



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Notebook PC System

Model:

LGX20, X200, XB200, XD200, XV200

Trade Name: LG

Issued to

LG Electronics Inc.

1000 Sylvan Avenue Englewood Cliffs, NJ 07632. U.S.A.

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



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1. TEST RESULT CERTIFICATION

Applicant: LG Electronics Inc.
1000 Sylvan Avenue Englewood Cliffs, NJ 07632. U.S.A.

Manufacturer: LG Electronics Inc
19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do,
451-713, Korea

Factory: Protek Asia(Shanghai) Limited

Factory address: No.3768, Xiuyan Road, NanHui District, ShangHai, P.R. China

Equipment Under Test: Notebook PC System

Trade Name: LG

Model: LGX20, X200, XB200, XD200, XV200

Date of Test: November 23 ~ December 18, 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	Notebook PC System
Trade Name	LG
Model Number	LGX20, X200, XB200, XD200, XV200
Model Discrepancy	All the specification and layout are identical except they come with different model numbers for marketing purposes.
Module Trade Name	AzureWave
Module Model Number	RTL8191SE
Power Adapter	1. Power Adapter: LIETON / PA-1400-11 I/P: 100-240V, 1.0A, 50-60Hz O/P: 20V, 2.0A Delta / ADP-40PH AD I/P: 100-240V, 1.2A, 50-60Hz O/P: 20V, 2A, 40W MAX 2. Battery: PEGATRON / NBP4B27(H00J) Rating: 29Wh
M/B	N450 Rev.
CPU	N450, 1.66GHz/667MHz/512K L2
LCD	LGD 10.1" HD(1366*768) LED LCD; LP101WH1-TLB5
HDD	SAMSUNG/SATA HDD 250G 5400R 2.5"/HM250HI
WLAN Module	AW-NE104H 802.11bgn 1x2 (Half)
WWAN Module	N/A
CMOS	Foxlink FS13FF-183 1.3M
Battery	H00J SAN 2000 4S1P STL /UF103450P 14.8V/29WH
Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 19.35dBm IEEE 802.11g mode: 21.16 dBm draft 802.11n Standard-20 MHz Channel mode: 20.55 dBm draft 802.11n Wide-40 MHz Channel mode: 20.79 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 (13, 14.4, 26, 28.89, 39, 43.33, 52, 57.78, 78, 86.67, 104, 115.56, 117, 130, 144.4 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	1. Model Name: H00J WLAN L Antenna PIFA Antenna / Gain: 0.82dBi 2. Model Name: H00J WLAN R Antenna PIFA Antenna / Gain: 0.50dBi

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: **BEJNT-LGX20** 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 comes with two different adapters (PA-1400-11 & ADP-40PH AD) for sale. After the preliminary test, the adapter with model number PA-1400-11 was found to emit the worst emissions and therefore had been tested under operating condition.

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

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

IEEE 802.11b mode:

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

IEEE 802.11g mode:

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

draft 802.11n Standard-20 MHz Channel mode:

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

draft 802.11n Wide-40 MHz Channel mode:

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



4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	02/23/2010

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	09/09/2010
Test Receiver	Rohde&Schwarz	ESCI	100064	11/28/2010
Switch Controller	TRC	Switch Controller	SC94050010	05/02/2010
4 Port Switch	TRC	4 Port Switch	SC94050020	05/02/2010
Loop Antenna	EMCO	6502	8905/2356	05/28/2010
Horn-Antenna	TRC	HA-0502	06	06/03/2010
Horn-Antenna	TRC	HA-0801	04	06/18/2010
Horn-Antenna	TRC	HA-1201A	01	08/10/2010
Horn-Antenna	TRC	HA-1301A	01	08/10/2010
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/27/2010
Loop Antenna	EMCO	6502	8905/2356	05/28/2010
Turn Table	Max-Full	MFT-120S	T120S940302	N.C.R.
Antenna Tower	Max-Full	MFA-430	A440940302	N.C.R.
Controller	Max-Full	MF-CM886	CC-C-1F-13	N.C.R.
Site NSA	CCS	N/A	FCC MRA: TW1039 IC: 2324G-1/-2	10/17/2010 11/04/2010
Test S/W	LABVIEW (V 6.1)			

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER 9kHz-30MHz	ROHDE & SCHWARZ	ESHS30	828144/003	11/17/2010
TWO-LINE V-NETWORK 9kHz-30MHz	SCHAFFNER	NNB41	03/10013	06/10/2010
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	04/08/2010
Test S/W	LABVIEW (V 6.1)			



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 2.81
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

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

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

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

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

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

5.2 EQUIPMENT

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

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

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

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

5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

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



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

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

6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1	LCD Monitor	SAMSUNG	959NF	AQ19H2RT706126P	FCC DoC	Shielded, 1.8m with 2 cores	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2	USB Mouse	Logitech	M-UAG96B	HC8500L	FCC DoC	Shielded, 1.8m	N/A
3	USB Mouse	DELL	M-UV69a	323617-001	FCC DoC	Shielded, 1.8m	N/A
4	USB 2.0 External HDD	TeraSyS	F12-U	A0100214-43b0007	FCC DoC	Shielded, 1.8m	N/A
5	USB 2.0 External HDD	TeraSyS	F12-U	A0100214-43b0012	FCC DoC	Shielded, 1.8m	N/A
6	Multimedia Earphone	Labtec	Axis-301	N/A	FCC DoC	Unshielded, 1.8m*2	N/A
7	Notebook PC (Remote)	DELL	PP05L	7T390 A03	E2K5HCKT	LAN Cable: Unshielded, 10m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
8	Wireless Pre-N Router (Remote)	BELKIN	F5D8230-4	N/A	SA3-AGNO901AP O100	N/A	Unshielded, 1.8m

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.

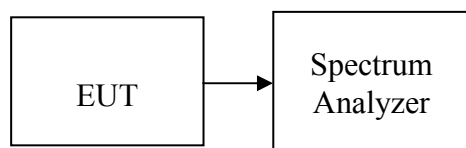
7. FCC PART 15.247 REQUIREMENTS

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 (MHz)	Limit (kHz)	Result
Low	2412	9.67	>500	PASS
Mid	2437	10.00		PASS
High	2462	9.67		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.50	>500	PASS
Mid	2437	16.50		PASS
High	2462	16.50		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.83	>500	PASS
Mid	2437	17.75		PASS
High	2462	17.67		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.40	>500	PASS
Mid	2437	36.40		PASS
High	2452	36.40		PASS

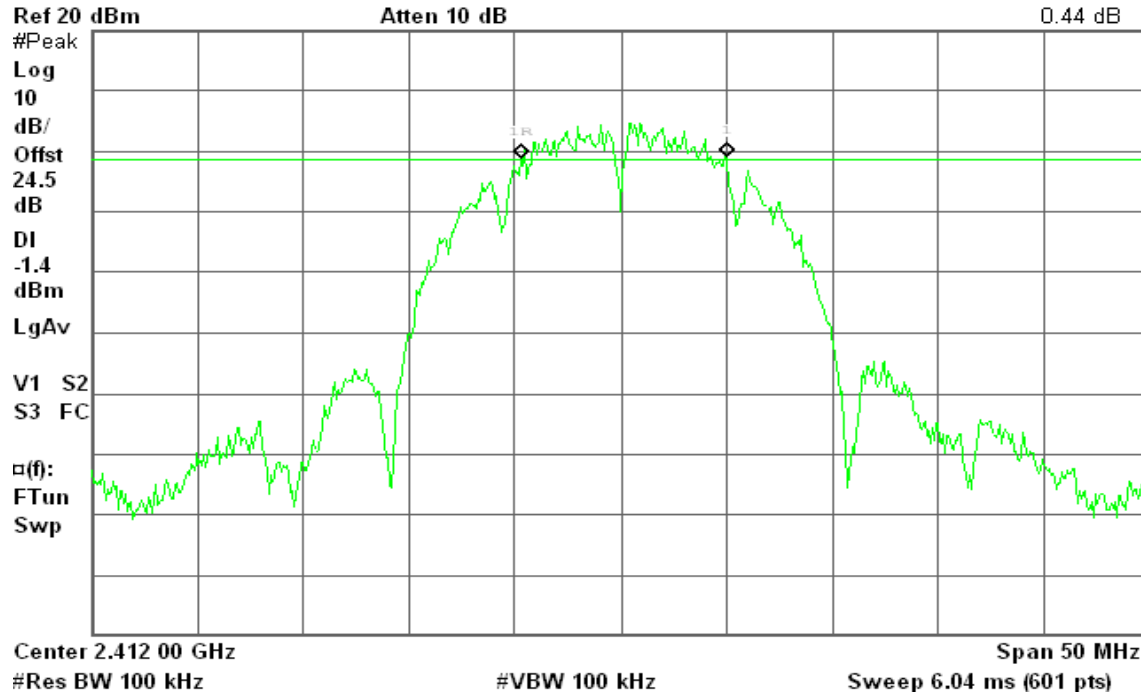


IEEE 802.11b mode

6dB Bandwidth (CH Low)

Agilent 21:44:28 Nov 30, 2009

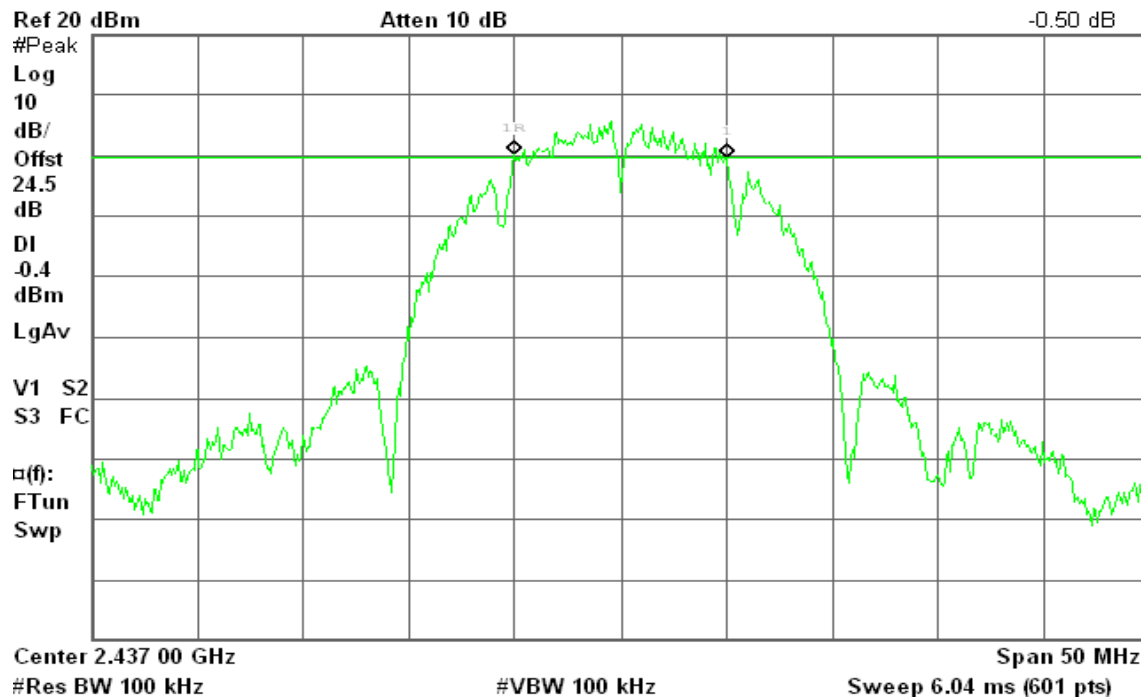
R T

 Δ Mkr1 9.67 MHz
0.44 dB

6dB Bandwidth (CH Mid)

Agilent 21:52:27 Nov 30, 2009

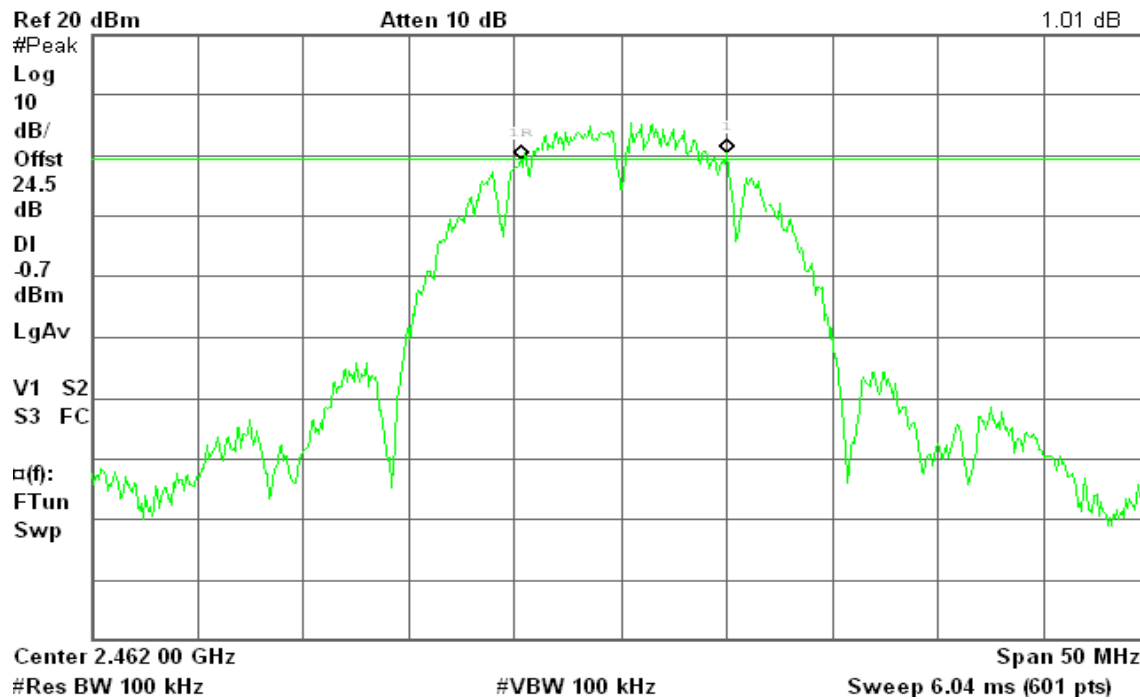
R T

 Δ Mkr1 10.00 MHz
-0.50 dB

**6dB Bandwidth (CH High)**

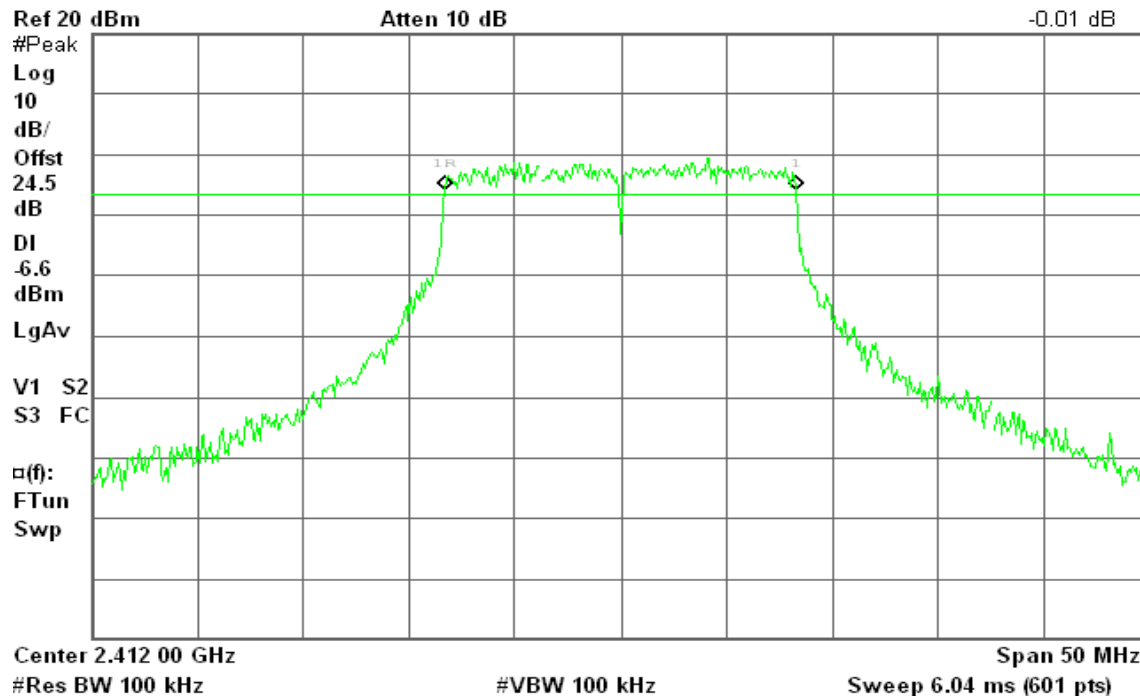
* Agilent 21:59:11 Nov 30, 2009

R T

 Δ Mkr1 9.67 MHz
1.01 dB**IEEE 802.11g mode****6dB Bandwidth (CH Low)**

* Agilent 22:17:03 Nov 30, 2009

R T

 Δ Mkr1 16.50 MHz
-0.01 dB

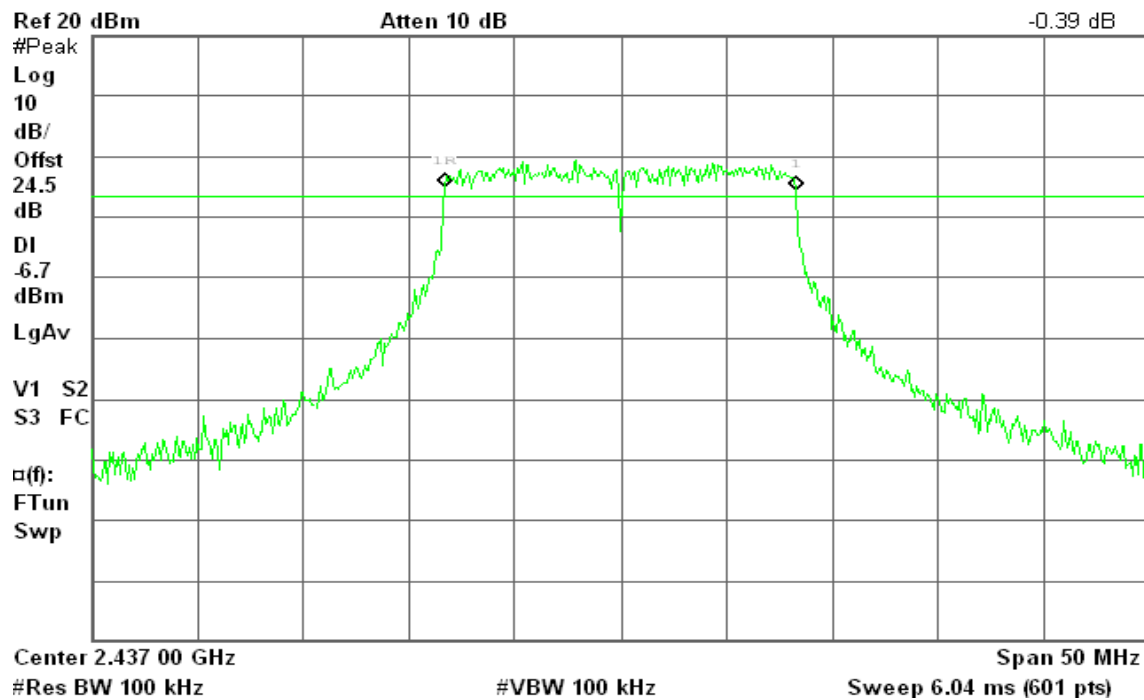
**6dB Bandwidth (CH Mid)**

* Agilent 22:11:16 Nov 30, 2009

R T

 Δ Mkr1 16.50 MHz

-0.39 dB

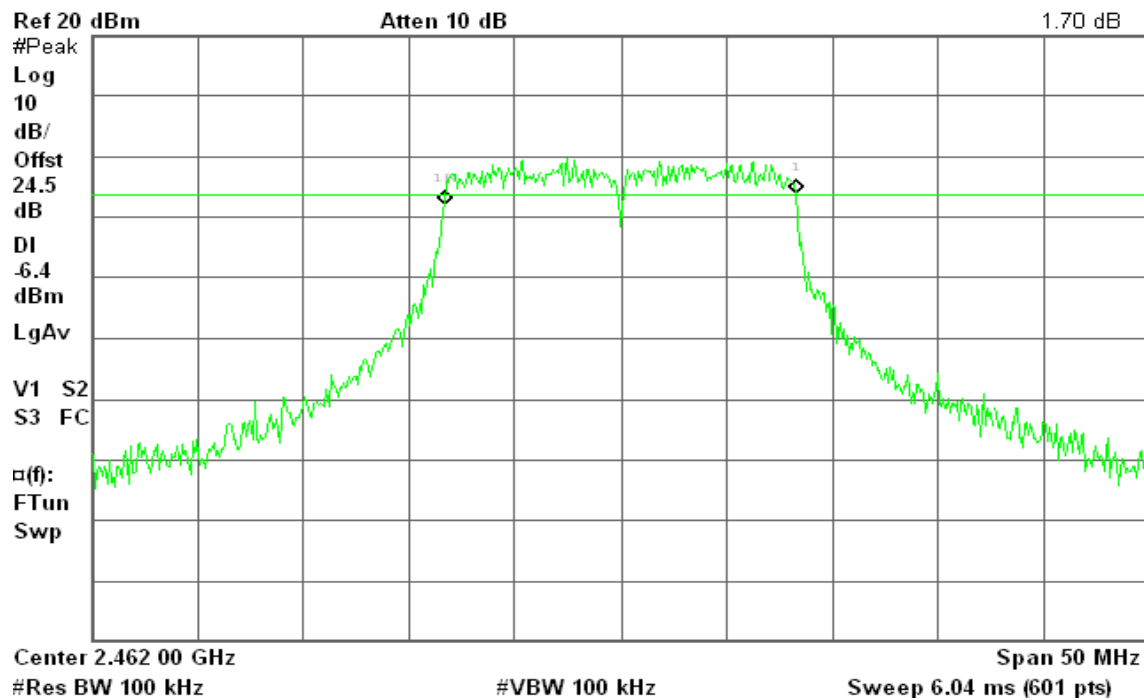
**6dB Bandwidth (CH High)**

* Agilent 22:05:20 Nov 30, 2009

R T

 Δ Mkr1 16.50 MHz

1.70 dB



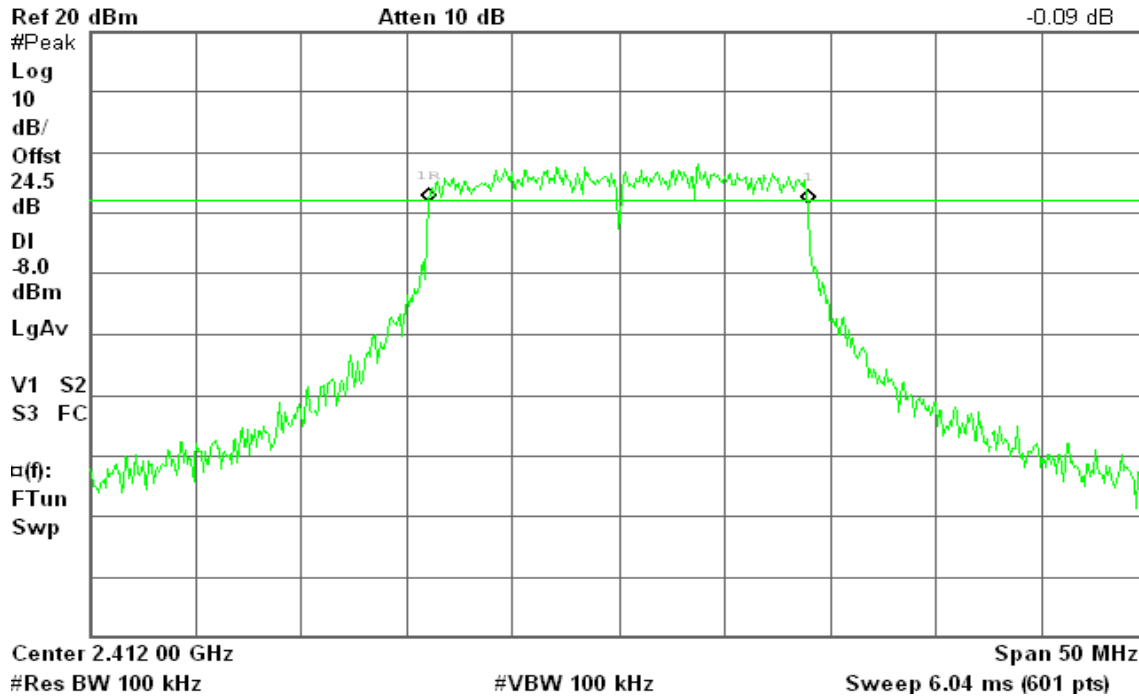


draft 802.11n Standard-20 MHz Channel mode

6dB Bandwidth (CH Low)

✱ Agilent 08:54:09 Dec 1, 2009

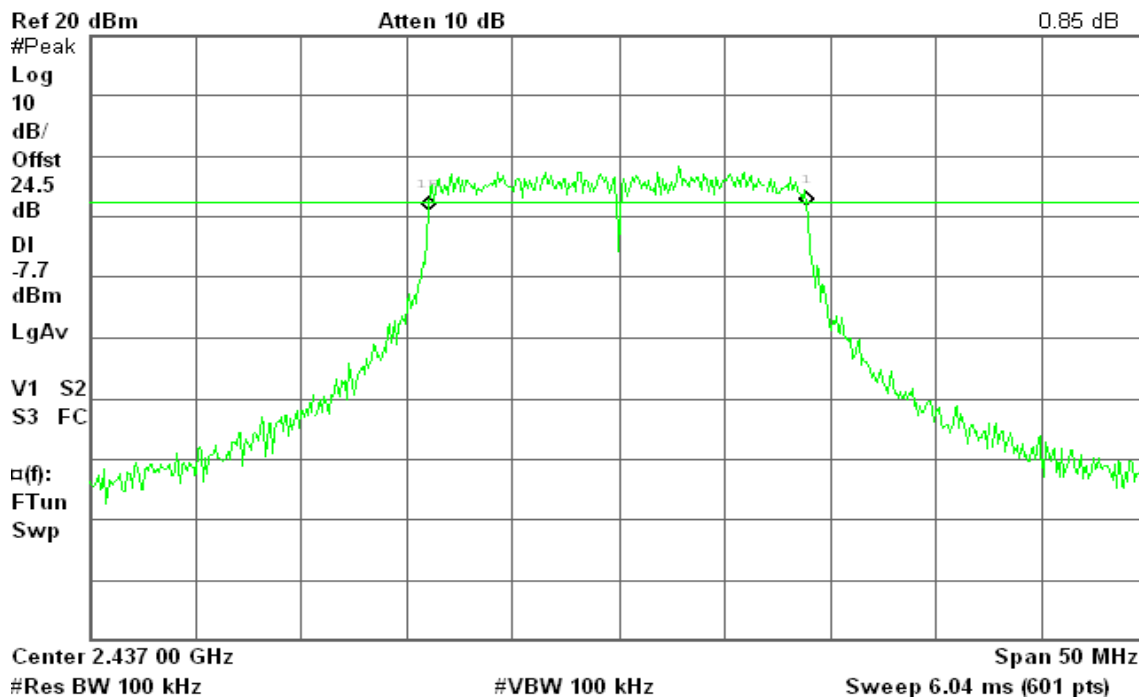
R T

 Δ Mkr1 17.83 MHz
-0.09 dB

6dB Bandwidth (CH Mid)

