



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

802.11N Wireless ADSL Router

Model:

TEW-657BRM, TEW-635BRM

Trade Name: TRENDnet

Issued to

TRENDnet, INC

20675 Manhattan Place, Torrance ,CA 90501

Issued by

Compliance Certification Services Inc.

**No. 11, Wu-Gong 6th Rd., Wugu Industrial Park,
Taipei Hsien 248, Taiwan (R.O.C.)**

<http://www.ccsrf.com>

service@ccsrf.com



Testing Laboratory
1309

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1. TEST RESULT CERTIFICATION

Applicant: TRENDnet, INC
20675 Manhattan Place, Torrance ,CA 90501

Equipment Under Test: 802.11N Wireless ADSL Router

Trade Name: TRENDnet

Model: TEW-657BRM, TEW-635BRM

Date of Test: October 31 ~ November 26, 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

Product	802.11N Wireless ADSL Router
Trade Name	TRENDnet
Model Number	TEW-657BRM, TEW-635BRM
Model Discrepancy	1. Model: TEW-635BRM for twin antenna 2. Model: TEW-657BRM 1 for single antenna
Power Adapter	LEADER / MU12-G120100-A1 I/P: 100-240V, 50/60Hz, 0.5A O/P: 12V, 1.0A
Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 19.90 dBm IEEE 802.11g mode: 24.02 dBm draft 802.11n Standard-20 MHz Channel mode: 23.38 dBm draft 802.11n Wide-40 MHz Channel mode: 23.95 dBm
Modulation Technique	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps) draft 802.11n Standard-20 MHz Channel mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33, 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) draft 802.11n Wide-40 MHz Channel mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)
Number of Channels	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
Antenna Specification	Dipole Antenna / Gain: 3.02dBi MIMO: $3.02 + 10 \log (2) = 6.03$ dBi (Numeric gain: 4.00)

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: XU8TEW635-657 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
¹ 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	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² 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 is a 2x2 configuration spatial MIMO (2Tx & 2Rx) without beam forming function. The 2x2 configuration is implemented with two outside TX & RX chains (Chain 0 and Chain 1).

The EUT (model: TEW-635BRM, TEW-657BRM) comes with two type antennas (twin Dipole antenna & single Dipole antenna) for sale.

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)			

Conducted Emission room # A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
TEST RECEIVER	R&S	ESHS20	840455/006	02/12/2010
LISN (EUT)	SCHWARZBECK	NSLK 8127	8127382	12/09/2009
LISN	SOLAR	8012-50-R-24-BNC	8305114	12/09/2009
BNC CABLE	MIYAZAKI	5D-FB	BNC A4	05/11/2010
THERMO-HYGRO METER	TECPEL	DTM-303	No.7	11/23/2010
Test S/W	EMI 32.exe			



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Conducted Emission room # A	± 1.7376
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 test items was tested at Compliance Certification Services Inc. (Hsintien Lab.)
The test equipments were listed in page 8 and the test data, please refer page 137-138.*

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

Wugu Lab

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC (Remoter)	ASUS	M5200AE	5BN0AG019631	PD9WM3B2100	LAN Cable: Unshielded, 10m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

Hsintien Lab

No.	Equipment	Model No.	Serial No.	FCC ID / BSMI ID	Trade Name	Data Cable	Power Cord
1	PS/2 Mouse	M071KC	443029438	DOC BSMI: R41108	DELL	Shielded, 1.8m	N/A
2	PS/2 Keyboard	SK-8110	N/A	DOC BSMI: T3A002	DELL	Shielded, 1.8m	N/A
3	Printer	EPSON C60	DR3K039417	BSMI ID: 3902E006	EPSON	Shielded, 1.8m	Unshielded, 1.8m
4	Monitor	710V	GS17H9NXA05855D	DOC BSMI: R33475	SAMSUNG	Shielded, 1.8m with two cores	Unshielded, 1.8m
5	Host PC	xw4400	N/A	DOC BSMI: R33001	HP	Unshielded, 1.0m	Unshielded, 1.8m
6	Modem	5JEG4033MKO	L0063CG2D007217	5RJTAI-35500-M5-E	TOP-SOLUTION	Shielded, 1.5m	Unshielded, 1.8m
7	ADSL	IES-1000	N/A	N/A	ZYXEL	Unshielded, 20m	Unshielded, 1.8m
8	Server Notebook	2210B	CNV7472KG5	DOC BSMI: R33001	HP	Unshielded, 20m	Unshielded, 1.8m
9-10	LAN cable X2	N/A	N/A	N/A	N/A	Unshielded, 3.0m	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.

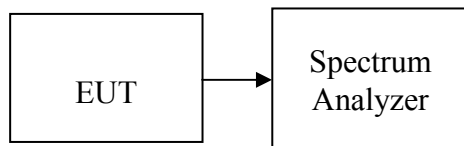
7. FCC PART 15.247 REQUIREMENTS

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	11250	>500	PASS
Mid	2437	11250		PASS
High	2462	10170		PASS

Test mode: IEEE 802.11g mode

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

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

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	17330	>500	PASS
Mid	2437	17250		PASS
High	2462	16080		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	17250	>500	PASS
Mid	2437	17250		PASS
High	2462	17170		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2422	35820	>500	PASS
Mid	2437	35700		PASS
High	2452	36050		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2422	35700	>500	PASS
Mid	2437	35820		PASS
High	2452	35700		PASS



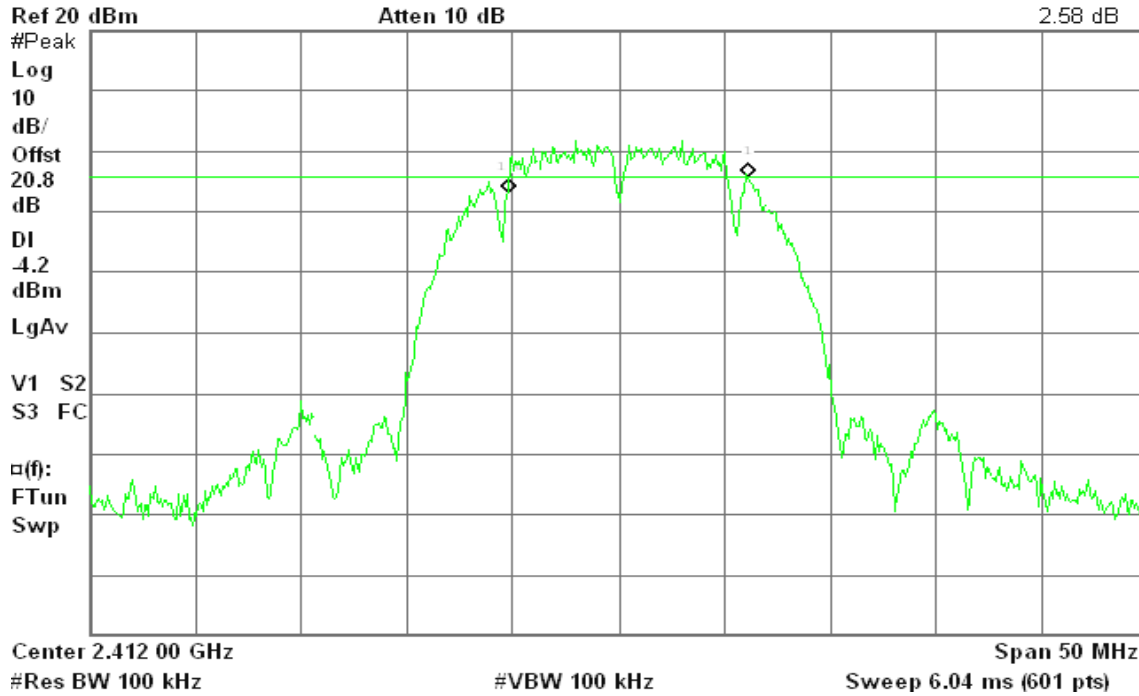
IEEE 802.11b mode

6dB Bandwidth (CH Low)

Agilent 09:43:26 Nov 25, 2009

R T

Δ Mkr1 11.25 MHz
2.58 dB

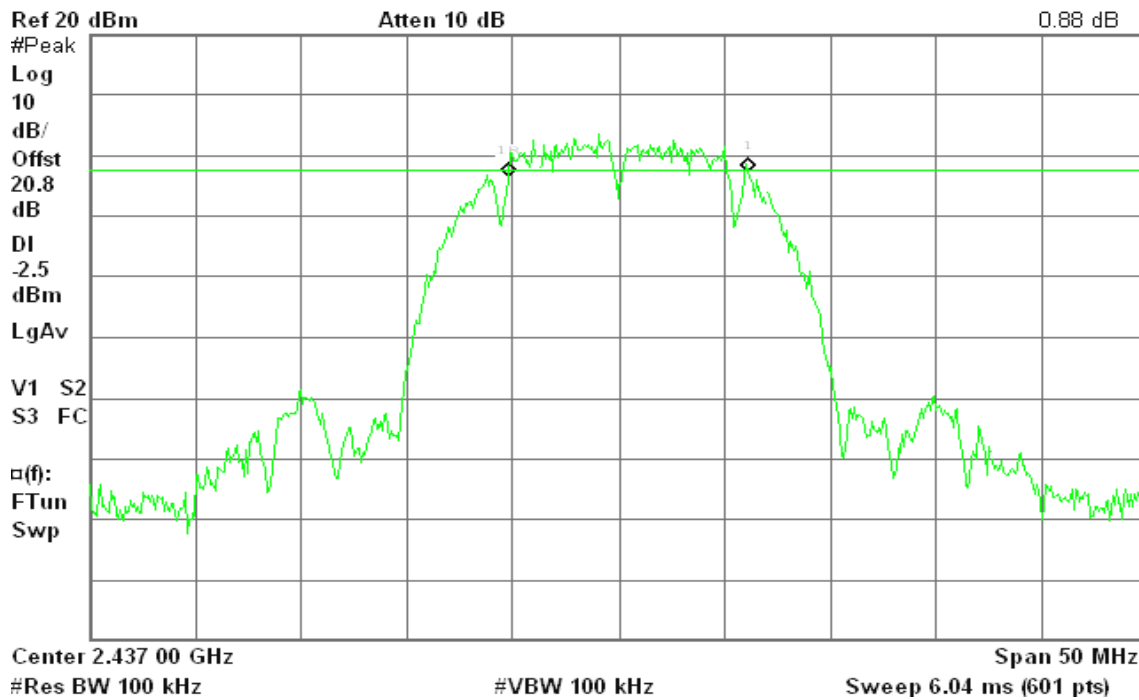


6dB Bandwidth (CH Mid)

Agilent 10:03:14 Nov 25, 2009

R T

Δ Mkr1 11.25 MHz
0.88 dB



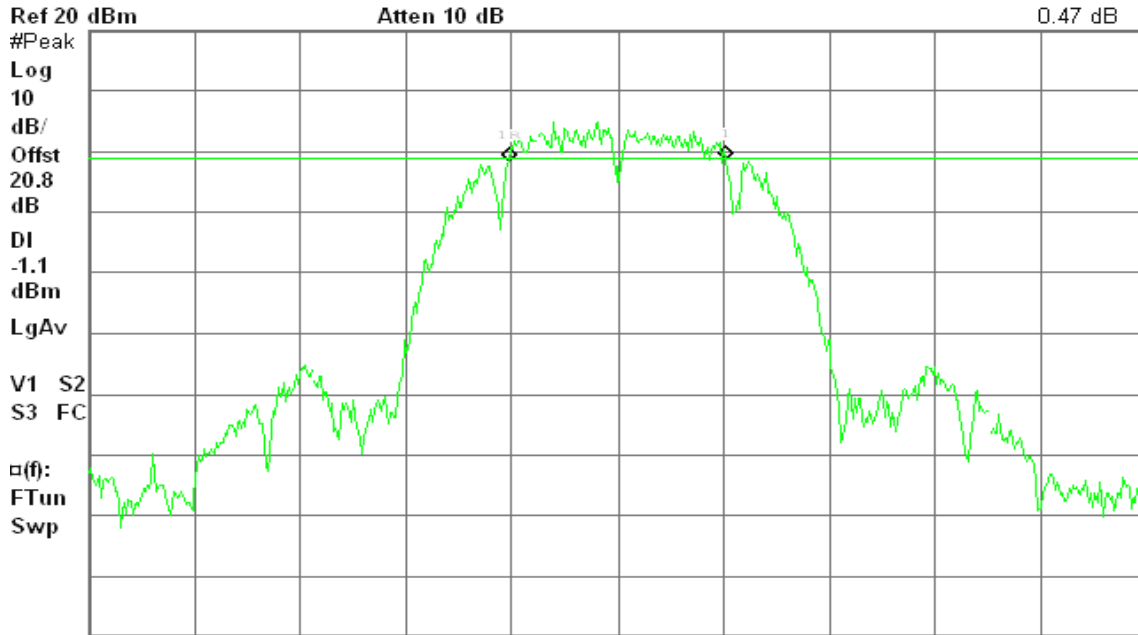


6dB Bandwidth (CH High)

Agilent 10:20:45 Nov 25, 2009

R T

Δ Mkr1 10.17 MHz
0.47 dB



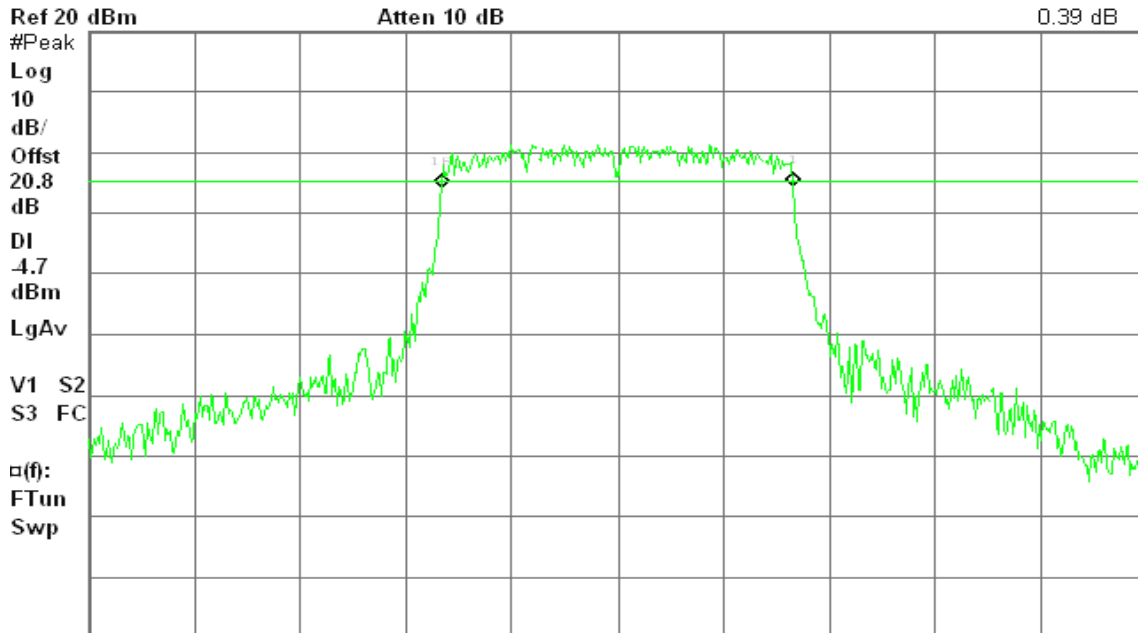
IEEE 802.11g mode

6dB Bandwidth (CH Low)

Agilent 10:49:13 Nov 25, 2009

R T

Δ Mkr1 16.50 MHz
0.39 dB



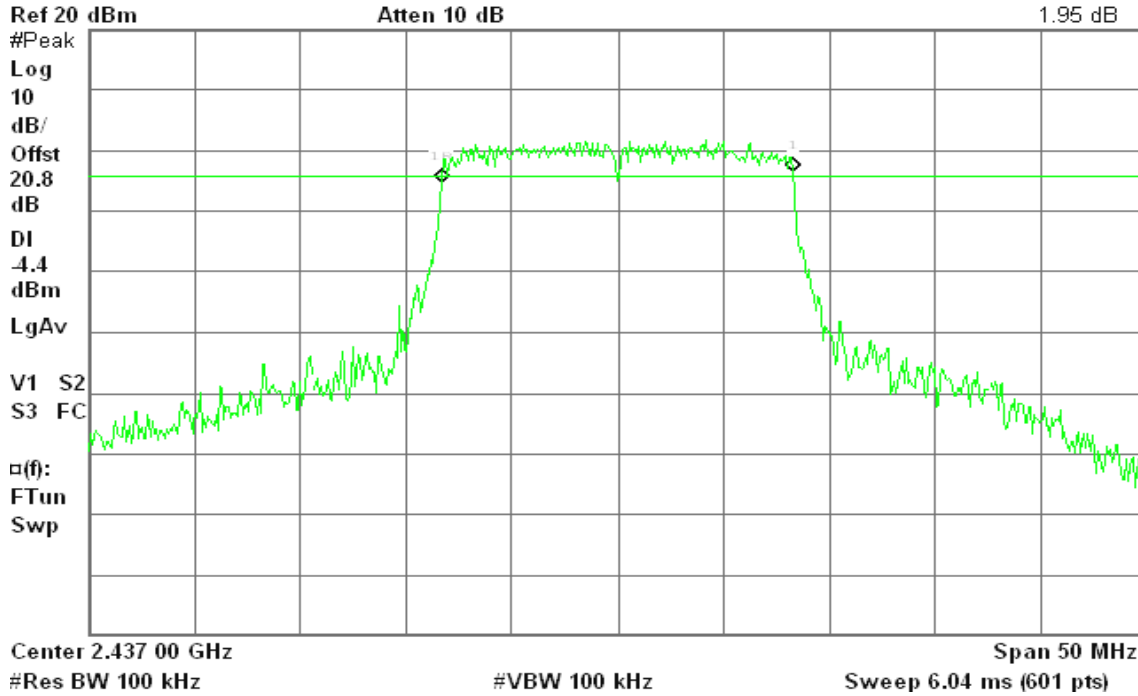


6dB Bandwidth (CH Mid)

Agilent 10:59:01 Nov 25, 2009

R T

Δ Mkr1 16.50 MHz
1.95 dB

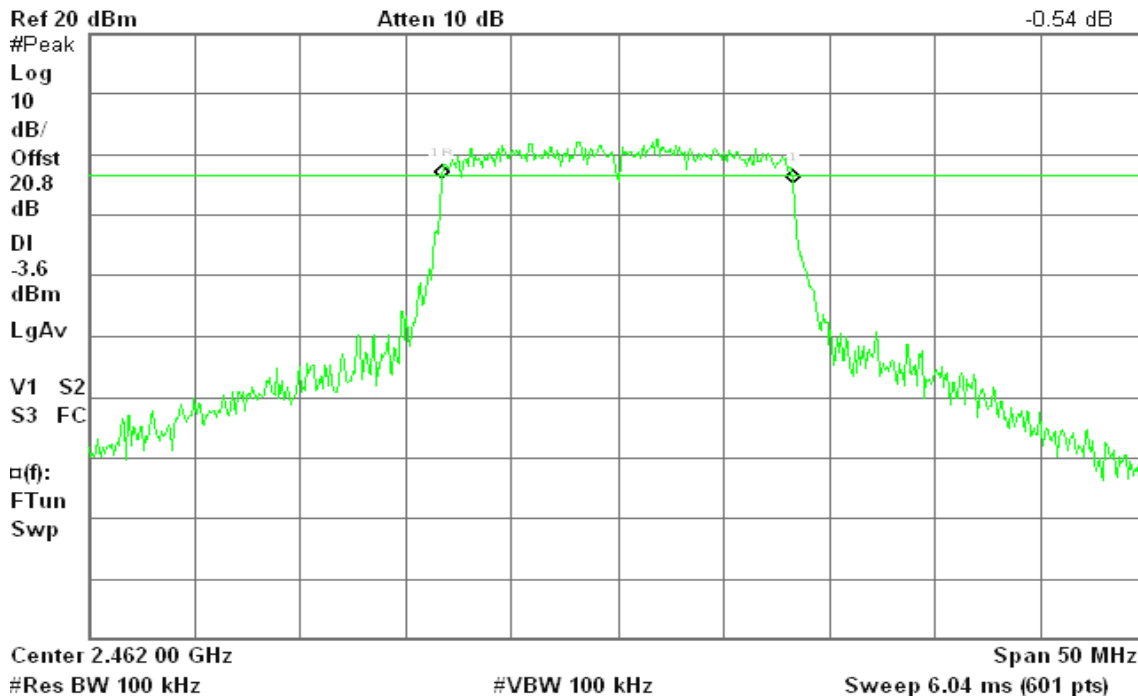


6dB Bandwidth (CH High)

Agilent 12:15:20 Nov 25, 2009

R T

Δ Mkr1 16.50 MHz
-0.54 dB





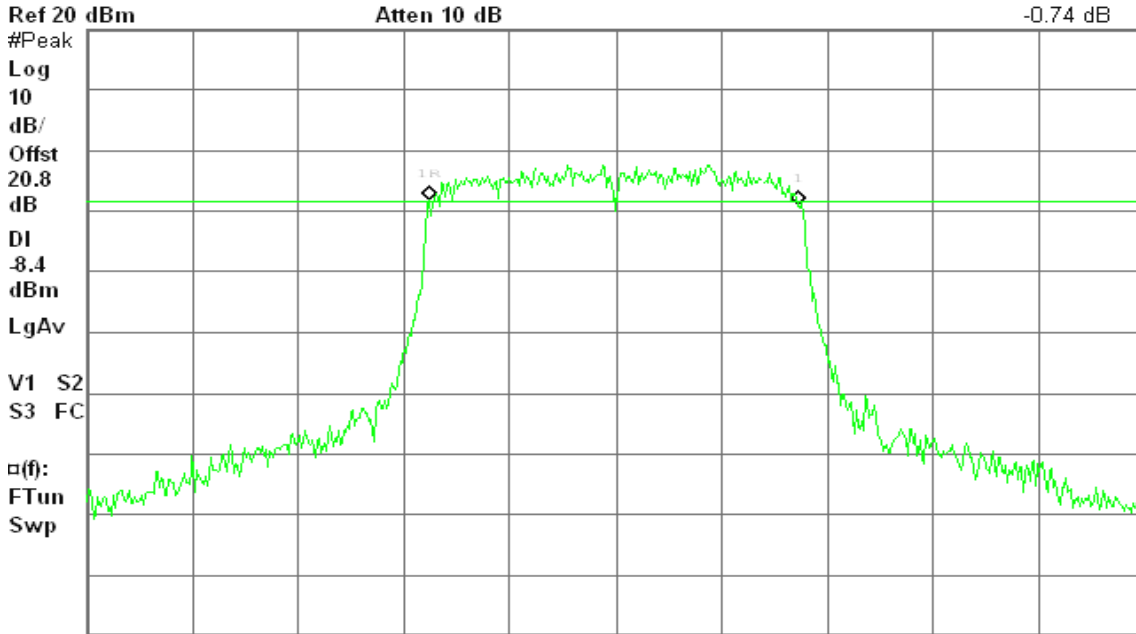
draft 802.11n Standard-20 MHz Channel mode / Chain 0

6dB Bandwidth (CH Low)

Agilent 13:26:53 Nov 25, 2009

R T

Δ Mkr1 17.33 MHz
-0.74 dB



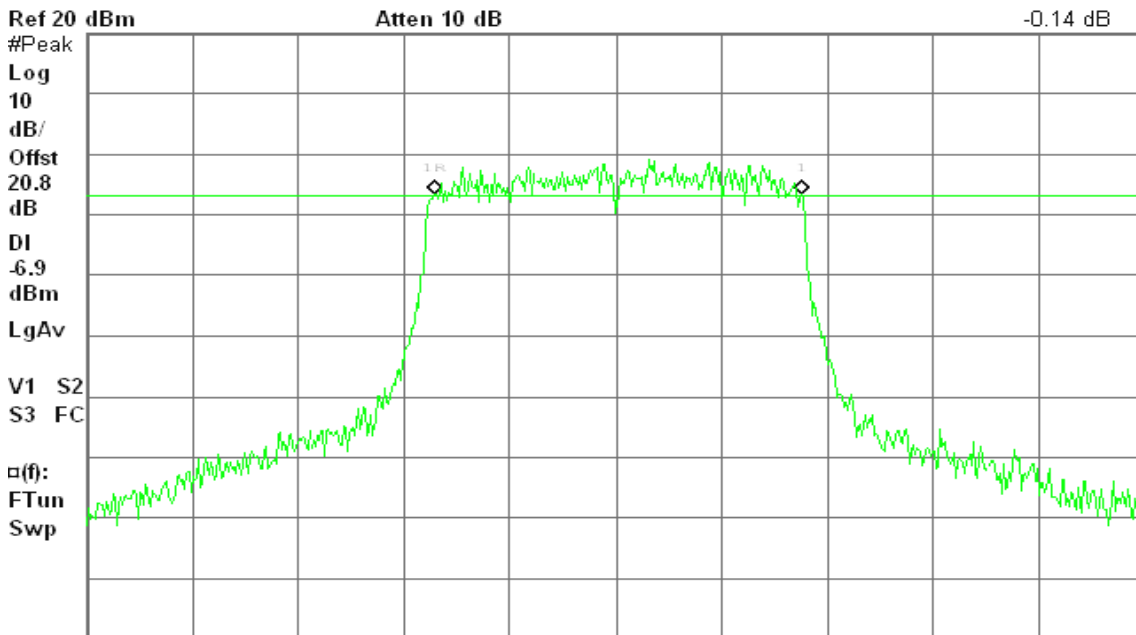
Center 2.412 00 GHz Span 50 MHz
#Res BW 100 kHz #VBW 100 kHz Sweep 6.04 ms (601 pts)

6dB Bandwidth (CH Mid)

Agilent 13:42:11 Nov 25, 2009

R T

Δ Mkr1 17.25 MHz
-0.14 dB



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

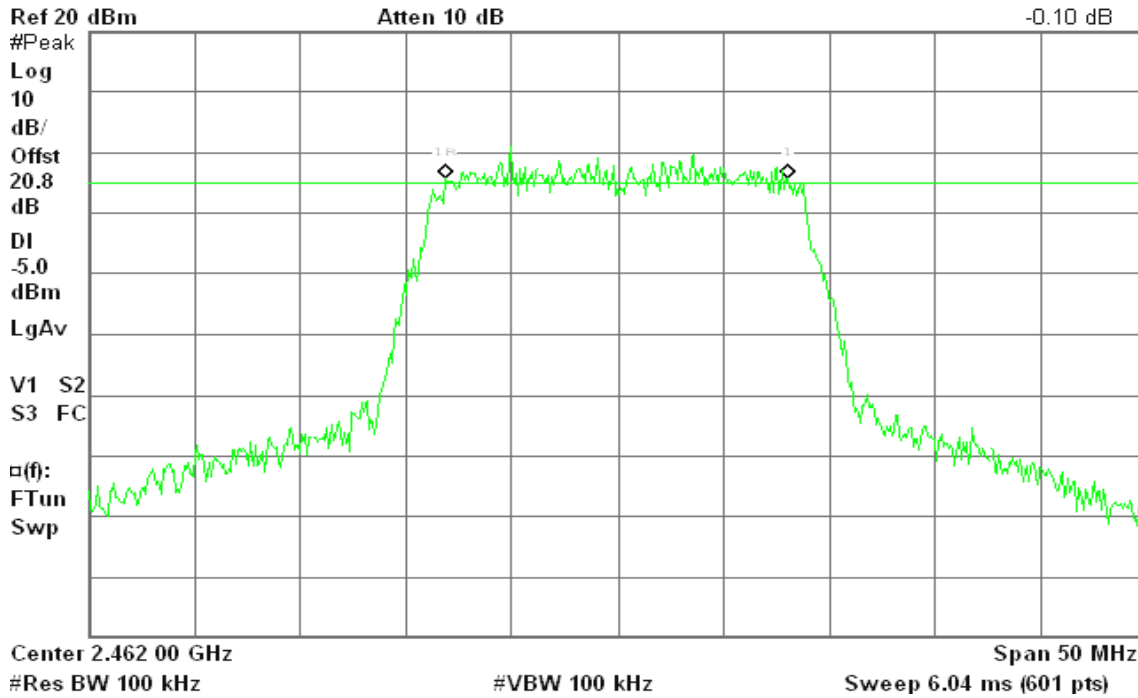


6dB Bandwidth (CH High)

Agilent 13:50:57 Nov 25, 2009

R T

Δ Mkr1 16.08 MHz
-0.10 dB



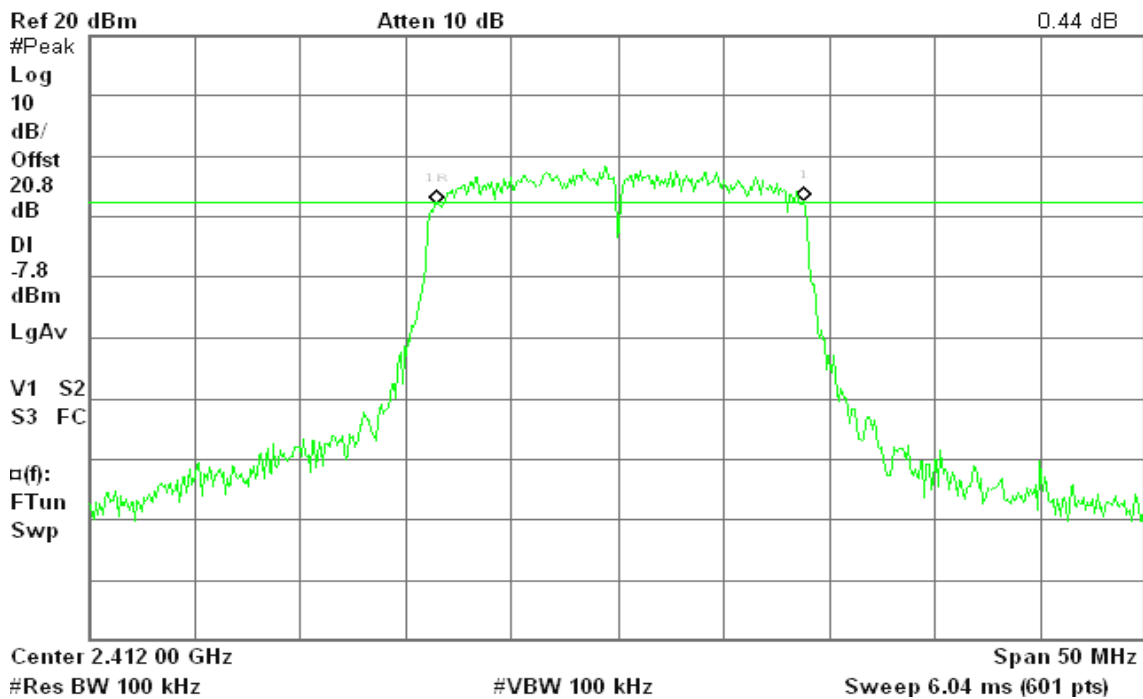
draft 802.11n Standard-20 MHz Channel mode / Chain 1

6dB Bandwidth (CH Low)

Agilent 10:30:01 Nov 26, 2009

R T

Δ Mkr1 17.25 MHz
0.44 dB



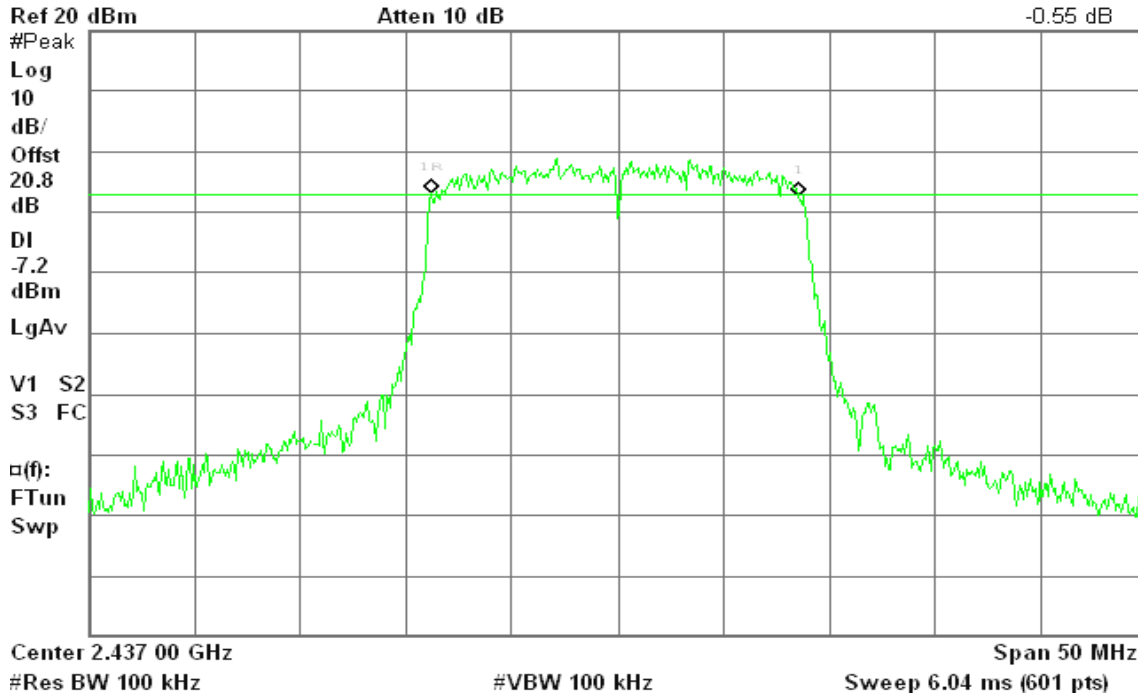


6dB Bandwidth (CH Mid)

Agilent 10:54:26 Nov 26, 2009

R L

Δ Mkr1 17.25 MHz
-0.55 dB

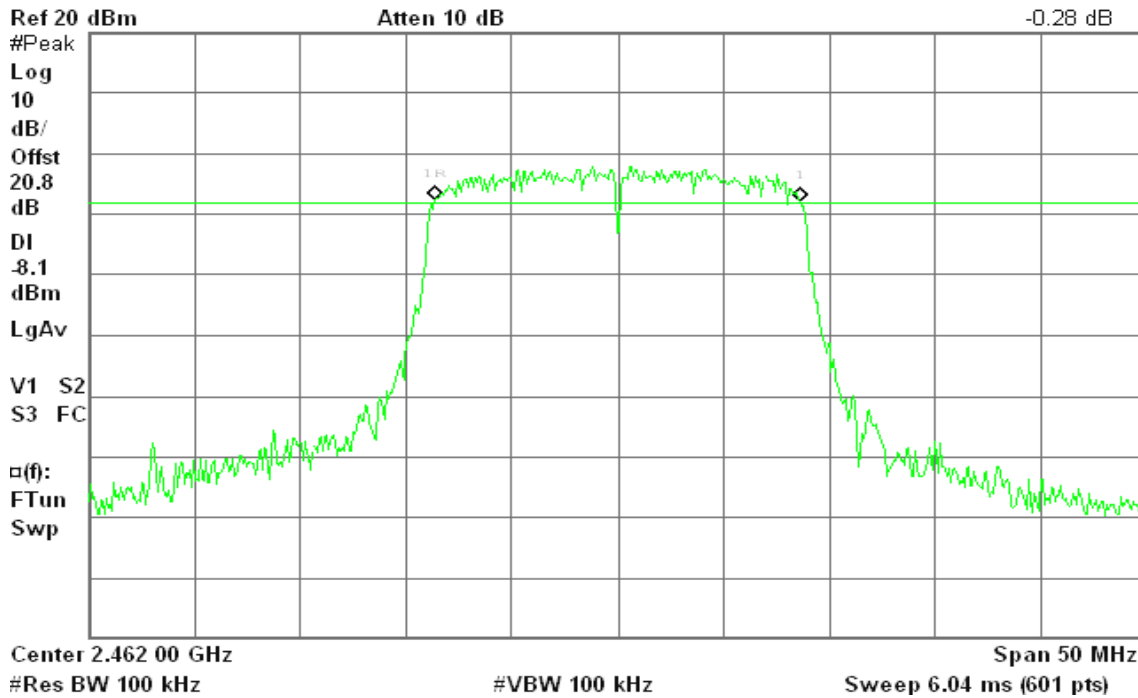


6dB Bandwidth (CH High)

Agilent 12:12:14 Nov 26, 2009

R T

Δ Mkr1 17.17 MHz
-0.28 dB





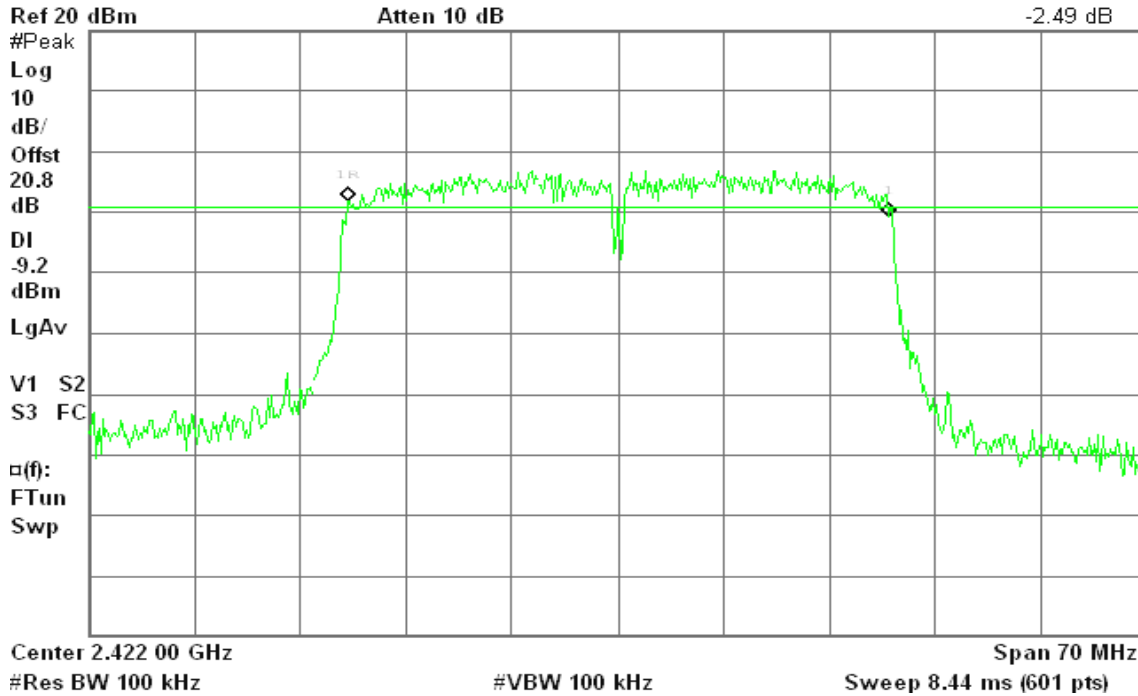
draft 802.11n Wide-40 MHz Channel mode / Chain 0

6dB Bandwidth (CH Low)

Agilent 14:20:51 Nov 25, 2009

R T

Δ Mkr1 35.82 MHz
-2.49 dB

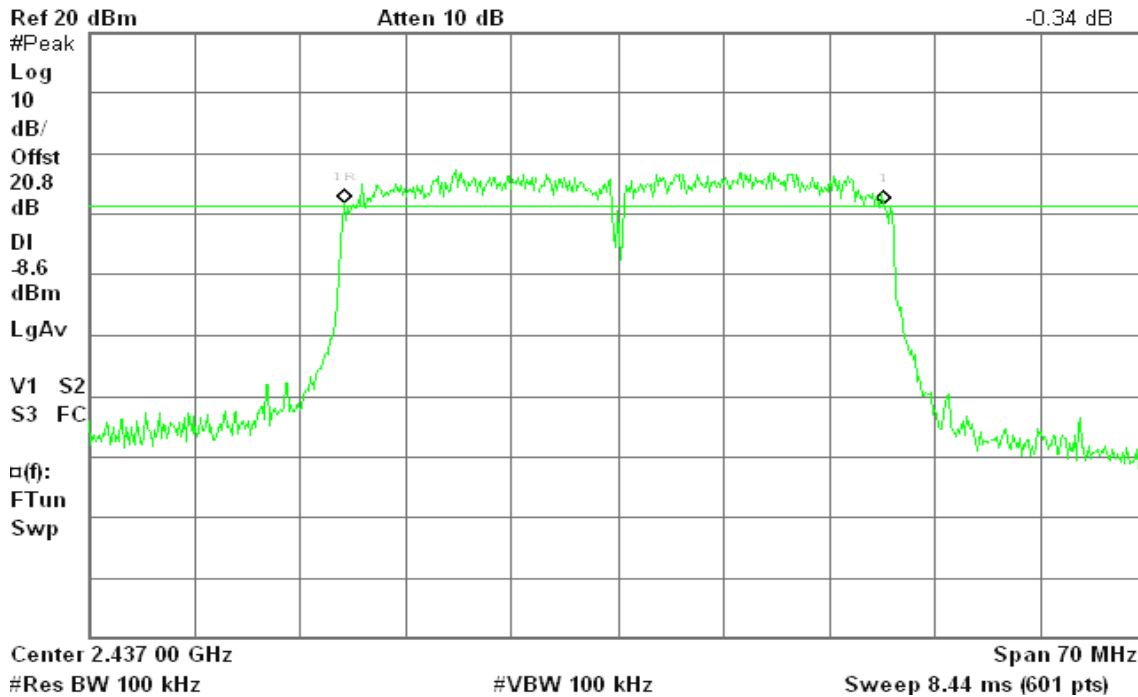


6dB Bandwidth (CH Mid)

Agilent 14:29:40 Nov 25, 2009

R T

Δ Mkr1 35.70 MHz
-0.34 dB



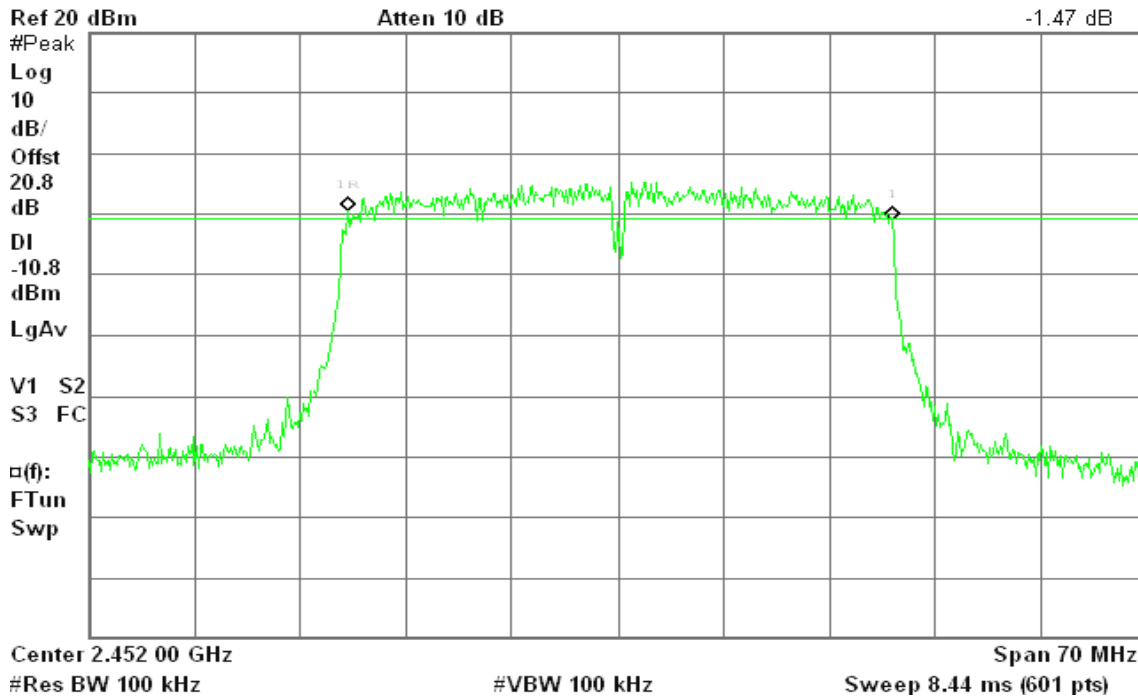


6dB Bandwidth (CH High)

Agilent 14:38:37 Nov 25, 2009

R T

Δ Mkr1 36.05 MHz
-1.47 dB



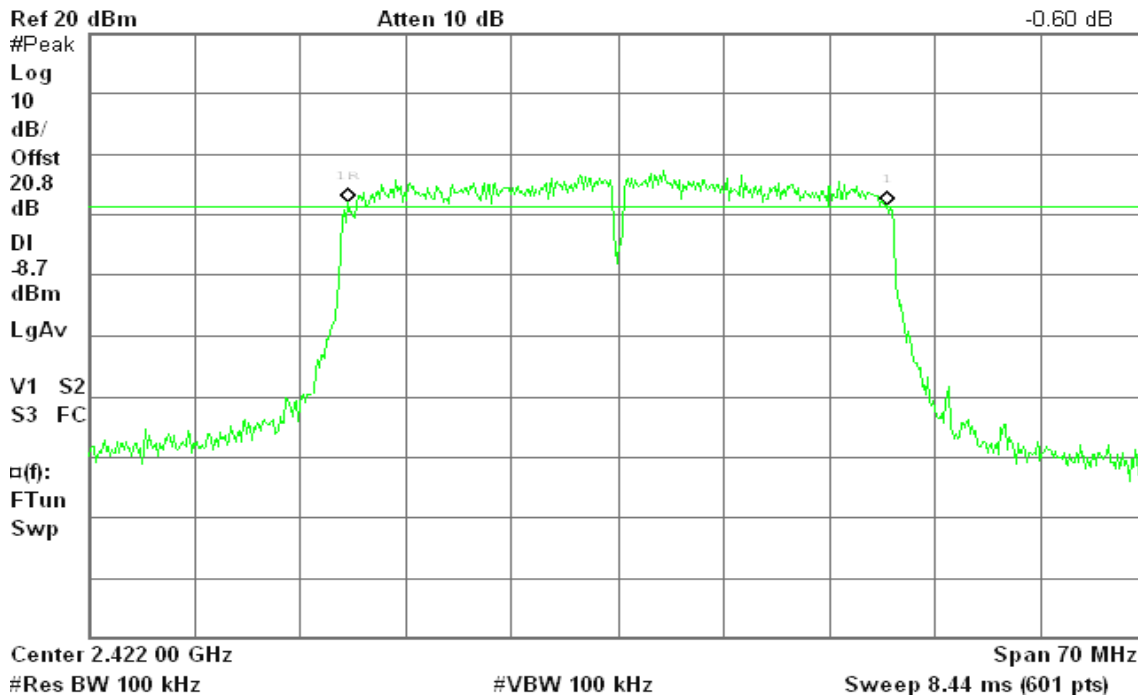
draft 802.11n Wide-40 MHz Channel mode / Chain 1

6dB Bandwidth (CH Low)

Agilent 15:07:00 Nov 25, 2009

R T

Δ Mkr1 35.70 MHz
-0.60 dB



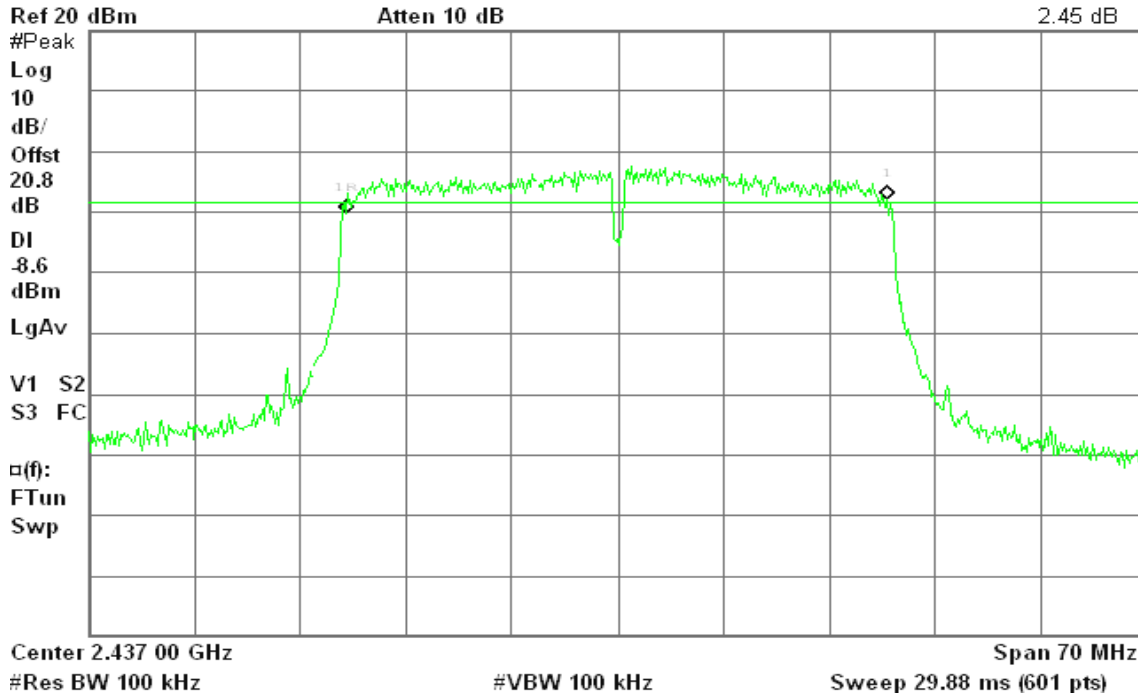


6dB Bandwidth (CH Mid)

Agilent 15:22:44 Nov 25, 2009

R T

Δ Mkr1 35.82 MHz
2.45 dB

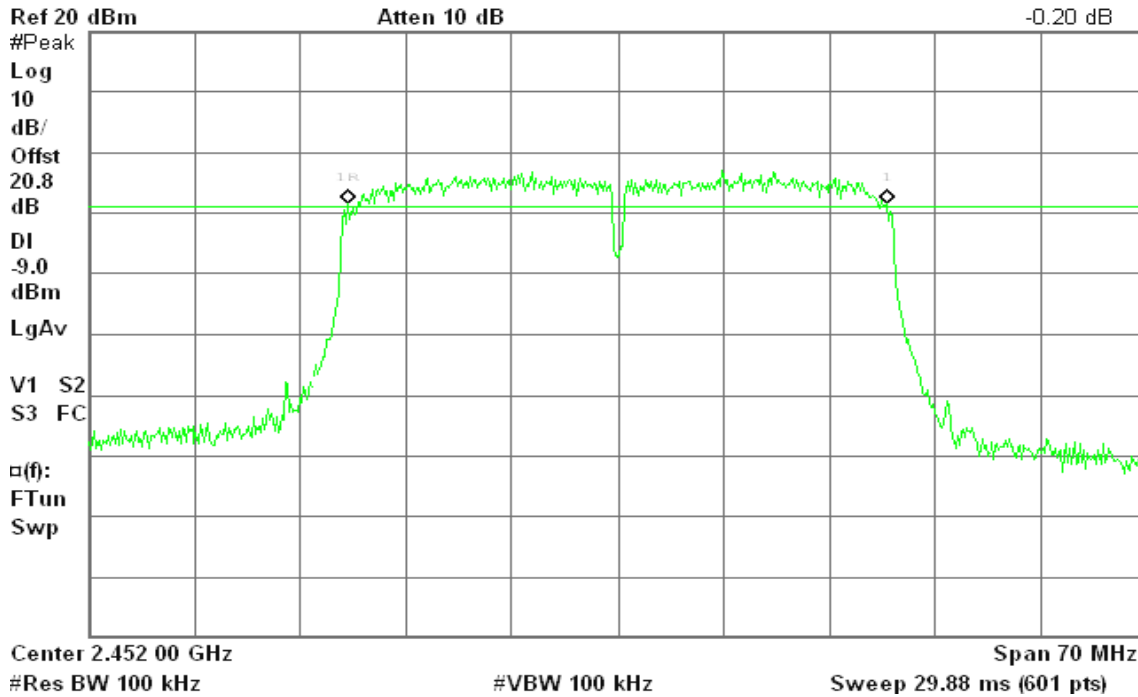


6dB Bandwidth (CH High)

Agilent 15:42:15 Nov 25, 2009

R T

Δ Mkr1 35.70 MHz
-0.20 dB



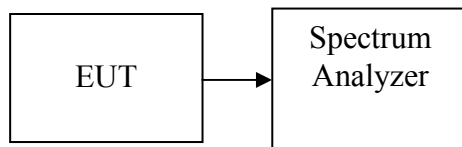
7.2 PEAK POWER

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)	Result
Low	2412	16.80	0.0479	1.00	PASS
Mid	2437	18.50	0.0708		PASS
High	2462	19.90	0.0977		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	23.96	0.2489	1.00	PASS
Mid	2437	23.84	0.2421		PASS
High	2462	24.02	0.2523		PASS

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	19.80	20.27	23.05	0.2019	0.794	PASS
Mid	2437	20.23	20.50	23.38	0.2176		PASS
High	2462	20.21	20.11	23.17	0.2075		PASS

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	20.93	20.53	23.74	0.2369	0.794	PASS
Mid	2437	21.16	20.70	23.95	0.2483		PASS
High	2452	18.99	20.47	22.80	0.1907		PASS

Remark:

- Total Output Power (w) = Chain 0 (10^{^(Output Power /10)/1000}) + Chain 1 (10^{^(Output Power /10)/1000})
- The maximum antenna gain is 6.03 dBi; therefore the reduction due to antenna gain is 1dB, so the limit is 29dBm.



