



## FCC 47 CFR PART 15 SUBPART C

### TEST REPORT

For

**450Mbps Wireless N Gigabit Router**

**Model: TEW-691GR**

**Trade Name: TRENDnet**

*Issued to*

**TRENDNET, Inc.  
20675 Manhattan Place, Torrance, CA 90501**

*Issued by*



**Compliance Certification Services Inc.  
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Taipei Hsien 248, Taiwan (R.O.C.)  
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# 1. TEST RESULT CERTIFICATION

**Applicant:** TRENDNET, Inc.  
20675 Manhattan Place, Torrance, CA 90501

**Equipment Under Test:** 450Mbps Wireless N Gigabit Router

**Trade Name:** TRENDnet

**Model Number:** TEW-691GR

**Date of Test:** April 23 ~ 27, 2010

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

### We hereby certify that:

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

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

*Approved by:*

*Reviewed by:*

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Rex Lai  
Section Manager  
Compliance Certification Services Inc.

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Gina Lo  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	450Mbps Wireless N Gigabit Router
<b>Trade Name</b>	TRENDnet
<b>Model Number</b>	TEW-691GR
<b>Model Discrepancy</b>	N/A
<b>Power Supply</b>	<b>Power Adapter</b> LEADER / MT12-4120100-A1 I/P: 120V, 50-60Hz, 0.3A O/P: 12V, 1.0A
<b>Frequency Range</b>	2412 ~ 2462 MHz
<b>Transmit Power</b>	EEE 802.11b mode: 18.87 dBm IEEE 802.11g mode: 15.37 dBm draft 802.11n Standard-20 MHz Channel mode: 18.91 dBm draft 802.11n Wide-40 MHz Channel mode: 18.70 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, 7.22, 13, 14.44, 19.5, 21.67, 26, 28.89, 39, 43.3, 43.33, 52, 57.78, 57.78, 58.5, 65.0, 72.22, 78, 86.67, 86.7, 104, 115.56, 117, 130, 144.44, 156, 173.3, 175.5, 195.0, 216.7 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, 360, 405, 450 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>	Omni Antenna / Gain: 4 dBi MIMO: $4 \text{ dBi} + 10 \log(3) = 8.77 \text{ dBi}$ (Numeric gain: 7.53)

**Remark:**

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: XU8TEW691GR 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 (model: TEW-691GR) had been tested under operating condition.

The EUT is a 3x3 configuration spatial MIMO (3Tx & 3Rx) without beam forming 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 were chosen for full testing.

**IEEE 802.11g mode:**

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate 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	03/03/2011

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	10/26/2010
EMI Test Receiver	R&S	ESCI	100064	02/04/2011
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/13/2011
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/20/2010
Bilog Antenna	Sunol Sciences	JB3	A030105	09/11/2010
Horn Antenna	EMCO	3117	00055165	12/07/2010
Loop Antenna	EMCO	6502	8905/2356	05/28/2010
Turn Table	CCS	CC-T-1F	N/A	N.C.R.
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R.
Controller	CCS	CC-C-1F	N/A	N.C.R.
Site NSA	CCS	N/A	N/A	12/31/2010
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 MRA: TW1039 IC: 2324G-1/-2	10/17/2010 11/04/2010
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room # A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESHS30	828144/003	12/06/2010
LISN	EMCO	3825/2	9106-1809	05/02/2011
LISN	SCHAFFNER	NNB 41	03/10013	12/03/2010
Test S/W	CCS-3A1-CE			





### 4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.6202
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0606
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9979
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5790
3M Semi Anechoic Chamber / 8G~18G	+/- 2.5928
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7212
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9520

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



## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

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

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

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

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

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

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

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

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

### 5.2 EQUIPMENT




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

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

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

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

### 5.3 TABLE OF ACCREDITATIONS AND LISTINGS

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

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



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

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

### 6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC	IBM	2672 (X31)	99PBTKB	FCC DoC	LAN Cable: Unshielded, 10m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	Notebook PC (Remote)	IBM	1951-I3V(T60)	L3B2188	FCC DoC	LAN Cable: Unshielded, 10m	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.

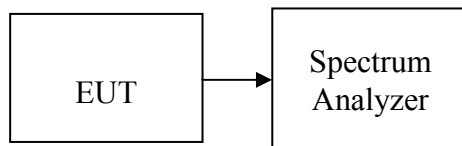
## 7. FCC PART 15.247 REQUIREMENTS

### 7.1 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**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	11.17	>500	PASS
Mid	2437	12.08		PASS
High	2462	12.08		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.42	>500	PASS
Mid	2437	16.50		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	17.67	>500	PASS
Mid	2437	16.92		PASS
High	2462	17.25		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.33	>500	PASS
Mid	2437	17.58		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	17.67	>500	PASS
Mid	2437	16.83		PASS
High	2462	17.17		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	35.67	>500	PASS
Mid	2437	34.50		PASS
High	2452	34.25		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	35.33	>500	PASS
Mid	2437	34.08		PASS
High	2452	35.33		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	35.67	>500	PASS
Mid	2437	35.17		PASS
High	2452	34.75		PASS



### Test Plot

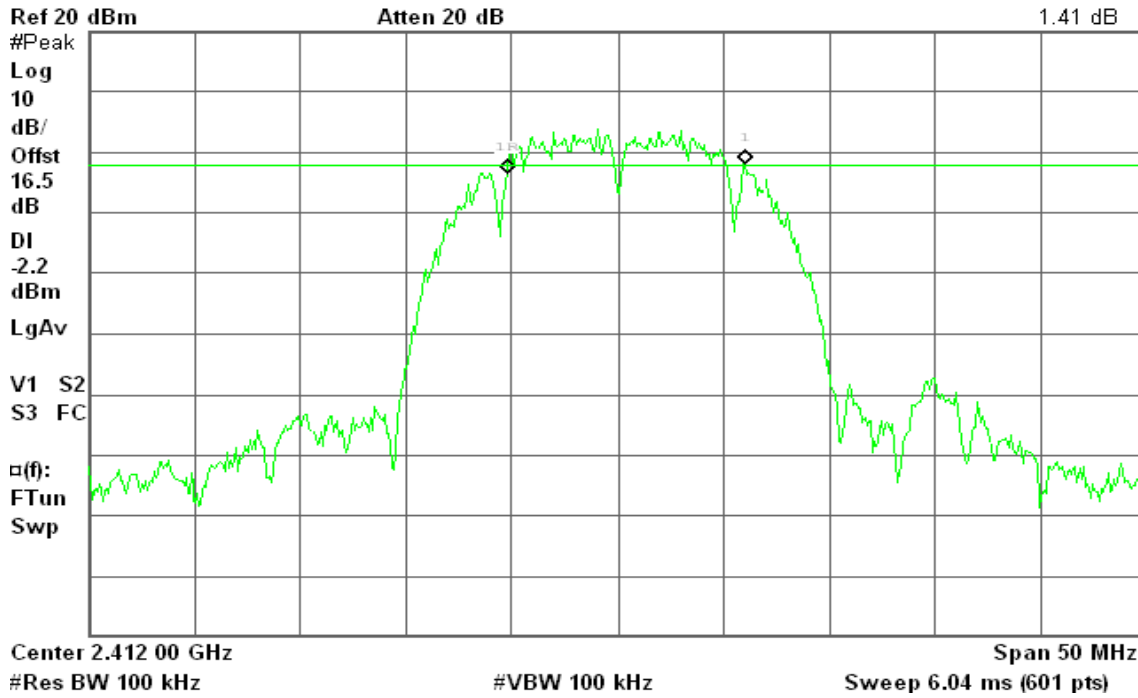
### IEEE 802.11b mode

### 6dB Bandwidth (CH Low)

Agilent 11:16:56 Apr 26, 2010

R T

Δ Mkr1 11.17 MHz  
1.41 dB

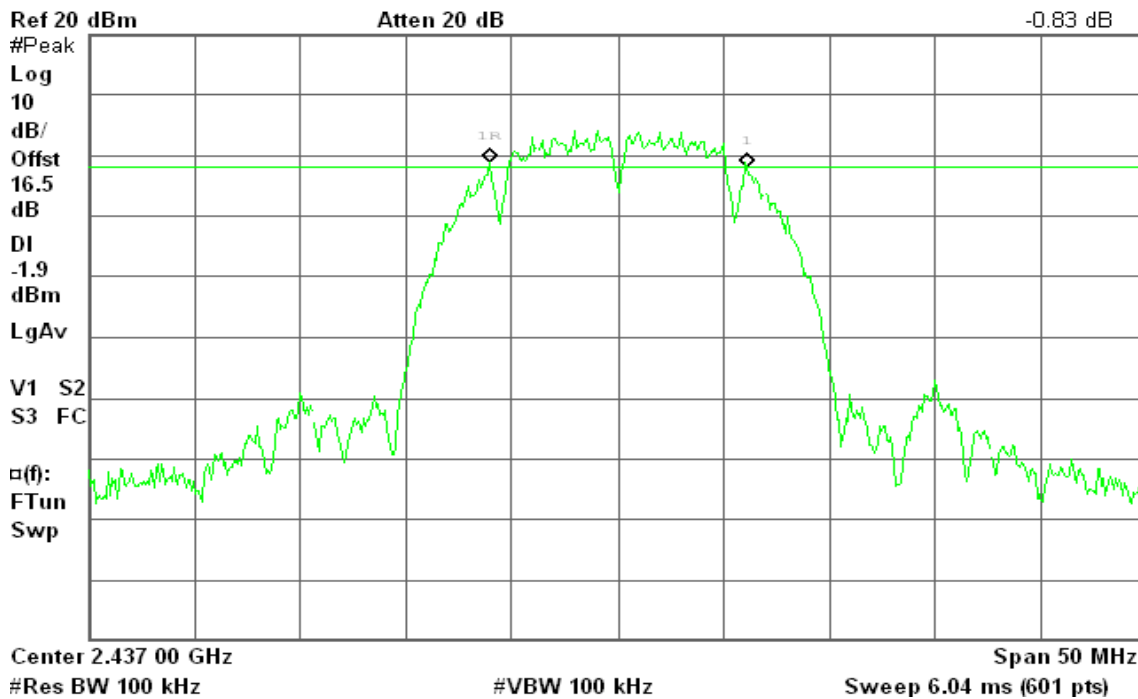


### 6dB Bandwidth (CH Mid)

Agilent 11:24:17 Apr 26, 2010

R T

Δ Mkr1 12.08 MHz  
-0.83 dB





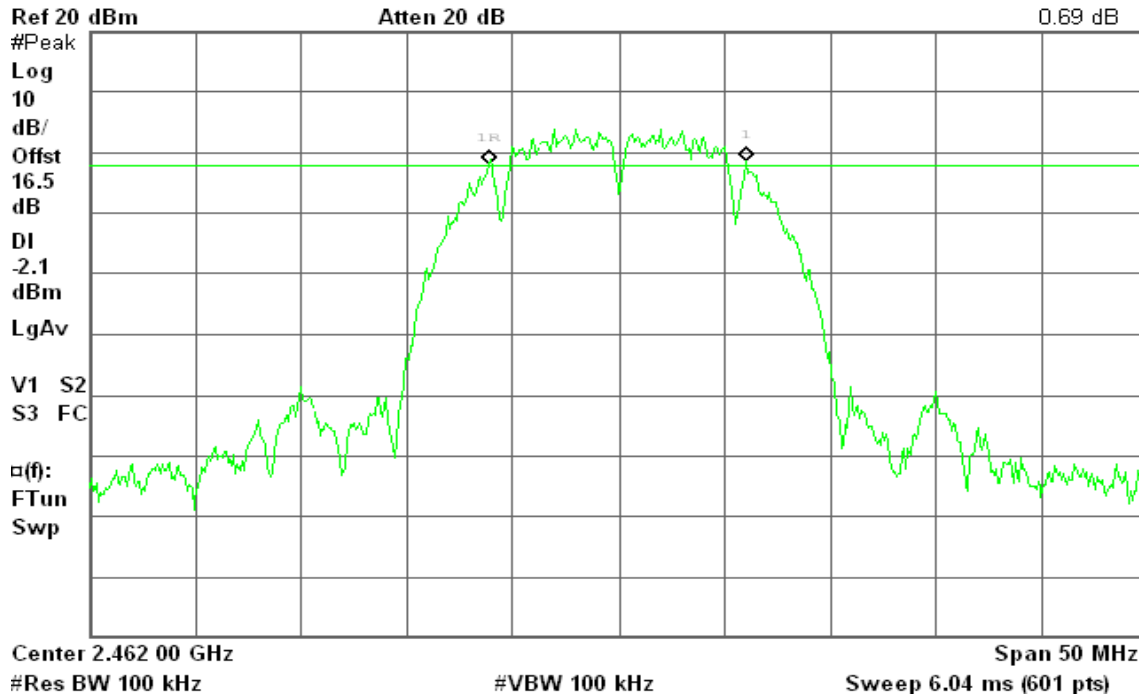


### 6dB Bandwidth (CH High)

Agilent 11:31:33 Apr 26, 2010

R T

Δ Mkr1 12.08 MHz  
0.69 dB





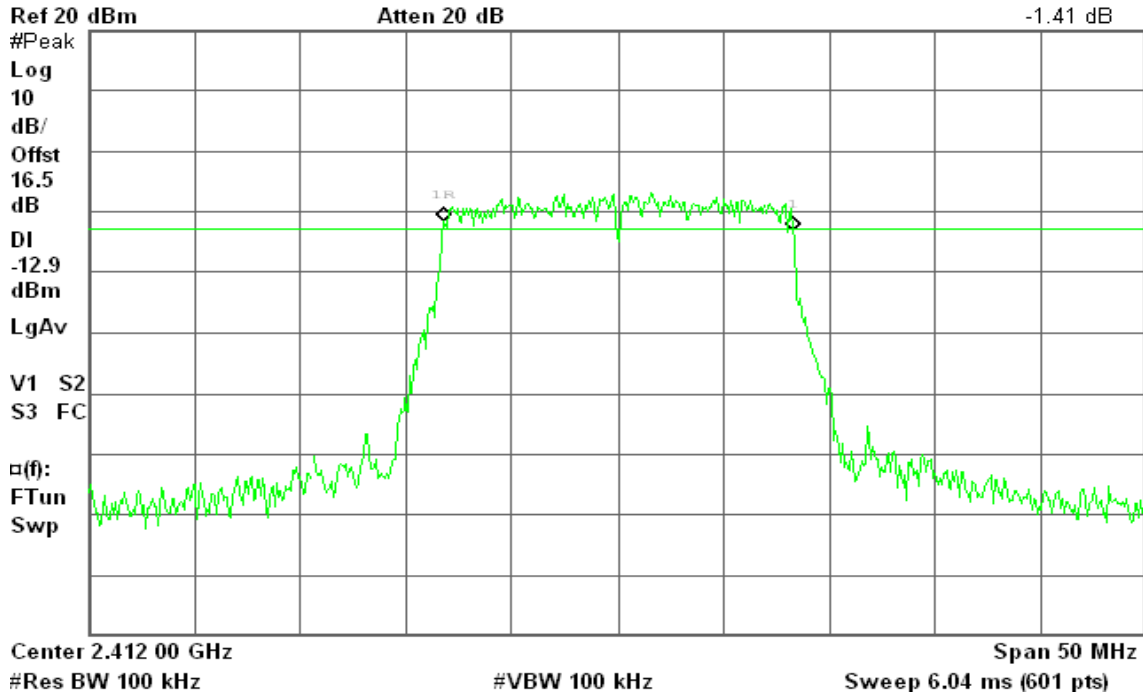
### IEEE 802.11g mode

#### 6dB Bandwidth (CH Low)

Agilent 14:13:29 Apr 26, 2010

R T

Δ Mkr1 16.42 MHz  
-1.41 dB

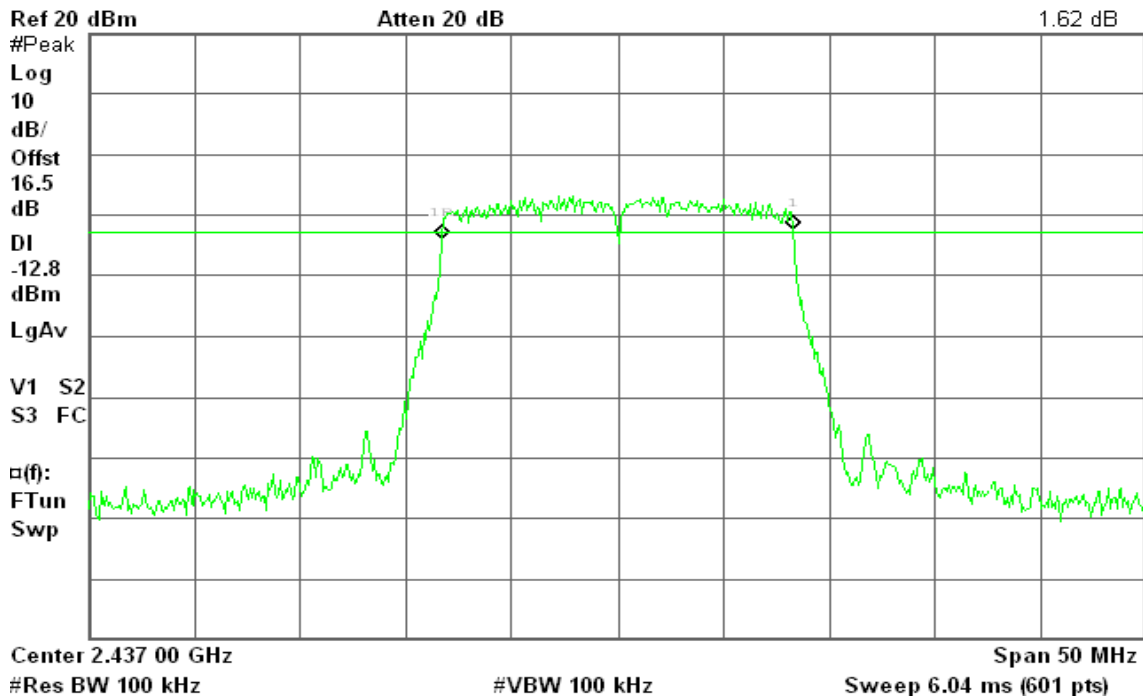


#### 6dB Bandwidth (CH Mid)

Agilent 14:19:53 Apr 26, 2010

R T

Δ Mkr1 16.50 MHz  
1.62 dB



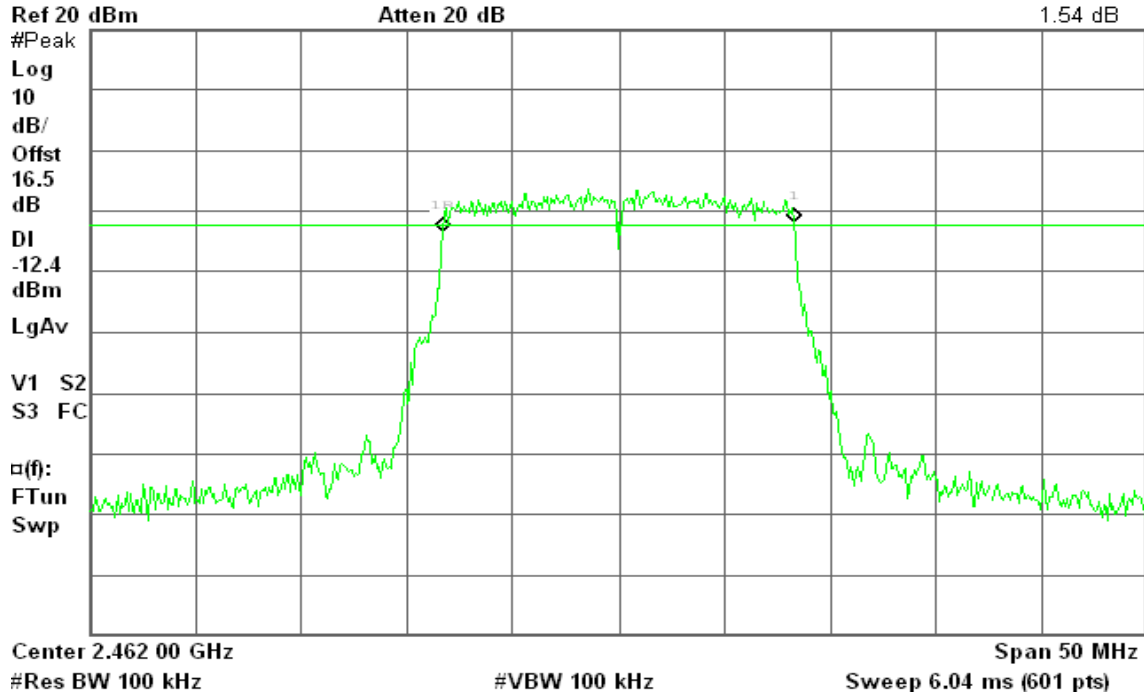


### 6dB Bandwidth (CH High)

Agilent 14:26:15 Apr 26, 2010

R T

Δ Mkr1 16.50 MHz  
1.54 dB





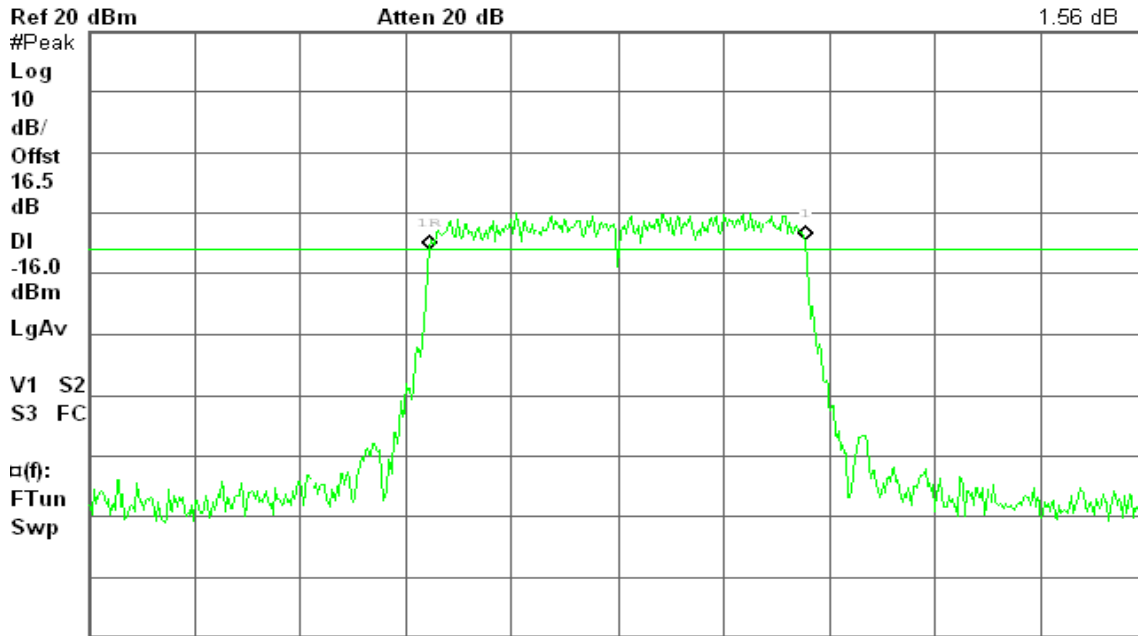
### draft 802.11n Standard-20 MHz Channel mode / Chain 0

#### 6dB Bandwidth (CH Low)

Agilent 14:37:46 Apr 26, 2010

R T

Δ Mkr1 17.67 MHz  
1.56 dB

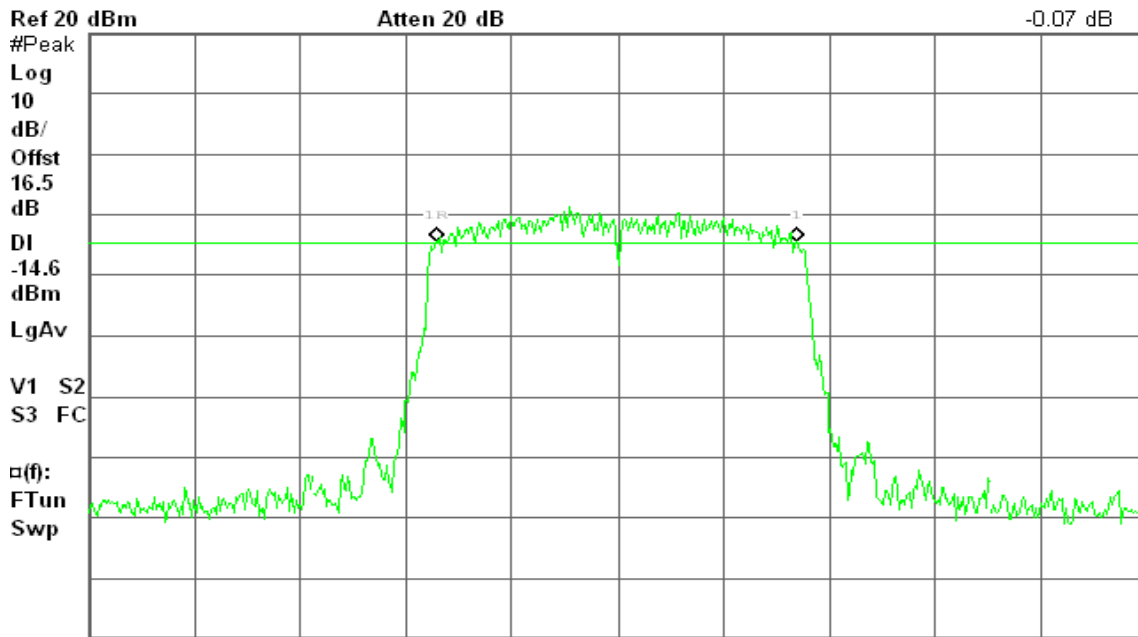


#### 6dB Bandwidth (CH Mid)

Agilent 14:59:19 Apr 26, 2010

R T

Δ Mkr1 16.92 MHz  
-0.07 dB



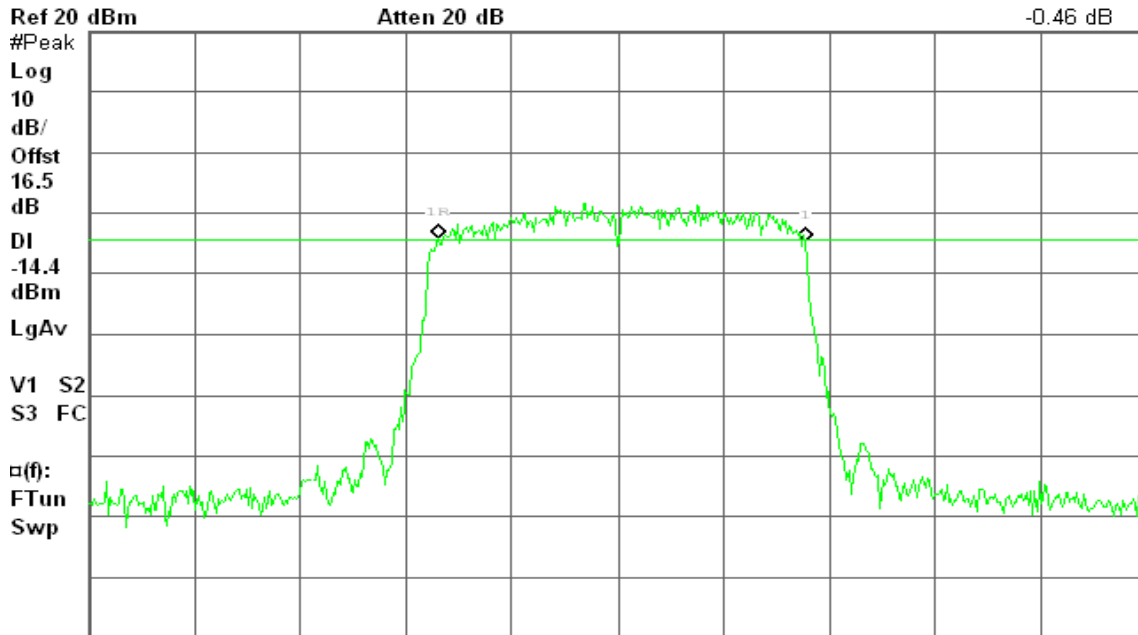


### 6dB Bandwidth (CH High)

Agilent 15:17:23 Apr 26, 2010

R T

Δ Mkr1 17.25 MHz  
-0.46 dB



Span 50 MHz

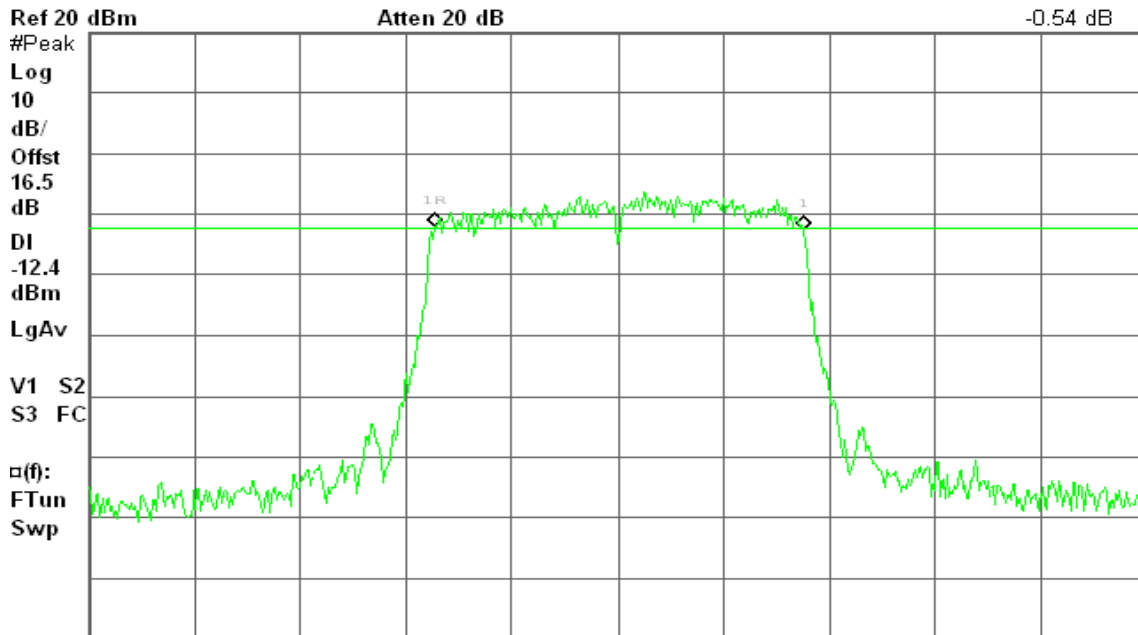
### draft 802.11n Standard-20 MHz Channel mode / Chain 1

### 6dB Bandwidth (CH Low)

Agilent 14:44:13 Apr 26, 2010

R T

Δ Mkr1 17.33 MHz  
-0.54 dB



Span 50 MHz

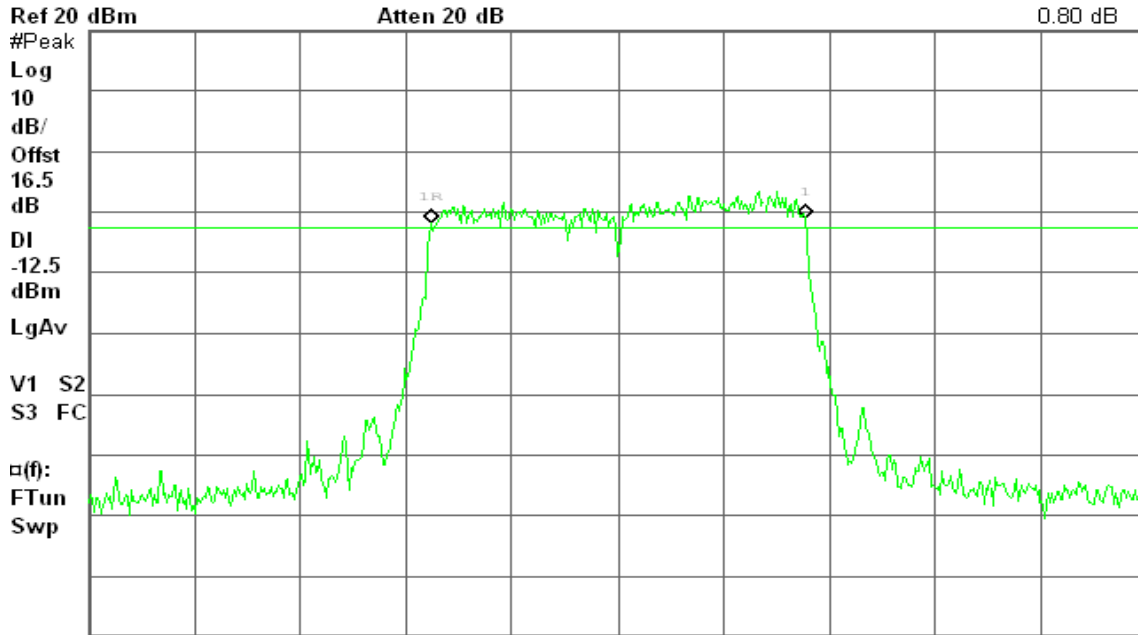


### 6dB Bandwidth (CH Mid)

Agilent 15:04:51 Apr 26, 2010

R T

Δ Mkr1 17.58 MHz  
0.80 dB



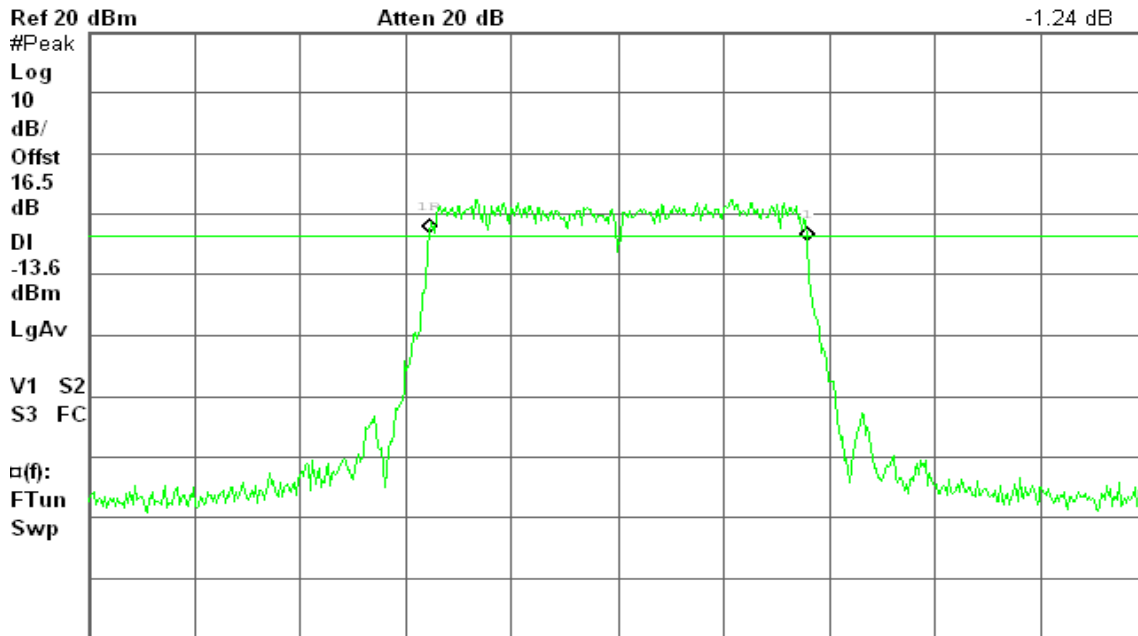
Center 2.437 00 GHz      Span 50 MHz  
#Res BW 100 kHz      #VBW 100 kHz      Sweep 6.04 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 15:22:22 Apr 26, 2010

R T

Δ Mkr1 17.75 MHz  
-1.24 dB



Center 2.462 00 GHz      Span 50 MHz  
#Res BW 100 kHz      #VBW 100 kHz      Sweep 6.04 ms (601 pts)



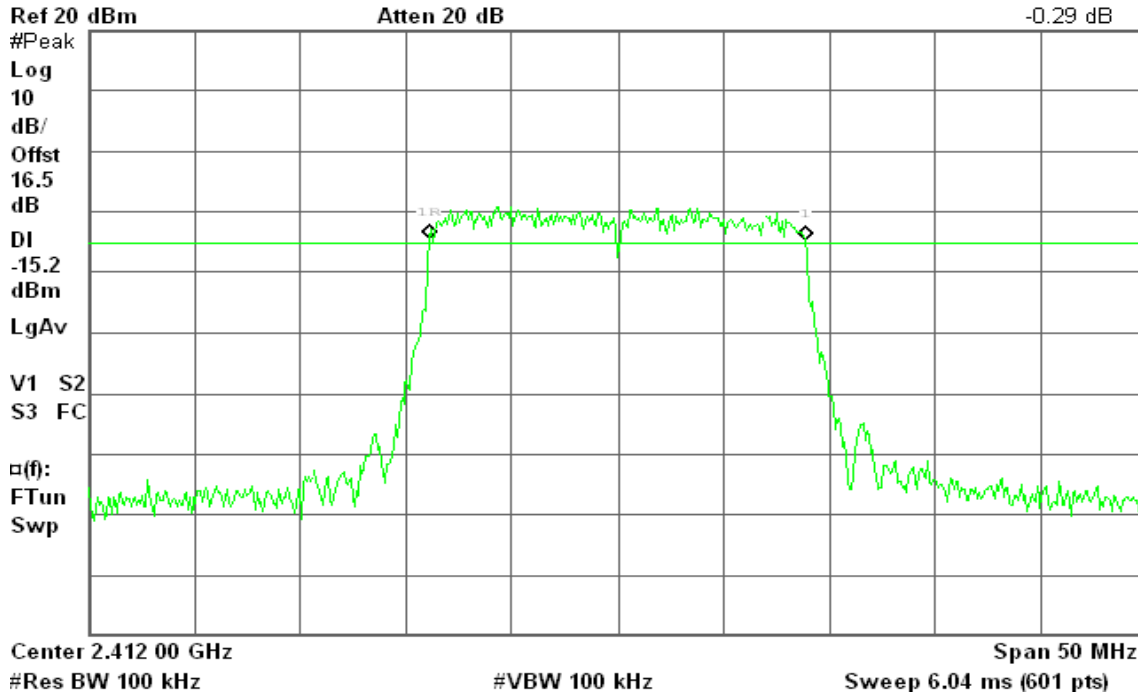
### draft 802.11n Standard-20 MHz Channel mode / Chain 2

#### 6dB Bandwidth (CH Low)

Agilent 14:49:43 Apr 26, 2010

R T

Δ Mkr1 17.67 MHz  
-0.29 dB

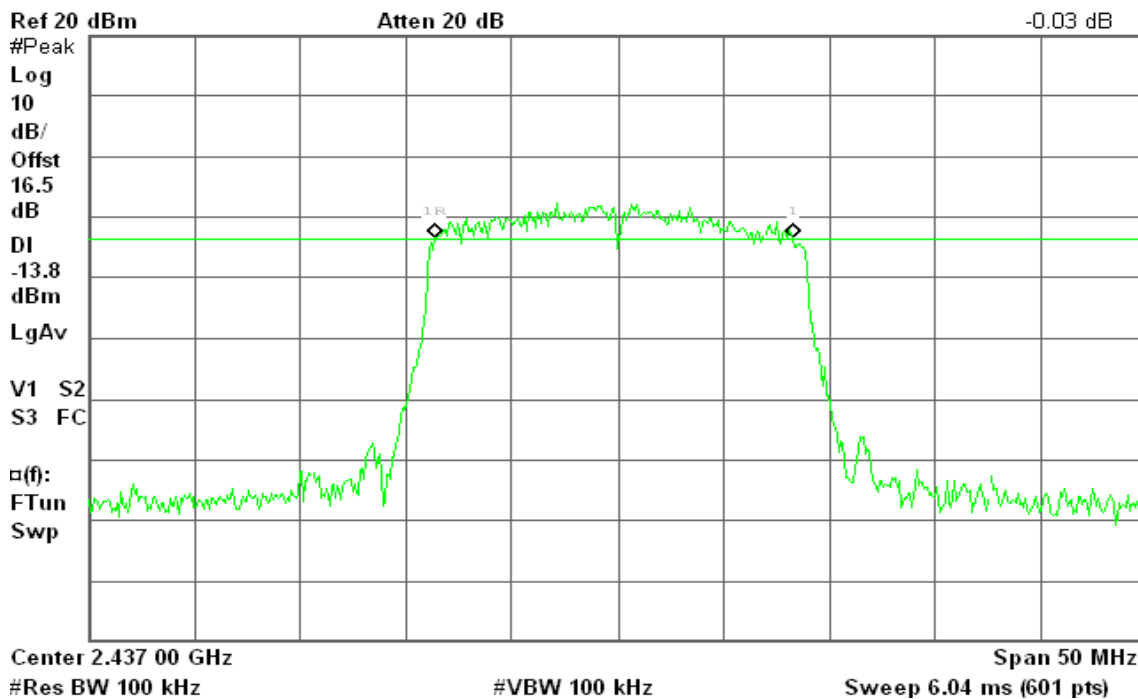


#### 6dB Bandwidth (CH Mid)

Agilent 15:10:11 Apr 26, 2010

R T

Δ Mkr1 16.83 MHz  
-0.03 dB



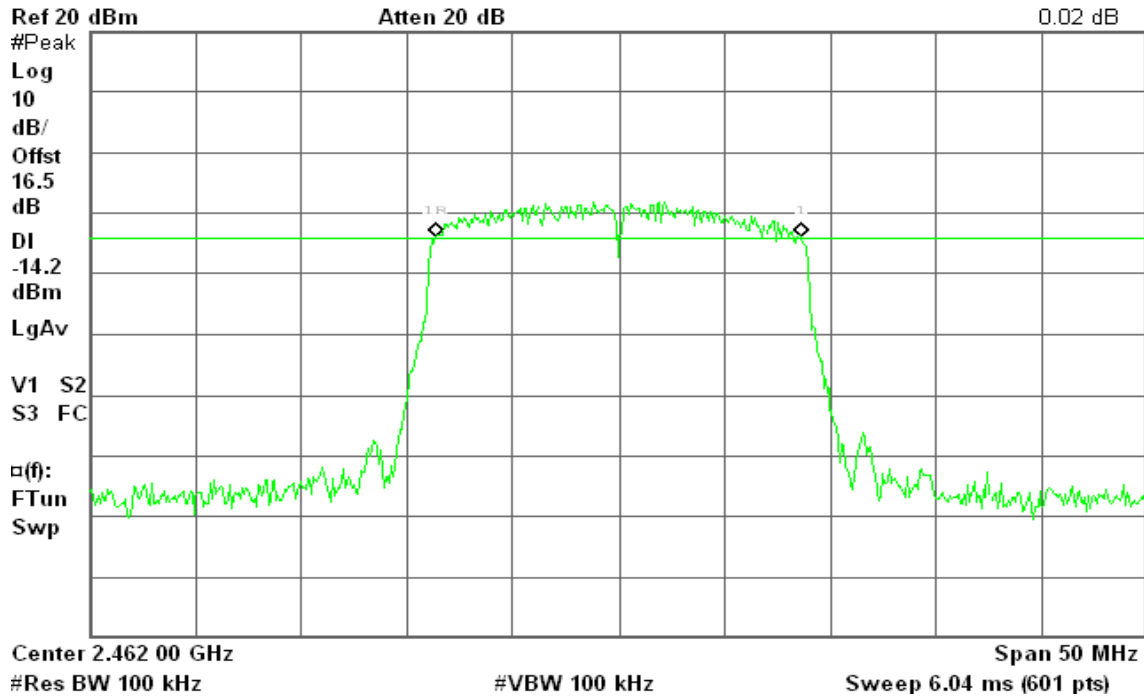


### 6dB Bandwidth (CH High)

Agilent 15:27:31 Apr 26, 2010

R T

Δ Mkr1 17.17 MHz  
0.02 dB







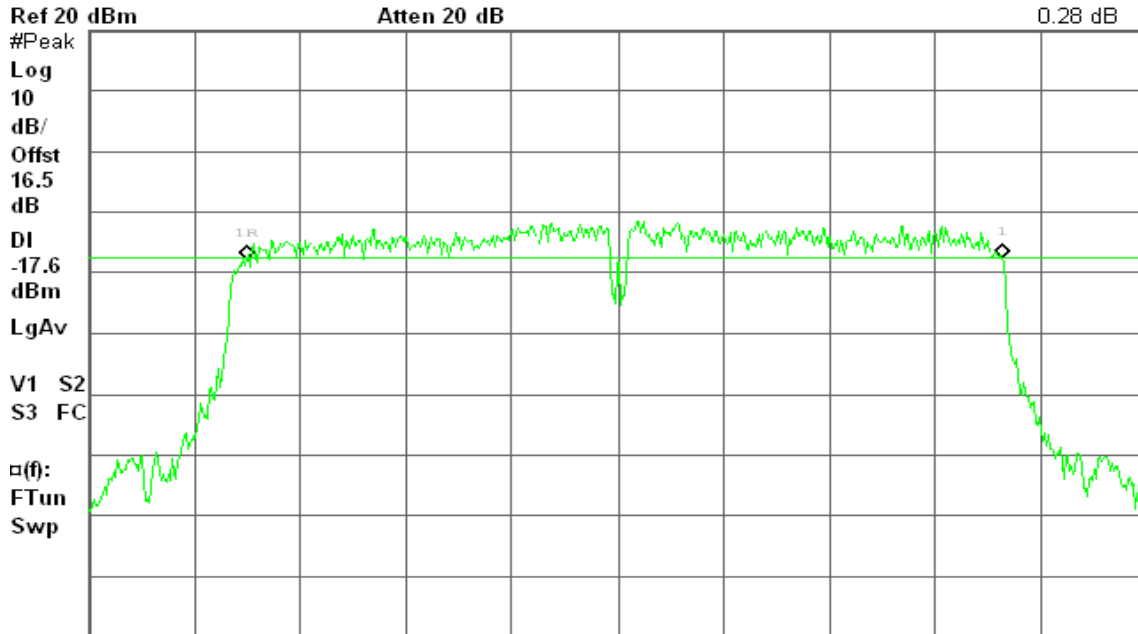
### draft 802.11n Wide-40 MHz Channel mode / Chain 0

#### 6dB Bandwidth (CH Low)

Agilent 16:05:41 Apr 26, 2010

R L

Δ Mkr1 35.67 MHz  
0.28 dB



Center 2.422 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

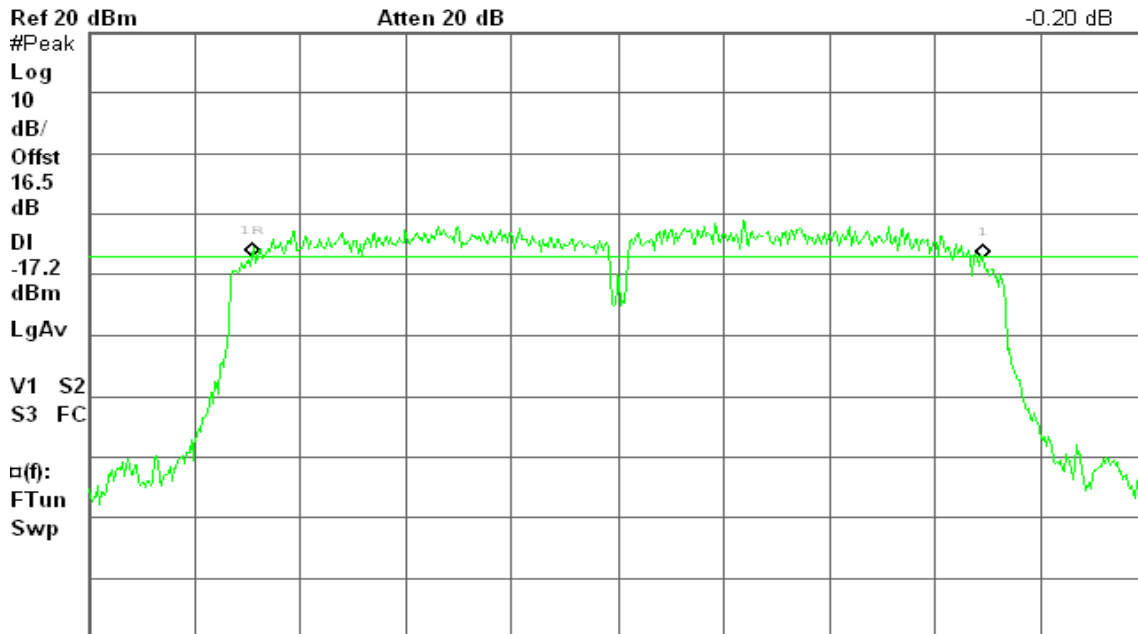
Span 50 MHz  
Sweep 6.04 ms (601 pts)

