FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

N1 Wireless Router

Model: F5D8231-4

Trade Name: Belkin

Issued to

Belkin International, Inc.
501 West Walnut Street,
Compton CA 90220, USA

Issued by

Compliance Certification Services Inc.
No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,
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ACCREDITED
No. 0824-01

TAF
Testing Laboratory
0363

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION 3

2. EUT DESCRIPTION 4

3. TEST METHODOLOGY 5

3.1 EUT CONFIGURATION 5
3.2 EUT EXERCISE 5
3.3 GENERAL TEST PROCEDURES 5
3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS 6
3.5 DESCRIPTION OF TEST MODES 7

4. INSTRUMENT CALIBRATION 8

4.1 MEASURING INSTRUMENT CALIBRATION 8
4.2 MEASUREMENT EQUIPMENT USED 8

5. FACILITIES AND ACCREDITATIONS 9

5.1 FACILITIES 9
5.2 EQUIPMENT 9
5.3 TABLE OF ACCREDITATIONS AND LISTINGS 10

6. SETUP OF EQUIPMENT UNDER TEST 11

6.1 SETUP CONFIGURATION OF EUT 11
6.2 SUPPORT EQUIPMENT 11

7. FCC PART 15.247 REQUIREMENTS 12

7.1 6DB BANDWIDTH 12
7.2 PEAK POWER 23
7.3 AVERAGE POWER 34
7.4 BAND EDGES MEASUREMENT 45
7.5 PEAK POWER SPECTRAL DENSITY 62
7.6 SPURIOUS EMISSIONS 77
7.7 RADIATED EMISSIONS 90
7.8 POWERLINE CONDUCTED EMISSIONS 106

APPENDIX I RADIO FREQUENCY EXPOSURE 109

APPENDIX II PHOTOGRAPHS OF TEST SETUP 112

1. TEST RESULT CERTIFICATION

Applicant:	Belkin International, Inc. 501 West Walnut Street, Compton CA 90220, USA
Equipment Under Test:	N1 Wireless Router
Trade Name:	Belkin
Model:	F5D8231-4
Date of Test:	April 11 ~ 24, 2007

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:

Johnny Liu
Section Manager
Compliance Certification Services Inc.

Reviewed by:

Amanda Wu
Section Manager
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	N1 Wireless Router
Trade Name	Belkin
Model Number	F5D8231-4
Model Discrepancy	N/A
Power Adapter	1. BELKIN / DSA-12R-12 AUS 120120 I/P: 100-120V, 50/60Hz, 0.3A O/P: 12V, 1A 2. RHN-120100-1-1 I/P: 100-120V, 50/60Hz, 0.36A O/P: 12V, 1A
Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 23.35 dBm IEEE 802.11g mode: 20.71 dBm draft 802.11n Standard-20 MHz Channel mode: 20.17 dBm draft 802.11n Wide-40 MHz Channel mode: 15.00 dBm
Modulation Technique	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mpbs) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mpbs) draft 802.11n Standard-20 MHz Channel mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) draft 802.11n Wide-40 MHz Channel mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)
Number of Channels	IEEE 802.11b/g mode: 11 Channels draft 802.11n Standard-20 MHz Channel mode: 11 Channels draft 802.11n Wide-40 MHz Channel mode: 7 Channels
Antenna Specification	Dipole Antenna / Gain: 0.5dBi (including cable loss)

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: **K7SF5D8231-4D** 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 (model: F5D8231-4) comes with two types of power adapters (DSA-12R-12 AUS 120120 & RHN-120100-1-1) for sale. After the preliminary test, the power adapter with model number DSA-12R-12 AUS 120120 was found to emit the worst emissions and therefore had been tested under operating condition.

The EUT is a 2x3 configuration spatial MIMO (2Tx & 3Rx) without beam forming function but with cyclic delay diversity function that operate in double TX chains and triple RX chains. The 2x3 configuration is implemented with two outside TX & RX chains (Chain 1 and the middle RX chain (chain 0).

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

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

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, 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 and cyclic delay diversity were chosen for full testing.

IEEE 802.11g mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate and cyclic delay diversity 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	01/30/2008

3M Semi Anechoic Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US42510252	07/25/2007
Test Receiver	Rohde&Schwarz	ESCI	100064	11/13/2007
Switch Controller	TRC	Switch Controller	SC94050010	05/05/2007
4 Port Switch	TRC	4 Port Switch	SC94050020	05/05/2007
Horn-Antenna	TRC	HA-0502	06	06/02/2007
Horn-Antenna	TRC	HA-0801	04	05/05/2007
Horn-Antenna	TRC	HA-1201A	01	07/04/2007
Horn-Antenna	TRC	HA-1301A	01	07/04/2007
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/29/2008
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: 965860 IC: IC 6106	09/26/2008
Test S/W	LABVIEW (V 6.1)			

Remark: *The measurement uncertainty is less than +/-2.0065dB (30MHz ~ 1GHz), +/-3.0958dB (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

Powerline Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver 9kHz-30MHz	Rohde & Schwarz	ESHS30	828144/003	09/26/2007
TWO-Line V-Network 9kHz-30MHz	Schaffner	NNB41	03/10013	06/14/2007
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	03/19/2008
Test S/W	LABVIEW (V 6.1)			

Remark: *The measurement uncertainty is less than +/- 2.81dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

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	A2LA	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/ EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	ACCREDITED 0824-01
USA	FCC	3/10 meter Open Area Test Sites (93105, 90471) / 3M Semi Anechoic Chamber (965860) to perform FCC Part 15/18 measurements	93105, 90471 965860
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	R-393/1066/725/879 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	ELA 124a ELA 124b ELA 124c
Taiwan	TAF	EN 300 328, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3	Testing Laboratory 0363
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	SL2-IS-E-0014 SL2-IN-E-0014 SL2-A1-E-0014 SL2-R1-E-0014 SL2-R2-E-0014 SL2-L1-E-0014
Canada	Industry Canada	3/10 meter Open Area Test Sites (IC 2324C-3, IC 2324C-5 / 3M Semi Anechoic Chamber (IC 6106) to perform RSS 212 Issue 1	IC 2324C-3 IC 2324C-5 IC 6106

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

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

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

6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC (Remote)	Sony	VGN-S44TP	28198080 8100339	WLAN: ETC094LPD0155 Bluetooth: ETC094LPD0156	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	Notebook PC (Remote)	IBM	2672 (X31)	99PBTKB	WLAN: ANO20030400LEG Bluetooth: ANO20020100MTN	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.*

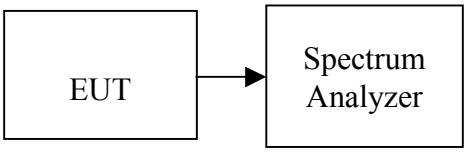
7. FCC PART 15.247 REQUIREMENTS

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 / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	11.58	>500	PASS
Mid	2437	10.25		PASS
High	2462	11.08		PASS

Test mode: IEEE 802.11b mode / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	12.00	>500	PASS
Mid	2437	9.92		PASS
High	2462	10.00		PASS

Test mode: IEEE 802.11g mode / Chain 1

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

Test mode: IEEE 802.11g mode / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.50	>500	PASS
Mid	2437	16.42		PASS
High	2462	16.33		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.67	>500	PASS
Mid	2437	17.75		PASS
High	2462	17.67		PASS

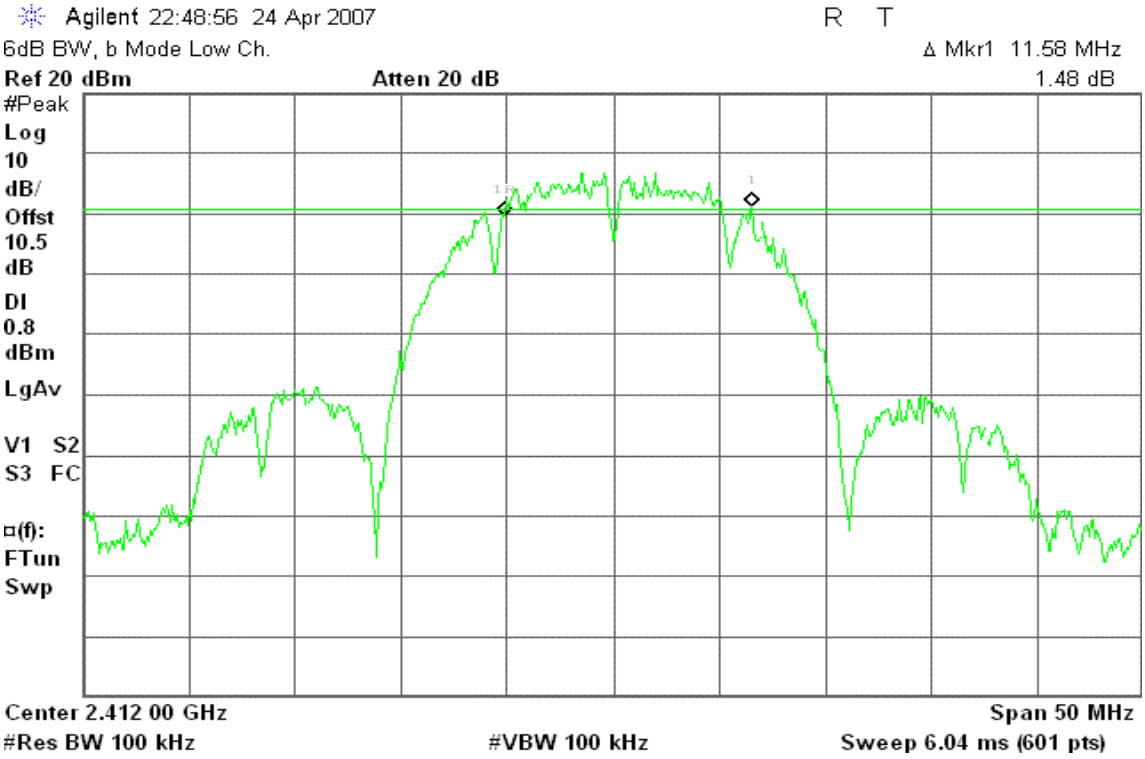
Test mode: draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.42	>500	PASS
Mid	2437	36.50		PASS
High	2452	36.50		PASS

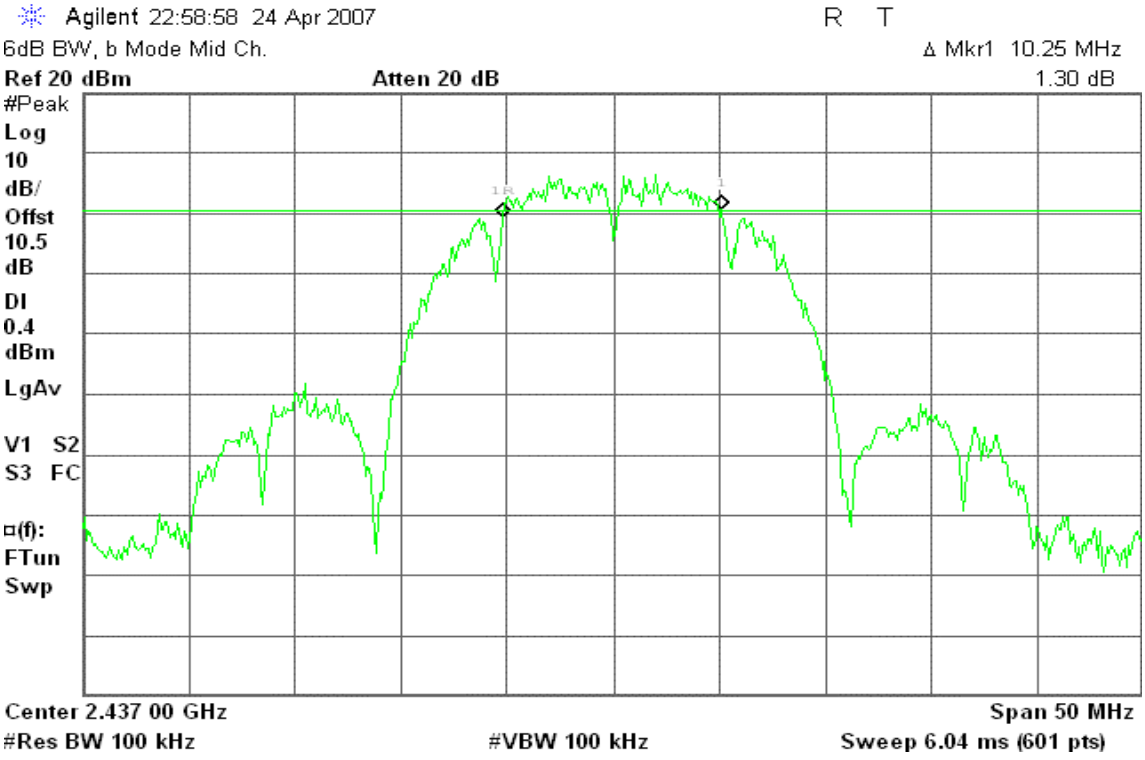
Test Plot

IEEE 802.11b mode / Chain 1

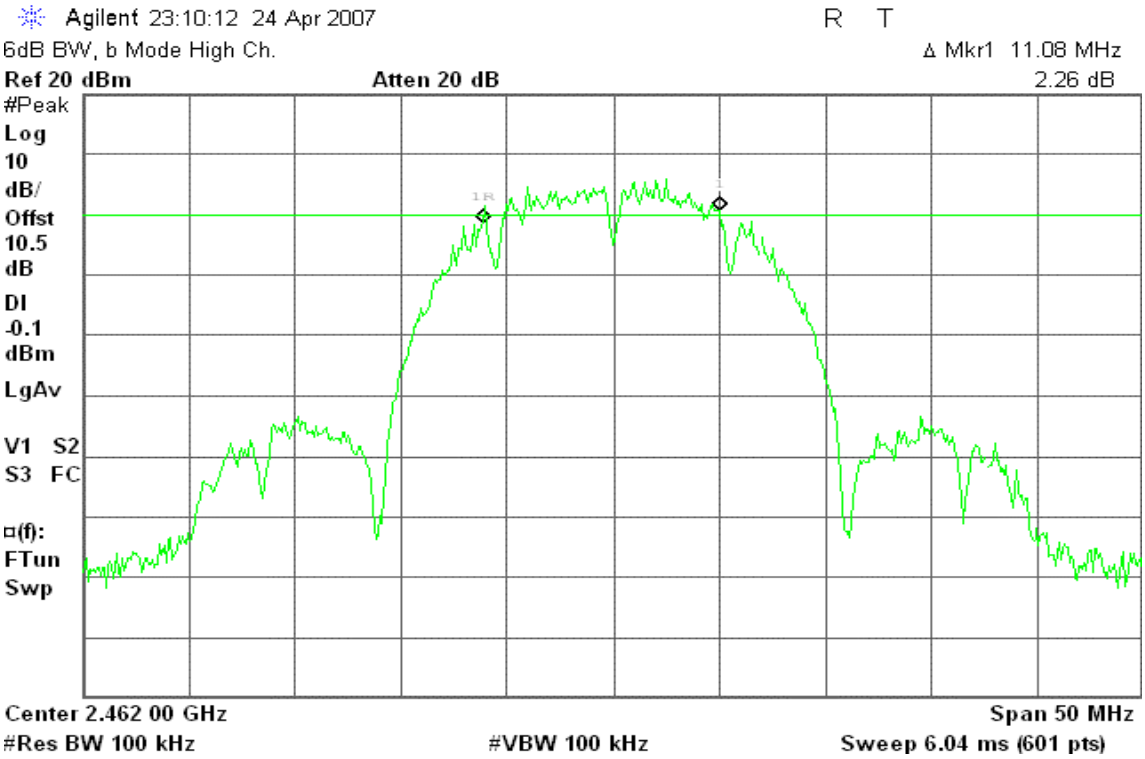
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

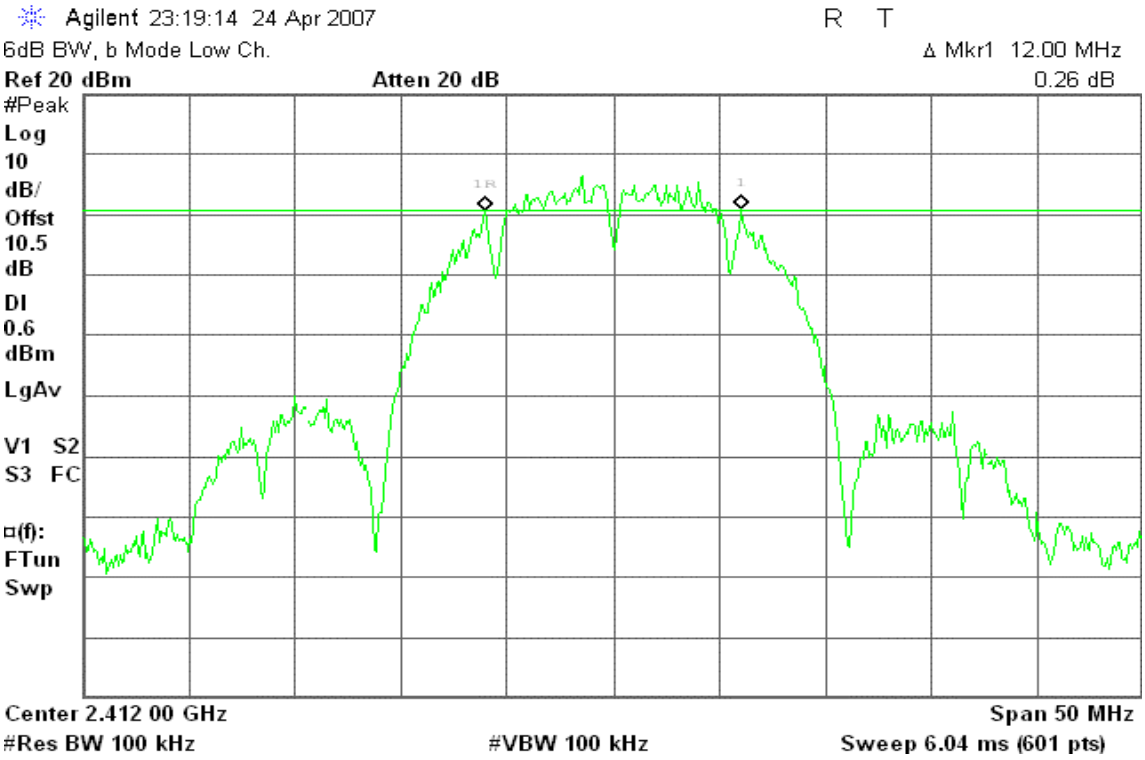


6dB Bandwidth (CH High)

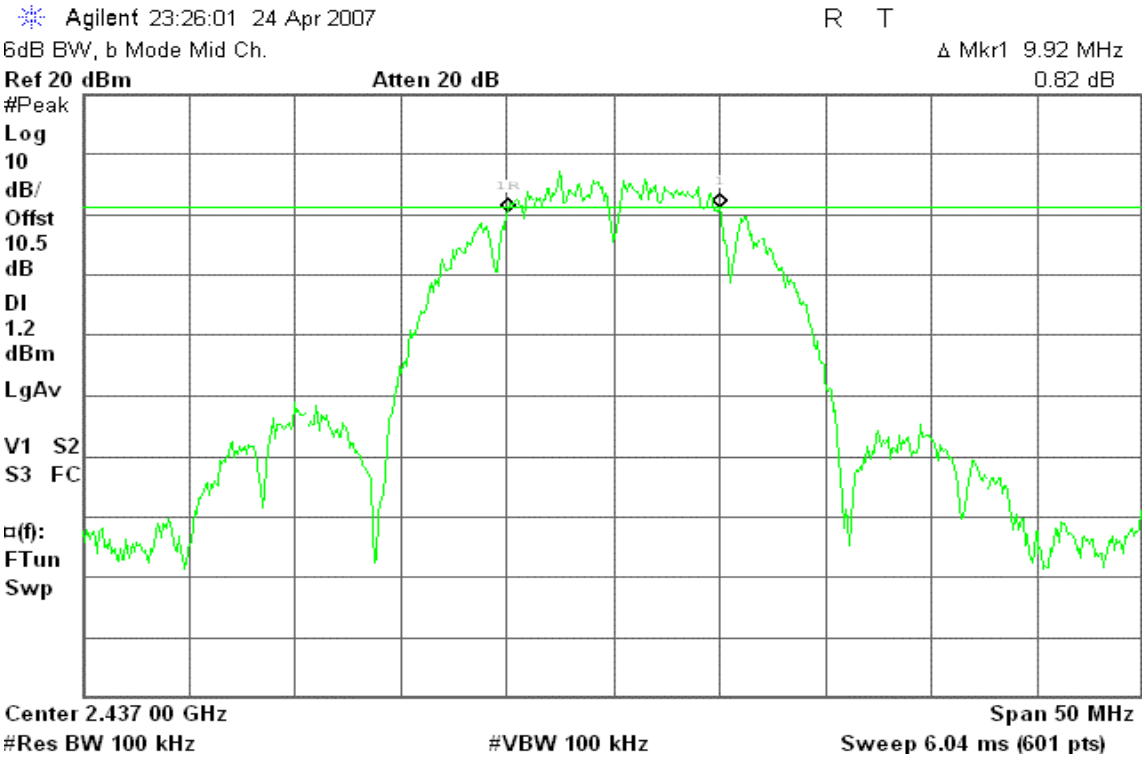


IEEE 802.11b mode / Chain 0

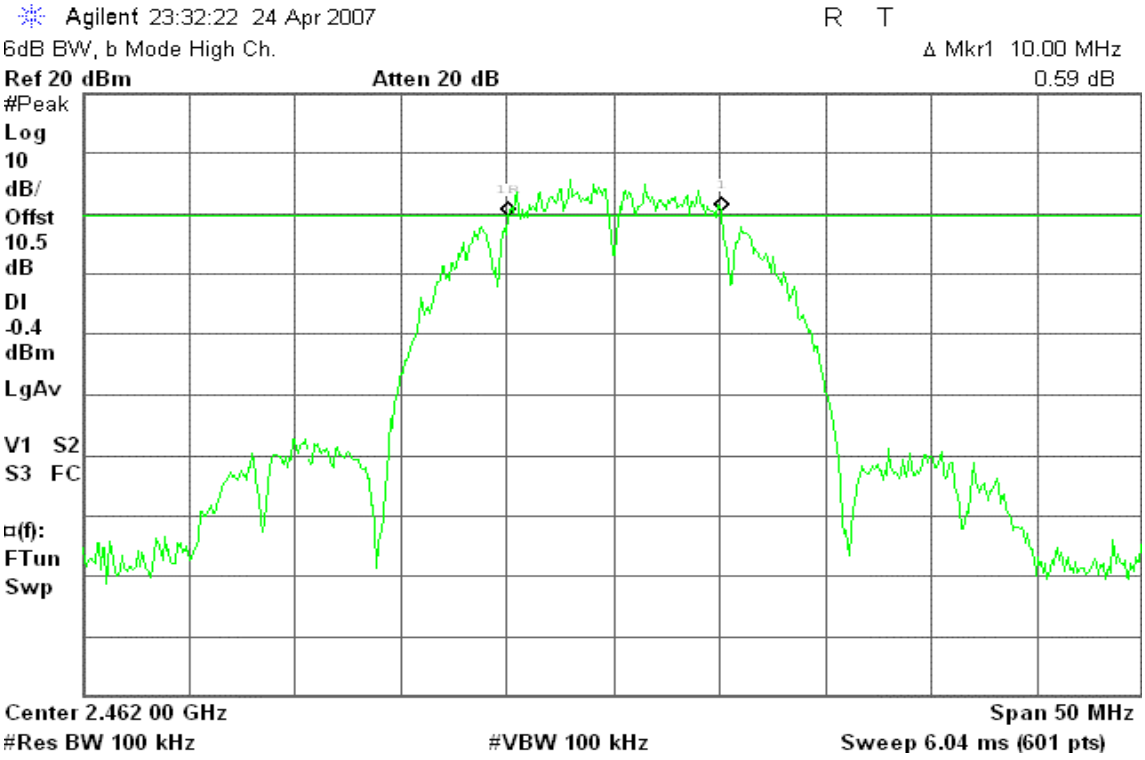
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

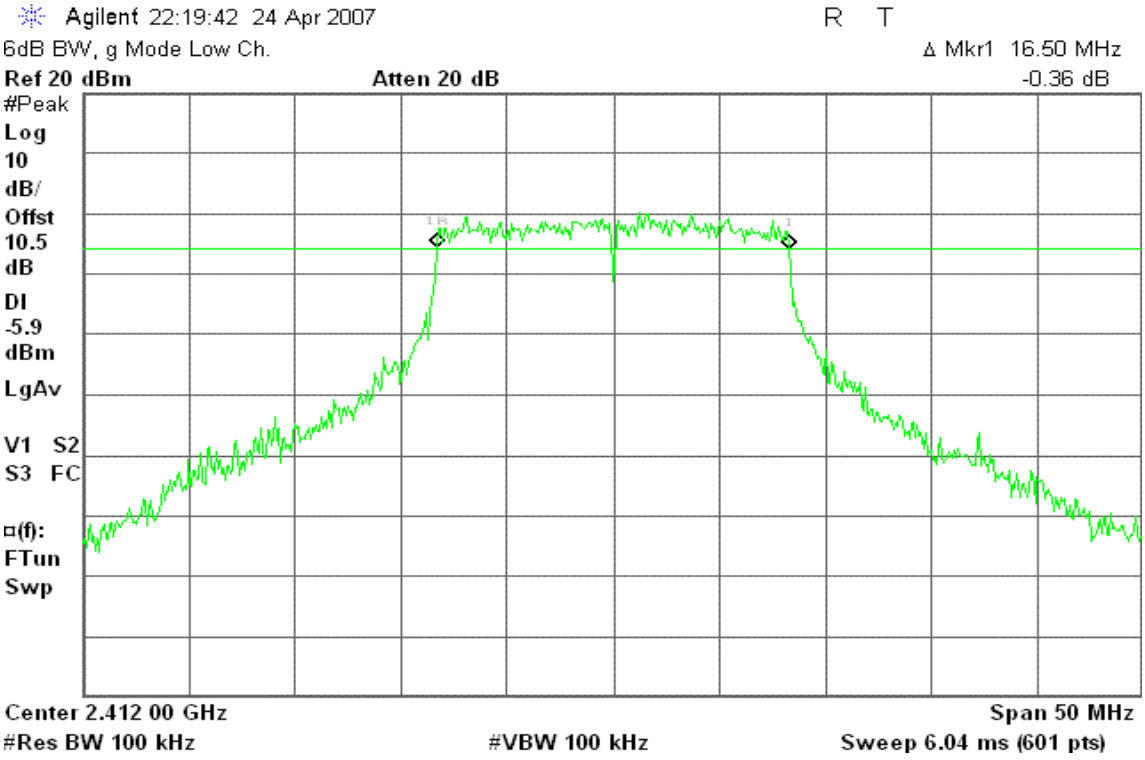


6dB Bandwidth (CH High)

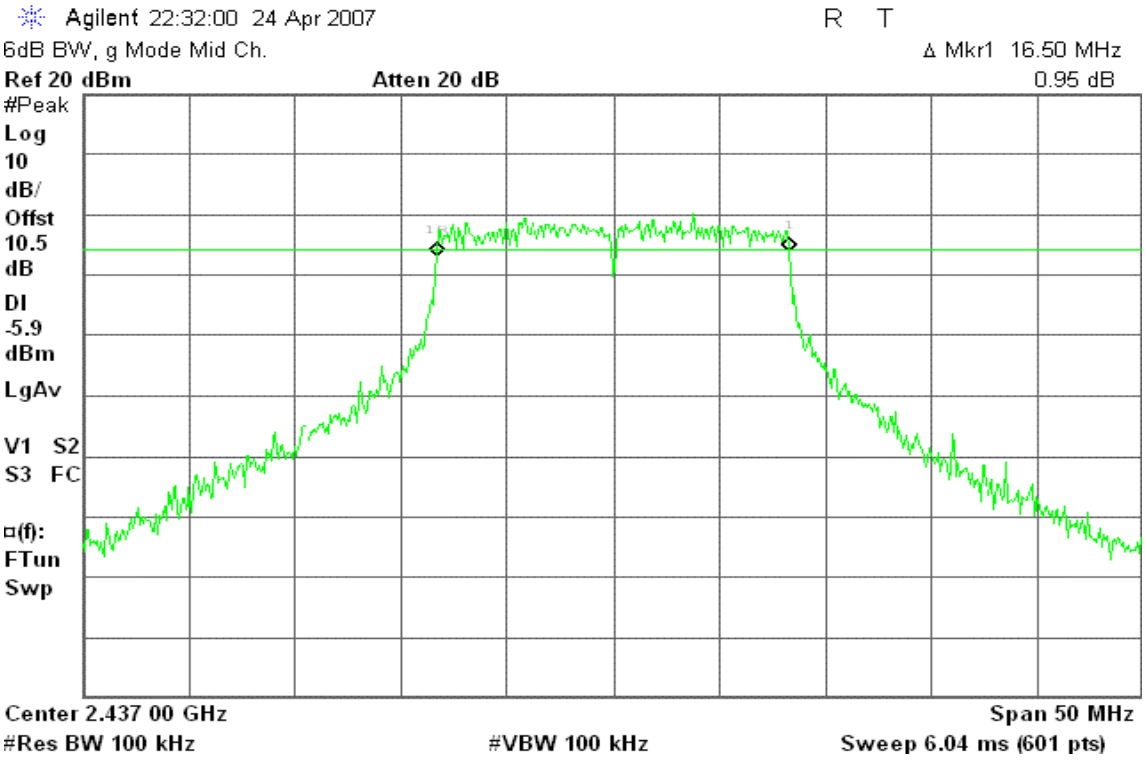


IEEE 802.11g mode / Chain 1

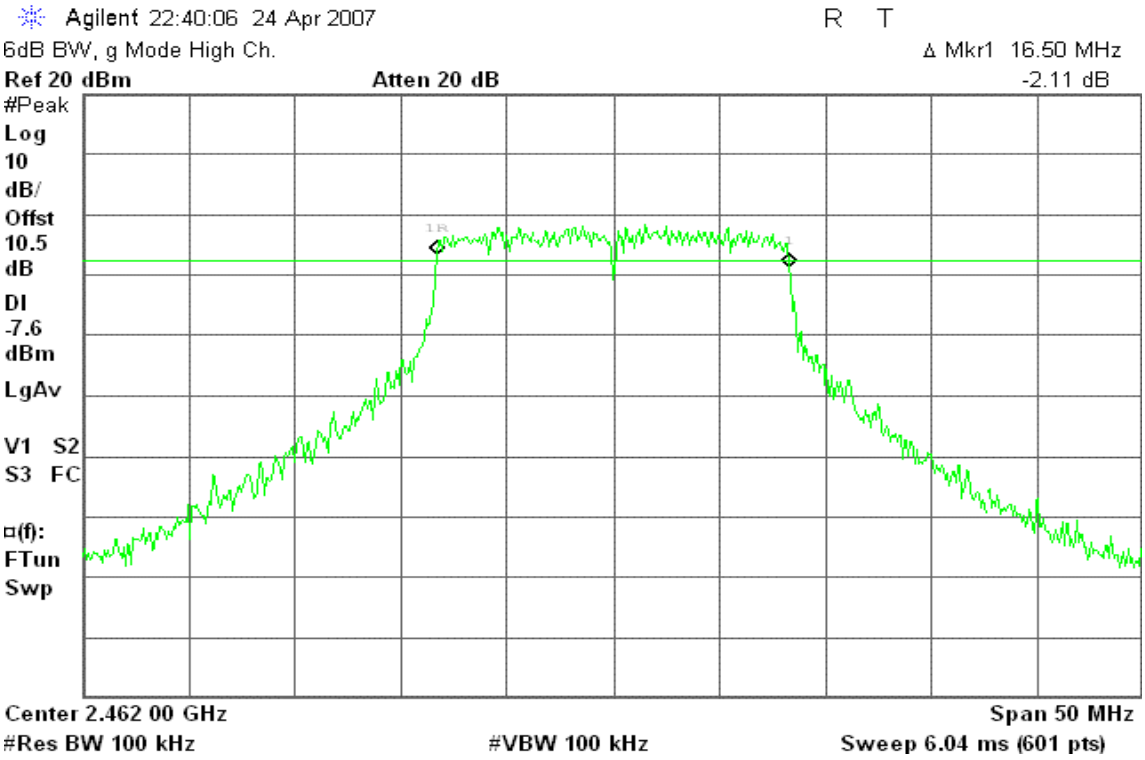
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

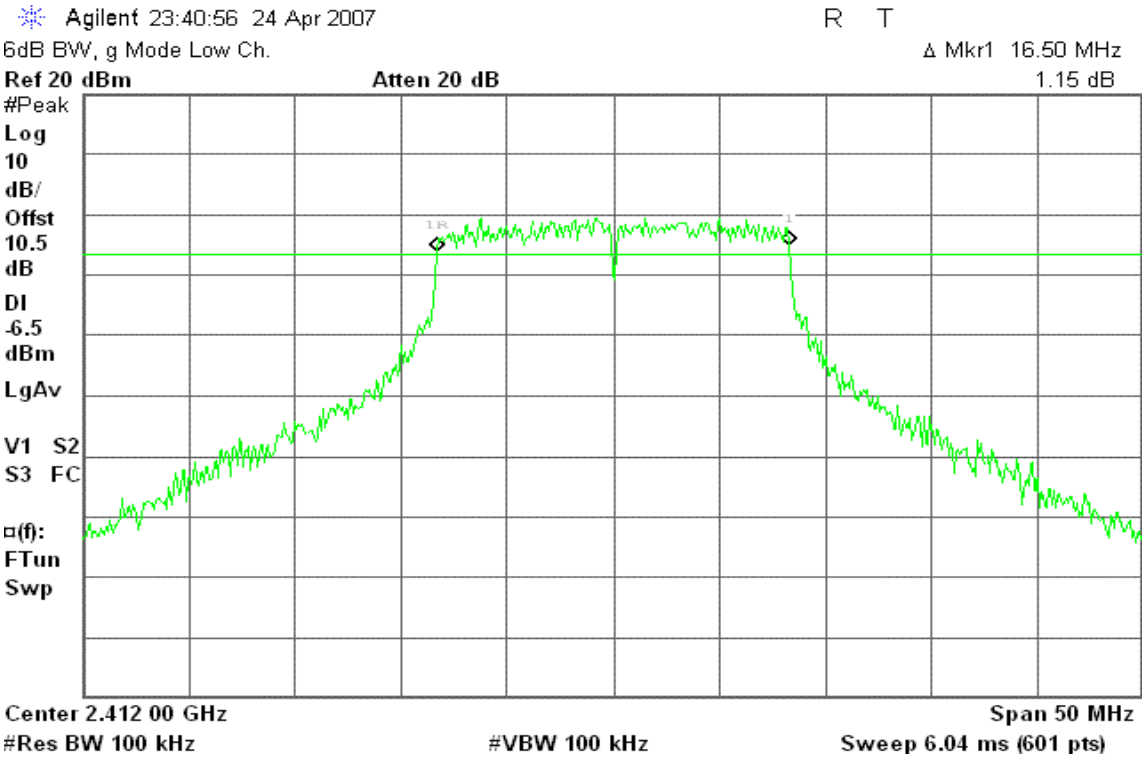


6dB Bandwidth (CH High)

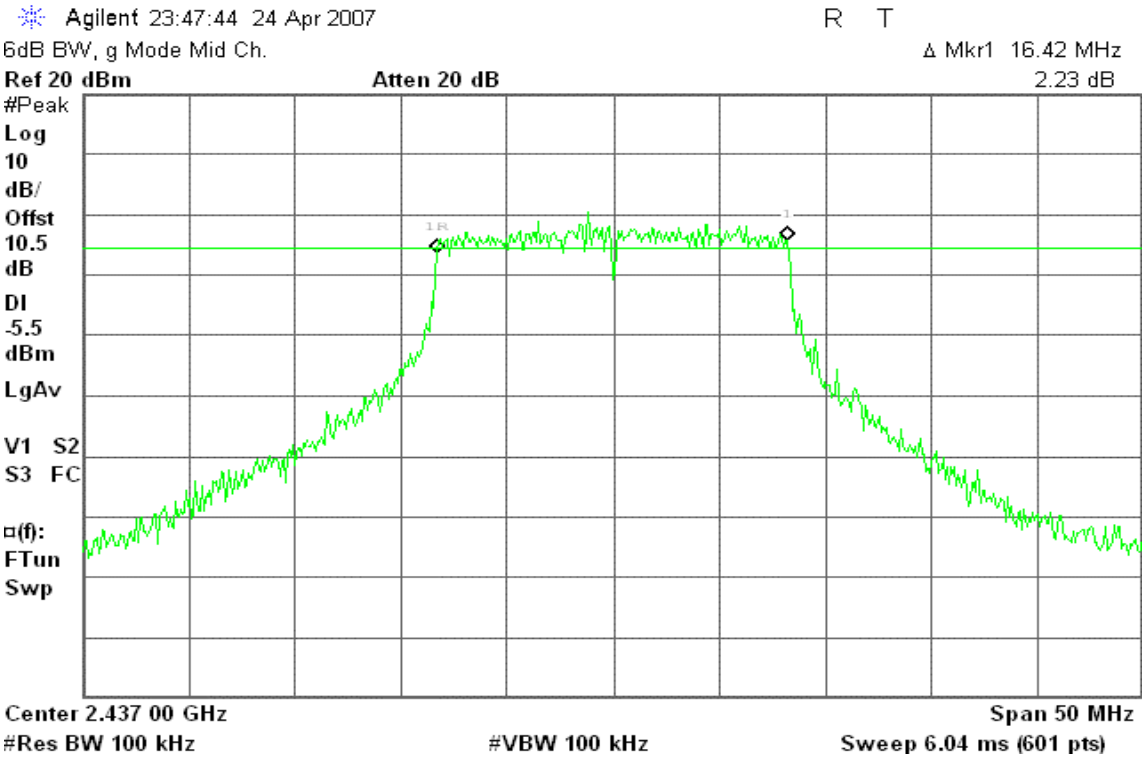


IEEE 802.11g mode / Chain 0

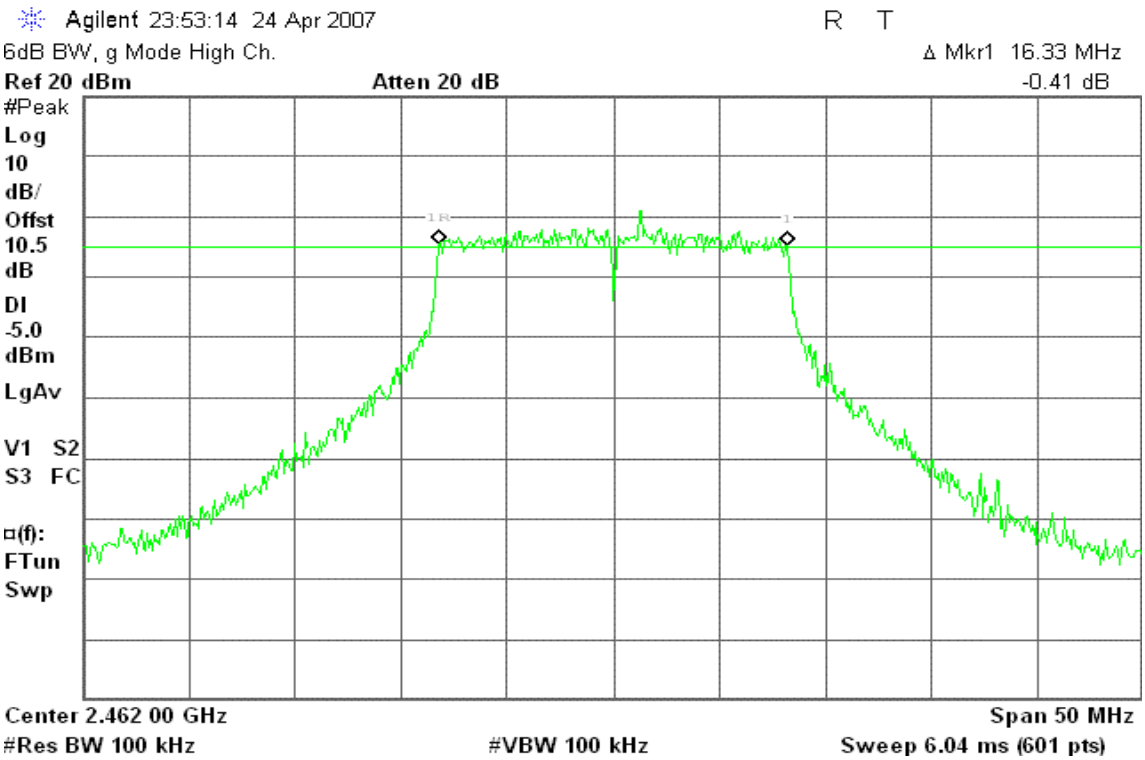
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

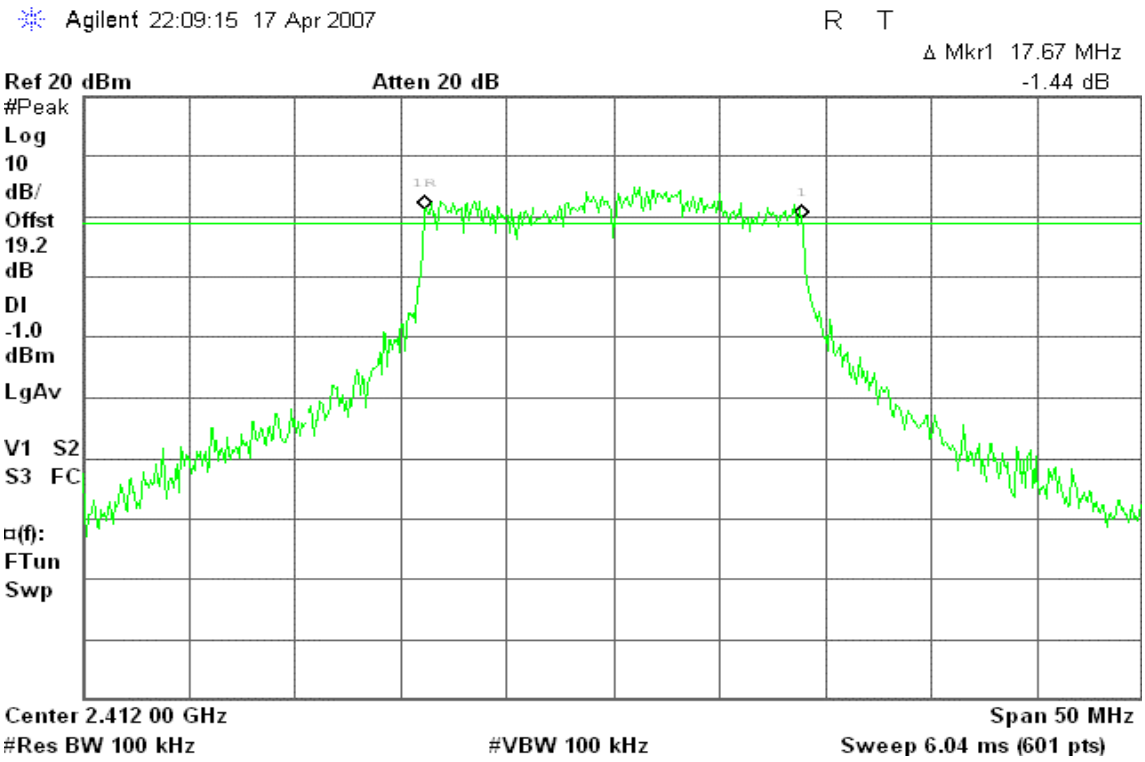


6dB Bandwidth (CH High)

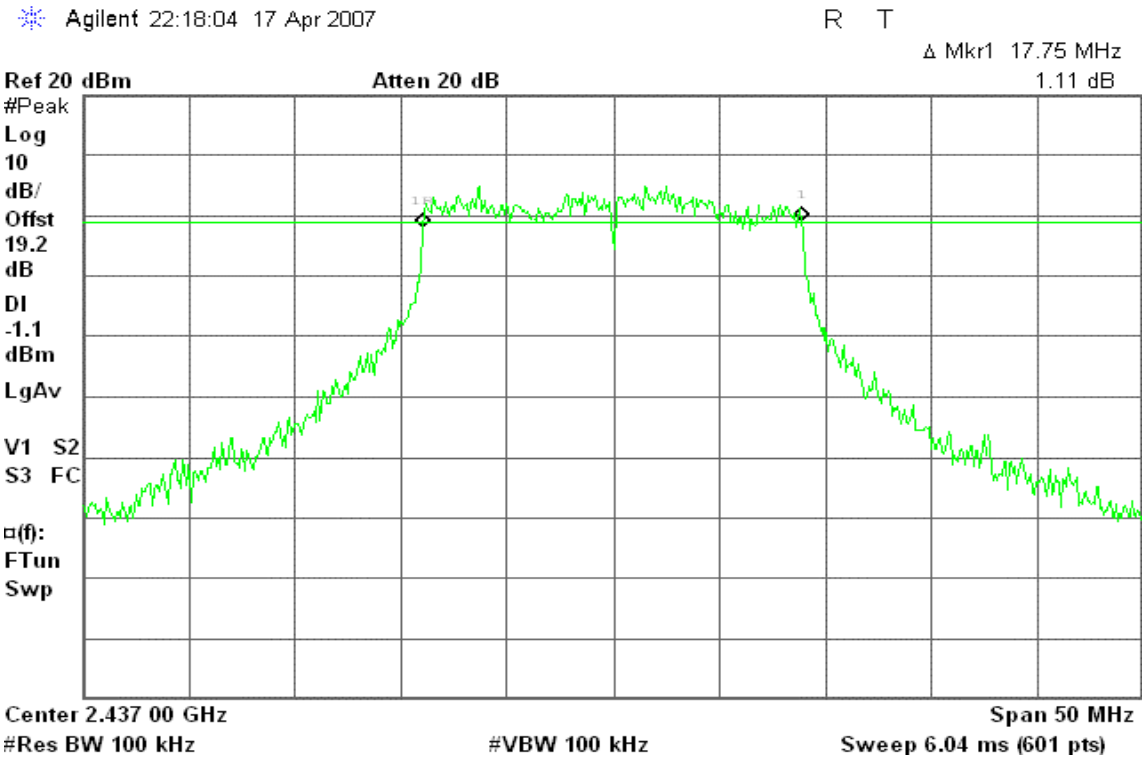


draft 802.11n Standard-20 MHz Channel mode

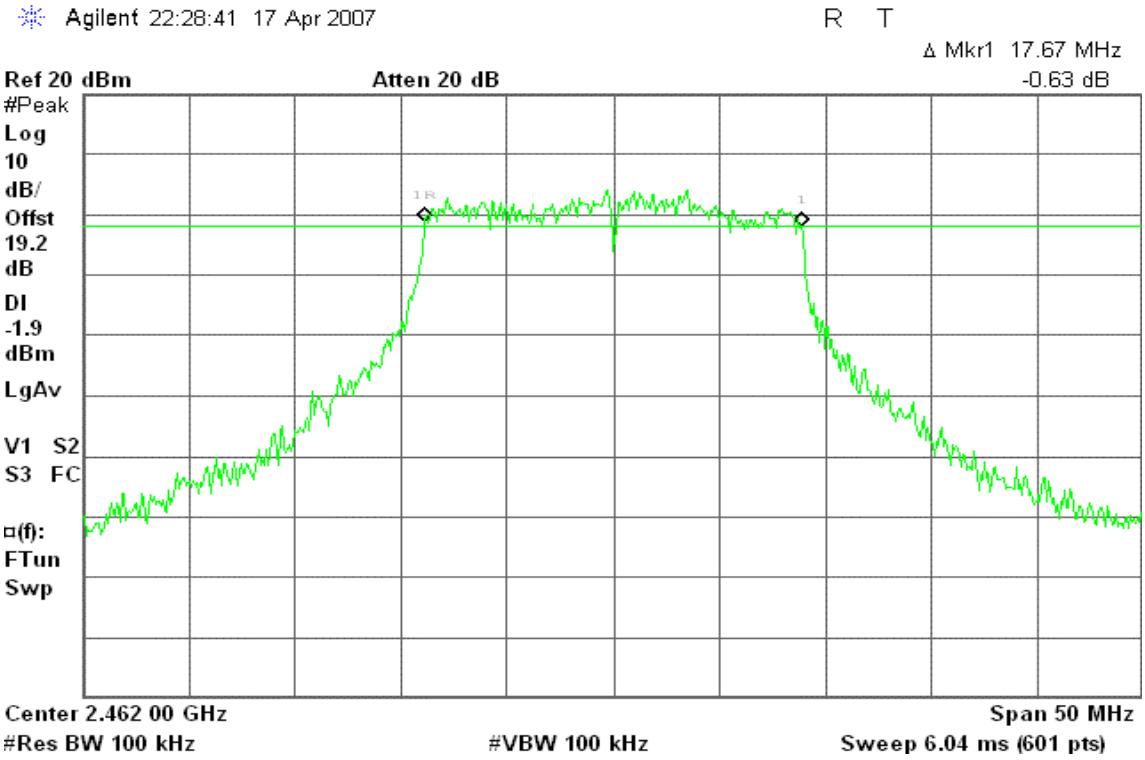
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

