



## FCC 47 CFR PART 15 SUBPART C

### TEST REPORT

For

### 802.11b/g Access Point

**Trade Name / Model:**

**RUBYTECH / OW-1000A, OW-1000 Advance, OW-1000A CPE, OW-1000APM,  
ROW-1000A, ROW-1000 Advance, ROW-1000A CPE, ROW-1000APM,  
Edimax / EW-7301APg,  
YUFO / Mini Station-2, YF-AR2315-400, ZOE-AP1400, ZOE-CPE1400**

*Issued to*

**RUBY TECH CORP.**  
2F, No.7, Lane 50, Nan Kang Road, Sec.3,  
Taipei, Taiwan

*Issued by*

**Compliance Certification Services Inc.**  
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## 1. TEST RESULT CERTIFICATION

**Applicant:** RUBY TECH CORP.  
2F, No.7, Lane 50, Nan Kang Road, Sec.3,  
Taipei, Taiwan

**Equipment Under Test:** 802.11b/g Access Point

**Trade Name / Model:** RUBYTECH / OW-1000A, OW-1000 Advance, OW-1000A CPE,  
OW-1000APM, ROW-1000A, ROW-1000 Advance,  
ROW-1000A CPE, ROW-1000APM,  
Edimax / EW-7301APg,  
YUFO / Mini Station-2, YF-AR2315-400, ZOE-AP1400,  
ZOE-CPE1400

**Date of Test:** December 3 ~ 23, 2008

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
Deviation from Applicable Standard	
N/A	

### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in **ANSI C63.4: 2003** and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

*Approved by:*

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Rex Lai  
Section Manager  
Compliance Certification Services Inc.

*Reviewed by:*

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Amanda Wu  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

Product	802.11b/g Access Point																			
Trade Name / Model Number	Trade Name	Model Number	Trade Name	Model Number	Trade Name	Model Number														
	RUBYTECH	OW-1000A, OW-1000 Advance, OW-1000A CPE, OW-1000APM, ROW-1000A, ROW-1000 Advance, ROW-1000A CPE, ROW-1000APM,	Edimax	EW-7301APg,	YUFO	Mini Station-2, YF-AR2315-400, ZOE-AP1400, ZOE-CPE1400														
Model Discrepancy	<ol style="list-style-type: none"><li>1. All the specification and layout are identical except they come with different trade names and model numbers for marketing purpose.</li><li>2. The EUT comes two types for sales, please refer to the table as below and photograph for the details.</li></ol>																			
		<table border="1"><thead><tr><th></th><th>Color of Appearance</th><th>Housing material</th><th>Patch Antenna</th><th>Monopole Antenna</th></tr></thead><tbody><tr><td>Type 1</td><td>White</td><td>Plastic</td><td>Y</td><td>Y</td></tr><tr><td>Type 2</td><td>Blue</td><td>Metal case</td><td>N</td><td>Y</td></tr></tbody></table>		Color of Appearance	Housing material	Patch Antenna	Monopole Antenna	Type 1	White	Plastic	Y	Y	Type 2	Blue	Metal case	N	Y			
	Color of Appearance	Housing material	Patch Antenna	Monopole Antenna																
Type 1	White	Plastic	Y	Y																
Type 2	Blue	Metal case	N	Y																
Power Supply	<ol style="list-style-type: none"><li>1. Power Adapter: Trade Name / Model number: UNIFIVE / US301210 I/P: AC 100-240V, 0.3A, 50-60Hz O/P: DC 12V, 1A</li><li>2. DC 12V from Power PoE</li></ol>																			
Frequency Range	2412 ~ 2462 MHz																			
Transmit Power	IEEE 802.11b: 15.11 dBm IEEE 802.11g: 16.24 dBm																			
Modulation Technique	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: DSSS (CCK, DQPSK, DBPSK) + OFDM (QPSK, BPSK, 16-QAM, 64-QAM)																			
Transmit Data Rate	IEEE 802.11b Mode: 11, 5.5, 2, 1 Mbps IEEE 802.11g Mode: 54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1Mbps																			
Number of Channels	11 Channels																			
Antenna Specification	<ol style="list-style-type: none"><li>1. Patch antenna / Gain: 9 dBi</li><li>2. Monopole antenna / Gain: 5 dBi</li></ol>																			

**Remark:**

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **KFWOW1000A** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



### 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2003 and FCC CFR 47 Part 15.207, 15.209 and 15.247.

#### 3.1 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.

#### 3.2 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 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

#### 3.3 GENERAL TEST PROCEDURES

##### 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: 2003 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### 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: 2003.



### 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41	322 - 335.4		

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



### 3.5 DESCRIPTION OF TEST MODES

The EUT (model: OW-1000A) comes with two type antennas (Patch antenna & Monopole antenna) for sales that cannot be simultaneous transmitter. After the preliminary test, the worst case of RF conducted emission is Patch antenna.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

IEEE 802.11b mode:

Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 11Mbps data rate were chosen for the final testing.

IEEE 802.11g mode:

Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 54Mbps data rate were chosen for the final testing.

The following test modes are listed as below:

	Test Mode	Tested Channel	Housing material	Color of Appearance	Antenna Type	Antenna Gain	
Type 1	1	Low, Mid, High	Plastic	White	Patch antenna	9dBi	With Adapter
	2	Low, Mid, High	Plastic	White	Monopole antenna	5dBi	With Adapter
Type 2	3	Low, Mid, High	Metal case	Blue	Monopole antenna	5dBi	With Adapter
	4	Low, Mid, High	Metal case	Blue	Monopole antenna	5dBi	With Adapter and PoE

**Test Mode 1** for conducted emissions testing.

**Test Mode 1 ~ 3** for radiated emissions testing.

**Test Mode 4** for power line conducted emissions.



## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

*Remark: Each piece of equipment is scheduled for calibration once a year.*

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	02/24/2009

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	09/10/2009
Test Receiver	Rohde&Schwarz	ESCI	100064	11/30/2009
Switch Controller	TRC	Switch Controller	SC94050010	05/03/2009
4 Port Switch	TRC	4 Port Switch	SC94050020	05/03/2009
Loop Antenna	EMCO	6502	8905/2356	05/30/2009
Horn-Antenna	TRC	HA-0502	06	06/04/2009
Horn-Antenna	TRC	HA-0801	04	06/18/2009
Horn-Antenna	TRC	HA-1201A	01	10/15/2009
Horn-Antenna	TRC	HA-1301A	01	10/15/2009
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/28/2009
Turn Table	Max-Full	MFT-120S	T120S940302	N.C.R.
Antenna Tower	Max-Full	MFA-430	A440940302	N.C.R.
Controller	Max-Full	MF-CM886	CC-C-1F-13	N.C.R.
Site NSA	CCS	N/A	FCC MRA: TW1039 IC: IC 2324G-1/-2	10/17/2010 11/04/2010
Test S/W	LABVIEW (V 6.1)			

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER 9kHz-30MHz	ROHDE & SCHWARZ	ESHS30	828144/003	11/18/2009
TWO-LINE V-NETWORK 9kHz-30MHz	SCHAFFNER	NNB41	03/10013	06/11/2009
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	04/09/2009
Test S/W	LABVIEW (V 6.1)			



### 4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 2.81
3M Semi Anechoic Chamber / 30MHz ~ 1GHz	+/-3.7046
3M Semi Anechoic Chamber / Above 1GHz	+/-3.0958

**Remark:** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .



## **5. FACILITIES AND ACCREDITATIONS**

### **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4: 2003 and CISPR Publication 22.

### **5.2 EQUIPMENT**

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



### 5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

*\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**Remark:**

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

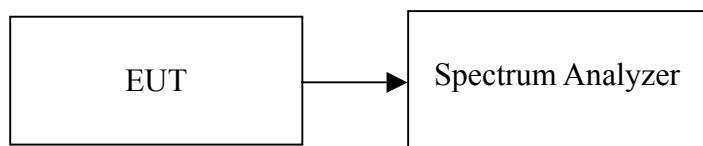
## 7. FCC PART 15.247 REQUIREMENTS

### 7.1 6DB BANDWIDTH

#### **LIMIT**

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

#### **Test Configuration**



#### **TEST PROCEDURE**

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz, VBW = RBW, Span = 50MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

#### **TEST RESULTS**

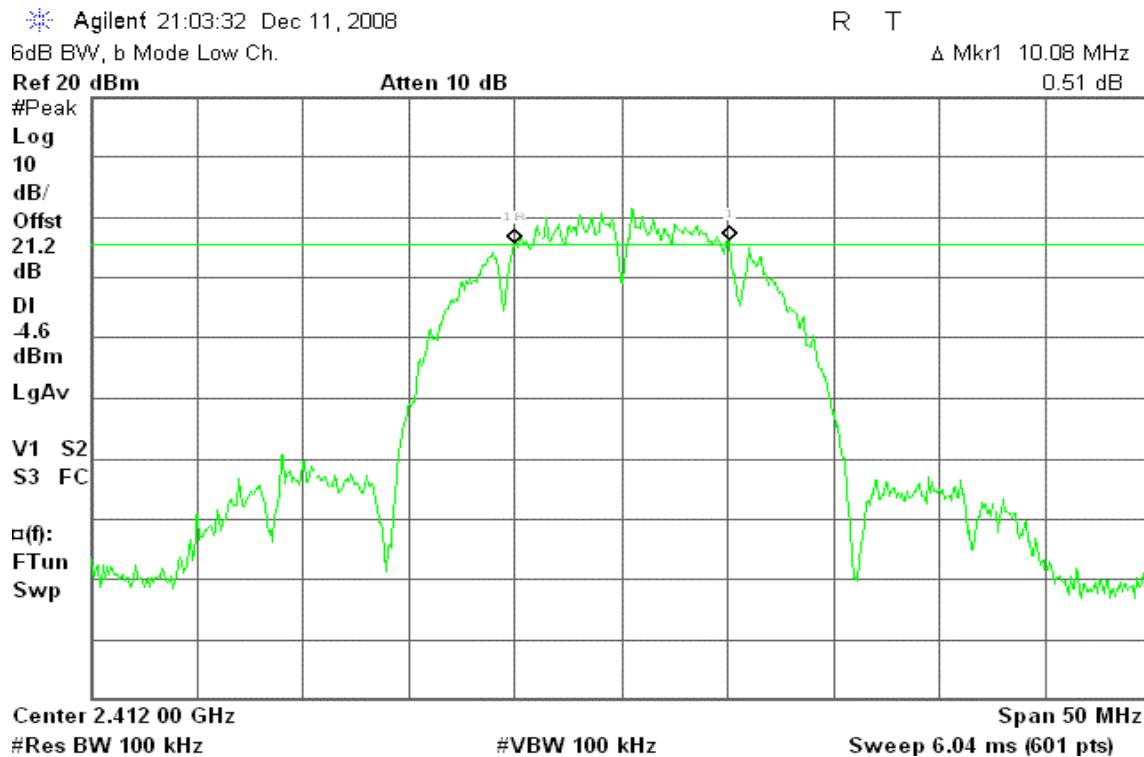
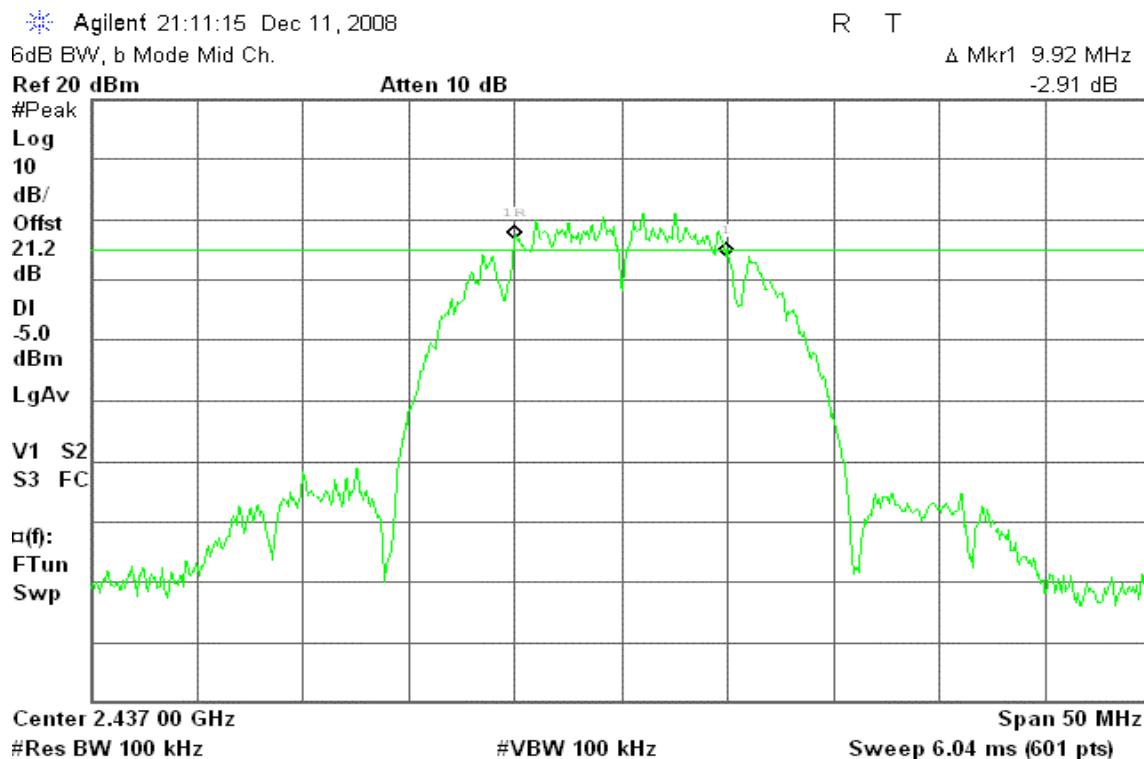
*No non-compliance noted.*

**Test Data / Test Mode 1****Test mode: IEEE 802.11b**

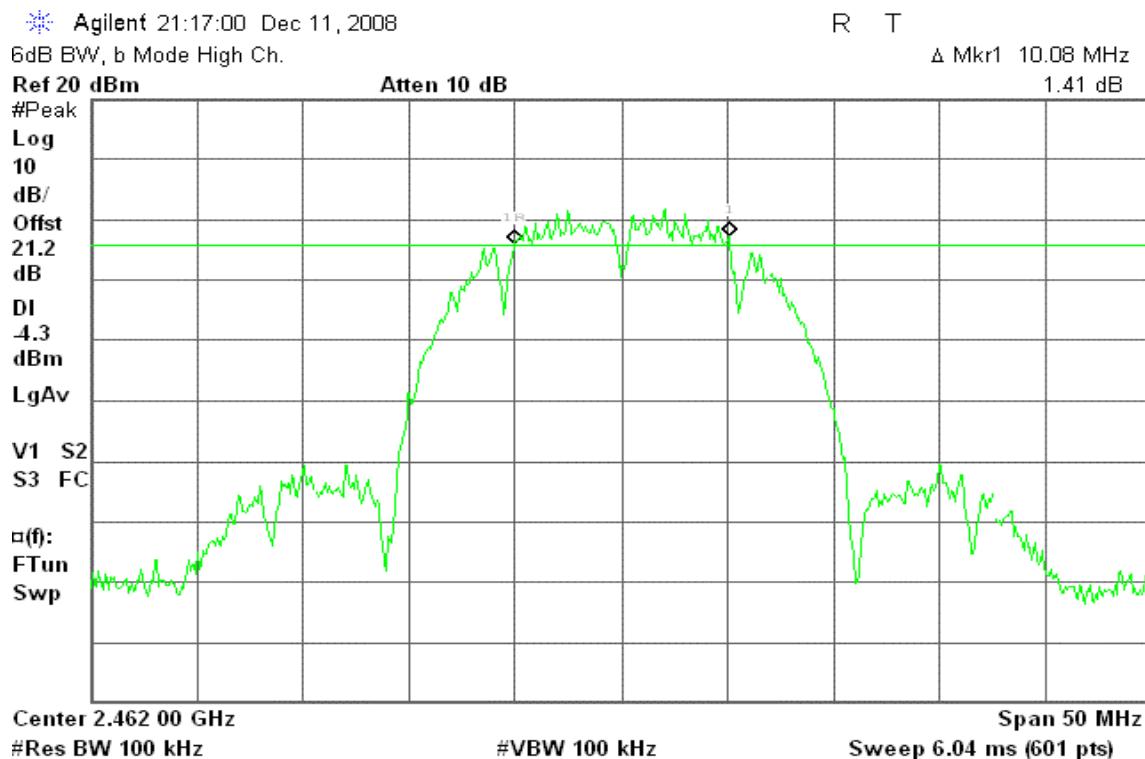
Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	10080	>500	PASS
Mid	2437	9920		PASS
High	2462	10080		PASS

**Test mode: IEEE 802.11g**

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	16580	>500	PASS
Mid	2437	16580		PASS
High	2462	16580		PASS

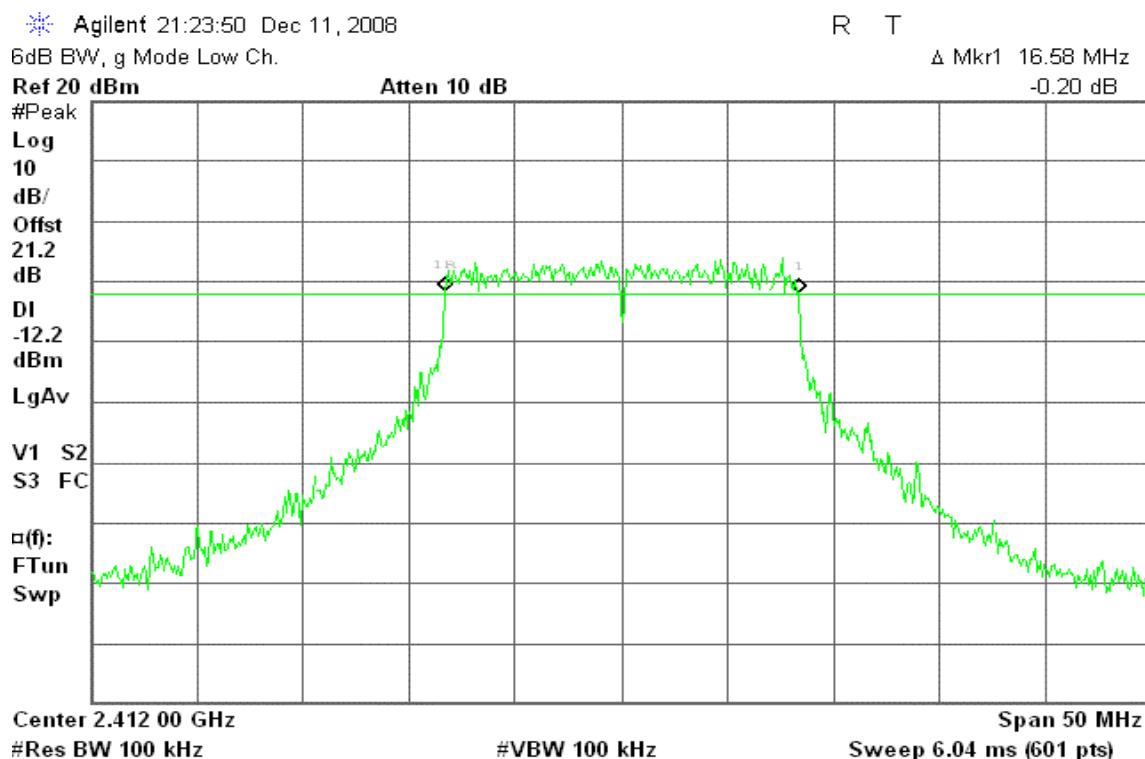
**Test Plot / Test Mode 1****IEEE 802.11b****6dB Bandwidth (CH Low)****6dB Bandwidth (CH Mid)**

### 6dB Bandwidth (CH High)

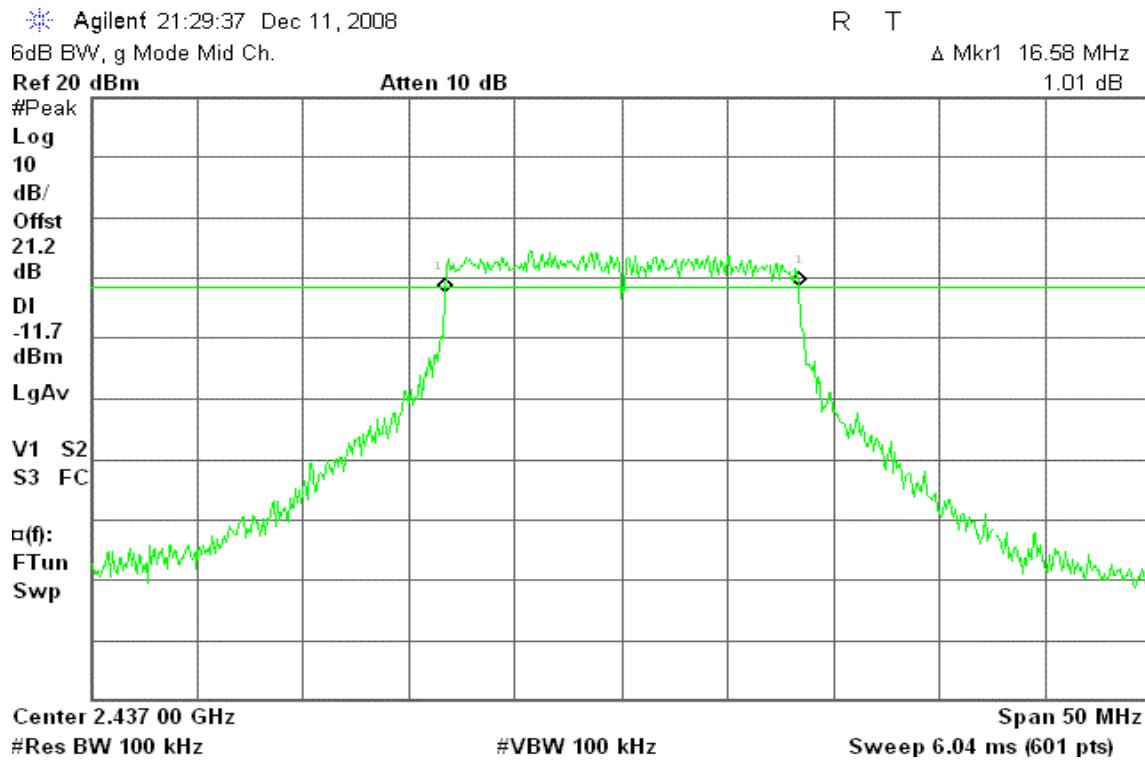


### IEEE 802.11g

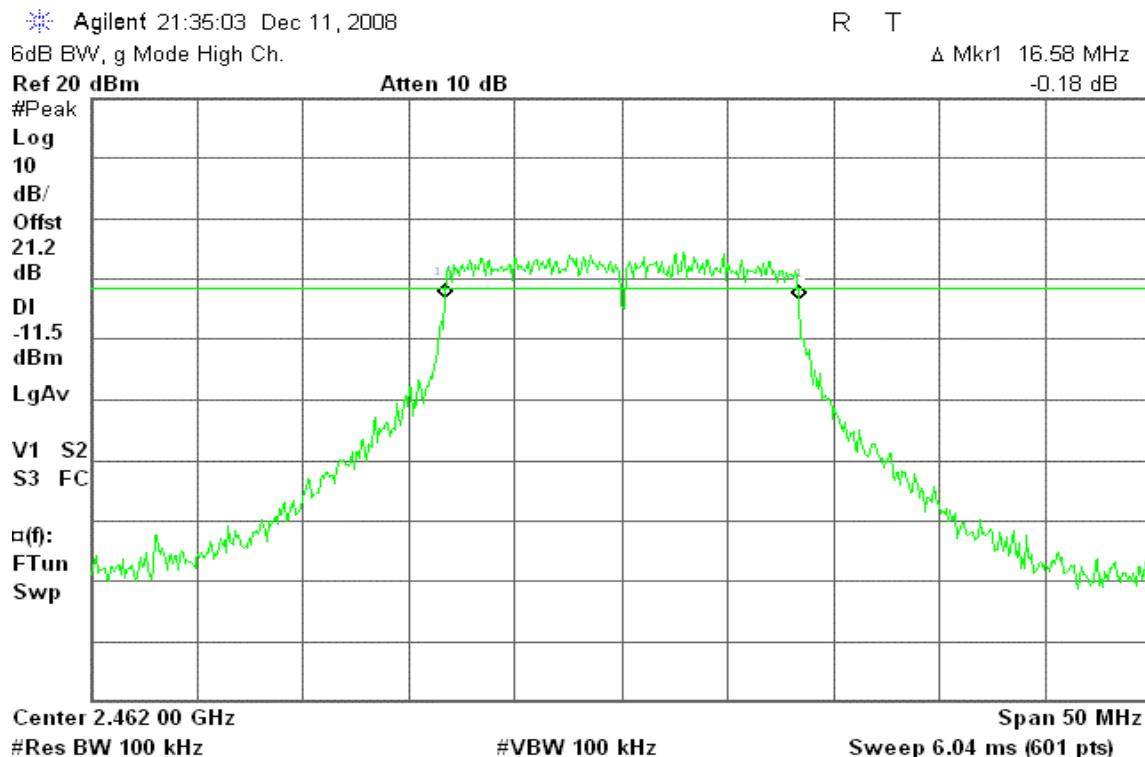
### 6dB Bandwidth (CH Low)



### 6dB Bandwidth (CH Mid)



### 6dB Bandwidth (CH High)



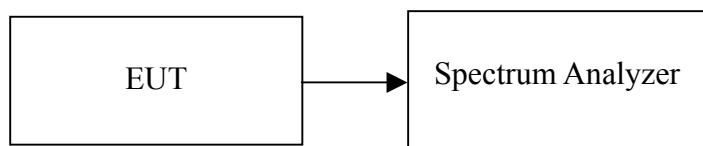
## 7.2 PEAK POWER

### LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### Test Configuration



### TEST PROCEDURE

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz.
3. Set VBW  $\geq$  3 MHz.
4. Use sample detector mode if bin width (i.e., span/number of points in spectrum display)  $< 0.5$  RBW. Otherwise use peak detector mode.
5. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to free run/ich.
6. Trace average 100 traces in power averaging mode.
7. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

### TEST RESULTS

*No non-compliance noted.*

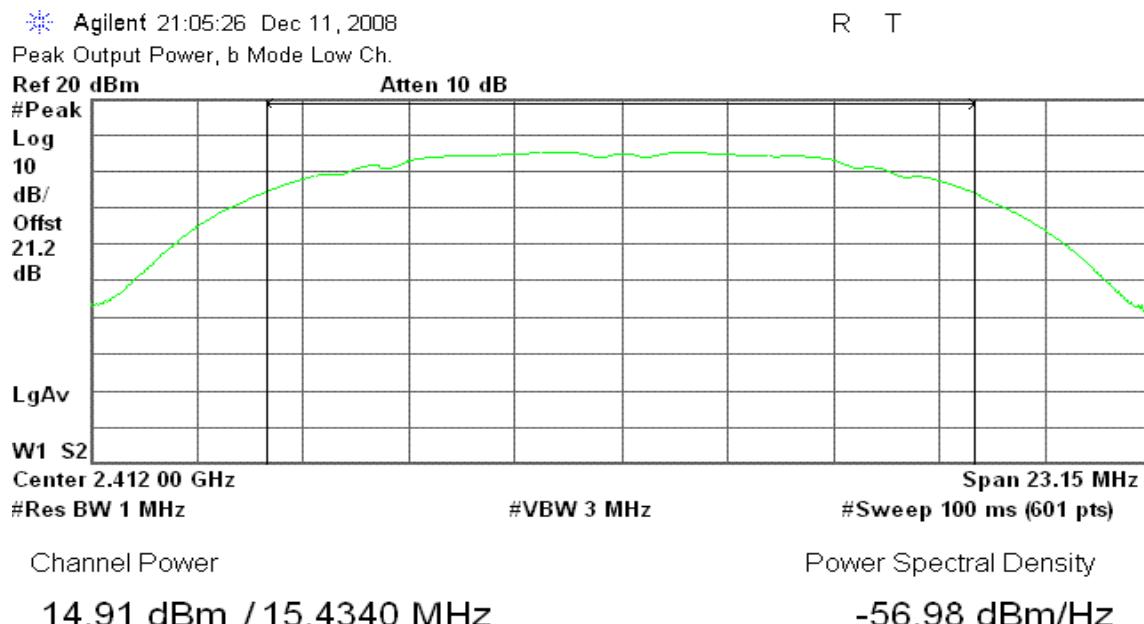
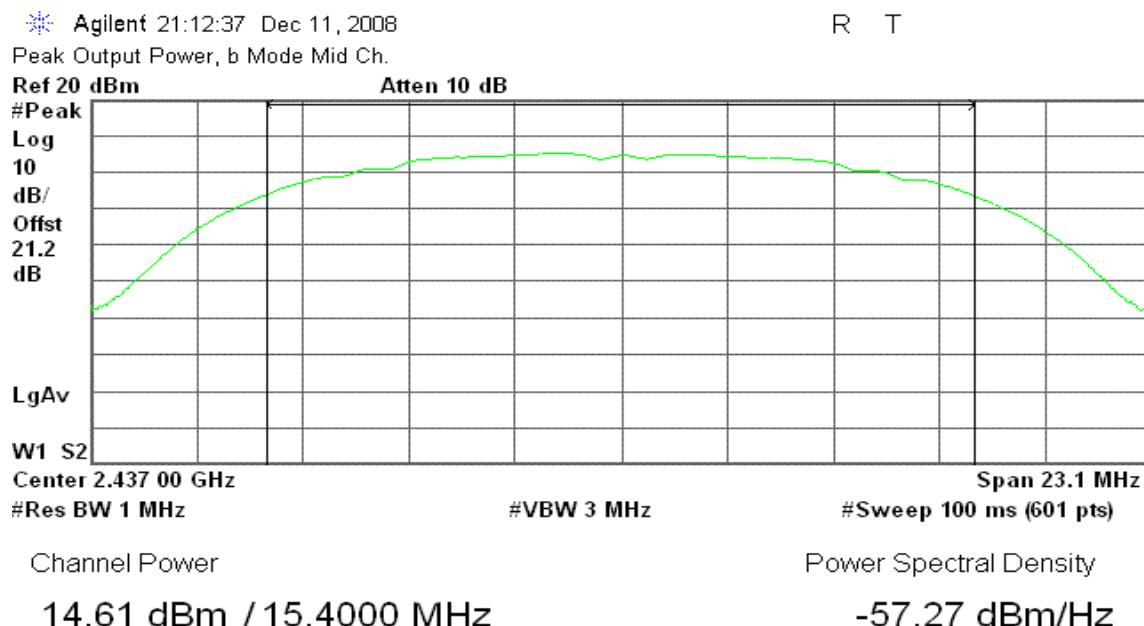
**Test Data / Test Mode 1****Test mode: IEEE 802.11b**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	14.91	0.0310	0.501	PASS
Mid	2437	14.61	0.0289		PASS
High	2462	15.11	0.0324		PASS