#### 6dB Bandwidth (CH Mid)

Agilent 16:37:00 Apr 26, 2010

R T

Δ Mkr1 34.50 MHz  
-0.20 dB



Center 2.437 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz  
Sweep 6.04 ms (601 pts)

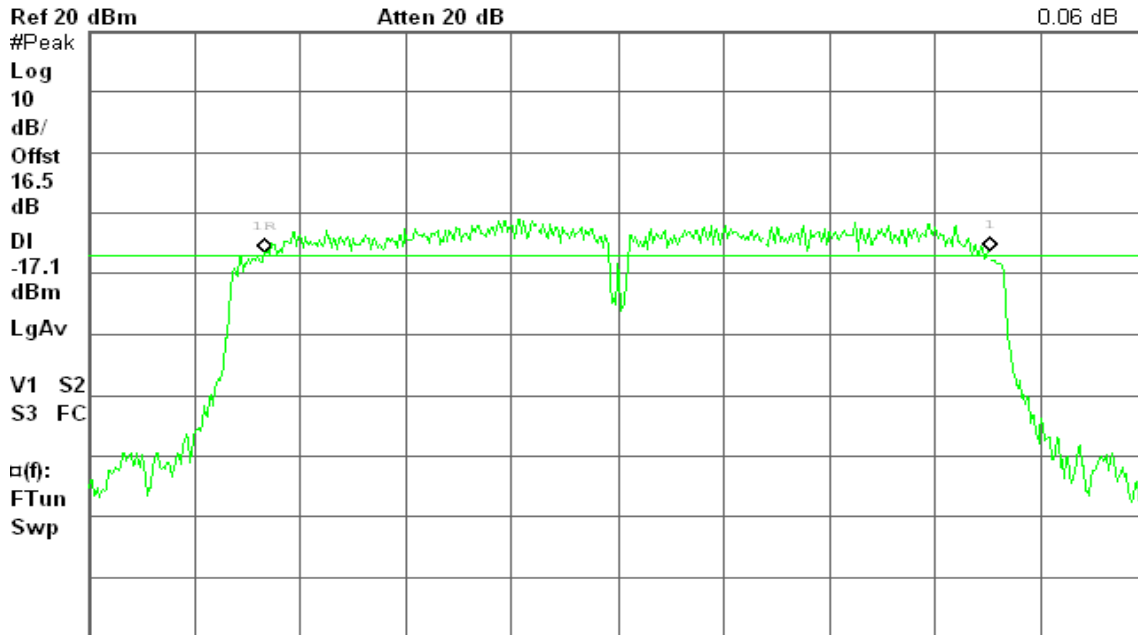


### 6dB Bandwidth (CH High)

Agilent 16:43:27 Apr 26, 2010

R T

Δ Mkr1 34.25 MHz  
0.06 dB



Center 2.452 00 GHz Span 50 MHz  
#Res BW 100 kHz #VBW 100 kHz Sweep 6.04 ms (601 pts)

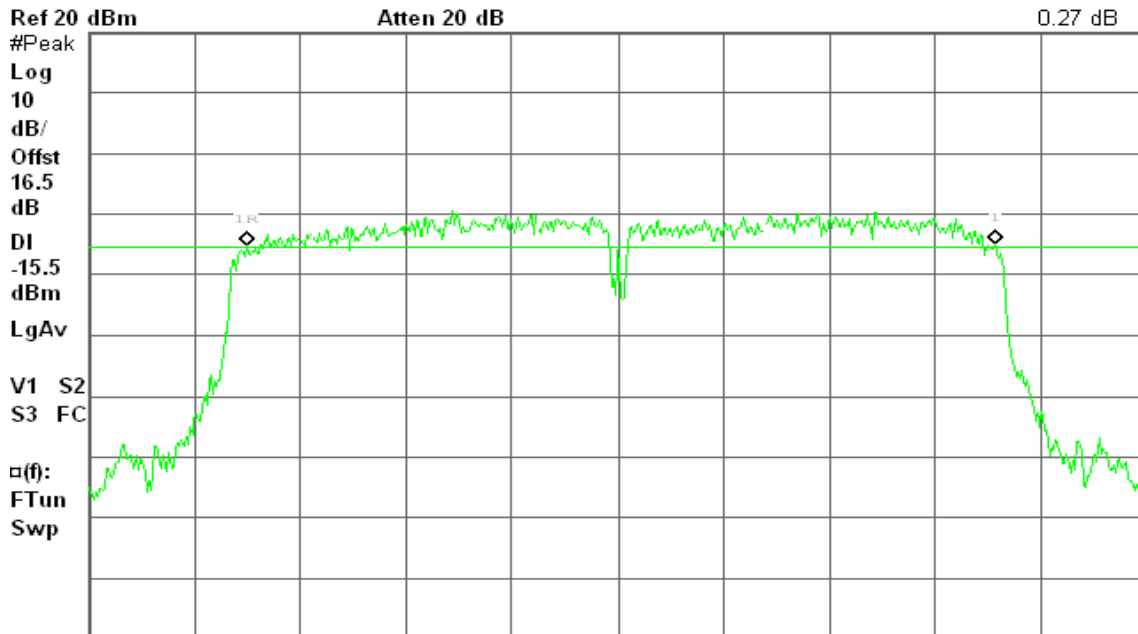
### draft 802.11n Wide-40 MHz Channel mode / Chain 1

### 6dB Bandwidth (CH Low)

Agilent 16:11:25 Apr 26, 2010

R T

Δ Mkr1 35.33 MHz  
0.27 dB



Center 2.422 00 GHz Span 50 MHz  
#Res BW 100 kHz #VBW 100 kHz Sweep 6.04 ms (601 pts)

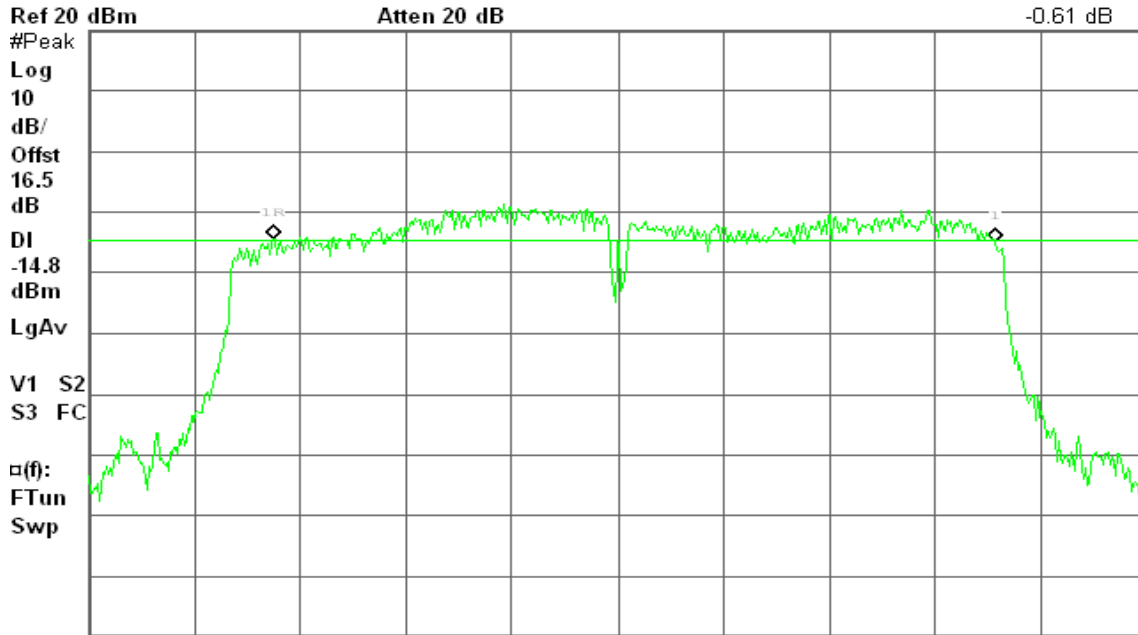


### 6dB Bandwidth (CH Mid)

Agilent 16:31:42 Apr 26, 2010

R T

Δ Mkr1 34.08 MHz  
-0.61 dB



Center 2.437 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz

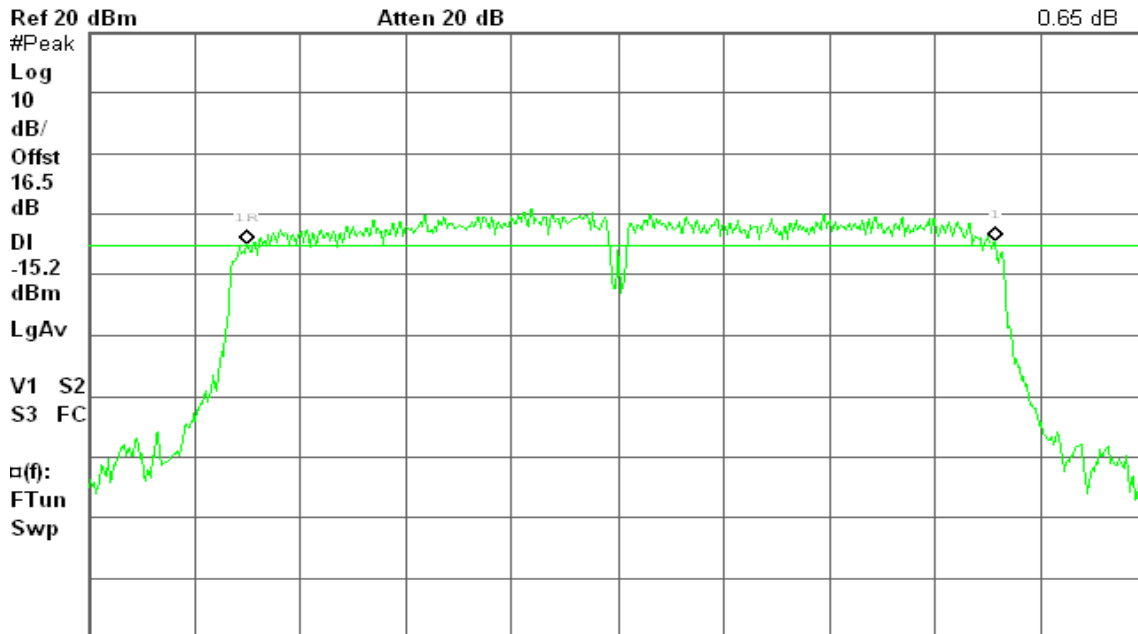
Sweep 6.04 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 16:51:03 Apr 26, 2010

R T

Δ Mkr1 35.33 MHz  
0.65 dB



Center 2.452 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz

Sweep 6.04 ms (601 pts)



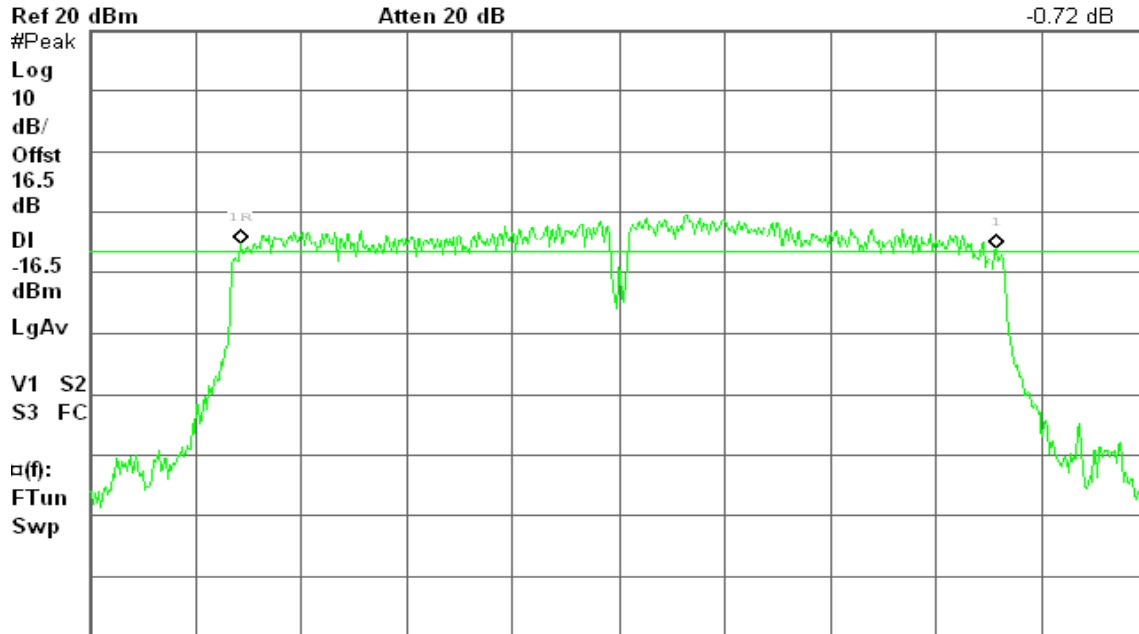
### draft 802.11n Wide-40 MHz Channel mode / Chain 2

#### 6dB Bandwidth (CH Low)

Agilent 16:17:10 Apr 26, 2010

R T

Δ Mkr1 35.67 MHz  
-0.72 dB



Center 2.422 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

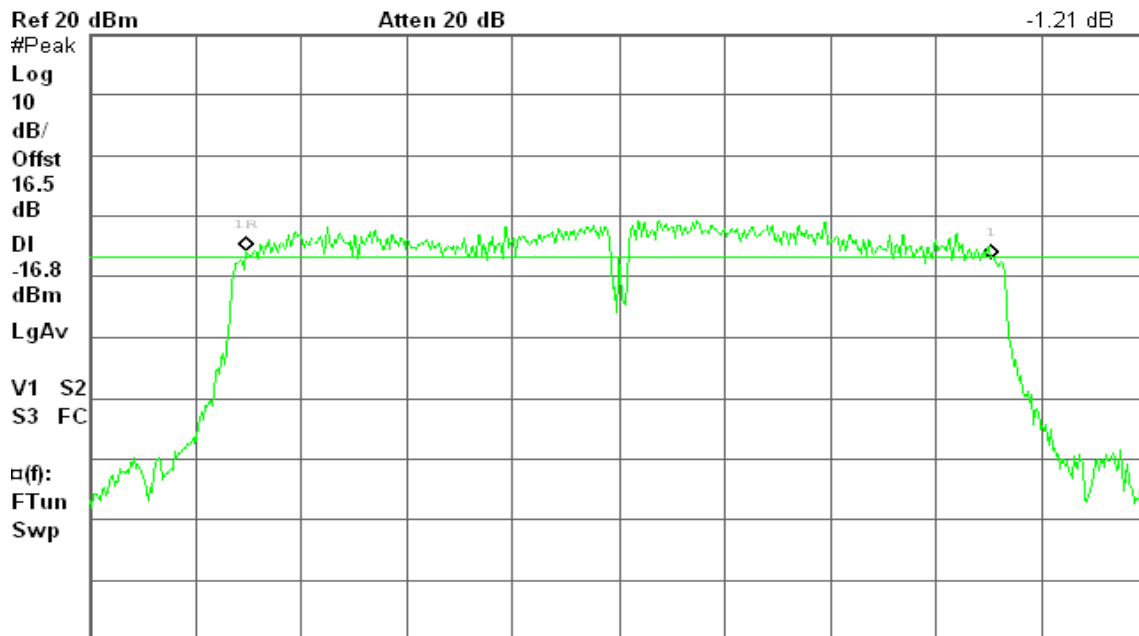
Span 50 MHz  
Sweep 6.04 ms (601 pts)

#### 6dB Bandwidth (CH Mid)

Agilent 16:24:14 Apr 26, 2010

R T

Δ Mkr1 35.17 MHz  
-1.21 dB



Center 2.437 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz  
Sweep 6.04 ms (601 pts)

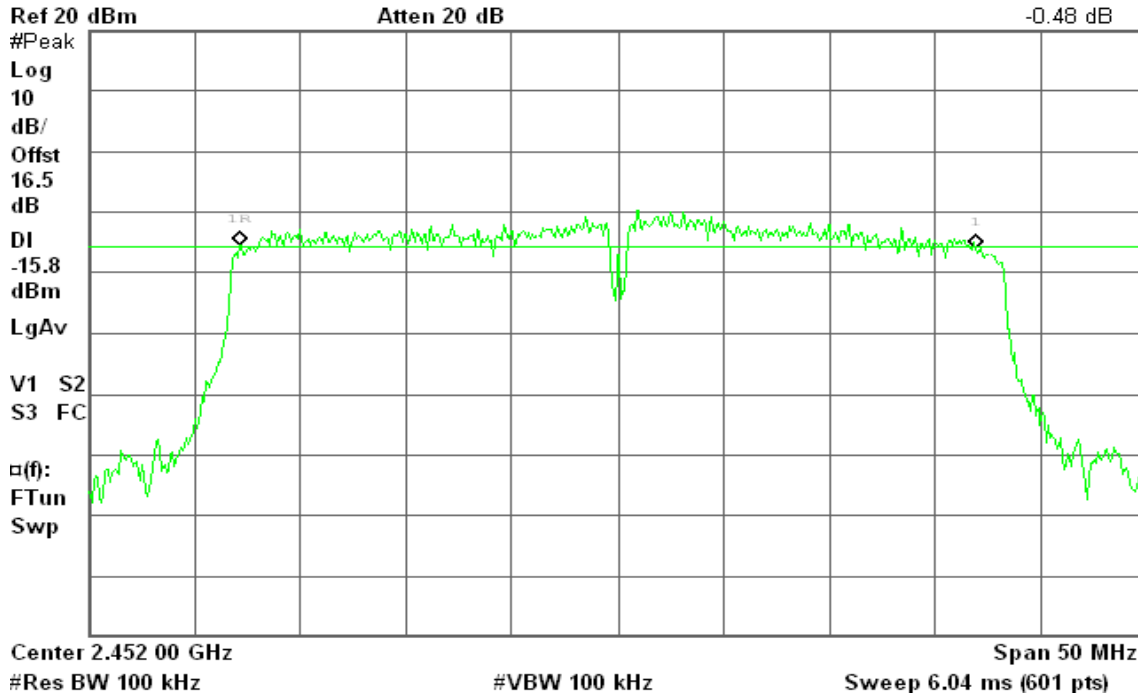


### 6dB Bandwidth (CH High)

Agilent 16:56:03 Apr 26, 2010

R T

Δ Mkr1 34.75 MHz  
-0.48 dB



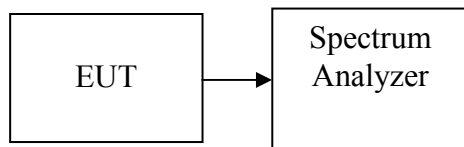
## 7.2 PEAK POWER

### 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)	Output Power (dBm)	Output Power (W)	Limit (W)	Test Result
Low	2412	18.87	0.0771	1	PASS
Mid	2437	18.44	0.0698		PASS
High	2462	18.44	0.0698		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Test Result
Low	2412	15.26	0.0336	1	PASS
Mid	2437	15.37	0.0344		PASS
High	2462	15.16	0.0328		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	12.87	15.19	13.30	18.68	0.0738	0.528	PASS
Mid	2437	12.73	14.66	13.83	18.58	0.0721		PASS
High	2462	13.15	14.81	14.28	18.91	0.0777		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	12.98	14.85	13.16	18.52	0.0711	0.528	PASS
Mid	2437	12.67	14.74	13.35	18.45	0.0699		PASS
High	2452	13.15	14.94	13.49	18.70	0.0742		PASS

**Remark:** 1. Total Output Power (w) = Chain 0 ( $10^{(Output Power / 10) / 1000}$ ) + Chain 1 ( $10^{(Output Power / 10) / 1000}$ ) + Chain 2 ( $10^{(Output Power / 10) / 1000}$ )  
 2. The maximum antenna gain is 8.77dBi; therefore the reduction due to antenna gain is 2.77dBi, so the limit is 27.23dBm.



