



## FCC 47 CFR PART 15 SUBPART C

### TEST REPORT

For

**802.11n Wireless Access Point**

**Model: AP101nA, WNAP-3000PE**

**Trade Name: SerComm**

*Issued to*

**SerComm Corporation**  
**8F, No. 3-1, YuanQu St., NanKang,**  
**Taipei 115, Taiwan, R.O.C.**

*Issued by*



**Compliance Certification Services Inc.**  
**No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,**  
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**[service@tw.ccsemc.com](mailto:service@tw.ccsemc.com)**



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## 1. TEST RESULT CERTIFICATION

**Applicant:** SerComm Corporation  
8F, No. 3-1, YuanQu St., NanKang,  
Taipei 115, Taiwan, R.O.C.

**Equipment Under Test:** 802.11n Wireless Access Point

**Trade Name:** SerComm

**Model Number:** AP101nA, WNAP-3000PE

**Date of Test:** March 27 ~ July 8, 2008

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
Deviation from Applicable Standard	
The Powerline Conducted Emissions was tested at Compliance Certification Services. (Hsintien Lab.) The test equipments were listed in page 8 and the test data were recorded in page 169~170.	

### 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:*

Rex Lai  
Section Manager  
Compliance Certification Services Inc.

*Reviewed by:*

Gina Lo  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	802.11n Wireless Access Point
<b>Trade Name</b>	SerComm
<b>Model Number</b>	AP101nA, WNAP-3000PE
<b>Model Discrepancy</b>	All the specification and layout are identical except they come with different model numbers for marketing purposes.
<b>Power Supply</b>	<b>Power Adapter</b> LEADER / MT12-Y120100-A1 I/P: 100-120V, 60Hz, 0.3A O/P: 12V, 1A <b>POE</b> Model: IWE500-INJ I/P: 100-240V, 2A, 50/60Hz O/P: 48V, 1A
<b>Frequency Range</b>	2412 ~ 2462 MHz
<b>Transmit Power</b>	EEE 802.11b mode: 20.69 dBm IEEE 802.11g mode: 19.61 dBm draft 802.11n Standard-20 MHz Channel mode: 19.68 dBm draft 802.11n Wide-40 MHz Channel mode: 16.79 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: 2 dBi Antenna Calculation for CDD Mode: $2 \text{ dBi} + 10 \log (3) = 6.8 \text{ dBi}$ (Numeric gain: 4.79)

**Remark:**

1. The sample selected for test was production product and was provided by manufacturer.



### **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.



### 3.4FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

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

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

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

<sup>2</sup> Above 38.6

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



### 3.5 DESCRIPTION OF TEST MODES

The EUT (model: AP101nA) comes with one type of power adapter and one type of POE for sale. After the preliminary test, the EUT with power adapter was found to emit the worst emissions and therefore had been tested under operating condition.

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

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

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

**IEEE 802.11b mode:**

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

**IEEE 802.11g 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	02/23/2010

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	09/10/2009
Test Receiver	Rohde&Schwarz	ESCI	100064	11/12/2009
Switch Controller	TRC	Switch Controller	SC94050010	05/02/2010
4 Port Switch	TRC	4 Port Switch	SC94050020	05/02/2010
Horn Antenna	EMCO	3115	9903-5761	01/09/2010
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/27/2010
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	09/24/2009
Test S/W	LABVIEW (V 6.1)			

**Remark:** The measurement uncertainty is less than  $\pm 3.7046\text{dB}$  (30MHz ~ 1GHz),  $\pm 3.0958\text{dB}$  (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.

Conducted Emission room # A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
TEST RECEIVER	R&S	ESHS20	840455/006	02/17/2010
LISN (EUT)	SCHWARZBECK	NSLK 8127	8127382	12/02/2009
LISN	SOLAR	8012-50-R-24-BNC	8305114	12/02/2009
BNC CABLE	Huber+Suhner	RG-223/U	BNC A2	05/11/2010
THERMO-HYGRO METER	TECPEL	DTM-303	No.7	11/14/2009
Test S/W	EMI 32.exe			

**Remark:** The measurement uncertainty is less than  $\pm 1.7376\text{dB}$ , 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






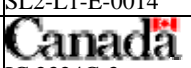
Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

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	 ACCREDITED TESTING CERT #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	<b>VCCI</b> 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	 Testing Laboratory 0363
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 2324C-3, IC 2324C-5) / 3M Semi Anechoic Chamber (IC 6106)	 IC 2324C-3 IC 2324C-5 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)	IBM	2672 (X31)	99KPZYN	WLAN: ANO20030400LEG Bluetooth: ANO20020100MTN	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

**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.



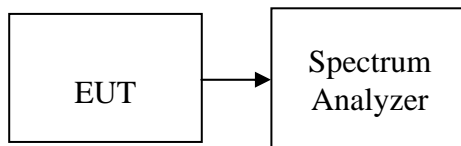
## 7 FCC PART 15.247 REQUIREMENTS

### 7.16DB 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	12.33	>500	PASS
Mid	2437	11.08		PASS
High	2462	10.08		PASS

**Test mode: IEEE 802.11b mode / Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	9.75	>500	PASS
Mid	2437	11.17		PASS
High	2462	10.17		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.00	>500	PASS
Mid	2437	11.08		PASS
High	2462	10.17		PASS

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

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

**Test mode: IEEE 802.11g mode / Chain 1**

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

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

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

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.67	>500	PASS
Mid	2437	17.67		PASS
High	2462	17.75		PASS

**Test mode: draft 802.11n Standard-20 MHz Channel mode / Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.42	>500	PASS
Mid	2437	17.67		PASS
High	2462	17.75		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.25	>500	PASS
Mid	2437	17.67		PASS
High	2462	16.00		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	36.33		PASS
High	2452	36.50		PASS

**Test mode: draft 802.11n Wide-40 MHz Channel mode / Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.33	>500	PASS
Mid	2437	36.50		PASS
High	2452	36.42		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.42	>500	PASS
Mid	2437	36.33		PASS
High	2452	36.42		PASS



## Test Plot

### IEEE 802.11b mode / Chain 0

#### 6dB Bandwidth (CH Low)

Agilent 15:12:07 Mar 31, 2008

R T

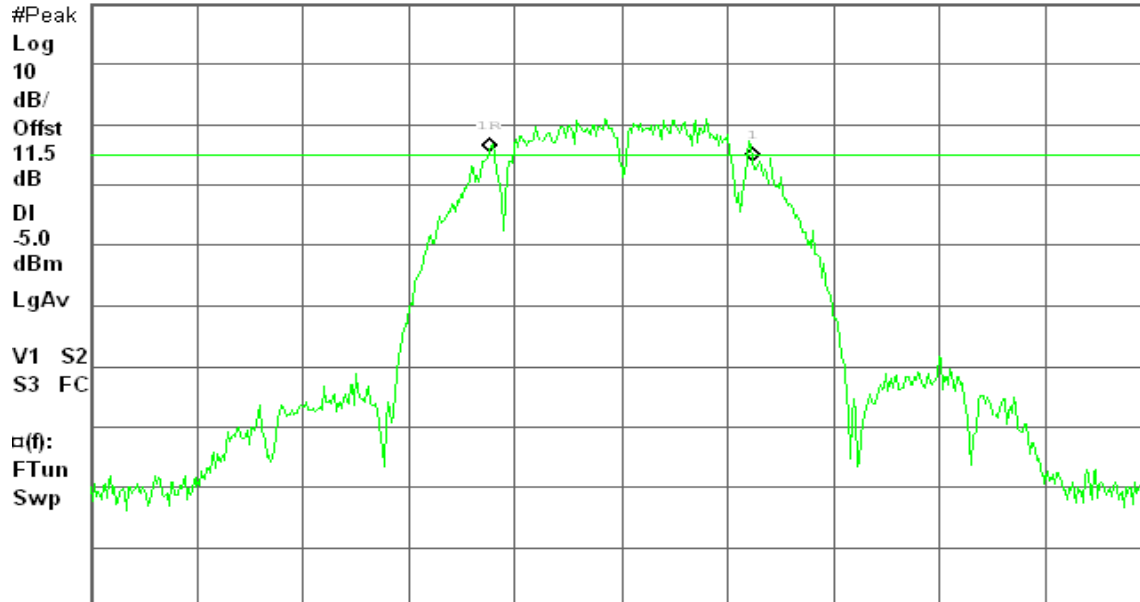
6dB BW, b Mode Low Ch.

 $\Delta$  Mkr1 12.33 MHz

Ref 20 dBm

Atten 20 dB

-1.58 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 15:16:48 Mar 31, 2008

R T

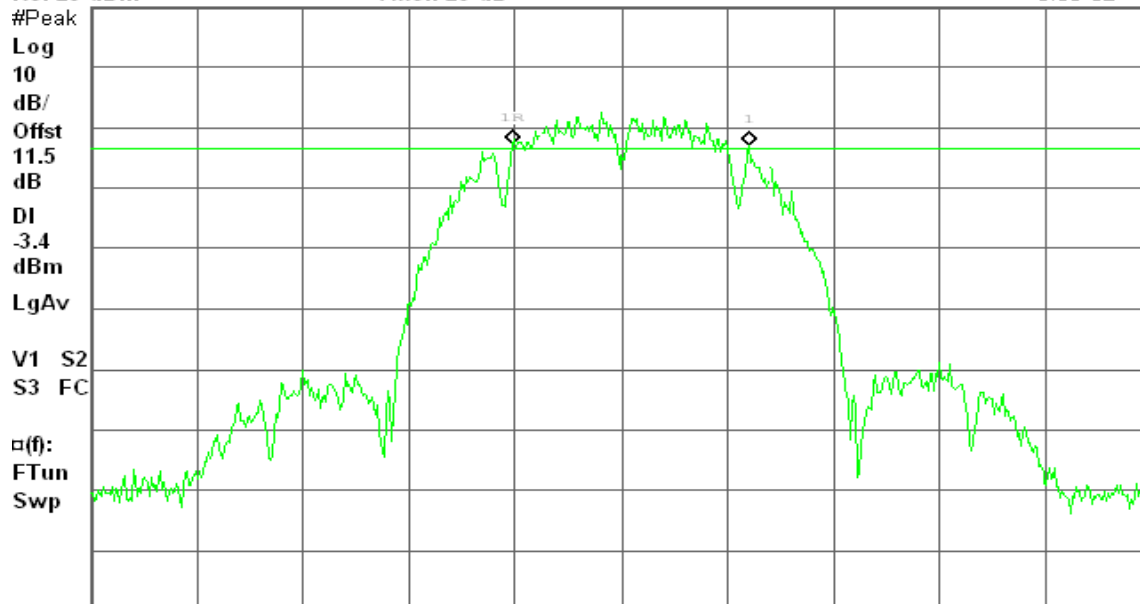
6dB BW, b Mode Mid Ch.

 $\Delta$  Mkr1 11.08 MHz

Ref 20 dBm

Atten 20 dB

-0.35 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 15:21:57 Mar 31, 2008

R T

6dB BW, b Mode High Ch.

 $\Delta$  Mkr1 10.08 MHz

Ref 20 dBm

Atten 20 dB

-0.17 dB

#Peak

Log

10

dB/

Offst

11.5

dB

DI

-3.1

dBm

LgAv

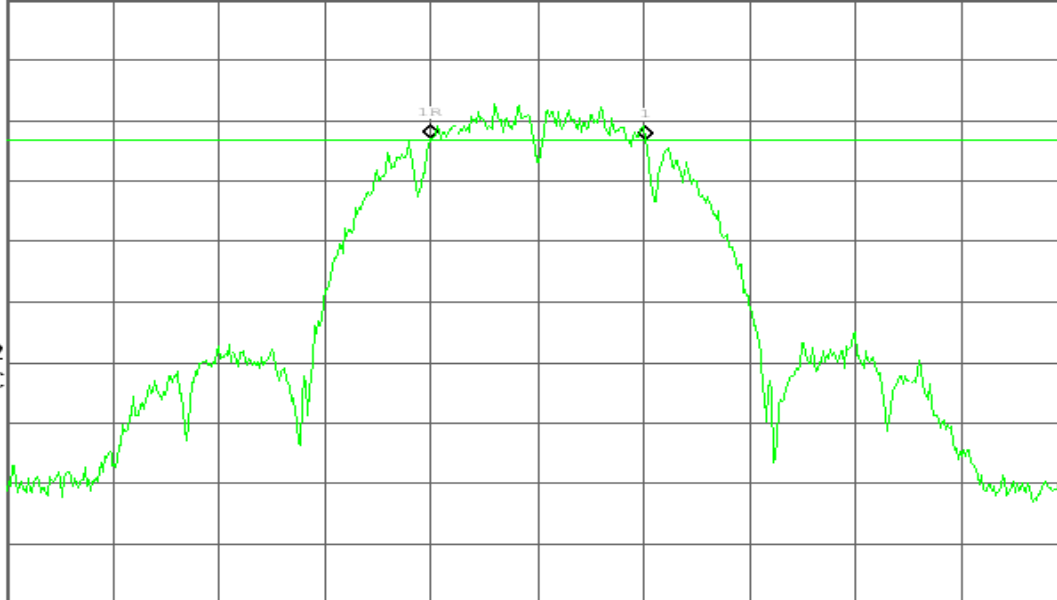
V1 S2

S3 FC

 $\alpha(f)$ :

FTun

Swp



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

## IEEE 802.11b mode / Chain 1

## 6dB Bandwidth (CH Low)

\* Agilent 15:09:49 Jun 13, 2008

R T

6dB BW, b Mode Low Ch.

 $\Delta$  Mkr1 9.75 MHz

Ref 20 dBm

Atten 30 dB

0.22 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-4.6

dBm

LgAv

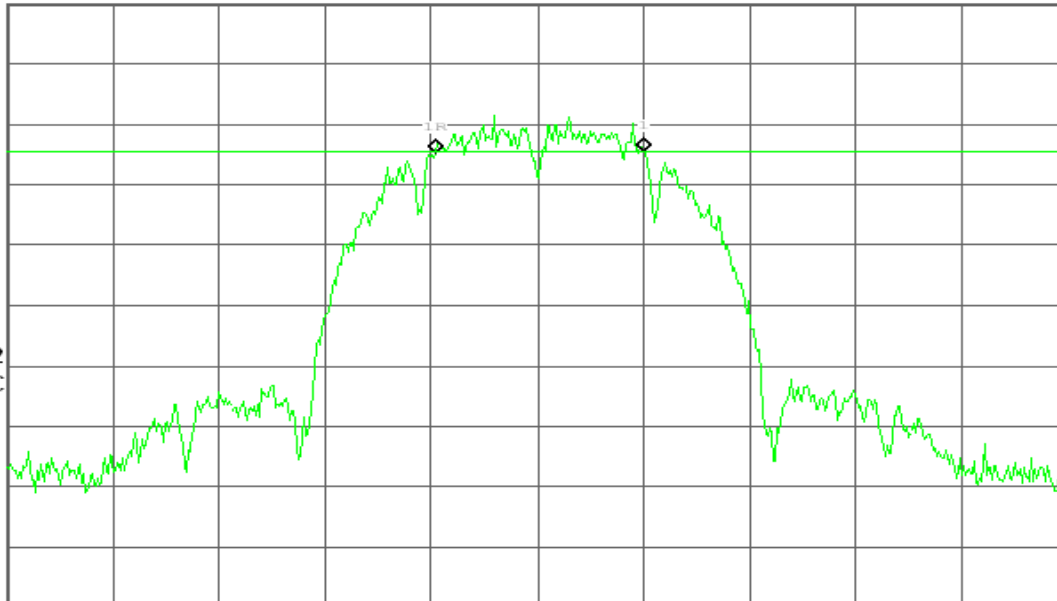
V1 S2

S3 FC

 $\alpha(f)$ :

FTun

Swp



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 15:17:38 Jun 13, 2008

R T

6dB BW, b Mode Mid Ch.

 $\Delta$  Mkr1 11.17 MHz

Ref 20 dBm

Atten 30 dB

1.74 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-5.6

dBm

LgAv

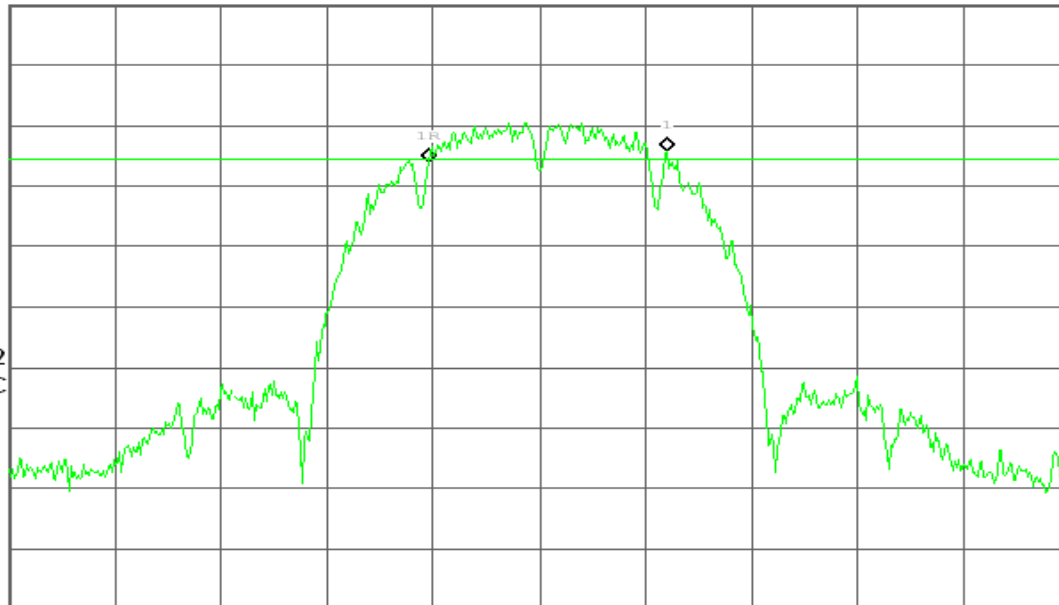
V1 S2

S3 FC

 $\alpha(f)$ :

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 15:26:10 Jun 13, 2008

R T

6dB BW, b Mode High Ch.

 $\Delta$  Mkr1 10.17 MHz

Ref 20 dBm

Atten 30 dB

-0.14 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-4.8

dBm

LgAv

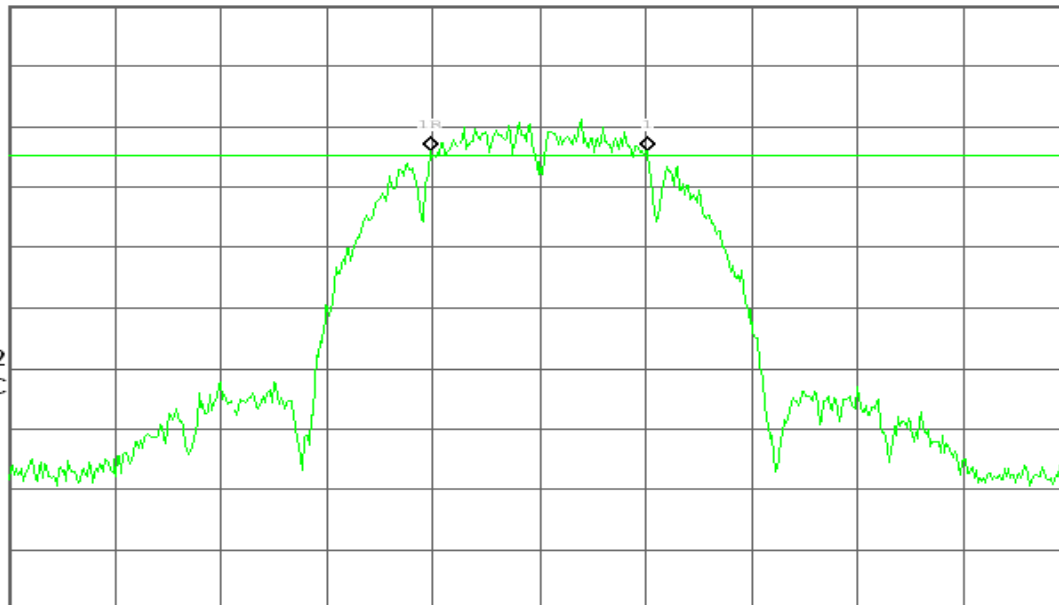
V1 S2

S3 FC

 $\alpha(f)$ :

FTun

Swp



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

**IEEE 802.11b mode / Chain 2****6dB Bandwidth (CH Low)**

Agilent 17:16:40 Jul 8, 2008

R T

6dB BW, b Mode Low Ch.

 $\Delta$  Mkr1 10.00 MHz

Ref 20 dBm

Atten 30 dB

-2.03 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-2.5

dBm

LgAv

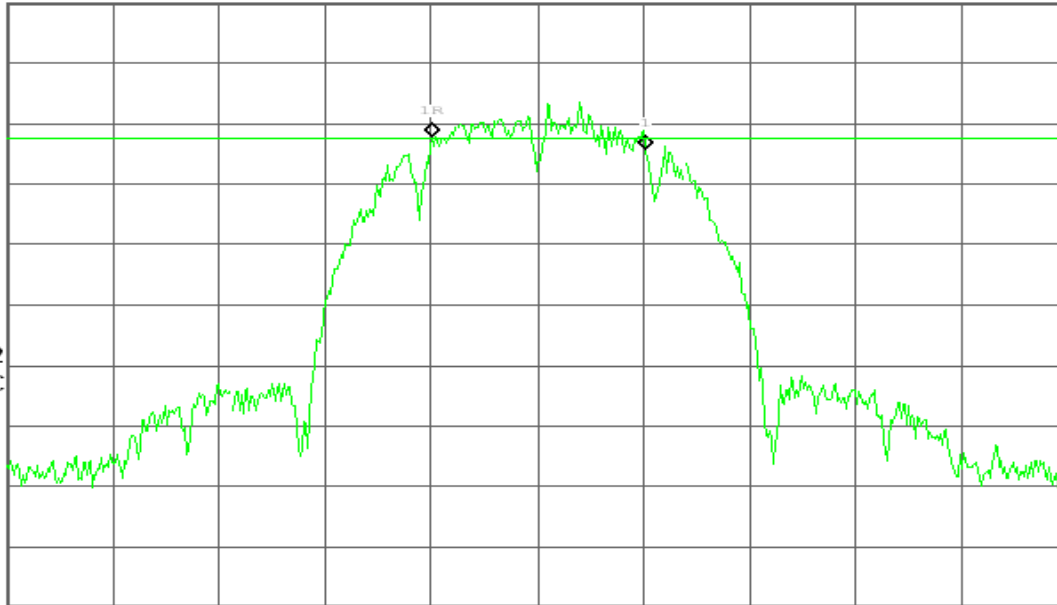
V1 S2

S3 FC

 $\alpha(f)$ :

FTun

Swp



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 17:26:36 Jul 8, 2008

R T

6dB BW, b Mode Mid Ch.

 $\Delta$  Mkr1 11.08 MHz

Ref 20 dBm

Atten 30 dB

0.72 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-3.2

dBm

LgAv

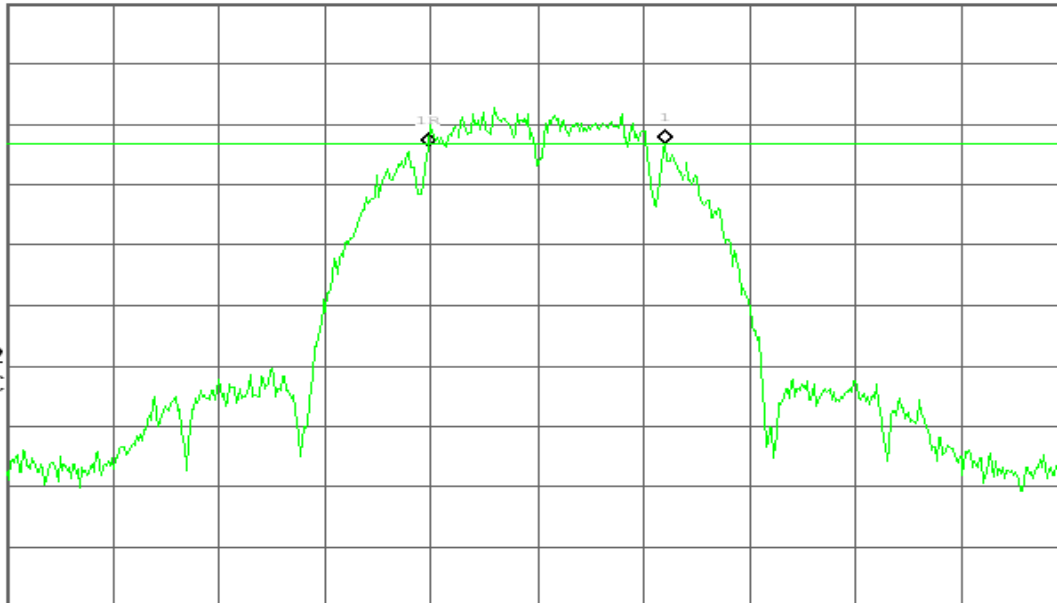
V1 S2

S3 FC

 $\alpha(f)$ :

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 17:35:59 Jul 8, 2008

R T

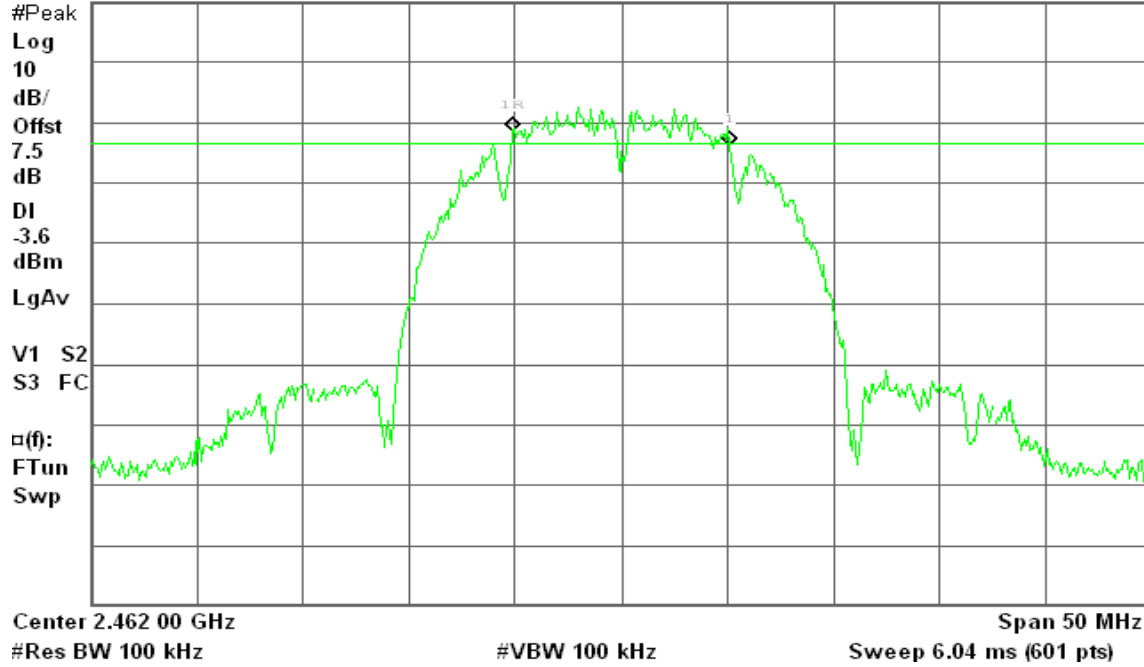
6dB BW, b Mode High Ch.

Δ Mkr1 10.17 MHz

Ref 20 dBm

Atten 30 dB

-2.51 dB



**IEEE 802.11g mode / Chain 0****6dB Bandwidth (CH Low)**

Agilent 15:01:24 Mar 31, 2008

R T

6dB BW, g Mode Low Ch.

 $\Delta$  Mkr1 16.50 MHz

Ref 20 dBm

Atten 20 dB

-0.34 dB

#Peak

Log

10

dB/

Offst

11.5

dB

DI

-7.8

dBm

LgAv

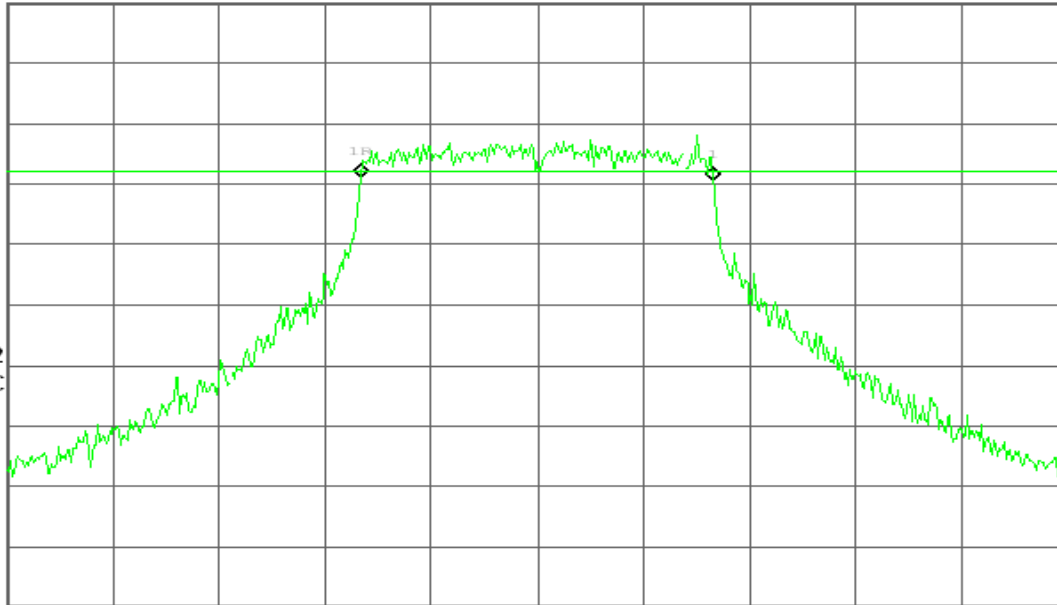
V1 S2

S3 FC

 $\alpha(f)$ :

FTun

Swp



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 14:56:40 Mar 31, 2008

R T

6dB BW, g Mode Mid Ch.

 $\Delta$  Mkr1 16.50 MHz

Ref 20 dBm

Atten 20 dB

1.13 dB

#Peak

Log

10

dB/

Offst

11.5

dB

DI

-7.7

dBm

LgAv

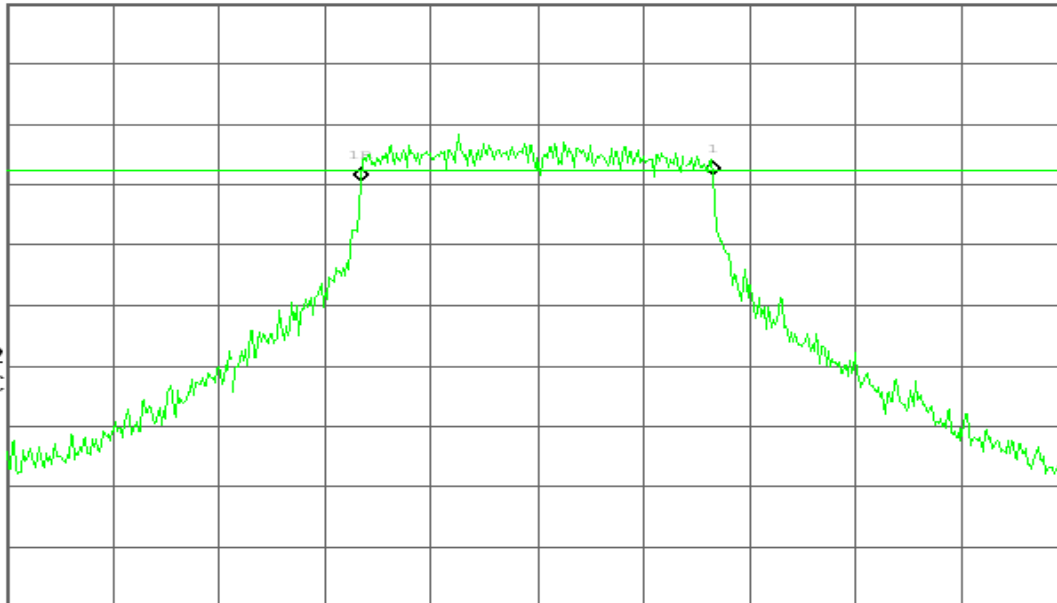
V1 S2

S3 FC

 $\alpha(f)$ :

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 15:06:02 Mar 31, 2008

R T

6dB BW, g Mode High Ch.

 $\Delta$  Mkr1 16.50 MHz

Ref 20 dBm

Atten 20 dB

-2.32 dB

#Peak

Log

10

dB/

Offst

11.5

dB

DI

-8.6

dBm

LgAv

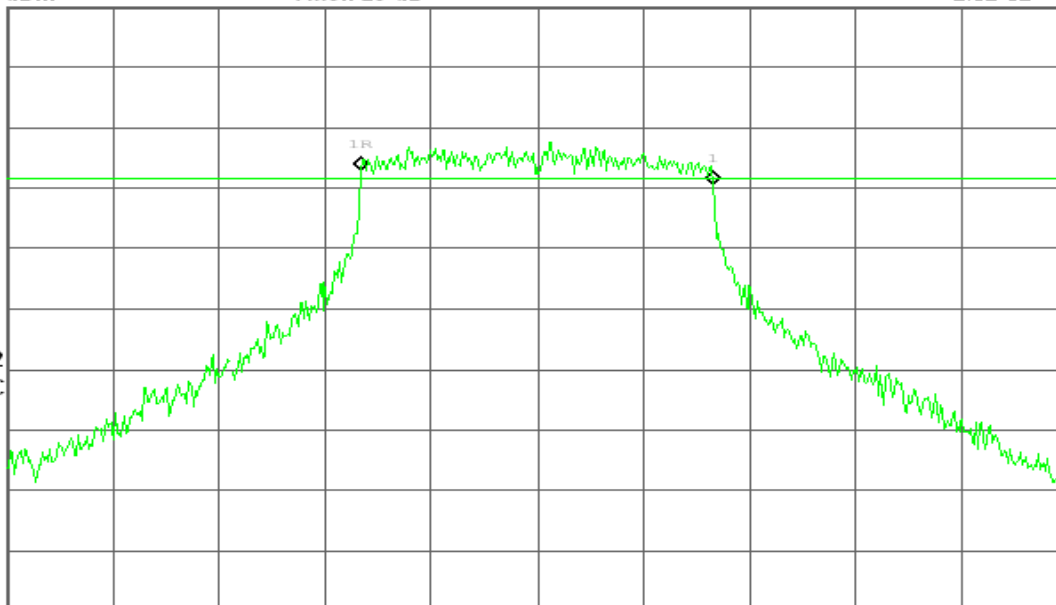
V1 S2

S3 FC

 $\alpha(f)$ :

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 1

## 6dB Bandwidth (CH Low)

\* Agilent 16:42:17 Jun 13, 2008

R T

6dB BW, g Mode Low Ch.

 $\Delta$  Mkr1 16.50 MHz

Ref 20 dBm

Atten 30 dB

0.61 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-9.4

dBm

LgAv

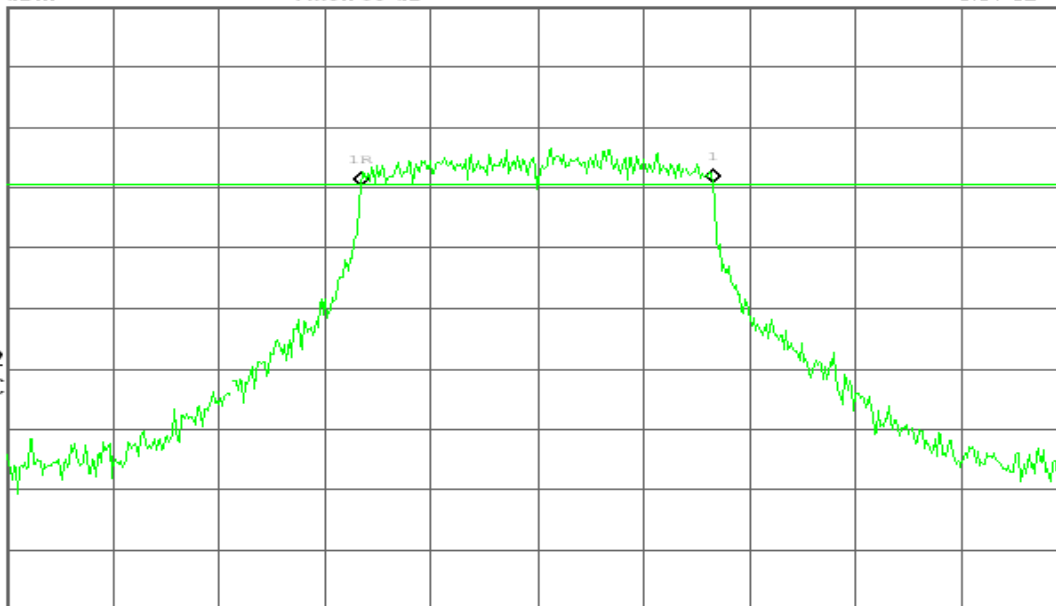
V1 S2

S3 FC

 $\alpha(f)$ :

FTun

Swp



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 16:48:45 Jun 13, 2008

R T

6dB BW, g Mode Mid Ch.

