FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

iNIC card

Model: IP1001RR MII

Trade Name: Wyplay

Issued to

WYPLAY SAS
200, Avenue de Provence /13190 ALLAUCH / FRANCE

Prepared by

COMPLIANCE CERTIFICATION SERVICES (KUNSHAN) INC.
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TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION 3

2. EUT DESCRIPTION 4

3. TEST METHODOLOGY 5

EUT CONFIGURATION 5
EUT EXERCISE 5
GENERAL TEST PROCEDURES 5
FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS 6
DESCRIPTION OF TEST MODES 7

4. INSTRUMENT CALIBRATION 8

MEASURING INSTRUMENT CALIBRATION 8

5. FACILITIES AND ACCREDITATIONS 9

FACILITIES 9
EQUIPMENT 9
LABORATORY ACCREDITATIONS AND LISTING 9
TABLE OF ACCREDITATIONS AND LISTINGS 10

6. SETUP OF EQUIPMENT UNDER TEST 11

SETUP CONFIGURATION OF EUT 11
SUPPORT EQUIPMENT 11

7. FCC PART 15.247 REQUIREMENTS 12

6DB BANDWIDTH 12
PEAK POWER 34
AVERAGE POWER 45
PEAK POWER SPECTRAL DENSITY 47
SPURIOUS EMISSIONS 58
RADIATED EMISSIONS 77
POWERLINE CONDUCTED EMISSIONS 109

APPENDIX 1 RADIO FREQUENCY EXPOSURE 112

APPENDIX 2 PHOTOGRAPHS OF TEST SETUP 115

1. TEST RESULT CERTIFICATION

Applicant:	WYPLAY SAS 200,Avenue de Provence / 13190 ALLAUCH / FRANCE
Equipment Under Test:	iNIC card
Trade Name:	Wyplay
Model:	IP1001RR MII
Date of Test:	July 18 ~ July 20, 2008

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:

Miro Chueh
EMC Manager
Compliance Certification Service Inc.

Reviewed by:

Lin Zhang
EMC Section Manager
Compliance Certification Service Inc.

2. EUT DESCRIPTION

Product	iNIC card
Trade Name	Wyplay
Model Number	IP1001RR MII
Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 16.19 dBm IEEE 802.11g mode: 14.06 dBm draft 802.11n Standard-20 MHz Channel mode: 13.89 dBm draft 802.11n Wide-40 MHz Channel mode: 12.26 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 (MCS 0~15) draft 802.11n Wide-40 MHz Channel mode: OFDM (MCS 0~15)
Number of Channels	IEEE 802.11b/g mode: 11 Channels draft 802.11n Standard-20 MHz Channel mode: 11 Channels draft 802.11n Wide-40 MHz Channel mode: 7 Channels
Antenna Specification	Gain 5.13dBi

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: **WGHWBD000713AA** 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.

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.

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.

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.

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.

DESCRIPTION OF TEST MODES

The 2x3 configuration was used for all testing in this report.

The worst-case data rates are determined to be as follows for each mode based on investigation by measuring the average power, peak power and PPSD across all data rates, bandwidths, and modulations.

The worst-case data rates:

IEEE802.11b mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

draft 802.11n Standard-20 MHz Channel mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with MCS8 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 MCS8 data rate were chosen for full testing.

All emissions tests were made with the worst-case data rates.

4. INSTRUMENT CALIBRATION

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.

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	MY44020154	11/12/2008
Peak and Avg Power Sensor	Agilent	E9327A	US40441788	09/11/2008
EPM-P Series Power Meter	Agilent	E4416A	QB41292714	09/11/2008

3M Semi Anechoic Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	11/12/2008
Pre-Amplfier	Miteq	NSP4000-NF	870731	01/21/2009
Horn Antenna	Austriah	BBHA9120D	D267	05/09/2009
Turn Table	CT	CT123	4162	N.C.R
Antenna Tower	CT	CTERG23	3253	N.C.R
Controller	CT	CT1OO	95635	N.C.R
Coax Switch	Anitsu	MP 598	M 80094	N/A
Site NSA	CCS Lab.	N/A	N/A	12/11/2008
ESPI3 EMI RECEIVER	R&S	ESPI3	101026	05/06/2009
Pre-Amplfier	MINI	ZFL-1000VH2	d041703	02/28/2009
Bilog Antenna	Sunol Sciences	JB1	A110204-2	11/22/2008

Remark: *The measurement uncertainty is less than +/-2.50dB (30MHz ~ 1GHz), +/-3.169dB (Above 1GHz)*

Power Line Conducted Emission Test Site A				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	SCHAFFNER	SCR3501	343	04/22/2009
V (V-LISN)	Schwarzbeck	NNLK 8129	8129-143	04/11/2009
LISN (EUT)	FCC	FCC-LISN-50/250-50-2-02	SN:05012	04/11/2009
TRANSIENT LIMITER	SCHAFFNER	CFL9206	1710	04/06/2009

which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.

Remark: *The measurement uncertainty is less than +/- 2.15dB, which is evaluated as per the LAB34 and CISPR/A/291/CDV.*

5. FACILITIES AND ACCREDITATIONS

FACILITIES

All measurement facilities used to collect the measurement data are located at
CCS China Kunshan Lab at 10#Weiye Rd, Innovation Park Eco. & Tec. Development Zone

Kunshan city JiangSu, (215300), CHINA.

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

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."

LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 200581-0 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC5743 for 10m chamber 10m, IC5743 for 10m chamber 3m.

TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	47 CFR FCC Part 15/18 (using ANSI C63.4:2003)； VCCI V3; CNS 13438; CNS 13439; CNS 13803; CISPR 11; EN 55011; CISPR 13; EN 55013; CISPR 22:2005; CISPR 22:1997 +A1 :2000+A2 :2002；EN 55022:2006; EN55022 :1998 +A1 :2001+A2 :2003；EN 61000-6-3 (excluding discontinuous interference); EN 61000-6-4; AS/NZS CISPR 22； CAN/CSA-CEI/IEC CISPR 22；EN 61000-3-2；EN 61000-3-3；EN550024； EN 61000-4-2； EN 61000-4-3；EN61000-4-4；EN 61000-4-5； EN 61000-4-6；IEC 61000-4-8；EN 61000-4-11； IEC61000-3-2；IEC61000-3-3；IEC 61000-4-2； IEC 61000-4-3；IEC 61000-4-4； IEC 61000-4-5； IEC 61000-4-6；IEC 61000-4-8；IEC 61000-4-11； EN 300 220-3; EN 300 328; EN 300 330-2; EN 300 440-1; EN 300-440-2; EN 300 893; EN 301 489-01; EN 301 489-3; EN 301 489-07; EN 301 489-17；47 CFR FCC Part 15, 22, 24	ACCREDITED TESTING CERT #2541.01
USA	FCC	3/10 meter Sites to perform FCC Part 15/18 measurements	93105, 90471
Japan	VCCI	3/10 meter Sites and conducted test sites to perform radiated/conducted measurements	VCCI R-1600 C-1707

** 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

SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

SUPPORT EQUIPMENT

No	Equipment	Model	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	Notebook	M285	1824064-1B	DoC	LEO	Line cable: Un-Shielded 1.8m LAN cable: Un-Shielded 1.8m	Shielded, 1.8m
2	Adapter	Mu12-2120100-A1	N/A	DoC	LEL	N/A	Un-Shielded 1.8m

Remark:

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

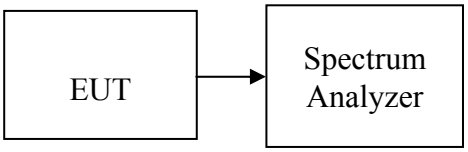
7. FCC PART 15.247 REQUIREMENTS

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

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the selected span. The VBW is set to 3 times the RBW. The sweep time is occupied.

TEST RESULTS

No non-compliance noted

Test Data

IEEE 802.11b mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	12.17	>500	PASS
Mid	2437	12.25		PASS
High	2462	12.25		PASS

IEEE 802.11g mode

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

TRANSMIT CHAIN 0

draft 802.11n Standard-20 MHz Channel mode

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

draft 802.11n Wide-40 MHz Channel mode

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

TRANSMIT CHAIN 1

draft 802.11n Standard-20 MHz Channel mode

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

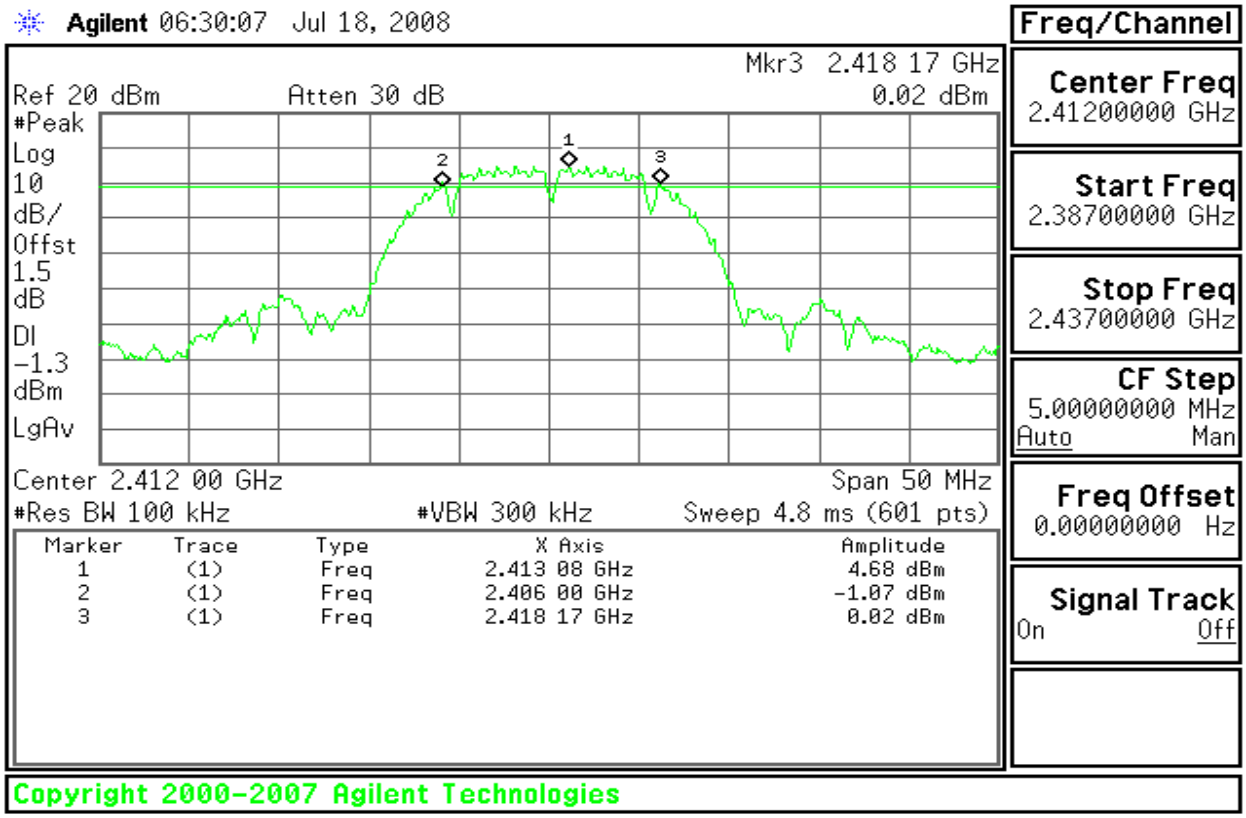
draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.41	>500	PASS
Mid	2437	36.41		PASS
High	2452	36.41		PASS

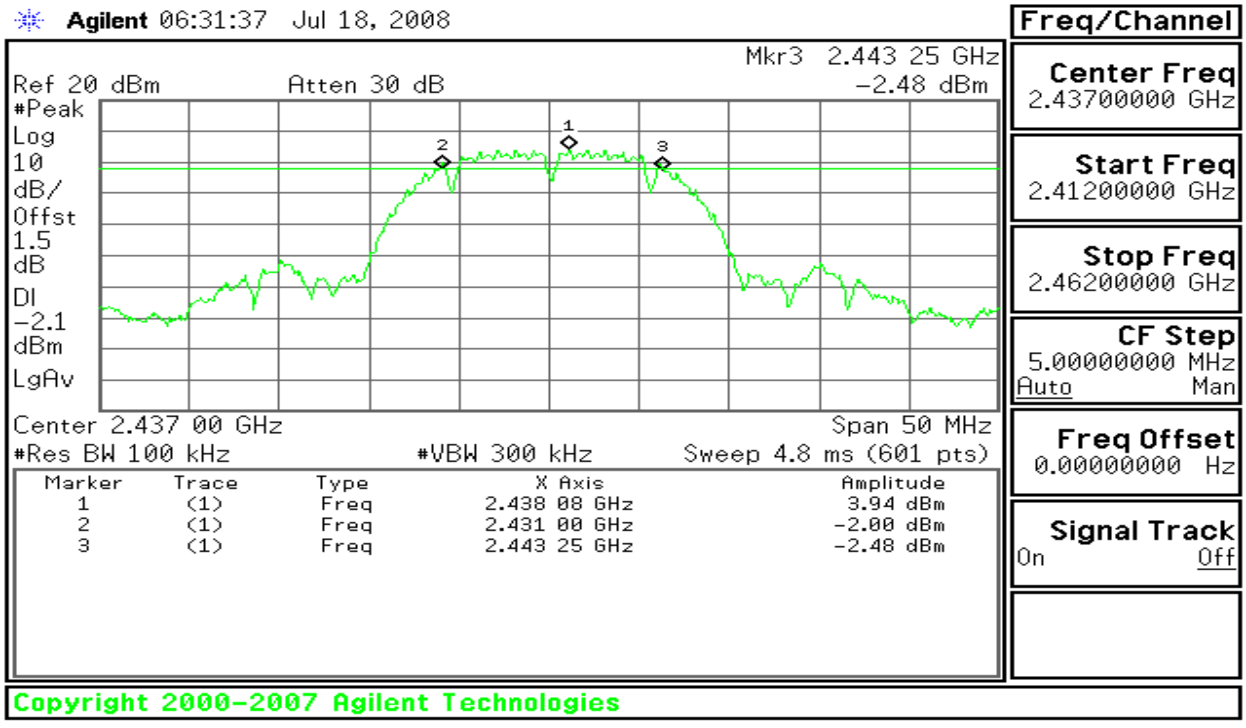
Test Plot

IEEE 802.11b MODE

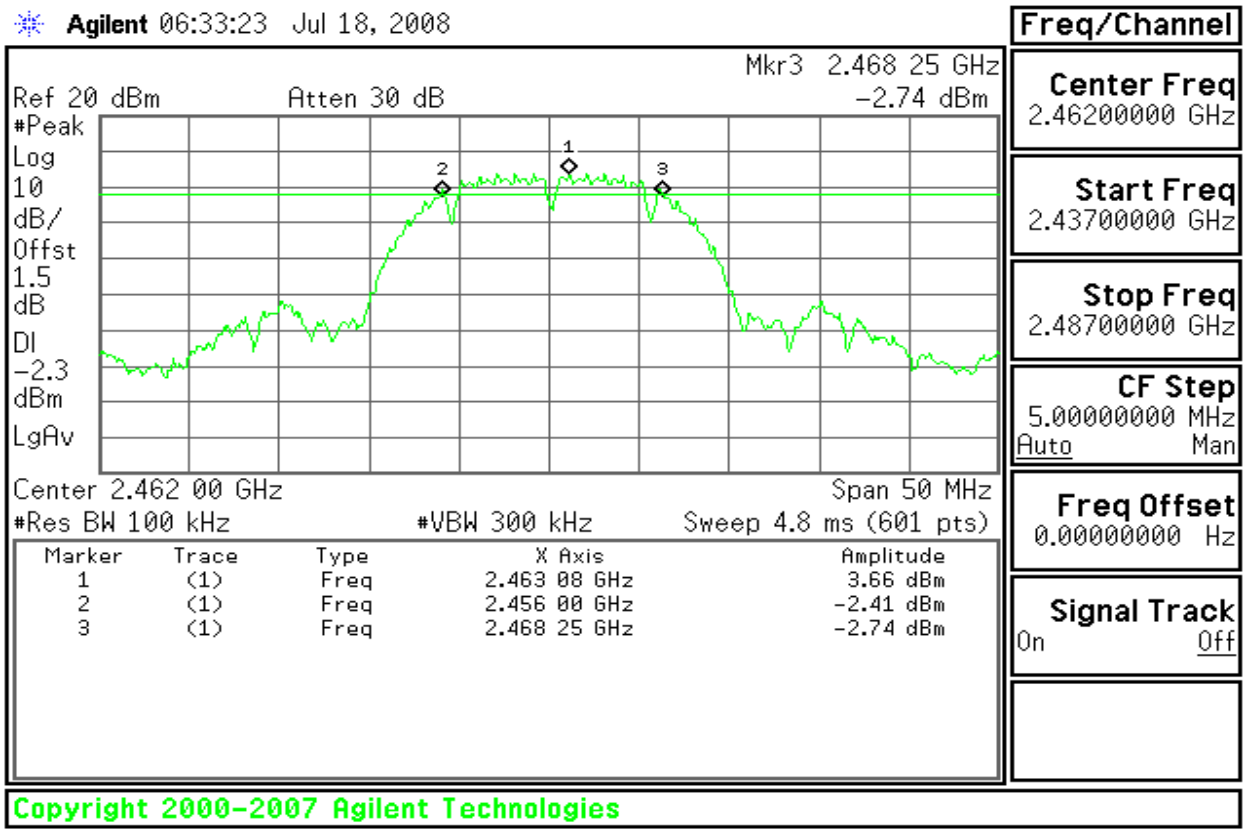
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