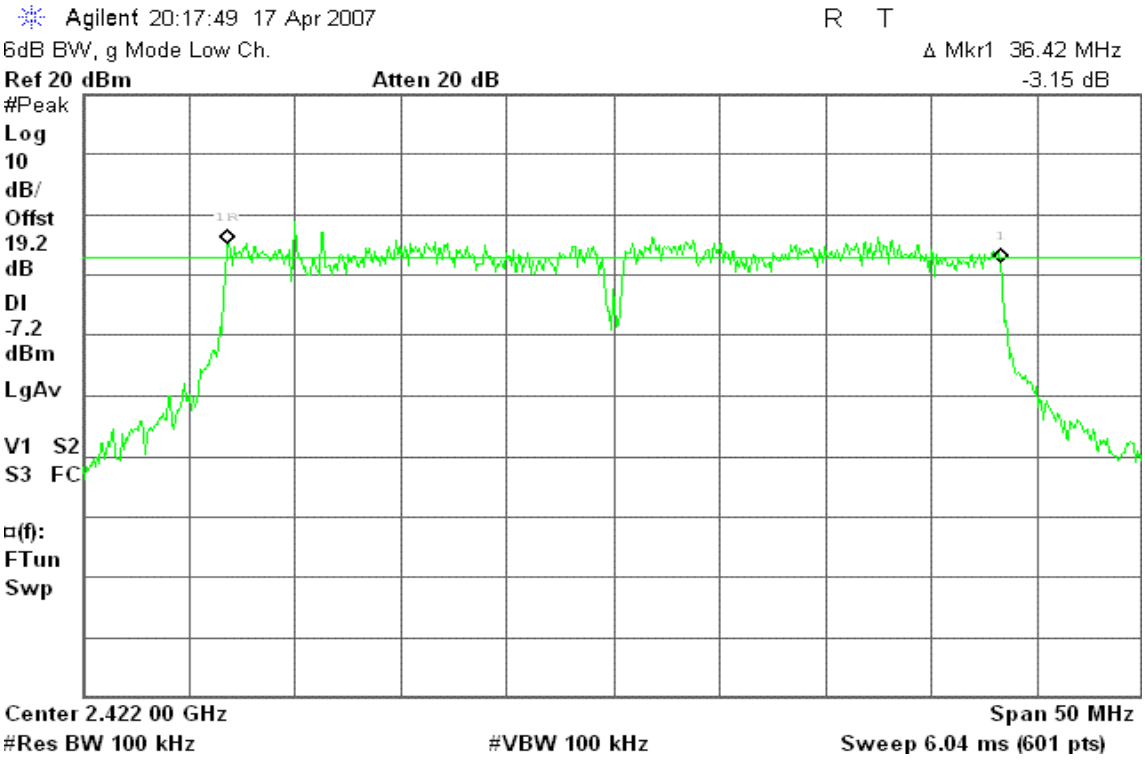


6dB Bandwidth (CH High)

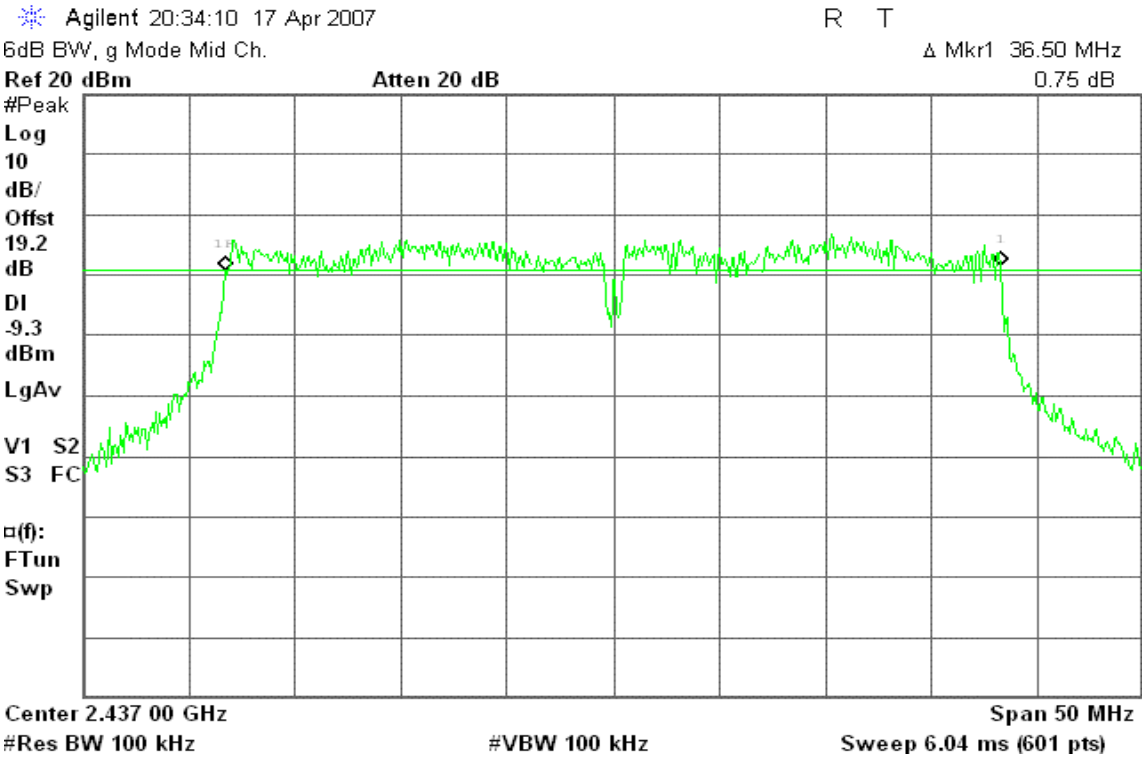


draft 802.11n Wide-40 MHz Channel mode

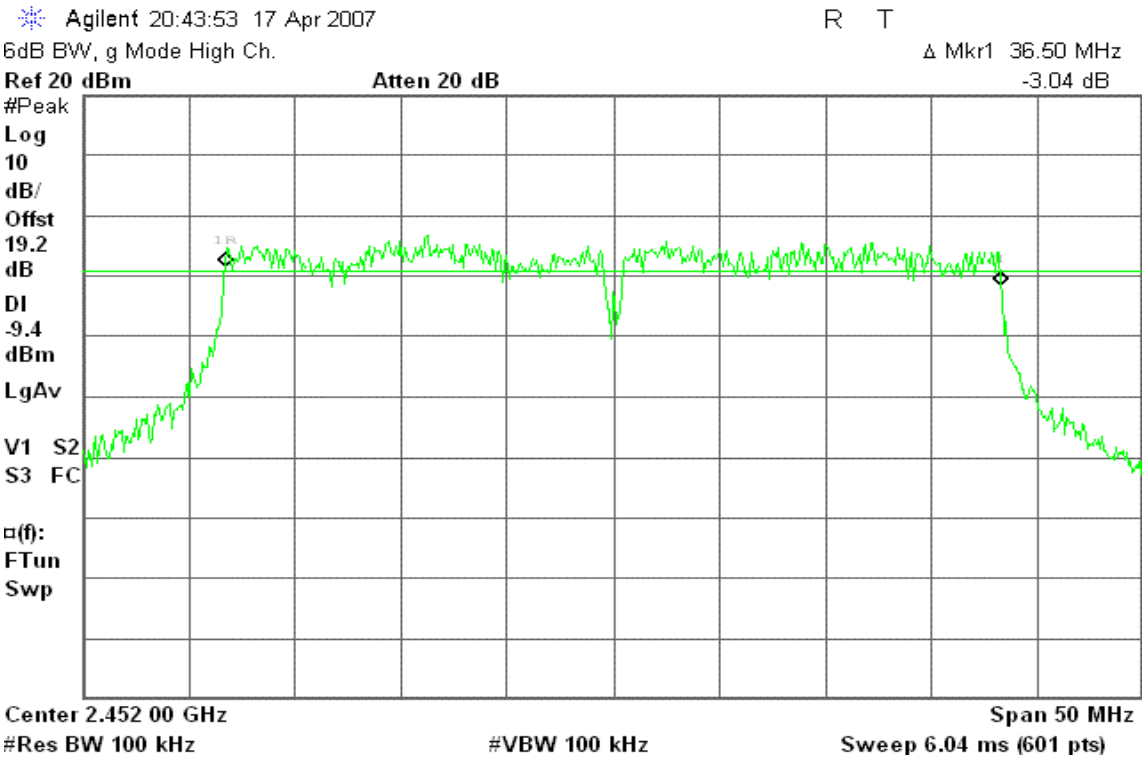
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)



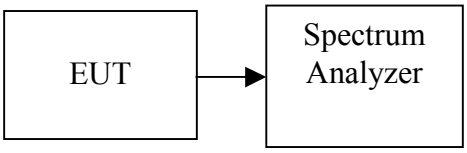
7.2 PEAK POWER

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. Place the EUT on the table and set it in 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 = 1 MHz, VBW >= 3 MHz. in “Channel Power ” measurement.
4. Record the max reading.
5. 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)	Chain 1 Output Power (dBm)	Chain 0 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	20.33	19.29	22.85	0.1928	1.00	PASS
Mid	2437	20.59	20.08	23.35	0.2164		PASS
High	2462	19.14	18.71	21.94	0.1563		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Chain 1 Output Power (dBm)	Chain 0 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	17.90	17.50	20.71	0.1179	1.00	PASS
Mid	2437	17.33	16.14	19.79	0.0952		PASS
High	2462	16.43	16.20	19.33	0.0856		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	17.68	0.0586	1.00	PASS
Mid	2437	19.59	0.0910		PASS
High	2462	20.17	0.1040		PASS

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

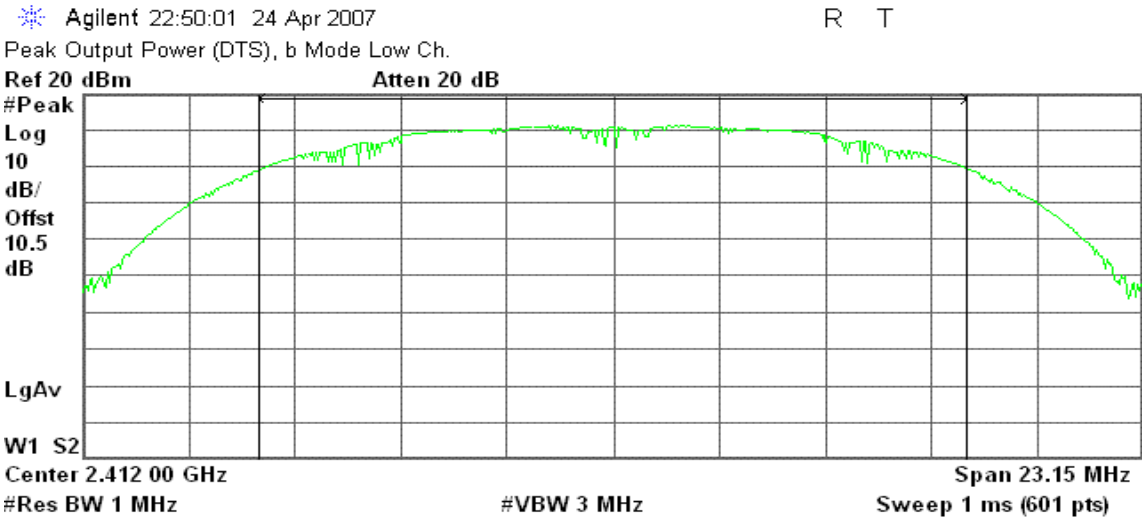
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	14.61	0.0289	1.00	PASS
Mid	2437	15.00	0.0316		PASS
High	2452	14.67	0.0293		PASS

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

Test Plot

IEEE 802.11b mode / Chain 1

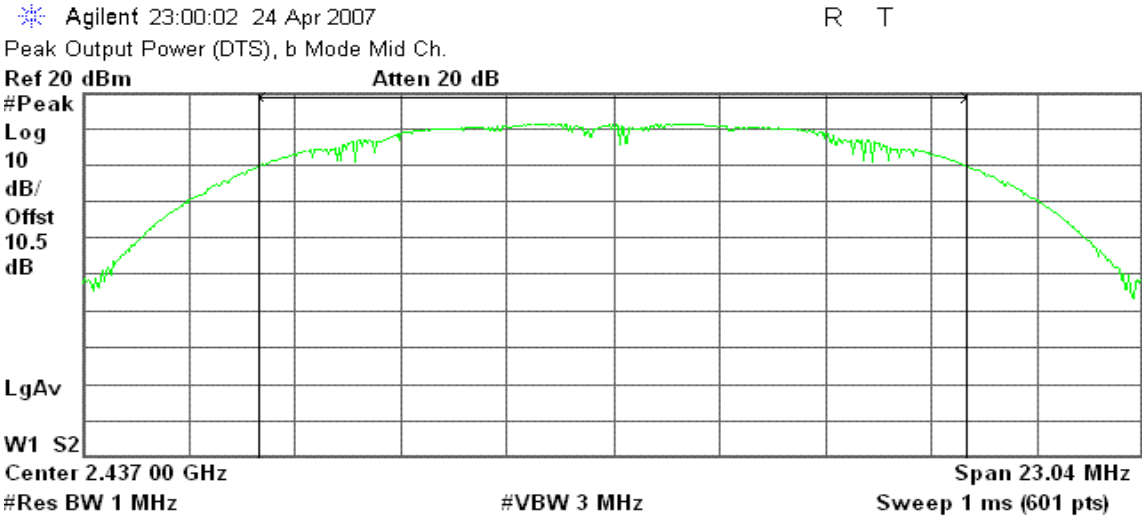
Peak Power (CH Low)



Channel Power
20.33 dBm / 15.4360 MHz

Power Spectral Density
-51.55 dBm/Hz

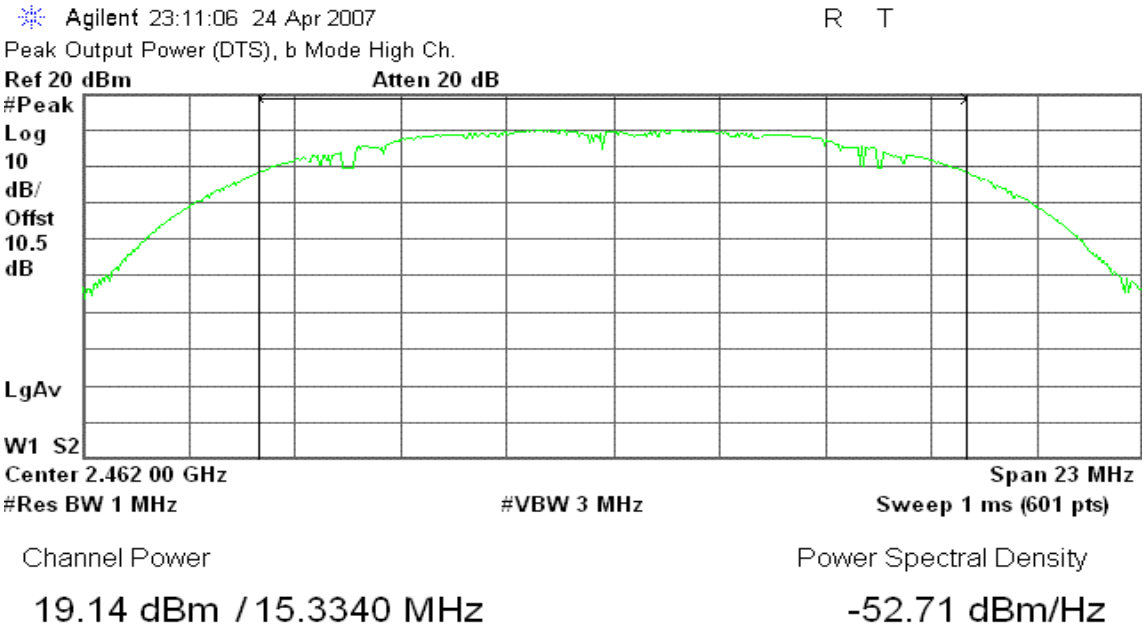
Peak Power (CH Mid)



Channel Power
20.59 dBm / 15.3580 MHz

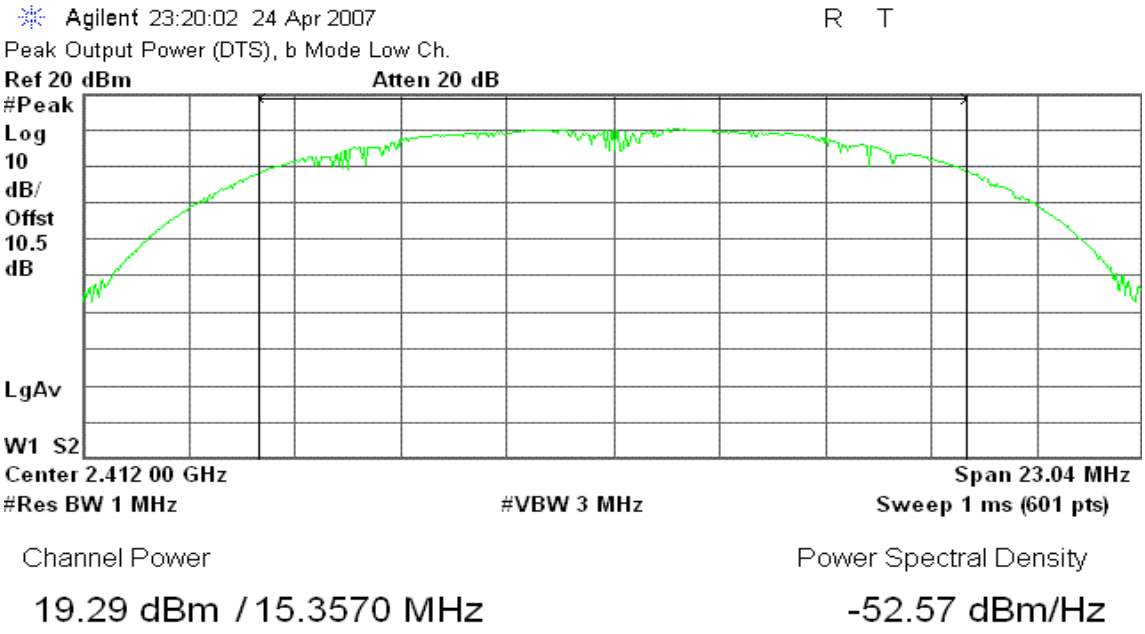
Power Spectral Density
-51.27 dBm/Hz

Peak Power (CH High)

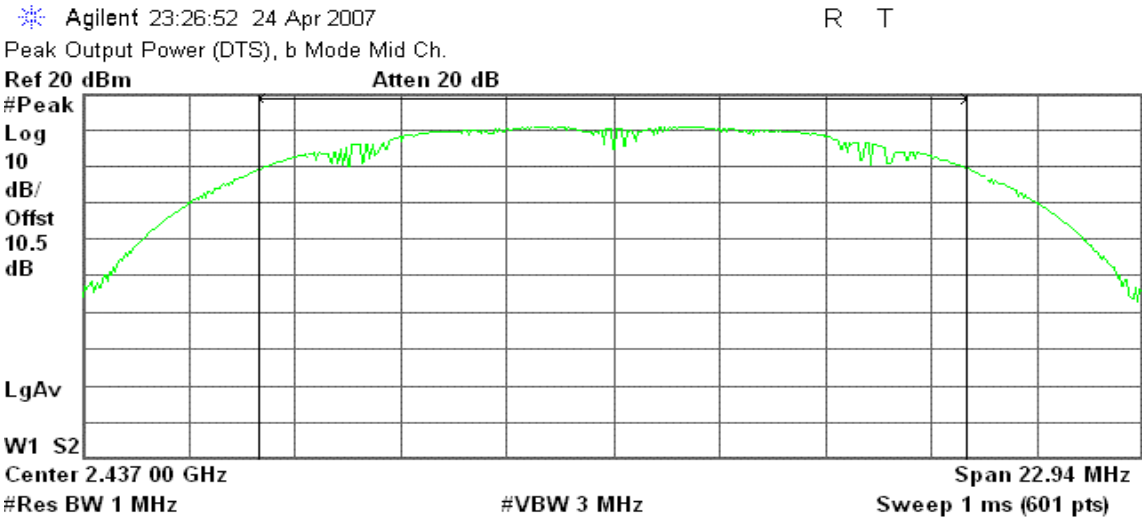


IEEE 802.11b mode / Chain 0

Peak Power (CH Low)



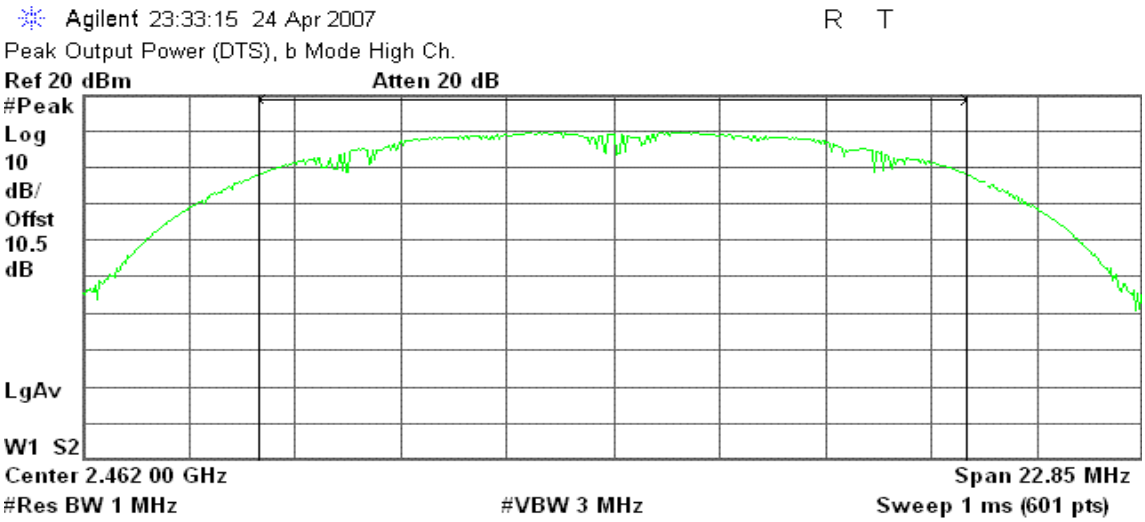
Peak Power (CH Mid)



Channel Power
20.08 dBm / 15.2930 MHz

Power Spectral Density
-51.77 dBm/Hz

Peak Power (CH High)

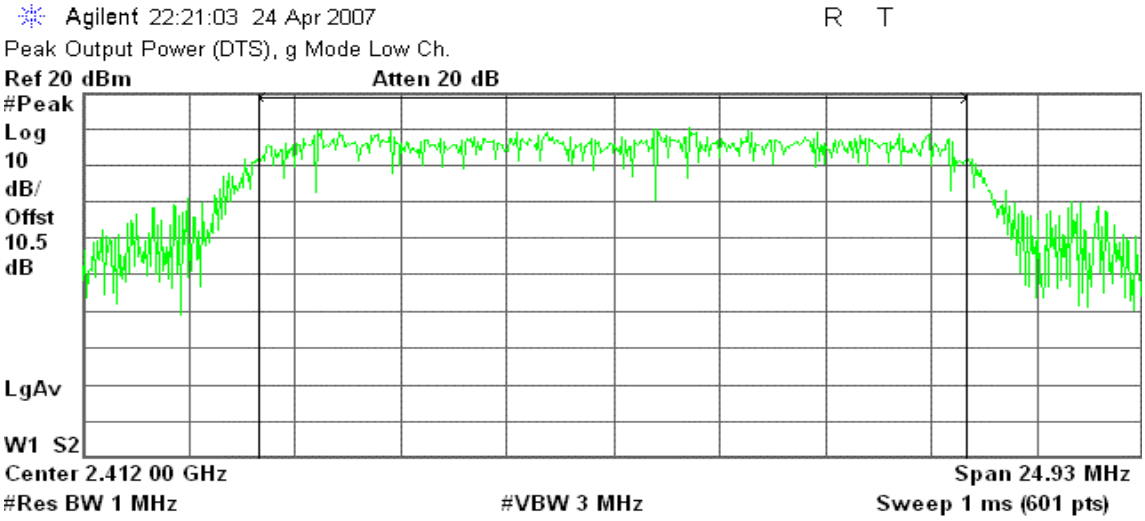


Channel Power
18.71 dBm / 15.2350 MHz

Power Spectral Density
-53.12 dBm/Hz

IEEE 802.11g mode / Chain 1

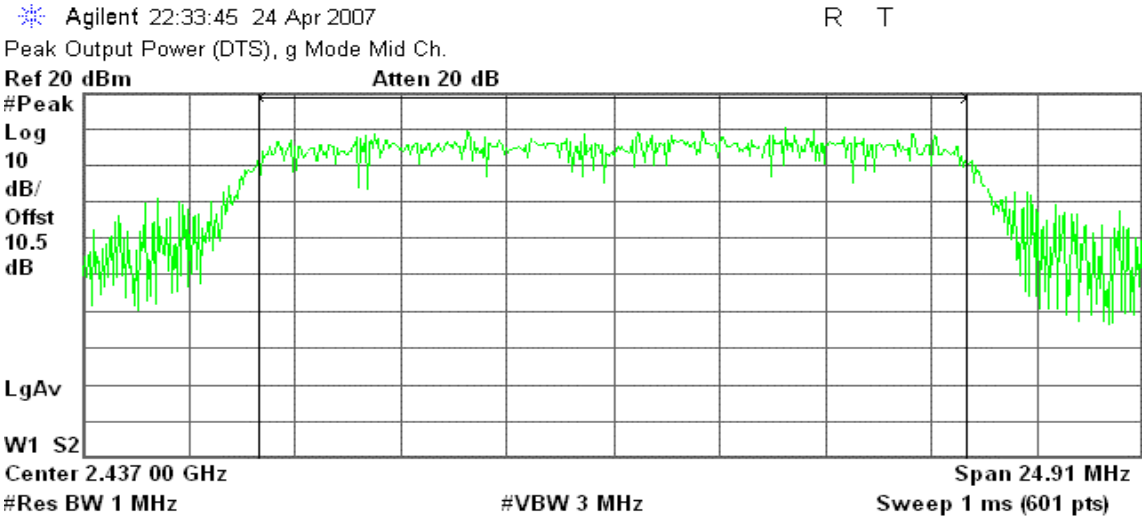
Peak Power (CH Low)



Channel Power
17.90 dBm / 16.6180 MHz

Power Spectral Density
-54.31 dBm/Hz

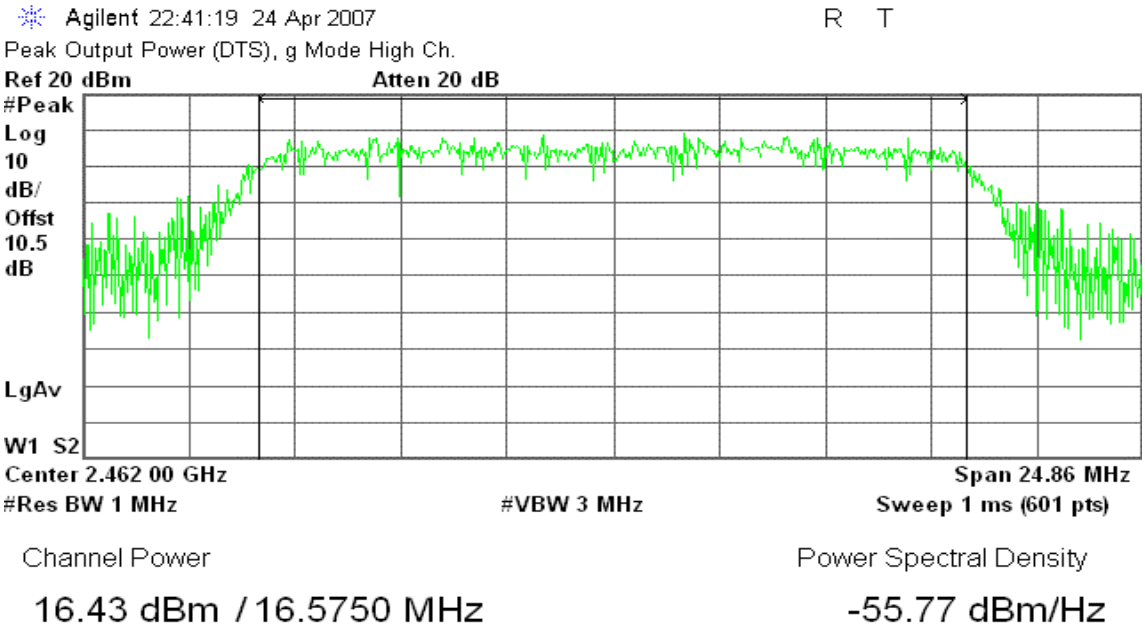
Peak Power (CH Mid)



Channel Power
17.33 dBm / 16.6080 MHz

Power Spectral Density
-54.87 dBm/Hz

Peak Power (CH High)

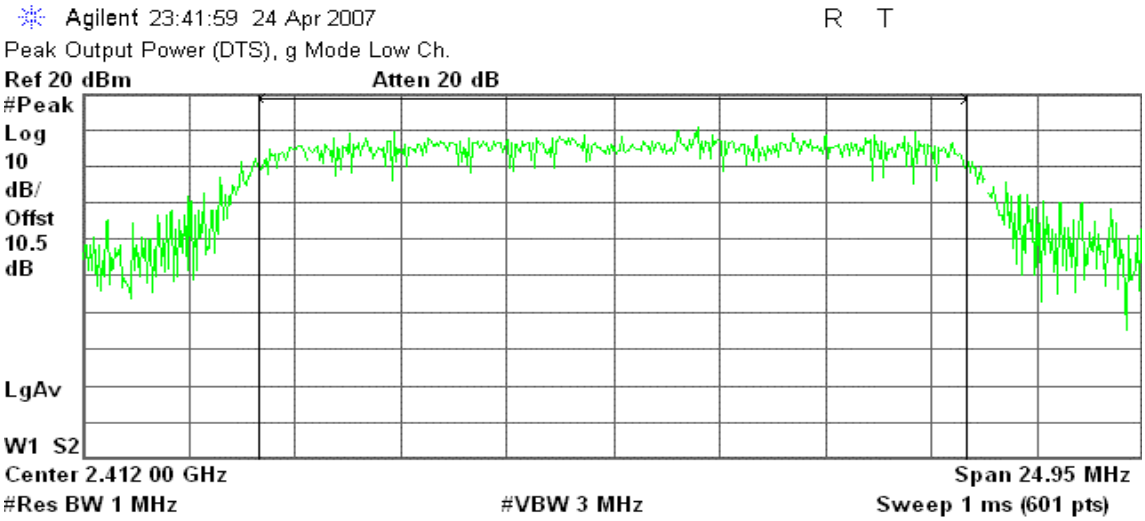


Channel Power
16.43 dBm / 16.5750 MHz

Power Spectral Density
-55.77 dBm/Hz

IEEE 802.11g mode / Chain 0

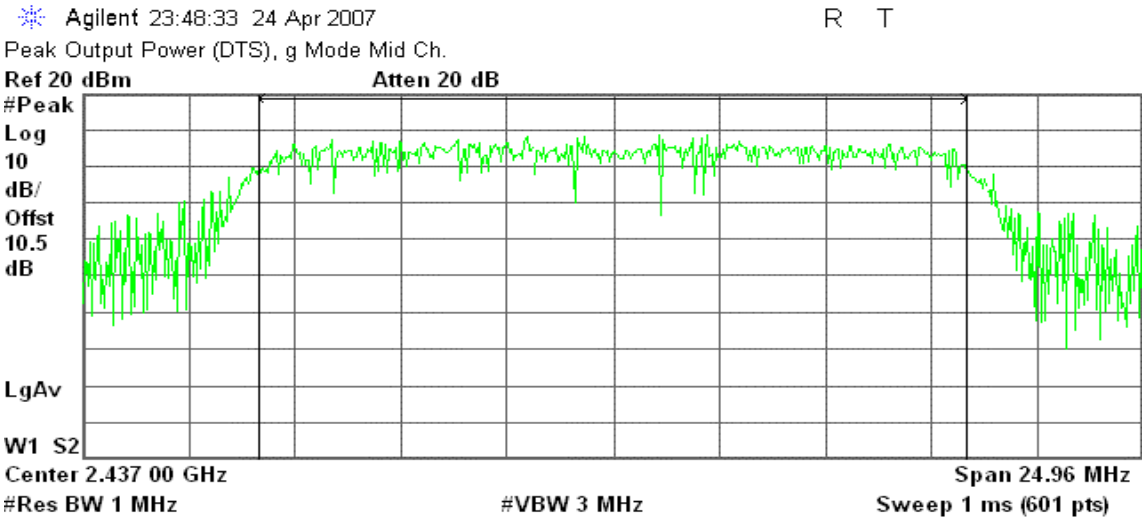
Peak Power (CH Low)



Channel Power
17.50 dBm / 16.6340 MHz

Power Spectral Density
-54.71 dBm/Hz

Peak Power (CH Mid)



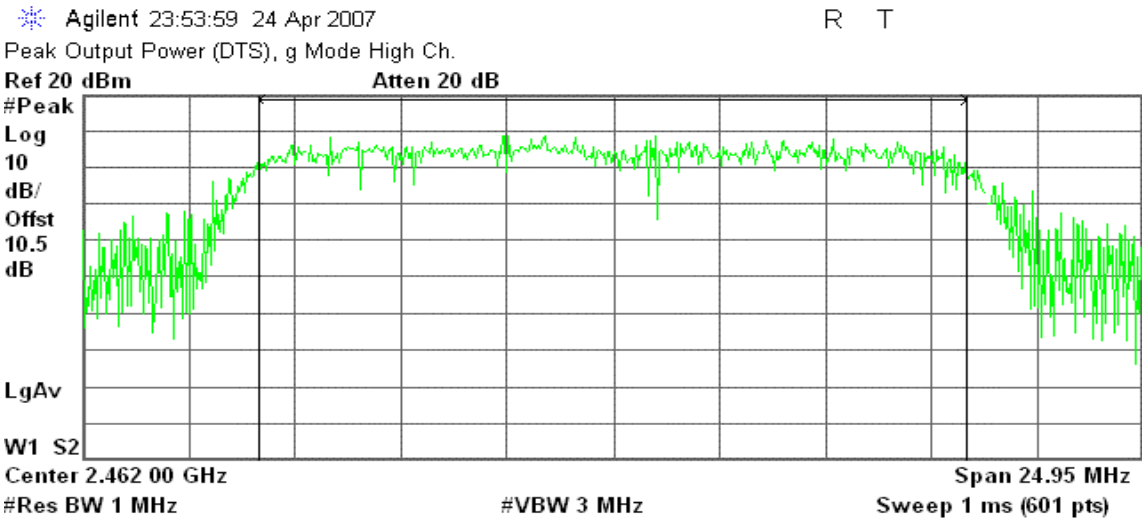
Channel Power

16.14 dBm / 16.6390 MHz

Power Spectral Density

-56.07 dBm/Hz

Peak Power (CH High)



Channel Power

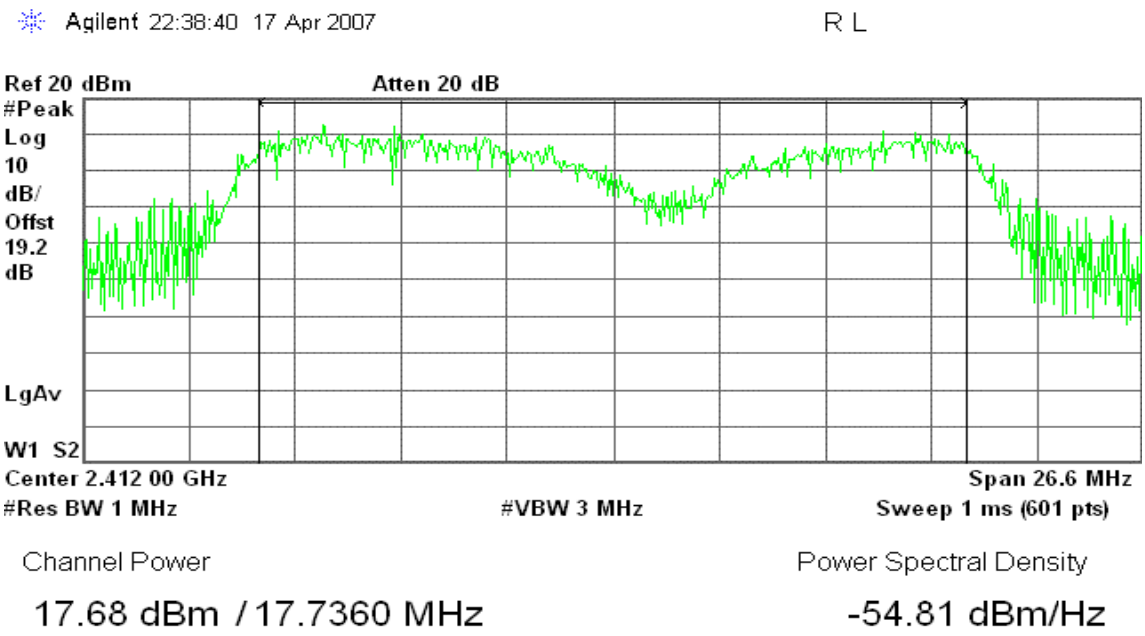
16.20 dBm / 16.6330 MHz

Power Spectral Density

-56.01 dBm/Hz

draft 802.11n Standard-20 MHz Channel mode

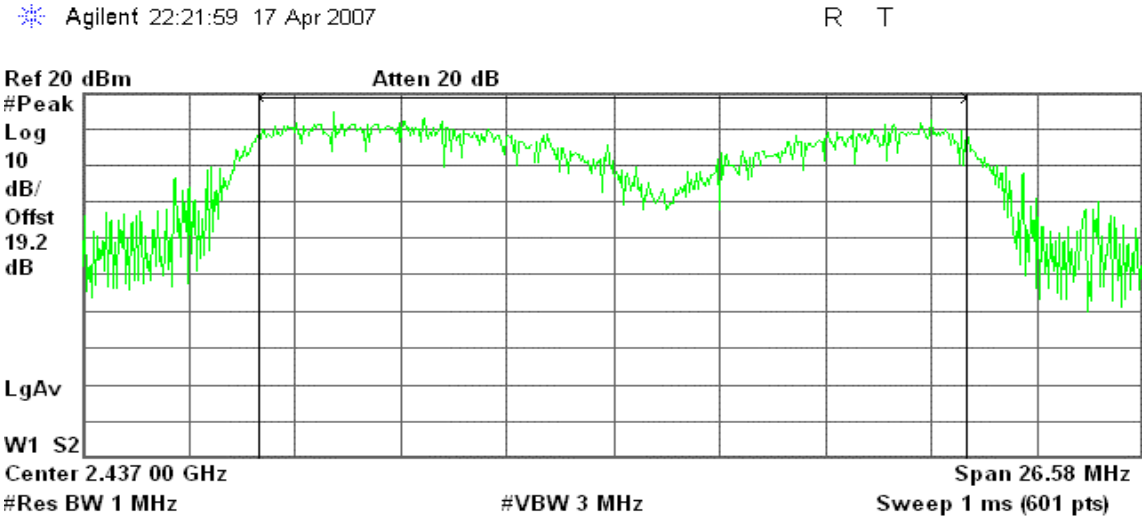
Peak Power (CH Low)



Channel Power
17.68 dBm / 17.7360 MHz

Power Spectral Density
-54.81 dBm/Hz

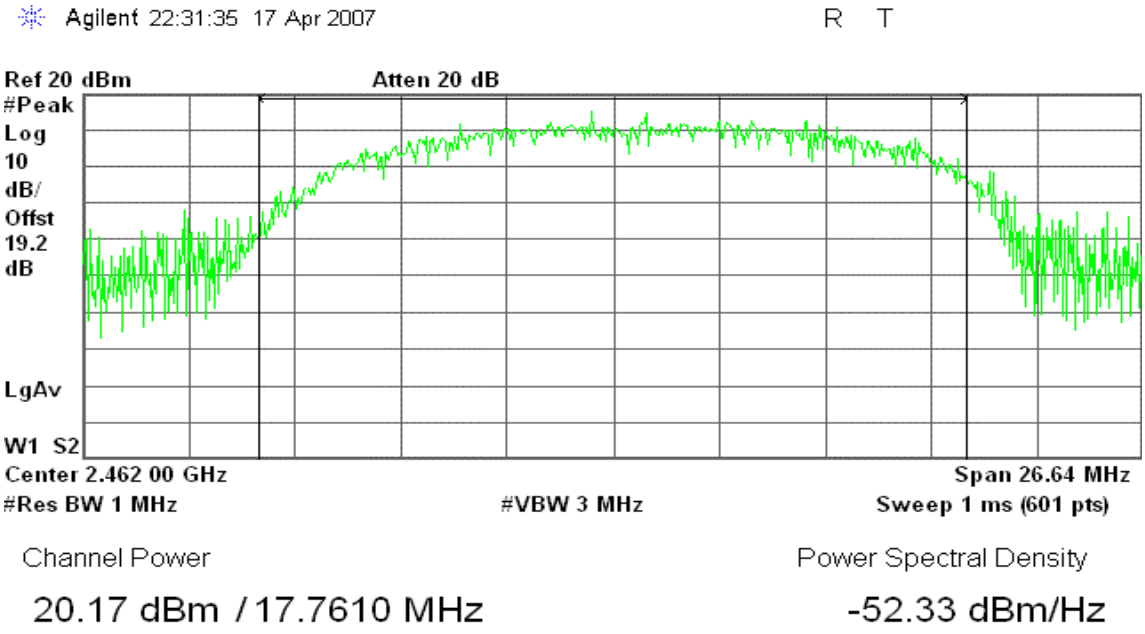
Peak Power (CH Mid)



Channel Power
19.59 dBm / 17.7200 MHz

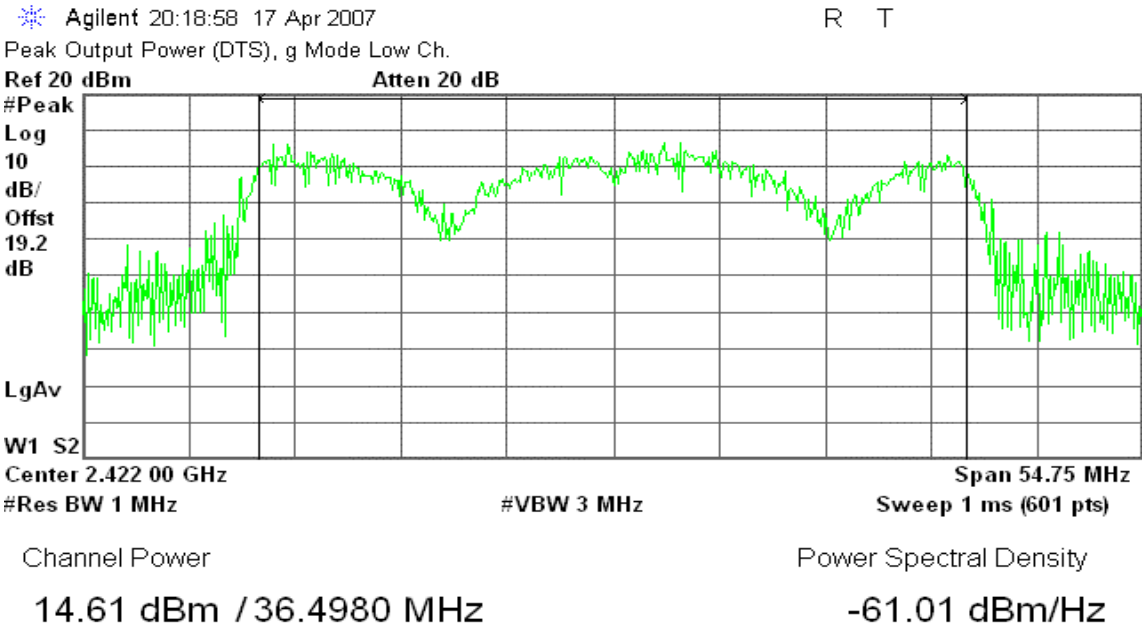
Power Spectral Density
-52.90 dBm/Hz

Peak Power (CH High)

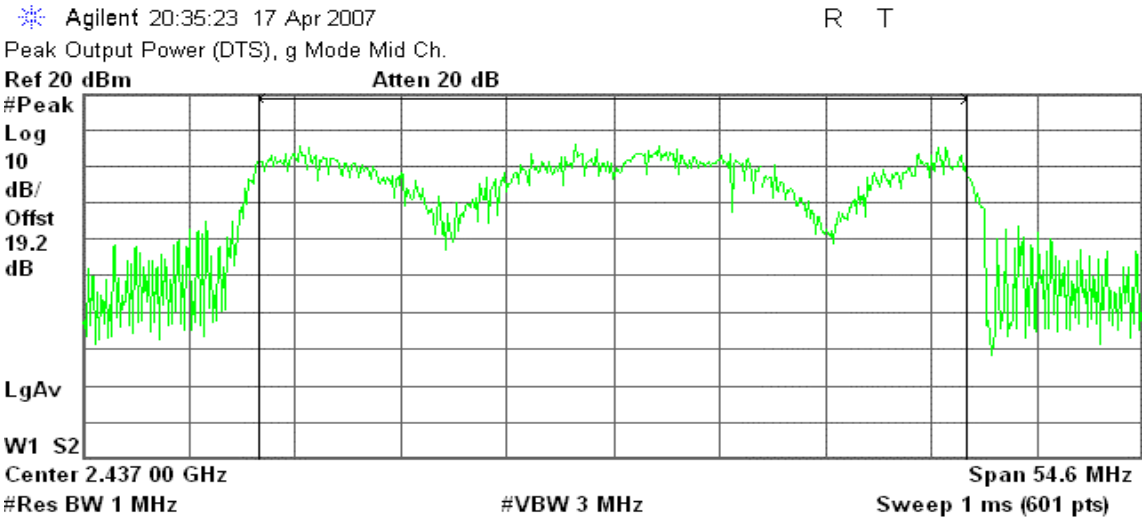


draft 802.11n Wide-40 MHz Channel mode

Peak Power (CH Low)



Peak Power (CH Mid)