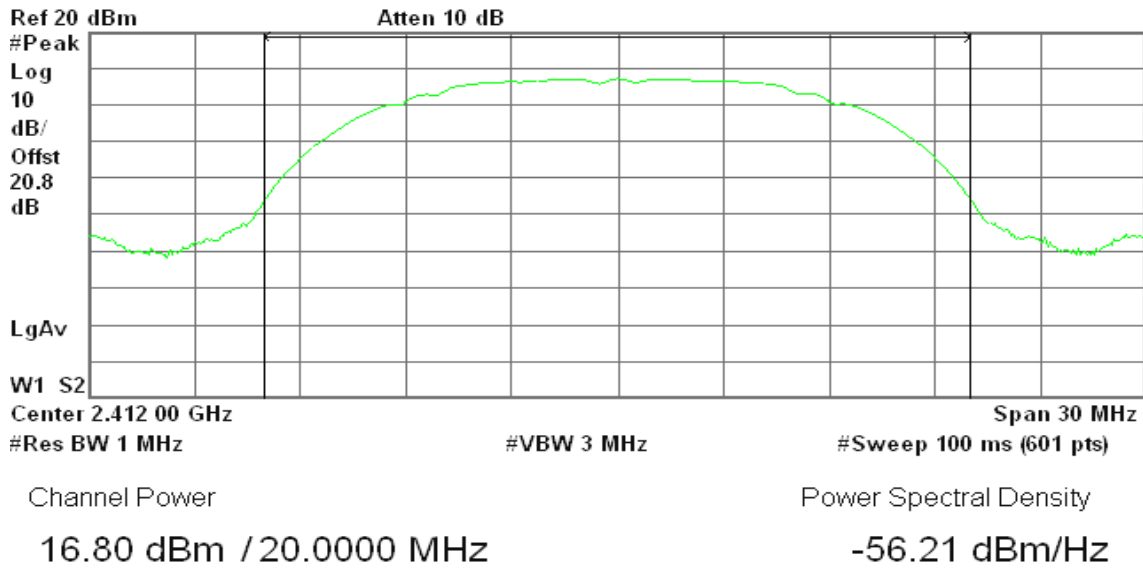
Test Plot

IEEE 802.11b mode

Peak Power (CH Low)

Agilent 09:46:59 Nov 25, 2009

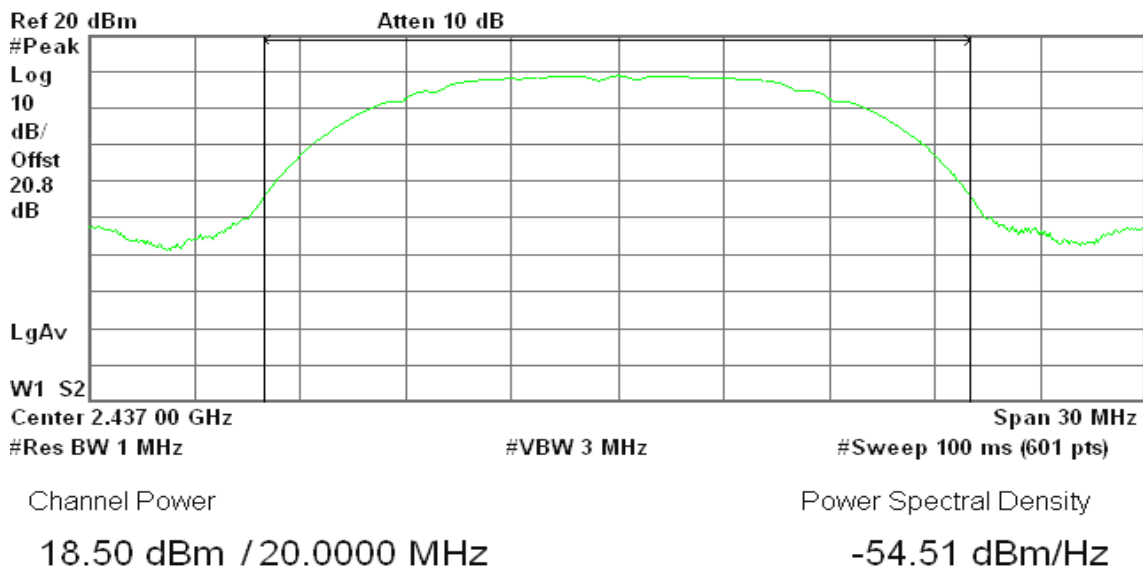
R T



Peak Power (CH Mid)

Agilent 10:19:11 Nov 25, 2009

R T

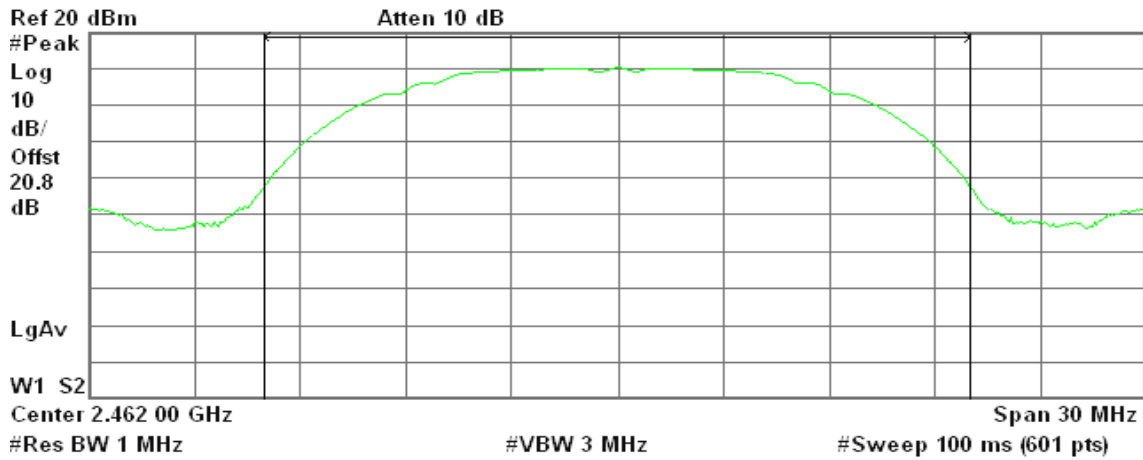




Peak Power (CH High)

Agilent 10:23:44 Nov 25, 2009

R T



Channel Power

19.90 dBm / 20.0000 MHz

Power Spectral Density

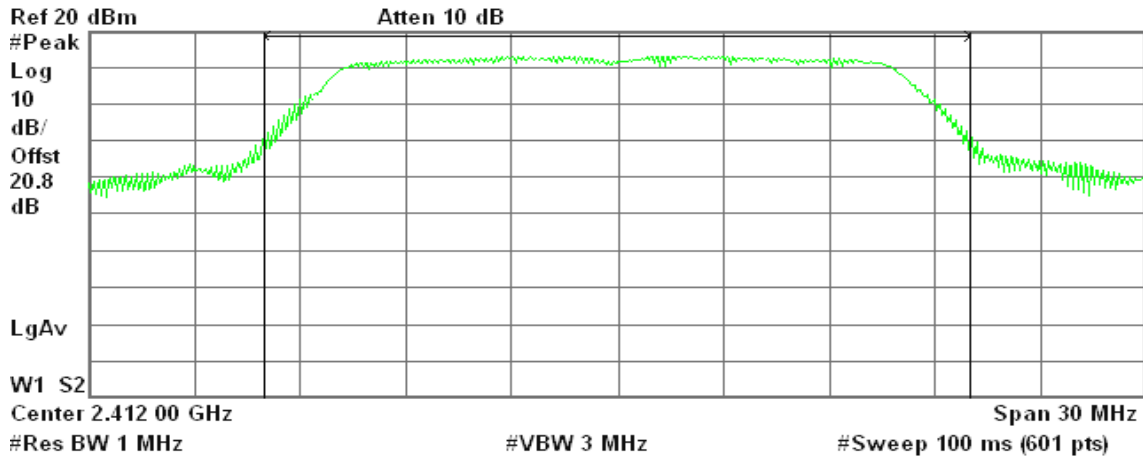
-53.11 dBm/Hz

IEEE 802.11g mode

Peak Power (CH Low)

Agilent 10:52:04 Nov 25, 2009

R T



Channel Power

23.96 dBm / 20.0000 MHz

Power Spectral Density

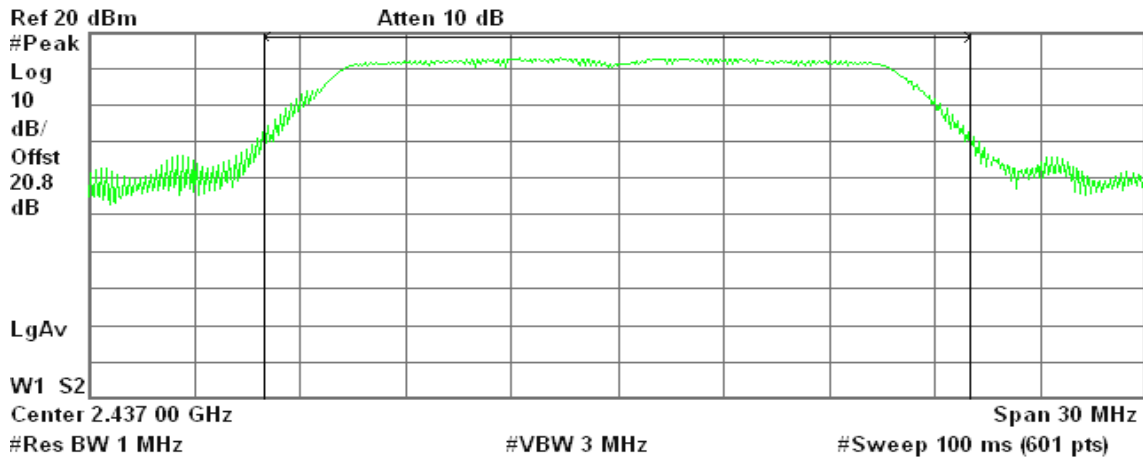
-49.05 dBm/Hz



Peak Power (CH Mid)

Agilent 12:07:36 Nov 25, 2009

R L



Channel Power

23.84 dBm / 20.0000 MHz

Power Spectral Density

-49.17 dBm/Hz

Peak Power (CH High)

Agilent 12:19:49 Nov 25, 2009

R T



Channel Power

24.02 dBm / 20.0000 MHz

Power Spectral Density

-48.99 dBm/Hz

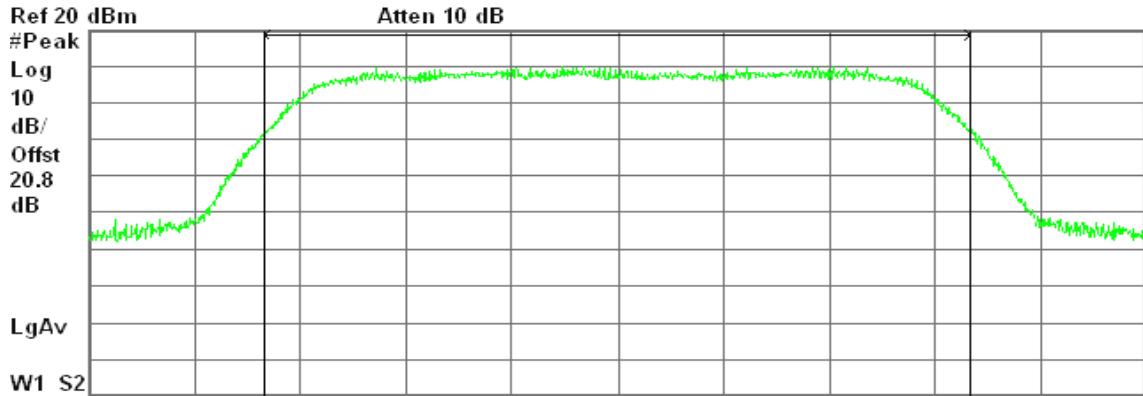


draft 802.11n Standard-20 MHz Channel mode / Chain 0

Peak Power (CH Low)

Agilent 14:06:59 Nov 25, 2009

R T



Center 2.412 00 GHz Span 30 MHz
 #Res BW 1 MHz #VBW 3 MHz #Sweep 100 ms (1001 pts)

Channel Power

Power Spectral Density

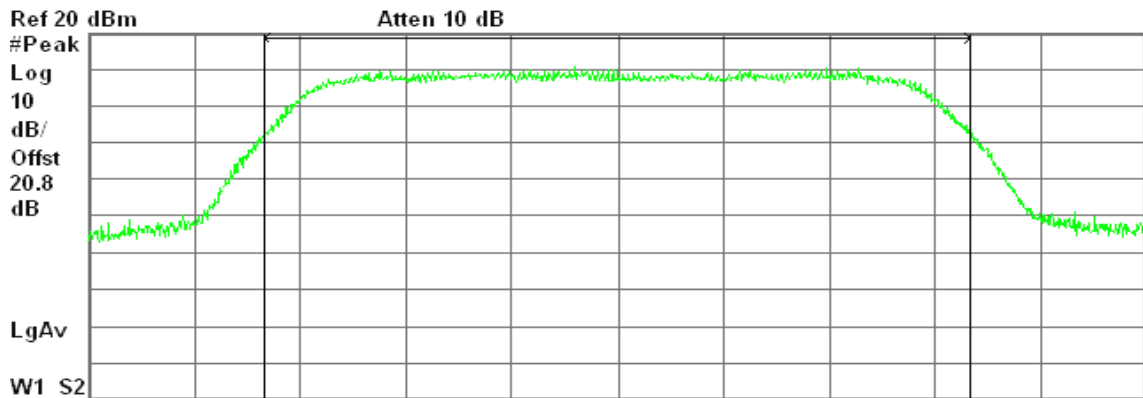
19.80 dBm / 20.0000 MHz

-53.21 dBm/Hz

Peak Power (CH Mid)

Agilent 14:07:46 Nov 25, 2009

R T



Center 2.437 00 GHz Span 30 MHz
 #Res BW 1 MHz #VBW 3 MHz #Sweep 100 ms (1001 pts)

Channel Power

Power Spectral Density

20.23 dBm / 20.0000 MHz

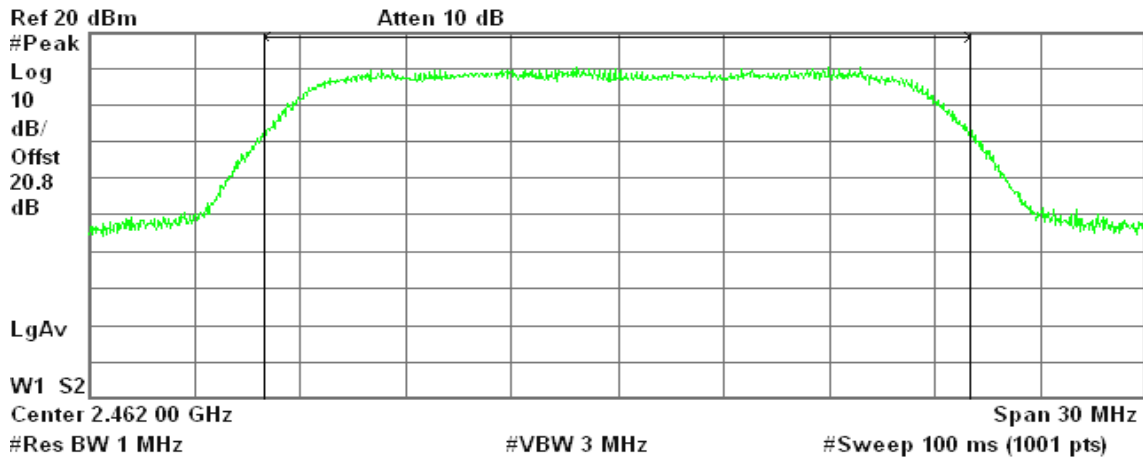
-52.79 dBm/Hz



Peak Power (CH High)

Agilent 14:08:38 Nov 25, 2009

R T



Channel Power

20.21 dBm / 20.0000 MHz

Power Spectral Density

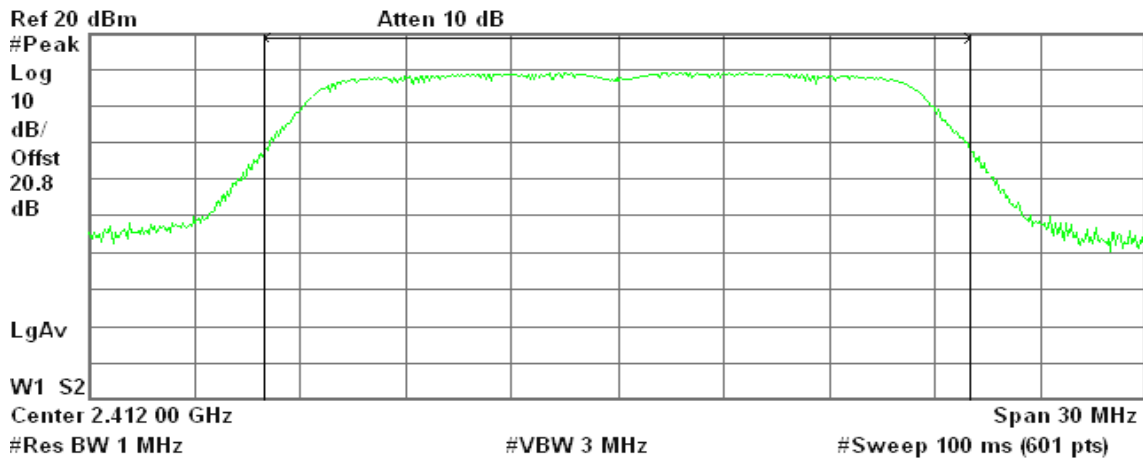
-52.81 dBm/Hz

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

Peak Power (CH Low)

Agilent 10:33:39 Nov 26, 2009

R T



Channel Power

20.27 dBm / 20.0000 MHz

Power Spectral Density

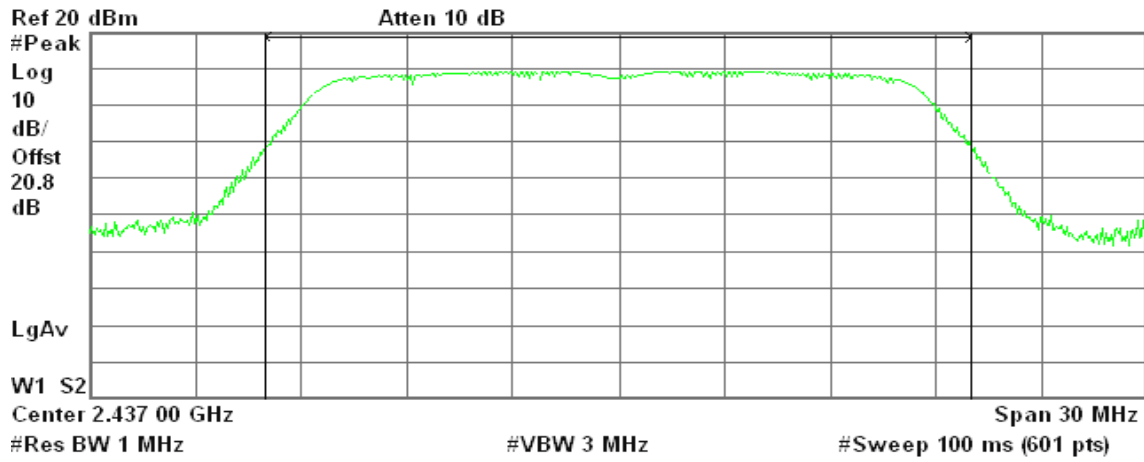
-52.74 dBm/Hz



Peak Power (CH Mid)

Agilent 10:56:50 Nov 26, 2009

R T



Channel Power

20.50 dBm / 20.0000 MHz

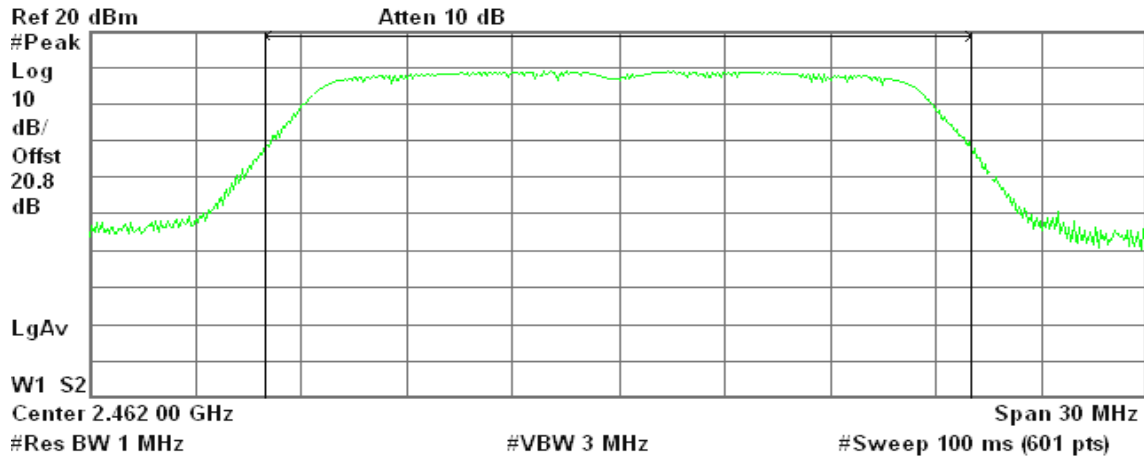
Power Spectral Density

-52.51 dBm/Hz

Peak Power (CH High)

Agilent 12:14:43 Nov 26, 2009

R T



Channel Power

20.11 dBm / 20.0000 MHz

Power Spectral Density

-52.90 dBm/Hz

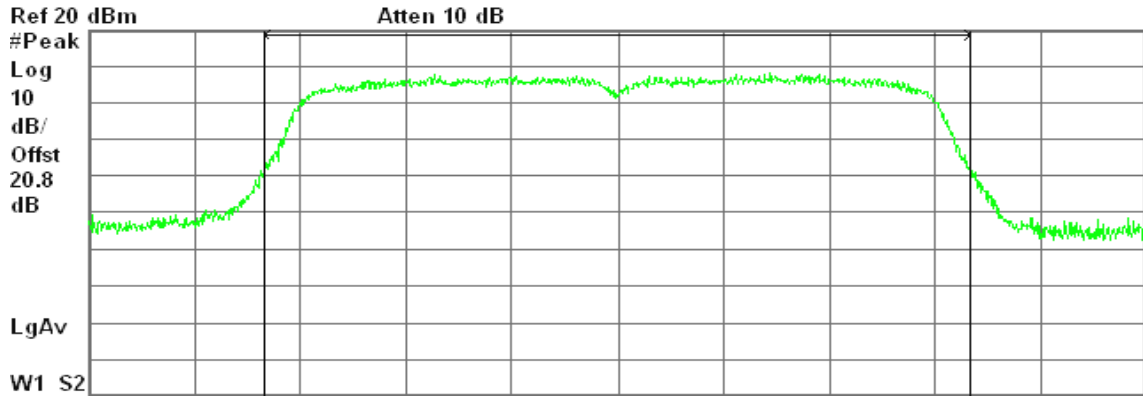


draft 802.11n Wide-40 MHz Channel mode / Chain 0

Peak Power (CH Low)

Agilent 14:51:14 Nov 25, 2009

R T



Channel Power

20.93 dBm / 40.0000 MHz

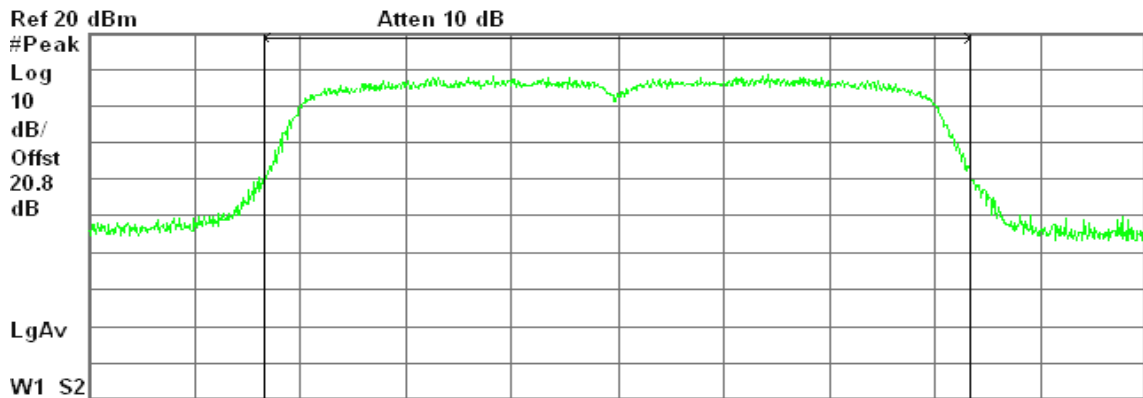
Power Spectral Density

-55.09 dBm/Hz

Peak Power (CH Mid)

Agilent 14:52:02 Nov 25, 2009

R T



Channel Power

21.16 dBm / 40.0000 MHz

Power Spectral Density

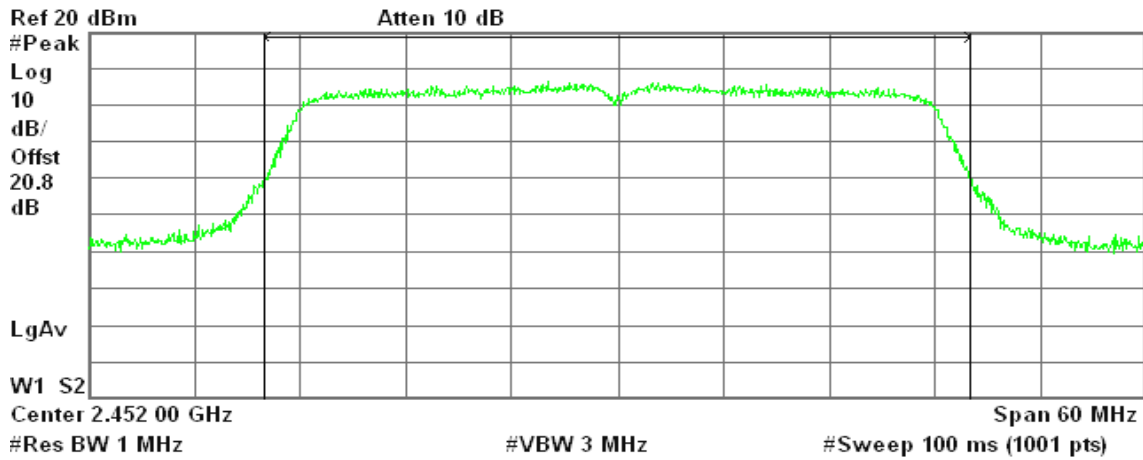
-54.86 dBm/Hz



Peak Power (CH High)

Agilent 14:53:43 Nov 25, 2009

R T



Channel Power

18.99 dBm / 40.0000 MHz

Power Spectral Density

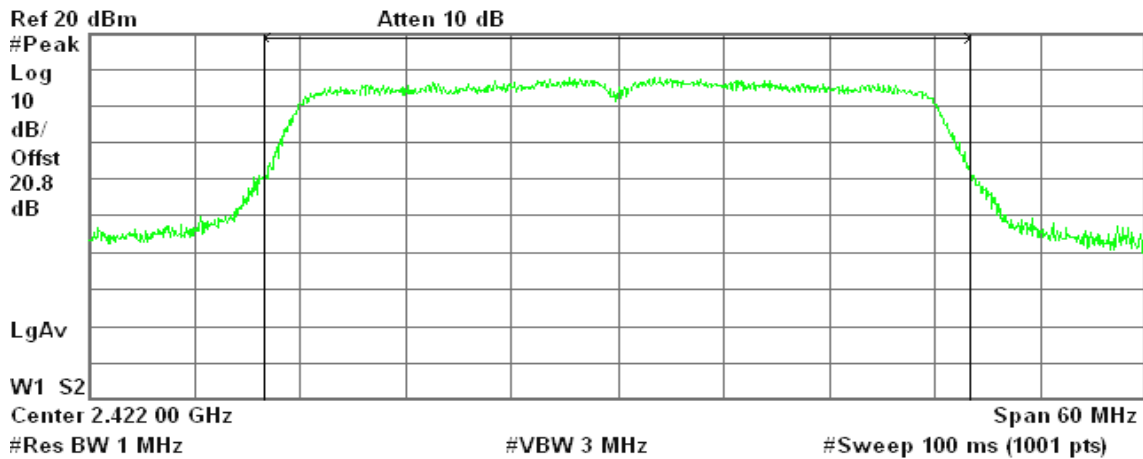
-57.03 dBm/Hz

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

Peak Power (CH Low)

Agilent 15:55:44 Nov 25, 2009

R T



Channel Power

20.53 dBm / 40.0000 MHz

Power Spectral Density

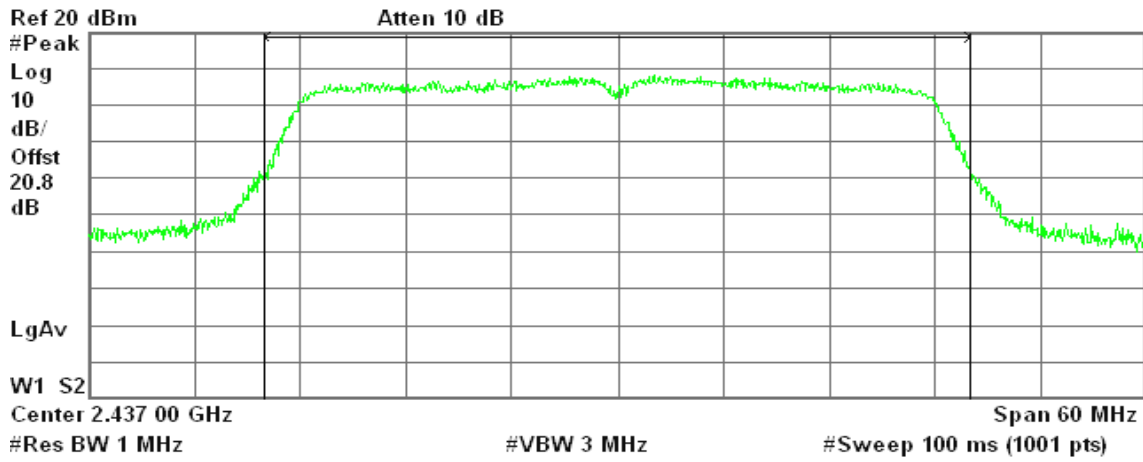
-55.49 dBm/Hz



Peak Power (CH Mid)

Agilent 15:54:56 Nov 25, 2009

R T



Channel Power

20.70 dBm / 40.0000 MHz

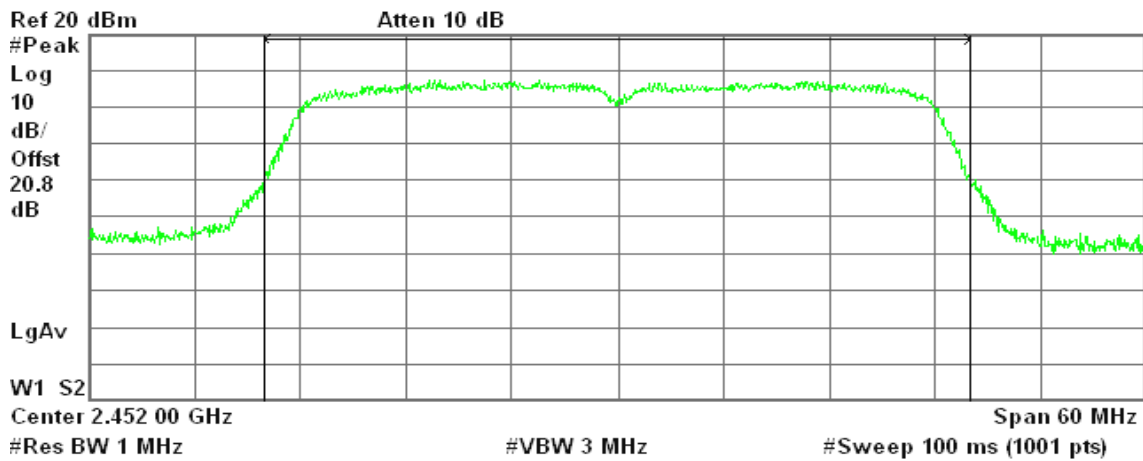
Power Spectral Density

-55.32 dBm/Hz

Peak Power (CH High)

Agilent 15:51:57 Nov 25, 2009

R T



Channel Power

20.47 dBm / 40.0000 MHz

Power Spectral Density

-55.56 dBm/Hz

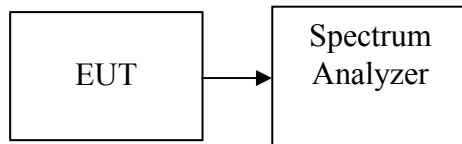


7.3 AVERAGE POWER

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	13.85	0.0243
Mid	2437	15.66	0.0368
High	2462	17.13	0.0516

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	16.85	0.0484
Mid	2437	16.69	0.0467
High	2462	17.04	0.0506

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2412	12.31	13.22	15.80	0.0380
Mid	2437	12.70	13.01	15.87	0.0386
High	2462	12.68	12.86	15.78	0.0379

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2422	13.84	13.36	16.62	0.0459
Mid	2437	14.03	13.75	16.90	0.0490
High	2452	12.07	13.54	15.88	0.0387

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



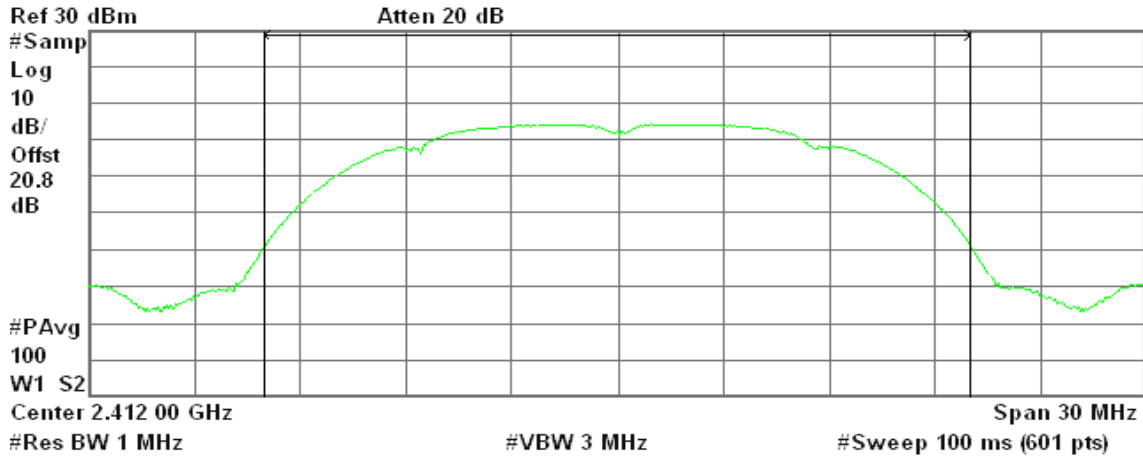
Test Plot

IEEE 802.11b mode

Average Power (CH Low)

Agilent 09:52:12 Nov 25, 2009

R T



Channel Power

13.85 dBm / 20.0000 MHz

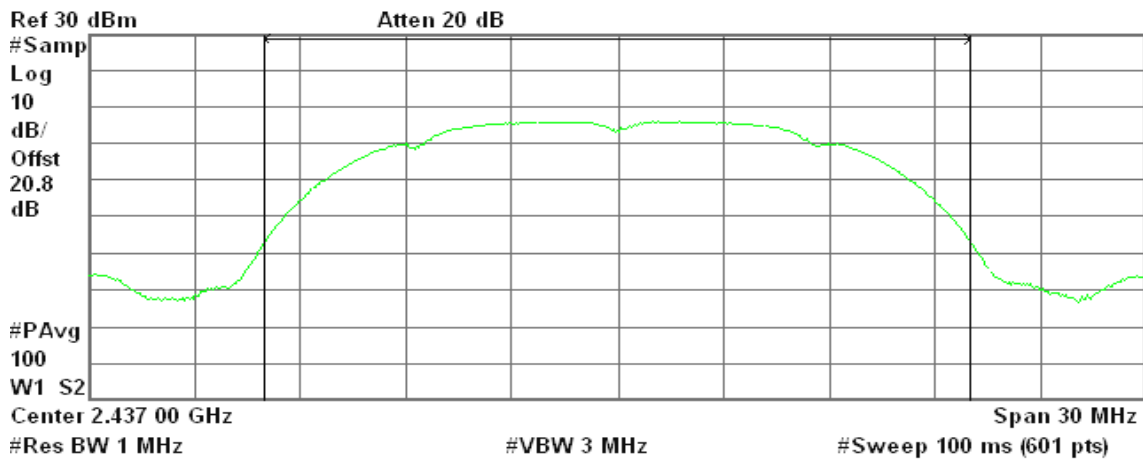
Power Spectral Density

-59.16 dBm/Hz

Average Power (CH Mid)

Agilent 10:46:57 Nov 25, 2009

R T



Channel Power

15.66 dBm / 20.0000 MHz

Power Spectral Density

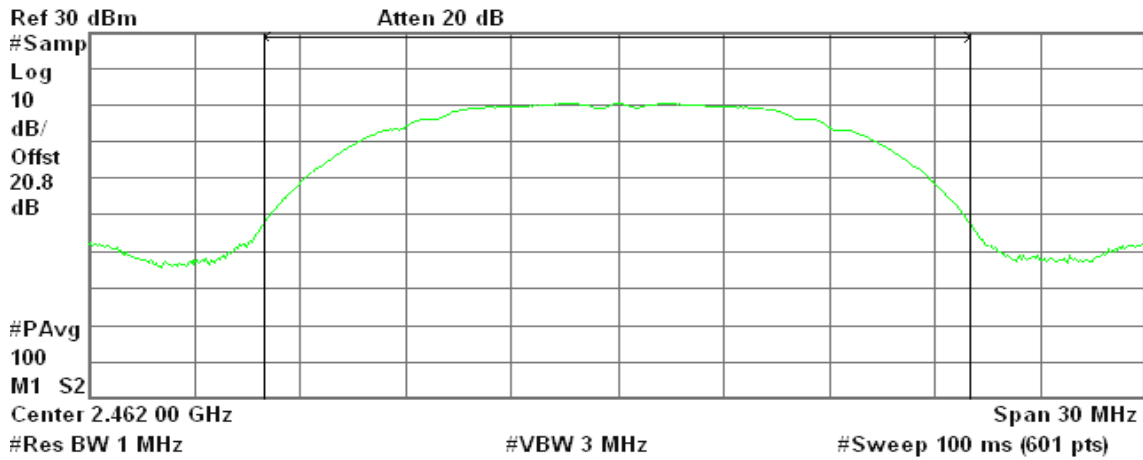
-57.36 dBm/Hz



Average Power (CH High)

Agilent 10:41:46 Nov 25, 2009

R T



Channel Power

17.13 dBm / 20.0000 MHz

Power Spectral Density

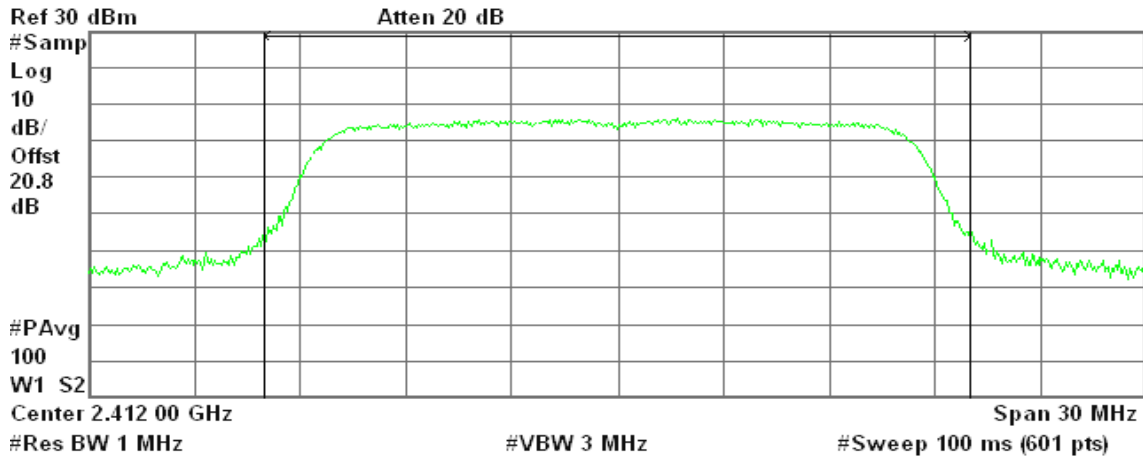
-55.88 dBm/Hz

IEEE 802.11g mode

Average Power (CH Low)

Agilent 10:53:19 Nov 25, 2009

R T



Channel Power

16.85 dBm / 20.0000 MHz

Power Spectral Density

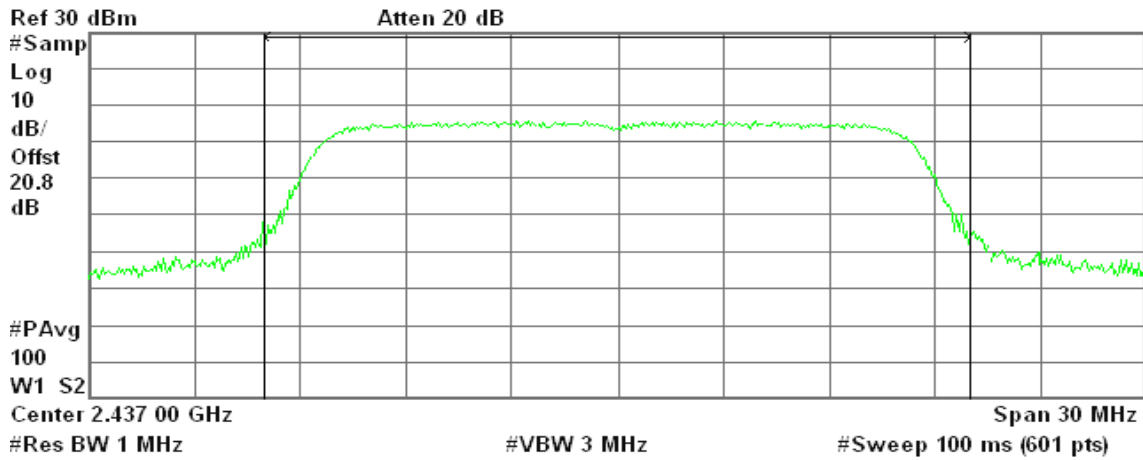
-56.16 dBm/Hz



Average Power (CH Mid)

Agilent 12:09:03 Nov 25, 2009

R T



Channel Power

16.69 dBm / 20.0000 MHz

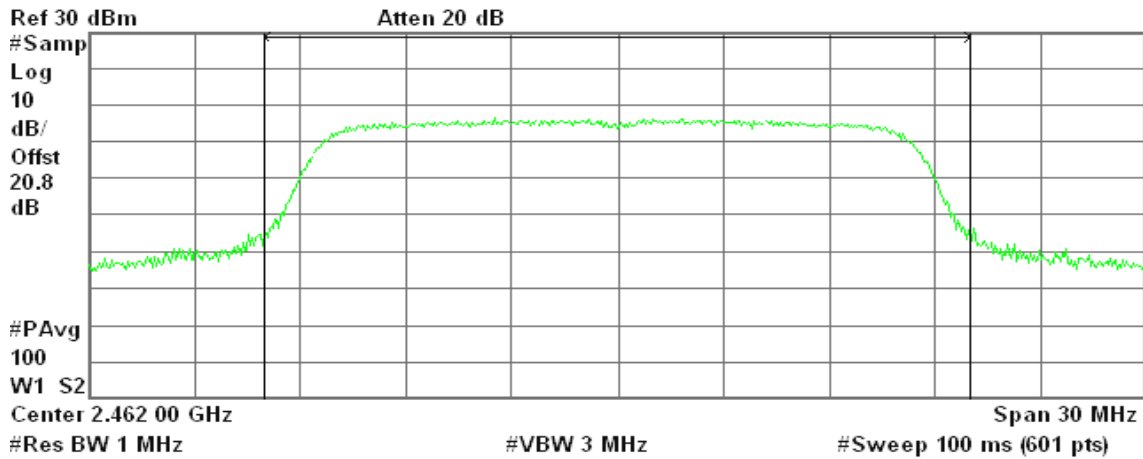
Power Spectral Density

-56.32 dBm/Hz

Average Power (CH High)

Agilent 12:22:23 Nov 25, 2009

R T



Channel Power

17.04 dBm / 20.0000 MHz

Power Spectral Density

-55.97 dBm/Hz

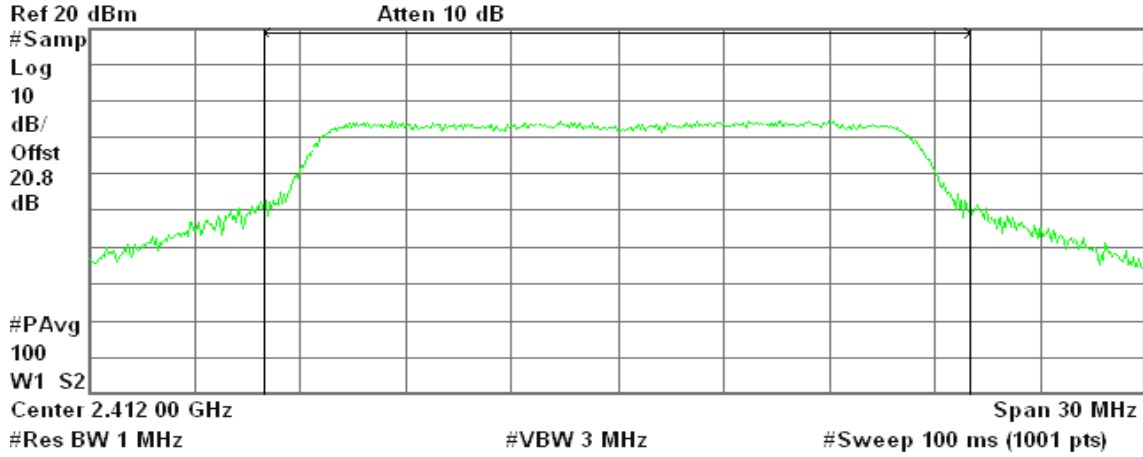


draft 802.11n Standard-20 MHz Channel mode / Chain 0

Average Power (CH Low)

Agilent 14:12:41 Nov 25, 2009

R T



Channel Power

12.31 dBm / 20.0000 MHz

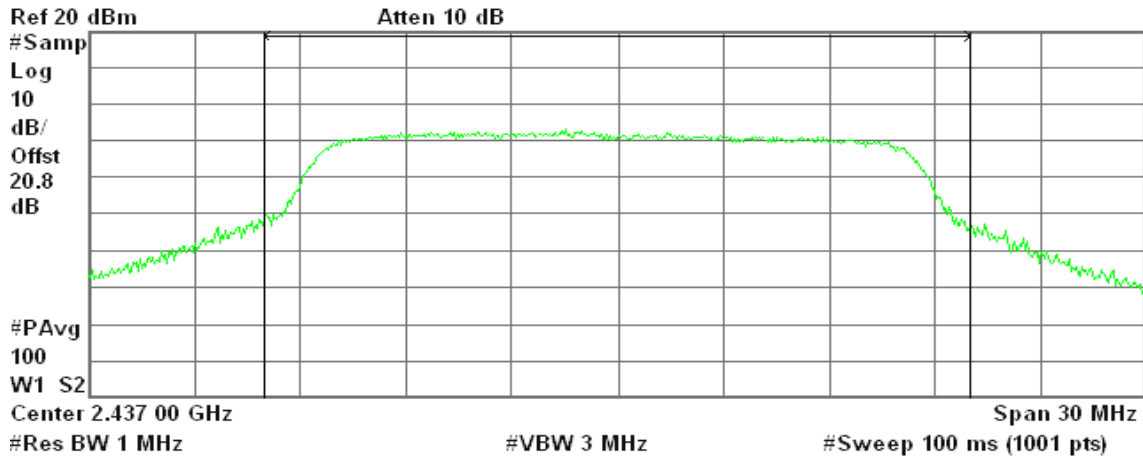
Power Spectral Density

-60.70 dBm/Hz

Average Power (CH Mid)

Agilent 14:12:01 Nov 25, 2009

R T



Channel Power

12.70 dBm / 20.0000 MHz

Power Spectral Density

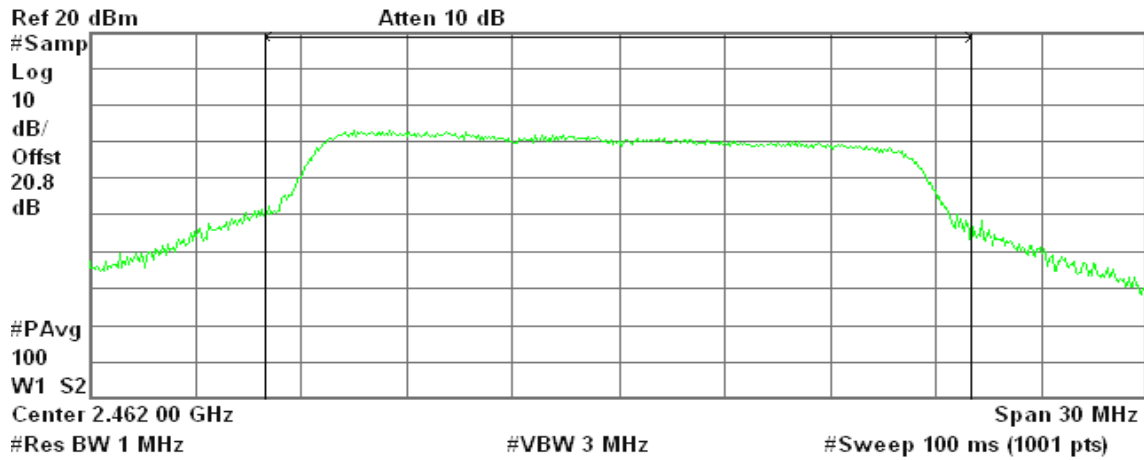
-60.31 dBm/Hz



Average Power (CH High)

Agilent 14:11:26 Nov 25, 2009

R T



Channel Power

12.68 dBm / 20.0000 MHz

Power Spectral Density

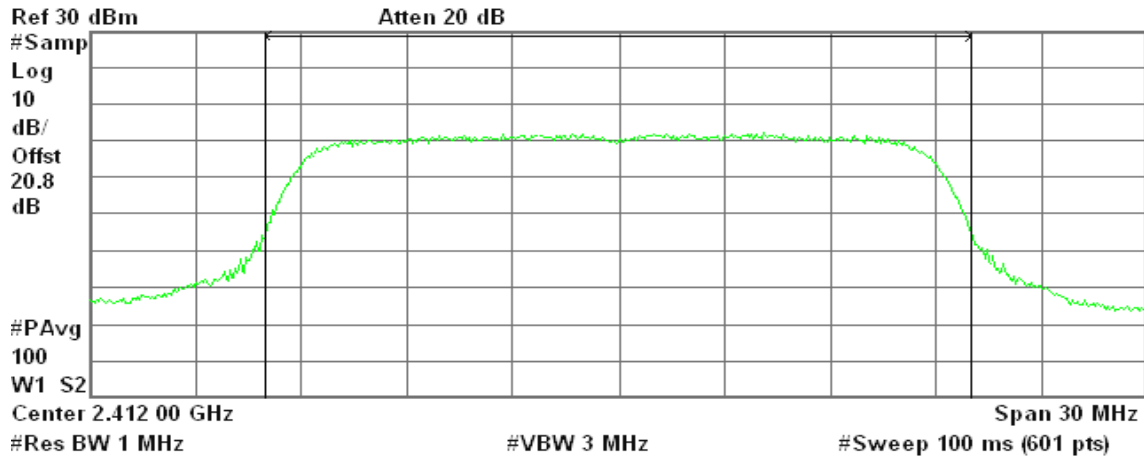
-60.33 dBm/Hz

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

Average Power (CH Low)

Agilent 10:35:28 Nov 26, 2009

R T



Channel Power

13.22 dBm / 20.0000 MHz

Power Spectral Density

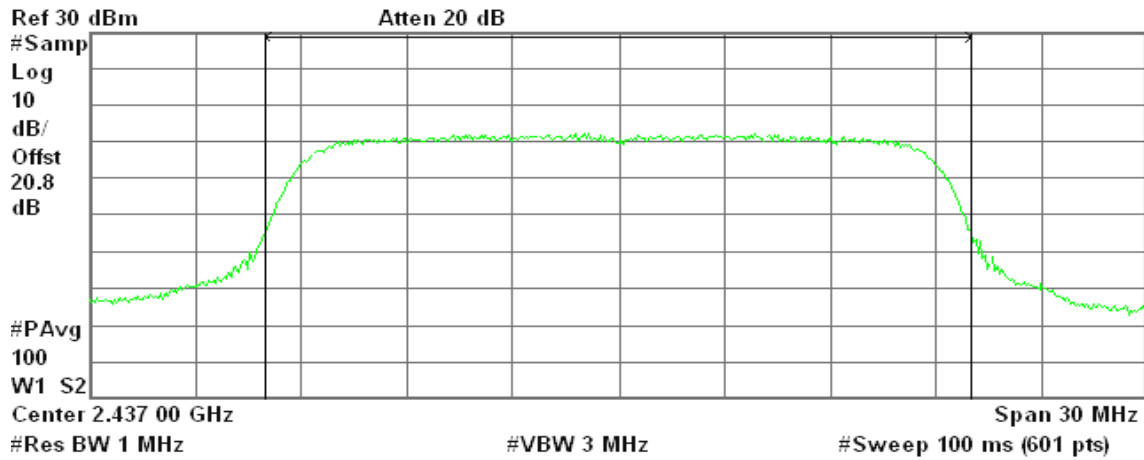
-59.79 dBm/Hz



Average Power (CH Mid)