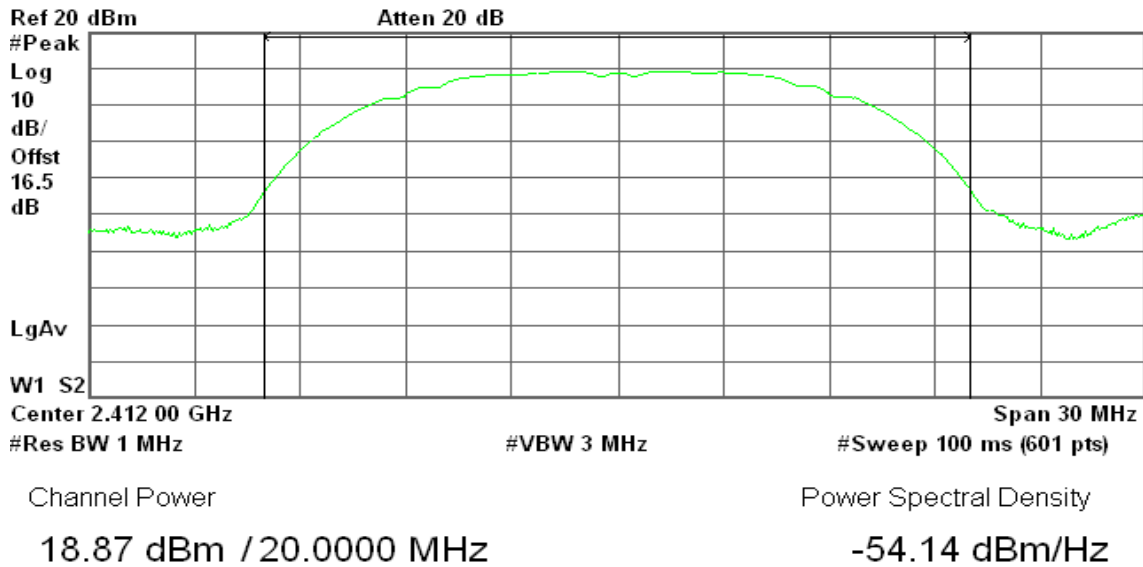
**Test Plot**

**IEEE 802.11b mode**

**Peak Power (CH Low)**

Agilent 11:19:07 Apr 26, 2010

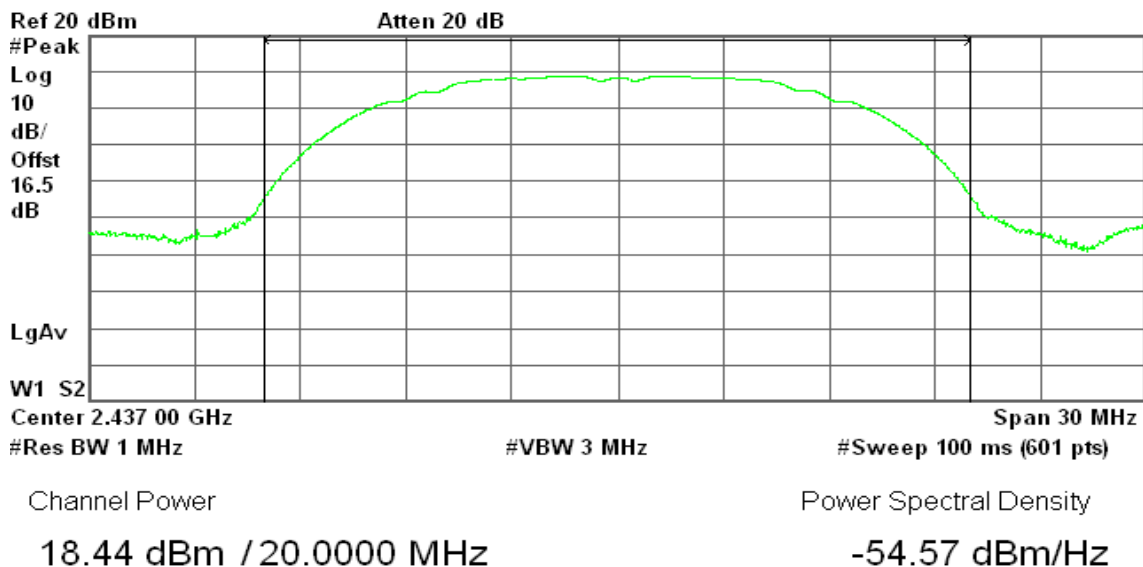
R T



**Peak Power (CH Mid)**

Agilent 13:41:08 Apr 26, 2010

R T



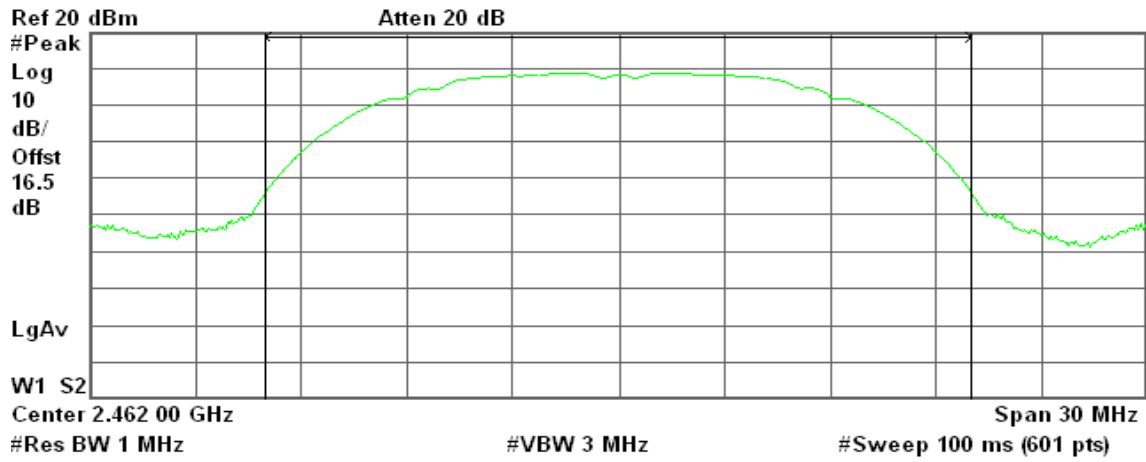




### Peak Power (CH High)

Agilent 11:32:30 Apr 26, 2010

R T



Channel Power

18.44 dBm / 20.0000 MHz

Power Spectral Density

-54.58 dBm/Hz

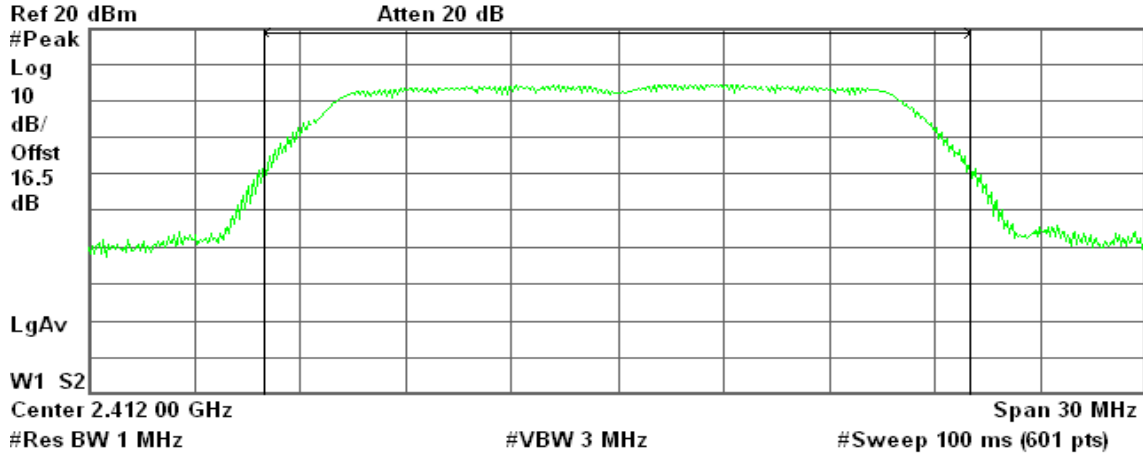


### IEEE 802.11g mode

#### Peak Power (CH Low)

Agilent 14:14:38 Apr 26, 2010

R T



Channel Power

15.26 dBm / 20.0000 MHz

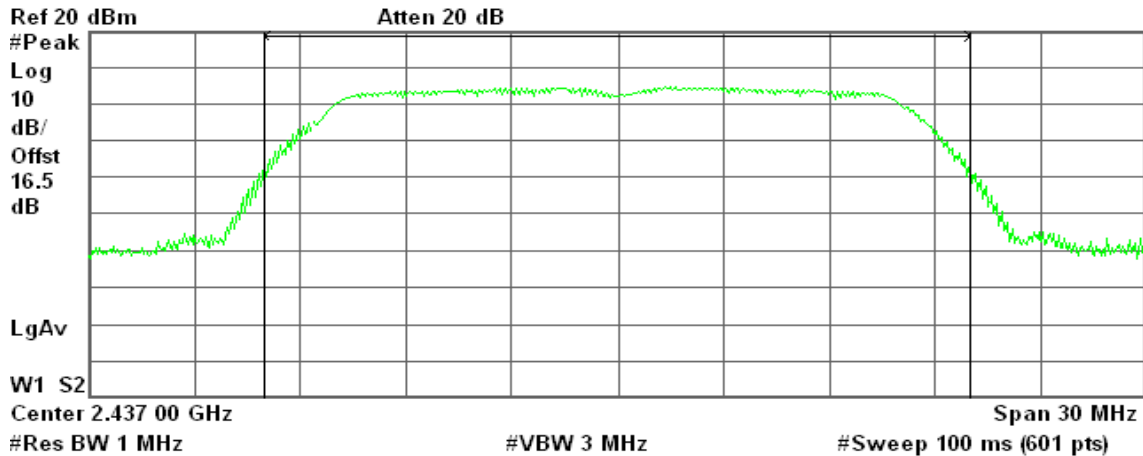
Power Spectral Density

-57.75 dBm/Hz

#### Peak Power (CH Mid)

Agilent 14:33:40 Apr 26, 2010

R T



Channel Power

15.37 dBm / 20.0000 MHz

Power Spectral Density

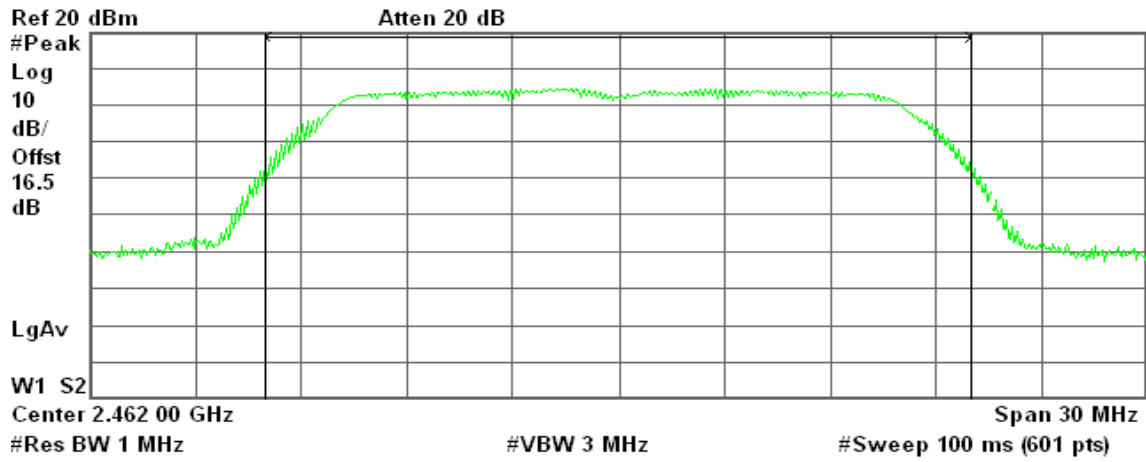
-57.64 dBm/Hz



### Peak Power (CH High)

Agilent 14:26:47 Apr 26, 2010

R T



Channel Power

15.16 dBm / 20.0000 MHz

Power Spectral Density

-57.85 dBm/Hz

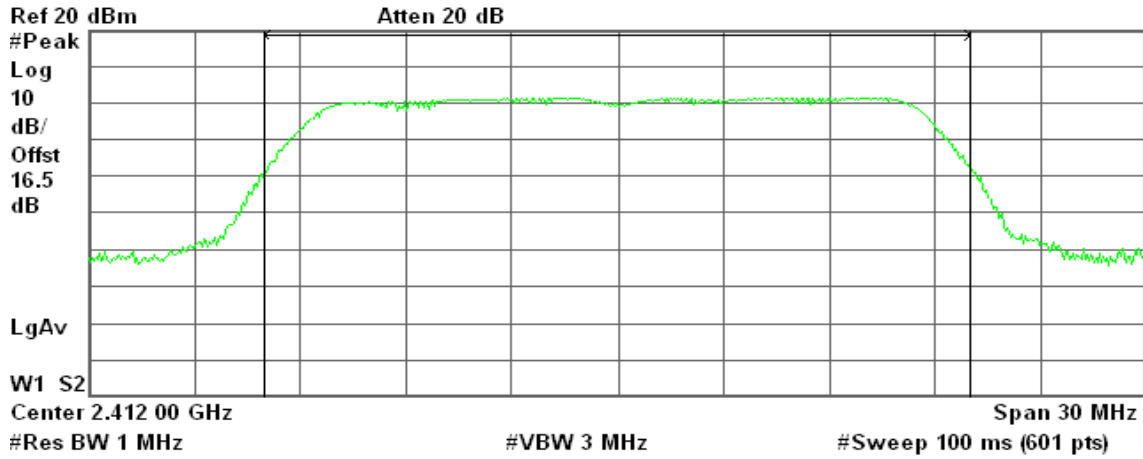


### draft 802.11n Standard-20 MHz Channel mode / Chain 0

#### Peak Power (CH Low)

Agilent 14:38:44 Apr 26, 2010

R L



Channel Power

12.87 dBm / 20.0000 MHz

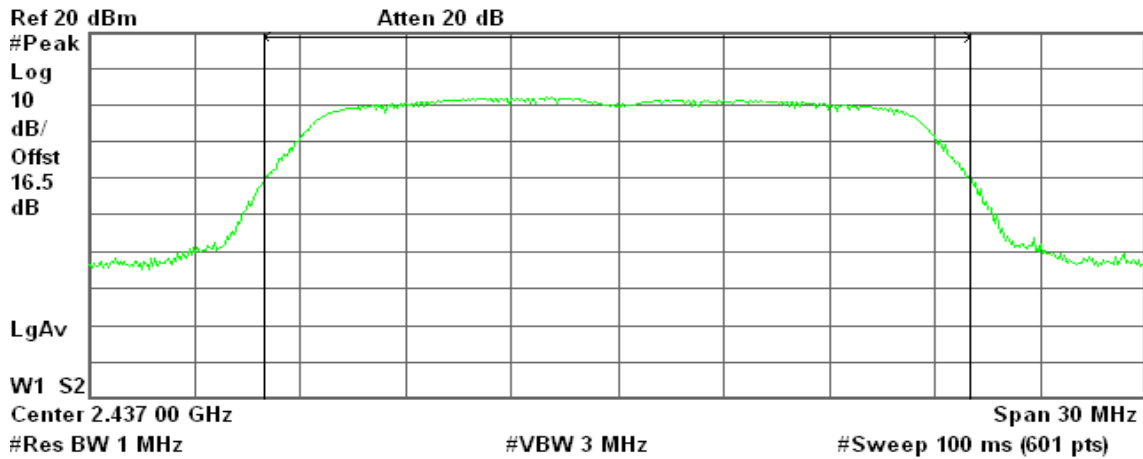
Power Spectral Density

-60.14 dBm/Hz

#### Peak Power (CH Mid)

Agilent 15:00:47 Apr 26, 2010

R T



Channel Power

12.73 dBm / 20.0000 MHz

Power Spectral Density

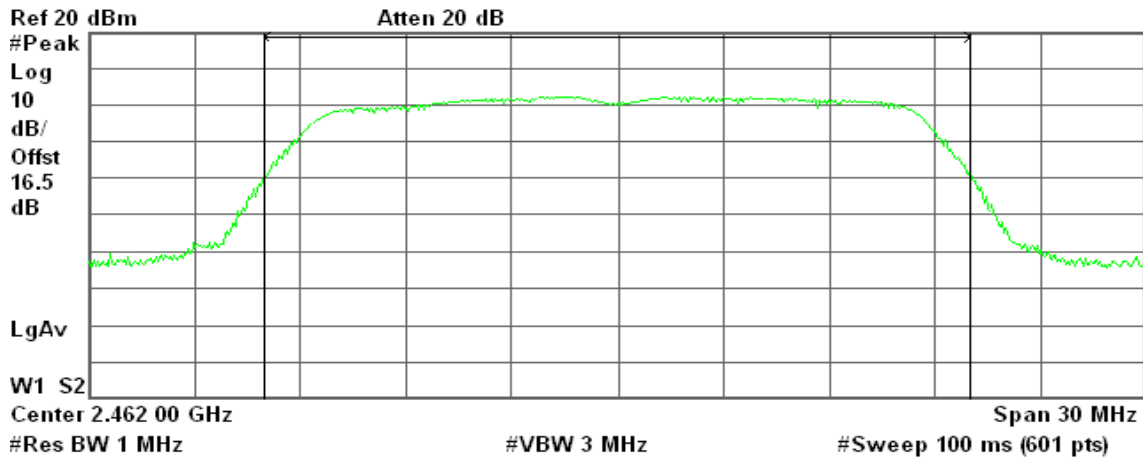
-60.28 dBm/Hz



### Peak Power (CH High)

Agilent 15:17:56 Apr 26, 2010

R T



Channel Power

13.15 dBm / 20.0000 MHz

Power Spectral Density

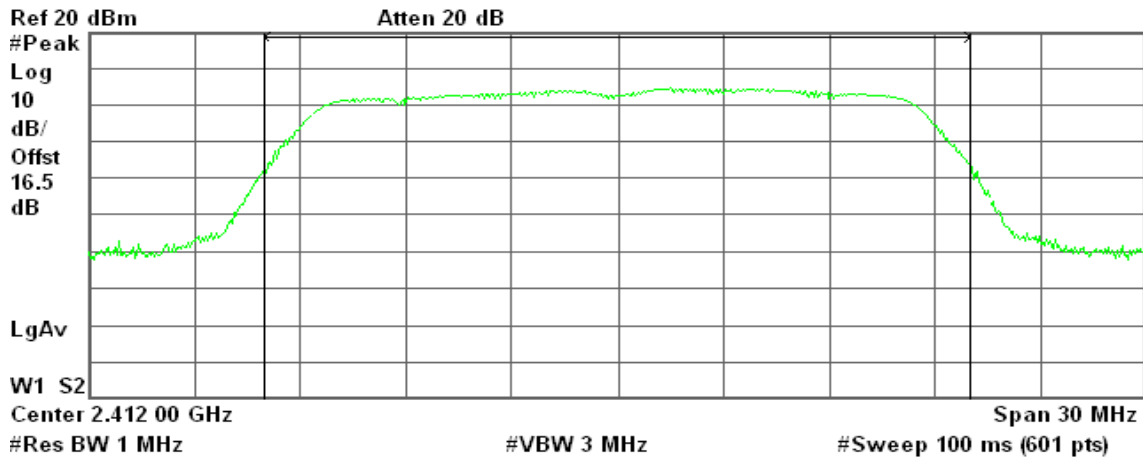
-59.86 dBm/Hz

### draft 802.11n Standard-20 MHz Channel mode / Chain 1

### Peak Power (CH Low)

Agilent 14:45:20 Apr 26, 2010

R T



Channel Power

15.19 dBm / 20.0000 MHz

Power Spectral Density

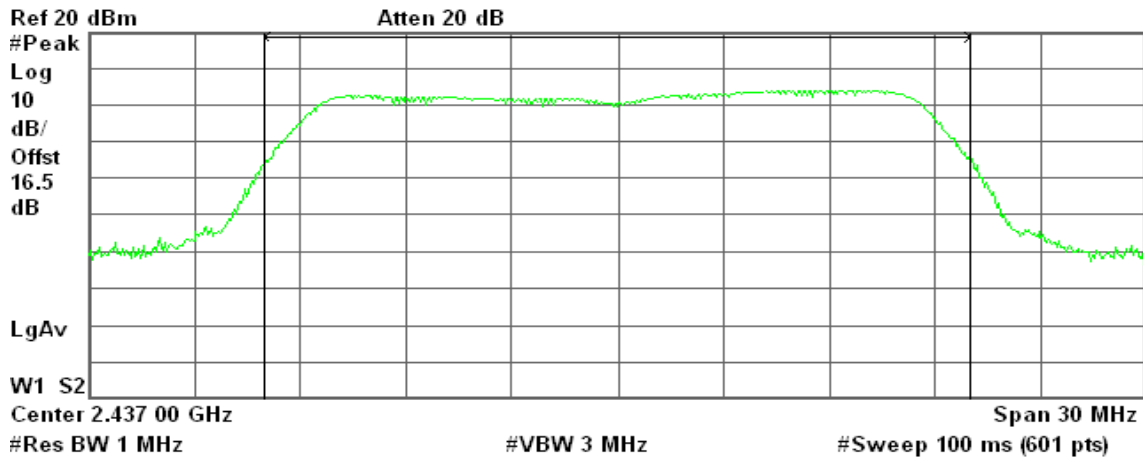
-57.82 dBm/Hz



### Peak Power (CH Mid)

Agilent 15:05:29 Apr 26, 2010

R T



Channel Power

14.66 dBm / 20.0000 MHz

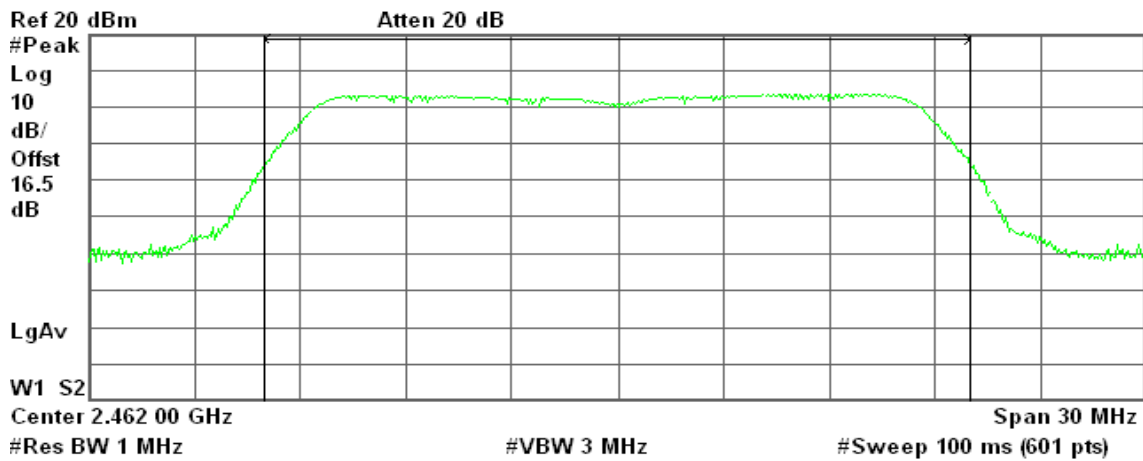
Power Spectral Density

-58.35 dBm/Hz

### Peak Power (CH High)

Agilent 15:23:03 Apr 26, 2010

R T



Channel Power

14.81 dBm / 20.0000 MHz

Power Spectral Density

-58.20 dBm/Hz

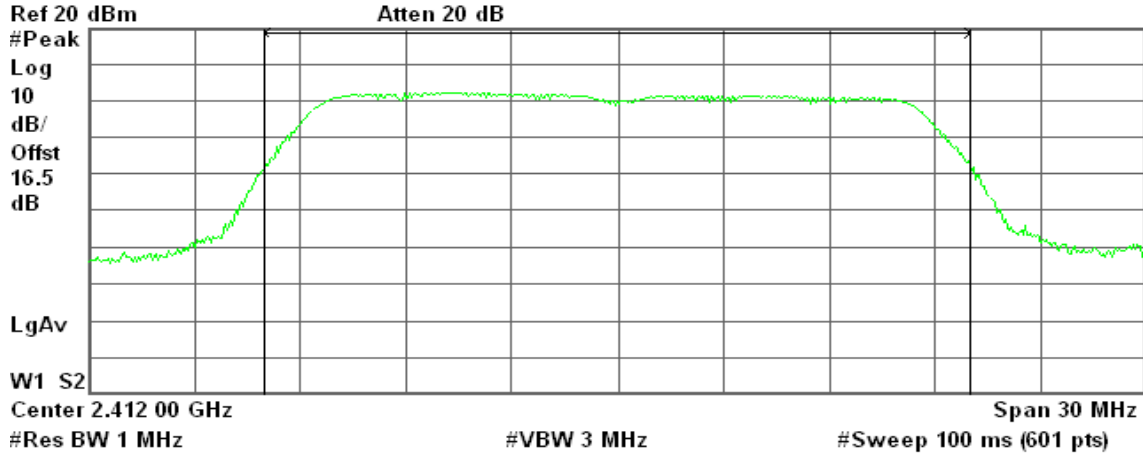


**draft 802.11n Standard-20 MHz Channel mode / Chain 2**

**Peak Power (CH Low)**

Agilent 14:50:42 Apr 26, 2010

R T



Channel Power

13.30 dBm / 20.0000 MHz

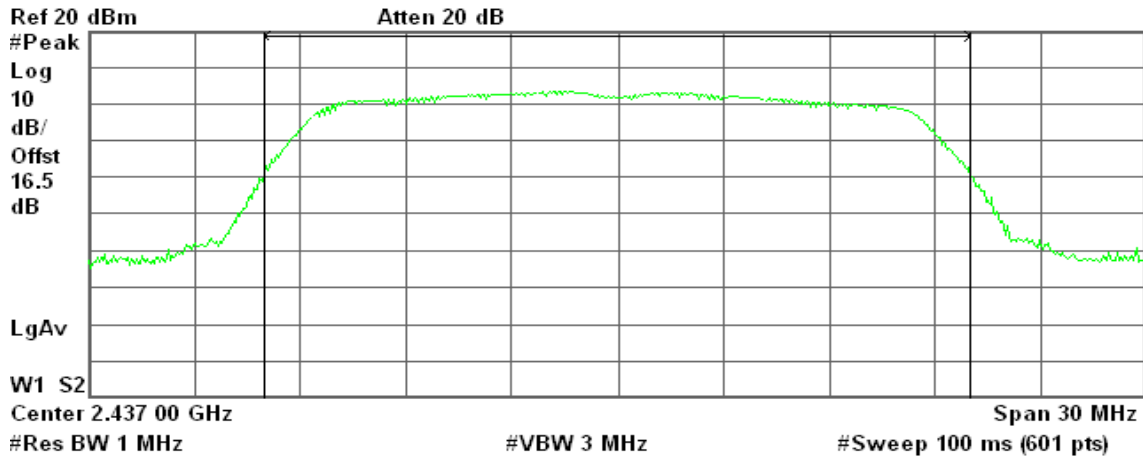
Power Spectral Density

-59.71 dBm/Hz

**Peak Power (CH Mid)**

Agilent 15:11:27 Apr 26, 2010

R T



Channel Power

13.83 dBm / 20.0000 MHz

Power Spectral Density

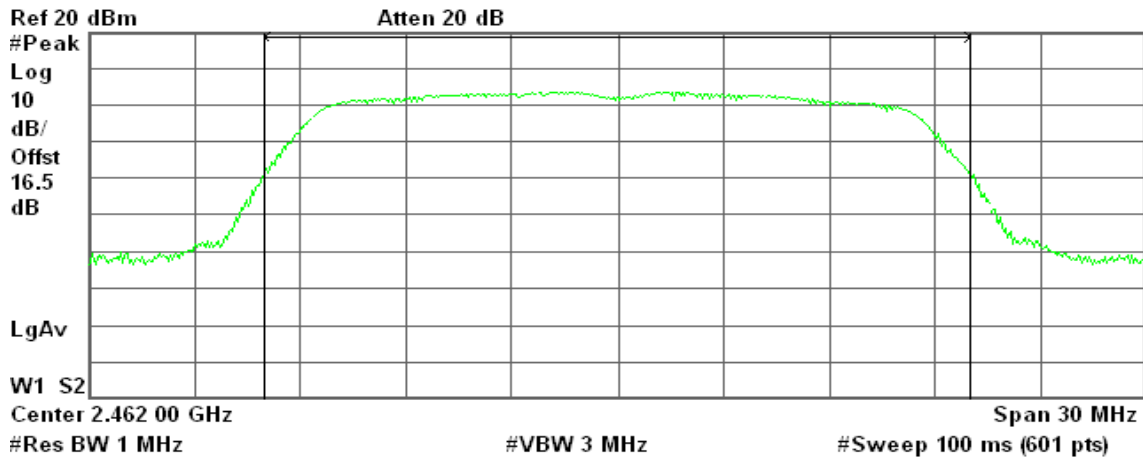
-59.18 dBm/Hz



### Peak Power (CH High)

Agilent 15:28:02 Apr 26, 2010

R T



Channel Power

14.28 dBm / 20.0000 MHz

Power Spectral Density

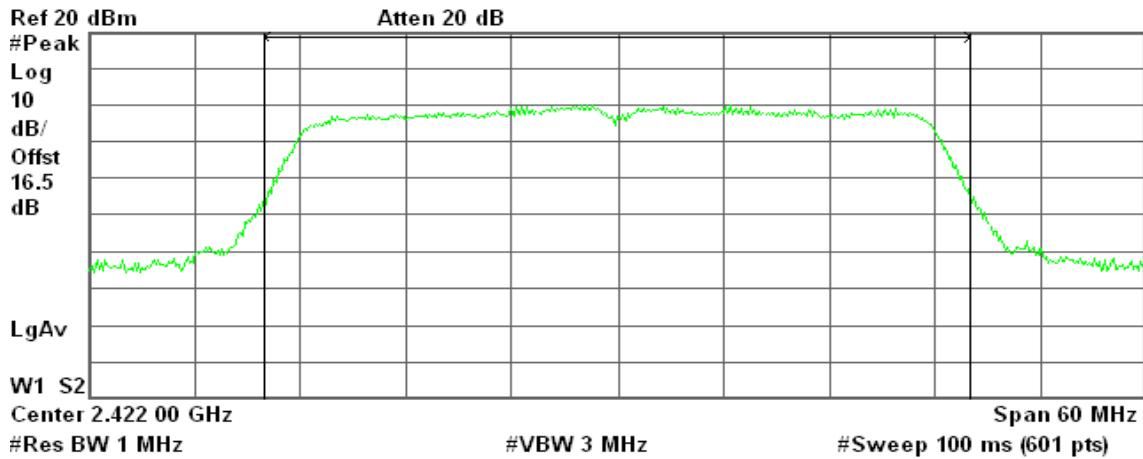
-58.73 dBm/Hz

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

#### Peak Power (CH Low)

Agilent 16:06:11 Apr 26, 2010

R T



Channel Power

12.98 dBm / 40.0000 MHz

Power Spectral Density

-63.04 dBm/Hz

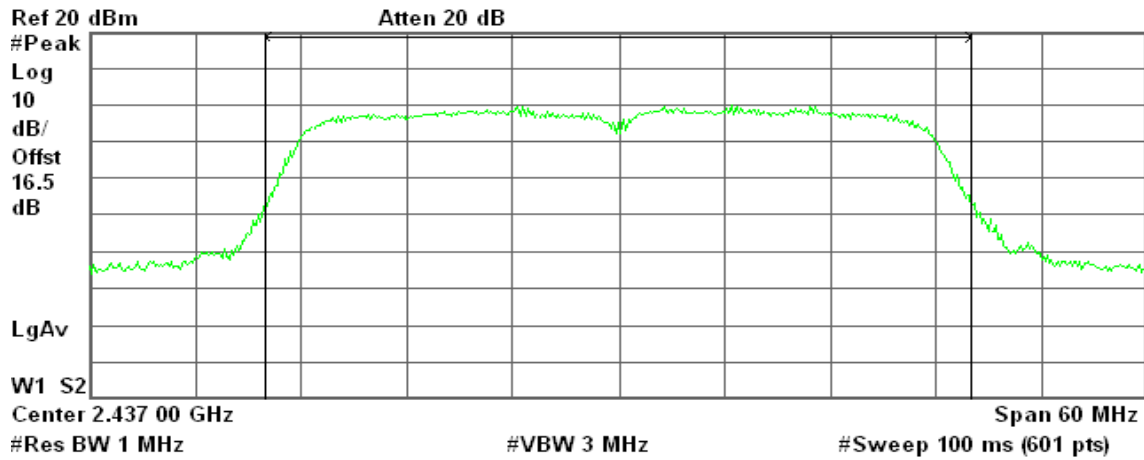




### Peak Power (CH Mid)

Agilent 16:37:30 Apr 26, 2010

R T



Channel Power

12.67 dBm / 40.0000 MHz

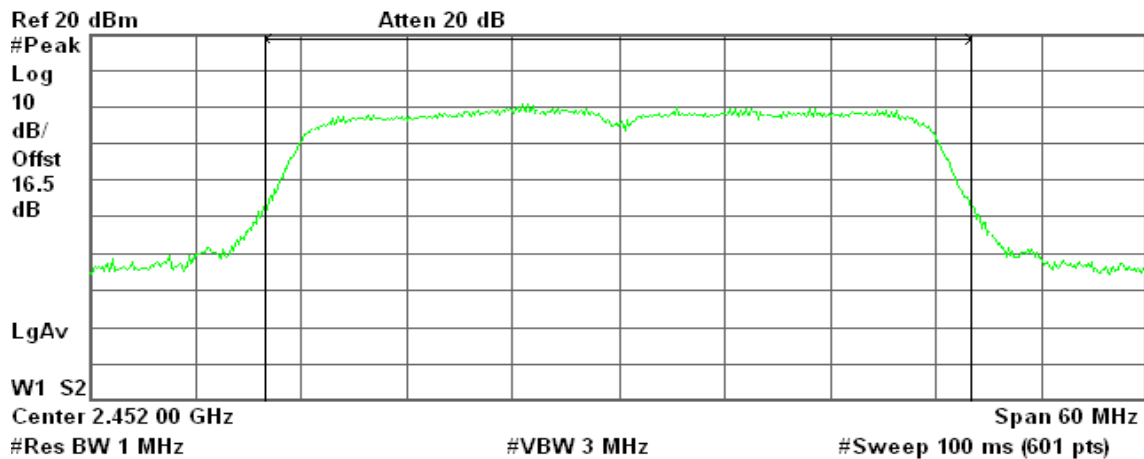
Power Spectral Density

-63.35 dBm/Hz

### Peak Power (CH High)

Agilent 16:43:59 Apr 26, 2010

R T



Channel Power

13.15 dBm / 40.0000 MHz

Power Spectral Density

-62.88 dBm/Hz

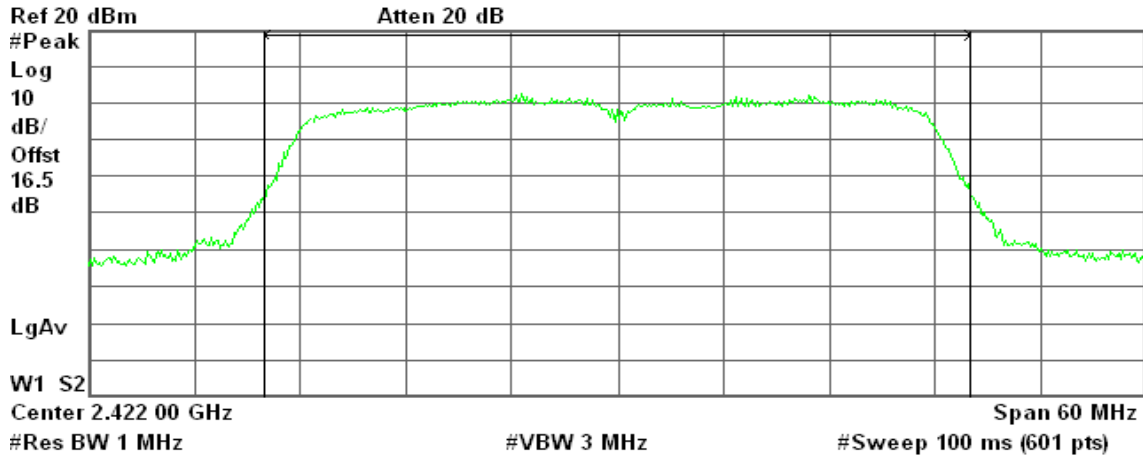


### draft 802.11n Wide-40 MHz Channel mode / Chain 1

#### Peak Power (CH Low)

Agilent 16:11:56 Apr 26, 2010

R T



Channel Power

14.85 dBm / 40.0000 MHz

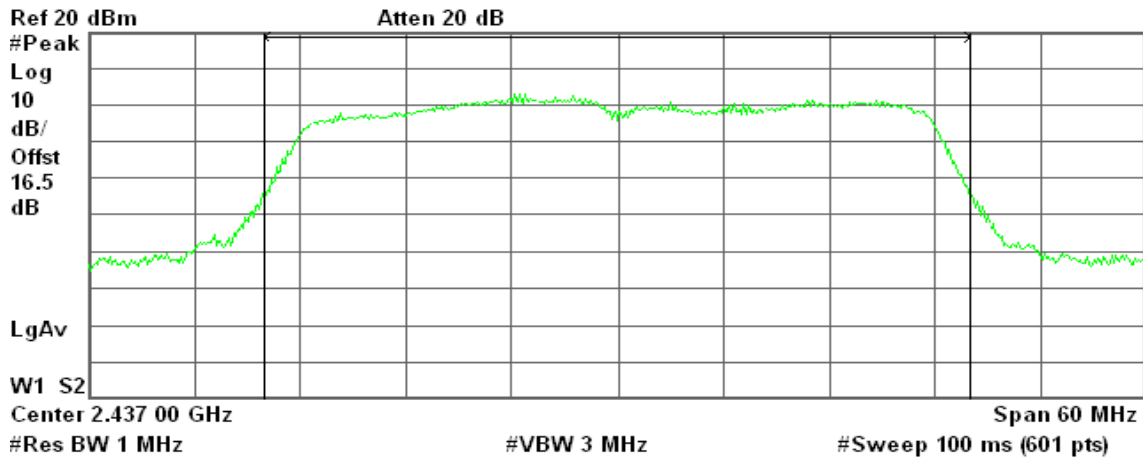
Power Spectral Density

-61.17 dBm/Hz

#### Peak Power (CH Mid)

Agilent 16:32:13 Apr 26, 2010

R T



Channel Power

14.74 dBm / 40.0000 MHz

Power Spectral Density

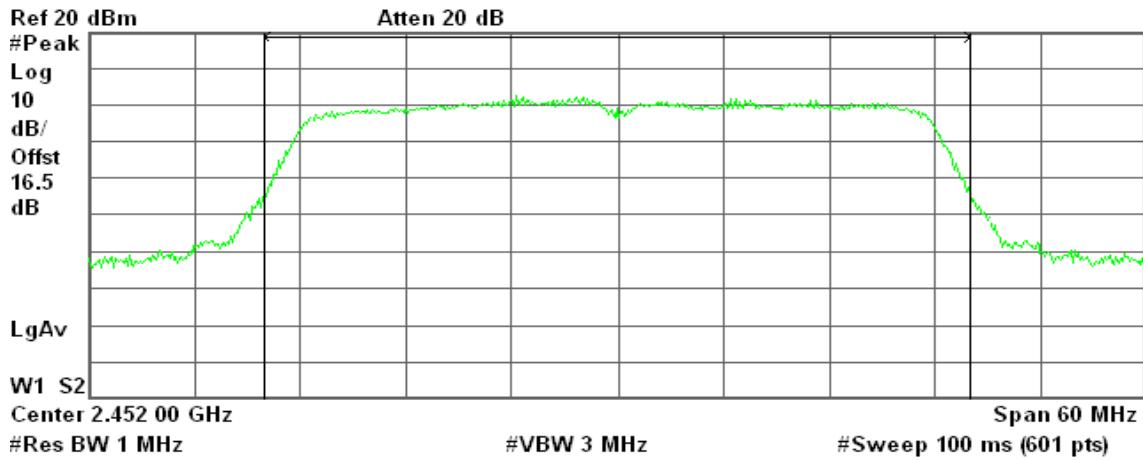
-61.28 dBm/Hz



### Peak Power (CH High)

Agilent 16:51:31 Apr 26, 2010

R T



Channel Power

14.94 dBm / 40.0000 MHz

Power Spectral Density

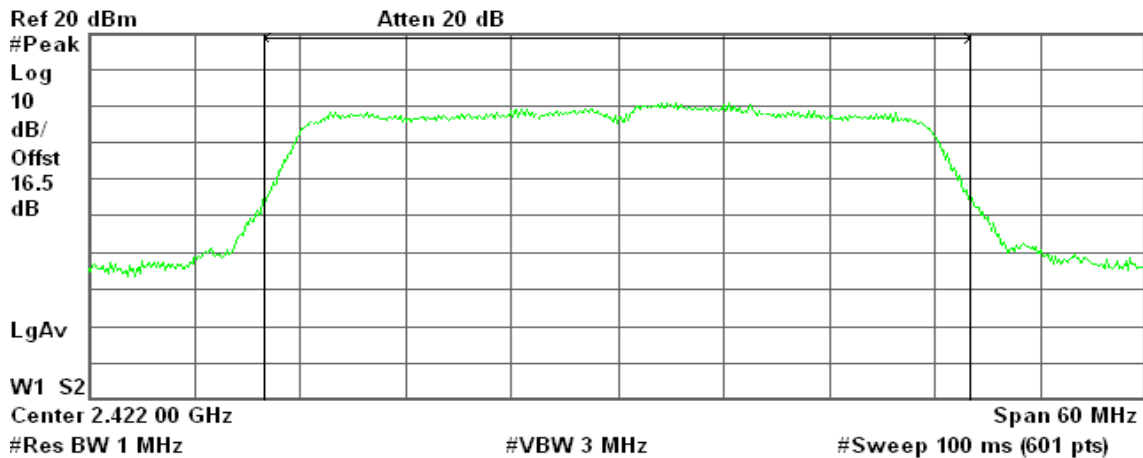
-61.08 dBm/Hz

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

### Peak Power (CH Low)

Agilent 16:17:45 Apr 26, 2010

R T



Channel Power

13.16 dBm / 40.0000 MHz

Power Spectral Density

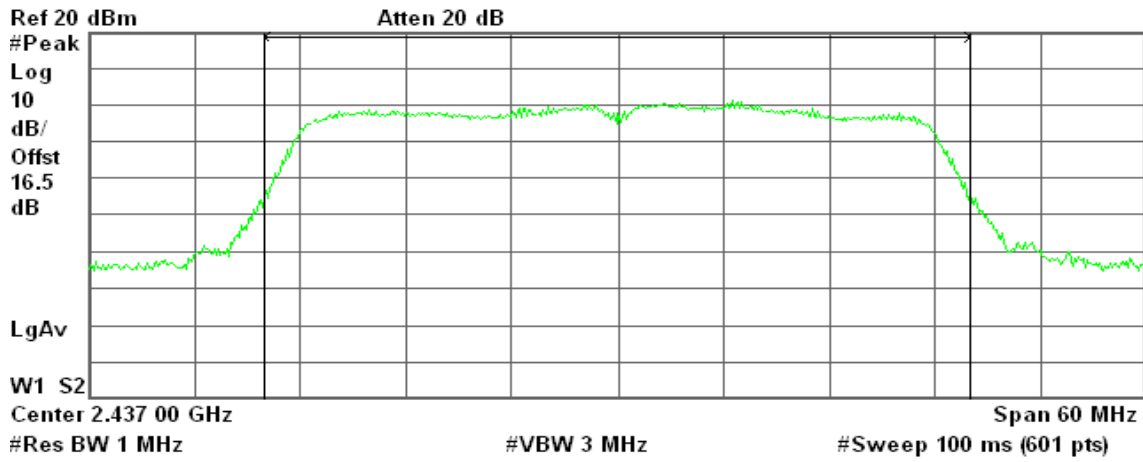
-62.86 dBm/Hz



### Peak Power (CH Mid)

Agilent 16:25:08 Apr 26, 2010

R T



Channel Power

13.35 dBm / 40.0000 MHz

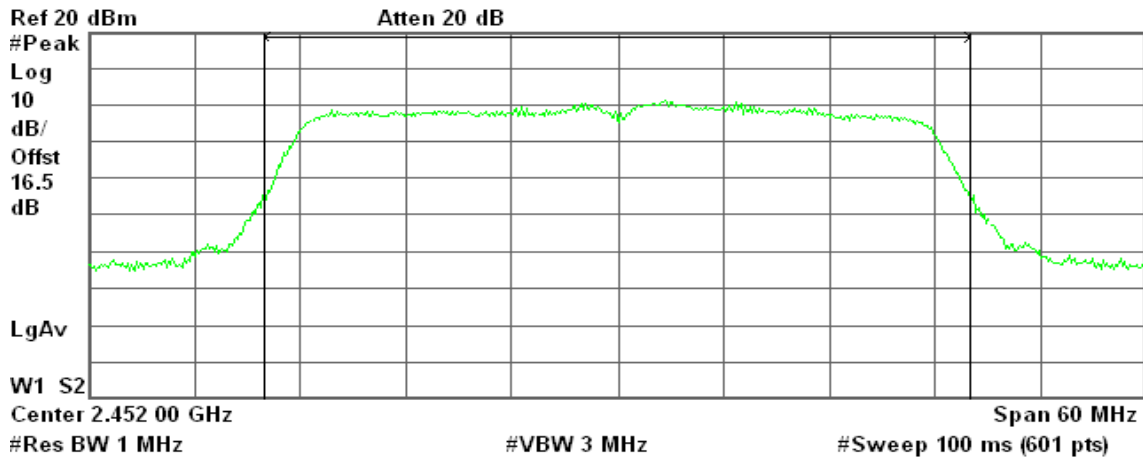
Power Spectral Density

-62.67 dBm/Hz

### Peak Power (CH High)

Agilent 16:56:32 Apr 26, 2010

R T



Channel Power

13.49 dBm / 40.0000 MHz

Power Spectral Density

-62.53 dBm/Hz

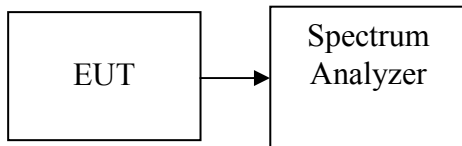


## 7.3 AVERAGE POWER

### 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)	Output Power (dBm)	Output Power (W)
Low	2412	15.56	0.0360
Mid	2437	15.21	0.0332
High	2462	15.55	0.0359

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	7.72	0.0059
Mid	2437	8.24	0.0067
High	2462	7.77	0.0060

**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	5.84	7.74	5.42	11.23	0.0133
Mid	2437	5.71	6.79	7.00	11.31	0.0135
High	2462	5.49	7.17	6.34	11.16	0.0131

**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	5.73	7.99	5.85	11.42	0.0139
Mid	2437	5.73	7.83	5.95	11.38	0.0137
High	2452	5.76	7.83	6.32	11.50	0.0141