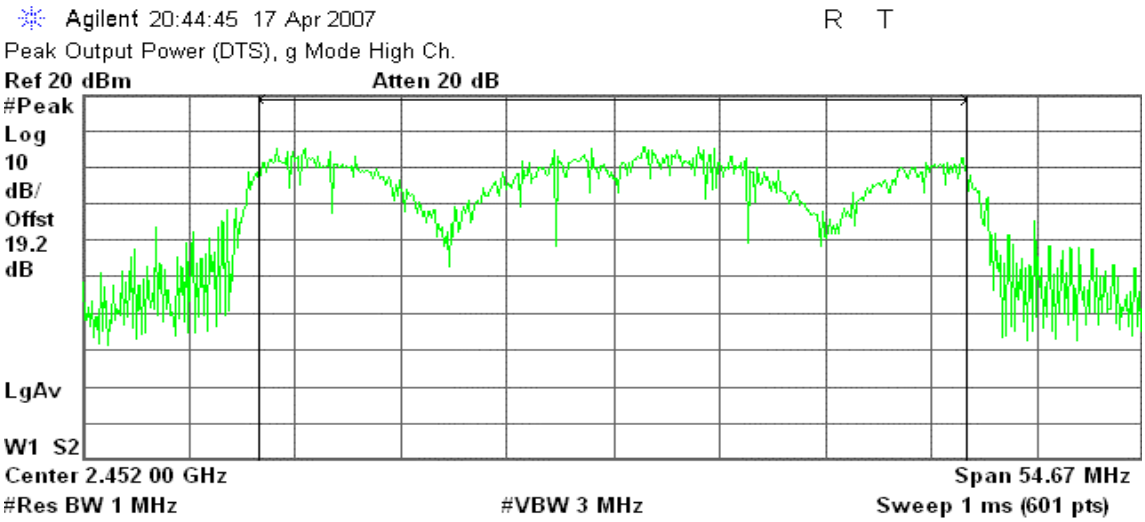
Channel Power

15.00 dBm / 36.4030 MHz

Power Spectral Density

-60.61 dBm/Hz

Peak Power (CH High)



Channel Power

14.67 dBm / 36.4470 MHz

Power Spectral Density

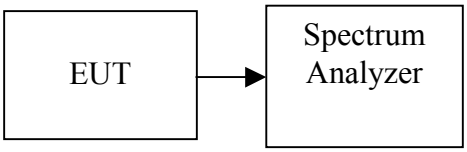
-60.95 dBm/Hz

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)	Chain 1 Output Power (dBm)	Chain 0 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Result
Low	2412	18.19	17.25	20.76	0.1190	PASS
Mid	2437	17.87	17.54	20.72	0.1180	PASS
High	2462	16.45	16.00	19.24	0.0840	PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Chain 1 Output Power (dBm)	Chain 0 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Result
Low	2412	14.14	14.26	17.21	0.0526	PASS
Mid	2437	13.47	12.87	16.19	0.0416	PASS
High	2462	12.63	12.55	15.60	0.0363	PASS

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

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
Low	2412	15.27	0.0337	PASS
Mid	2437	17.16	0.0520	PASS
High	2462	16.95	0.0495	PASS

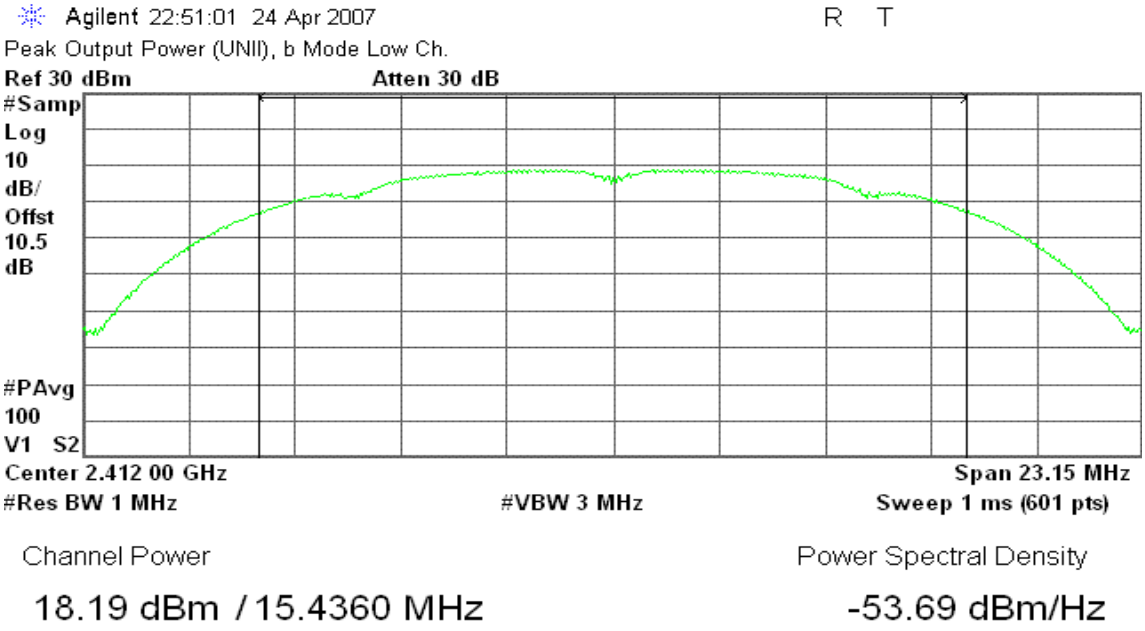
Test mode: draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Result
Low	2422	10.92	0.0124	PASS
Mid	2437	11.47	0.0140	PASS
High	2452	12.04	0.0160	PASS

Test Plot

IEEE 802.11b mode / Chain 1

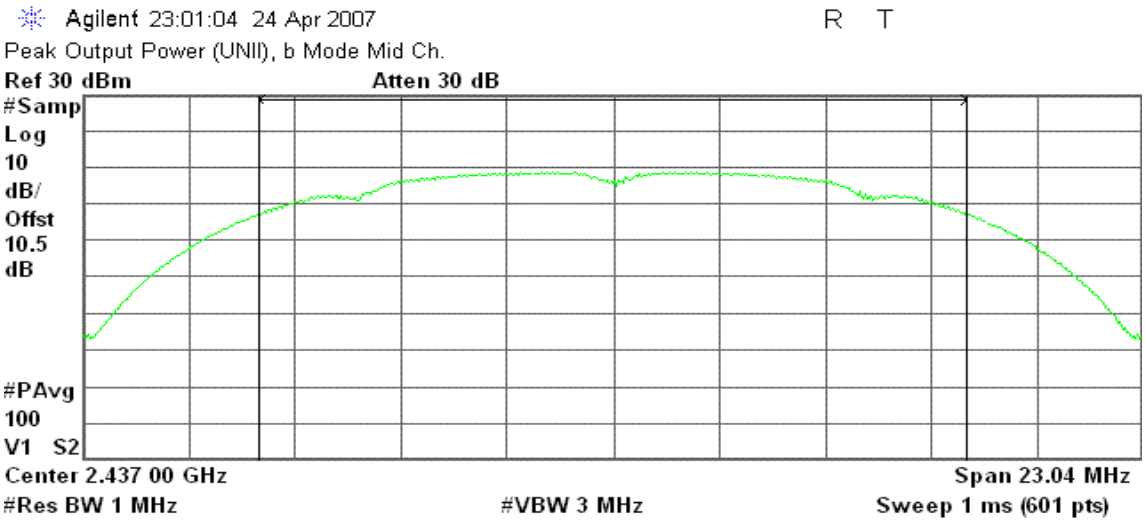
Average Power (CH Low)



Channel Power
18.19 dBm / 15.4360 MHz

Power Spectral Density
-53.69 dBm/Hz

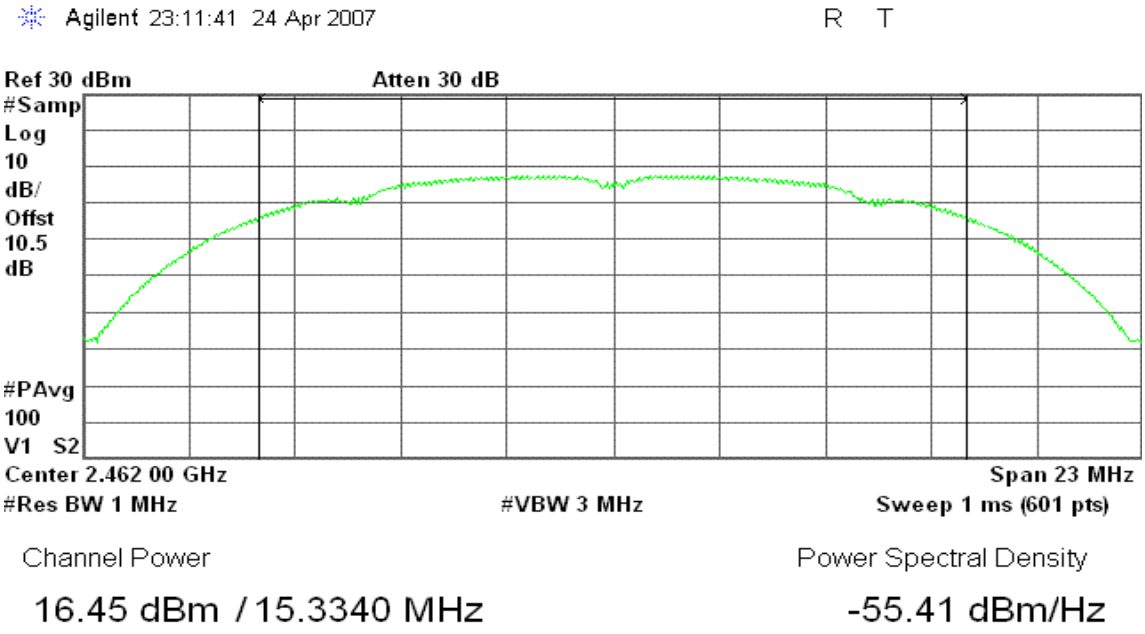
Average Power (CH Mid)



Channel Power
17.87 dBm / 15.3580 MHz

Power Spectral Density
-53.99 dBm/Hz

Average Power (CH High)

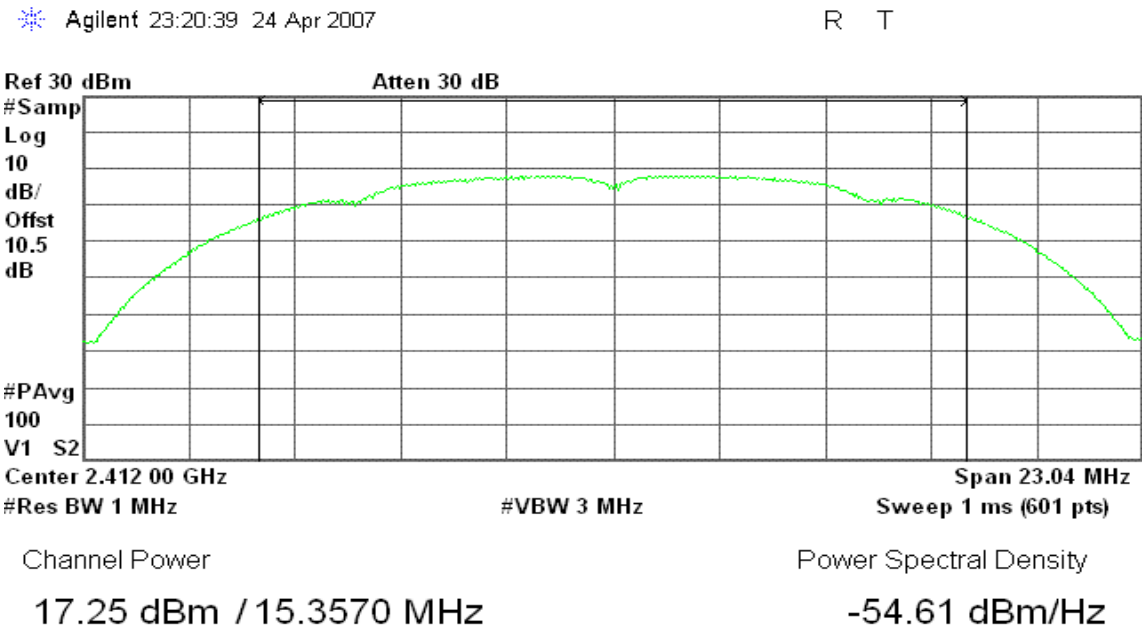


Channel Power
16.45 dBm / 15.3340 MHz

Power Spectral Density
-55.41 dBm/Hz

IEEE 802.11b mode / Chain 0

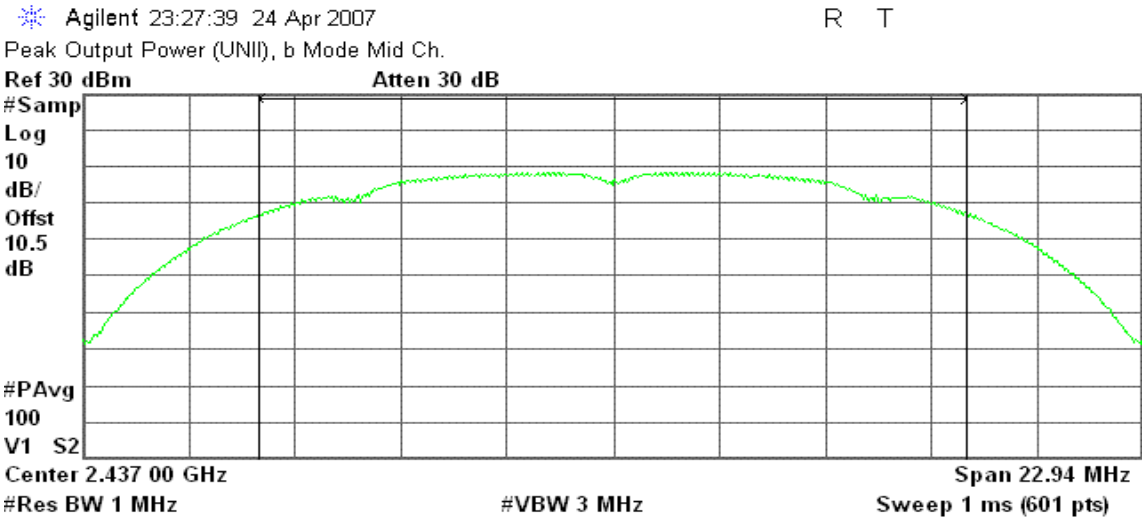
Average Power (CH Low)



Channel Power
17.25 dBm / 15.3570 MHz

Power Spectral Density
-54.61 dBm/Hz

Average Power (CH Mid)



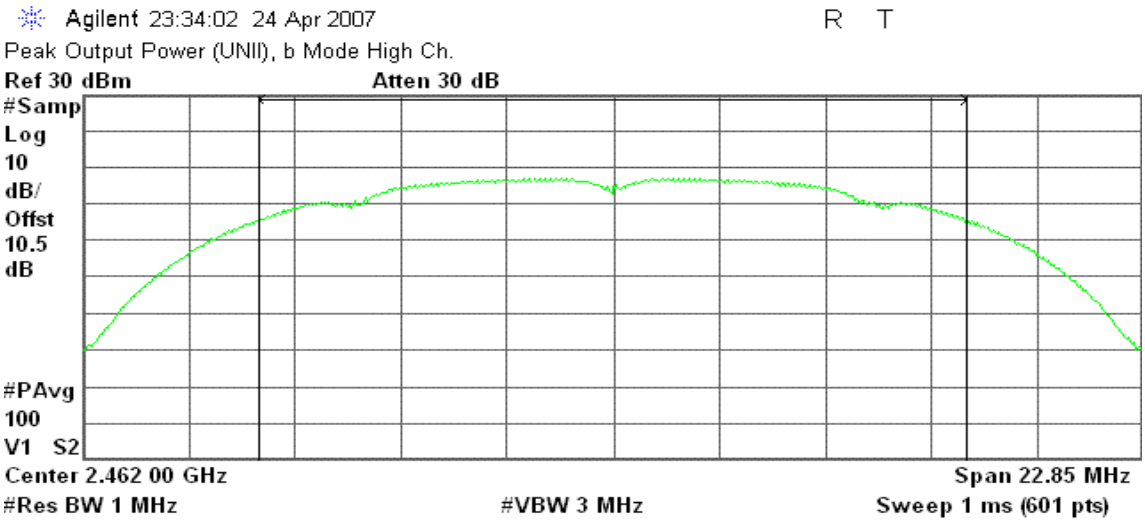
Channel Power

17.54 dBm / 15.2930 MHz

Power Spectral Density

-54.31 dBm/Hz

Average Power (CH High)



Channel Power

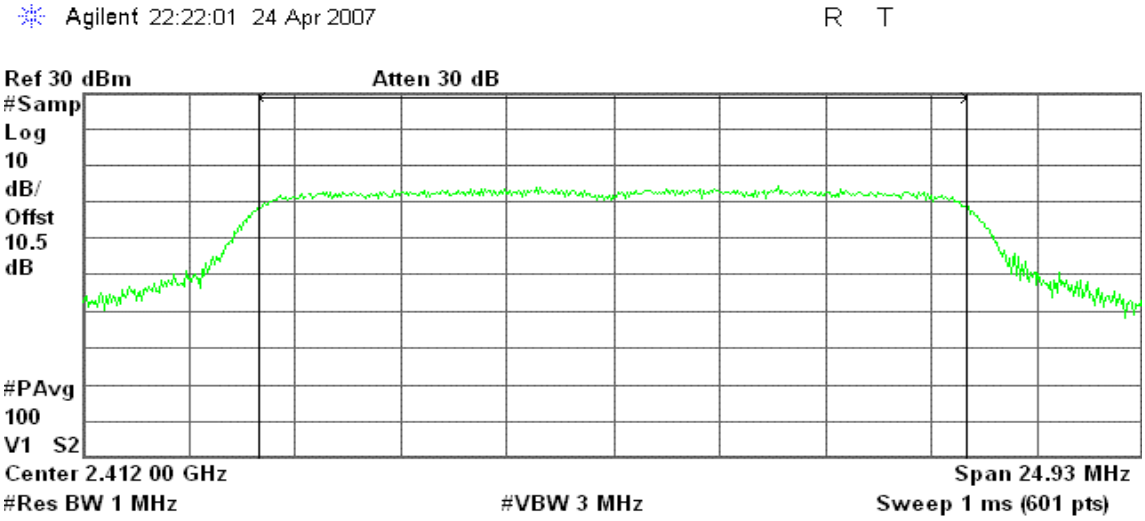
16.00 dBm / 15.2350 MHz

Power Spectral Density

-55.83 dBm/Hz

IEEE 802.11g mode / Chain 1

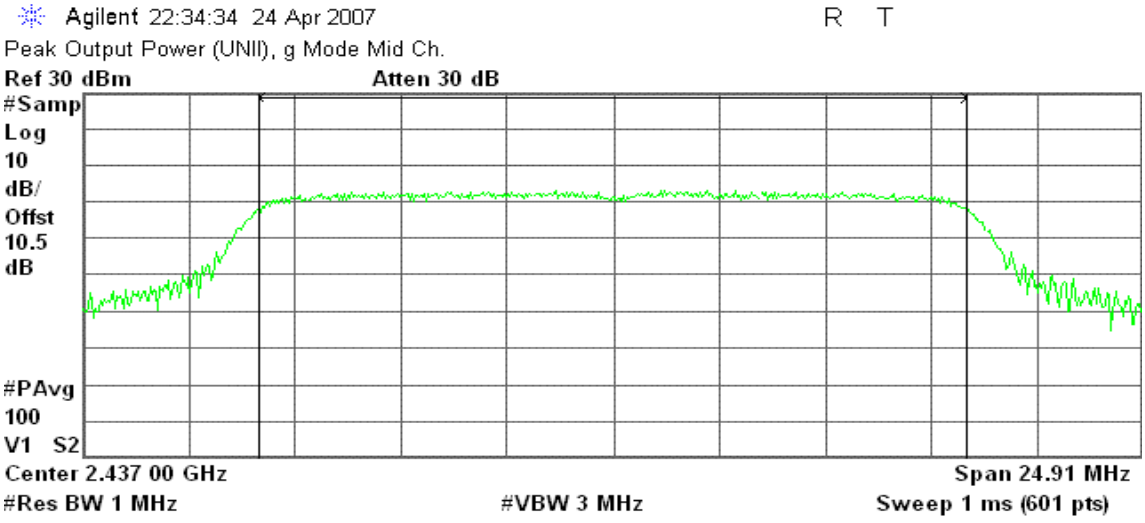
Average Power (CH Low)



Channel Power
14.14 dBm / 16.6180 MHz

Power Spectral Density
-58.07 dBm/Hz

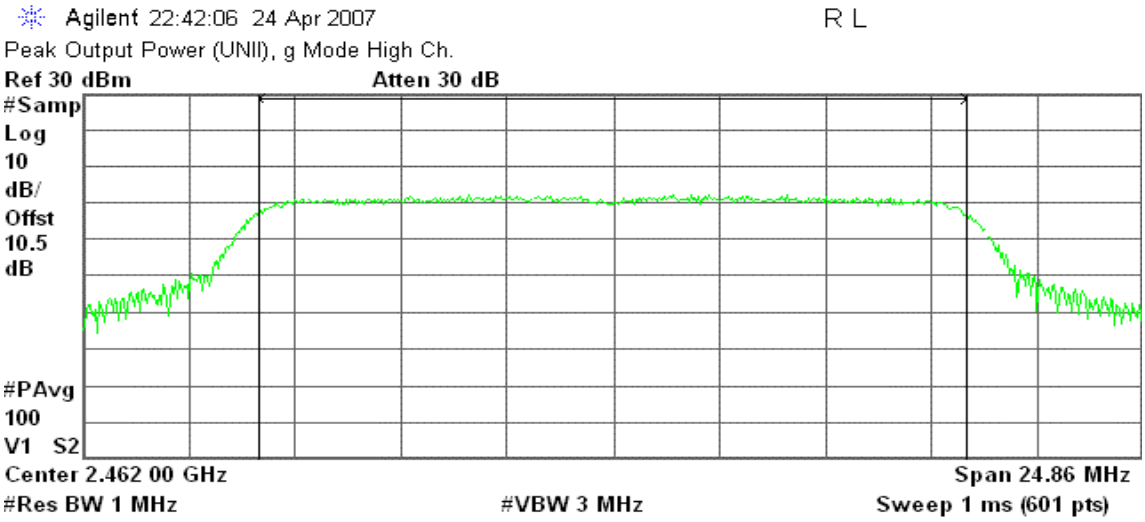
Average Power (CH Mid)



Channel Power
13.47 dBm / 16.6080 MHz

Power Spectral Density
-58.73 dBm/Hz

Average Power (CH High)

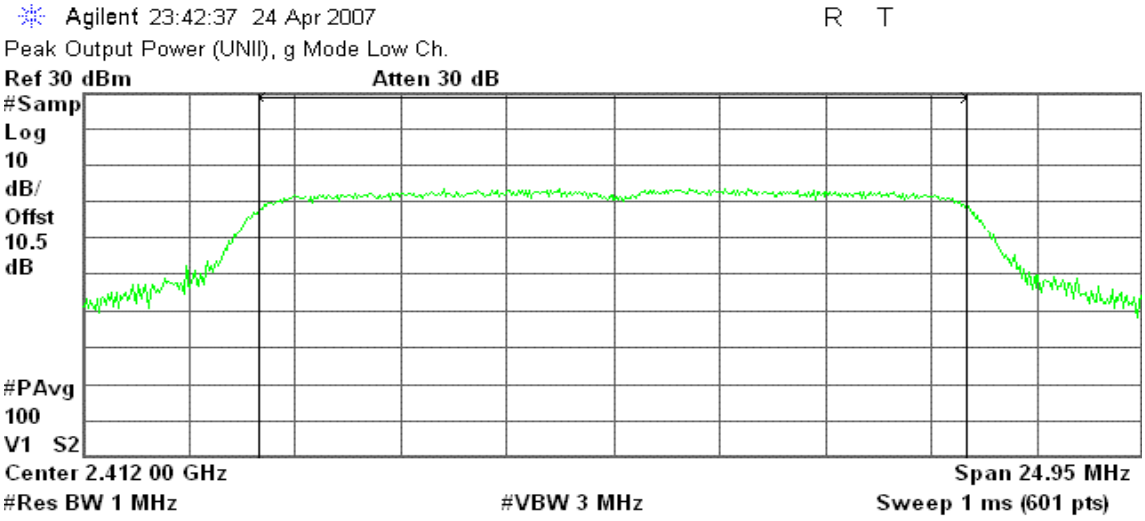


Channel Power
12.63 dBm / 16.5750 MHz

Power Spectral Density
-59.57 dBm/Hz

IEEE 802.11g mode / Chain 0

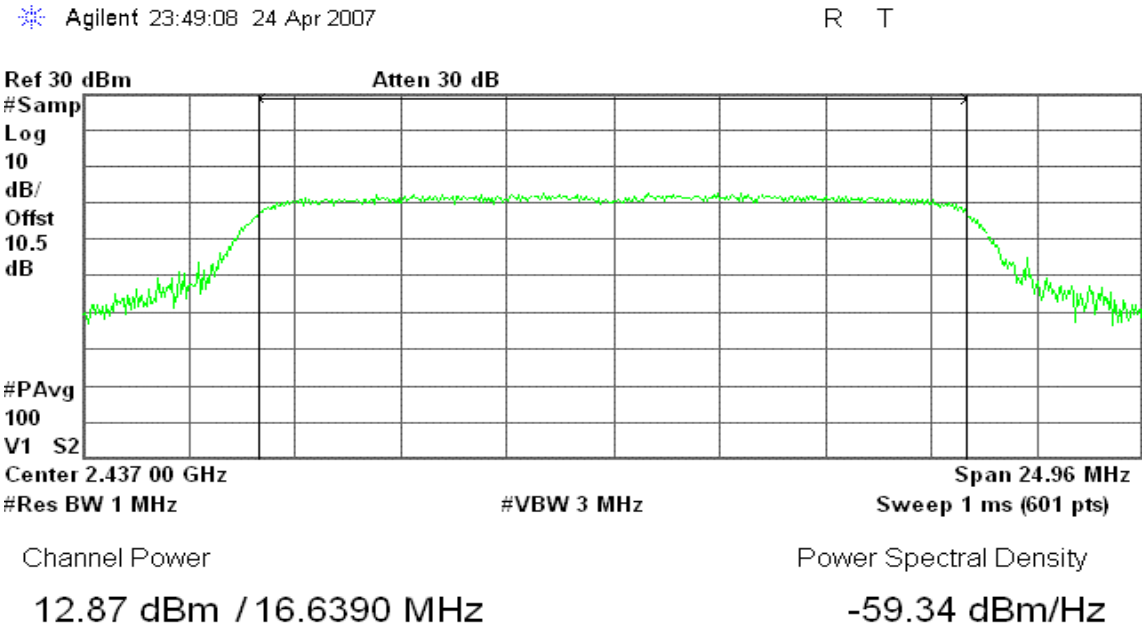
Average Power (CH Low)



Channel Power
14.26 dBm / 16.6340 MHz

Power Spectral Density
-57.95 dBm/Hz

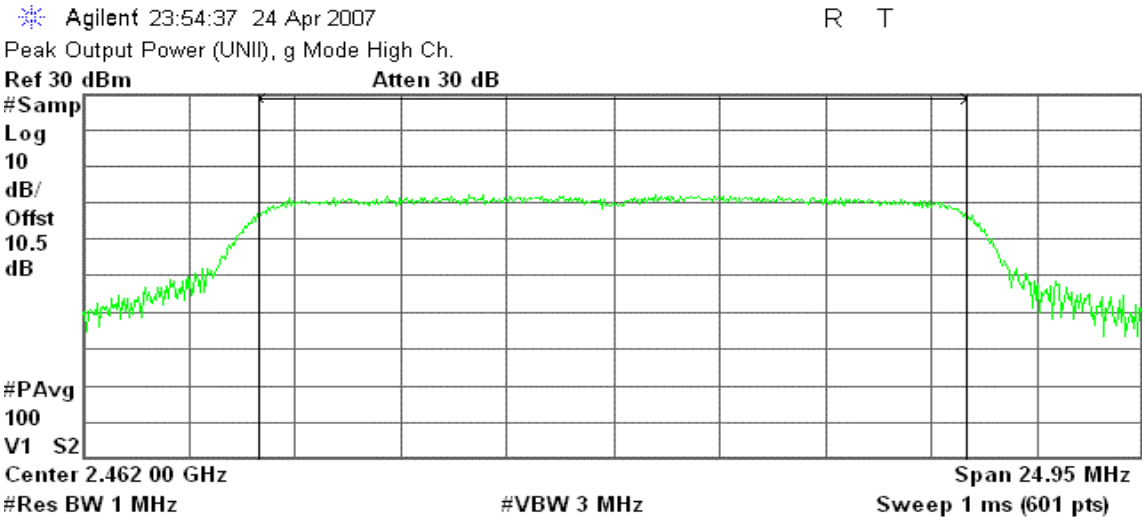
Average Power (CH Mid)



Channel Power
12.87 dBm / 16.6390 MHz

Power Spectral Density
-59.34 dBm/Hz

Average Power (CH High)

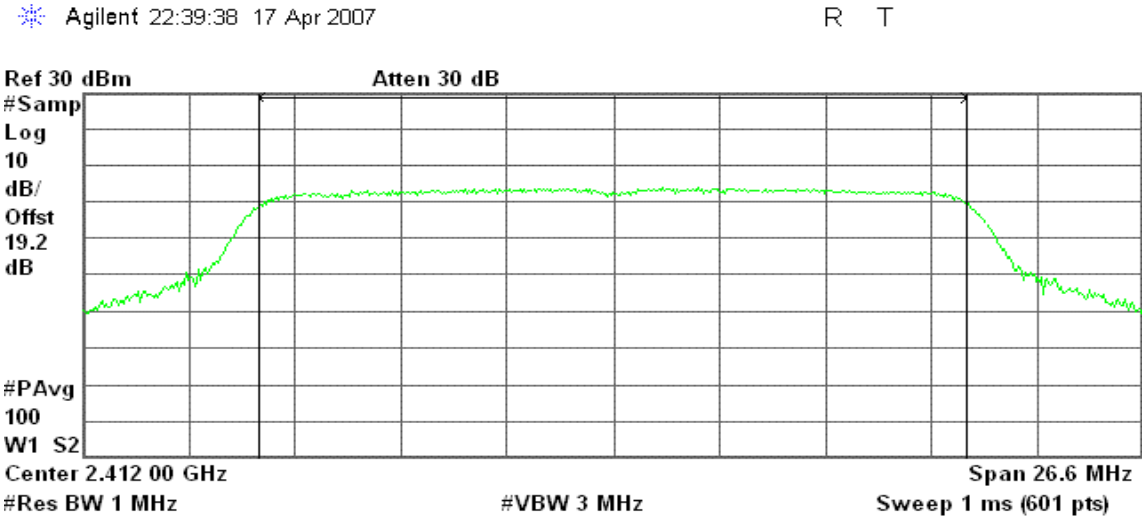


Channel Power
12.55 dBm / 16.6330 MHz

Power Spectral Density
-59.66 dBm/Hz

draft 802.11n Standard-20 MHz Channel mode

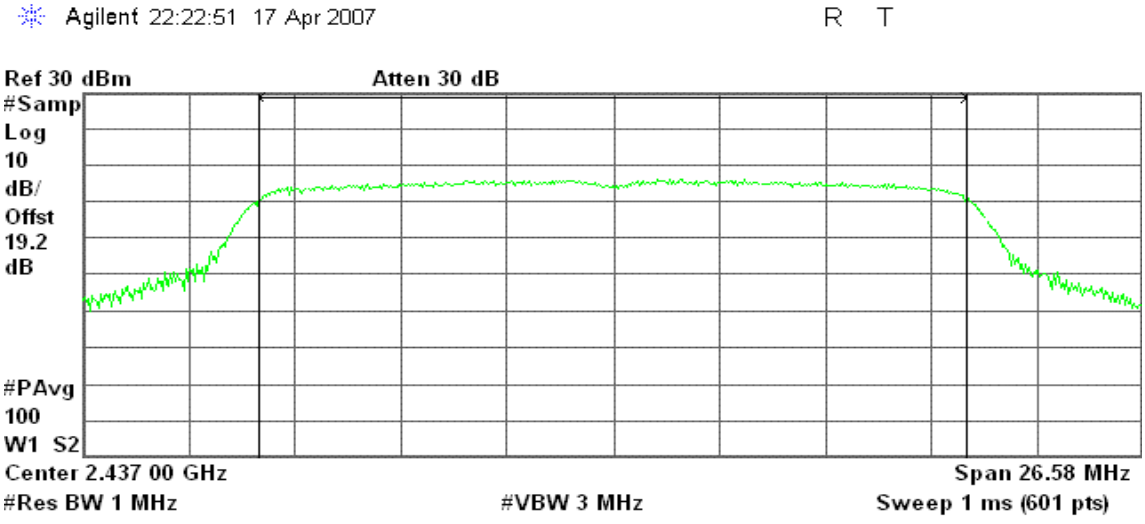
Average Power (CH Low)



Channel Power
15.27 dBm / 17.7360 MHz

Power Spectral Density
-57.22 dBm/Hz

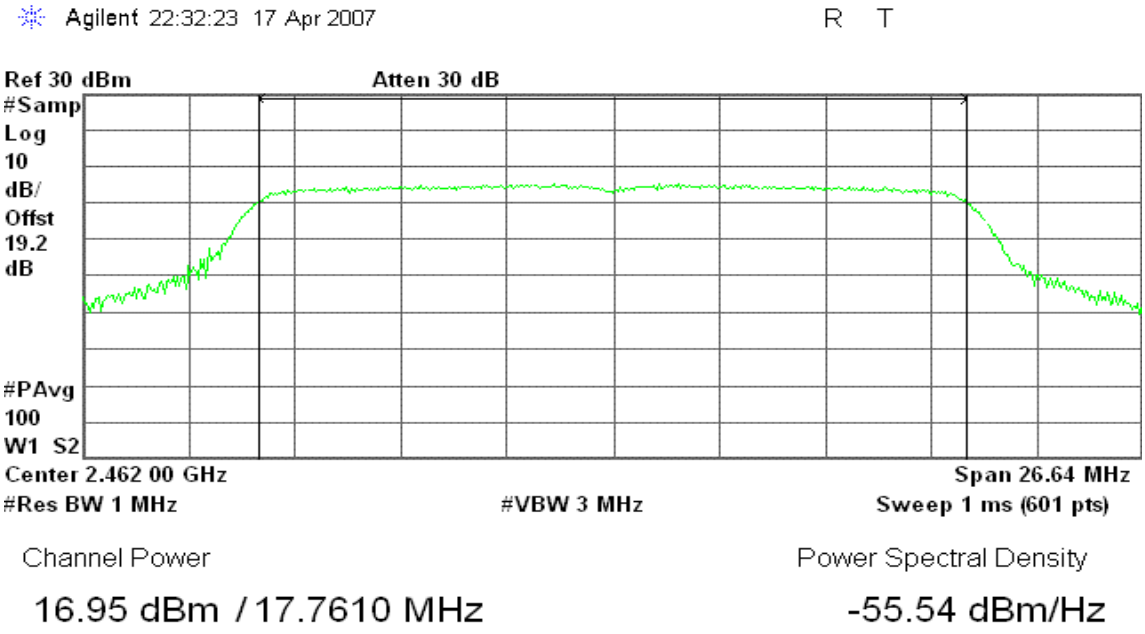
Average Power (CH Mid)



Channel Power
17.16 dBm / 17.7200 MHz

Power Spectral Density
-55.32 dBm/Hz

Average Power (CH High)

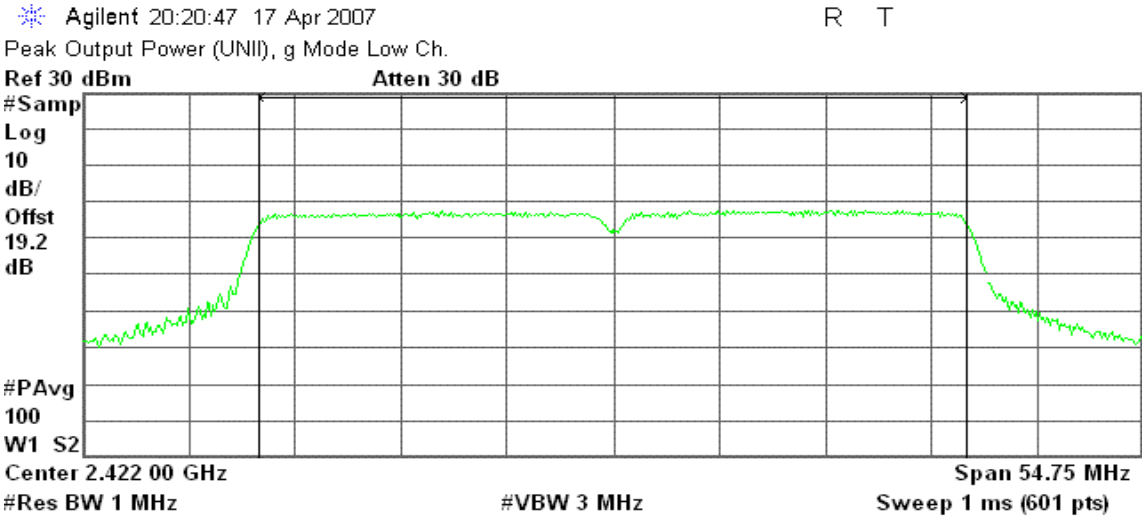


Channel Power
16.95 dBm / 17.7610 MHz

Power Spectral Density
-55.54 dBm/Hz

draft 802.11n Wide-40 MHz Channel mode

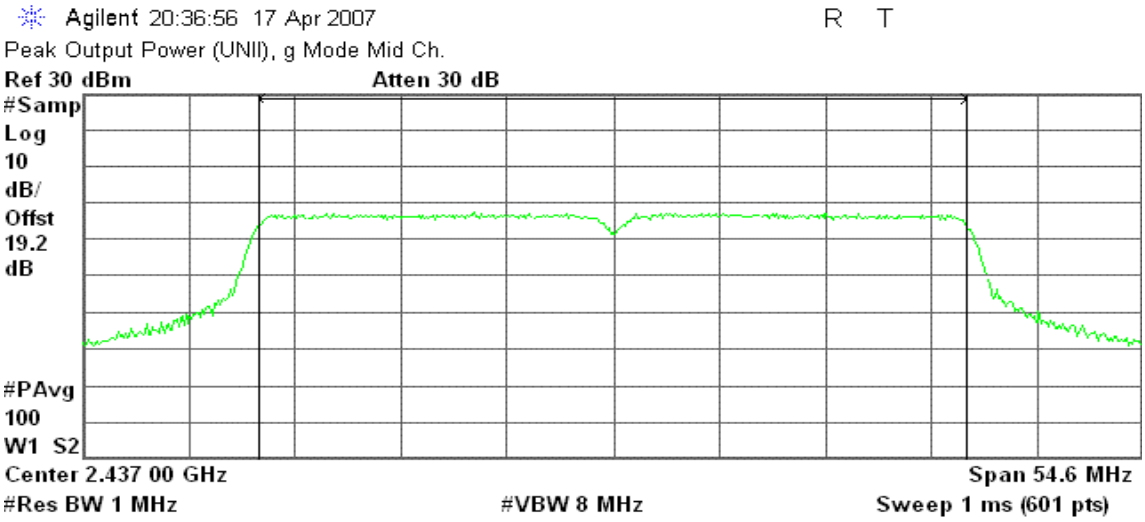
Average Power (CH Low)



Channel Power
10.92 dBm / 36.4980 MHz

Power Spectral Density
-64.70 dBm/Hz

Average Power (CH Mid)



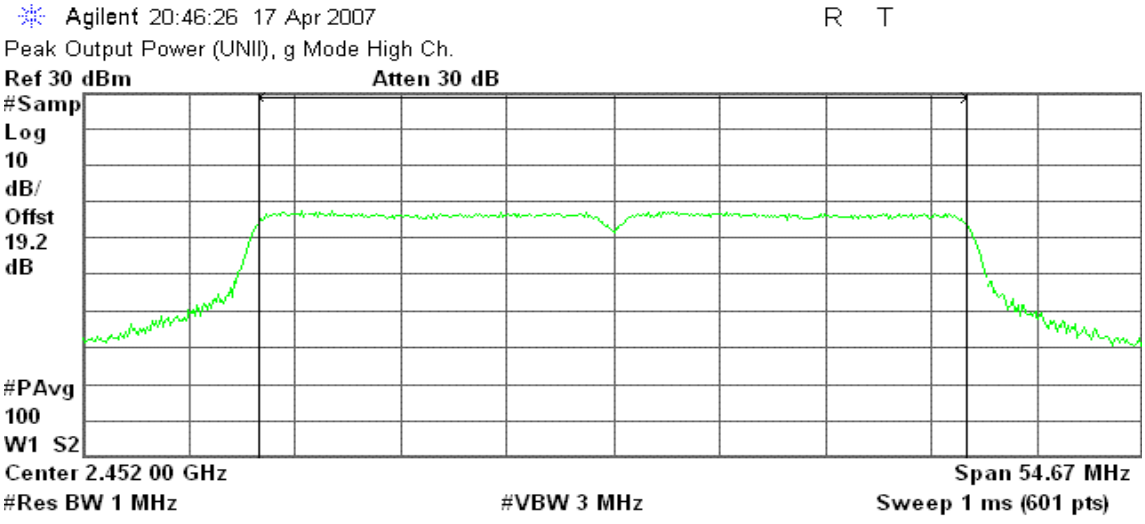
Channel Power

11.47 dBm / 36.4030 MHz

Power Spectral Density

-64.14 dBm/Hz

Average Power (CH High)



Channel Power

12.04 dBm / 36.4470 MHz

Power Spectral Density

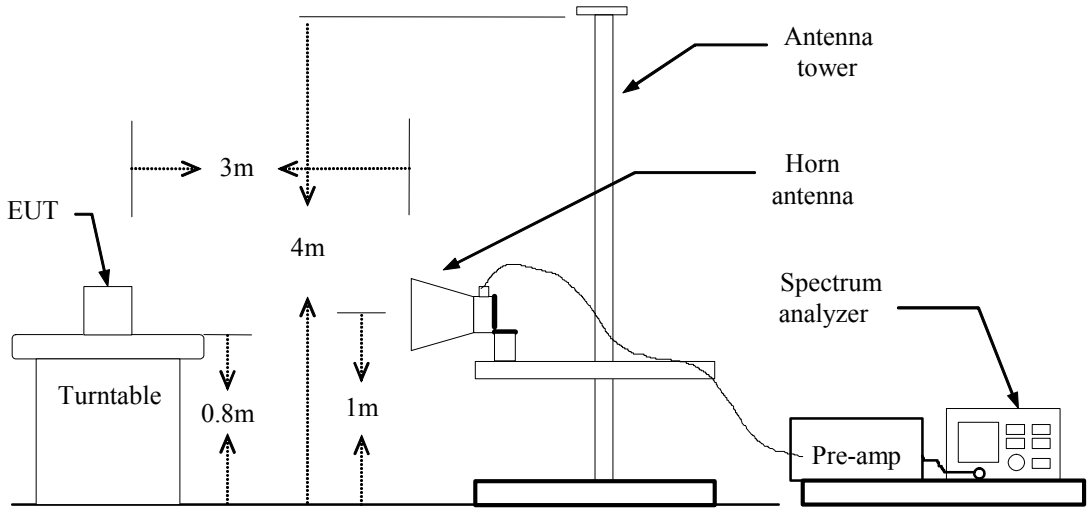
-63.57 dBm/Hz

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

Test Configuration



TEST PROCEDURE

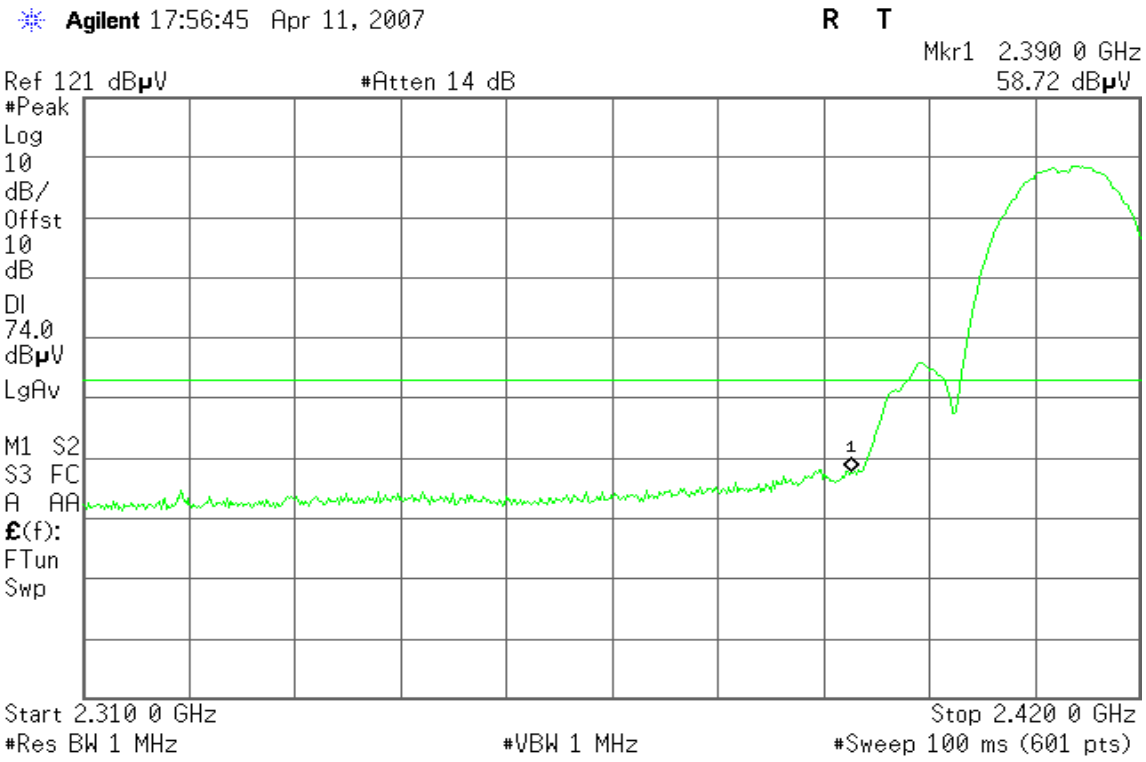
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the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

TEST RESULTS

Refer to attach spectrum analyzer data chart.

