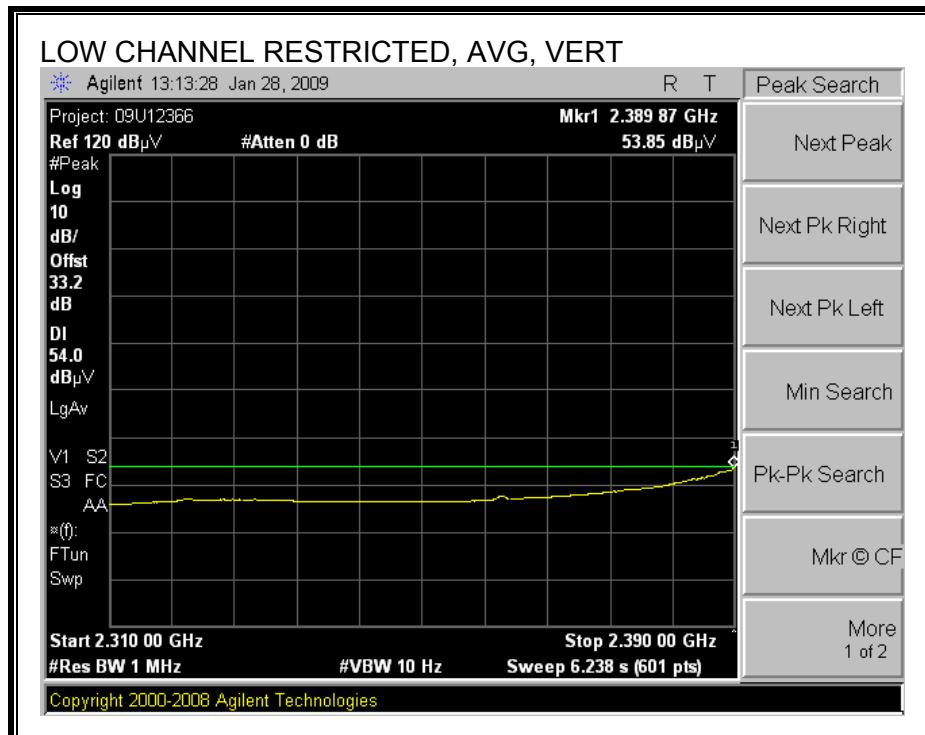
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



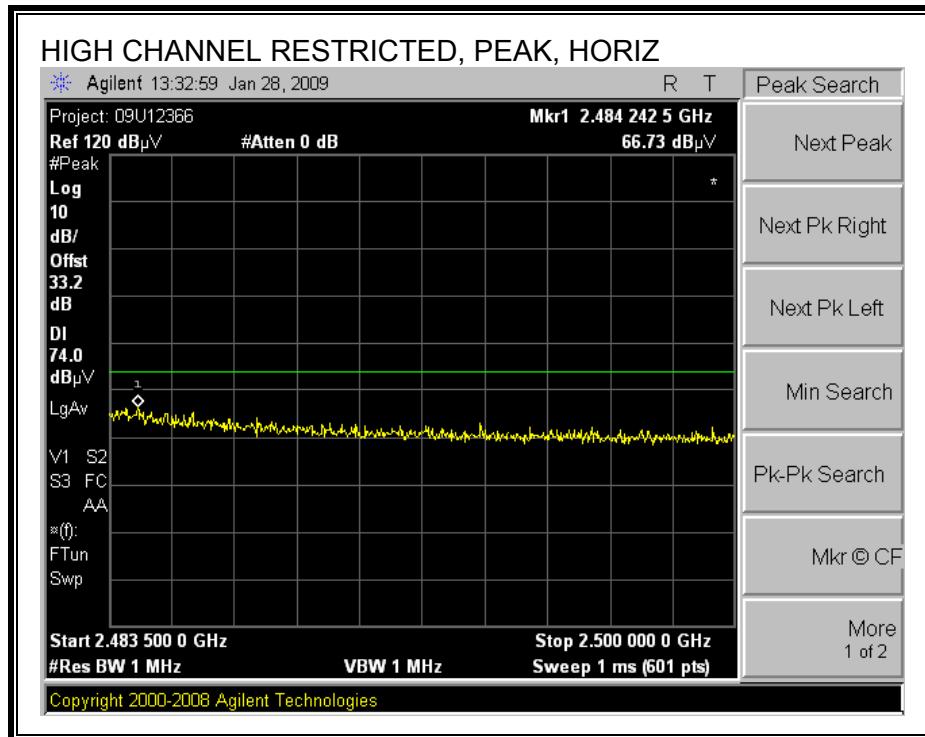


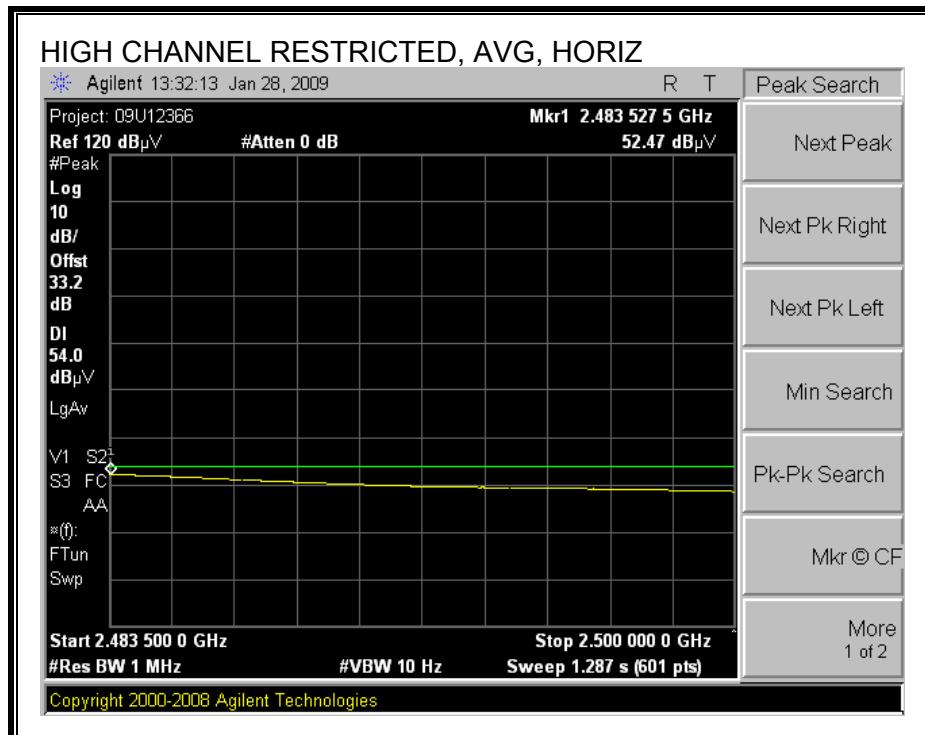
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



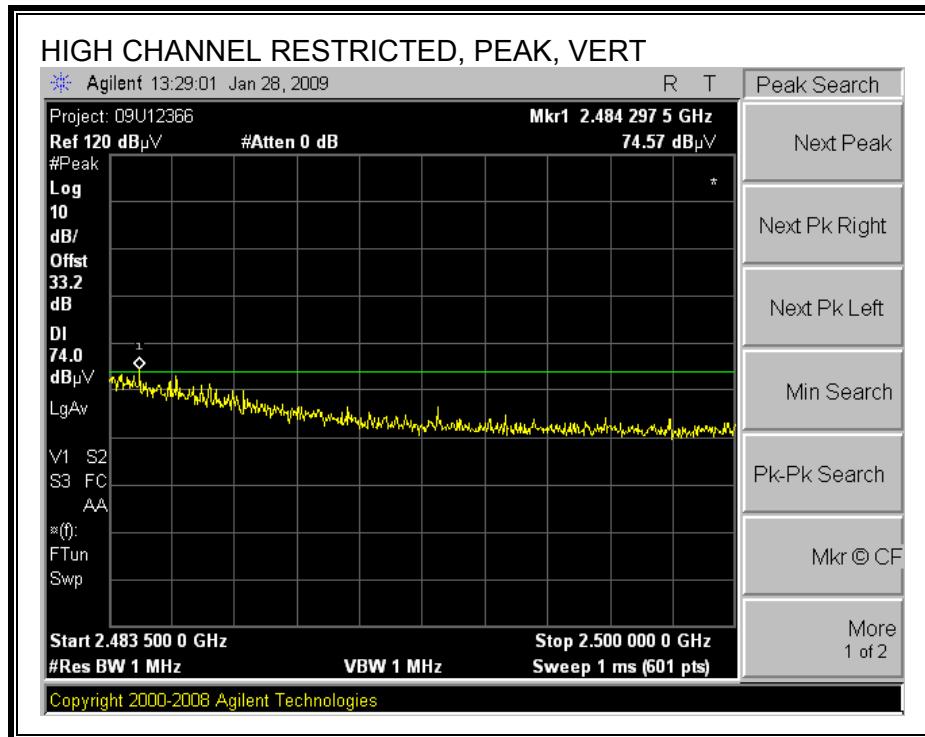


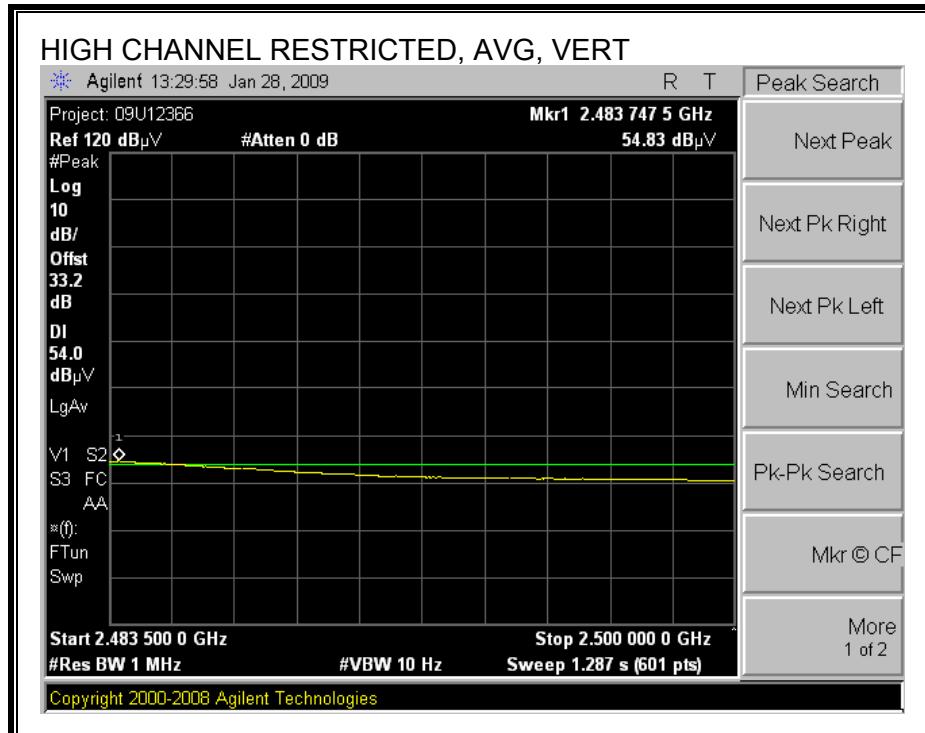
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



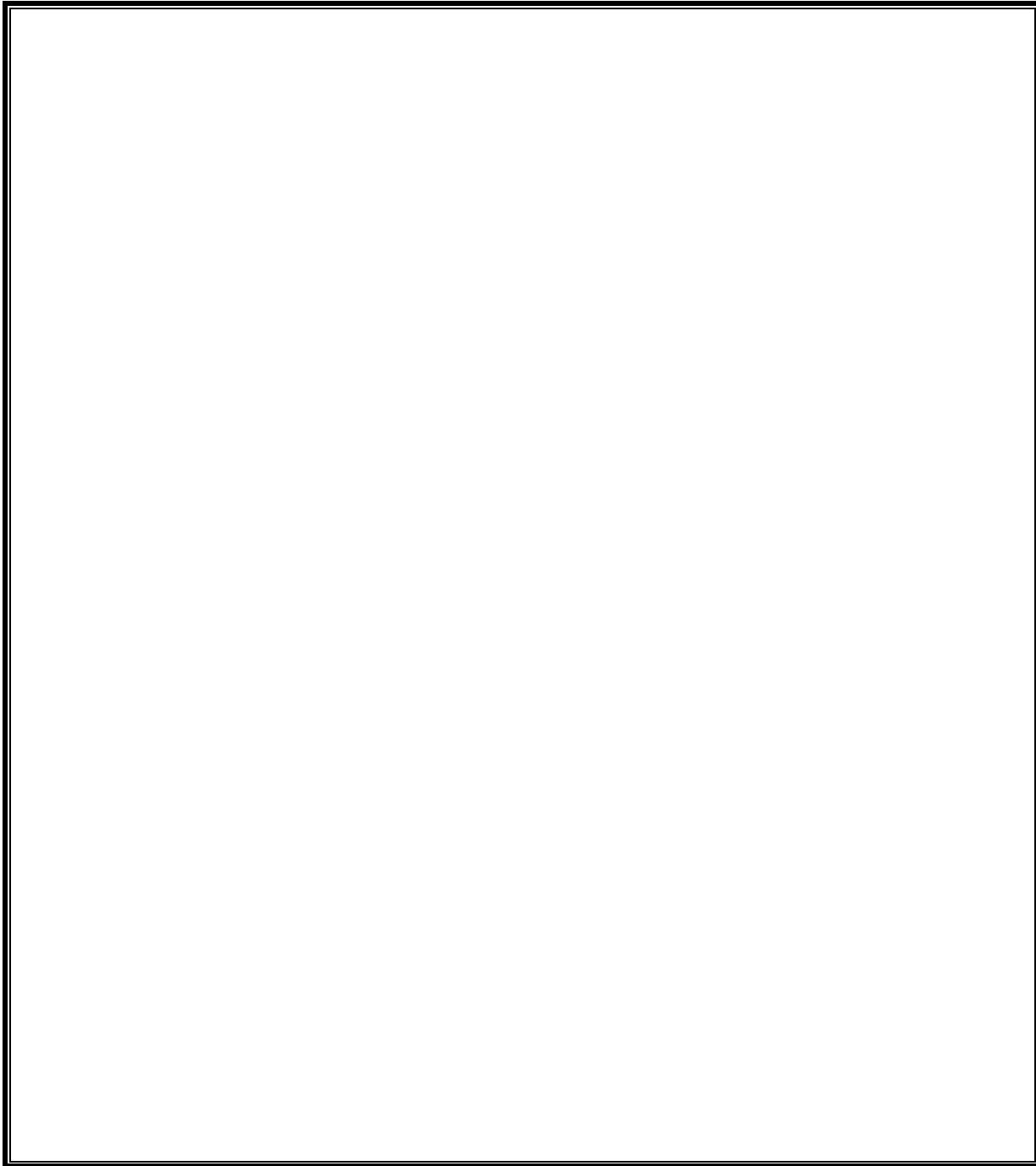


**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**





**HARMONICS AND SPURIOUS EMISSIONS (See Worst Case)**



## 7.6. HIGH GAIN PATCH ANTENNA

### 7.6.1. TX ABOVE 1 GHz FOR 802.11a MODE IN THE 5.8 GHz BAND

#### HARMONICS AND SPURIOUS EMISSIONS

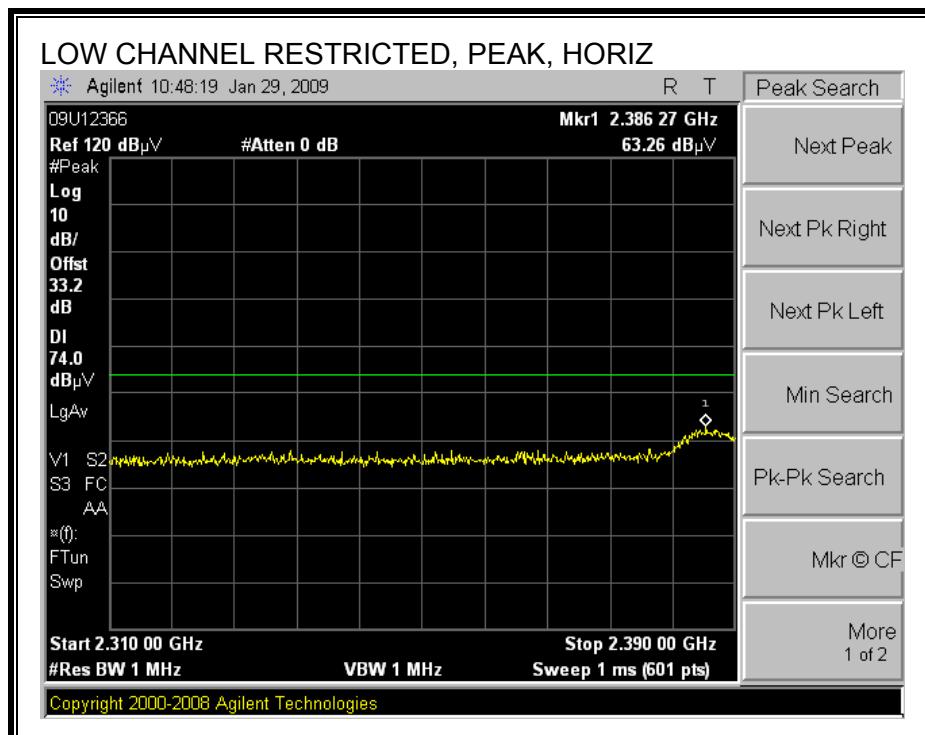
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																	
Company:	Meraki Inc.																
Project #:	09U12366																
Date:	01/30/09																
Test Engineer:	Thanh Nguyen																
Configuration:	EUT with High Gain Patch Antenna - 23dBi Gain																
Mode:	Transmit Worst case a mode Art=14.5																
<b>Test Equipment:</b>																	
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit					
T73; S/N: 6717 @3m	T34 HP 8449B							T125; ARA 18-26GHz; S/N:1007			FCC 15.209						
Hi Frequency Cables																	
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements RBW=VBW=1MHz		
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_002			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)		
<b>LOW CHANNEL, 5745 MHz</b>																	
11.490	3.0	41.0	27.5	38.6	9.5	-32.5	0.0	0.0	56.6	43.1	74	54	-17.4	-10.9	V, Noise Floor		
11.490	3.0	39.7	27.5	38.6	9.5	-32.5	0.0	0.0	55.3	43.0	74	54	-18.7	-11.0	H, Noise floor		
<b>MID CHANNEL, 5785 MHz</b>																	
11.570	3.0	41.1	27.9	38.7	9.5	-32.5	0.0	0.0	56.8	43.5	74	54	-17.2	-10.5	V, Noise Floor		
11.570	3.0	40.7	27.9	38.7	9.5	-32.5	0.0	0.0	56.4	43.5	74	54	-17.6	-10.5	H, Noise floor		
<b>HIGH CHANNEL, 5825 MHz</b>																	
11.650	3.0	41.7	29.5	38.7	9.6	-32.5	0.0	0.0	57.5	45.2	74	54	-16.5	-8.8	V, Noise Floor		
11.650	3.0	41.1	28.3	38.7	9.6	-32.5	0.0	0.0	56.9	44.1	74	54	-17.1	9.9	H, Noise floor		
No other emissions were detected above noise floor.																	
Rev. 10.15.08																	
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											

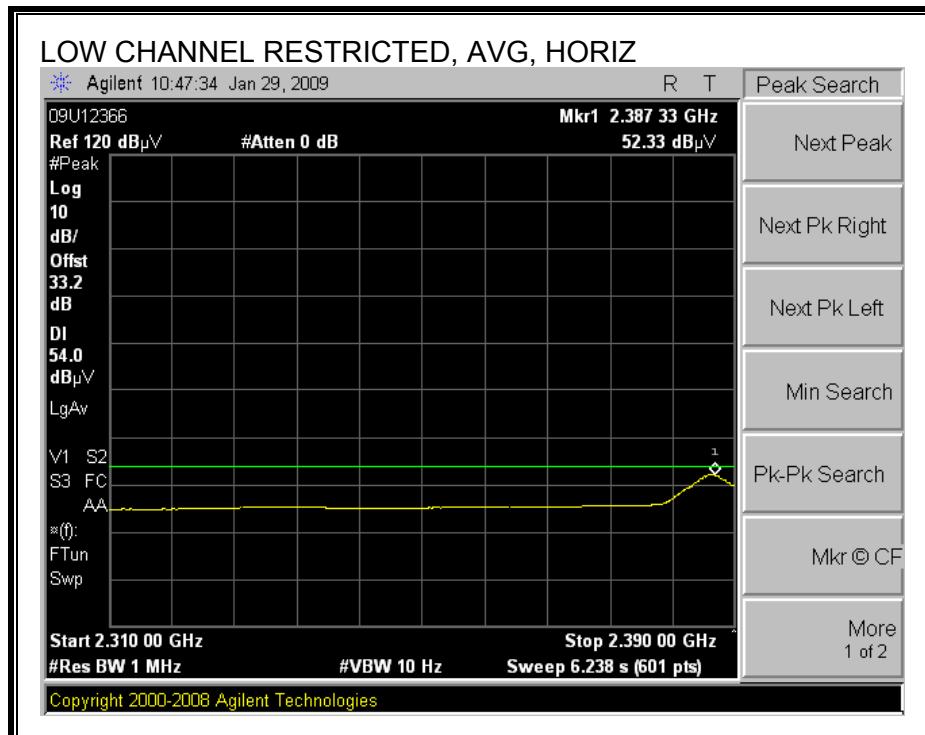
## 7.7. DIRECTIONAL ANTENNA (2.4GHz)

### 7.7.1. TX ABOVE 1 GHz FOR 802.11b

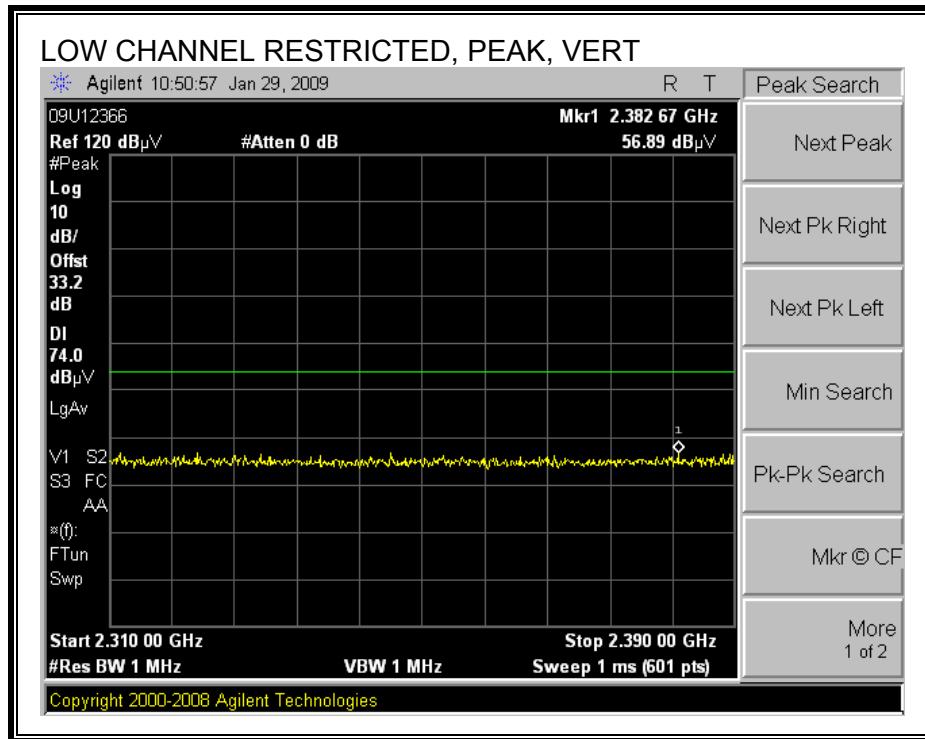
MODE 100:

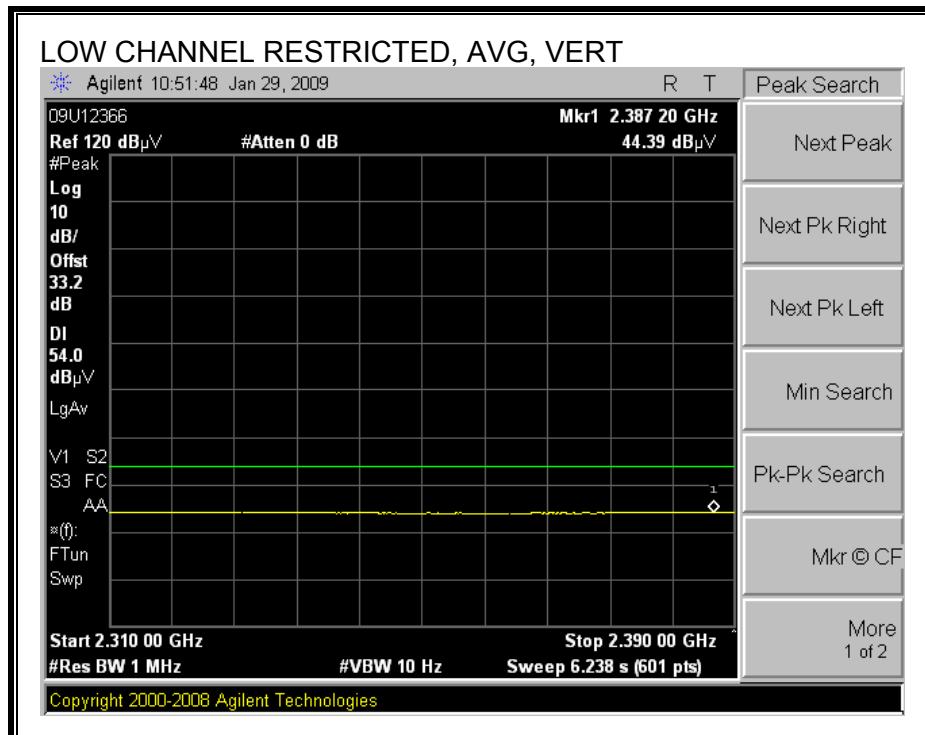
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