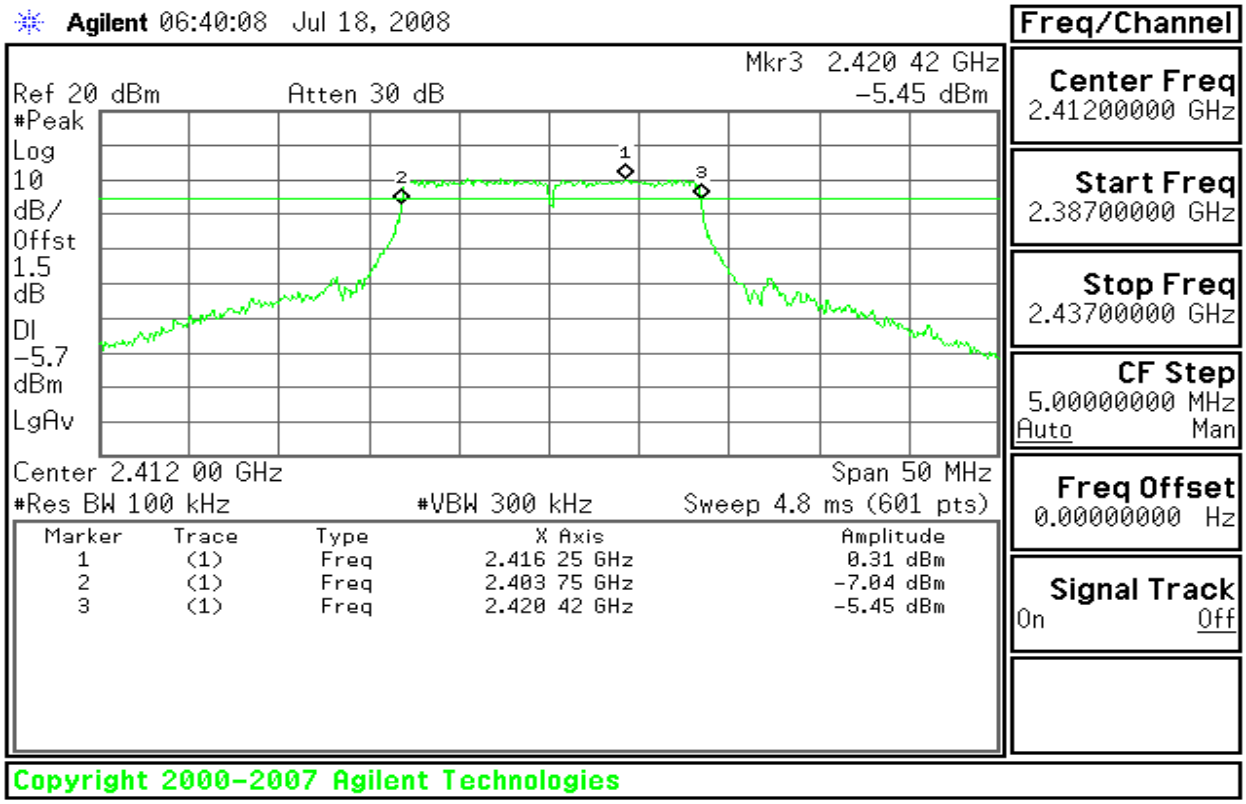


6dB Bandwidth (CH High)

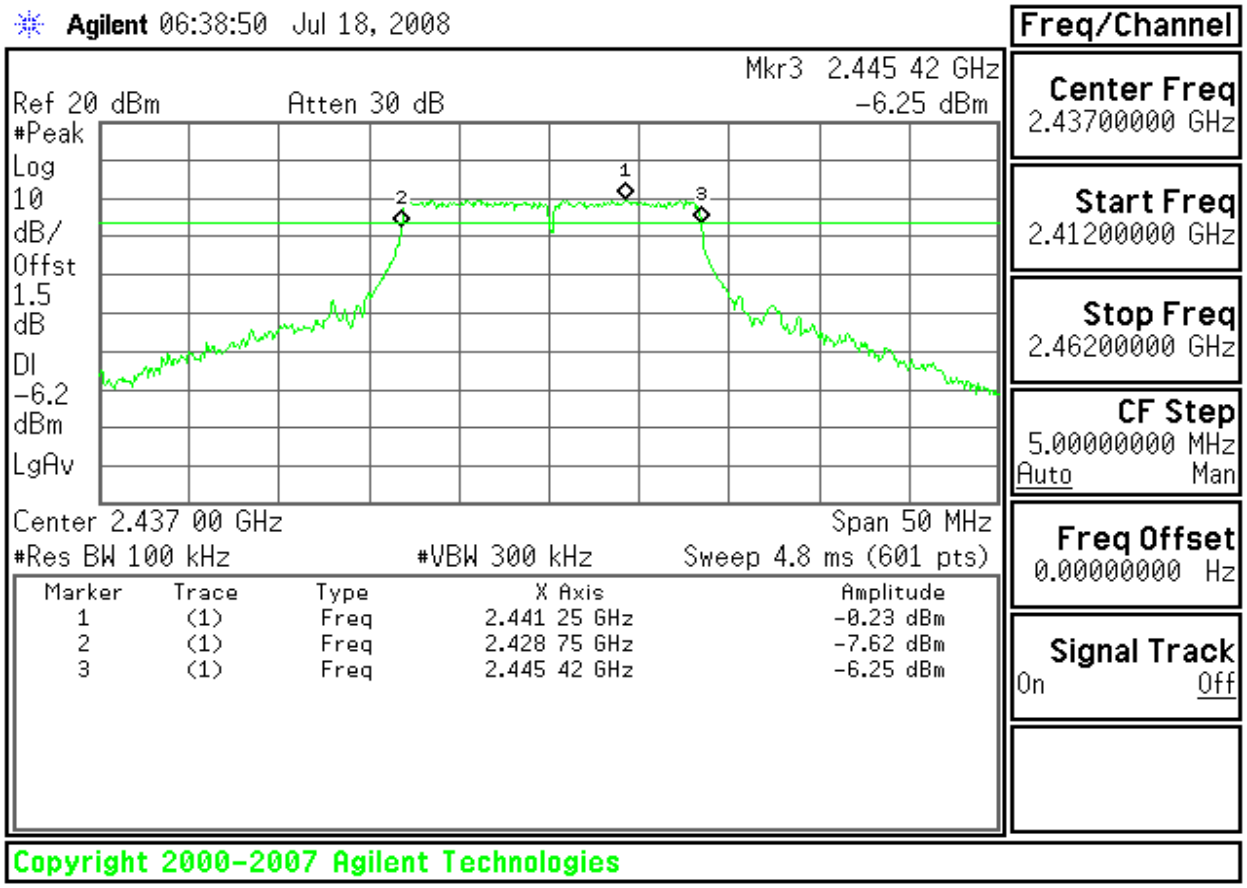


IEEE 802.11g MODE

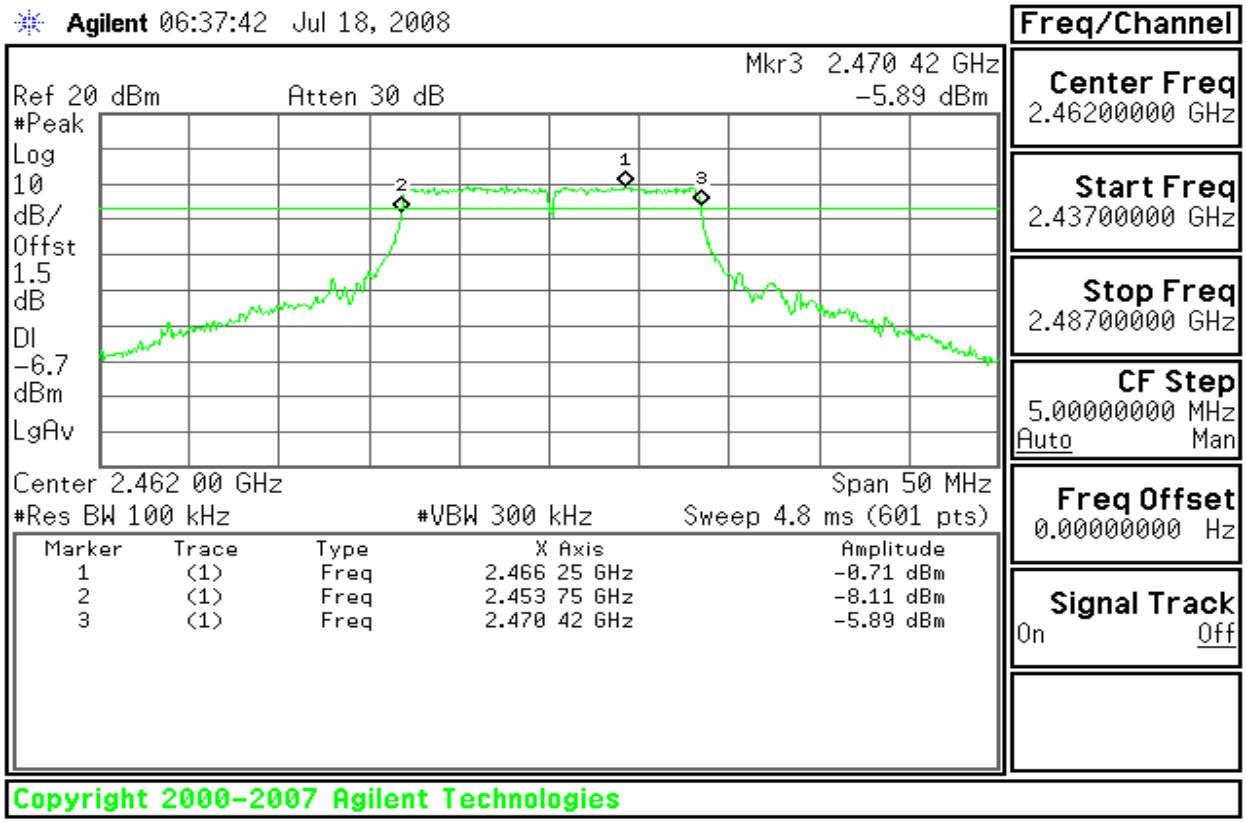
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

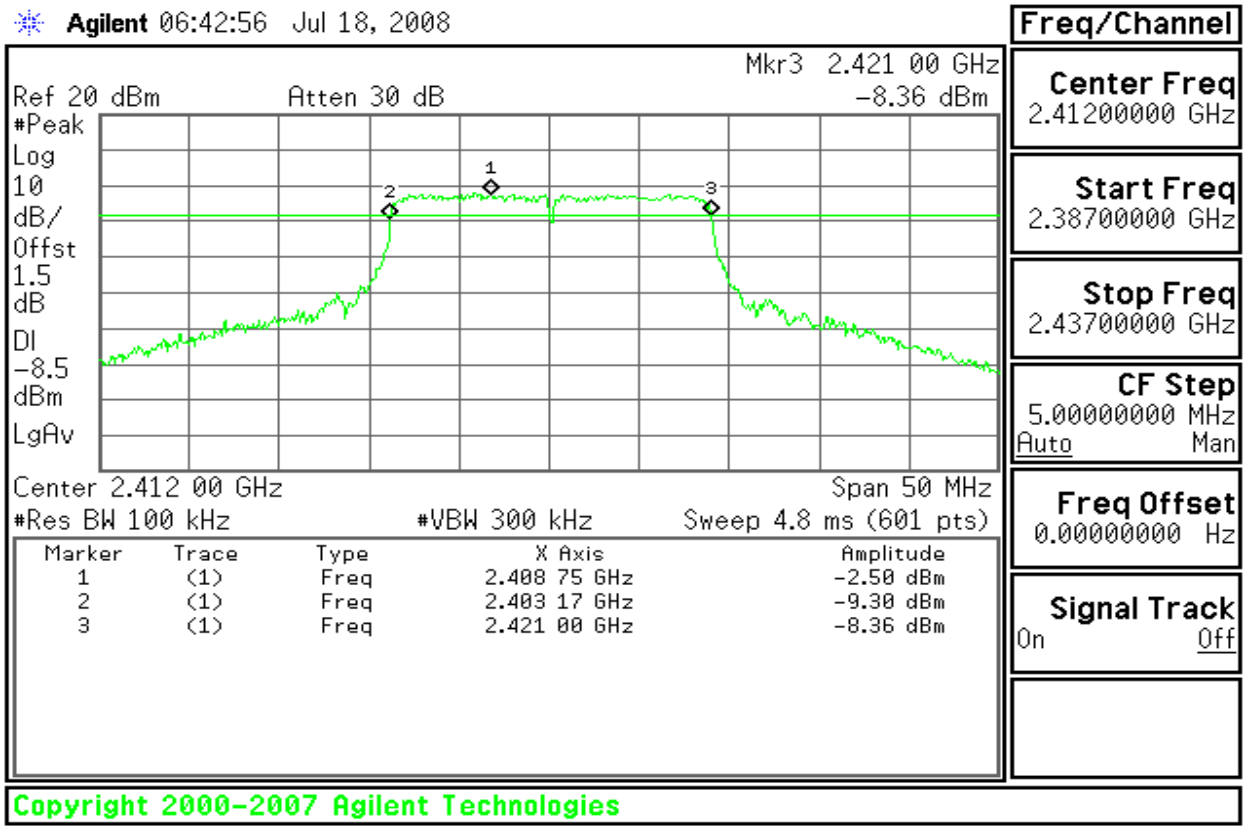


6dB Bandwidth (CH High)

