



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Notebook

Trade Name: FIC

Model: CW001

Issued to

**First International Computer Inc
4FL., No.300, Yang Guang St., NeiHu,
Taipei, Taiwan, 114**

Issued by



**Compliance Certification Services Inc.
No. 11, Wu-Gong 6th Rd., Wugu Industrial Park,
Taipei Hsien 248, Taiwan (R.O.C.)
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1. TEST RESULT CERTIFICATION

Applicant: First International Computer Inc
 4FL., No.300, Yang Guang St., NeiHu,
 Taipei, Taiwan, 114

Equipment Under Test: Notebook

Trade Name: FIC

Model: CW001

Date of Test: December 31, 2008 ~ January 20, 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.

Amanda Wu
 Section Manager
 Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	Notebook			
Trade Name	FIC			
Model Number	CW001			
Model Discrepancy	N/A			
Power Supply	1. VDC from Power Adapter 2. Battery: 14.4V, 2200mAh			
Power Adapter Manufacturer	DELTA	Model	ADP-40MH AD	
Power Adapter Power Rating	For ADP-40MH AD I/P: 100-240V~1.2A, 50-60Hz O/P: 20V, 2A			
Frequency Range	IEEE 802.11b: 2412 ~ 2462 MHz IEEE 802.11g: 2412 ~ 2462 MHz draft 802.11n Standard-20 MHz: 2412 ~ 2462 MHz draft 802.11n Standard-40 MHz: 2422 ~ 2452 MHz			
Transmit Power	Mode	Frequency Range	Output Power (dBm)	Output Power (mw)
	802.11b	2412 - 2462	19.25	84.1395
	802.11g	2412 - 2462	18.30	67.6083
	802.11n Standard-20 MHz	2412 - 2462	16.05	40.2717
	802.11n Standard-40 MHz	2422 - 2452	14.70	29.5121
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	Gain: 2.95 dBi			
Antenna Designation	PIFA Antenna Manufacturer: Smart Approach Co. , Ltd WiFi Main: PE-AB0370 WiFi AUX: PE-AB0430			

Remark:

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **EUNCW001-02** 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: 2003 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: 2003 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: 2003.



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 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

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 (model: CW001) 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.

After the preliminary test, the power of the Main antenna is maximal and therefore had been tested under operating condition.

IEEE 802.11b:

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

IEEE 802.11g:

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 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 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	01/24/2009

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	10/07/2009
Test Receiver	Rohde&Schwarz	ESCI	100064	11/29/2009
Switch Controller	TRC	Switch Controller	SC94050010	05/03/2009
4 Port Switch	TRC	4 Port Switch	SC94050020	05/03/2009
Loop Antenna	EMCO	6502	8905/2356	05/30/2009
Horn-Antenna	TRC	HA-0502	06	06/04/2009
Horn-Antenna	TRC	HA-0801	04	10/20/2009
Horn-Antenna	TRC	HA-1201A	01	10/15/2009
Horn-Antenna	TRC	HA-1301A	01	10/15/2009
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/28/2009
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: 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	11/25/2009
TWO-Line V-Network 9kHz-30MHz	Schaffner	NNB41	03/10013	06/11/2009
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	04/09/2009
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 / 1GHz Above	+/-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: 2003 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 1 for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	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-CAA43	LZE03262922	FCC DoC	Shielded, 1.8m	N/A
3.	USB 2.0 External HDD	TeraSyS	F12-U	A0100214-43b0012	FCC DoC	Shielded, 1.8m	N/A
4.	Multimedia Earphone	Labtec	Axis-301	N/A	FCC DoC	Unshielded, 1.8m*2	N/A
5.	Notebook PC (Remote)	DELL	PP10L	50XP51J	QDS-BRCM1021	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

Remark:

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



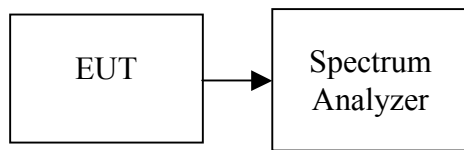
7. FCC PART 15.247 REQUIREMENTS

7.1 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	12.50	>500	PASS
Mid	2437	11.17		PASS
High	2462	12.25		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.58	>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	17.83		PASS
High	2462	17.75		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.08	>500	PASS
Mid	2437	34.50		PASS
High	2452	36.33		PASS



Test Plot

IEEE 802.11b mode

6dB Bandwidth (CH Low)

Agilent 20:39:40 Jan 6, 2009

R T

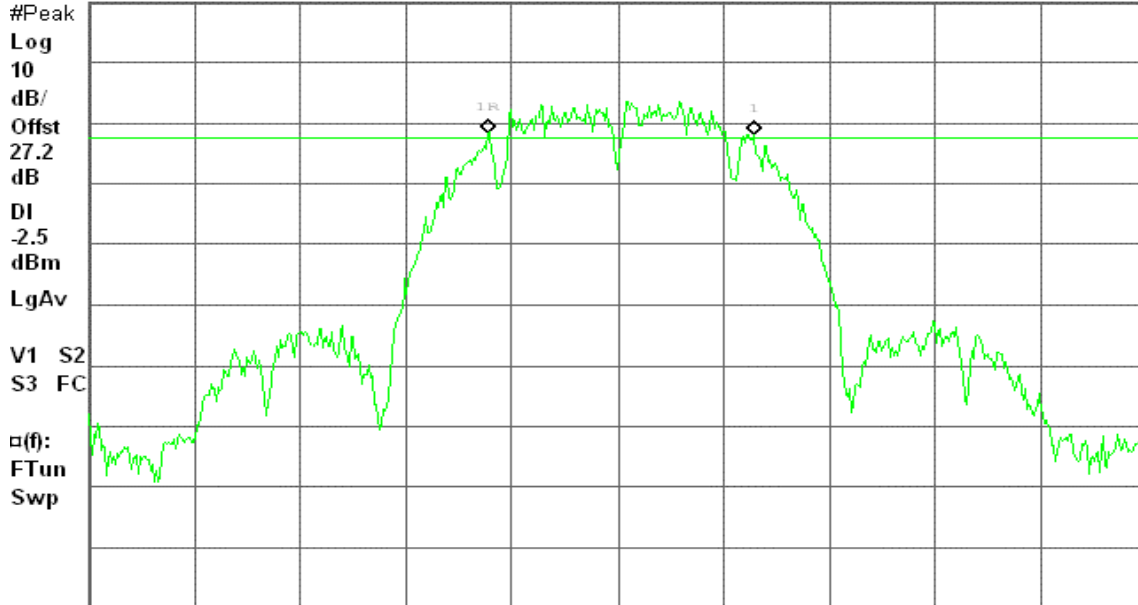
6dB BW, b Mode Low Ch.

Δ Mkr1 12.50 MHz

Ref 20 dBm

Atten 10 dB

-0.25 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 20:45:36 Jan 6, 2009

R T

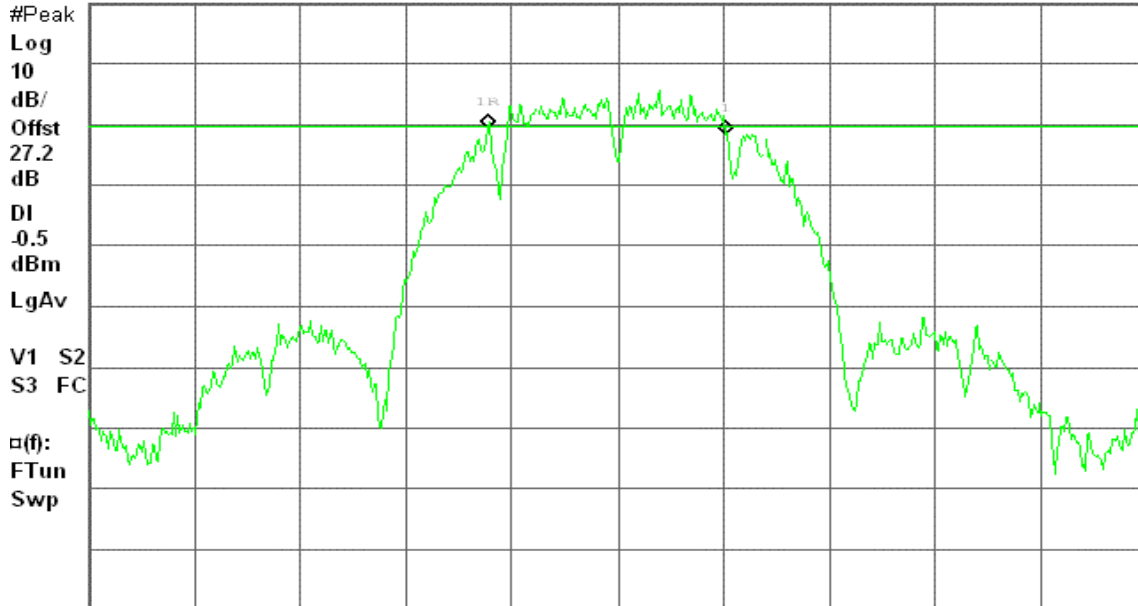
6dB BW, b Mode Mid Ch.

Δ Mkr1 11.17 MHz

Ref 20 dBm

Atten 10 dB

-0.84 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 20:58:42 Jan 6, 2009

R T

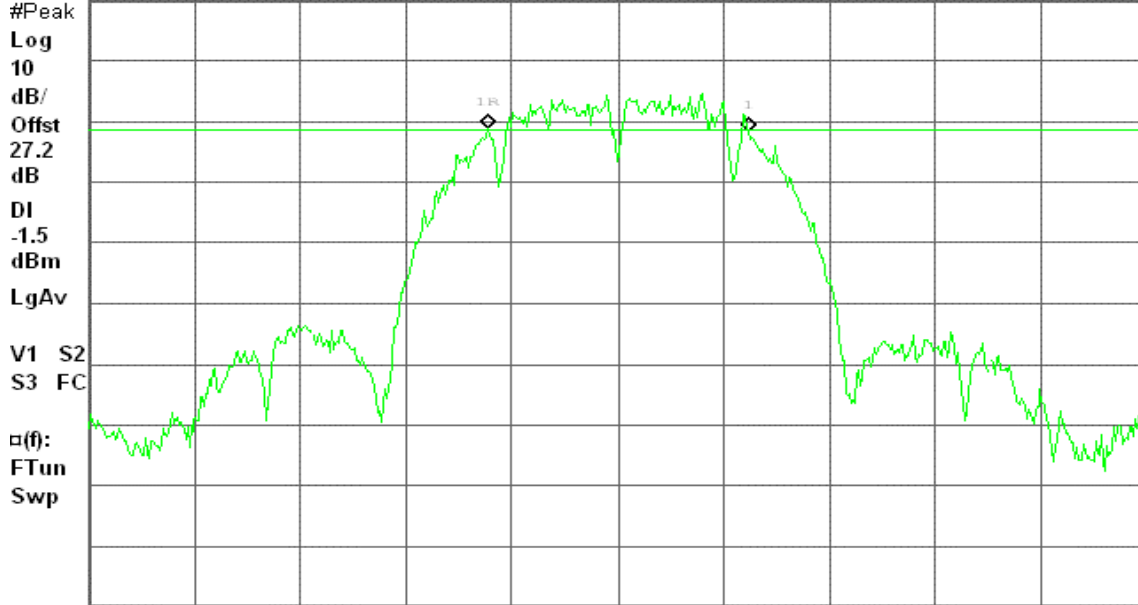
6dB BW, b Mode High Ch.

Δ Mkr1 12.25 MHz

Ref 20 dBm

Atten 10 dB

-0.66 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

IEEE 802.11g mode

6dB Bandwidth (CH Low)

Agilent 20:15:26 Jan 6, 2009

R T

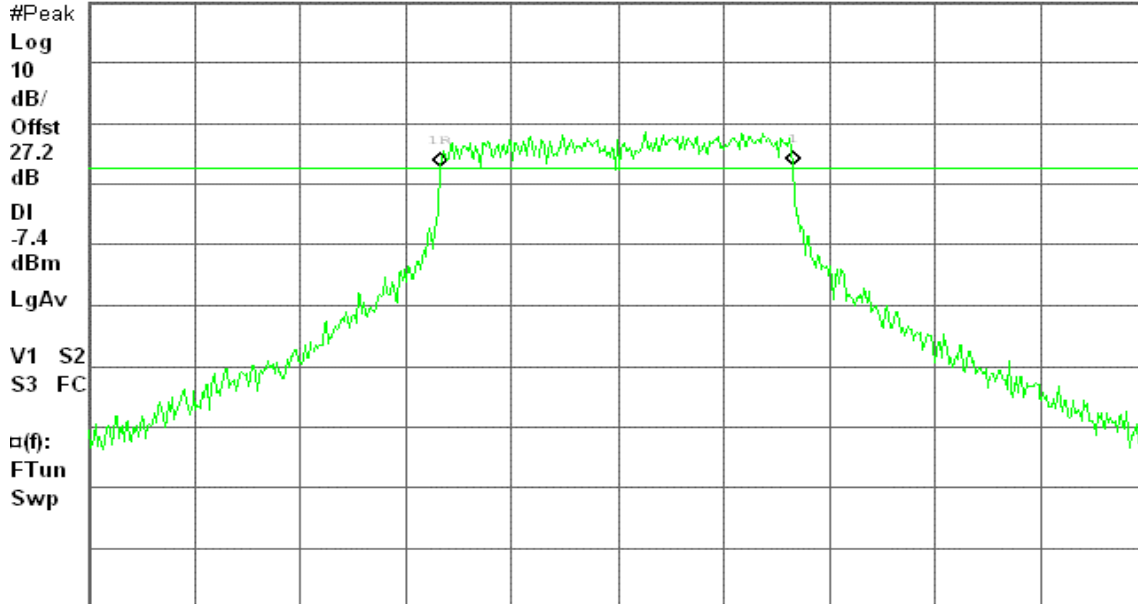
6dB BW, g Mode Low Ch.

Δ Mkr1 16.58 MHz

Ref 20 dBm

Atten 10 dB

0.27 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 20:25:16 Jan 6, 2009

R T

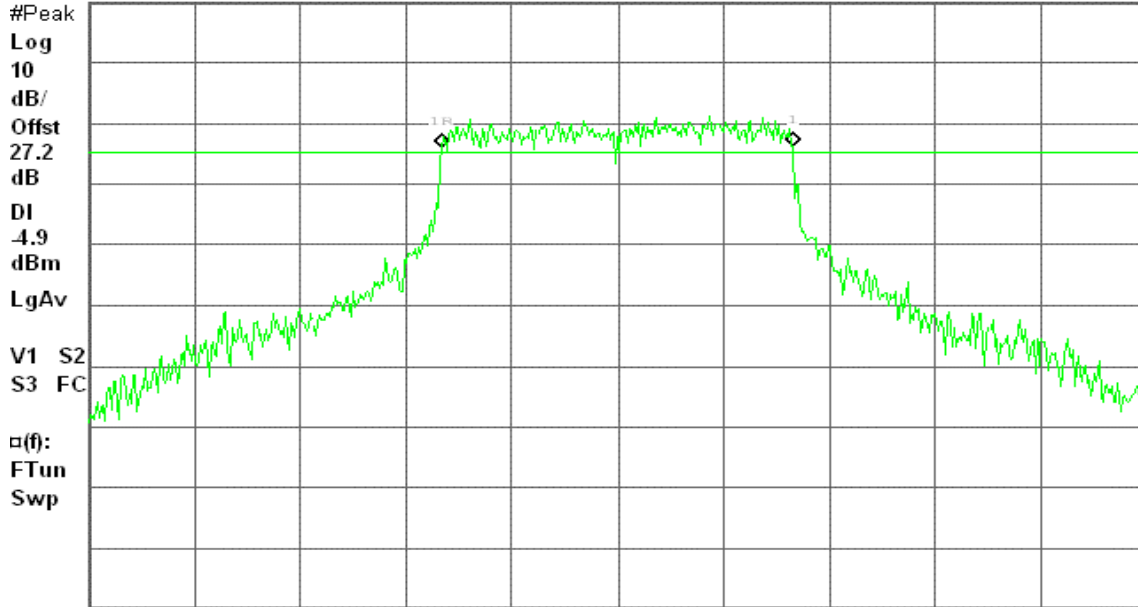
6dB BW, g Mode Mid Ch.

Δ Mkr1 16.50 MHz

Ref 20 dBm

Atten 10 dB

0.25 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 20:31:56 Jan 6, 2009

R T

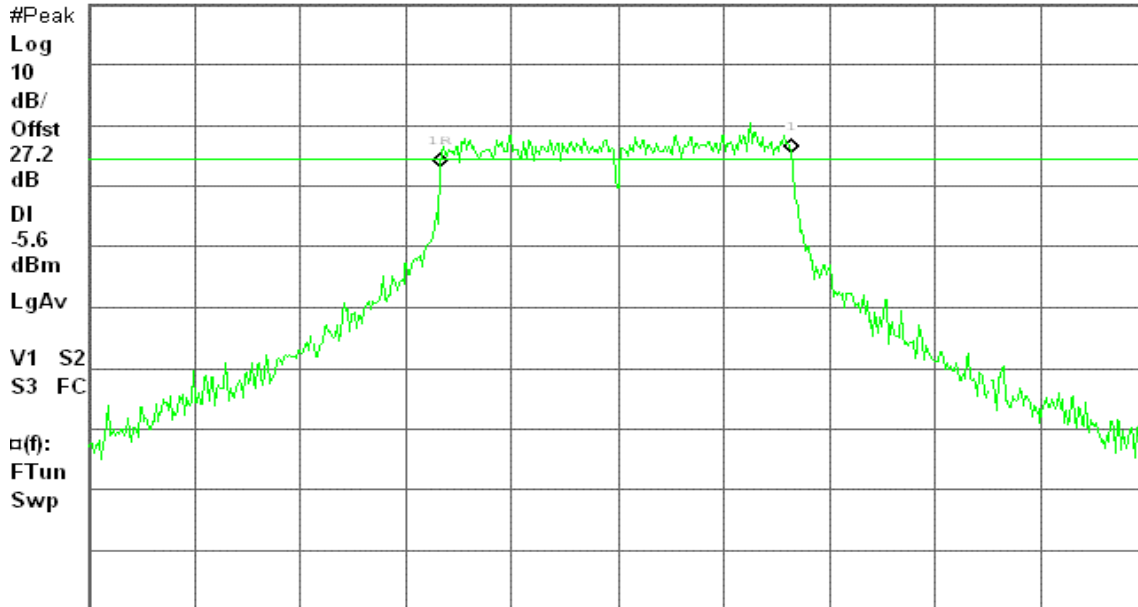
6dB BW, g Mode High Ch.

Δ Mkr1 16.50 MHz

Ref 20 dBm

Atten 10 dB

2.23 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



draft 802.11n Standard-20 MHz Channel mode

6dB Bandwidth (CH Low)

Agilent 21:06:01 Jan 6, 2009

R T

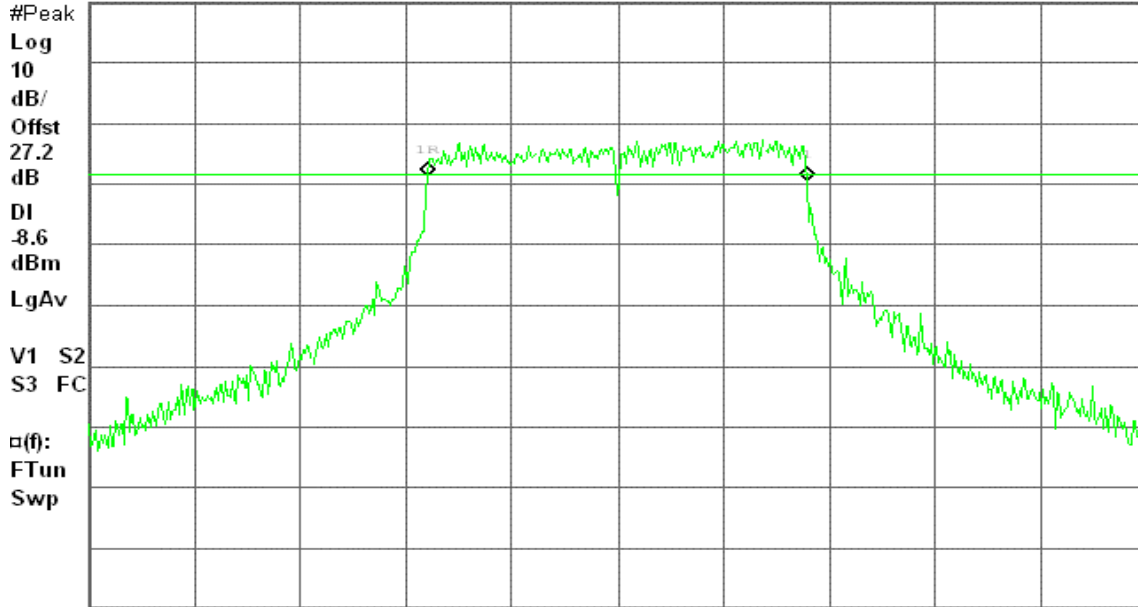
6dB BW, g Mode Low Ch.

Δ Mkr1 17.83 MHz

Ref 20 dBm

Atten 10 dB

-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 21:11:59 Jan 6, 2009

R T

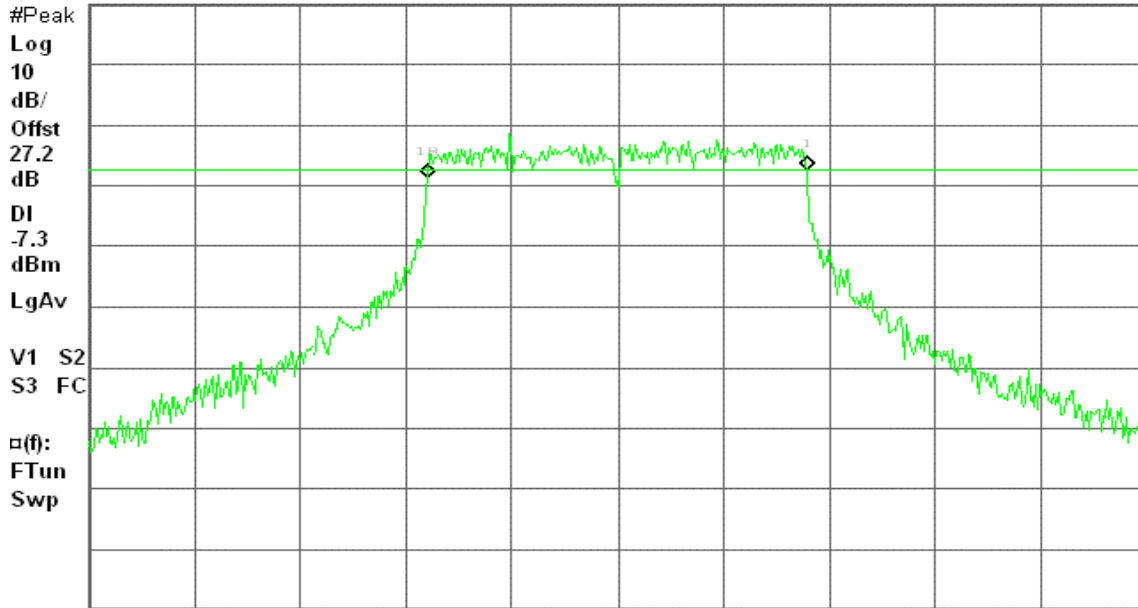
6dB BW, g Mode Mid Ch.

Δ Mkr1 17.83 MHz

Ref 20 dBm

Atten 10 dB

1.34 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 21:17:43 Jan 6, 2009

R T

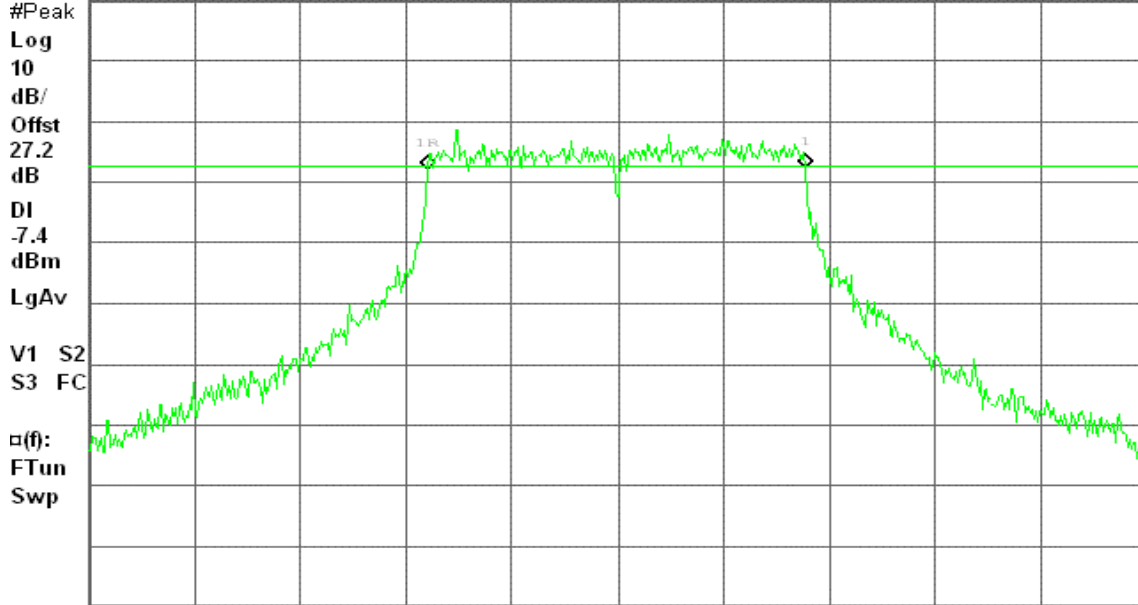
6dB BW, g Mode High Ch.

Δ Mkr1 17.75 MHz

Ref 20 dBm

Atten 10 dB

0.41 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

draft 802.11n Wide-40 MHz Channel mode

6dB Bandwidth (CH Low)

Agilent 21:24:51 Jan 6, 2009

R T

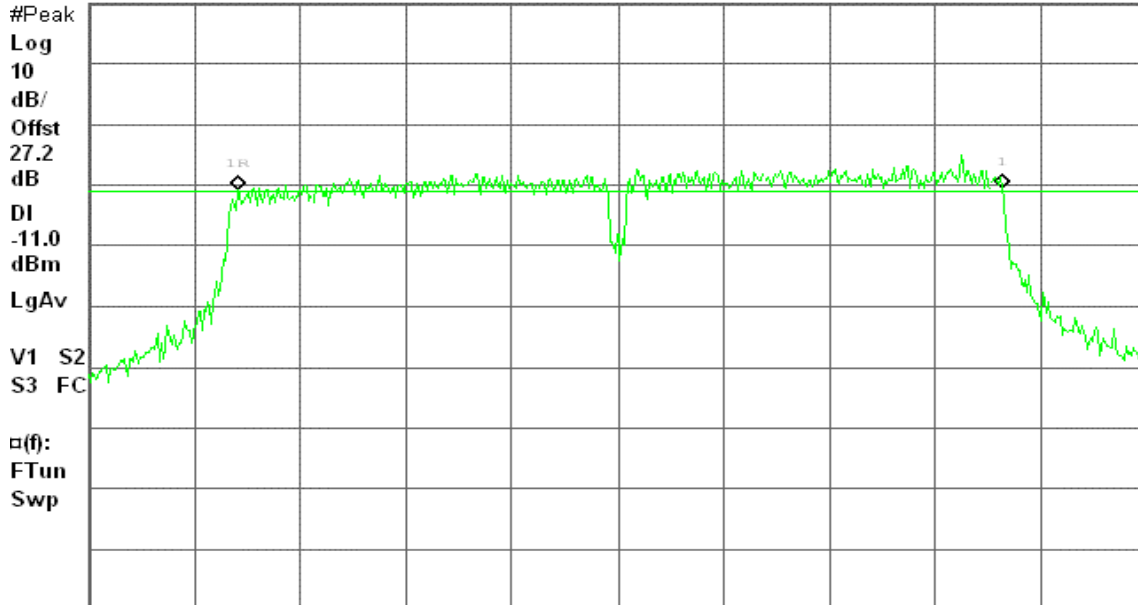
6dB BW, g Mode Low Ch.

Δ Mkr1 36.08 MHz

Ref 20 dBm

Atten 10 dB

0.34 dB



Center 2.422 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



6dB Bandwidth (CH Mid)

Agilent 21:30:53 Jan 6, 2009

R T

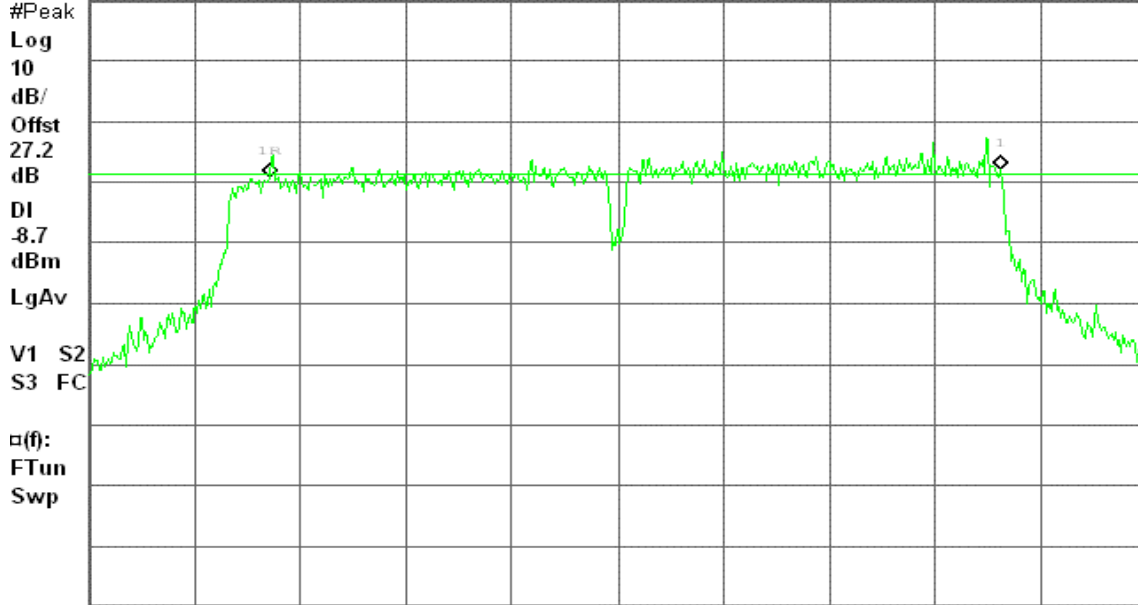
6dB BW, g Mode Mid Ch.