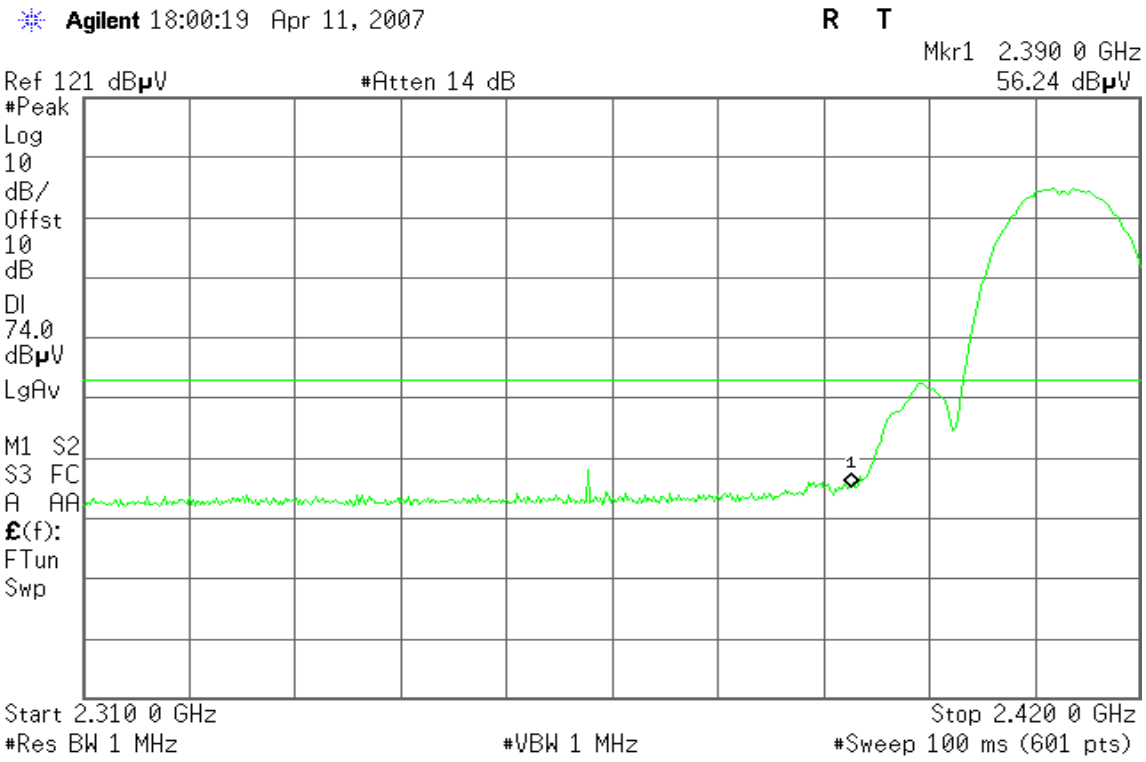
Band Edges (IEEE 802.11b mode / CH Low)

Detector mode: Peak Polarity: Vertical

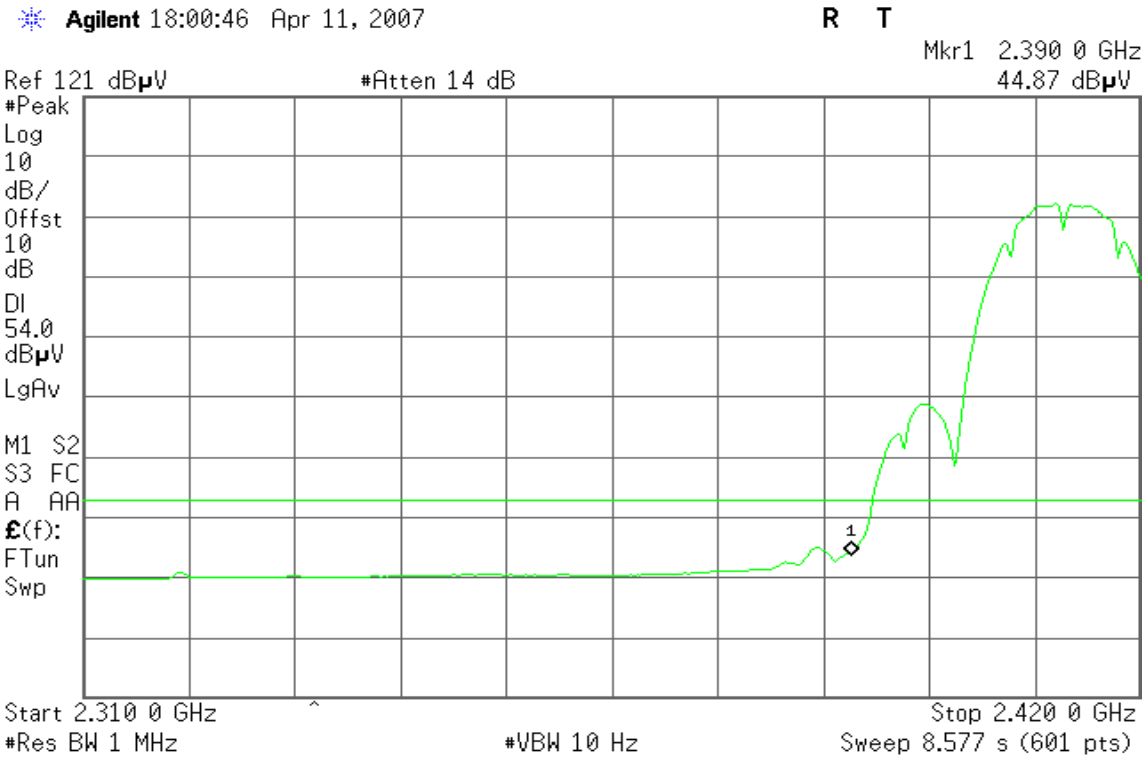


Detector mode: Average Polarity: Vertical

Detector mode: Peak **Polarity: Horizontal**

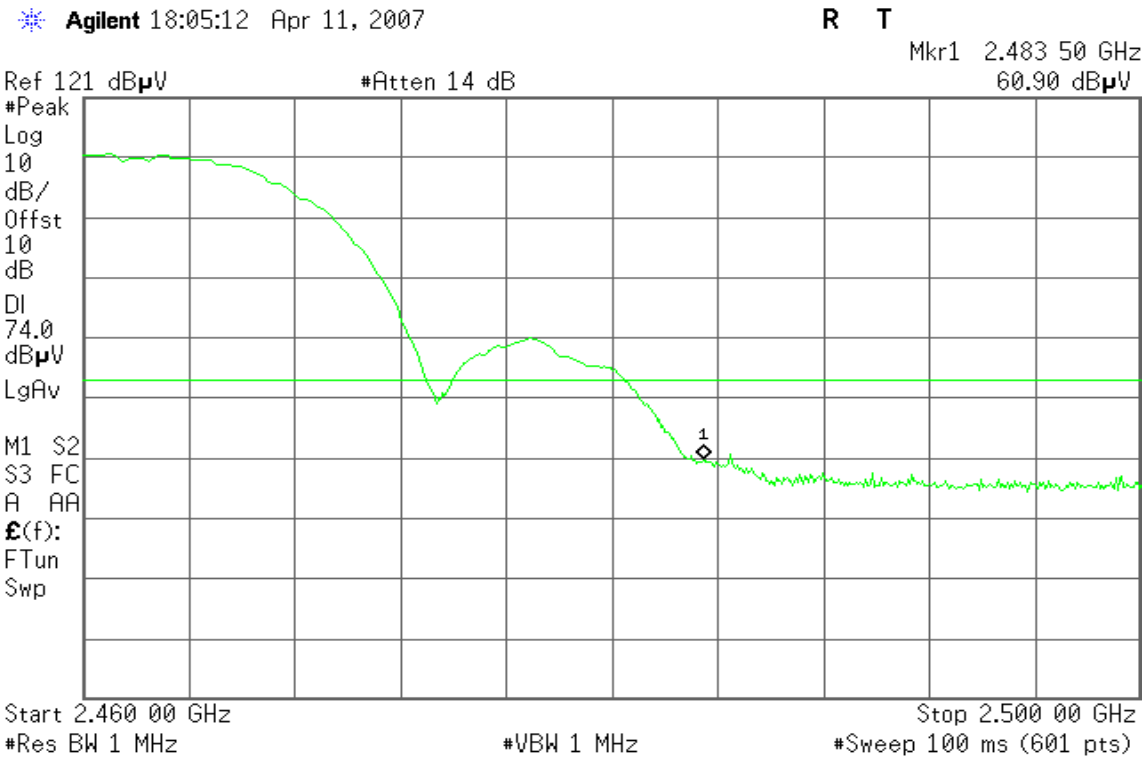


Detector mode: Average **Polarity: Horizontal**

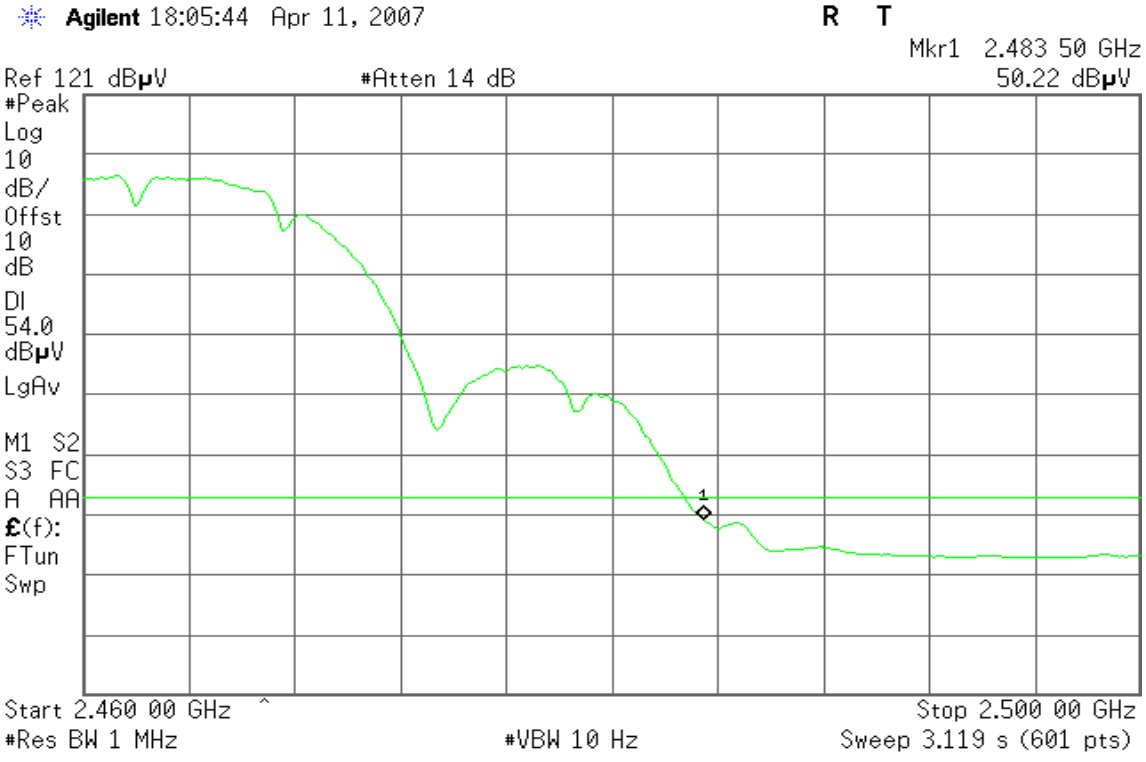


Band Edges (IEEE 802.11b mode / CH High)

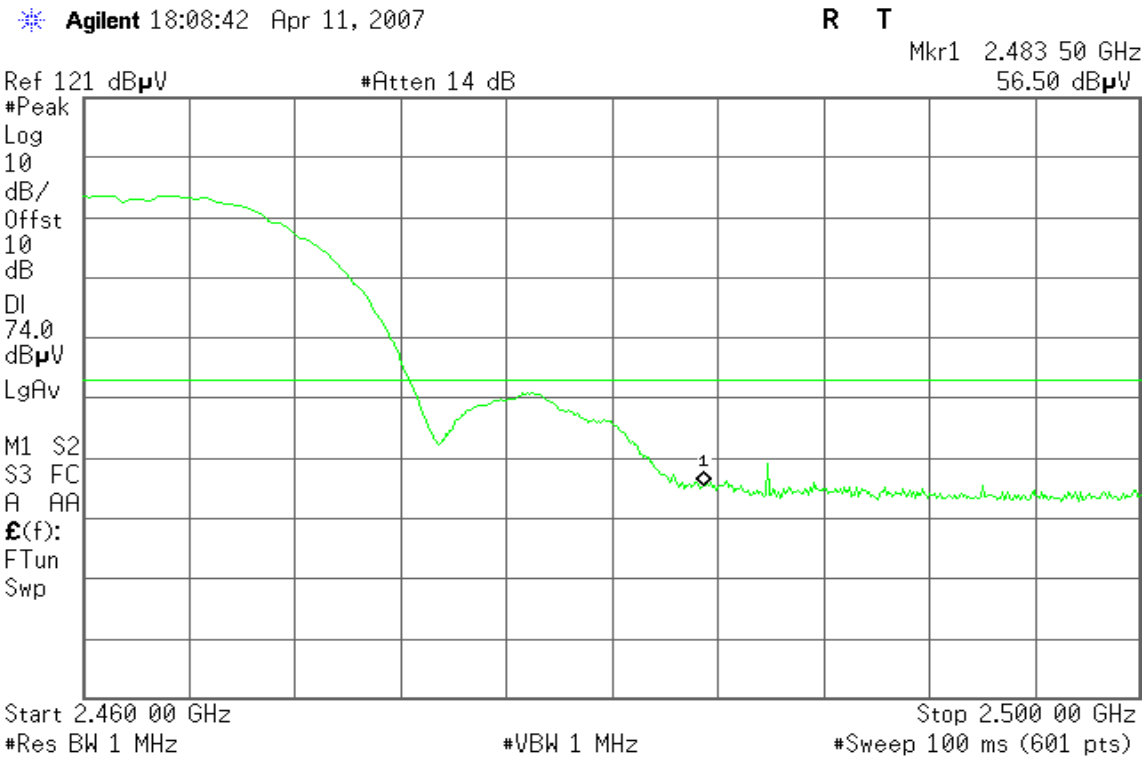
Detector mode: Peak Polarity: Vertical



Detector mode: Average Polarity: Vertical



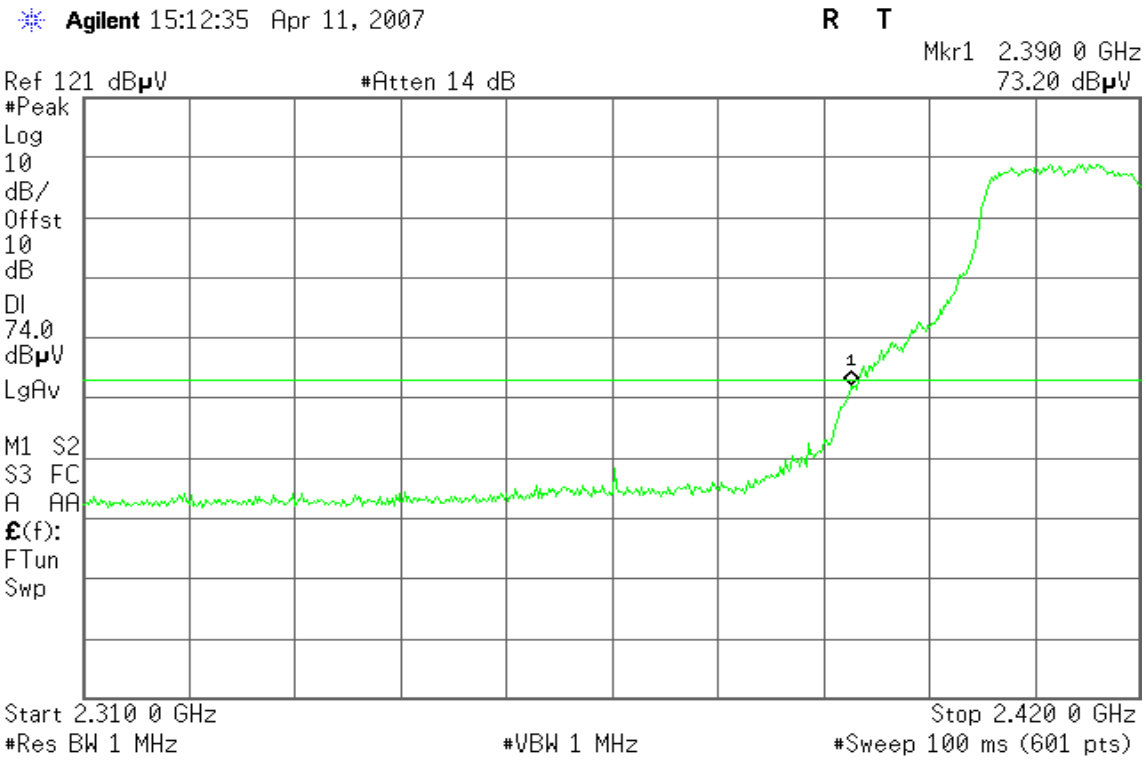
Detector mode: Peak **Polarity: Horizontal**



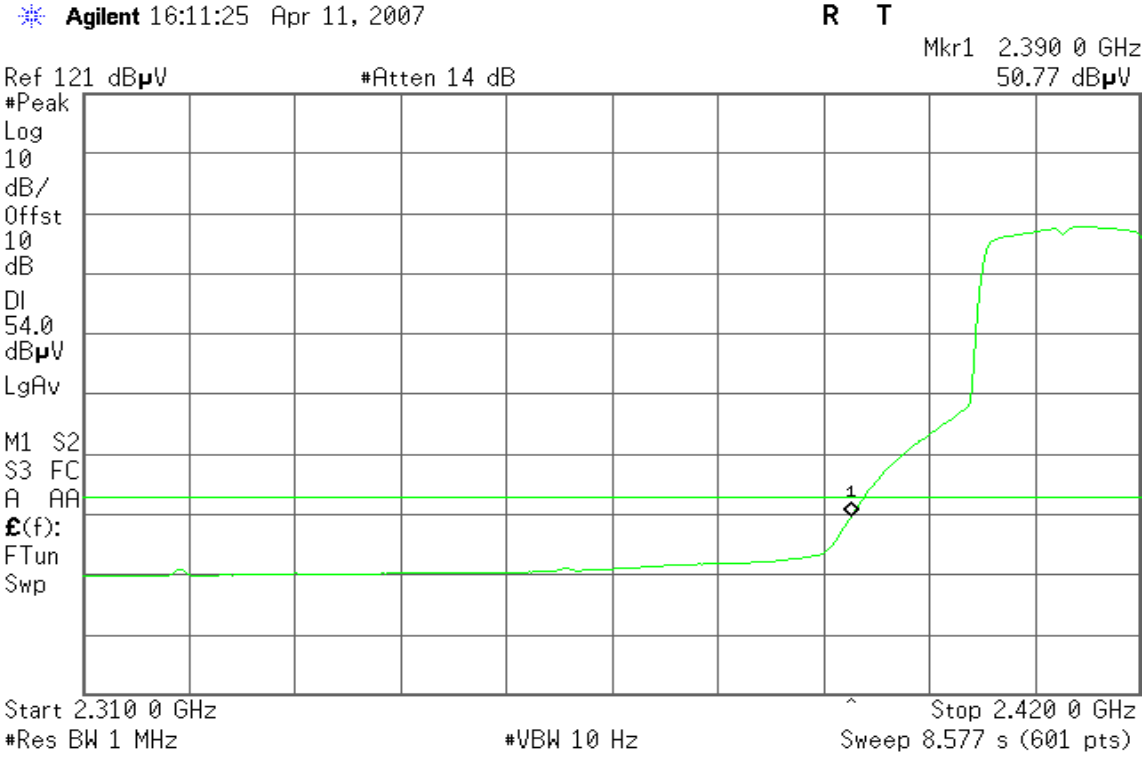
Detector mode: Average **Polarity: Horizontal**

Band Edges (IEEE 802.11g mode / CH Low)

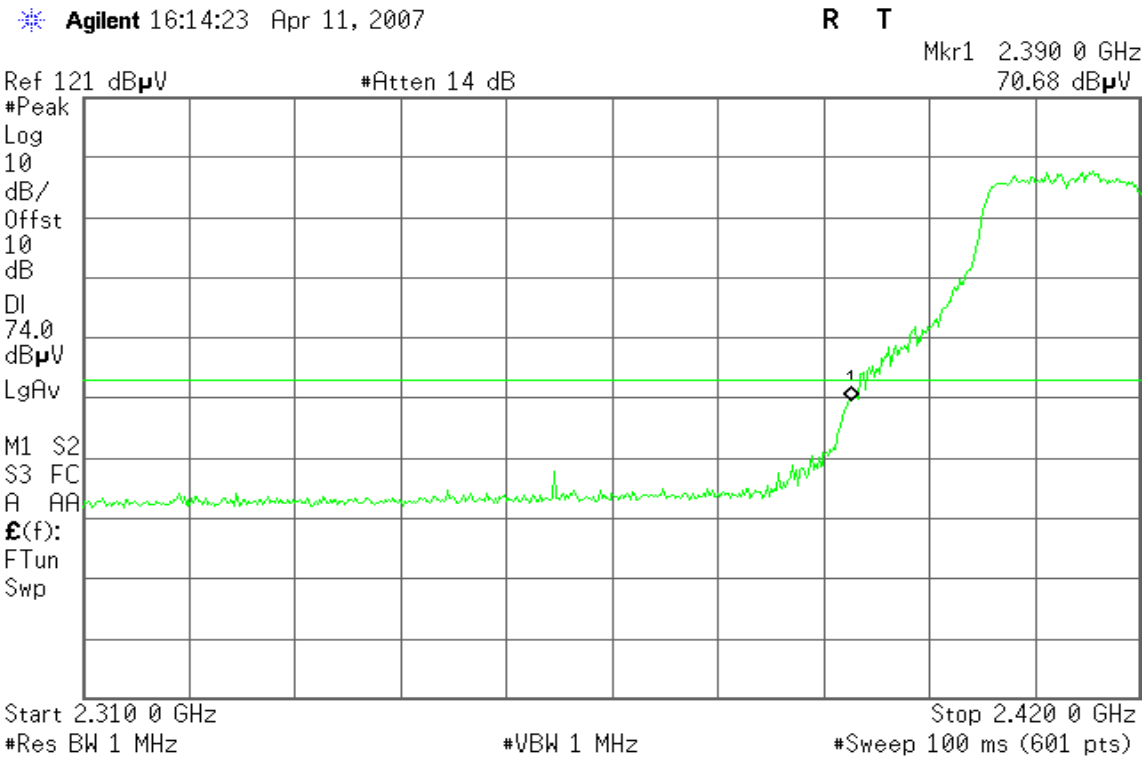
Detector mode: Peak Polarity: Vertical



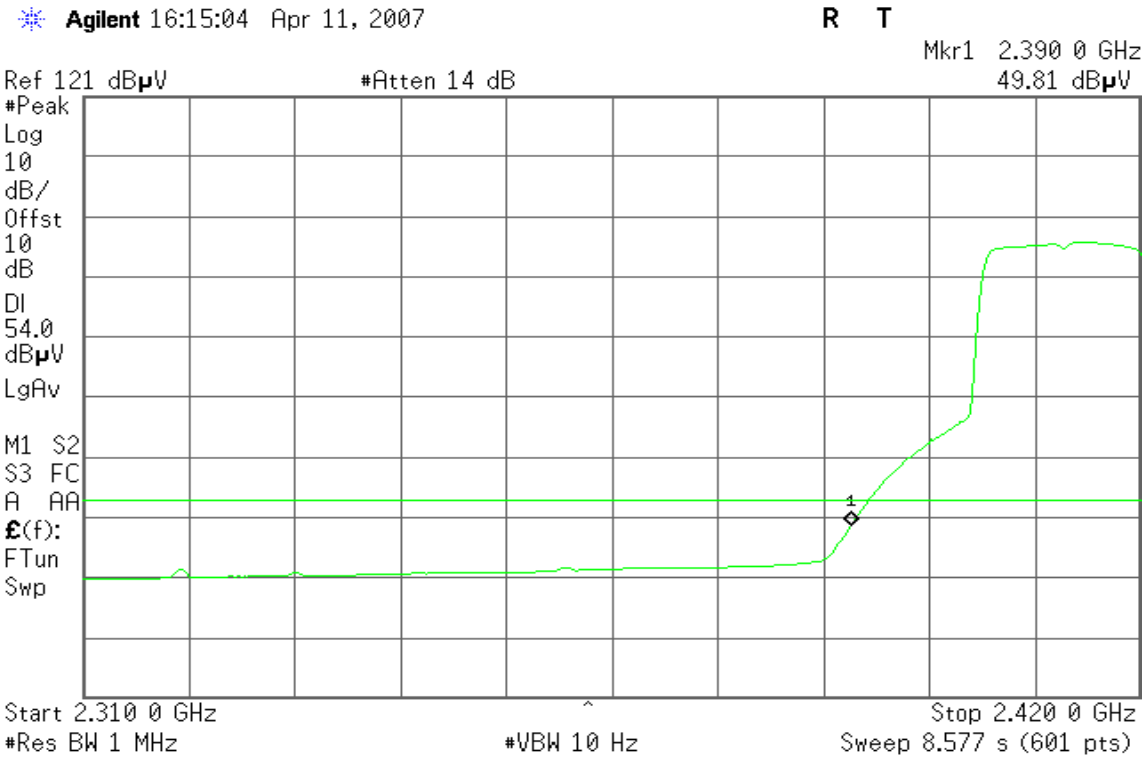
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

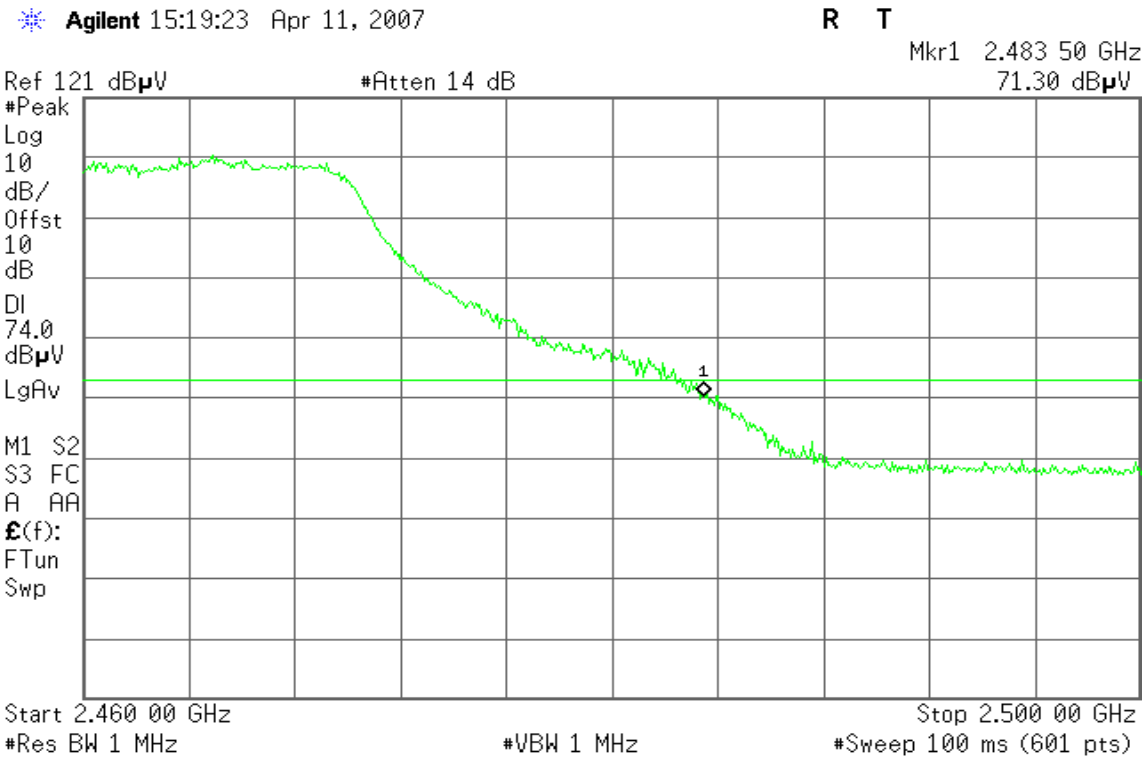


Detector mode: Average **Polarity: Horizontal**

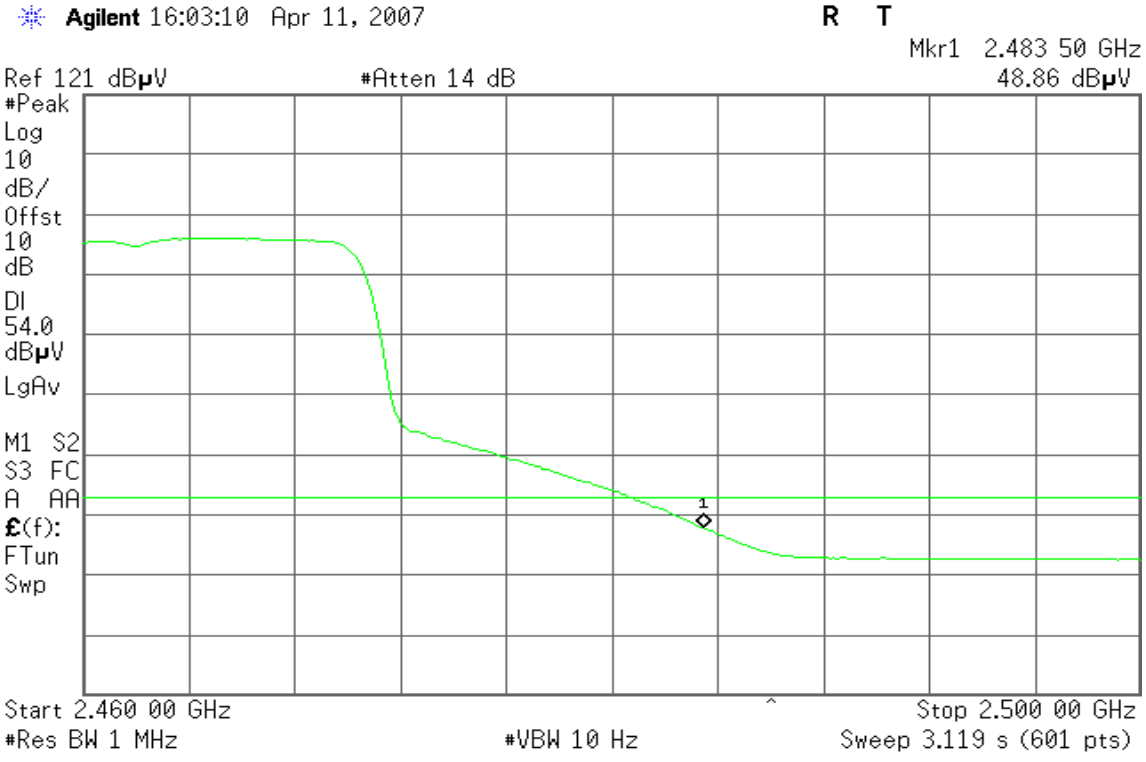


Band Edges (IEEE 802.11g mode / CH High)

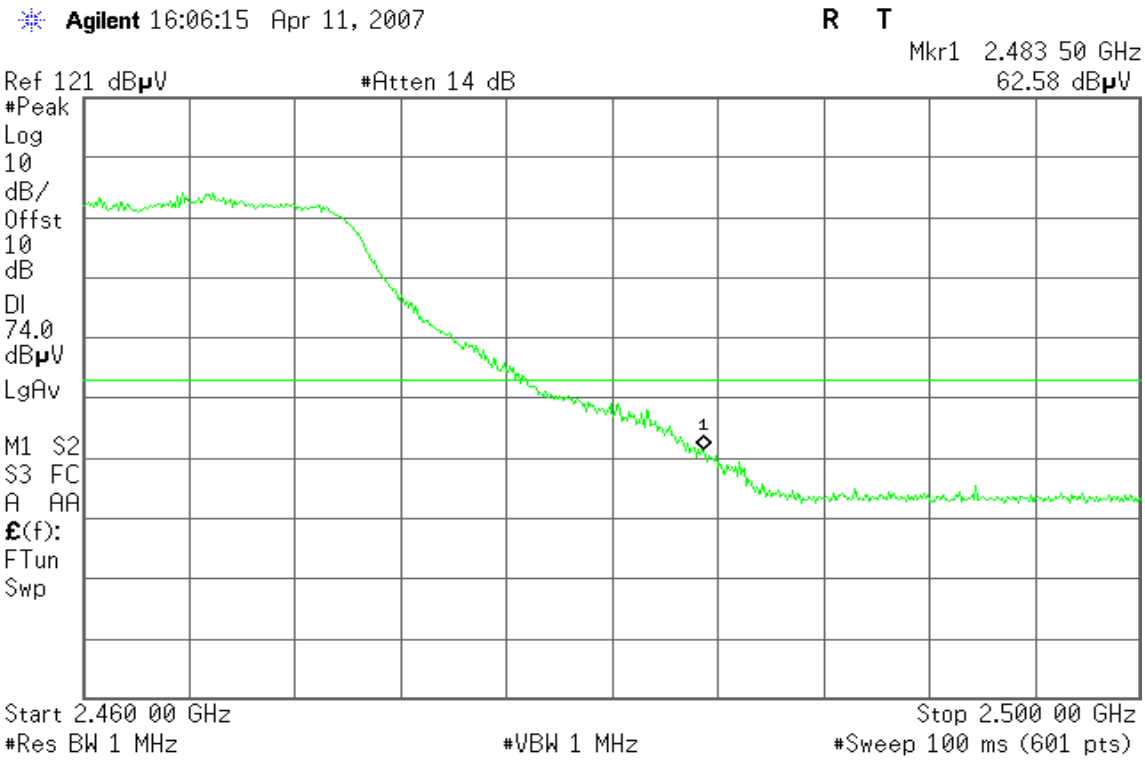
Detector mode: Peak Polarity: Vertical



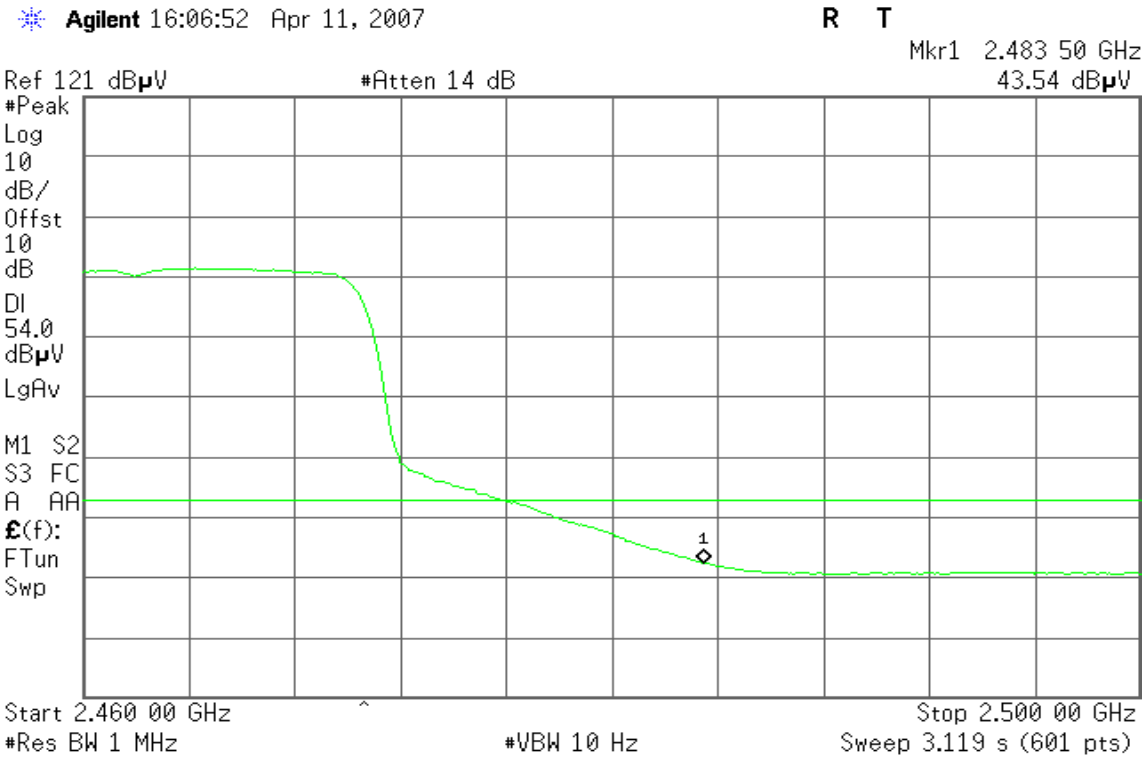
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

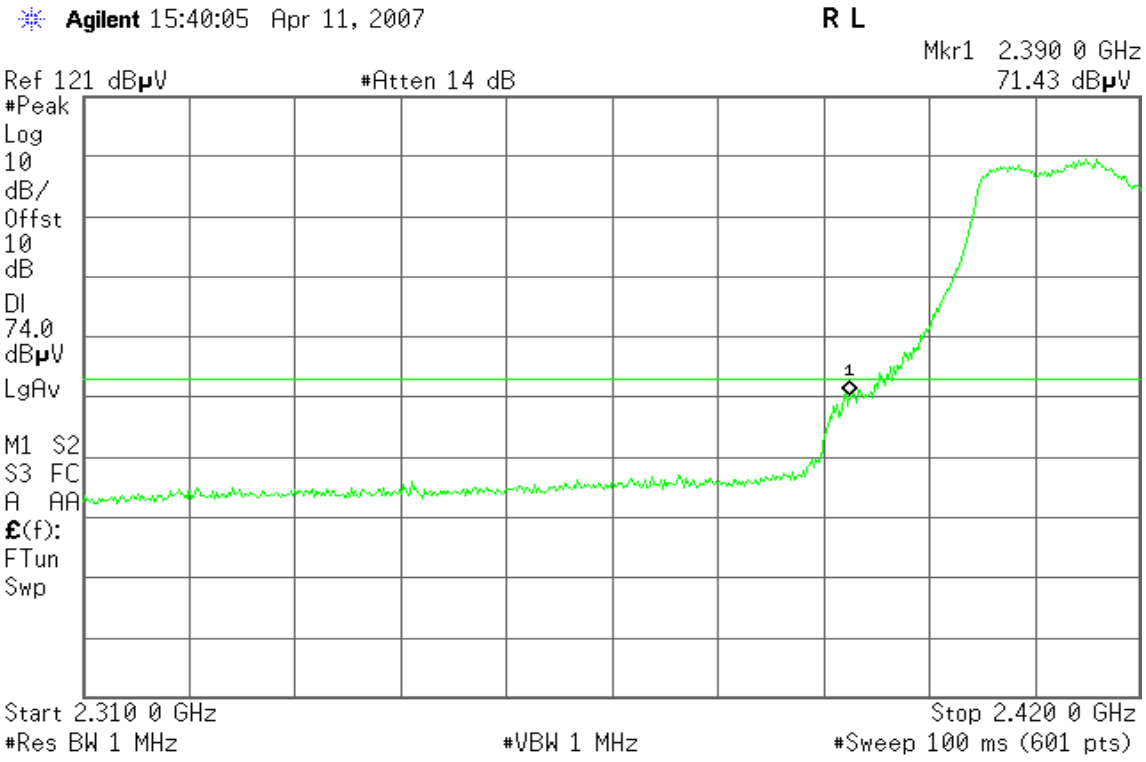


Detector mode: Average **Polarity: Horizontal**



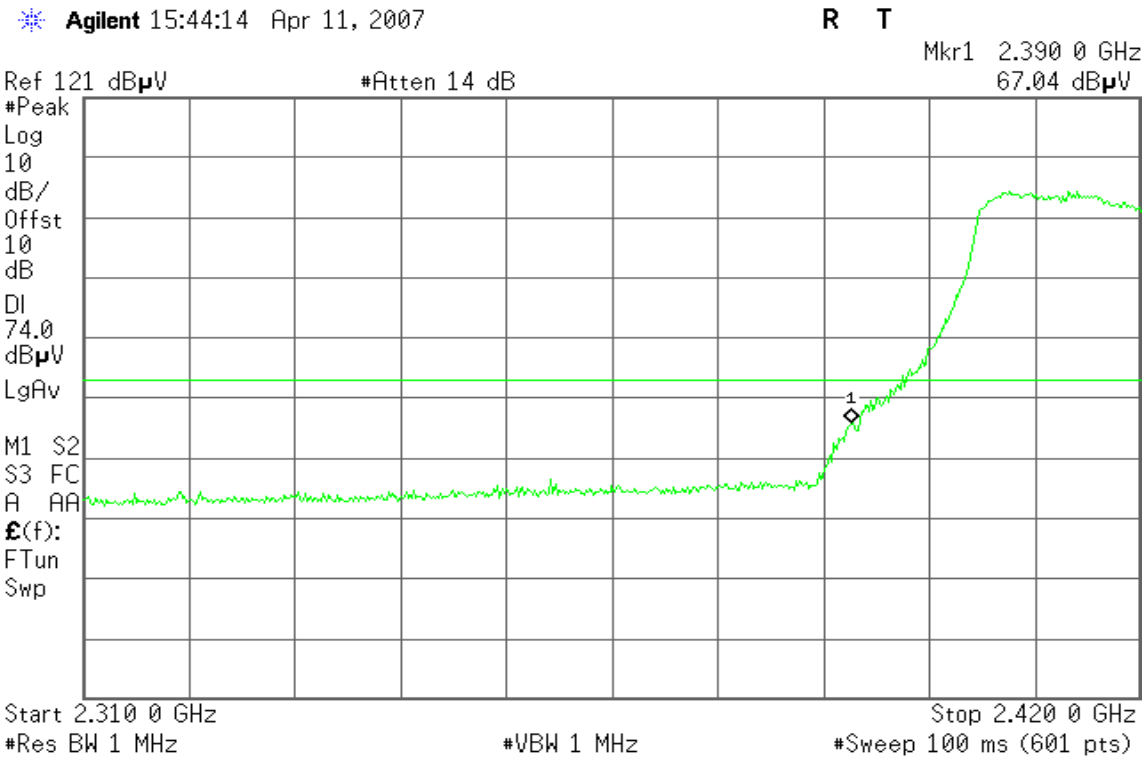
Band Edges (draft 802.11n Standard-20 MHz Channel mode / CH Low)

Detector mode: Peak **Polarity: Vertical**

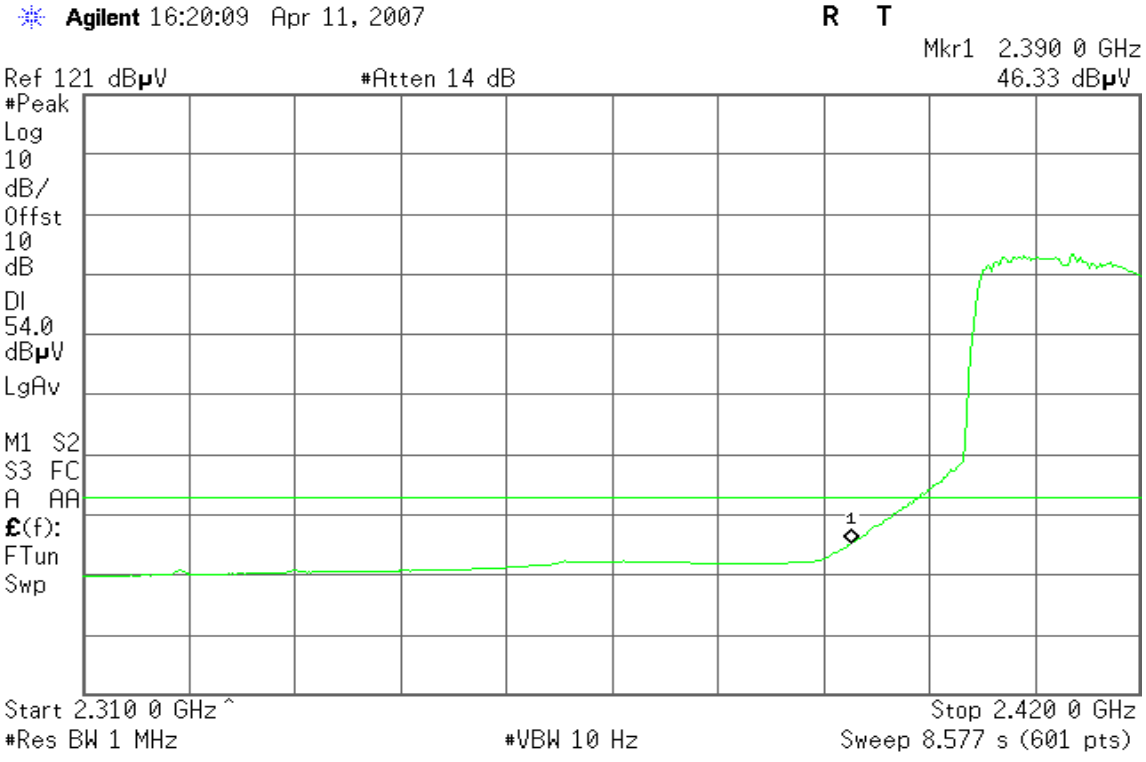


Detector mode: Average **Polarity: Vertical**

Detector mode: Peak **Polarity: Horizontal**

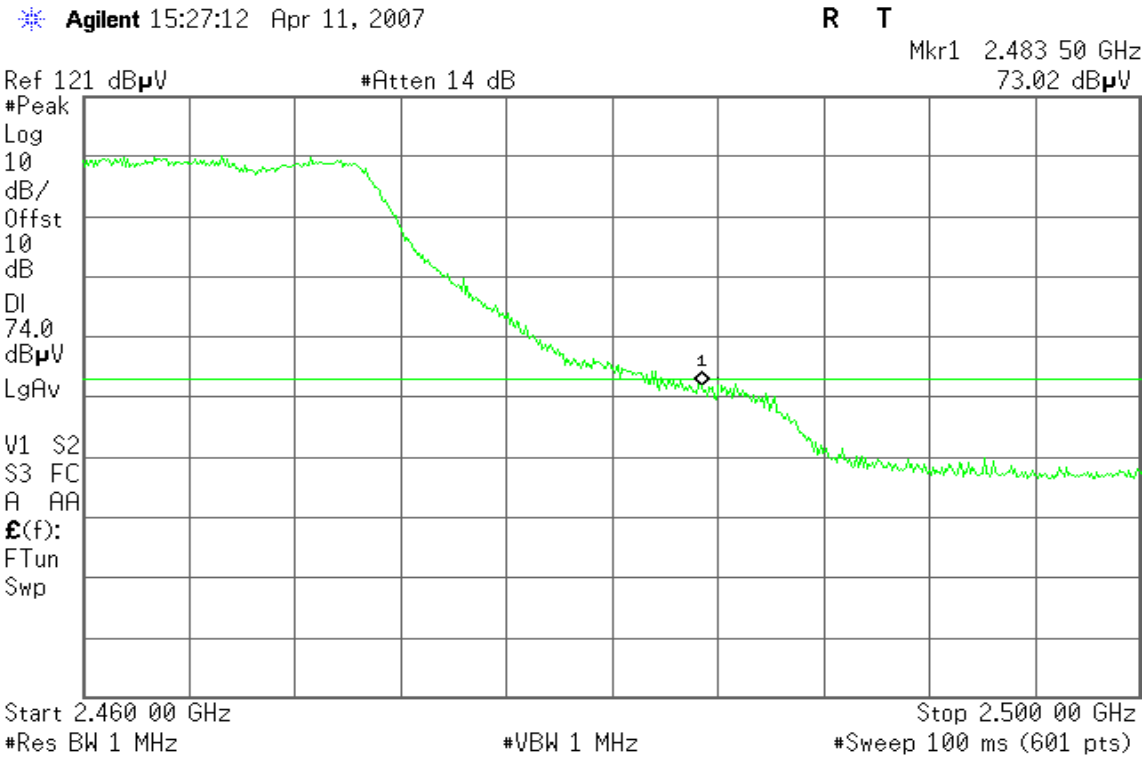


Detector mode: Average **Polarity: Horizontal**

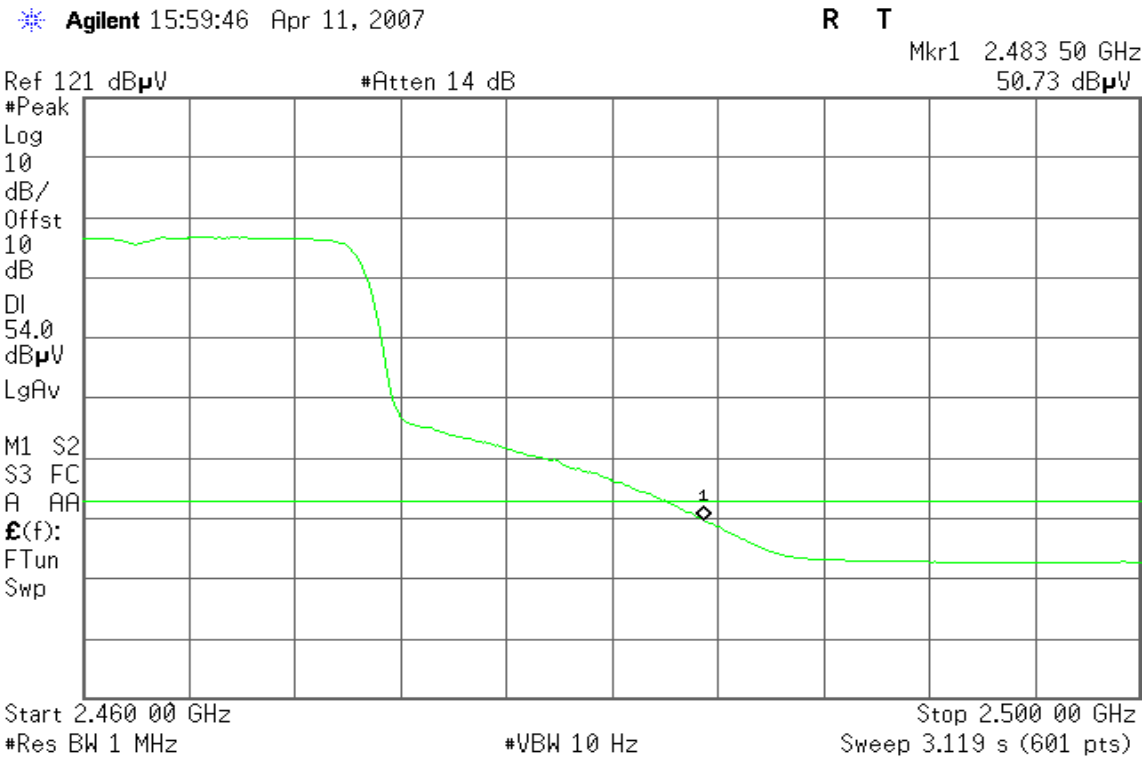


Band Edges (draft 802.11n Standard-20 MHz Channel mode / CH High)