✱ Agilent 09:23:09 Dec 1, 2009

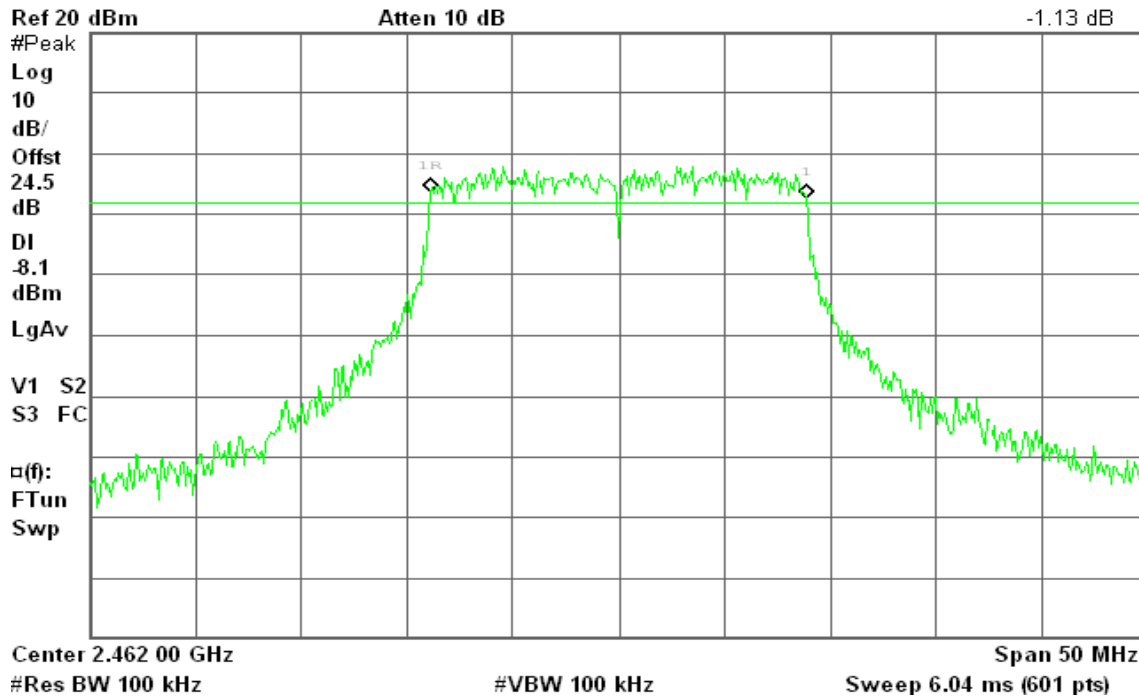
R T

 Δ Mkr1 17.75 MHz
0.85 dB

**6dB Bandwidth (CH High)**

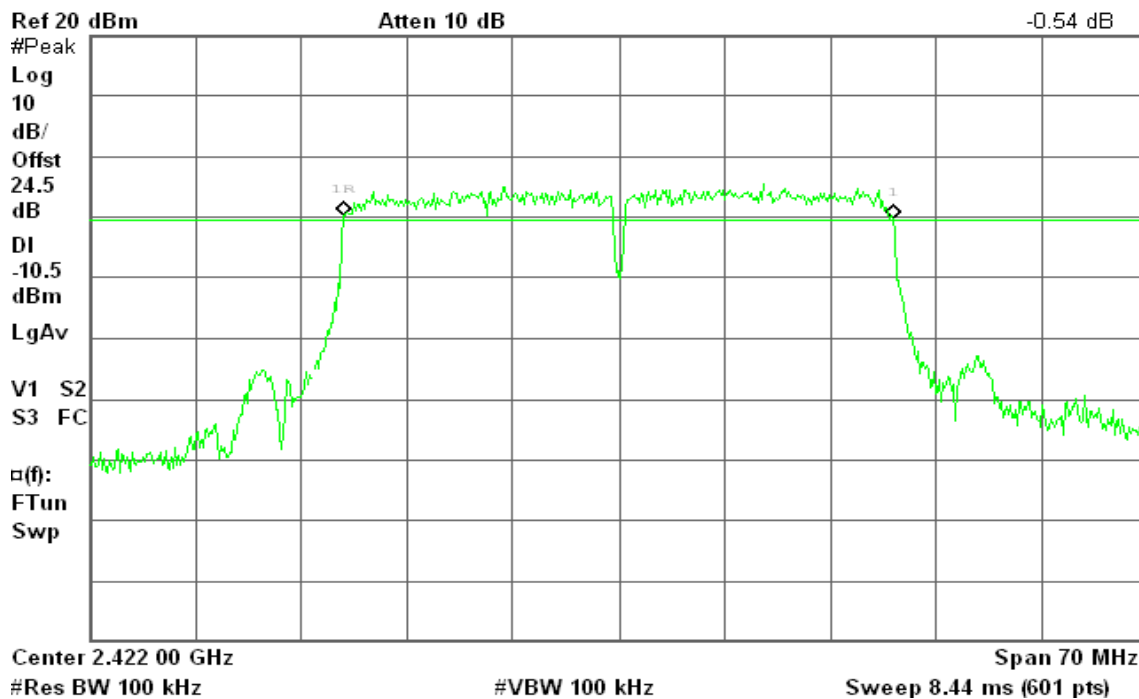
* Agilent 09:39:12 Dec 1, 2009

R T

 Δ Mkr1 17.67 MHz
-1.13 dB**draft 802.11n Wide-40 MHz Channel mode****6dB Bandwidth (CH Low)**

* Agilent 09:48:15 Dec 1, 2009

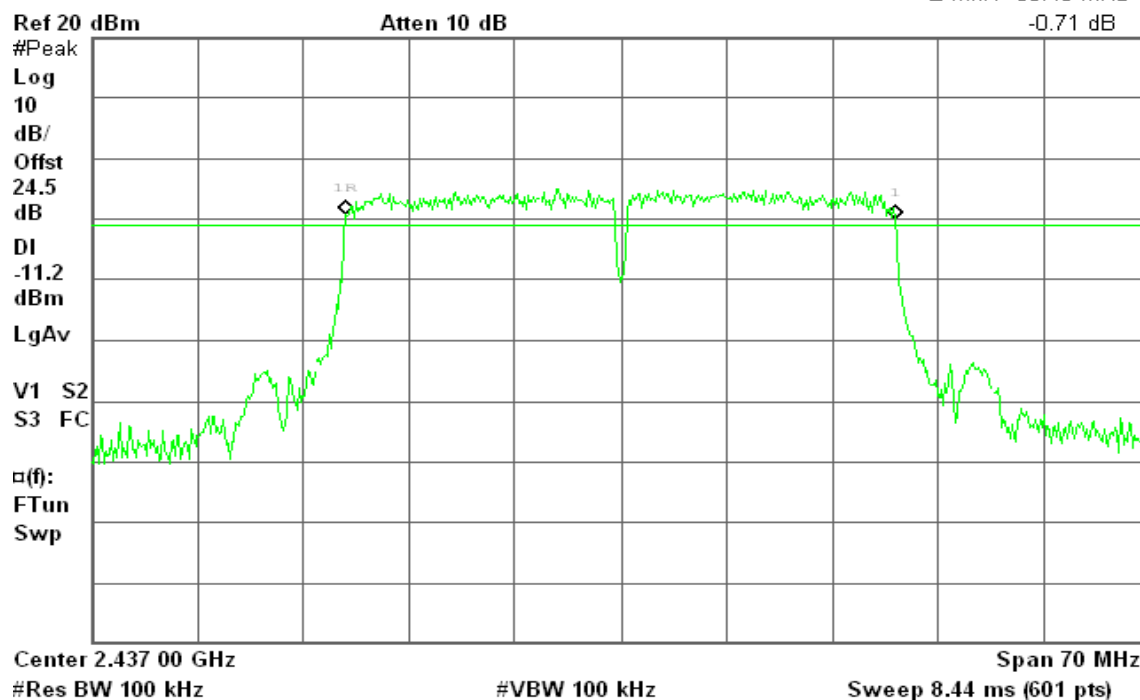
R T

 Δ Mkr1 36.40 MHz
-0.54 dB

**6dB Bandwidth (CH Mid)**

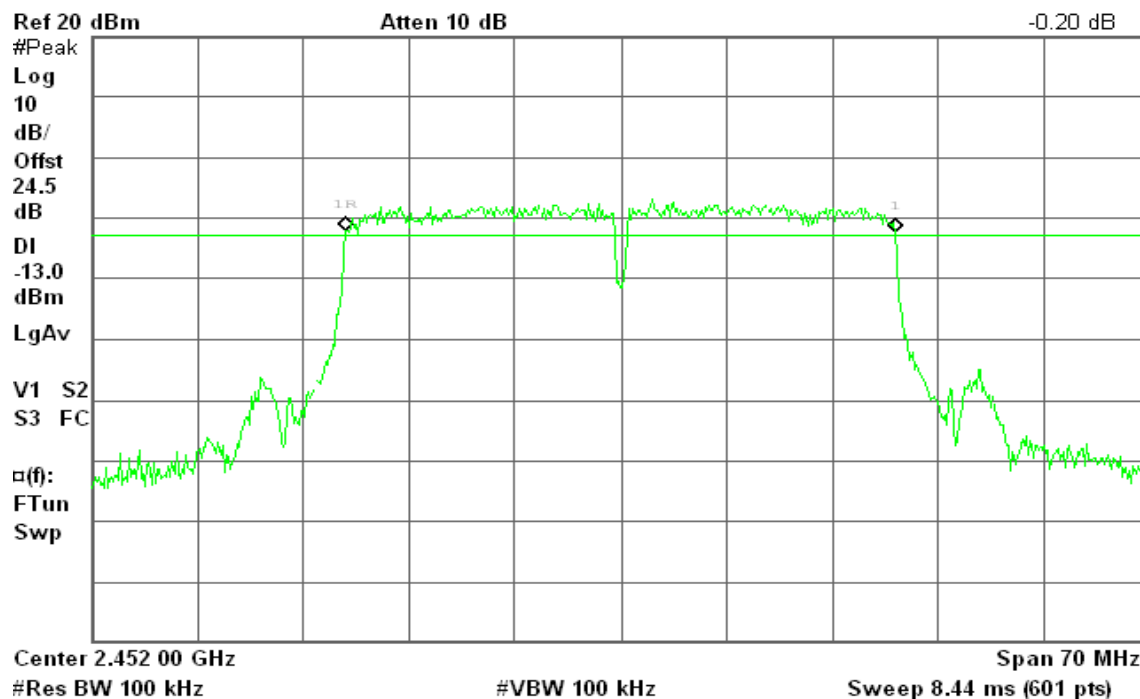
* Agilent 10:01:09 Dec 1, 2009

R T

 Δ Mkr1 36.40 MHz
-0.71 dB**6dB Bandwidth (CH High)**

* Agilent 10:09:04 Dec 1, 2009

R T

 Δ Mkr1 36.40 MHz
-0.20 dB



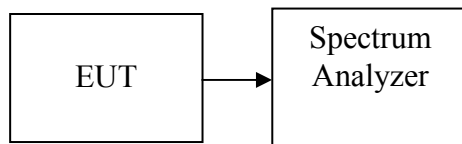
7.2 PEAK POWER

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	18.71	0.0743	1.00	PASS
Mid	2437	19.16	0.0824		PASS
High	2462	19.35	0.0861		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	21.00	0.1259	1.00	PASS
Mid	2437	21.13	0.1297		PASS
High	2462	21.16	0.1306		PASS

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	20.54	0.1132	1.00	PASS
Mid	2437	20.54	0.1132		PASS
High	2462	20.55	0.1135		PASS

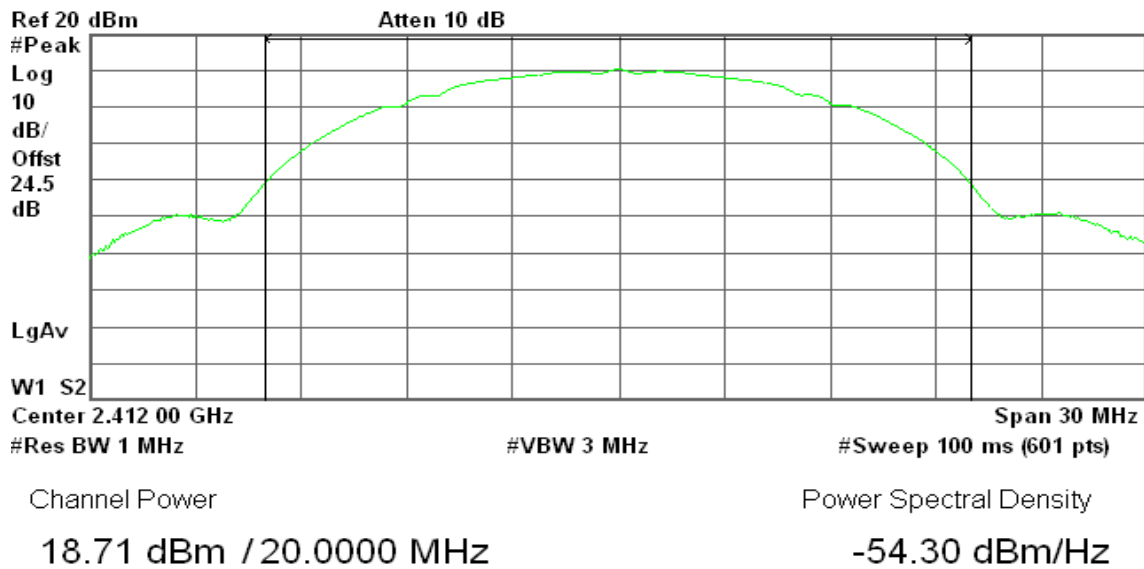
Test mode: draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	20.06	0.1014	1.00	PASS
Mid	2437	20.31	0.1074		PASS
High	2452	20.79	0.1199		PASS

**Test Plot****IEEE 802.11b mode****Peak Power (CH Low)**

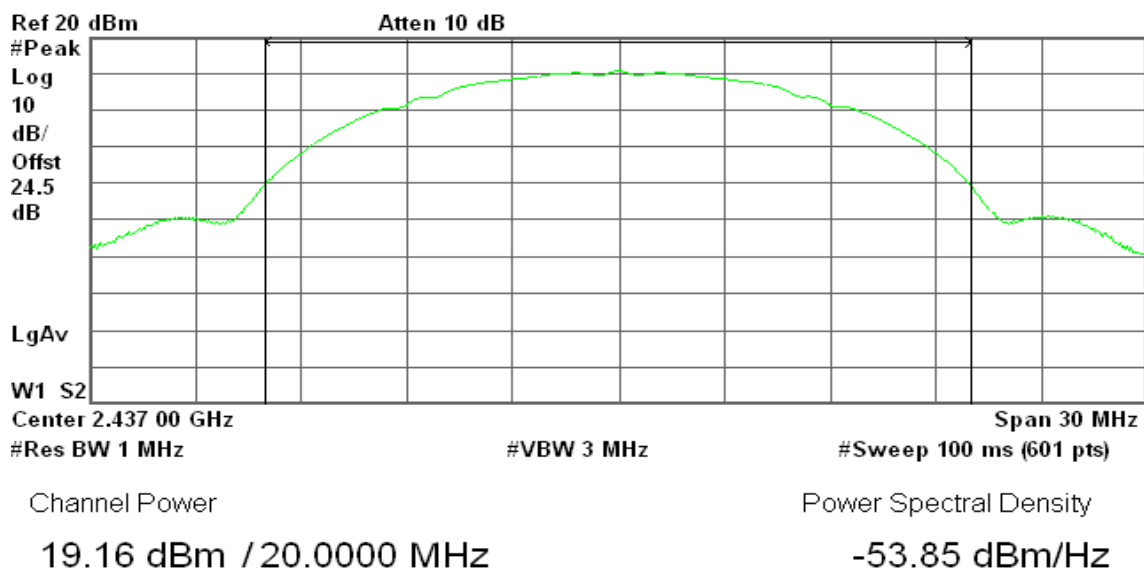
* Agilent 21:47:18 Nov 30, 2009

R T

**Peak Power (CH Mid)**

* Agilent 21:54:04 Nov 30, 2009

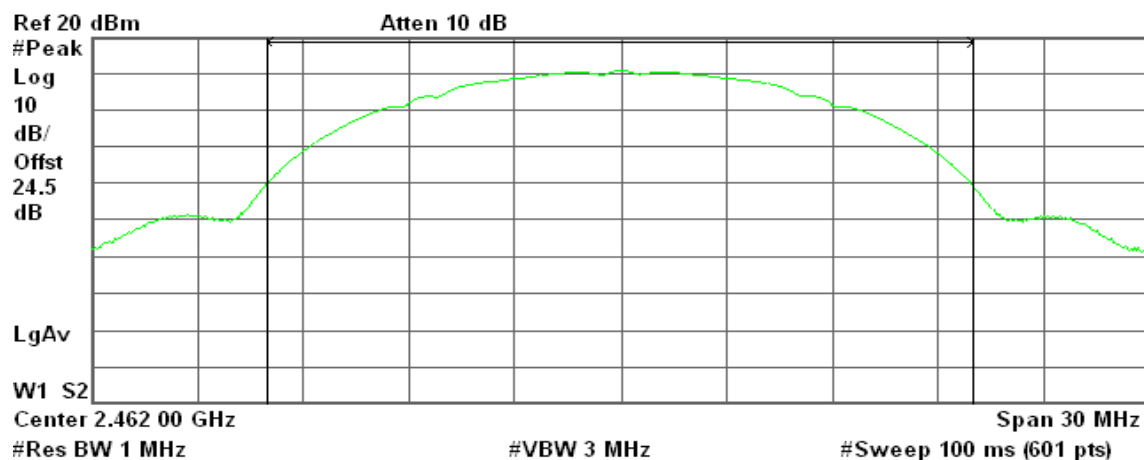
R T



**Peak Power (CH High)**

* Agilent 22:00:18 Nov 30, 2009

R T



Channel Power

19.35 dBm / 20.0000 MHz

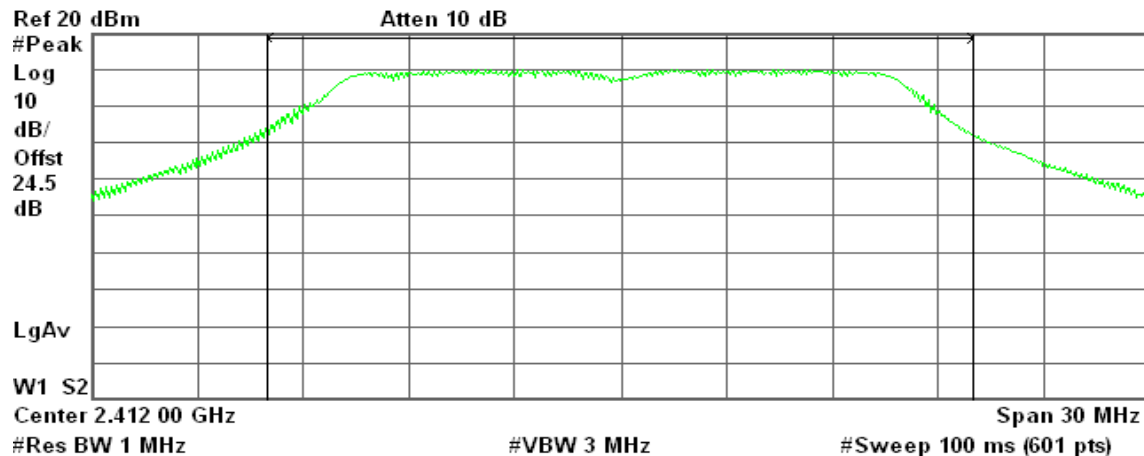
Power Spectral Density

-53.66 dBm/Hz

IEEE 802.11g mode**Peak Power (CH Low)**

* Agilent 22:18:01 Nov 30, 2009

R T



Channel Power

21.00 dBm / 20.0000 MHz

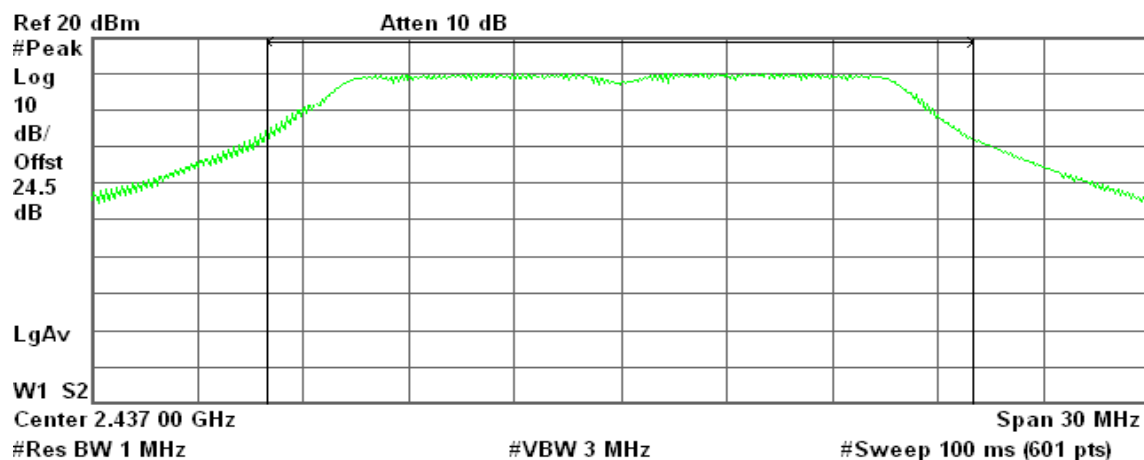
Power Spectral Density

-52.01 dBm/Hz

**Peak Power (CH Mid)**

* Agilent 22:12:22 Nov 30, 2009

R T



Channel Power

21.13 dBm / 20.0000 MHz

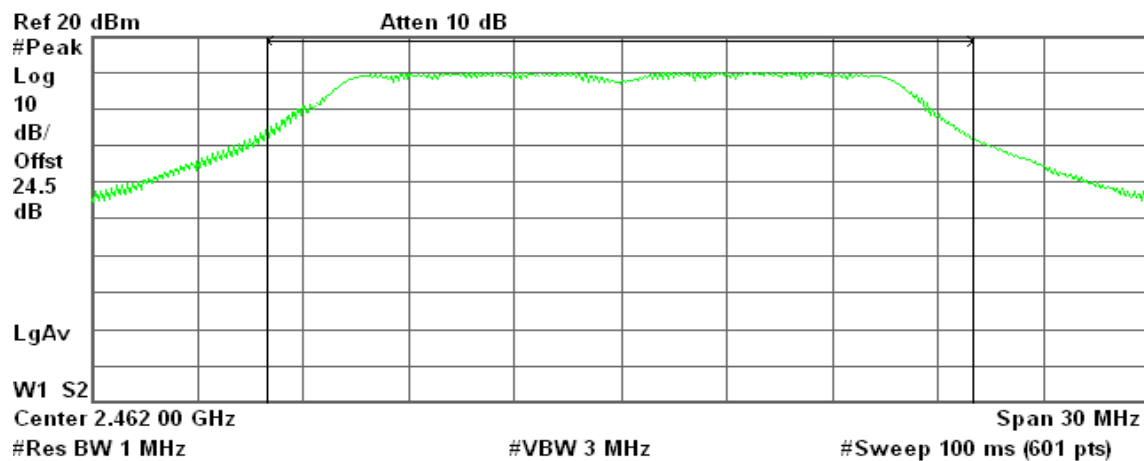
Power Spectral Density

-51.88 dBm/Hz

Peak Power (CH High)

* Agilent 22:06:34 Nov 30, 2009

R T



Channel Power

21.16 dBm / 20.0000 MHz

Power Spectral Density

-51.85 dBm/Hz

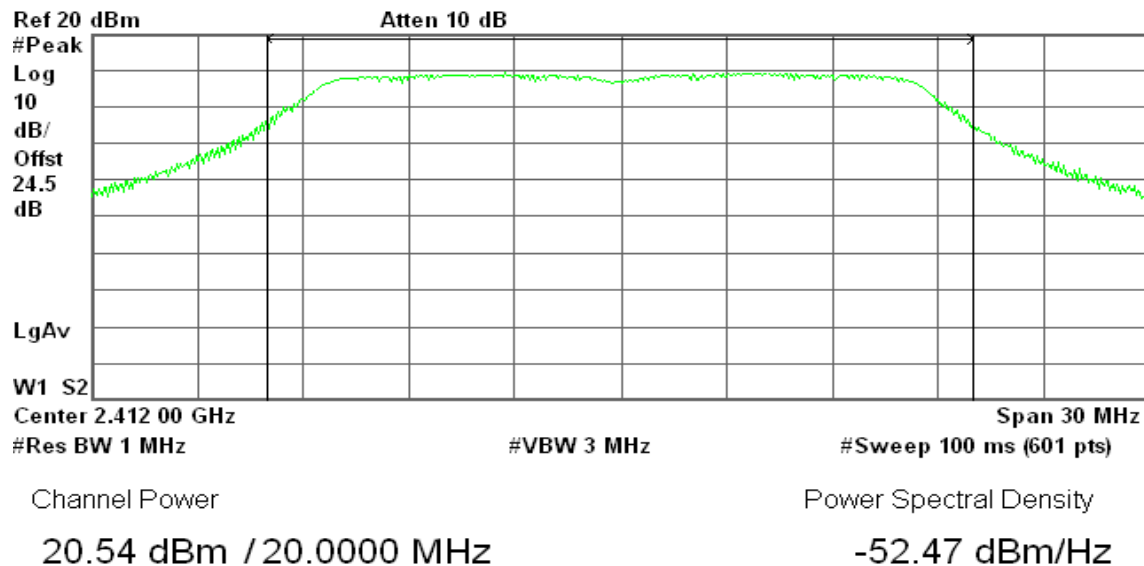


draft 802.11n Standard-20 MHz Channel mode

Peak Power (CH Low)