Agilent 10:58:08 Nov 26, 2009

R T



Channel Power

13.01 dBm / 20.0000 MHz

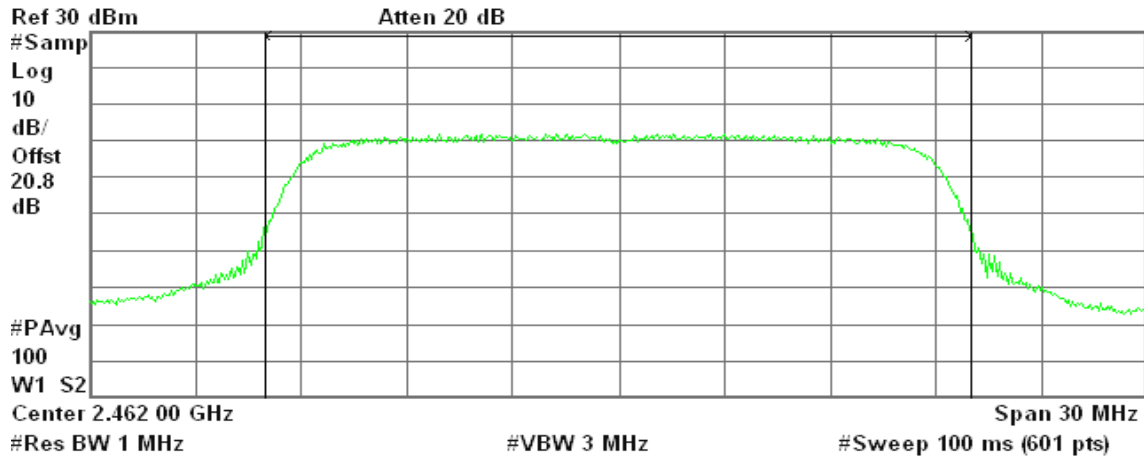
Power Spectral Density

-60.00 dBm/Hz

Average Power (CH High)

Agilent 12:15:54 Nov 26, 2009

R T



Channel Power

12.86 dBm / 20.0000 MHz

Power Spectral Density

-60.15 dBm/Hz

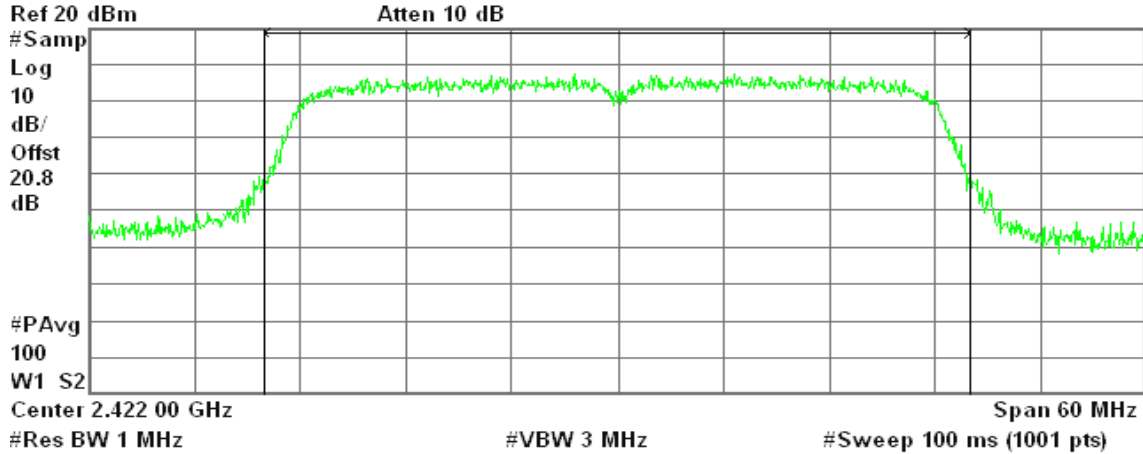


draft 802.11n Wide-40 MHz Channel mode / Chain 0

Average Power (CH Low)

Agilent 15:00:31 Nov 25, 2009

R T



Channel Power

13.84 dBm / 40.0000 MHz

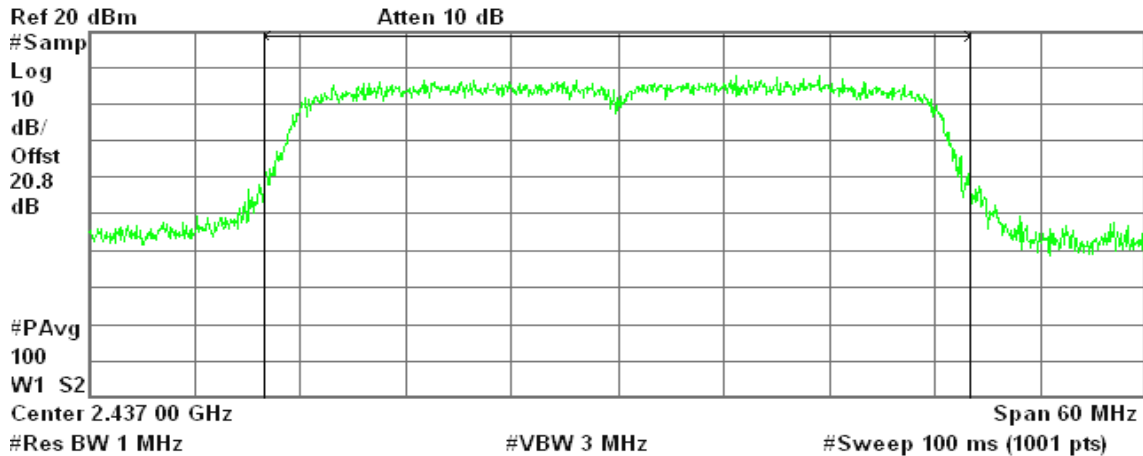
Power Spectral Density

-62.18 dBm/Hz

Average Power (CH Mid)

Agilent 14:57:32 Nov 25, 2009

R T



Channel Power

14.03 dBm / 40.0000 MHz

Power Spectral Density

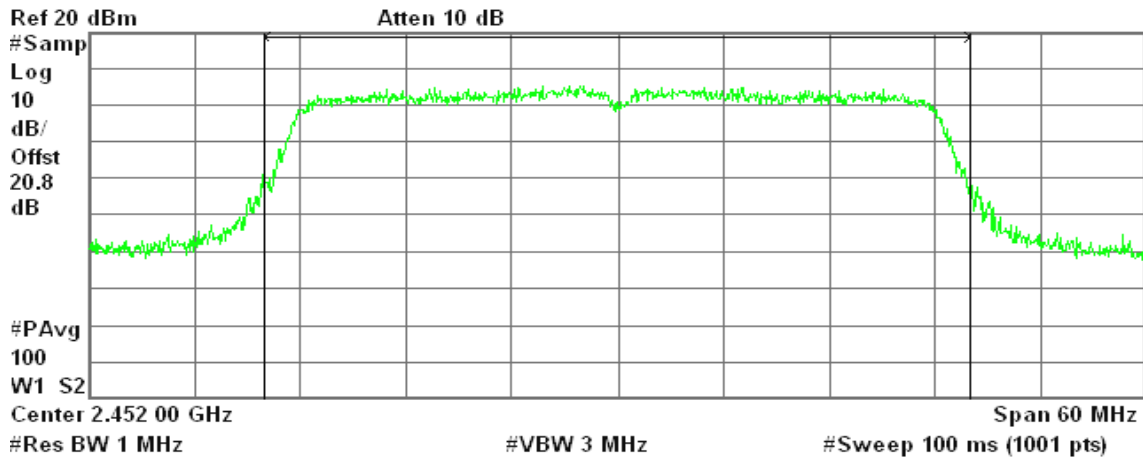
-61.99 dBm/Hz



Average Power (CH High)

Agilent 14:54:33 Nov 25, 2009

R T



Channel Power

12.07 dBm / 40.0000 MHz

Power Spectral Density

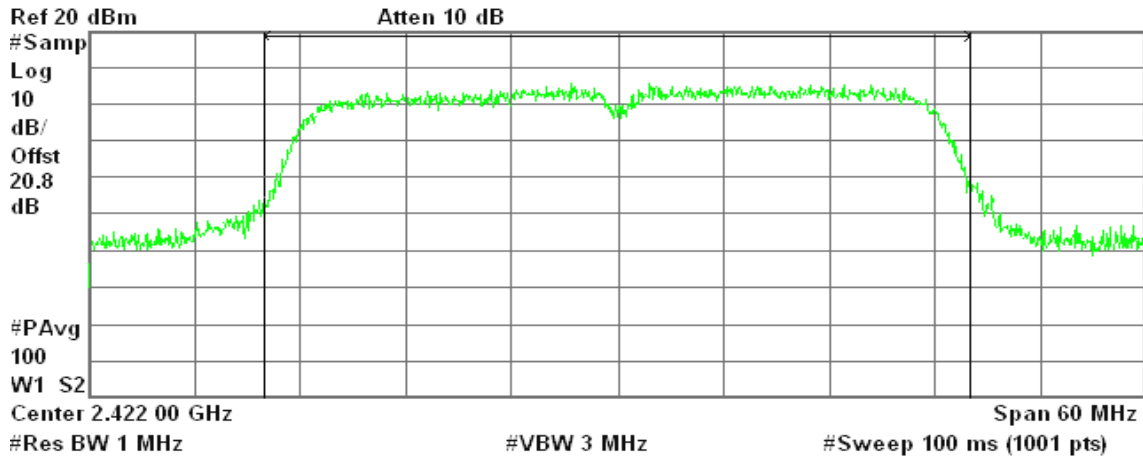
-63.95 dBm/Hz

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

Average Power (CH Low)

Agilent 15:56:27 Nov 25, 2009

R T



Channel Power

13.36 dBm / 40.0000 MHz

Power Spectral Density

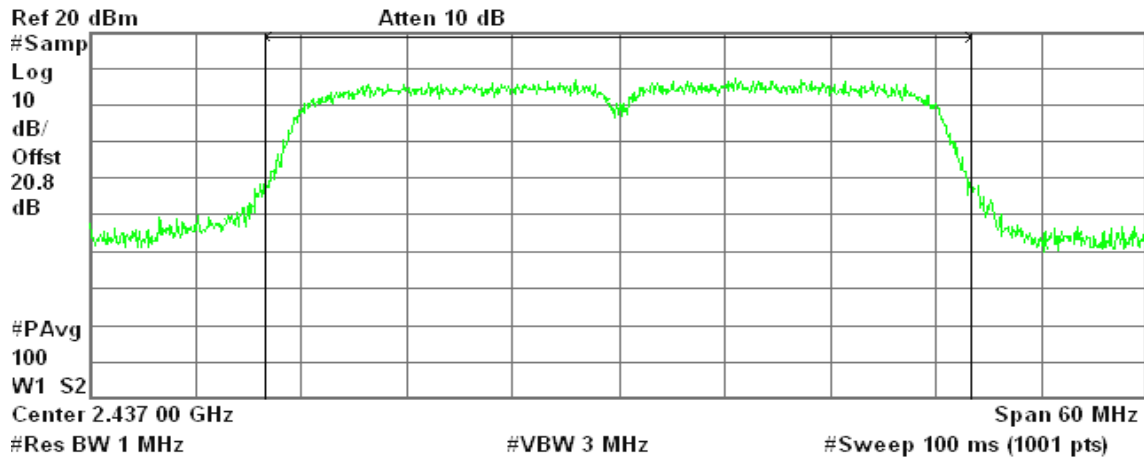
-62.66 dBm/Hz



Average Power (CH Mid)

Agilent 15:54:01 Nov 25, 2009

R T



Channel Power

13.75 dBm / 40.0000 MHz

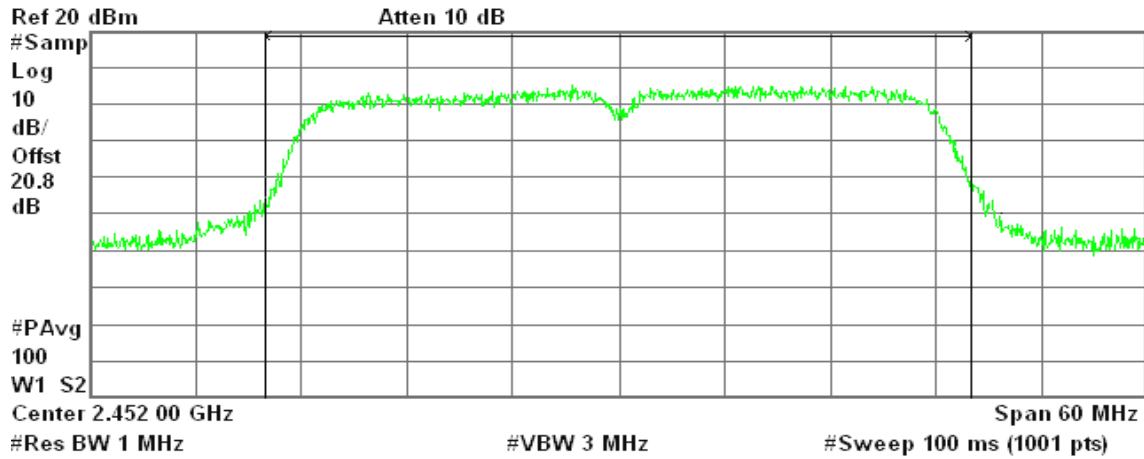
Power Spectral Density

-62.27 dBm/Hz

Average Power (CH High)

Agilent 15:52:59 Nov 25, 2009

R T



Channel Power

13.54 dBm / 40.0000 MHz

Power Spectral Density

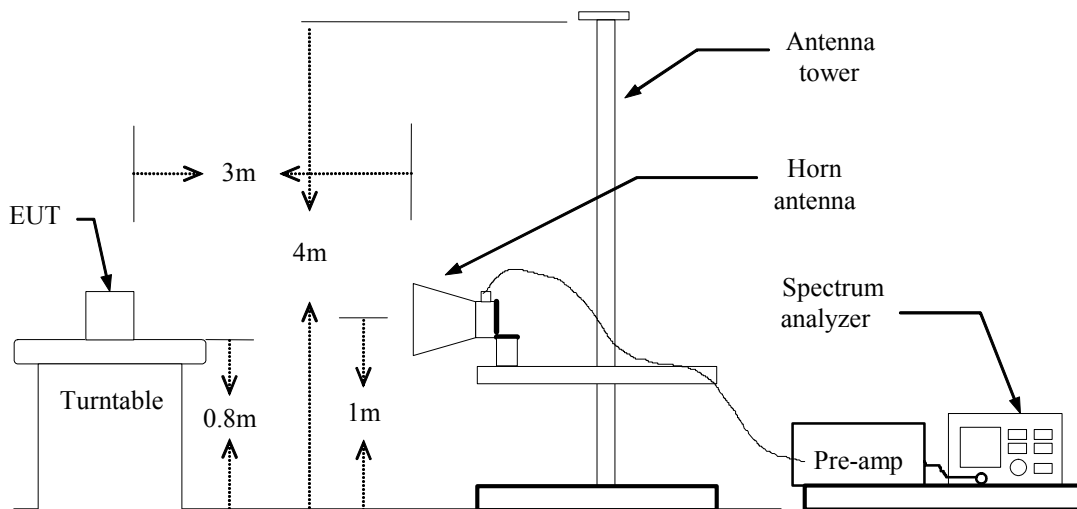
-62.48 dBm/Hz

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.

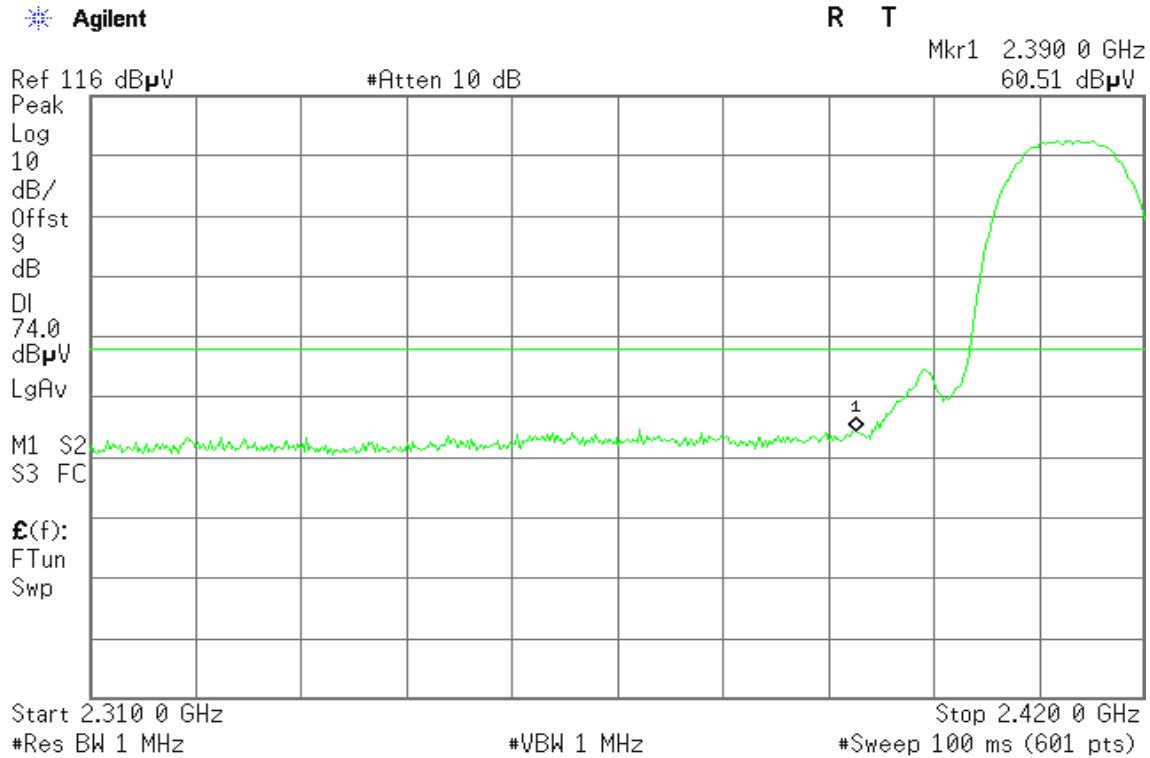


For TEW-635BRM (Twin Dipole Antenna)

Band Edges (IEEE 802.11b mode / CH Low)

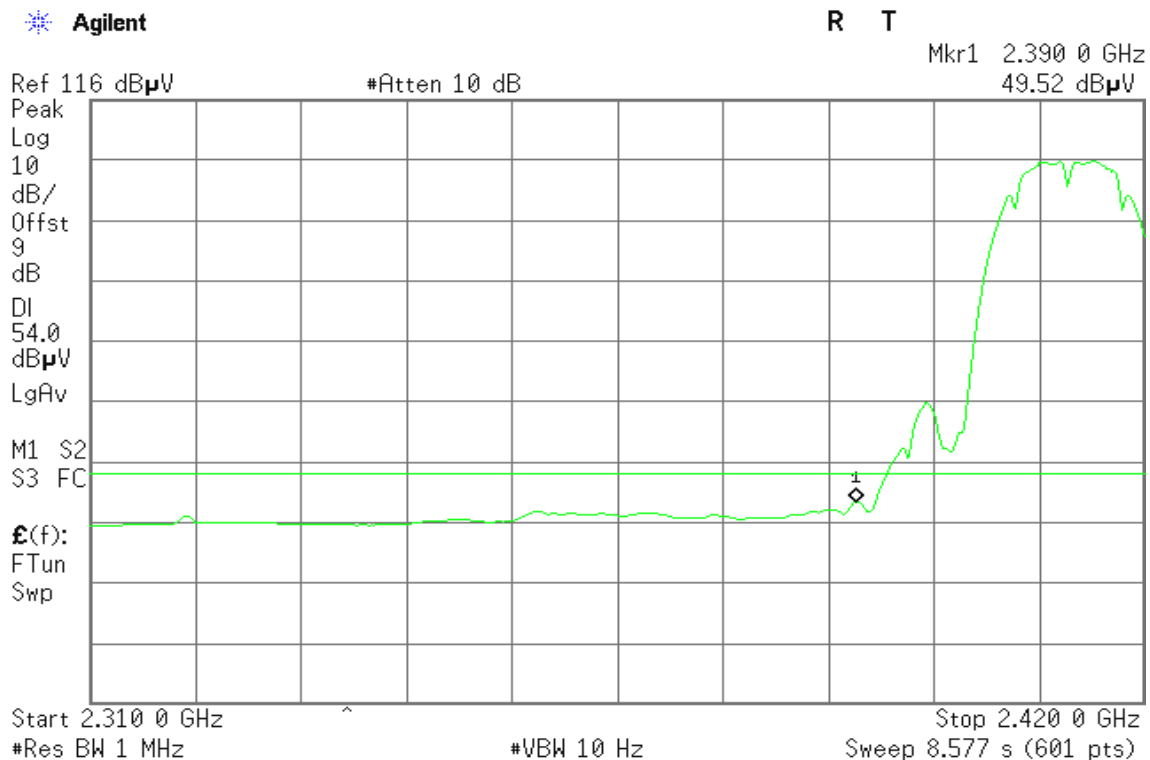
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





Detector mode: Peak

Polarity: Horizontal

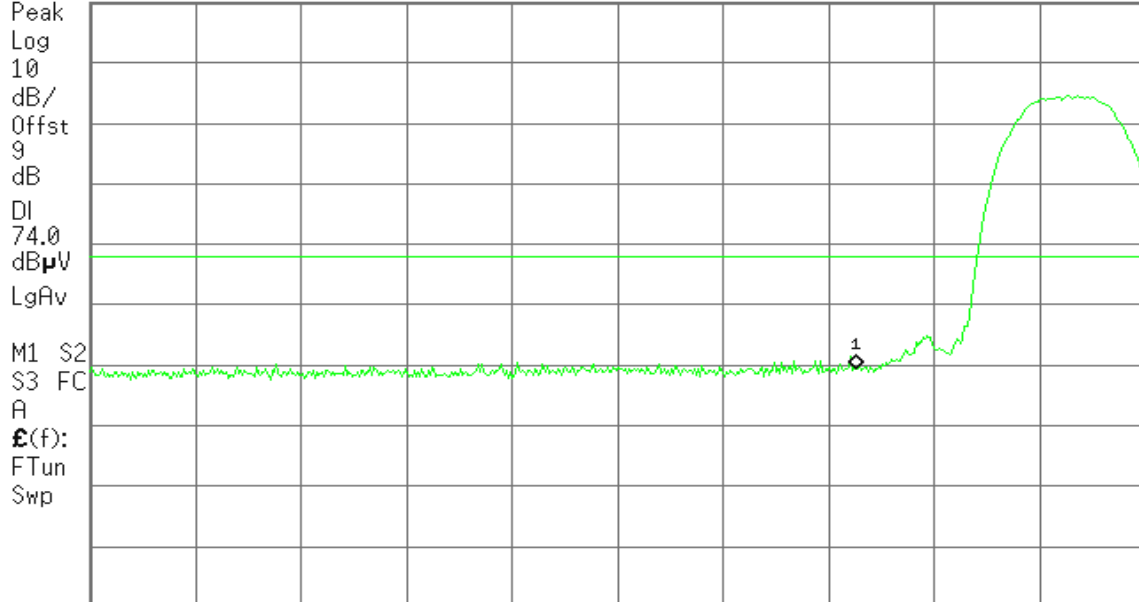
Agilent

R T

Mkr1 2.390 0 GHz
55.30 dB μ V

Ref 116 dB μ V

#Atten 10 dB



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

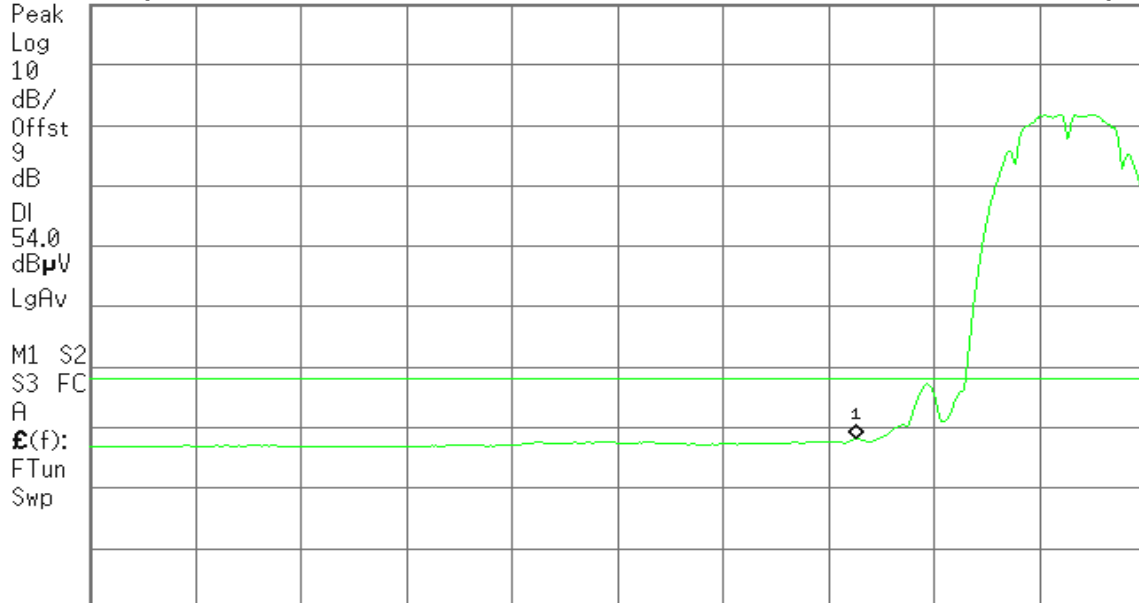
Agilent

R T

Mkr1 2.390 0 GHz
44.19 dB μ V

Ref 116 dB μ V

#Atten 10 dB



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

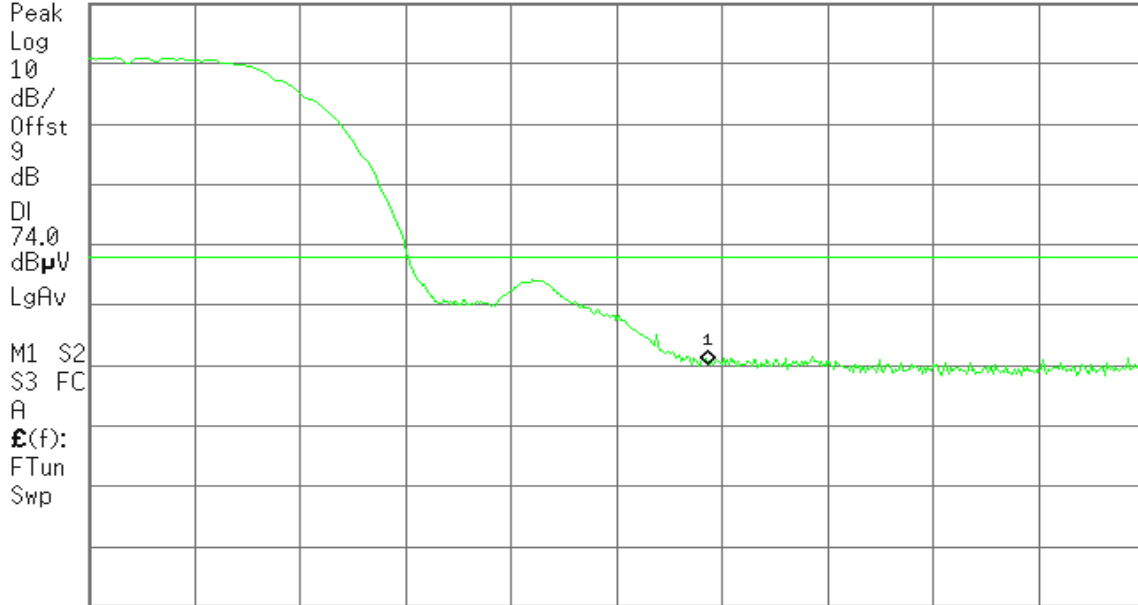
Agilent

R T

Mkr1 2.483 50 GHz
56.12 dB μ V

Ref 116 dB μ V

#Atten 10 dB



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

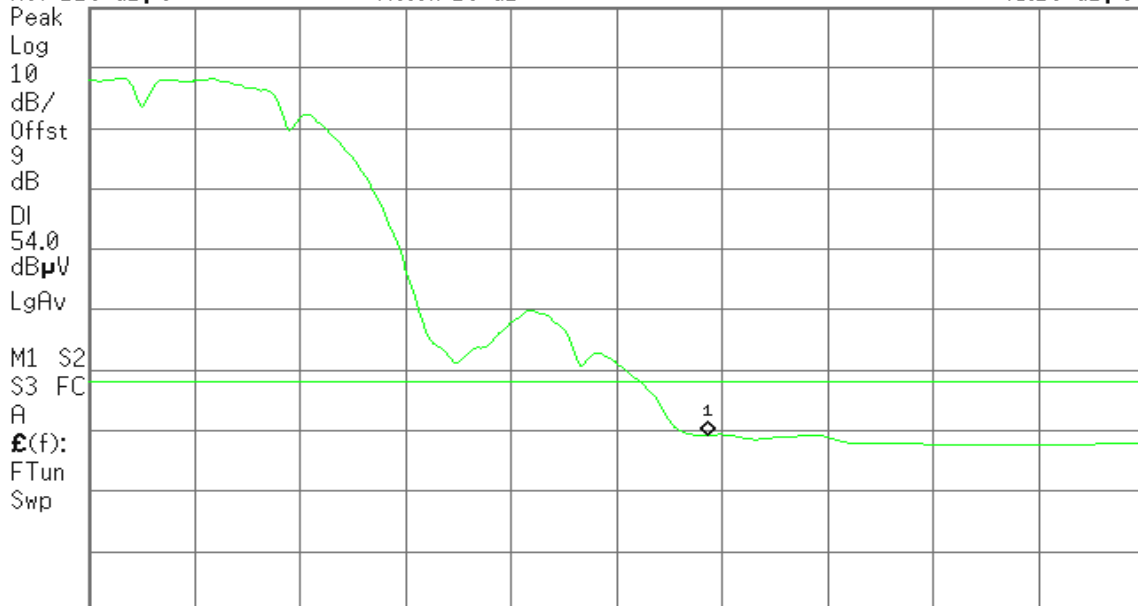
Agilent

R T

Mkr1 2.483 50 GHz
45.18 dB μ V

Ref 116 dB μ V

#Atten 10 dB



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

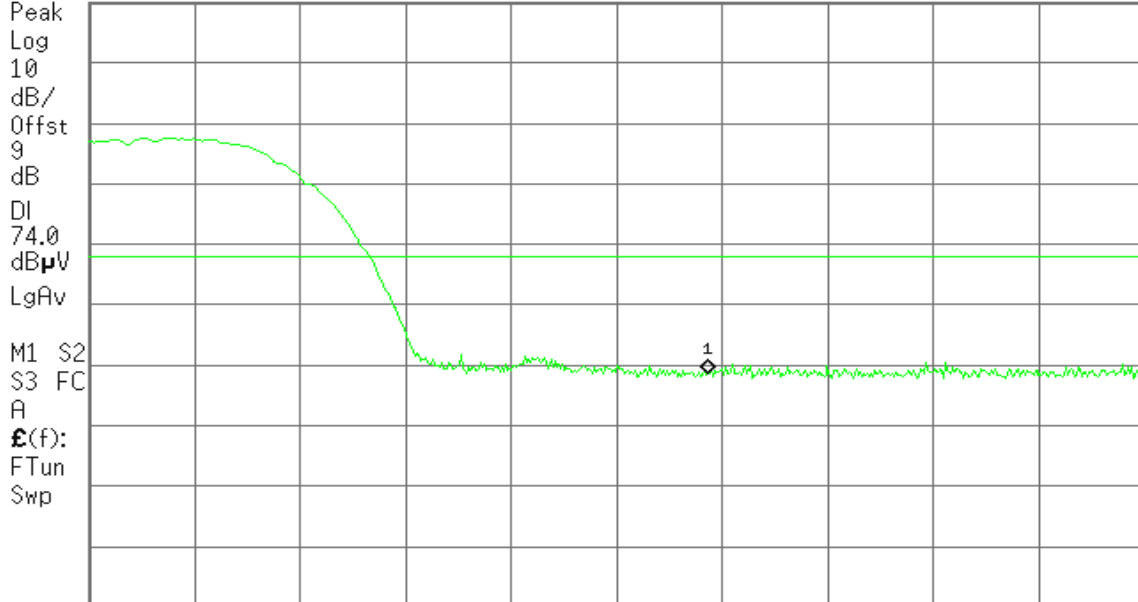
Agilent

R T

Mkr1 2.483 50 GHz
54.68 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

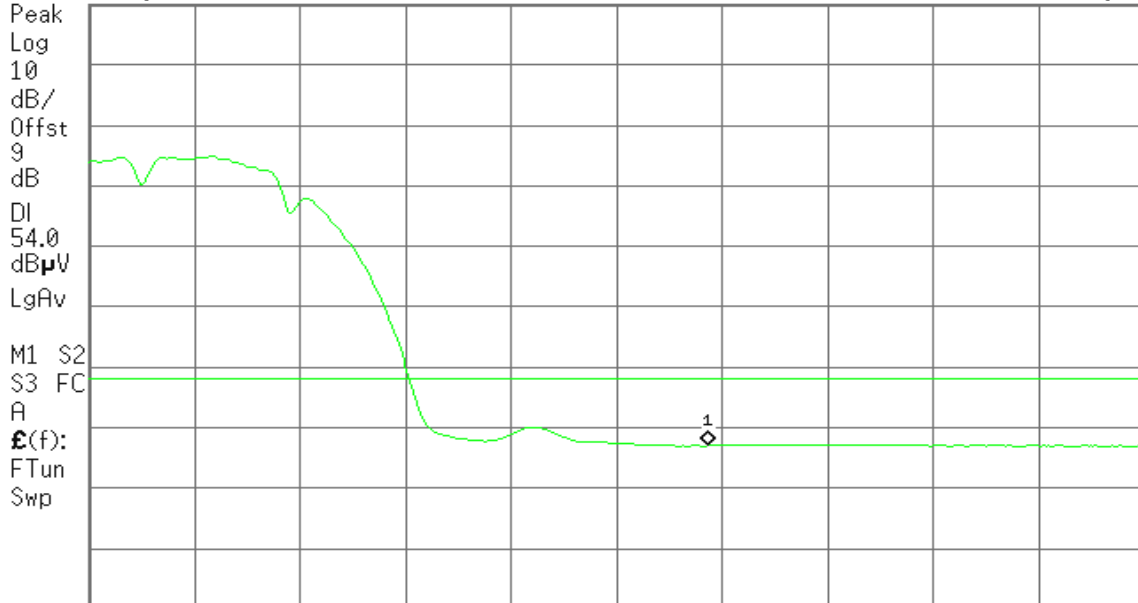
Agilent

R T

Mkr1 2.483 50 GHz
43.02 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

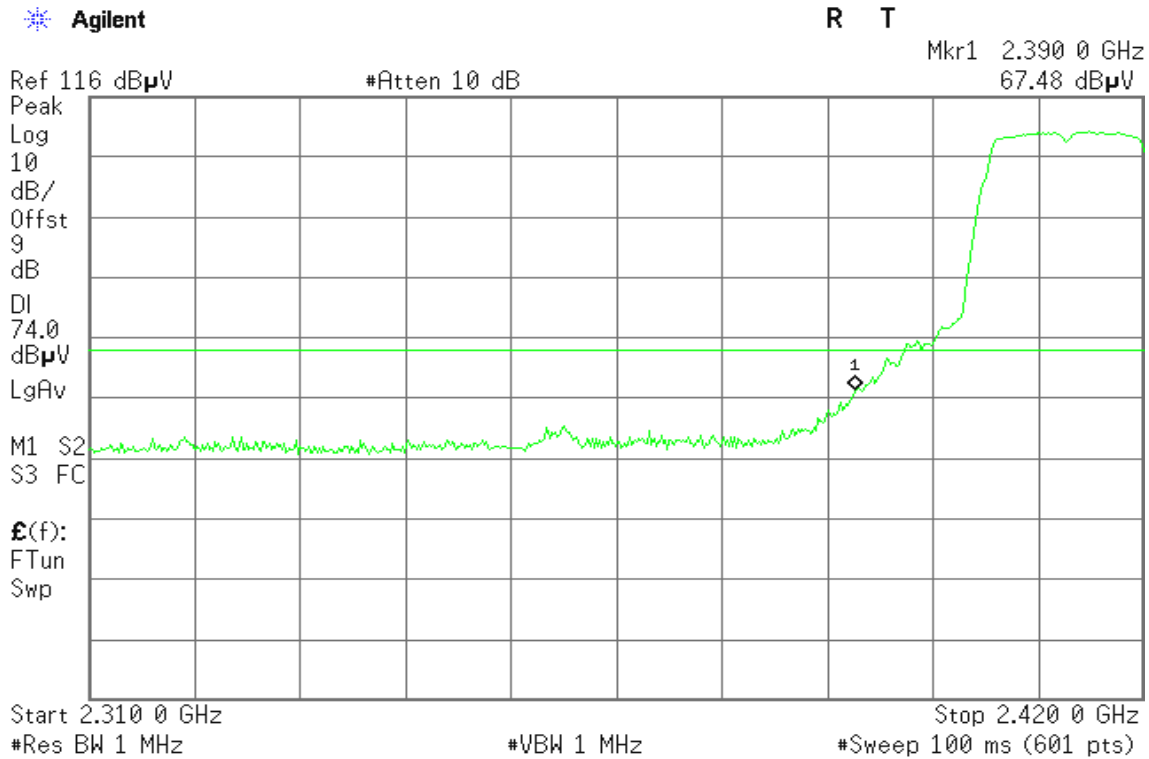
Sweep 3.119 s (601 pts)



Band Edges (IEEE 802.11g mode / CH Low)

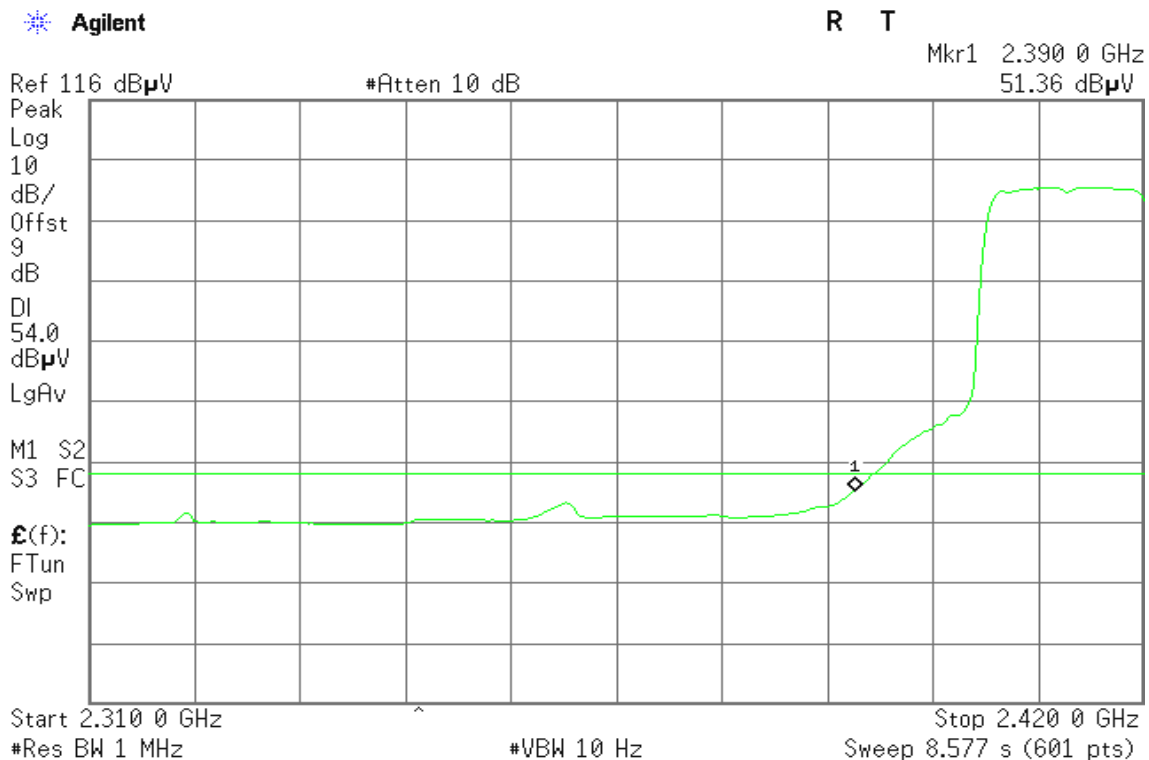
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

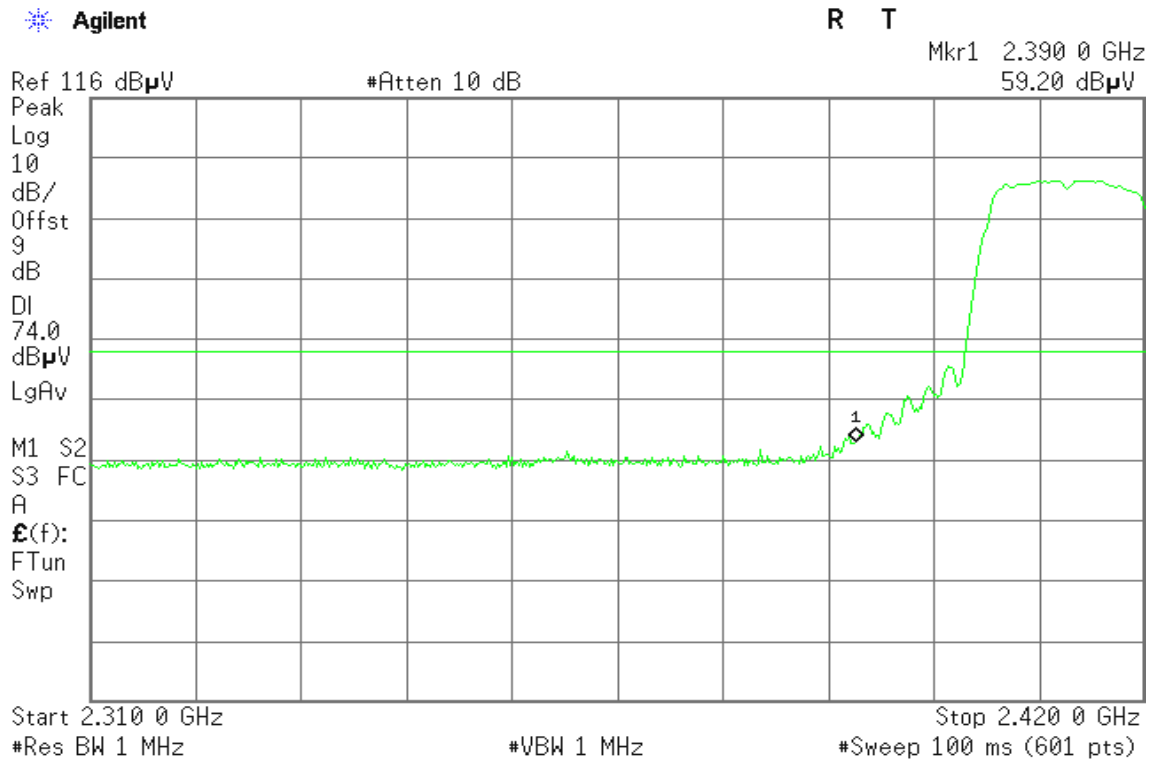
Polarity: Vertical





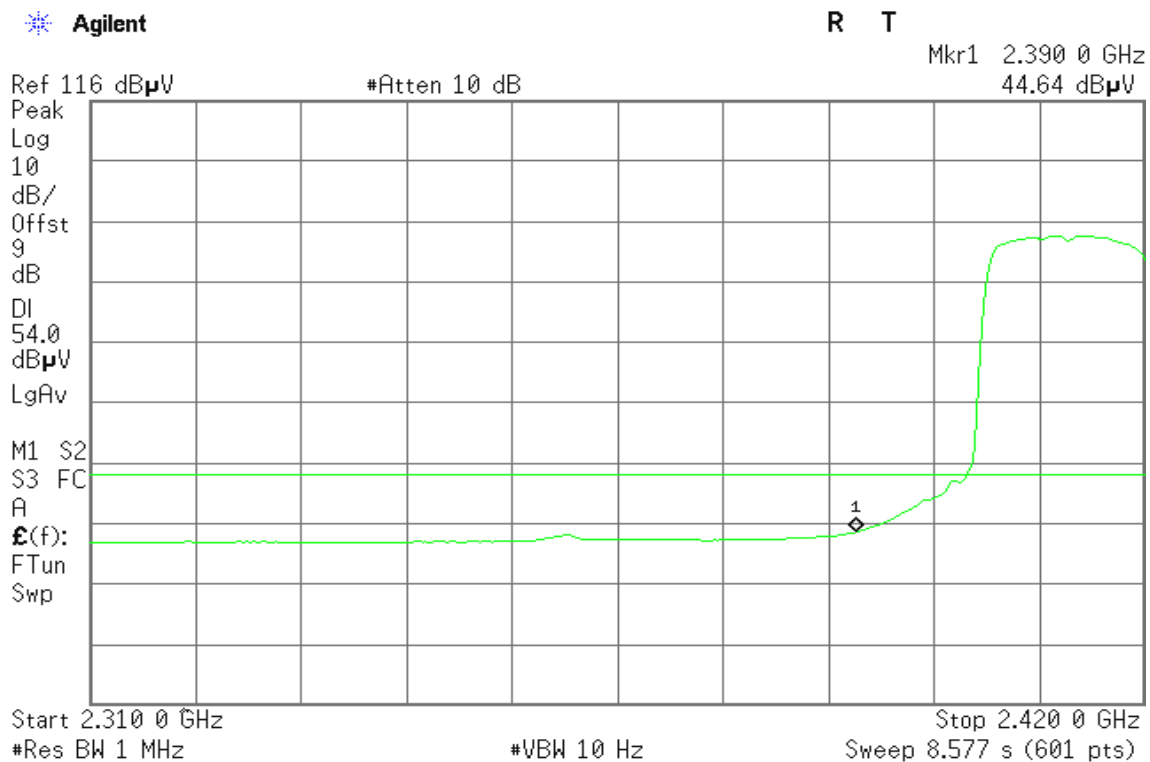
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

Polarity: Horizontal





Band Edges (IEEE 802.11g mode / CH High)

Detector mode: Peak

Polarity: Vertical

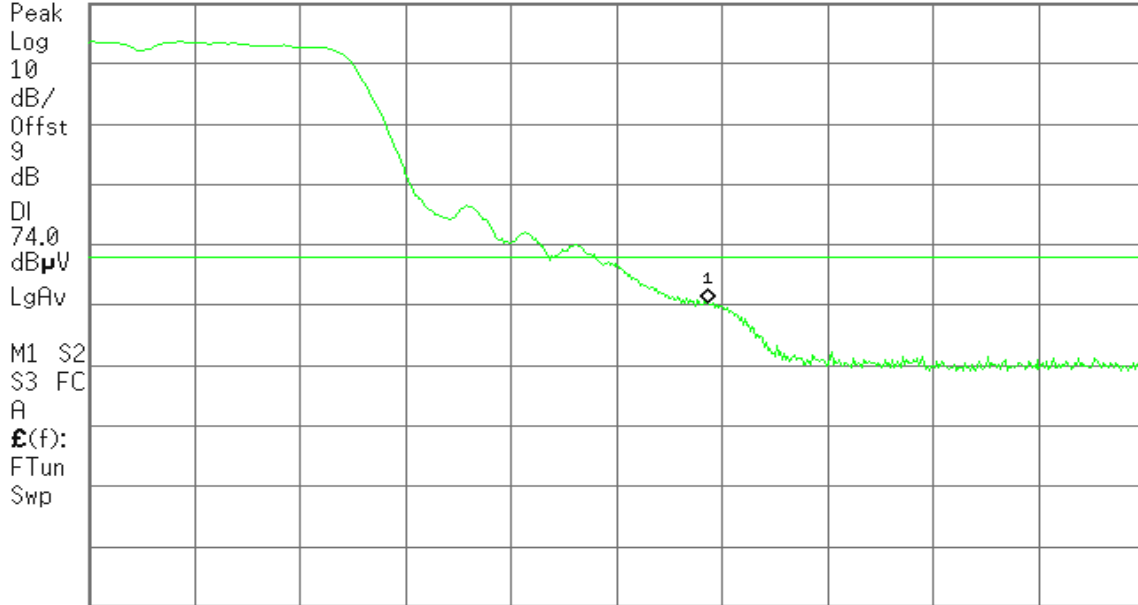
Agilent

R T

Mkr1 2.483 50 GHz
66.42 dB μ V

Ref 116 dB μ V

#Atten 10 dB



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

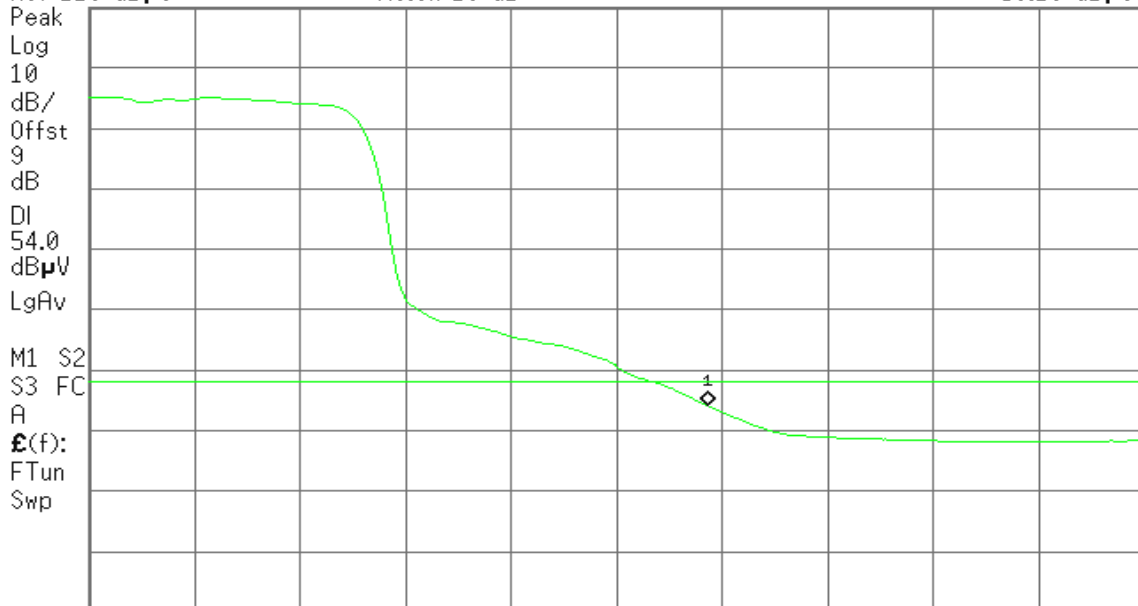
Agilent

R T

Mkr1 2.483 50 GHz
50.10 dB μ V

Ref 116 dB μ V

#Atten 10 dB



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

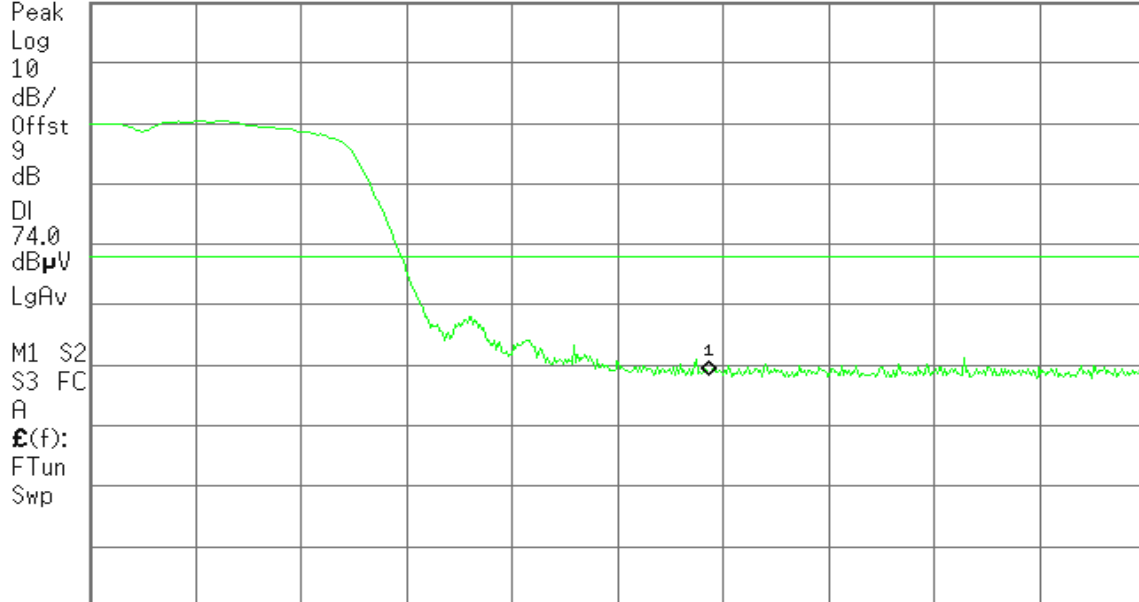
Agilent

R T

Mkr1 2.483 50 GHz
54.41 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

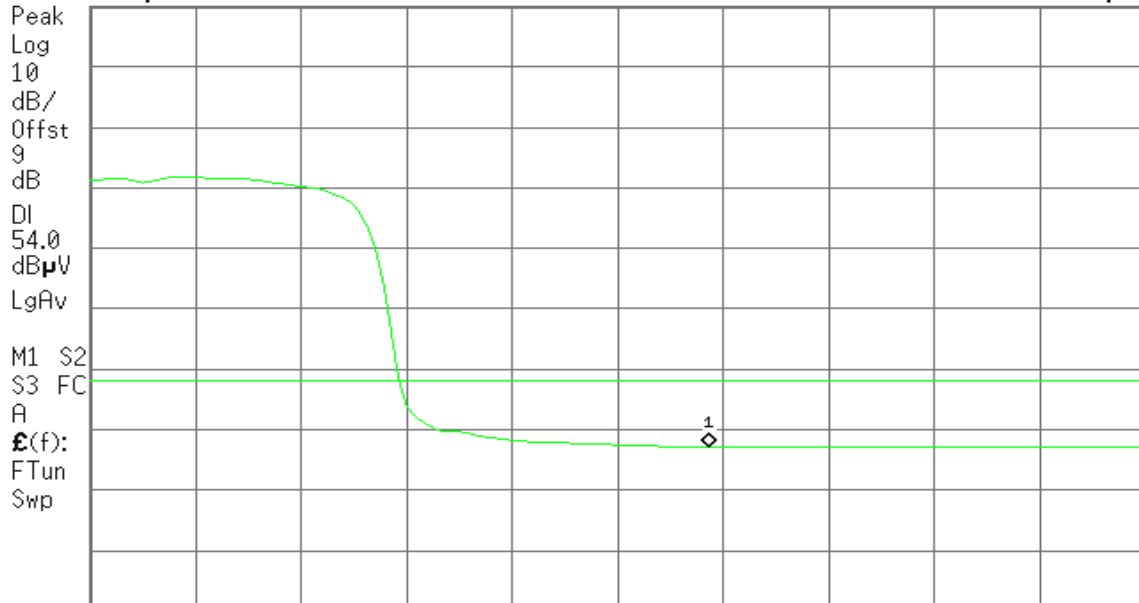
Agilent

R T

Mkr1 2.483 50 GHz
43.23 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

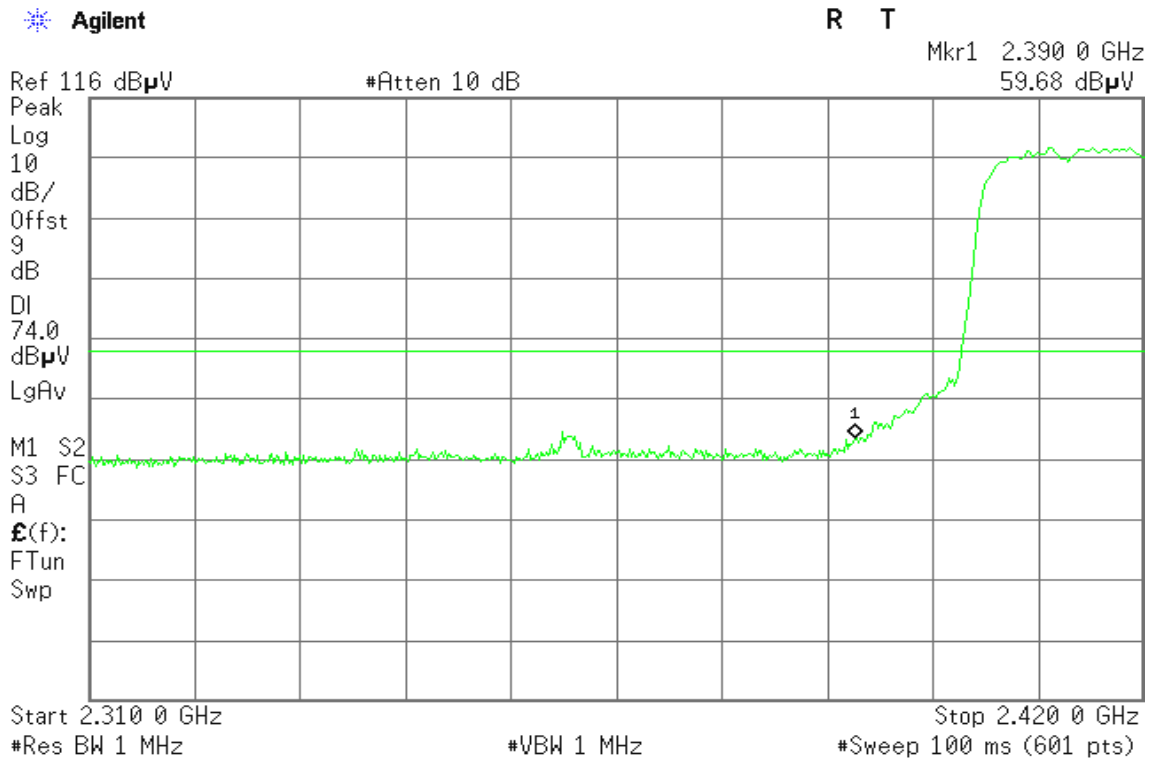
Sweep 3.119 s (601 pts)