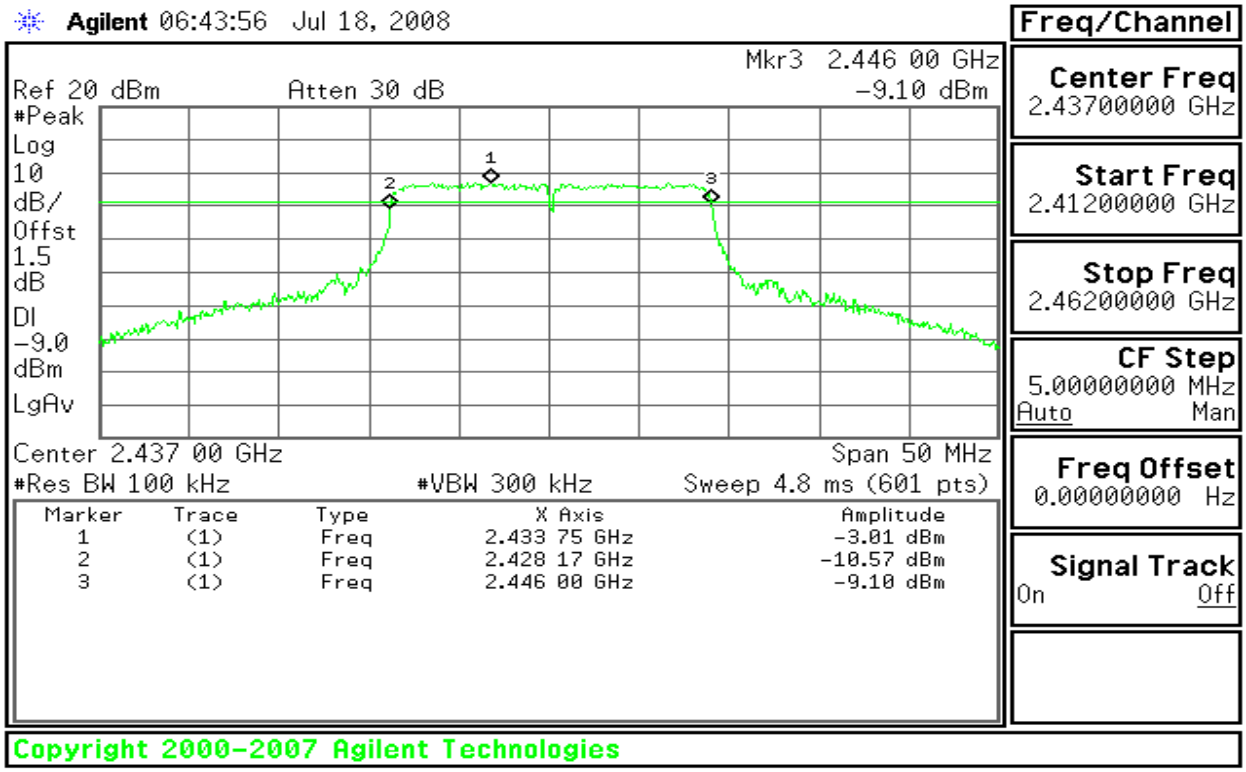


draft 802.11n Standard-20 MHz Channel mode / Chain 0

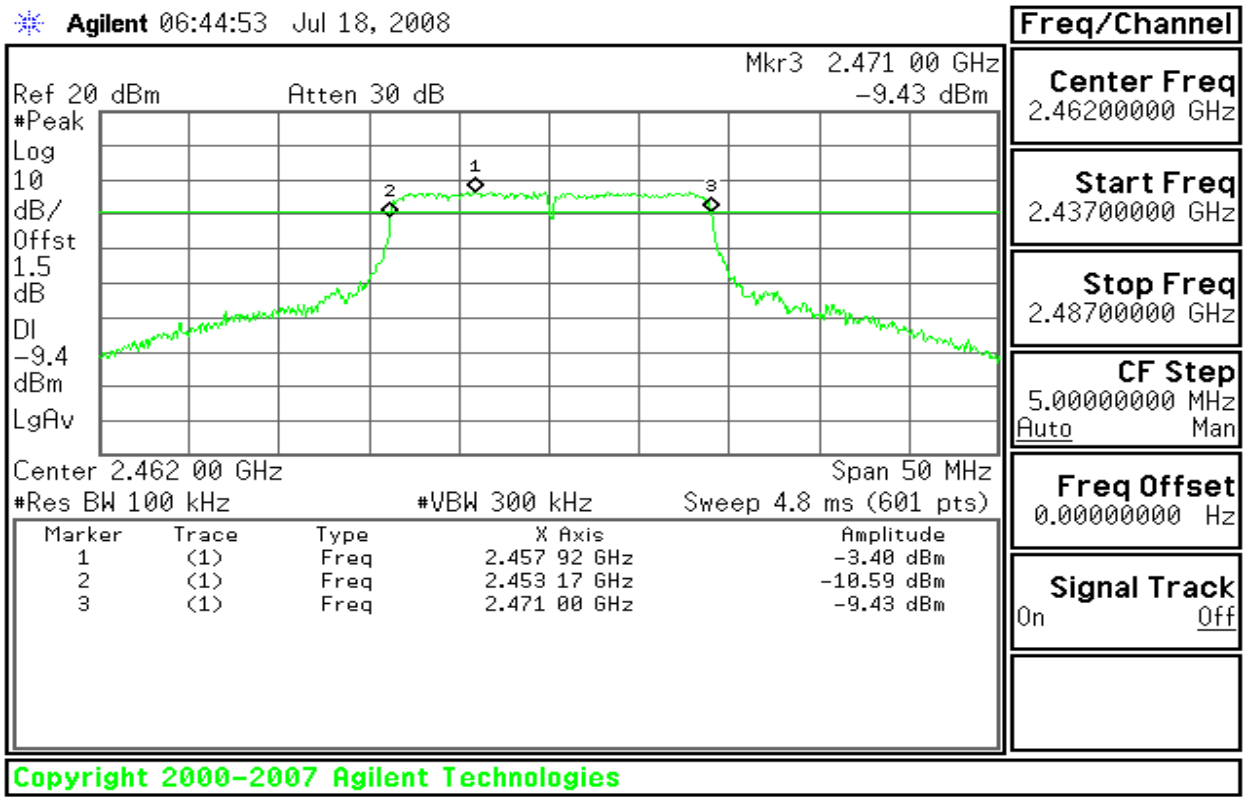
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

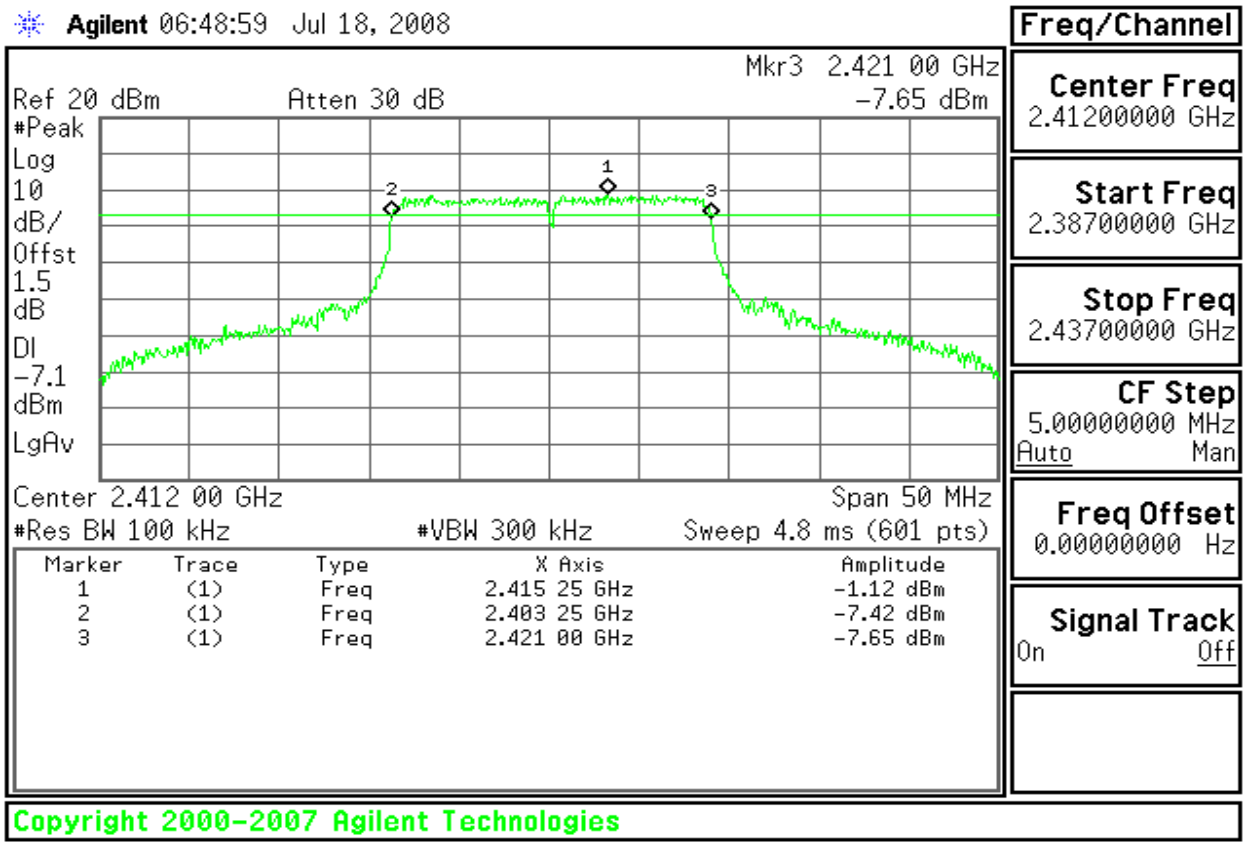


6dB Bandwidth (CH High)

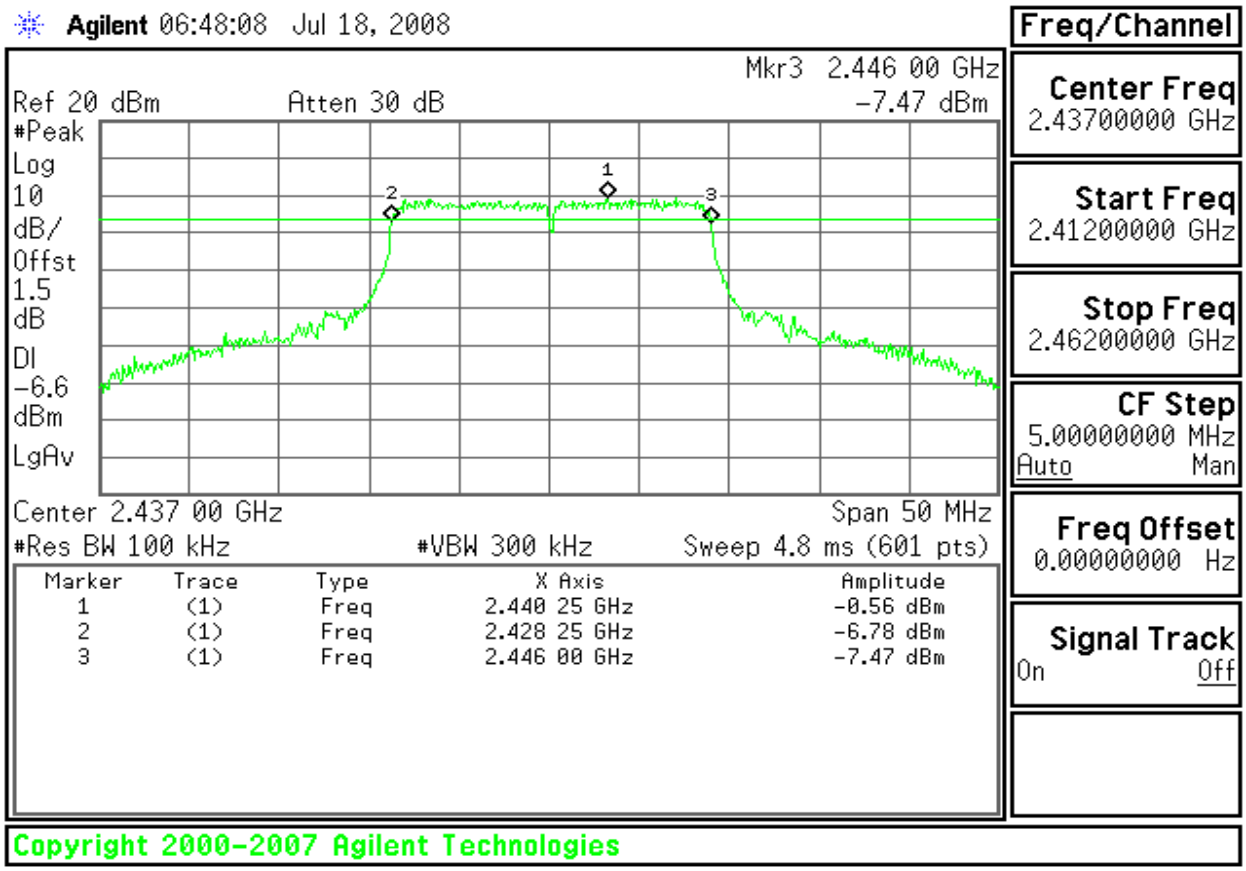


draft 802.11n Standard-20 MHz Channel mode / Chain 1

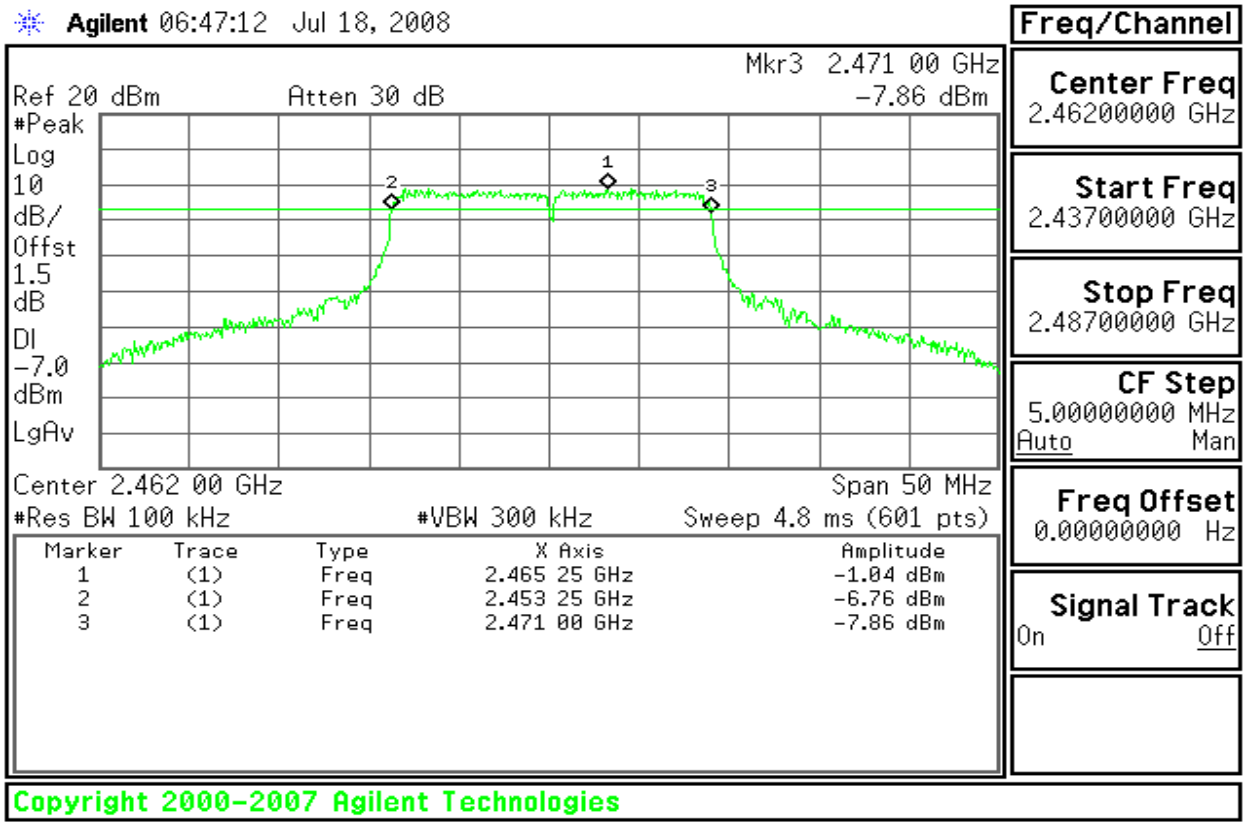
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

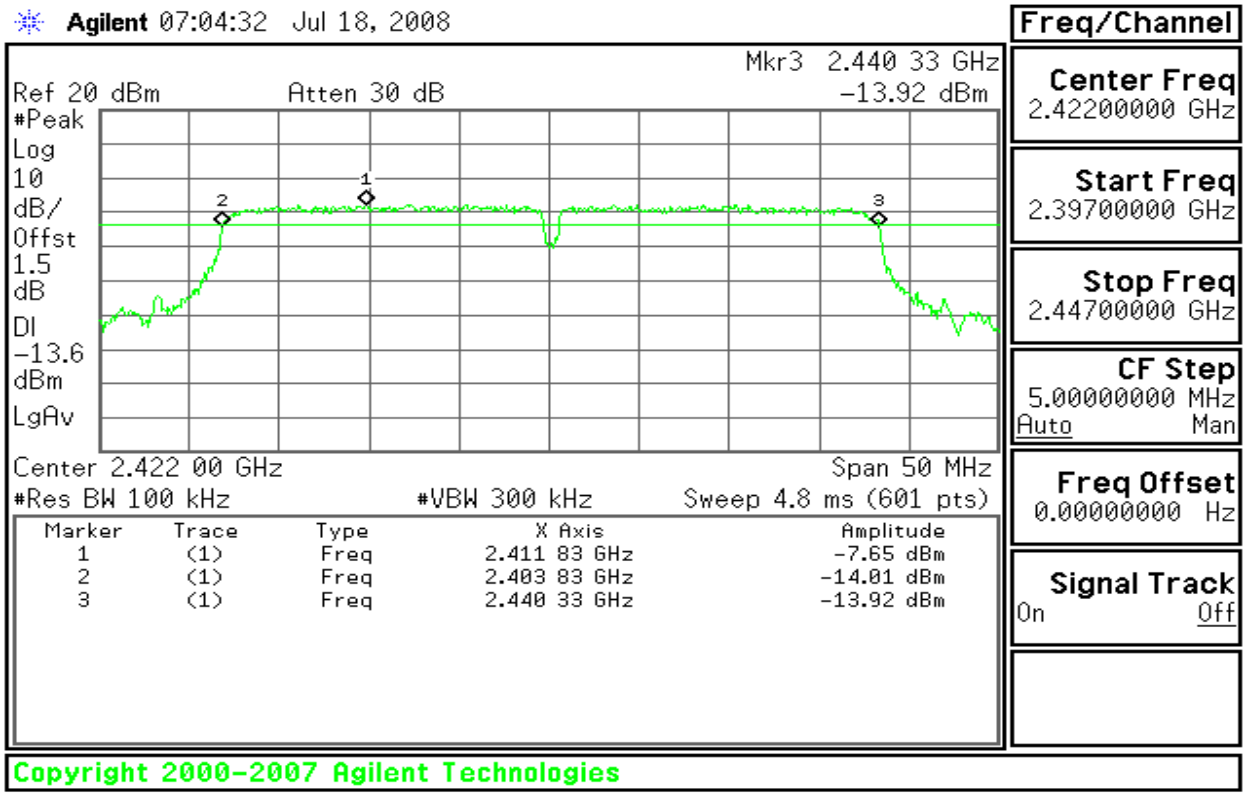


6dB Bandwidth (CH High)