 $\Delta$  Mkr1 16.50 MHz

Ref 20 dBm

Atten 30 dB

1.17 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-10.3

dBm

LgAv

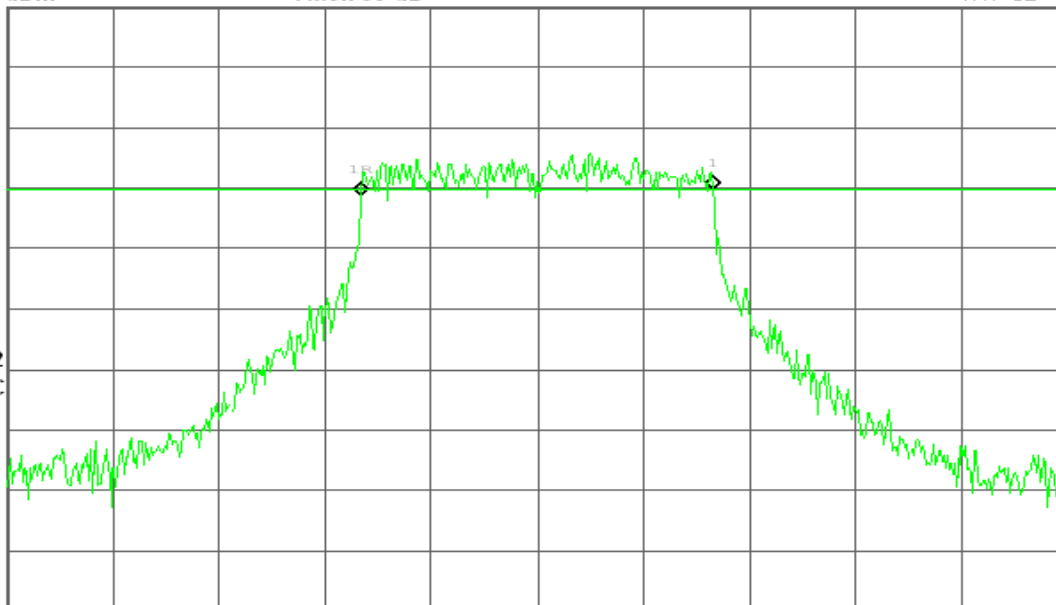
V1 S2

S3 FC

 $\alpha(f)$ :

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 16:54:25 Jun 13, 2008

R T

6dB BW, g Mode High Ch.

 $\Delta$  Mkr1 16.50 MHz

Ref 20 dBm

Atten 30 dB

-0.19 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-10.3

dBm

LgAv

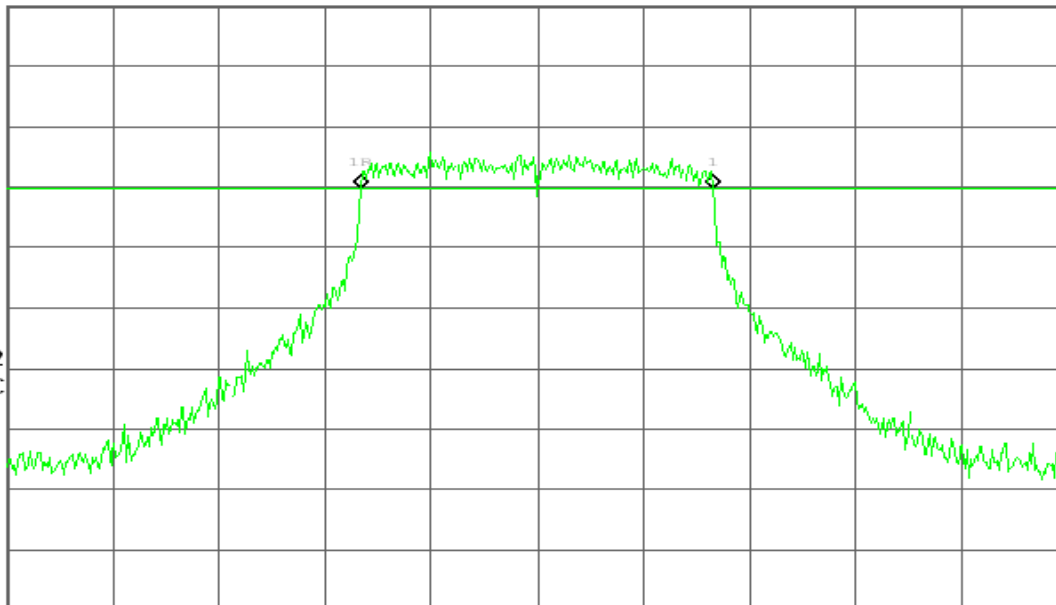
V1 S2

S3 FC

 $\alpha(f)$ :

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 2****6dB Bandwidth (CH Low)**

Agilent 17:51:43 Jul 8, 2008

R T

6dB BW, g Mode Low Ch.

 $\Delta$  Mkr1 16.42 MHz

Ref 20 dBm

Atten 30 dB

-1.49 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-8.5

dBm

LgAv

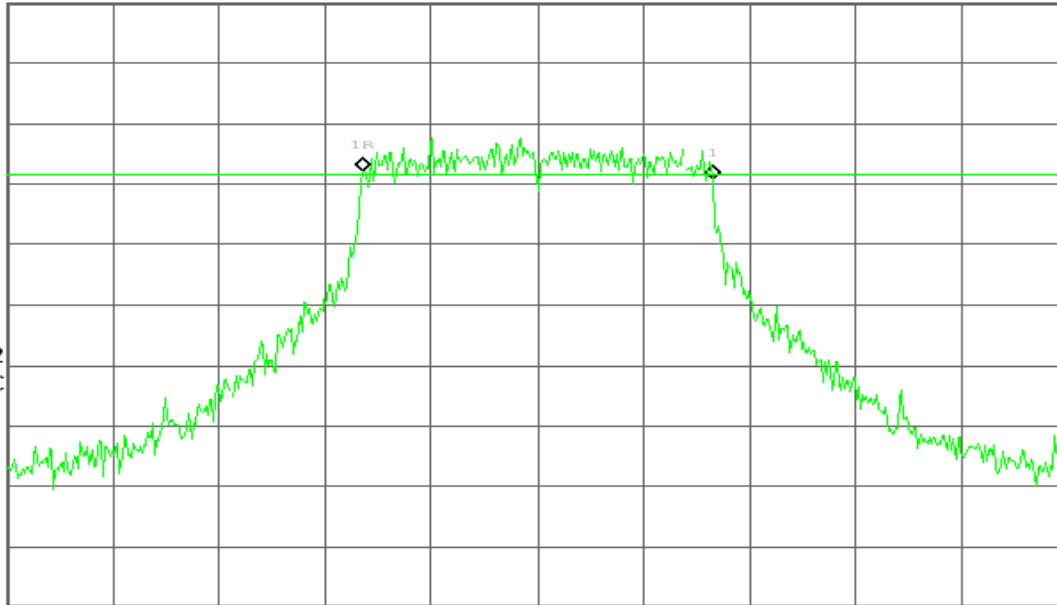
V1 S2

S3 FC

 $\alpha(f)$ :

FTun

Swp



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 18:00:18 Jul 8, 2008

R T

6dB BW, g Mode Mid Ch.

 $\Delta$  Mkr1 16.33 MHz

Ref 20 dBm

Atten 30 dB

-0.02 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-6.4

dBm

LgAv

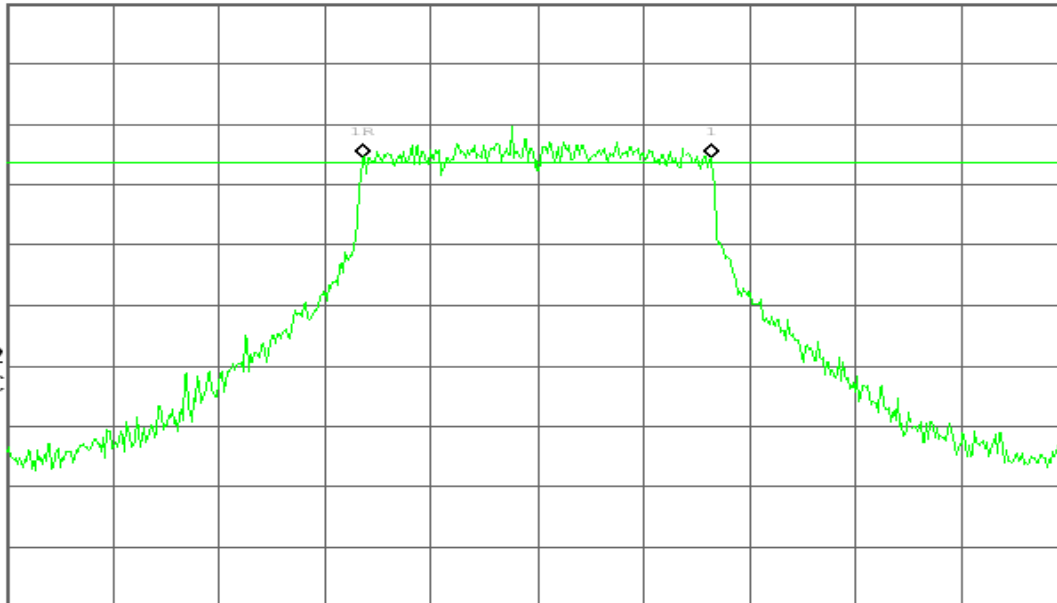
V1 S2

S3 FC

 $\alpha(f)$ :

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 18:09:06 Jul 8, 2008

R T

6dB BW, g Mode High Ch.

 $\Delta$  Mkr1 16.42 MHz

Ref 20 dBm

Atten 30 dB

0.14 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-9.0

dBm

LgAv

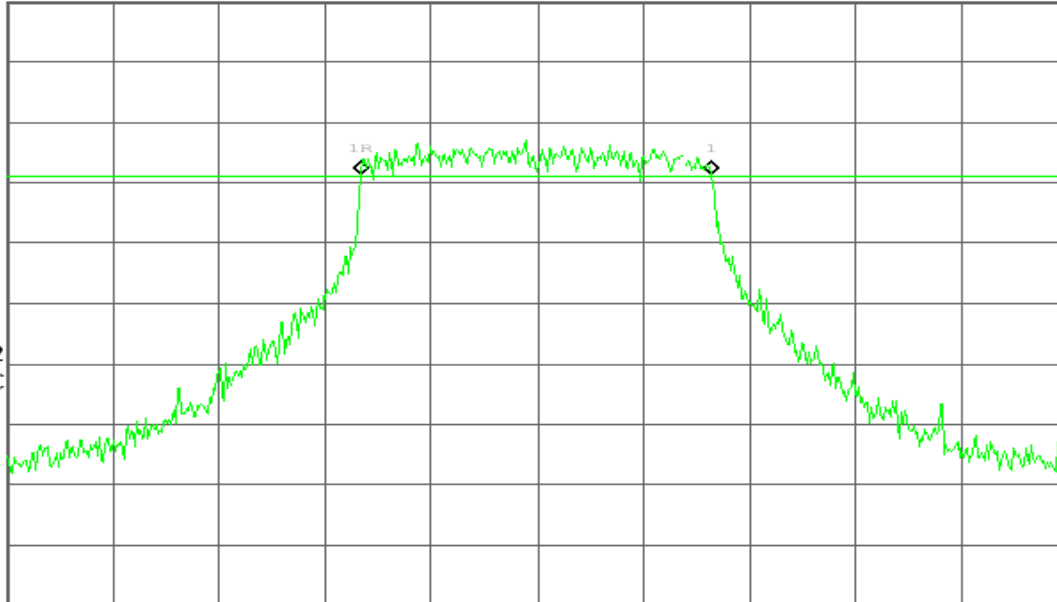
V1 S2

S3 FC

 $\square(f)$ :

FTun

Swp



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



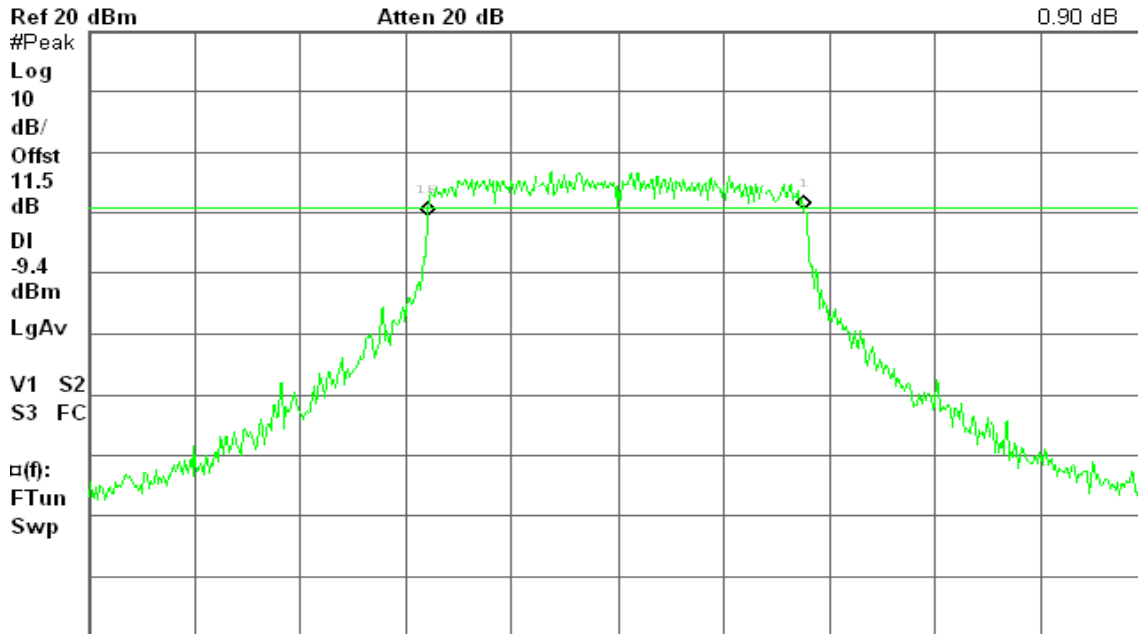
**draft 802.11n Standard-20 MHz Channel mode / Chain 0****6dB Bandwidth (CH Low)**

✱ Agilent 15:29:56 Mar 31, 2008

R T

Δ Mkr1 17.67 MHz

0.90 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

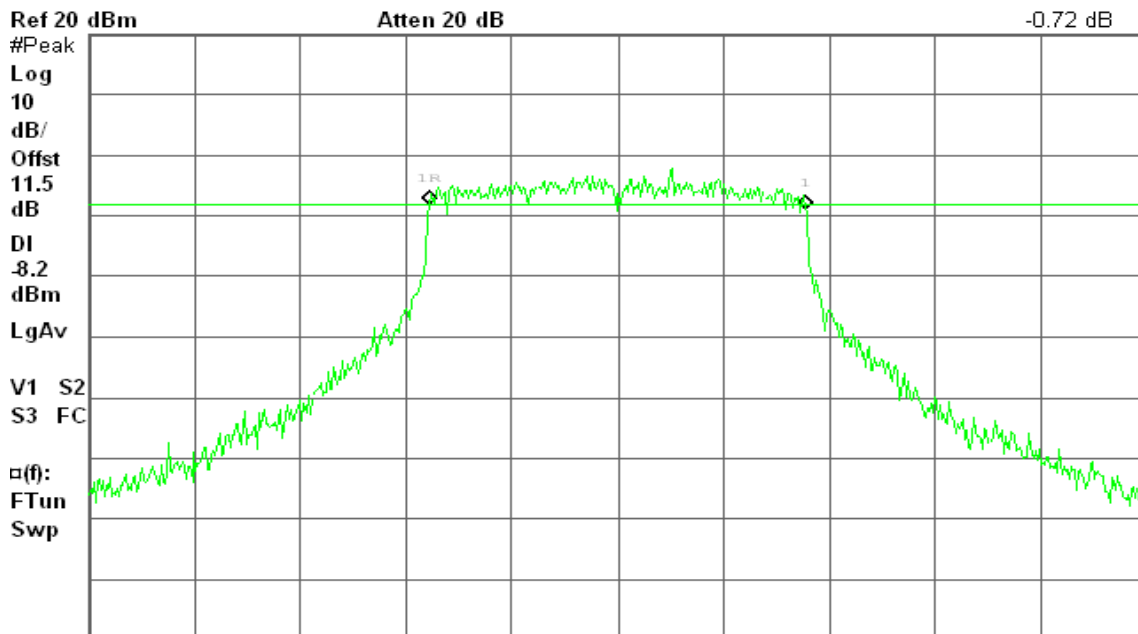
**6dB Bandwidth (CH Mid)**

✱ Agilent 15:38:25 Mar 31, 2008

R T

Δ Mkr1 17.67 MHz

-0.72 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

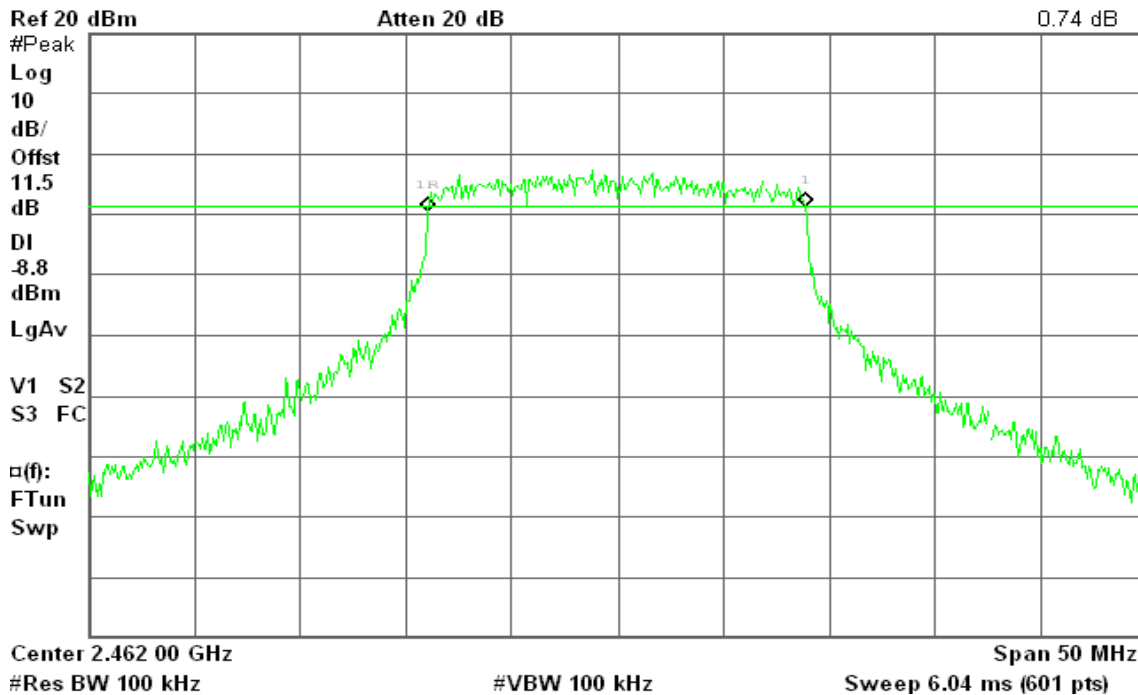
#VBW 100 kHz

Sweep 6.04 ms (601 pts)

**6dB Bandwidth (CH High)**

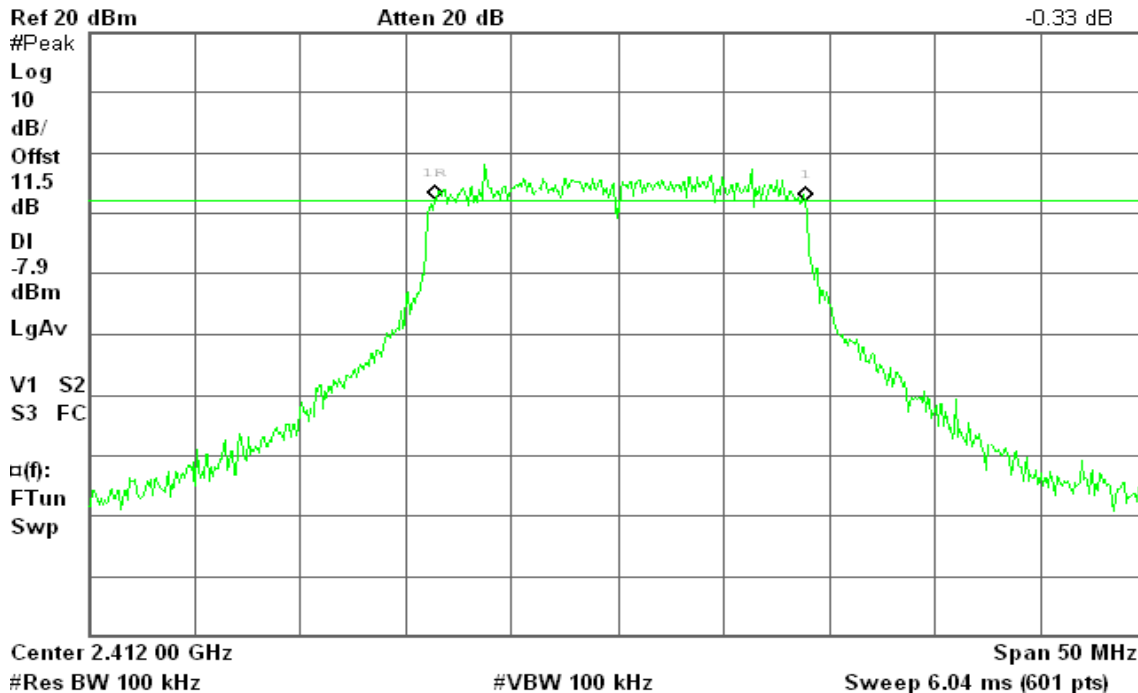
\* Agilent 15:43:05 Mar 31, 2008

R T

 $\Delta$  Mkr1 17.75 MHz  
0.74 dB**draft 802.11n Standard-20 MHz Channel mode / Chain 1****6dB Bandwidth (CH Low)**

\* Agilent 16:03:10 Mar 31, 2008

R T

 $\Delta$  Mkr1 17.42 MHz  
-0.33 dB



## 6dB Bandwidth (CH Mid)

Agilent 15:54:59 Mar 31, 2008

R T

 $\Delta$  Mkr1 17.67 MHz

-2.18 dB

Ref 20 dBm

Atten 20 dB

#Peak

Log

10

dB/

Offst

11.5

dB

DI

-9.7

dBm

LgAv

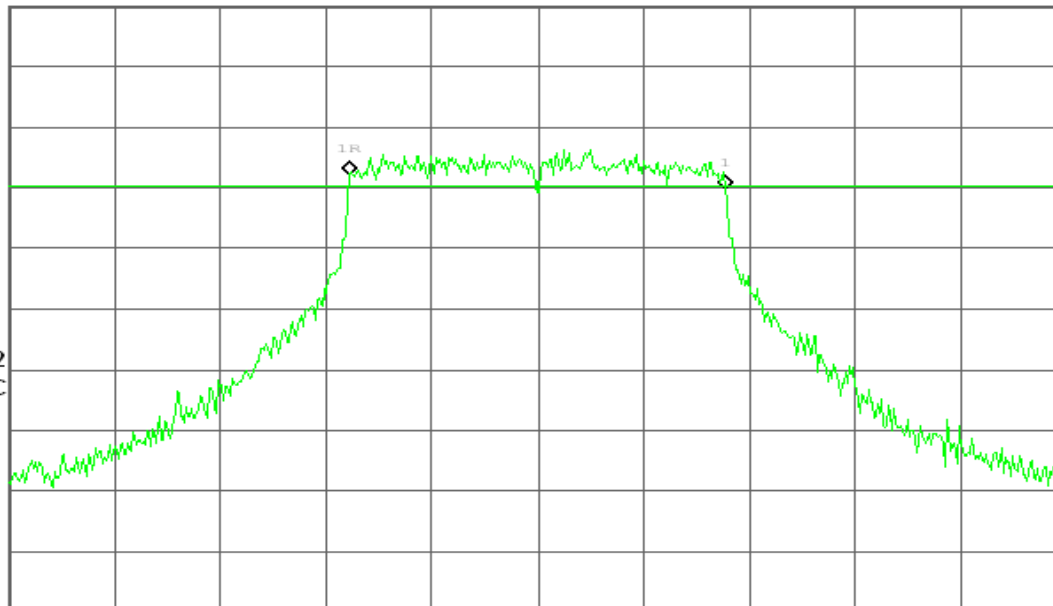
V1 S2

S3 FC

 $\square(f)$ :

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 15:54:10 Mar 31, 2008

R T

 $\Delta$  Mkr1 17.75 MHz

1.15 dB

Ref 20 dBm

Atten 20 dB

#Peak

Log

10

dB/

Offst

11.5

dB

DI

-9.3

dBm

LgAv

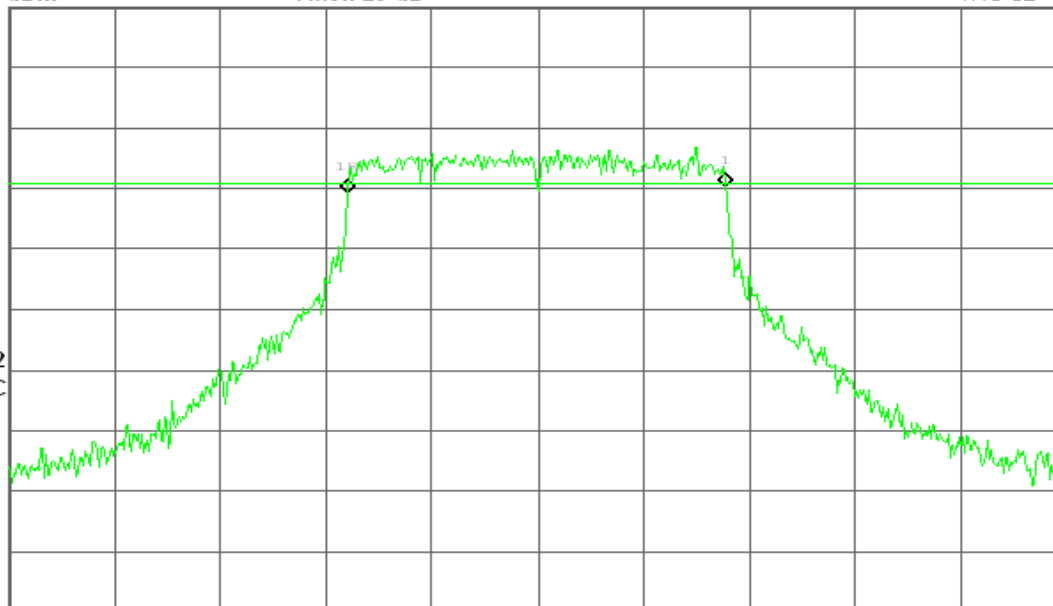
V1 S2

S3 FC

 $\square(f)$ :

FTun

Swp



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

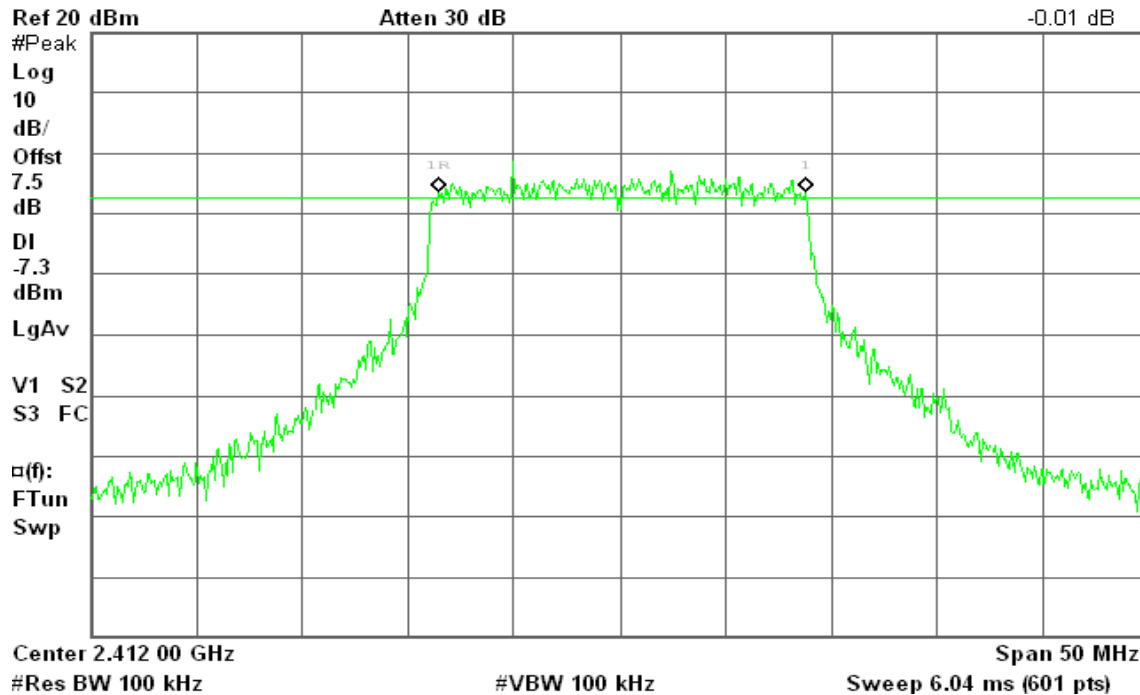
**draft 802.11n Standard-20 MHz Channel mode / Chain 2****6dB Bandwidth (CH Low)**

\* Agilent 14:54:25 Jul 7, 2008

R T

 $\Delta$  Mkr1 17.25 MHz

-0.01 dB

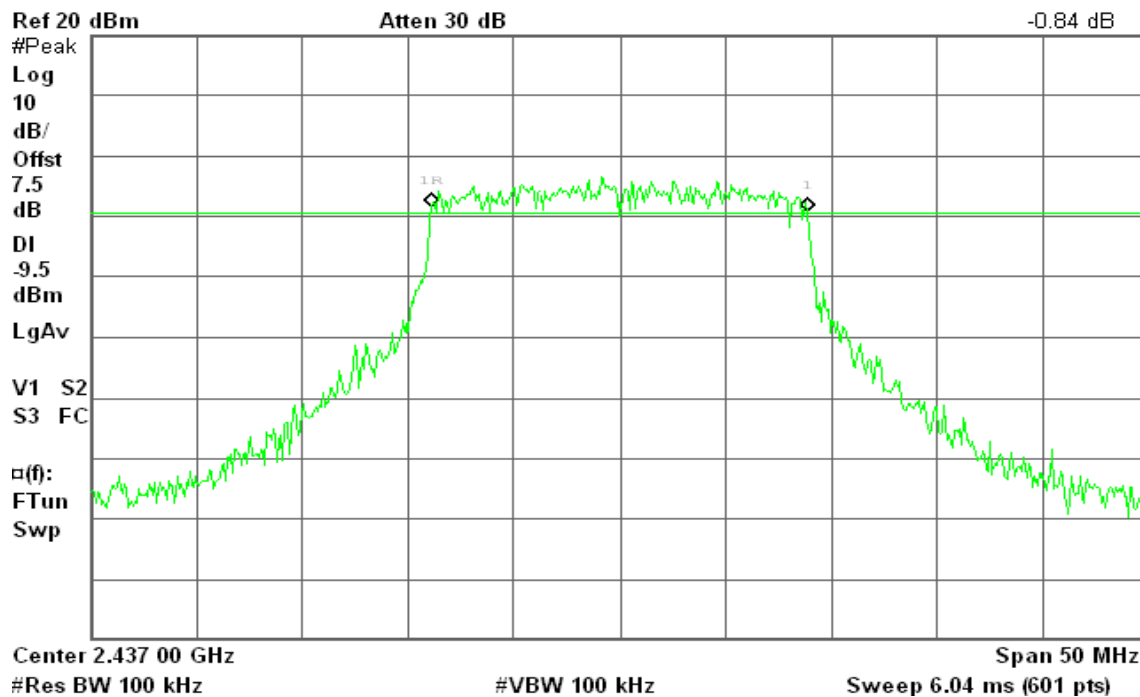
**6dB Bandwidth (CH Mid)**

\* Agilent 15:02:22 Jul 7, 2008

R T

 $\Delta$  Mkr1 17.67 MHz

-0.84 dB



**6dB Bandwidth (CH High)**

\* Agilent 15:09:33 Jul 7, 2008

R T

 $\Delta$  Mkr1 16.00 MHz

0.38 dB

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-6.8

dBm

LgAv

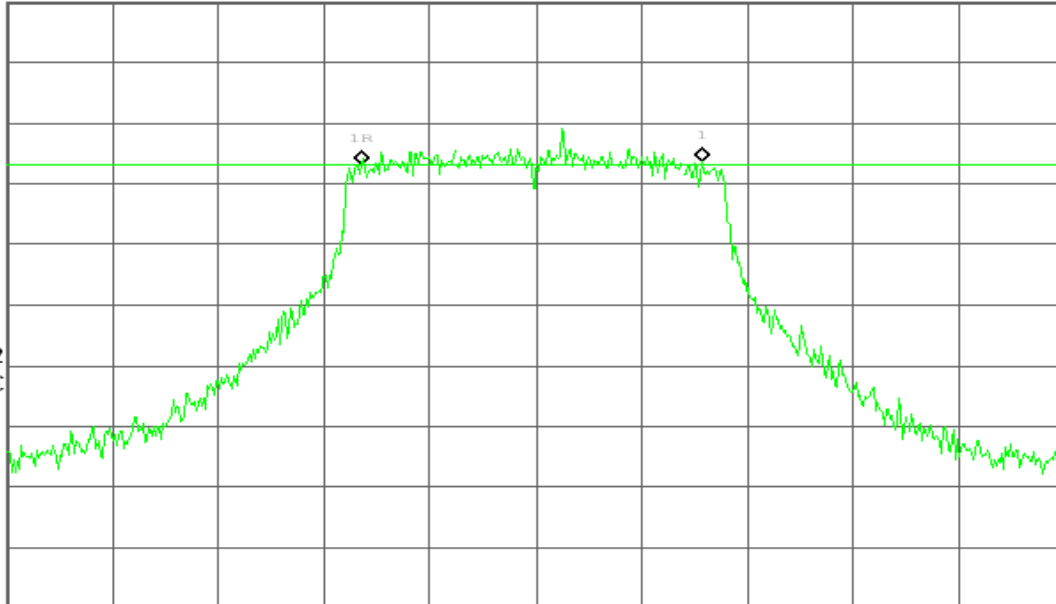
V1 S2

S3 FC

 $\alpha(f)$ :

FTun

Swp



Center 2.462 00 GHz

#VBW 100 kHz

Span 50 MHz

#Res BW 100 kHz

Sweep 6.04 ms (601 pts)

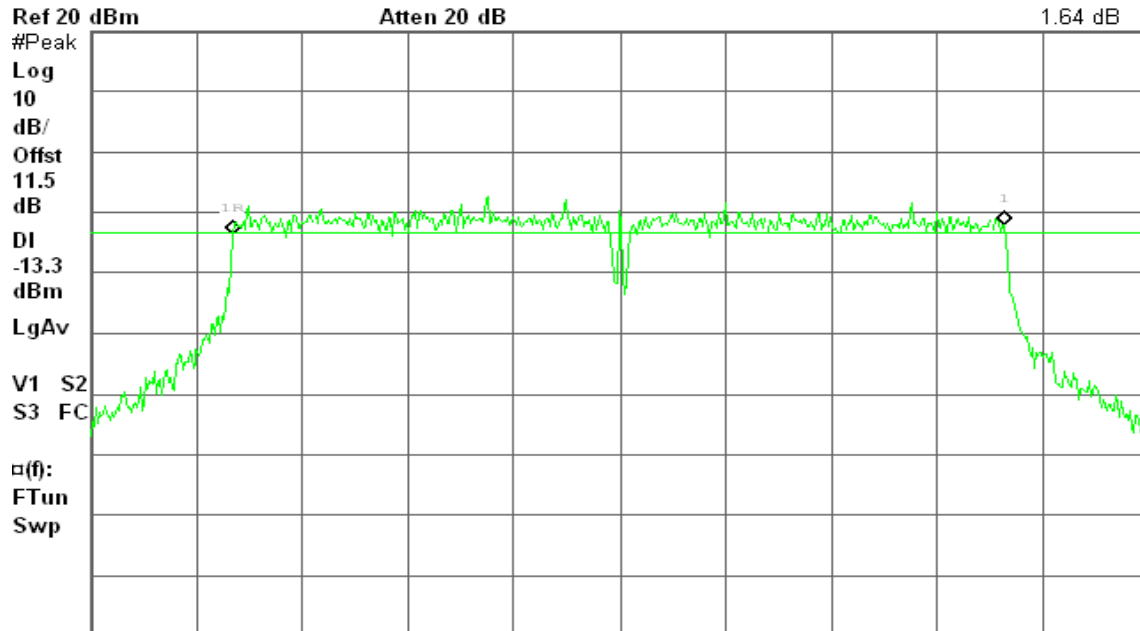
**draft 802.11n Wide-40 MHz Channel mode / Chain 0****6dB Bandwidth (CH Low)**

\* Agilent 16:35:09 Mar 31, 2008

R T

 $\Delta$  Mkr1 36.42 MHz

1.64 dB



Center 2.422 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz

Sweep 6.04 ms (601 pts)

