



## FCC 47 CFR PART 15 SUBPART C

# TEST REPORT

**For**

**Notebook**

**Model:  
Daria SVE00**

**Trade Name: FIC**

*Issued to*

**First International Computer, Inc.  
NO.300, Yang Guang St., NeiHu, Taipei, Taiwan,114**

*Issued by*

**Compliance Certification Services Inc.  
No. 11, Wu-Gong 6<sup>th</sup> Rd., Wugu Industrial Park,  
Taipei Hsien 248, Taiwan (R.O.C.)  
<http://www.ccsemc.com.tw>  
[service@ccsrf.com](mailto:service@ccsrf.com)**



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# 1. TEST RESULT CERTIFICATION

**Applicant:** First International Computer, Inc.  
 NO.300, Yang Guang St., NeiHu, Taipei, Taiwan, 114

**Equipment Under Test:** Notebook

**Trade Name:** FIC

**Model:** Daria SVE00

**Date of Test:** December 11 ~ 16, 2009

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

### We hereby certify that:

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

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

*Approved by:*

*Reviewed by:*

\_\_\_\_\_  
 Rex Lai  
 Section Manager  
 Compliance Certification Services Inc.

\_\_\_\_\_  
 Gina Lo  
 Section Manager  
 Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	Notebook
<b>Trade Name</b>	FIC
<b>Model Number</b>	Daria SVE00
<b>Model Discrepancy</b>	N/A
<b>Power Rating</b>	1. Power Adapter DARFON / BB01-K I/P: 100-240V, 50/60Hz, 1A O/P: 20V, 2A 2. Battery Model: SMP-SVEXXXBKA3 Rating: 11.1V, 2200mAh
<b>Frequency Range</b>	2412 ~ 2462 MHz
<b>Transmit Power</b>	IEEE 802.11b mode: 18.30 dBm IEEE 802.11g mode: 20.51 dBm draft 802.11n Standard-20 MHz Channel mode: 20.11 dBm draft 802.11n Wide-40 MHz Channel mode: 17.07 dBm
<b>Modulation Technique</b>	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps) draft 802.11n Standard-20 MHz Channel mode: OFDM (6.5, 7.2, 13, 14.44, 19.5, 21.67, 26, 28.89, 39, 43.33 52, 57.78, 58.5, 65.0, 72.22Mbps) 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, 150Mbps)
<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>	PCB Antenna / Gain: 5.22dBi

### Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **EUN-DARIASVE00** 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: Daria SVE00) had been tested under operating condition.

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

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

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz 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	02/23/2010
Spectrum Analyzer	R&S	FSEK30	100264	04/14/2010

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	09/09/2010
Test Receiver	Rohde&Schwarz	ESCI	100064	11/28/2010
Switch Controller	TRC	Switch Controller	SC94050010	05/02/2010
4 Port Switch	TRC	4 Port Switch	SC94050020	05/02/2010
Loop Antenna	EMCO	6502	8905/2356	05/28/2010
Horn-Antenna	TRC	HA-0502	06	06/03/2010
Horn-Antenna	TRC	HA-0801	04	06/18/2010
Horn-Antenna	TRC	HA-1201A	01	08/10/2010
Horn-Antenna	TRC	HA-1301A	01	08/10/2010
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/27/2010
Loop Antenna	EMCO	6502	8905/2356	05/28/2010
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	LABVIEW (V 6.1)			

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
TEST RECEIVER	R&S	ESHS10	843743/015	03/29/2010
LISN (EUT)	FCC	FCC-LISN-50-32-2	08009	03/29/2010
LISN	EMCO	3825/2	1382	01/05/2010
BNC CABLE	Huber+Suhner	RG 223/U	BNC B2	01/12/2010
Pulse Limiter	R&S	ESH3-Z2	100374	08/23/2010
THERMO-HYGRO METER	TOP	HA-202	9303-3	02/04/2010
Test S/W	EMI 32.exe			



### 4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.73
3M Semi Anechoic Chamber / 30MHz ~ 1GHz	+/-3.7046
3M Semi Anechoic Chamber / Above 1GHz	+/-3.0958

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



## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

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

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

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

*Remark: The powerline conducted emissions test items was tested at Compliance Certification Services Inc. (Hsintien Lab.) The test equipments were listed in page 9 and the test data, please refer page 87- 88.*

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	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

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



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

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

### 6.2 SUPPORT EQUIPMENT

No	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	USB Keyboard	DELL	Sk-8115	N/A	FCC DoC	Shielded, 1.8m	N/A
2.	USB 2.0 HDD	A-Tec	HD-234	N/A	N/A	Shielded, 1.8m with a core	N/A
3.	USB Mouse	DELL	MO56UC	443007174	FCC DoC	Shielded, 1.8m	N/A
4.	Earphone & Microphone	e-Sense	MSB301	N/A	N/A	Unshielded, 1.8m	N/A
5.	Monitor	DELL	2408WFPb	N/A	FCC DoC	Shielded, 1.8m with two cores	Unshielded, 1.8m
6.	Server Notebook	HP	2210B	CNV7472KG5	FCC DoC	Unshielded, 20m	Unshielded, 1.8m
7.	SD Card	N/A	N/A	N/A	N/A	N/A	N/A

**Remark:**

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

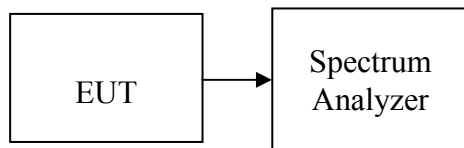
## 7. FCC PART 15.247 REQUIREMENTS

### 7.1 6DB BANDWIDTH

#### LIMIT

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 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)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	12170	>500	PASS
Mid	2437	11080		PASS
High	2462	10080		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	16420	>500	PASS
Mid	2437	16500		PASS
High	2462	16420		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	17580	>500	PASS
Mid	2437	17500		PASS
High	2462	17080		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2422	32550	>500	PASS
Mid	2437	31620		PASS
High	2452	31850		PASS



### IEEE 802.11b mode

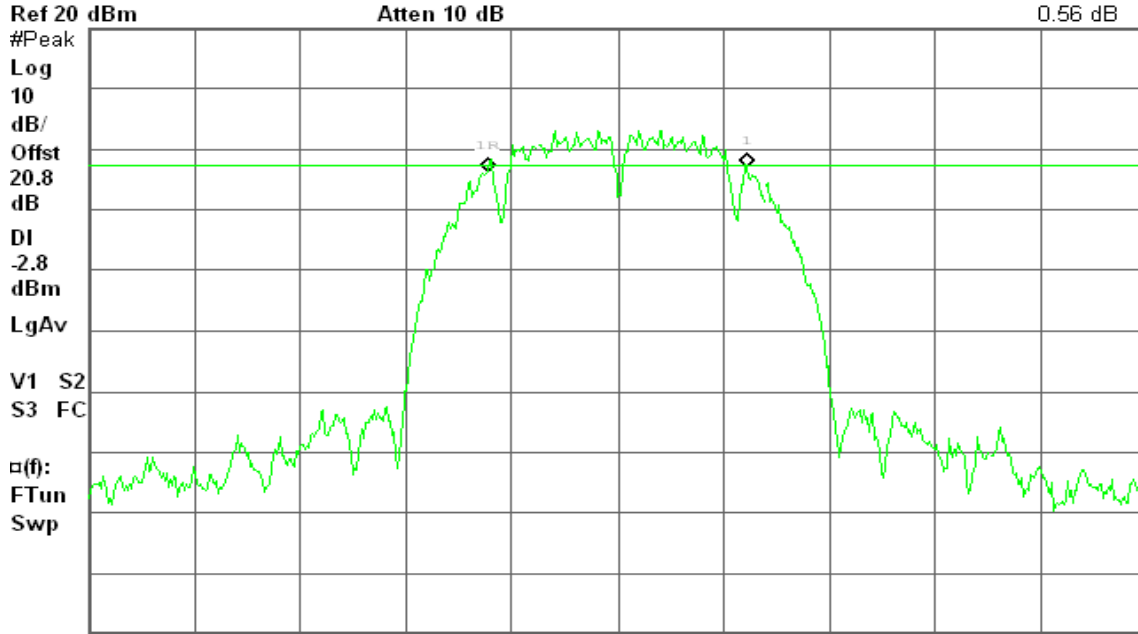
### 6dB Bandwidth (CH Low)

Agilent 21:48:45 Dec 15, 2009

R L

Δ Mkr1 12.17 MHz

0.56 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

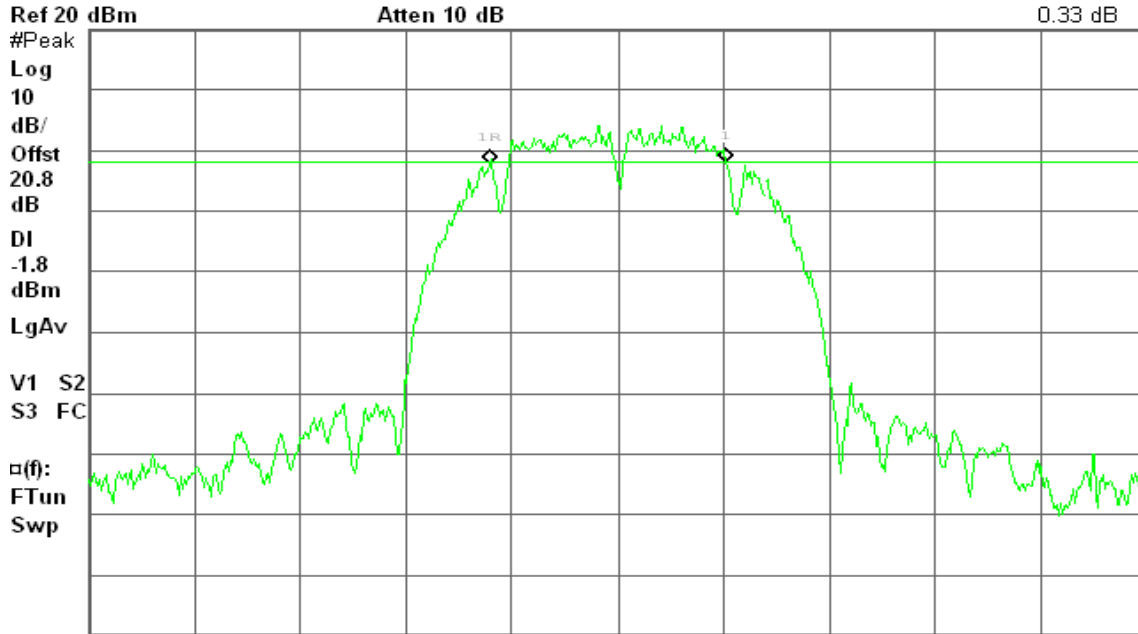
### 6dB Bandwidth (CH Mid)

Agilent 21:57:56 Dec 15, 2009

R T

Δ Mkr1 11.08 MHz

0.33 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



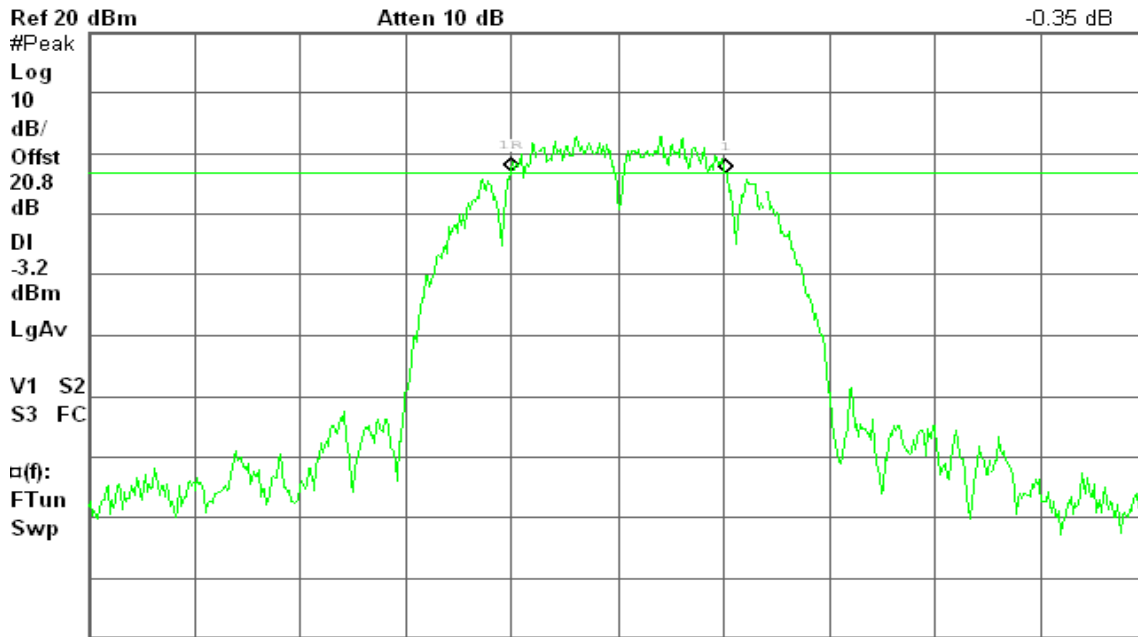


### 6dB Bandwidth (CH High)

Agilent 22:03:46 Dec 15, 2009

R T

Δ Mkr1 10.08 MHz  
-0.35 dB



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

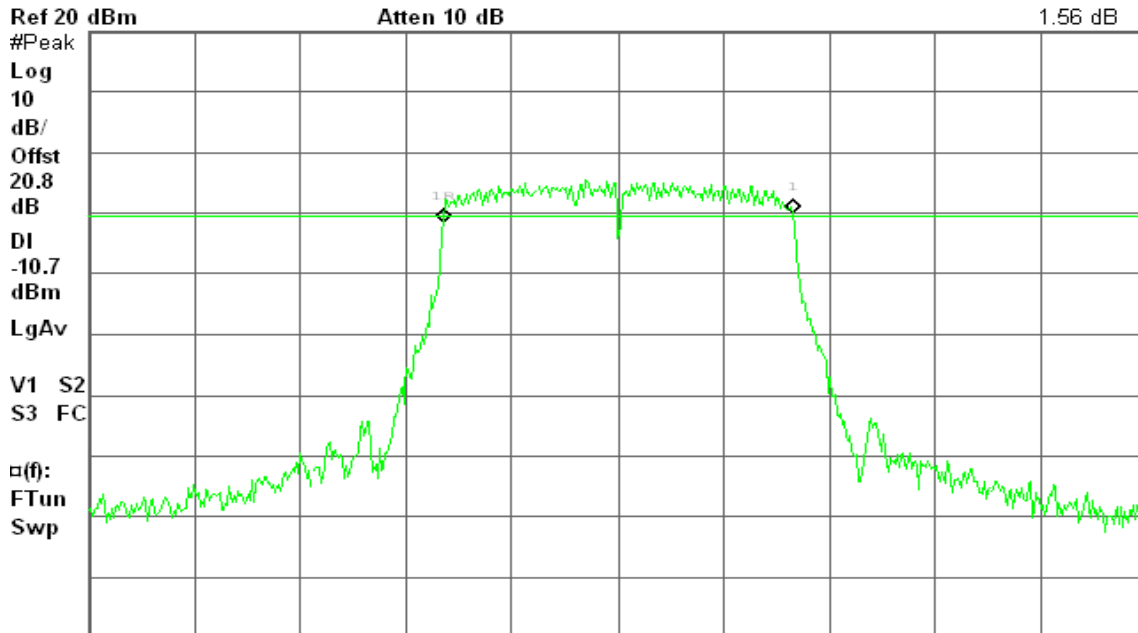
### IEEE 802.11g mode

### 6dB Bandwidth (CH Low)

Agilent 23:03:48 Dec 15, 2009

R T

Δ Mkr1 16.42 MHz  
1.56 dB



Center 2.412 00 GHz Span 50 MHz  
#Res BW 100 kHz #VBW 100 kHz Sweep 6.04 ms (601 pts)

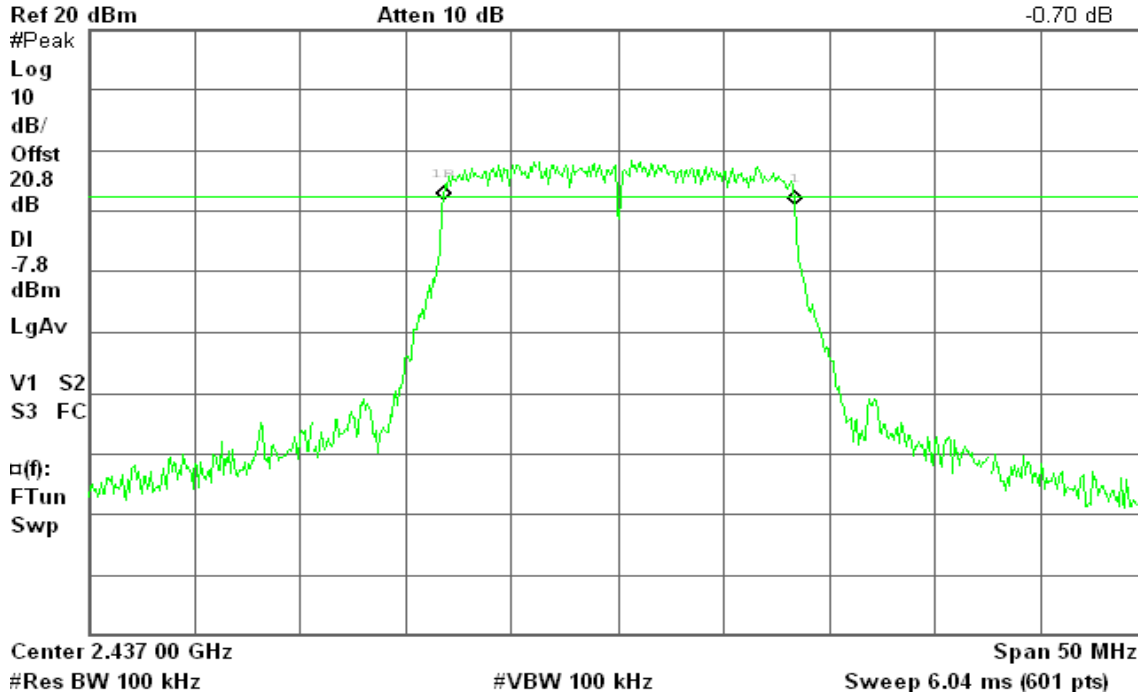


### 6dB Bandwidth (CH Mid)

Agilent 22:54:15 Dec 15, 2009

R T

Δ Mkr1 16.50 MHz  
-0.70 dB

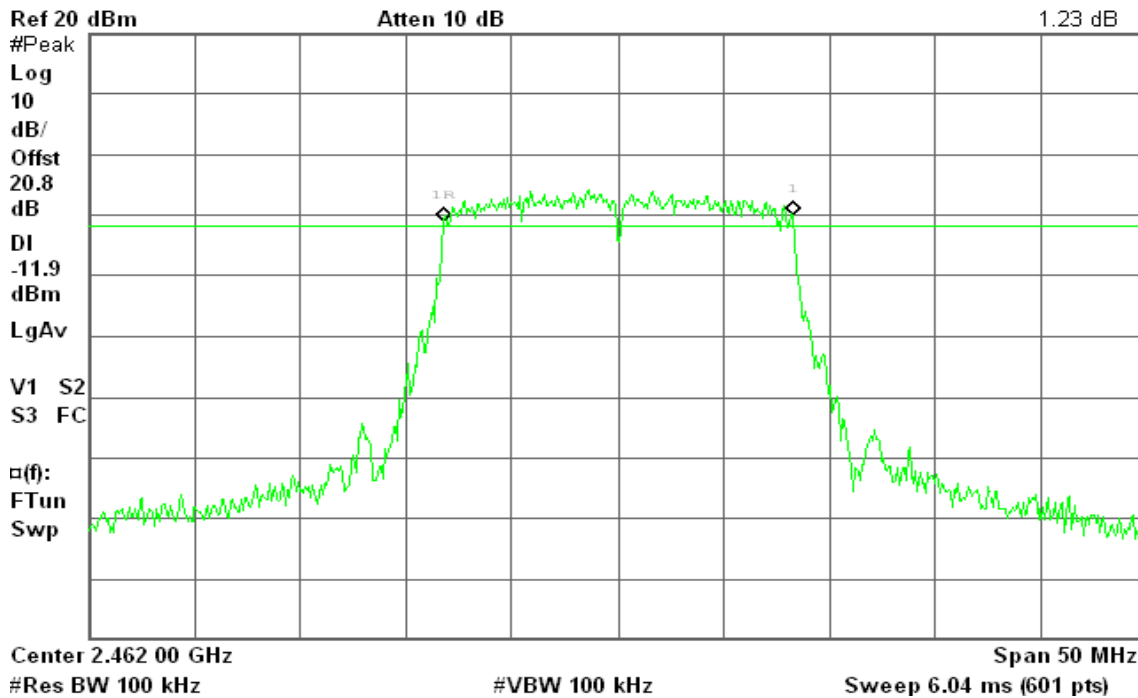


### 6dB Bandwidth (CH High)

Agilent 23:25:55 Dec 15, 2009

R T

Δ Mkr1 16.42 MHz  
1.23 dB





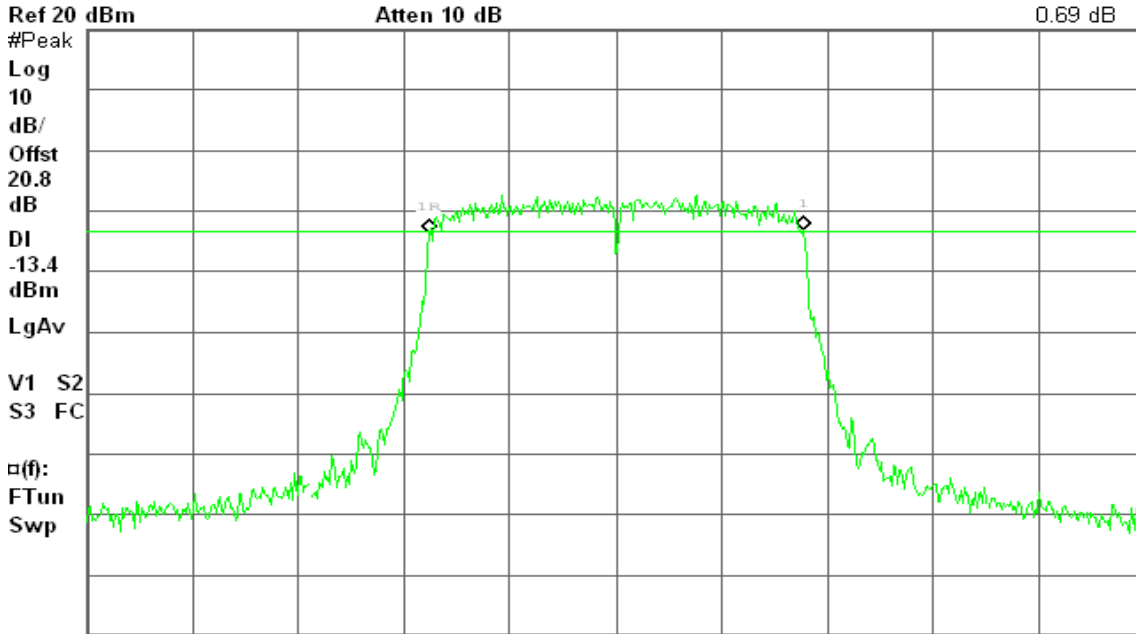
draft 802.11n Standard-20 MHz Channel mode

6dB Bandwidth (CH Low)

Agilent 23:23:42 Dec 15, 2009

R T

Δ Mkr1 17.58 MHz  
0.69 dB

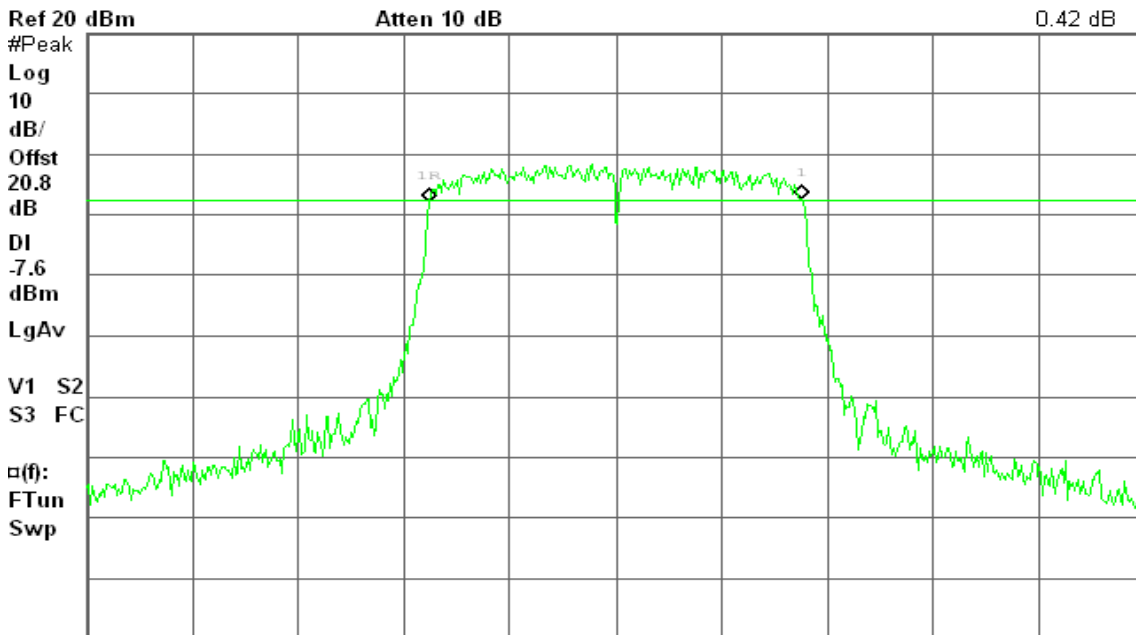


6dB Bandwidth (CH Mid)

Agilent 23:27:17 Dec 15, 2009

R T

Δ Mkr1 17.50 MHz  
0.42 dB



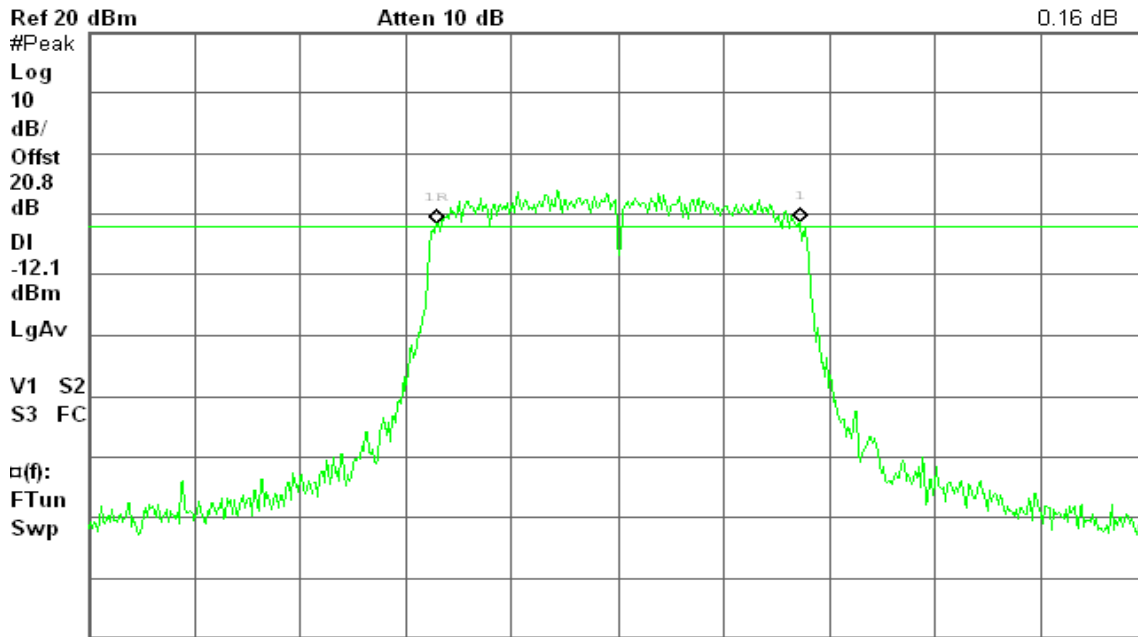


### 6dB Bandwidth (CH High)

Agilent 23:40:16 Dec 15, 2009

R T

Δ Mkr1 17.08 MHz  
0.16 dB



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

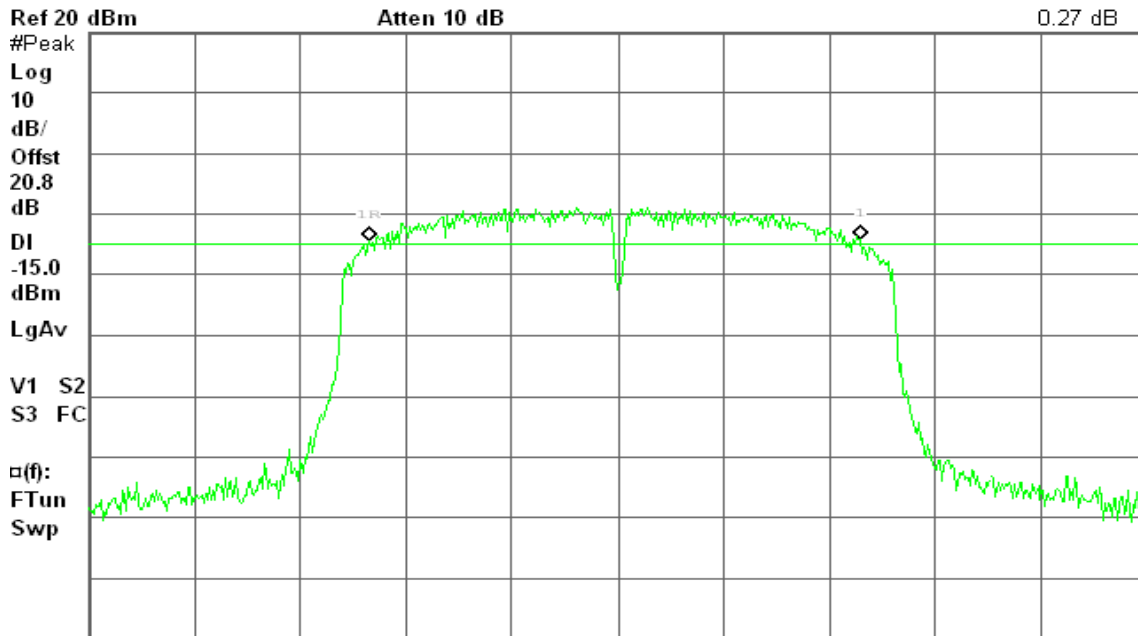
draft 802.11n Wide-40 MHz Channel mode

### 6dB Bandwidth (CH Low)

Agilent 23:49:50 Dec 15, 2009

R T

Δ Mkr1 32.55 MHz  
0.27 dB



Center 2.422 00 GHz Span 70 MHz  
#Res BW 100 kHz #VBW 100 kHz Sweep 8.44 ms (601 pts)