✱ Agilent 09:09:22 Dec 1, 2009

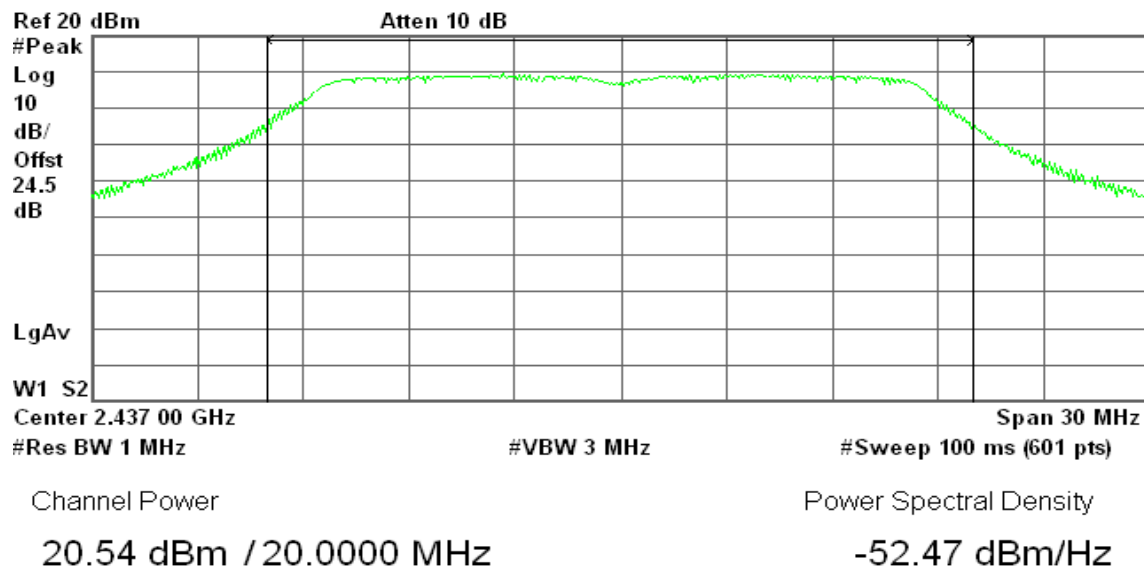
R T



Peak Power (CH Mid)

✱ Agilent 09:24:48 Dec 1, 2009

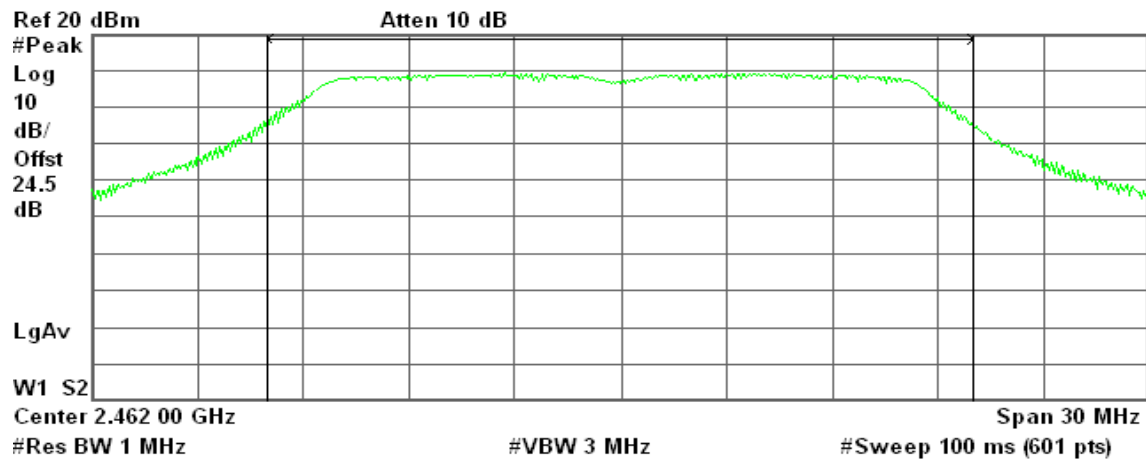
R T



**Peak Power (CH High)**

* Agilent 09:40:33 Dec 1, 2009

R T



Channel Power

20.55 dBm / 20.0000 MHz

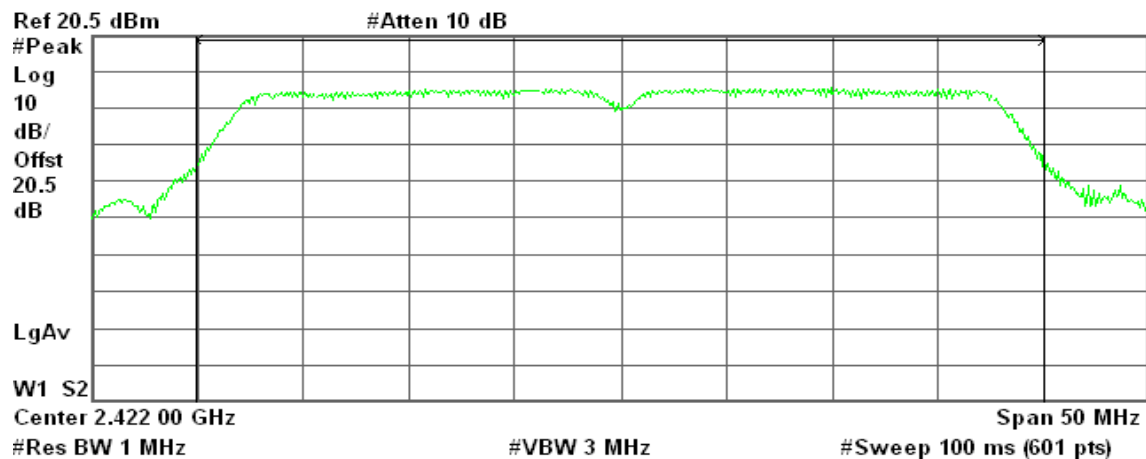
Power Spectral Density

-52.46 dBm/Hz

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

* Agilent 09:55:08 Dec 1, 2009

R T



Channel Power

20.06 dBm / 40.0000 MHz

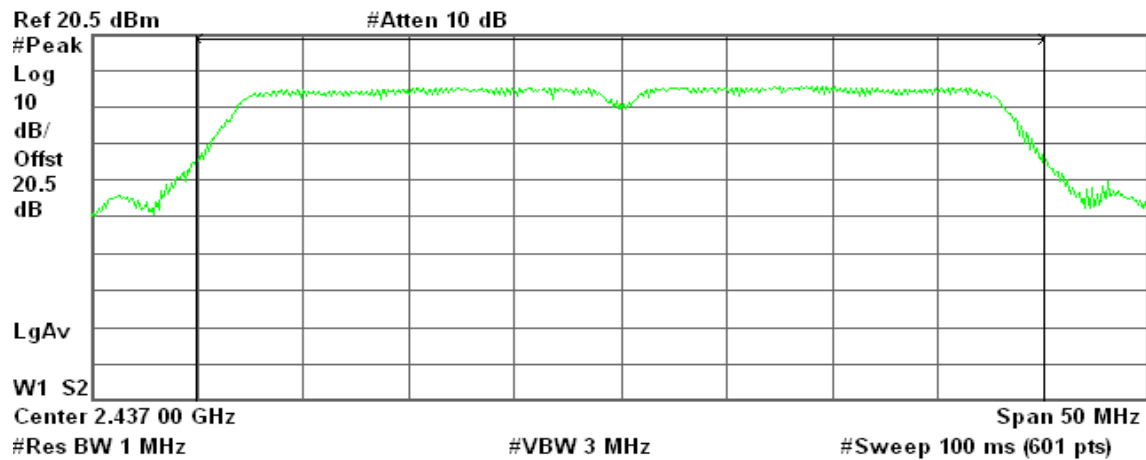
Power Spectral Density

-55.96 dBm/Hz

**Peak Power (CH Mid)**

* Agilent 10:03:31 Dec 1, 2009

R T



Channel Power

20.31 dBm / 40.0000 MHz

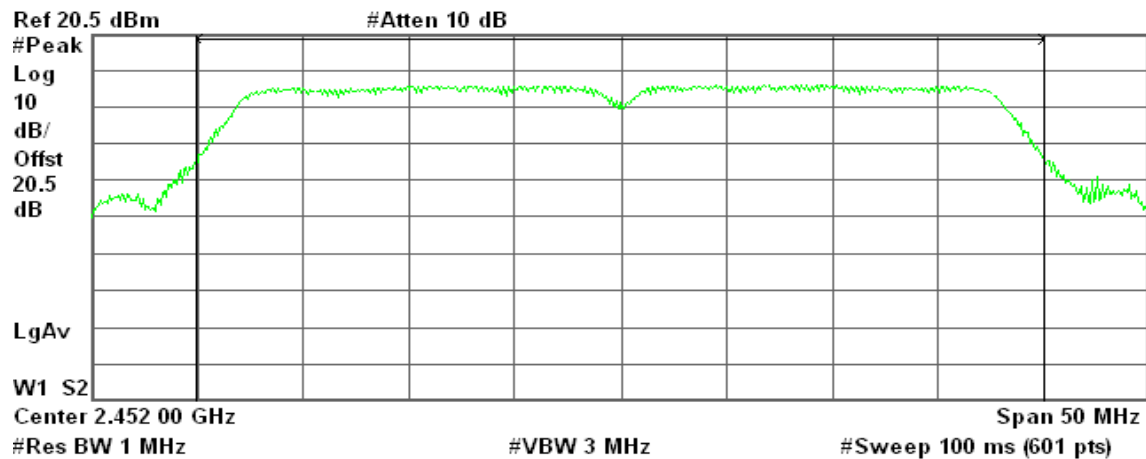
Power Spectral Density

-55.71 dBm/Hz

Peak Power (CH High)

* Agilent 10:32:47 Dec 1, 2009

R T



Channel Power

20.79 dBm / 40.0000 MHz

Power Spectral Density

-55.23 dBm/Hz

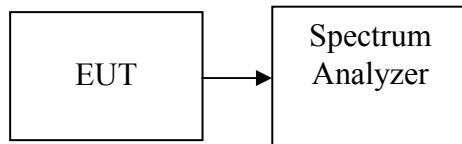


7.3 AVERAGE POWER

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	16.63	0.0460
Mid	2437	16.16	0.0413
High	2462	16.37	0.0434

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	13.91	0.0246
Mid	2437	14.26	0.0267
High	2462	14.01	0.0252

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	13.02	0.0200
Mid	2437	12.75	0.0188
High	2462	12.84	0.0192

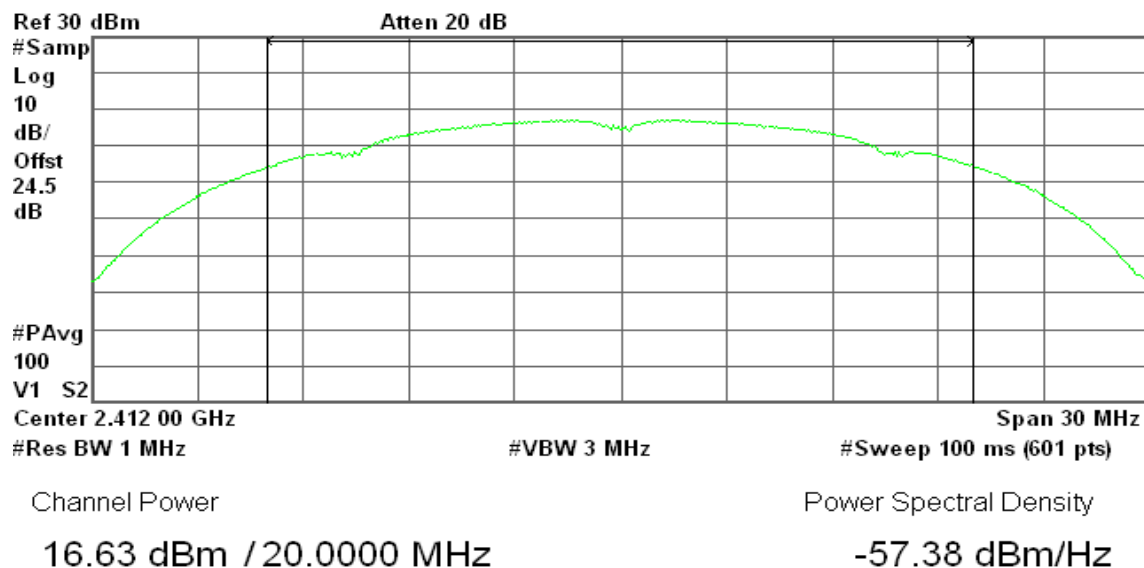
Test mode: draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2422	12.81	0.0191
Mid	2437	13.27	0.0212
High	2452	13.31	0.0214

**Test Plot****IEEE 802.11b mode****Average Power (CH Low)**

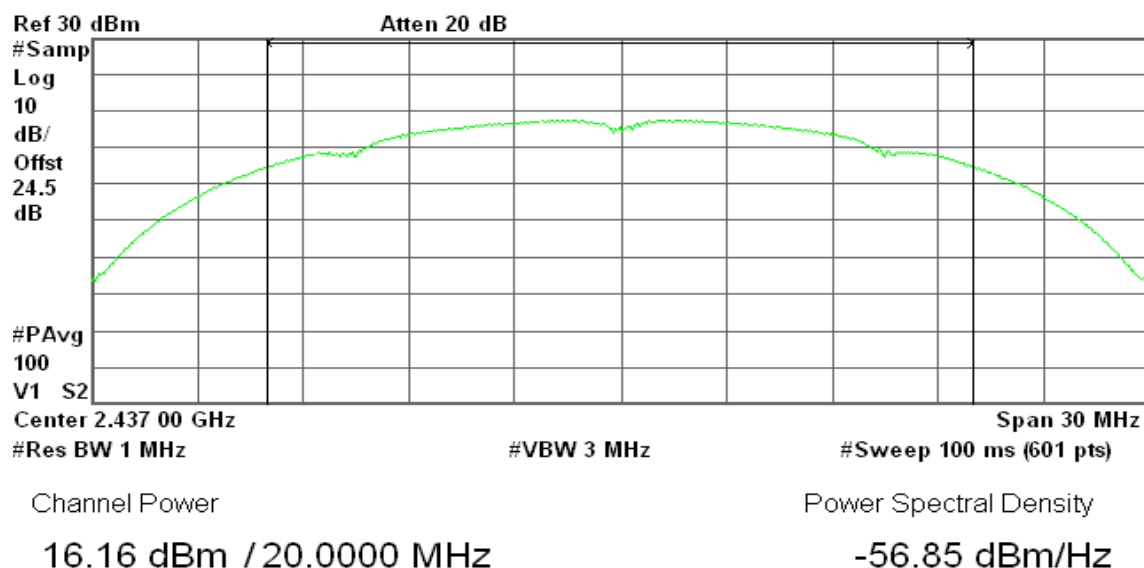
* Agilent 21:48:47 Nov 30, 2009

R T

**Average Power (CH Mid)**

* Agilent 21:54:57 Nov 30, 2009

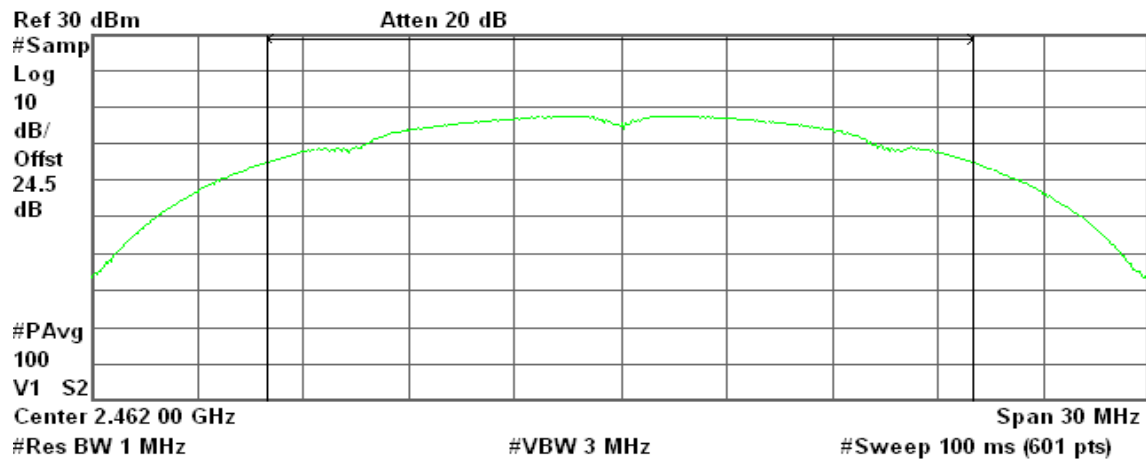
R T



**Average Power (CH High)**

* Agilent 22:01:22 Nov 30, 2009

R T



Channel Power

16.37 dBm / 20.0000 MHz

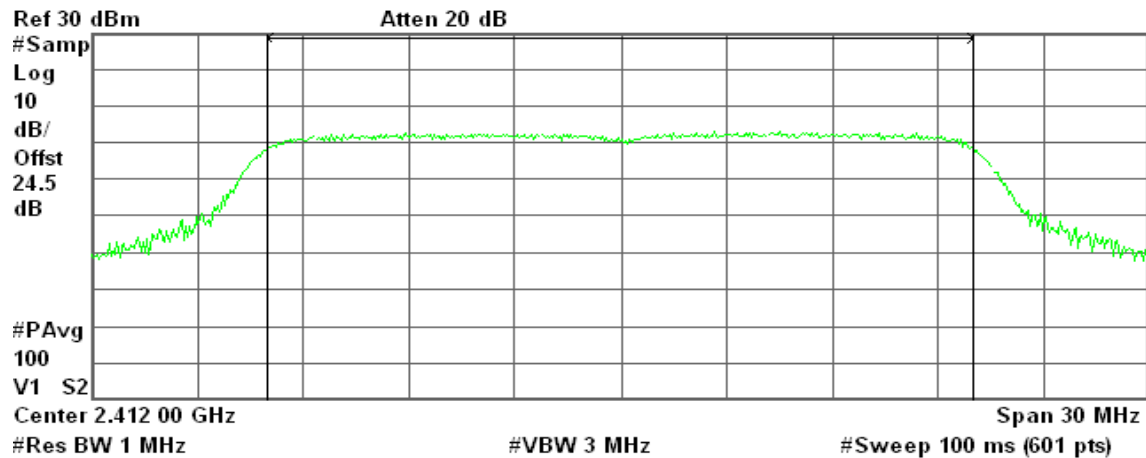
Power Spectral Density

-56.64 dBm/Hz

IEEE 802.11g mode**Average Power (CH Low)**

* Agilent 22:18:53 Nov 30, 2009

R T



Channel Power

13.91 dBm / 20.0000 MHz

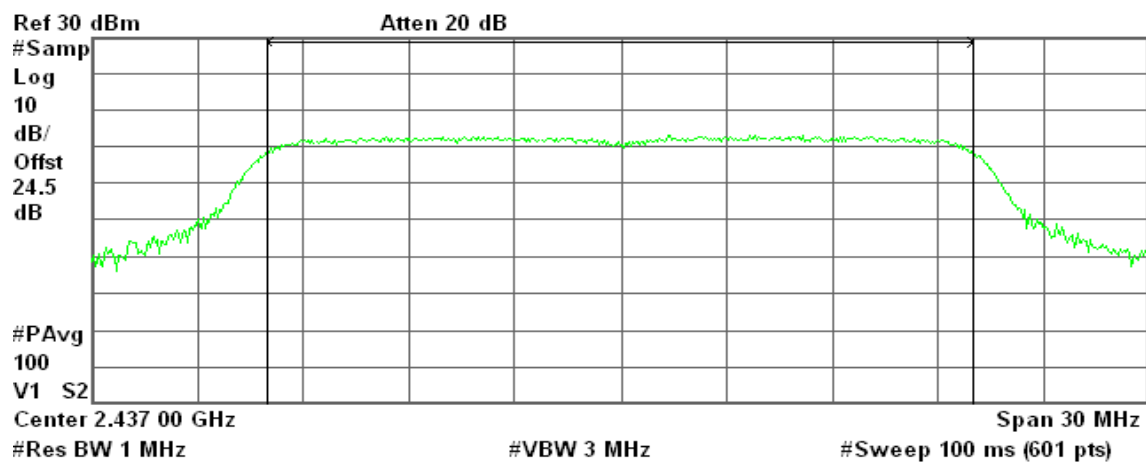
Power Spectral Density

-59.10 dBm/Hz

**Average Power (CH Mid)**

* Agilent 22:13:25 Nov 30, 2009

R T



Channel Power

14.26 dBm / 20.0000 MHz

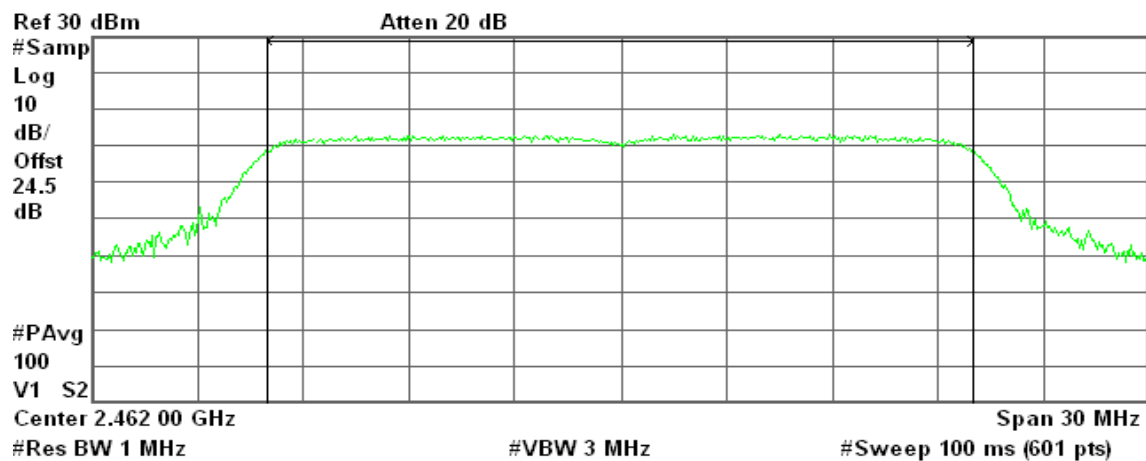
Power Spectral Density

-58.75 dBm/Hz

Average Power (CH High)