Δ Mkr1 34.50 MHz

Ref 20 dBm

Atten 10 dB

1.27 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 21:40:08 Jan 6, 2009

R T

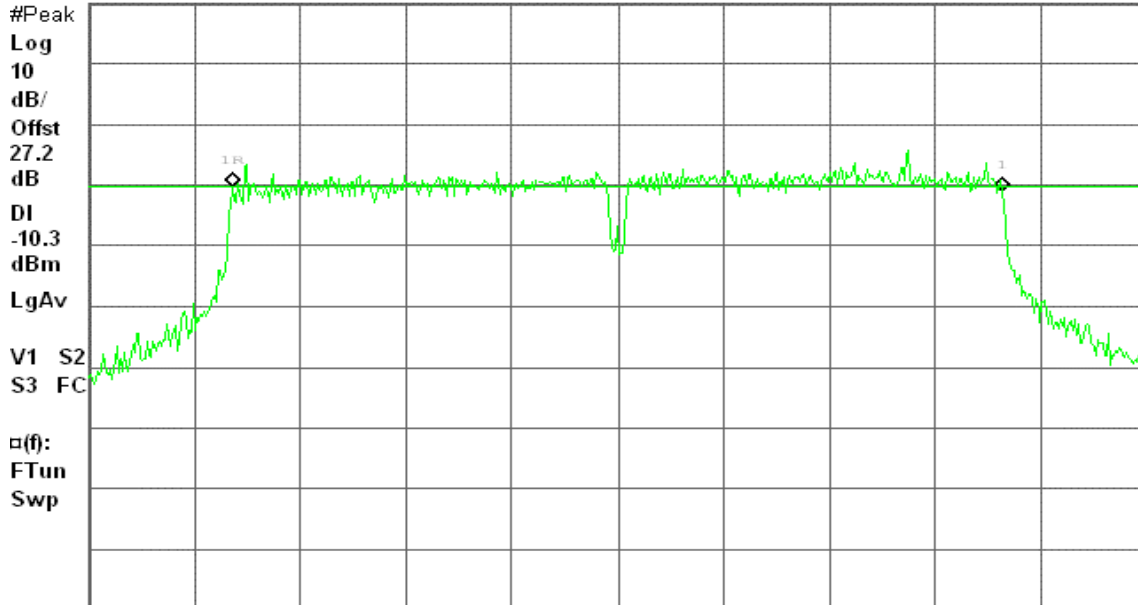
6dB BW, g Mode High Ch.

Δ Mkr1 36.33 MHz

Ref 20 dBm

Atten 10 dB

-0.78 dB



Center 2.452 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

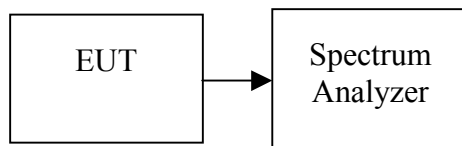
7.2 PEAK POWER

LIMIT

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

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

Test Configuration



TEST PROCEDURE

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz.
3. Set VBW \geq 3 MHz.
4. Use sample detector mode if bin width (i.e., span/number of points in spectrum display) $<$ 0.5 RBW. Otherwise use peak detector mode.
5. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to free run.
6. Trace average 100 traces in power averaging mode.
7. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

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	18.40	0.0692	1.00	PASS
Mid	2437	18.89	0.0774		PASS
High	2462	19.25	0.0841		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	16.02	0.0400	1.00	PASS
Mid	2437	18.30	0.0676		PASS
High	2462	16.96	0.0497		PASS

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.18	0.0330	1.00	PASS
Mid	2437	16.05	0.0403		PASS
High	2462	15.13	0.0326		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	14.32	0.0270	1.00	PASS
Mid	2437	14.70	0.0295		PASS
High	2452	13.85	0.0243		PASS



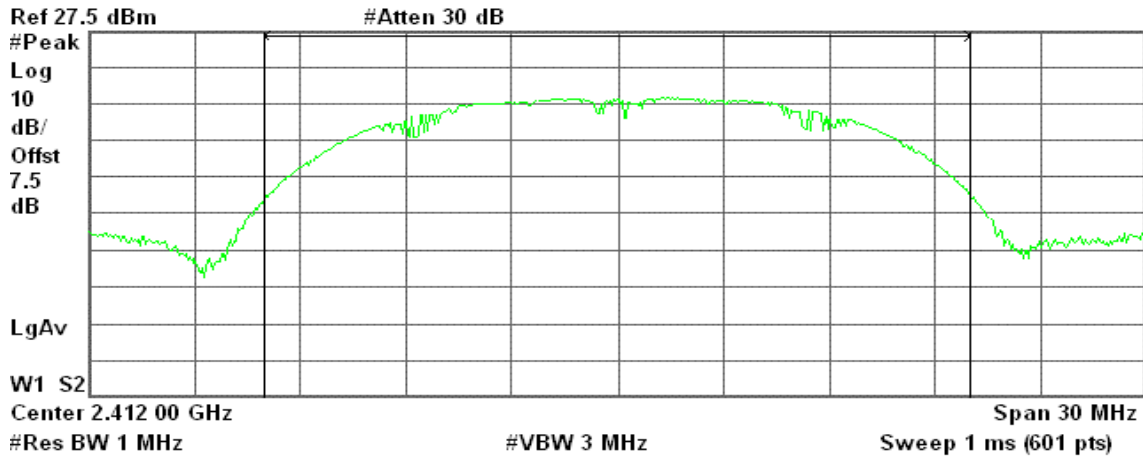
Test Plot

IEEE 802.11b mode

Peak Power (CH Low)

Agilent 08:57:27 Jan 20, 2009

R T



Channel Power

18.40 dBm / 20.0000 MHz

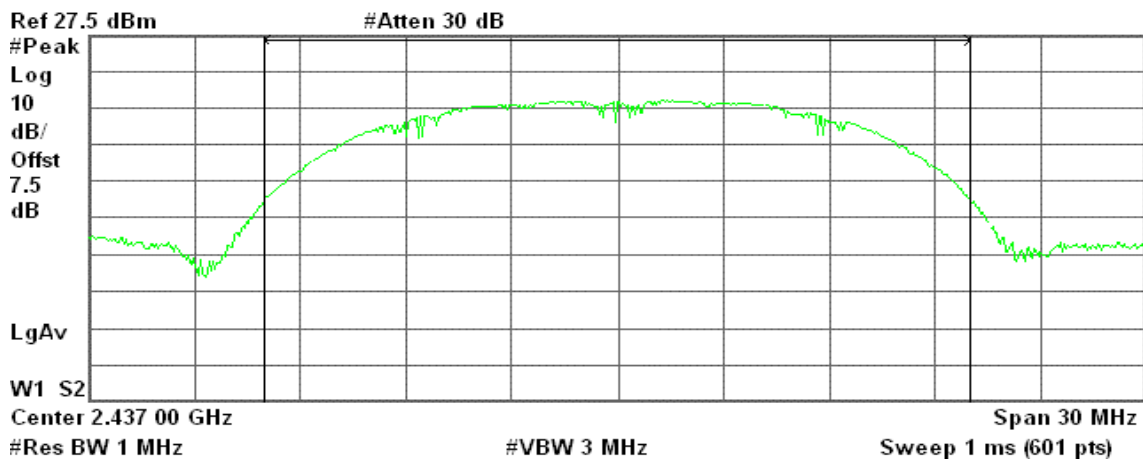
Power Spectral Density

-54.61 dBm/Hz

Peak Power (CH Mid)

Agilent 08:56:19 Jan 20, 2009

R T



Channel Power

18.89 dBm / 20.0000 MHz

Power Spectral Density

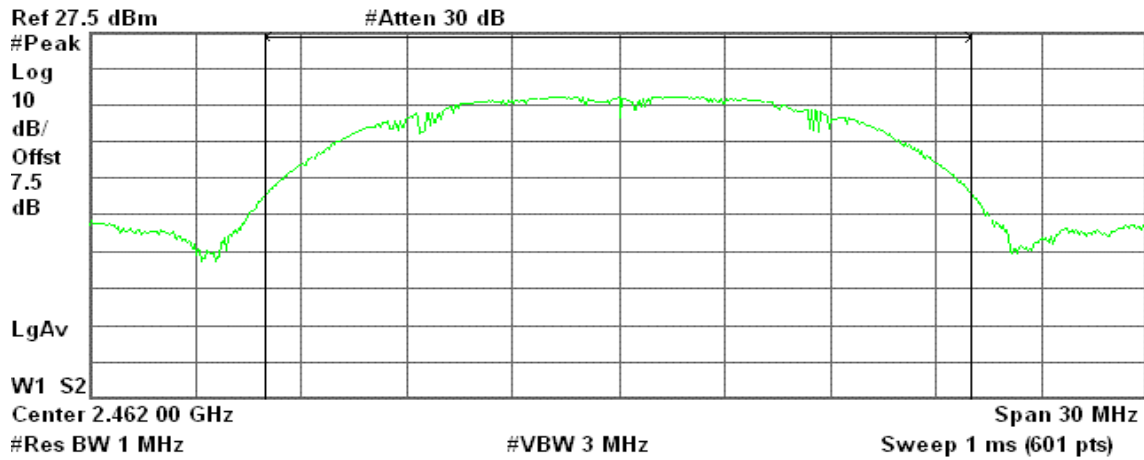
-54.12 dBm/Hz



Peak Power (CH High)

Agilent 08:55:16 Jan 20, 2009

R T



Channel Power

19.25 dBm / 20.0000 MHz

Power Spectral Density

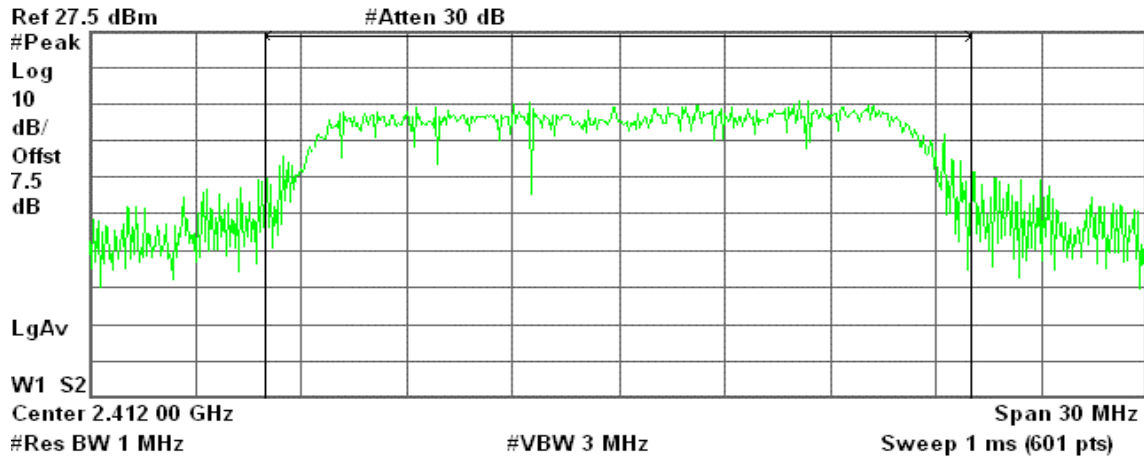
-53.76 dBm/Hz

IEEE 802.11g mode

Peak Power (CH Low)

Agilent 08:48:47 Jan 20, 2009

R T



Channel Power

16.02 dBm / 20.0000 MHz

Power Spectral Density

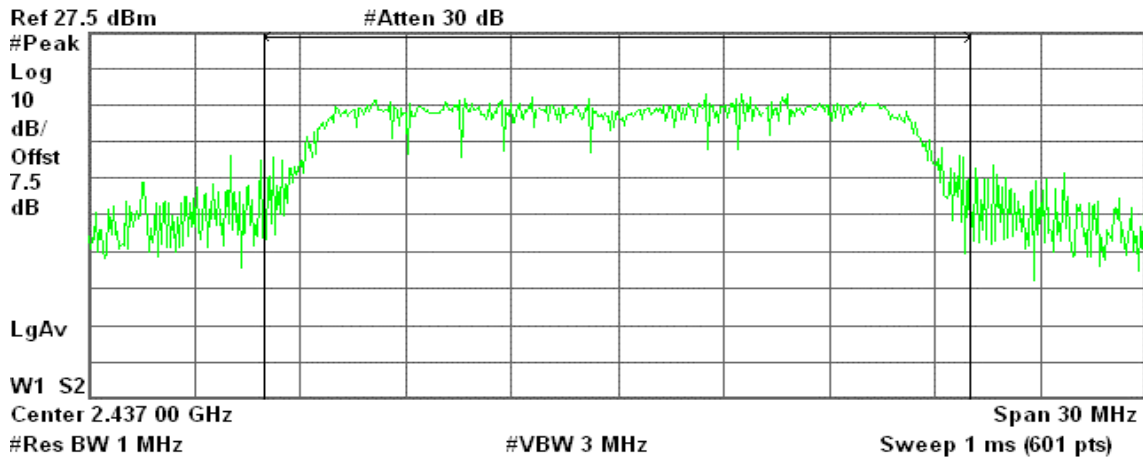
-56.99 dBm/Hz



Peak Power (CH Mid)

Agilent 08:50:15 Jan 20, 2009

R T



Channel Power

18.30 dBm / 20.0000 MHz

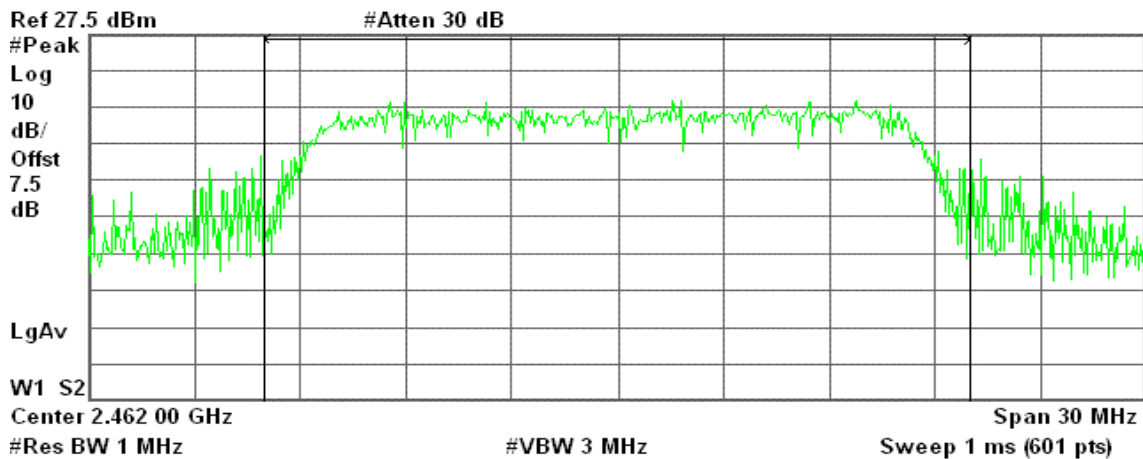
Power Spectral Density

-54.71 dBm/Hz

Peak Power (CH High)

Agilent 08:51:27 Jan 20, 2009

R T



Channel Power

16.96 dBm / 20.0000 MHz

Power Spectral Density

-56.05 dBm/Hz

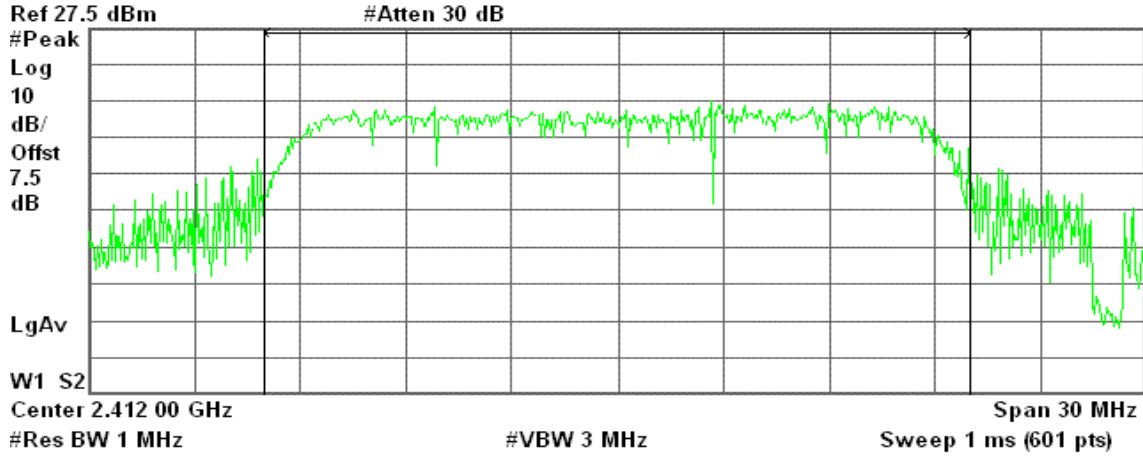


draft 802.11n Standard-20 MHz Channel mode

Peak Power (CH Low)

Agilent 09:00:02 Jan 20, 2009

R T



Channel Power

15.18 dBm / 20.0000 MHz

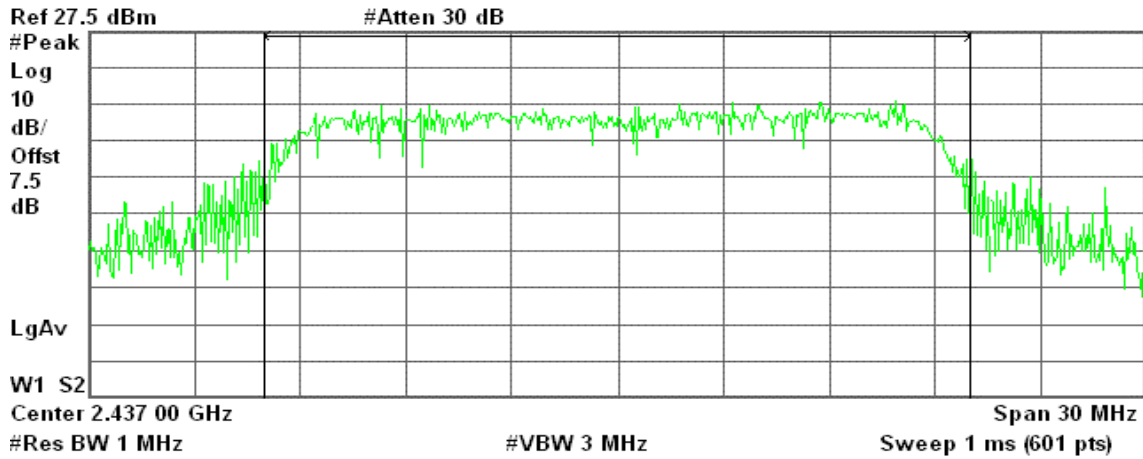
Power Spectral Density

-57.83 dBm/Hz

Peak Power (CH Mid)

Agilent 09:01:05 Jan 20, 2009

R T



Channel Power

16.05 dBm / 20.0000 MHz

Power Spectral Density

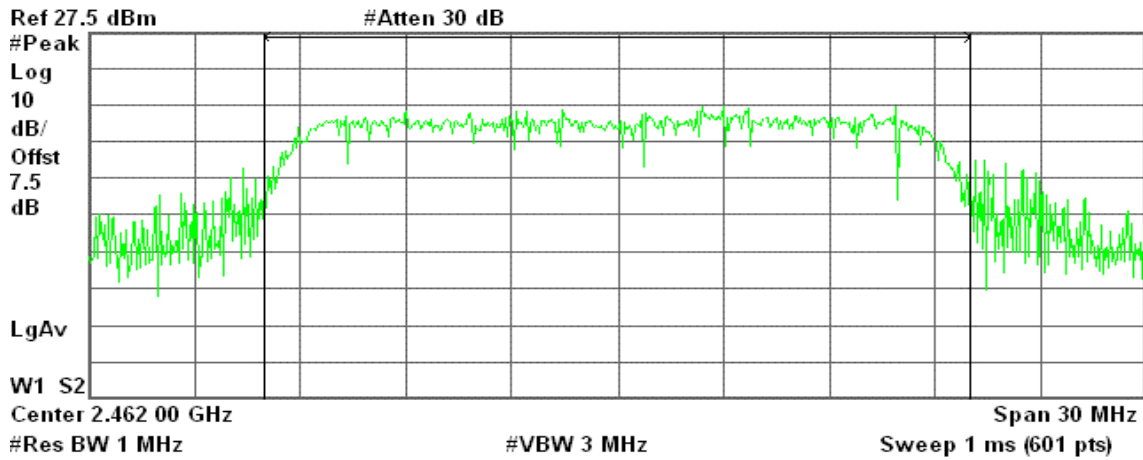
-56.96 dBm/Hz



Peak Power (CH High)

Agilent 09:02:10 Jan 20, 2009

R T



Channel Power

15.13 dBm / 20.0000 MHz

Power Spectral Density

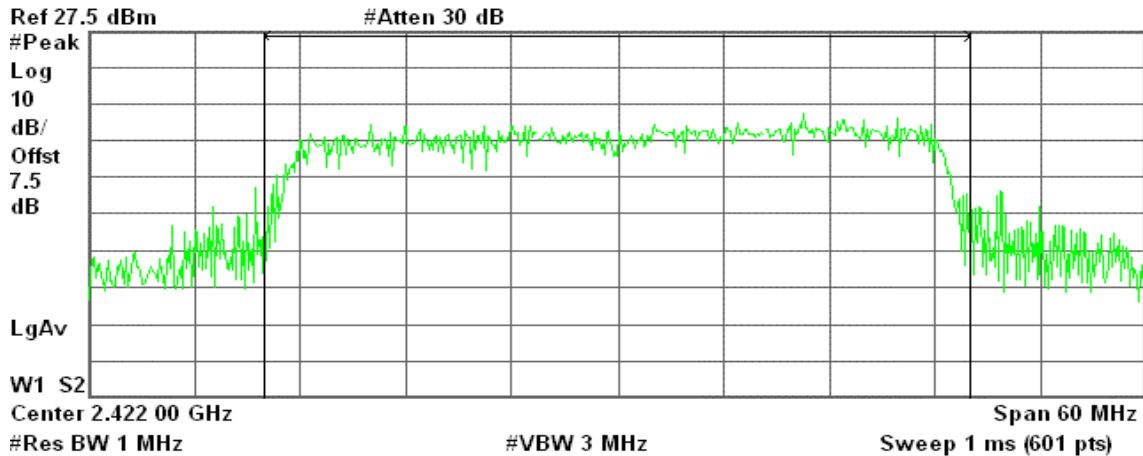
-57.88 dBm/Hz

draft 802.11n Wide-40 MHz Channel mode

Peak Power (CH Low)

Agilent 09:07:11 Jan 20, 2009

R T



Channel Power

14.32 dBm / 40.0000 MHz

Power Spectral Density

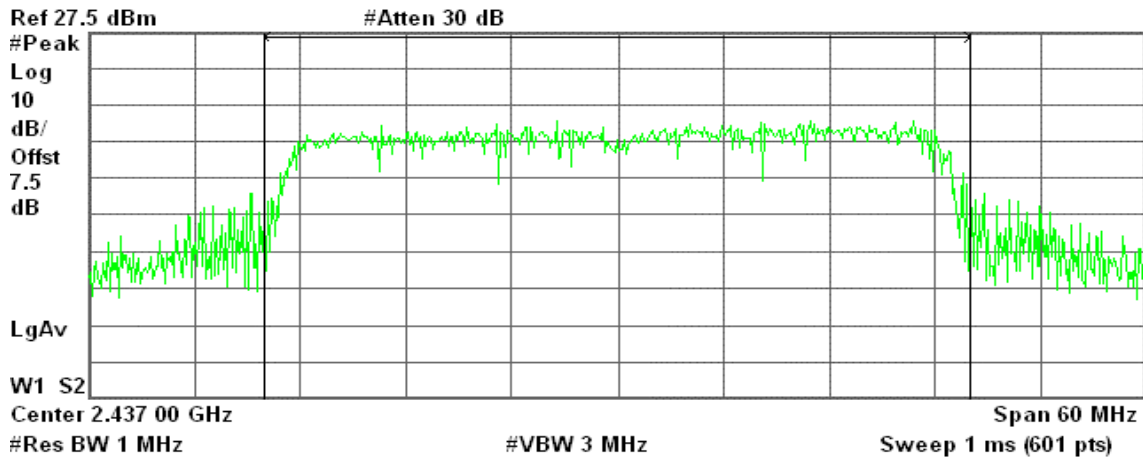
-61.70 dBm/Hz



Peak Power (CH Mid)

Agilent 09:08:15 Jan 20, 2009

R T



Channel Power

14.70 dBm / 40.0000 MHz

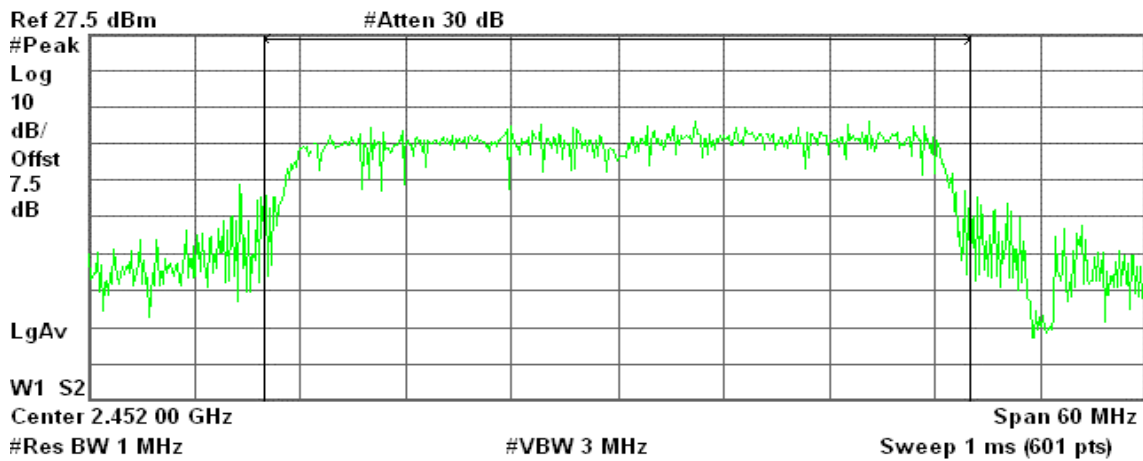
Power Spectral Density

-61.32 dBm/Hz

Peak Power (CH High)

Agilent 09:09:06 Jan 20, 2009

R T



Channel Power

13.85 dBm / 40.0000 MHz

Power Spectral Density

-62.18 dBm/Hz

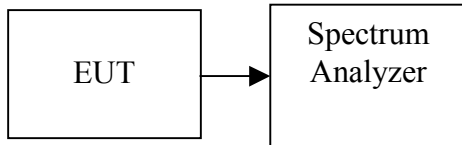


7.3 AVERAGE POWER

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	15.52	0.0356
Mid	2437	16.42	0.0439
High	2462	16.74	0.0472

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	13.51	0.0224
Mid	2437	15.31	0.0340
High	2462	13.27	0.0212

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	11.93	0.0156
Mid	2437	12.66	0.0185
High	2462	11.56	0.0143

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2422	10.43	0.0110
Mid	2437	11.27	0.0134
High	2452	9.95	0.0099



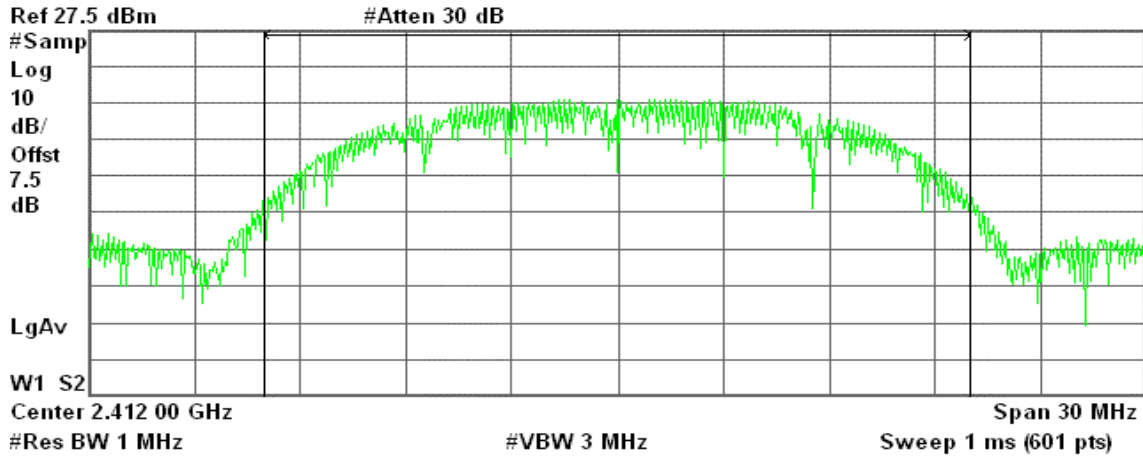
Test Plot

IEEE 802.11b mode

Average Power (CH Low)