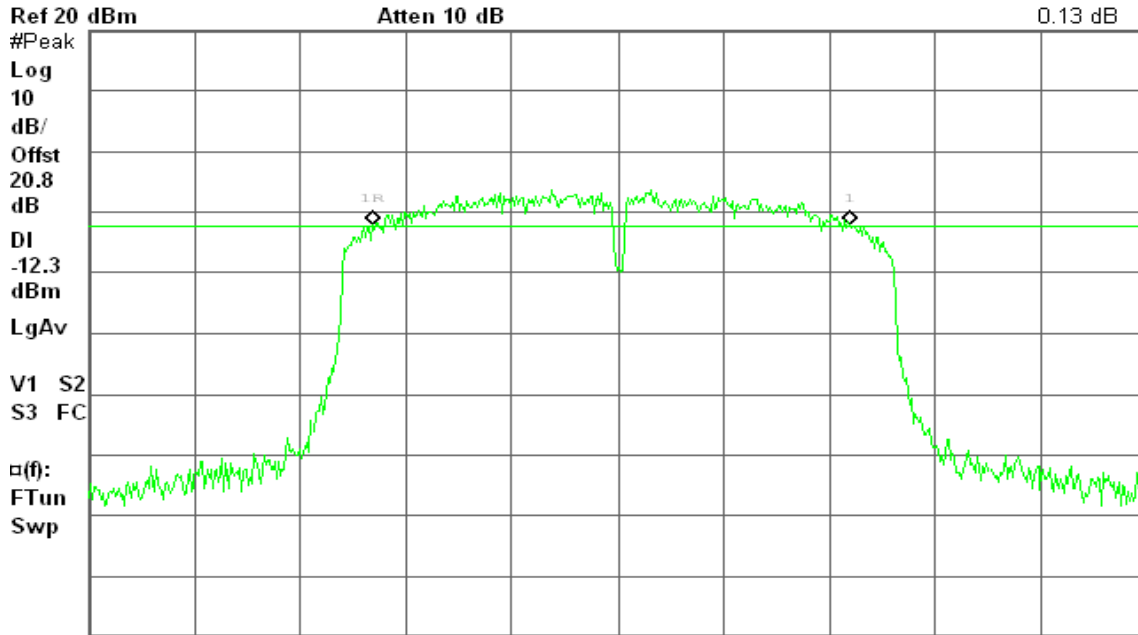


### 6dB Bandwidth (CH Mid)

Agilent 00:05:14 Dec 16, 2009

R T

Δ Mkr1 31.62 MHz  
0.13 dB



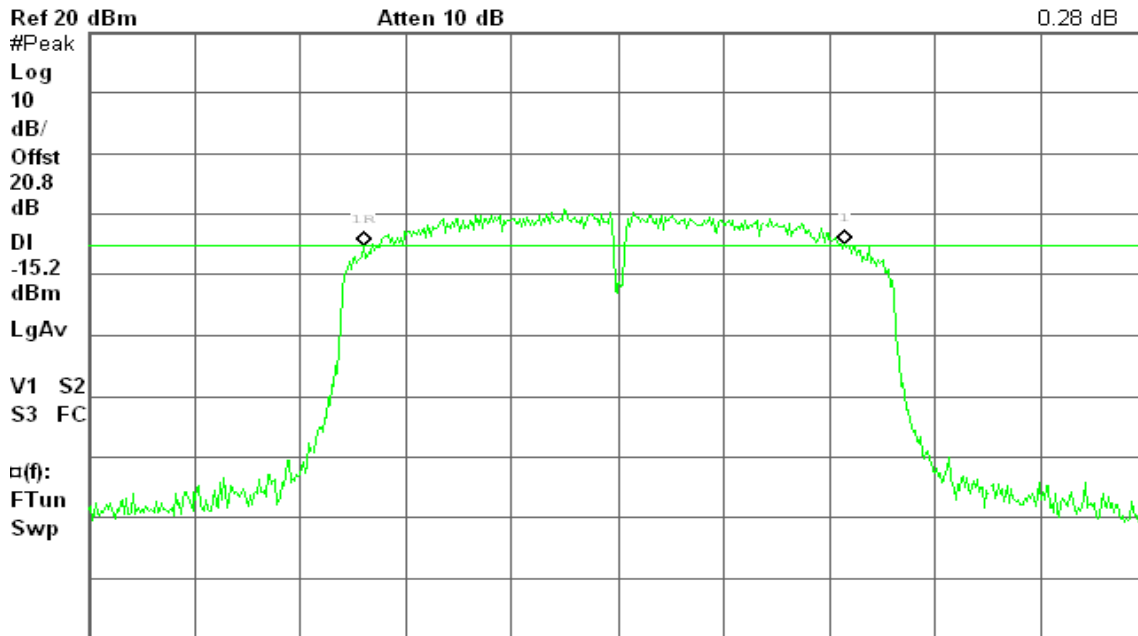
Center 2.437 00 GHz Span 70 MHz  
#Res BW 100 kHz #VBW 100 kHz Sweep 8.44 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 00:12:42 Dec 16, 2009

R T

Δ Mkr1 31.85 MHz  
0.28 dB



Center 2.452 00 GHz Span 70 MHz  
#Res BW 100 kHz #VBW 100 kHz Sweep 8.44 ms (601 pts)

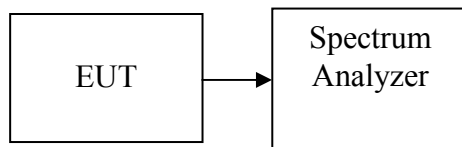
## 7.2 PEAK POWER

### LIMIT

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

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

### Test Configuration



### TEST PROCEDURE

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

### TEST RESULTS

*No non-compliance noted*

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	17.54	0.05675	1.00	PASS
Mid	2437	18.30	0.06761		PASS
High	2462	17.12	0.05152		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	17.70	0.05888	1.00	PASS
Mid	2437	20.51	0.11246		PASS
High	2462	15.96	0.03945		PASS

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.11	0.03243	1.00	PASS
Mid	2437	20.11	0.10257		PASS
High	2462	15.65	0.03673		PASS

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	15.46	0.03516	1.00	PASS
Mid	2437	17.07	0.05093		PASS
High	2452	14.92	0.03105		PASS



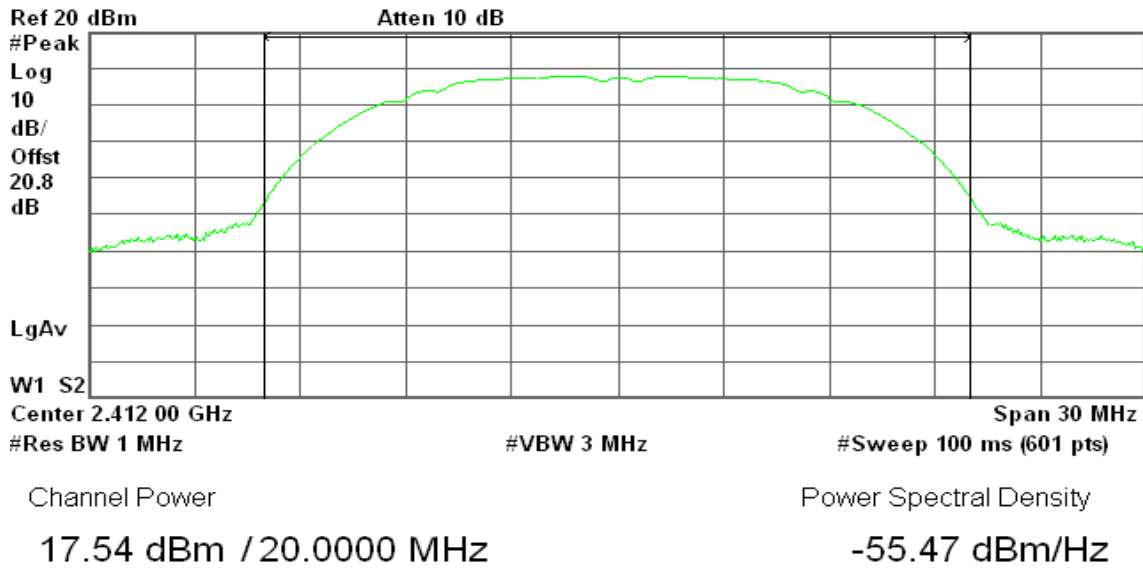
**Test Plot**

**IEEE 802.11b mode**

**Peak Power (CH Low)**

Agilent 22:30:16 Dec 15, 2009

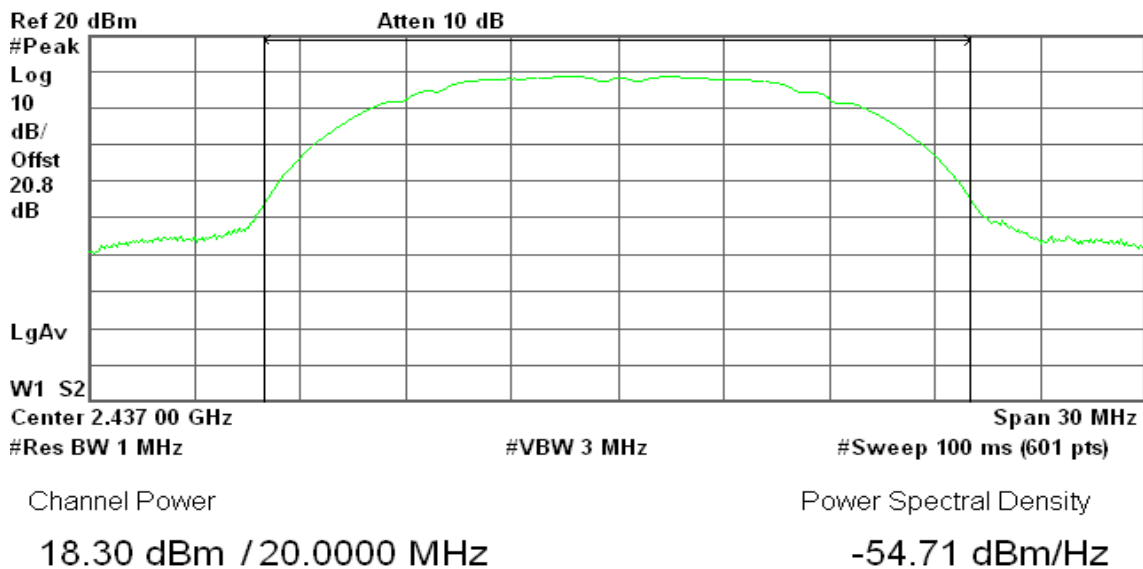
R T



**Peak Power (CH Mid)**

Agilent 22:24:58 Dec 15, 2009

R T



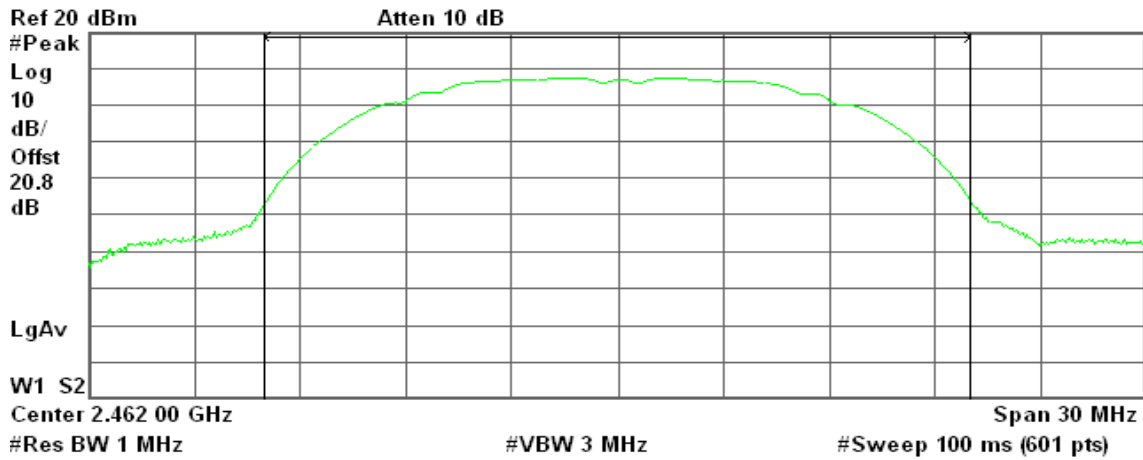




### Peak Power (CH High)

Agilent 22:22:36 Dec 15, 2009

R T



Channel Power

17.12 dBm / 20.0000 MHz

Power Spectral Density

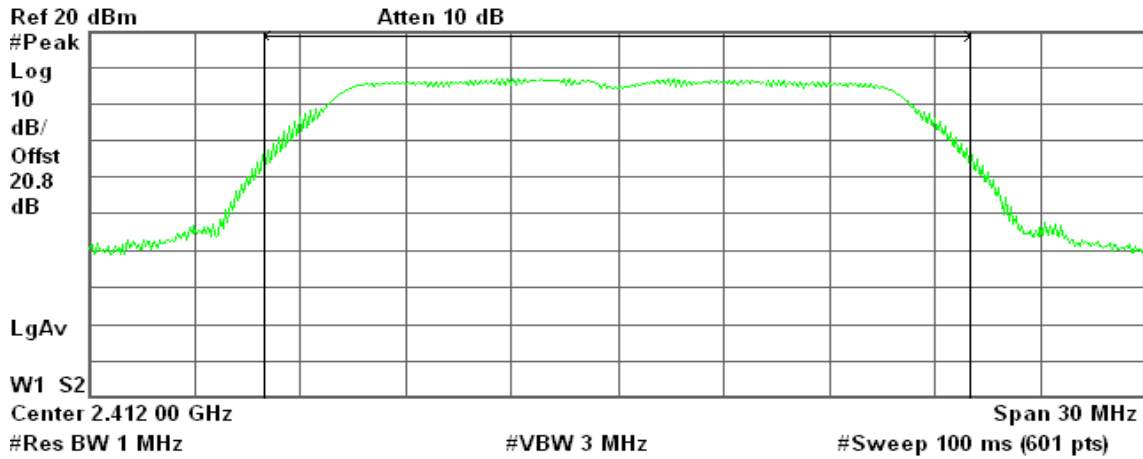
-55.89 dBm/Hz

### IEEE 802.11g mode

#### Peak Power (CH Low)

Agilent 22:39:17 Dec 15, 2009

R T



Channel Power

17.70 dBm / 20.0000 MHz

Power Spectral Density

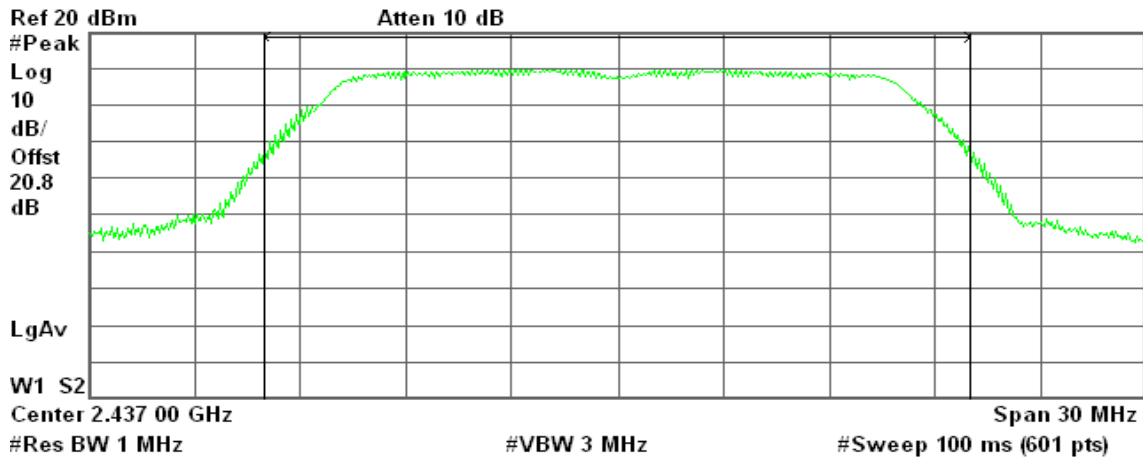
-55.31 dBm/Hz



### Peak Power (CH Mid)

Agilent 22:42:37 Dec 15, 2009

R T



Channel Power

20.51 dBm / 20.0000 MHz

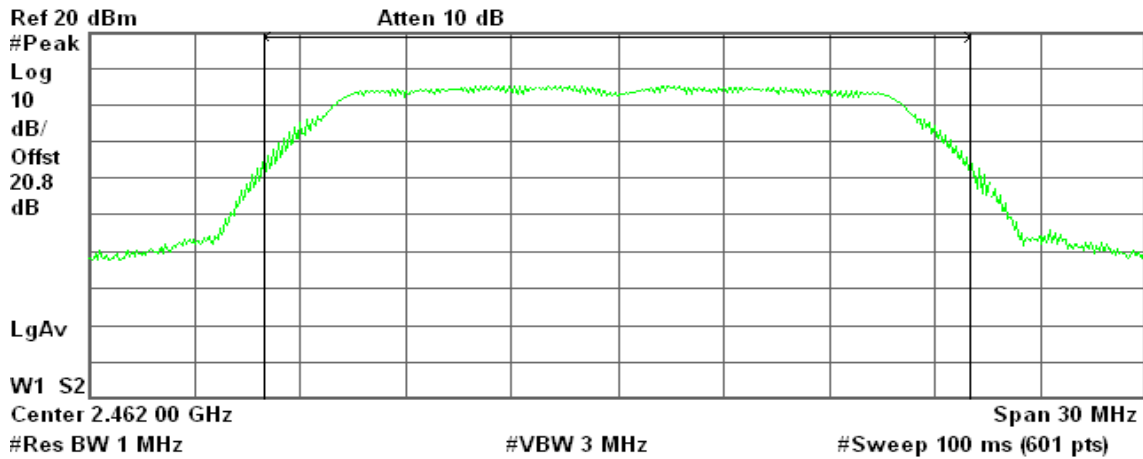
Power Spectral Density

-52.50 dBm/Hz

### Peak Power (CH High)

Agilent 22:46:31 Dec 15, 2009

R T



Channel Power

15.96 dBm / 20.0000 MHz

Power Spectral Density

-57.05 dBm/Hz

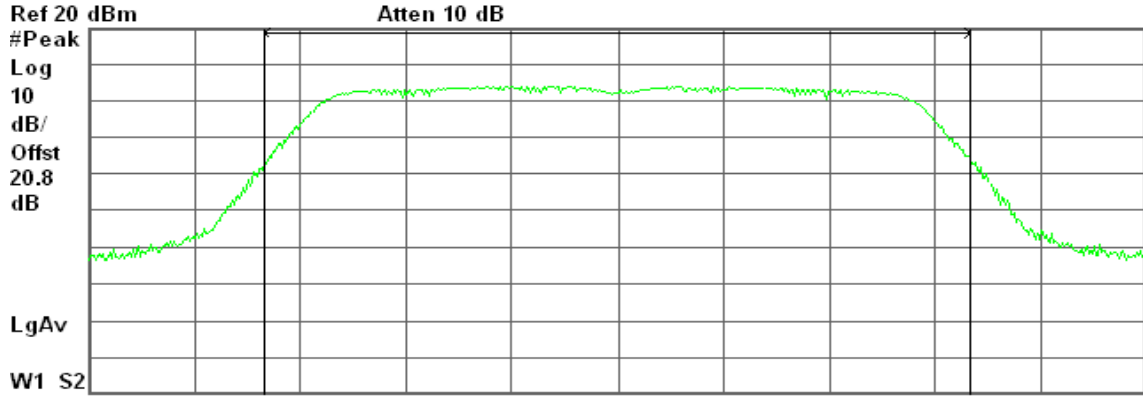


### draft 802.11n Standard-20 MHz Channel mode

#### Peak Power (CH Low)

Agilent 23:15:57 Dec 15, 2009

R T



Center 2.412 00 GHz Span 30 MHz  
 #Res BW 1 MHz #VBW 3 MHz #Sweep 100 ms (601 pts)

Channel Power

15.11 dBm / 20.0000 MHz

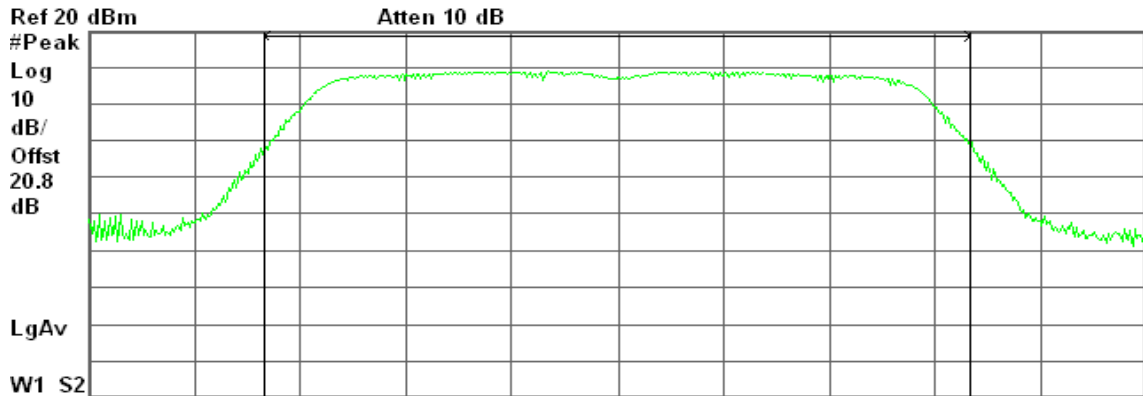
Power Spectral Density

-57.90 dBm/Hz

#### Peak Power (CH Mid)

Agilent 23:33:30 Dec 15, 2009

R T



Center 2.437 00 GHz Span 30 MHz  
 #Res BW 1 MHz #VBW 3 MHz #Sweep 100 ms (601 pts)

Channel Power

20.11 dBm / 20.0000 MHz

Power Spectral Density

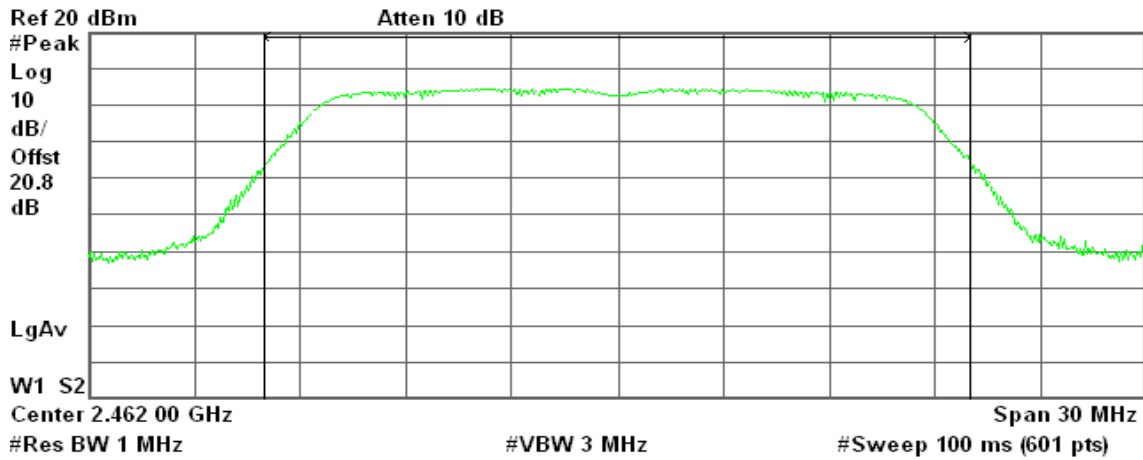
-52.90 dBm/Hz



### Peak Power (CH High)

Agilent 23:38:47 Dec 15, 2009

R T



Channel Power

15.65 dBm / 20.0000 MHz

Power Spectral Density

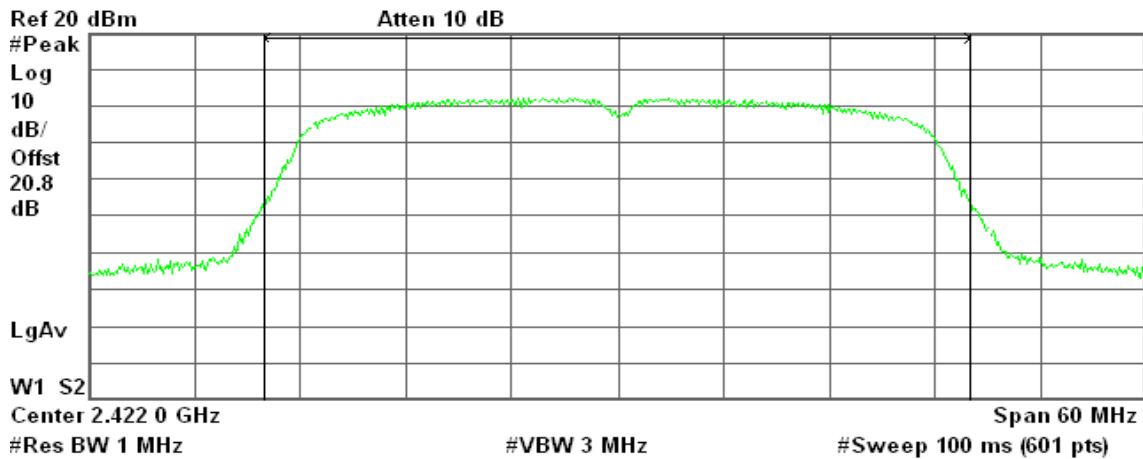
-57.36 dBm/Hz

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

### Peak Power (CH Low)

Agilent 23:57:27 Dec 15, 2009

R T



Channel Power

15.46 dBm / 40.0000 MHz

Power Spectral Density

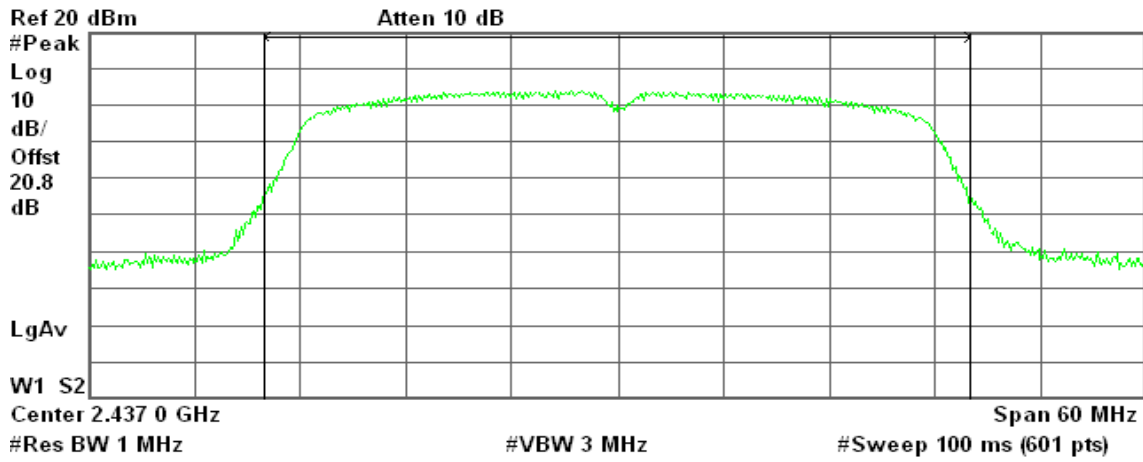
-60.56 dBm/Hz



### Peak Power (CH Mid)

Agilent 00:03:17 Dec 16, 2009

R T



Channel Power

17.07 dBm / 40.0000 MHz

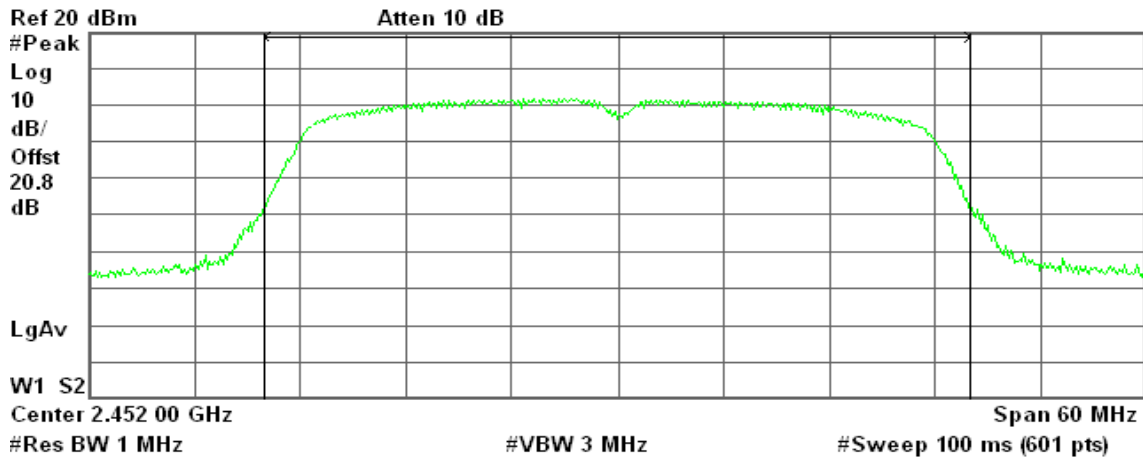
Power Spectral Density

-58.95 dBm/Hz

### Peak Power (CH High)

Agilent 00:11:16 Dec 16, 2009

R T



Channel Power

14.92 dBm / 40.0000 MHz

Power Spectral Density

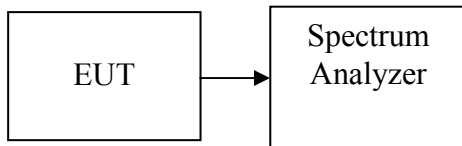
-61.10 dBm/Hz

### **7.3 AVERAGE POWER**

#### **LIMIT**

None; for reporting purposes only.