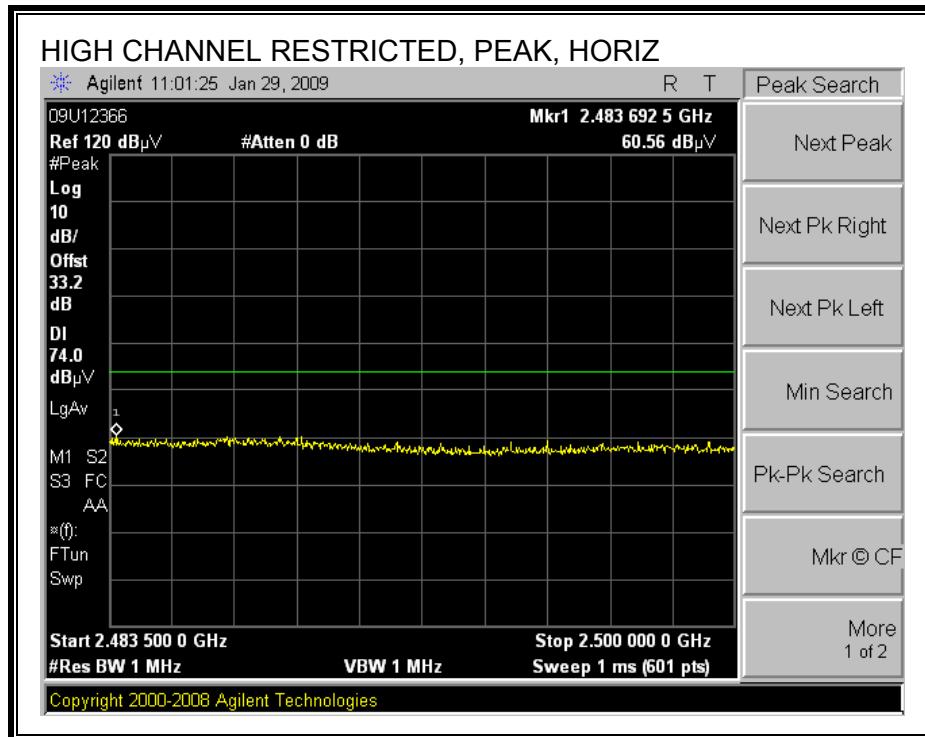


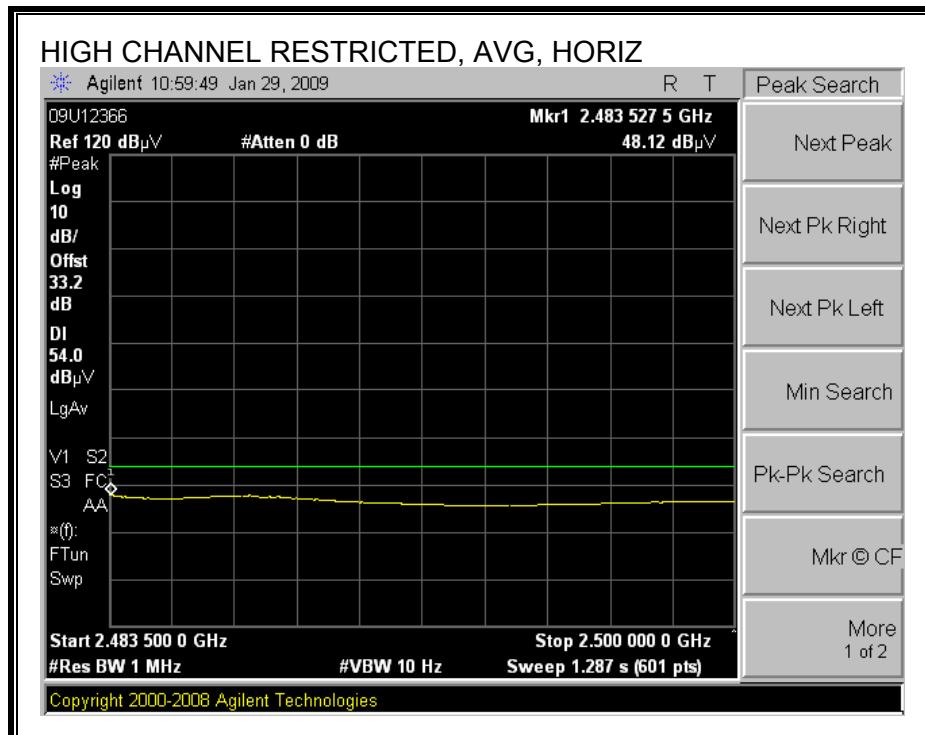
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



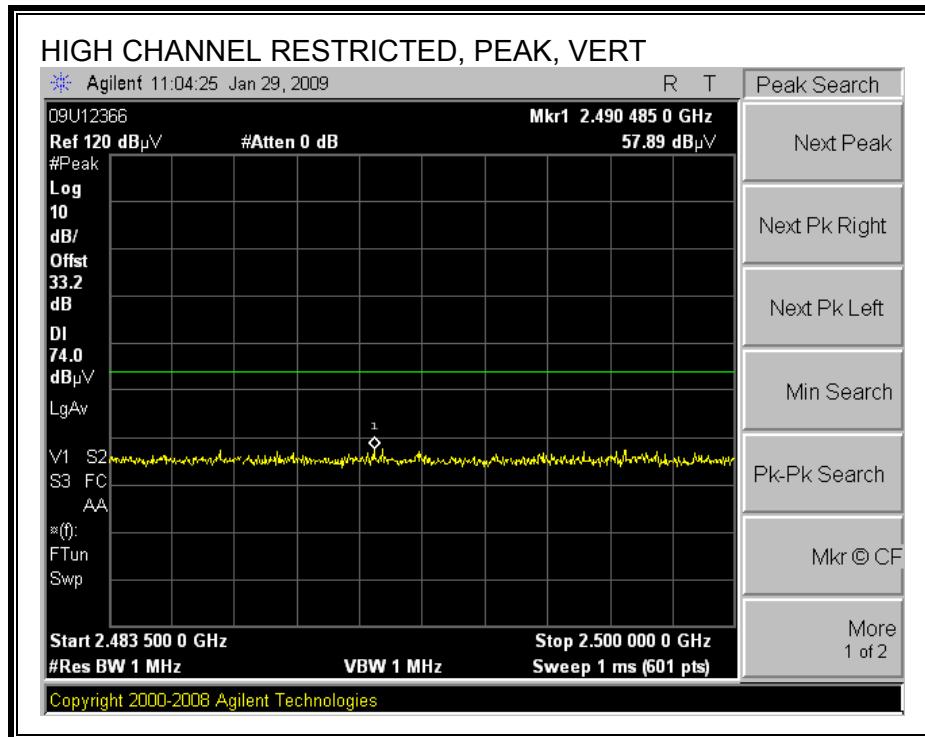


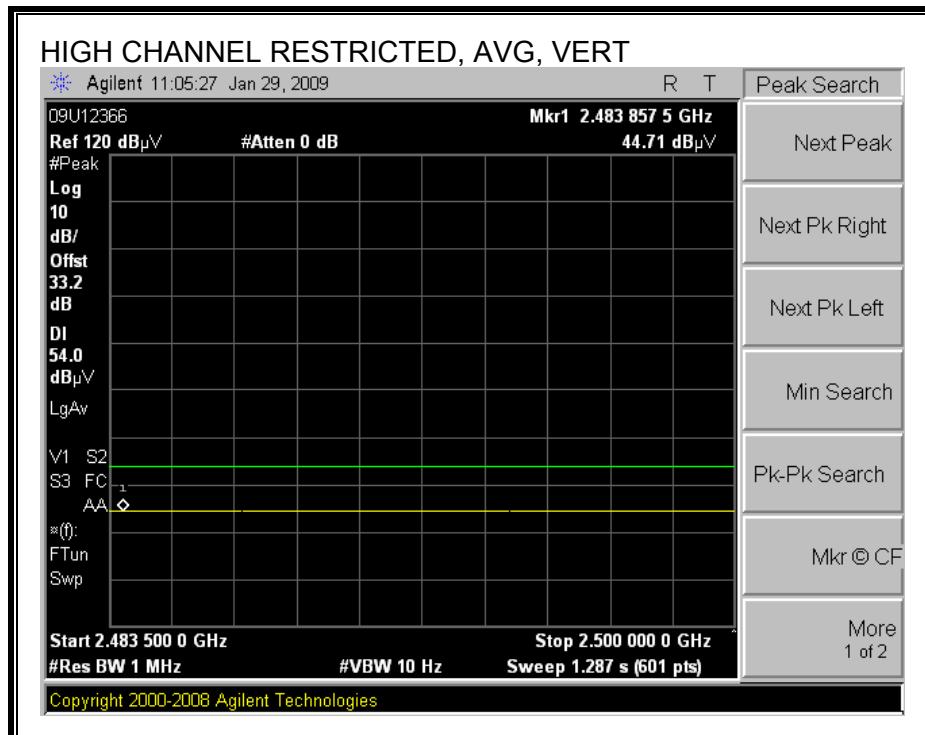
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





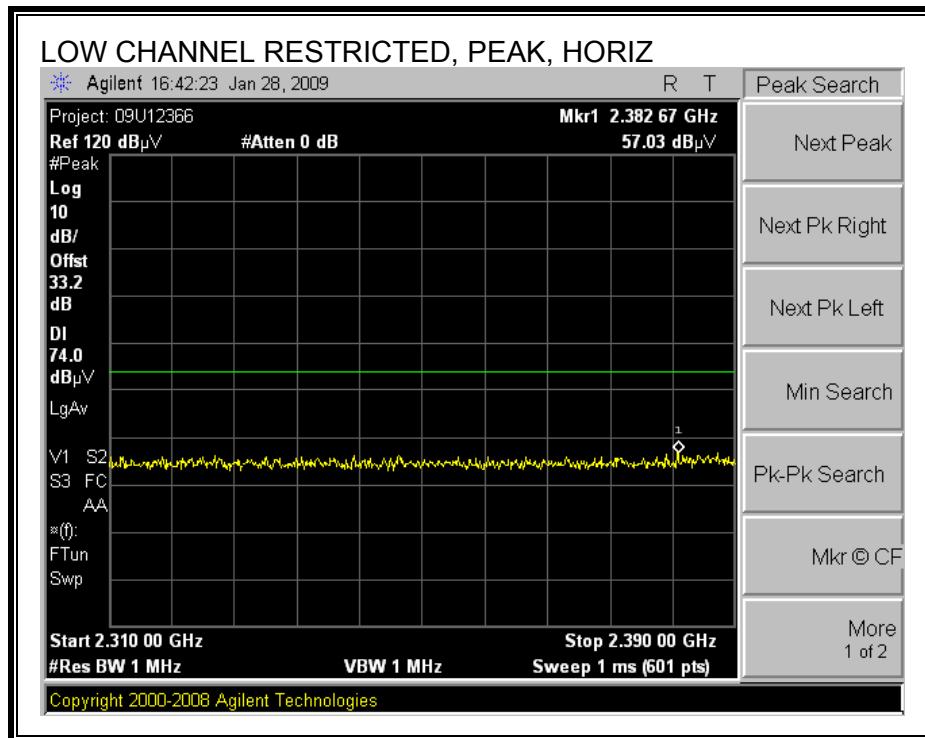
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

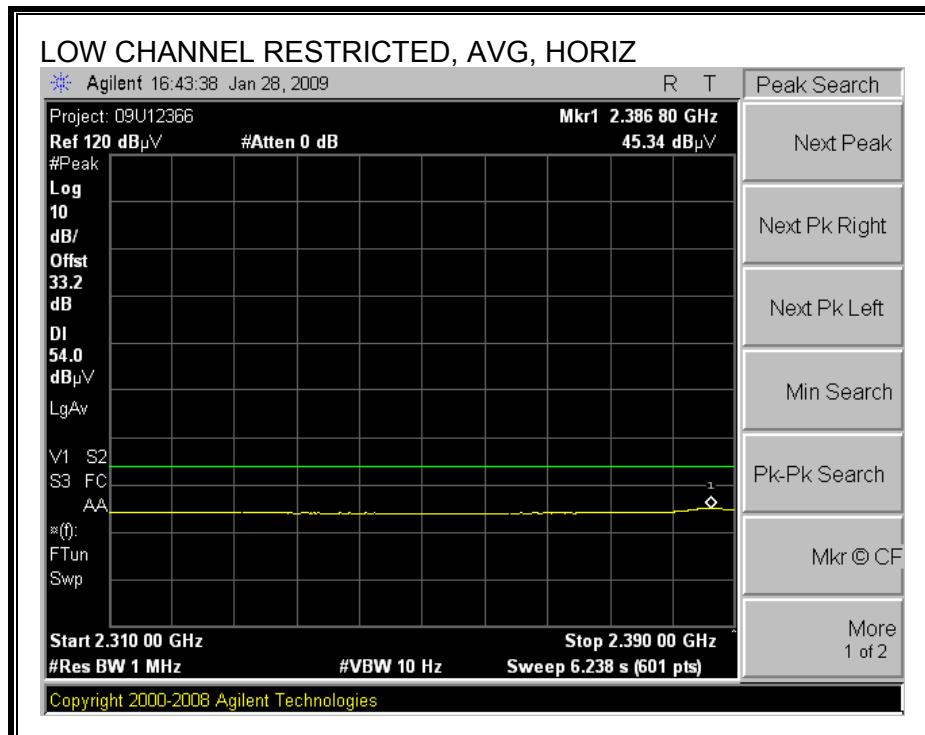




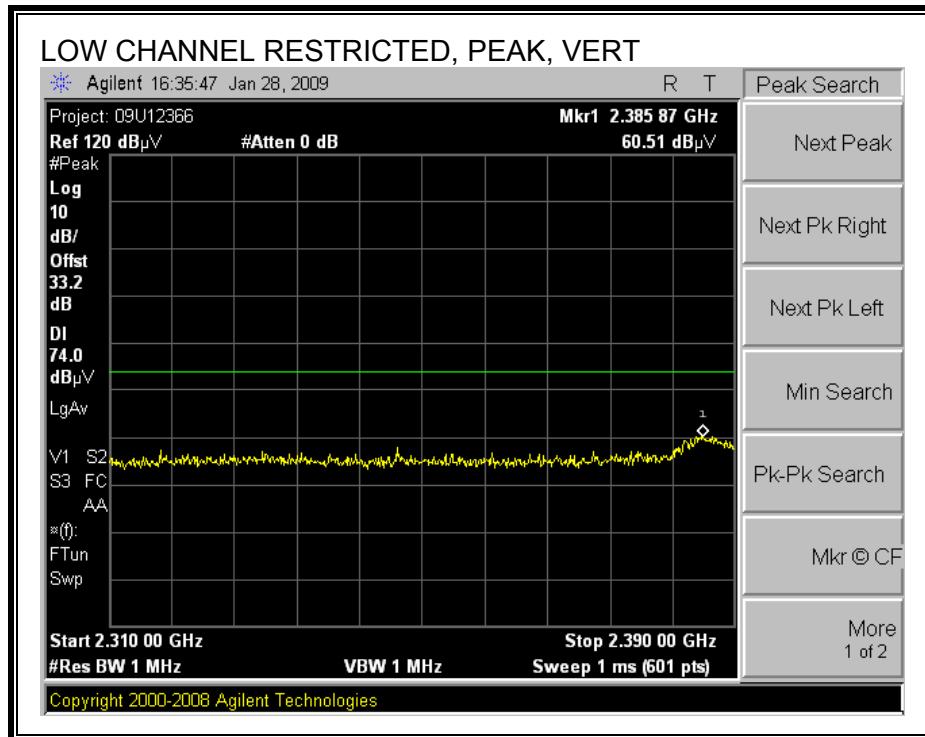
**MODE 010:**

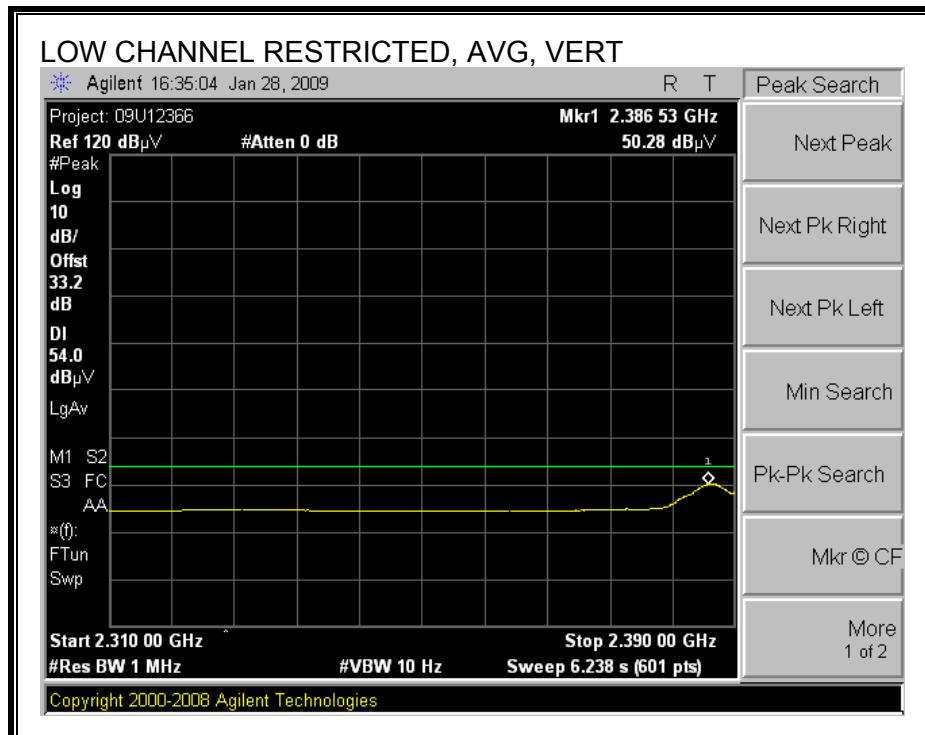
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



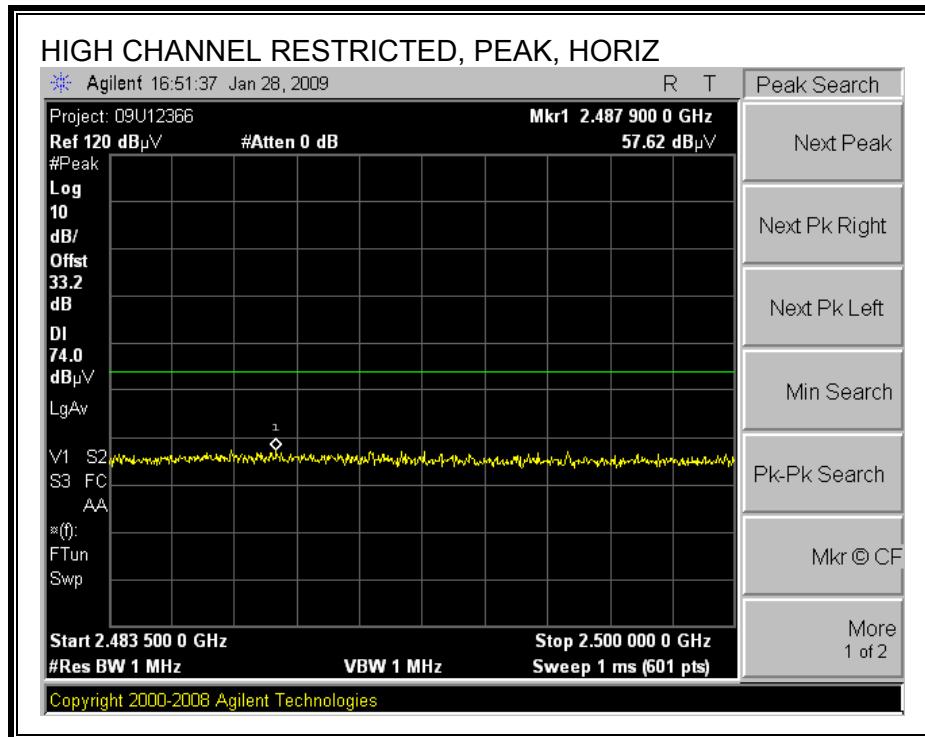


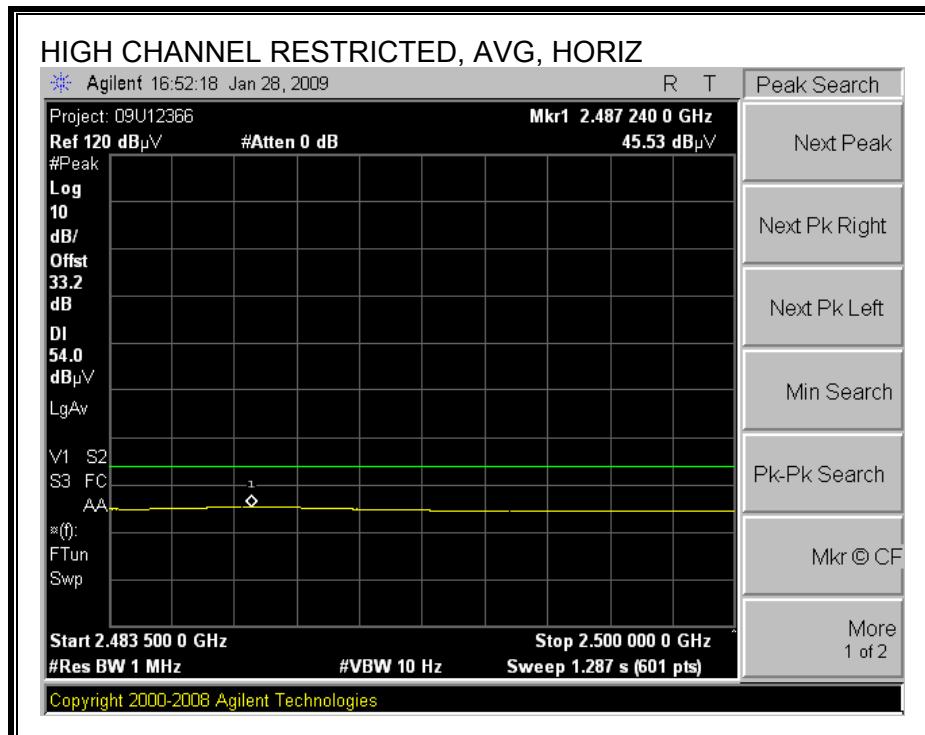
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



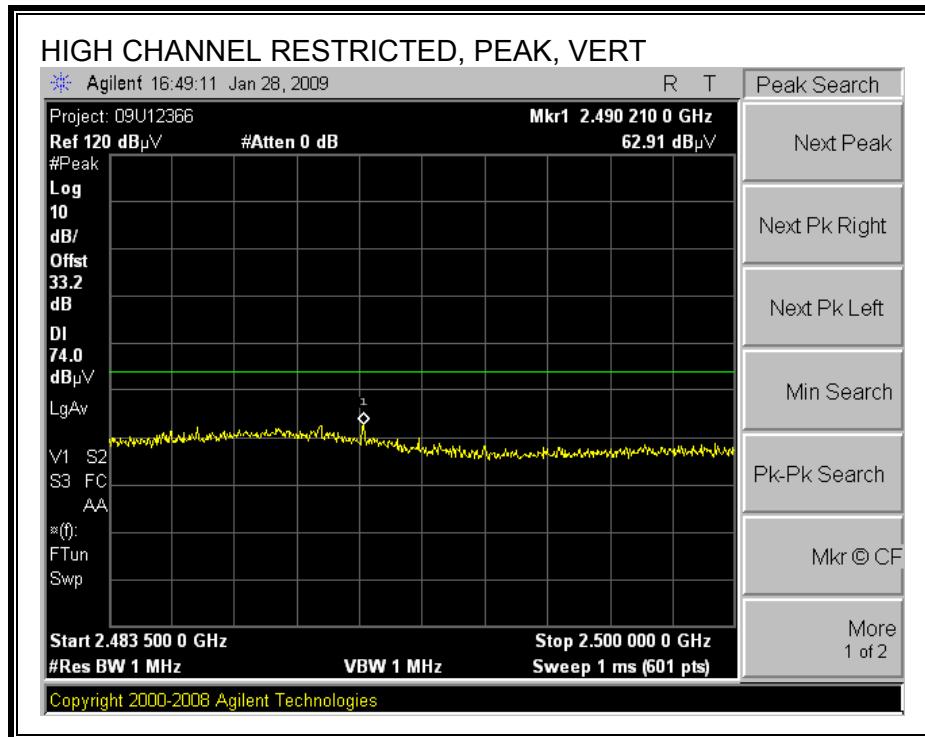


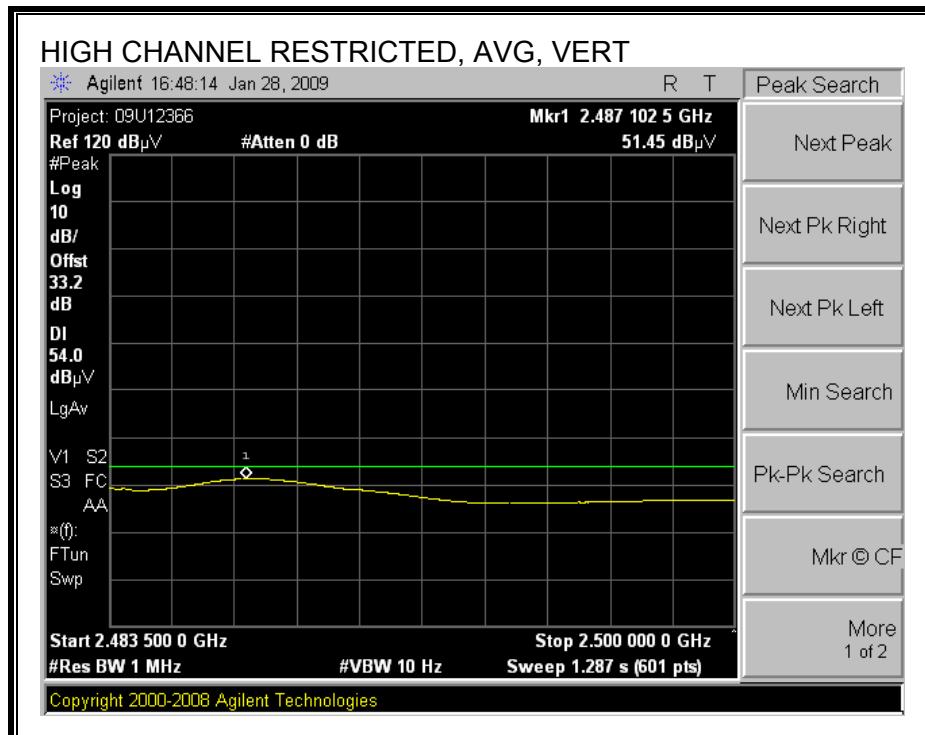
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