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

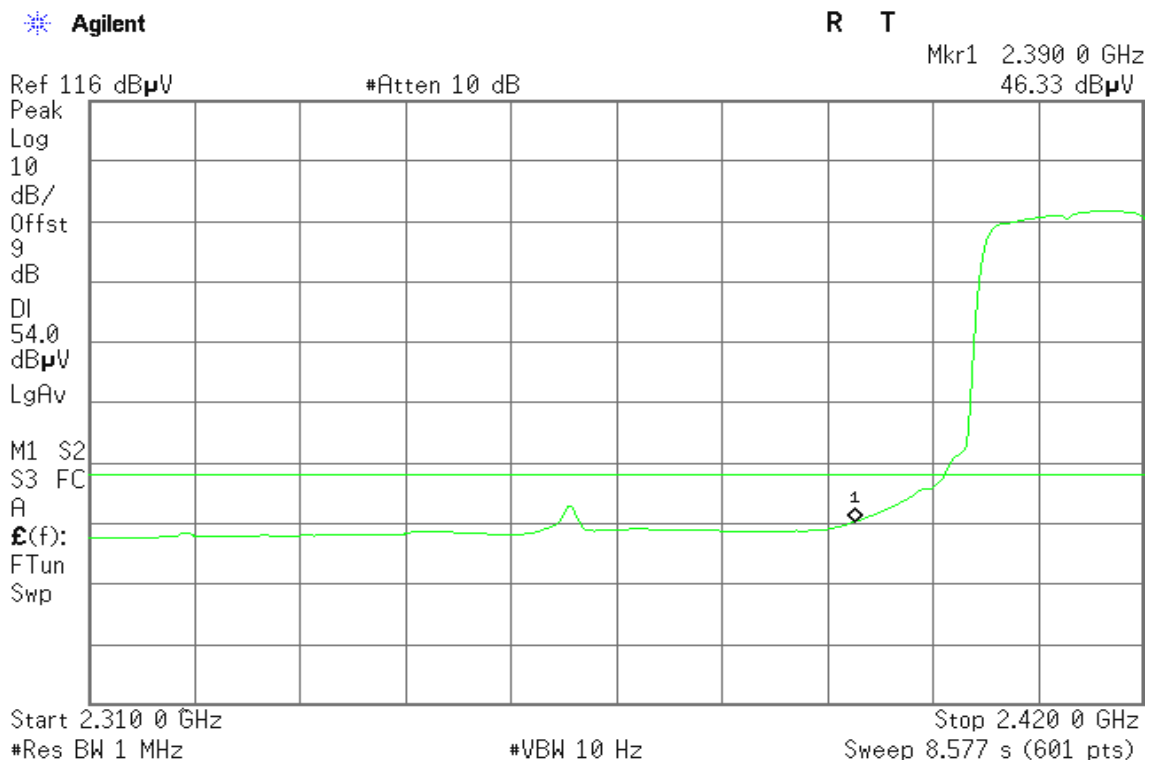
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





Detector mode: Peak

Polarity: Horizontal

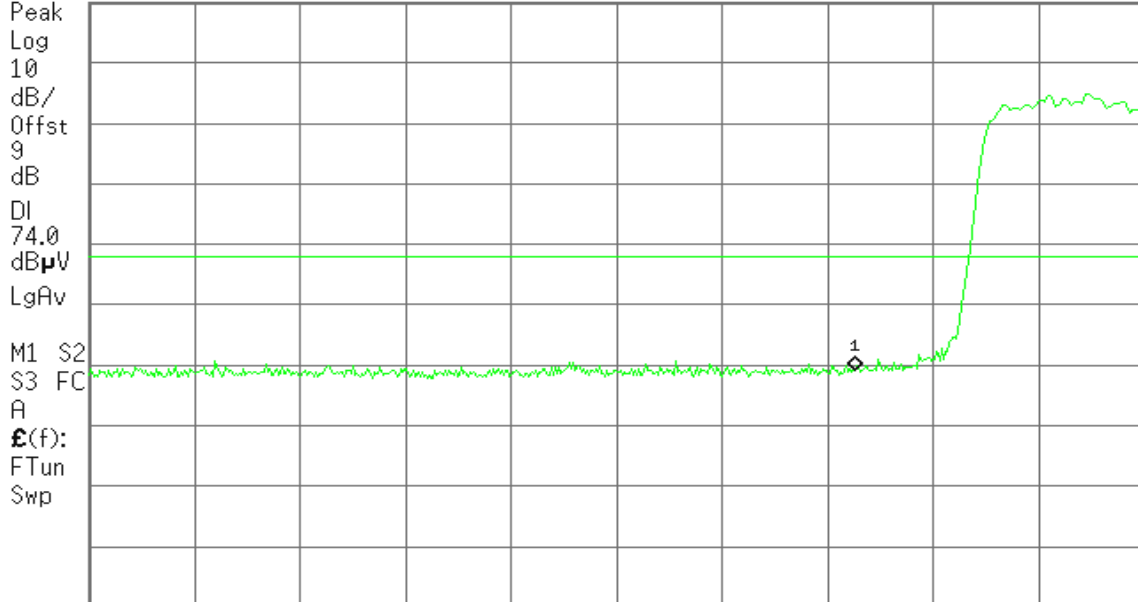
Agilent

R T

Mkr1 2.390 0 GHz
55.17 dBµV

Ref 116 dBµV

#Atten 10 dB



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

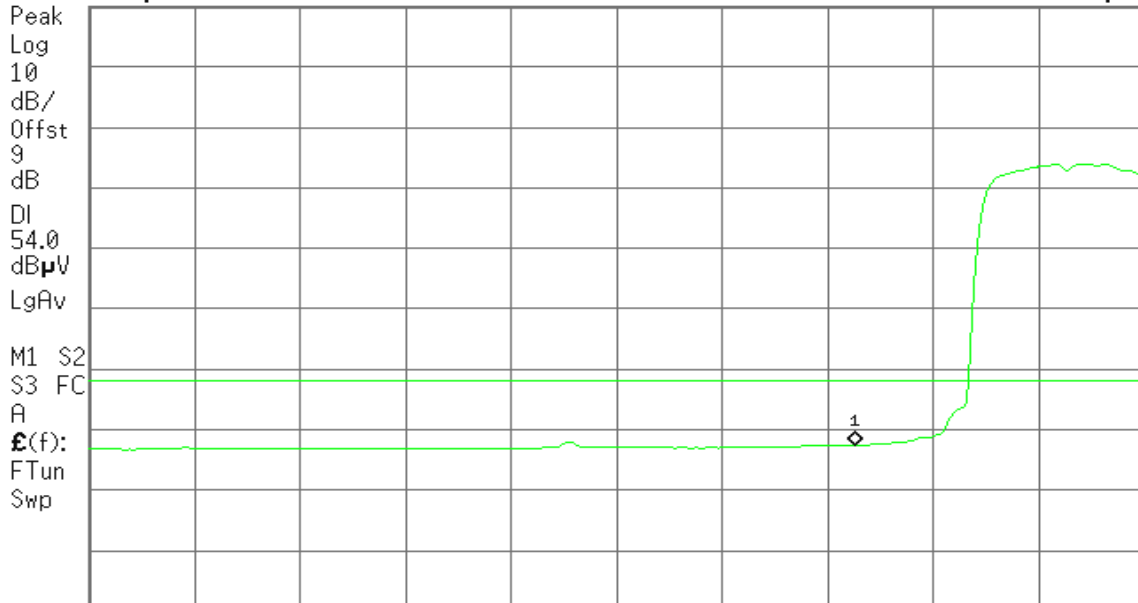
Agilent

R T

Mkr1 2.390 0 GHz
43.43 dBµV

Ref 116 dBµV

#Atten 10 dB



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)

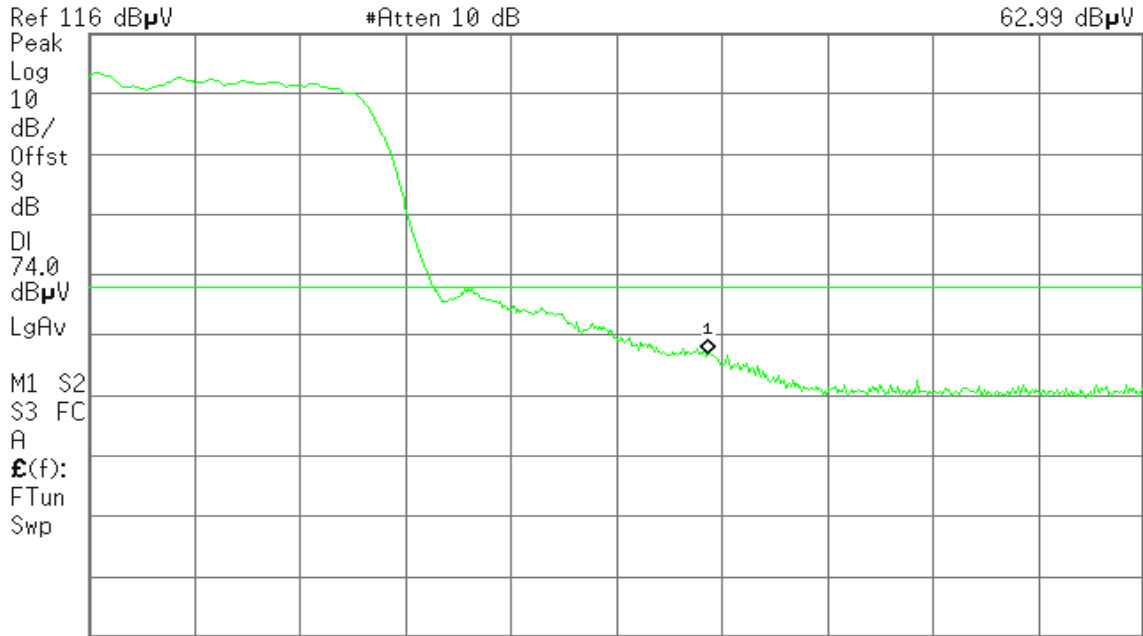
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz
62.99 dB μ V



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

Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz
47.76 dB μ V



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



Detector mode: Peak

Polarity: Horizontal

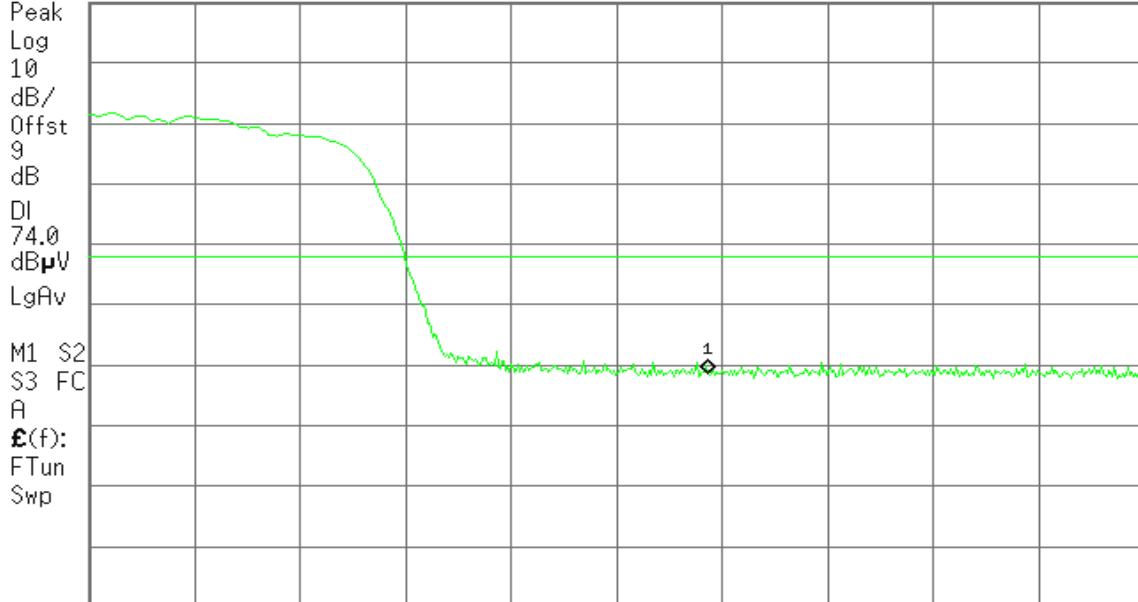
Agilent

R T

Mkr1 2.483 50 GHz
54.59 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

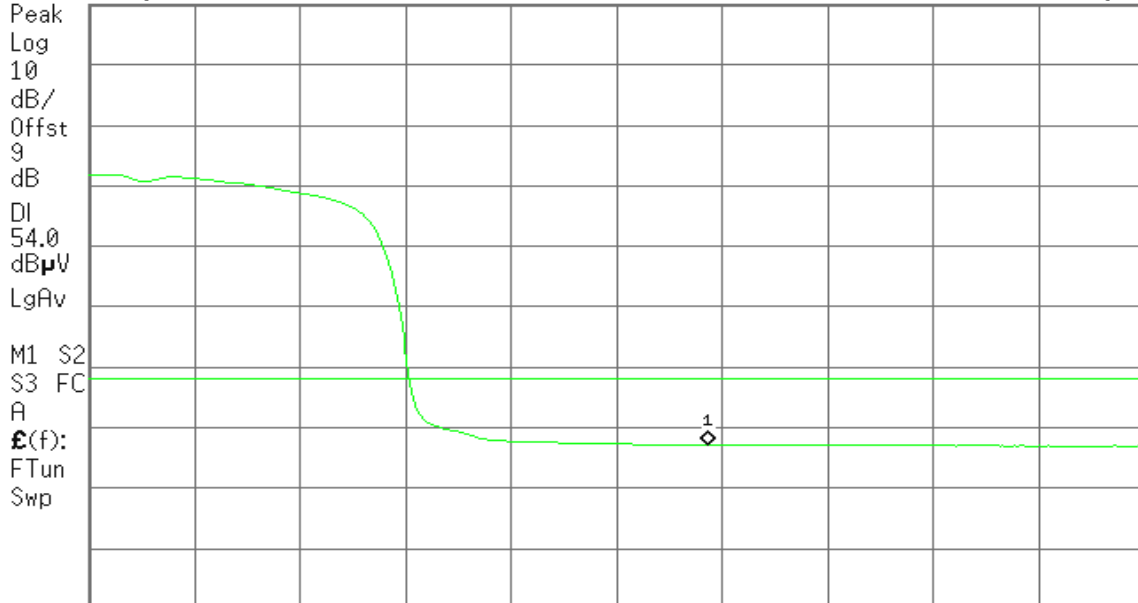
Agilent

R T

Mkr1 2.483 50 GHz
43.11 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

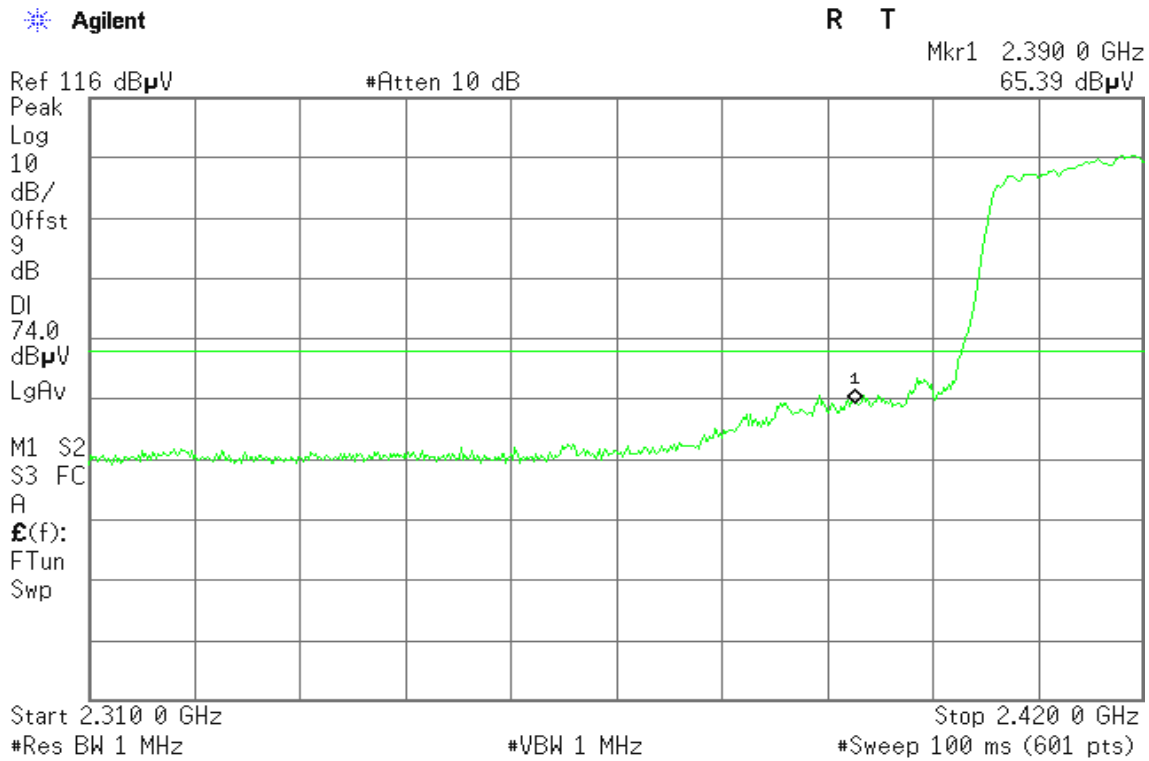
Sweep 3.119 s (601 pts)



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

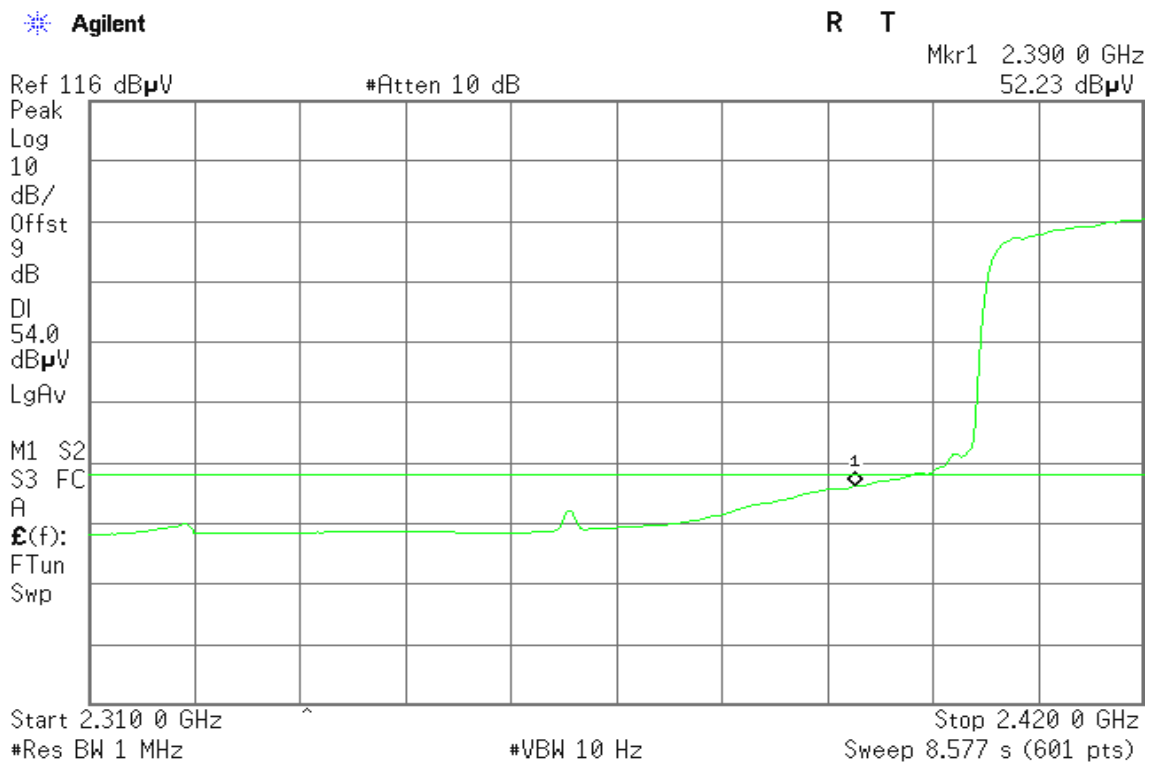
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





Detector mode: Peak

Polarity: Horizontal

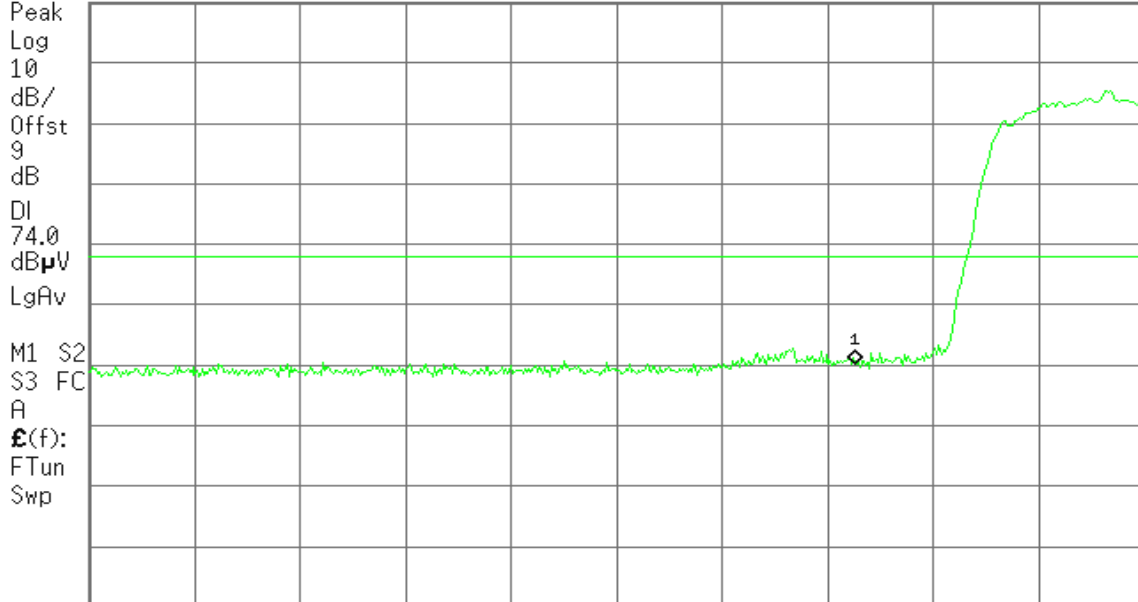
Agilent

R T

Mkr1 2.390 0 GHz
56.26 dBμV

Ref 116 dBμV

#Atten 10 dB



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

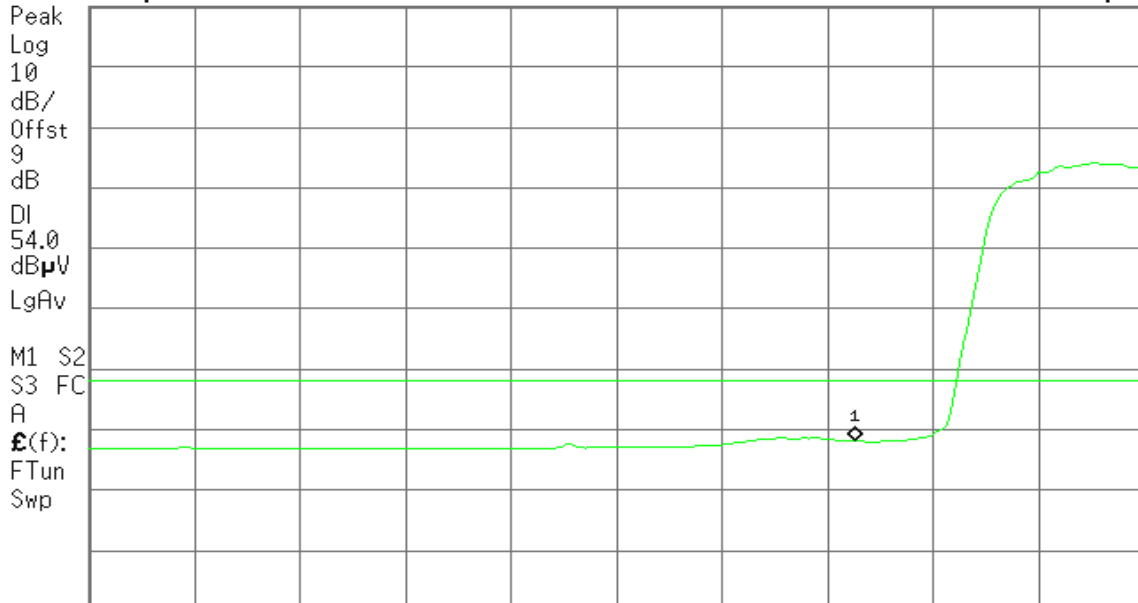
Agilent

R T

Mkr1 2.390 0 GHz
44.07 dBμV

Ref 116 dBμV

#Atten 10 dB



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 Wide-40 MHz Channel mode / CH High)

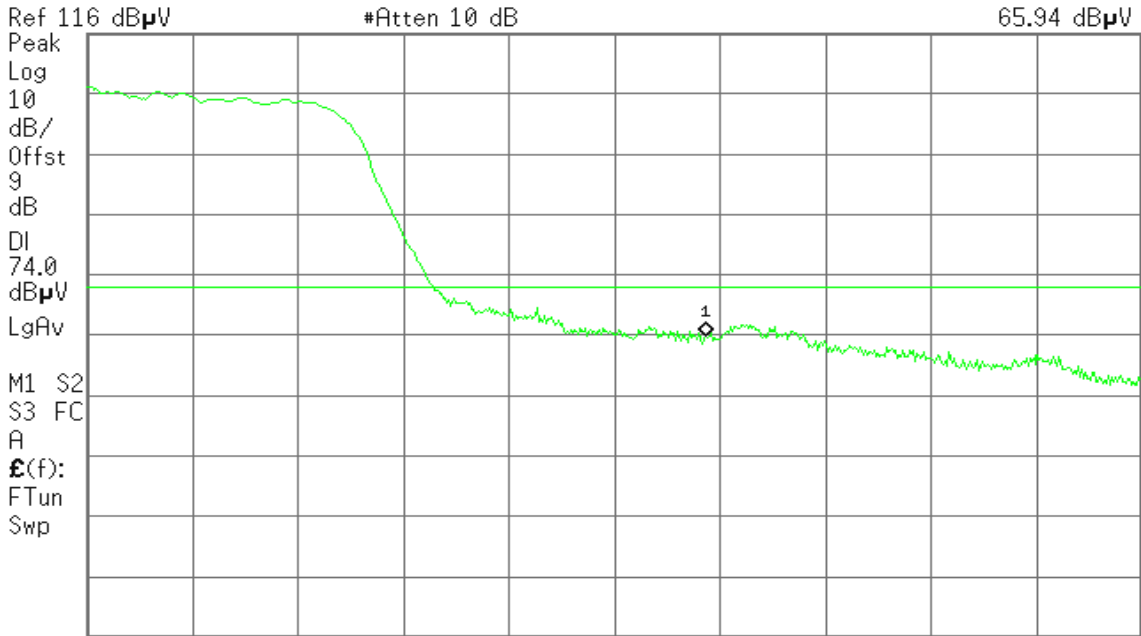
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz
65.94 dB μ V



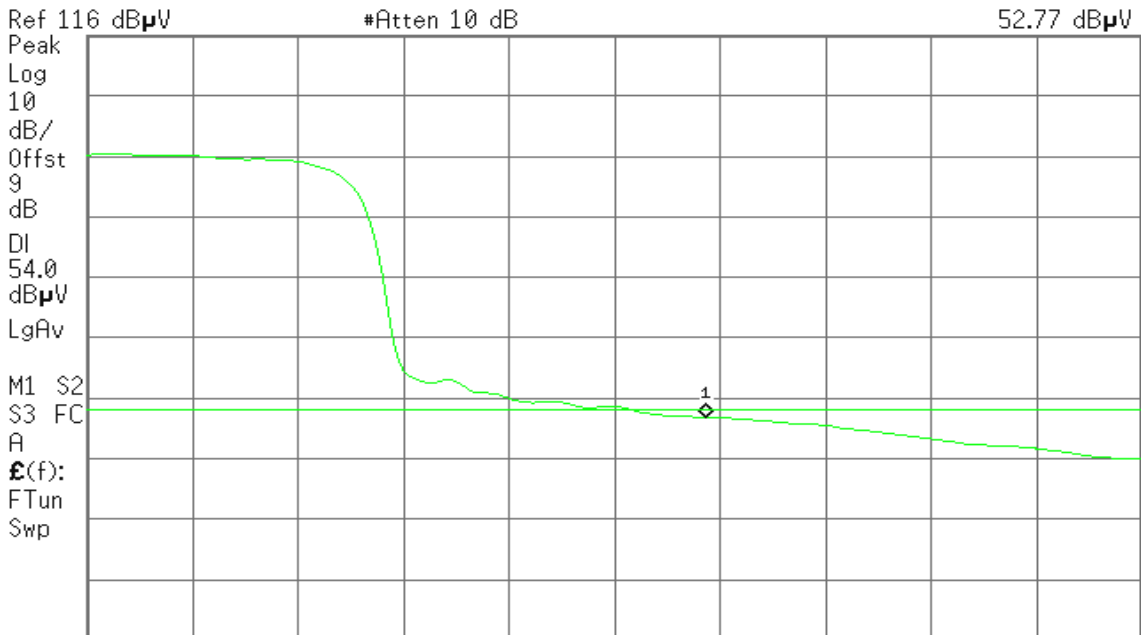
Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz
52.77 dB μ V





Detector mode: Peak

Polarity: Horizontal

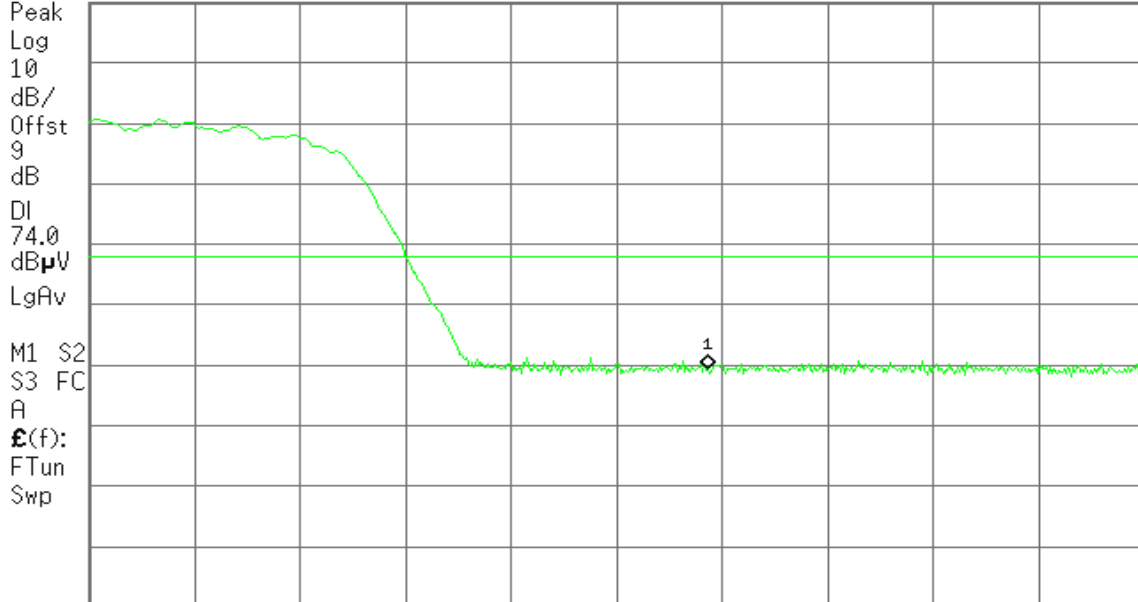
Agilent

R T

Mkr1 2.483 50 GHz
55.30 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

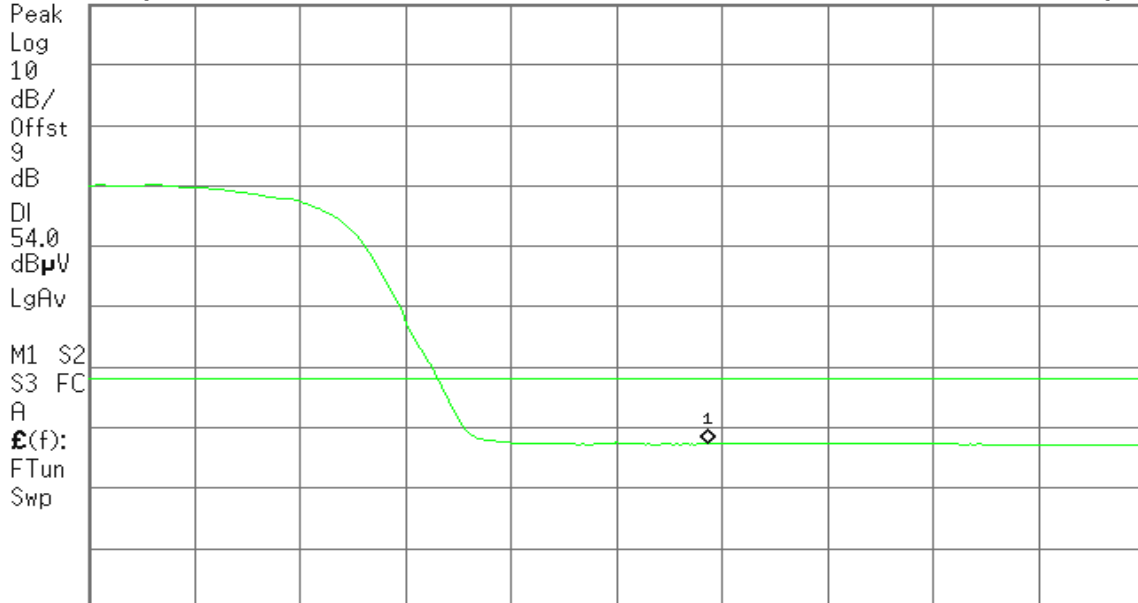
Agilent

R T

Mkr1 2.483 50 GHz
43.29 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 3.119 s (601 pts)

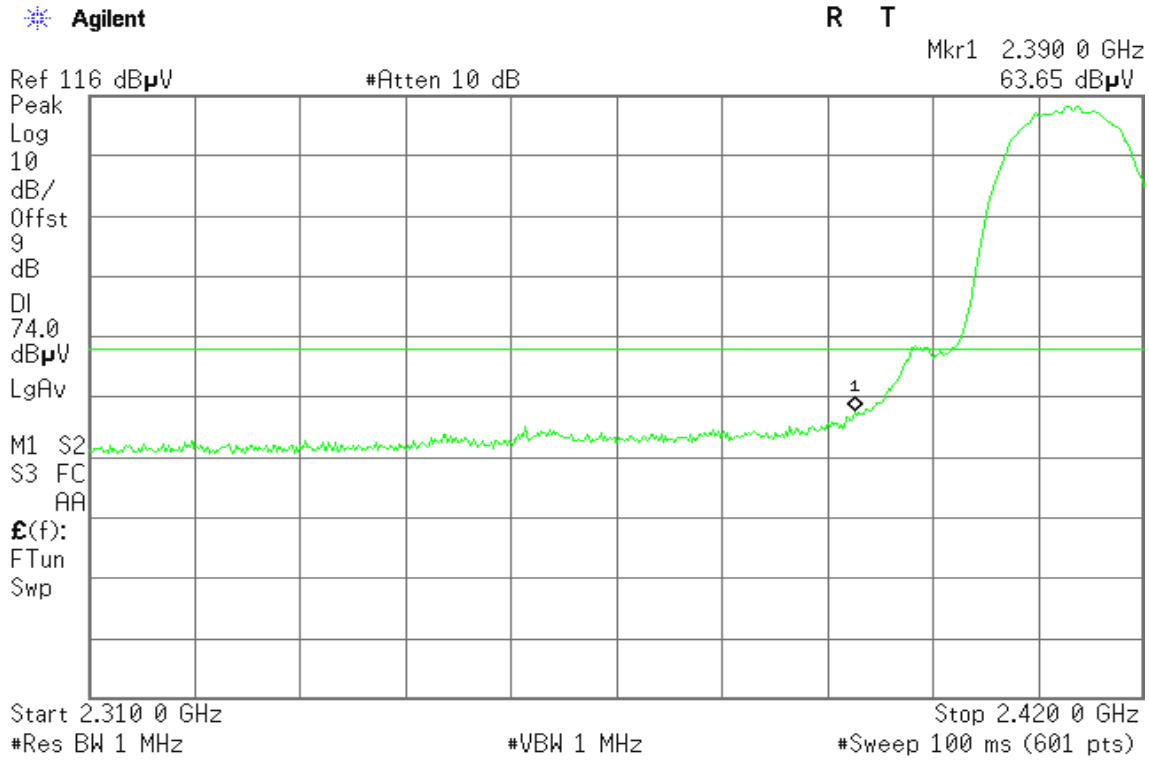


For TEW-657BRM(Single Dipole Antenna)

Band Edges (IEEE 802.11b mode / CH Low)

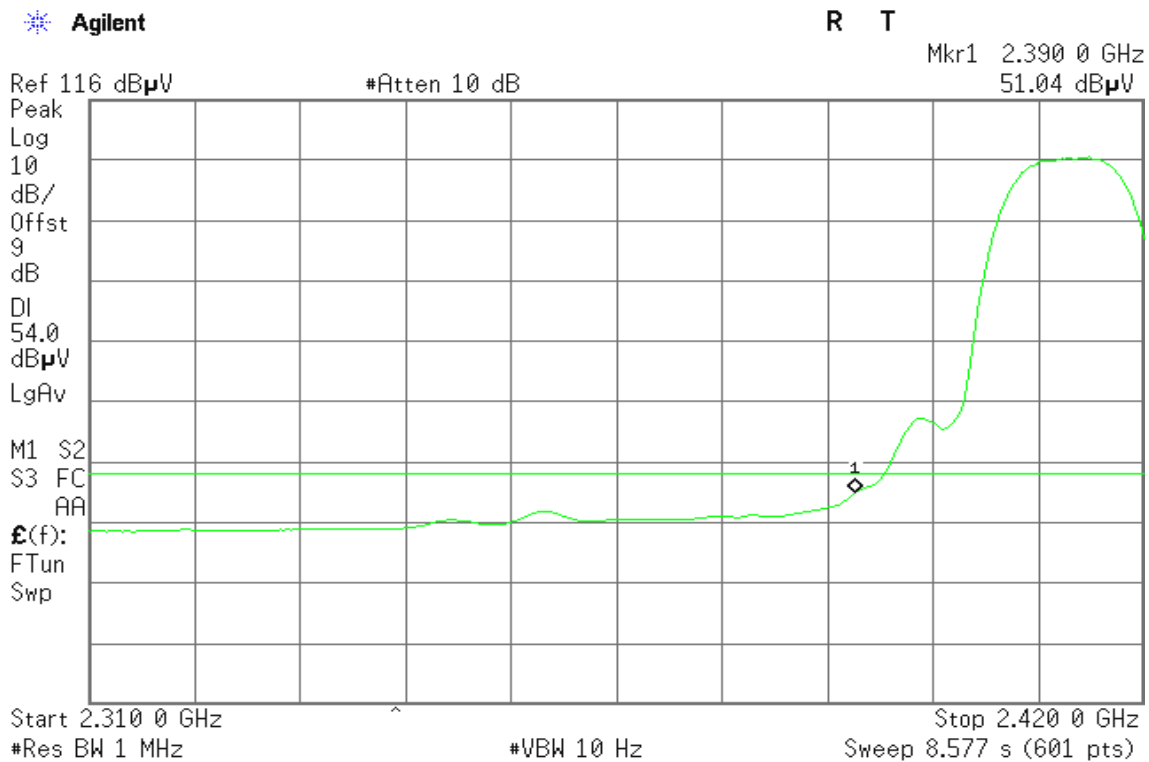
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical



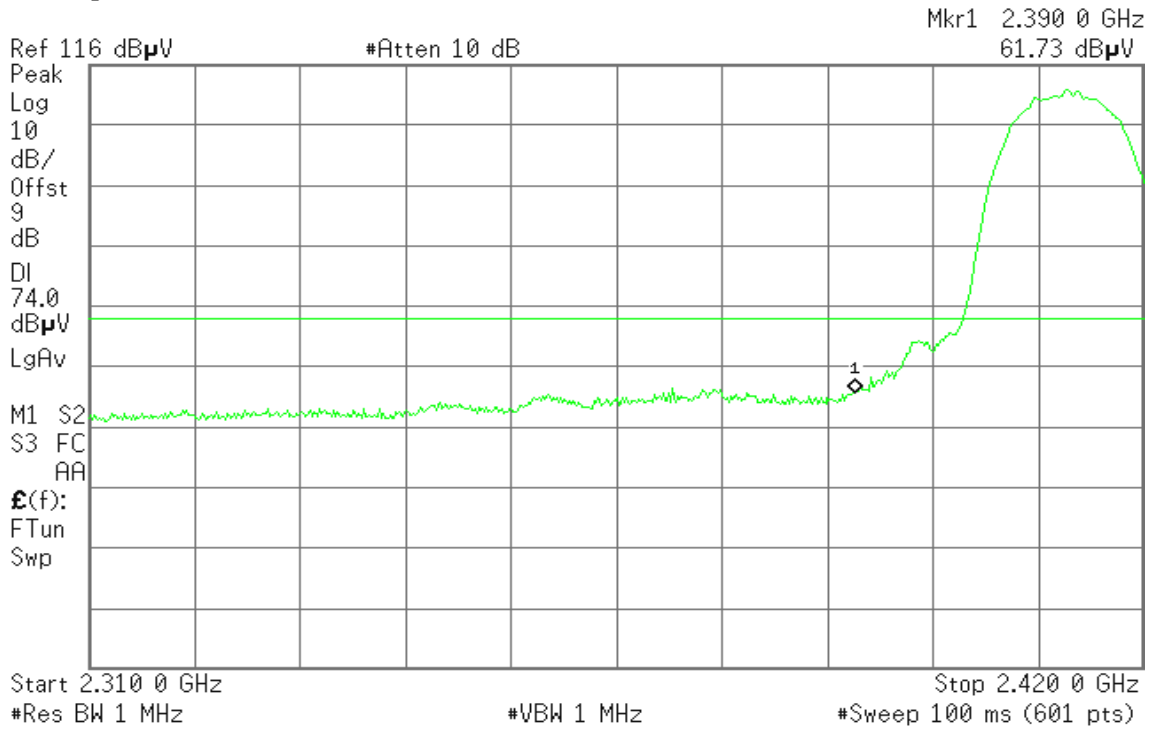


Detector mode: Peak

Polarity: Horizontal

Agilent

R T

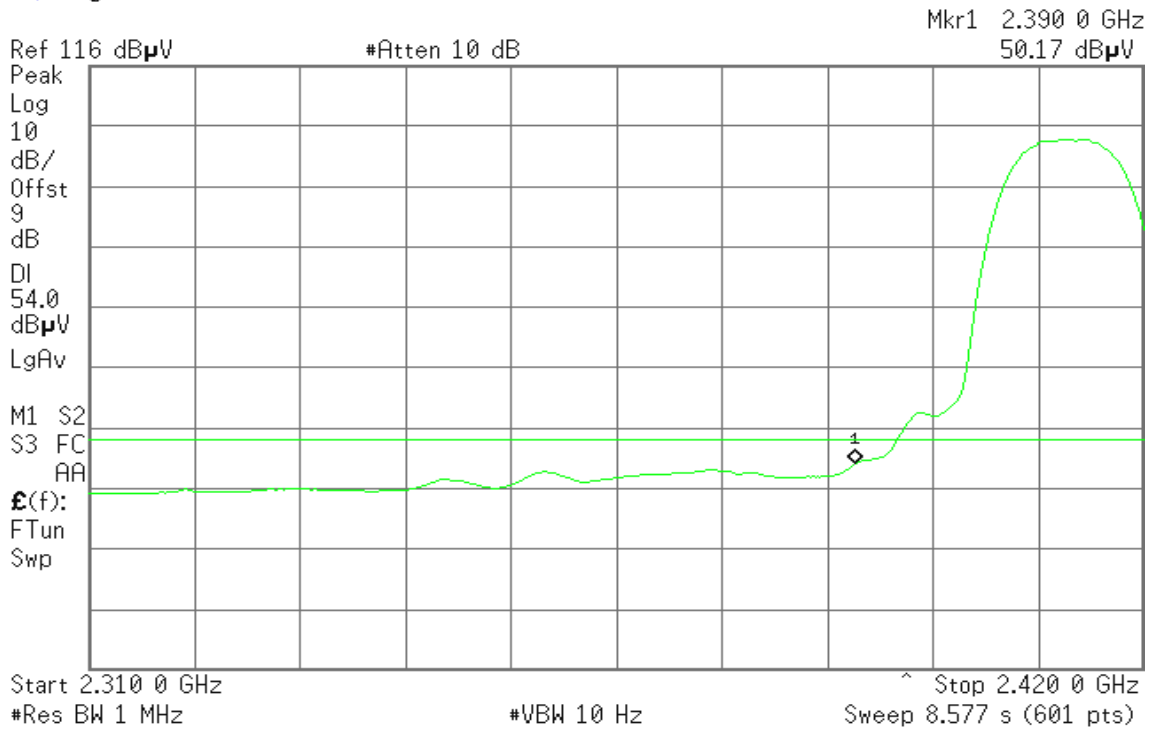


Detector mode: Average

Polarity: Horizontal

Agilent

R T

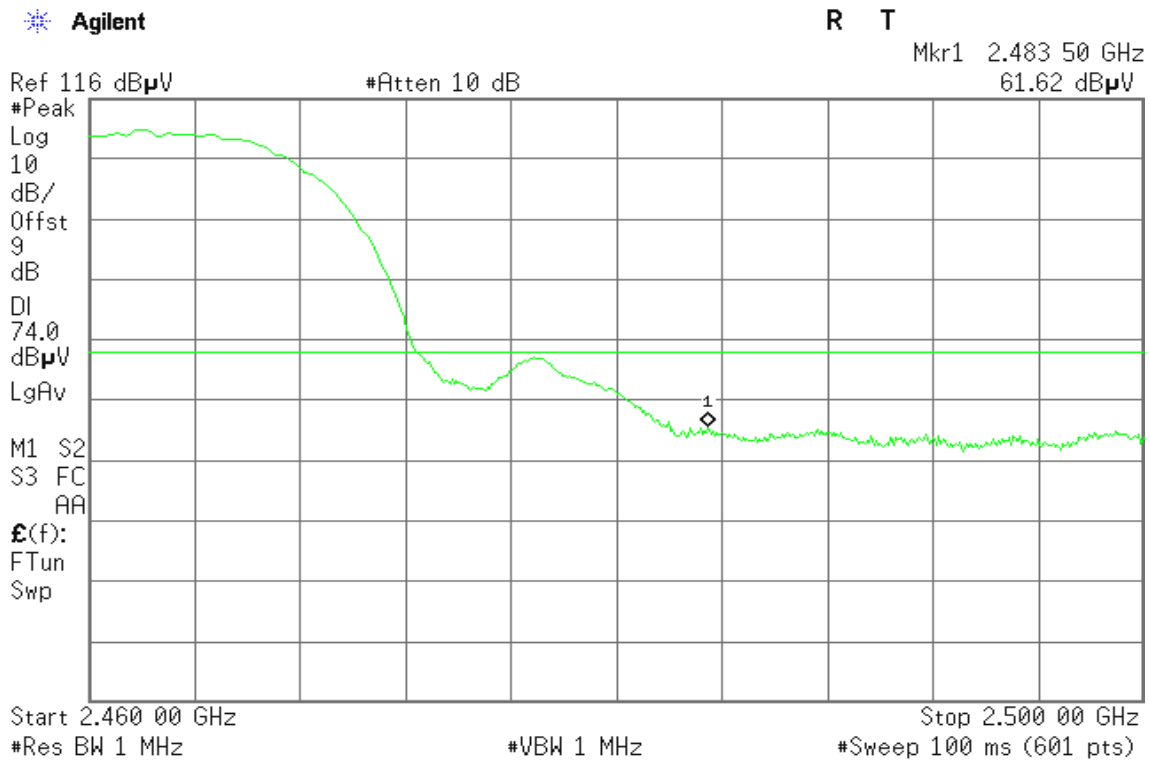




Band Edges (IEEE 802.11b mode / CH High)