* Agilent 22:07:36 Nov 30, 2009

R T



Channel Power

14.01 dBm / 20.0000 MHz

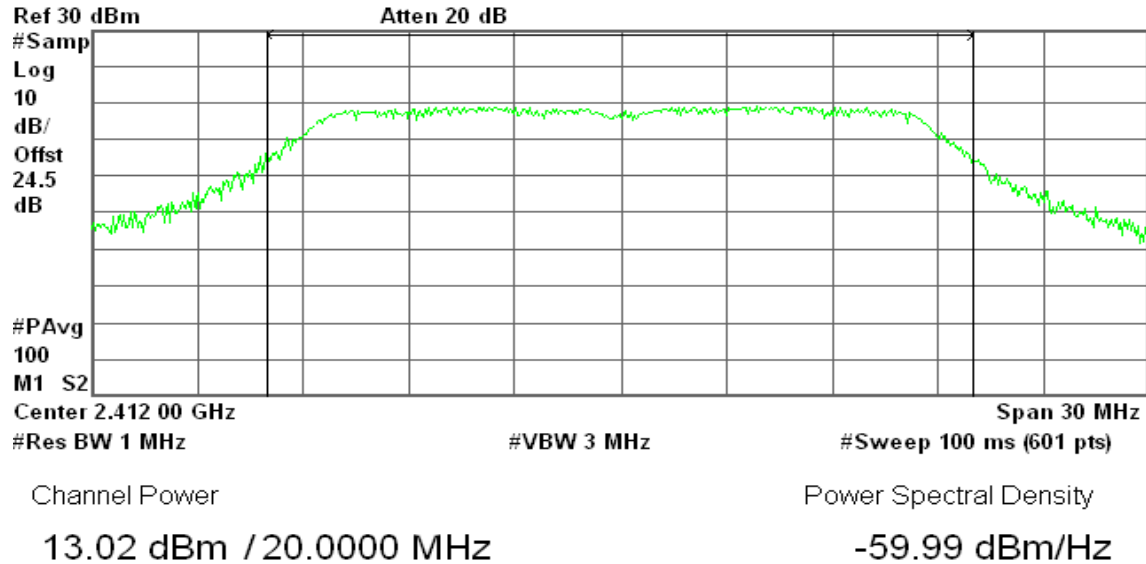
Power Spectral Density

-59.01 dBm/Hz

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

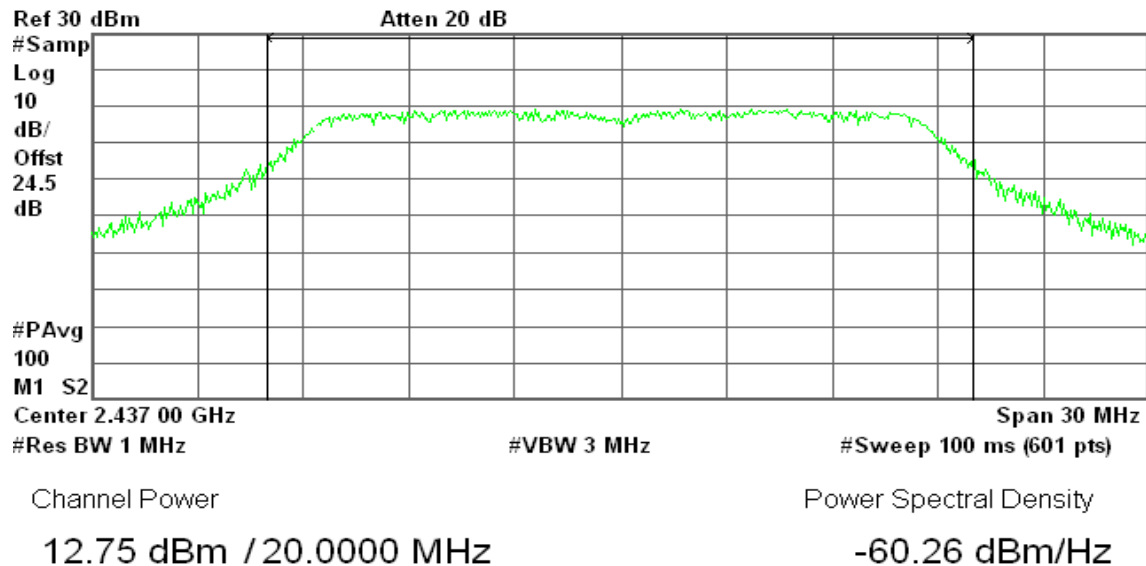
* Agilent 09:21:40 Dec 1, 2009

R T

**Average Power (CH Mid)**

* Agilent 09:26:11 Dec 1, 2009

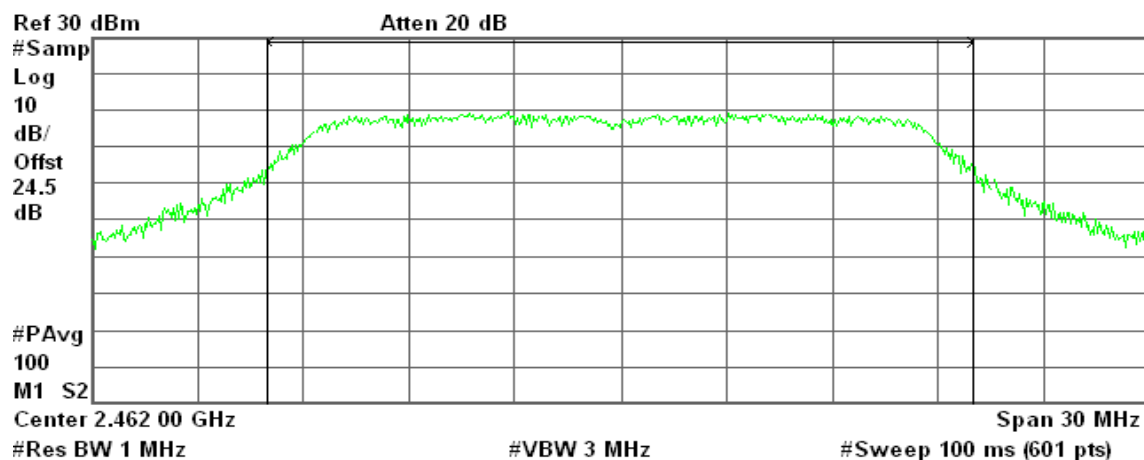
R T



**Average Power (CH High)**

* Agilent 09:41:47 Dec 1, 2009

R T



Channel Power

12.84 dBm / 20.0000 MHz

Power Spectral Density

-60.17 dBm/Hz

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

* Agilent 09:56:23 Dec 1, 2009

R T



Channel Power

12.81 dBm / 40.0000 MHz

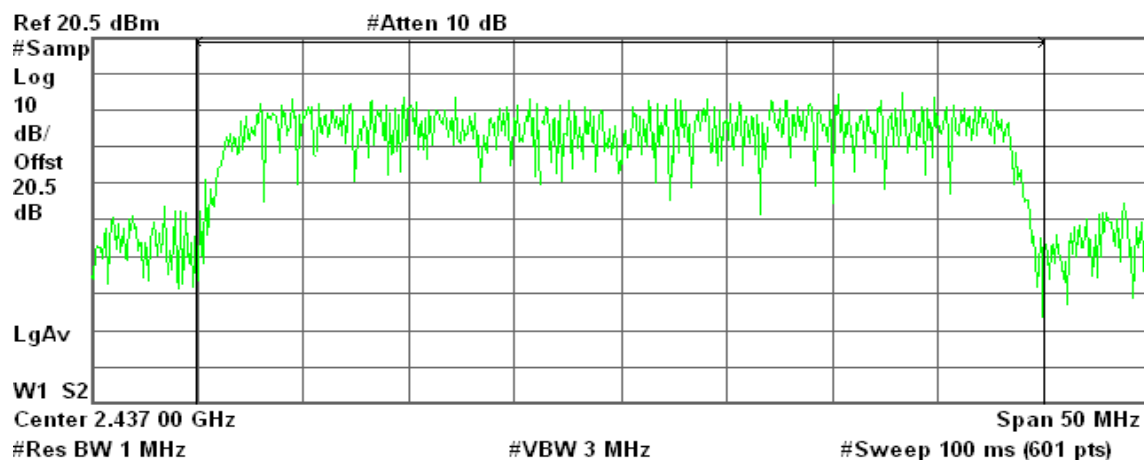
Power Spectral Density

-63.21 dBm/Hz

**Average Power (CH Mid)**

* Agilent 10:20:04 Dec 1, 2009

R T



Channel Power

13.27 dBm / 40.0000 MHz

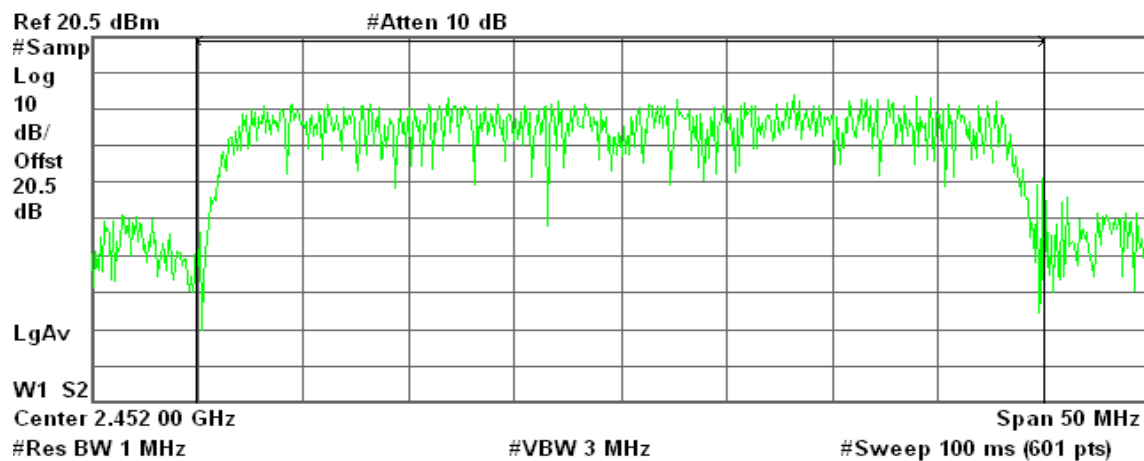
Power Spectral Density

-62.75 dBm/Hz

Average Power (CH High)

* Agilent 10:12:44 Dec 1, 2009

R T



Channel Power

13.31 dBm / 40.0000 MHz

Power Spectral Density

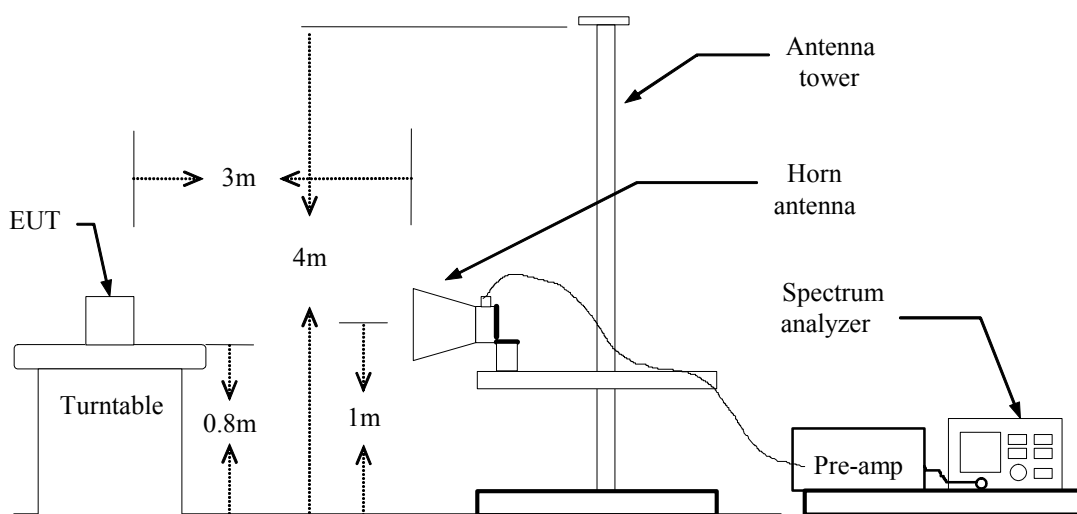
-62.71 dBm/Hz

7.4 BAND EDGES MEASUREMENT

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

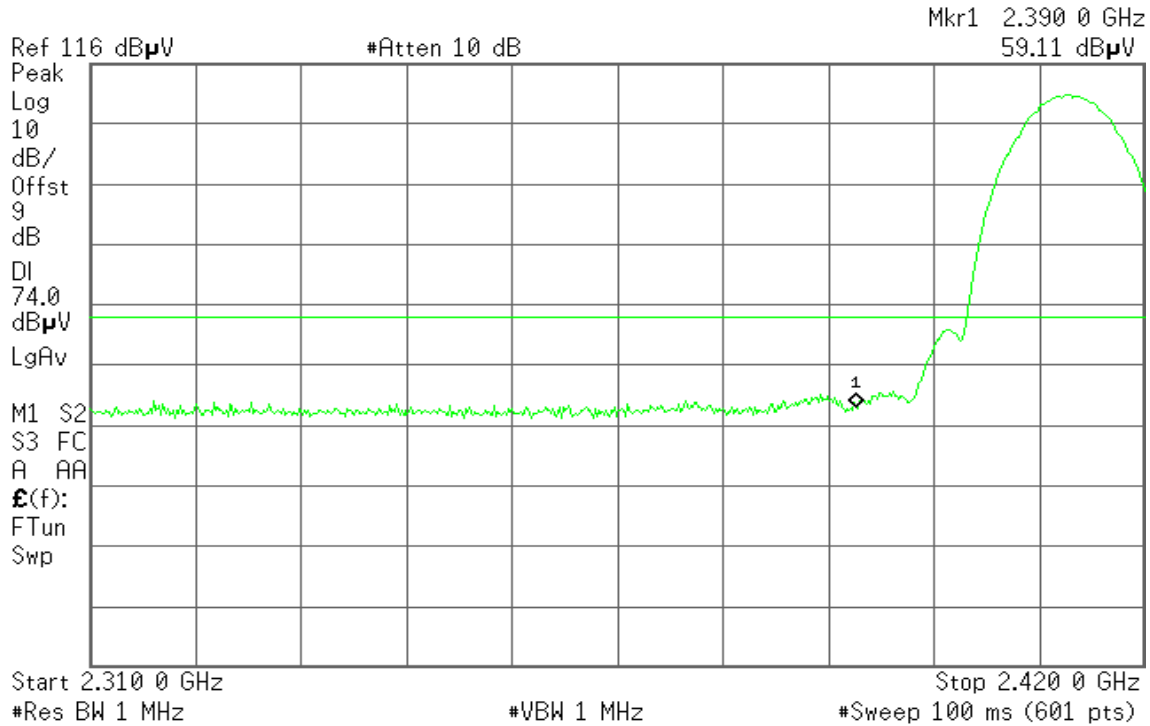
TEST RESULTS

Refer to attach spectrum analyzer data chart.

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

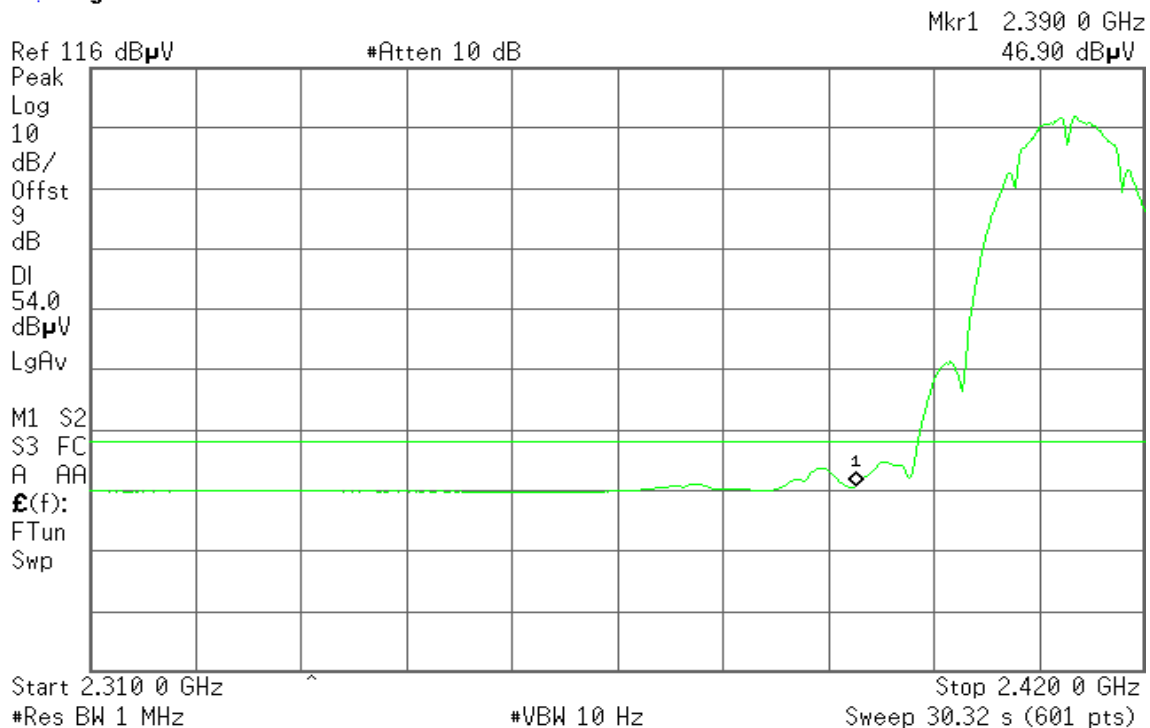
Agilent

R T

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

Agilent

R T



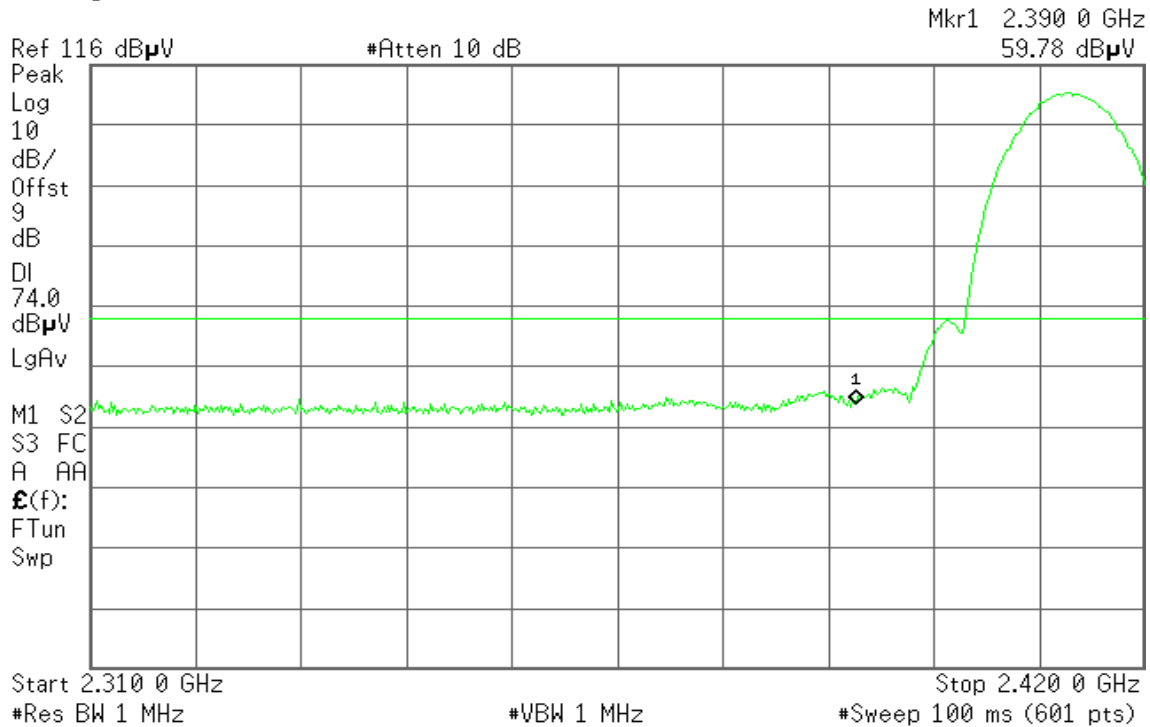


Detector mode: Peak

Polarity: Horizontal

Agilent

R T

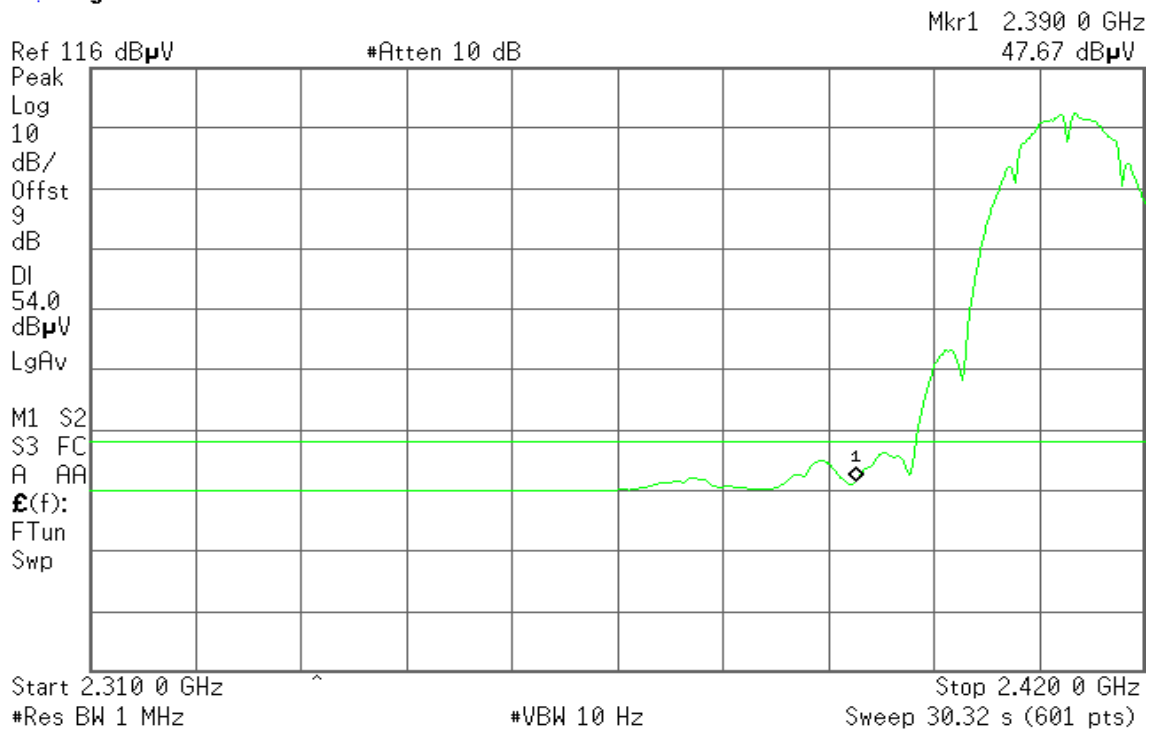


Detector mode: Average

Polarity: Horizontal

Agilent

R T



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

* Agilent

R T

Mkr1 2.483 50 GHz
62.33 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average**Polarity: Vertical**

* Agilent

R T

Mkr1 2.483 50 GHz
52.97 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

^ Stop 2.500 00 GHz

Sweep 11.03 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
63.12 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
53.37 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

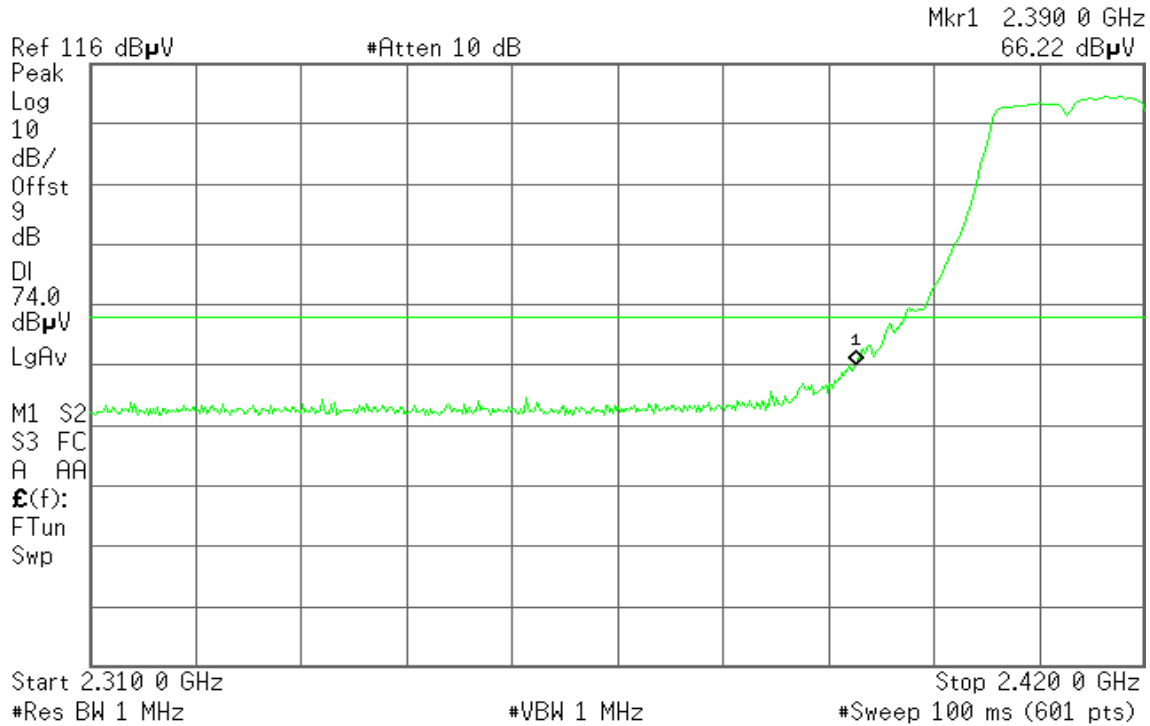
Stop 2.500 00 GHz

Sweep 11.03 s (601 pts)