Agilent 08:57:15 Jan 20, 2009

R T



Channel Power

15.52 dBm / 20.0000 MHz

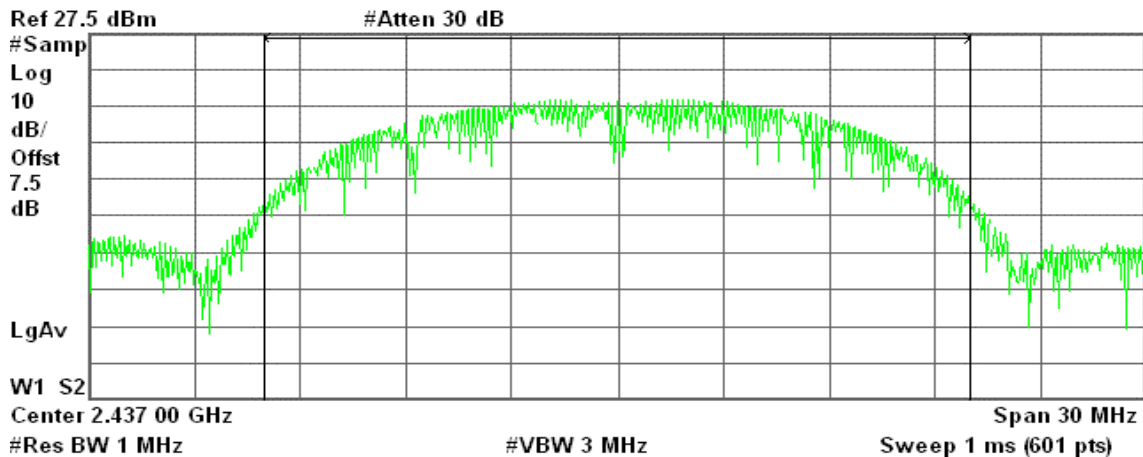
Power Spectral Density

-57.49 dBm/Hz

Average Power (CH Mid)

Agilent 08:56:04 Jan 20, 2009

R T



Channel Power

16.42 dBm / 20.0000 MHz

Power Spectral Density

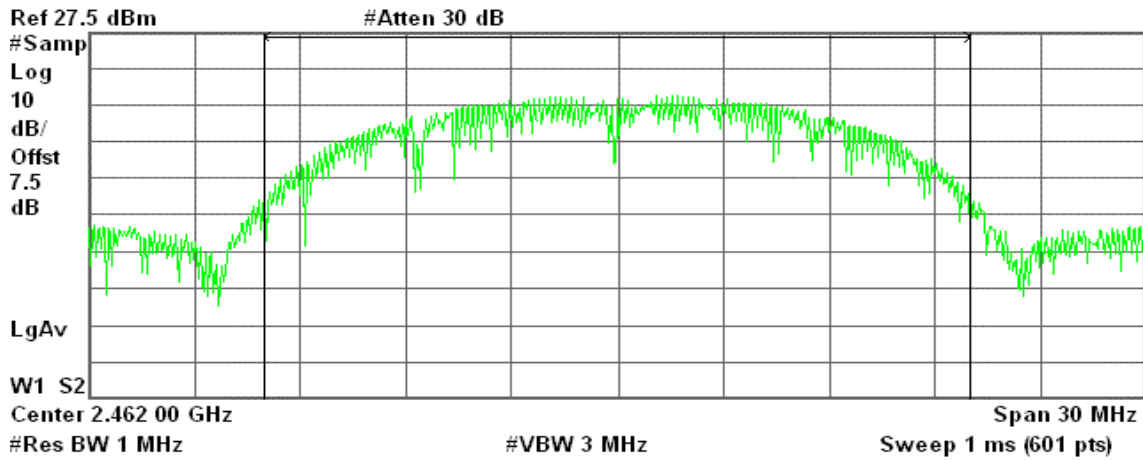
-56.60 dBm/Hz



Average Power (CH High)

Agilent 08:54:57 Jan 20, 2009

R T



Channel Power

16.74 dBm / 20.0000 MHz

Power Spectral Density

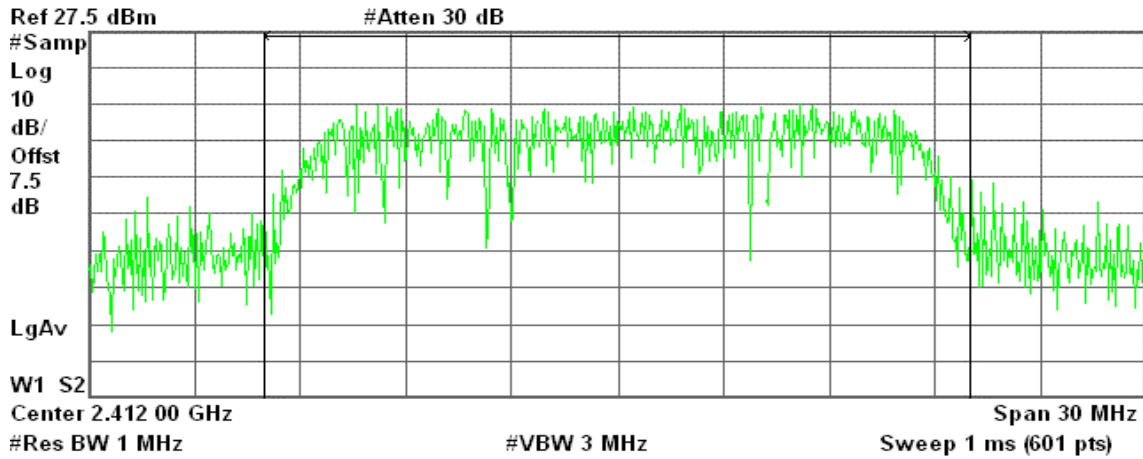
-56.27 dBm/Hz

IEEE 802.11g mode

Average Power (CH Low)

Agilent 08:48:00 Jan 20, 2009

R T



Channel Power

13.51 dBm / 20.0000 MHz

Power Spectral Density

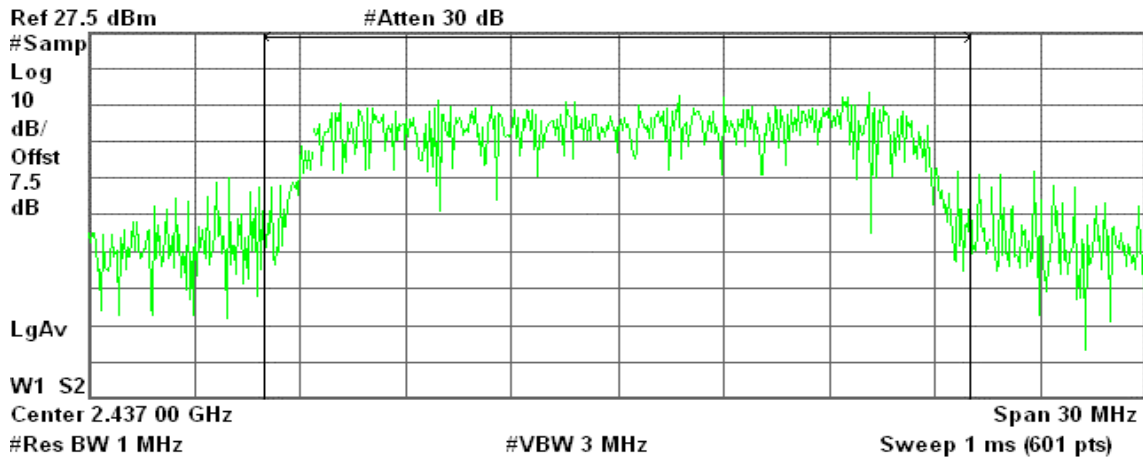
-59.50 dBm/Hz



Average Power (CH Mid)

Agilent 08:49:49 Jan 20, 2009

R T



Channel Power

15.31 dBm / 20.0000 MHz

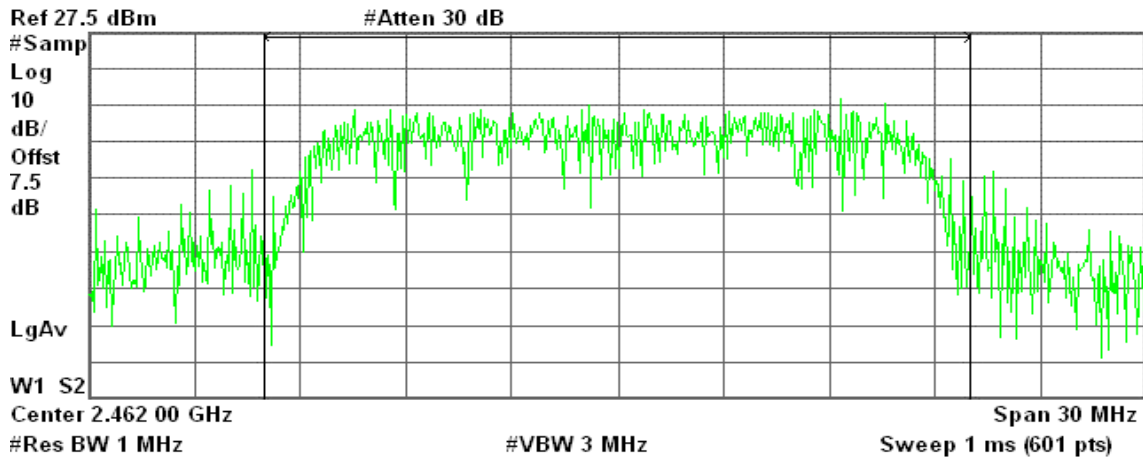
Power Spectral Density

-57.70 dBm/Hz

Average Power (CH High)

Agilent 08:51:07 Jan 20, 2009

R T



Channel Power

13.27 dBm / 20.0000 MHz

Power Spectral Density

-59.74 dBm/Hz

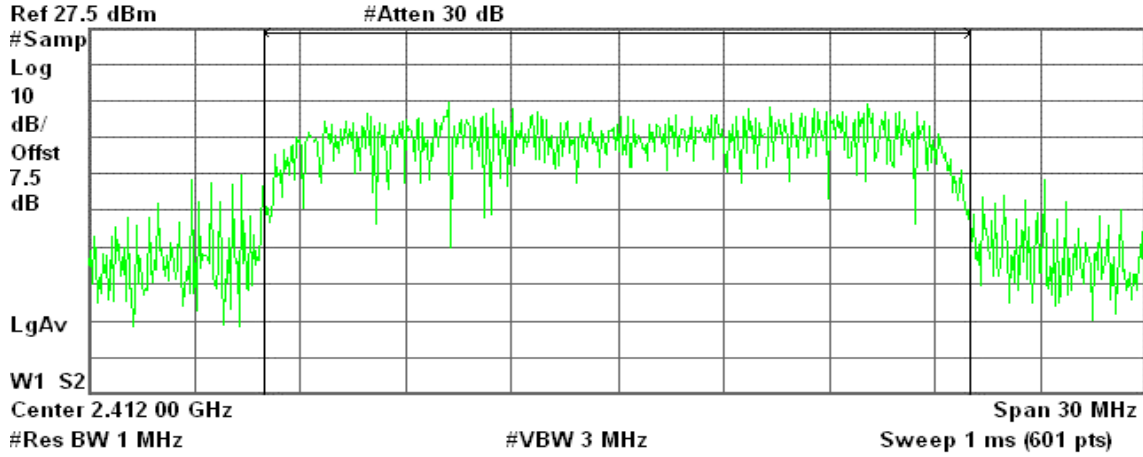


draft 802.11n Standard-20 MHz Channel mode

Average Power (CH Low)

Agilent 08:59:37 Jan 20, 2009

R T



Channel Power

11.93 dBm / 20.0000 MHz

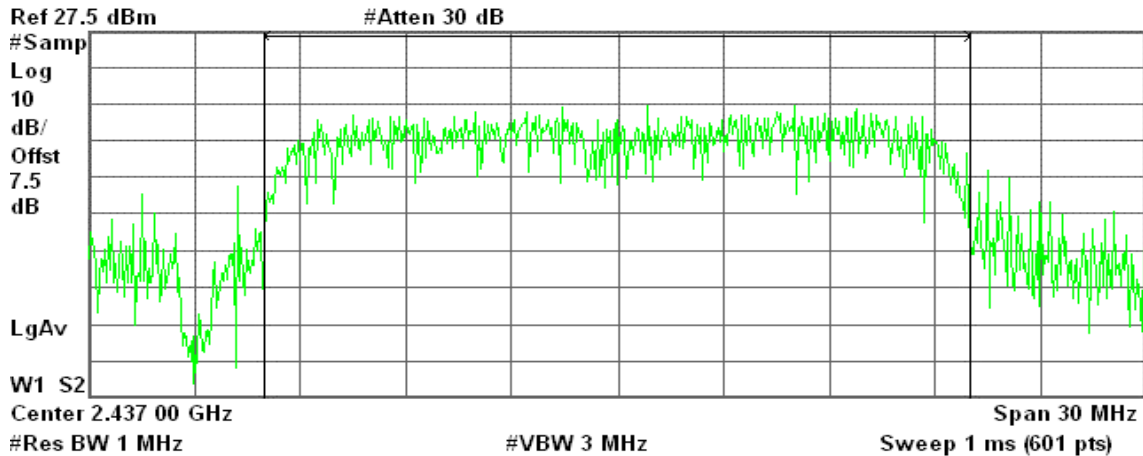
Power Spectral Density

-61.08 dBm/Hz

Average Power (CH Mid)

Agilent 09:00:43 Jan 20, 2009

R T



Channel Power

12.66 dBm / 20.0000 MHz

Power Spectral Density

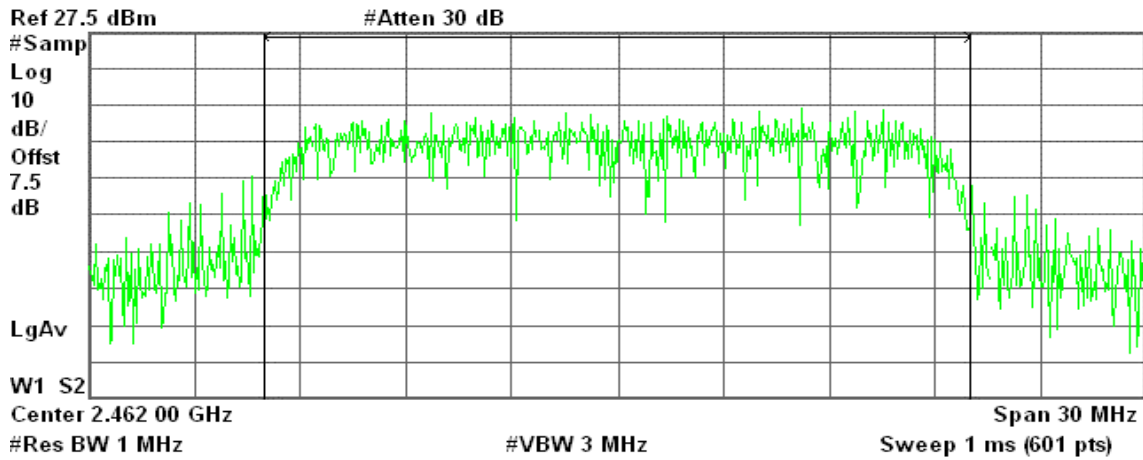
-60.35 dBm/Hz



Average Power (CH High)

Agilent 09:01:54 Jan 20, 2009

R T



Channel Power

11.56 dBm / 20.0000 MHz

Power Spectral Density

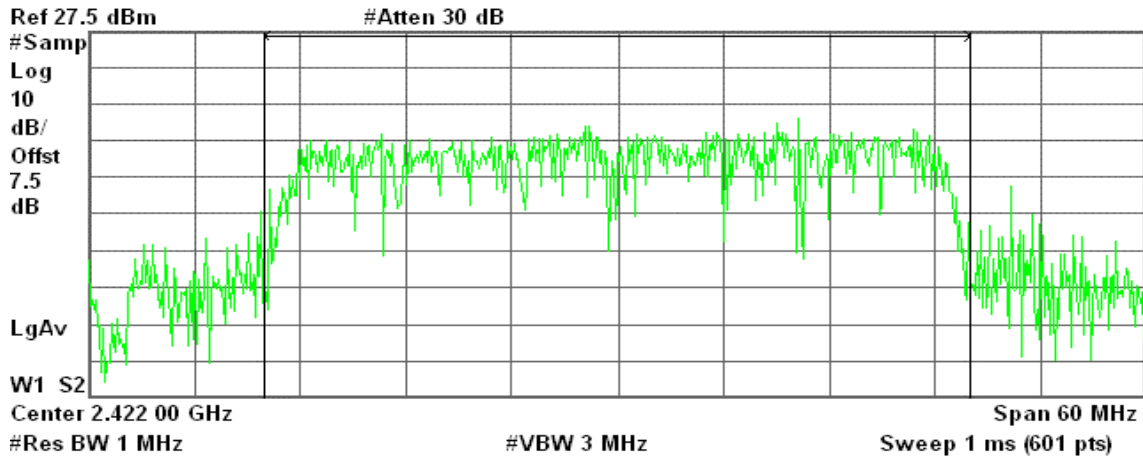
-61.45 dBm/Hz

draft 802.11n Wide-40 MHz Channel mode

Average Power (CH Low)

Agilent 09:06:56 Jan 20, 2009

R T



Channel Power

10.43 dBm / 40.0000 MHz

Power Spectral Density

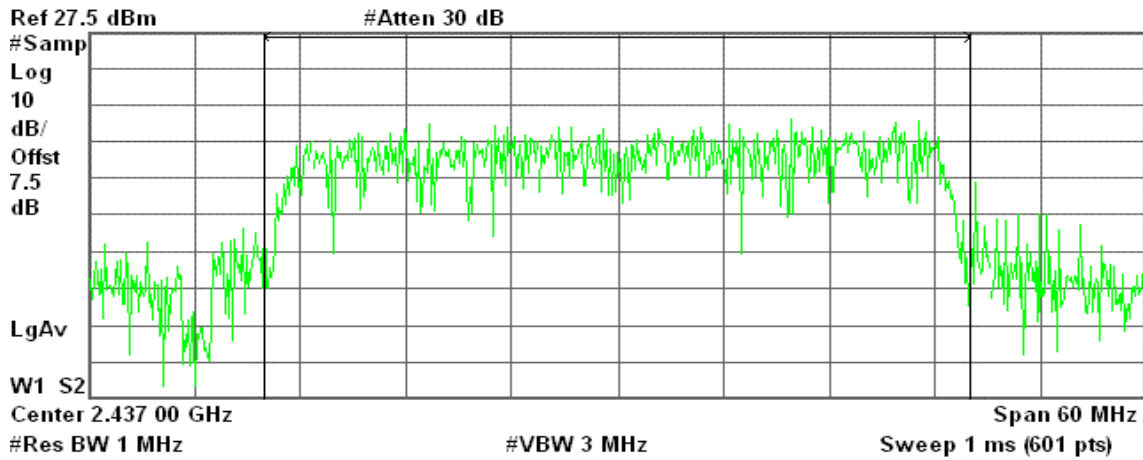
-65.59 dBm/Hz



Average Power (CH Mid)

Agilent 09:07:58 Jan 20, 2009

R T



Channel Power

11.27 dBm / 40.0000 MHz

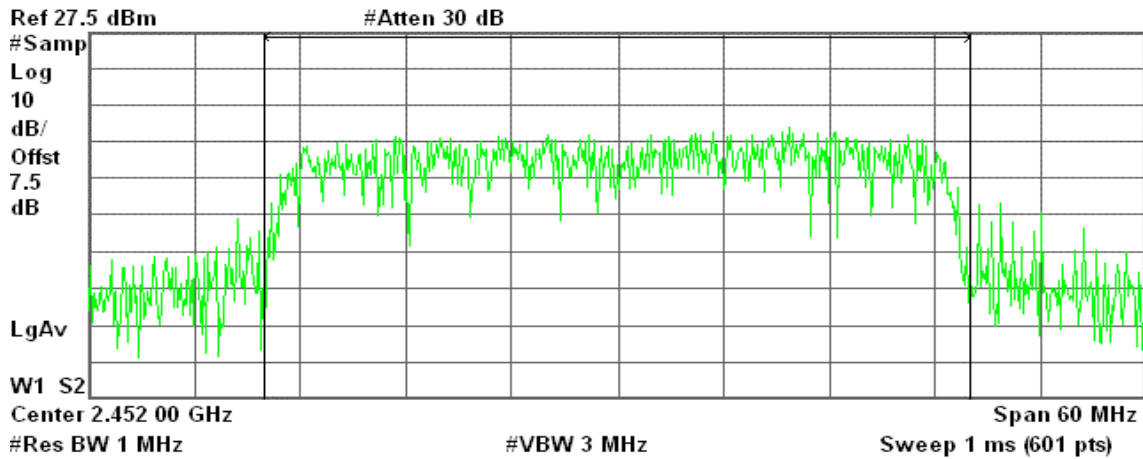
Power Spectral Density

-64.75 dBm/Hz

Average Power (CH High)

Agilent 09:08:52 Jan 20, 2009

R T



Channel Power

9.95 dBm / 40.0000 MHz

Power Spectral Density

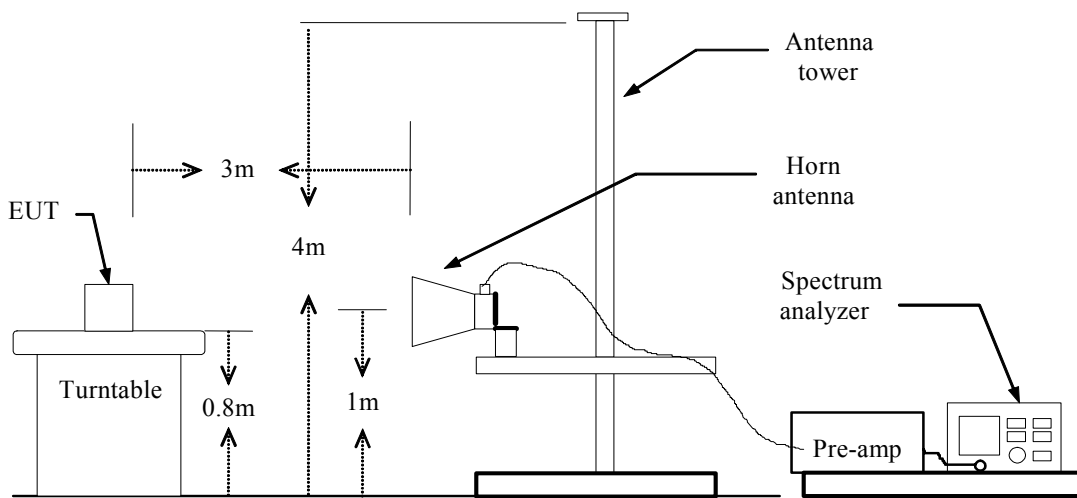
-66.07 dBm/Hz

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)

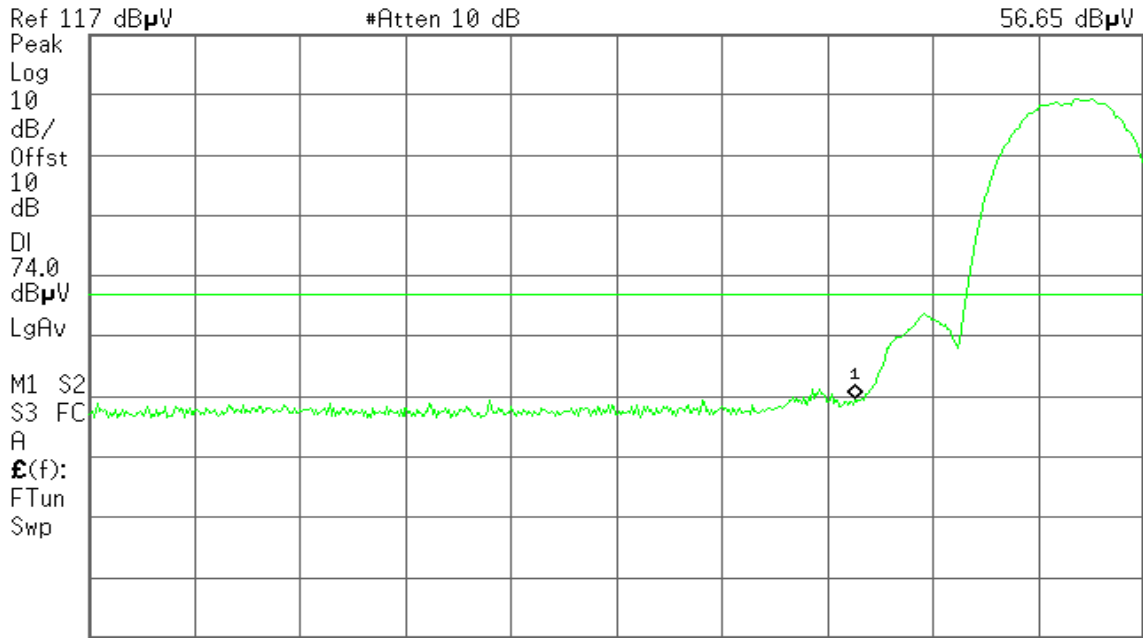
Detector mode: Peak

Polarity: Vertical

Agilent 14:29:45 Dec 31, 2008

R T

Mkr1 2.390 0 GHz
56.65 dBμV



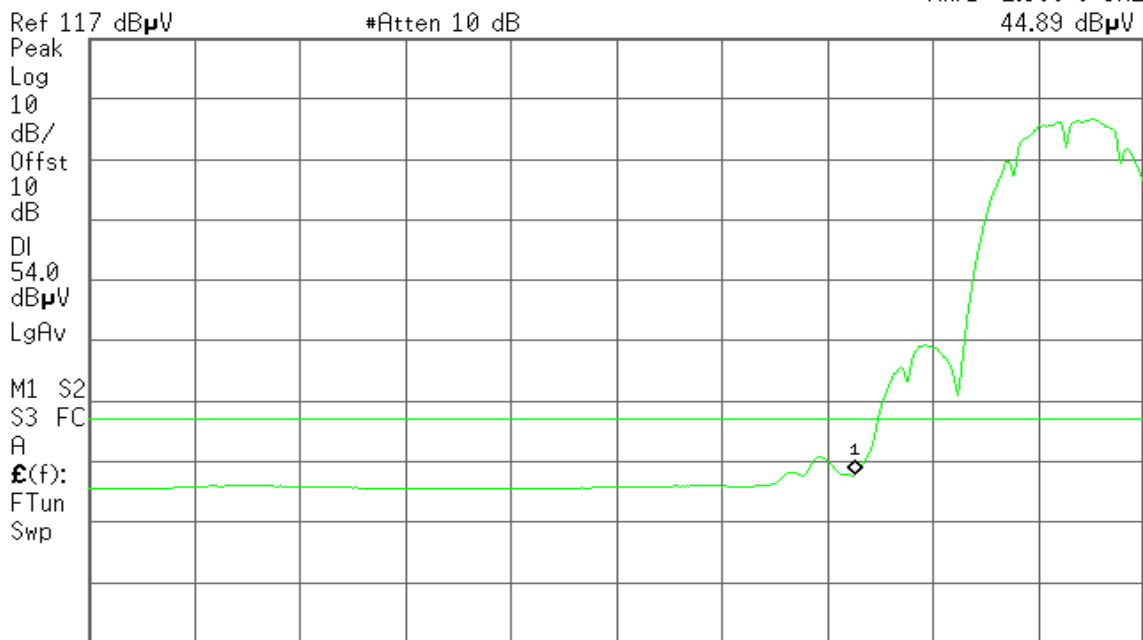
Detector mode: Average

Polarity: Vertical

Agilent 14:29:32 Dec 31, 2008

R T

Mkr1 2.390 0 GHz
44.89 dBμV





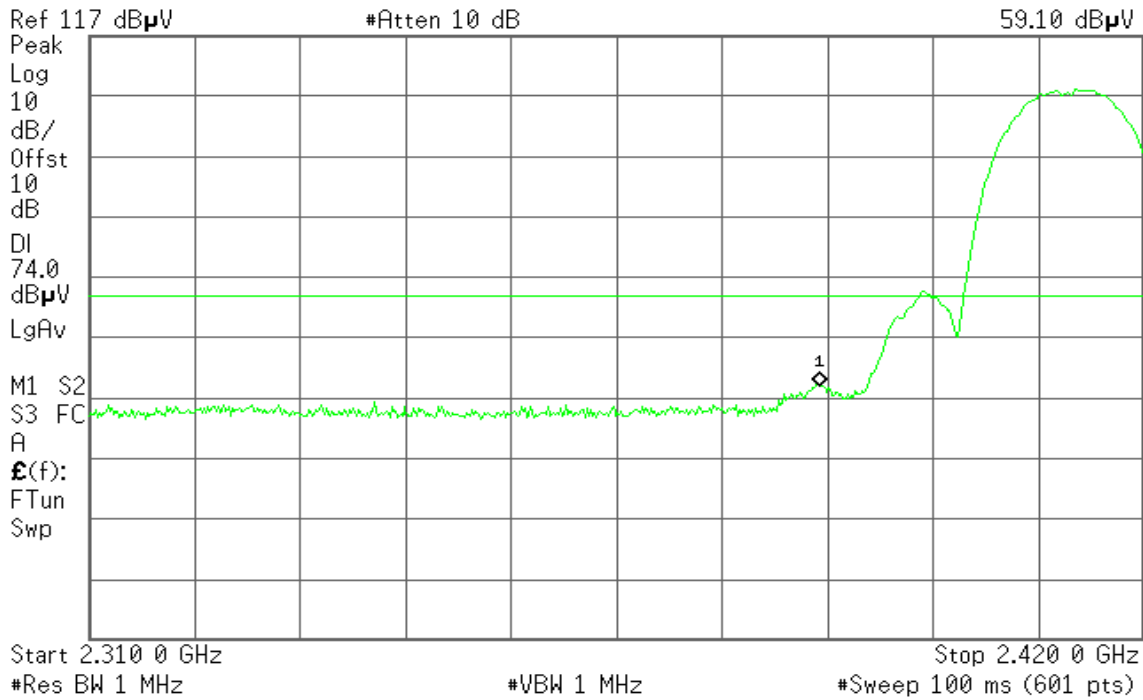
Detector mode: Peak

Polarity: Horizontal

Agilent 14:20:32 Dec 31, 2008

R T

Mkr1 2.386 1 GHz
59.10 dBμV



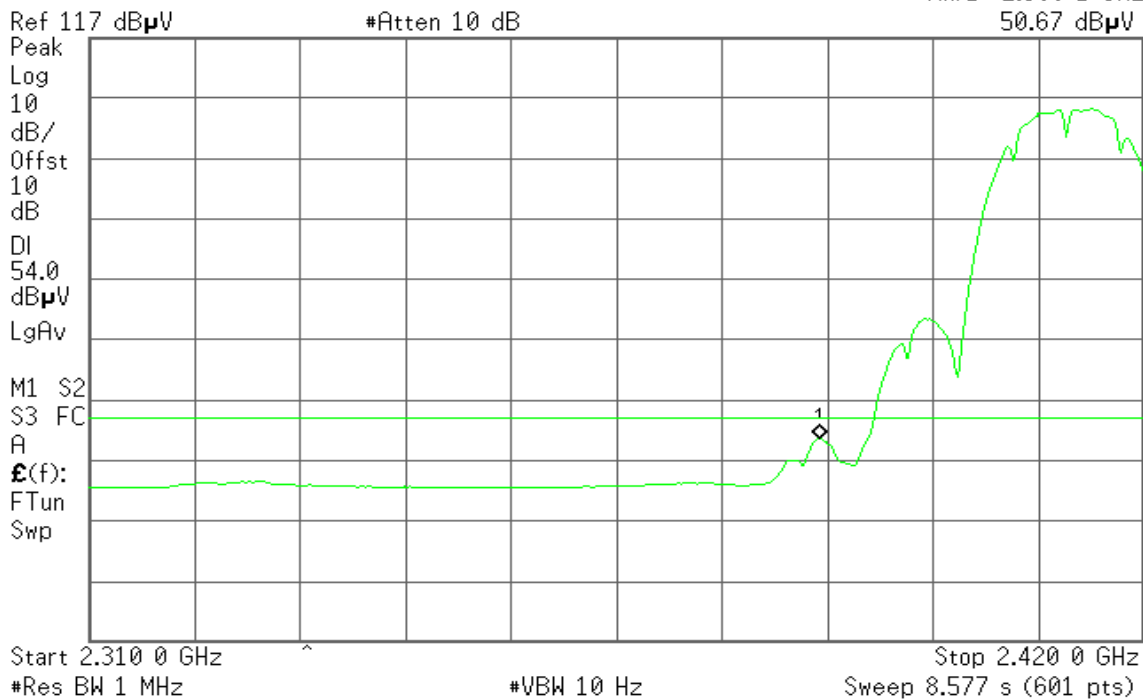
Detector mode: Average

Polarity: Horizontal

Agilent 14:20:16 Dec 31, 2008

R T

Mkr1 2.386 1 GHz
50.67 dBμV





Band Edges (IEEE 802.11b mode / CH High)