#### **Test Configuration**



#### **TEST PROCEDURE**

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



## **TEST RESULTS**

*No non-compliance noted*

### **Test Data**

#### **Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	14.57	0.02864
Mid	2437	15.31	0.03396
High	2462	14.18	0.02618

#### **Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	10.28	0.01067
Mid	2437	13.15	0.02065
High	2462	8.45	0.00700

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	7.79	0.00601
Mid	2437	12.74	0.01879
High	2462	8.29	0.00675

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2422	8.25	0.00668
Mid	2437	9.75	0.00944
High	2452	7.75	0.00596



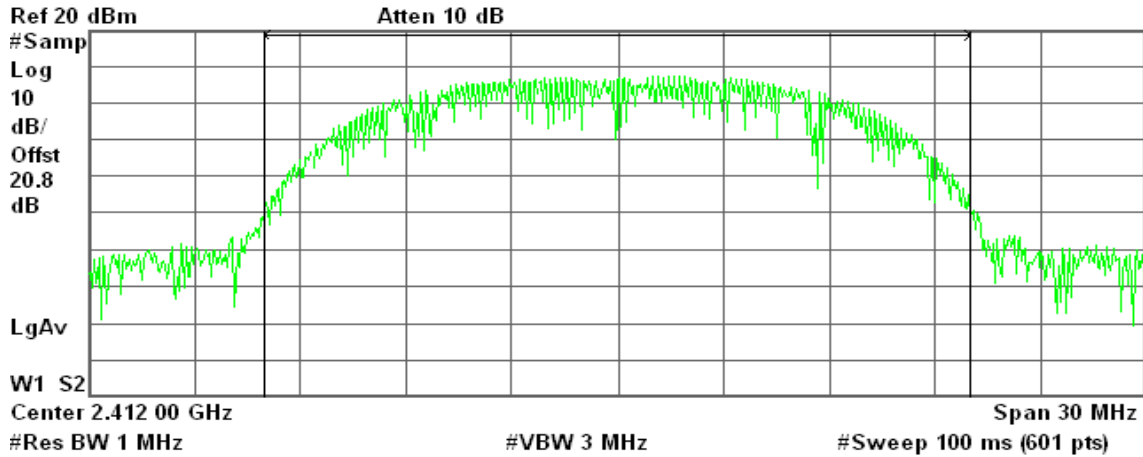
**Test Plot**

**IEEE 802.11b mode**

**Average Power (CH Low)**

Agilent 22:30:59 Dec 15, 2009

R T



Channel Power

14.57 dBm / 20.0000 MHz

Power Spectral Density

-58.44 dBm/Hz

**Average Power (CH Mid)**

Agilent 22:26:50 Dec 15, 2009

R T



Channel Power

15.31 dBm / 20.0000 MHz

Power Spectral Density

-57.70 dBm/Hz

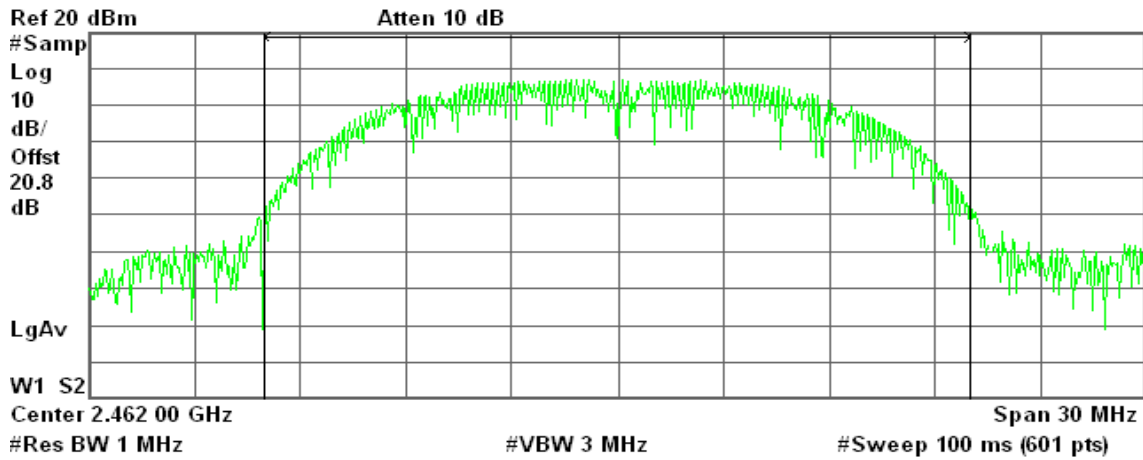




### Average Power (CH High)

Agilent 22:22:01 Dec 15, 2009

R T



Channel Power

14.18 dBm / 20.0000 MHz

Power Spectral Density

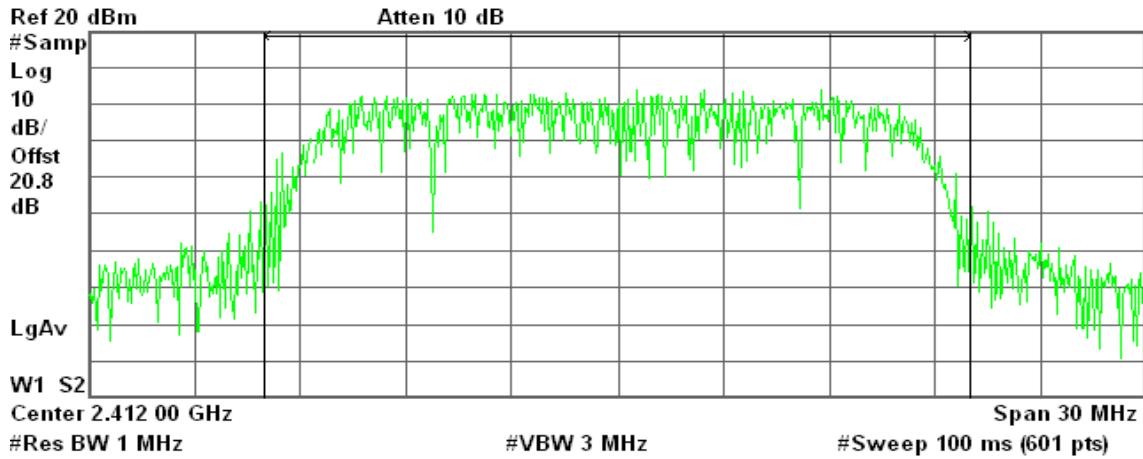
-58.83 dBm/Hz

### IEEE 802.11g mode

#### Average Power (CH Low)

Agilent 22:40:18 Dec 15, 2009

R T



Channel Power

10.28 dBm / 20.0000 MHz

Power Spectral Density

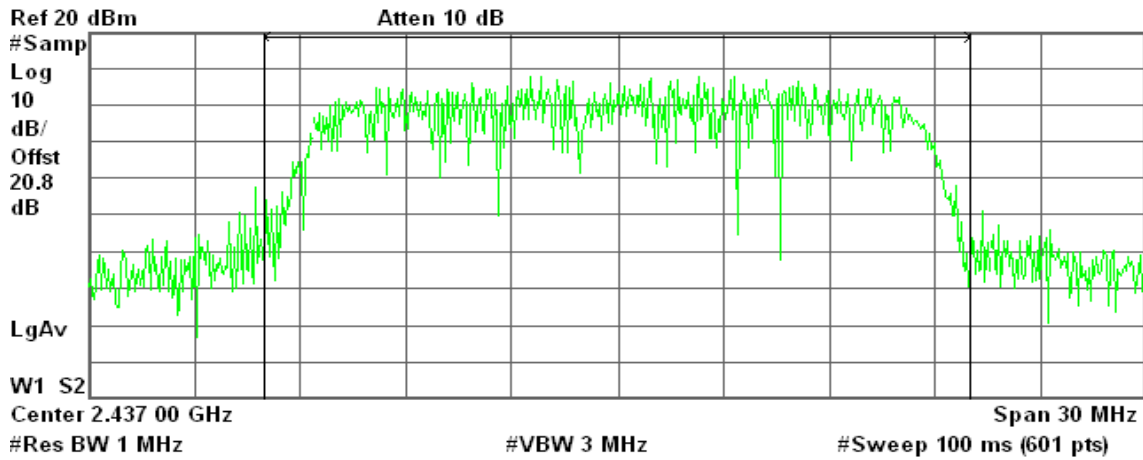
-62.73 dBm/Hz



### Average Power (CH Mid)

Agilent 22:43:37 Dec 15, 2009

R T



Channel Power

13.15 dBm / 20.0000 MHz

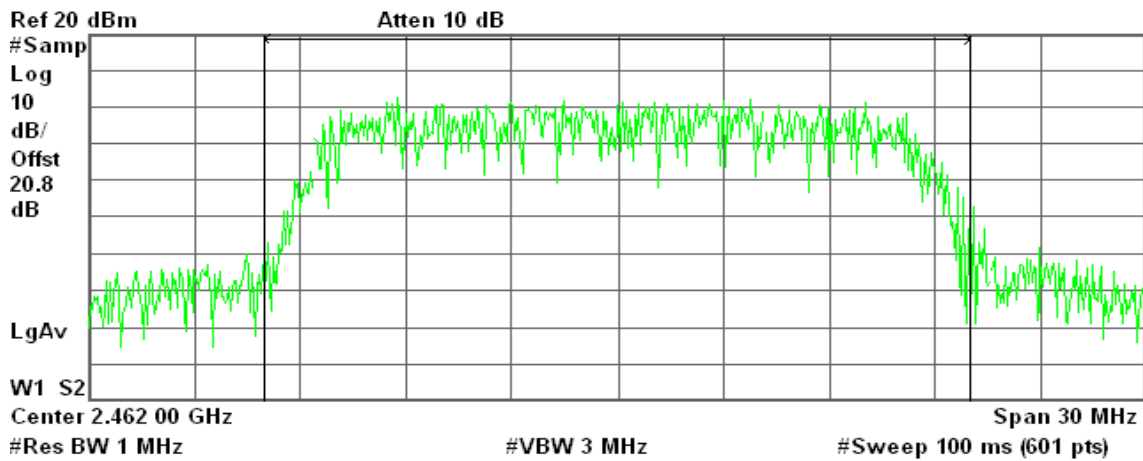
Power Spectral Density

-59.86 dBm/Hz

### Average Power (CH High)

Agilent 22:47:42 Dec 15, 2009

R T



Channel Power

8.45 dBm / 20.0000 MHz

Power Spectral Density

-64.56 dBm/Hz

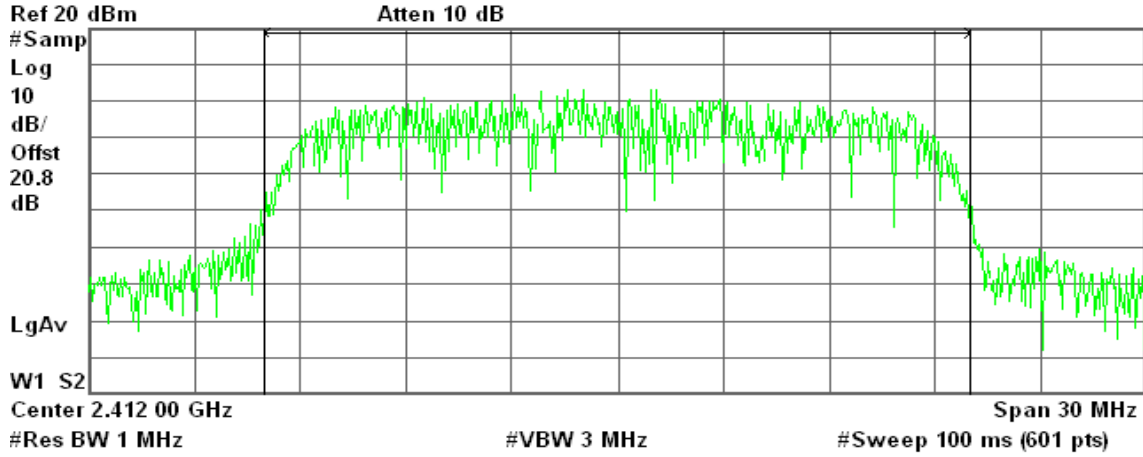


### draft 802.11n Standard-20 MHz Channel mode

#### Average Power (CH Low)

Agilent 23:17:59 Dec 15, 2009

R T



Channel Power

7.79 dBm / 20.0000 MHz

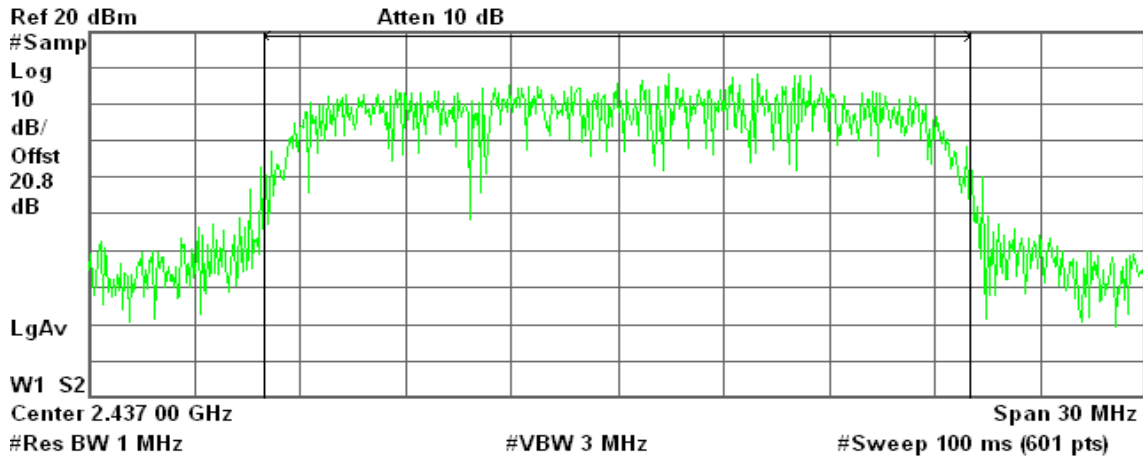
Power Spectral Density

-65.22 dBm/Hz

#### Average Power (CH Mid)

Agilent 23:34:56 Dec 15, 2009

R T



Channel Power

12.74 dBm / 20.0000 MHz

Power Spectral Density

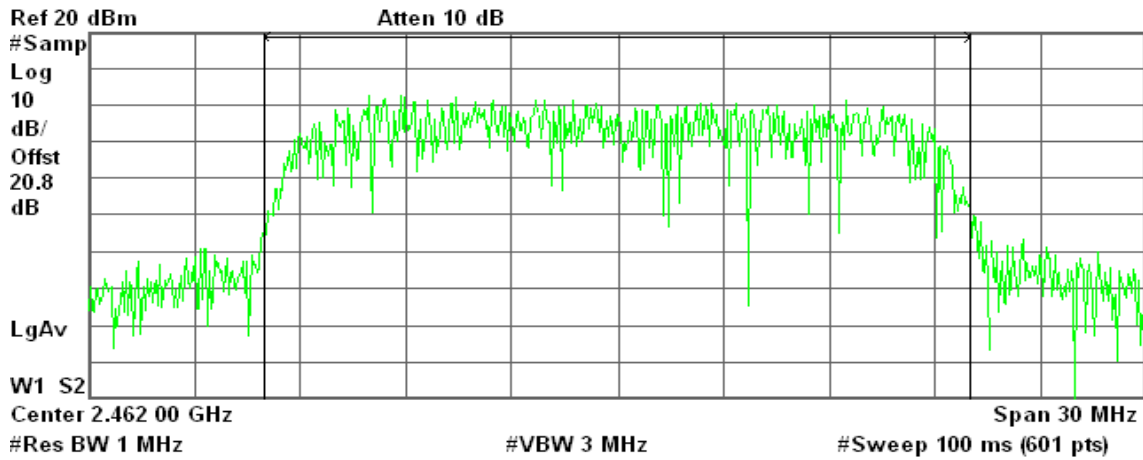
-60.27 dBm/Hz



### Average Power (CH High)

Agilent 23:39:36 Dec 15, 2009

R T



Channel Power

8.29 dBm / 20.0000 MHz

Power Spectral Density

-64.72 dBm/Hz

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

#### Average Power (CH Low)

Agilent 23:58:58 Dec 15, 2009

R T



Channel Power

8.25 dBm / 40.0000 MHz

Power Spectral Density

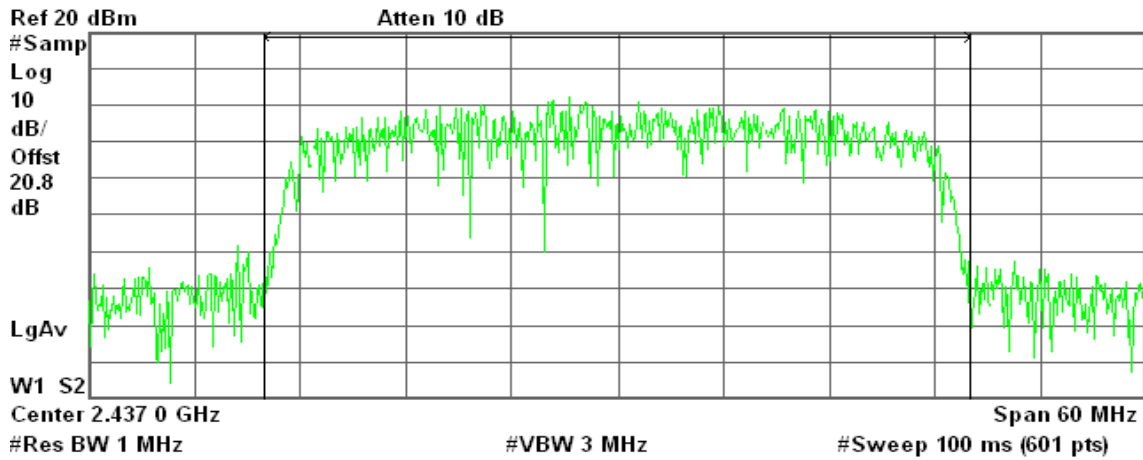
-67.77 dBm/Hz



### Average Power (CH Mid)

Agilent 00:04:22 Dec 16, 2009

R T



Channel Power

9.75 dBm / 40.0000 MHz

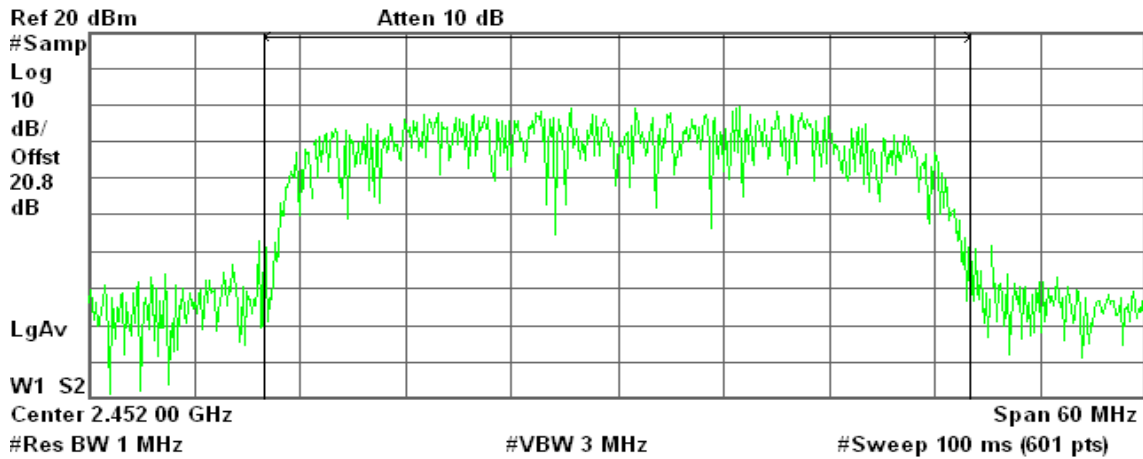
Power Spectral Density

-66.27 dBm/Hz

### Average Power (CH High)

Agilent 00:12:08 Dec 16, 2009

R T



Channel Power

7.75 dBm / 40.0000 MHz

Power Spectral Density

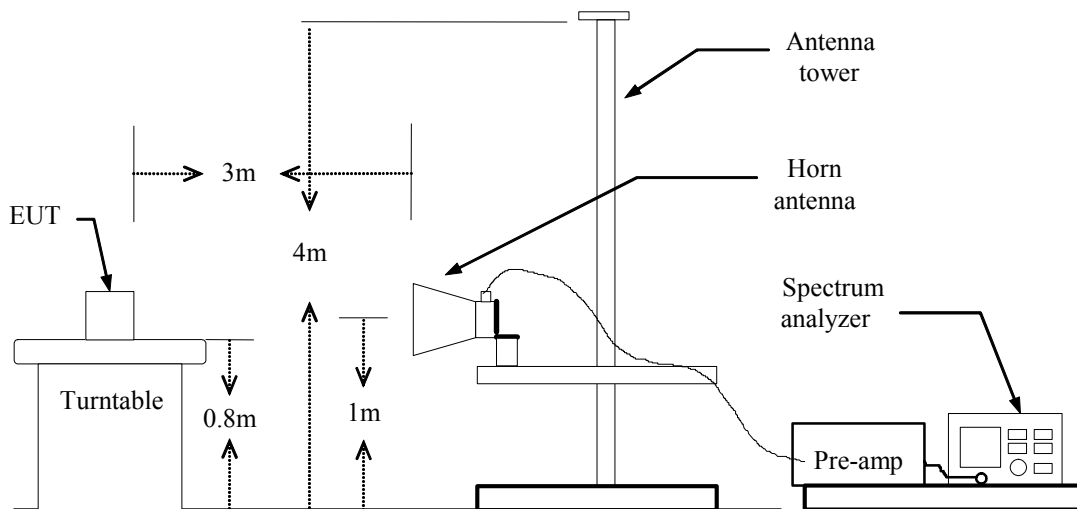
-68.27 dBm/Hz

## 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

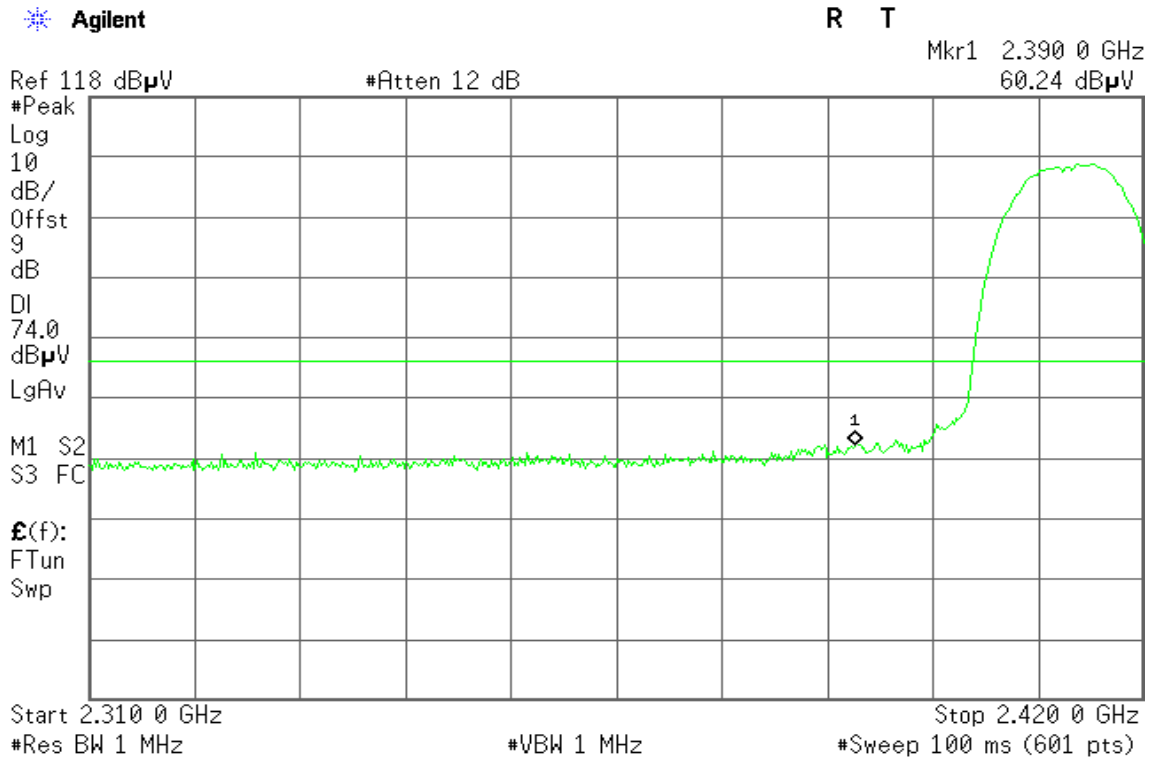
Refer to attach spectrum analyzer data chart.