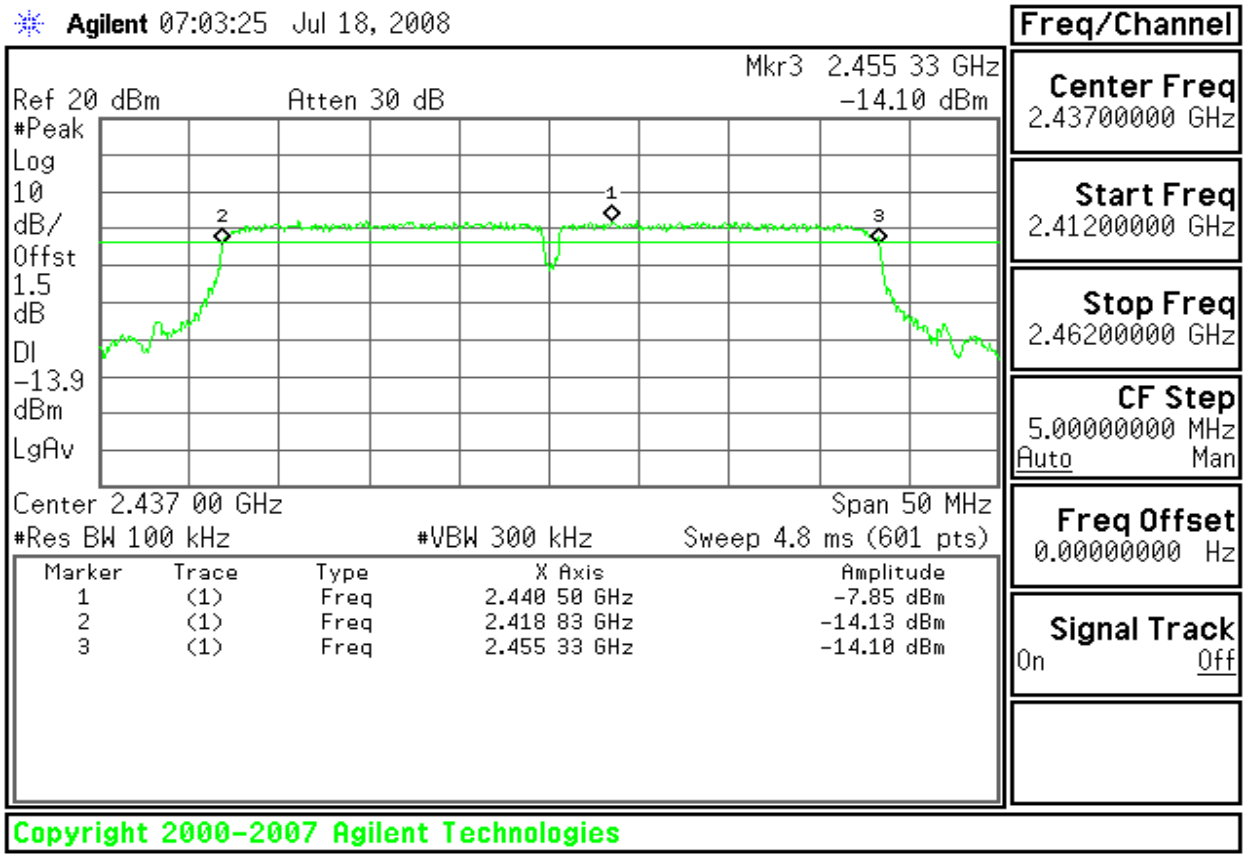


draft 802.11n Wide-40 MHz Channel mode / Chain 0

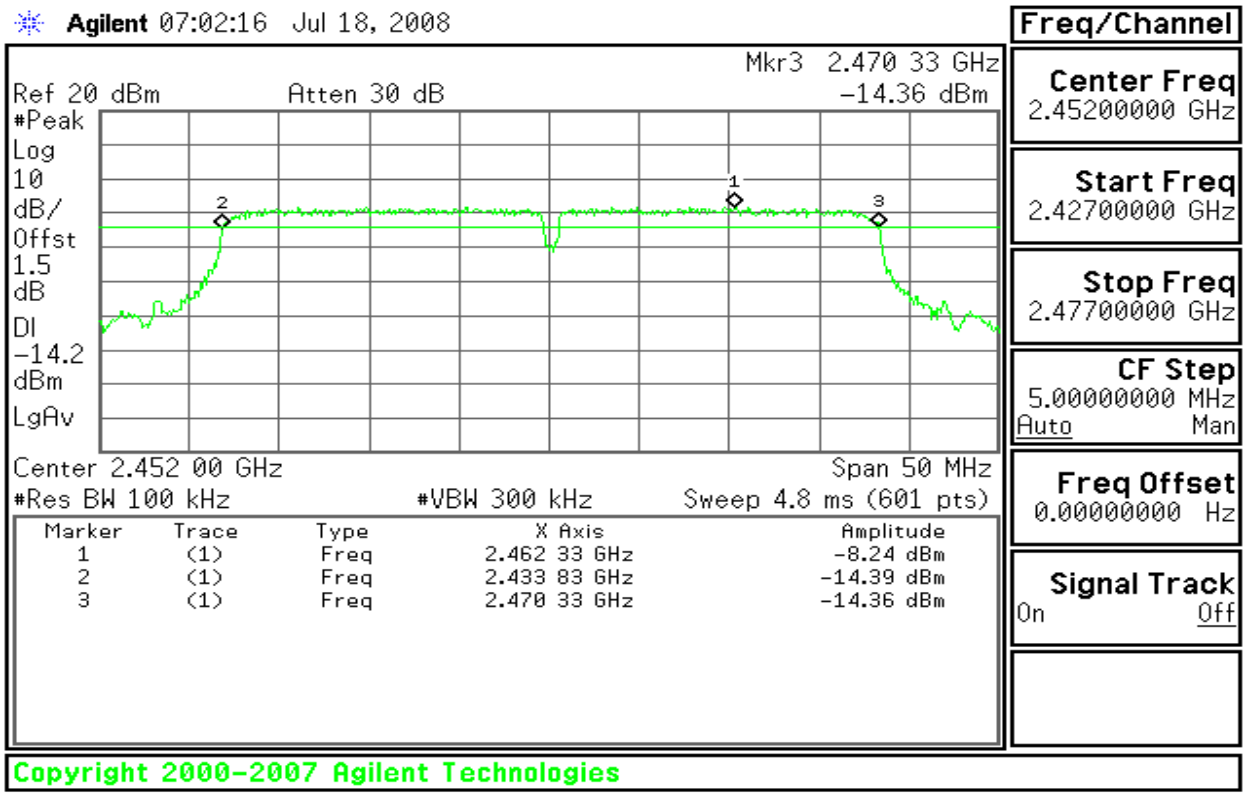
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

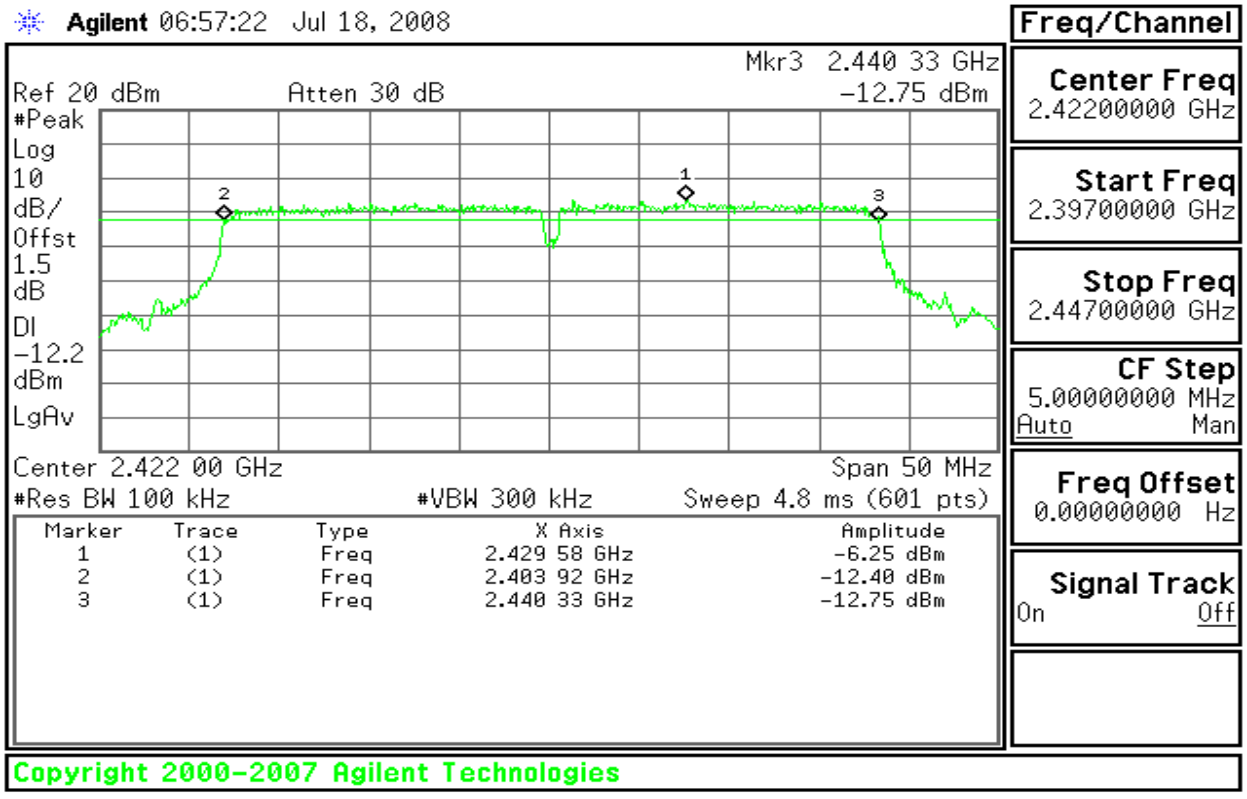


6dB Bandwidth (CH High)

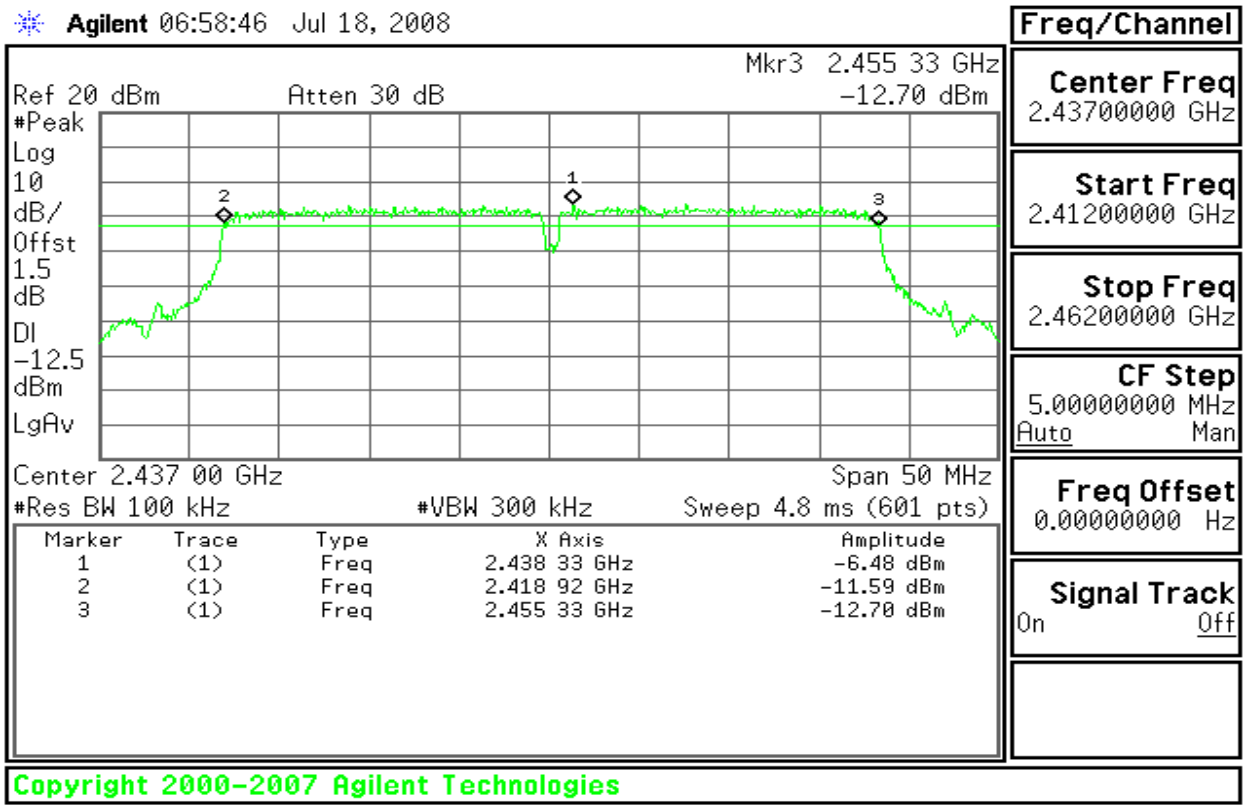


draft 802.11n Wide-40 MHz Channel mode / Chain 1

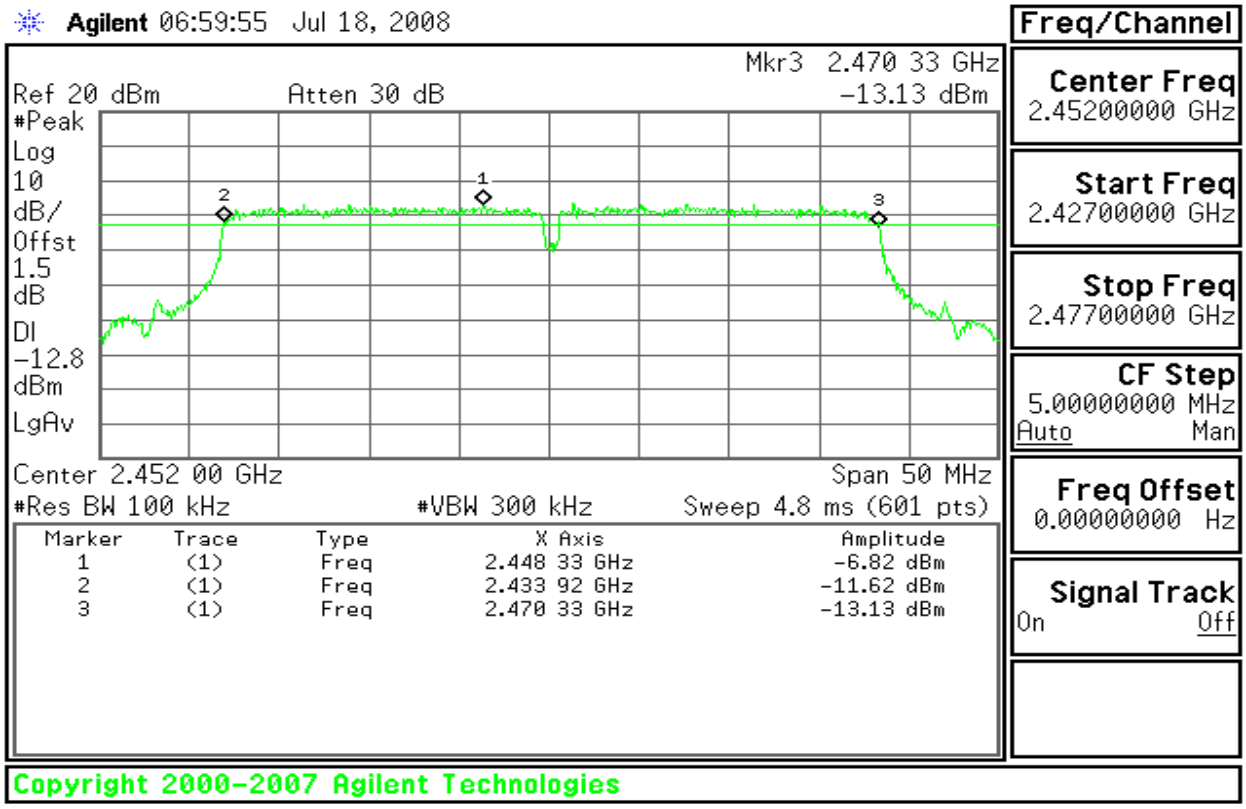
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)

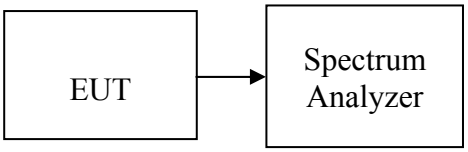


99% bandwidth

LIMIT

None; for reporting purposes only

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the selected span. The VBW is set to 3 times the RBW. The sweep time is occupied.