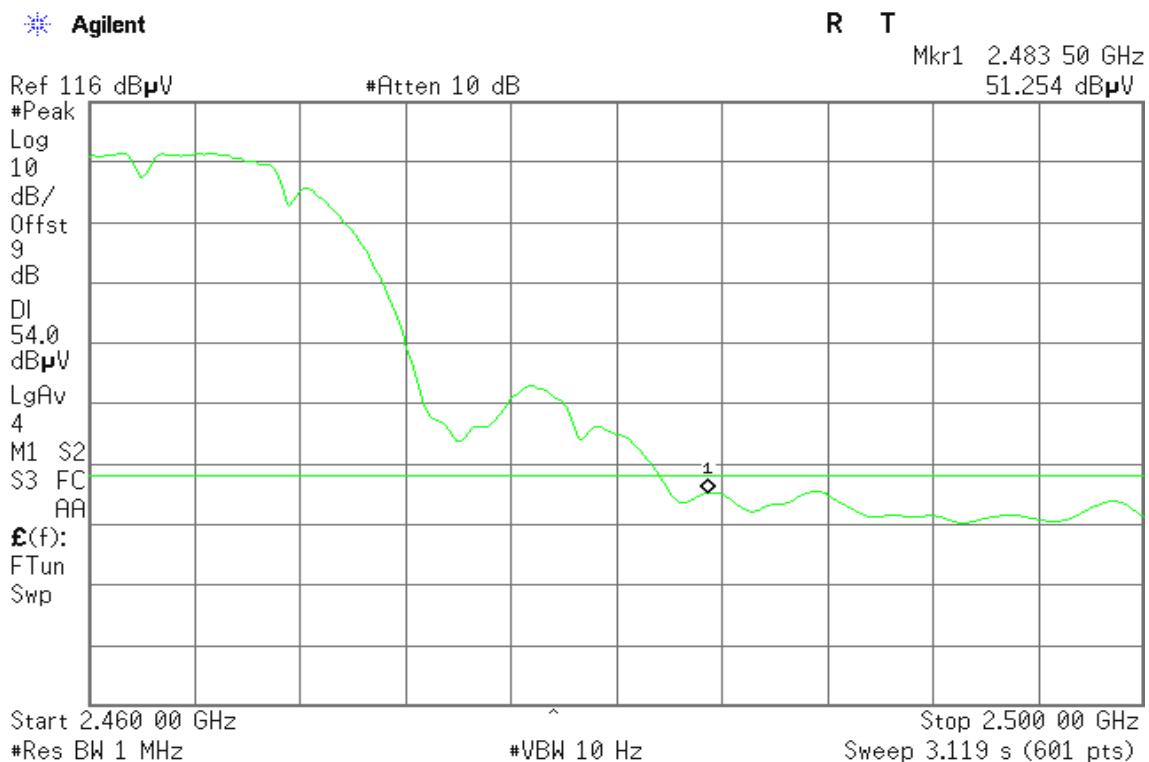
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





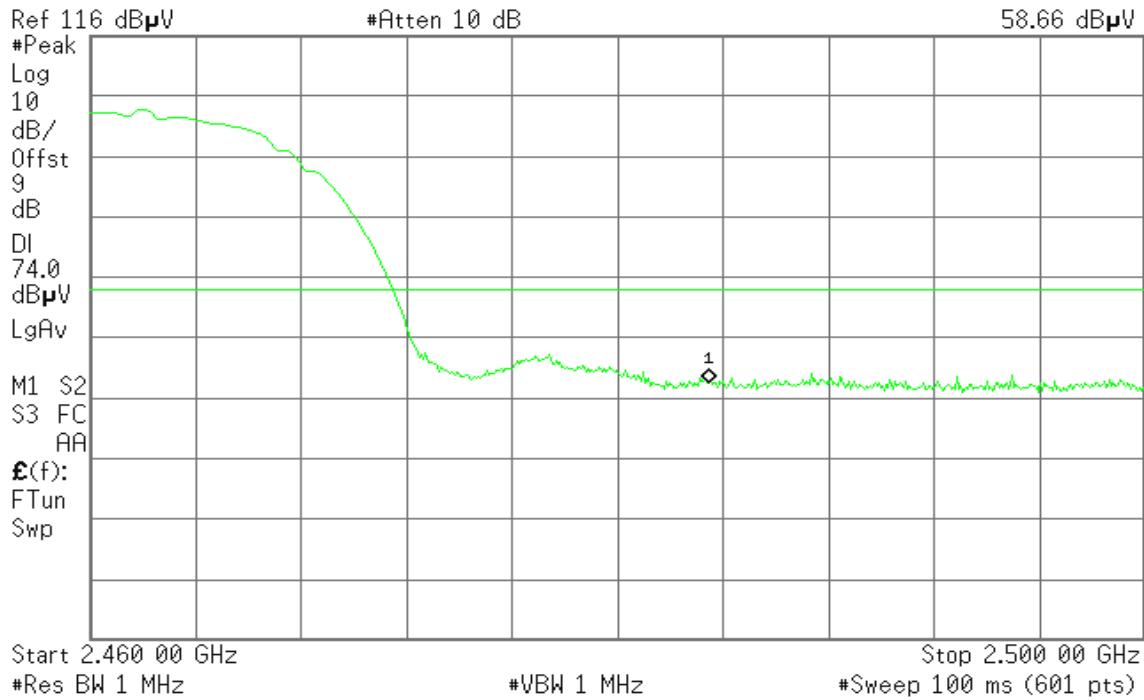
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
58.66 dB μ V



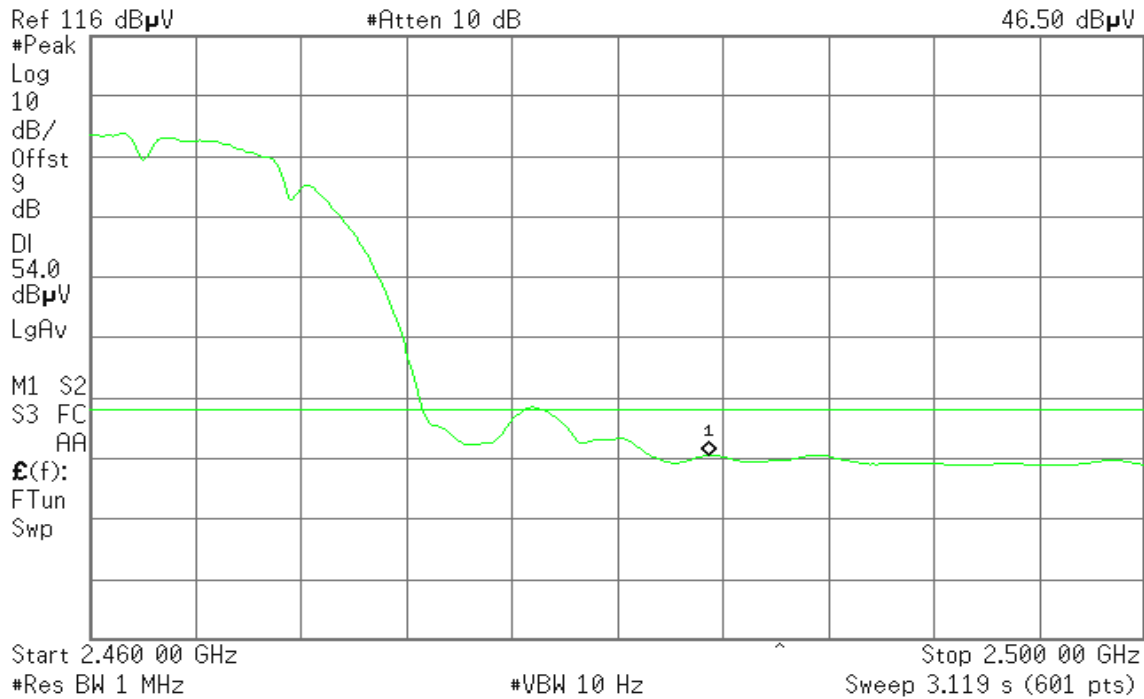
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
46.50 dB μ V

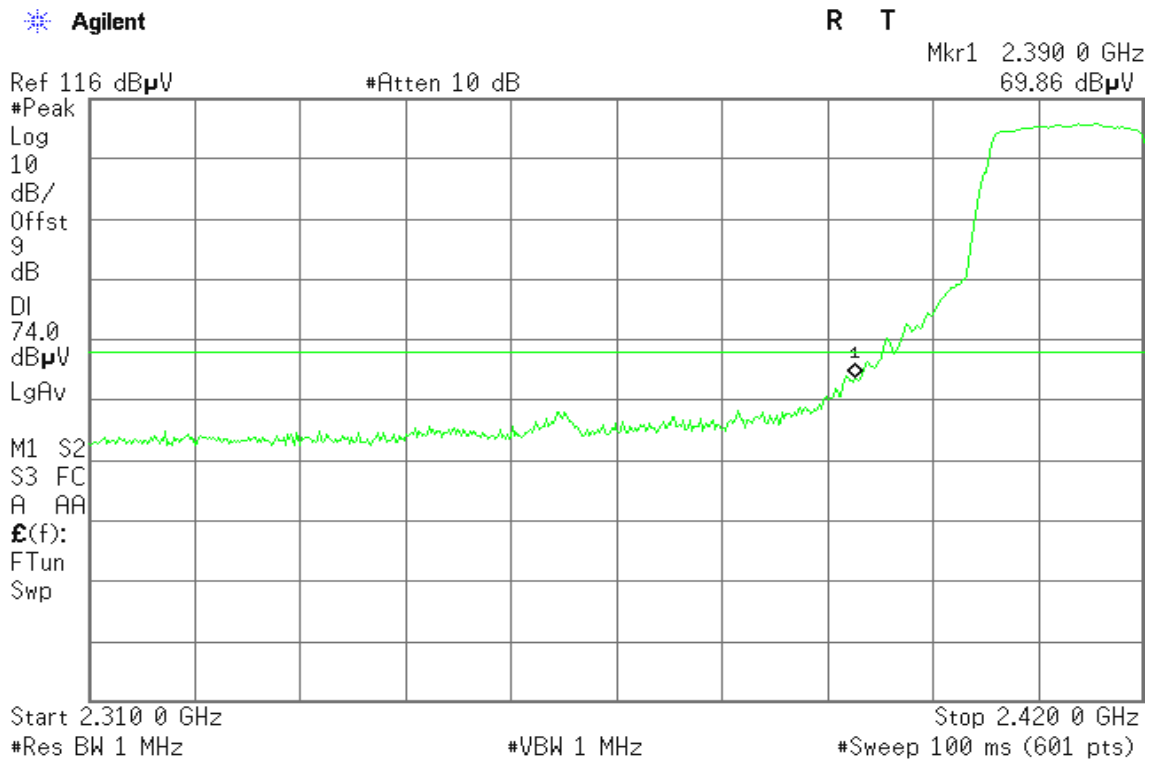




Band Edges (IEEE 802.11g mode / CH Low)

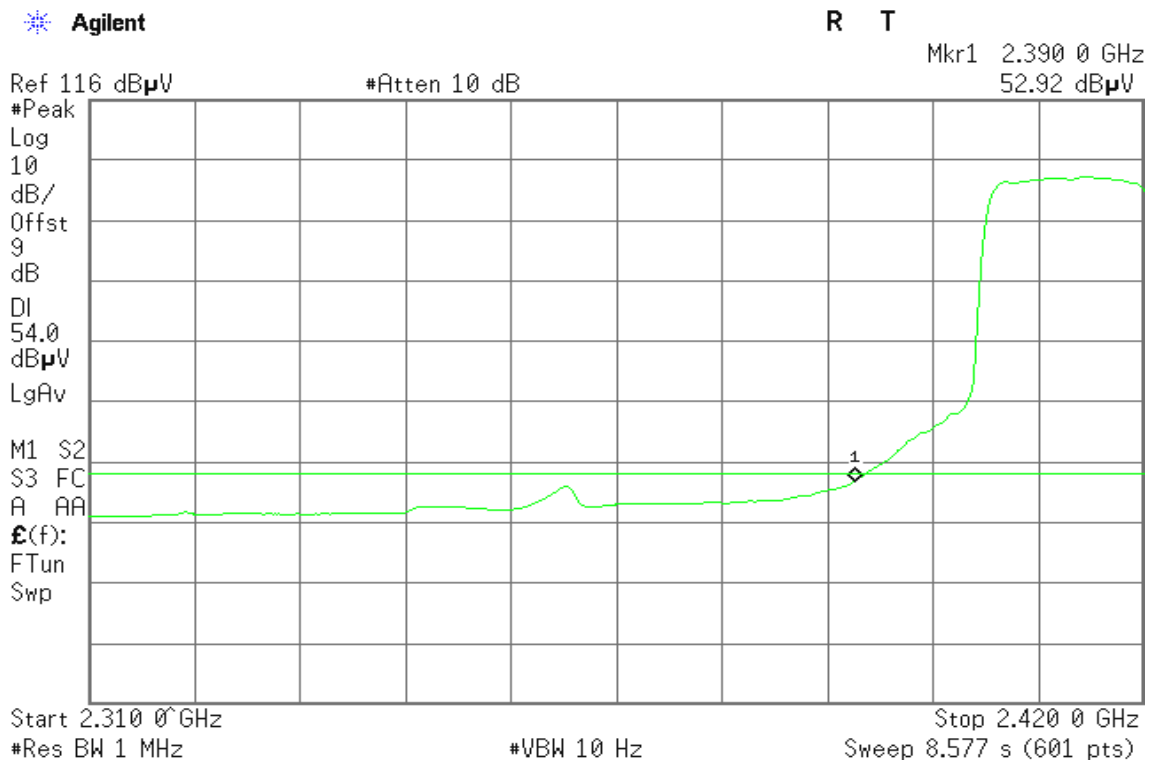
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

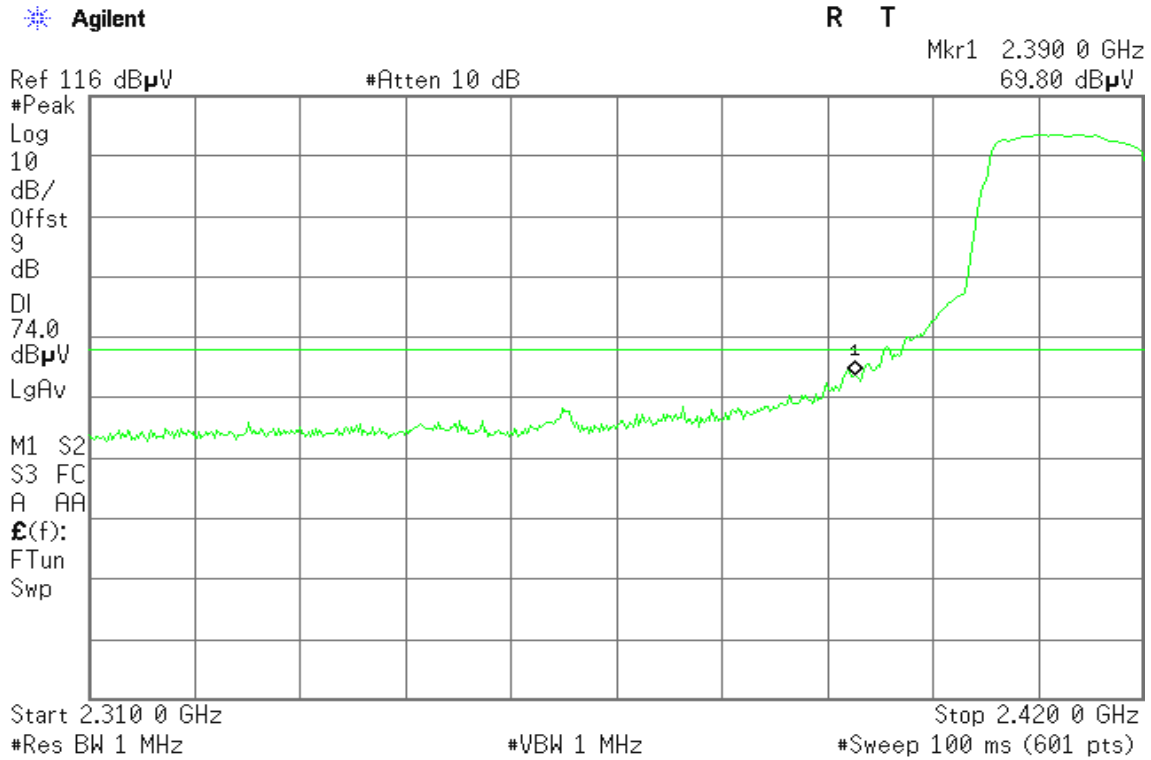
Polarity: Vertical





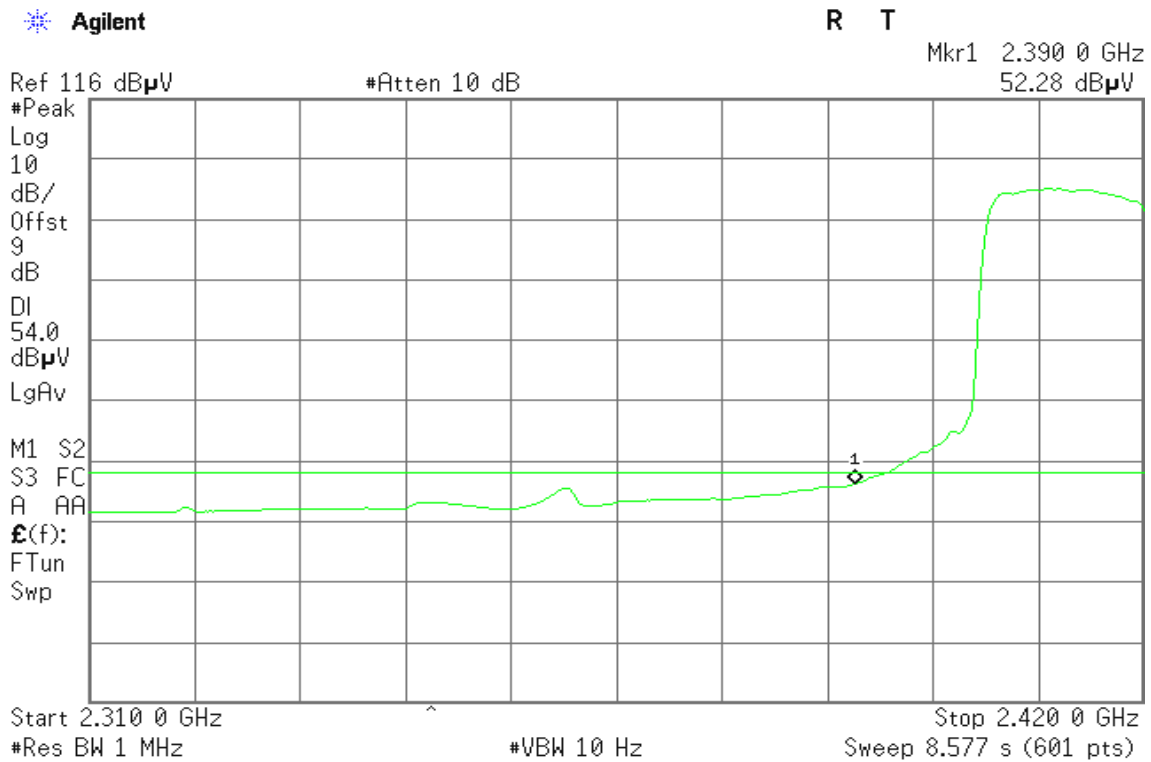
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

Polarity: Horizontal





Band Edges (IEEE 802.11g mode / CH High)

Detector mode: Peak

Polarity: Vertical

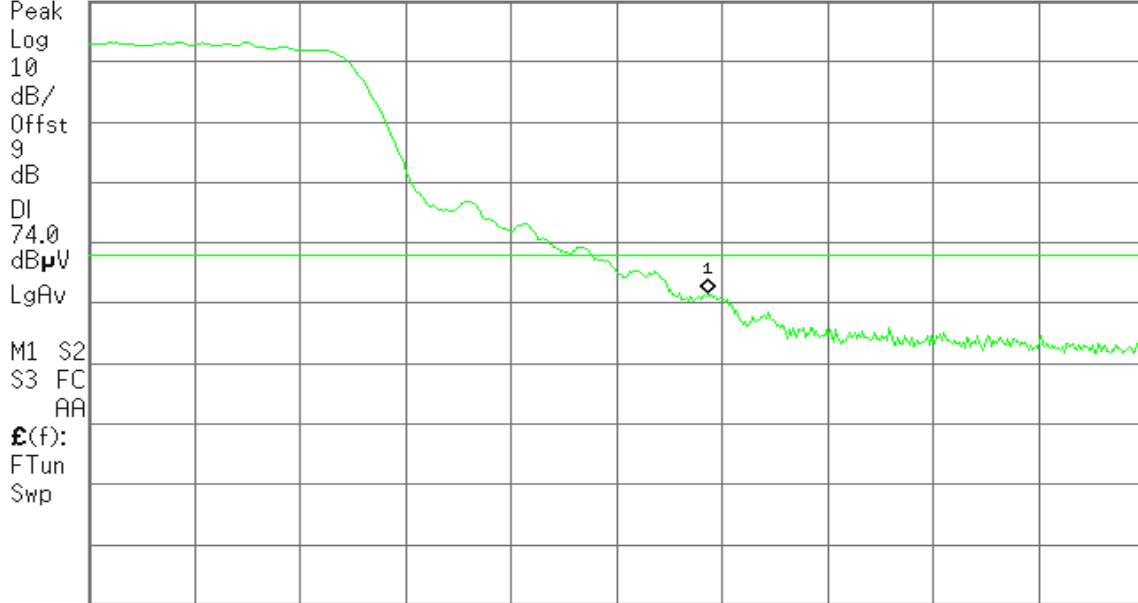
Agilent

R T

Mkr1 2.483 50 GHz
67.62 dB μ V

Ref 116 dB μ V

#Atten 10 dB



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

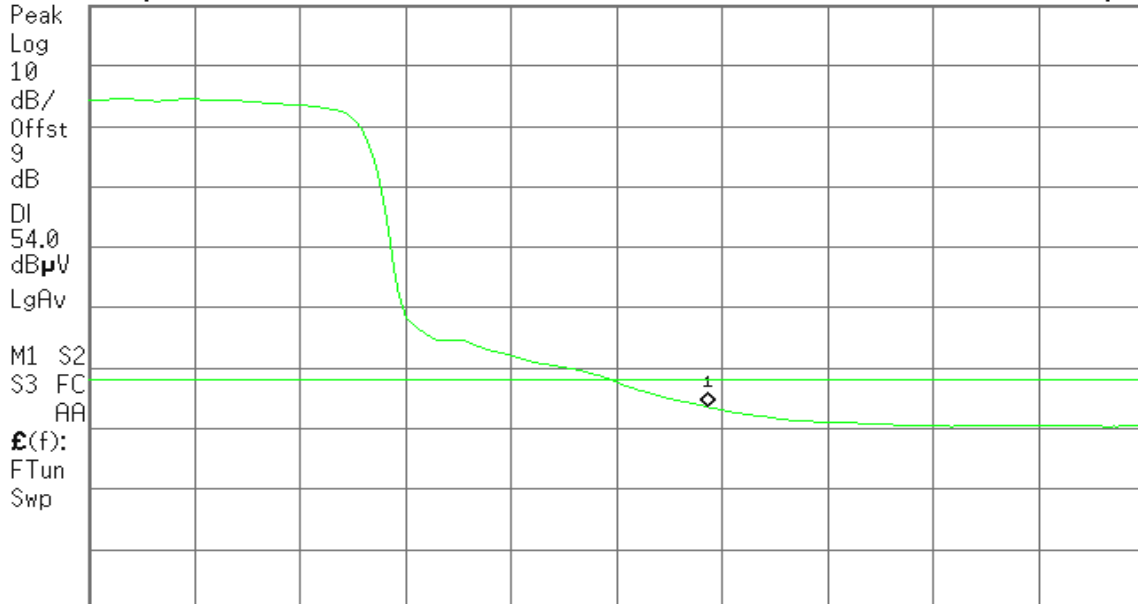
Agilent

R T

Mkr1 2.483 50 GHz
49.60 dB μ V

Ref 116 dB μ V

#Atten 10 dB



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

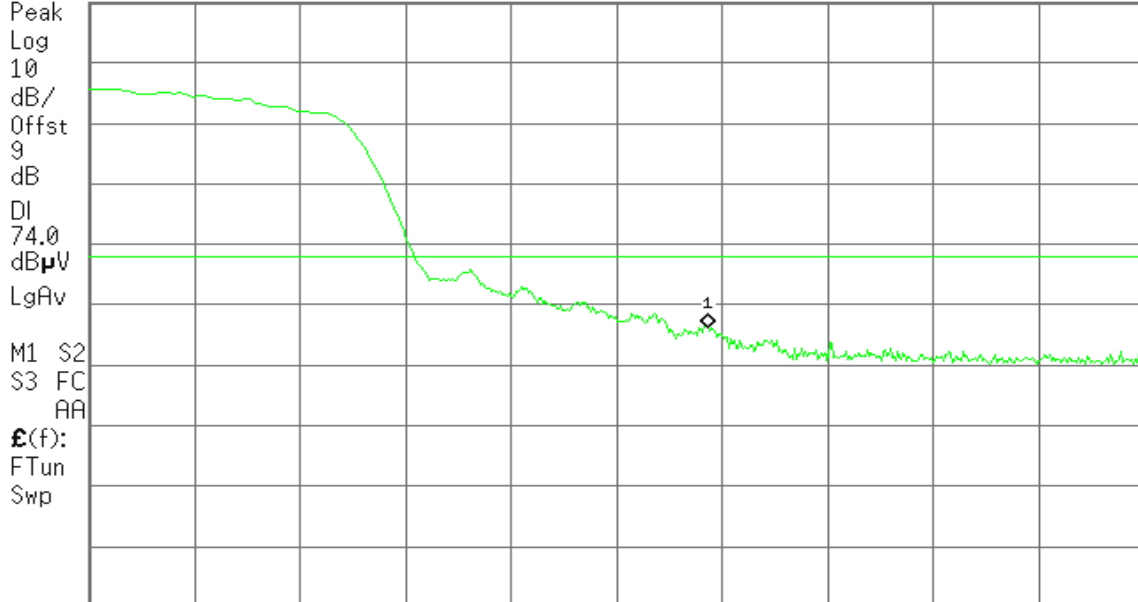
Agilent

R T

Mkr1 2.483 50 GHz
62.14 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

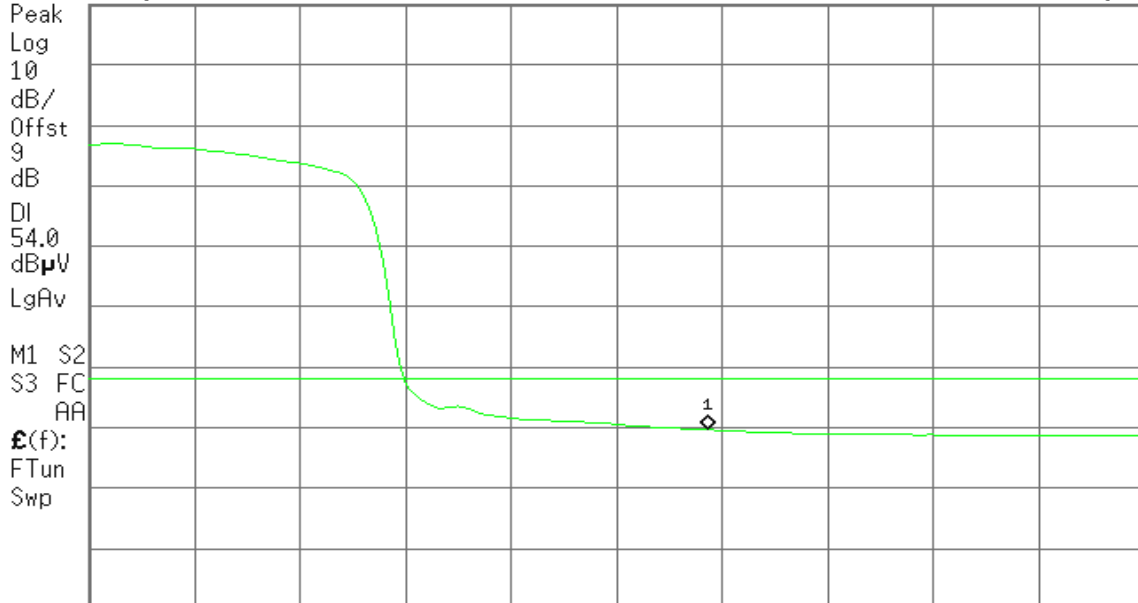
Agilent

R T

Mkr1 2.483 50 GHz
45.70 dB μ V

Ref 116 dB μ V

#Atten 10 dB



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

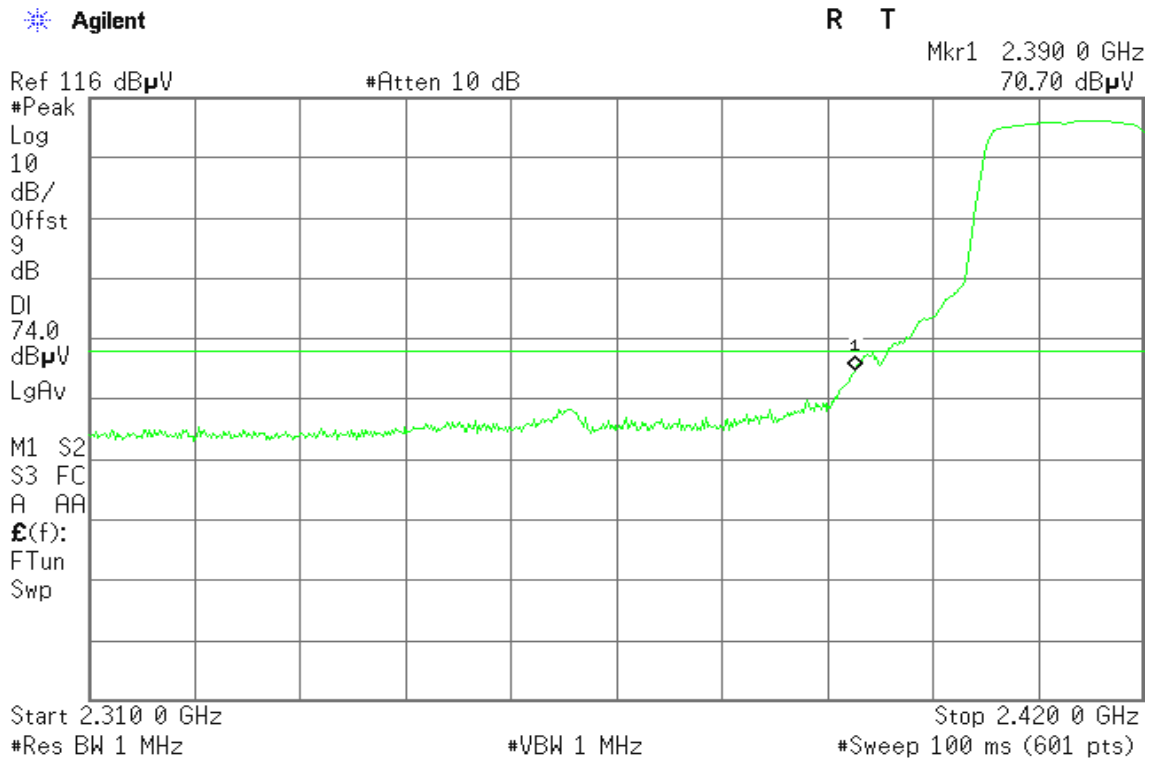
Sweep 3.119 s (601 pts)



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

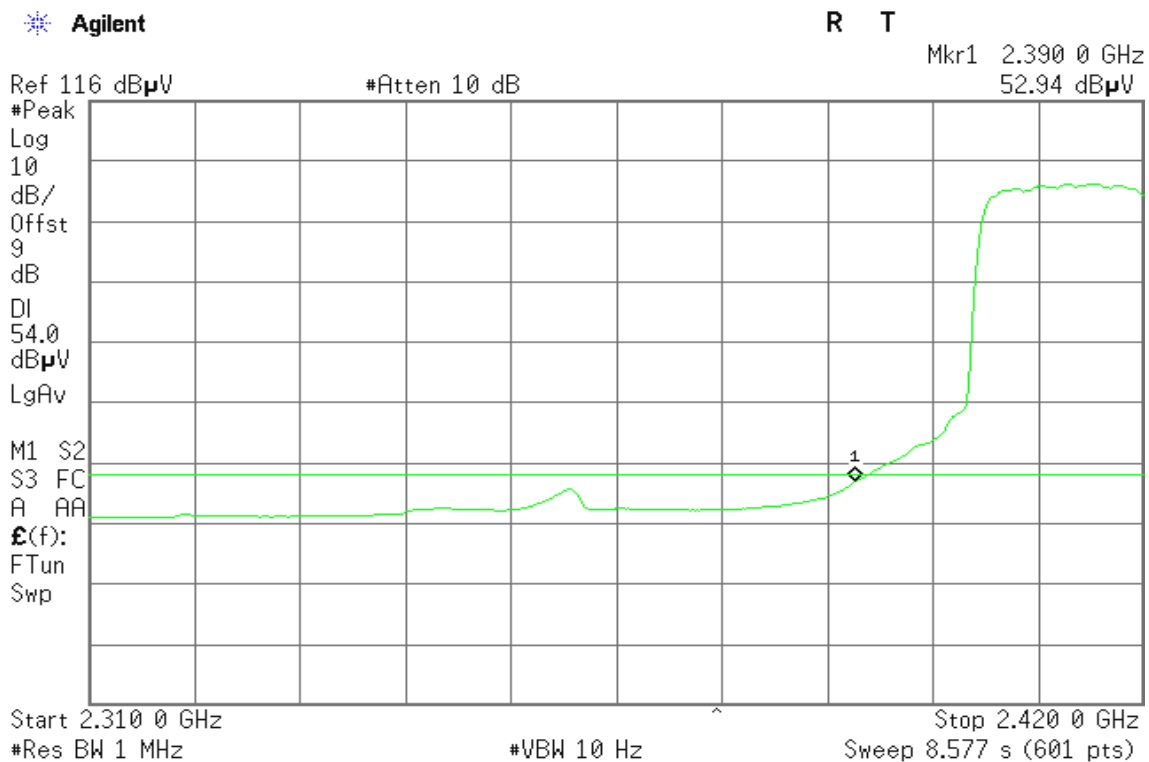
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





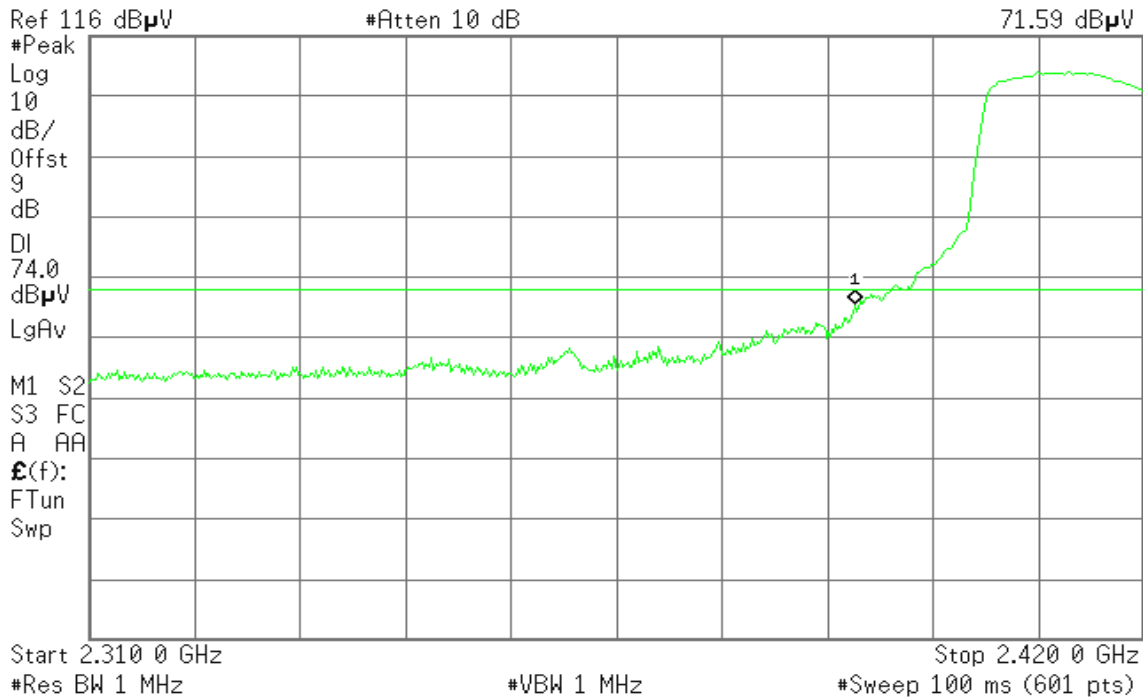
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz
71.59 dBμV



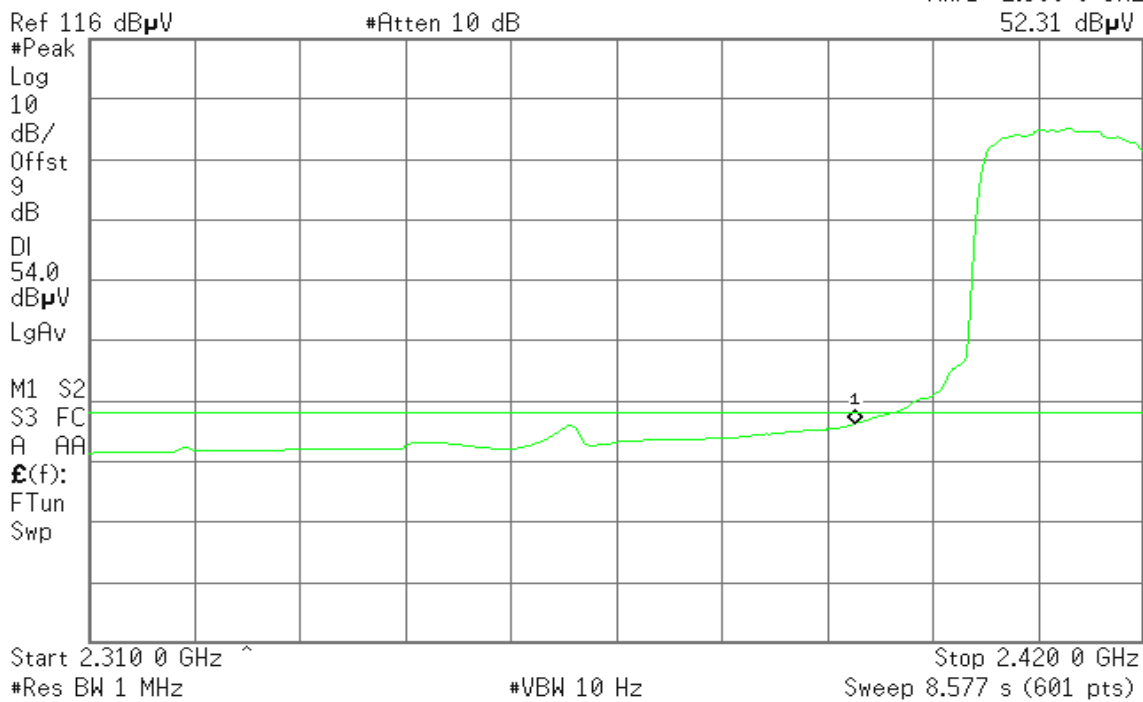
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz
52.31 dBμV





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

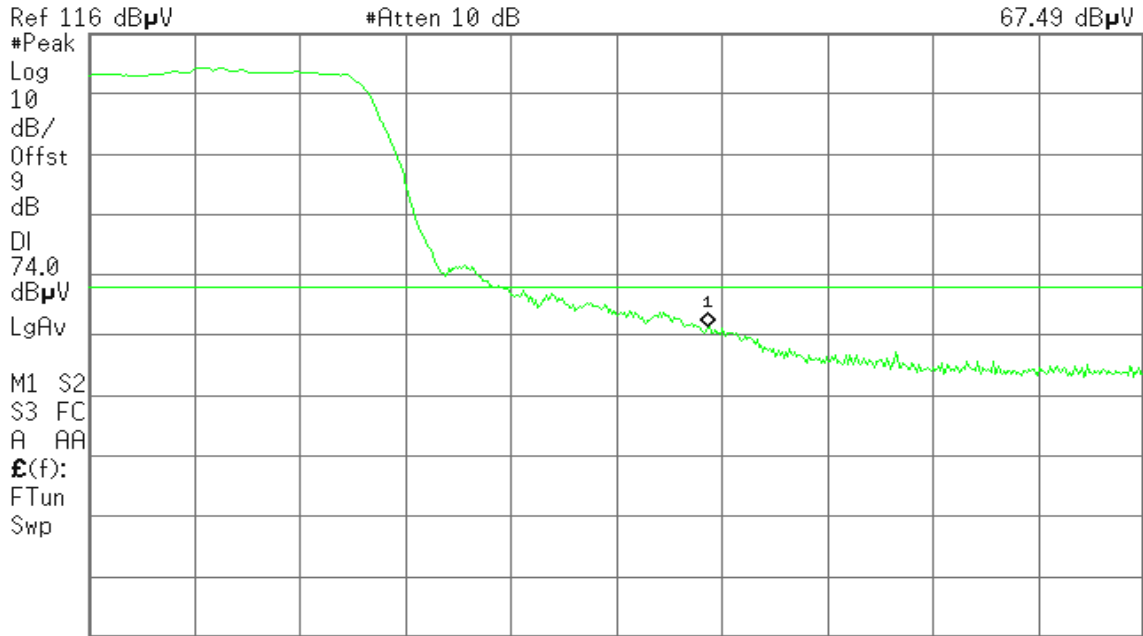
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz
67.49 dB μ V



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

Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz
52.85 dB μ V



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



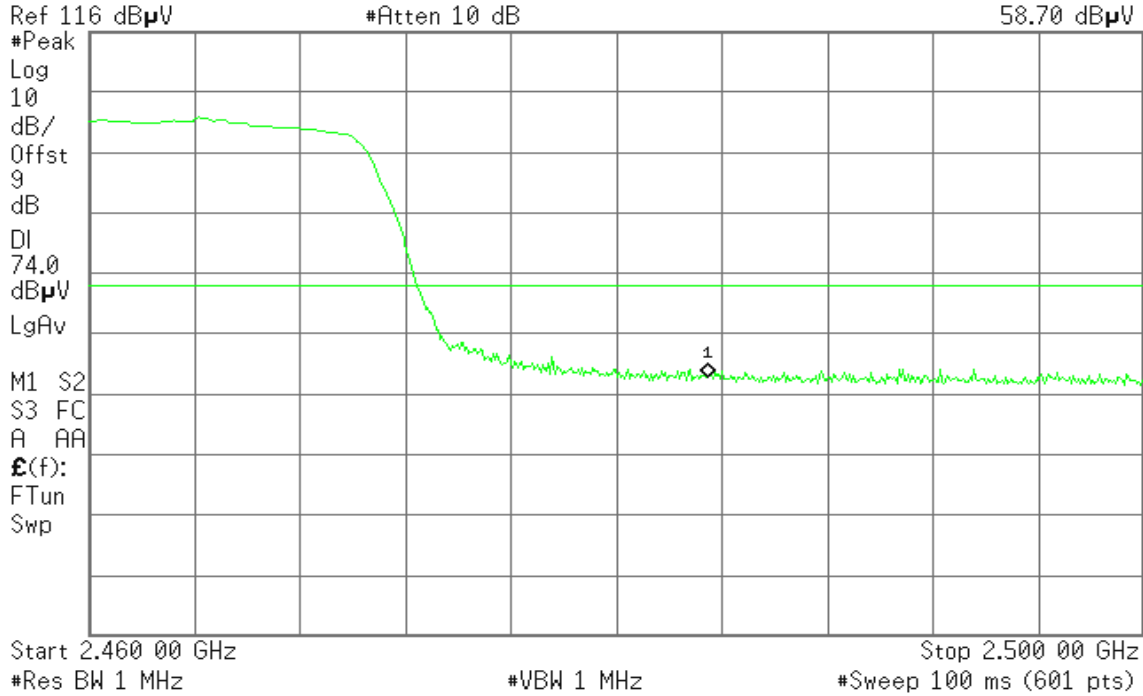
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
58.70 dB μ V



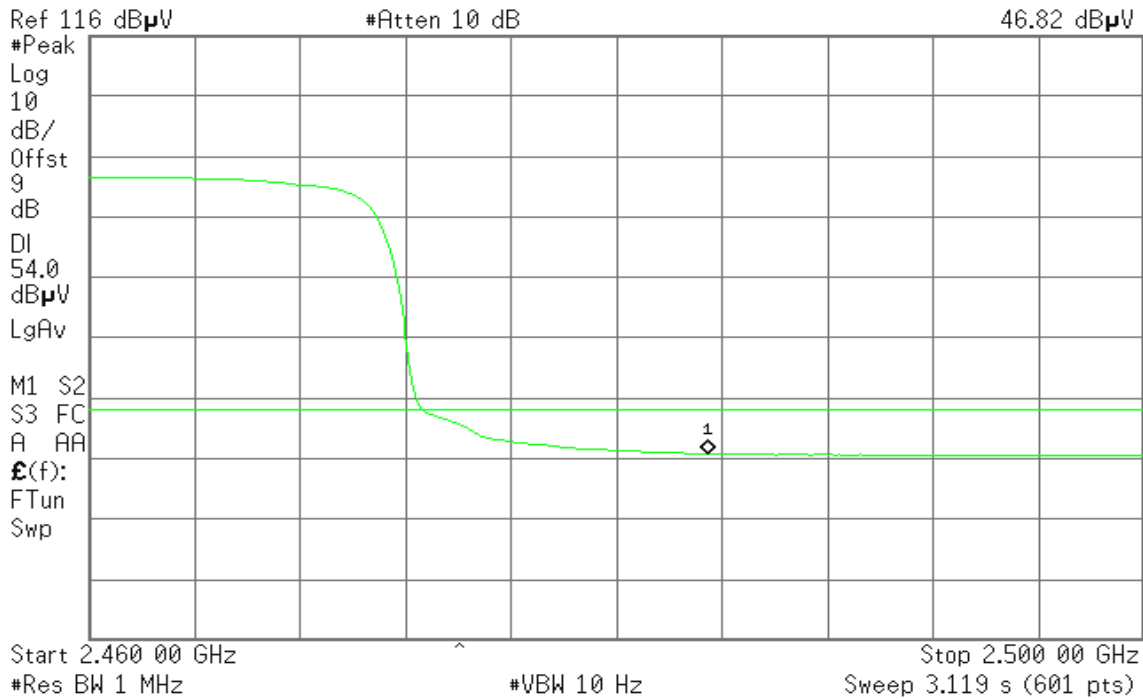
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
46.82 dB μ V

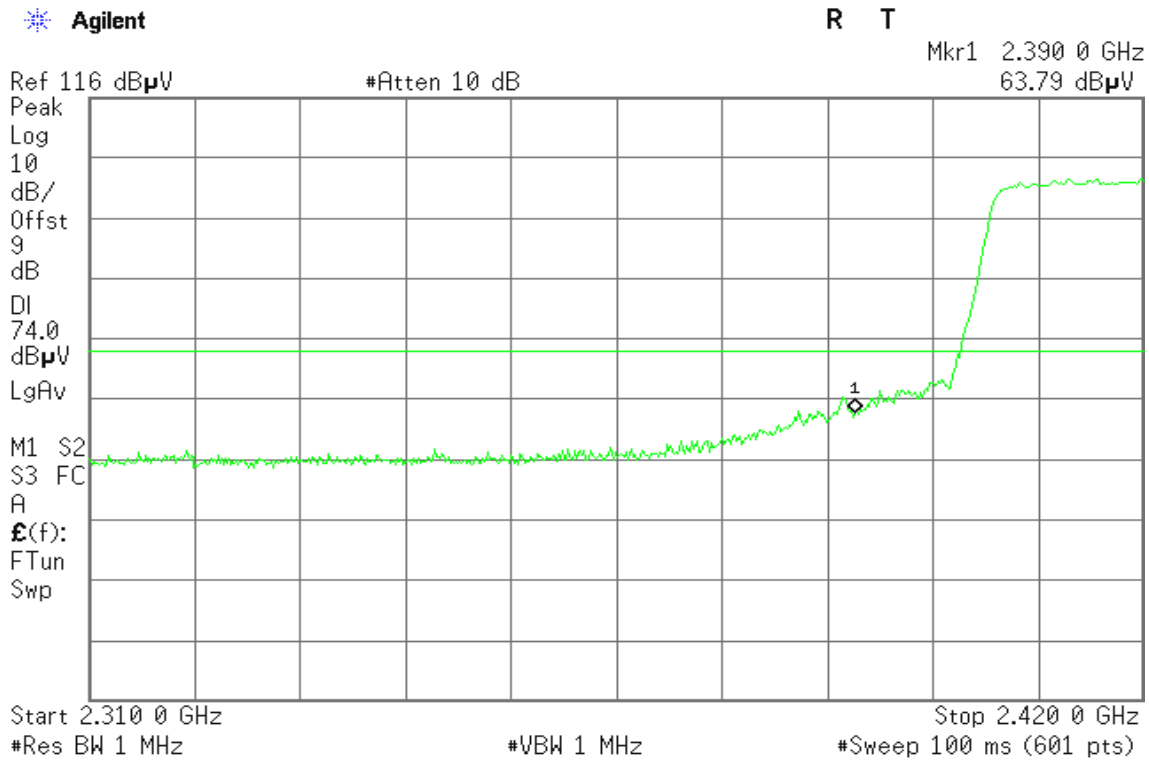




Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH Low)

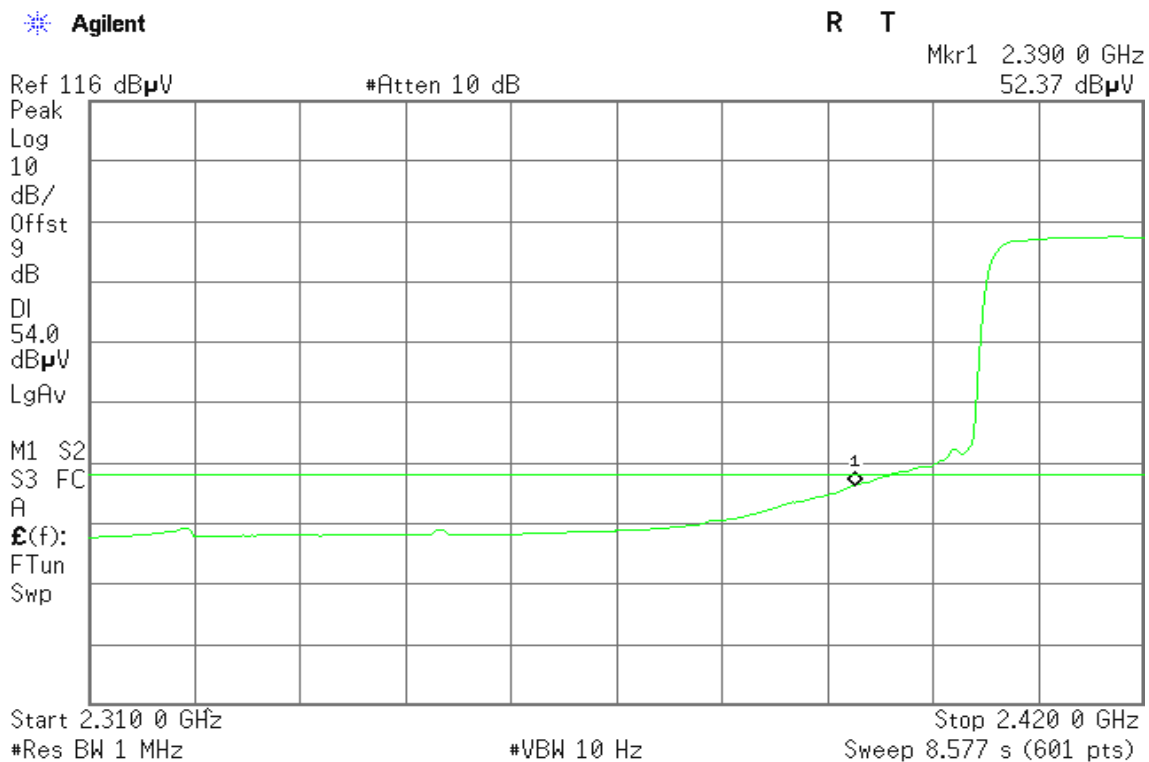
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