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

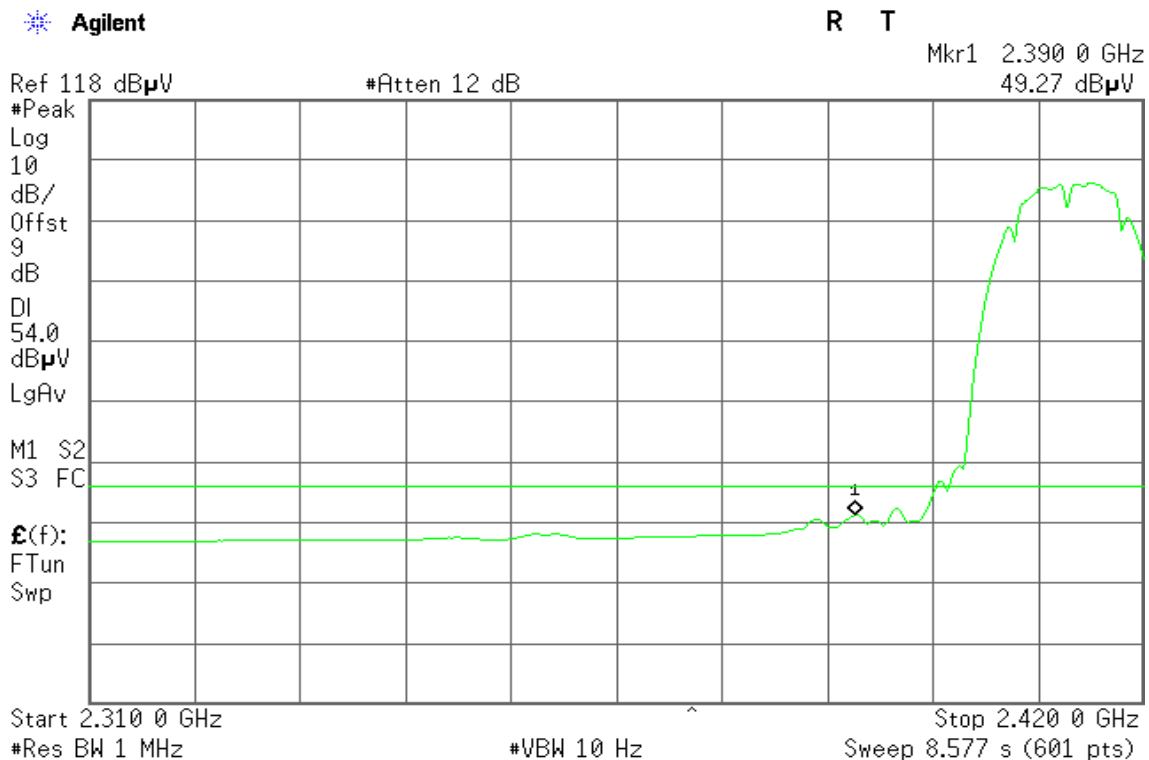
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz  
60.52 dBµV

Ref 118 dBµV

#Atten 12 dB

#Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dBµV

LgAv

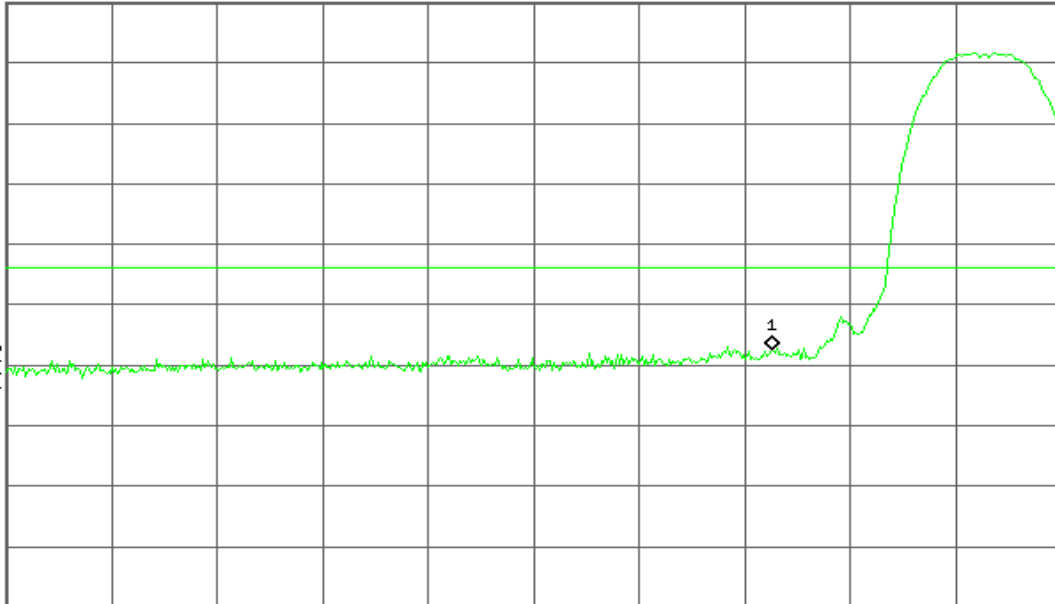
M1 S2

S3 FC

£(f):

FTun

Swp



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz  
50.00 dBµV

Ref 118 dBµV

#Atten 12 dB

#Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dBµV

LgAv

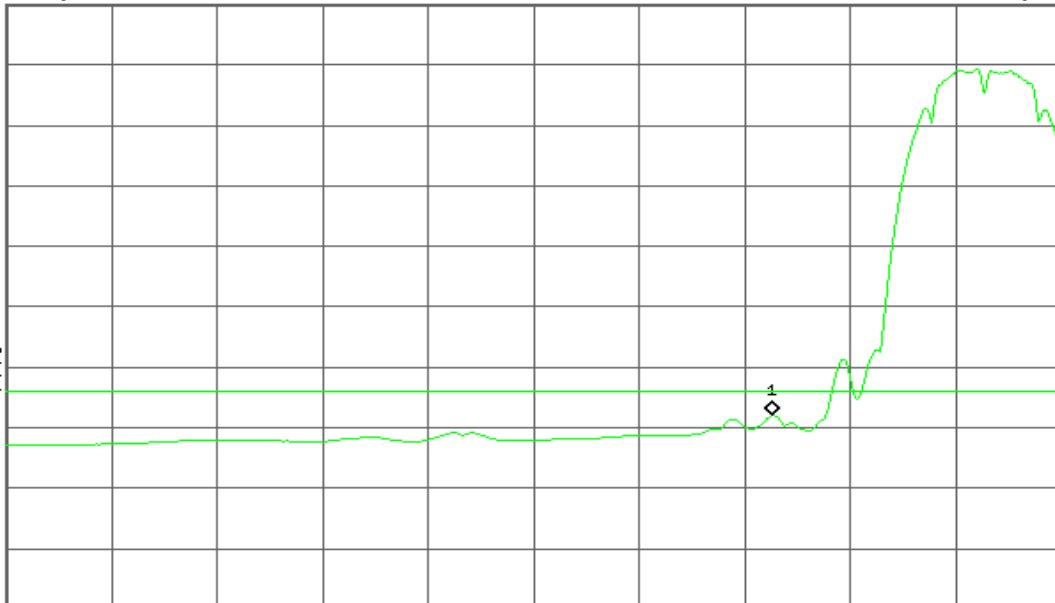
M1 S2

S3 FC

£(f):

FTun

Swp



Start 2.310 0 GHz ^

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)





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

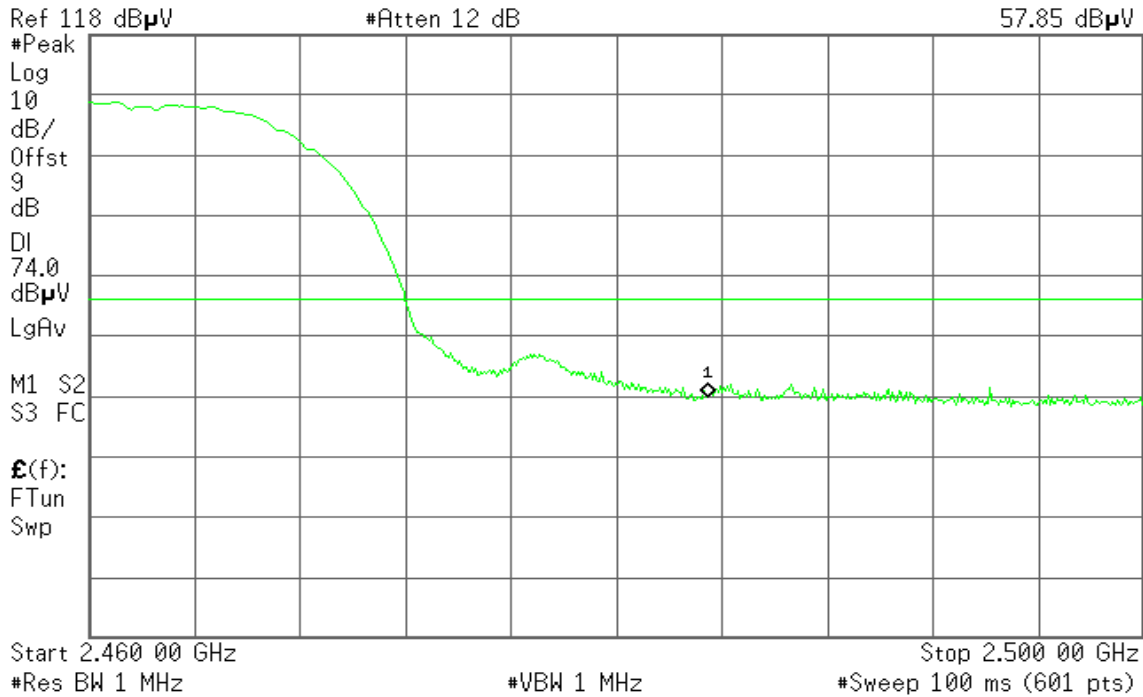
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz  
57.85 dB $\mu$ V



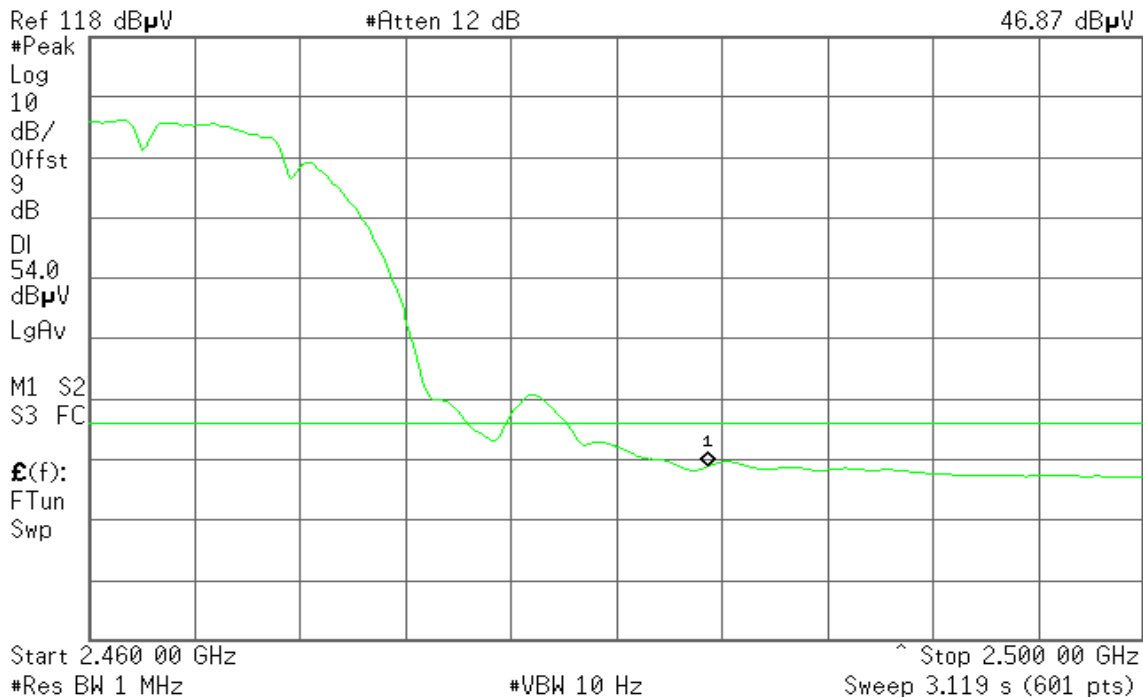
Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz  
46.87 dB $\mu$ V





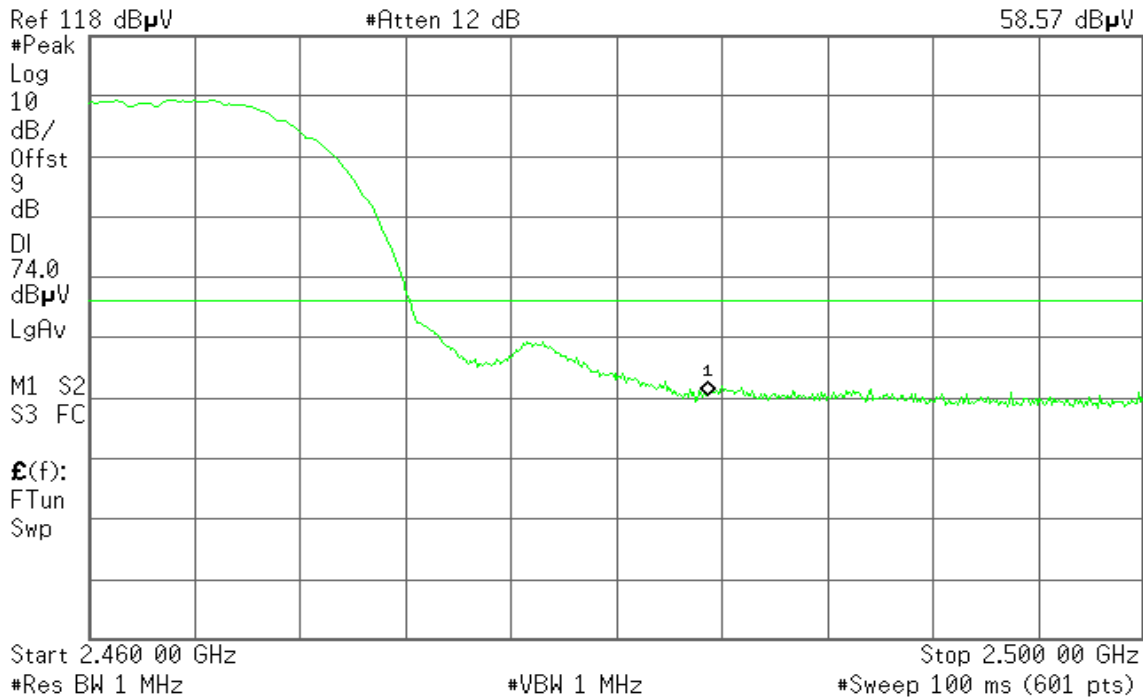
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
58.57 dBμV



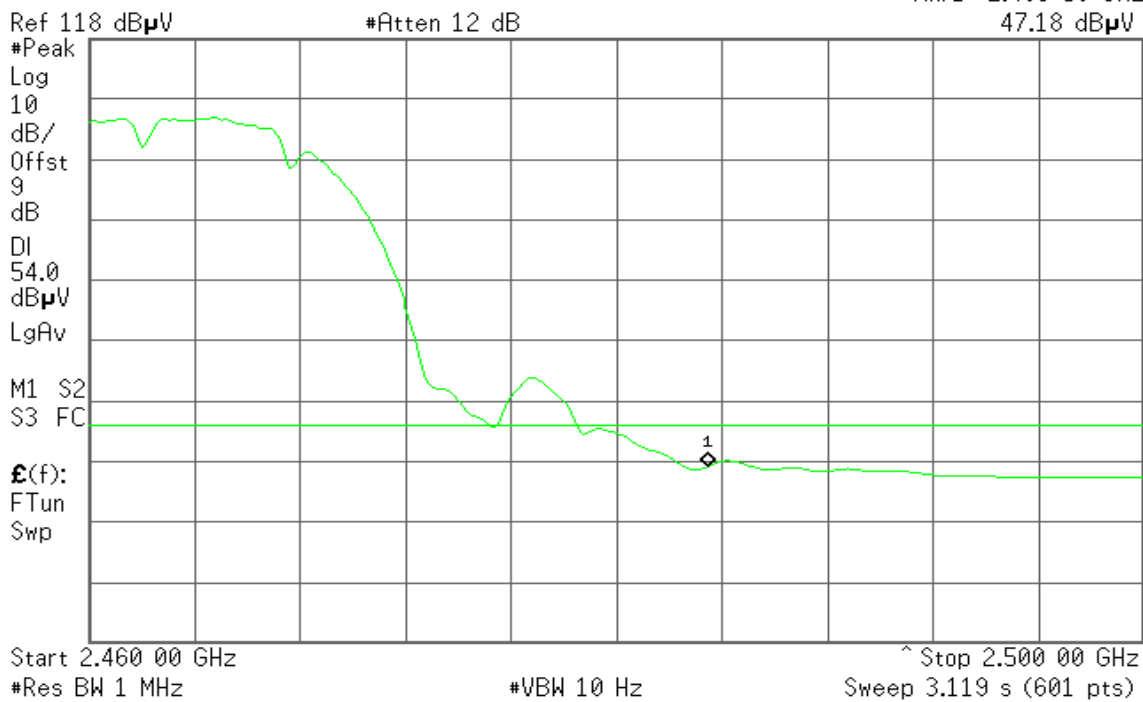
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
47.18 dBμV

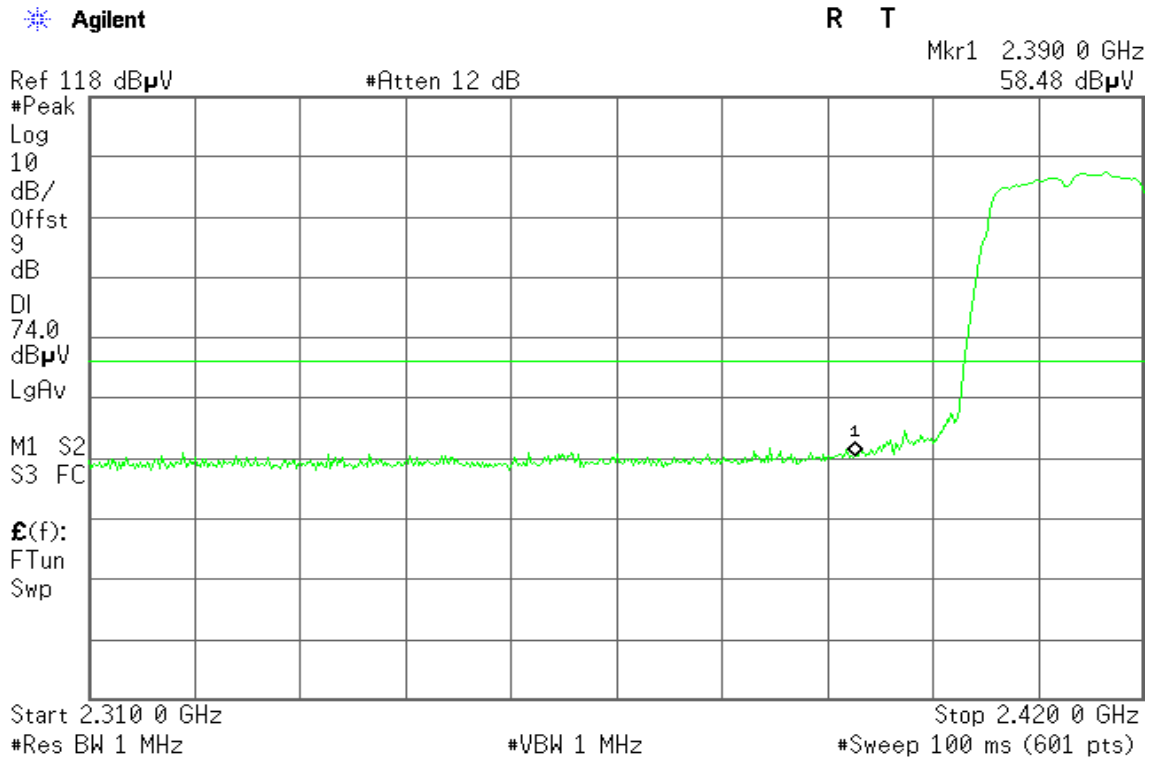




### Band Edges (IEEE 802.11g mode / CH Low)

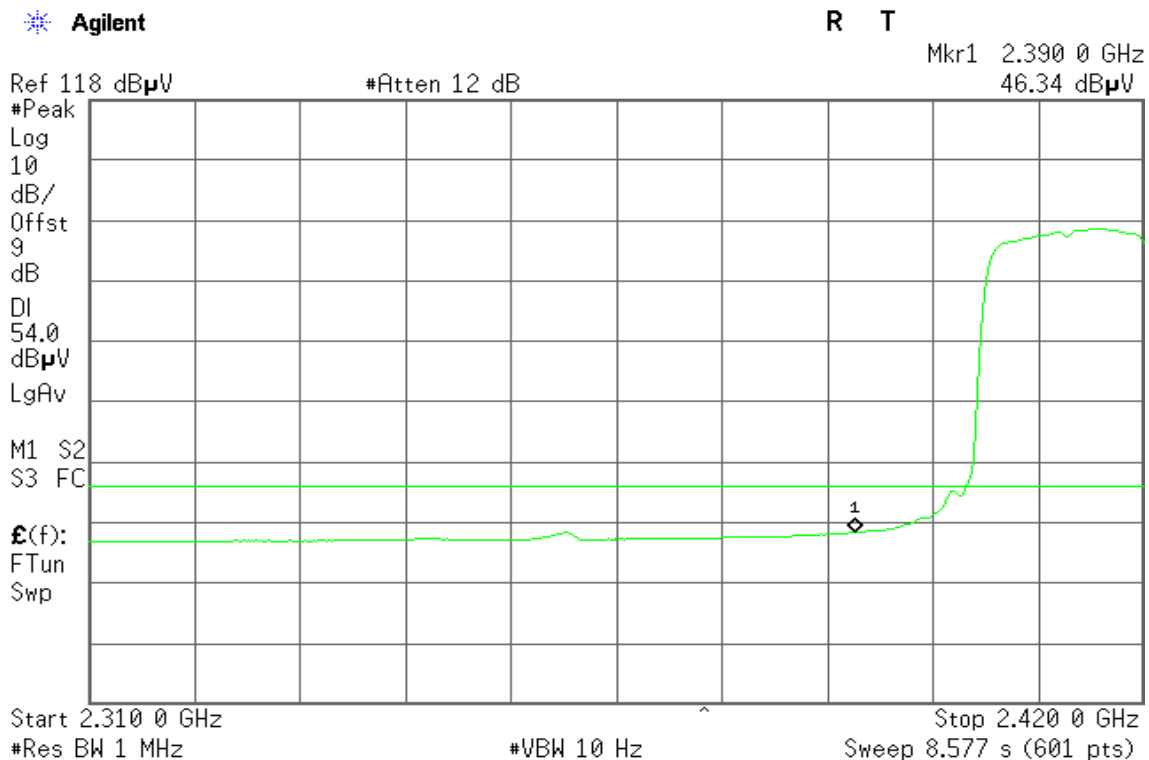
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





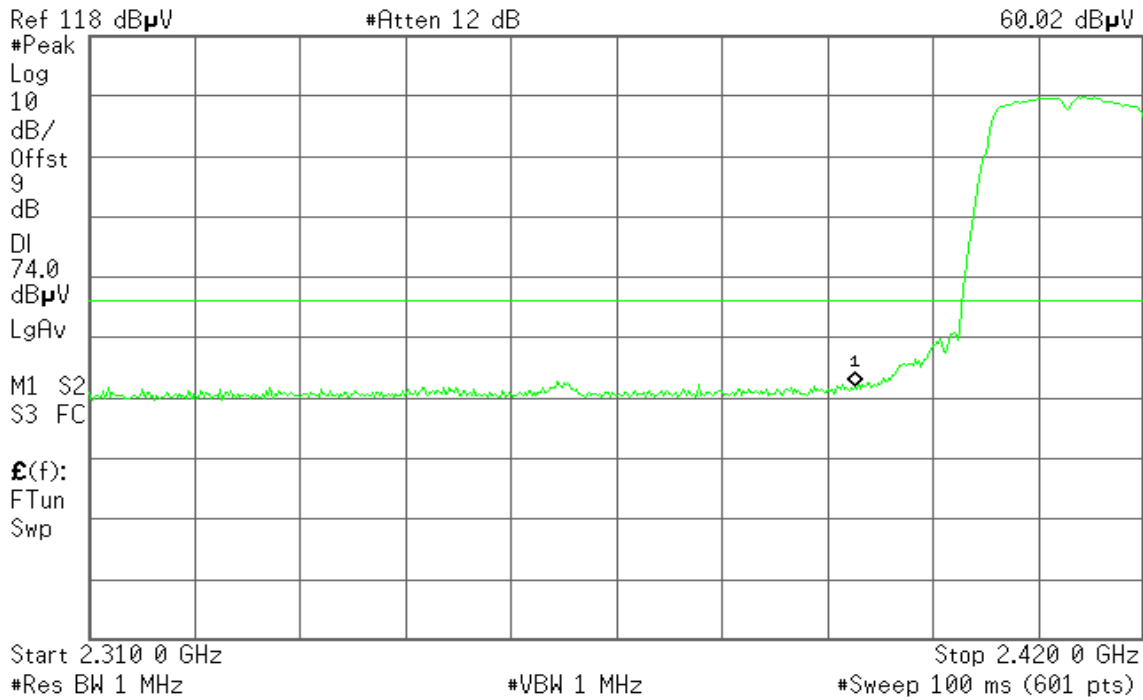
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz  
60.02 dBµV



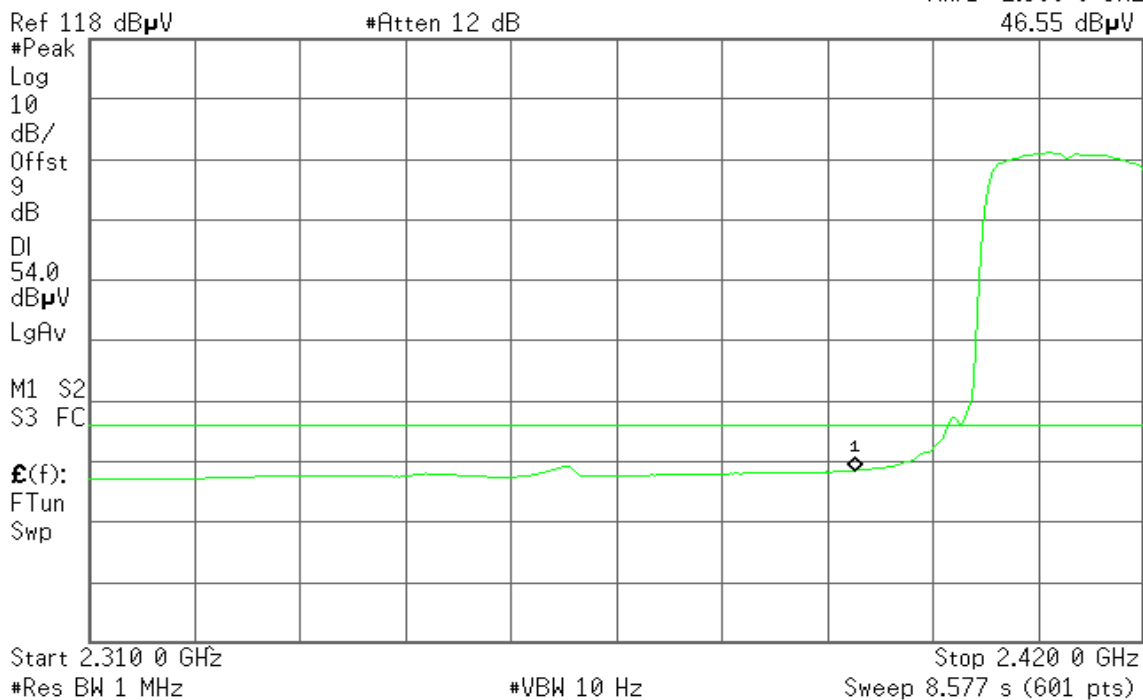
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz  
46.55 dBµV





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

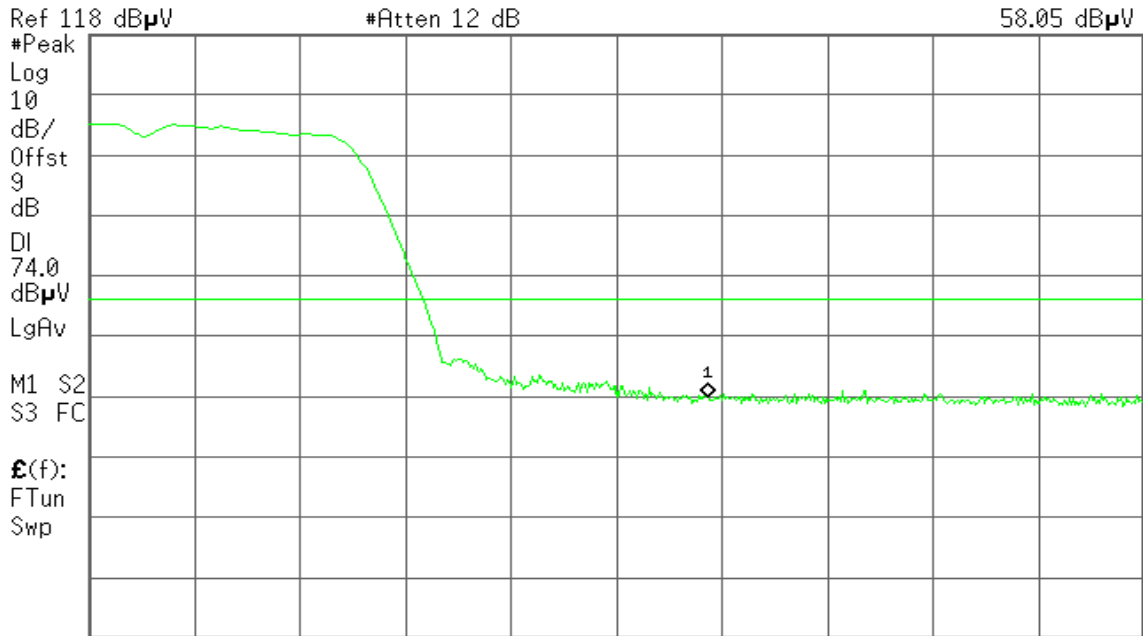
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz  
58.05 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)