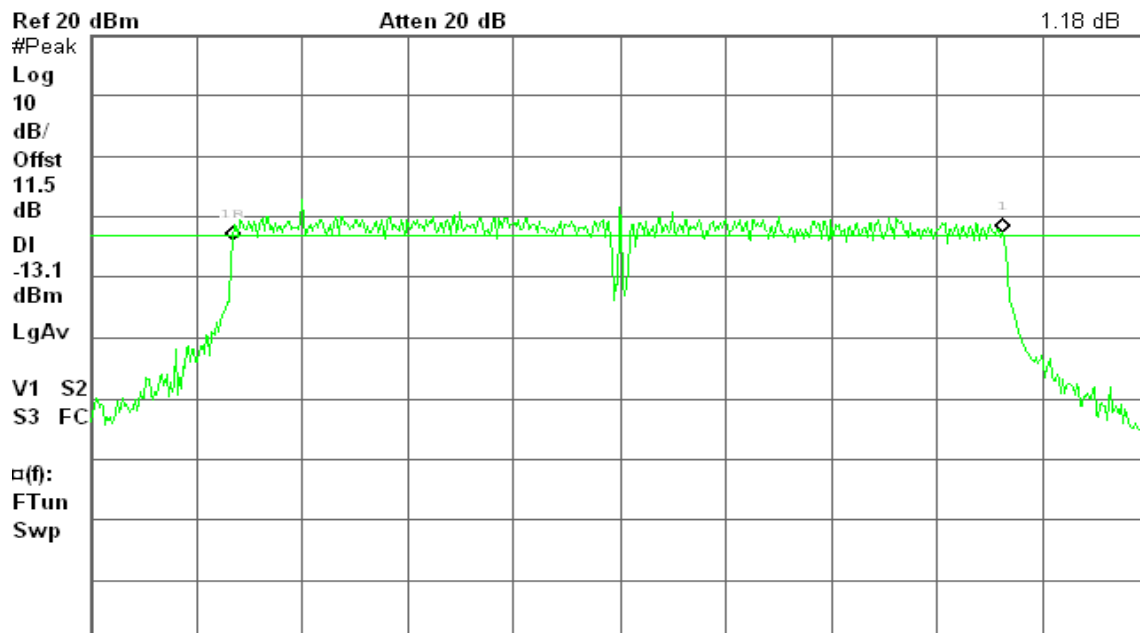
**6dB Bandwidth (CH Mid)**

\* Agilent 16:30:32 Mar 31, 2008

R T

 $\Delta$  Mkr1 36.33 MHz

1.18 dB



Center 2.437 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

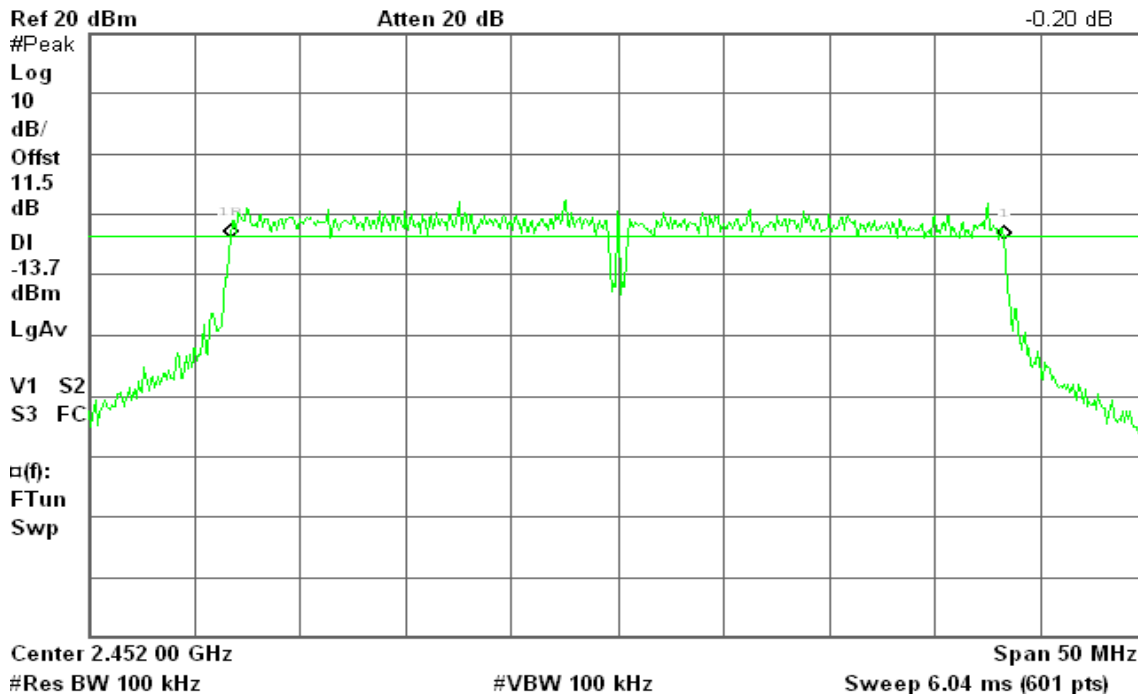
Span 50 MHz

Sweep 6.04 ms (601 pts)

**6dB Bandwidth (CH High)**

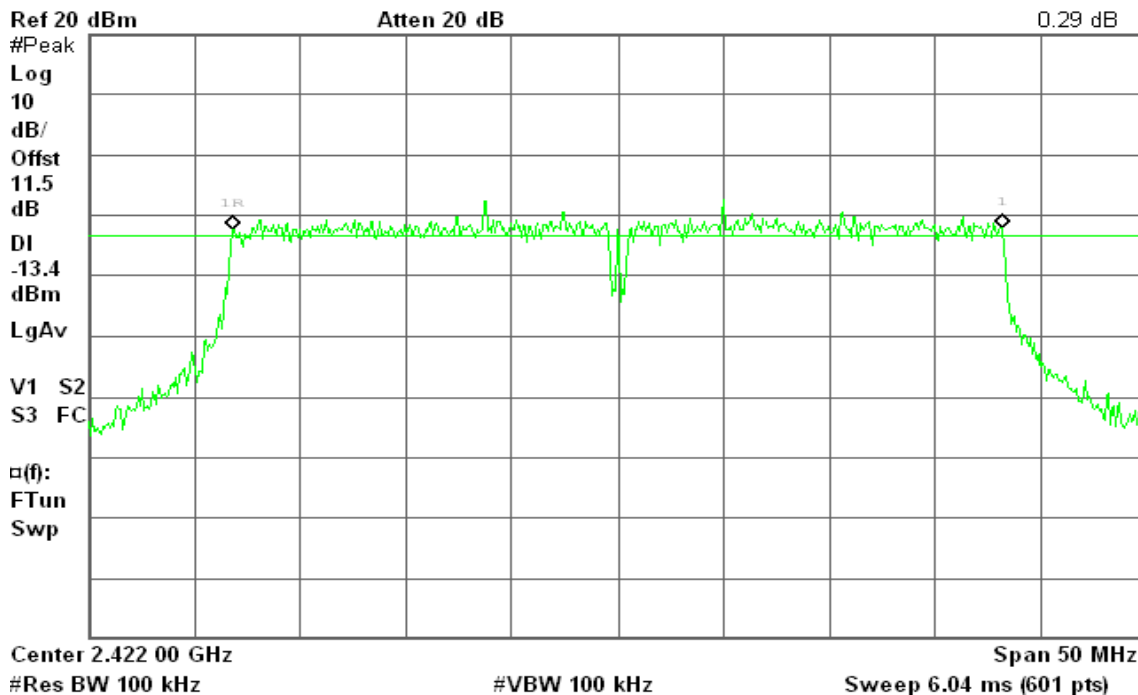
\* Agilent 16:25:56 Mar 31, 2008

R T

 $\Delta$  Mkr1 36.50 MHz  
-0.20 dB**draft 802.11n Wide-40 MHz Channel mode / Chain 1****6dB Bandwidth (CH Low)**

\* Agilent 16:10:54 Mar 31, 2008

R T

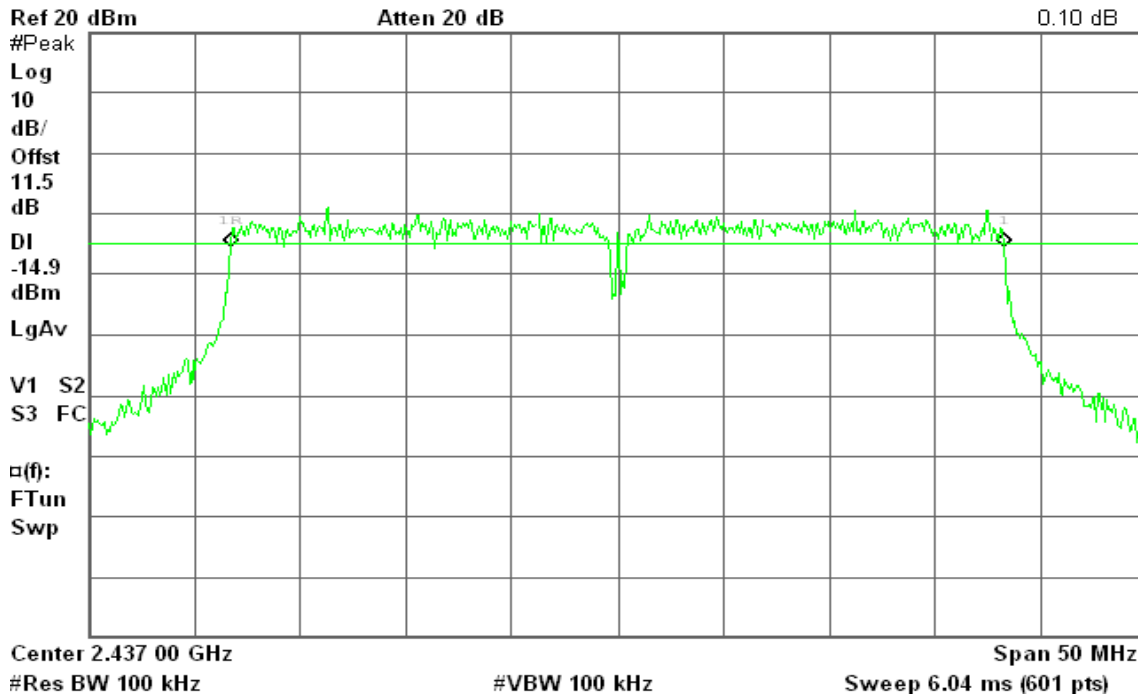
 $\Delta$  Mkr1 36.33 MHz  
0.29 dB



## 6dB Bandwidth (CH Mid)

\* Agilent 16:16:22 Mar 31, 2008

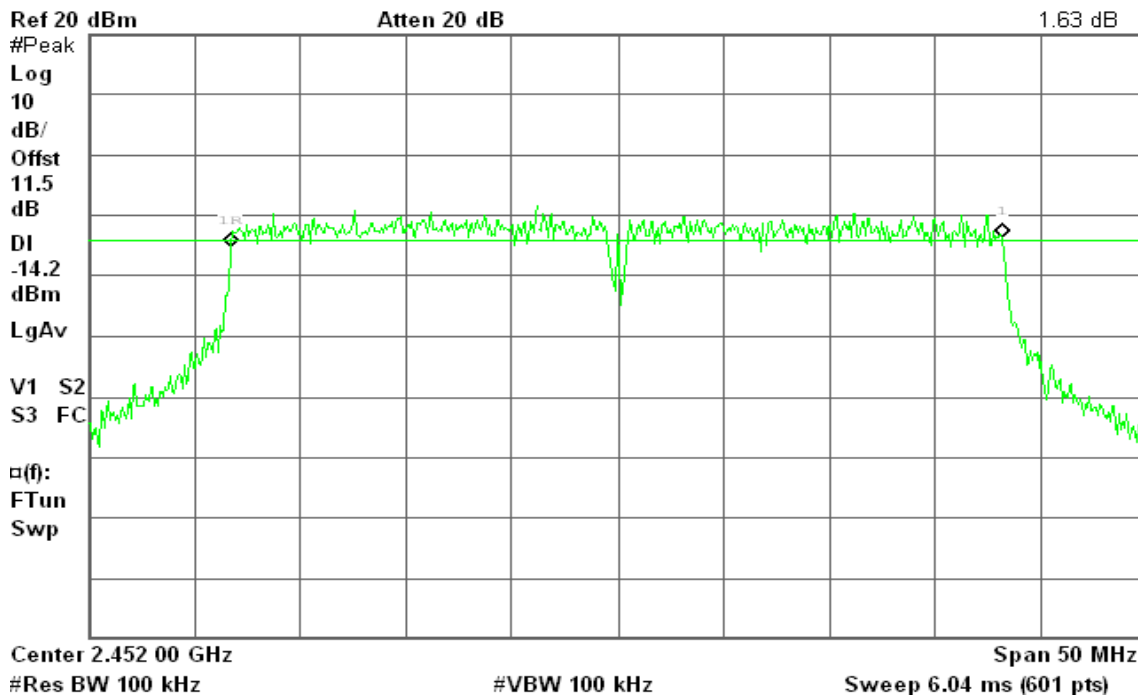
R T

 $\Delta$  Mkr1 36.50 MHz  
0.10 dB

## 6dB Bandwidth (CH High)

\* Agilent 16:21:00 Mar 31, 2008

R T

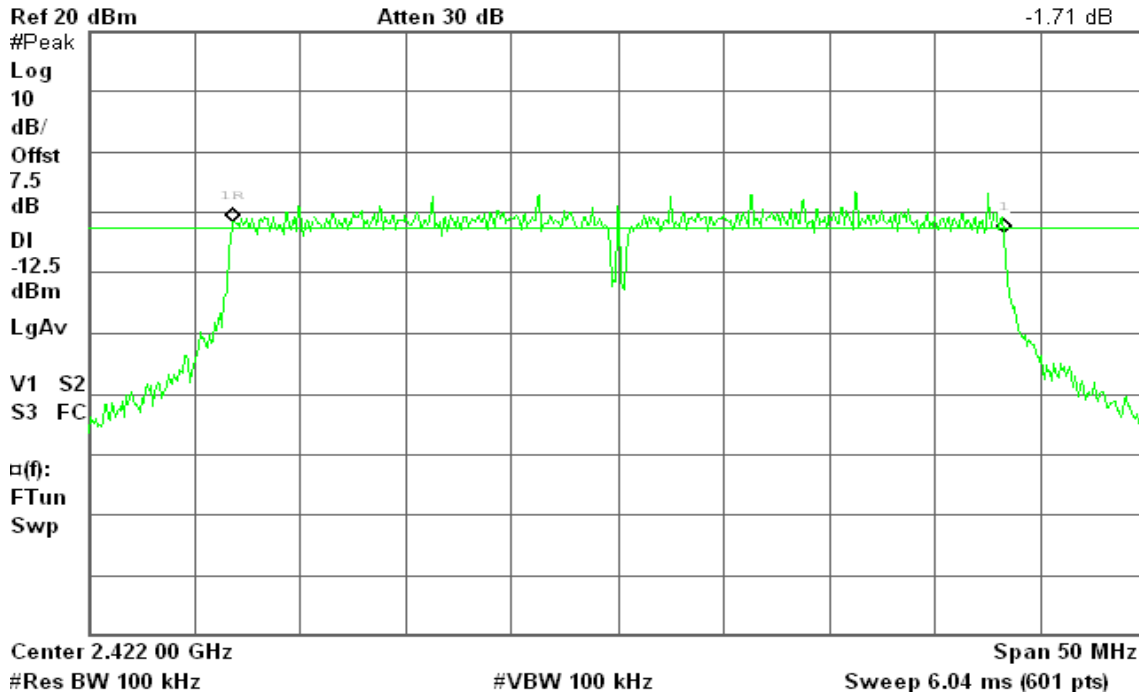
 $\Delta$  Mkr1 36.42 MHz  
1.63 dB



**draft 802.11n Wide-40 MHz Channel mode / Chain 2****6dB Bandwidth (CH Low)**

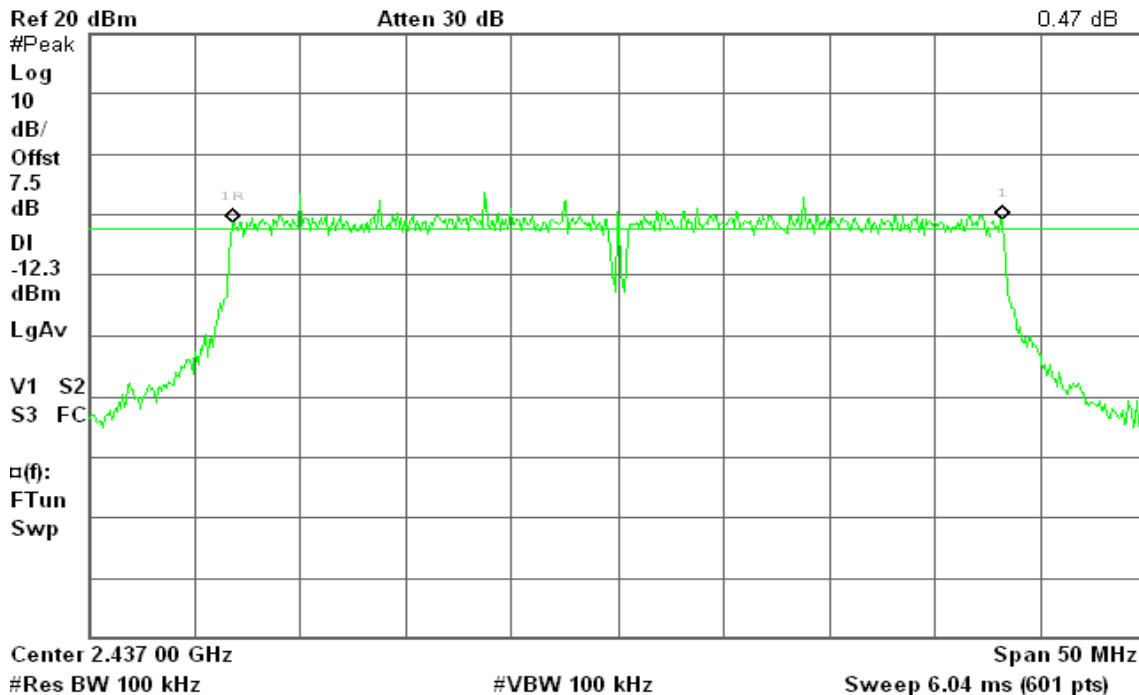
\* Agilent 16:17:58 Jul 7, 2008

R T

 $\Delta$  Mkr1 36.42 MHz  
-1.71 dB**6dB Bandwidth (CH Mid)**

\* Agilent 16:29:56 Jul 7, 2008

R T

 $\Delta$  Mkr1 36.33 MHz  
0.47 dB



## 6dB Bandwidth (CH High)

Agilent 16:41:35 Jul 7, 2008

R T

Δ Mkr1 36.42 MHz

0.17 dB

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

7.5

dB

DI

-14.5

dBm

LgAv

V1 S2

S3 FC

□(f):

FTun

Swp

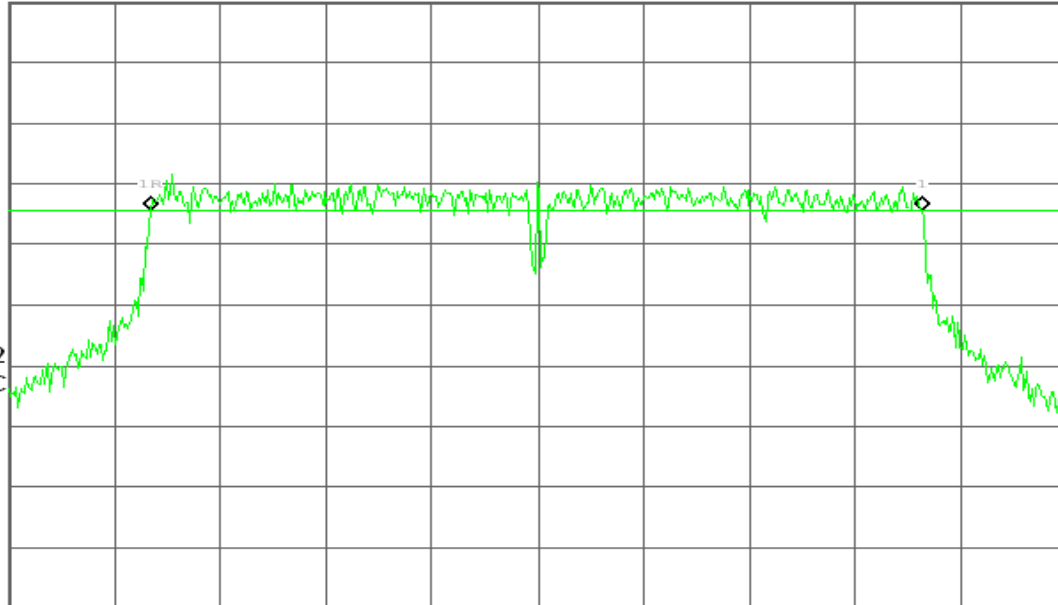
Center 2.452 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz

Sweep 6.04 ms (601 pts)





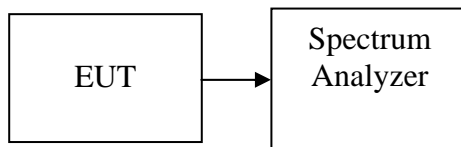
## 7.2 PEAK POWER

### 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. Peak power is measured using the spectrum analyzer's internal channel power integration function.
2. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

### TEST RESULTS

*No non-compliance noted*

**Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.84	15.01	16.35	20.54	0.1132	0.832	PASS
Mid	2437	16.06	14.93	16.55	20.67	0.1167		PASS
High	2462	16.59	14.77	16.19	20.69	0.1172		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.07	14.08	14.88	19.47	0.0885	0.832	PASS
Mid	2437	15.07	14.23	15.16	19.61	0.0914		PASS
High	2462	14.99	13.50	14.86	19.27	0.0846		PASS

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.27	14.61	14.82	19.68	0.0929	0.832	PASS
Mid	2437	14.28	14.16	14.77	19.18	0.0828		PASS
High	2462	14.88	14.87	14.08	19.40	0.0870		PASS

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	11.96	10.98	12.14	16.49	0.0446	0.832	PASS
Mid	2437	12.04	11.23	11.99	16.54	0.0451		PASS
High	2452	12.23	11.82	12.01	16.79	0.0478		PASS

**Remark:** 1. Total Output Power (w) = Chain 0 ( $10^{(\text{Output Power}/10)/1000}$ ) + Chain 1 ( $10^{(\text{Output Power}/10)/1000}$ ) + Chain 2 ( $10^{(\text{Output Power}/10)/1000}$ )  
 2. The maximum antenna gain is 6.8dBi; therefore the reduction due to antenna gain is 0.8dBi, so the limit is 29.2dBm.



## Test Plot

### IEEE 802.11b mode / Chain 0

#### Peak Power (CH Low)

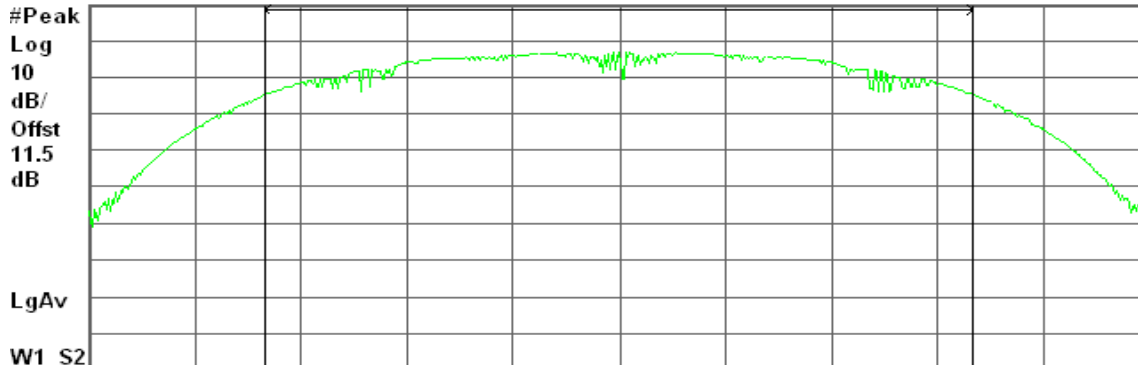
\* Agilent 15:12:43 Mar 31, 2008

R T

Peak Output Power , b Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 22.86 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.84 dBm / 15.2390 MHz

-55.99 dBm/Hz

#### Peak Power (CH Mid)

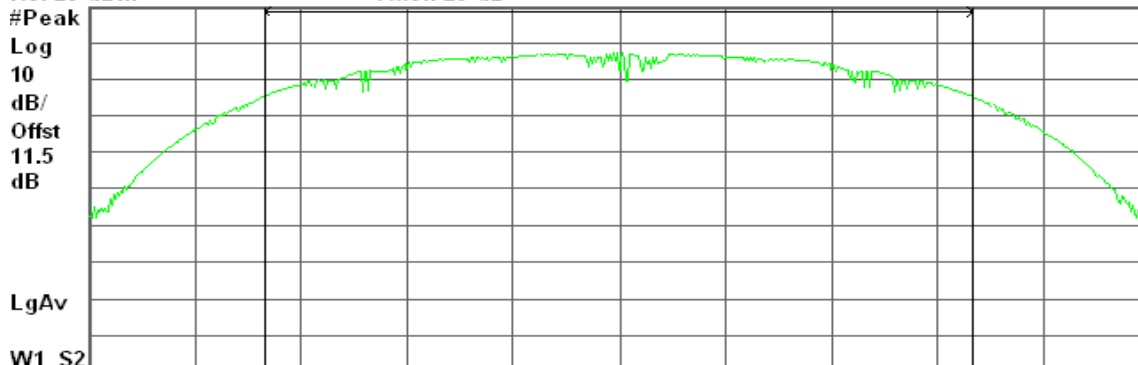
\* Agilent 15:17:26 Mar 31, 2008

R T

Peak Output Power , b Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 22.89 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

16.06 dBm / 15.2630 MHz

-55.78 dBm/Hz



## Peak Power (CH High)

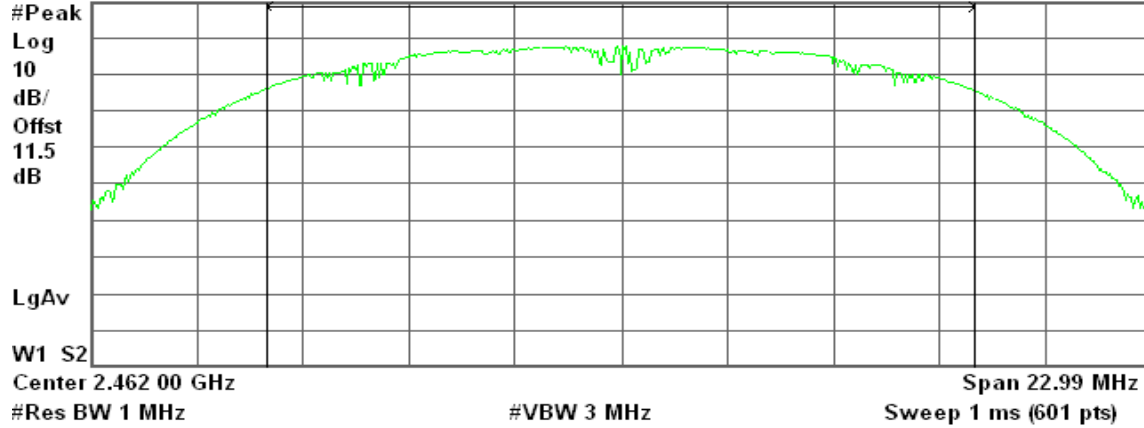
\* Agilent 15:22:40 Mar 31, 2008

R T

Peak Output Power , b Mode High Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

16.59 dBm / 15.3280 MHz

Power Spectral Density

-55.27 dBm/Hz

## IEEE 802.11b mode / Chain 1

### Peak Power (CH Low)

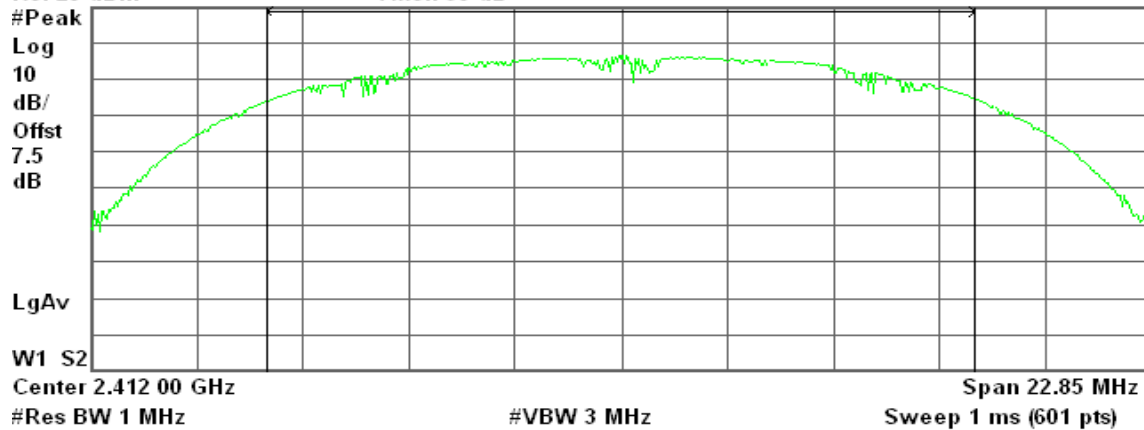
\* Agilent 15:10:35 Jun 13, 2008

R T

Peak Output Power , b Mode Low Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

15.01 dBm / 15.2360 MHz

Power Spectral Density

-56.81 dBm/Hz



### Peak Power (CH Mid)

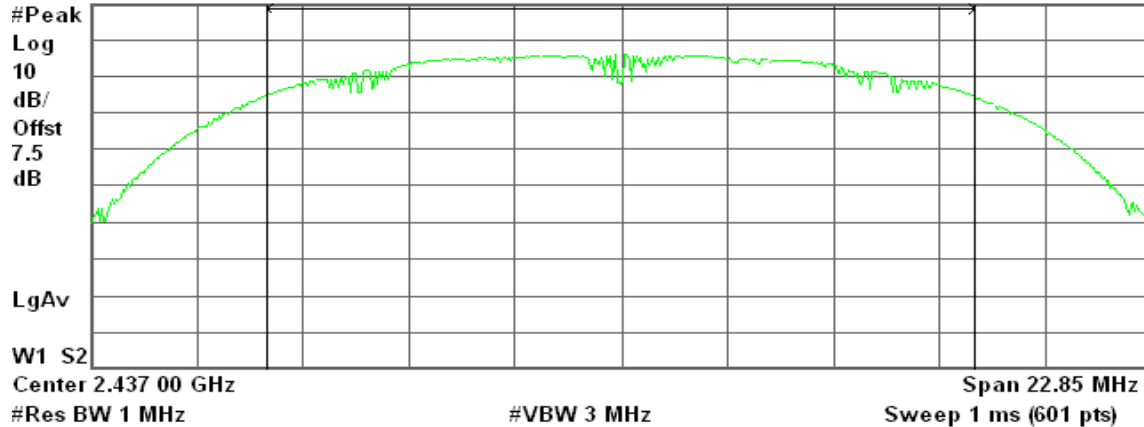
\* Agilent 15:18:12 Jun 13, 2008

R T

Peak Output Power , b Mode Mid Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

Power Spectral Density

14.93 dBm / 15.2360 MHz

-56.90 dBm/Hz

### Peak Power (CH High)

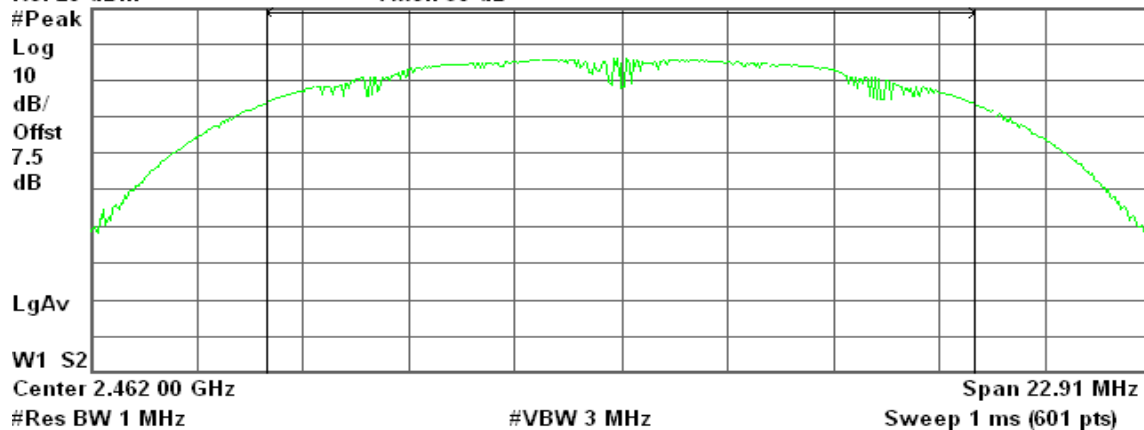
\* Agilent 15:26:47 Jun 13, 2008

R T

Peak Output Power , b Mode High Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

Power Spectral Density

14.77 dBm / 15.2700 MHz

-57.07 dBm/Hz

**IEEE 802.11b mode / Chain 2****Peak Power (CH Low)**

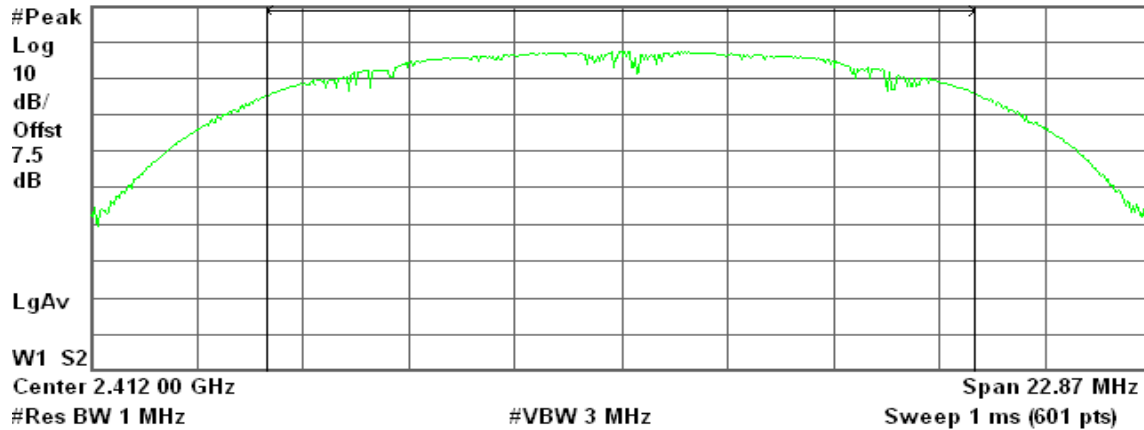
\* Agilent 17:17:32 Jul 8, 2008

R T

Peak Output Power , b Mode Low Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

Power Spectral Density

16.35 dBm / 15.2490 MHz

-55.48 dBm/Hz

**Peak Power (CH Mid)**

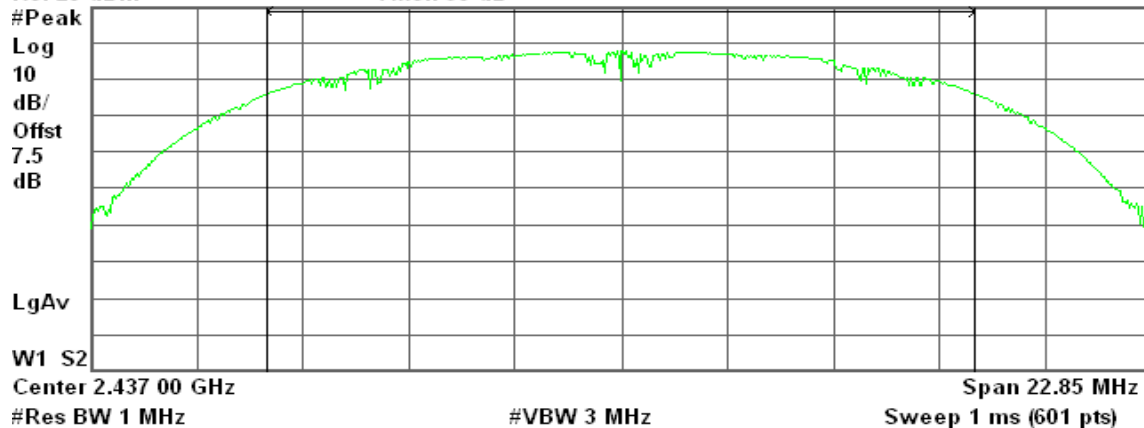
\* Agilent 17:27:34 Jul 8, 2008

R T

Peak Output Power , b Mode Mid Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

Power Spectral Density

16.55 dBm / 15.2350 MHz

-55.28 dBm/Hz





## Peak Power (CH High)

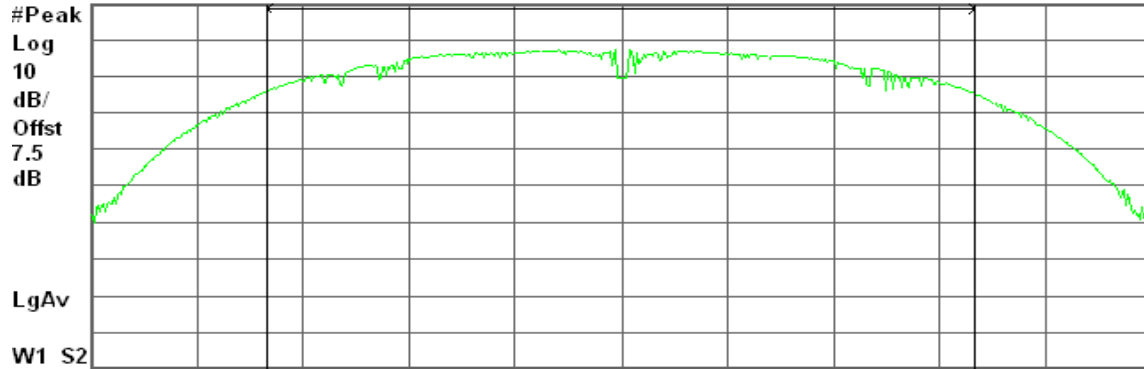
Agilent 17:44:07 Jul 8, 2008

R T

Peak Output Power , b Mode High Ch.