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



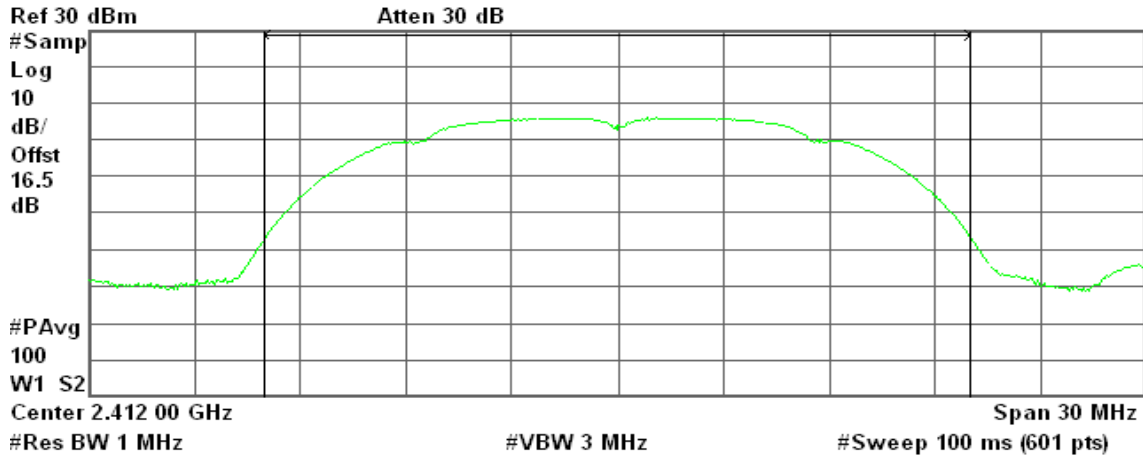
**Test Plot**

**IEEE 802.11b mode**

**Average Power (CH Low)**

Agilent 11:20:09 Apr 26, 2010

R T



Channel Power

15.56 dBm / 20.0000 MHz

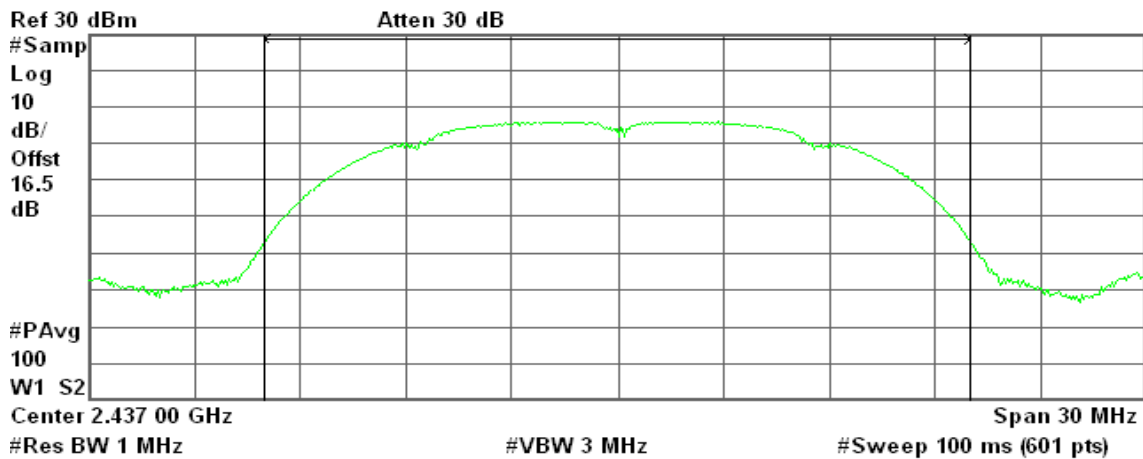
Power Spectral Density

-57.45 dBm/Hz

**Average Power (CH Mid)**

Agilent 11:26:22 Apr 26, 2010

R T



Channel Power

15.21 dBm / 20.0000 MHz

Power Spectral Density

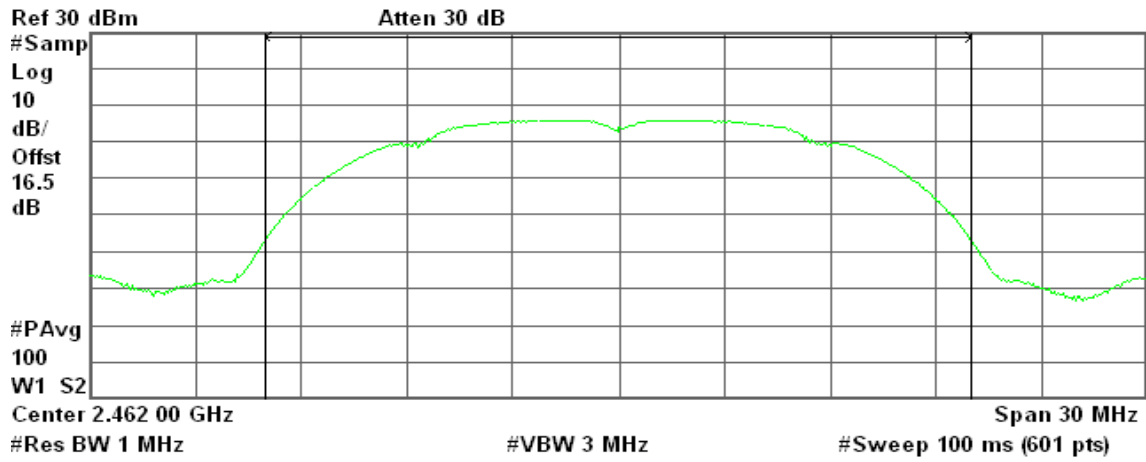
-57.80 dBm/Hz



### Average Power (CH High)

Agilent 11:33:26 Apr 26, 2010

R T



Channel Power

15.55 dBm / 20.0000 MHz

Power Spectral Density

-57.46 dBm/Hz



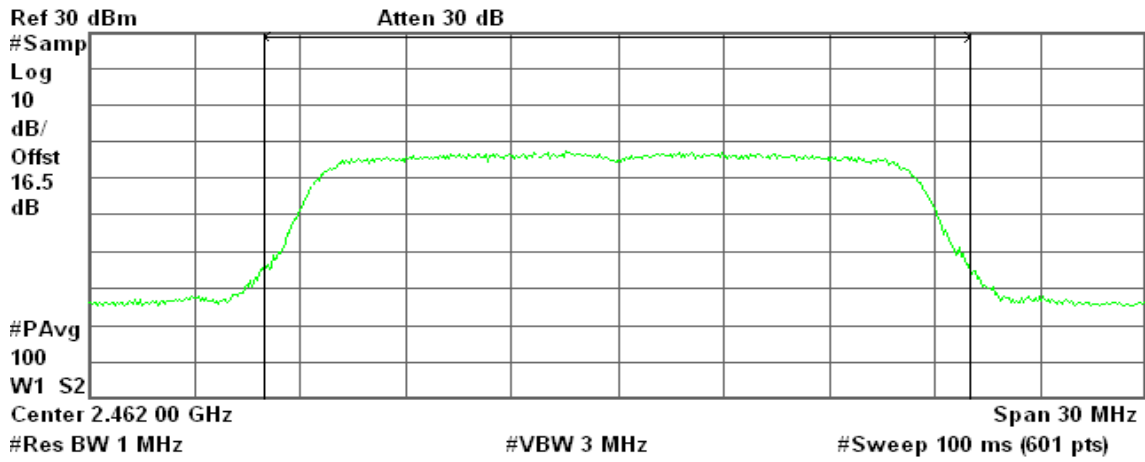




### Average Power (CH High)

Agilent 14:28:02 Apr 26, 2010

R T



Channel Power

7.77 dBm / 20.0000 MHz

Power Spectral Density

-65.24 dBm/Hz

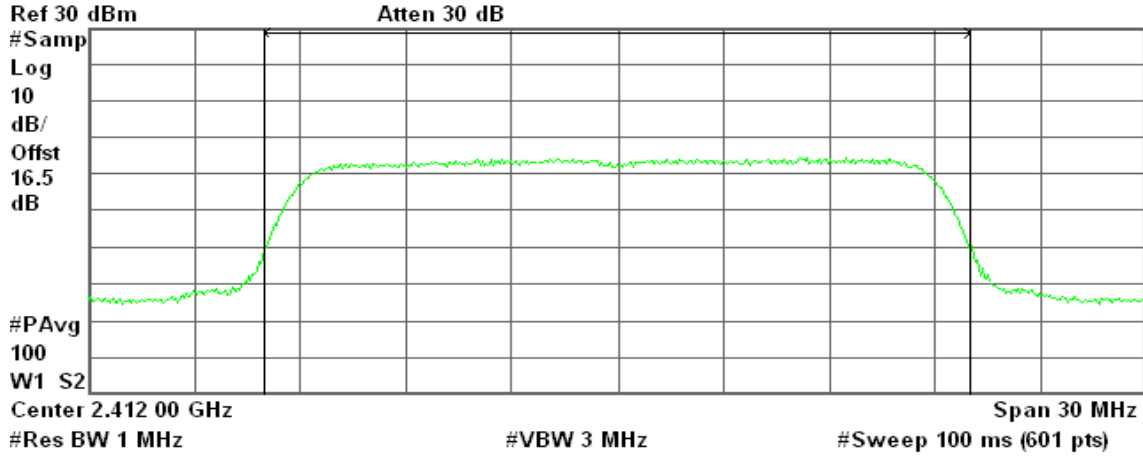


**draft 802.11n Standard-20 MHz Channel mode / Chain 0**

**Average Power (CH Low)**

Agilent 14:40:12 Apr 26, 2010

R T



Channel Power

5.84 dBm / 20.0000 MHz

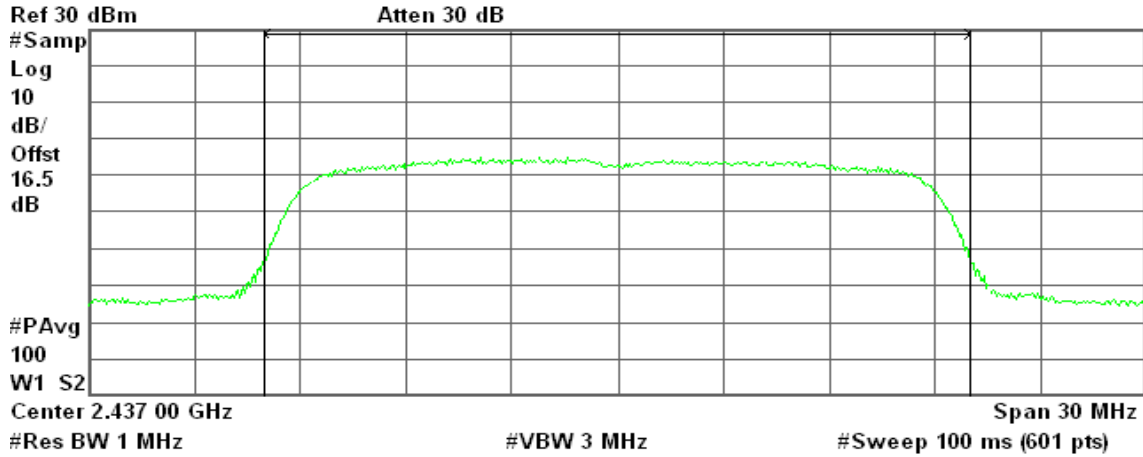
Power Spectral Density

-67.17 dBm/Hz

**Average Power (CH Mid)**

Agilent 15:01:30 Apr 26, 2010

R T



Channel Power

5.71 dBm / 20.0000 MHz

Power Spectral Density

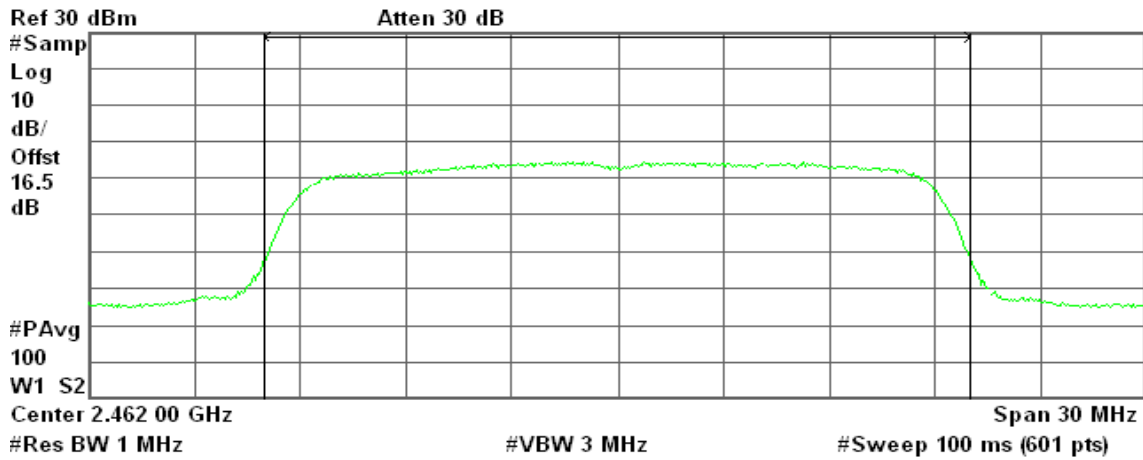
-67.30 dBm/Hz



### Average Power (CH High)

Agilent 15:18:53 Apr 26, 2010

R T



Channel Power

5.49 dBm / 20.0000 MHz

Power Spectral Density

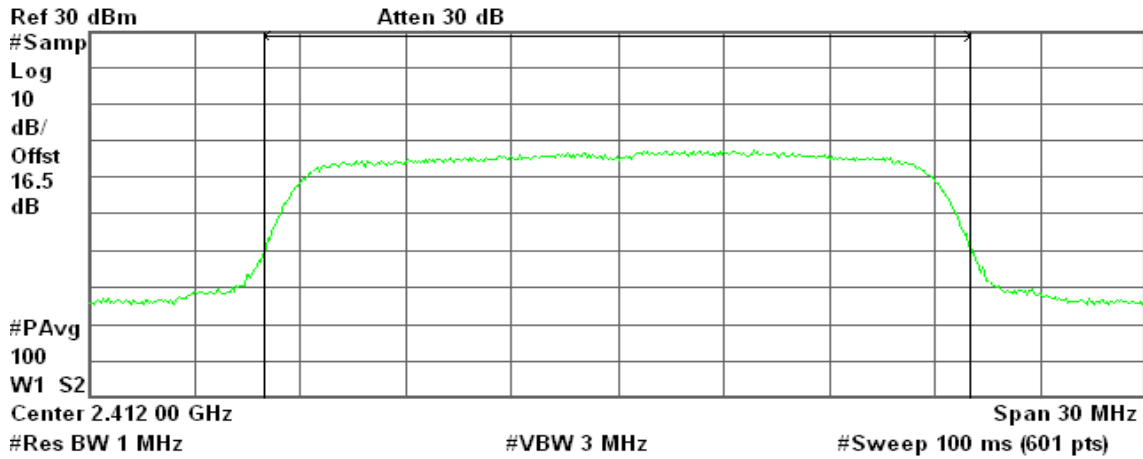
-67.52 dBm/Hz

### draft 802.11n Standard-20 MHz Channel mode / Chain 1

### Average Power (CH Low)

Agilent 14:46:13 Apr 26, 2010

R T



Channel Power

7.74 dBm / 20.0000 MHz

Power Spectral Density

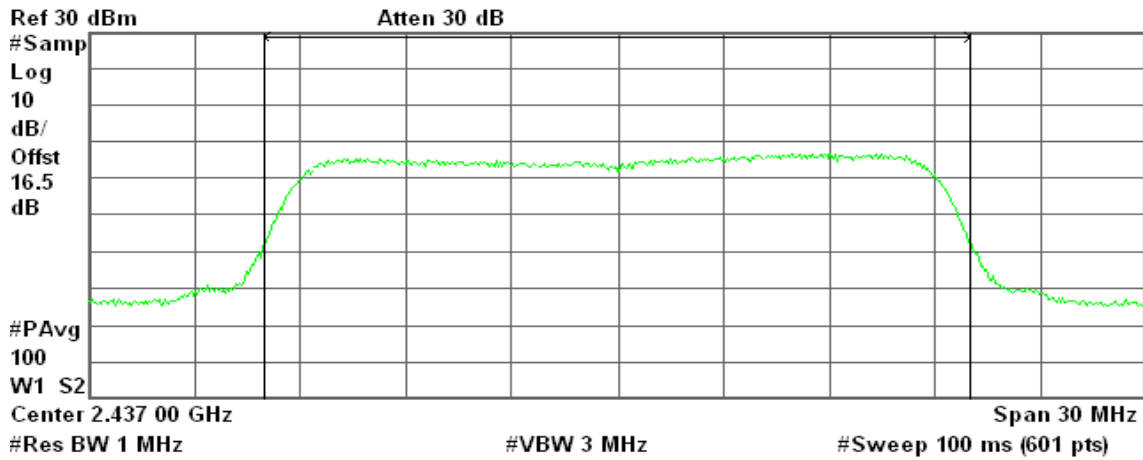
-65.27 dBm/Hz



### Average Power (CH Mid)

Agilent 15:06:18 Apr 26, 2010

R T



Channel Power

6.79 dBm / 20.0000 MHz

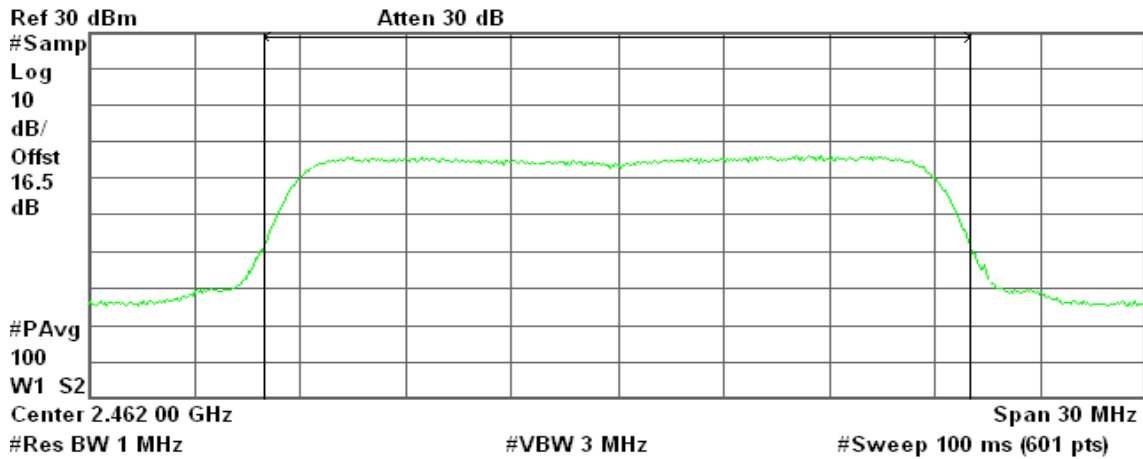
Power Spectral Density

-66.22 dBm/Hz

### Average Power (CH High)

Agilent 15:24:07 Apr 26, 2010

R T



Channel Power

7.17 dBm / 20.0000 MHz

Power Spectral Density

-65.84 dBm/Hz

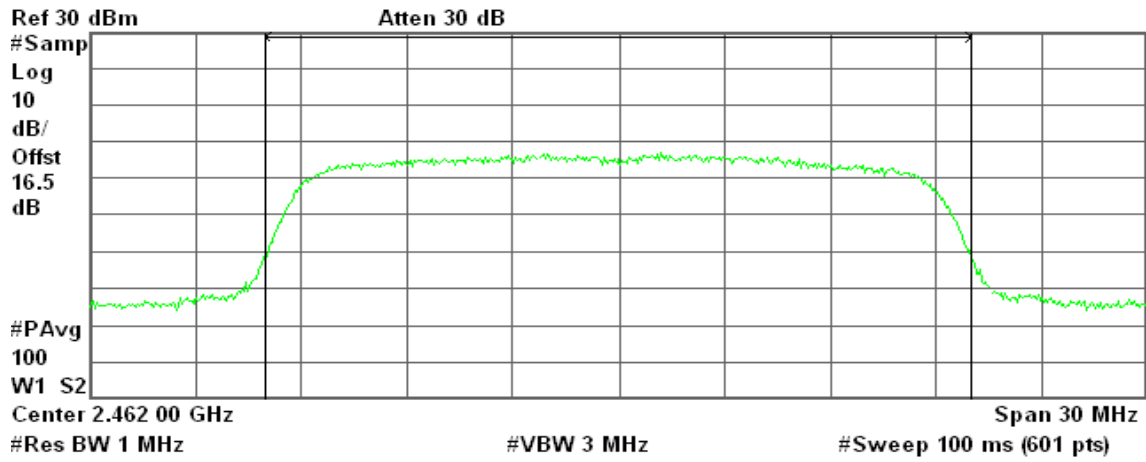




### Average Power (CH High)

Agilent 15:28:43 Apr 26, 2010

R L



Channel Power

6.34 dBm / 20.0000 MHz

Power Spectral Density

-66.67 dBm/Hz

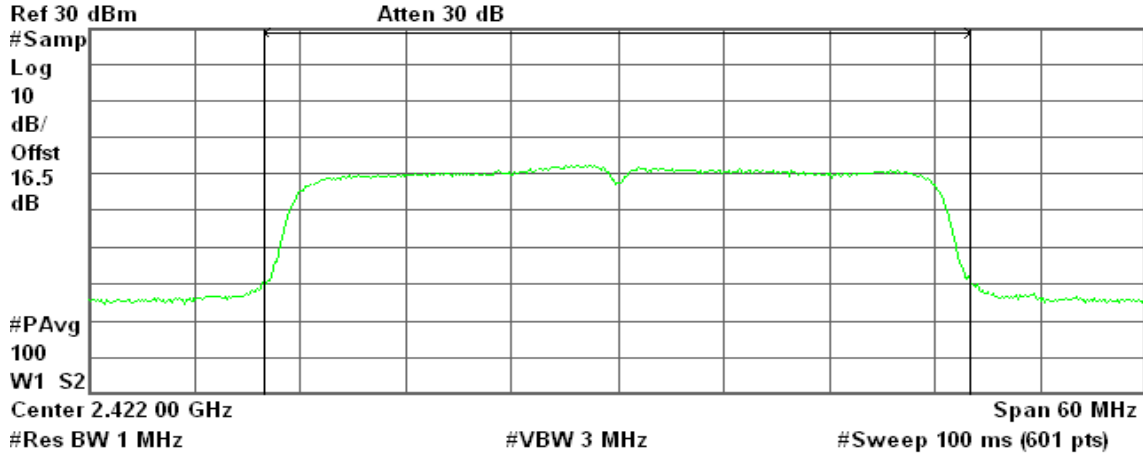


**draft 802.11n Wide-40 MHz Channel mode / Chain 0**

**Average Power (CH Low)**

Agilent 16:07:18 Apr 26, 2010

R T



Channel Power

5.73 dBm / 40.0000 MHz

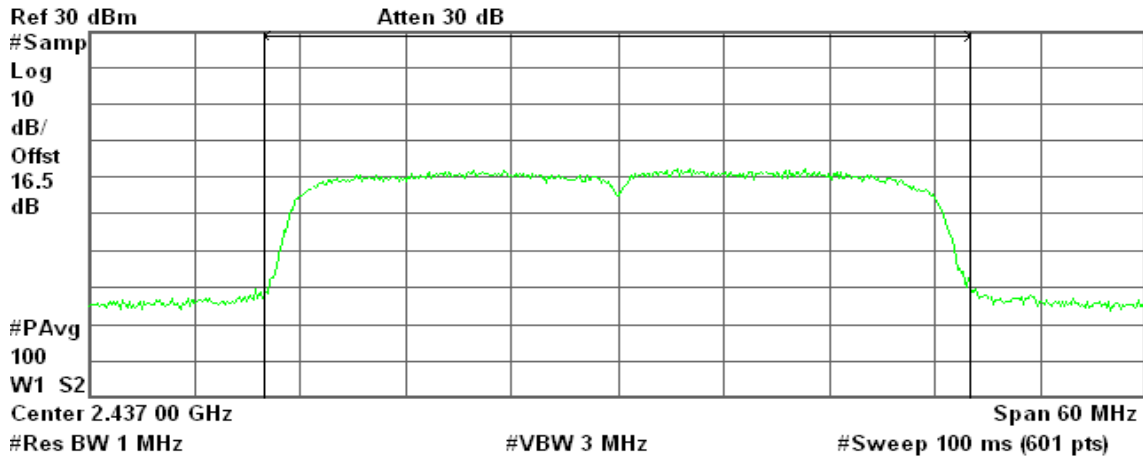
Power Spectral Density

-70.29 dBm/Hz

**Average Power (CH Mid)**

Agilent 16:38:08 Apr 26, 2010

R T



Channel Power

5.73 dBm / 40.0000 MHz

Power Spectral Density

-70.29 dBm/Hz

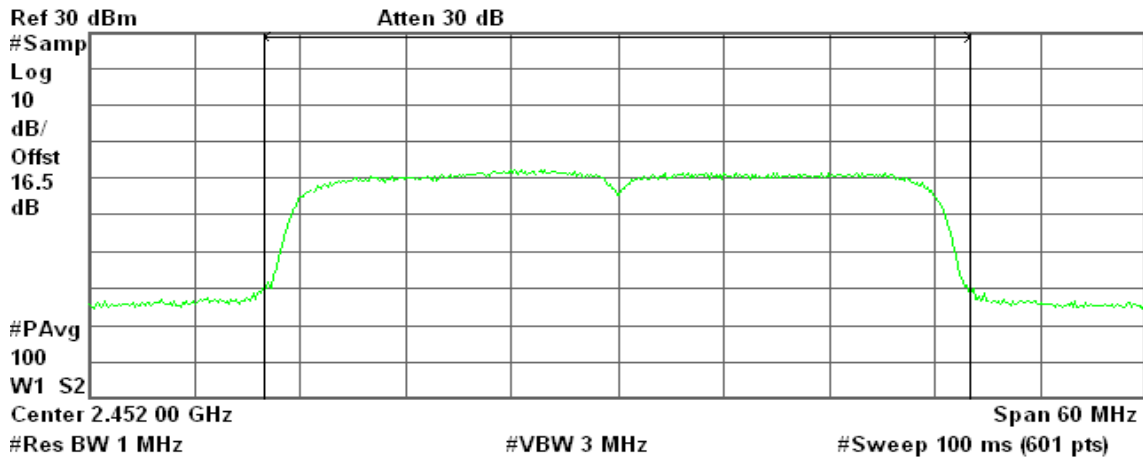




### Average Power (CH High)

Agilent 16:44:45 Apr 26, 2010

R T



Channel Power

5.76 dBm / 40.0000 MHz

Power Spectral Density

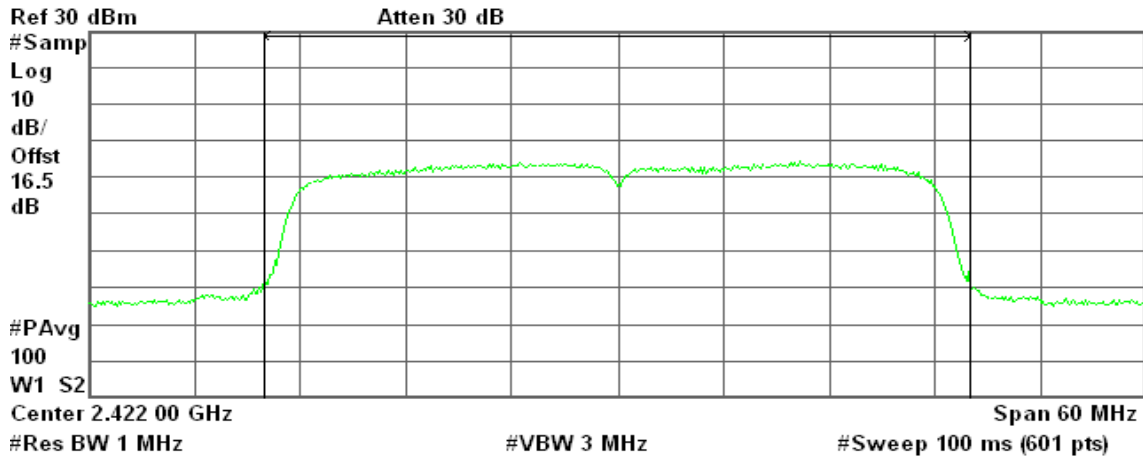
-70.26 dBm/Hz

### draft 802.11n Wide-40 MHz Channel mode / Chain 1

### Average Power (CH Low)

Agilent 16:12:49 Apr 26, 2010

R T



Channel Power

7.99 dBm / 40.0000 MHz

Power Spectral Density

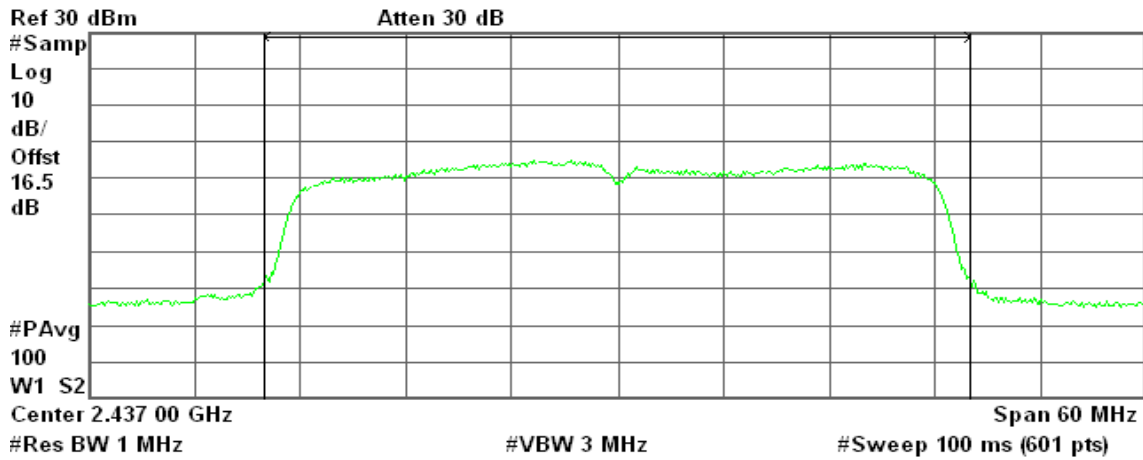
-68.03 dBm/Hz



### Average Power (CH Mid)

Agilent 16:33:03 Apr 26, 2010

R T



Channel Power

7.83 dBm / 40.0000 MHz

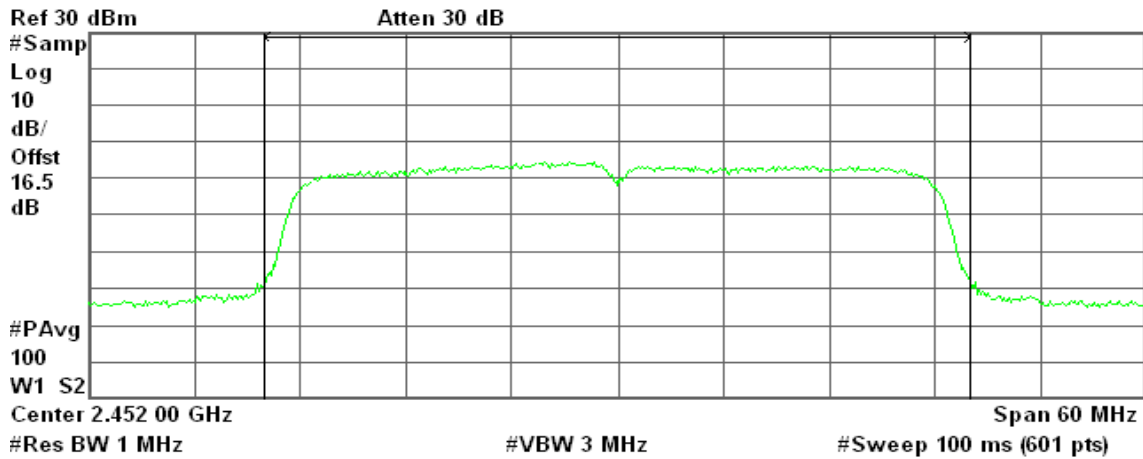
Power Spectral Density

-68.19 dBm/Hz

### Average Power (CH High)

Agilent 16:52:34 Apr 26, 2010

R T



Channel Power

7.83 dBm / 40.0000 MHz

Power Spectral Density

-68.19 dBm/Hz

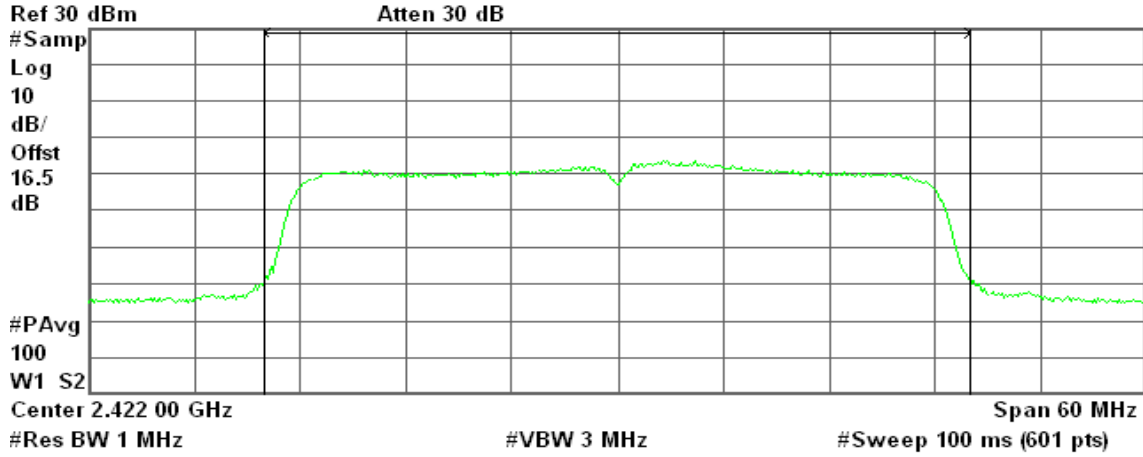


### draft 802.11n Wide-40 MHz Channel mode / Chain 2

#### Average Power (CH Low)

Agilent 16:18:48 Apr 26, 2010

R T



Channel Power

5.85 dBm / 40.0000 MHz

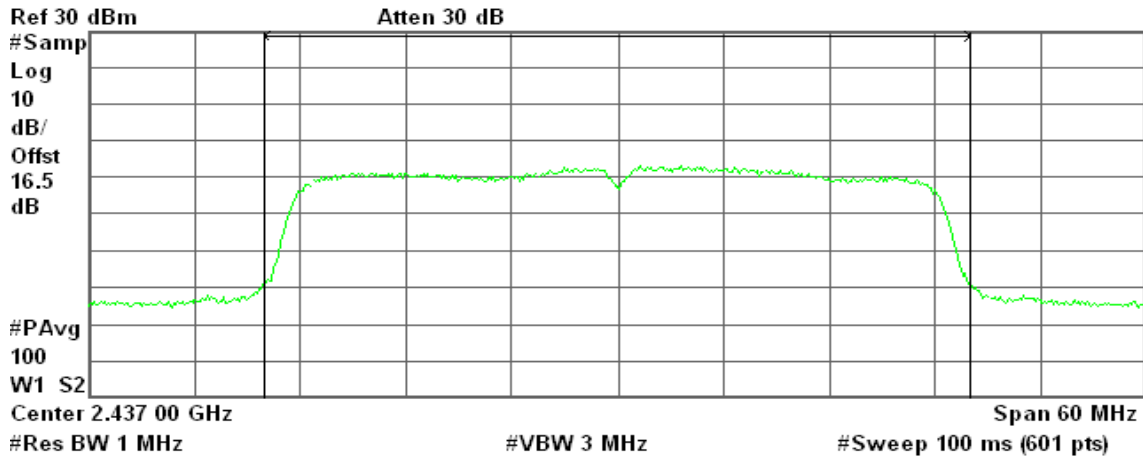
Power Spectral Density

-70.17 dBm/Hz

#### Average Power (CH Mid)

Agilent 16:25:51 Apr 26, 2010

R T



Channel Power

5.95 dBm / 40.0000 MHz

Power Spectral Density

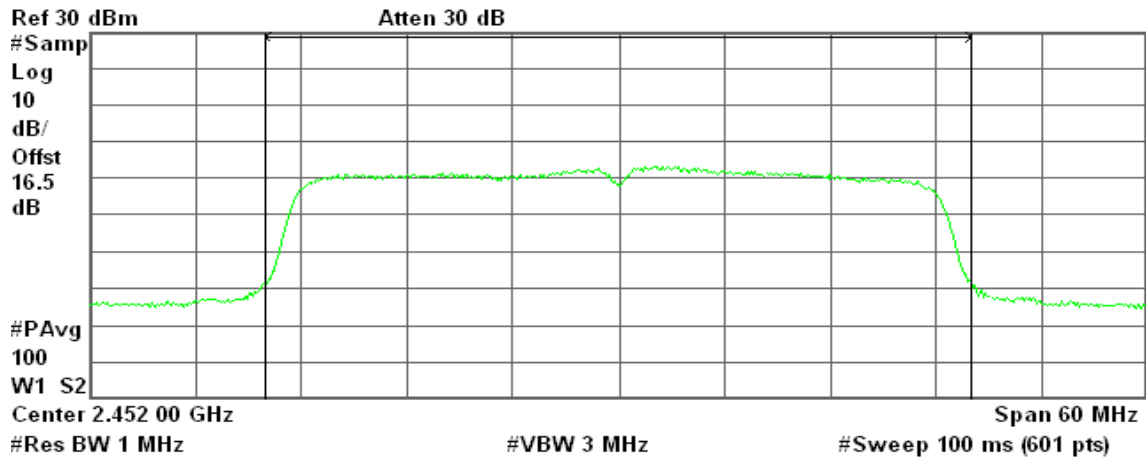
-70.07 dBm/Hz



### Average Power (CH High)

Agilent 16:58:13 Apr 26, 2010

R T



Channel Power

6.32 dBm / 40.0000 MHz

Power Spectral Density

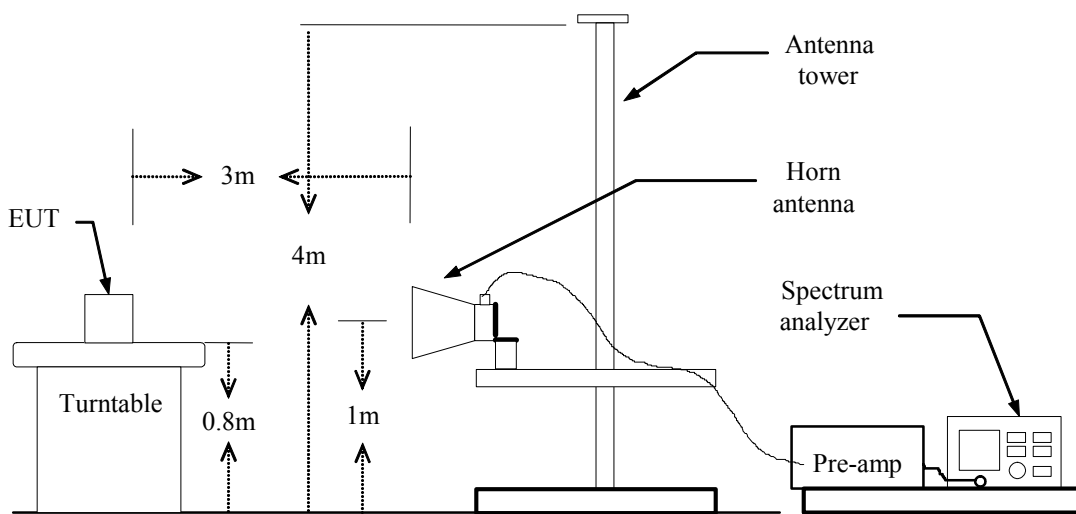
-69.70 dBm/Hz

## 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.



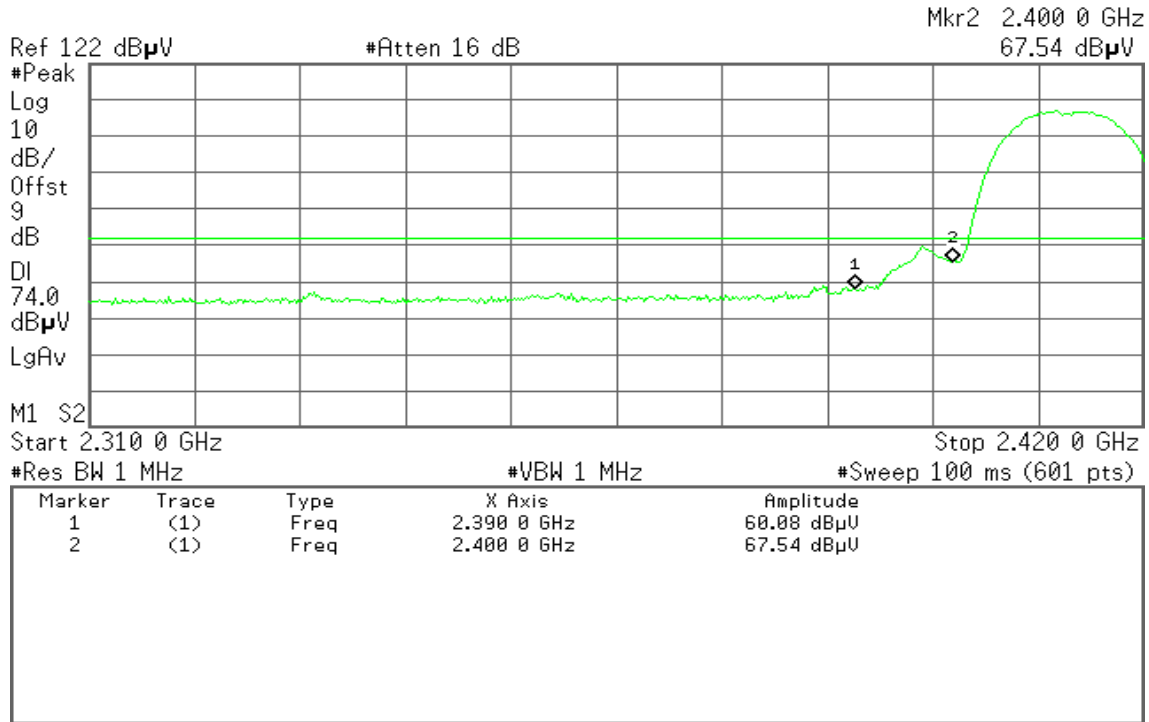
### Band Edges (IEEE 802.11b mode / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 23:06:17 Apr 23, 2010

R L

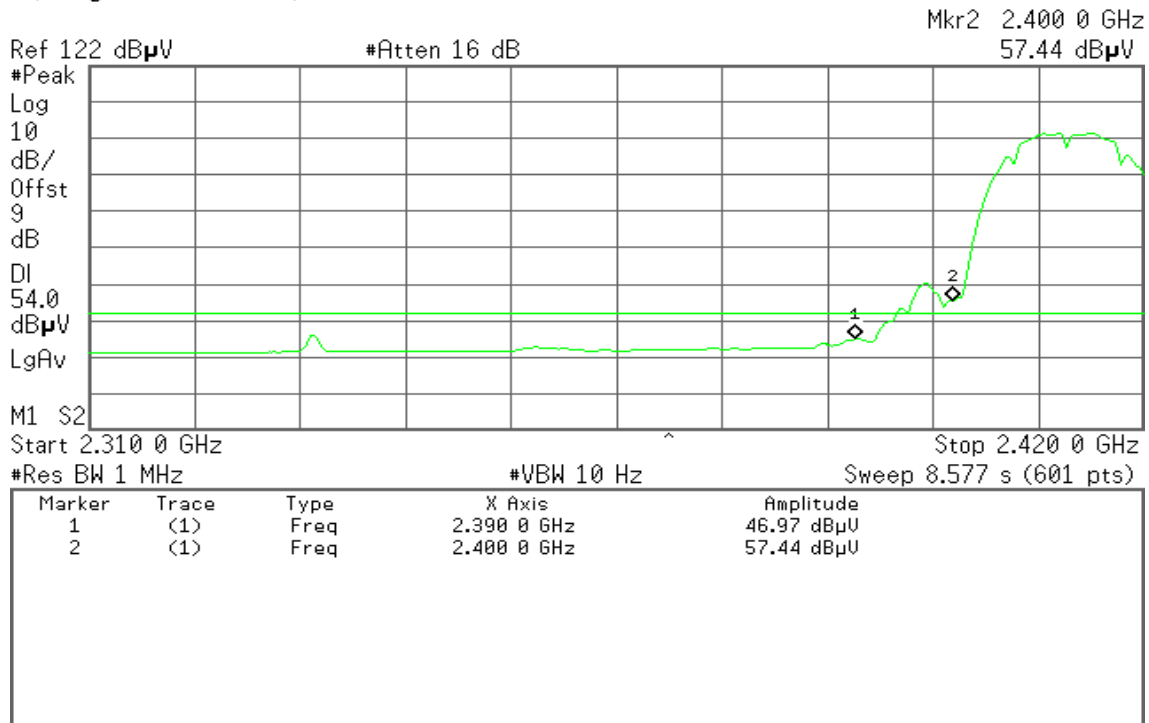


Detector mode: Average

Polarity: Vertical

Agilent 23:07:05 Apr 23, 2010

R L





Detector mode: Peak

Polarity: Horizontal

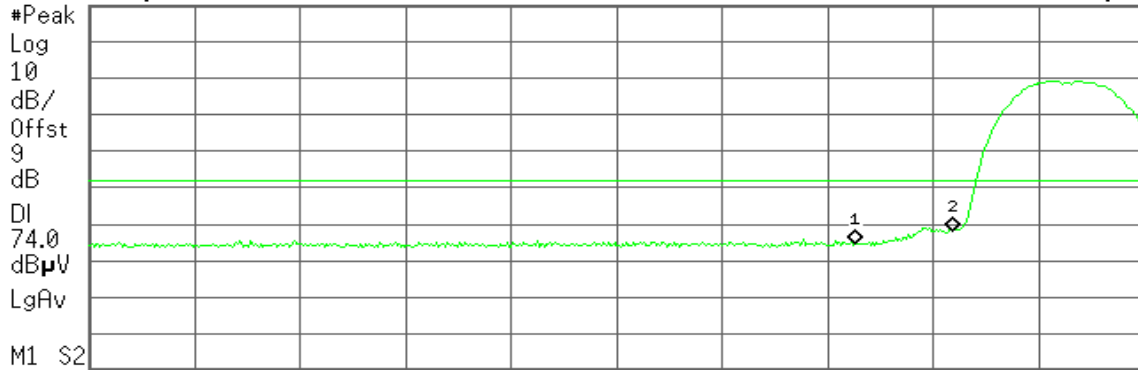
Agilent 23:14:57 Apr 23, 2010

R L

Mkr2 2.400 0 GHz  
60.10 dBµV

Ref 122 dBµV

#Atten 16 dB



Start 2.310 0 GHz Stop 2.420 0 GHz  
#Res BW 1 MHz #VBW 1 MHz #Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	56.64 dBµU
2	(1)	Freq	2.400 0 GHz	60.10 dBµU

Detector mode: Average

Polarity: Horizontal

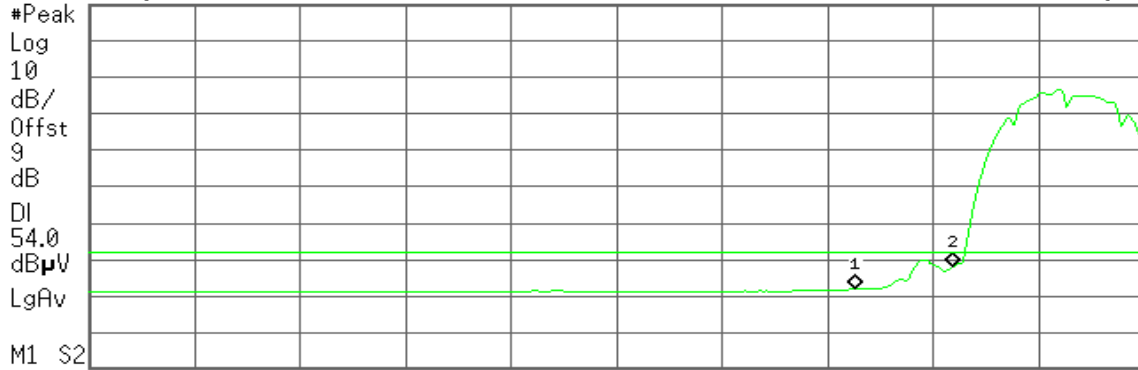
Agilent 23:16:14 Apr 23, 2010

R L

Mkr2 2.400 0 GHz  
50.02 dBµV

Ref 122 dBµV

#Atten 16 dB



Start 2.310 0 GHz Stop 2.420 0 GHz  
#Res BW 1 MHz #VBW 10 Hz Sweep 8.577 s (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	43.96 dBµU
2	(1)	Freq	2.400 0 GHz	50.02 dBµU



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

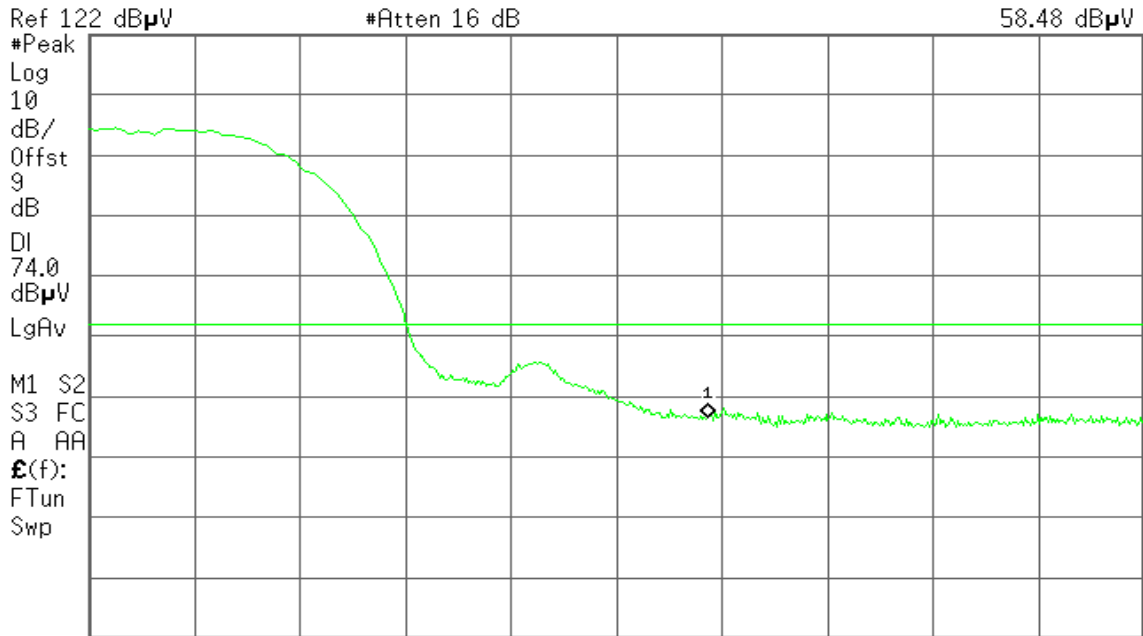
Detector mode: Peak

Polarity: Vertical

Agilent 23:43:52 Apr 23, 2010

R L

Mkr1 2.483 50 GHz  
58.48 dB $\mu$ V



Start 2.460 00 GHz Stop 2.500 00 GHz  
#Res BW 1 MHz #VBW 1 MHz #Sweep 100 ms (601 pts)

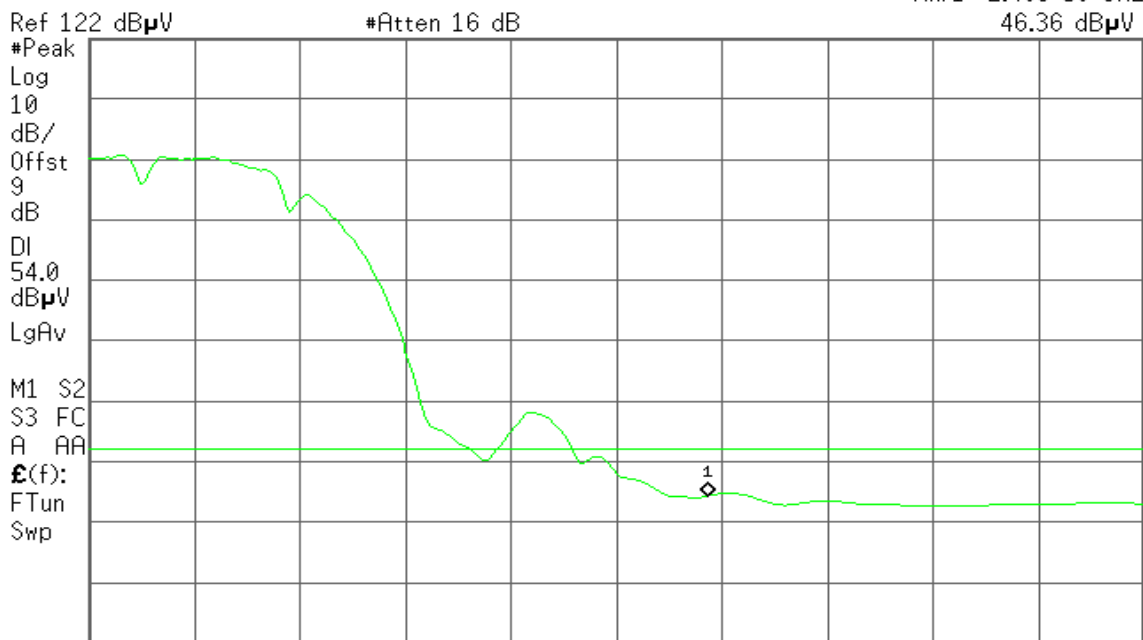
Detector mode: Average

Polarity: Vertical

Agilent 23:44:25 Apr 23, 2010

R L

Mkr1 2.483 50 GHz  
46.36 dB $\mu$ V



Start 2.460 00 GHz Stop 2.500 00 GHz  
#Res BW 1 MHz #VBW 10 Hz Sweep 3.119 s (601 pts)





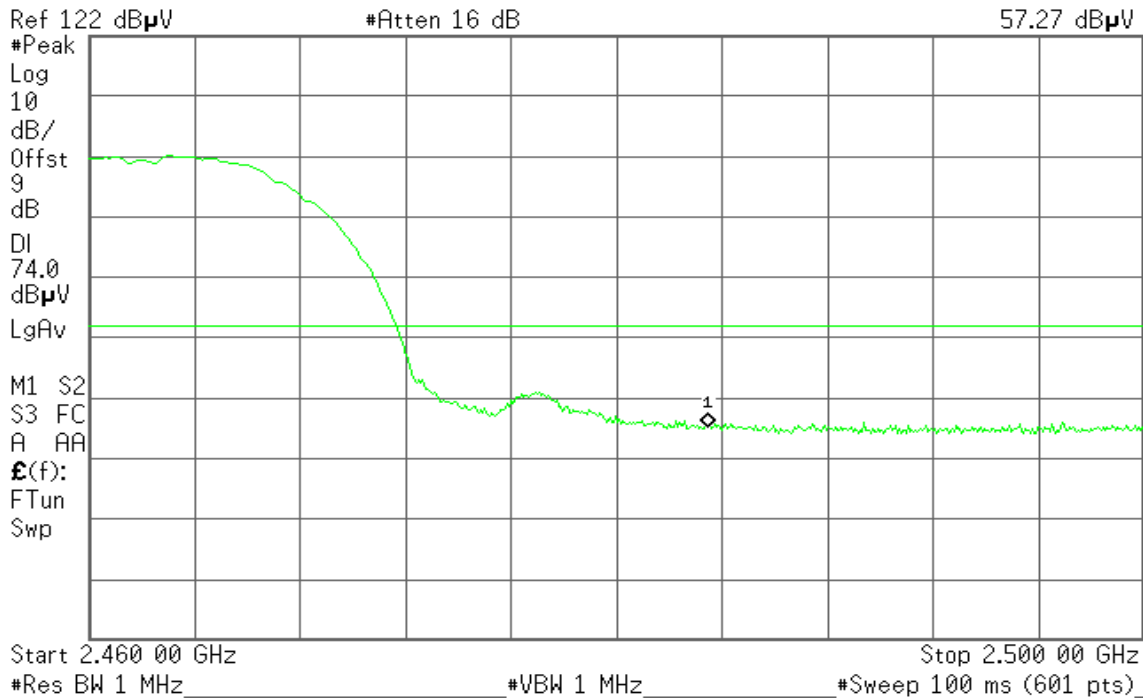
**Detector mode: Peak**

**Polarity: Horizontal**

Agilent 23:32:24 Apr 23, 2010

R L

Mkr1 2.483 50 GHz  
57.27 dB $\mu$ V



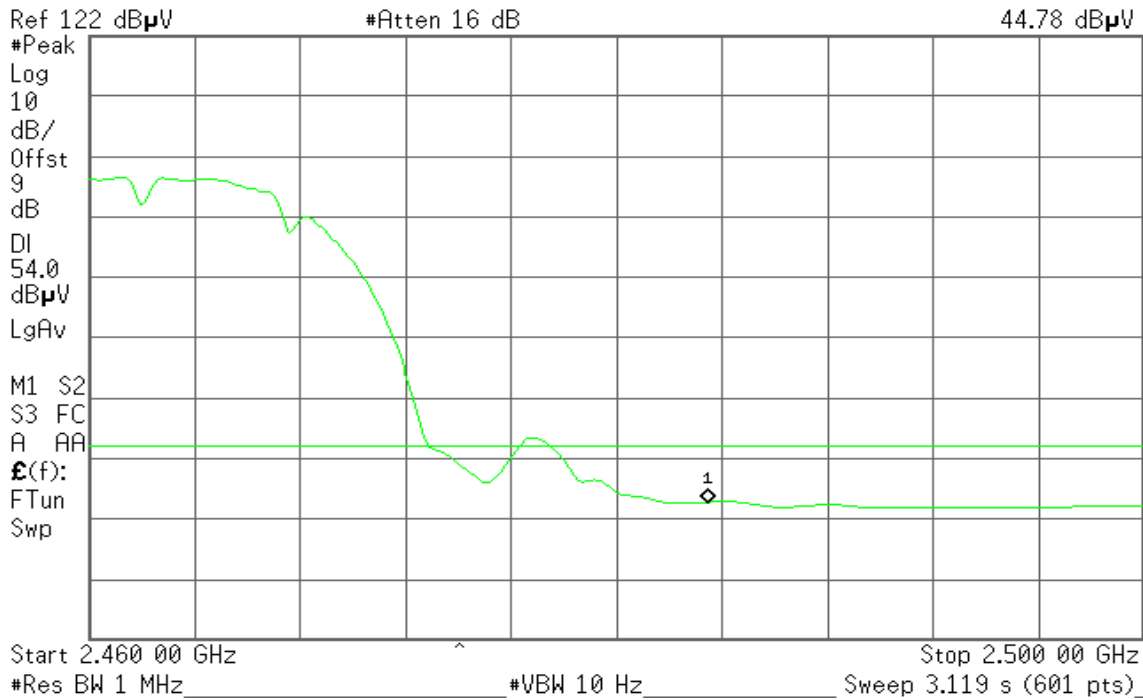
**Detector mode: Average**

**Polarity: Horizontal**

Agilent 23:33:11 Apr 23, 2010

R L

Mkr1 2.483 50 GHz  
44.78 dB $\mu$ V





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

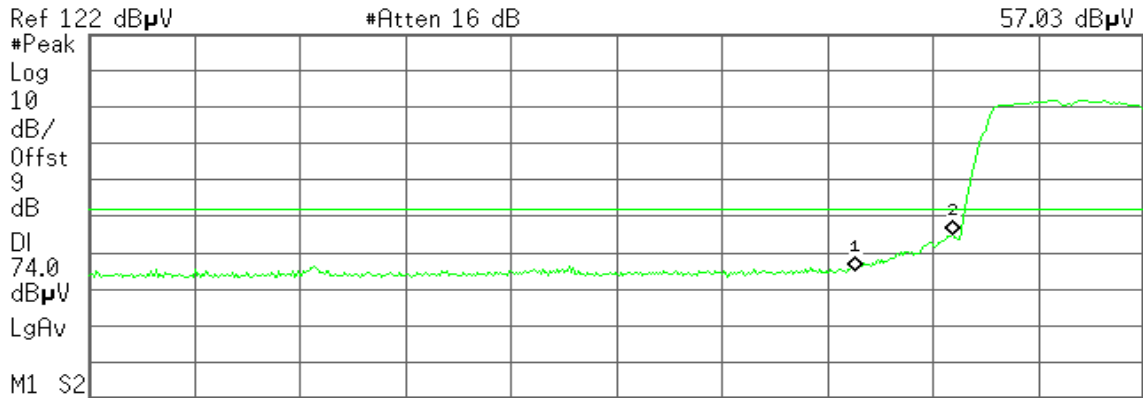
Detector mode: Peak

Polarity: Vertical

Agilent 23:51:08 Apr 26, 2010

R L

Mkr1 2.390 0 GHz  
57.03 dB $\mu$ V



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	57.03 dB $\mu$ U
2	(1)	Freq	2.400 0 GHz	66.84 dB $\mu$ U

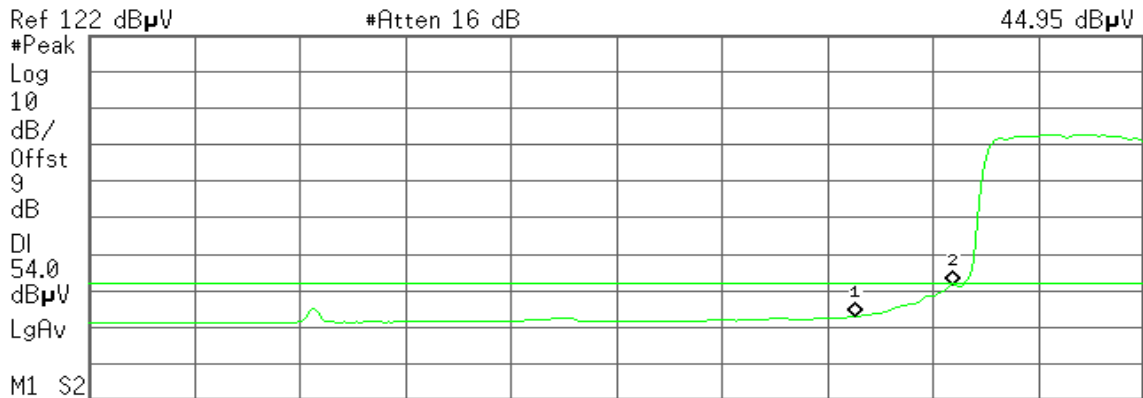
Detector mode: Average

Polarity: Vertical

Agilent 23:51:47 Apr 26, 2010

R L

Mkr1 2.390 0 GHz  
44.95 dB $\mu$ V



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	44.95 dB $\mu$ U
2	(1)	Freq	2.400 0 GHz	53.71 dB $\mu$ U



Detector mode: Peak

Polarity: Horizontal

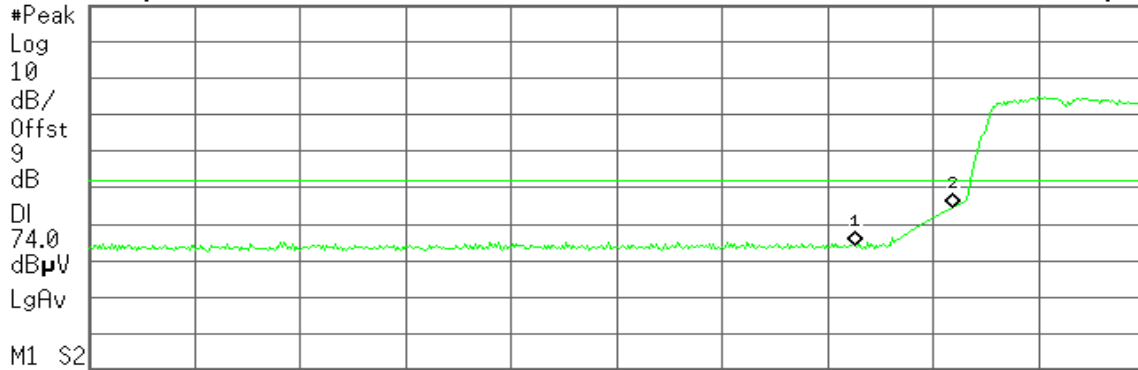
Agilent 00:00:17 Apr 27, 2010

R L

Mkr1 2.390 0 GHz  
56.10 dBµV

Ref 122 dBµV

#Atten 16 dB



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	56.10 dBµU
2	(1)	Freq	2.400 0 GHz	66.57 dBµU

Detector mode: Average

Polarity: Horizontal

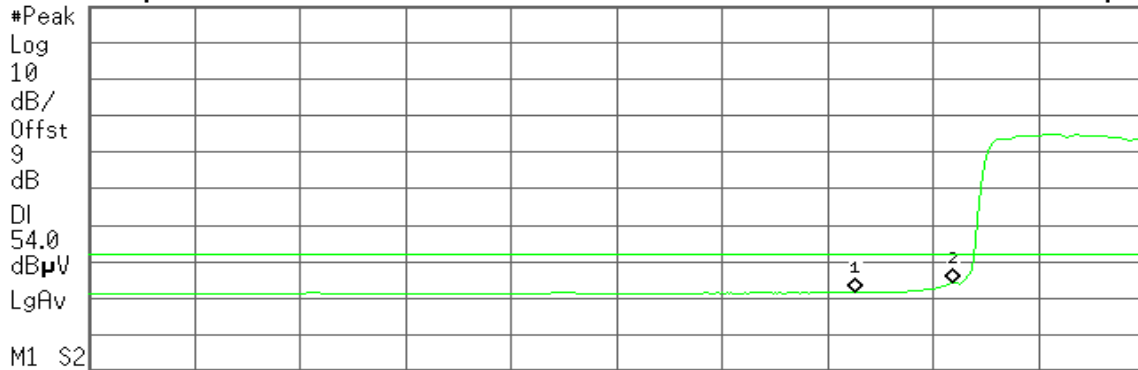
Agilent 00:00:50 Apr 27, 2010

R L

Mkr1 2.390 0 GHz  
43.50 dBµV

Ref 122 dBµV

#Atten 16 dB



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	43.50 dBµU
2	(1)	Freq	2.400 0 GHz	46.33 dBµU



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

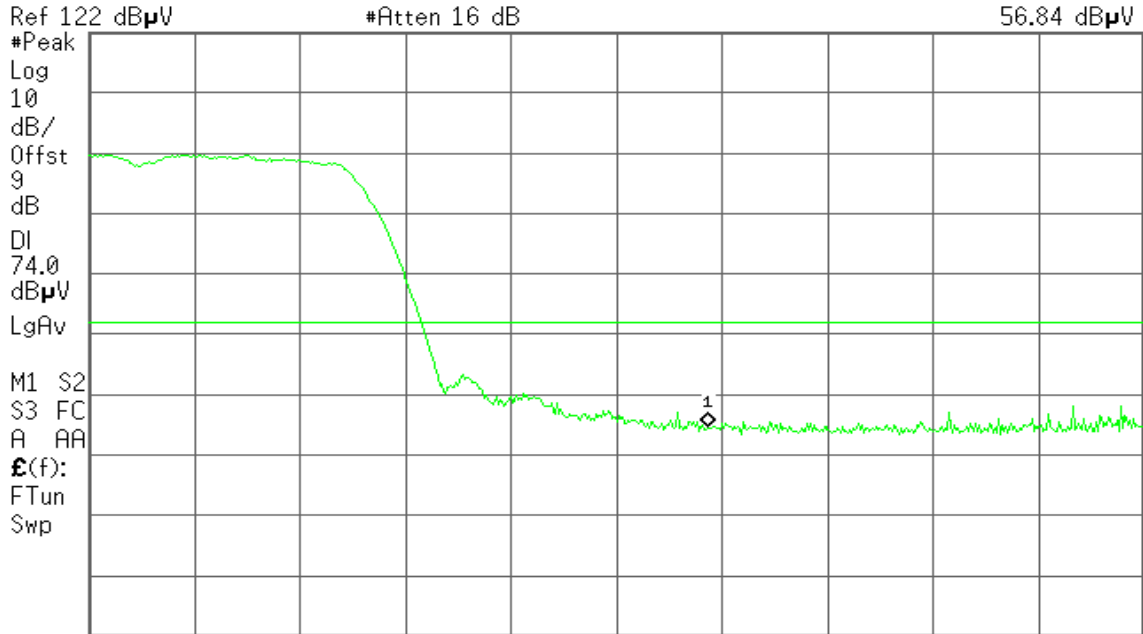
Detector mode: Peak

Polarity: Vertical

Agilent 00:15:17 Apr 27, 2010

R L

Mkr1 2.483 50 GHz  
56.84 dB $\mu$ V



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

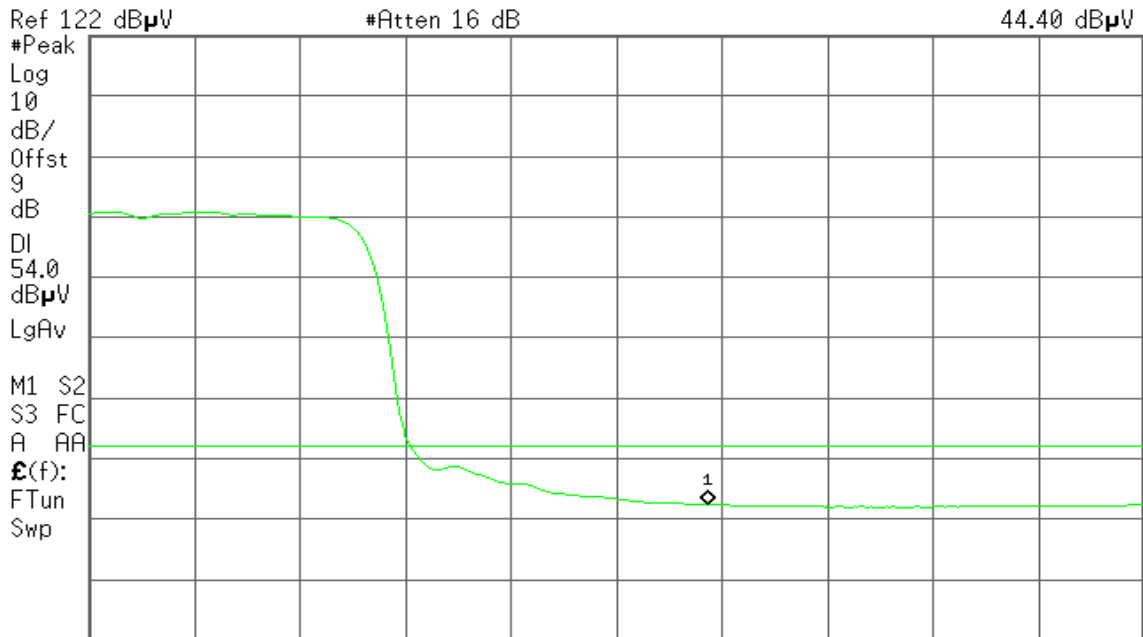
Detector mode: Average

Polarity: Vertical

Agilent 00:15:42 Apr 27, 2010

R L

Mkr1 2.483 50 GHz  
44.40 dB $\mu$ V



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 3.119 s (601 pts)