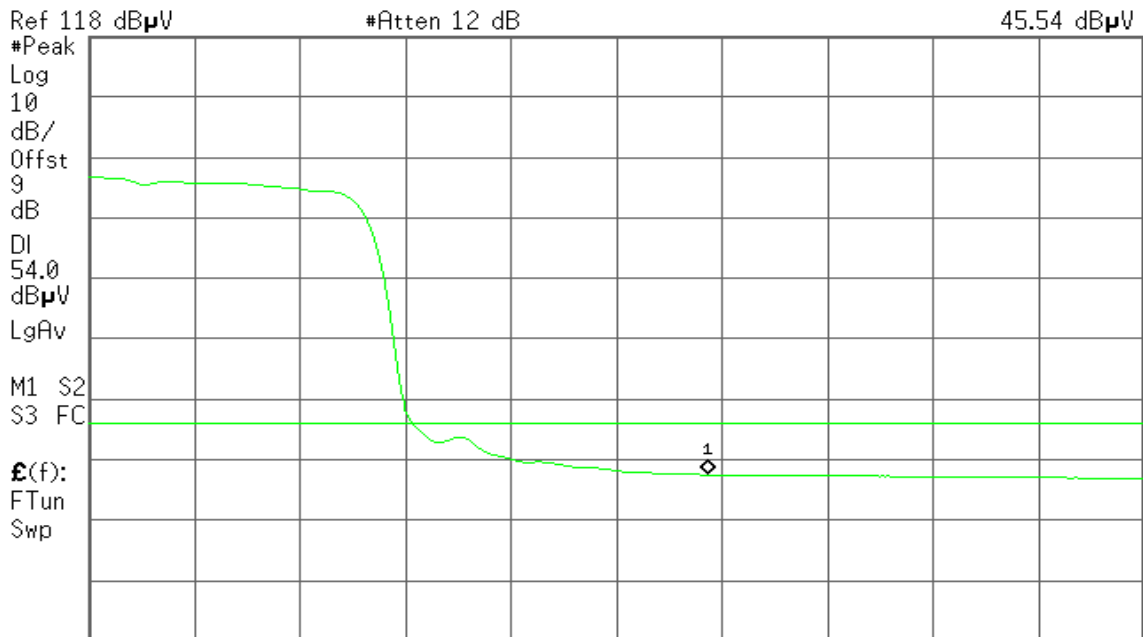
Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz  
45.54 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)



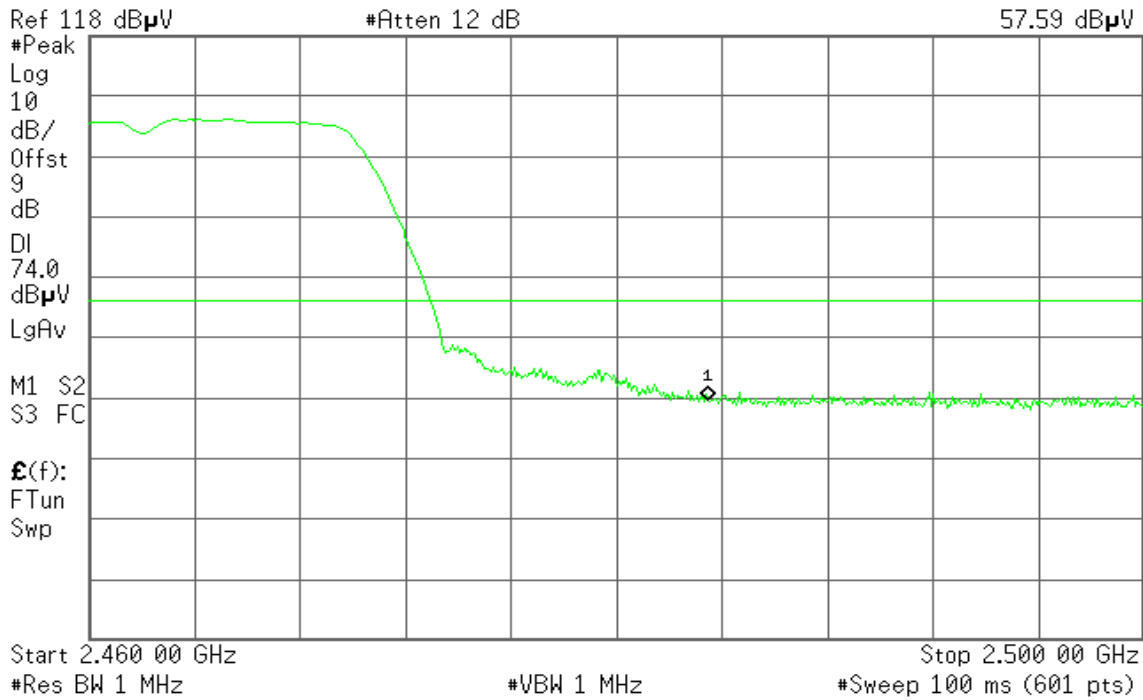
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
57.59 dBμV



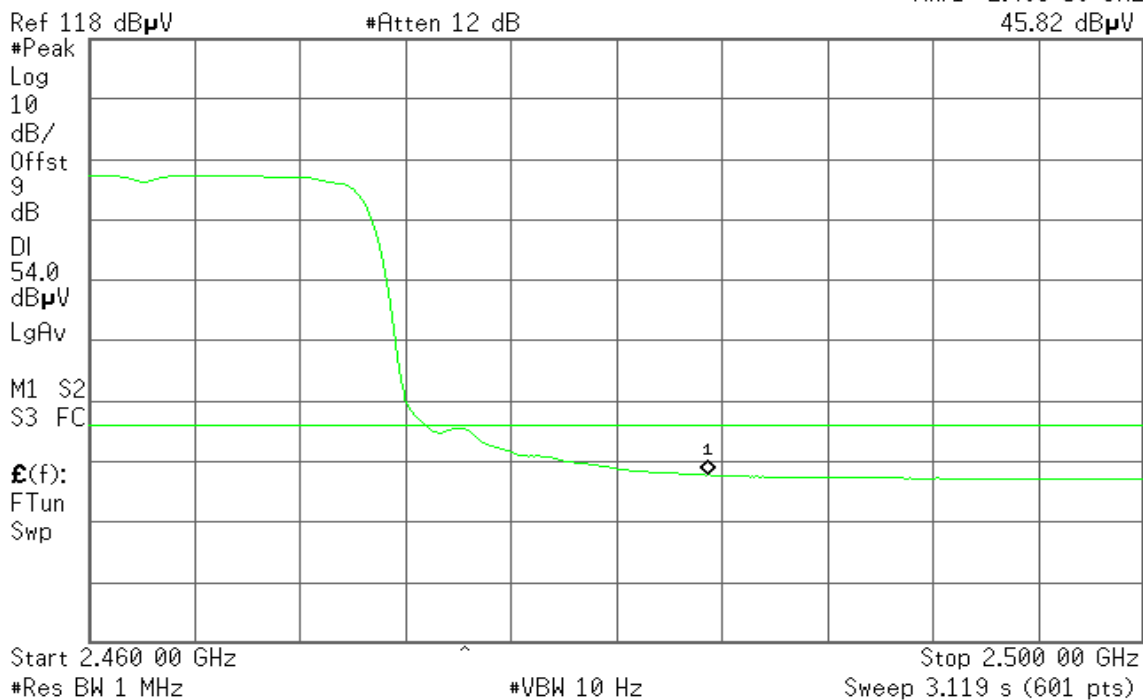
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
45.82 dBμV

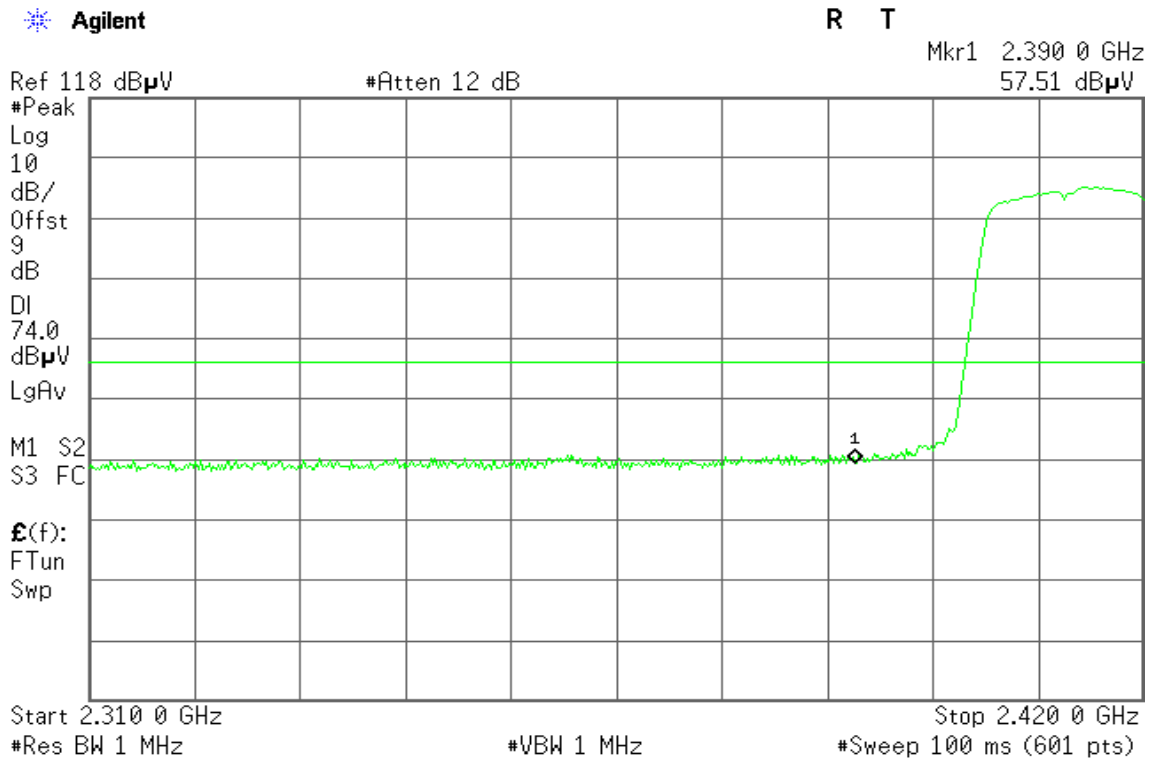




### Band Edges (draft 802.11n Standard-20 MHz Channel mode / CH Low)

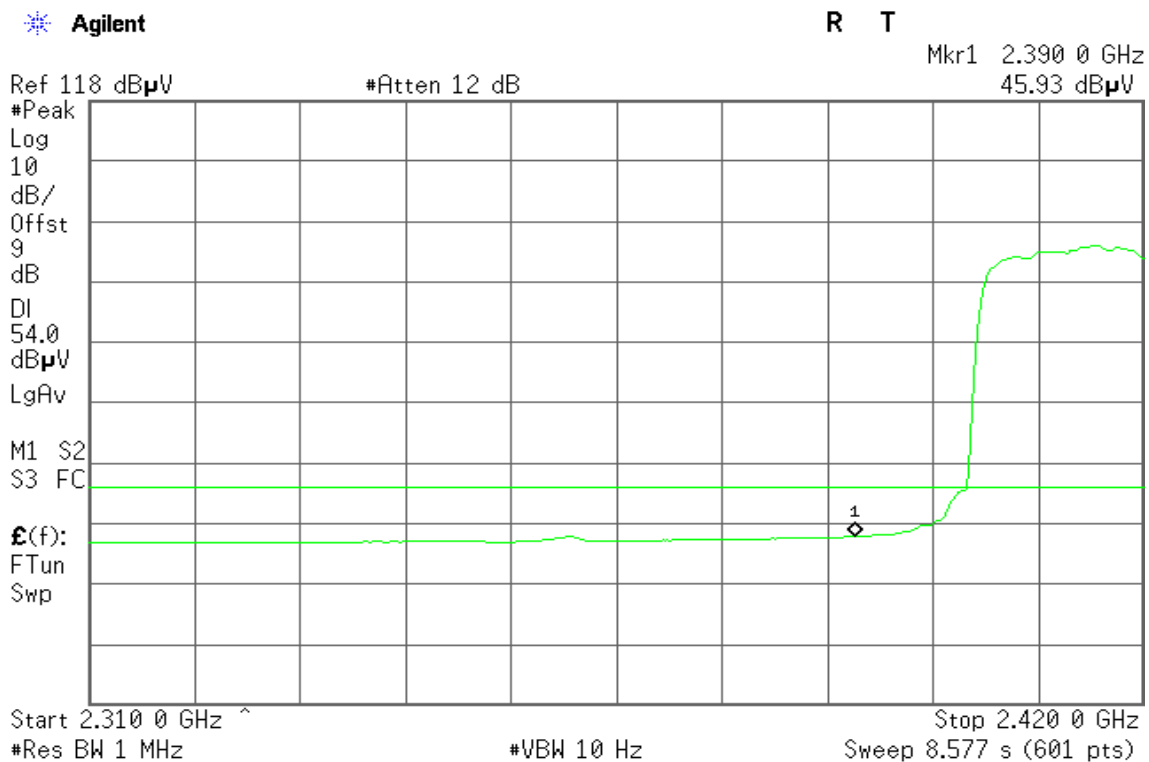
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz  
58.26 dBμV

Ref 118 dBμV

#Atten 12 dB

#Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dBμV

LgAv

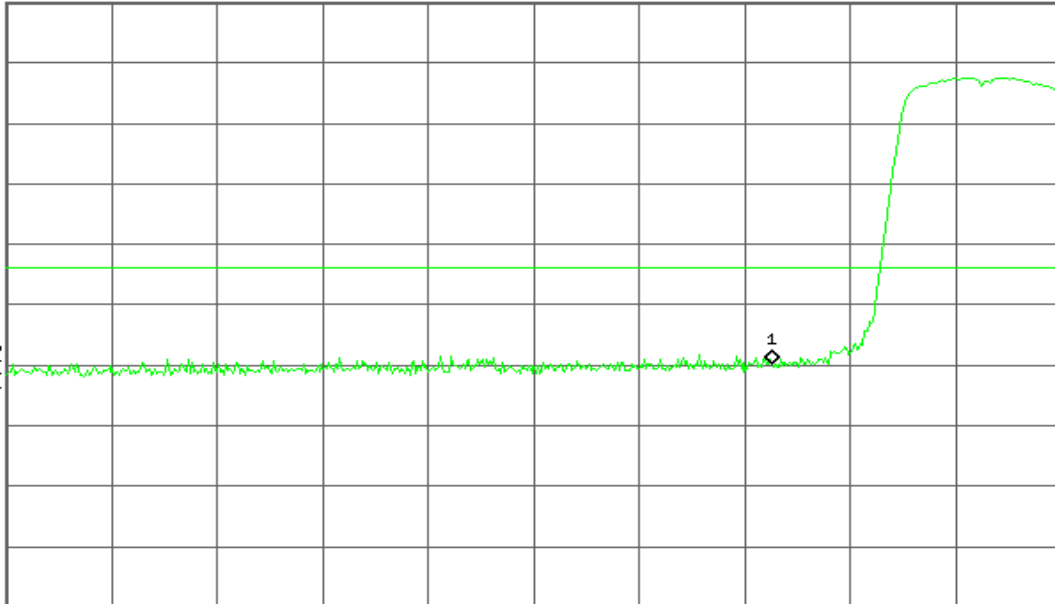
M1 S2

S3 FC

£(f):

FTun

Swp



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz  
46.34 dBμV

Ref 118 dBμV

#Atten 12 dB

#Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dBμV

LgAv

M1 S2

S3 FC

£(f):

FTun

Swp



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)





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

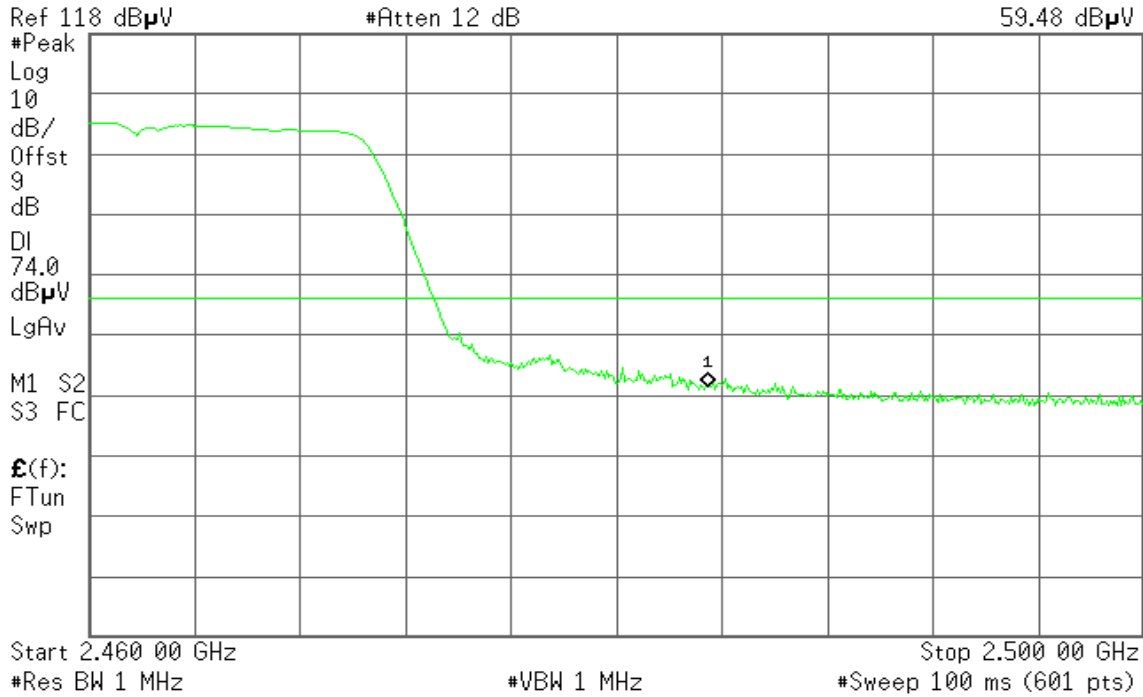
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz  
59.48 dB $\mu$ V



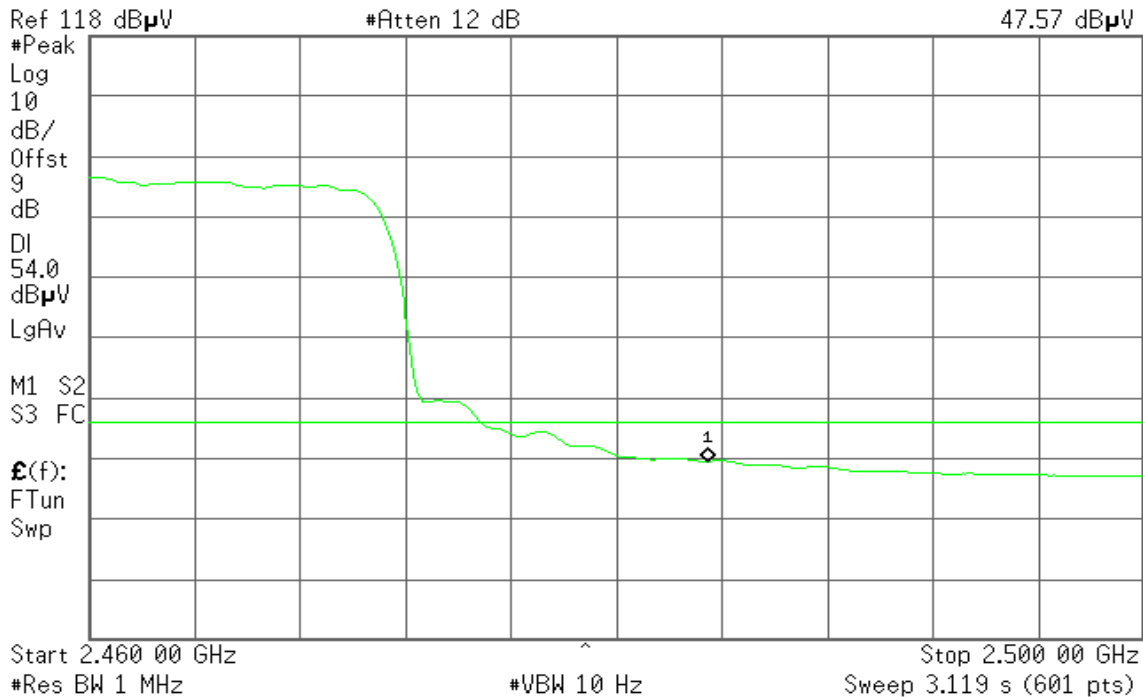
Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz  
47.57 dB $\mu$ V





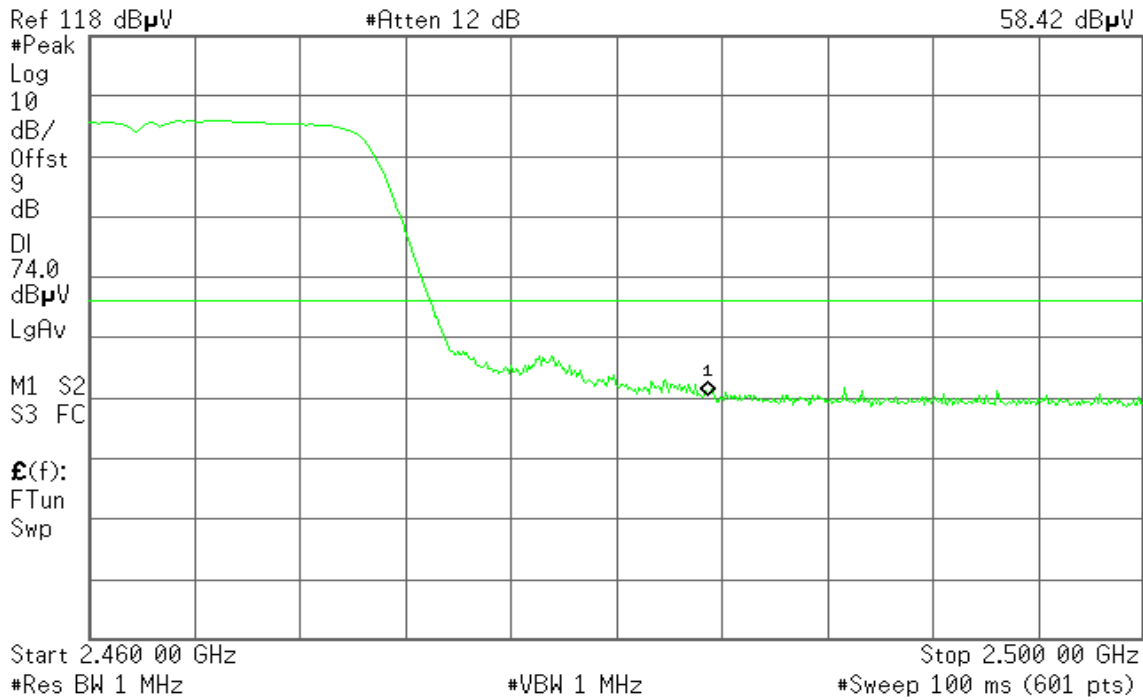
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
58.42 dBμV



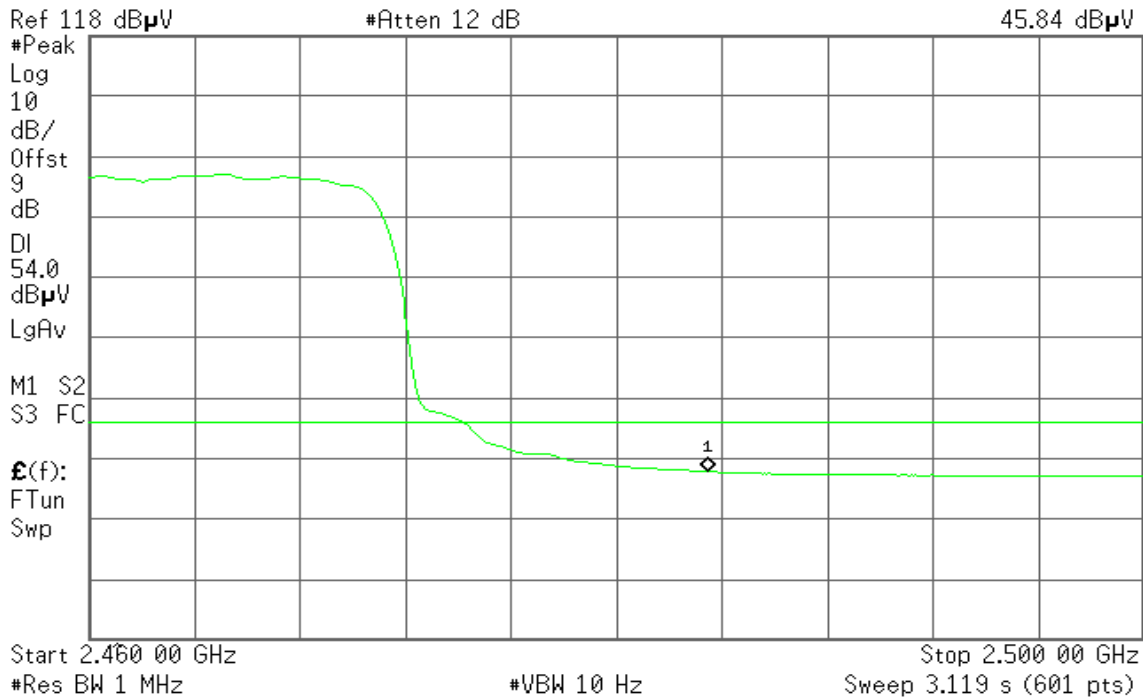
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz  
45.84 dBμV

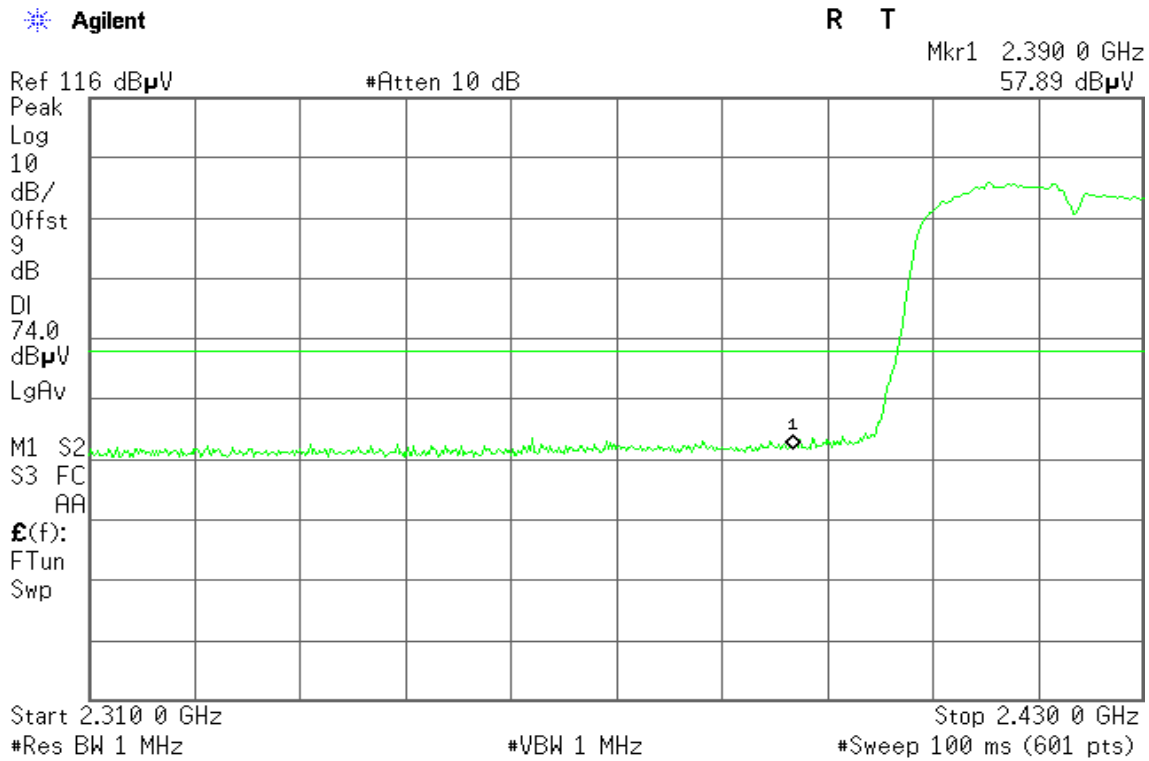




### Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH Low)

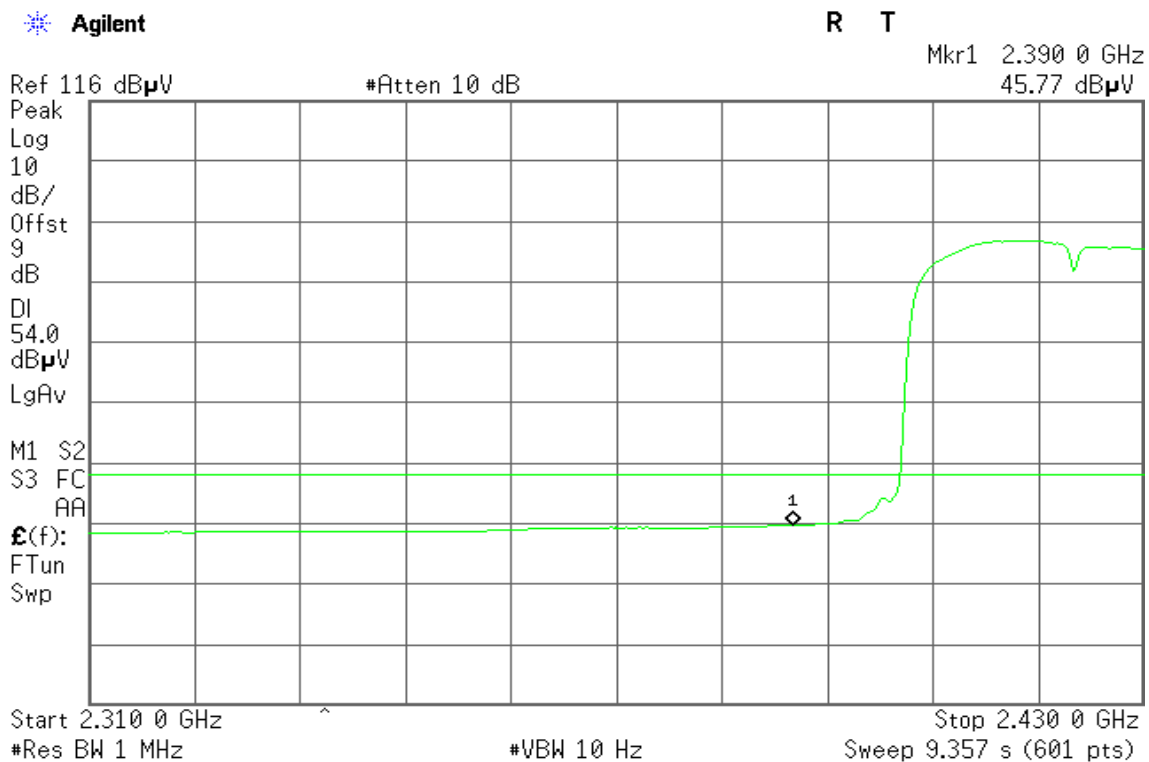
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