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

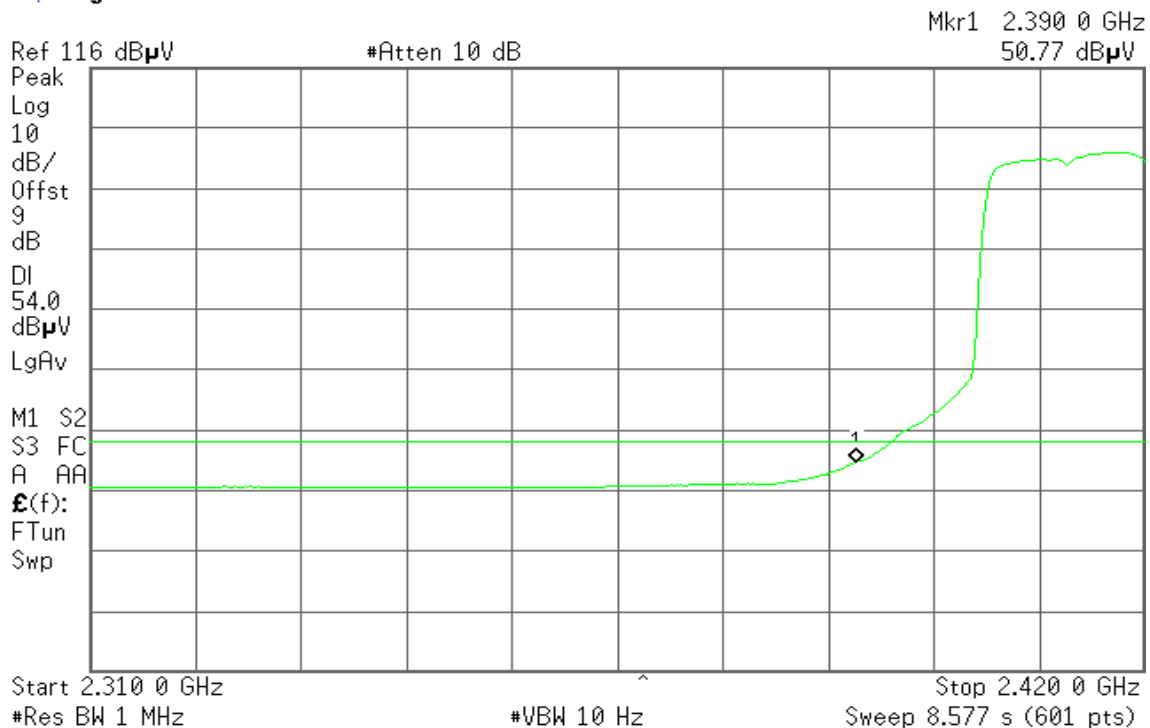
* Agilent

R T

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

* Agilent

R T



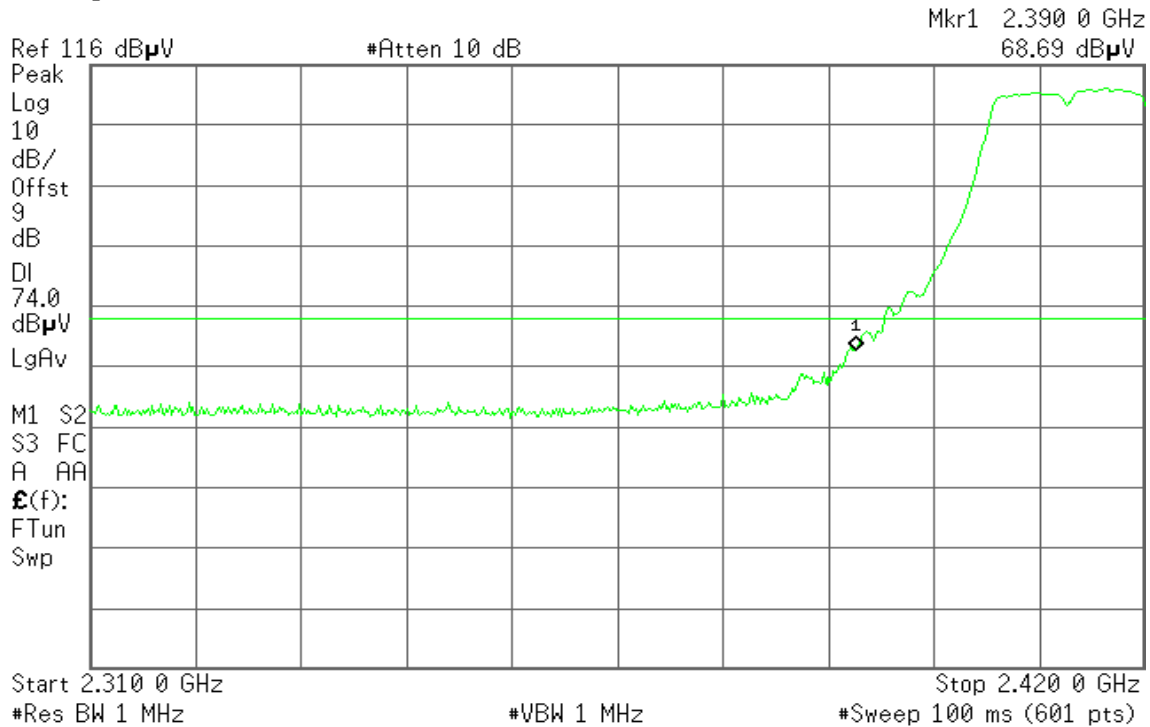


Detector mode: Peak

Polarity: Horizontal

Agilent

R T

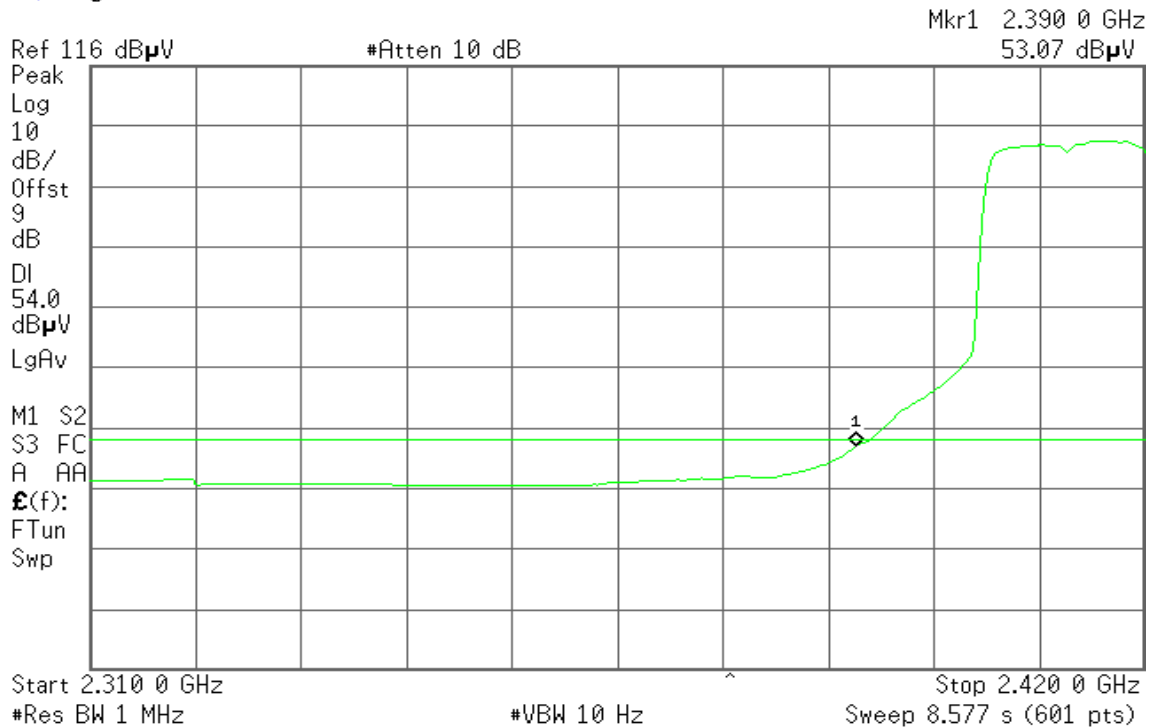


Detector mode: Average

Polarity: Horizontal

Agilent

R T



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

* Agilent

R T

Mkr1 2.483 50 GHz
71.21 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average**Polarity: Vertical**

* Agilent

R T

Mkr1 2.483 50 GHz
53.41 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 11.03 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
71.22 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
53.47 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp

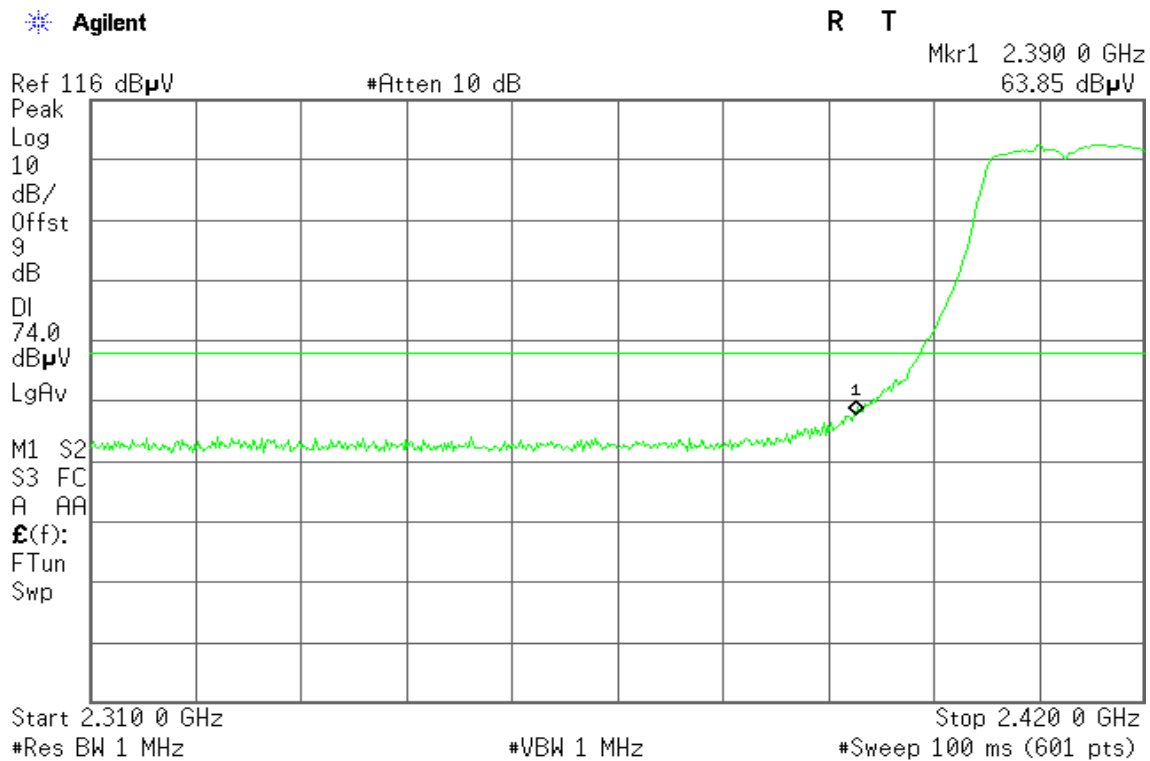
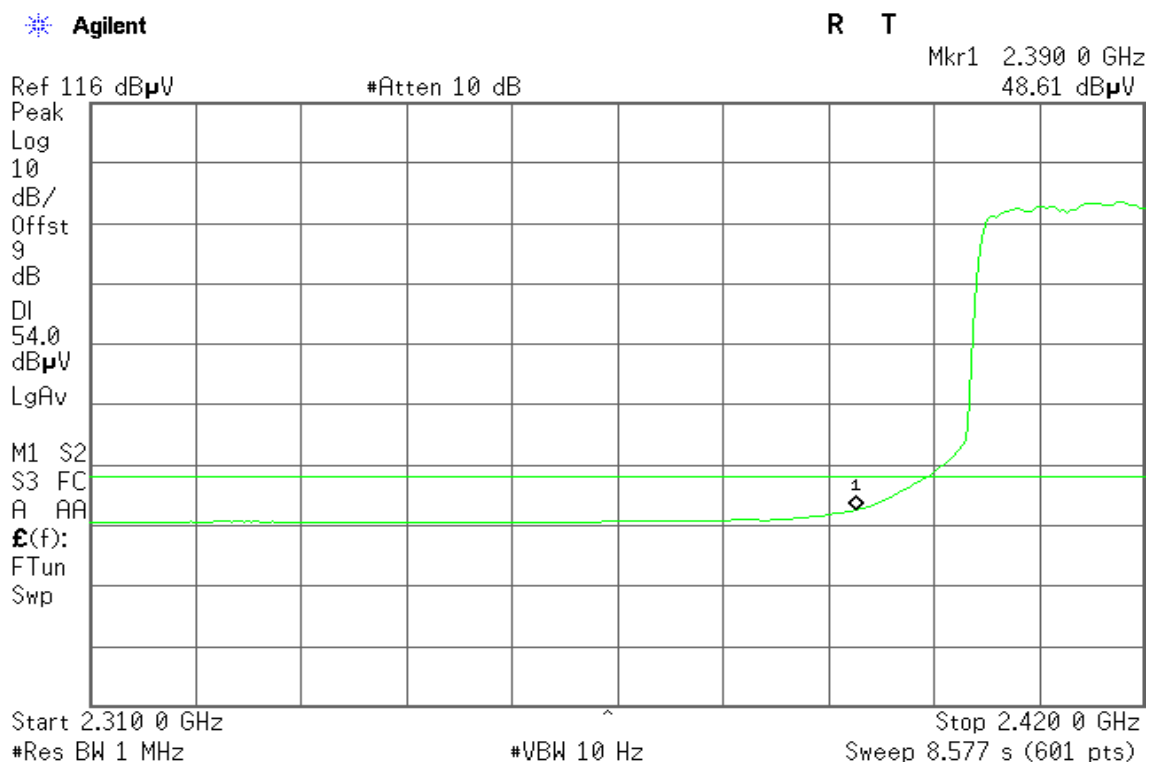
Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 11.03 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**

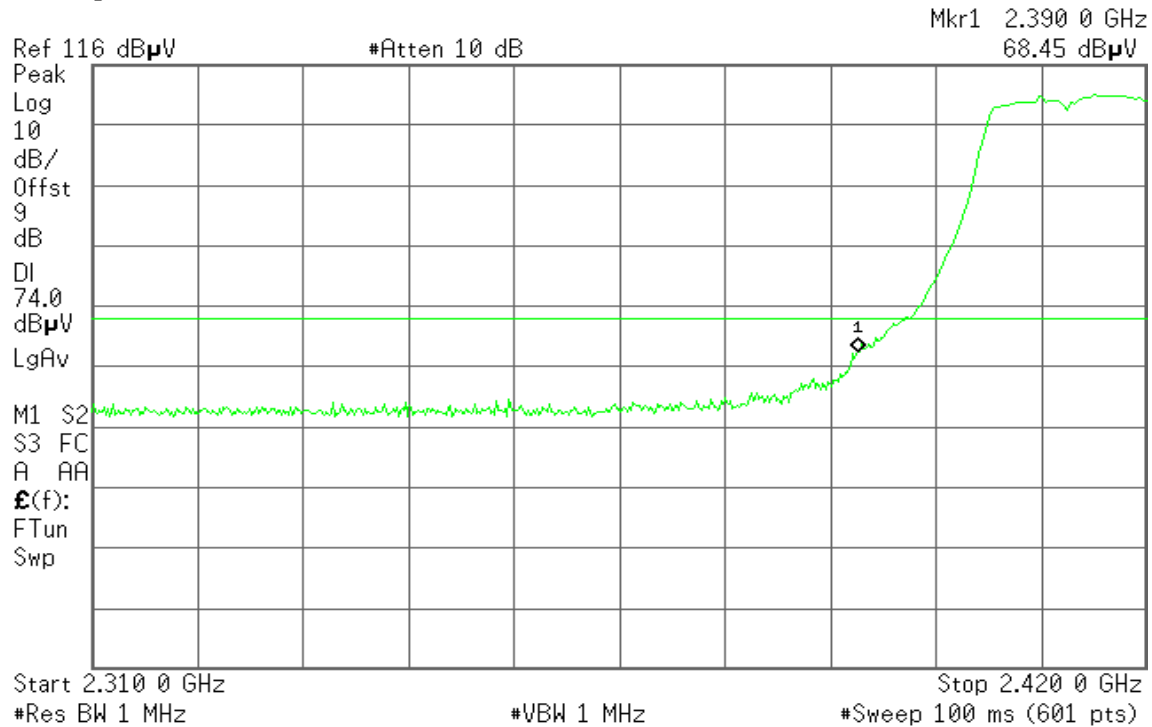


Detector mode: Peak

Polarity: Horizontal

Agilent

R T

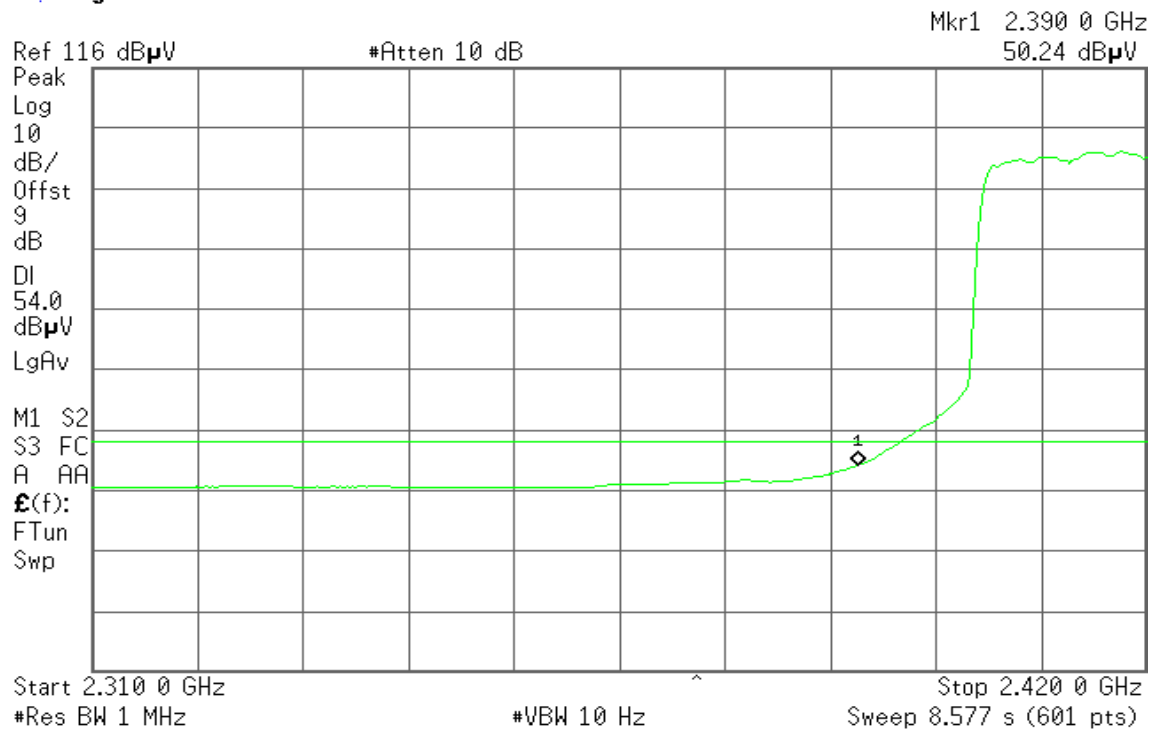


Detector mode: Average

Polarity: Horizontal

Agilent

R T



**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

69.89 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average**Polarity: Vertical**

Agilent

R T

Mkr1 2.483 50 GHz

52.07 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 11.03 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
70.04 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

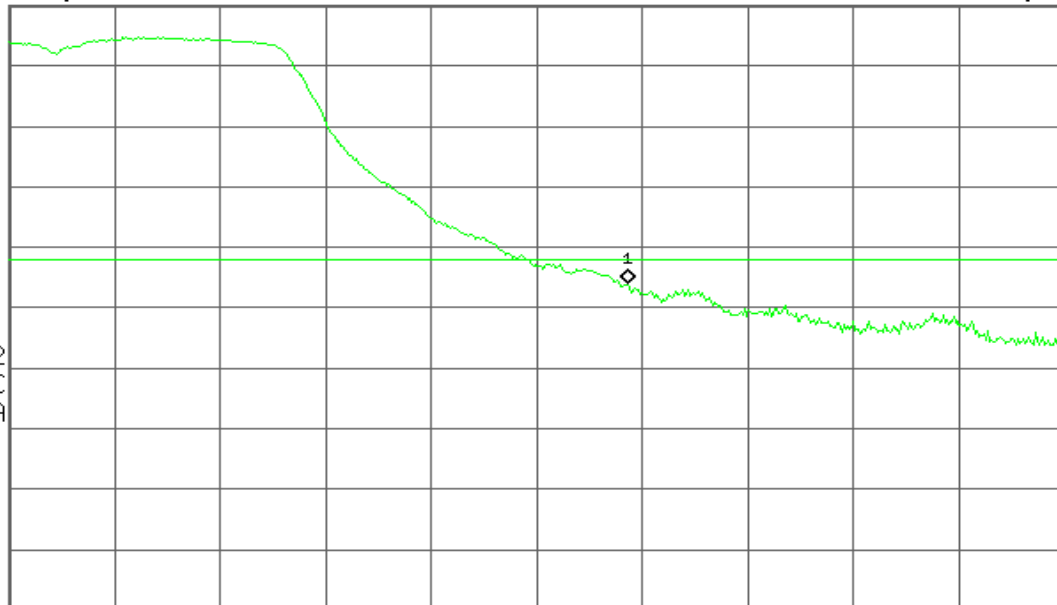
S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp



Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
51.68 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

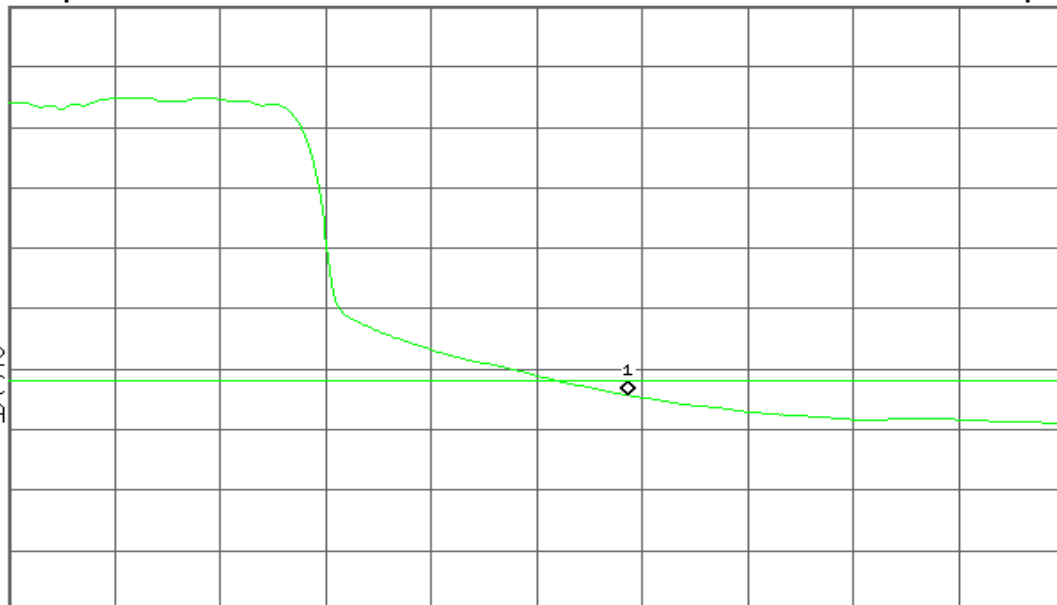
S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp



Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

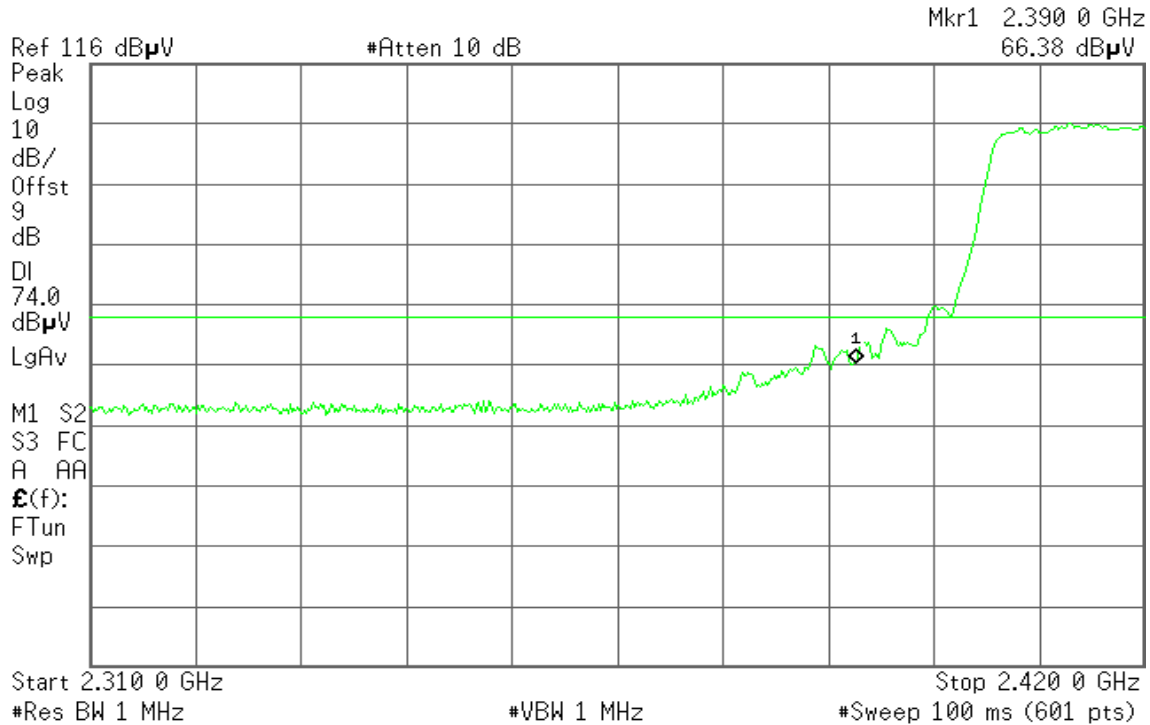
Stop 2.500 00 GHz

Sweep 11.03 s (601 pts)