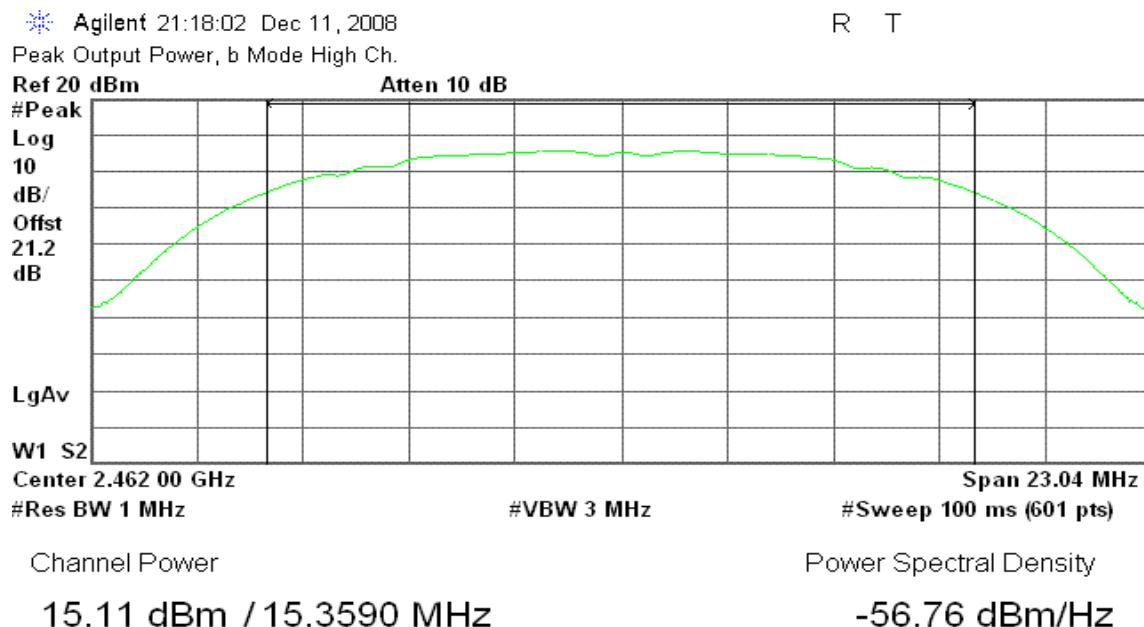
**Test mode: IEEE 802.11g**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.22	0.0333	0.501	PASS
Mid	2437	16.24	0.0421		PASS
High	2462	14.42	0.0277		PASS

*Remark: The maximum antenna gain is 9 dBi; therefore the reduction due to antenna gain is 3 dB, so the limit is 27 dBm.*

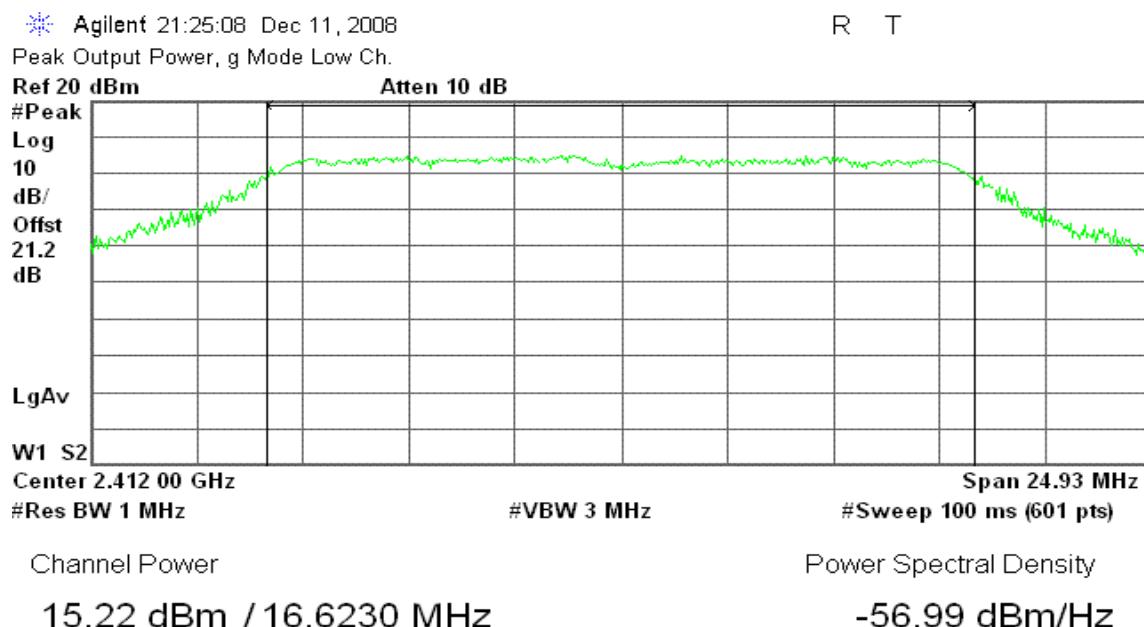
**Test Plot / Test Mode 1****IEEE 802.11b****Peak Power (CH Low)****Peak Power (CH Mid)**

### Peak Power (CH High)



### IEEE 802.11g

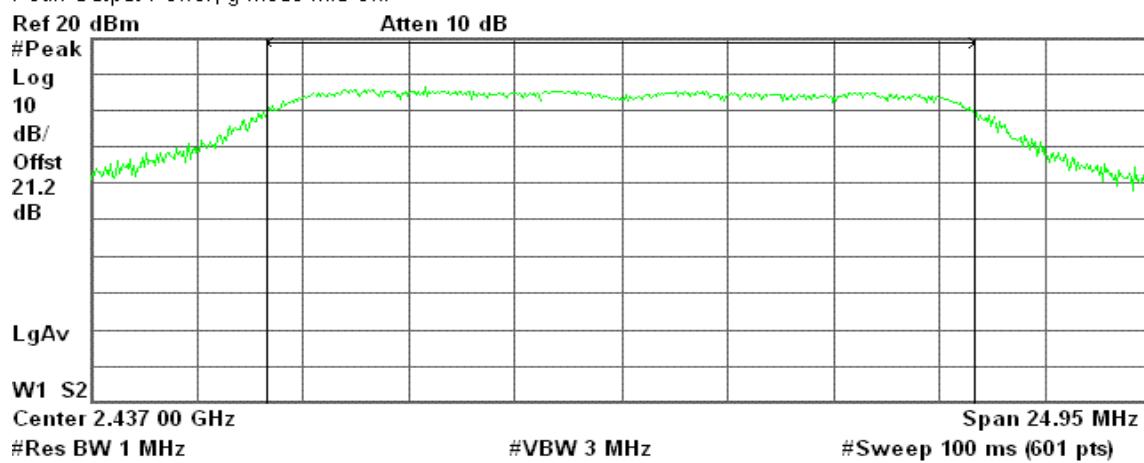
### Peak Power (CH Low)



### Peak Power (CH Mid)

Agilent 21:30:41 Dec 11, 2008  
Peak Output Power, g Mode Mid Ch.

R T



Channel Power

16.24 dBm / 16.6320 MHz

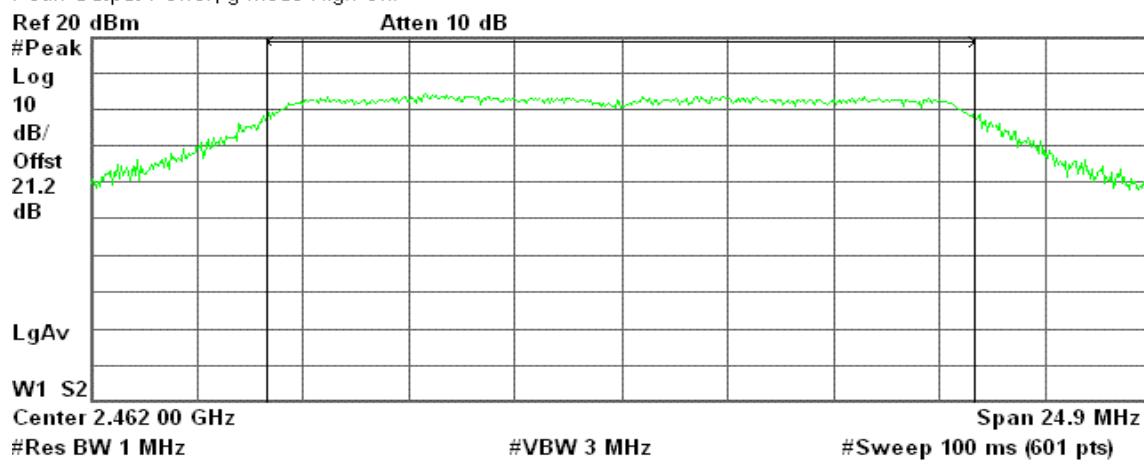
Power Spectral Density

-55.97 dBm/Hz

### Peak Power (CH High)

Agilent 21:36:05 Dec 11, 2008  
Peak Output Power, g Mode High Ch.

R T



Channel Power

14.42 dBm / 16.6020 MHz

Power Spectral Density

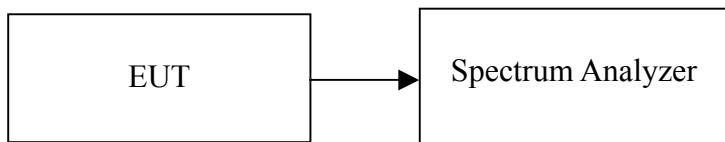
-57.78 dBm/Hz

### 7.3 AVERAGE POWER

#### LIMIT

None; for reporting purposes only.

#### Test Configuration



#### TEST PROCEDURE

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the average power detection.

#### TEST RESULTS

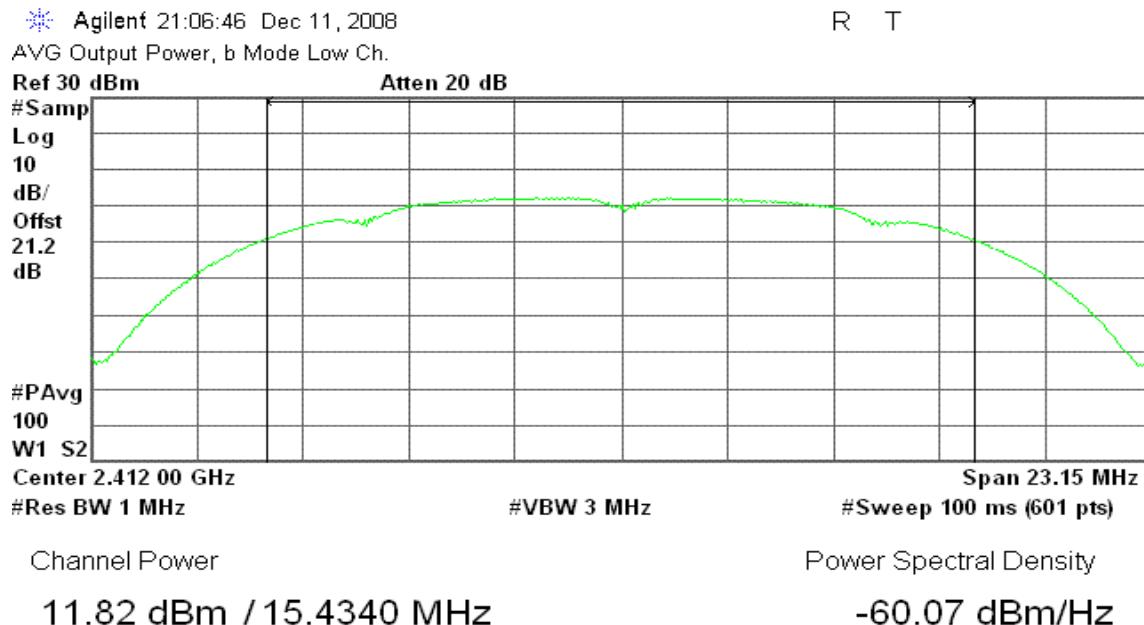
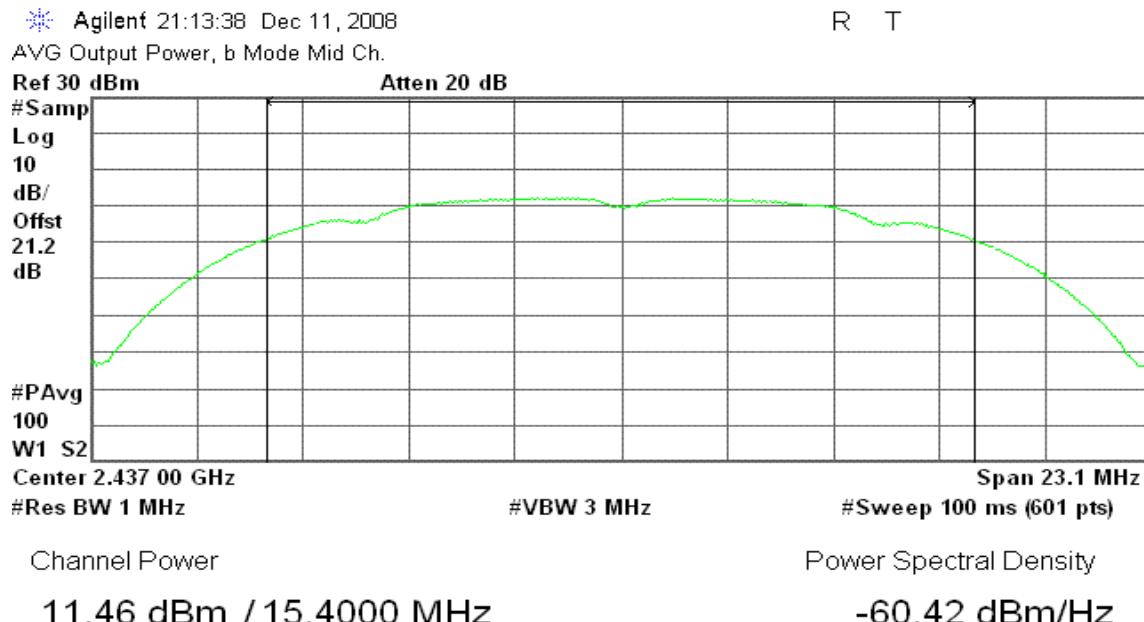
*No non-compliance noted.*

**Test Data / Test Mode 1****Test mode: IEEE 802.11b mode**

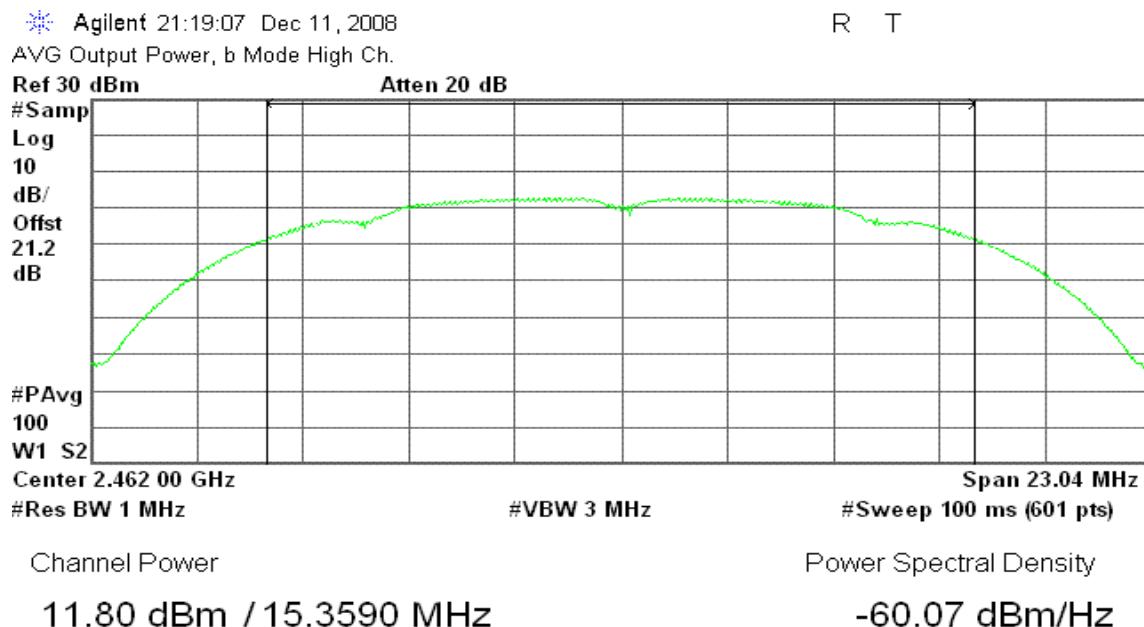
Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	11.82
Mid	2437	11.46
High	2462	11.80

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	7.82
Mid	2437	8.47
High	2462	7.74

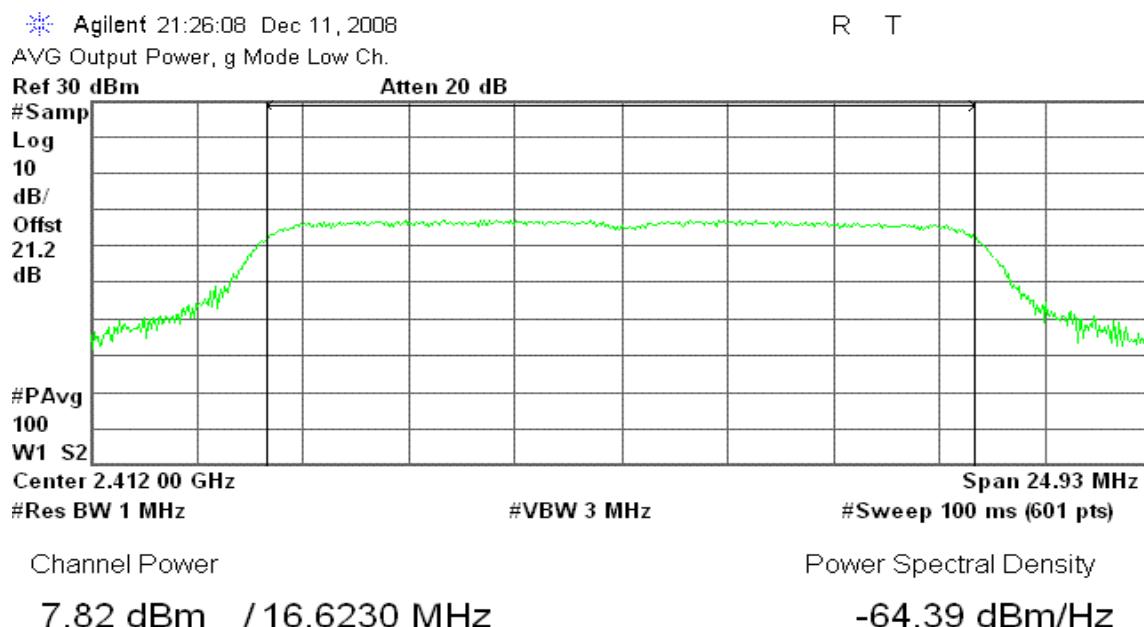
**Test Plot / Test Mode 1****IEEE 802.11b****Average Power (CH Low)****Average Power (CH Mid)**

### Average Power (CH High)



### IEEE 802.11g

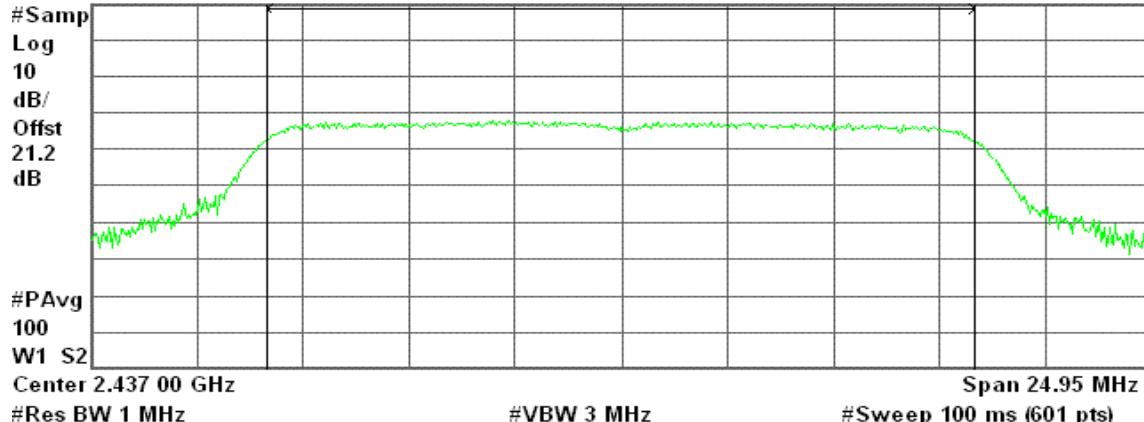
### Average Power (CH Low)



### Average Power (CH Mid)

\* Agilent 21:31:41 Dec 11, 2008  
AVG Output Power, g Mode Mid Ch.

Ref 30 dBm Atten 20 dB



### Channel Power

### Power Spectral Density

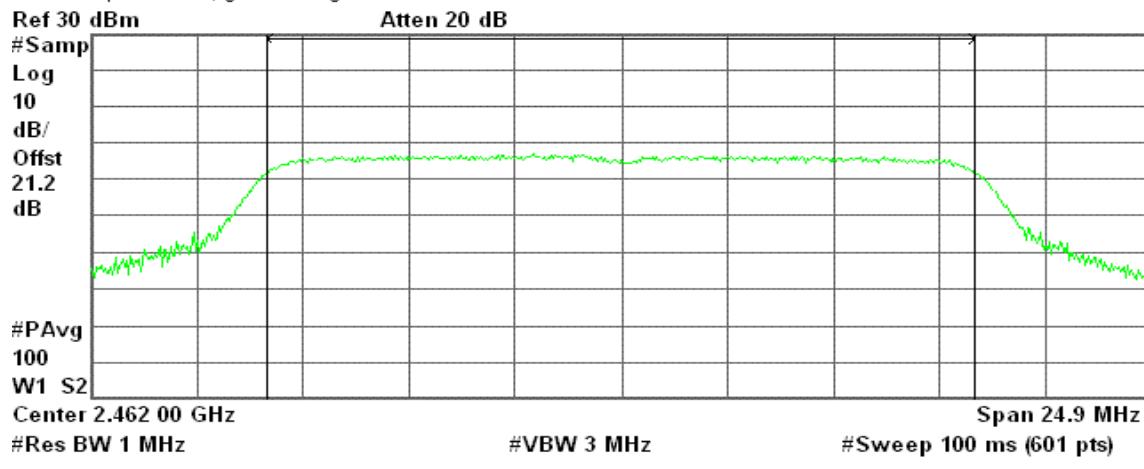
8.47 dBm / 16.6320 MHz

-63.74 dBm/Hz

### Average Power (CH High)

\* Agilent 21:37:03 Dec 11, 2008

### Avg Output Power, g Mode High Ch.



### Channel Power

## Power Spectral Density

7.74 dBm / 16.6020 MHz

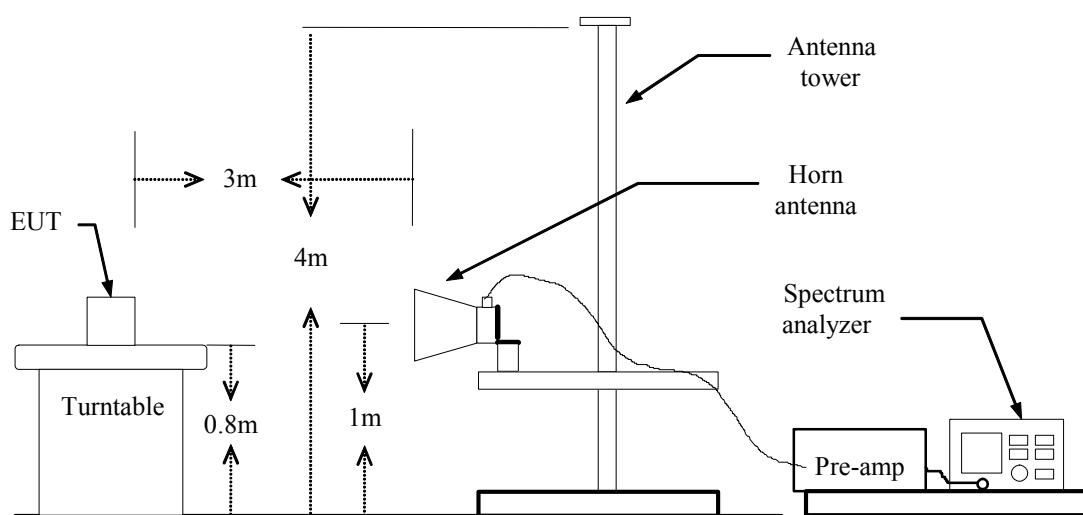
-64.46 dBm/Hz

## 7.4 BAND EDGES MEASUREMENT

### LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

### Test Configuration

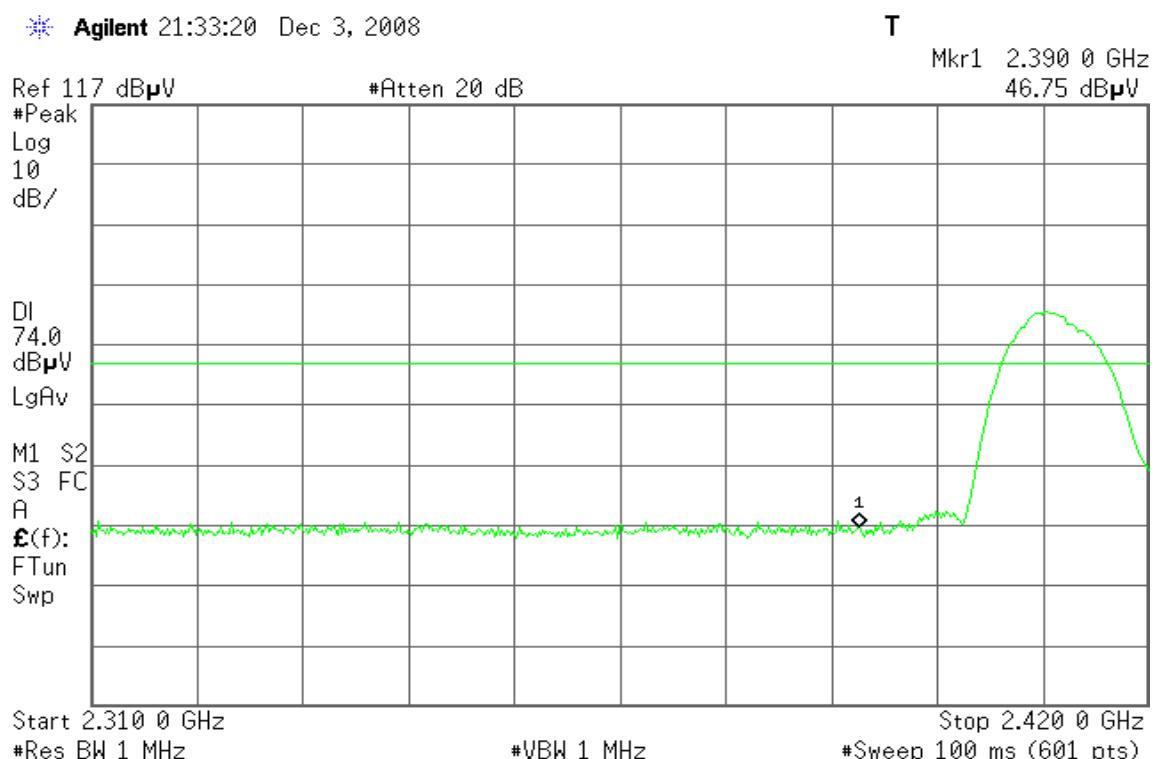
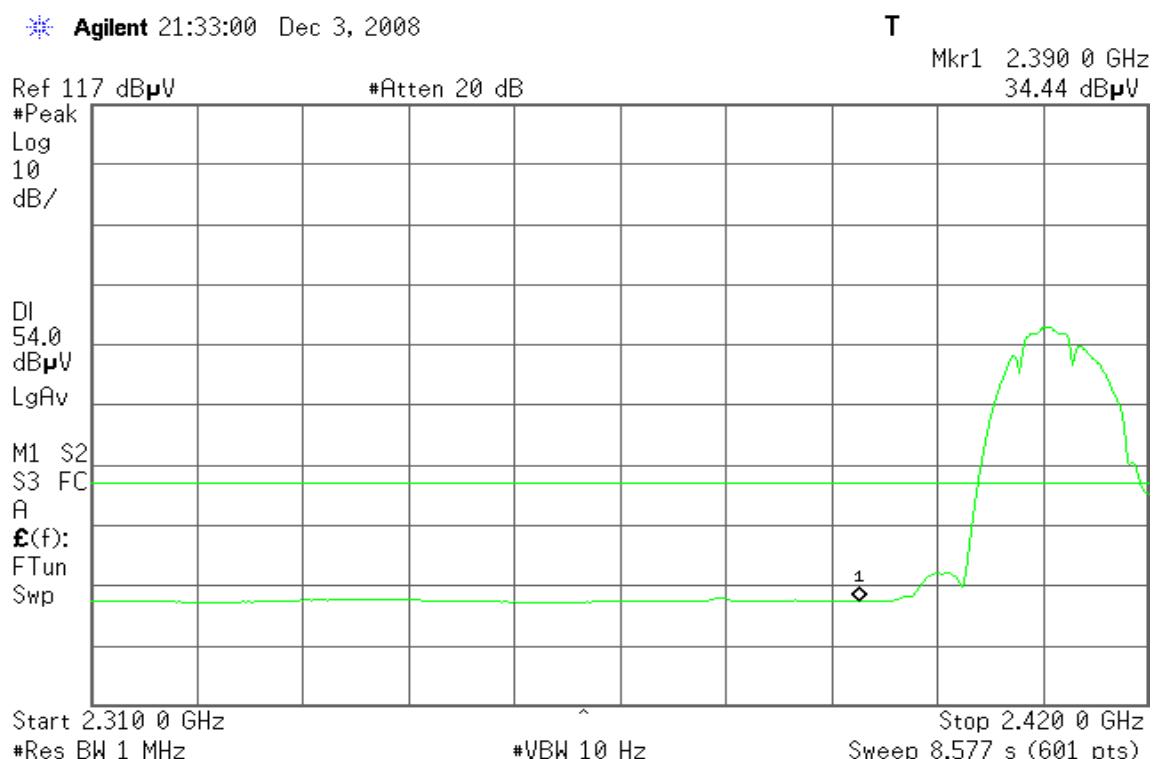