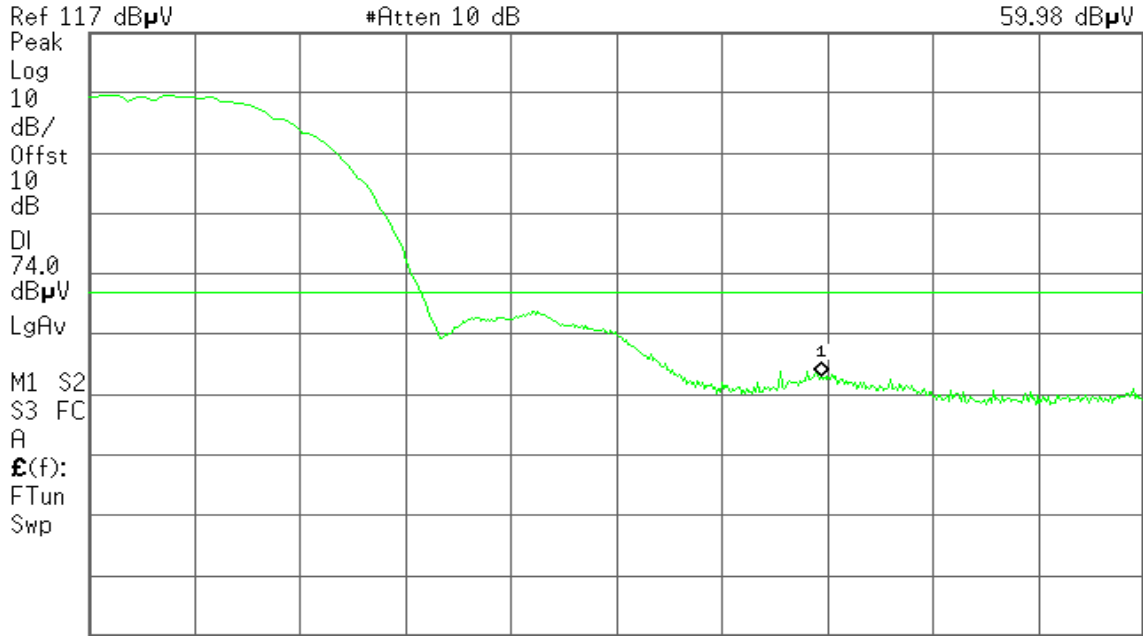
Detector mode: Peak

Polarity: Vertical

Agilent 13:50:30 Dec 31, 2008

R T

Mkr1 2.487 70 GHz
59.98 dB μ V



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

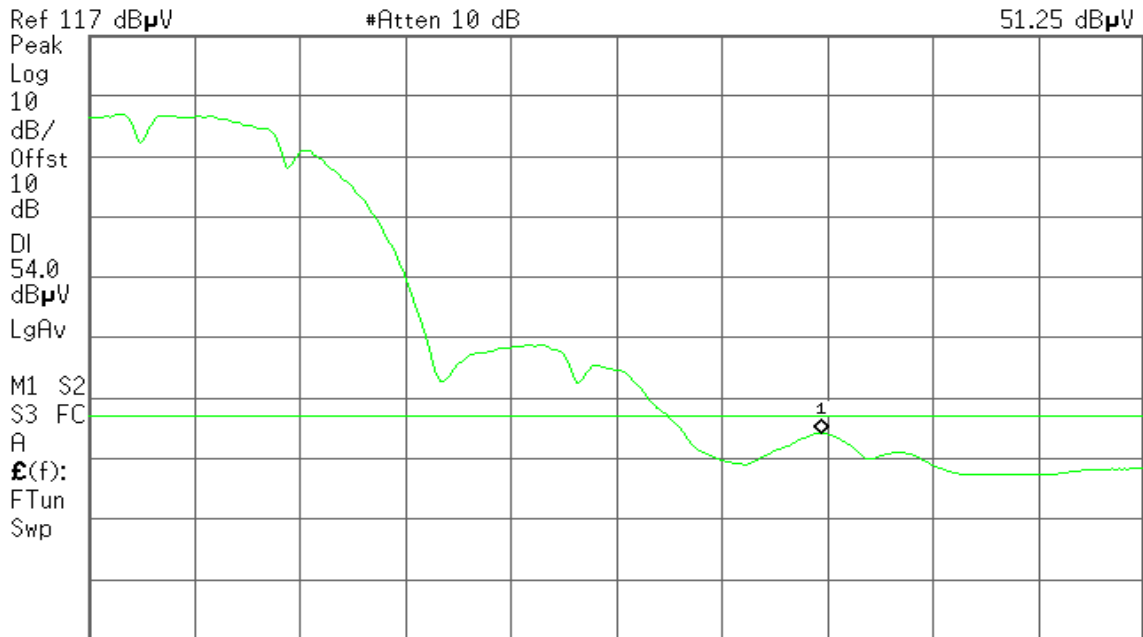
Detector mode: Average

Polarity: Vertical

Agilent 13:50:15 Dec 31, 2008

R T

Mkr1 2.487 70 GHz
51.25 dB μ V



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 3.119 s (601 pts)



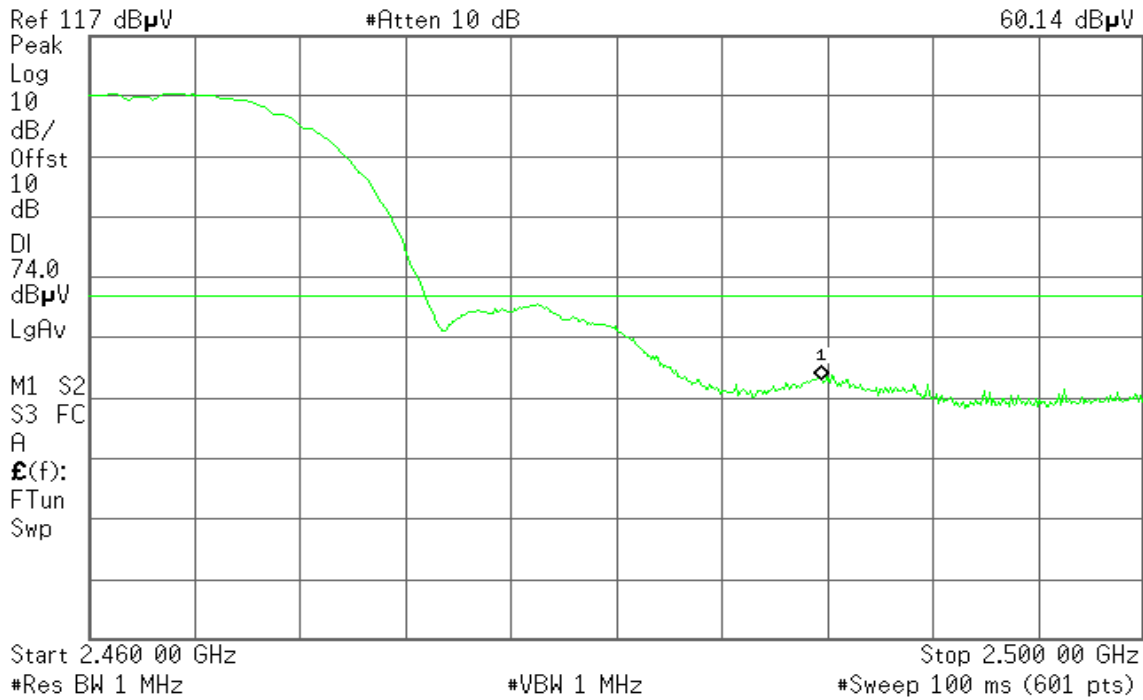
Detector mode: Peak

Polarity: Horizontal

Agilent 13:49:23 Dec 31, 2008

R T

Mkr1 2.487 70 GHz
60.14 dBμV



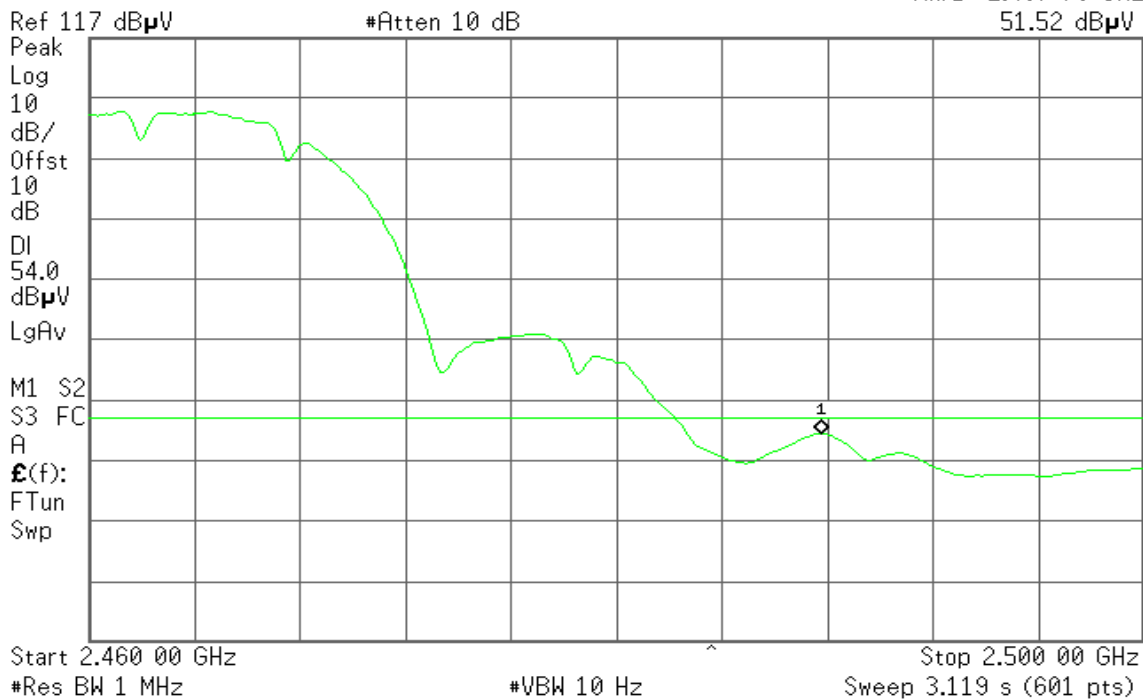
Detector mode: Average

Polarity: Horizontal

Agilent 13:49:02 Dec 31, 2008

R T

Mkr1 2.487 70 GHz
51.52 dBμV





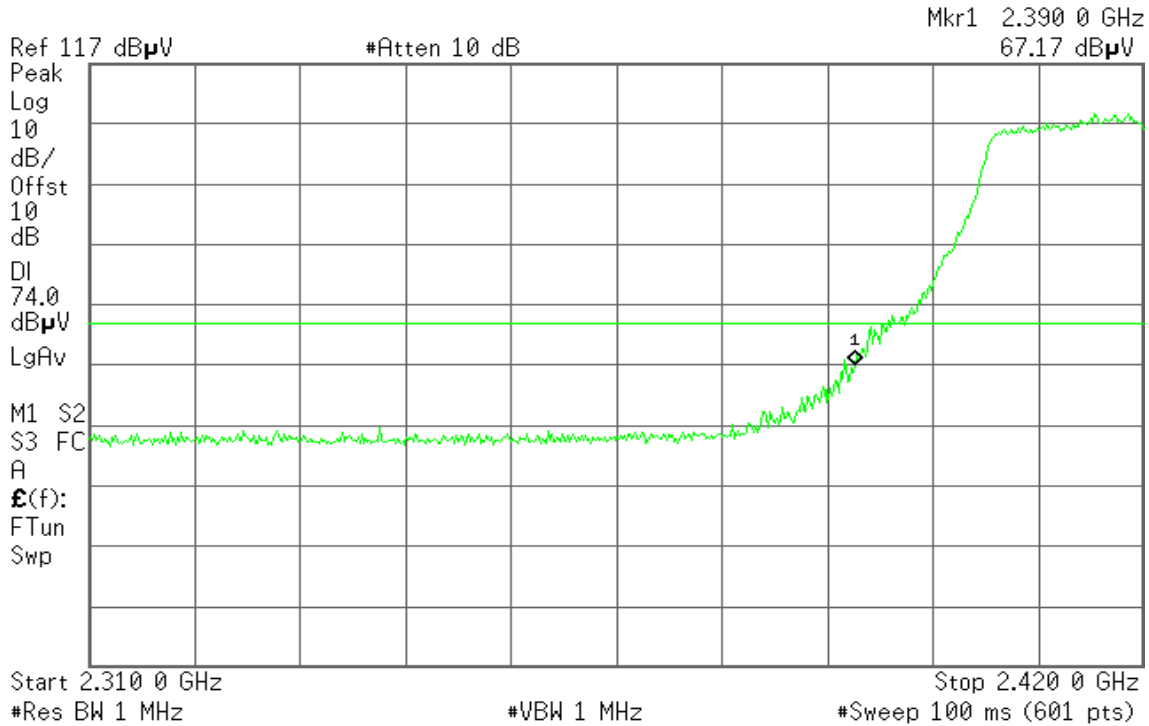
Band Edges (IEEE 802.11g mode / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 14:32:55 Dec 31, 2008

R T

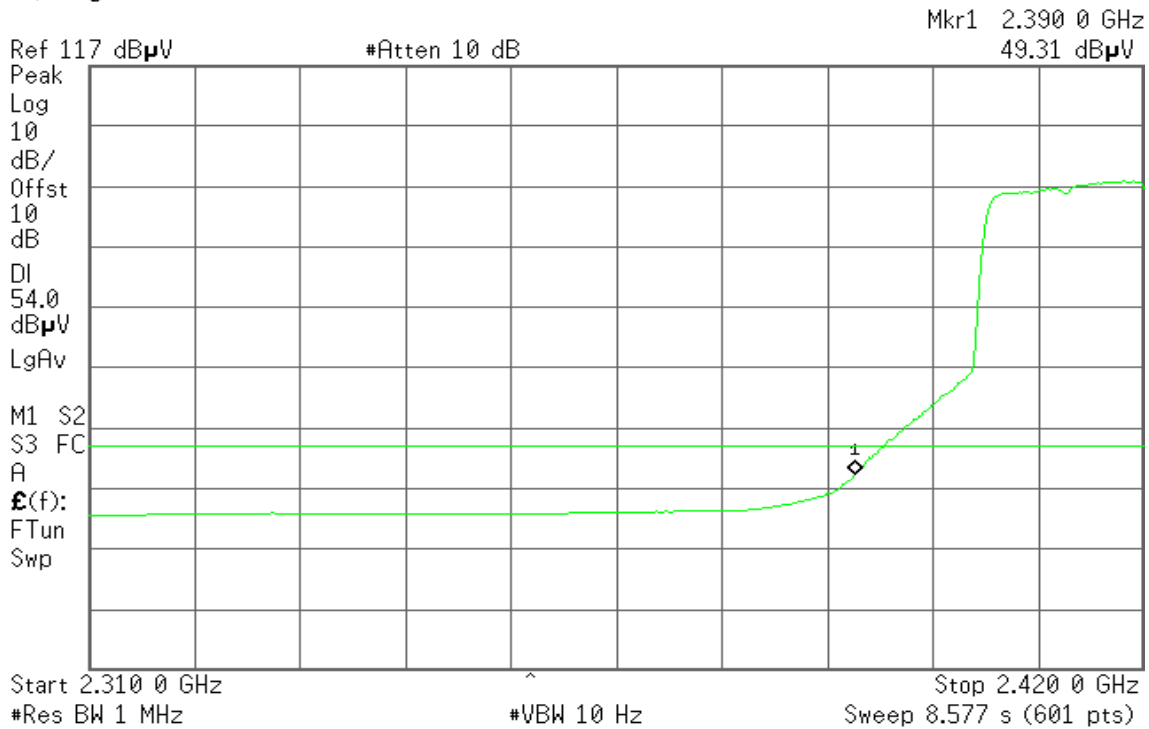


Detector mode: Average

Polarity: Vertical

Agilent 14:32:36 Dec 31, 2008

R T





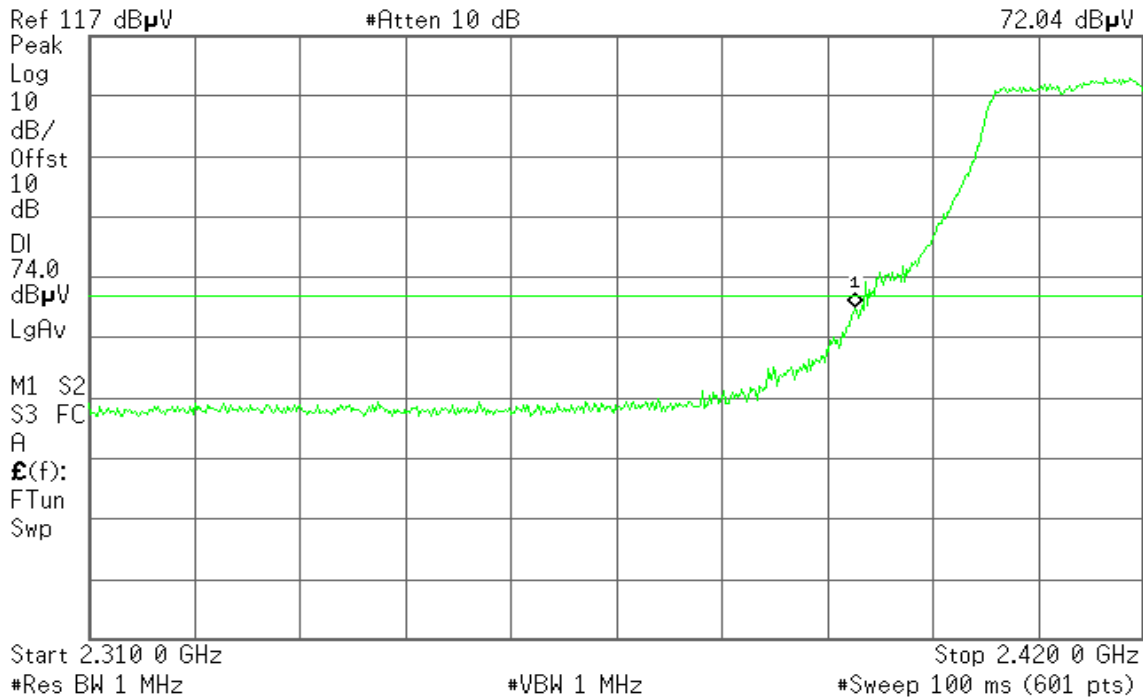
Detector mode: Peak

Polarity: Horizontal

Agilent 14:25:22 Dec 31, 2008

R T

Mkr1 2.390 0 GHz
72.04 dBµV



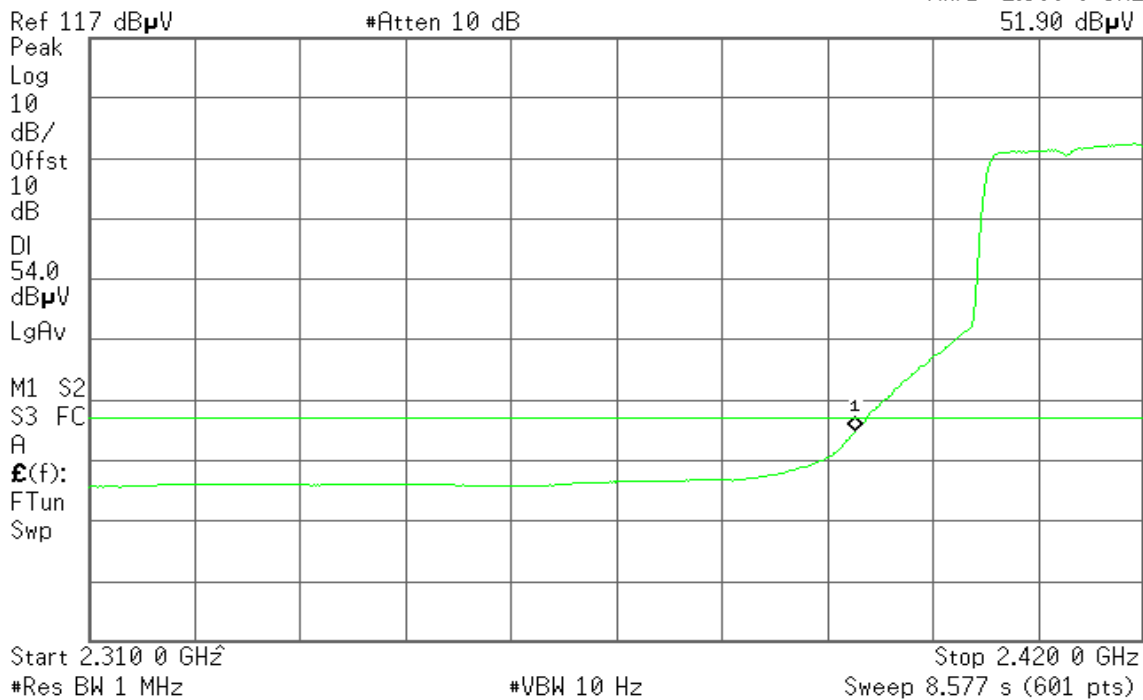
Detector mode: Average

Polarity: Horizontal

Agilent 14:24:32 Dec 31, 2008

R T

Mkr1 2.390 0 GHz
51.90 dBµV





Band Edges (IEEE 802.11g mode / CH High)