Ref 20 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 22.87 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

16.19 dBm / 15.2460 MHz

-55.64 dBm/Hz

**IEEE 802.11g mode / Chain 0****Peak Power (CH Low)**

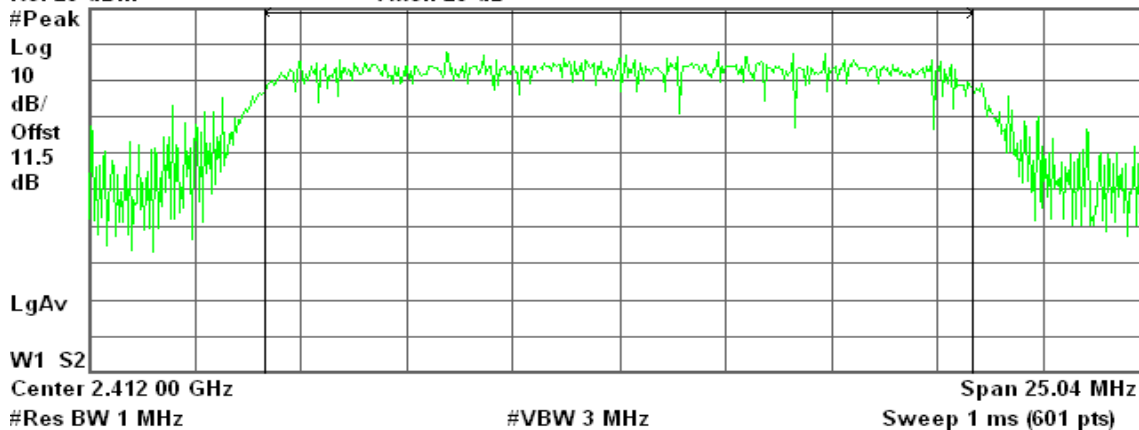
\* Agilent 15:02:03 Mar 31, 2008

R T

Peak Output Power , g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

Power Spectral Density

15.07 dBm / 16.6950 MHz

-57.16 dBm/Hz

**Peak Power (CH Mid)**

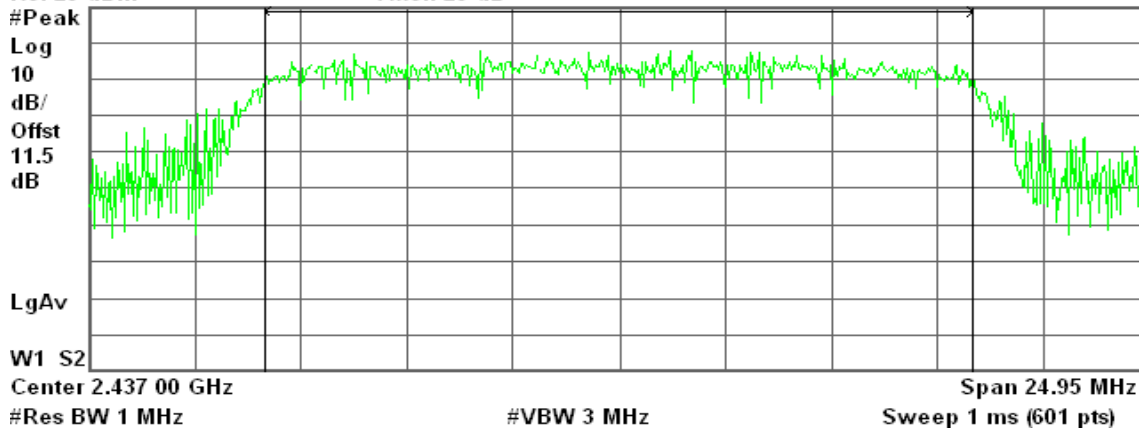
\* Agilent 14:57:14 Mar 31, 2008

R T

Peak Output Power , g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

Power Spectral Density

15.07 dBm / 16.6330 MHz

-57.14 dBm/Hz



## Peak Power (CH High)

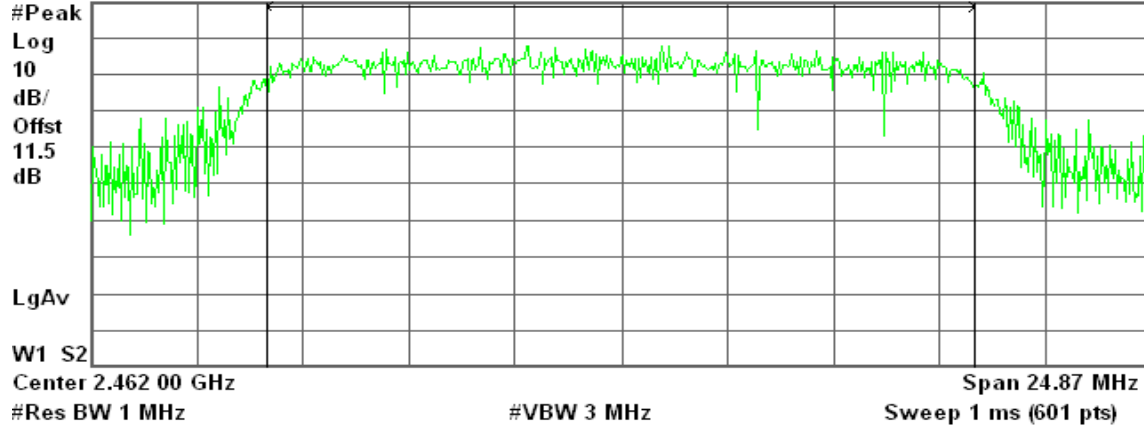
\* Agilent 15:06:42 Mar 31, 2008

R T

Peak Output Power, g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

14.99 dBm / 16.5780 MHz

Power Spectral Density

-57.21 dBm/Hz

## IEEE 802.11g mode / Chain 1

### Peak Power (CH Low)

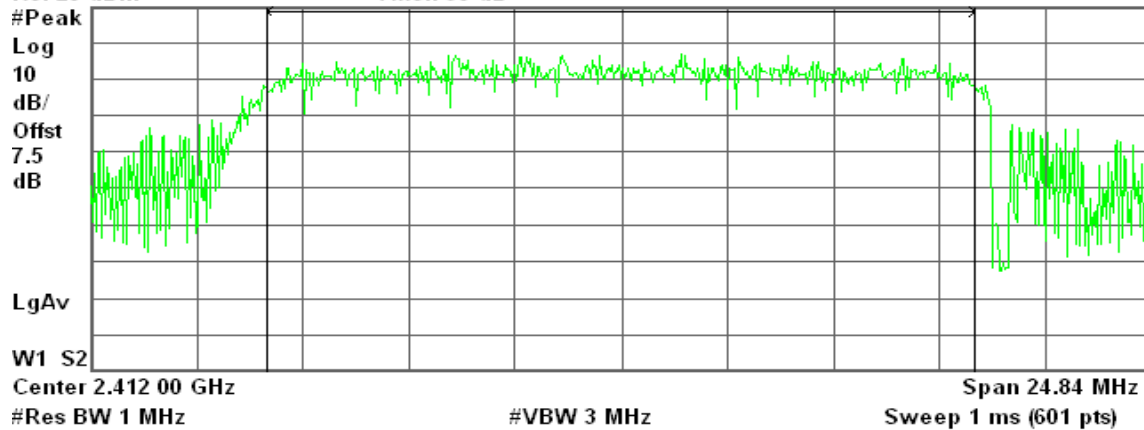
\* Agilent 16:42:55 Jun 13, 2008

R T

Peak Output Power, g Mode Low Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

14.08 dBm / 16.5600 MHz

Power Spectral Density

-58.11 dBm/Hz



## Peak Power (CH Mid)

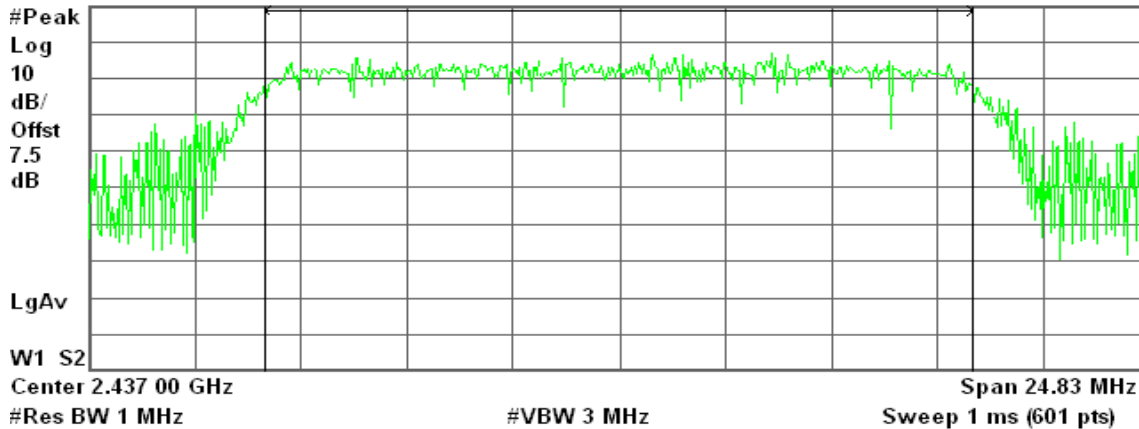
\* Agilent 16:50:04 Jun 13, 2008

R T

Peak Output Power , g Mode Mid Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

14.23 dBm / 16.5550 MHz

Power Spectral Density

-57.96 dBm/Hz

## Peak Power (CH High)

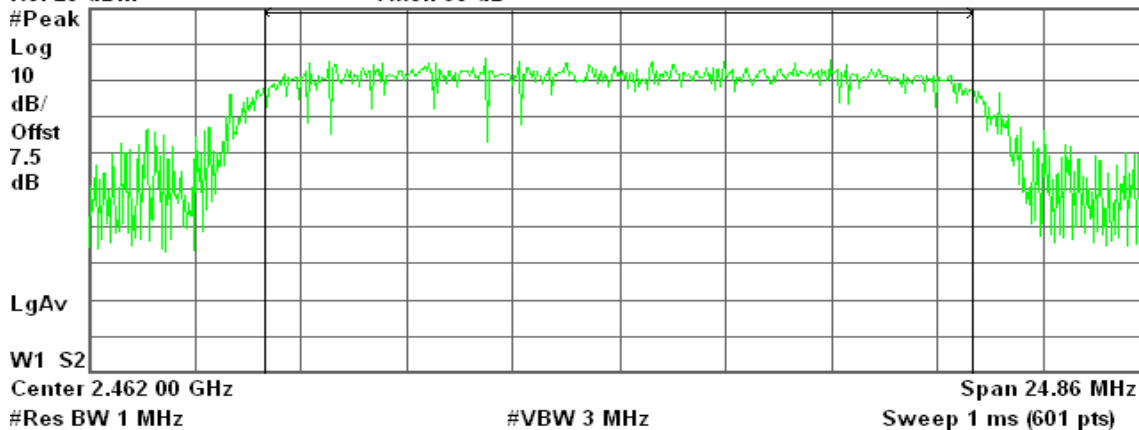
\* Agilent 16:55:02 Jun 13, 2008

R T

Peak Output Power , g Mode High Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

13.50 dBm / 16.5700 MHz

Power Spectral Density

-58.69 dBm/Hz

**IEEE 802.11g mode / Chain 2****Peak Power (CH Low)**

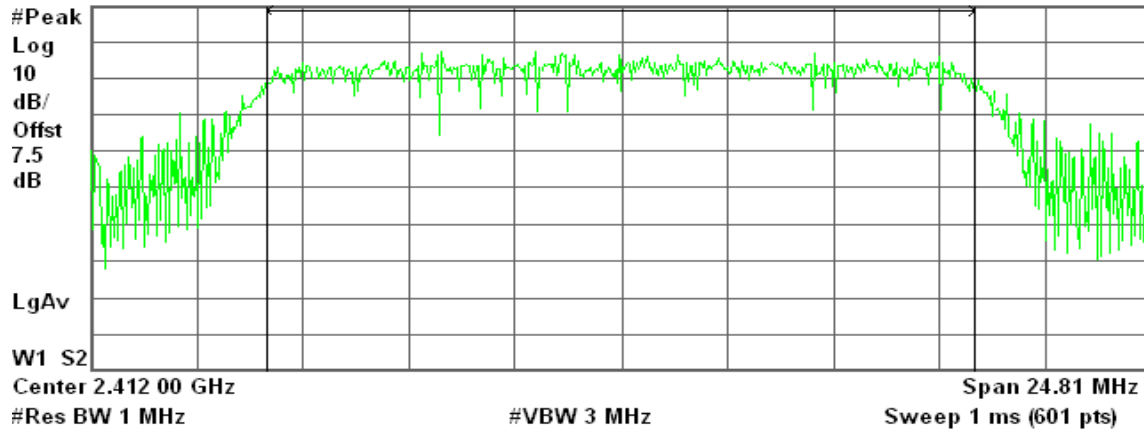
\* Agilent 17:52:29 Jul 8, 2008

R T

Peak Output Power, g Mode Low Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

Power Spectral Density

14.88 dBm / 16.5410 MHz

-57.30 dBm/Hz

**Peak Power (CH Mid)**

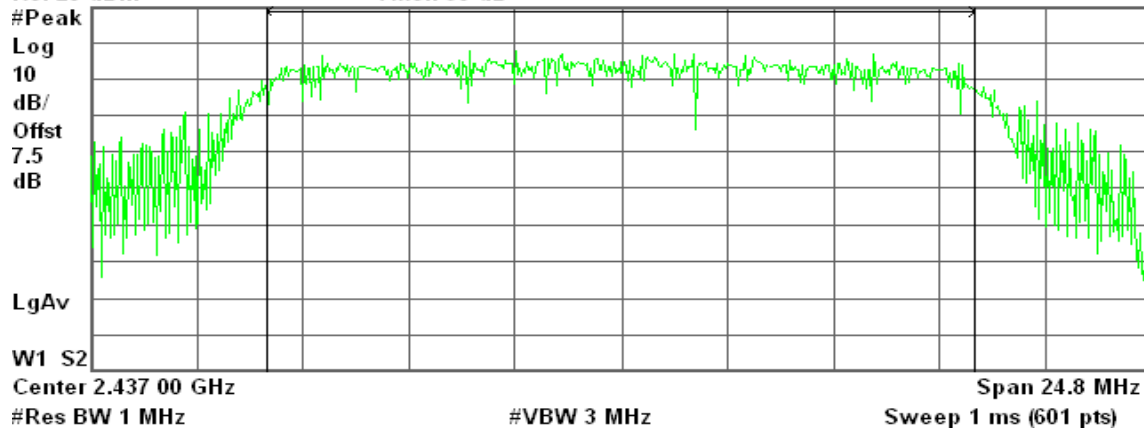
\* Agilent 18:01:18 Jul 8, 2008

R T

Peak Output Power, g Mode Mid Ch.

Ref 20 dBm

Atten 30 dB



Channel Power

Power Spectral Density

15.16 dBm / 16.5350 MHz

-57.02 dBm/Hz



## Peak Power (CH High)

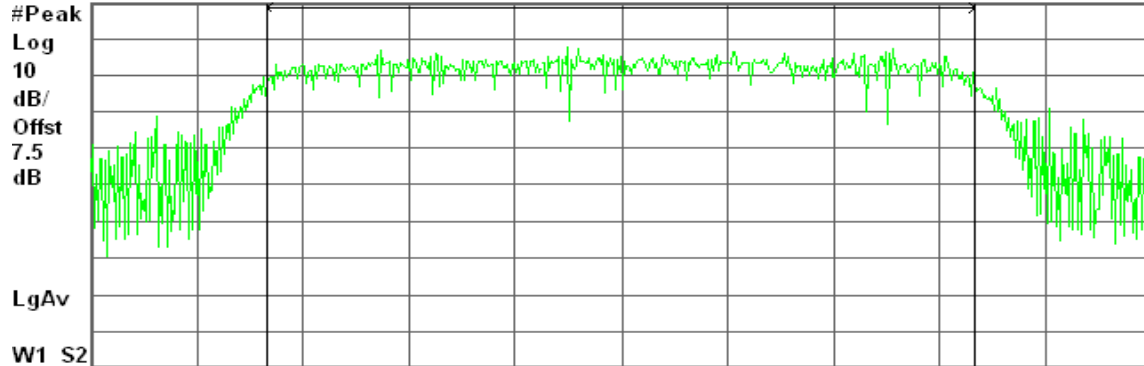
Agilent 18:10:42 Jul 8, 2008

R T

Peak Output Power , g Mode High Ch.

Ref 20 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 24.81 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

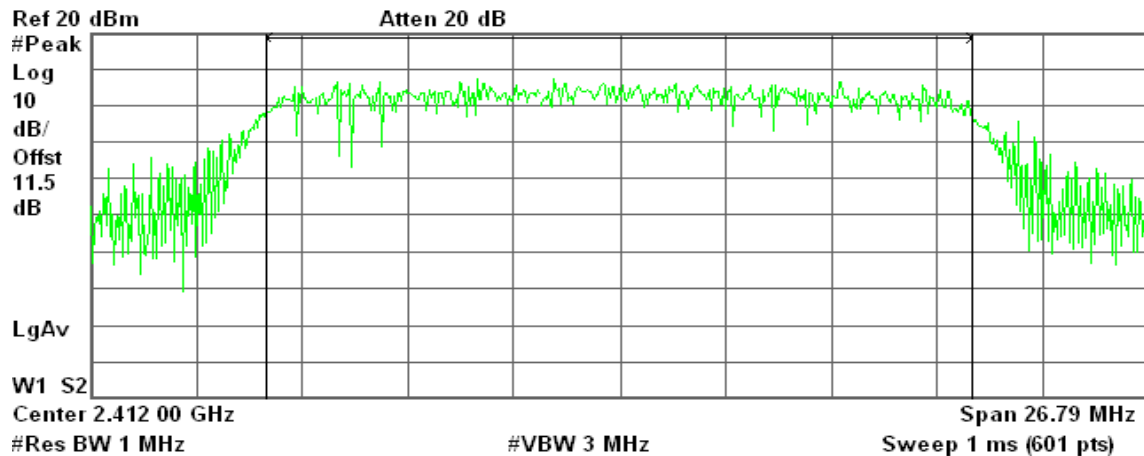
14.86 dBm / 16.5420 MHz

-57.33 dBm/Hz

**draft 802.11n Standard-20 MHz Channel mode / Chain 0****Peak Power (CH Low)**

\* Agilent 15:31:25 Mar 31, 2008

R T



Channel Power

15.27 dBm / 17.8590 MHz

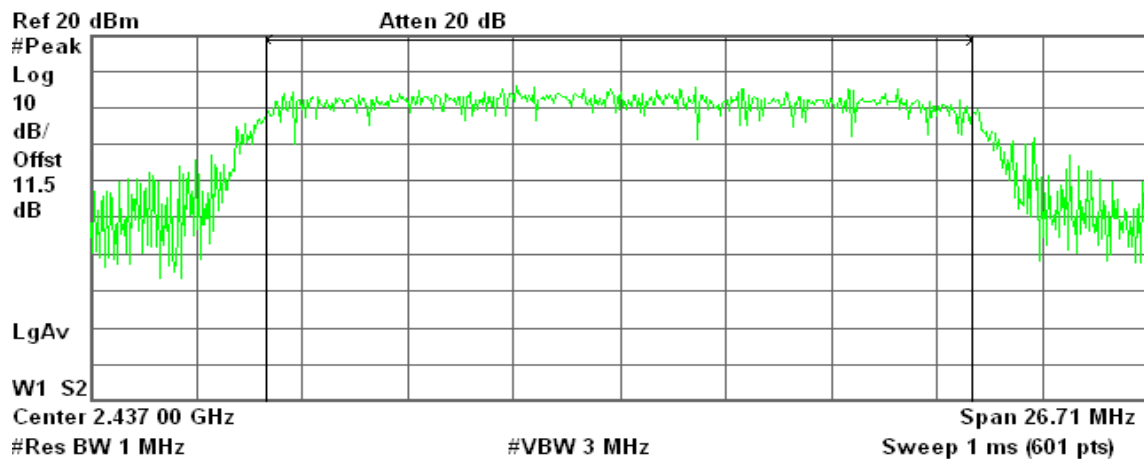
Power Spectral Density

-57.25 dBm/Hz

**Peak Power (CH Mid)**

\* Agilent 15:39:03 Mar 31, 2008

R T



Channel Power

14.28 dBm / 17.8100 MHz

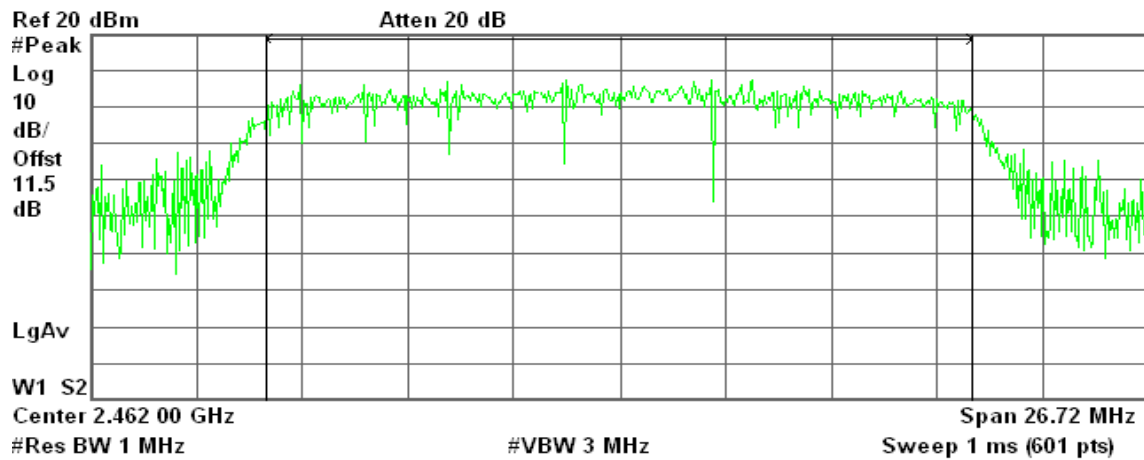
Power Spectral Density

-58.23 dBm/Hz

**Peak Power (CH High)**

\* Agilent 15:43:37 Mar 31, 2008

R T



Channel Power

14.88 dBm / 17.8110 MHz

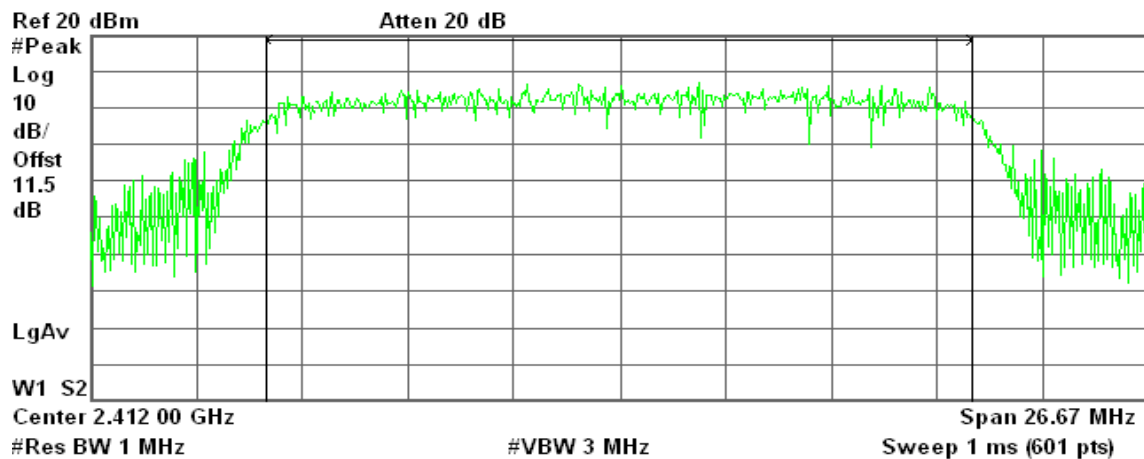
Power Spectral Density

-57.62 dBm/Hz

**draft 802.11n Standard-20 MHz Channel mode / Chain 1****Peak Power (CH Low)**

\* Agilent 16:03:48 Mar 31, 2008

R T



Channel Power

14.61 dBm / 17.7790 MHz

Power Spectral Density

-57.89 dBm/Hz

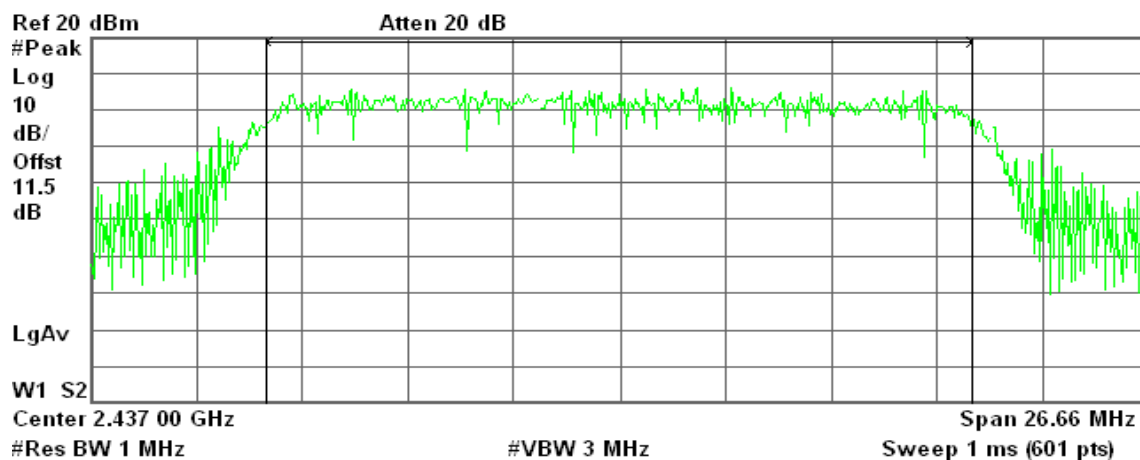




## Peak Power (CH Mid)

\* Agilent 15:55:43 Mar 31, 2008

R T



Channel Power

14.16 dBm / 17.7750 MHz

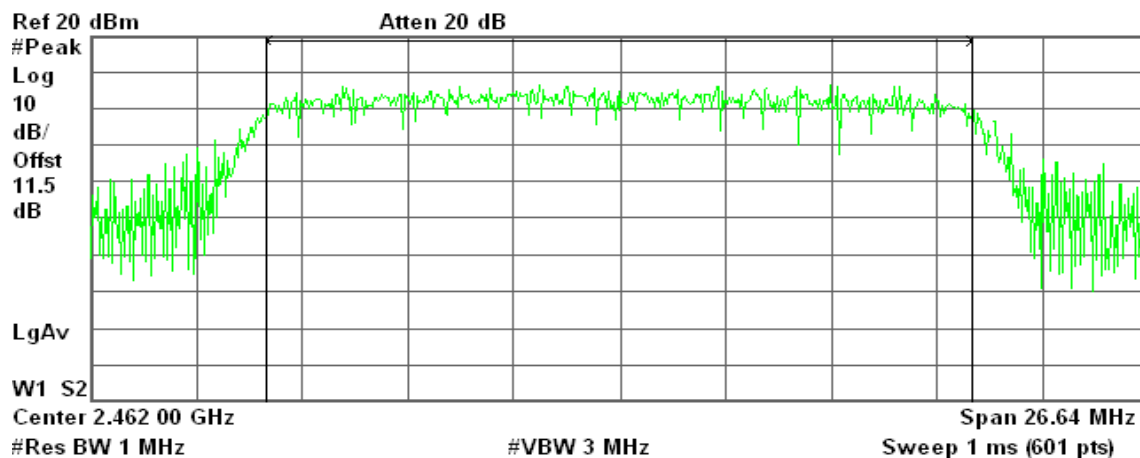
Power Spectral Density

-58.34 dBm/Hz

## Peak Power (CH High)

\* Agilent 15:49:52 Mar 31, 2008

R T



Channel Power

14.87 dBm / 17.7590 MHz

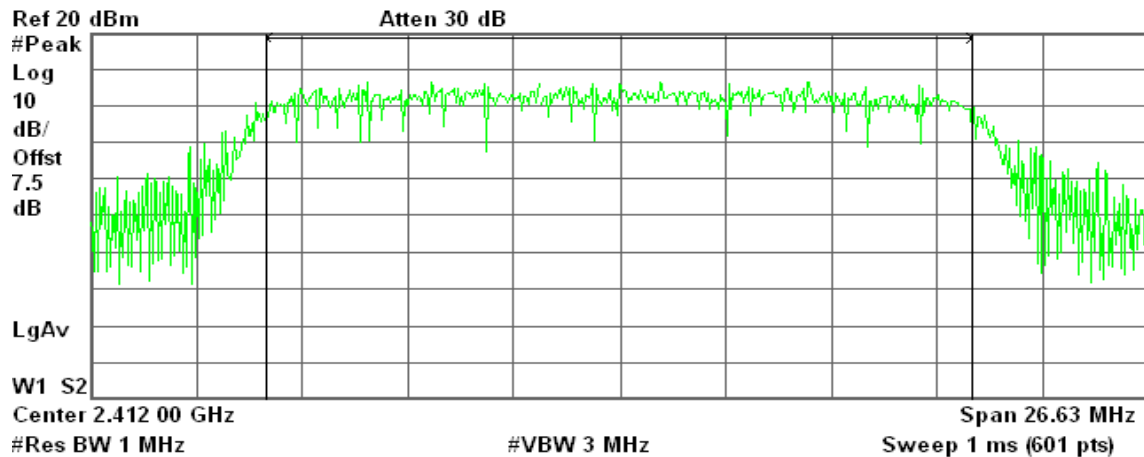
Power Spectral Density

-57.62 dBm/Hz

**draft 802.11n Standard-20 MHz Channel mode / Chain 2****Peak Power (CH Low)**

\* Agilent 14:55:32 Jul 7, 2008

R T



Channel Power

14.82 dBm / 17.7520 MHz

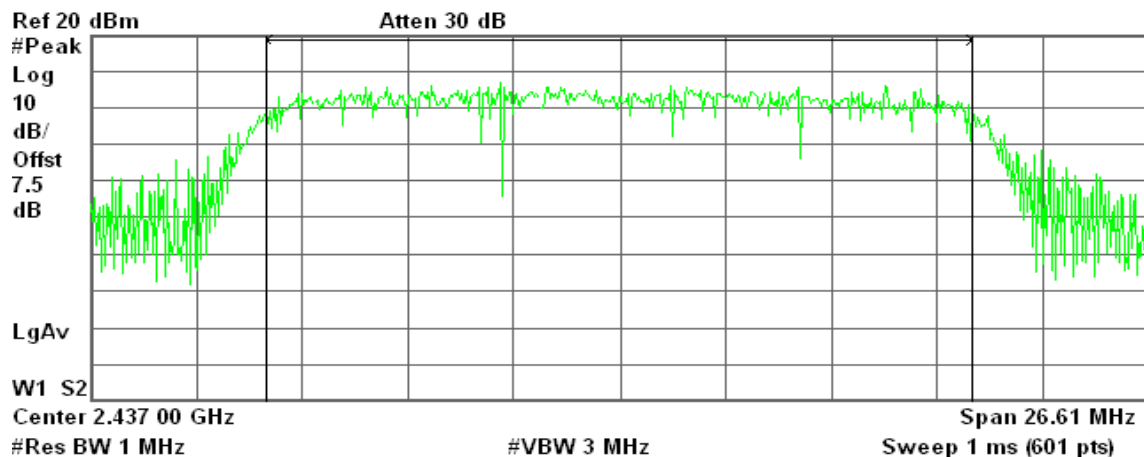
Power Spectral Density

-57.68 dBm/Hz

**Peak Power (CH Mid)**

\* Agilent 15:03:00 Jul 7, 2008

R T



Channel Power

14.77 dBm / 17.7390 MHz

Power Spectral Density

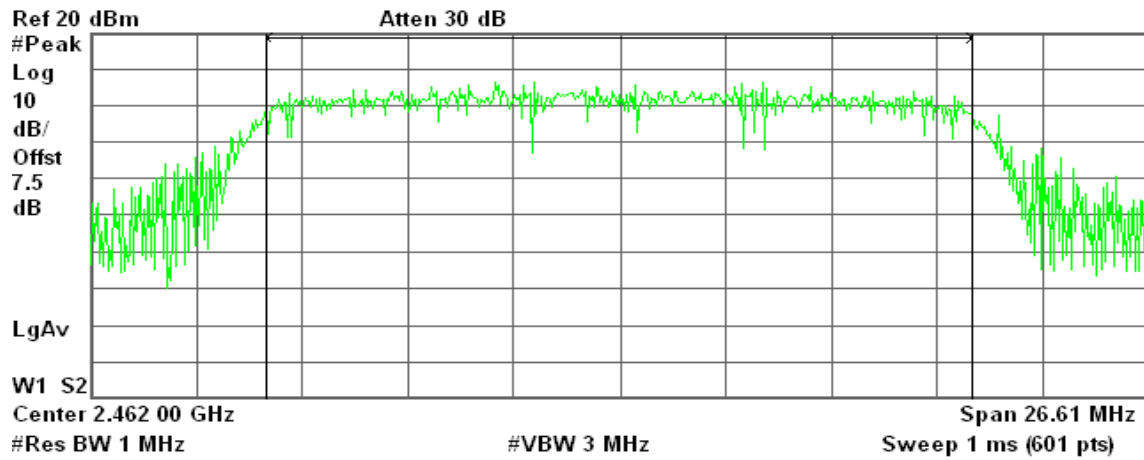
-57.72 dBm/Hz



## Peak Power (CH High)

Agilent 15:10:14 Jul 7, 2008

R T



Channel Power

14.08 dBm / 17.7420 MHz

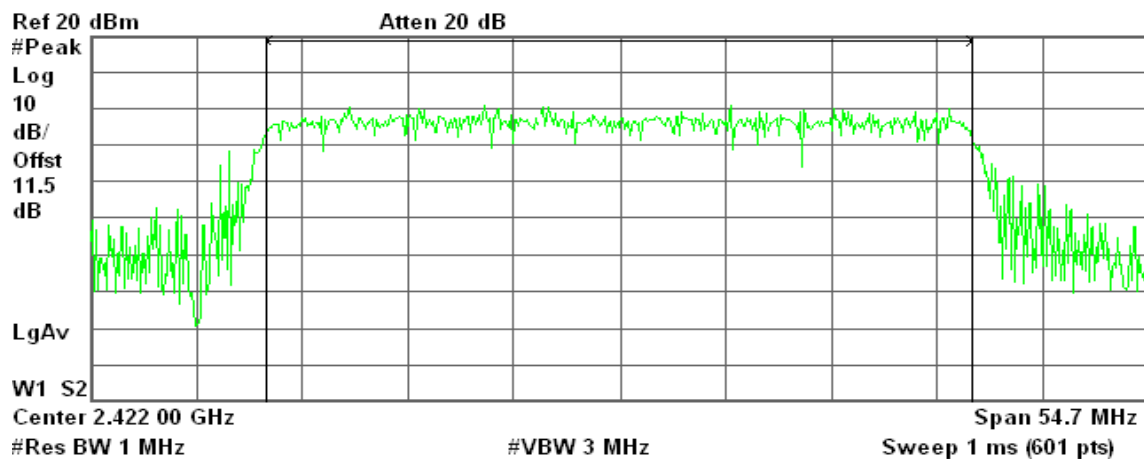
Power Spectral Density

-58.41 dBm/Hz

**draft 802.11n Wide-40 MHz Channel mode / Chain 0****Peak Power (CH Low)**

\* Agilent 16:35:43 Mar 31, 2008

R T



Channel Power

11.96 dBm / 36.4660 MHz

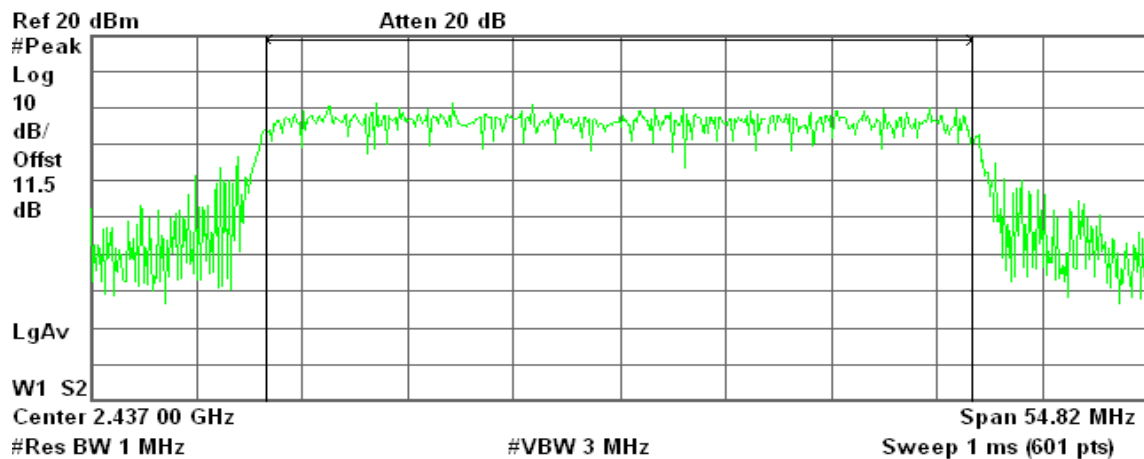
Power Spectral Density

-63.65 dBm/Hz

**Peak Power (CH Mid)**

\* Agilent 16:31:11 Mar 31, 2008

R T



Channel Power

12.04 dBm / 36.5460 MHz

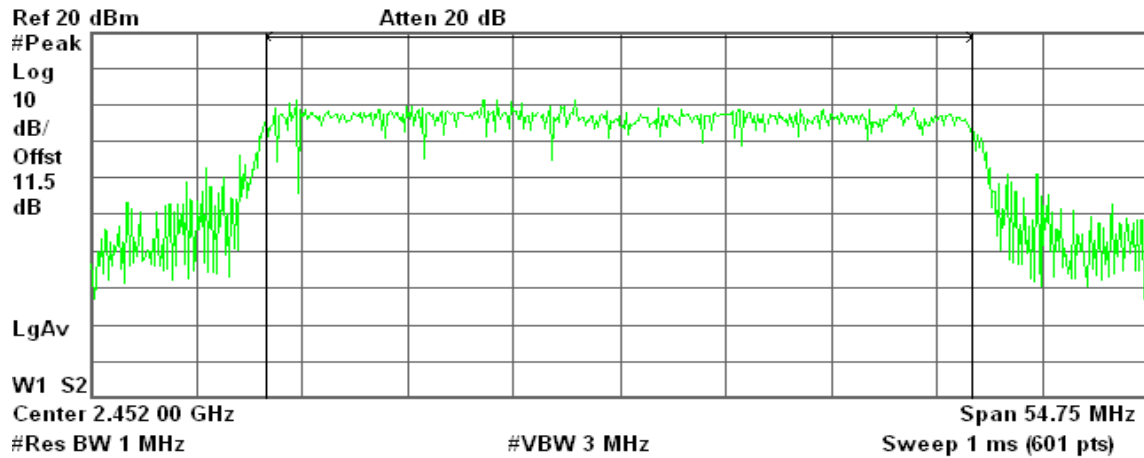
Power Spectral Density

-63.59 dBm/Hz

**Peak Power (CH High)**

\* Agilent 16:26:38 Mar 31, 2008

R T



Channel Power

12.23 dBm / 36.4990 MHz

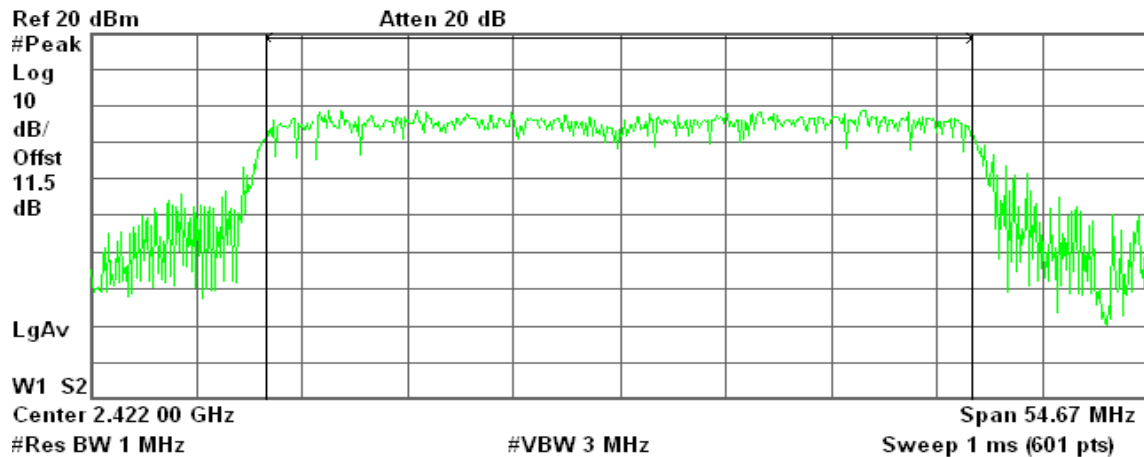
Power Spectral Density

-63.39 dBm/Hz

**draft 802.11n Wide-40 MHz Channel mode / Chain 1****Peak Power (CH Low)**

\* Agilent 16:11:31 Mar 31, 2008

R T



Channel Power

10.98 dBm / 36.4470 MHz

Power Spectral Density

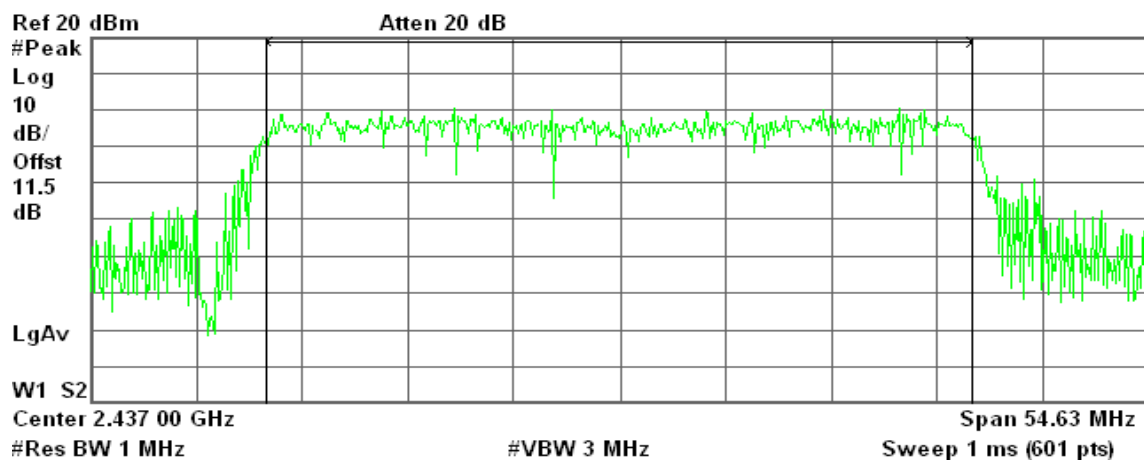
-64.63 dBm/Hz



## Peak Power (CH Mid)

\* Agilent 16:16:57 Mar 31, 2008

R T



Channel Power

11.23 dBm / 36.4210 MHz

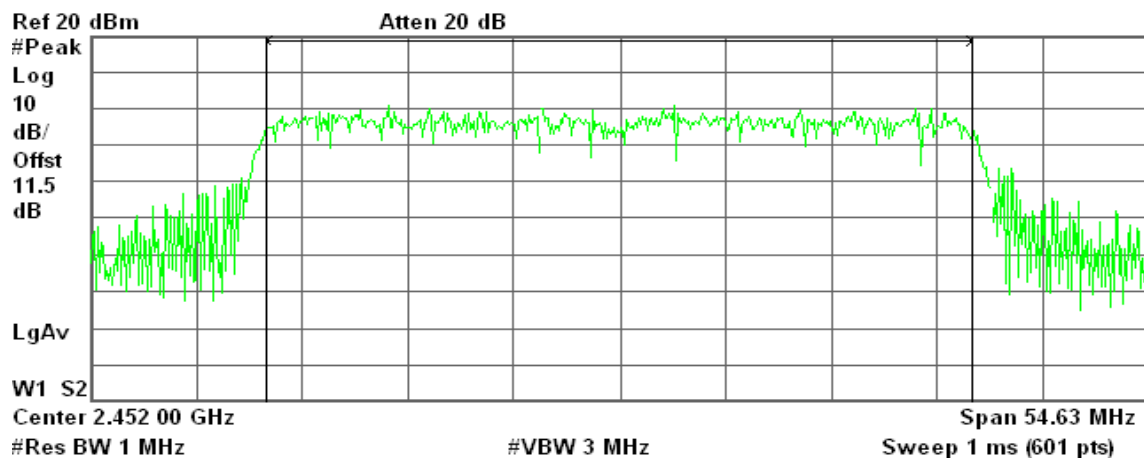
Power Spectral Density

-64.39 dBm/Hz

## Peak Power (CH High)

\* Agilent 16:21:36 Mar 31, 2008

R T



Channel Power

11.82 dBm / 36.4180 MHz

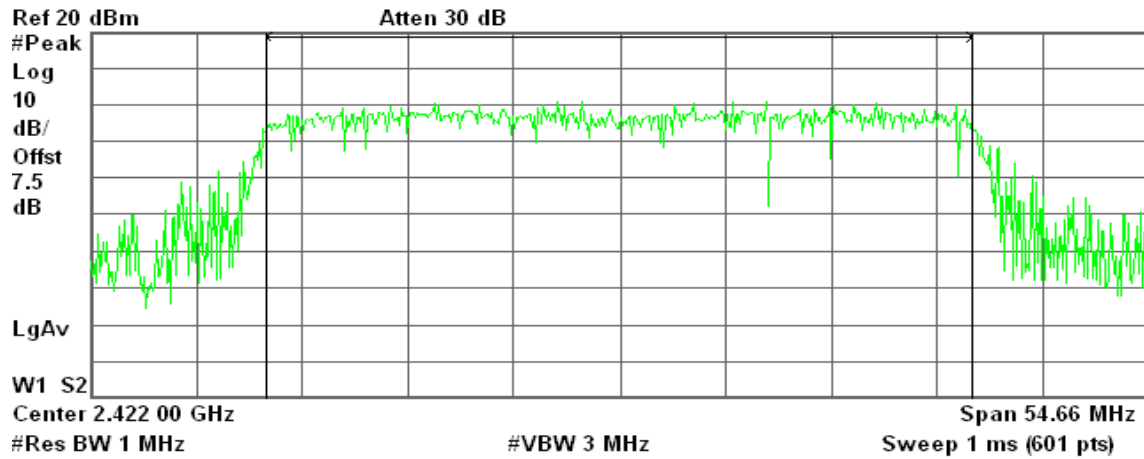
Power Spectral Density

-63.79 dBm/Hz

**draft 802.11n Wide-40 MHz Channel mode / Chain 2****Peak Power (CH Low)**

\* Agilent 16:19:17 Jul 7, 2008

R T



Channel Power

12.14 dBm / 36.4400 MHz

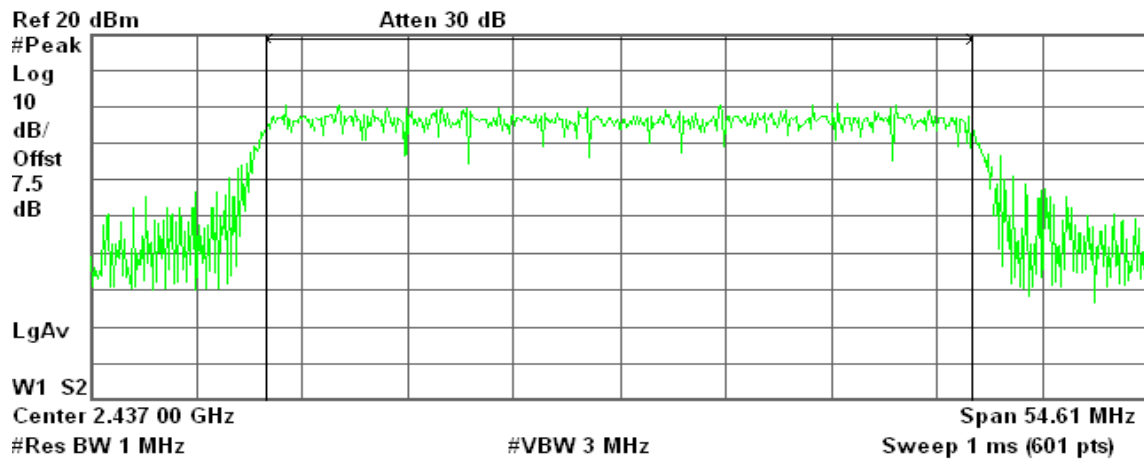
Power Spectral Density

-63.47 dBm/Hz

**Peak Power (CH Mid)**

\* Agilent 16:30:47 Jul 7, 2008

R T



Channel Power

11.99 dBm / 36.4080 MHz

Power Spectral Density

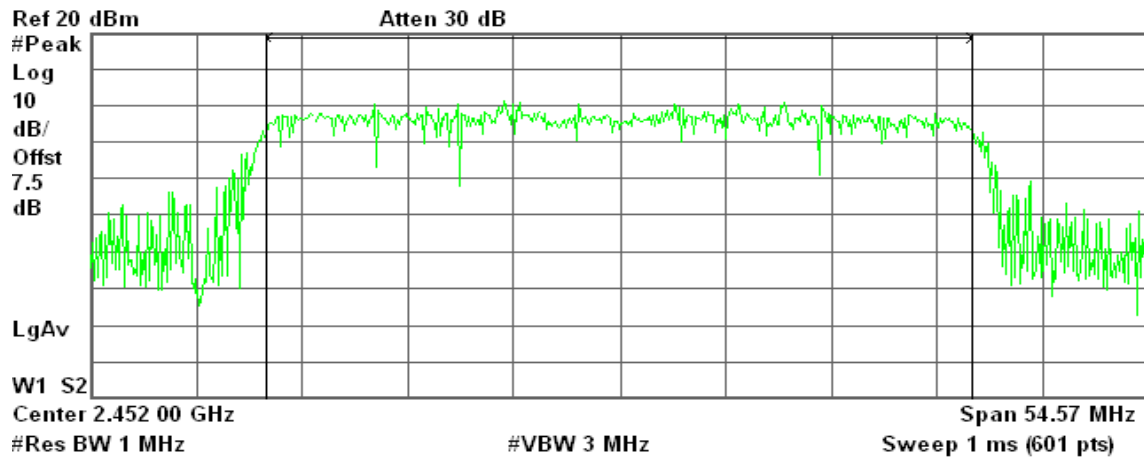
-63.62 dBm/Hz



## Peak Power (CH High)

Agilent 16:45:15 Jul 7, 2008

R T



Channel Power

12.01 dBm / 36.3810 MHz

Power Spectral Density

-63.60 dBm/Hz



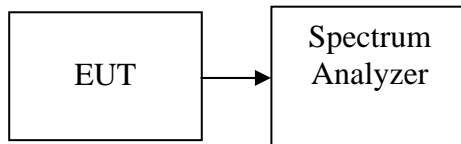


## 7.3 AVERAGE POWER

### LIMIT

None; for reporting purposes only.

### Test Configuration



### TEST PROCEDURE

1. Average power is measured using the spectrum analyzer's internal channel power integration function.
2. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

### TEST RESULTS

*No non-compliance noted*



## Test Data

### Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2412	13.84	12.37	13.64	18.10	0.0646
Mid	2437	13.51	12.73	13.94	18.19	0.0660
High	2462	13.97	12.33	13.60	18.13	0.0650

### Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2412	11.38	10.45	11.21	15.80	0.0380
Mid	2437	11.08	10.56	11.53	15.85	0.0384
High	2462	11.69	10.04	11.60	15.94	0.0393

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2412	11.58	11.00	11.06	15.99	0.0397
Mid	2437	10.99	10.67	10.74	15.57	0.0361
High	2462	11.15	11.25	10.73	15.82	0.0382

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2422	8.57	7.81	8.20	12.98	0.0198
Mid	2437	8.33	7.67	8.27	12.87	0.0194
High	2452	8.41	8.12	8.05	12.97	0.0198

**Remark:** Total Output Power (w) = Chain 0 ( $10^{(\text{Output Power}/10)/1000}$ ) + Chain 1 ( $10^{(\text{Output Power}/10)/1000}$ ) + Chain 2 ( $10^{(\text{Output Power}/10)/1000}$ )



## Test Plot

### IEEE 802.11b mode / Chain 0

#### Average Power (CH Low)

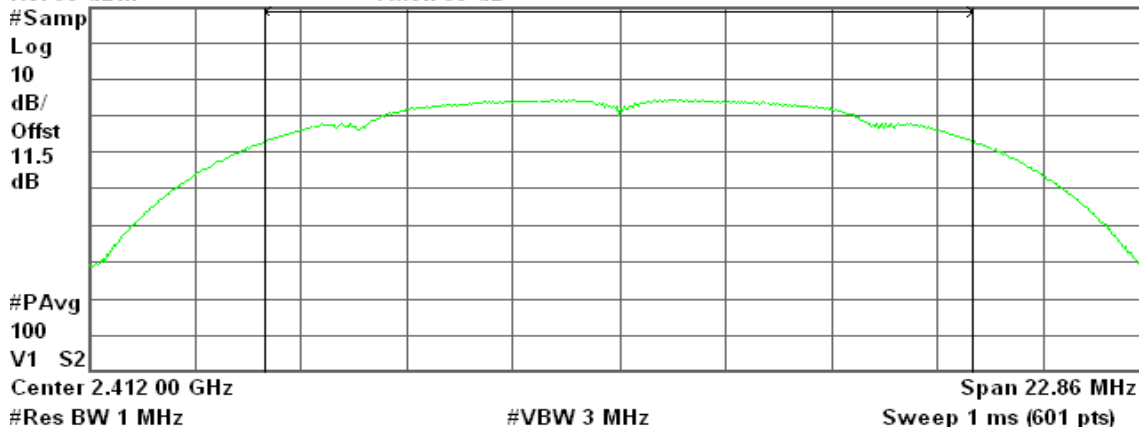
\* Agilent 15:13:20 Mar 31, 2008

R T

AVG Output Power , b Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

13.84 dBm / 15.2390 MHz

Power Spectral Density

-57.99 dBm/Hz

#### Average Power (CH Mid)

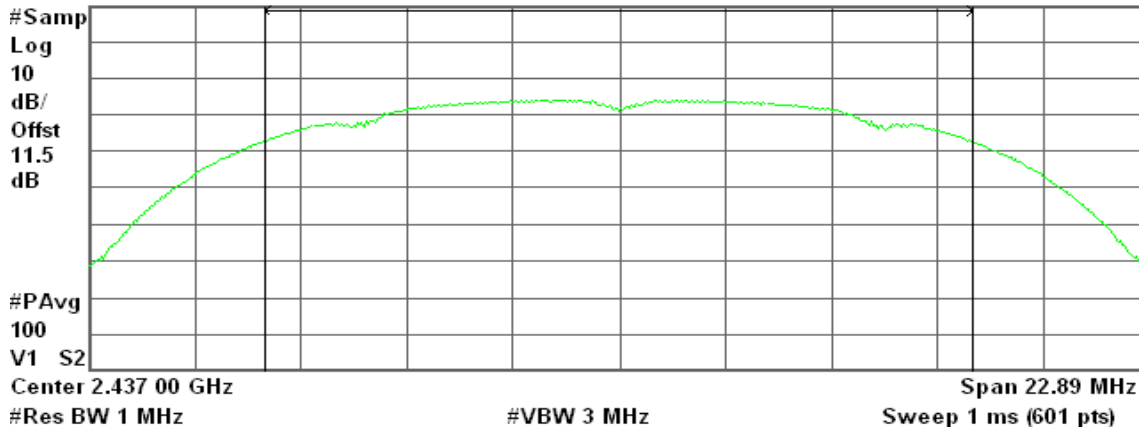
\* Agilent 15:18:02 Mar 31, 2008

R T

AVG Output Power , b Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

13.51 dBm / 15.2630 MHz

Power Spectral Density

-58.32 dBm/Hz



### Average Power (CH High)

\* Agilent 15:23:18 Mar 31, 2008

R T

AVG Output Power , b Mode High Ch.

Ref 30 dBm

Atten 30 dB

#Samp

Log

10

dB/

Offst

11.5

dB

#PAvg

100

V1 S2

Center 2.462 00 GHz

#VBW 3 MHz

Span 22.99 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.97 dBm / 15.3280 MHz

-57.89 dBm/Hz

### IEEE 802.11b mode / Chain 1

#### Average Power (CH Low)

\* Agilent 15:11:11 Jun 13, 2008

R T

AVG Output Power , b Mode Low Ch.

Ref 30 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

7.5

dB

#PAvg

100

V1 S2

Center 2.412 00 GHz

#VBW 3 MHz

Span 22.85 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.37 dBm / 15.2360 MHz

-59.46 dBm/Hz



### Average Power (CH Mid)

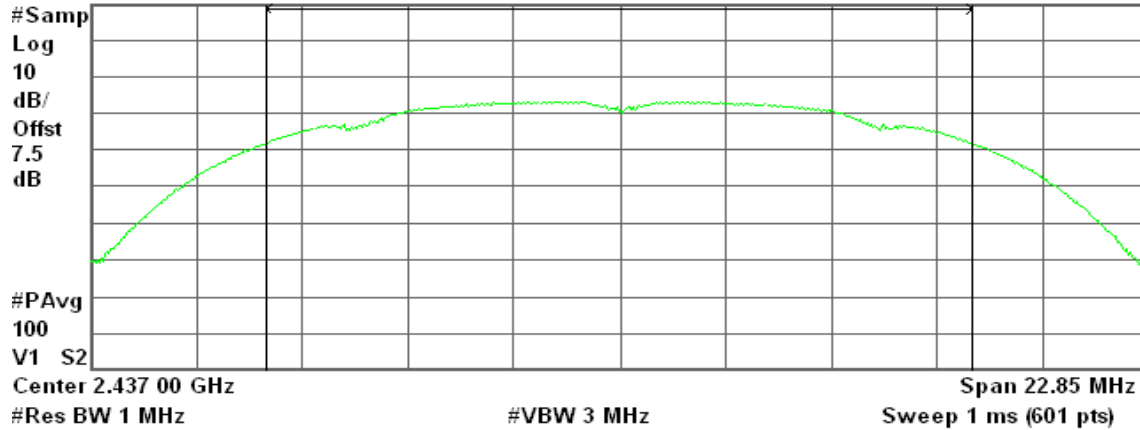
\* Agilent 15:19:12 Jun 13, 2008

R T

AVG Output Power , b Mode Mid Ch.

Ref 30 dBm

Atten 40 dB



Channel Power

12.73 dBm / 15.2360 MHz

Power Spectral Density

-59.10 dBm/Hz

### Average Power (CH High)

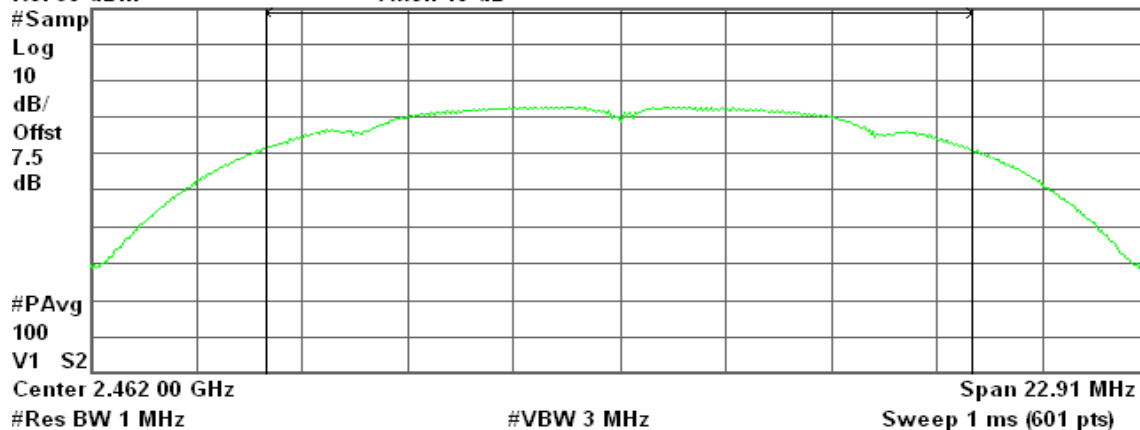
\* Agilent 15:27:23 Jun 13, 2008

R T

AVG Output Power , b Mode High Ch.

Ref 30 dBm

Atten 40 dB



Channel Power

12.33 dBm / 15.2700 MHz

Power Spectral Density

-59.51 dBm/Hz

**IEEE 802.11b mode / Chain 2****Average Power (CH Low)**

\* Agilent 17:19:23 Jul 8, 2008

R T

AVG Output Power , b Mode Low Ch.

Ref 30 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

7.5

dB

#PAvg

100

W1 S2

Center 2.412 00 GHz

Span 22.87 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.64 dBm / 15.2490 MHz

-58.19 dBm/Hz

**Average Power (CH Mid)**

\* Agilent 17:29:36 Jul 8, 2008

R T

AVG Output Power , b Mode Mid Ch.

Ref 30 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

7.5

dB

#PAvg

100

M1 S2

Center 2.437 00 GHz

Span 22.85 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.94 dBm / 15.2350 MHz

-57.89 dBm/Hz



## Average Power (CH High)

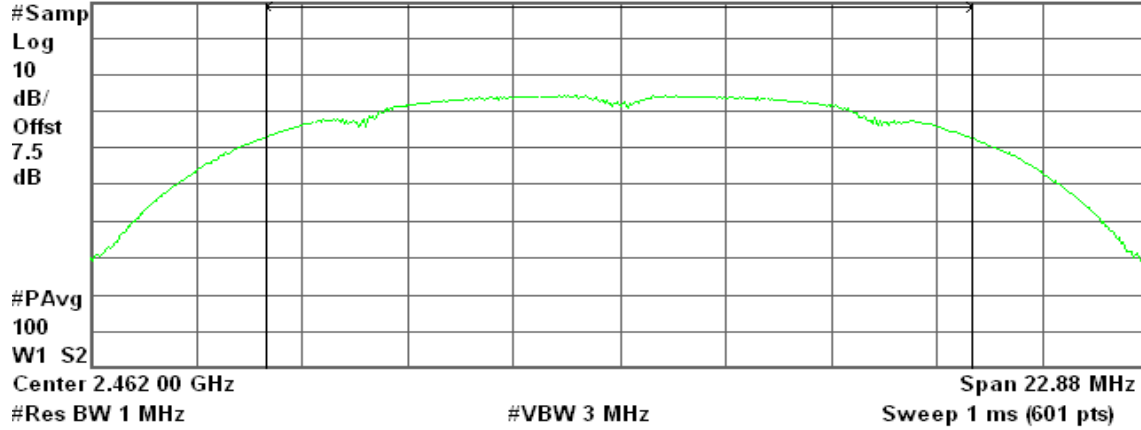
Agilent 17:38:16 Jul 8, 2008

R T

AVG Output Power , b Mode High Ch.

Ref 30 dBm

Atten 40 dB



Channel Power

13.60 dBm / 15.2560 MHz

Power Spectral Density

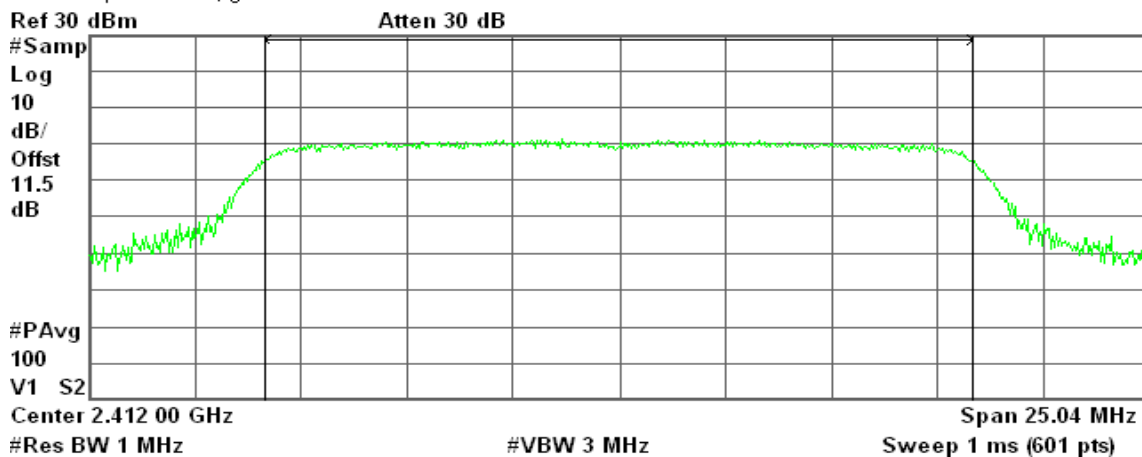
-58.24 dBm/Hz

**IEEE 802.11g mode / Chain 0****Average Power (CH Low)**

Agilent 15:02:41 Mar 31, 2008

R T

AVG Output Power , g Mode Low Ch.



Channel Power

Power Spectral Density

11.38 dBm / 16.6950 MHz

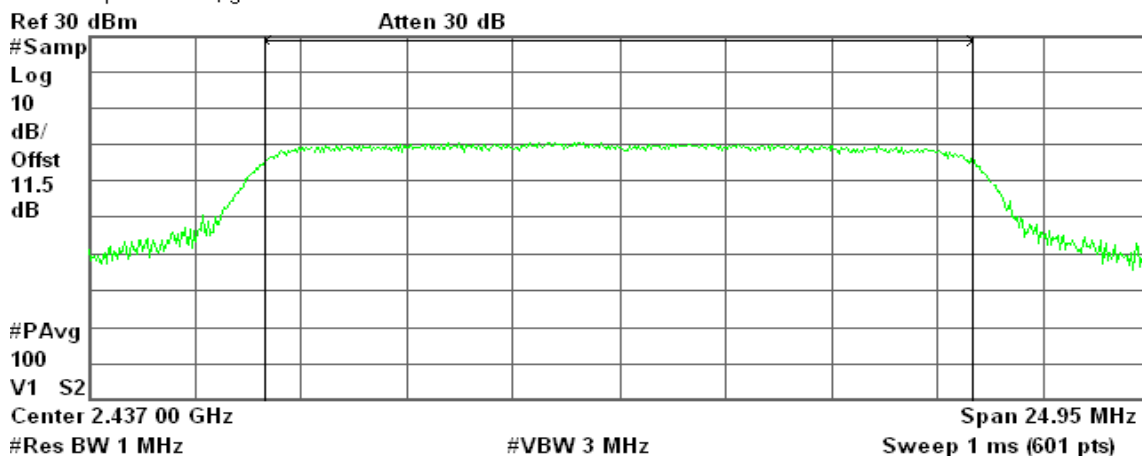
-60.85 dBm/Hz

**Average Power (CH Mid)**

Agilent 14:57:55 Mar 31, 2008

R T

AVG Output Power , g Mode Mid Ch.



Channel Power

Power Spectral Density

11.08 dBm / 16.6330 MHz

-61.13 dBm/Hz





### Average Power (CH High)

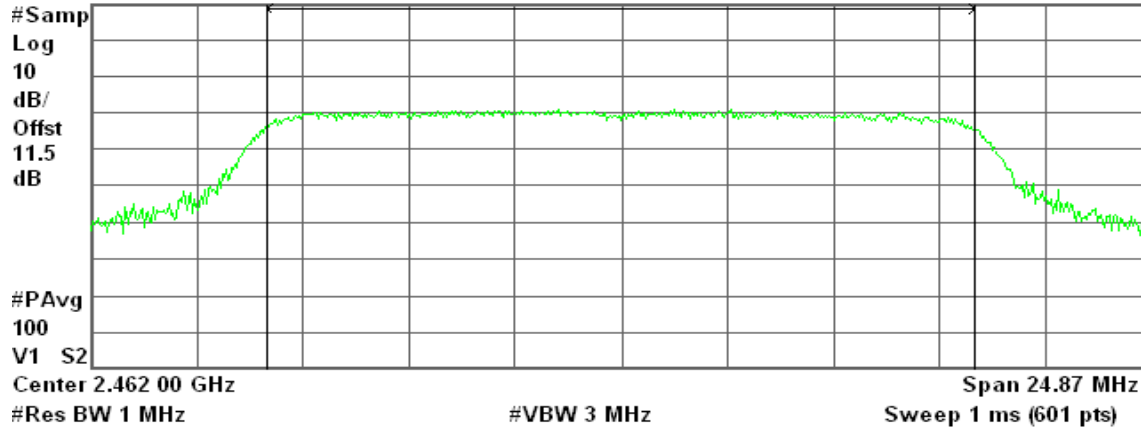
\* Agilent 15:07:22 Mar 31, 2008

R T

AVG Output Power , g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

11.69 dBm / 16.5780 MHz

Power Spectral Density

-60.51 dBm/Hz

### IEEE 802.11g mode / Chain 1

#### Average Power (CH Low)

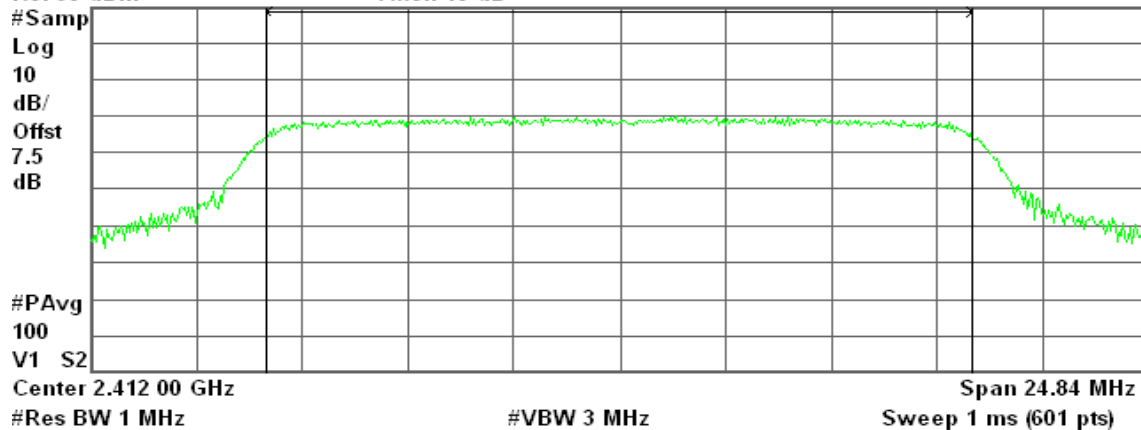
\* Agilent 16:43:27 Jun 13, 2008

R T

AVG Output Power , g Mode Low Ch.

Ref 30 dBm

Atten 40 dB



Channel Power

10.45 dBm / 16.5600 MHz

Power Spectral Density

-61.74 dBm/Hz



### Average Power (CH Mid)

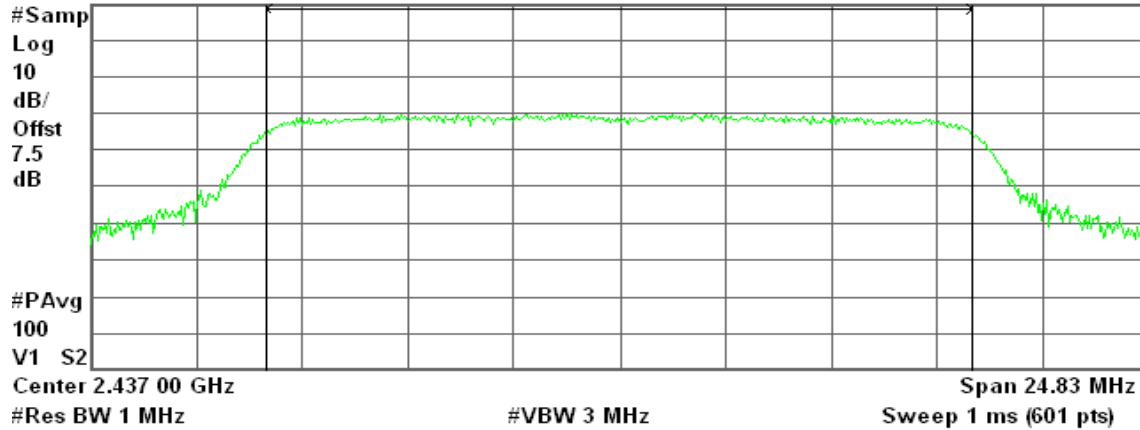
\* Agilent 16:50:46 Jun 13, 2008

R T

AVG Output Power , g Mode Mid Ch.

Ref 30 dBm

Atten 40 dB



Channel Power

10.56 dBm / 16.5550 MHz

Power Spectral Density

-61.63 dBm/Hz

### Average Power (CH High)

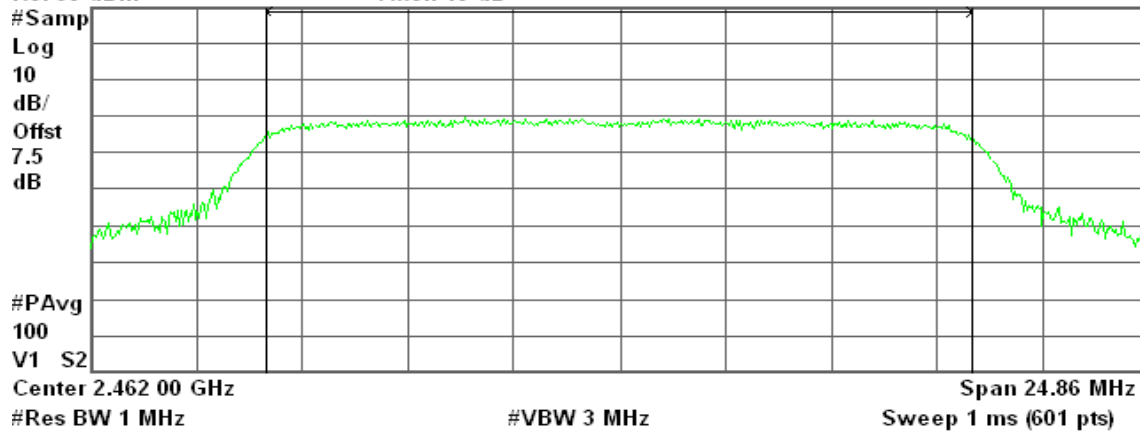
\* Agilent 16:55:38 Jun 13, 2008

R T

AVG Output Power , g Mode High Ch.

Ref 30 dBm

Atten 40 dB



Channel Power

10.04 dBm / 16.5700 MHz

Power Spectral Density

-62.16 dBm/Hz

**IEEE 802.11g mode / Chain 2****Average Power (CH Low)**

\* Agilent 17:53:56 Jul 8, 2008

R T

AVG Output Power , g Mode Low Ch.

Ref 30 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

7.5

dB

#PAvg

100

W1 S2

Center 2.412 00 GHz

#VBW 3 MHz

Span 24.81 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.21 dBm / 16.5410 MHz

-60.98 dBm/Hz

**Average Power (CH Mid)**

\* Agilent 18:02:08 Jul 8, 2008

R T

AVG Output Power , g Mode Mid Ch.

Ref 30 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

7.5

dB

#PAvg

100

W1 S2

Center 2.437 00 GHz

#VBW 3 MHz

Span 24.8 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.53 dBm / 16.5350 MHz

-60.66 dBm/Hz



## Average Power (CH High)

Agilent 18:12:45 Jul 8, 2008

R T

AVG Output Power , g Mode High Ch.

Ref 30 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

7.5

dB

#PAvg

100

W1 S2

Center 2.462 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 24.81 MHz

Sweep 1 ms (601 pts)

Channel Power

11.60 dBm / 16.5420 MHz

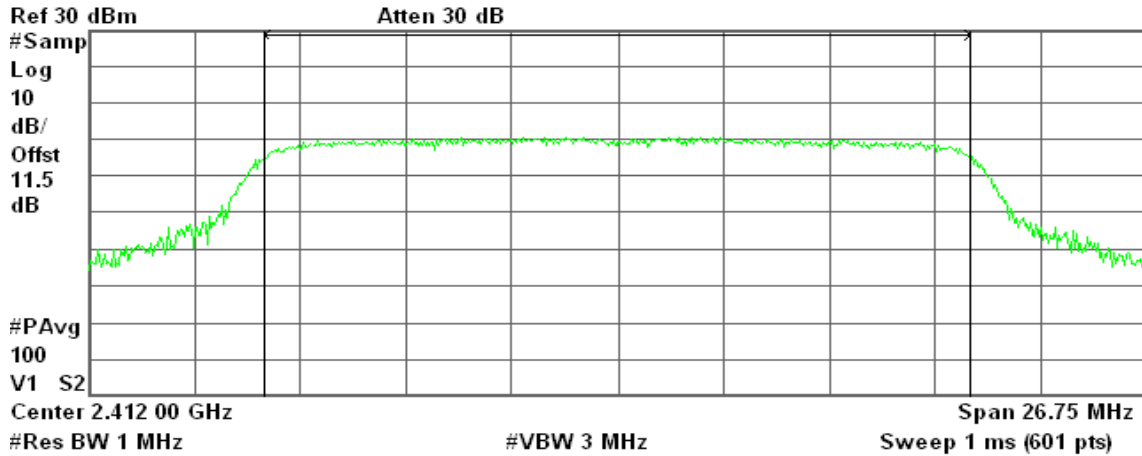
Power Spectral Density

-60.58 dBm/Hz

**draft 802.11n Standard-20 MHz Channel mode / Chain 0****Average Power (CH Low)**

\* Agilent 15:34:05 Mar 31, 2008

R T



Channel Power

11.58 dBm / 17.8310 MHz

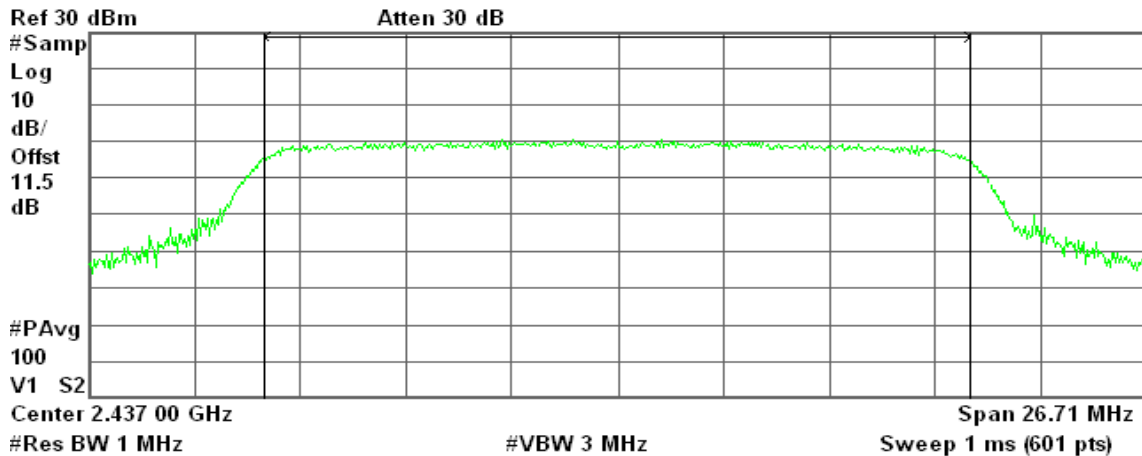
Power Spectral Density

-60.93 dBm/Hz

**Average Power (CH Mid)**

\* Agilent 15:39:45 Mar 31, 2008

R T



Channel Power

10.99 dBm / 17.8100 MHz

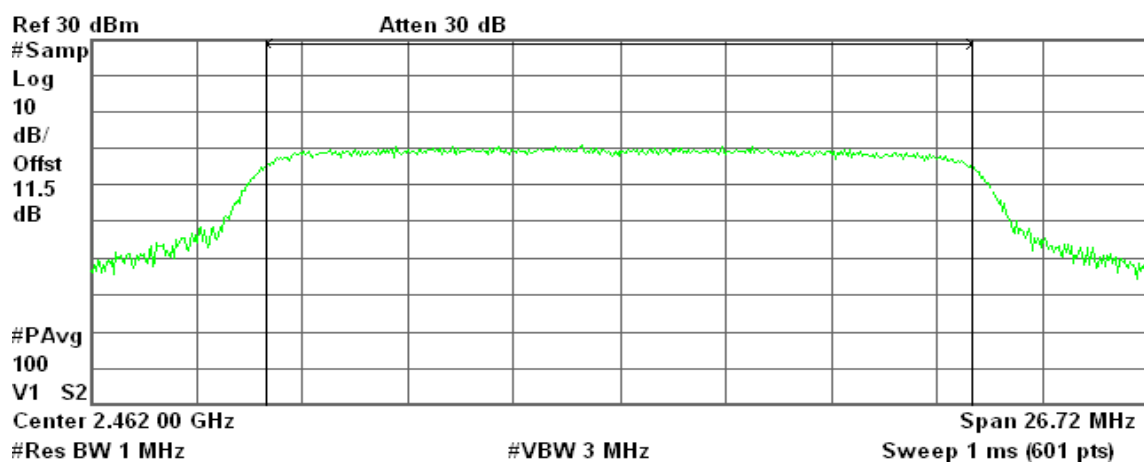
Power Spectral Density

-61.52 dBm/Hz

**Average Power (CH High)**

\* Agilent 15:44:23 Mar 31, 2008

R T



Channel Power

11.15 dBm / 17.8110 MHz

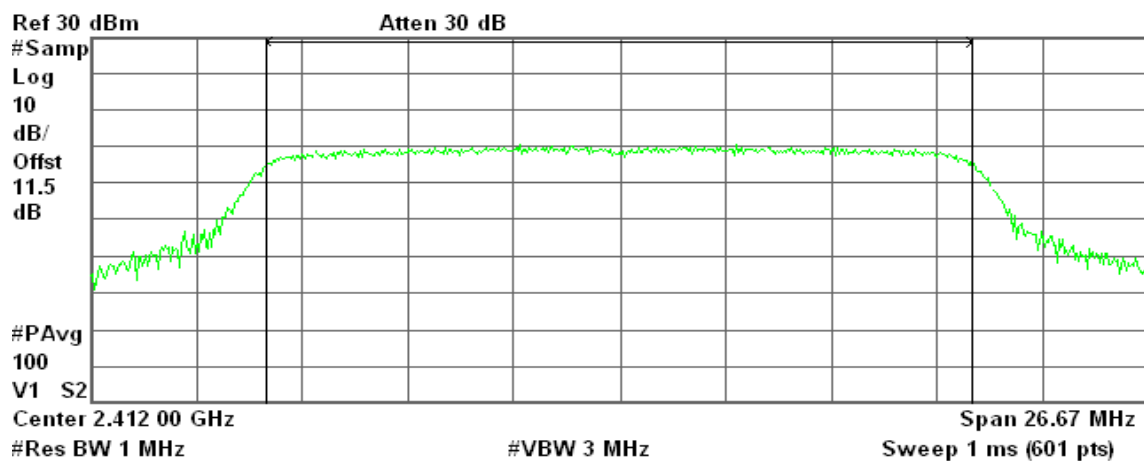
Power Spectral Density

-61.36 dBm/Hz

**draft 802.11n Standard-20 MHz Channel mode / Chain 1****Average Power (CH Low)**

\* Agilent 16:04:25 Mar 31, 2008

R T



Channel Power

11.00 dBm / 17.7790 MHz

Power Spectral Density

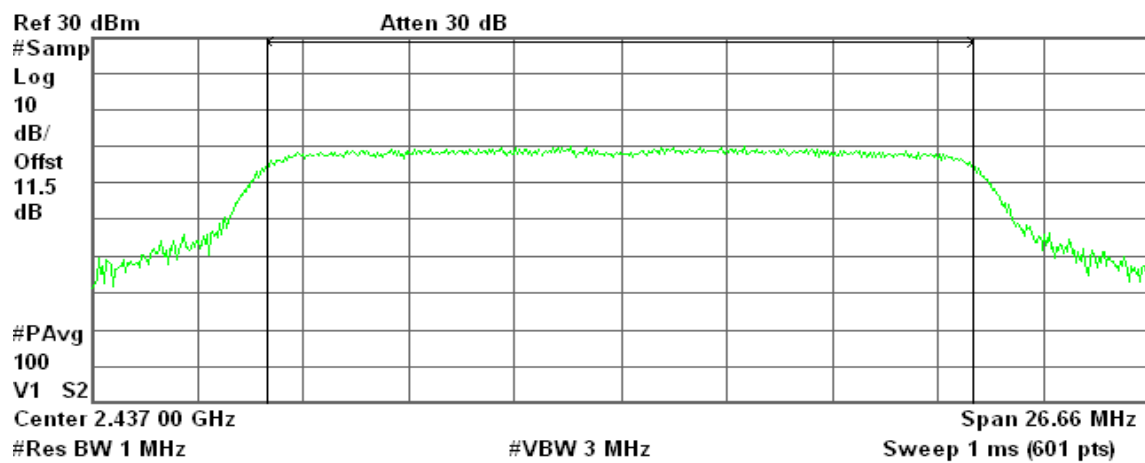
-61.50 dBm/Hz



### Average Power (CH Mid)

\* Agilent 15:56:21 Mar 31, 2008

R T



Channel Power

10.67 dBm / 17.7750 MHz

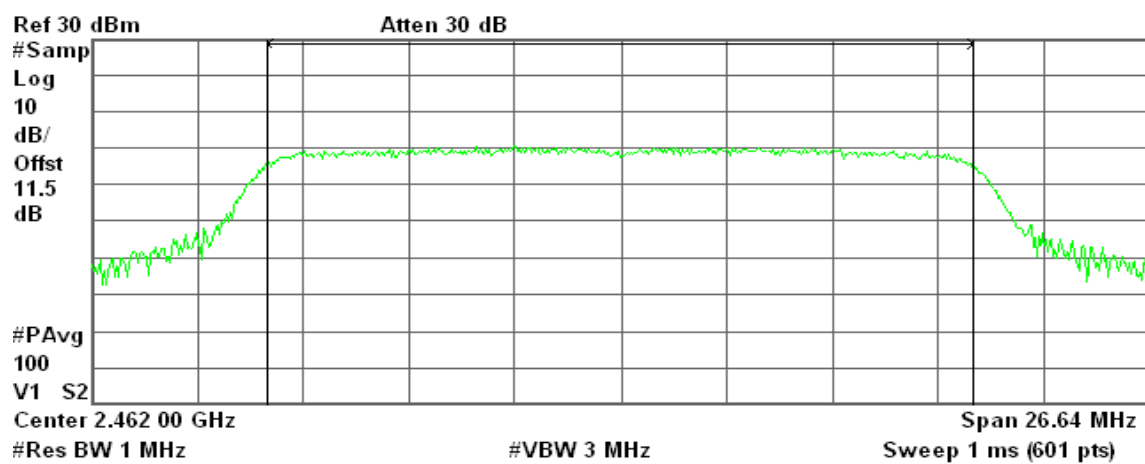
Power Spectral Density

-61.83 dBm/Hz

### Average Power (CH High)

\* Agilent 15:50:29 Mar 31, 2008

R T



Channel Power

11.25 dBm / 17.7590 MHz

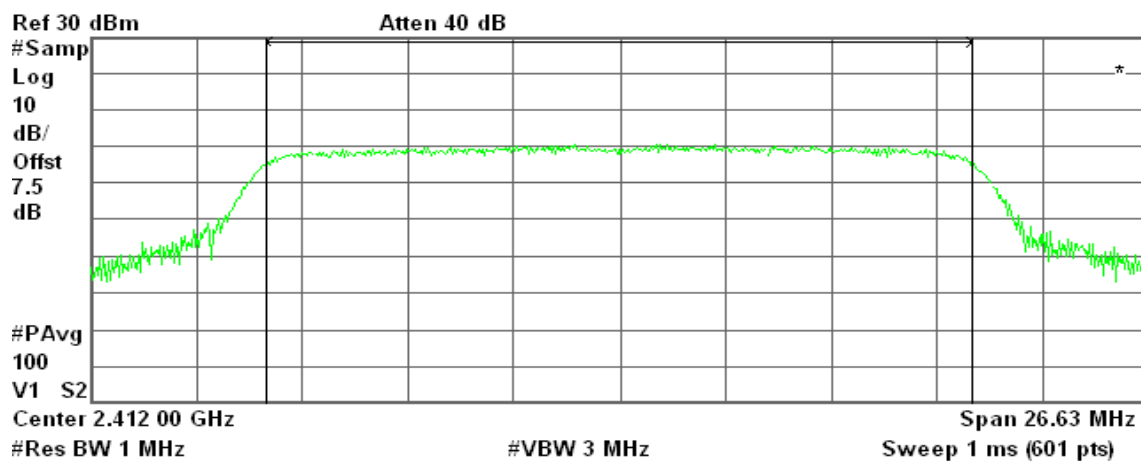
Power Spectral Density

-61.24 dBm/Hz

**draft 802.11n Standard-20 MHz Channel mode / Chain 2****Average Power (CH Low)**

\* Agilent 14:56:09 Jul 7, 2008

R L



Channel Power

11.06 dBm / 17.7520 MHz

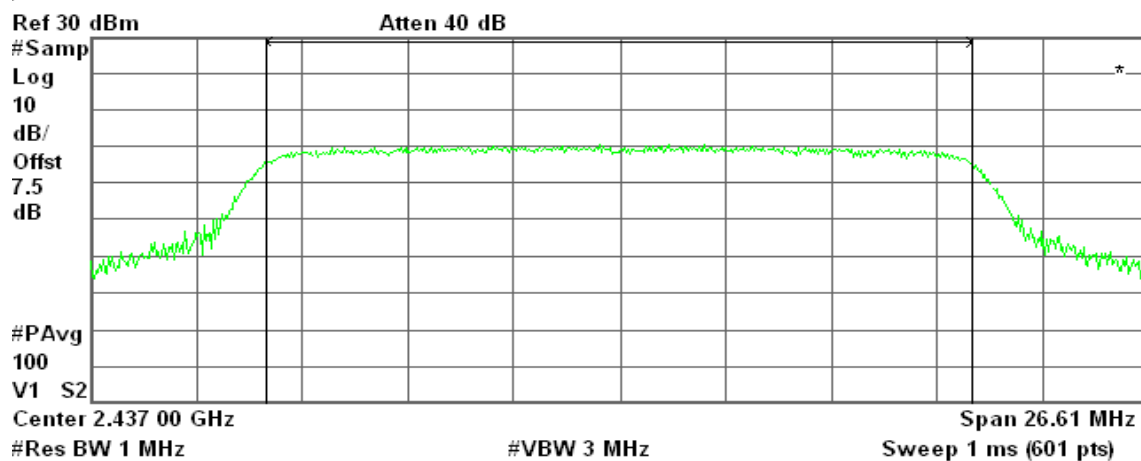
Power Spectral Density

-61.43 dBm/Hz

**Average Power (CH Mid)**

\* Agilent 15:03:34 Jul 7, 2008

R T



Channel Power

10.74 dBm / 17.7390 MHz

Power Spectral Density

-61.75 dBm/Hz

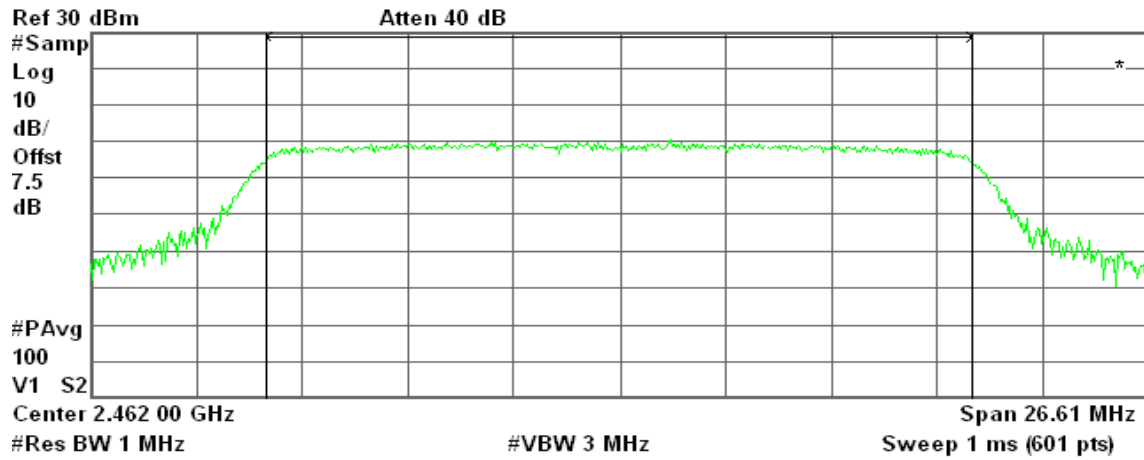




## Average Power (CH High)

Agilent 15:10:52 Jul 7, 2008

R T



Channel Power

10.73 dBm / 17.7420 MHz

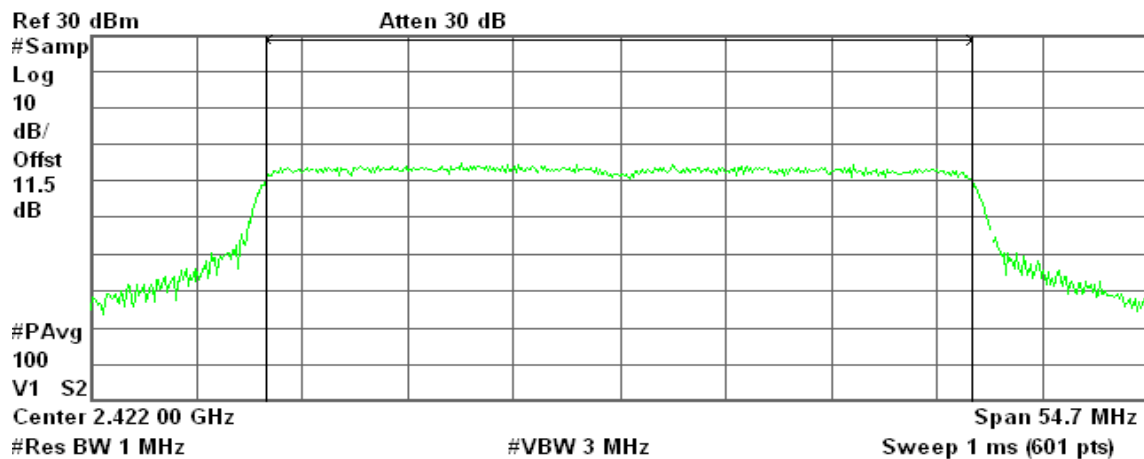
Power Spectral Density

-61.76 dBm/Hz

**draft 802.11n Wide-40 MHz Channel mode / Chain 0****Average Power (CH Low)**

\* Agilent 16:36:22 Mar 31, 2008

R L



Channel Power

8.57 dBm / 36.4660 MHz

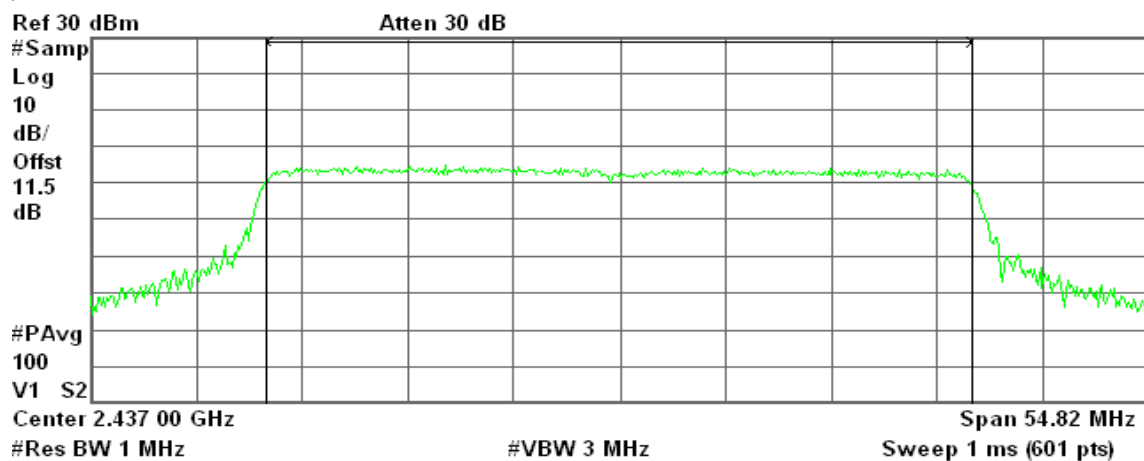
Power Spectral Density

-67.05 dBm/Hz

**Average Power (CH Mid)**

\* Agilent 16:31:50 Mar 31, 2008

R T



Channel Power

8.33 dBm / 36.5460 MHz

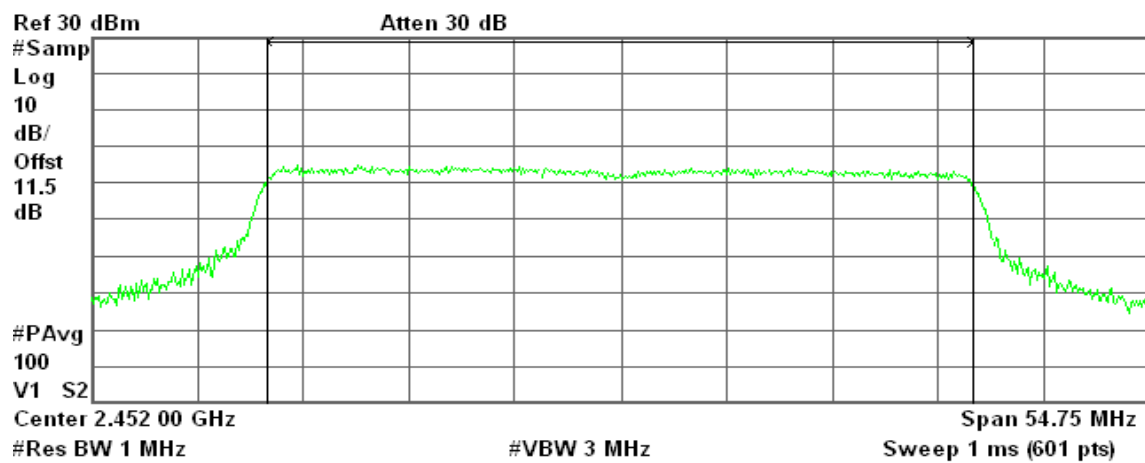
Power Spectral Density

-67.30 dBm/Hz

**Average Power (CH High)**

\* Agilent 16:27:19 Mar 31, 2008

R T



Channel Power

8.41 dBm / 36.4990 MHz

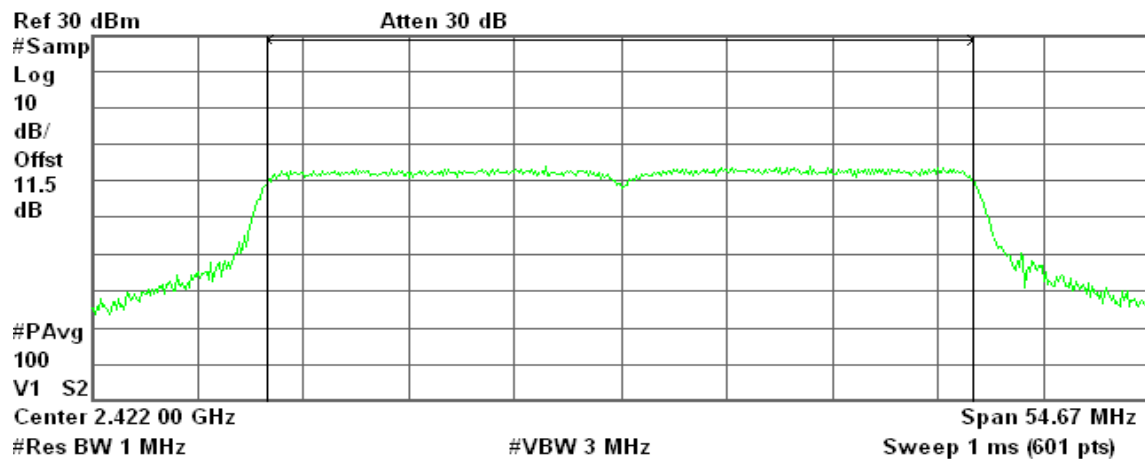
Power Spectral Density

-67.21 dBm/Hz

**draft 802.11n Wide-40 MHz Channel mode / Chain 1****Average Power (CH Low)**

\* Agilent 16:12:11 Mar 31, 2008

R T



Channel Power

7.81 dBm / 36.4470 MHz

Power Spectral Density

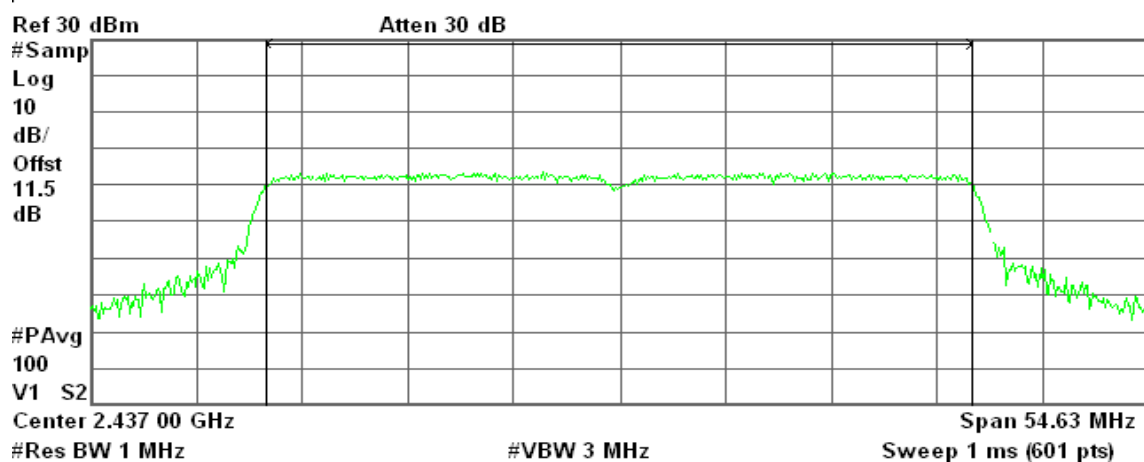
-67.80 dBm/Hz



### Average Power (CH Mid)

\* Agilent 16:17:37 Mar 31, 2008

R T



Channel Power

7.67 dBm / 36.4210 MHz

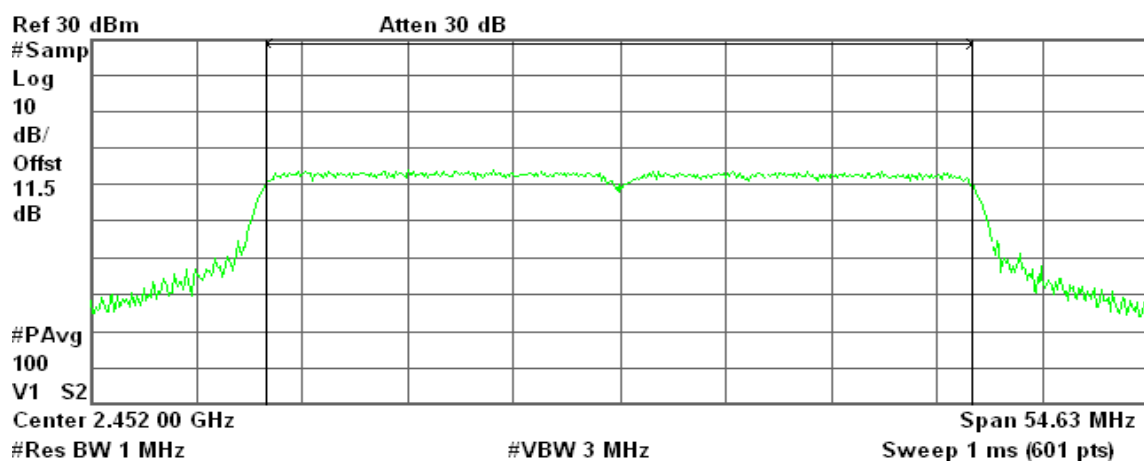
Power Spectral Density

-67.94 dBm/Hz

### Average Power (CH High)

\* Agilent 16:22:15 Mar 31, 2008

R T



Channel Power

8.12 dBm / 36.4180 MHz

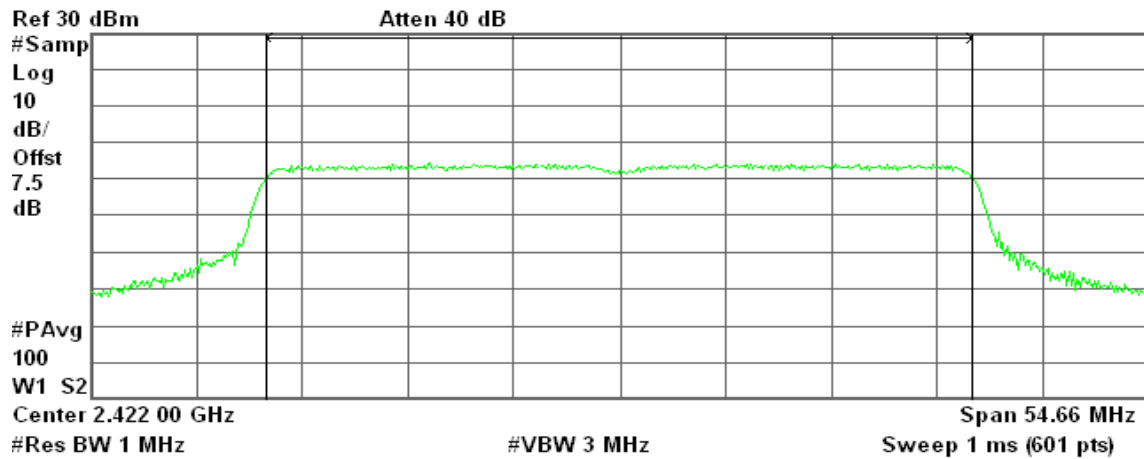
Power Spectral Density

-67.49 dBm/Hz

**draft 802.11n Wide-40 MHz Channel mode / Chain 2****Average Power (CH Low)**

\* Agilent 16:21:15 Jul 7, 2008

R T



Channel Power

8.20 dBm / 36.4400 MHz

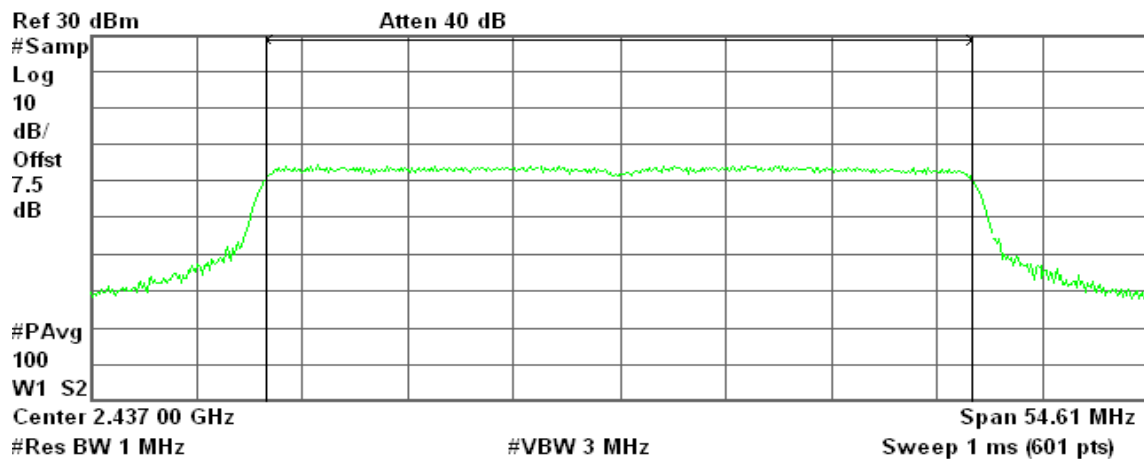
Power Spectral Density

-67.42 dBm/Hz

**Average Power (CH Mid)**

\* Agilent 16:32:03 Jul 7, 2008

R T



Channel Power

8.27 dBm / 36.4080 MHz

Power Spectral Density

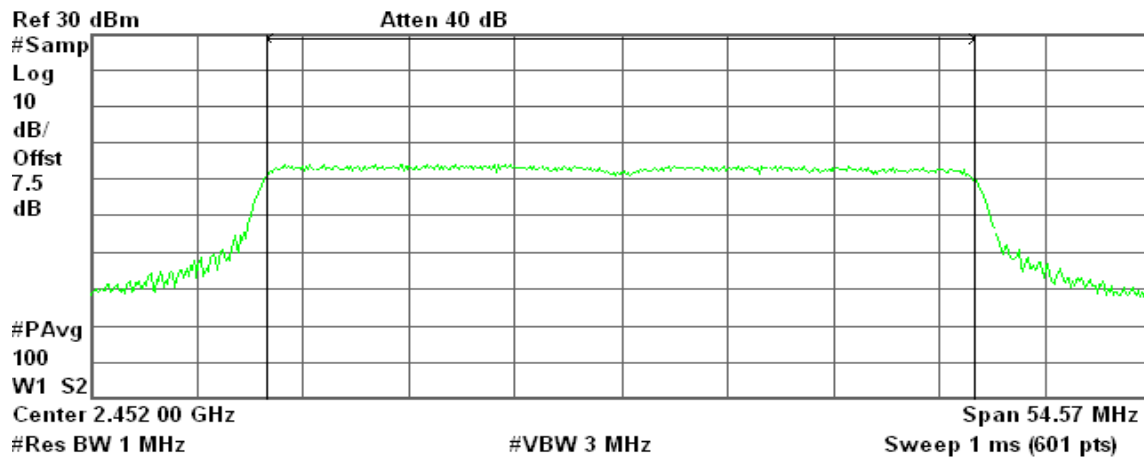
-67.34 dBm/Hz



## Average Power (CH High)

Agilent 16:47:05 Jul 7, 2008

R T



Channel Power

8.05 dBm / 36.3810 MHz

Power Spectral Density

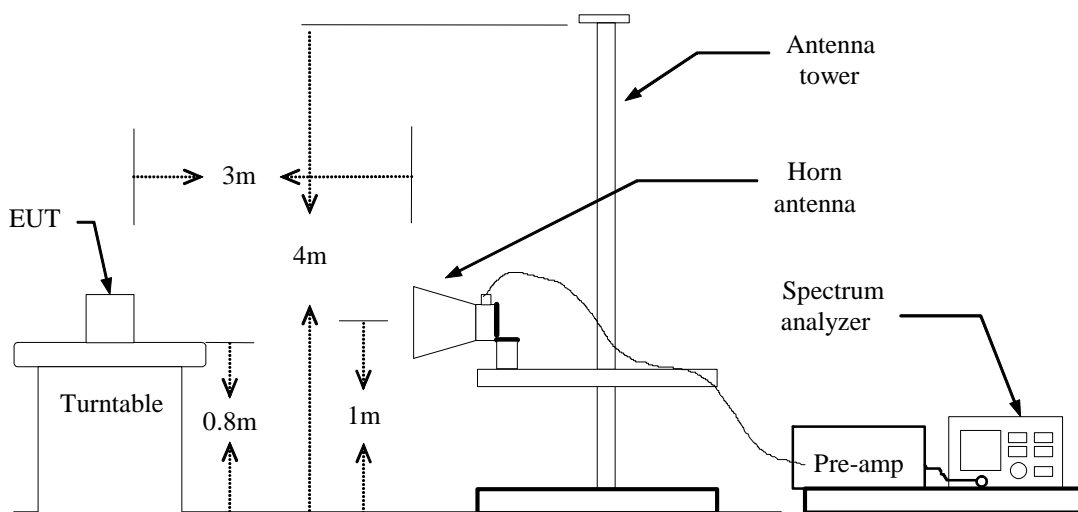
-67.56 dBm/Hz

## 7.4BAND 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

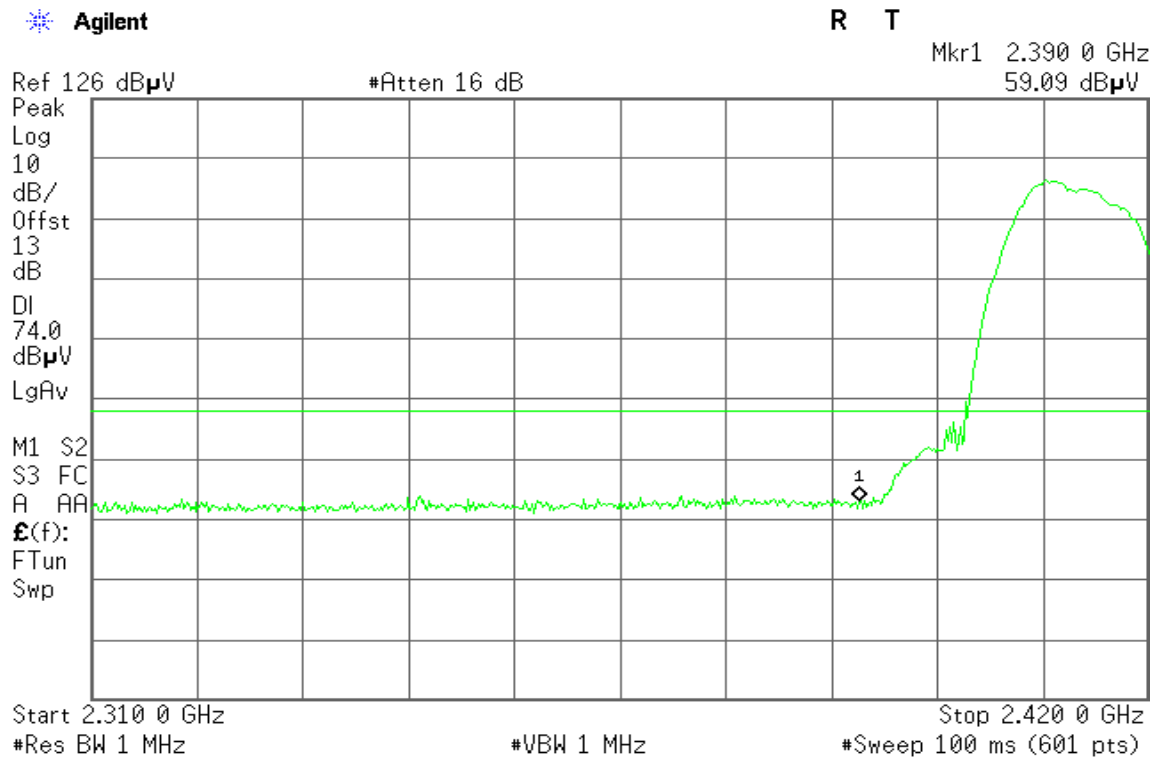
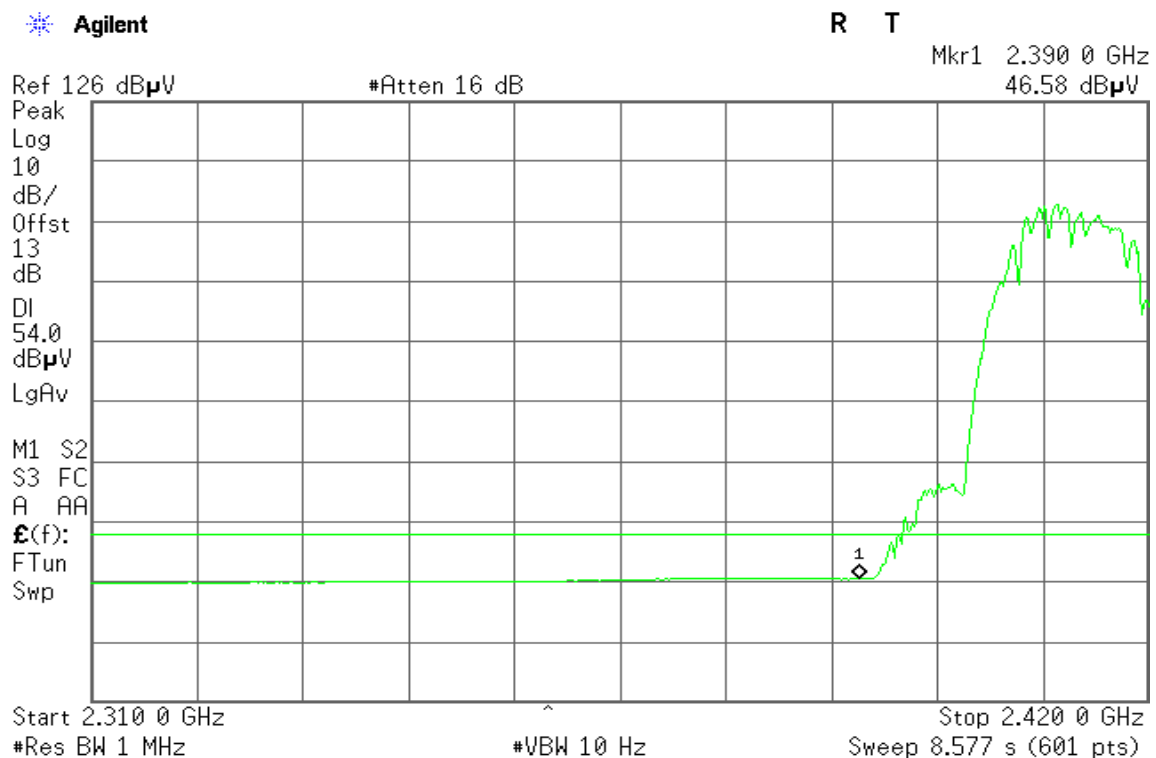


### TEST PROCEDURE

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****Detector mode: Average****Polarity: Vertical**



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

Agilent

R T

Mkr1 2.390 0 GHz  
57.89 dB $\mu$ VRef 126 dB $\mu$ V

#Atten 16 dB

Peak

Log

10

dB/

Offst

13

dB

DI

74.0

dB $\mu$ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.420 0 GHz

#Sweep 100 ms (601 pts)

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

Agilent

R T

Mkr1 2.390 0 GHz  
45.57 dB $\mu$ VRef 126 dB $\mu$ V

#Atten 16 dB

Peak

Log

10

dB/

Offst

13

dB

DI

54.0

dB $\mu$ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.420 0 GHz

Sweep 8.577 s (601 pts)

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

\* Agilent

R T

Mkr1 2.483 50 GHz  
59.21 dB $\mu$ VRef 126 dB $\mu$ V

#Atten 16 dB

Peak

Log

10

dB/

Offst

13

dB

DI

74.0

dB $\mu$ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

**Detector mode: Average****Polarity: Vertical**

\* Agilent

R T

Mkr1 2.483 50 GHz  
47.07 dB $\mu$ VRef 126 dB $\mu$ V

#Atten 16 dB

Peak

Log

10

dB/

Offst

13

dB

DI

54.0

dB $\mu$ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 3.119 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
57.72 dB $\mu$ VRef 126 dB $\mu$ V

#Atten 16 dB

Peak

Log

10

dB/

Offst

13

dB

DI

74.0

dB $\mu$ V

LgAv

M1 S2

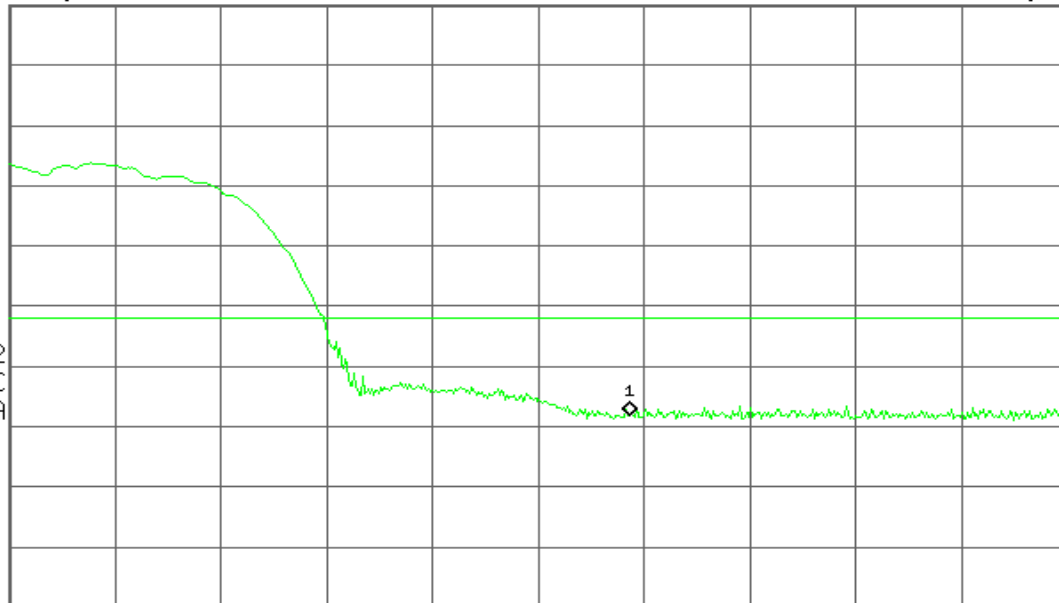
S3 FC

A AA

E(f):

FTun

Swp



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
45.71 dB $\mu$ VRef 126 dB $\mu$ V

#Atten 16 dB

Peak

Log

10

dB/

Offst

13

dB

DI

54.0

dB $\mu$ V

LgAv

M1 S2

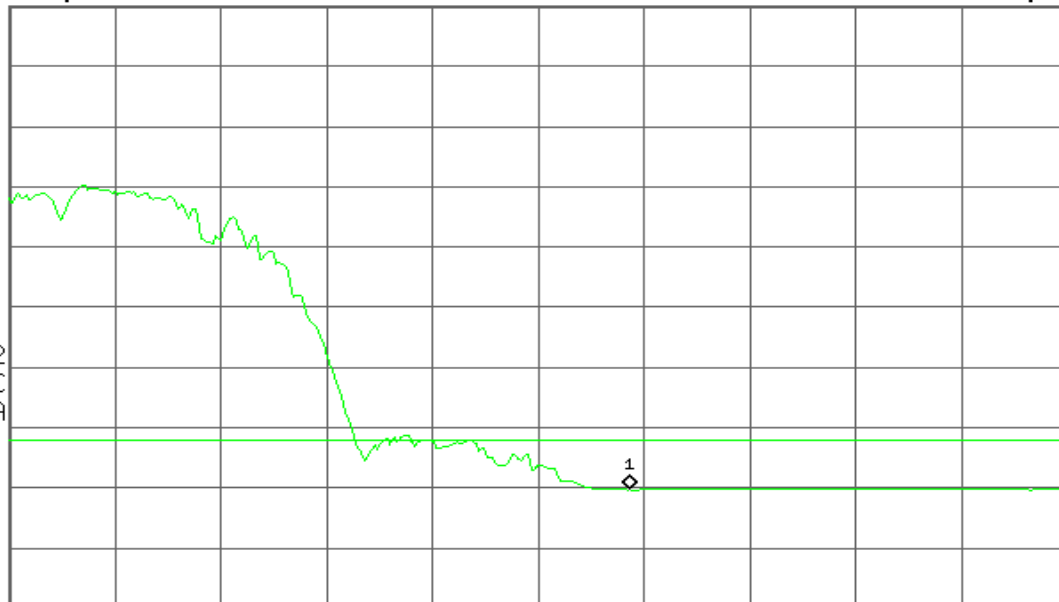
S3 FC

A AA

E(f):

FTun

Swp



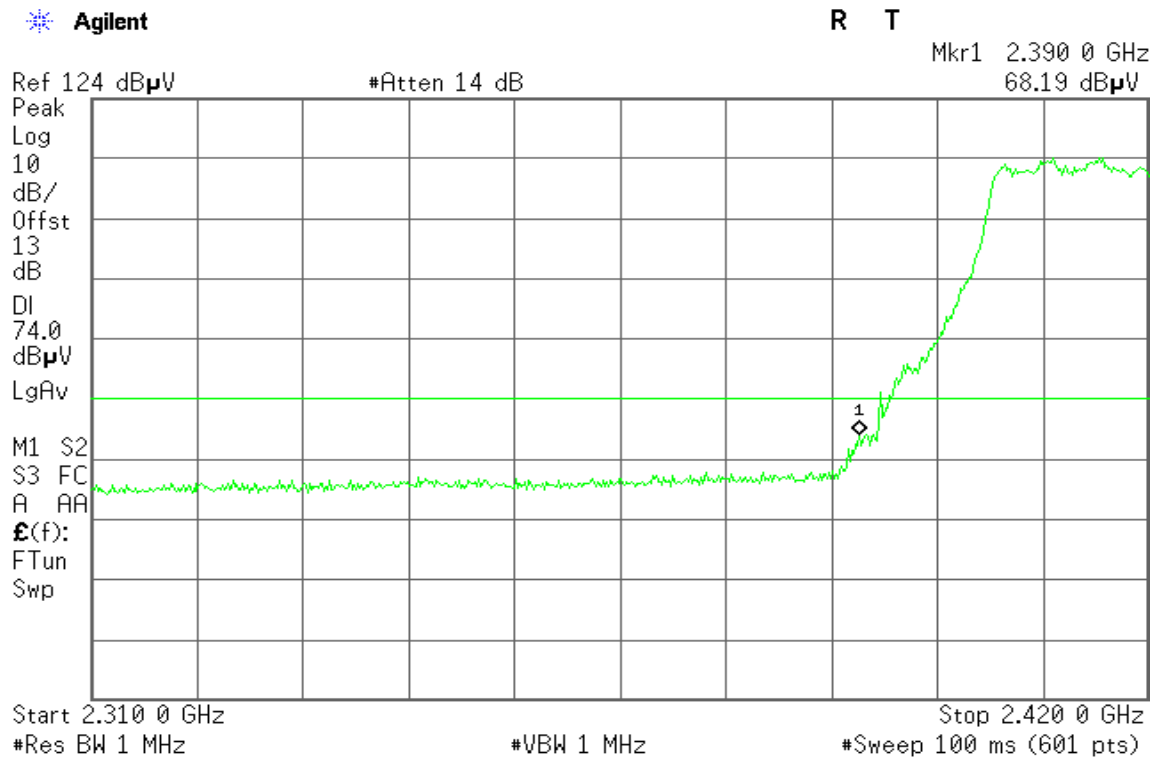
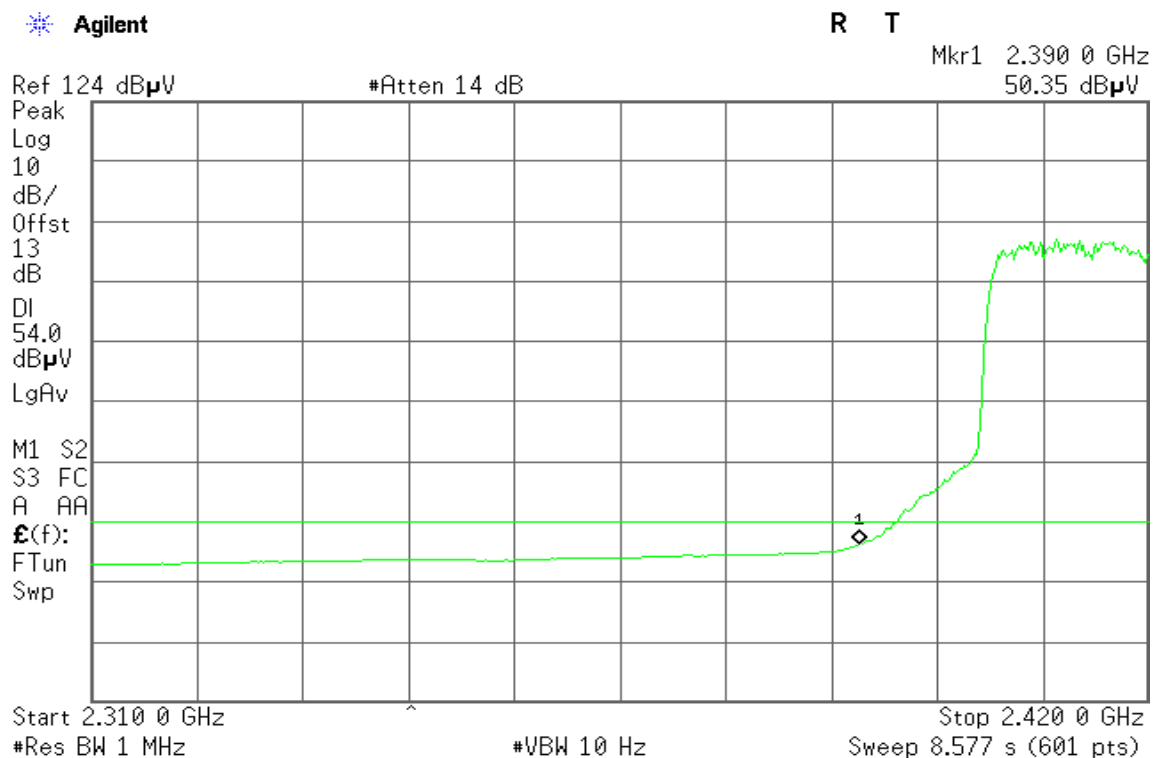
Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 3.119 s (601 pts)

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

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

\* Agilent

R T

Mkr1 2.390 0 GHz  
58.59 dB $\mu$ VRef 124 dB $\mu$ V

#Atten 14 dB

Peak

Log

10

dB/

Offst

13

dB

DI

74.0

dB $\mu$ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.420 0 GHz  
#Sweep 100 ms (601 pts)**Detector mode: Average****Polarity: Horizontal**

\* Agilent

R T

Mkr1 2.390 0 GHz  
45.72 dB $\mu$ VRef 124 dB $\mu$ V

#Atten 14 dB

Peak

Log

10

dB/

Offst

13

dB

DI

54.0

dB $\mu$ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

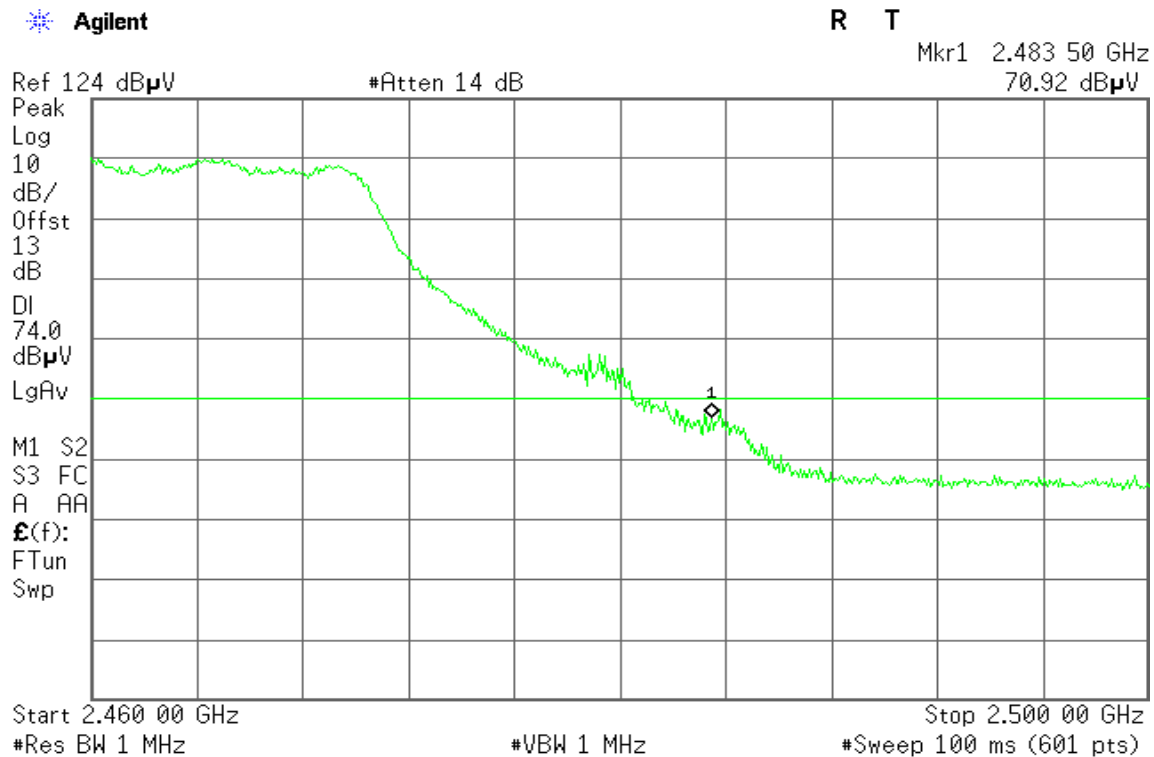
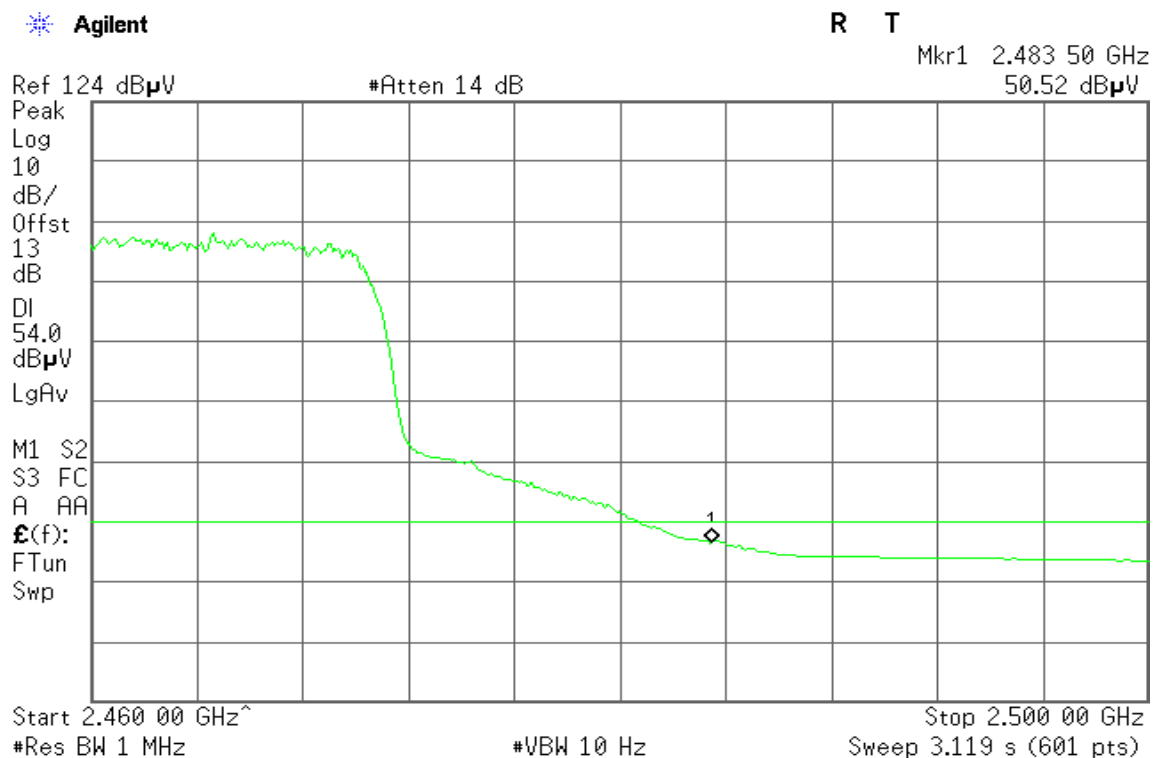
Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.420 0 GHz  
Sweep 8.577 s (601 pts)

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



Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
67.12 dB $\mu$ VRef 126 dB $\mu$ V

#Atten 16 dB

Peak

Log

10

dB/

Offst

13

dB

DI

74.0

dB $\mu$ V

LgAv

M1 S2

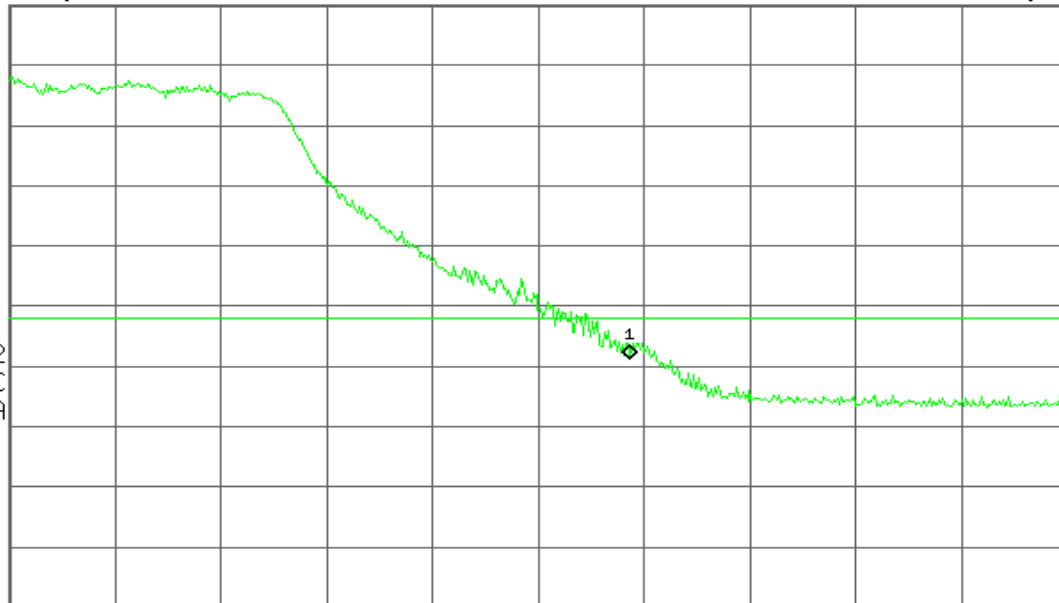
S3 FC

A AA

E(f):

FTun

Swp



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
50.19 dB $\mu$ VRef 126 dB $\mu$ V

#Atten 16 dB

Peak

Log

10

dB/

Offst

13

dB

DI

54.0

dB $\mu$ V

LgAv

M1 S2

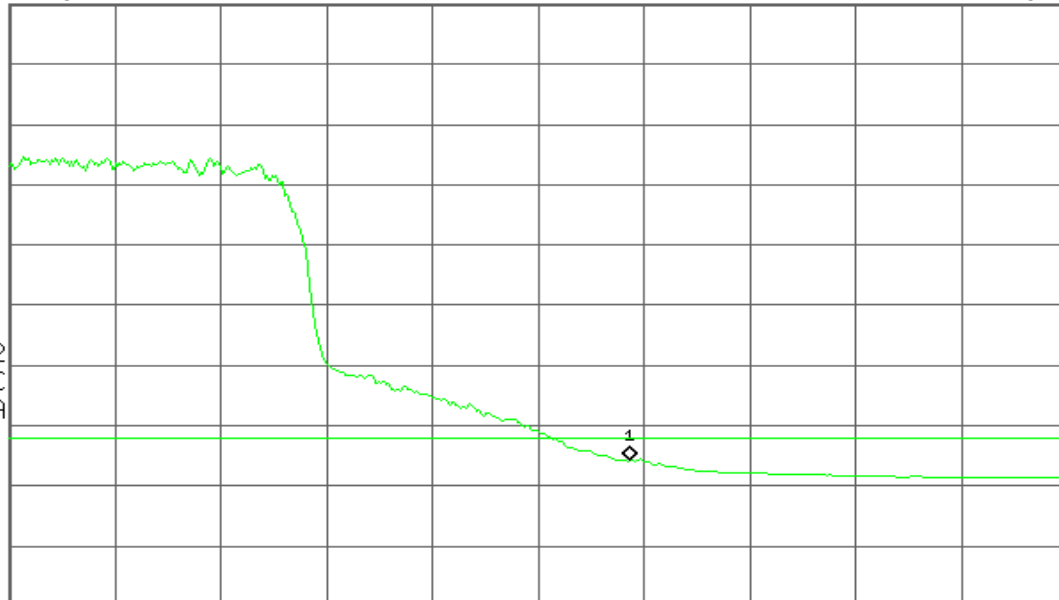
S3 FC

A AA

E(f):

FTun

Swp



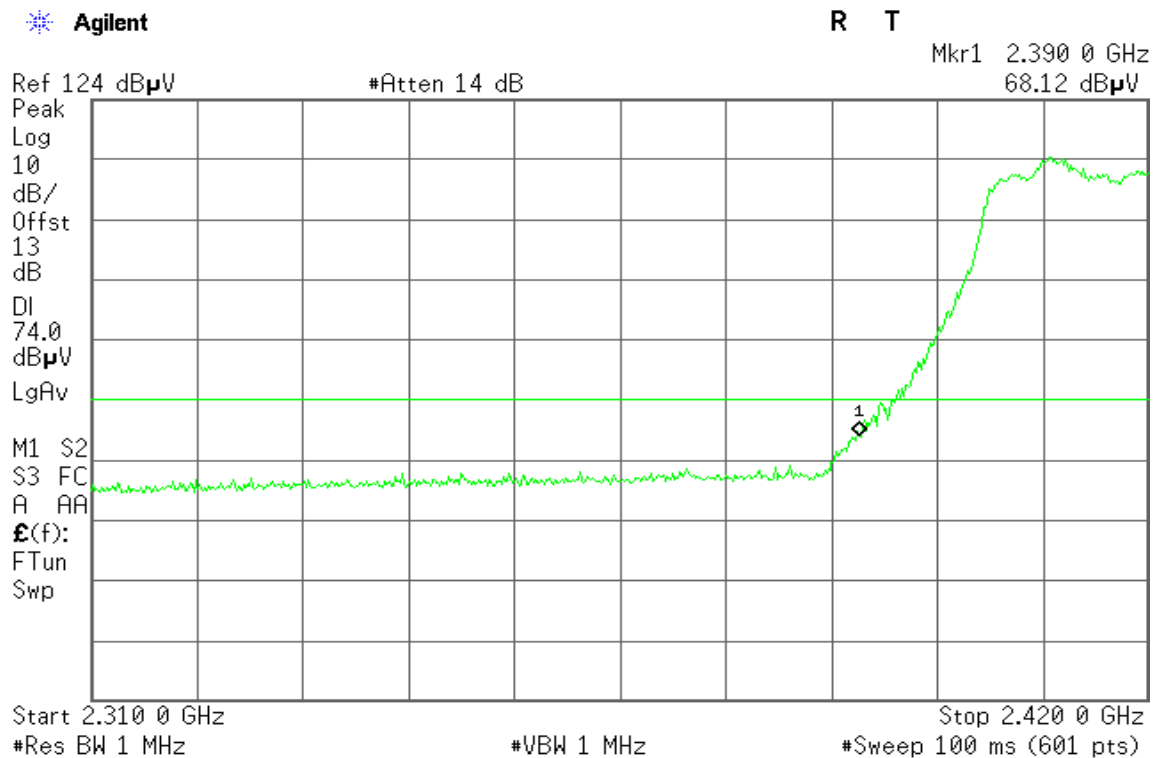
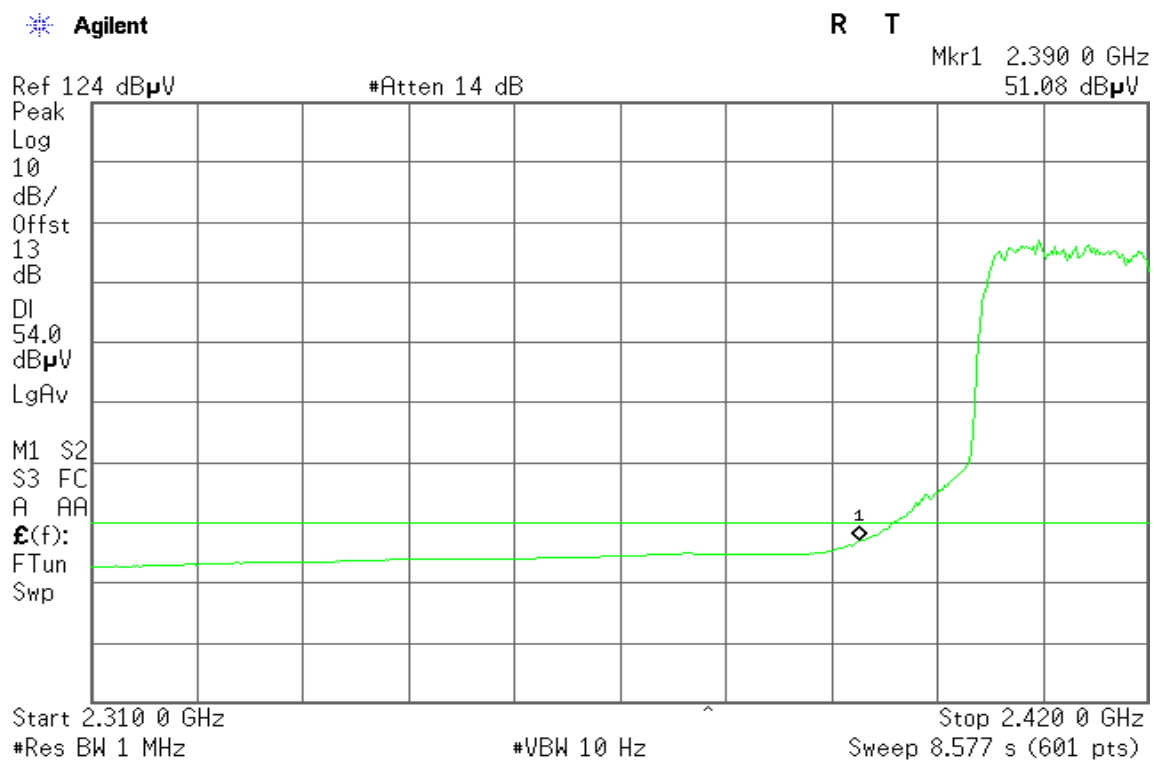
Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 3.119 s (601 pts)

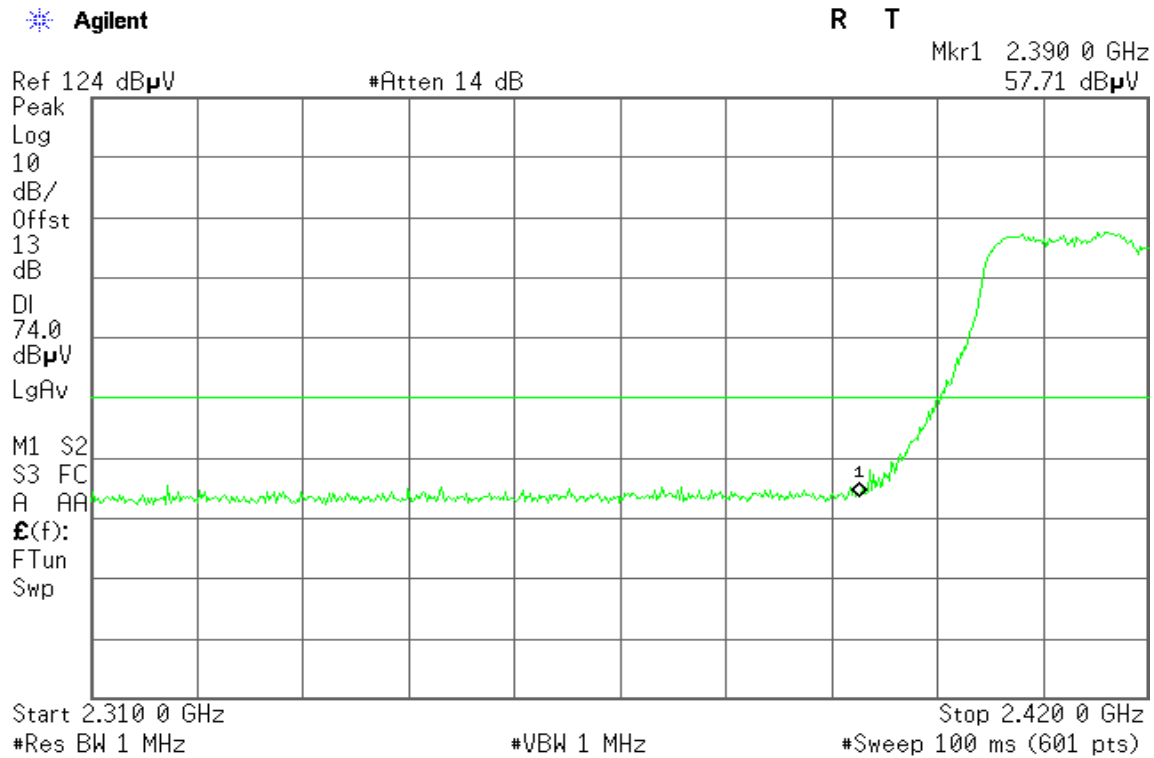
**Band Edges (draft 802.11n Standard-20 MHz Channel mode / CH Low)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**





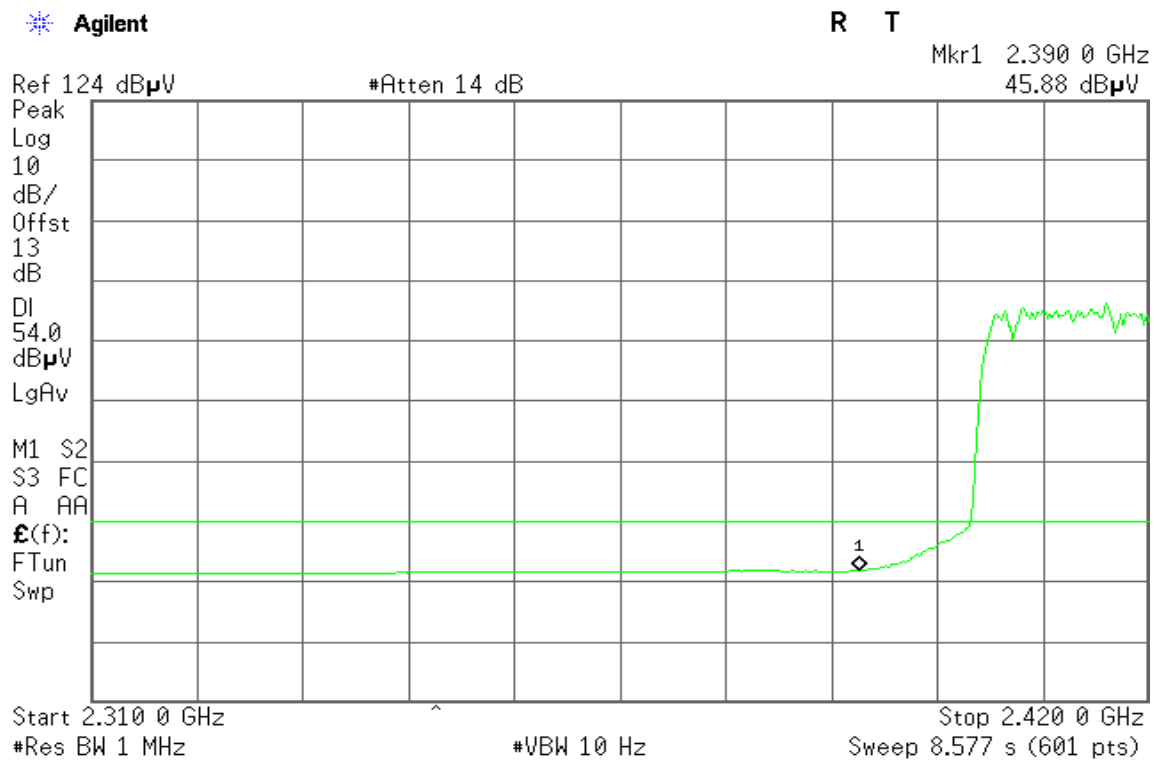
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

Polarity: Horizontal



**Band Edges (draft 802.11n Standard-20 MHz Channel mode / CH High)****Detector mode: Peak****Polarity: Vertical**

\* Agilent

R T

Mkr1 2.483 50 GHz

70.31 dB $\mu$ VRef 124 dB $\mu$ V

#Atten 14 dB

Peak

Log

10

dB/

Offst

13

dB

DI

74.0

dB $\mu$ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

**Detector mode: Average****Polarity: Vertical**

\* Agilent

R T

Mkr1 2.483 50 GHz

50.526 dB $\mu$ VRef 124 dB $\mu$ V

#Atten 14 dB

Samp

Log

10

dB/

Offst

13

dB

DI

54.0

dB $\mu$ V

LgAv

3

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 9.863 s (601 pts)

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

\* Agilent

R T

Mkr1 2.483 50 GHz  
57.85 dB $\mu$ VRef 124 dB $\mu$ V

#Atten 14 dB

Peak

Log

10

dB/

Offst

13

dB

DI

74.0

dB $\mu$ V

LgAv

M1 S2

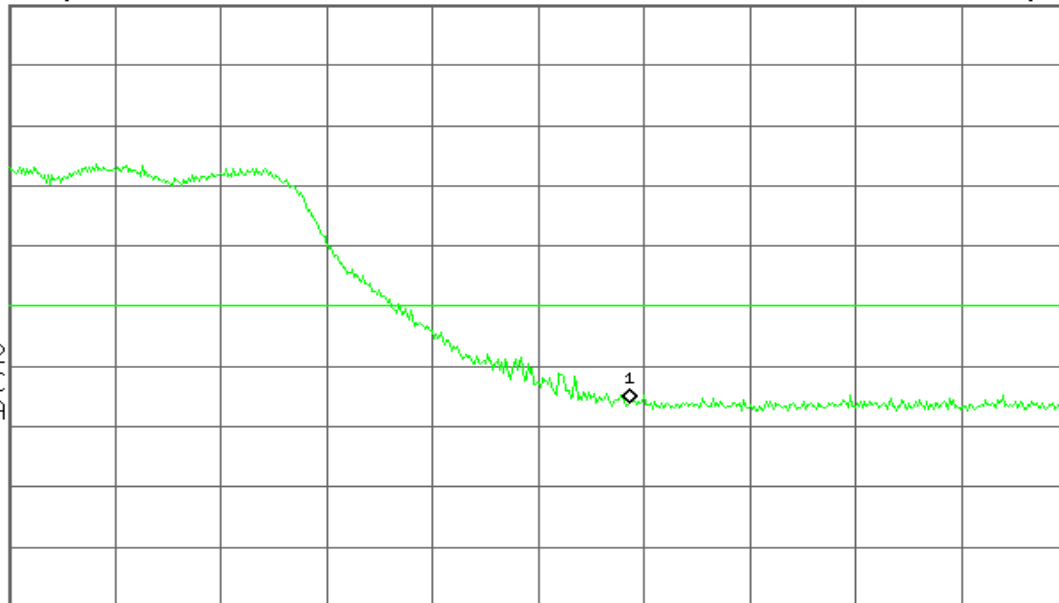
S3 FC

A AA

E(f):

FTun

Swp



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

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

\* Agilent

R T

Mkr1 2.483 50 GHz  
45.71 dB $\mu$ VRef 124 dB $\mu$ V

#Atten 14 dB

Peak

Log

10

dB/

Offst

13

dB

DI

54.0

dB $\mu$ V

LgAv

M1 S2

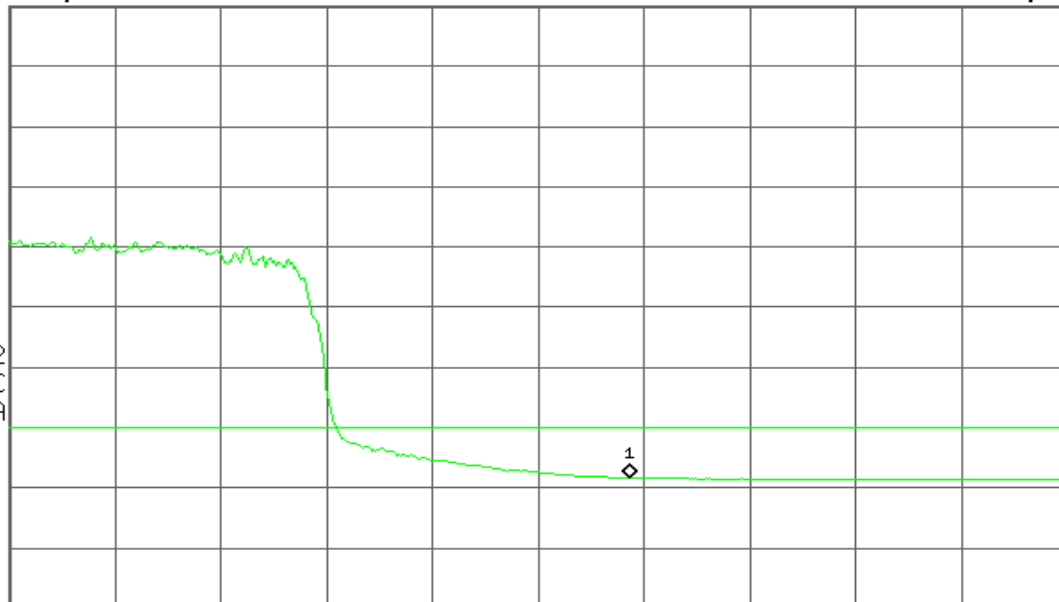
S3 FC

A AA

E(f):

FTun

Swp



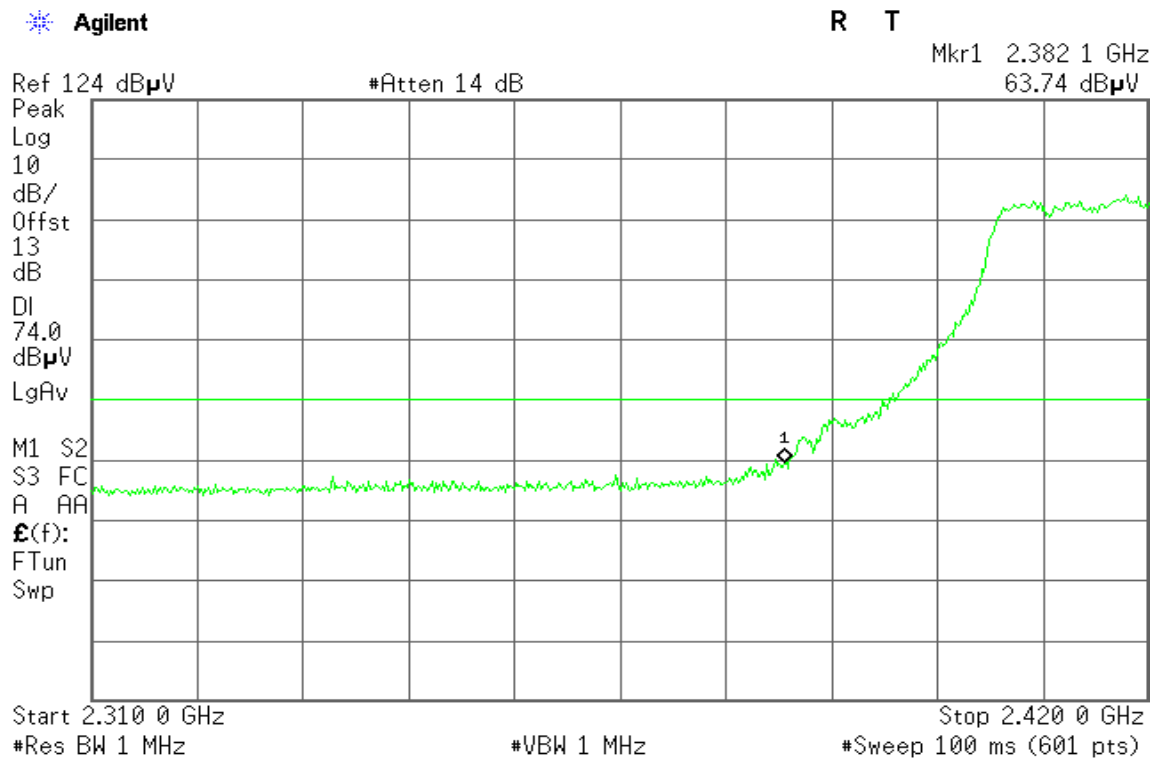
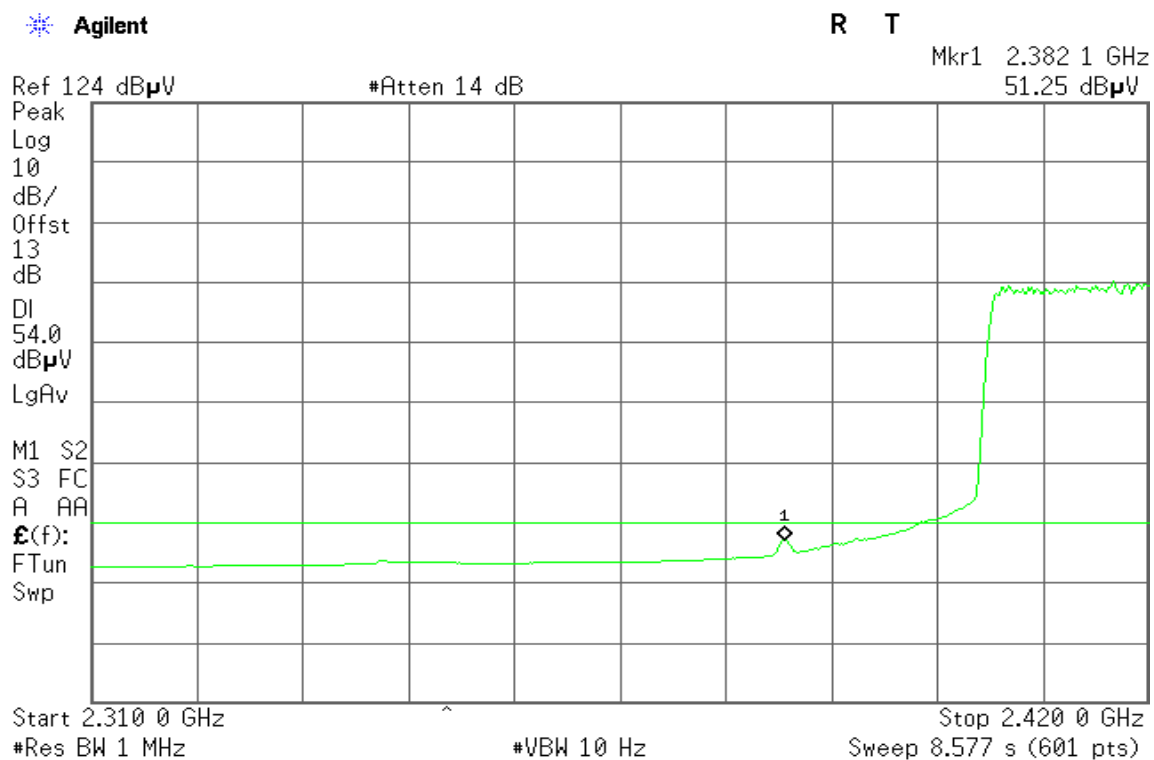
Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

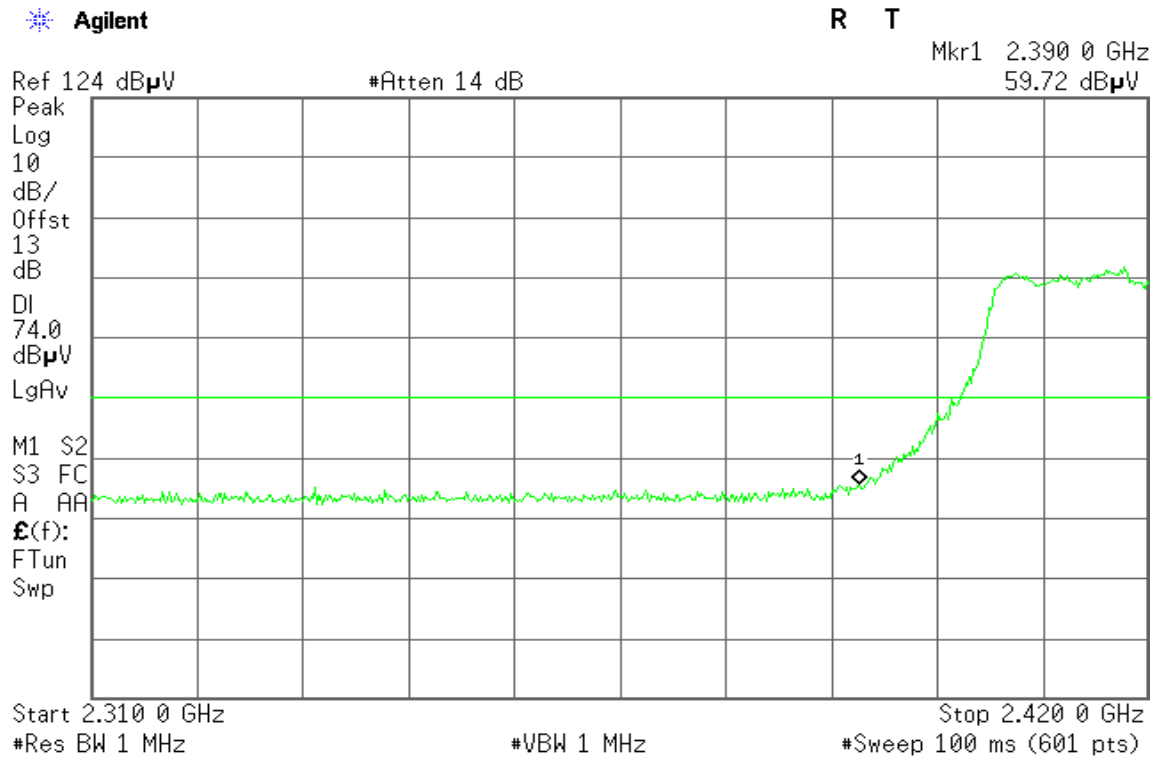
Sweep 3.119 s (601 pts)

**Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH Low)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**



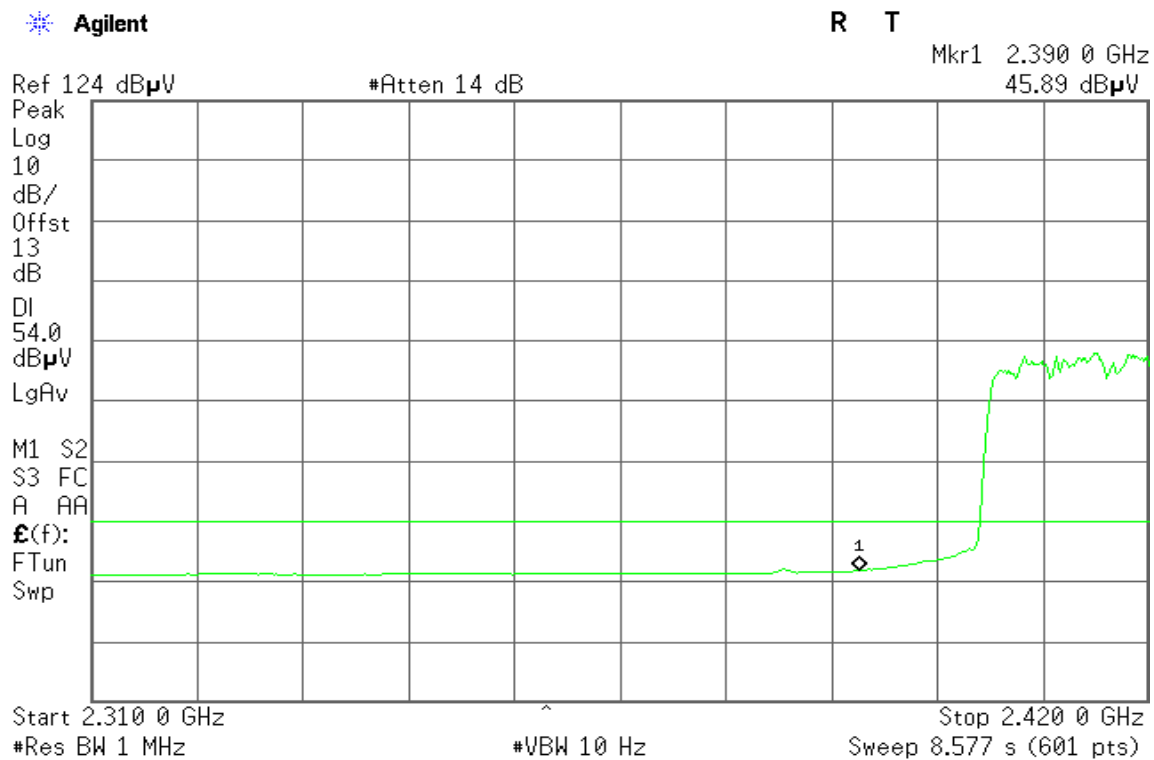
Detector mode: Peak

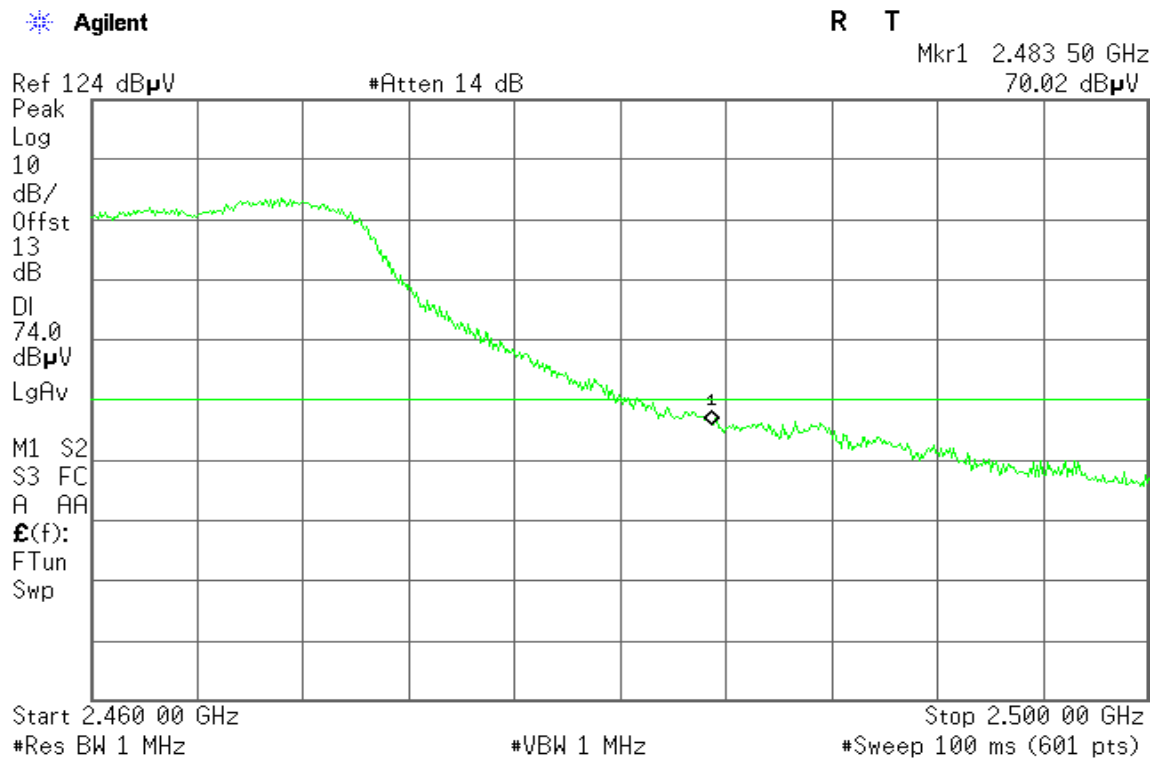
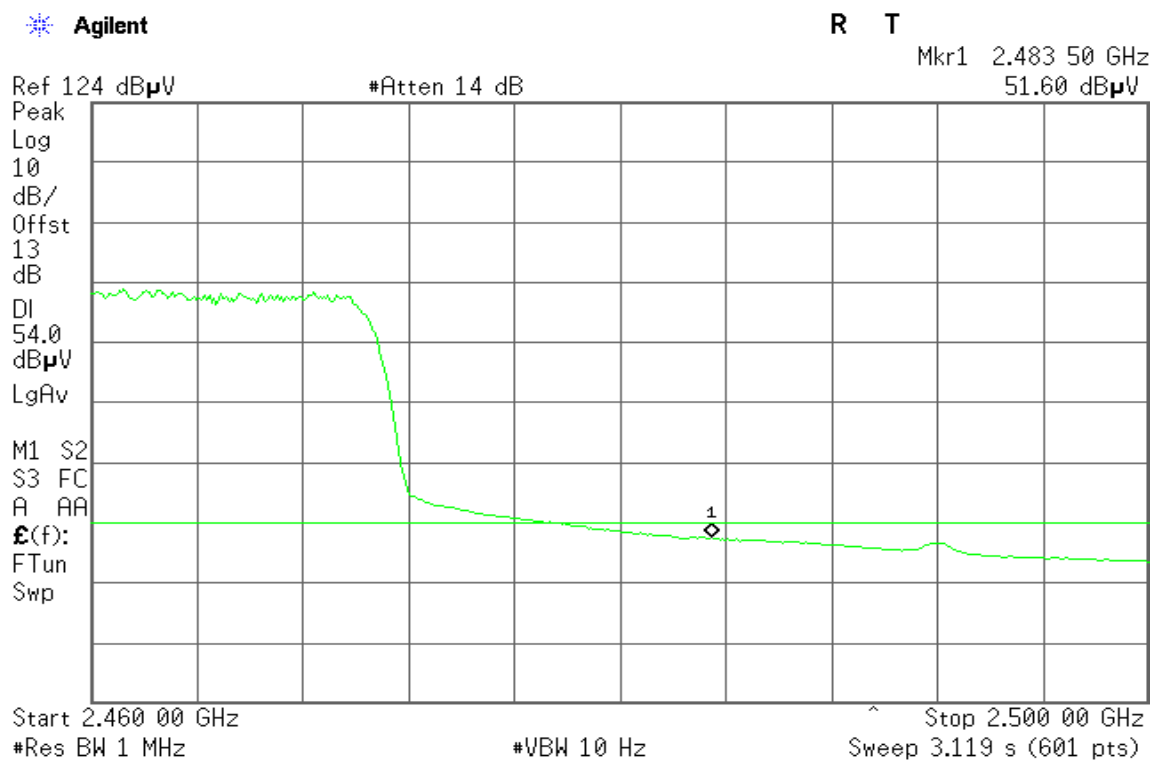
Polarity: Horizontal



Detector mode: Average

Polarity: Horizontal



**Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH High)****Detector mode: Peak****Polarity: Vertical****Detector mode: Average****Polarity: Vertical**



Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
59.52 dB $\mu$ VRef 124 dB $\mu$ V

#Atten 14 dB

Peak

Log

10

dB/

Offst

13

dB

DI

74.0

dB $\mu$ V

LgAv

M1 S2

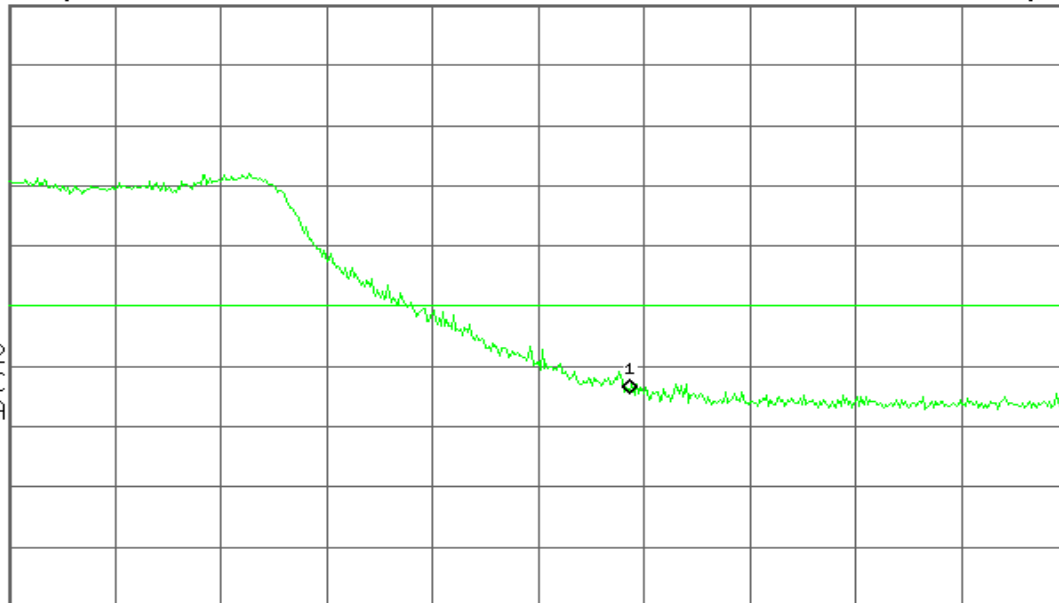
S3 FC

A AA

 $\mathcal{E}(f)$ :

FTun

Swp



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
46.19 dB $\mu$ VRef 124 dB $\mu$ V

#Atten 14 dB

Peak

Log

10

dB/

Offst

13

dB

DI

54.0

dB $\mu$ V

LgAv

M1 S2

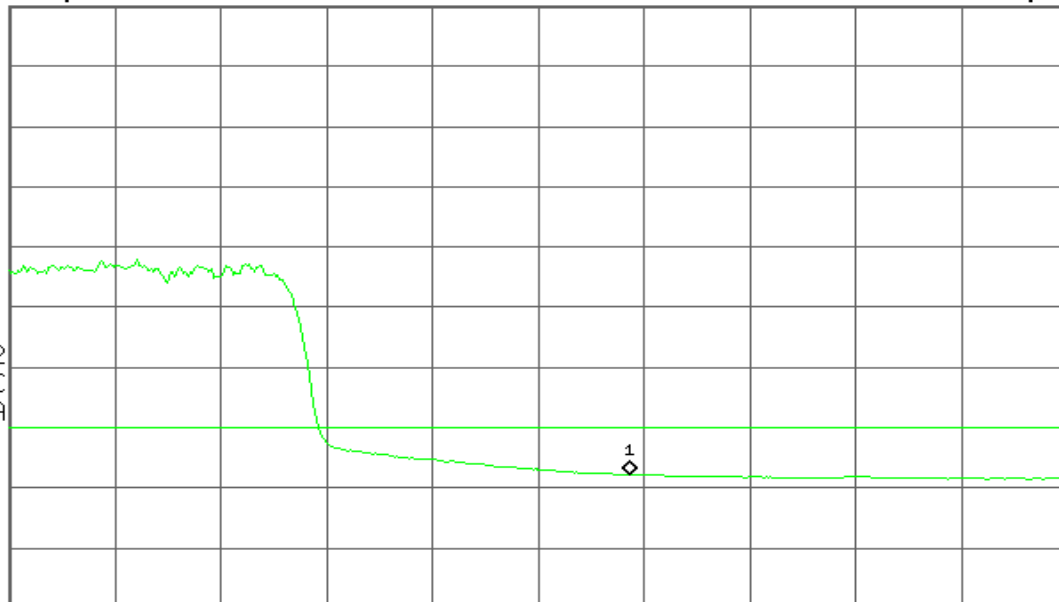
S3 FC

A AA

 $\mathcal{E}(f)$ :

FTun

Swp



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

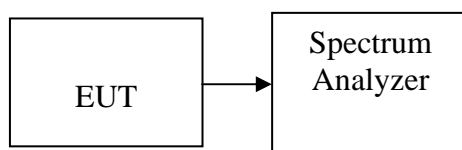
Sweep 3.119 s (601 pts)

## 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 1 PPSD (dBm)	Chain 2 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-9.82	-10.39	-9.01	-4.93	7.20	PASS
Mid	2437	-11.08	-11.27	-9.28	-5.68		PASS
High	2462	-10.70	-10.70	-9.37	-5.44		PASS

### Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-8.50	-10.04	-9.08	-4.39	7.20	PASS
Mid	2437	-7.24	-9.95	-8.66	-3.70		PASS
High	2462	-8.06	-10.35	-8.87	-4.22		PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-7.70	-11.60	-9.21	-4.45	7.20	PASS
Mid	2437	-8.40	-13.11	-9.35	-5.09		PASS
High	2462	-8.02	-11.79	-9.92	-4.87		PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-10.20	-14.03	-9.69	-6.15	7.20	PASS
Mid	2437	-9.15	-13.98	-9.82	-5.75		PASS
High	2452	-9.70	-13.88	-10.07	-6.08		PASS

**Remark:** 1. Total PPSD (dBm) =  $10 * \text{LOG}(10^{\text{Chain 0 PPSD} / 10} + 10^{\text{Chain 1 PPSD} / 10} + 10^{\text{Chain 2 PPSD} / 10})$

2. The maximum antenna gain is 6.8dBi; therefore the reduction due to antenna gain is 0.8dBi, so the limit is 7.2dBm.

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-0.39	7.20	PASS
Mid	2437	-0.23		PASS
High	2462	-2.07		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-0.22	7.20	PASS
Mid	2437	-0.16		PASS
High	2462	-1.23		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-6.77	7.20	PASS
Mid	2437	-2.25		PASS
High	2462	-2.29		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-3.23	7.20	PASS
Mid	2437	-2.97		PASS
High	2452	-3.21		PASS

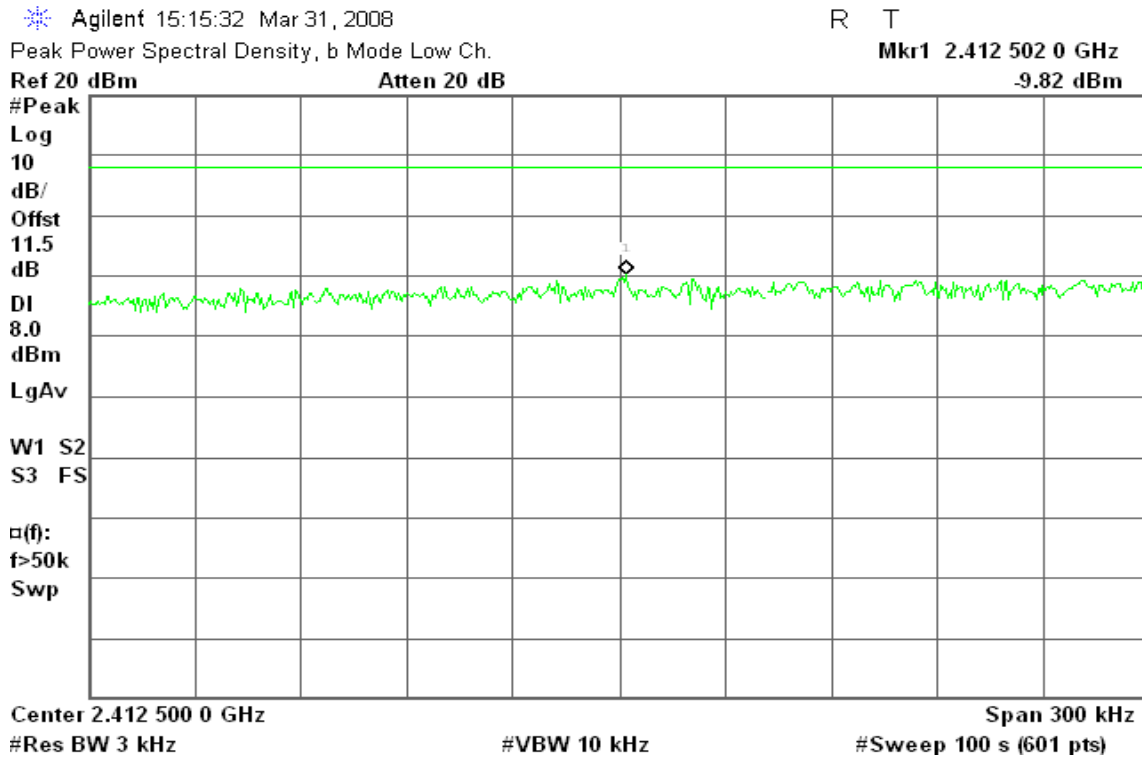
**Remark:** The maximum antenna gain is 6.8dBi; therefore the reduction due to antenna gain is 0.8dBi, so the limit is 7.2dBm.



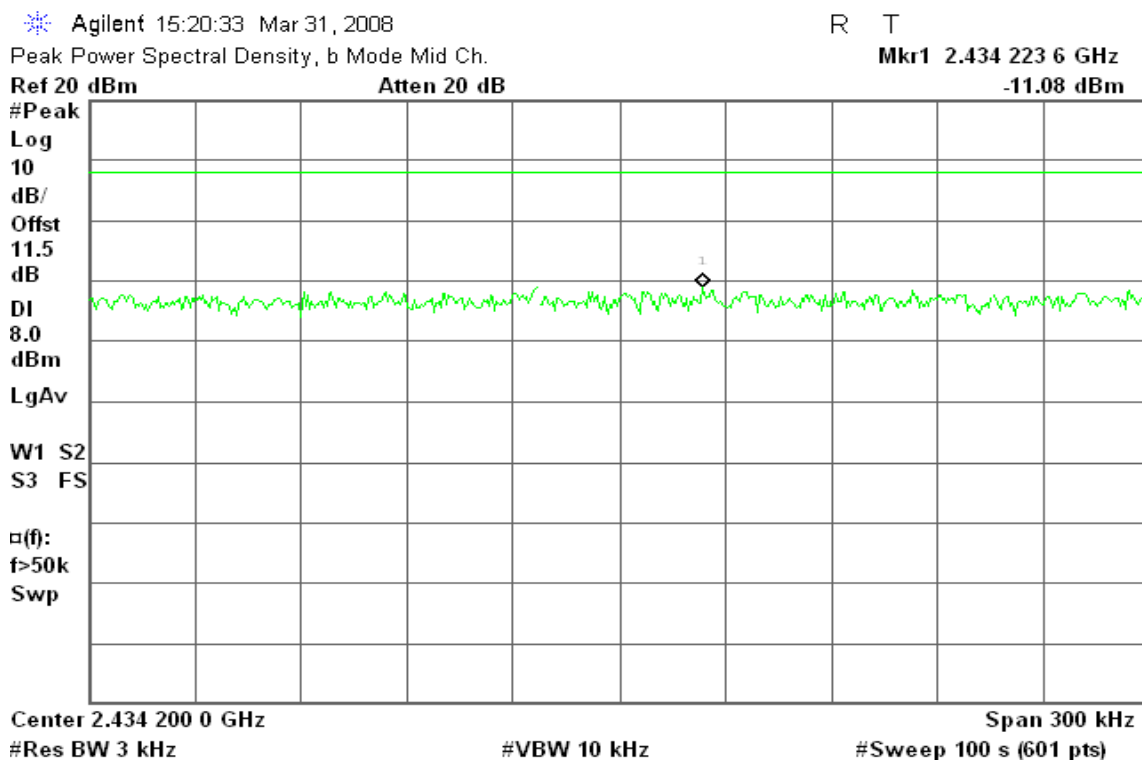
## Test Plot

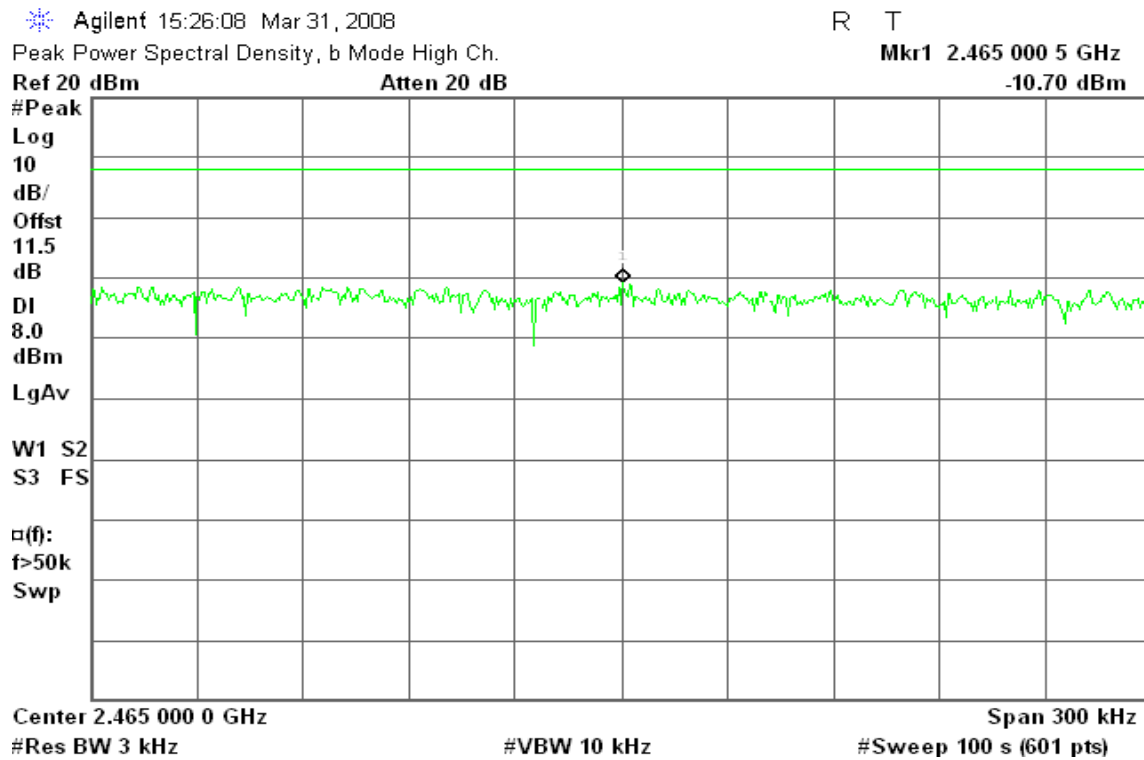
### IEEE 802.11b mode / Chain 0

#### PPSD (CH Low)



#### PPSD (CH Mid)



**PPSD (CH High)****IEEE 802.11b mode / Chain 1****PPSD (CH Low)**