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

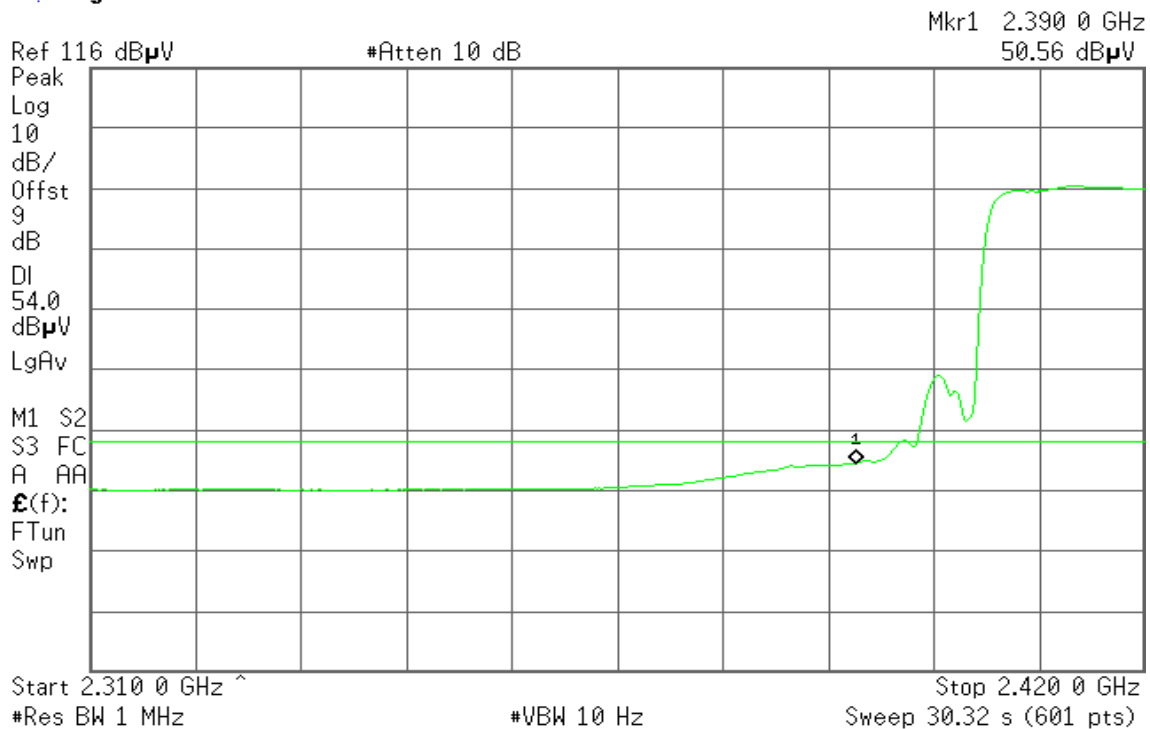
* Agilent

R T

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

* Agilent

R T



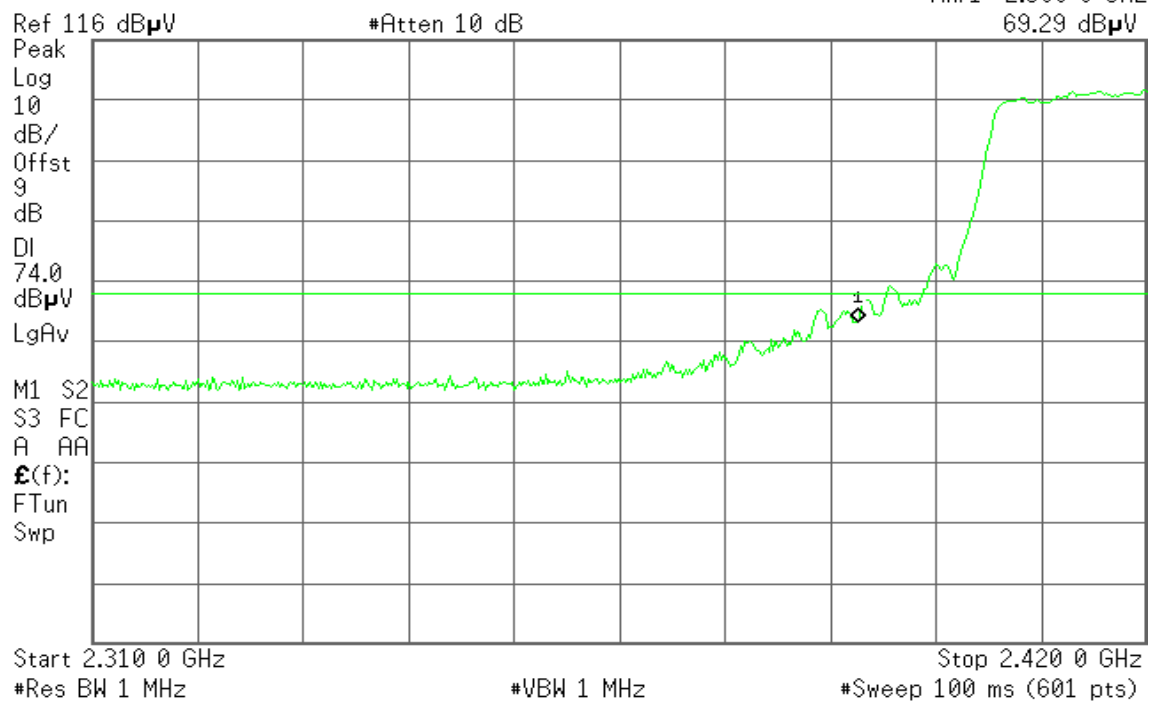


Detector mode: Peak

Polarity: Horizontal

Agilent

R T



Detector mode: Average

Polarity: Horizontal

Agilent

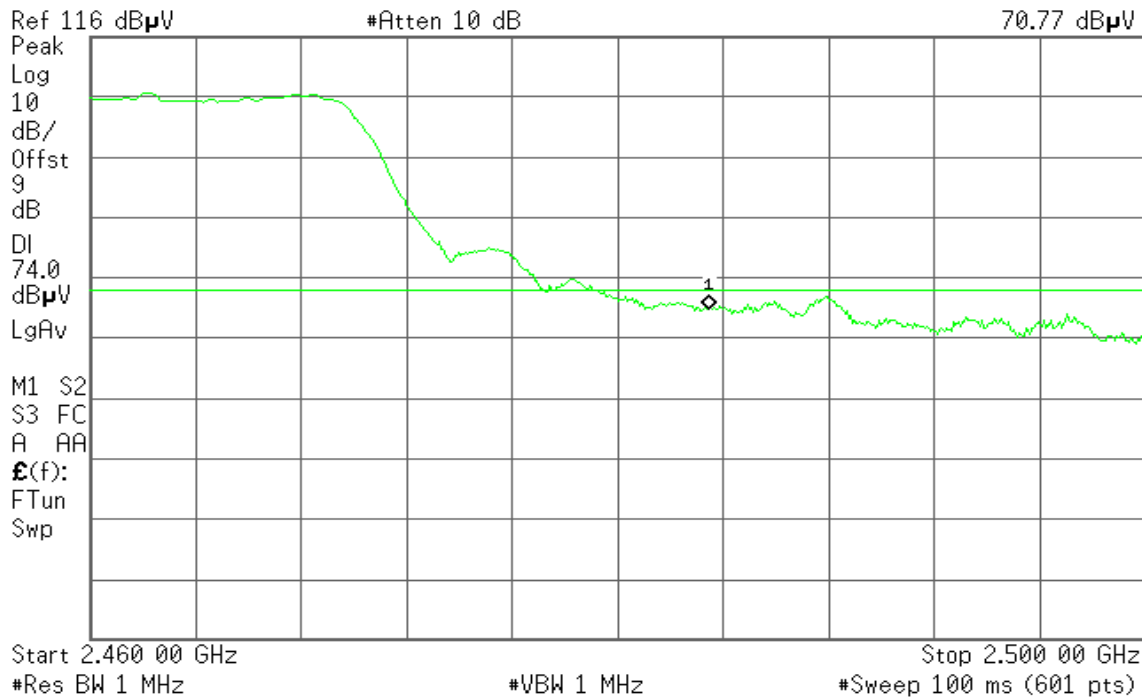
R T



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

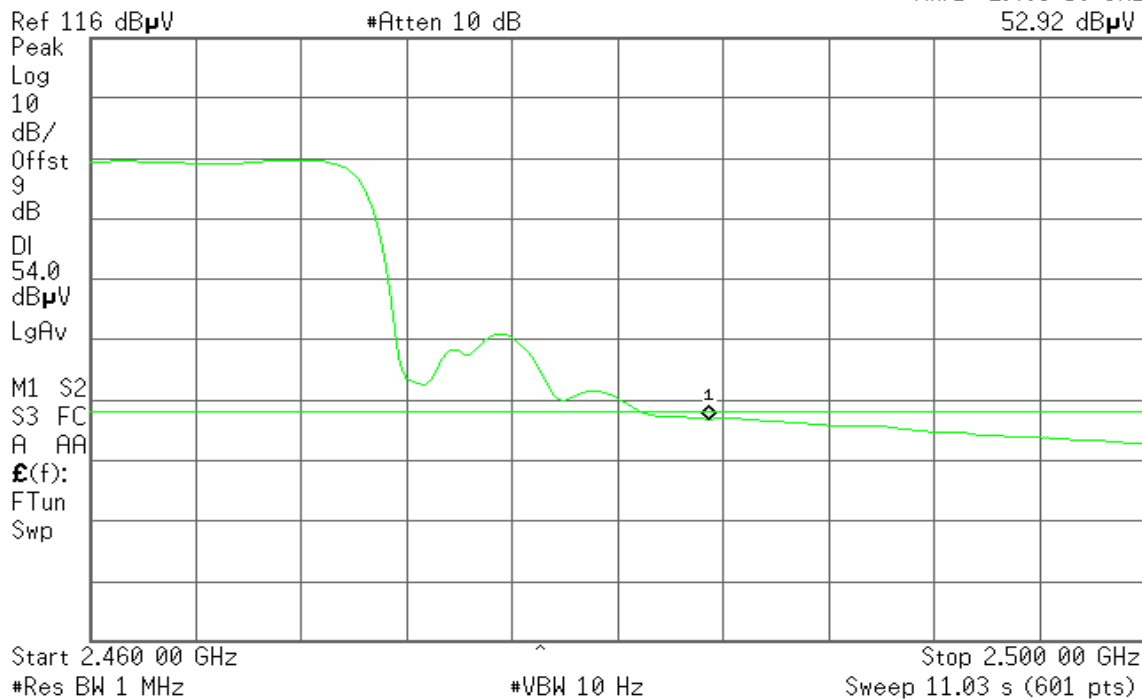
* Agilent

R T

Mkr1 2.483 50 GHz
70.77 dB μ V**Detector mode: Average****Polarity: Vertical**

* Agilent

R T

Mkr1 2.483 50 GHz
52.92 dB μ V



Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
66.80 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

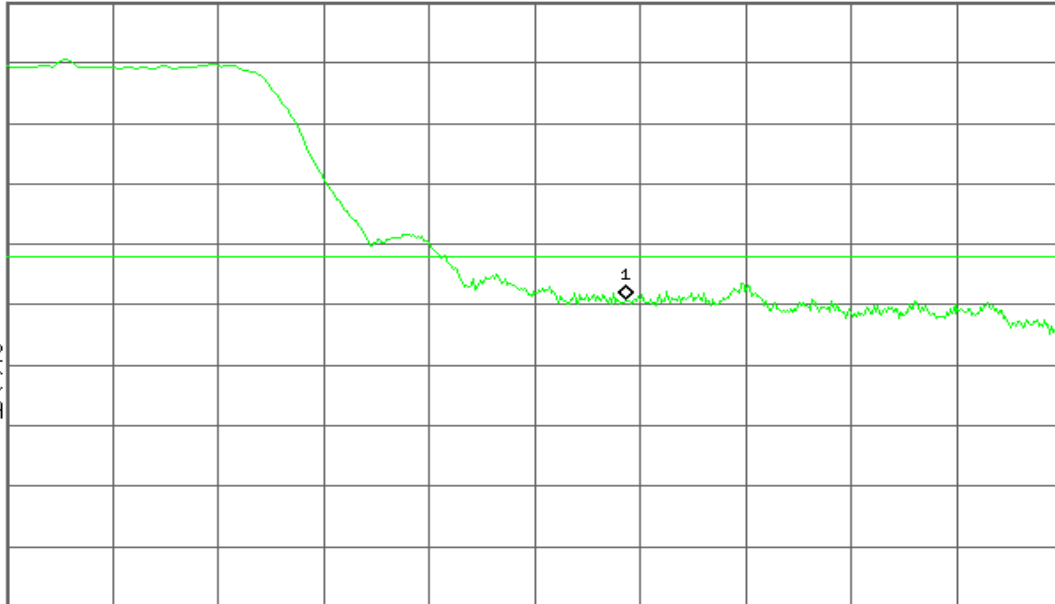
S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp



Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
52.23 dB μ VRef 116 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

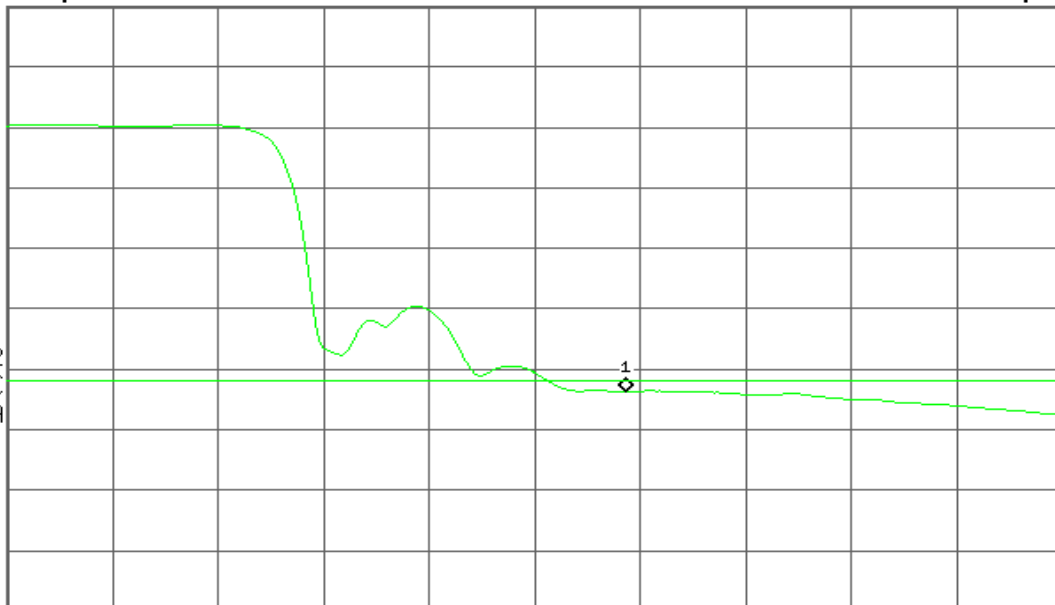
S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp



Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

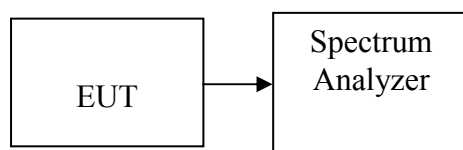
Sweep 11.03 s (601 pts)

7.5 PEAK POWER SPECTRAL DENSITY

LIMIT

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

Test Configuration



TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-15.03	8.00	PASS
Mid	2437	-14.46		PASS
High	2462	-14.31		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-15.26	8.00	PASS
Mid	2437	-15.46		PASS
High	2462	-15.14		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-14.75	8.00	PASS
Mid	2437	-14.68		PASS
High	2462	-14.97		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-16.11	8.00	PASS
Mid	2437	-15.97		PASS
High	2452	-18.49		PASS



Test Plot

IEEE 802.11b mode

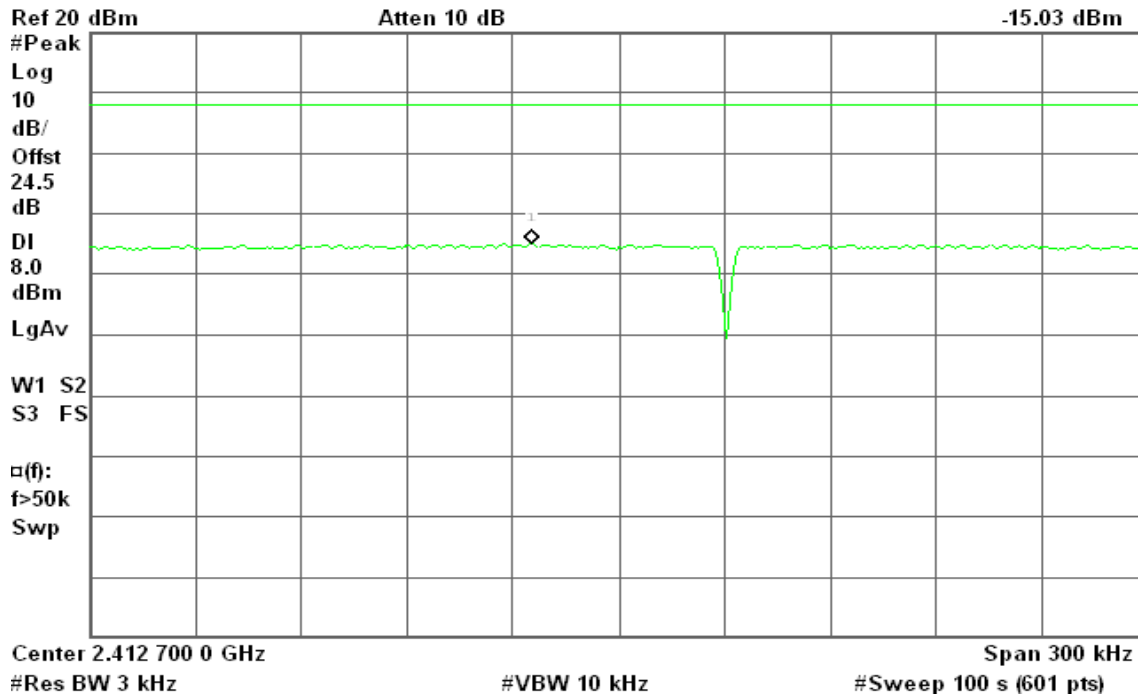
PPSD (CH Low)

* Agilent 21:50:59 Nov 30, 2009

R T

Mkr1 2.412 675 4 GHz

-15.03 dBm



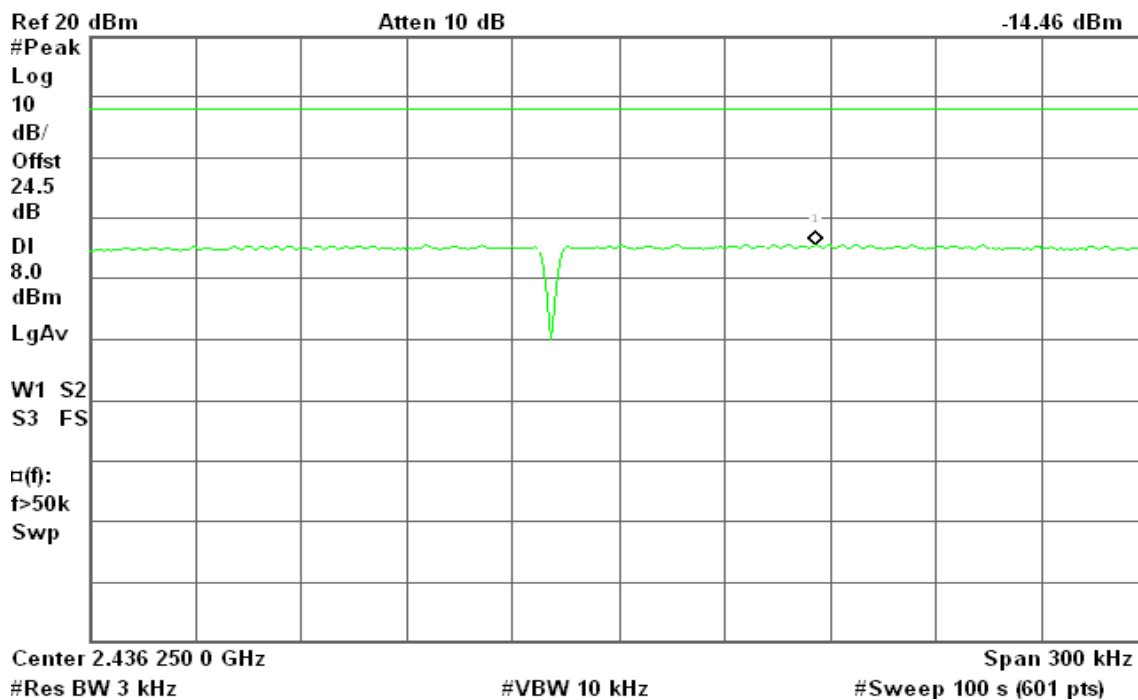
PPSD (CH Mid)

* Agilent 21:57:21 Nov 30, 2009

R T

Mkr1 2.436 305 6 GHz

-14.46 dBm

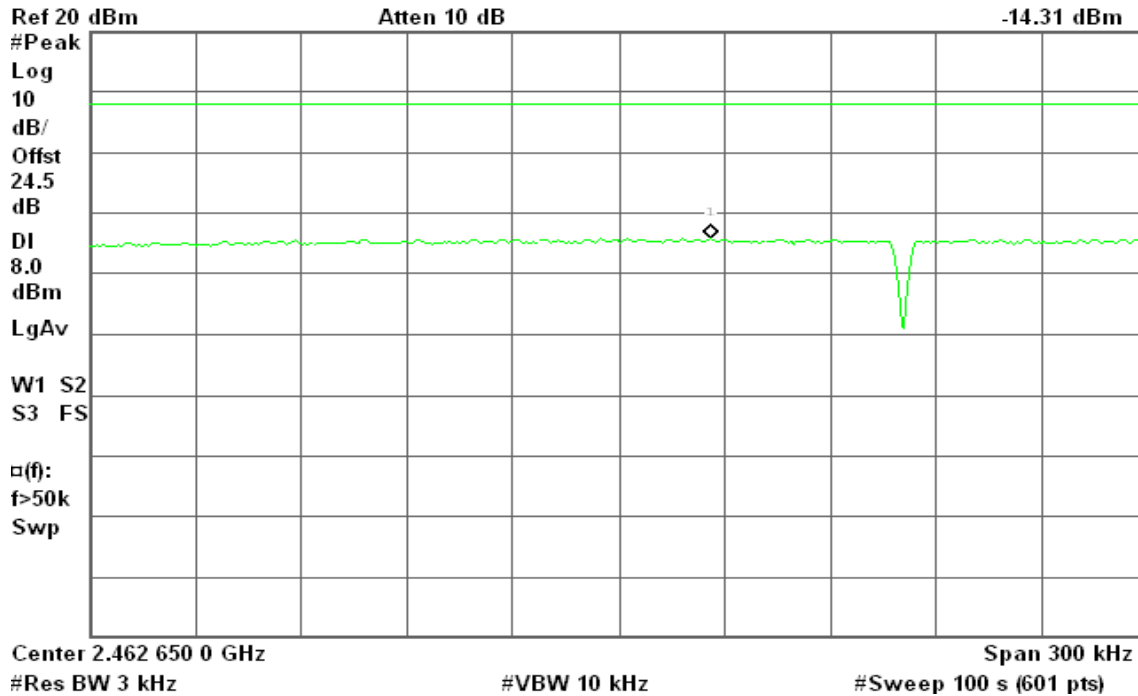




PPSD (CH High)

* Agilent 22:03:32 Nov 30, 2009

R T

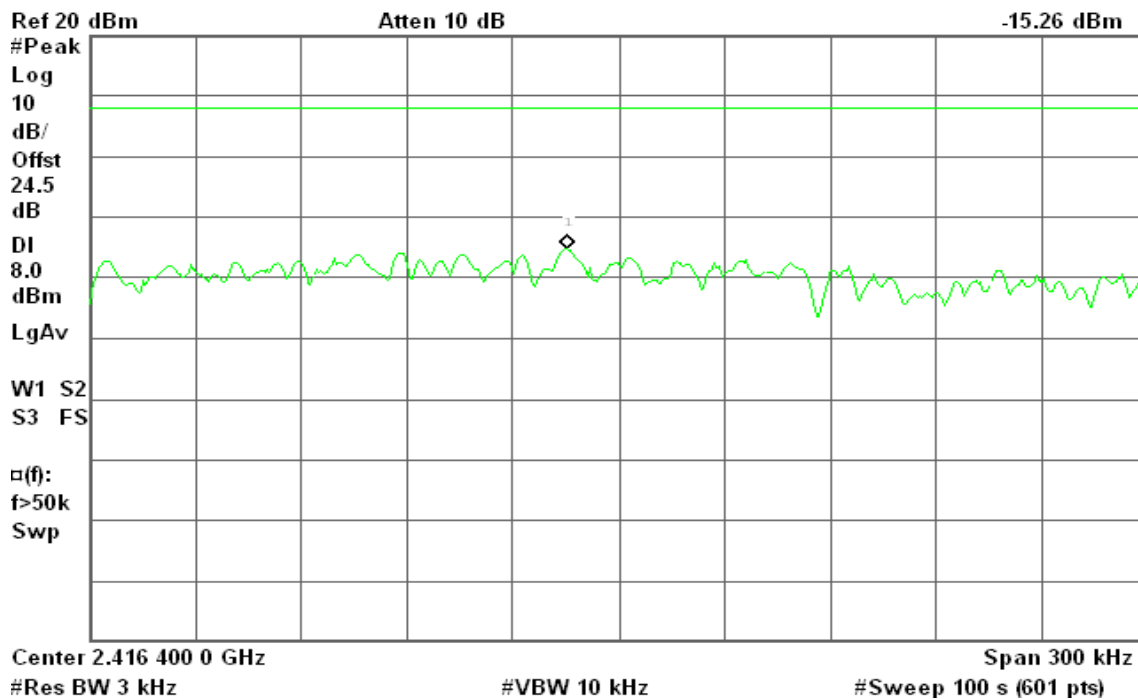
Mkr1 2.462 676 1 GHz
-14.31 dBm

IEEE 802.11g mode

PPSD (CH Low)

* Agilent 22:21:02 Nov 30, 2009

R T

Mkr1 2.416 385 4 GHz
-15.26 dBm



PPSD (CH Mid)

* Agilent 22:15:32 Nov 30, 2009

R T

Mkr1 2.436 046 0 GHz

-15.46 dBm

Ref 20 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

24.5

dB

DI

8.0

dBm

LgAv

W1 S2

S3 FS

□(f):

f>50k

Swp

Center 2.436 050 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)

PPSD (CH High)

* Agilent 22:09:45 Nov 30, 2009

R T

Mkr1 2.466 384 9 GHz

-15.14 dBm

Ref 20 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

24.5

dB

DI

8.0

dBm

LgAv

W1 S2

S3 FS

□(f):

f>50k

Swp

Center 2.466 400 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)



draft 802.11n Standard-20 MHz Channel mode

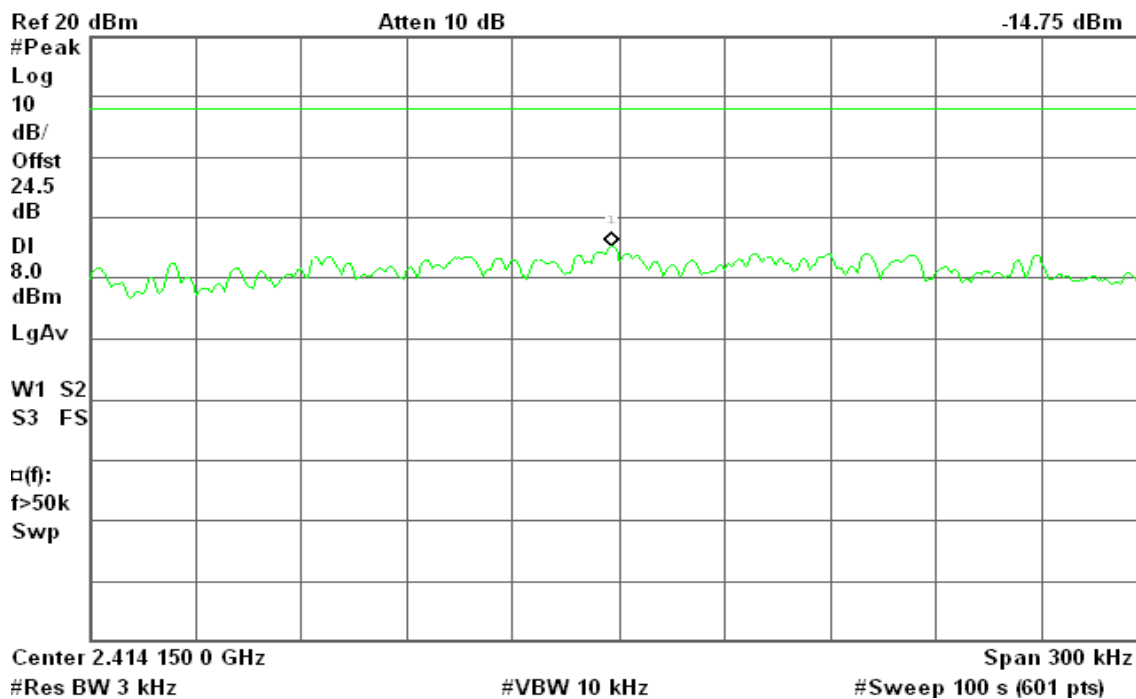
PPSD (CH Low)