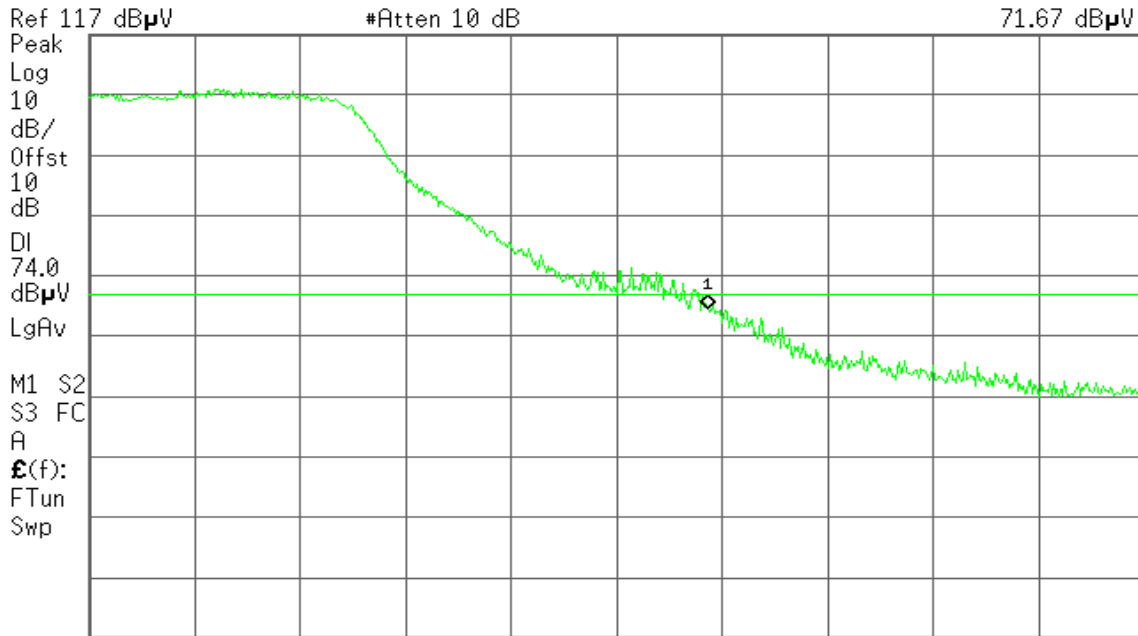
Detector mode: Peak

Polarity: Vertical

Agilent 13:30:26 Dec 31, 2008

R T

Mkr1 2.483 50 GHz
71.67 dB μ V



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

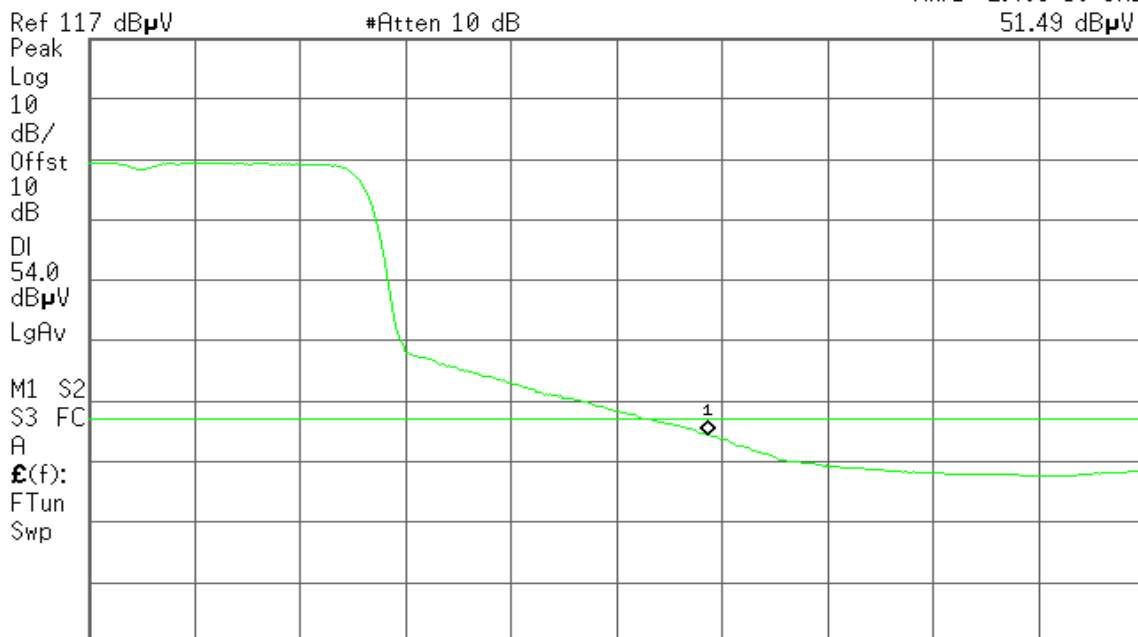
Detector mode: Average

Polarity: Vertical

Agilent 13:30:59 Dec 31, 2008

R T

Mkr1 2.483 50 GHz
51.49 dB μ V



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



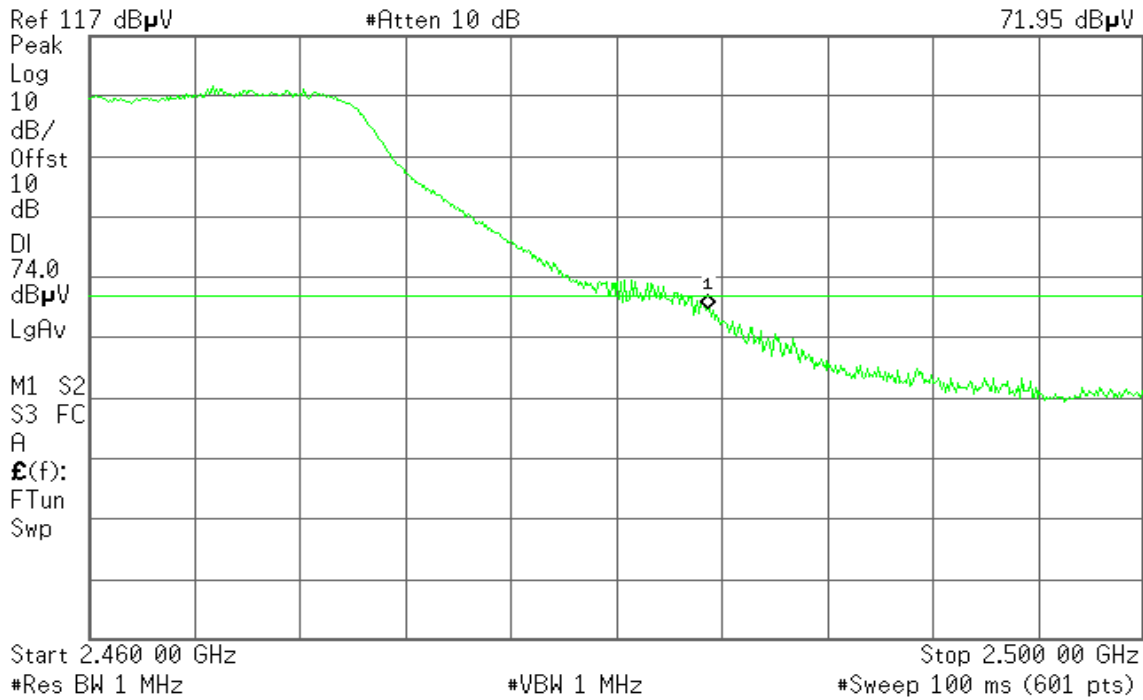
Detector mode: Peak

Polarity: Horizontal

Agilent 13:53:06 Dec 31, 2008

R T

Mkr1 2.483 50 GHz
71.95 dBμV



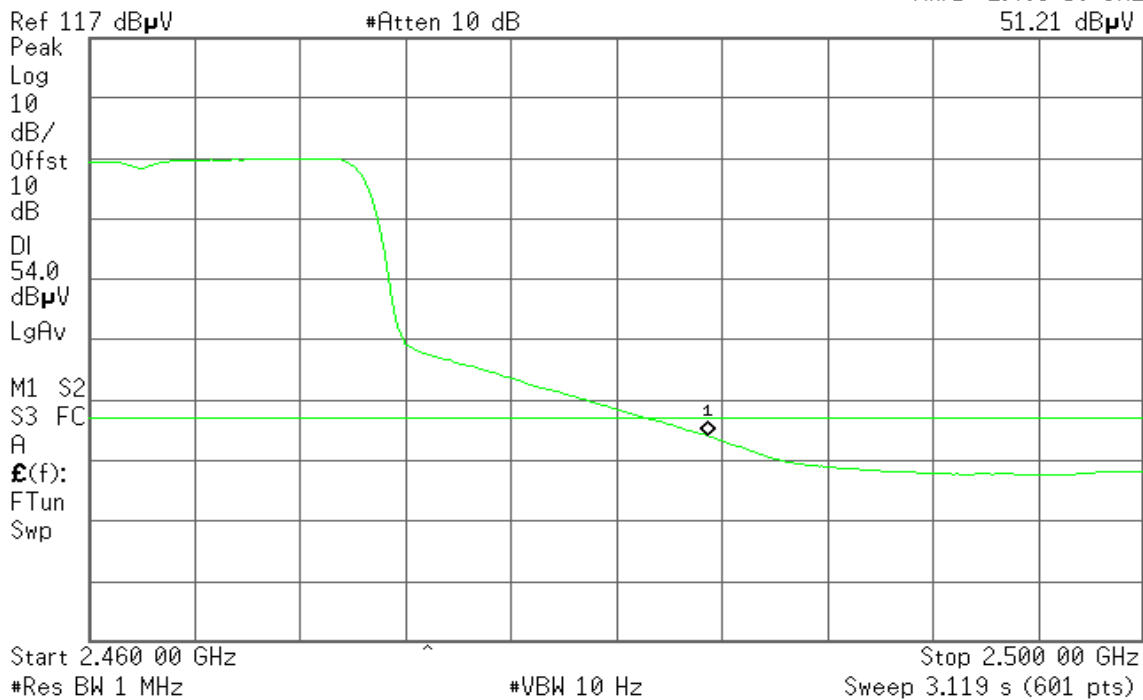
Detector mode: Average

Polarity: Horizontal

Agilent 13:53:32 Dec 31, 2008

R T

Mkr1 2.483 50 GHz
51.21 dBμV





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

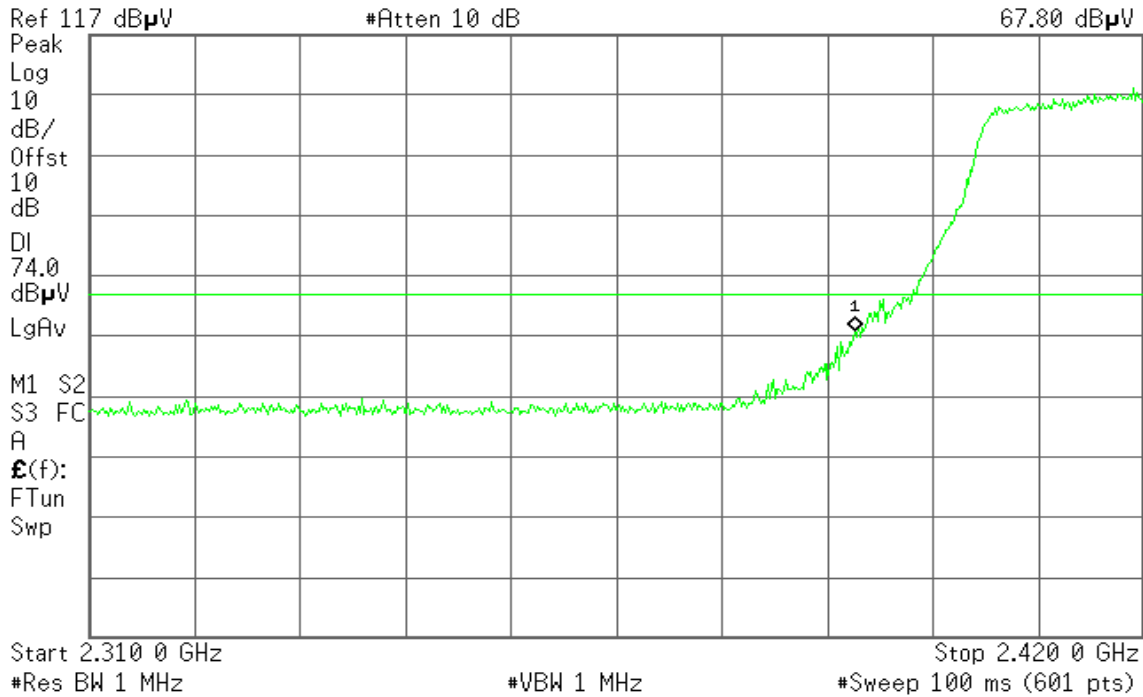
Detector mode: Peak

Polarity: Vertical

Agilent 14:33:44 Dec 31, 2008

R T

Mkr1 2.390 0 GHz
67.80 dBμV



Detector mode: Average

Polarity: Vertical

Agilent 14:34:05 Dec 31, 2008

R T

Mkr1 2.390 0 GHz
49.32 dBμV





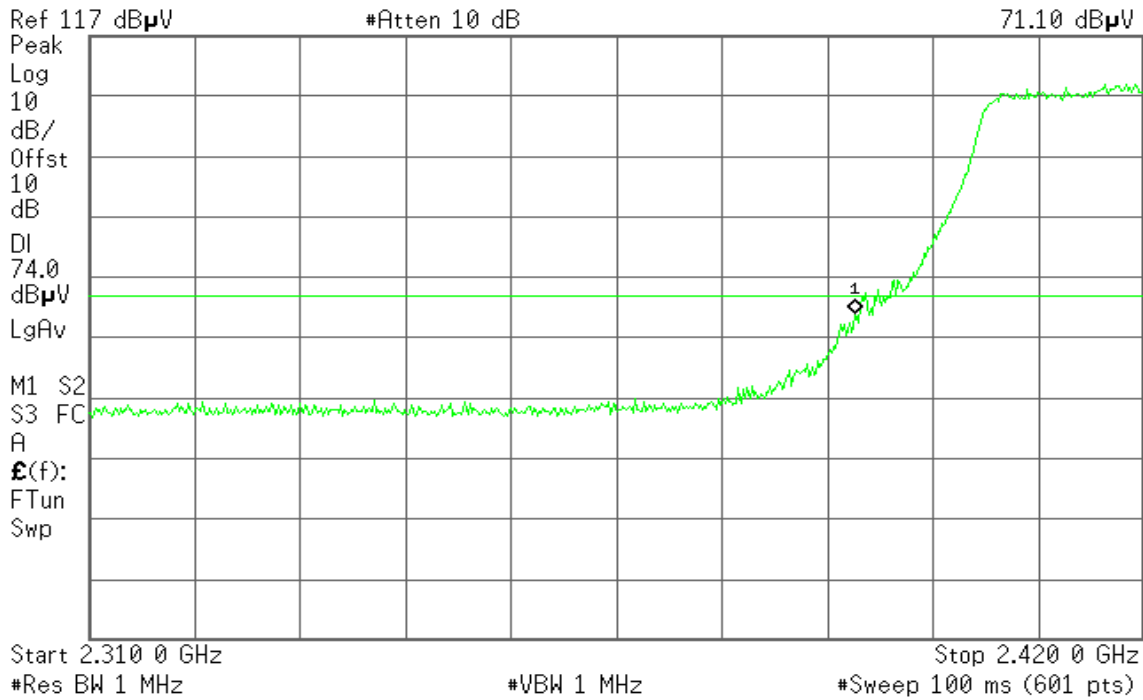
Detector mode: Peak

Polarity: Horizontal

Agilent 14:27:43 Dec 31, 2008

R T

Mkr1 2.390 0 GHz
71.10 dBµV



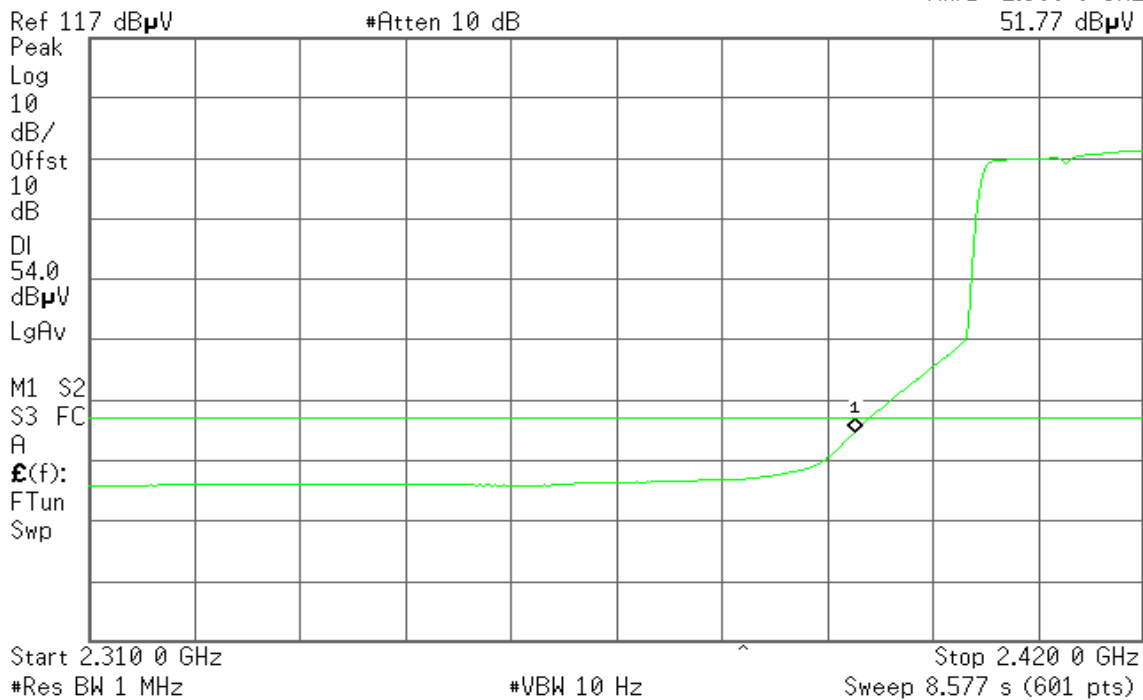
Detector mode: Average

Polarity: Horizontal

Agilent 14:27:24 Dec 31, 2008

R T

Mkr1 2.390 0 GHz
51.77 dBµV





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

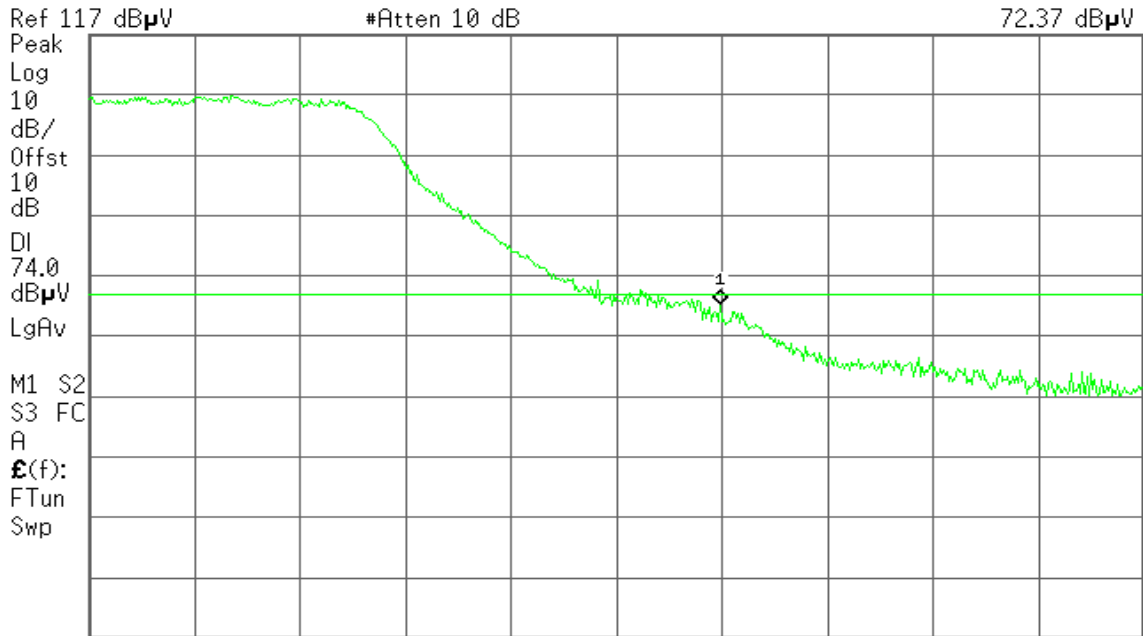
Detector mode: Peak

Polarity: Vertical

Agilent 13:36:59 Dec 31, 2008

R T

Mkr1 2.483 93 GHz
72.37 dB μ V



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

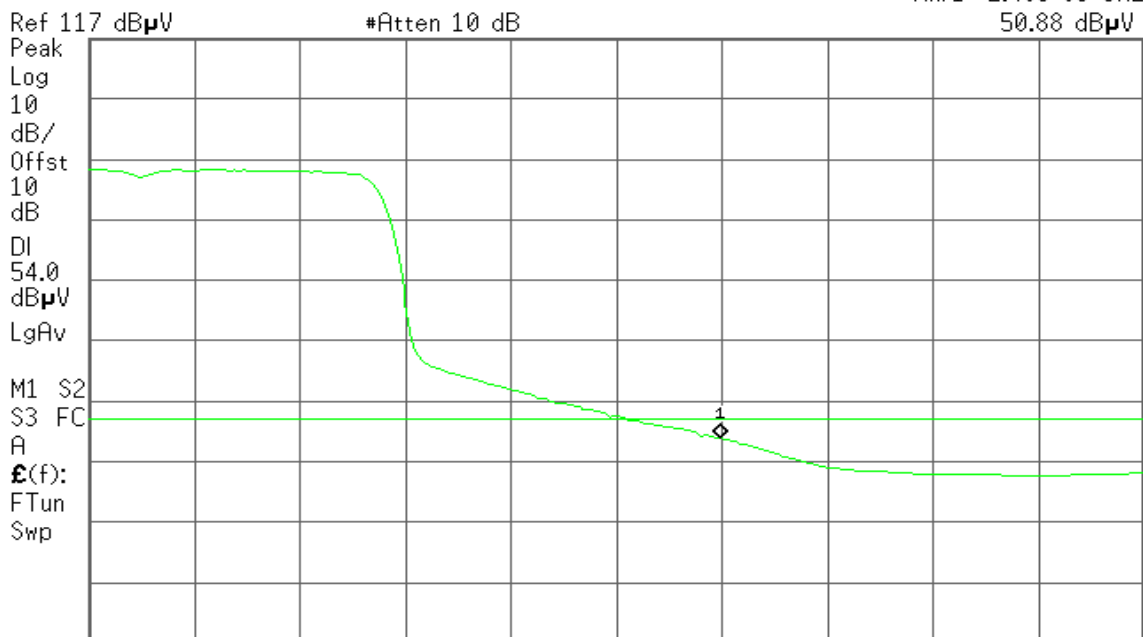
Detector mode: Average

Polarity: Vertical

Agilent 13:37:17 Dec 31, 2008

R T

Mkr1 2.483 93 GHz
50.88 dB μ V



Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 3.119 s (601 pts)



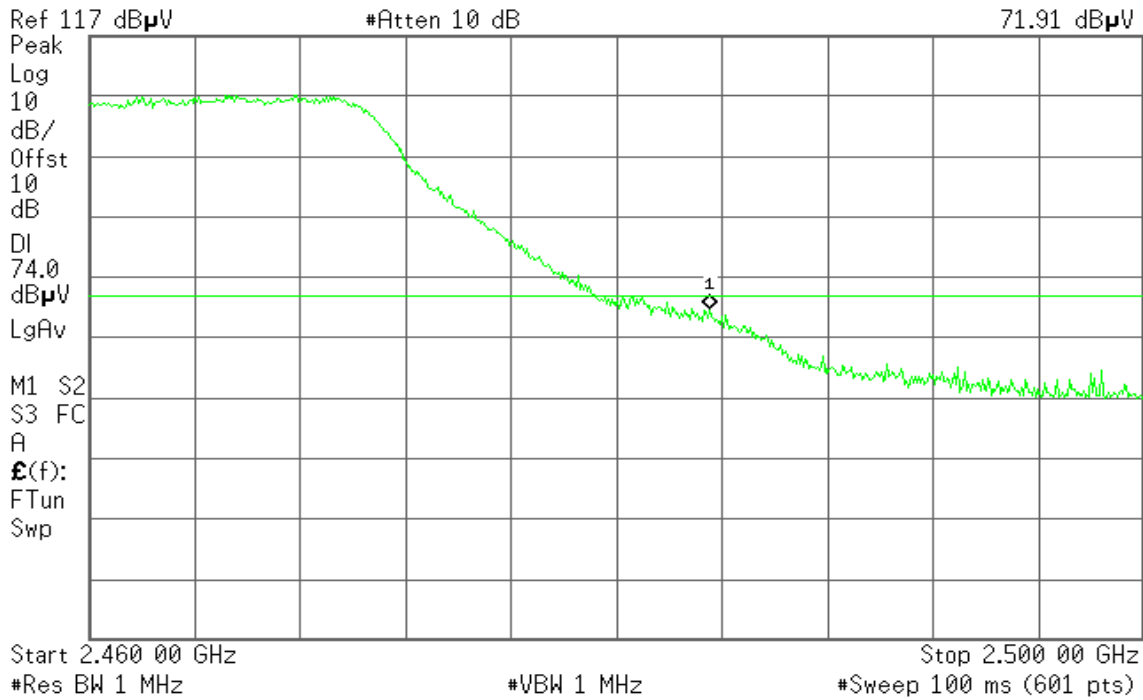
Detector mode: Peak

Polarity: Horizontal

Agilent 13:56:50 Dec 31, 2008

R T

Mkr1 2.483 53 GHz
71.91 dBμV



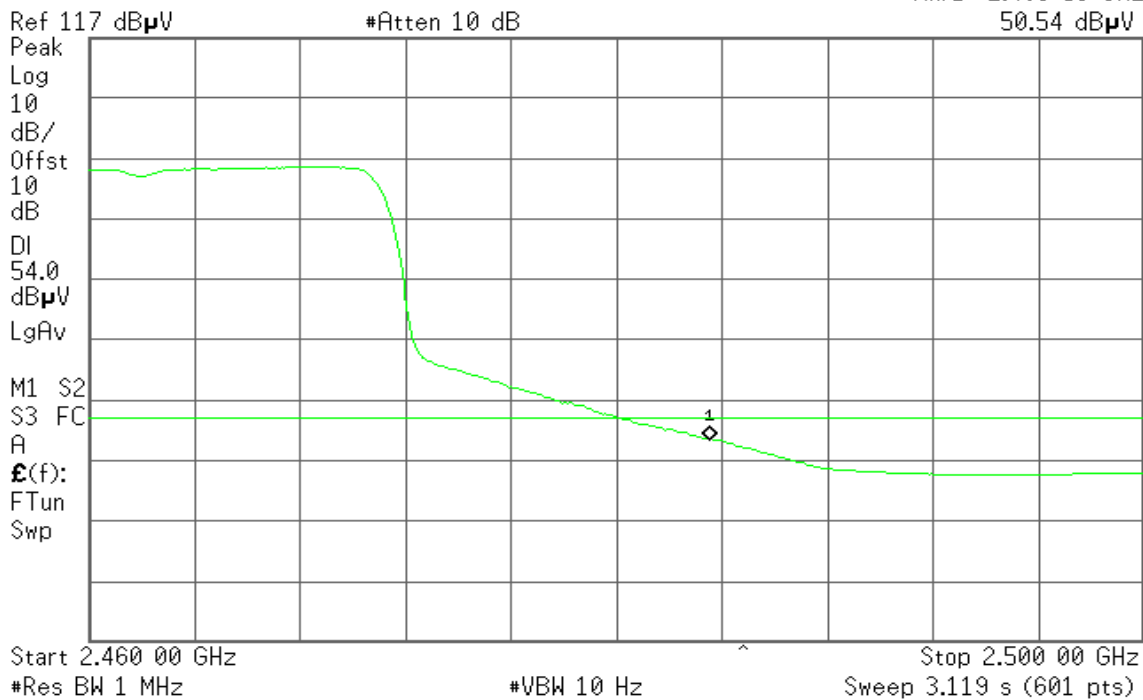
Detector mode: Average

Polarity: Horizontal

Agilent 13:57:17 Dec 31, 2008

R T

Mkr1 2.483 53 GHz
50.54 dBμV





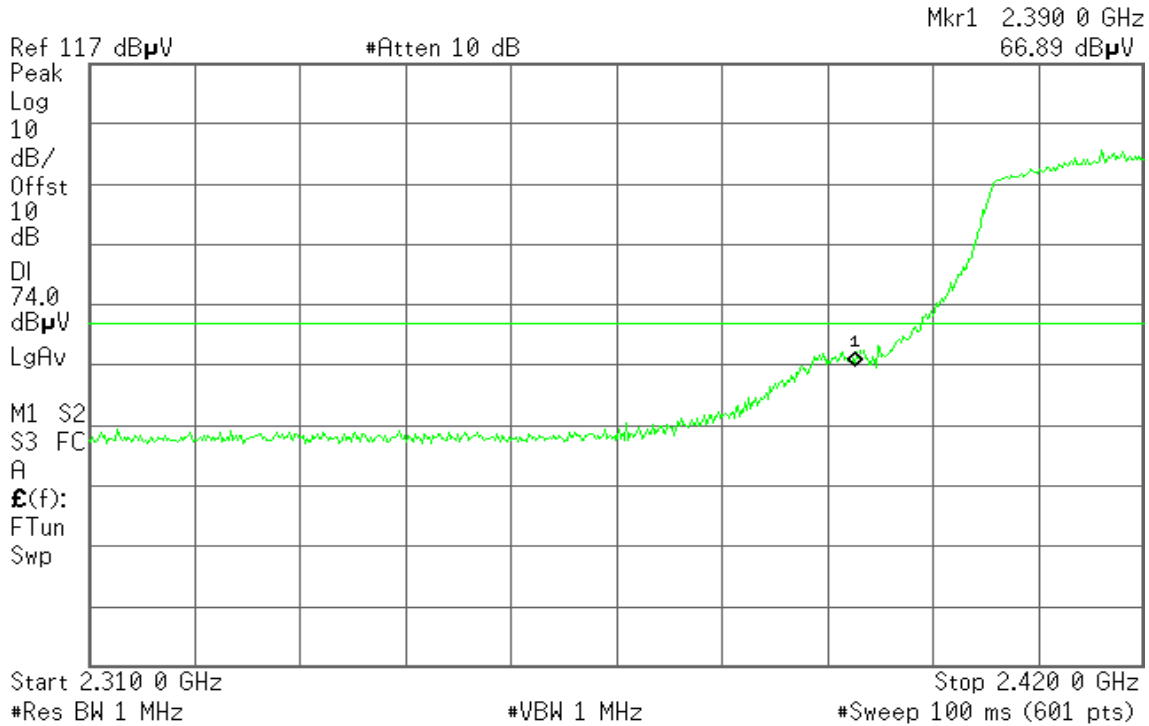
Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 14:45:15 Dec 31, 2008