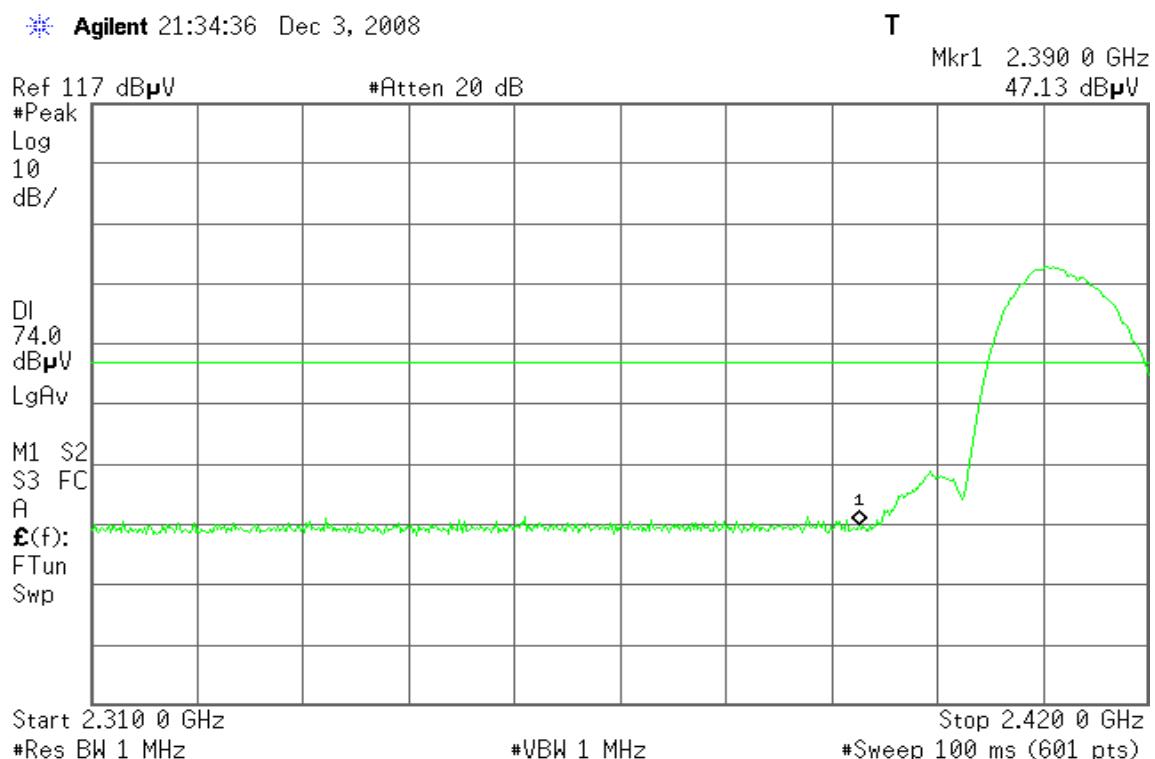
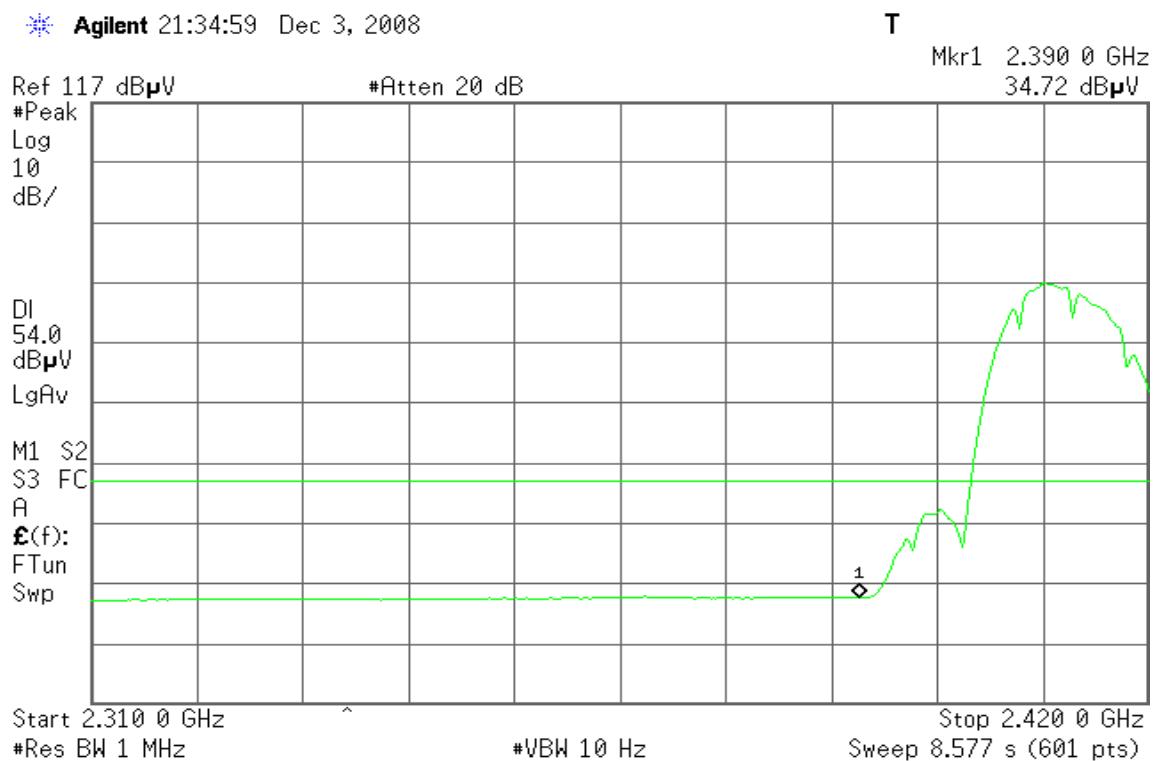
### TEST PROCEDURE

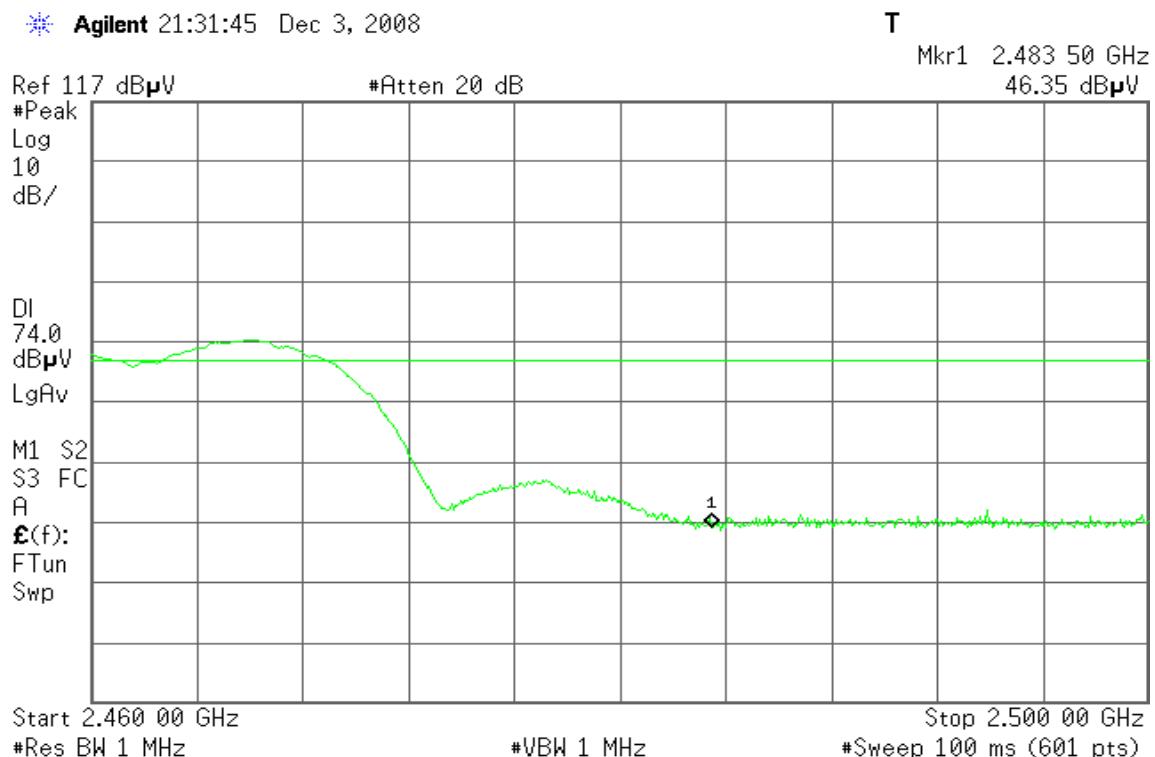
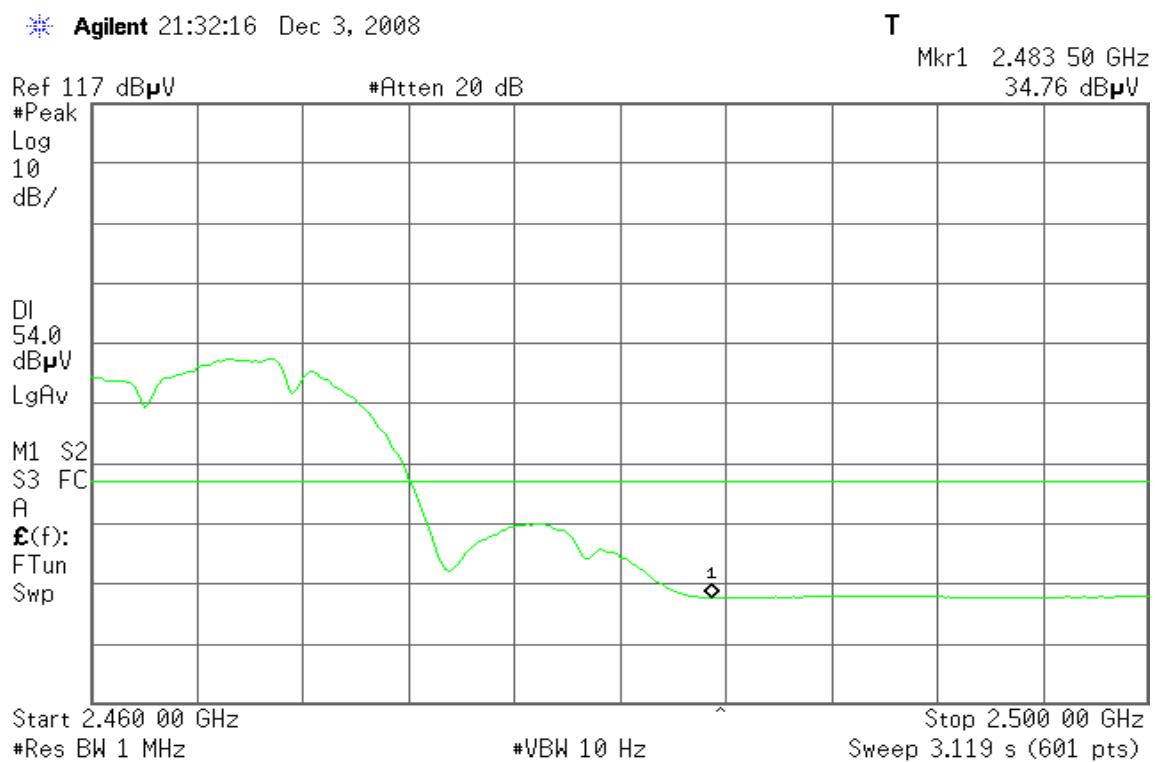
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

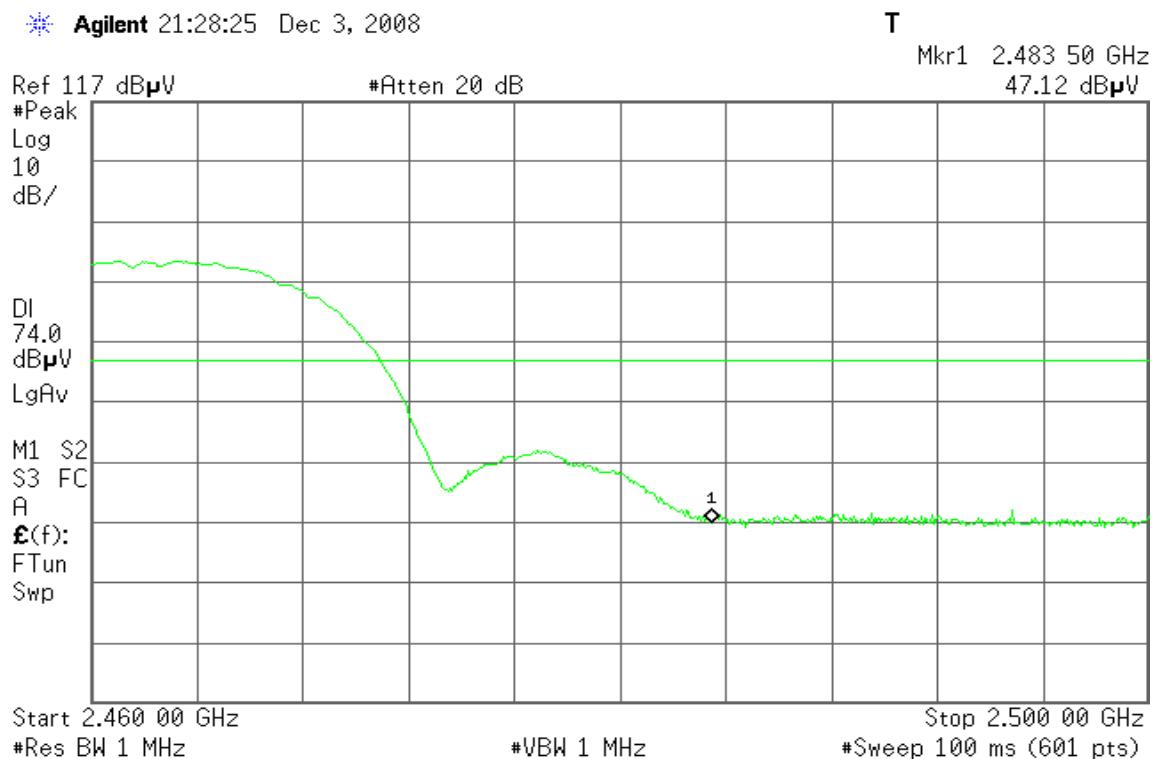
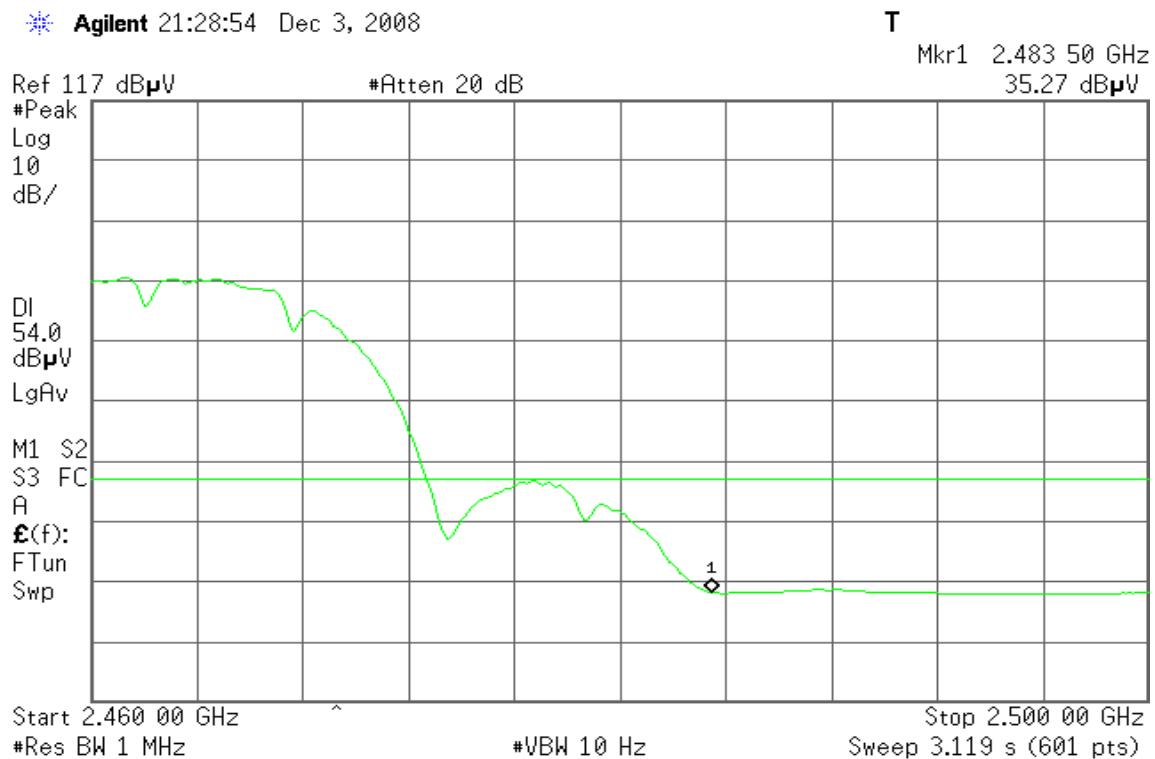
### TEST RESULTS

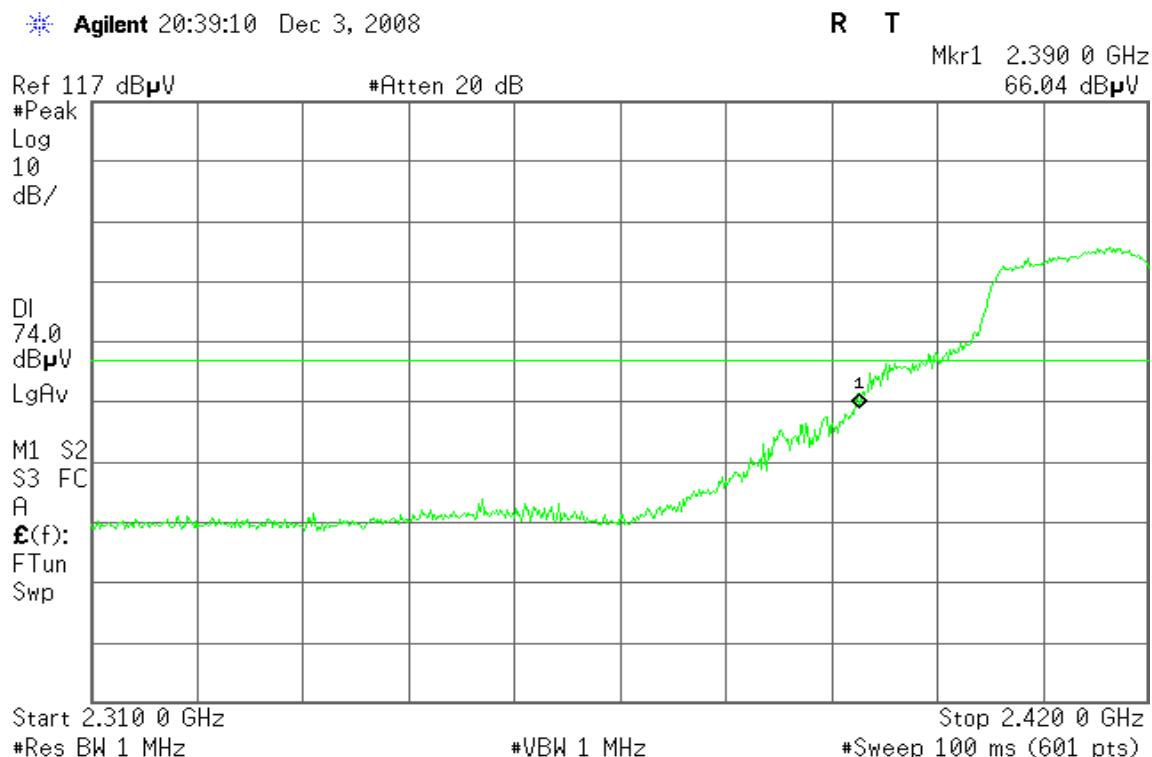
Refer to attach spectrum analyzer data chart.

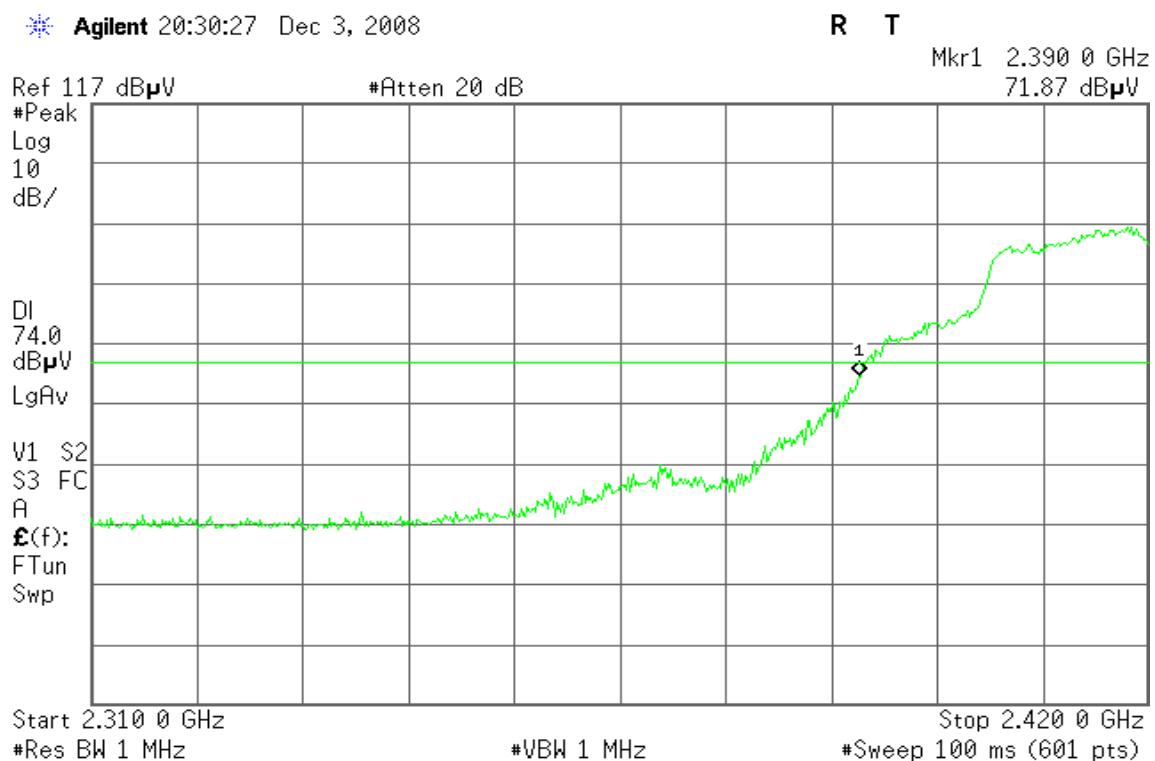
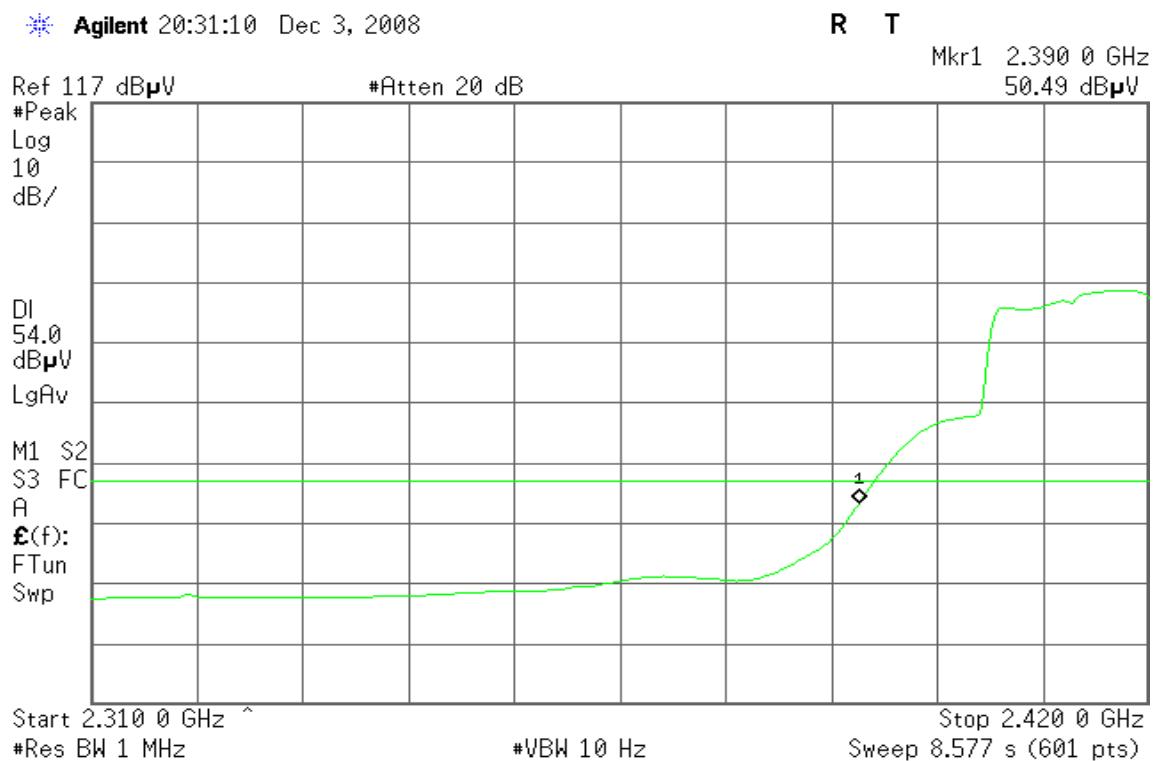
**Test Mode 1****Band Edges (IEEE 802.11b / CH Low)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

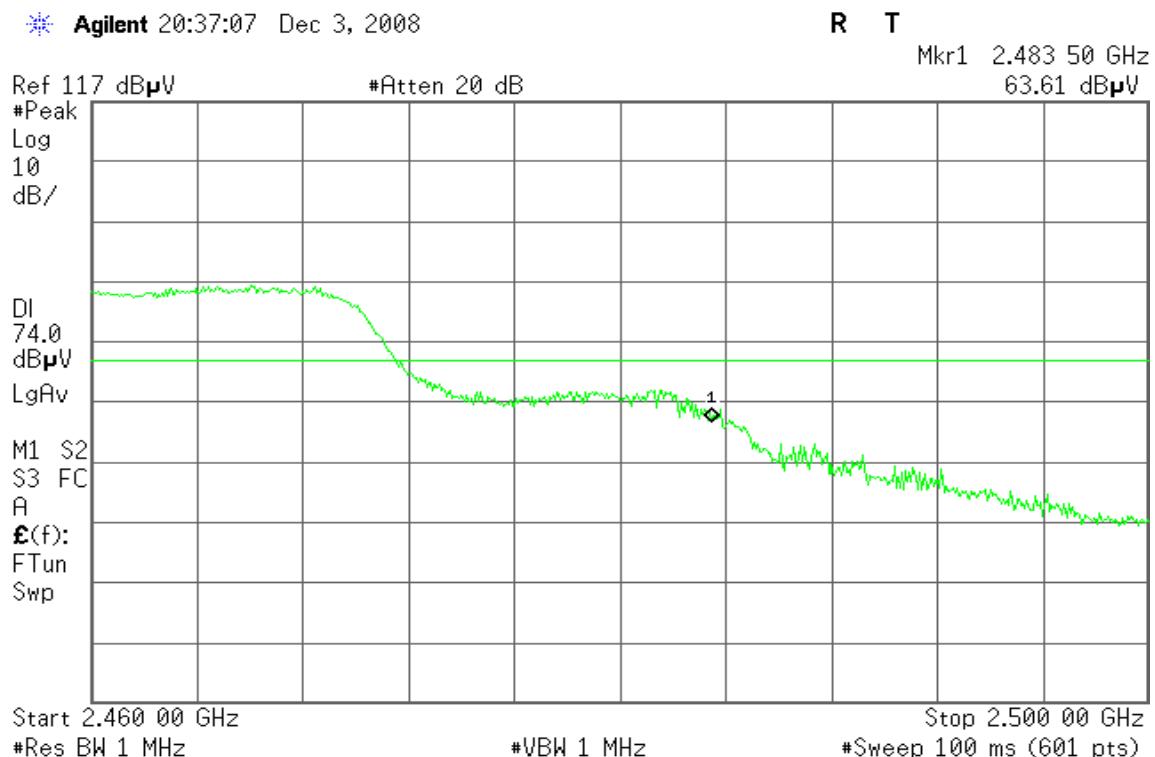
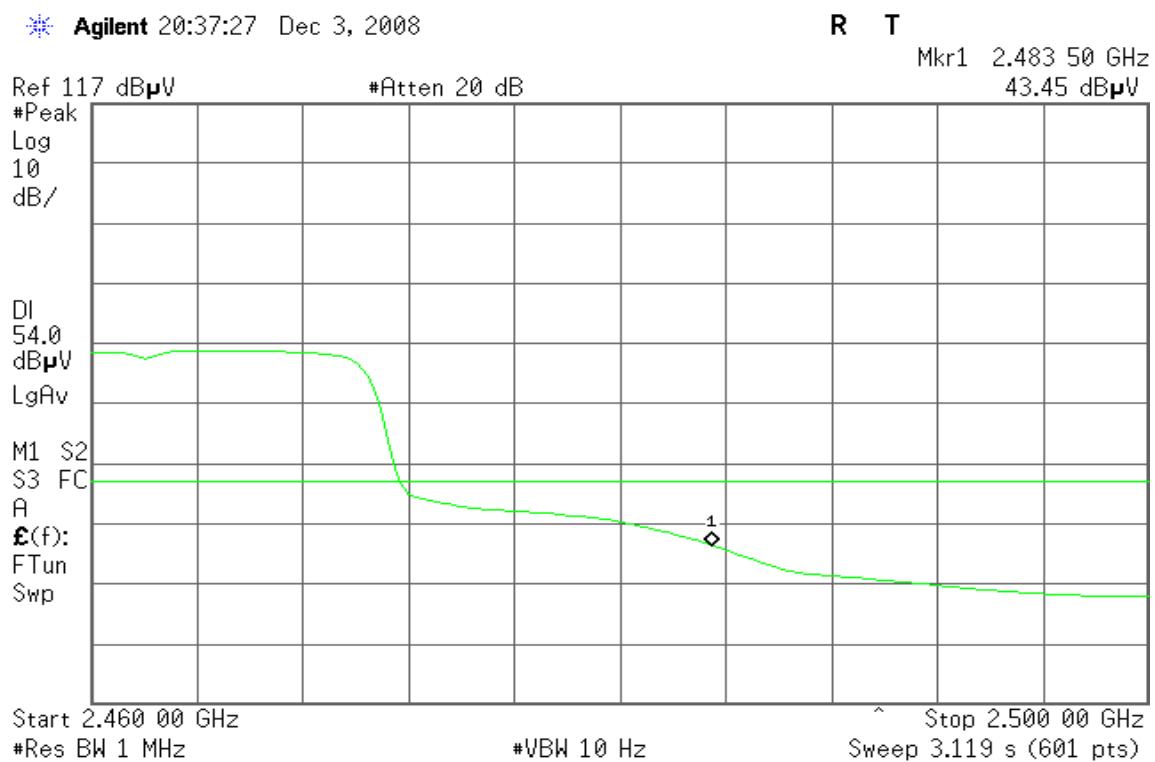
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