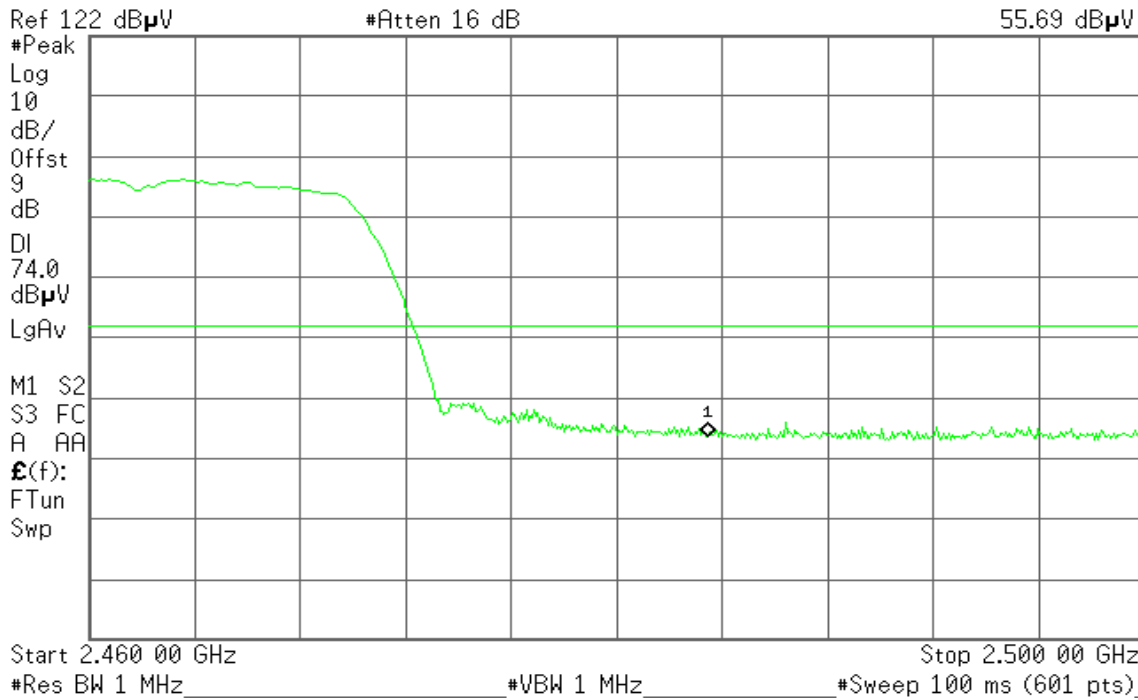
Detector mode: Peak

Polarity: Horizontal

Agilent 00:10:35 Apr 27, 2010

R L

Mkr1 2.483 50 GHz  
55.69 dBμV



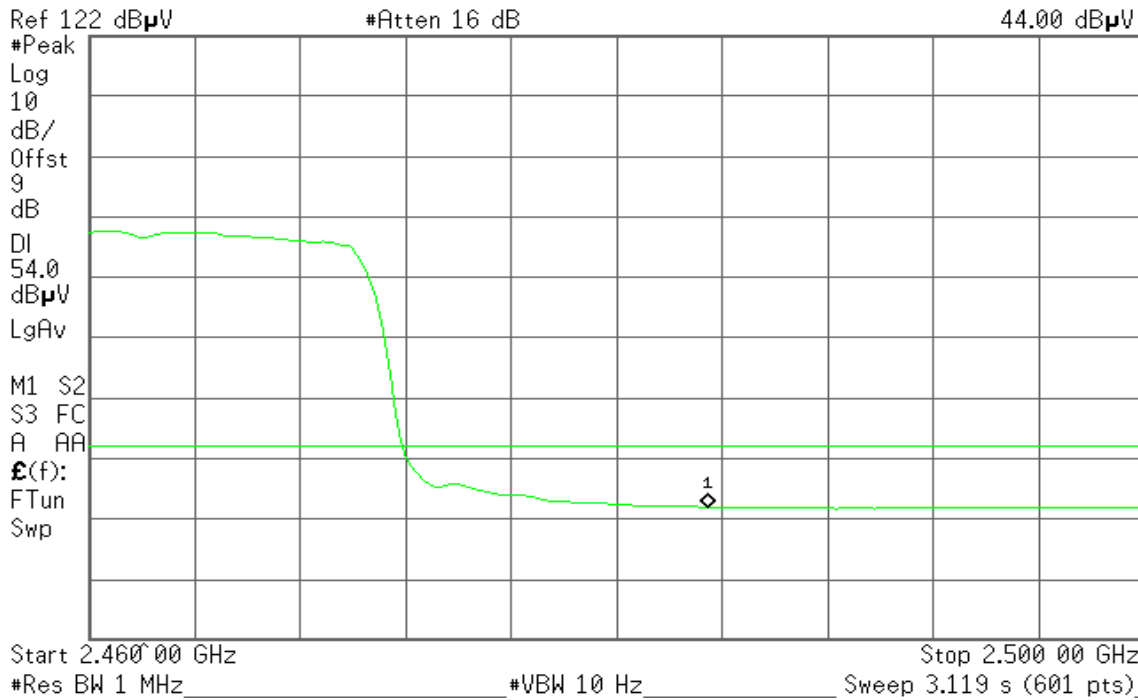
Detector mode: Average

Polarity: Horizontal

Agilent 00:11:02 Apr 27, 2010

R L

Mkr1 2.483 50 GHz  
44.00 dBμV





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

**Detector mode: Peak**

**Polarity: Vertical**

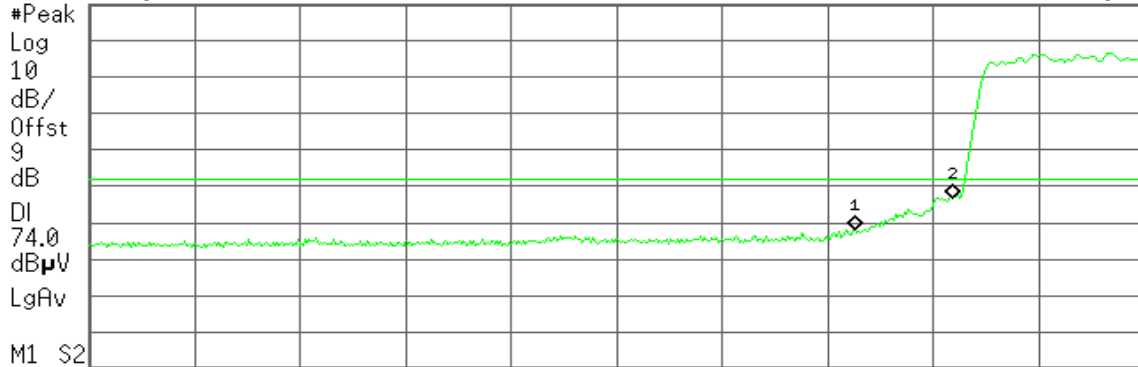
Agilent 01:42:28 Apr 24, 2010

R L

Mkr1 2.390 0 GHz  
60.27 dB $\mu$ V

Ref 122 dB $\mu$ V

#Atten 16 dB



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	60.27 dB $\mu$ U
2	(1)	Freq	2.400 0 GHz	68.79 dB $\mu$ U

**Detector mode: Average**

**Polarity: Vertical**

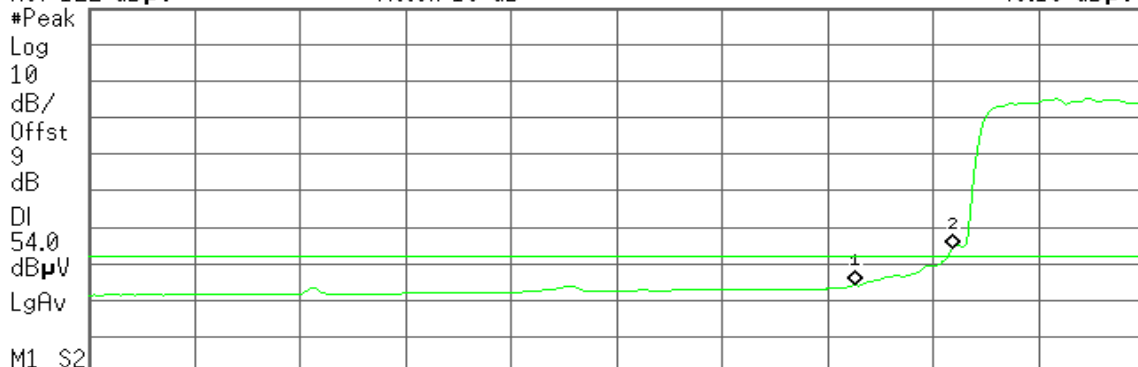
Agilent 01:43:01 Apr 24, 2010

R L

Mkr1 2.390 0 GHz  
46.16 dB $\mu$ V

Ref 122 dB $\mu$ V

#Atten 16 dB



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	46.16 dB $\mu$ U
2	(1)	Freq	2.400 0 GHz	56.36 dB $\mu$ U



Detector mode: Peak

Polarity: Horizontal

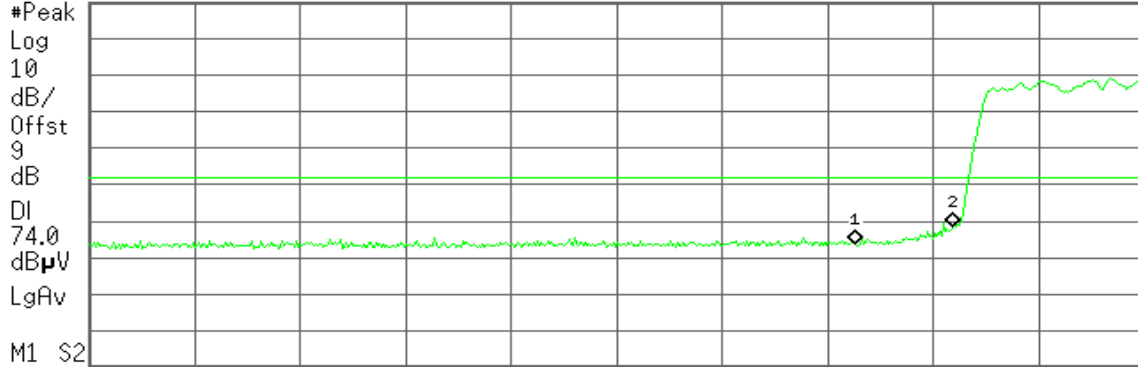
Agilent 01:52:30 Apr 24, 2010

R L

Mkr1 2.390 0 GHz  
55.93 dBµV

Ref 122 dBµV

#Atten 16 dB



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	55.93 dBµU
2	(1)	Freq	2.400 0 GHz	60.60 dBµU

Detector mode: Average

Polarity: Horizontal

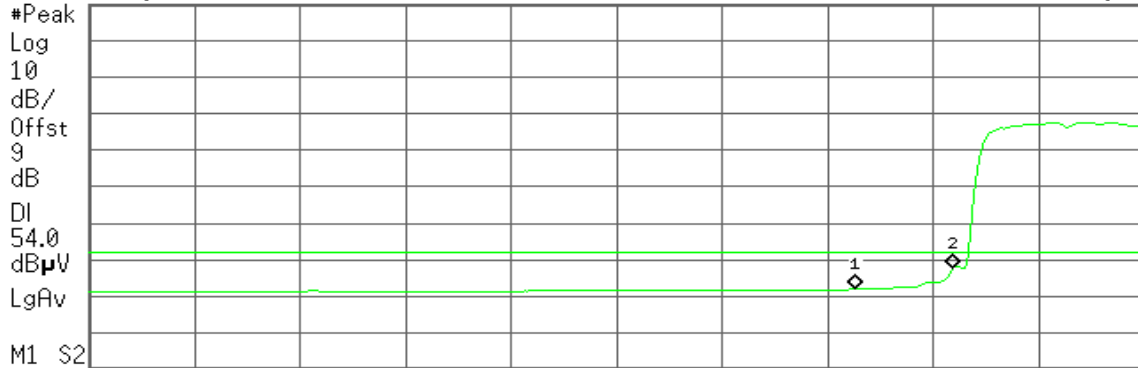
Agilent 01:53:25 Apr 24, 2010

R L

Mkr1 2.390 0 GHz  
43.90 dBµV

Ref 122 dBµV

#Atten 16 dB



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	43.90 dBµU
2	(1)	Freq	2.400 0 GHz	49.59 dBµU



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

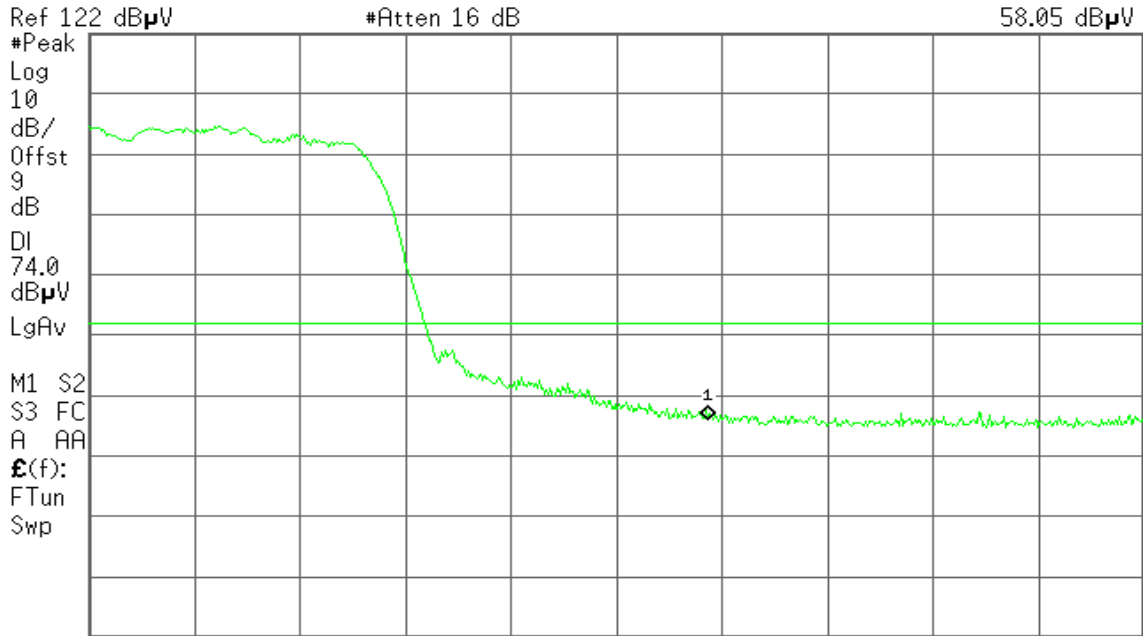
Detector mode: Peak

Polarity: Vertical

Agilent 02:14:37 Apr 24, 2010

R L

Mkr1 2.483 50 GHz  
58.05 dBμV



Start 2.460 00 GHz Stop 2.500 00 GHz  
#Res BW 1 MHz #VBW 1 MHz #Sweep 100 ms (601 pts)

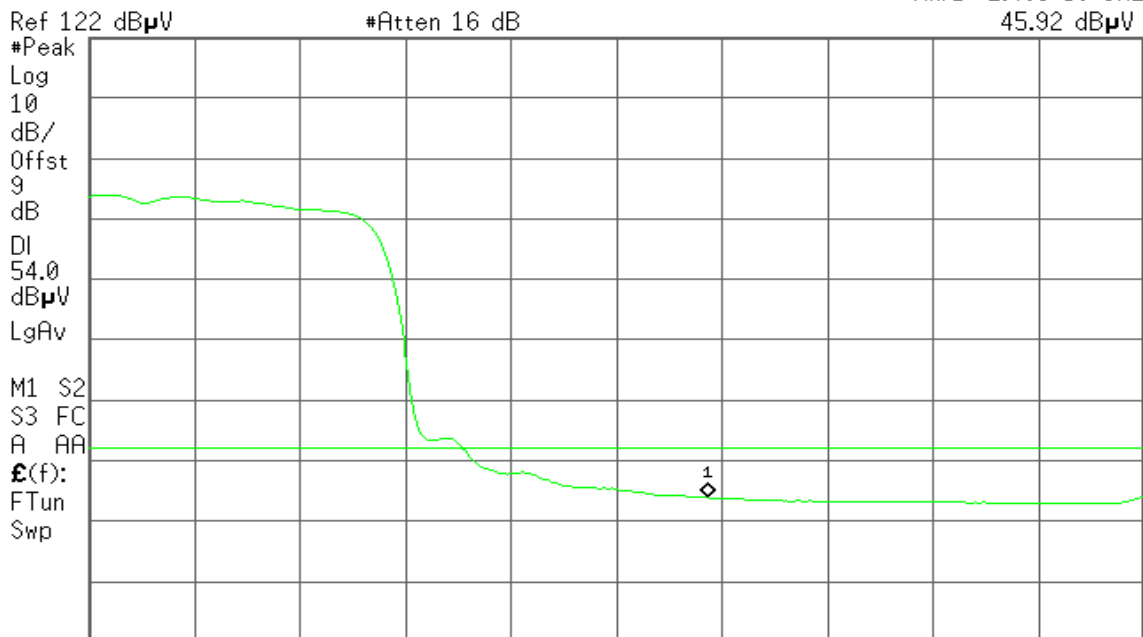
Detector mode: Average

Polarity: Vertical

Agilent 02:14:59 Apr 24, 2010

R L

Mkr1 2.483 50 GHz  
45.92 dBμV



Start 2.460 00 GHz Stop 2.500 00 GHz  
#Res BW 1 MHz #VBW 10 Hz Sweep 3.119 s (601 pts)





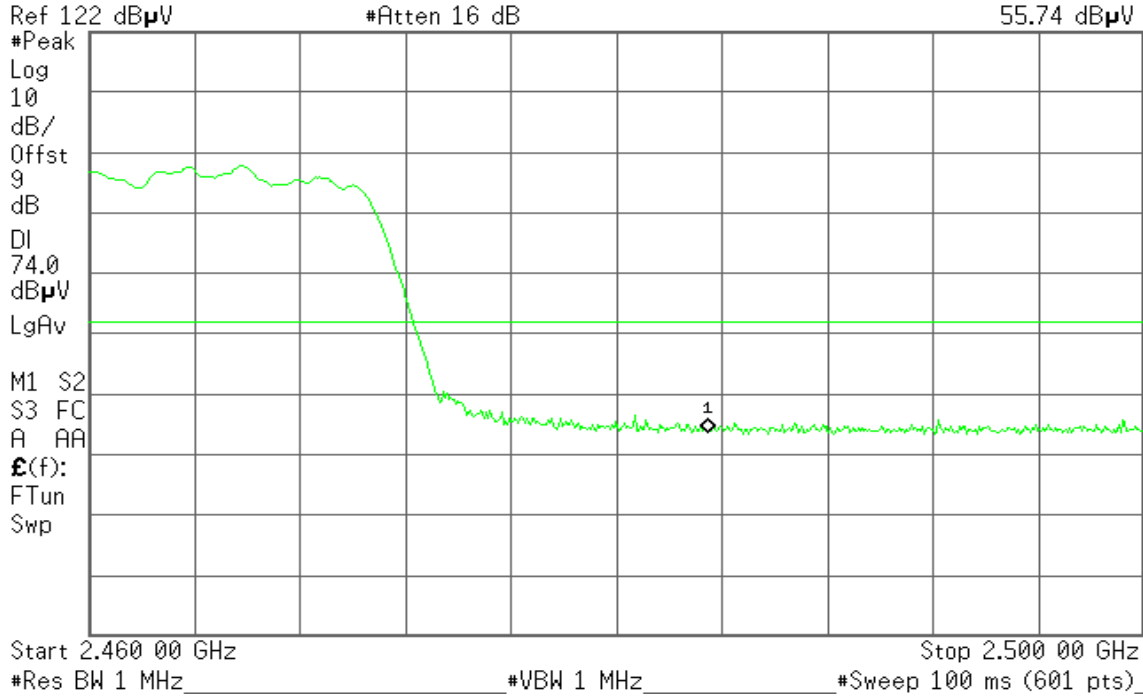
Detector mode: Peak

Polarity: Horizontal

Agilent 02:10:37 Apr 24, 2010

R T

Mkr1 2.483 50 GHz  
55.74 dBμV



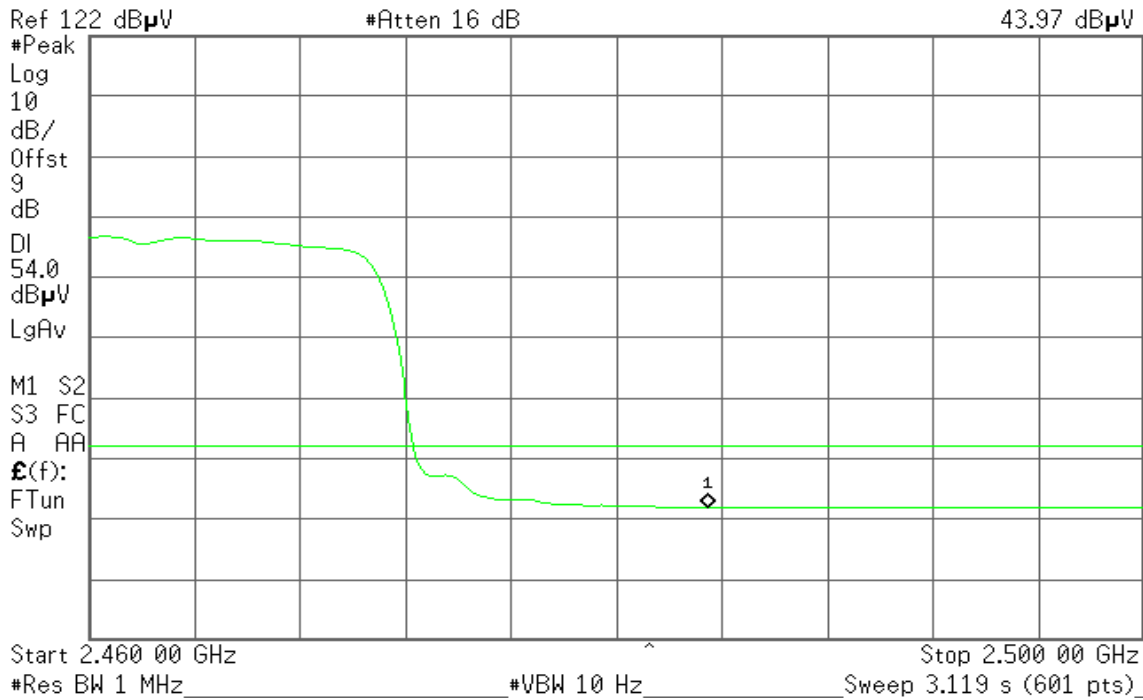
Detector mode: Average

Polarity: Horizontal

Agilent 02:09:59 Apr 24, 2010

R L

Mkr1 2.483 50 GHz  
43.97 dBμV





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

Detector mode: Peak

Polarity: Vertical

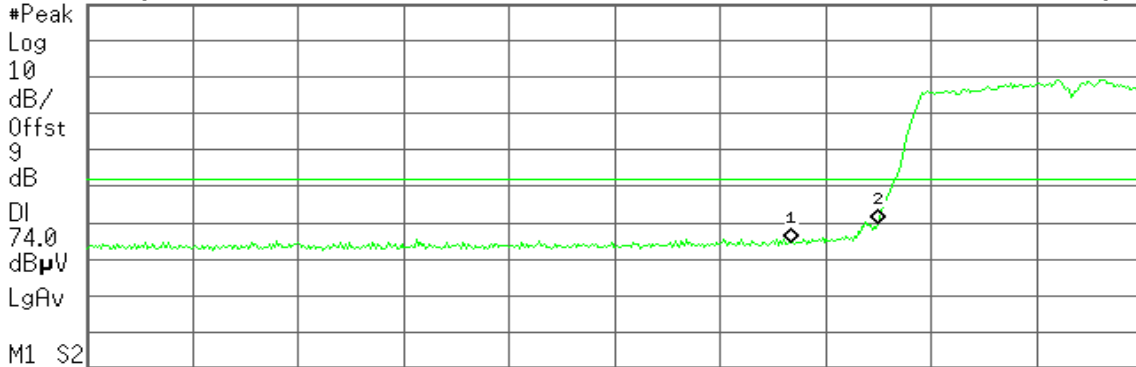
Agilent 02:35:01 Apr 24, 2010

R L

Mkr2 2.400 0 GHz  
61.83 dBµV

Ref 122 dBµV

#Atten 16 dB



Start 2.310 0 GHz

Stop 2.430 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	56.47 dBµU
2	(1)	Freq	2.400 0 GHz	61.83 dBµU

Detector mode: Average

Polarity: Vertical

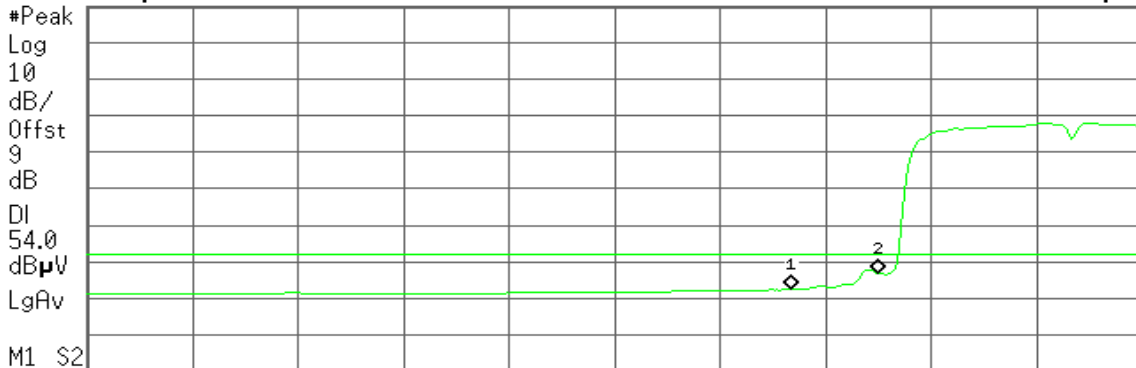
Agilent 02:35:24 Apr 24, 2010

R L

Mkr2 2.400 0 GHz  
48.94 dBµV

Ref 122 dBµV

#Atten 16 dB



Start 2.310 0 GHz

Stop 2.430 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 9.357 s (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	44.40 dBµU
2	(1)	Freq	2.400 0 GHz	48.94 dBµU



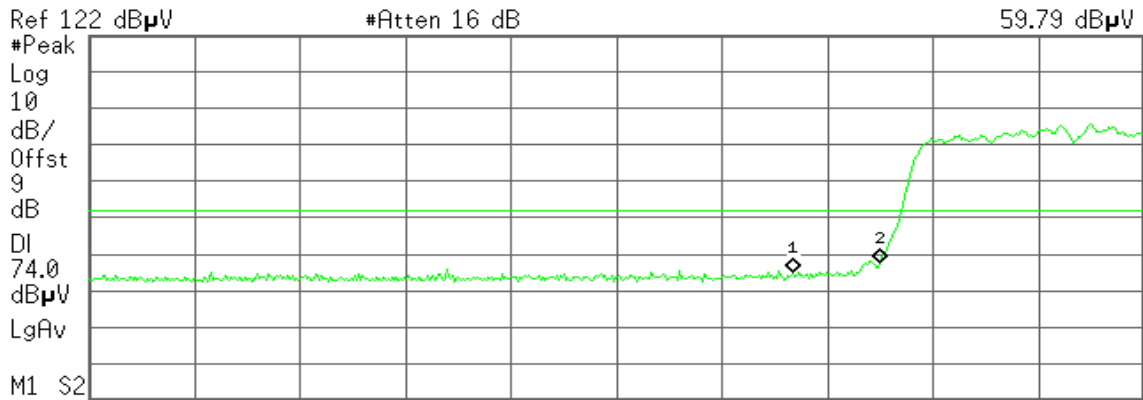
**Detector mode: Peak**

**Polarity: Horizontal**

Agilent 02:36:55 Apr 24, 2010

R T

Mkr2 2.400 0 GHz  
59.79 dBμV



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	56.87 dBμU
2	(1)	Freq	2.400 0 GHz	59.79 dBμU

#Res BW 1 MHz #VBW 1 MHz #Sweep 100 ms (601 pts)

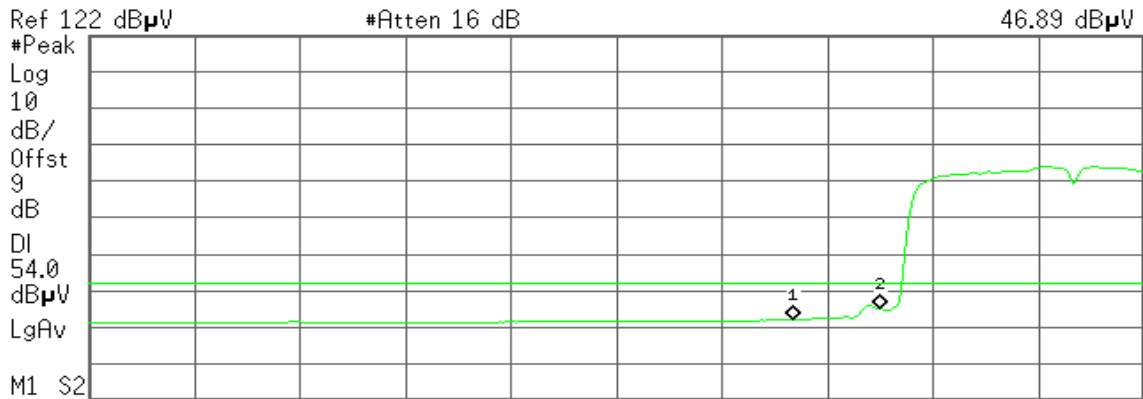
**Detector mode: Average**

**Polarity: Horizontal**

Agilent 02:36:26 Apr 24, 2010

R L

Mkr2 2.400 0 GHz  
46.89 dBμV



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 0 GHz	44.82 dBμU
2	(1)	Freq	2.400 0 GHz	46.89 dBμU

#Res BW 1 MHz #VBW 10 Hz Sweep 9.357 s (601 pts)



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

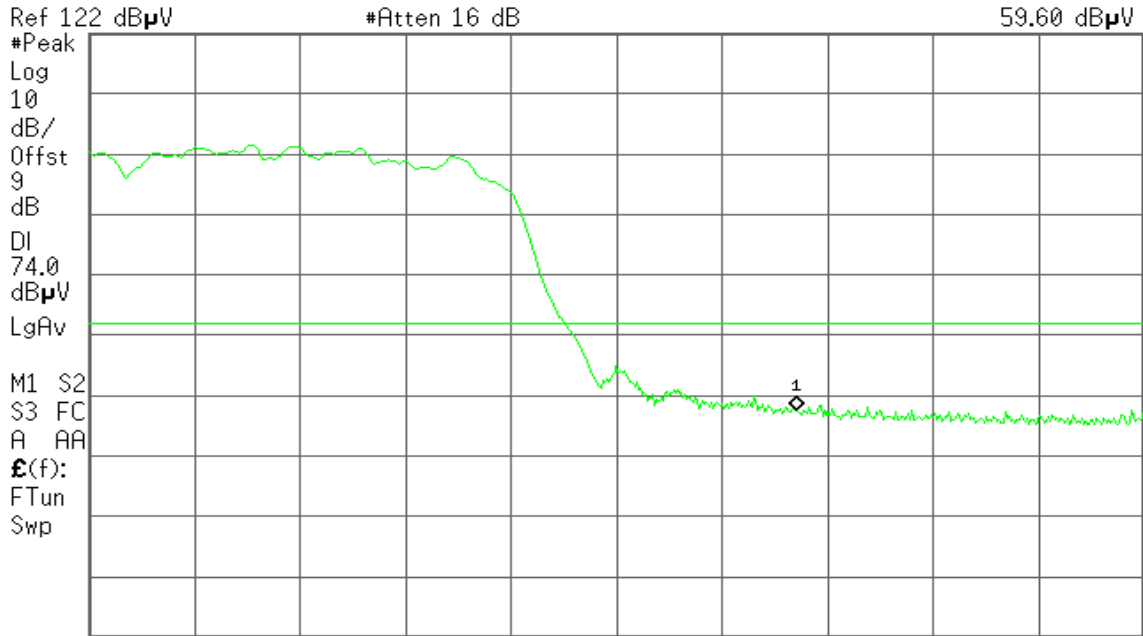
Detector mode: Peak

Polarity: Vertical

Agilent 02:47:13 Apr 24, 2010

R T

Mkr1 2.483 50 GHz  
59.60 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz  
#Res BW 1 MHz #VBW 1 MHz #Sweep 100 ms (601 pts)

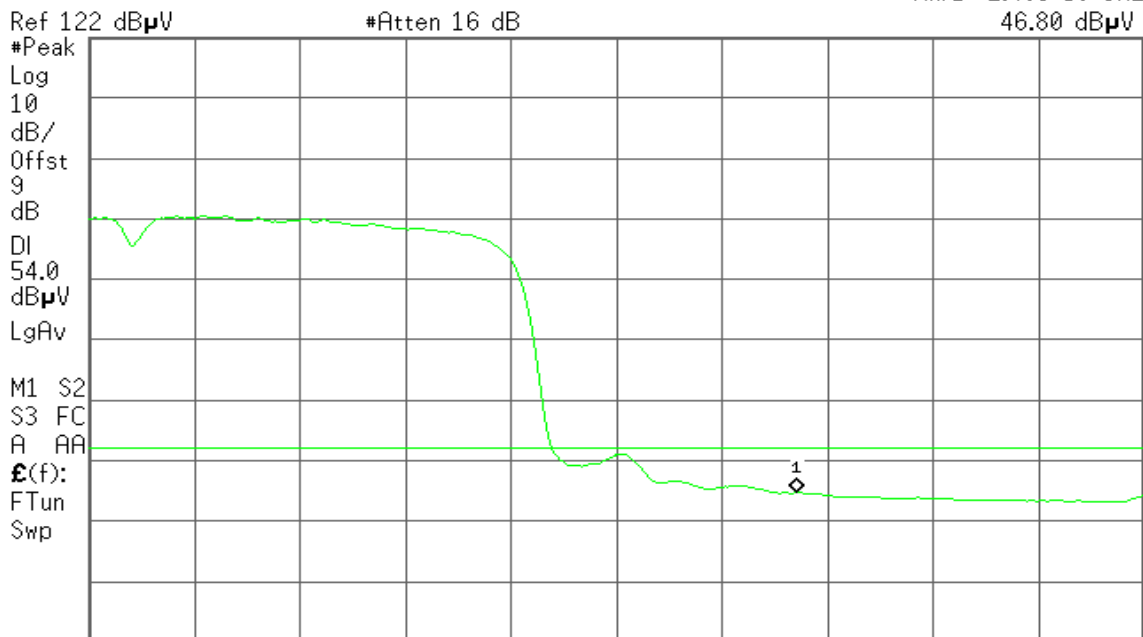
Detector mode: Average

Polarity: Vertical

Agilent 02:46:14 Apr 24, 2010

R T

Mkr1 2.483 50 GHz  
46.80 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz  
#Res BW 1 MHz #VBW 10 Hz Sweep 3.899 s (601 pts)



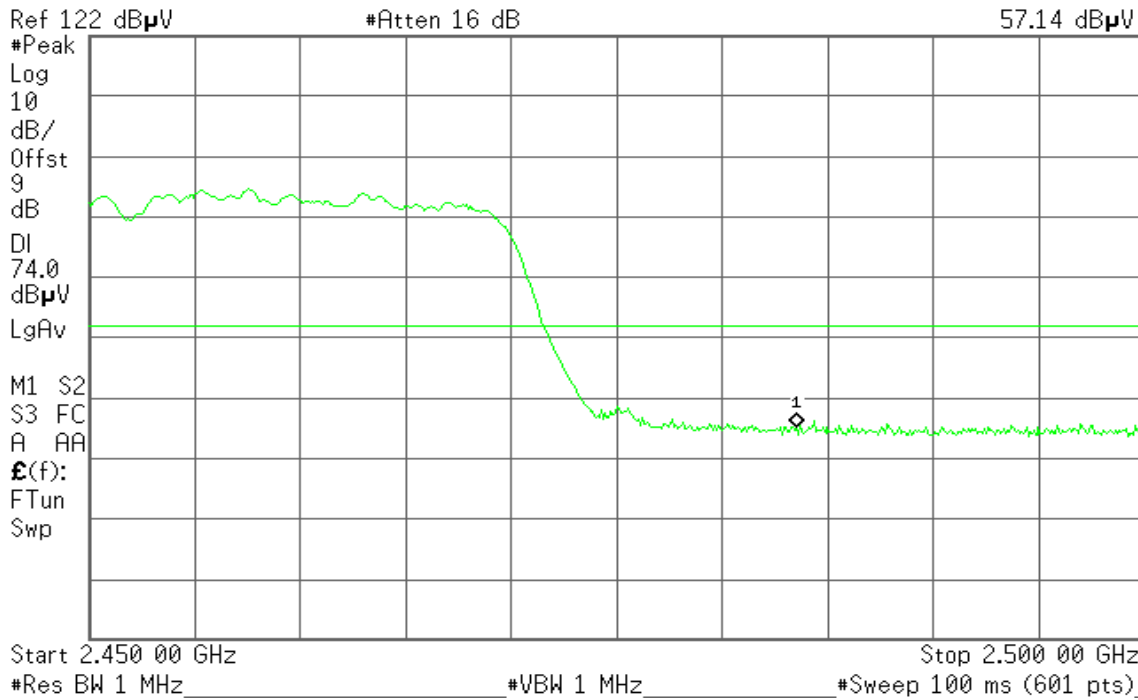
Detector mode: Peak

Polarity: Horizontal

Agilent 02:44:13 Apr 24, 2010

R T

Mkr1 2.483 50 GHz  
57.14 dBµV



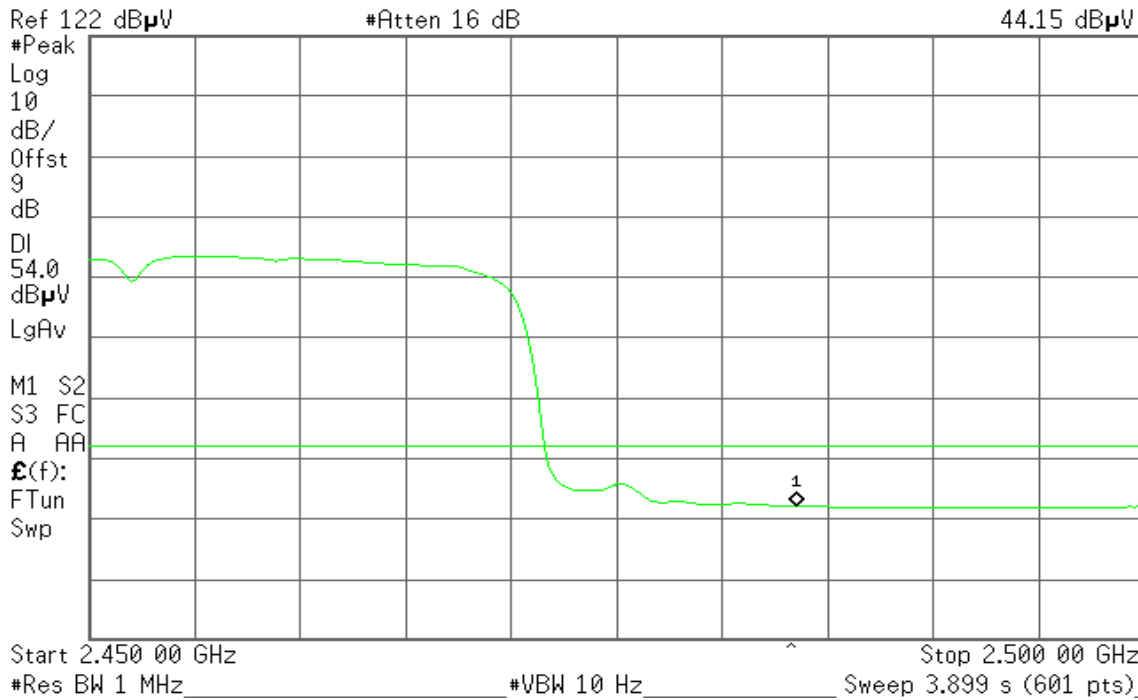
Detector mode: Average

Polarity: Horizontal

Agilent 02:44:40 Apr 24, 2010

R T

Mkr1 2.483 50 GHz  
44.15 dBµV

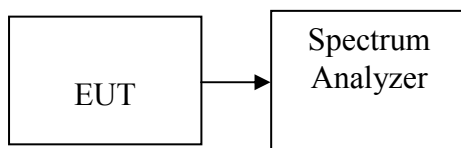


## 7.5 PEAK POWER SPECTRAL DENSITY

### 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)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-13.49	8.00	PASS
Mid	2437	-13.28		PASS
High	2462	-13.93		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-18.98	8.00	PASS
Mid	2437	-19.49		PASS
High	2462	-19.32		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	-20.63	-17.80	-22.33	-15.07	5.23	PASS
Mid	2437	-20.65	-19.65	-19.72	-15.21		PASS
High	2462	-20.69	-19.02	-19.92	-15.05		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	-20.04	-19.04	-21.31	-15.26	5.23	PASS
Mid	2437	-22.35	-18.17	-20.55	-15.25		PASS
High	2452	-20.86	-18.43	-20.62	-15.05		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 8.77dBi; therefore the reduction due to antenna gain is 2.77dBi, so the limit is 5.23dBm.