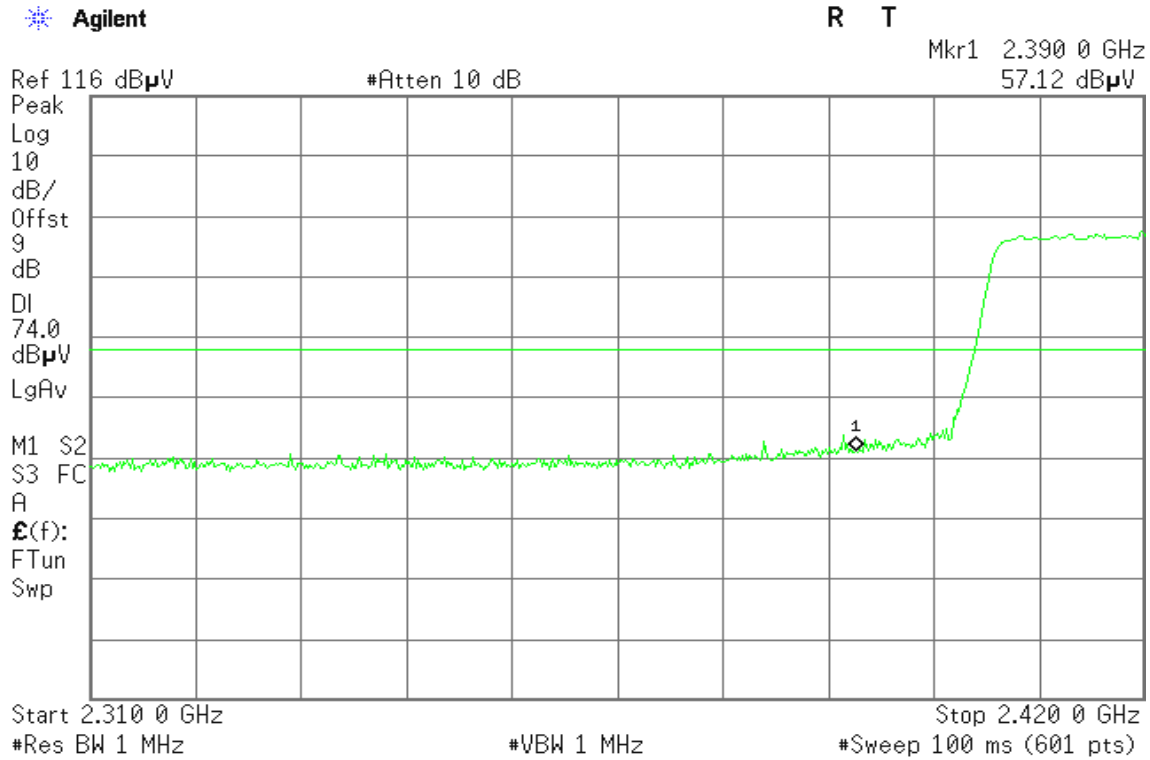
Polarity: Vertical





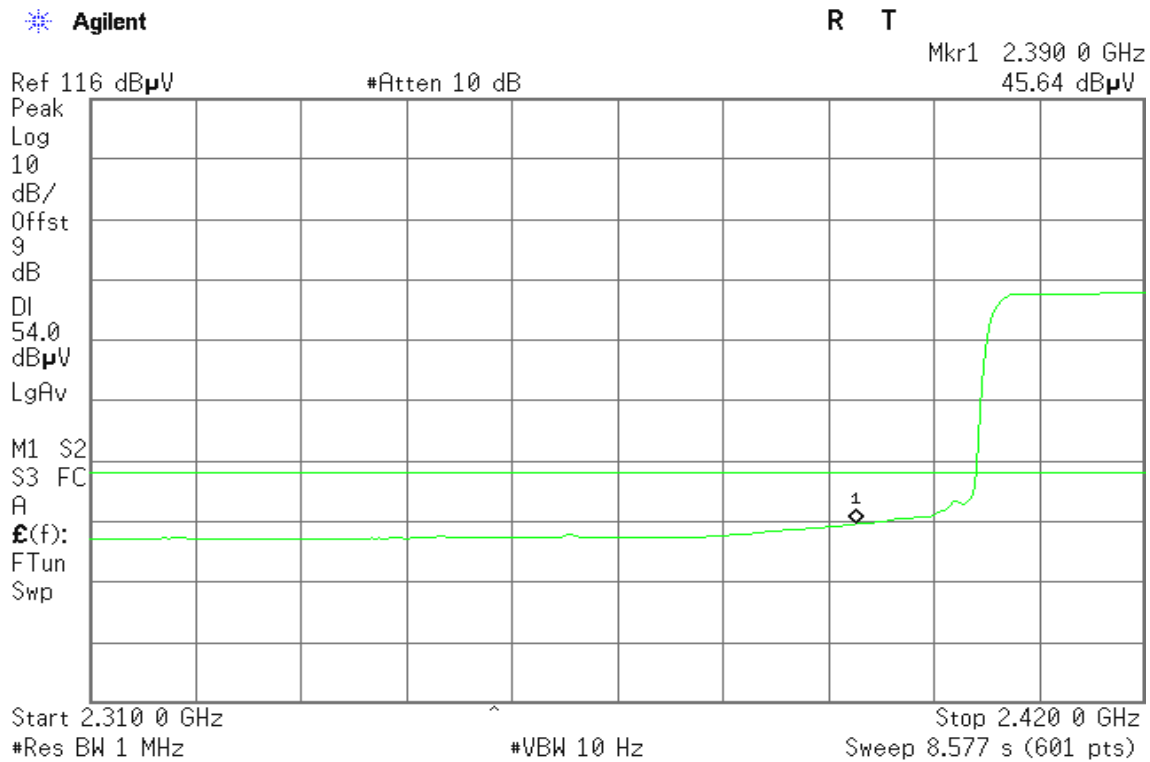
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

Polarity: Horizontal





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

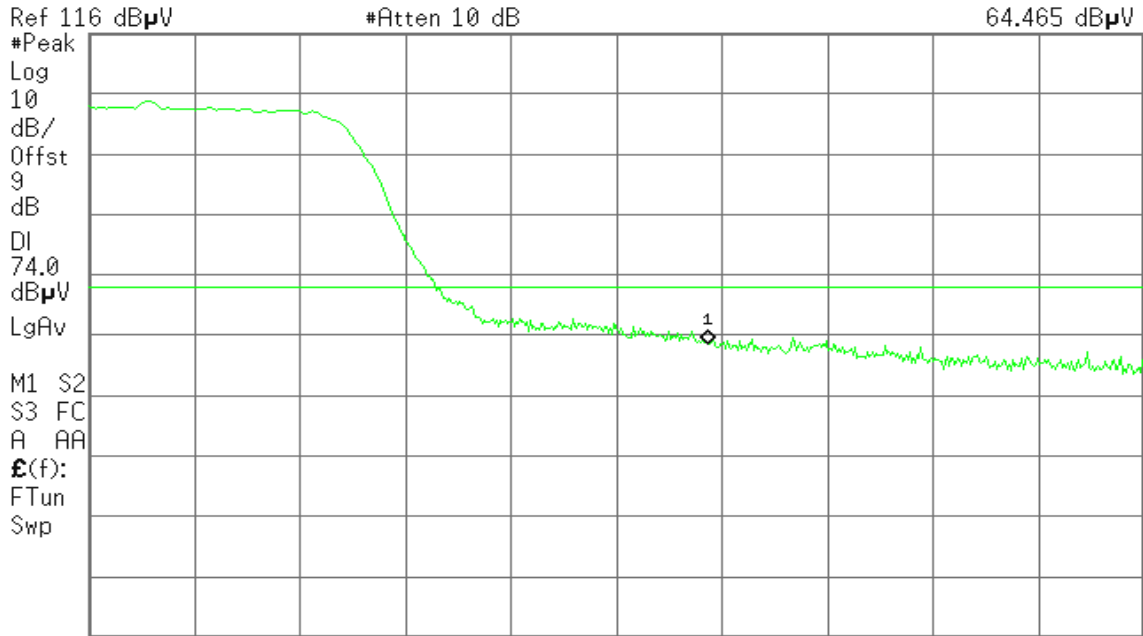
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz
64.465 dB μ V



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

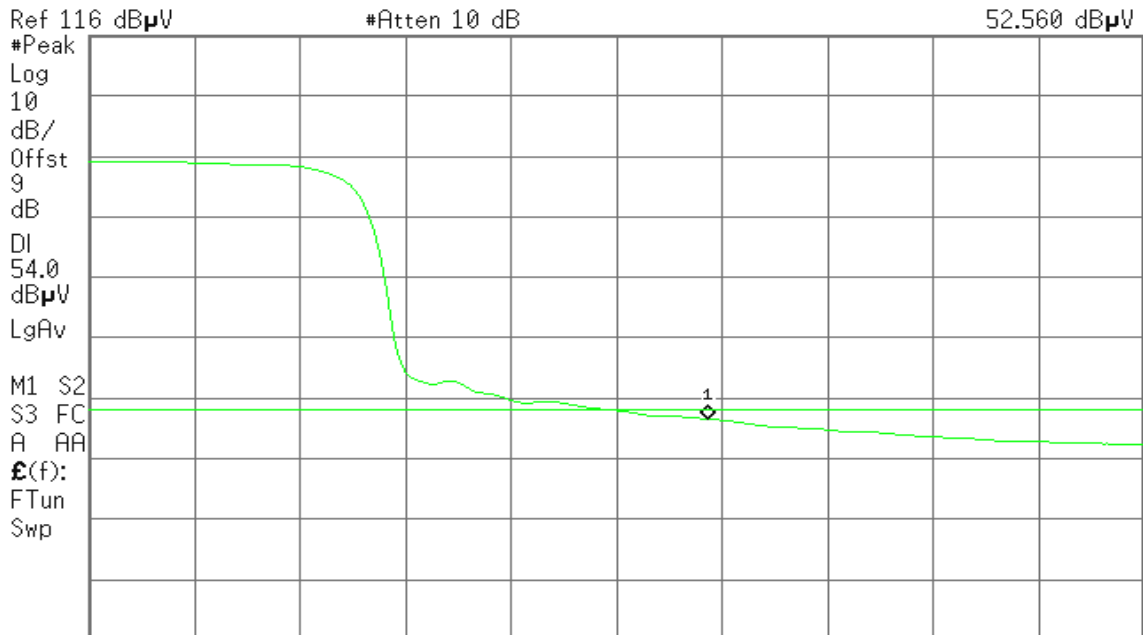
Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz
52.560 dB μ V



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



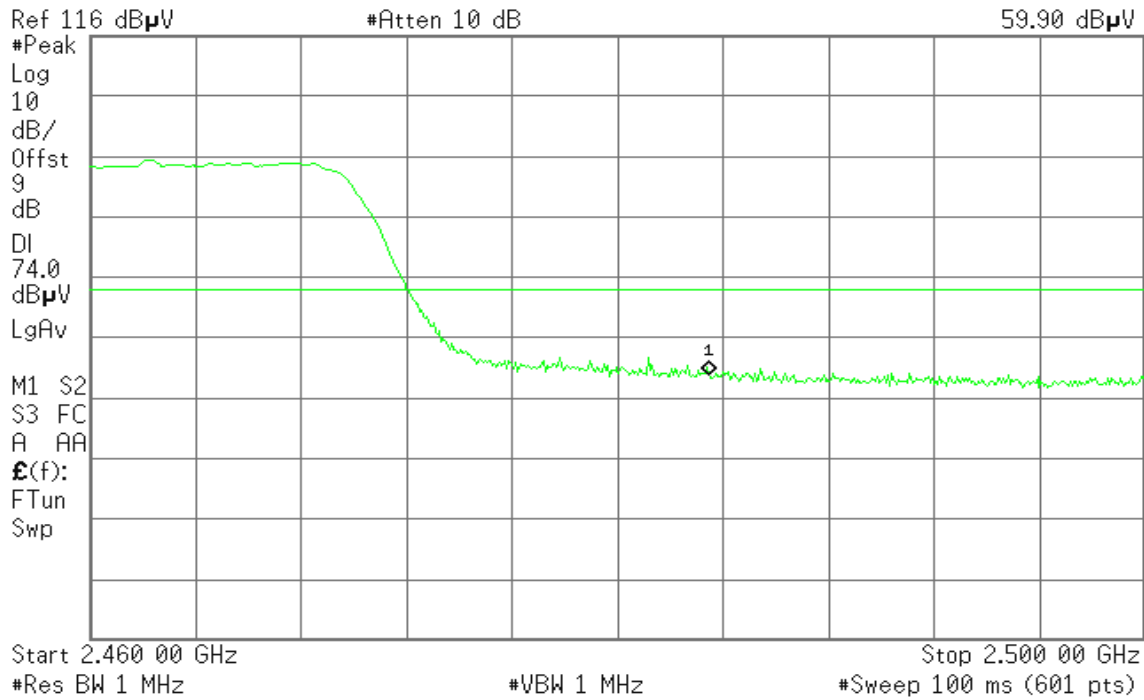
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
59.90 dB μ V



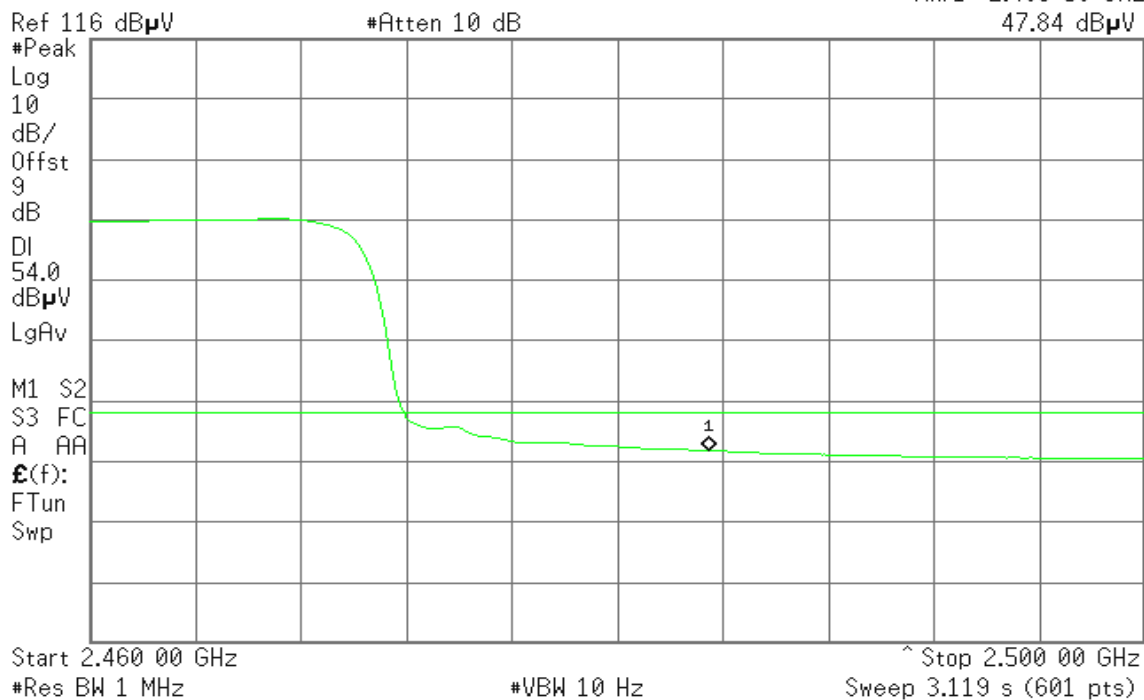
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
47.84 dB μ V

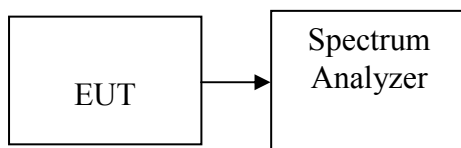


7.5 PEAK POWER SPECTRAL DENSITY

LIMIT

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

Test Configuration



TEST PROCEDURE

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



TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-15.03	8.00	PASS
Mid	2437	-13.10		PASS
High	2462	-12.14		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-8.42	8.00	PASS
Mid	2437	-8.44		PASS
High	2462	-8.16		PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-12.65	-14.94	-10.64	7.00	PASS
Mid	2437	-11.98	-15.29	-10.32		PASS
High	2462	-11.80	-14.62	-9.97		PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-11.50	-17.24	-10.47	7.00	PASS
Mid	2437	-11.28	-15.57	-9.91		PASS
High	2452	-13.34	-15.52	-11.28		PASS

Remark:

1. Total PPSD (dBm) = $10 * \text{LOG}(10^{(\text{Chain 0 PPSD} / 10)} + 10^{(\text{Chain 1 PPSD} / 10)})$
2. The maximum antenna gain is 6.03 dBi; therefore the reduction due to antenna gain is 1dB, so the limit is 7dBm.



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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-11.66	7.00	PASS
Mid	2437	-11.72		PASS
High	2462	-12.27		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-10.94	7.00	PASS
Mid	2437	-11.65		PASS
High	2452	-13.11		PASS

Remark:

1. Total PPSD (dBm) = $10 * \text{LOG}(10^{(\text{Chain 0 PPSD} / 10)} + 10^{(\text{Chain 1 PPSD} / 10)})$
2. The maximum antenna gain is 6.03 dBi; therefore the reduction due to antenna gain is 1dB, so the limit is 7dBm.



Test Plot

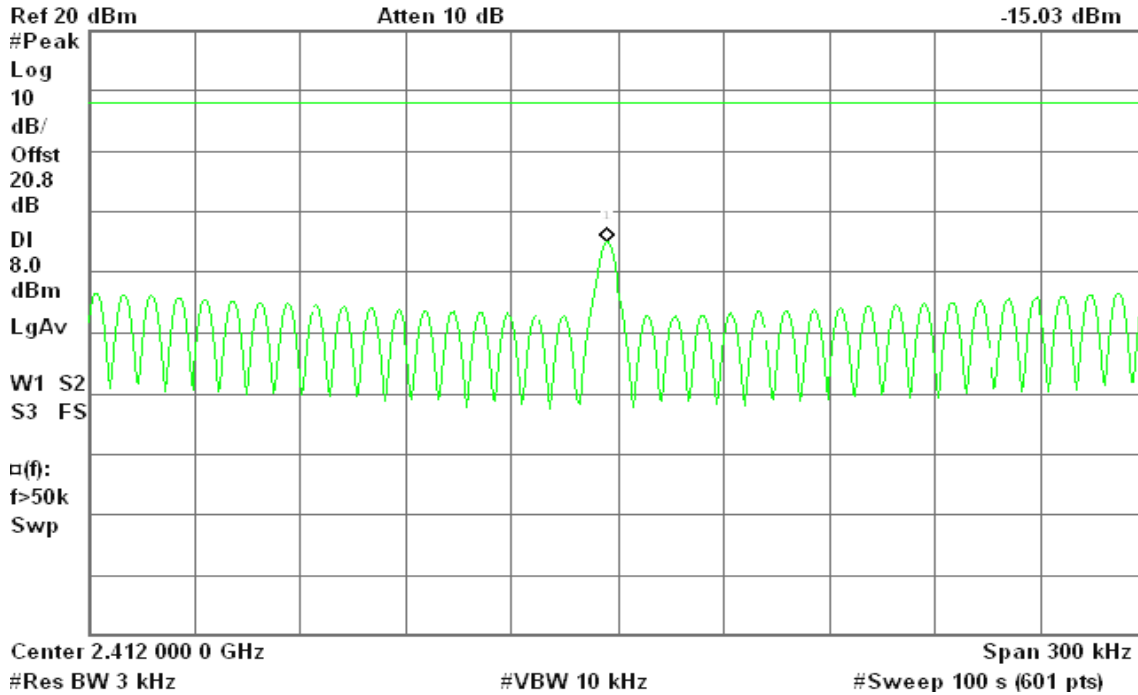
IEEE 802.11b mode

PPSD (CH Low)

Agilent 10:00:07 Nov 25, 2009

R T

Mkr1 2.411 996 5 GHz
-15.03 dBm

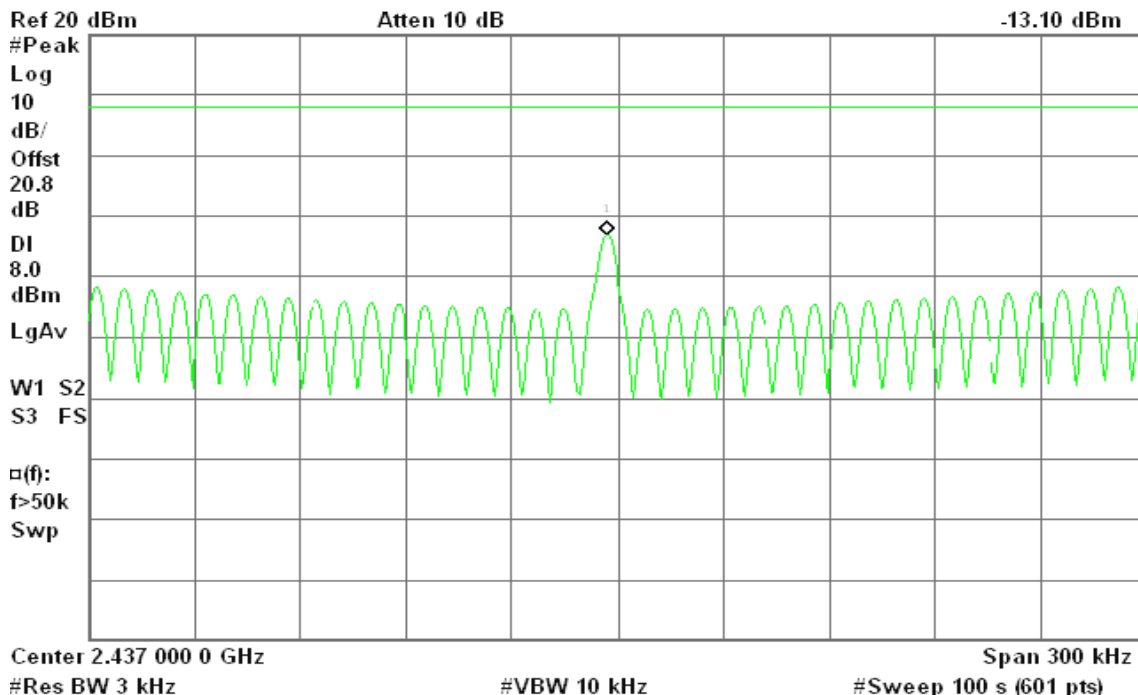


PPSD (CH Mid)

Agilent 10:12:22 Nov 25, 2009

R T

Mkr1 2.436 996 5 GHz
-13.10 dBm



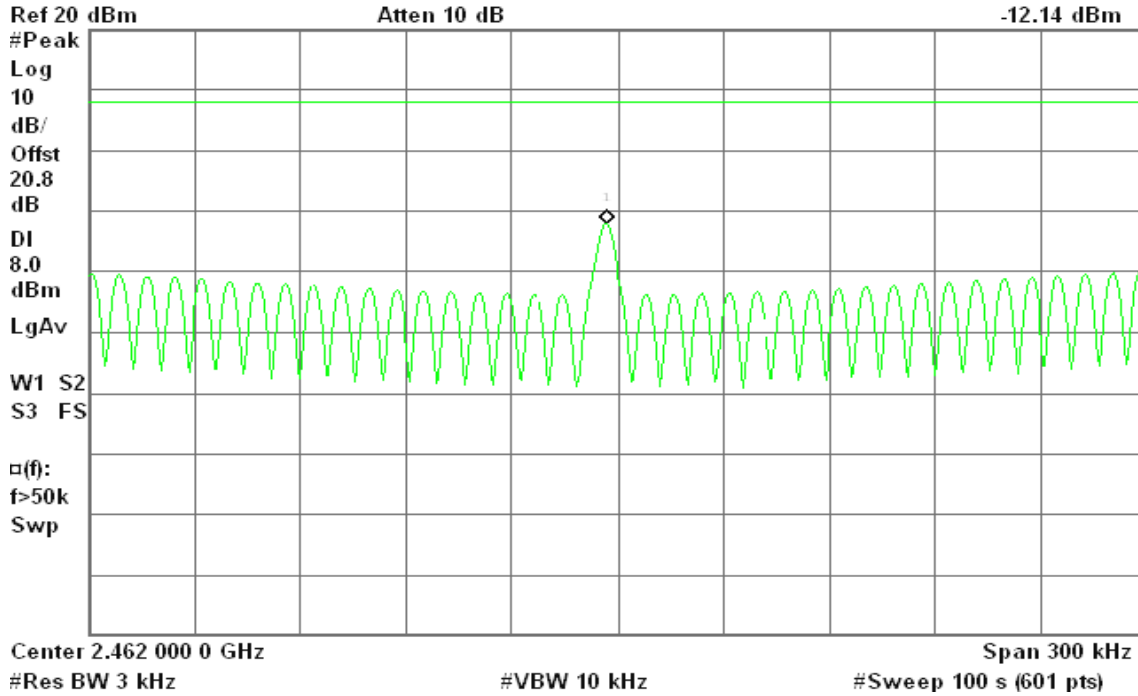


PPSD (CH High)

Agilent 10:27:07 Nov 25, 2009

R L

Mkr1 2.461 996 5 GHz
-12.14 dBm



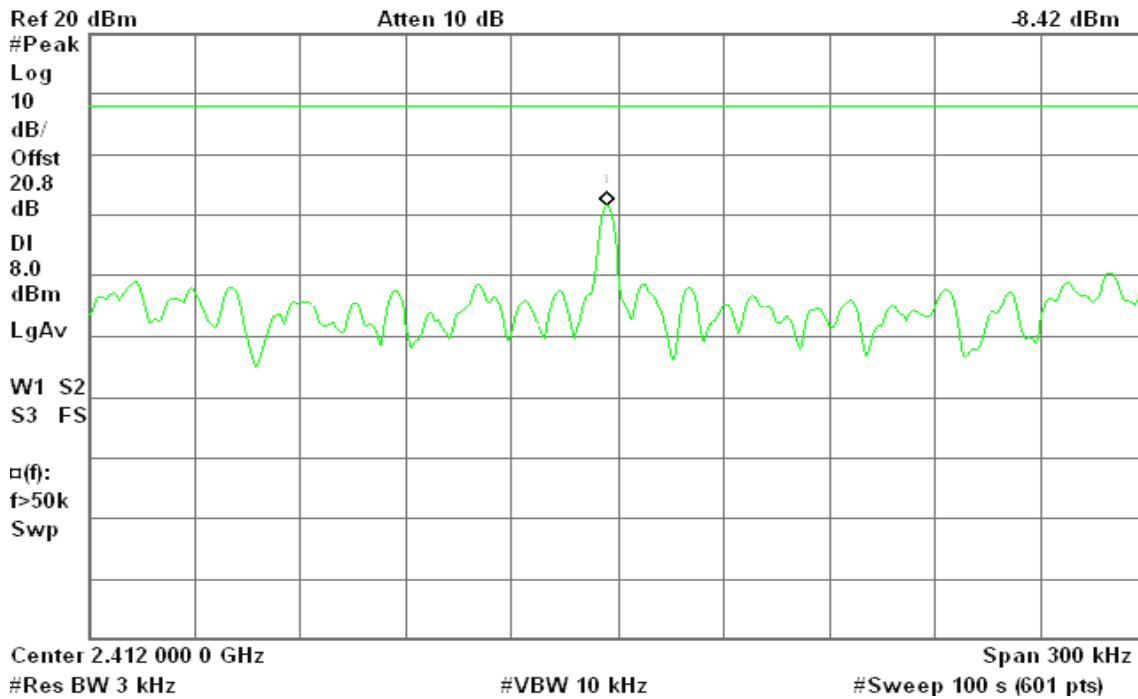
IEEE 802.11g mode

PPSD (CH Low)

Agilent 10:56:02 Nov 25, 2009

R T

Mkr1 2.411 996 5 GHz
-8.42 dBm



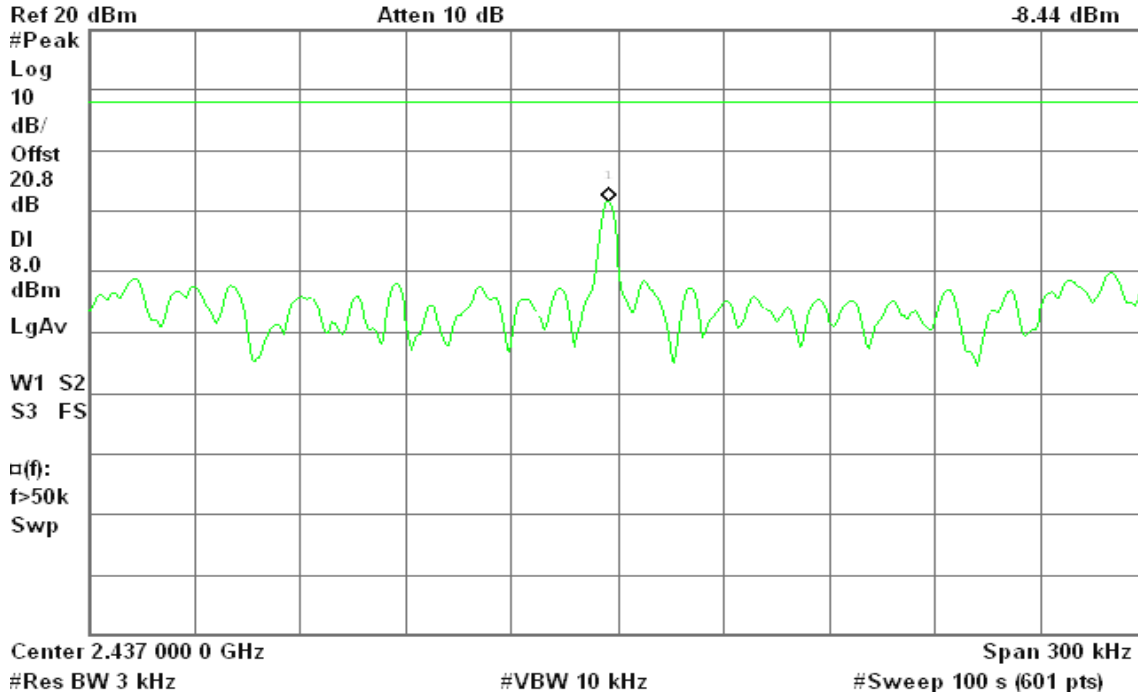


PPSD (CH Mid)

Agilent 12:12:05 Nov 25, 2009

R T

Mkr1 2.436 997 0 GHz
-8.44 dBm

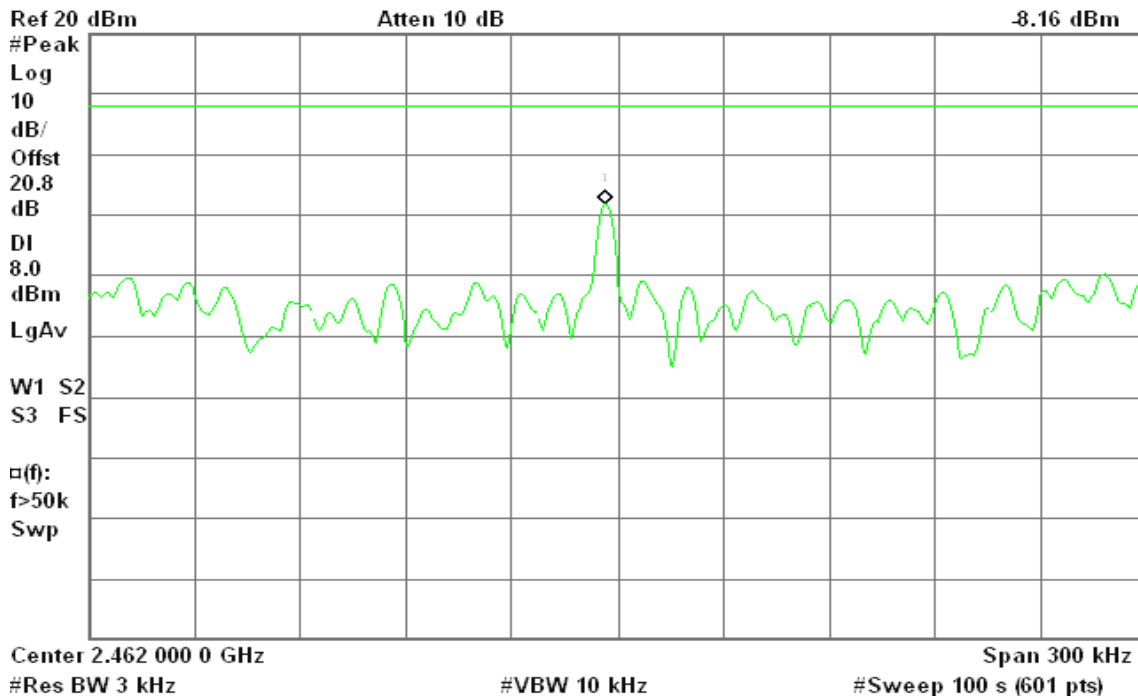


PPSD (CH High)

Agilent 12:24:55 Nov 25, 2009

R T

Mkr1 2.461 996 0 GHz
-8.16 dBm





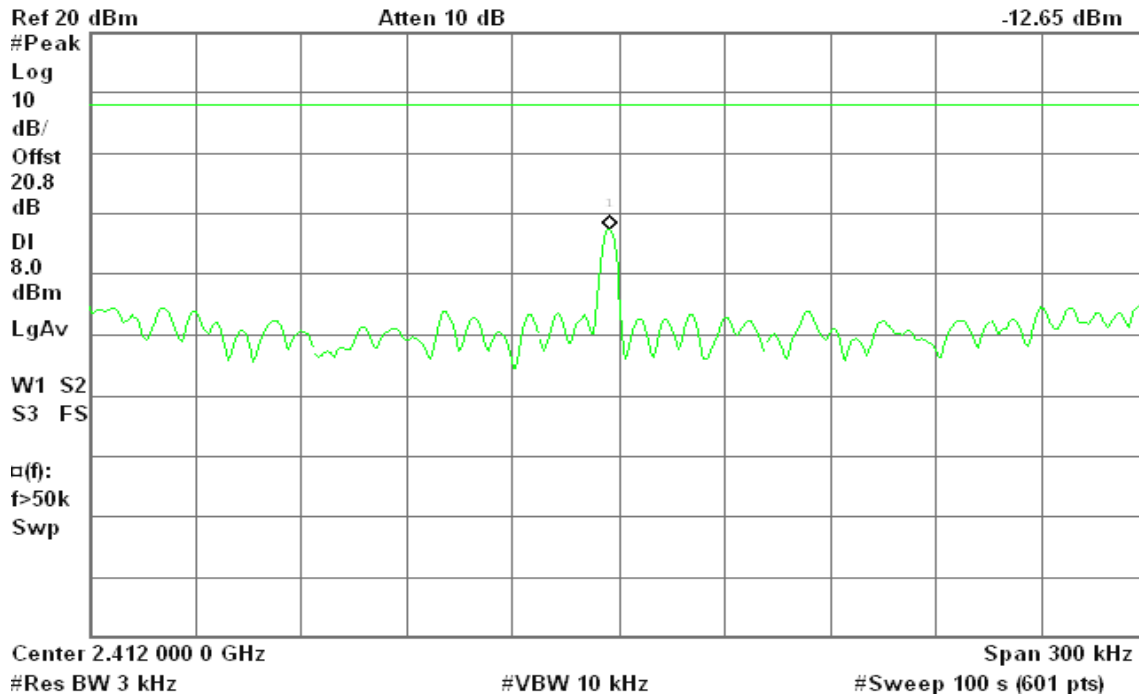
draft 802.11n Standard-20 MHz Channel mode / Chain 0

PPSD (CH Low)

Agilent 13:33:38 Nov 25, 2009

R T

Mkr1 2.411 997 0 GHz
-12.65 dBm

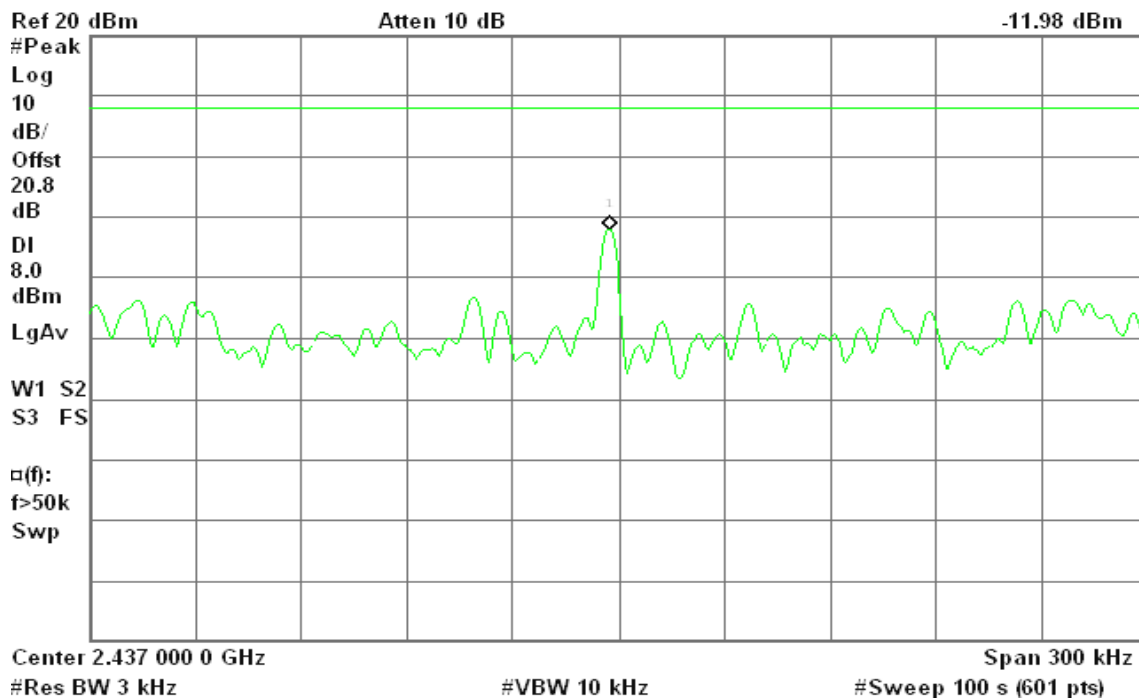


PPSD (CH Mid)

Agilent 13:47:28 Nov 25, 2009

R T

Mkr1 2.436 997 0 GHz
-11.98 dBm



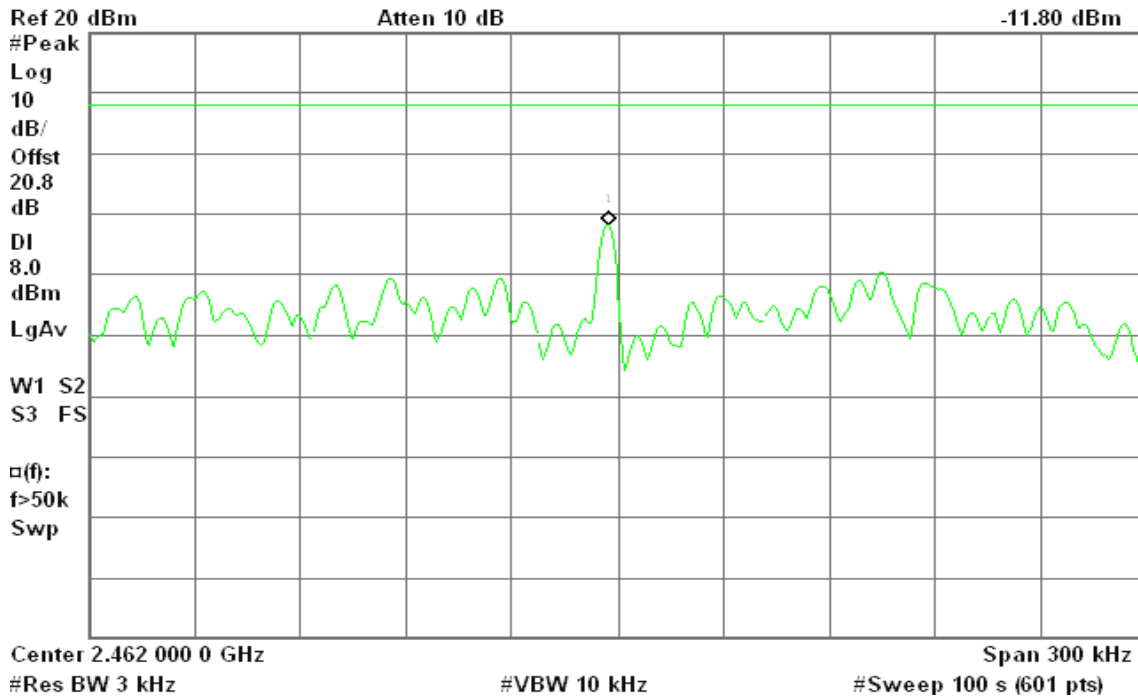


PPSD (CH High)

Agilent 14:00:49 Nov 25, 2009

R T

Mkr1 2.461 997 0 GHz
-11.80 dBm



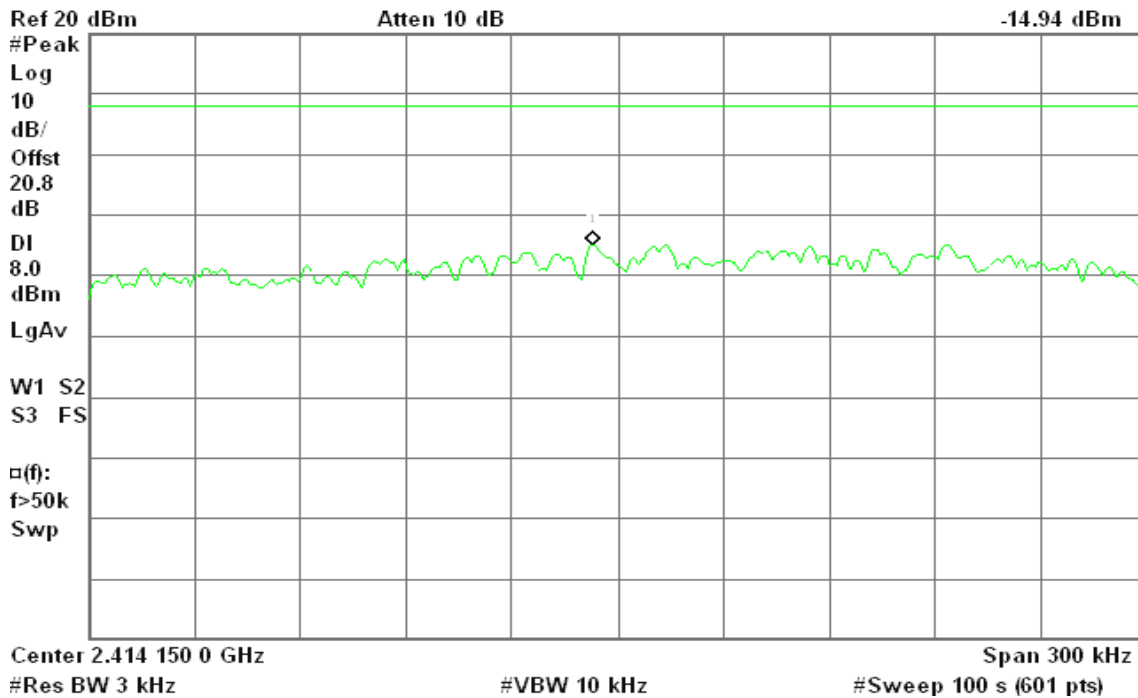
draft 802.11n Standard-20 MHz Channel mode / Chain 1

PPSD (CH Low)

Agilent 10:51:50 Nov 26, 2009

R T

Mkr1 2.414 142 5 GHz
-14.94 dBm



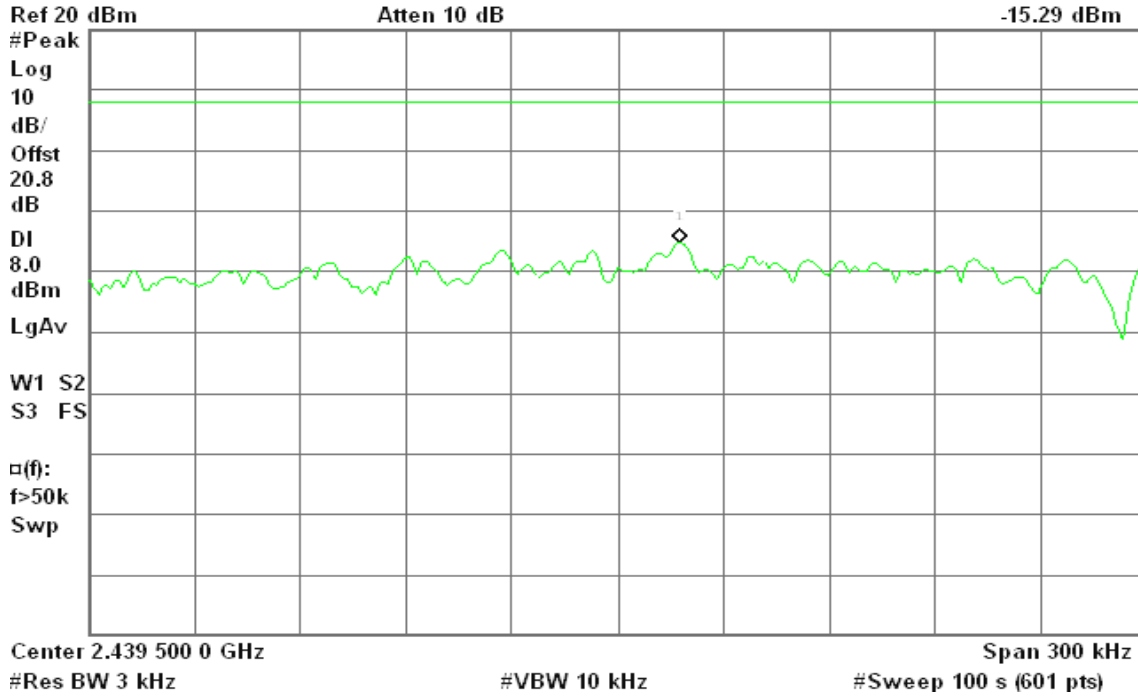


PPSD (CH Mid)

Agilent 11:00:33 Nov 26, 2009

R T

Mkr1 2.439 517 6 GHz
-15.29 dBm

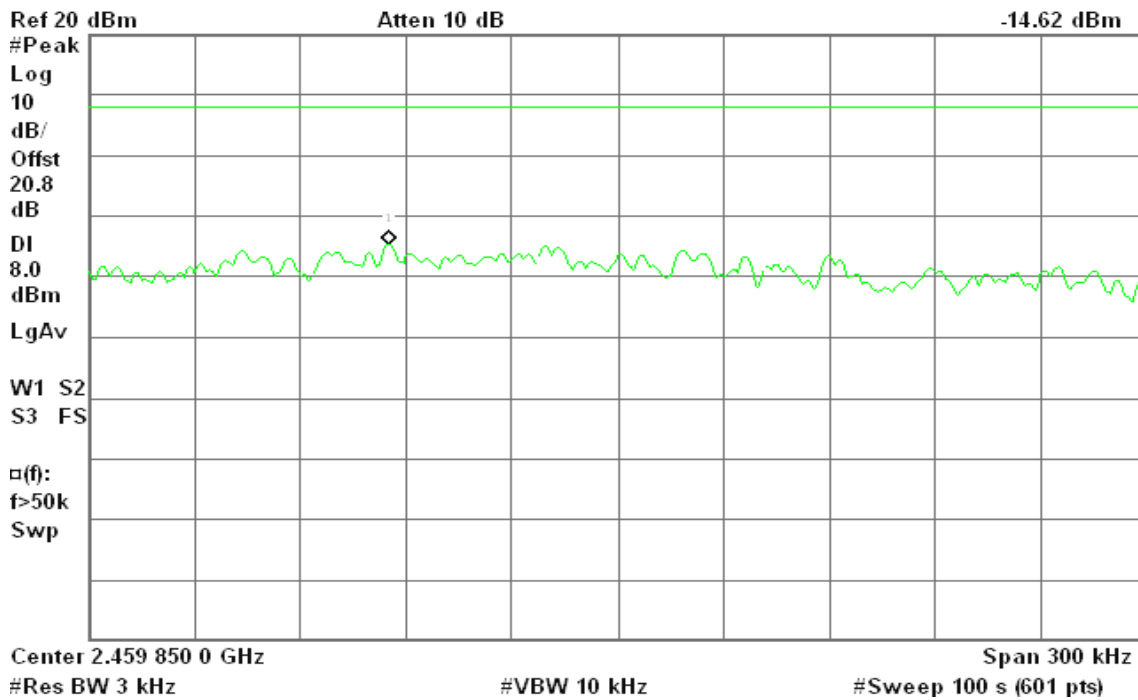


PPSD (CH High)

Agilent 12:23:23 Nov 26, 2009

R T

Mkr1 2.459 784 8 GHz
-14.62 dBm





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

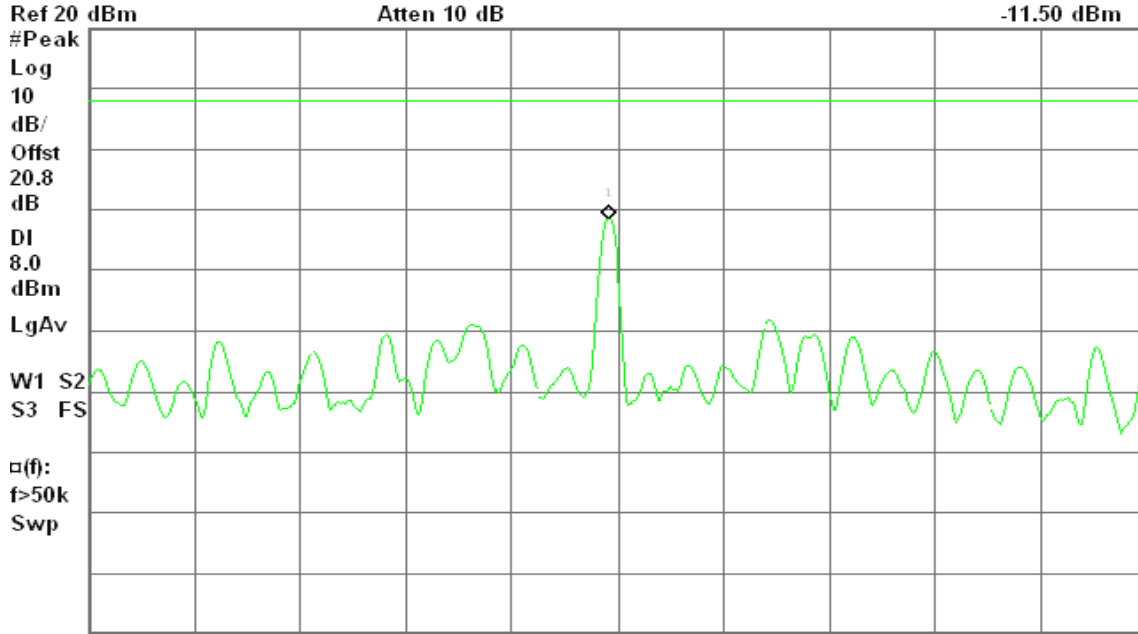
PPSD (CH Low)

Agilent 14:27:03 Nov 25, 2009

R T

Mkr1 2.421 997 0 GHz

-11.50 dBm



Center 2.422 000 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)

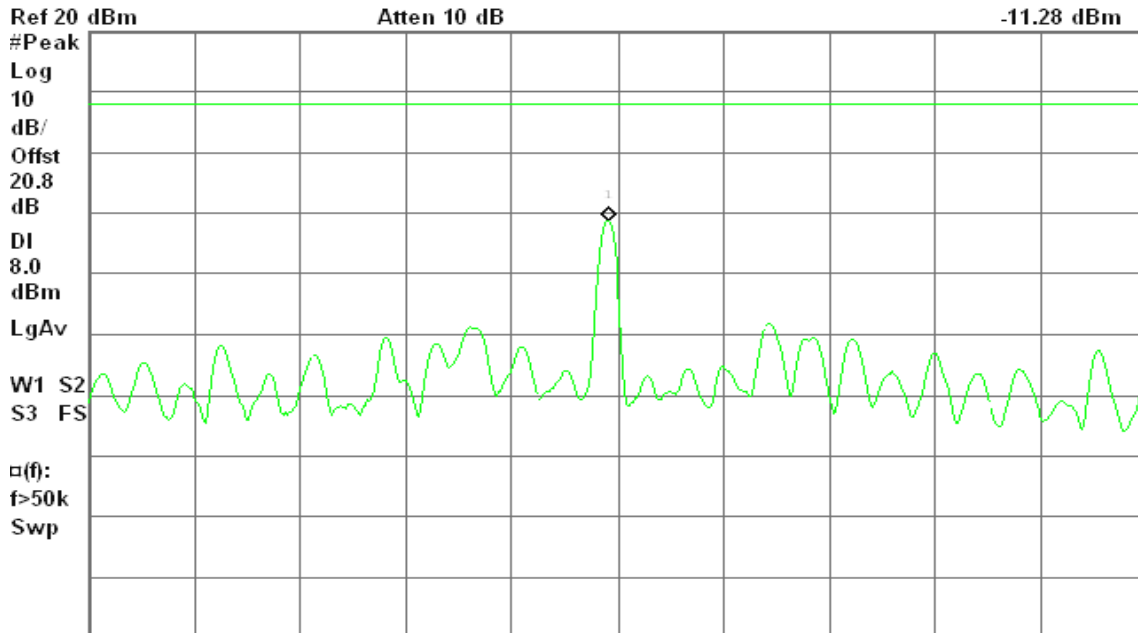
PPSD (CH Mid)

Agilent 14:35:53 Nov 25, 2009

R T

Mkr1 2.436 997 0 GHz

-11.28 dBm



Center 2.437 000 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)