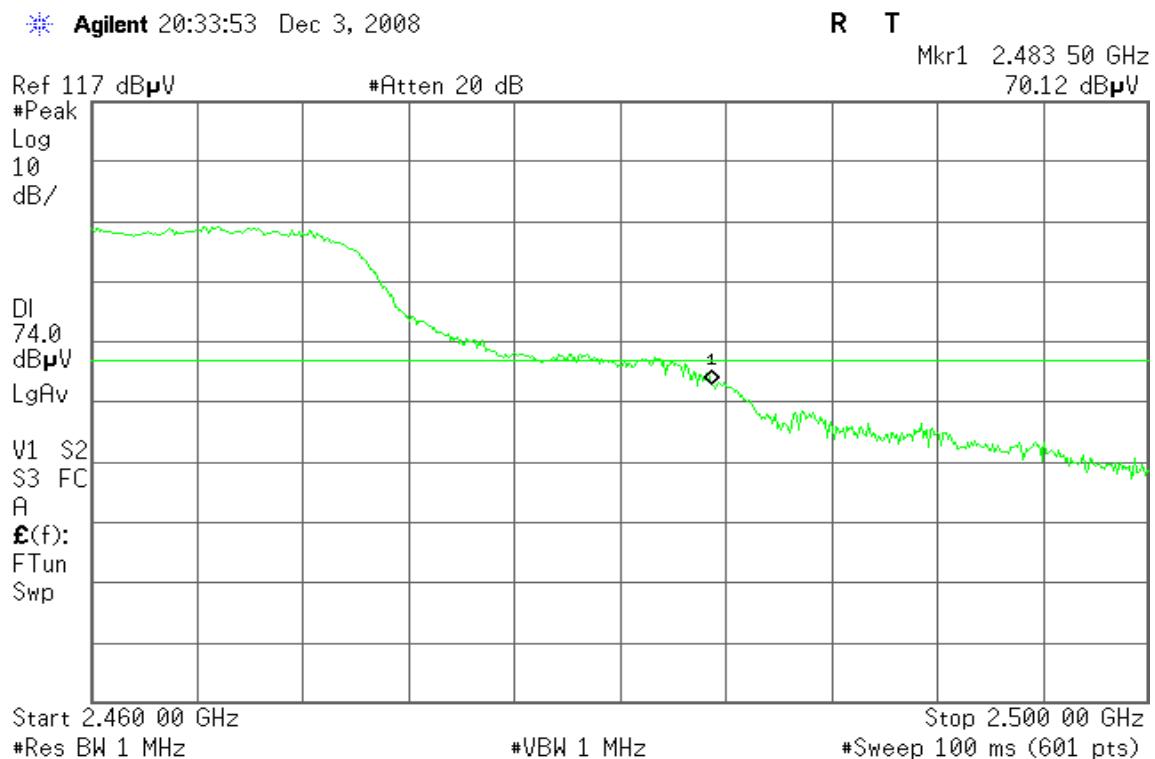
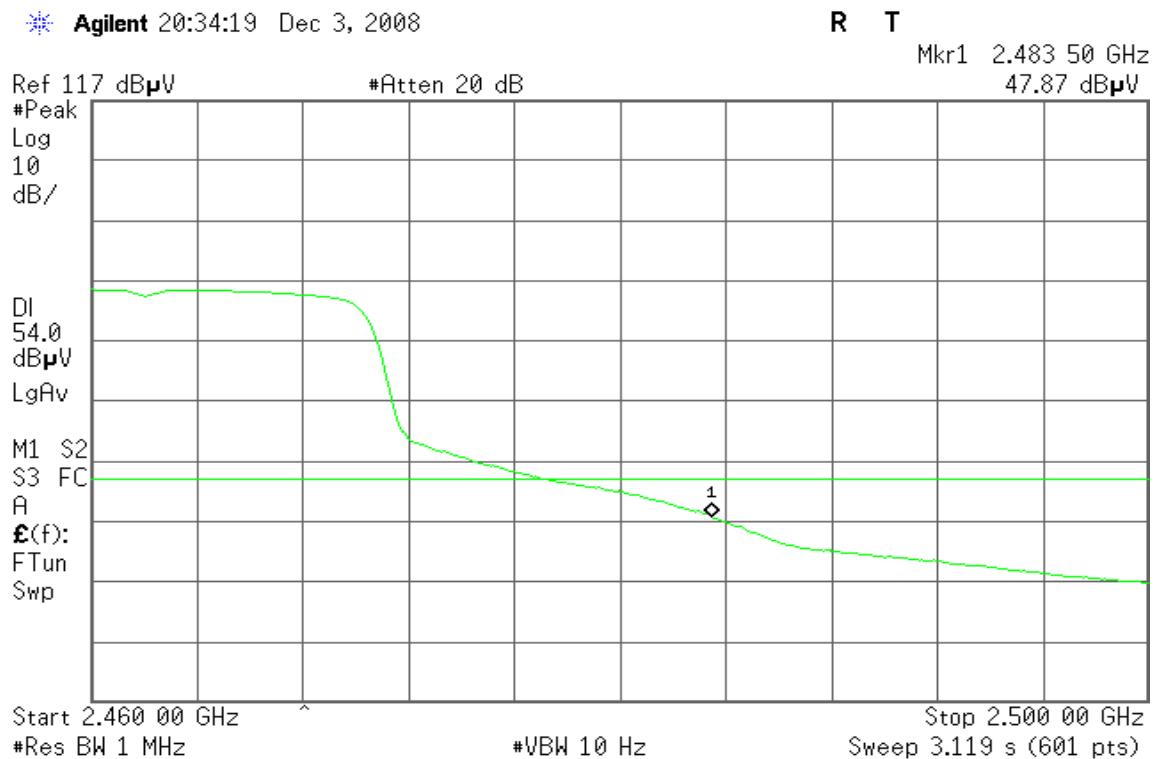
**Band Edges (IEEE 802.11b / CH High)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

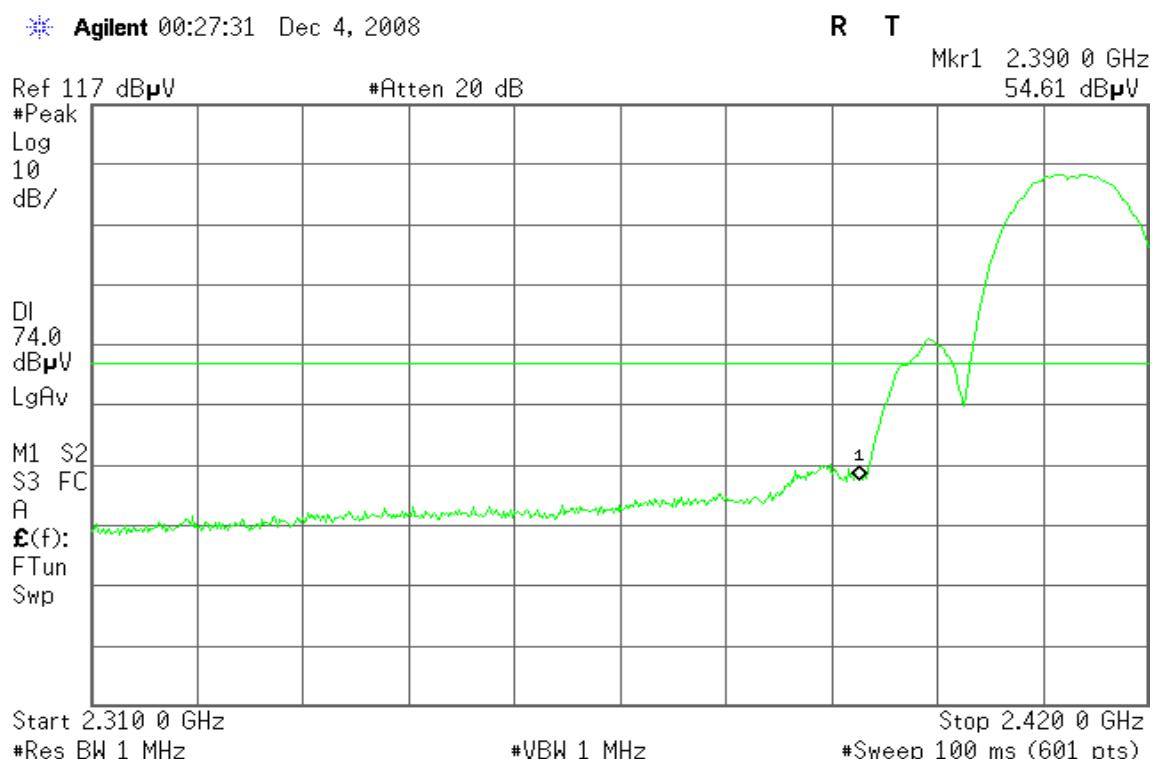
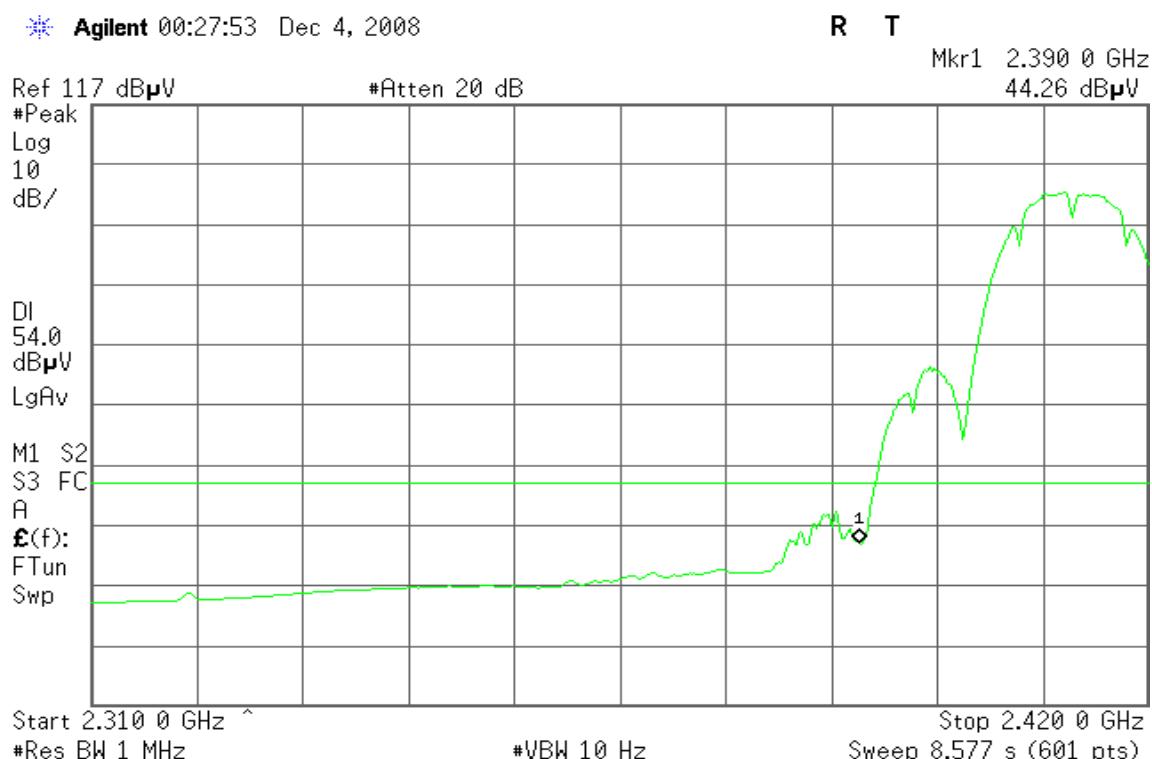
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

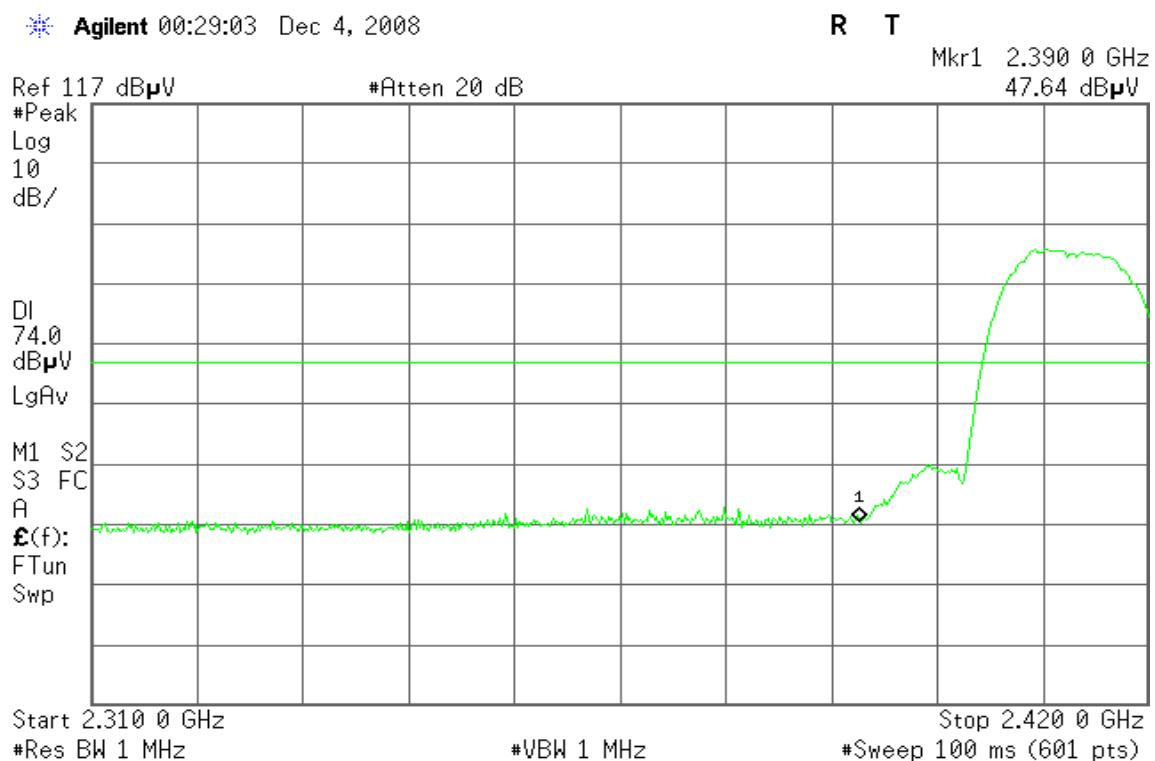
**Band Edges (IEEE 802.11g / CH Low)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

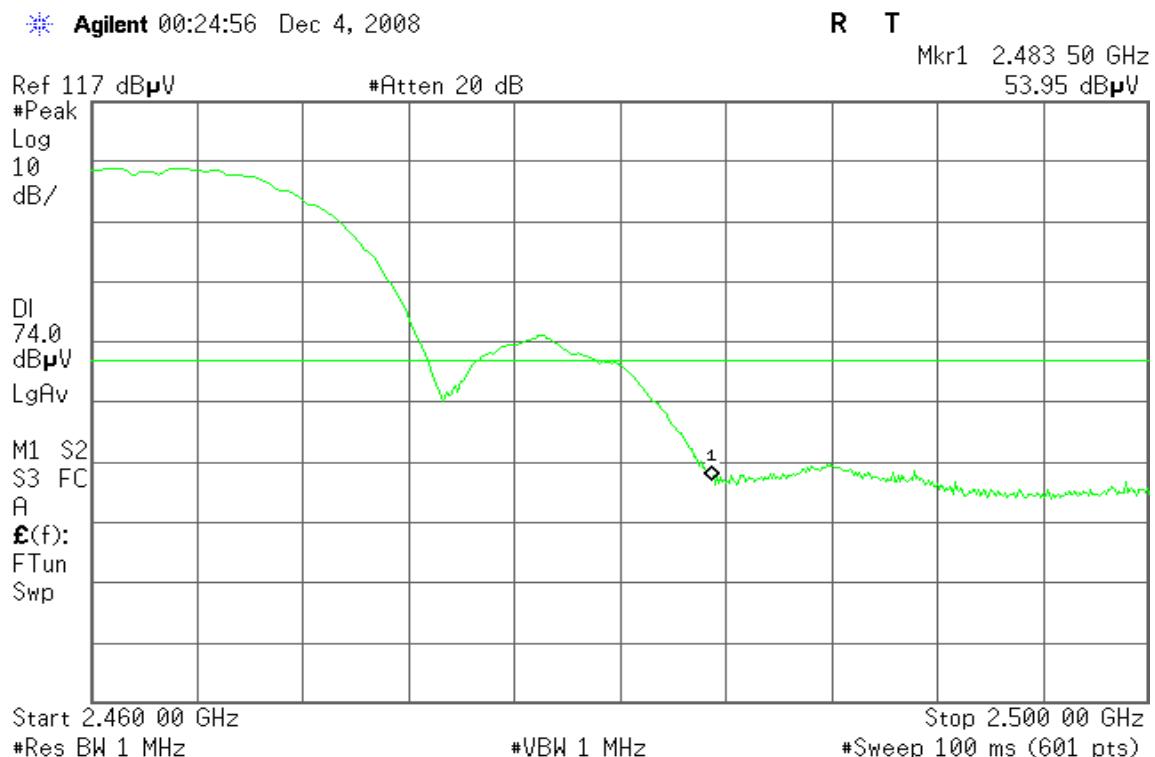
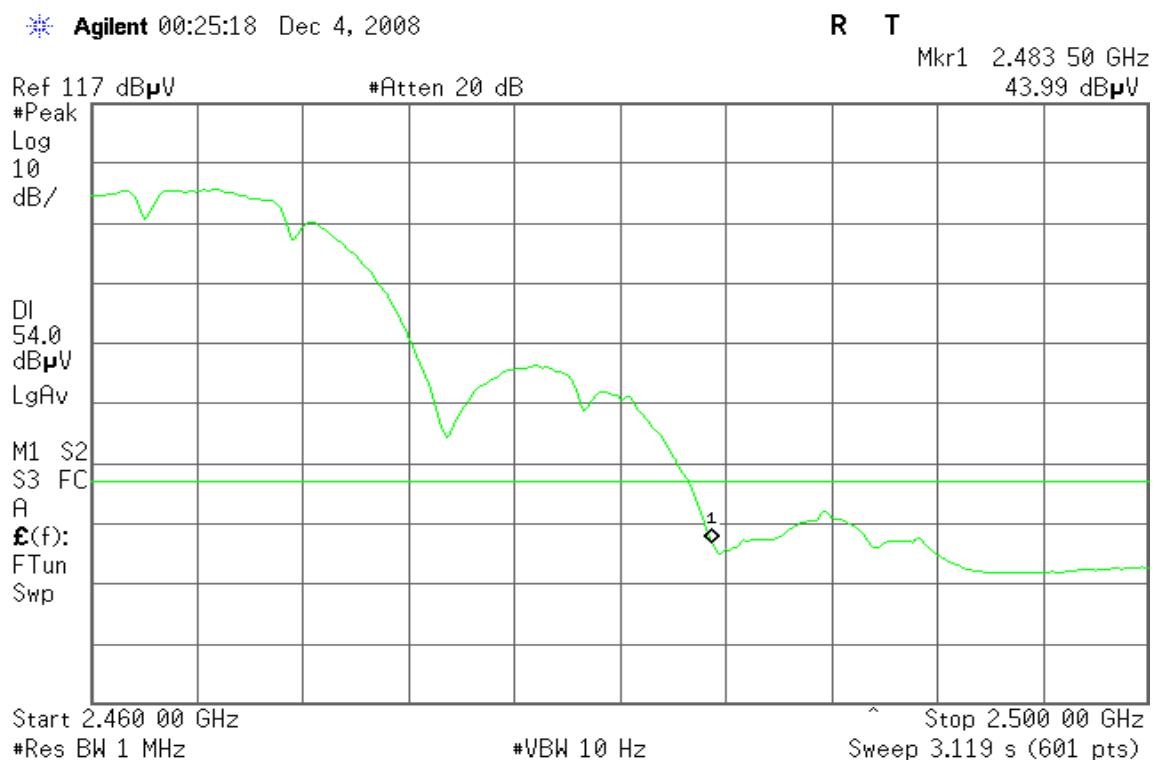
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

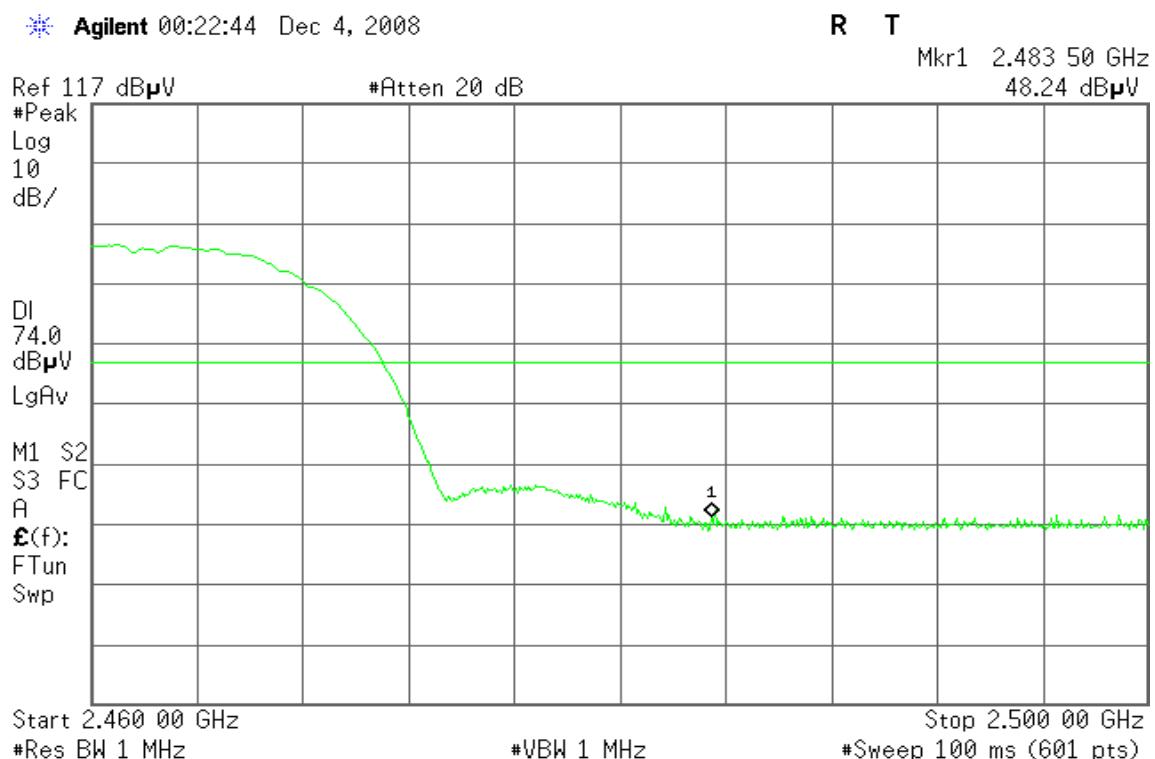
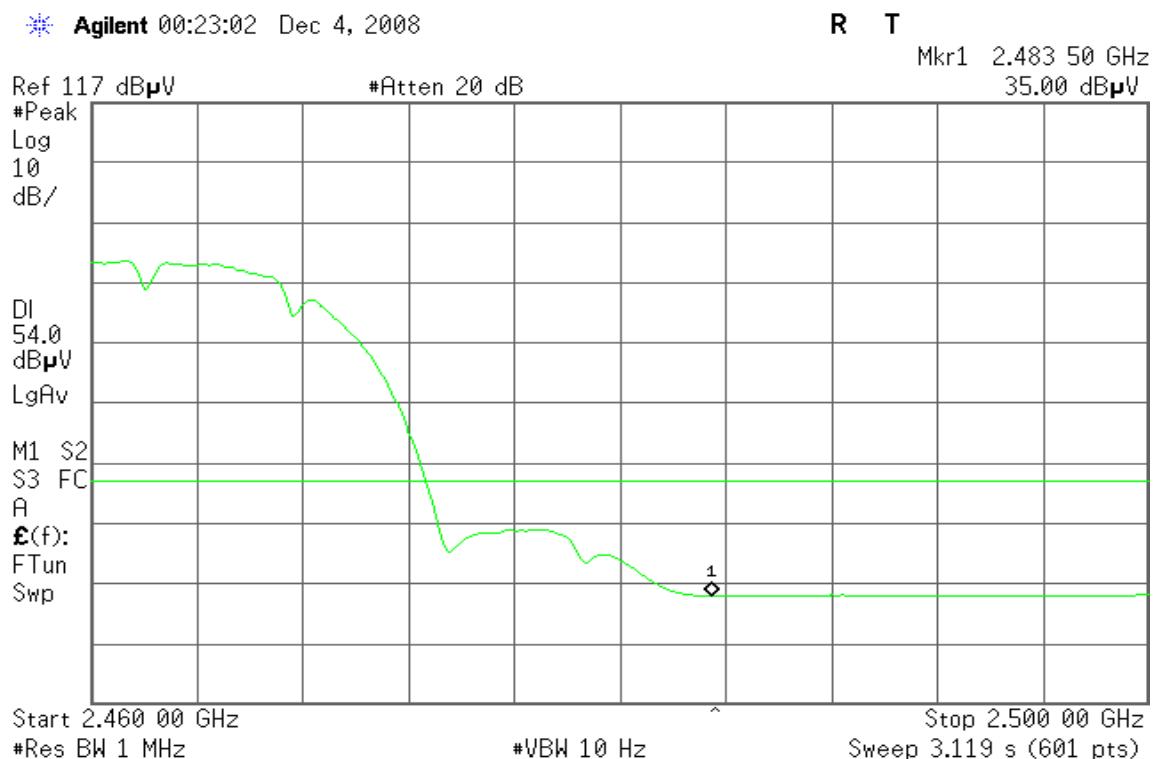
**Band Edges (IEEE 802.11g / CH High)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

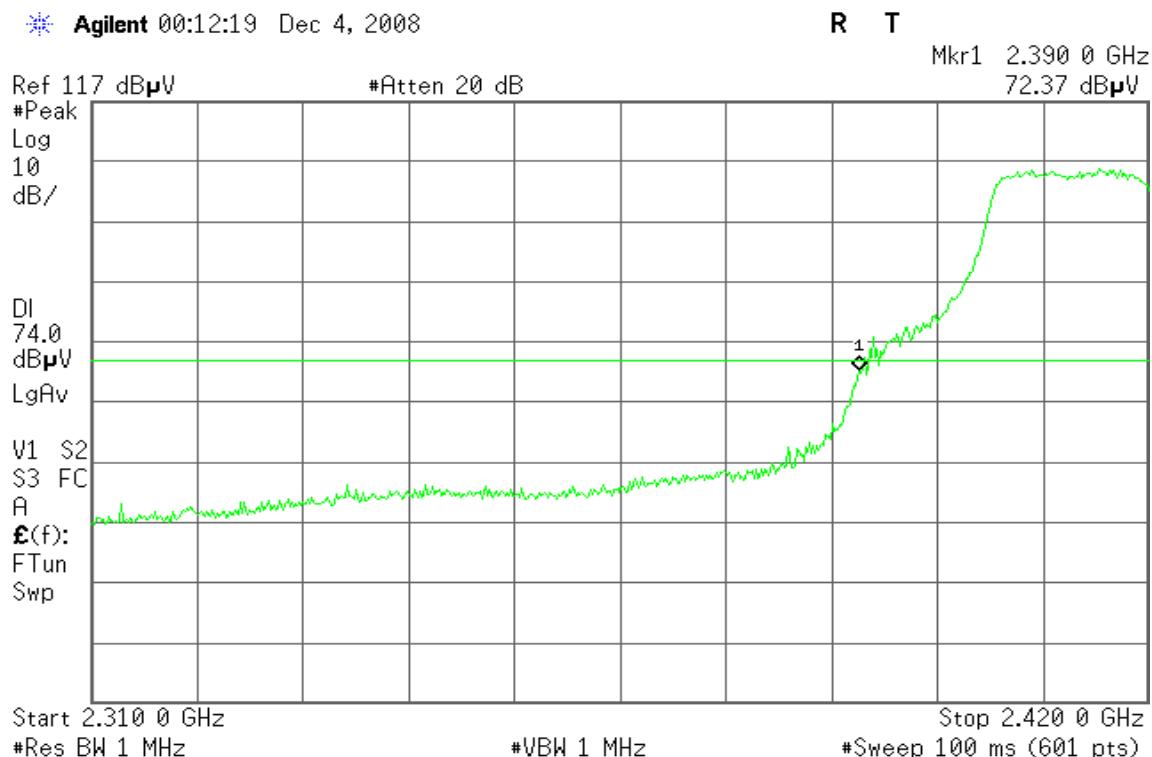
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

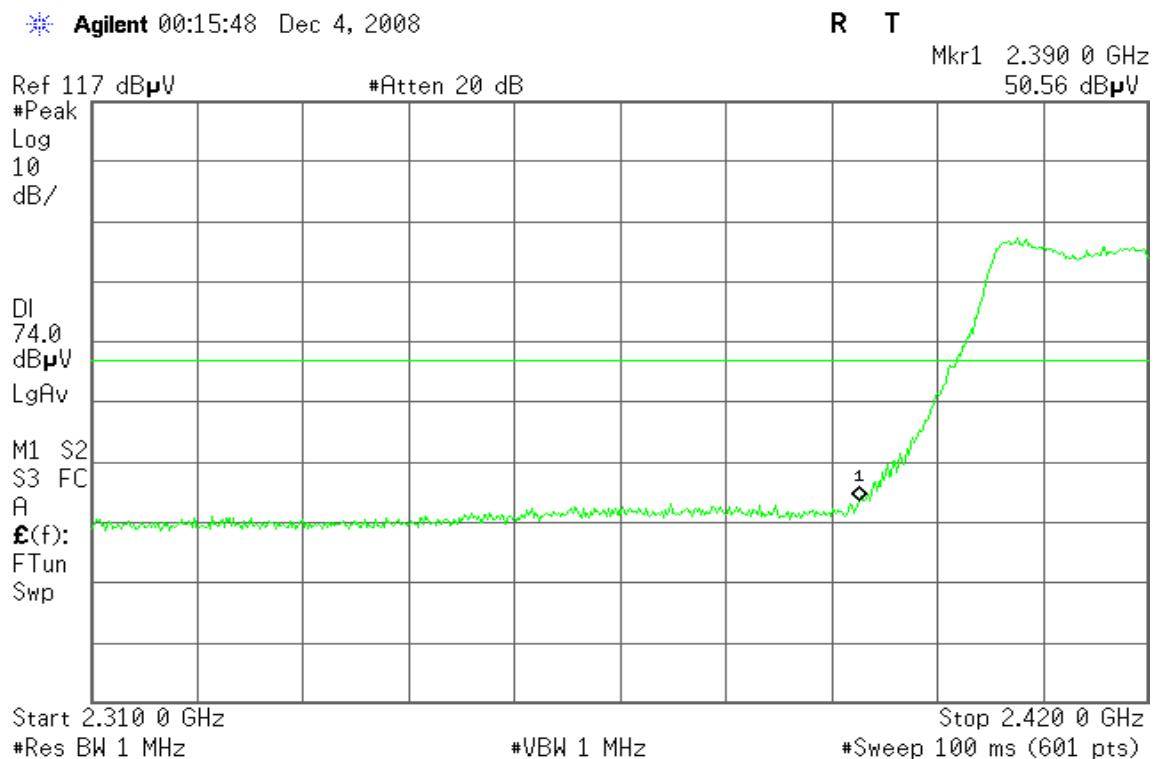
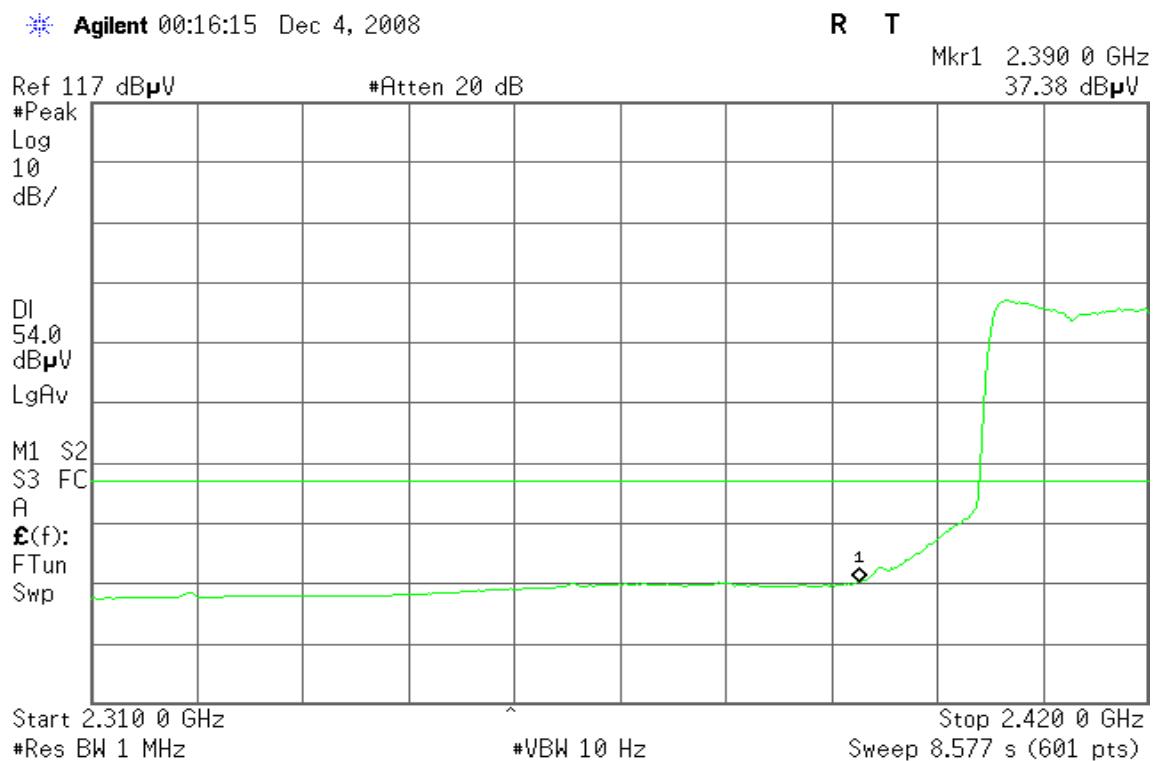
**Test Mode 2****Band Edges (IEEE 802.11b / CH Low)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

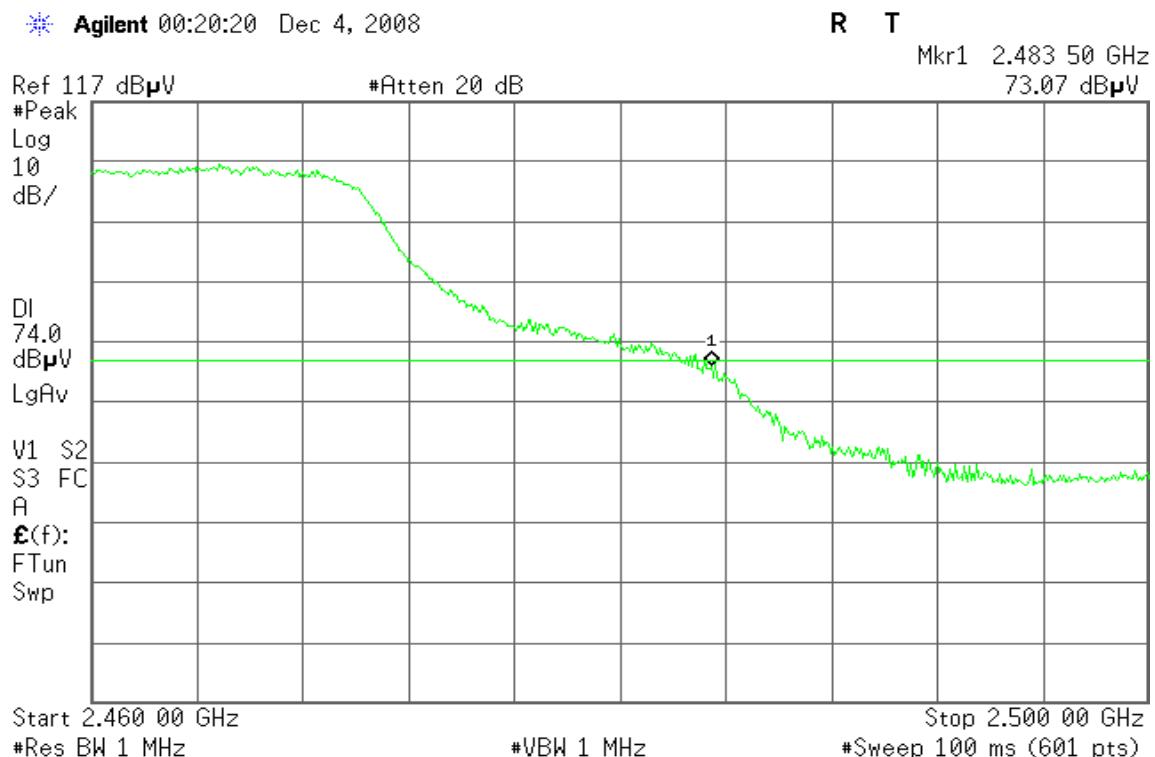
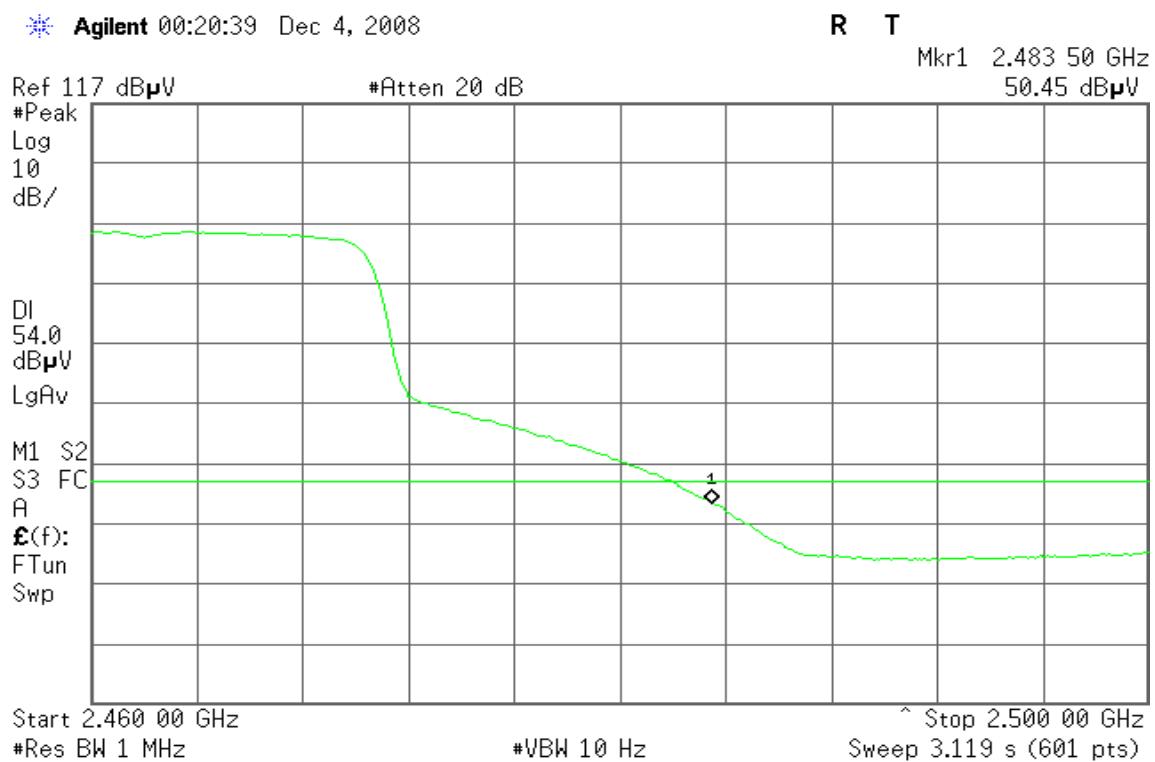
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

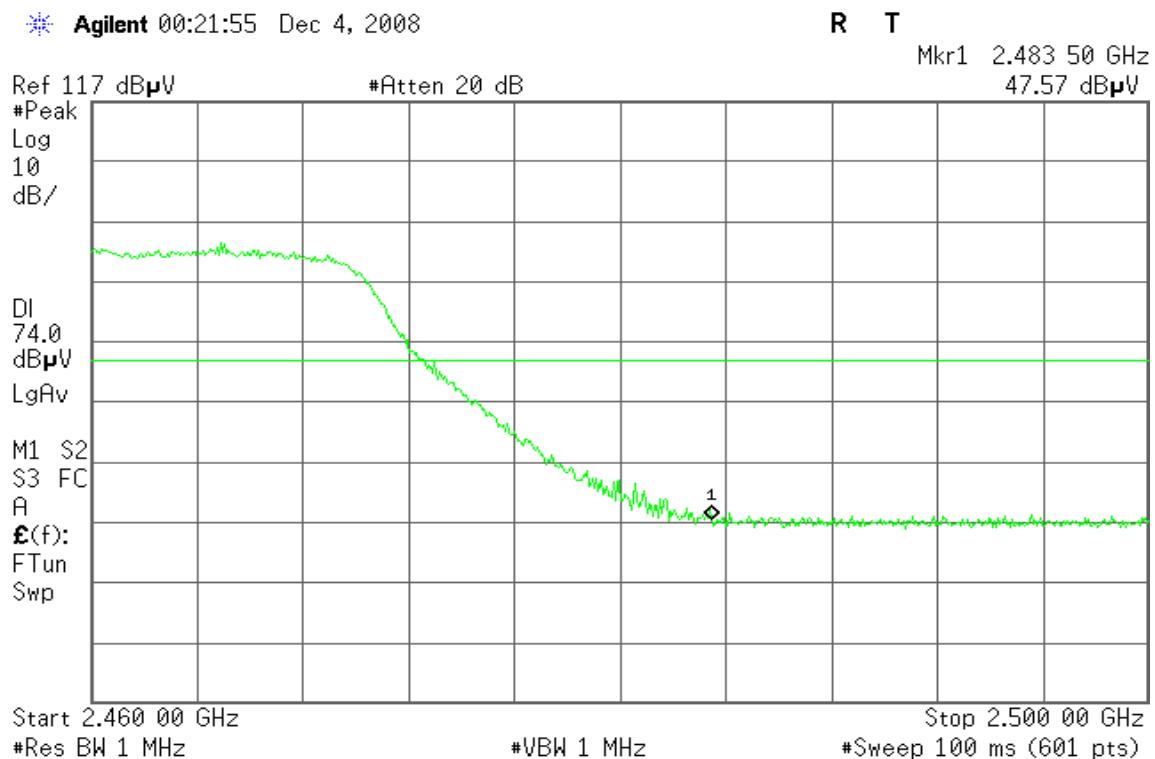
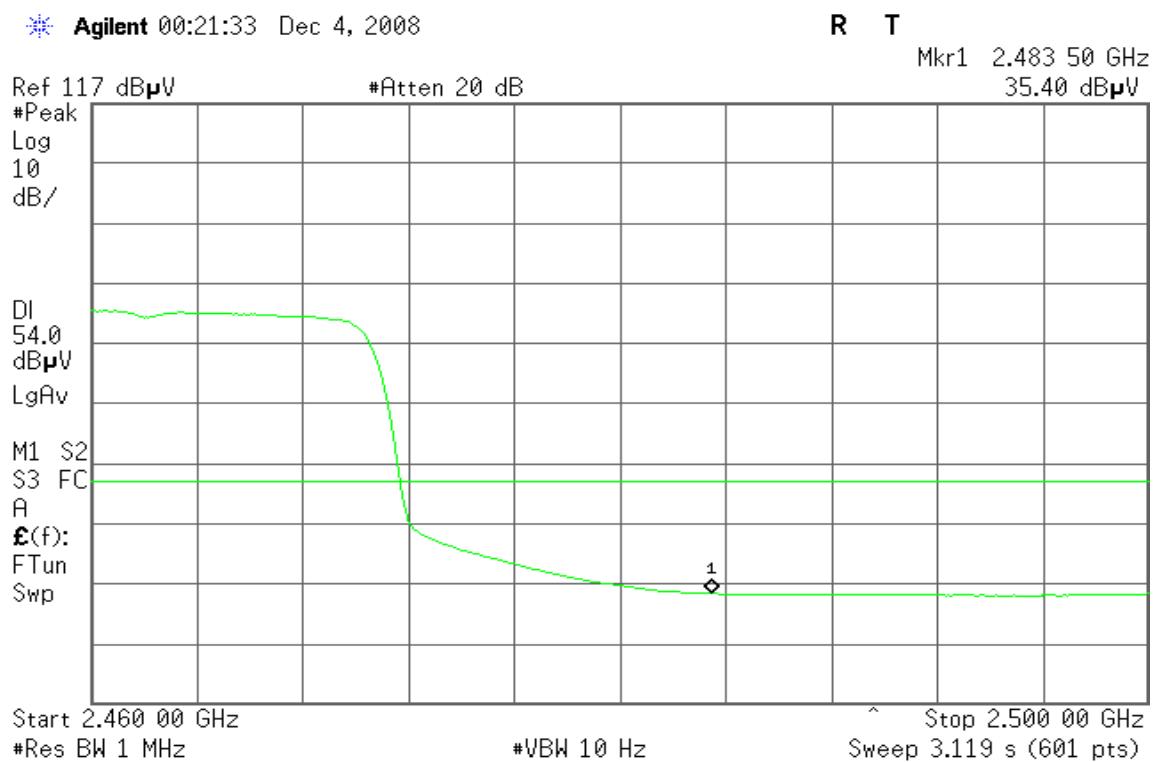
**Band Edges (IEEE 802.11b / CH High)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

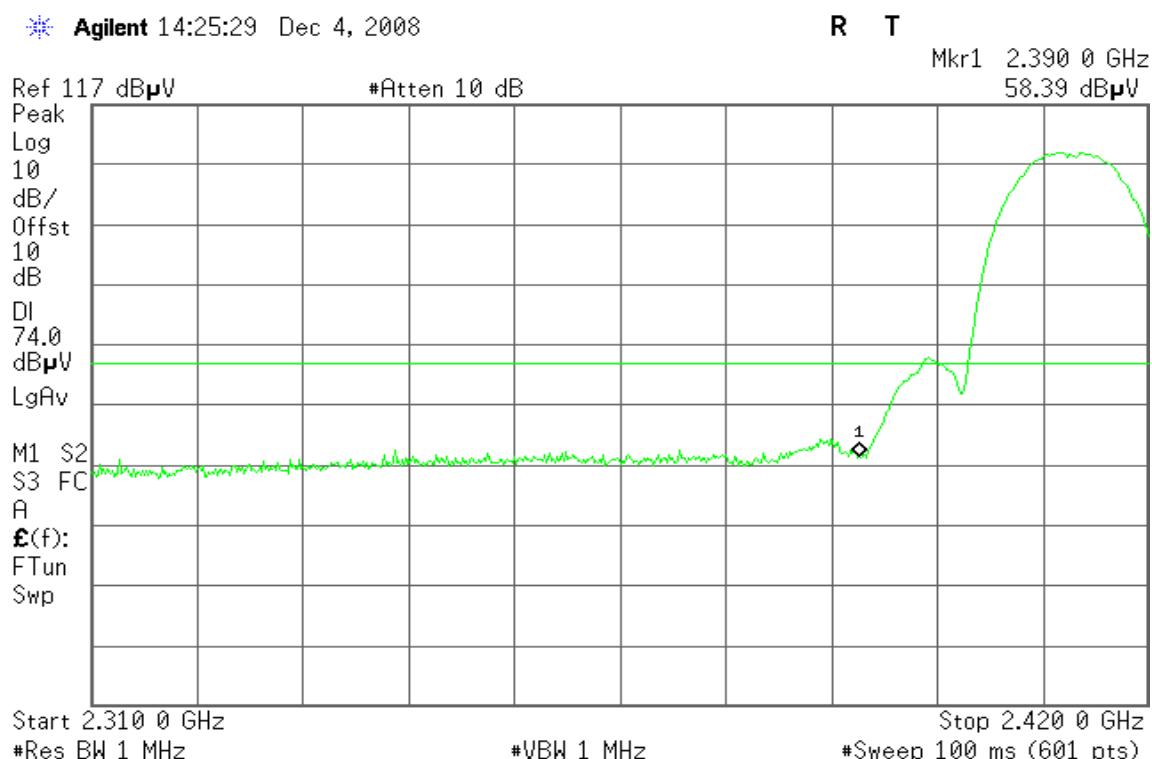
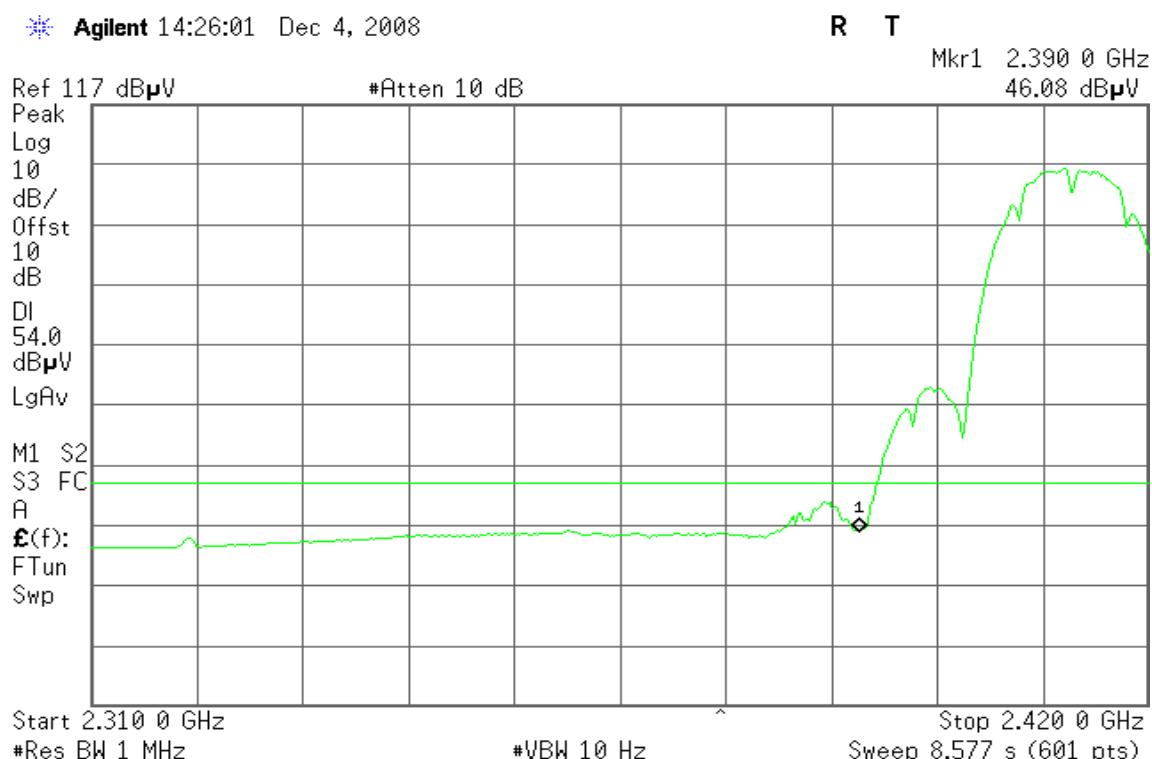
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

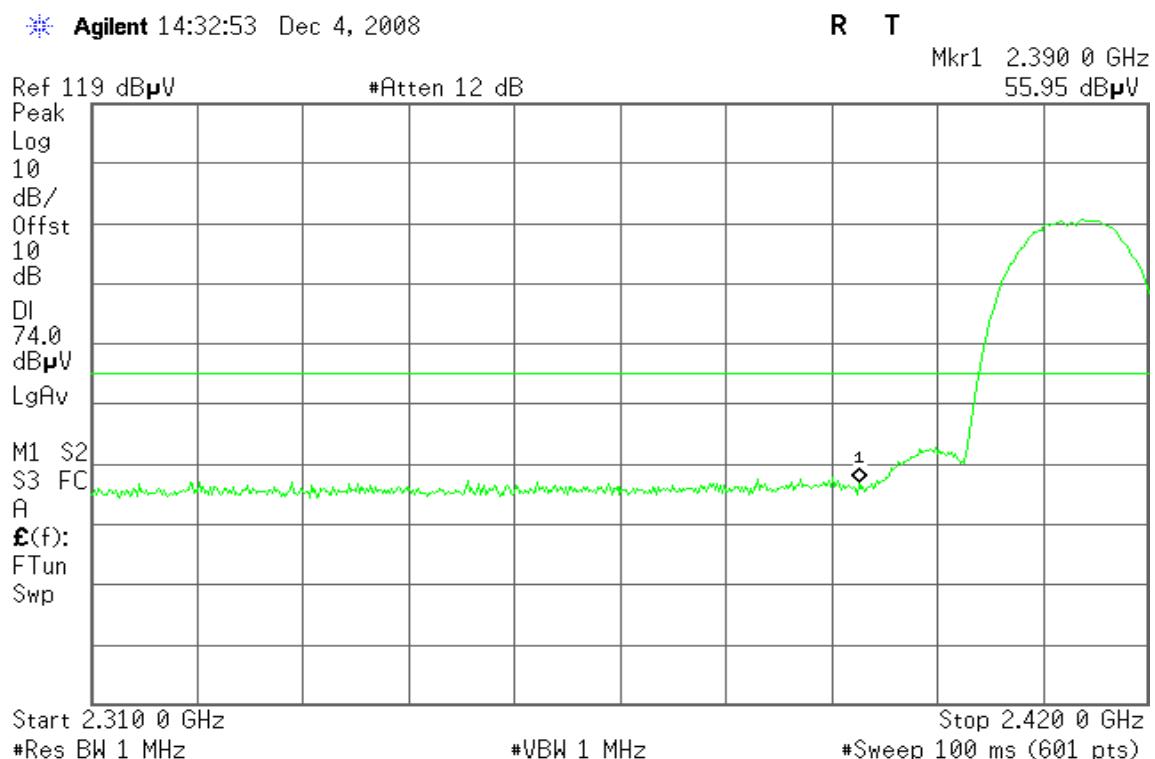
**Band Edges (IEEE 802.11g / CH Low)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

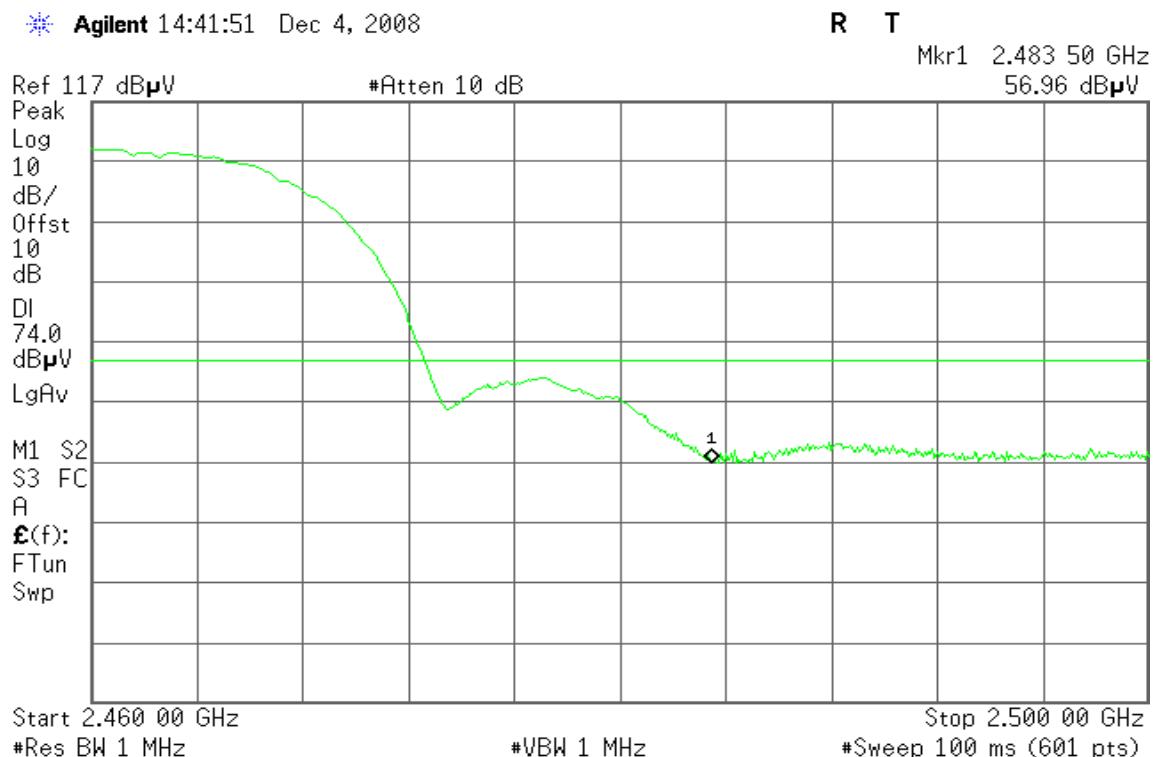
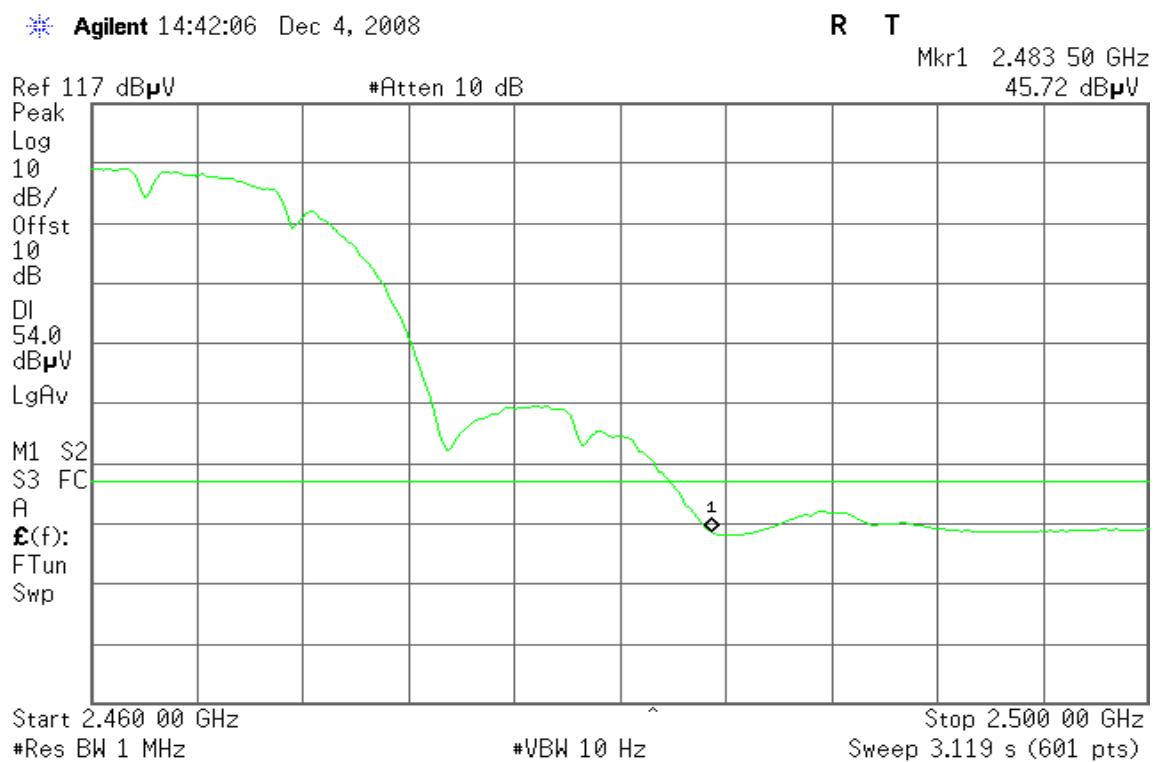
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

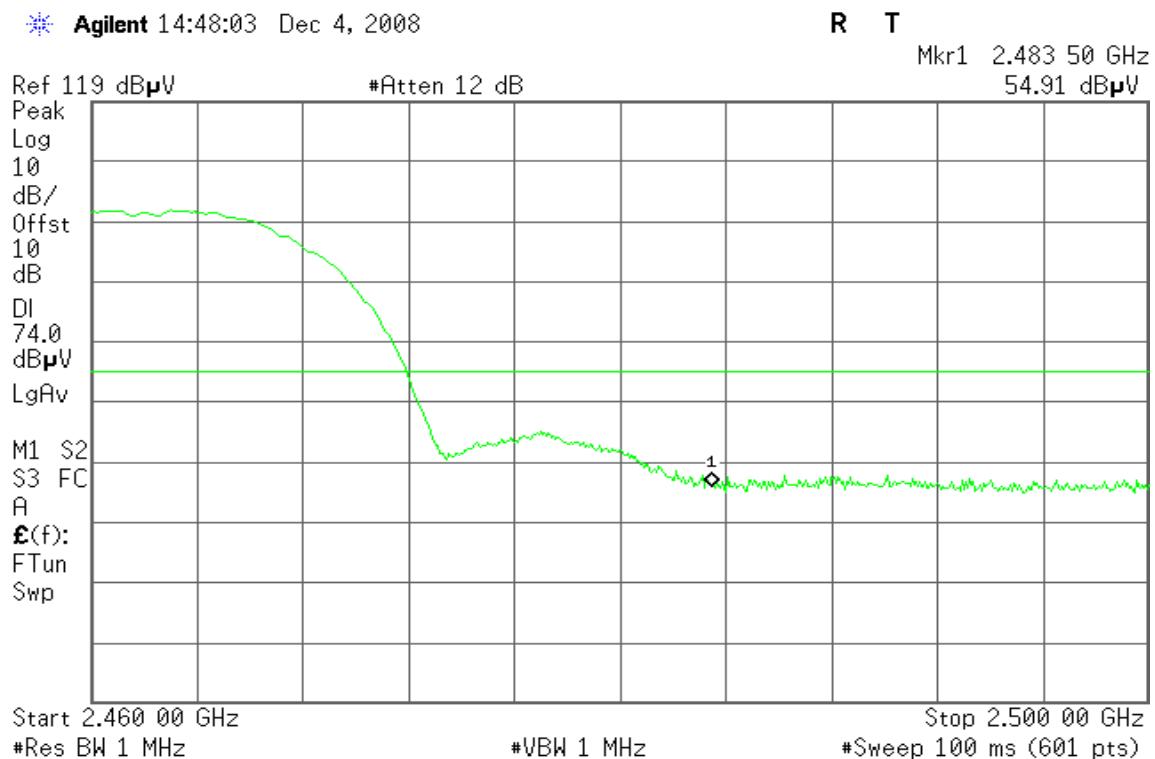
**Band Edges (IEEE 802.11g / CH High)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

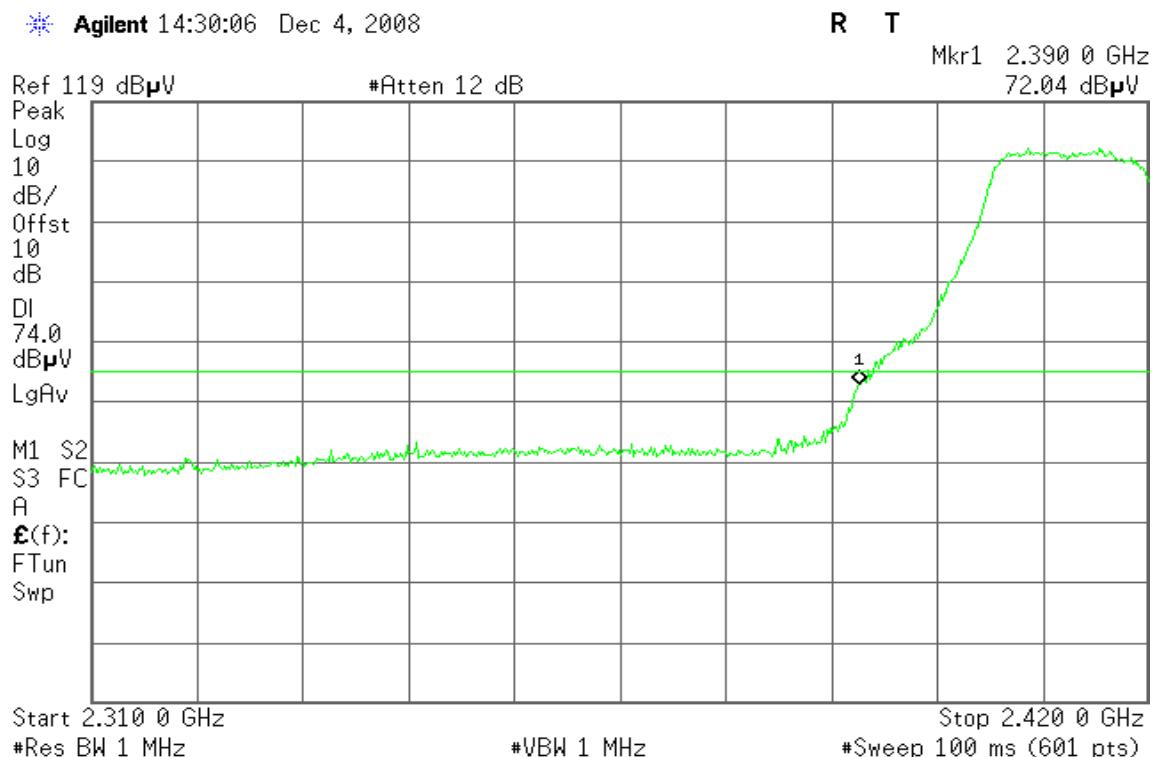
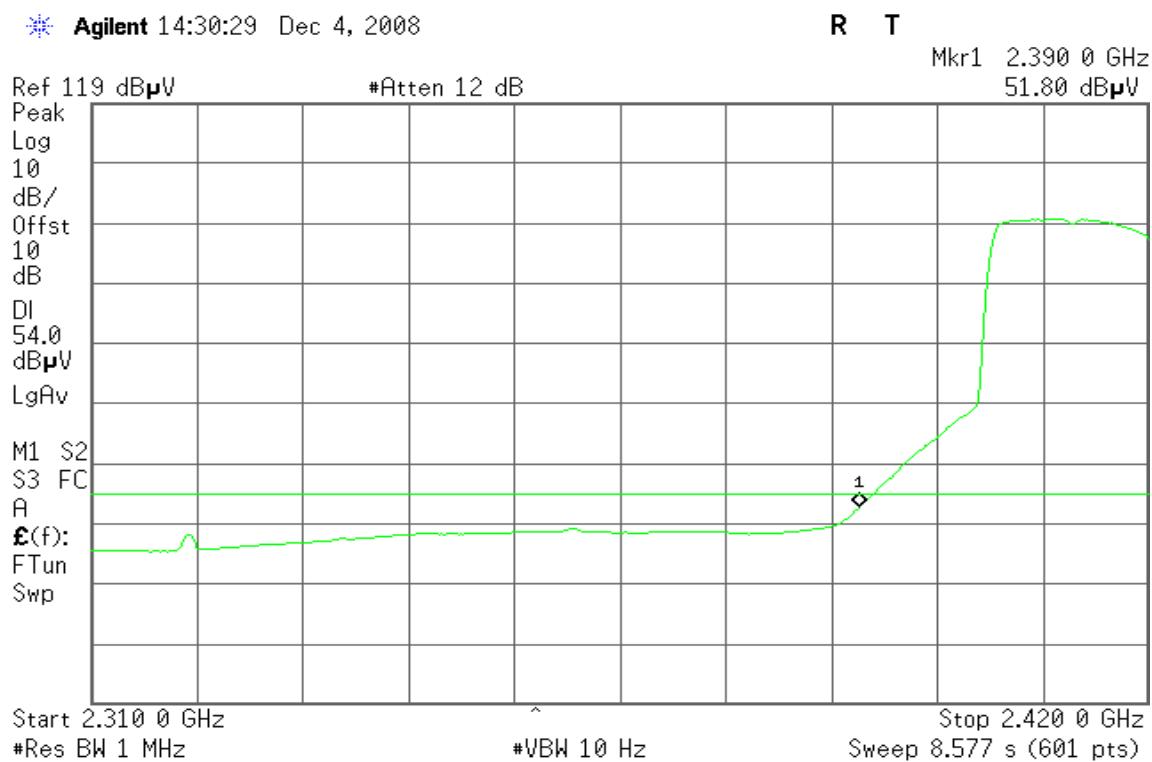
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

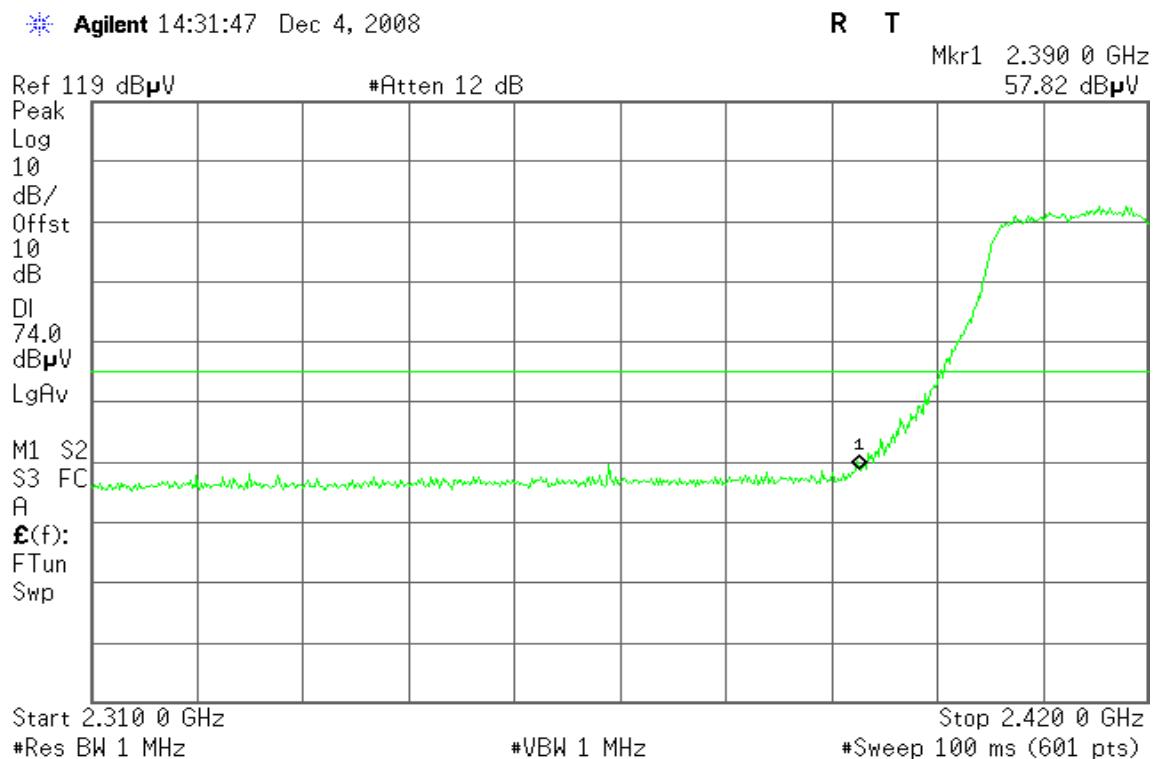
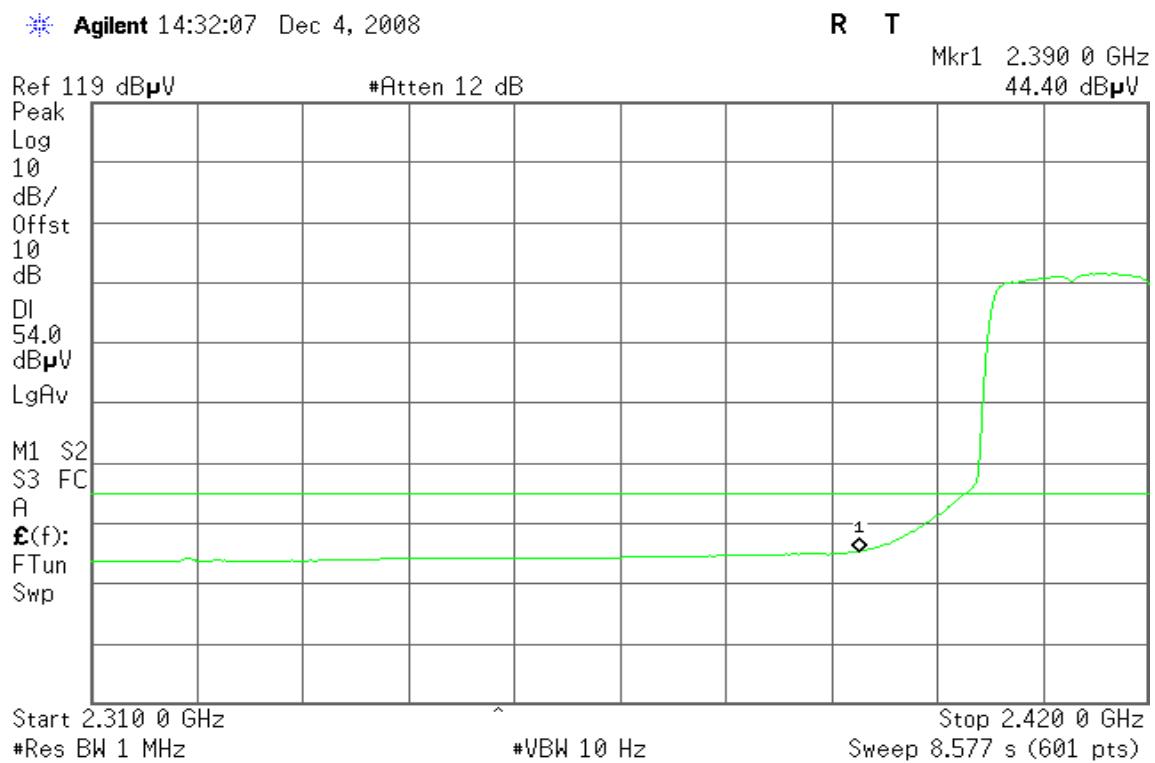
**Test Mode 3****Band Edges (IEEE 802.11b / CH Low)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

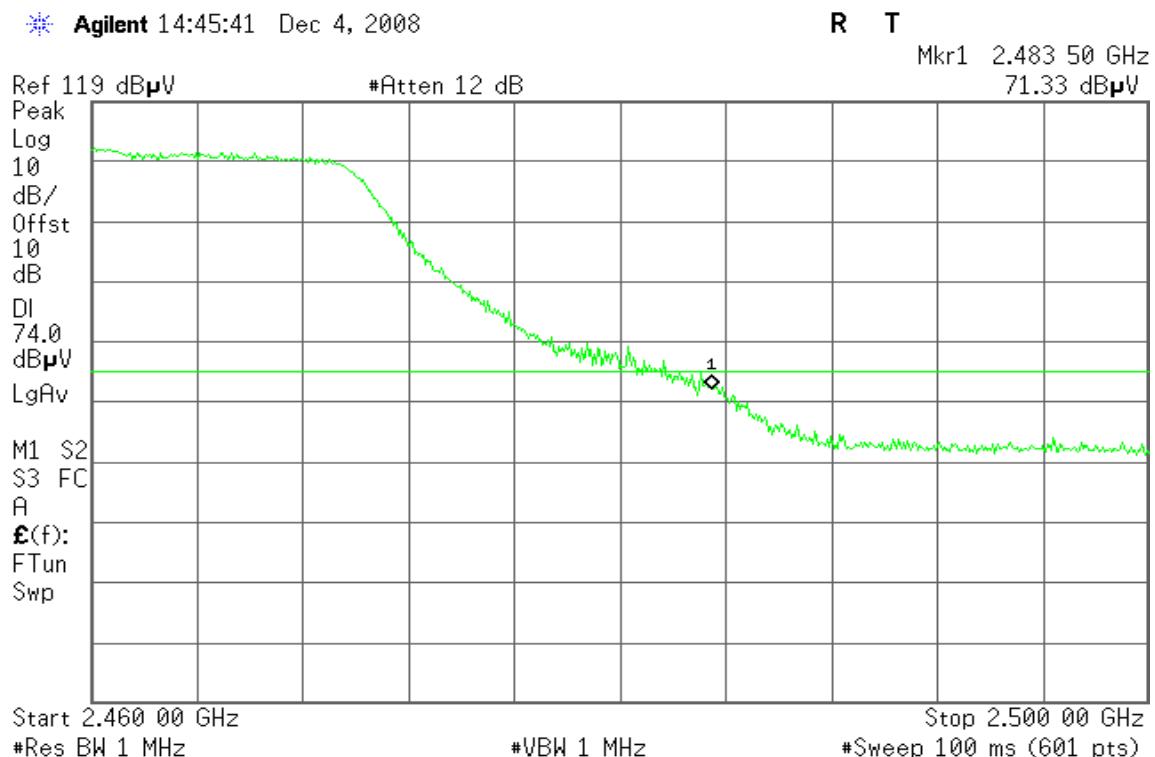
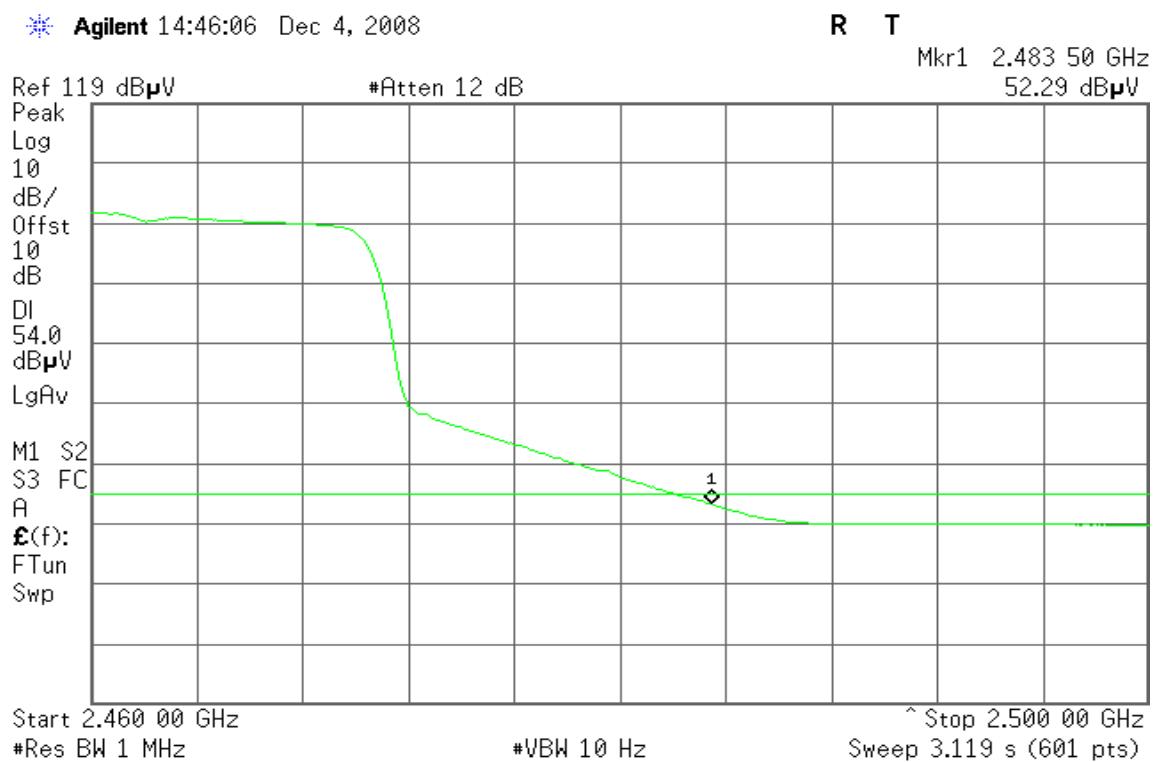
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

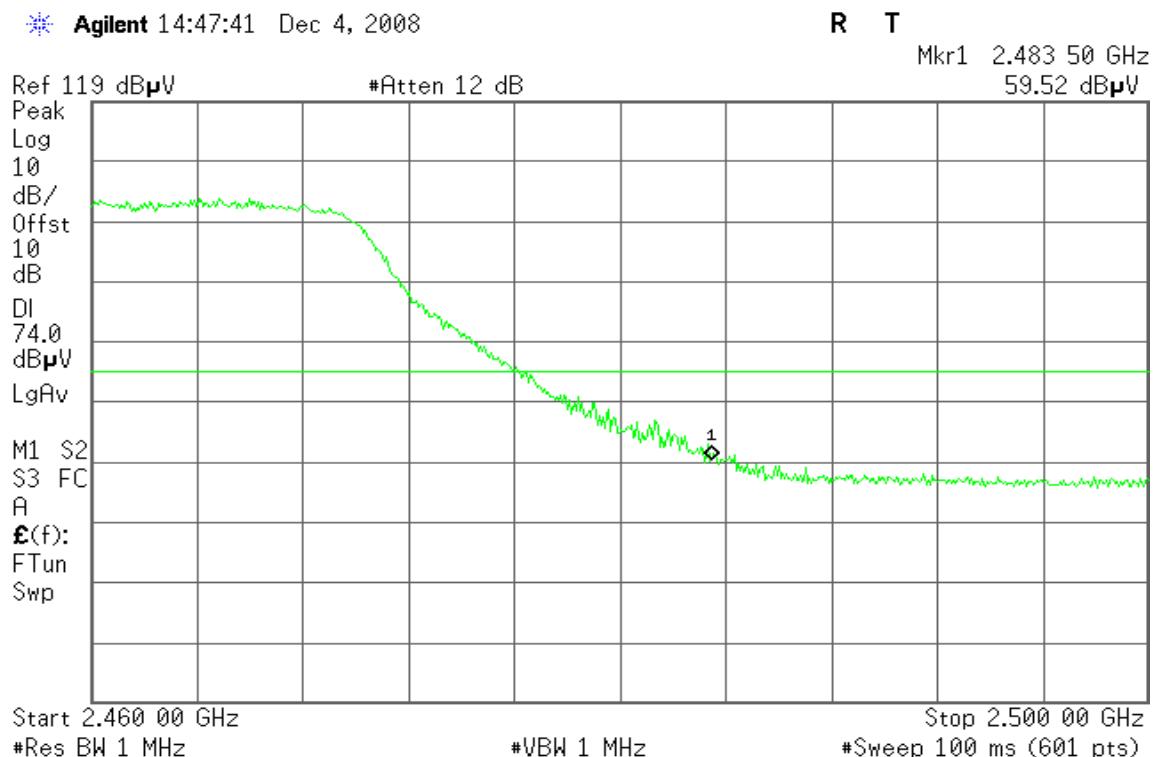
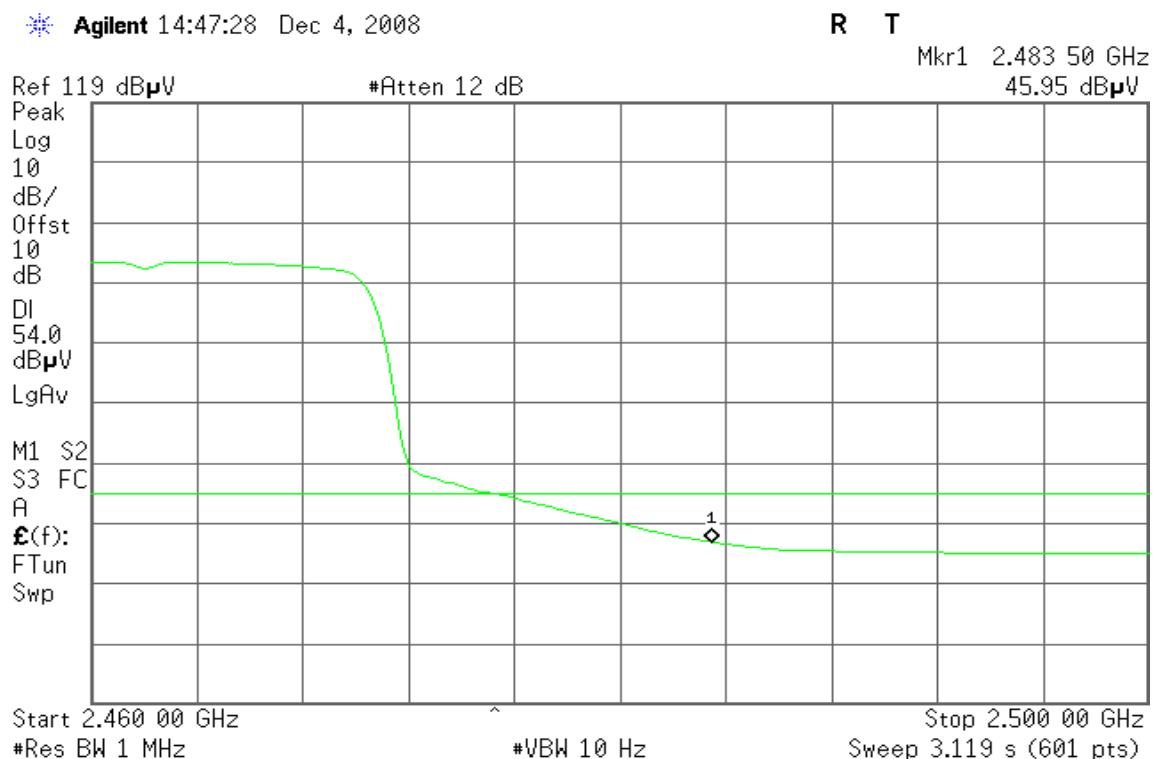
**Band Edges (IEEE 802.11b / CH High)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

**Band Edges (IEEE 802.11g / CH Low)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

**Band Edges (IEEE 802.11g / CH High)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**

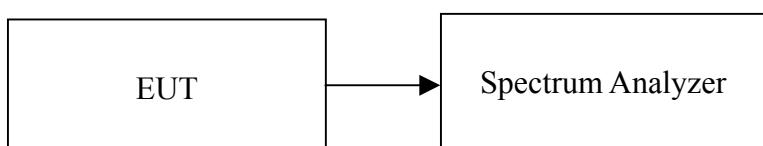
**Detector mode: Peak****Polarity: Horizontal****Detector mode: Average****Polarity: Horizontal**

## 7.5 PEAK POWER SPECTRAL DENSITY

### LIMIT

1. 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.
2. According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

### Test Configuration



### TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

### TEST RESULTS

*No non-compliance noted.*

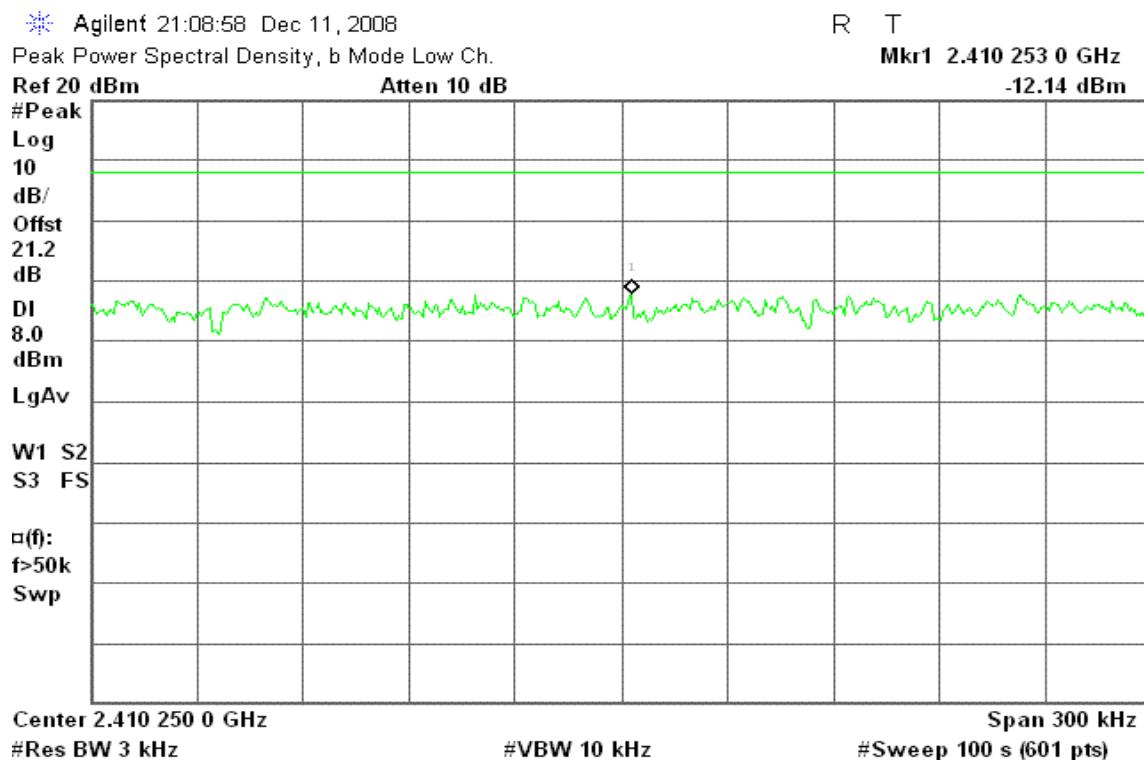
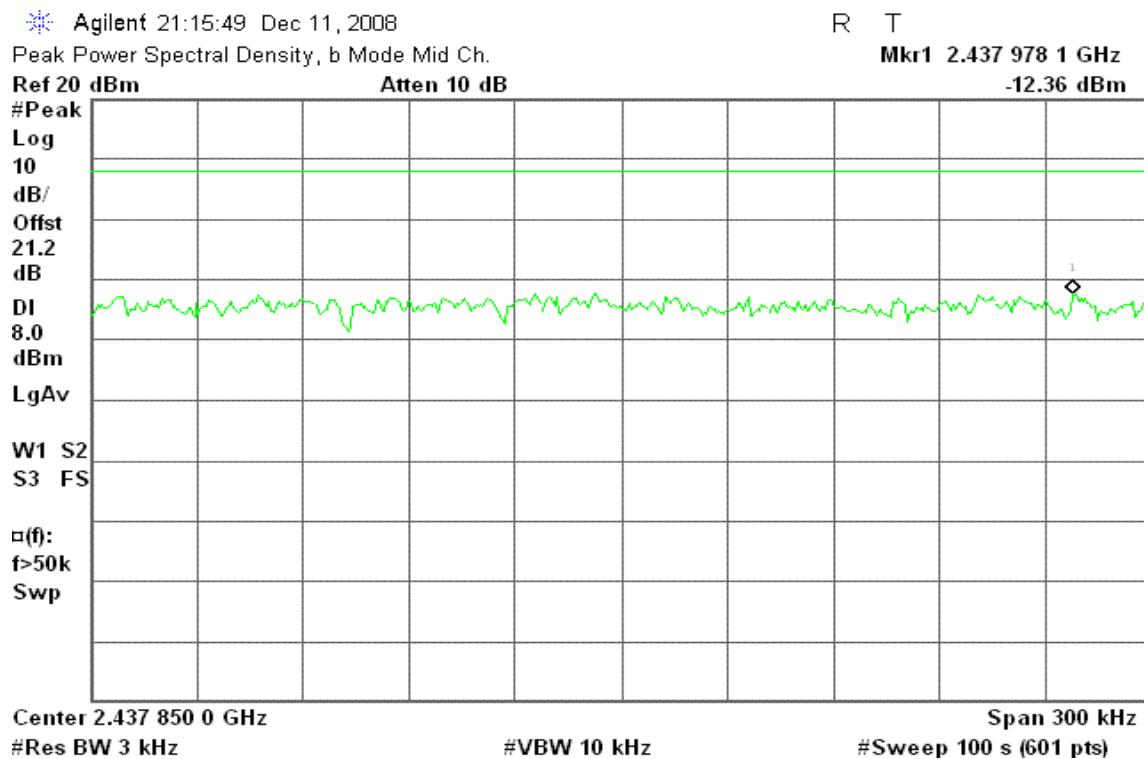
**Test Data/ Test Mode 1****Test mode: IEEE 802.11b**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-12.14	5.00	PASS
Mid	2437	-12.36		PASS
High	2462	-9.74		PASS

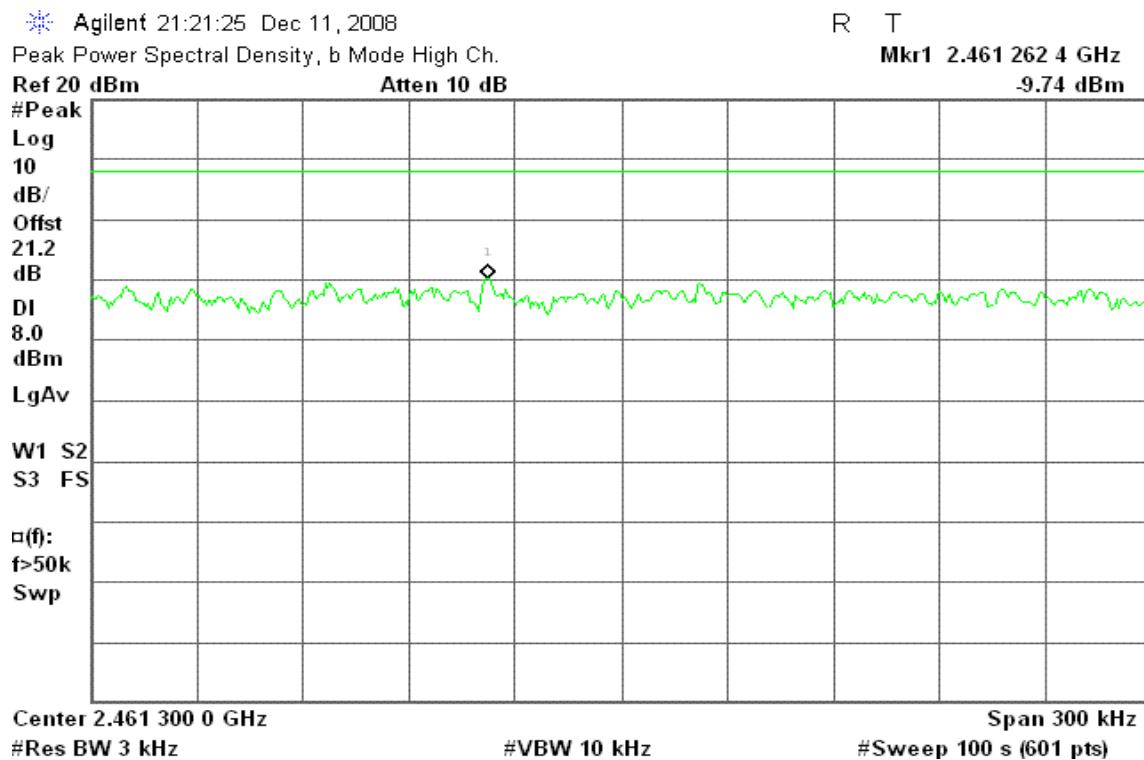
**Test mode: IEEE 802.11g**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-16.65	5.00	PASS
Mid	2437	-14.78		PASS
High	2462	-16.30		PASS

*Remark: The maximum antenna gain is 9 dBi; therefore the reduction due to antenna gain is 3 dB, so the limit is 5 dBm.*

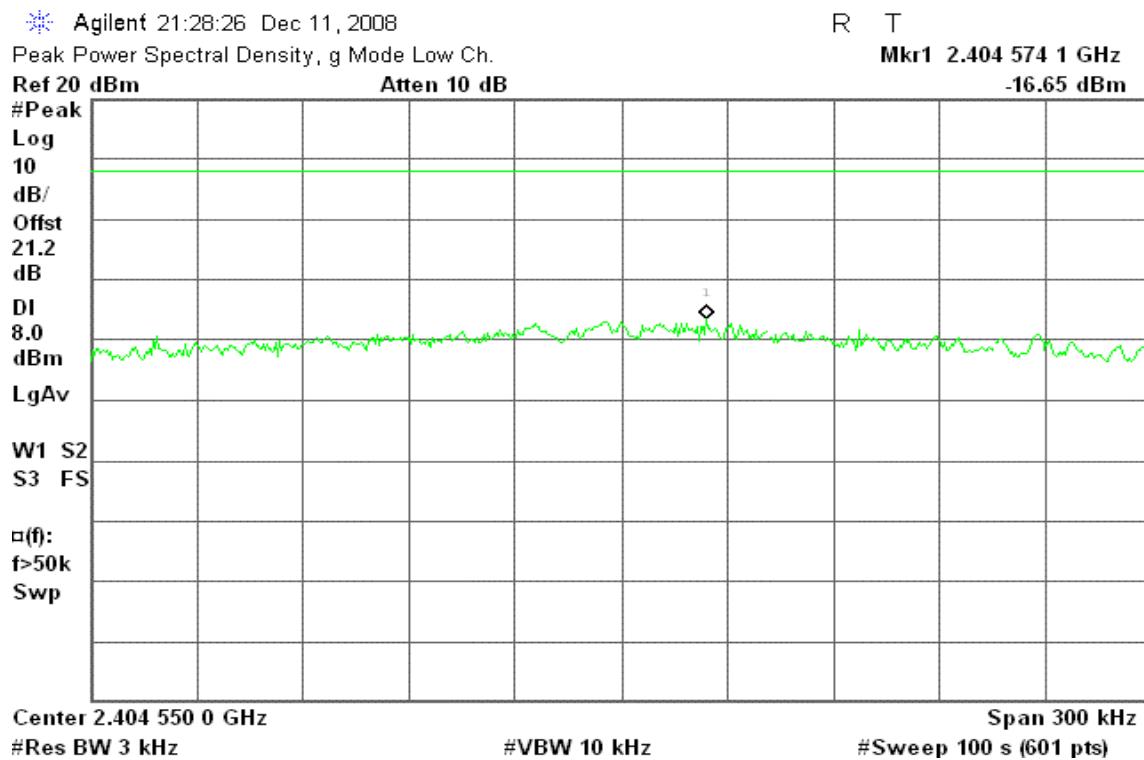
**Test Plot / Test Mode 1****IEEE 802.11b****PPSD (CH Low)****PPSD (CH Mid)**

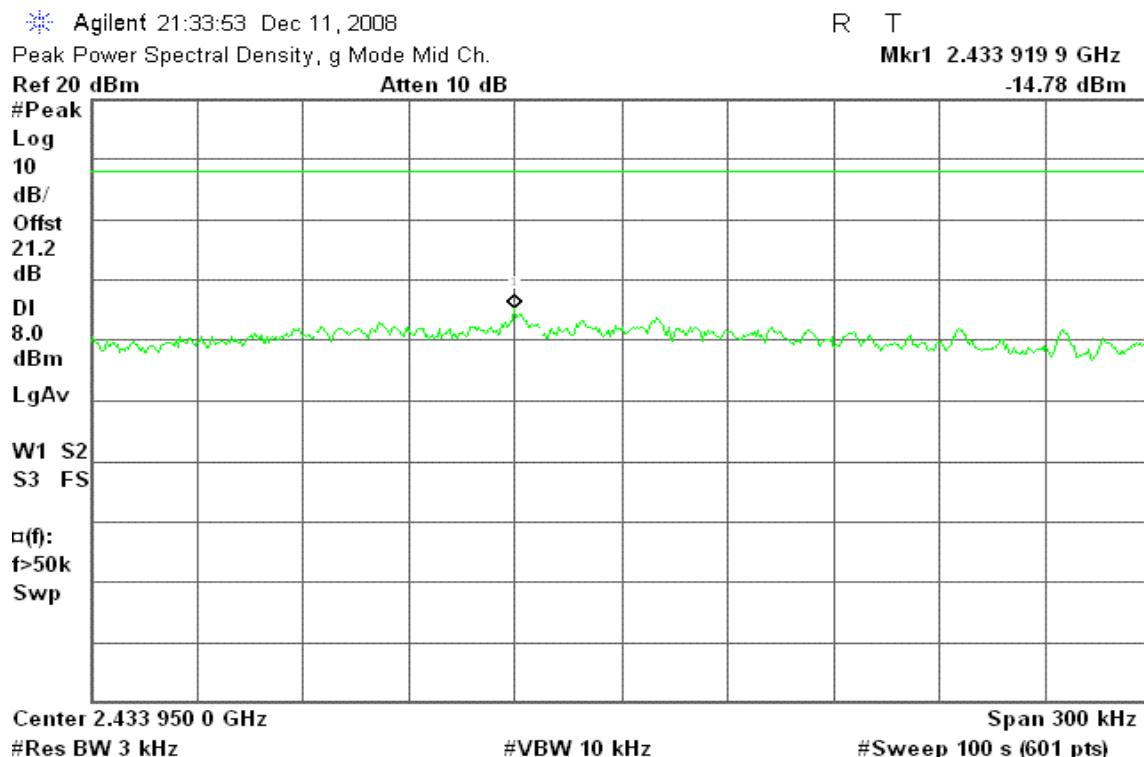
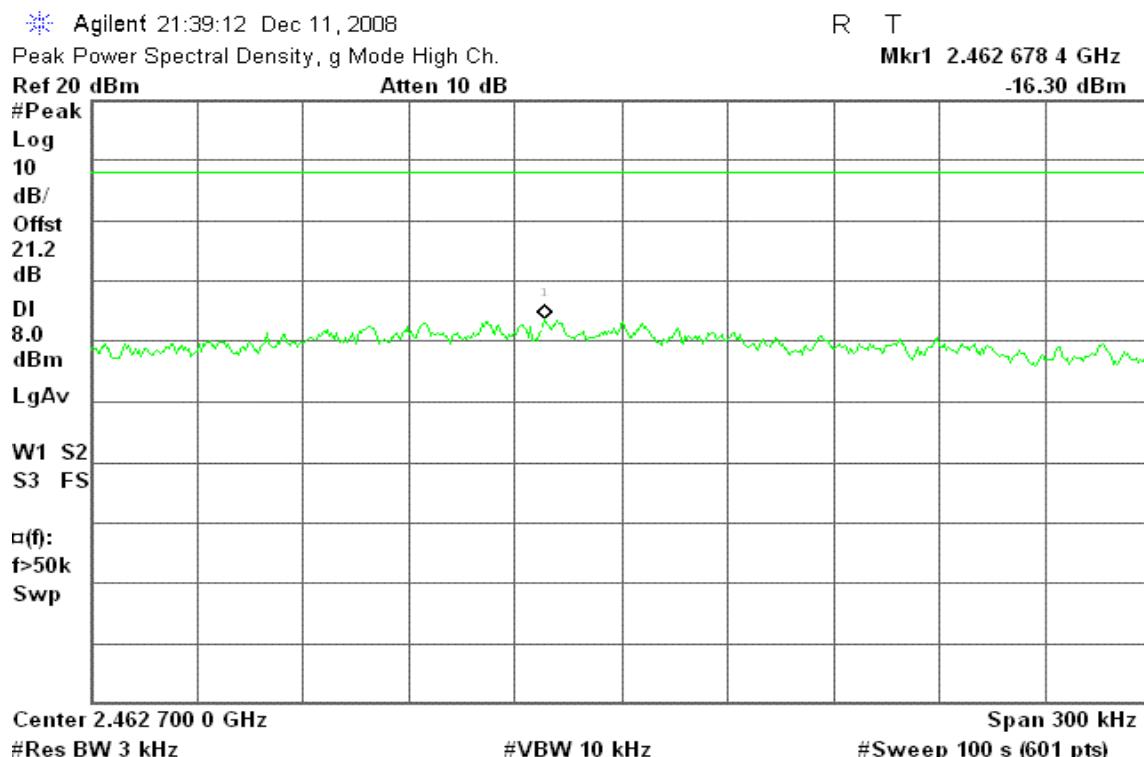
### PPSD (CH High)



### IEEE 802.11g

### PPSD (CH Low)



**PPSD (CH Mid)****PPSD (CH High)**

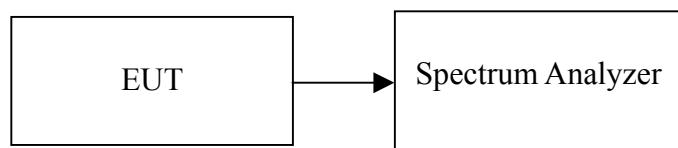
## 7.6 SPURIOUS EMISSIONS

### 7.6.1 Conducted Measurement

#### LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

#### Test Configuration



#### TEST PROCEDURE

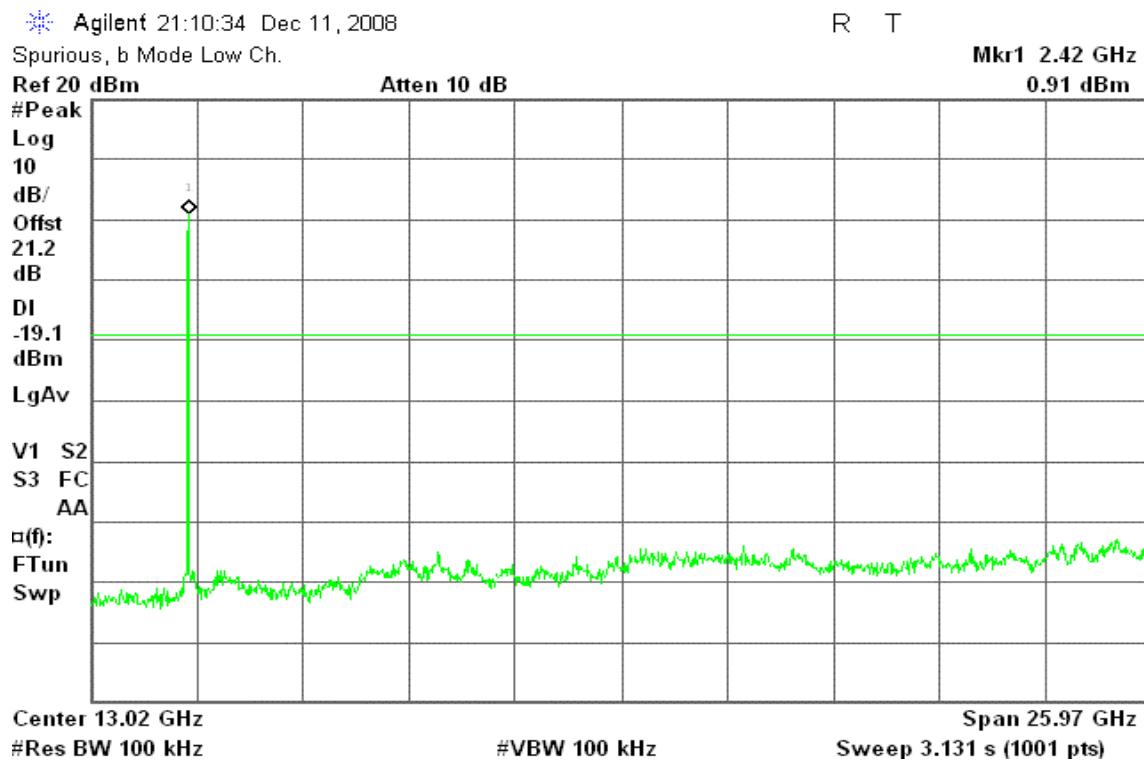
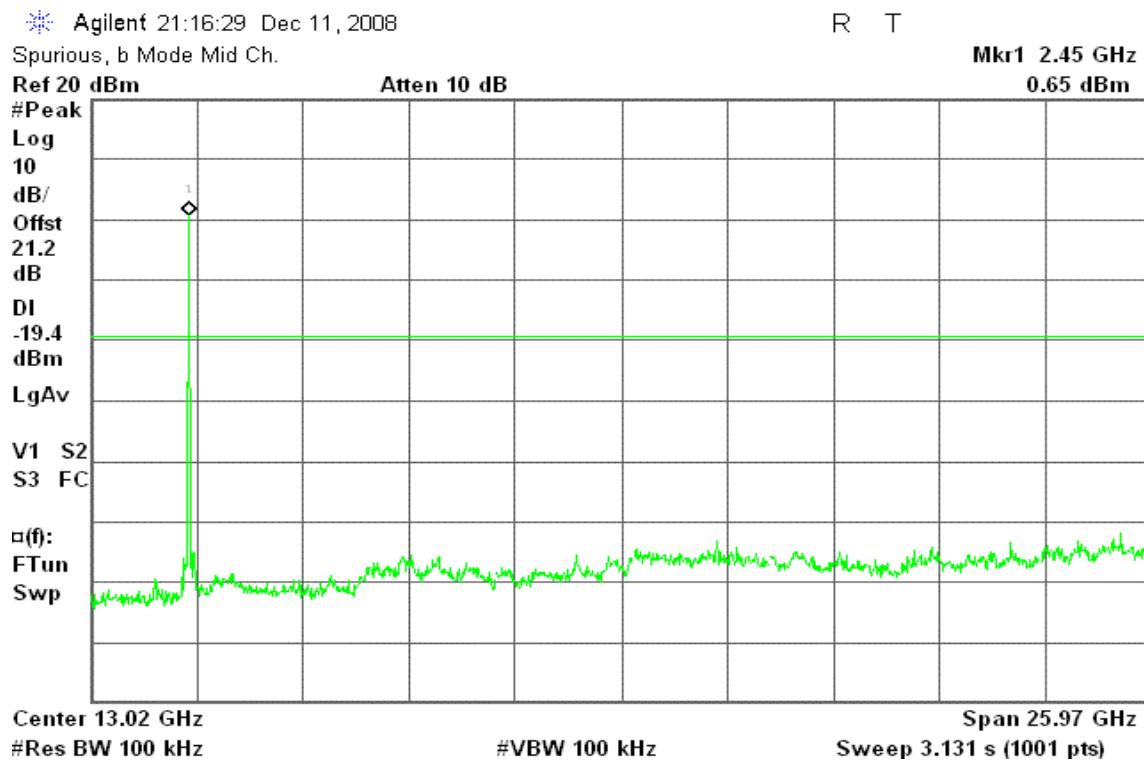
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

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

Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

#### TEST RESULTS

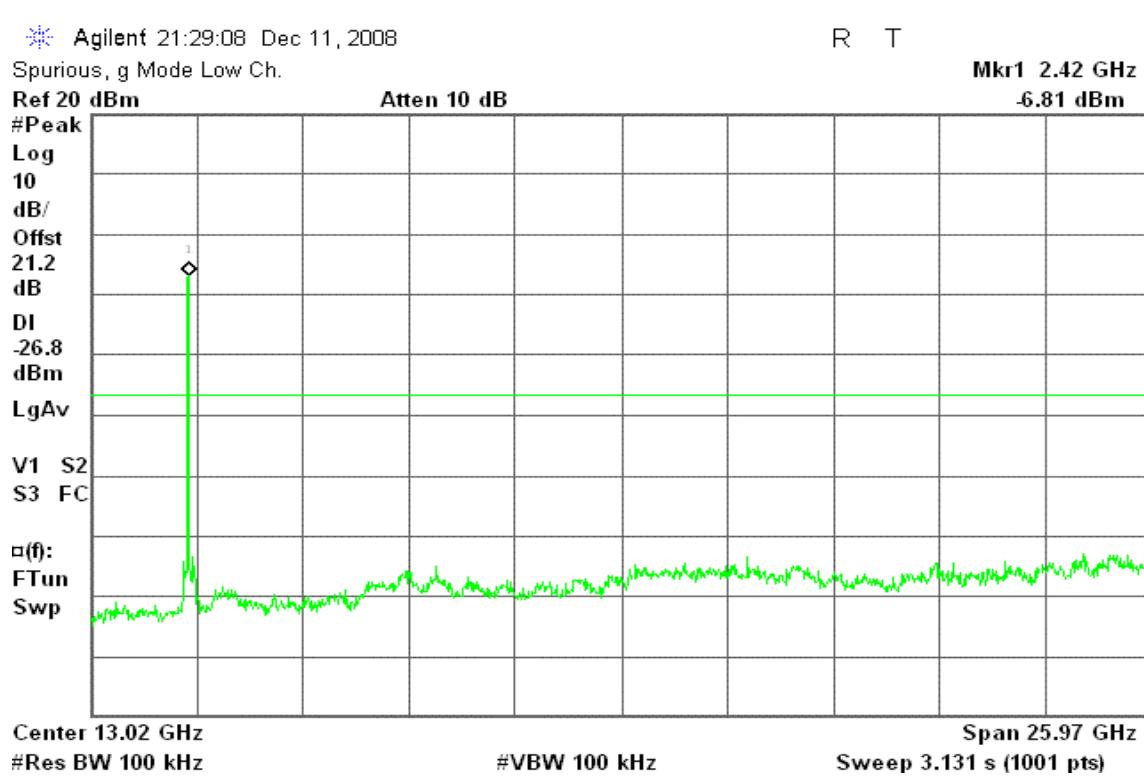
*No non-compliance noted.*

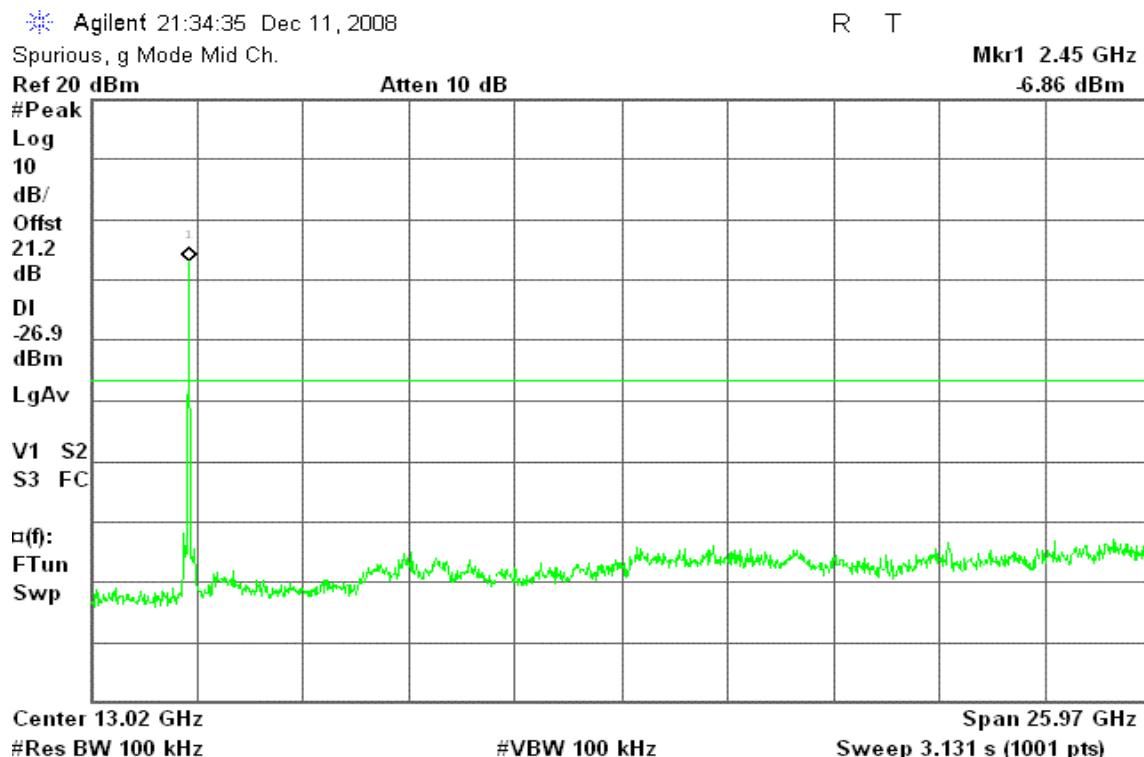
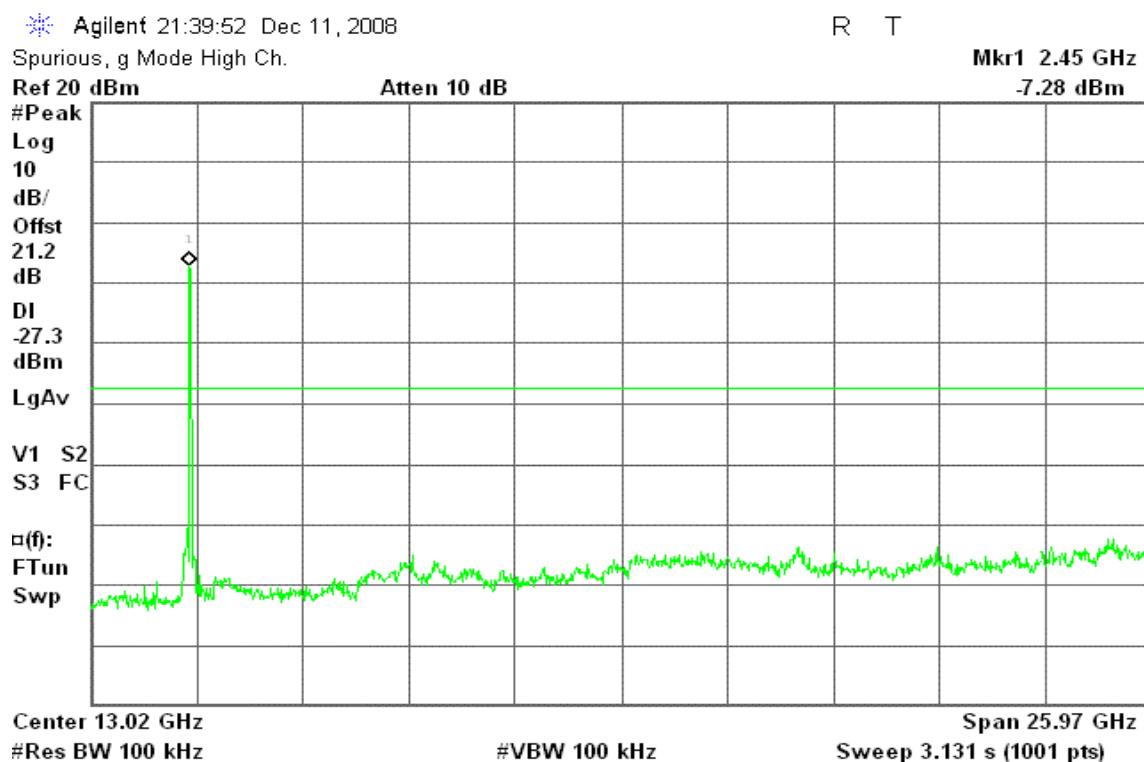
**Test Plot / Test Mode 1****IEEE 802.11b****CH Low****CH Mid**