TEST RESULTS

No non-compliance noted

Test Data

IEEE 802.11b mode

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	15.2693
Mid	2437	15.2804
High	2462	15.2902

IEEE 802.11g mode

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	16.5998
Mid	2437	16.6590
High	2462	16.5888

TRANSMIT CHAIN 0

draft 802.11n Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	17.6120
Mid	2437	17.6152
High	2462	17.6030

draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2422	36.0216
Mid	2437	35.9880
High	2452	36.0220

TRANSMIT CHAIN 1

draft 802.11n Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	17.5994
Mid	2437	17.6038
High	2462	17.5972

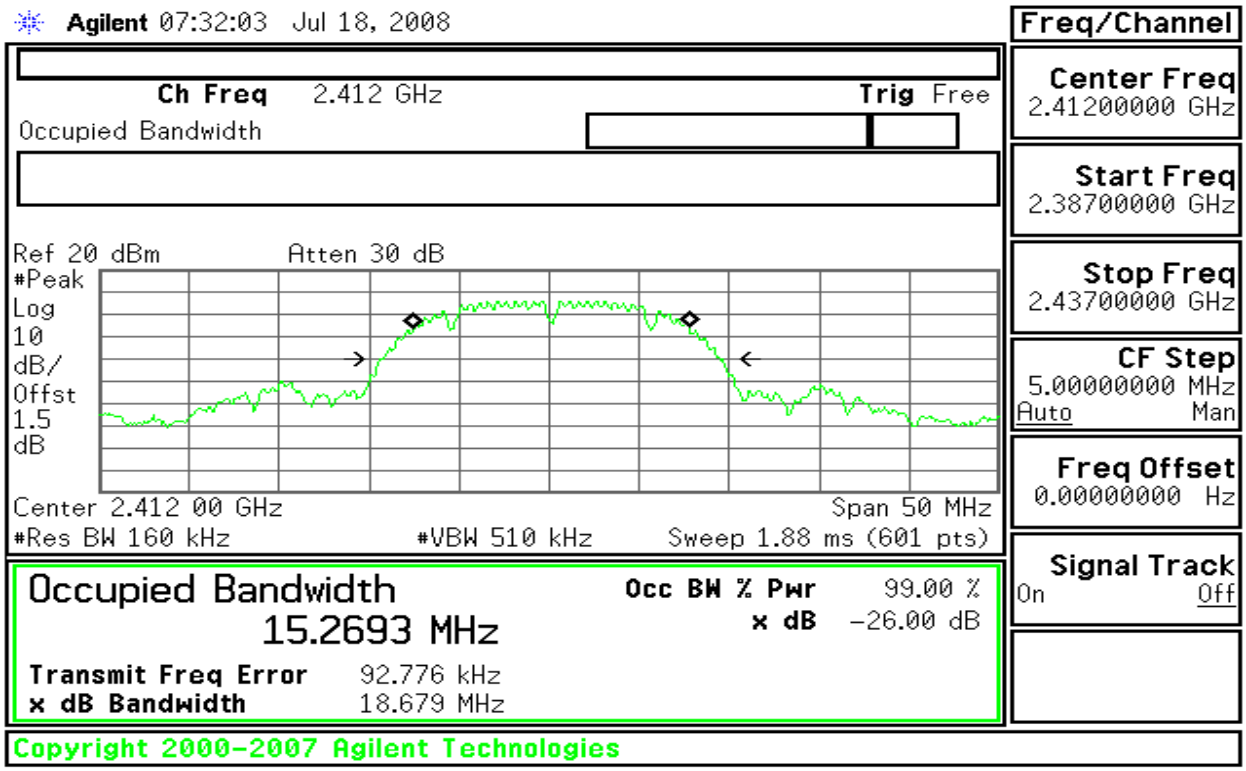
draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2422	35.9243
Mid	2437	35.9351
High	2452	35.9234

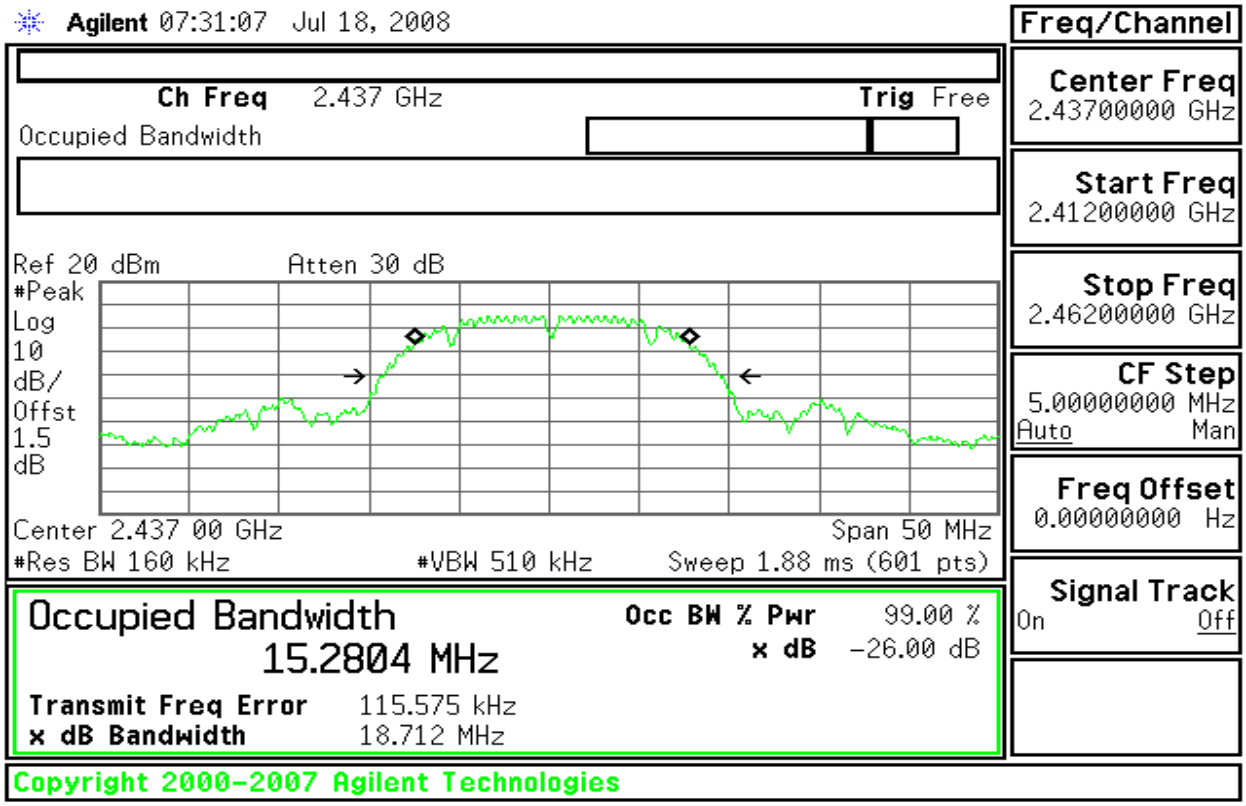
Test Plot

IEEE 802.11b MODE

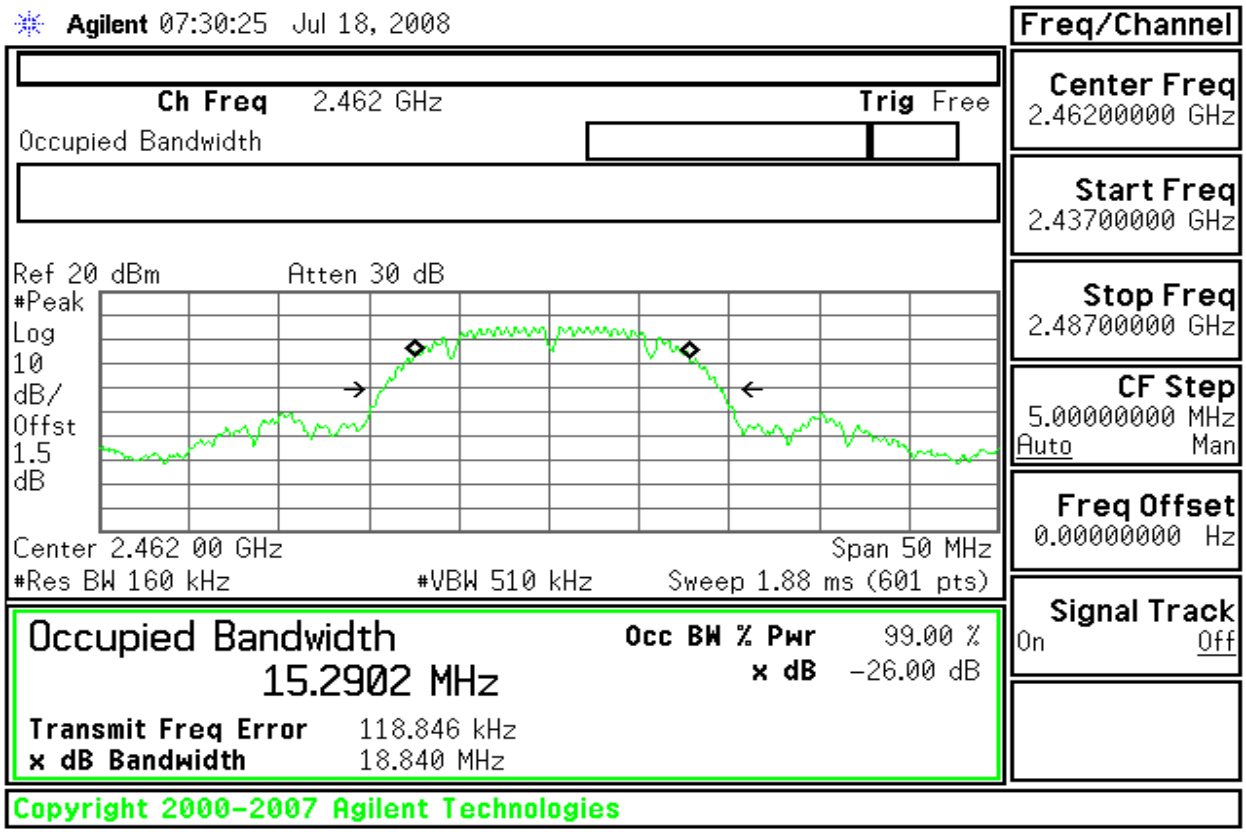
99% Bandwidth (CH Low)



99% Bandwidth (CH Mid)

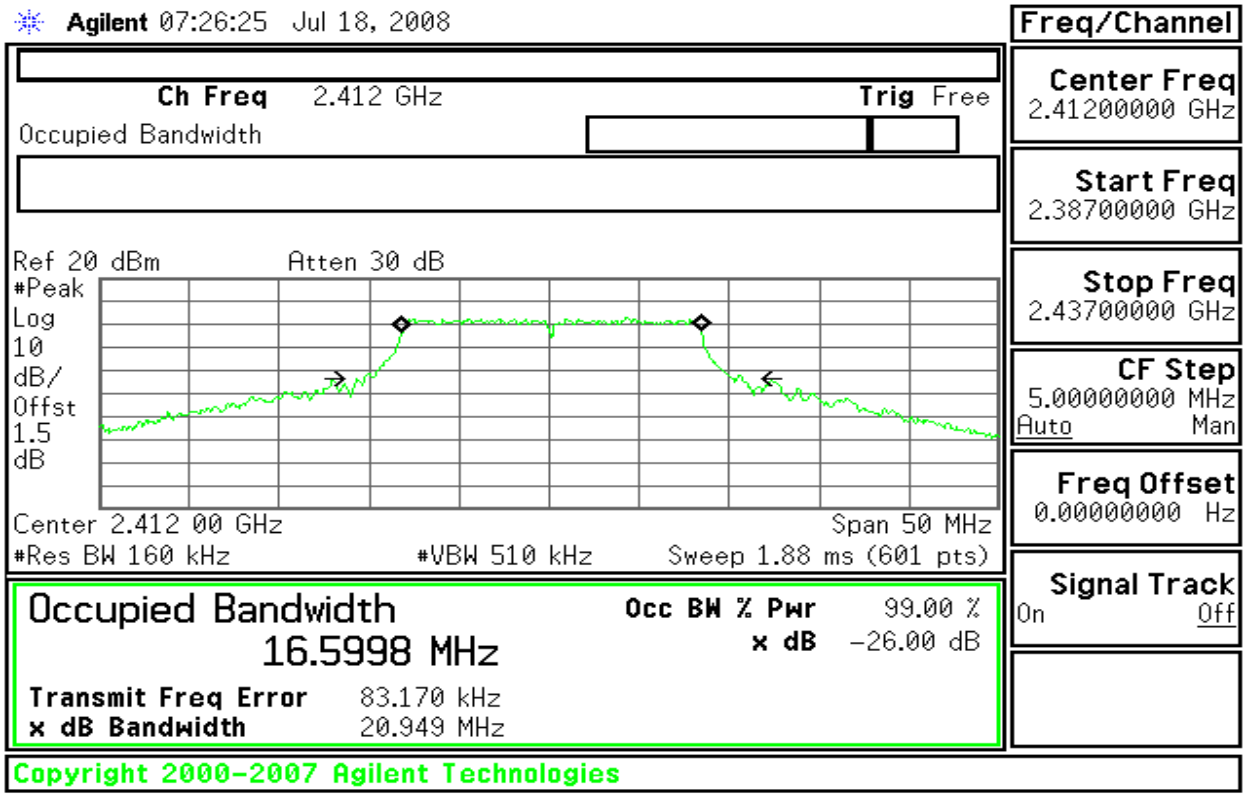


99% Bandwidth (CH High)