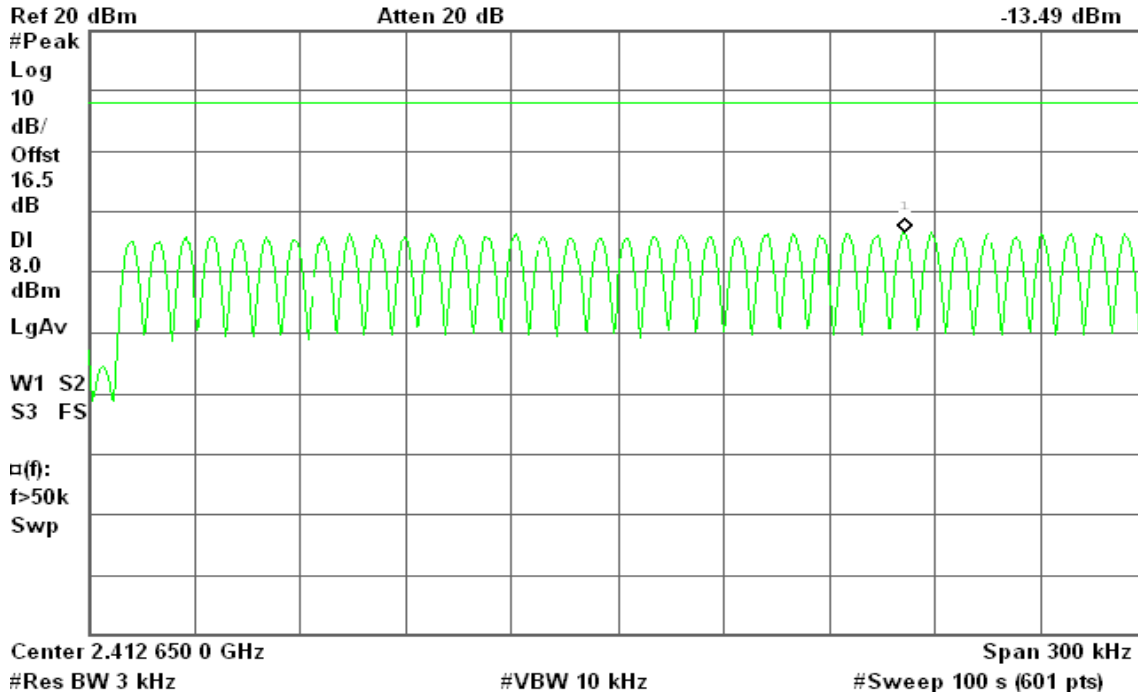
### Test Plot

### IEEE 802.11b mode

### PPSD (CH Low)

Agilent 11:22:39 Apr 26, 2010

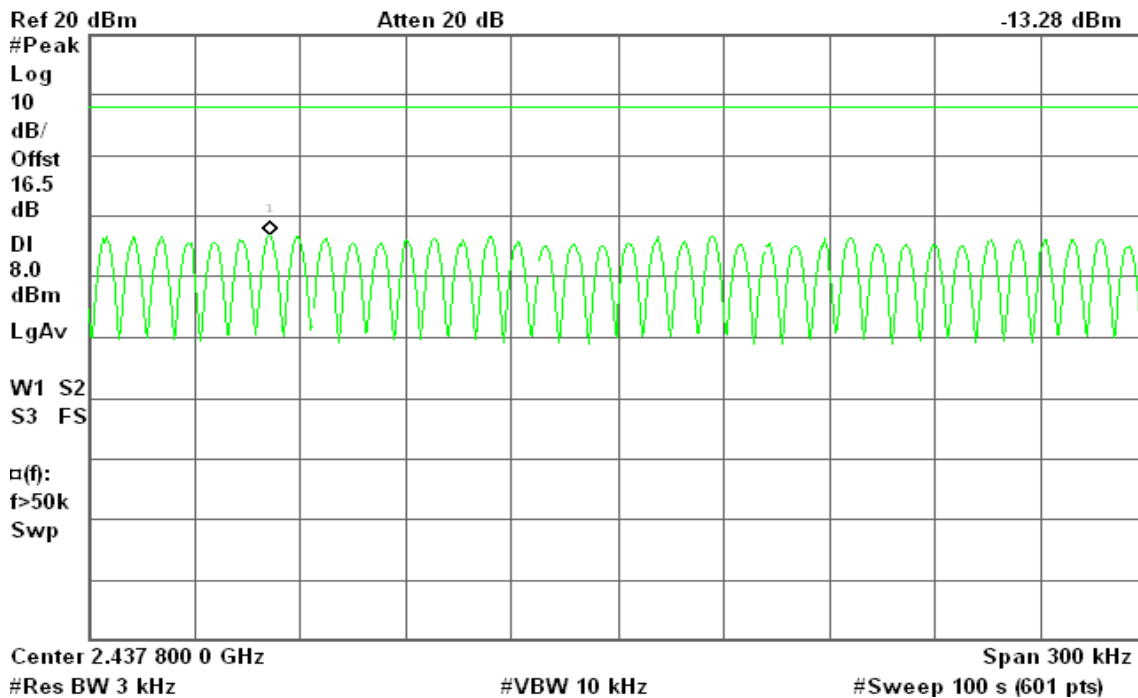
R T  
Mkr1 2.412 731 6 GHz  
-13.49 dBm



### PPSD (CH Mid)

Agilent 11:28:45 Apr 26, 2010

R L  
Mkr1 2.437 700 8 GHz  
-13.28 dBm





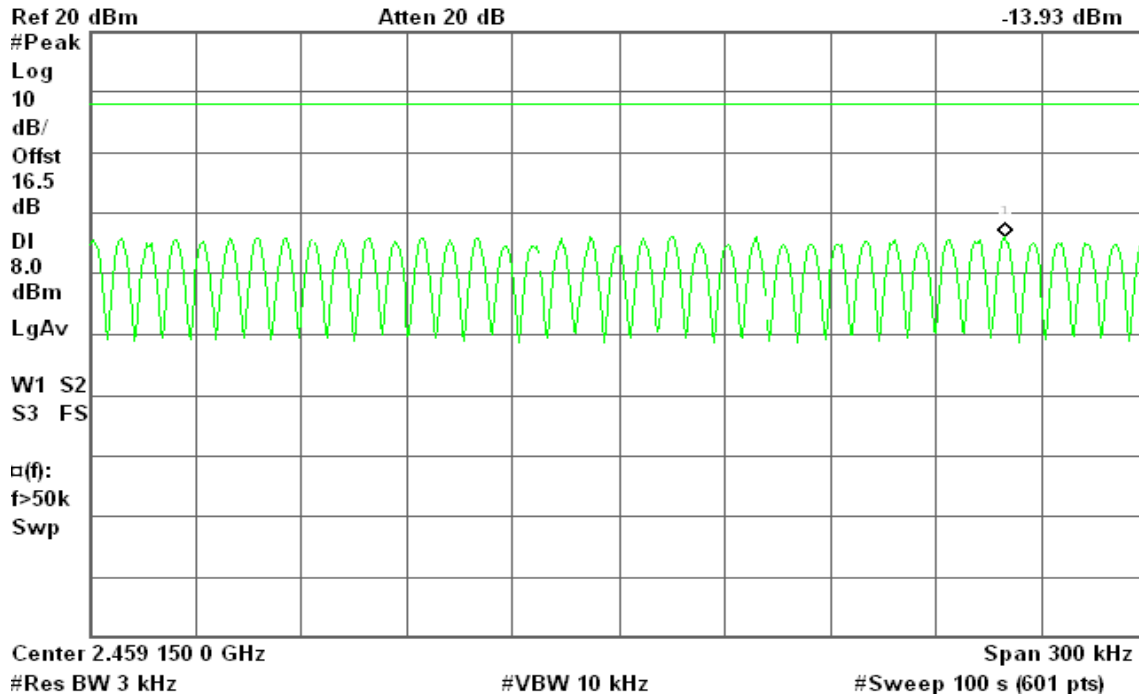


### PPSD (CH High)

Agilent 11:47:36 Apr 26, 2010

R T

Mkr1 2.459 259 6 GHz  
-13.93 dBm





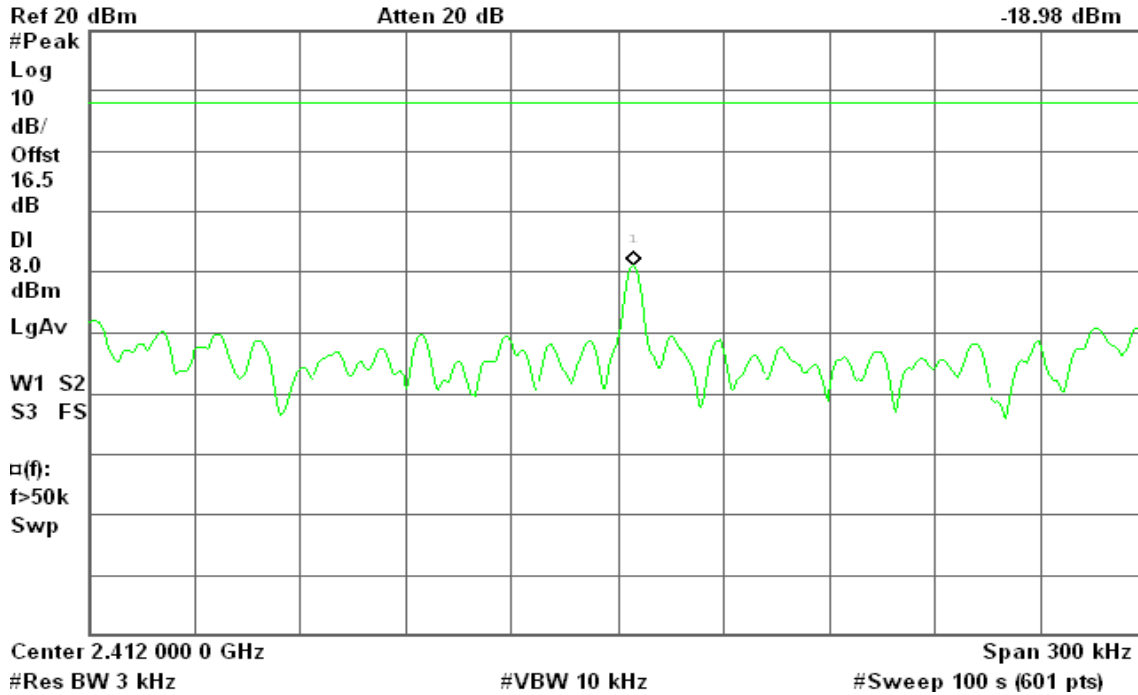
### IEEE 802.11g mode

#### PPSD (CH Low)

Agilent 14:18:10 Apr 26, 2010

R T

Mkr1 2.412 004 5 GHz  
-18.98 dBm

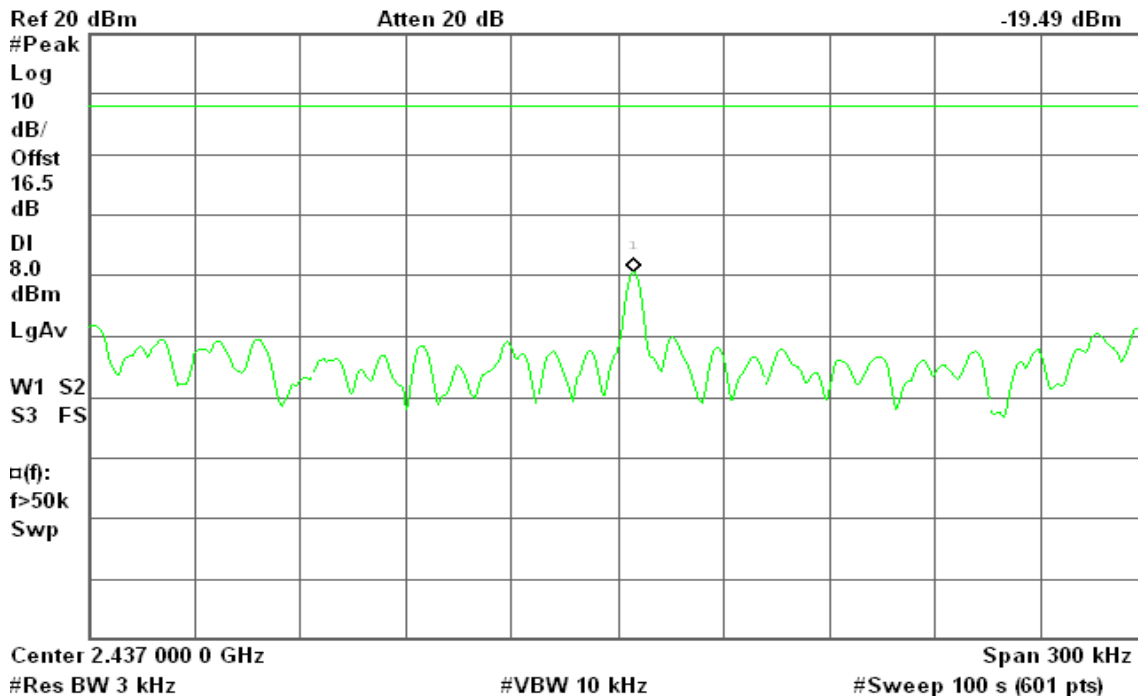


#### PPSD (CH Mid)

Agilent 14:24:49 Apr 26, 2010

R T

Mkr1 2.437 004 5 GHz  
-19.49 dBm



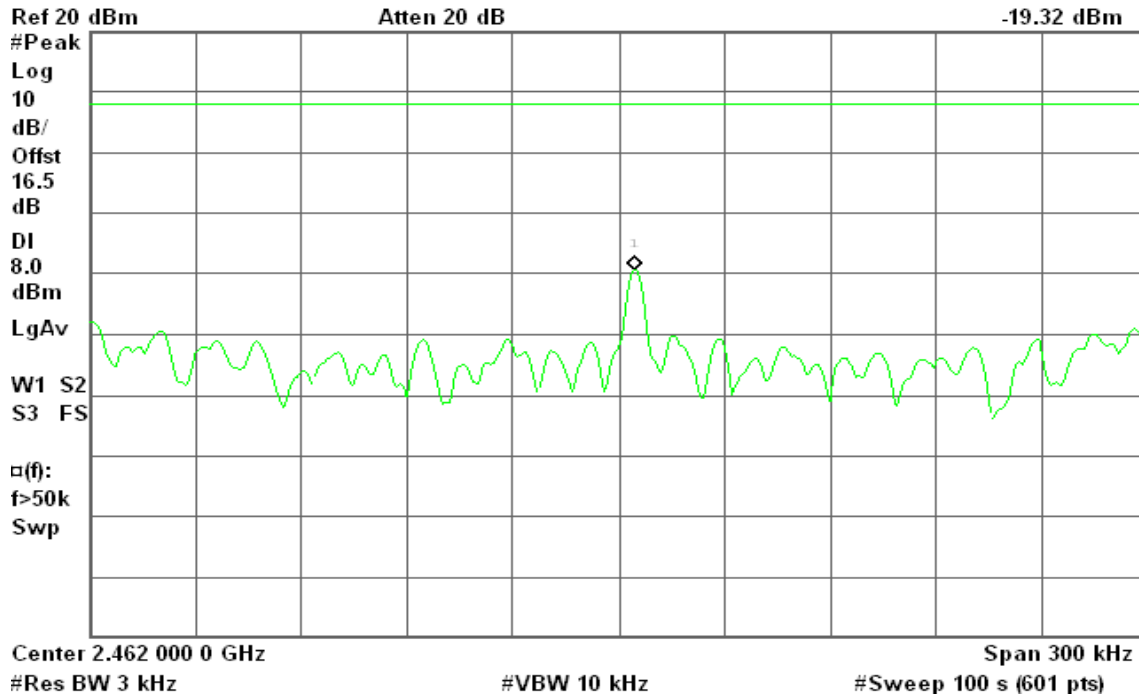


### PPSD (CH High)

Agilent 14:31:24 Apr 26, 2010

R T

Mkr1 2.462 004 5 GHz  
-19.32 dBm





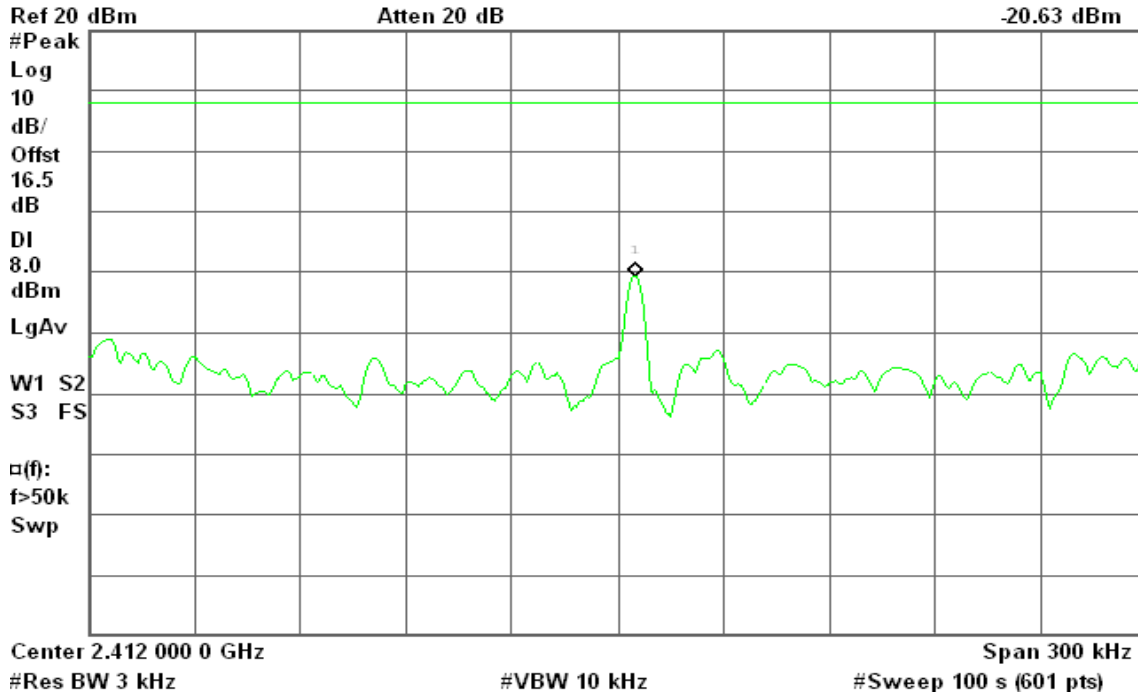
**draft 802.11n Standard-20 MHz Channel mode / Chain 0**

**PPSD (CH Low)**

Agilent 14:42:32 Apr 26, 2010

R T

Mkr1 2.412 005 0 GHz  
-20.63 dBm

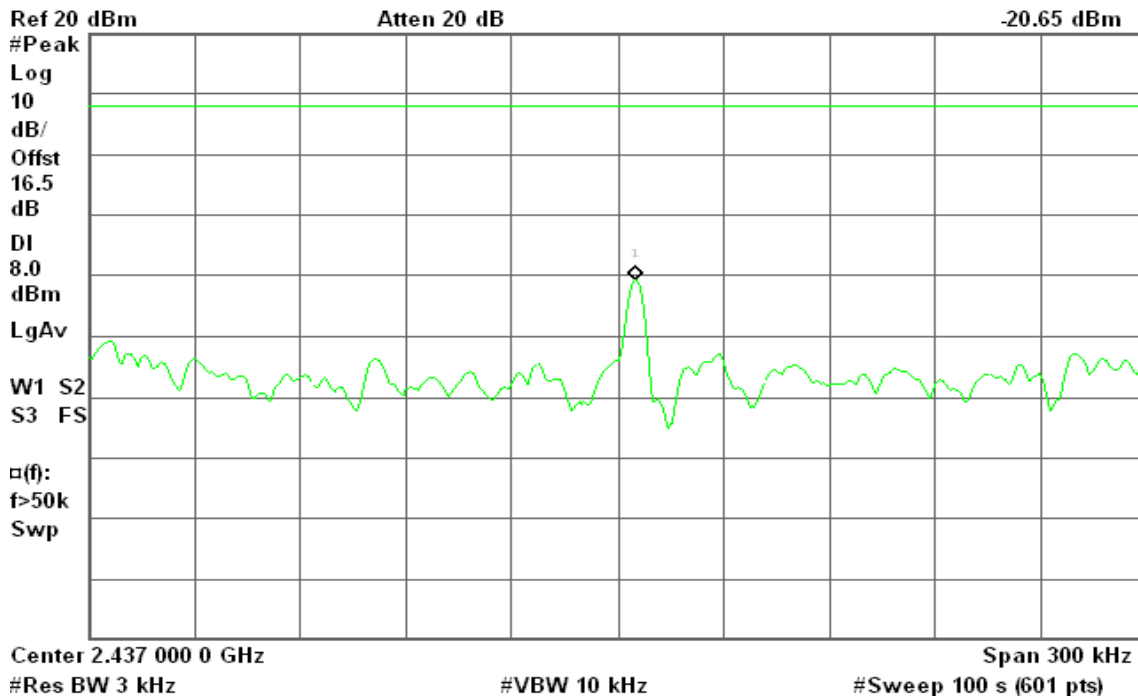


**PPSD (CH Mid)**

Agilent 15:03:49 Apr 26, 2010

R T

Mkr1 2.437 005 0 GHz  
-20.65 dBm



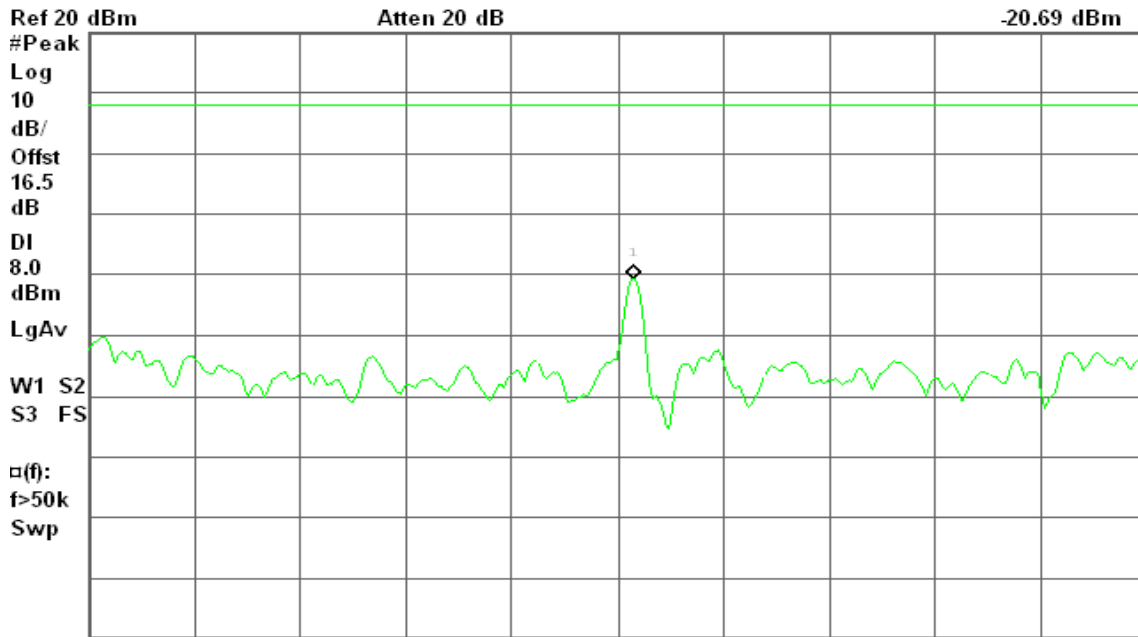


### PPSD (CH High)

Agilent 15:21:15 Apr 26, 2010

R T

Mkr1 2.462 004 5 GHz  
-20.69 dBm



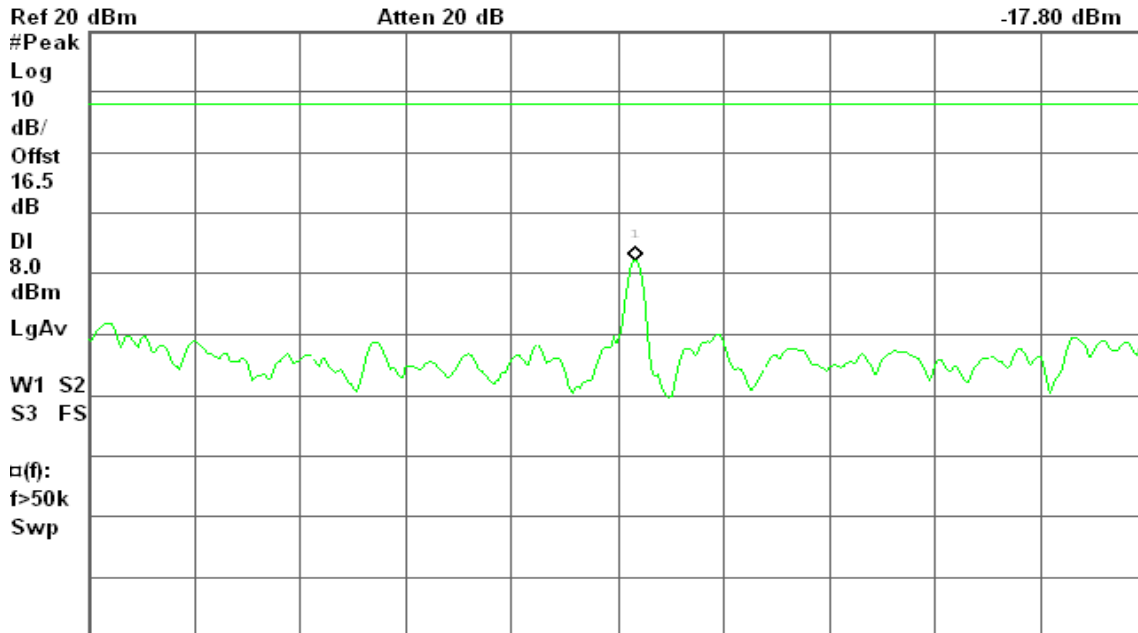
### draft 802.11n Standard-20 MHz Channel mode / Chain 1

### PPSD (CH Low)

Agilent 14:48:35 Apr 26, 2010

R L

Mkr1 2.412 005 0 GHz  
-17.80 dBm



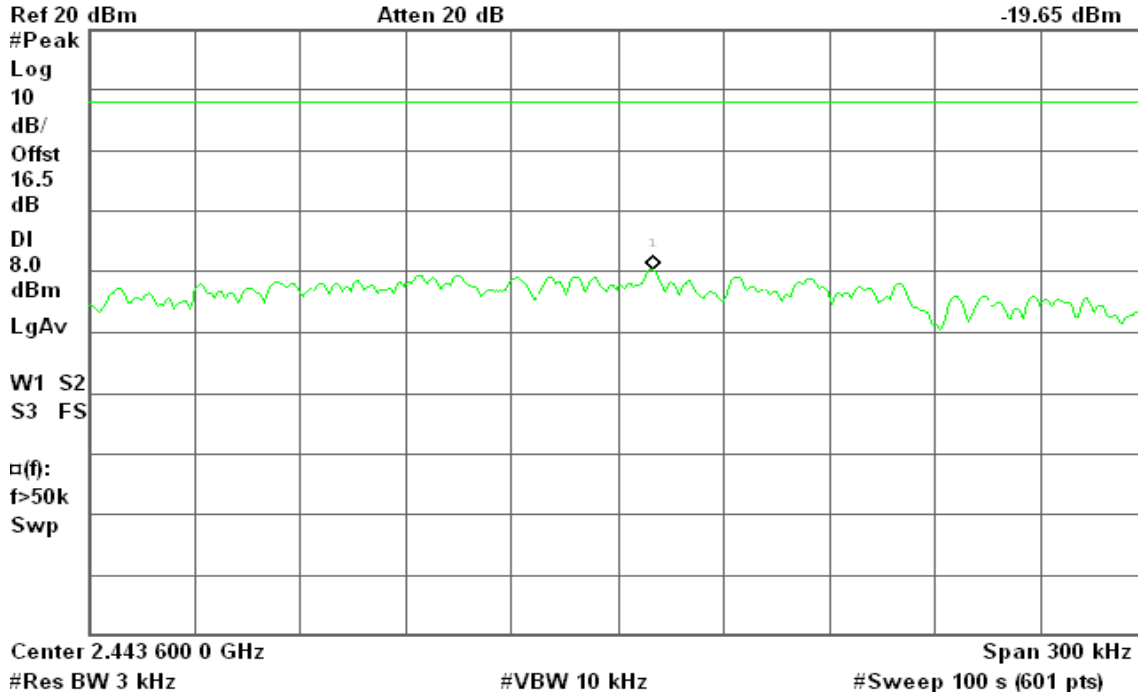


### PPSD (CH Mid)

Agilent 15:08:32 Apr 26, 2010

R T

Mkr1 2.443 610 0 GHz  
-19.65 dBm

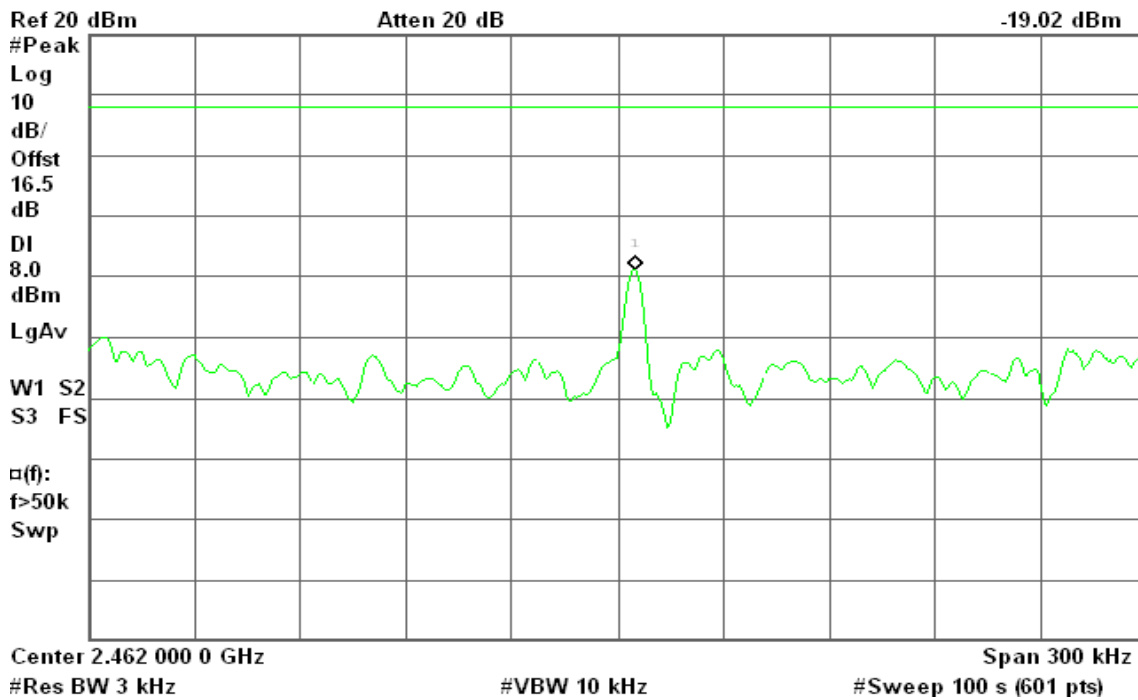


### PPSD (CH High)

Agilent 15:26:26 Apr 26, 2010

R T

Mkr1 2.462 005 0 GHz  
-19.02 dBm





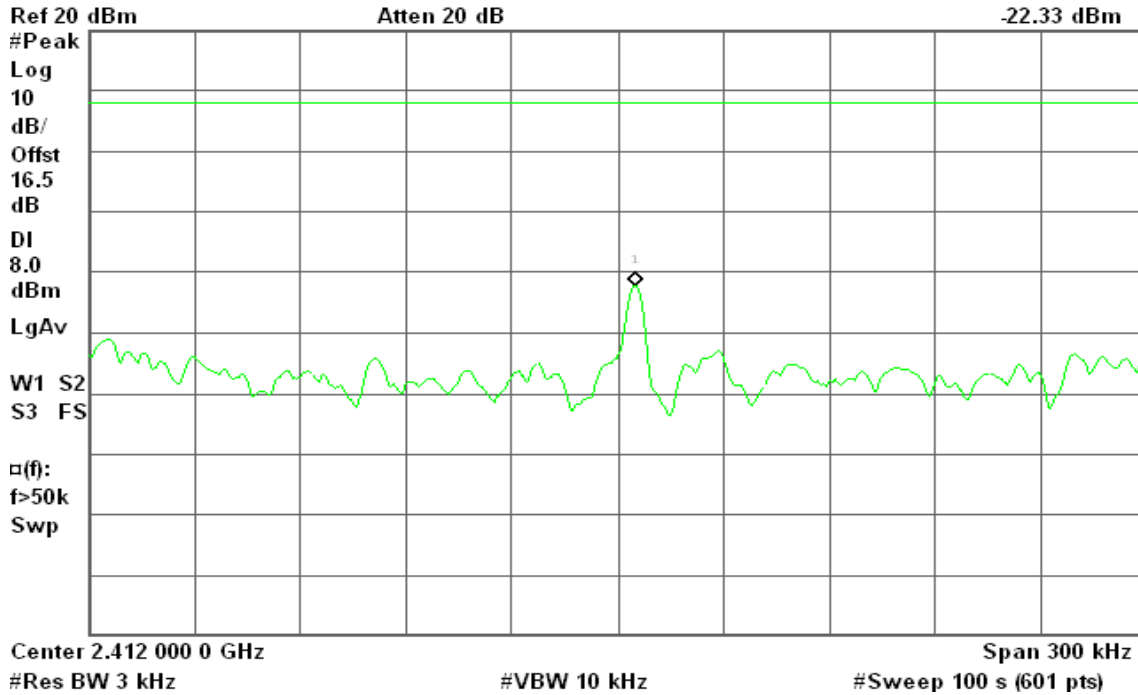
### draft 802.11n Standard-20 MHz Channel mode / Chain 2

#### PPSD (CH Low)

Agilent 14:53:40 Apr 26, 2010

R T

Mkr1 2.412 005 0 GHz  
-22.33 dBm

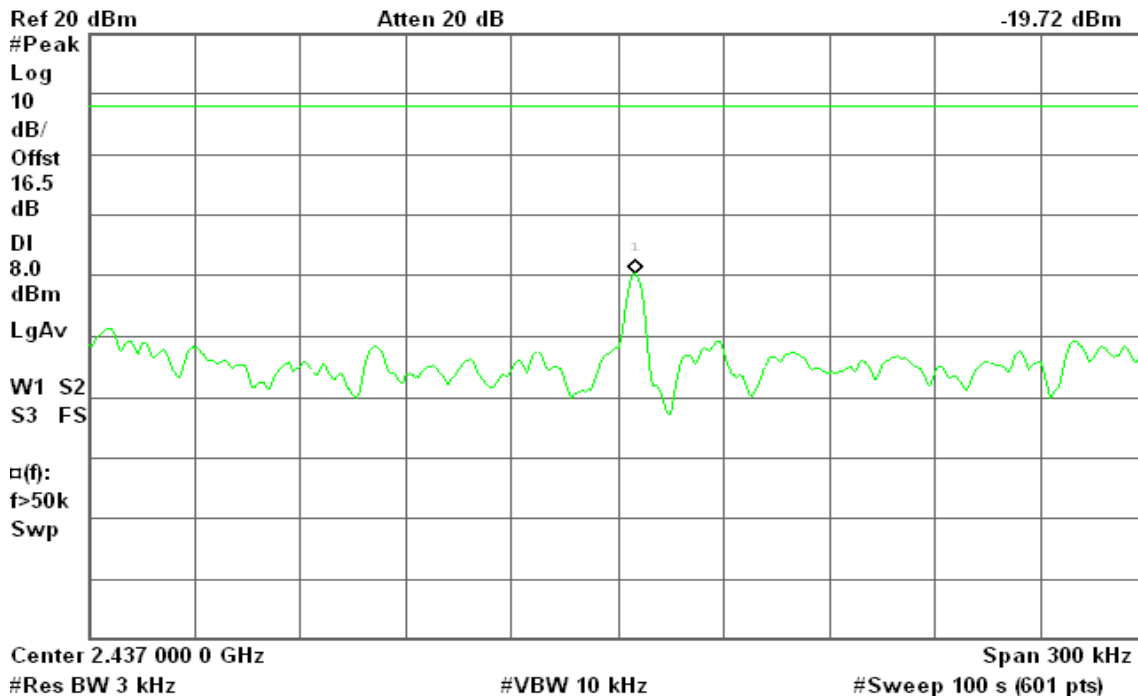


#### PPSD (CH Mid)

Agilent 15:14:56 Apr 26, 2010

R T

Mkr1 2.437 005 0 GHz  
-19.72 dBm



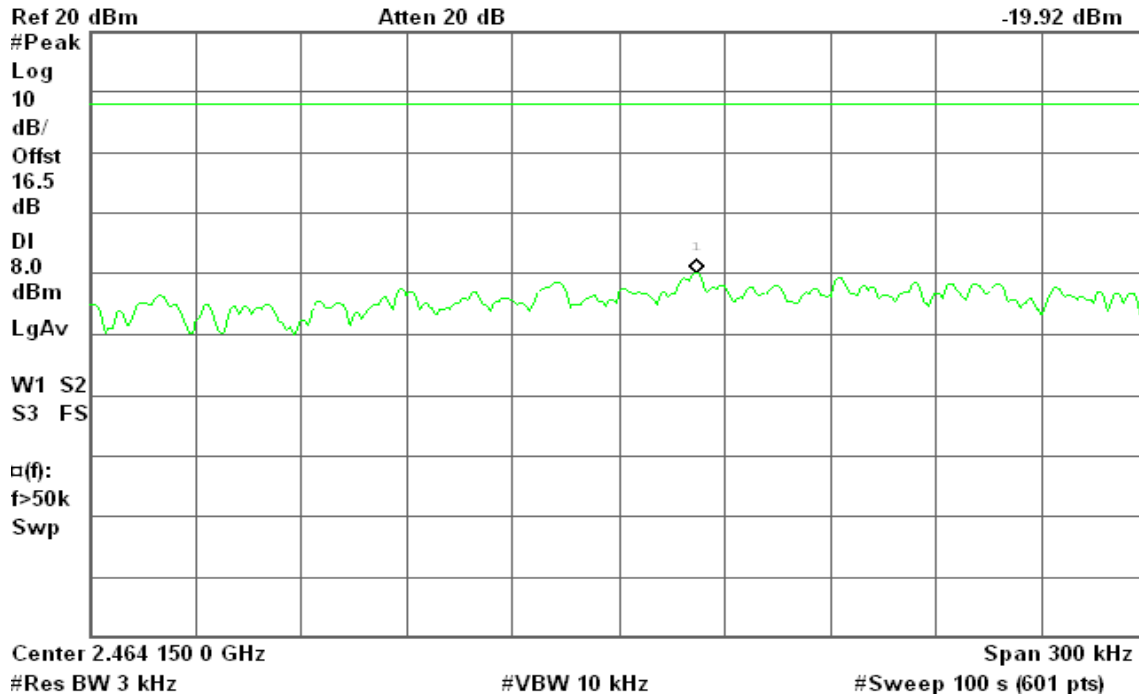


### PPSD (CH High)

Agilent 15:31:02 Apr 26, 2010

R T

Mkr1 2.464 172 1 GHz  
-19.92 dBm







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

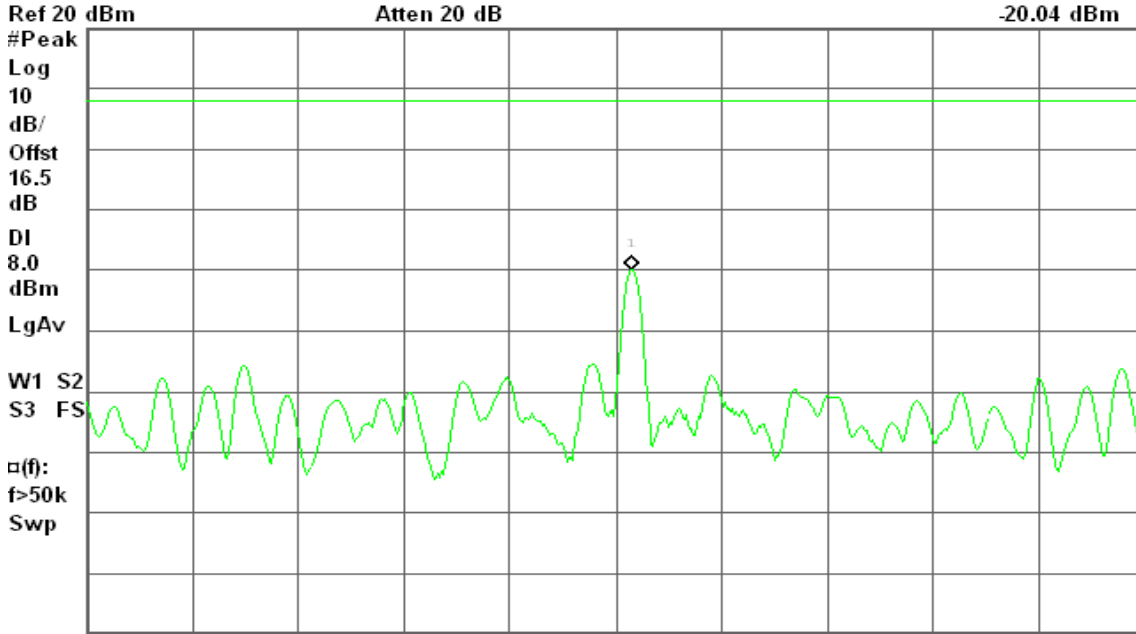
**PPSD (CH Low)**

Agilent 16:09:48 Apr 26, 2010

R T

Mkr1 2.422 004 5 GHz

-20.04 dBm



Center 2.422 000 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)

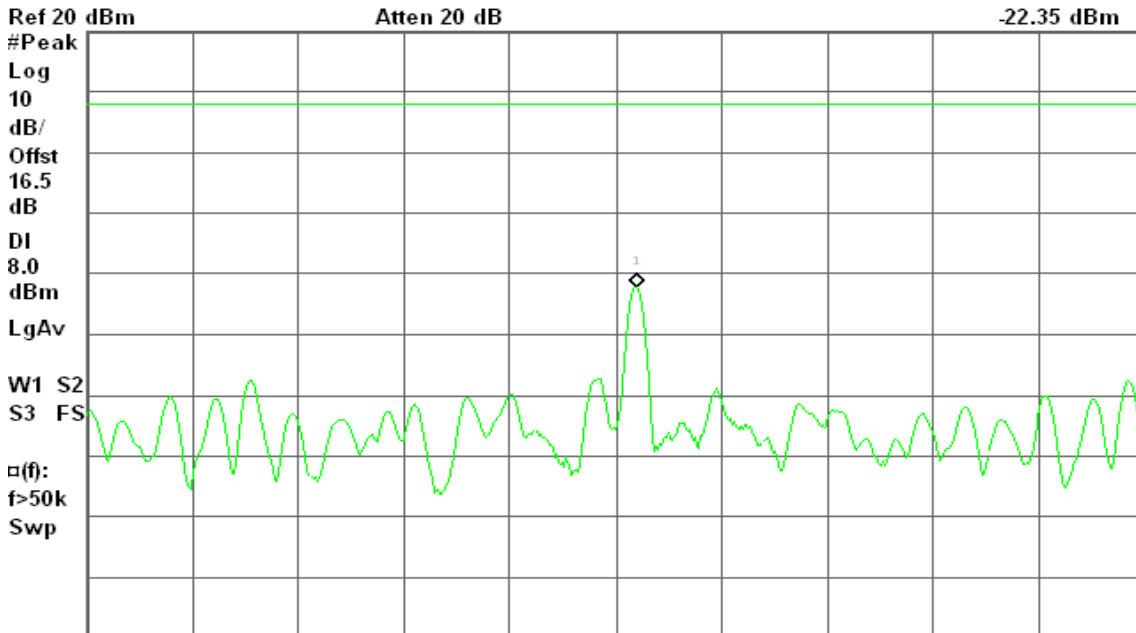
**PPSD (CH Mid)**

Agilent 16:40:28 Apr 26, 2010

R T

Mkr1 2.437 006 0 GHz

-22.35 dBm



Center 2.437 000 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)

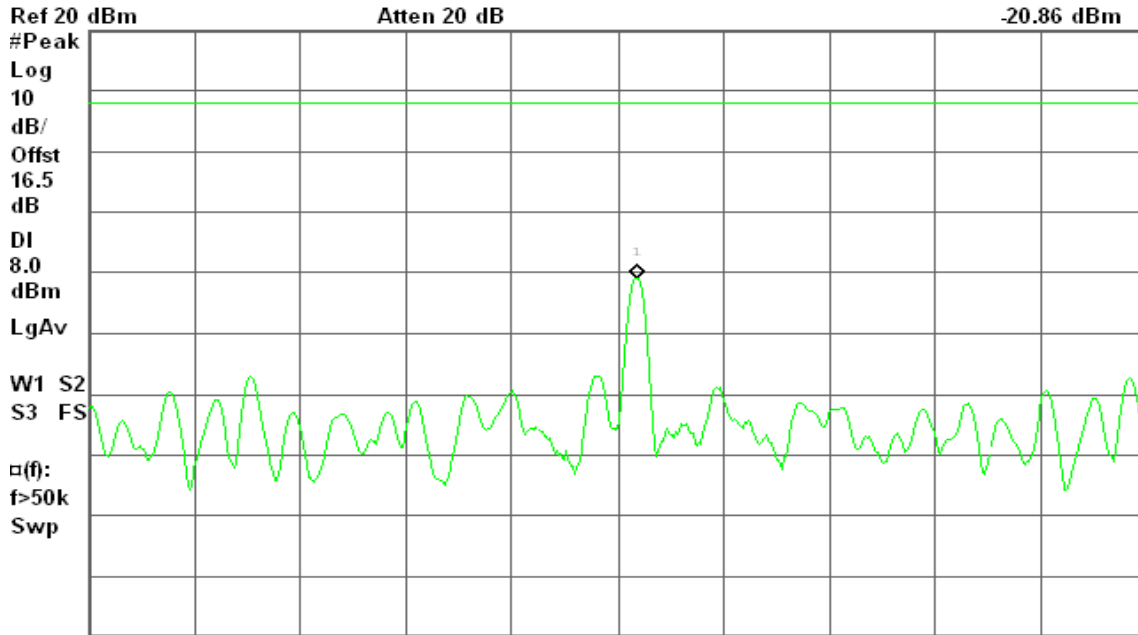


### PPSD (CH High)

Agilent 16:48:38 Apr 26, 2010

R T

Mkr1 2.452 005 5 GHz  
-20.86 dBm



Center 2.452 000 0 GHz      Span 300 kHz  
#Res BW 3 kHz      #VBW 10 kHz      #Sweep 100 s (601 pts)

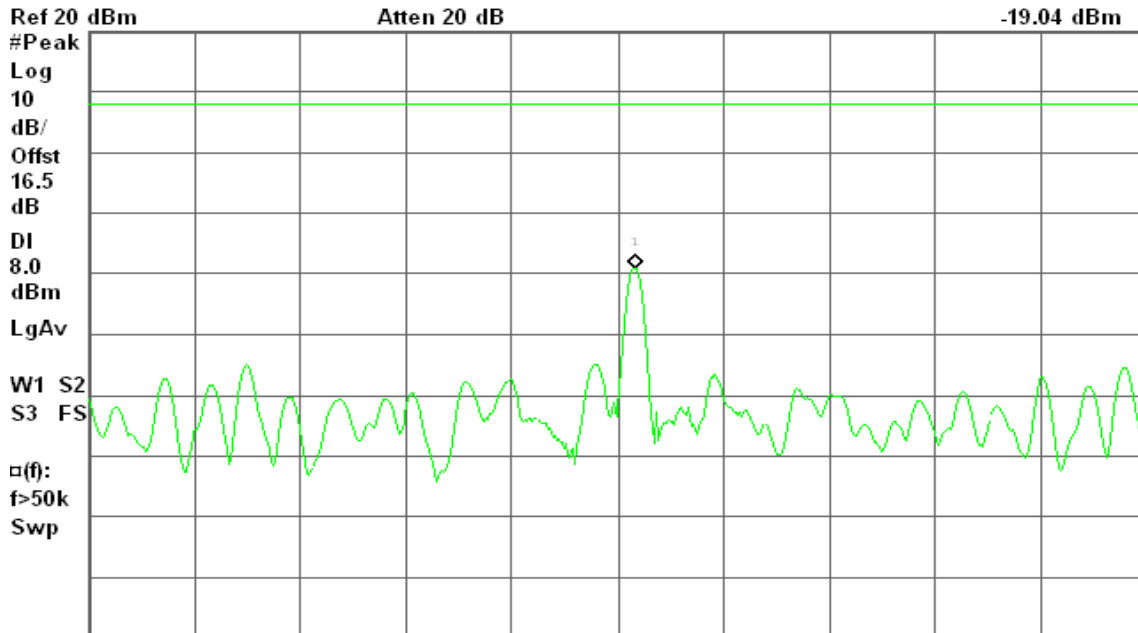
### draft 802.11n Wide-40 MHz Channel mode / Chain 1

### PPSD (CH Low)

Agilent 16:15:32 Apr 26, 2010

R T

Mkr1 2.422 005 0 GHz  
-19.04 dBm



Center 2.422 000 0 GHz      Span 300 kHz  
#Res BW 3 kHz      #VBW 10 kHz      #Sweep 100 s (601 pts)





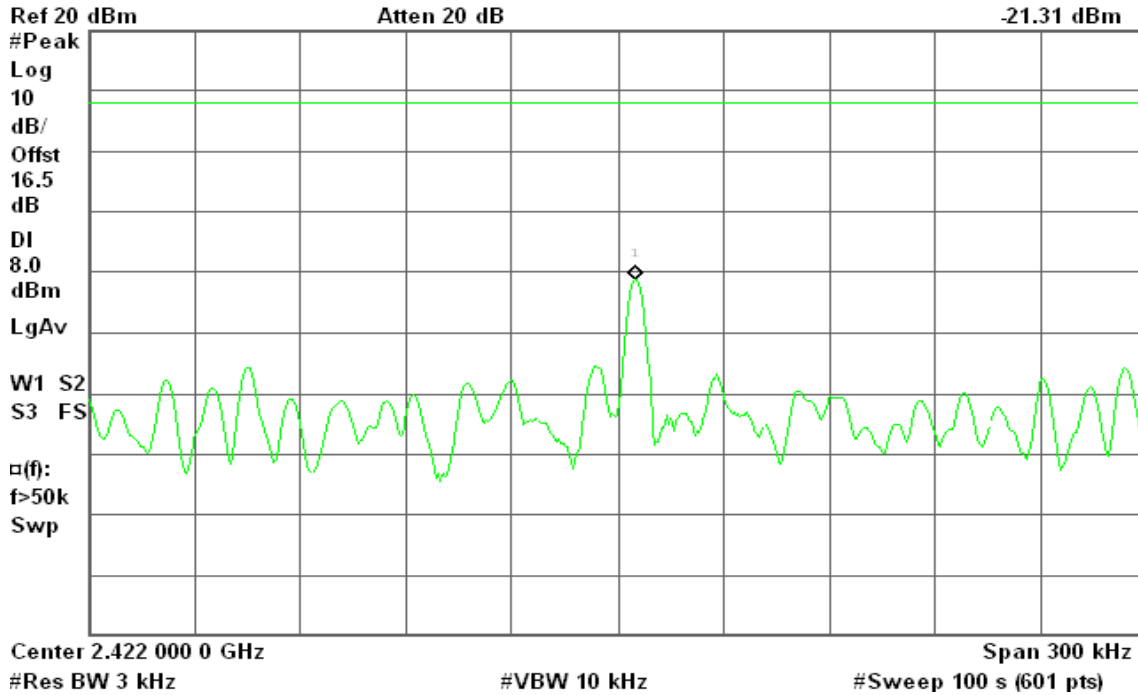
**draft 802.11n Wide-40 MHz Channel mode / Chain 2**