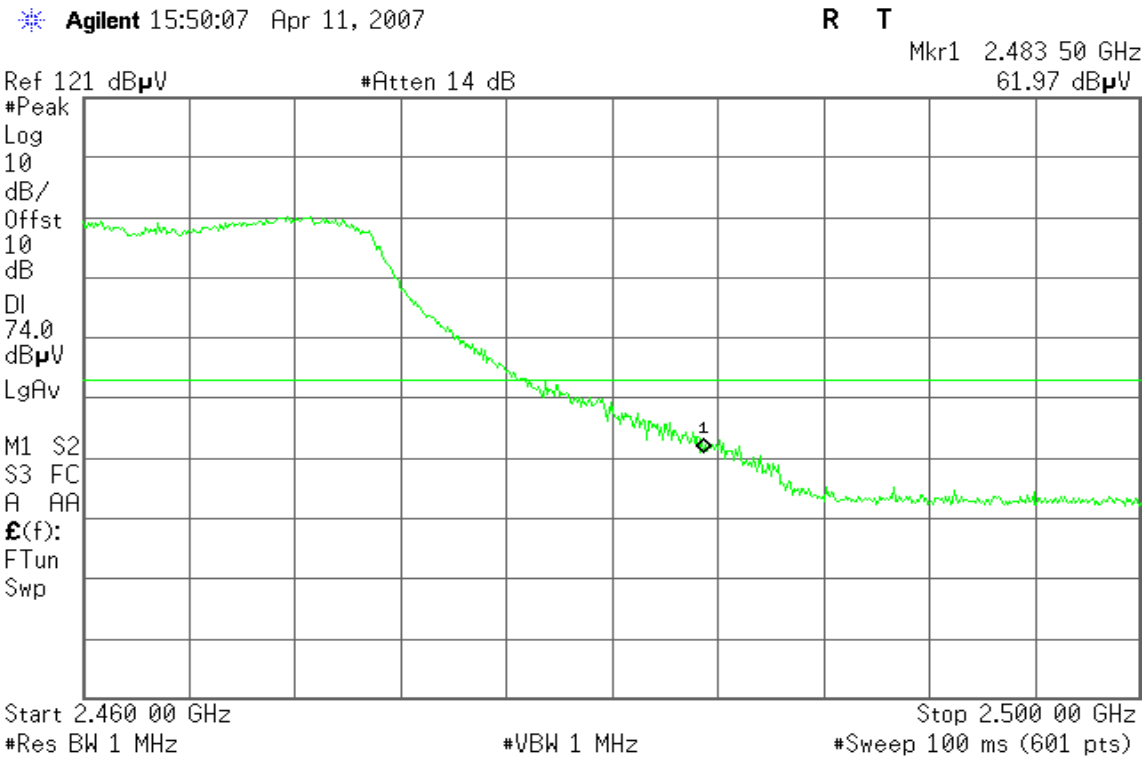
Detector mode: Peak **Polarity: Vertical**



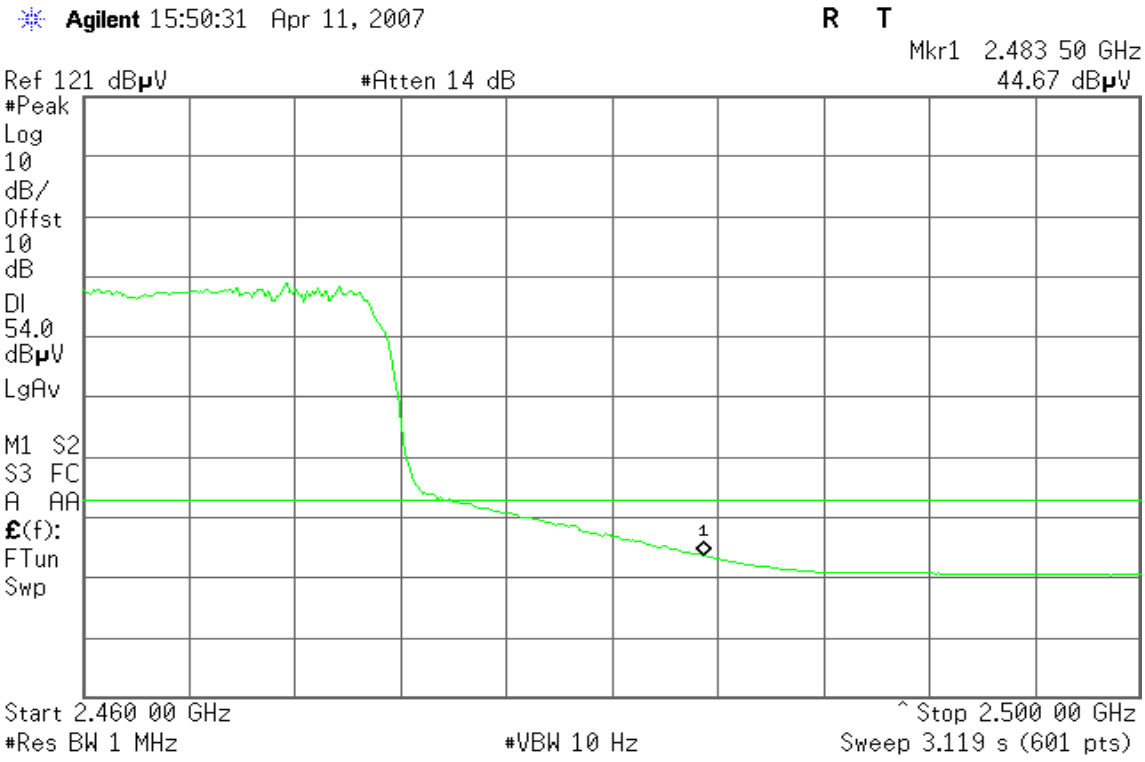
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

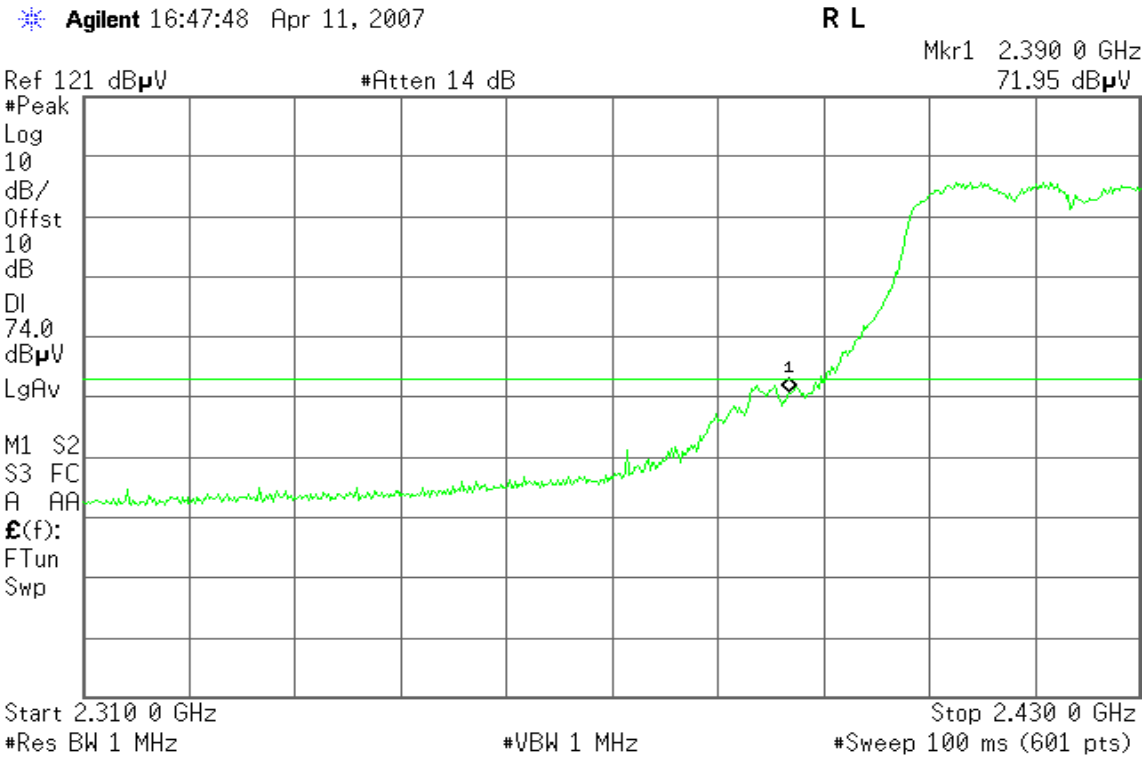


Detector mode: Average **Polarity: Horizontal**

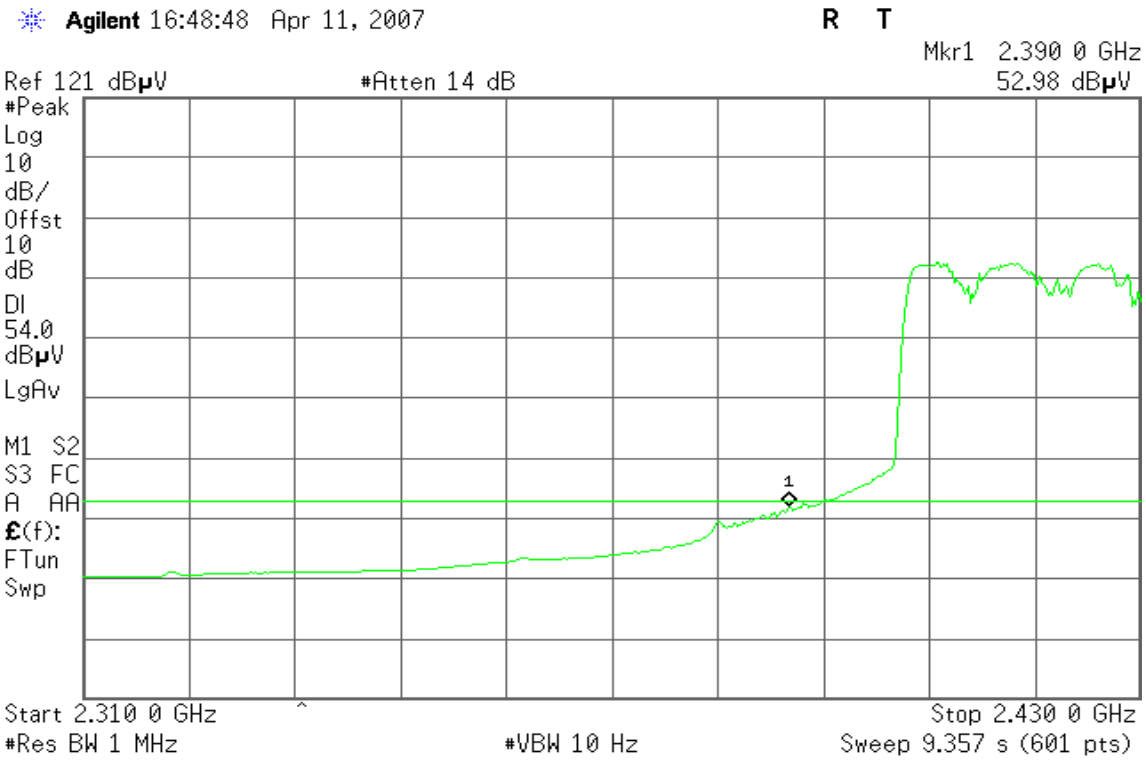


Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH Low)

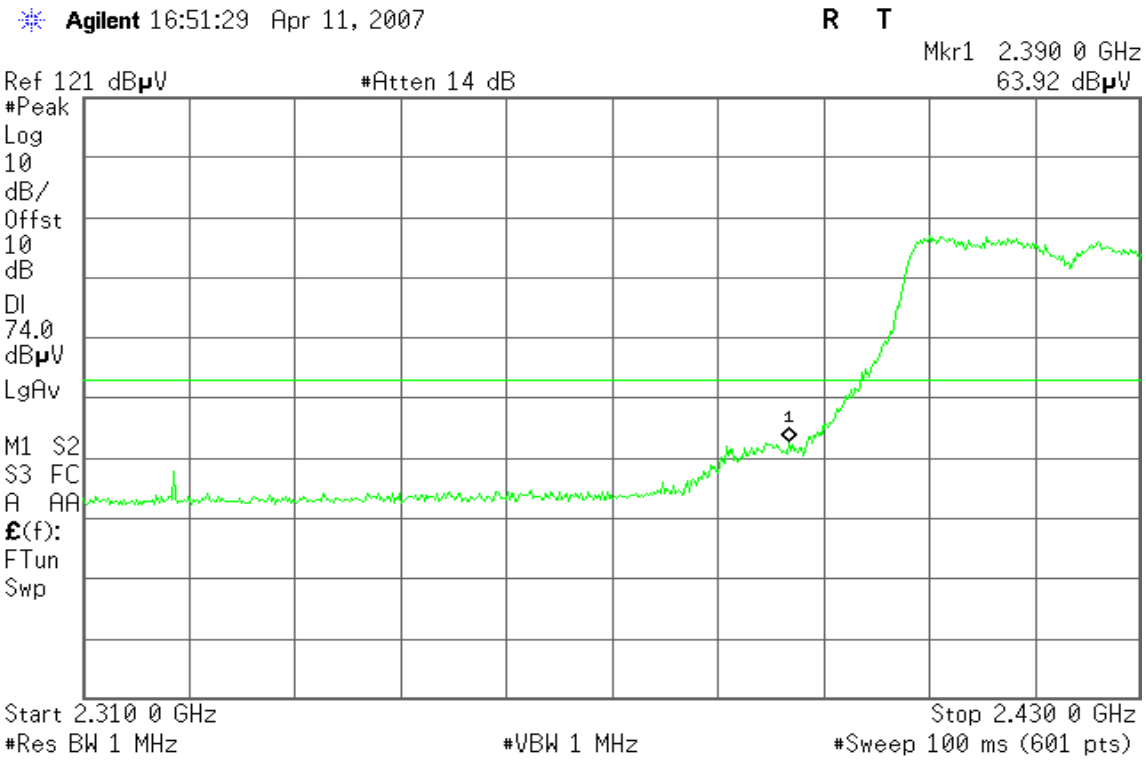
Detector mode: Peak **Polarity: Vertical**



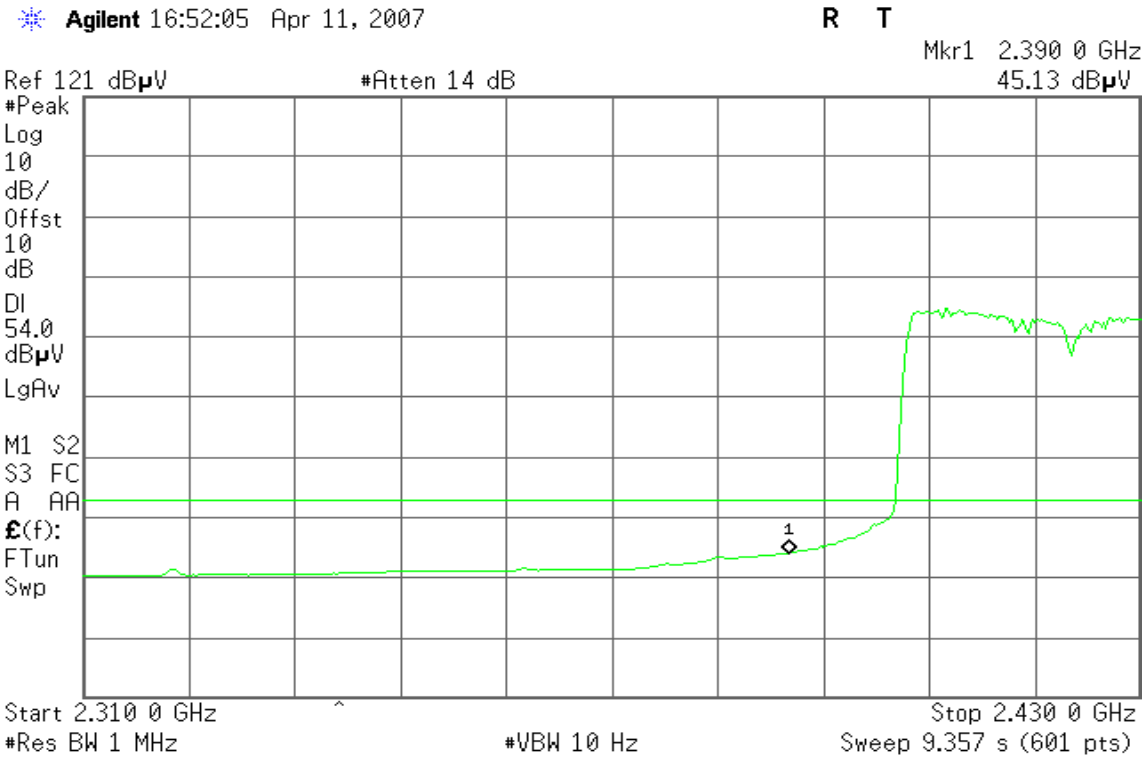
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

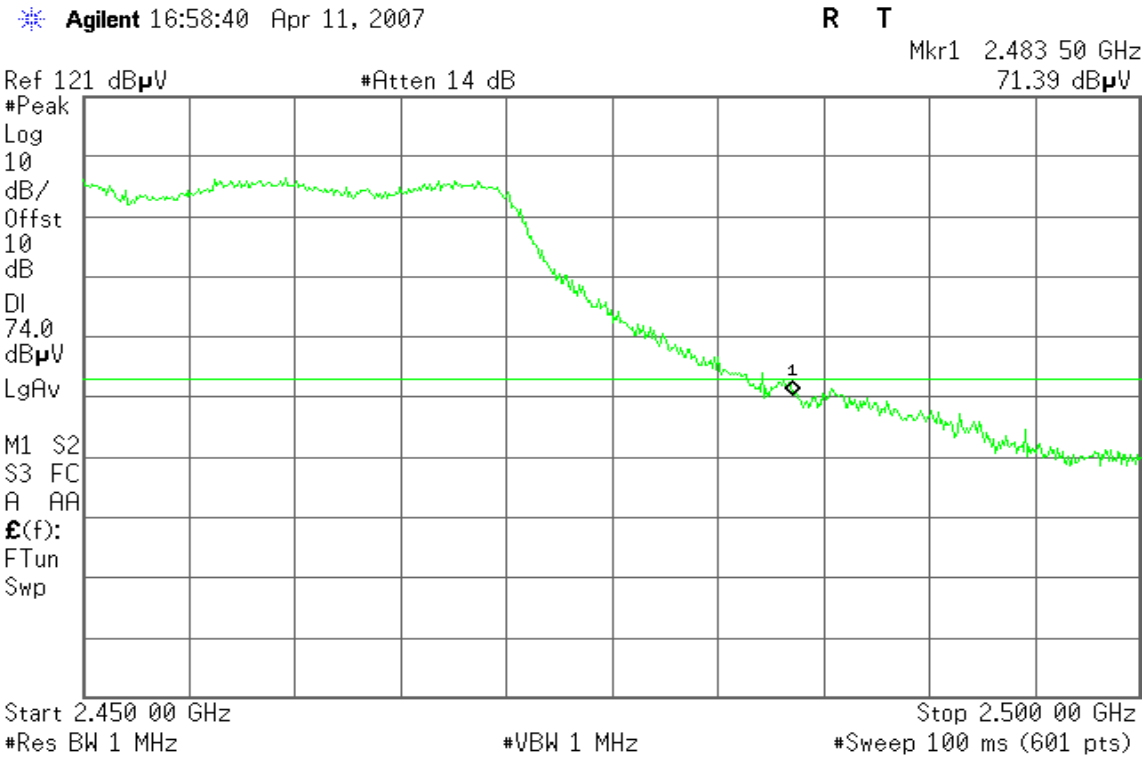


Detector mode: Average **Polarity: Horizontal**

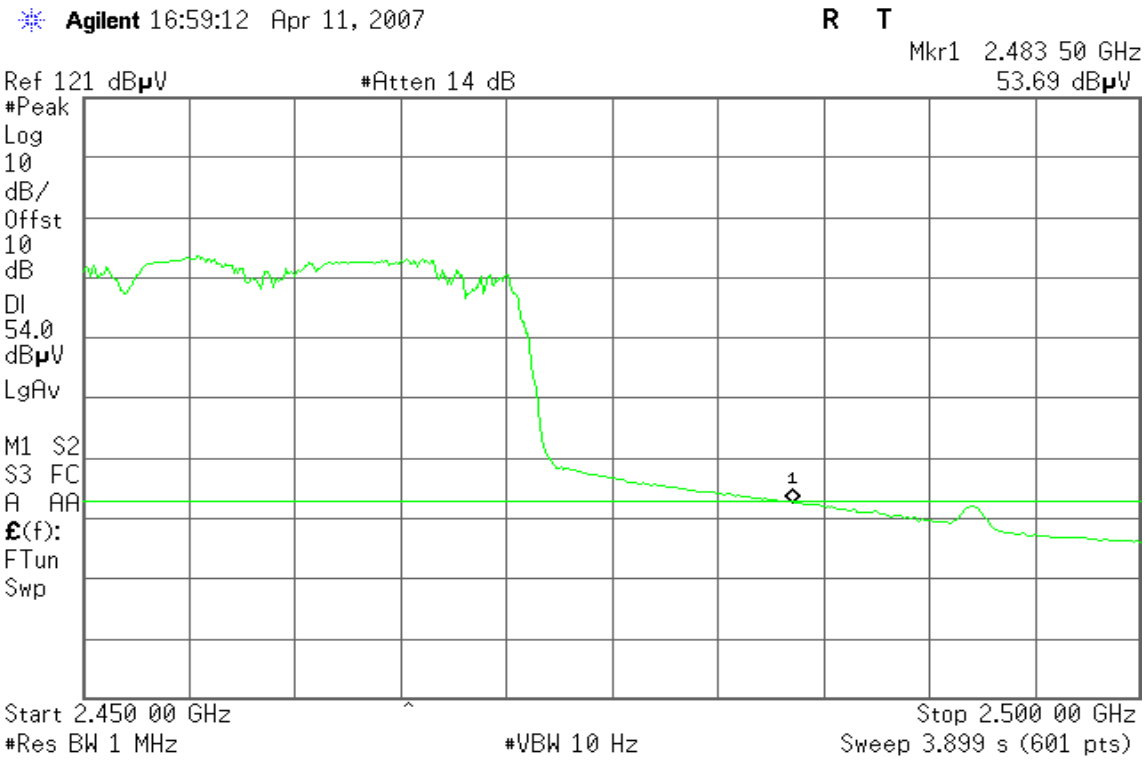


Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH High)

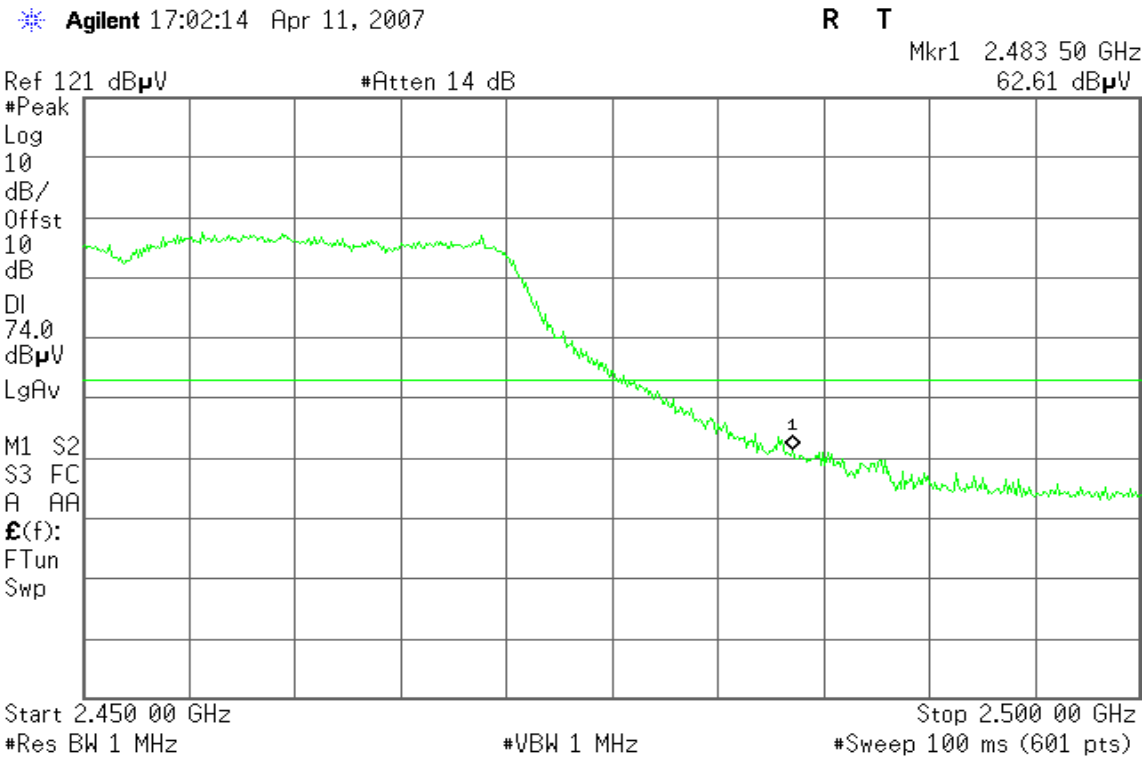
Detector mode: Peak **Polarity: Vertical**



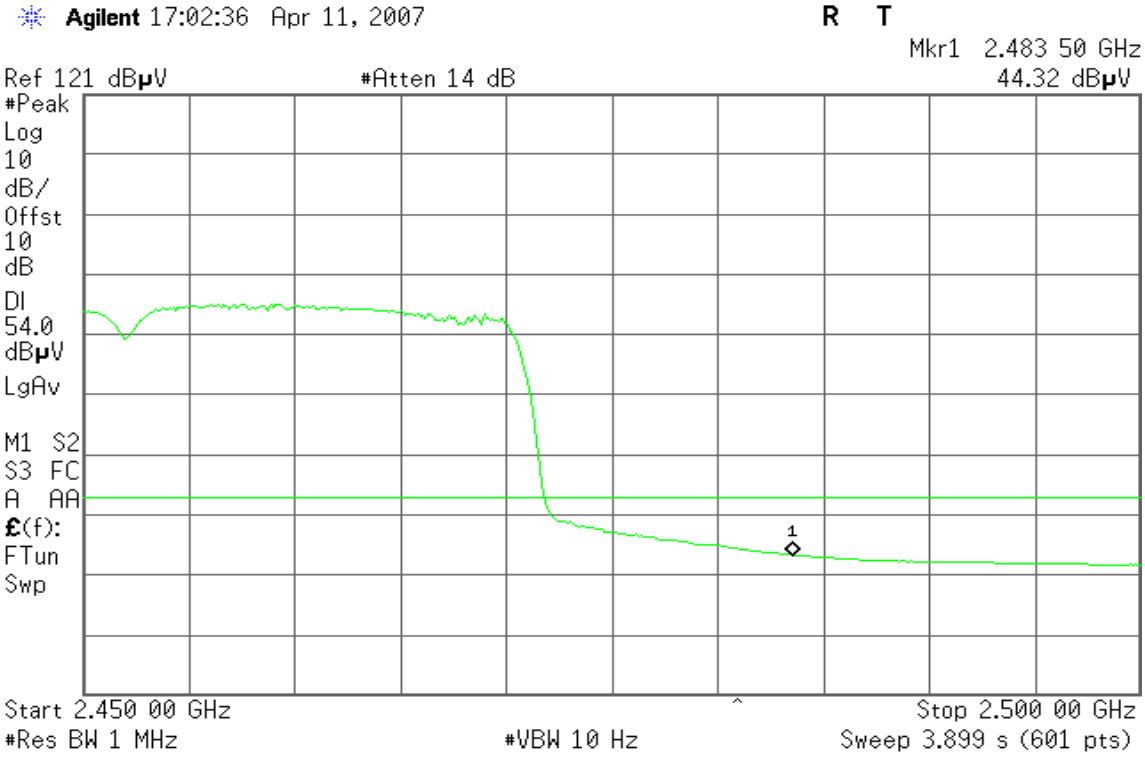
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**

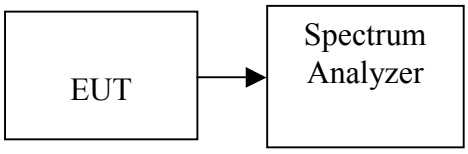


7.5 PEAK POWER SPECTRAL DENSITY

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)	Chain 1 PPSD (dBm)	Chain 0 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-4.63	-5.61	-2.08	8.00	PASS
Mid	2437	-4.88	-6.25	-2.50		PASS
High	2462	-7.23	-5.87	-3.49		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 0 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-10.18	-10.59	-7.37	8.00	PASS
Mid	2437	-10.81	-10.81	-7.80		PASS
High	2462	-11.27	-12.64	-8.89		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-7.86	8.00	PASS
Mid	2437	-5.40		PASS
High	2462	-5.37		PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-13.51	8.00	PASS
Mid	2437	-12.16		PASS
High	2452	-13.51		PASS

Remark: *Total PPSD (dBm) = 10*LOG(10^(Chain 1 PPSD / 10)+10^(Chain 0 PPSD /10))*

Test mode: IEEE 802.11b mode with combiner

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	0.74	8.00	PASS
Mid	2437	1.06		PASS
High	2462	1.66		PASS

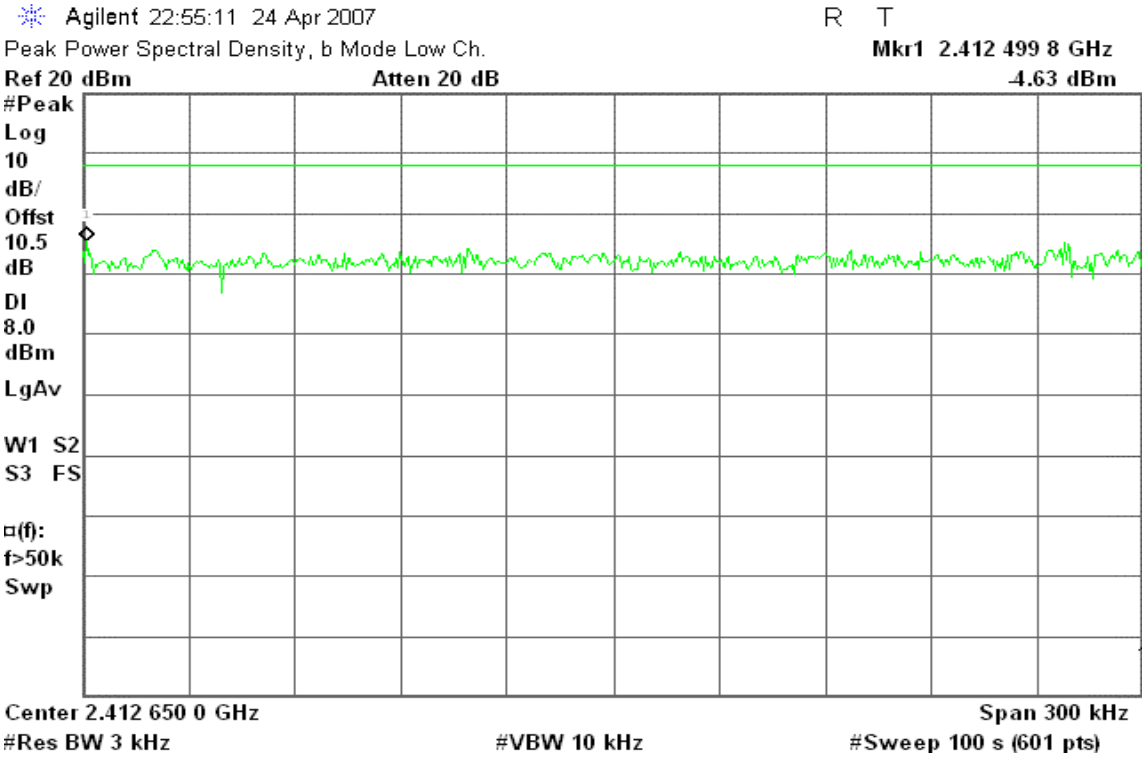
Test mode: IEEE 802.11g mode with combiner

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-4.06	8.00	PASS
Mid	2437	-3.94		PASS
High	2462	-5.50		PASS

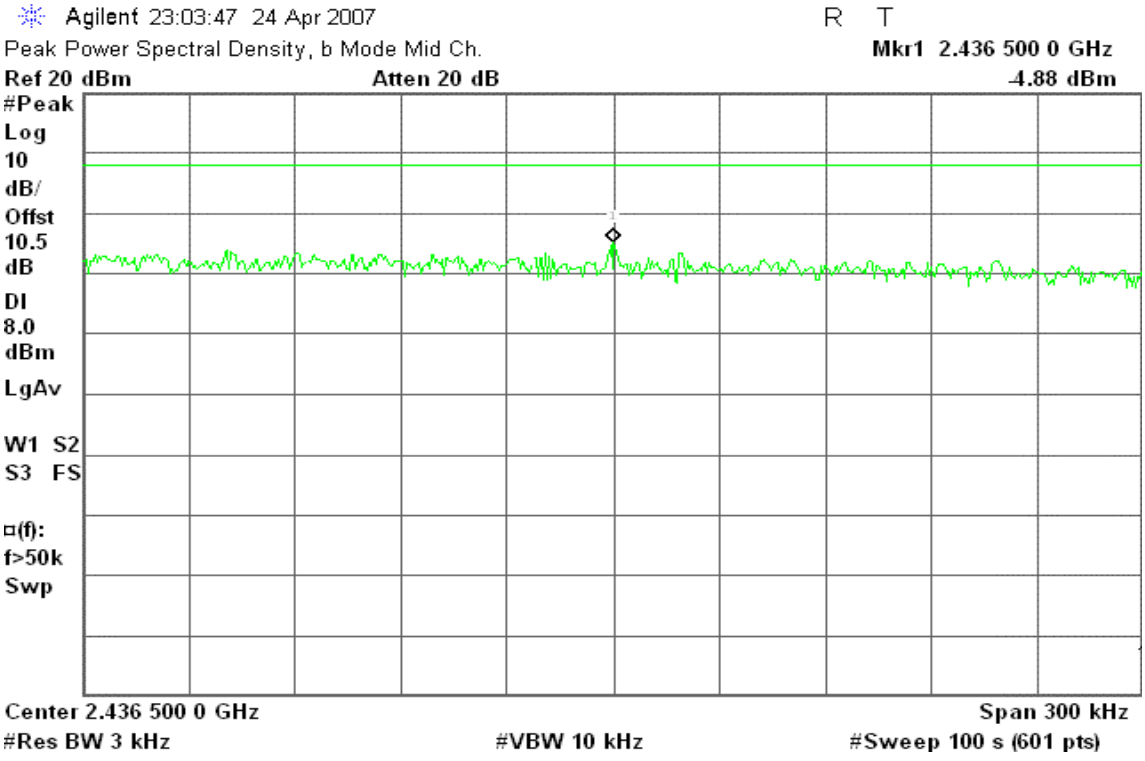
Test Plot

IEEE 802.11b mode / Chain 1

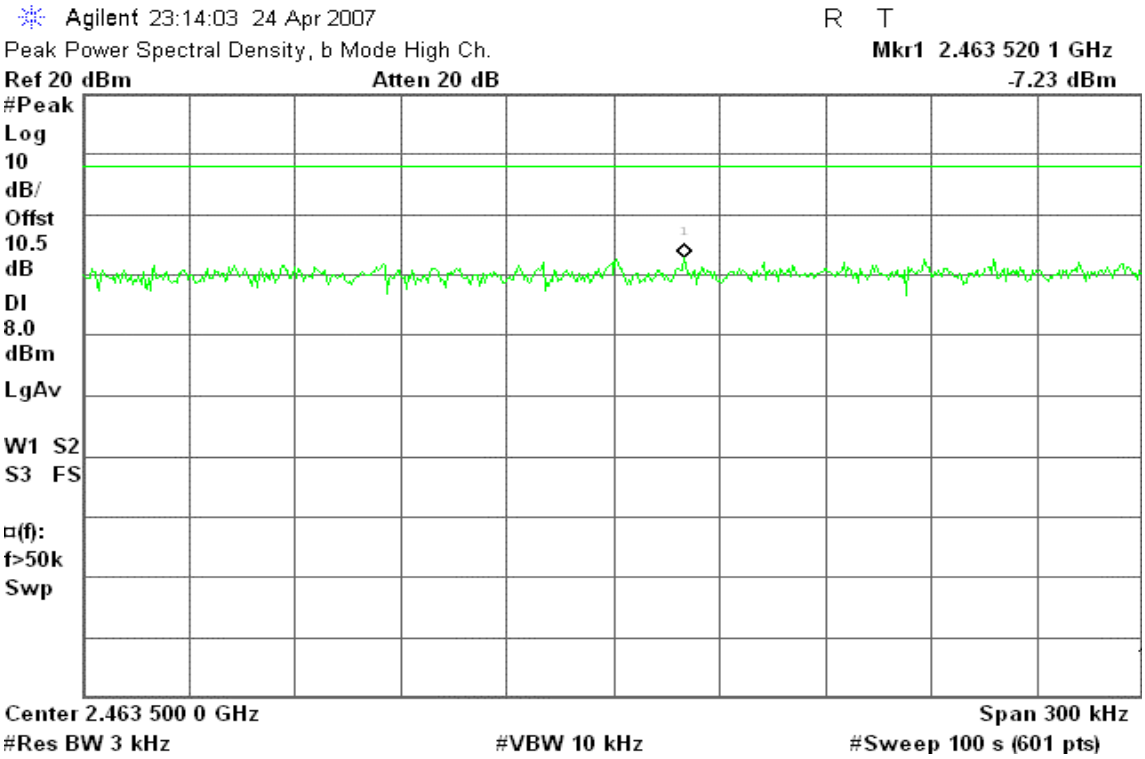
PPSD (CH Low)



PPSD (CH Mid)

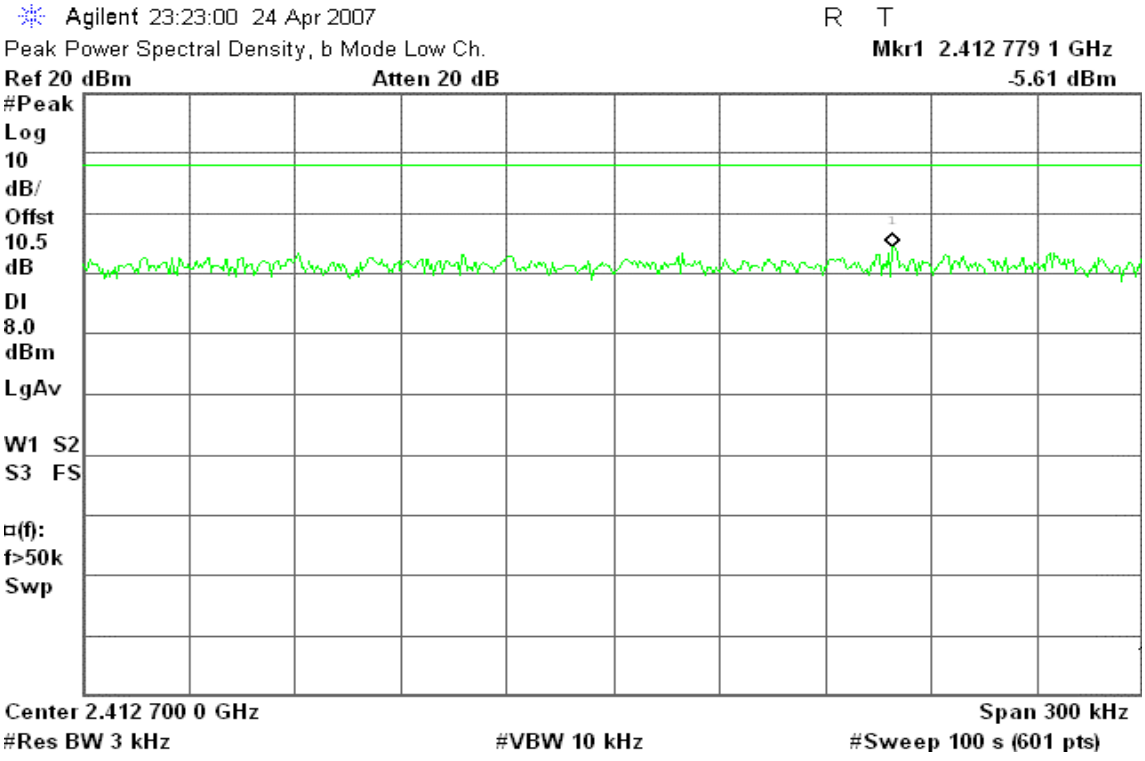


PPSD (CH High)

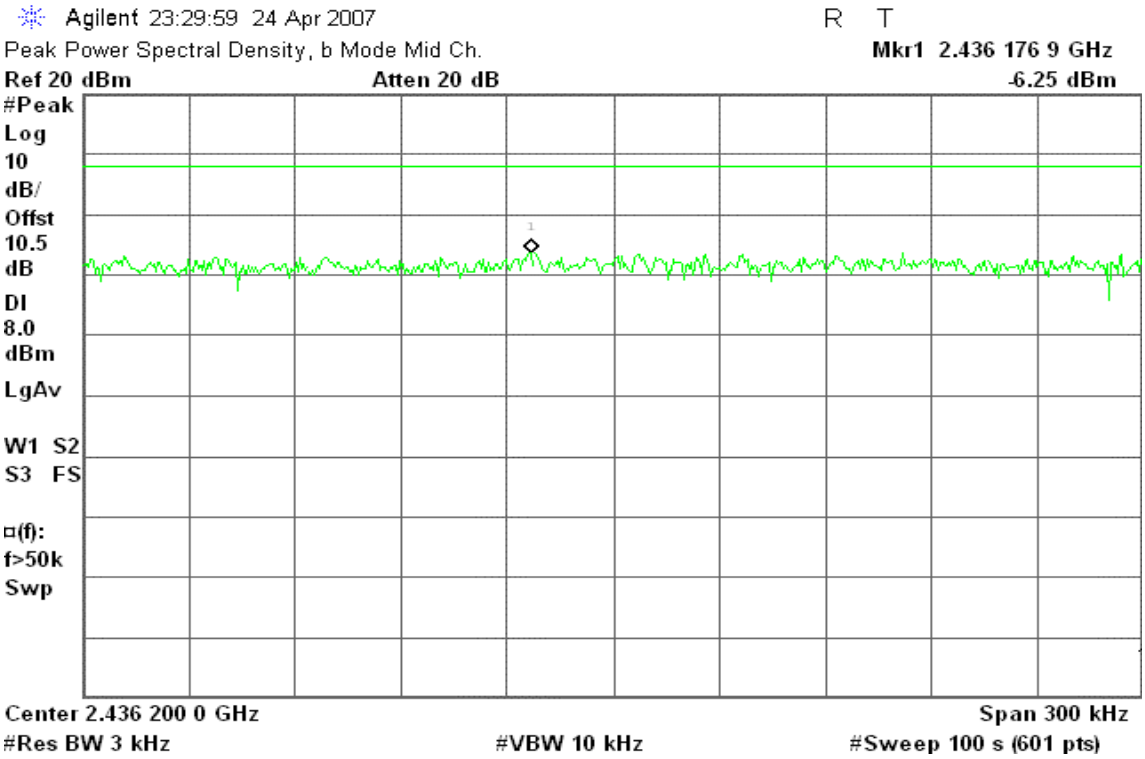


IEEE 802.11b mode / Chain 0

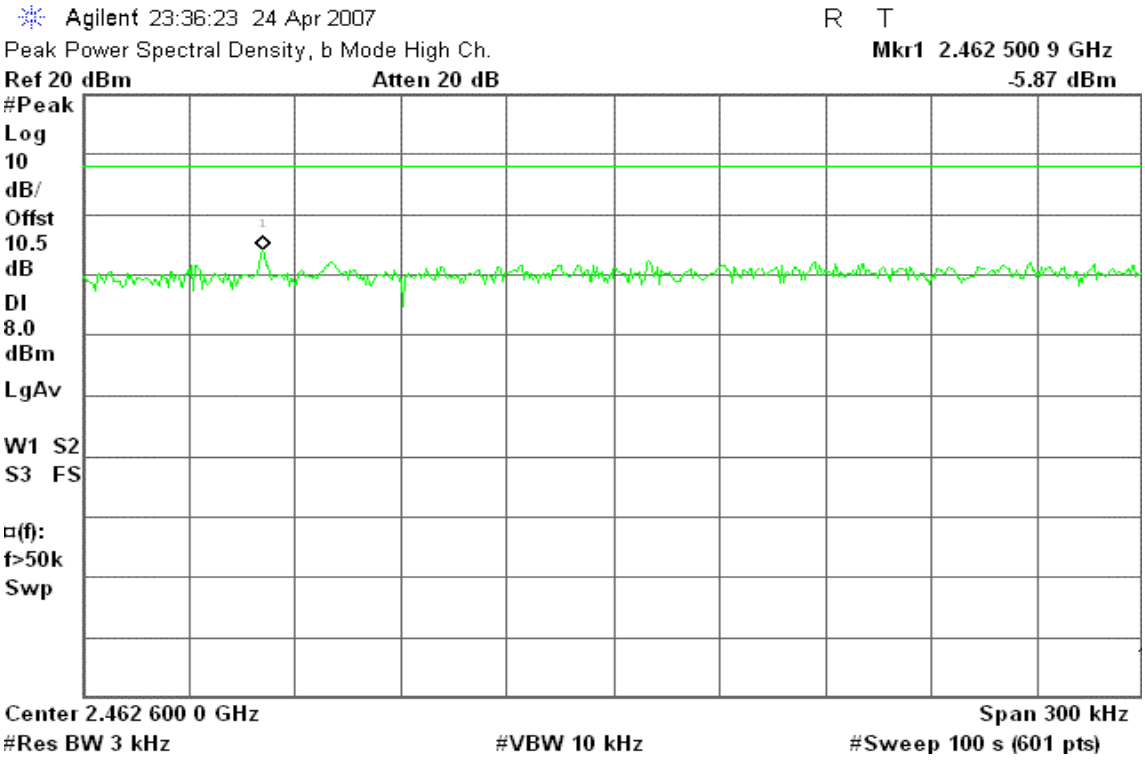
PPSD (CH Low)



PPSD (CH Mid)

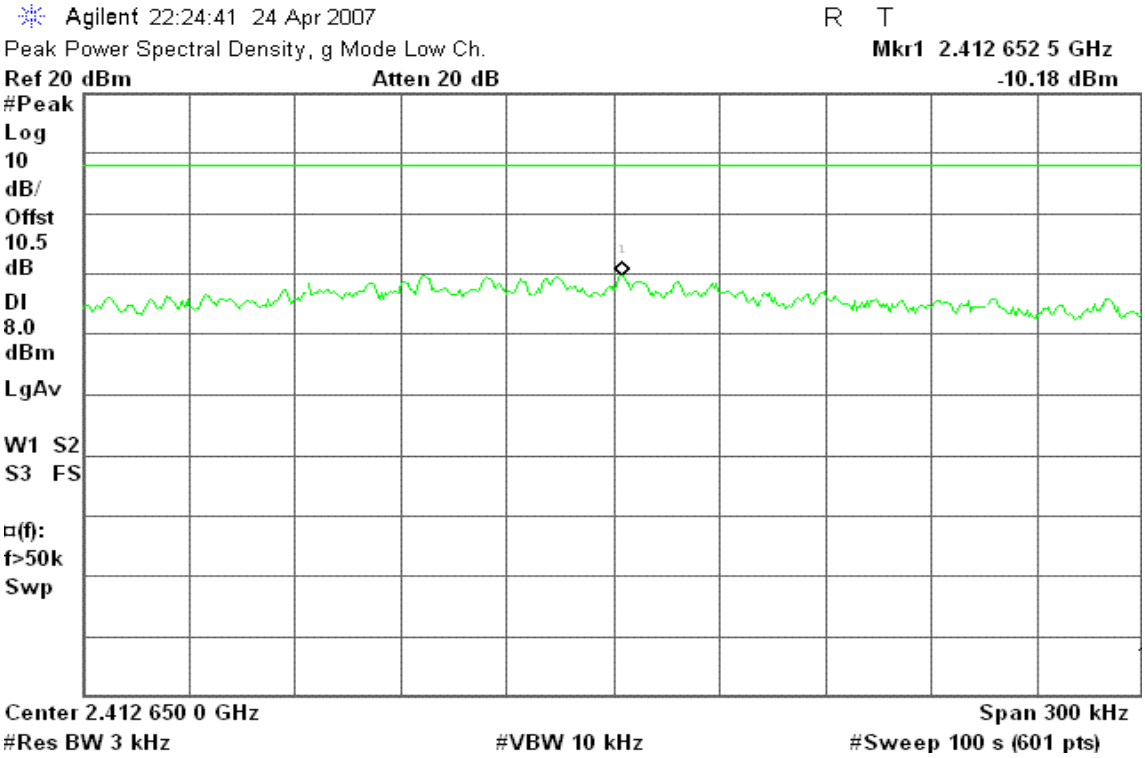


PPSD (CH High)