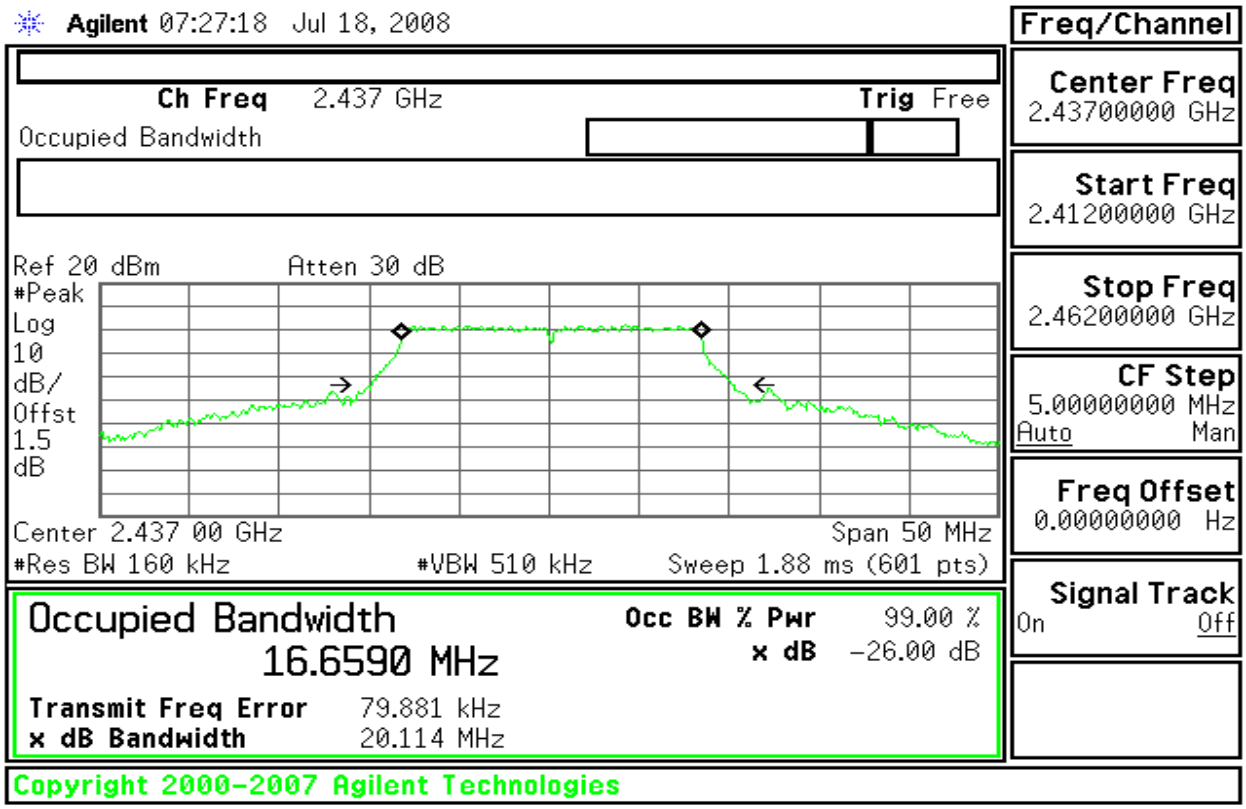


IEEE 802.11g MODE

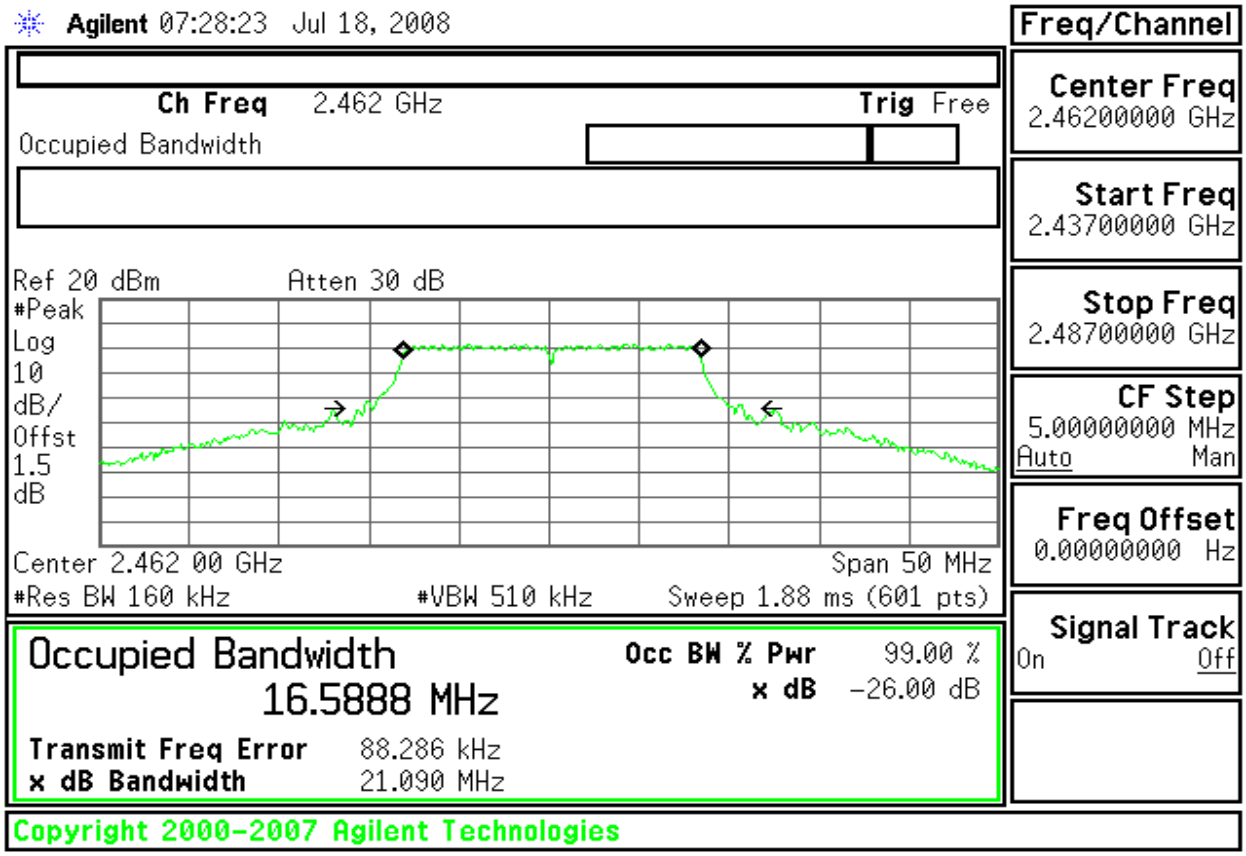
99% Bandwidth (CH Low)



99% Bandwidth (CH Mid)

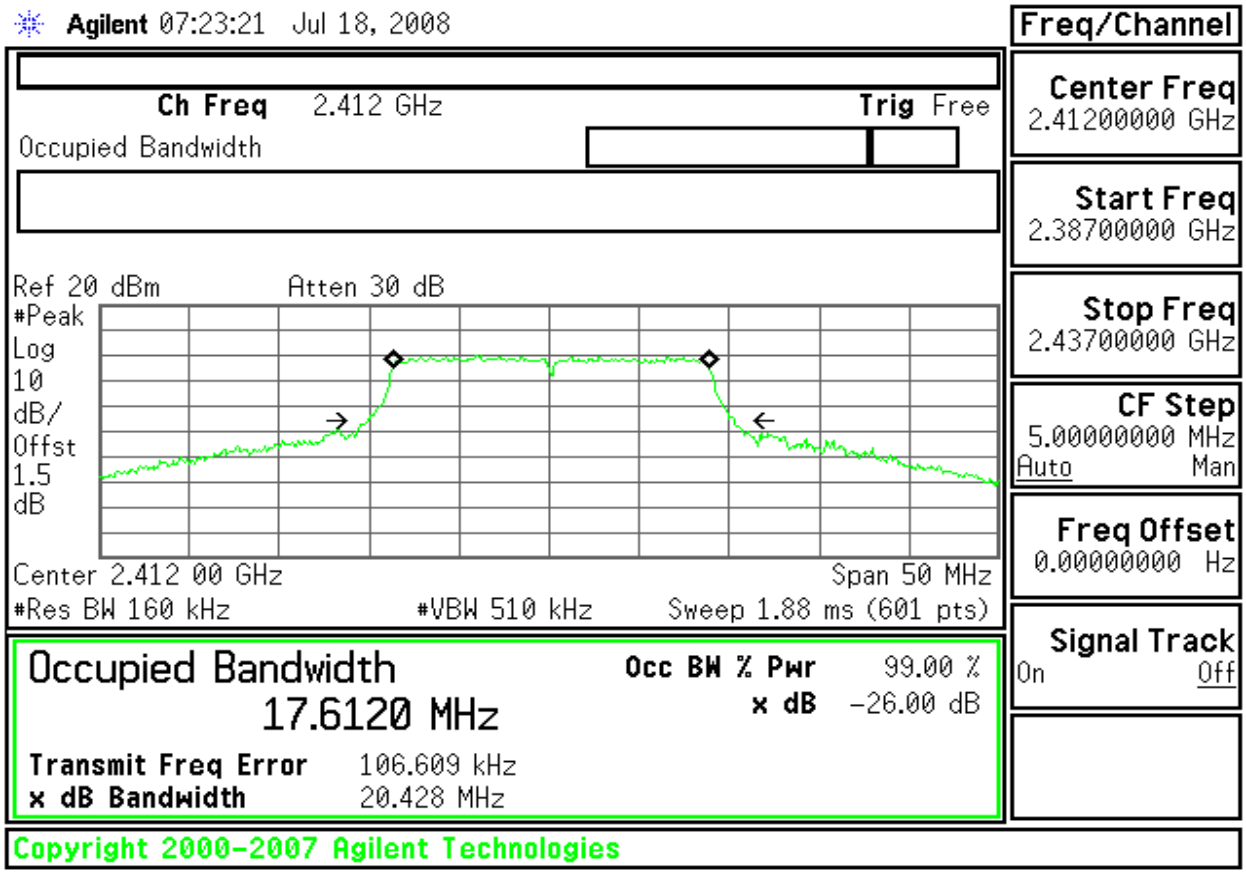


99% Bandwidth (CH High)

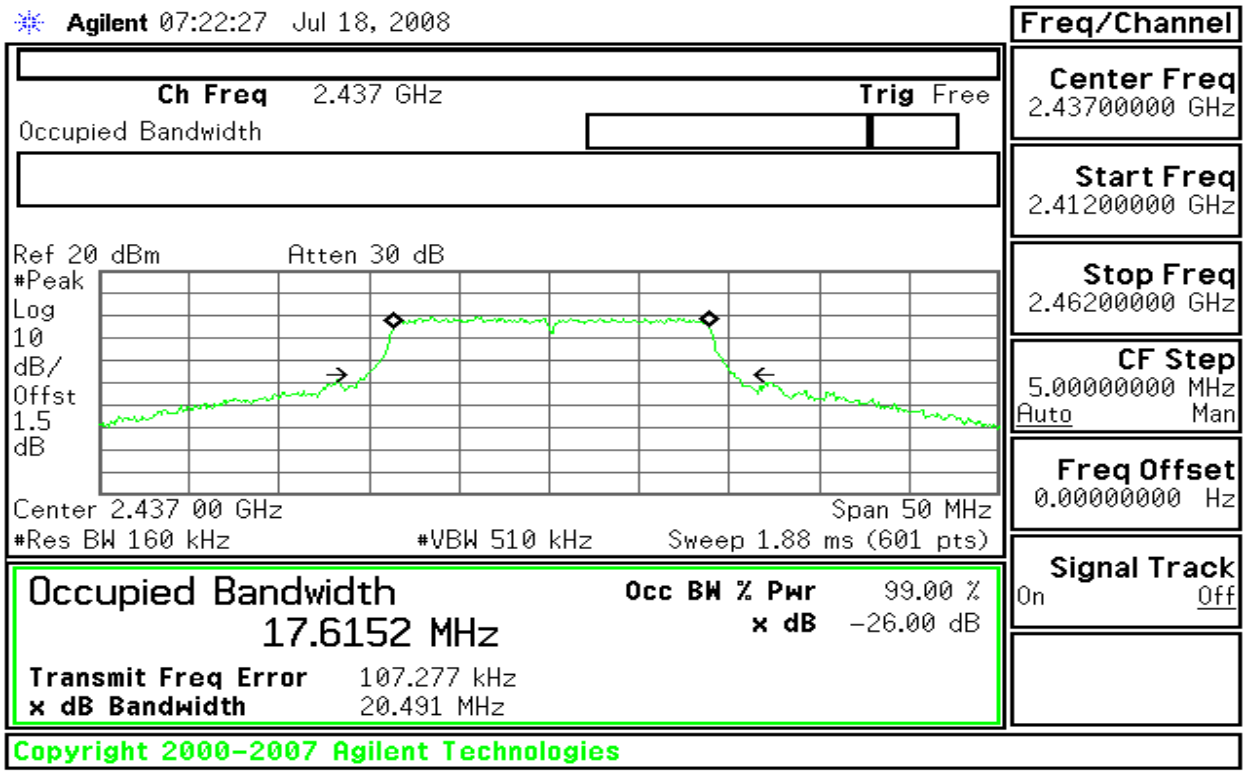


draft 802.11n Standard-20 MHz Channel mode / Chain 0

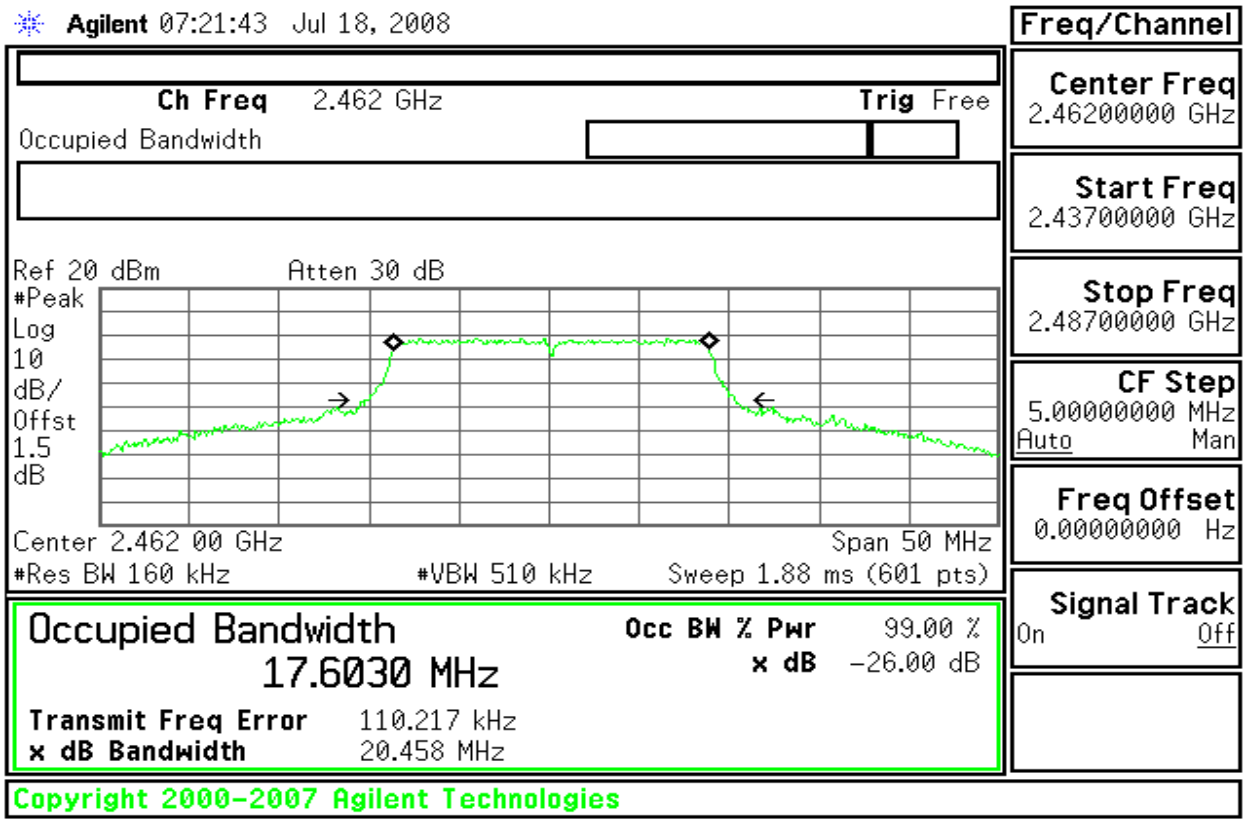
99% Bandwidth (CH Low)



99% Bandwidth (CH Mid)