Detector mode: Peak

Polarity: Horizontal

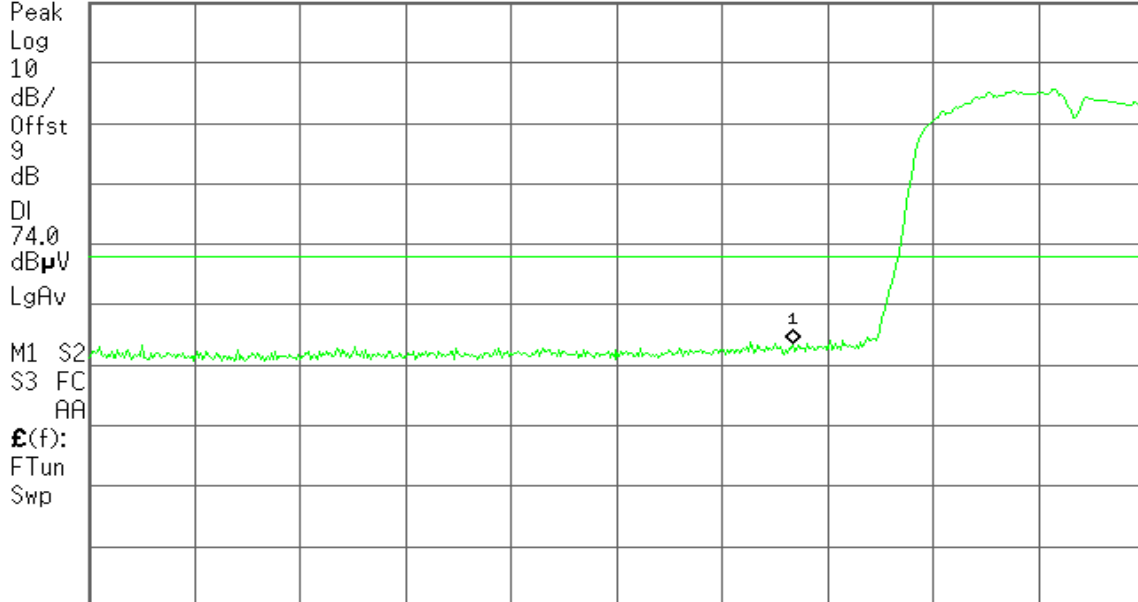
Agilent

R T

Mkr1 2.390 0 GHz  
59.57 dBµV

Ref 116 dBµV

#Atten 10 dB



Start 2.310 0 GHz

Stop 2.430 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz  
46.36 dBµV

Ref 116 dBµV

#Atten 10 dB



Start 2.310 0 GHz

Stop 2.430 0 GHz

#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)

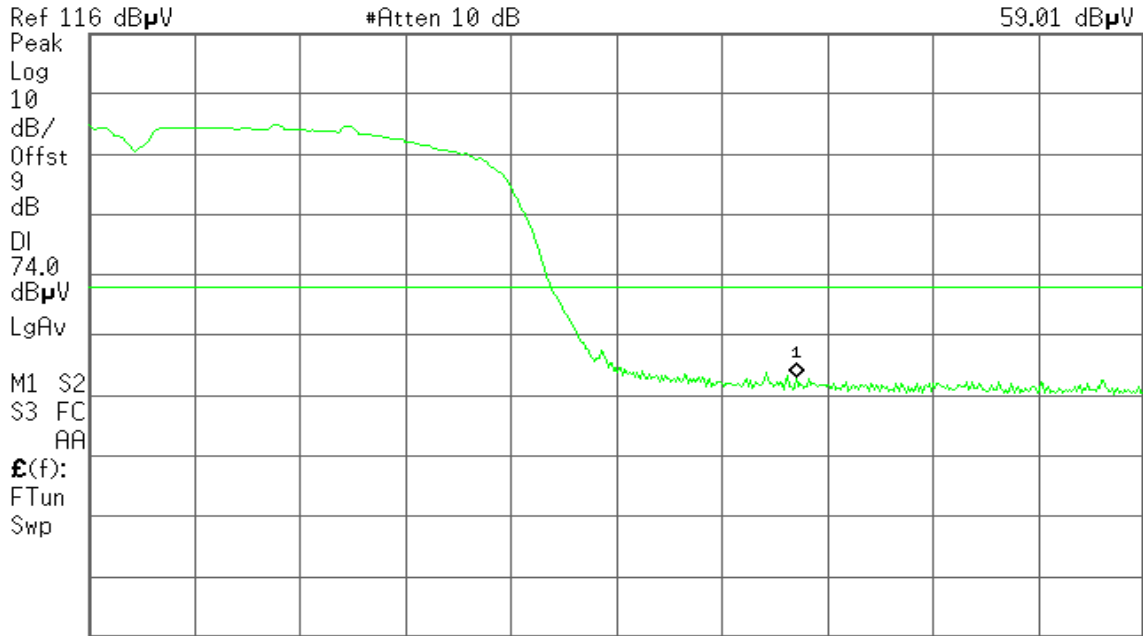
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz  
59.01 dBμV



Start 2.450 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

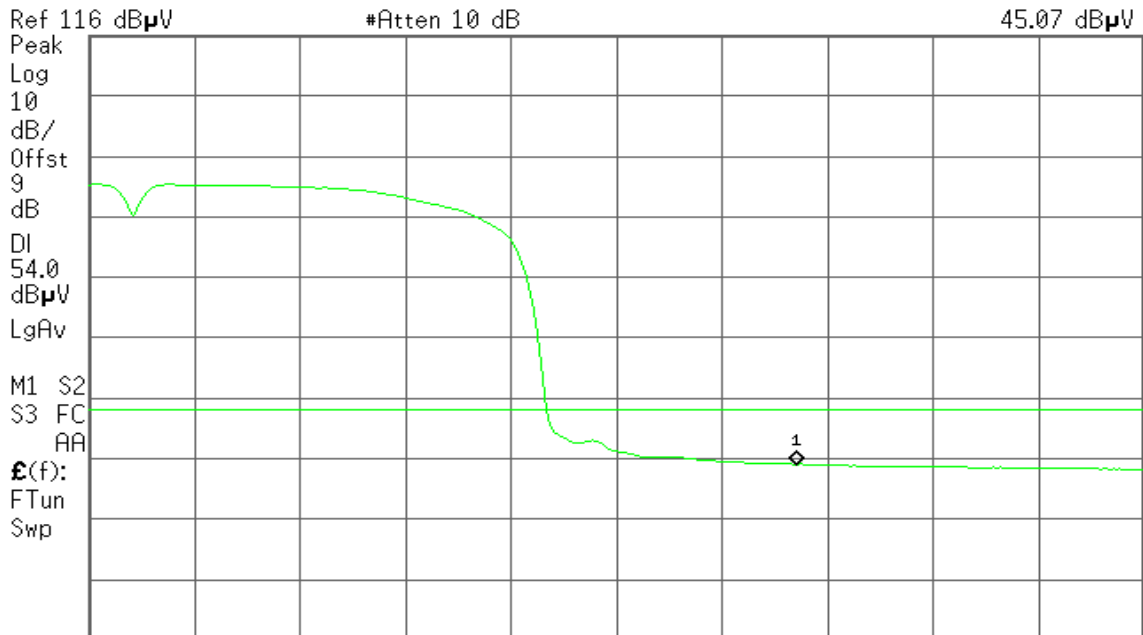
Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz  
45.07 dBμV



Start 2.450 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 3.899 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

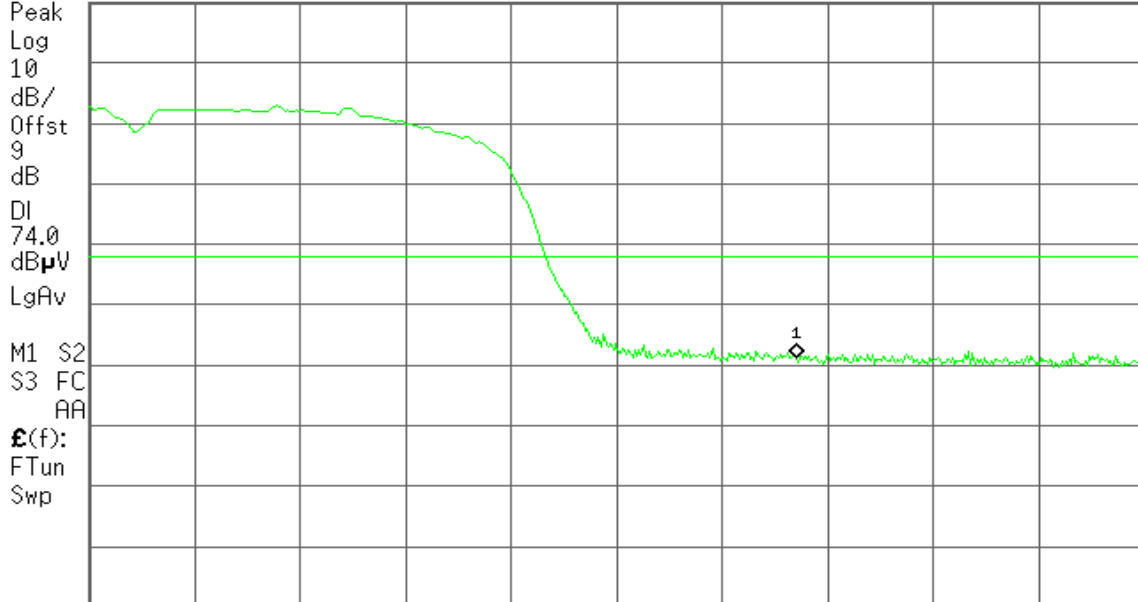
Agilent

R T

Mkr1 2.483 50 GHz  
57.28 dBμV

Ref 116 dBμV

#Atten 10 dB



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: Horizontal

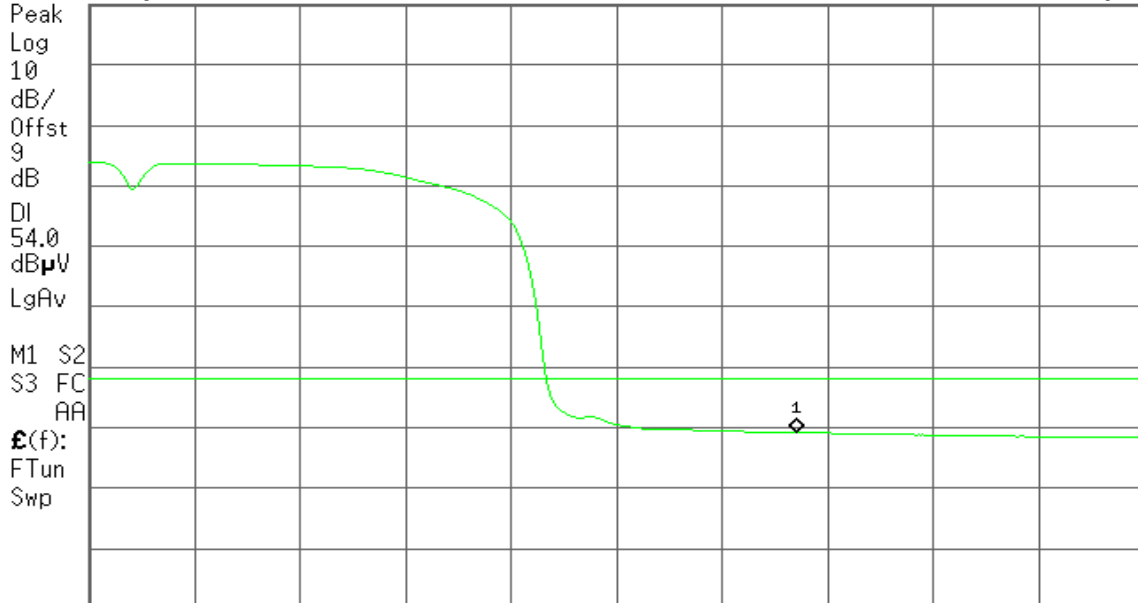
Agilent

R T

Mkr1 2.483 50 GHz  
45.19 dBμV

Ref 116 dBμV

#Atten 10 dB



Start 2.450 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

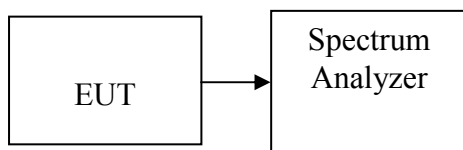
Sweep 3.899 s (601 pts)

## 7.5 PEAK POWER SPECTRAL DENSITY

### LIMIT

1. According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
2. According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

### Test Configuration



### TEST PROCEDURE

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

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-14.91	8.00	PASS
Mid	2437	-14.28		PASS
High	2462	-15.41		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-19.12	8.00	PASS
Mid	2437	-16.03		PASS
High	2462	-20.64		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-20.73	8.00	PASS
Mid	2437	-14.35		PASS
High	2462	-20.55		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-21.08	8.00	PASS
Mid	2437	-20.87		PASS
High	2452	-21.14		PASS





### Test Plot

#### IEEE 802.11b mode

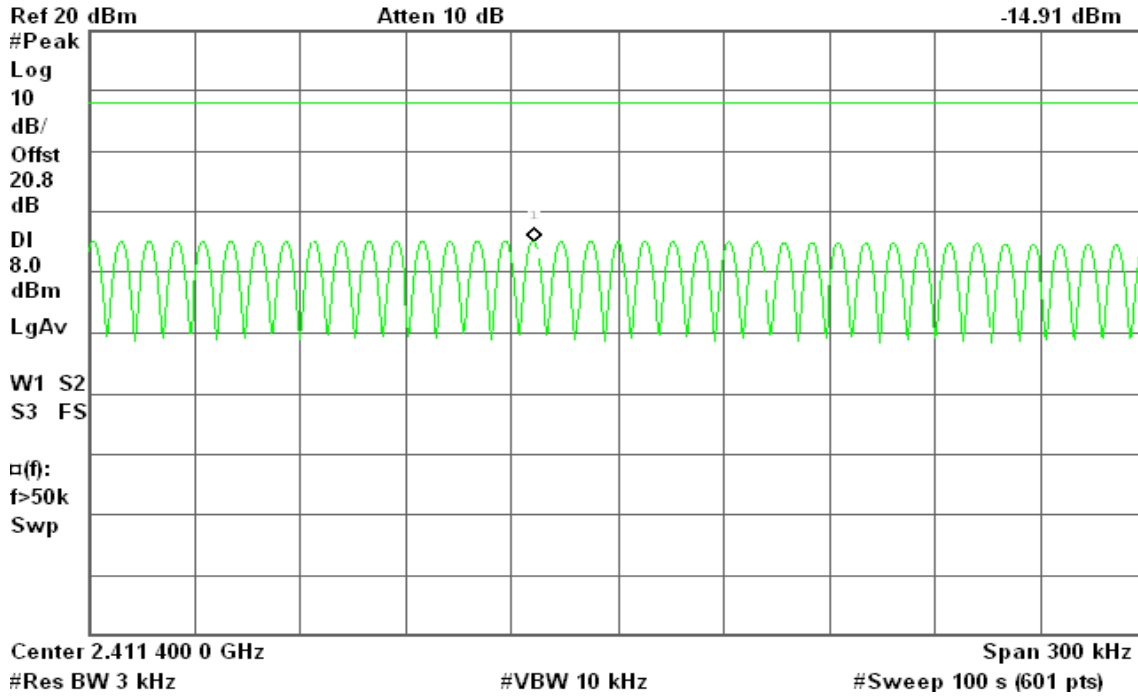
#### PPSD (CH Low)

Agilent 21:55:13 Dec 15, 2009

R T

Mkr1 2.411 376 4 GHz

-14.91 dBm



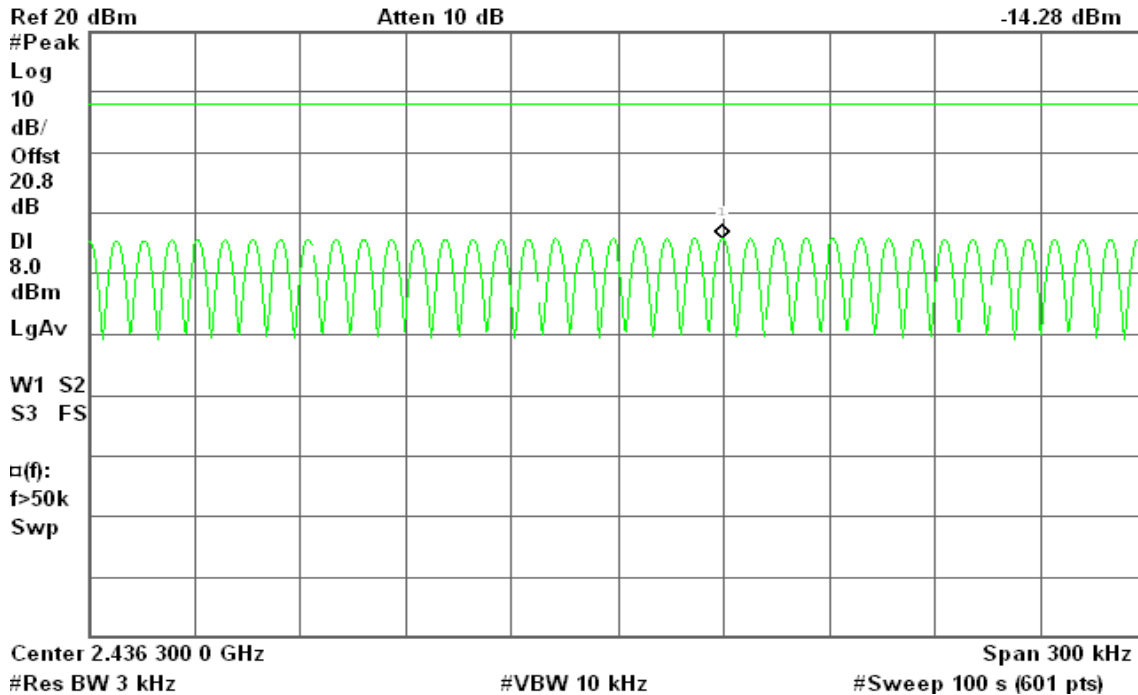
#### PPSD (CH Mid)

Agilent 22:01:27 Dec 15, 2009

R T

Mkr1 2.436 329 6 GHz

-14.28 dBm



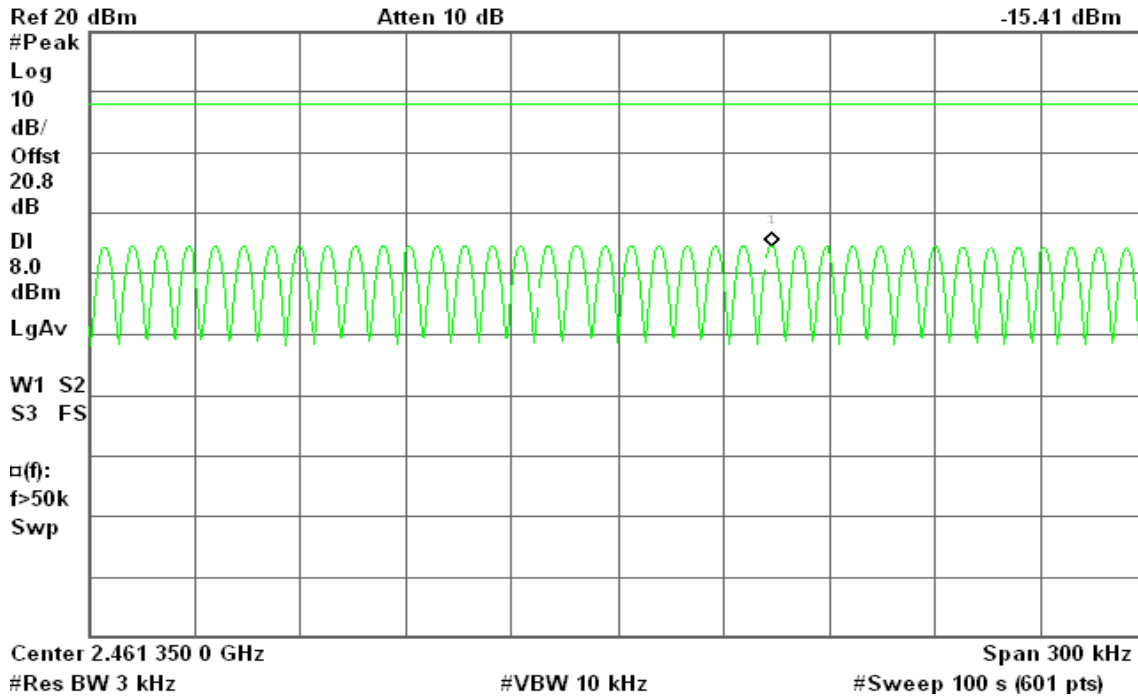


### PPSD (CH High)

Agilent 22:07:31 Dec 15, 2009

R T

Mkr1 2.461 393 7 GHz  
-15.41 dBm



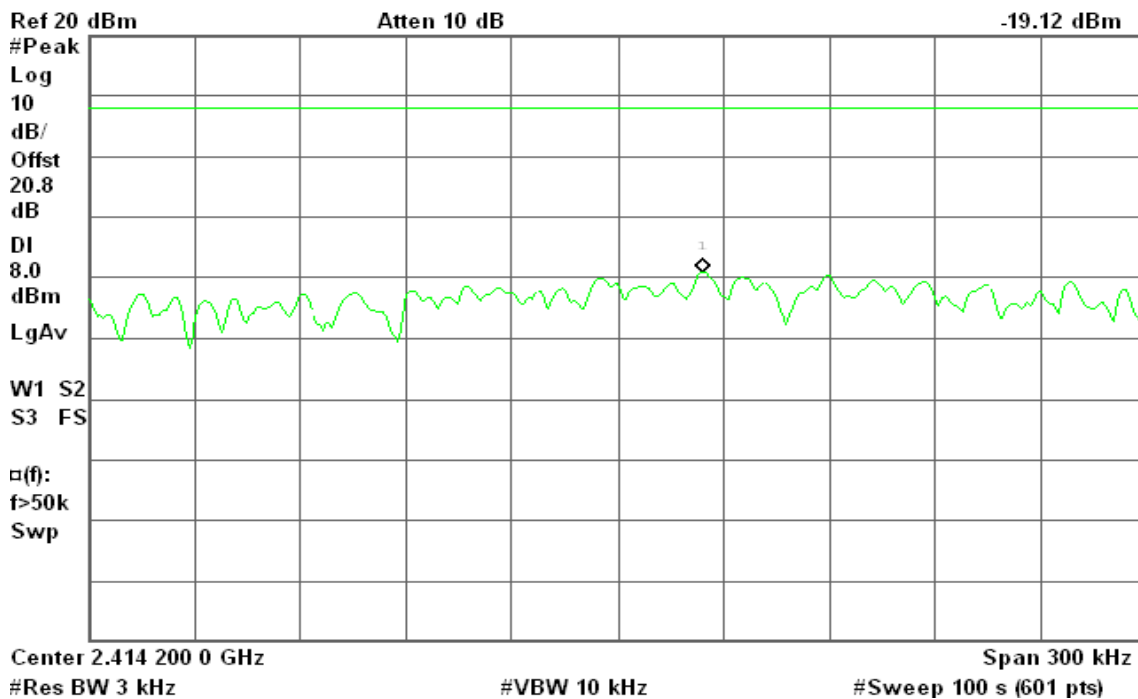
### IEEE 802.11g mode

### PPSD (CH Low)

Agilent 23:07:17 Dec 15, 2009

R T

Mkr1 2.414 224 1 GHz  
-19.12 dBm



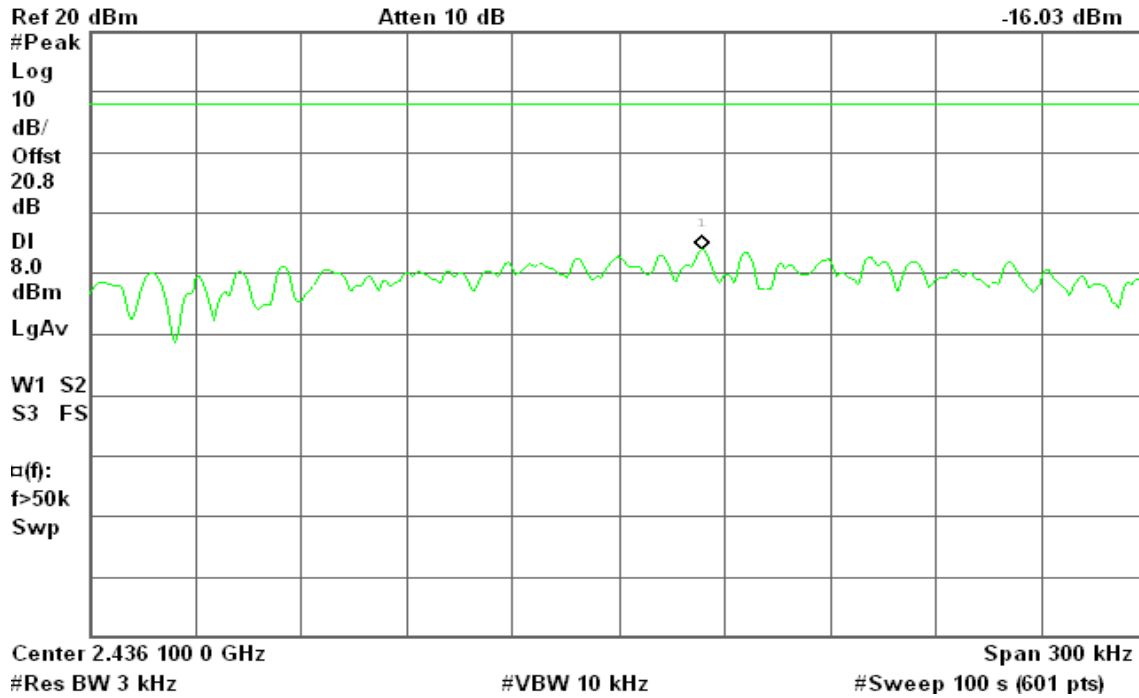


### PPSD (CH Mid)

Agilent 22:58:37 Dec 15, 2009

R T

Mkr1 2.436 123 6 GHz  
-16.03 dBm

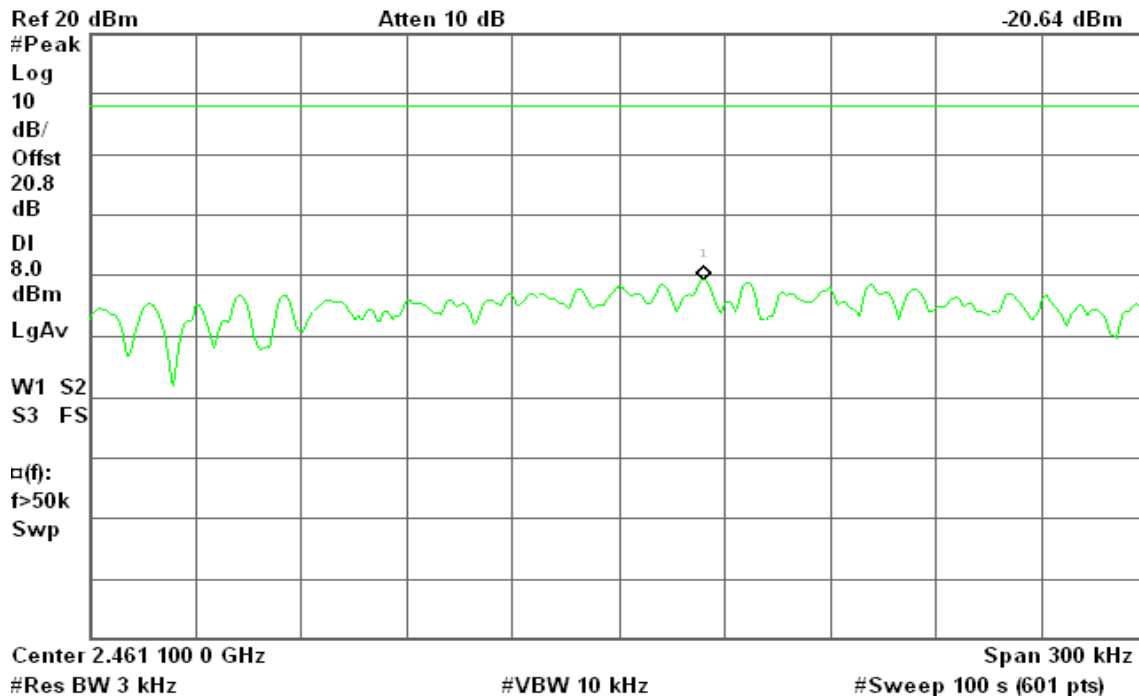


### PPSD (CH High)

Agilent 22:51:53 Dec 15, 2009

R T

Mkr1 2.461 124 1 GHz  
-20.64 dBm





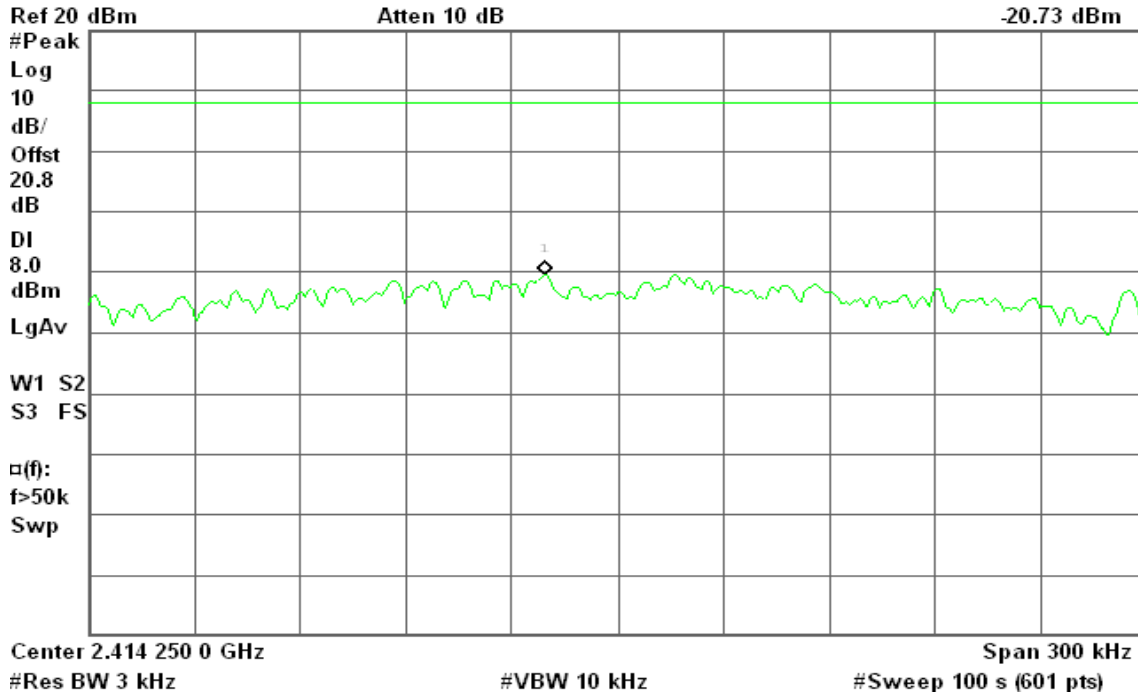
### draft 802.11n Standard-20 MHz Channel mode