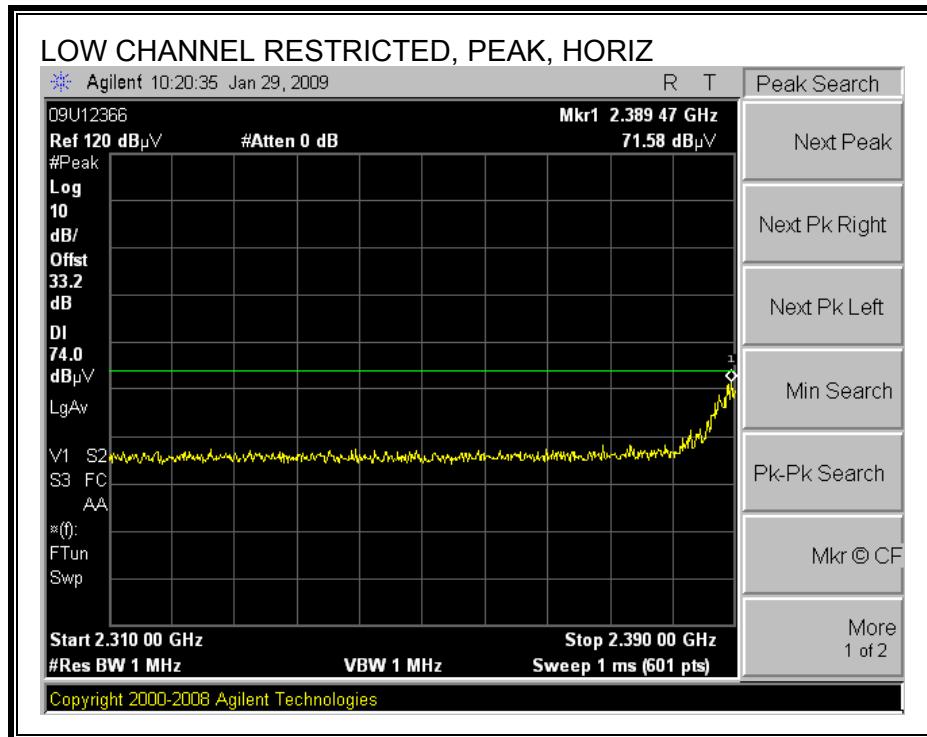
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

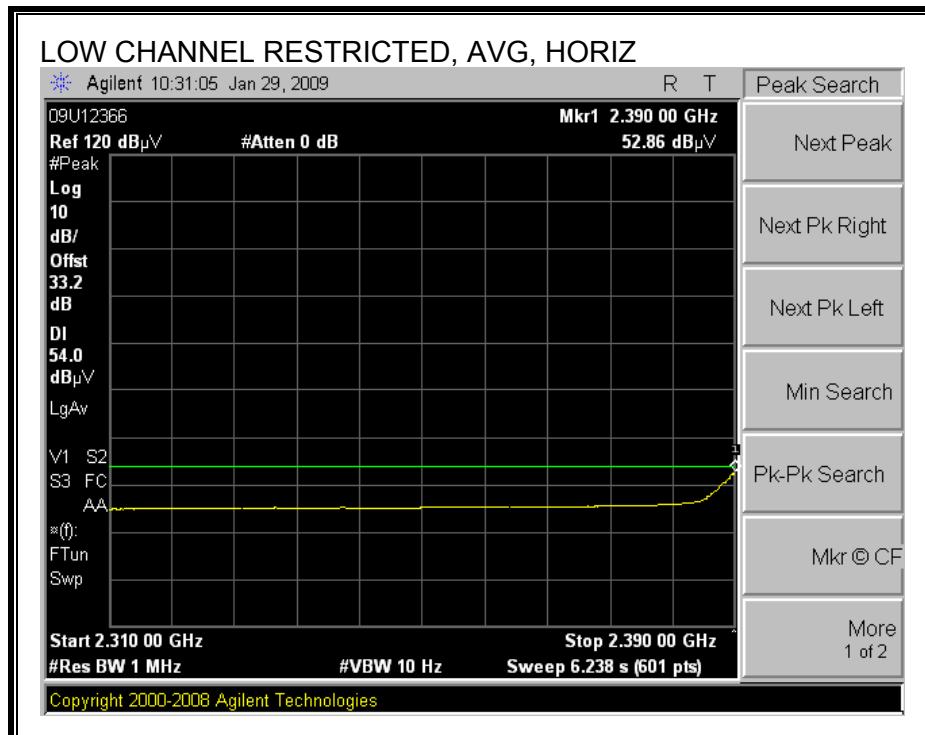




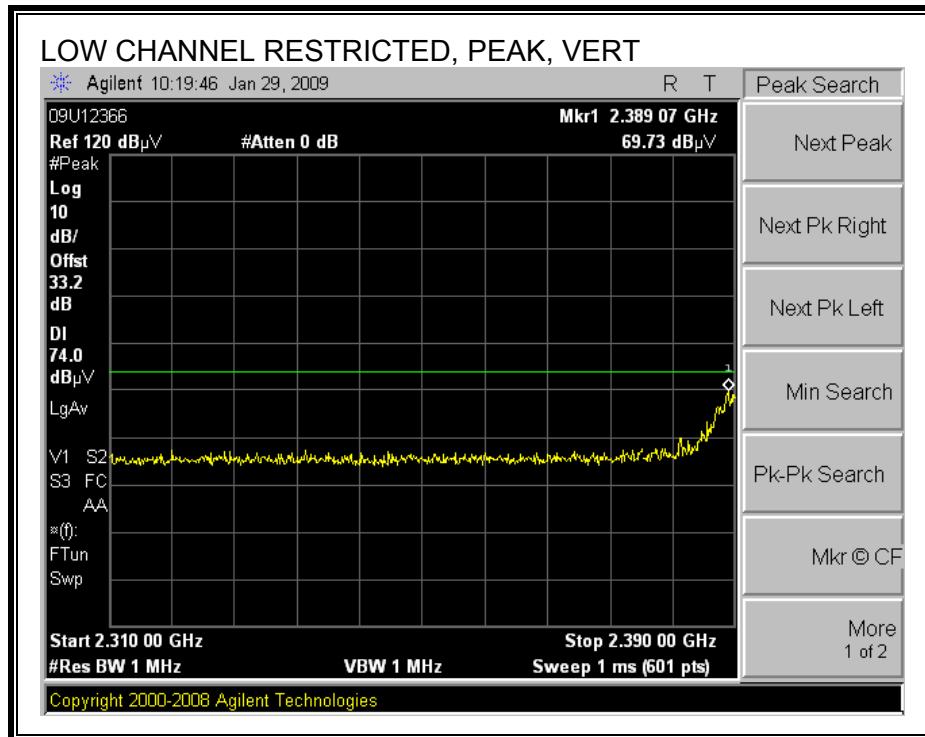
## MODE 110 (HT20)

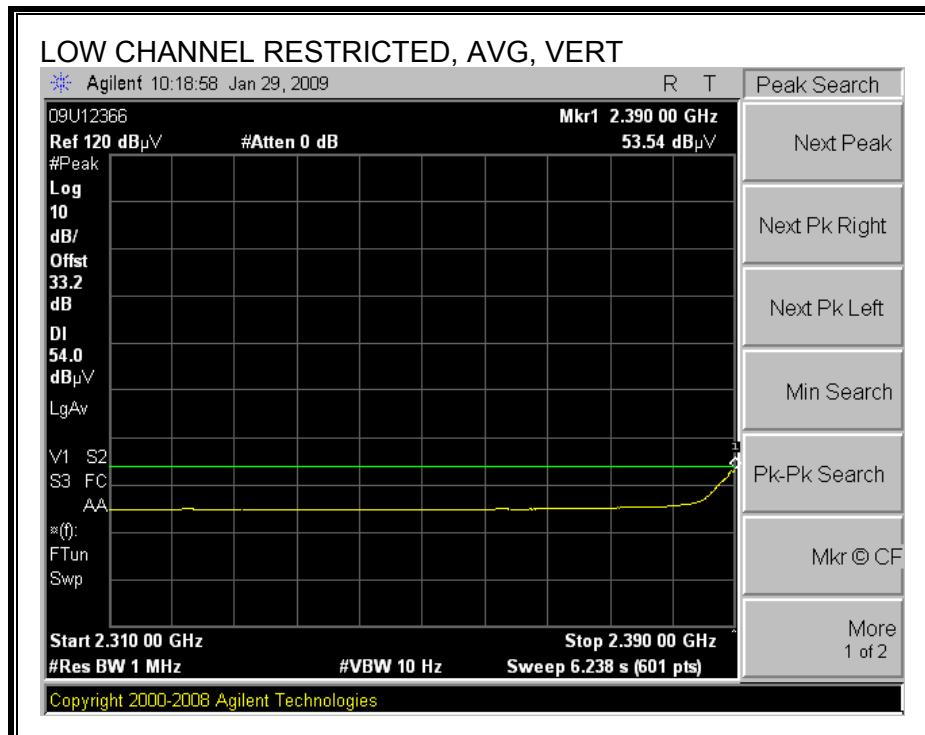
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



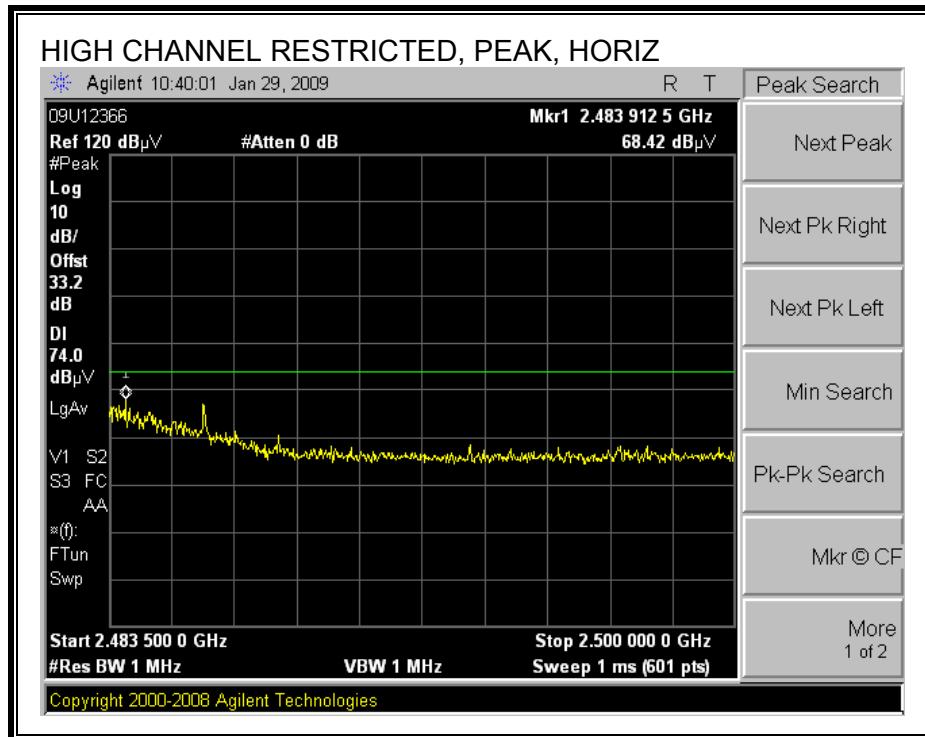


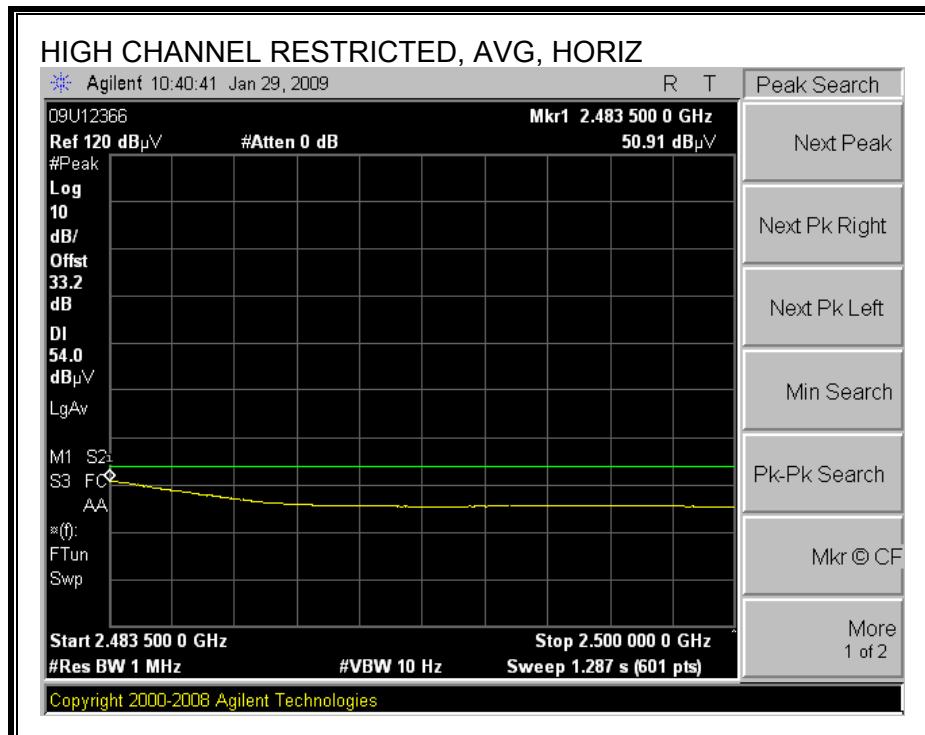
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



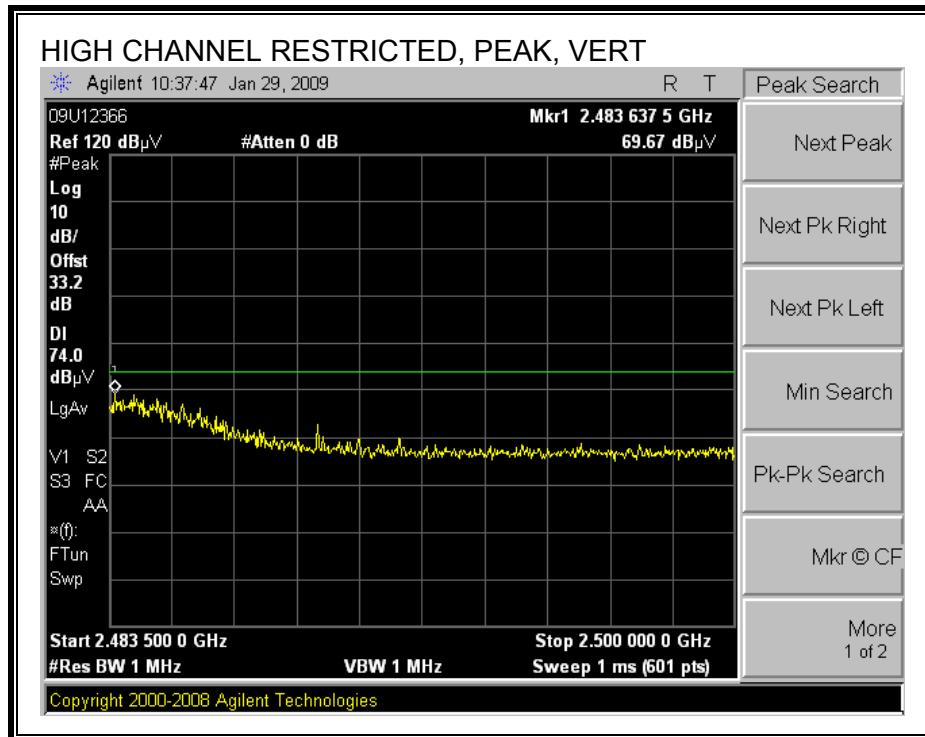


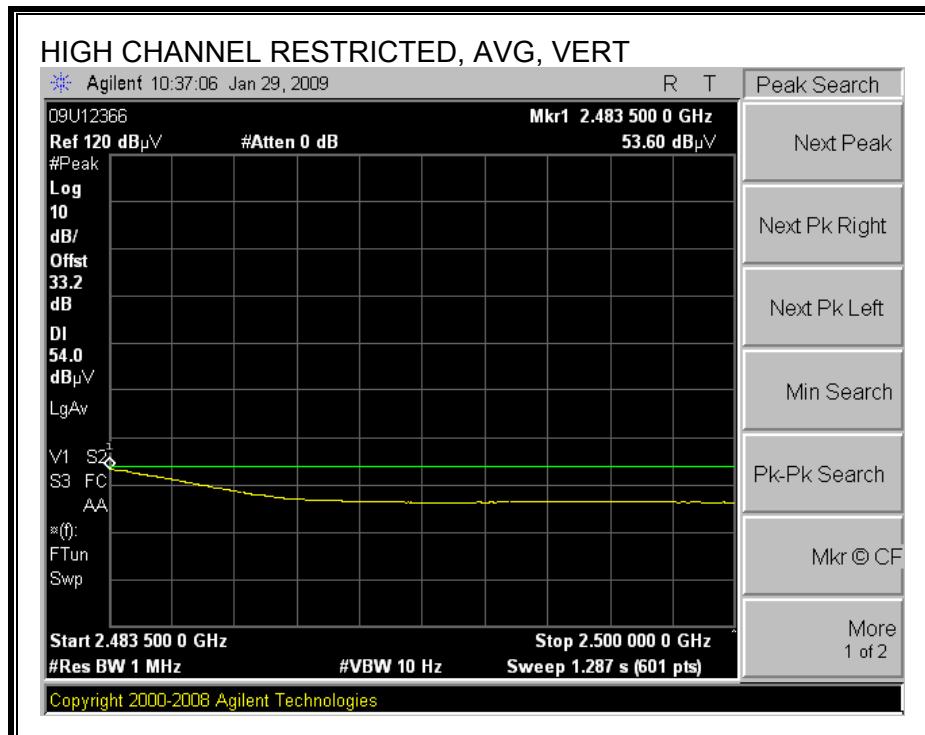
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





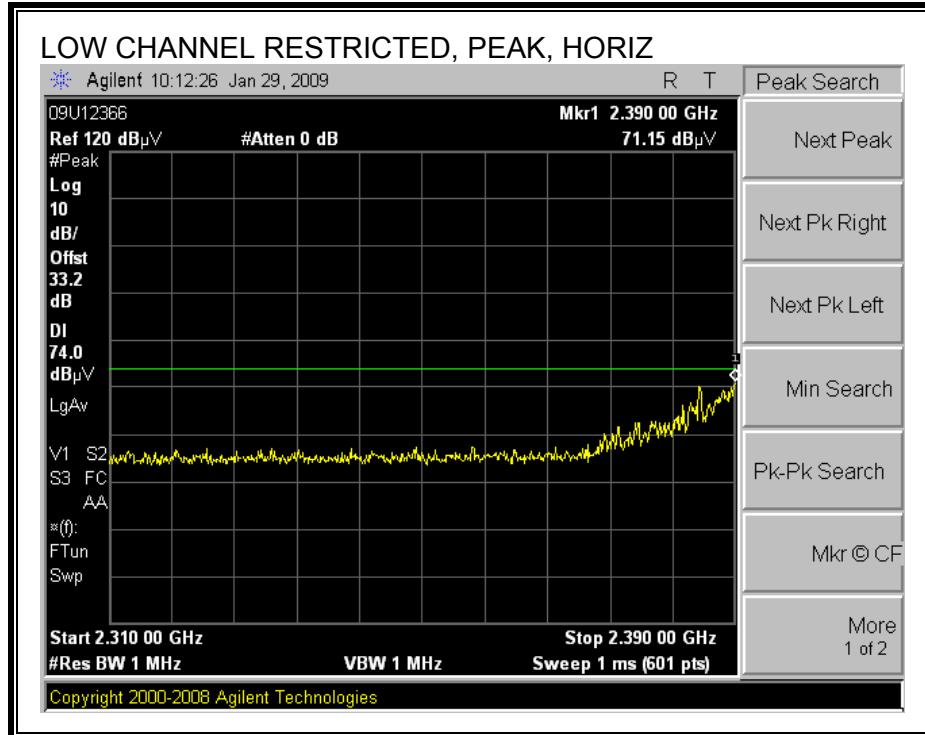
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

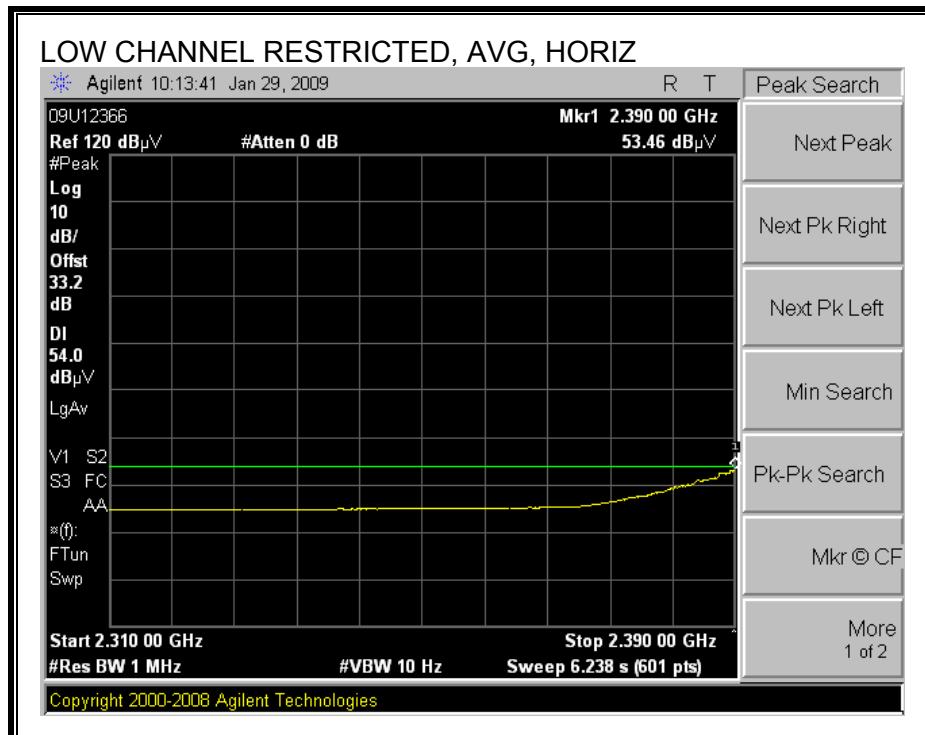




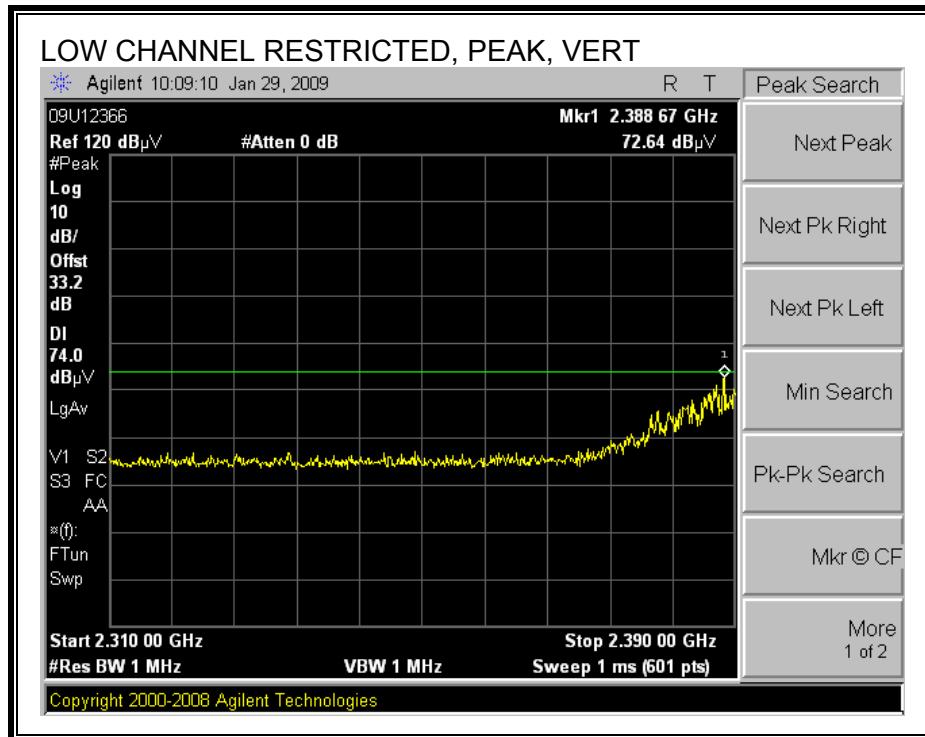
**MODE 110 (HT 40):**

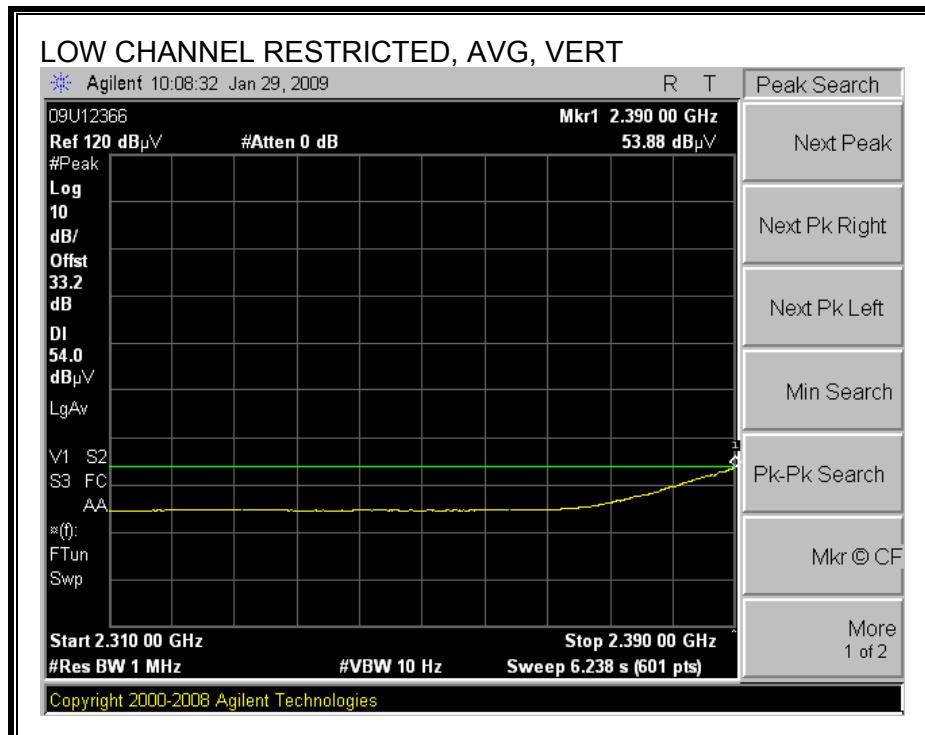
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