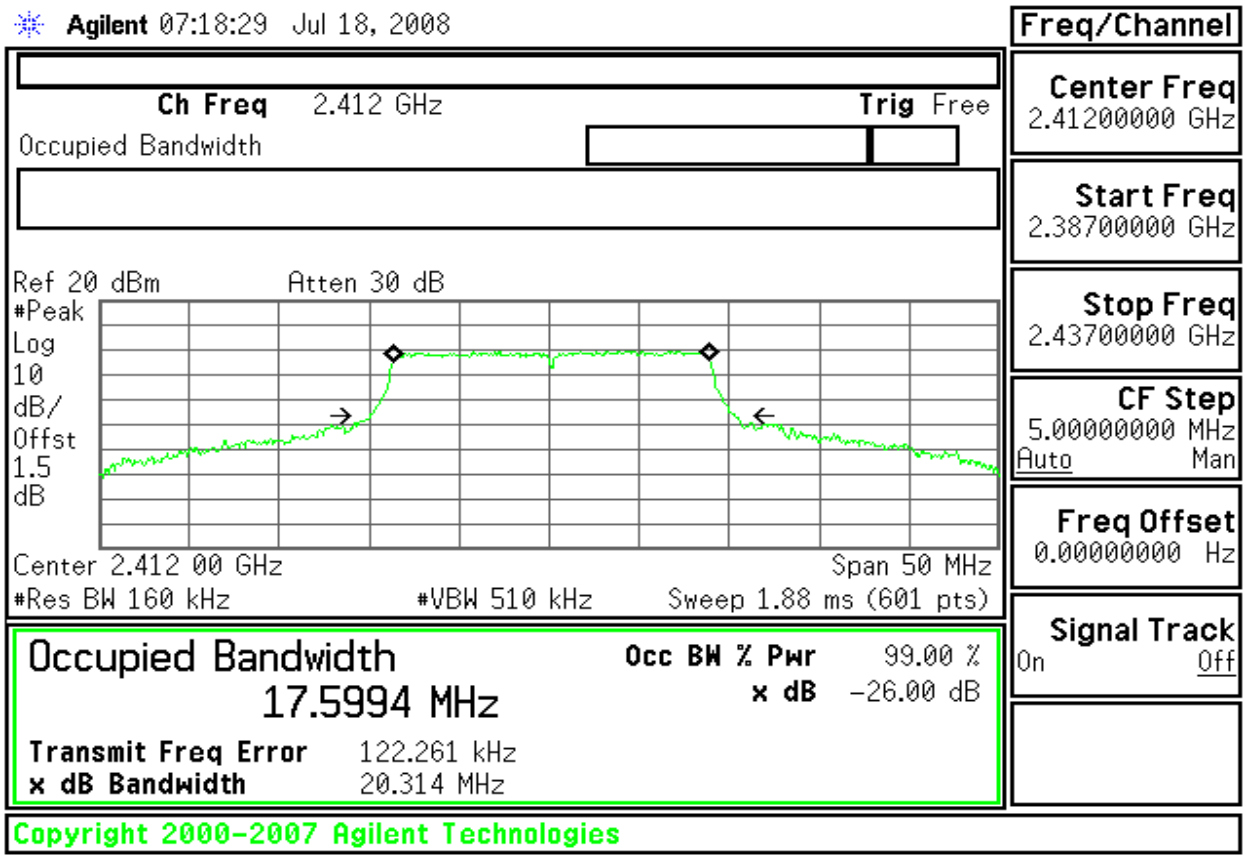


99% Bandwidth (CH High)

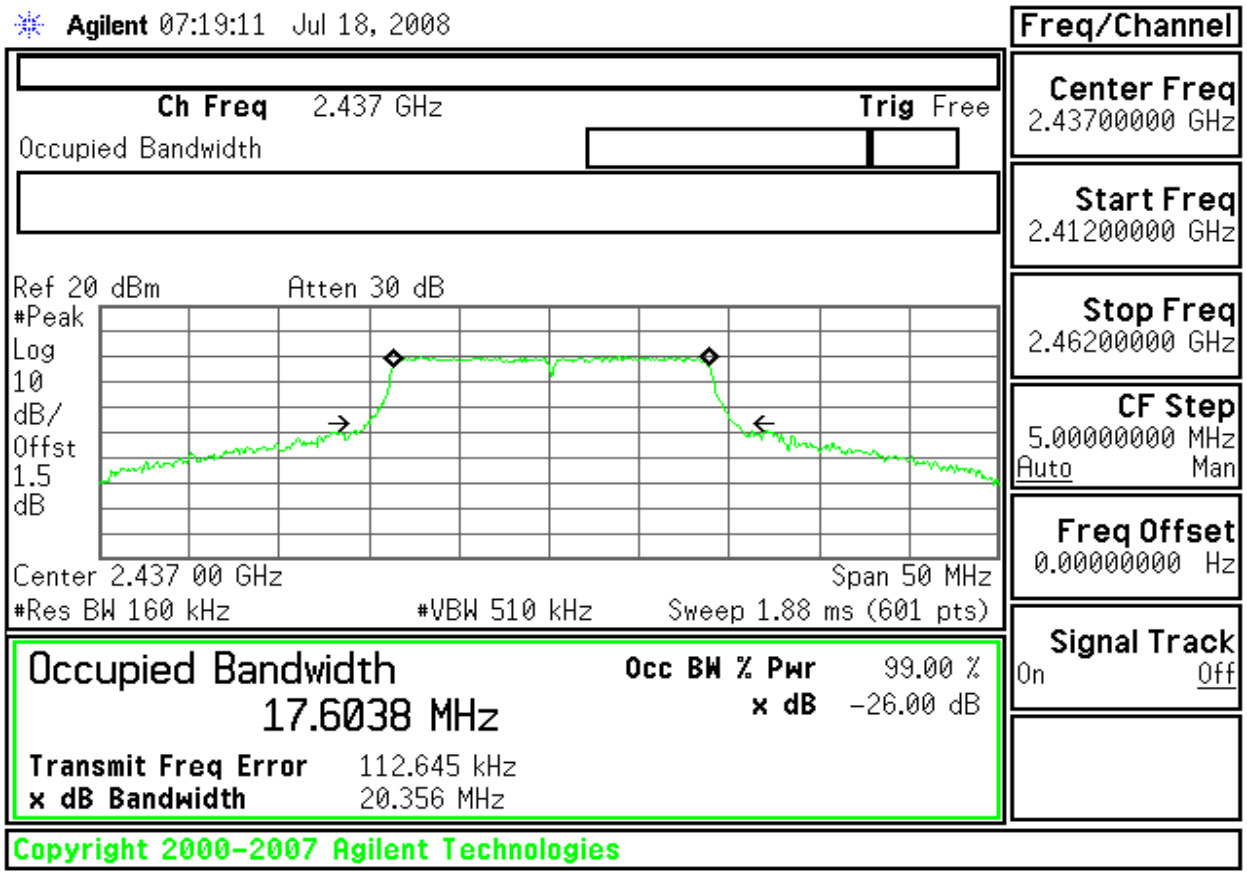


draft 802.11n Standard-20 MHz Channel mode / Chain 1

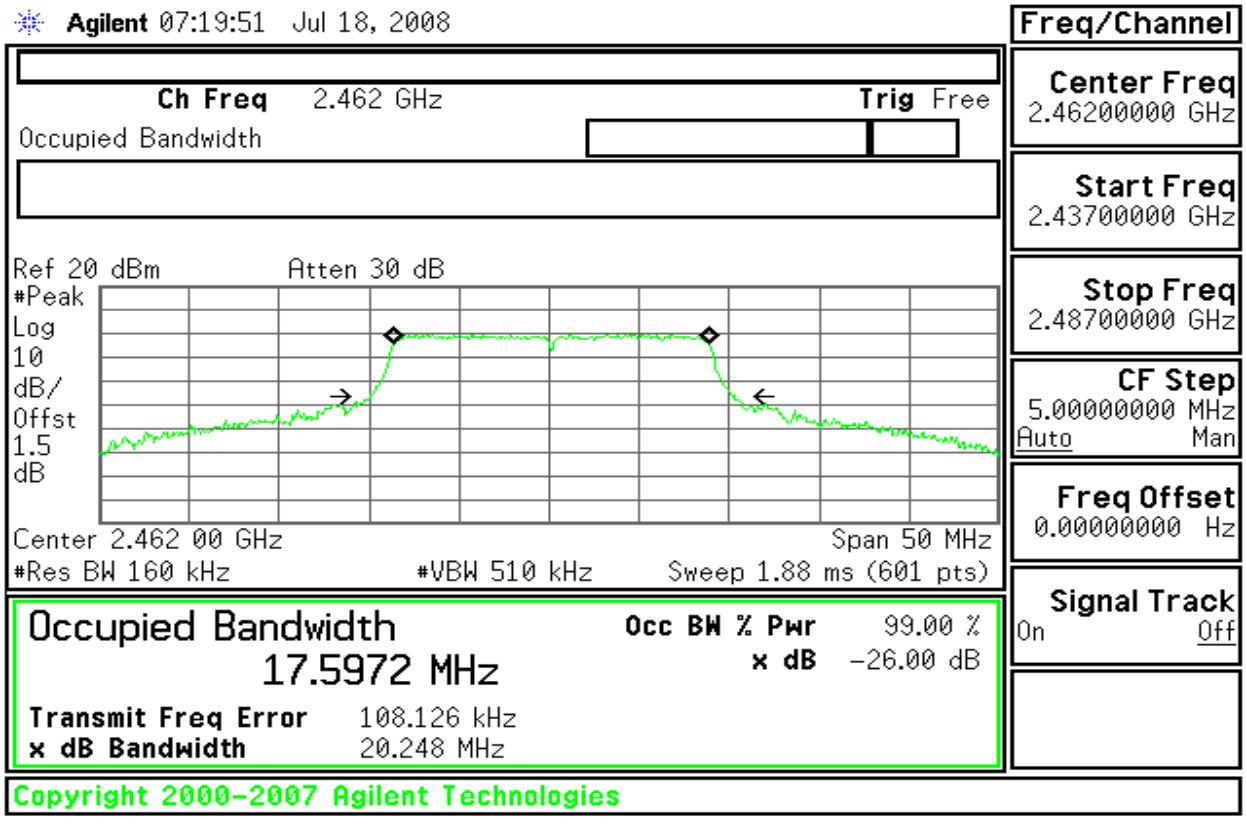
99% Bandwidth (CH Low)



99%Bandwidth (CH Mid)

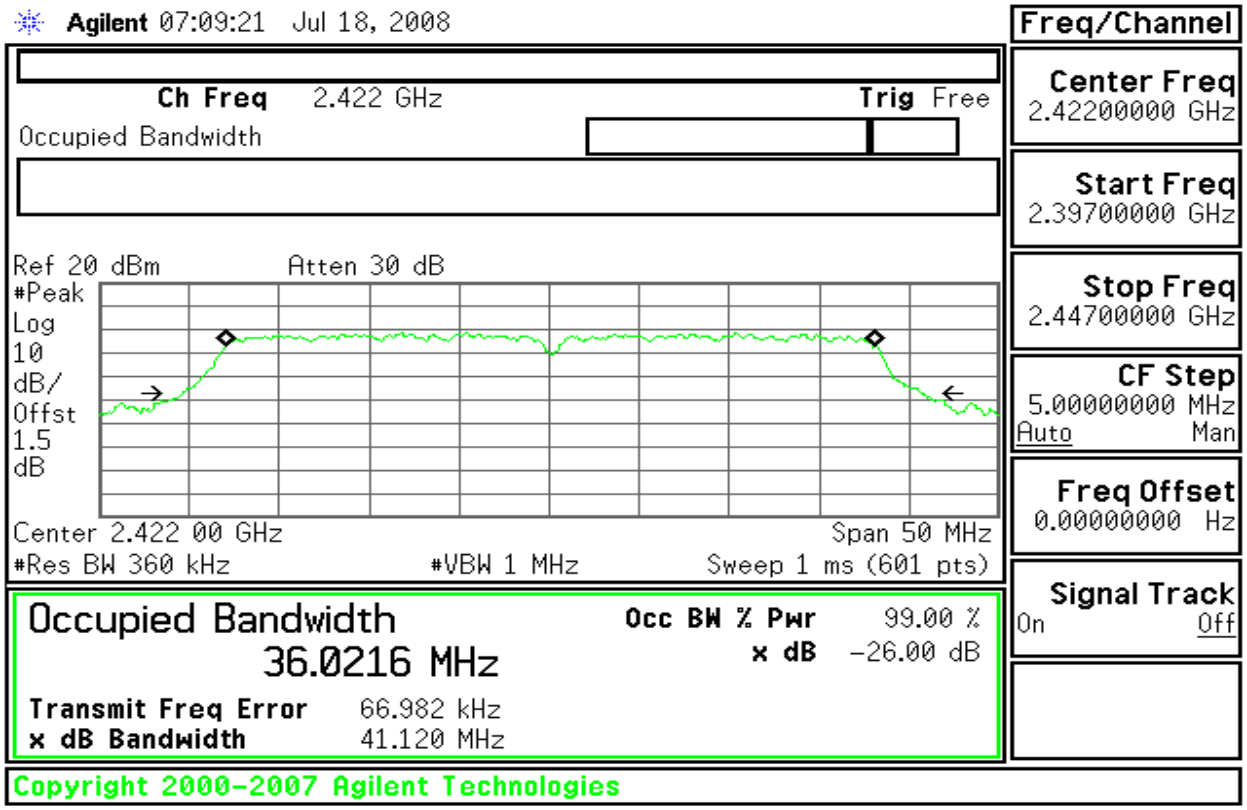


99% Bandwidth (CH High)

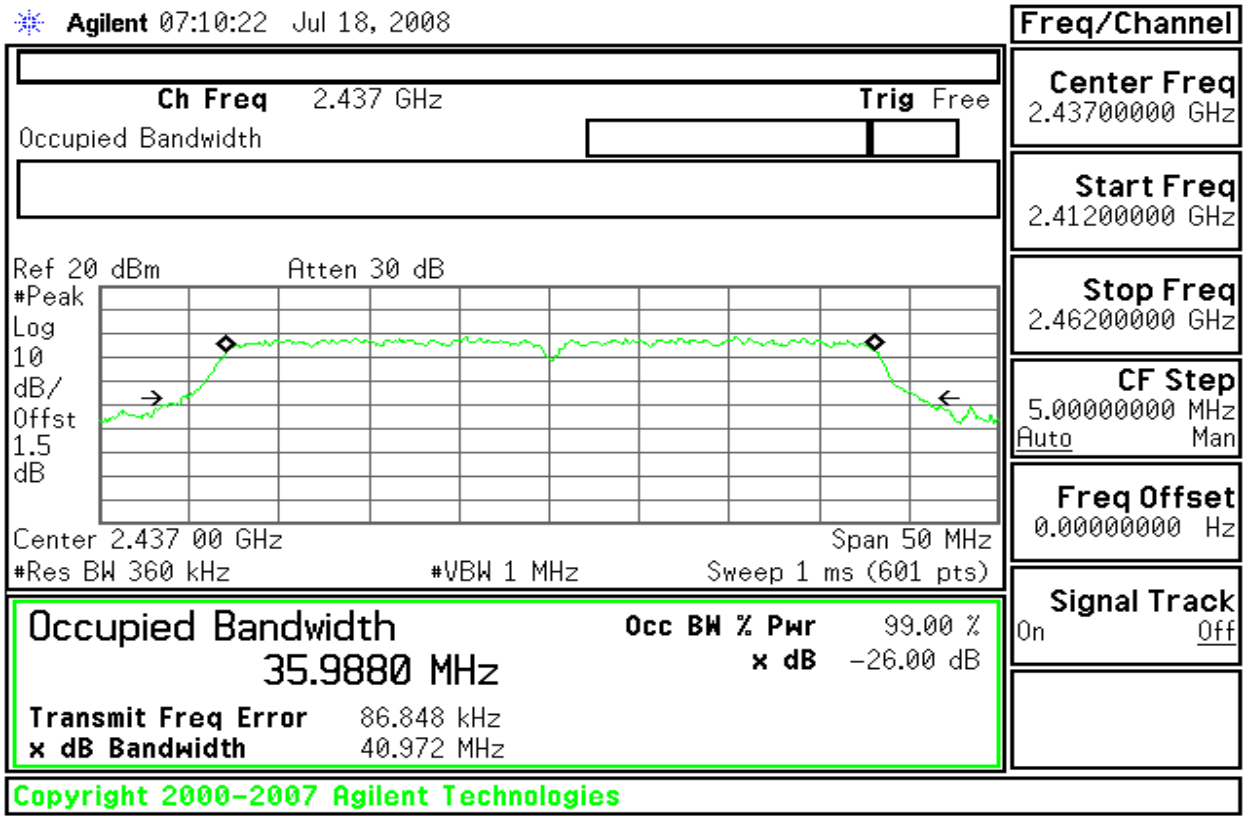


draft 802.11n Wide-40 MHz Channel mode / Chain 0

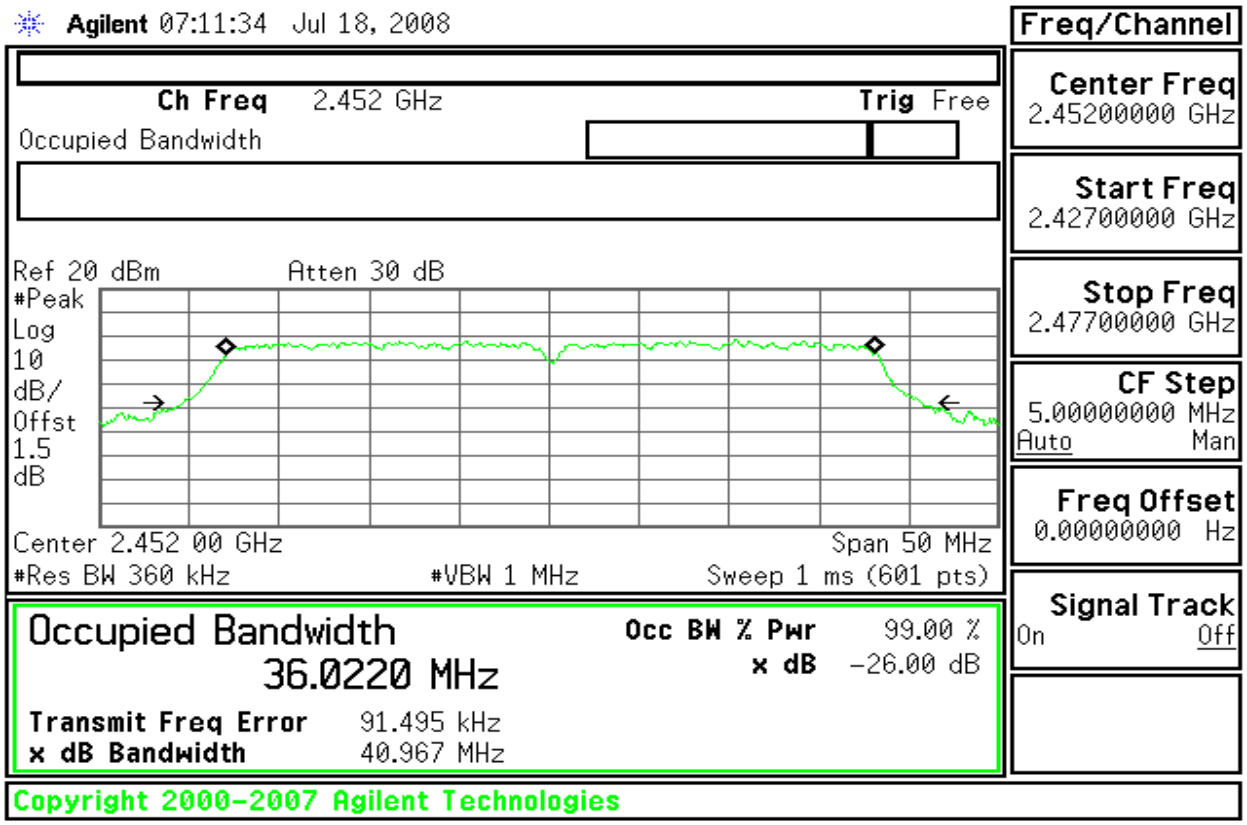
99% Bandwidth (CH Low)



