

FCC CFR47 PART 15 SUBPART C (15.247)

CERTIFICATION

TEST REPORT

For

Shenzhen Century Xinyang Tech Co., Ltd

Wireless Adapter

Model No.: SL-D001

Prepared for : Shenzhen Century Xinyang Tech Co., Ltd  
Address : Room 3001-3002, East Tower 30/F, Nanshan Software Park,  
Shenzhen, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.  
Address : 1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd., Bao'an  
District, Shenzhen, Guangdong, China

Date of receipt of test sample : April 21, 2012  
Number of tested samples : 1  
Serial number : Prototype  
Date of Test : April 21, 2012 – May 12, 2012  
Date of Report : May 12, 2012

**TEST REPORT  
FCC CFR 47 PART 15 C(15.247)**

**Report Reference No.** ..... : **LCS120421096QF**

Date of Issue ..... : May 12, 2012

**Testing Laboratory Name** ..... : **Shenzhen LCS Compliance Testing Laboratory Ltd.**

Address ..... : 1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd.,  
Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure..... : Full application of Harmonised standards   
Partial application of Harmonised standards   
Other standard testing method

**Applicant's Name**..... : **Shenzhen Century Xinyang Tech Co., Ltd**

Address ..... : Room 3001~3002, East Tower 30/F, Nanshan Software Park,  
Shenzhen, China

**Test Specification**

Standard ..... : FCC CFR 47 PART 15 Subpart C: 2011, ANSI C63.4-2003

**Test Report Form No.**..... : **LCSEMC-1.0**

TRF Originator ..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF ..... : Dated 2011-03

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**Test Item Description.** ..... : **Wireless Adapter**

Trade Mark ..... : N/A

Manufacturer..... : Shenzhen Century Xinyang Tech Co., Ltd

Model/ Type reference..... : SL-D001

Ratings ..... : DC 5V, Current: 500mA

Result ..... : **Positive**

**Compiled by:**

**Supervised by:**

**Approved by:**

Ada Liang / File administrators

Vito Cao/ Technique principal

Gavin Liang/ Manager

# EMC -- TEST REPORT

<b>Test Report No. : LCS120421096QF</b>	<u>May 12, 2012</u> Date of issue
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Type / Model..... : SL-D001  EUT..... : Wireless Adapter
<b>Applicant..... : Shenzhen Century Xinyang Tech Co., Ltd</b> Address..... : Room 3001~3002, East Tower 30/F, Nanshan Software Park, Shenzhen, China Telephone..... : / Fax..... : /
<b>Manufacturer..... : Shenzhen Century Xinyang Tech Co., Ltd</b> Address..... : Room 3001~3002, East Tower 30/F, Nanshan Software Park, Shenzhen, China Telephone..... : / Fax..... : /
<b>Factory..... : Shenzhen Century Xinyang Tech Co., Ltd</b> Address..... : Room 3001~3002, East Tower 30/F, Nanshan Software Park, Shenzhen, China Telephone..... : / Fax..... : /

<b>Test Result:</b> <span style="float: right;"><b>Positive</b></span>
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The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT : Wireless Adapter

Model Number : SL-D001

Power Supply : DC 5.0V

Frequency Range : 2412.00-2462.00MHz, (Channel Number: 11, Channel  
Frequency=2412+5(K-1), K=1, 2, 3 .....11)

Modulation Type DSSS,OFDM

Antenna Gain : 0.0dBi

### 1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
COMPAQ	Notebook	Compaq Presario V3000	2CE7220NN7	DoC

### 1.3. External I/O Cable

Cable Description	Length (M)	From/Port	To
N/A	N/A	N/A	N/A

### 1.4. Description of Test Facility

#### Site Description

#### EMC Lab.

: Accredited by CNAS, June 04, 2010

The Certificate Registration Number. is L4595.

Accredited by FCC, July 14, 2011

The Certificate Registration Number. is 899208.

Accredited by Industry Canada, May. 02, 2011

The Certificate Registration Number. is 9642A-1

## 1.5. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

## 1.6. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation Uncertainty	30MHz~200MHz	$\pm 2.96\text{dB}$	(1)
	200MHz~1000MHz	$\pm 3.10\text{dB}$	(1)
	1GHz~26.5GHz	$\pm 3.80\text{dB}$	(1)
Conduction Uncertainty	150kHz~30MHz	$\pm 1.63\text{dB}$	(1)
Power disturbance	30MHz~300MHz	$\pm 1.60\text{dB}$	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

## 1.7. Description Of Test Modes

The EUT has been tested under operating condition.

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power, that was determined to be 802.11g mode, mid channel.

Worst-case mode and channel used for 9kHz-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power, that was determined to be 802.11g mode, mid channel.

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

802.11b Mode : 1 Mbps, DSSS.

802.11g Mode : 6 Mbps, OFDM.

802.11n Mode HT20: .260Mbps, OFDM.

802.11n Mode HT40: 540Mbps, OFDM.

For PSD measurement preliminary testing showed that combiner is worst-case compared to individual chains; therefore final measurements were performed using combiner for all channels and modes.

## 2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

### 2.3. General Test Procedures

#### 2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4

### 3. SYSTEM TEST CONFIGURATION

#### 3.1. Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

#### 3.2. EUT Exercise Software

N/A

#### 3.3. Special Accessories

The special accessories were supplied by Shenzhen LCS Compliance Testing Laboratory Ltd.

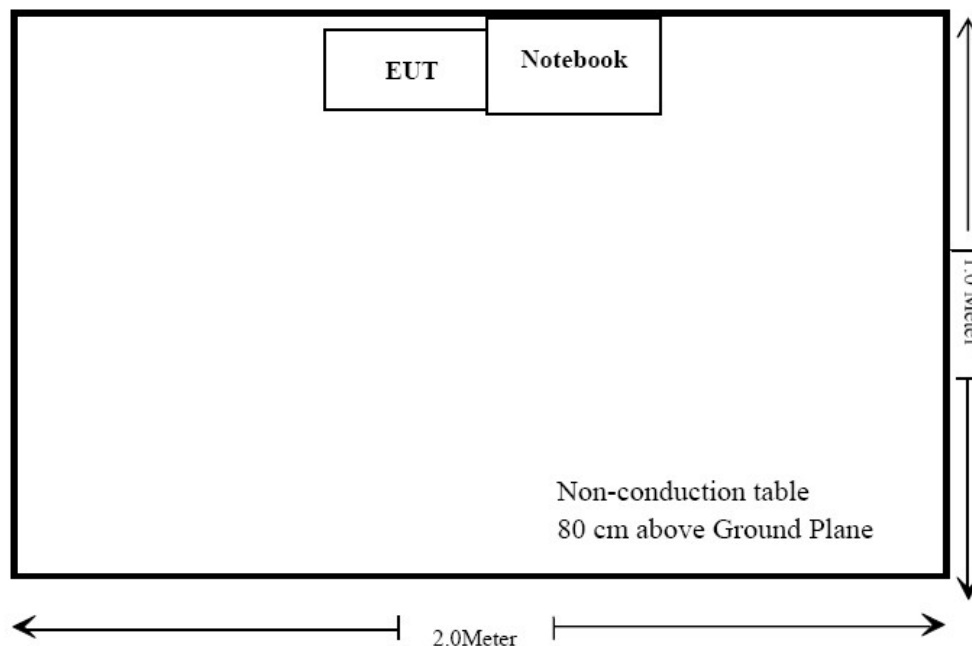
#### 3.4. Block Diagram/Schematics

Please refer to the report

#### 3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

#### 3.6. Block Diagram of Test Setup





## 4. SUMMARY OF TEST RESULTS

<b>Applied Standard: 47 CFR FCC Part 15 Subpart C</b>		
<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
§15.247(b)	Maximum Conducted Output Power	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.247(a)	Occupied Bandwidth	Compliant
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	Compliant
§15.205	Emissions at Restricted Band	Compliant
§15.207(a)	Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant
§15.247(i)§2.1093§1.1307	RF Exposure	Compliant

## 5. TEST RESULT

### 5.1. Maximum Conducted Output Power Measurement

#### 5.1.1. Standard Applicable

According to §15.247(b): For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

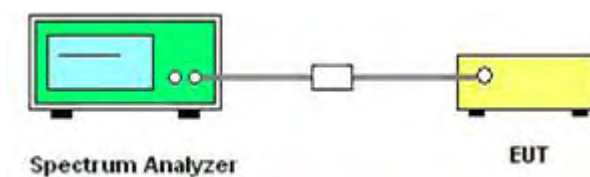
#### 5.1.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of the spectrum analyzer.

#### 5.1.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Set the span to a value that is 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.

#### 5.1.4. Test Setup Layout



#### 5.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

#### 5.1.6. Test Result of Maximum Conducted Output Power

Temperature	25°C	Humidity	60%
Test Engineer	Vito Cao	Configurations	802.11b,g,n

## 802.11b

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412	12.43	30	Complies
6	2437	12.86	30	Complies
11	2462	12.08	30	Complies

## 802.11g

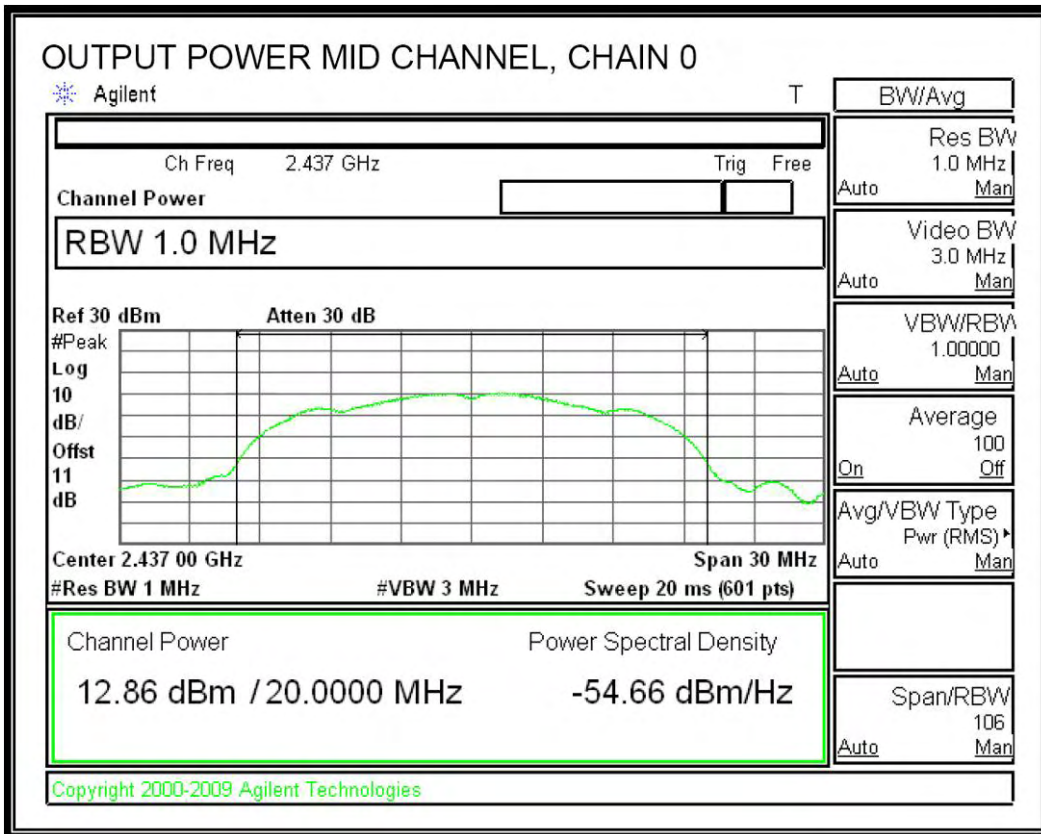
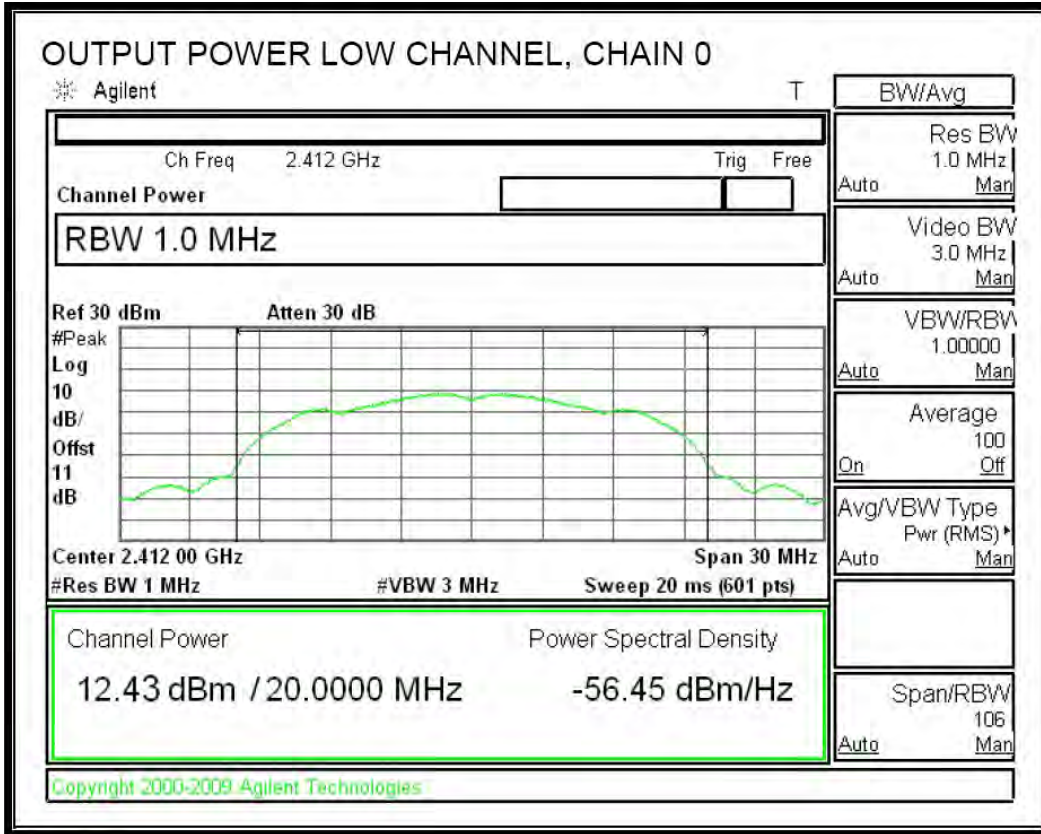
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412	12.34	30	Complies
6	2437	12.43	30	Complies
11	2462	12.31	30	Complies

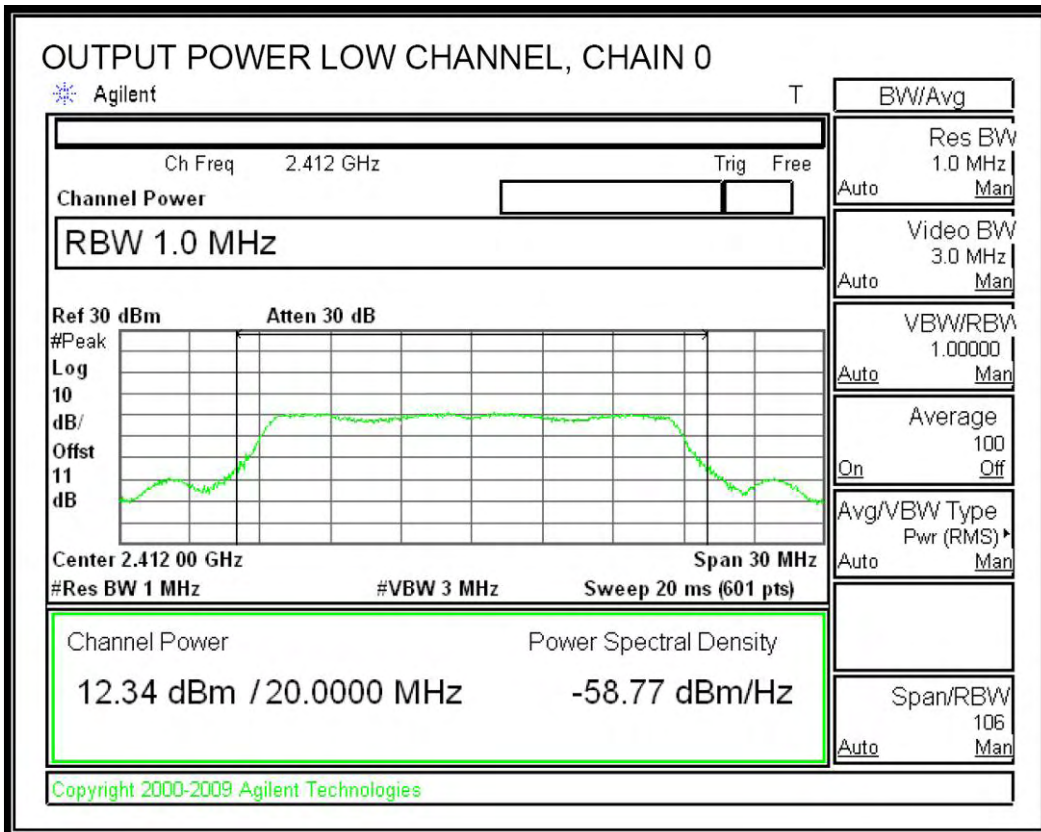
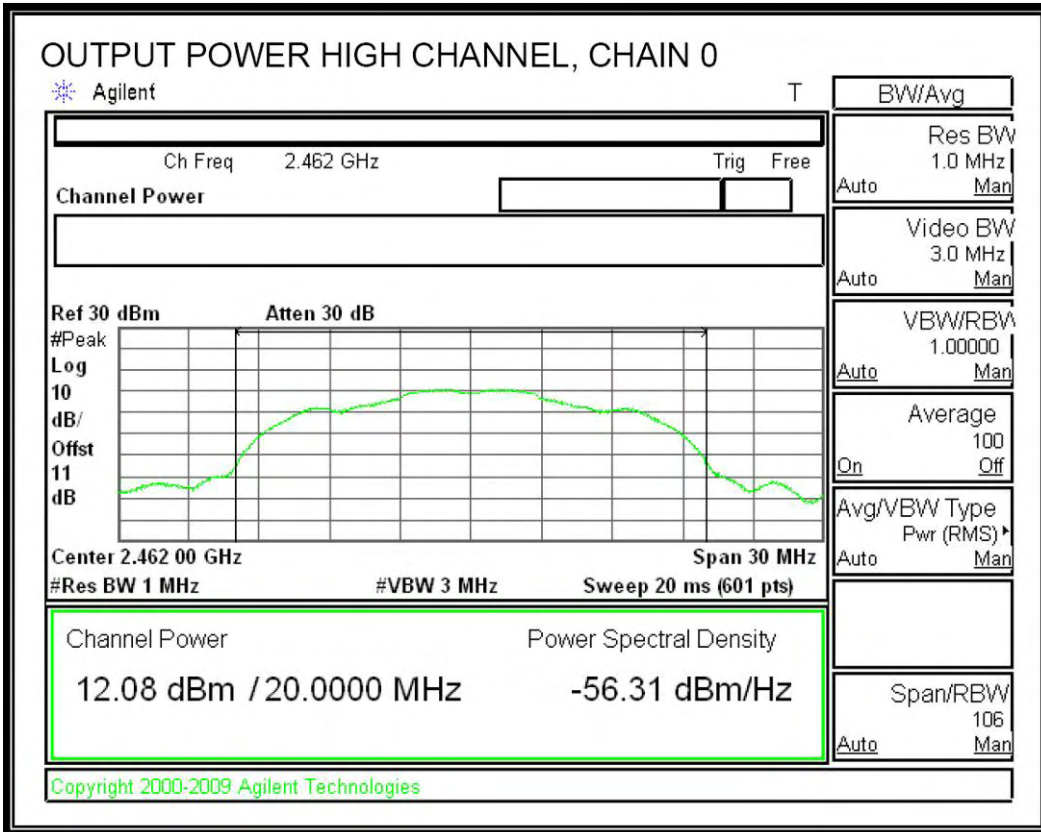
## 802.11n HT20

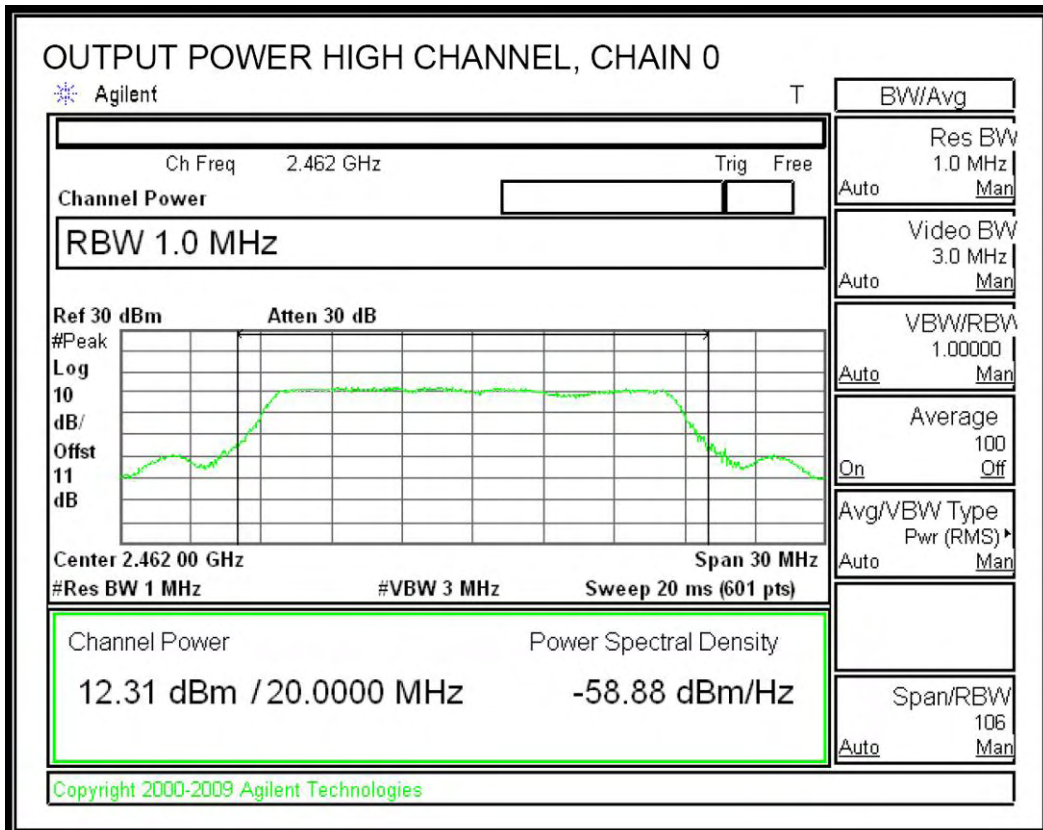
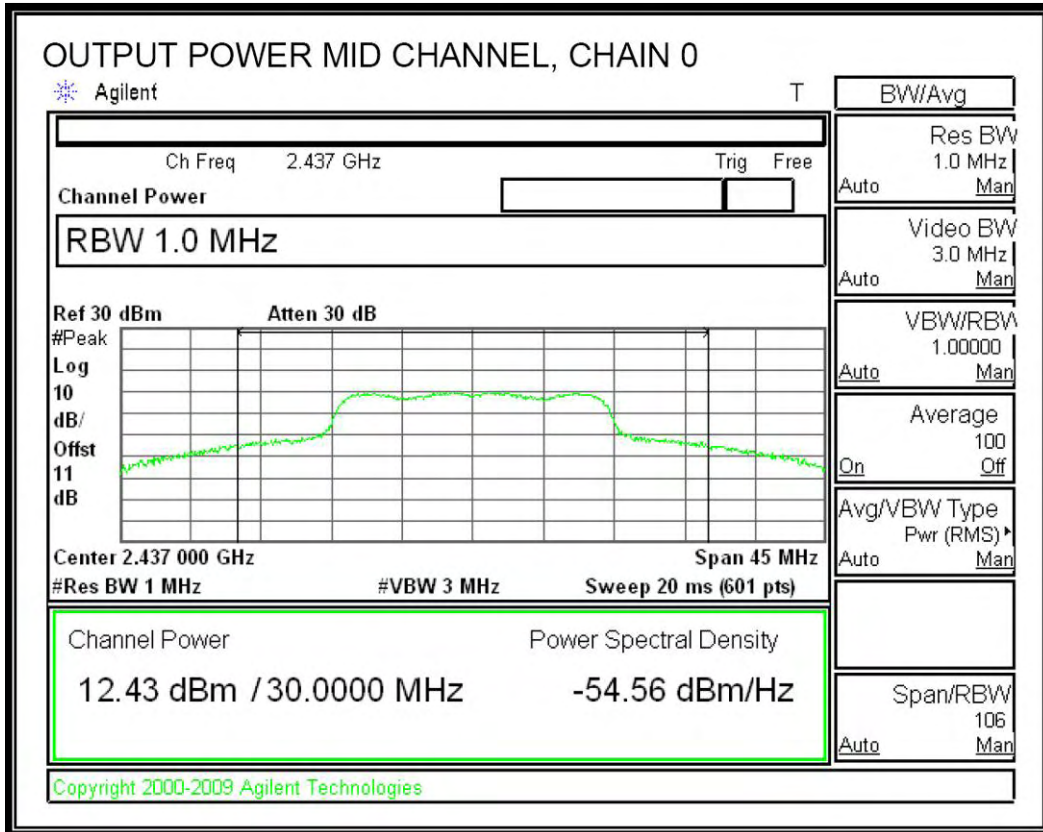
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412	12.15	30	Complies
6	2437	12.39	30	Complies
11	2462	12.37	30	Complies

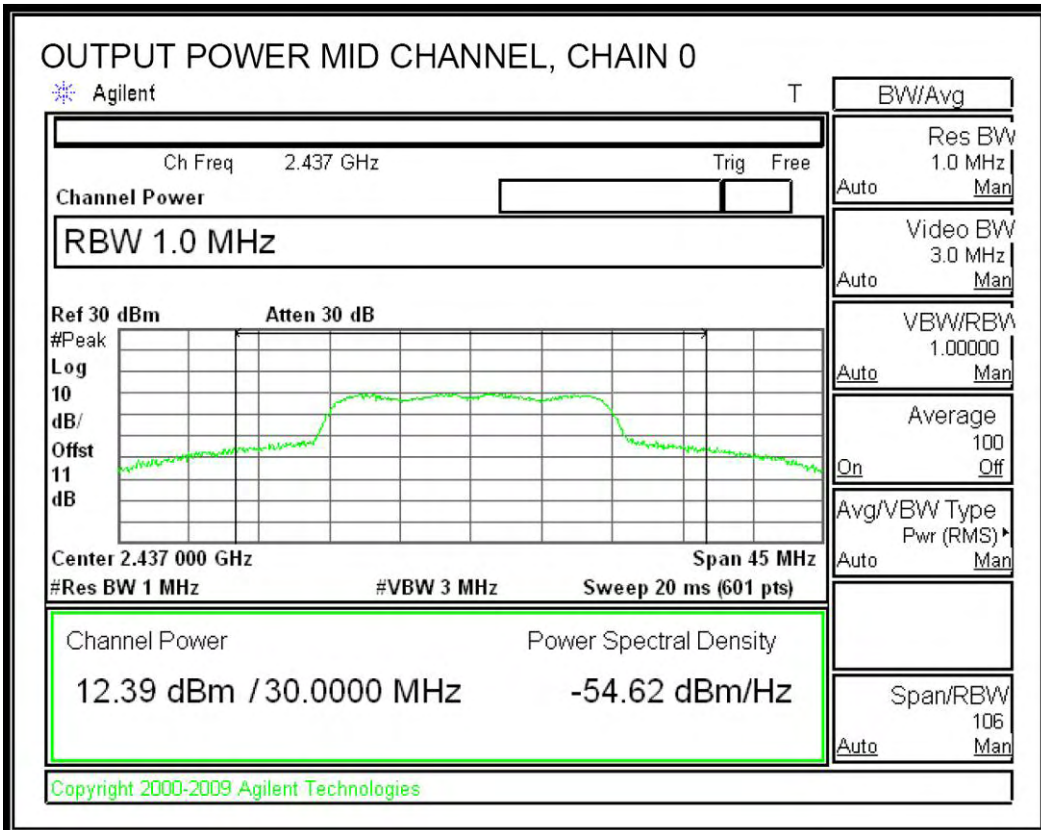
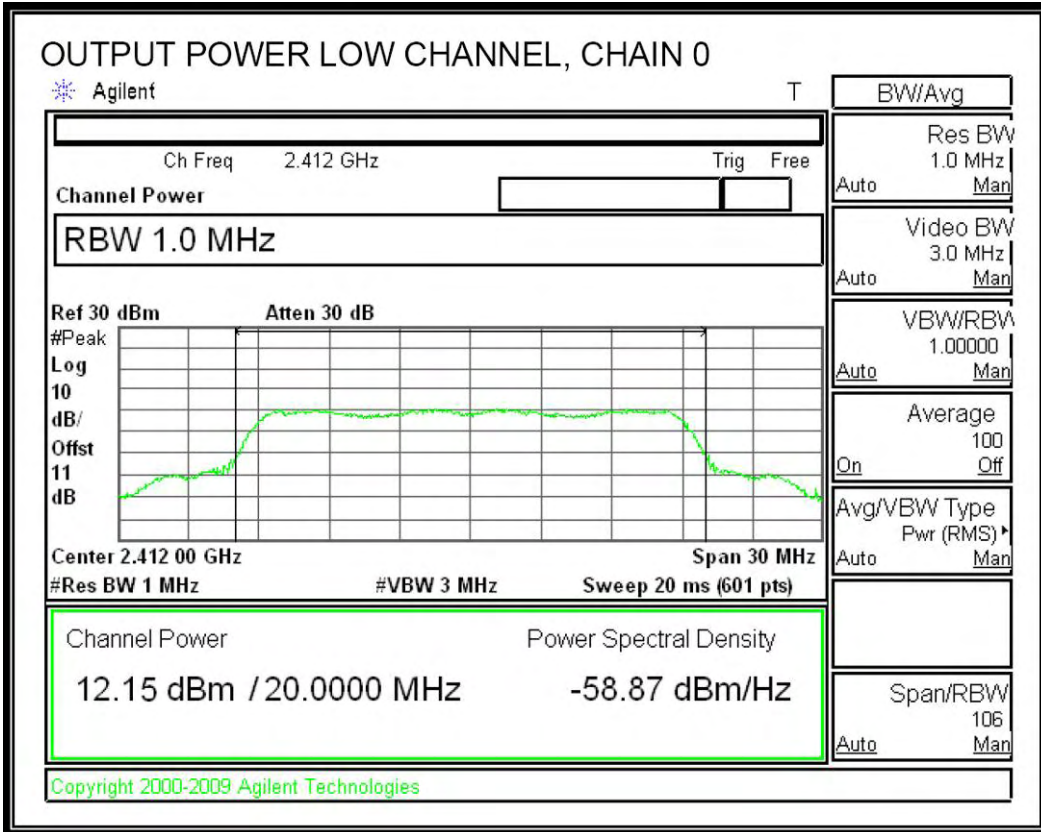
## 802.11n HT40

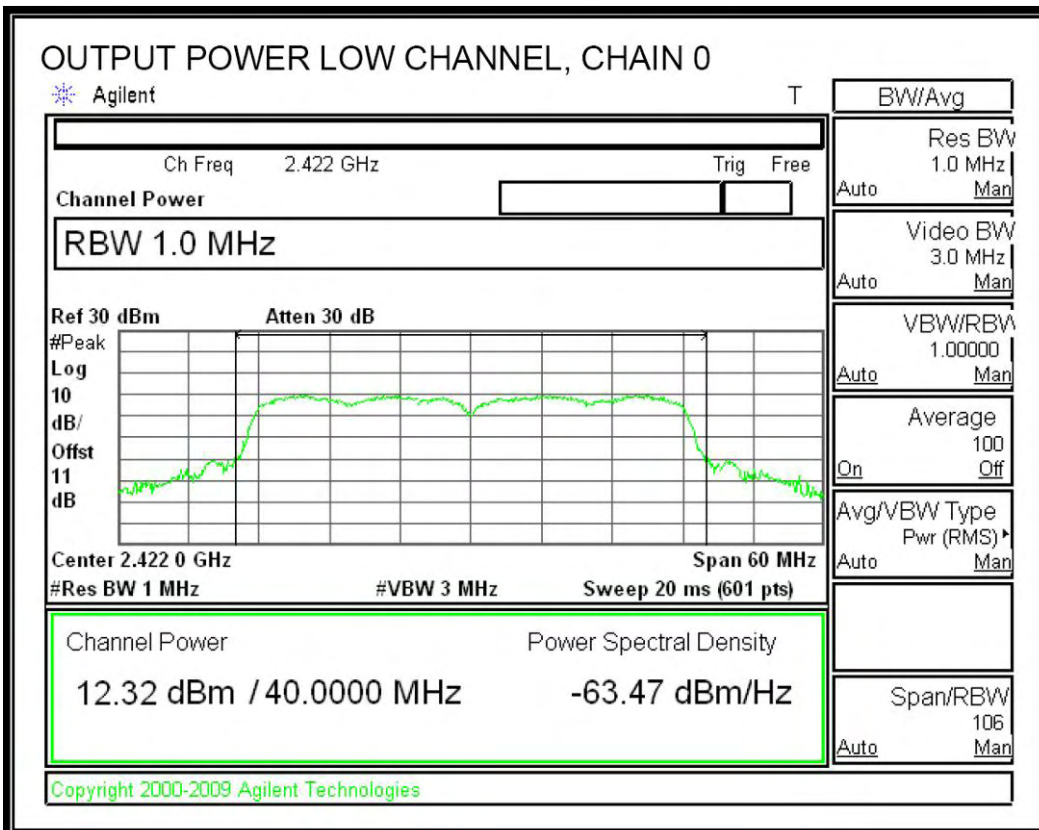
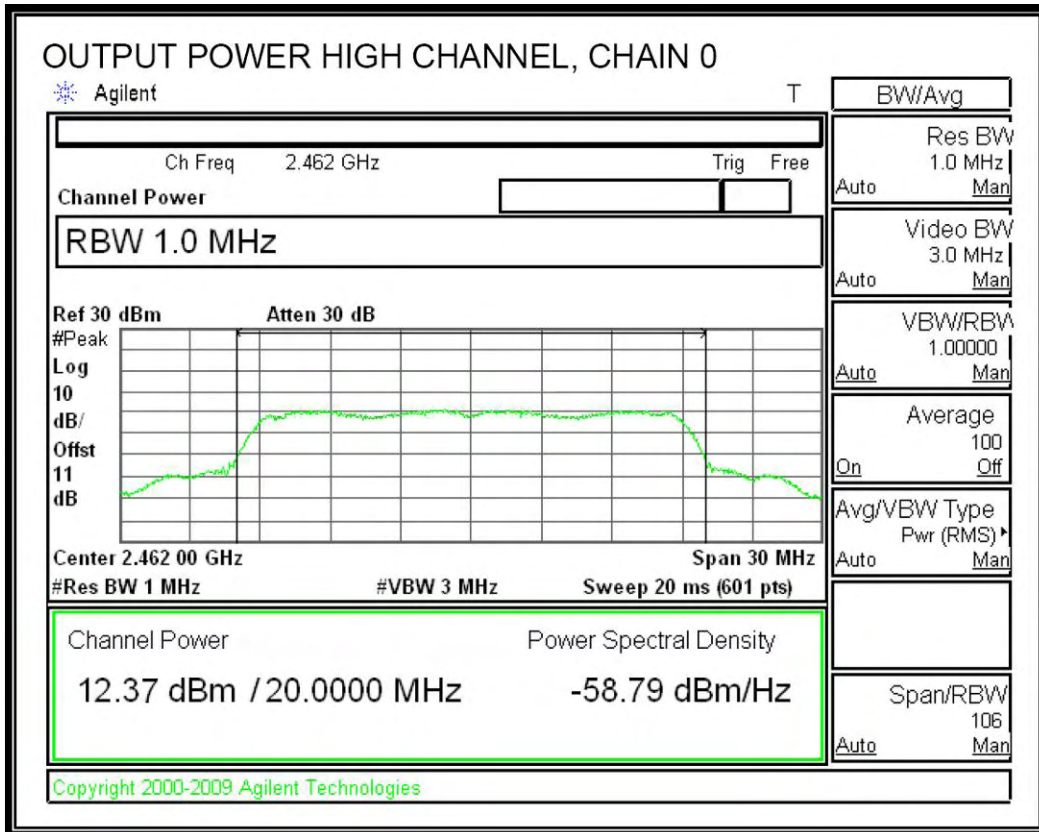
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2422	12.32	30	Complies
6	2437	12.18	30	Complies
11	2452	12.26	30	Complies



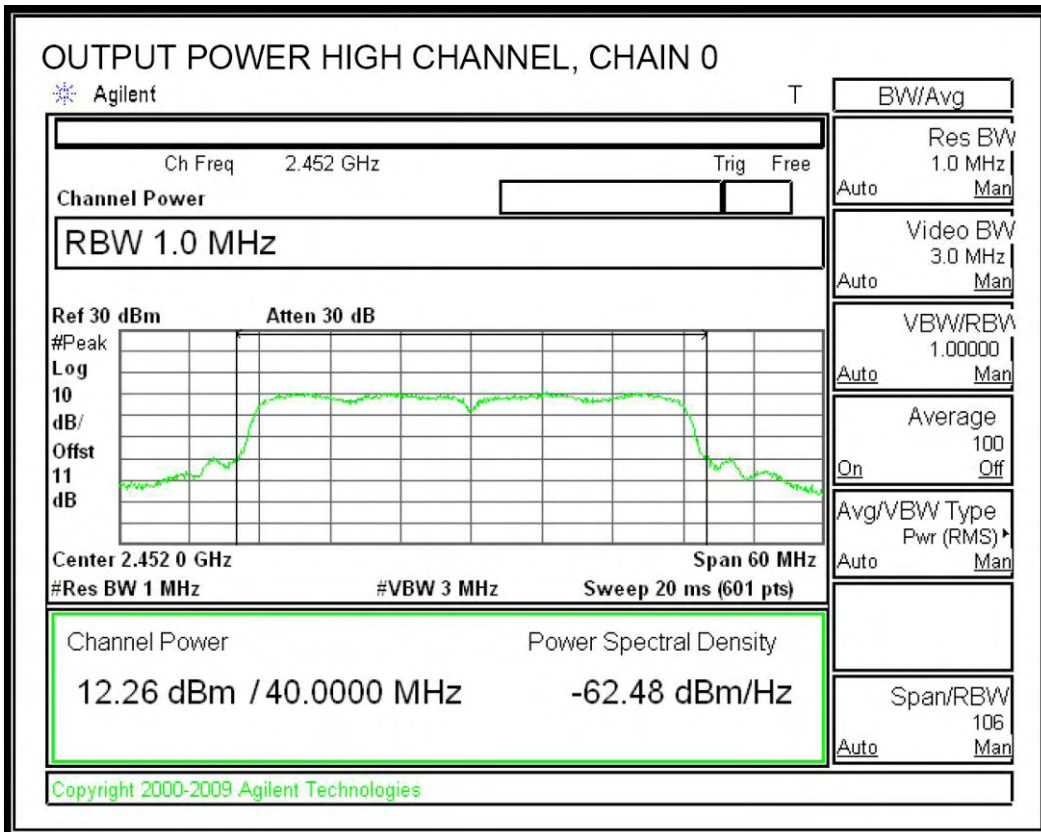
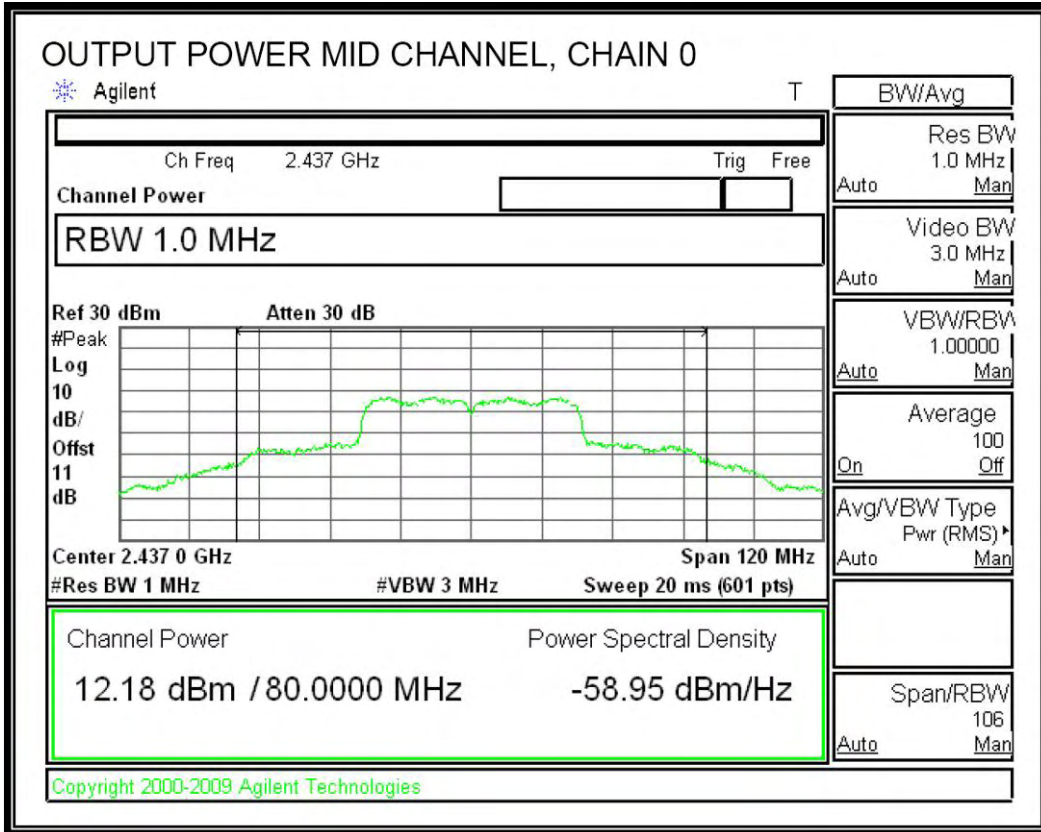












## 5.2. Power Spectral Density Measurement

### 5.2.1. Standard Applicable

According to §15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

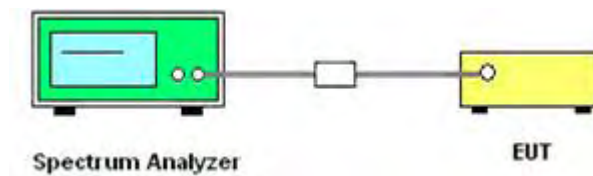
### 5.2.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of Spectrum Analyzer.