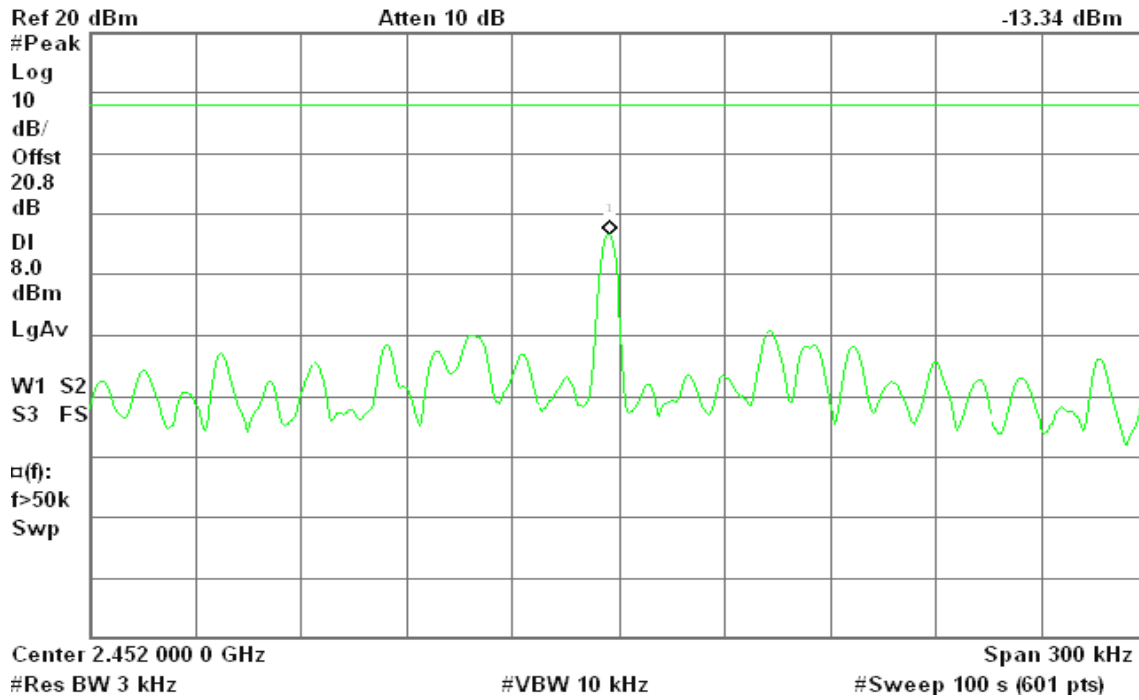


PPSD (CH High)

Agilent 14:47:25 Nov 25, 2009

R L

Mkr1 2.451 997 0 GHz
-13.34 dBm



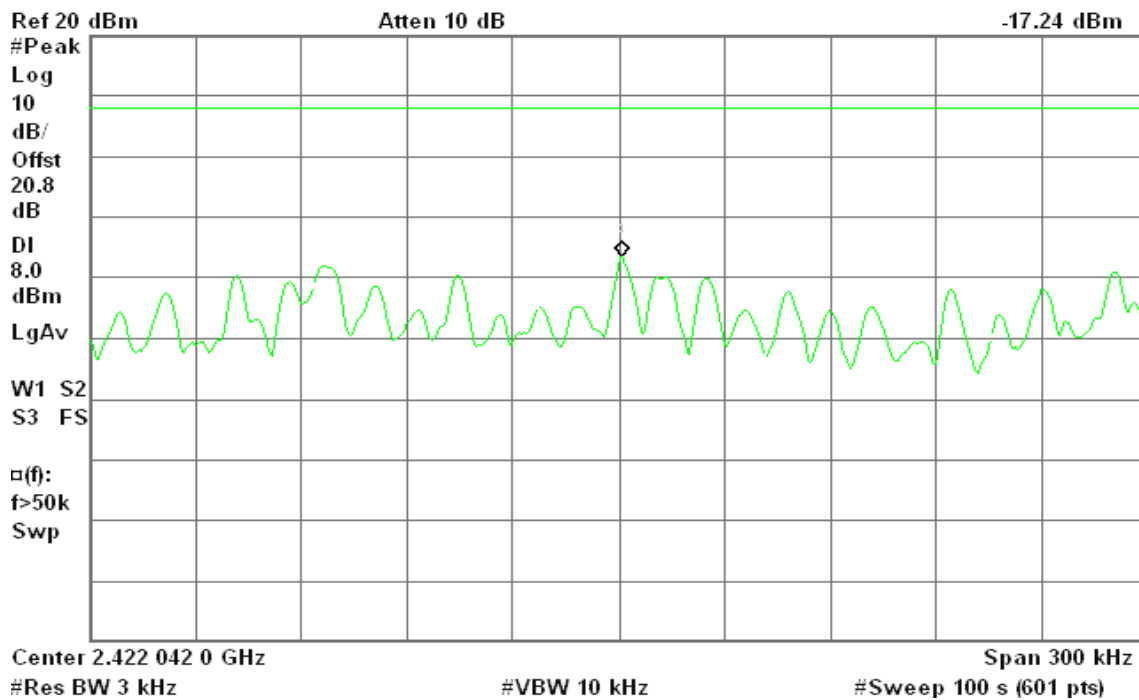
draft 802.11n Wide-40 MHz Channel mode / Chain 1

PPSD (CH Low)

Agilent 15:18:45 Nov 25, 2009

R T

Mkr1 2.422 043 0 GHz
-17.24 dBm



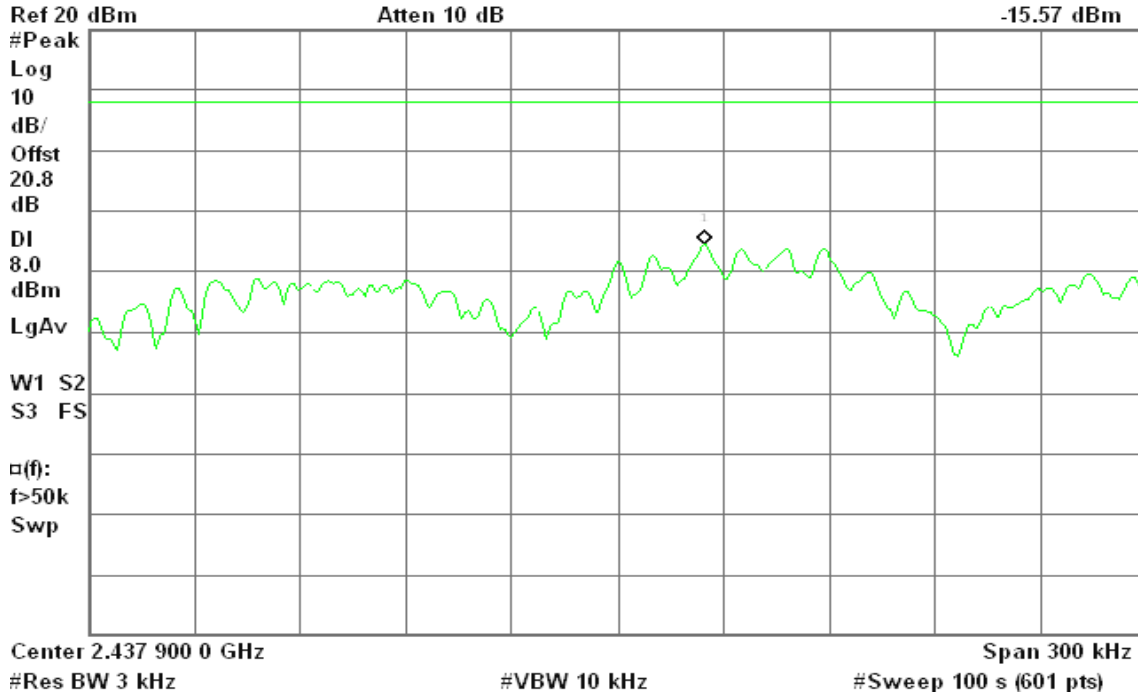


PPSD (CH Mid)

Agilent 15:39:45 Nov 25, 2009

R L

Mkr1 2.437 924 6 GHz
-15.57 dBm

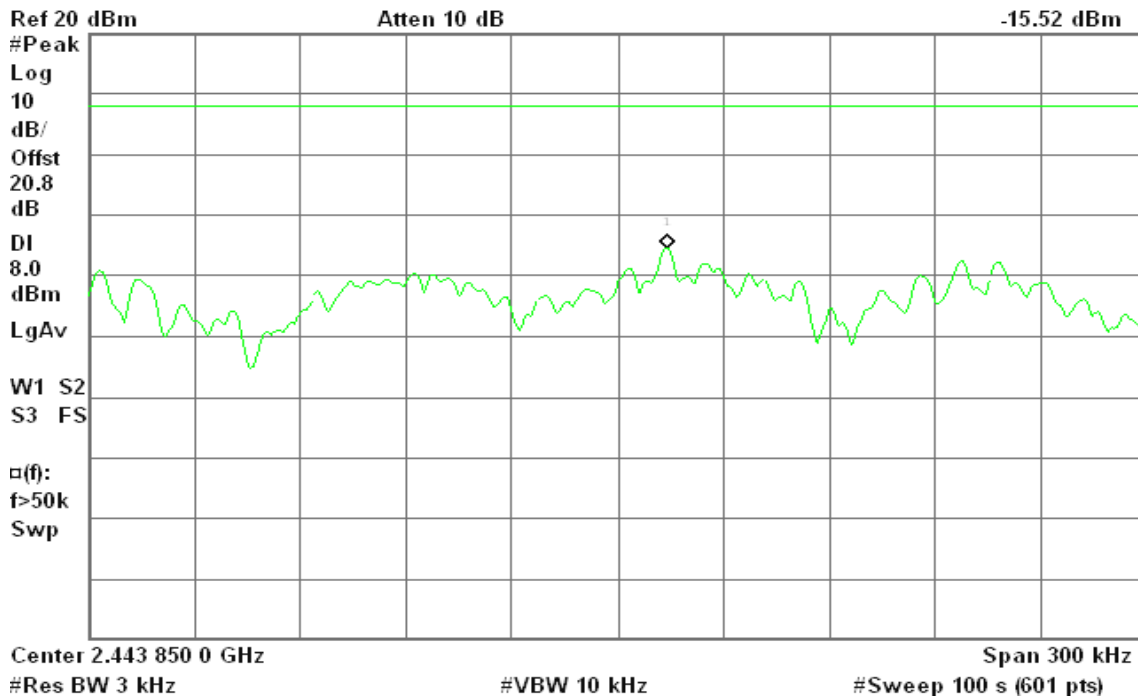


PPSD (CH High)

Agilent 15:46:04 Nov 25, 2009

R T

Mkr1 2.443 864 1 GHz
-15.52 dBm





draft 802.11n Standard-20 MHz Channel mode with combiner

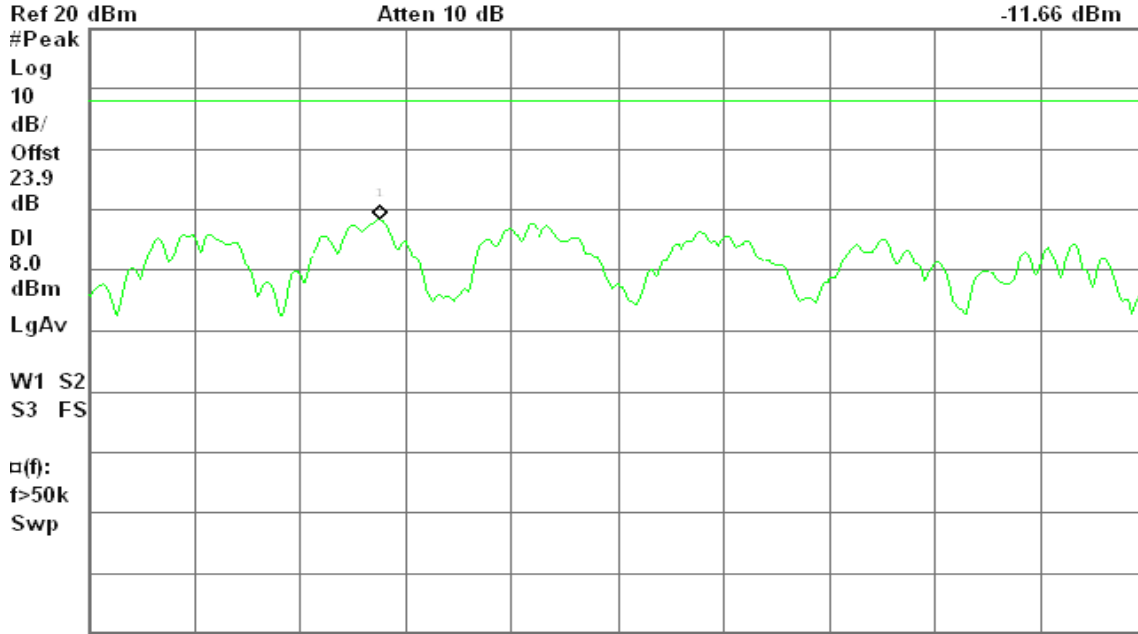
PPSD (CH Low)

Agilent 09:25:26 Nov 26, 2009

R T

Mkr1 2.414 482 1 GHz

-11.66 dBm



Center 2.414 550 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)

PPSD (CH Mid)

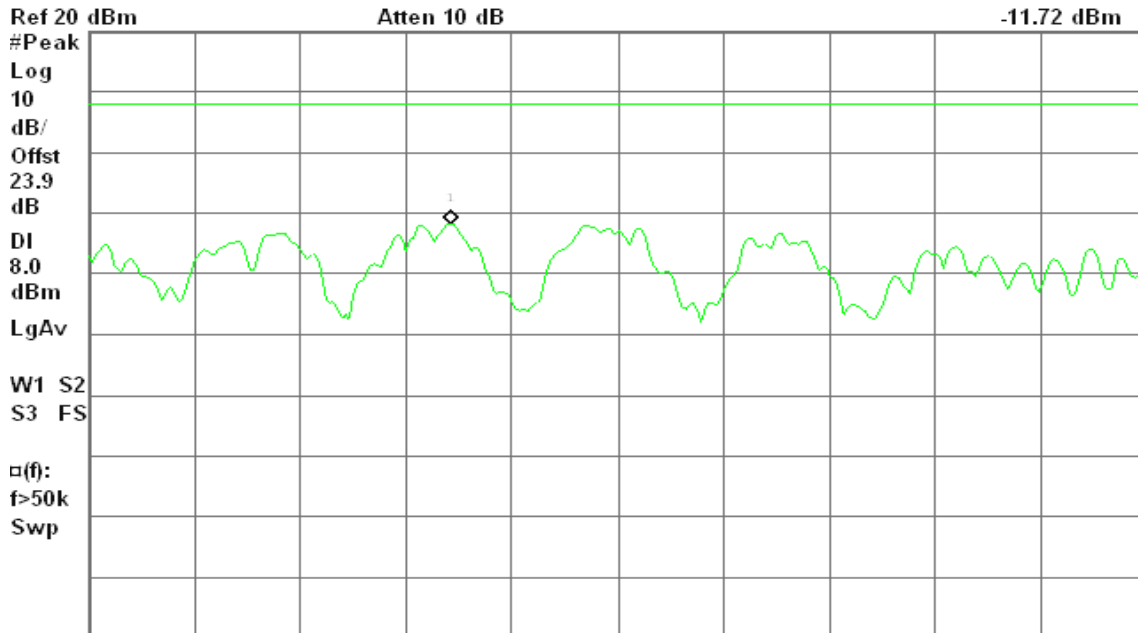
Agilent 09:39:33 Nov 26, 2009

R T

Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.439 802 9 GHz

-11.72 dBm



Center 2.439 850 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)

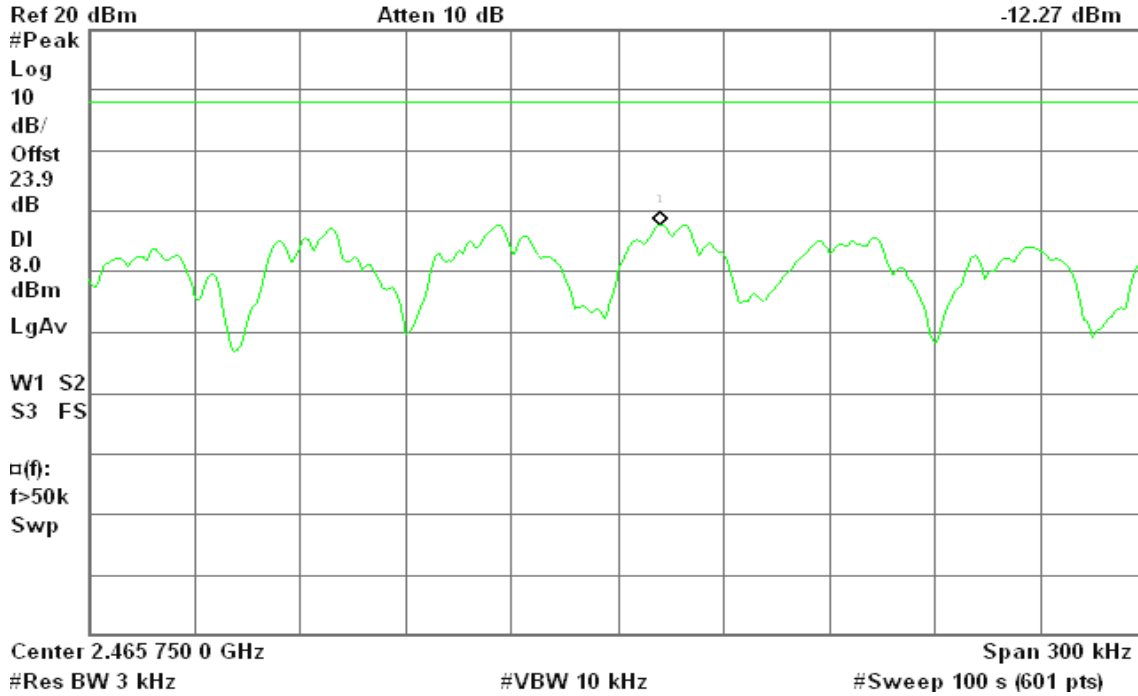


PPSD (CH High)

Agilent 09:44:40 Nov 26, 2009

R T

Mkr1 2.465 762 0 GHz
-12.27 dBm



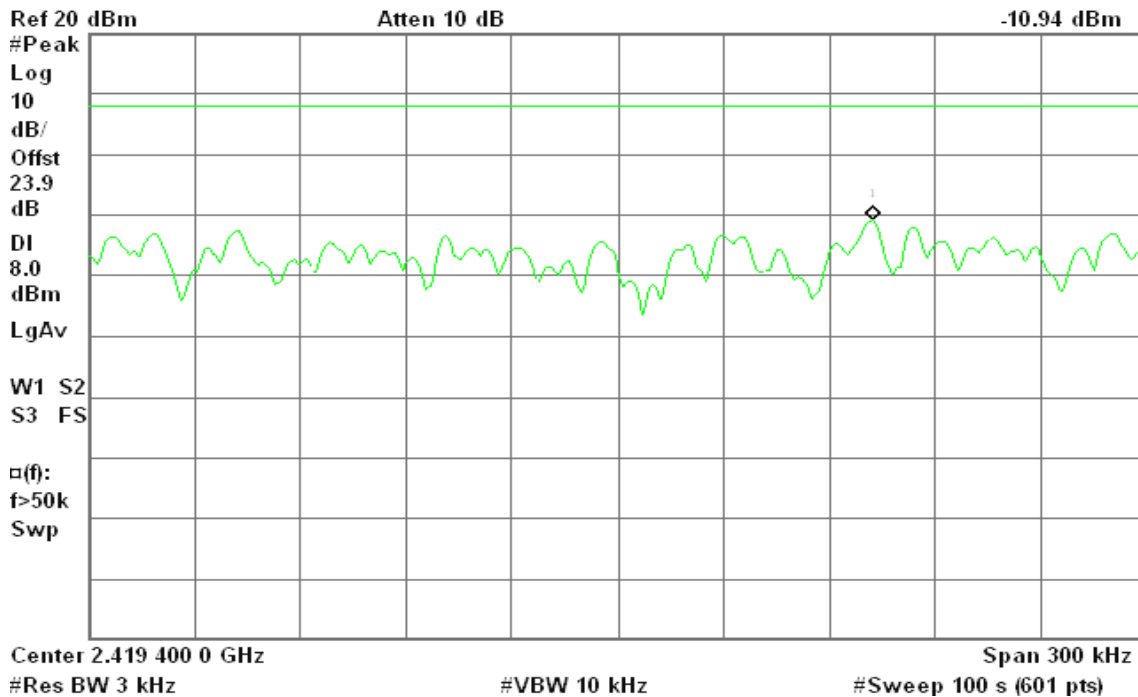
draft 802.11n Wide-40 MHz Channel mode with combiner

PPSD (CH Low)

Agilent 09:55:45 Nov 26, 2009

R T

Mkr1 2.419 472 9 GHz
-10.94 dBm



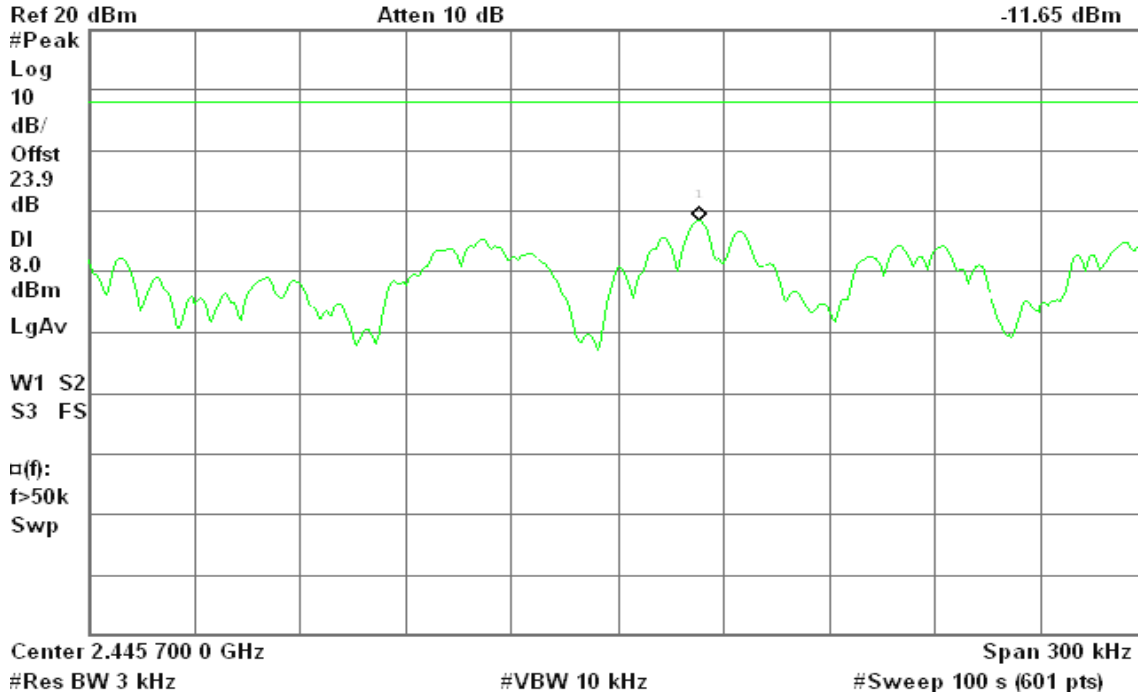


PPSD (CH Mid)

Agilent 10:21:09 Nov 26, 2009

R T

Mkr1 2.445 723 1 GHz
-11.65 dBm

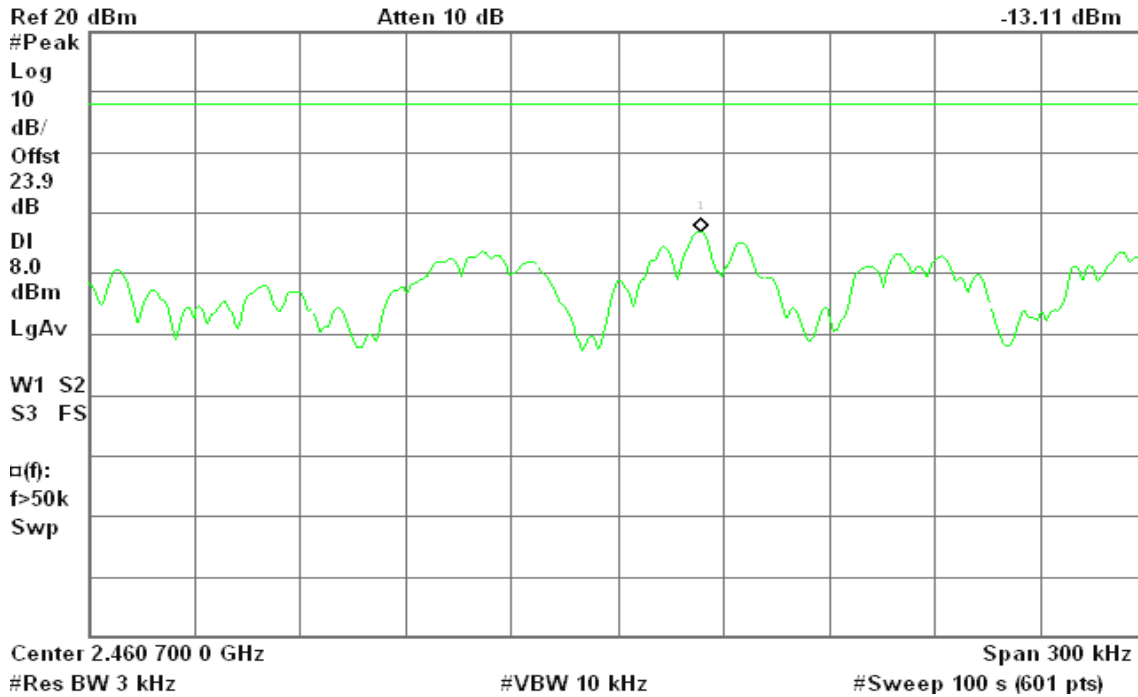


PPSD (CH High)

Agilent 10:14:18 Nov 26, 2009

R T

Mkr1 2.460 723 6 GHz
-13.11 dBm



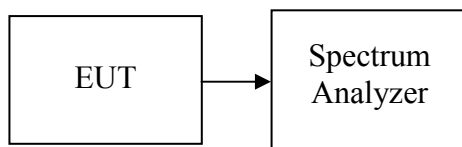
7.6 SPURIOUS EMISSIONS

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

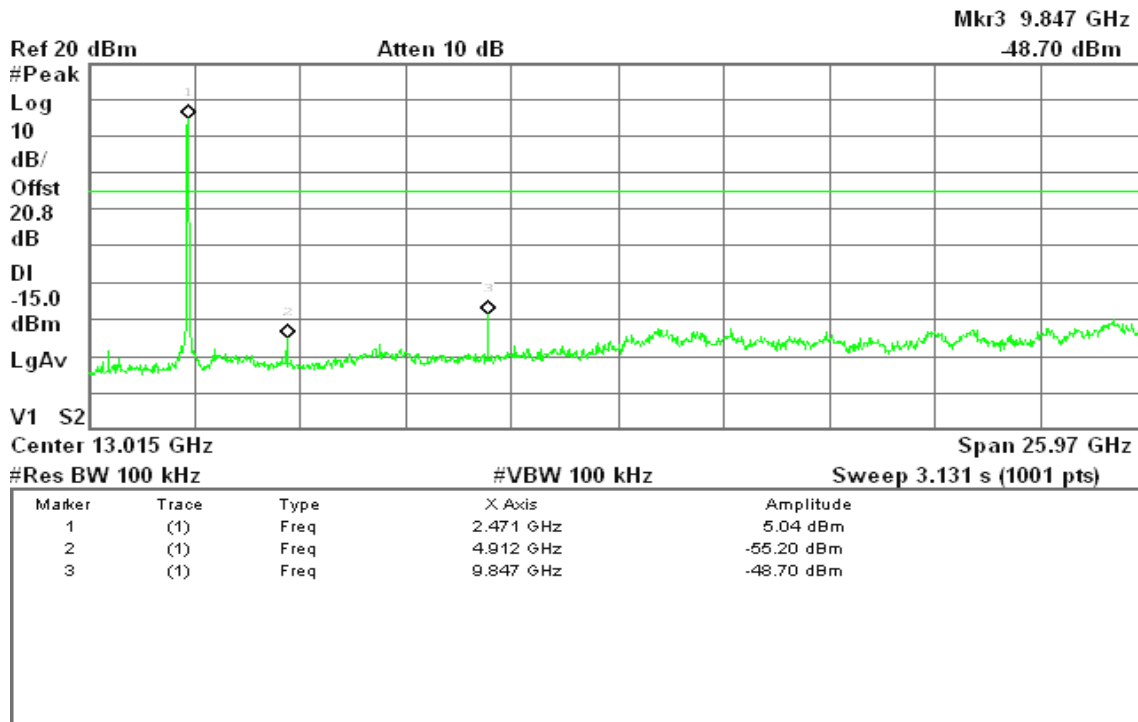
No non-compliance noted



CH High

Agilent 10:31:59 Nov 25, 2009

R T

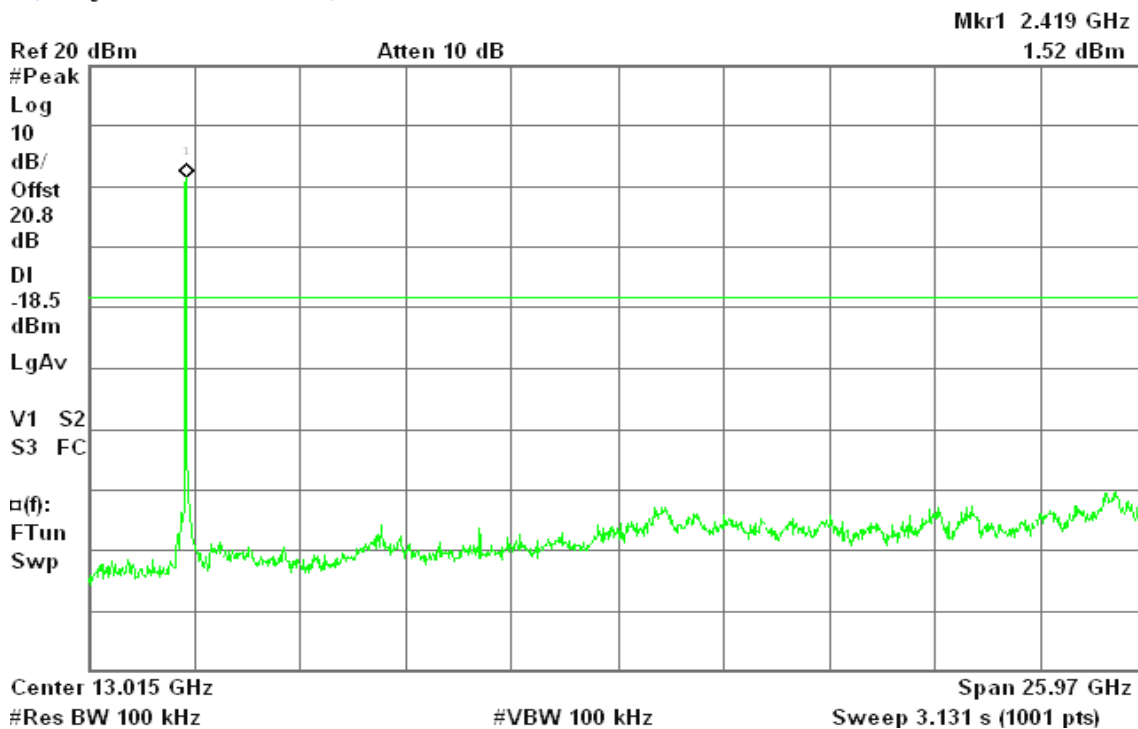


IEEE 802.11g mode

CH Low

Agilent 10:57:26 Nov 25, 2009

R T



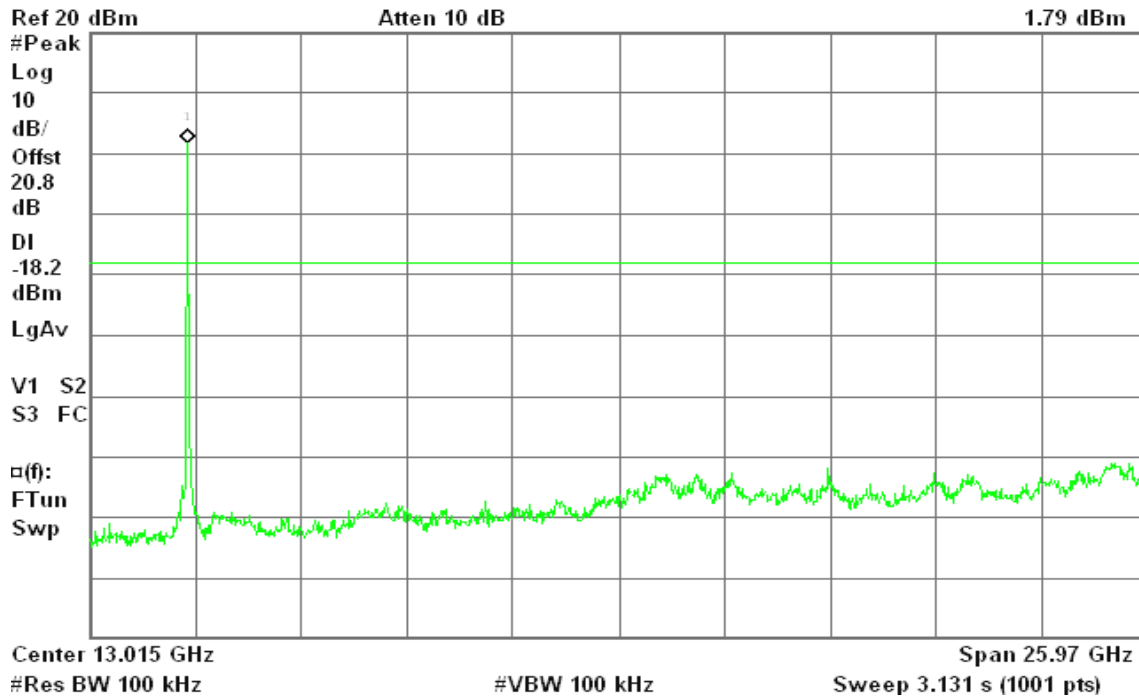


CH Mid

Agilent 12:14:08 Nov 25, 2009

R T

Mkr1 2.445 GHz
1.79 dBm

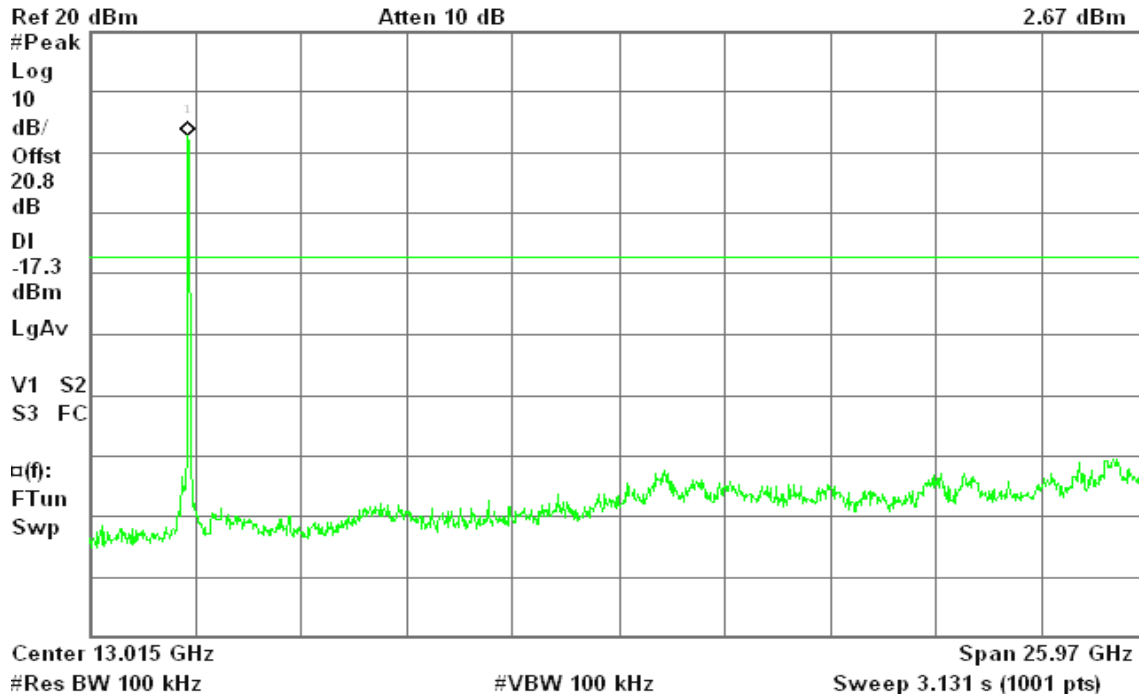


CH High

Agilent 12:26:18 Nov 25, 2009

R T

Mkr1 2.445 GHz
2.67 dBm



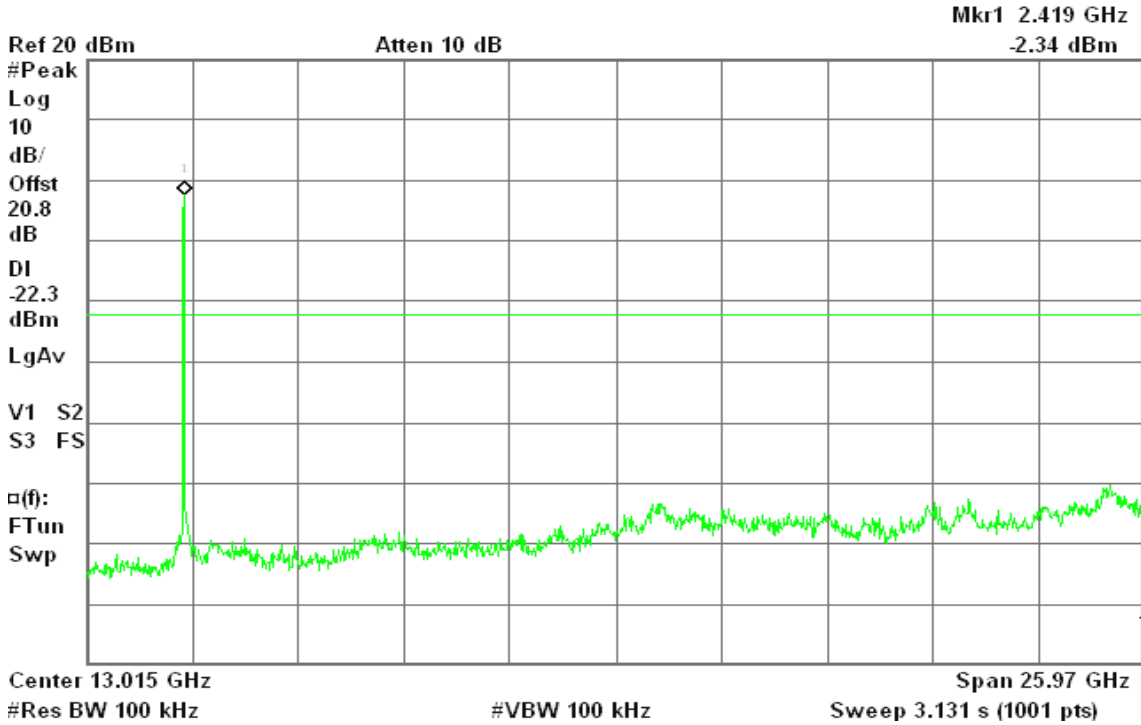


draft 802.11n Standard-20 MHz Channel mode / Chain 0

CH Low

Agilent 13:35:26 Nov 25, 2009

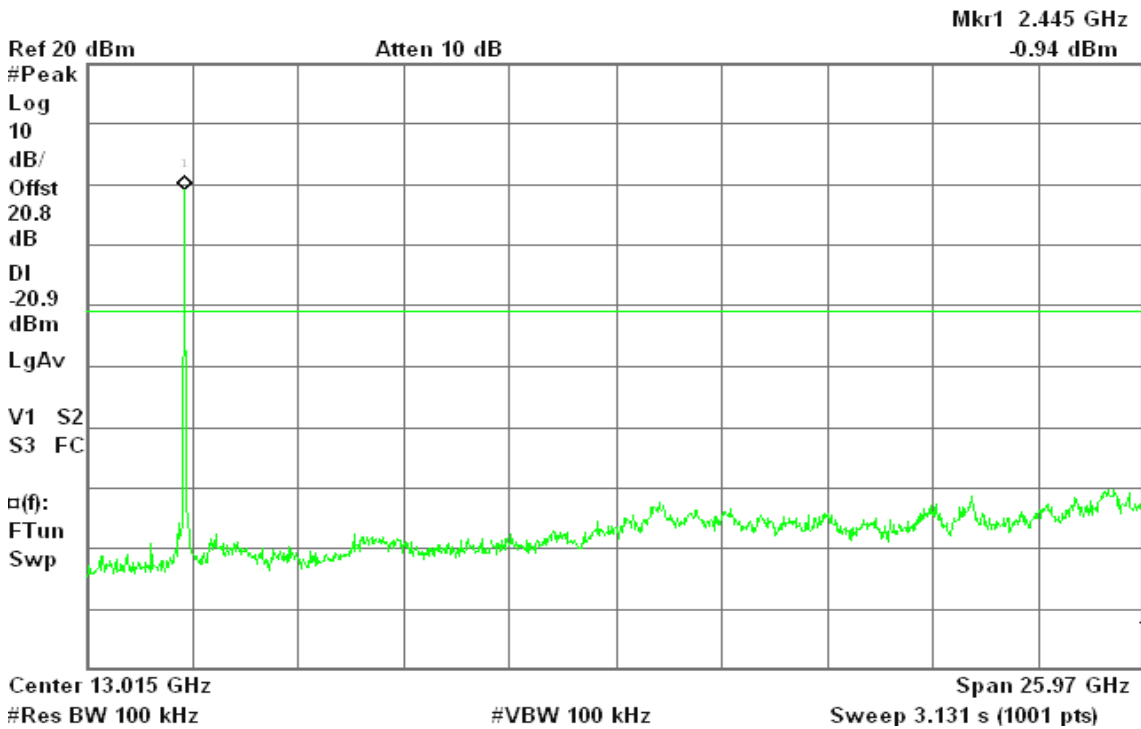
R T



CH Mid

Agilent 13:49:00 Nov 25, 2009

R T



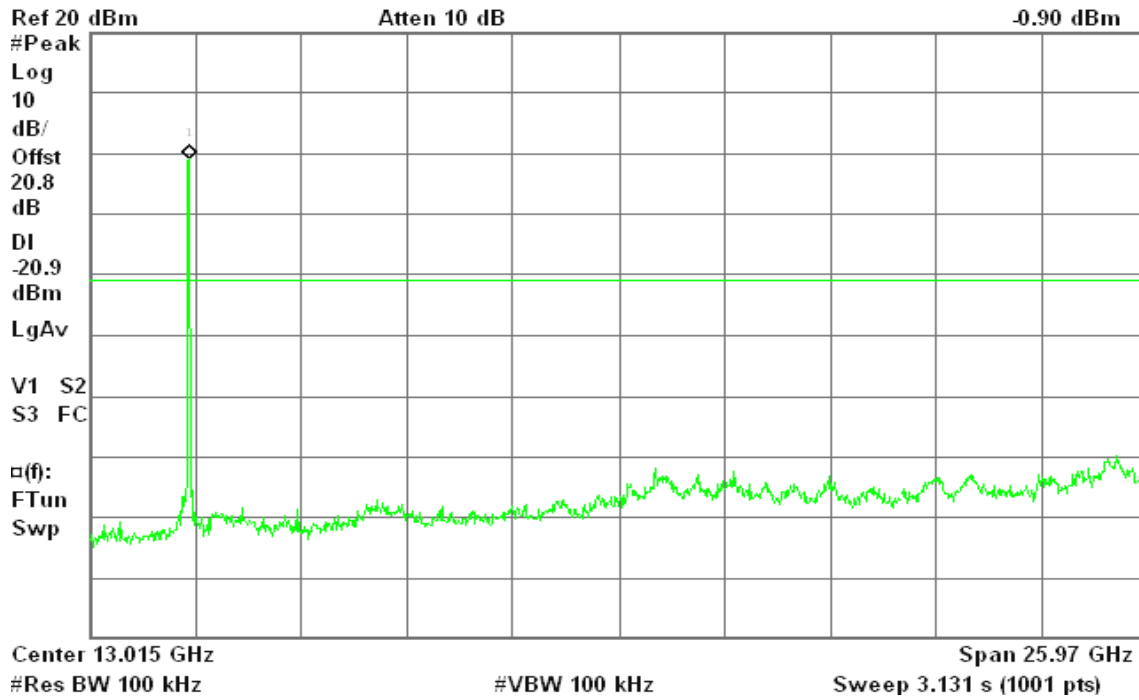


CH High

Agilent 14:02:43 Nov 25, 2009

R T

Mkr1 2.471 GHz
-0.90 dBm



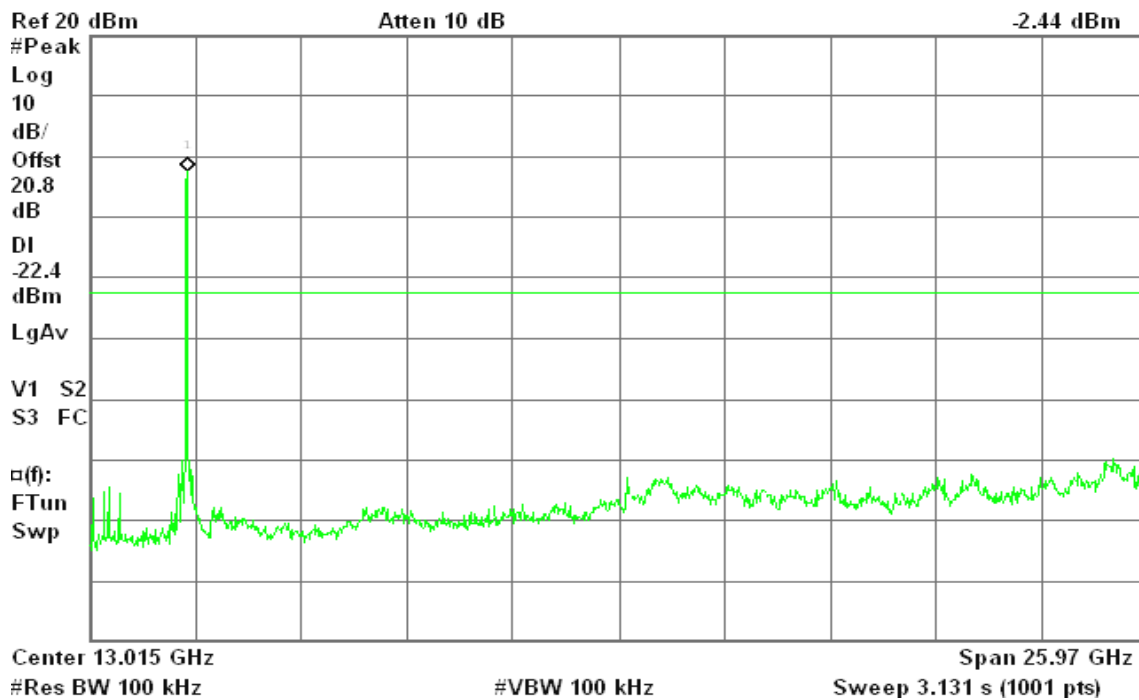
draft 802.11n Standard-20 MHz Channel mode / Chain 1