* Agilent 09:01:30 Dec 1, 2009

R T

Mkr1 2.414 147 5 GHz

-14.75 dBm



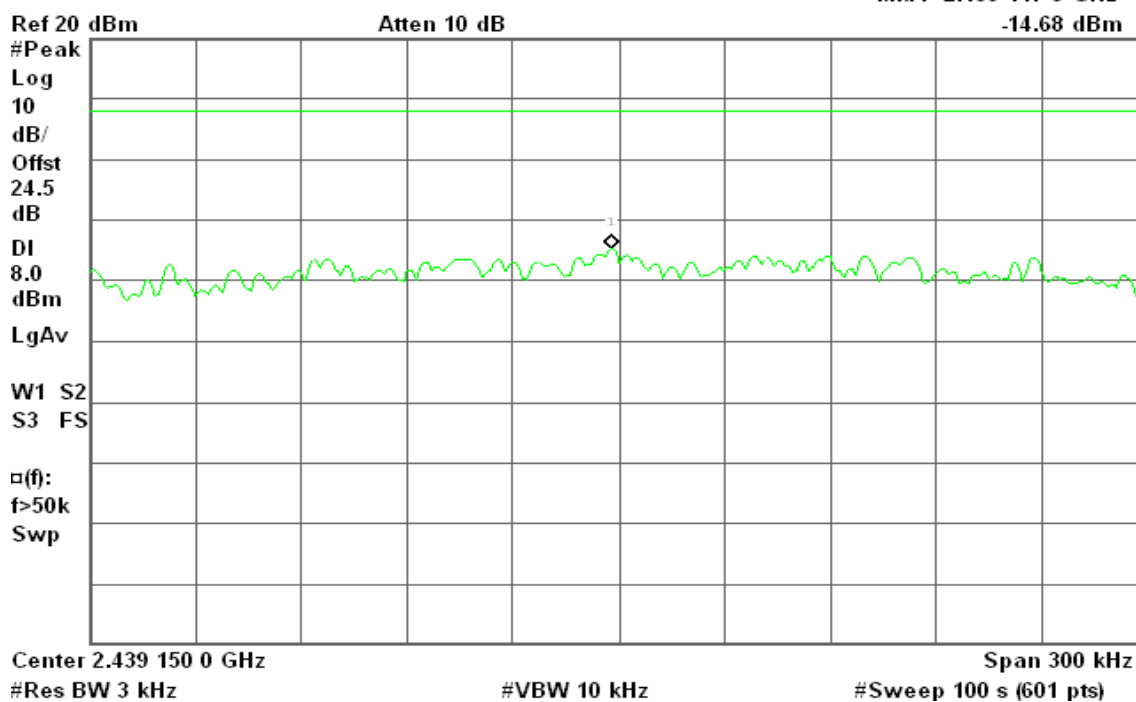
PPSD (CH Mid)

* Agilent 09:28:43 Dec 1, 2009

R T

Mkr1 2.439 147 5 GHz

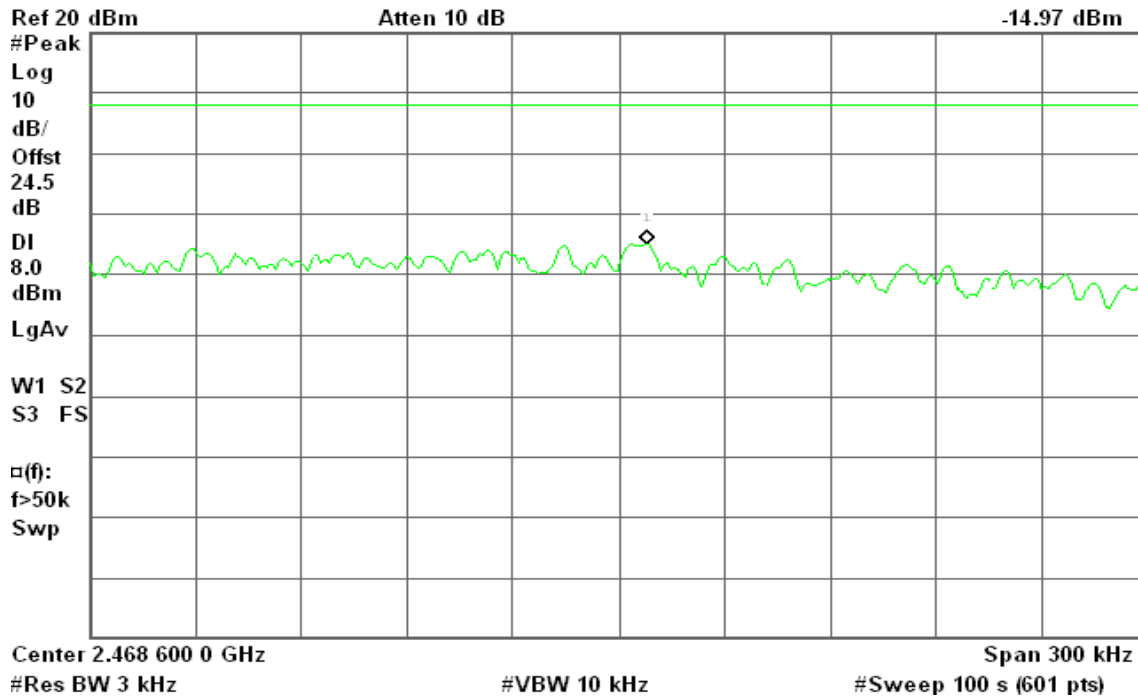
-14.68 dBm



**PPSD (CH High)**

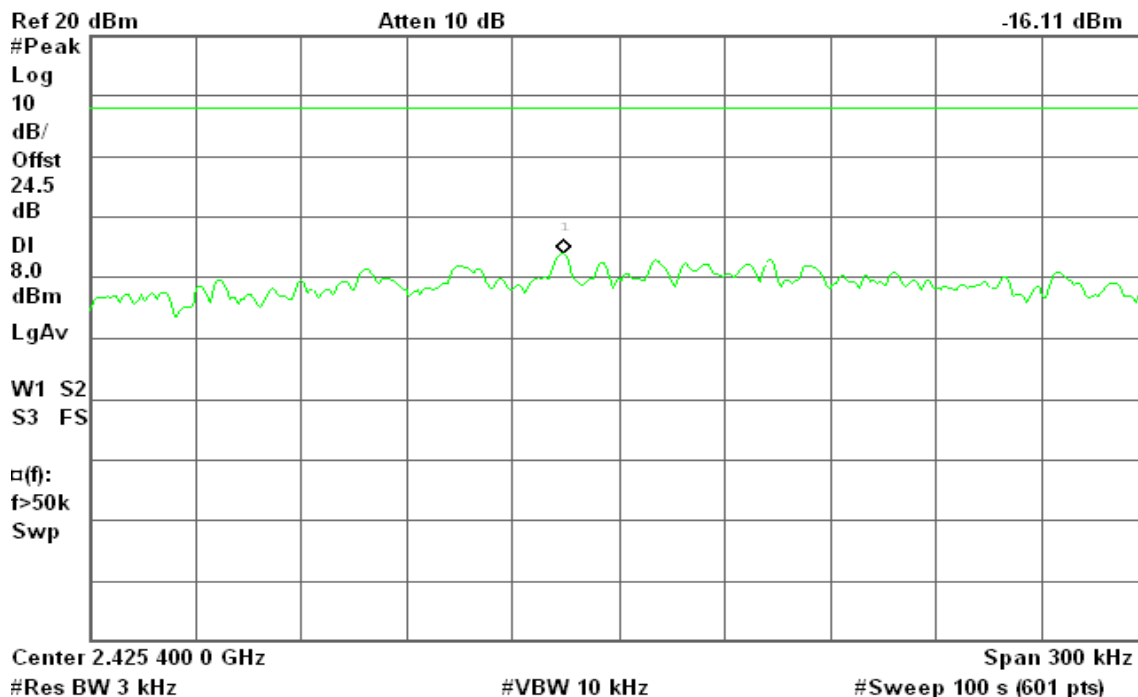
* Agilent 09:44:14 Dec 1, 2009

R T

Mkr1 2.468 608 0 GHz
-14.97 dBm**draft 802.11n Wide-40 MHz Channel mode****PPSD (CH Low)**

* Agilent 09:59:04 Dec 1, 2009

R T

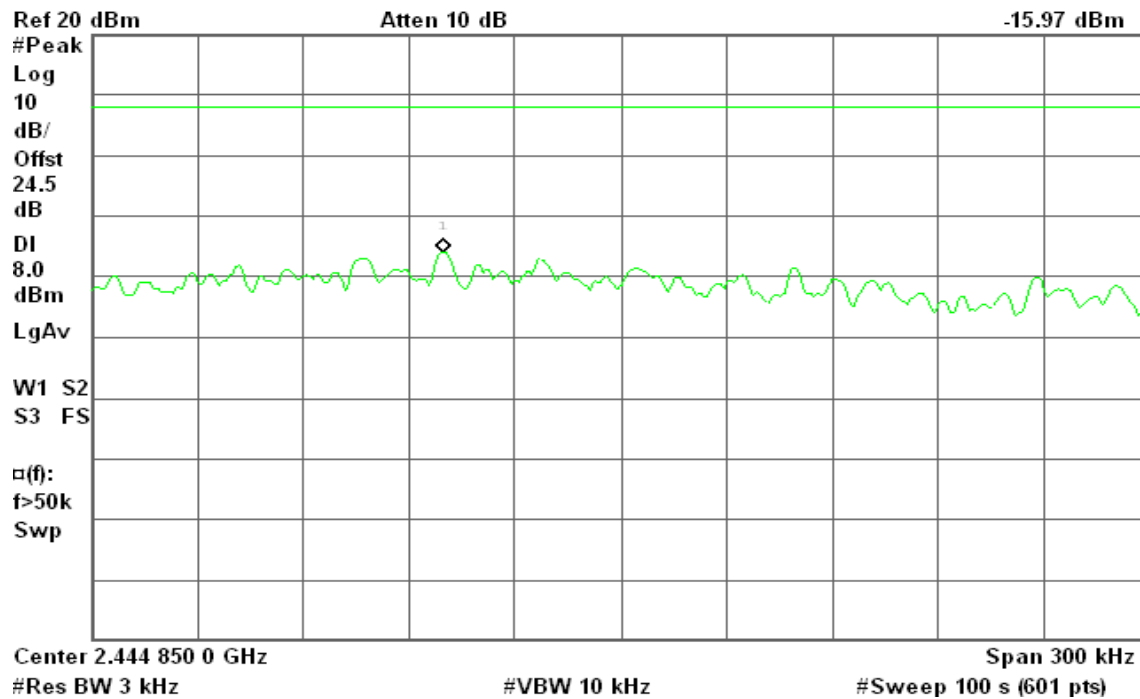
Mkr1 2.425 384 4 GHz
-16.11 dBm



PPSD (CH Mid)

* Agilent 10:07:09 Dec 1, 2009

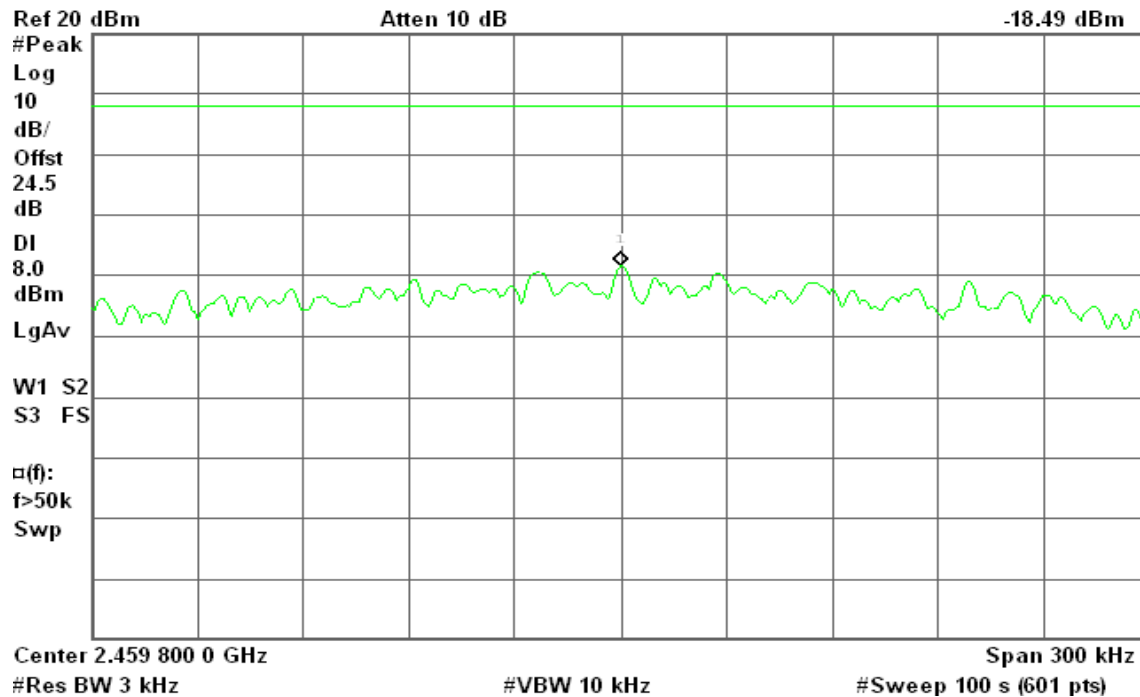
R T

Mkr1 2.444 799 9 GHz
-15.97 dBm

PPSD (CH High)

* Agilent 10:45:45 Dec 1, 2009

R T

Mkr1 2.459 800 0 GHz
-18.49 dBm

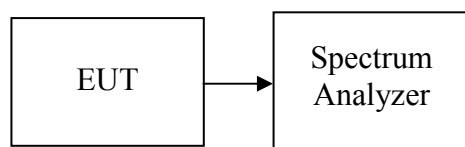
7.6 SPURIOUS EMISSIONS

7.6.1 Conducted Measurement

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

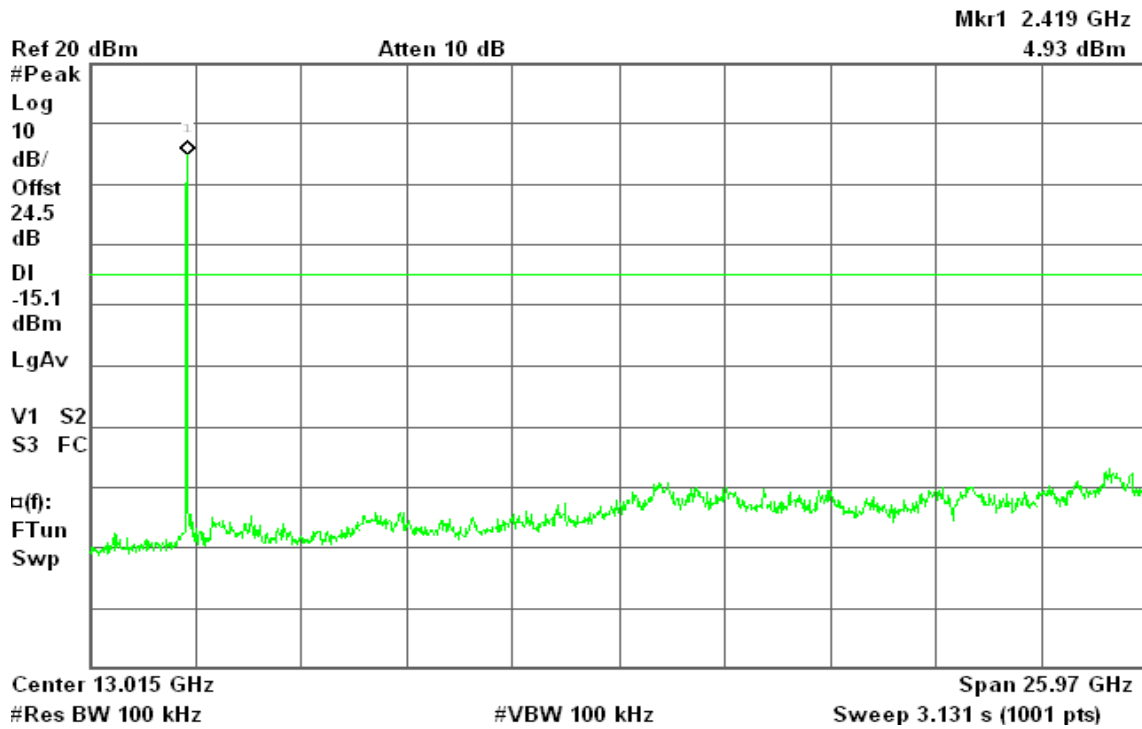
TEST RESULTS

No non-compliance noted

**Test Plot****IEEE 802.11b mode****CH Low**

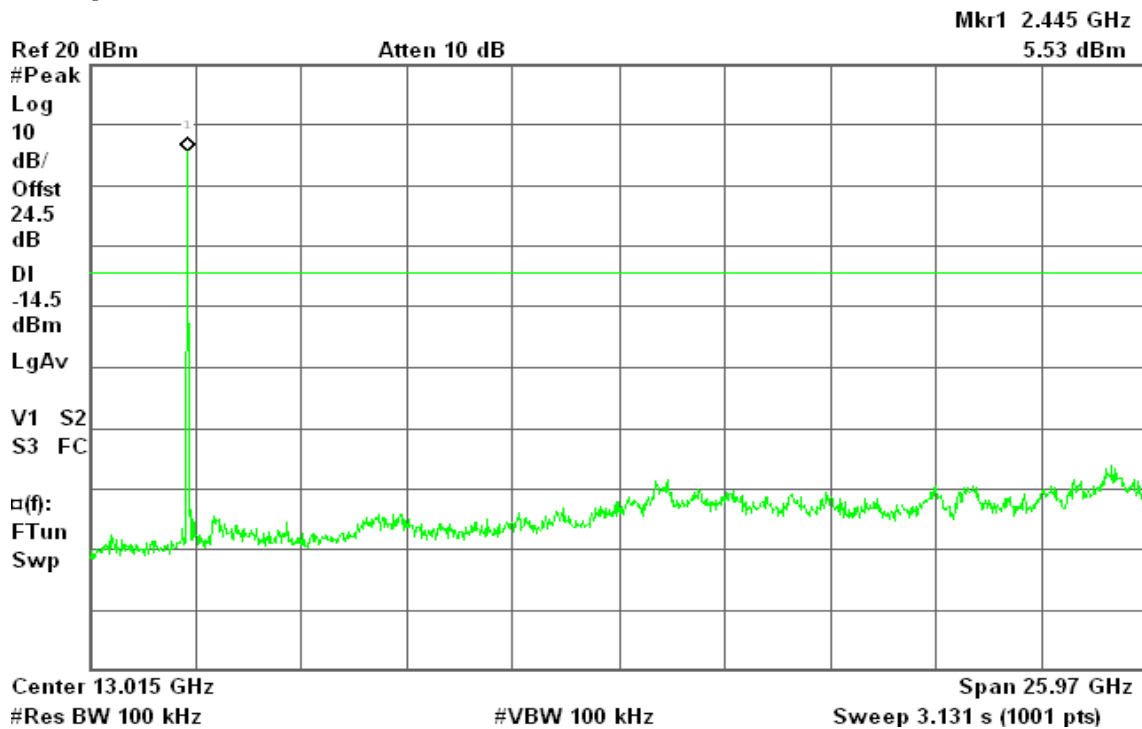
* Agilent 21:51:46 Nov 30, 2009

R T

**CH Mid**

* Agilent 21:58:33 Nov 30, 2009

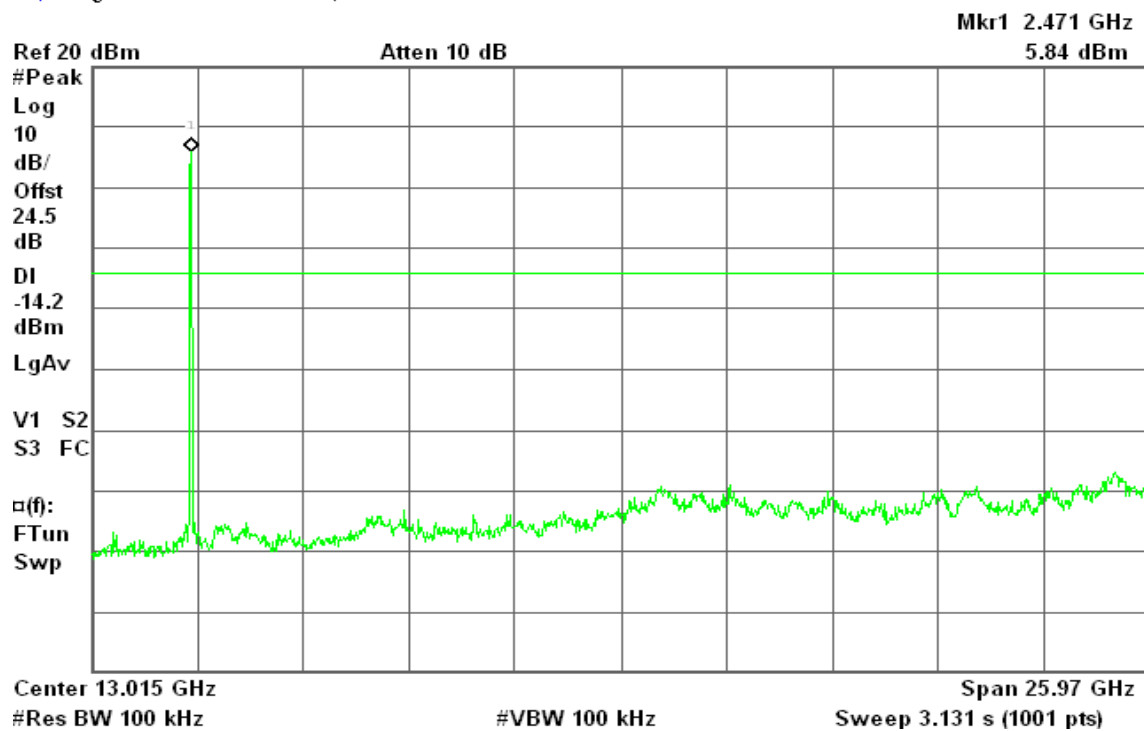
R T



**CH High**

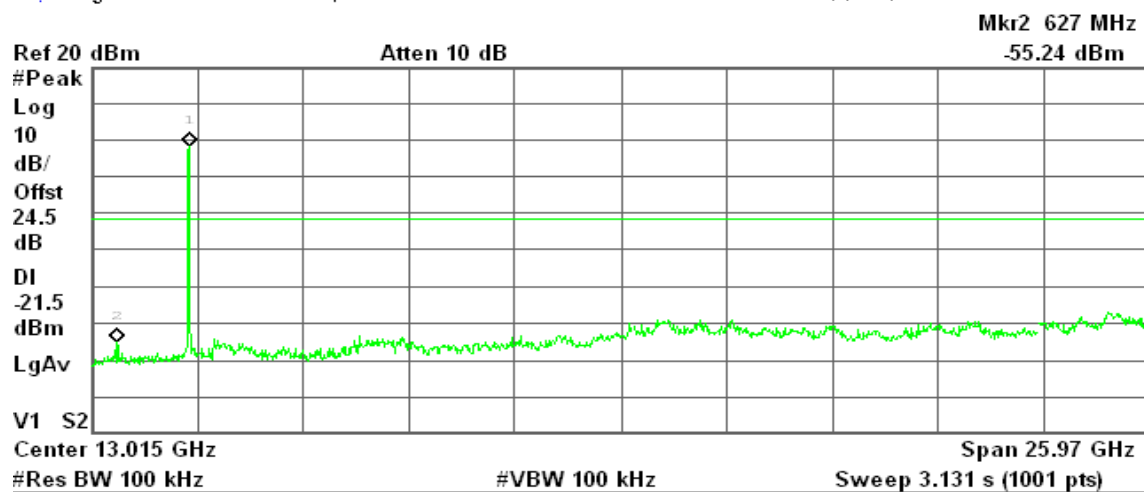
* Agilent 22:04:17 Nov 30, 2009

R T

**IEEE 802.11g mode****CH Low**

* Agilent 22:21:53 Nov 30, 2009

R T



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.419 GHz	-1.50 dBm
2	(1)	Freq	627 MHz	-55.24 dBm