T

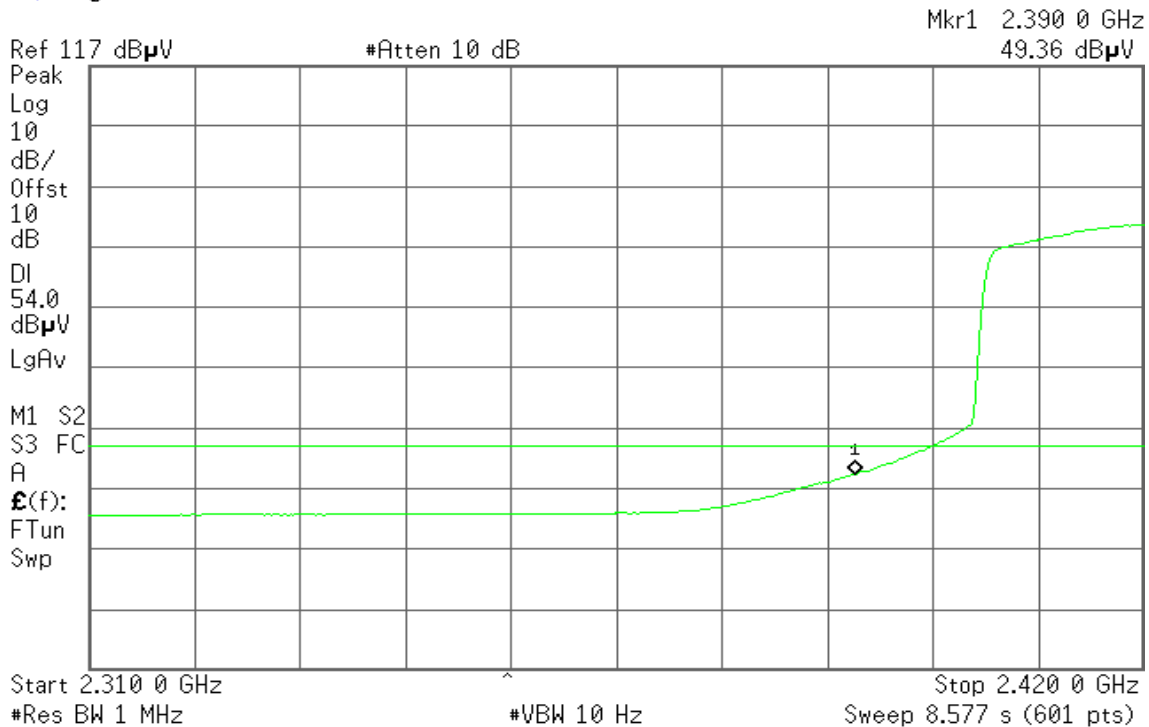


Detector mode: Average

Polarity: Vertical

Agilent 14:45:34 Dec 31, 2008

T





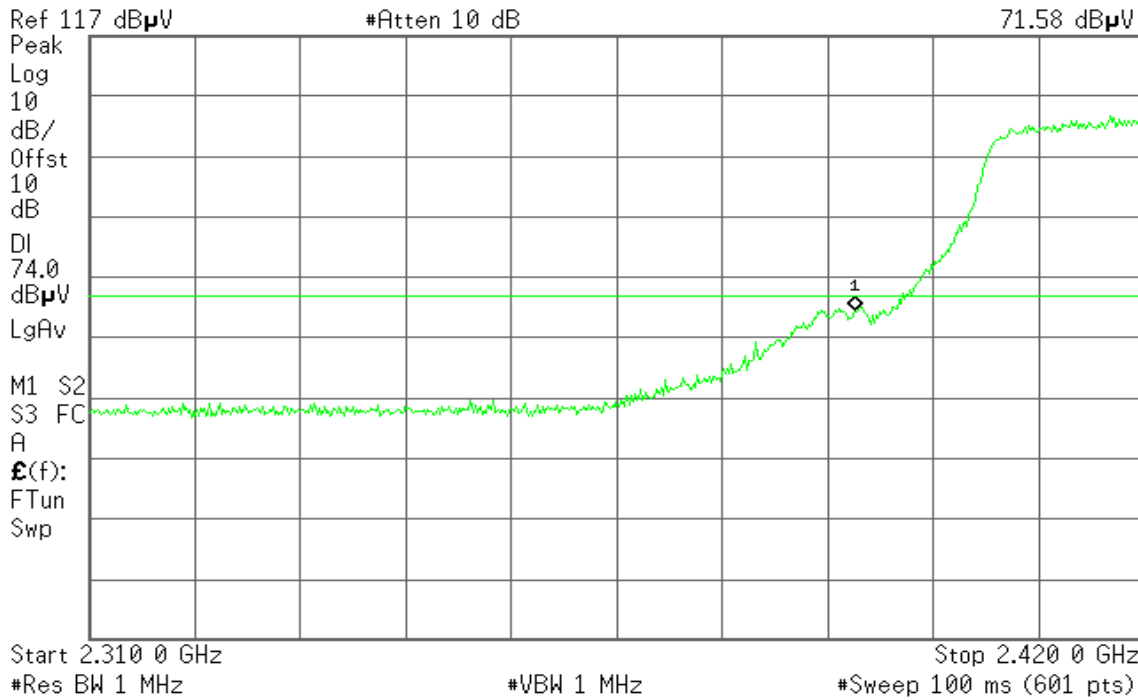
Detector mode: Peak

Polarity: Horizontal

Agilent 14:44:18 Dec 31, 2008

T

Mkr1 2.390 0 GHz
71.58 dBμV



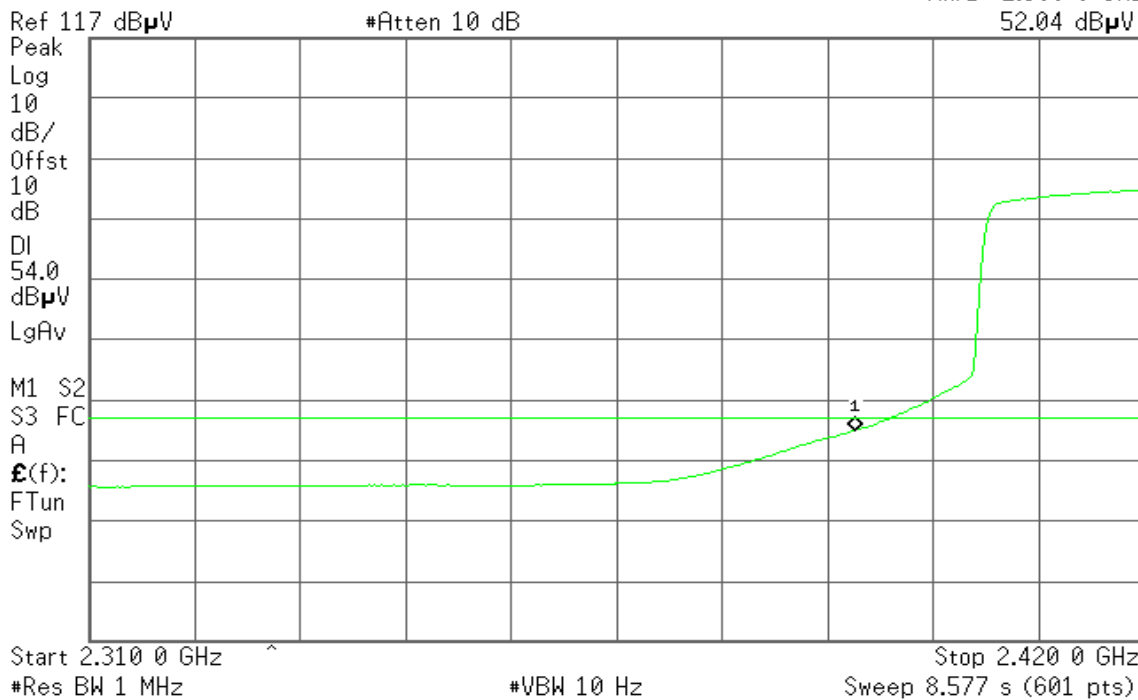
Detector mode: Average

Polarity: Horizontal

Agilent 14:43:58 Dec 31, 2008

T

Mkr1 2.390 0 GHz
52.04 dBμV





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

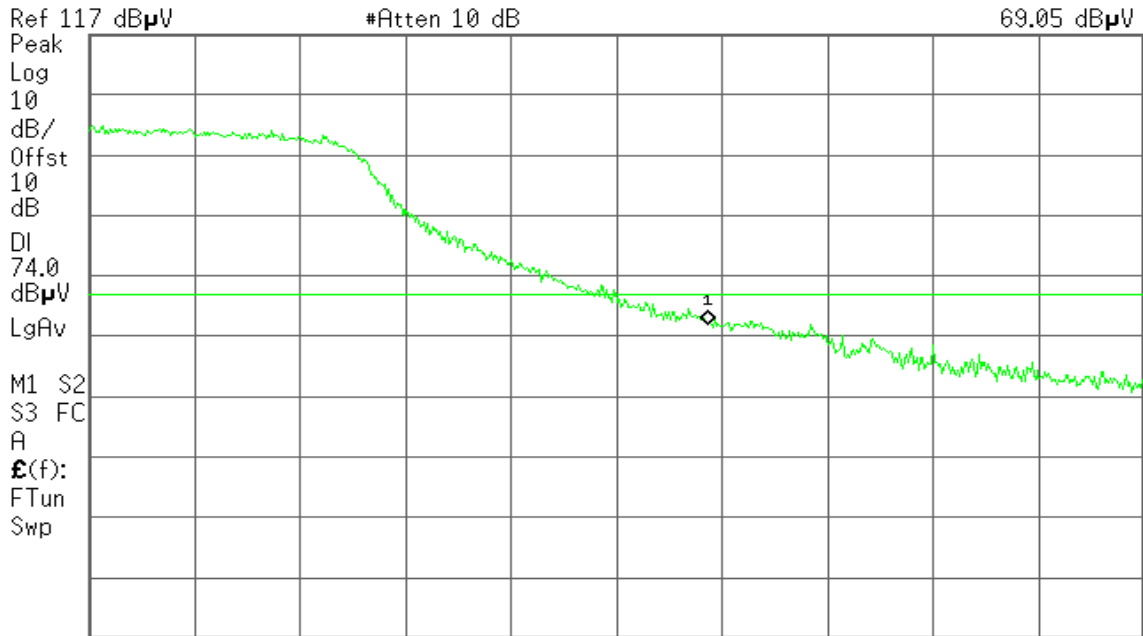
Detector mode: Peak

Polarity: Vertical

Agilent 15:14:10 Dec 31, 2008

R T

Mkr1 2.483 50 GHz
69.05 dBμV



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

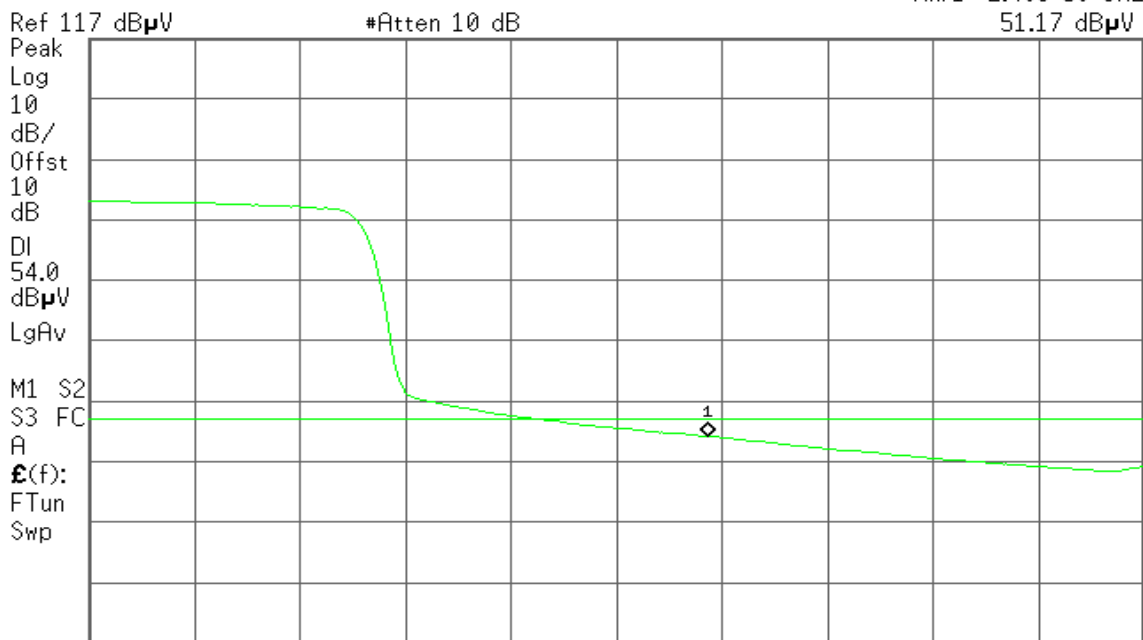
Detector mode: Average

Polarity: Vertical

Agilent 15:14:24 Dec 31, 2008

R T

Mkr1 2.483 50 GHz
51.17 dBμV



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



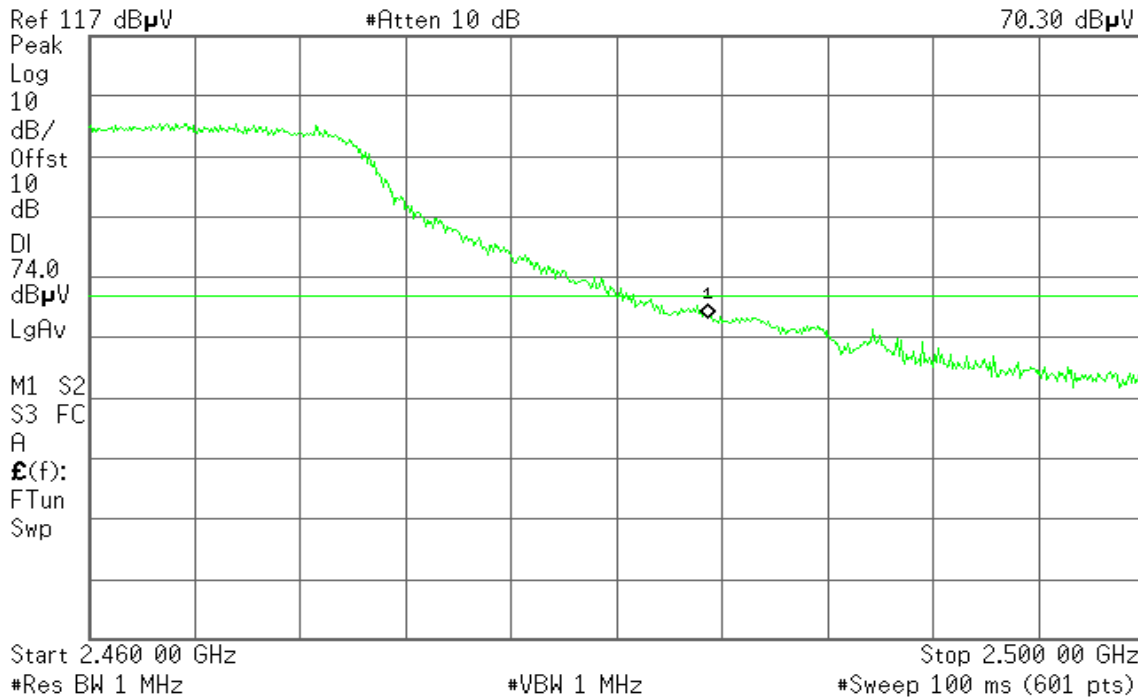
Detector mode: Peak

Polarity: Horizontal

Agilent 15:09:14 Dec 31, 2008

R T

Mkr1 2.483 50 GHz
70.30 dBμV



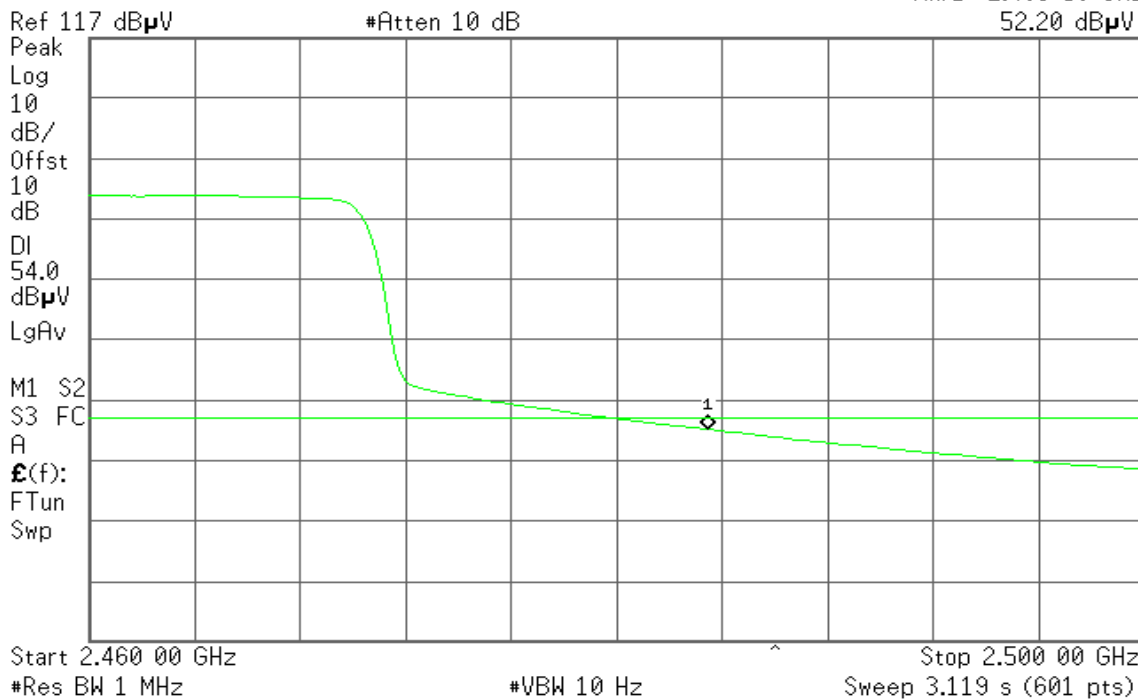
Detector mode: Average

Polarity: Horizontal

Agilent 15:08:47 Dec 31, 2008

R T

Mkr1 2.483 50 GHz
52.20 dBμV

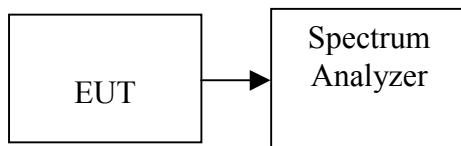


7.5 PEAK POWER SPECTRAL DENSITY

LIMIT

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

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s.
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	-8.01	8.00	PASS
Mid	2437	-7.56		PASS
High	2462	-6.69		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-4.00	8.00	PASS
Mid	2437	-2.55		PASS
High	2462	-3.10		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-12.16	8.00	PASS
Mid	2437	-12.92		PASS
High	2462	-12.92		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-16.28	8.00	PASS
Mid	2437	-15.29		PASS
High	2452	-17.53		PASS

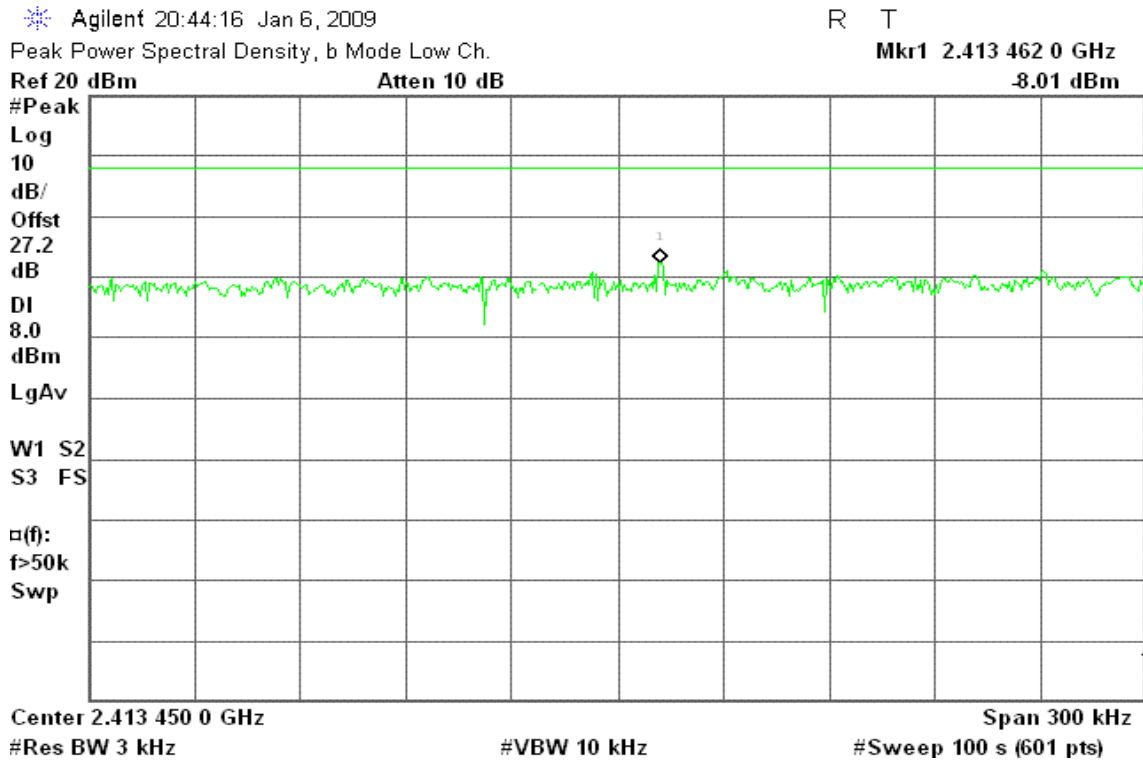
,



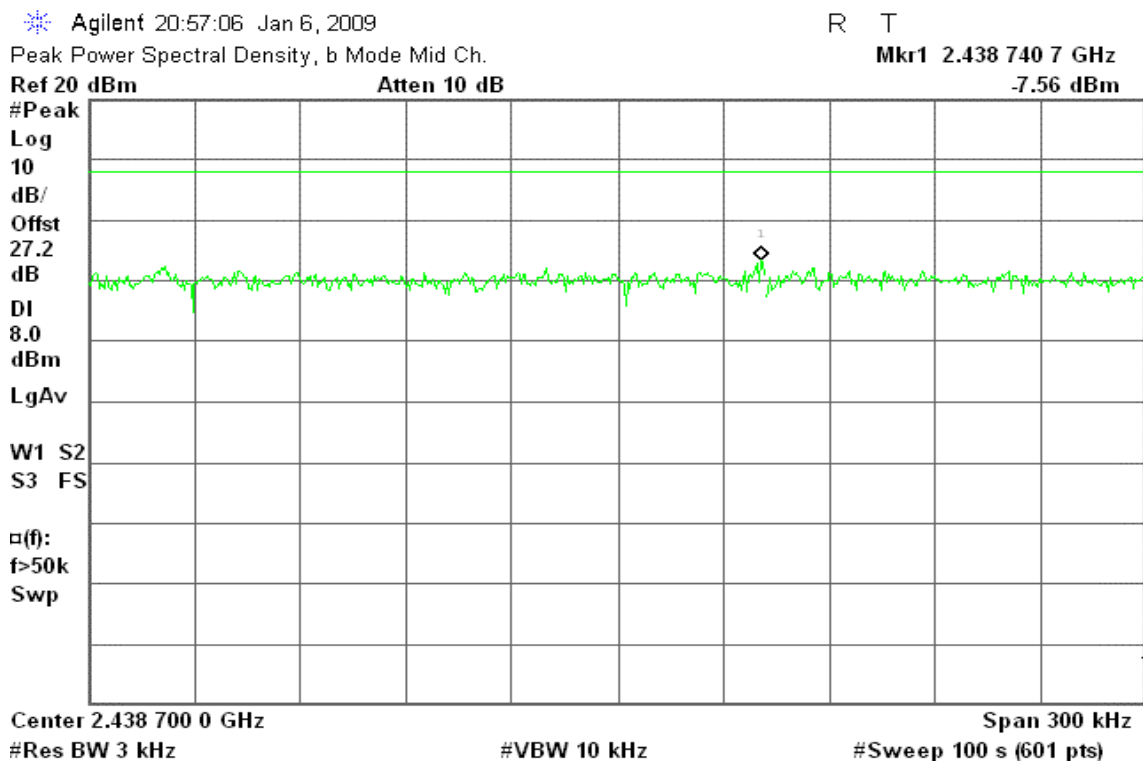
Test Plot

IEEE 802.11b mode

PPSD (CH Low)



PPSD (CH Mid)





PPSD (CH High)

Agilent 21:03:22 Jan 6, 2009

R T

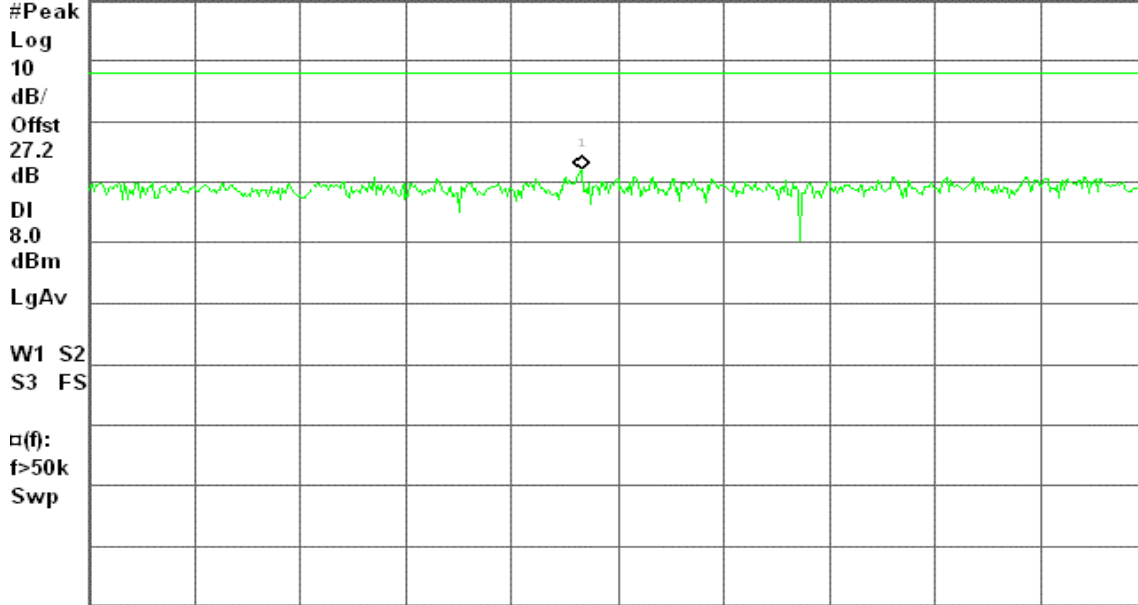
Peak Power Spectral Density, b Mode High Ch.

Mkr1 2.458 739 5 GHz

Ref 20 dBm

Atten 10 dB

-6.69 dBm



Center 2.458 750 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

IEEE 802.11g mode

PPSD (CH Low)

Agilent 20:21:28 Jan 6, 2009

R T

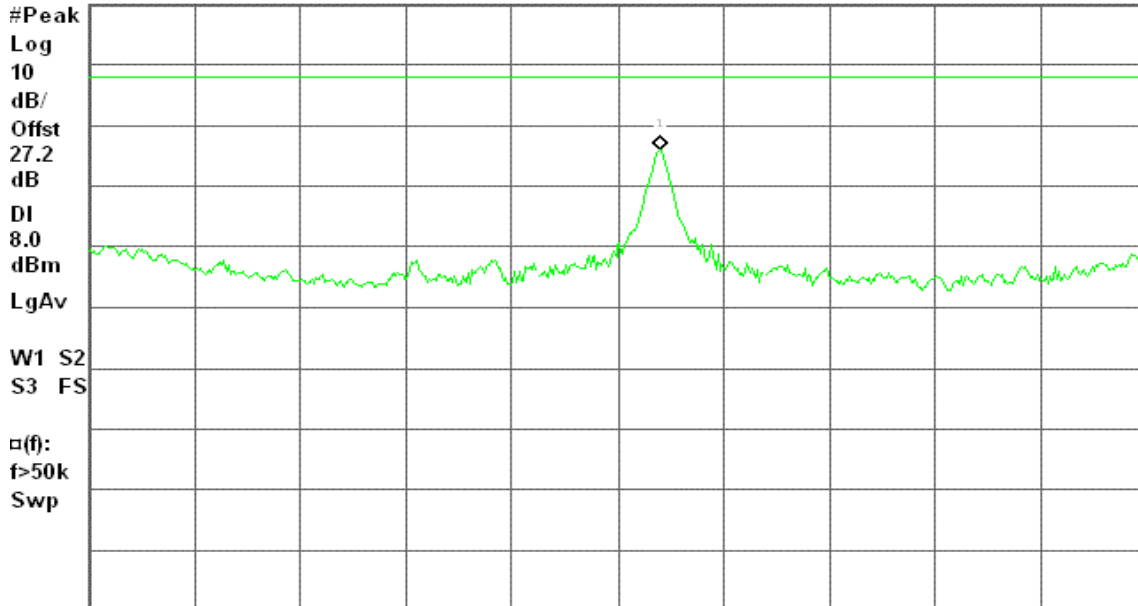
Peak Power Spectral Density, g Mode Low Ch.

Mkr1 2.411 962 0 GHz

Ref 20 dBm

Atten 10 dB

-4.00 dBm



Center 2.411 950 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



PPSD (CH Mid)

Agilent 20:30:03 Jan 6, 2009

R T

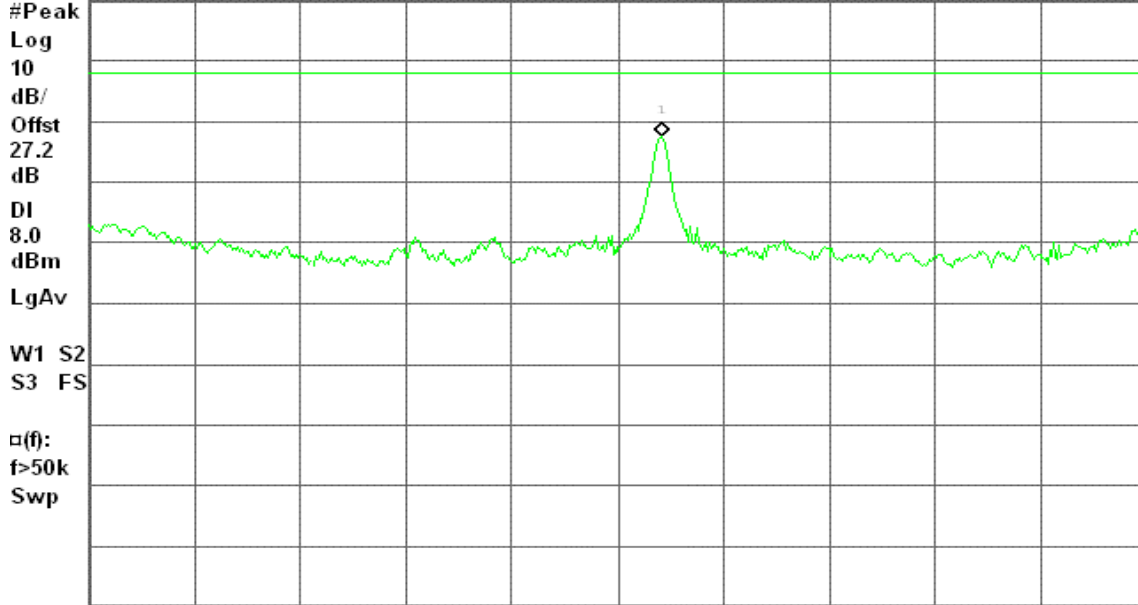
Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.436 962 5 GHz

Ref 20 dBm

Atten 10 dB

-2.55 dBm



Center 2.436 950 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

PPSD (CH High)

Agilent 20:28:28 Jan 6, 2009

R T

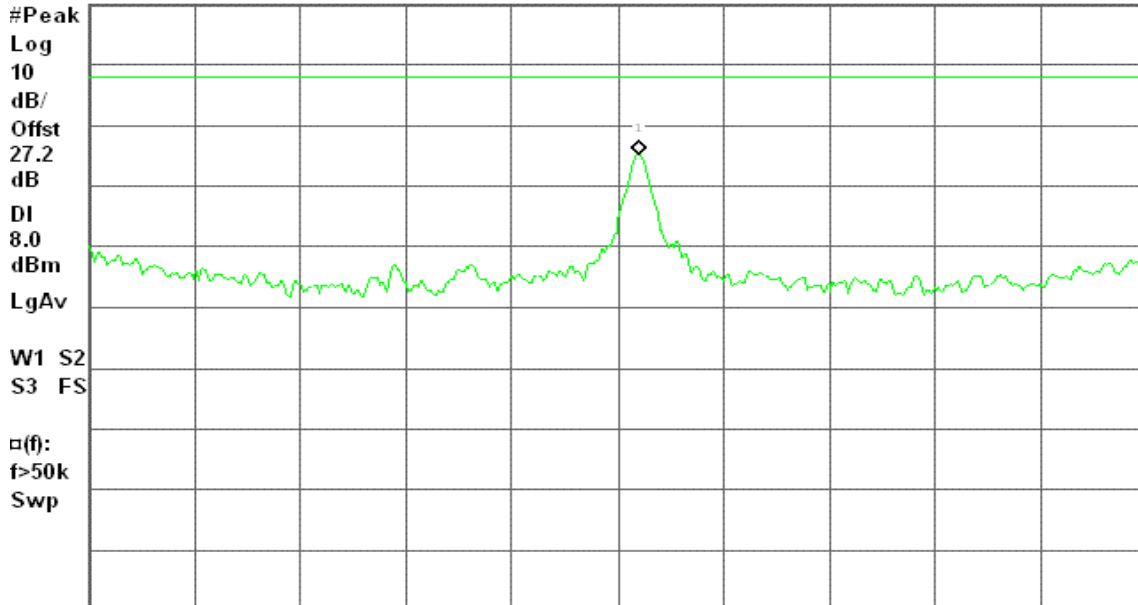
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.461 964 0 GHz

Ref 20 dBm

Atten 10 dB

-3.10 dBm



Center 2.461 958 0 GHz

Span 300 kHz

#Res BW 3 kHz

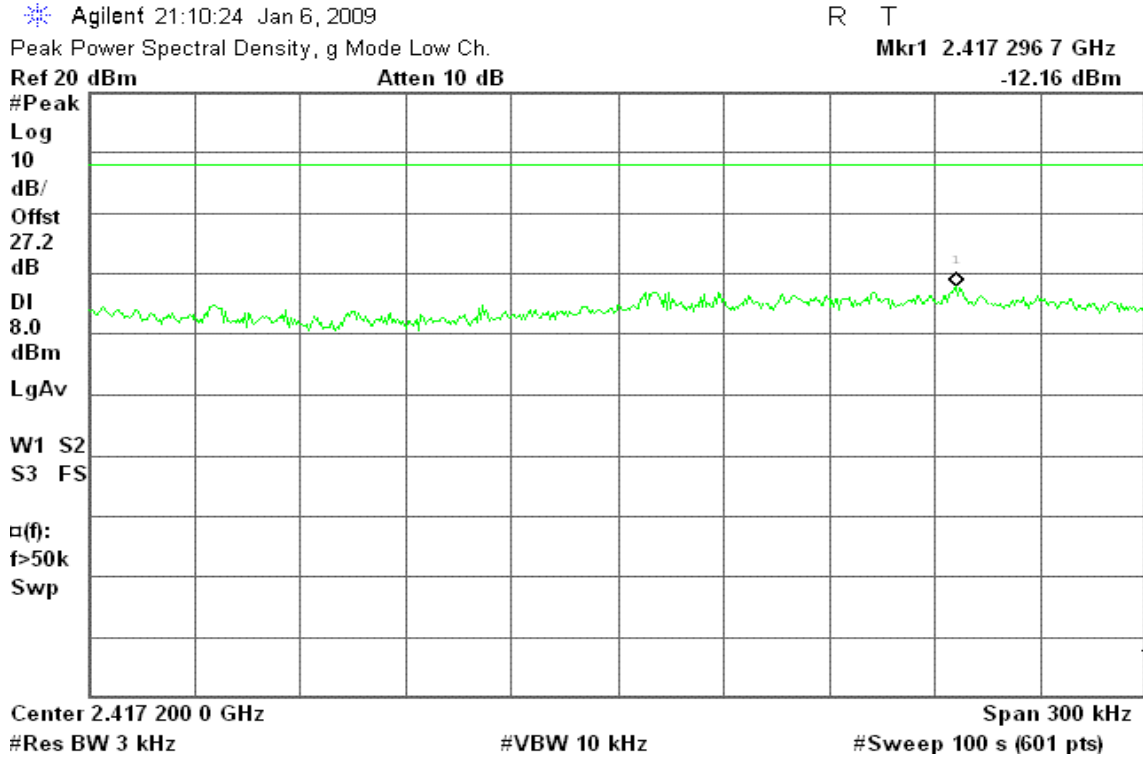
#VBW 10 kHz

#Sweep 100 s (601 pts)