### PPSD (CH Low)

Agilent 23:22:14 Dec 15, 2009

R T

Mkr1 2.414 229 4 GHz  
-20.73 dBm

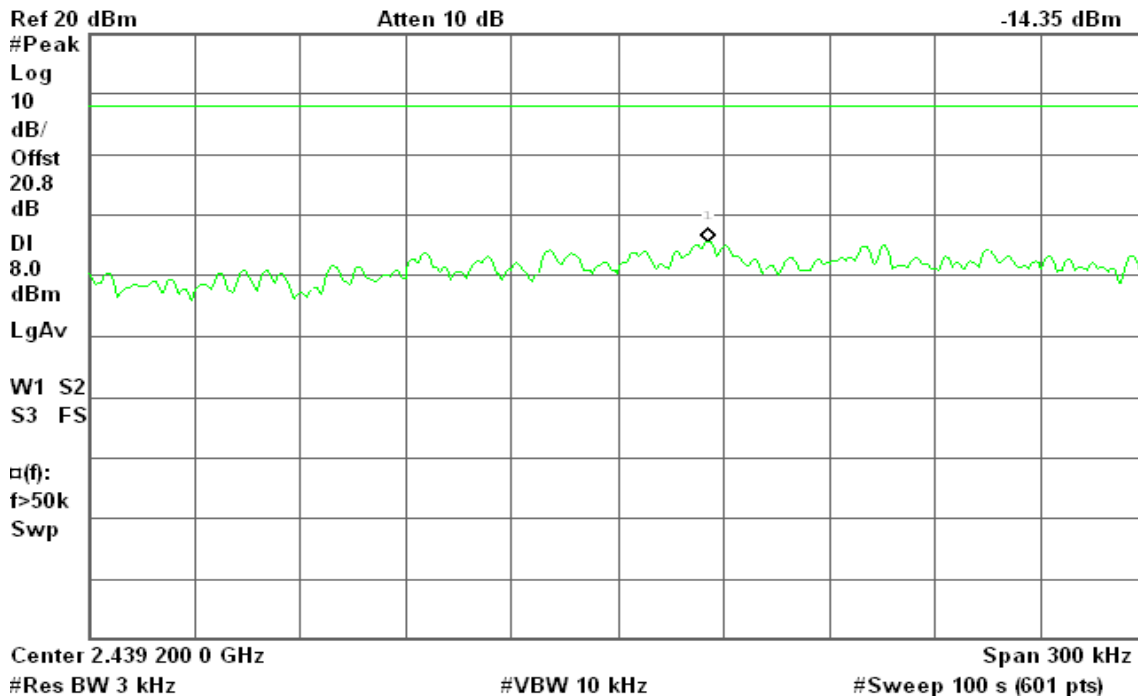


### PPSD (CH Mid)

Agilent 23:30:37 Dec 15, 2009

R T

Mkr1 2.439 225 6 GHz  
-14.35 dBm



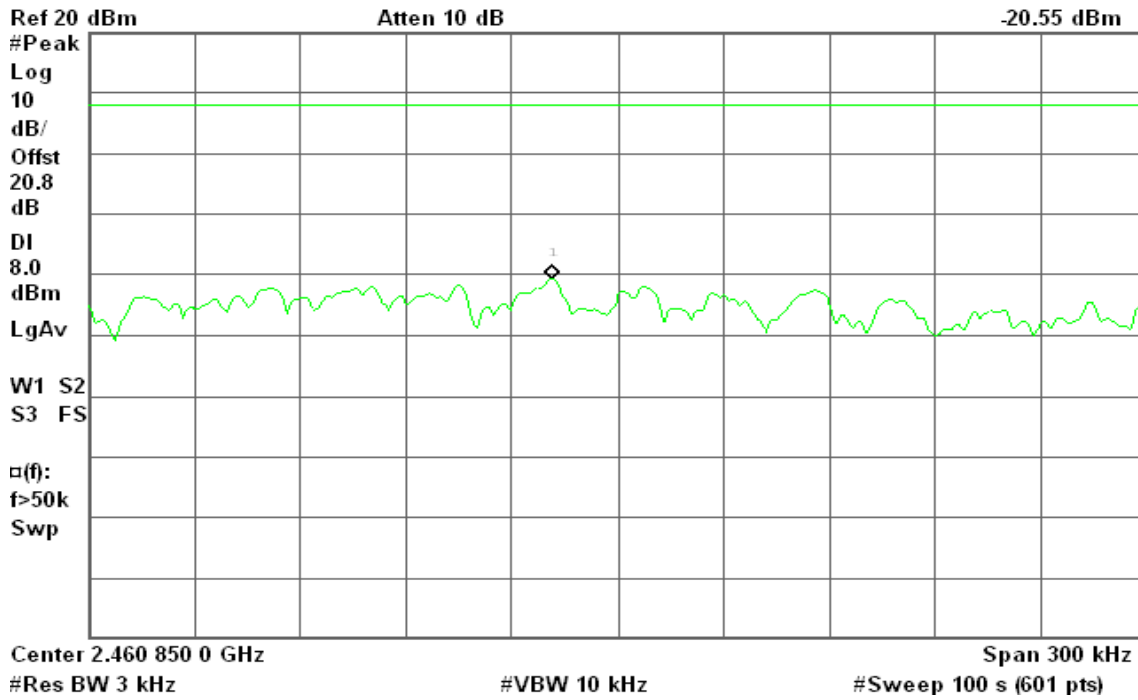


### PPSD (CH High)

Agilent 23:43:03 Dec 15, 2009

R T

Mkr1 2.460 831 4 GHz  
-20.55 dBm



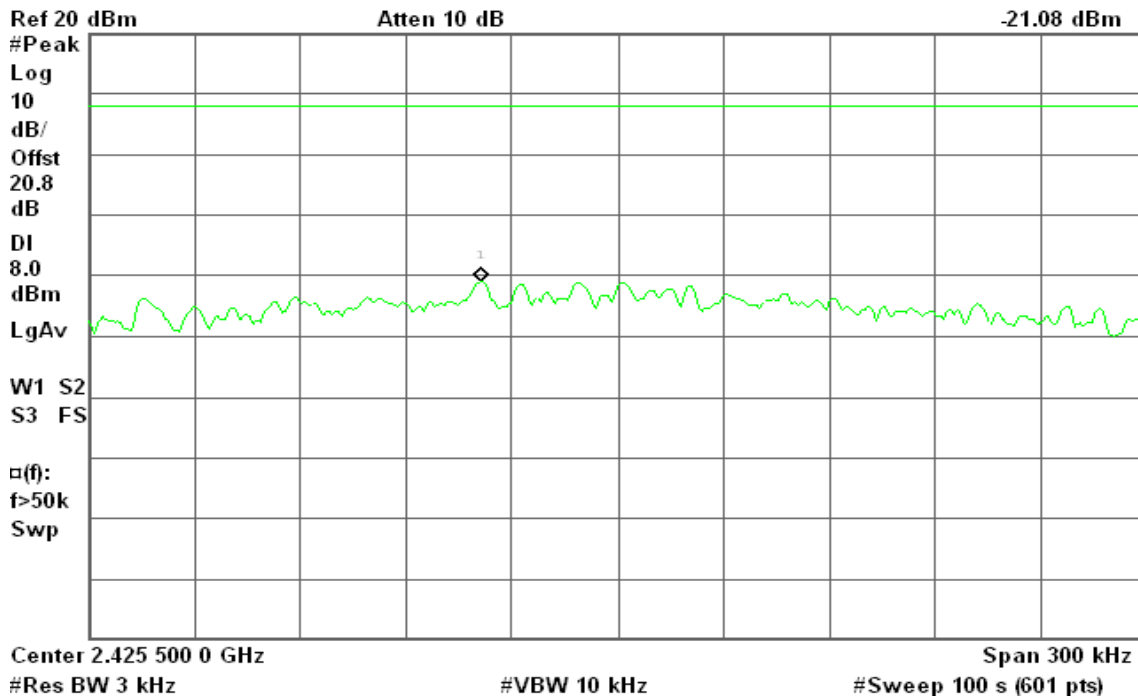
### draft 802.11n Wide-40 MHz Channel mode