**PPSD (CH Low)**

Agilent 16:21:13 Apr 26, 2010

R T

Mkr1 2.422 005 0 GHz  
-21.31 dBm

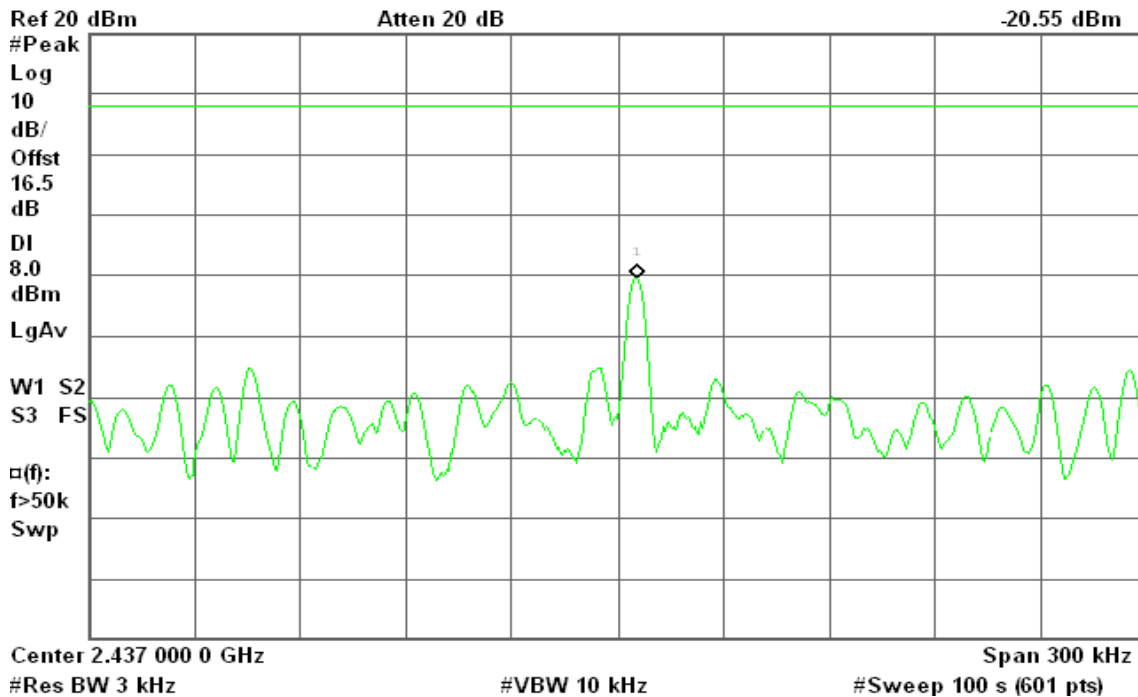


**PPSD (CH Mid)**

Agilent 16:28:49 Apr 26, 2010

R T

Mkr1 2.437 005 5 GHz  
-20.55 dBm



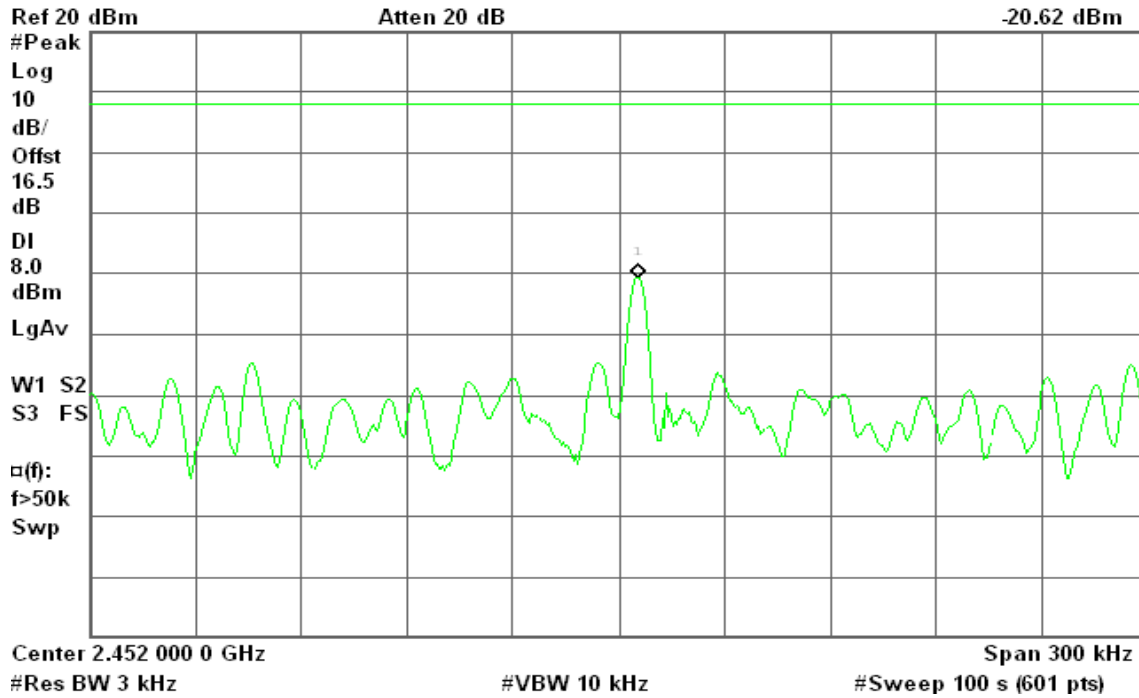


### PPSD (CH High)

Agilent 17:00:22 Apr 26, 2010

R T

Mkr1 2.452 005 5 GHz  
-20.62 dBm



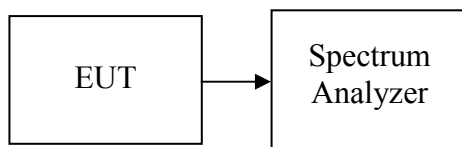
## 7.6 SPURIOUS EMISSIONS

### 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*



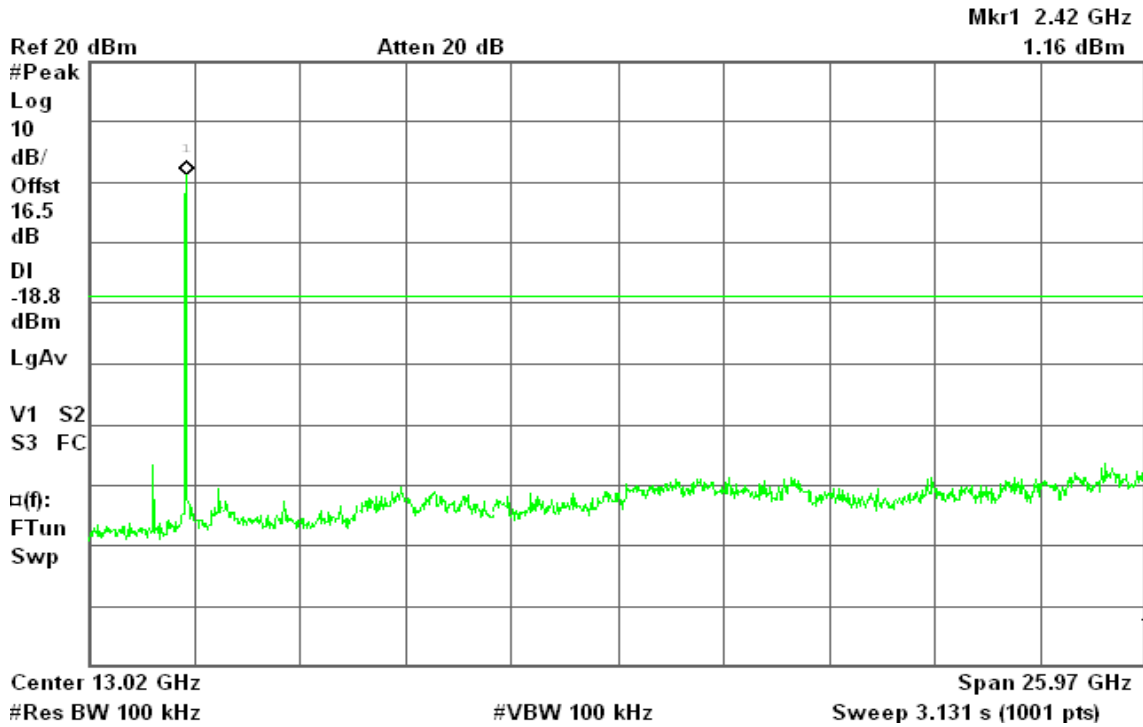
**Test Plot**

**IEEE 802.11b mode**

**CH Low**

Agilent 11:23:21 Apr 26, 2010

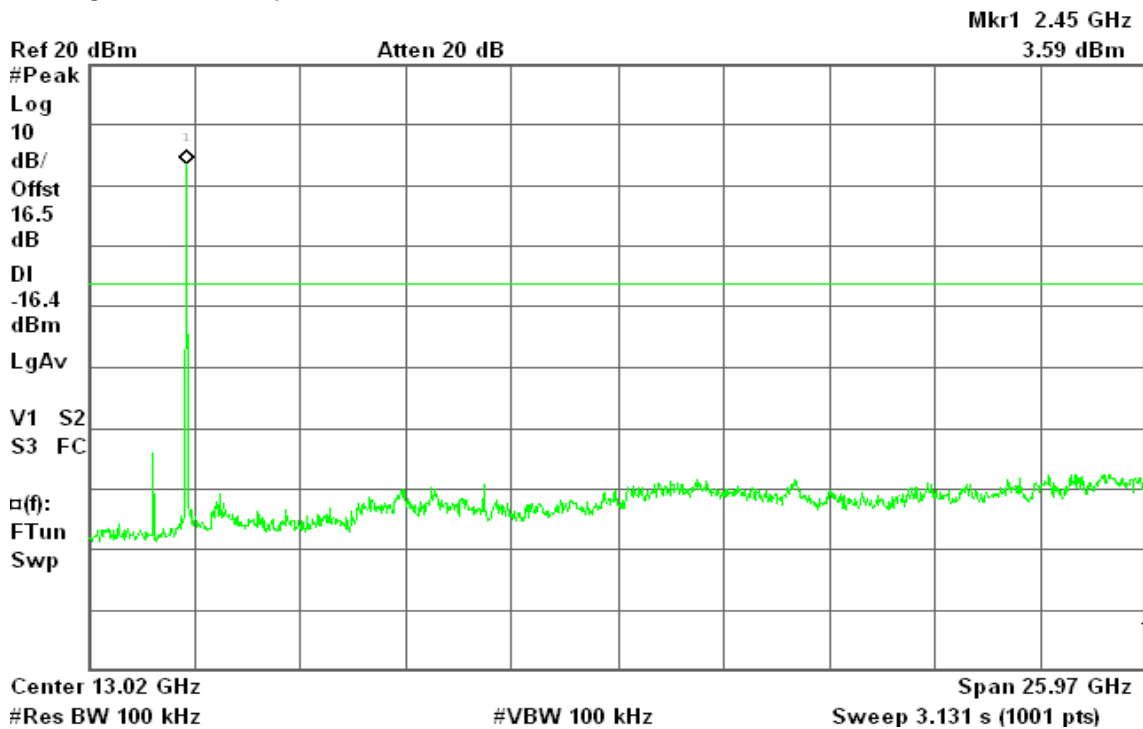
R T



**CH Mid**

Agilent 11:29:48 Apr 26, 2010

R L



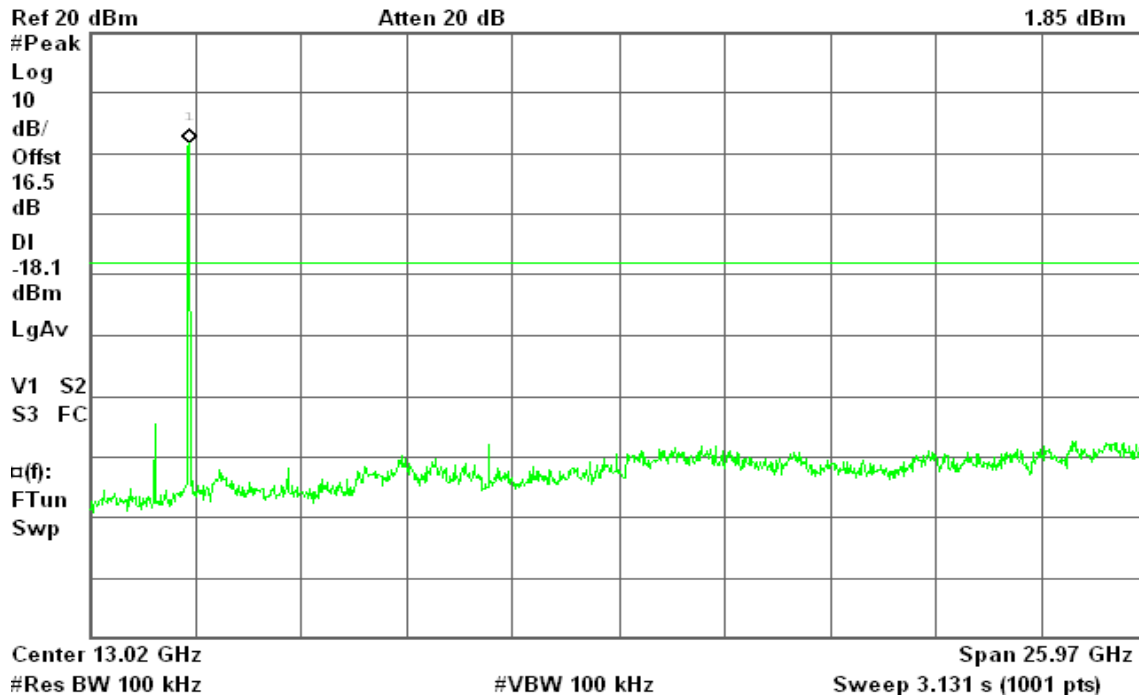


### CH High

Agilent 11:48:10 Apr 26, 2010

R T

Mkr1 2.47 GHz  
1.85 dBm







### IEEE 802.11g mode

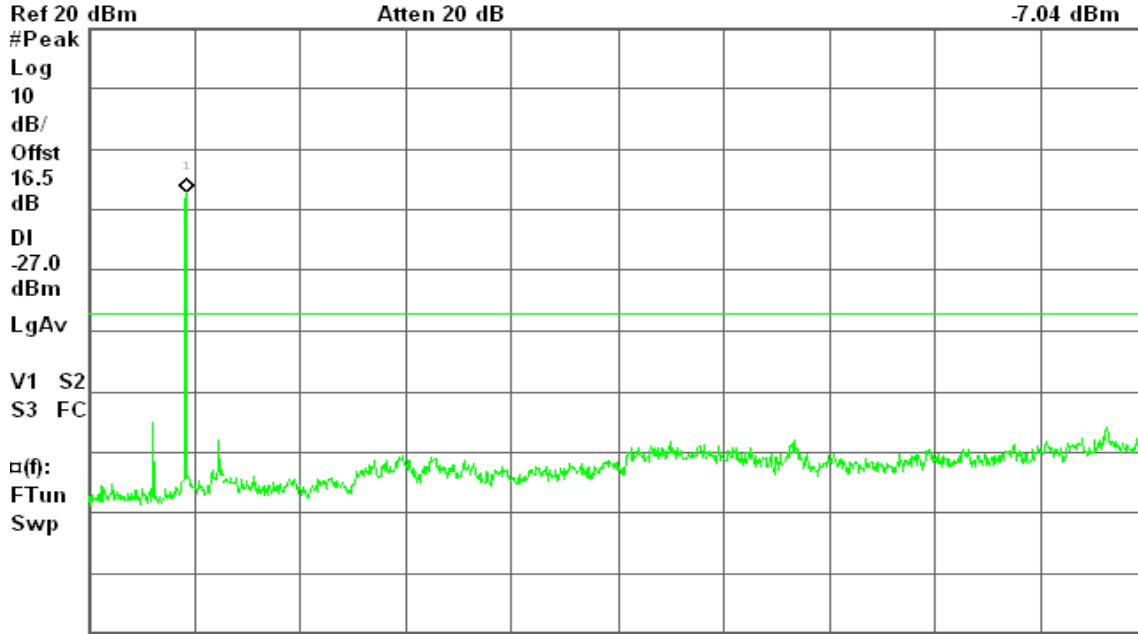
#### CH Low

Agilent 14:18:44 Apr 26, 2010

R T

Mkr1 2.42 GHz

-7.04 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

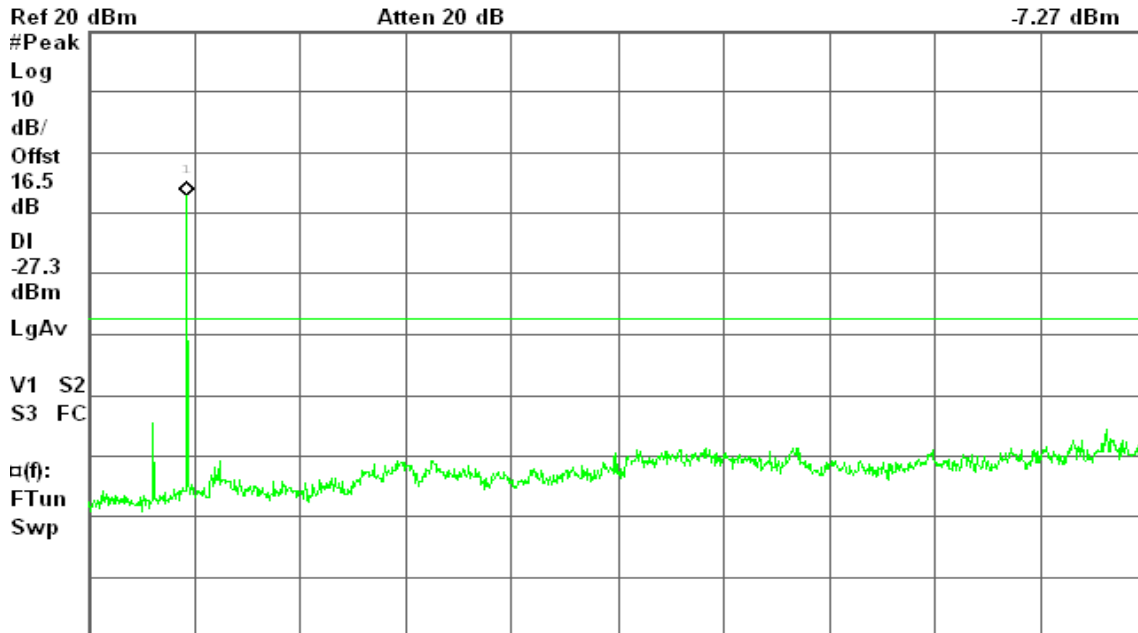
#### CH Mid

Agilent 14:25:26 Apr 26, 2010

R T

Mkr1 2.45 GHz

-7.27 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

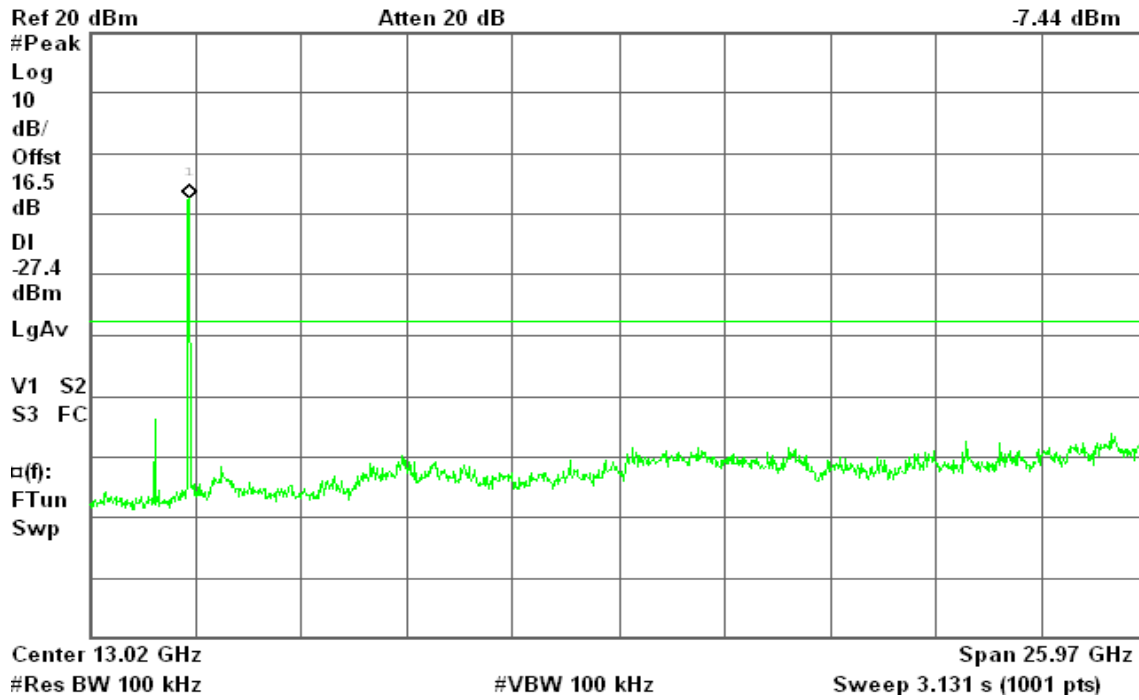


### CH High

Agilent 14:32:15 Apr 26, 2010

R T

Mkr1 2.47 GHz  
-7.44 dBm





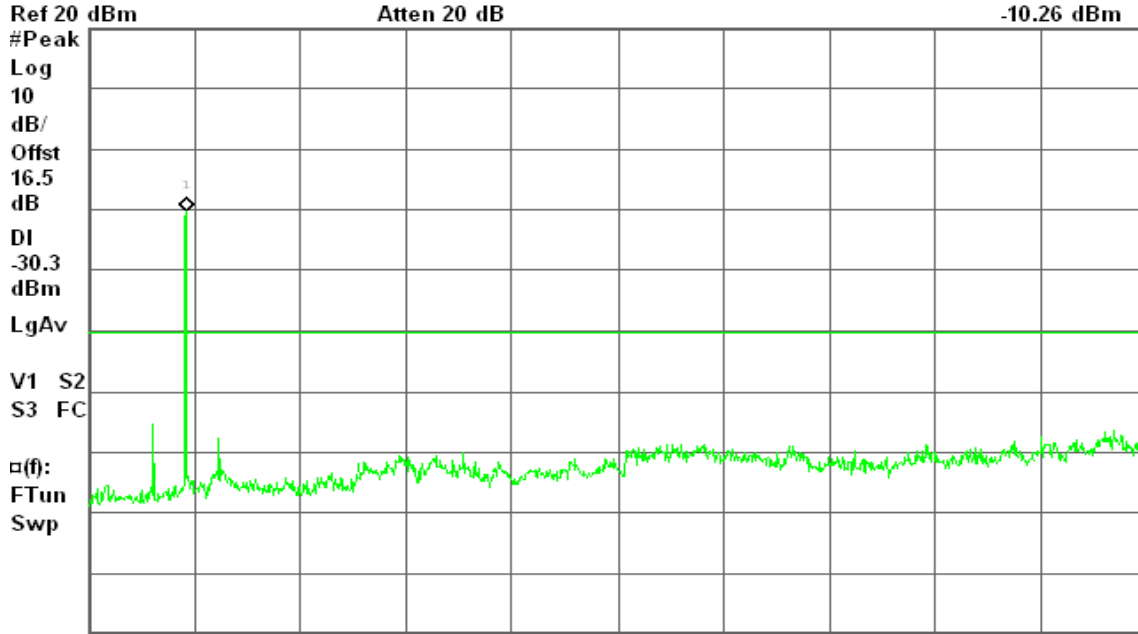
**draft 802.11n Standard-20 MHz Channel mode / Chain 0**

**CH Low**

Agilent 14:43:07 Apr 26, 2010

R T

Mkr1 2.42 GHz  
-10.26 dBm

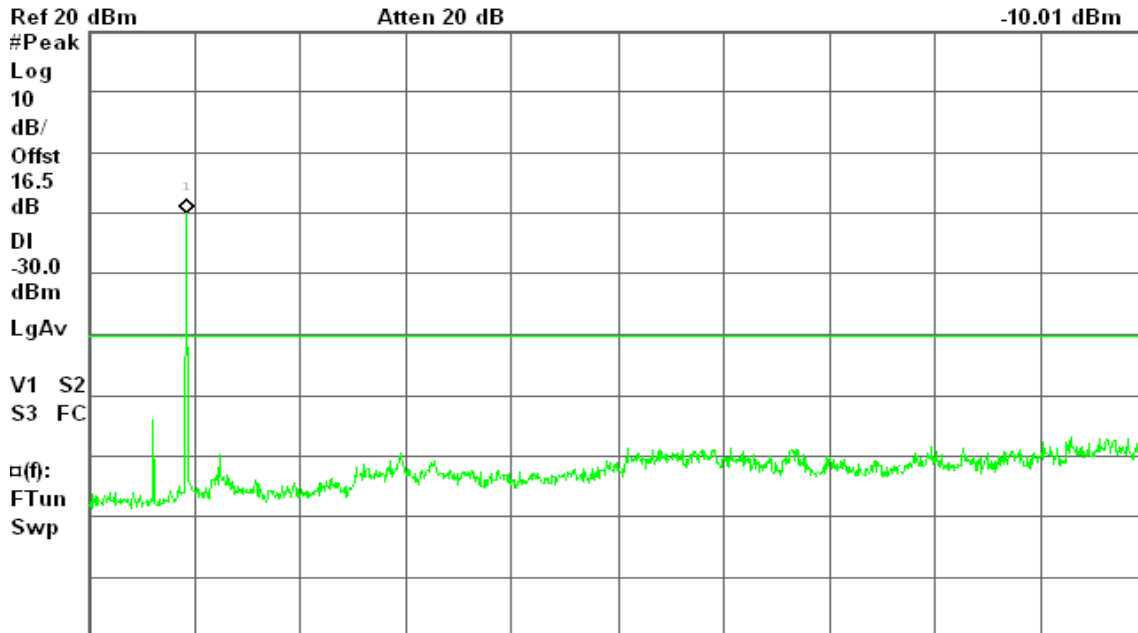


**CH Mid**

Agilent 15:04:23 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-10.01 dBm



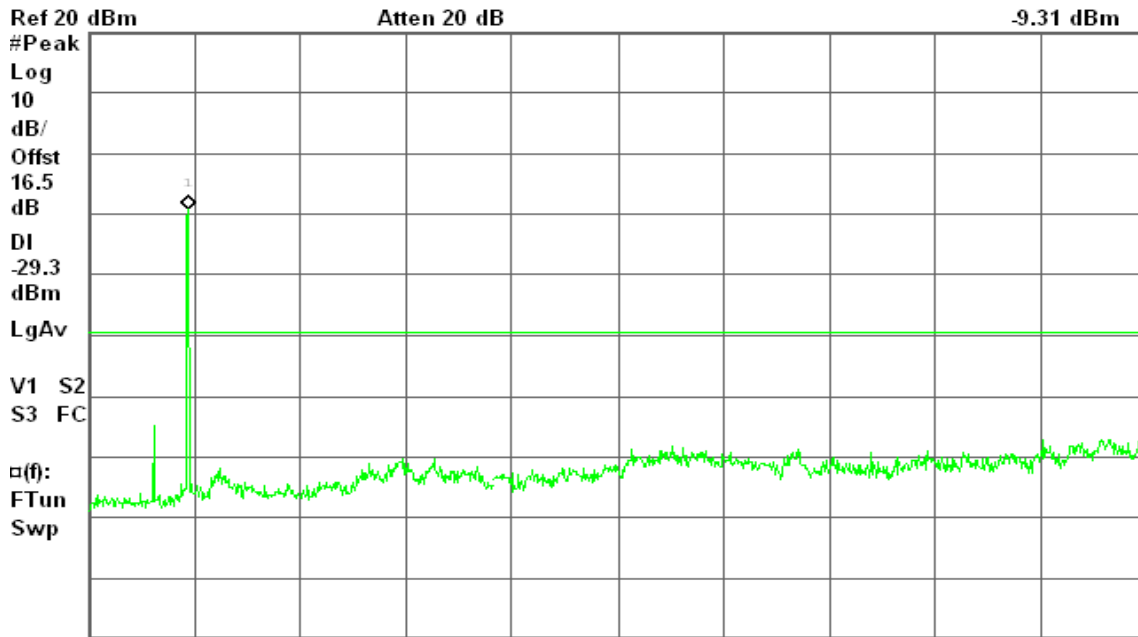


### CH High

Agilent 15:21:47 Apr 26, 2010

R T

Mkr1 2.47 GHz  
-9.31 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

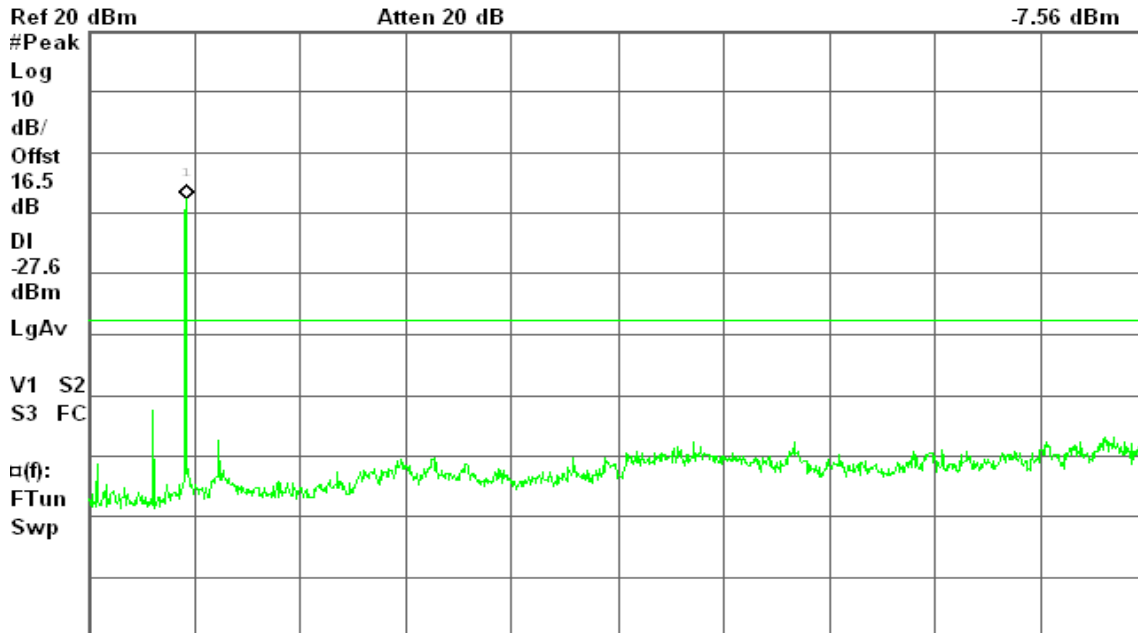
### draft 802.11n Standard-20 MHz Channel mode / Chain 1

### CH Low

Agilent 14:49:05 Apr 26, 2010

R T

Mkr1 2.42 GHz  
-7.56 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

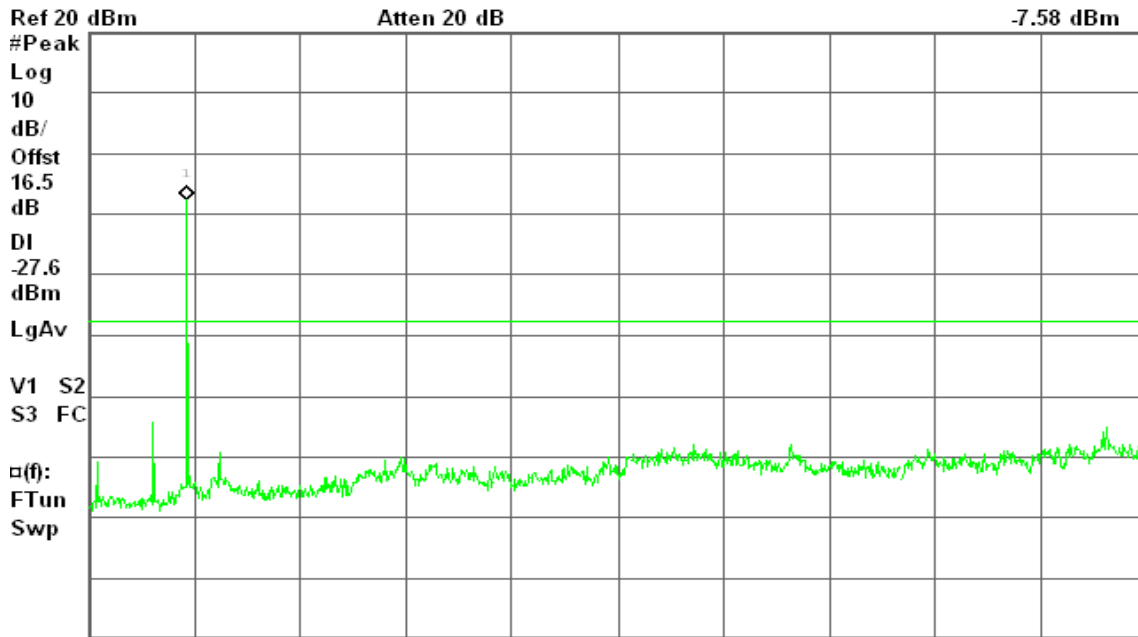


### CH Mid

Agilent 15:09:34 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-7.58 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

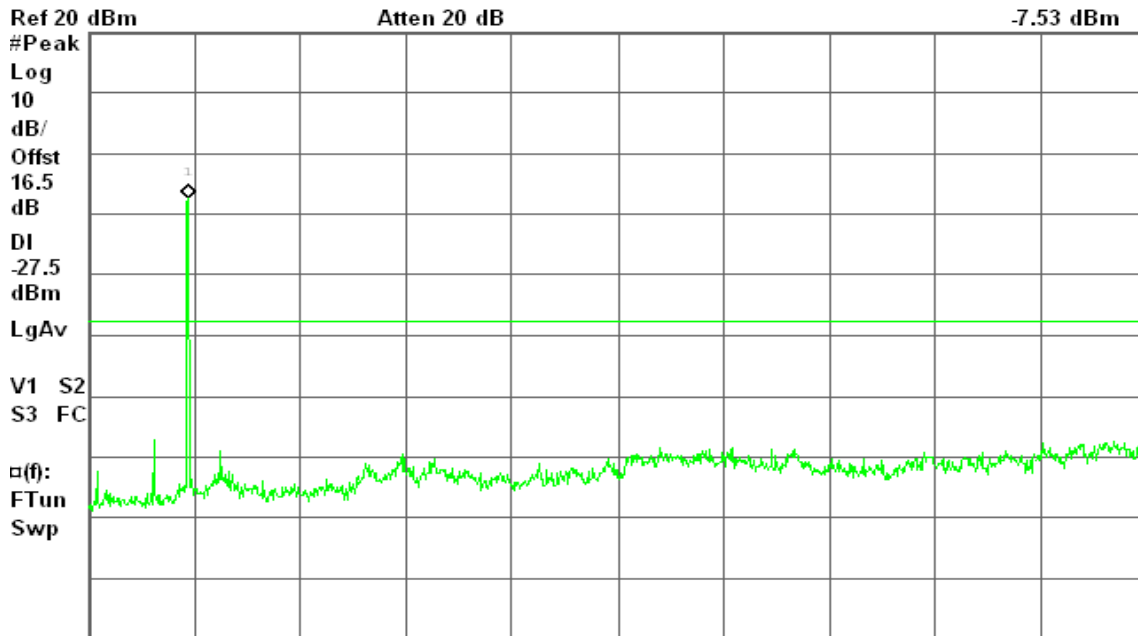
Sweep 3.131 s (1001 pts)

### CH High

Agilent 15:26:58 Apr 26, 2010

R T

Mkr1 2.47 GHz  
-7.53 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 2**

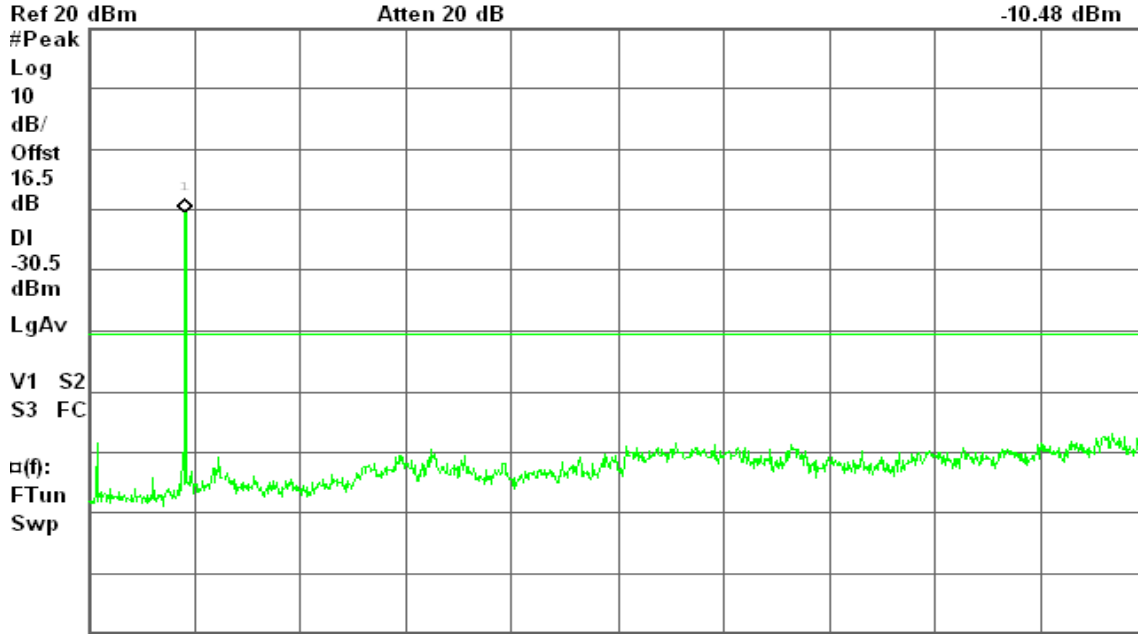
**CH Low**

Agilent 14:54:15 Apr 26, 2010

R T

Mkr1 2.39 GHz

-10.48 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

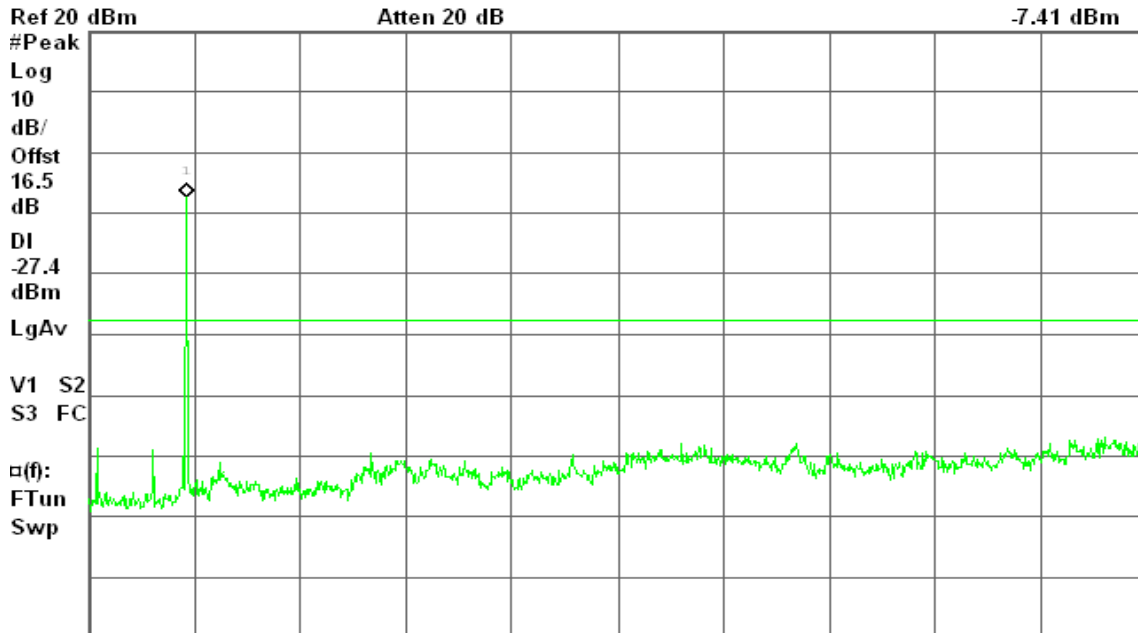
**CH Mid**

Agilent 15:15:26 Apr 26, 2010

R T

Mkr1 2.45 GHz

-7.41 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

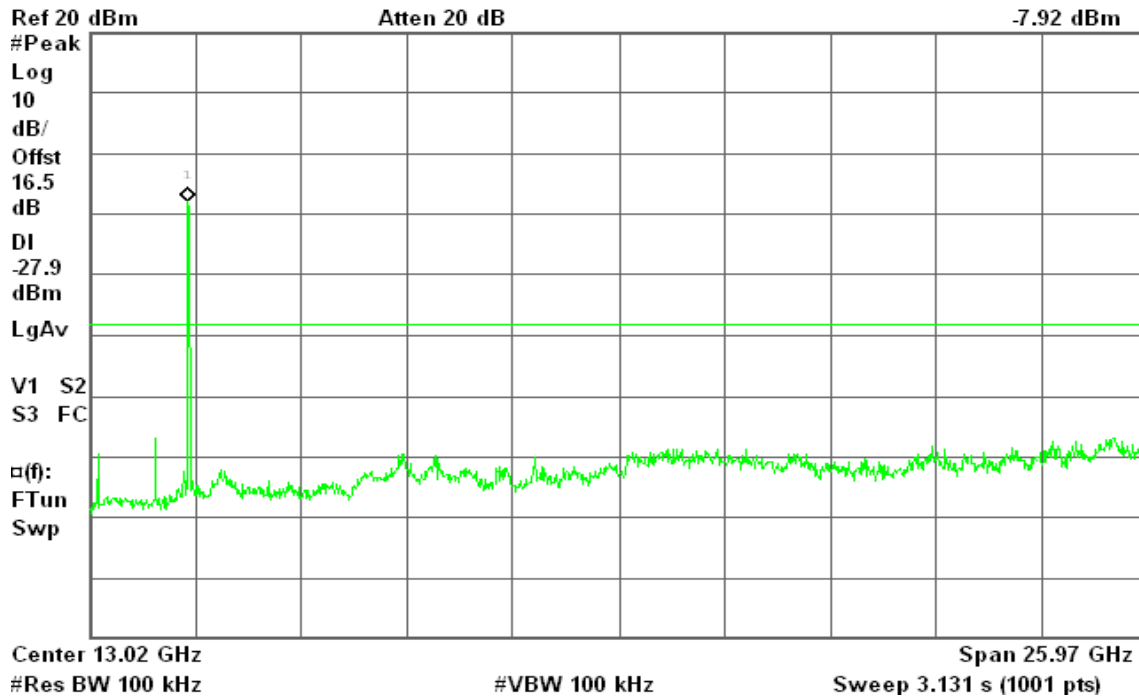


### CH High

Agilent 15:31:31 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-7.92 dBm





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

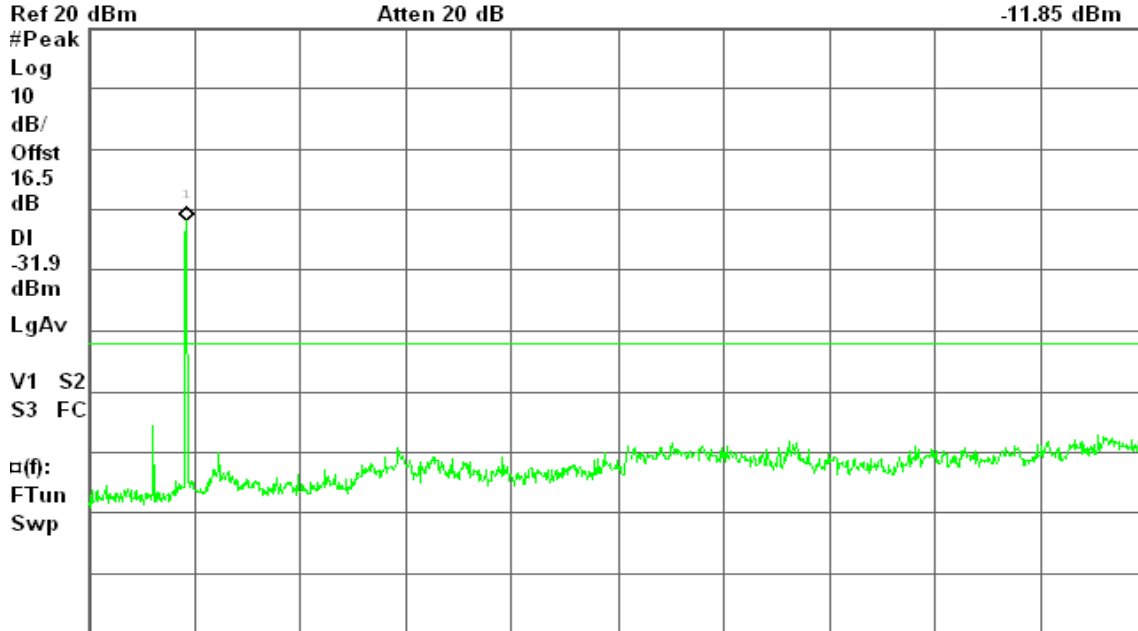
**CH Low**

Agilent 16:10:33 Apr 26, 2010

R L

Mkr1 2.42 GHz

-11.85 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

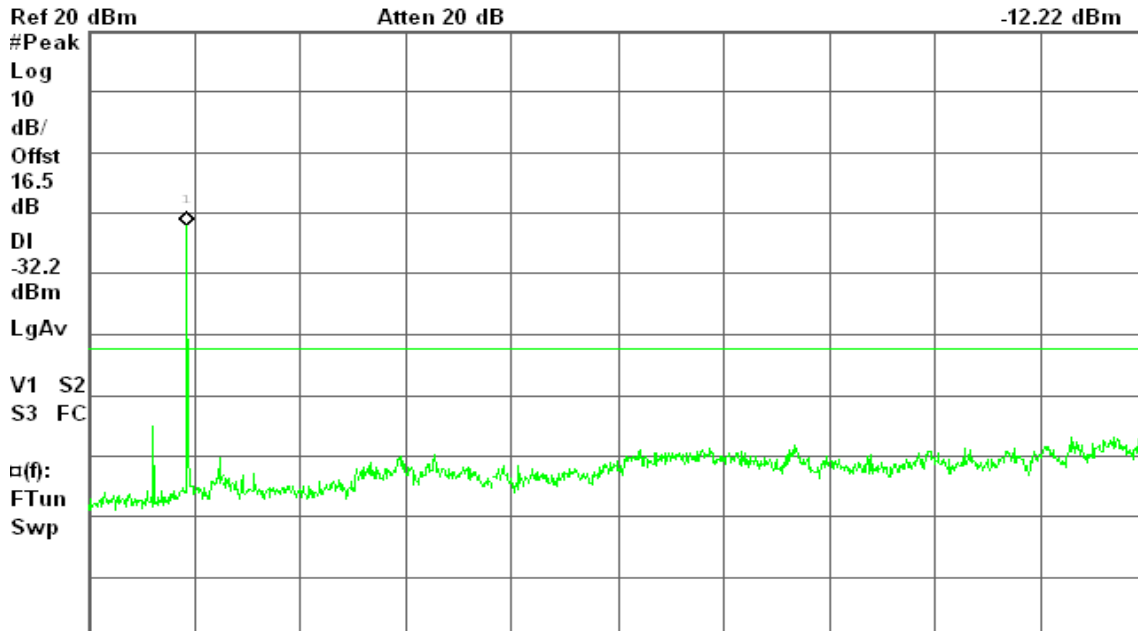
**CH Mid**

Agilent 16:41:02 Apr 26, 2010

R T

Mkr1 2.45 GHz

-12.22 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



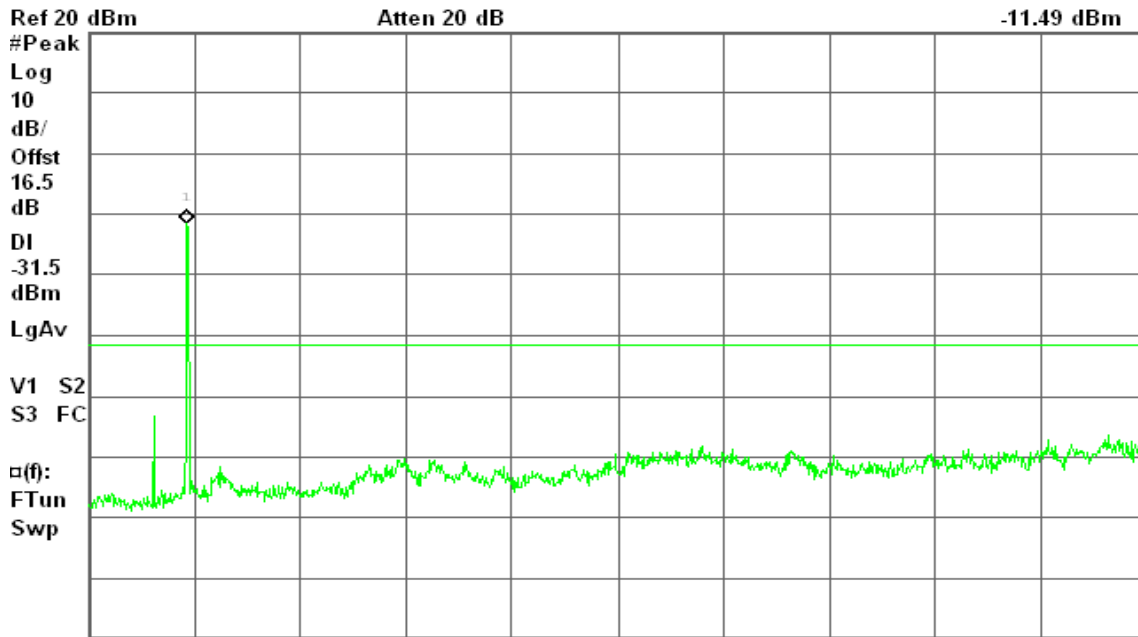


### CH High

Agilent 16:50:21 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-11.49 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

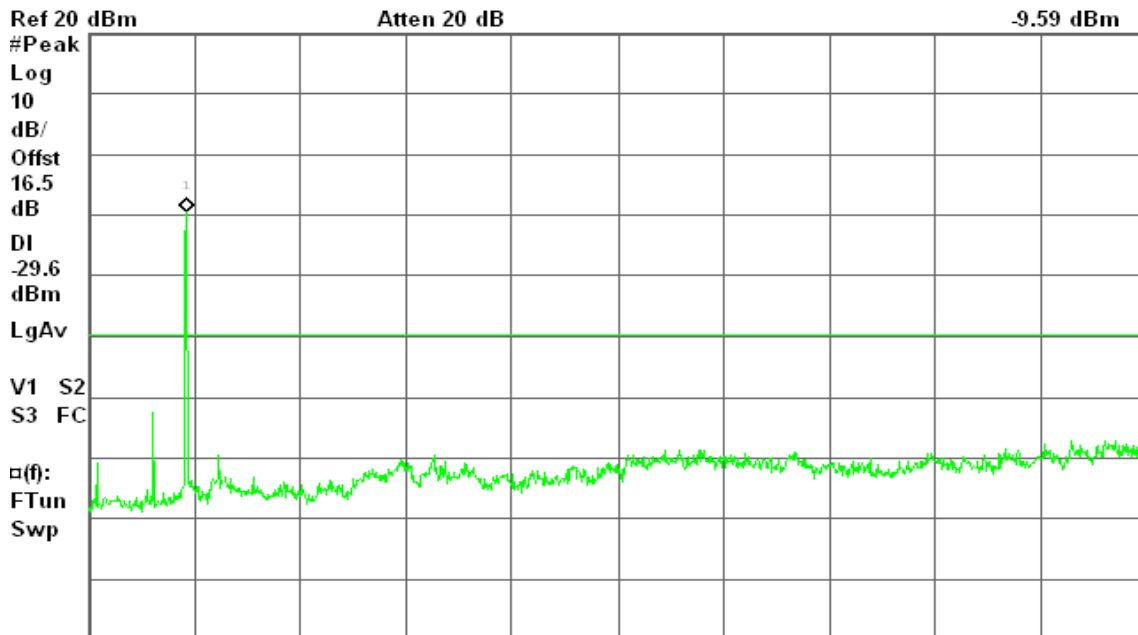
### draft 802.11n Wide-40 MHz Channel mode / Chain 1