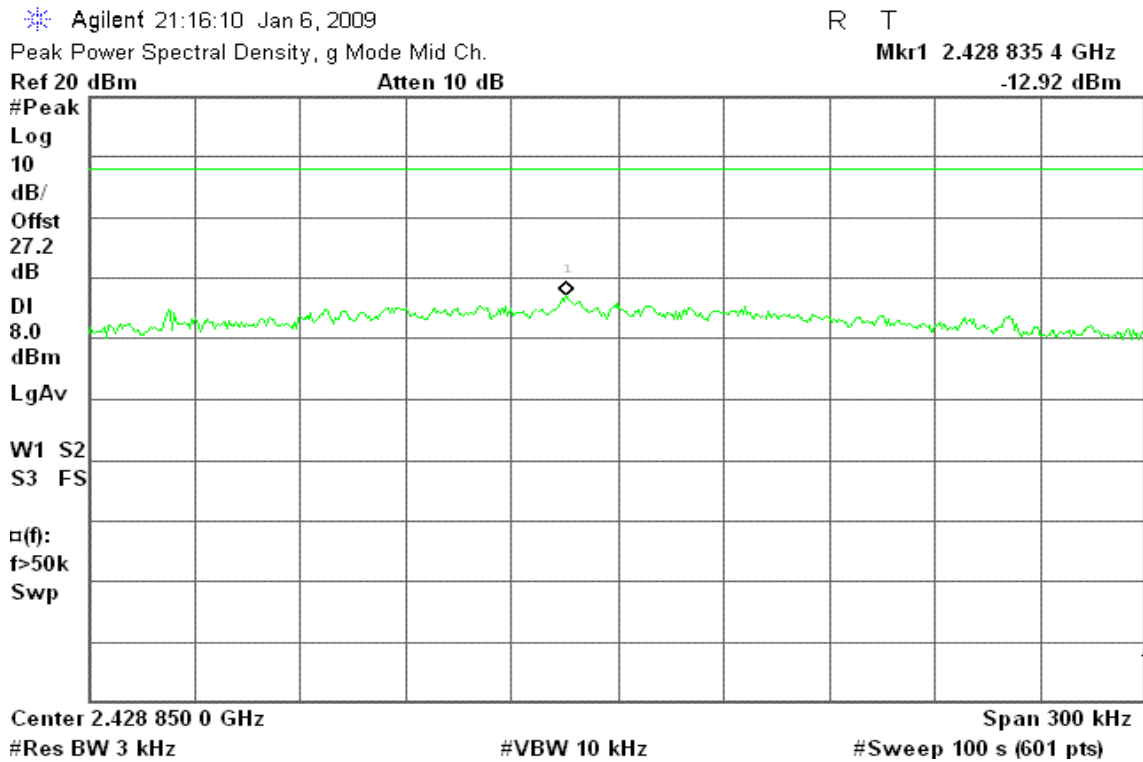


draft 802.11n Standard-20 MHz Channel mode

PPSD (CH Low)



PPSD (CH Mid)





PPSD (CH High)

Agilent 21:22:30 Jan 6, 2009

R T

Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.468 226 6 GHz

Ref 20 dBm

Atten 10 dB

-12.92 dBm

#Peak

Log

10

dB/

Offst

27.2

dB

DI

8.0

dBm

LgAv

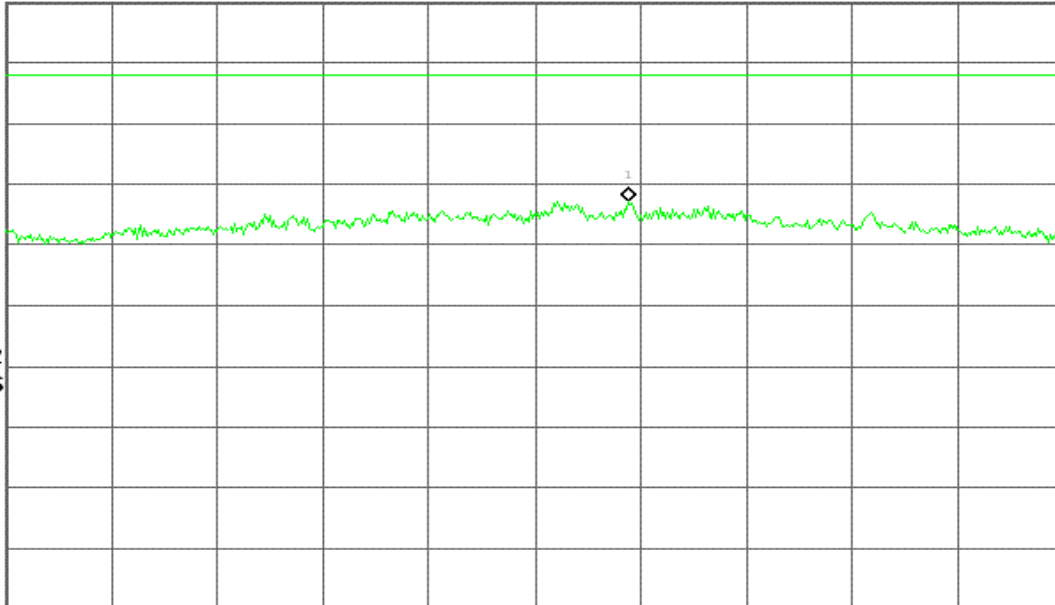
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.468 200 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

draft 802.11n Wide-40 MHz Channel mode

PPSD (CH Low)

Agilent 21:29:21 Jan 6, 2009

R T

Peak Power Spectral Density, g Mode Low Ch.

Mkr1 2.434 456 0 GHz

Ref 20 dBm

Atten 10 dB

-16.28 dBm

#Peak

Log

10

dB/

Offst

27.2

dB

DI

8.0

dBm

LgAv

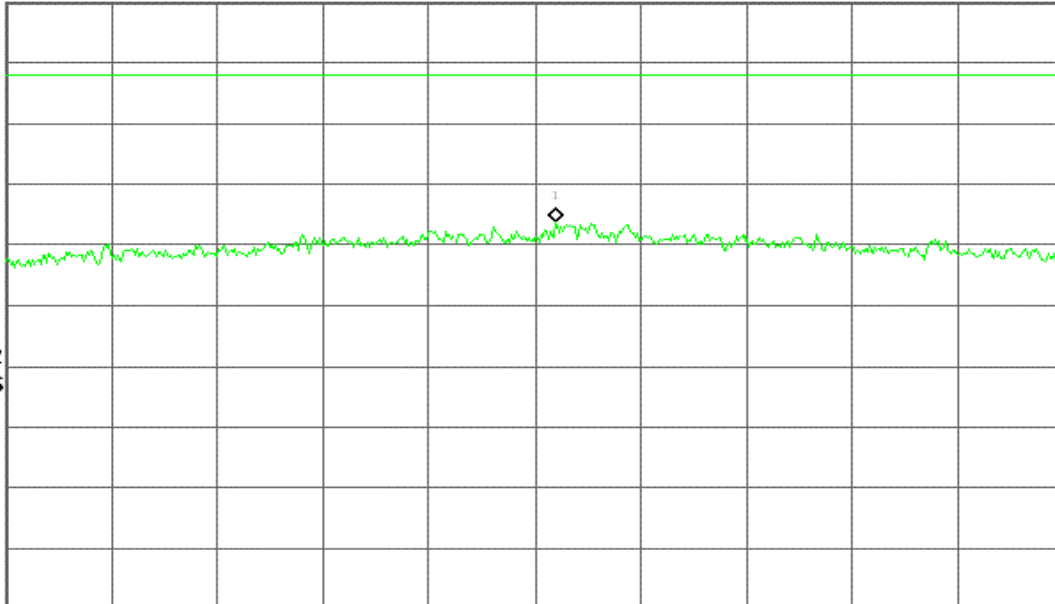
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.434 450 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



PPSD (CH Mid)

Agilent 21:35:58 Jan 6, 2009

R T

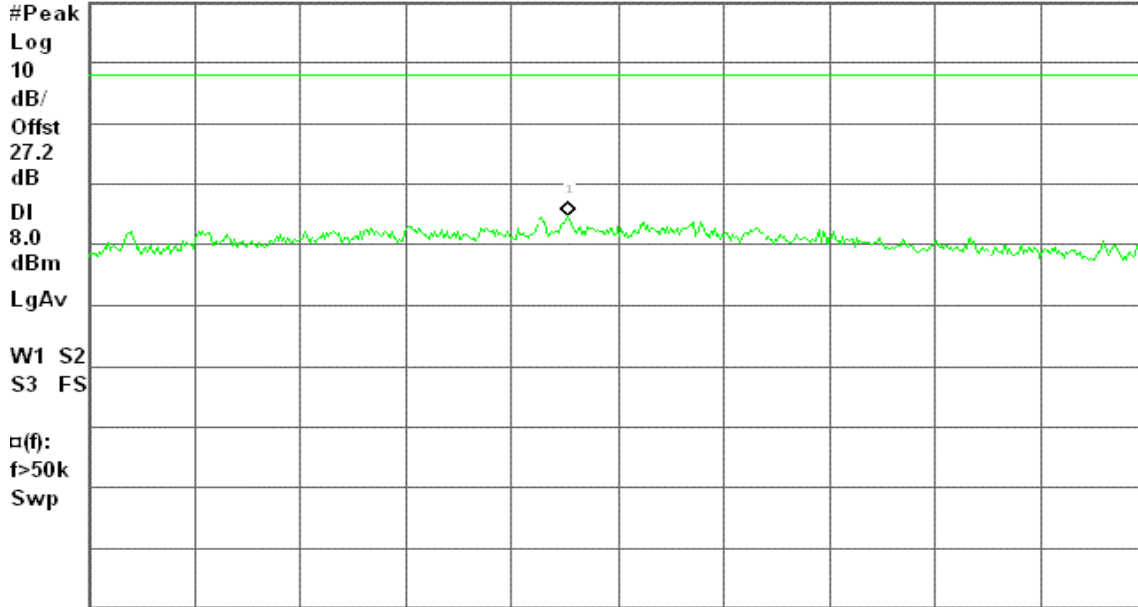
Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.447 585 9 GHz

Ref 20 dBm

Atten 10 dB

-15.29 dBm



Center 2.447 600 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

PPSD (CH High)

Agilent 21:44:47 Jan 6, 2009

R T

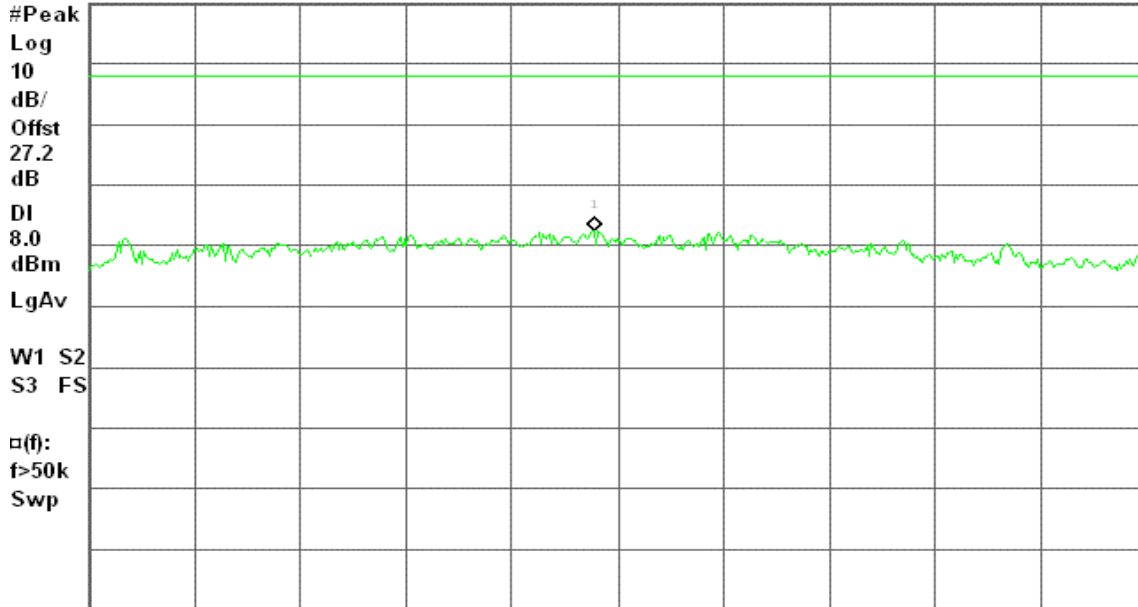
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.460 093 0 GHz

Ref 20 dBm

Atten 10 dB

-17.53 dBm



Center 2.460 100 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



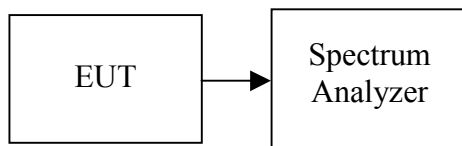
7.6 SPURIOUS EMISSIONS

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 20:44:58 Jan 6, 2009

R T

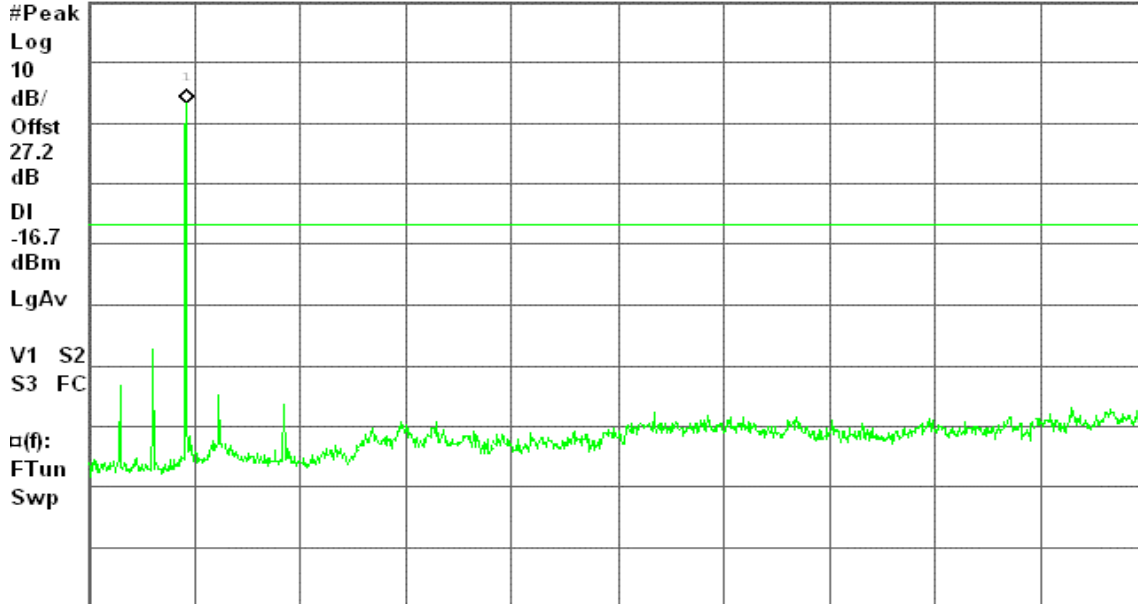
Spurious, b Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 10 dB

3.26 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

CH Mid

Agilent 20:57:55 Jan 6, 2009

R T

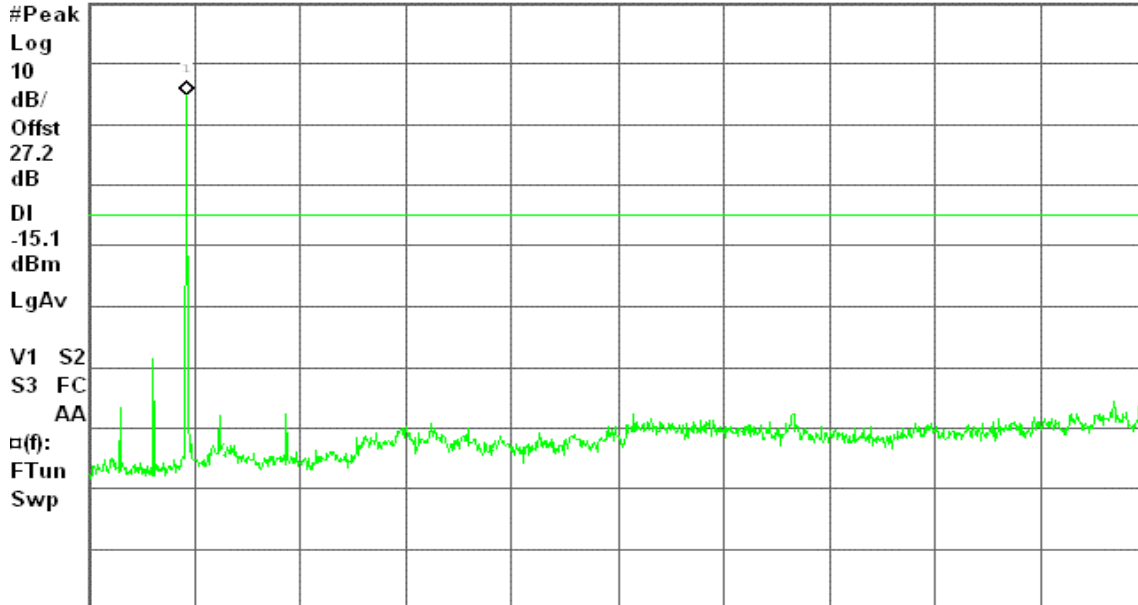
Spurious, b Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 10 dB

4.93 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



CH High

Agilent 21:04:06 Jan 6, 2009

R T

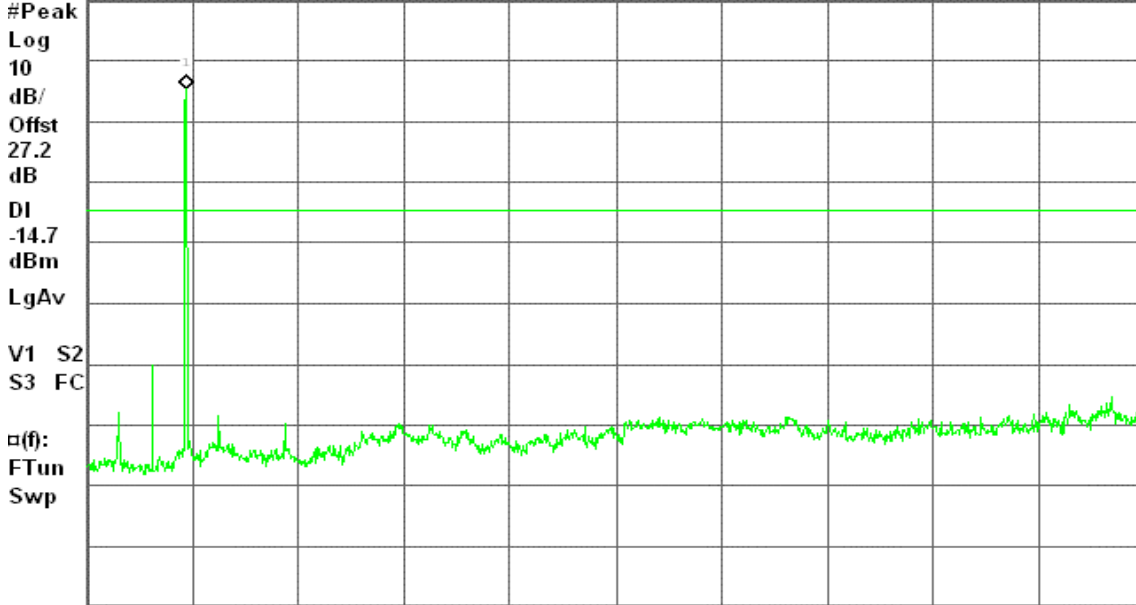
Spurious, b Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 10 dB

5.33 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

IEEE 802.11g mode

CH Low

Agilent 20:22:13 Jan 6, 2009

R T

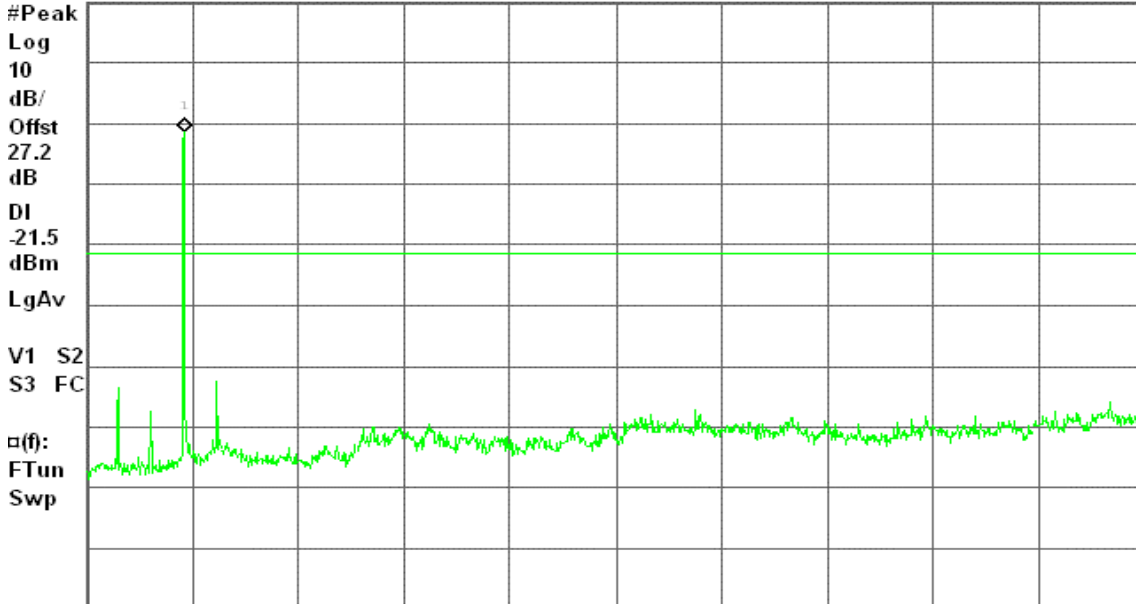
Spurious, g Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 10 dB

-1.46 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



CH Mid

Agilent 20:30:47 Jan 6, 2009

R T

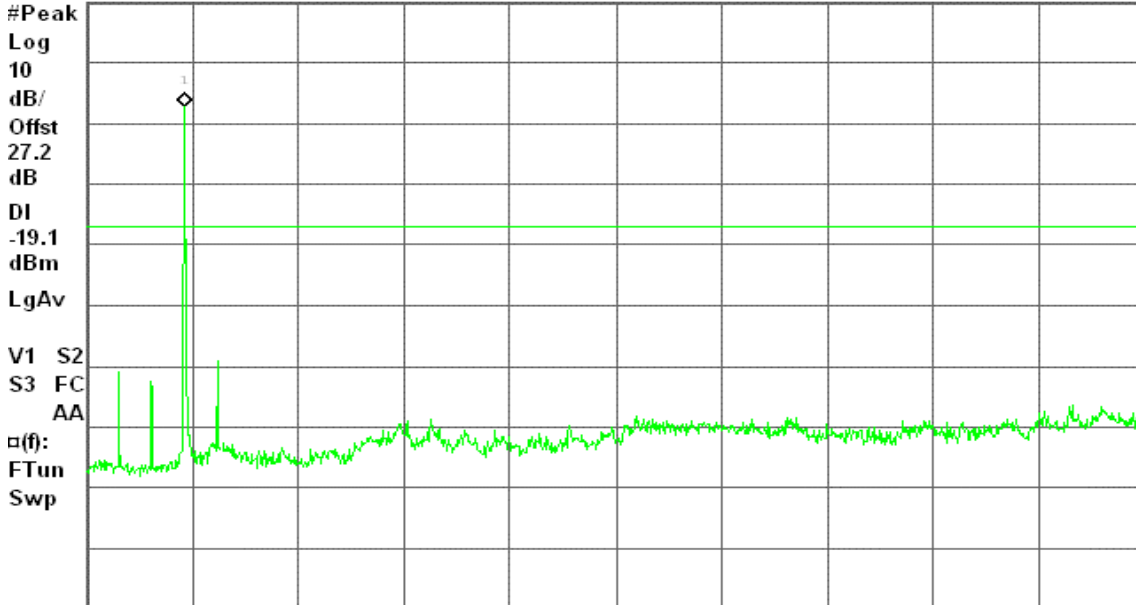
Spurious, g Mode Mid Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 10 dB

0.86 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

CH High

Agilent 20:37:44 Jan 6, 2009

R T

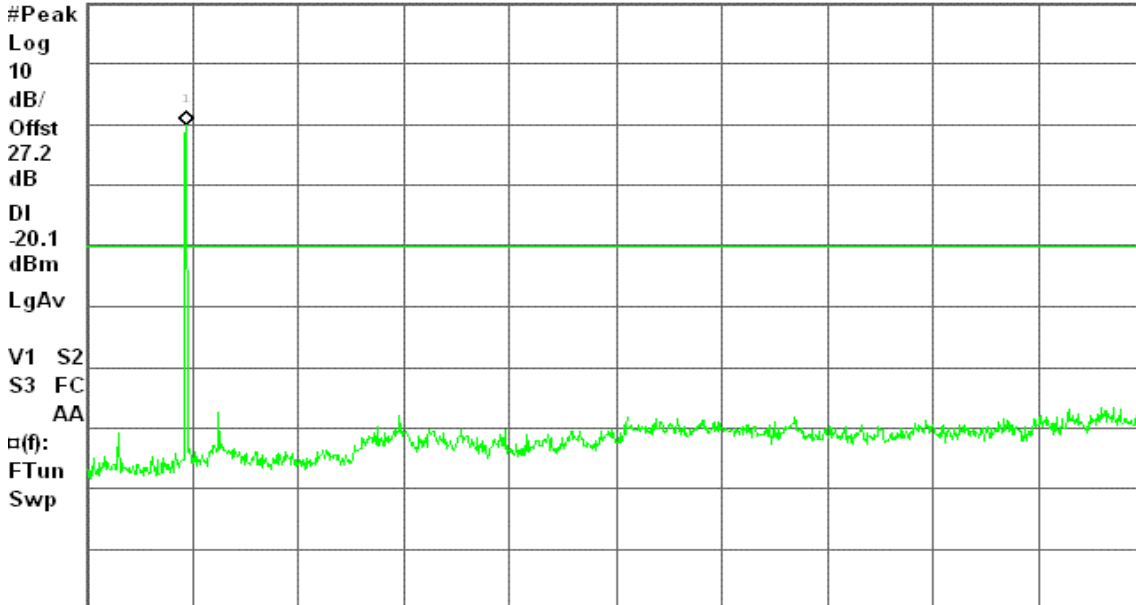
Spurious, g Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 10 dB

-0.14 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



draft 802.11n Standard-20 MHz Channel mode

CH Low

Agilent 21:11:27 Jan 6, 2009

R T

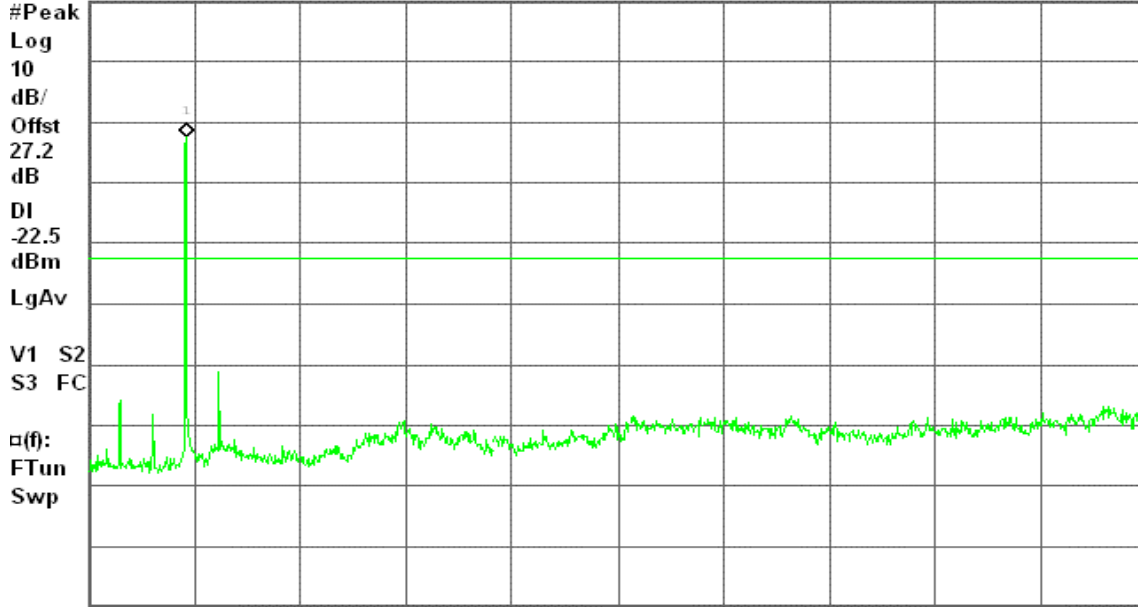
Spurious, g Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 10 dB