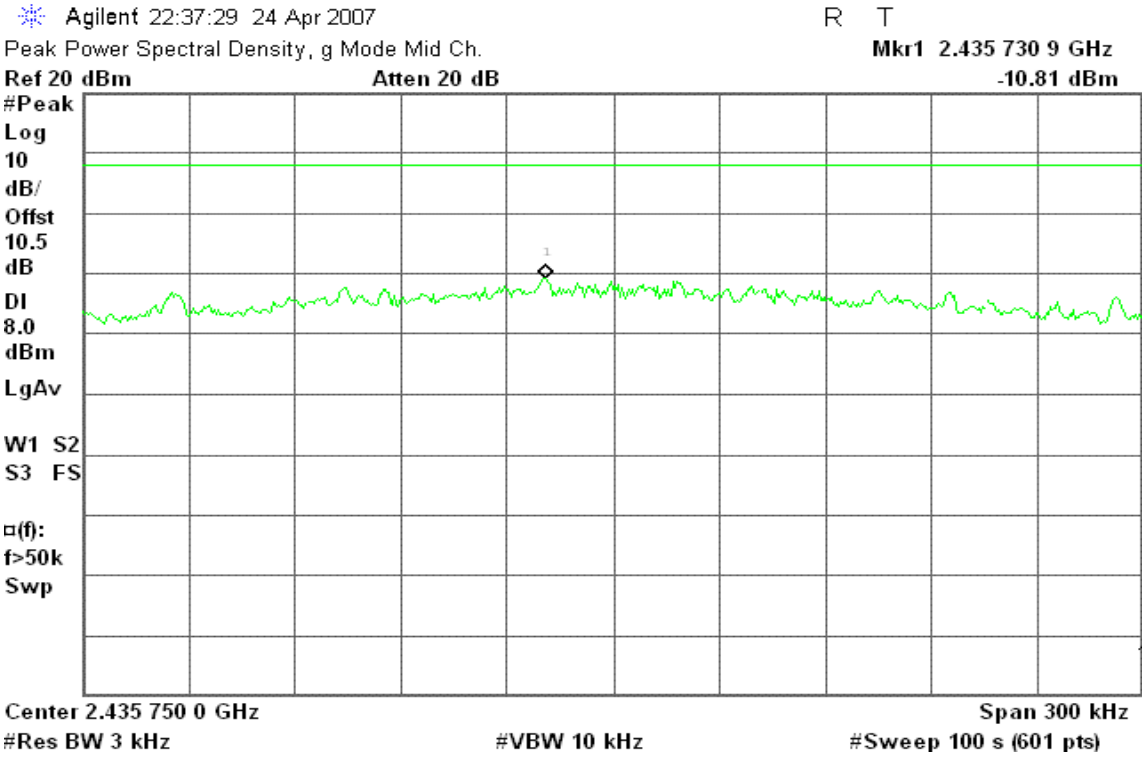


IEEE 802.11g mode / Chain 1

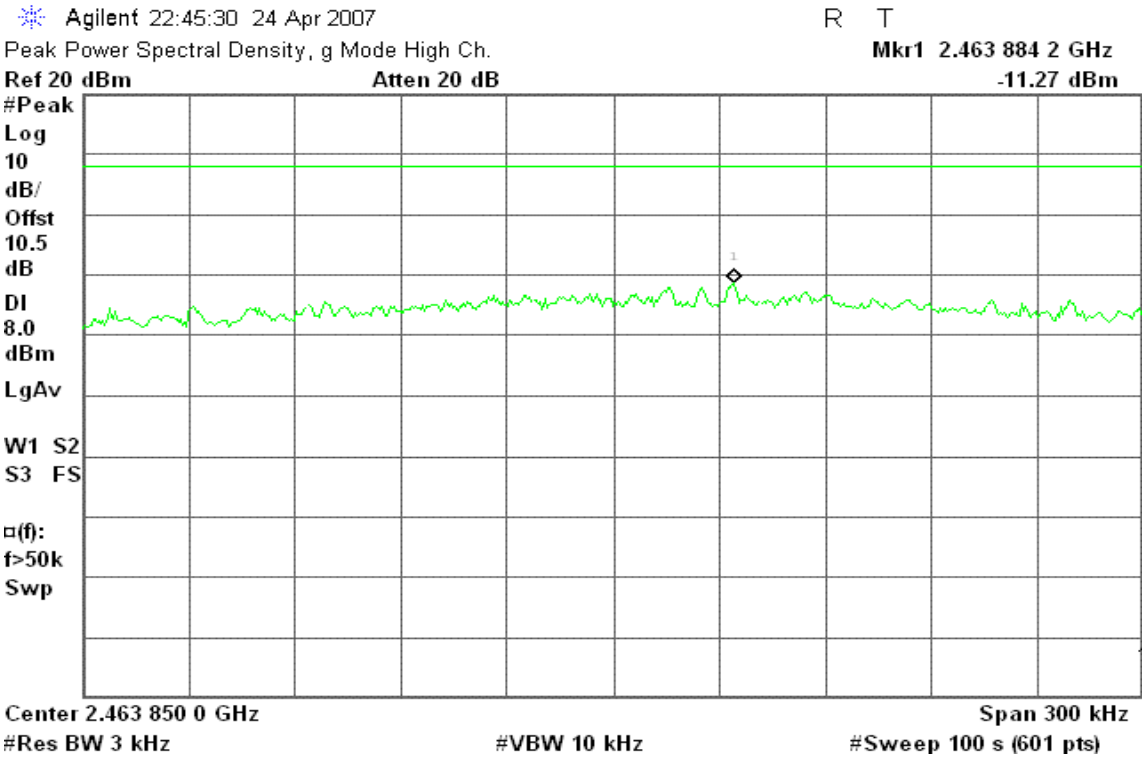
PPSD (CH Low)



PPSD (CH Mid)

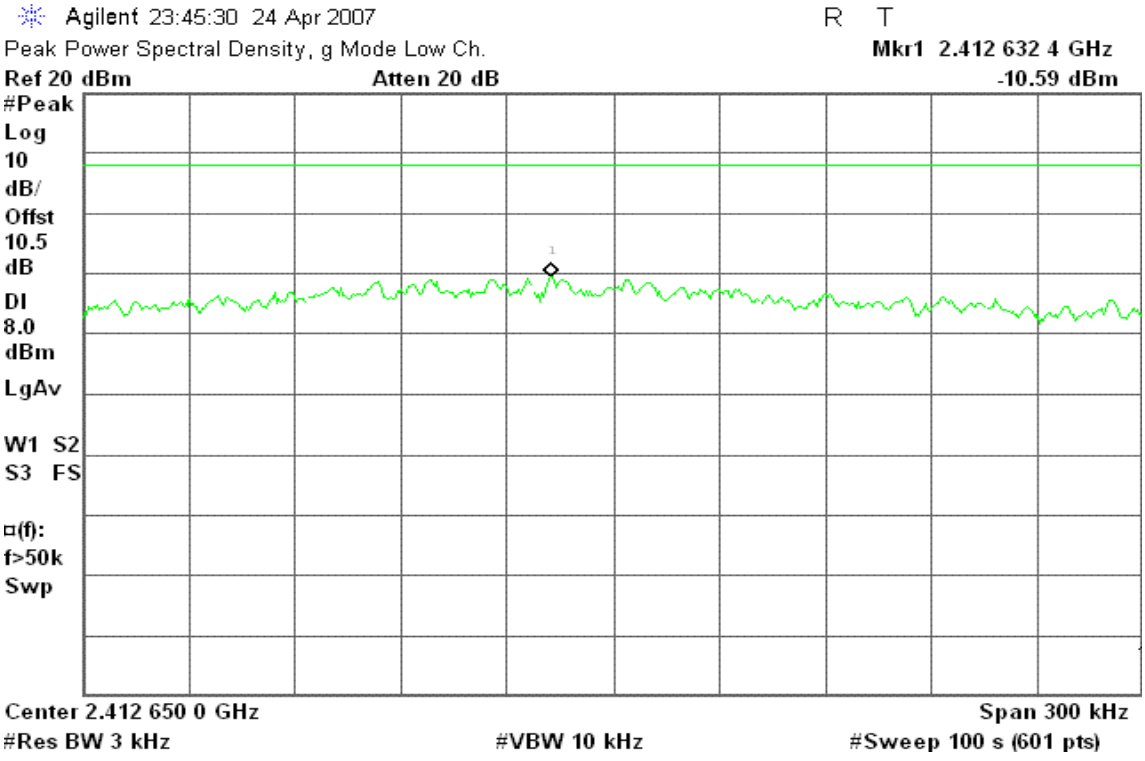


PPSD (CH High)

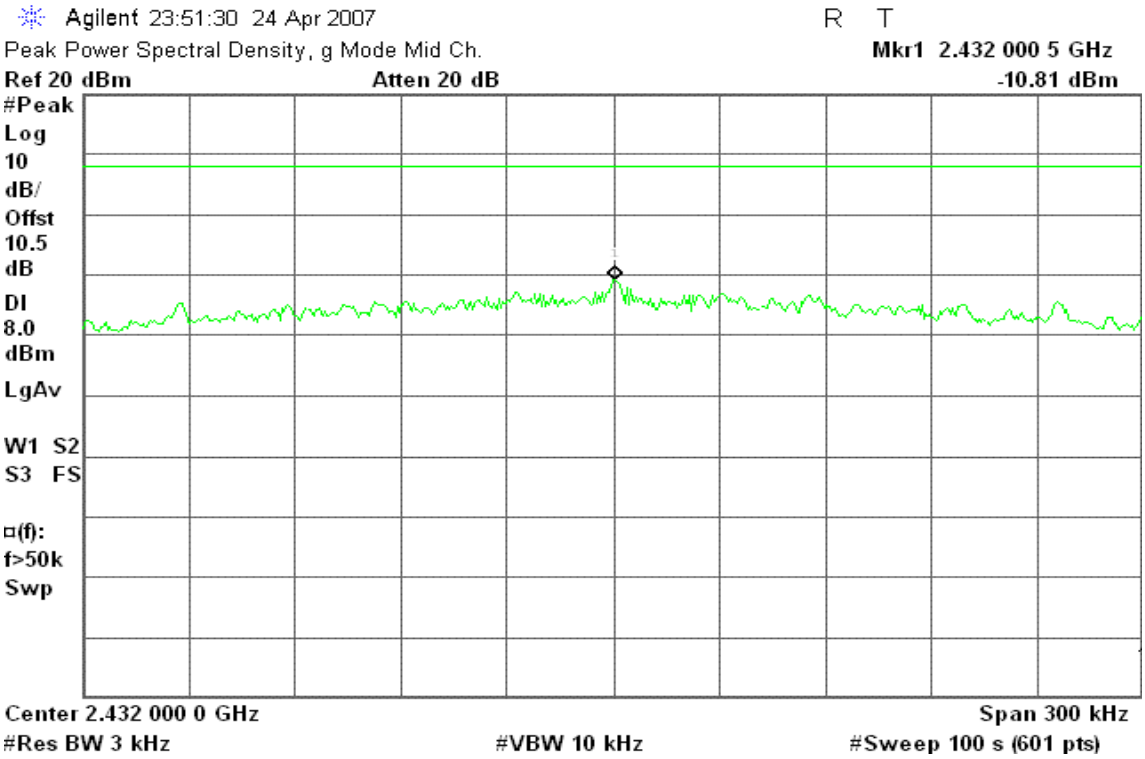


IEEE 802.11g mode / Chain 0

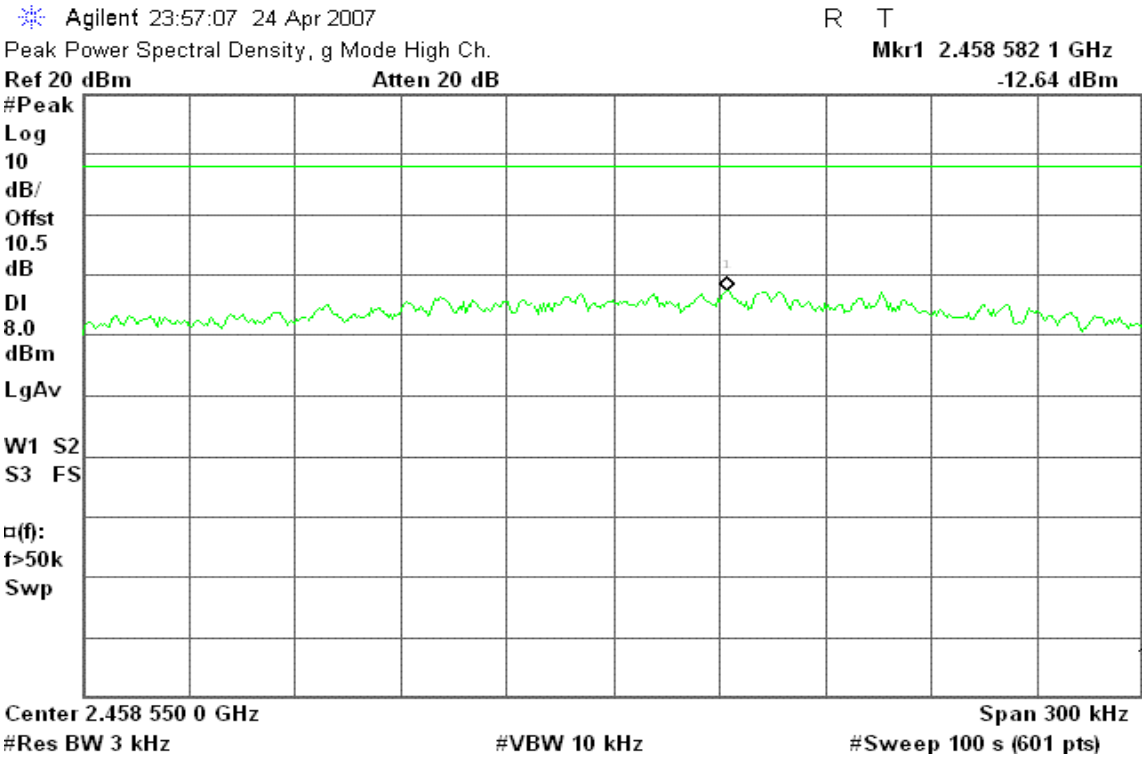
PPSD (CH Low)



PPSD (CH Mid)

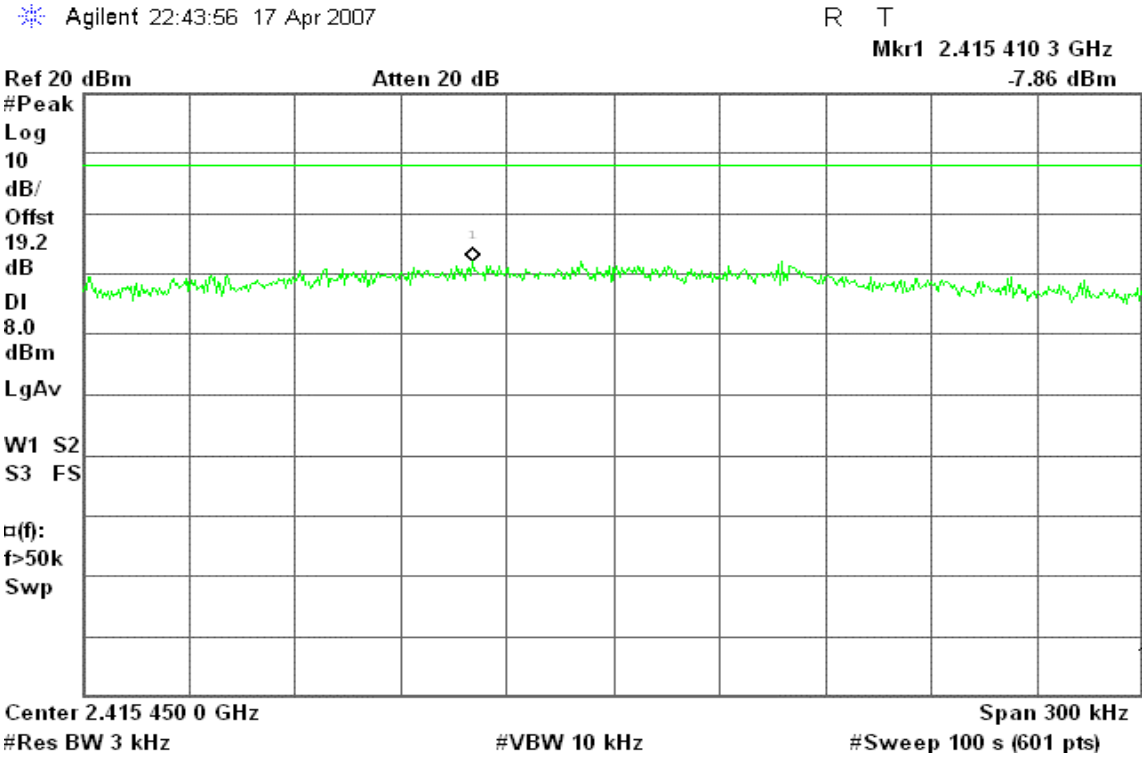


PPSD (CH High)

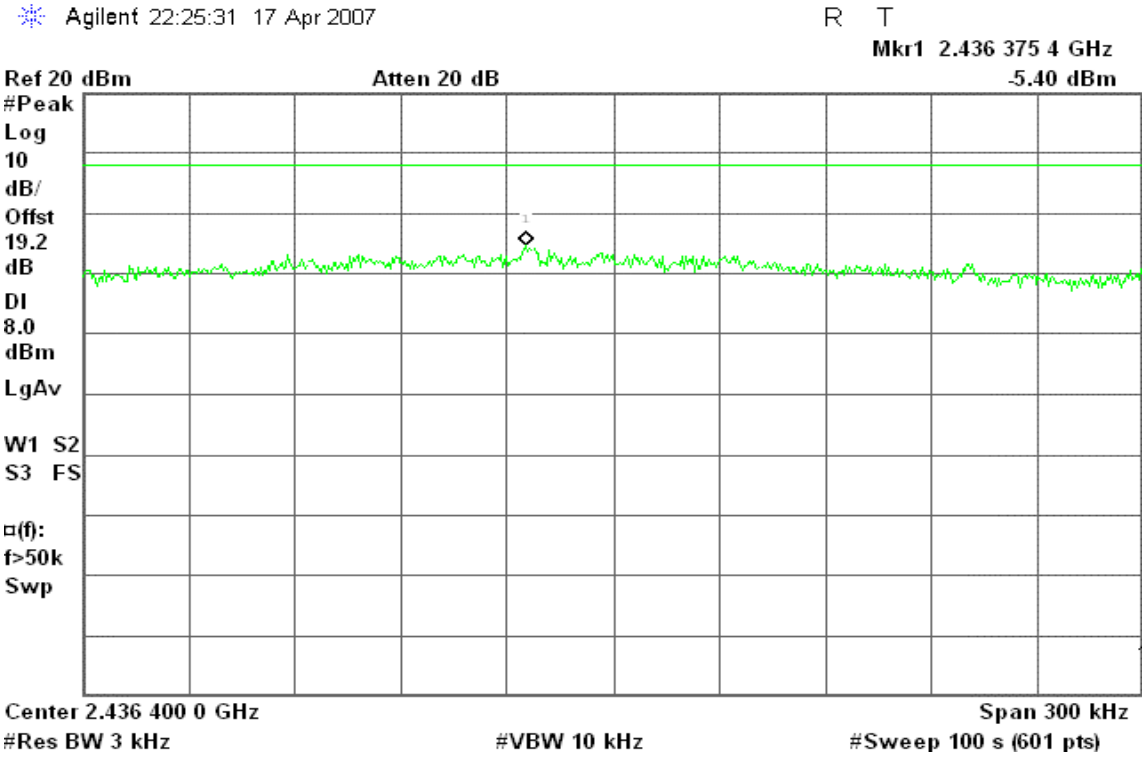


draft 802.11n Standard-20 MHz Channel mode

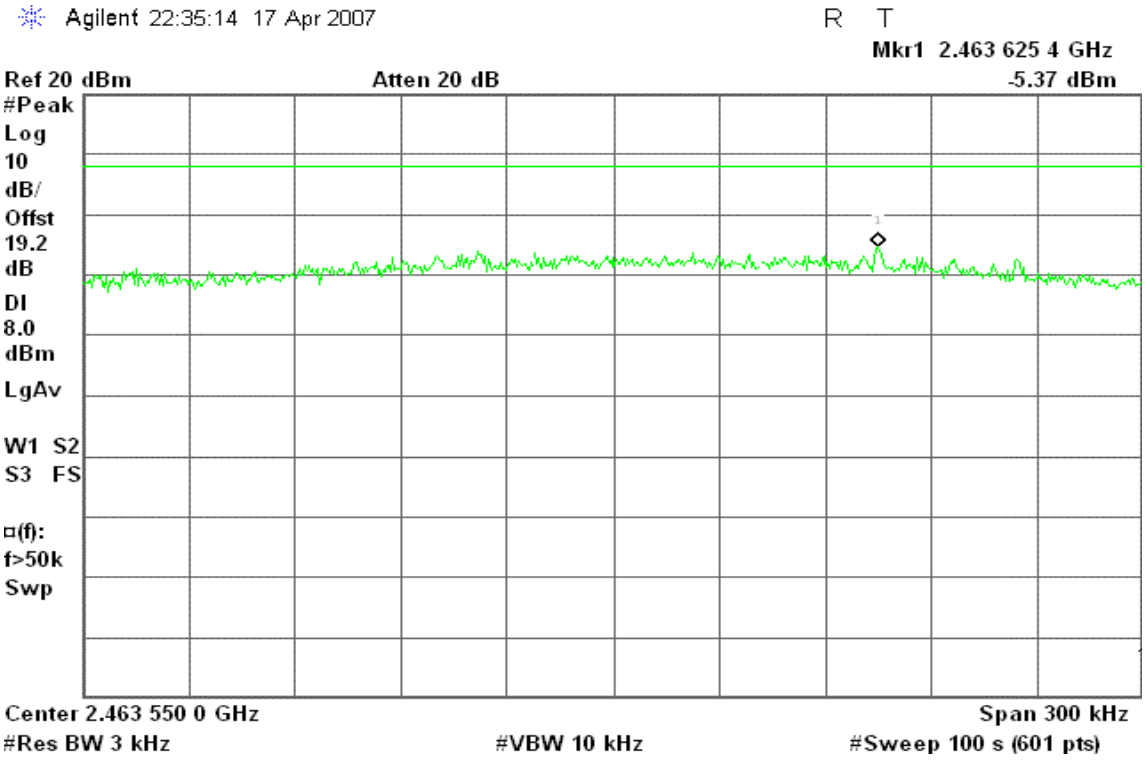
PPSD (CH Low)



PPSD (CH Mid)

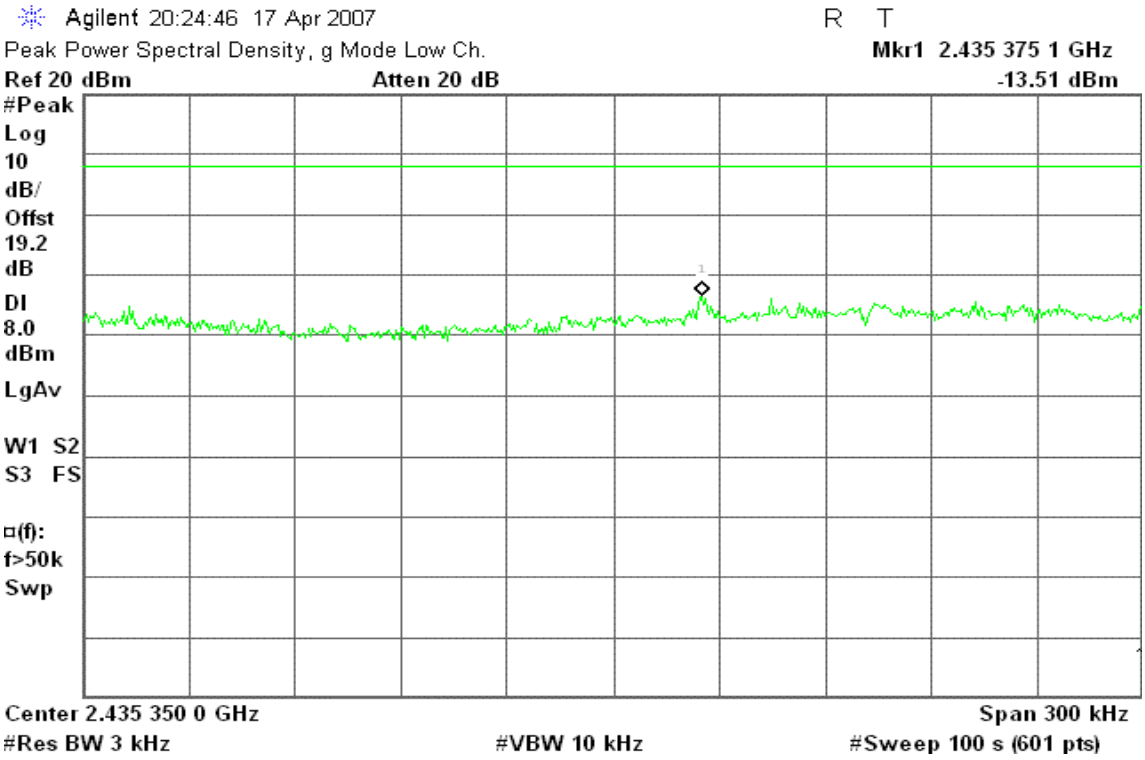


PPSD (CH High)

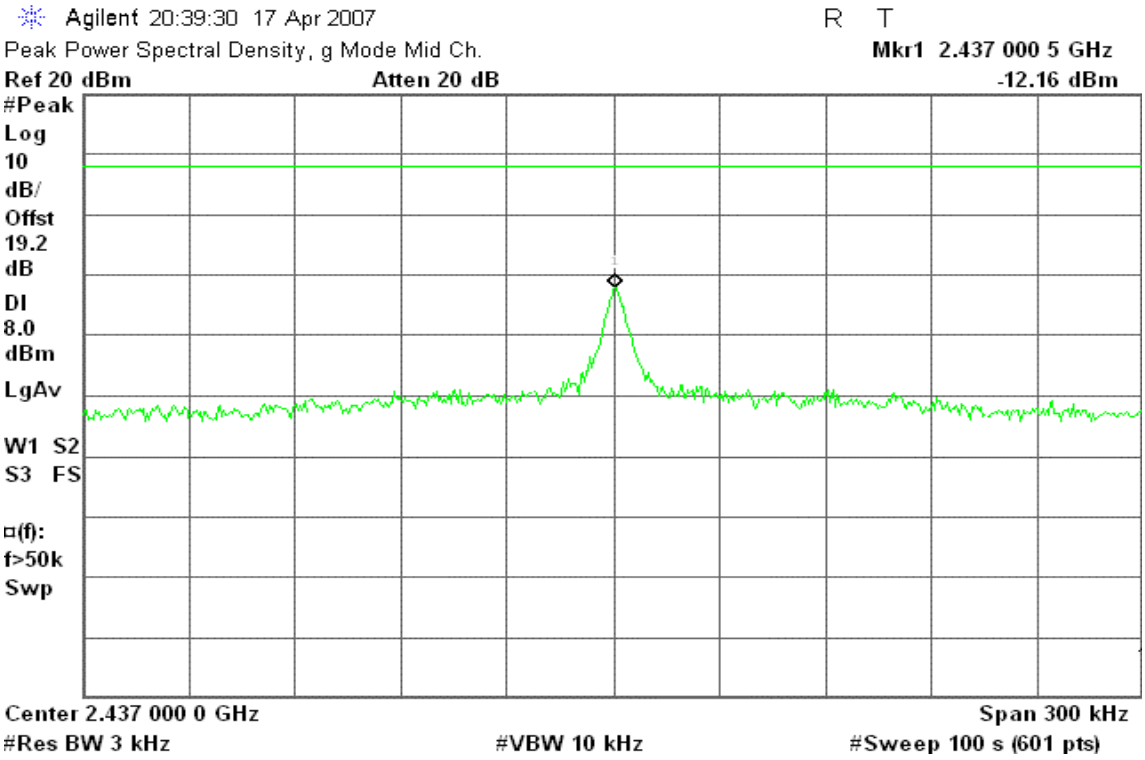


draft 802.11n Wide-40 MHz Channel mode

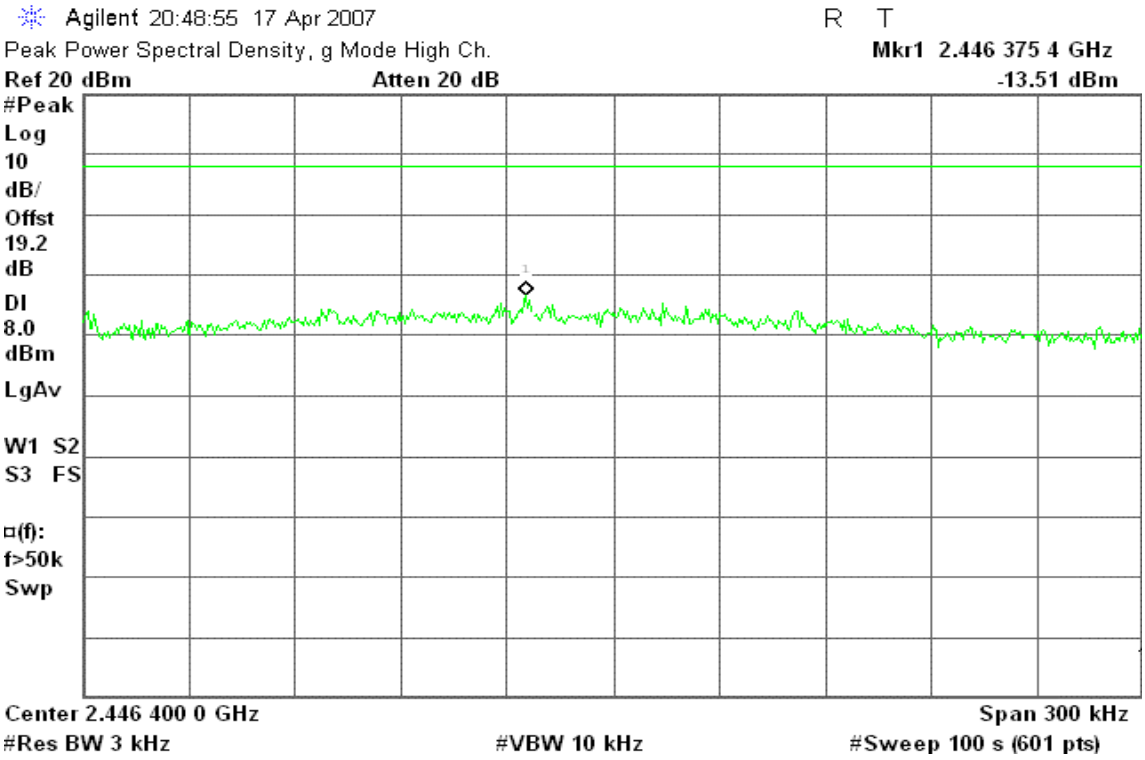
PPSD (CH Low)



PPSD (CH Mid)

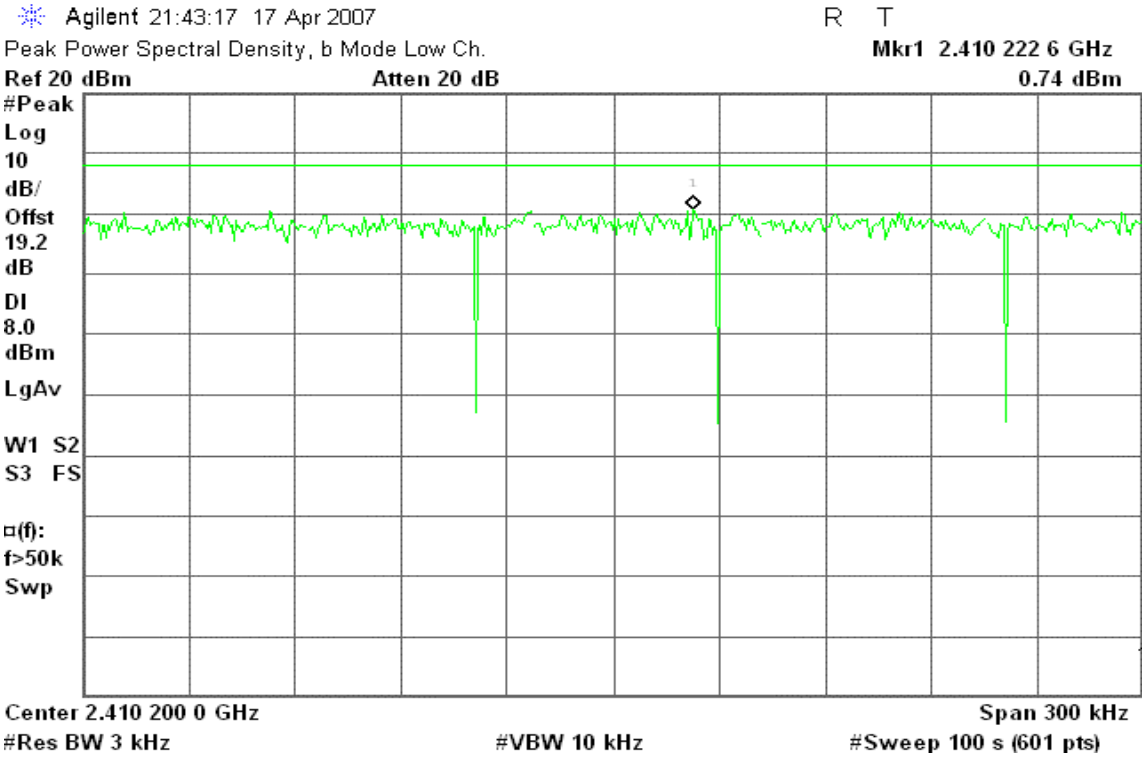


PPSD (CH High)

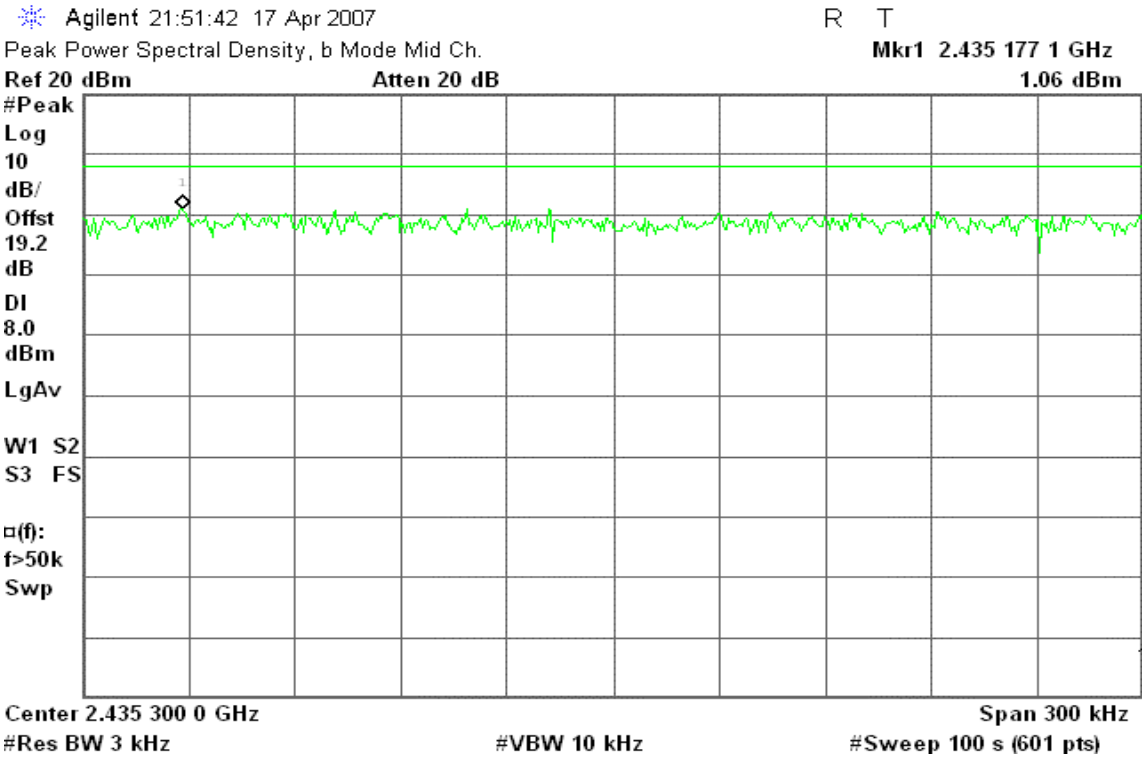


IEEE 802.11b mode with combiner

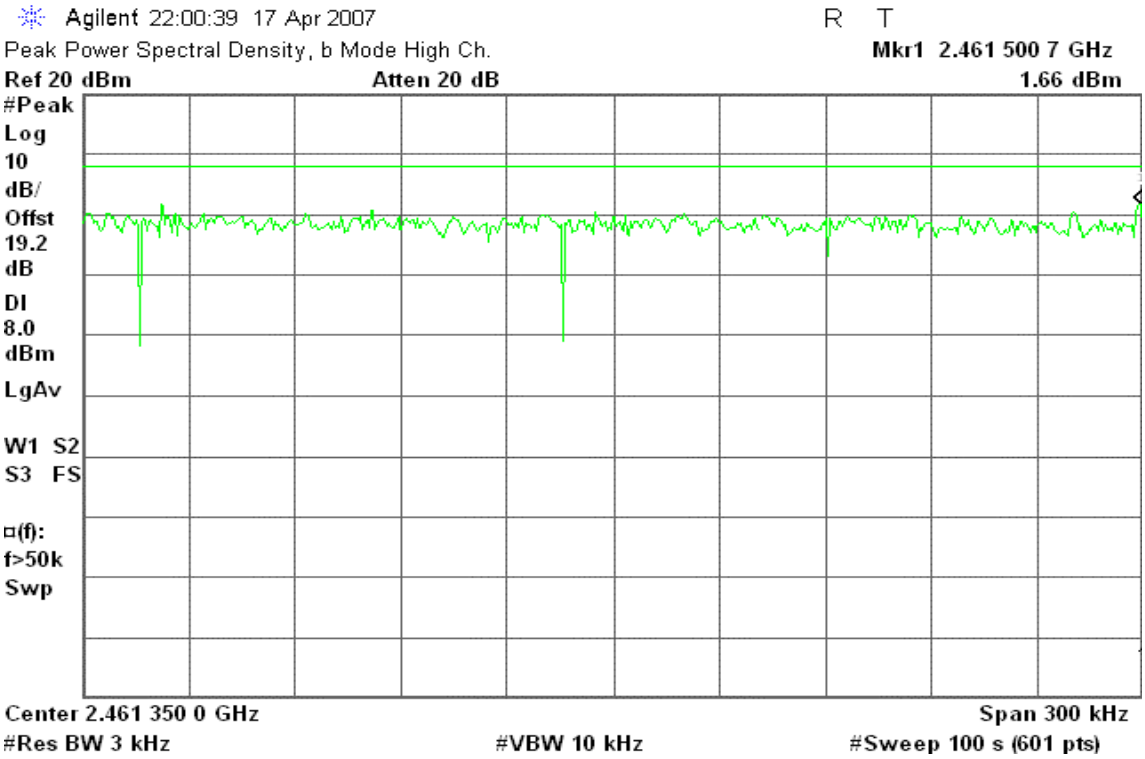
PPSD (CH Low)



PPSD (CH Mid)

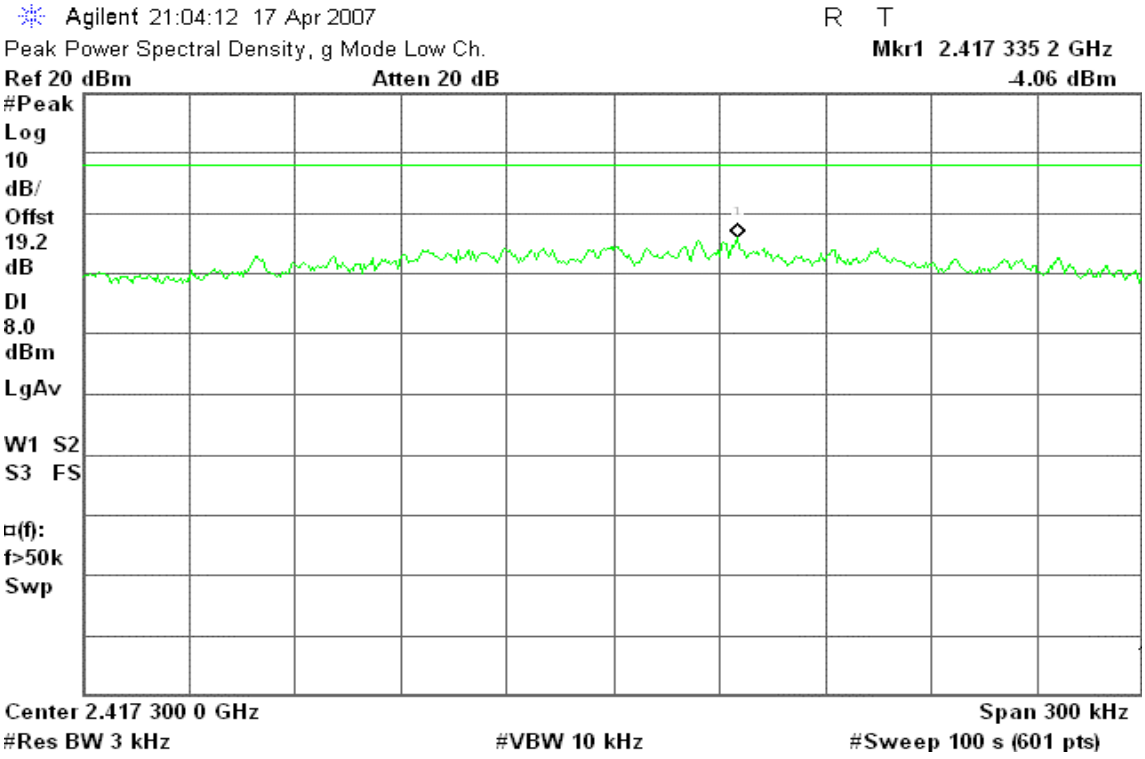


PPSD (CH High)

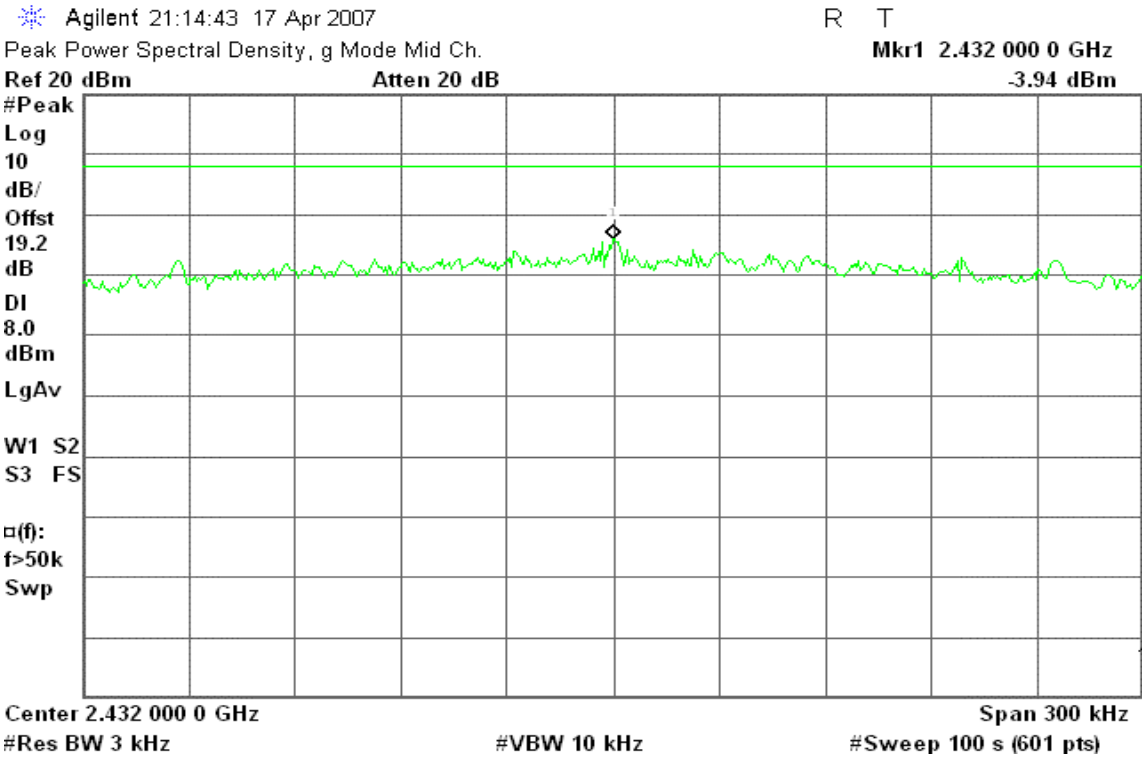


IEEE 802.11g mode with combiner

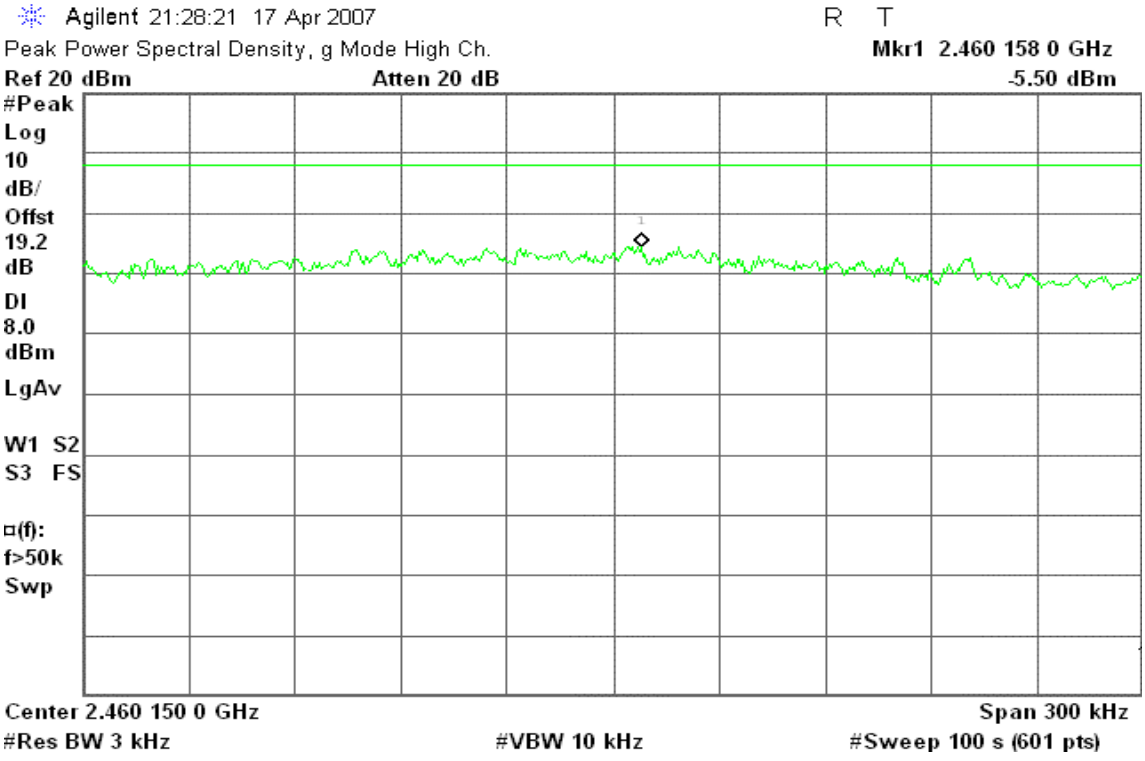
PPSD (CH Low)



PPSD (CH Mid)



PPSD (CH High)



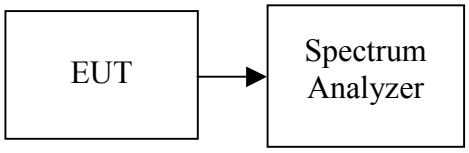
7.6 SPURIOUS EMISSIONS

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 in 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.