CH Mid

* Agilent 22:16:30 Nov 30, 2009

R T



CH High

* Agilent 22:10:26 Nov 30, 2009

R T



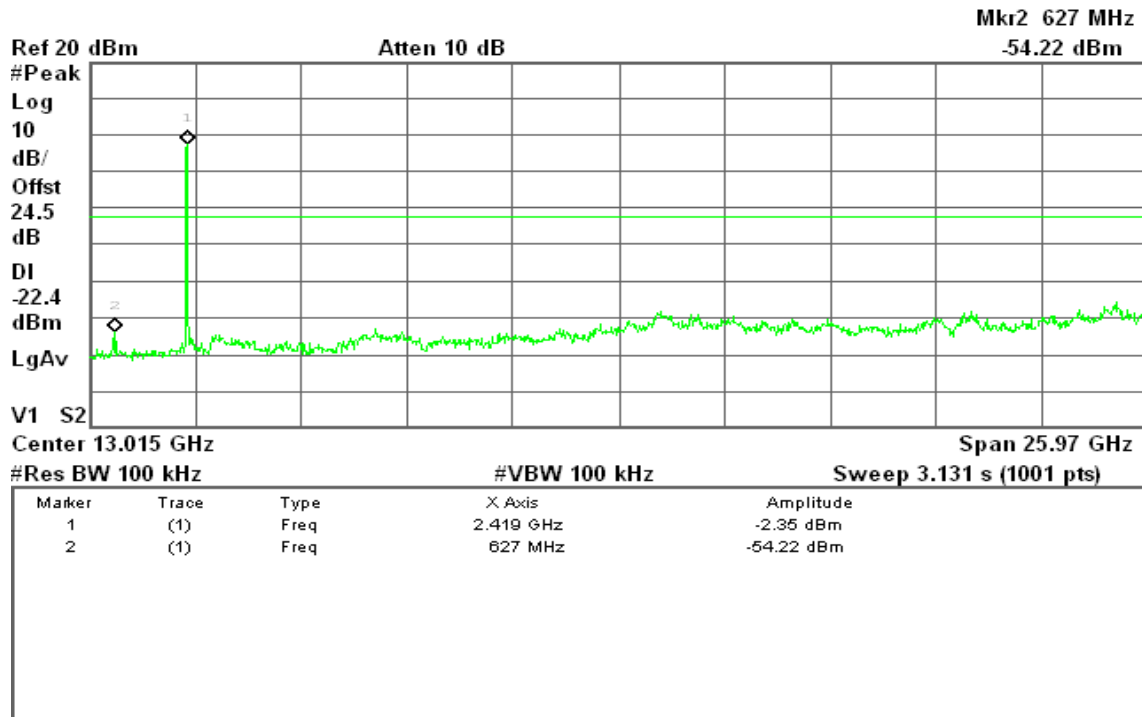


draft 802.11n Standard-20 MHz Channel mode

CH Low

* Agilent 09:03:20 Dec 1, 2009

R T



CH Mid

* Agilent 09:30:37 Dec 1, 2009

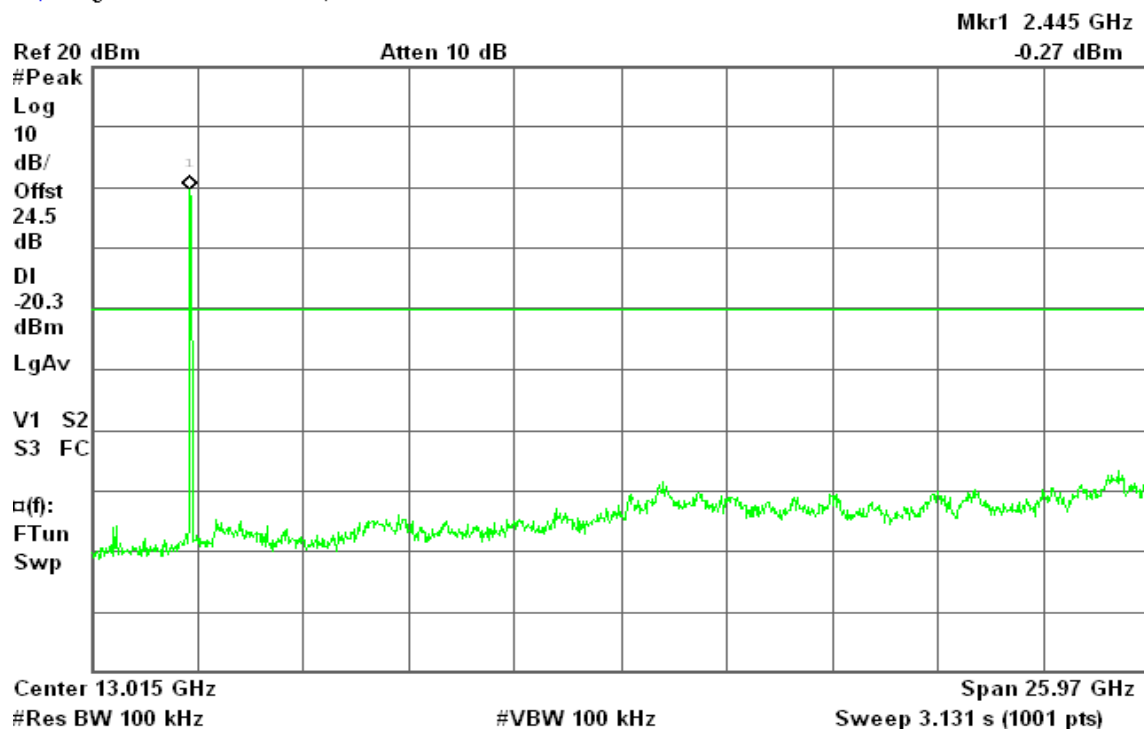
R T



**CH High**

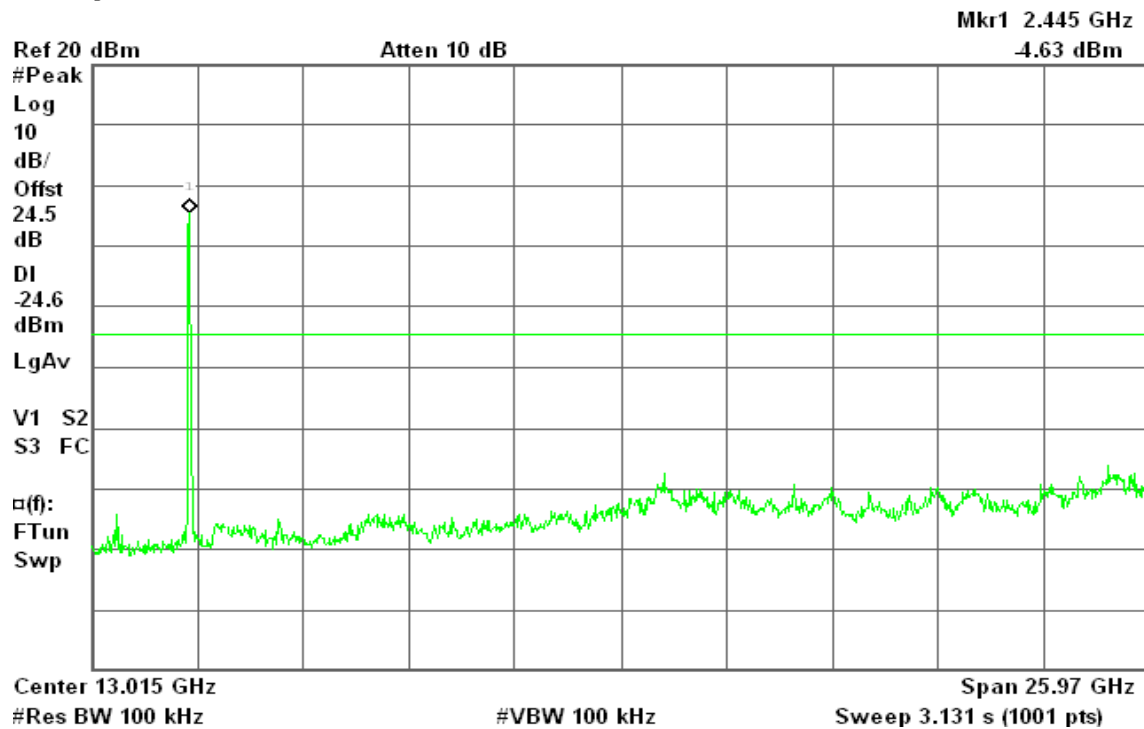
* Agilent 09:45:18 Dec 1, 2009

R T

**draft 802.11n Wide-40 MHz Channel mode****CH Low**

* Agilent 10:00:10 Dec 1, 2009

R T





CH Mid

* Agilent 10:08:07 Dec 1, 2009

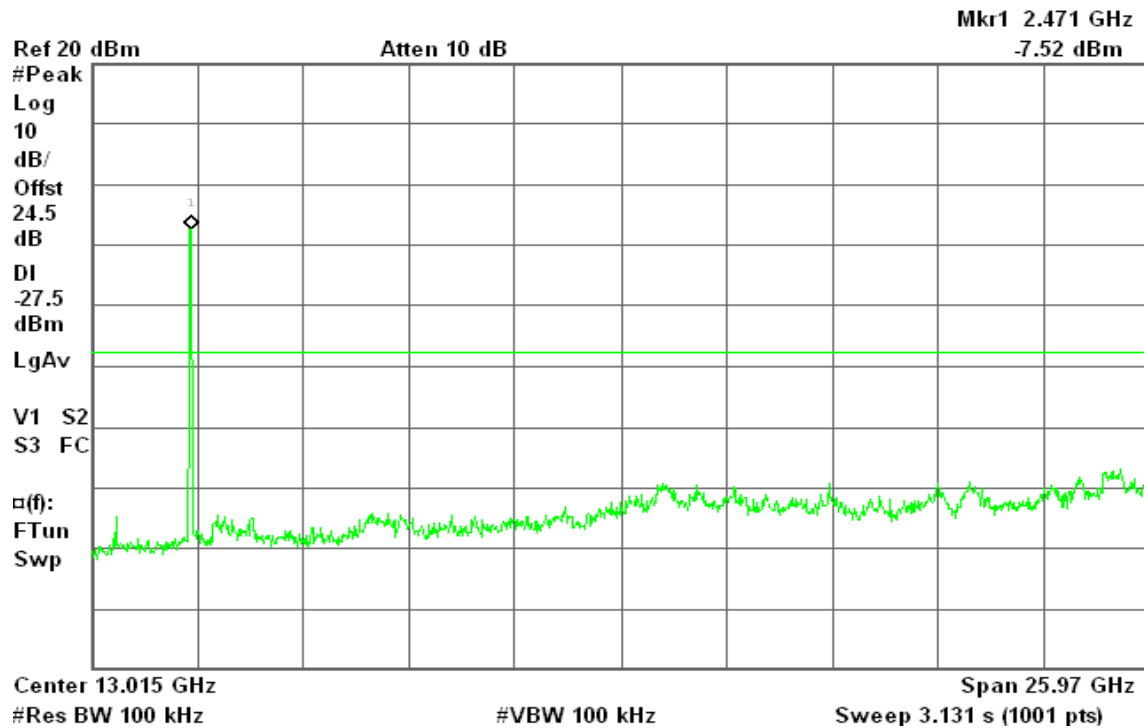
R L



CH High

* Agilent 10:16:25 Dec 1, 2009

R T





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

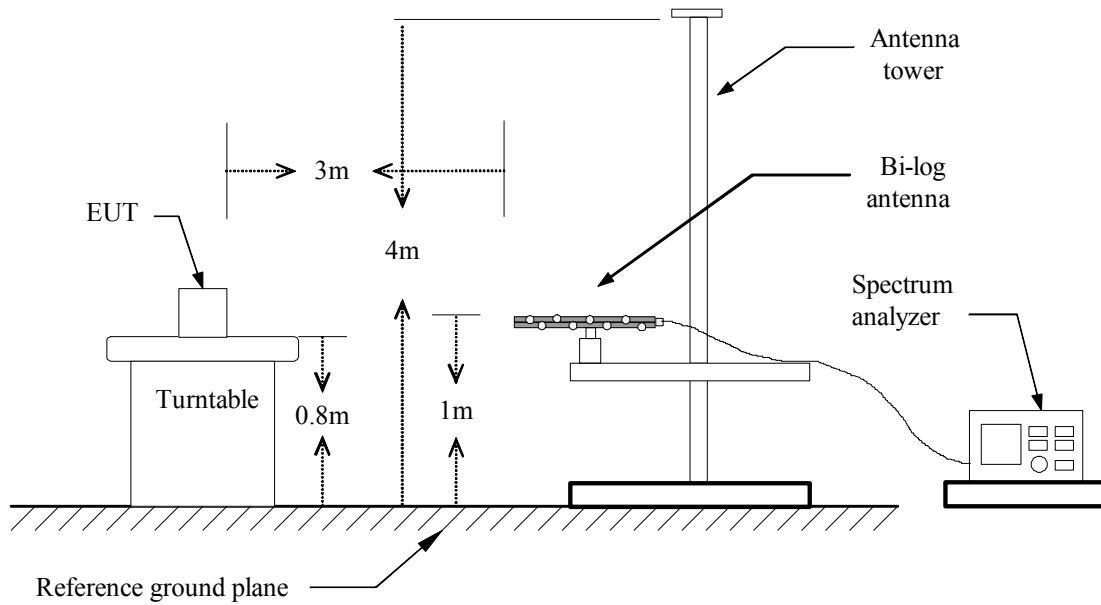
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

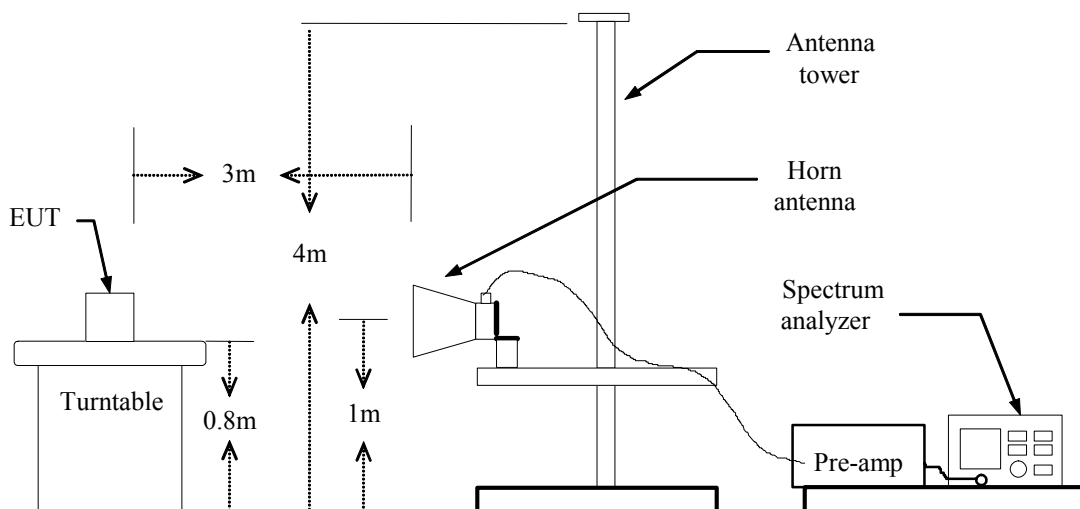
Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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

Below 1GHz

Operation Mode: Normal Link**Test Date:** November 23, 2009**Temperature:** 25°C**Tested by:** Ming Chen**Humidity:** 55% 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
484.28	V	44.52	-4.46	40.06	46.00	-5.94	Peak
553.80	V	39.72	-3.38	36.34	46.00	-9.66	Peak
621.70	V	44.72	-2.40	42.32	46.00	-3.68	Peak
691.22	V	39.17	-1.38	37.79	46.00	-8.21	Peak
959.58	V	35.42	2.05	37.47	46.00	-8.53	Peak
967.67	V	39.46	2.16	41.62	54.00	-12.38	Peak
206.22	H	41.08	-10.04	31.05	43.50	-12.45	Peak
414.77	H	36.78	-5.99	30.79	46.00	-15.21	Peak
484.28	H	40.96	-4.46	36.51	46.00	-9.49	Peak
898.15	H	31.61	0.91	32.52	46.00	-13.48	Peak
959.58	H	34.01	2.05	36.06	46.00	-9.94	Peak
967.67	H	41.51	2.16	43.67	54.00	-10.33	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. $\text{Margin (dB)} = \text{Result (dBuV/m)} - \text{Limit (dBuV/m)}$.

**Above 1 GHz****Operation Mode:** TX / IEEE 802.11b / CH Low**Test Date:** November 23, 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
1266.67	V	55.78	---	-7.46	48.31	---	74.00	54.00	-5.69	Peak
4825.00	V	53.35	48.03	1.04	54.39	49.07	74.00	54.00	-4.93	AVG
N/A										
1646.67	H	55.25	---	-5.63	49.62	---	74.00	54.00	-4.38	Peak
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11b / CH Mid**Test Date:** November 23, 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
1940.00	V	55.13	46.13	-2.82	52.3	43.31	74.00	54.00	-10.69	AVG
4875.00	V	50.62	---	1.02	51.65	---	74.00	54.00	-2.35	Peak
N/A										
1370.00	H	55.62	---	-7.27	48.35	---	74.00	54.00	-5.65	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:** 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
1663.33	V	56.04	---	-5.47	50.58	---	74.00	54.00	-3.42	Peak
4925.00	V	49.05	---	1.01	50.06	---	74.00	54.00	-3.94	Peak
7283.33	V	50.10	35.02	4.04	54.14	39.06	74.00	54.00	-14.94	AVG
N/A										
1966.67	H	55.38	47.24	-2.82	52.56	44.42	74.00	54.00	-9.58	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 26, 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
1570.00	V	58.68	48.36	-2.82	55.86	45.54	74.00	54.00	-8.46	AVG
4825.00	V	50.62	---	1.04	51.66	---	74.00	54.00	-2.34	Peak
N/A										
1466.67	H	58.91	---	-7.09	51.82	---	74.00	54.00	-2.18	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 26, 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
1560.00	V	58.77	48.34	-2.82	55.95	45.52	74.00	54.00	-8.48	AVG
4875.00	V	50.48	---	1.02	51.50	---	74.00	54.00	-2.50	Peak
N/A										
1900.00	H	58.18	47.43	-2.82	55.36	44.61	74.00	54.00	-9.39	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 26, 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
1763.33	V	58.98	48.28	-2.82	56.16	45.46	74.00	54.00	-8.54	AVG
4925.00	V	50.69	---	1.01	51.70	---	74.00	54.00	-2.30	Peak
N/A										
1643.33	H	58.73	47.85	-2.82	55.91	45.03	74.00	54.00	-8.97	AVG
N/A										

Remark:

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

**Operation Mode:** TX / draft 802.11n Standard-20 MHz Channel mode / CH Low**Test Date:** November 26, 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
2136.67	V	58.48	47.67	-2.82	55.66	44.85	74.00	54.00	-9.15	AVG
4825.00	V	50.69	---	1.04	51.72	---	74.00	54.00	-2.28	Peak
N/A										
1463.33	H	58.32	---	-7.10	51.22	---	74.00	54.00	-2.78	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 26, 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
2270.00	V	58.82	47.83	-2.82	56	45.01	74.00	54.00	-8.99	AVG
N/A										
1870.00	H	58.20	47.73	-2.82	55.38	44.91	74.00	54.00	-9.09	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 26, 2009**Temperature:** 20°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
2130.00	V	58.54	47.59	-2.82	55.72	44.77	74.00	54.00	-9.23	AVG
4925.00	V	50.30	---	1.01	51.31	---	74.00	54.00	-2.69	Peak
N/A										
2240.00	H	58.26	47.64	-2.82	55.44	44.82	74.00	54.00	-9.18	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).



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

Test Date: November 26, 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
1446.67	V	58.64	---	-7.13	51.52	---	74.00	54.00	-2.48	Peak
4841.67	V	53.58	46.92	1.03	54.61	47.95	74.00	54.00	-6.05	AVG
N/A										
2223.33	H	57.90	46.84	-2.82	55.08	44.02	74.00	54.00	-9.98	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 26, 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
1583.33	V	58.33	47.33	-2.82	55.51	44.51	74.00	54.00	-9.49	AVG
4875.00	V	53.62	45.69	1.02	54.64	46.71	74.00	54.00	-7.29	AVG
N/A										
2163.33	H	58.87	49.36	-2.82	56.05	46.54	74.00	54.00	-7.46	AVG
N/A										

Remark:

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

**Operation Mode:** TX / draft 802.11n Wide-40 MHz Channel mode
/ CH High**Test Date:** November 26, 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
1920.00	V	58.21	48.13	-2.82	55.39	45.31	74.00	54.00	-8.69	AVG
4900.00	V	50.54	---	1.02	51.56	---	74.00	54.00	-2.44	Peak
N/A										
1620.00	H	58.97	48.29	-2.82	56.15	45.47	74.00	54.00	-8.53	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:** December 7, 2009
Temperature: 22°C **Tested by:** Nan Tsai
Humidity: 45% 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
0.1634	38.09	15.05	0.12	38.21	15.17	65.29	55.29	-27.08	-40.12	L1
3.1691	39.72	27.77	0.06	39.78	27.83	56.00	46.00	-16.22	-18.17	L1
3.6333	38.60	25.15	0.06	38.66	25.21	56.00	46.00	-17.34	-20.79	L1
12.2442	47.50	39.49	0.21	47.71	39.70	60.00	50.00	-12.29	-10.30	L1
12.9719	53.27	46.39	0.24	53.51	46.63	60.00	50.00	-6.49	-3.37	L1
19.4318	37.38	30.54	0.41	37.79	30.95	60.00	50.00	-22.21	-19.05	L1
0.1780	41.38	23.44	0.12	41.50	23.56	64.58	54.58	-23.08	-31.02	L2
3.3754	36.17	23.50	0.08	36.25	23.58	56.00	46.00	-19.75	-22.42	L2
3.8642	40.30	29.89	0.09	40.39	29.98	56.00	46.00	-15.61	-16.02	L2
12.2795	50.51	41.66	0.17	50.68	41.83	60.00	50.00	-9.32	-8.17	L2
13.1365	47.29	38.35	0.19	47.48	38.54	60.00	50.00	-12.52	-11.46	L2
19.4296	35.80	29.09	0.17	35.97	29.26	60.00	50.00	-24.03	-20.74	L2

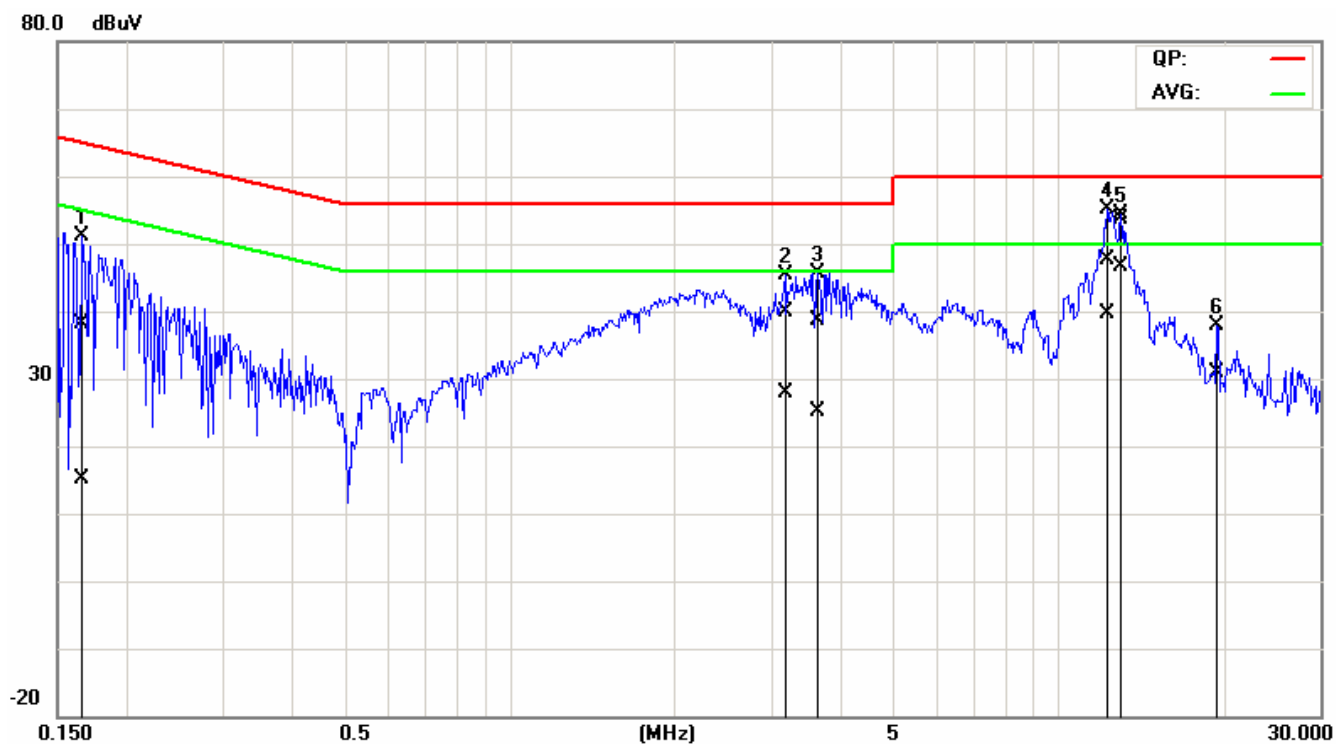
Remark:

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

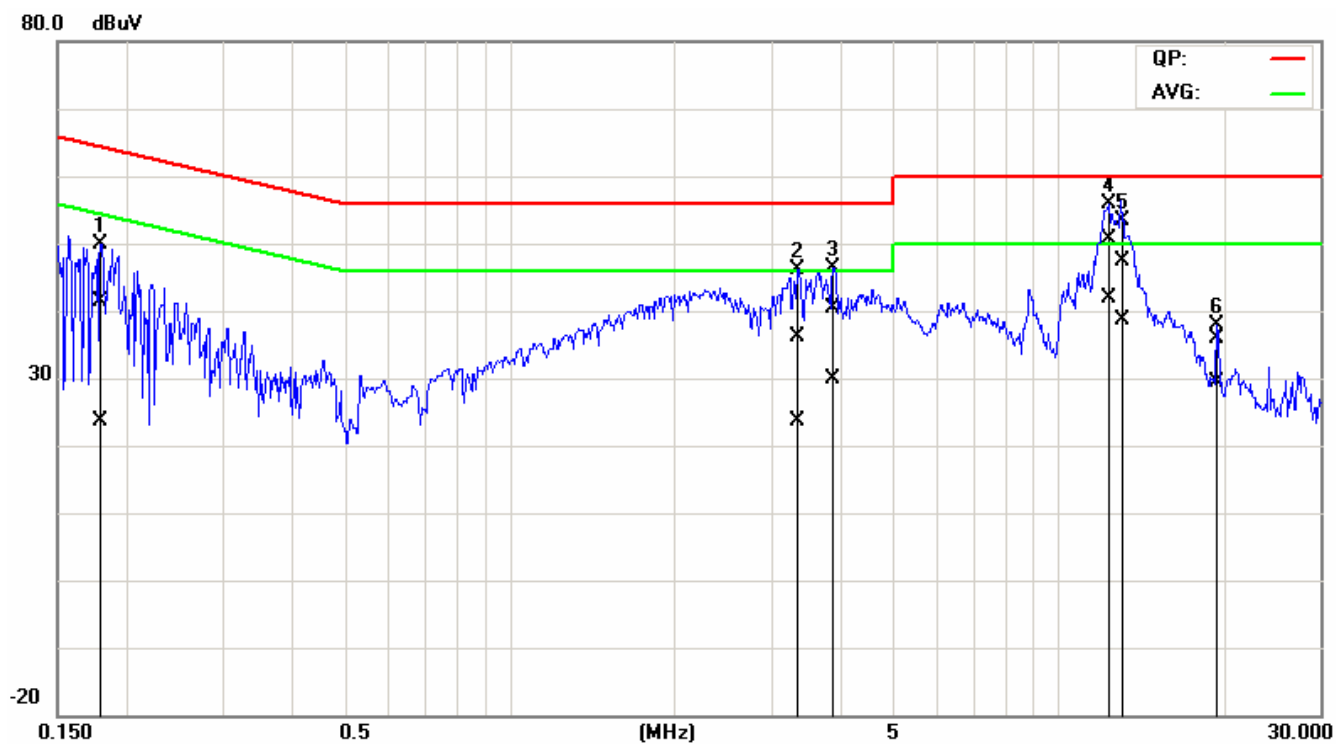


Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)





APPENDIX I

RADIO FREQUENCY EXPOSURE

LIMIT

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

EUT Specification

EUT	Notebook PC System
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☐ Others
Device category	☒ Portable (<20cm separation) ☐ Mobile (>20cm separation) ☐ Others
Exposure classification	☐ Occupational/Controlled exposure ($S = 5\text{mW/cm}^2$) ☒ General Population/Uncontrolled exposure ($S=1\text{mW/cm}^2$)
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	IEEE 802.11b mode: 19.35dBm (86.10mW) IEEE 802.11g mode: 21.16 dBm (130.62mW) draft 802.11n Standard-20 MHz Channel mode: 20.55 dBm(113.50mW) draft 802.11n Wide-40 MHz Channel mode: 20.79 dBm (119.95mW)
Antenna gain (Max)	0.82 dBi (Numeric gain: 1.21)
Evaluation applied	☐ MPE Evaluation ☒ SAR Evaluation* ☐ N/A

Remark:

1. The maximum output power is 21.16dBm (130.62mW) at 2462MHz (with 1.21 numeric antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.

TEST RESULTS

No non-compliance noted.

Remark: Please refer to the separated SAR report.

MPE EVALUATION

Not applicable.