## CH High



## CH Low



**CH Mid****CH High**



## 7.6.2 Radiated Emissions

### LIMIT

1. According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ( $\mu$ V/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

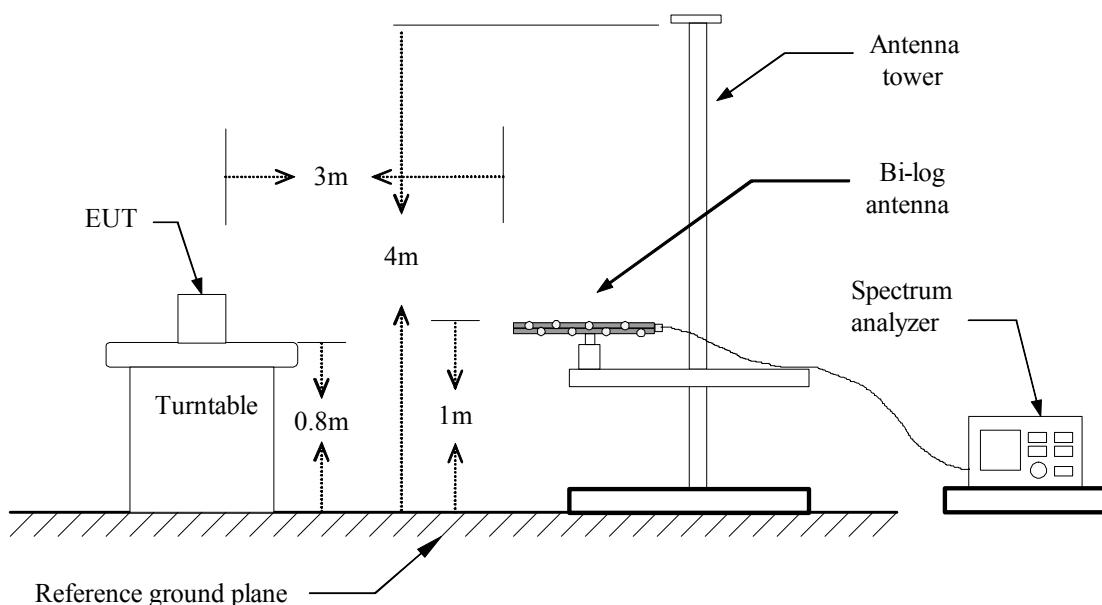
**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

2. In the emission table above, the tighter limit applies at the band edges.

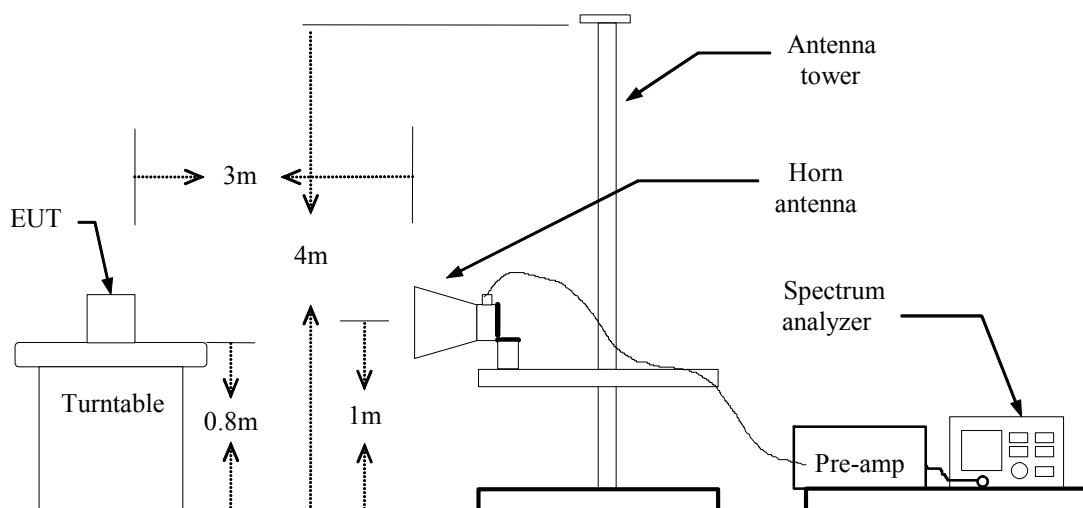
Frequency (MHz)	Field Strength ( $\mu$ V/m at 3-meter)	Field Strength (dB $\mu$ V/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

## Test Configuration

### Below 1 GHz



### Above 1 GHz





## **TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

7. Repeat above procedures until the measurements for all frequencies are complete.

**Below 1 GHz****Test Mode 1****Operation Mode:** TX**Test Date:** December 3, 2008**Temperature:** 25°C**Tested by:** Nan Tsai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
51.02	V	51.88	-13.59	38.29	40.00	-1.71	Peak
249.87	V	42.87	-9.74	33.13	46.00	-12.87	Peak
367.88	V	42.07	-7.18	34.89	46.00	-11.11	Peak
552.18	V	37.32	-2.94	34.38	46.00	-11.62	Peak
644.33	V	37.60	-2.29	35.31	46.00	-10.69	Peak
749.42	V	37.81	-0.09	37.73	46.00	-8.27	Peak
249.87	H	50.51	-9.74	40.77	46.00	-5.23	Peak
367.88	H	46.55	-7.18	39.37	46.00	-6.63	Peak
500.45	H	40.46	-4.13	36.33	46.00	-9.67	Peak
624.93	H	36.63	-2.37	34.26	46.00	-11.74	Peak
749.42	H	38.15	-0.09	38.06	46.00	-7.94	Peak
920.78	H	35.09	1.01	36.11	46.00	-9.89	Peak

**Remark:**

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

**Test Mode 2****Operation Mode:** TX**Test Date:** December 3, 2008**Temperature:** 25°C**Tested by:** Nan Tsai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
42.93	V	47.81	-9.70	38.11	40.00	-1.89	Peak
183.58	V	49.94	-10.44	39.51	43.50	-3.99	Peak
249.87	V	46.11	-9.74	36.37	46.00	-9.63	Peak
500.45	V	42.63	-4.13	38.50	46.00	-7.50	Peak
624.93	V	40.23	-2.37	37.87	46.00	-8.13	Peak
749.42	V	42.51	-0.09	42.42	46.00	-3.58	Peak
183.58	H	48.20	-10.44	37.76	43.50	-5.74	Peak
249.87	H	50.08	-9.74	40.34	46.00	-5.66	Peak
374.35	H	47.65	-6.95	40.70	46.00	-5.30	Peak
500.45	H	42.46	-4.13	38.33	46.00	-7.67	Peak
624.93	H	38.22	-2.37	35.86	46.00	-10.14	Peak
749.42	H	40.21	-0.09	40.12	46.00	-5.88	Peak

**Remark:**

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).*

**Test Mode 3****Operation Mode:** TX**Test Date:** December 15, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
59.10	V	50.64	-14.66	35.99	40.00	-4.01	Peak
296.75	V	40.63	-8.65	31.98	46.00	-14.02	Peak
374.35	V	38.10	-6.95	31.15	46.00	-14.85	Peak
500.45	V	38.52	-4.13	34.39	46.00	-11.61	Peak
552.18	V	47.15	-2.94	44.21	46.00	-1.79	QP
624.93	V	35.61	-2.37	33.25	46.00	-12.75	Peak
374.35	H	38.13	-6.95	31.18	46.00	-14.82	Peak
500.45	H	39.35	-4.13	35.22	46.00	-10.78	Peak
552.18	H	46.65	-2.94	43.71	46.00	-2.29	QP
624.93	H	36.25	-2.37	33.88	46.00	-12.12	Peak
749.42	H	34.06	-0.09	33.97	46.00	-12.03	Peak
875.52	H	33.52	0.26	33.78	46.00	-12.22	Peak

**Remark:**

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).*

**Above 1 GHz****Test Mode 1****Operation Mode:** IEEE 802.11b / TX / CH Low**Test Date:** December 3, 2008**Temperature:** 25°C**Tested by:** Nan Tsai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1060.00	V	54.75	---	-9.40	45.35	---	74.00	54.00	-8.65	Peak
4825.00	V	57.54	52.00	0.35	57.88	52.35	74.00	54.00	-1.65	AVG
N/A										
1473.33	H	54.38	---	-8.42	45.96	---	74.00	54.00	-8.04	Peak
4825.00	H	50.54	---	0.35	50.89	---	74.00	54.00	-3.11	Peak
4966.67	H	49.75	---	0.04	49.79	---	74.00	54.00	-4.21	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11b / TX / CH Mid**Test Date:** December 3, 2008**Temperature:** 25°C**Tested by:** Nan Tsai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1103.33	V	54.65	---	-9.30	45.35	---	74.00	54.00	-8.65	Peak
1286.67	V	53.00	---	-8.86	44.14	---	74.00	54.00	-9.86	Peak
4141.67	V	48.99	---	0.87	49.86	---	74.00	54.00	-4.14	Peak
4875.00	V	54.68	52.07	0.24	54.91	52.31	74.00	54.00	-1.69	AVG
N/A										
1563.33	H	51.85	---	-7.83	44.02	---	74.00	54.00	-9.98	Peak
2840.00	H	51.24	---	-1.73	49.50	---	74.00	54.00	-4.50	Peak
3250.00	H	48.70	---	-0.85	47.85	---	74.00	54.00	-6.15	Peak
4875.00	H	52.38	49.32	0.24	52.62	49.56	74.00	54.00	-4.44	AVG
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11b / TX / CH High**Test Date:** December 3, 2008**Temperature:** 25°C**Tested by:** Nan Tsai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1103.33	V	55.23	---	-9.30	45.94	---	74.00	54.00	-8.06	Peak
4925.00	V	56.14	52.20	0.13	56.27	52.33	74.00	54.00	-1.67	AVG
9850.00	V	45.32	43.51	9.83	55.15	53.34	74.00	54.00	-0.66	AVG
N/A										
1513.33	H	52.40	---	-8.25	44.16	---	74.00	54.00	-9.84	Peak
2373.33	H	51.58	---	-3.02	48.56	---	74.00	54.00	-5.44	Peak
4925.00	H	53.96	49.28	0.13	54.09	49.41	74.00	54.00	-4.59	AVG
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11g / TX / CH Low**Test Date:** December 3, 2008**Temperature:** 25°C**Tested by:** Nan Tsai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1056.67	V	56.18	---	-9.41	46.77	---	74.00	54.00	-7.23	Peak
1286.67	V	52.93	---	-8.86	44.06	---	74.00	54.00	-9.94	Peak
4825.00	V	55.61	45.42	0.35	55.96	45.77	74.00	54.00	-8.23	AVG
7241.67	V	53.03	41.05	2.96	55.99	44.01	74.00	54.00	-9.99	AVG
9633.33	V	46.56	33.23	9.44	56.00	42.67	74.00	54.00	-11.33	AVG
N/A										
1560.00	H	51.71	---	-7.86	43.85	---	74.00	54.00	-10.15	Peak
3991.67	H	49.01	---	0.77	49.78	---	74.00	54.00	-4.22	Peak
4825.00	H	52.69	41.73	0.35	53.04	42.08	74.00	54.00	-11.92	AVG
7233.33	H	49.58	37.96	2.96	52.54	40.92	74.00	54.00	-13.08	AVG
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11g / TX / CH Mid**Test Date:** December 3, 2008**Temperature:** 25°C**Tested by:** Nan Tsai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1283.33	V	52.89	---	-8.87	44.02	---	74.00	54.00	-9.98	Peak
2060.00	V	51.31	---	-3.99	47.32	---	74.00	54.00	-6.68	Peak
2693.33	V	51.77	---	-2.12	49.65	---	74.00	54.00	-4.35	Peak
4866.67	V	58.23	46.60	0.26	58.49	46.86	74.00	54.00	-7.14	AVG
7308.33	V	55.60	43.93	2.95	58.55	46.88	74.00	54.00	-7.12	AVG
9766.67	V	45.98	34.54	9.68	55.66	44.22	74.00	54.00	-9.78	AVG
1563.33	H	52.66	---	-7.83	44.83	---	74.00	54.00	-9.17	Peak
2116.67	H	51.54	---	-3.82	47.72	---	74.00	54.00	-6.28	Peak
4866.67	H	54.95	44.35	0.26	55.21	44.61	74.00	54.00	-9.39	AVG
7308.33	H	50.49	38.97	2.95	53.44	41.92	74.00	54.00	-12.08	AVG
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11g / TX / CH High**Test Date:** December 3, 2008**Temperature:** 25°C**Tested by:** Nan Tsai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1103.33	V	54.32	---	-9.30	45.02	---	74.00	54.00	-8.98	Peak
1286.67	V	53.00	---	-8.86	44.14	---	74.00	54.00	-9.86	Peak
4925.00	V	53.88	42.65	0.13	54.01	42.78	74.00	54.00	-11.22	AVG
9866.67	V	46.29	36.40	9.86	56.15	46.26	74.00	54.00	-7.74	AVG
N/A										
1473.33	H	53.24	---	-8.42	44.82	---	74.00	54.00	-9.18	Peak
4925.00	H	52.80	40.67	0.13	52.93	40.80	74.00	54.00	-13.2	AVG
7400.00	H	49.62	36.46	2.93	52.55	39.39	74.00	54.00	-14.61	AVG
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode 2****Operation Mode:** IEEE 802.11b / TX / CH Low**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1220.00	V	59.60	---	-9.02	50.58	---	74.00	54.00	-3.42	Peak
4558.33	V	49.35	---	0.94	50.28	---	74.00	54.00	-3.72	Peak
4825.00	V	52.59	51.54	0.35	52.94	51.89	74.00	54.00	-2.11	AVG
N/A										
1163.33	H	59.09	---	-9.16	49.94	---	74.00	54.00	-4.06	Peak
4825.00	H	49.65	---	0.35	49.99	---	74.00	54.00	-4.01	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11b / TX / CH Mid**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1160.00	V	59.29	---	-9.16	50.13	---	74.00	54.00	-3.87	Peak
4875.00	V	52.71	50.77	0.24	52.95	51.01	74.00	54.00	-2.99	AVG
N/A										
1203.33	H	59.18	---	-9.06	50.12	---	74.00	54.00	-3.88	Peak
4875.00	H	50.82	41.50	0.24	51.06	41.74	74.00	54.00	-12.26	AVG
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11b / TX / CH High**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1203.33	V	59.32	---	-9.06	50.26	---	74.00	54.00	-3.74	Peak
3283.33	V	49.66	---	-0.78	48.88	---	74.00	54.00	-5.12	Peak
4925.00	V	54.08	51.28	0.13	54.21	51.41	74.00	54.00	-2.59	AVG
N/A										
1283.33	H	58.85	---	-8.87	49.98	---	74.00	54.00	-4.02	Peak
3283.33	H	48.91	---	-0.78	48.13	---	74.00	54.00	-5.87	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11g / TX / CH Low**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1186.67	V	58.71	---	-9.10	49.61	---	74.00	54.00	-4.39	Peak
4016.67	V	48.49	---	0.80	49.28	---	74.00	54.00	-4.72	Peak
N/A										
1270.00	H	59.74	---	-8.90	50.84	---	74.00	54.00	-3.16	Peak
4225.00	H	47.94	---	0.91	48.86	---	74.00	54.00	-5.14	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11g / TX / CH Mid**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1186.67	V	59.59	---	-9.10	50.49	---	74.00	54.00	-3.51	Peak
4608.33	V	48.80	---	0.83	49.63	---	74.00	54.00	-4.37	Peak
N/A										
1236.67	H	59.28	---	-8.98	50.30	---	74.00	54.00	-3.70	Peak
4908.33	H	49.01	---	0.16	49.18	---	74.00	54.00	-4.82	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11g / TX / CH High**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1213.33	V	59.62	---	-9.04	50.58	---	74.00	54.00	-3.42	Peak
3283.33	V	50.21	---	-0.78	49.43	---	74.00	54.00	-4.57	Peak
4216.67	V	49.02	---	0.91	49.93	---	74.00	54.00	-4.07	Peak
N/A										
1203.33	H	58.99	---	-9.06	49.93	---	74.00	54.00	-4.07	Peak
4216.67	H	48.91	---	0.91	49.82	---	74.00	54.00	-4.18	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode 3****Operation Mode:** IEEE 802.11b / TX / CH Low**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1253.33	V	59.43	---	-8.94	50.48	---	74.00	54.00	-3.52	Peak
4825.00	V	56.52	51.32	0.35	56.87	51.67	74.00	54.00	-2.33	AVG
N/A										
1276.67	H	59.24	---	-8.89	50.35	---	74.00	54.00	-3.65	Peak
4825.00	H	50.43	---	0.35	50.78	---	74.00	54.00	-3.22	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11b / TX / CH Mid**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1263.33	V	59.40	---	-8.92	50.48	---	74.00	54.00	-3.52	Peak
4875.00	V	55.34	50.75	0.24	55.58	50.99	74.00	54.00	-3.01	AVG
N/A										
1226.67	H	58.88	---	-9.01	49.88	---	74.00	54.00	-4.12	Peak
4875.00	H	50.03	---	0.24	50.27	---	74.00	54.00	-3.73	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11b / TX / CH High**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1213.33	V	59.23	---	-9.04	50.20	---	74.00	54.00	-3.80	Peak
4925.00	V	55.30	50.86	0.13	55.43	50.99	74.00	54.00	-3.01	AVG
N/A										
1210.00	H	59.13	---	-9.04	50.08	---	74.00	54.00	-3.92	Peak
4925.00	H	49.84	---	0.13	49.97	---	74.00	54.00	-4.03	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11g / TX / CH Low**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2360.00	V	63.49	50.36	-3.06	60.43	47.30	74.00	54.00	-6.70	AVG
2520.00	V	64.14	53.02	-2.58	61.56	50.44	74.00	54.00	-3.56	AVG
N/A										
1200.00	H	59.50	---	-9.07	50.43	---	74.00	54.00	-3.57	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11g / TX / CH Mid**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2360.00	V	64.91	51.50	-3.06	61.85	48.44	74.00	54.00	-5.56	AVG
2520.00	V	62.75	52.92	-2.58	60.17	50.34	74.00	54.00	-3.66	AVG
N/A										
1233.33	H	58.58	---	-8.99	49.59	---	74.00	54.00	-4.41	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** IEEE 802.11g / TX / CH High**Test Date:** December 4, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2353.33	V	64.55	51.64	-3.08	61.47	48.56	74.00	54.00	-5.44	AVG
2530.00	V	62.73	49.61	-2.55	60.18	47.06	74.00	54.00	-6.94	AVG
N/A										
1296.67	H	59.56	---	-8.84	50.72	---	74.00	54.00	-3.28	Peak
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



## 7.7 POWERLINE CONDUCTED EMISSIONS

### LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that 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 the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

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

### Test Configuration

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

### TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.



## TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

### Test Data

<b>Operation Mode:</b>	Normal Link	<b>Test Date:</b>	December 23, 2008
<b>Temperature:</b>	22°C	<b>Tested by:</b>	Chihkai Chung
<b>Humidity:</b>	45% RH	<b>Test Mode:</b>	4

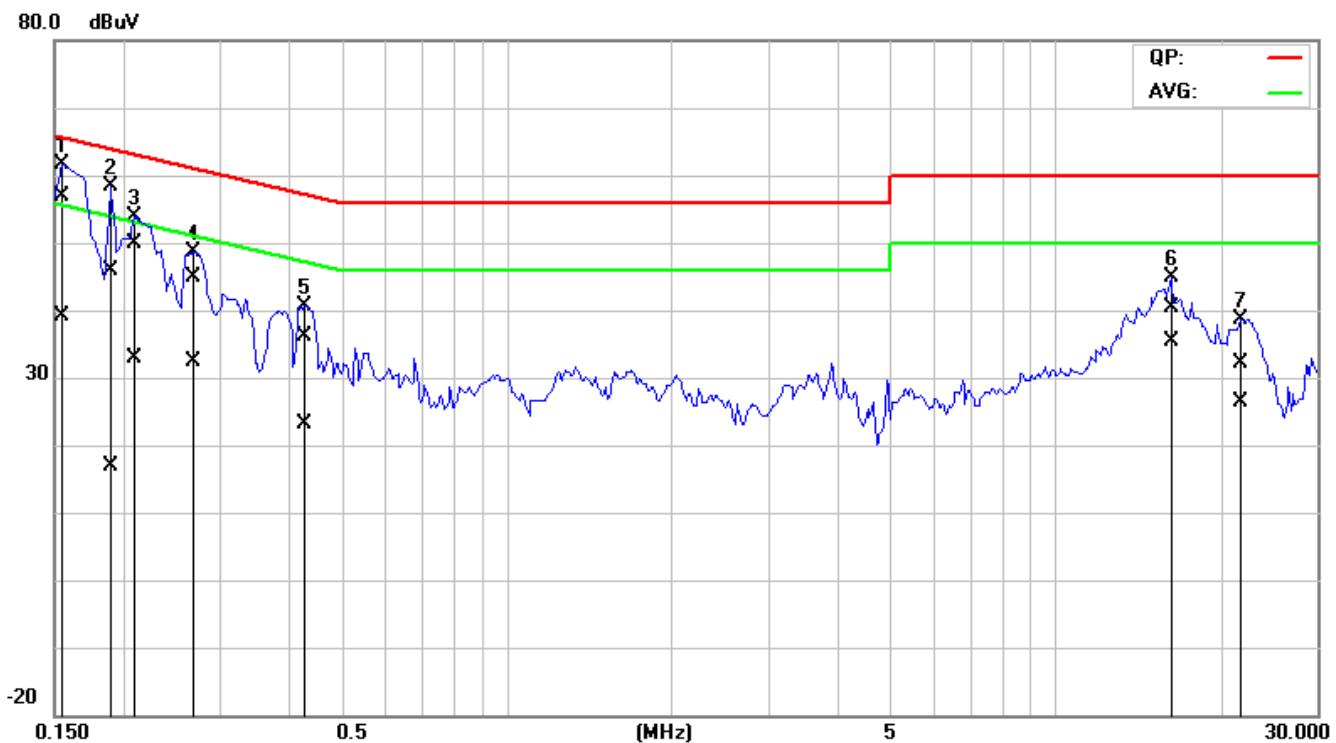
Frequency (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1550	56.80	39.00	0.20	57.00	39.20	65.73	55.73	-8.73	-16.53	L1
0.1900	45.73	16.73	0.17	45.90	16.90	64.04	54.04	-18.14	-37.14	L1
0.2100	49.64	32.84	0.16	49.80	33.00	63.21	53.21	-13.41	-20.21	L1
0.2700	44.77	32.27	0.13	44.90	32.40	61.12	51.12	-16.22	-18.72	L1
0.4300	36.14	23.04	0.06	36.20	23.10	57.25	47.25	-21.05	-24.15	L1
16.2300	39.74	34.64	0.66	40.40	35.30	60.00	50.00	-19.60	-14.70	L1
21.7600	31.32	25.72	0.78	32.10	26.50	60.00	50.00	-27.90	-23.50	L1
0.1582	55.71	39.91	0.19	55.90	40.10	65.56	55.56	-9.66	-15.46	L2
0.1800	39.23	22.93	0.17	39.40	23.10	64.49	54.49	-25.09	-31.39	L2
0.2100	47.15	28.05	0.15	47.30	28.20	63.21	53.21	-15.91	-25.01	L2
0.2600	38.97	18.67	0.13	39.10	18.80	61.43	51.43	-22.33	-32.63	L2
0.3800	32.12	21.82	0.08	32.20	21.90	58.28	48.28	-26.08	-26.38	L2
4.9550	26.96	20.86	0.24	27.20	21.10	56.00	46.00	-28.80	-24.90	L2
16.2300	38.51	33.11	0.69	39.20	33.80	60.00	50.00	-20.80	-16.20	L2
29.2350	28.99	24.99	1.01	30.00	26.00	60.00	50.00	-30.00	-24.00	L2

### **Remark:**

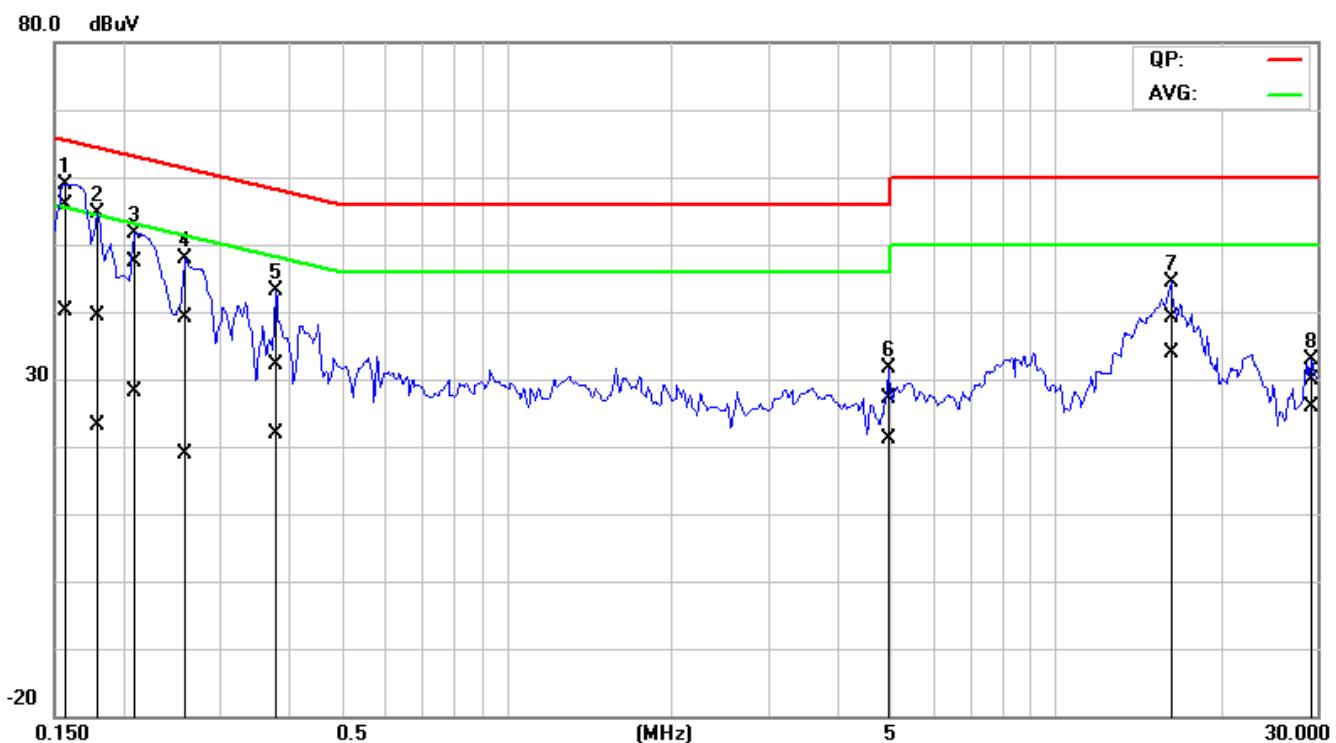
1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

## Test Plots

### *Conducted emissions (Line 1)*



### *Conducted emissions (Line 2)*





## APPENDIX I

## RADIO FREQUENCY EXPOSURE

### LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §15.247(i) and §1.1307(b)(1) of this chapter.

### EUT Specification

<b>EUT</b>	802.11b/g Access Point
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Bluetooth: 2.402GHz ~ 2.480 GHz
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation)
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
<b>Antenna diversity</b>	<input checked="" type="checkbox"/> Single antenna <small>(Remark 2)</small> <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
<b>Max. output power</b>	IEEE 802.11b: 15.11 dBm (32.43mW) IEEE 802.11g: 16.24 dBm (42.07mW)
<b>Antenna gain (Max)</b>	Patch antenna / Gain: 9 dBi (Numeric gain: 7.94) Monopole antenna / Gain: 5 dBi (Numeric gain: 3.16)
<b>Evaluation applied</b>	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A

#### **Remark:**

1. The maximum output power is 16.24dBm (42.07mW) at 2437MHz (with 7.94 numeric antenna gain.)
2. Patch antenna & Monopole antenna cannot be simultaneous transmitter.
3. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
4. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm<sup>2</sup> even if the calculation indicates that the power density would be larger.

## TEST RESULTS

No non-compliance noted.

**Calculation**

$$\text{Given } E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

Where  $E$  = Field strength in Volts / meter

$P$  = Power in Watts

$G$  = Numeric antenna gain

$d$  = Distance in meters

$S$  = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$$P(\text{mW}) = P(\text{W}) / 1000 \text{ and}$$

$$d(\text{cm}) = d(\text{m}) / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where  $d$  = Distance in cm

$P$  = Power in mW

$G$  = Numeric antenna gain

$S$  = Power density in mW / cm<sup>2</sup>

**Maximum Permissible Exposure**

EUT output power = 42.07mW

Numeric Antenna gain = 7.94

Substituting the MPE safe distance using  $d = 20$  cm into Equation 1:

Yields

$$S = 0.000199 \times P \times G$$

Where  $P$  = Power in mW

$G$  = Numeric antenna gain

$S$  = Power density in mW / cm<sup>2</sup>

$$\rightarrow \text{Power density} = 0.0665 \text{ mW / cm}^2$$

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm<sup>2</sup> even if the calculation indicates that the power density would be larger.)