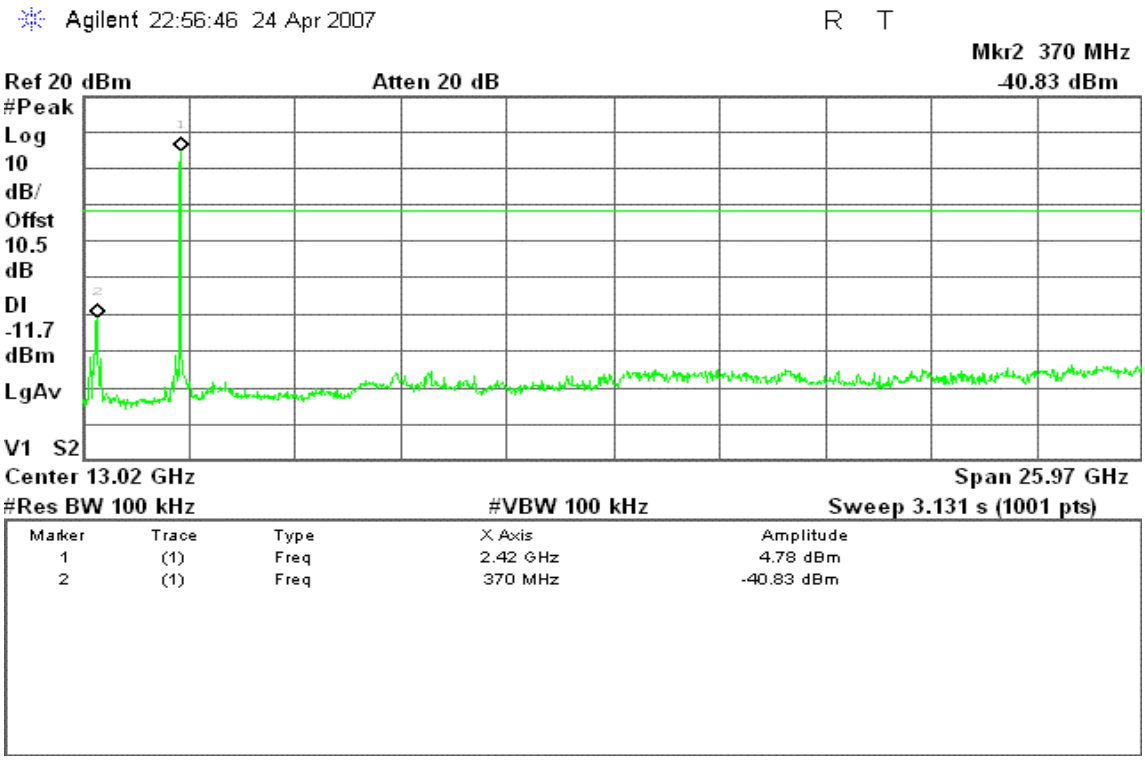
TEST RESULTS

No non-compliance noted

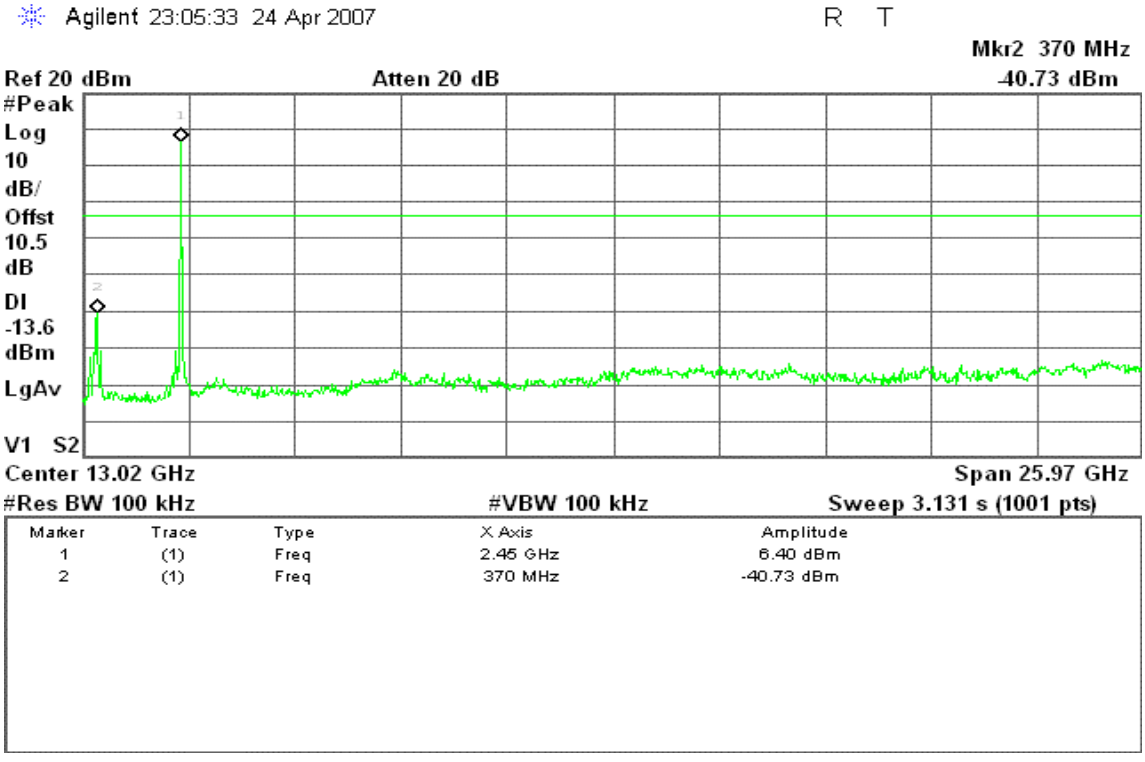
Test Plot

IEEE 802.11b mode / Chain 1

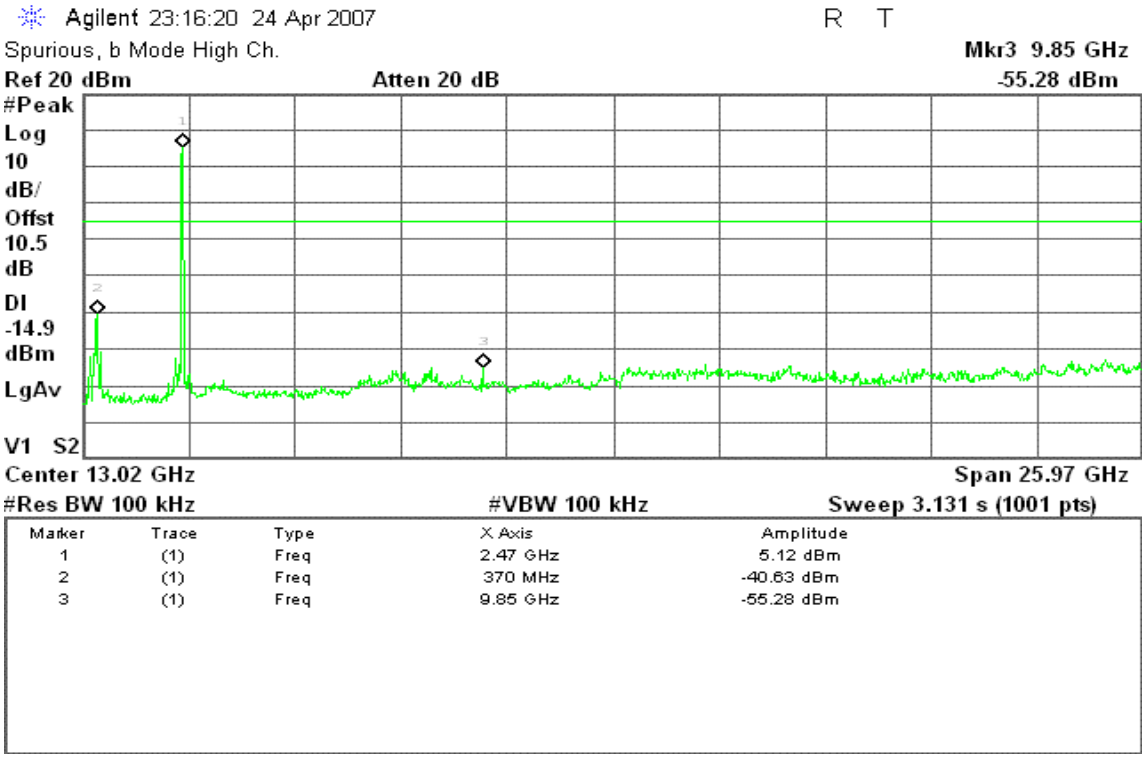
CH Low



CH Mid

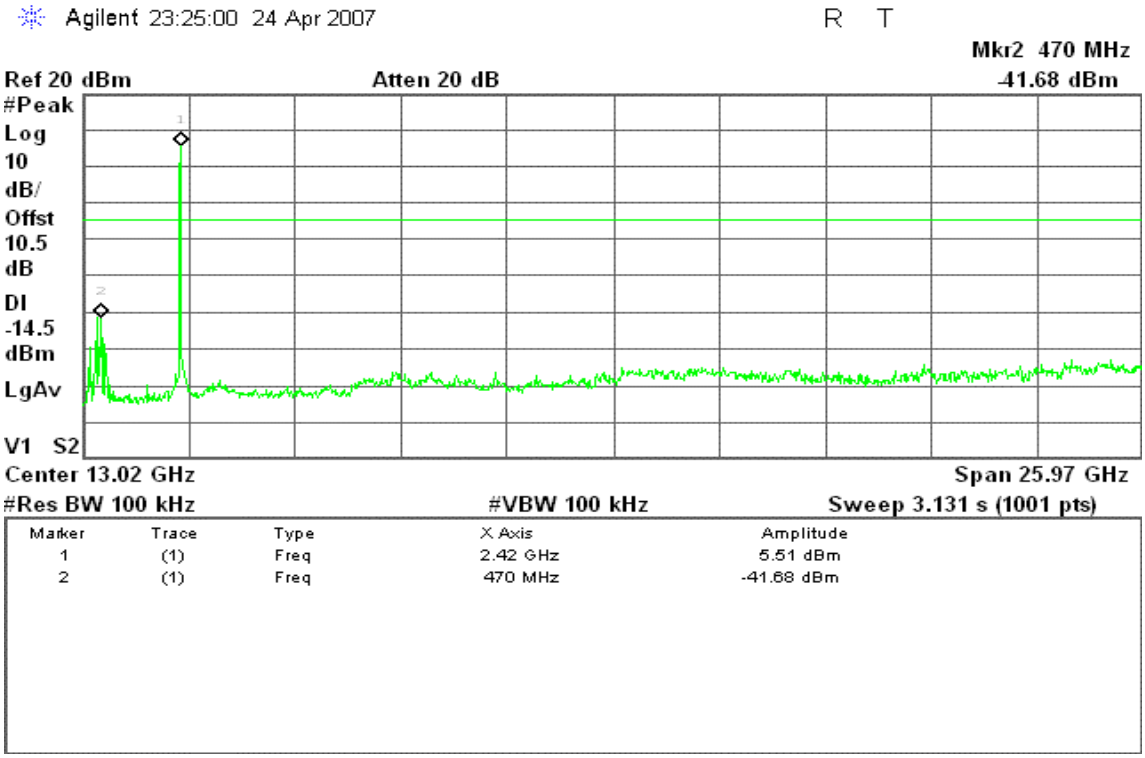


CH High

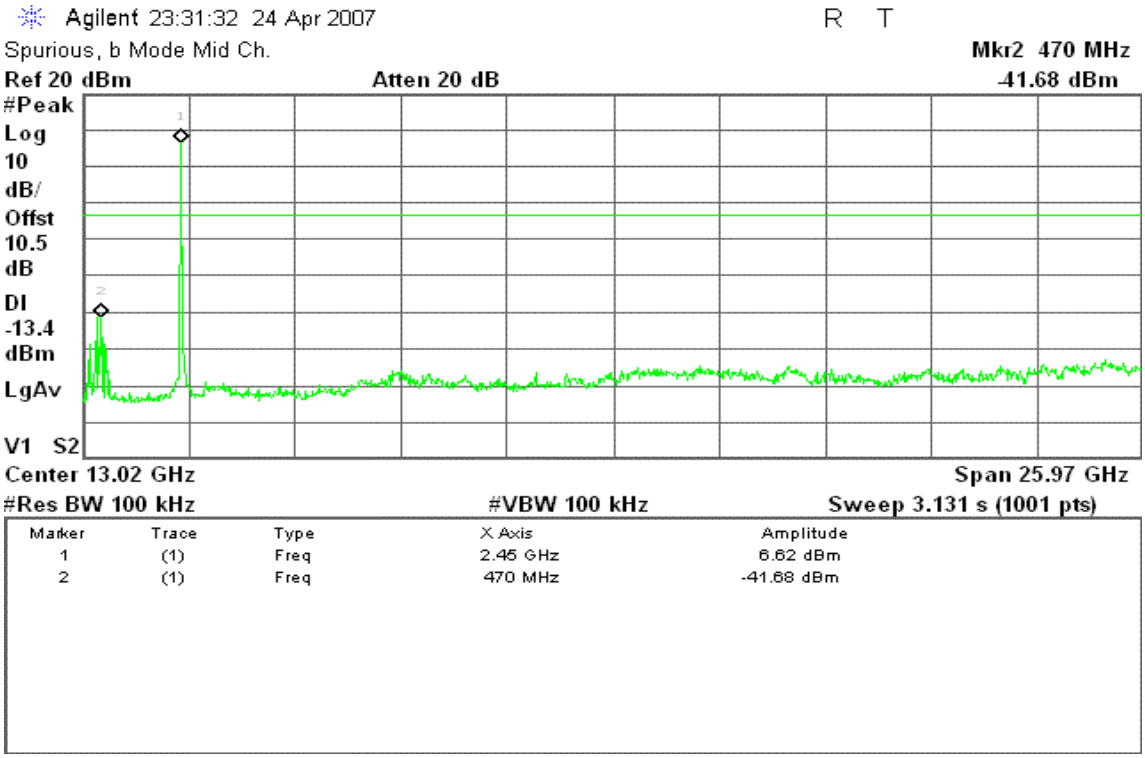


IEEE 802.11b mode / Chain 0

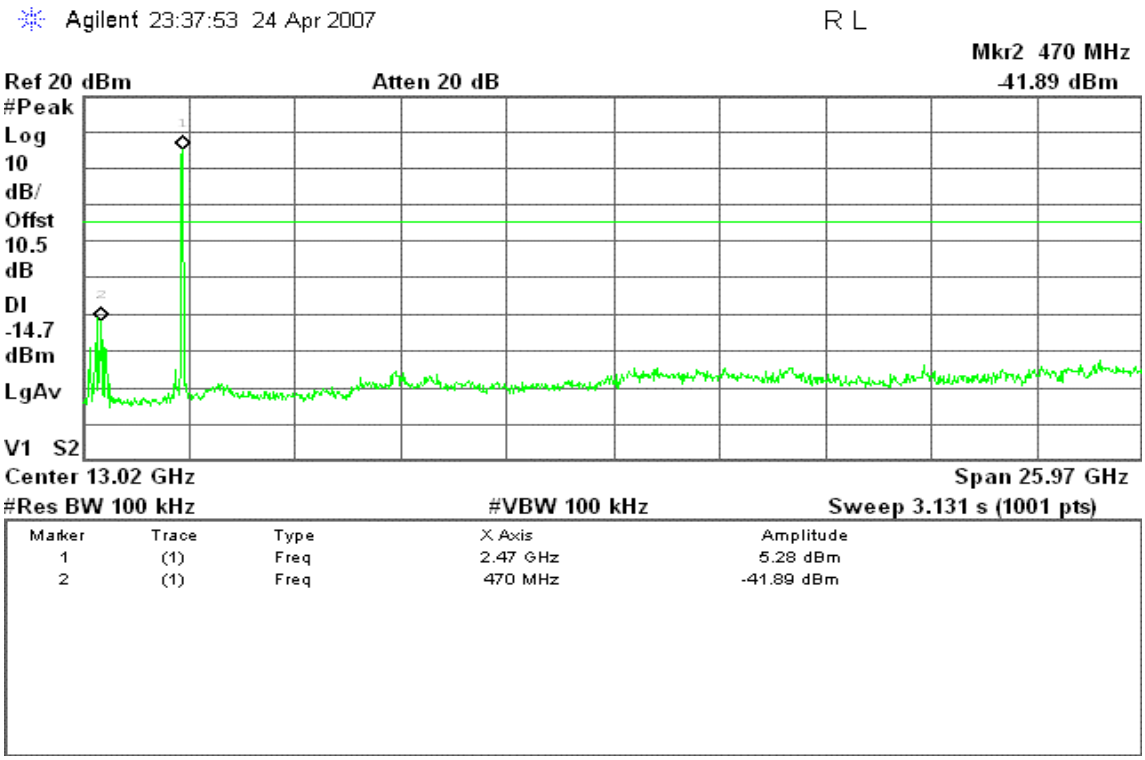
CH Low



CH Mid

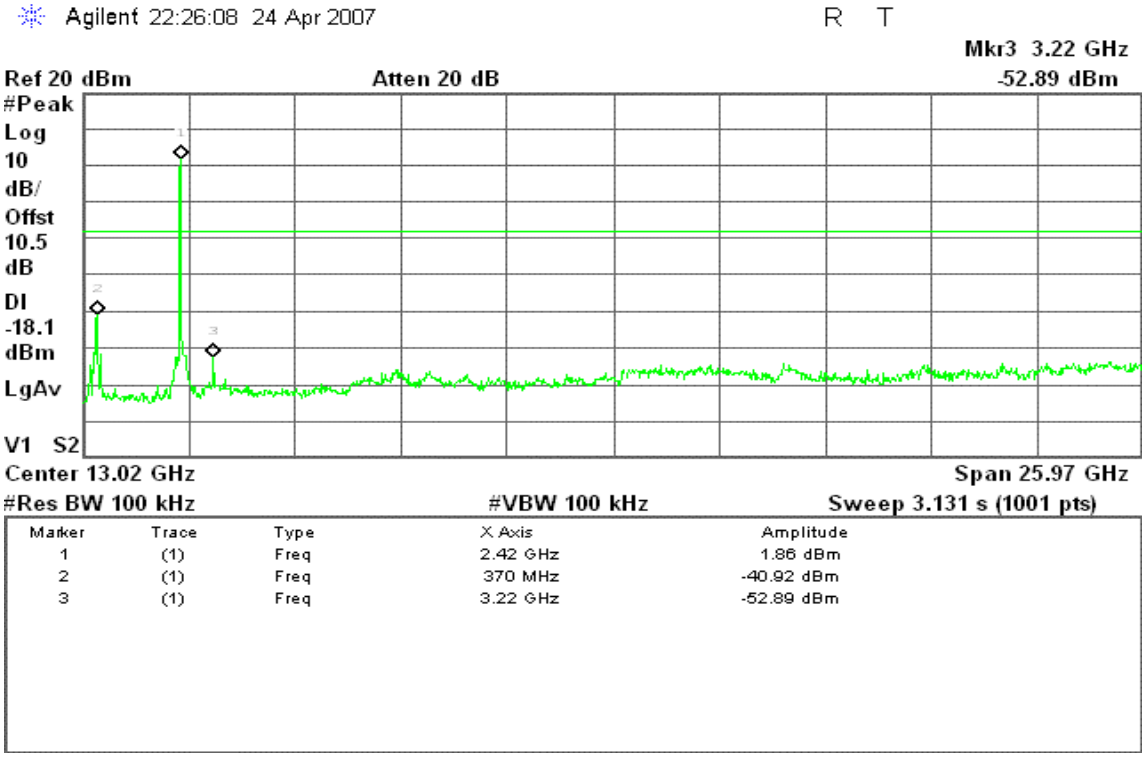


CH High



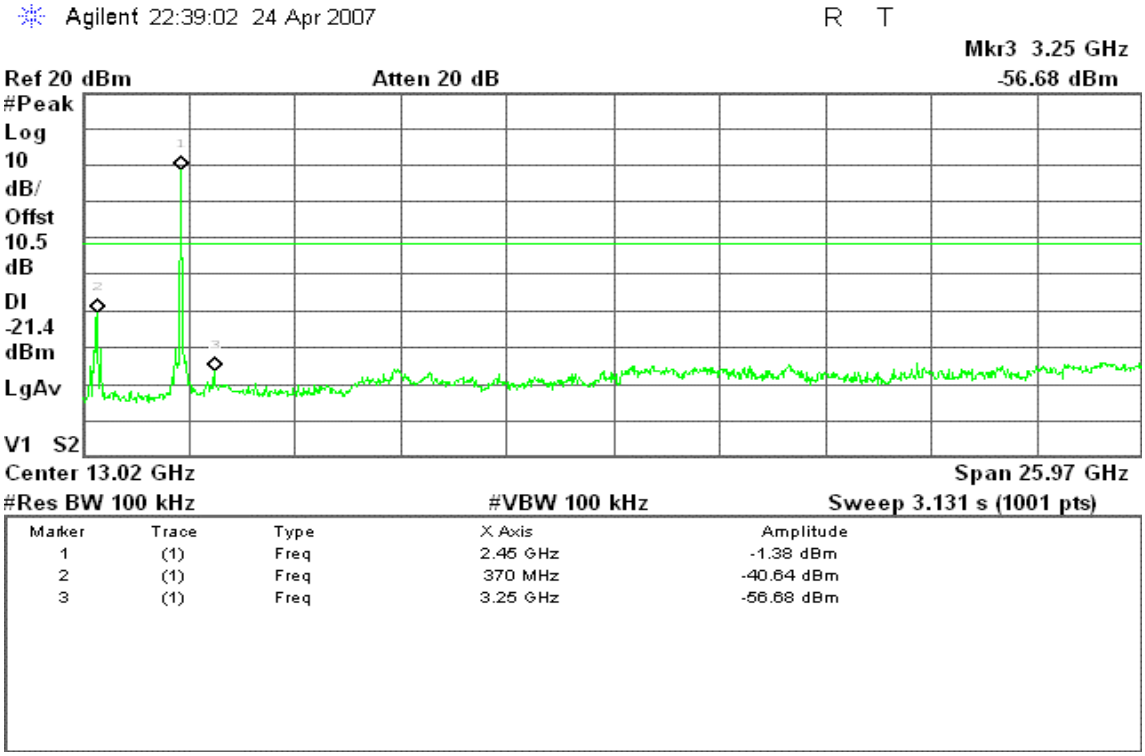
IEEE 802.11g mode / Chain 1

CH Low



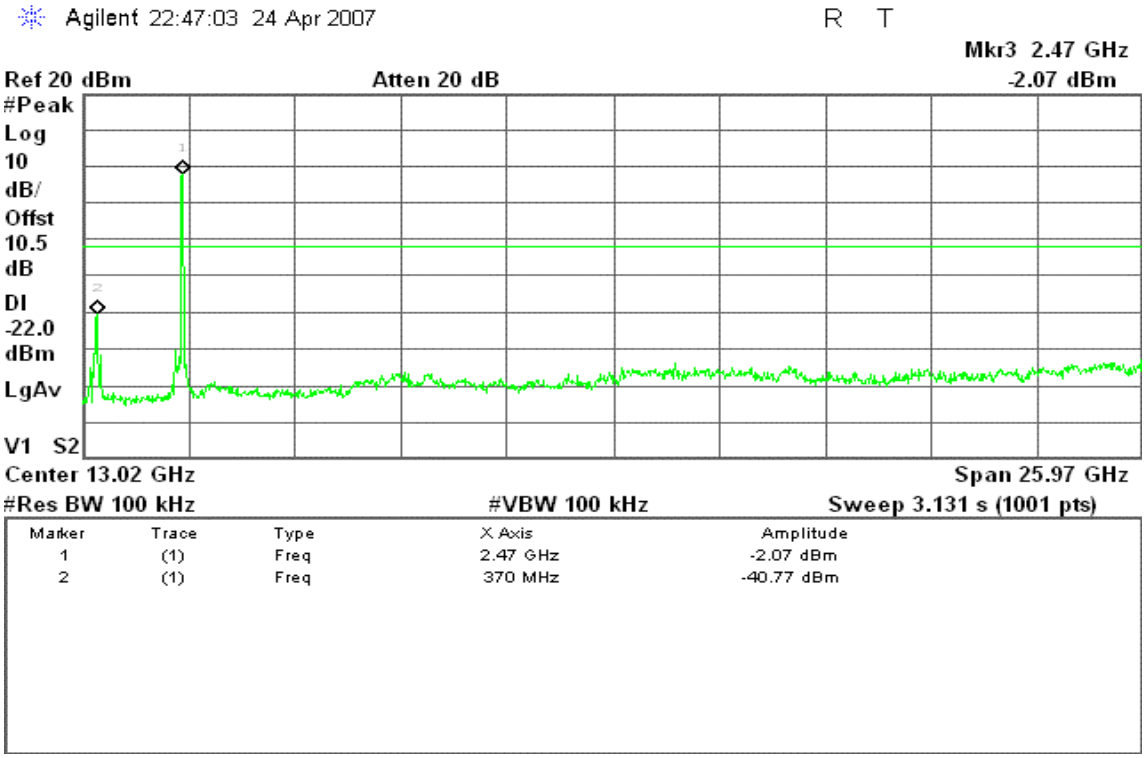
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	1.86 dBm
2	(1)	Freq	370 MHz	-40.92 dBm
3	(1)	Freq	3.22 GHz	-52.89 dBm

CH Mid



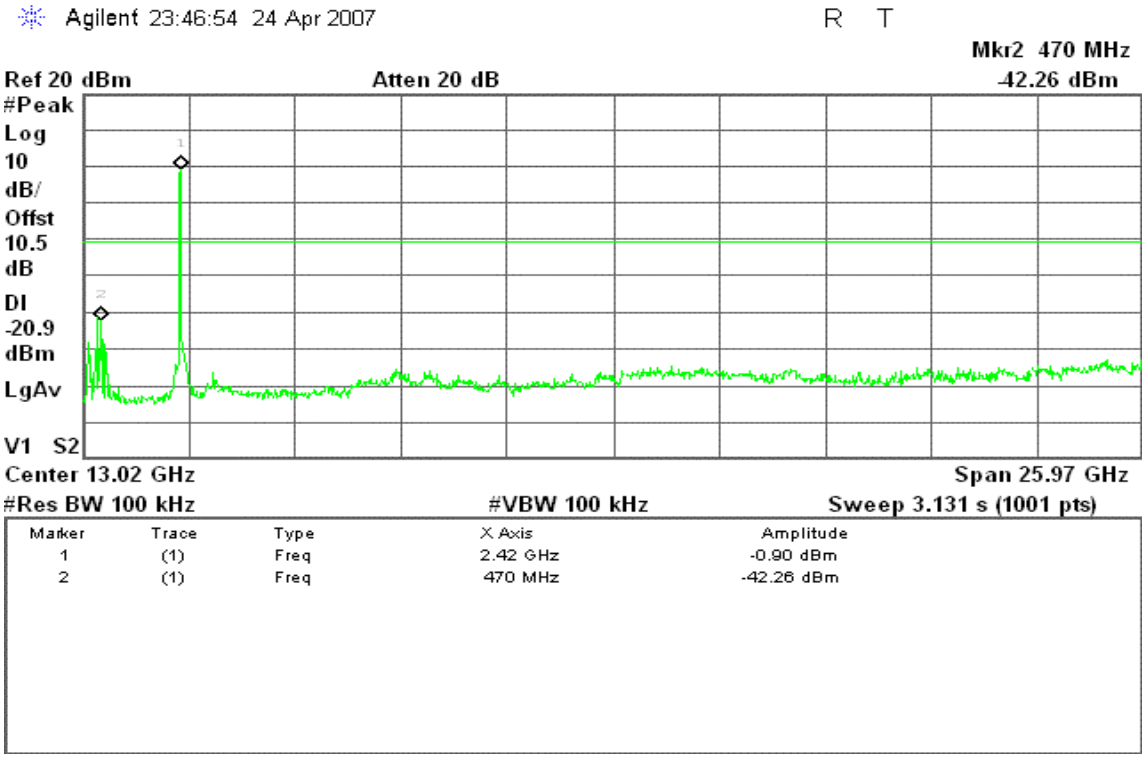
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45 GHz	-1.38 dBm
2	(1)	Freq	370 MHz	-40.64 dBm
3	(1)	Freq	3.25 GHz	-56.68 dBm