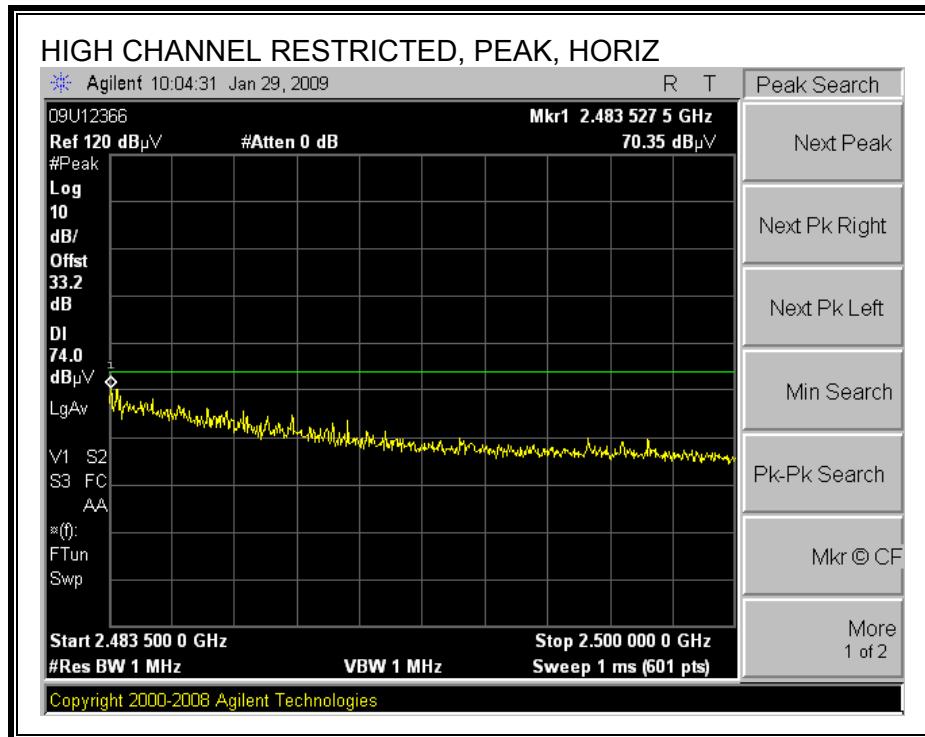


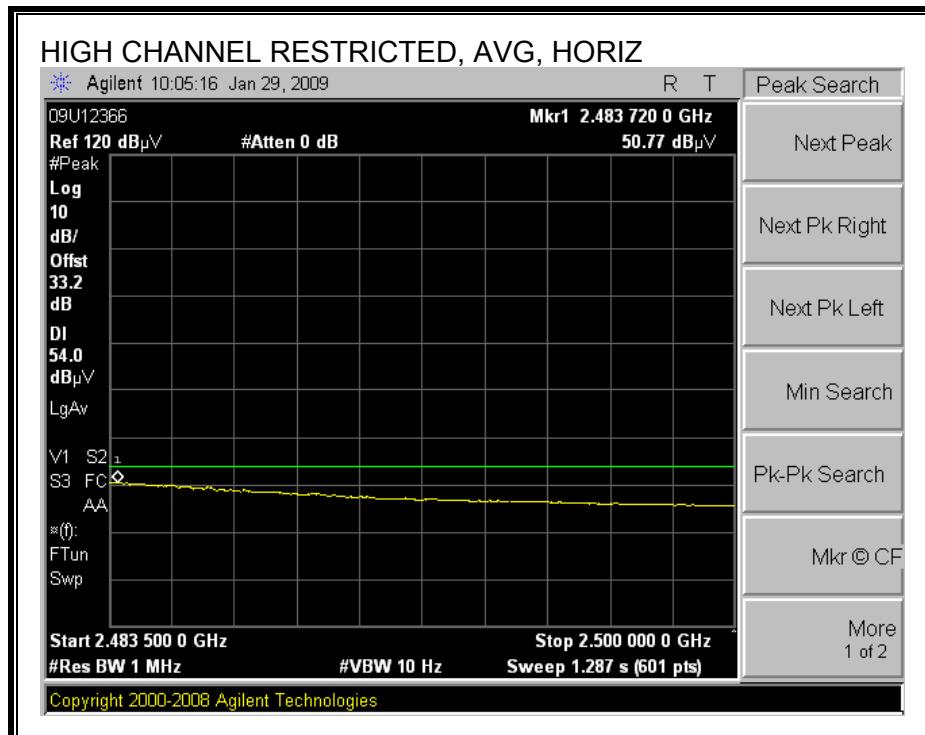
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



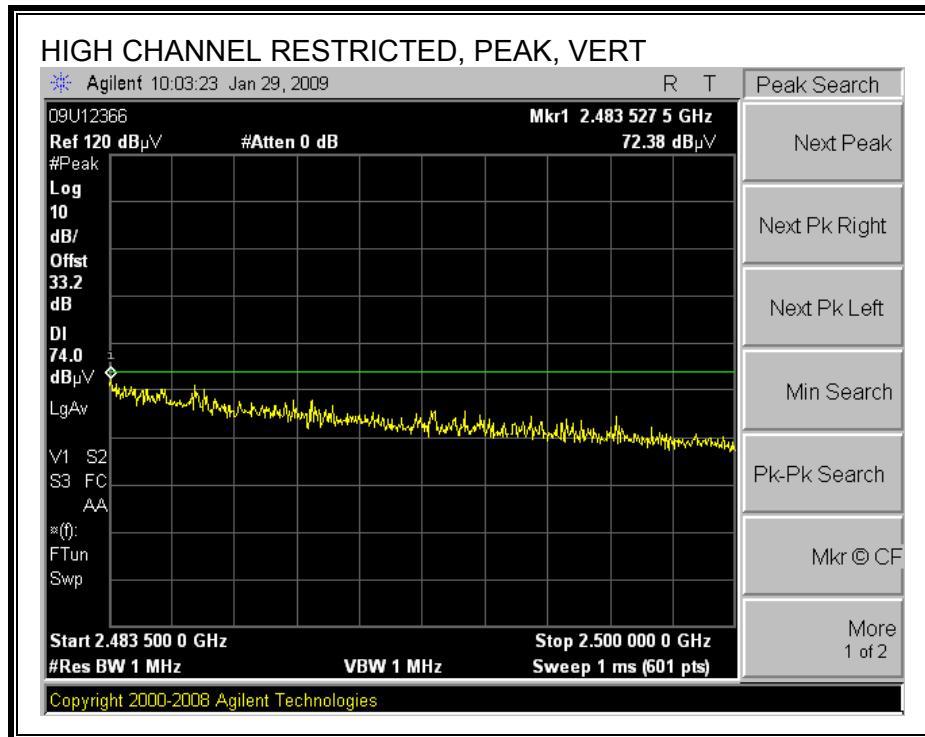


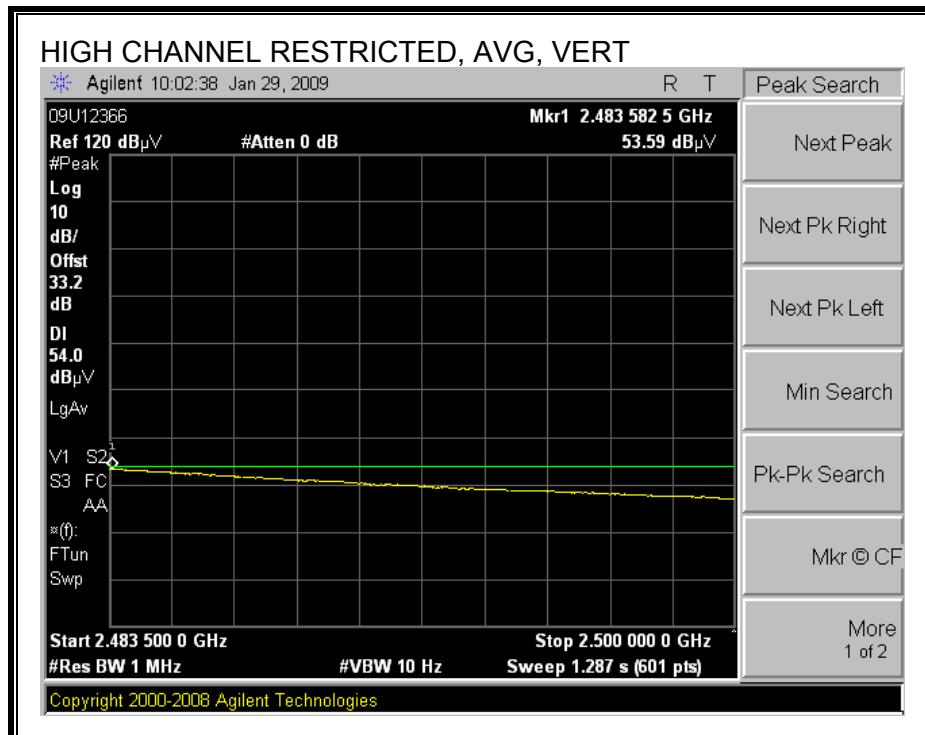
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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

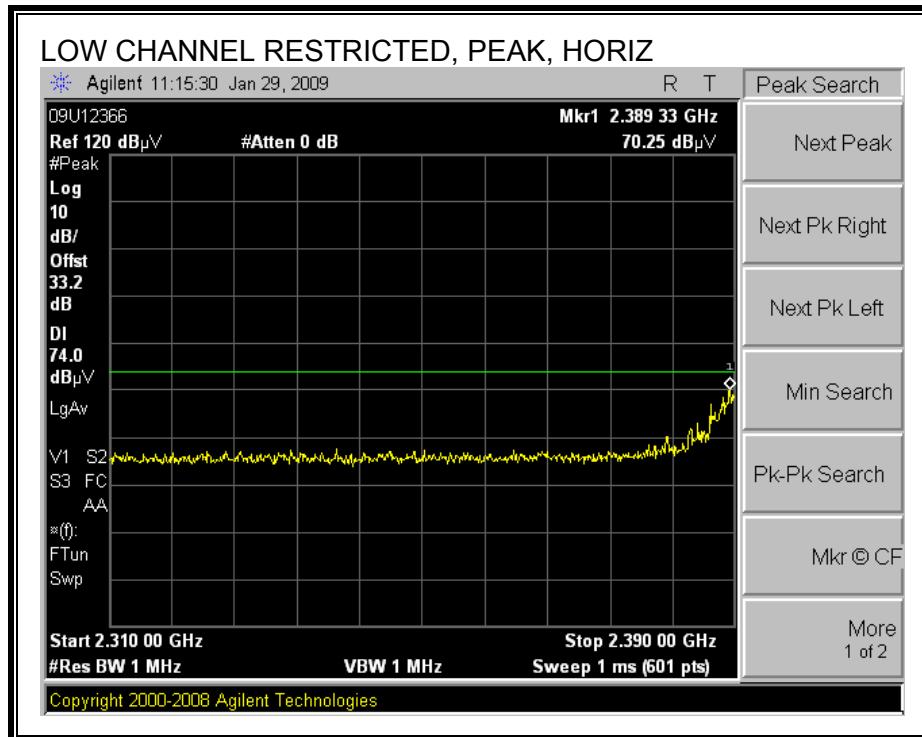


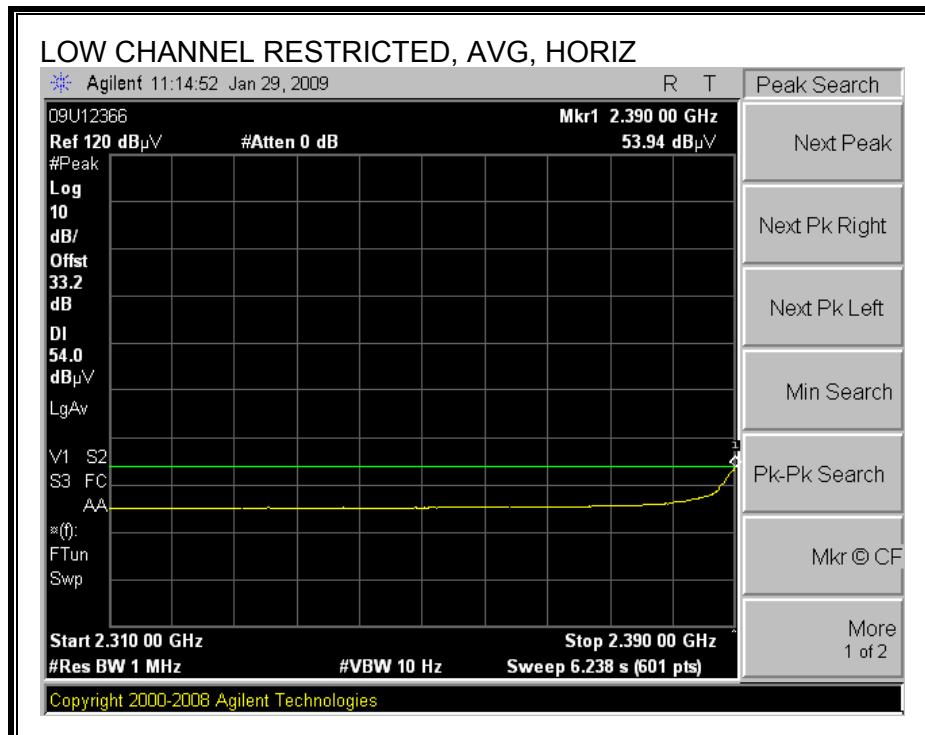


### 7.7.2. TX ABOVE 1 GHz FOR 802.11g

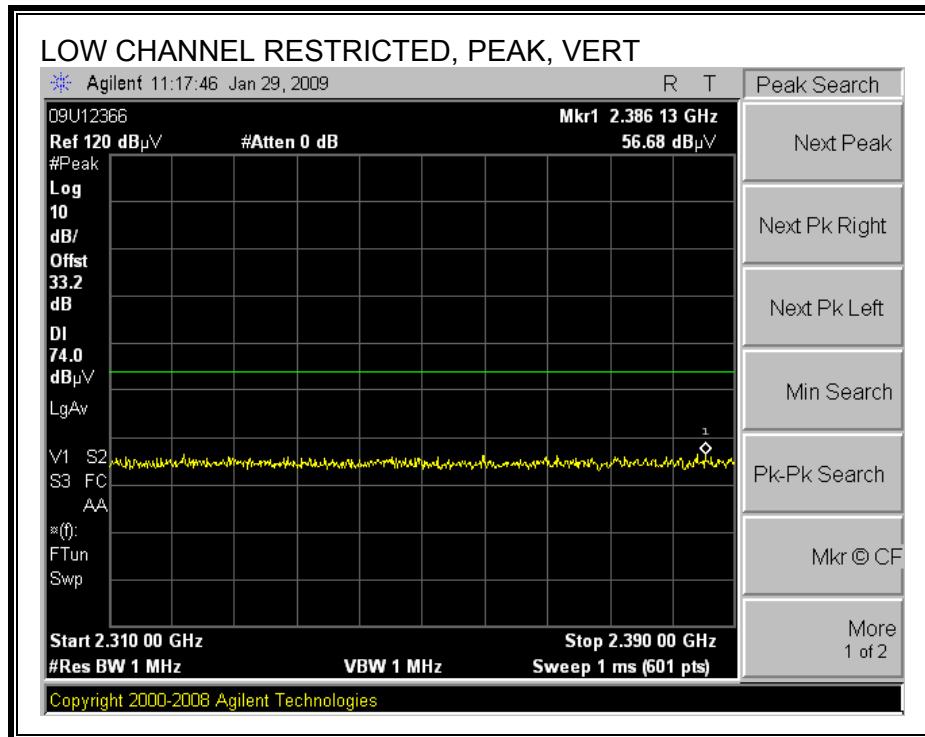
MODE 100:

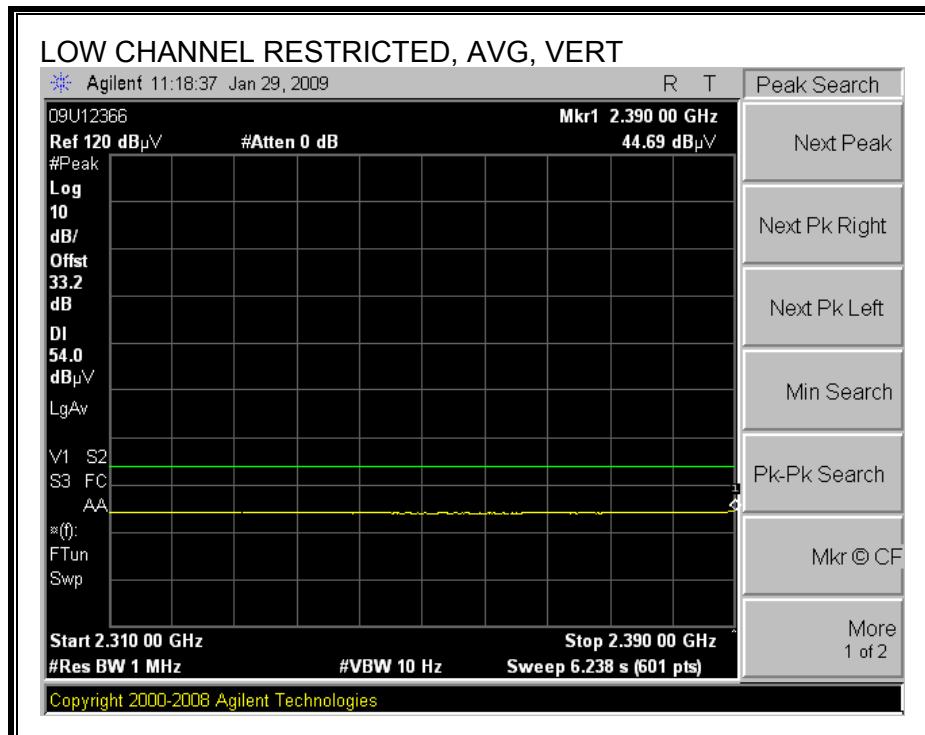
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



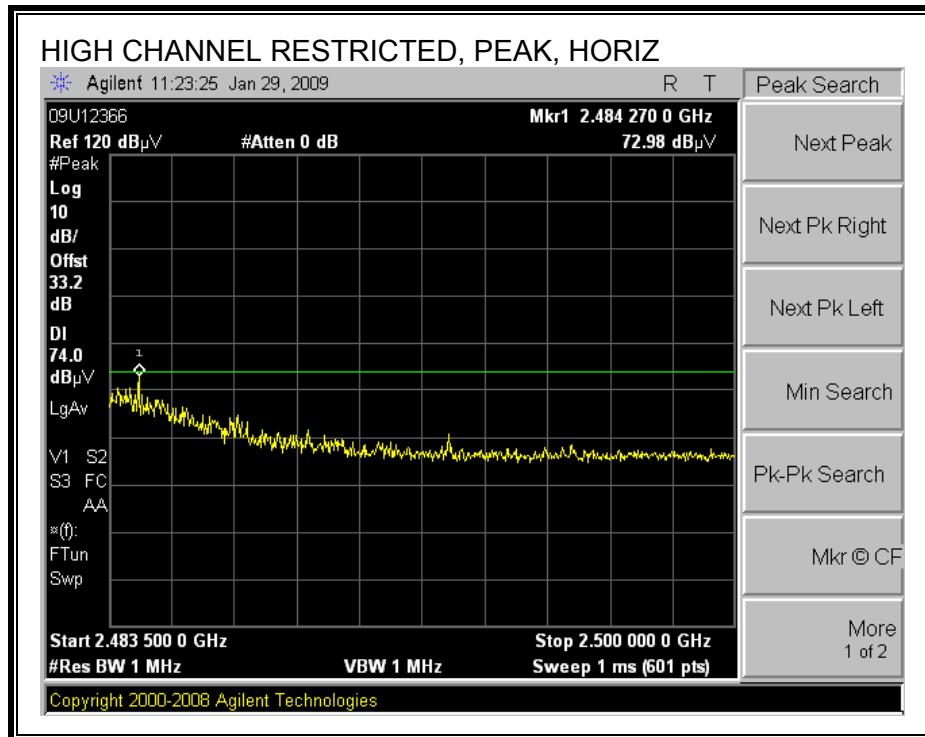


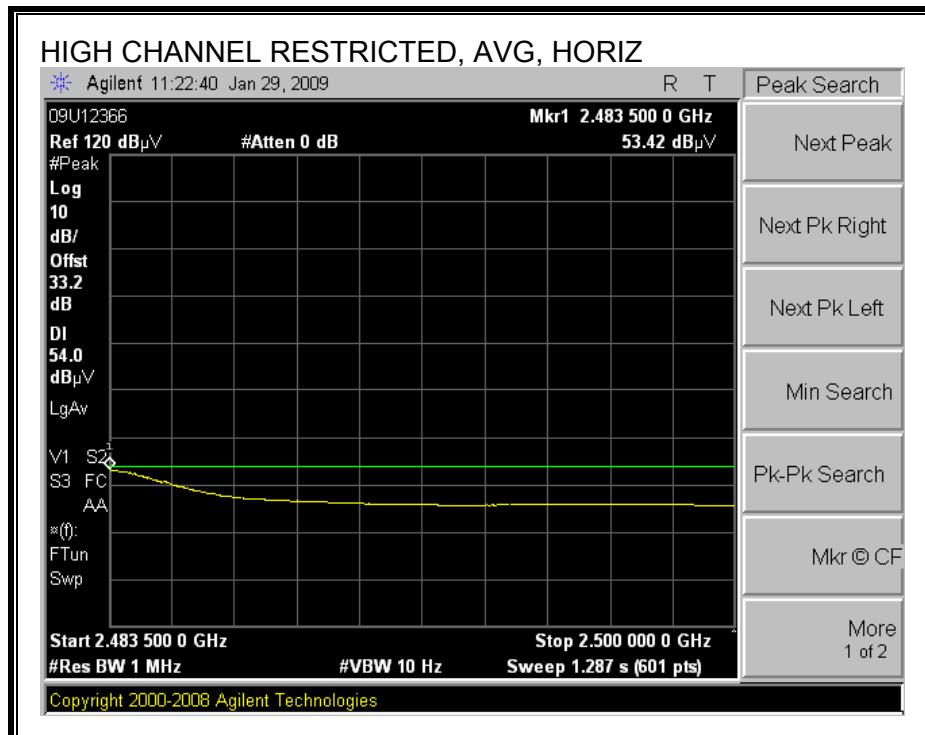
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



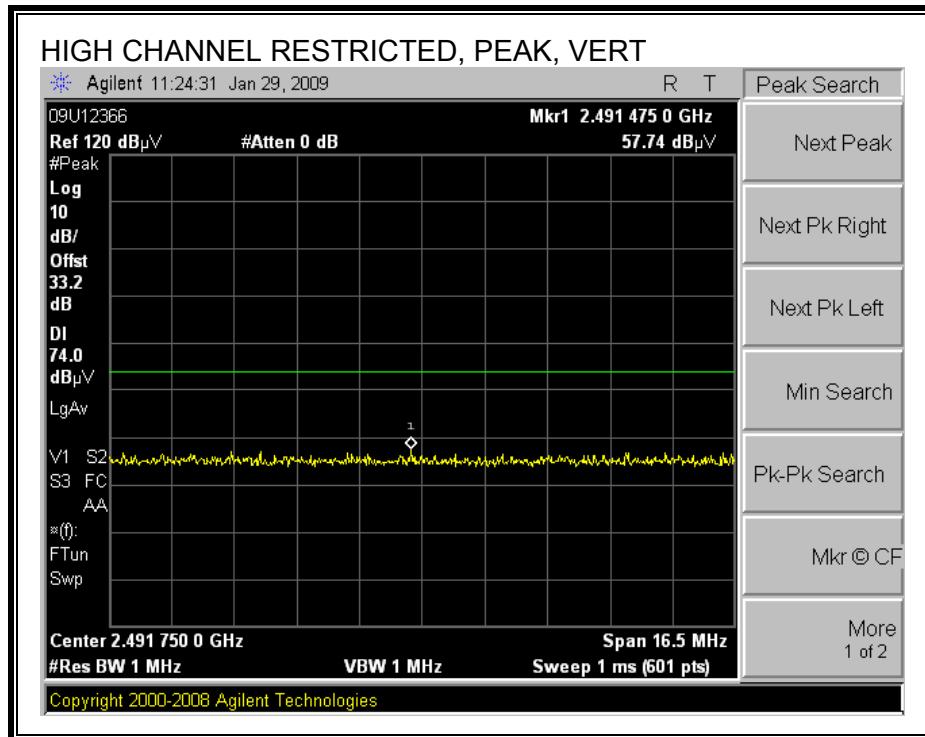


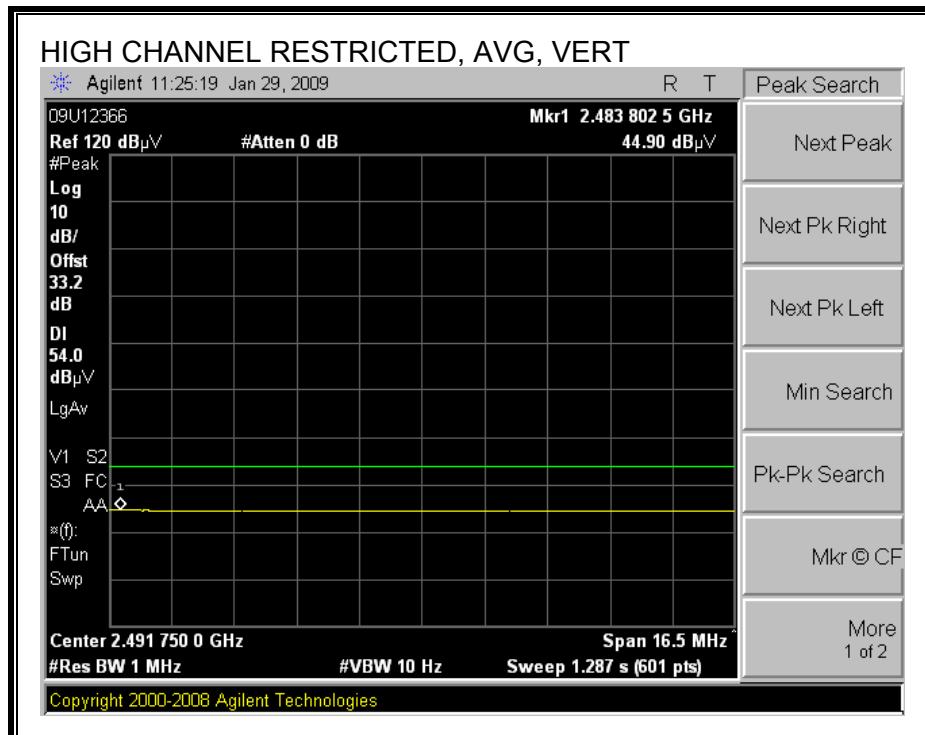
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





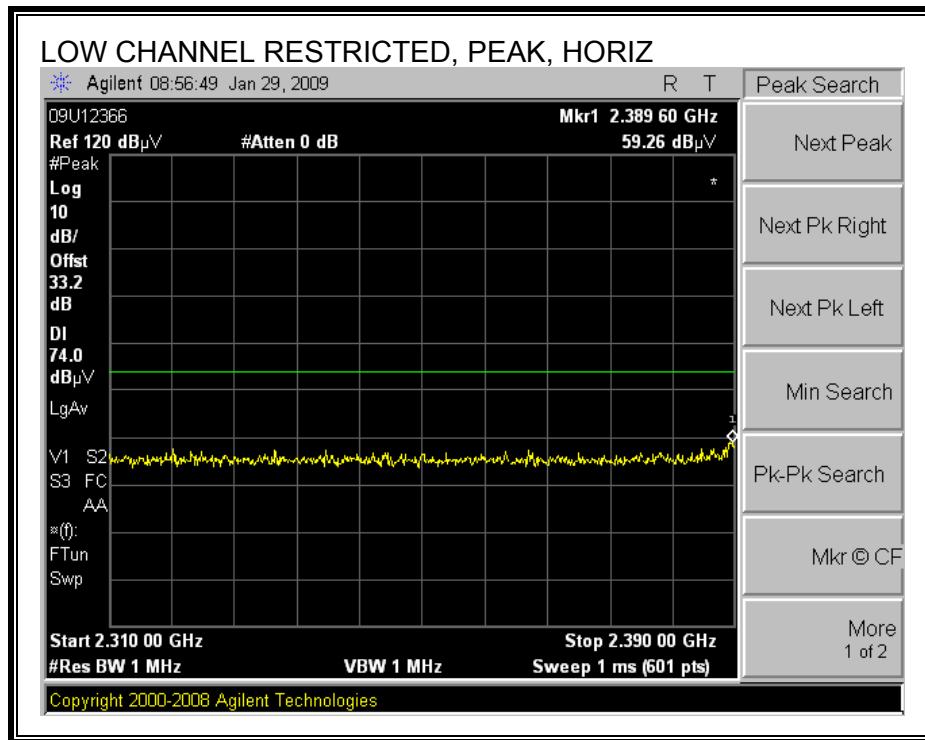
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

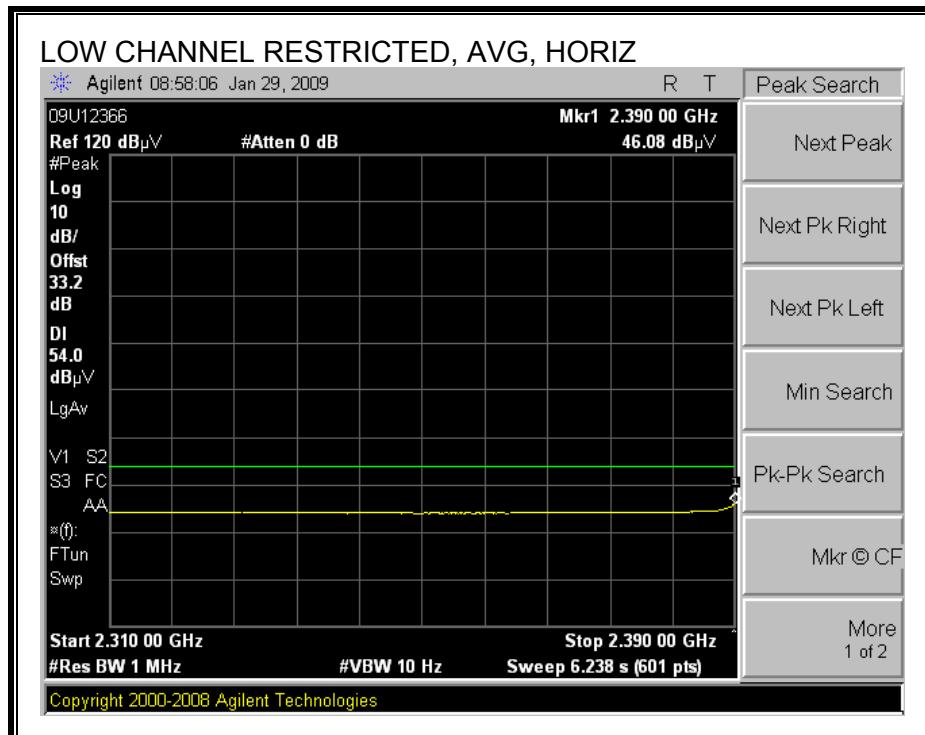




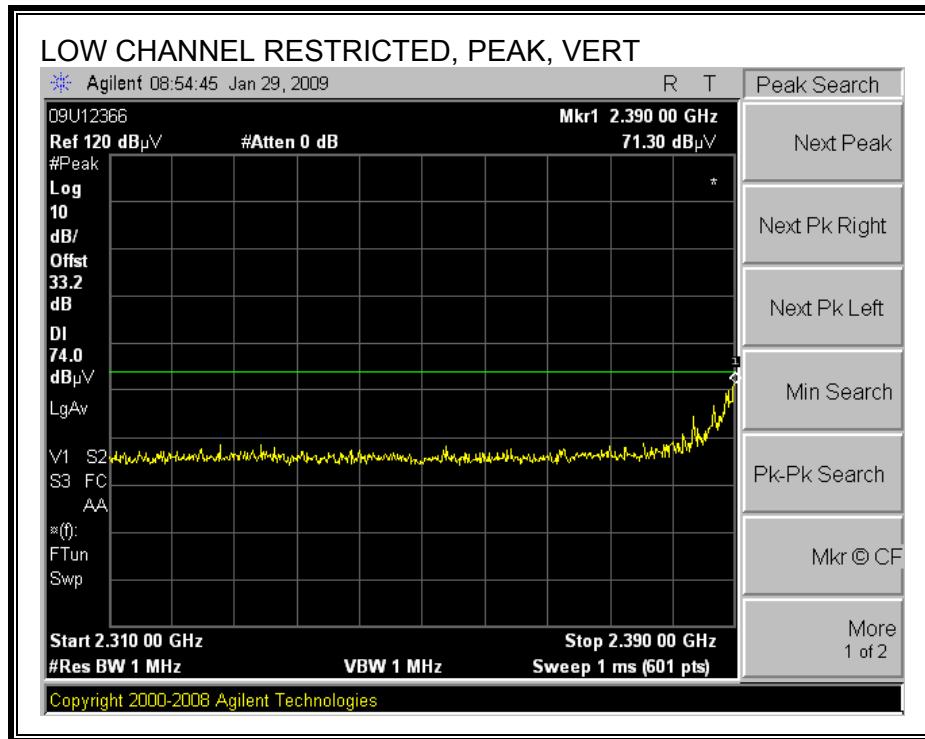
**MODE 010:**

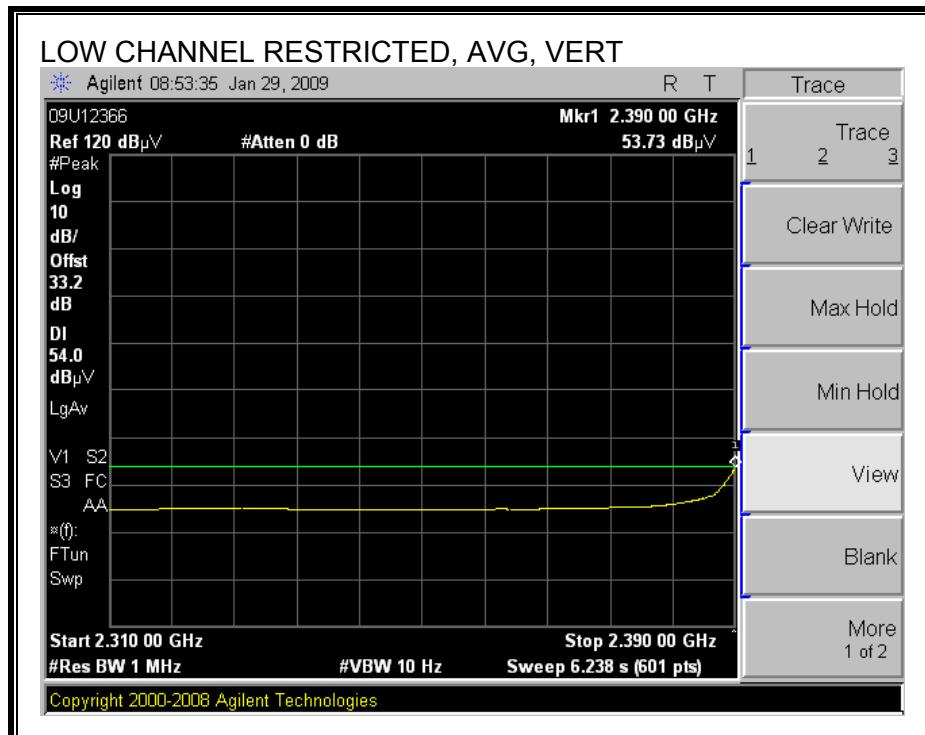
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



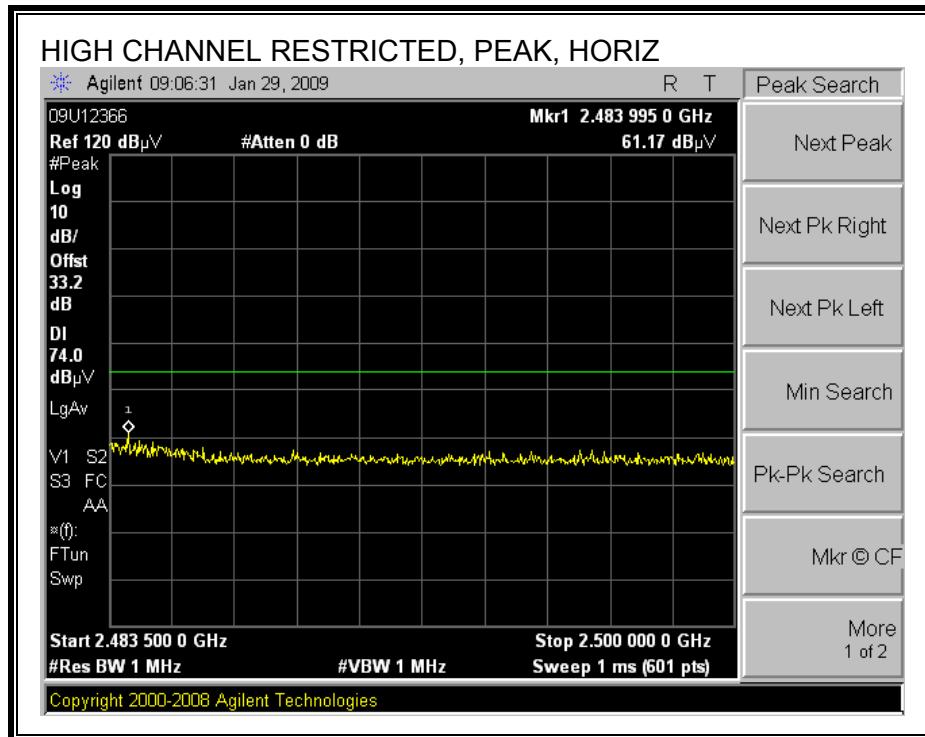


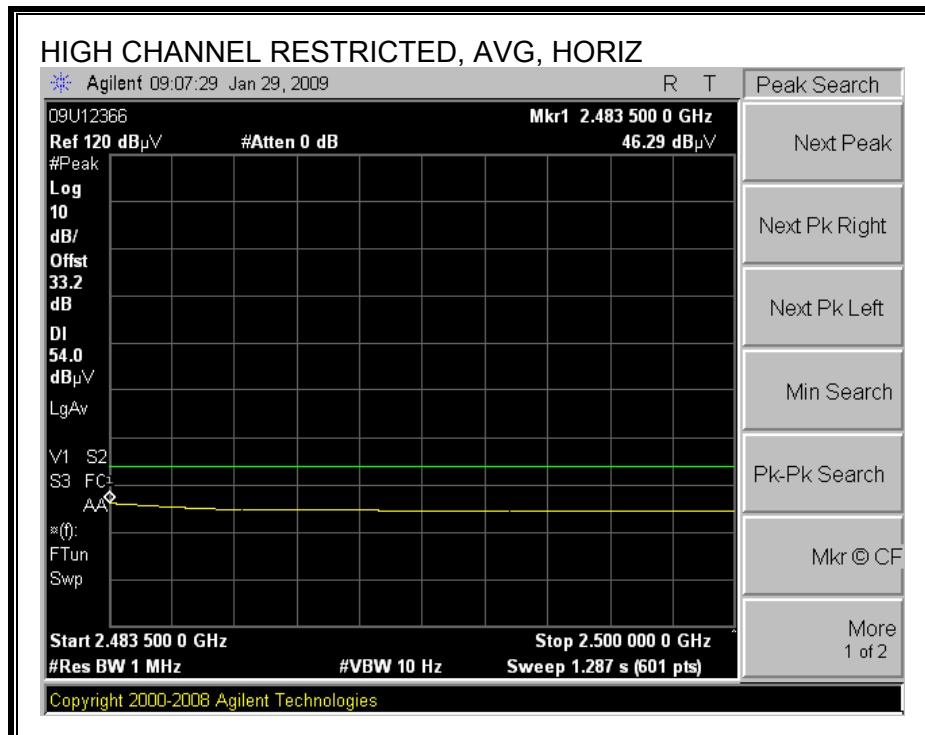
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



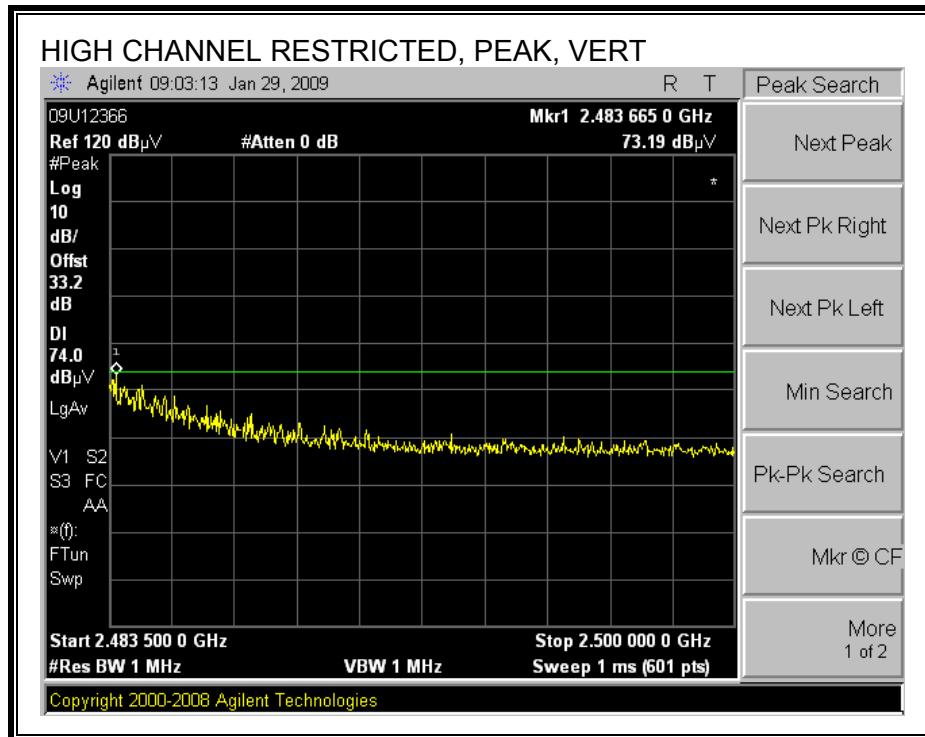


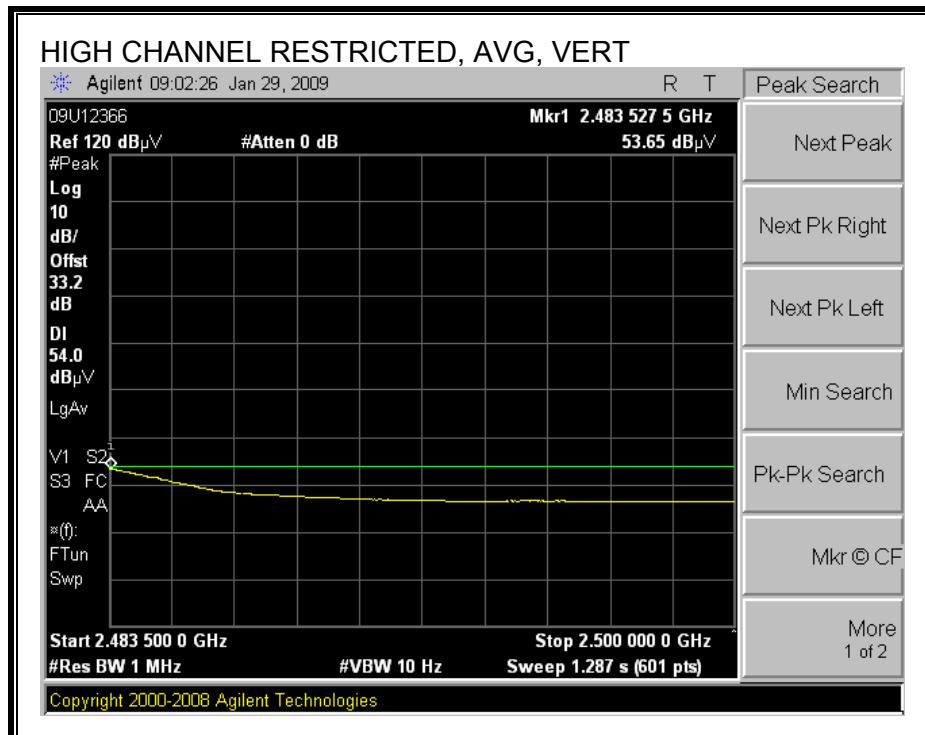
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





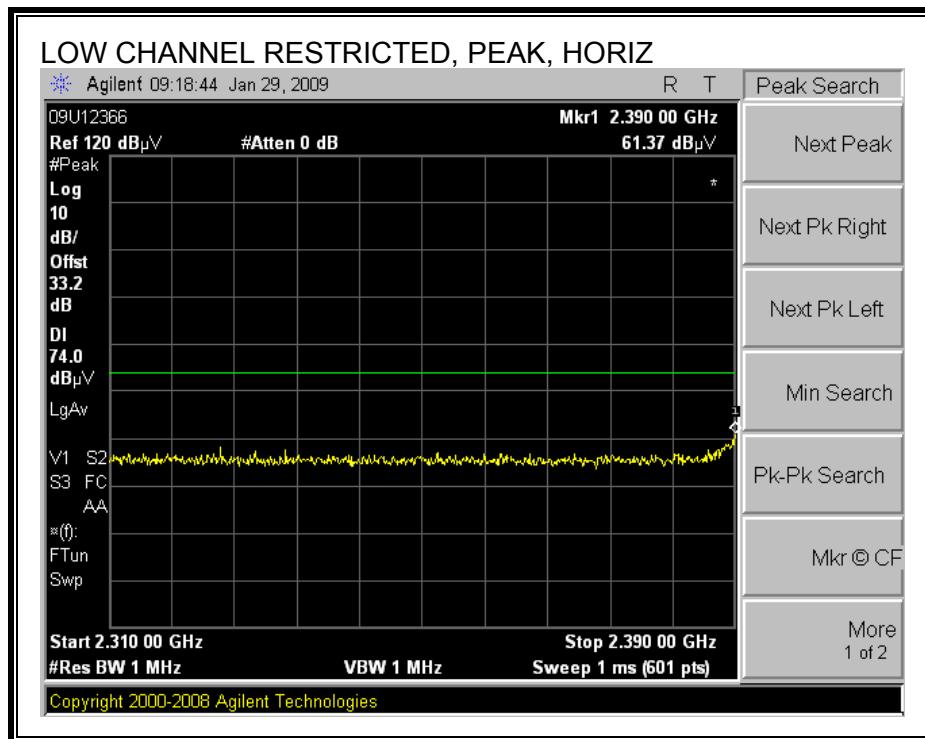
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

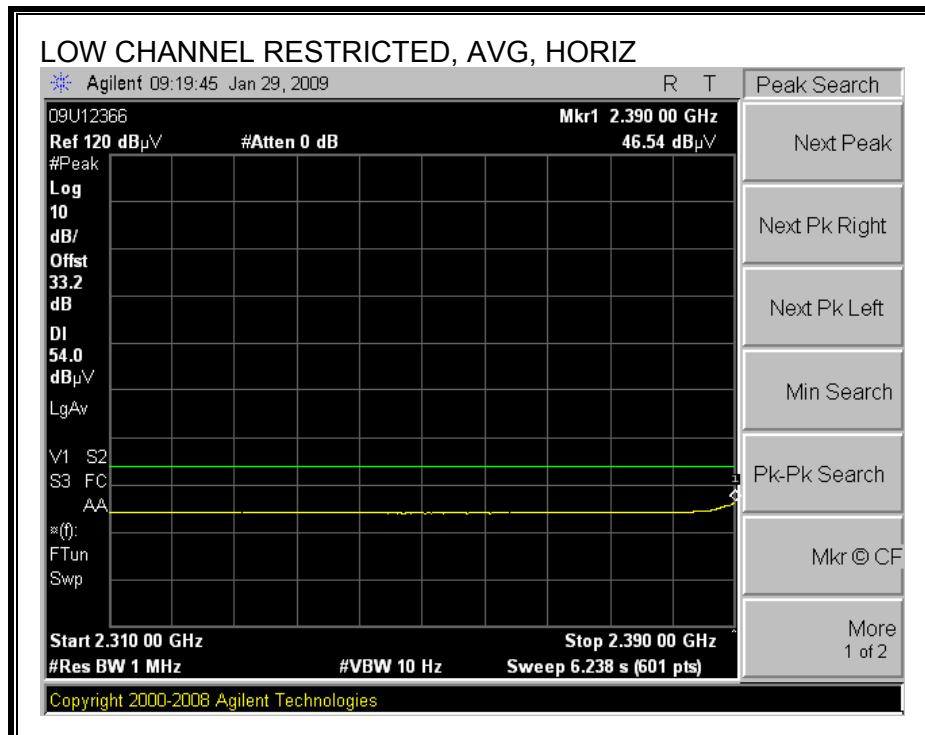




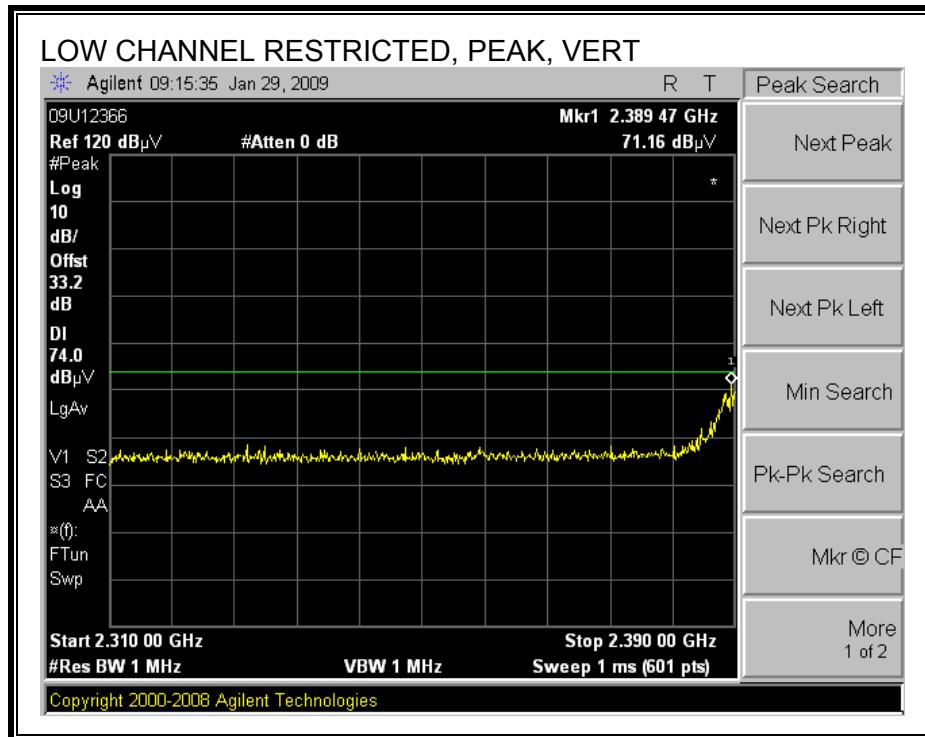
**MODE 110 (HT20):**

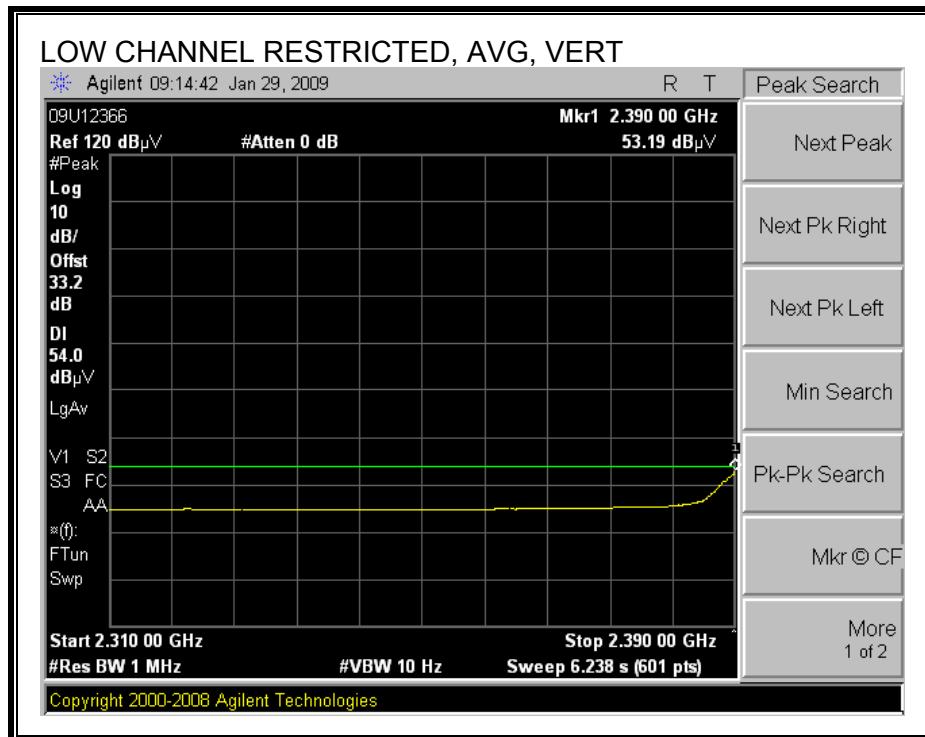
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



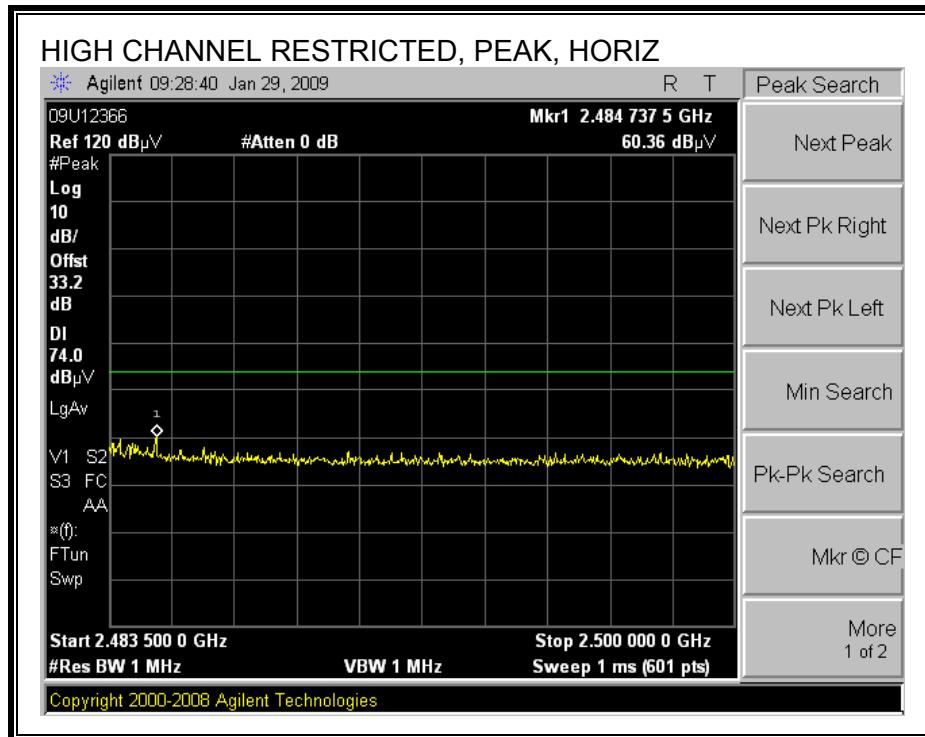


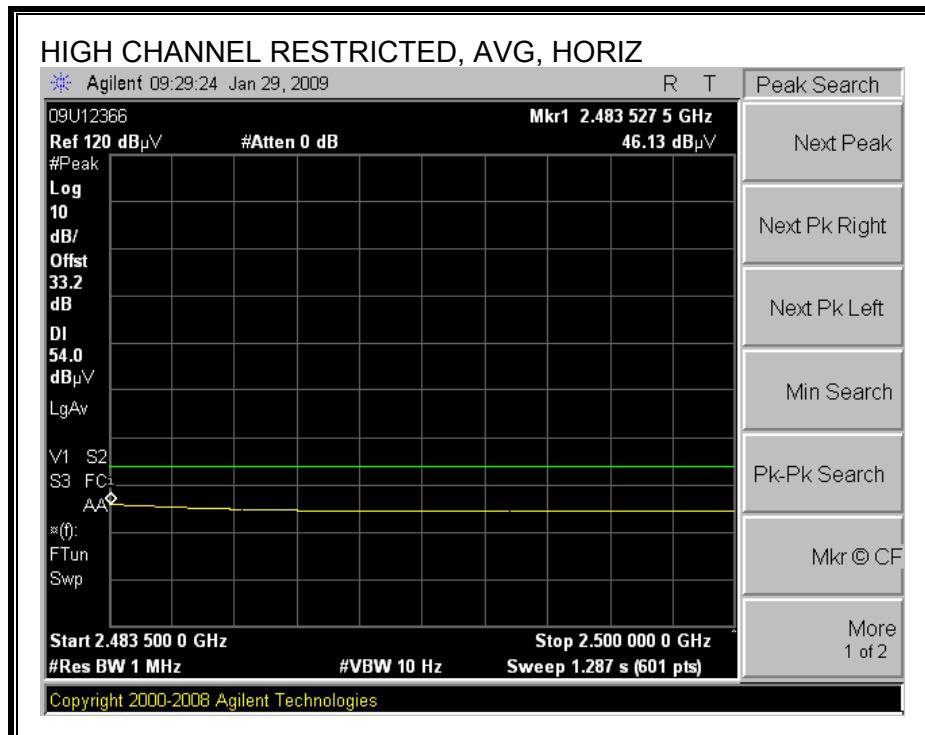
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



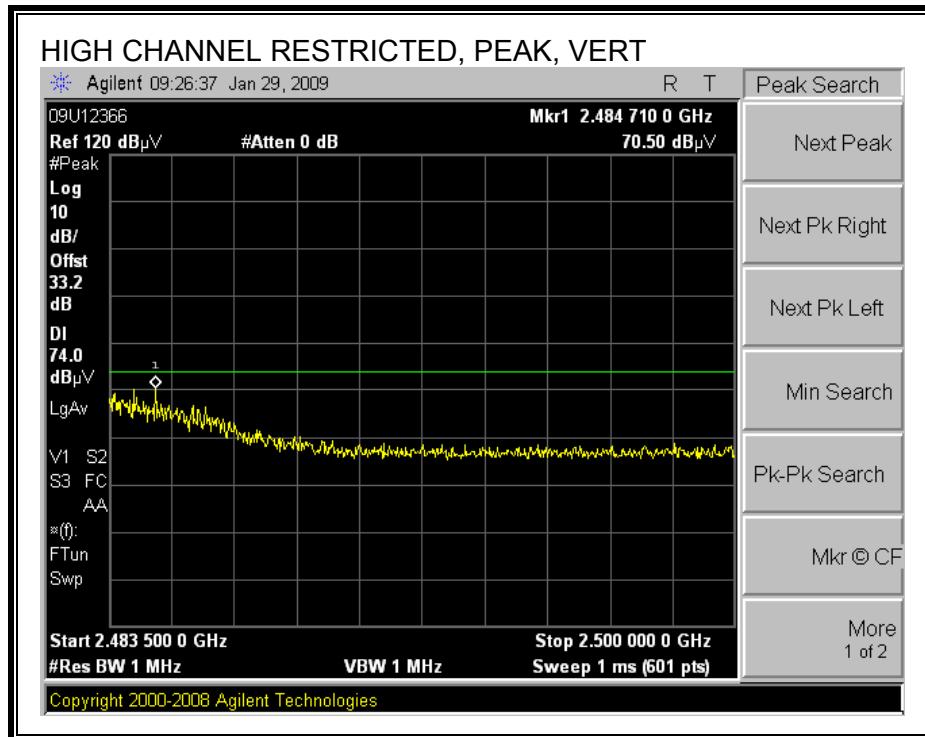


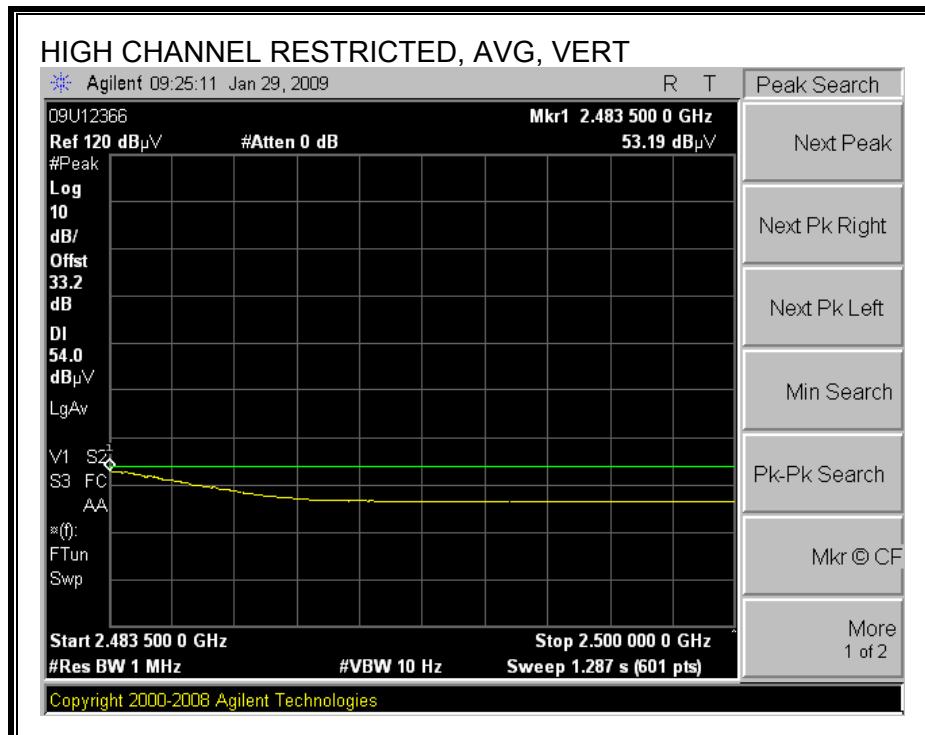
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





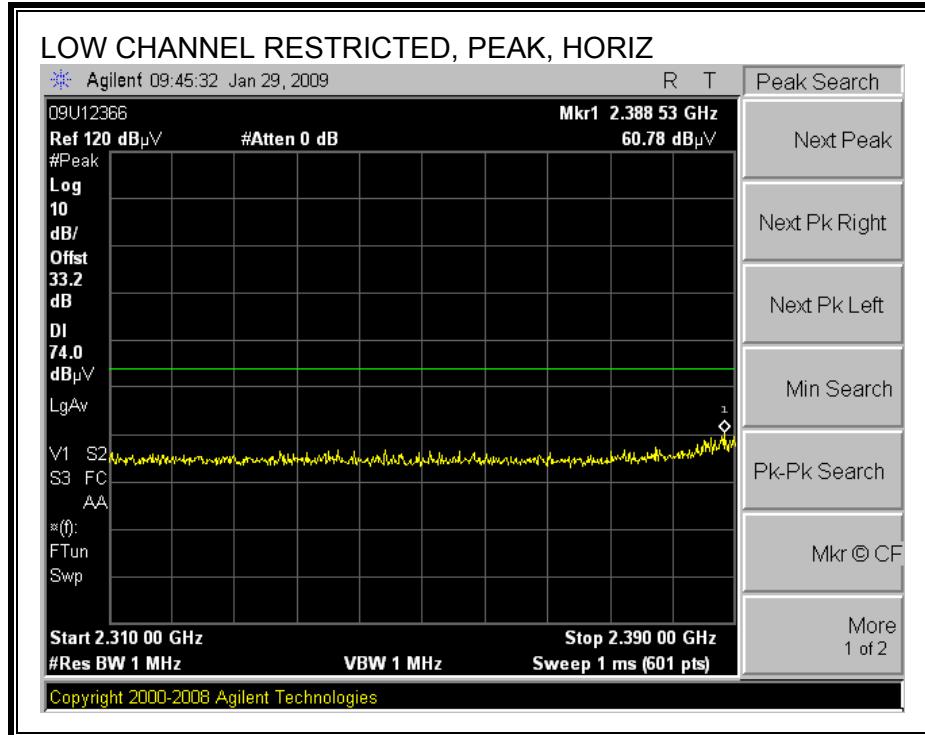
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

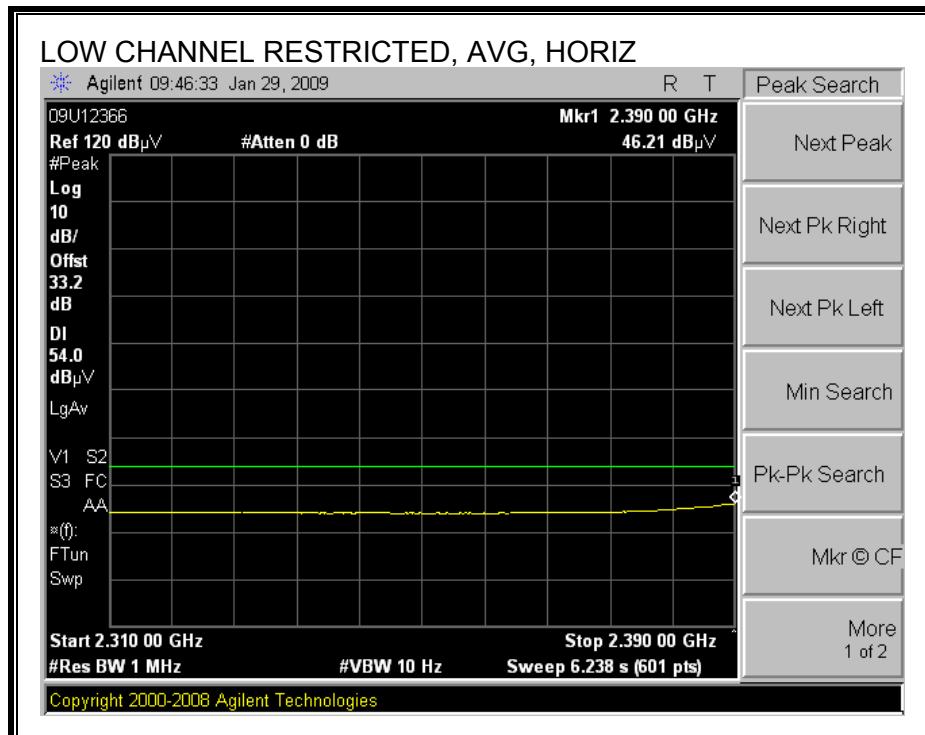




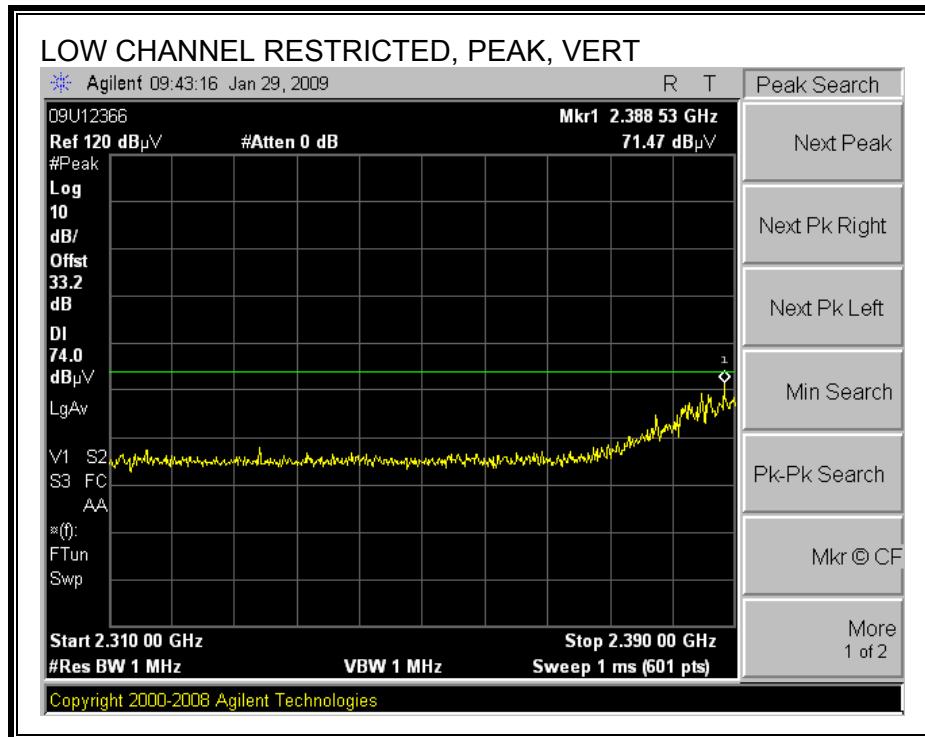
**MODE 110 (HT 40):**

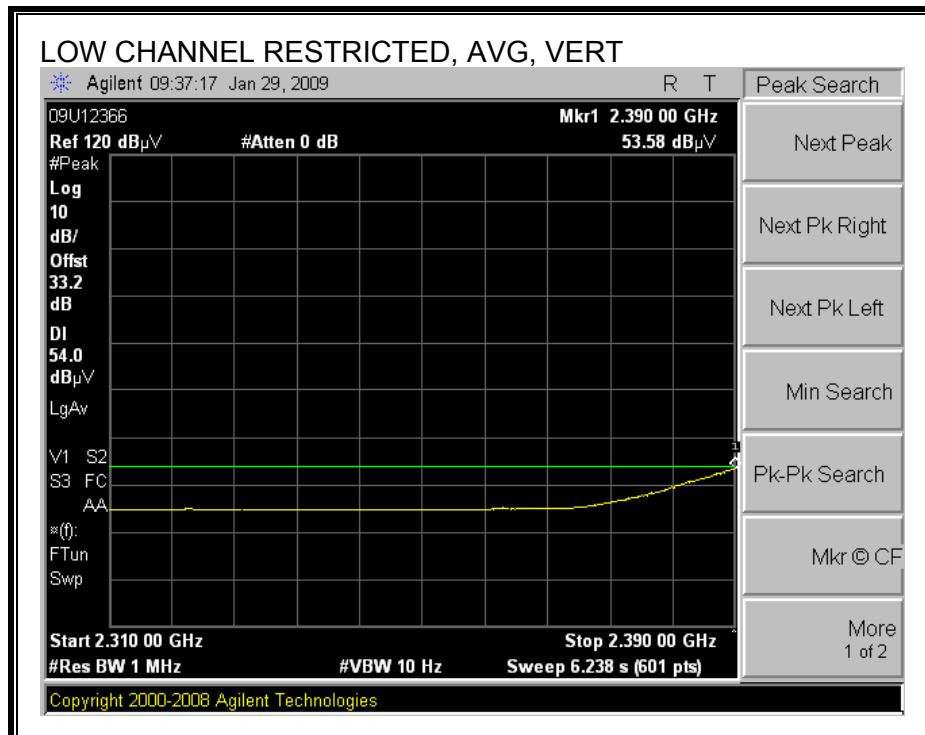
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



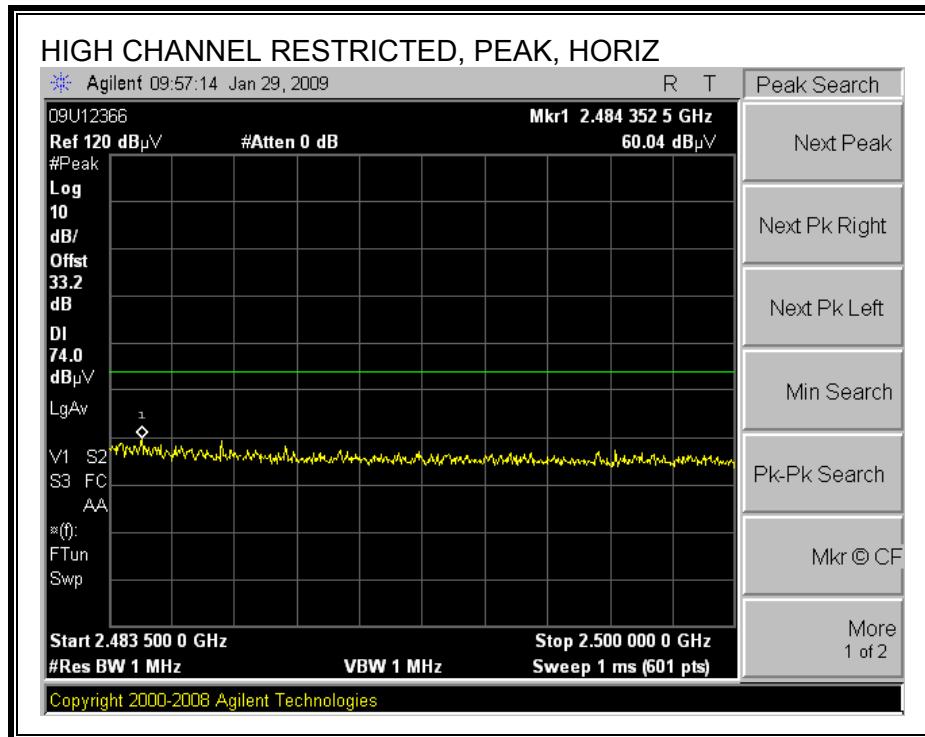


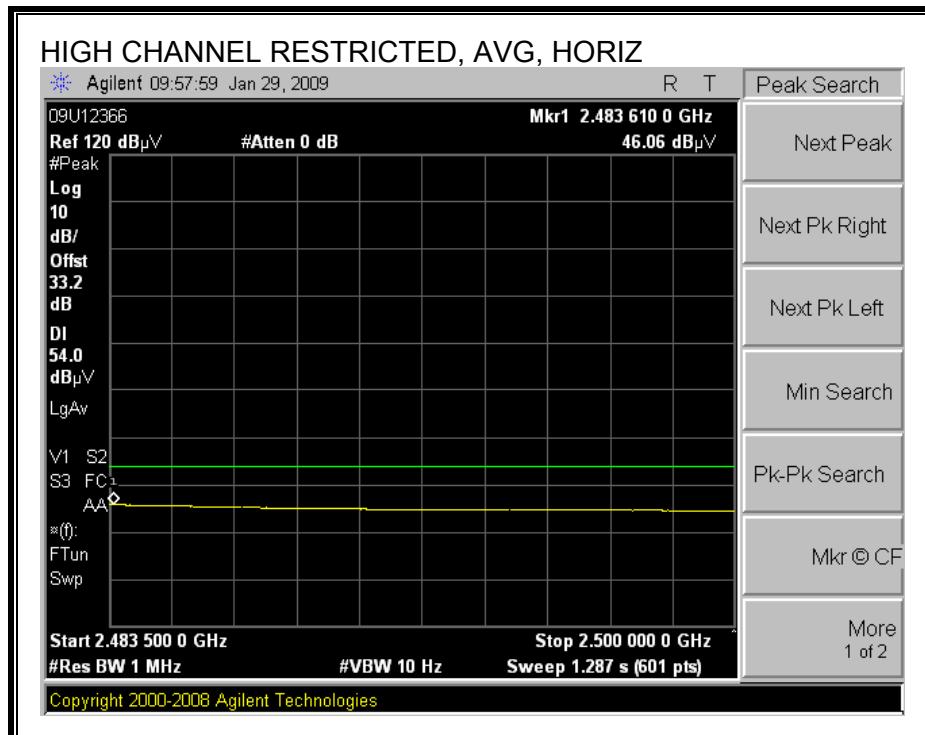
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



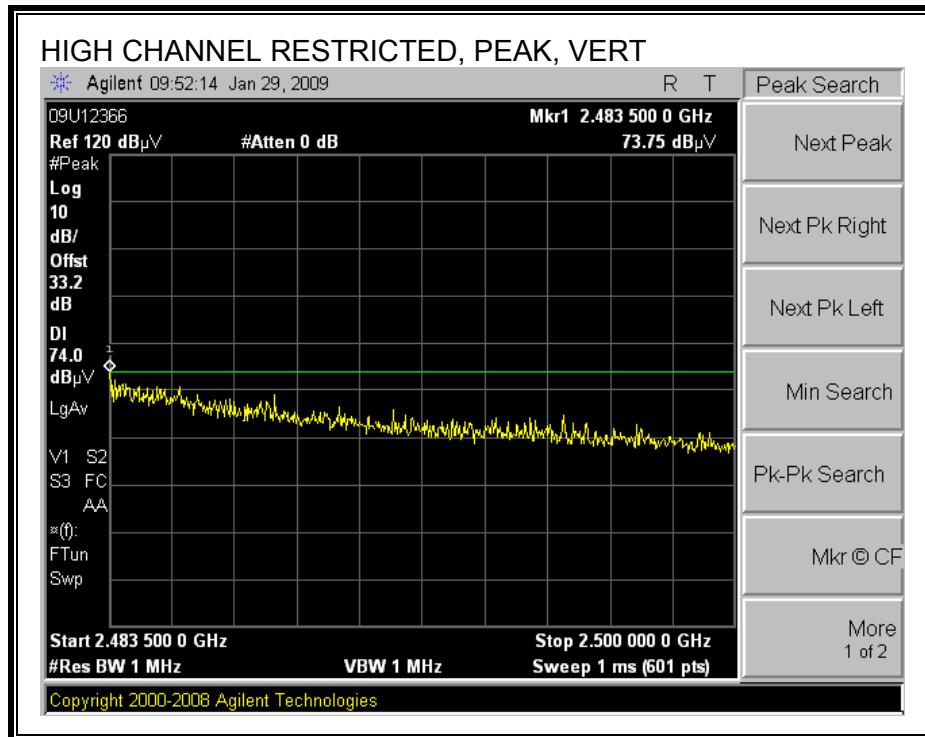


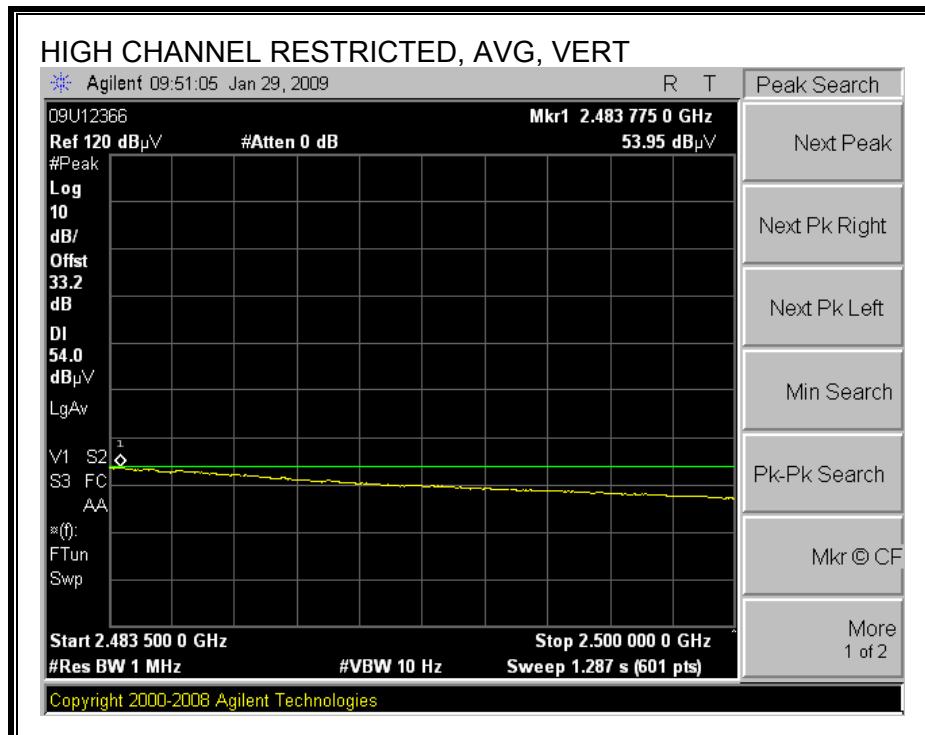
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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





## HARMONICS AND SPURIOUS EMISSIONS (11g Worst-case)

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company:	Meraki Inc.														
Project #:	09U12366														
Date:	01/29/09														
Test Engineer:	Thanh Nguyen														
Configuration:	EUT with Dual V&H Patch 11dBi														
Mode:	Transmit Worst case g mode Art=13.5														
<u>Test Equipment:</u>															
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit			
T73; S/N: 6717 @3m	T34 HP 8449B								T125; ARA 18-26GHz; S/N:1007			FCC 15.209			
Hi Frequency Cables															
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements
3' cable 22807700	12' cable 22807600		20' cable 22807500								R_001			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)
<u>Low channel</u>															
4.824	3.0	40.4	27.9	33.7	5.8	-34.8	0.0	0.0	45.1	32.6	74	54	-28.9	-21.4	V
7.236	3.0	41.2	28.7	36.2	7.2	-34.1	0.0	0.0	50.5	37.9	74	54	-23.5	-16.1	Noise floor
4.824	3.0	41.4	28.0	33.7	5.8	-34.8	0.0	0.0	46.1	32.7	74	54	-27.9	-21.3	H
7.236	3.0	40.3	28.6	36.2	7.2	-34.1	0.0	0.0	49.6	37.9	74	54	-24.4	-16.1	Noise floor
<u>Mid channel</u>															
4.874	3.0	40.9	27.9	33.8	5.8	-34.8	0.0	0.0	45.8	32.7	74	54	-28.2	-21.3	V
7.311	3.0	41.2	28.4	36.2	7.3	-34.1	0.0	0.0	50.6	37.8	74	54	-23.4	-16.2	Noise floor
4.874	3.0	41.3	28.0	33.8	5.8	-34.8	0.0	0.0	46.1	32.8	74	54	-27.9	-21.2	H
7.311	3.0	41.3	28.4	36.2	7.3	-34.1	0.0	0.0	50.7	37.8	74	54	-23.3	-16.2	Noise floor
<u>High channel</u>															
4.924	3.0	40.6	28.1	33.9	5.9	-34.8	0.0	0.0	45.5	33.1	74	54	-28.5	-20.9	V
7.386	3.0	42.2	28.9	36.3	7.3	-34.1	0.0	0.0	51.7	38.4	74	54	-22.3	-15.6	Noise floor
4.924	3.0	40.2	27.9	33.9	5.9	-34.8	0.0	0.0	45.1	32.9	74	54	-28.9	-21.1	H
7.386	3.0	41.9	28.9	36.3	7.3	-34.1	0.0	0.0	51.4	38.4	74	54	-22.6	-15.6	Noise floor
No other emissions were detected above noise floor.															
Rev. 10.15.08															
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											

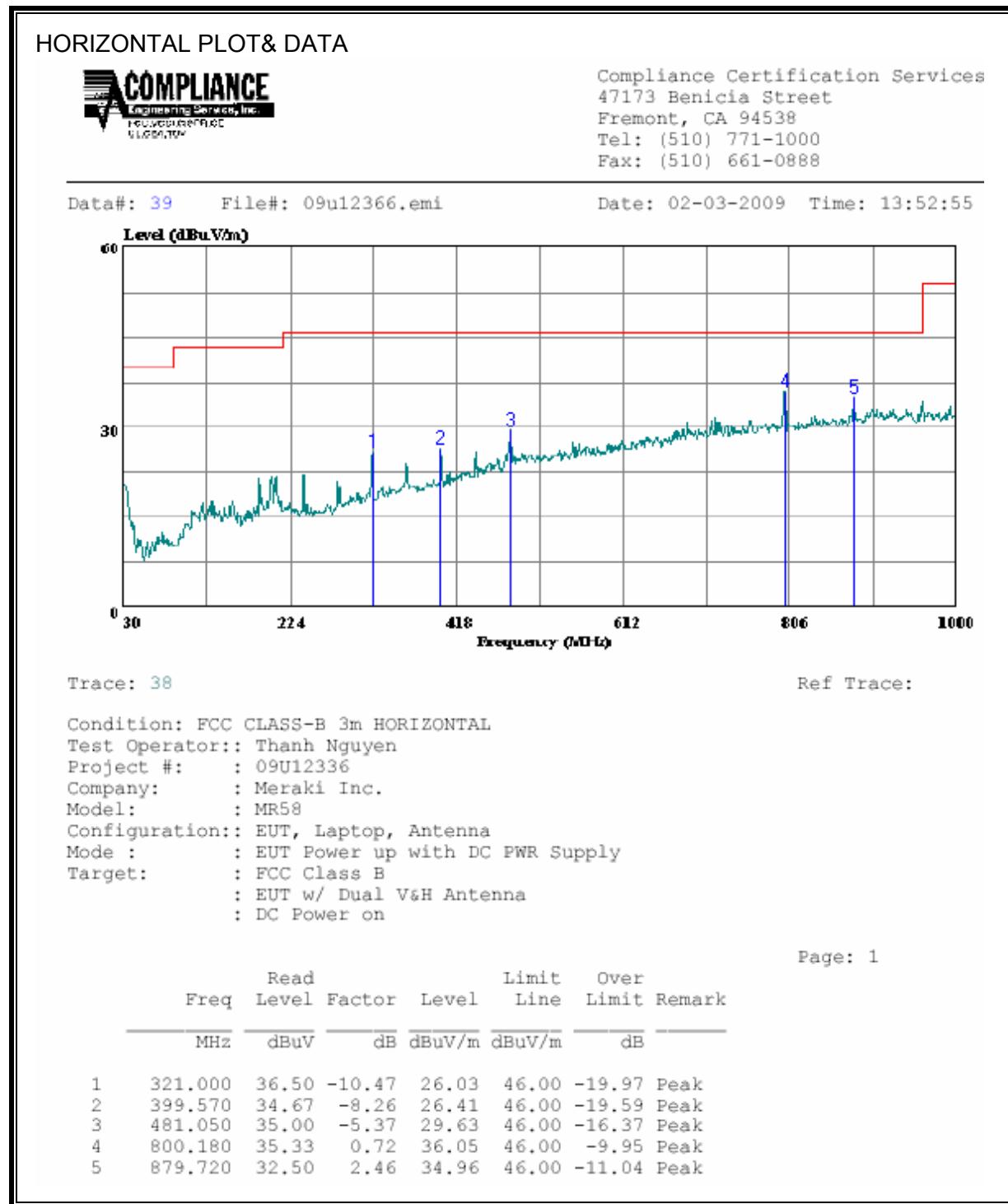
### 7.7.3. TX ABOVE 1 GHz FOR 802.11a MODE IN THE 5.8 GHz BAND MODE 100 (Worst-case): (Directional Antenna)

#### HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																	
Company:	Meraki Inc.																
Project #:	09U12366																
Date:	01/30/09																
Test Engineer:	Thanh Nguyen																
Configuration:	EUT with dual flat panel antenna 11dBi Gain																
Mode:	Transmit Worst case a mode.																
<u>Test Equipment:</u>																	
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit					
T73; S/N: 6717 @3m			T34 HP 8449B						T125; ARA 18-26 GHz; S/N:1007			FCC 15.209					
Hi Frequency Cables																	
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements RBW=VBW=1MHz		
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_002			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, 5745 MHz																	
11.490	3.0	40.8	27.5	38.6	9.5	-32.5	0.0	0.0	56.3	43.1	74	54	-17.7	-10.9	V, Noise Floor		
11.490	3.0	40.4	28.8	38.6	9.5	-32.5	0.0	0.0	55.9	44.3	74	54	-18.1	-9.7	H, Noise floor		
MID CHANNEL, 5785 MHz																	
11.570	3.0	40.2	27.9	38.7	9.5	-32.5	0.0	0.0	55.9	43.6	74	54	-18.1	-10.4	V, Noise Floor		
11.570	3.0	40.1	27.9	38.7	9.5	-32.5	0.0	0.0	55.8	43.6	74	54	-18.2	-10.4	H, Noise floor		
HI CHANNEL, 5825 MHz																	
11.650	3.0	41.4	28.3	38.7	9.6	-32.5	0.0	0.0	57.1	44.0	74	54	-16.9	-10.0	V, Noise Floor		
11.650	3.0	41.0	28.3	38.7	9.6	-32.5	0.0	0.0	56.8	44.1	74	54	-17.2	-9.9	H, Noise floor		
No other emissions were detected above noise floor.																	
Rev. 10.15.08																	
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												

## 7.7.4. TX BELOW 1 GHz (WORST-CASE CONFIGURATION)

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



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

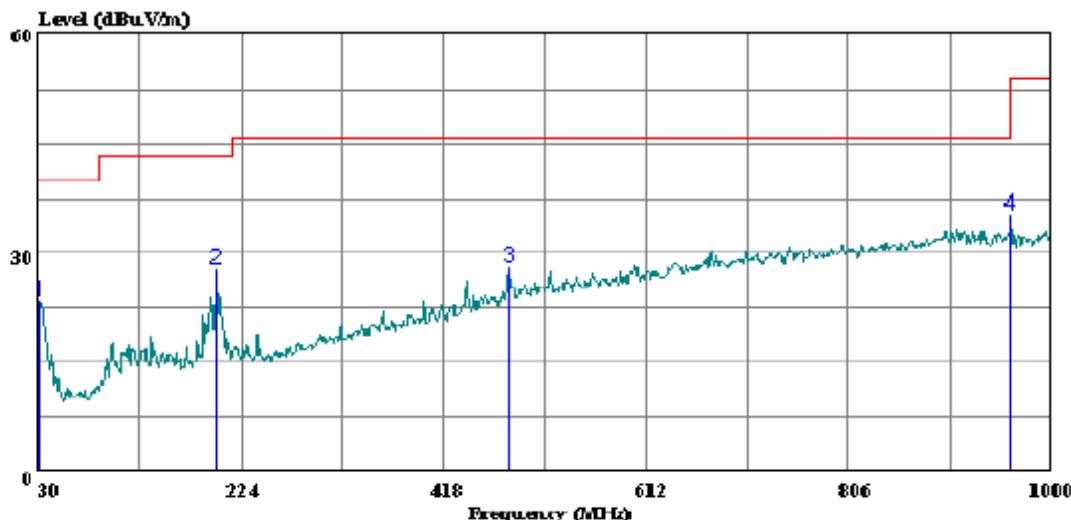
**VERTICAL PLOT& DATA**



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 37 File#: 09u12366.emi

Date: 02-03-2009 Time: 13:49:11



Trace: 36

Ref Trace:

Condition: FCC CLASS-B 3m VERTICAL  
Test Operator::: Thanh Nguyen  
Project #: : 09U12336  
Company: : Meraki Inc.  
Model: : MR58  
Configuration::: EUT, Laptop, Antenna  
Mode : : EUT Power up with DC PWR Supply  
Target: : FCC Class B  
: EUT w/ Dual V&H Antenna  
: DC Power on

Page: 1

Freq	Read		Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m
1	30.970	30.70	-7.41	23.29	40.00 -16.71 Peak
2	199.750	40.50	-12.77	27.73	43.50 -15.77 Peak
3	481.050	33.50	-5.37	28.13	46.00 -17.87 Peak
4	961.200	31.83	3.39	35.22	54.00 -18.78 Peak

## 7.8. OMNI-DIRECTIONAL LOW GAIN ANTENNA

### 7.8.1. TX ABOVE 1 GHz FOR 802.11a IN THE 5.8GHz BAND

MODE 100 (Worst-case):

#### HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company: Meraki Inc. Project #: 09U12366 Date: 01/30/09 Test Engineer: Thanh Nguyen Configuration: EUT with 4dBi gain Omni-Directional Antenna. Mode: Transmit Worst case a mode Att=14.5															
Test Equipment:															
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit			
T73; S/N: 6717 @3m	T34 HP 8449B								T125; ARA 18-26GHz; S/N:1007			FCC 15.209			
Hi Frequency Cables															
3' cable 22807700	12' cable 22807600	20' cable 22807500	3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz							
R_001								Average Measurements RBW=1MHz ; VBW=10Hz							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF	CL	Amp dB	D Corr dB	Fltr	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, 5745 MHz															
11.490	3.0	40.9	27.7	38.6	9.5	-32.5	0.0	0.0	56.5	43.3	74	54	-17.5	-10.7	V, Noise Floor
11.490	3.0	40.5	29.5	38.6	9.5	-32.5	0.0	0.0	56.0	45.1	74	54	-18.0	-8.9	H, Noise floor
MID CHANNEL, 5785 MHz															
11.570	3.0	40.8	28.0	38.7	9.5	-32.5	0.0	0.0	56.5	43.6	74	54	-17.5	-10.4	V, Noise Floor
11.570	3.0	39.8	28.0	38.7	9.5	-32.5	0.0	0.0	55.4	43.6	74	54	-18.6	-10.4	H, Noise floor
HI CHANNEL, 5825 MHz															
11.650	3.0	40.7	28.3	38.7	9.6	-32.5	0.0	0.0	56.5	44.0	74	54	-17.5	-10.0	V, Noise Floor
11.650	3.0	41.0	28.3	38.7	9.6	-32.5	0.0	0.0	56.8	44.1	74	54	-17.2	-9.9	H, Noise floor
No other emissions were detected above noise floor.															
Rev. 10.15.08															
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											

## 7.8.2. TX BELOW 1 GHz (WORST-CASE CONFIGURATION)

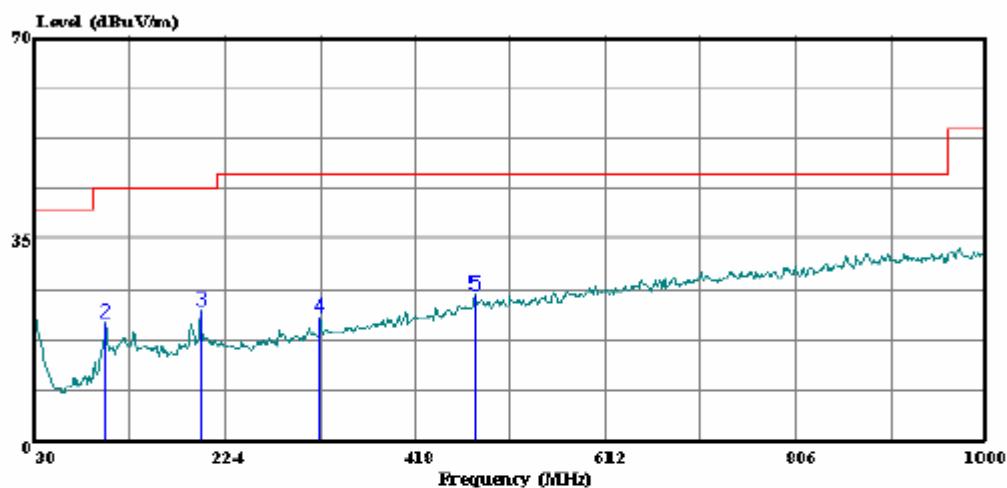
### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

#### HORIZONTAL PLOT& DATA



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 25 File#: 09U12366.EMI Date: 02-02-2009 Time: 15:45:52



(Fremont)  
Trace: 24

Ref Trace:

Condition: FCC CLASS-B 3m HORIZONTAL  
Test Operator:: Thanh Nguyen  
Project #: : 09U12336  
Company: : Meraki Inc.  
Model: : MR58  
Configuration:: BUT, Laptop, Antenna  
Mode : : BUT Power up with DC PWR Supply  
Target: : FCC Class B  
: BUT w/Mono.Ant  
: DC Power on

Page: 1

Freq	Read		Limit	Over	Remark
	Level	Factor			
MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	30.000	30.34	-7.41	22.93	40.00 -17.07 Peak
2	101.780	36.67	-16.05	20.62	43.50 -22.88 Peak
3	198.780	35.56	-12.76	22.80	43.50 -20.70 Peak
4	320.030	32.04	-10.50	21.54	46.00 -24.46 Peak
5	478.140	31.04	-5.48	25.56	46.00 -20.44 Peak

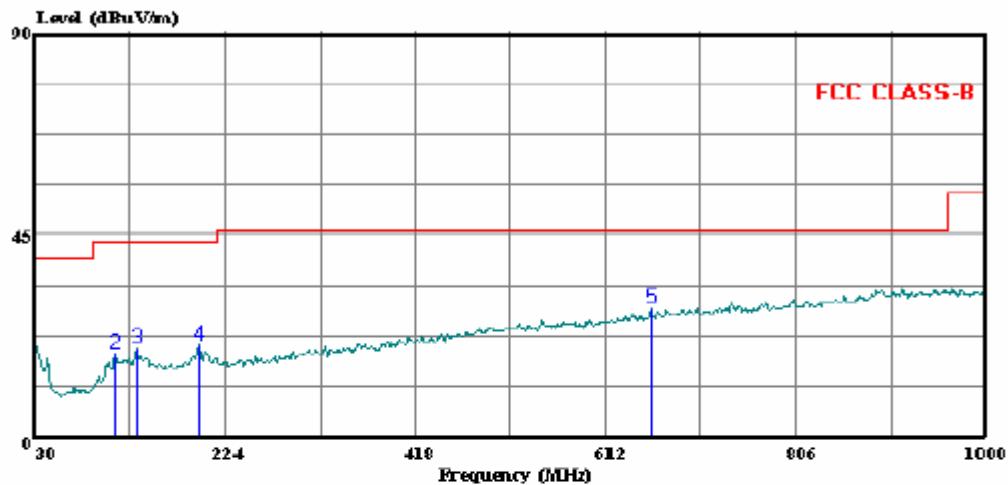
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**

**VERTICAL PLOT& DATA**



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 27 File#: 09U12366.EMI Date: 02-02-2009 Time: 15:50:40



(Fremont)

Trace: 26

Ref Trace:

Condition: FCC CLASS-B 3m VERTICAL  
Test Operator:: Thanh Nguyen  
Project #: : 09U12336  
Company: : Meraki Inc.  
Model: : MR58  
Configuration:: EUT, Laptop, Antenna  
Mode : : EUT Power up with DC PWR Supply  
Target: : FCC Class B  
: EUT w/Mono.Ant  
: DC Power on

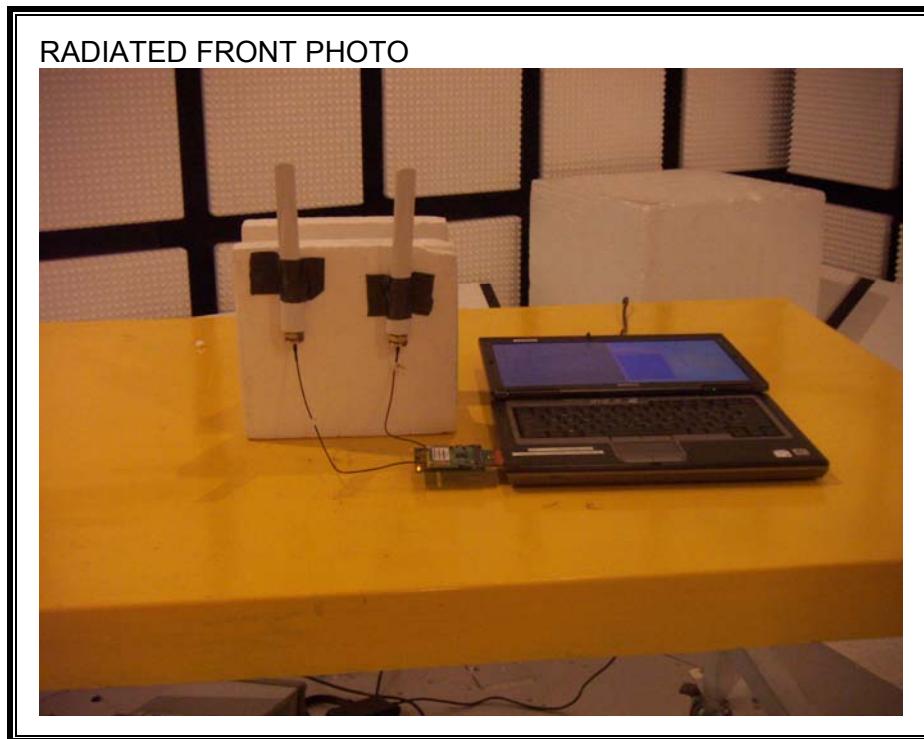
Page: 1

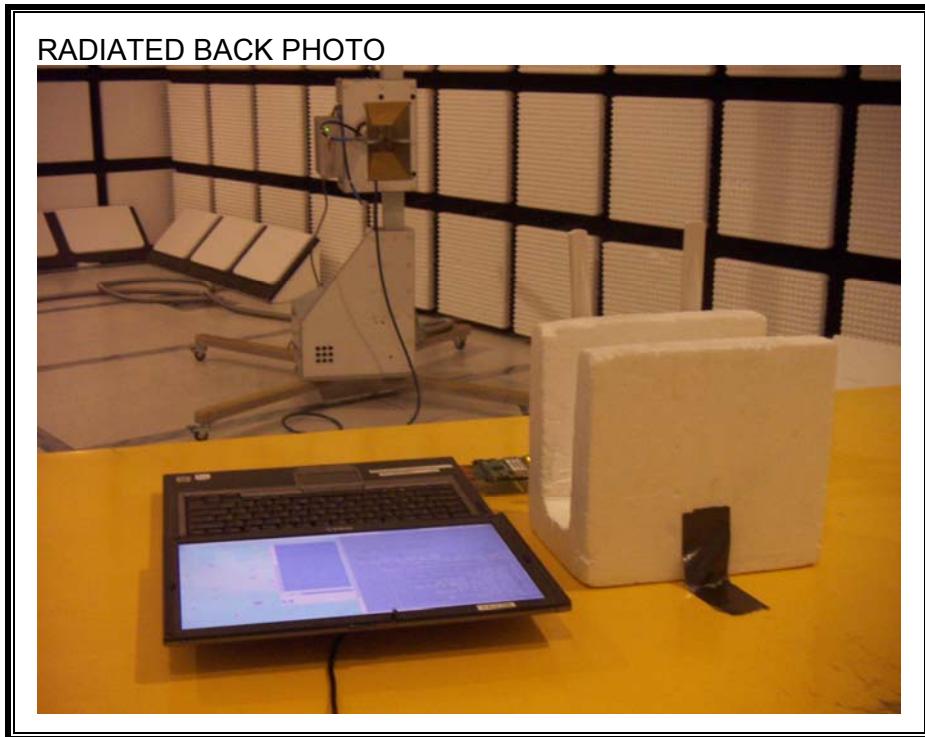
Freq	Read		Limit	Over	Remark
	Level	Factor			
MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	30.000	28.72	-7.41	21.31	40.00 -18.69 Peak
2	111.480	32.81	-14.13	18.68	43.50 -24.82 Peak
3	133.790	33.10	-13.31	19.79	43.50 -23.71 Peak
4	196.840	33.35	-12.71	20.64	43.50 -22.86 Peak
5	657.590	30.19	-1.48	28.71	46.00 -17.29 Peak

## 8. SETUP PHOTOS

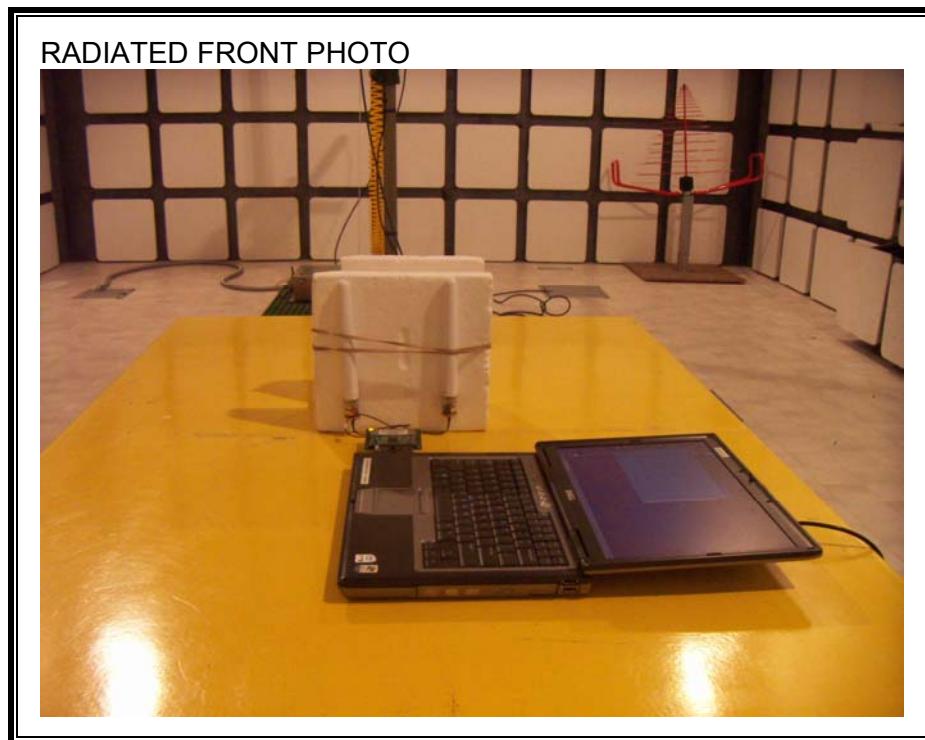
### 8.1. RADIATED RF MEASUREMENT SETUP

#### 8.1.1. DUAL BAND OMNI-DIRECTIONAL ANTENNA

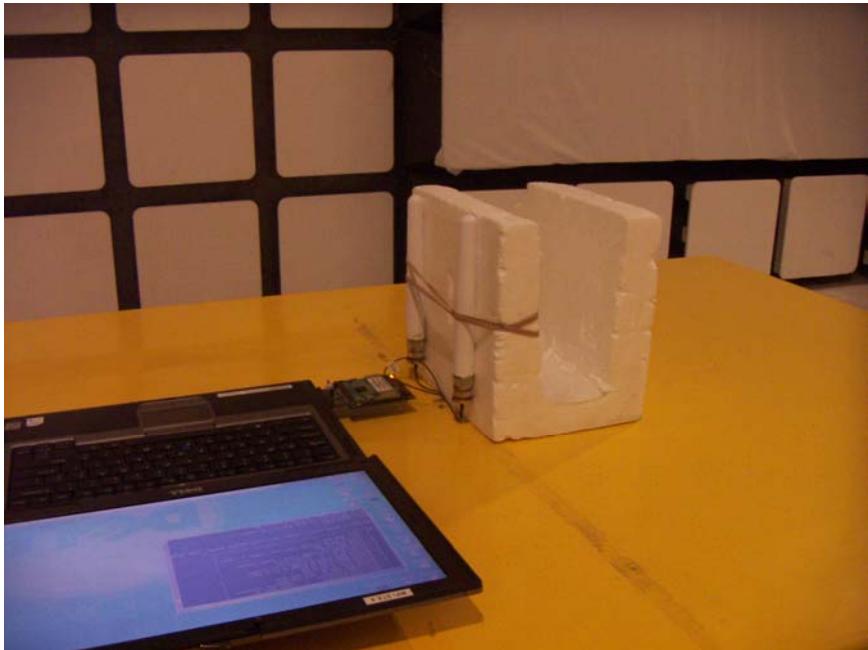




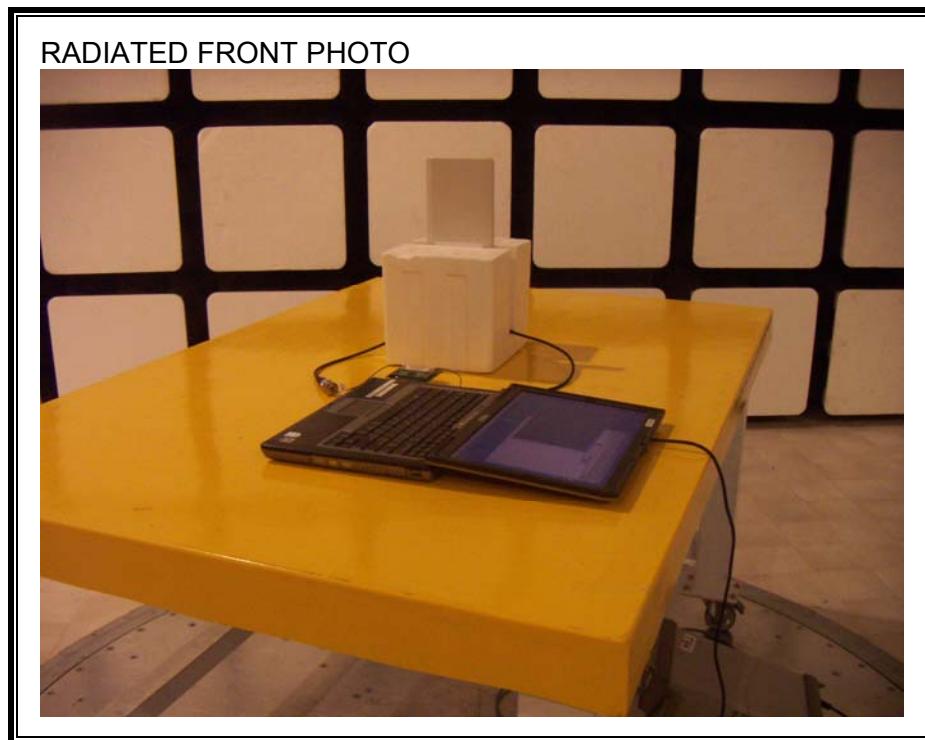
### 8.1.2. MONOPOLE OMNI 2.4GHz ANTENNA



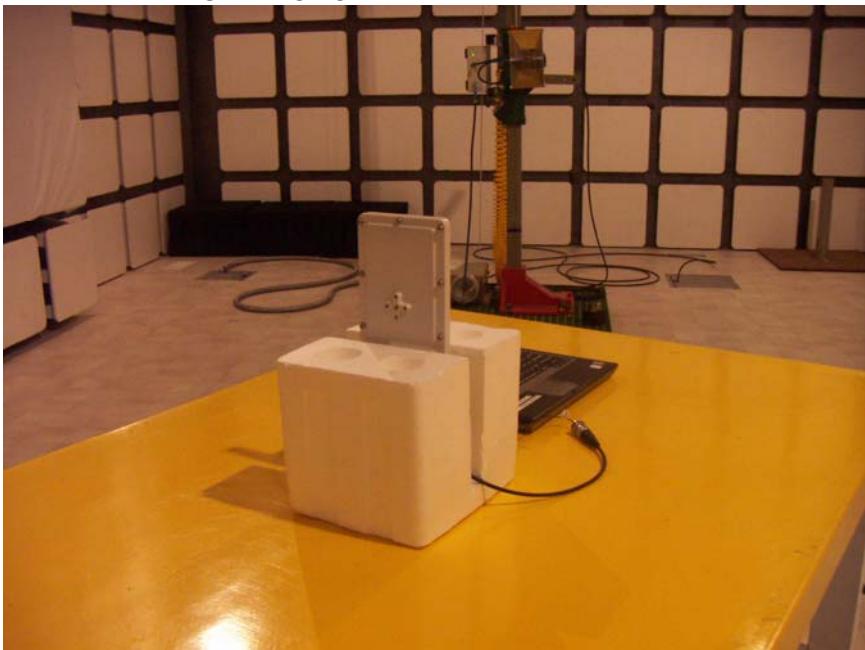
RADIATED BACK PHOTO



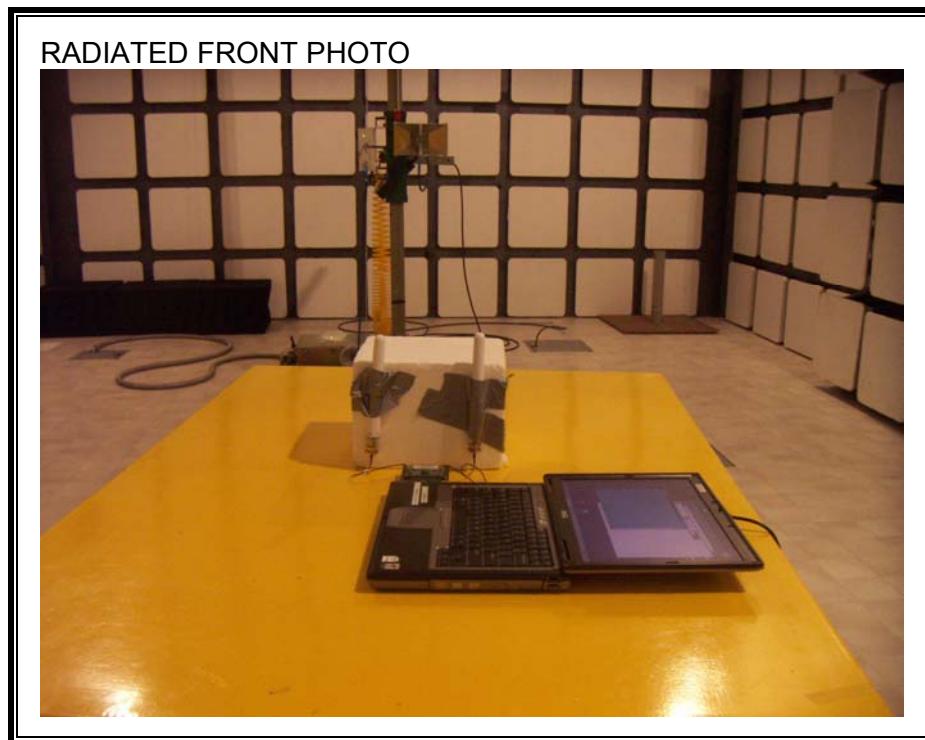
### 8.1.3. DIRECTIONAL ANTENNA (11.5dBi)



RADIATED BACK PHOTO



#### 8.1.4. OMNI DIRECTIONAL ANTENNA (4dBi)

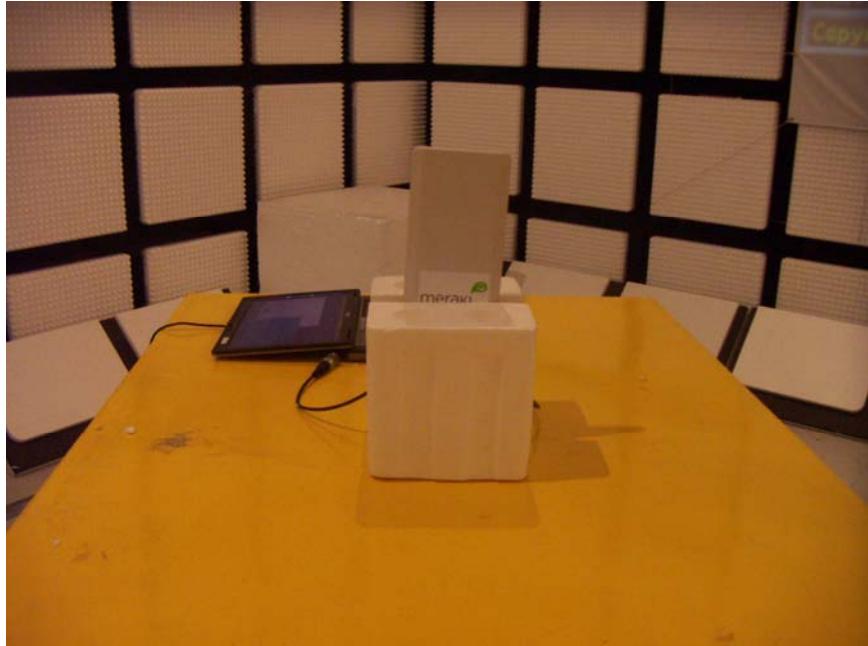


RADIATED BACK PHOTO

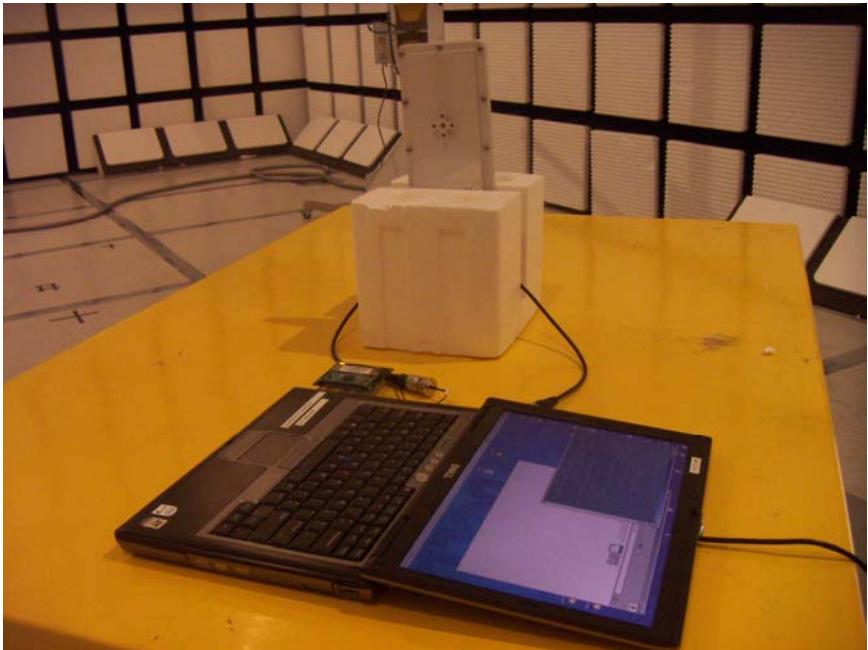


### 8.1.5. DIRECTIONAL ANTENNA (14.5dBi)

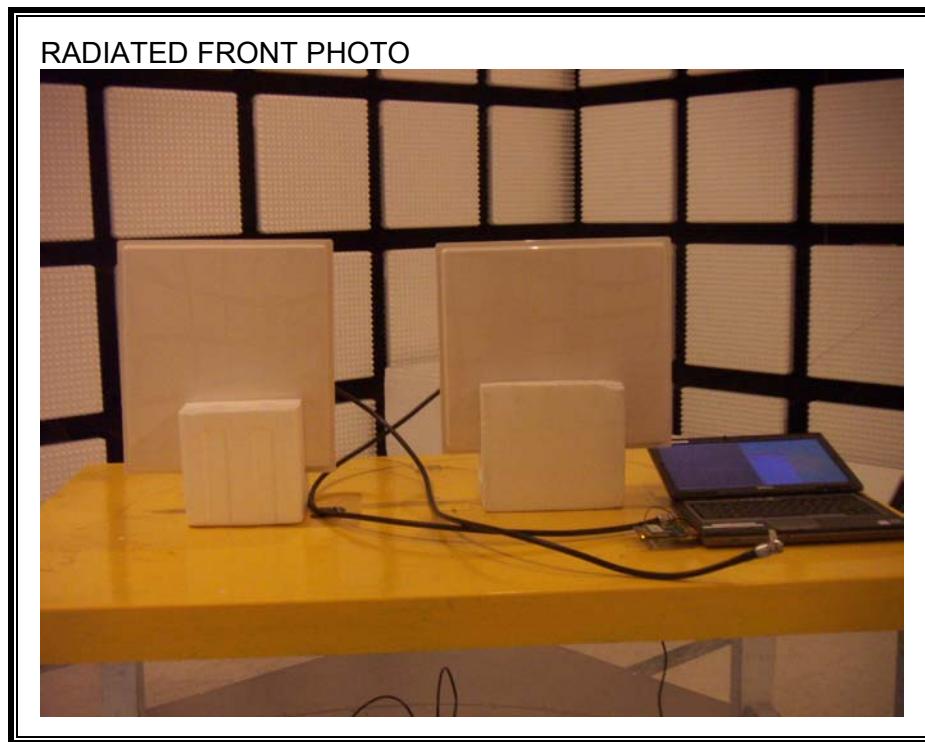
RADIATED FRONT PHOTO



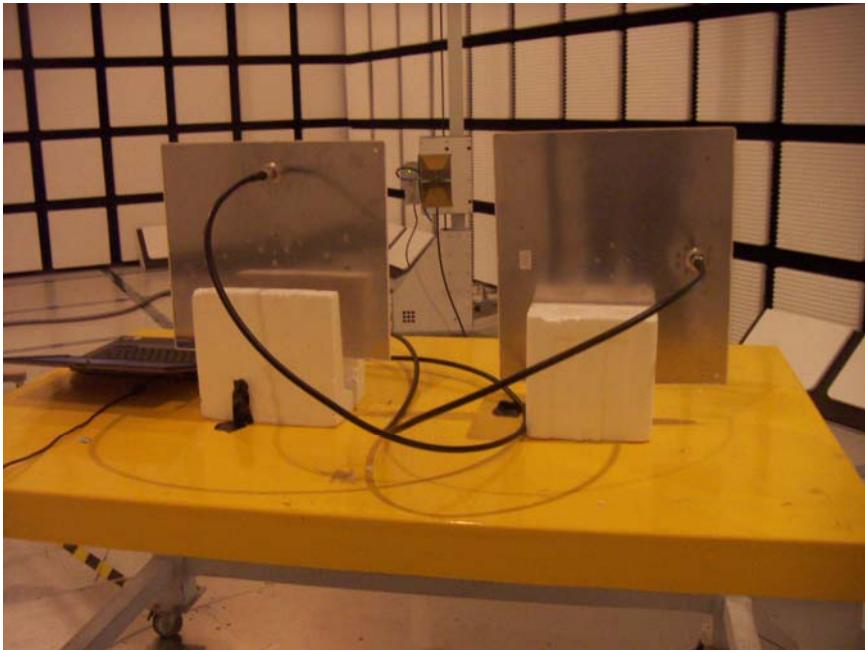
RADIATED BACK PHOTO



### 8.1.6. FLAT PANEL ANTENNA 19dBi



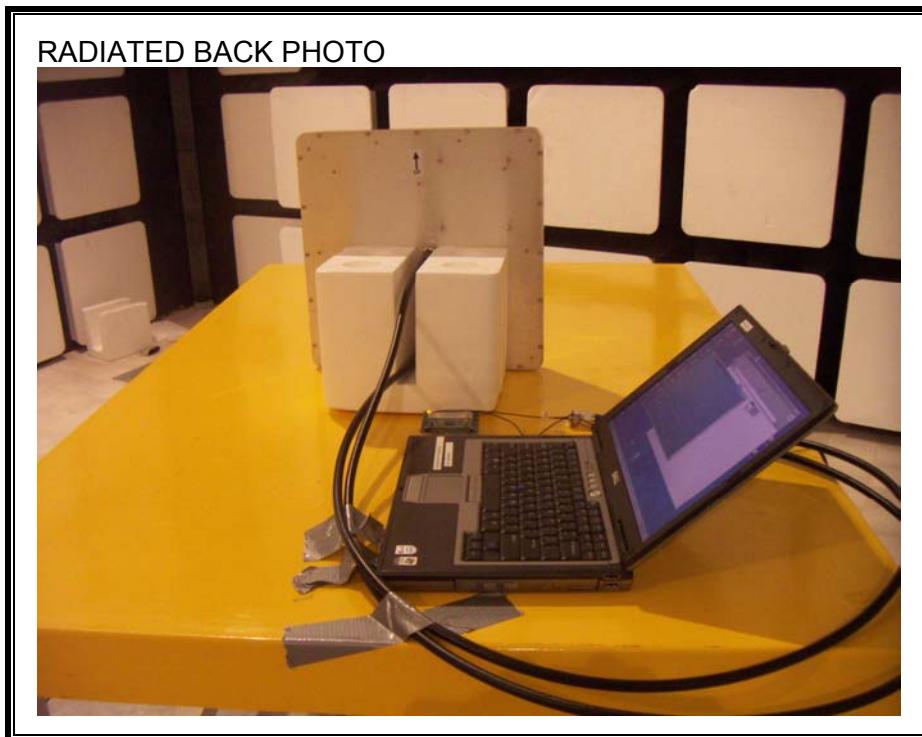
RADIATED BACK PHOTO



### 8.1.7. FLAT PANEL ANTENNA 23dBi

RADIATED FRONT PHOTO



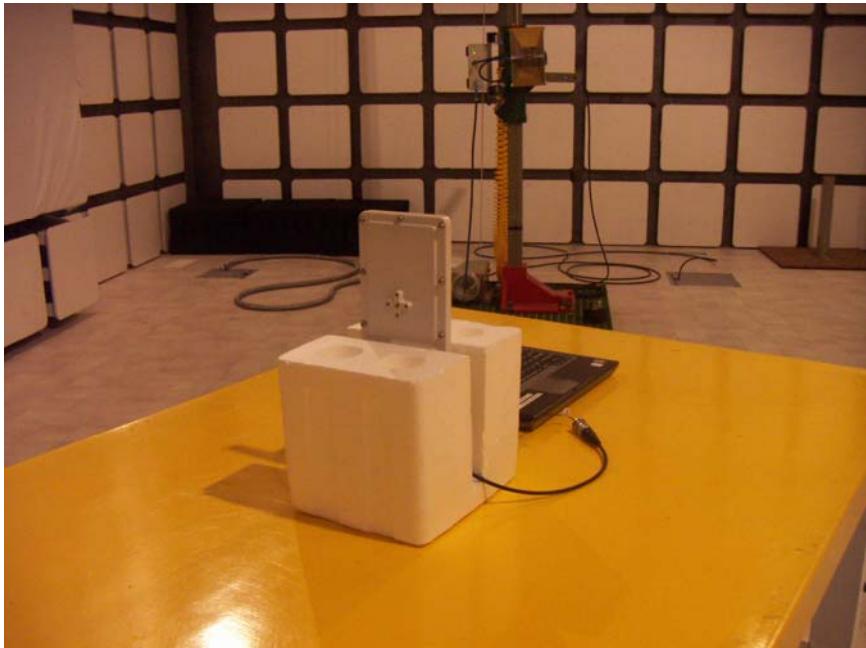




**DIRECTIONAL ANTENNA FOR 5GHz**



RADIATED BACK PHOTO



**END OF REPORT**