### CH Low

Agilent 16:16:14 Apr 26, 2010

R T

Mkr1 2.42 GHz  
-9.59 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

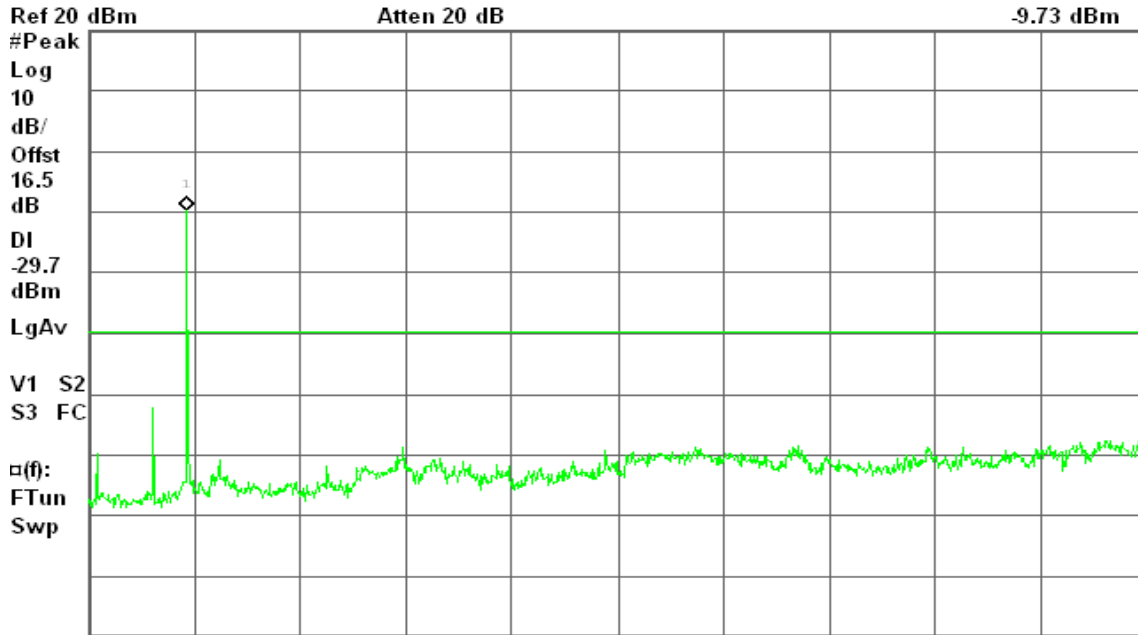


### CH Mid

Agilent 16:36:28 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-9.73 dBm



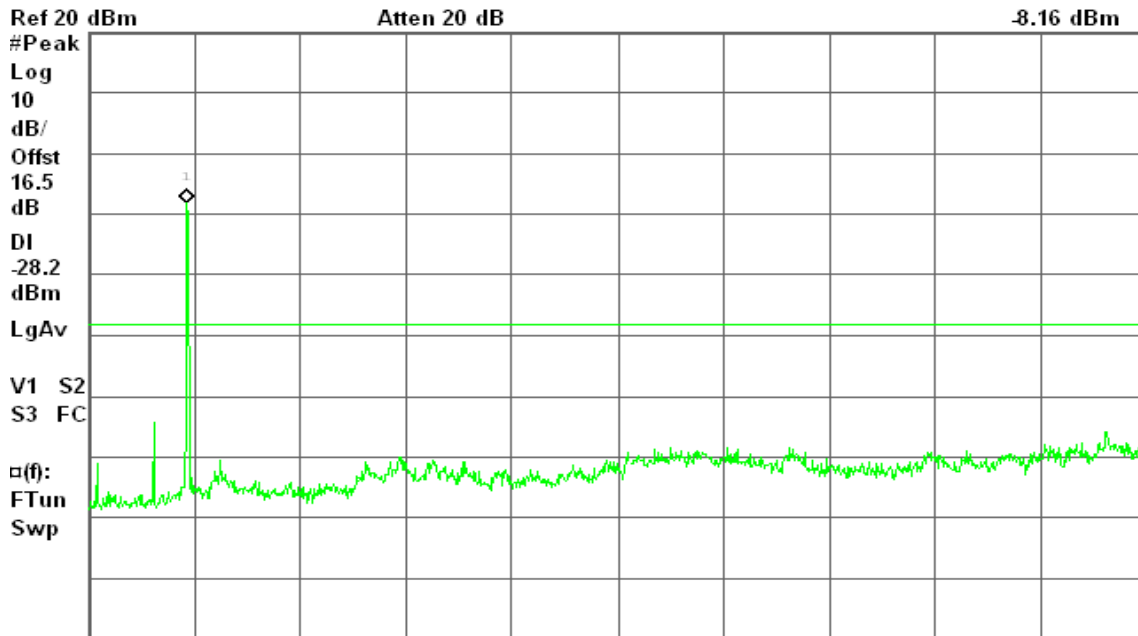
Center 13.02 GHz      Span 25.97 GHz  
#Res BW 100 kHz      #VBW 100 kHz      Sweep 3.131 s (1001 pts)

### CH High

Agilent 16:55:21 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-8.16 dBm



Center 13.02 GHz      Span 25.97 GHz  
#Res BW 100 kHz      #VBW 100 kHz      Sweep 3.131 s (1001 pts)



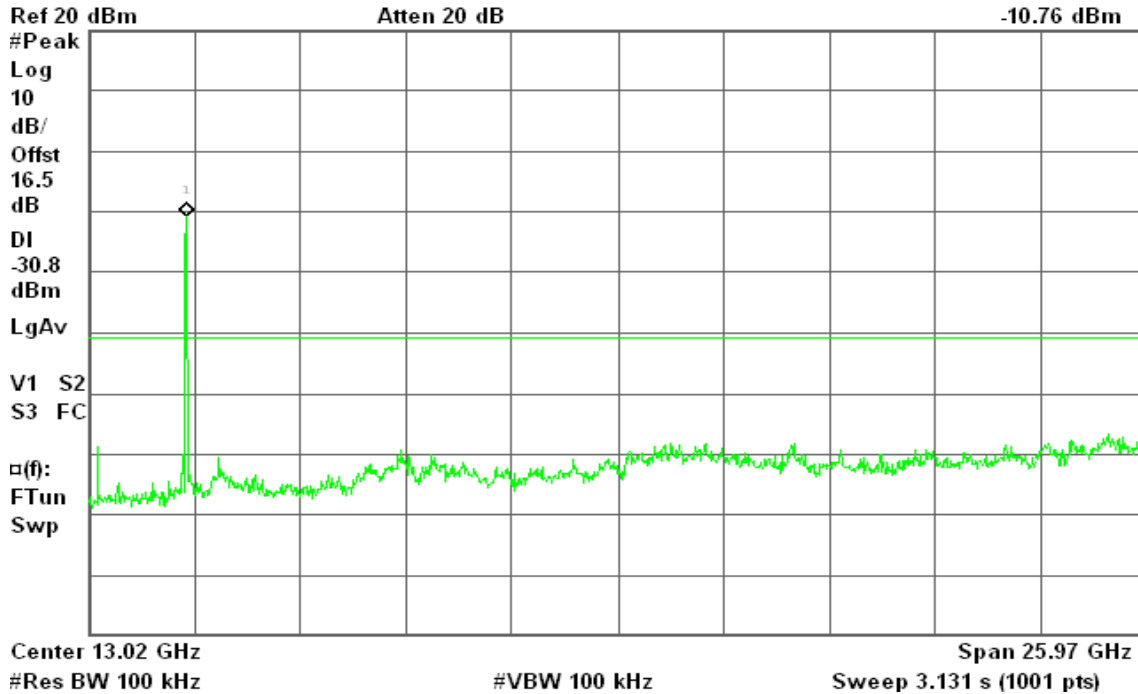
### draft 802.11n Wide-40 MHz Channel mode / Chain 2

#### CH Low

Agilent 16:21:47 Apr 26, 2010

R T

Mkr1 2.42 GHz  
-10.76 dBm

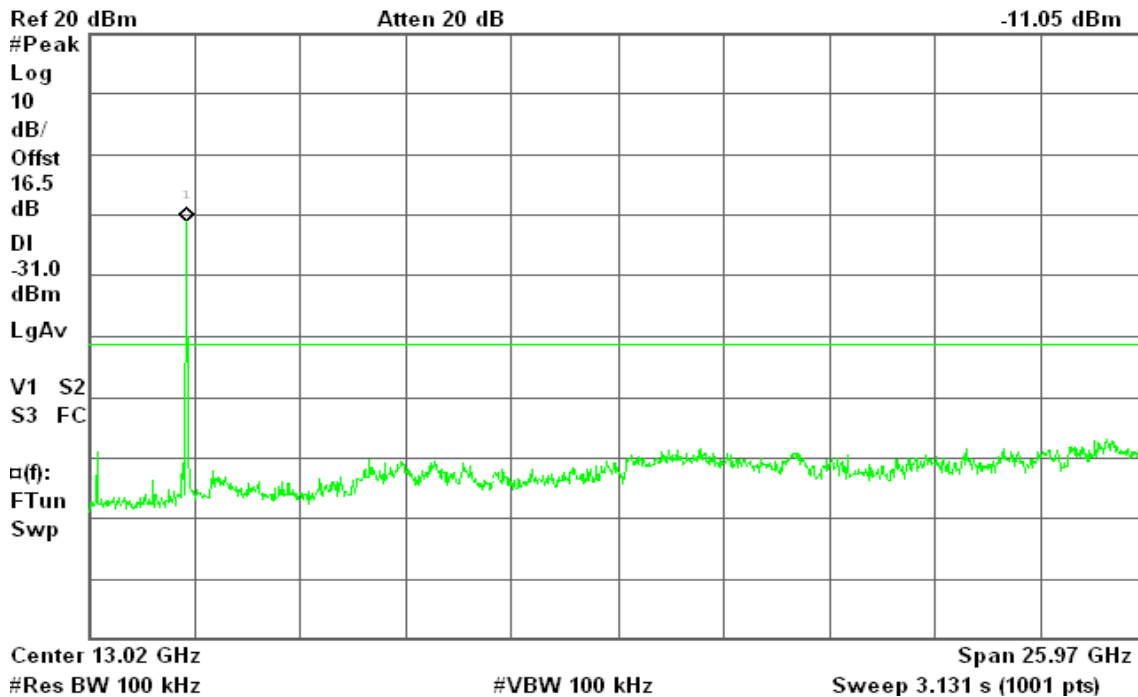


#### CH Mid

Agilent 16:30:05 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-11.05 dBm



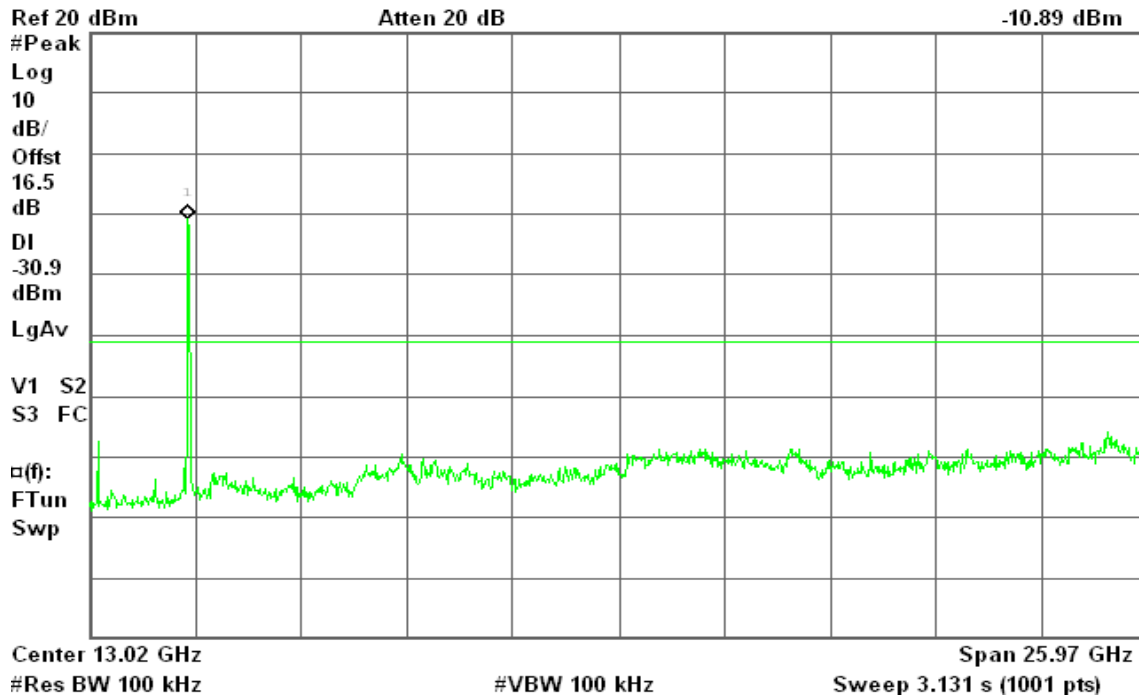


### CH High

Agilent 17:00:54 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-10.89 dBm



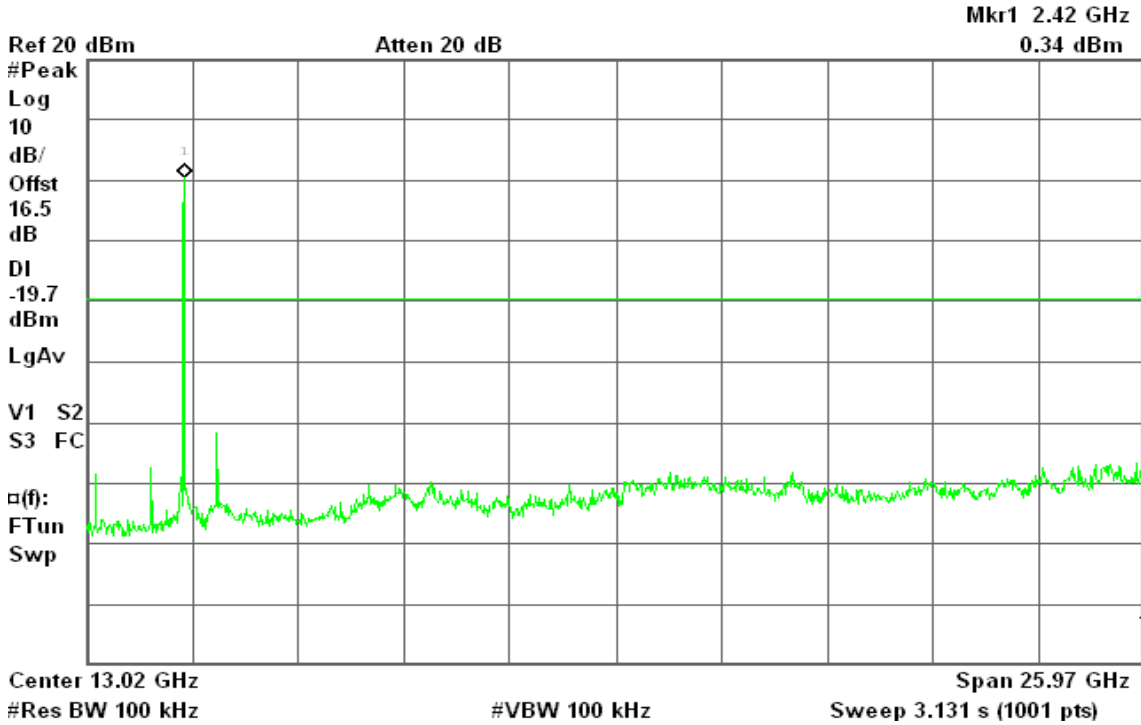


### draft 802.11n Standard-20 MHz Channel mode with combiner

#### CH Low

Agilent 15:47:20 Apr 26, 2010

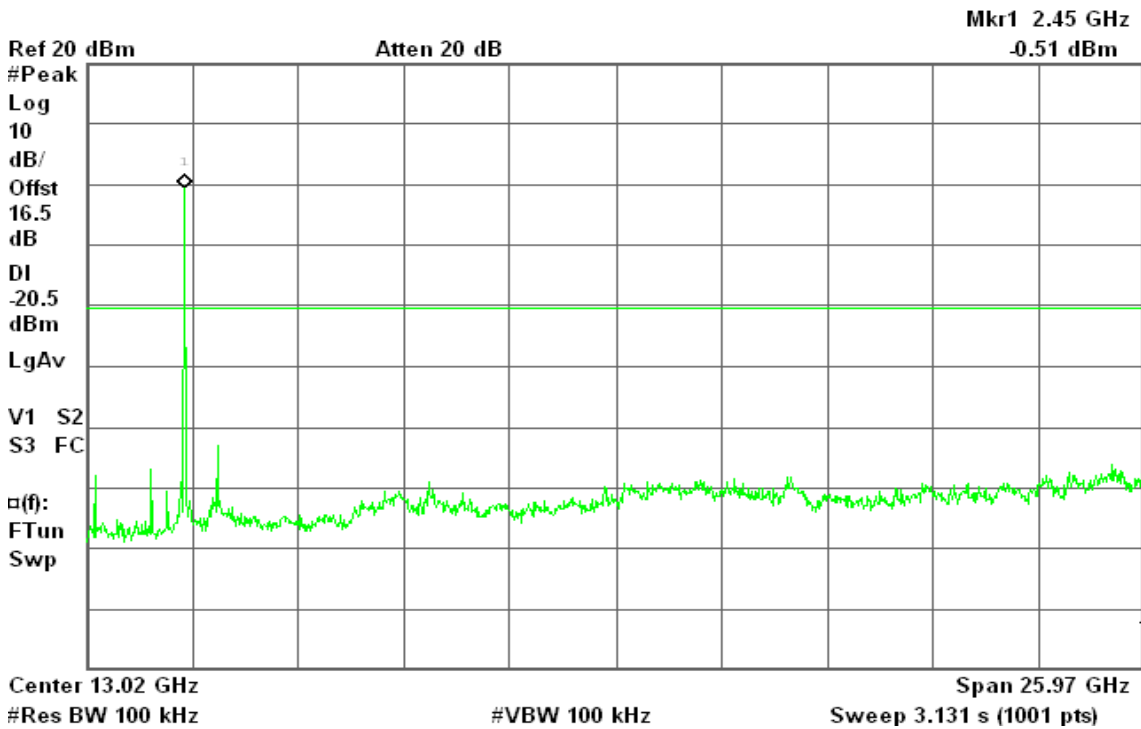
R T



#### CH Mid

Agilent 15:43:51 Apr 26, 2010

R T



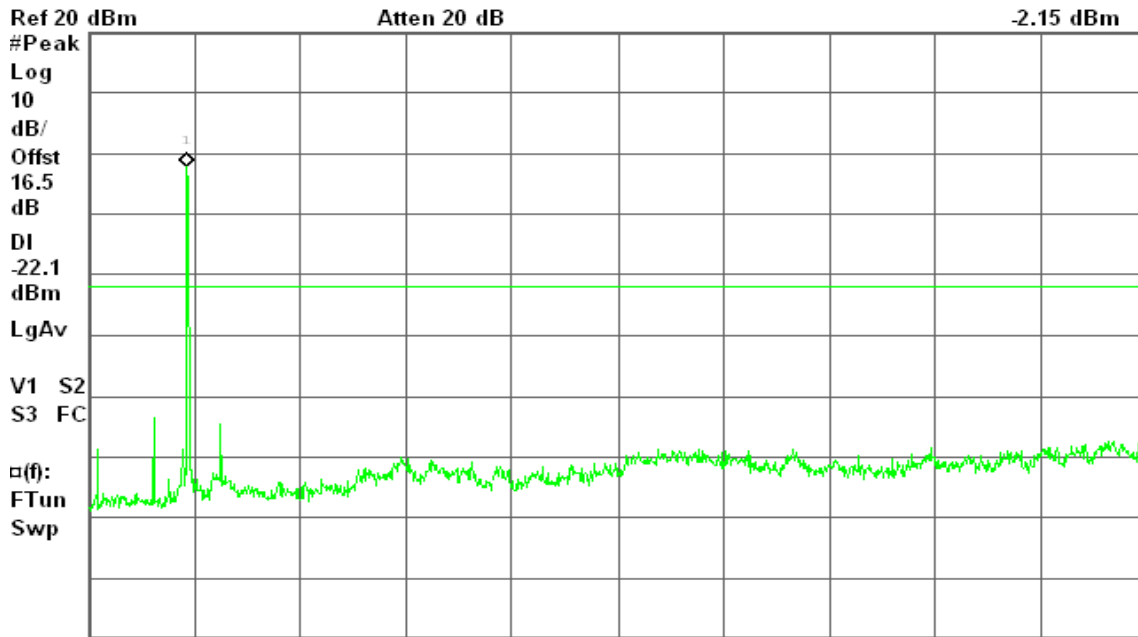


### CH High

Agilent 15:39:22 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-2.15 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

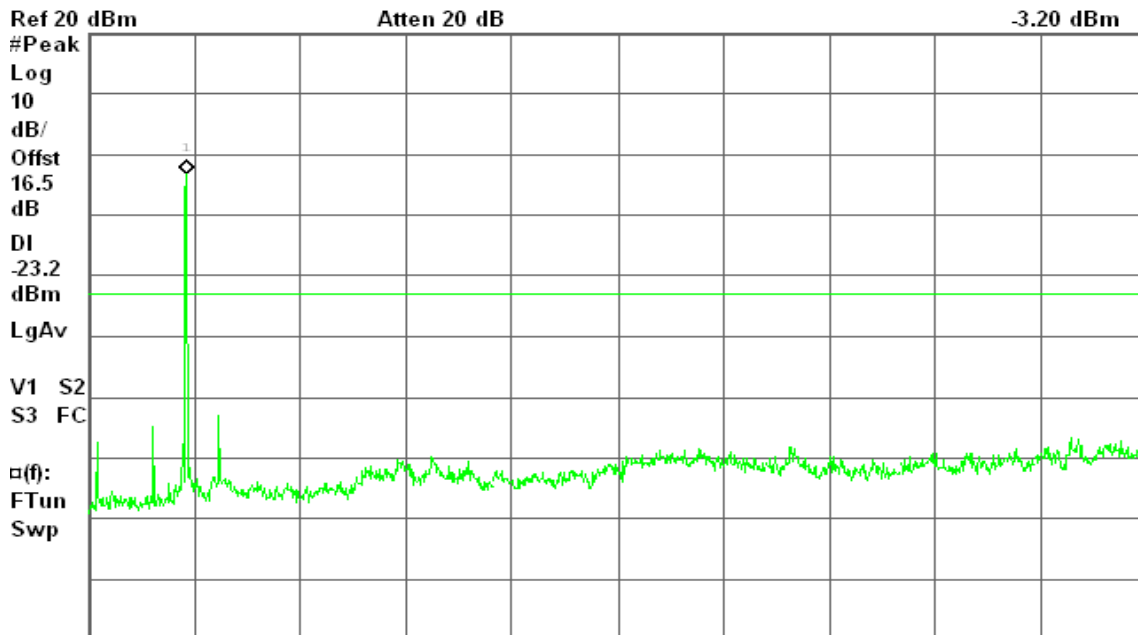
### draft 802.11n Wide-40 MHz Channel mode with combiner

### CH Low

Agilent 17:13:12 Apr 26, 2010

R L

Mkr1 2.42 GHz  
-3.20 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

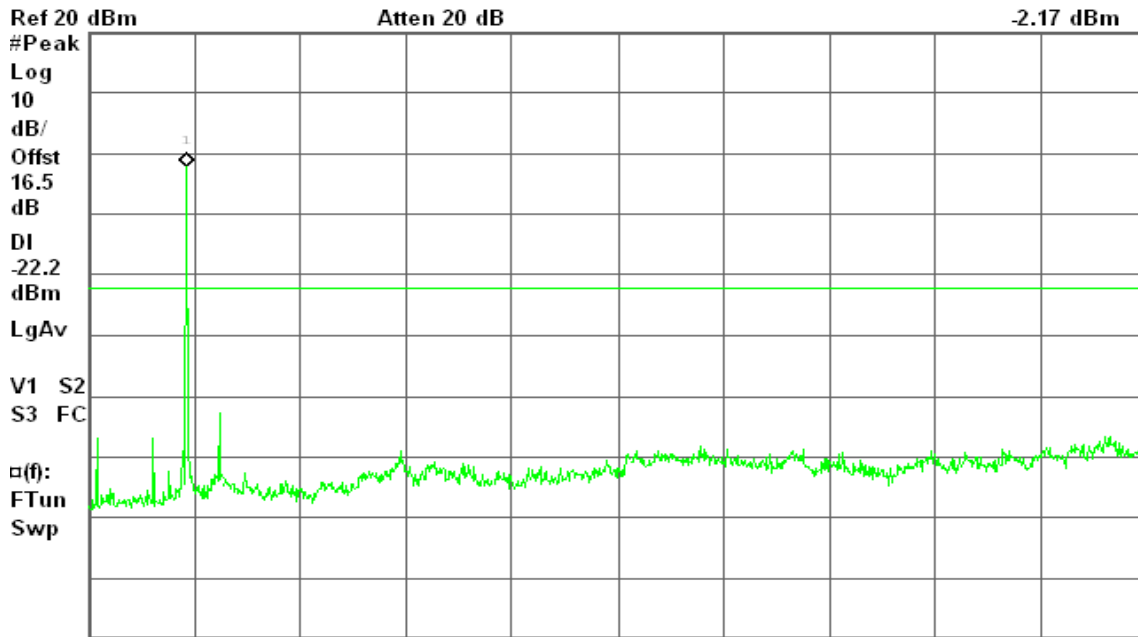


### CH Mid

Agilent 17:09:54 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-2.17 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

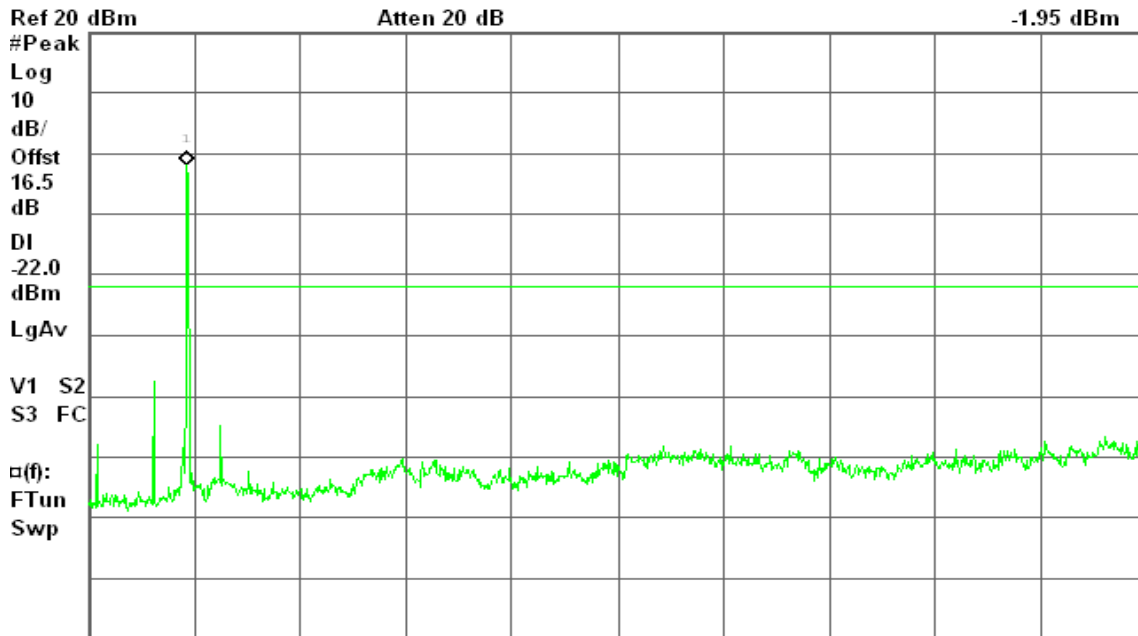
Sweep 3.131 s (1001 pts)

### CH High

Agilent 17:06:32 Apr 26, 2010

R T

Mkr1 2.45 GHz  
-1.95 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



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

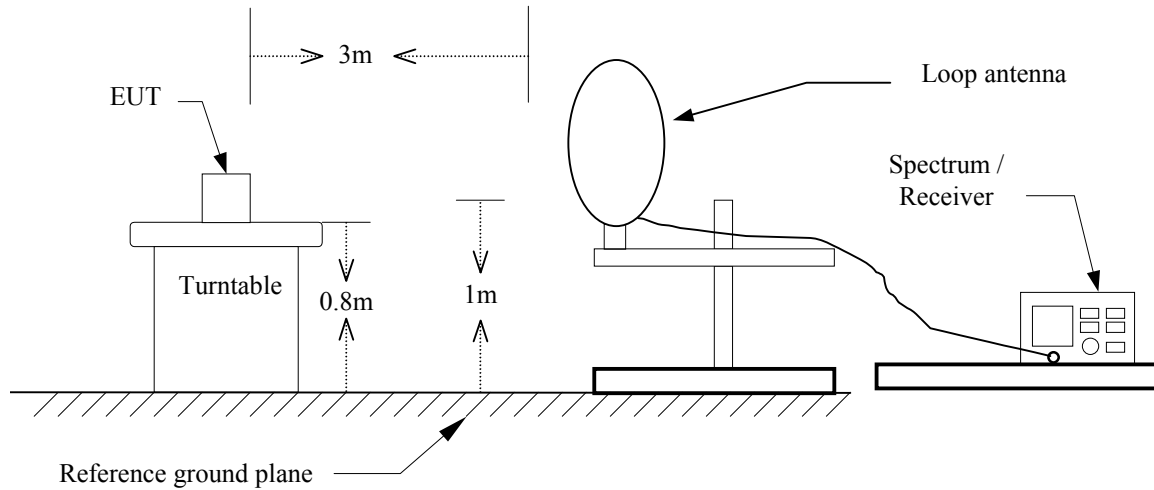
2. In the emission table above, the tighter limit applies at the band edges.

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

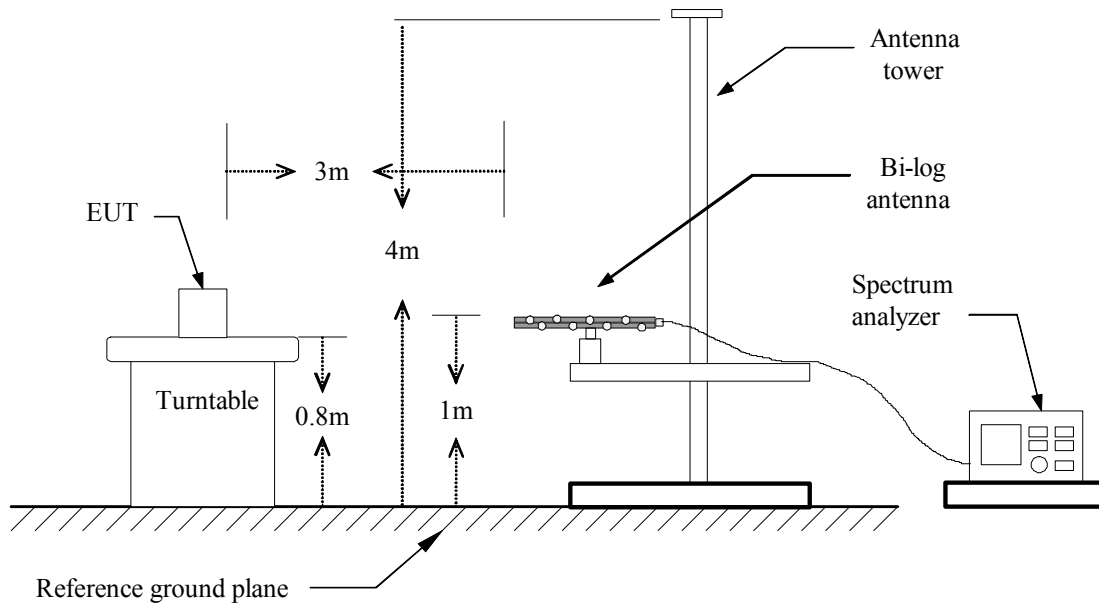


### Test Configuration

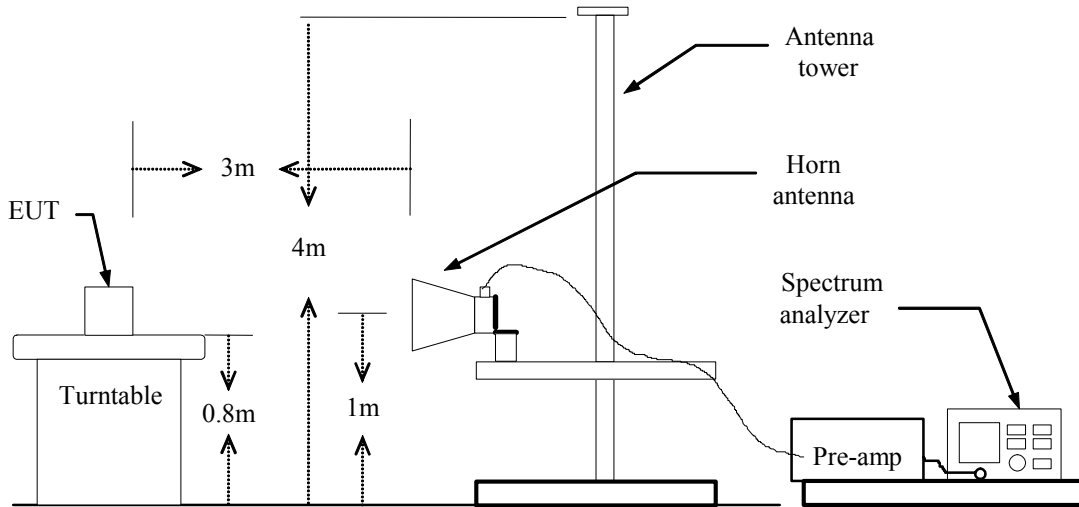
#### 9kHz ~ 30MHz



#### 30MHz ~ 1GHz



### Above 1 GHz





## **TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:  
Below 1GHz:  
RBW=100kHz / VBW=300kHz / Sweep=AUTO  
Above 1GHz:  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

**Below 1GHz****Operation Mode:** Normal Link**Test Date:** April 24, 2010**Temperature:** 23°C**Tested by:** Wolf Huang**Humidity:** 52% 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
55.87	V	52.46	-15.57	36.89	40.00	-3.11	QP
96.28	V	54.66	-13.95	40.71	43.50	-2.79	Peak
374.35	V	49.87	-7.58	42.29	46.00	-3.71	Peak
500.45	V	44.29	-5.14	39.15	46.00	-6.85	Peak
624.93	V	39.31	-3.48	35.83	46.00	-10.17	Peak
875.52	V	37.93	-0.73	37.20	46.00	-8.80	Peak
193.28	H	53.35	-10.49	42.86	43.50	-0.64	QP
249.87	H	54.28	-10.90	43.38	46.00	-2.62	Peak
374.35	H	49.86	-7.58	42.27	46.00	-3.73	Peak
624.93	H	40.76	-3.48	37.29	46.00	-8.71	Peak
749.42	H	37.47	-1.83	35.64	46.00	-10.36	Peak
875.52	H	38.49	-0.73	37.76	46.00	-8.24	Peak

**Remark:**

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)
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:** April 24, 2010**Temperature:** 23°C**Tested by:** Wolf Huang**Humidity:** 52 % 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
1876.67	V	54.55	---	-5.29	49.27	---	74.00	54.00	-4.73	Peak
N/A										
2053.33	H	54.48	---	-3.99	50.49	---	74.00	54.00	-3.51	Peak
N/A										

**Remark:**

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



Operation Mode: TX / IEEE 802.11b / CH Mid

Test Date: April 24, 2010

Temperature: 23°C

Tested by: Wolf Huang

Humidity: 52 % 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
1623.33	V	56.00	---	-7.62	48.38	---	74.00	54.00	-5.62	Peak
N/A										
1626.67	H	55.65	---	-7.59	48.06	---	74.00	54.00	-5.94	Peak
N/A										

**Remark:**

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

**Operation Mode:** TX / IEEE 802.11b / CH High**Test Date:** April 24, 2010**Temperature:** 23°C**Tested by:** Wolf Huang**Humidity:** 52 % 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
1926.67	V	53.68	---	-4.83	48.86	---	74.00	54.00	-5.14	Peak
3283.33	V	49.64	---	-1.15	48.48	---	74.00	54.00	-5.52	Peak
N/A										
1373.33	H	56.71	---	-8.97	47.74	---	74.00	54.00	-6.26	Peak
1640.00	H	56.92	---	-7.47	49.45	---	74.00	54.00	-4.55	Peak
N/A										

**Remark:**

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



Operation Mode: TX / IEEE 802.11g / CH Low

Test Date: April 24, 2010

Temperature: 23°C

Tested by: Wolf Huang

Humidity: 52 % 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
1870.00	V	54.51	---	-5.35	49.16	---	74.00	54.00	-4.84	Peak
3216.67	V	49.35	---	-1.17	48.18	---	74.00	54.00	-5.82	Peak
N/A										
1606.67	H	56.54	---	-7.78	48.77	---	74.00	54.00	-5.23	Peak
N/A										

Remark:

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





Operation Mode: TX / IEEE 802.11g / CH Mid

Test Date: April 24, 2010

Temperature: 23°C

Tested by: Wolf Huang

Humidity: 52 % 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
1666.67	V	55.20	---	-7.22	47.97	---	74.00	54.00	-6.03	Peak
3250.00	V	49.47	---	-1.16	48.31	---	74.00	54.00	-5.69	Peak
N/A										
1623.33	H	57.25	---	-7.62	49.63	---	74.00	54.00	-4.37	Peak
N/A										

**Remark:**

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

**Operation Mode:** TX / IEEE 802.11g / CH High**Test Date:** April 24, 2010**Temperature:** 23°C**Tested by:** Wolf Huang**Humidity:** 52 % 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
1640.00	V	55.09	---	-7.47	47.62	---	74.00	54.00	-6.38	Peak
2333.33	V	57.50	51.08	-3.16	54.34	47.92	74.00	54.00	-6.08	AVG
2500.00	V	59.03	41.08	-2.66	56.37	38.42	74.00	54.00	-15.58	AVG
3283.33	V	49.85	---	-1.15	48.70	---	74.00	54.00	-5.30	Peak
N/A										
1640.00	H	56.40	---	-7.47	48.93	---	74.00	54.00	-5.07	Peak
N/A										

**Remark:**

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



Operation Mode: TX / draft 802.11n Standard-20 MHz Channel mode / CH Low

Test Date: April 24, 2010

Temperature: 23°C

Tested by: Wolf Huang

Humidity: 52 % 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
2170.00	V	58.68	42.73	-3.64	55.04	39.09	74.00	54.00	-14.91	AVG
3216.67	V	51.05	---	-1.17	49.89	---	74.00	54.00	-4.11	Peak
N/A										
1610.00	H	58.00	---	-7.75	50.26	---	74.00	54.00	-3.74	Peak
3216.67	H	49.61	---	-1.17	48.44	---	74.00	54.00	-5.56	Peak
N/A										

Remark:

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

**Operation Mode:** TX / draft 802.11n Standard-20 MHz Channel mode / CH Mid**Test Date:** April 24, 2010**Temperature:** 23°C**Tested by:** Wolf Huang**Humidity:** 52 % 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
1960.00	V	53.62	---	-4.52	49.10	---	74.00	54.00	-4.90	Peak
3250.00	V	51.78	---	-1.16	50.62	---	74.00	54.00	-3.38	Peak
N/A										
1623.33	H	55.90	---	-7.62	48.28	---	74.00	54.00	-5.72	Peak
2486.67	H	54.69	---	-2.70	51.99	---	74.00	54.00	-2.01	Peak
3250.00	H	49.70	---	-1.16	48.54	---	74.00	54.00	-5.46	Peak
N/A										

**Remark:**

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



Operation Mode: TX / draft 802.11n Standard-20 MHz Channel mode / CH High

Test Date: April 24, 2010

Temperature: 23°C

Tested by: Wolf Huang

Humidity: 52 % 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
2016.67	V	54.02	---	-4.10	49.92	---	74.00	54.00	-4.08	Peak
3283.33	V	52.42	---	-1.15	51.27	---	74.00	54.00	-2.73	Peak
N/A										
1376.67	H	56.67	---	-8.96	47.70	---	74.00	54.00	-6.30	Peak
3283.33	H	49.16	---	-1.15	48.00	---	74.00	54.00	-6.00	Peak
N/A										

Remark:

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



**Operation Mode:** TX / draft 802.11n Wide-40 MHz Channel mode / CH Low **Test Date:** April 24, 2010  
**Temperature:** 23°C **Tested by:** Wolf Huang  
**Humidity:** 52 % 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
2333.33	V	60.34	51.66	-3.16	57.18	48.50	74.00	54.00	-5.50	AVG
3233.33	V	52.49	---	-1.16	51.33	---	74.00	54.00	-2.67	Peak
N/A										
3225.00	H	51.18	---	-1.16	50.02	---	74.00	54.00	-3.98	Peak
N/A										

**Remark:**

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



**Operation Mode:** TX / draft 802.11n Wide-40 MHz Channel mode / CH Mid **Test Date:** April 24, 2010  
**Temperature:** 23°C **Tested by:** Wolf Huang  
**Humidity:** 52 % 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
1623.33	V	56.65	---	-7.62	49.03	---	74.00	54.00	-4.97	Peak
2333.33	V	60.79	51.67	-3.16	57.63	48.51	74.00	54.00	-5.49	AVG
2503.33	V	58.61	44.00	-2.65	55.96	41.35	74.00	54.00	-12.65	AVG
3250.00	V	52.27	---	-1.16	51.11	---	74.00	54.00	-2.89	Peak
N/A										
1623.33	H	58.82	---	-7.62	51.19	---	74.00	54.00	-2.81	Peak
3250.00	H	49.37	---	-1.16	48.21	---	74.00	54.00	-5.79	Peak
N/A										

**Remark:**

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



Operation Mode: TX / draft 802.11n Wide-40 MHz Channel mode / CH High

Test Date: April 24, 2010

Temperature: 23°C

Tested by: Wolf Huang

Humidity: 52 % 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
3266.67	V	52.14	---	-1.16	50.99	---	74.00	54.00	-3.01	Peak
N/A										
1633.33	H	55.91	---	-7.53	48.38	---	74.00	54.00	-5.62	Peak
3266.67	H	49.85	---	-1.16	48.70	---	74.00	54.00	-5.30	Peak
N/A										

Remark:

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





## 7.8 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  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

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

\* Decreases with the logarithm of the frequency.

### Test Configuration

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

### TEST PROCEDURE

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



## TEST RESULTS

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

### Test Data

**Operation Mode:** Normal Link                      **Test Date:** April 26, 2010  
**Temperature:** 26°C                                      **Tested by:** Wolf Huang  
**Humidity:** 60% 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
0.1500	55.38	33.38	0.22	55.60	33.60	66.00	56.00	-10.40	-22.40	L1
0.1800	55.00	47.70	0.20	55.20	47.90	64.49	54.49	-9.29	-6.59	L1
0.2250	47.63	24.43	0.17	47.80	24.60	62.63	52.63	-14.83	-28.03	L1
0.3050	47.66	22.56	0.14	47.80	22.70	60.11	50.11	-12.31	-27.41	L1
0.3598	49.38	42.18	0.12	49.50	42.30	58.73	48.73	-9.23	-6.43	L1
0.4500	48.92	40.92	0.08	49.00	41.00	56.88	46.88	-7.88	-5.88	L1
0.5403	45.64	36.74	0.06	45.70	36.80	56.00	46.00	-10.30	-9.20	L1
0.6850	43.34	19.94	0.06	43.40	20.00	56.00	46.00	-12.60	-26.00	L1
0.8125	47.75	38.65	0.05	47.80	38.70	56.00	46.00	-8.20	-7.30	L1
1.0836	45.75	37.75	0.05	45.80	37.80	56.00	46.00	-10.20	-8.20	L1
1.5335	41.25	34.95	0.05	41.30	35.00	56.00	46.00	-14.70	-11.00	L1
4.8712	43.35	34.25	0.15	43.50	34.40	56.00	46.00	-12.50	-11.60	L1
5.5028	43.60	33.60	0.20	43.80	33.80	60.00	50.00	-16.20	-16.20	L1
7.2100	44.65	32.05	0.35	45.00	32.40	60.00	50.00	-15.00	-17.60	L1
0.2697	40.93	32.33	0.17	41.10	32.50	61.13	51.13	-20.03	-18.63	L2
0.3596	46.36	33.76	0.14	46.50	33.90	58.74	48.74	-12.24	-14.84	L2
0.4500	40.90	33.00	0.10	41.00	33.10	56.88	46.88	-15.88	-13.78	L2
0.6325	39.22	33.02	0.08	39.30	33.10	56.00	46.00	-16.70	-12.90	L2
0.9917	41.32	33.42	0.08	41.40	33.50	56.00	46.00	-14.60	-12.50	L2
1.5342	36.32	33.12	0.08	36.40	33.20	56.00	46.00	-19.60	-12.80	L2

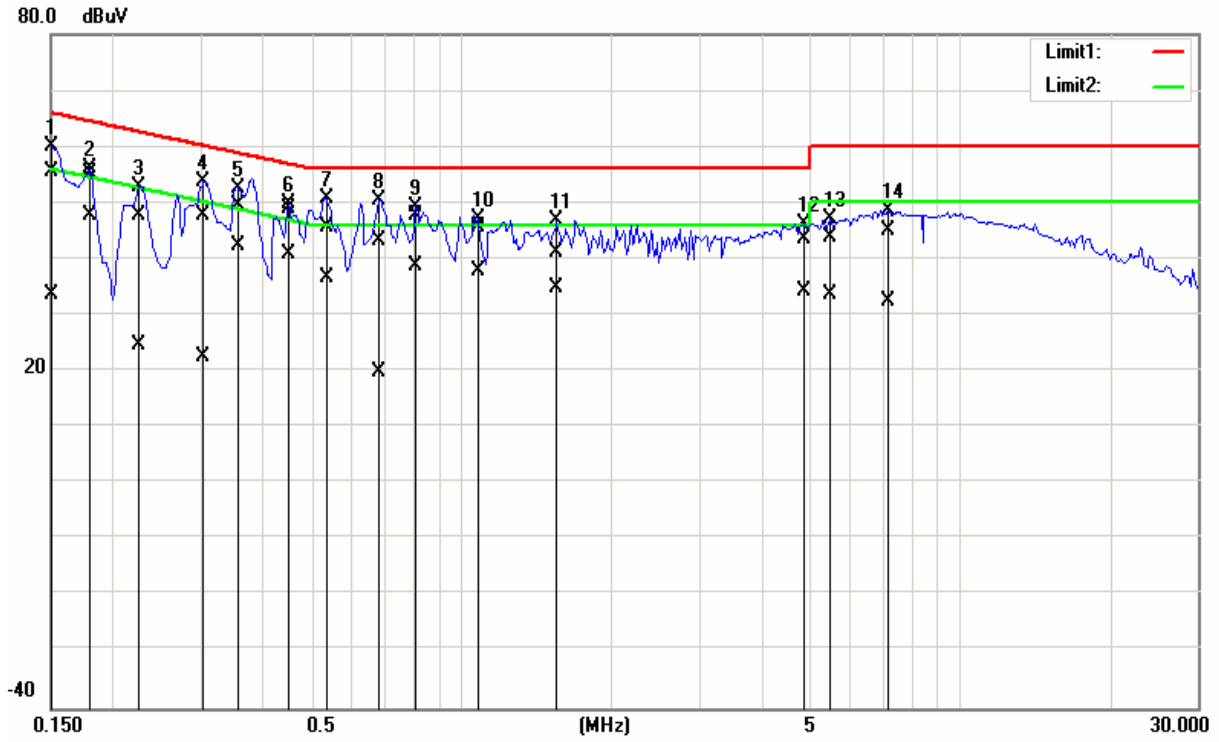
### **Remark:**

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)