-2.55 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

CH Mid

Agilent 21:16:54 Jan 6, 2009

R T

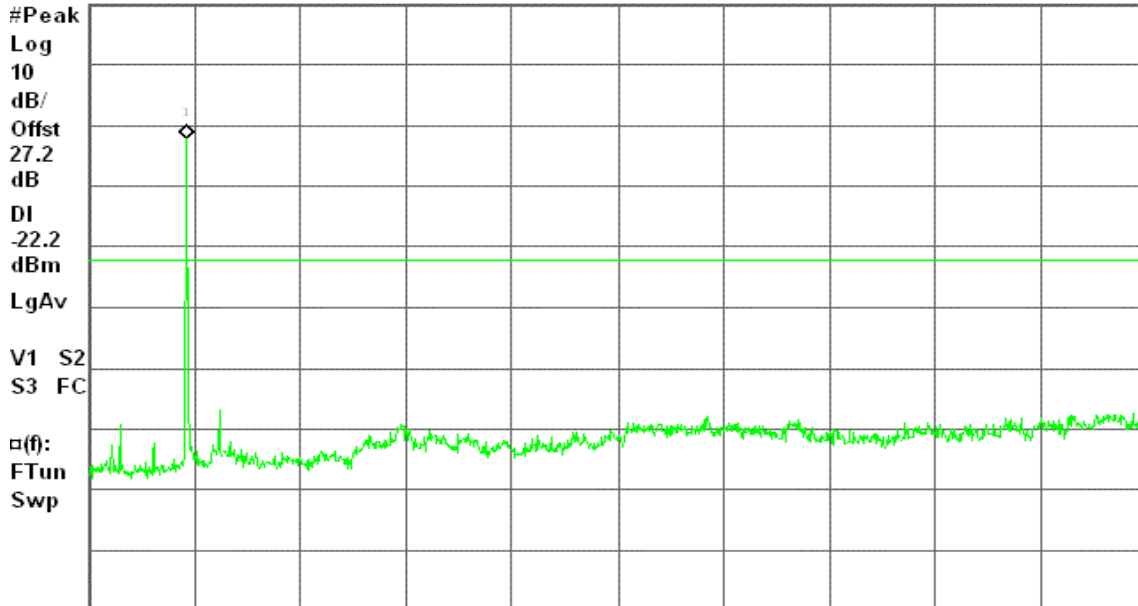
Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 10 dB

-2.18 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



CH High

Agilent 21:23:16 Jan 6, 2009

R T

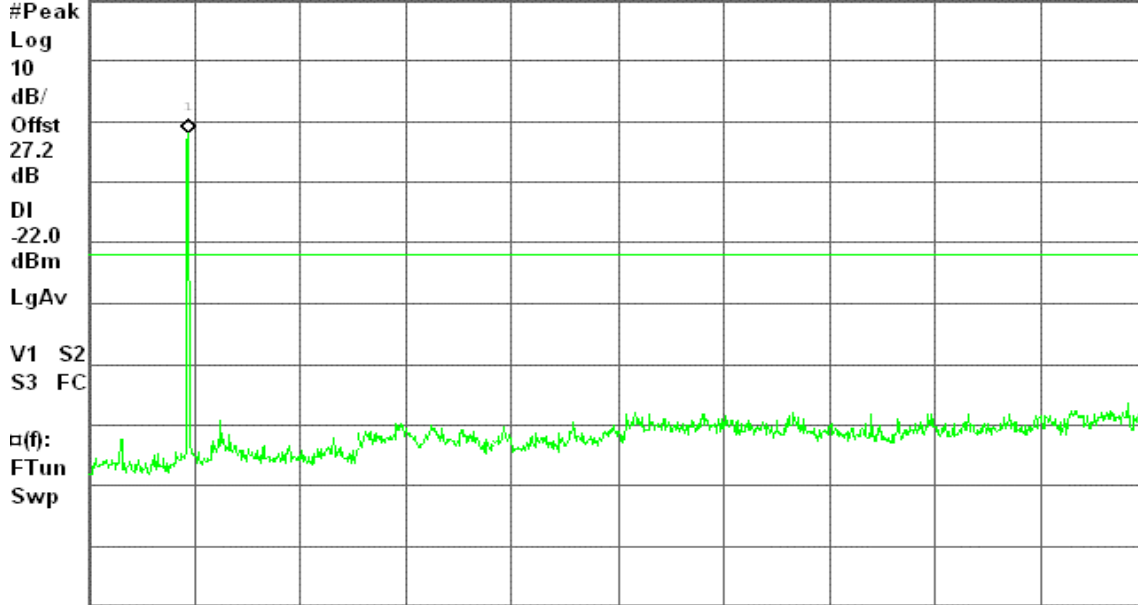
Spurious, g Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 10 dB

-1.99 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

draft 802.11n Wide-40 MHz Channel mode

CH Low

Agilent 21:30:07 Jan 6, 2009

R T

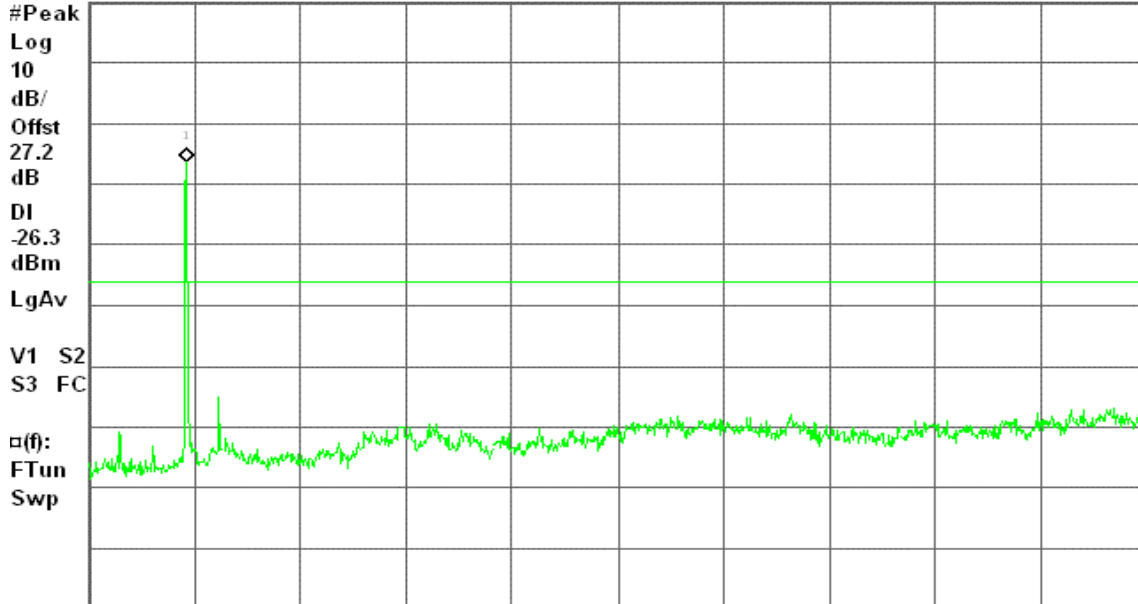
Spurious, g Mode Low Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 10 dB

-6.33 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



CH Mid

Agilent 21:36:54 Jan 6, 2009

R T

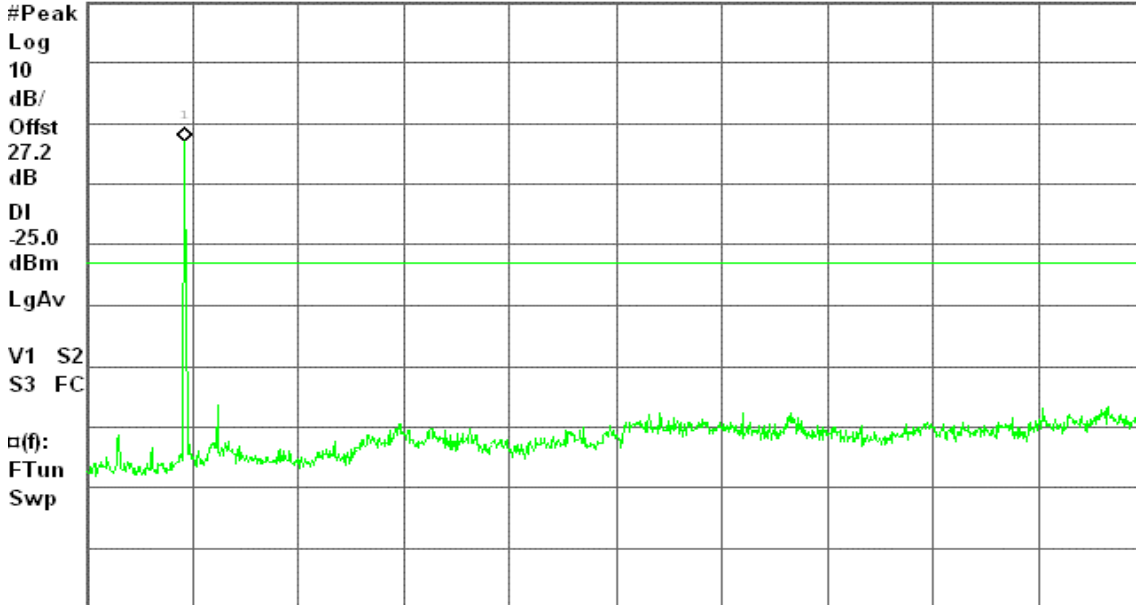
Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 10 dB

-6.00 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

CH High

Agilent 21:45:27 Jan 6, 2009

R T

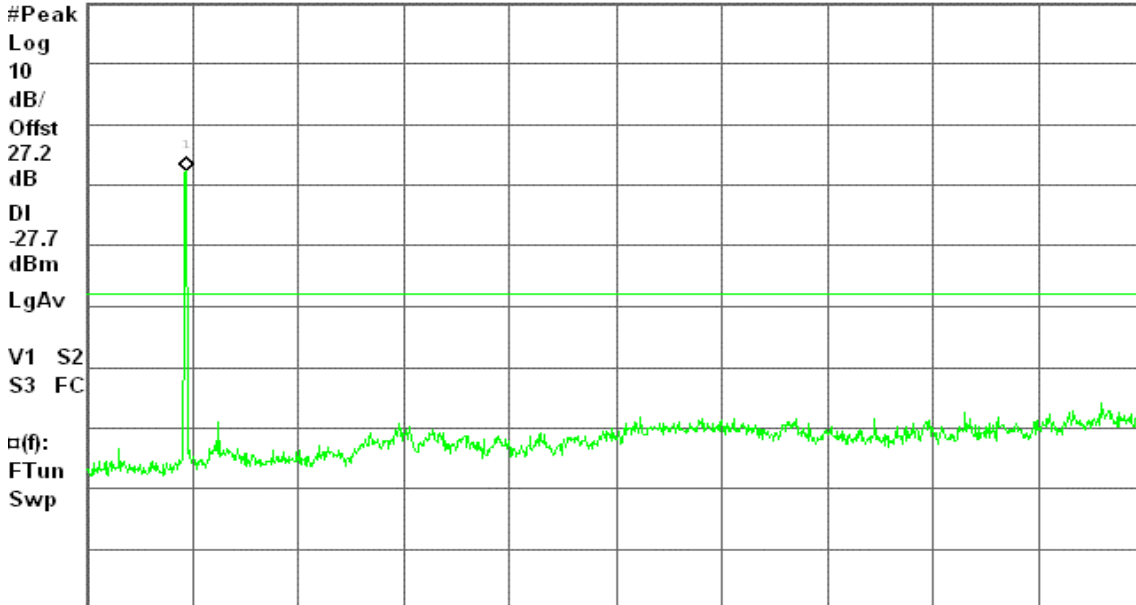
Spurious, g Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 10 dB

-7.72 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



7.6.2 Radiated Emissions

LIMIT

1. 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

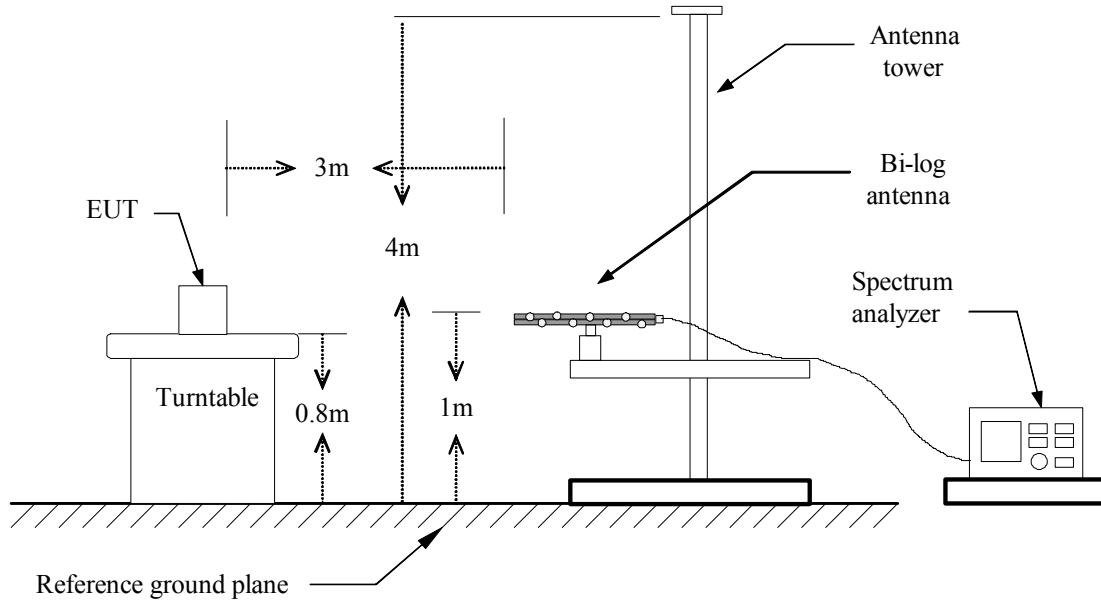
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

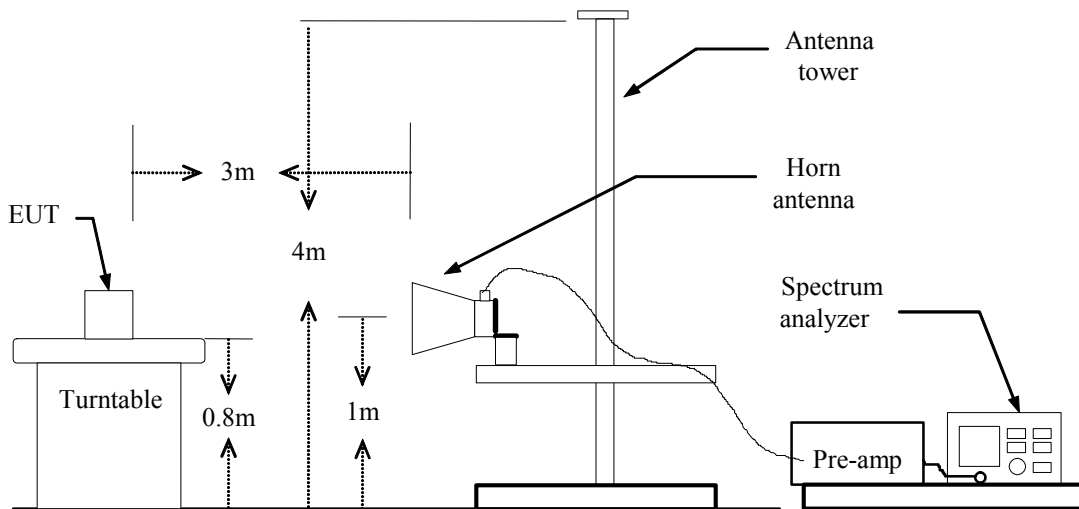
Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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.



Below 1 GHz

Operation Mode: Normal Link

Test Date: December 31, 2008

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
199.75	V	44.25	-8.13	36.12	43.50	-7.38	Peak
405.07	V	40.44	-6.00	34.44	46.00	-11.56	Peak
495.60	V	41.78	-4.27	37.51	46.00	-8.49	Peak
539.25	V	42.38	-3.21	39.17	46.00	-6.83	Peak
584.52	V	41.33	-2.62	38.71	46.00	-7.29	Peak
629.78	V	37.62	-2.35	35.27	46.00	-10.73	Peak
299.98	H	43.22	-8.61	34.60	46.00	-11.40	Peak
314.53	H	44.30	-8.38	35.92	46.00	-10.08	Peak
335.55	H	42.66	-8.04	34.62	46.00	-11.38	Peak
366.27	H	42.39	-7.23	35.16	46.00	-10.84	Peak
539.25	H	35.27	-3.21	32.05	46.00	-13.95	Peak
801.15	H	37.09	0.41	37.51	46.00	-8.49	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) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).



Above 1 GHz

Operation Mode: TX / IEEE 802.11b / CH Low

Test Date: December 31, 2008

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
1863.33	V	70.10	46.35	-5.32	64.78	41.03	74.00	54.00	-12.97	AVG
4825.00	V	54.67	50.75	0.35	55.02	51.10	74.00	54.00	-2.90	AVG
7233.33	V	48.71	---	2.96	51.67	---	74.00	54.00	-2.33	Peak
N/A										
1200.00	H	59.13	---	-9.07	50.07	---	74.00	54.00	-3.93	Peak
3216.67	H	52.14	---	-0.91	51.23	---	74.00	54.00	-2.77	Peak
4825.00	H	56.36	51.39	0.35	56.71	51.74	74.00	54.00	-2.26	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: December 31, 2008

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
1250.00	V	59.96	---	-8.95	51.01	---	74.00	54.00	-2.99	Peak
4875.00	V	50.16	---	0.24	50.39	---	74.00	54.00	-3.61	Peak
N/A										
1180.00	H	58.90	---	-9.12	49.78	---	74.00	54.00	-4.22	Peak
4875.00	H	55.27	50.69	0.24	55.51	50.93	74.00	54.00	-3.07	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: December 31, 2008

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
1866.67	V	65.42	46.03	-5.29	60.13	40.74	74.00	54.00	-13.26	AVG
4925.00	V	49.58	---	0.13	49.71	---	74.00	54.00	-4.29	Peak
N/A										
1293.33	H	59.17	---	-8.85	50.32	---	74.00	54.00	-3.68	Peak
4925.00	H	50.73	---	0.13	50.86	---	74.00	54.00	-3.14	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: December 31, 2008

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
1866.67	V	66.20	46.28	-5.29	60.91	40.99	74.00	54.00	-13.01	AVG
3216.67	V	50.83	---	-0.91	49.92	---	74.00	54.00	-4.08	Peak
N/A										
1233.33	H	59.62	---	-8.99	50.63	---	74.00	54.00	-3.37	Peak
3216.67	H	57.28	53.18	-0.91	56.37	52.27	74.00	54.00	-1.73	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 Mid

Test Date: December 31, 2008

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
1866.67	V	65.86	46.28	-5.29	60.57	40.99	74.00	54.00	-13.01	AVG
3250.00	V	49.22	---	-0.85	48.37	---	74.00	54.00	-5.63	Peak
N/A										
1293.33	H	59.21	---	-8.85	50.36	---	74.00	54.00	-3.64	Peak
3250.00	H	51.61	---	-0.85	50.77	---	74.00	54.00	-3.23	Peak
4866.67	H	50.06	---	0.26	50.31	---	74.00	54.00	-3.69	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 / IEEE 802.11g / CH High

Test Date: December 31, 2008

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
1290.00	V	58.98	---	-8.86	50.12	---	74.00	54.00	-3.88	Peak
N/A										
1250.00	H	59.11	---	-8.95	50.16	---	74.00	54.00	-3.84	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: December 31, 2008

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
1333.33	V	66.51	46.72	-8.75	57.76	37.97	74.00	54.00	-16.03	AVG
1866.67	V	67.93	46.21	-5.29	62.64	40.92	74.00	54.00	-13.08	AVG
3216.67	V	50.43	---	-0.91	49.52	---	74.00	54.00	-4.48	Peak
N/A										
1180.00	H	59.52	---	-9.12	50.41	---	74.00	54.00	-3.59	Peak
3216.67	H	56.56	53.14	-0.91	55.65	52.23	74.00	54.00	-1.77	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: December 31, 2008

Temperature: 231°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
1200.00	V	59.36	---	-9.07	50.29	---	74.00	54.00	-3.71	Peak
N/A										
1243.33	H	60.28	---	-8.97	51.32	---	74.00	54.00	-2.68	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: December 31, 2008

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
1223.33	V	60.25	---	-9.01	51.24	---	74.00	54.00	-2.76	Peak
N/A										
1243.33	H	59.47	---	-8.97	50.50	---	74.00	54.00	-3.50	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: December 31, 2008

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
1206.67	V	59.82	---	-9.05	50.77	---	74.00	54.00	-3.23	Peak
N/A										
1316.67	H	59.23	---	-8.79	50.43	---	74.00	54.00	-3.57	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: December 31, 2008

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
1746.67	V	70.01	46.16	-6.30	63.71	39.86	74.00	54.00	-14.14	AVG
N/A										
1283.33	H	59.69	---	-8.87	50.82	---	74.00	54.00	-3.18	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 / draft 802.11n Wide-40 MHz Channel mode / CH High

Test Date: December 31, 2008

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
1200.00	V	59.38	---	-9.07	50.32	---	74.00	54.00	-3.68	Peak
N/A										
1206.67	H	59.10	---	-9.05	50.04	---	74.00	54.00	-3.96	Peak
N/A										

Remark:

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



7.7 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:** January 19, 2009
Temperature: 22°C **Tested by:** Eddy Chung
Humidity: 45% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.2000	45.44	38.94	0.16	45.60	39.10	63.61	53.61	-18.01	-14.51	L1
0.2650	43.57	39.97	0.13	43.70	40.10	61.27	51.27	-17.57	-11.17	L1
0.4000	41.33	40.23	0.07	41.40	40.30	57.85	47.85	-16.45	-7.55	L1
2.9400	37.51	32.21	0.09	37.60	32.30	56.00	46.00	-18.40	-13.70	L1
4.5450	42.50	31.80	0.20	42.70	32.00	56.00	46.00	-13.30	-14.00	L1
23.8750	34.14	24.74	0.86	35.00	25.60	60.00	50.00	-25.00	-24.40	L1
0.2000	50.05	44.05	0.15	50.20	44.20	63.61	53.61	-13.41	-9.41	L2
0.2650	39.58	33.68	0.12	39.70	33.80	61.27	51.27	-21.57	-17.47	L2
2.2000	37.86	33.86	0.04	37.90	33.90	56.00	46.00	-18.10	-12.10	L2
2.8050	38.71	33.61	0.09	38.80	33.70	56.00	46.00	-17.20	-12.30	L2
4.5300	31.19	15.39	0.21	31.40	15.60	56.00	46.00	-24.60	-30.40	L2
23.6100	24.42	18.02	0.88	25.30	18.90	60.00	50.00	-34.70	-31.10	L2

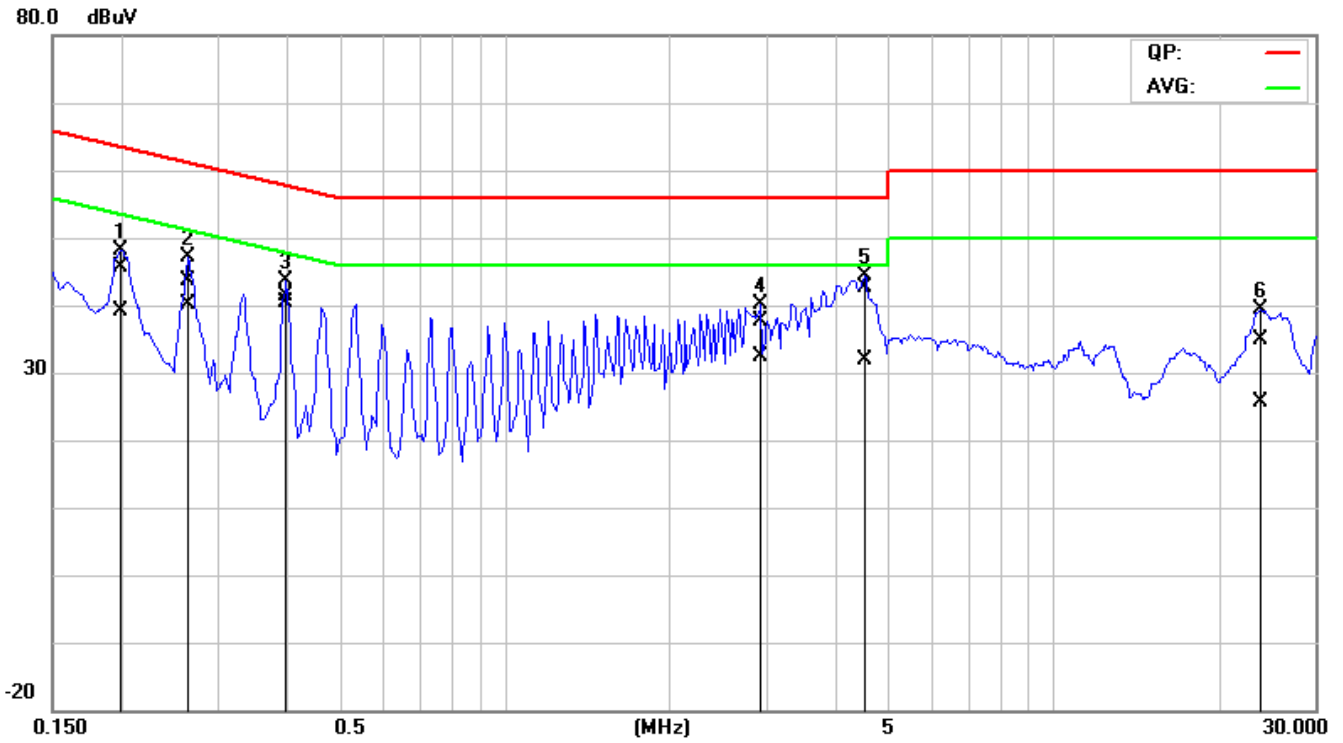
Remark:

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 to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz.
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

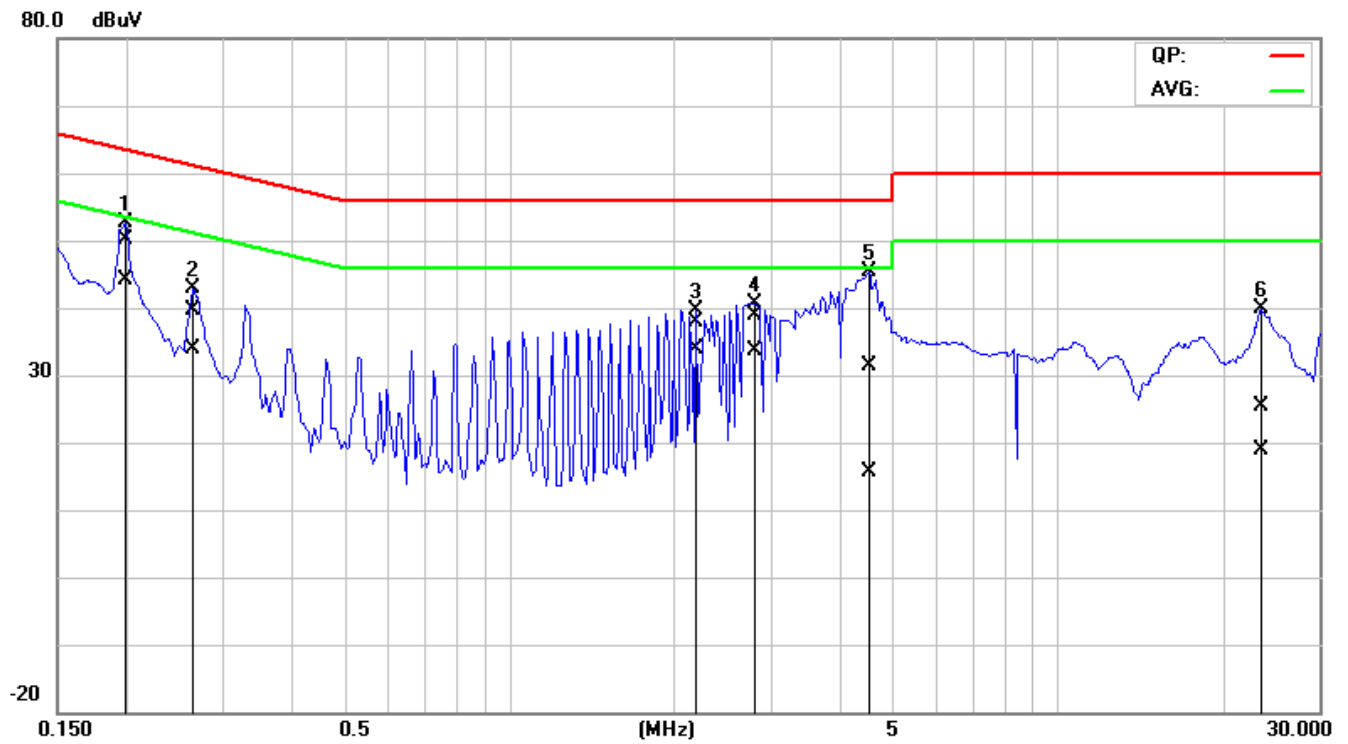


Test Plots

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
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Bluetooth: 2.402GHz ~ 2.480 GHz
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation)
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input checked="" type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	IEEE 802.11b: 16.74 dBm (47.21 mW) IEEE 802.11g: 15.31 dBm (33.96 mW) draft 802.11n Standard-20 MHz: 12.66 dBm (18.45 mW) draft 802.11n Standard-40 MHz: 11.27 dBm (13.40 mW)
Antenna gain (Max)	2.95 dBi (Numeric gain: 1.92)
Evaluation applied	<input type="checkbox"/> MPE Evaluation <input checked="" type="checkbox"/> SAR Evaluation* <input type="checkbox"/> N/A

Remark:

1. The maximum output power is 16.74 dBm (47.21 mW) at 2462MHz (with 1.92 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.