### 5.2.3. Test Procedures

1. The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
2. The power was monitored at the coupler port with a Peak Power Meter. The power level was set to the maximum level.
3. Detector = Peak.
4. The RBW was set to 3 kHz and VBW was set to 10 kHz and a SPAN of 1.0 MHz with a 333.3 second sweep on the Spectrum Analyzer. Set the sweep time=span/3kHz.
5. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.
6. Measurements were carried out at the low, mid and high channels.

### 5.2.4. Test Setup Layout



### 5.2.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 5.2.6. Test Result of Power Spectral Density

Temperature	25°C	Humidity	60%
Test Engineer	Vito Cao	Configurations	802.11b,g,n

## 802.11b

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412	-9.55	8	Complies
6	2437	-4.72	8	Complies
11	2462	-7.01	8	Complies

## 802.11g

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412	-10.12	8	Complies
6	2437	-7.10	8	Complies
11	2462	-11.32	8	Complies

## 802.11n HT20

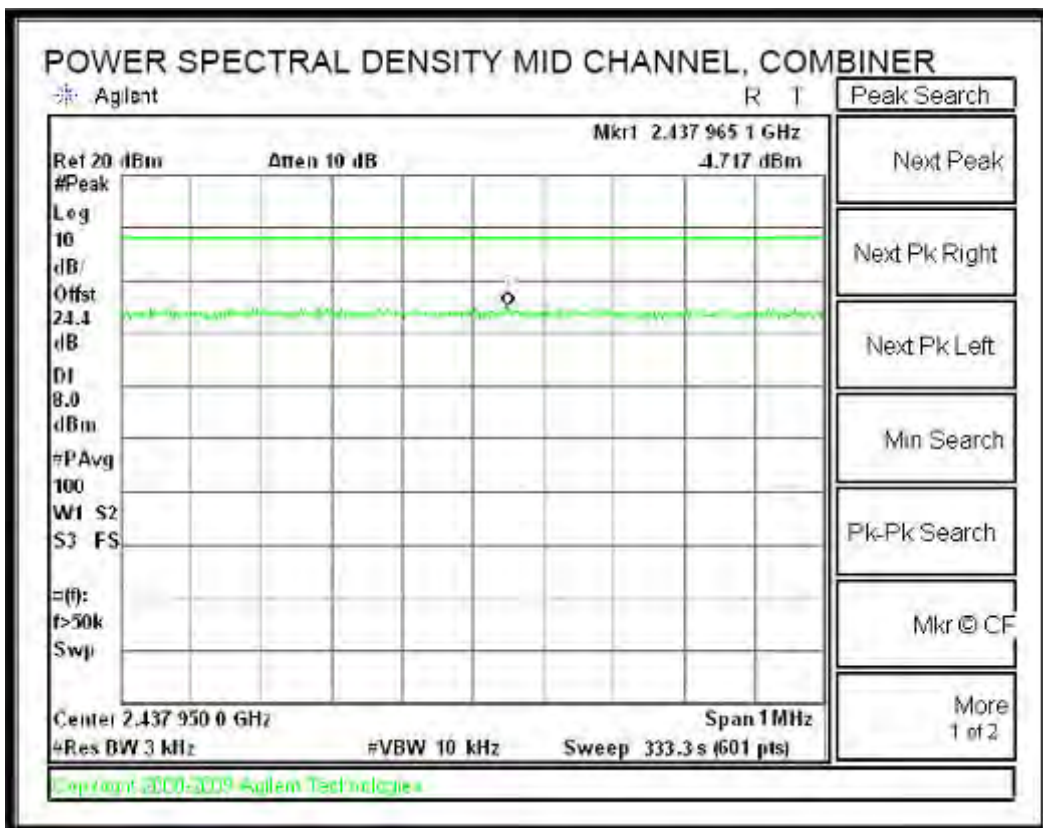
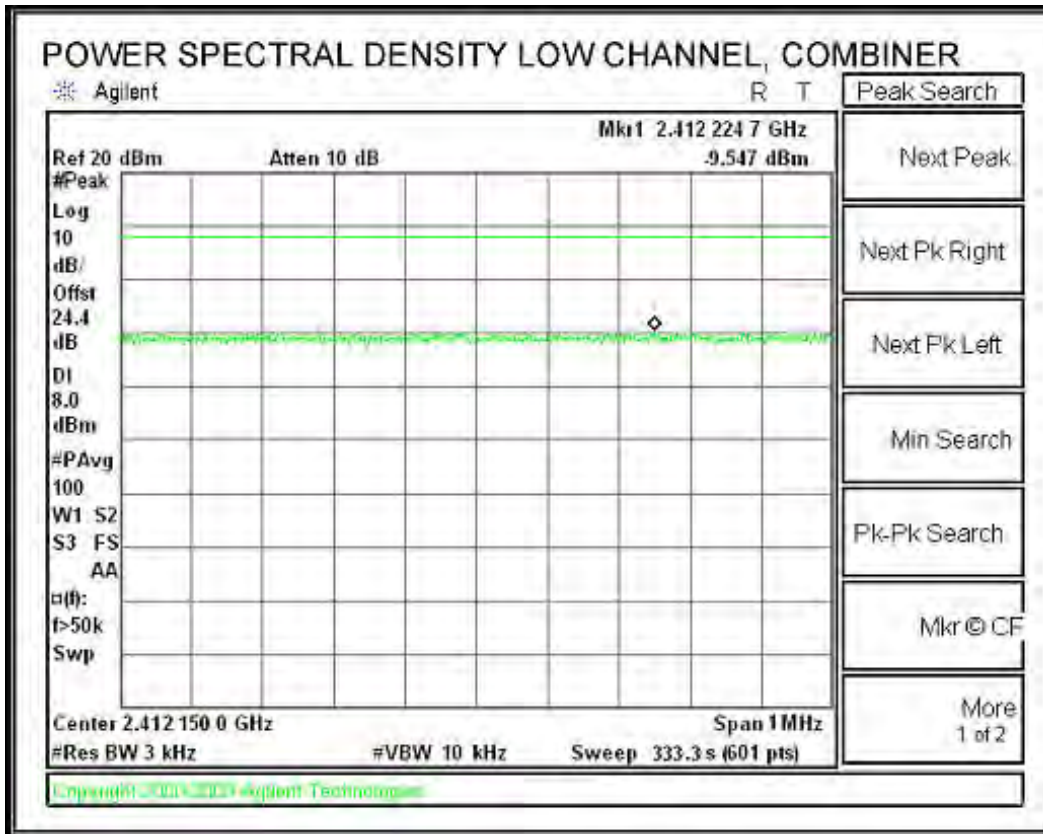
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412	-1.03	8	Complies
6	2437	-2.30	8	Complies
11	2462	-11.32	8	Complies

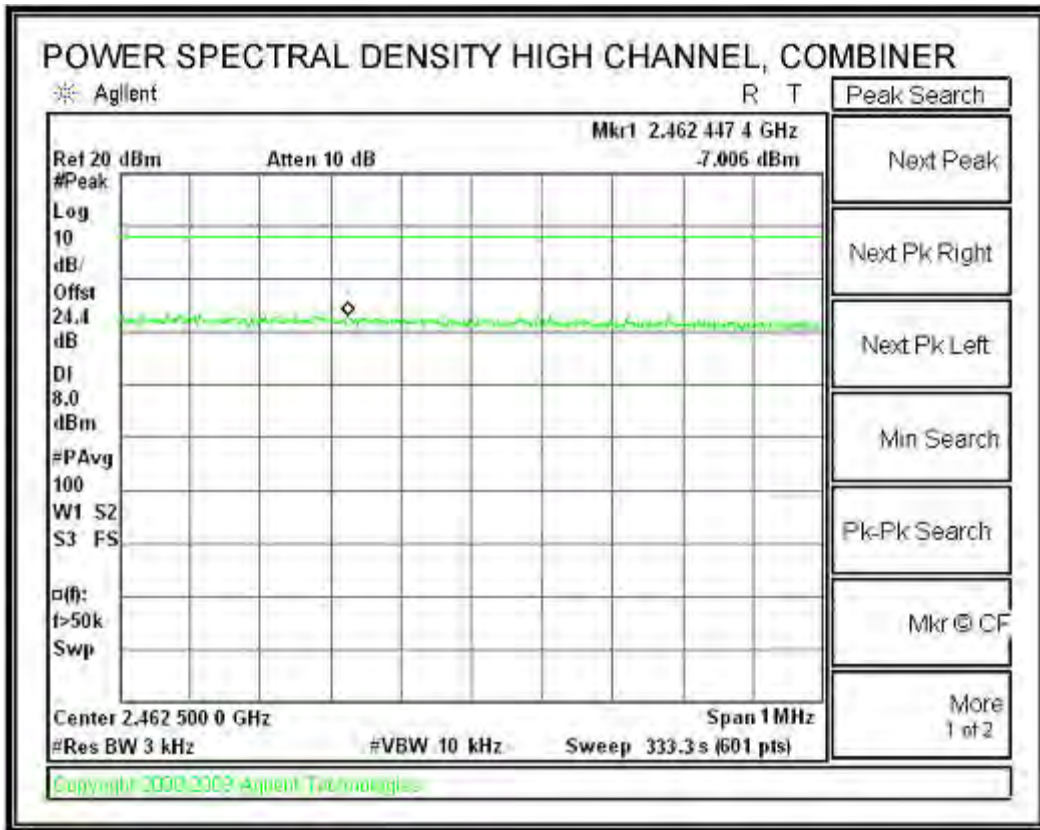
## 802.11n HT40

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2422	-7.02	8	Complies
6	2437	-6.37	8	Complies
11	2452	-9.84	8	Complies

802.11b channel power density

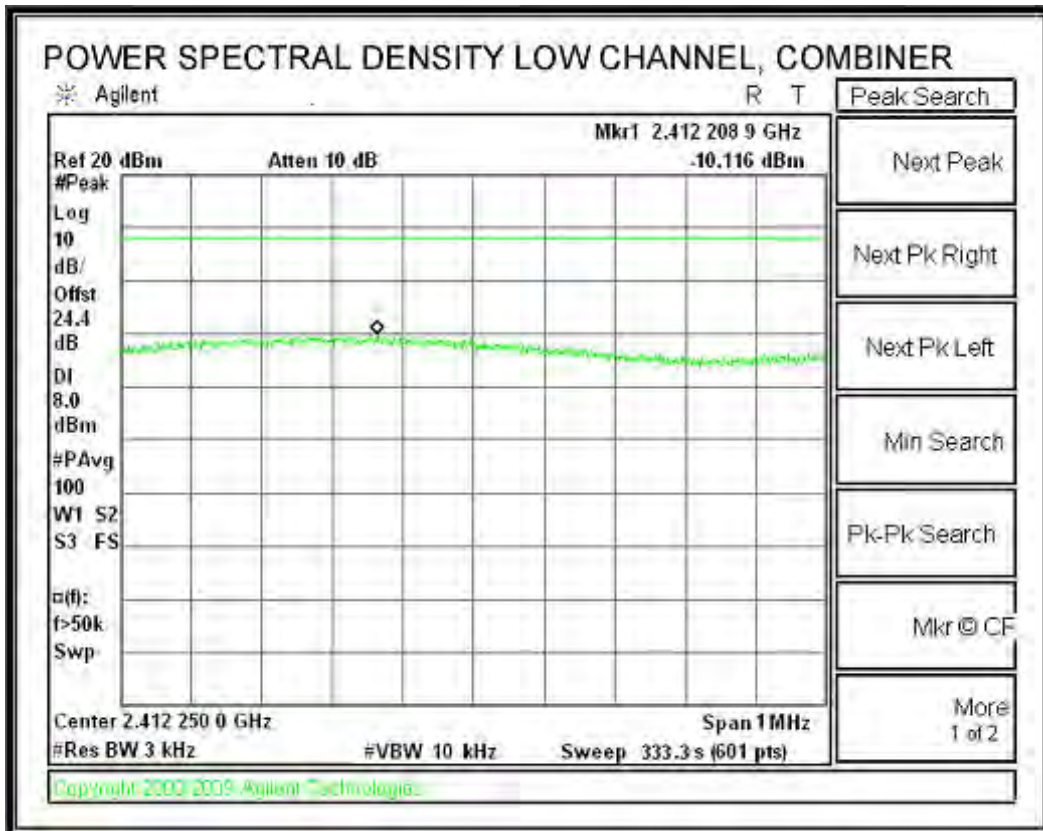
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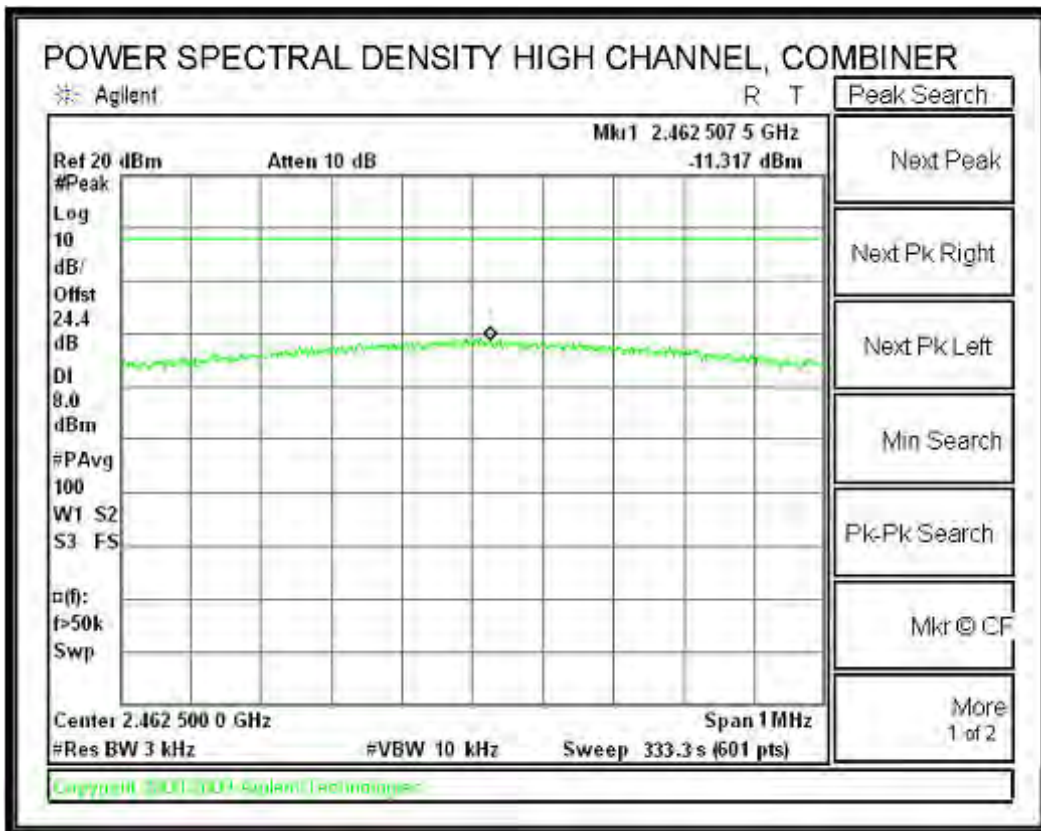
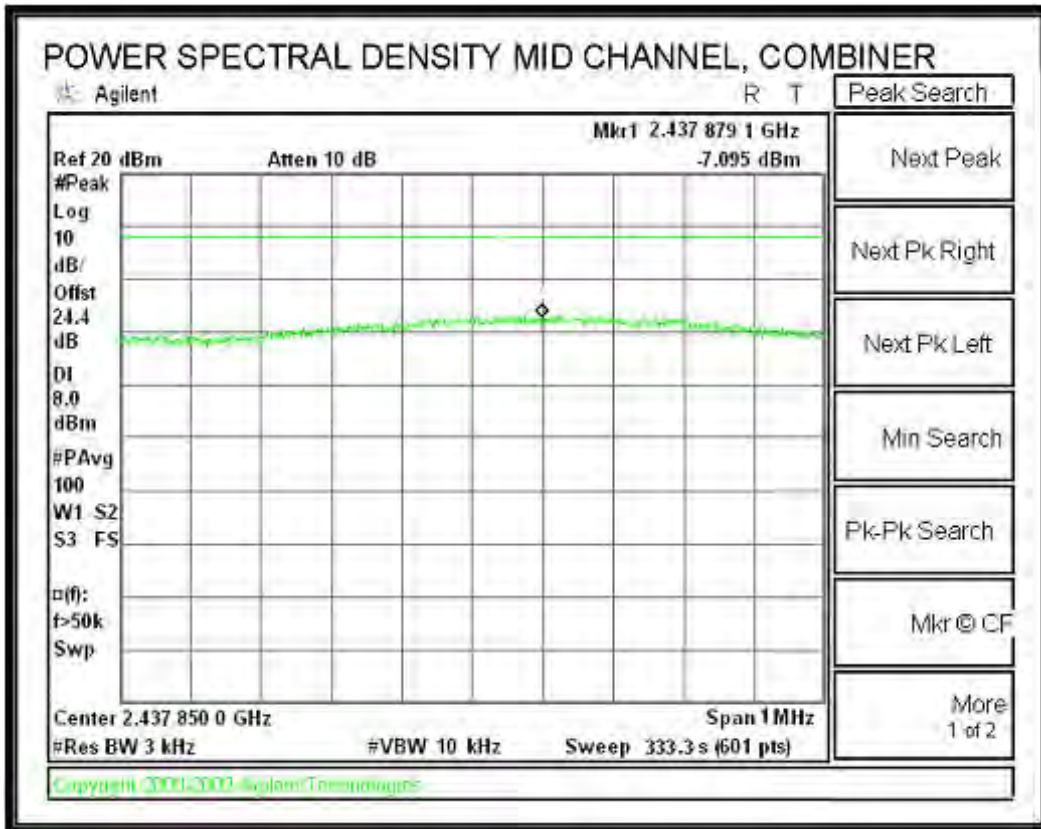




802.11g channel power density

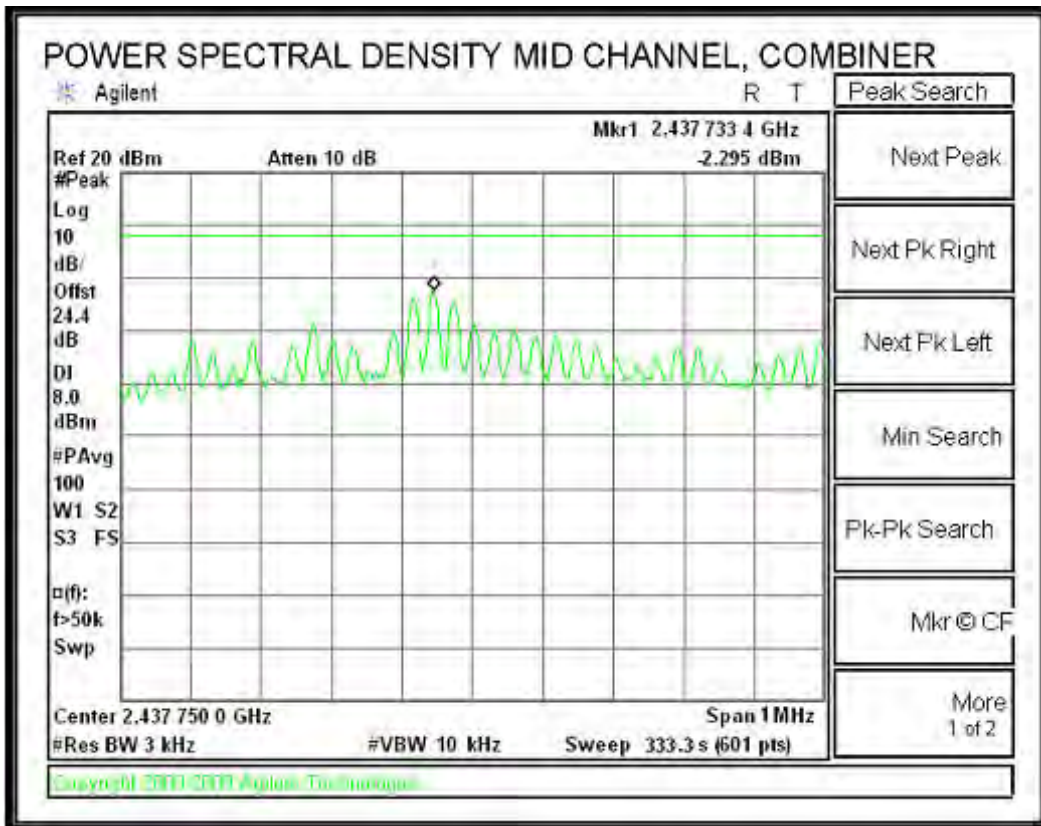
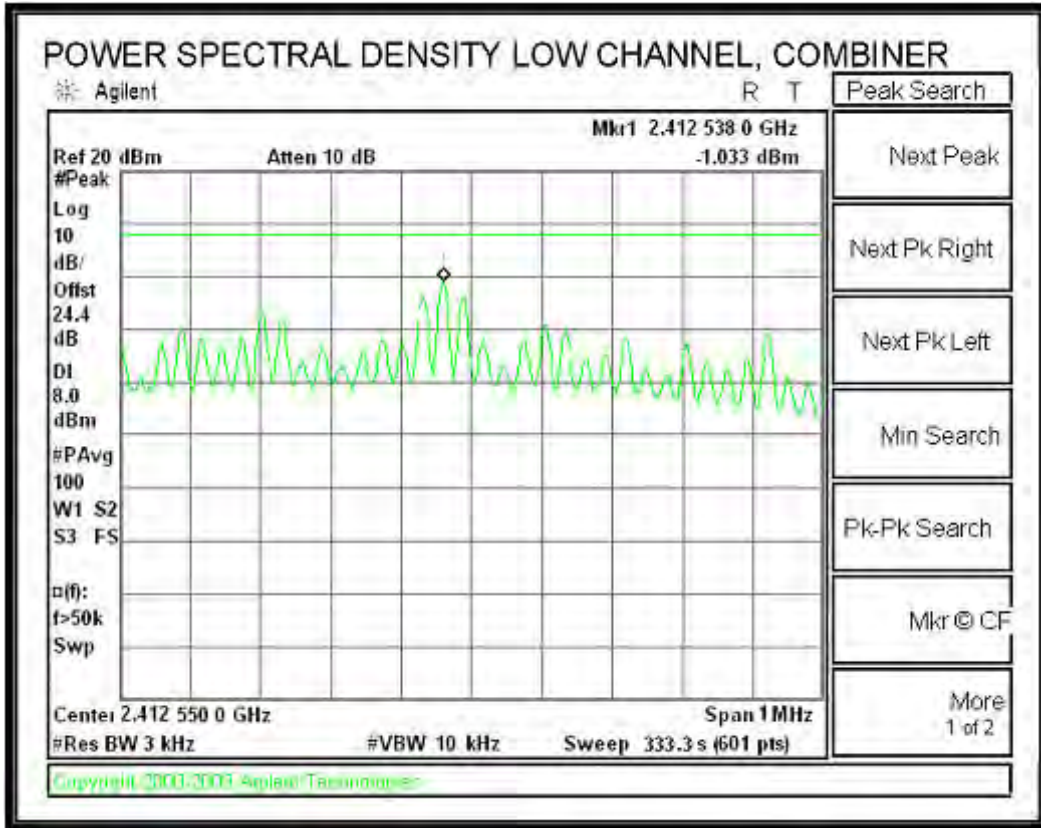
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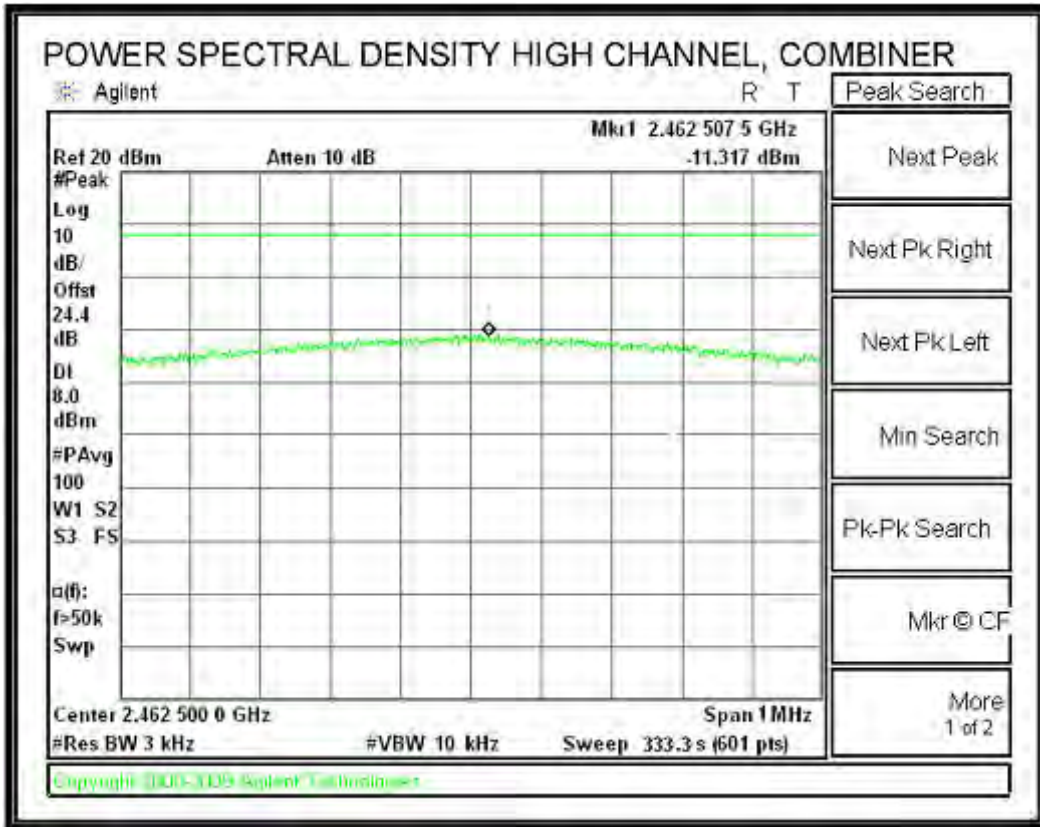




802.11n HT20 channel power density

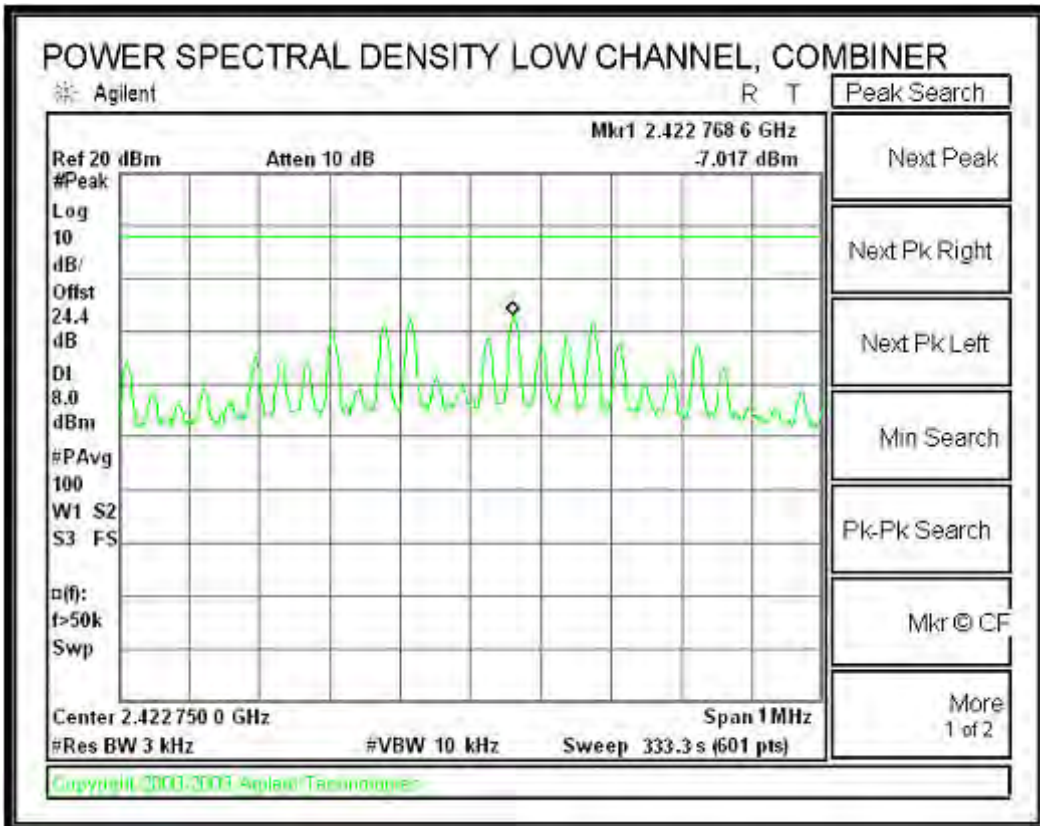
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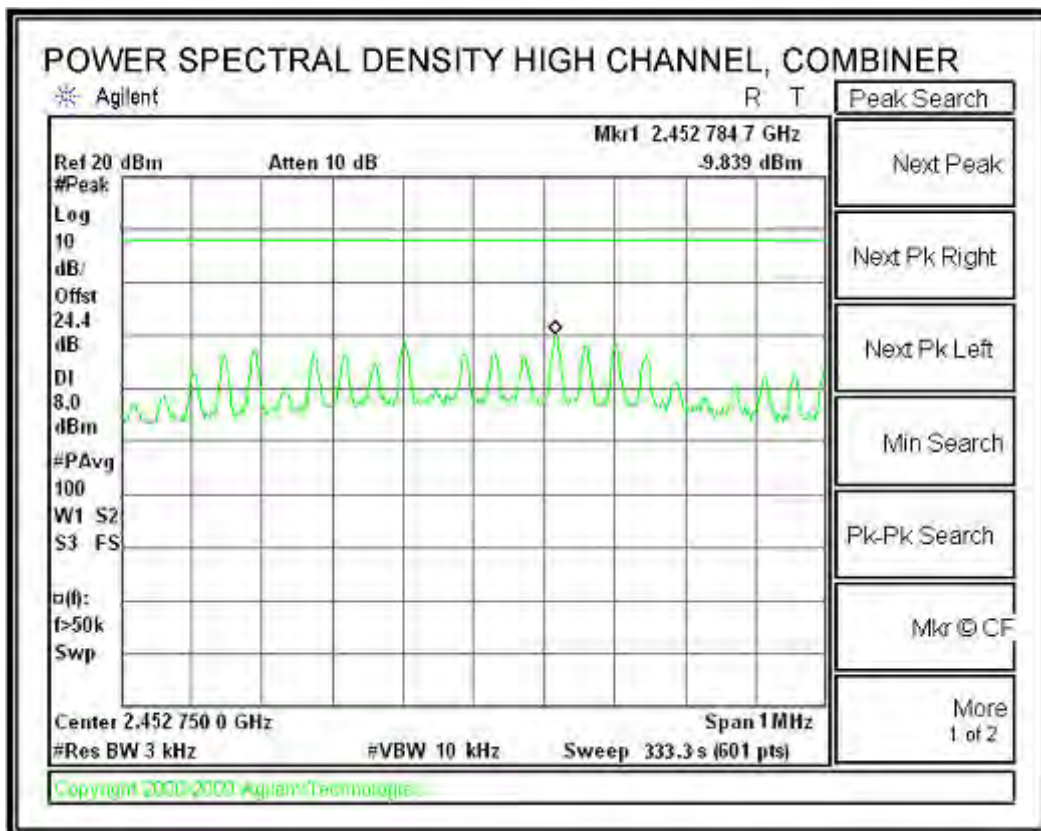
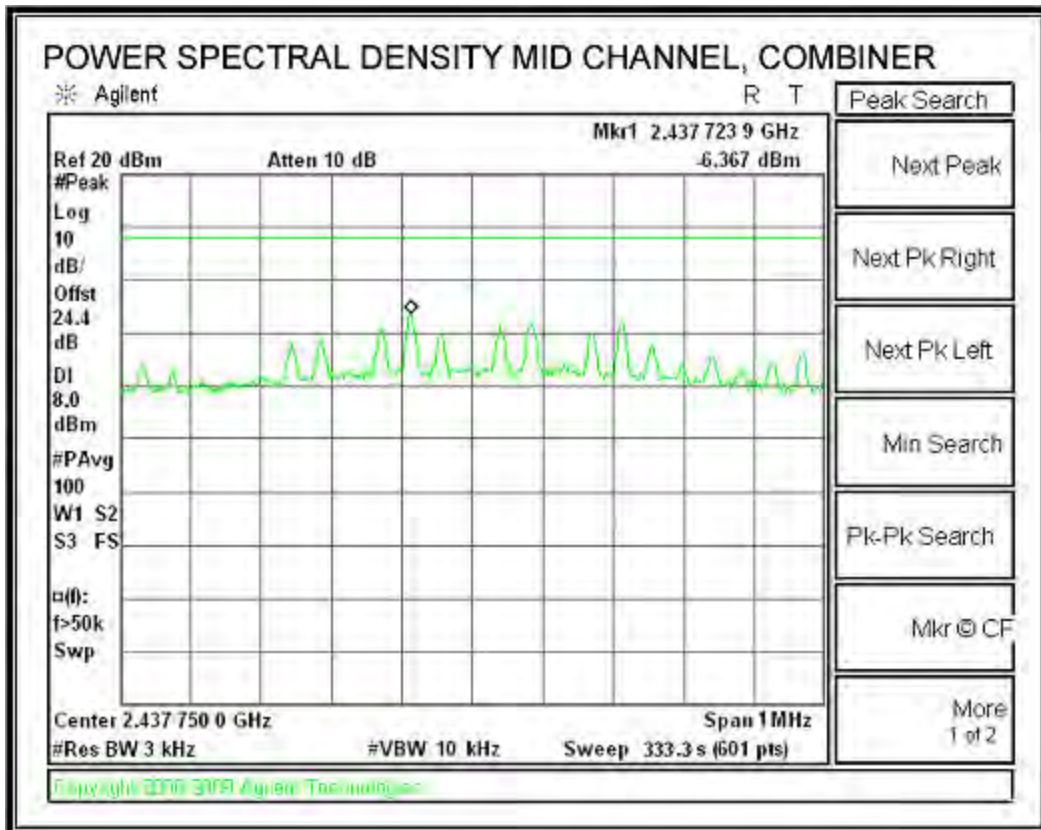


802.11n HT40 channel power density

Date: May 04, 2012







### 5.3. 6 dB Spectrum Bandwidth Measurement

#### 5.3.1. Standard Applicable

According to §15.247(a)(2): For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

#### 5.3.2. Measuring Instruments and Setting

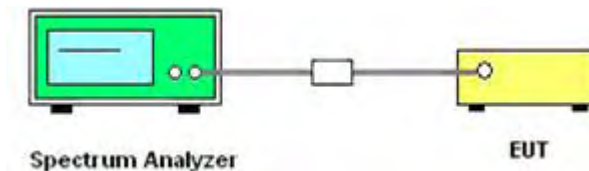
Please refer to section 6 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> RBW
Detector	Peak
Trace	Max Hold
Sweep Time	100ms

#### 5.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.

#### 5.3.4. Test Setup Layout



#### 5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

#### 5.3.6. Test Result of 6dB Spectrum Bandwidth

Temperature	25°C	Humidity	60%
Test Engineer	Vito Cao	Configurations	802.11b,g,n

## 802.11b

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	10.0	500	Complies
6	2437	10.0	500	Complies
11	2462	9.0	500	Complies

## 802.11g

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	16.33	500	Complies
6	2437	16.30	500	Complies
11	2462	16.31	500	Complies

## 802.11n HT20

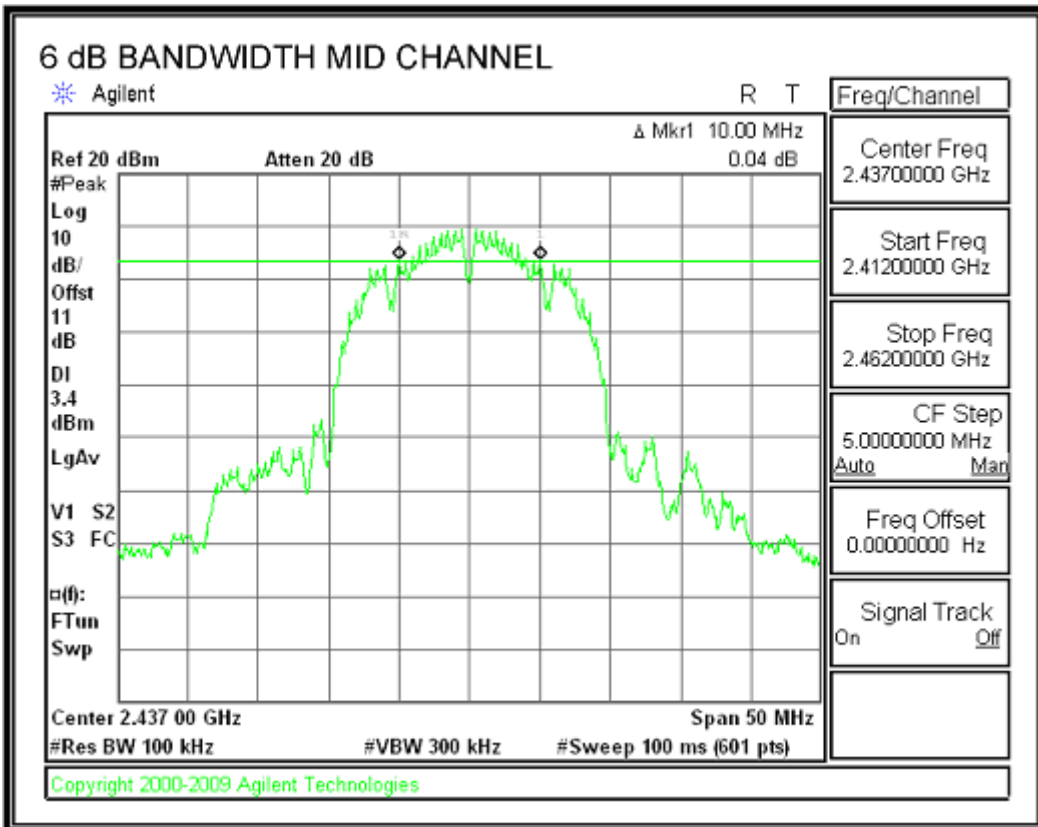
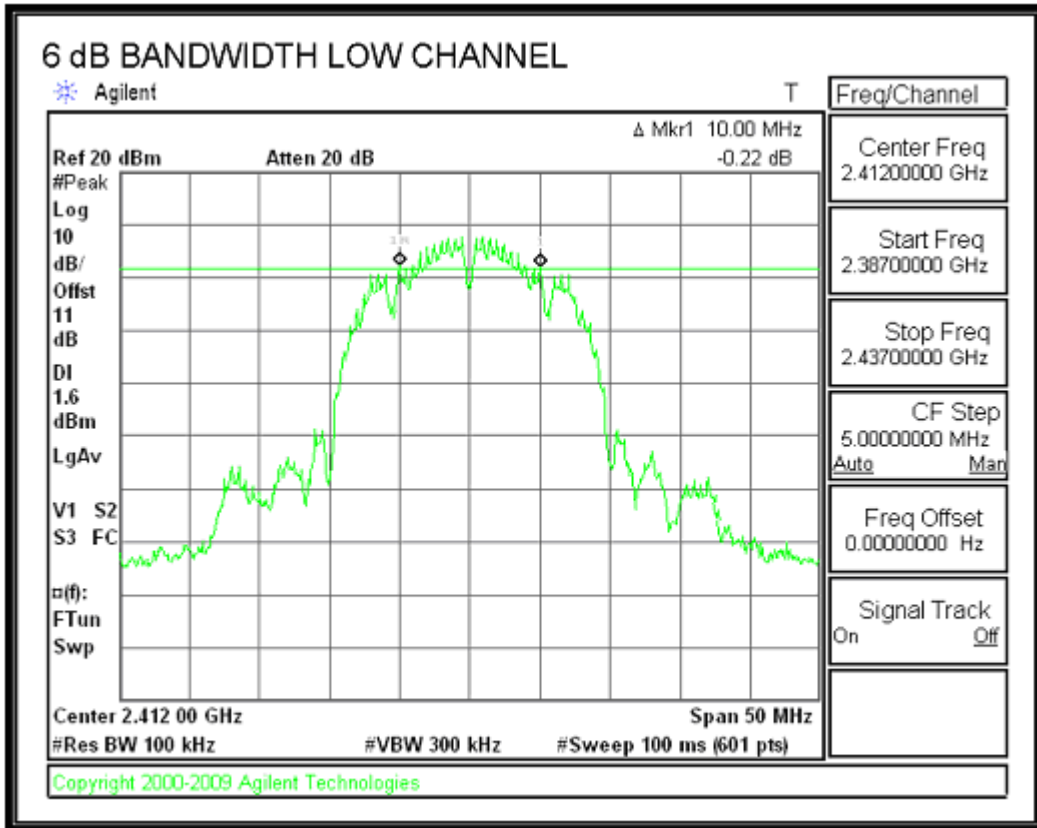
Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	17.08	500	Complies
6	2437	16.92	500	Complies
11	2462	17.25	500	Complies

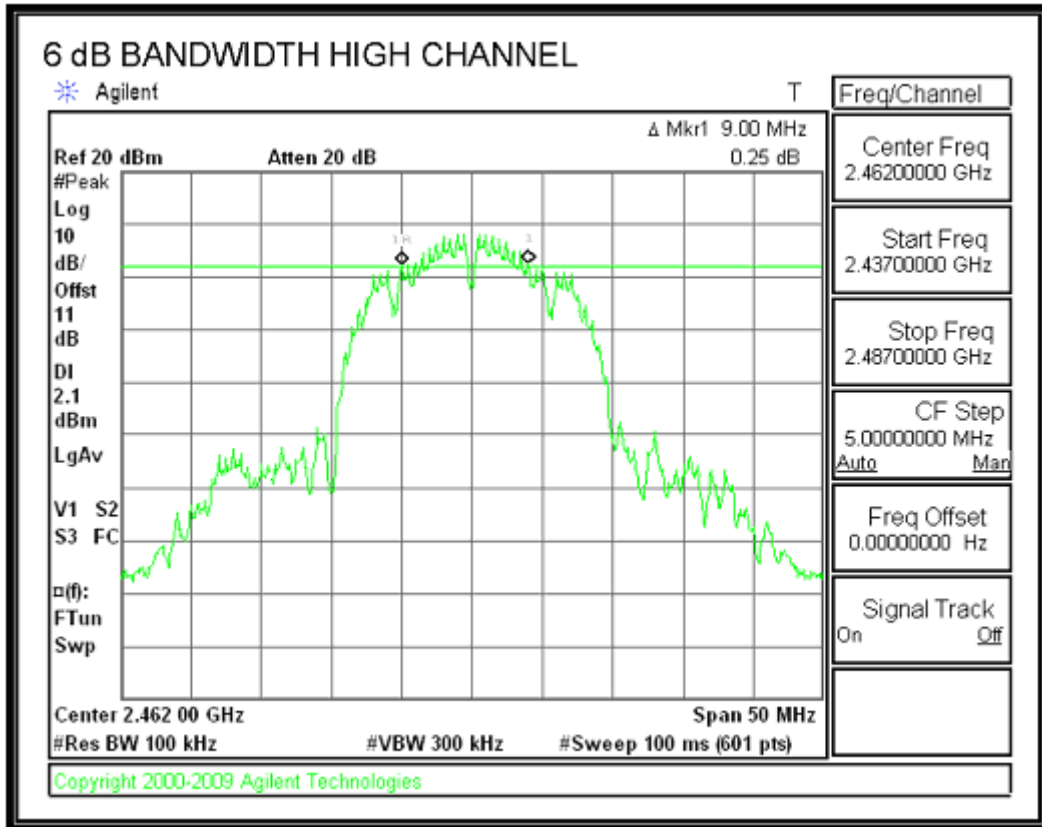
## 802.11n HT40

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	35.33	500	Complies
6	2437	35.60	500	Complies
11	2462	35.47	500	Complies

802.11b channel, 6dB bandwidth

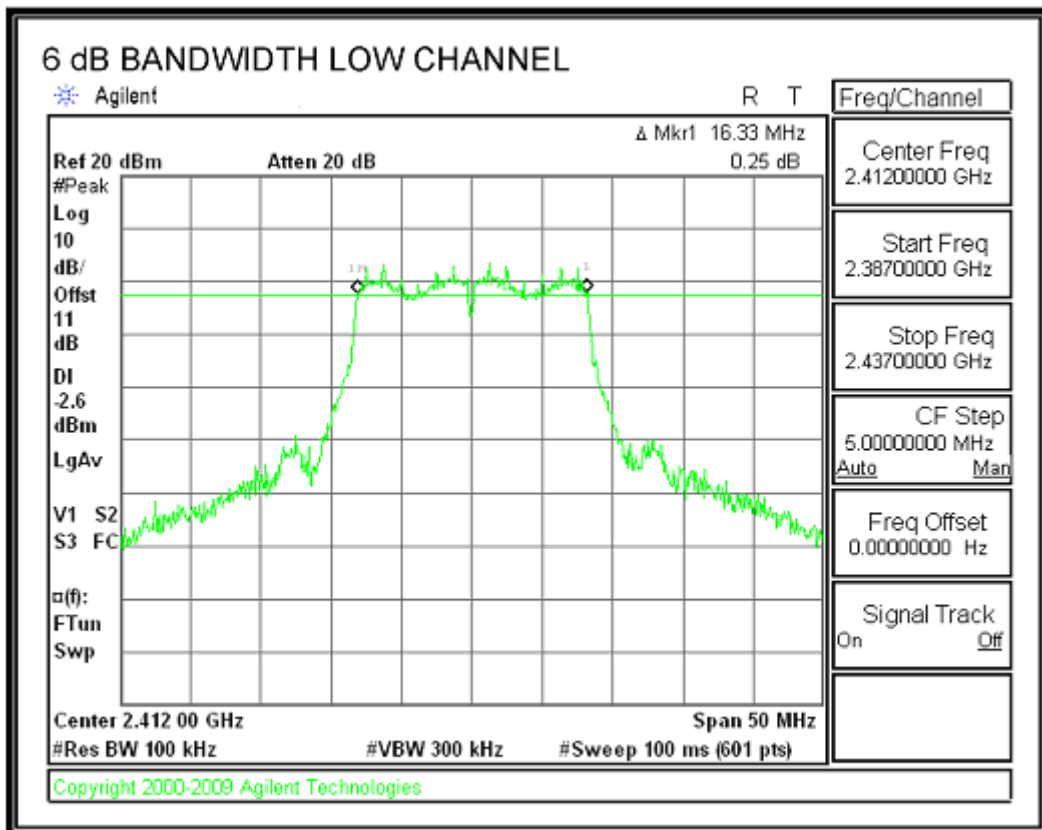
Date: May 04, 2012

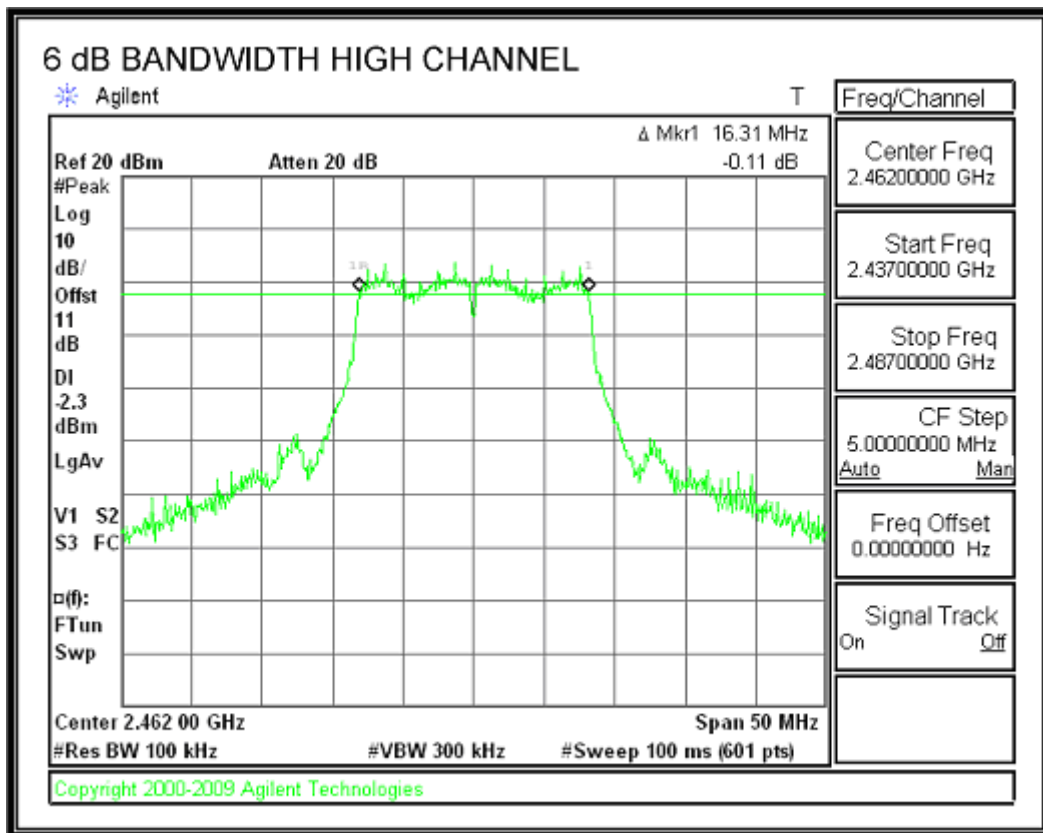
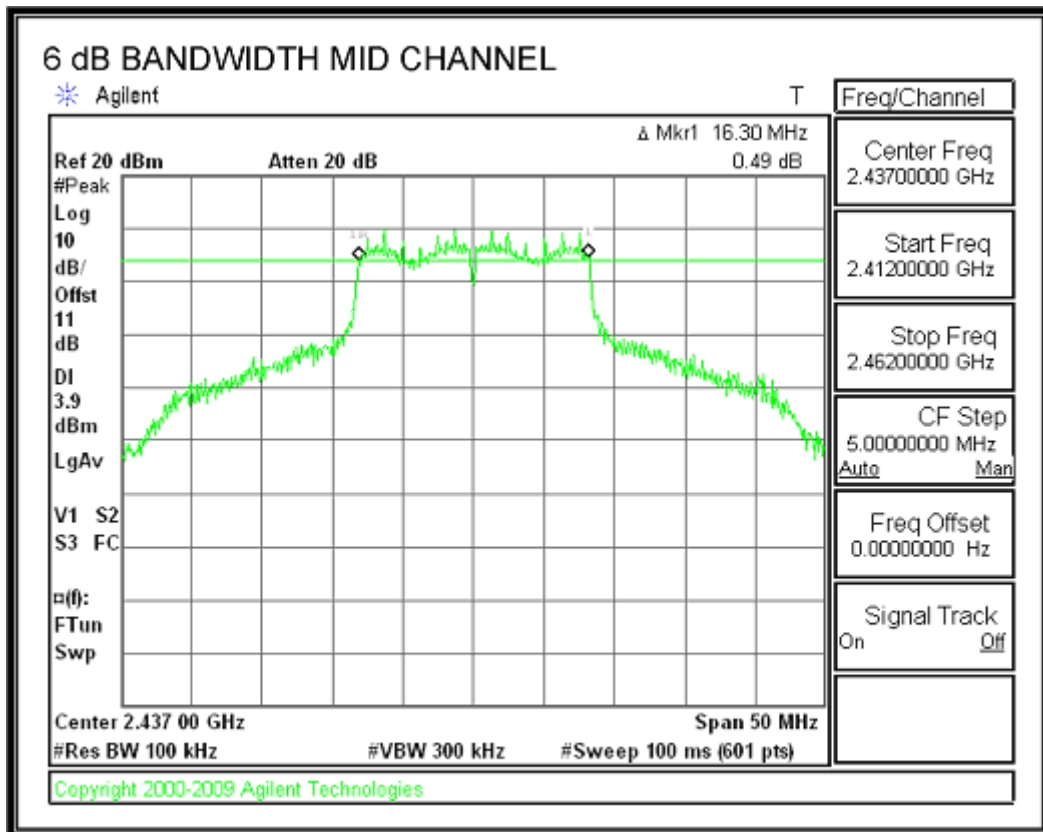




802.11g channel, 6dB bandwidth

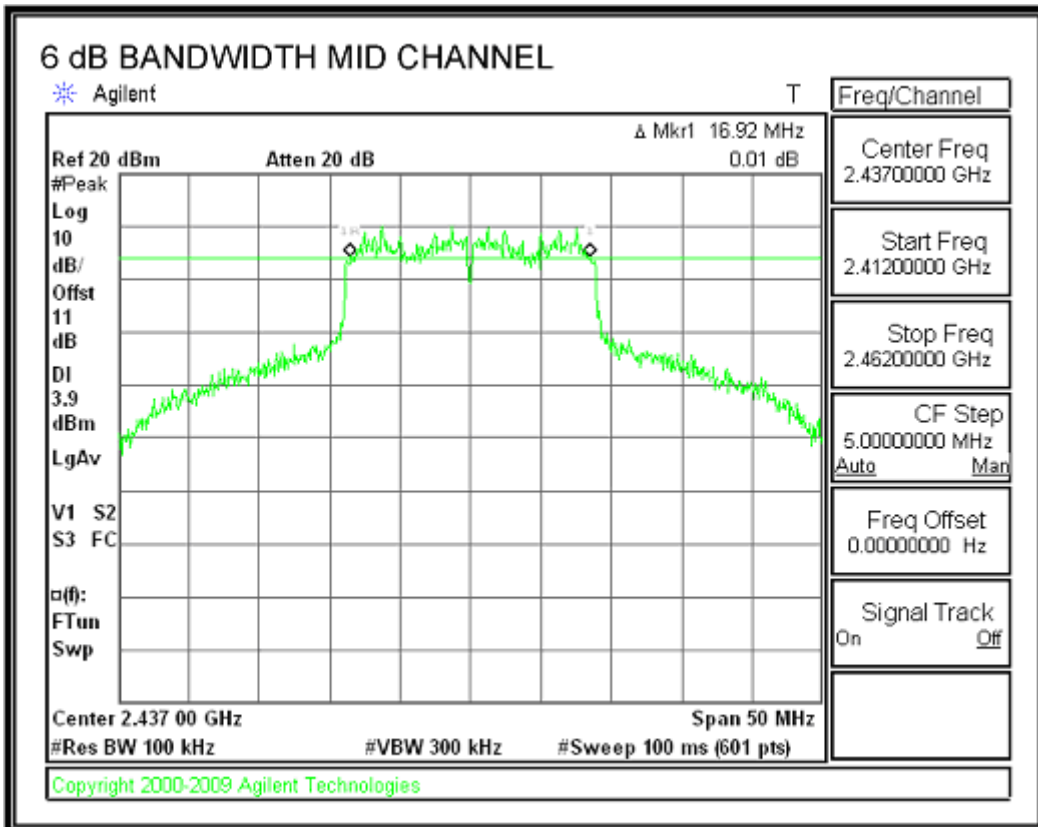
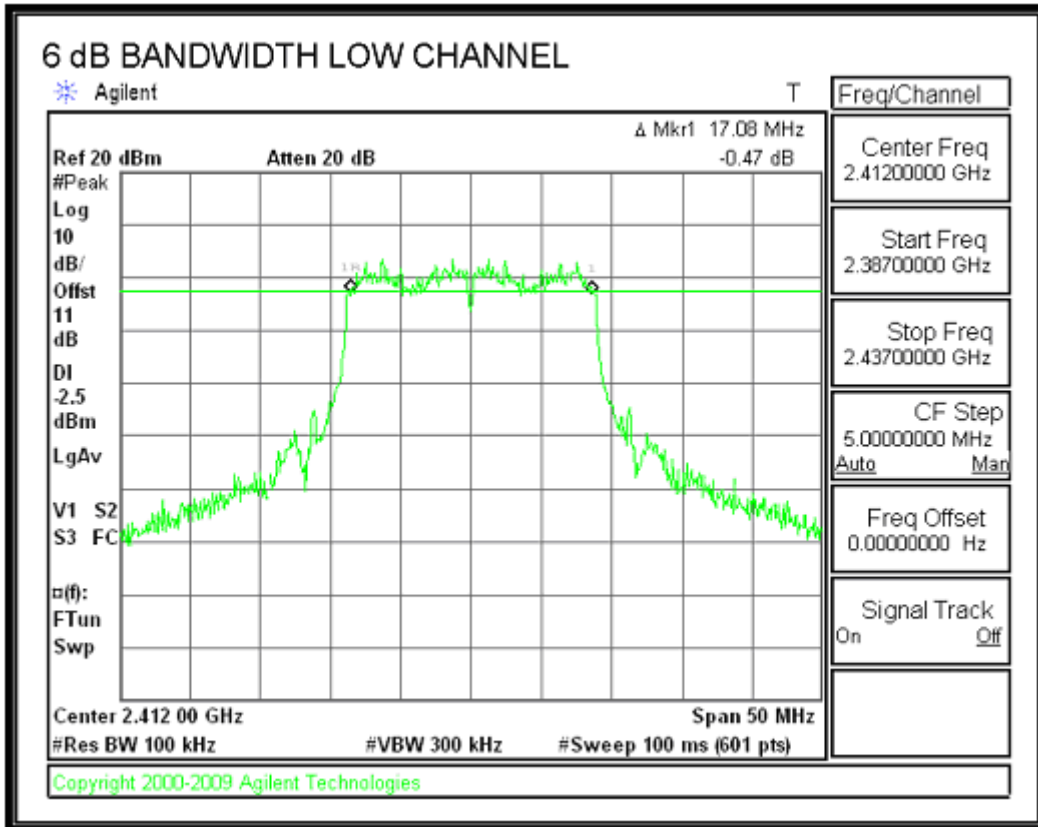
Date: May 04, 2012

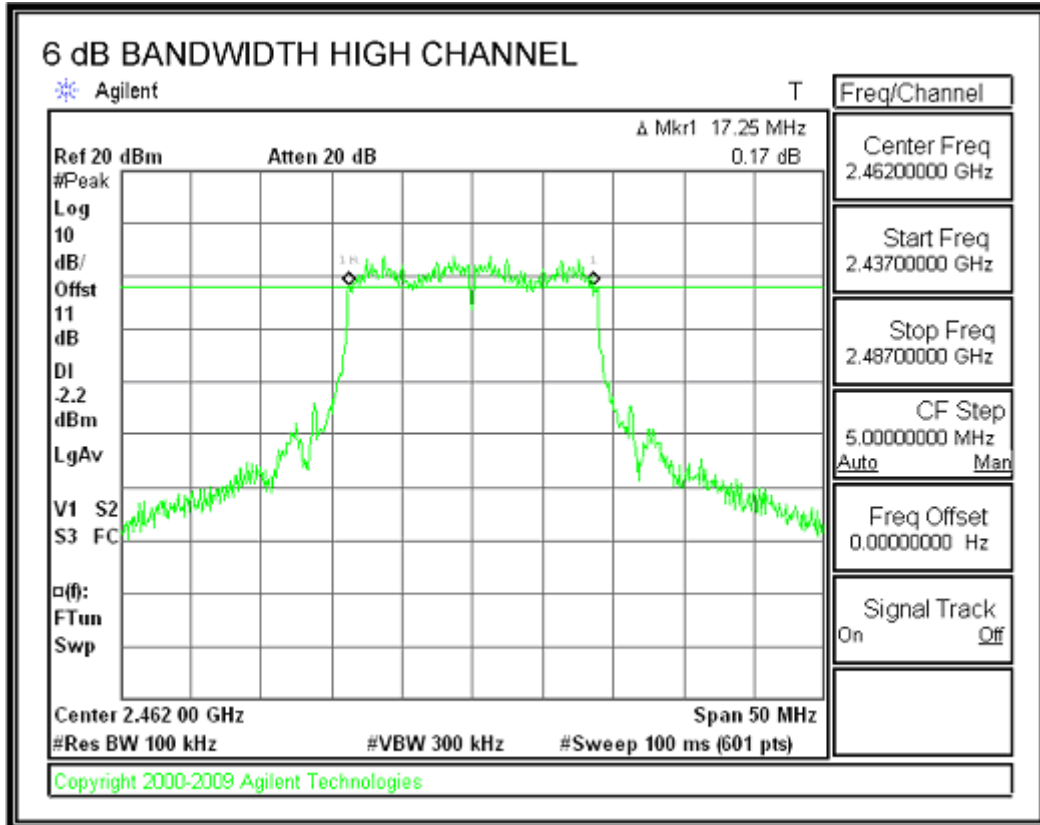




802.11n HT20 channel, 6dB bandwidth

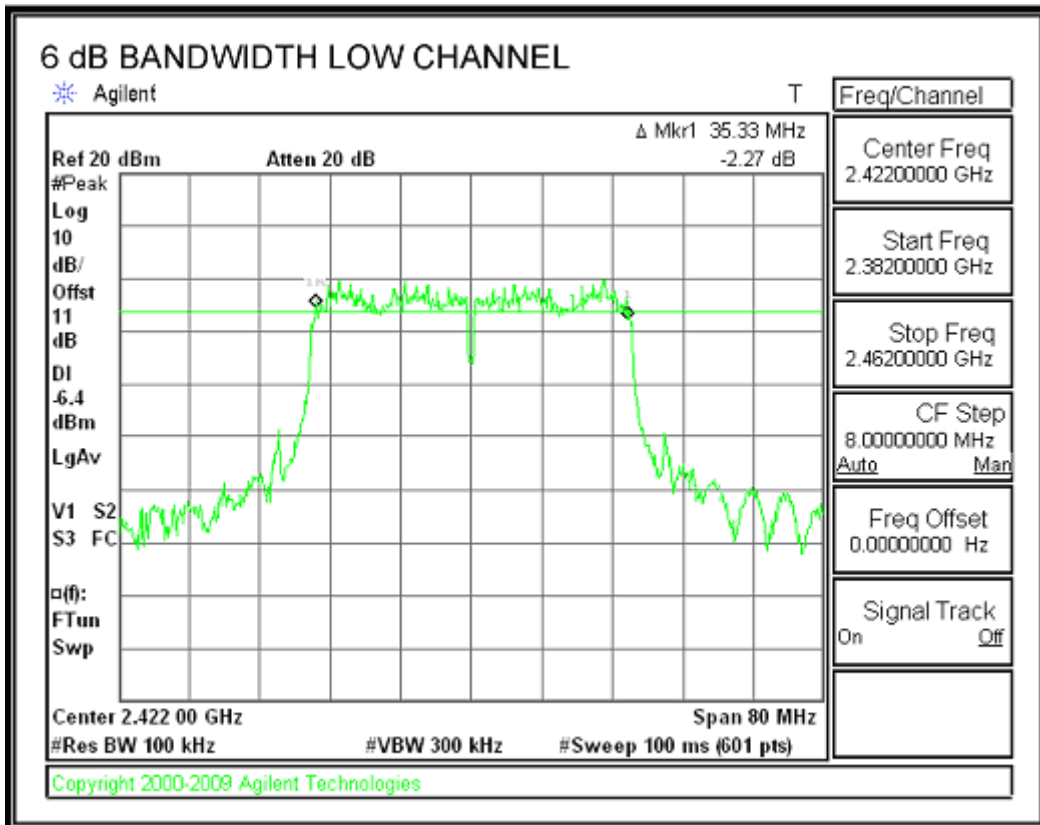
Date: May 04, 2012



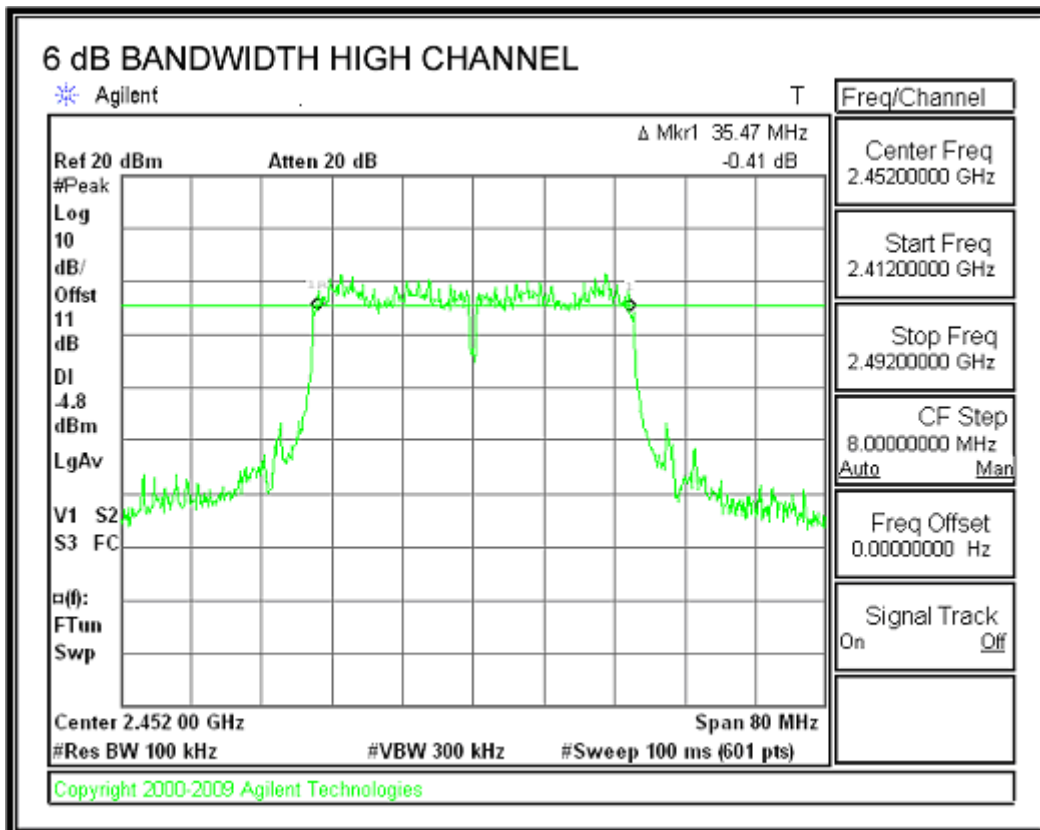
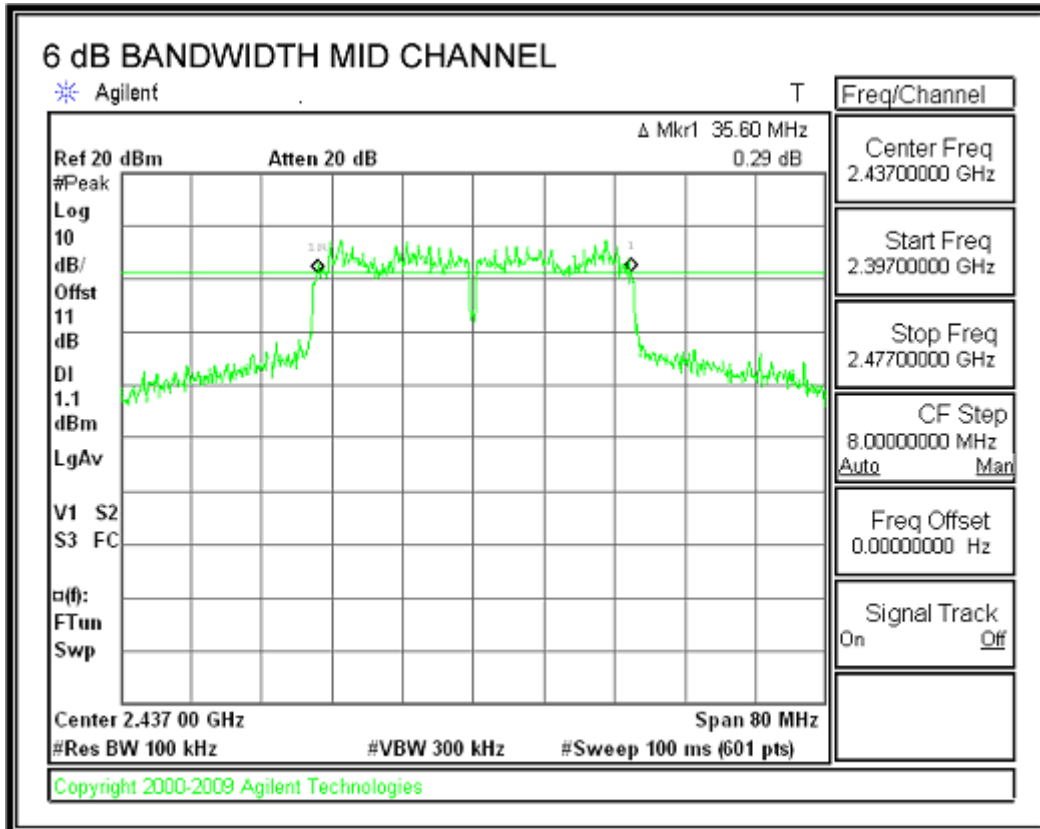


802.11n HT40 channel, 6dB bandwidth

Date: May 04, 2012







## 5.4. Occupied Bandwidth

### 5.4.1. Standard Applicable

According to §15.247(a): Operation under the provisions of this section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

For systems using digital modulation techniques, the EUT may operate in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

### 5.4.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

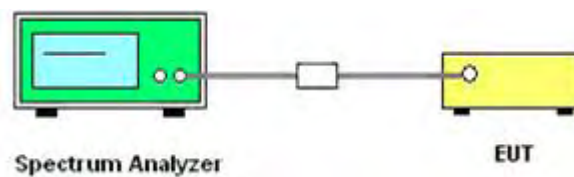
Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> RBW
RBW	1% to 3% of the band
VBW	3 times the RBW
Detector	Peak
Trace	Max Hold
Sweep Time	100ms

## 5

### 5.4.3. Test Procedures

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

### 5.4.4. Test Setup Layout



### 5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

## 5.4.6. Test Result of 99% Occupied Bandwidth.

Temperature	25°C	Humidity	60%
Test Engineer	Vito Cao	Configurations	802.11b,g,n

## 802.11b

Channel	Frequency	99% OBW (MHz)	26dB BW (MHz)
1	2412	15.46	18.39
6	2437	15.63	18.39
11	2462	15.61	18.45

## 802.11g

Channel	Frequency	99% OBW (MHz)	26dB BW (MHz)
1	2412	16.36	18.64
6	2437	16.81	18.45
11	2462	16.49	18.38

## 802.11n HT20

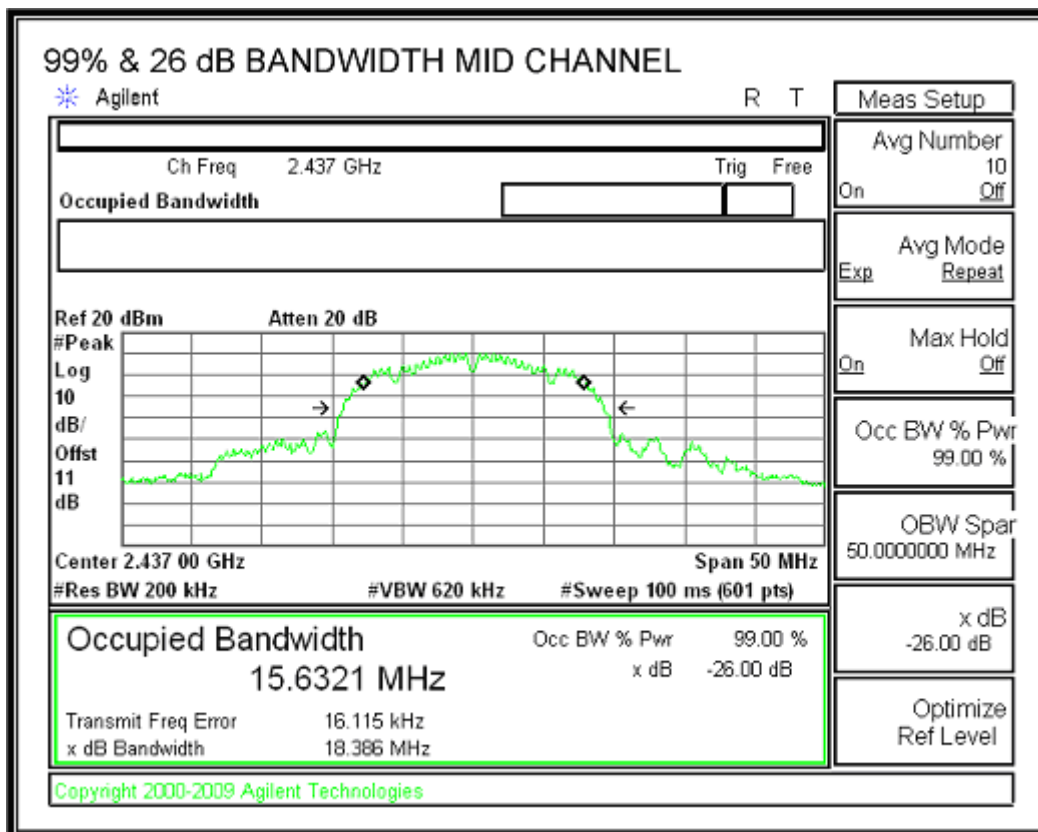
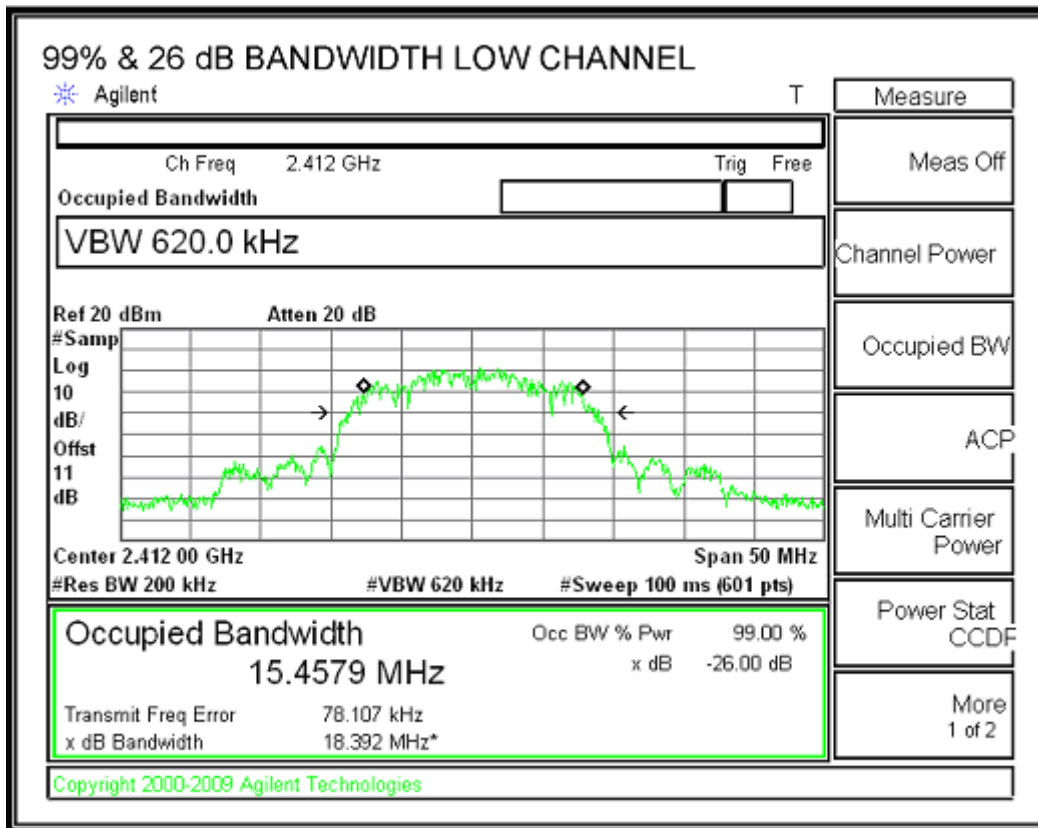
Channel	Frequency	99% OBW (MHz)	26dB BW (MHz)
1	2412	17.48	18.59
6	2437	17.49	28.95
11	2462	17.43	18.30

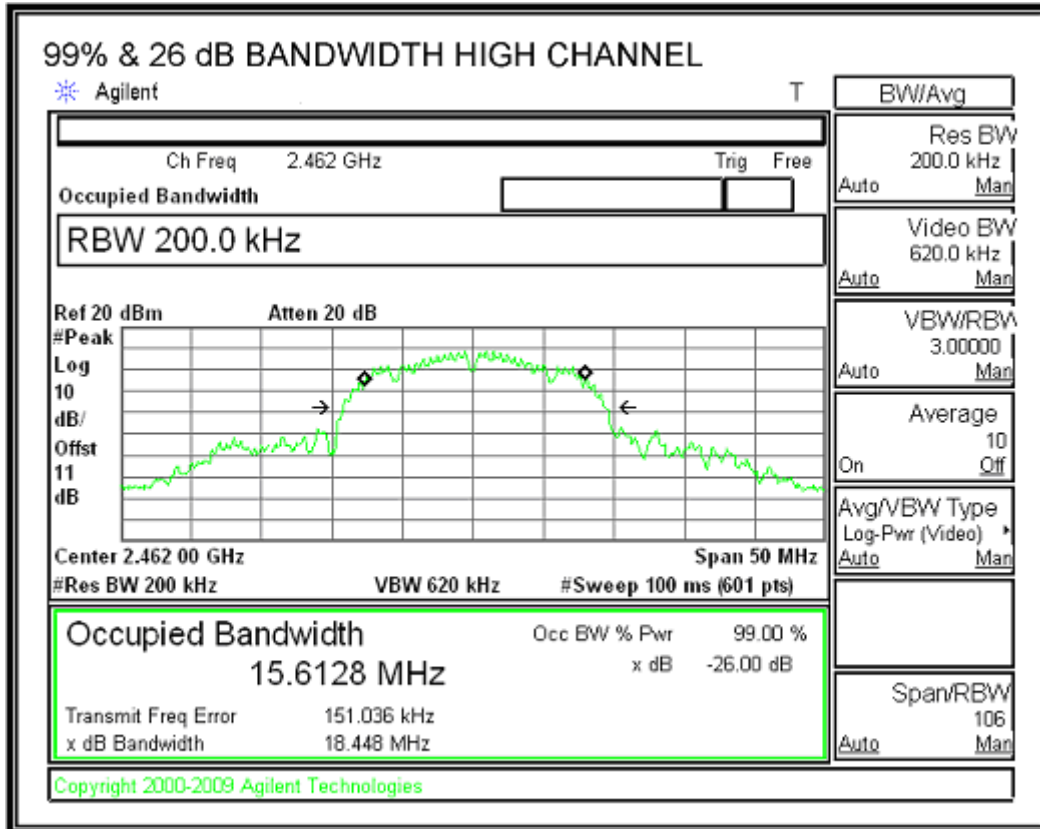
## 802.11n HT40

Channel	Frequency	99% OBW (MHz)	26dB BW (MHz)
1	2422	35.85	38.20
6	2437	36.29	74.18
11	2452	35.51	38.76

802.11b channel, 99% Occupied Bandwidth.

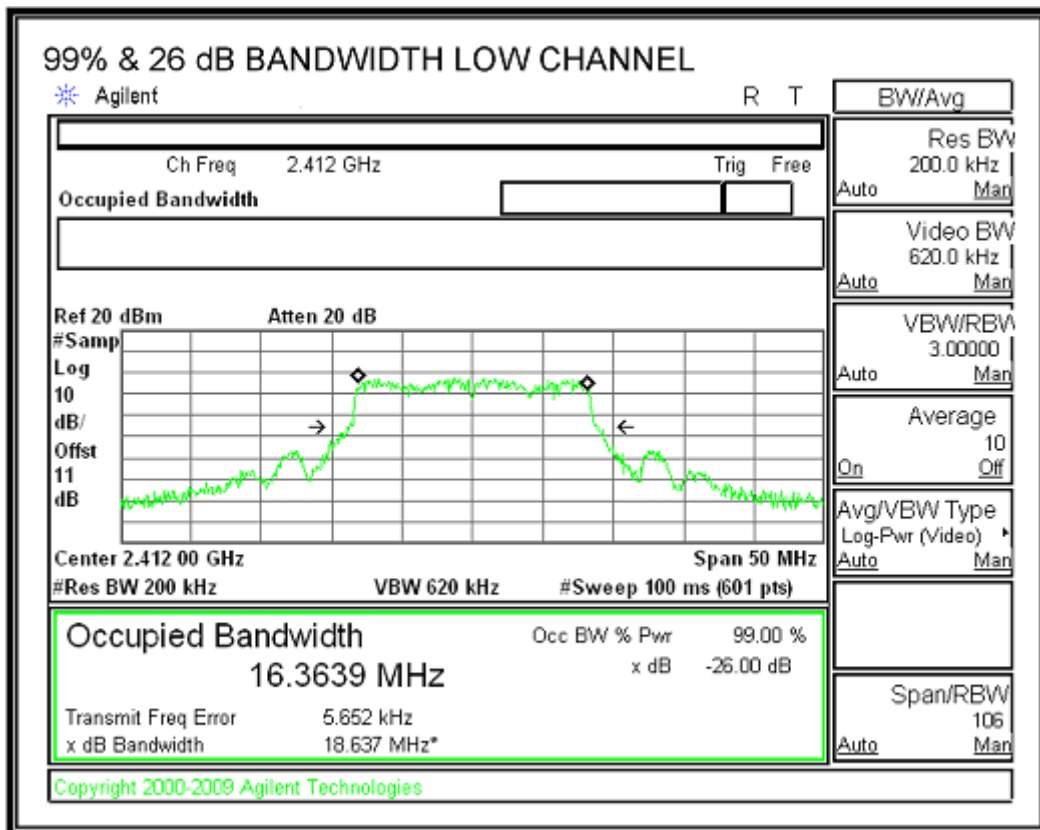
Date: May 04, 2012

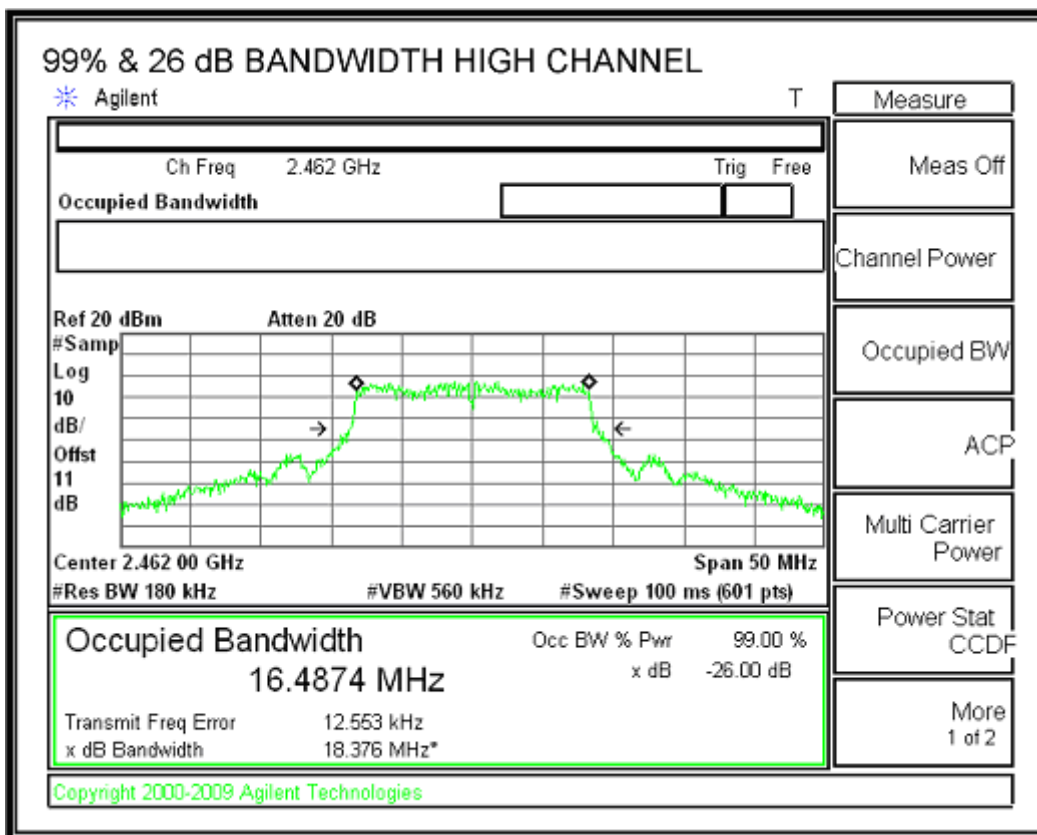
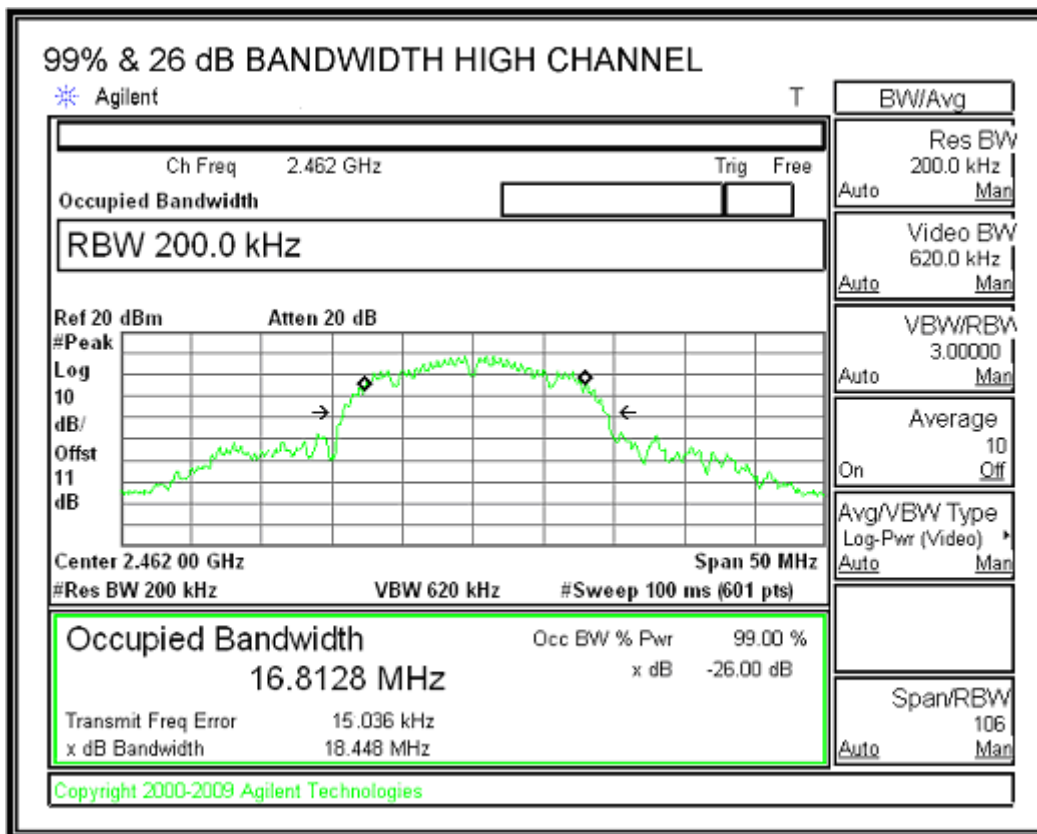




802.11g channel, 99% Occupied Bandwidth.

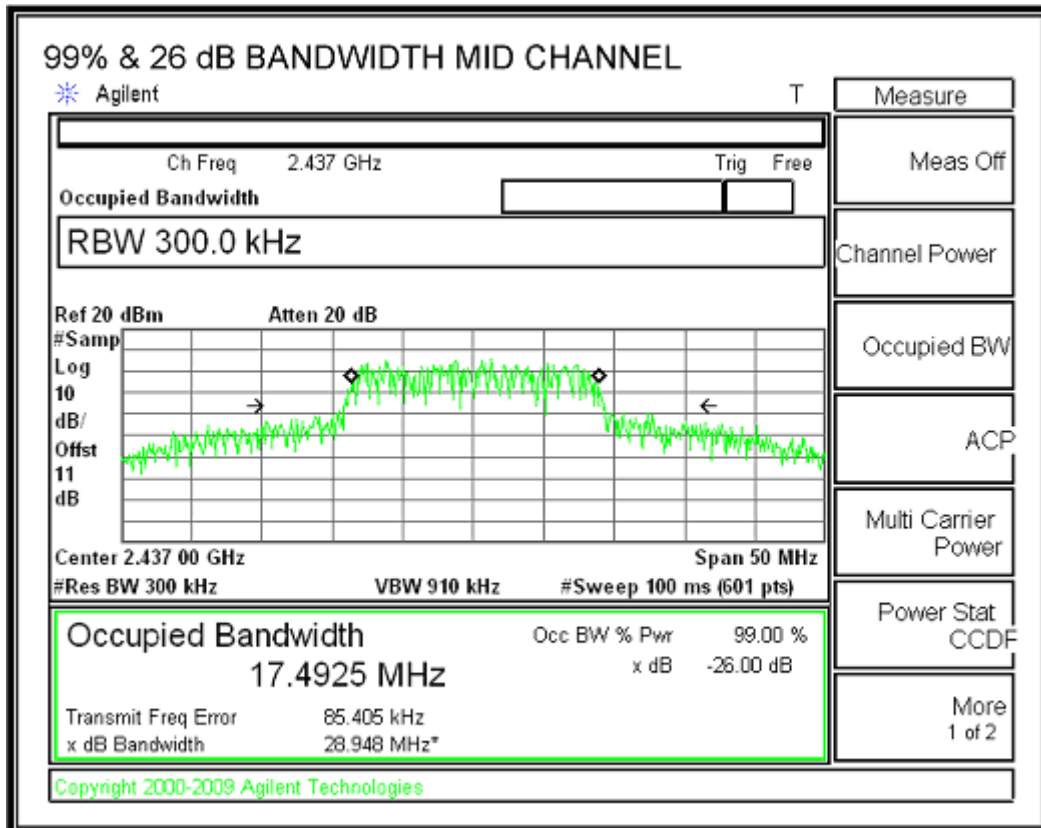
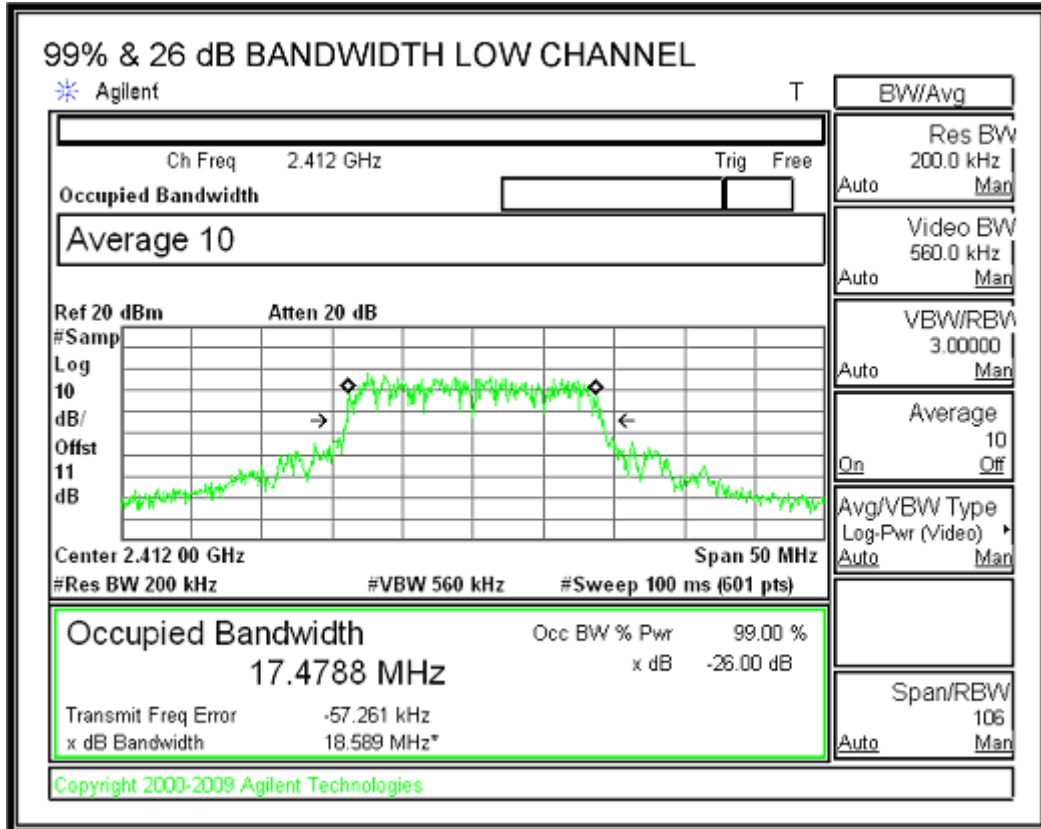
Date: May 04, 2012

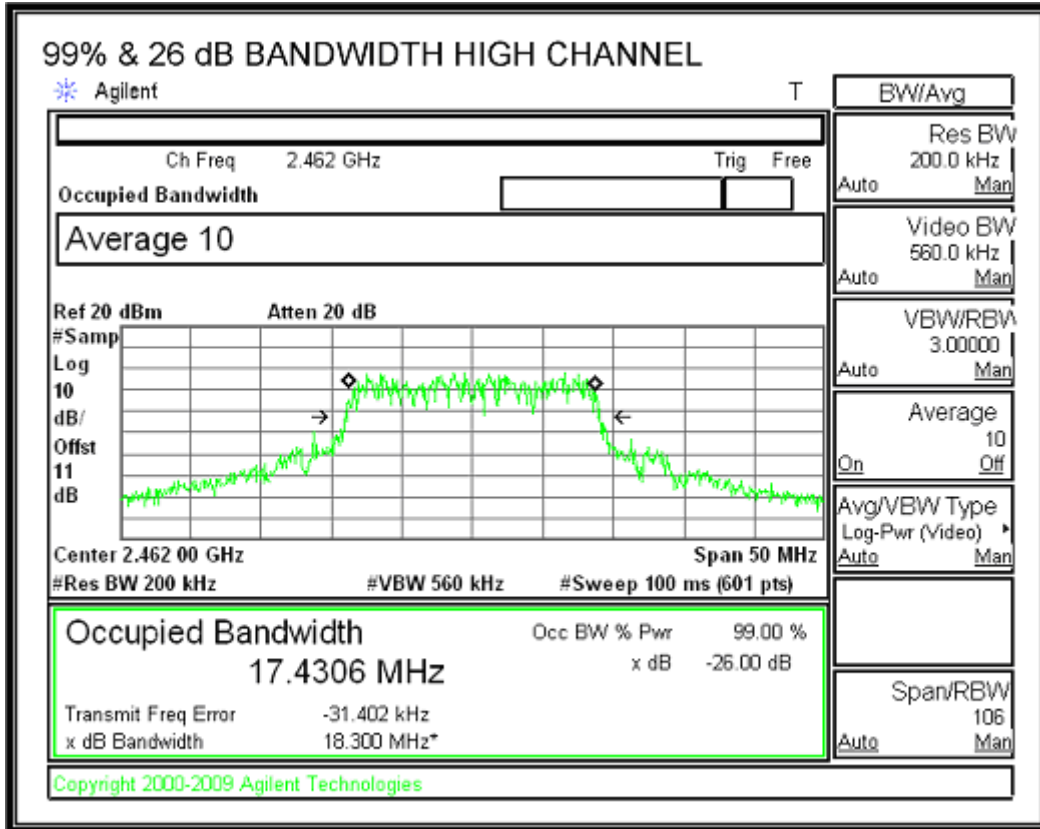




802.11n HT20 channel, 99% Occupied Bandwidth.

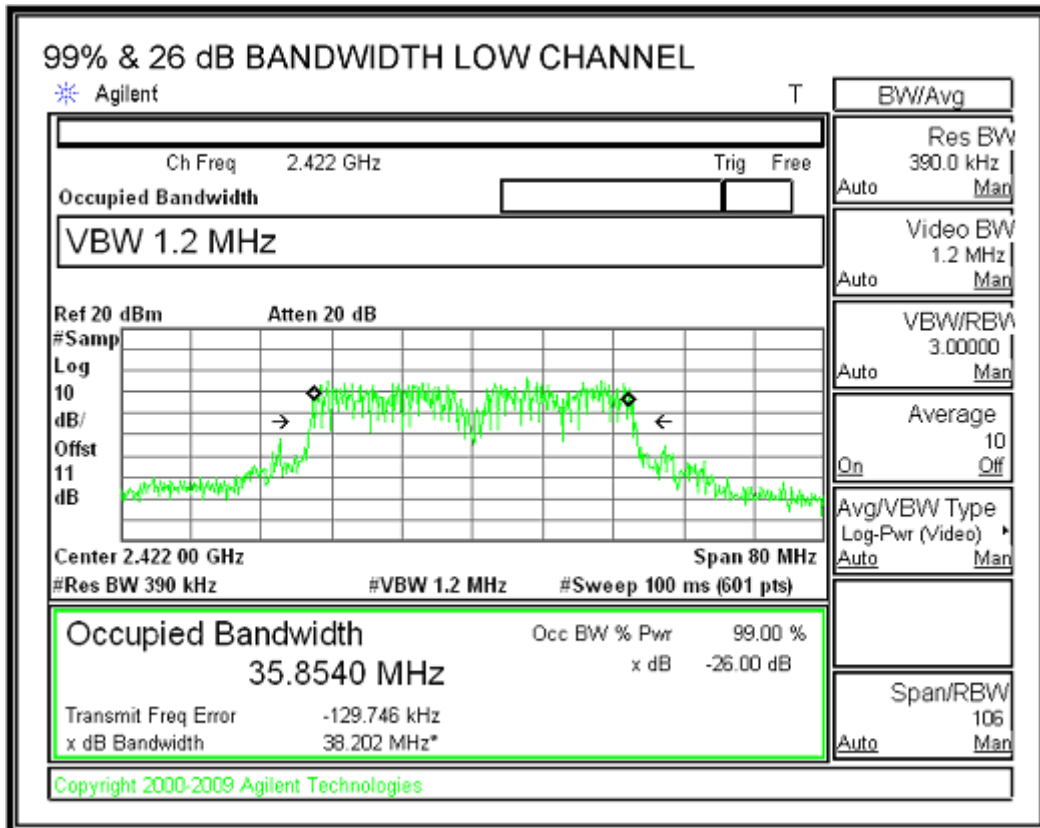
Date: May 04, 2012



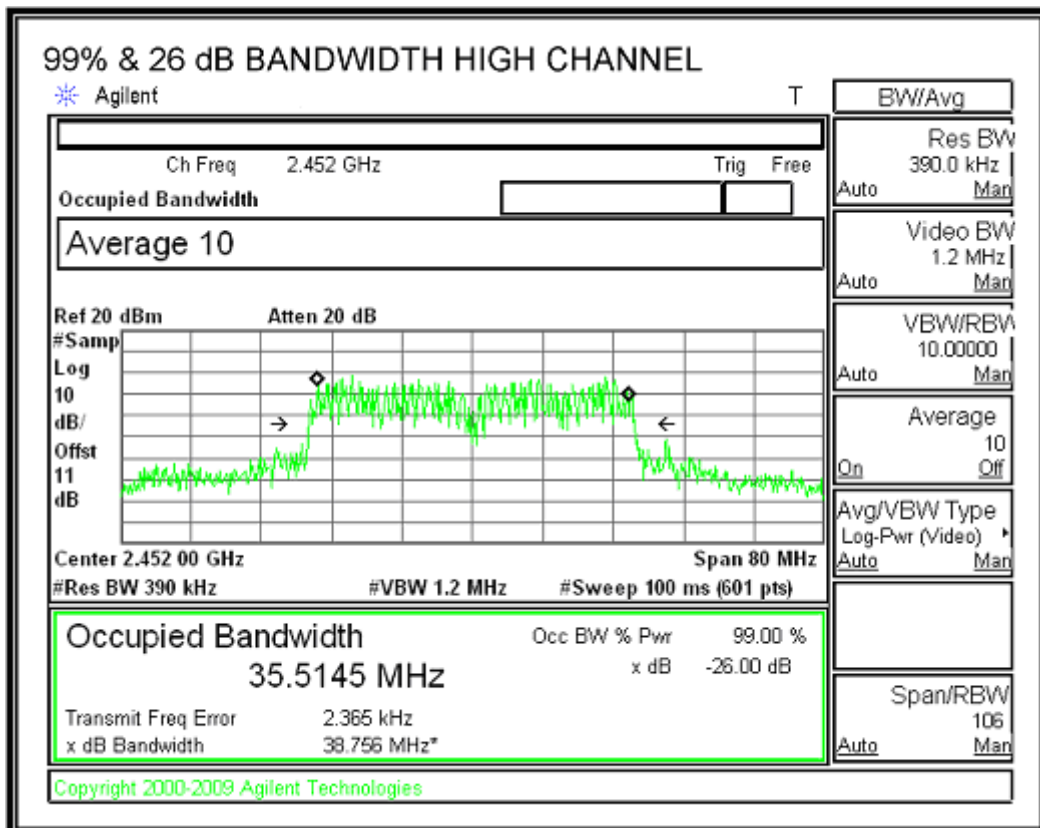
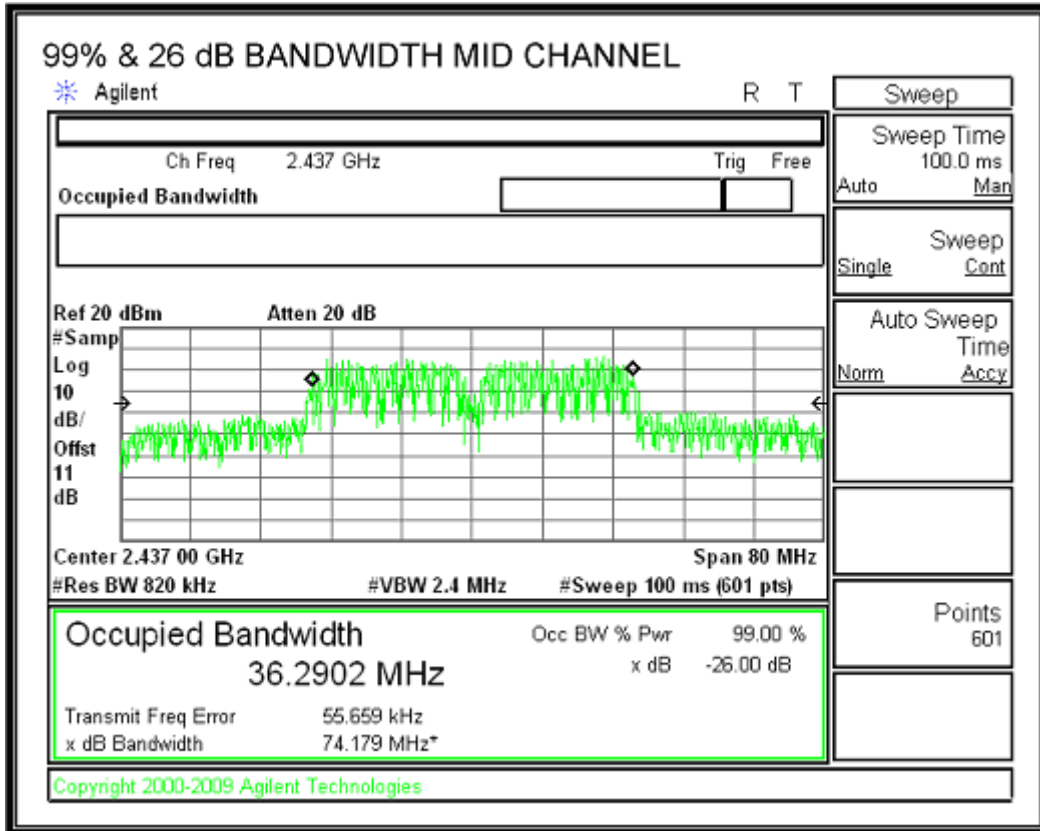


802.11n HT40 channel, 99% Occupied Bandwidth.

Date: May 04, 2012







## 5.5. Radiated Emissions Measurement

### 5.5.1. Standard Applicable

According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies(MHz)	Field Strength(micorvolts/meter)	Measurement Distance(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

### 5.5.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Spectrum Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

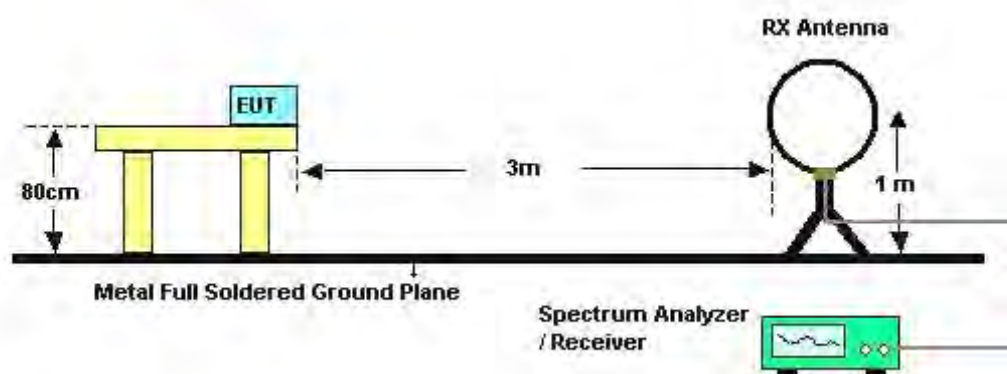
### 5.5.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.

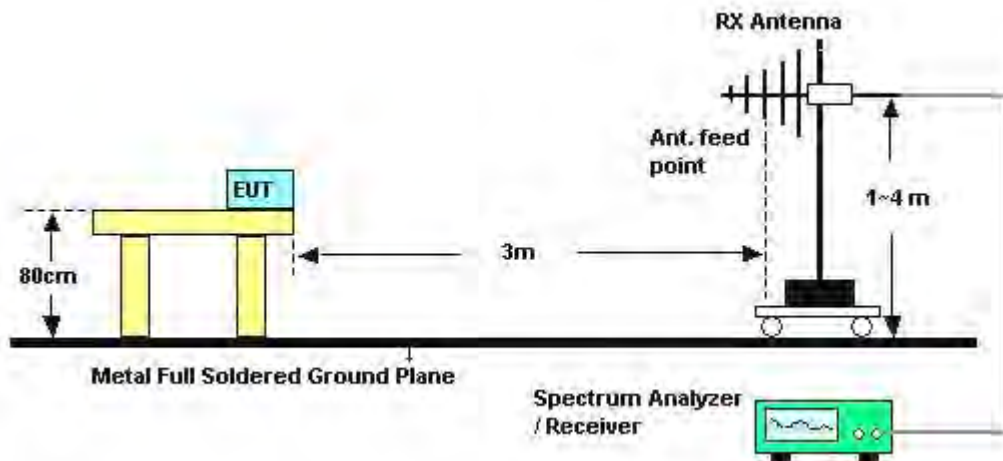
4. For each suspected emissions, the antenna tower was scan (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

#### 5.5.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.5.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.5.6. Results of Radiated Emissions (9kHz~30MHz)

Temperature	25°C	Humidity	60%
Test Engineer	Vito Cao	Configurations	802.11b,g,n

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:

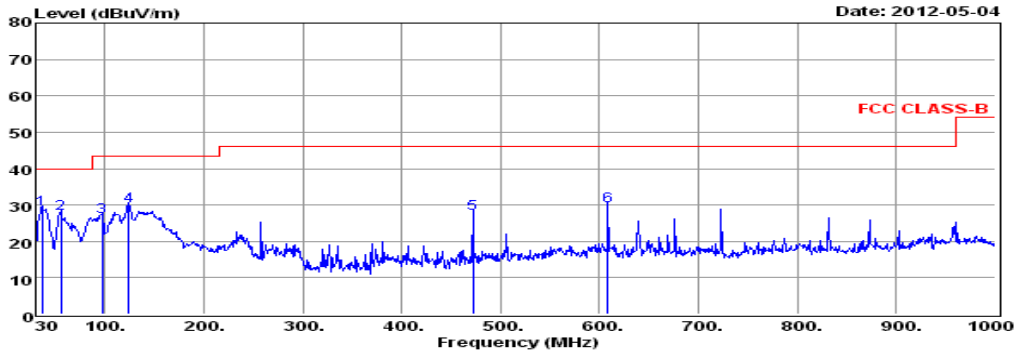
The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

5.5.7. Results of Radiated Emissions (30MHz~1GHz)

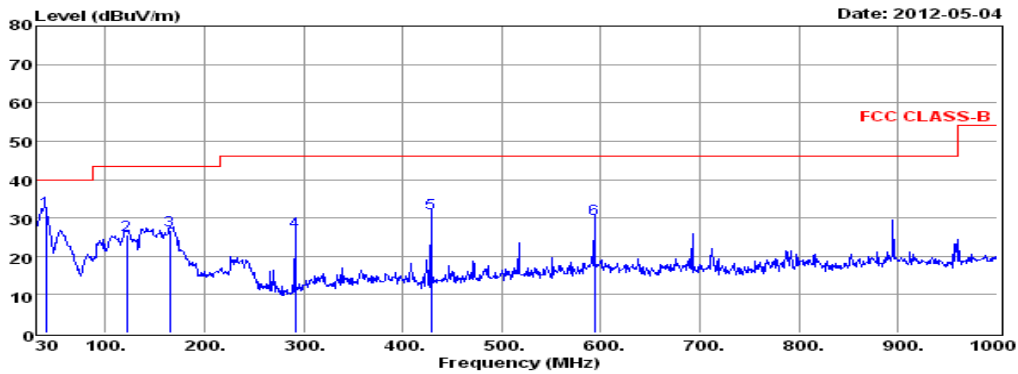
Temperature	25°C	Humidity	60%
Test Engineer	Vito Cao	Configurations	Normal Link



Env. / Ins: 24°C/56%  
 EUT: Wireless Adapter  
 M/N: SL-D001  
 Power Rating: DC 5V From PC Input AC 120/60Hz  
 Test Mode: ON  
 Operator: FOX  
 Memo:  
 pol: HORIZONTAL

	Freq.	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1	36.79	46.11	0.00	12.76	30.13	28.74	40.00	-11.26	QP
2	55.22	44.94	0.00	13.01	30.15	27.80	40.00	-12.20	QP
3	96.93	43.97	0.00	12.96	30.20	26.73	43.50	-16.77	QP
4	124.09	49.98	0.00	9.85	30.20	29.63	43.50	-13.87	QP
5	472.32	41.72	0.00	15.89	30.06	27.55	46.00	-18.45	QP
6	608.12	41.15	0.00	18.48	30.00	29.63	46.00	-16.37	QP

Note: 1. All readings are Quasi-peak values.  
 2. Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.  
 3. The emission levels that are 20dB below the official limit are not reported.



Env. / Ins: 24°C/56%  
 EUT: Wireless Adapter  
 M/N: SL-D001  
 Power Rating: DC 5V From PC Input AC 120/60Hz  
 Test Mode: ON  
 Operator: FOX  
 Memo:  
 pol: VERTICAL

	Freq.	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1	39.70	48.46	0.00	13.50	30.13	31.83	40.00	-8.17	QP
2	121.18	45.43	0.00	10.30	30.20	25.53	43.50	-17.97	QP
3	164.83	48.22	0.00	8.81	30.20	26.83	43.50	-16.67	QP
4	291.90	43.61	0.00	12.90	30.15	26.36	46.00	-19.64	QP
5	428.67	45.91	0.00	15.51	30.09	31.33	46.00	-14.67	QP
6	593.57	41.48	0.00	18.33	30.00	29.81	46.00	-16.19	QP

Note: 1. All readings are Quasi-peak values.  
 2. Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.  
 3. The emission levels that are 20dB below the official limit are not reported.

Note:

Pre-scan all mode and recorded the worst case results in this report (802.11g Channel 6).

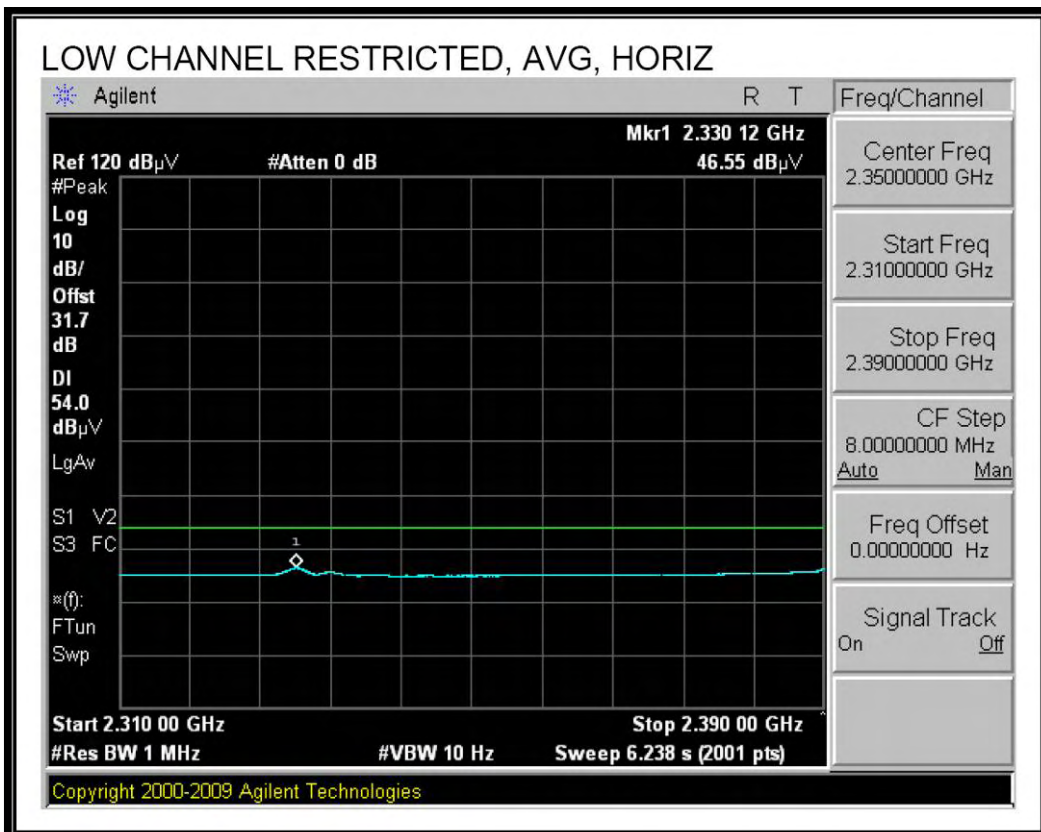
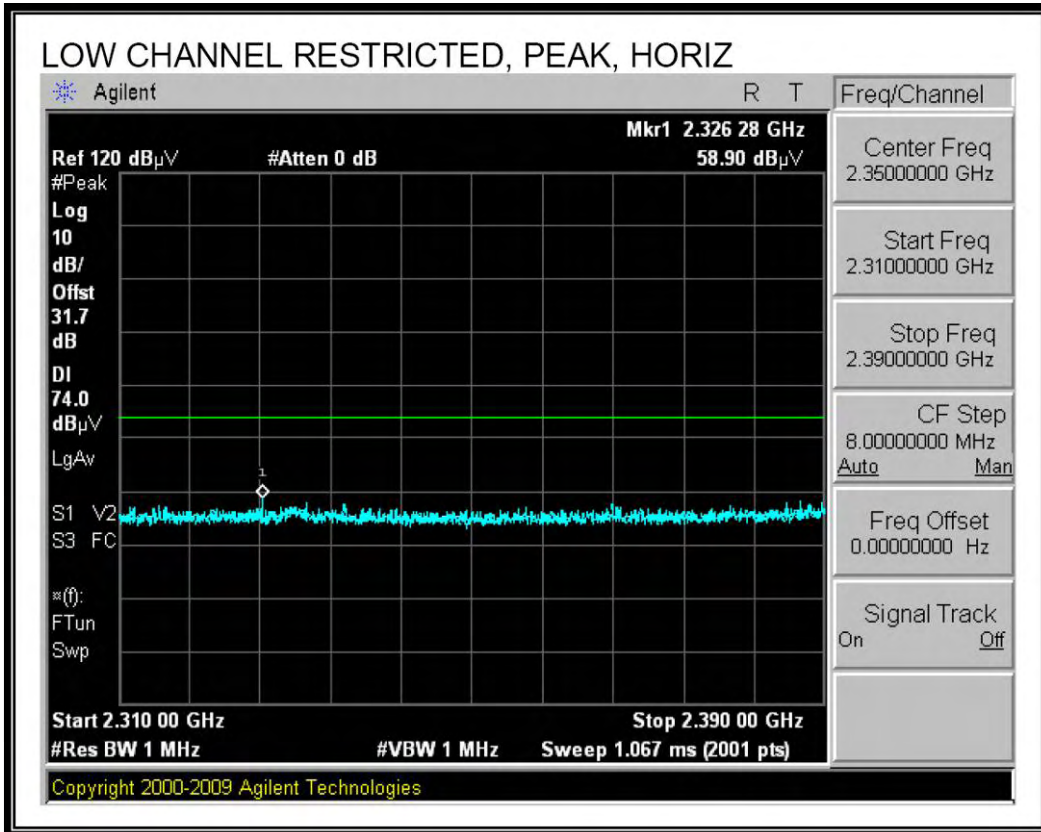
Emission level (dBuV/m) = 20 log Emission level (uV/m).

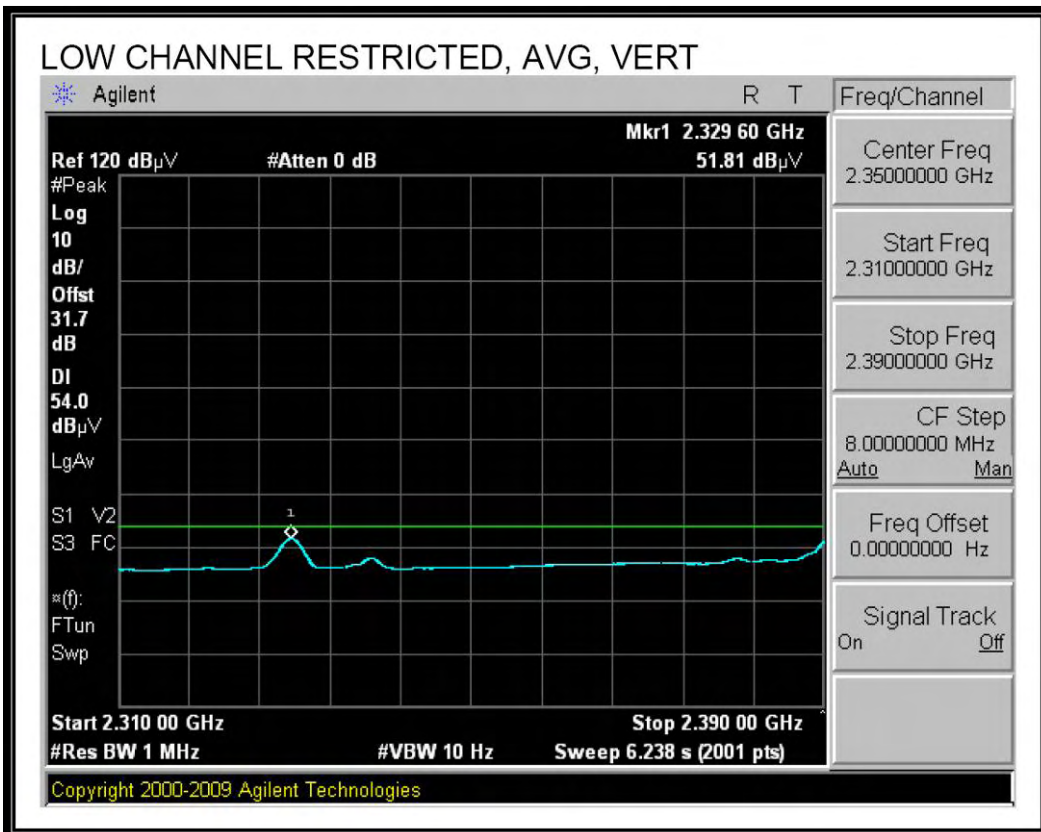
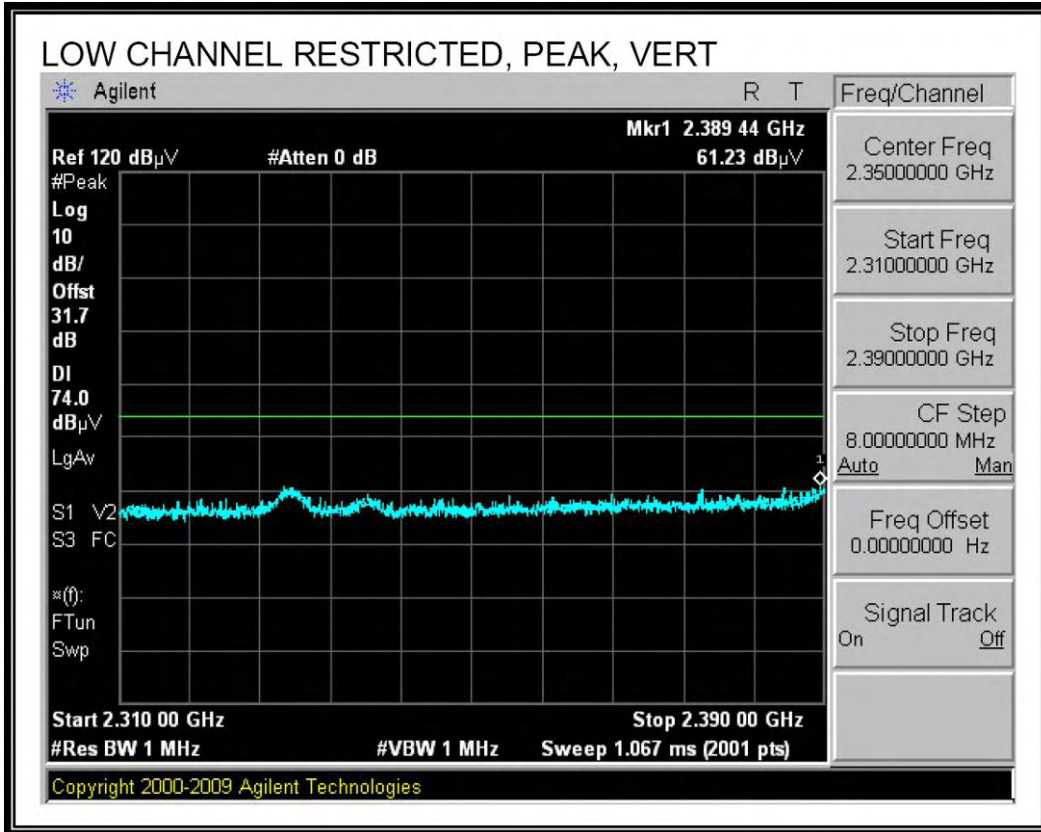
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

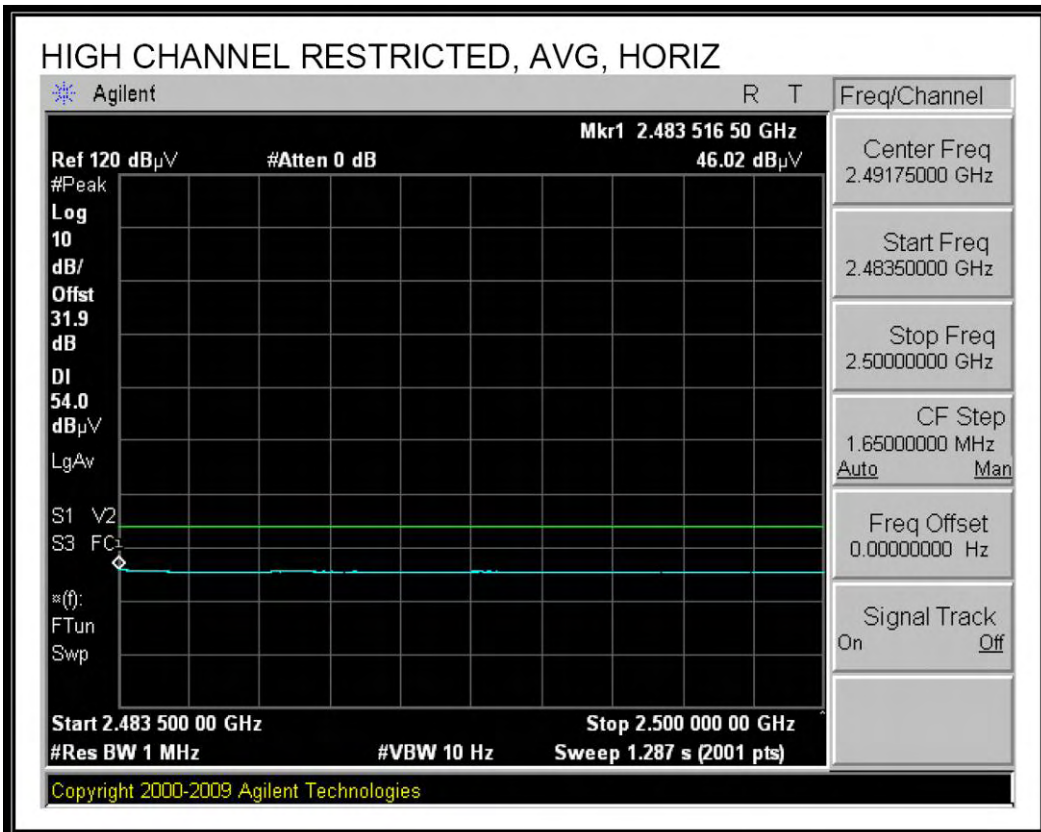
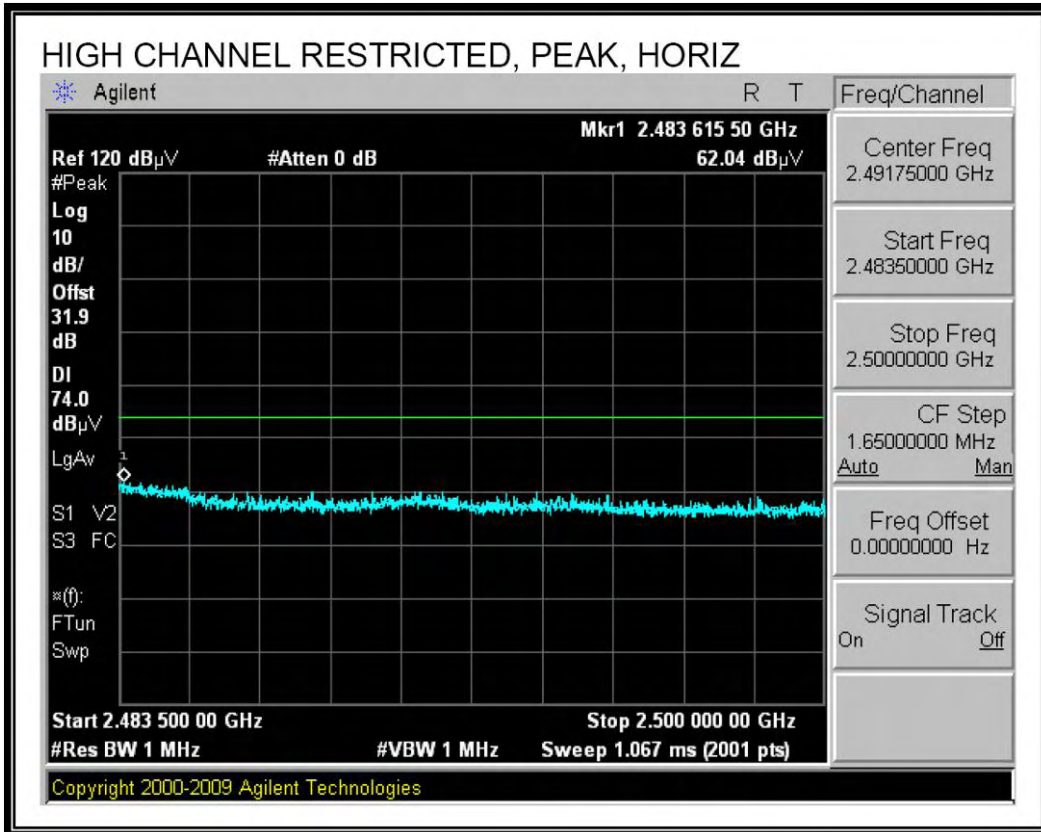
5.5.8. Results for Restricted Band

802.11b restricted band

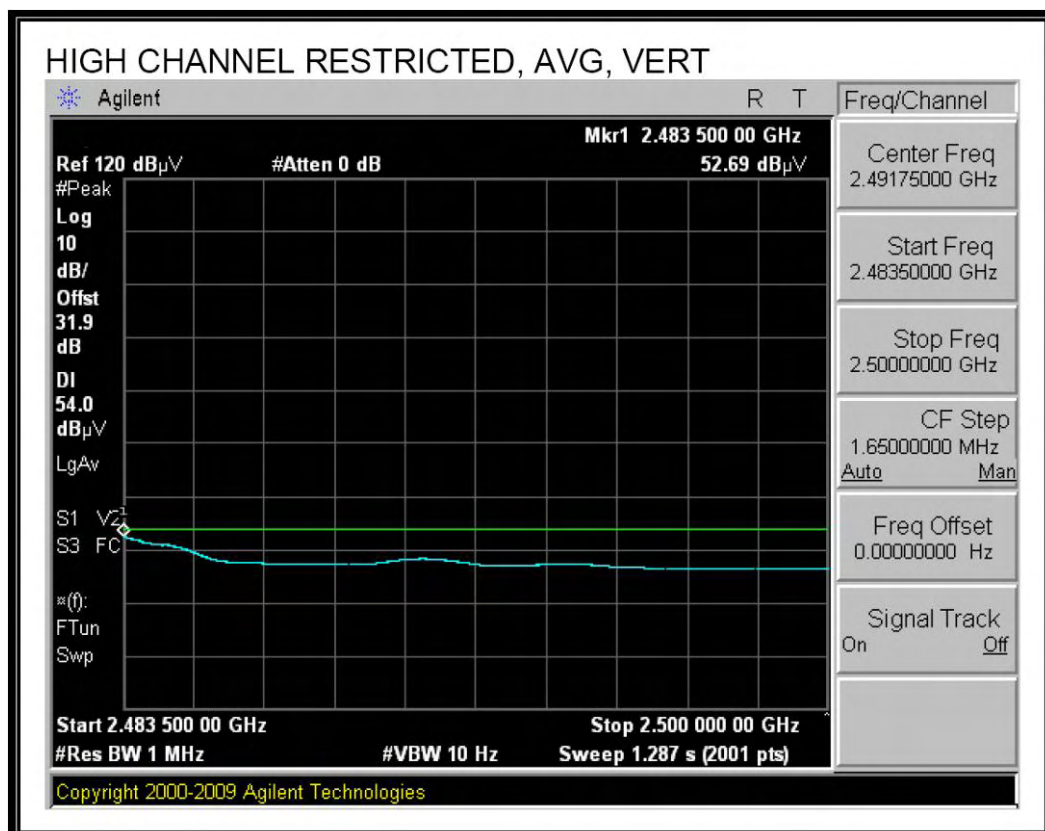
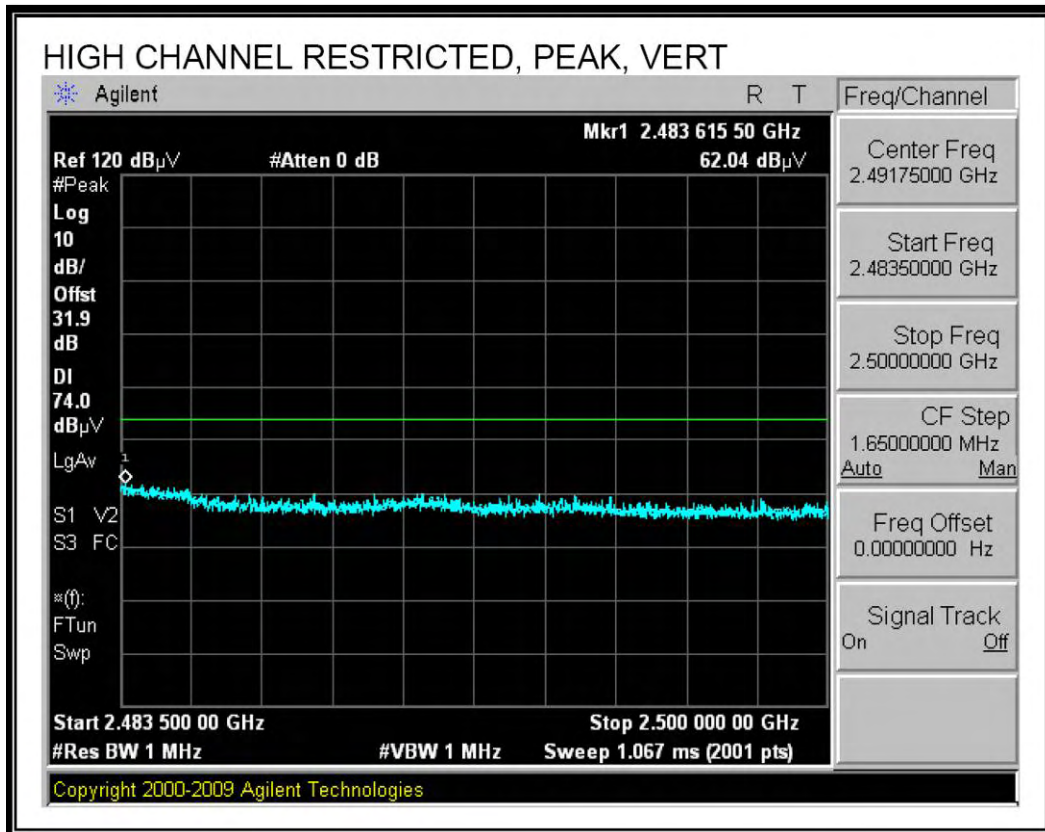
Date: May 04, 2012





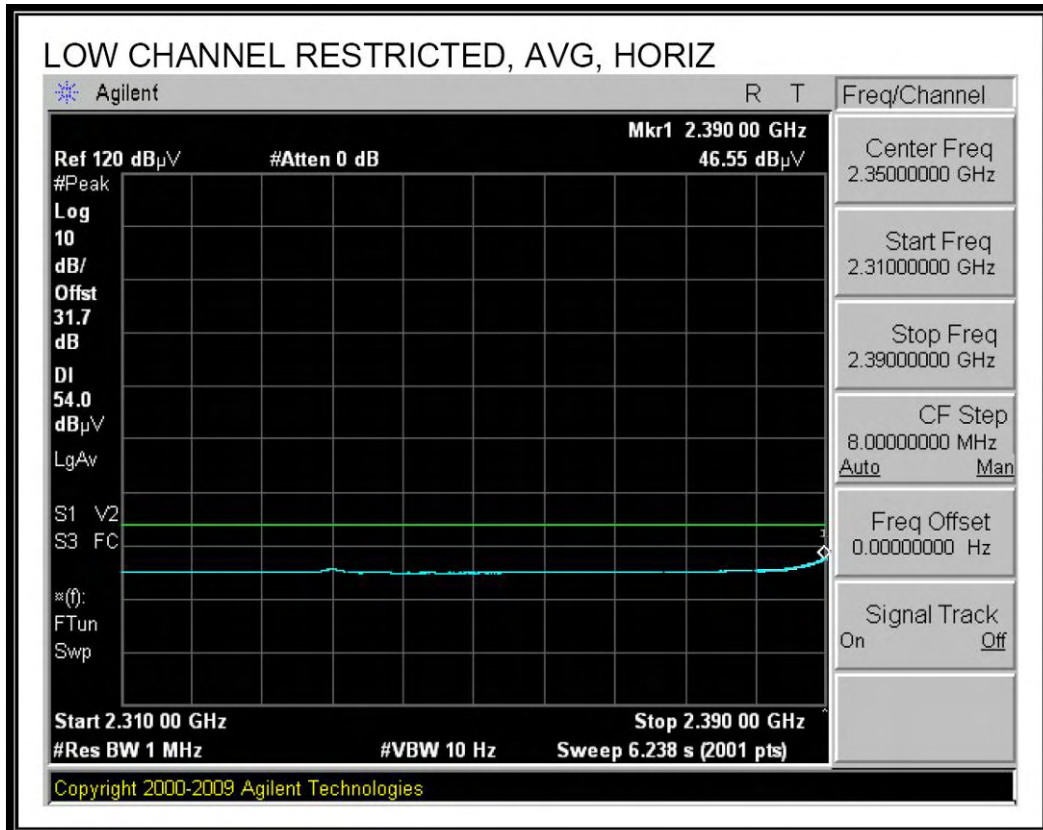
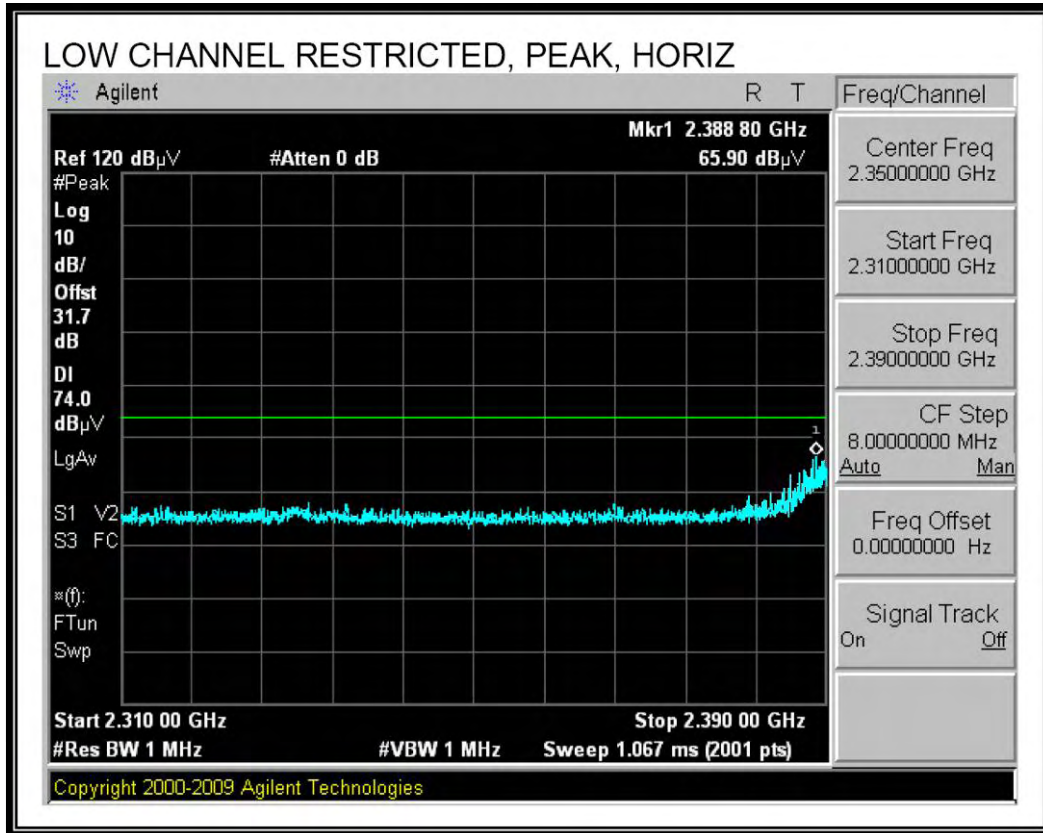


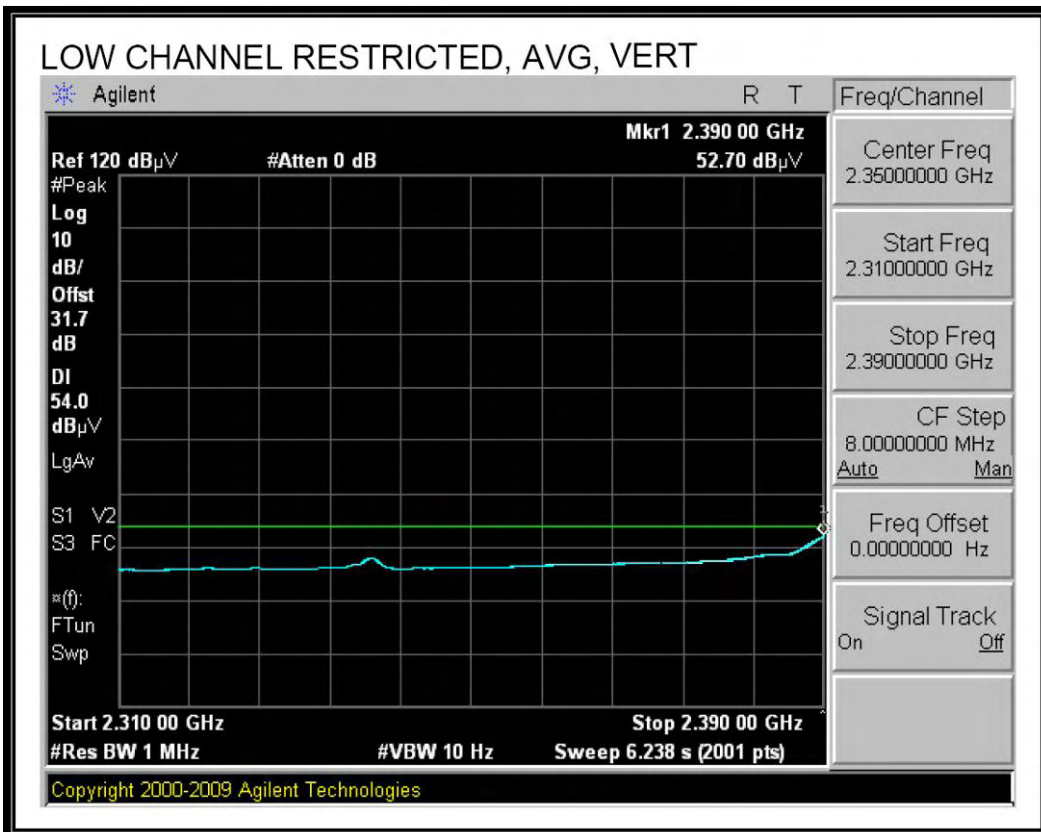
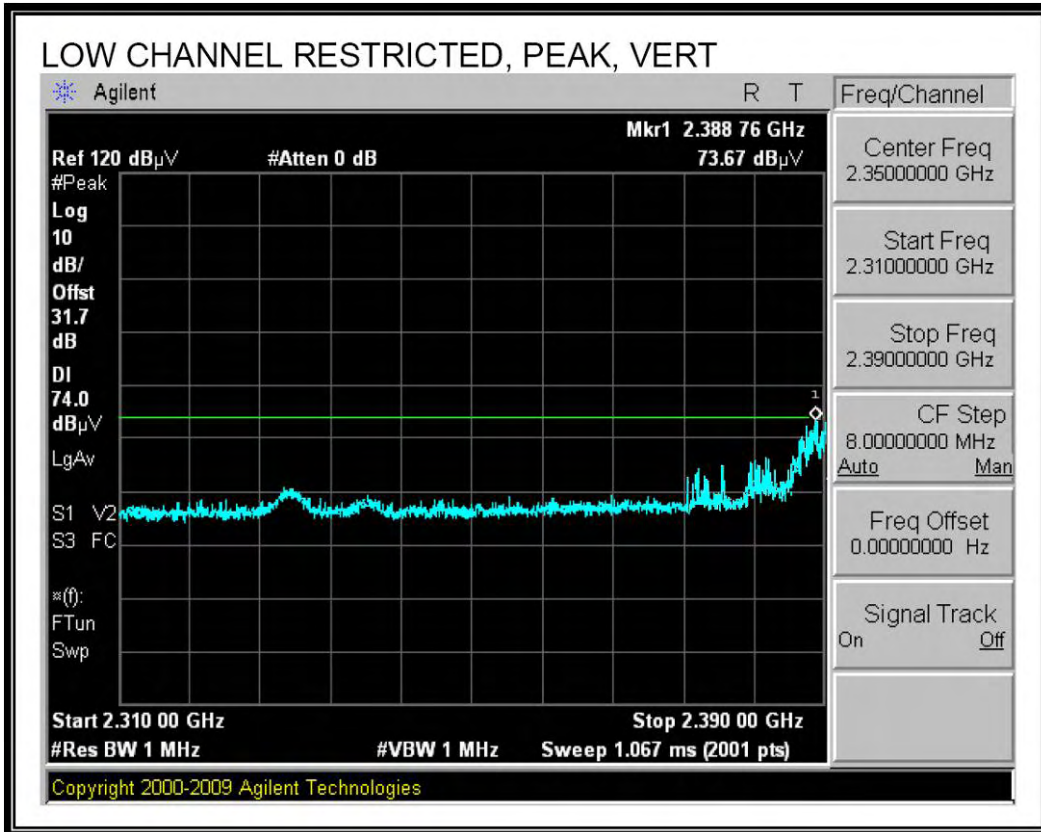


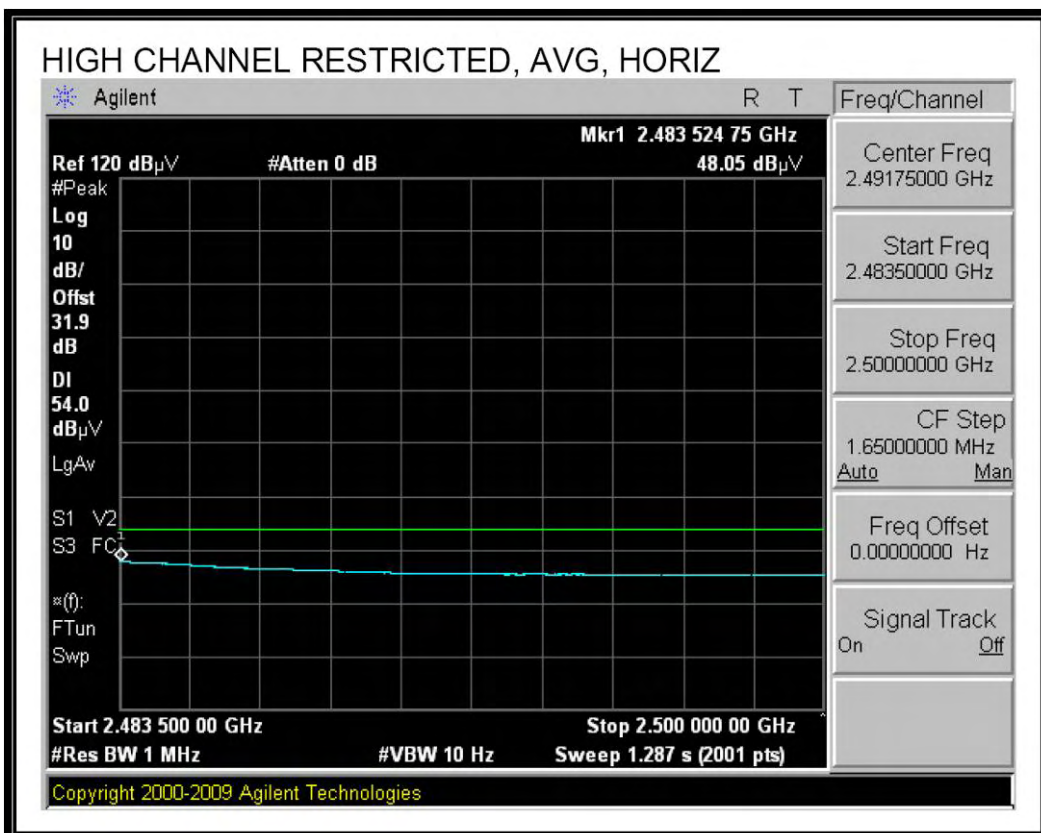
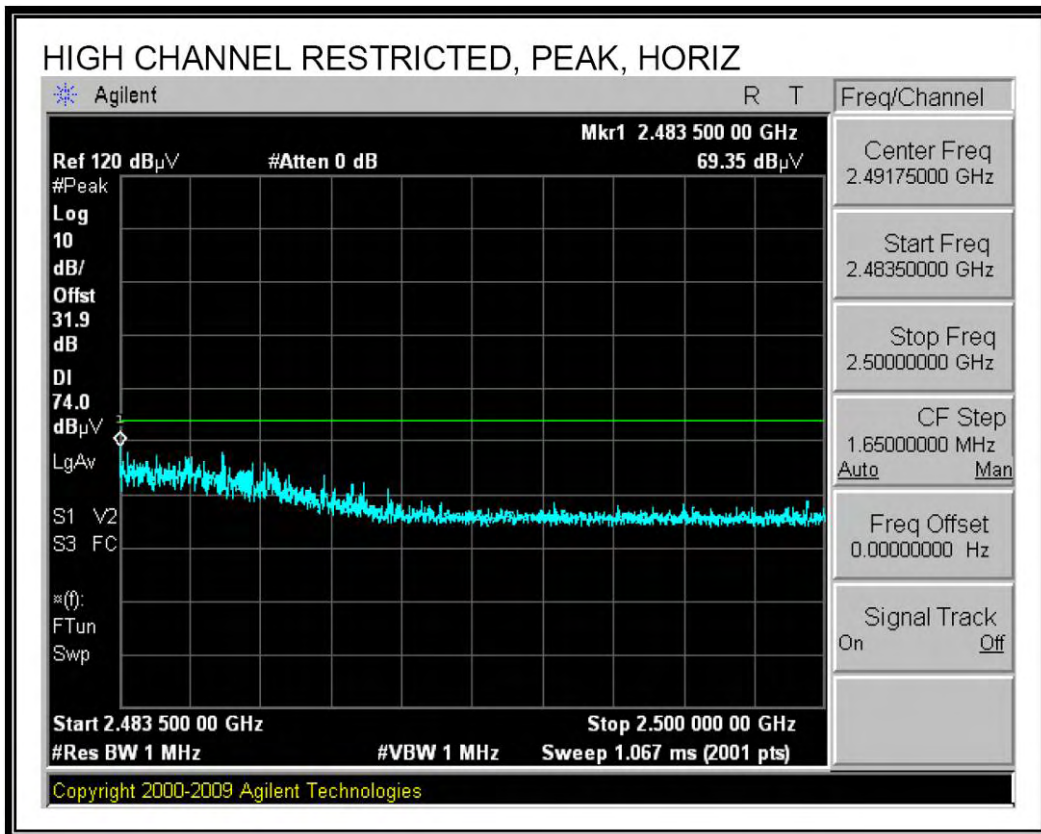


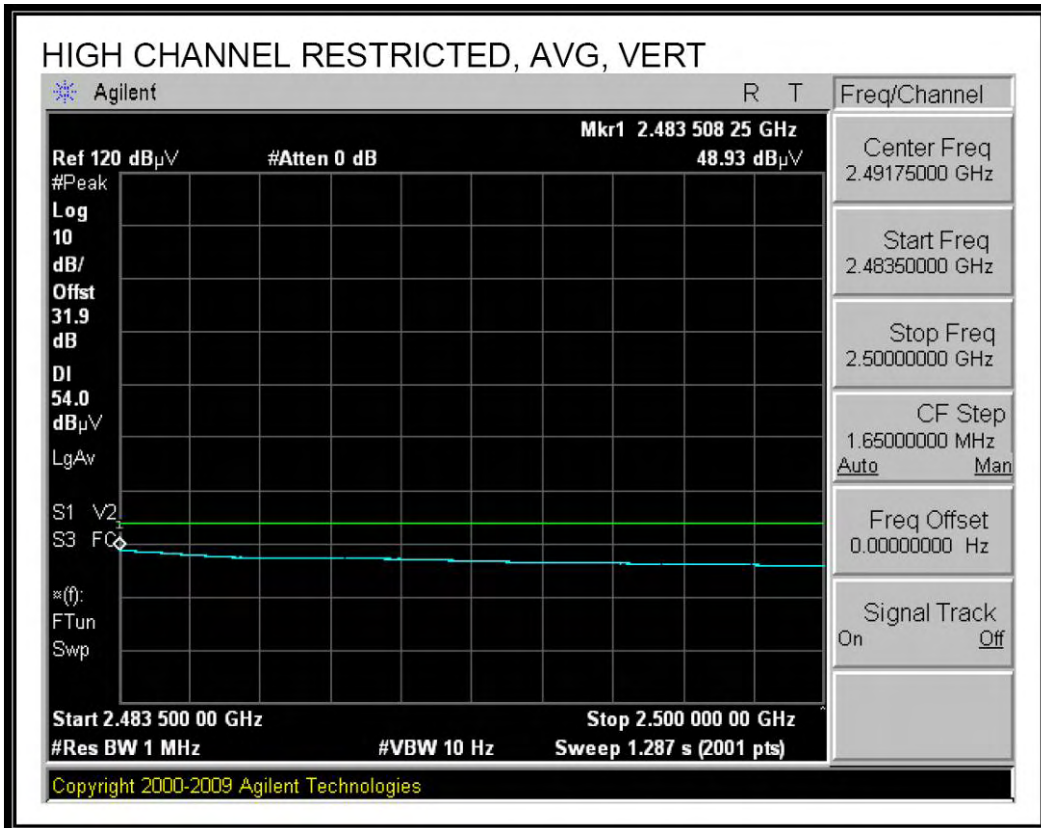
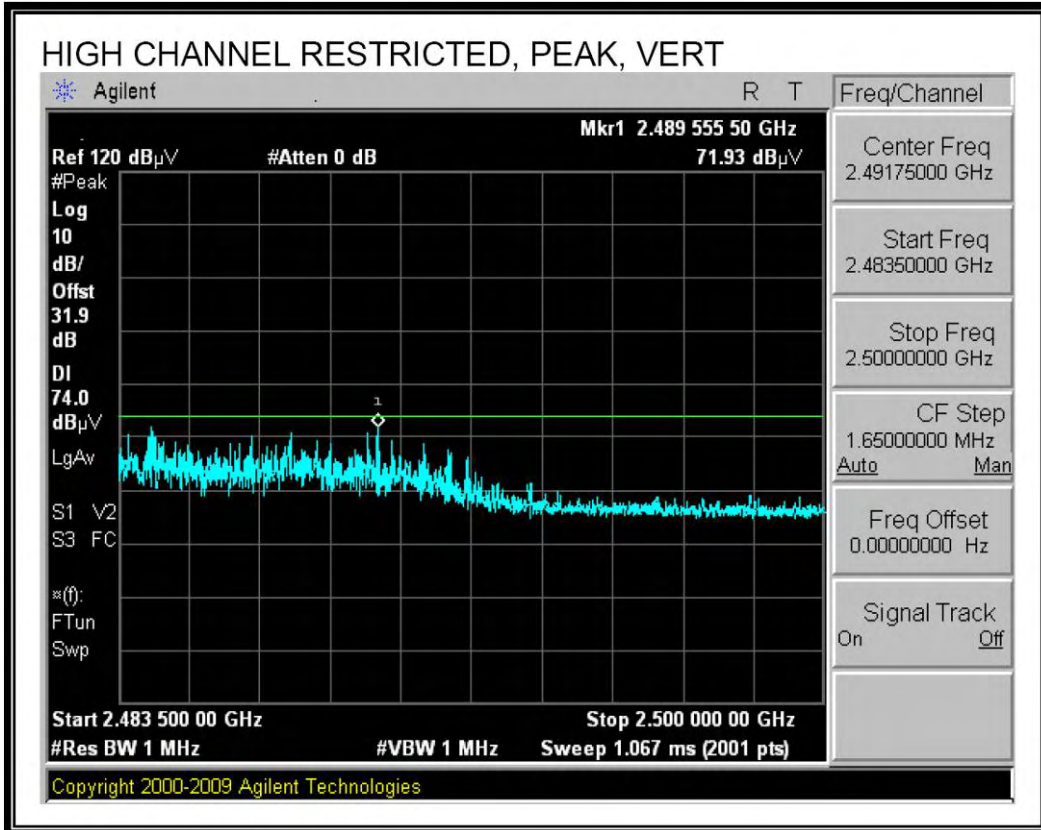
802.11g restricted band

Date: May 04, 2012



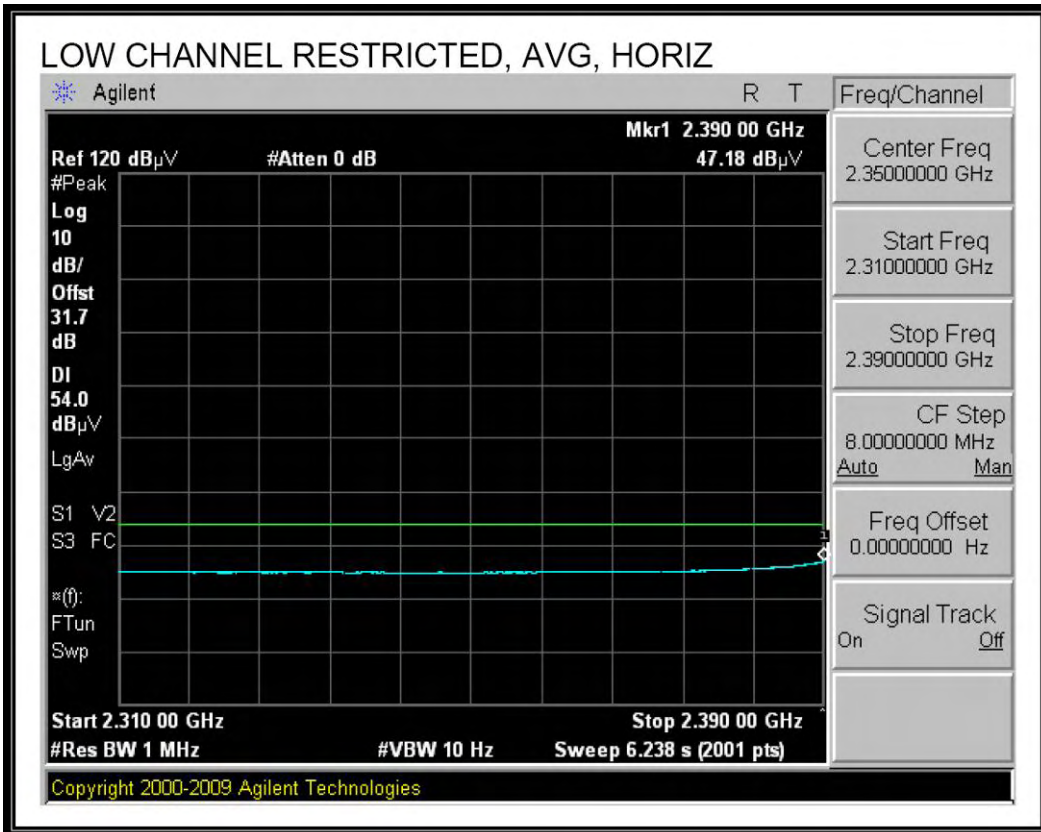
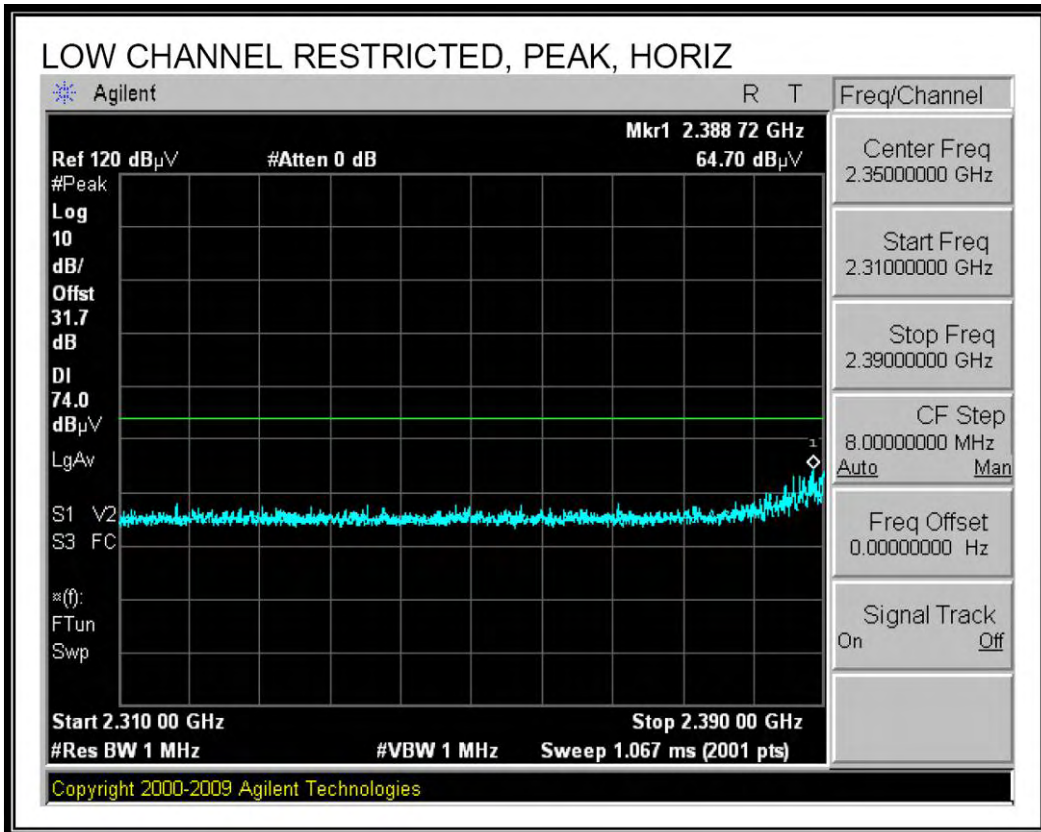


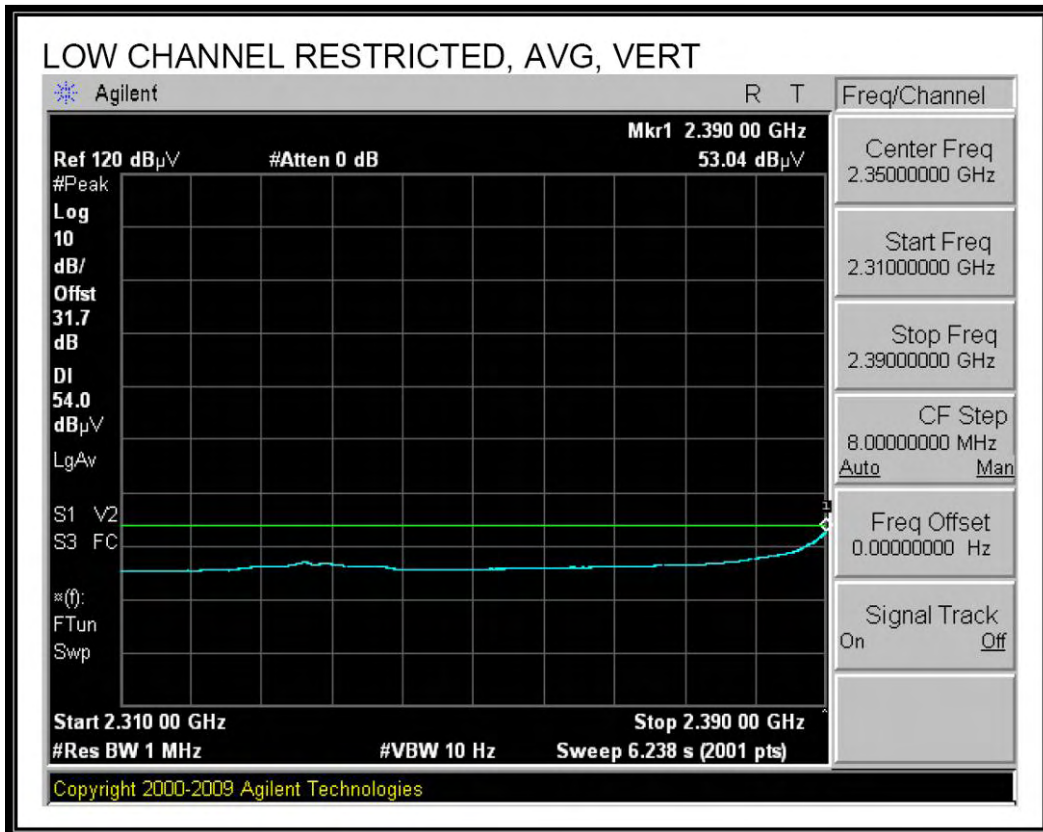
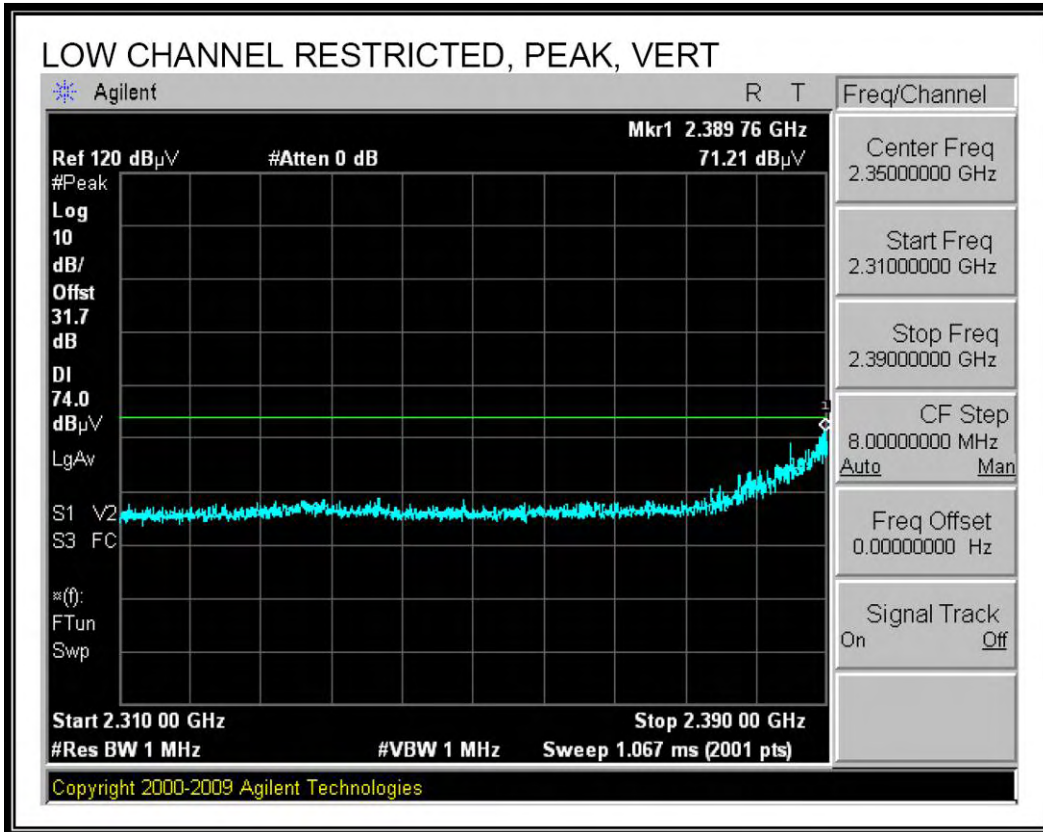


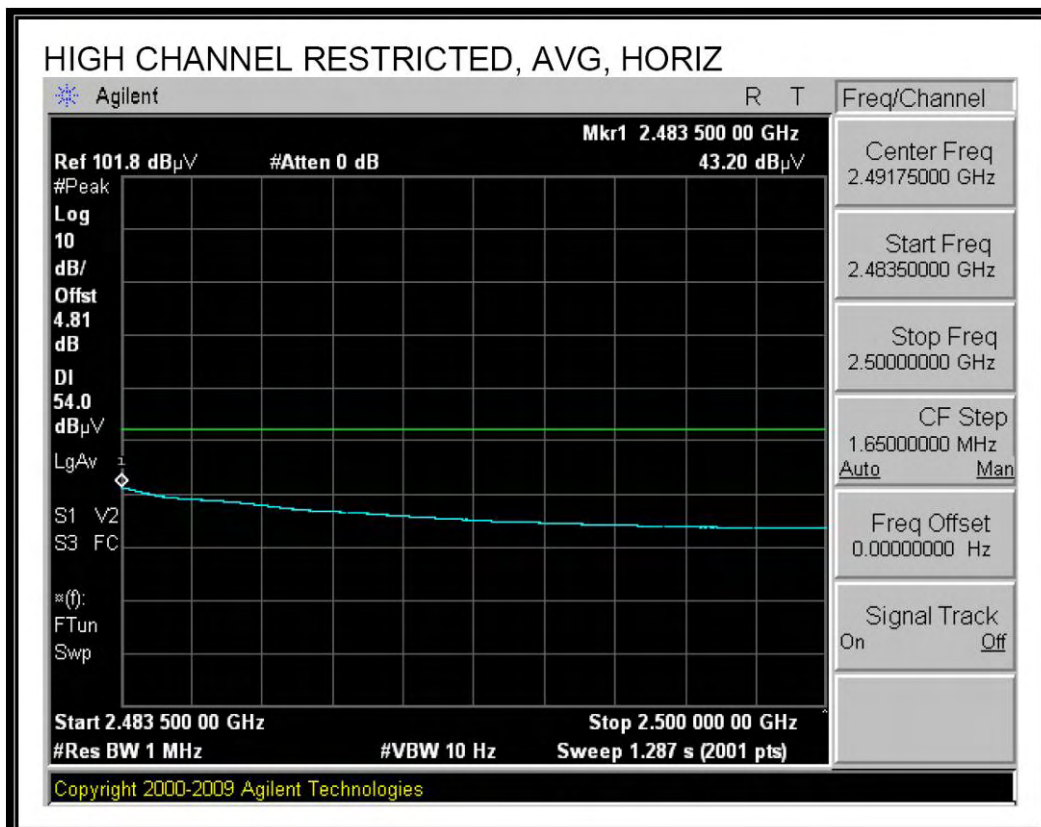
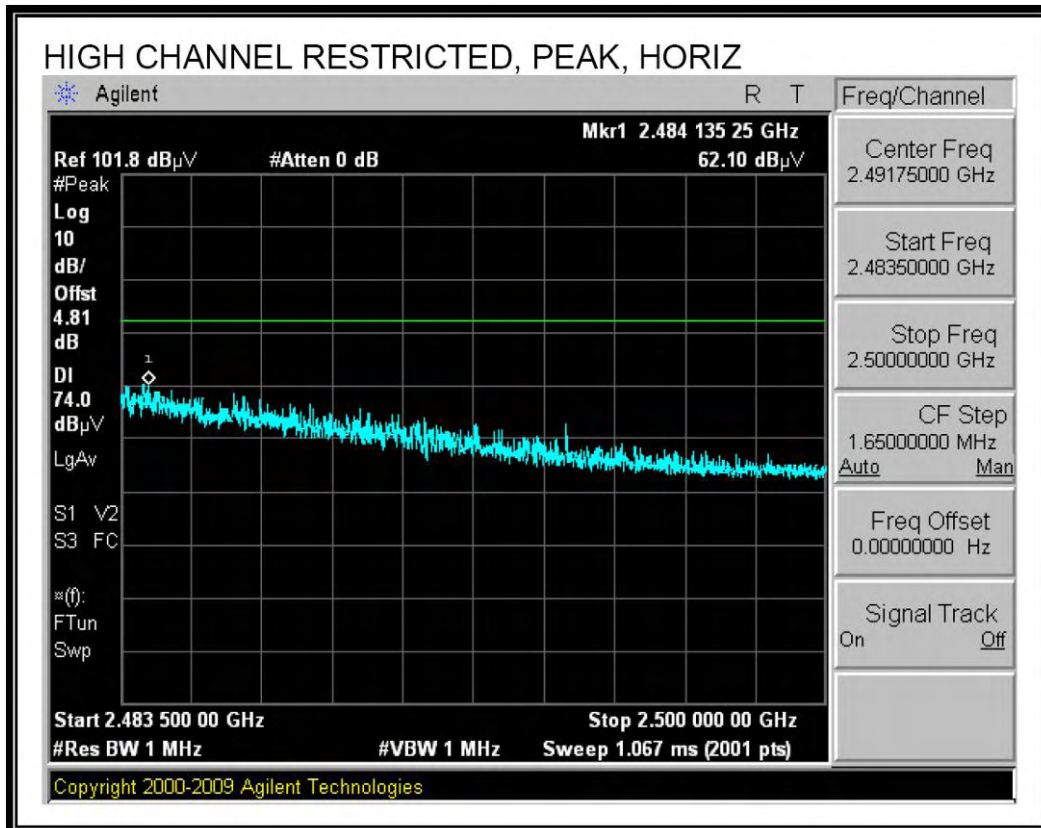


802.11n HT20 restricted band

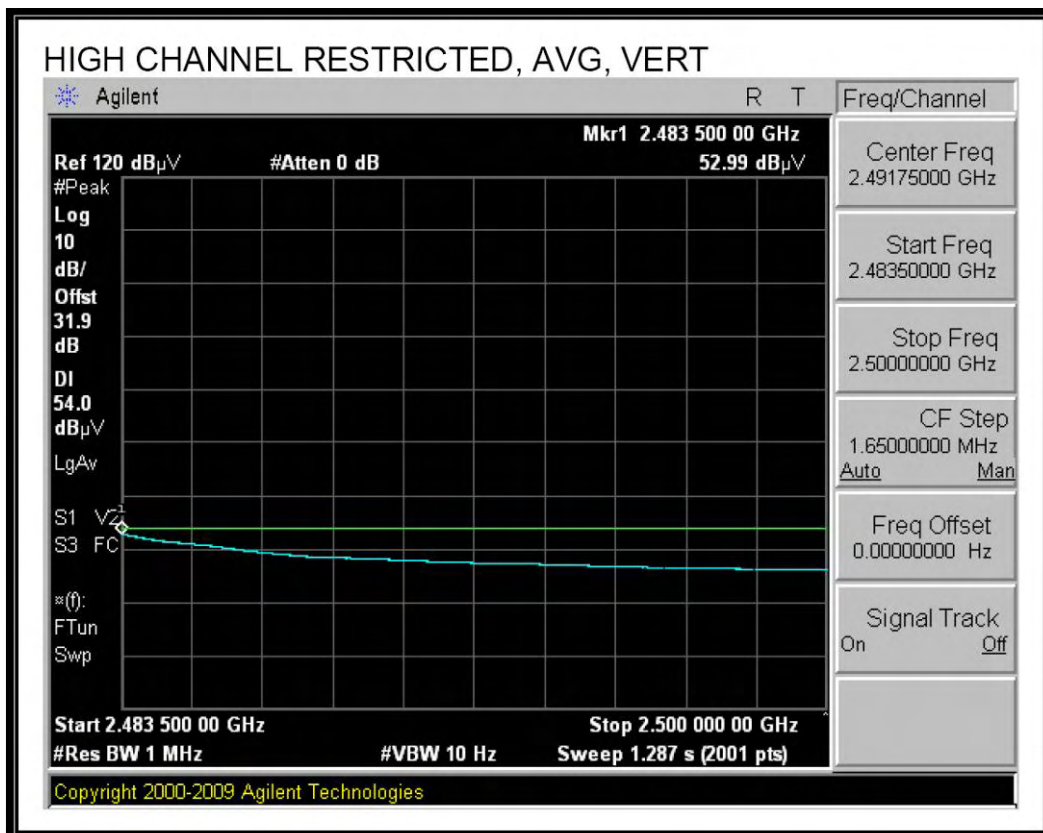
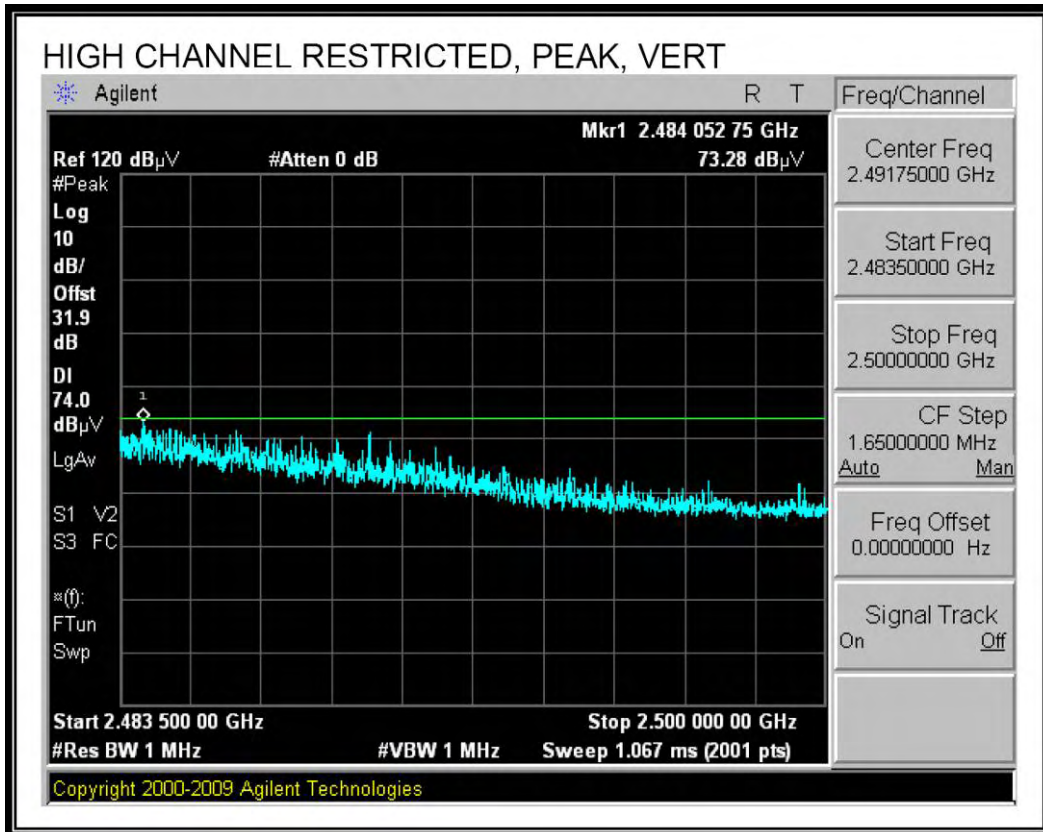
Date: May 04, 2012





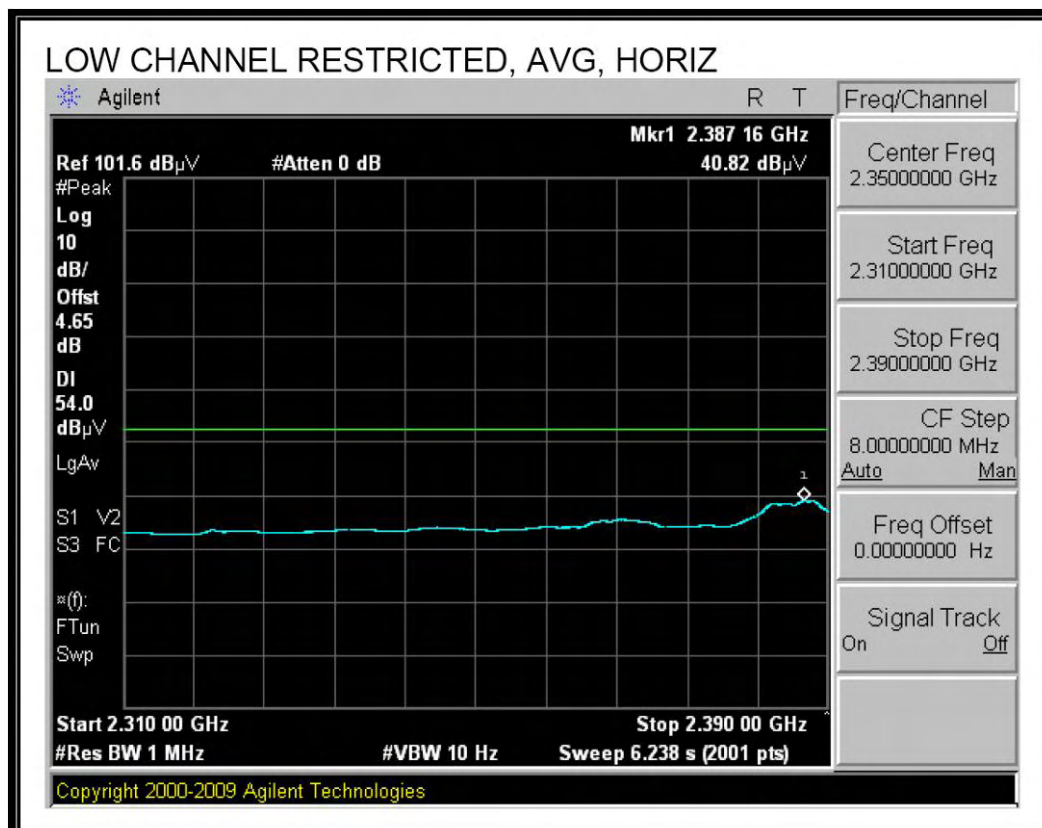
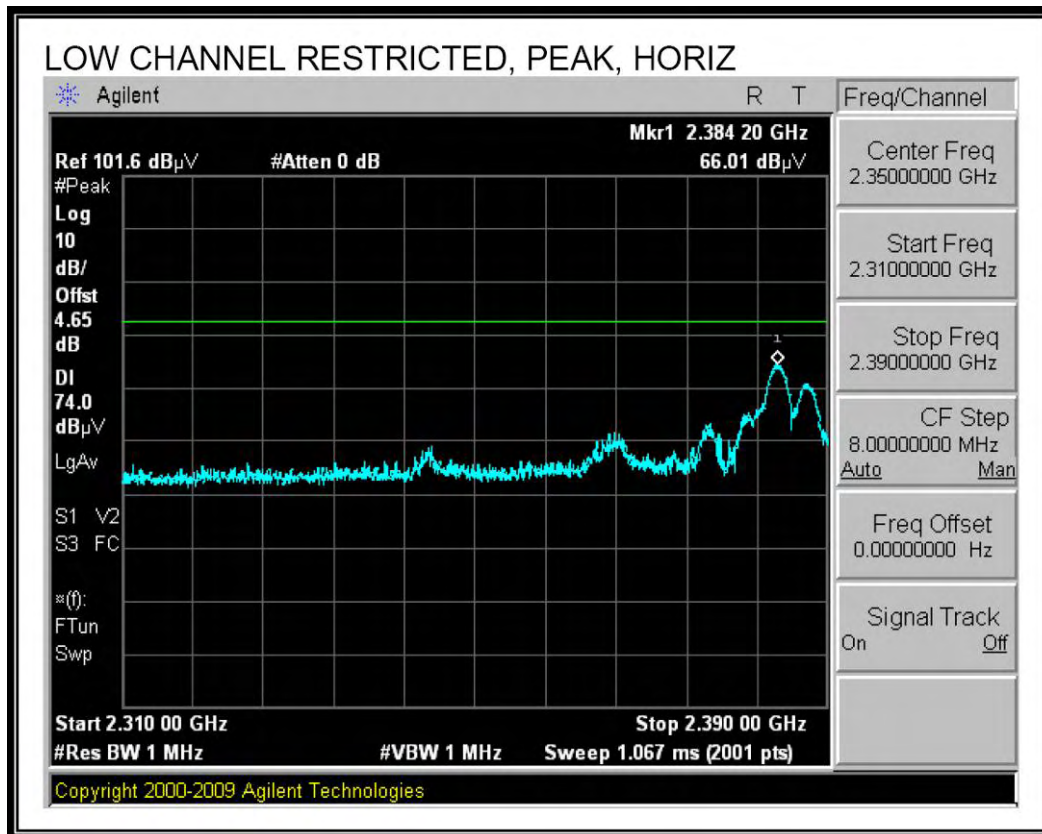


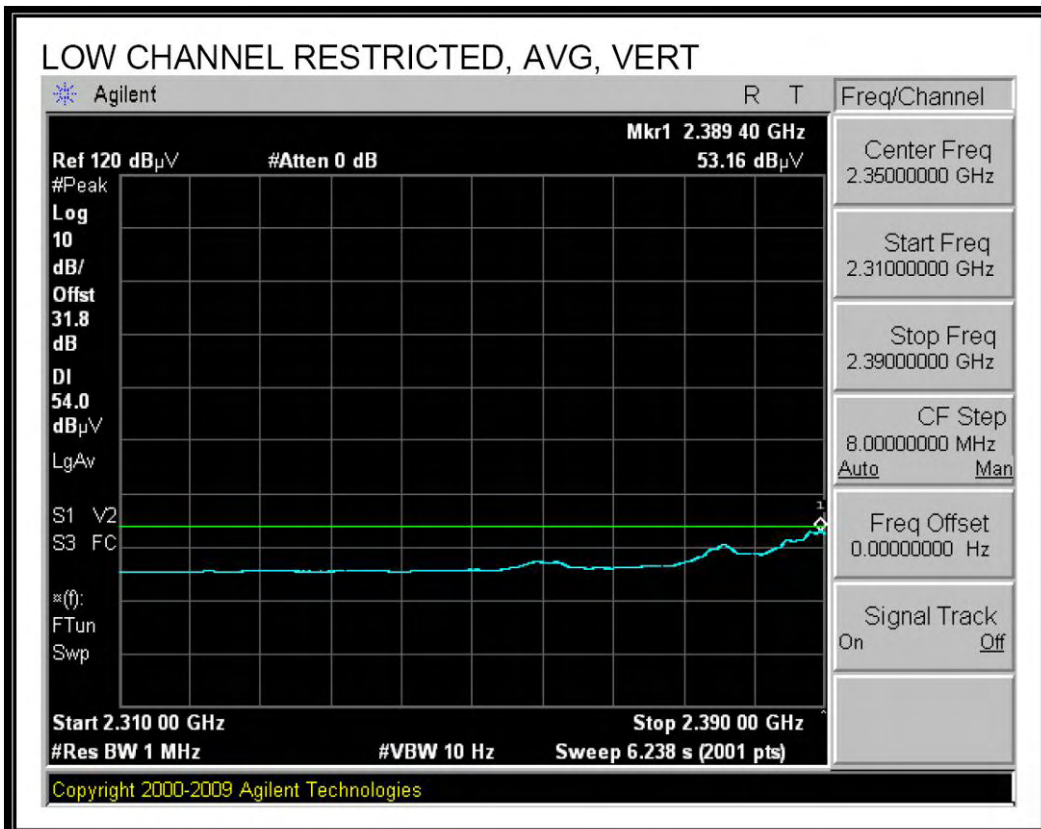
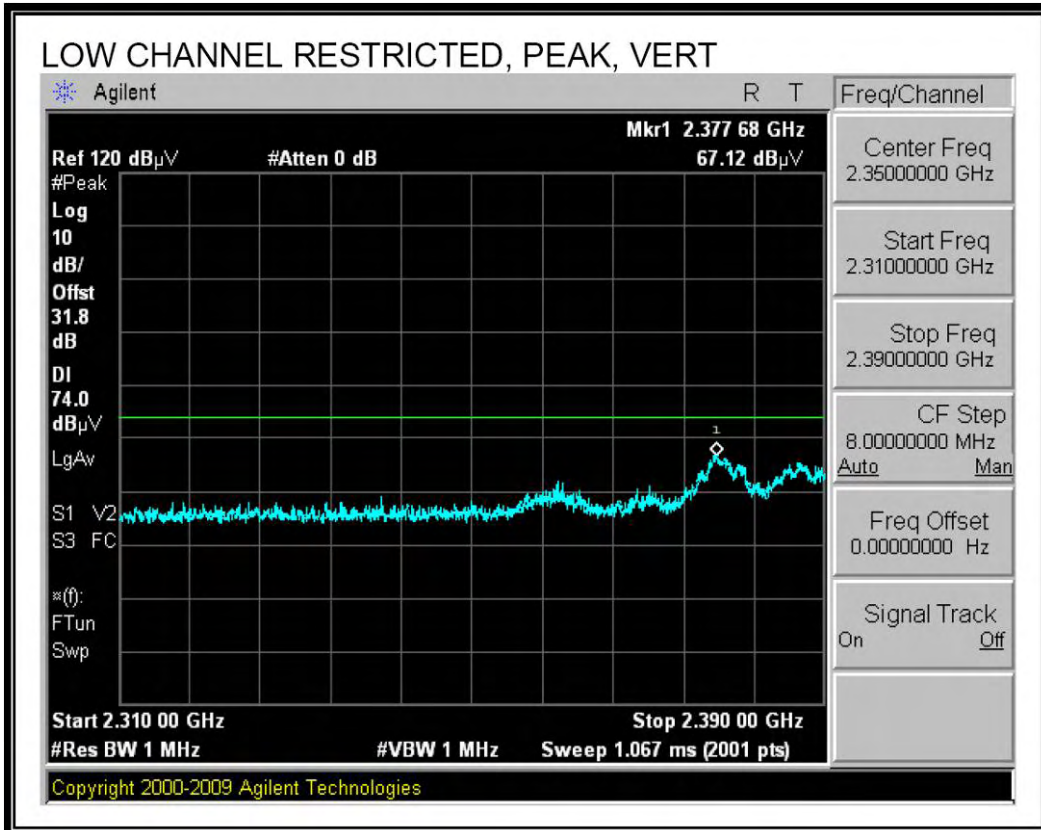


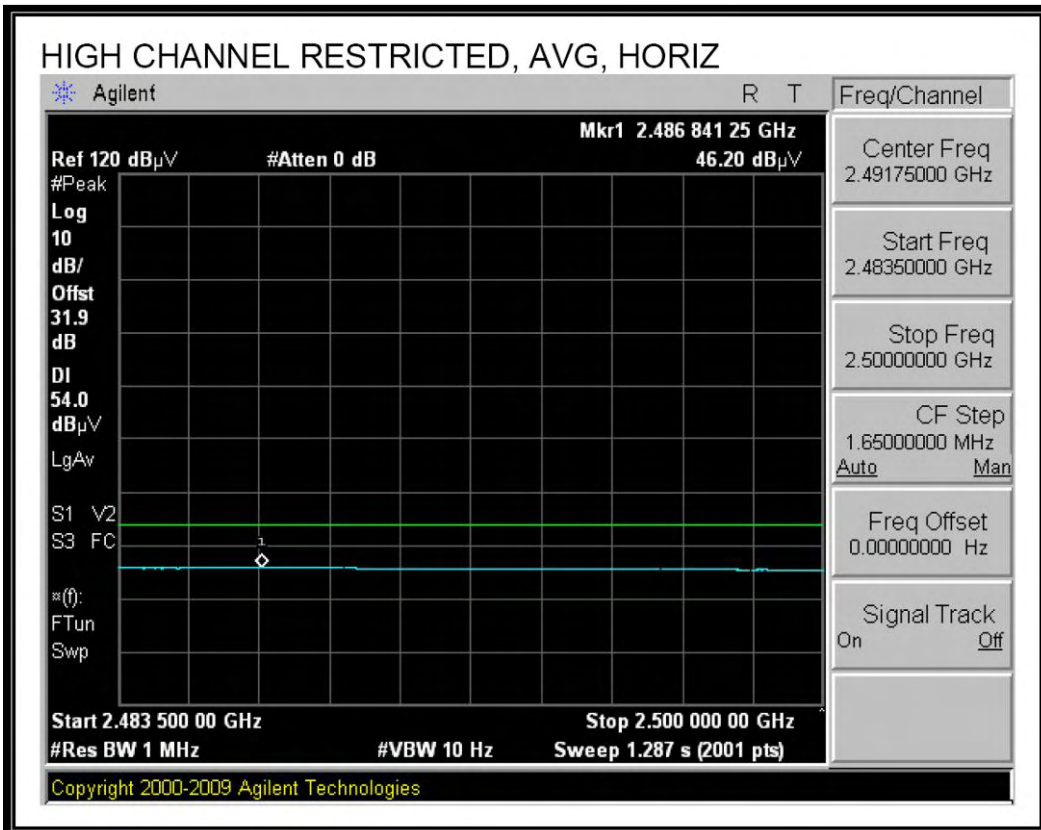
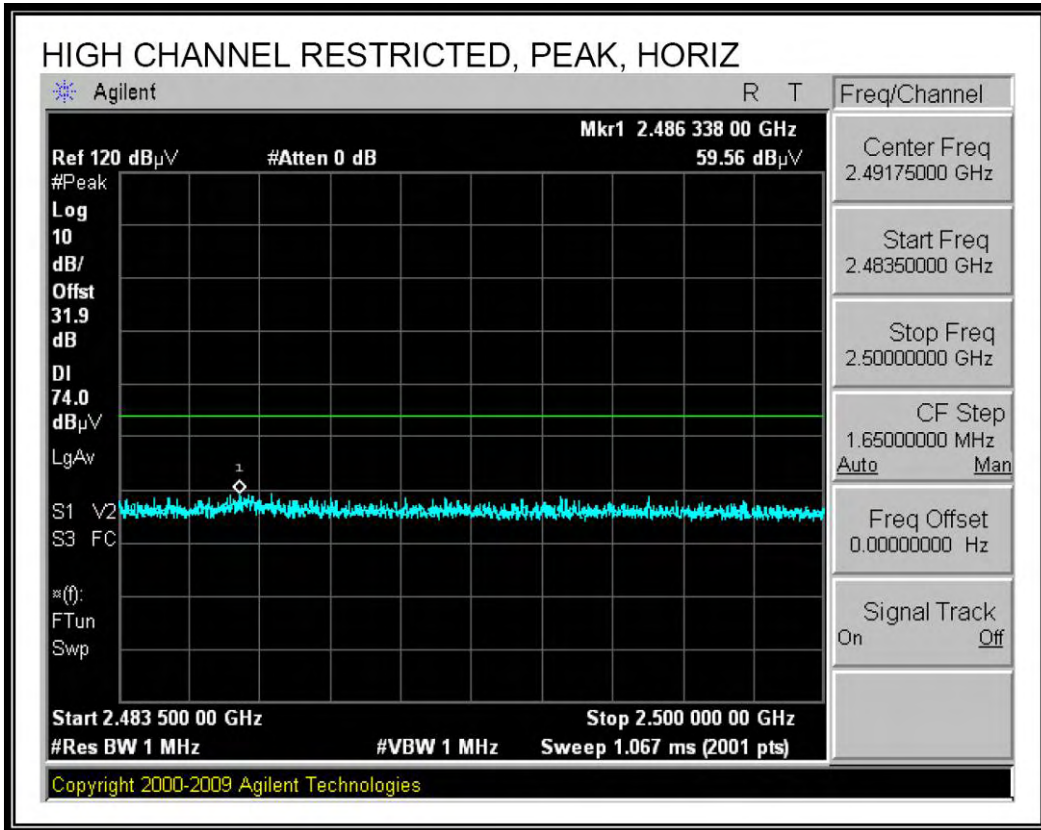


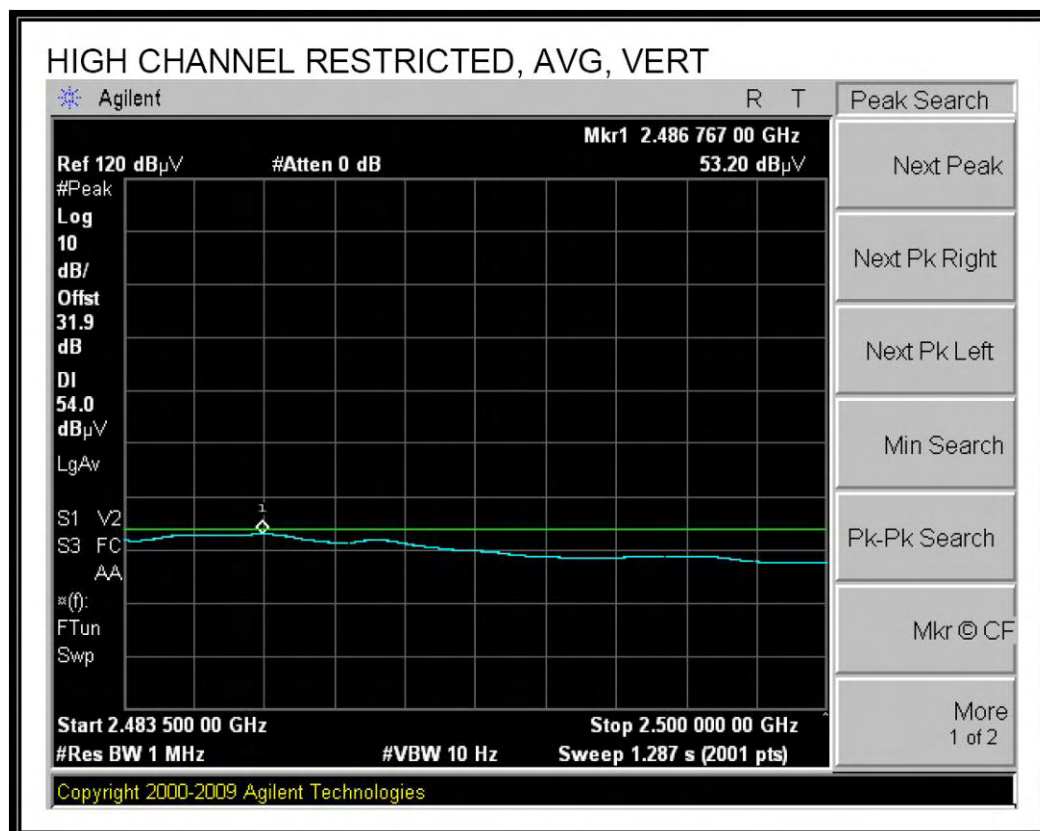
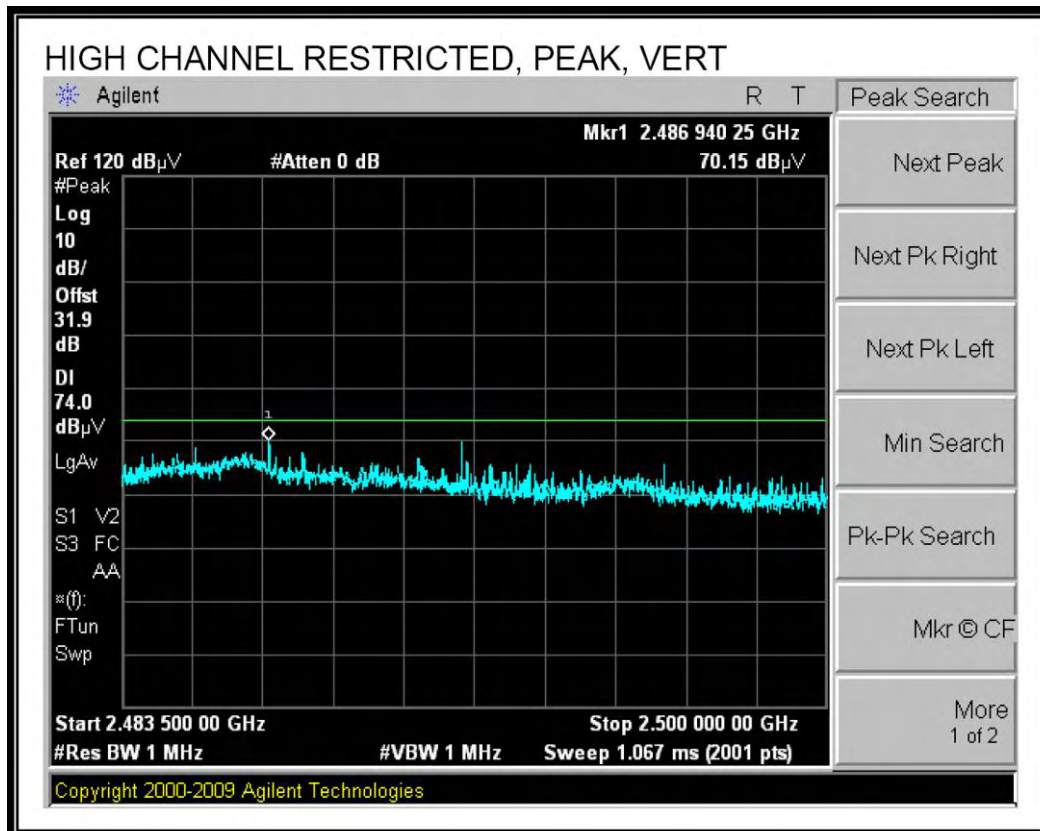
802.11n HT40 restricted band

Date: May 04, 2012









## 5.5.9. Results for Radiated Emissions (1GHz~10th Harmonic)

802.11b

Channel 1

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4824.12	47.67	45.71	33.06	35.04	3.94	74	-26.33	Peak	Horizontal
4824.23	39.21	37.25	33.06	35.04	3.94	54	-14.79	Average	Horizontal
4824.12	48.24	46.28	33.06	35.04	3.94	74	-25.76	Peak	Vertical
4824.25	40.12	38.16	33.06	35.04	3.94	54	-13.88	Average	Vertical

Channel 6

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4874.65	47.86	45.89	33.16	35.15	3.96	74	-26.14	Peak	Horizontal
4874.65	36.09	34.12	33.16	35.15	3.96	54	-17.91	Average	Horizontal
4874.65	46.28	44.31	33.16	35.15	3.96	74	-27.72	Peak	Vertical
4874.65	35.76	33.79	33.16	35.15	3.96	54	-18.24	Average	Vertical

Channel 11

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4924.37	46.36	44.26	33.26	35.14	3.98	74	-27.64	Peak	Horizontal
4924.37	34.78	32.68	33.26	35.14	3.98	54	-19.22	Average	Horizontal
4924.37	45.27	43.17	33.26	35.14	3.98	74	-28.73	Peak	Vertical
4924.37	34.05	31.95	33.26	35.14	3.98	54	-19.95	Average	Vertical

802.11g

Channel 1

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4824.75	47.33	45.37	33.06	35.04	3.94	74	-26.67	Peak	Horizontal
4824.96	37.58	35.62	33.06	35.04	3.94	54	-16.42	Average	Horizontal
4824.75	46.70	44.74	33.06	35.04	3.94	74	-27.3	Peak	Vertical
4824.96	35.65	33.69	33.06	35.04	3.94	54	-18.35	Average	Vertical

Channel 6

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4874.38	48.25	46.28	33.16	35.15	3.96	74	-25.75	Peak	Horizontal
4874.38	40.13	38.16	33.16	35.15	3.96	54	-13.87	Average	Horizontal
4874.38	47.74	45.77	33.16	35.15	3.96	74	-26.26	Peak	Vertical
4874.38	41.42	39.45	33.16	35.15	3.96	54	-12.58	Average	Vertical

Channel 11

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4924.85	50.82	48.72	33.26	35.14	3.98	74	-23.18	Peak	Horizontal
4924.85	41.28	39.18	33.26	35.14	3.98	54	-12.72	Average	Horizontal
4924.85	48.32	46.22	33.26	35.14	3.98	74	-25.68	Peak	Vertical
4924.85	42.39	40.29	33.26	35.14	3.98	54	-11.61	Average	Vertical

## 802.11n HT20

## Channel 1

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4824.75	45.33	43.23	33.06	35.04	3.94	74	-28.67	Peak	Horizontal
4824.96	35.84	33.74	33.06	35.04	3.94	54	-18.16	Average	Horizontal
4824.75	44.29	42.19	33.06	35.04	3.94	74	-29.71	Peak	Vertical
4824.96	34.63	32.53	33.06	35.04	3.94	54	-19.37	Average	Vertical

## Channel 6

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4874.42	46.8	44.7	33.16	35.15	3.96	74	-27.2	Peak	Horizontal
4874.42	36.29	34.19	33.16	35.15	3.96	54	-17.71	Average	Horizontal
4874.42	45.33	43.23	33.16	35.15	3.96	74	-28.67	Peak	Vertical
4874.42	35.66	33.56	33.16	35.15	3.96	54	-18.34	Average	Vertical

## Channel 11

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4924.68	49.61	47.51	33.26	35.14	3.98	74	-24.39	Peak	Horizontal
4924.68	40.34	38.24	33.26	35.14	3.98	54	-13.66	Average	Horizontal
4924.68	47.88	45.78	33.26	35.14	3.98	74	-26.12	Peak	Vertical
4924.68	41.93	39.83	33.26	35.14	3.98	54	-12.07	Average	Vertical



## 802.11n HT40

## Channel 1

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4844.46	44.14	42.18	33.06	35.04	3.94	74	-29.86	Peak	Horizontal
4844.46	37.3	35.34	33.06	35.04	3.94	54	-16.7	Average	Horizontal
4844.46	42.45	40.49	33.06	35.04	3.94	74	-31.55	Peak	Vertical
4844.46	35.67	33.71	33.06	35.04	3.94	54	-18.33	Average	Vertical

## Channel 6

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4874.29	47.73	45.76	33.16	35.15	3.96	74	-26.27	Peak	Horizontal
4874.29	37.36	35.39	33.16	35.15	3.96	54	-16.64	Average	Horizontal
4874.29	46.15	44.18	33.16	35.15	3.96	74	-27.85	Peak	Vertical
4874.29	35.44	33.47	33.16	35.15	3.96	54	-18.56	Average	Vertical

## Channel 11

Freq MHz	Level dBuV/m	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4844.29	50.52	48.42	33.26	35.14	3.98	74	-23.48	Peak	Horizontal
4844.29	41.01	38.91	33.26	35.14	3.98	54	-12.99	Average	Horizontal
4904.54	47.36	45.26	33.26	35.14	3.98	74	-26.64	Peak	Vertical
4904.54	41.47	39.37	33.26	35.14	3.98	54	-12.53	Average	Vertical

## 5.6. Conducted Spurious Emissions

### 5.6.1. Standard Applicable

According to §15.247 (d): Output power was measured based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

### 5.6.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
RB / VB (Emission in restricted band)	100KHz/300KHz
RB / VB (Emission in non-restricted band)	100KHz/300KHz

### 5.6.3. Test Procedures

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz

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

Preliminary tests on individual chains, and on all chains with a combiner, were performed. The worst-case configuration was with a combiner, therefore final test were performed with all chains feeding a combiner.

### 5.6.4. Test Setup Layout

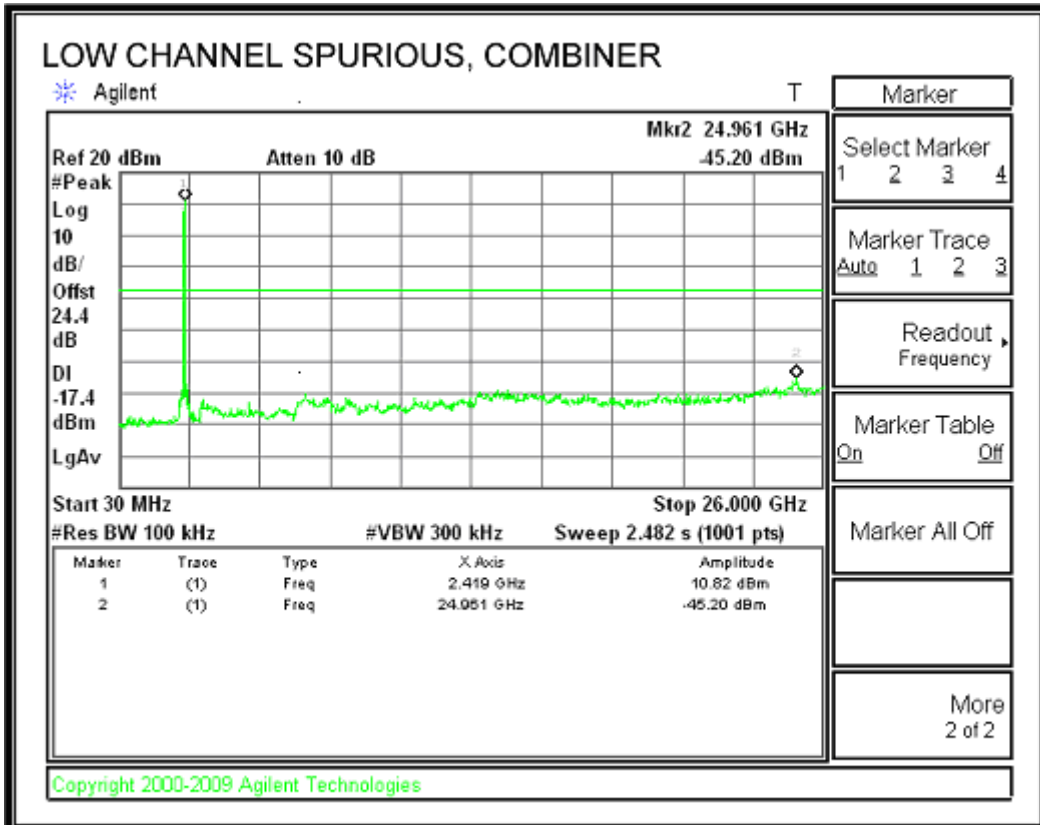
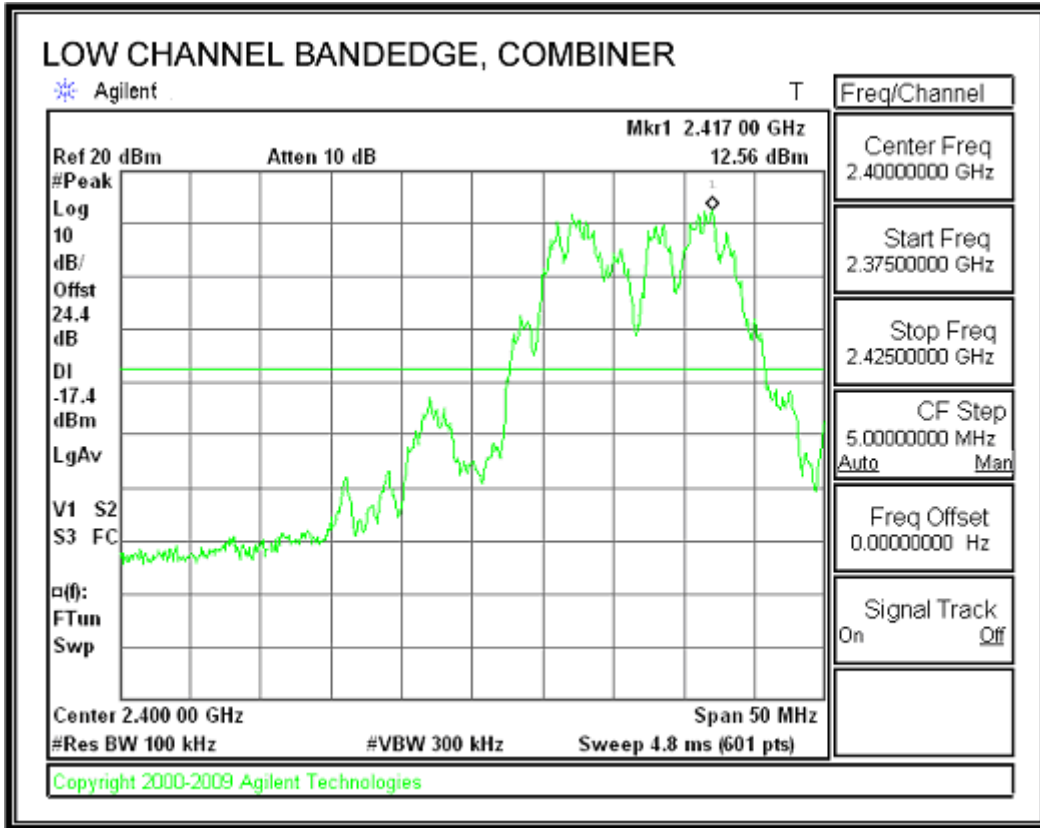
This test setup layout is the same as that shown in section 5.4.4.

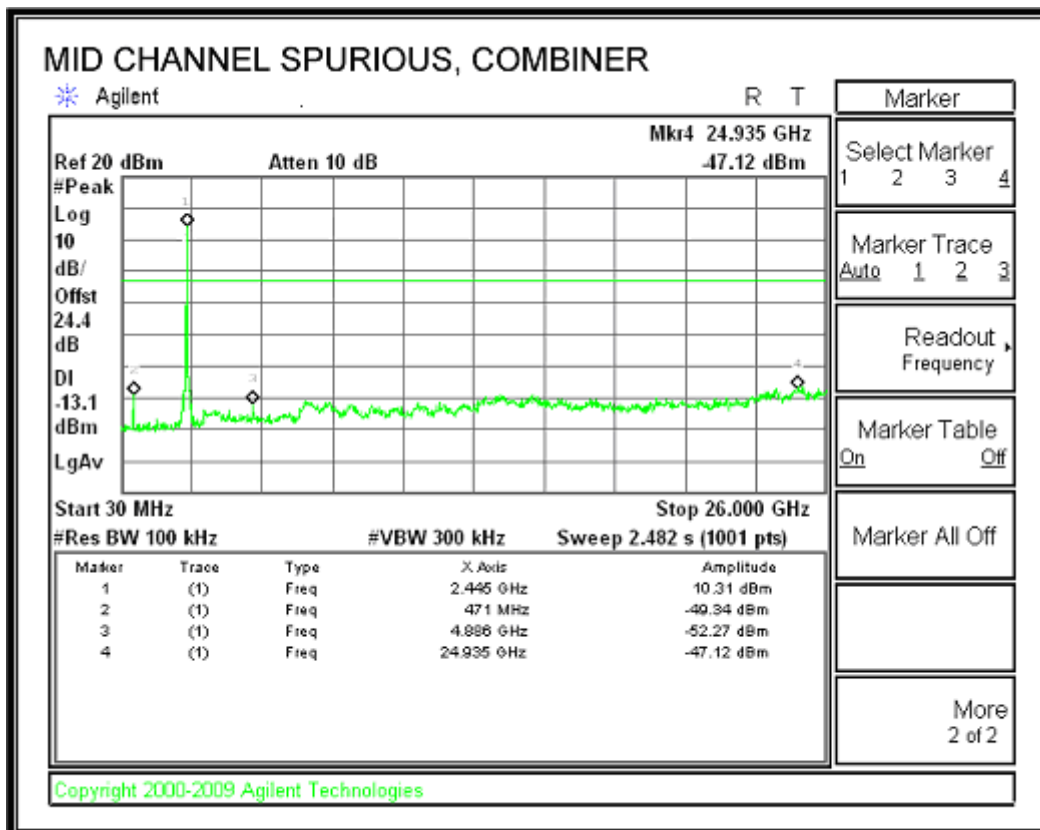
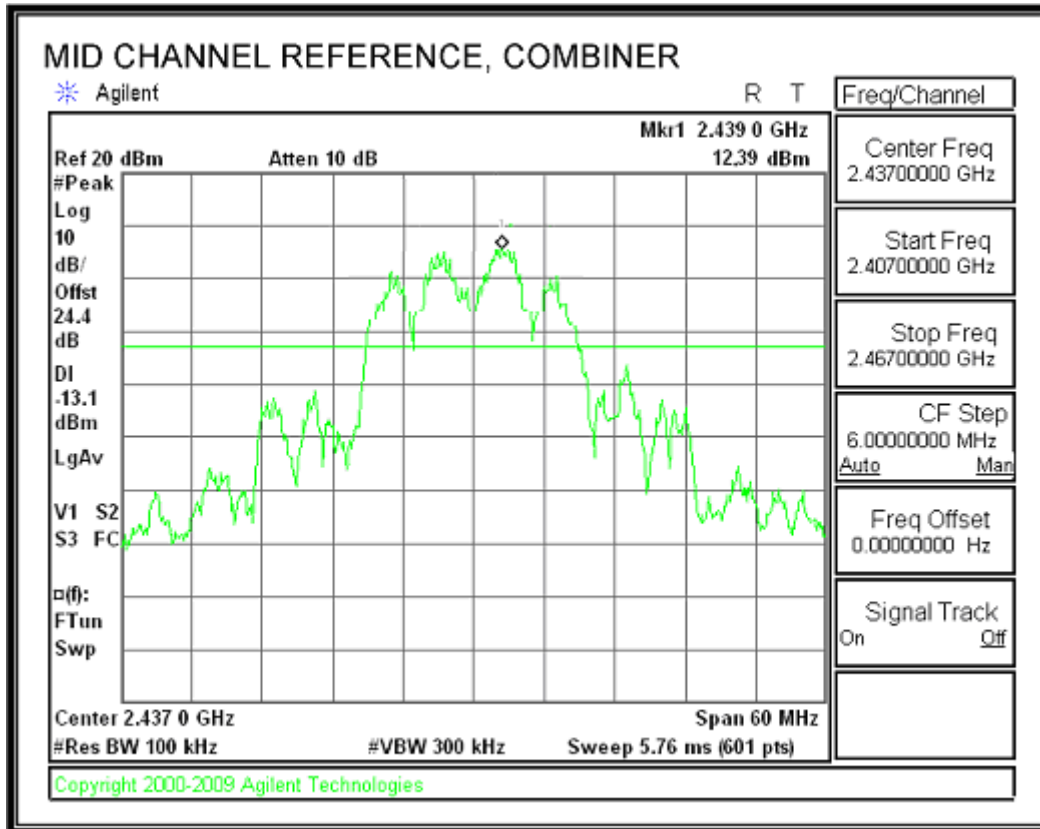
### 5.6.5. EUT Operation during Test

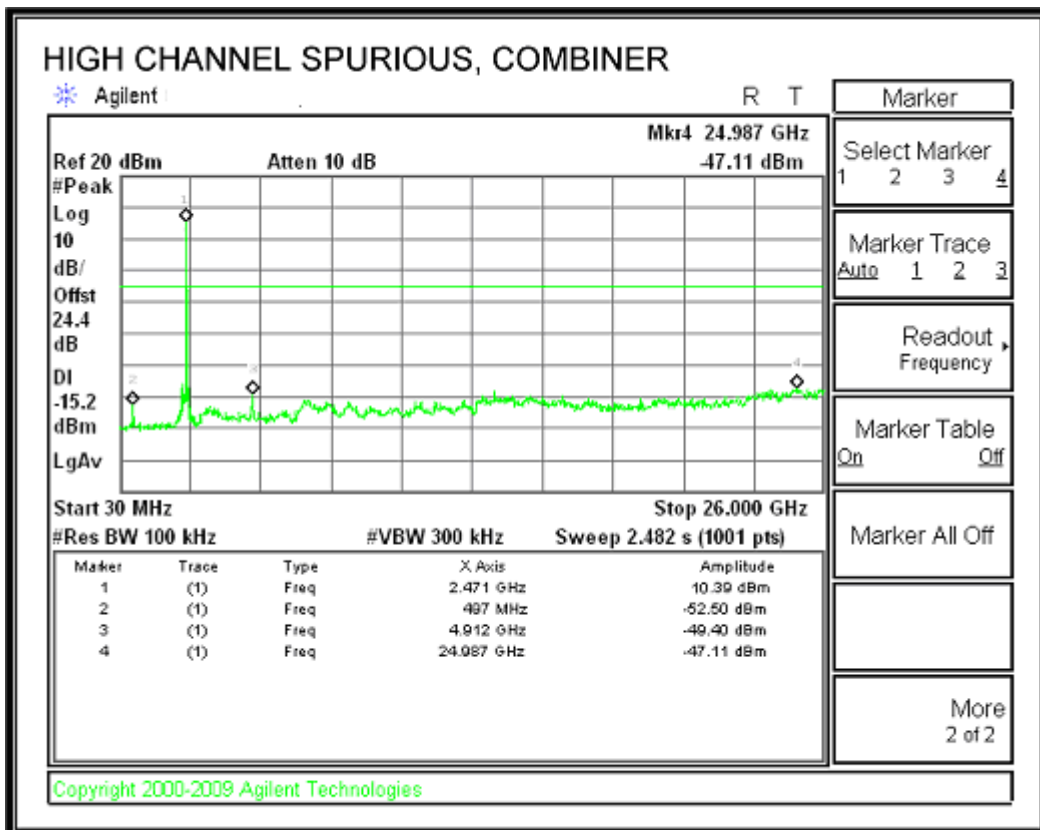
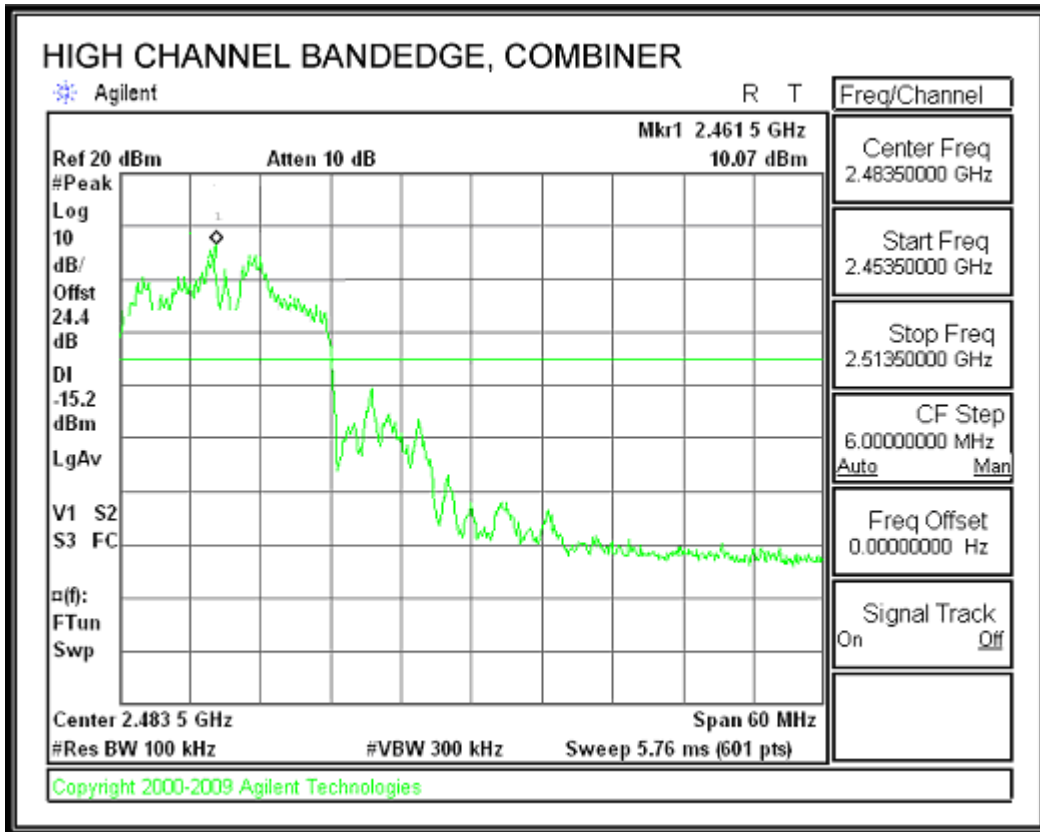
The EUT was programmed to be in continuously transmitting mode.

### 5.6.6. Test Results of Conducted Spurious Emissions

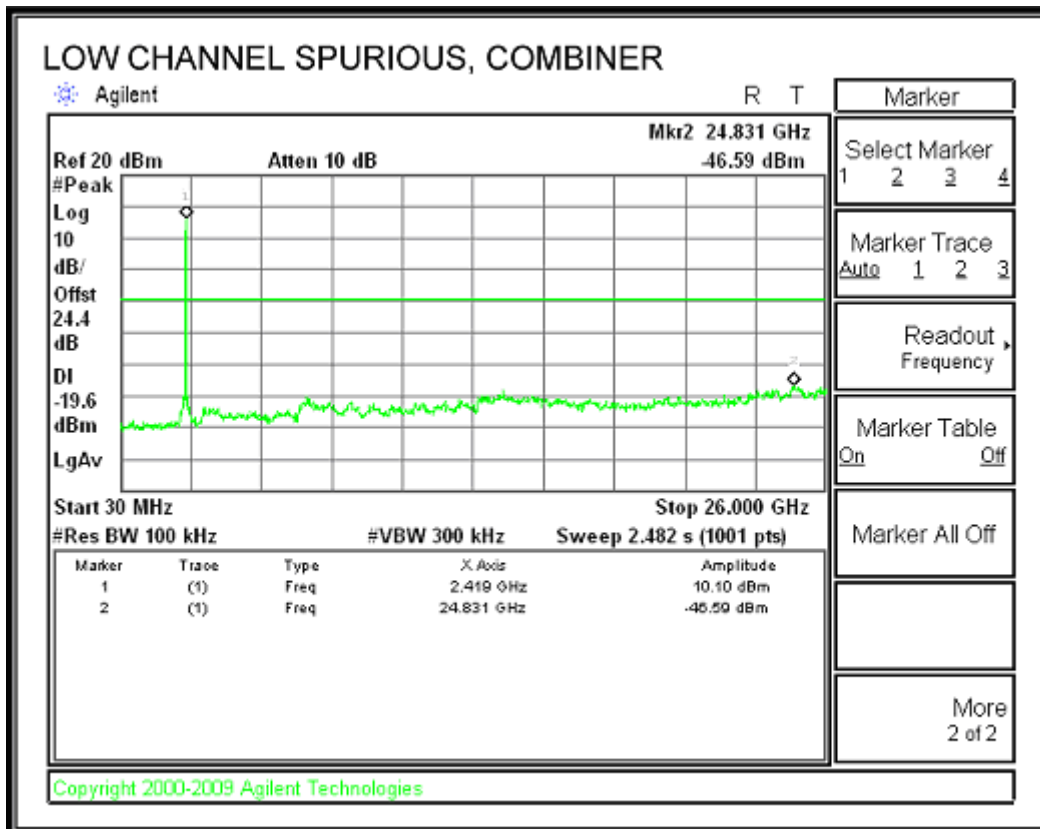
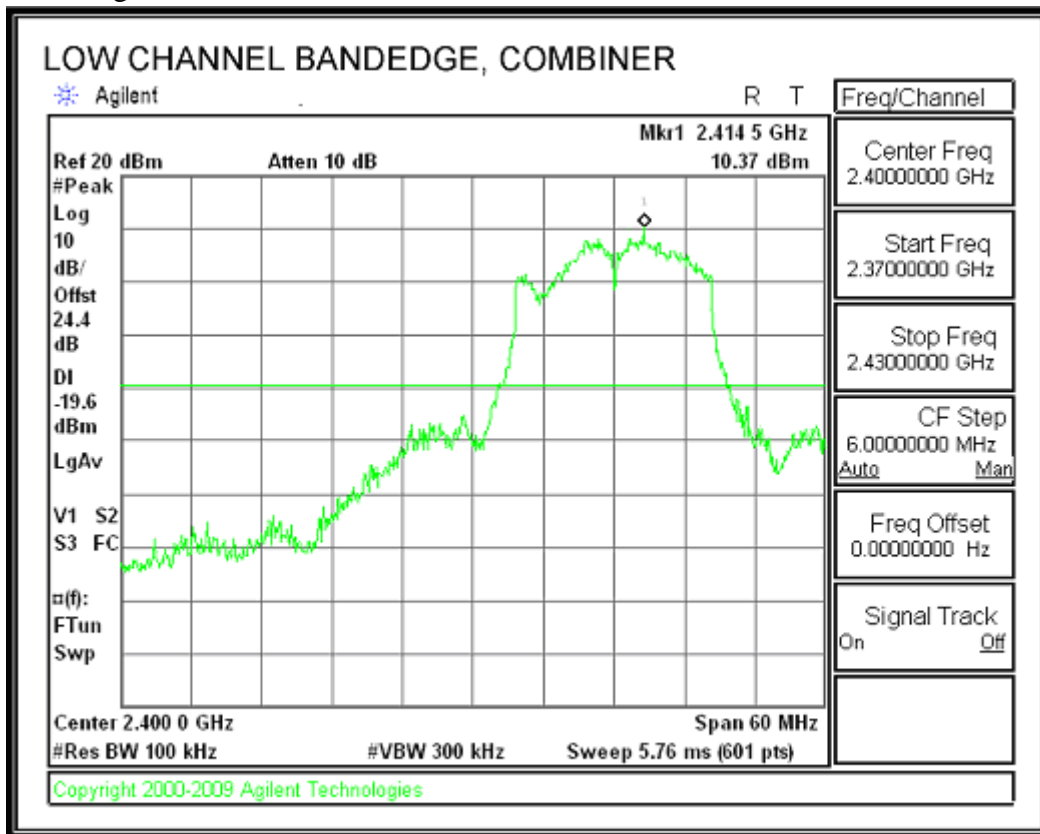
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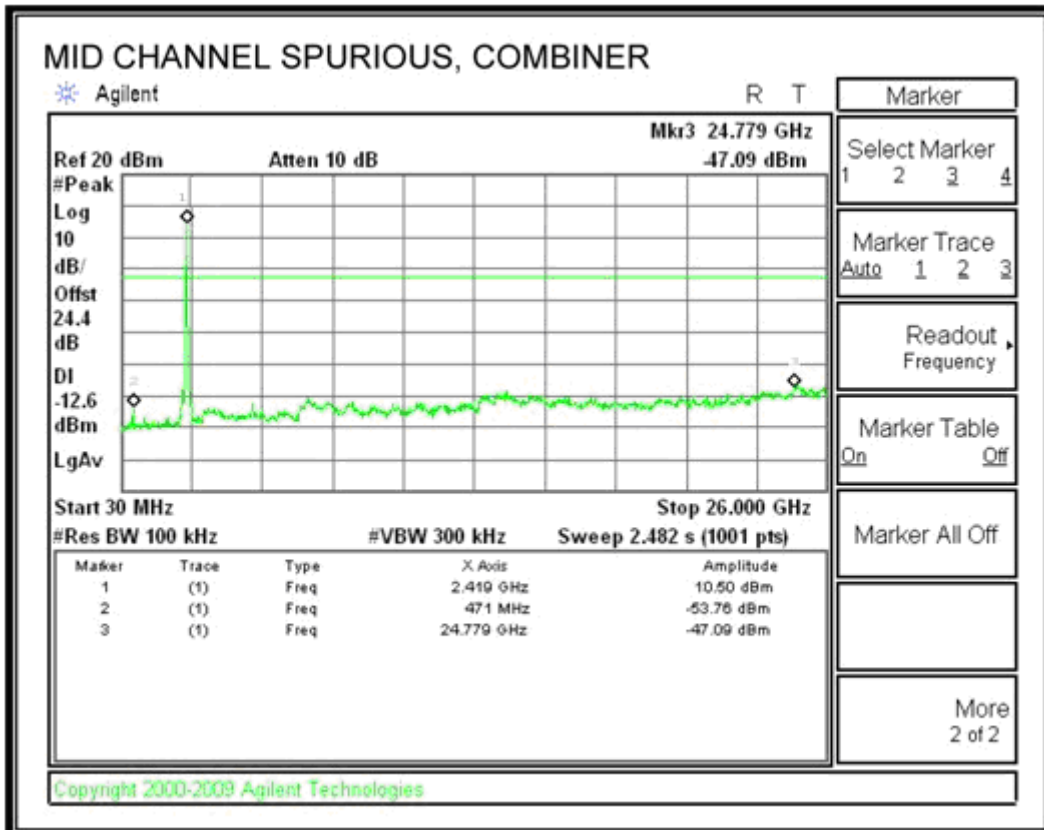
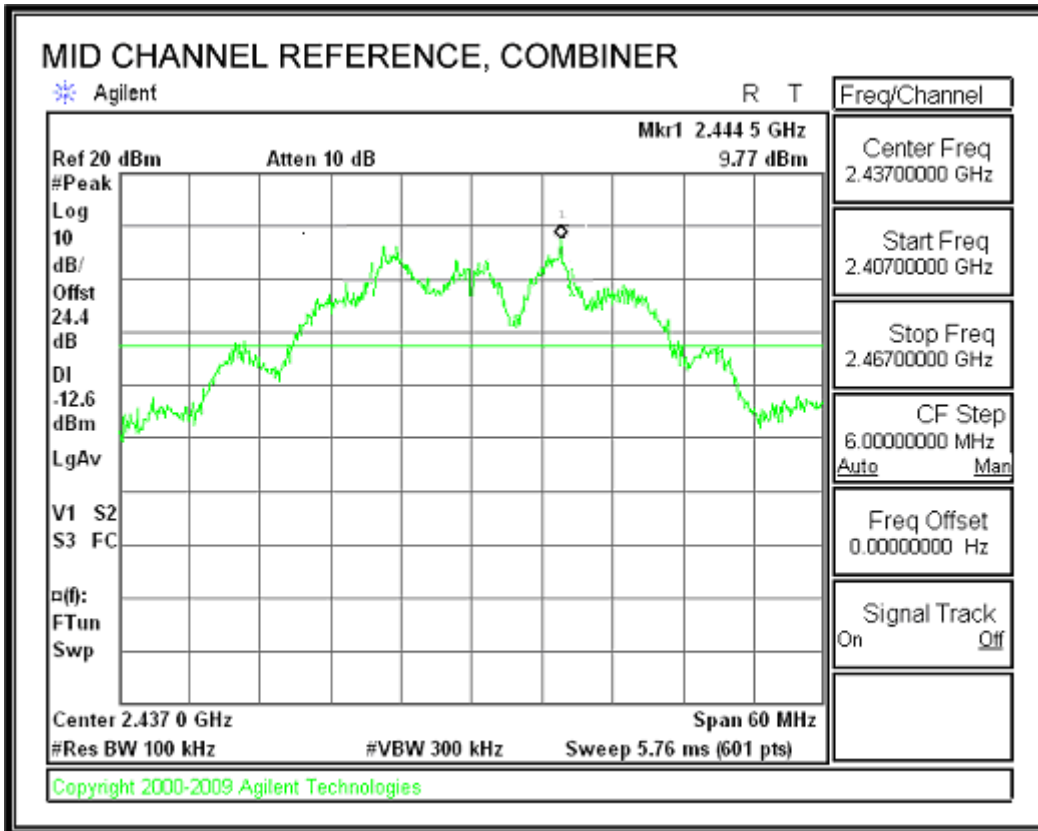


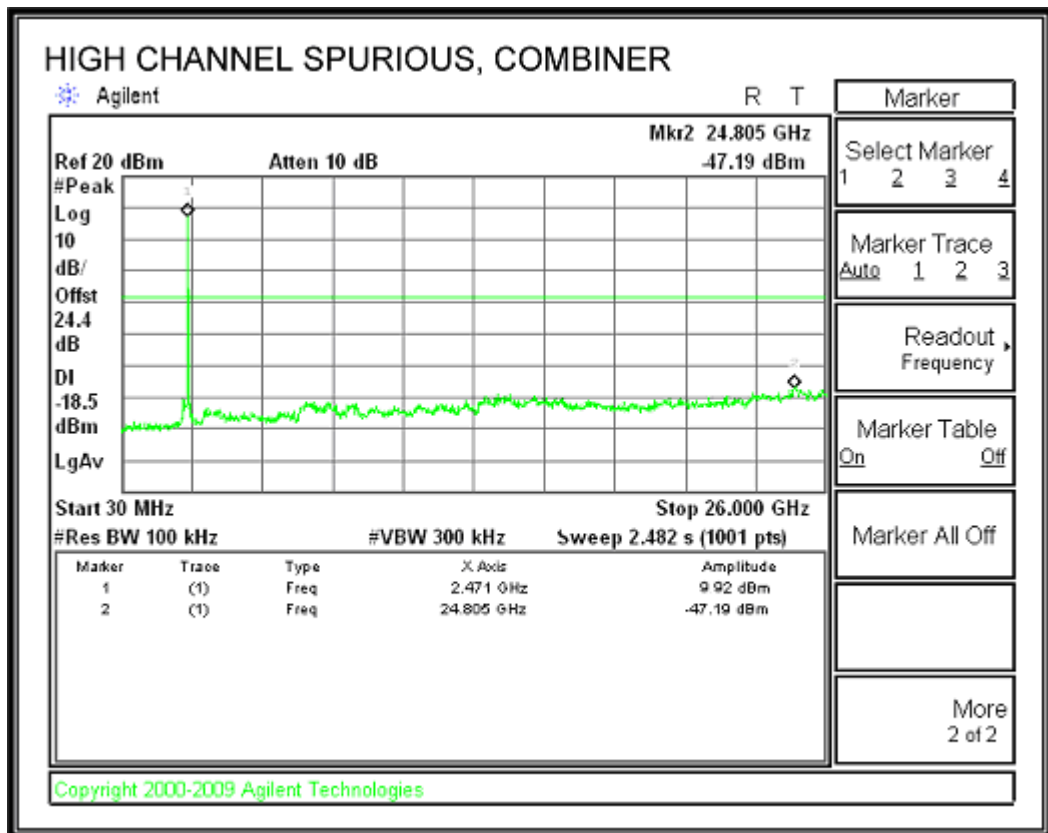
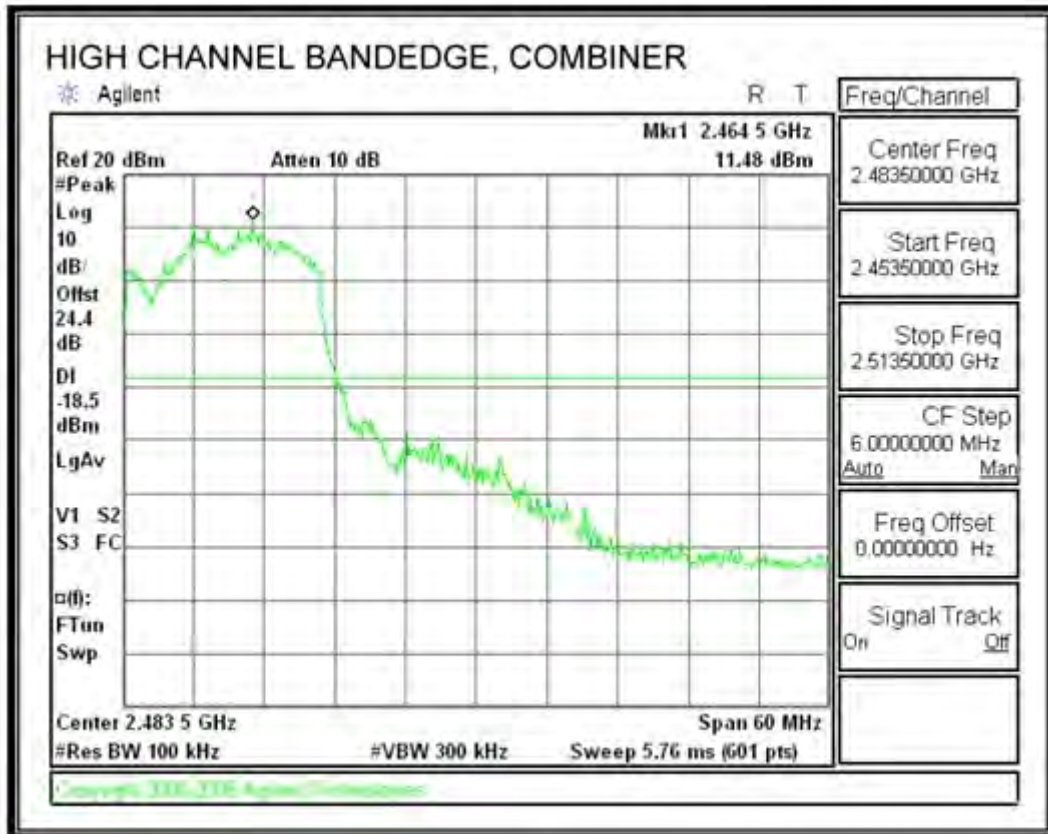




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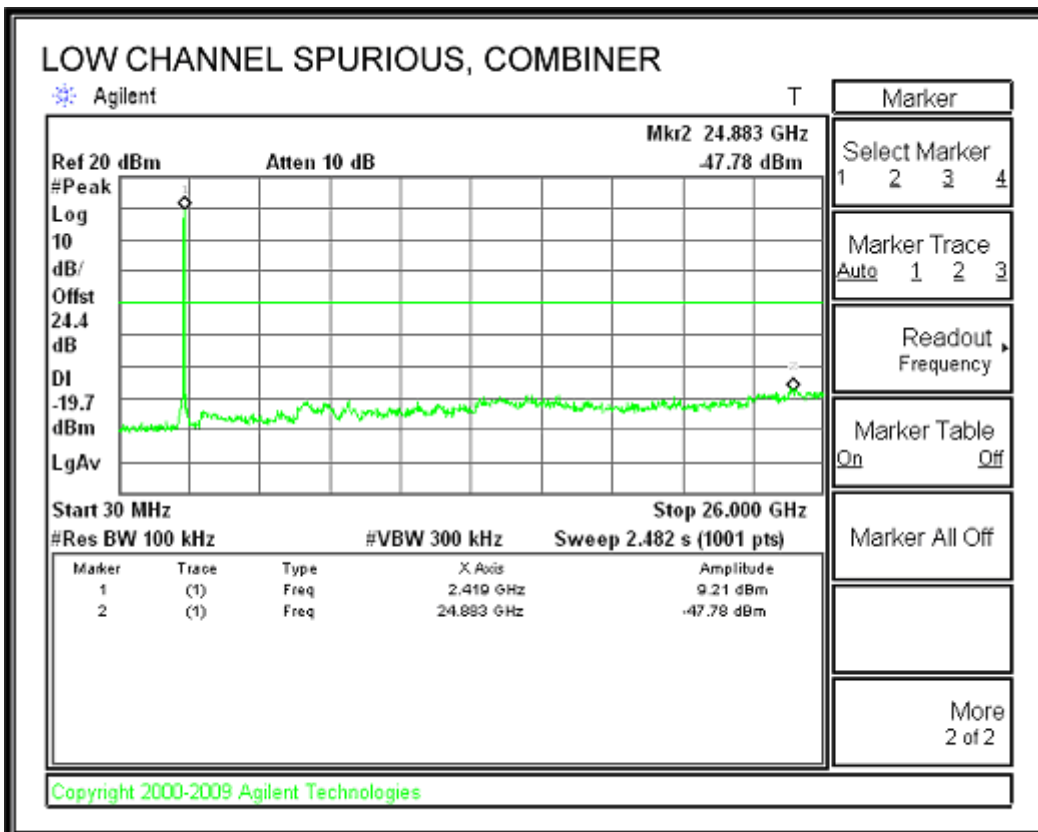
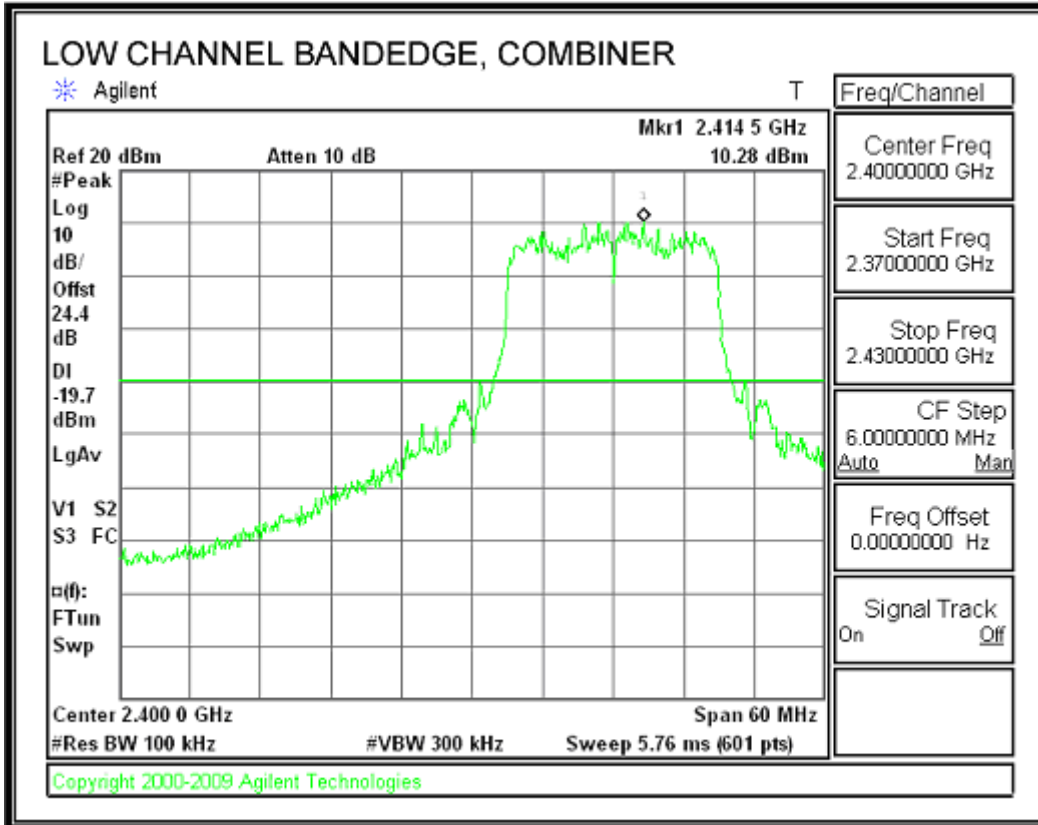


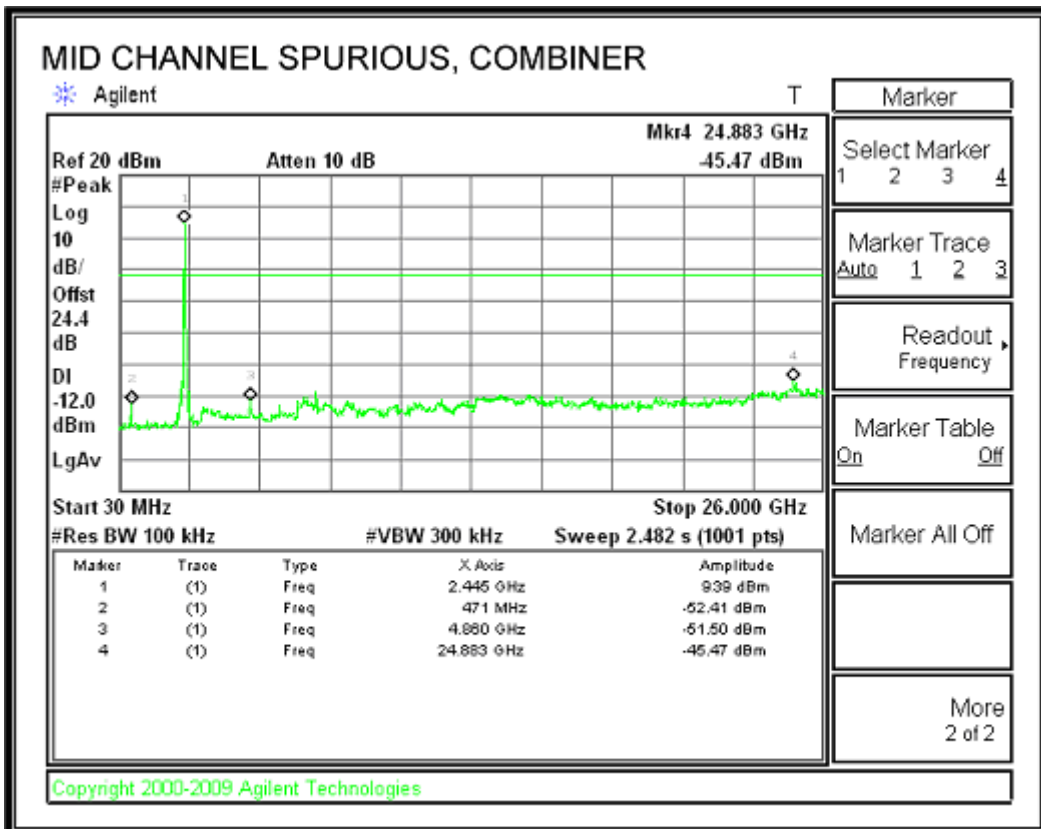
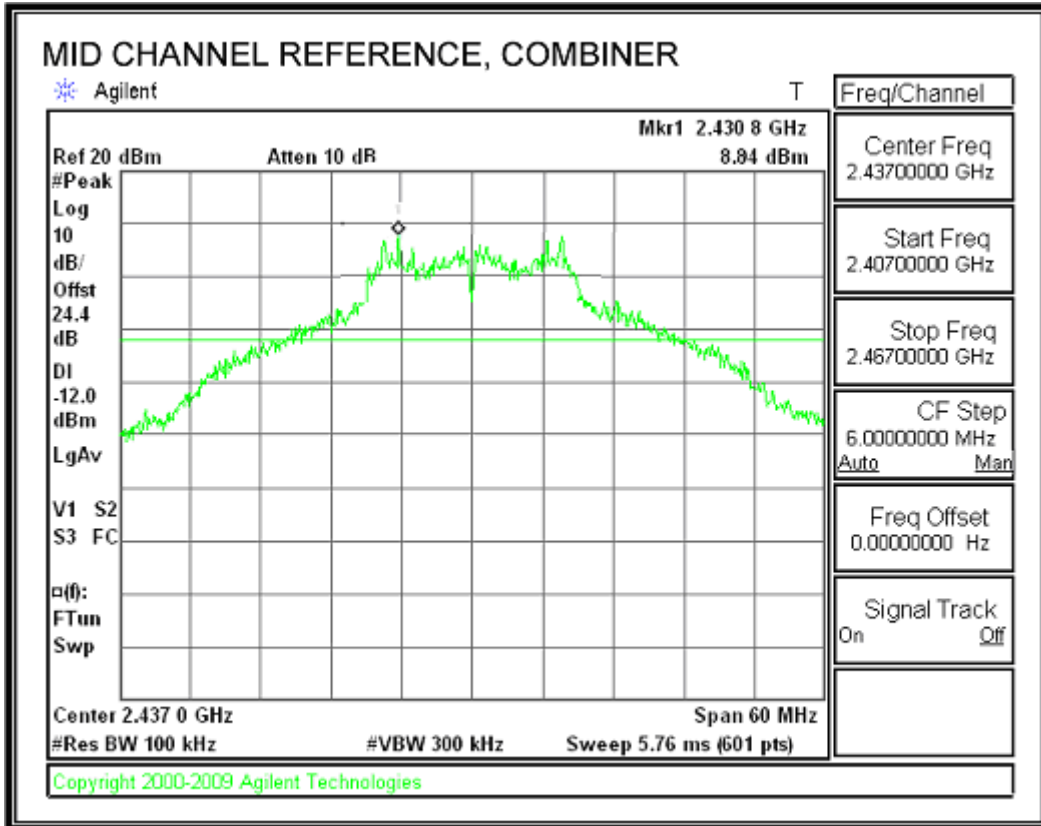


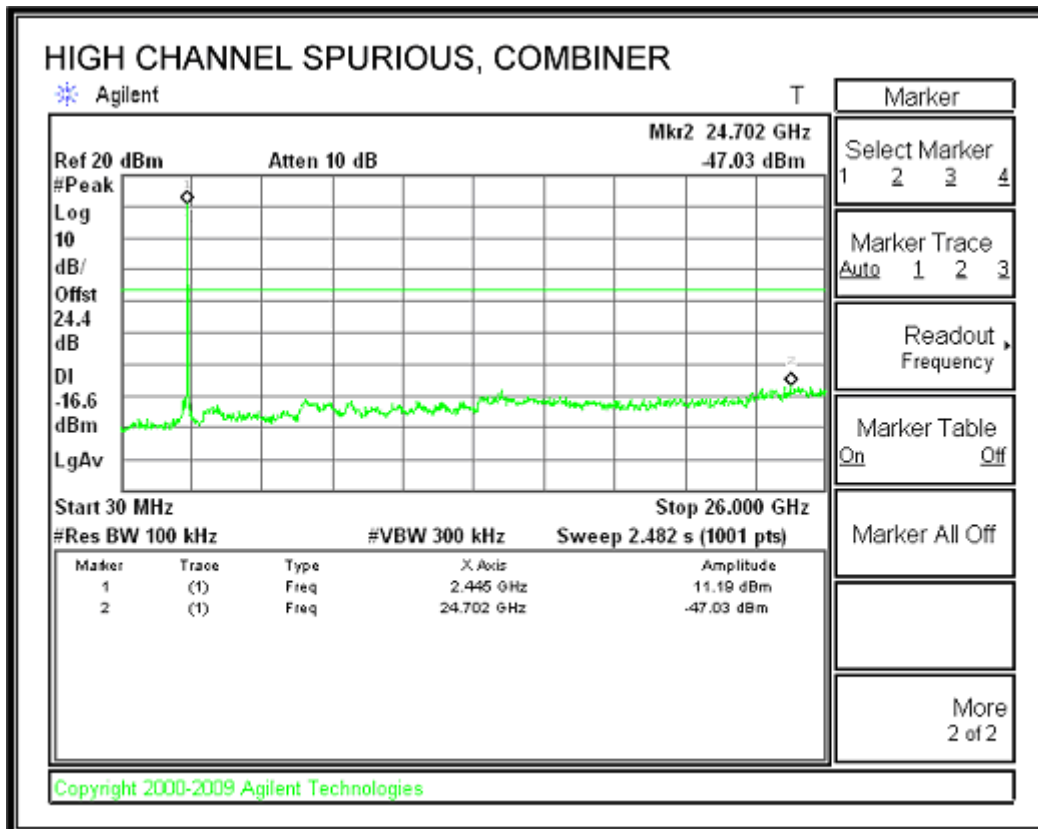
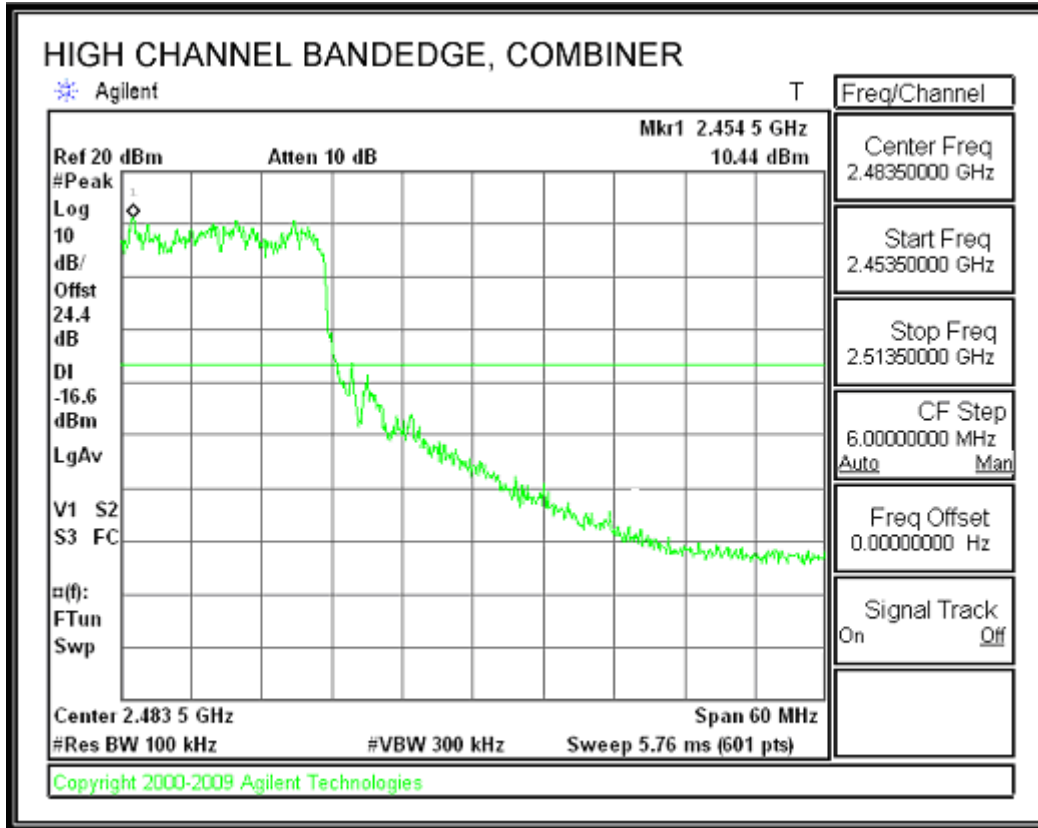




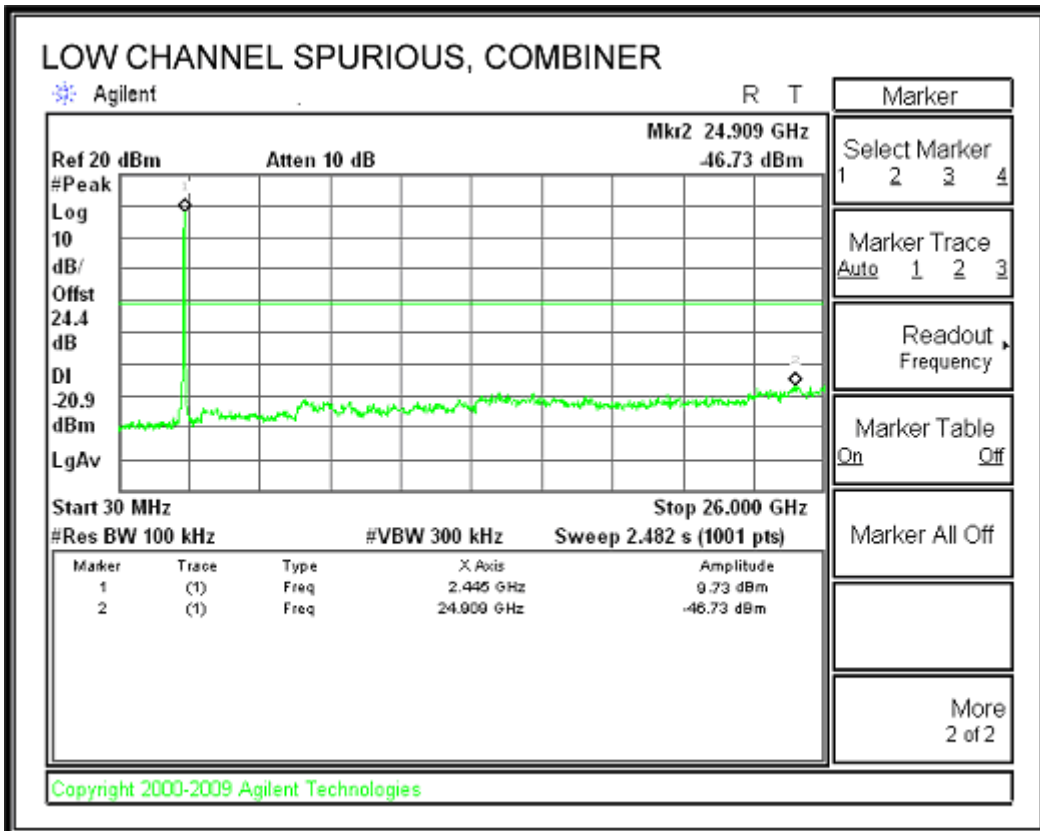
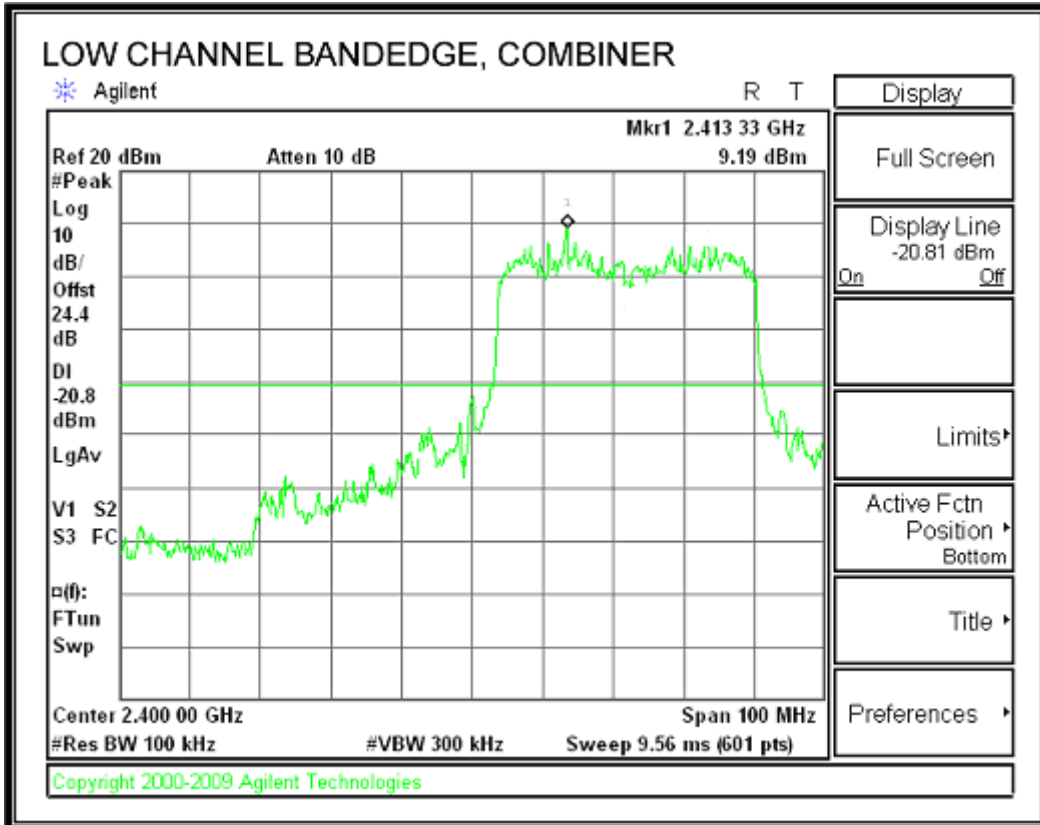
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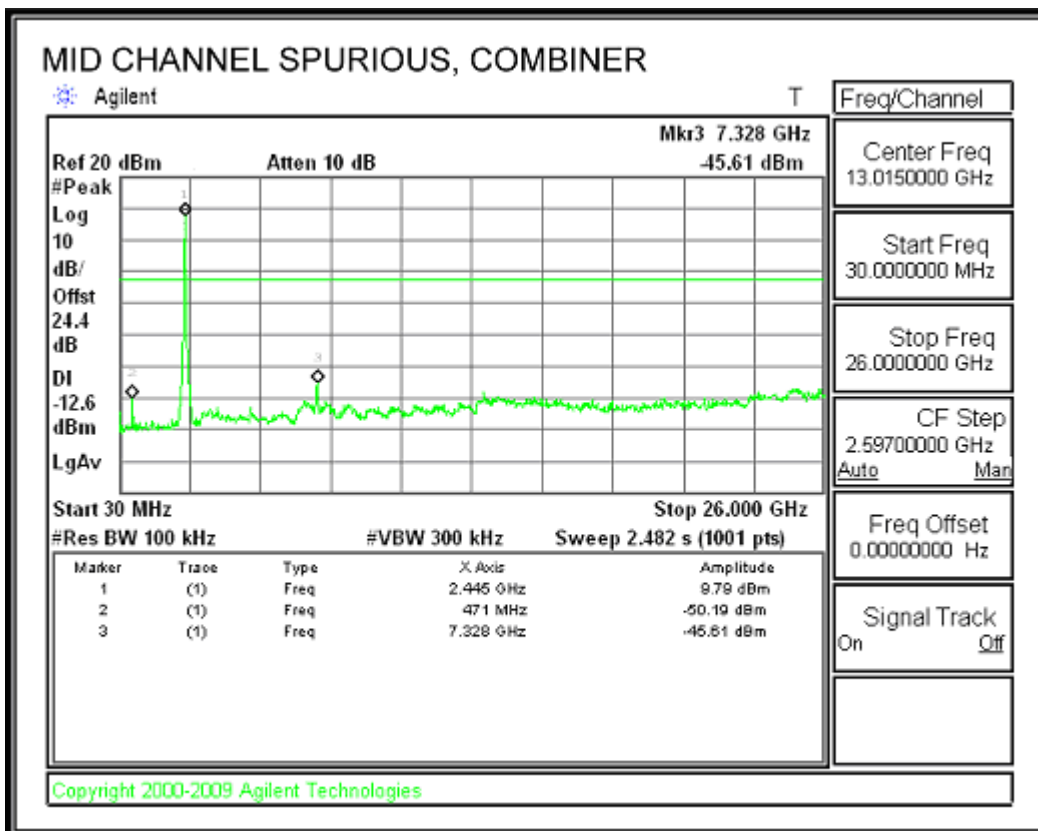
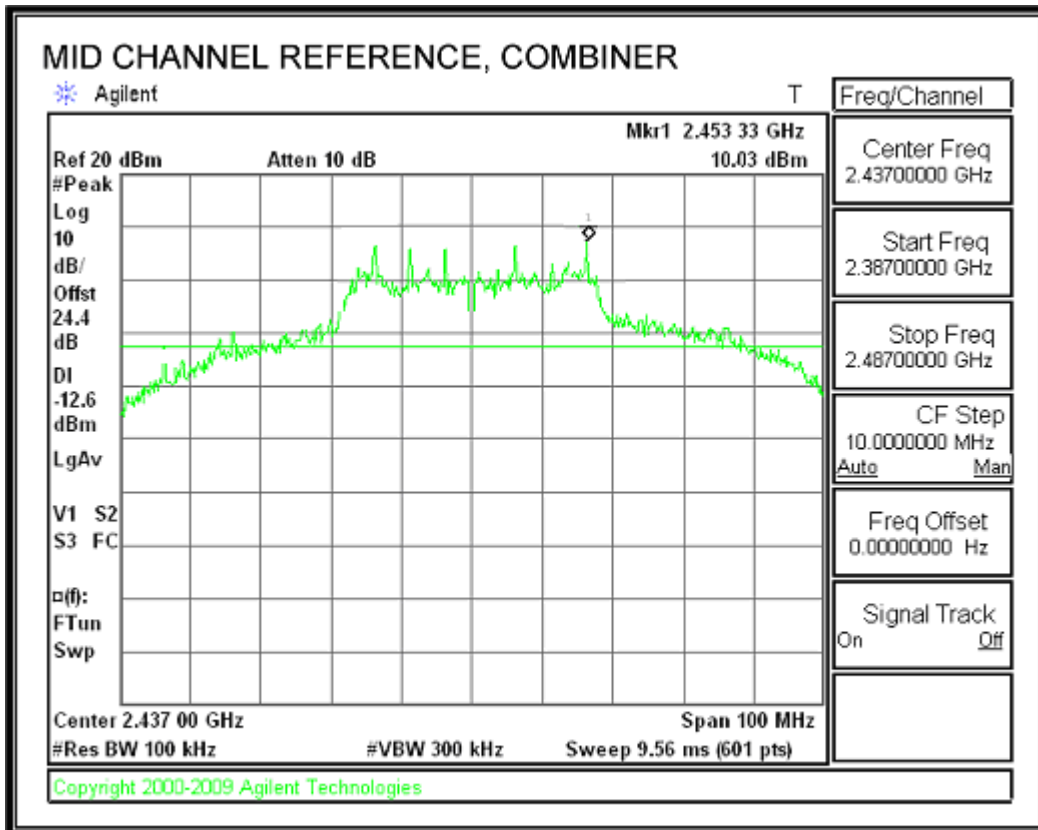


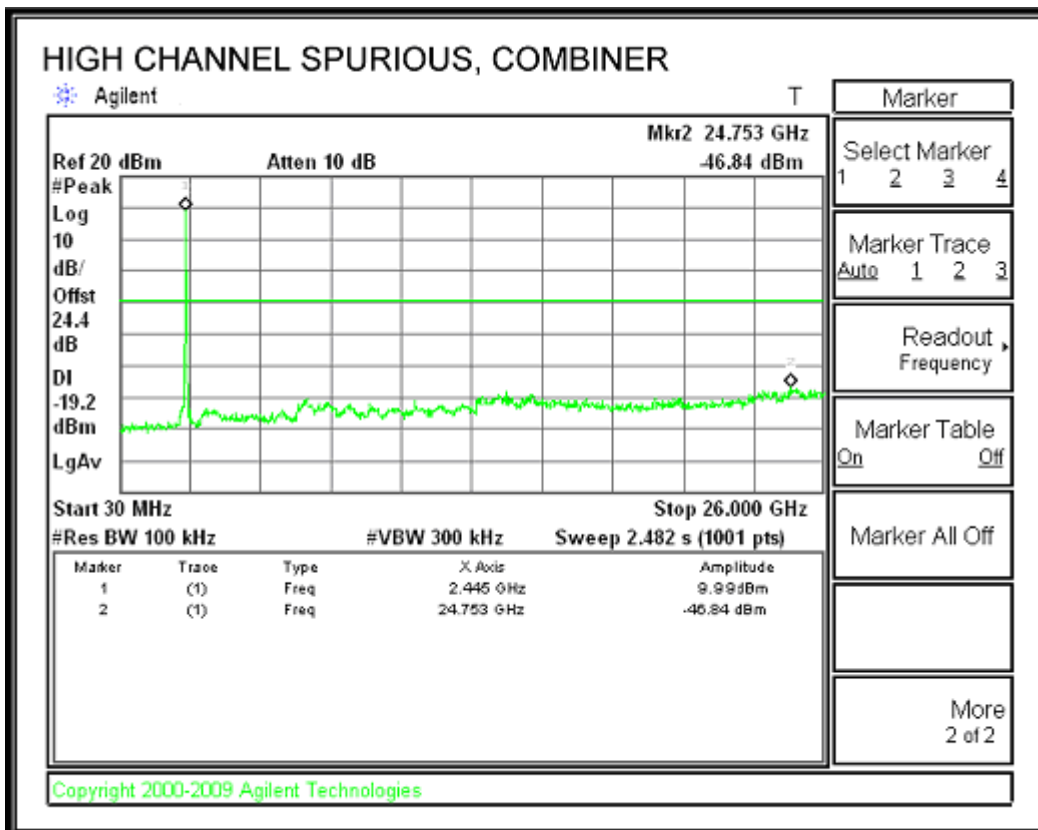
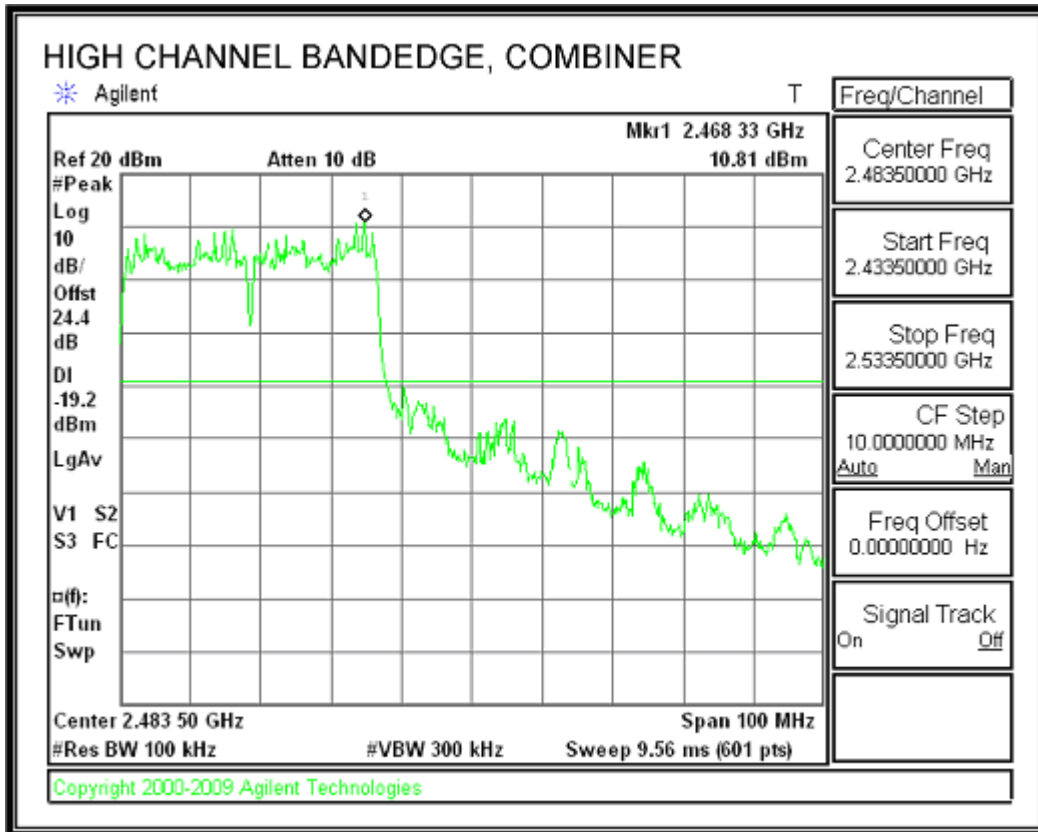




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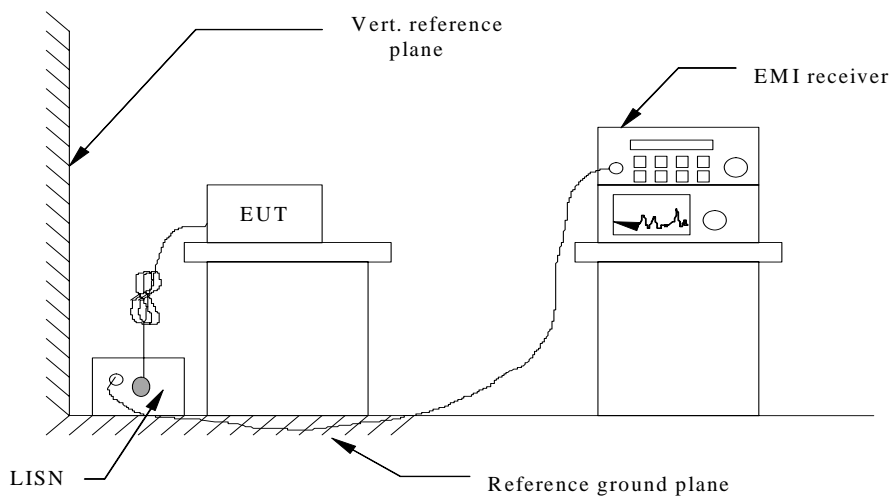
### 5.7. Power line conducted emissions

#### 5.7.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

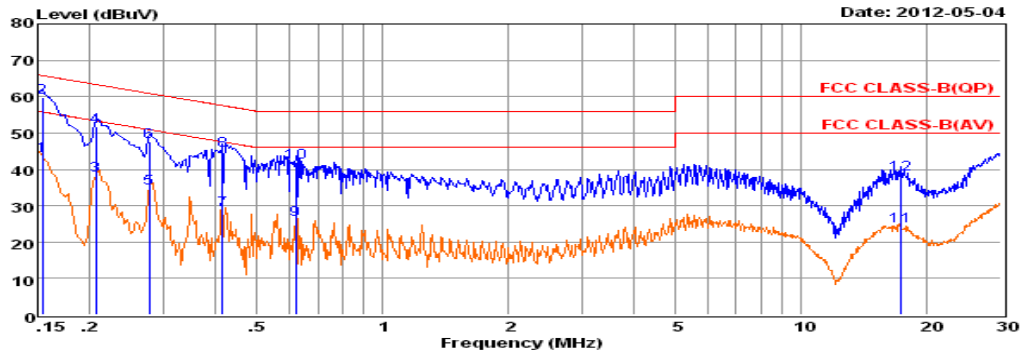
#### 5.7.2 Block Diagram of Test Setup



#### 5.7.3 Test Results

PASS.

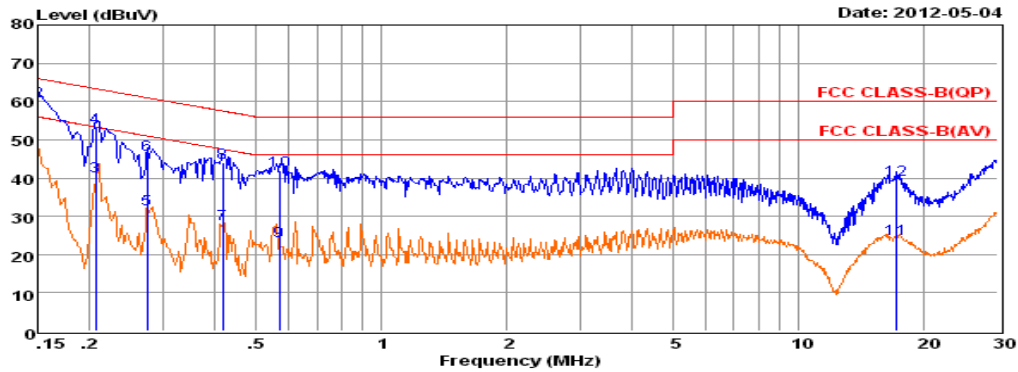
The test data please refer to following page.



Env. Ins: 24\*/56%  
 EUT: Wireless Adapter  
 M/N: SL-D001  
 Power Rating: DC 5V From PC Input AC 120V/60Hz  
 Test Mode: On  
 Operator: FOX  
 Memo:  
 Pol: LINE

	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.15	34.24	9.58	0.02	43.84	55.78	-11.94	Average
2	0.15	50.30	9.58	0.02	59.90	65.78	-5.88	QP
3	0.21	28.78	9.63	0.03	38.44	53.36	-14.92	Average
4	0.21	42.20	9.63	0.03	51.86	63.36	-11.50	QP
5	0.28	25.24	9.63	0.03	34.90	50.90	-16.00	Average
6	0.28	37.96	9.63	0.03	47.62	60.90	-13.28	QP
7	0.41	19.10	9.62	0.04	28.76	47.55	-18.79	Average
8	0.41	35.40	9.62	0.04	45.06	57.55	-12.49	QP
9	0.62	16.47	9.63	0.04	26.14	46.00	-19.86	Average
10	0.62	32.13	9.63	0.04	41.80	56.00	-14.20	QP
11	17.38	14.63	9.73	0.11	24.47	50.00	-25.53	Average
12	17.38	28.80	9.73	0.11	38.64	60.00	-21.36	QP

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.  
 2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: 24\*/56%  
 EUT: Wireless Adapter  
 M/N: SL-D001  
 Power Rating: DC 5V From PC Input AC 120V/60Hz  
 Test Mode: On  
 Operator: FOX  
 Memo:  
 Pol: NEUTRAL

	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.15	37.89	9.70	0.02	47.61	56.00	-8.39	Average
2	0.15	50.37	9.70	0.02	60.09	66.00	-5.91	QP
3	0.21	30.69	9.59	0.03	40.31	53.36	-13.05	Average
4	0.21	43.57	9.59	0.03	53.19	63.36	-10.17	QP
5	0.27	22.15	9.60	0.03	31.78	50.98	-19.20	Average
6	0.27	36.36	9.60	0.03	45.99	60.98	-14.99	QP
7	0.42	18.32	9.61	0.04	27.97	47.51	-19.54	Average
8	0.42	34.49	9.61	0.04	44.14	57.51	-13.37	QP
9	0.57	13.86	9.62	0.04	23.52	46.00	-22.48	Average
10	0.57	32.19	9.62	0.04	41.85	56.00	-14.15	QP
11	17.11	14.28	9.77	0.11	24.16	50.00	-25.84	Average
12	17.11	29.75	9.77	0.11	39.63	60.00	-20.37	QP

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.  
 2. The emission levels that are 20dB below the official limit are not reported.

Note: Pre-scan all mode and recorded the worst case results in this report (802.11g Channel 6)



## 5.8. Antenna Requirements

### 5.8.1. Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### 5.8.2. Antenna Connector Construction

The EUT has a component antenna, which, in accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EUT photo for details.

### 5.8.3. Results: Compliance.

## 5.9. Deviation to test specifications

[ NONE ]

## 6. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 21,2011	June 21,2012
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 21,2011	June 21,2012
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 21,2011	June 21,2012
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 29,2011	June 29,2012
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 21,2011	June 21,2012
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 21,2011	June 21,2012
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHz	June 21,2011	June 21,2012
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	June 21,2011	June 21,2012
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	June 21,2011	June 21,2012
Spectrum Analyzer	Agilent	E4446A	MY41440289	9k-26.5GHz	June 21,2011	June 21,2012
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	June 21,2011	June 21,2012
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	July 07,2011	July 07,2012
By-log Antenna	SCHAFFNER	CBL 6112D	22237	30MHz-1GHz	July 07,2011	July 07,2012
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	July 07,2011	July 07,2012
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	July 07,2011	July 07,2012
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 29,2011	June 29,2012
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 29,2011	June 29,2012
Spectrum Meter	R&S	FSP 30	100023	9kHz-30GHz	June 25,2011	June 25,2012
Power Meter	R&S	NRVS	100444	DC-40GHz	June 25,2011	June 25,2012
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 21,2011	June 21,2012
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 21,2011	June 21,2012
AC Power Source	HPC	HPA-500E	HPA-9100024	AC 0~300V	June 25,2011	June 25,2012
DC power Source	GW	GPC-6030D	C671845	DC 1V-60V	June 25,2011	June 25,2012
Temp. and Humidity	Giant Force	GTH-225-20-S	MAB0103-00	N/A	June 21,2011	June 21,2012
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 29,2011	June 29,2012
RF CABLE-2m	JYE Bao	RG142	CB)35-2m	20MHz-1GHz	June 29,2011	June 29,2012
Vector signal Generator	R&S	SMU200A	102098	100kHz~6GHz	June 25,2011	June 25,2012
Signal Generator	R&S	SMR40	10016	10MHz~40GHz	June 25,2011	June 25,2012
Oscilloscope	Tektonix	TDS380	B016197	400MHz/2GRS	June 21,2011	June 21,2012

### 7. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(s):

SL-5401G	SL-5402G	SL-5405G	SL-1501N
SL-1502N	SL-1503N	SL-1504N	SL-1505N
SL-1506N	SL-1507N	SL-1508N	SL-1509N
SL-3502N	SL-3503N	SL-3504N	SL-3505N
SL-3506N	SL-D002	--	--

Belong to the tested device:

Product description : Wireless Adapter

Model name : SL-D001

No additional models were tested.

-----THE END OF REPORT-----