CH High

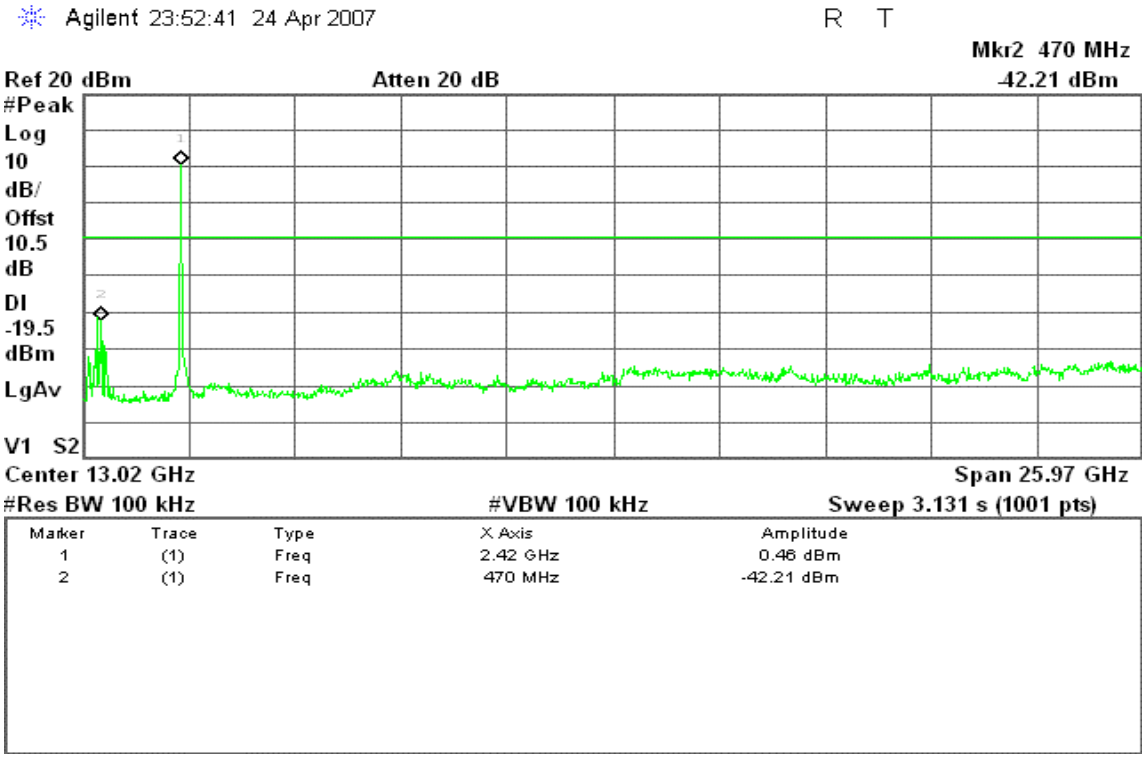


IEEE 802.11g mode / Chain 0

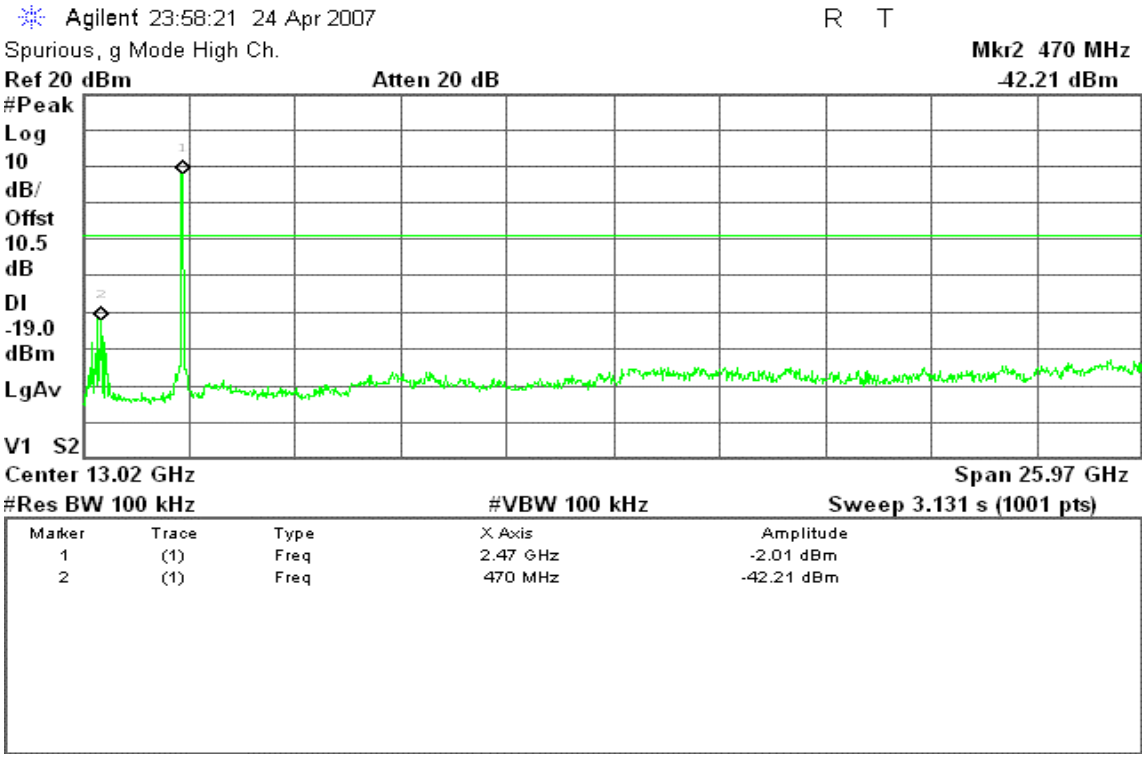
CH Low



CH Mid

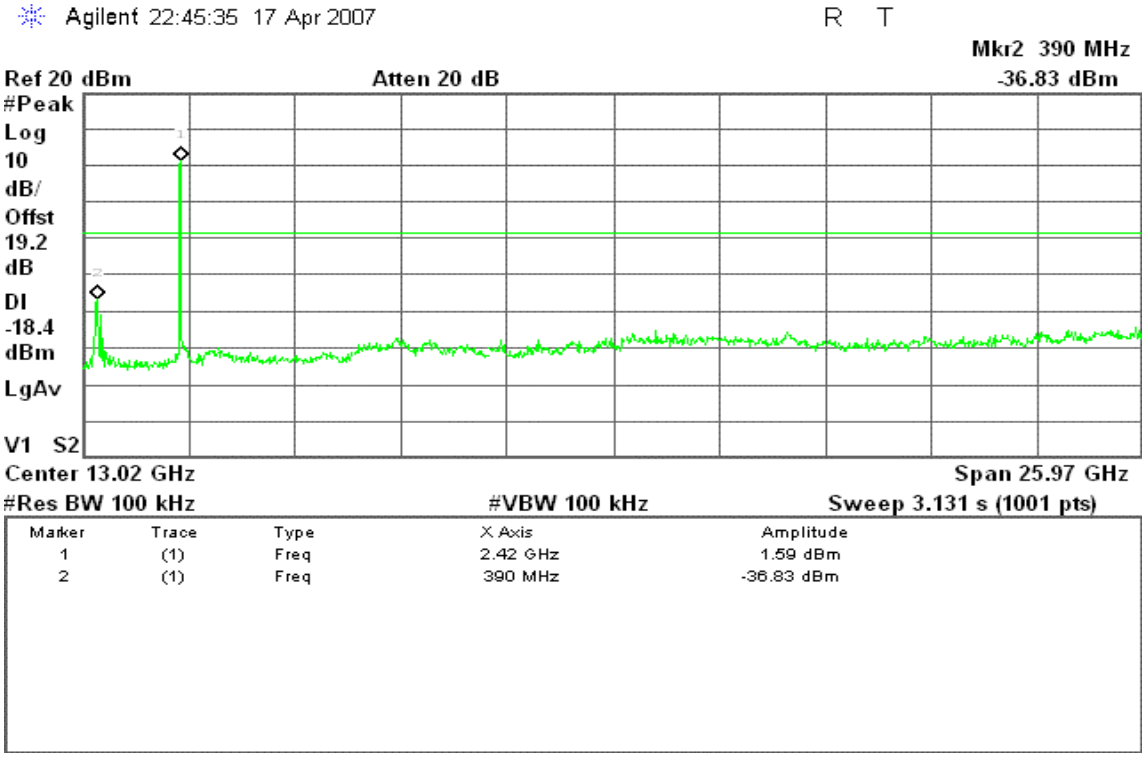


CH High

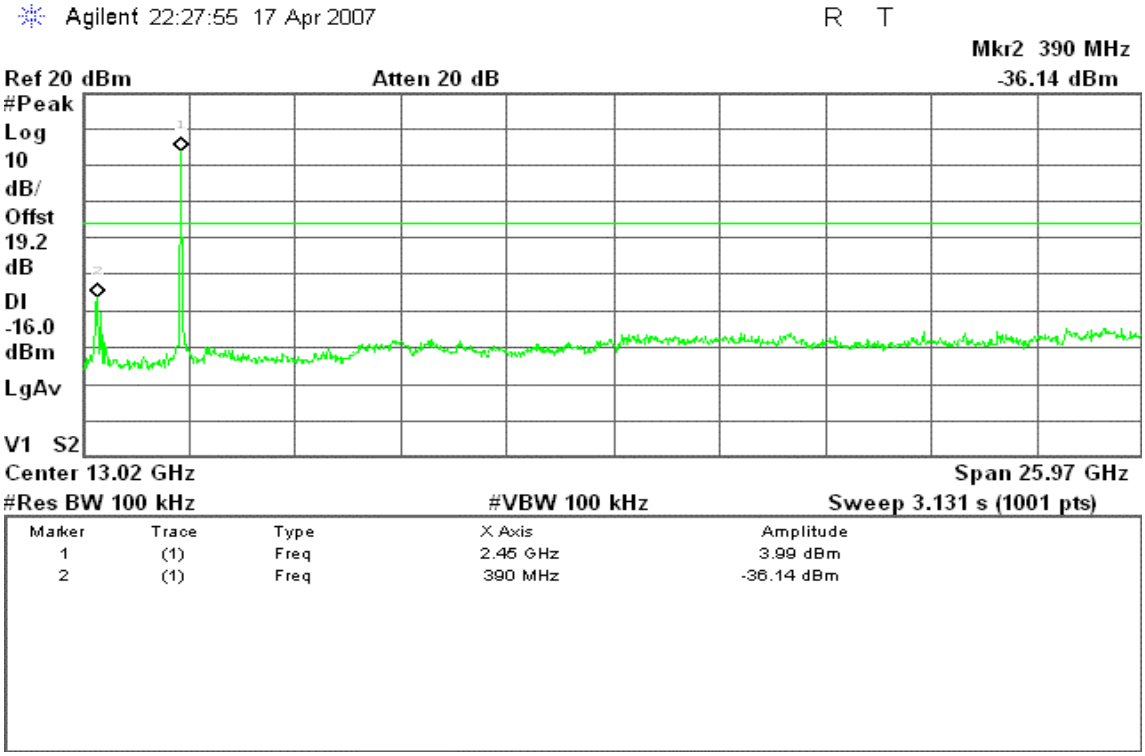


draft 802.11n Standard-20 MHz Channel mode

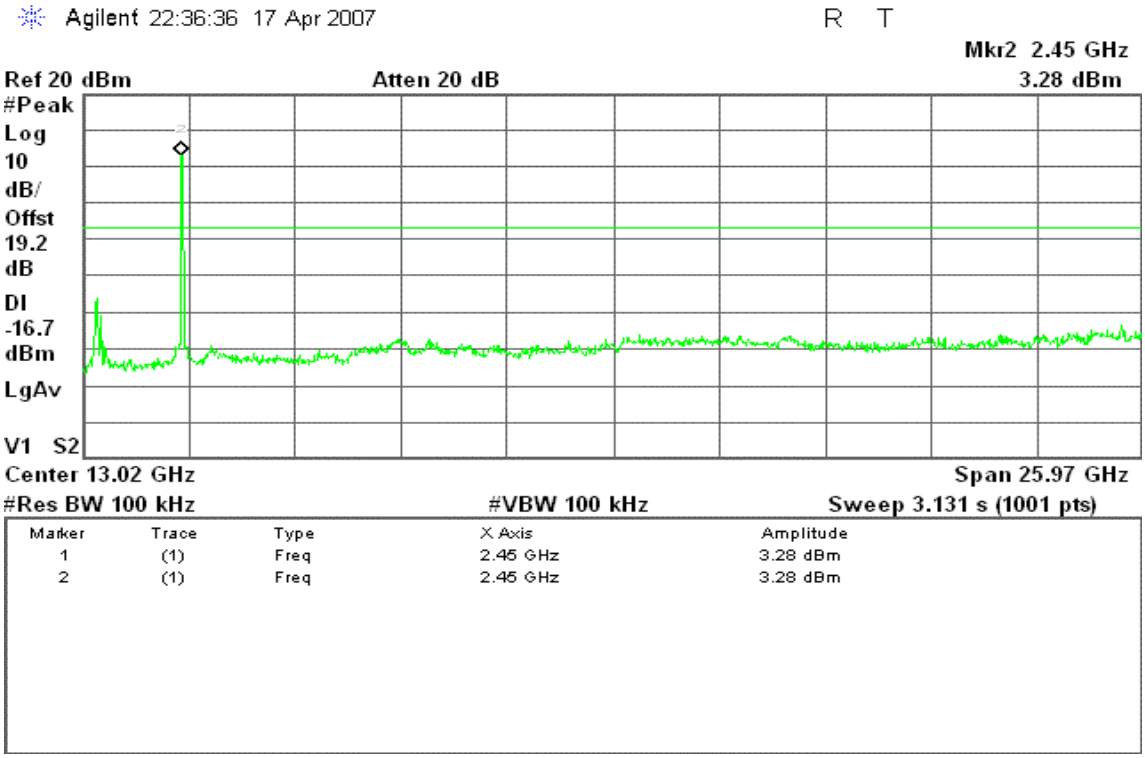
CH Low



CH Mid

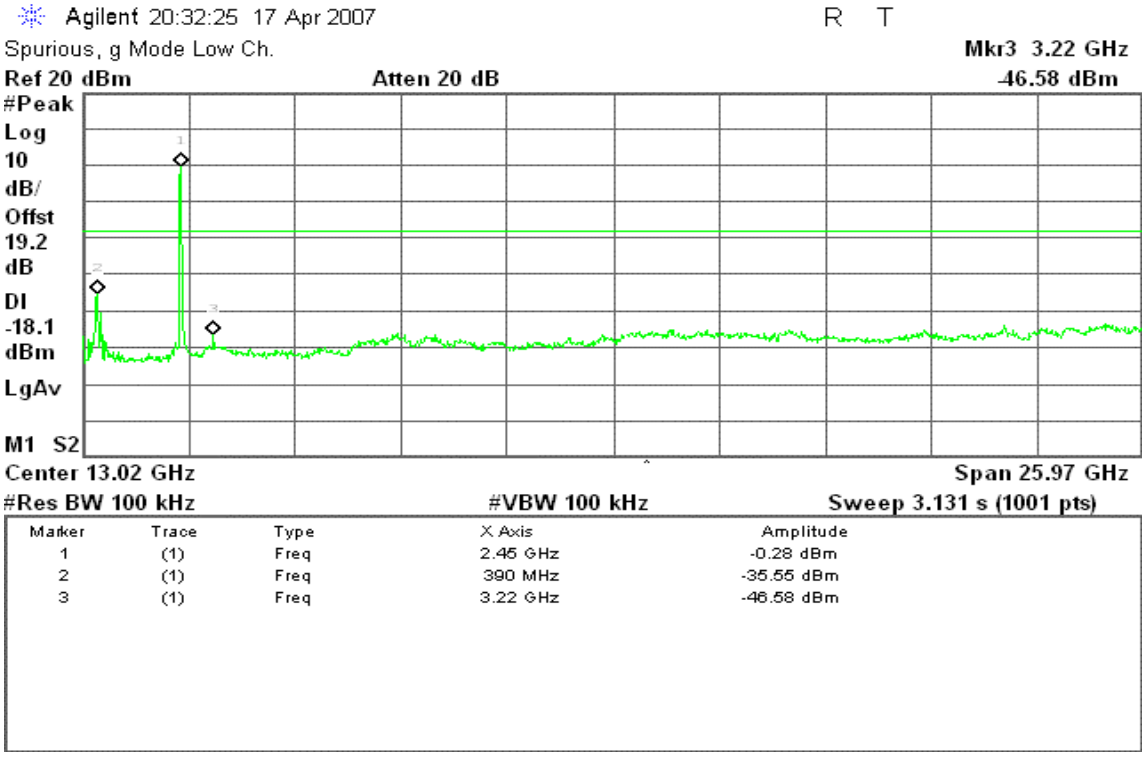


CH High

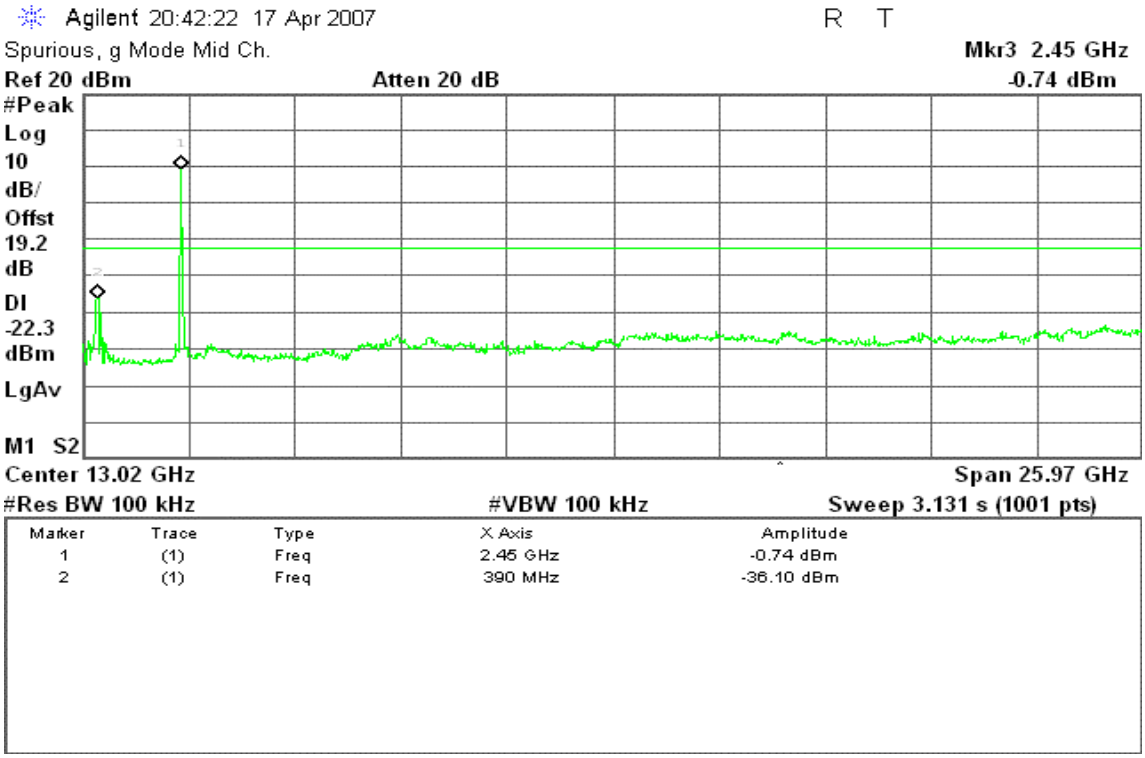


draft 802.11n Wide-40 MHz Channel mode

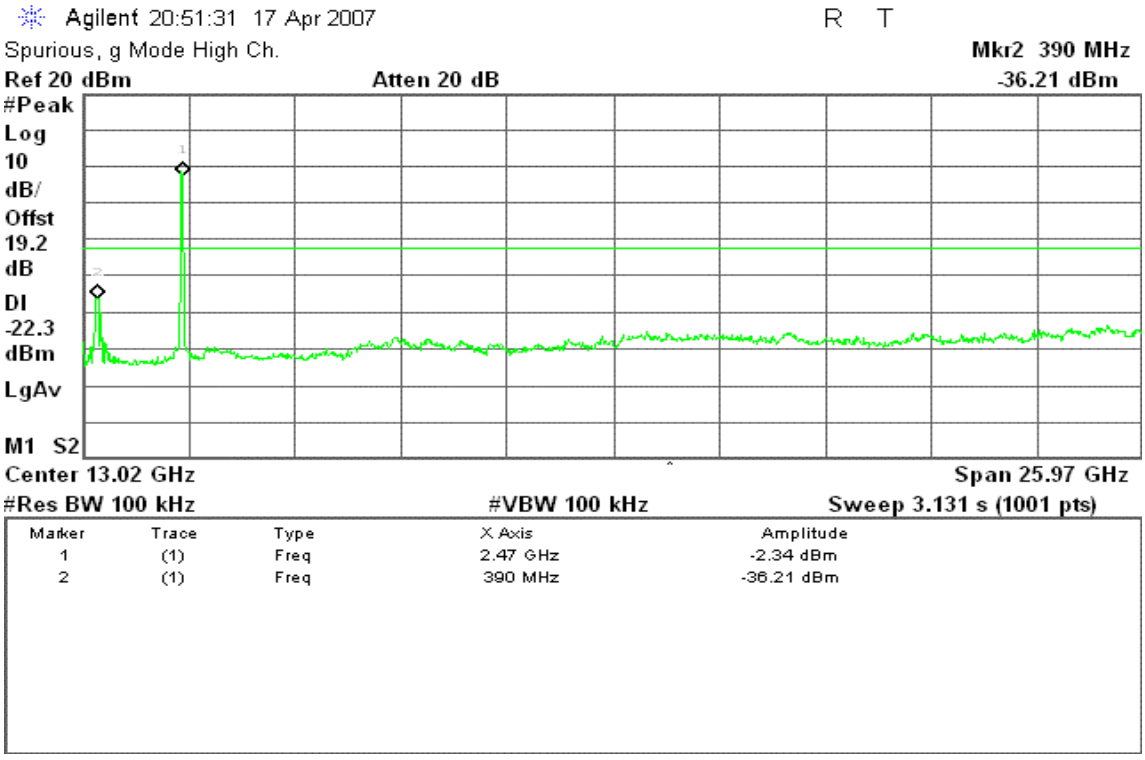
CH Low



CH Mid

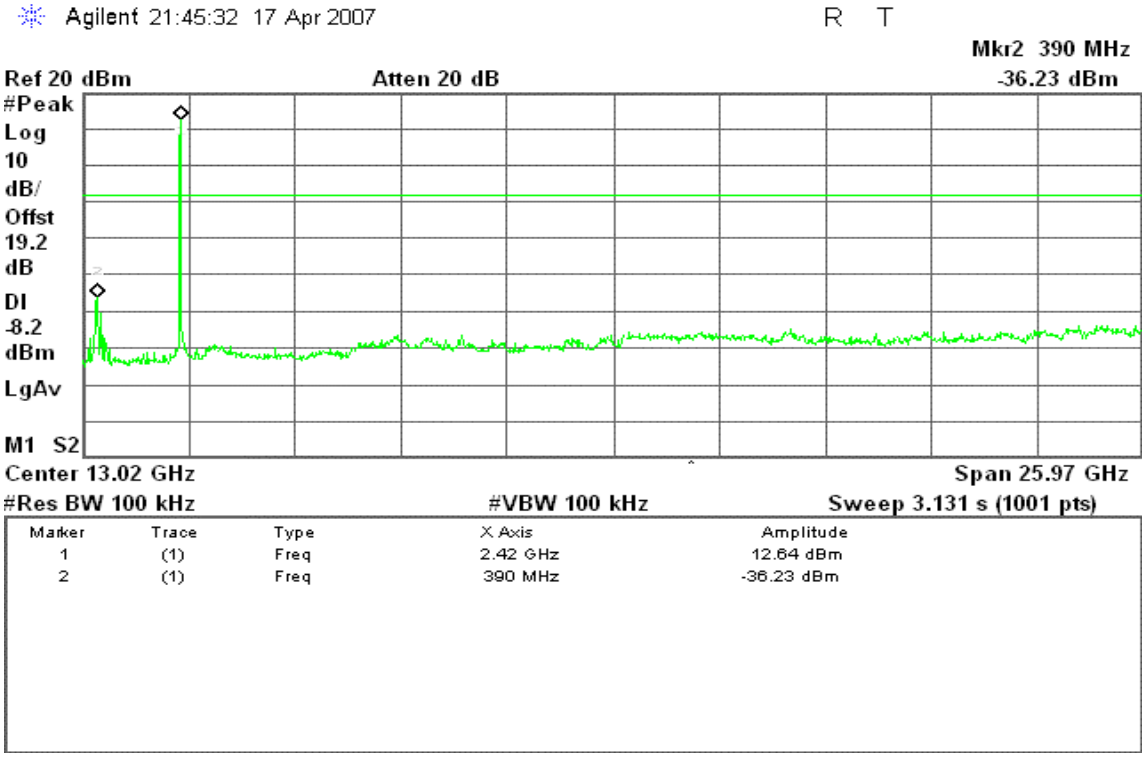


CH High

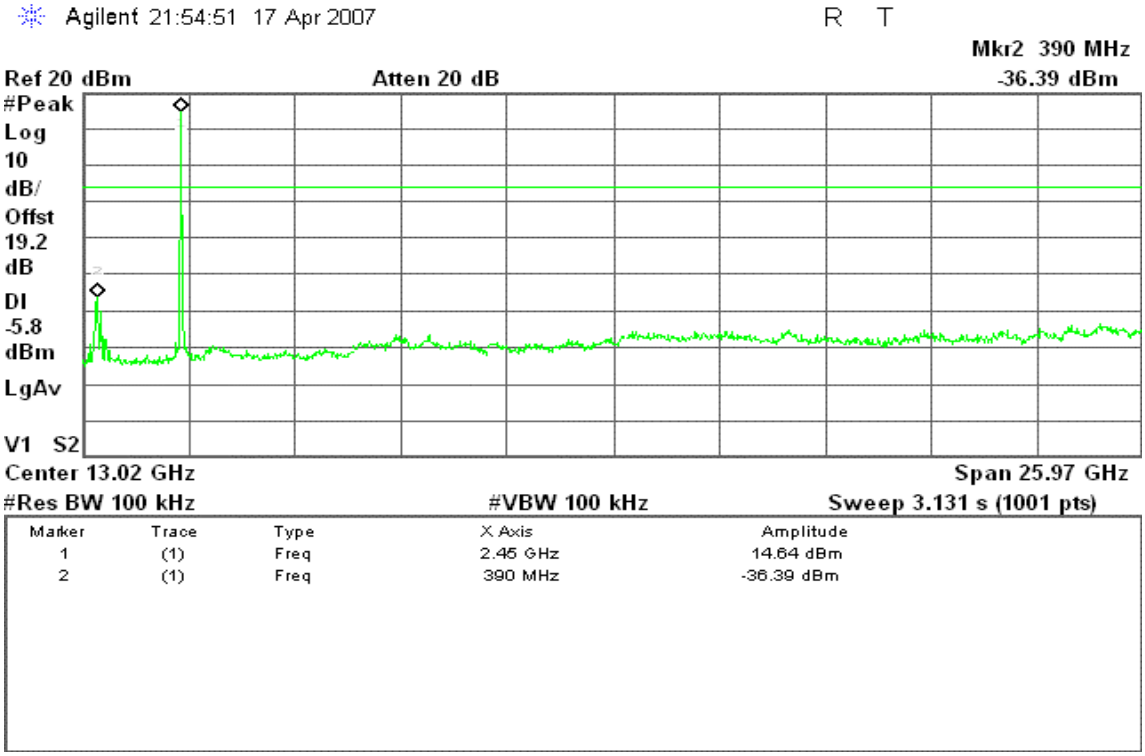


IEEE 802.11b mode with combiner

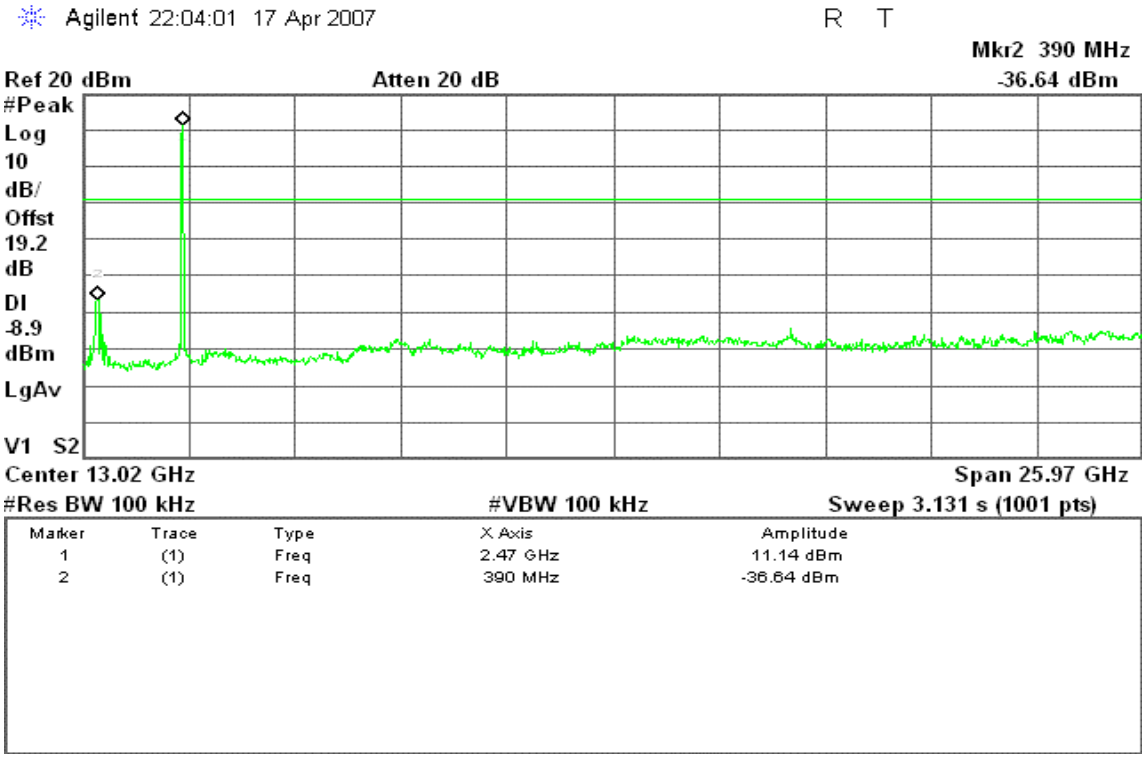
CH Low



CH Mid

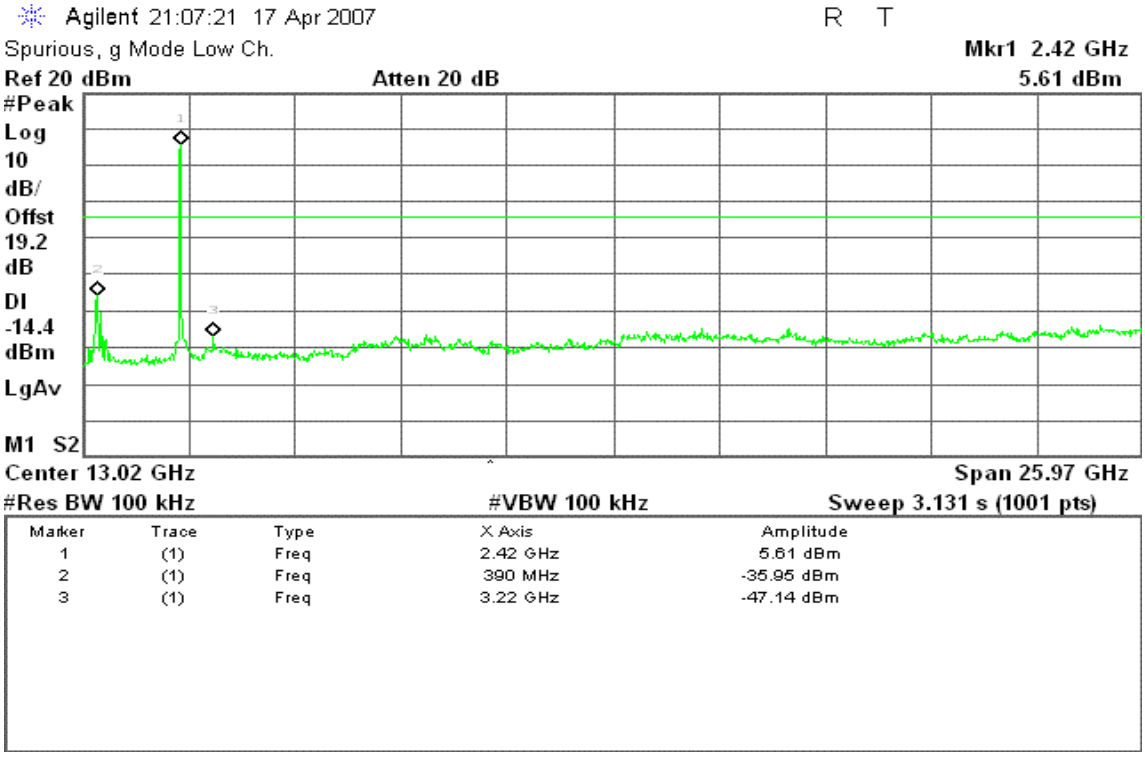


CH High

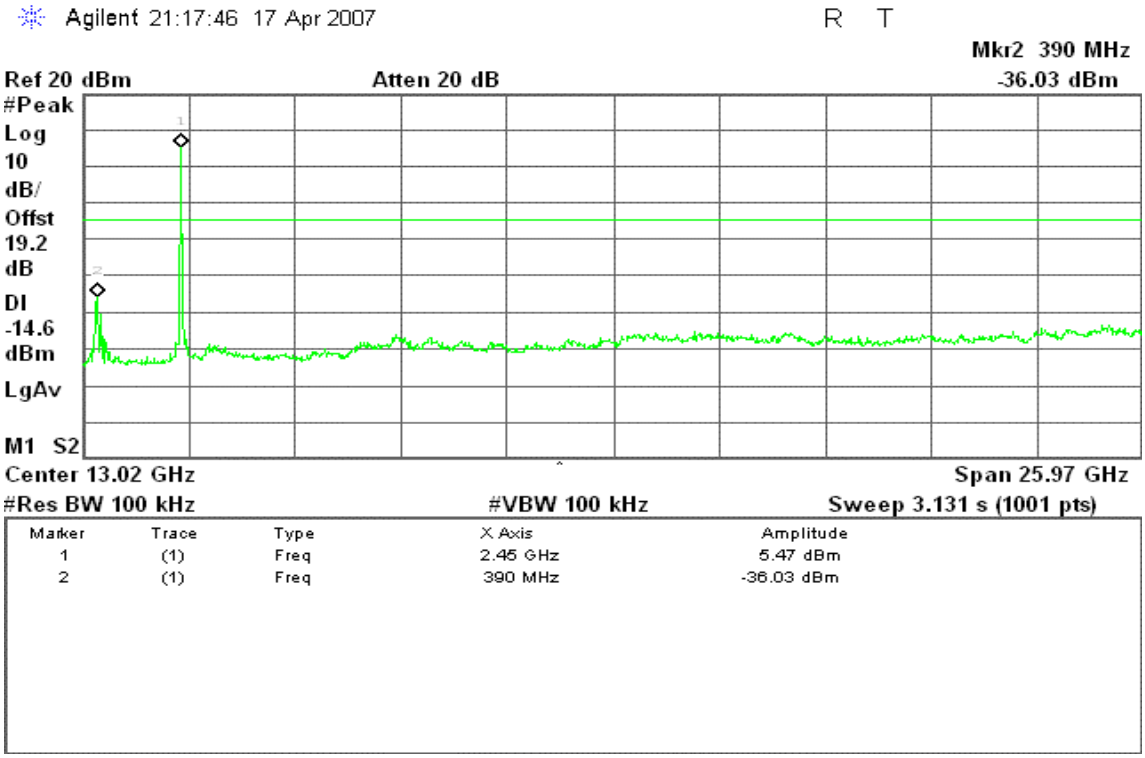


IEEE 802.11g mode with combiner

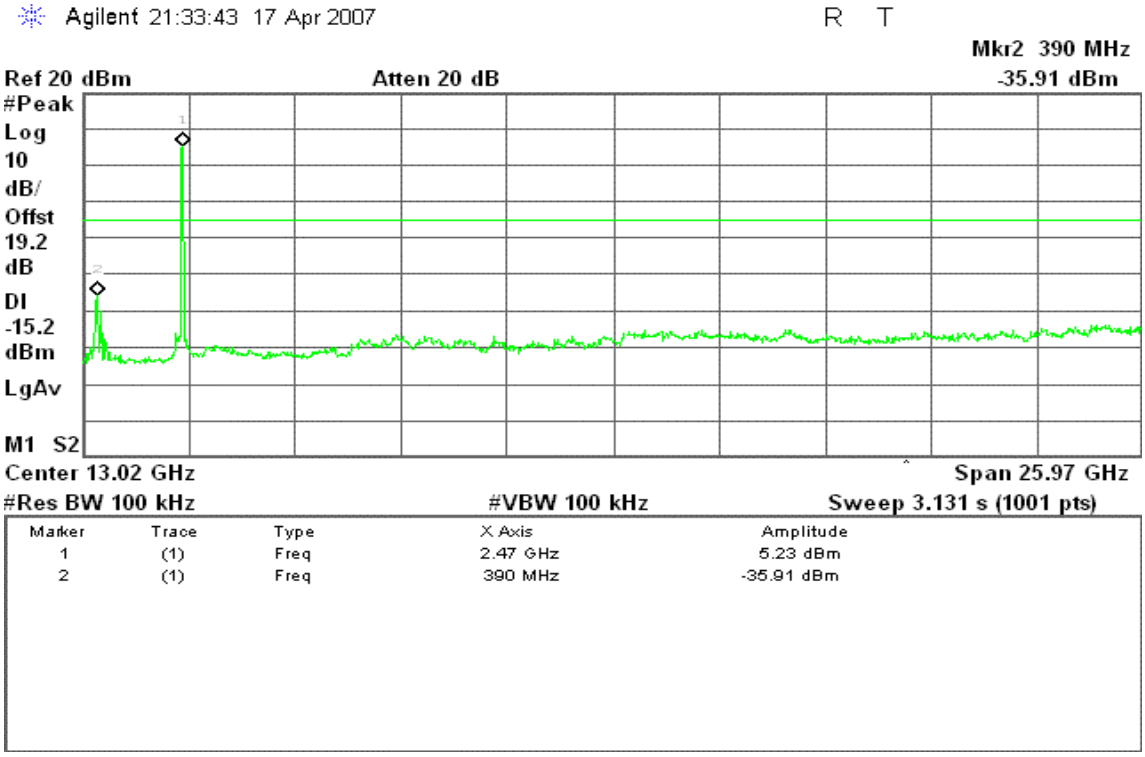
CH Low



CH Mid



CH High



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 (µV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

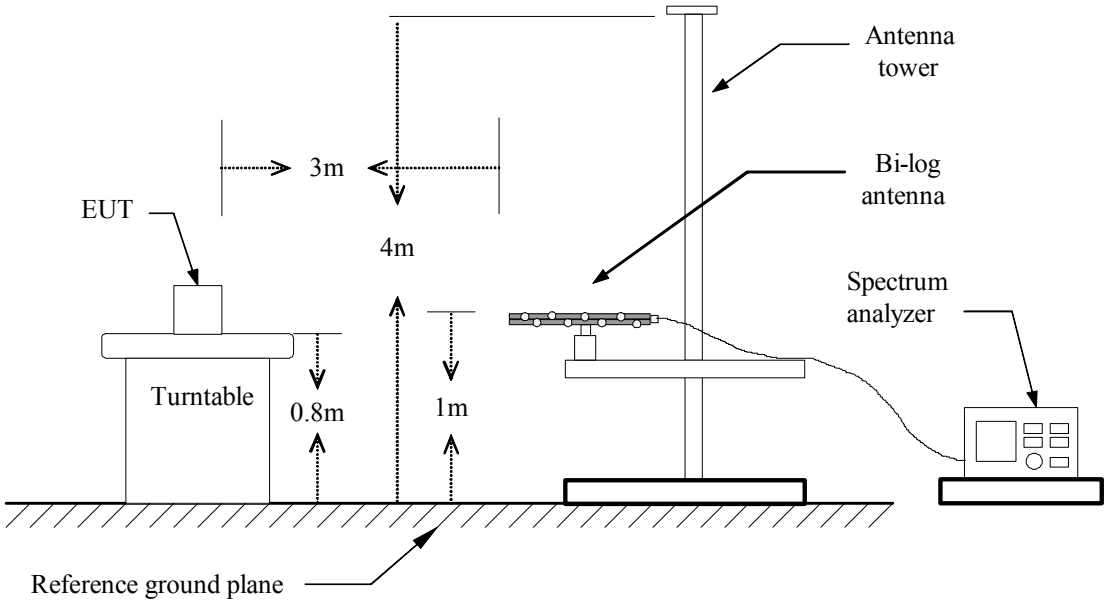
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

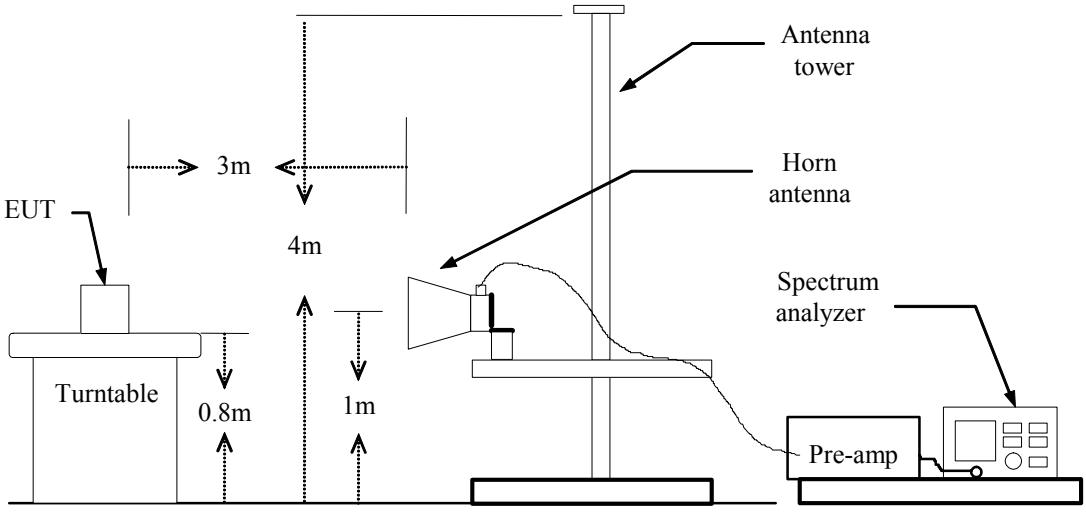
Frequency (MHz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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:** April 14, 2007

Temperature: 20°C **Tested by:** Nan Tsai

Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
199.75	V	52.27	-13.37	38.90	43.50	-4.60	Peak
225.62	V	5742	-14.90	42.52	46.00	-3.48	QP
299.98	V	53.64	-12.43	41.21	46.00	-4.79	Peak
500.45	V	50.23	-7.86	42.37	46.00	-3.63	Peak
519.85	V	49.40	-7.27	42.13	46.00	-3.87	Peak
600.68	V	48.82	-6.19	42.63	46.00	-3.37	QP
199.75	H	50.49	-13.37	37.11	43.50	-6.39	Peak
299.98	H	55.30	-12.43	42.87	46.00	-3.13	QP
500.45	H	50.74	-7.86	42.88	46.00	-3.12	QP
519.85	H	50.17	-7.27	42.90	46.00	-3.10	QP
749.42	H	46.62	-4.15	42.47	46.00	-3.53	Peak
899.77	H	44.47	-2.15	42.31	46.00	-3.69	Peak

Remark:

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Margin (dB) = Result (dBuV/m) – Limit (dBuV/m).*

Above 1 GHz

Operation Mode: TX / IEEE 802.11b / CH Low **Test Date:** April 12, 2007

Temperature: 20°C **Tested by:** Nan Tsai

Humidity: 50 % 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
1198.33	V	51.86	---	-10.47	41.39	---	74.00	54.00	-12.61	Peak
4826.67	V	53.24	---	0.56	53.79	---	74.00	54.00	-0.21	Peak
7241.67	V	49.87	---	3.54	53.41	---	74.00	54.00	-0.59	Peak
9650.00	V	41.90	---	11.54	53.44	---	74.00	54.00	-0.56	Peak
N/A										
1501.67	H	49.91	---	-9.96	39.95	---	74.00	54.00	-14.05	Peak
4826.67	H	47.54	---	0.56	48.09	---	74.00	54.00	-5.91	Peak
7241.67	H	49.14	---	3.54	52.67	---	74.00	54.00	-1.33	Peak
N/A										

Remark:

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

Operation Mode: TX / IEEE 802.11b / CH Mid **Test Date:** April 12, 2007

Temperature: 20°C **Tested by:** Nan Tsai

Humidity: 50 % 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
1198.33	V	51.96	---	-10.47	41.49	---	74.00	54.00	-12.51	Peak
3601.67	V	44.64	---	-1.57	43.06	---	74.00	54.00	-10.94	Peak
4873.33	V	50.58	---	0.60	51.18	---	74.00	54.00	-2.82	Peak
7311.67	V	48.65	---	3.40	52.05	---	74.00	54.00	-1.95	Peak
9750.00	V	42.08	---	11.75	53.84	---	74.00	54.00	-0.16	Peak
N/A										
1501.67	H	49.61	---	-9.96	39.66	---	74.00	54.00	-14.34	Peak
4126.67	H	44.01	---	-0.40	43.61	---	74.00	54.00	-10.39	Peak
4873.33	H	45.02	---	0.60	45.62	---	74.00	54.00	-8.38	Peak
7311.67	H	48.31	---	3.40	51.71	---	74.00	54.00	-2.29	Peak
13566.67	H	39.50	---	12.08	51.58	---	74.00	54.00	-2.42	Peak
N/A										

Remark:

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

Operation Mode: TX / IEEE 802.11b / CH High **Test Date:** April 12, 2007

Temperature: 20°C **Tested by:** Nan Tsai

Humidity: 50 % 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
1198.33	V	52.07	---	-10.47	41.61	---	74.00	54.00	-12.39	Peak
1805.00	V	47.47	---	-6.94	40.53	---	74.00	54.00	-13.47	Peak
4920.00	V	49.89	---	0.65	50.54	---	74.00	54.00	-3.46	Peak
7393.33	V	54.55	48.24	3.25	57.80	51.49	74.00	54.00	-2.51	AVG
9850.00	V	40.35	---	11.97	52.32	---	74.00	54.00	-1.68	Peak
N/A										
1501.67	H	49.50	---	-9.96	39.54	---	74.00	54.00	-14.46	Peak
4920.00	H	48.14	---	0.65	48.79	---	74.00	54.00	-5.21	Peak
7393.33	H	50.55	---	3.25	53.80	---	74.00	54.00	-0.20	Peak
9850.00	H	39.17	---	11.97	51.14	---	74.00	54.00	-2.86	Peak
N/A										

Remark:

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

Operation Mode: TX / IEEE 802.11g / CH Low **Test Date:** April 12, 2007

Temperature: 20°C **Tested by:** Nan Tsai

Humidity: 50 % 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
1198.33	V	52.76	---	-10.47	42.29	---	74.00	54.00	-11.71	Peak
3216.67	V	45.67	---	-2.17	43.50	---	74.00	54.00	-10.50	Peak
4826.67	V	45.84	---	0.56	46.40	---	74.00	54.00	-7.60	Peak
7241.67	V	46.61	---	3.54	50.15	---	74.00	54.00	-3.85	Peak
N/A										
1501.67	H	50.05	---	-9.96	40.10	---	74.00	54.00	-13.90	Peak
4931.67	H	44.16	---	0.66	44.82	---	74.00	54.00	-9.18	Peak
6751.67	H	43.67	---	3.49	47.16	---	74.00	54.00	-6.84	Peak
7241.67	H	45.35	---	3.54	48.88	---	74.00	54.00	-5.12	Peak
N/A										

Remark:

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

Operation Mode: TX / IEEE 802.11g / CH Mid **Test Date:** April 12, 2007

Temperature: 20°C **Tested by:** Nan Tsai

Humidity: 50 % 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
1198.33	V	51.10	---	-10.47	40.63	---	74.00	54.00	-13.37	Peak
1501.67	V	49.10	---	-9.96	39.14	---	74.00	54.00	-14.86	Peak
1805.00	V	45.99	---	-6.94	39.04	---	74.00	54.00	-14.96	Peak
7300.00	V	45.30	---	3.43	48.73	---	74.00	54.00	-5.27	Peak
N/A										
1501.67	H	49.97	---	-9.96	40.01	---	74.00	54.00	-13.99	Peak
3438.33	H	42.97	---	-1.89	41.08	---	74.00	54.00	-12.92	Peak
4966.67	H	43.85	---	0.69	44.54	---	74.00	54.00	-9.46	Peak
7323.33	H	44.51	---	3.38	47.89	---	74.00	54.00	-6.11	Peak
N/A										

Remark:

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

Operation Mode: TX / IEEE 802.11g / CH High **Test Date:** April 12, 2007

Temperature: 20°C **Tested by:** Nan Tsai

Humidity: 50 % 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
1198.33	V	50.57	---	-10.47	40.10	---	74.00	54.00	-13.90	Peak
1805.00	V	46.97	---	-6.94	40.03	---	74.00	54.00	-13.97	Peak
2236.67	V	44.34	---	-4.41	39.92	---	74.00	54.00	-14.08	Peak
2995.00	V	43.30	---	-2.46	40.84	---	74.00	54.00	-13.16	Peak
3601.67	V	43.35	---	-1.57	41.77	---	74.00	54.00	-12.23	Peak
7393.33	V	48.07	---	3.25	51.32	---	74.00	54.00	-2.68	Peak
1501.67	H	49.65	---	-9.96	39.70	---	74.00	54.00	-14.30	Peak
7393.33	H	46.53	---	3.25	49.78	---	74.00	54.00	-4.22	Peak
10016.67	H	38.76	---	12.37	51.13	---	74.00	54.00	-2.87	Peak
N/A										

Remark:

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

Operation Mode:	TX / draft 802.11n Standard-20 MHz Channel mode / CH Low	**Test Date:**	April 12, 2007
Temperature:	20°C	**Tested by:**	Nan Tsai
Humidity:	50 % 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
1198.33	V	51.03	---	-10.47	40.56	---	74.00	54.00	-13.44	Peak
1805.00	V	46.65	---	-6.94	39.71	---	74.00	54.00	-14.29	Peak
3216.67	V	47.63	---	-2.17	45.46	---	74.00	54.00	-8.54	Peak
3601.67	V	44.21	---	-1.57	42.64	---	74.00	54.00	-11.36	Peak
5200.00	V	43.96	---	1.00	44.96	---	74.00	54.00	-9.04	Peak
6705.00	V	43.59	---	3.40	46.99	---	74.00	54.00	-7.01	Peak
1711.67	H	53.67	---	-7.87	45.80	---	74.00	54.00	-8.20	Peak
3613.33	H	43.24	---	-1.55	41.70	---	74.00	54.00	-12.30	Peak
6670.00	H	43.62	---	3.33	46.95	---	74.00	54.00	-7.05	Peak
8566.67	H	42.17	---	9.40	51.57	---	74.00	54.00	-2.43	Peak
N/A										

Remark:

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

Operation Mode:	TX / draft 802.11n Standard-20 MHz Channel mode / CH Mid	**Test Date:**	April 12, 2007
Temperature:	20°C	**Tested by:**	Nan Tsai
Humidity:	50 % 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
1198.33	V	51.48	---	-10.47	41.01	---	74.00	54.00	-12.99	Peak
1805.00	V	46.65	---	-6.94	39.71	---	74.00	54.00	-14.29	Peak
2236.67	V	44.70	---	-4.41	40.28	---	74.00	54.00	-13.72	Peak
3251.67	V	43.77	---	-2.13	41.64	---	74.00	54.00	-12.36	Peak
3601.67	V	44.62	---	-1.57	43.05	---	74.00	54.00	-10.95	Peak
7311.67	V	45.21	---	3.40	48.61	---	74.00	54.00	-5.39	Peak
1501.67	H	49.36	---	-9.96	39.40	---	74.00	54.00	-14.60	Peak
3030.00	H	43.22	---	-2.41	40.81	---	74.00	54.00	-13.19	Peak
4418.33	H	43.39	---	0.10	43.49	---	74.00	54.00	-10.51	Peak
5480.00	H	44.59	---	1.38	45.97	---	74.00	54.00	-8.03	Peak
7311.67	H	43.85	---	3.40	47.25	---	74.00	54.00	-6.75	Peak
N/A										

Remark:

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

Operation Mode:	TX / draft 802.11n Standard-20 MHz Channel mode / CH High	**Test Date:**	April 12, 2007
Temperature:	20°C	**Tested by:**	Nan Tsai
Humidity:	50 % 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
1198.33	V	51.88	---	-10.47	41.41	---	74.00	54.00	-12.59	Peak
2155.00	V	44.67	---	-4.62	40.06	---	74.00	54.00	-13.94	Peak
4931.67	V	44.69	---	0.66	45.34	---	74.00	54.00	-8.66	Peak
7381.67	V	46.30	---	3.27	49.57	---	74.00	54.00	-4.43	Peak
N/A										
1000.00	H	51.68	---	-10.79	40.89	---	74.00	54.00	-13.11	Peak
1501.67	H	49.08	---	-9.96	39.12	---	74.00	54.00	-14.88	Peak
2295.00	H	43.68	---	-4.27	39.41	---	74.00	54.00	-14.59	Peak
4266.67	H	43.37	---	-0.16	43.21	---	74.00	54.00	-10.79	Peak
6133.33	H	43.87	---	2.33	46.21	---	74.00	54.00	-7.79	Peak
7381.67	H	45.48	---	3.27	48.75	---	74.00	54.00	-5.25	Peak

Remark:

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

Operation Mode:	TX / draft 802.11n Wide-40 MHz Channel mode / CH Low	**Test Date:**	April 12, 2007
Temperature:	20°C	**Tested by:**	Nan Tsai
Humidity:	50 % 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
1035.00	V	52.97	---	-10.73	42.24	---	74.00	54.00	-11.76	Peak
1198.33	V	51.76	---	-10.47	41.29	---	74.00	54.00	-12.71	Peak
1805.00	V	46.98	---	-6.94	40.04	---	74.00	54.00	-13.96	Peak
3228.33	V	46.63	---	-2.16	44.47	---	74.00	54.00	-9.53	Peak
5958.33	V	44.31	---	2.04	46.35	---	74.00	54.00	-7.65	Peak
N/A										
1000.00	H	54.64	---	-10.79	43.85	---	74.00	54.00	-10.15	Peak
1070.00	H	49.26	---	-10.68	38.59	---	74.00	54.00	-15.41	Peak
1501.67	H	49.69	---	-9.96	39.73	---	74.00	54.00	-14.27	Peak
3205.00	H	43.47	---	-2.19	41.28	---	74.00	54.00	-12.72	Peak
5071.67	H	42.89	---	0.82	43.72	---	74.00	54.00	-10.28	Peak
10116.67	H	38.79	---	12.85	51.64	---	74.00	54.00	-2.36	Peak

Remark:

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

Operation Mode:	TX / draft 802.11n Wide-40 MHz Channel mode / CH Mid	**Test Date:**	April 12, 2007
Temperature:	20°C	**Tested by:**	Nan Tsai
Humidity:	50 % 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
1198.33	V	51.85	---	-10.47	41.38	---	74.00	54.00	-12.62	Peak
1805.00	V	46.32	---	-6.94	39.38	---	74.00	54.00	-14.62	Peak
3251.67	V	43.72	---	-2.13	41.59	---	74.00	54.00	-12.41	Peak
4955.00	V	43.74	---	0.68	44.42	---	74.00	54.00	-9.58	Peak
7743.33	V	42.98	---	4.34	47.31	---	74.00	54.00	-6.69	Peak
N/A										
1000.00	H	53.18	---	-10.79	42.39	---	74.00	54.00	-11.61	Peak
1501.67	H	49.37	---	-9.96	39.41	---	74.00	54.00	-14.59	Peak
6460.00	H	43.85	---	2.92	46.77	---	74.00	54.00	-7.23	Peak
7183.33	H	43.20	---	3.65	46.85	---	74.00	54.00	-7.15	Peak
N/A										

Remark:

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

Operation Mode:	TX / draft 802.11n Wide-40 MHz Channel mode / CH High	**Test Date:**	April 12, 2007
Temperature:	20°C	**Tested by:**	Nan Tsai
Humidity:	50 % 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
1198.33	V	51.58	---	-10.47	41.12	---	74.00	54.00	-12.88	Peak
1711.67	V	50.11	---	-7.87	42.24	---	74.00	54.00	-11.76	Peak
3275.00	V	44.22	---	-2.10	42.12	---	74.00	54.00	-11.88	Peak
6133.33	V	44.36	---	2.33	46.69	---	74.00	54.00	-7.31	Peak
6541.67	V	44.24	---	3.07	47.31	---	74.00	54.00	-6.69	Peak
7941.67	V	42.59	---	5.39	47.98	---	74.00	54.00	-6.02	Peak
1000.00	H	51.41	---	-10.79	40.61	---	74.00	54.00	-13.39	Peak
1501.67	H	49.37	---	-9.96	39.41	---	74.00	54.00	-14.59	Peak
3275.00	H	44.02	---	-2.10	41.92	---	74.00	54.00	-12.08	Peak
7918.33	H	42.26	---	5.26	47.53	---	74.00	54.00	-6.47	Peak
9350.00	H	40.42	---	10.55	50.96	---	74.00	54.00	-3.04	Peak
N/A										

Remark:

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

7.8 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/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 (dBμV)	
	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:**	April 12, 2007
Temperature:	25°C	**Tested by:**	Snake Shan
Humidity:	55% RH		

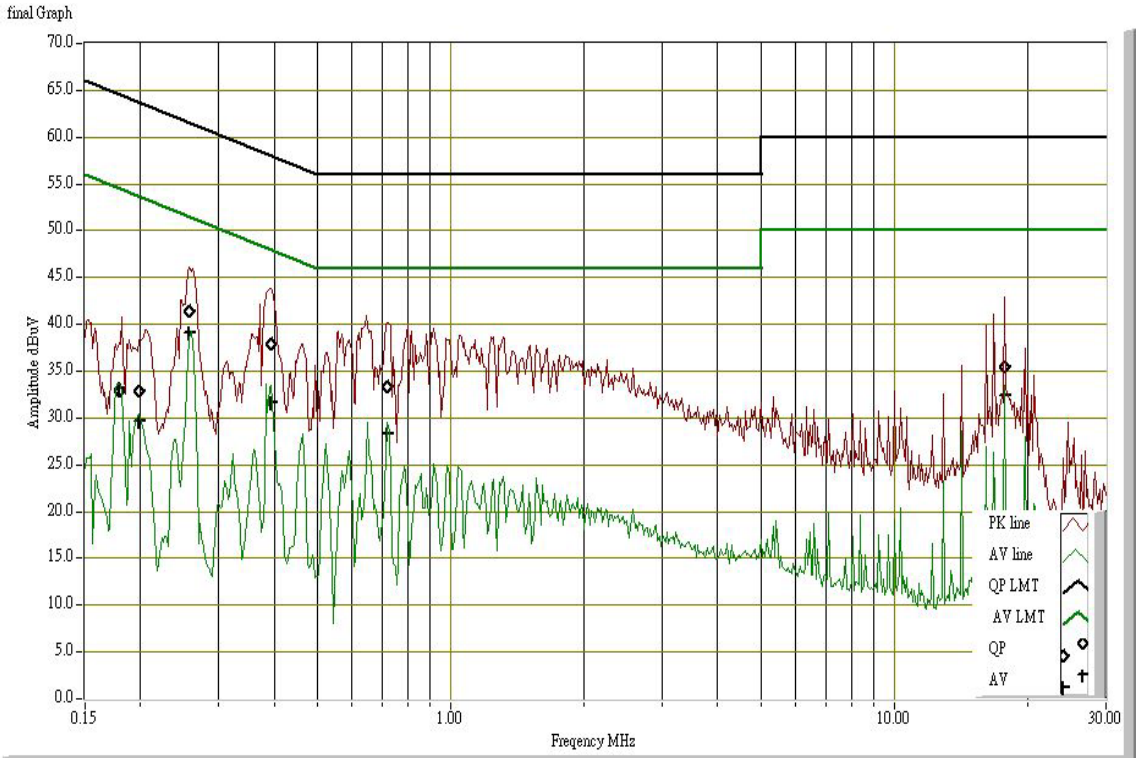
Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.179	33.830	33.230	0.142	33.972	33.372	64.532	54.532	-30.560	-21.160	L1
0.198	32.870	29.640	0.104	32.974	29.744	63.694	53.694	-30.720	-23.950	L1
0.258	41.380	39.100	0.100	41.480	39.200	61.496	51.496	-20.016	-12.296	L1
0.393	37.900	31.650	0.100	38.000	31.750	58.000	48.000	-20.000	-16.250	L1
0.721	33.300	28.300	0.100	33.400	28.400	56.000	46.000	-22.600	-17.600	L1
17.740	35.490	32.480	1.019	36.509	33.499	60.000	50.000	-23.491	-16.501	L1
0.177	33.130	32.640	0.146	33.276	32.786	64.625	54.625	-31.349	-21.839	L2
0.201	30.160	23.650	0.100	30.260	23.750	63.569	53.569	-33.309	-29.819	L2
0.262	34.910	31.530	0.100	35.010	31.630	61.368	51.368	-26.358	-19.738	L2
0.400	30.120	22.140	0.100	30.220	22.240	57.853	47.853	-27.633	-25.613	L2
0.469	25.400	18.460	0.100	25.500	18.560	56.532	46.532	-31.032	-27.972	L2
16.122	29.030	25.710	0.890	29.920	26.600	60.000	50.000	-30.080	-23.400	L2

Remark:

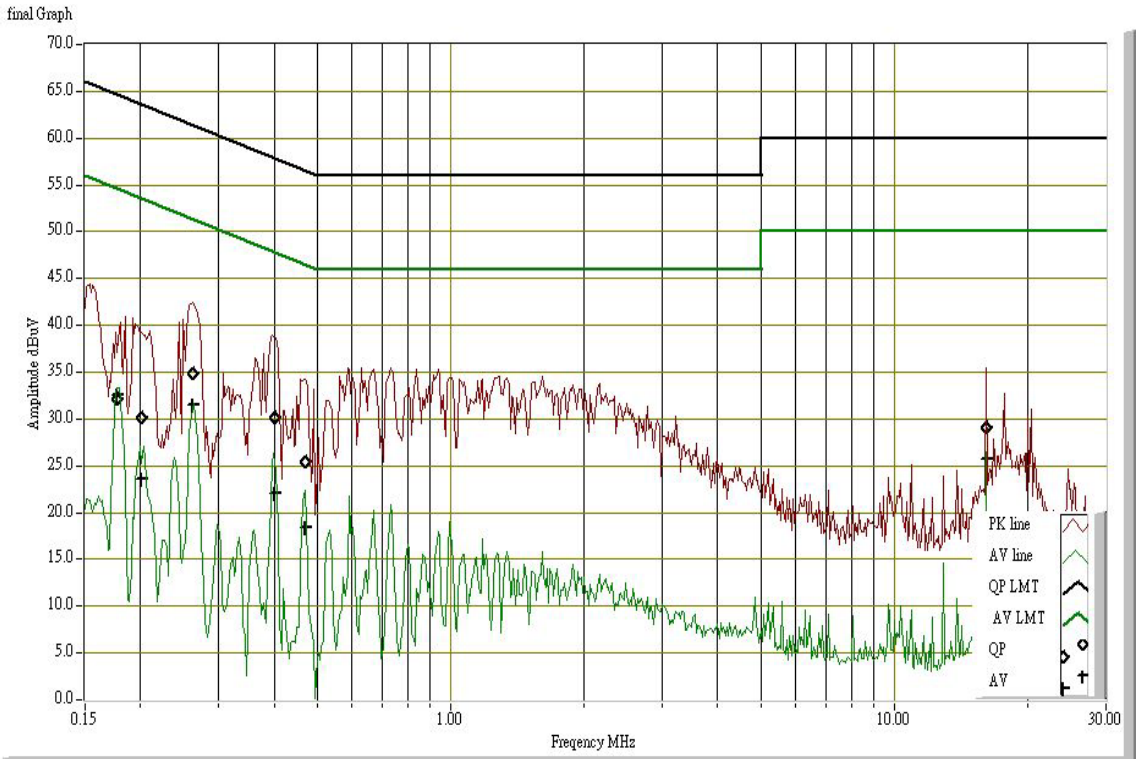
1. *Measuring frequencies from 0.15 MHz to 30MHz.*
2. *The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
3. *The IF bandwidth of SPA between 0.15MHz and 30MHz was 10 kHz; the IF bandwidth of Test Receiver between 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	N1 Wireless Router
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 = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Max. output power	IEEE 802.11b mode: 23.35 dBm (216.27 mW) EEE 802.11g mode: 20.71dBm (117.76 mW) draft 802.11n Standard-20 MHz Channel mode: 20.17 dBm (103.99 mW) draft 802.11n Wide-40 MHz Channel mode: 15.00 dBm (31.62 mW)
Antenna gain (Max)	0.5dBi (including cable loss) (Numeric gain: 1.12)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:

1. *The maximum output power is 23.35dBm (216.27mW) at 2437MHz (with 1.12 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.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where *E = Field strength in Volts / meter*
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

Where *d = Distance in cm*
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm^2

Maximum Permissible Exposure

Substituting the MPE safe distance using d = 20 cm into Equation 1:

Yields

$$S = 0.000199 \times P \times G$$

Where *P = Power in mW*
G = Numeric antenna gain
S = Power density in mW / cm^2

IEEE 802.11b mode:

EUT output power = 216.27mW

Numeric Antenna gain = 1.12

→ *Power density = 0.0482 mW / cm^2*

IEEE 802.11g mode:

EUT output power = 117.76 mW

Numeric Antenna gain = 1.12

→ *Power density = 0.0262 mW / cm^2*

draft 802.11n Standard-20 MHz Channel mode:

EUT output power =103.99 mW

Numeric Antenna gain = 1.12

→ *Power density = 0.0232 mW / cm^2*

draft 802.11n Wide-40 MHz Channel mode:

EUT output power = 31.62mW

Numeric Antenna gain = 1.12

→ *Power density = 0.0070 mW / cm^2*

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.)