### PPSD (CH Low)

Agilent 23:53:15 Dec 15, 2009

R T

Mkr1 2.425 461 3 GHz  
-21.08 dBm



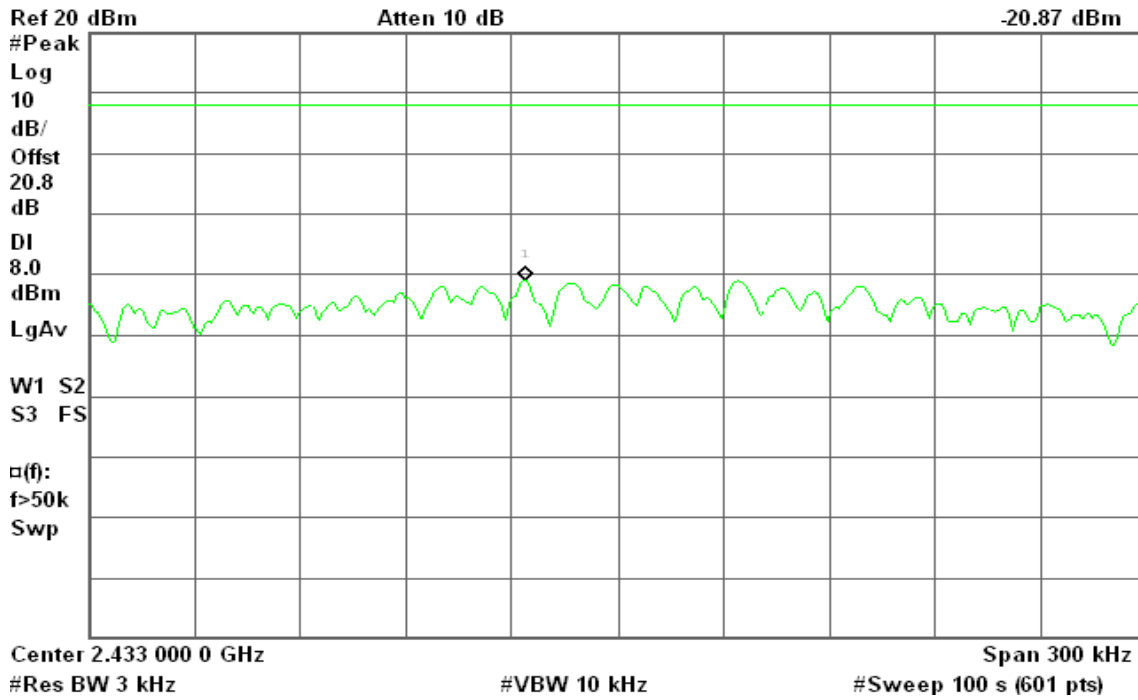


### PPSD (CH Mid)

Agilent 00:08:30 Dec 16, 2009

R T

Mkr1 2.432 973 9 GHz  
-20.87 dBm

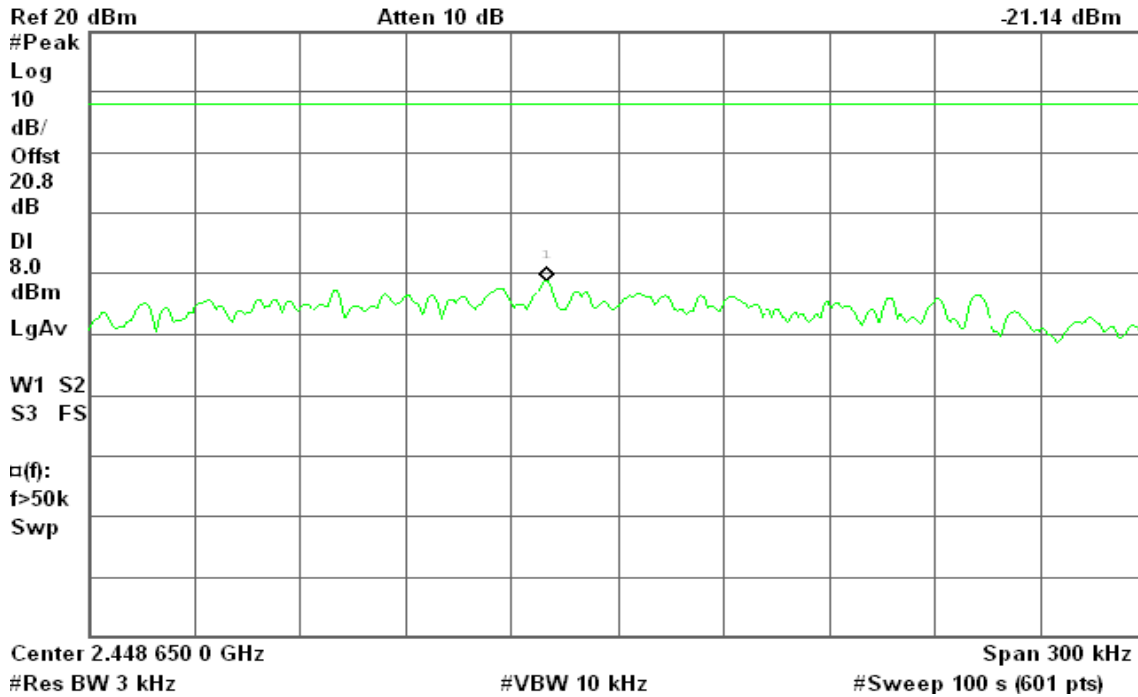


### PPSD (CH High)

Agilent 00:15:58 Dec 16, 2009

R T

Mkr1 2.448 629 9 GHz  
-21.14 dBm



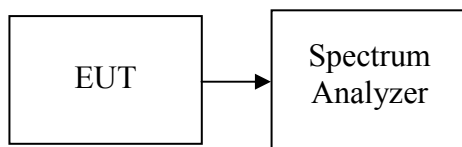
## 7.6 SPURIOUS EMISSIONS

### 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

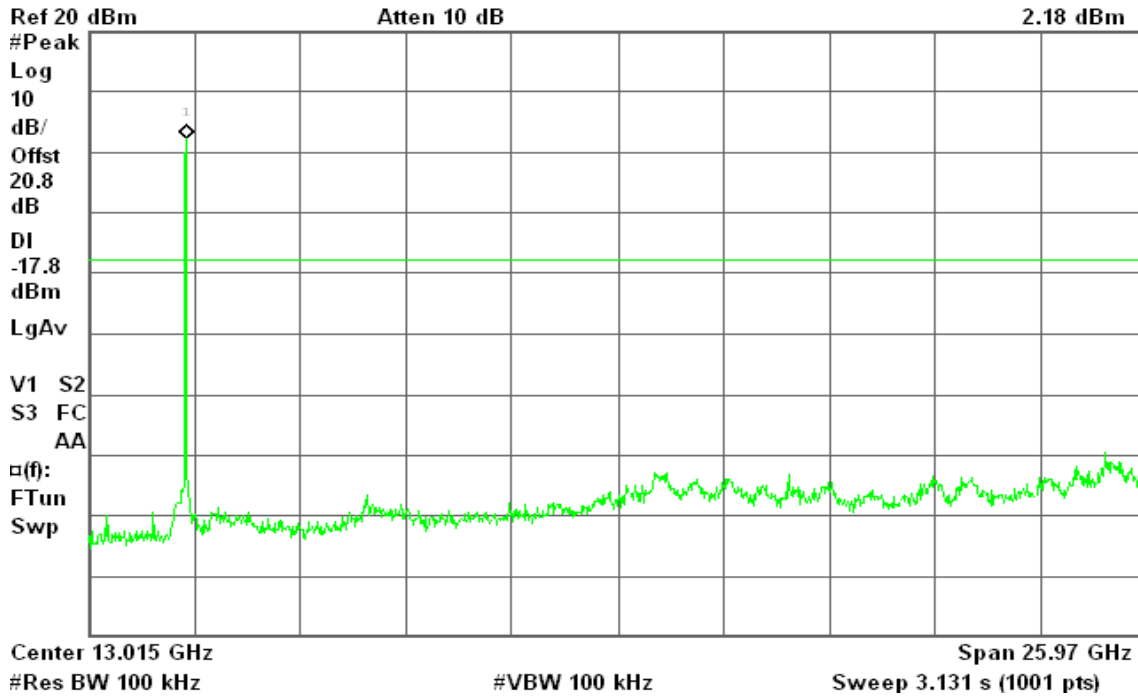
### IEEE 802.11b mode

### CH Low

Agilent 21:56:22 Dec 15, 2009

R T

Mkr1 2.419 GHz  
2.18 dBm

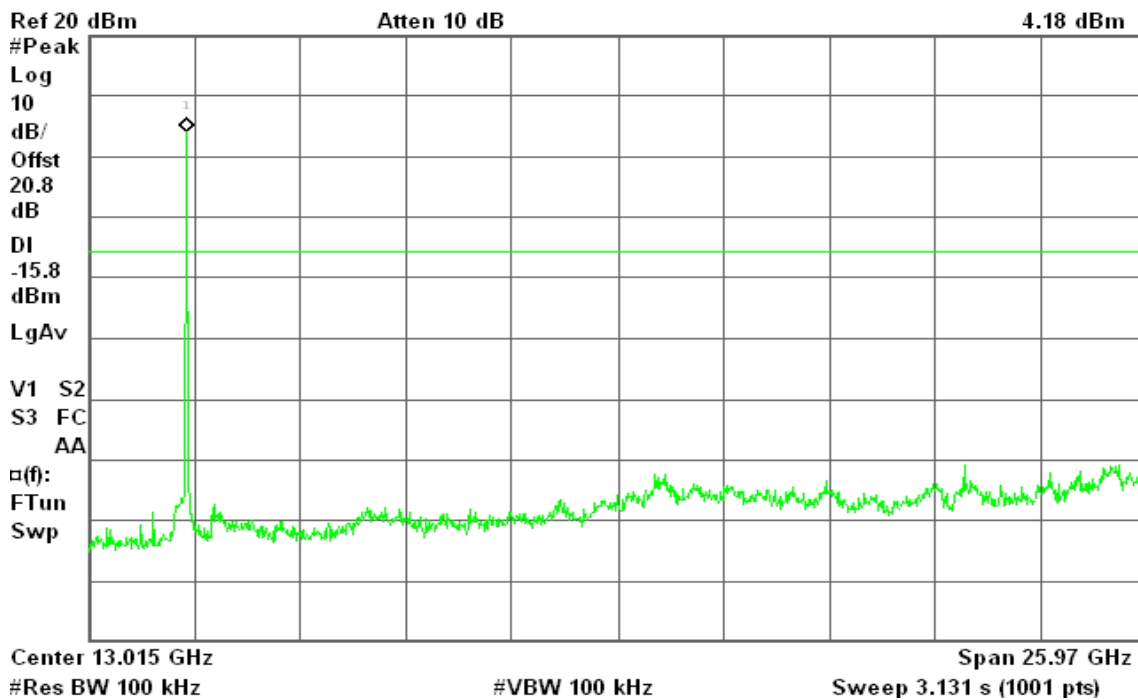


### CH Mid

Agilent 22:02:15 Dec 15, 2009

R T

Mkr1 2.445 GHz  
4.18 dBm







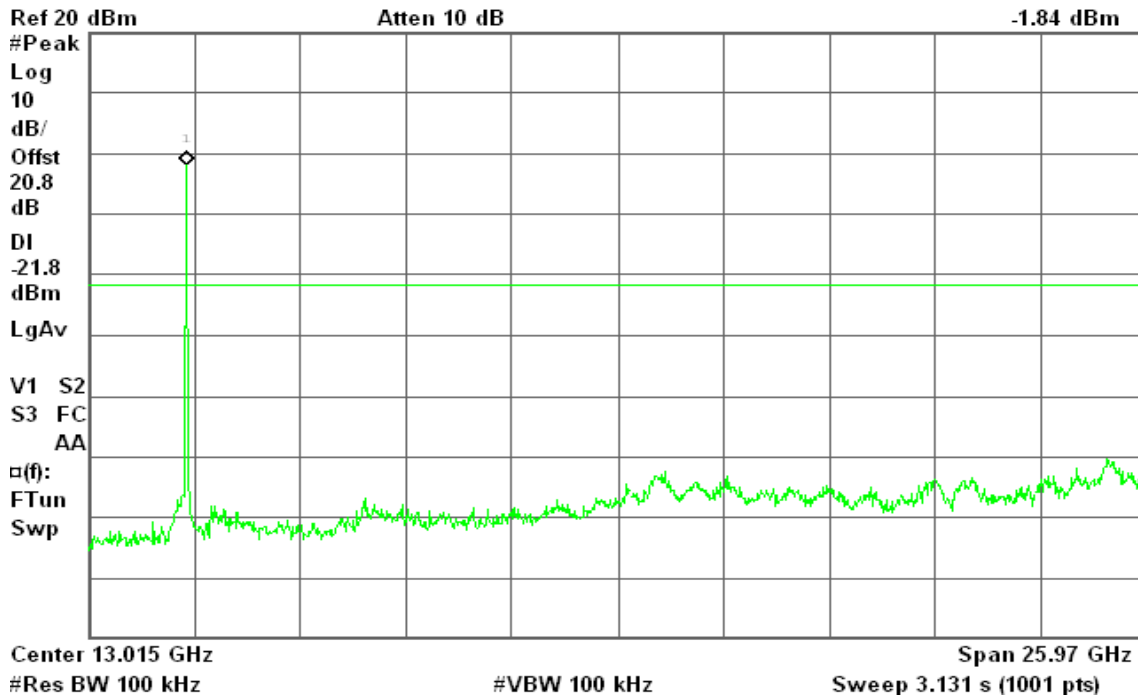


### CH Mid

Agilent 22:59:47 Dec 15, 2009

R T

Mkr1 2.445 GHz  
-1.84 dBm

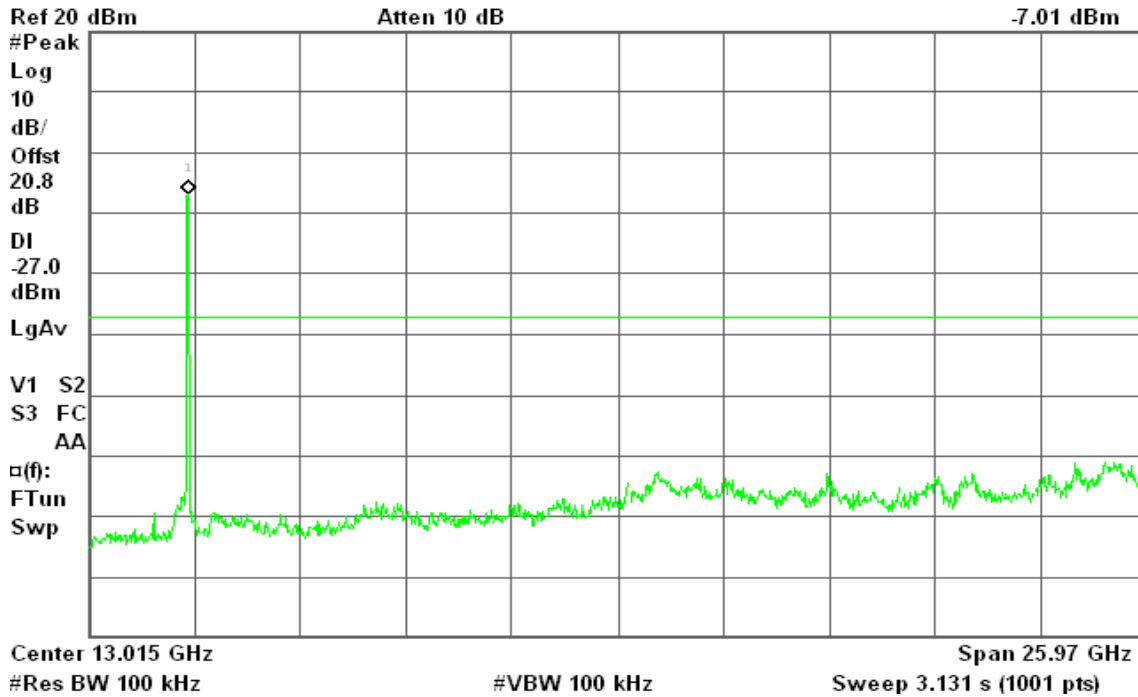


### CH High

Agilent 22:52:50 Dec 15, 2009

R T

Mkr1 2.471 GHz  
-7.01 dBm



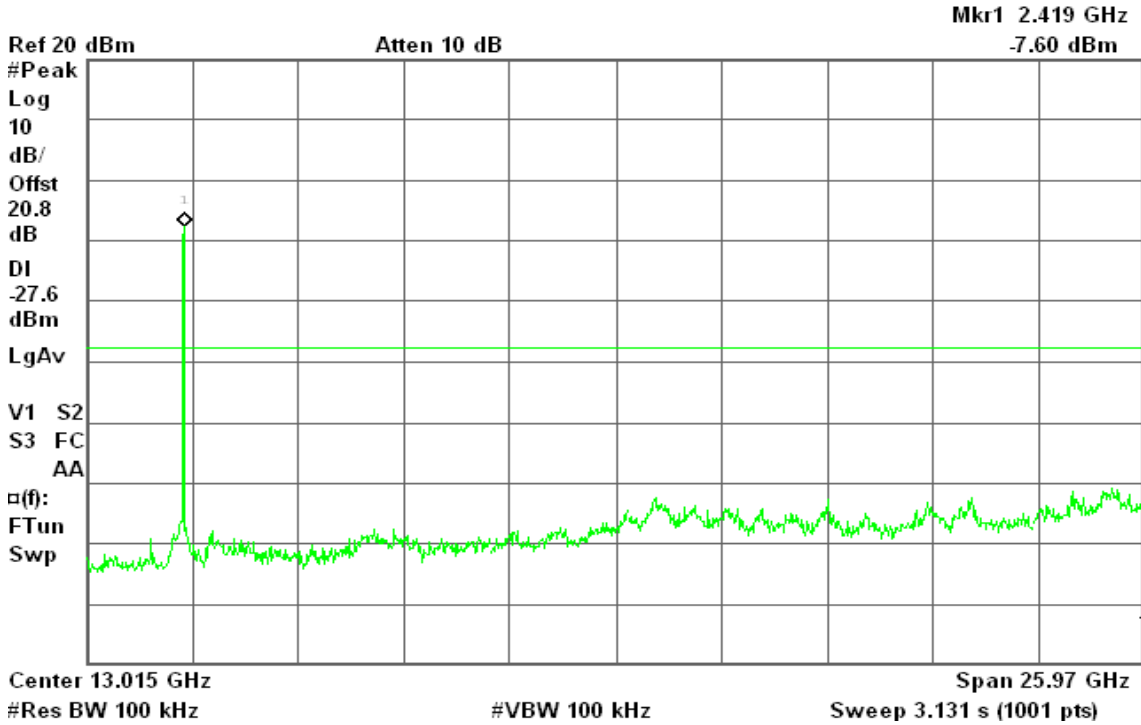


### draft 802.11n Standard-20 MHz Channel mode

#### CH Low

Agilent 23:23:03 Dec 15, 2009

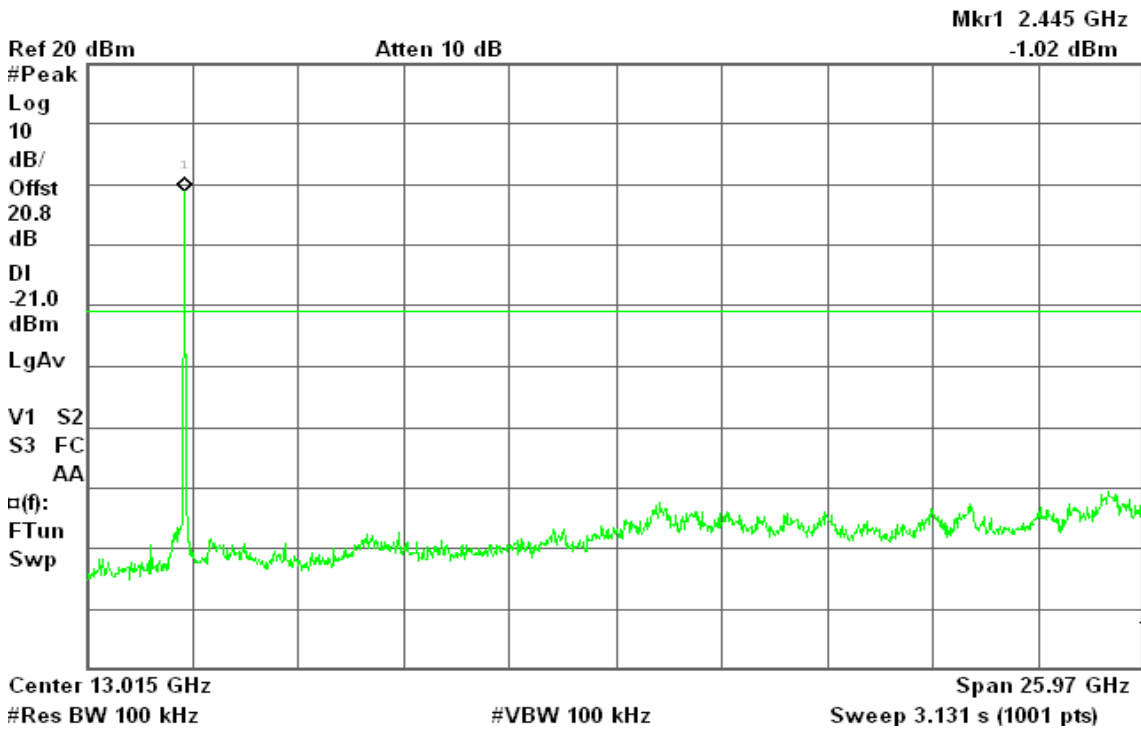
R T



#### CH Mid

Agilent 23:31:31 Dec 15, 2009

R T



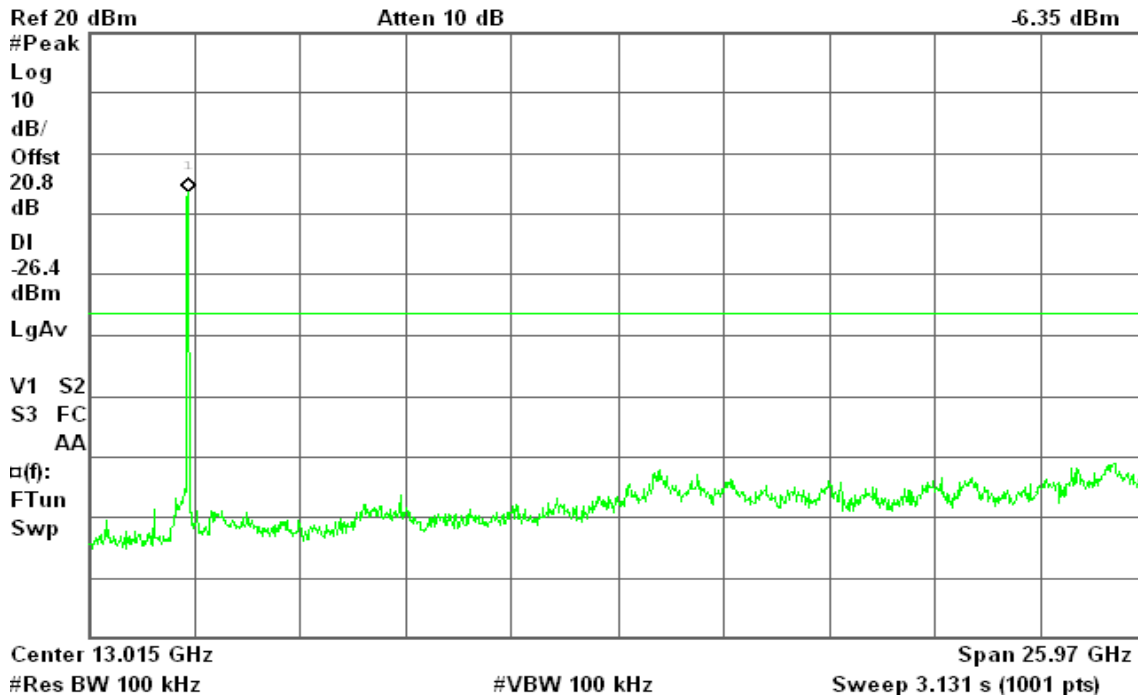


### CH High

Agilent 23:43:54 Dec 15, 2009

R T

Mkr1 2.471 GHz  
-6.35 dBm



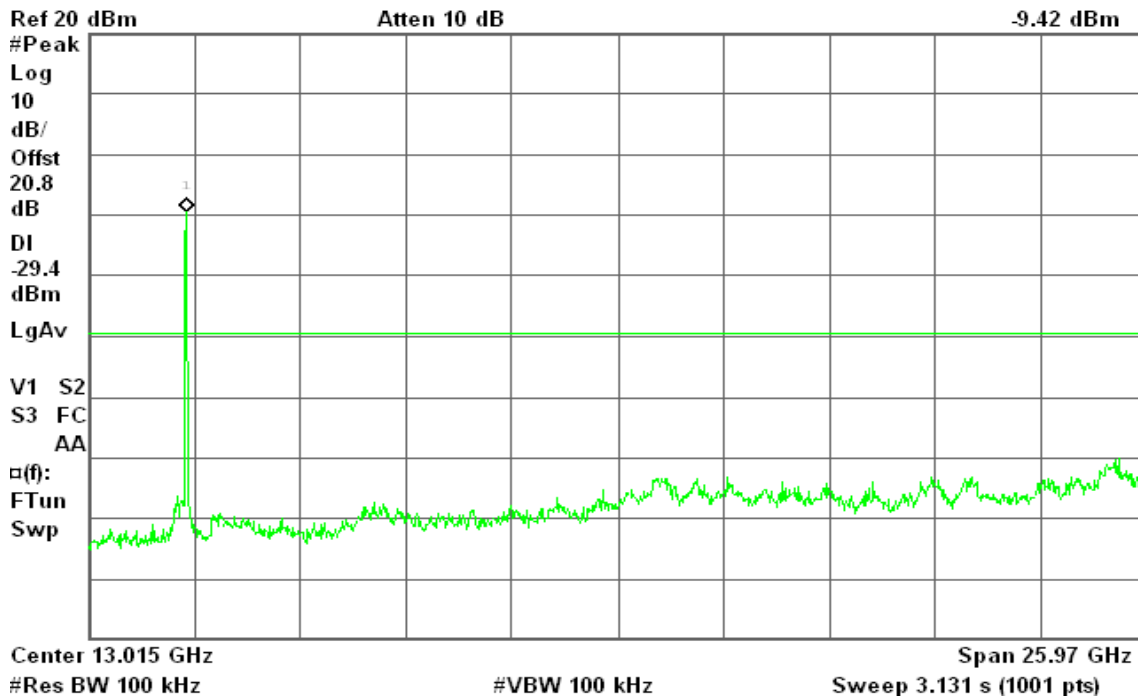
### draft 802.11n Wide-40 MHz Channel mode

### CH Low

Agilent 23:54:01 Dec 15, 2009

R T

Mkr1 2.419 GHz  
-9.42 dBm



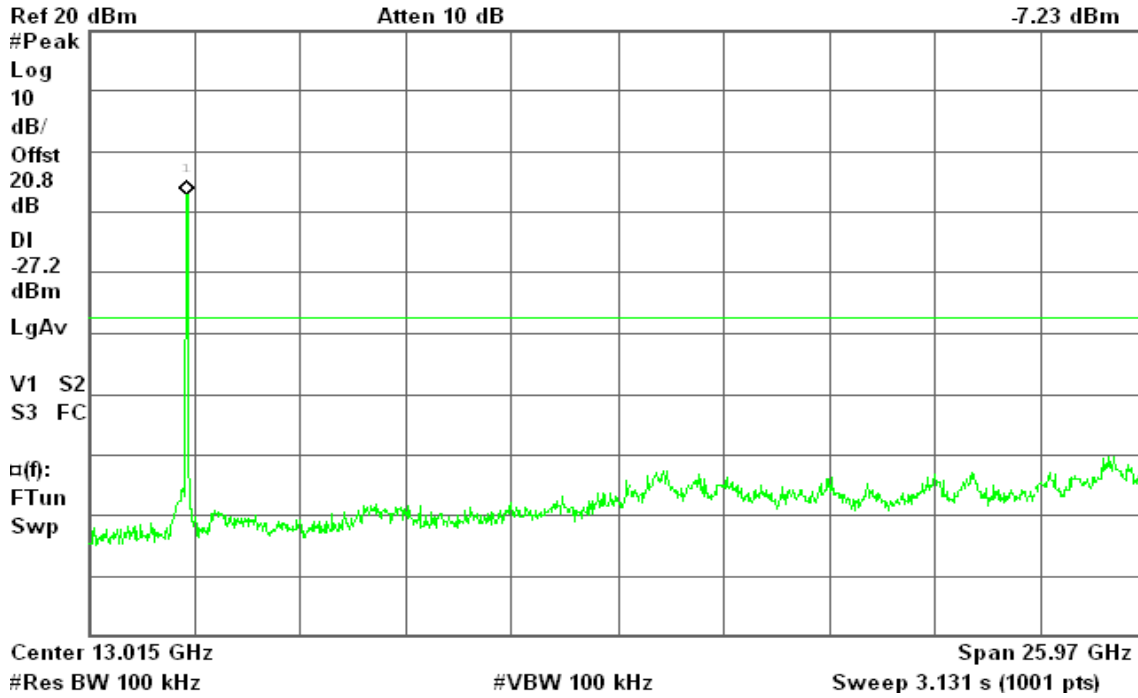


### CH Mid

Agilent 00:09:28 Dec 16, 2009

R T

Mkr1 2.419 GHz  
-7.23 dBm

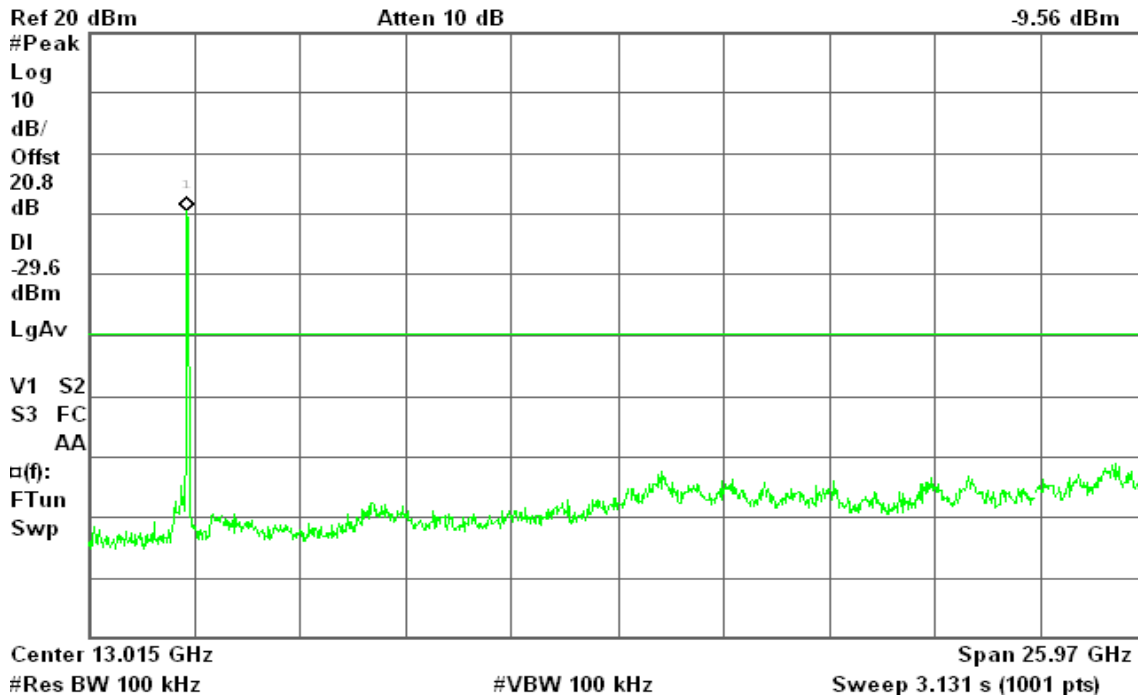


### CH High

Agilent 00:17:26 Dec 16, 2009

R T

Mkr1 2.445 GHz  
-9.56 dBm





## 7.7 RADIATED EMISSIONS

### LIMIT

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

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

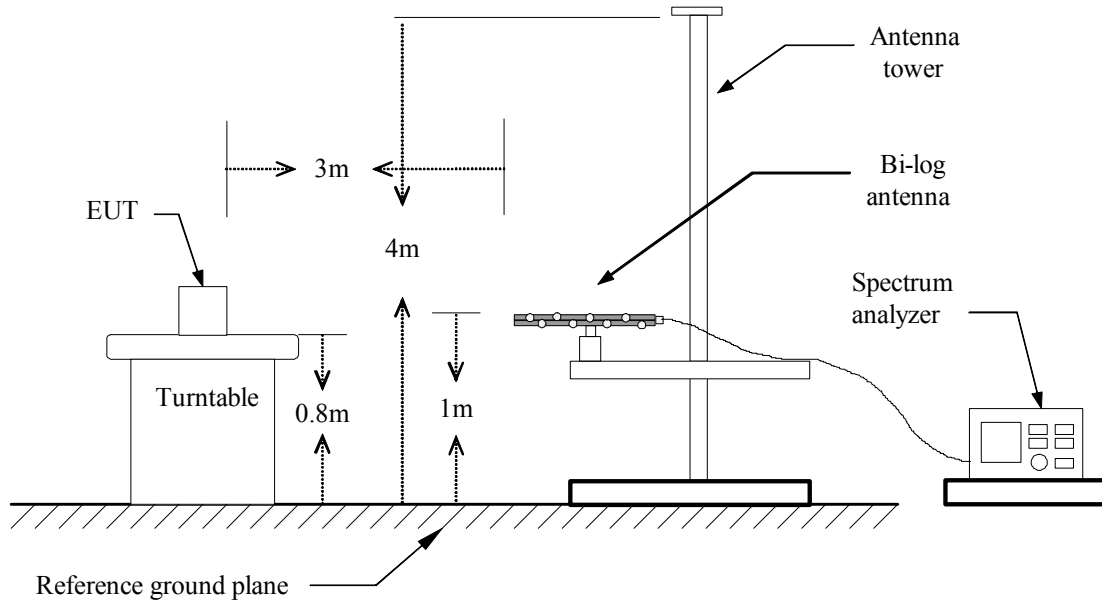
**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections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

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

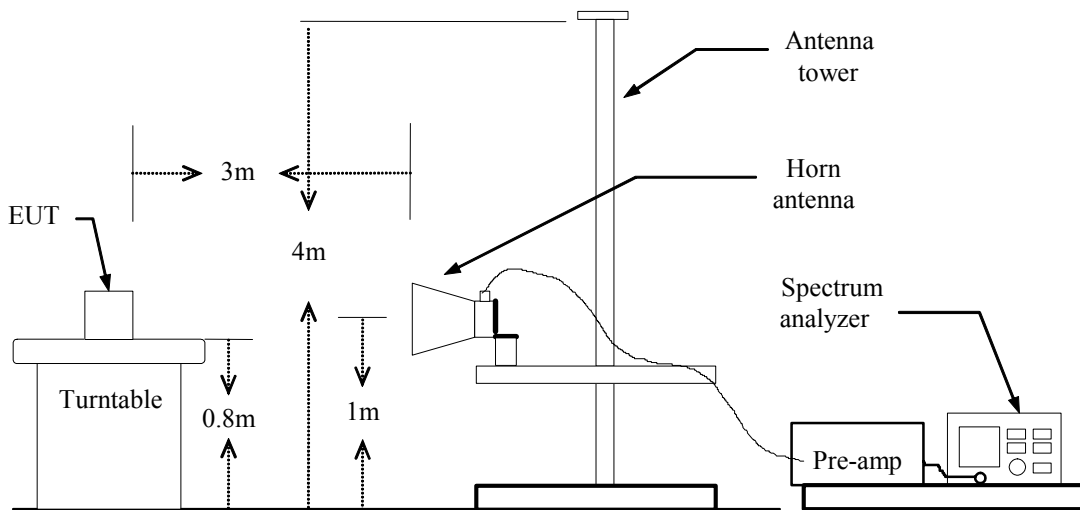
Frequency (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ at 3-meter)	Field Strength (dB $\mu\text{V}/\text{m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

### Test Configuration

#### Below 1 GHz



#### Above 1 GHz





## **TEST PROCEDURE**

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





## TEST RESULTS

### Below 1GHz

**Operation Mode:** Normal Link**Test Date:** December 14, 2009**Temperature:** 25°C**Tested by:** Wolf Huang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.00	V	36.71	-1.79	34.92	40.00	-5.08	QP
322.62	V	40.10	-8.12	31.98	46.00	-14.02	Peak
411.53	V	44.52	-6.08	38.44	46.00	-7.56	Peak
479.43	V	36.55	-4.54	32.02	46.00	-13.98	Peak
822.17	V	35.27	0.30	35.56	46.00	-10.44	Peak
880.37	V	35.57	0.80	36.37	46.00	-9.63	Peak
72.03	H	46.05	-14.58	31.47	40.00	-8.53	Peak
411.53	H	46.63	-6.08	40.55	46.00	-5.45	QP
733.25	H	31.18	-0.76	30.42	46.00	-15.58	Peak
822.17	H	33.92	0.30	34.22	46.00	-11.78	Peak
880.37	H	30.42	0.80	31.22	46.00	-14.78	Peak
959.58	H	30.75	2.05	32.81	46.00	-13.19	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. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5.  $Margin (dB) = Result (dBuV/m) - Limit (dBuV/m)$ .





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

**Test Date:** December 14, 2009

**Temperature:** 20°C

**Tested by:** Wolf Huang

**Humidity:** 51 % RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
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: December 14, 2009

Temperature: 20°C

Tested by: Wolf Huang

Humidity: 51 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
4958.33	V	48.96	---	1.00	49.97	---	74.00	54.00	-4.03	Peak
N/A										
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:** December 14, 2009

**Temperature:** 20°C

**Tested by:** Wolf Huang

**Humidity:** 51 % RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
N/A										
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: December 14, 2009

Temperature: 20°C

Tested by: Wolf Huang

Humidity: 51 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
N/A										
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: December 14, 2009

Temperature: 20°C

Tested by: Wolf Huang

Humidity: 51 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
N/A										
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: December 14, 2009

Temperature: 20°C

Tested by: Wolf Huang

Humidity: 51 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
N/A										
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:** December 14, 2009  
**Temperature:** 20°C **Tested by:** Wolf Huang  
**Humidity:** 51 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
N/A										
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:** December 14, 2009  
**Temperature:** 20°C **Tested by:** Wolf Huang  
**Humidity:** 51 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
N/A										
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 1 for the actual connections between EUT and support equipment.

### TEST PROCEDURE

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



## TEST RESULTS

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

### Test Data

**Operation Mode:** Normal Link                      **Test Date:** December 11, 2009  
**Temperature:** 25°C                                      **Tested by:** Roger Yang  
**Humidity:** 55% RH

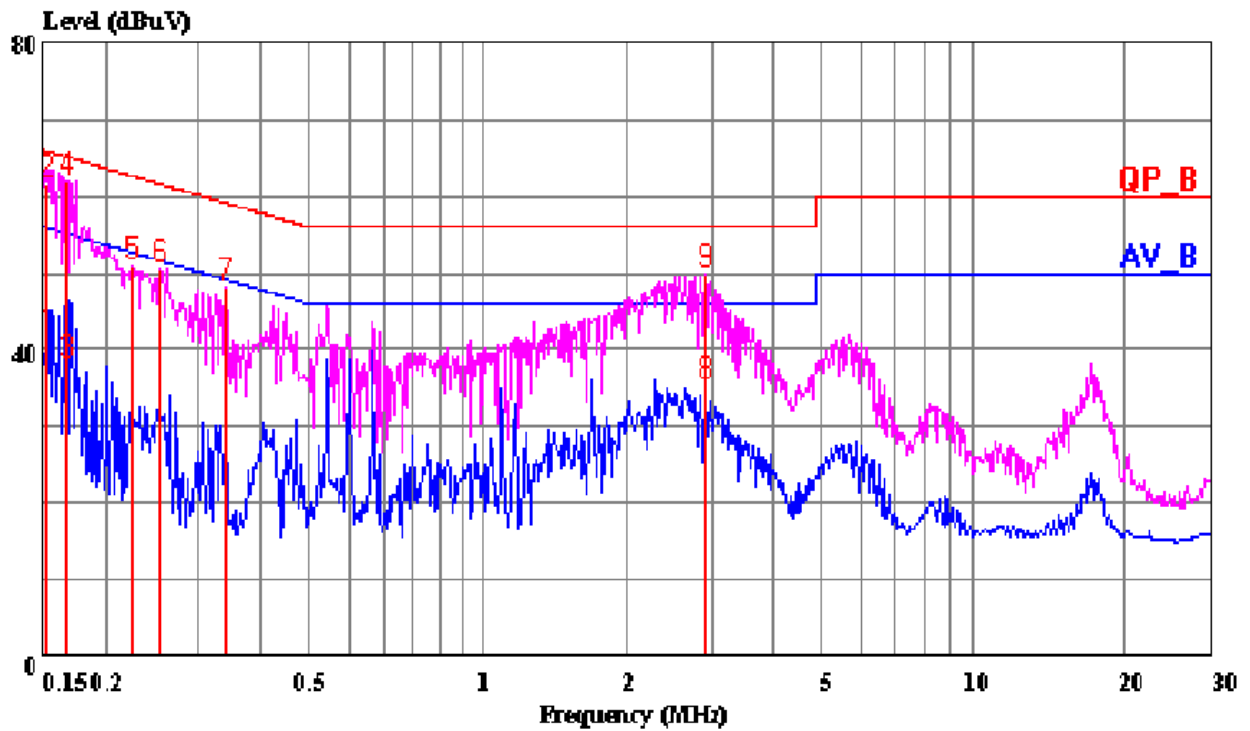
Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.152	50.40	30.18	11.34	61.73	41.52	65.89	55.91	-4.16	-14.39	L1
0.166	50.93	26.98	11.22	62.15	38.20	65.16	55.16	-3.02	-16.97	L1
0.224	40.03	---	10.90	50.93	---	62.66	---	-11.73	---	L1
0.253	39.73	---	10.84	50.57	---	61.64	---	-11.08	---	L1
0.341	37.31	---	10.68	47.99	---	59.18	---	-11.19	---	L1
2.993	39.29	24.95	10.54	49.83	35.49	56.00	46.00	-6.17	-10.51	L1
0.152	50.60	27.43	10.99	61.59	38.43	65.89	55.91	-4.30	-17.49	L2
0.170	50.58	32.63	10.84	61.43	43.48	64.94	54.94	-3.52	-11.47	L2
0.256	40.45	---	10.51	50.96	---	61.56	---	-10.60	---	L2
0.300	36.21	---	10.43	46.64	---	60.24	---	-13.60	---	L2
0.541	33.98	---	10.26	44.24	---	56.00	---	-11.76	---	L2
2.721	38.23	21.03	10.24	48.47	31.27	56.00	46.00	-7.53	-14.73	L2

### **Remark:**

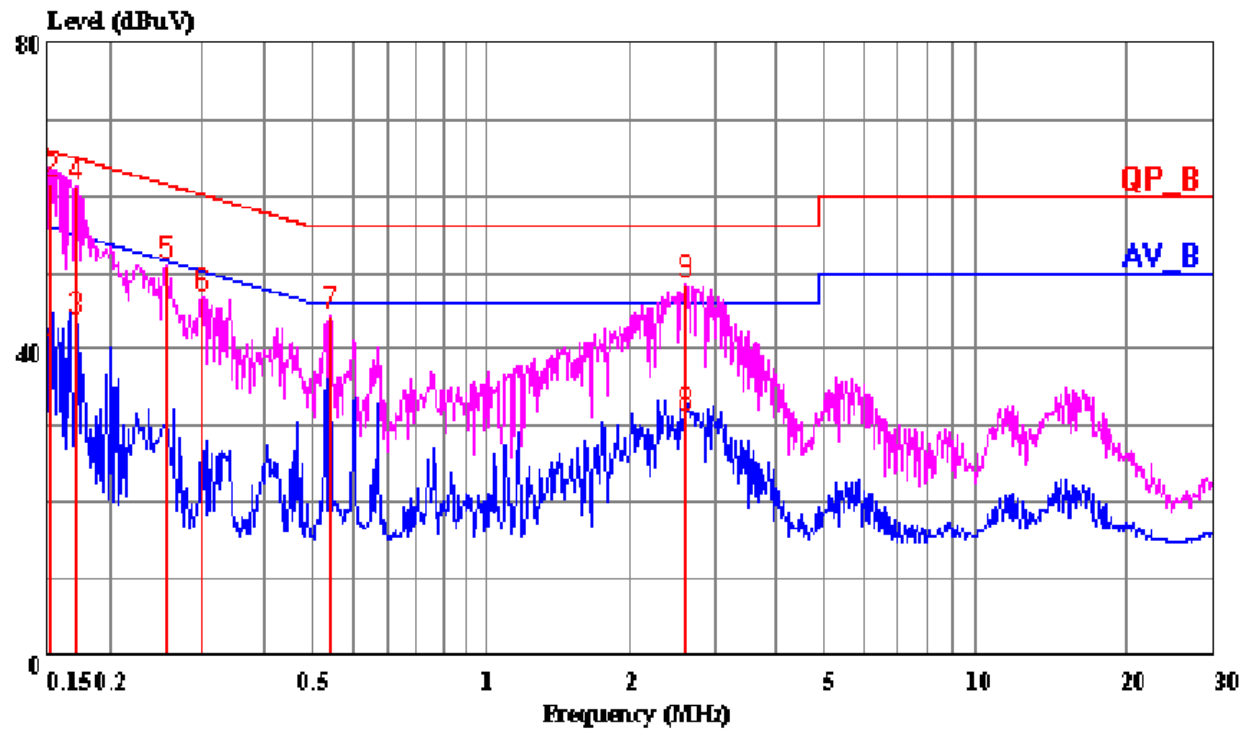
1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10 kHz; the IF bandwidth of Test Receiver between 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)







## APPENDIX I RADIO FREQUENCY EXPOSURE

### LIMIT

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

### EUT Specification

<b>EUT</b>	Notebook
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others
<b>Device category</b>	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others
<b>Exposure classification</b>	<input checked="" type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> ) <input type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
<b>Antenna diversity</b>	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
<b>Max. output power</b>	IEEE 802.11b mode: 18.30 dBm (67.60 mW) IEEE 802.11g mode: 20.51dBm (112.46 mW) draft 802.11n Standard-20 MHz Channel mode: 20.11 dBm (102.56 mW) draft 802.11n Wide-40 MHz Channel mode: 17.07 dBm (50.93 mW)
<b>Antenna gain (Max)</b>	5.22 dBi (Numeric gain: 3.32)
<b>Evaluation applied</b>	<input type="checkbox"/> MPE Evaluation <input checked="" type="checkbox"/> SAR Evaluation* <input type="checkbox"/> N/A

#### **Remark:**

1. The maximum output power is 20.51dBm (112.46 mW) at 2437MHz (with 3.32 numeric antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm<sup>2</sup> even if the calculation indicates that the power density would be larger.

### TEST RESULTS

No non-compliance noted.

**Remark:** Please refer to the separated SAR report.