CH Low

Agilent 10:53:24 Nov 26, 2009

R T

Mkr1 2.419 GHz
-2.44 dBm



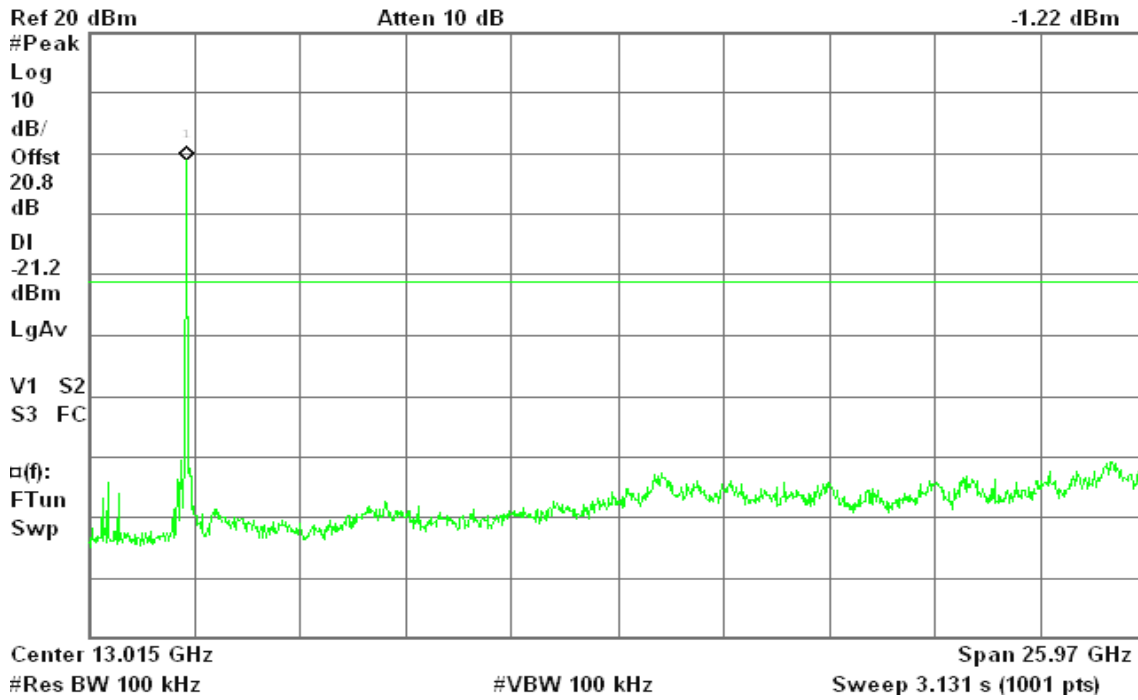


CH Mid

Agilent 11:01:44 Nov 26, 2009

R T

Mkr1 2.445 GHz
-1.22 dBm

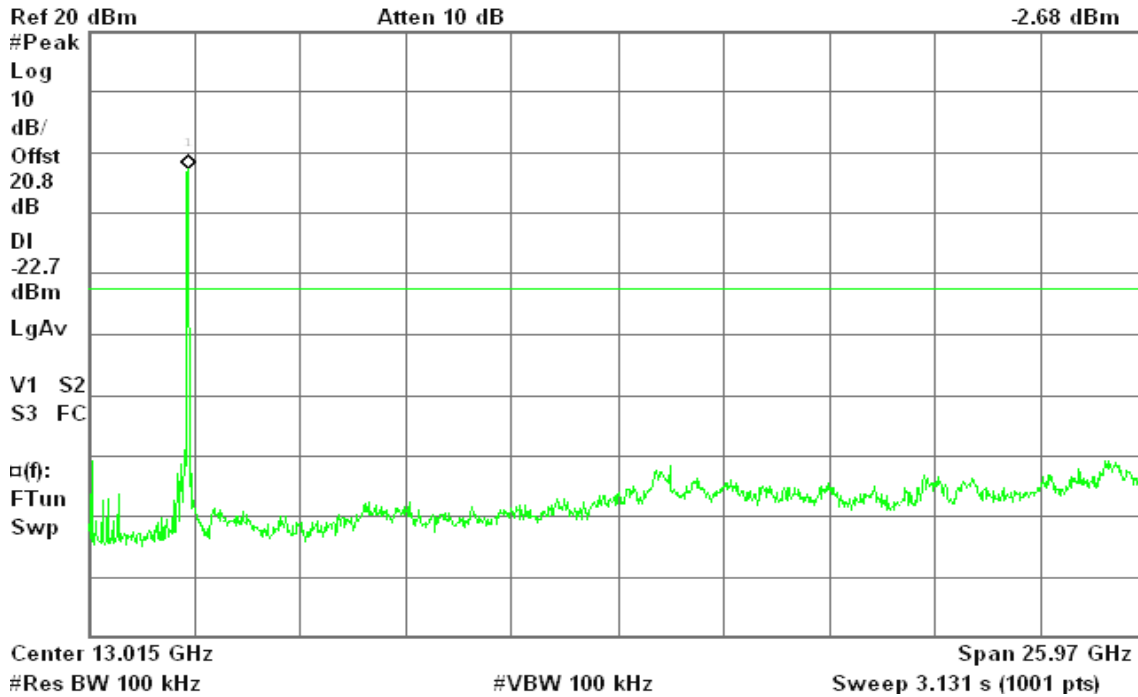


CH High

Agilent 12:24:24 Nov 26, 2009

R T

Mkr1 2.471 GHz
-2.68 dBm



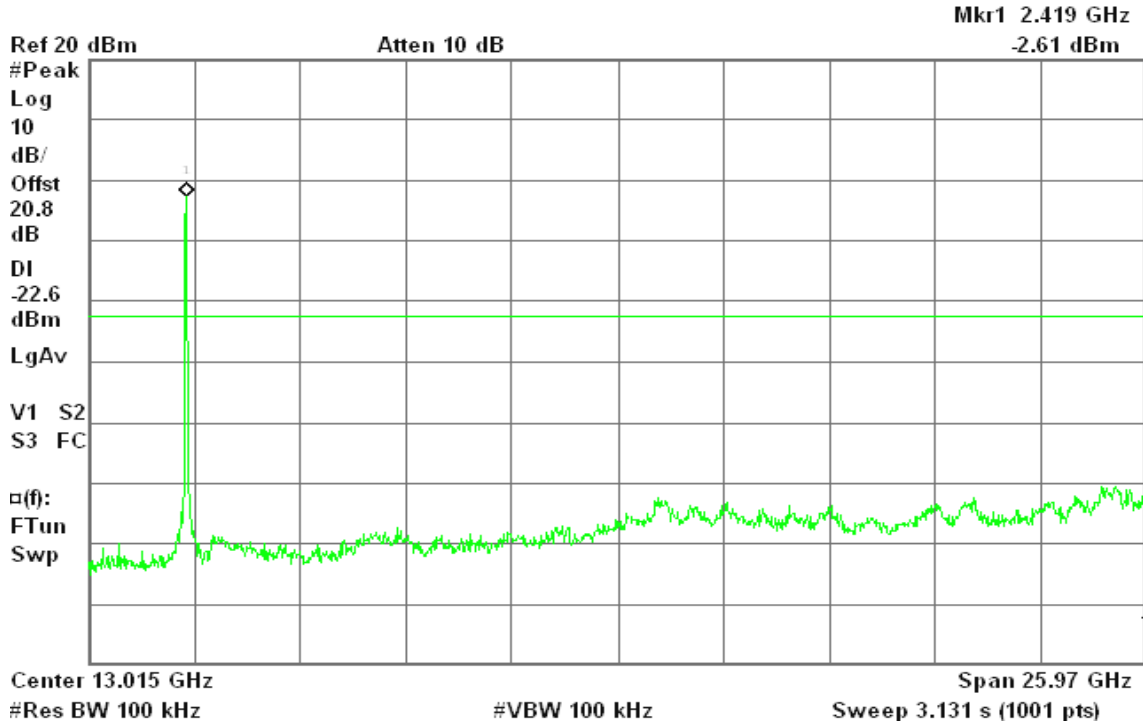


draft 802.11n Wide-40 MHz Channel mode / Chain 0

CH Low

Agilent 14:28:41 Nov 25, 2009

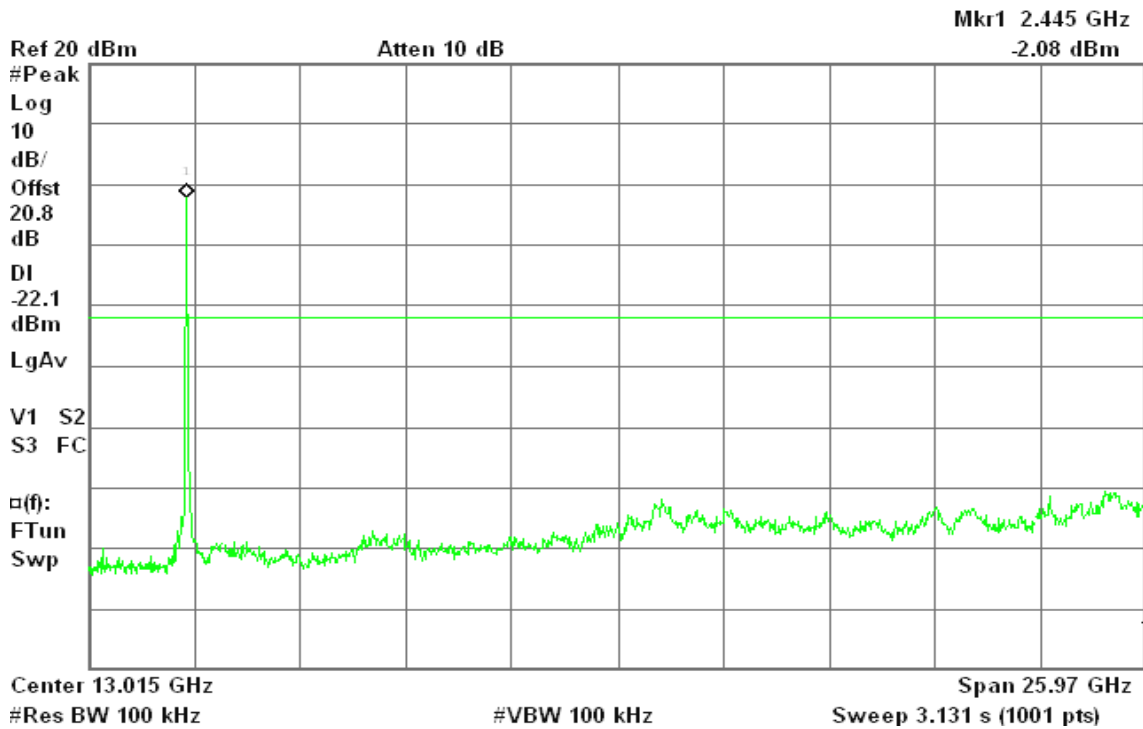
R T



CH Mid

Agilent 14:37:30 Nov 25, 2009

R T



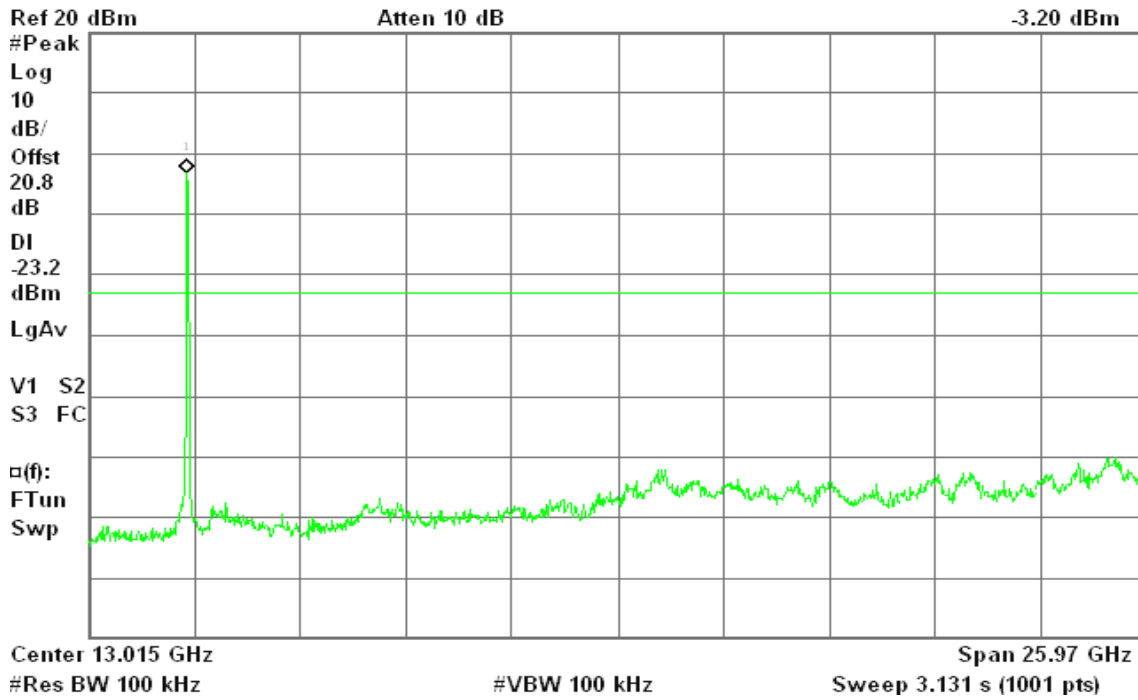


CH High

Agilent 14:48:44 Nov 25, 2009

R T

Mkr1 2.445 GHz
-3.20 dBm



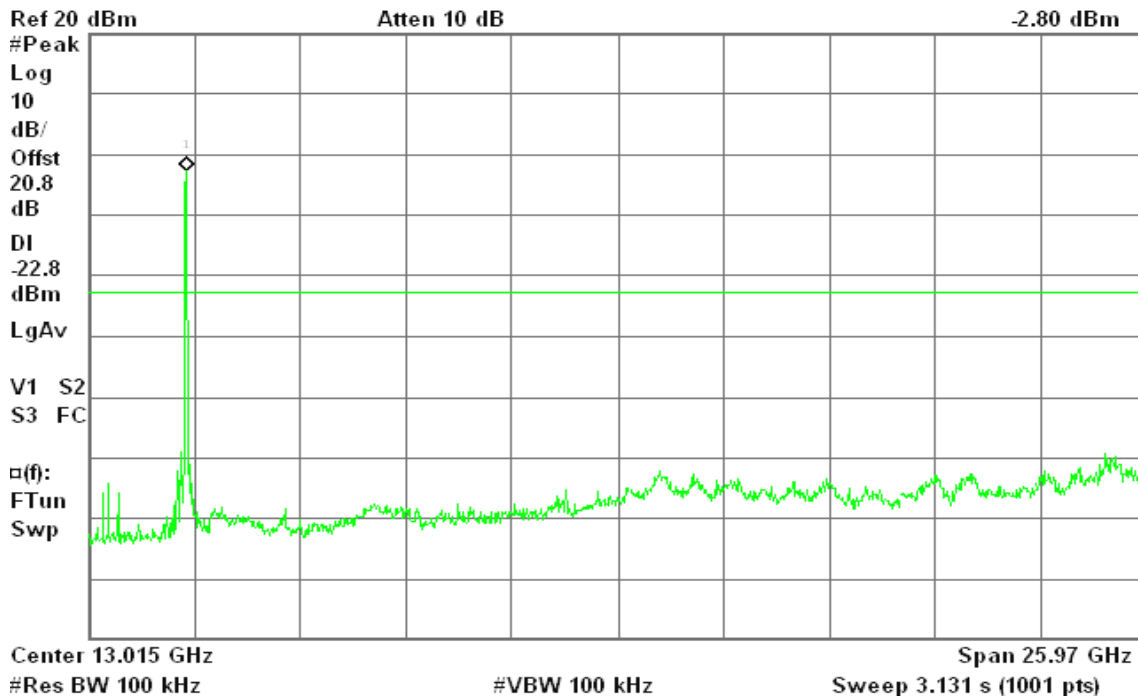
draft 802.11n Wide-40 MHz Channel mode / Chain 1

CH Low

Agilent 15:21:56 Nov 25, 2009

R T

Mkr1 2.419 GHz
-2.80 dBm



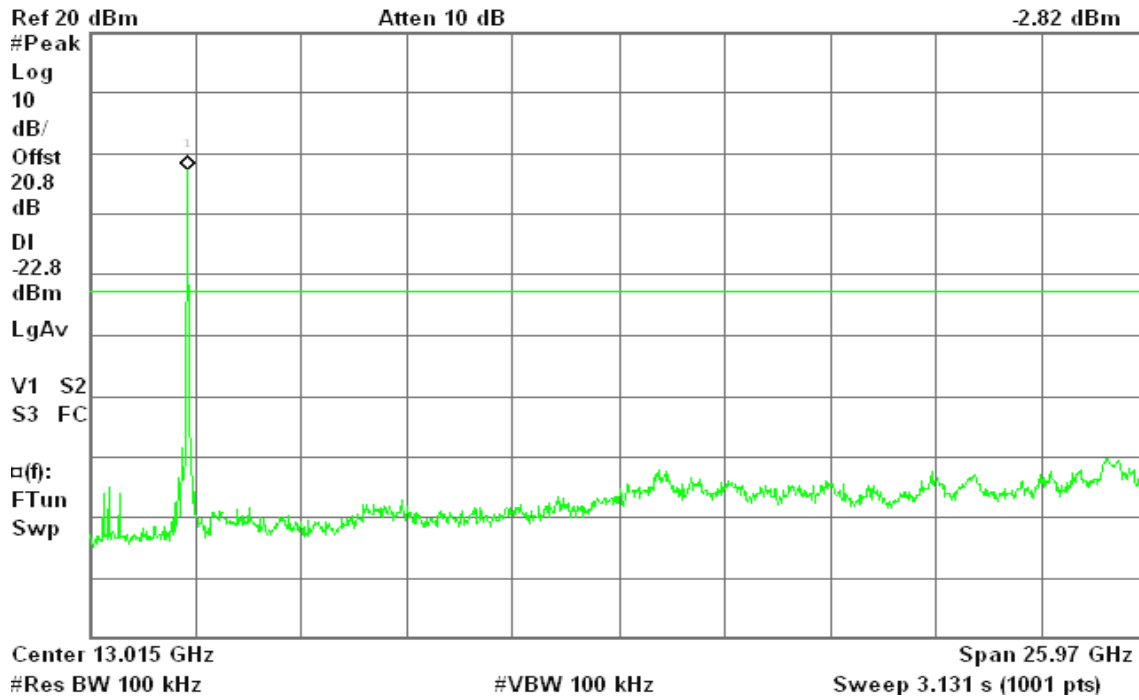


CH Mid

Agilent 15:41:19 Nov 25, 2009

R T

Mkr1 2.445 GHz
-2.82 dBm

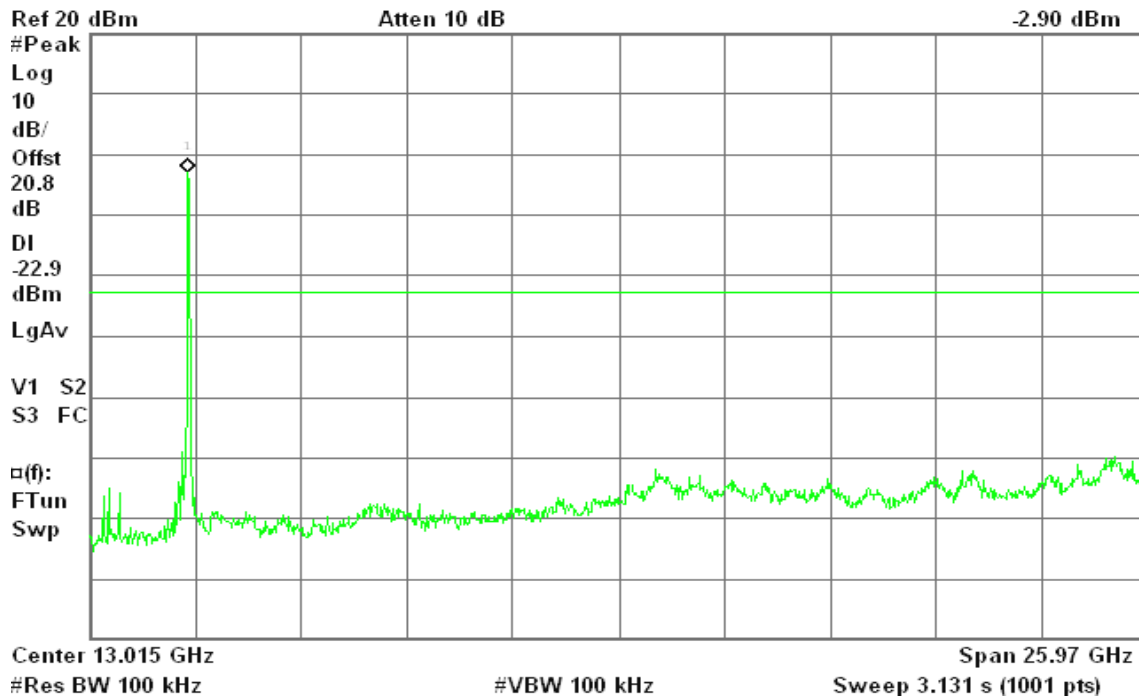


CH High

Agilent 15:47:21 Nov 25, 2009

R T

Mkr1 2.445 GHz
-2.90 dBm



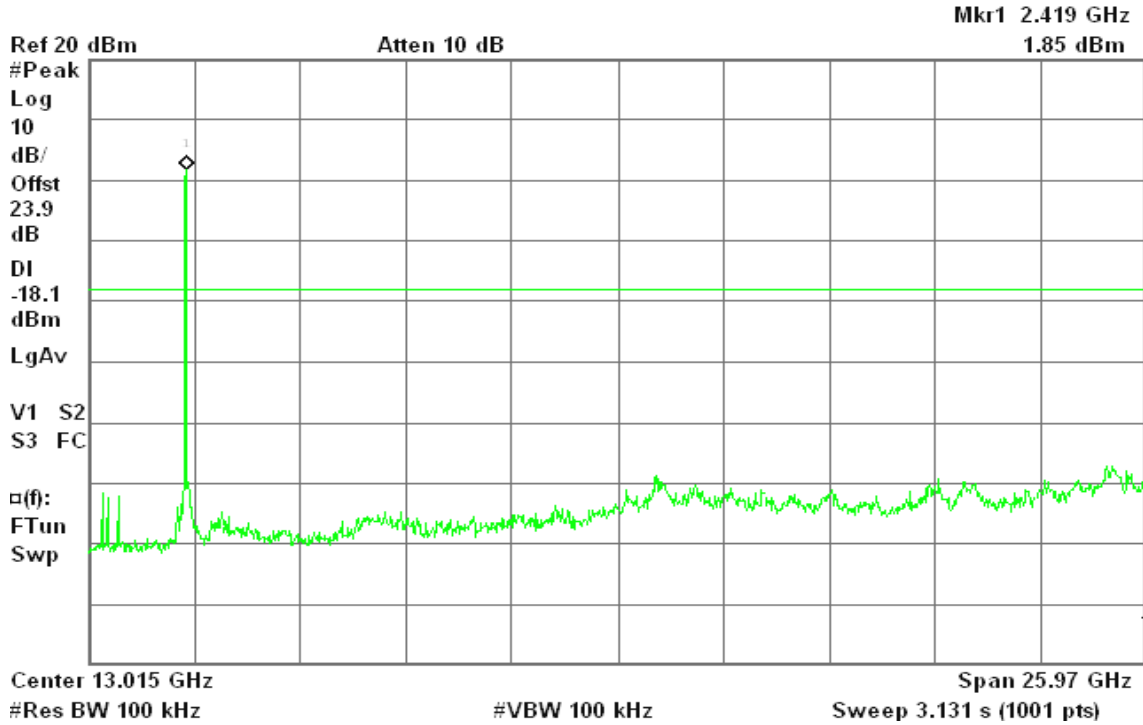


draft 802.11n Standard-20 MHz Channel mode with combiner

CH Low

Agilent 09:32:38 Nov 26, 2009

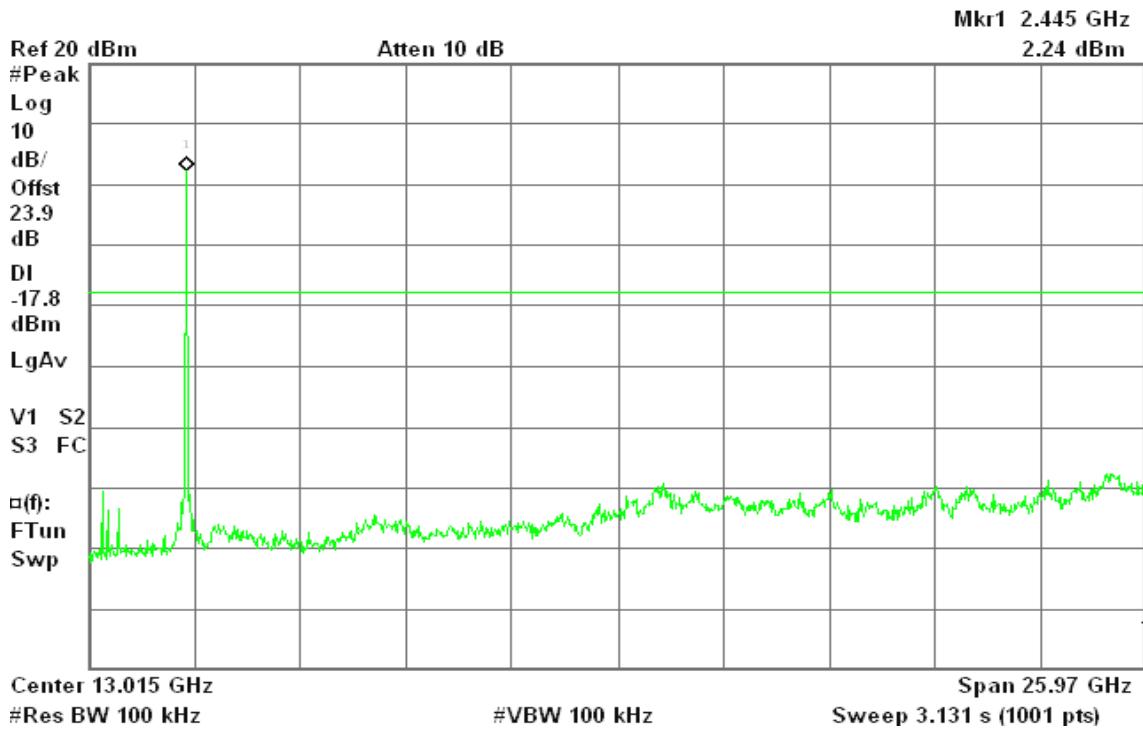
R T



CH Mid

Agilent 09:40:55 Nov 26, 2009

R T



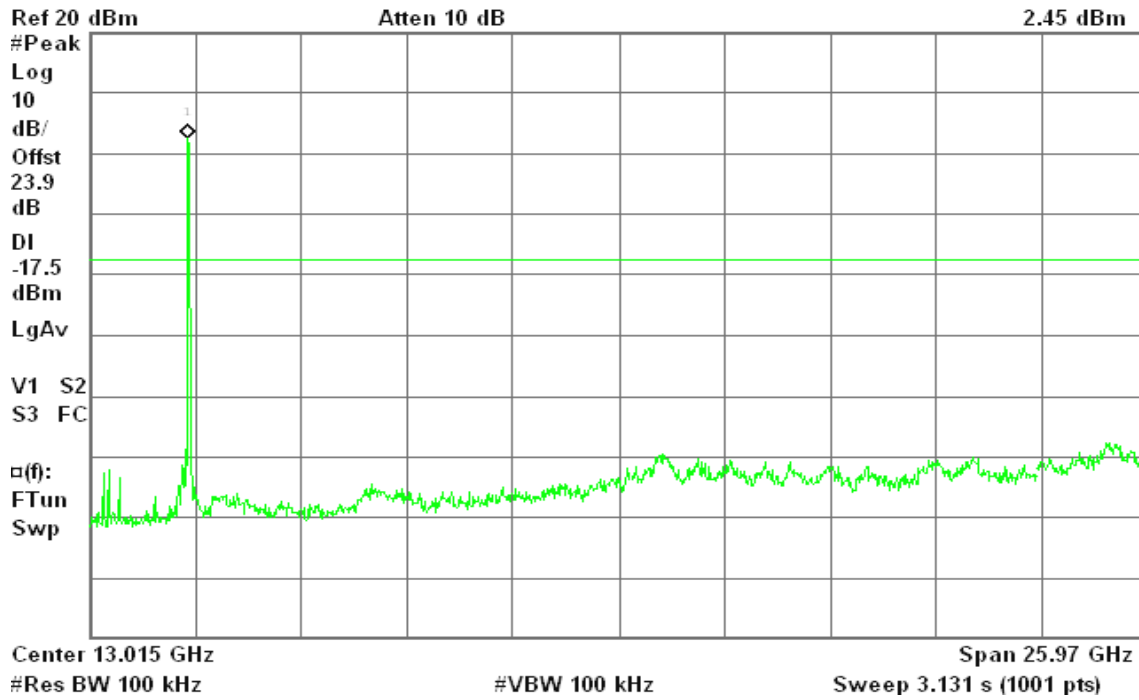


CH High

Agilent 09:47:38 Nov 26, 2009

R T

Mkr1 2.445 GHz
2.45 dBm



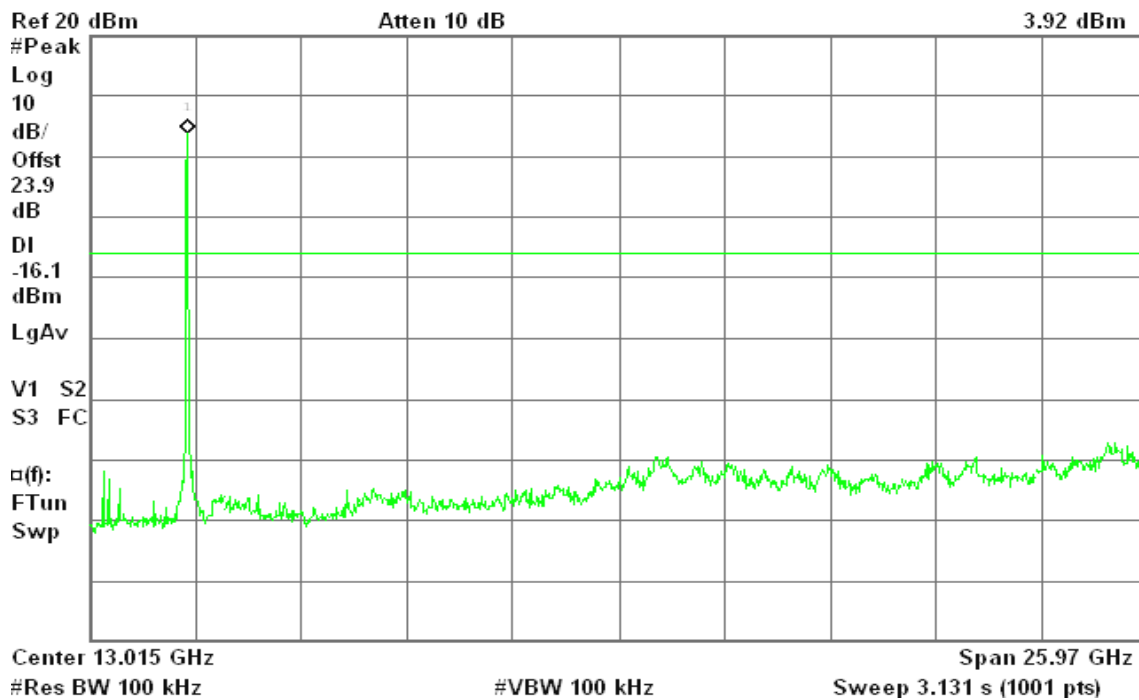
draft 802.11n Wide-40 MHz Channel mode with combiner

CH Low

Agilent 09:57:59 Nov 26, 2009

R T

Mkr1 2.419 GHz
3.92 dBm



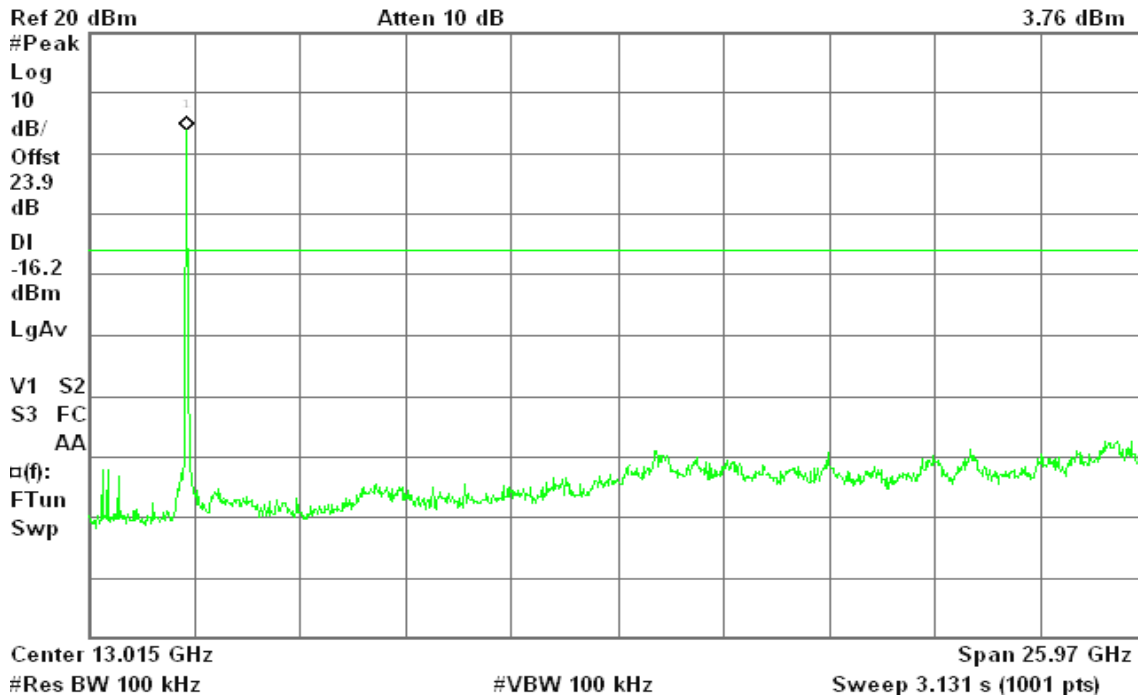


CH Mid

Agilent 10:07:27 Nov 26, 2009

R T

Mkr1 2.419 GHz
3.76 dBm

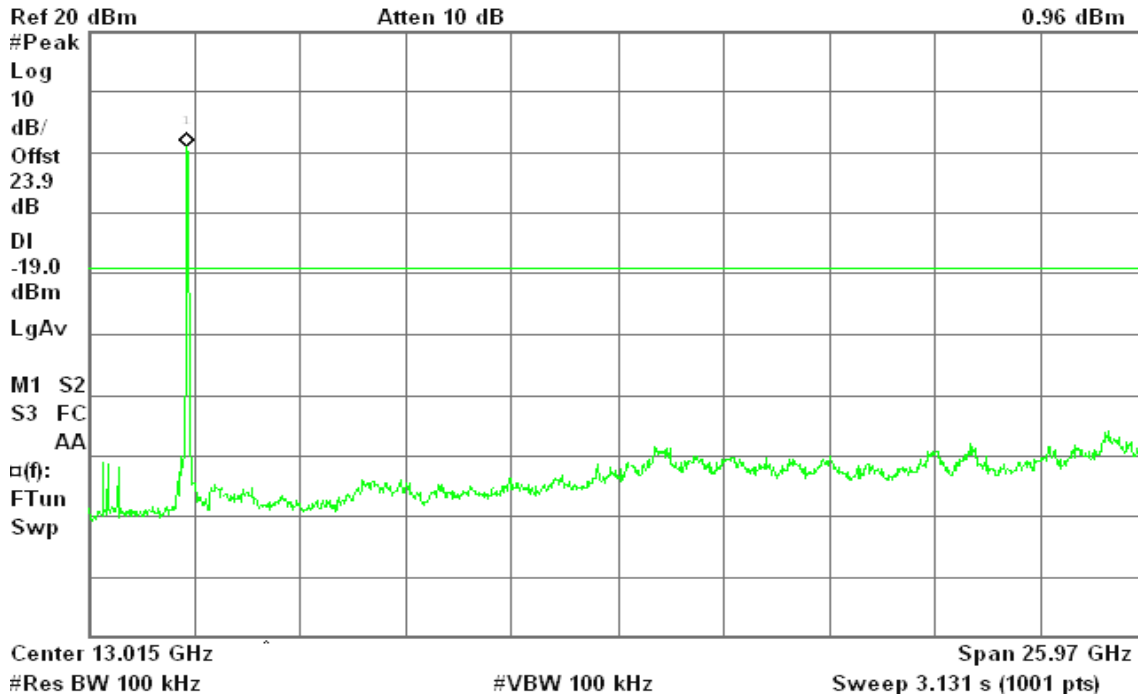


CH High

Agilent 10:10:44 Nov 26, 2009

R T

Mkr1 2.445 GHz
0.96 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 ($\mu\text{V/m}$)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

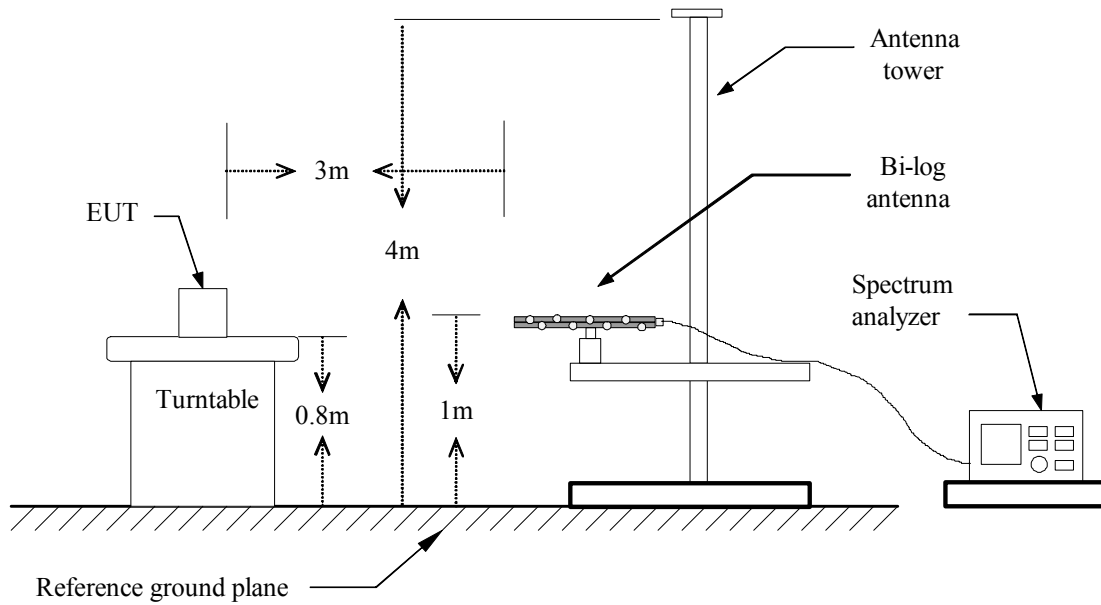
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

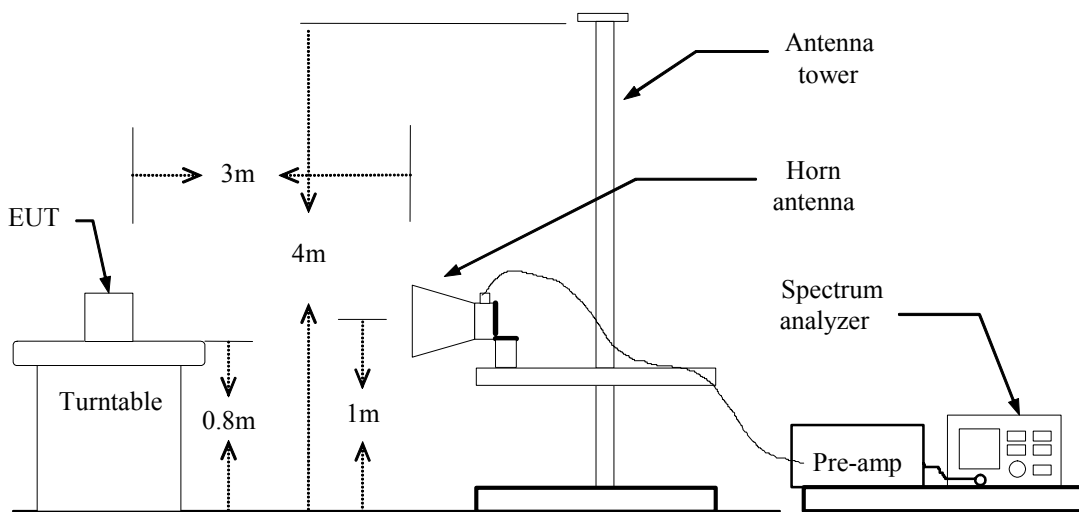
Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

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****For TEW-635BRM (Twin Dipole Antenna)****Below 1GHz****Operation Mode:** Normal Link**Test Date:** November 24, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
52.63	V	50.26	-15.12	35.14	40.00	-4.86	Peak
146.40	V	45.03	-9.87	35.16	43.50	-8.34	QP
232.08	V	48.48	-10.85	37.63	46.00	-8.37	Peak
400.22	V	47.59	-6.39	41.20	46.00	-4.80	QP
639.48	V	39.18	-1.97	37.21	46.00	-8.79	Peak
666.97	V	38.86	-1.57	37.28	46.00	-8.72	Peak
144.78	H	51.15	-9.81	41.34	43.50	-2.16	Peak
266.03	H	52.87	-9.38	43.49	46.00	-2.51	QP
329.08	H	51.09	-7.95	43.14	46.00	-2.86	Peak
400.22	H	51.26	-6.39	44.87	46.00	-1.13	QP
532.78	H	43.91	-3.69	40.22	46.00	-5.78	Peak
896.53	H	40.80	0.90	41.70	46.00	-4.30	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).

**Above 1 GHz****Operation Mode:** TX / IEEE 802.11b / CH Low**Test Date:** November 23, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1153.33	V	56.38	---	-7.67	48.70	---	74.00	54.00	-5.30	Peak
4825.00	V	53.40	51.43	1.04	54.44	52.47	74.00	54.00	-1.53	AVG
N/A										
1403.33	H	55.71	---	-7.21	48.50	---	74.00	54.00	-5.50	Peak
4825.00	H	53.80	49.67	1.04	54.84	50.71	74.00	54.00	-3.29	AVG
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11b / CH Mid**Test Date:** November 23, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1256.67	V	55.46	---	-7.48	47.98	---	74.00	54.00	-6.02	Peak
4875.00	V	53.63	51.24	1.02	54.65	52.26	74.00	54.00	-1.74	AVG
N/A										
1476.67	H	56.15	---	-7.07	49.08	---	74.00	54.00	-4.92	Peak
4875.00	H	49.86	---	1.02	50.88	---	74.00	54.00	-3.12	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:** November 23, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1293.33	V	55.56	---	-7.41	48.15	---	74.00	54.00	-5.85	Peak
4925.00	V	53.47	51.20	1.01	54.48	52.21	74.00	54.00	-1.79	AVG
N/A										
1293.33	H	55.56	---	-7.41	48.15	---	74.00	54.00	-5.85	Peak
4925.00	H	53.47	51.20	1.01	54.48	52.21	74.00	54.00	-1.79	AVG
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11g / CH Low**Test Date:** November 23, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2463.33	V	61.45	51.13	-1.48	59.97	49.65	74.00	54.00	-4.35	AVG
N/A										
1403.33	H	55.79	---	-7.21	48.58	---	74.00	54.00	-5.42	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:** November 23, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1246.67	V	55.48	---	-7.50	47.98	---	74.00	54.00	-6.02	Peak
N/A										
1243.33	H	55.42	---	-7.51	47.91	---	74.00	54.00	-6.09	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:** November 23, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2513.33	V	59.47	47.89	-1.39	58.08	46.50	74.00	54.00	-7.50	AVG
N/A										
1300.00	H	56.17	---	-7.40	48.76	---	74.00	54.00	-5.24	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: November 23, 2009

Temperature: 23°C

Tested by: Mimic Yang

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2240.00	V	57.40	50.34	-1.85	55.55	48.49	74.00	54.00	-5.51	AVG
2320.00	V	59.29	54.10	-1.72	57.57	52.38	74.00	54.00	-1.62	AVG
N/A										
1220.00	H	55.36	---	-7.55	47.81	---	74.00	54.00	-6.19	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:** November 23, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2240.00	V	56.70	50.00	-1.85	54.85	48.15	74.00	54.00	-5.85	AVG
2320.00	V	59.48	53.94	-1.72	57.76	52.22	74.00	54.00	-1.78	AVG
N/A										
1273.33	H	55.90	---	-7.45	48.45	---	74.00	54.00	-5.55	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 / draft 802.11n Standard-20 MHz Channel mode / CH High**Test Date:** November 23, 2009**Temperature:** 20°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2240.00	V	57.71	51.53	-1.85	55.85	49.68	74.00	54.00	-4.32	AVG
2320.00	V	59.38	54.09	-1.72	57.66	52.37	74.00	54.00	-1.63	AVG
N/A										
1436.67	H	55.46	---	-7.15	48.31	---	74.00	54.00	-5.69	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:** November 24, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2280.00	V	60.35	54.37	-1.79	58.57	52.58	74.00	54.00	-1.42	AVG
2320.00	V	59.37	50.28	-1.72	57.66	48.56	74.00	54.00	-5.44	AVG
N/A										
1243.33	H	55.79	---	-7.51	48.28	---	74.00	54.00	-5.72	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:** November 24, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2280.00	V	60.18	52.77	-1.79	58.40	50.98	74.00	54.00	-3.02	AVG
N/A										
1316.67	H	55.67	---	-7.37	48.30	---	74.00	54.00	-5.70	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:** November 24, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
2280.00	V	59.54	52.80	-1.79	57.75	51.01	74.00	54.00	-2.99	AVG
2323.33	V	58.86	51.10	-1.71	57.15	49.39	74.00	54.00	-4.61	AVG
N/A										
1193.33	H	55.96	---	-7.60	48.36	---	74.00	54.00	-5.64	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).

**For TEW-657BRM(Single Dipole Antenna)****Below 1GHz****Operation Mode:** Normal Link**Test Date:** November 8, 2009**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
146.40	V	49.80	-9.87	39.93	43.50	-3.57	Peak
280.58	V	46.90	-8.96	37.94	46.00	-8.06	Peak
319.38	V	49.74	-8.20	41.54	46.00	-4.46	Peak
532.78	V	41.96	-3.69	38.27	46.00	-7.73	Peak
749.42	V	37.95	-0.50	37.46	46.00	-8.54	Peak
875.52	V	37.32	0.77	38.09	46.00	-7.91	Peak
280.58	H	50.46	-8.96	41.49	46.00	-4.51	Peak
319.38	H	53.15	-8.20	44.95	46.00	-1.05	QP
400.22	H	48.62	-6.39	42.23	46.00	-3.77	Peak
426.08	H	47.03	-5.68	41.35	46.00	-4.65	Peak
532.78	H	45.30	-3.69	41.61	46.00	-4.39	Peak
852.88	H	39.66	0.64	40.31	46.00	-5.69	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).

**Above 1 GHz****Operation Mode:** TX / IEEE 802.11b / CH Low**Test Date:** November 8, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% 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
1613.33	V	58.34	48.53	-5.95	52.40	42.58	74.00	54.00	-11.42	AVG
4825.00	V	54.28	51.82	1.04	55.32	52.86	74.00	54.00	-1.14	AVG
7241.67	V	51.62	45.47	4.07	55.69	49.54	74.00	54.00	-4.46	AVG
N/A										
1563.33	H	59.69	49.85	-6.42	53.26	43.43	74.00	54.00	-10.57	AVG
4825.00	H	54.80	50.33	1.04	55.84	51.37	74.00	54.00	-2.63	AVG
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11b / CH Mid**Test Date:** November 8, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% 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
1953.33	V	59.10	49.84	-2.70	56.40	47.14	74.00	54.00	-6.86	AVG
4866.67	V	50.26	---	1.02	51.29	---	74.00	54.00	-2.71	Peak
7308.33	V	48.66	45.34	4.03	52.69	49.37	74.00	54.00	-4.63	AVG
N/A										
1373.33	H	58.87	---	-7.27	51.60	---	74.00	54.00	-2.40	Peak
4875.00	H	49.90	---	1.02	50.93	---	74.00	54.00	-3.07	Peak
7308.33	H	48.12	45.84	4.03	52.15	49.87	74.00	54.00	-4.13	AVG
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11b / CH High**Test Date:** November 8, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1283.33	V	59.49	48.24	-7.43	52.60	40.81	74.00	54.00	-13.19	AVG
4916.67	V	49.38	---	1.01	50.39	---	74.00	54.00	-3.61	Peak
7391.67	V	48.53	43.54	3.98	52.51	47.52	74.00	54.00	-6.48	AVG
N/A										
1660.00	H	58.75	47.83	-5.50	53.25	42.33	74.00	54.00	-11.67	AVG
5733.33	H	49.88	---	1.89	51.77	---	74.00	54.00	-2.23	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 Low**Test Date:** November 8, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% 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
1530.00	V	58.70	---	-6.74	51.95	---	74.00	54.00	-2.05	Peak
4825.00	V	54.80	39.42	1.04	55.84	40.46	74.00	54.00	-13.54	AVG
7241.67	V	51.10	37.48	4.07	55.17	41.55	74.00	54.00	-12.45	AVG
N/A										
1506.67	H	58.09	---	-6.97	51.13	---	74.00	54.00	-2.87	Peak
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11g / CH Mid**Test Date:** November 8, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% 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
1386.67	V	58.81	---	-7.24	51.57	---	74.00	54.00	-2.43	Peak
4875.00	V	51.30	45.26	1.02	52.32	46.28	74.00	54.00	-7.72	AVG
7308.33	V	48.81	42.83	4.03	52.84	46.86	74.00	54.00	-7.14	AVG
N/A										
1790.00	H	58.28	47.62	-4.26	54.02	43.36	74.00	54.00	-10.64	AVG
7308.33	H	48.75	41.64	4.03	52.78	45.67	74.00	54.00	-8.33	AVG
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11g / CH High**Test Date:** November 8, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% 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
1713.33	V	58.49	46.43	-4.99	53.5	41.44	74.00	54.00	-12.56	AVG
N/A										
1280.00	H	58.92	---	-7.44	51.48	---	74.00	54.00	-2.52	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: November 8, 2009

Temperature: 25°C

Tested by: Ming Chen

Humidity: 55% 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
1496.67	V	58.52	---	-7.04	51.49	---	74.00	54.00	-2.51	Peak
4825.00	V	49.40	---	1.04	50.44	---	74.00	54.00	-3.56	Peak
N/A										
1623.33	H	58.36	46.73	-5.85	52.51	40.88	74.00	54.00	-13.12	AVG
N/A										

Remark:

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

**Operation Mode:** TX / draft 802.11n Standard-20 MHz Channel mode / CH Mid**Test Date:** November 8, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% 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
1340.00	V	58.54	---	-7.33	51.22	---	74.00	54.00	-2.78	Peak
4875.00	V	49.70	---	1.02	50.72	---	74.00	54.00	-3.28	Peak
7308.33	V	48.88	42.16	4.03	52.91	46.19	74.00	54.00	-7.81	AVG
N/A										
1370.00	H	58.62	---	-7.27	51.34	---	74.00	54.00	-2.66	Peak
7316.67	H	48.19	43.65	4.02	52.21	47.67	74.00	54.00	-6.33	AVG
N/A										

Remark:

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



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

Test Date: November 8, 2009

Temperature: 25°C

Tested by: Ming Chen

Humidity: 55% 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
1610.00	V	58.05	47.34	-5.98	52.07	41.36	74.00	54.00	-12.64	AVG
N/A										
1713.33	H	58.92	47.23	-4.99	53.93	42.24	74.00	54.00	-11.76	AVG
N/A										

Remark:

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

**Operation Mode:** TX / draft 802.11n Wide-40 MHz Channel mode / CH Low**Test Date:** November 8, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% 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
1376.67	V	59.23	---	-7.26	51.97	---	74.00	54.00	-2.03	Peak
N/A										
1700.00	H	58.68	47.34	-5.12	53.56	42.22	74.00	54.00	-11.78	AVG
N/A										

Remark:

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



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

Test Date: November 8, 2009

Temperature: 25°C

Tested by: Ming Chen

Humidity: 55% 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
1256.67	V	58.69	---	-7.48	51.21	---	74.00	54.00	-2.79	Peak
N/A										
1336.67	H	58.15	---	-7.33	50.81	---	74.00	54.00	-3.19	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:** November 8, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% 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
1766.67	V	58.42	47.51	-4.48	53.94	43.03	74.00	54.00	-10.97	AVG
N/A										
1676.67	H	58.48	48.16	-5.34	53.14	42.82	74.00	54.00	-11.18	AVG
N/A										

Remark:

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



7.8 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ 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 μ 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:** October 31, 2009
Temperature: 25°C **Tested by:** Jason Chia
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
0.150	62.80	38.39	0.07	62.87	38.46	66.00	56.00	-3.13	-17.54	L1
0.239	53.01	29.05	0.06	53.07	29.11	62.13	52.13	-9.06	-23.02	L1
0.387	47.26	---	0.06	47.32	---	58.12	---	-10.80	---	L1
0.914	38.63	---	0.11	38.74	---	56.00	---	-17.26	---	L1
1.928	38.54	---	0.15	38.69	---	56.00	---	-17.31	---	L1
11.438	44.78	---	0.72	45.50	---	60.00	---	-14.50	---	L1
0.153	62.36	42.74	0.08	62.44	42.82	65.82	55.82	-3.38	-13.00	L2
0.228	52.57	28.24	0.07	52.64	28.31	62.52	52.523	-9.88	-24.21	L2
0.389	46.36	---	0.07	46.43	---	58.08	---	-11.65	---	L2
0.839	38.56	---	0.10	38.66	---	56.00	---	-17.34	---	L2
1.928	38.60	---	0.15	38.75	---	56.00	---	-17.25	---	L2
11.621	43.93	---	0.58	44.51	---	60.00	---	-15.49	---	L2

Remark:

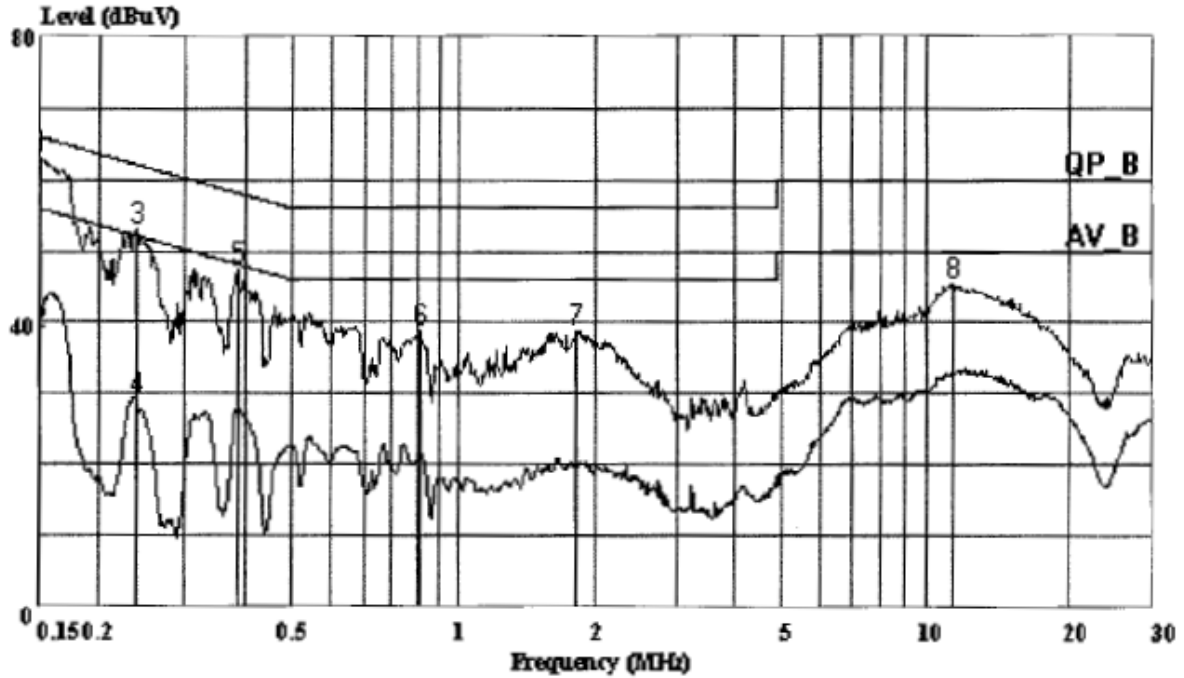
1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10 kHz; the IF bandwidth of Test Receiver between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



Test Plots

Conducted emissions (Line 1)

Data#: 27 File#: 91029203AD1006D(AnnexA).EMI Date: 2009-10-31 Time: 11:53:49

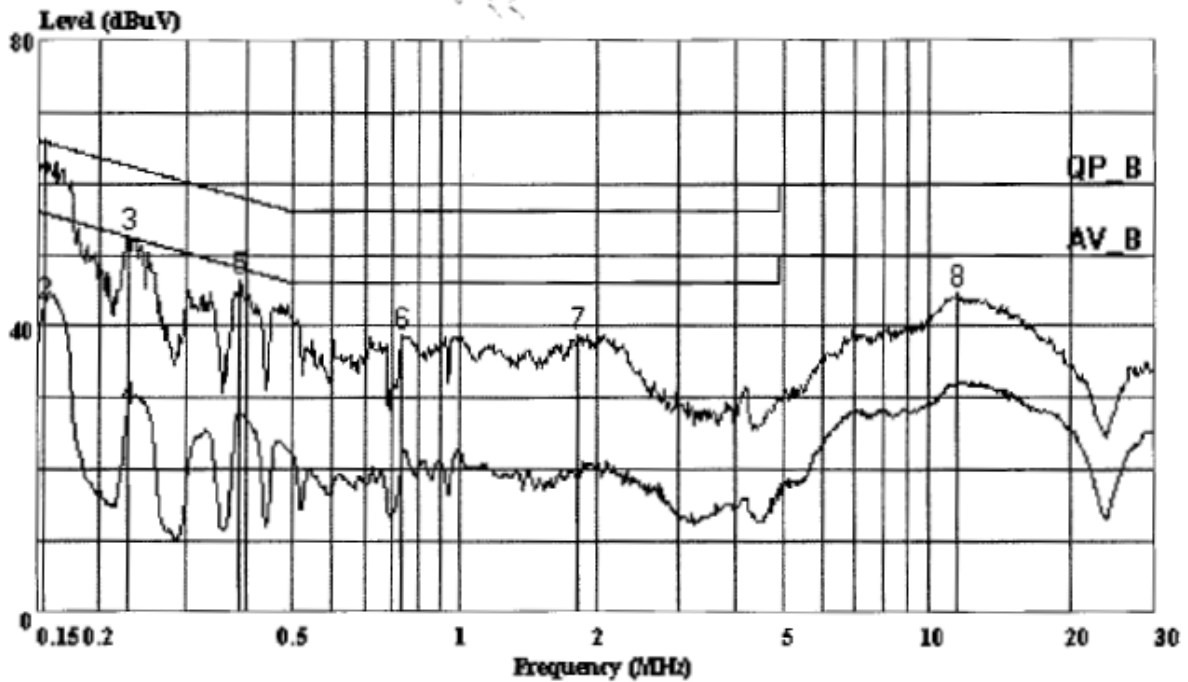


(Conducted A)
Trace: 24 23

Ref Trace:

Conducted emissions (Line 2)

Data#: 34 File#: 91029203AD1006D(AnnexA).EMI Date: 2009-10-31 Time: 11:59:43



(Conducted A)
Trace: 29 29

Ref Trace: