



## FCC 47 CFR PART 15 SUBPART C

### TEST REPORT

For

**Wireless-N ADSL2+ Gateway**

**Model: WAG325N-Annex A, WAG325N-Annex B**

**Trade Name: Linksys**

*Issued to*

**Cisco-Linksys LLC**  
121 Theory Drive  
Irvine, CA 92617(USA)

*Issued by*

**Compliance Certification Services Inc.**  
No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,  
Taoyuan Hsien, (338) Taiwan, R.O.C.  
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# 1. TEST RESULT CERTIFICATION

**Applicant:** Cisco-Linksys LLC  
 121 Theory Drive  
 Irvine, CA 92617(USA)

**Equipment Under Test:** Wireless-N ADSL2+ Gateway

**Trade Name:** LINKSYS

**Model:** WAG325N-Annex A, WAG325N-Annex B

**Date of Test:** September 12 ~ October 20, 2006

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

### 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:

Reviewed by:

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Gavin Lim  
 Section Manager  
 Compliance Certification Services Inc.

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Amanda Wu  
 Section Manager  
 Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	Wireless-N ADSL2+ Gateway
<b>Trade Name</b>	LINKSYS
<b>Model Number</b>	WAG325N-Annex A, WAG325N-Annex B
<b>Model Discrepancy</b>	WAG325N-Annex A for RJ11 version, WAG325N-Annex B for RJ45 version
<b>Power Supply</b>	Adapter 1: Trade Name / Model: I.T.E. / MU12-2120100-A1 I/P: 100-240V, 50/60Hz, 0.5A O/P: 12V, 1.0A Adapter 2: Trade Name / Model: LINKSYS / LS120V10AE I/P: 100-240V, 50/60Hz, 0.5A O/P: 12V, 1.0A Adapter 3: Trade Name / Model: LINKSYS / DSA-12W-10 FEU 12012 I/P: 100-240V, 50/60Hz, 0.3A O/P: 12V, 1.0A
<b>Frequency Range</b>	2412 ~ 2462 MHz
<b>Transmit Power</b>	IEEE 802.11b mode: 18.25 dBm IEEE 802.11g mode: 17.63 dBm draft 802.11n Standard-20 MHz Channel mode: 17.61 dBm draft 802.11n Wide-40 MHz Channel mode: 15.16 dBm
<b>Modulation Technique</b>	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps) draft 802.11n Standard-20 MHz Channel mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33, 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) draft 802.11n Wide-40 MHz Channel mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)
<b>Number of Channels</b>	IEEE 802.11b/g mode: 11 Channels draft 802.11n Standard-20 MHz Channel mode: 11 Channels draft 802.11n Wide-40 MHz Channel mode: 7 Channels
<b>Antenna Specification</b>	Dipole Antenna / Gain: 0.9dBi (including cable loss) PCB Antenna / Gain: 0.95dBi (including cable loss) Antenna Calculation for CDD Mode: 0.9dBi (including cable loss)+ 10 log (2) = 3.91 dBi (Numeric gain: 2.46) 0.95dBi (including cable loss) + 10 log (2) = 3.96 dBi (Numeric gain: 2.49)

### Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **Q87-WAG325N** 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 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 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 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.



### 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 comes with two models (WAG325N-Annex A for RJ11 version, WAG325N-Annex B for RJ45 version) and three different adapters (MU12-2120100-A1 & LS120V10AE & DSA-12W-10 FEU 12012) for sale. After the preliminary test, the EUT with model number WAG325N-Annex A and adapter with model number LS120V10AE was found to emit the worst emissions and therefore had been tested under operating condition.

The EUT is a 2x3 configuration spatial MIMO (2Tx & 3Rx) without beam forming function but with cyclic delay diversity function that operate in double TX chains and triple RX chains. The 2x3 configuration is implemented with two outside TX & RX chains (Chain 0 and 2) and the middle RX chain (chain 1).

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

The worst case data rate is determined as the data rate with highest output power.

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

#### **IEEE802.11b mode:**

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate and cyclic delay diversity were chosen for full testing.

#### **IEEE802.11g mode:**

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate and cyclic delay diversity were chosen for full testing.

#### **draft 802.11n Standard-20 MHz Channel mode:**

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.

#### **draft 802.11n Wide-40 MHz Channel mode:**

Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with 13.5Mbps data rate were chosen for full testing.



## 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	01/18/2007

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	07/25/2007
Test Receiver	Rohde&Schwarz	ESCI	100064	11/05/2006
Switch Controller	TRC	Switch Controller	SC94050010	05/05/2007
4 Port Switch	TRC	4 Port Switch	SC94050020	05/05/2007
Horn-Antenna	TRC	HA-0502	06	06/02/2007
Horn-Antenna	TRC	HA-0801	04	05/05/2007
Horn-Antenna	TRC	HA-1201A	01	07/04/2007
Horn-Antenna	TRC	HA-1301A	01	07/04/2007
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/09/2007
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: 965860 IC: IC 6106	09/26/2008
Test S/W	LABVIEW (V 6.1)			

*Remark: The measurement uncertainty is less than +/-2.0065dB (30MHz ~ 1GHz), +/-3.0958dB (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER 9kHz-30MHz	ROHDE & SCHWARZ	ESHS30	828144/003	09/26/2007
TWO-LINE V-NETWORK 9kHz-30MHz	SCHAFFNER	NNB41	03/10013	06/14/2007
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	03/20/2007
Test S/W	LABVIEW (V 6.1)			

*Remark: The measurement uncertainty is less than +/- 2.81dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*





## 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 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	A2LA	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/ EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	 0824-01
USA	FCC	3/10 meter Open Area Test Sites (93105, 90471) / 3M Semi Anechoic Chamber (965860) to perform FCC Part 15/18 measurements	 93105, 90471 965860
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	 R-393/1066/725/879 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	 ELA 124a ELA 124b ELA 124c
Taiwan	TAF	EN 300 328, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3	
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	 SL2-IS-E-0014 SL2-IN-E-0014 SL2-A1-E-0014 SL2-R1-E-0014 SL2-R2-E-0014 SL2-L1-E-0014
Canada	Industry Canada	3/10 meter Open Area Test Sites (IC 3991-3, IC 3991-4) / 3M Semi Anechoic Chamber (IC 6106) to perform RSS 212 Issue 1	 IC 3991-3 IC 3991-4 IC 6106

\* 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	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC (Remote)	Sony	VGN-S44TP	28198080 8100339	WLAN: ETC094LPD0155 Bluetooth: ETC094LPD0156	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	Notebook PC (Remote)	IBM	2672 (X31)	99PBTB	WLAN: ANO20030400LEG Bluetooth: ANO20020100MTN	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
3.	Wireless-N Notebook Adapter	LINKSYS	WPC300N	N/A	FCC DoC	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.

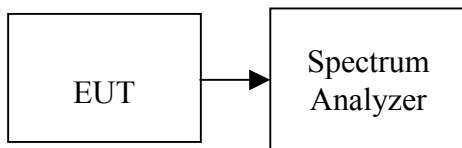
## 7. FCC PART 15.247 REQUIREMENTS

### 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 6dB 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 = 100 kHz, VBW = RBW, Span = 50 MHz, 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: IEEE 802.11b mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	12.00	>500	PASS
Mid	2437	10.17		PASS
High	2462	10.08		PASS

**Test mode: IEEE 802.11b mode / Chain 2**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.17	>500	PASS
Mid	2437	10.08		PASS
High	2462	10.00		PASS

**Test mode: IEEE 802.11g mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.42	>500	PASS
Mid	2437	16.00		PASS
High	2462	16.33		PASS

**Test mode: IEEE 802.11g mode / Chain 2**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.50	>500	PASS
Mid	2437	16.33		PASS
High	2462	16.50		PASS



**Test mode: draft 802.11n Standard-20 MHz Channel mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.58	>500	PASS
Mid	2437	17.42		PASS
High	2462	17.67		PASS

**Test mode: draft 802.11n Standard-20 MHz Channel mode / Chain 2**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.50	>500	PASS
Mid	2437	17.67		PASS
High	2462	17.50		PASS

**Test mode: draft 802.11n Wide-40 MHz Channel mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.42	>500	PASS
Mid	2437	36.08		PASS
High	2452	34.42		PASS

**Test mode: draft 802.11n Wide-40 MHz Channel mode / Chain 2**

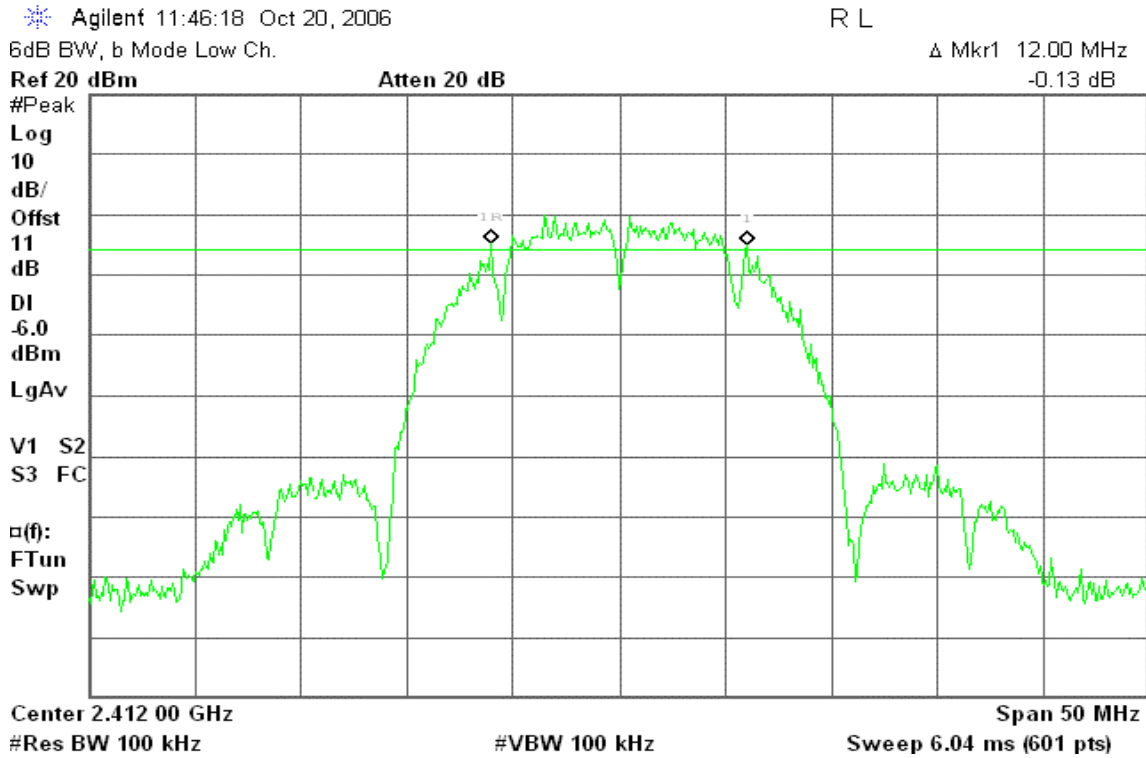
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.50	>500	PASS
Mid	2437	36.42		PASS
High	2452	36.50		PASS



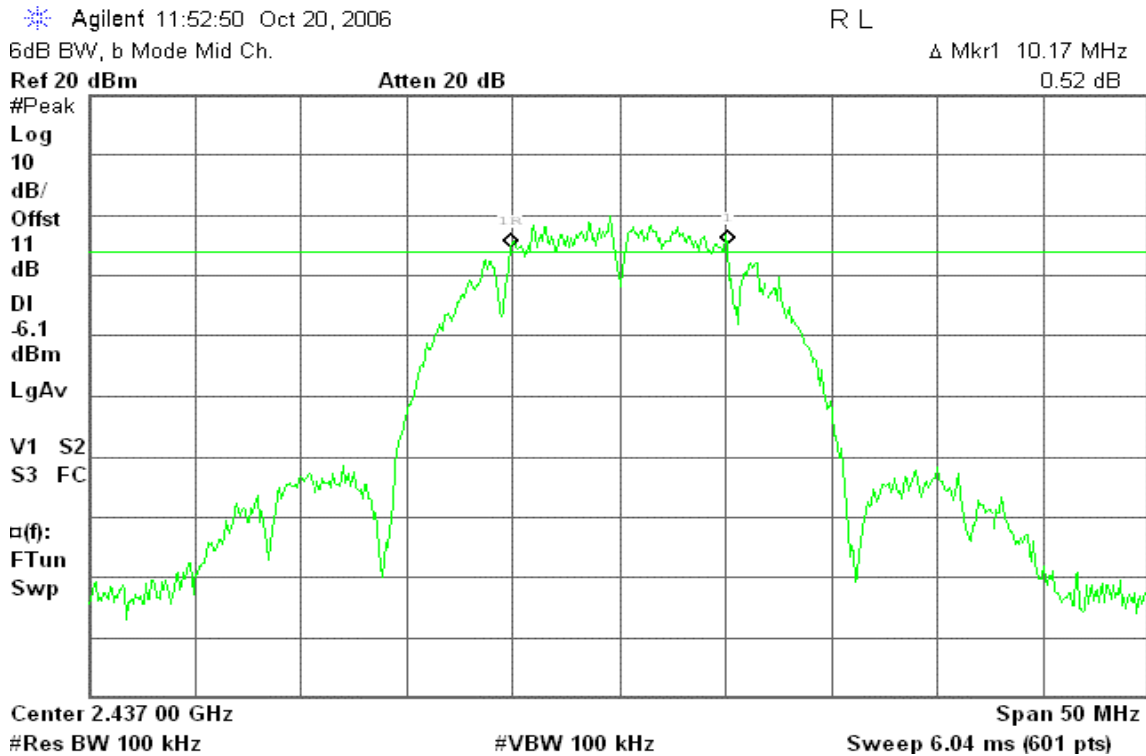
### Test Plot

### IEEE 802.11b mode / Chain 0

### 6dB Bandwidth (CH Low)



### 6dB Bandwidth (CH Mid)





### 6dB Bandwidth (CH High)

Agilent 11:58:05 Oct 20, 2006

R L

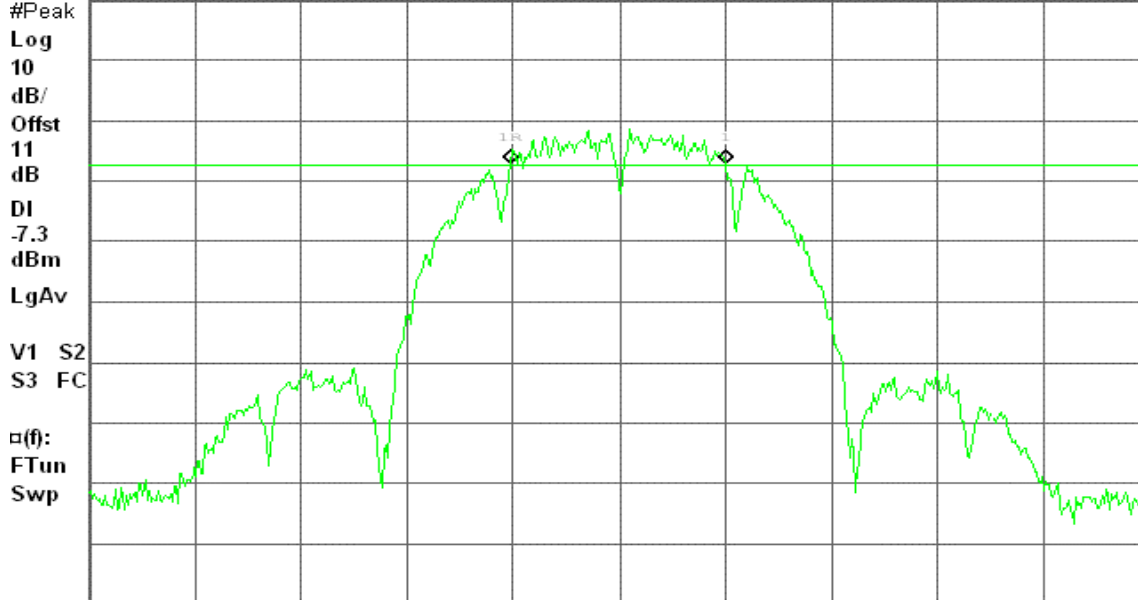
6dB BW, b Mode High Ch.

Δ Mkr1 10.08 MHz

Ref 20 dBm

Atten 20 dB

0.14 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### IEEE 802.11b mode / Chain 2

### 6dB Bandwidth (CH Low)

Agilent 13:03:40 Oct 20, 2006

R L

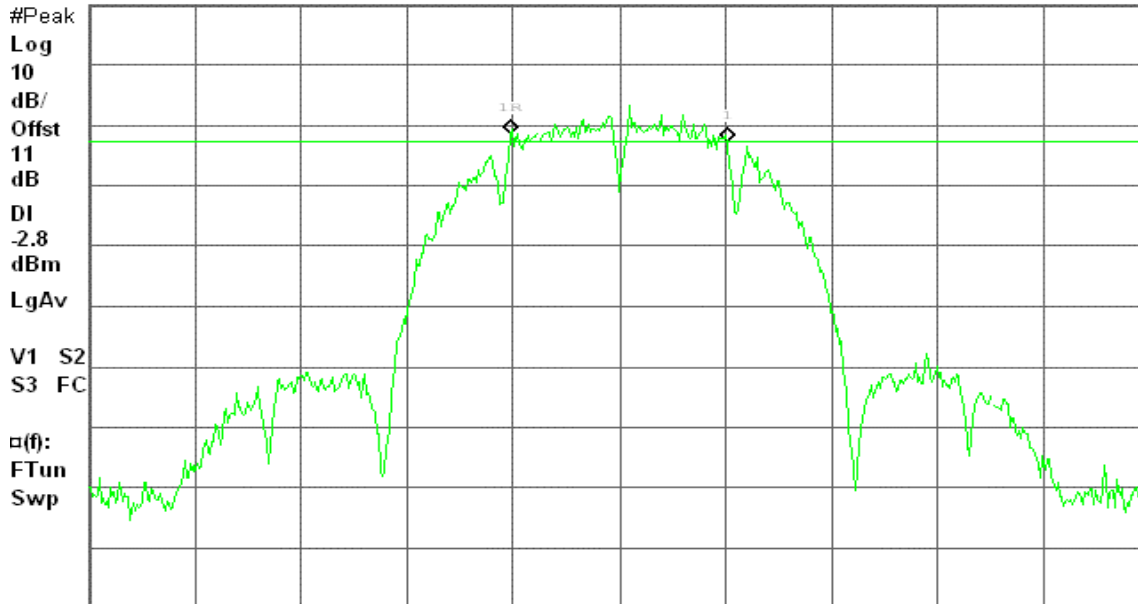
6dB BW, b Mode Low Ch.

Δ Mkr1 10.17 MHz

Ref 20 dBm

Atten 20 dB

-1.41 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)





### 6dB Bandwidth (CH Mid)

Agilent 13:13:53 Oct 20, 2006

R L

6dB BW, b Mode Mid Ch.

Δ Mkr1 10.08 MHz

Ref 20 dBm

Atten 20 dB

-0.01 dB

#Peak

Log

10

dB/

Offst

11

dB

DI

-2.7

dBm

LgAv

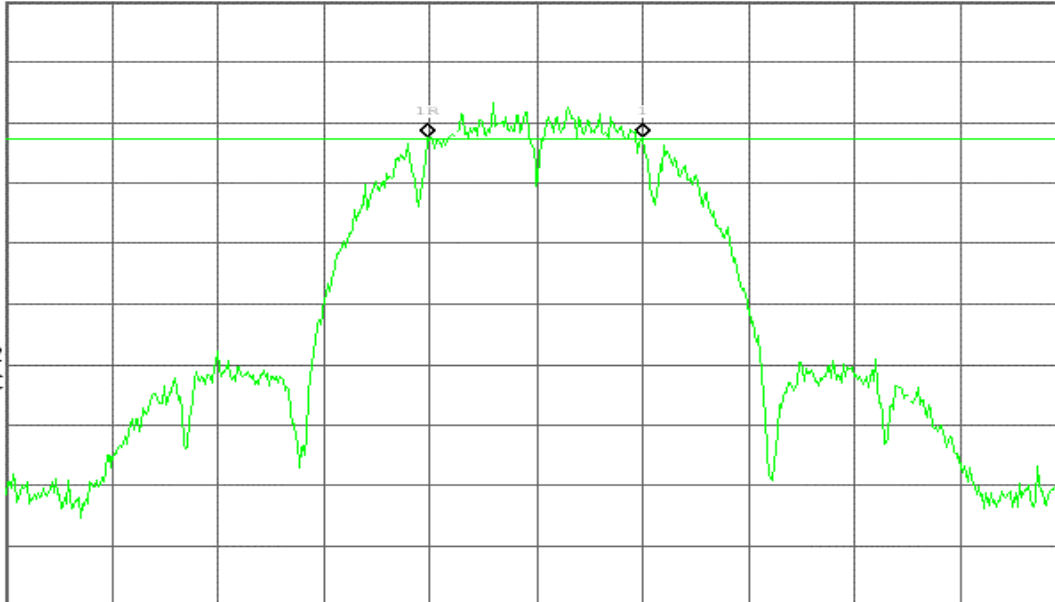
V1 S2

S3 FC

□(f):

FTun

Swp



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 13:20:16 Oct 20, 2006

R L

6dB BW, b Mode High Ch.

Δ Mkr1 10.00 MHz

Ref 20 dBm

Atten 20 dB

2.48 dB

#Peak

Log

10

dB/

Offst

11

dB

DI

-3.8

dBm

LgAv

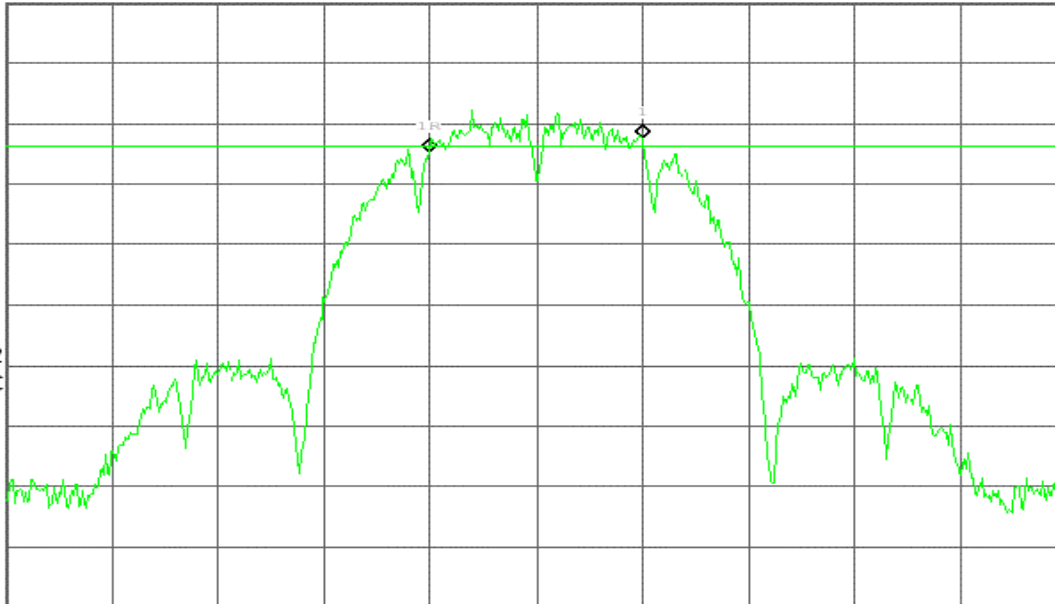
V1 S2

S3 FC

□(f):

FTun

Swp



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### IEEE 802.11g mode / Chain 0

#### 6dB Bandwidth (CH Low)

Agilent 11:28:07 Oct 20, 2006

R T

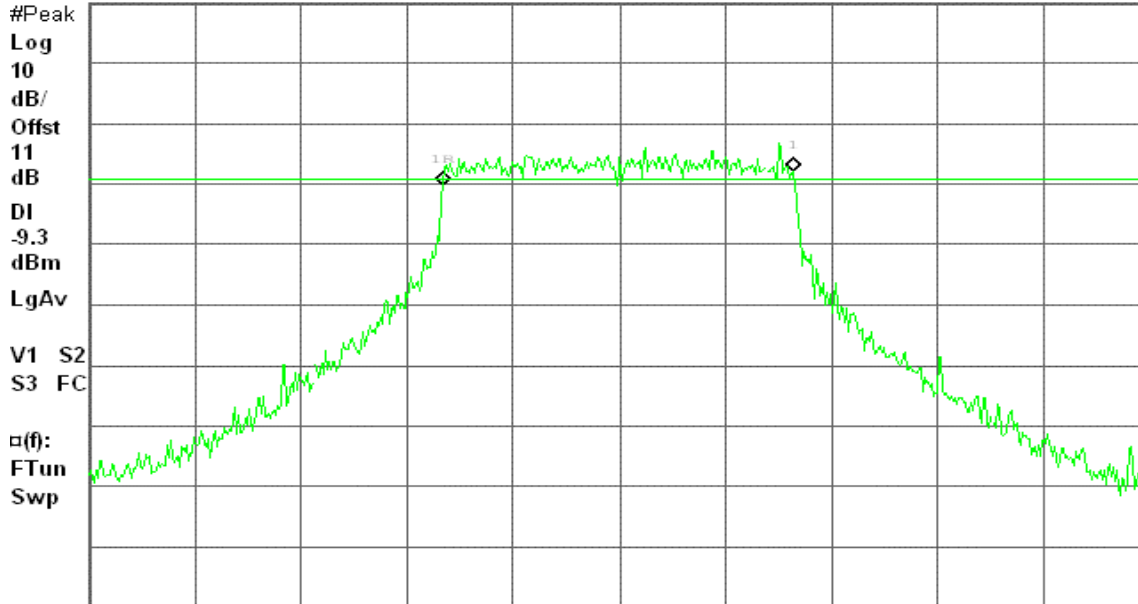
6dB BW, g Mode Low Ch.

Δ Mkr1 16.42 MHz

Ref 20 dBm

Atten 20 dB

2.30 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

#### 6dB Bandwidth (CH Mid)

Agilent 11:33:31 Oct 20, 2006

R L

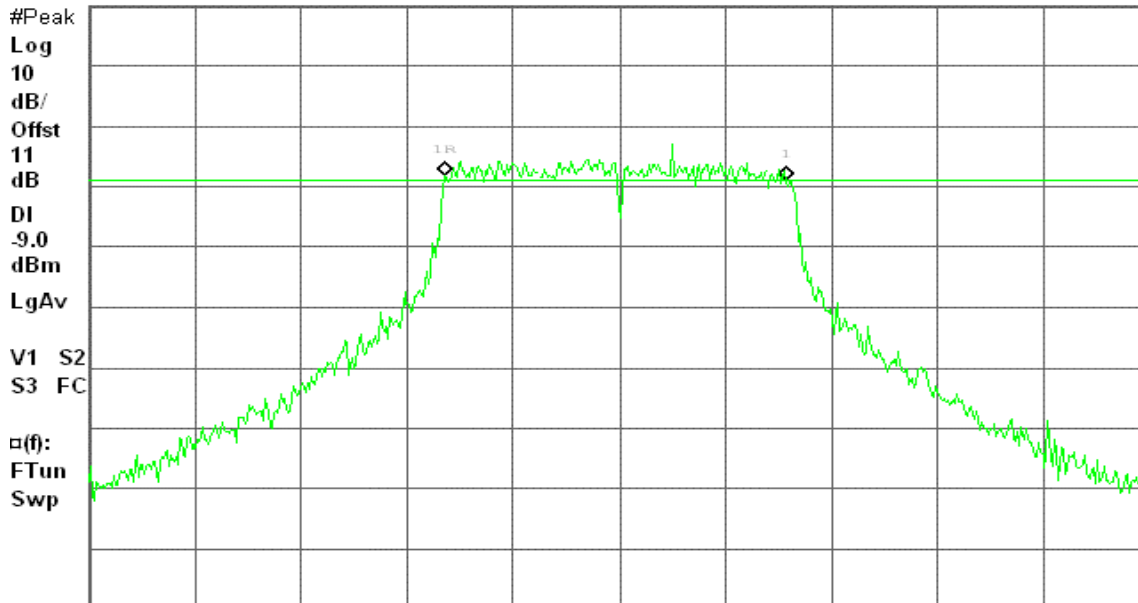
6dB BW, g Mode Mid Ch.

Δ Mkr1 16.00 MHz

Ref 20 dBm

Atten 20 dB

-0.56 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### 6dB Bandwidth (CH High)

Agilent 11:39:04 Oct 20, 2006

R L

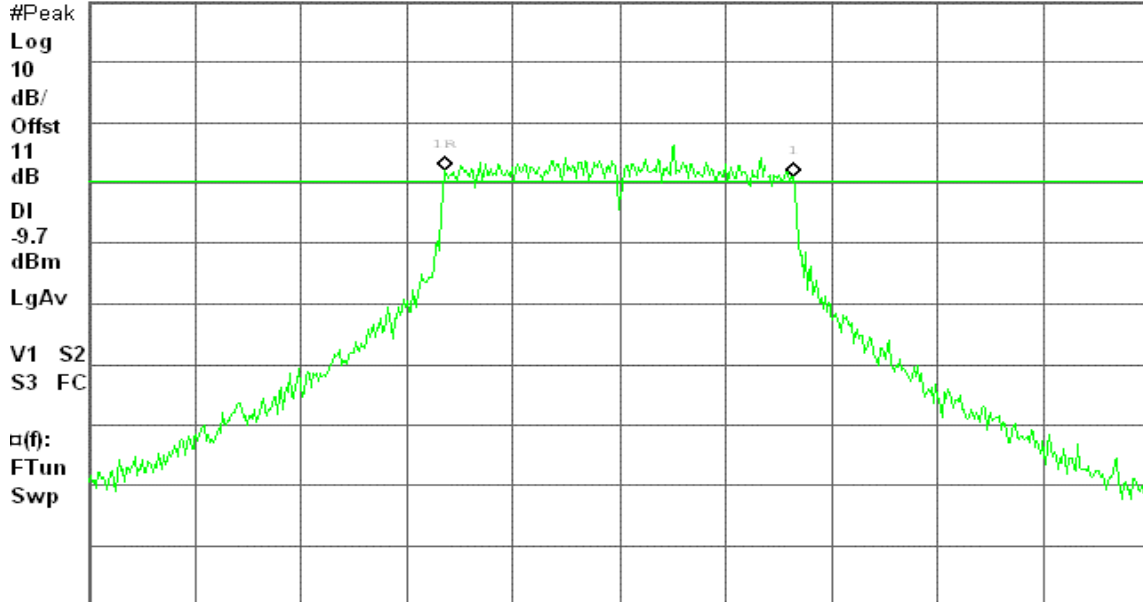
6dB BW, g Mode High Ch.

Δ Mkr1 16.33 MHz

Ref 20 dBm

Atten 20 dB

-0.89 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### IEEE 802.11g mode / Chain 2

#### 6dB Bandwidth (CH Low)

Agilent 10:58:57 Oct 20, 2006

R

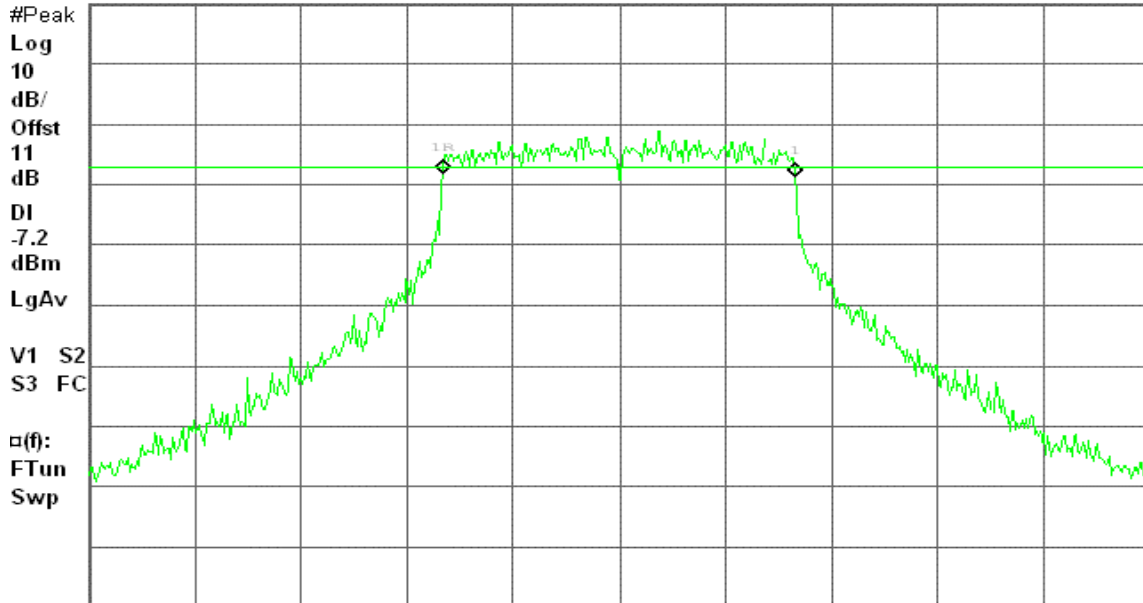
6dB BW, g Mode Low Ch.

Δ Mkr1 16.50 MHz

Ref 20 dBm

Atten 20 dB

-0.62 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### 6dB Bandwidth (CH Mid)

Agilent 11:09:06 Oct 20, 2006

R L

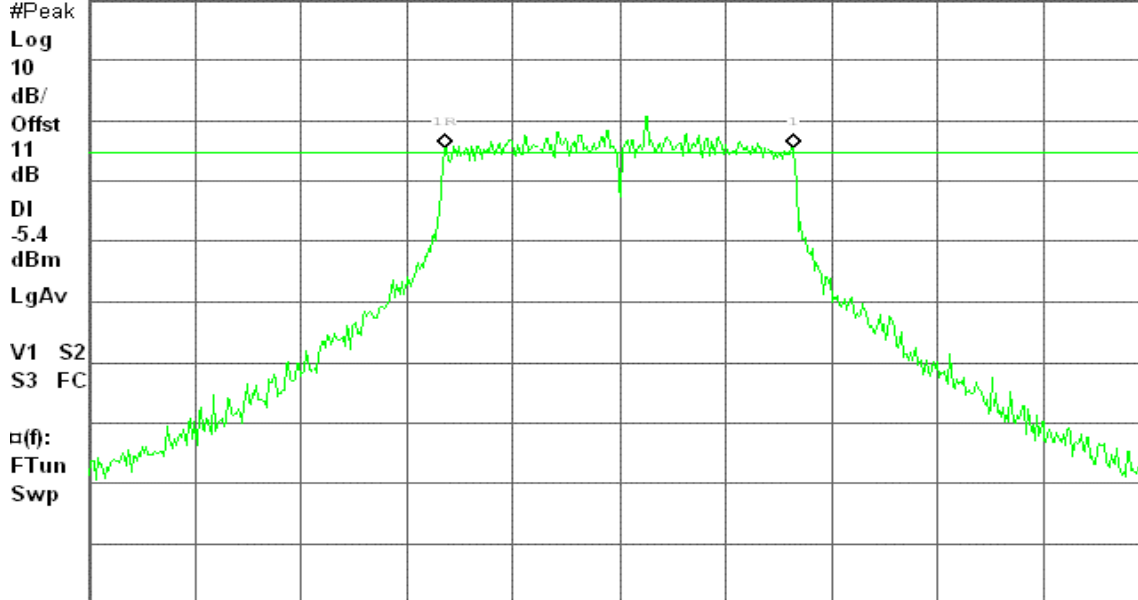
6dB BW, g Mode Mid Ch.

Δ Mkr1 16.33 MHz

Ref 20 dBm

Atten 20 dB

0.06 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 11:16:23 Oct 20, 2006

R L

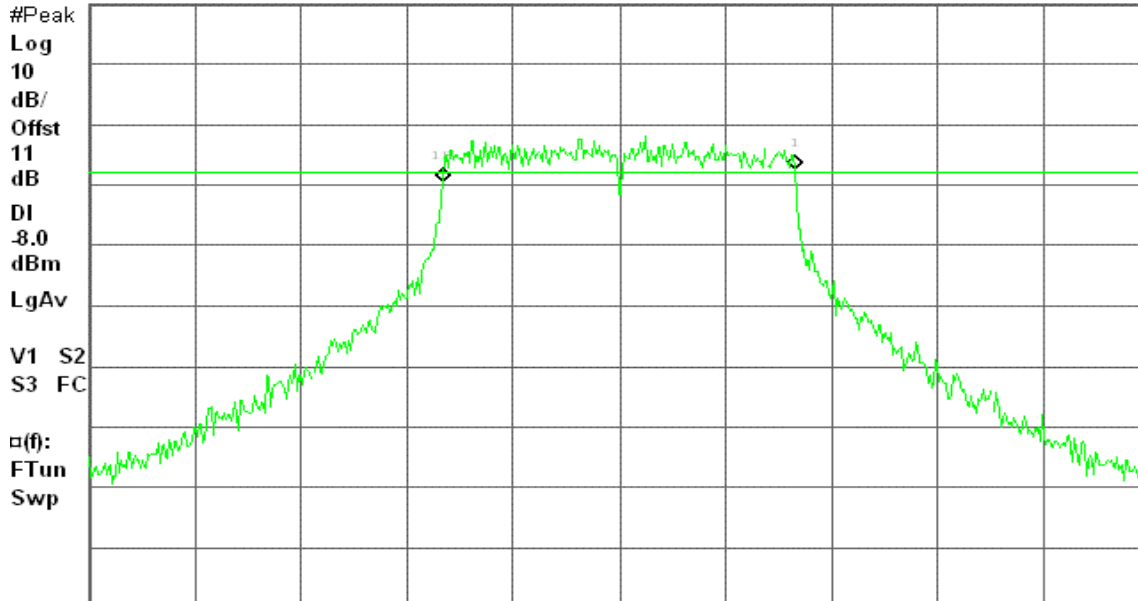
6dB BW, g Mode High Ch.

Δ Mkr1 16.50 MHz

Ref 20 dBm

Atten 20 dB

2.02 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

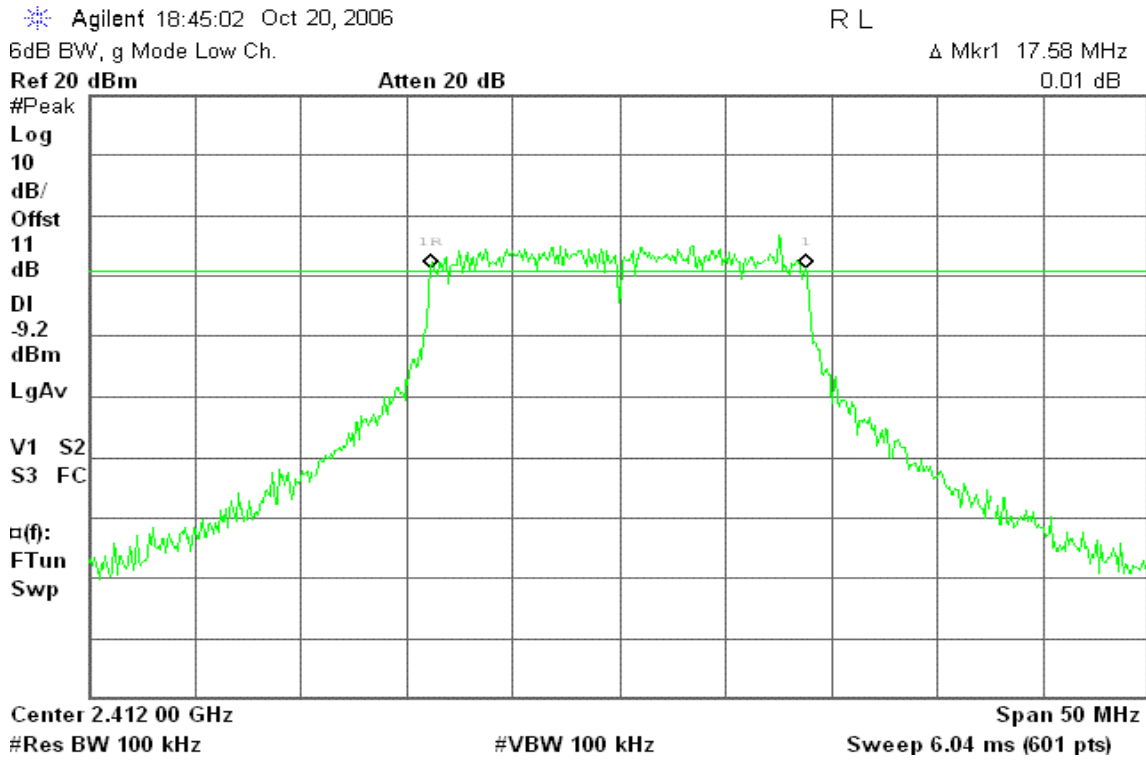
#VBW 100 kHz

Sweep 6.04 ms (601 pts)

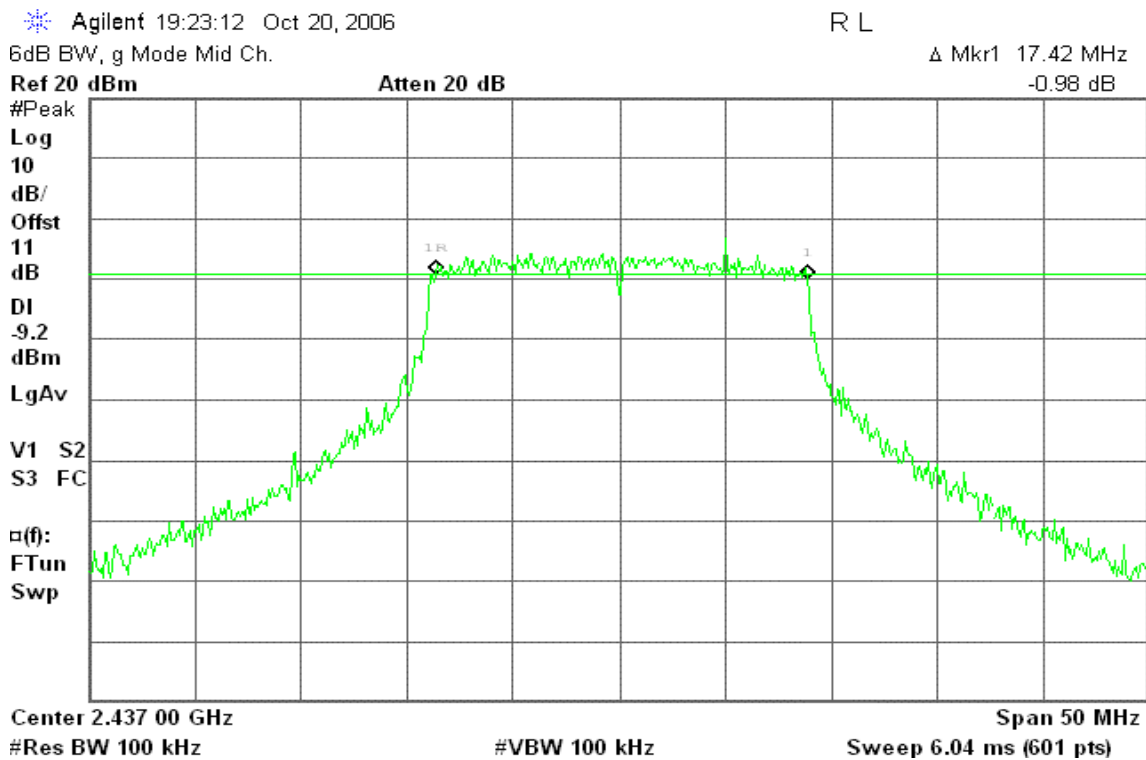


### draft 802.11n Standard-20 MHz Channel mode / Chain 0

#### 6dB Bandwidth (CH Low)



#### 6dB Bandwidth (CH Mid)





### 6dB Bandwidth (CH High)

Agilent 19:31:13 Oct 20, 2006

R L

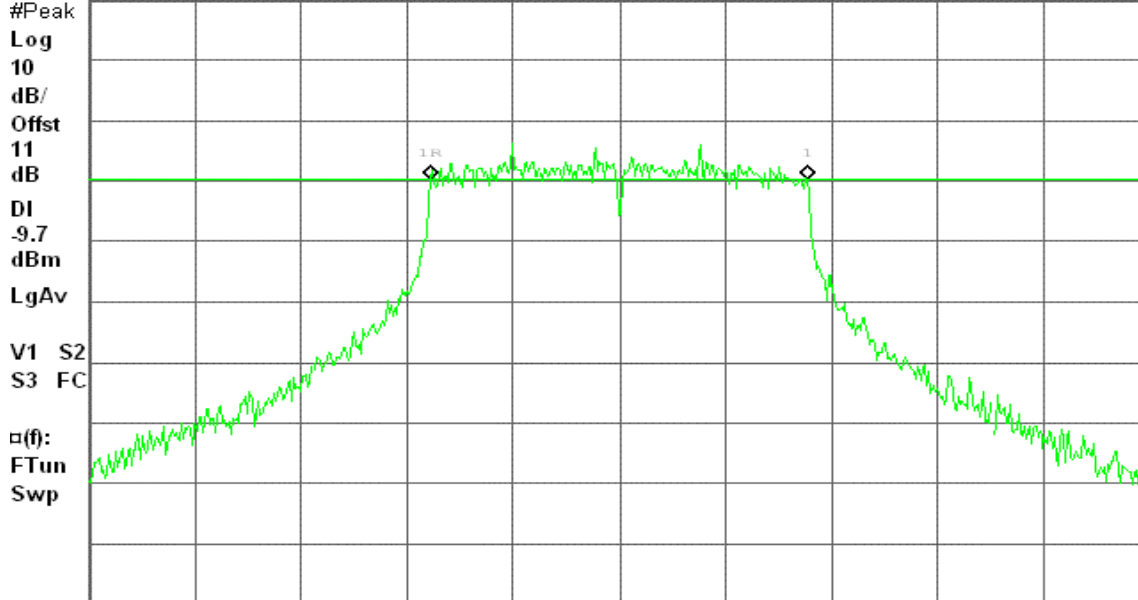
6dB BW, g Mode High Ch.

Δ Mkr1 17.67 MHz

Ref 20 dBm

Atten 20 dB

0.07 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### draft 802.11n Standard-20 MHz Channel mode / Chain 2

### 6dB Bandwidth (CH Low)

Agilent 18:26:46 Oct 20, 2006

R L

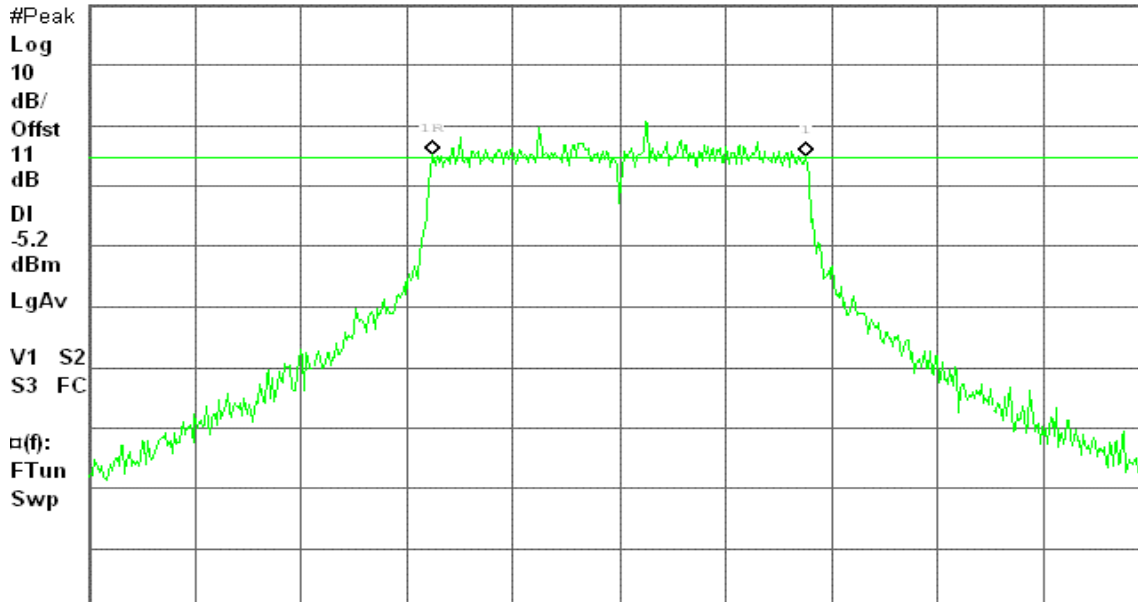
6dB BW, g Mode Low Ch.

Δ Mkr1 17.50 MHz

Ref 20 dBm

Atten 20 dB

-0.34 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### 6dB Bandwidth (CH Mid)

Agilent 18:33:00 Oct 20, 2006

R L

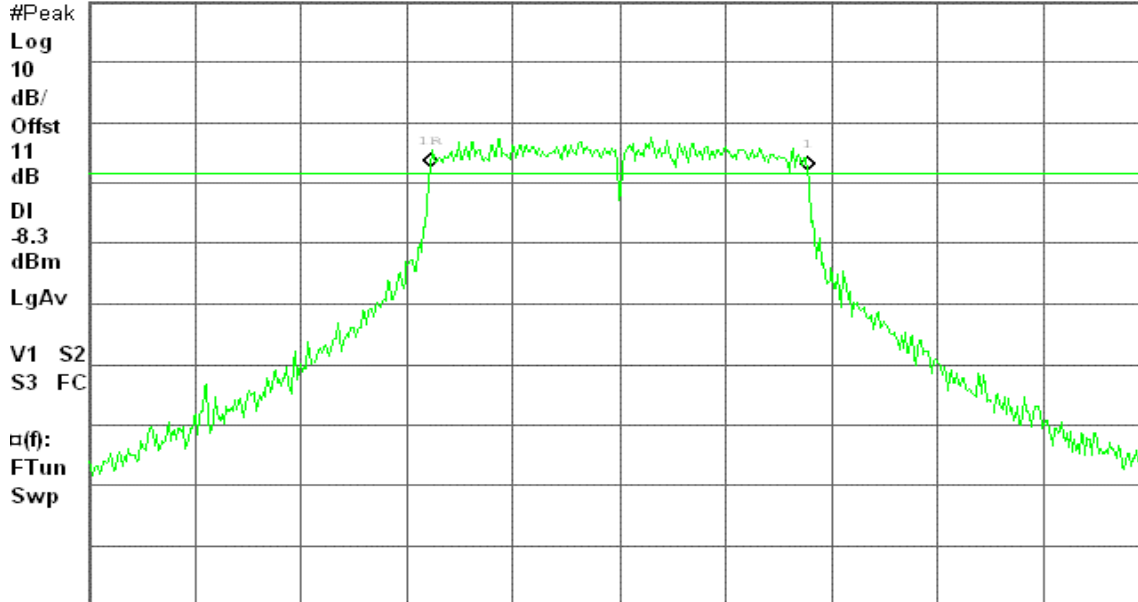
6dB BW, g Mode Mid Ch.

Δ Mkr1 17.67 MHz

Ref 20 dBm

Atten 20 dB

-0.34 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 18:38:53 Oct 20, 2006

R L

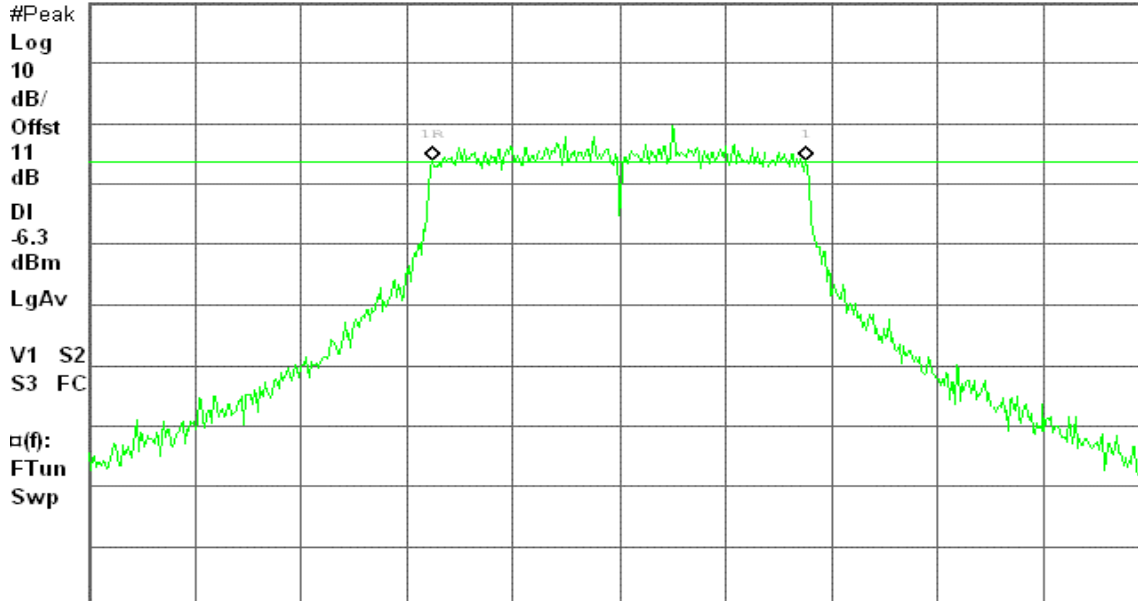
6dB BW, g Mode High Ch.

Δ Mkr1 17.50 MHz

Ref 20 dBm

Atten 20 dB

-0.05 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### draft 802.11n Wide-40 MHz Channel mode / Chain 0

#### 6dB Bandwidth (CH Low)

Agilent 19:39:12 Oct 20, 2006

R T

6dB BW, g Mode Low Ch.

Δ Mkr1 36.42 MHz

Ref 20 dBm

Atten 20 dB

1.77 dB

#Peak

Log

10

dB/

Offst

11

dB

D1

-14.8

dBm

LgAv

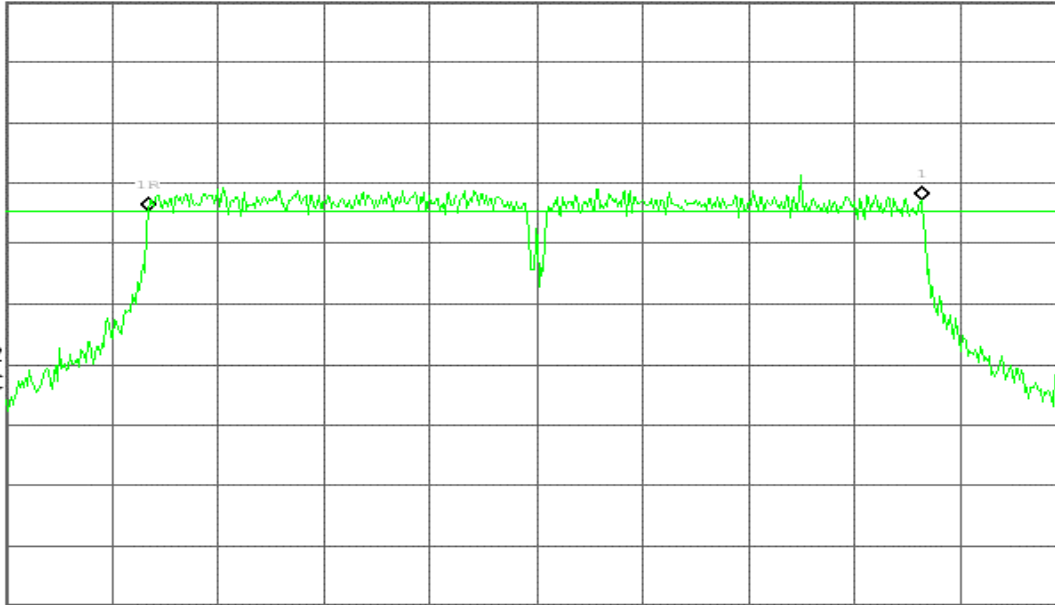
V1 S2

S3 FC

□(f):

FTun

Swp



Center 2.422 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

#### 6dB Bandwidth (CH Mid)

Agilent 19:45:41 Oct 20, 2006

R L

6dB BW, g Mode Mid Ch.

Δ Mkr1 36.08 MHz

Ref 20 dBm

Atten 20 dB

-0.62 dB

#Peak

Log

10

dB/

Offst

11

dB

D1

-14.2

dBm

LgAv

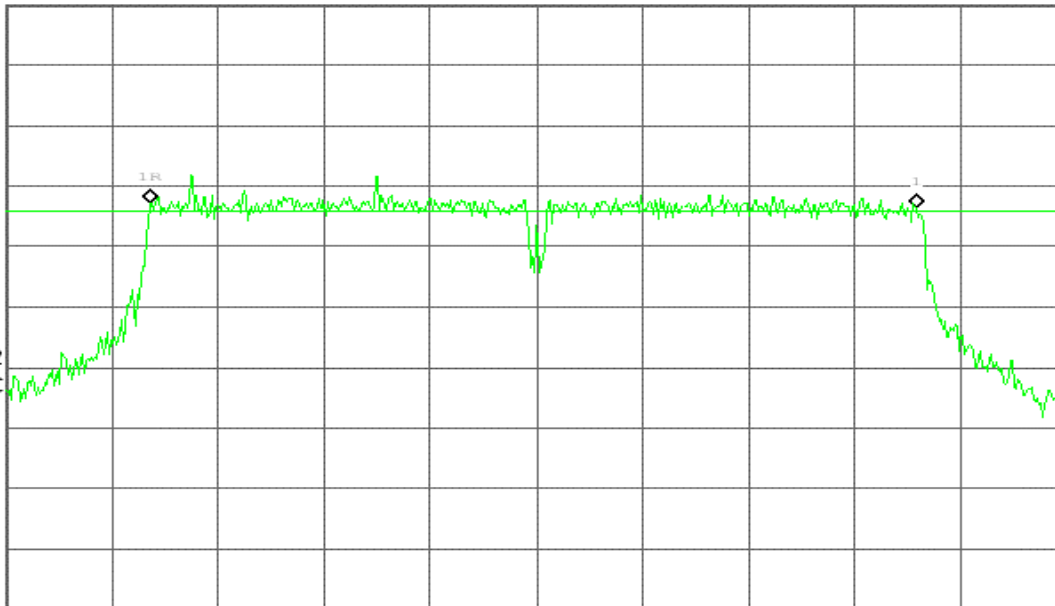
V1 S2

S3 FC

□(f):

FTun

Swp



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)





### 6dB Bandwidth (CH High)

Agilent 19:51:41 Oct 20, 2006

R L

6dB BW, g Mode High Ch.

$\Delta$  Mkr1 36.42 MHz

Ref 20 dBm

Atten 20 dB

0.29 dB

#Peak

Log

10

dB/

Offst

11

dB

DI

-15.1

dBm

LgAv

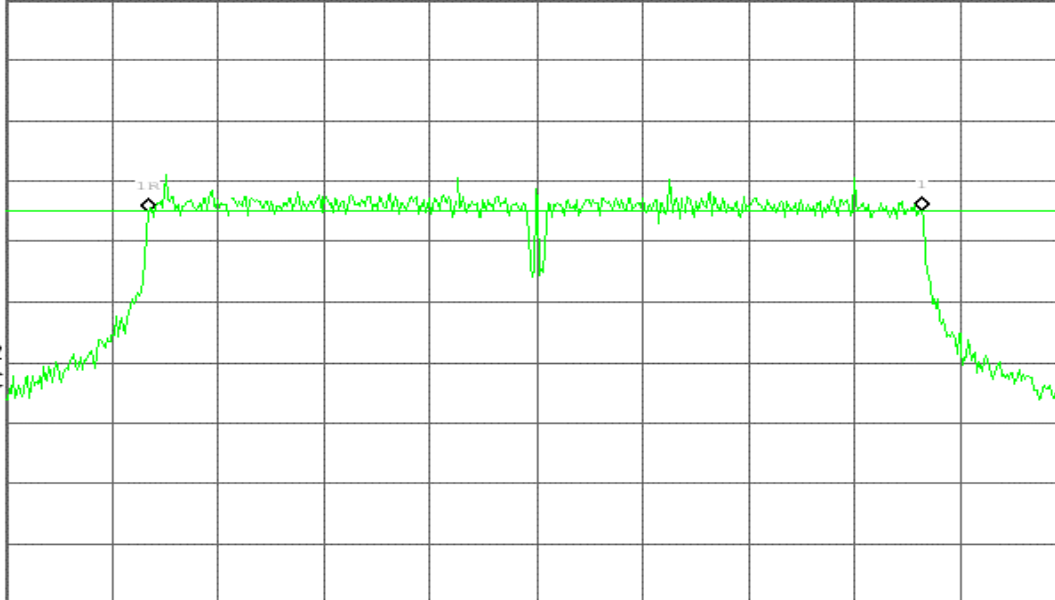
V1 S2

S3 FC

$\square(f)$ :

FTun

Swp



Center 2.452 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### draft 802.11n Wide-40 MHz Channel mode / Chain 2

### 6dB Bandwidth (CH Low)

Agilent 19:58:18 Oct 20, 2006

R T

6dB BW, g Mode Low Ch.

$\Delta$  Mkr1 36.50 MHz

Ref 20 dBm

Atten 20 dB

1.18 dB

#Peak

Log

10

dB/

Offst

11

dB

DI

-12.1

dBm

LgAv

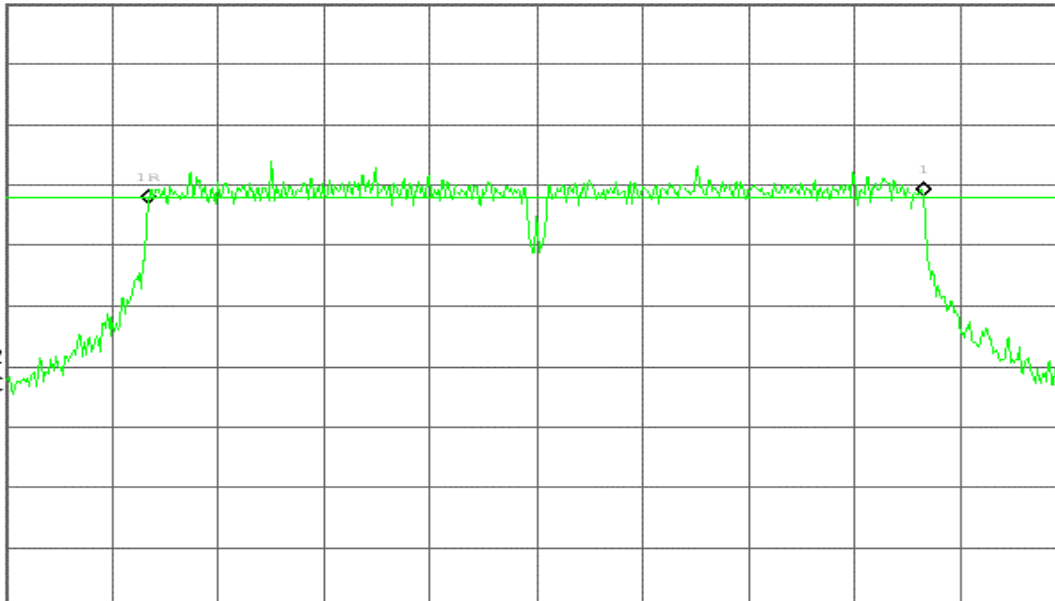
V1 S2

S3 FC

$\square(f)$ :

FTun

Swp



Center 2.422 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### 6dB Bandwidth (CH Mid)

Agilent 20:05:35 Oct 20, 2006

R L

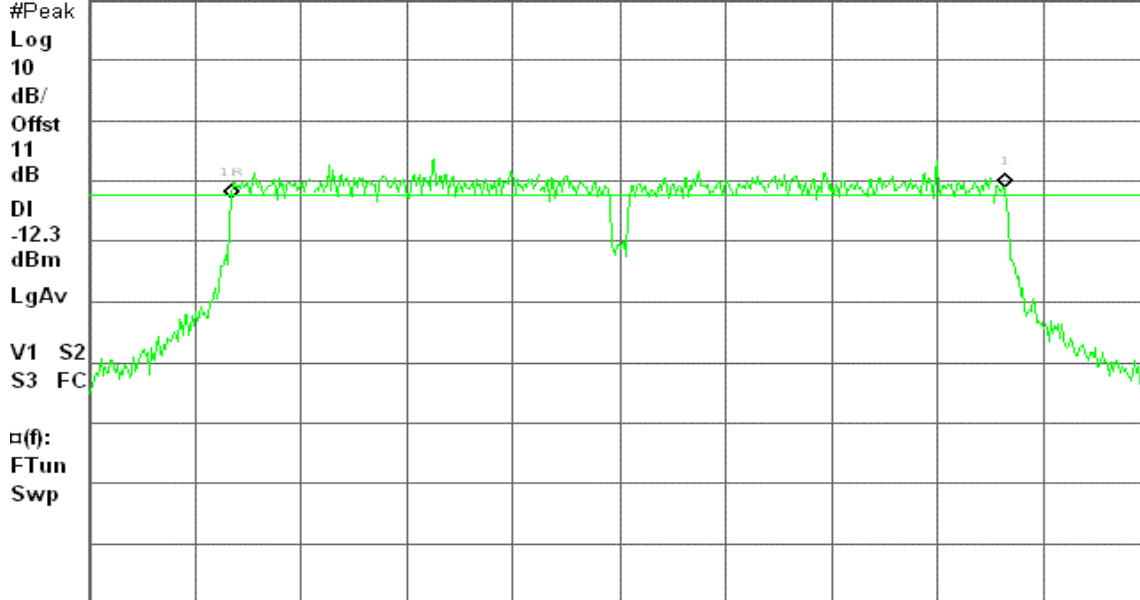
6dB BW, g Mode Mid Ch.

$\Delta$  Mkr1 36.42 MHz

Ref 20 dBm

Atten 20 dB

1.85 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 20:10:50 Oct 20, 2006

R L

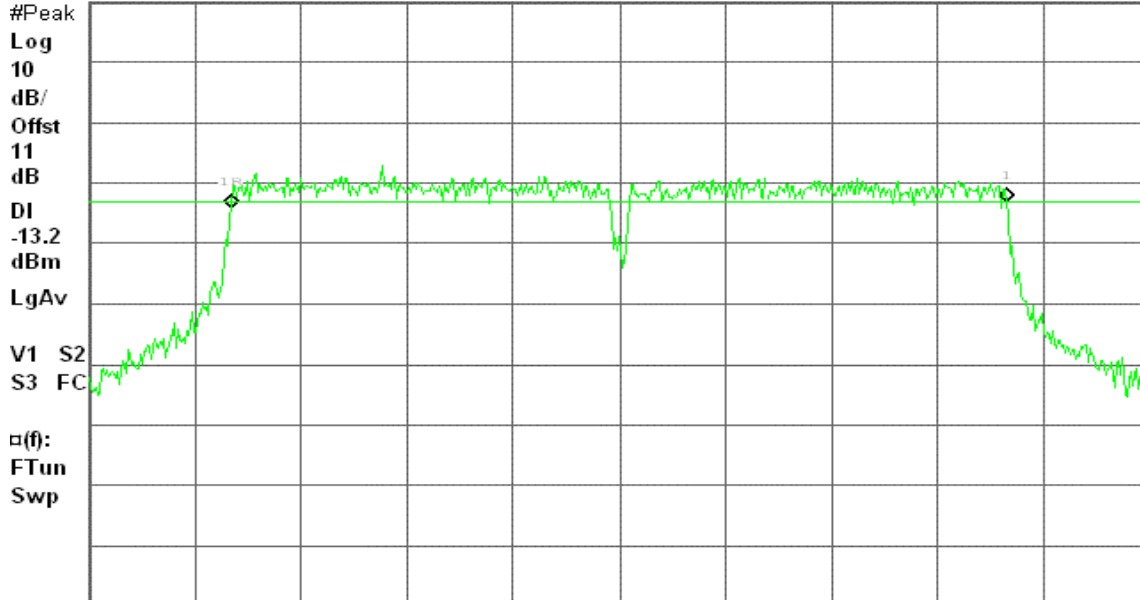
6dB BW, g Mode High Ch.

$\Delta$  Mkr1 36.50 MHz

Ref 20 dBm

Atten 20 dB

0.99 dB



Center 2.452 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

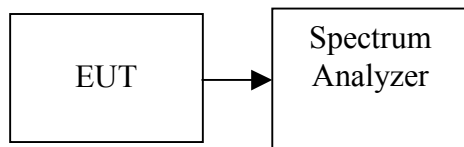
## 7.2 PEAK POWER

### 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. Place the EUT on the table and set it in 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 = 1 MHz, VBW  $\geq$  3 MHz. in “Channel Power ” measurement.
4. Record the max reading.
5. Repeat the above procedure until the measurements for all frequencies are completed.

**TEST RESULTS***No non-compliance noted***Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	13.77	15.67	17.83	0.0607	1.00	PASS
Mid	2437	13.19	16.63	18.25	0.0669		PASS
High	2462	12.83	15.72	17.52	0.0565		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	13.31	15.63	17.63	0.0580	1.00	PASS
Mid	2437	12.78	15.70	17.49	0.0561		PASS
High	2462	12.07	15.27	16.97	0.0498		PASS

**Test mode: draft 802.11n Standard-20 MHz Channel mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	13.41	15.53	17.61	0.0577	1.00	PASS
Mid	2437	12.71	15.47	17.32	0.0539		PASS
High	2462	12.25	15.13	16.93	0.0494		PASS

**Test mode: draft 802.11n Wide-40 MHz Channel mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	13.20	10.75	15.16	0.0328	1.00	PASS
Mid	2437	13.13	10.51	15.02	0.0318		PASS
High	2452	13.17	10.11	14.91	0.0310		PASS

**Remark:** Total Output Power (w) = Chain 0 (10<sup>^(Output Power /10)</sup>/1000)+ Chain 2 (10<sup>^(Output Power /10)</sup>/1000)



### Test Plot

### IEEE 802.11b mode / Chain 0

### Peak Power (CH Low)

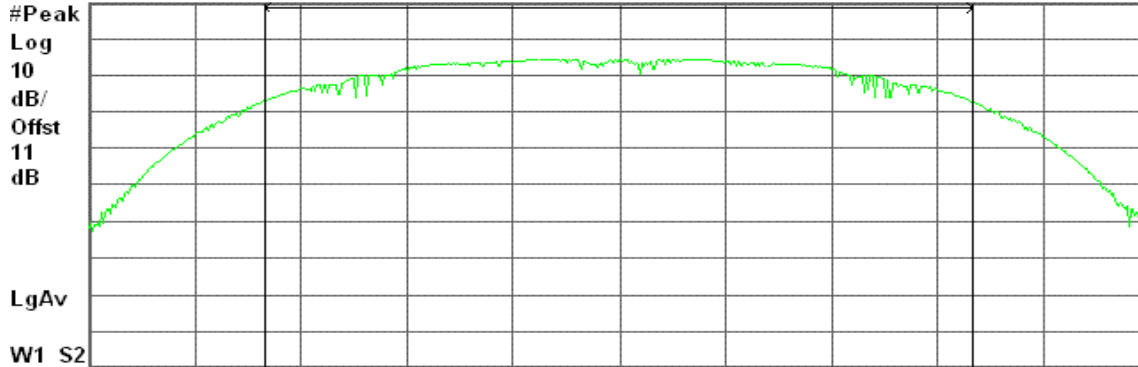
Agilent 16:47:32 Oct 20, 2006

R L

Peak Output Power (DTS), b Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 22.94 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.77 dBm / 15.2930 MHz

-58.08 dBm/Hz

### Peak Power (CH Mid)

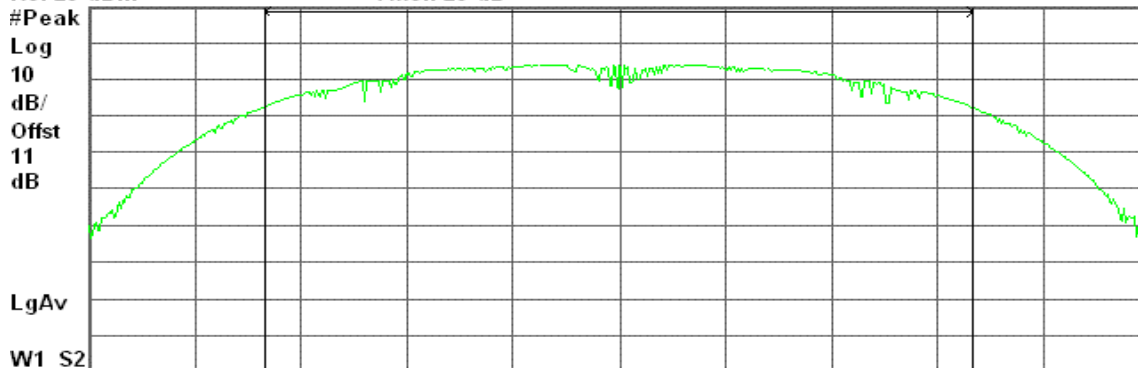
Agilent 16:53:48 Oct 20, 2006

R L

Peak Output Power (DTS), b Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 22.98 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.19 dBm / 15.3180 MHz

-58.67 dBm/Hz



### Peak Power (CH High)

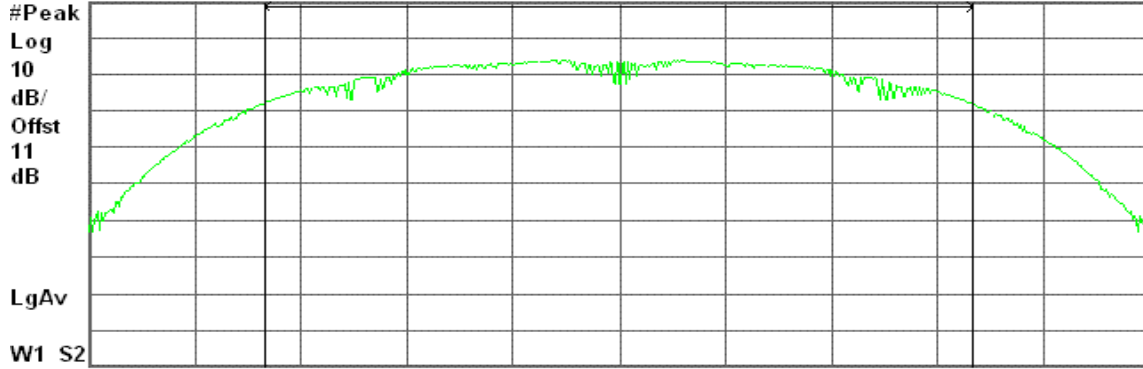
Agilent 16:58:58 Oct 20, 2006

R L

Peak Output Power (DTS), b Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 22.95 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.83 dBm / 15.3010 MHz

-59.02 dBm/Hz

### IEEE 802.11b mode / Chain 2

#### Peak Power (CH Low)

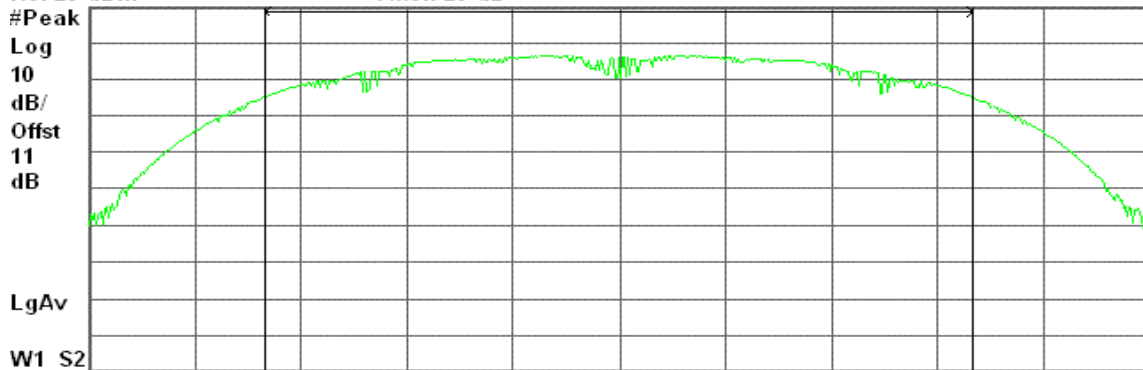
Agilent 13:04:25 Oct 20, 2006

R L

Peak Output Power (DTS), b Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 23.03 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.67 dBm / 15.3550 MHz

-56.19 dBm/Hz



### Peak Power (CH Mid)

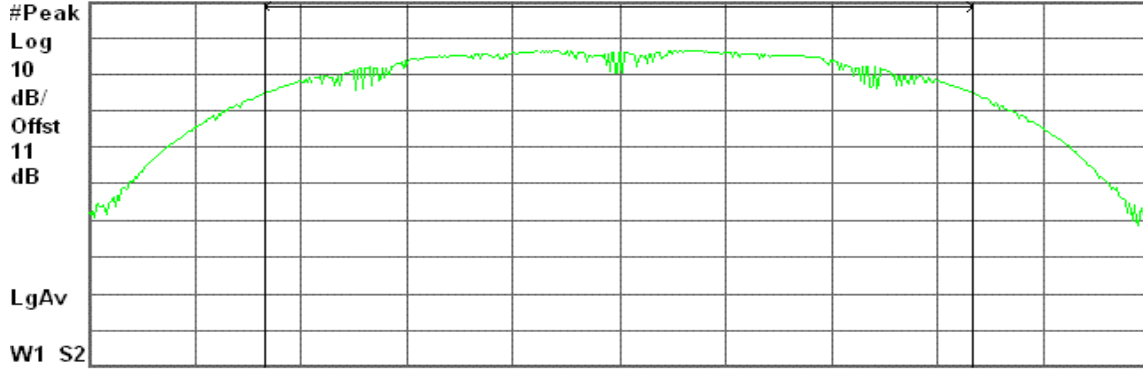
Agilent 13:15:23 Oct 20, 2006

R L

Peak Output Power (DTS), b Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 23.03 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.63 dBm / 15.3550 MHz

-56.23 dBm/Hz

### Peak Power (CH High)

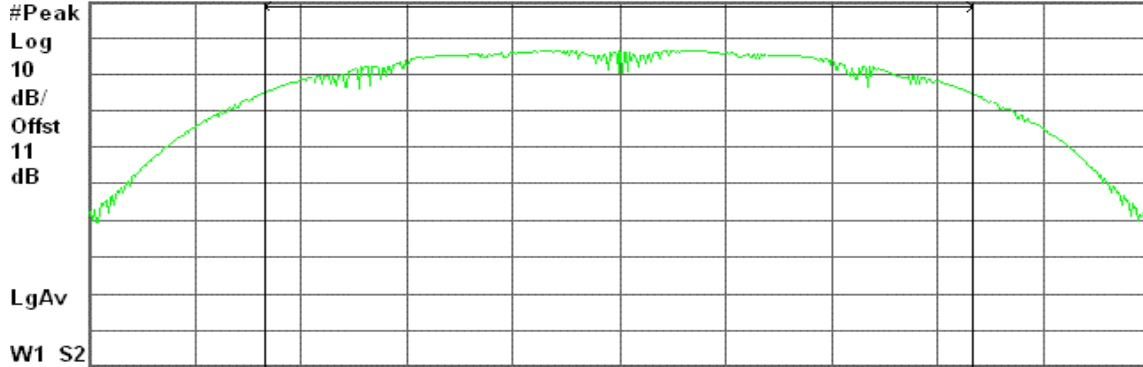
Agilent 13:21:09 Oct 20, 2006

R L

Peak Output Power (DTS), b Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 23.07 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.72 dBm / 15.3820 MHz

-56.15 dBm/Hz



### IEEE 802.11g mode / Chain 0

#### Peak Power (CH Low)

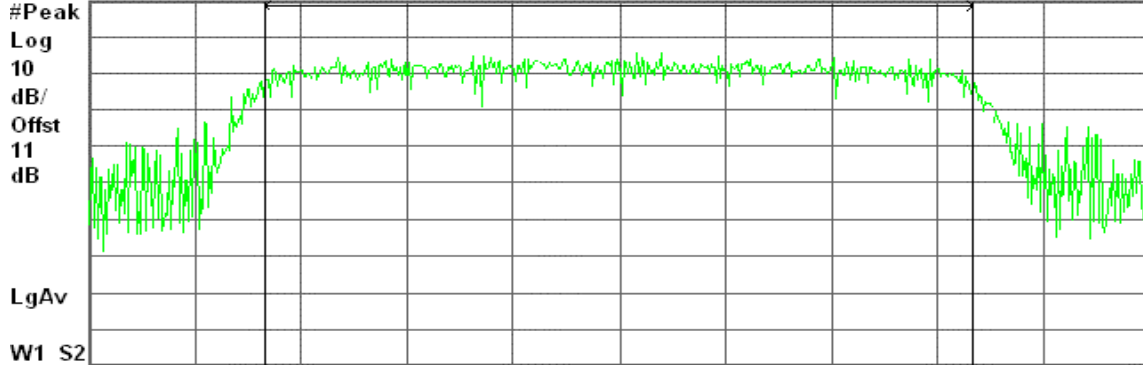
Agilent 11:29:03 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 24.93 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.31 dBm / 16.6230 MHz

-58.90 dBm/Hz

#### Peak Power (CH Mid)

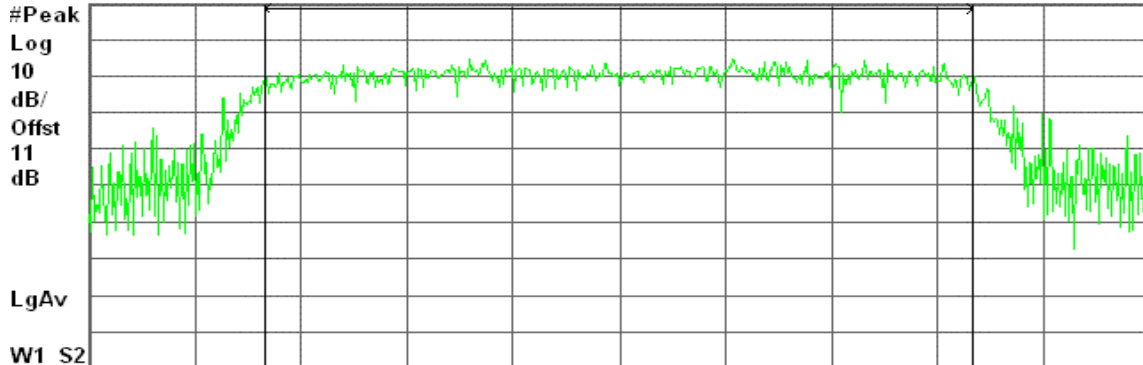
Agilent 11:34:38 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 24.9 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.78 dBm / 16.6010 MHz

-59.42 dBm/Hz





### Peak Power (CH High)

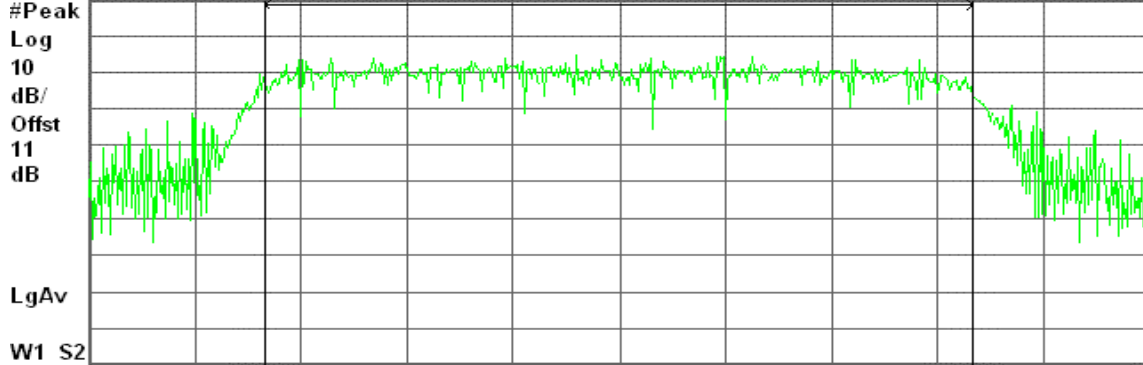
Agilent 11:40:34 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 24.9 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.07 dBm / 16.5970 MHz

-60.13 dBm/Hz

### IEEE 802.11g mode / Chain 2

#### Peak Power (CH Low)

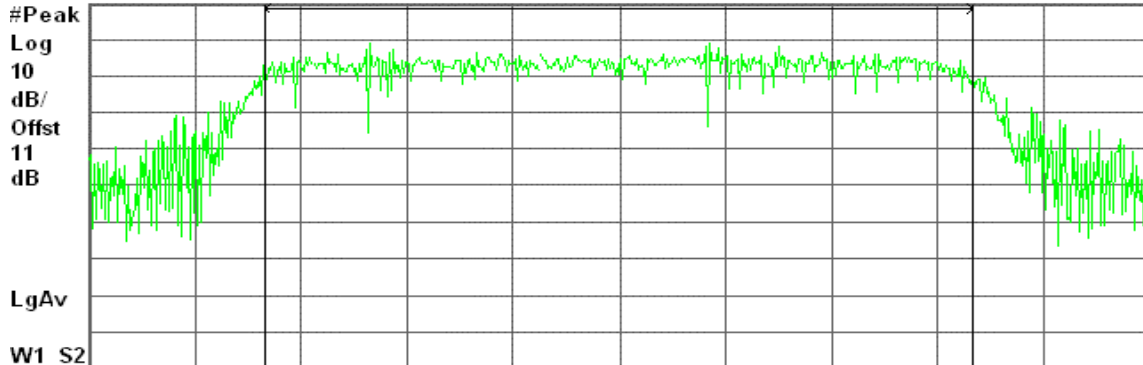
Agilent 11:03:26 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 24.9 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.63 dBm / 16.5980 MHz

-56.57 dBm/Hz



### Peak Power (CH Mid)

Agilent 11:09:55 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 24.84 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.70 dBm / 16.5610 MHz

-56.50 dBm/Hz

### Peak Power (CH High)

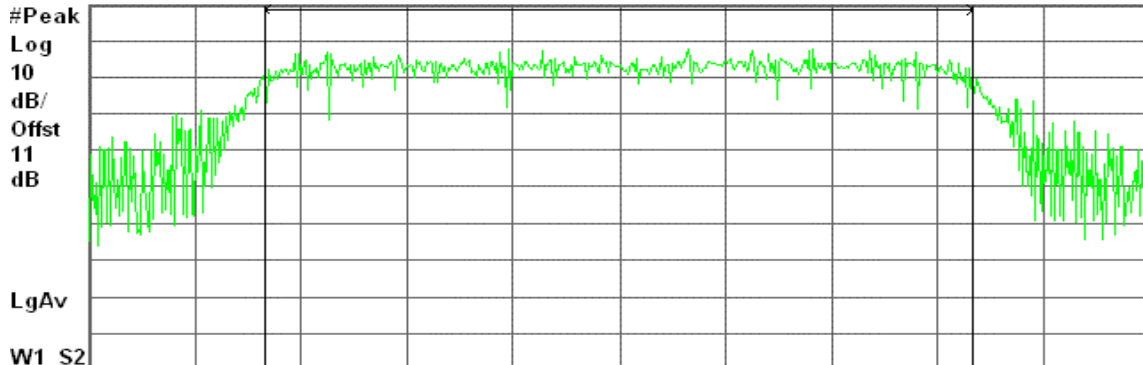
Agilent 11:17:15 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 24.88 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.27 dBm / 16.5850 MHz

-56.93 dBm/Hz



### draft 802.11n Standard-20 MHz Channel mode / Chain 0

#### Peak Power (CH Low)

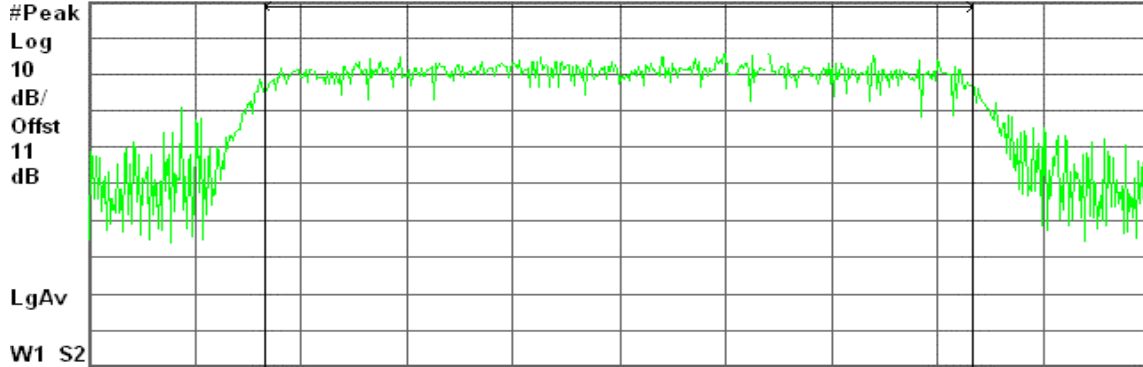
Agilent 18:46:31 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 26.75 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.41 dBm / 17.8340 MHz

-59.10 dBm/Hz

#### Peak Power (CH Mid)

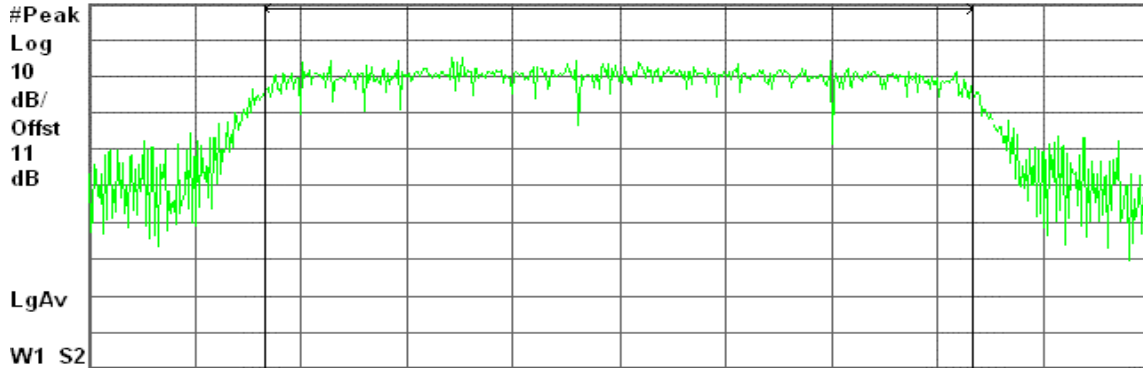
Agilent 19:24:07 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 26.76 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.71 dBm / 17.8430 MHz

-59.81 dBm/Hz



### Peak Power (CH High)

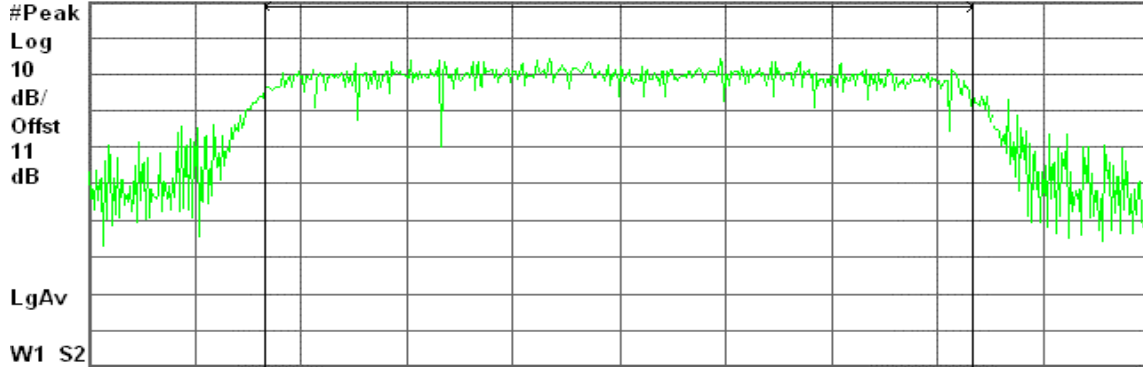
Agilent 19:33:14 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 26.74 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.25 dBm / 17.8250 MHz

-60.26 dBm/Hz

### draft 802.11n Standard-20 MHz Channel mode / Chain 2

### Peak Power (CH Low)

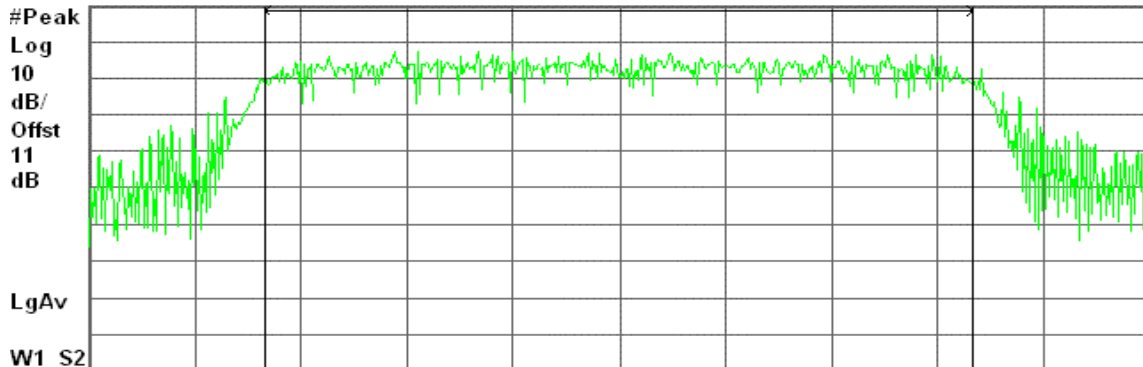
Agilent 18:27:53 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 26.71 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.53 dBm / 17.8080 MHz

-56.97 dBm/Hz



### Peak Power (CH Mid)

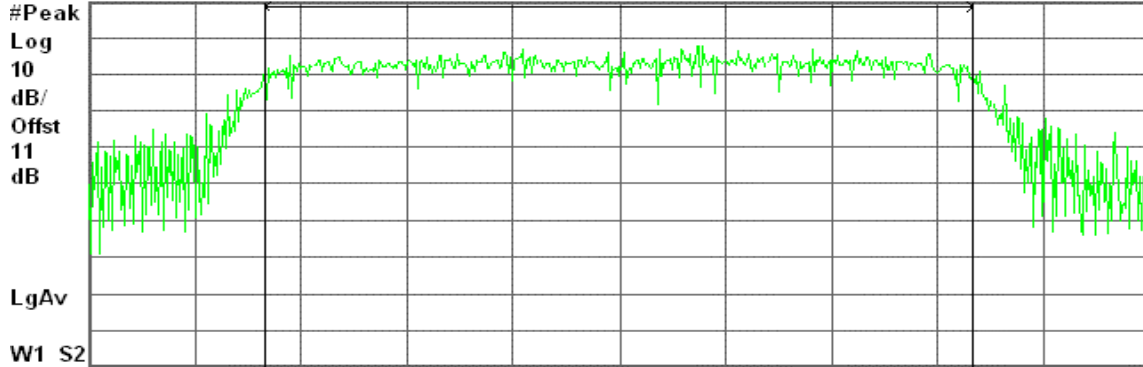
Agilent 18:33:58 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 26.7 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.47 dBm / 17.7990 MHz

-57.03 dBm/Hz

### Peak Power (CH High)

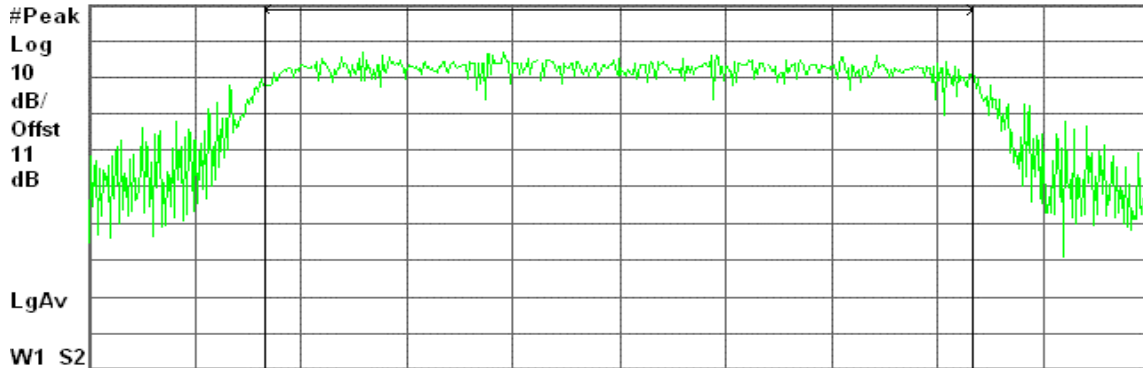
Agilent 18:39:46 Oct 20, 2006

R L

Peak Output Power (DTS), g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 26.7 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.13 dBm / 17.7970 MHz

-57.37 dBm/Hz

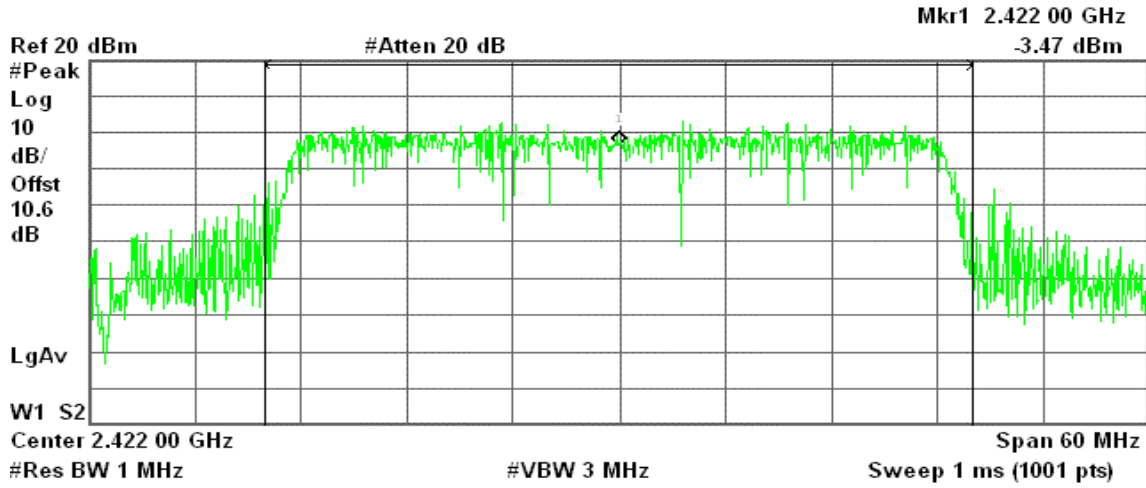


### draft 802.11n Wide-40 MHz Channel mode / Chain 0

#### Peak Power (CH Low)

Agilent 10:41:08 Oct 23, 2006

L



Channel Power

13.20 dBm / 40.0000 MHz

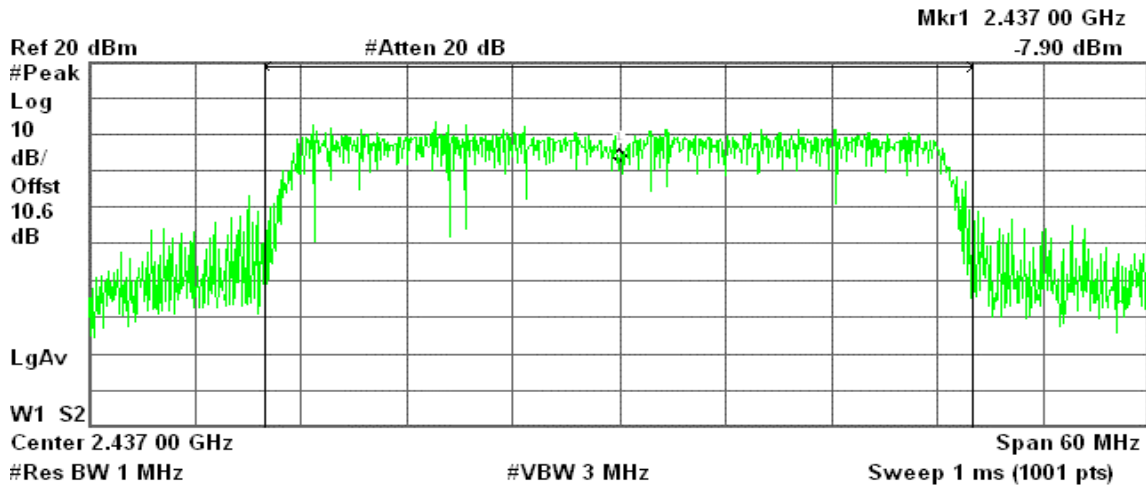
Power Spectral Density

-62.82 dBm/Hz

#### Peak Power (CH Mid)

Agilent 10:45:24 Oct 23, 2006

T



Channel Power

13.13 dBm / 40.0000 MHz

Power Spectral Density

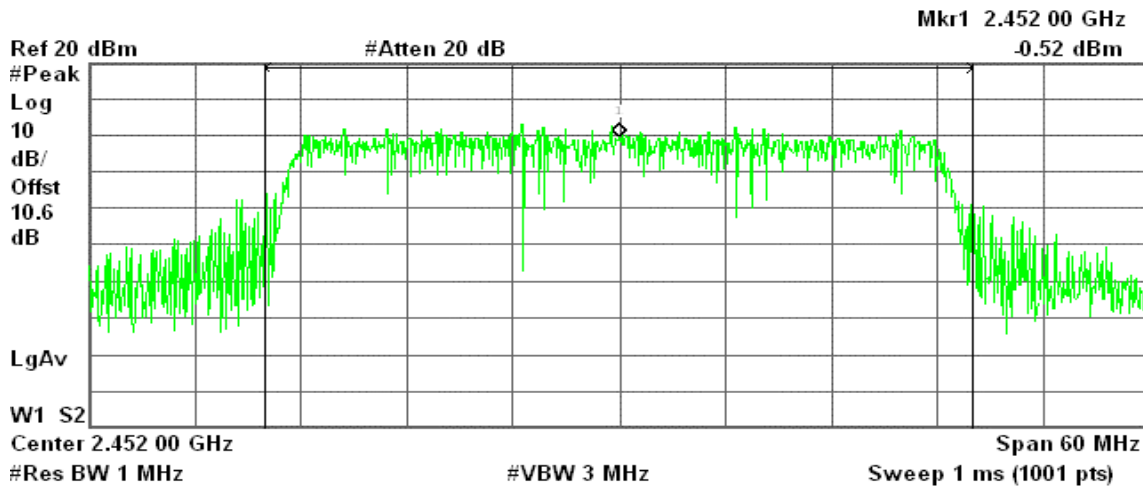
-62.89 dBm/Hz



### Peak Power (CH High)

Agilent 10:46:02 Oct 23, 2006

T



Channel Power

13.17 dBm / 40.0000 MHz

Power Spectral Density

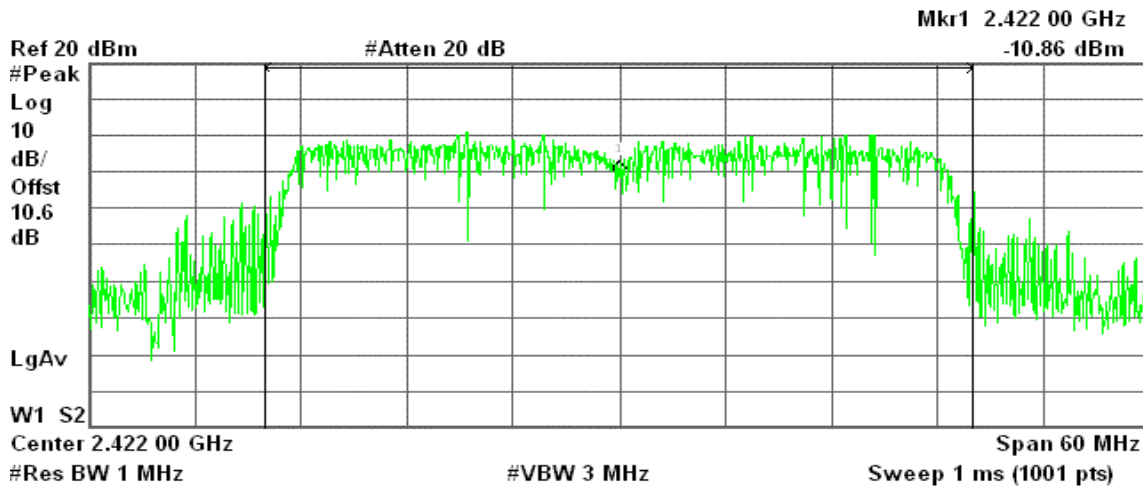
-62.85 dBm/Hz

### draft 802.11n Wide-40 MHz Channel mode / Chain 2

### Peak Power (CH Low)

Agilent 10:43:38 Oct 23, 2006

T



Channel Power

10.75 dBm / 40.0000 MHz

Power Spectral Density

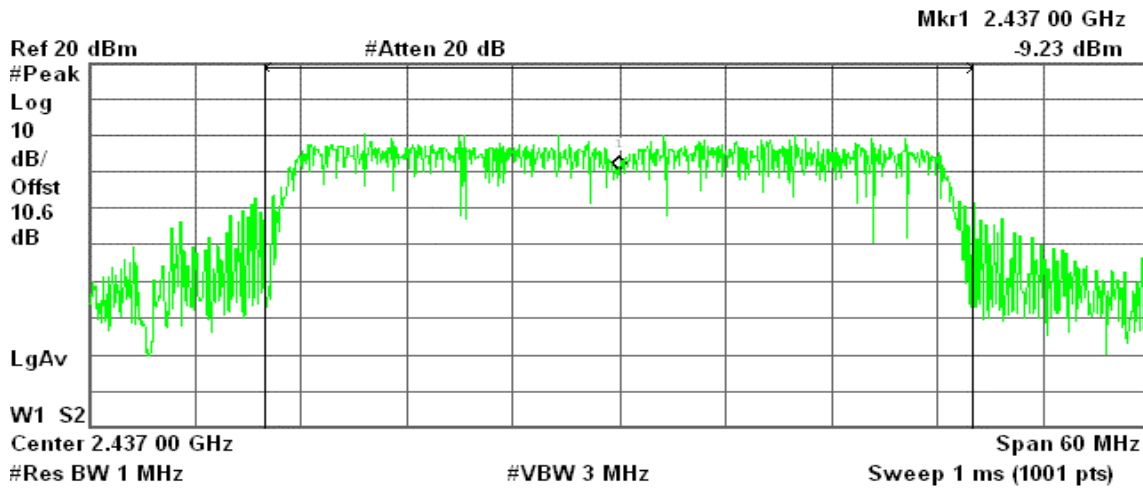
-65.27 dBm/Hz



### Peak Power (CH Mid)

Agilent 10:44:12 Oct 23, 2006

T



Channel Power

10.51 dBm / 40.0000 MHz

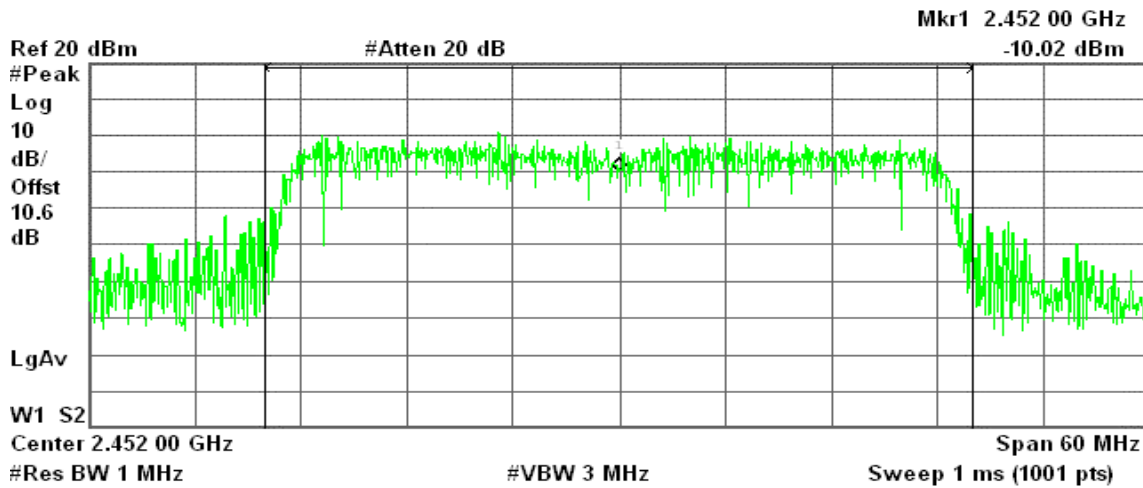
Power Spectral Density

-65.51 dBm/Hz

### Peak Power (CH High)

Agilent 10:47:13 Oct 23, 2006

T



Channel Power

10.11 dBm / 40.0000 MHz

Power Spectral Density

-65.91 dBm/Hz



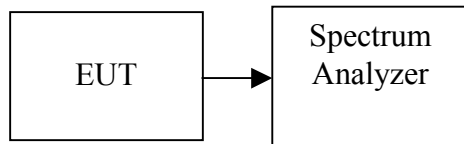


## 7.3 AVERAGE POWER

### 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: IEEE 802.11b mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	11.13	13.37	15.40	0.0347	1.00	PASS
Mid	2437	10.63	13.00	14.99	0.0315		PASS
High	2462	10.23	13.06	14.88	0.0308		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	10.03	11.99	14.13	0.0259	1.00	PASS
Mid	2437	9.53	12.23	14.10	0.0257		PASS
High	2462	8.25	11.63	13.27	0.0212		PASS

**Test mode: draft 802.11n Standard-20 MHz Channel mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	9.58	11.38	13.58	0.0228	1.00	PASS
Mid	2437	9.12	11.79	13.67	0.0233		PASS
High	2462	8.72	11.44	13.30	0.0214		PASS

**Test mode: draft 802.11n Wide-40 MHz Channel mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	6.89	9.29	11.26	0.0134	1.00	PASS
Mid	2437	6.18	9.63	11.25	0.0133		PASS
High	2452	5.99	9.25	10.93	0.0124		PASS



**Test Plot**

**IEEE 802.11b mode / Chain 0**

**Average Power (CH Low)**

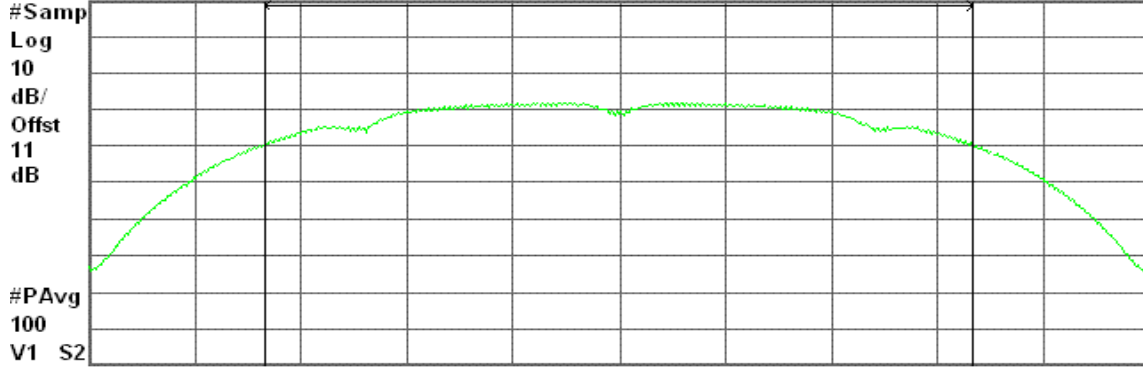
Agilent 11:48:03 Oct 20, 2006

R L

Peak Output Power (UNII), b Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.412 00 GHz

Span 22.94 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.13 dBm / 15.2930 MHz

-60.71 dBm/Hz

**Average Power (CH Mid)**

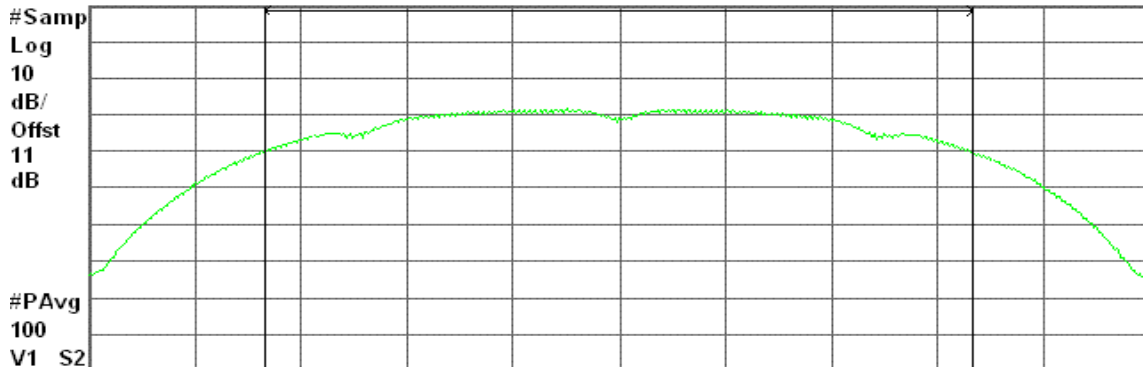
Agilent 11:54:17 Oct 20, 2006

R L

Peak Output Power (UNII), b Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 22.98 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

10.63 dBm / 15.3180 MHz

-61.22 dBm/Hz



### Average Power (CH High)

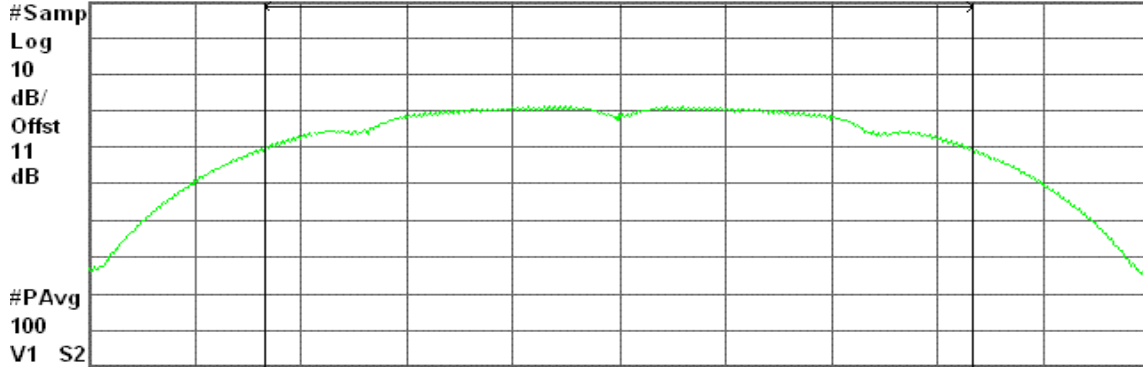
Agilent 11:59:22 Oct 20, 2006

R L

Peak Output Power (UNII), b Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 22.95 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

10.23 dBm / 15.3010 MHz

-61.62 dBm/Hz

### IEEE 802.11b mode / Chain 2

#### Average Power (CH Low)

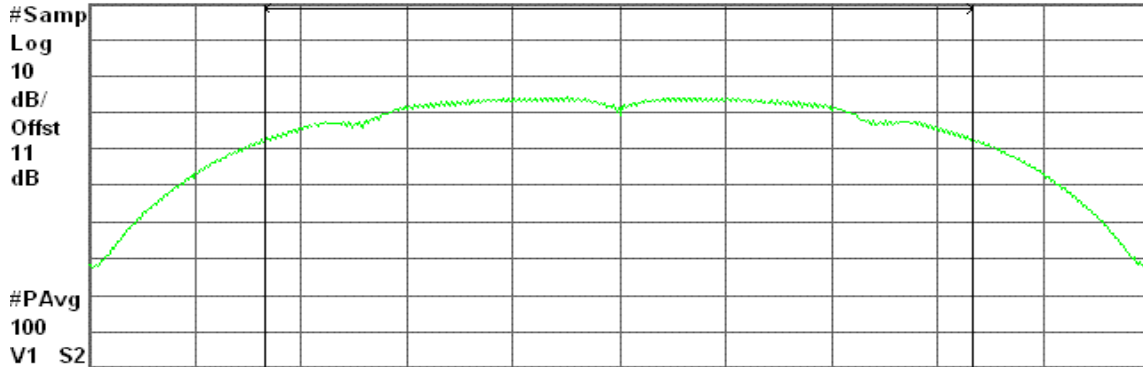
Agilent 13:04:48 Oct 20, 2006

R L

Peak Output Power (UNII), b Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.412 00 GHz

Span 23.03 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.37 dBm / 15.3550 MHz

-58.49 dBm/Hz



### Average Power (CH Mid)

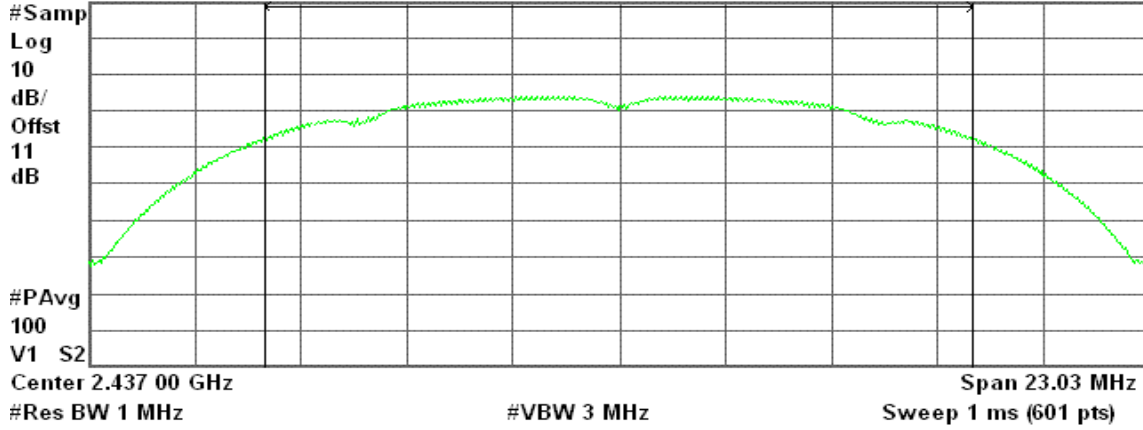
Agilent 13:15:56 Oct 20, 2006

R L

Peak Output Power (UNII), b Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

Power Spectral Density

13.00 dBm / 15.3550 MHz

-58.86 dBm/Hz

### Average Power (CH High)

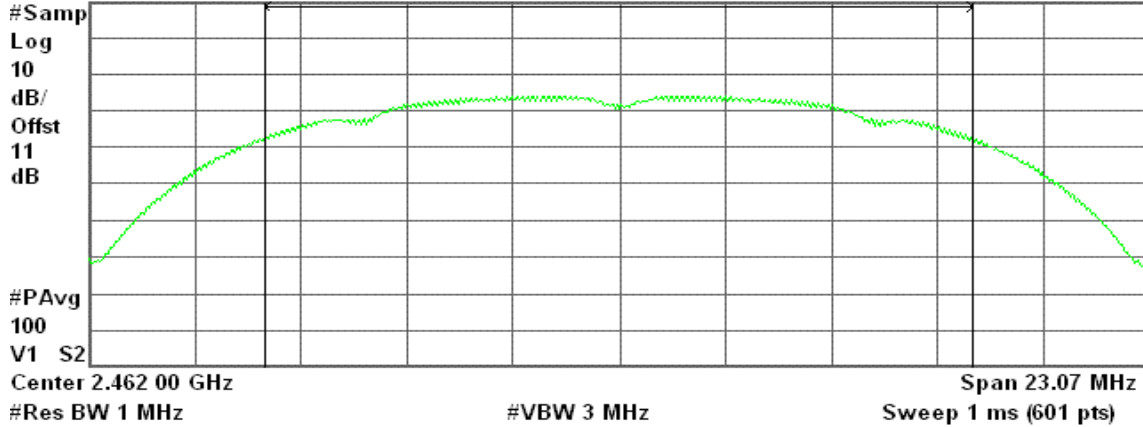
Agilent 13:21:36 Oct 20, 2006

R L

Peak Output Power (UNII), b Mode High Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

Power Spectral Density

13.06 dBm / 15.3820 MHz

-58.81 dBm/Hz



### IEEE 802.11g mode / Chain 0

#### Average Power (CH Low)

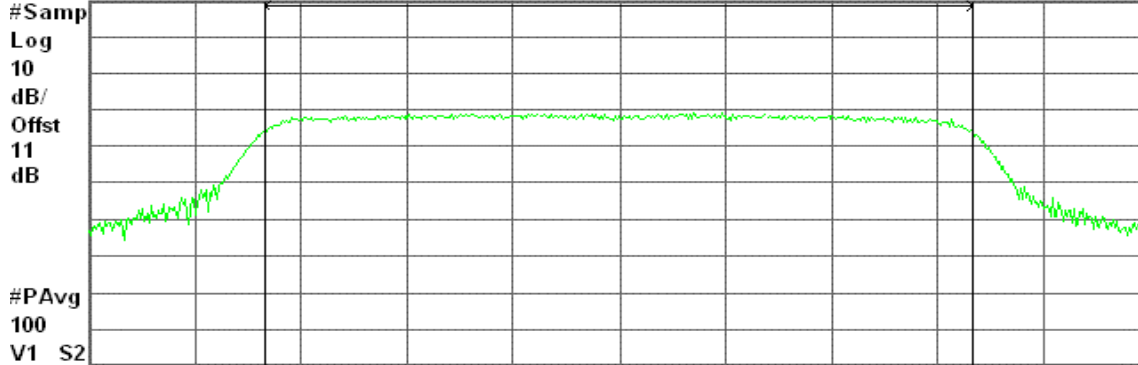
Agilent 11:29:29 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.412 00 GHz

Span 24.93 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

10.03 dBm / 16.6230 MHz

-62.18 dBm/Hz

#### Average Power (CH Mid)

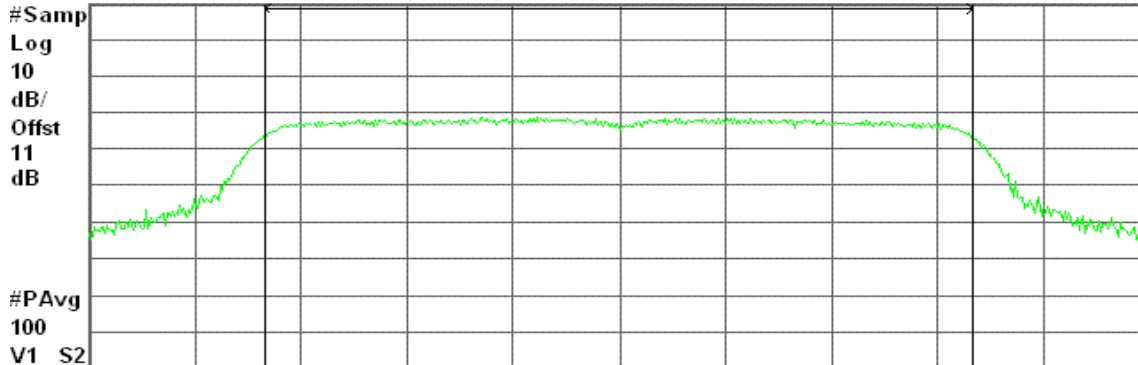
Agilent 11:35:06 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 24.9 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

9.53 dBm / 16.6010 MHz

-62.68 dBm/Hz



### Average Power (CH High)

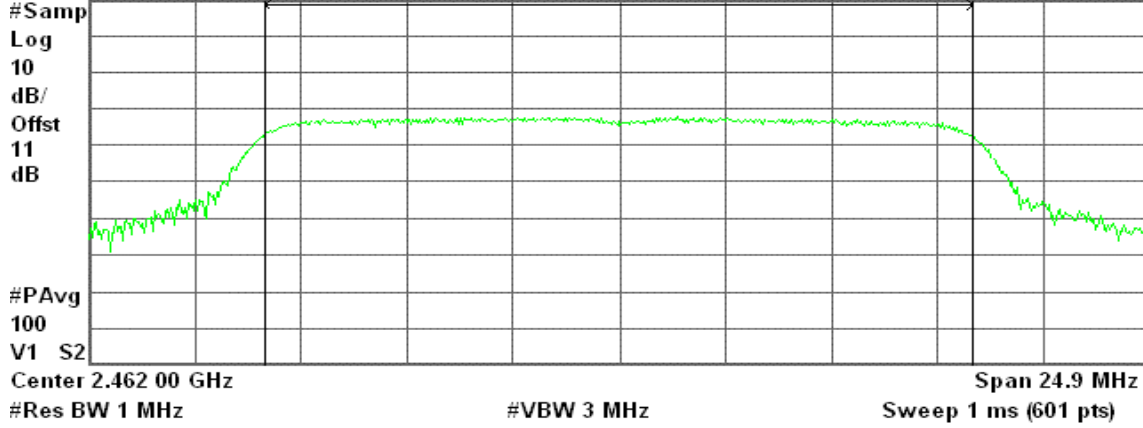
Agilent 11:41:00 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

Power Spectral Density

8.25 dBm / 16.5970 MHz

-63.95 dBm/Hz

### IEEE 802.11g mode / Chain 2

#### Average Power (CH Low)

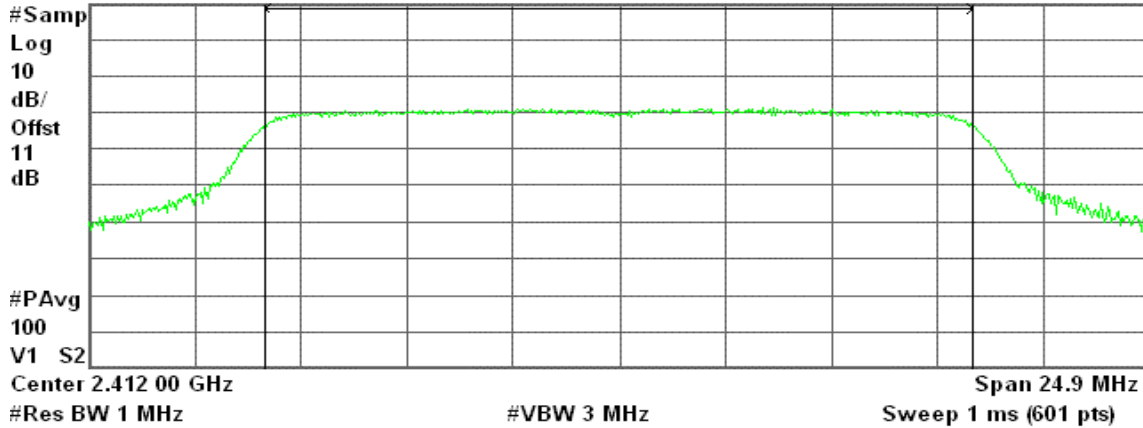
Agilent 11:04:14 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

Power Spectral Density

11.99 dBm / 16.5980 MHz

-60.21 dBm/Hz



### Average Power (CH Mid)

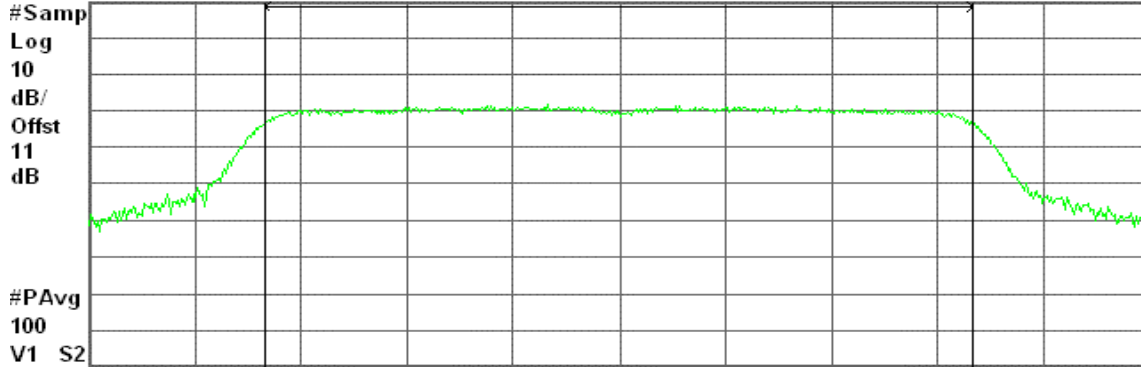
Agilent 11:10:38 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



#Samp

Log

10

dB/

Offst

11

dB

#PAvg

100

V1 S2

Center 2.437 00 GHz

Span 24.84 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.23 dBm / 16.5610 MHz

-59.96 dBm/Hz

### Average Power (CH High)

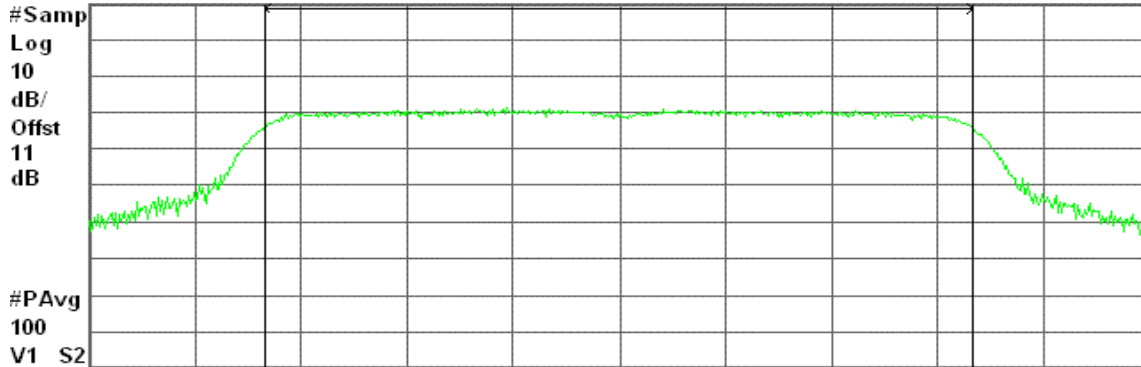
Agilent 11:17:44 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode High Ch.

Ref 30 dBm

Atten 30 dB



#Samp

Log

10

dB/

Offst

11

dB

#PAvg

100

V1 S2

Center 2.462 00 GHz

Span 24.88 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.63 dBm / 16.5850 MHz

-60.56 dBm/Hz





**draft 802.11n Standard-20 MHz Channel mode / Chain 0**

**Average Power (CH Low)**

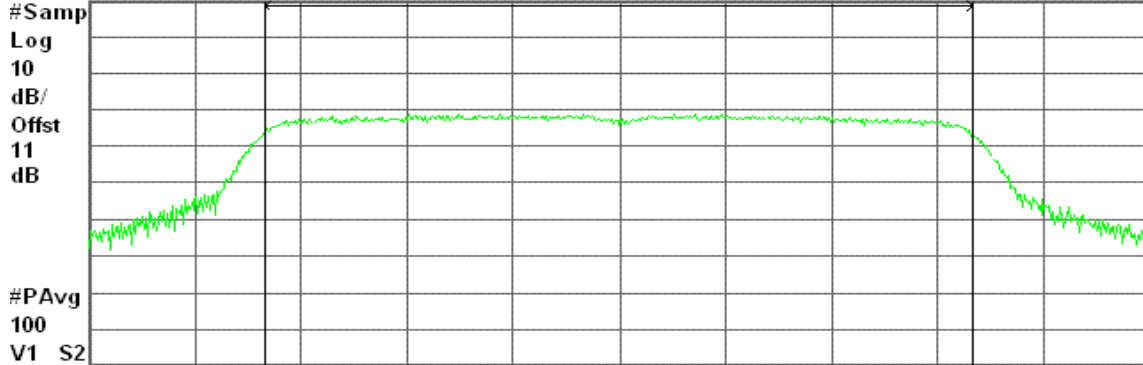
Agilent 18:46:56 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.412 00 GHz

Span 26.75 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

9.58 dBm / 17.8340 MHz

-62.93 dBm/Hz

**Average Power (CH Mid)**

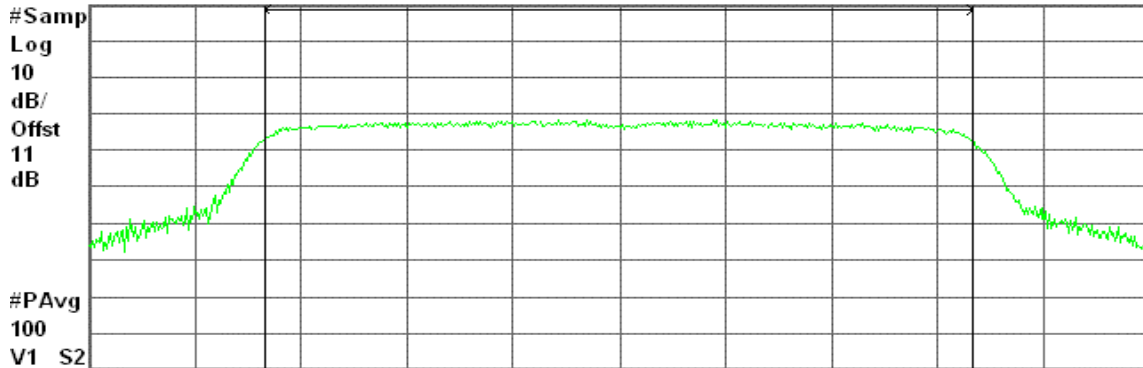
Agilent 19:25:10 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 26.76 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

9.12 dBm / 17.8430 MHz

-63.39 dBm/Hz



### Average Power (CH High)

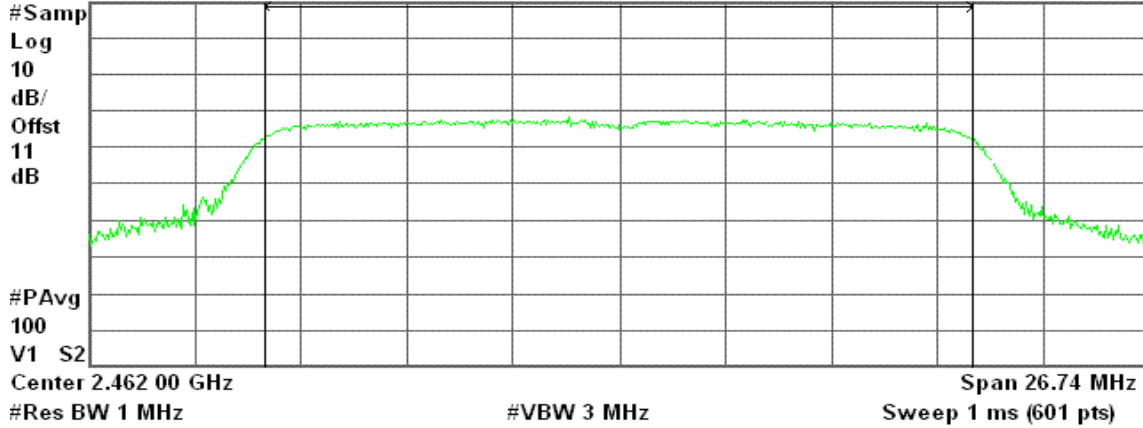
Agilent 19:33:40 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

Power Spectral Density

8.72 dBm / 17.8250 MHz

-63.79 dBm/Hz

### draft 802.11n Standard-20 MHz Channel mode / Chain 2

#### Average Power (CH Low)

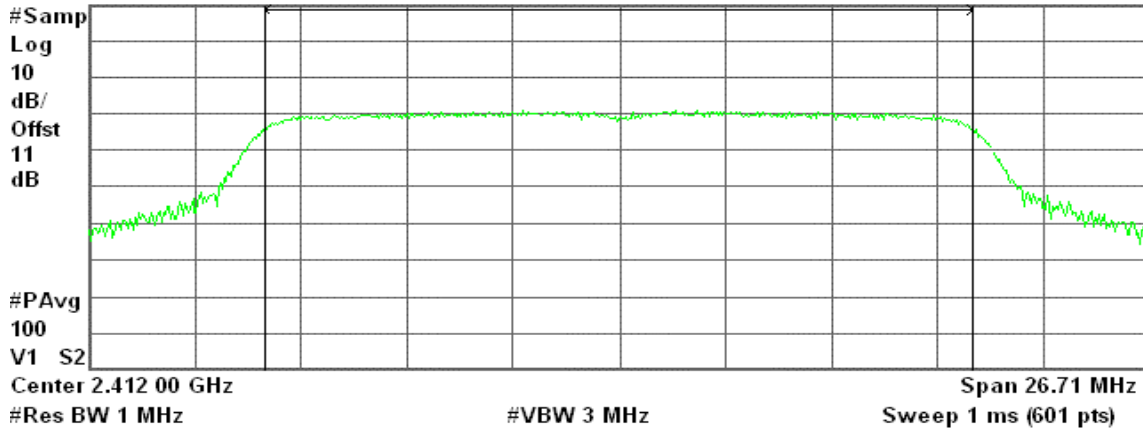
Agilent 18:28:20 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

Power Spectral Density

11.38 dBm / 17.8080 MHz

-61.13 dBm/Hz



### Average Power (CH Mid)

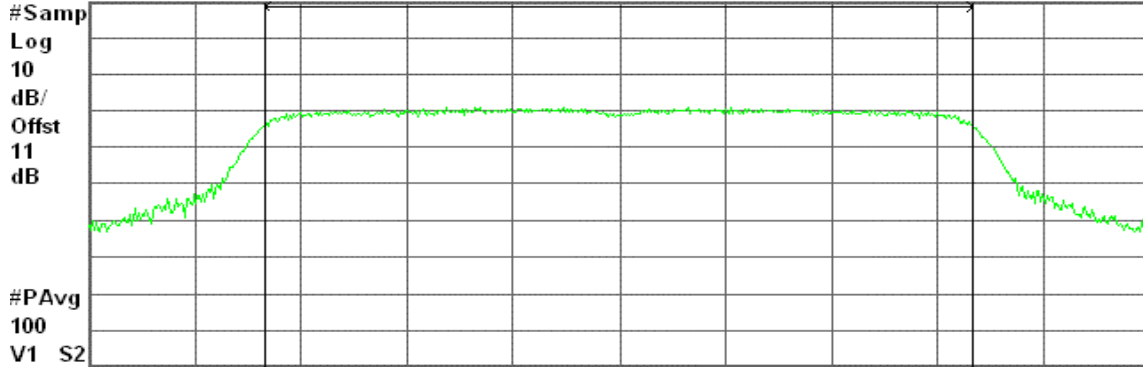
Agilent 18:34:29 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 26.7 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.79 dBm / 17.7990 MHz

-60.72 dBm/Hz

### Average Power (CH High)

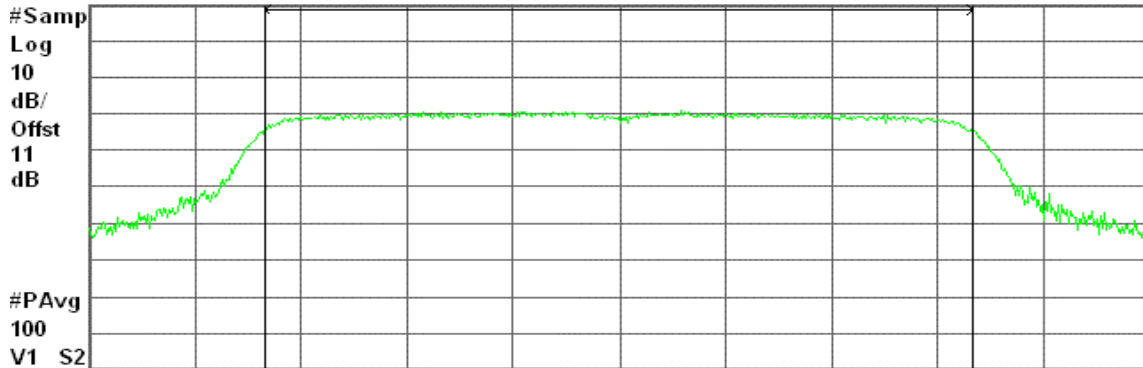
Agilent 18:40:13 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 26.7 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.44 dBm / 17.7970 MHz

-61.07 dBm/Hz



**draft 802.11n Wide-40 MHz Channel mode / Chain 0**

**Average Power (CH Low)**

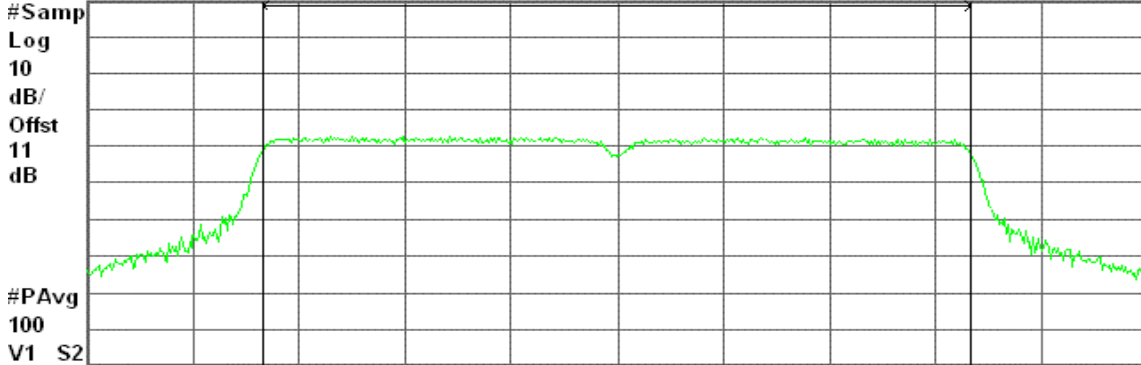
Agilent 19:41:23 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.422 00 GHz

Span 54.89 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

6.89 dBm / 36.5910 MHz

-68.74 dBm/Hz

**Average Power (CH Mid)**

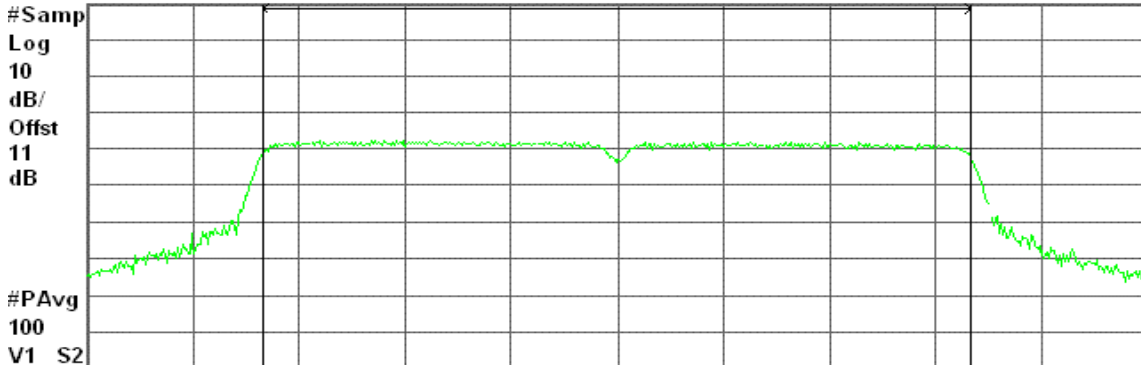
Agilent 19:47:02 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 54.84 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

6.18 dBm / 36.5600 MHz

-69.45 dBm/Hz



### Average Power (CH High)

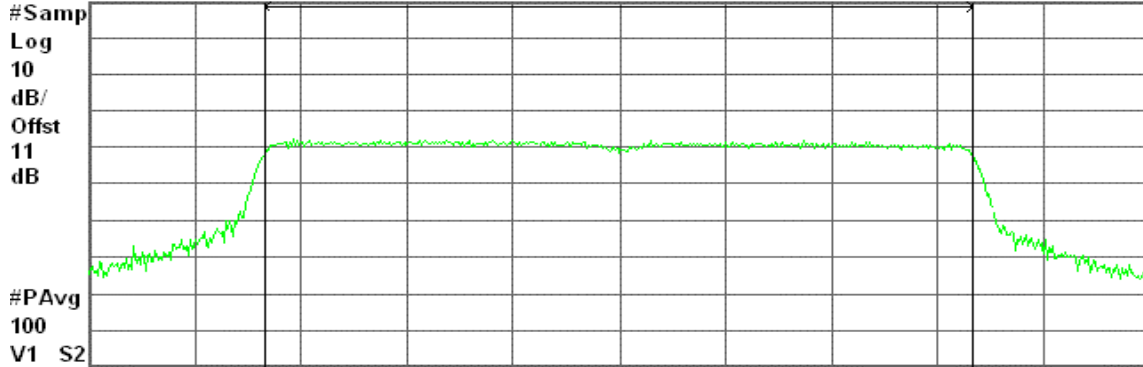
Agilent 19:53:10 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.452 00 GHz

Span 54.77 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

5.99 dBm / 36.5100 MHz

-69.63 dBm/Hz

### draft 802.11n Wide-40 MHz Channel mode / Chain 2

### Average Power (CH Low)

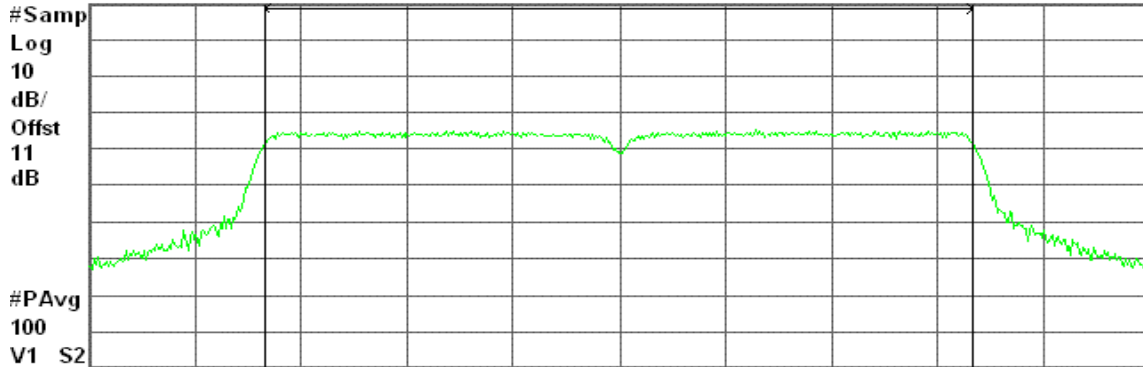
Agilent 20:00:12 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.422 00 GHz

Span 54.7 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

9.29 dBm / 36.4690 MHz

-66.33 dBm/Hz



### Average Power (CH Mid)

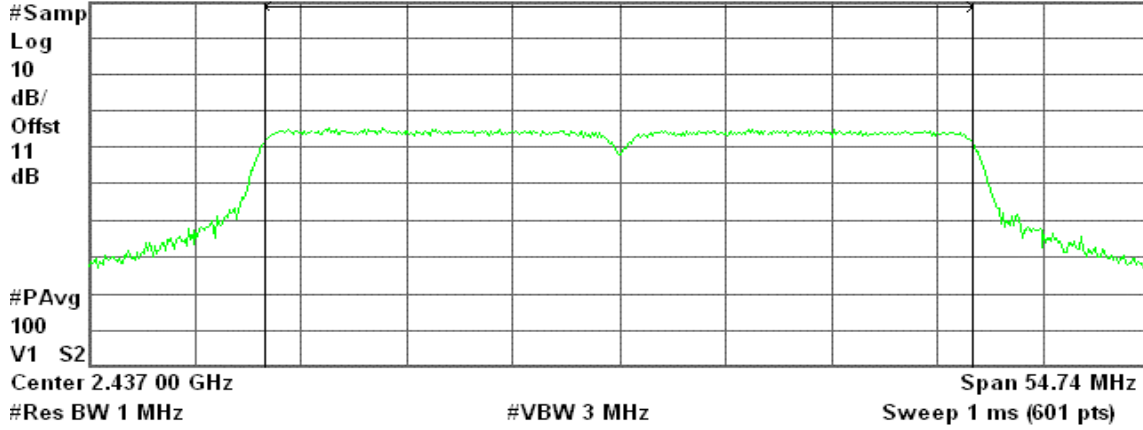
Agilent 20:06:55 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

9.63 dBm / 36.4950 MHz

Power Spectral Density

-65.99 dBm/Hz

### Average Power (CH High)

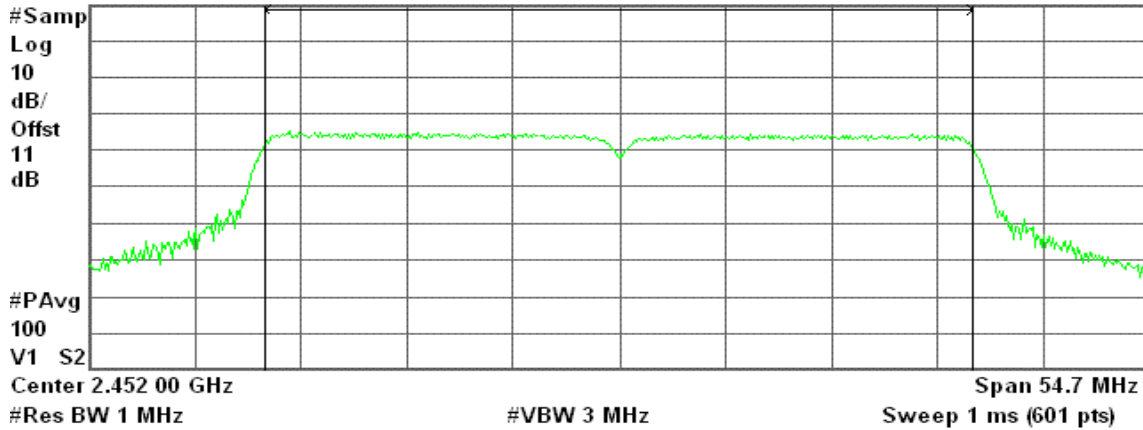
Agilent 20:12:52 Oct 20, 2006

R L

Peak Output Power (UNII), g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

9.25 dBm / 36.4650 MHz

Power Spectral Density

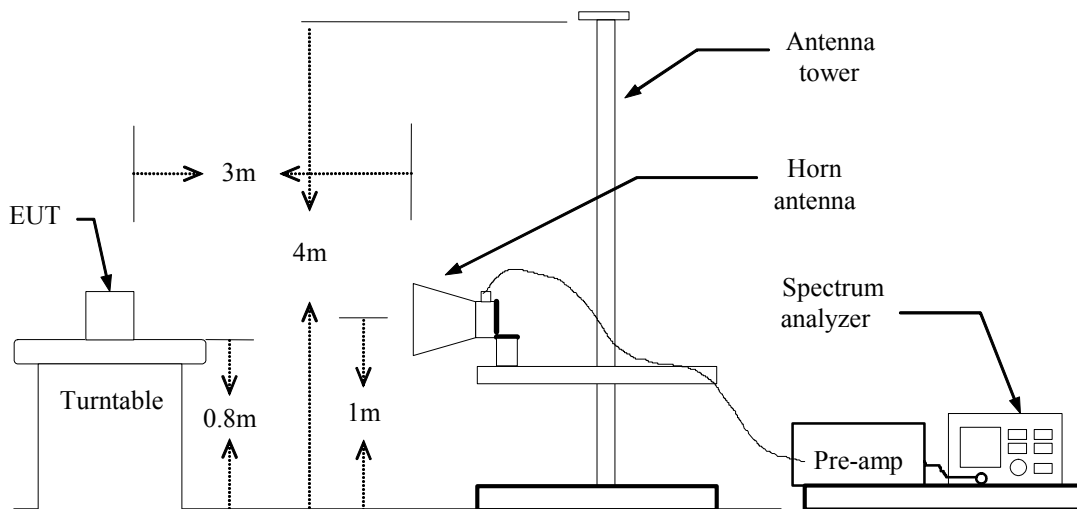
-66.37 dBm/Hz

## 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.



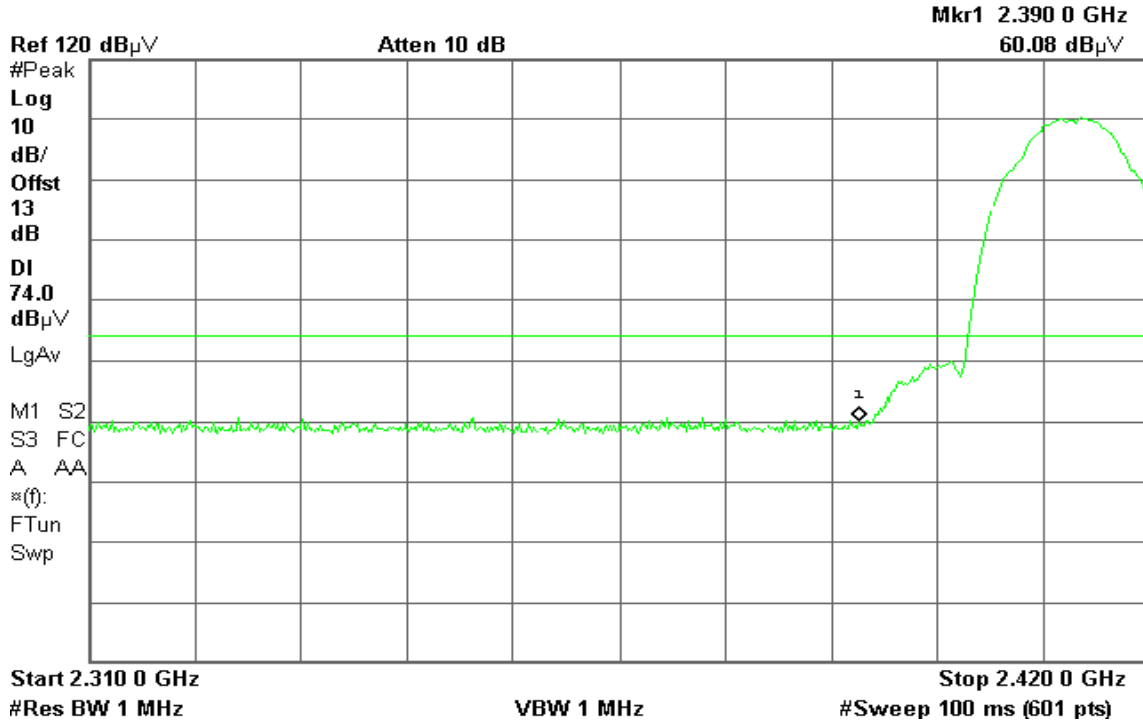
### Band Edges (IEEE 802.11b mode / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 19:17:32 Oct 19, 2006

R T

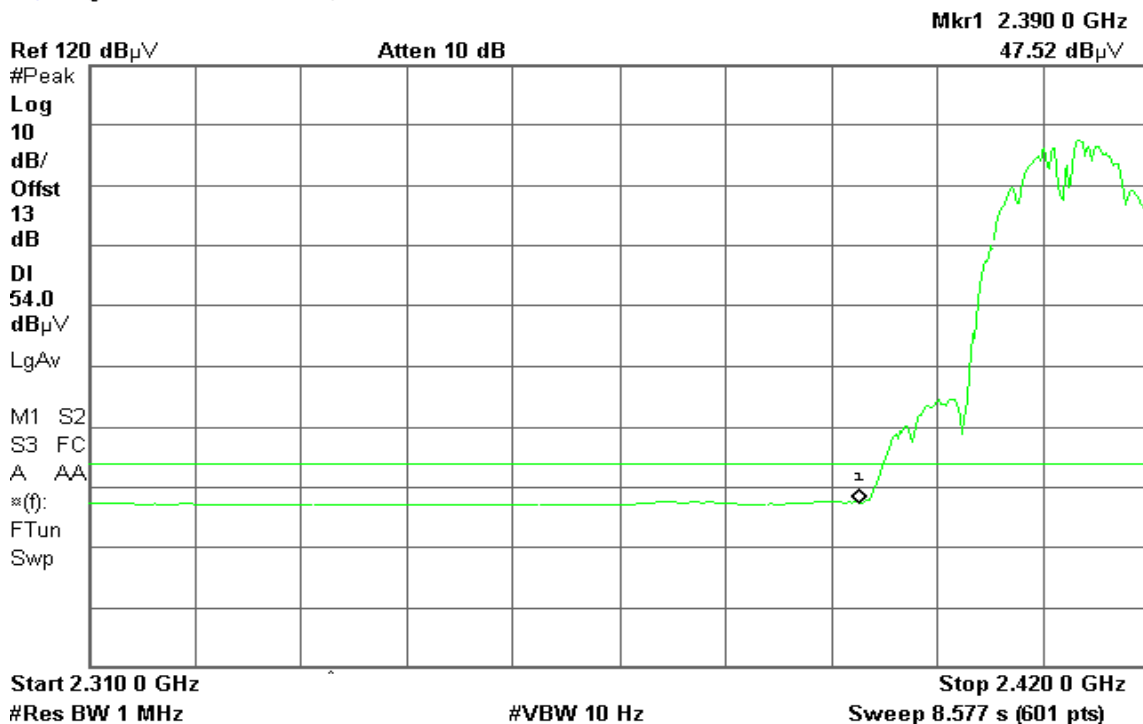


Detector mode: Average

Polarity: Vertical

Agilent 19:17:14 Oct 19, 2006

R T





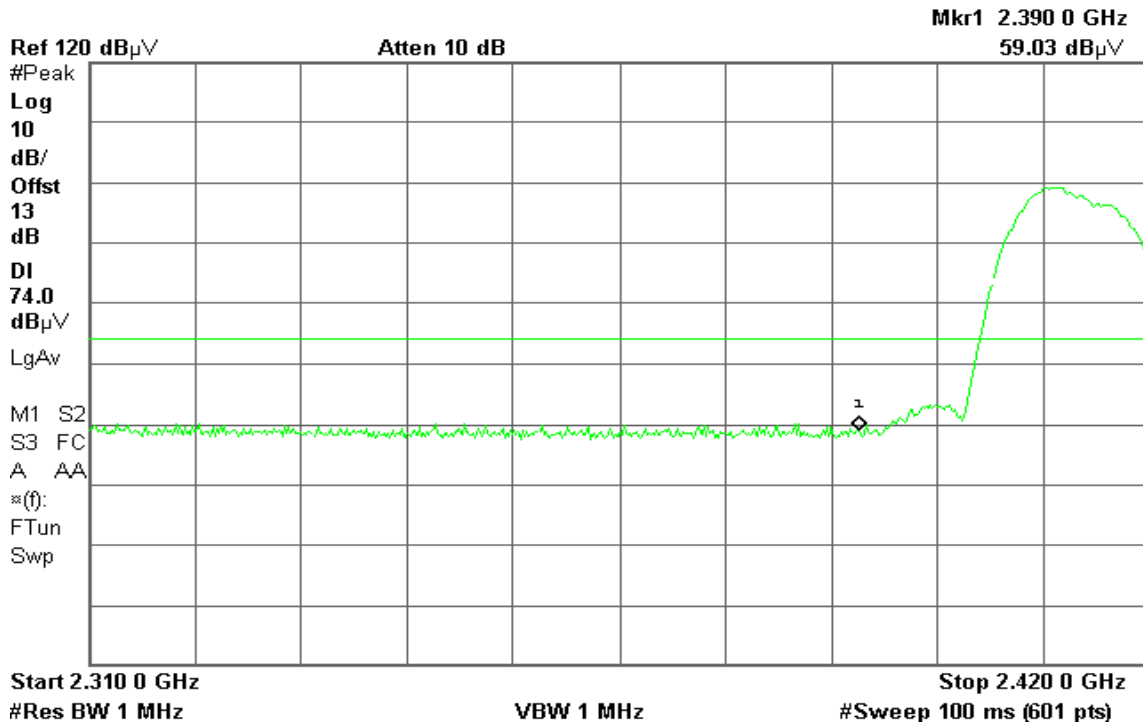


Detector mode: Peak

Polarity: Horizontal

Agilent 19:21:56 Oct 19, 2006

R T



Detector mode: Average

Polarity: Horizontal

Agilent 19:21:37 Oct 19, 2006

R T





### Band Edges (IEEE 802.11b mode / CH High)

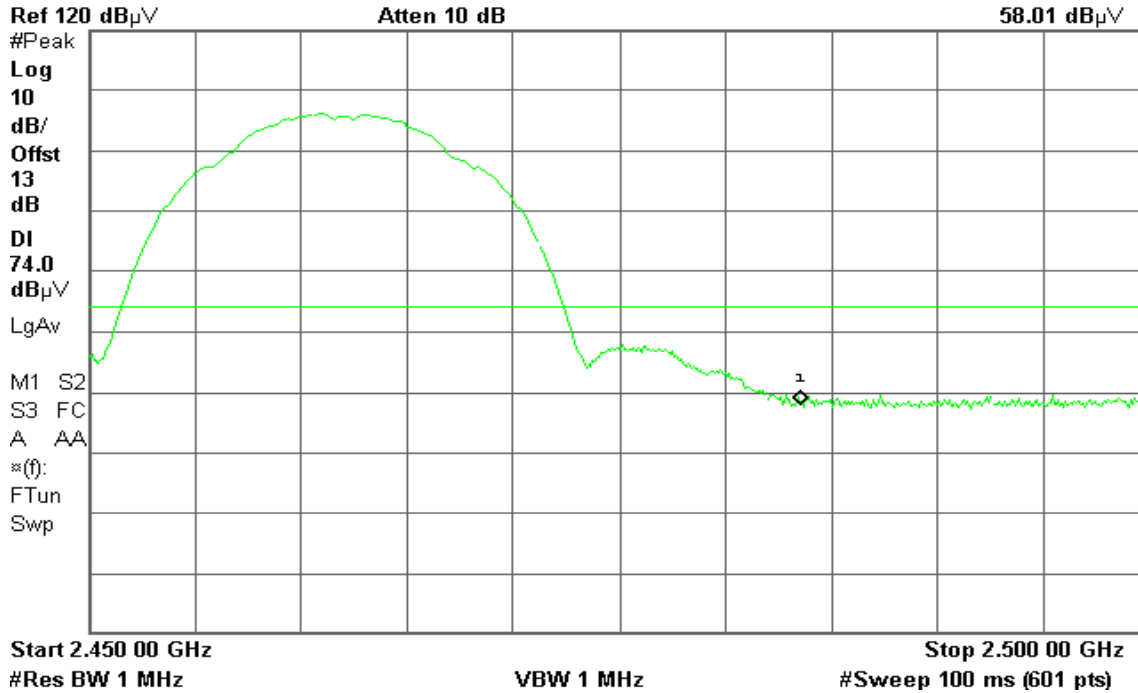
Detector mode: Peak

Polarity: Vertical

Agilent 19:26:05 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
58.01 dB $\mu$ V



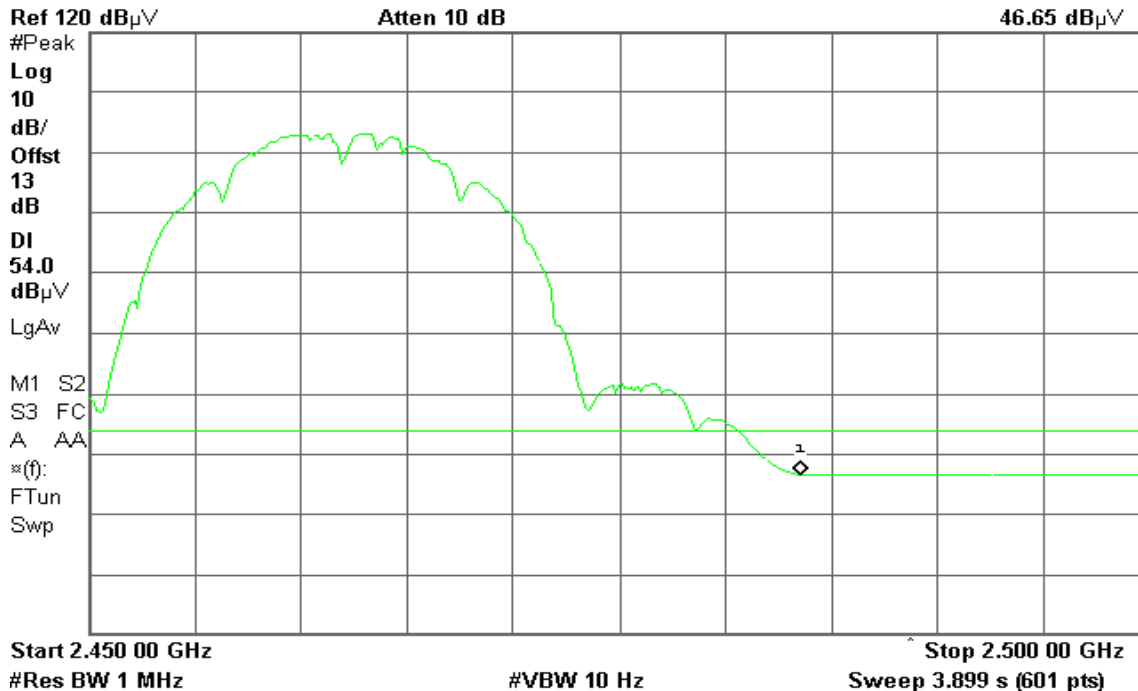
Detector mode: Average

Polarity: Vertical

Agilent 19:25:48 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
46.65 dB $\mu$ V





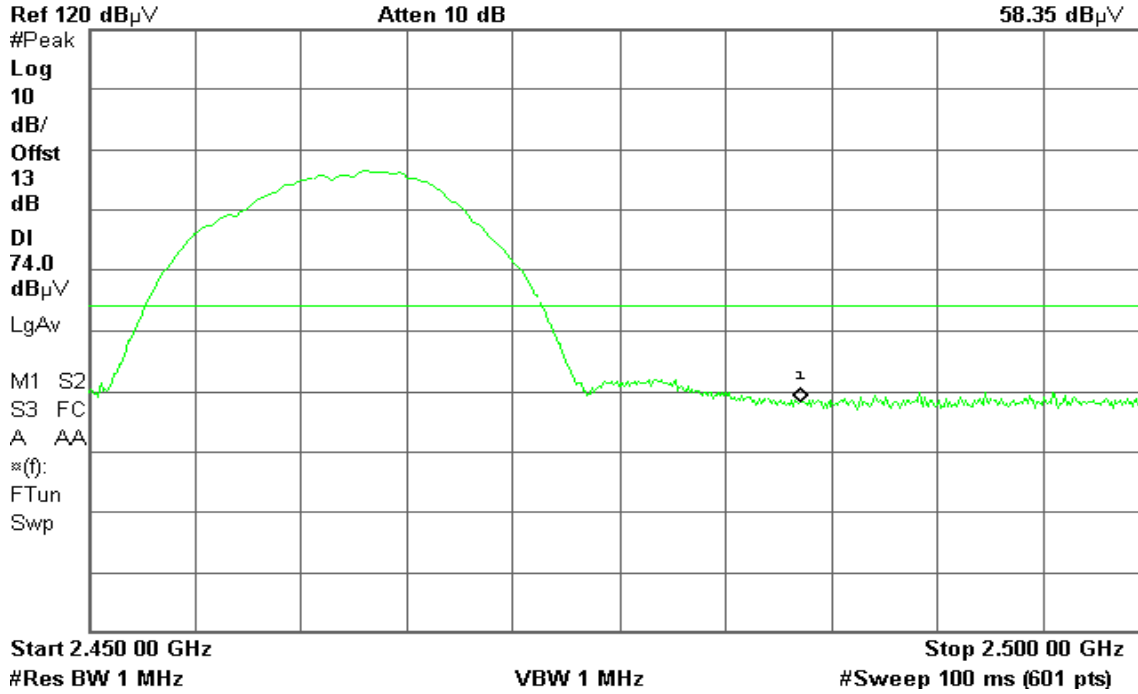
Detector mode: Peak

Polarity: Horizontal

Agilent 19:37:45 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
58.35 dB $\mu$ V



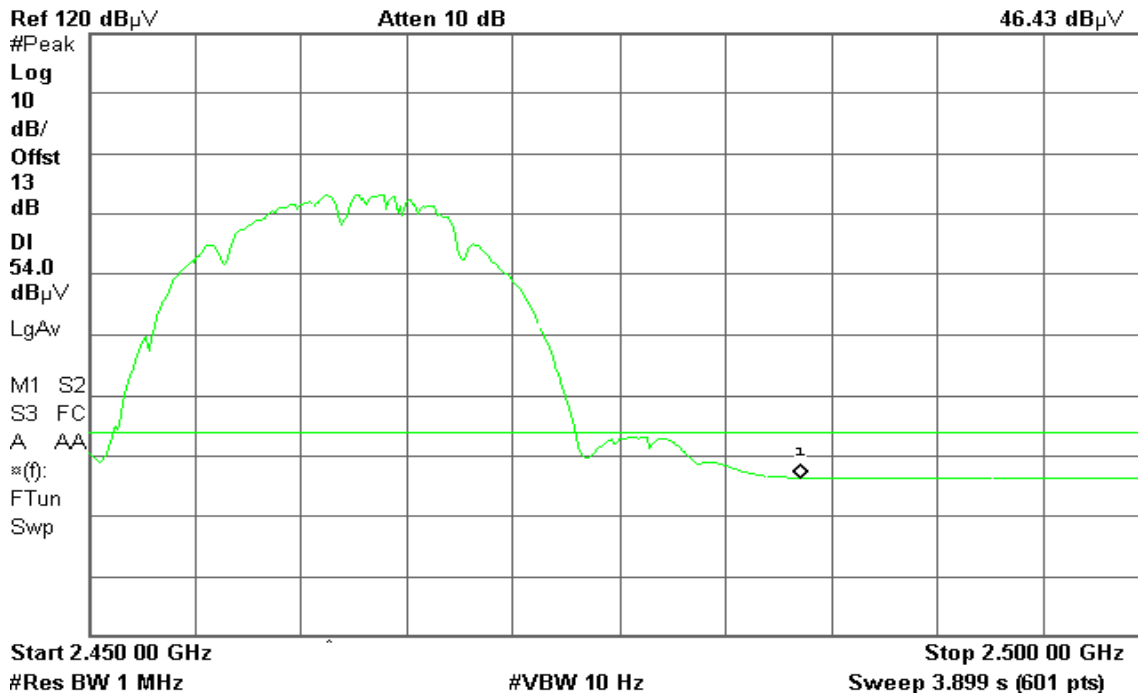
Detector mode: Average

Polarity: Horizontal

Agilent 19:37:29 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
46.43 dB $\mu$ V





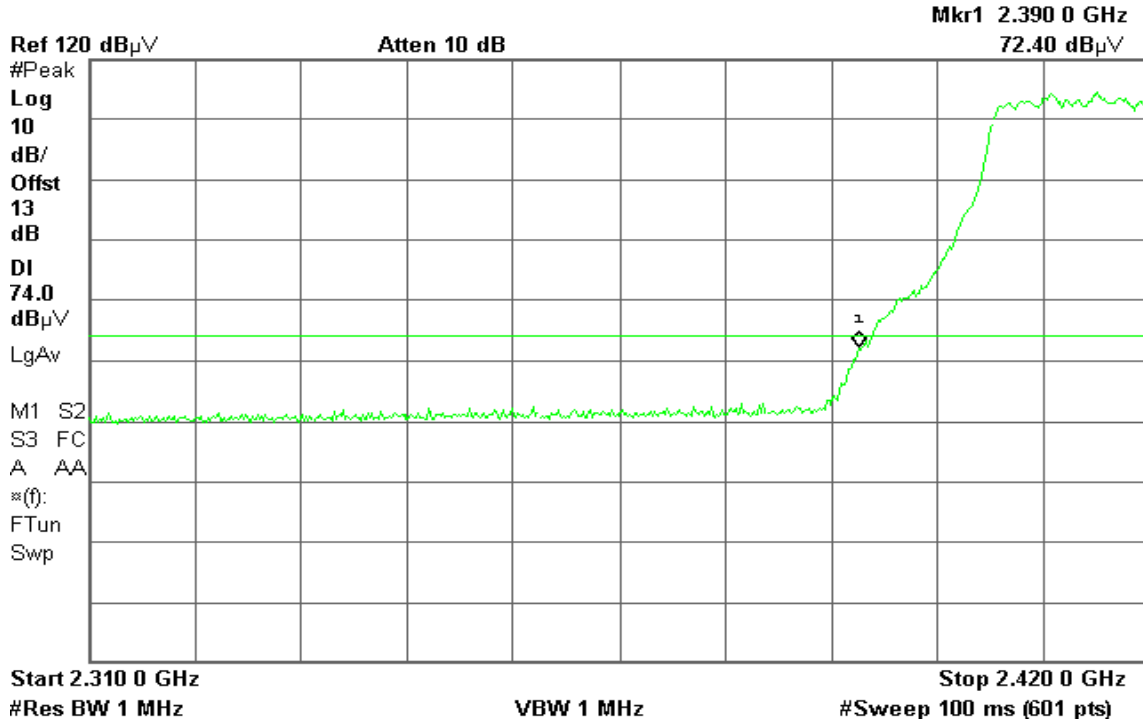
### Band Edges (IEEE 802.11g mode / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 20:05:26 Oct 19, 2006

R T

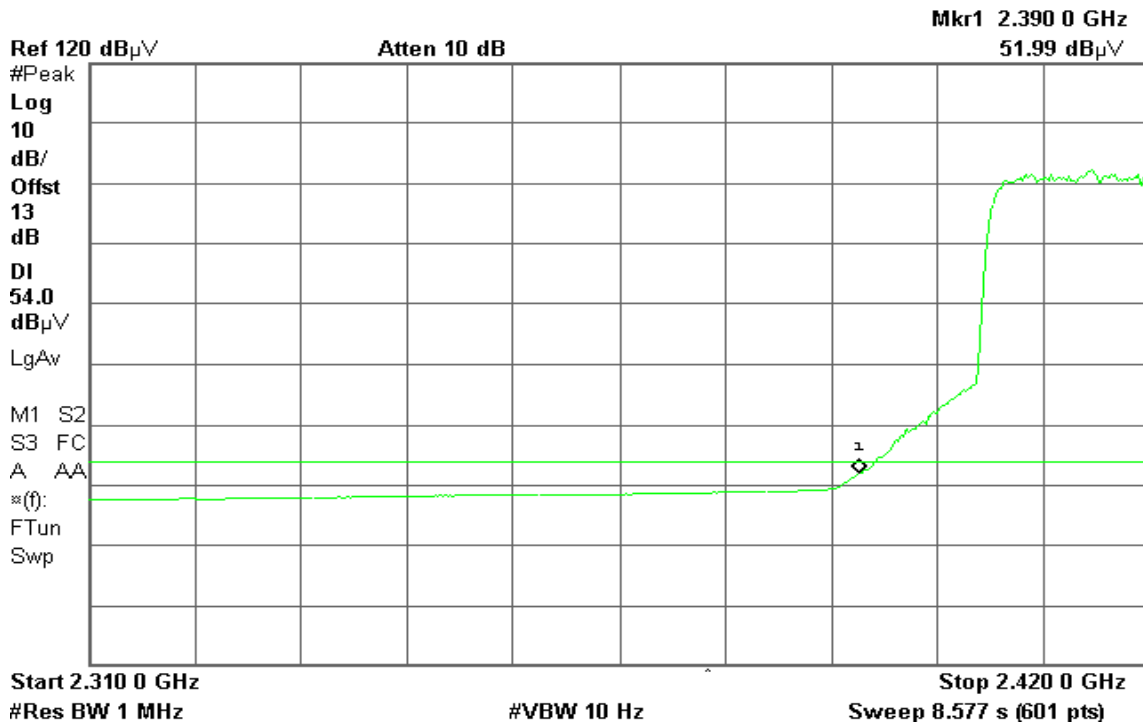


Detector mode: Average

Polarity: Vertical

Agilent 20:03:01 Oct 19, 2006

R T



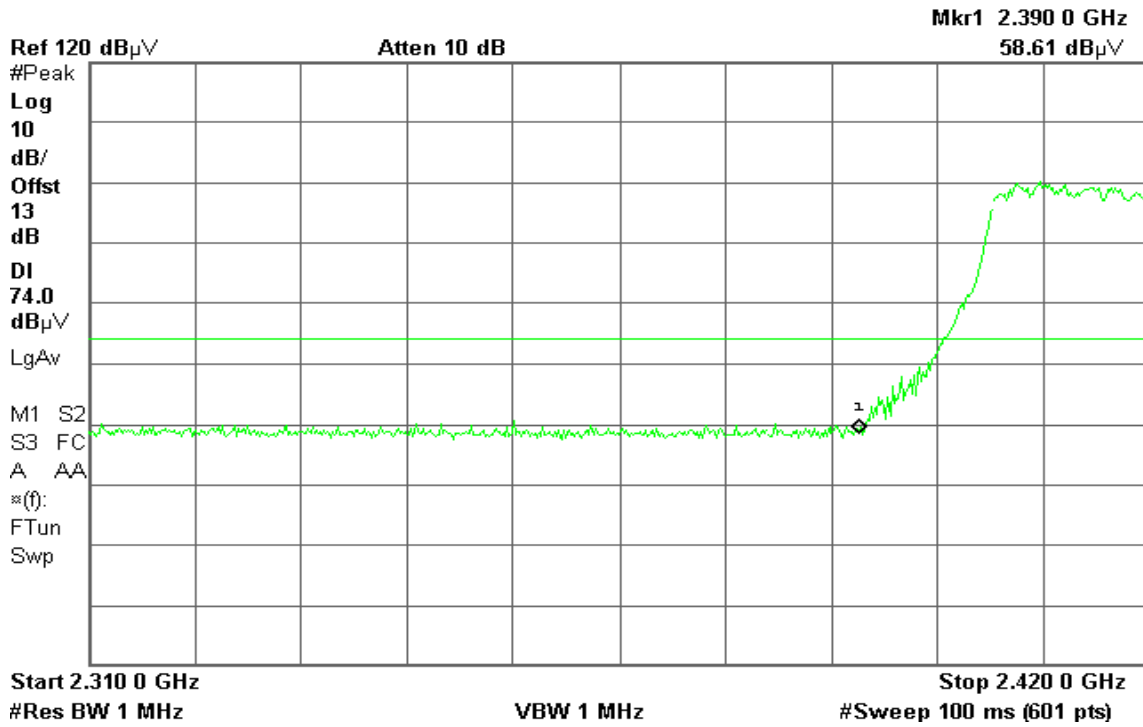


Detector mode: Peak

Polarity: Horizontal

Agilent 20:08:46 Oct 19, 2006

R T

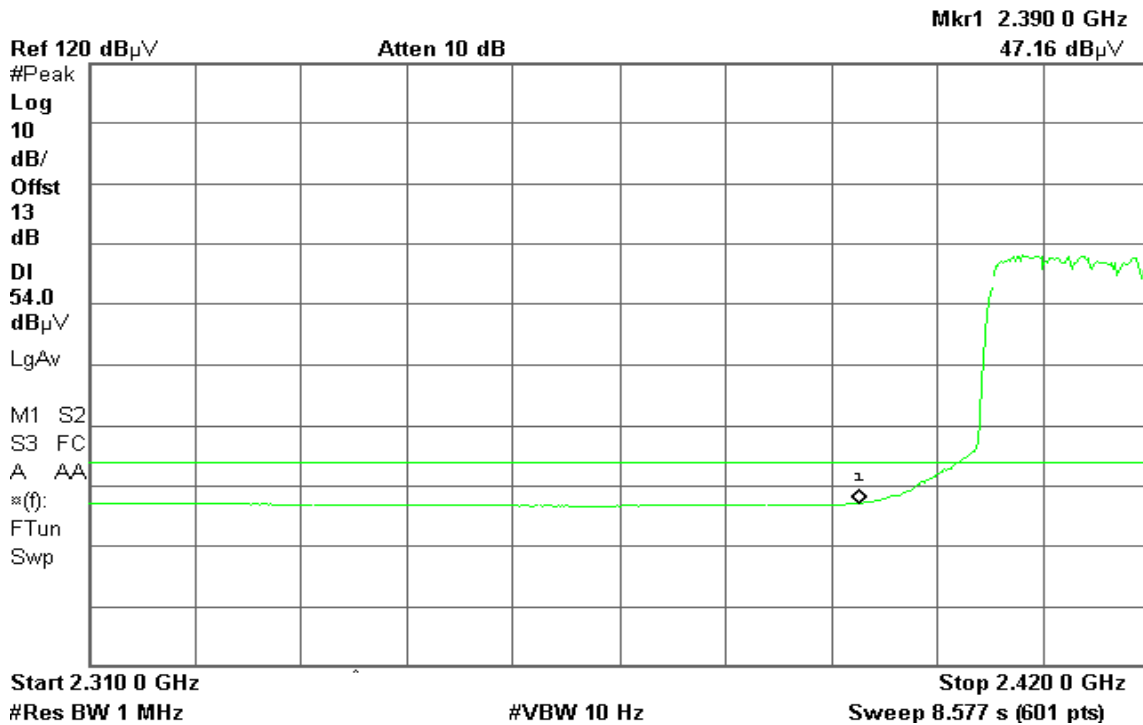


Detector mode: Average

Polarity: Horizontal

Agilent 20:08:29 Oct 19, 2006

R T





### Band Edges (IEEE 802.11g mode / CH High)

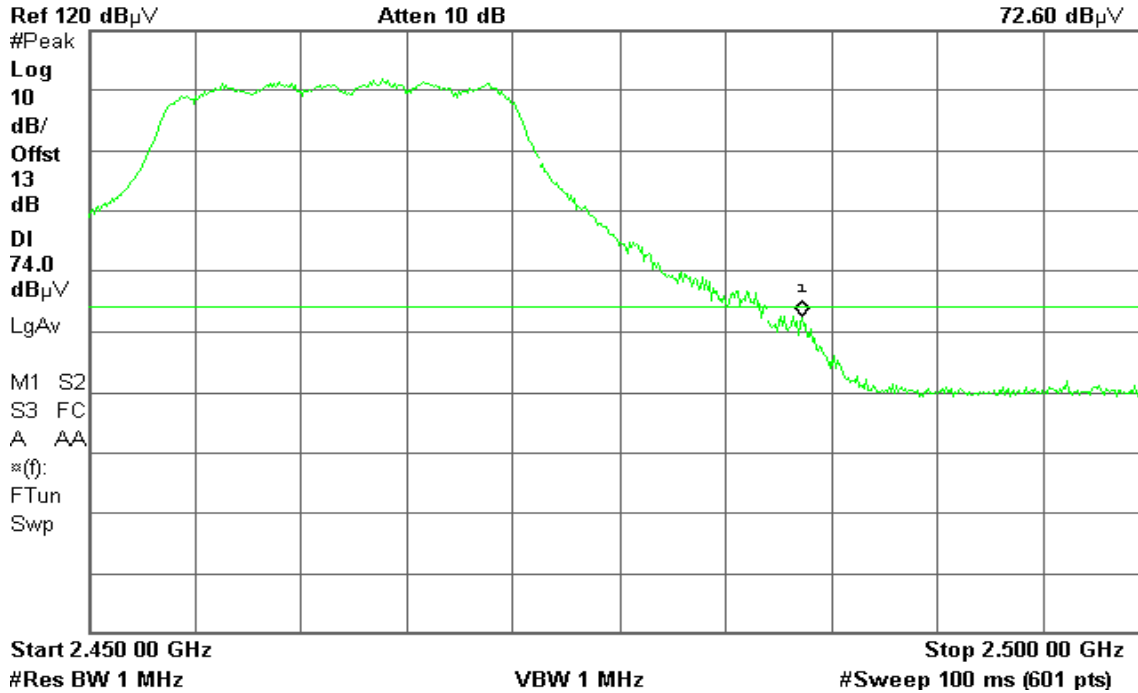
Detector mode: Peak

Polarity: Vertical

Agilent 19:54:31 Oct 19, 2006

R T

Mkr1 2.483 58 GHz  
72.60 dB $\mu$ V



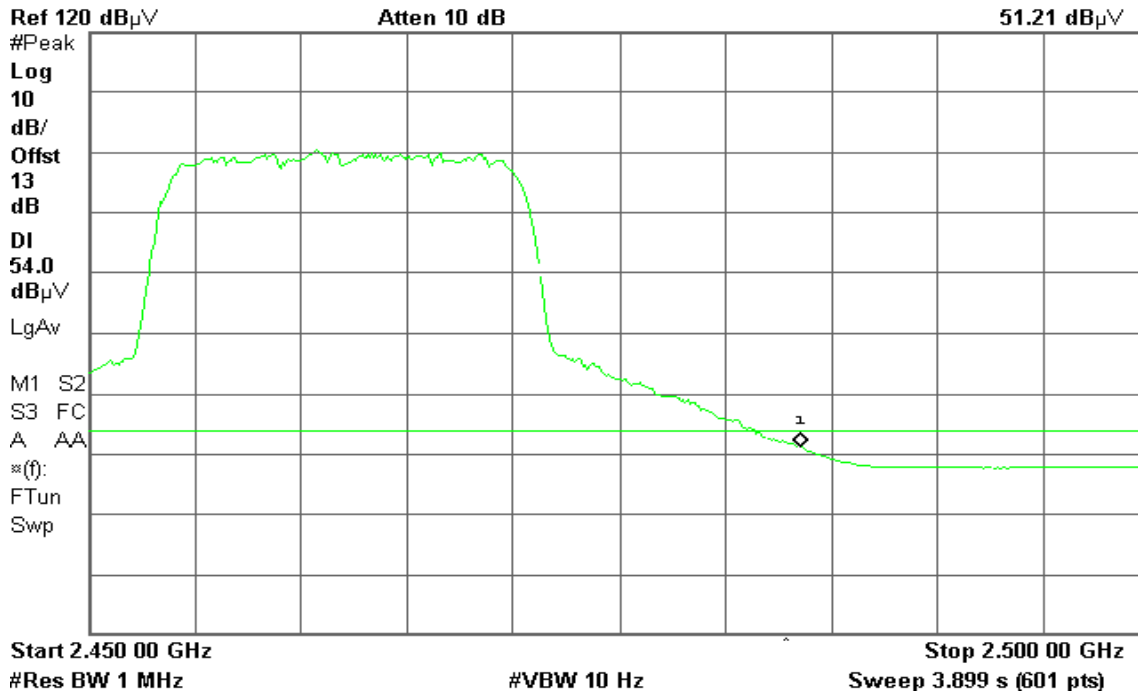
Detector mode: Average

Polarity: Vertical

Agilent 19:53:34 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
51.21 dB $\mu$ V





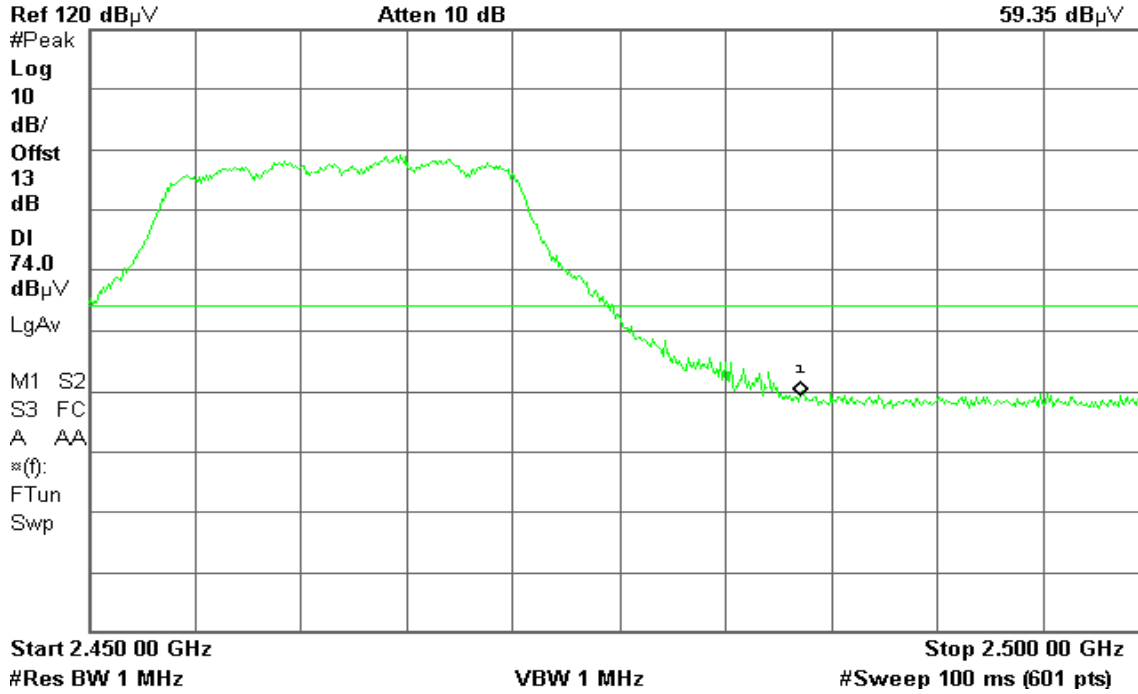
Detector mode: Peak

Polarity: Horizontal

Agilent 19:58:52 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
59.35 dB $\mu$ V



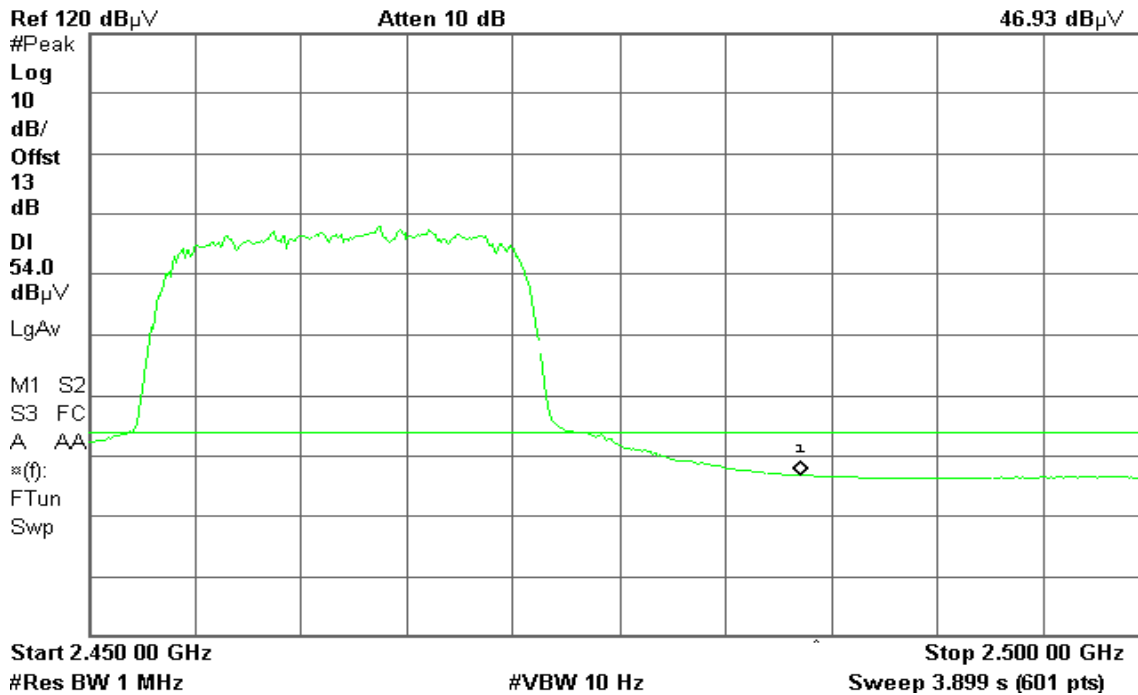
Detector mode: Average

Polarity: Horizontal

Agilent 19:58:34 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
46.93 dB $\mu$ V





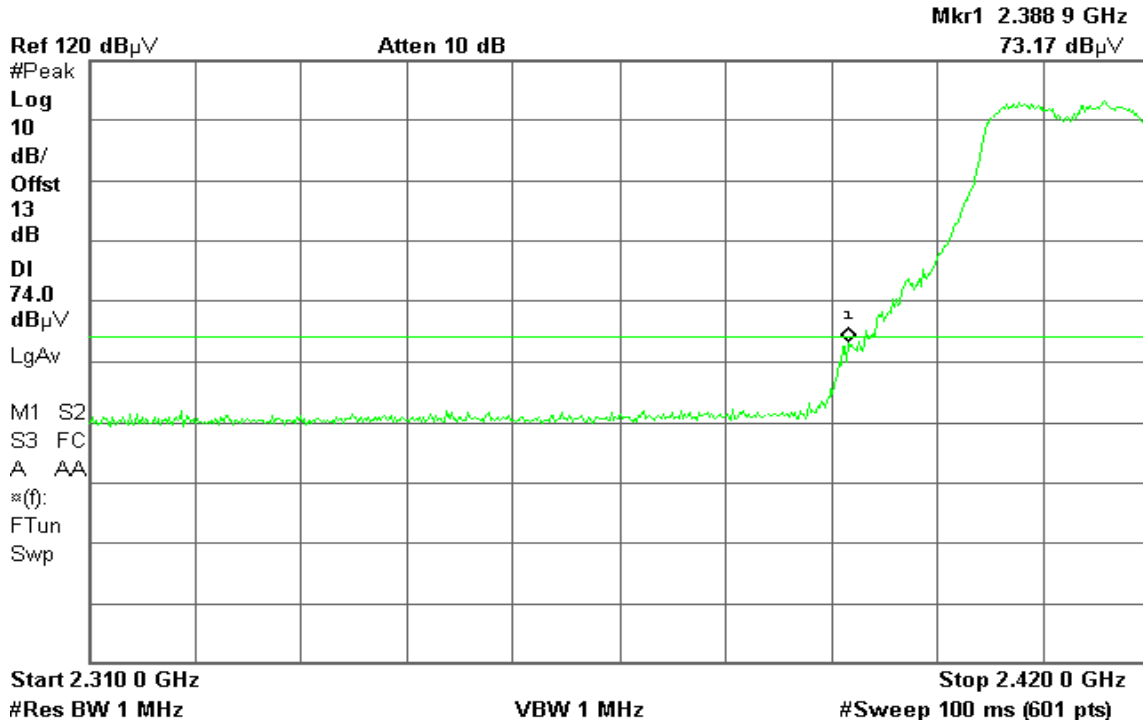
### Band Edges (draft 802.11n Standard-20 MHz Channel mode / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 20:15:34 Oct 19, 2006

R T

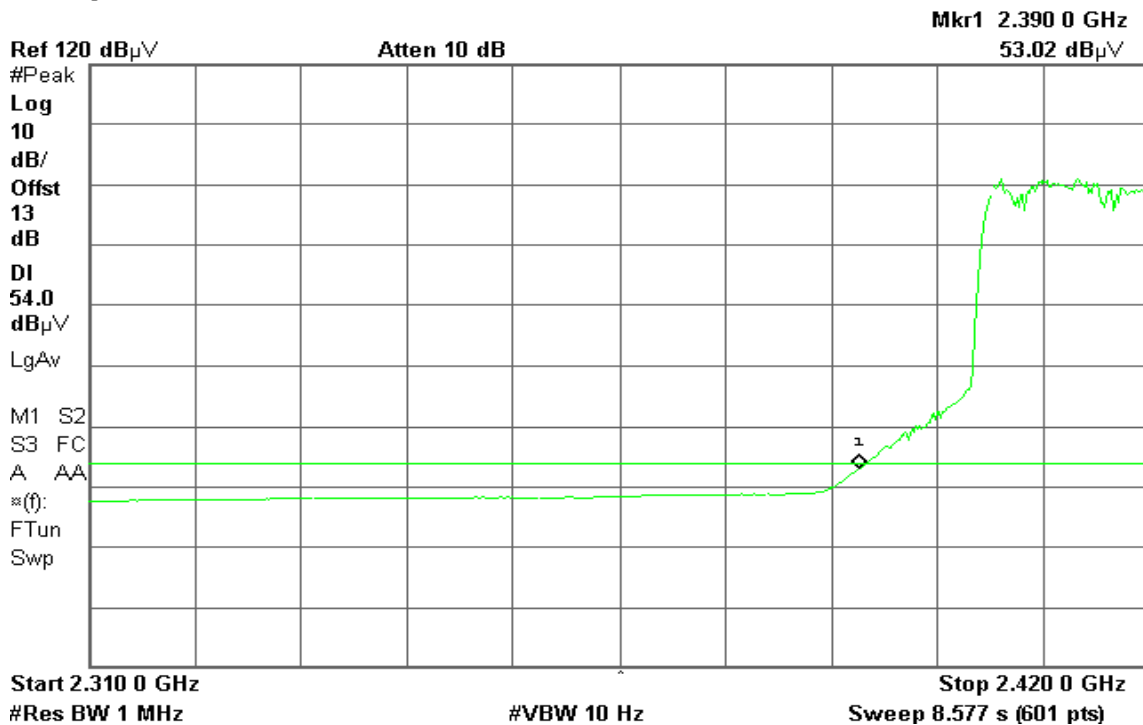


Detector mode: Average

Polarity: Vertical

Agilent 20:14:34 Oct 19, 2006

R T





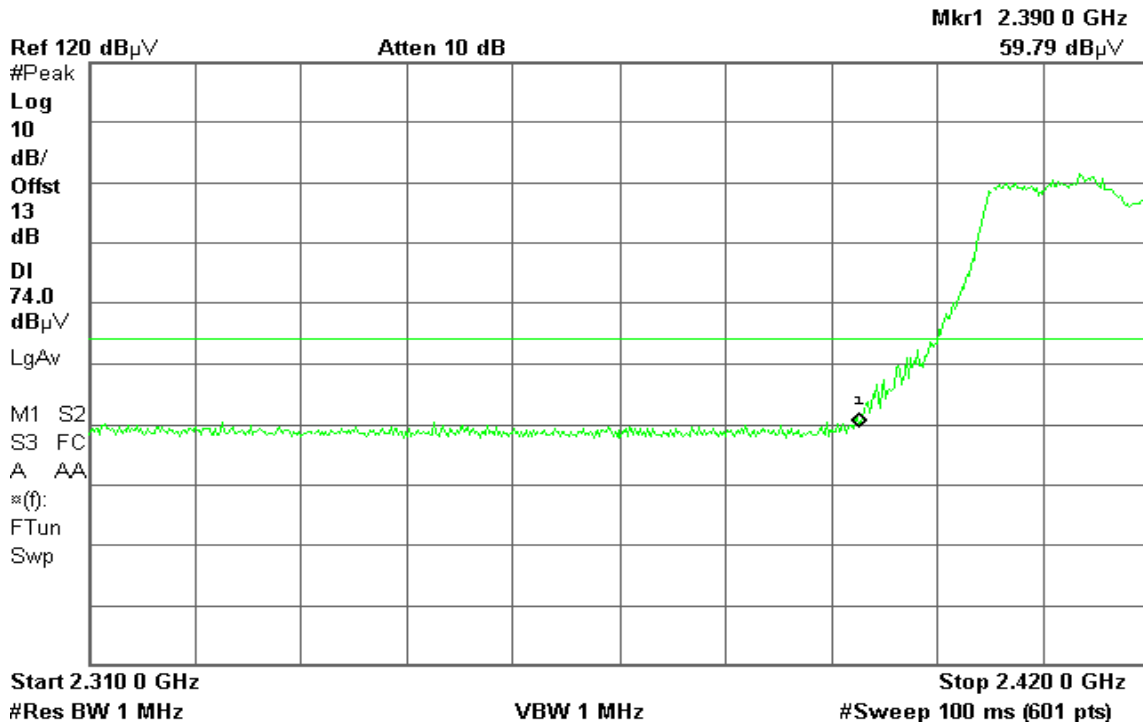


Detector mode: Peak

Polarity: Horizontal

Agilent 20:19:31 Oct 19, 2006

R T

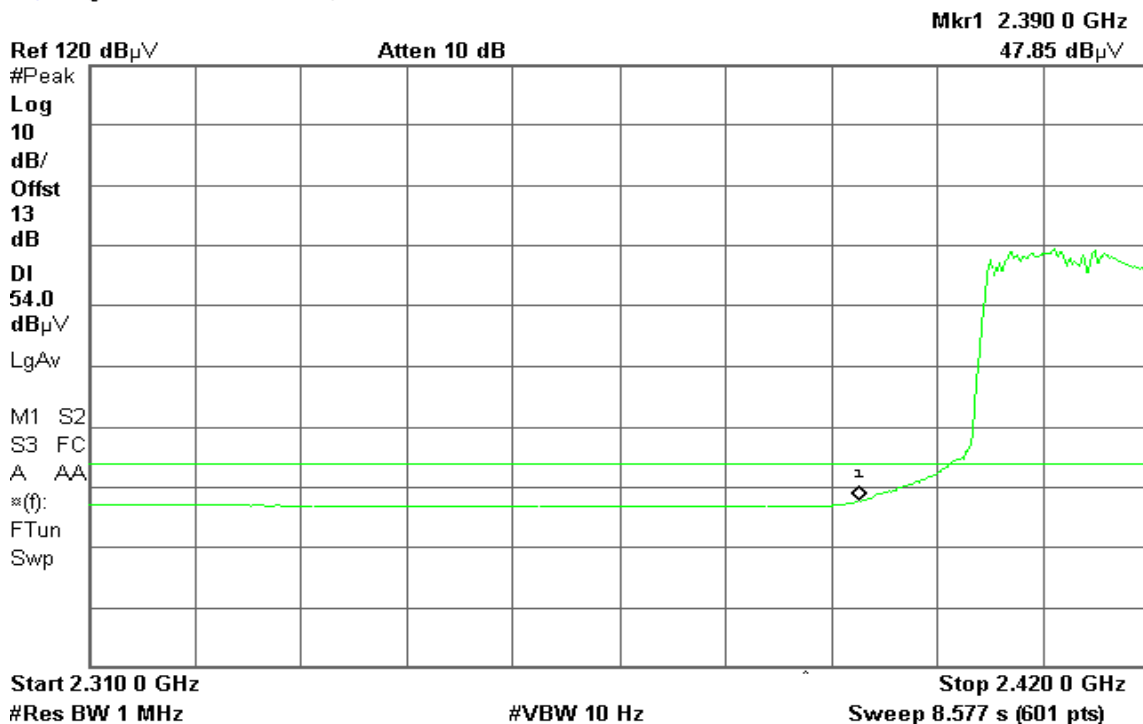


Detector mode: Average

Polarity: Horizontal

Agilent 20:19:12 Oct 19, 2006

R T





### Band Edges (draft 802.11n Standard-20 MHz Channel mode / CH High)

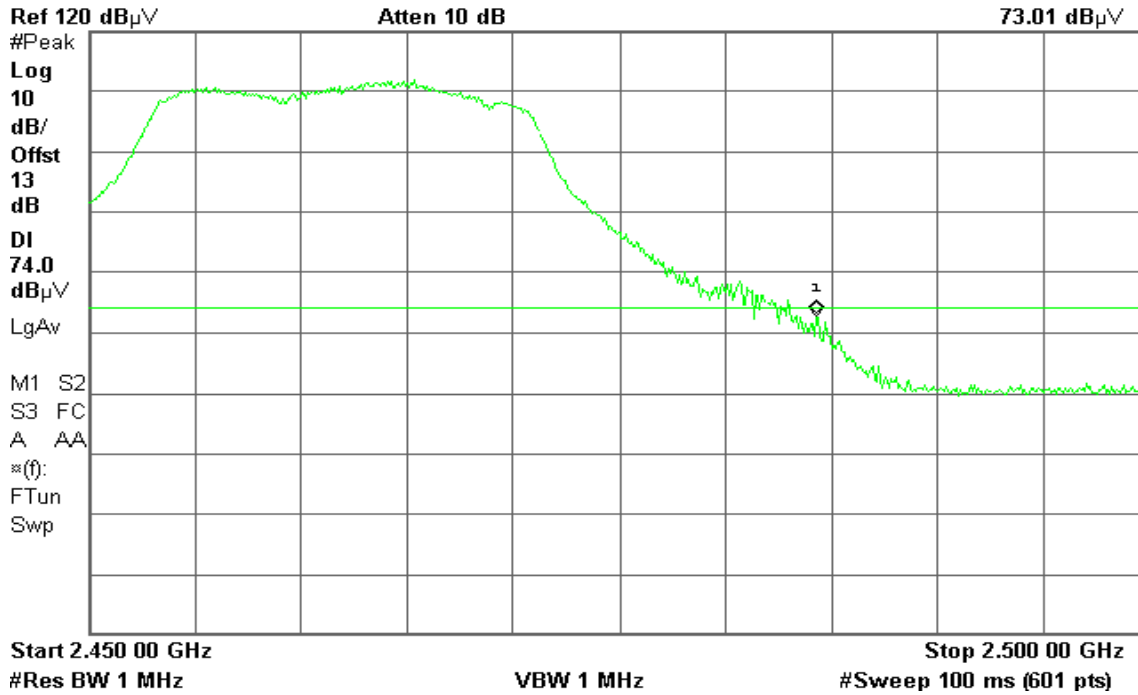
Detector mode: Peak

Polarity: Vertical

Agilent 20:27:33 Oct 19, 2006

R T

Mkr1 2.484 25 GHz  
73.01 dB $\mu$ V



Detector mode: Average

Polarity: Vertical

Agilent 20:24:59 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
53.04 dB $\mu$ V





Detector mode: Peak

Polarity: Horizontal

Agilent 20:32:46 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
62.09 dB $\mu$ V



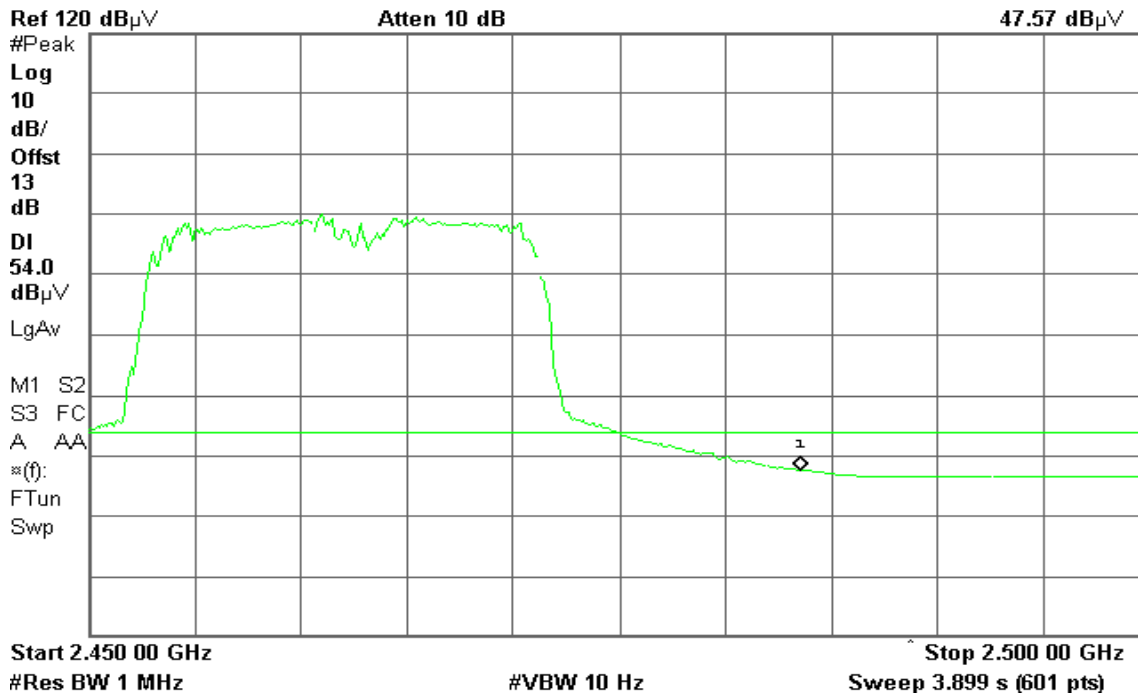
Detector mode: Average

Polarity: Horizontal

Agilent 20:32:28 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
47.57 dB $\mu$ V





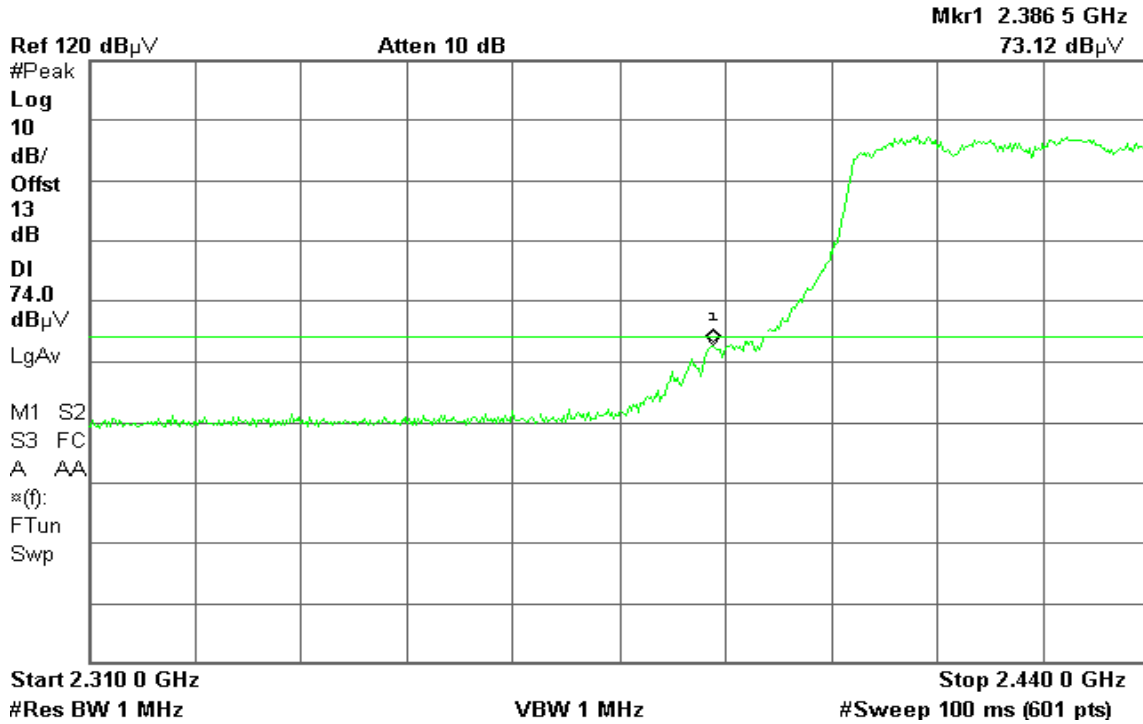
### Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 20:48:31 Oct 19, 2006

R T

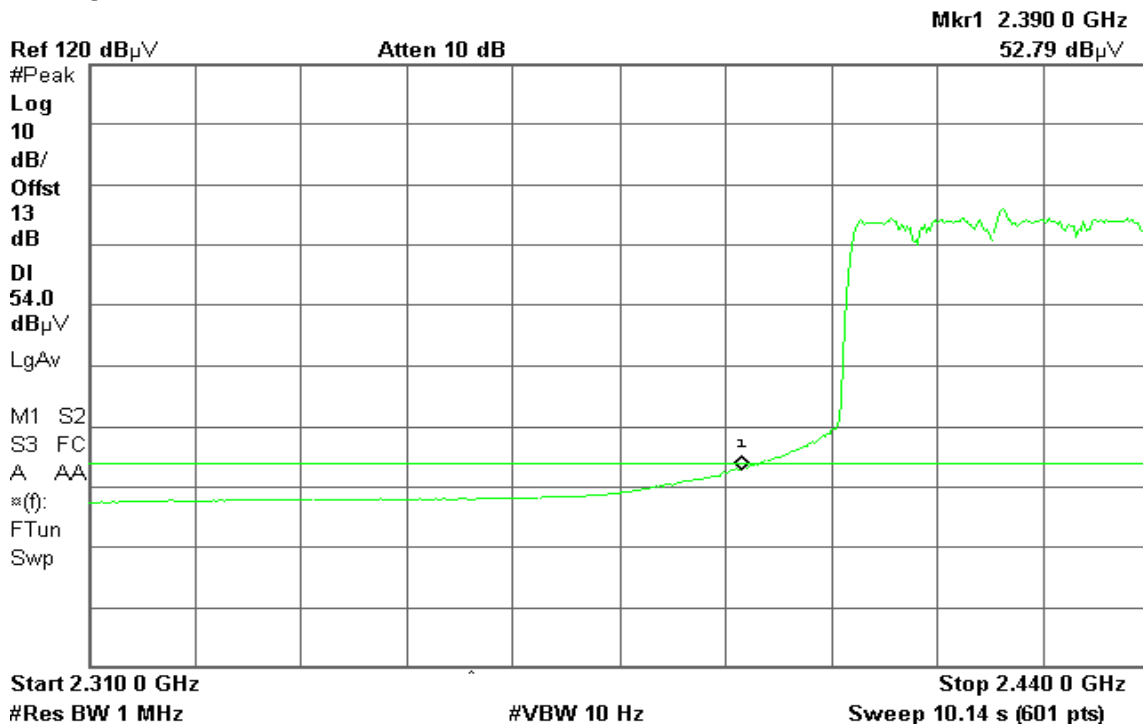


Detector mode: Average

Polarity: Vertical

Agilent 20:47:47 Oct 19, 2006

R T



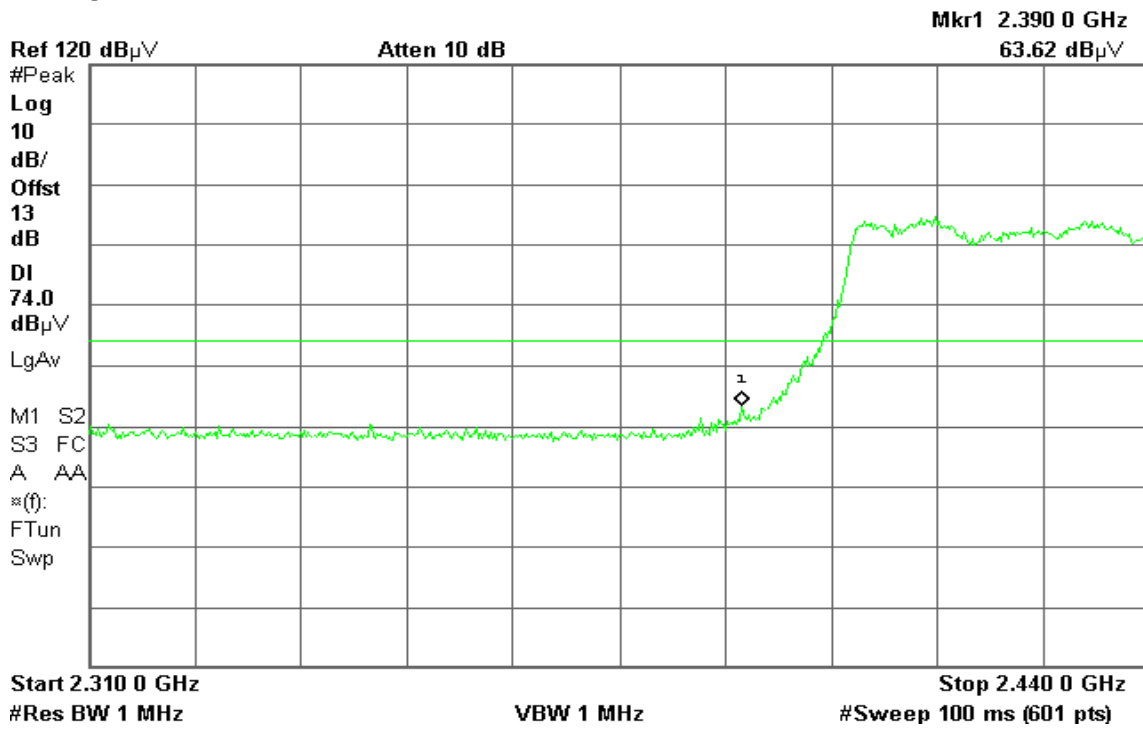


Detector mode: Peak

Polarity: Horizontal

Agilent 20:54:31 Oct 19, 2006

R T

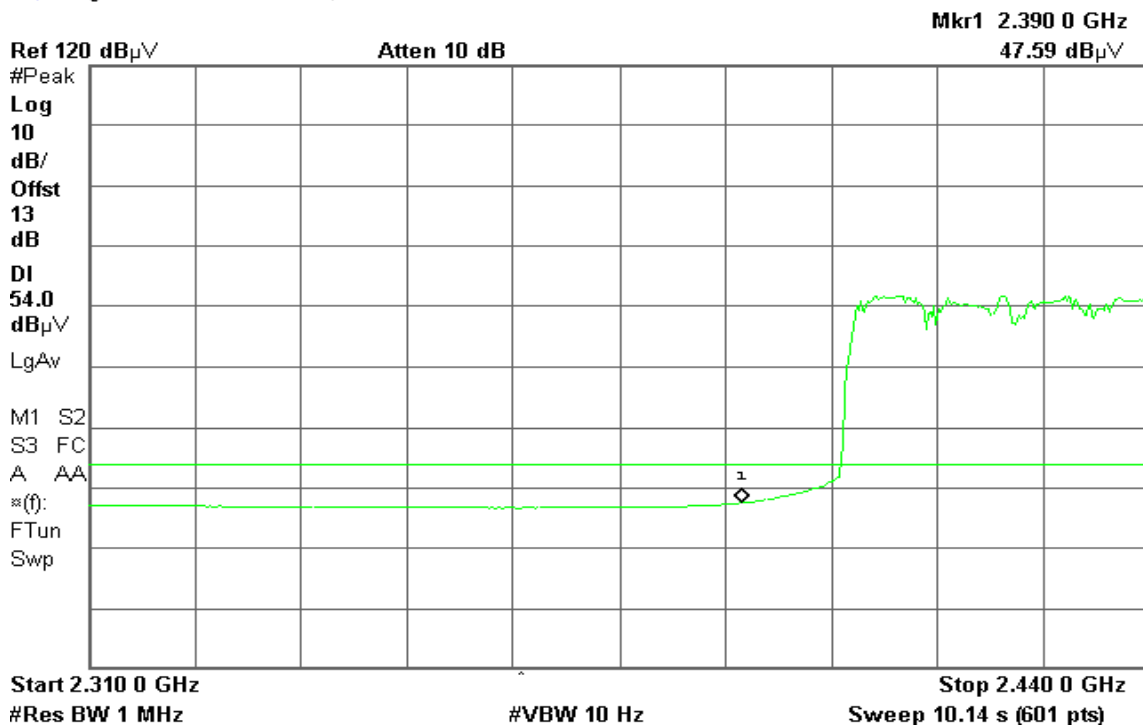


Detector mode: Average

Polarity: Horizontal

Agilent 20:54:14 Oct 19, 2006

R T





### Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH High)

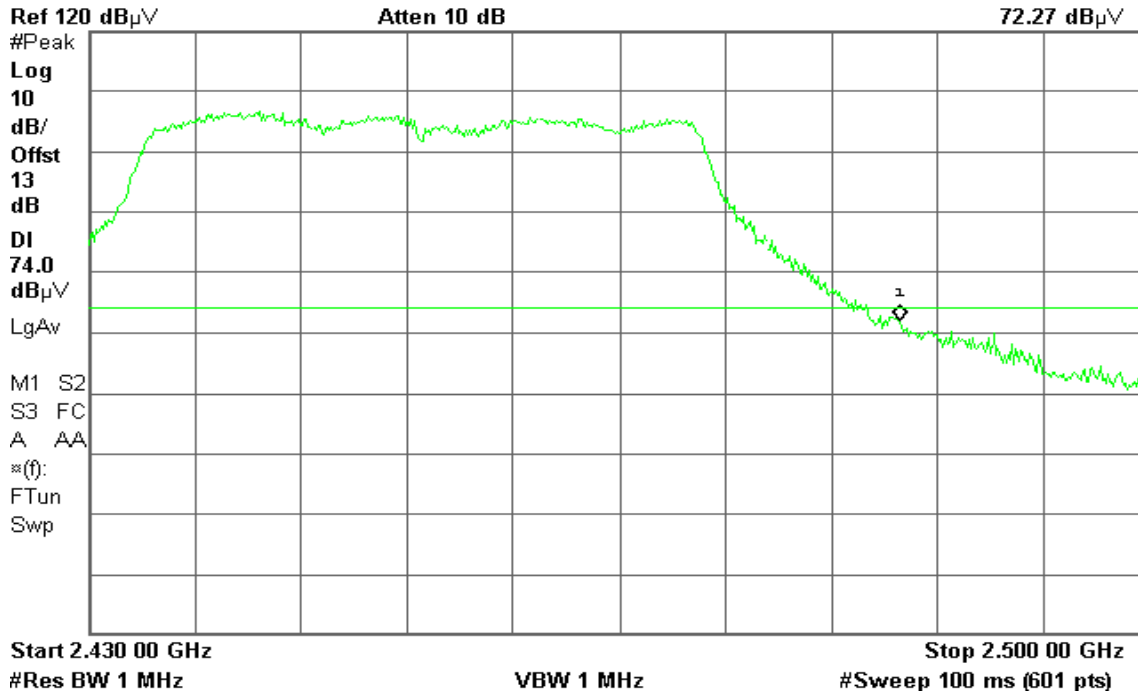
Detector mode: Peak

Polarity: Vertical

Agilent 20:38:45 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
72.27 dB $\mu$ V



Detector mode: Average

Polarity: Vertical

Agilent 20:38:16 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
52.98 dB $\mu$ V





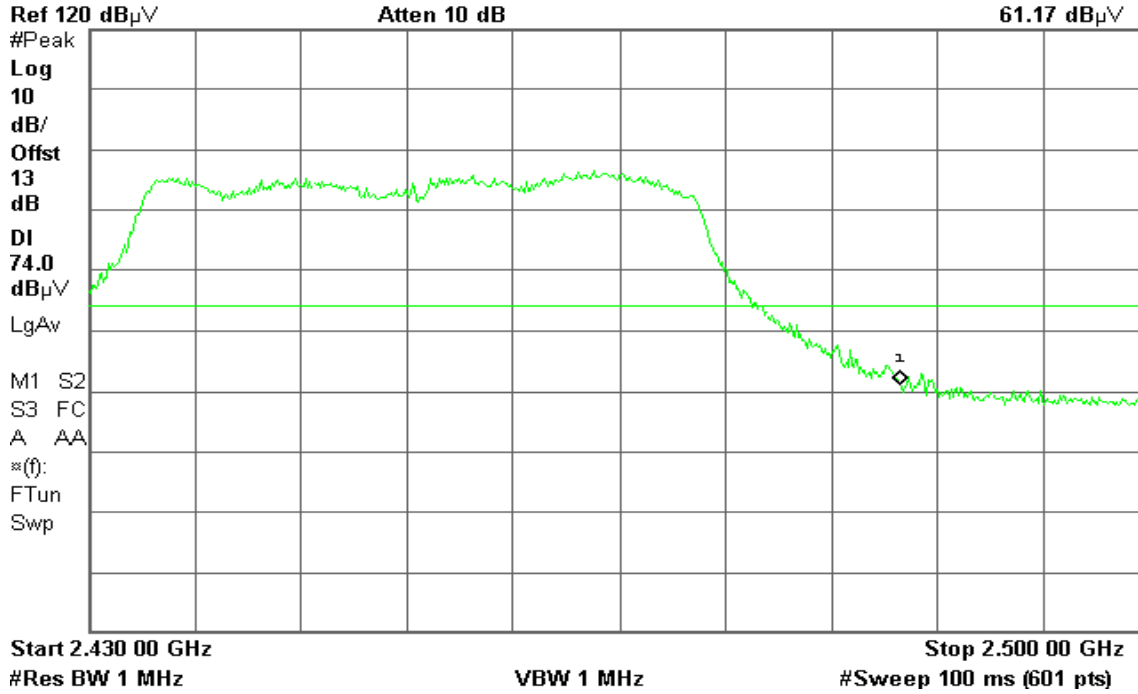
Detector mode: Peak

Polarity: Horizontal

Agilent 20:43:03 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
61.17 dB $\mu$ V



Detector mode: Average

Polarity: Horizontal

Agilent 20:42:45 Oct 19, 2006

R T

Mkr1 2.483 50 GHz  
47.83 dB $\mu$ V

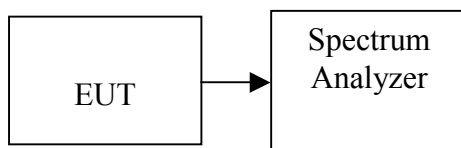


## 7.5 PEAK POWER SPECTRAL DENSITY

### 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 = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep time = 100 s
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: IEEE 802.11b mode**

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 2 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-11.79	-9.40	-7.42	8.00	PASS
Mid	2437	-12.17	-9.89	-7.87		PASS
High	2462	-14.29	-9.99	-8.62		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 2 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-7.99	-8.52	-5.24	8.00	PASS
Mid	2437	-15.34	-12.05	-10.38		PASS
High	2462	-15.52	-13.06	-11.11		PASS

**Test mode: draft 802.11n Standard-20 MHz Channel mode**

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 2 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-14.81	-12.75	-10.65	8.00	PASS
Mid	2437	-14.70	-12.68	-10.56		PASS
High	2462	-15.52	-12.56	-10.78		PASS

**Test mode: draft 802.11n Wide-40 MHz Channel mode**

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 2 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-19.63	-18.40	-15.96	8.00	PASS
Mid	2437	-19.10	-18.25	-15.64		PASS
High	2452	-12.38	-18.09	-11.35		PASS

**Remark:** Total PPSD (dBm) =  $10 * \text{LOG}(10^{(\text{Chain 0 PPSD} / 10)} + 10^{(\text{Chain 2 PPSD} / 10)})$



**Test mode: IEEE 802.11b mode with combiner**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-7.39	8.00	PASS
Mid	2437	-7.74		PASS
High	2462	-8.47		PASS

**Test mode: IEEE 802.11g mode with combiner**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-9.73	8.00	PASS
Mid	2437	-10.70		PASS
High	2462	-10.56		PASS

**Test mode: draft 802.11n Standard-20 MHz Channel mode with combiner**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-10.22	8.00	PASS
Mid	2437	-9.76		PASS
High	2462	-10.56		PASS

**Test mode: draft 802.11n Wide-40 MHz Channel mode with combiner**

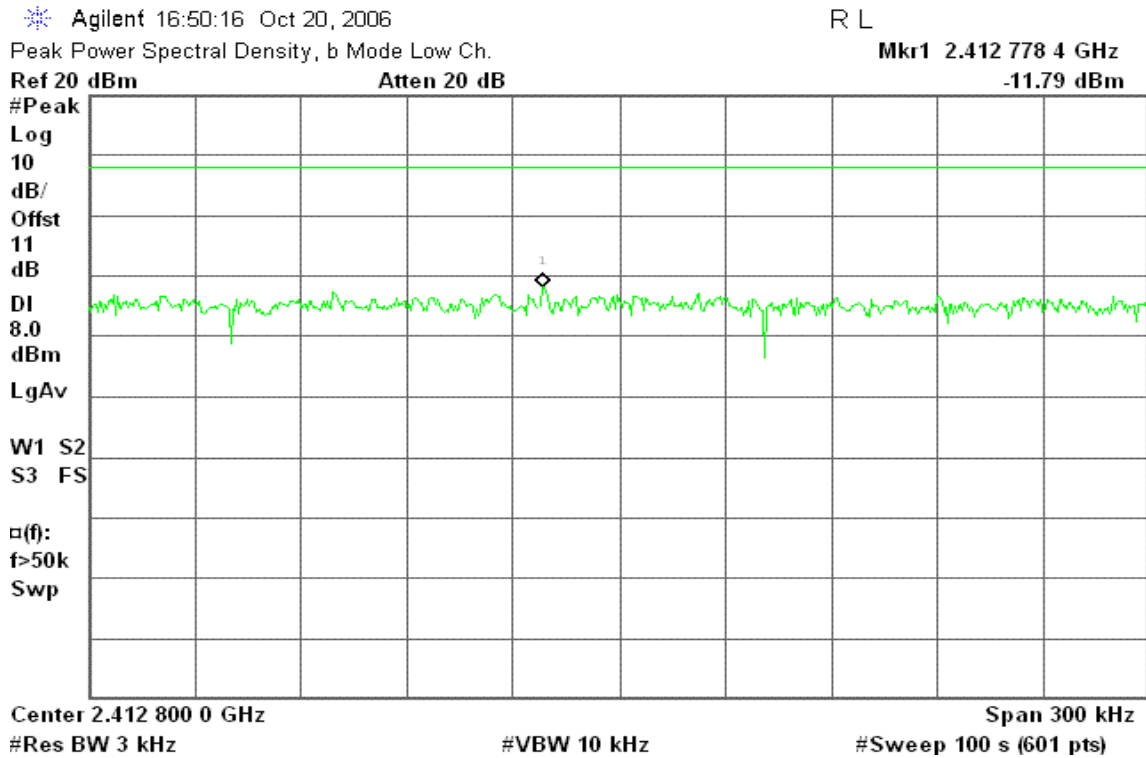
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-10.06	8.00	PASS
Mid	2437	-15.11		PASS
High	2462	-14.78		PASS



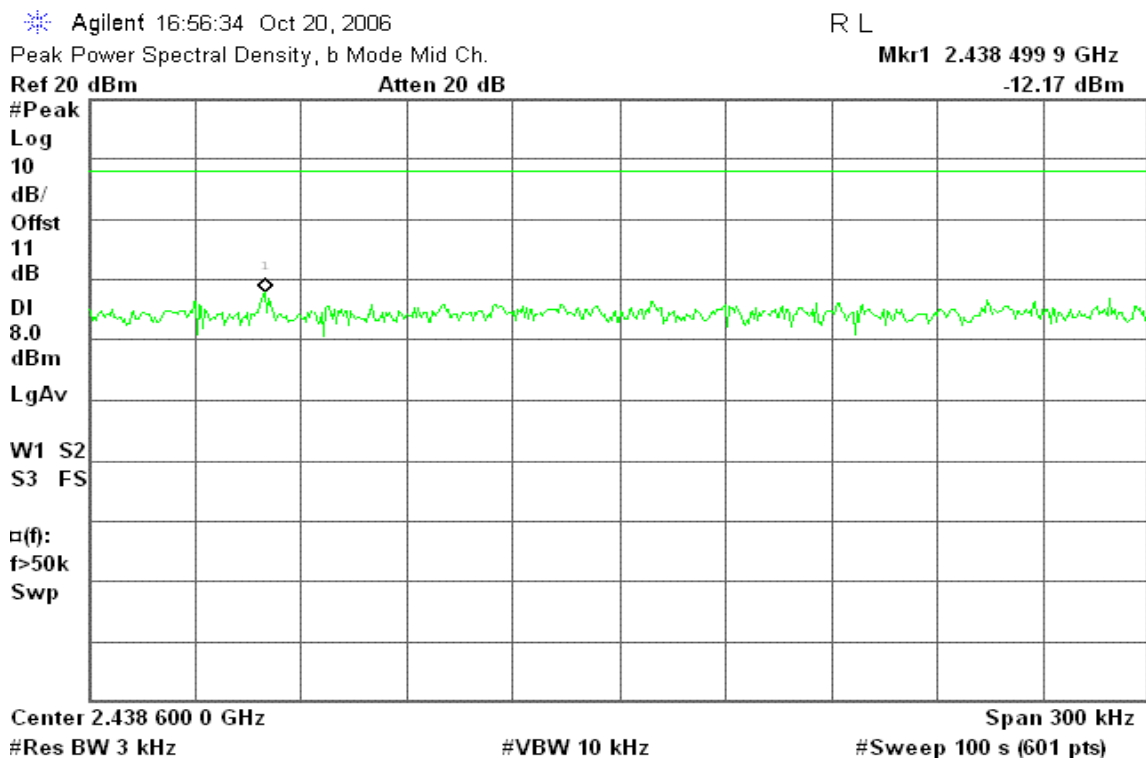
### Test Plot

### IEEE 802.11b mode / Chain 0

### PPSD (CH Low)



### PPSD (CH Mid)





### PPSD (CH High)

Agilent 16:05:30 Oct 20, 2006

R L

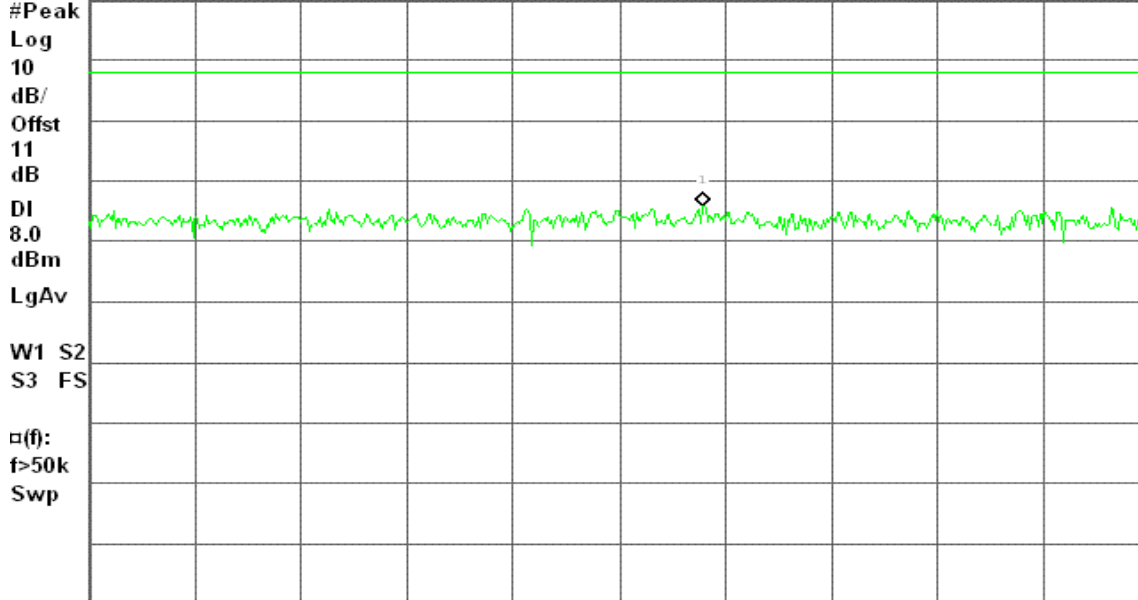
Peak Power Spectral Density, b Mode High Ch.

Mkr1 2.464 823 6 GHz

Ref 20 dBm

Atten 20 dB

-14.29 dBm



Center 2.464 800 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### IEEE 802.11b mode / Chain 2

### PPSD (CH Low)

Agilent 13:07:24 Oct 20, 2006

R L

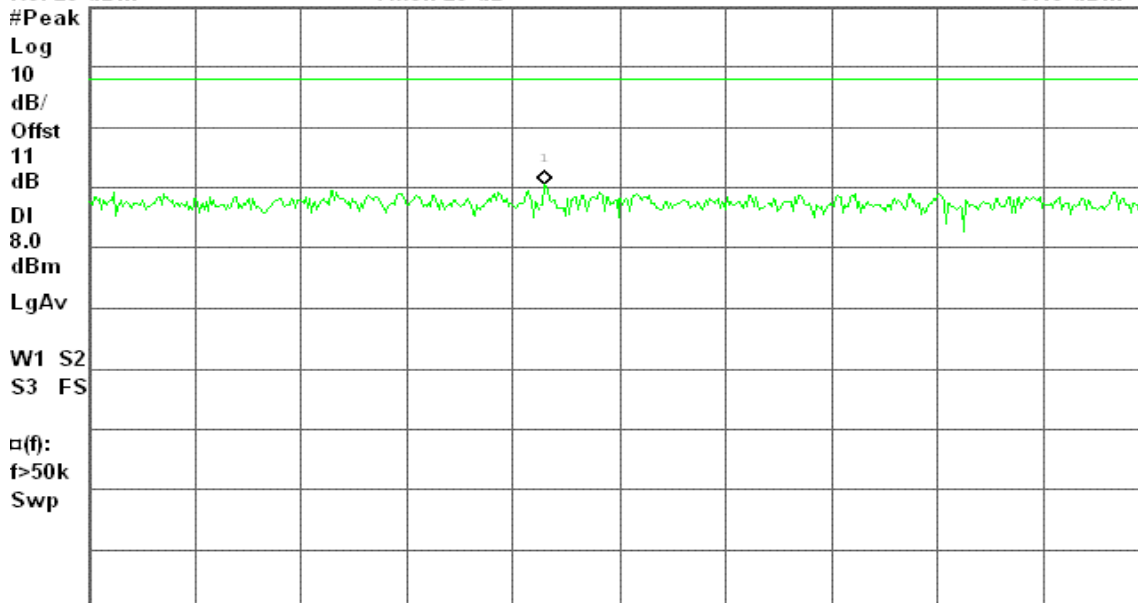
Peak Power Spectral Density, b Mode Low Ch.

Mkr1 2.412 778 9 GHz

Ref 20 dBm

Atten 20 dB

-9.40 dBm



Center 2.412 800 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



### PPSD (CH Mid)

Agilent 13:18:22 Oct 20, 2006

R L

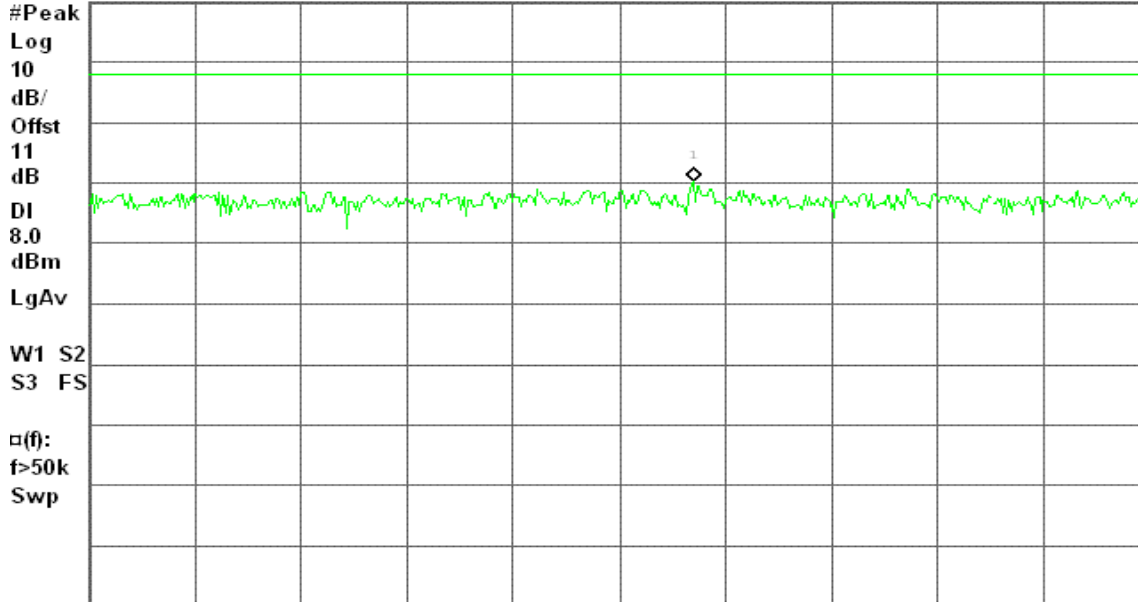
Peak Power Spectral Density, b Mode Mid Ch.

Mkr1 2.436 221 1 GHz

Ref 20 dBm

Atten 20 dB

-9.89 dBm



Center 2.436 200 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### PPSD (CH High)

Agilent 13:24:01 Oct 20, 2006

R L

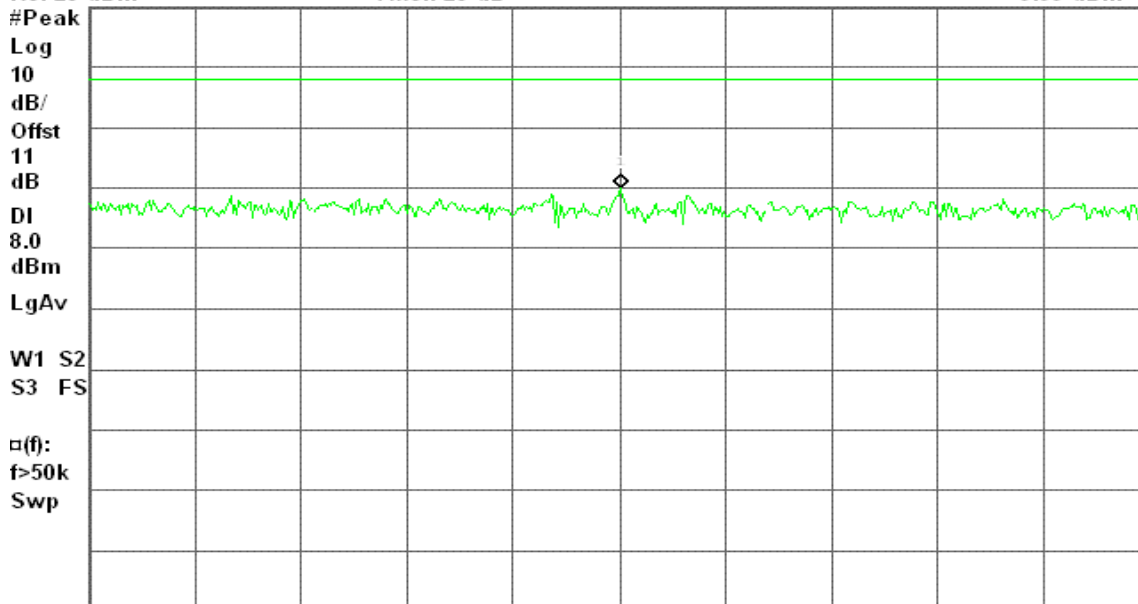
Peak Power Spectral Density, b Mode High Ch.

Mkr1 2.460 500 5 GHz

Ref 20 dBm

Atten 20 dB

-9.99 dBm



Center 2.460 500 0 GHz

Span 300 kHz

#Res BW 3 kHz

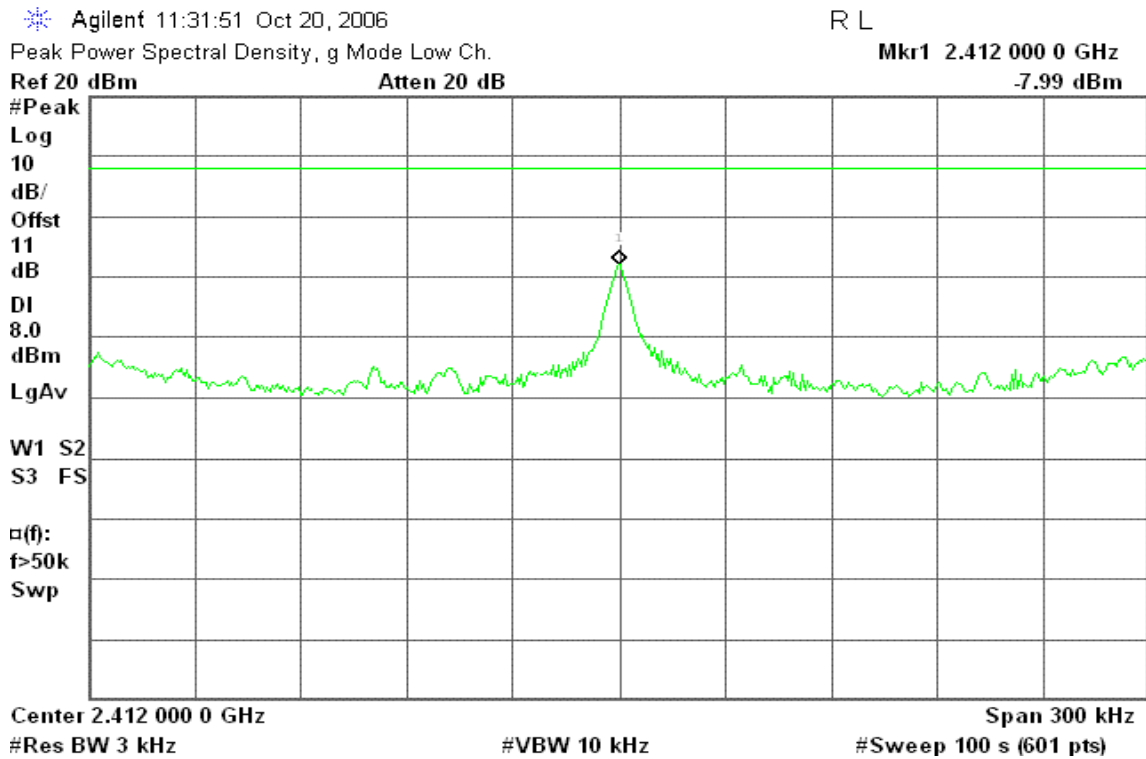
#VBW 10 kHz

#Sweep 100 s (601 pts)

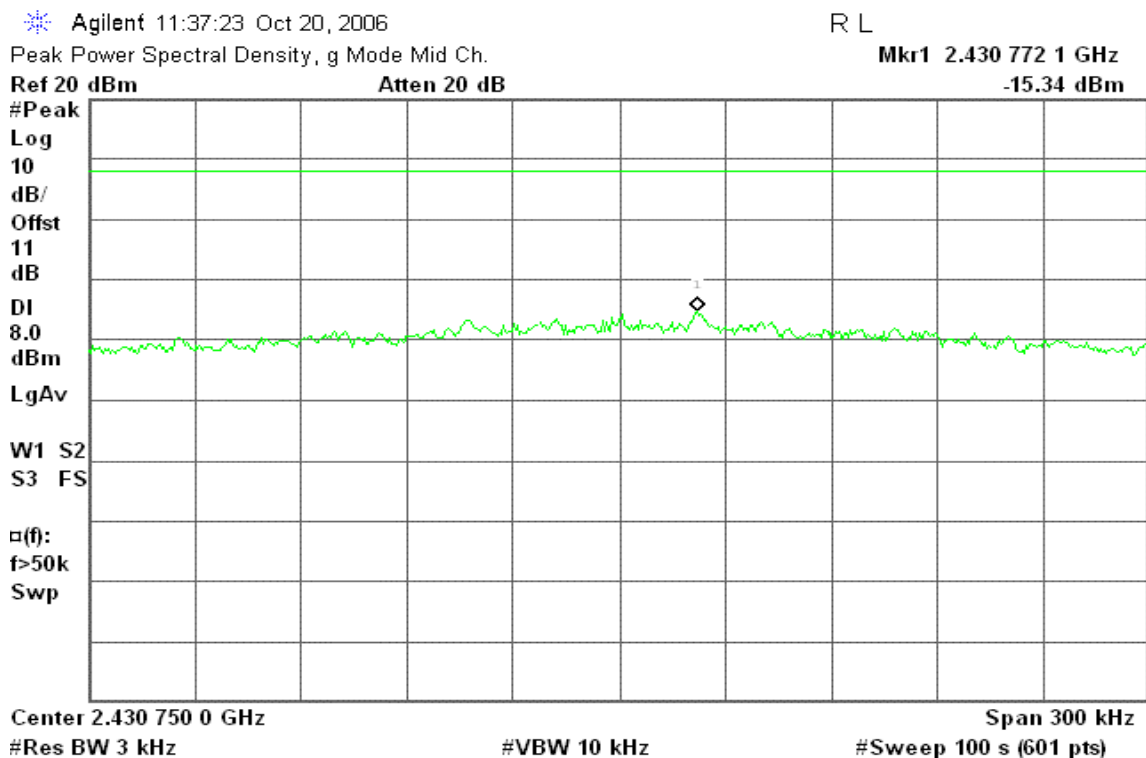


### IEEE 802.11g mode / Chain 0

#### PPSD (CH Low)

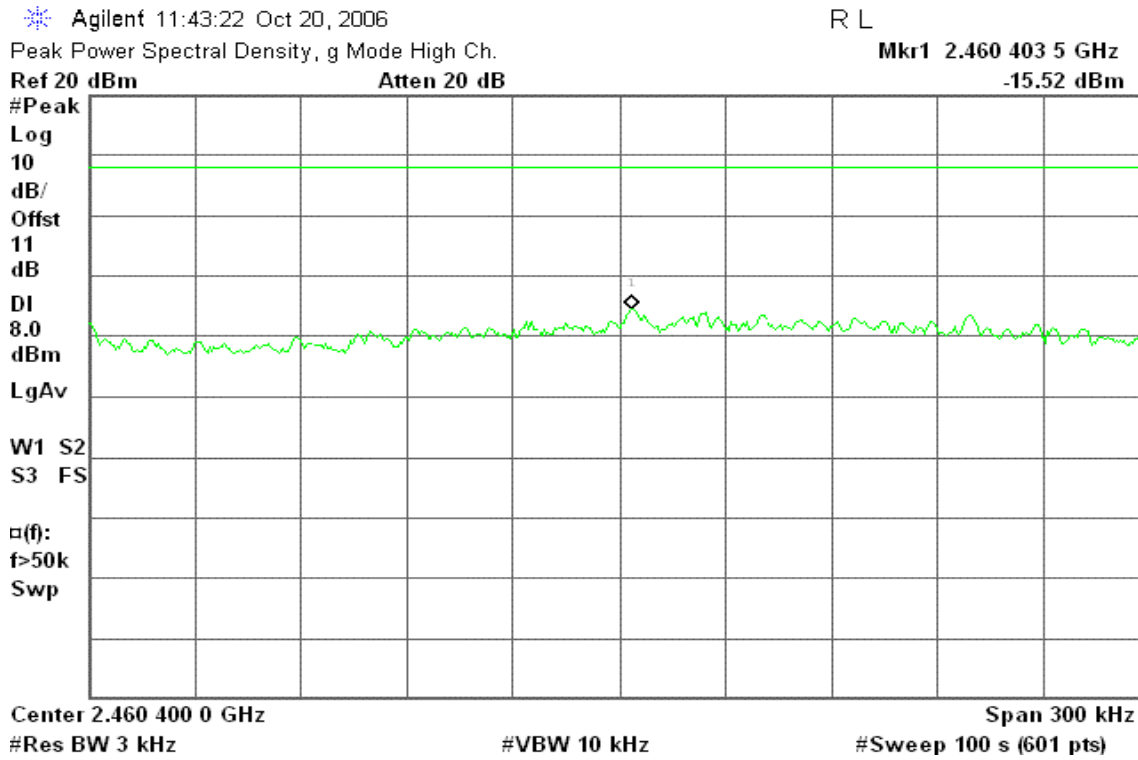


#### PPSD (CH Mid)



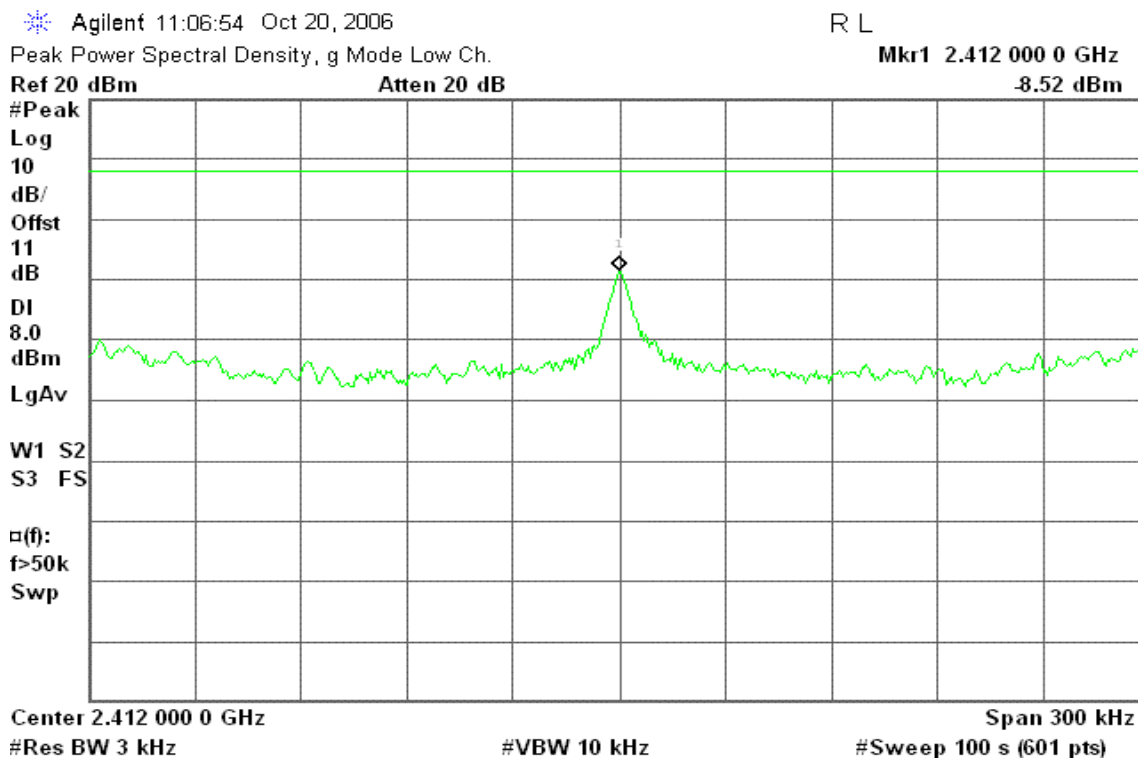


### PPSD (CH High)



### IEEE 802.11g mode / Chain 2

### PPSD (CH Low)





### PPSD (CH Mid)

Agilent 11:13:40 Oct 20, 2006

R L

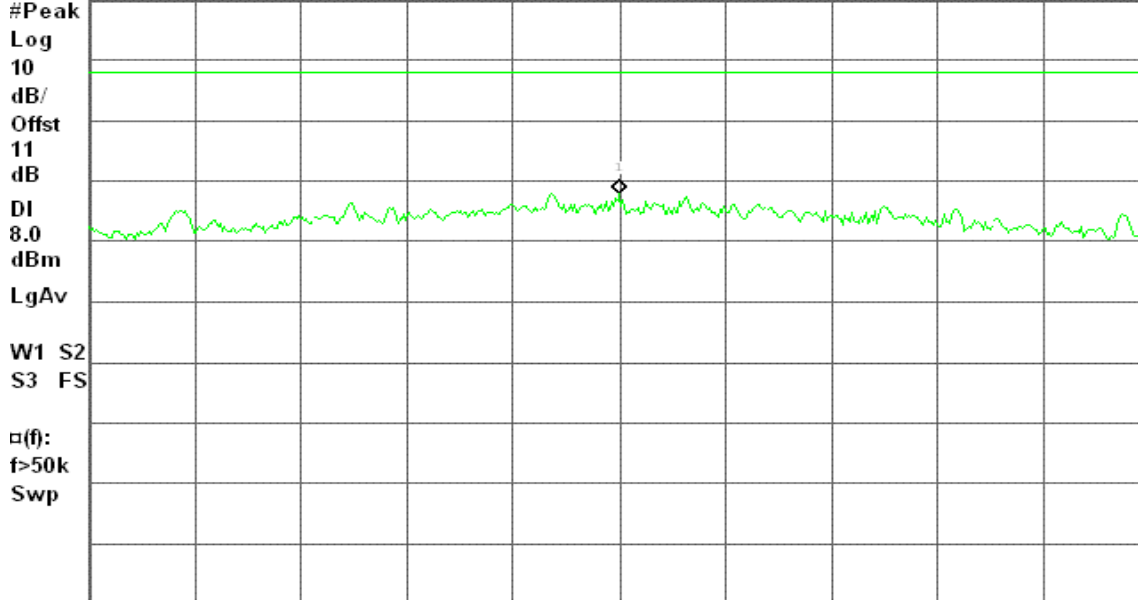
Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.435 750 0 GHz

Ref 20 dBm

Atten 20 dB

-12.05 dBm



Center 2.435 750 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### PPSD (CH High)

Agilent 11:25:57 Oct 20, 2006

R L

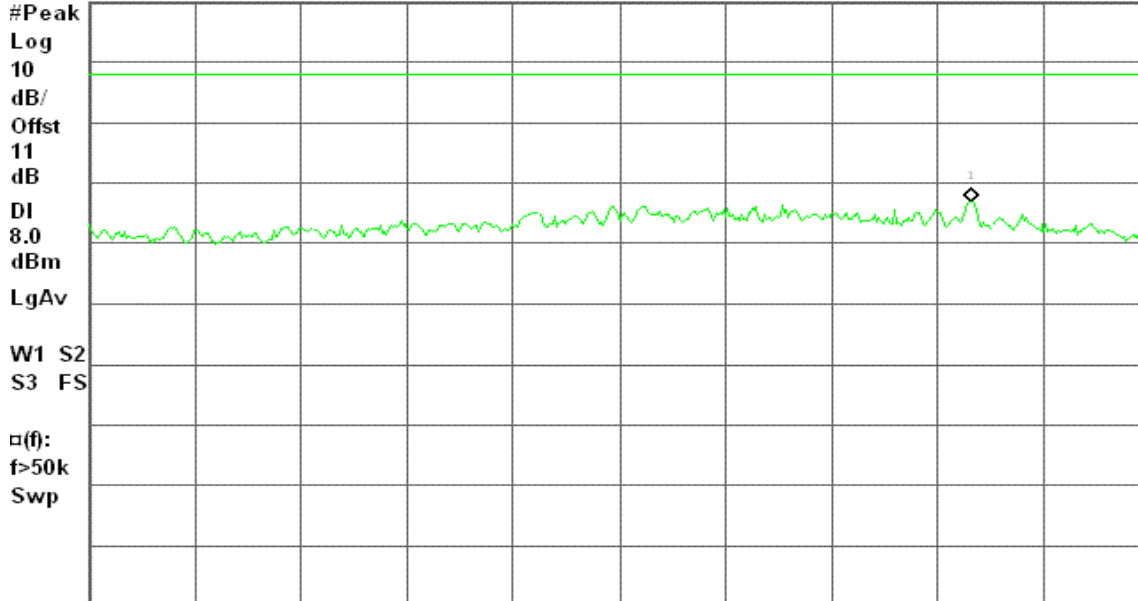
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.461 750 2 GHz

Ref 20 dBm

Atten 20 dB

-13.06 dBm



Center 2.461 650 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)





### draft 802.11n Standard-20 MHz Channel mode / Chain 0

#### PPSD (CH Low)

Agilent 18:49:31 Oct 20, 2006

R T

Peak Power Spectral Density, g Mode Low Ch.

Mkr1 2.412 292 7 GHz

Ref 20 dBm

Atten 20 dB

-14.81 dBm

#Peak

Log

10

dB/

Offst

11

dB

DI

8.0

dBm

LgAv

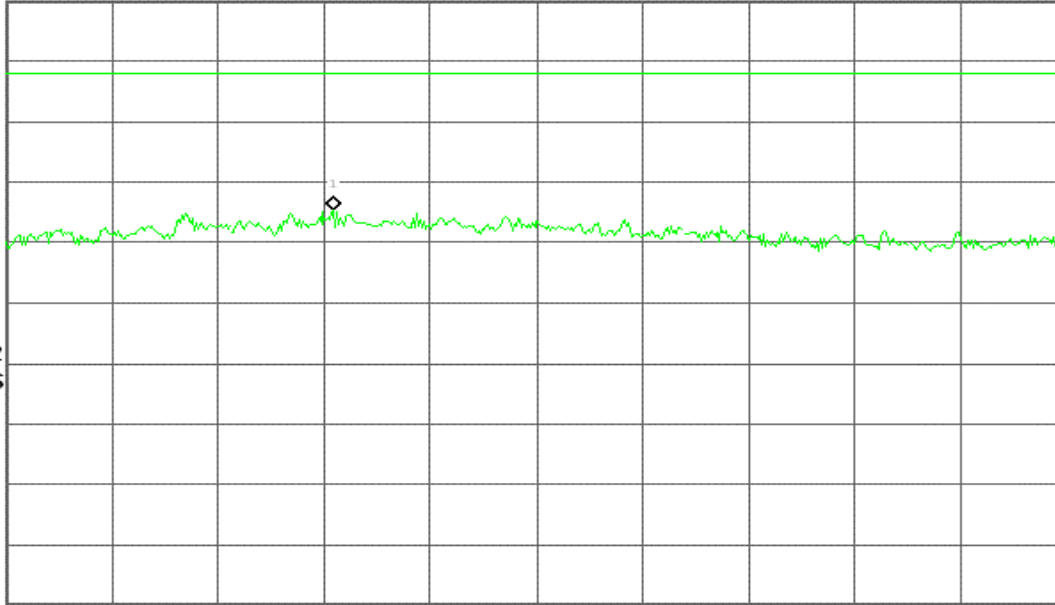
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.412 350 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

#### PPSD (CH Mid)

Agilent 19:28:20 Oct 20, 2006

R L

Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.438 248 9 GHz

Ref 20 dBm

Atten 20 dB

-14.70 dBm

#Peak

Log

10

dB/

Offst

11

dB

DI

8.0

dBm

LgAv

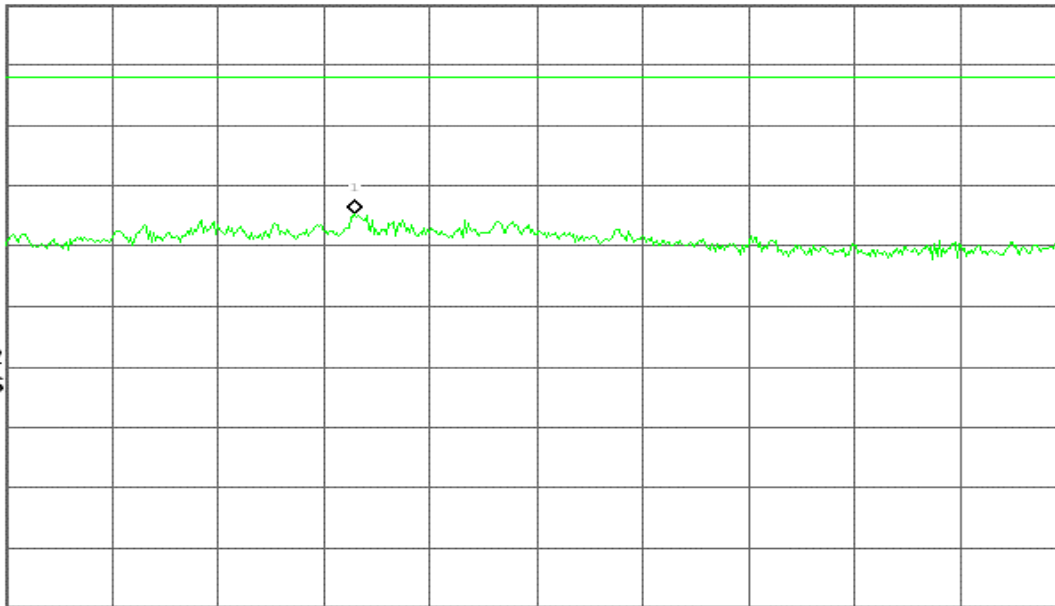
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.438 300 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



### PPSD (CH High)

Agilent 19:36:13 Oct 20, 2006

R L

Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.464 499 5 GHz

Ref 20 dBm

Atten 20 dB

-15.52 dBm

#Peak

Log

10

dB/

Offst

11

dB

DI

8.0

dBm

LgAv

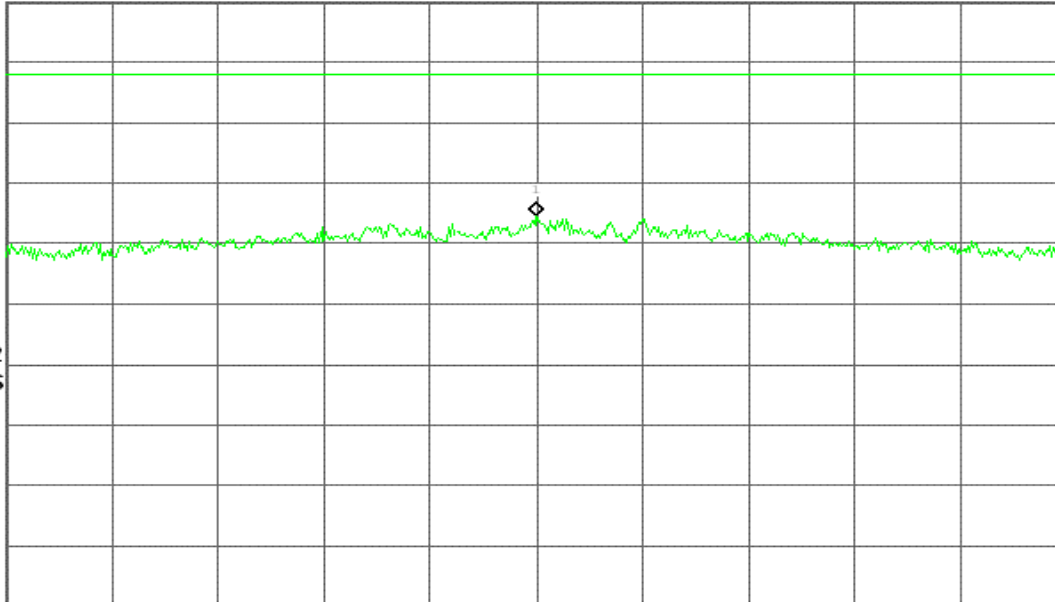
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.464 500 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### draft 802.11n Standard-20 MHz Channel mode / Chain 2

### PPSD (CH Low)

Agilent 18:30:49 Oct 20, 2006

R L

Peak Power Spectral Density, g Mode Low Ch.

Mkr1 2.410 488 1 GHz

Ref 20 dBm

Atten 20 dB

-12.75 dBm

#Peak

Log

10

dB/

Offst

11

dB

DI

8.0

dBm

LgAv

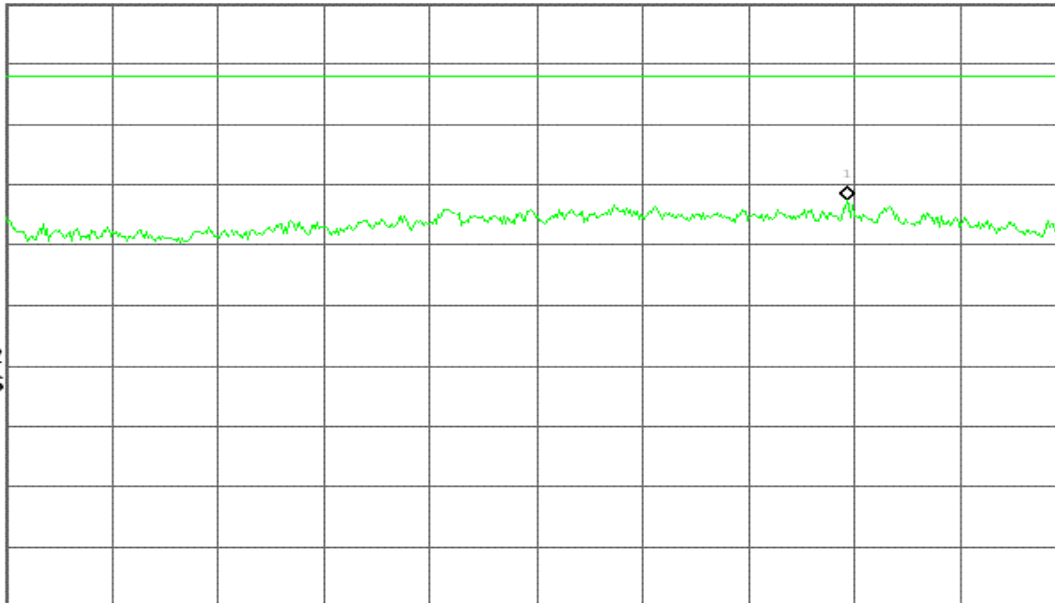
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.410 400 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



### PPSD (CH Mid)

Agilent 18:36:51 Oct 20, 2006

R L

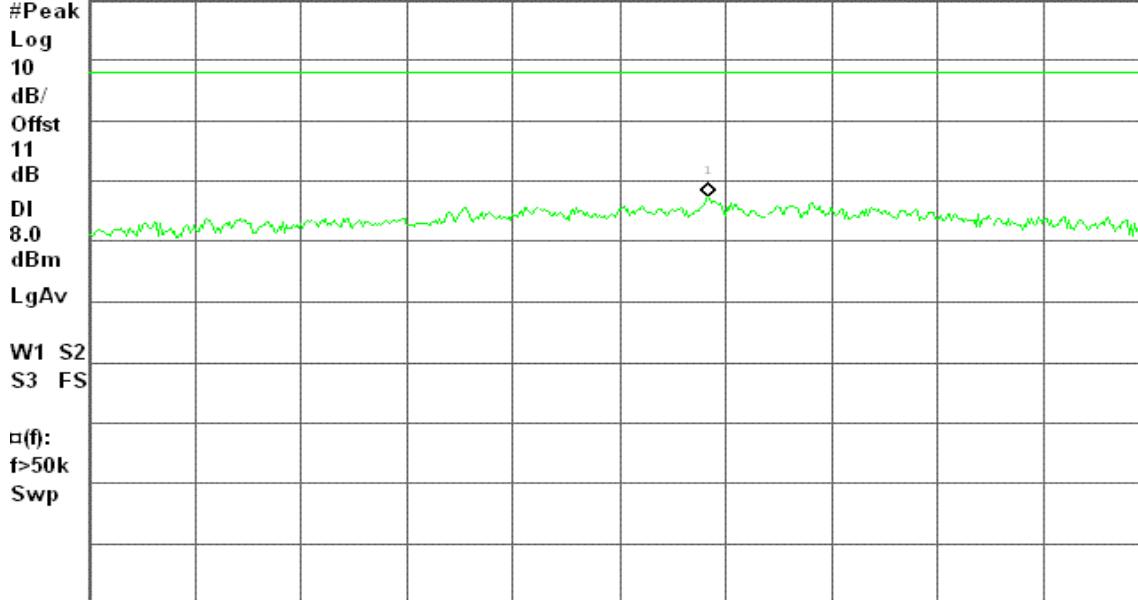
Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.436 375 1 GHz

Ref 20 dBm

Atten 20 dB

-12.68 dBm



Center 2.436 350 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### PPSD (CH High)

Agilent 18:42:39 Oct 20, 2006

R L

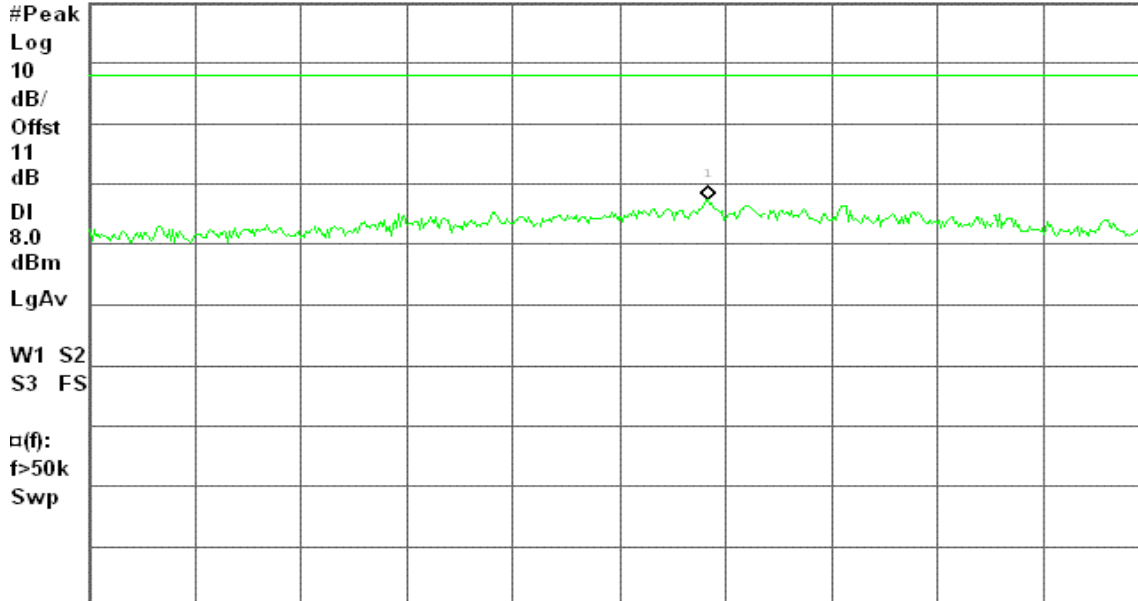
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.462 625 1 GHz

Ref 20 dBm

Atten 20 dB

-12.56 dBm



Center 2.462 600 0 GHz

Span 300 kHz

#Res BW 3 kHz

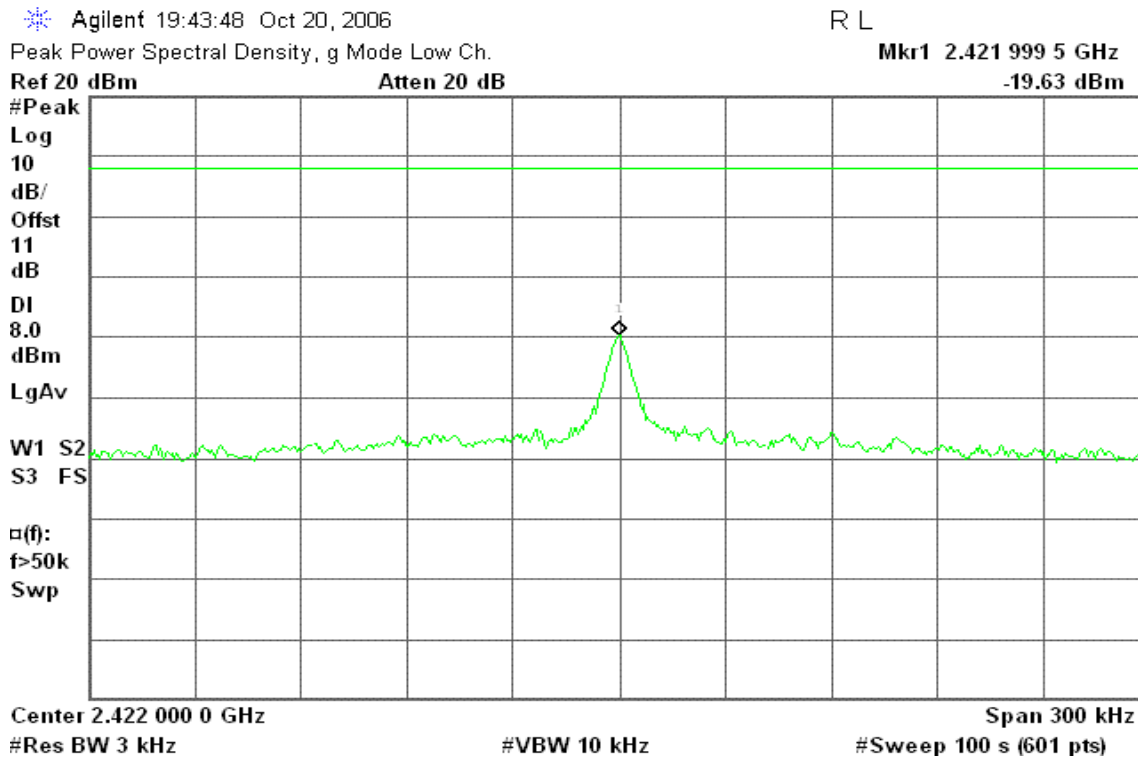
#VBW 10 kHz

#Sweep 100 s (601 pts)

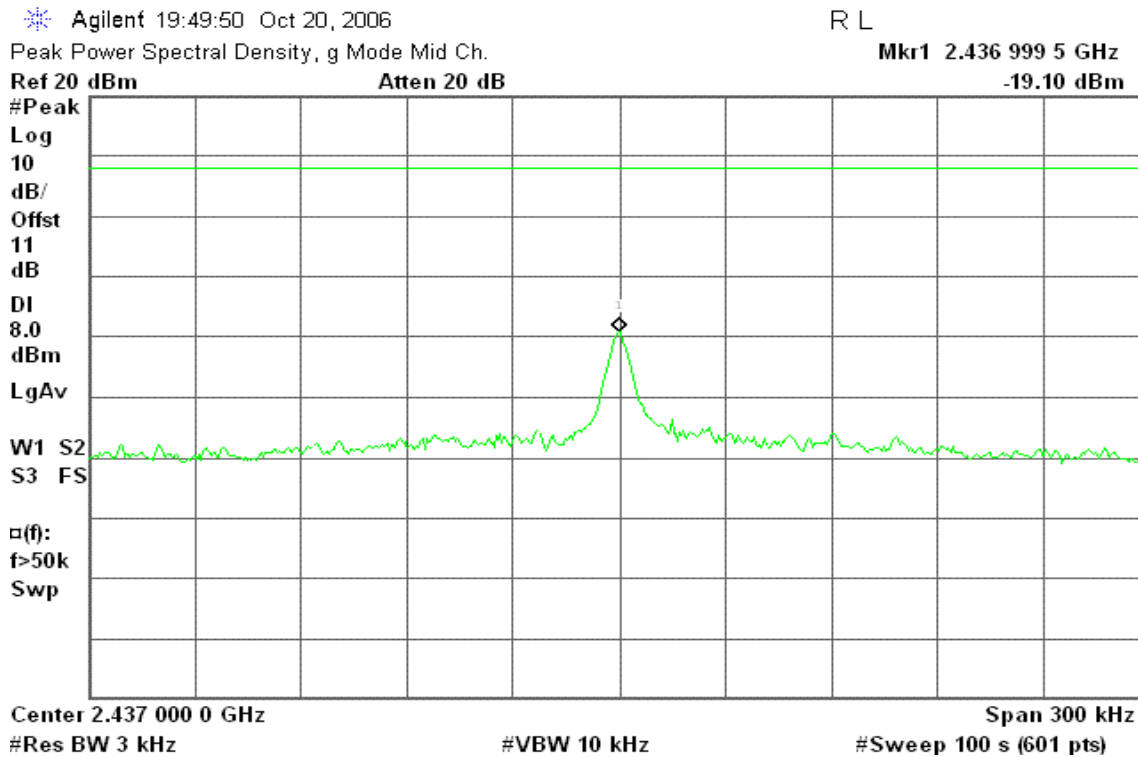


### draft 802.11n Wide-40 MHz Channel mode / Chain 0

#### PPSD (CH Low)



#### PPSD (CH Mid)





### PPSD (CH High)

Agilent 19:55:46 Oct 20, 2006

R L

Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.451 999 5 GHz

Ref 20 dBm

Atten 20 dB

-12.38 dBm

#Peak

Log

10

dB/

Offst

11

dB

DI

8.0

dBm

LgAv

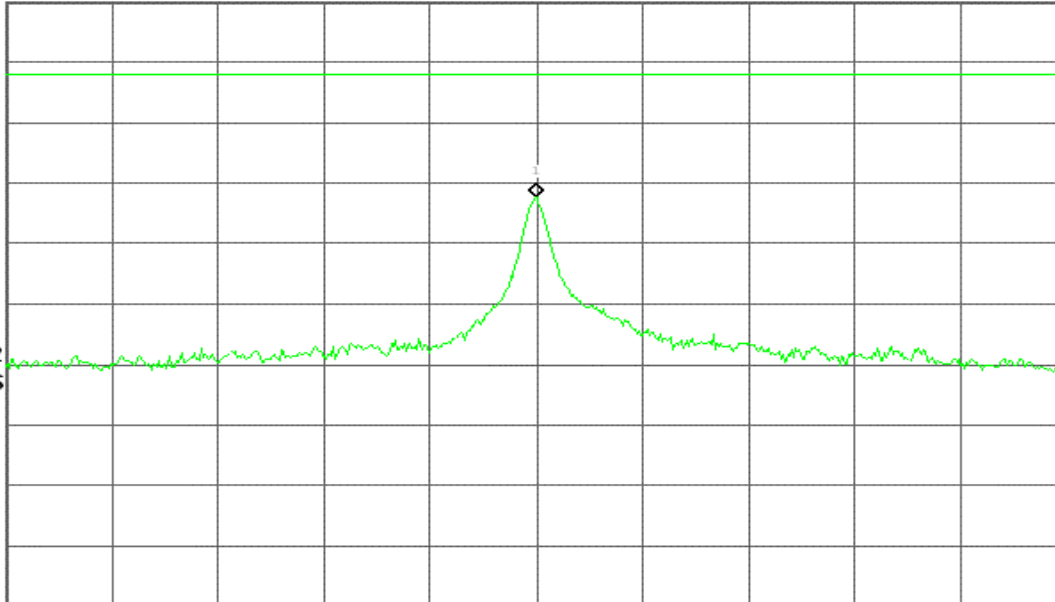
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.452 000 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### draft 802.11n Wide-40 MHz Channel mode / Chain 2

### PPSD (CH Low)

Agilent 20:02:55 Oct 20, 2006

R L

Peak Power Spectral Density, g Mode Low Ch.

Mkr1 2.414 499 5 GHz

Ref 20 dBm

Atten 20 dB

-18.40 dBm

#Peak

Log

10

dB/

Offst

11

dB

DI

8.0

dBm

LgAv

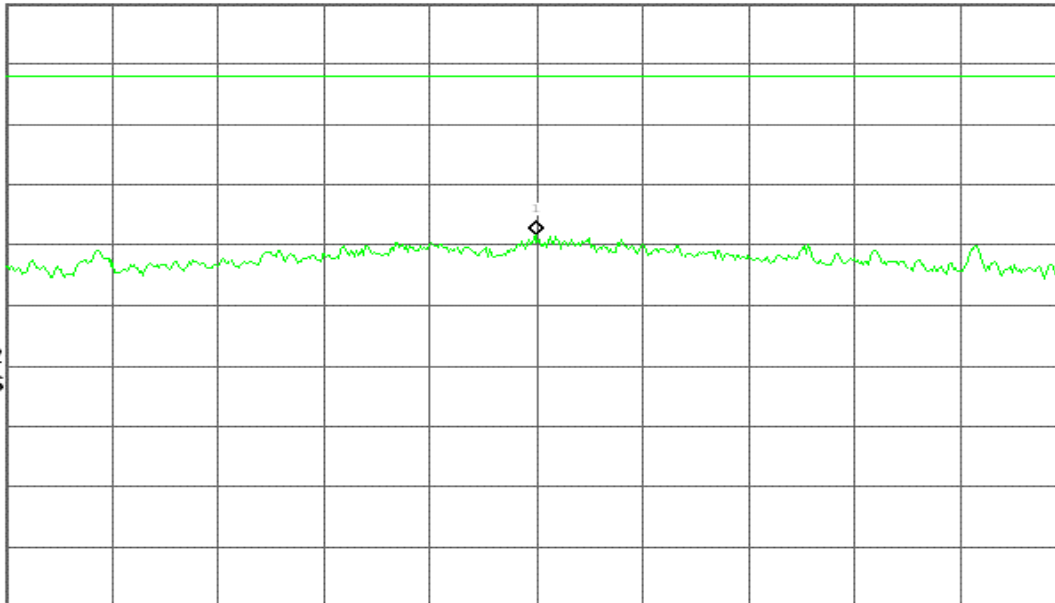
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.414 500 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



### PPSD (CH Mid)

Agilent 20:09:17 Oct 20, 2006

R L

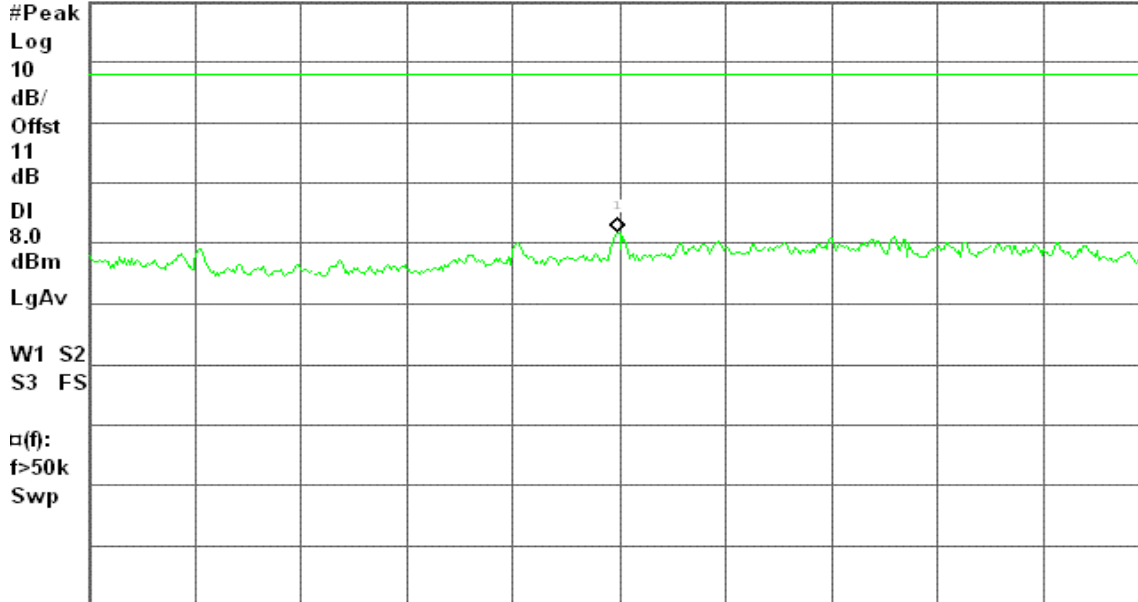
Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.432 249 0 GHz

Ref 20 dBm

Atten 20 dB

-18.25 dBm



Center 2.432 250 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### PPSD (CH High)

Agilent 20:15:17 Oct 20, 2006

R L

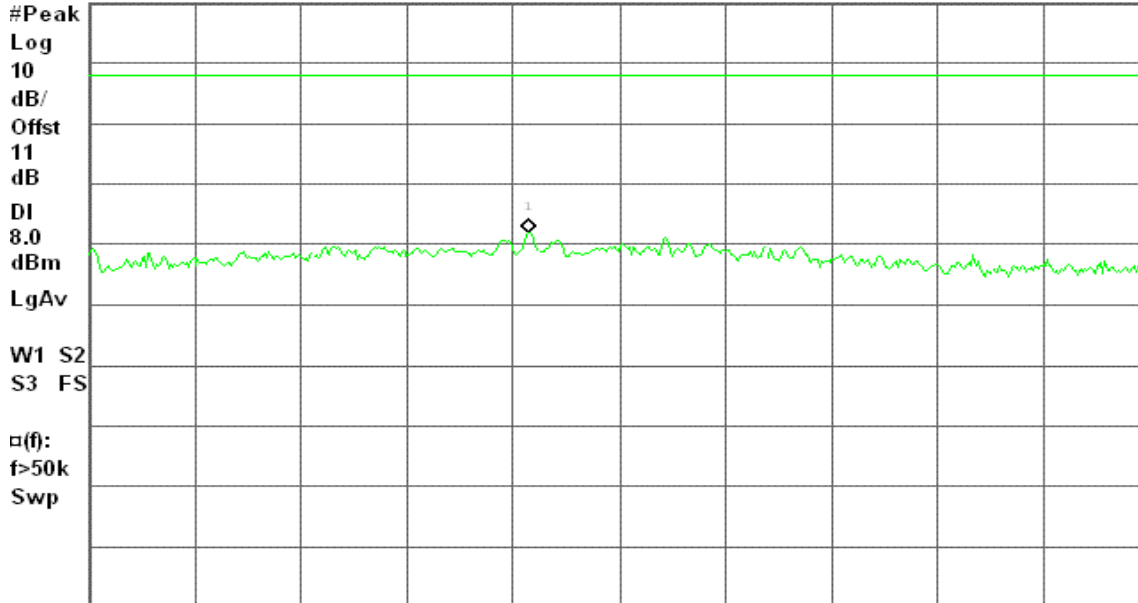
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.446 374 4 GHz

Ref 20 dBm

Atten 20 dB

-18.09 dBm



Center 2.446 400 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



### IEEE 802.11b mode with combiner

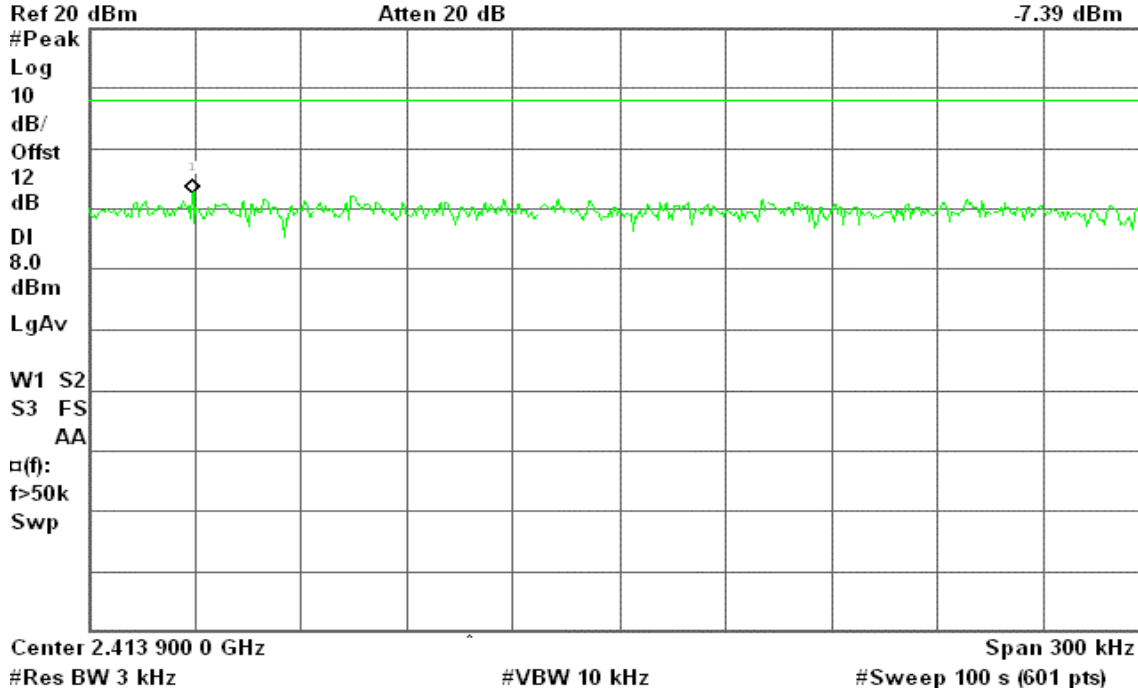
#### PPSD (CH Low)

Agilent 16:14:56 Oct 20, 2006

L

Mkr1 2.413 778 1 GHz

-7.39 dBm



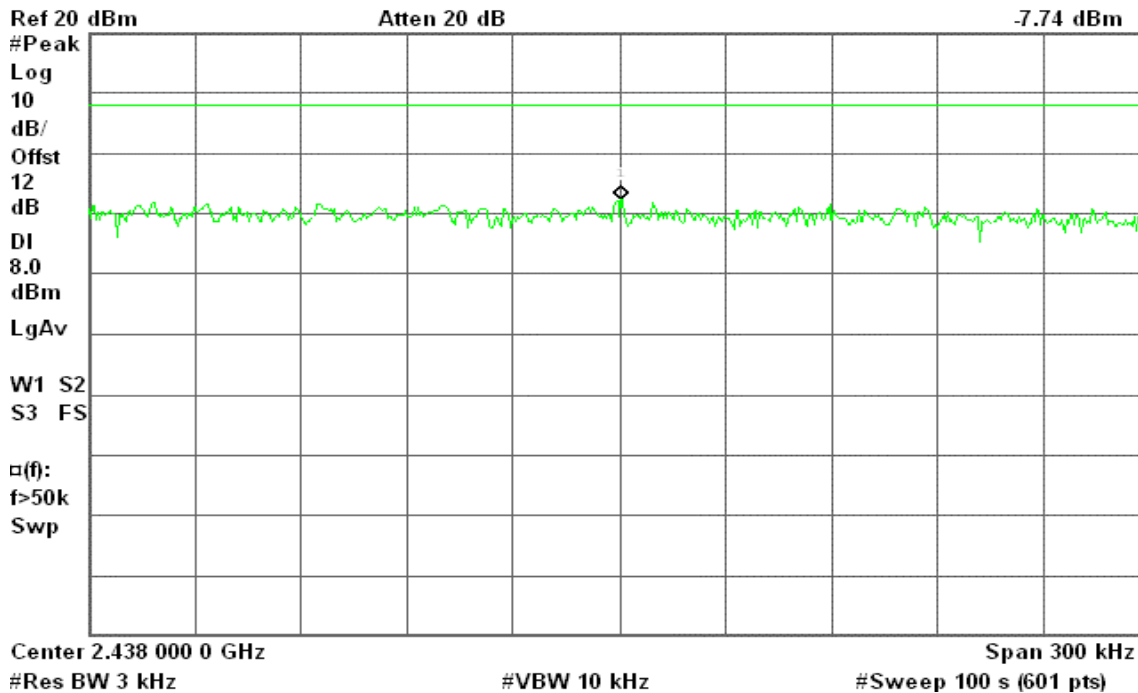
#### PPSD (CH Mid)

Agilent 16:05:36 Oct 20, 2006

R L

Mkr1 2.438 000 5 GHz

-7.74 dBm



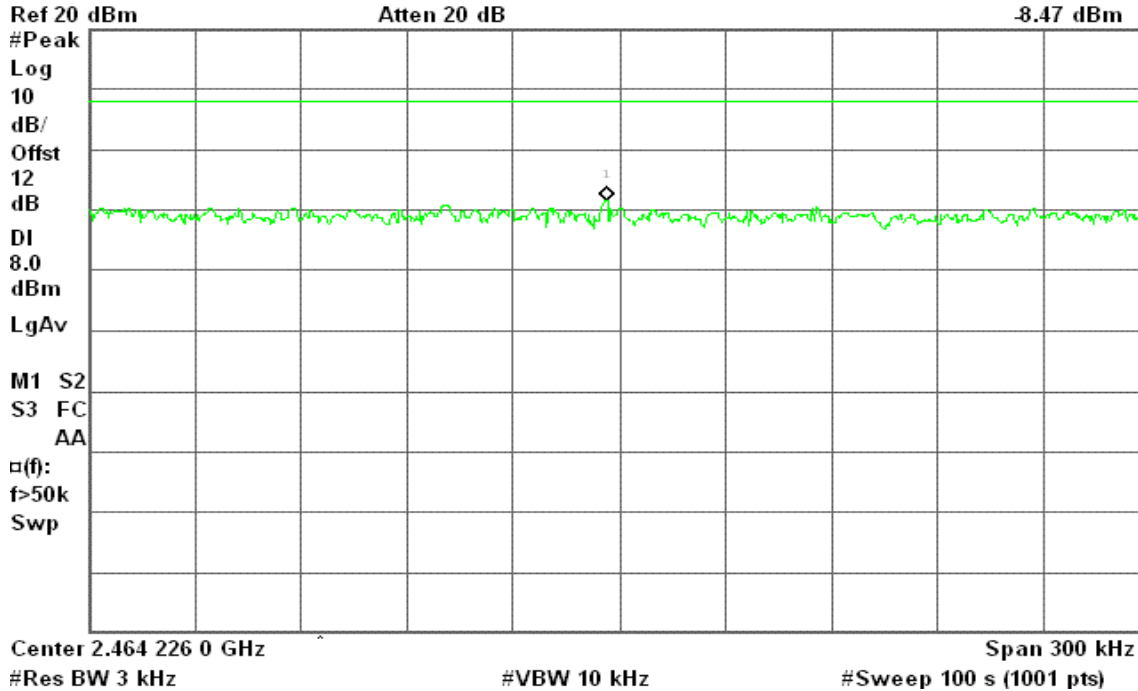


### PPSD (CH High)

Agilent 16:49:31 Oct 20, 2006

L

Mkr1 2.464 222 1 GHz  
-8.47 dBm



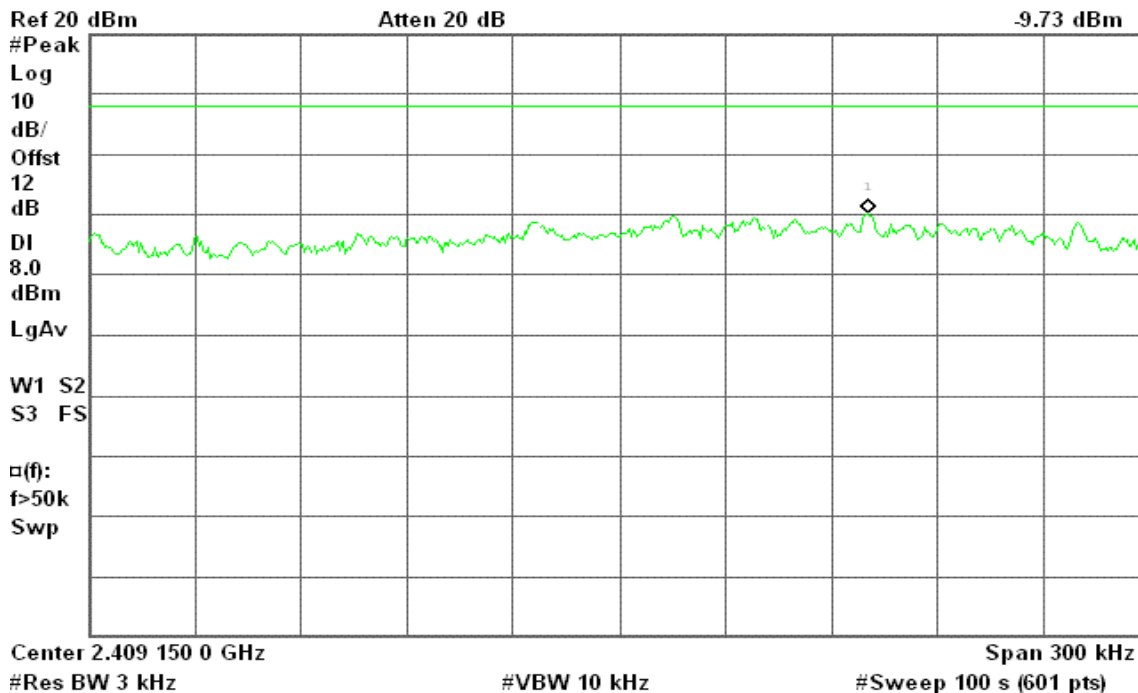
### IEEE 802.11g mode with combiner

### PPSD (CH Low)

Agilent 16:18:18 Oct 20, 2006

R T

Mkr1 2.409 220 6 GHz  
-9.73 dBm





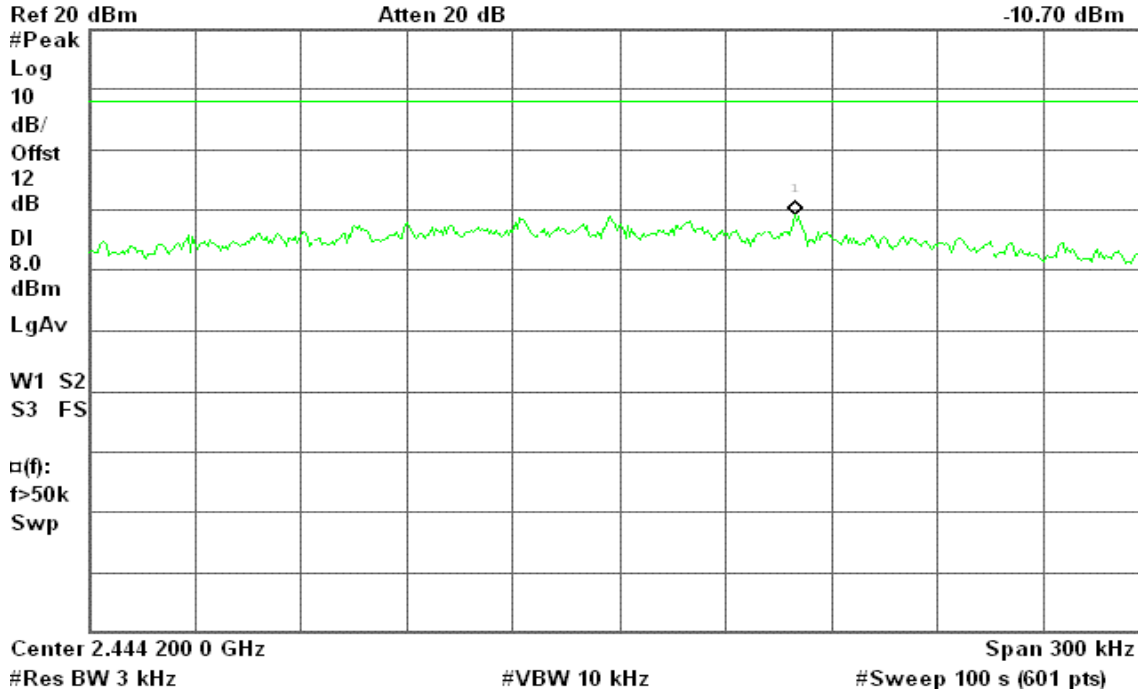


### PPSD (CH Mid)

Agilent 16:21:43 Oct 20, 2006

R L

Mkr1 2.444 249 8 GHz  
-10.70 dBm

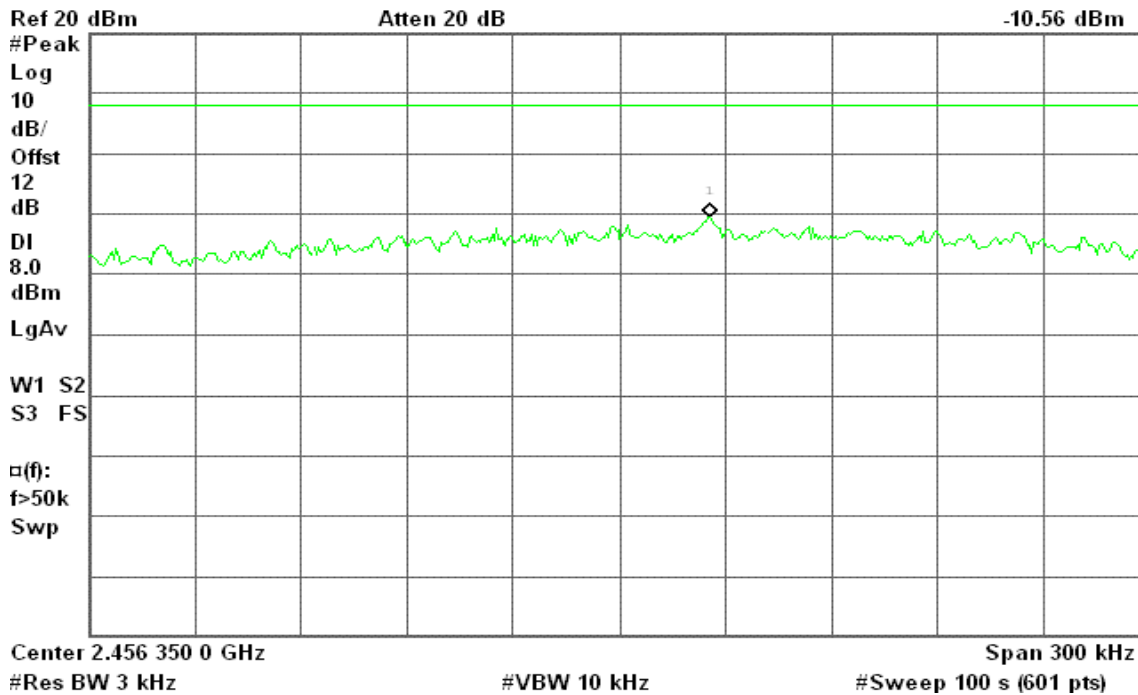


### PPSD (CH High)

Agilent 16:24:28 Oct 20, 2006

R L

Mkr1 2.456 375 6 GHz  
-10.56 dBm





**draft 802.11n Standard-20 MHz Channel mode with combiner**

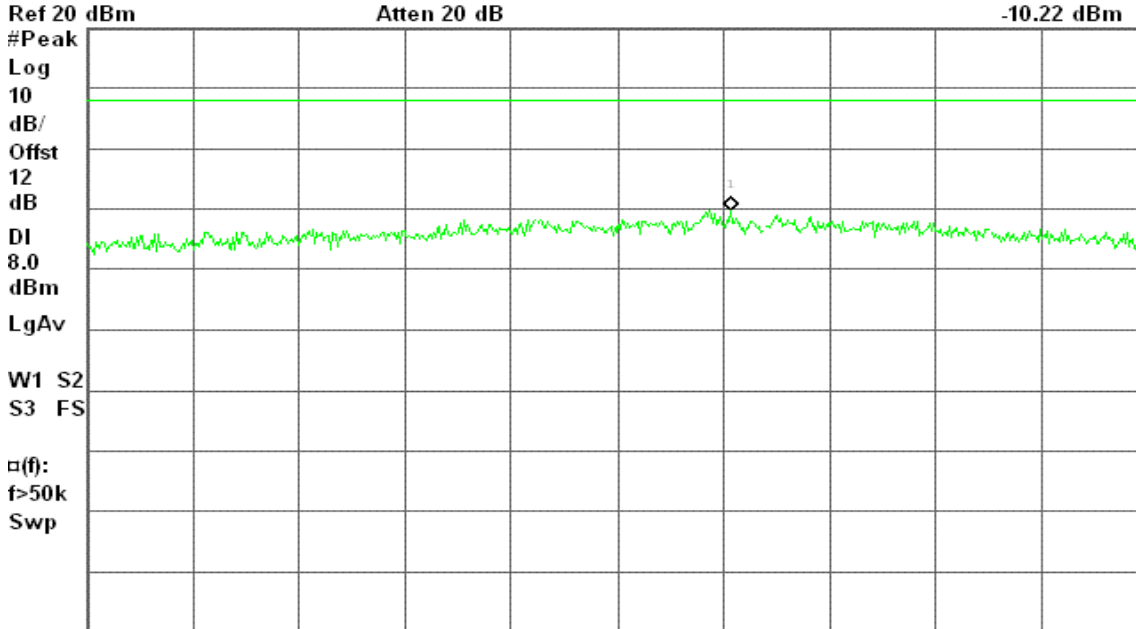
**PPSD (CH Low)**

Agilent 16:27:34 Oct 20, 2006

R L

Mkr1 2.411 382 1 GHz

-10.22 dBm



Center 2.411 350 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

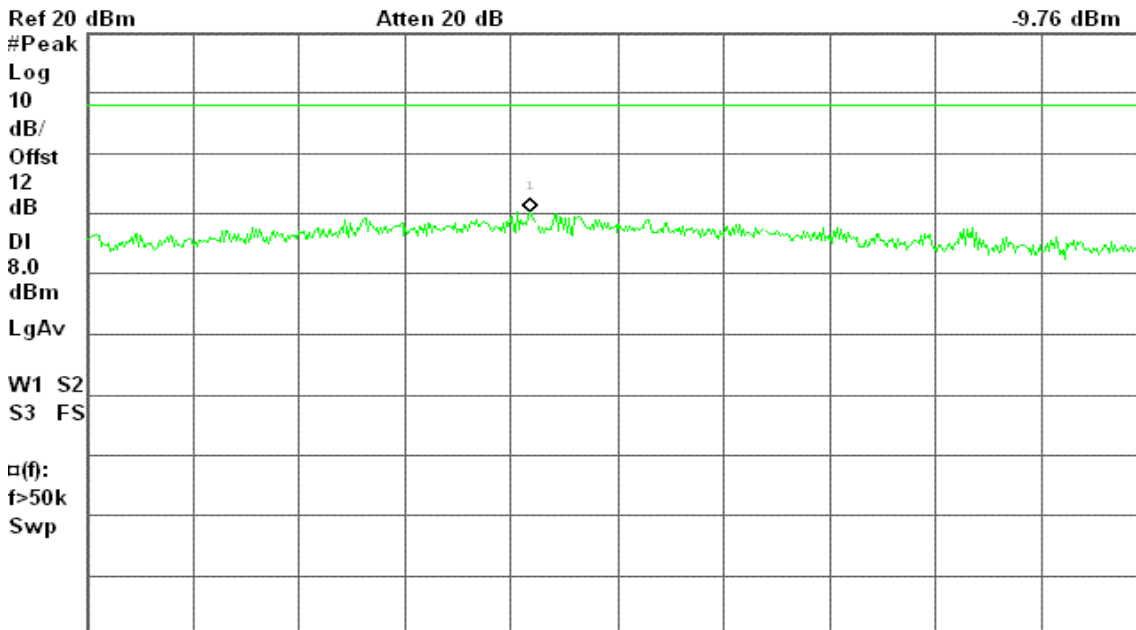
**PPSD (CH Mid)**

Agilent 16:31:30 Oct 20, 2006

R L

Mkr1 2.433 875 4 GHz

-9.76 dBm



Center 2.433 900 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

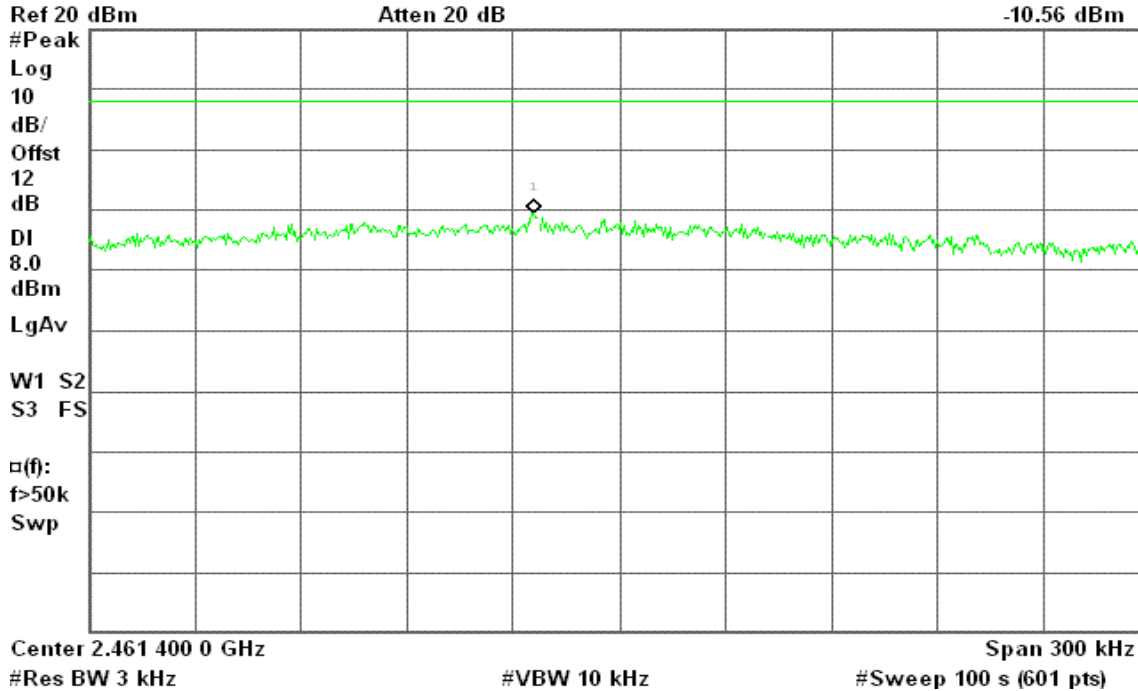


### PPSD (CH High)

Agilent 16:34:09 Oct 20, 2006

R L

Mkr1 2.461 375 9 GHz  
-10.56 dBm



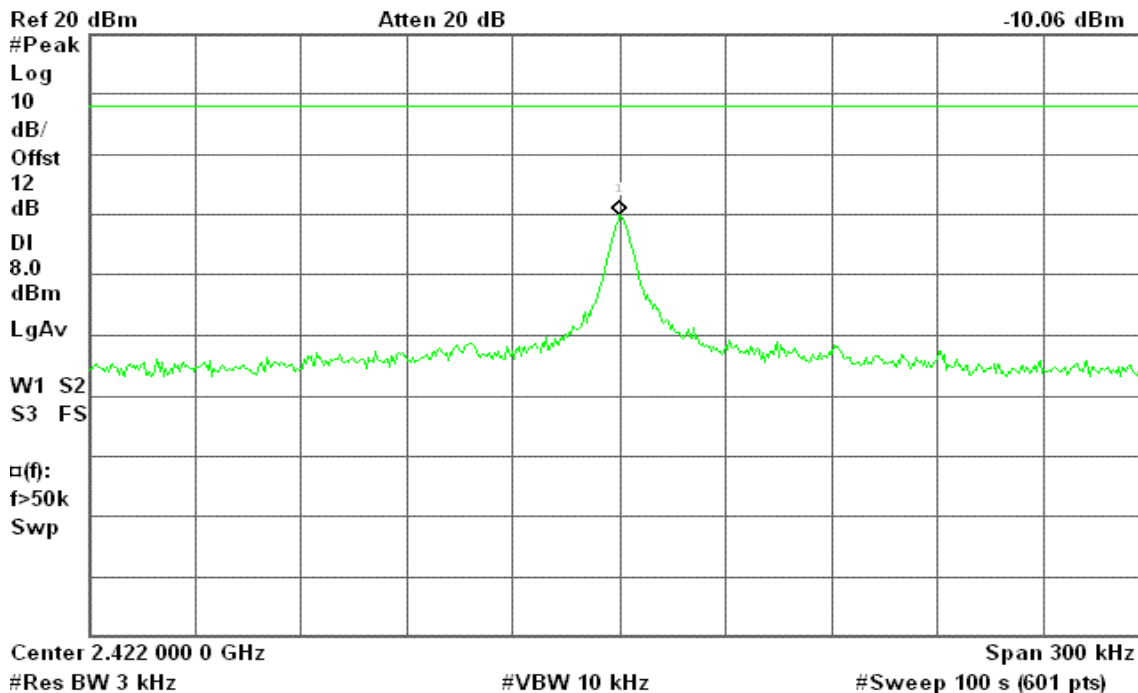
### draft 802.11n Wide-40 MHz Channel mode with combiner

### PPSD (CH Low)

Agilent 16:37:37 Oct 20, 2006

R L

Mkr1 2.422 000 0 GHz  
-10.06 dBm



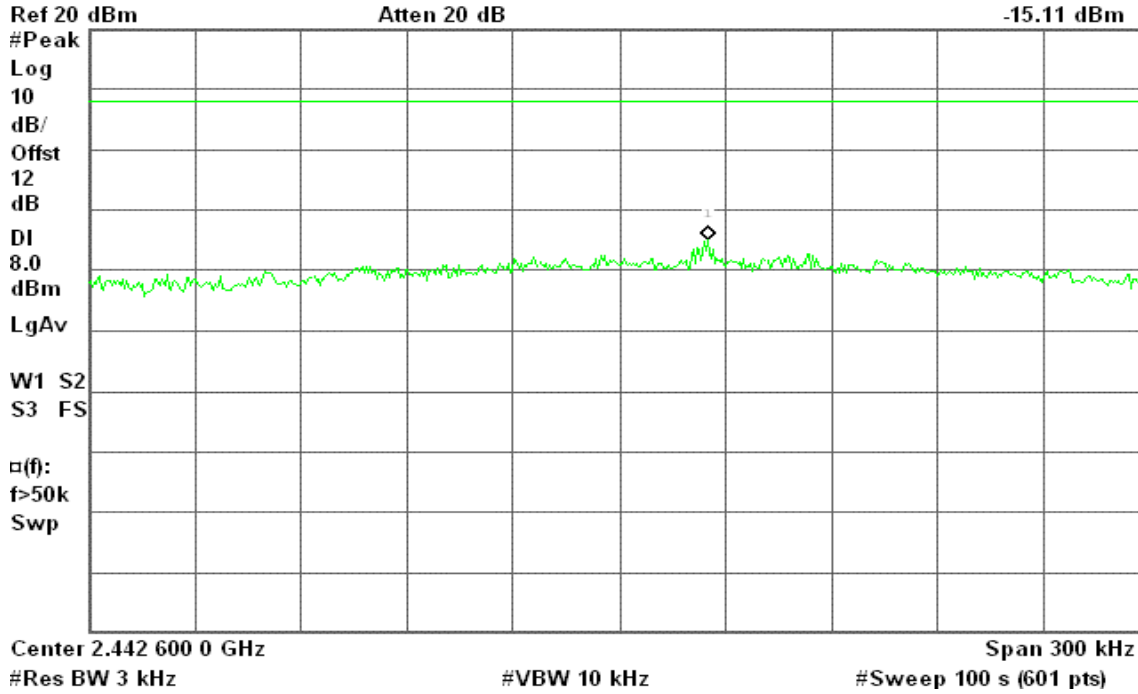


### PPSD (CH Mid)

Agilent 16:40:14 Oct 20, 2006

R L

Mkr1 2.442 625 1 GHz  
-15.11 dBm

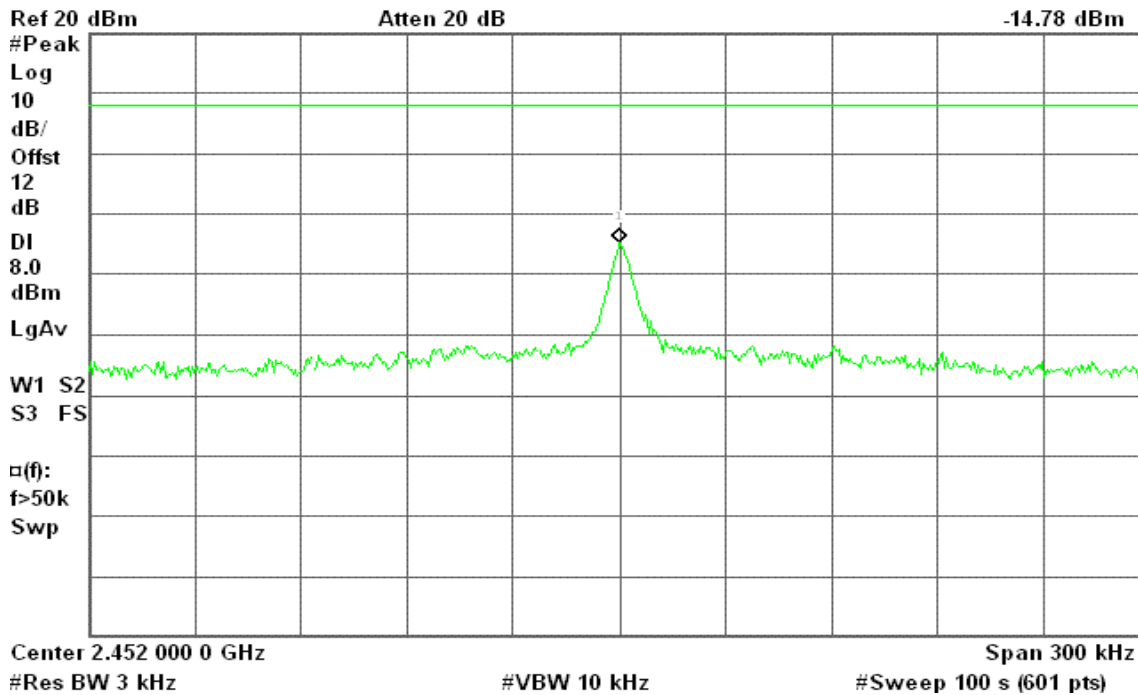


### PPSD (CH High)

Agilent 16:43:47 Oct 20, 2006

R L

Mkr1 2.452 000 0 GHz  
-14.78 dBm



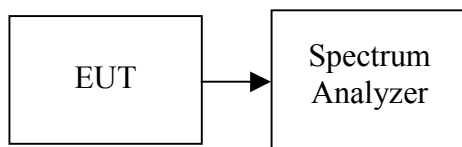
## 7.6 SPURIOUS EMISSIONS

### 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

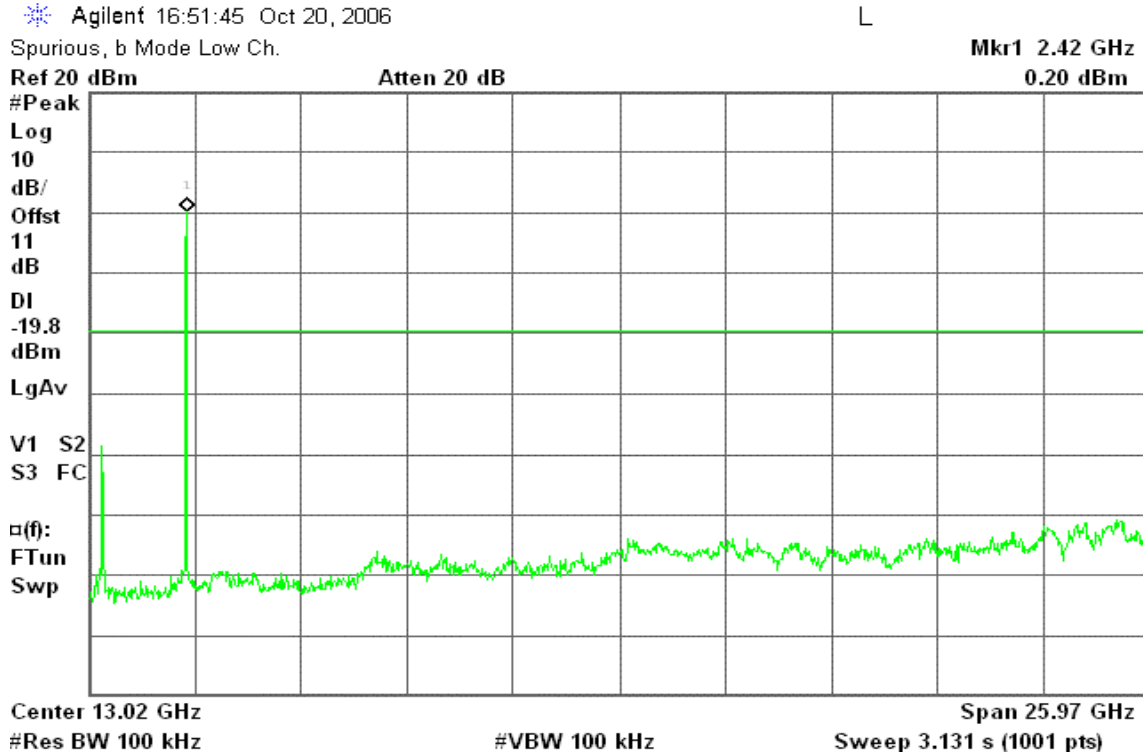
*No non-compliance noted*



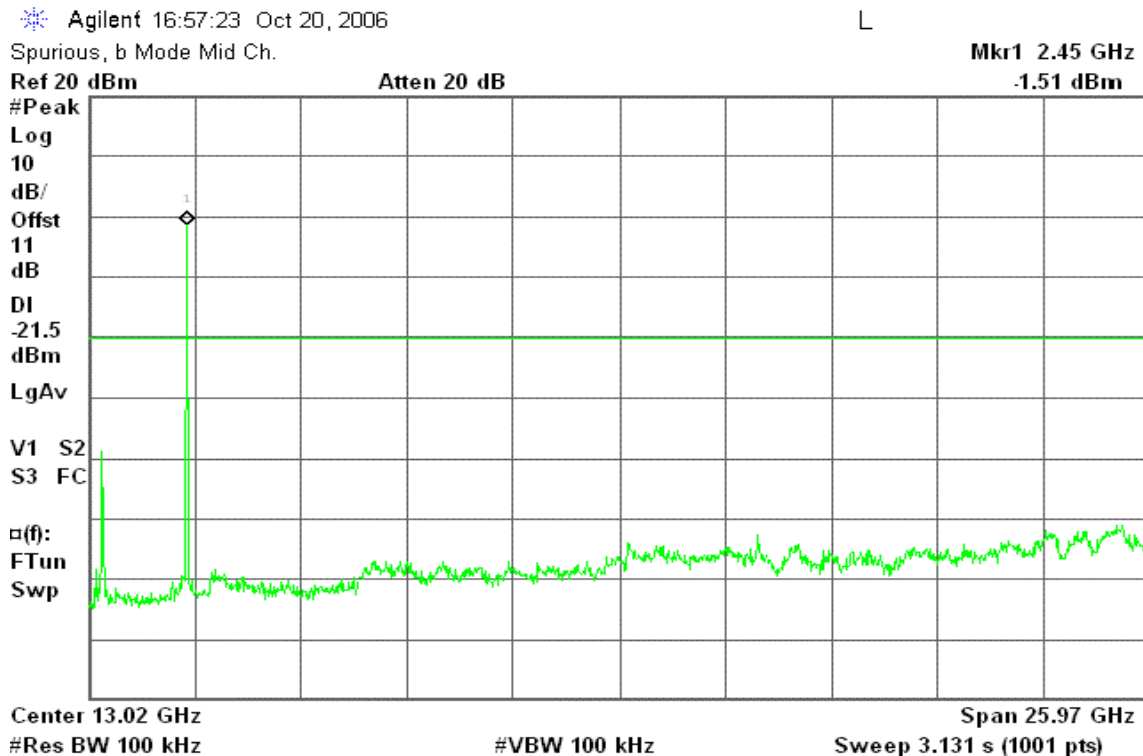
### Test Plot

### IEEE 802.11b mode / Chain 0

#### CH Low



#### CH Mid





### CH High

Agilent 17:06:27 Oct 20, 2006

R L

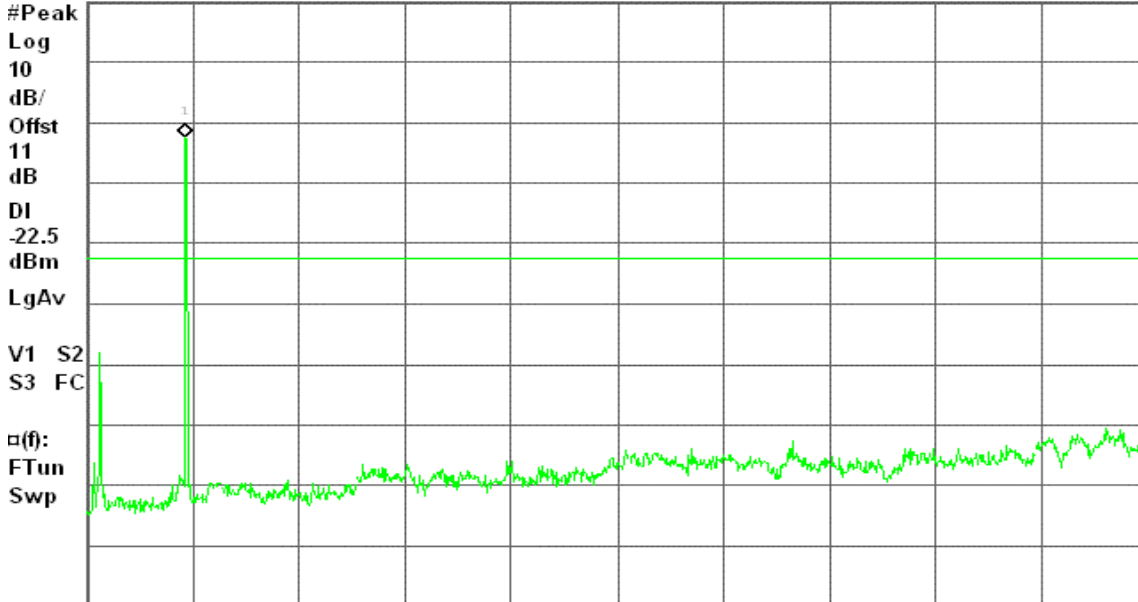
Spurious, b Mode High Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

-2.50 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

### IEEE 802.11b mode / Chain 2

#### CH Low

Agilent 18:08:58 Oct 20, 2006

L

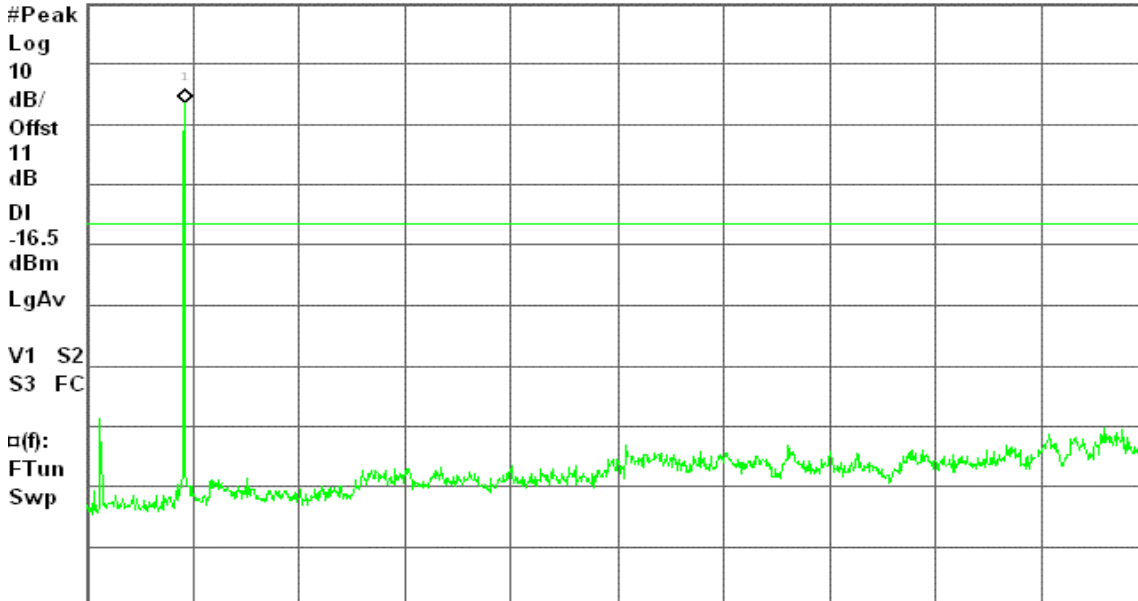
Spurious, b Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

3.53 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



### CH Mid

Agilent 18:19:30 Oct 20, 2006

L

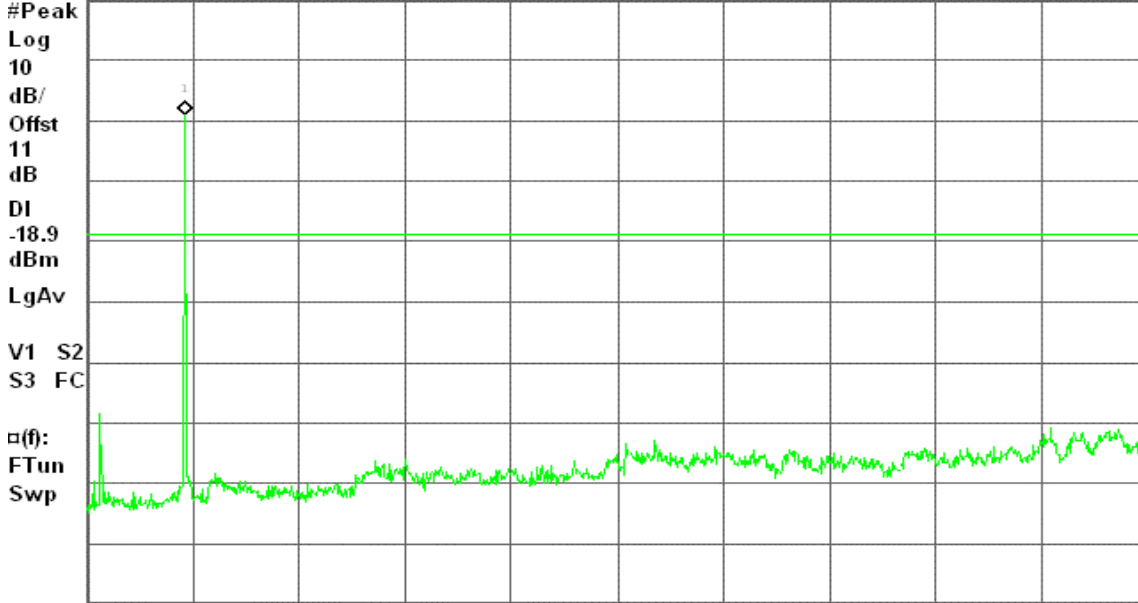
Spurious, b Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

1.06 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

### CH High

Agilent 18:24:56 Oct 20, 2006

L

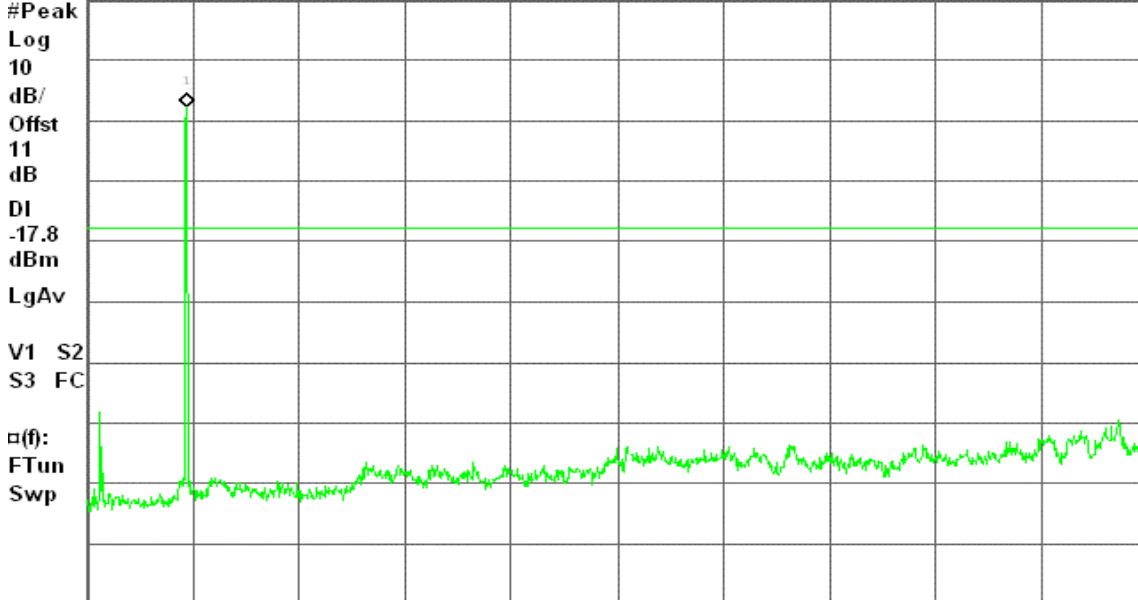
Spurious, b Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 20 dB

2.21 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)





### IEEE 802.11g mode / Chain 0

#### CH Low

Agilent 11:32:54 Oct 20, 2006

L

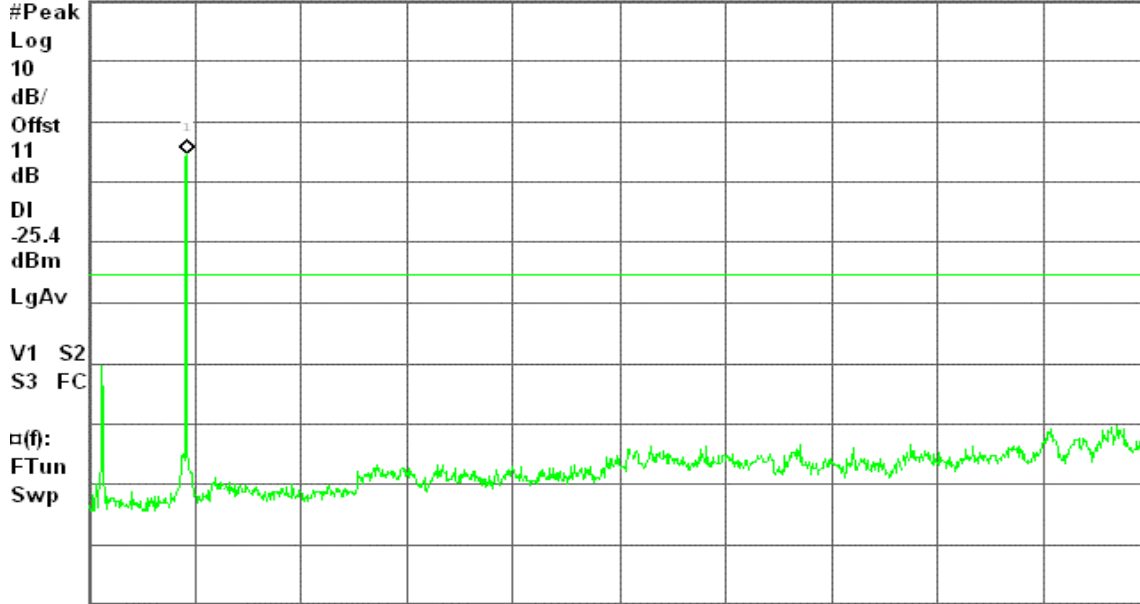
Spurious, g Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

-5.40 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

#### CH Mid

Agilent 11:38:14 Oct 20, 2006

L

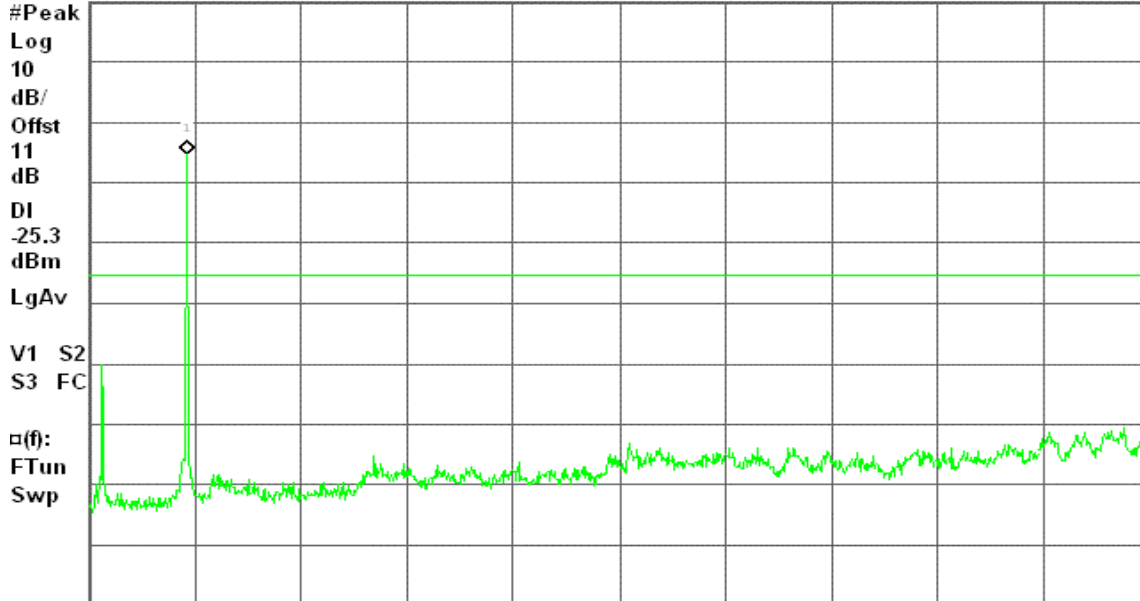
Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

-5.30 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



### CH High

Agilent 11:44:21 Oct 20, 2006

L

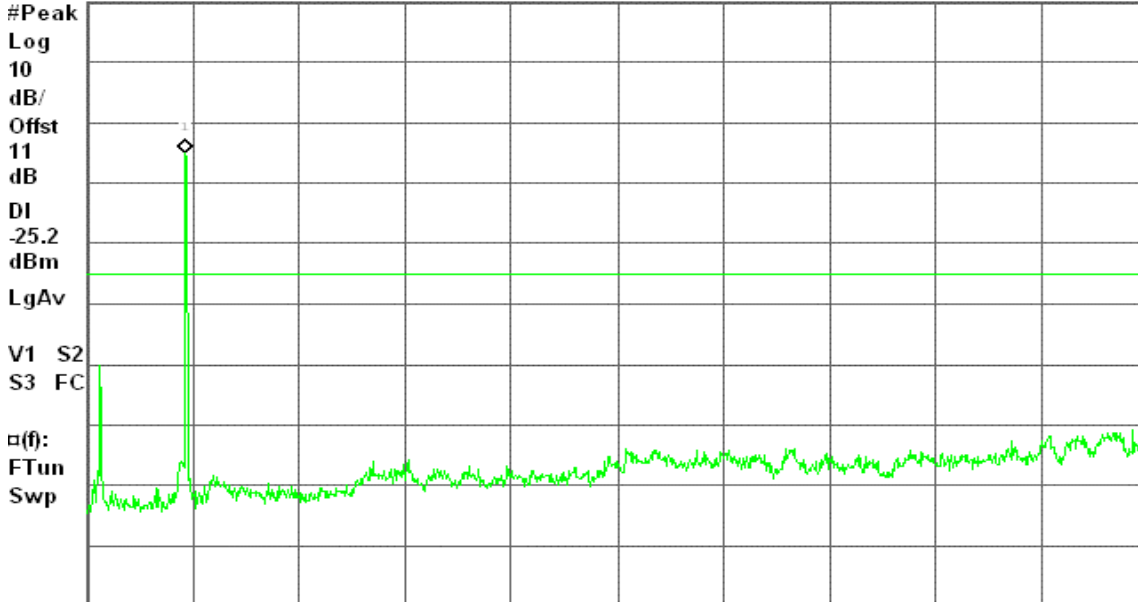
Spurious, g Mode High Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

-5.16 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

### IEEE 802.11g mode / Chain 2

#### CH Low

Agilent 11:08:00 Oct 20, 2006

L

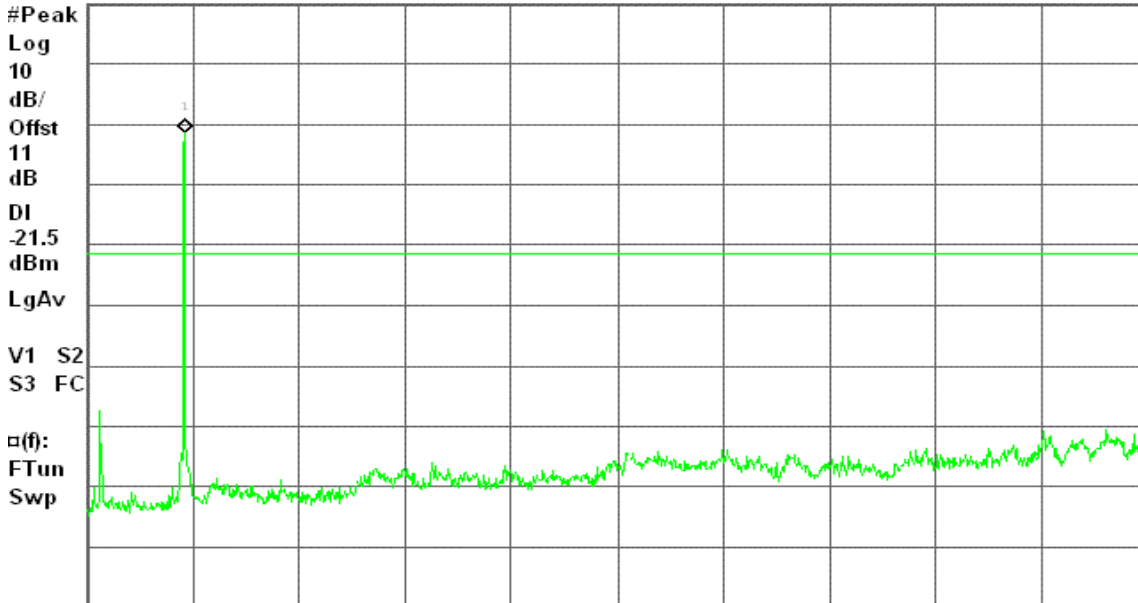
Spurious, g Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

-1.52 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



### CH Mid

Agilent 11:14:57 Oct 20, 2006

L

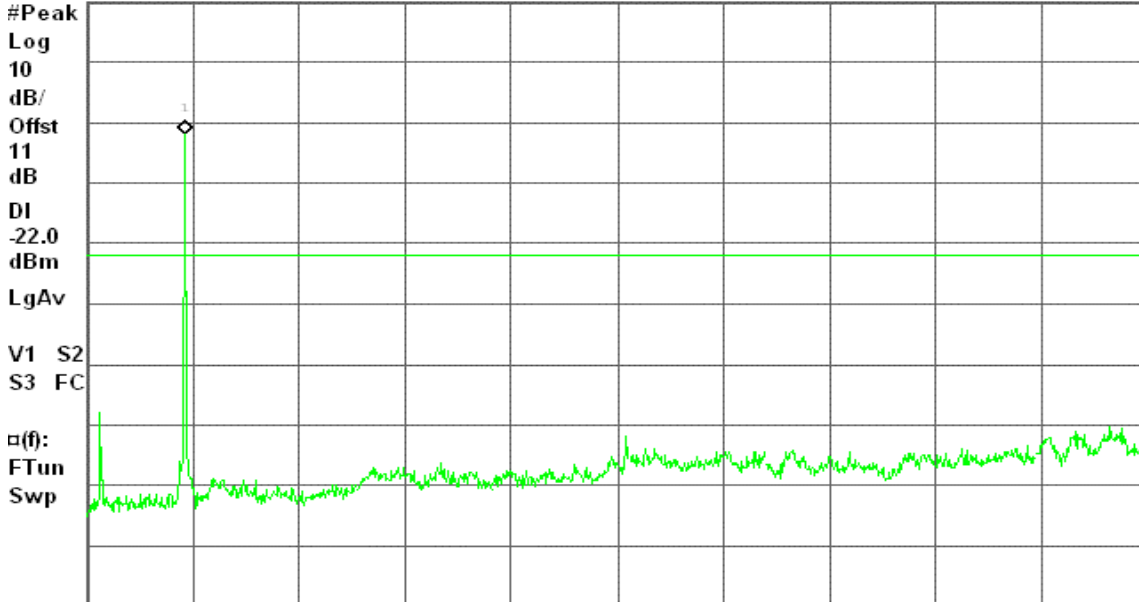
Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

-1.99 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

### CH High

Agilent 11:26:50 Oct 20, 2006

L

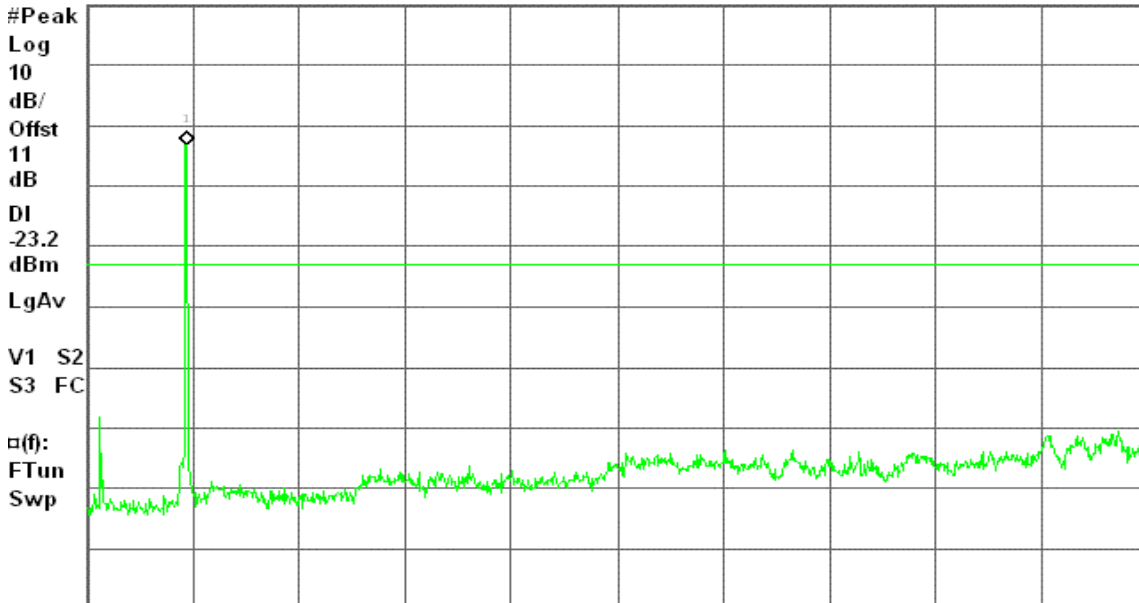
Spurious, g Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 20 dB

-3.16 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



### draft 802.11n Standard-20 MHz Channel mode / Chain 0

#### CH Low

Agilent 18:50:31 Oct 20, 2006

L

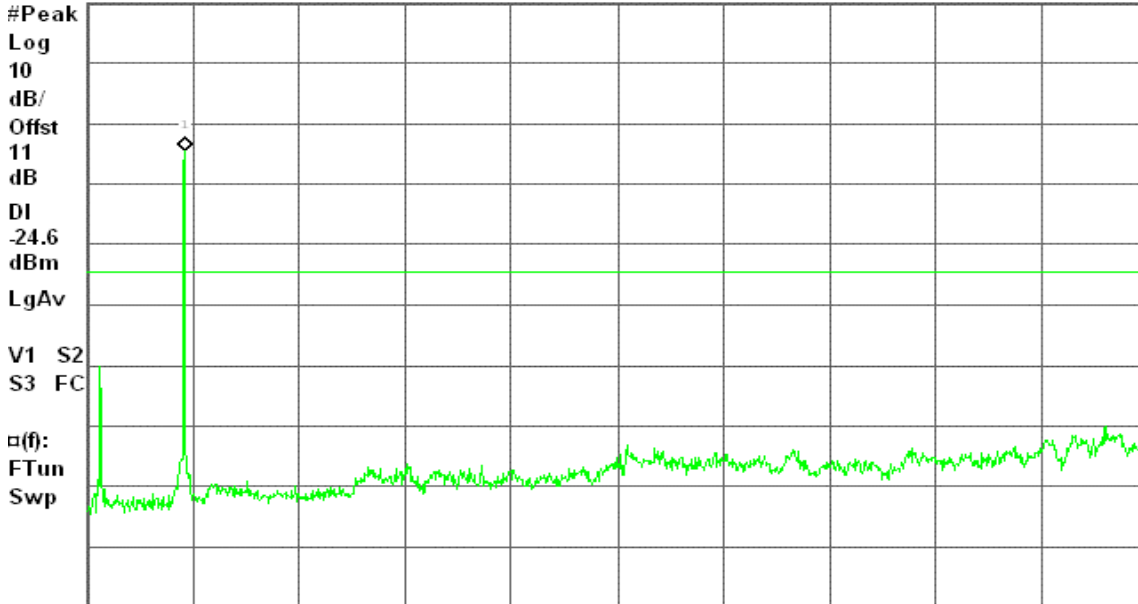
Spurious, g Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

4.65 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

#### CH Mid

Agilent 19:30:27 Oct 20, 2006

L

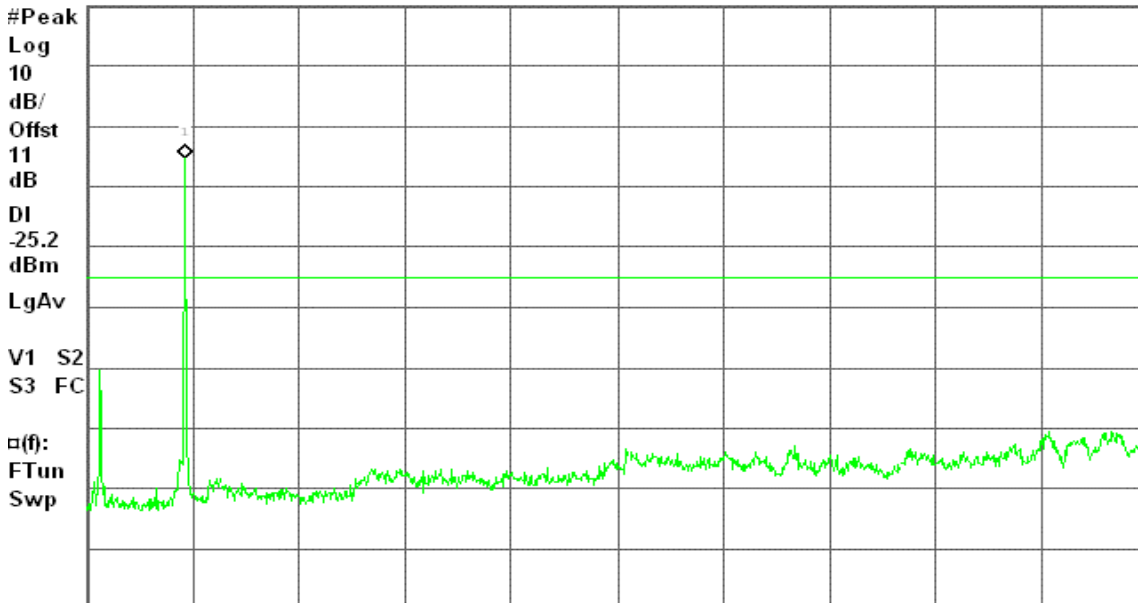
Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

5.22 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



### CH High

Agilent 19:37:18 Oct 20, 2006

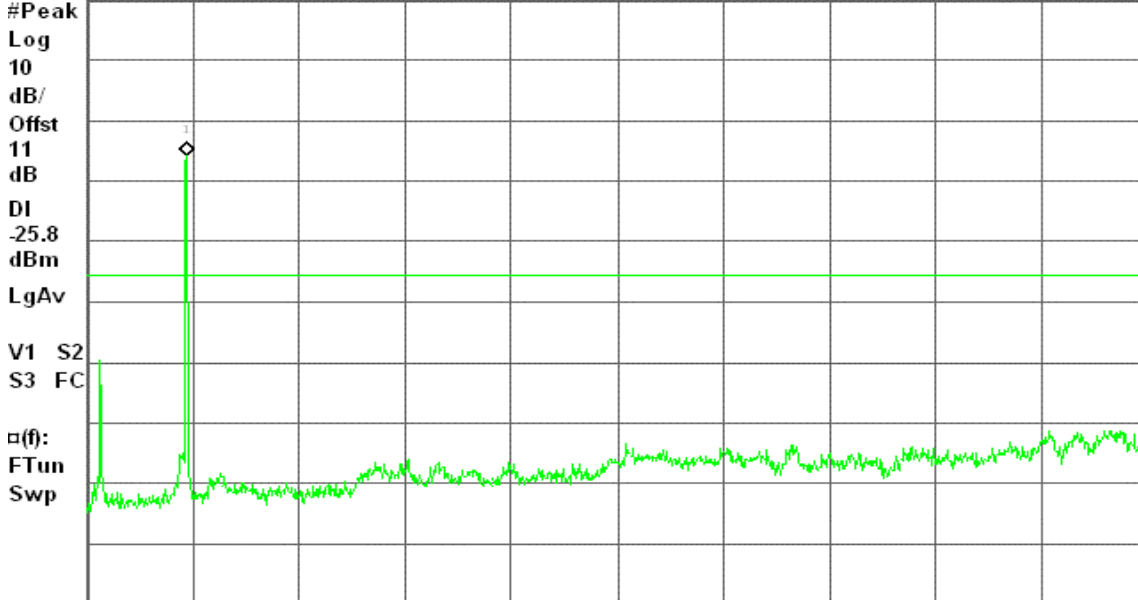
L

Spurious, g Mode High Ch.

Mkr1 2.47 GHz  
-5.79 dBm

Ref 20 dBm

Atten 20 dB



Center 13.02 GHz  
#Res BW 100 kHz

#VBW 100 kHz

Span 25.97 GHz  
Sweep 3.131 s (1001 pts)

### draft 802.11n Standard-20 MHz Channel mode / Chain 2

#### CH Low

Agilent 18:31:49 Oct 20, 2006

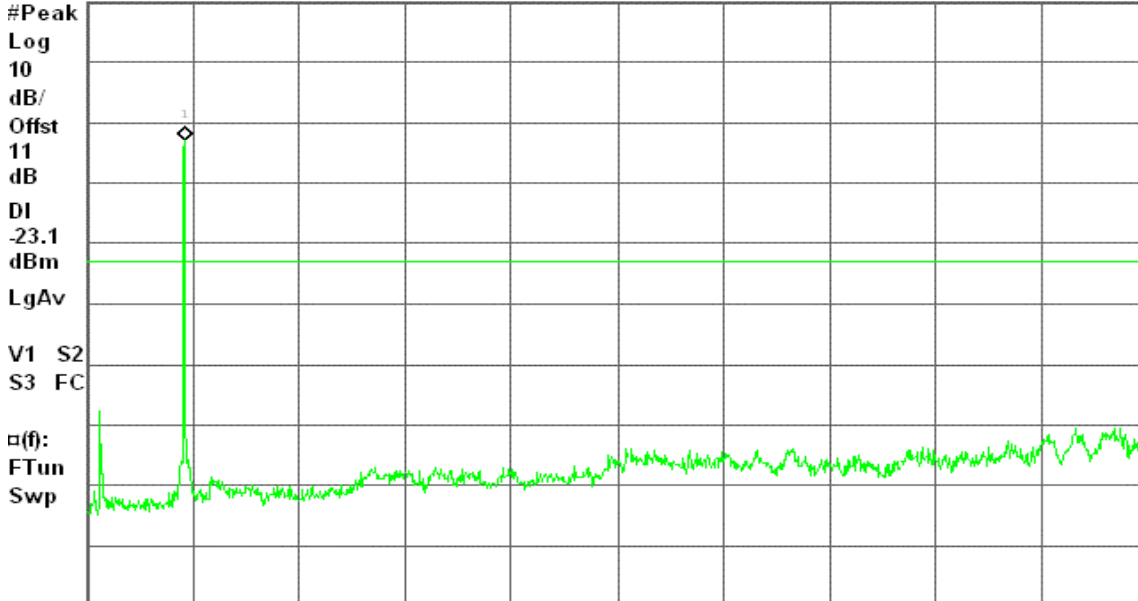
L

Spurious, g Mode Low Ch.

Mkr1 2.42 GHz  
-3.09 dBm

Ref 20 dBm

Atten 20 dB



Center 13.02 GHz  
#Res BW 100 kHz

#VBW 100 kHz

Span 25.97 GHz  
Sweep 3.131 s (1001 pts)



### CH Mid

Agilent 18:38:12 Oct 20, 2006

L

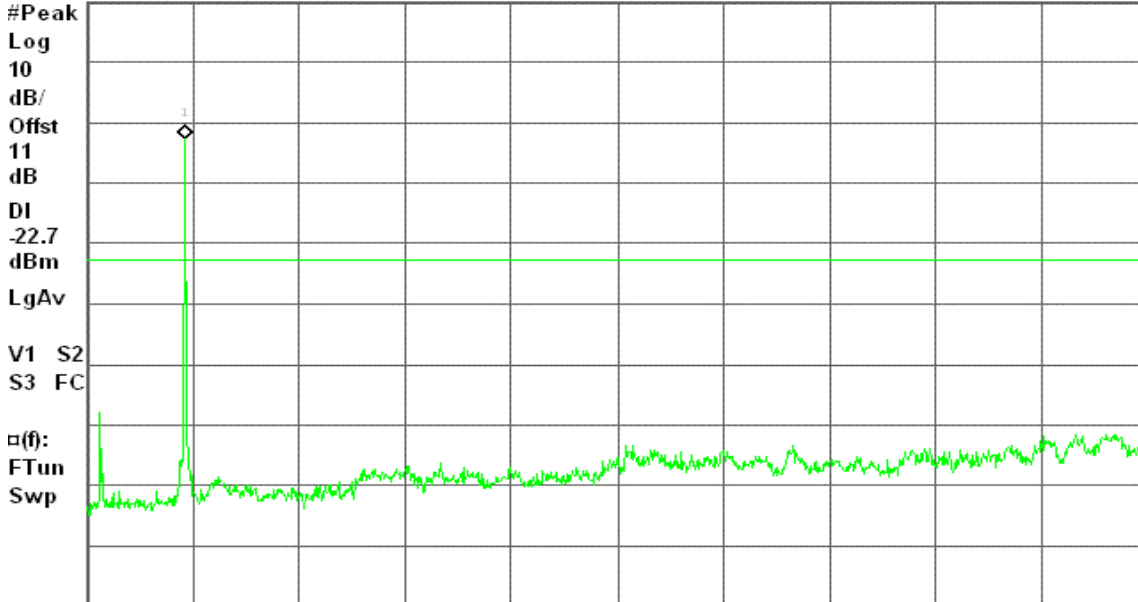
Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

-2.70 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

### CH High

Agilent 18:43:56 Oct 20, 2006

L

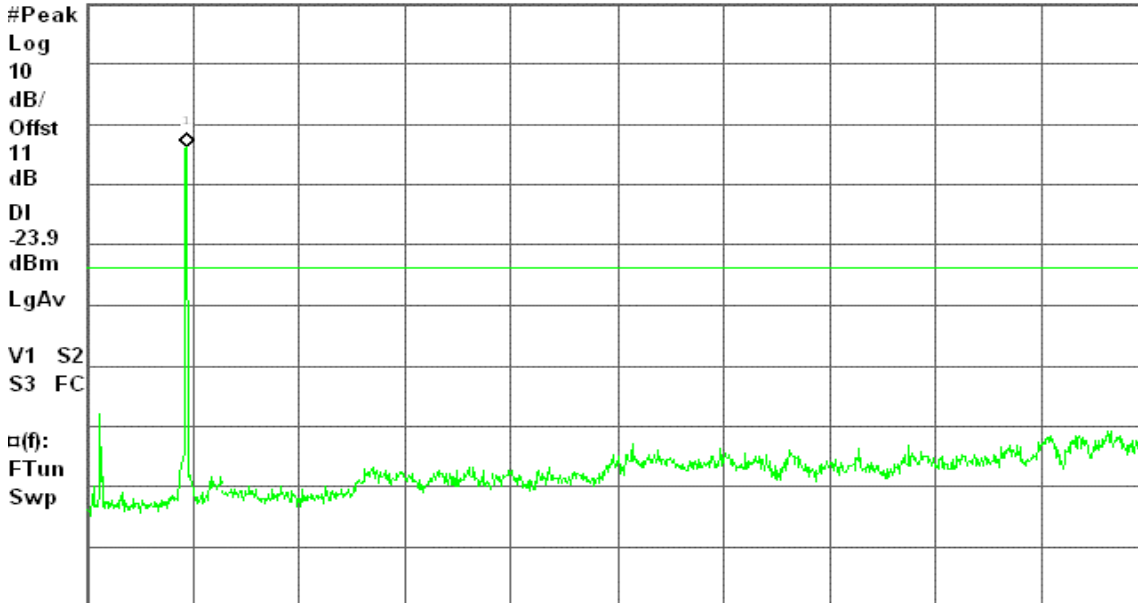
Spurious, g Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 20 dB

-3.85 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



### draft 802.11n Wide-40 MHz Channel mode / Chain 0

#### CH Low

Agilent 19:44:52 Oct 20, 2006

L

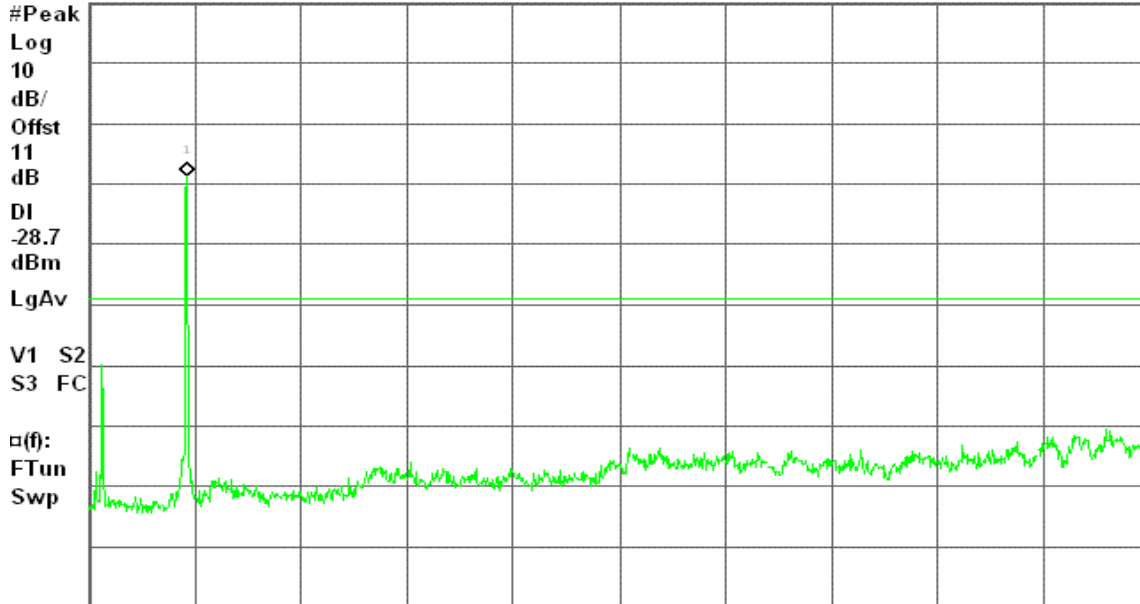
Spurious, g Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

-8.72 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

#### CH Mid

Agilent 19:50:51 Oct 20, 2006

L

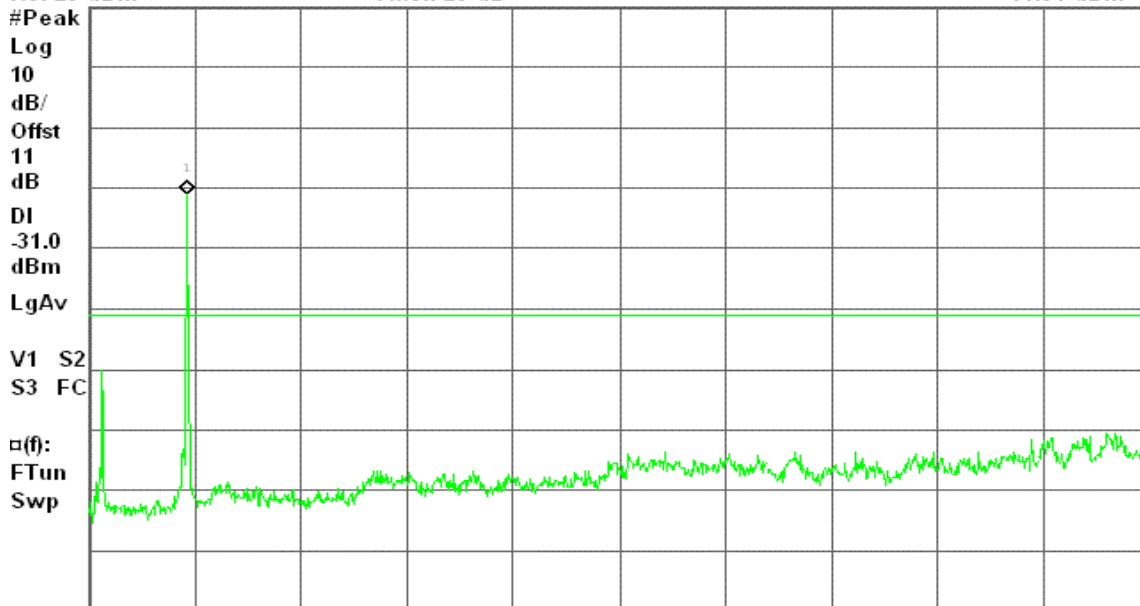
Spurious, g Mode Mid Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

-11.04 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



### CH High

Agilent 19:57:10 Oct 20, 2006

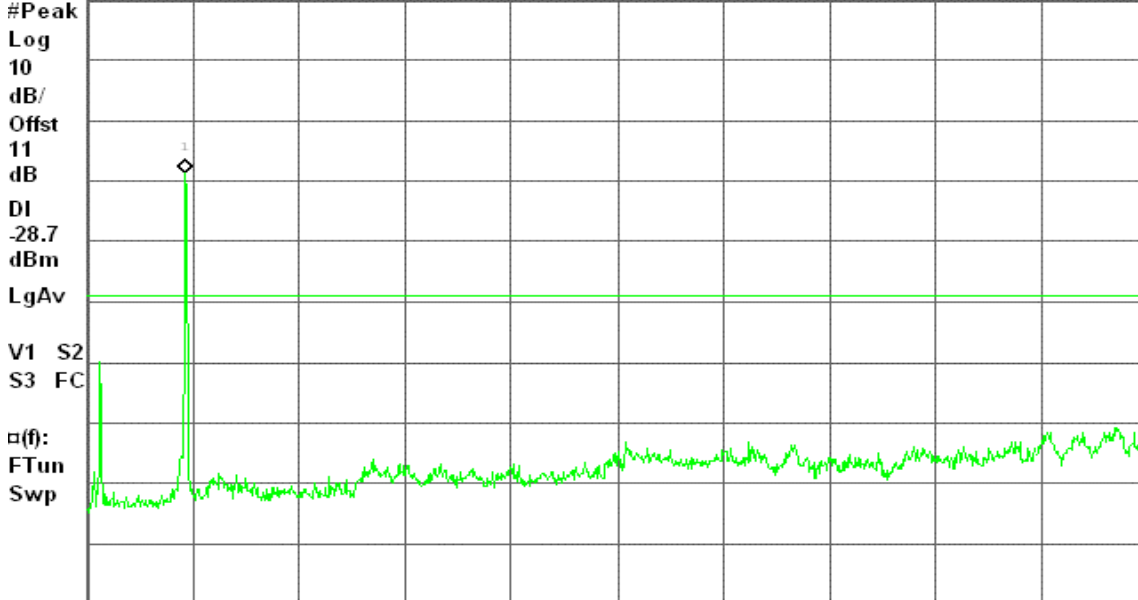
L

Spurious, g Mode High Ch.

Mkr1 2.45 GHz  
-8.70 dBm

Ref 20 dBm

Atten 20 dB



Center 13.02 GHz  
#Res BW 100 kHz

#VBW 100 kHz

Span 25.97 GHz  
Sweep 3.131 s (1001 pts)

### draft 802.11n Wide-40 MHz Channel mode / Chain 2

### CH Low

Agilent 20:04:17 Oct 20, 2006

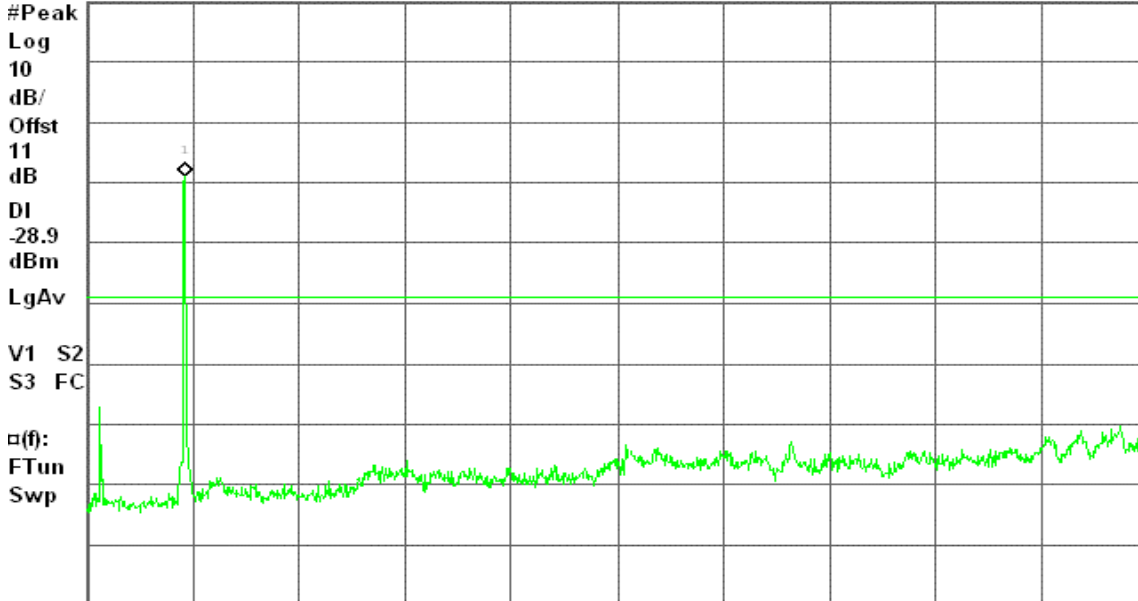
L

Spurious, g Mode Low Ch.

Mkr1 2.42 GHz  
-8.86 dBm

Ref 20 dBm

Atten 20 dB



Center 13.02 GHz  
#Res BW 100 kHz

#VBW 100 kHz

Span 25.97 GHz  
Sweep 3.131 s (1001 pts)





### CH Mid

Agilent 20:10:13 Oct 20, 2006

L

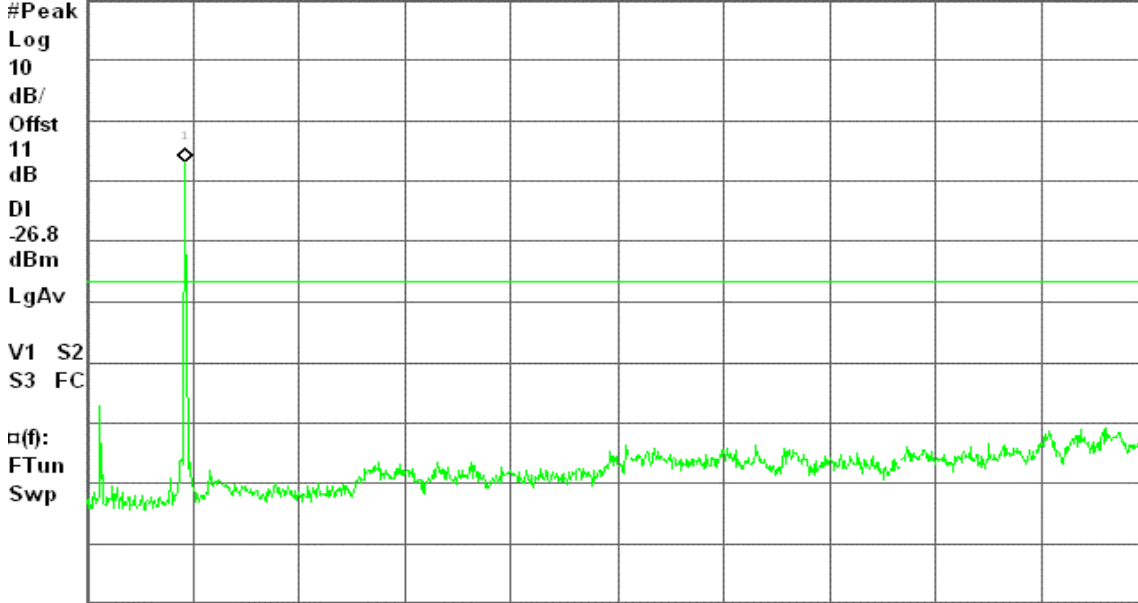
Spurious, g Mode Mid Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

-6.83 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

### CH High

Agilent 20:16:38 Oct 20, 2006

L

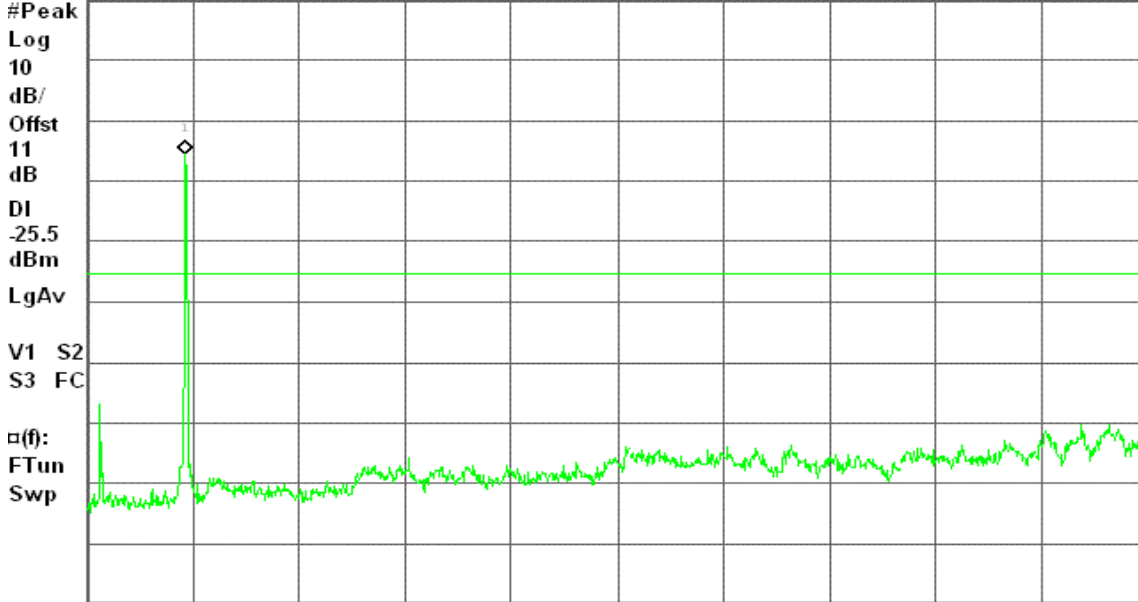
Spurious, g Mode High Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

-5.51 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

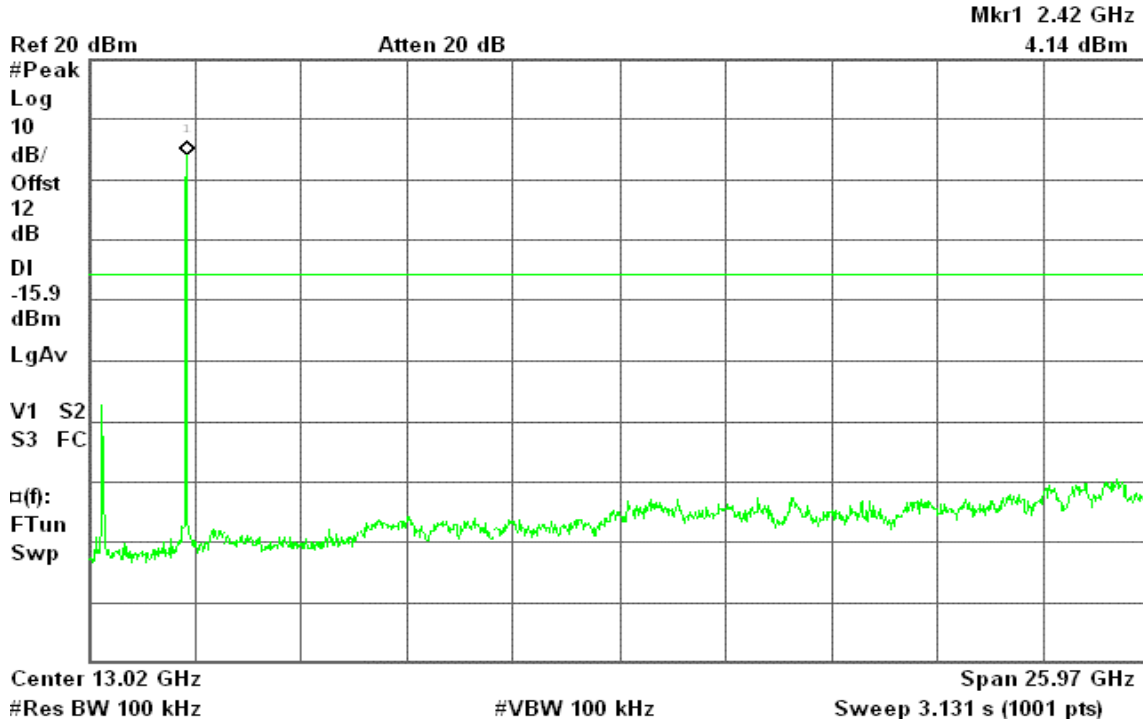


### IEEE 802.11b mode with combiner

#### CH Low

Agilent 15:36:24 Oct 20, 2006

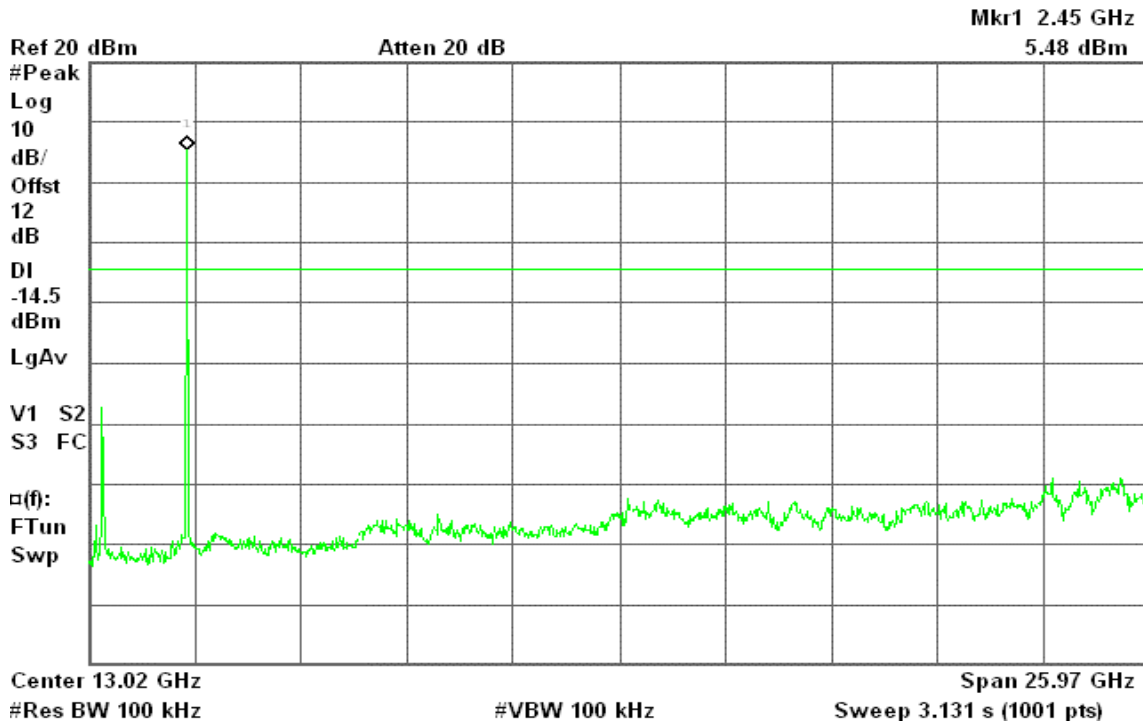
T



#### CH Mid

Agilent 15:37:03 Oct 20, 2006

T

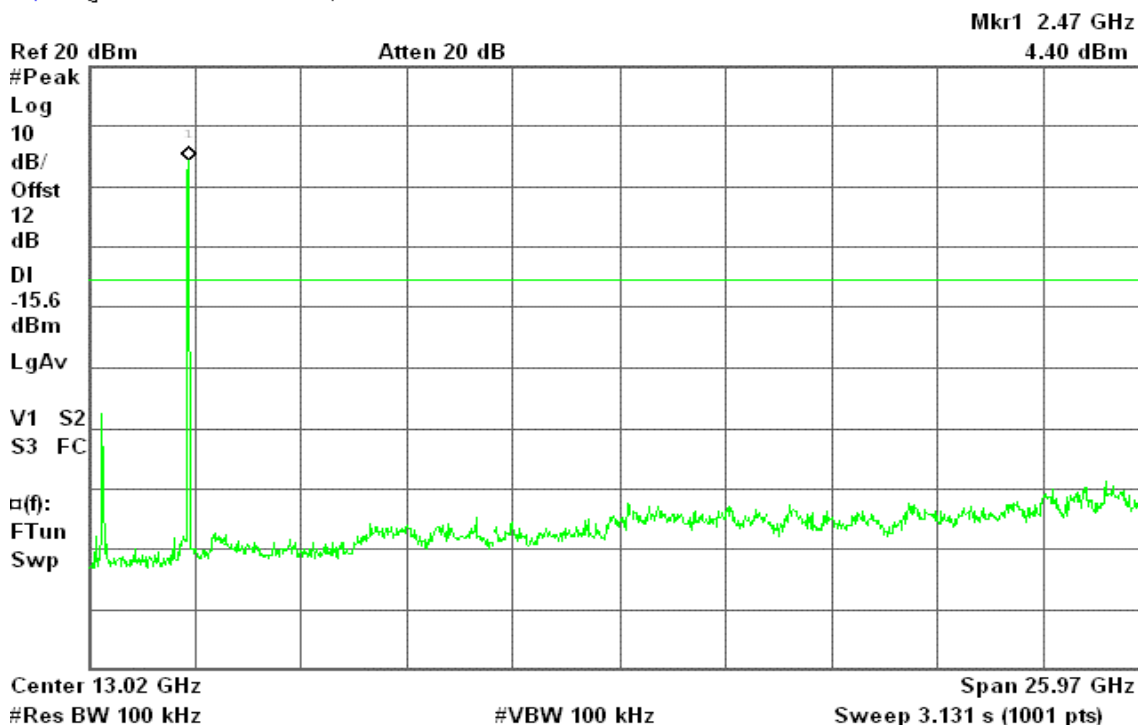




### CH High

Agilent 15:37:46 Oct 20, 2006

T

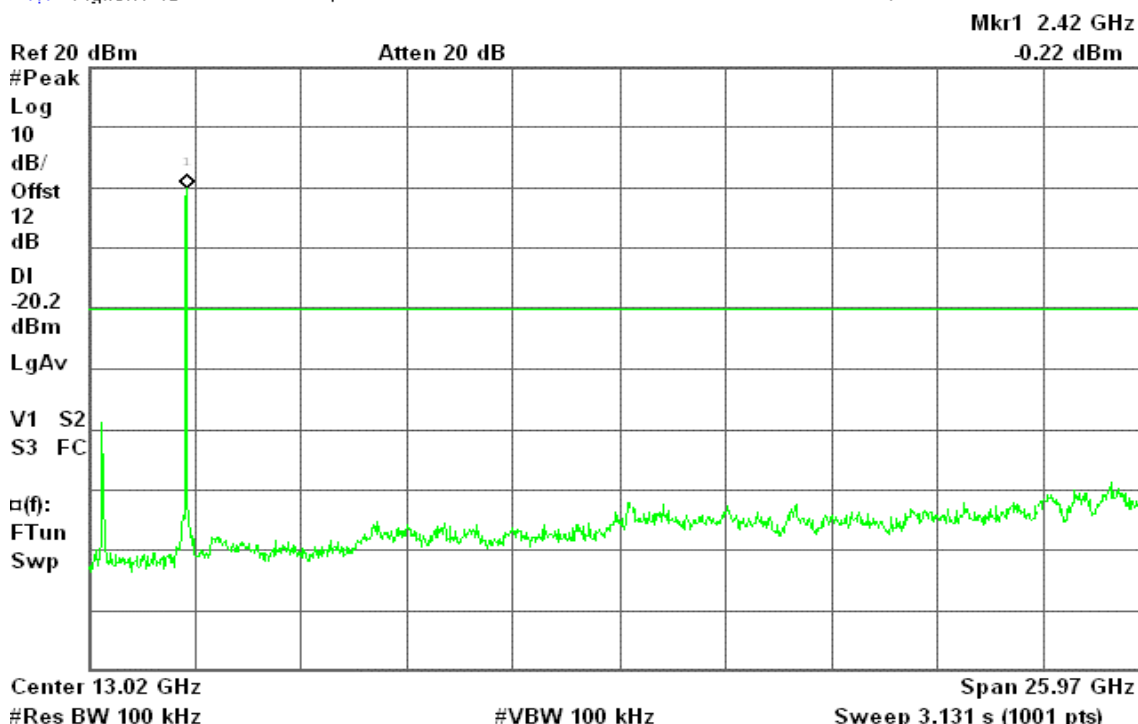


### IEEE 802.11g mode with combiner

#### CH Low

Agilent 15:35:22 Oct 20, 2006

T

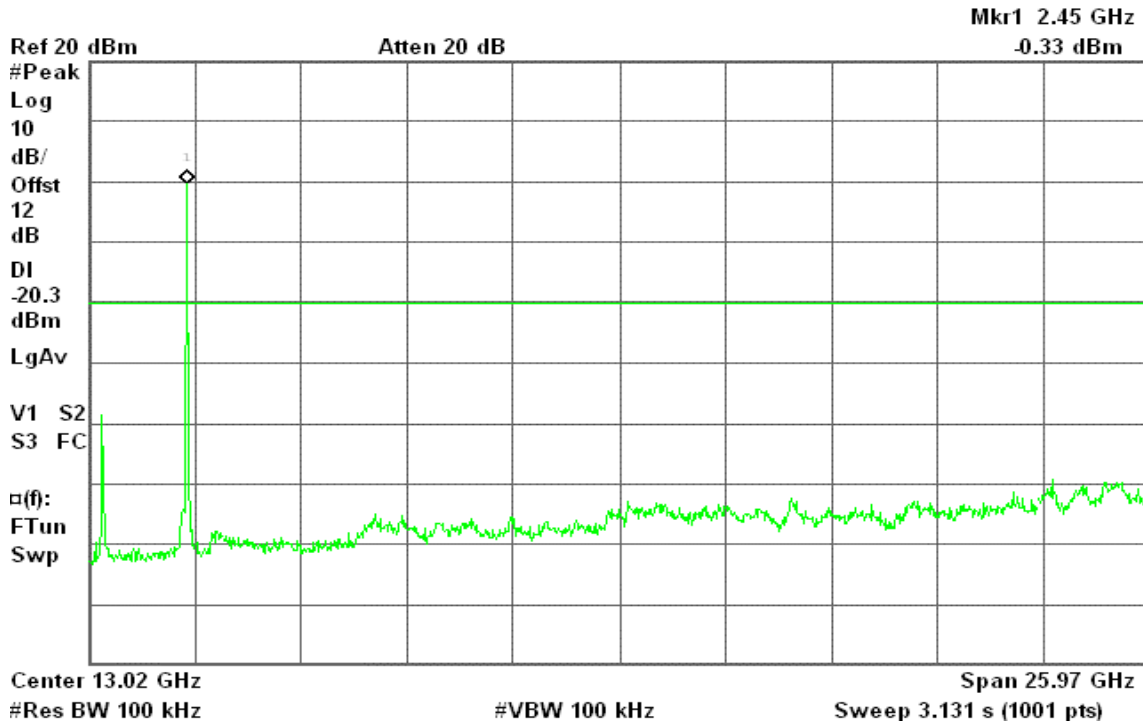




### CH Mid

Agilent 15:34:41 Oct 20, 2006

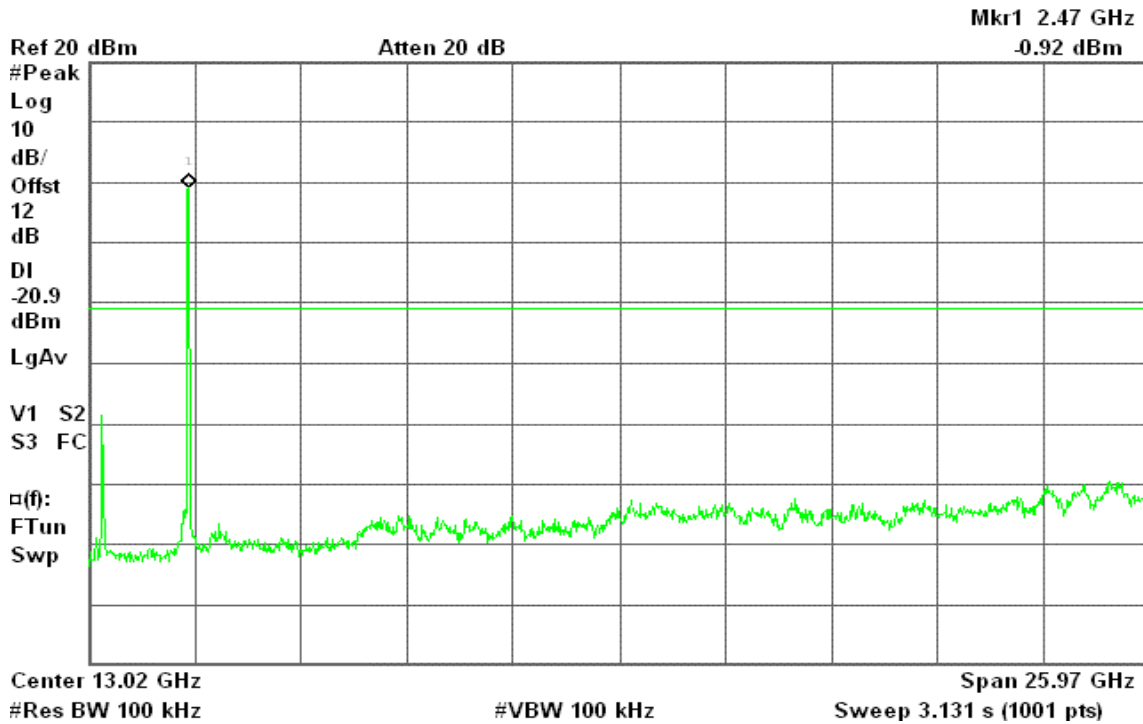
T



### CH High

Agilent 15:33:57 Oct 20, 2006

T



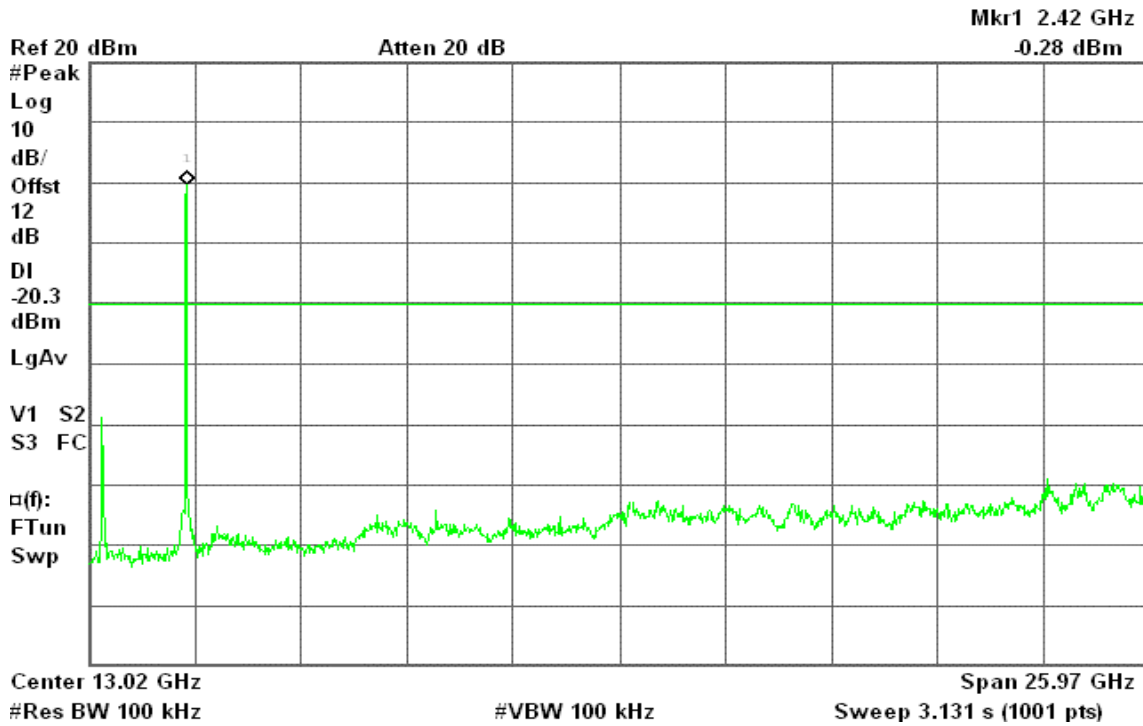


### draft 802.11n Standard-20 MHz Channel mode with combiner

#### CH Low

Agilent 15:31:20 Oct 20, 2006

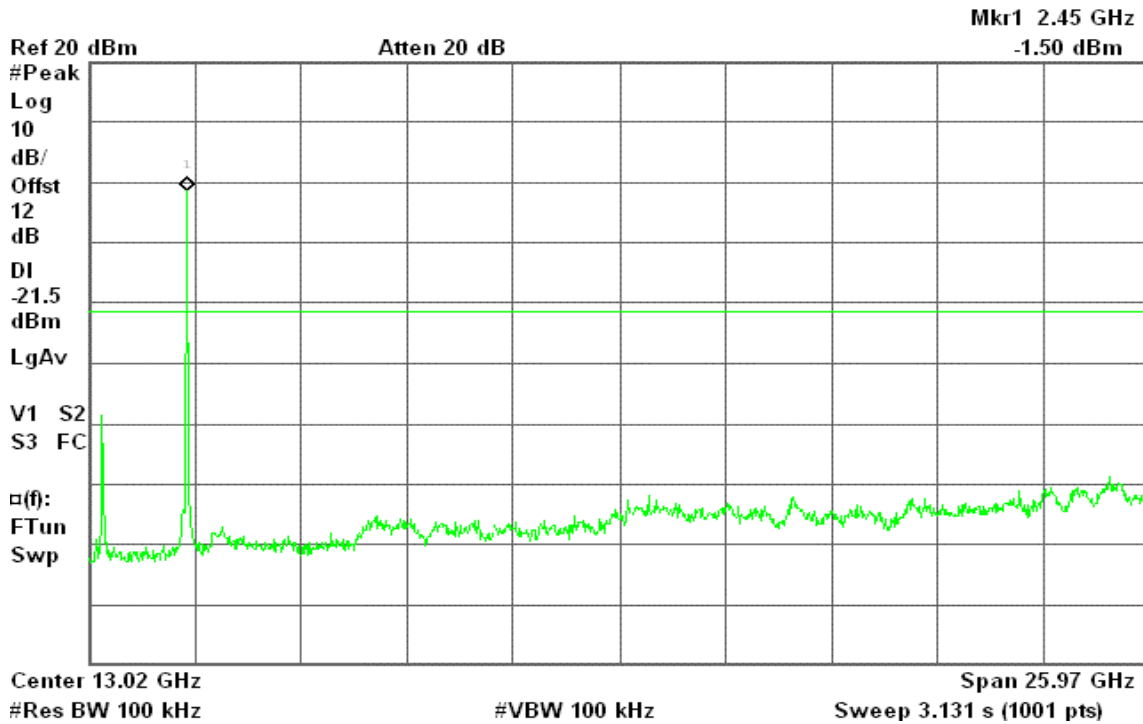
T



#### CH Mid

Agilent 15:32:07 Oct 20, 2006

T

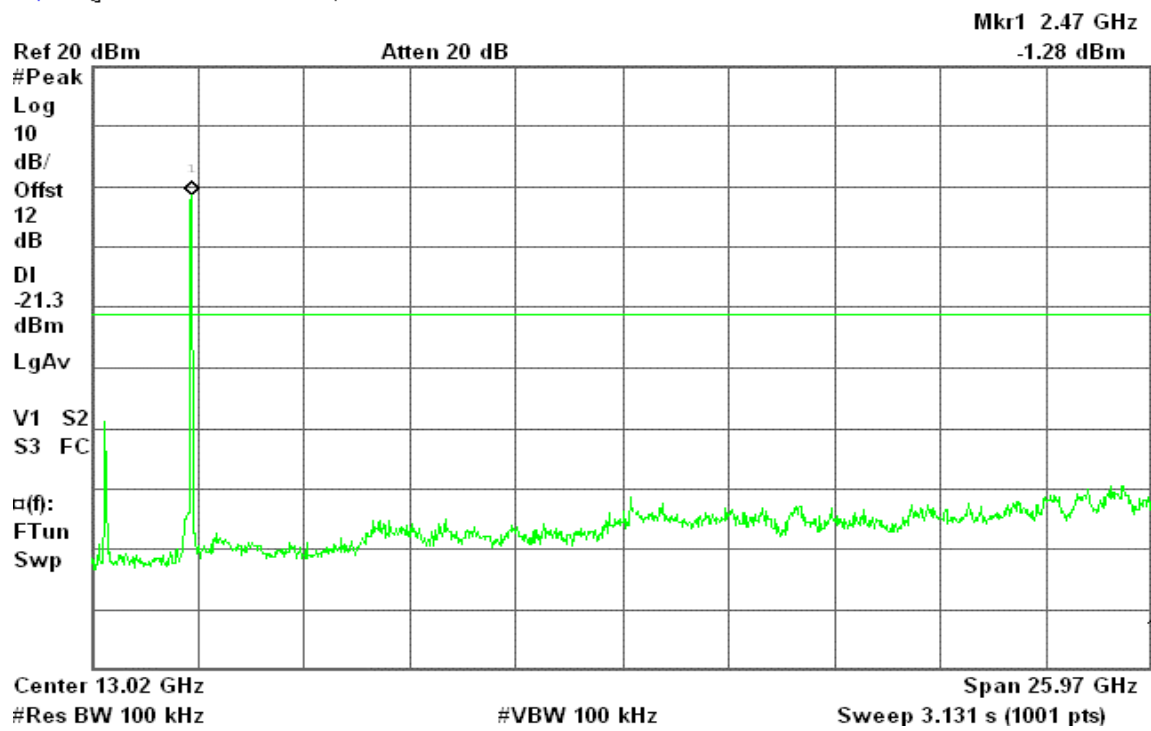




**CH High**

Agilent 15:32:49 Oct 20, 2006

T

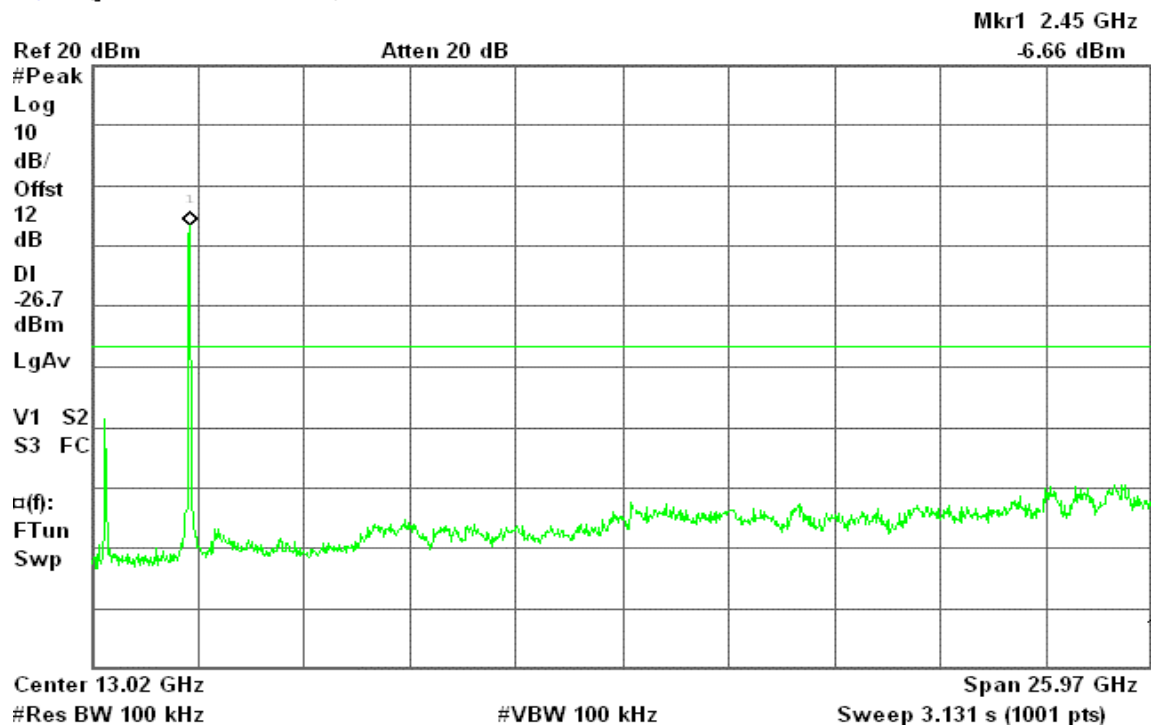


**draft 802.11n Wide-40 MHz Channel mode with combiner**

**CH Low**

Agilent 15:29:54 Oct 20, 2006

T



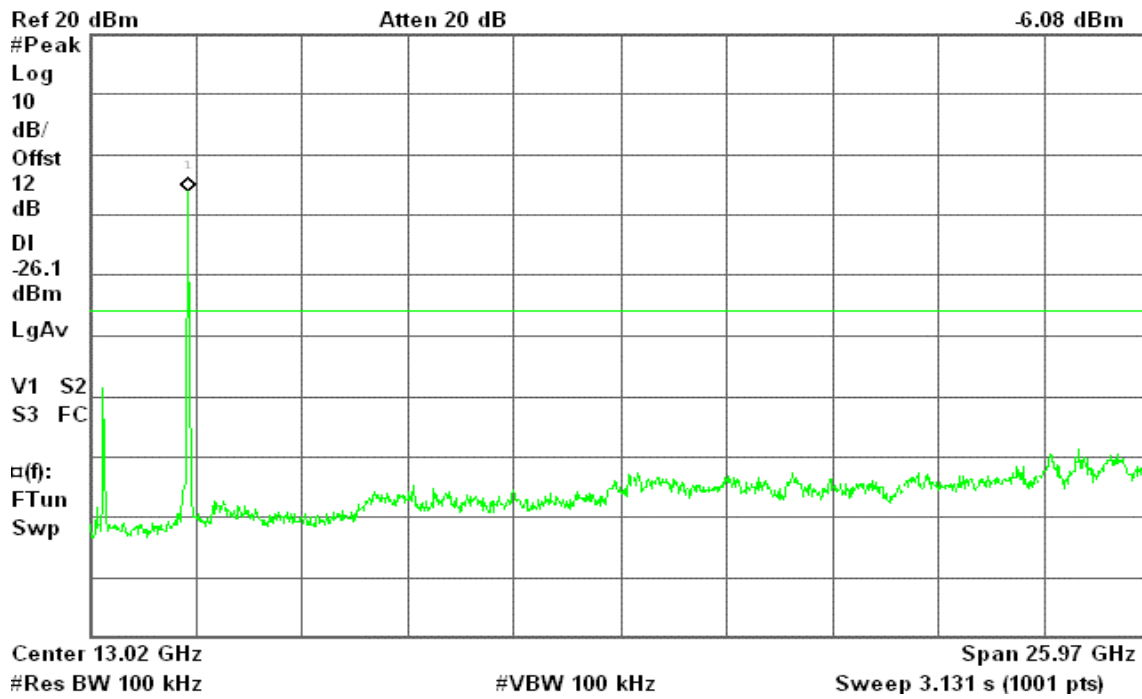


### CH Mid

Agilent 15:28:47 Oct 20, 2006

T

Mkr1 2.42 GHz  
-6.08 dBm

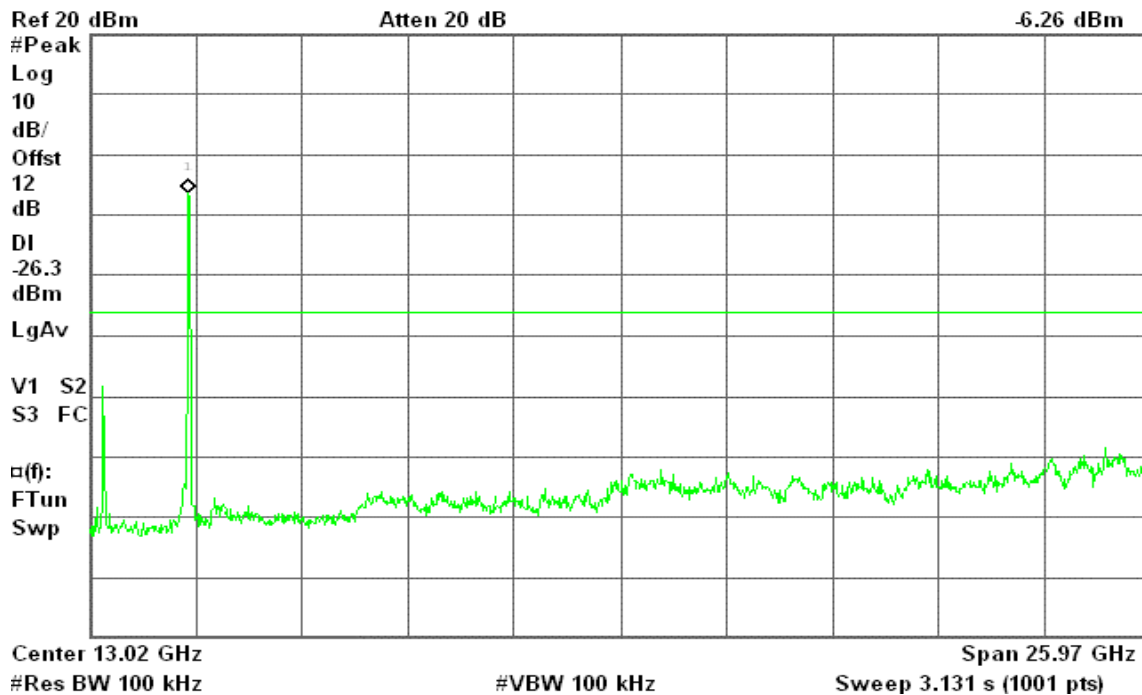


### CH High

Agilent 15:27:58 Oct 20, 2006

L

Mkr1 2.45 GHz  
-6.26 dBm





## 7.7 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 ( $\mu\text{V}/\text{m}$ )	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.

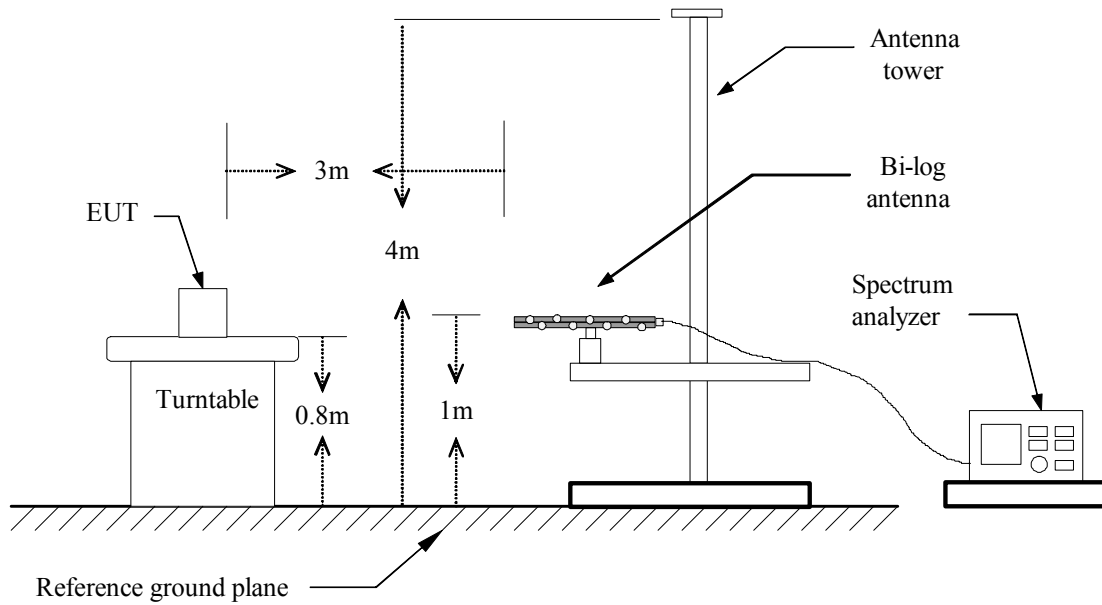
2. In the emission table above, the tighter limit applies at the band edges.

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

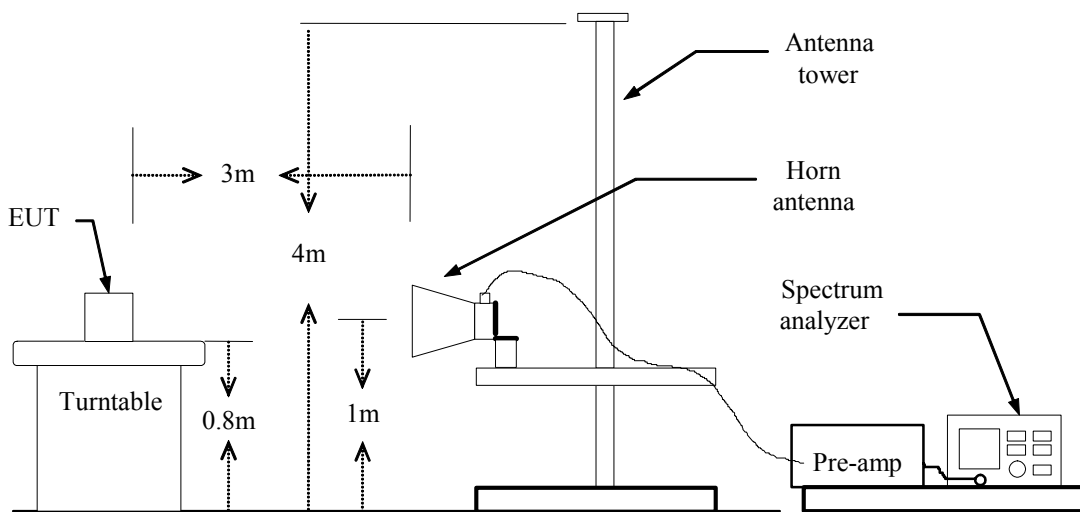


### Test Configuration

#### **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.

**TEST RESULTS****Below 1GHz****Operation Mode:** Normal Link**Test Date:** October 20, 2006**Temperature:** 25°C**Tested by:** Ryan Chen**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
99.52	V	64.55	-30.24	34.31	43.50	-9.19	Peak
165.80	V	64.37	-27.81	36.56	43.50	-6.94	Peak
434.17	V	50.77	-21.92	28.85	46.00	-17.15	Peak
565.12	V	48.65	-19.02	29.64	46.00	-16.36	Peak
666.97	V	51.69	-17.28	34.41	46.00	-11.59	Peak
901.38	V	45.32	-13.89	31.43	46.00	-14.57	Peak
99.52	H	70.25	-30.24	40.01	43.50	-3.49	Peak
165.80	H	69.90	-27.81	42.09	43.50	-1.41	QP
354.95	H	63.58	-23.83	39.76	46.00	-6.24	Peak
665.35	H	54.96	-17.30	37.66	46.00	-8.34	Peak
770.43	H	56.03	-15.67	40.36	46.00	-5.64	Peak
898.15	H	51.29	-13.93	37.36	46.00	-8.64	Peak

**Remark:**

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
3. 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.
4. Margin (dB) = Result (dBuV/m) – Limit (dBuV/m).



**Above 1 GHz**

**Operation Mode:** TX / IEEE 802.11b / CH Low

**Test Date:** October 20, 2006

**Temperature:** 20°C

**Tested by:** Ryan Chen

**Humidity:** 51 % 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
1336.67	V	47.09	39.12	12.24	59.32	51.36	74.00	54.00	-2.68	AVG
N/A										
1133.33	H	46.55	39.08	13.96	60.51	53.04	74.00	54.00	-0.96	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: TX / IEEE 802.11b / CH Mid

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1356.67	V	47.17	39.26	12.07	59.24	51.96	74.00	54.00	-2.04	AVG
N/A										
1136.67	H	45.96	39.17	13.93	59.89	53.10	74.00	54.00	-0.90	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: TX / IEEE 802.11b / CH High

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1166.67	V	46.15	39.15	13.68	59.83	52.83	74.00	54.00	-1.17	AVG
N/A										
1220.00	H	46.21	39.44	13.23	59.43	52.67	74.00	54.00	-1.33	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: TX / IEEE 802.11g / CH Low

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1193.33	V	46.44	39.65	13.45	59.89	53.10	74.00	54.00	-0.90	AVG
N/A										
1146.67	H	45.91	39.11	13.85	59.76	52.96	74.00	54.00	-1.04	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: TX / IEEE 802.11g / CH Mid

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1136.67	V	46.42	38.45	13.93	60.35	52.38	74.00	54.00	-1.62	AVG
N/A										
1136.67	H	45.97	39.11	13.93	59.90	53.04	74.00	54.00	-0.96	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: TX / IEEE 802.11g / CH High

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1080.00	V	45.76	38.77	14.41	60.17	53.18	74.00	54.00	-0.82	AVG
N/A										
1190.00	H	45.92	38.76	13.48	59.40	52.24	74.00	54.00	-1.76	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: TX / draft 802.11n Standard-20 MHz Channel mode / CH Low

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1020.00	V	46.43	38.03	14.92	61.35	52.95	74.00	54.00	-1.05	AVG
N/A										
1243.33	H	45.92	39.35	13.03	58.94	52.38	74.00	54.00	-1.62	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: TX / draft 802.11n Standard-20 MHz Channel mode / CH Mid

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1166.67	V	46.30	38.77	13.68	59.97	52.45	74.00	54.00	-1.55	AVG
N/A										
1150.00	H	46.55	38.62	13.82	60.37	52.44	74.00	54.00	-1.56	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: TX / draft 802.11n Standard-20 MHz Channel mode / CH High

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1266.67	V	46.50	38.95	12.83	59.33	51.78	74.00	54.00	-2.22	AVG
N/A										
1176.67	H	46.50	35.56	13.59	60.09	51.15	74.00	54.00	-2.85	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: TX / draft 802.11n Wide-40 MHz Channel mode / CH Low

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1146.67	V	46.34	38.77	13.85	60.19	52.62	74.00	54.00	-1.38	AVG
N/A										
1226.67	H	46.27	39.07	13.17	59.44	52.24	74.00	54.00	-1.76	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: TX / draft 802.11n Wide-40 MHz Channel mode / CH Mid

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1150.00	V	45.92	39.12	13.82	59.74	52.94	74.00	54.00	-1.06	AVG
N/A										
1536.67	H	48.20	39.35	10.82	59.03	50.17	74.00	54.00	-3.83	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: TX / draft 802.11n Wide-40 MHz Channel mode / CH High

Test Date: October 20, 2006

Temperature: 20°C

Tested by: Ryan Chen

Humidity: 51 % 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
1140.00	V	47.02	39.16	13.90	60.92	53.06	74.00	54.00	-0.94	AVG
N/A										
1113.33	H	46.40	39.03	14.13	60.53	53.16	74.00	54.00	-0.84	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).



## 7.8 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 μH/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 (dBμV)	
	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

\* Decreases with the logarithm of the frequency.

### Test Configuration

See test photographs attached in Appendix 1 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

**Operation Mode:** Normal Link                      **Test Date:** September 12, 2006  
**Temperature:** 25°C                                      **Tested by:** Ivan Tsai  
**Humidity:** 55% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.264	37.320	33.310	0.100	37.420	33.410	61.305	51.305	-23.885	-17.895	L1
0.537	30.510	24.180	0.100	30.610	24.280	56.000	46.000	-25.390	-21.720	L1
0.660	35.120	28.280	0.100	35.220	28.380	56.000	46.000	-20.780	-17.620	L1
0.806	34.260	26.300	0.100	34.360	26.400	56.000	46.000	-21.640	-19.600	L1
1.321	33.680	24.500	0.100	33.780	24.600	56.000	46.000	-22.220	-21.400	L1
5.412	35.620	33.530	0.241	35.861	33.771	60.000	50.000	-24.139	-16.229	L1
0.179	22.330	21.820	0.142	22.472	21.962	64.532	54.532	-42.060	-32.570	L2
0.266	34.420	28.970	0.100	34.520	29.070	61.242	51.242	-26.722	-22.172	L2
0.676	31.800	25.340	0.100	31.900	25.440	56.000	46.000	-24.100	-20.560	L2
0.799	30.160	23.210	0.100	30.260	23.310	56.000	46.000	-25.740	-22.690	L2
1.074	29.980	22.030	0.100	30.080	22.130	56.000	46.000	-25.920	-23.870	L2
1.364	28.200	20.300	0.100	28.300	20.400	56.000	46.000	-27.700	-25.600	L2

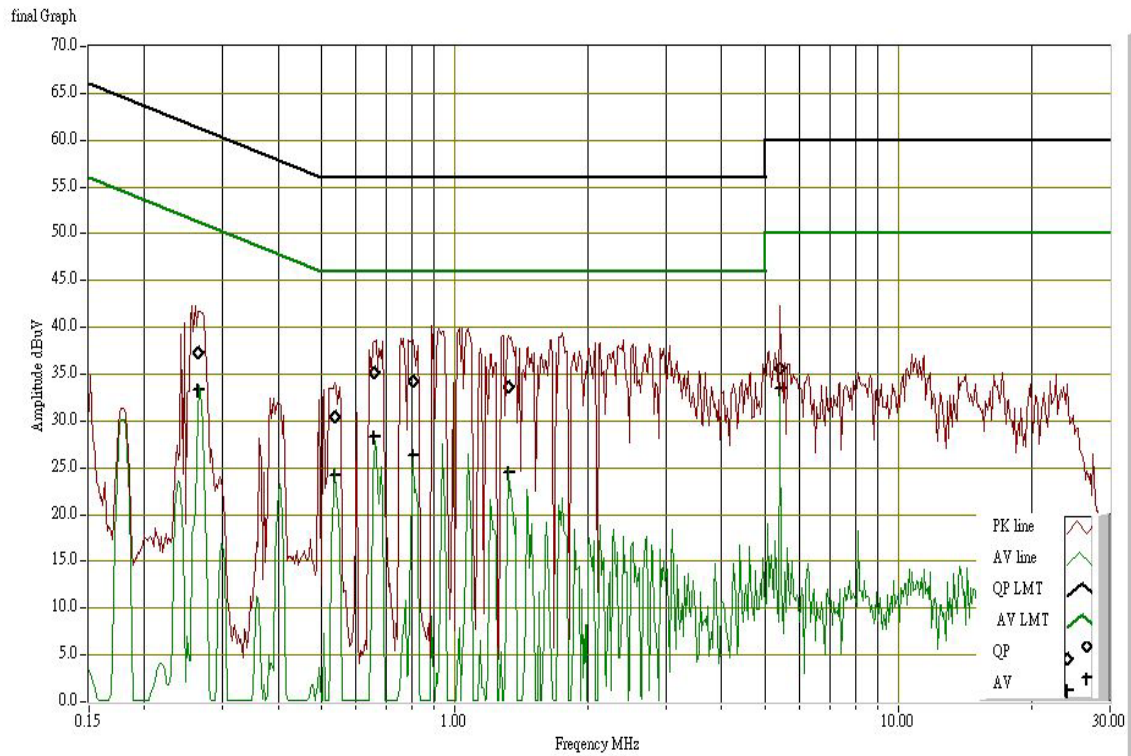
### **Remark:**

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 and 30MHz was 10 kHz; the IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9 kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)



### Test Plots

#### Conducted emissions (Line 1)



#### Conducted emissions (Line 2)