99% Bandwidth (CH Mid)

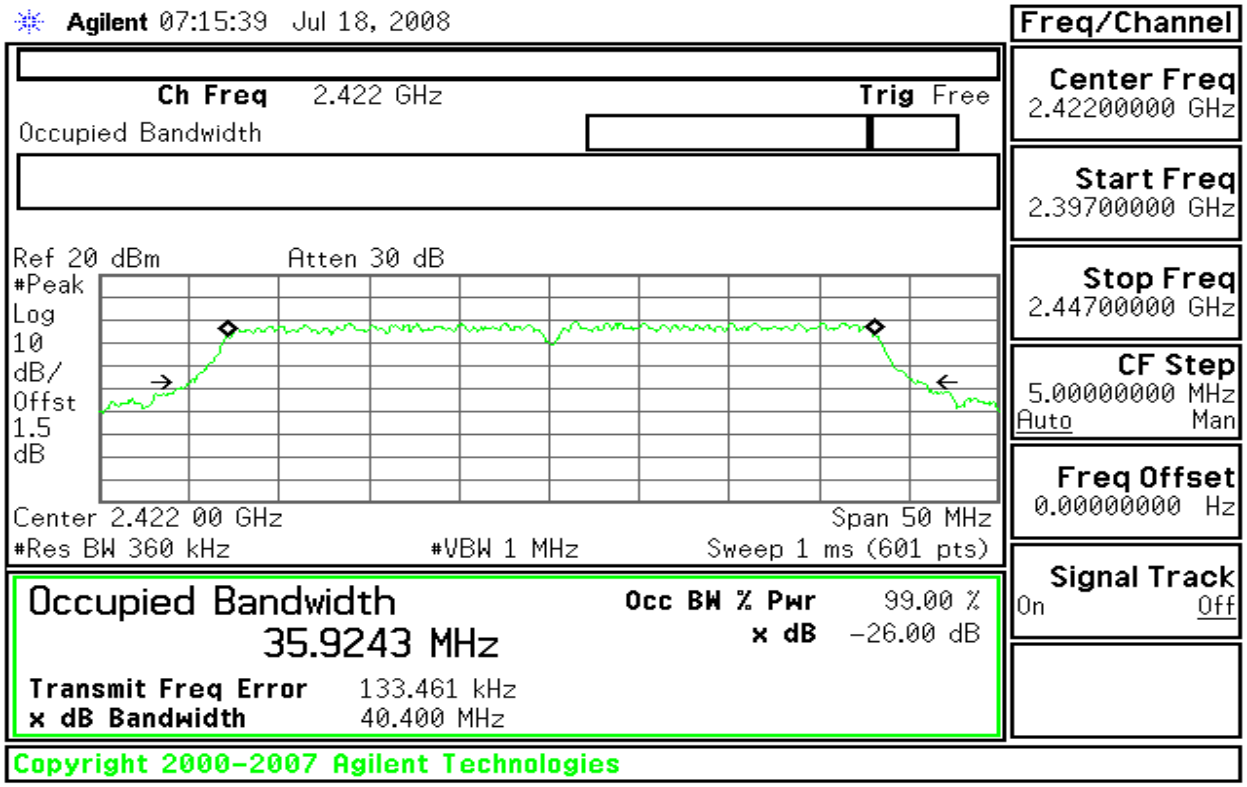


99% Bandwidth (CH High)

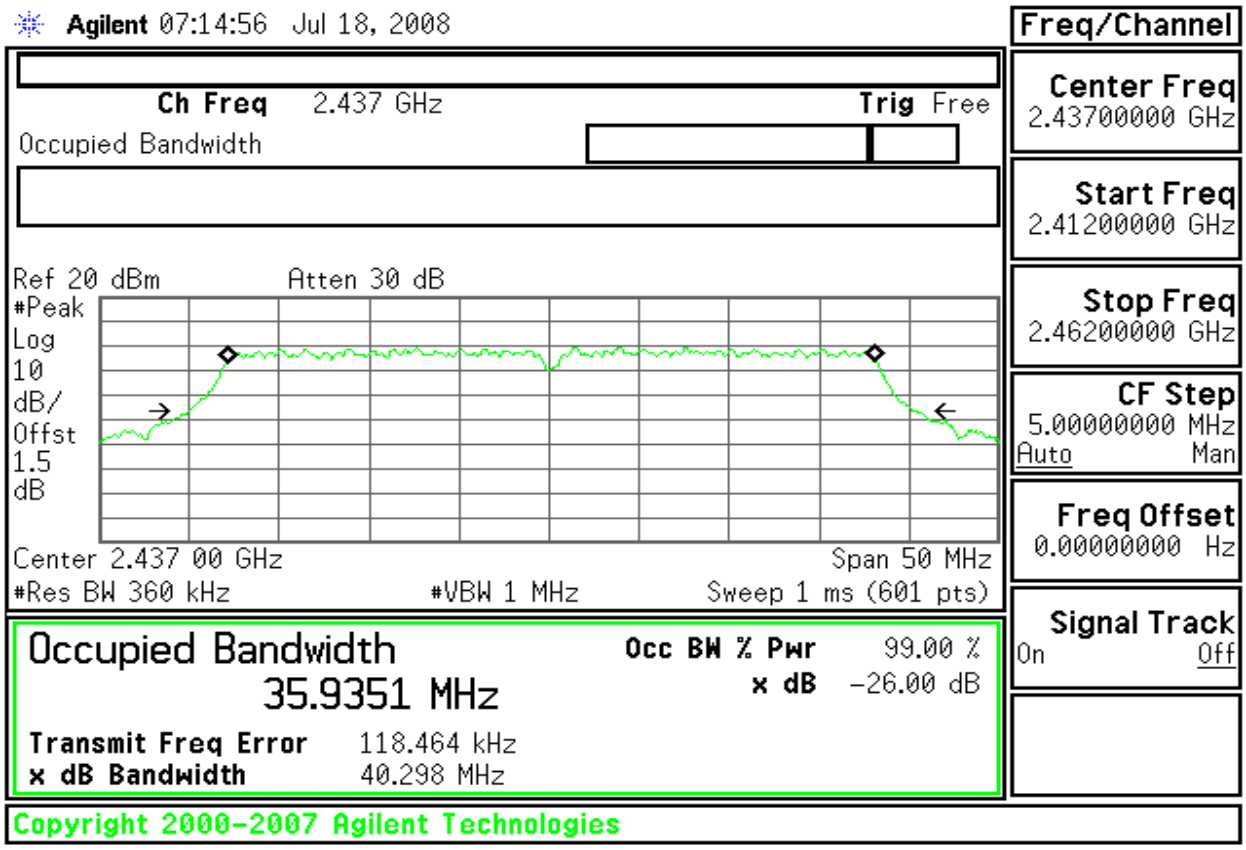


draft 802.11n Wide-40 MHz Channel mode / Chain 1

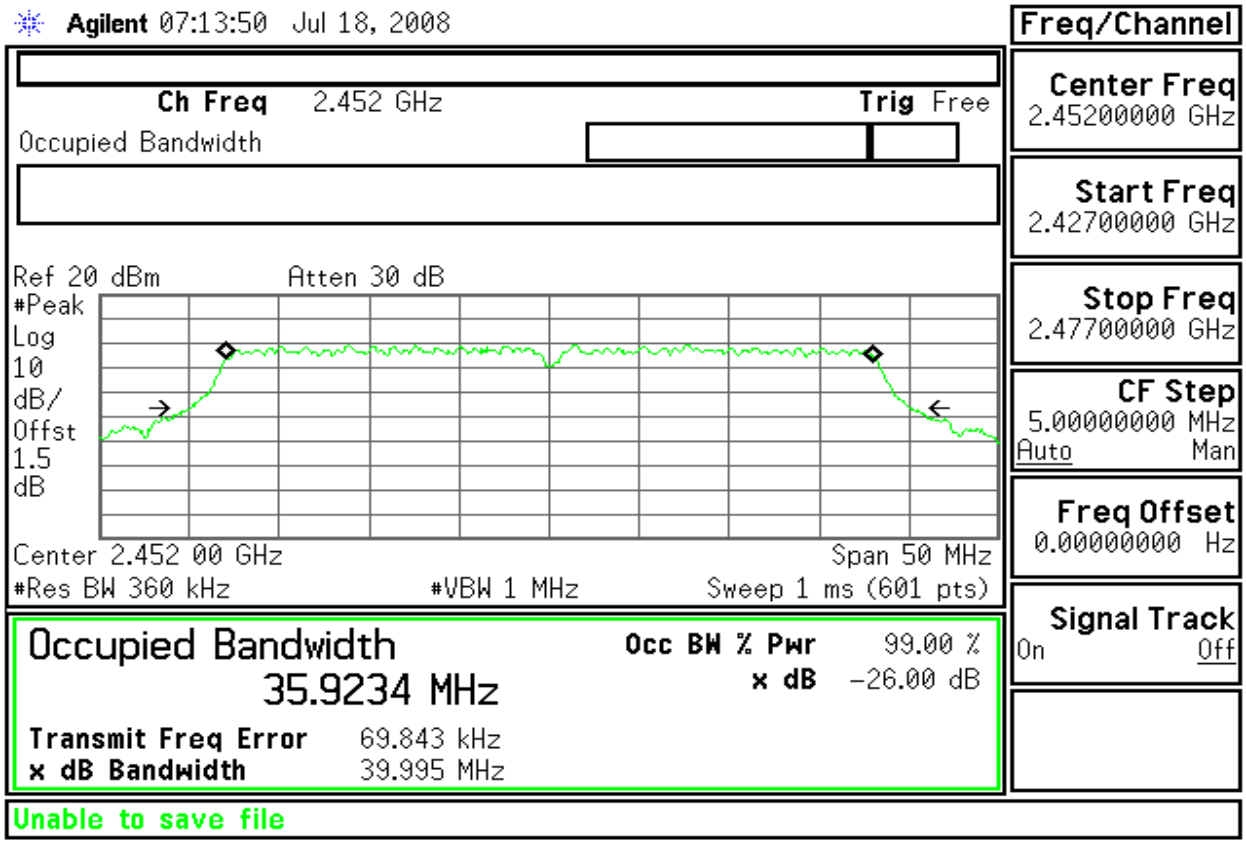
99% Bandwidth (CH Low)



99% Bandwidth (CH Mid)



99% Bandwidth (CH High)



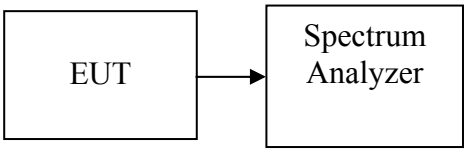
PEAK POWER

LIMIT

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

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

Test Configuration



TEST PROCEDURE

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

Output Power=10 log (10^(Chain 0 Output Power / 10) + 10^(Chain 1 Output Power / 10))

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	***16.19**	0.0416	1.00	PASS
Mid	2437	15.54	0.0358		PASS
High	2462	15.19	0.0330		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	***14.06**	0.0255	1.00	PASS
Mid	2437	13.47	0.0222		PASS
High	2462	13.10	0.0204		PASS

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	11.16	10.59	***13.89**	0.0245	1.00	PASS
Mid	2437	10.49	11.08	13.81	0.0240		PASS
High	2462	10.17	10.79	13.50	0.0224		PASS

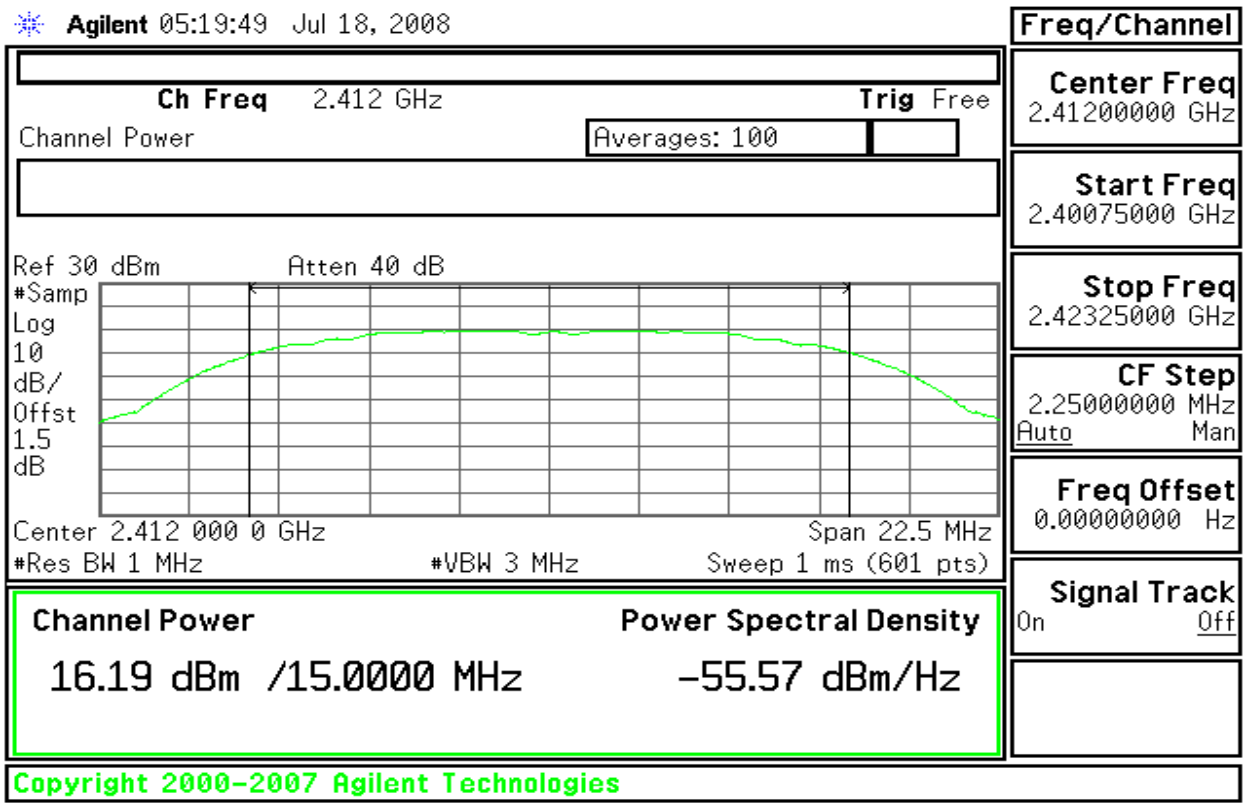
Test mode: draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	9.46	9.03	***12.26**	0.0168	1.00	PASS
Mid	2437	9.14	9.28	12.22	0.0167		PASS
High	2452	8.92	9.18	12.06	0.0161		PASS

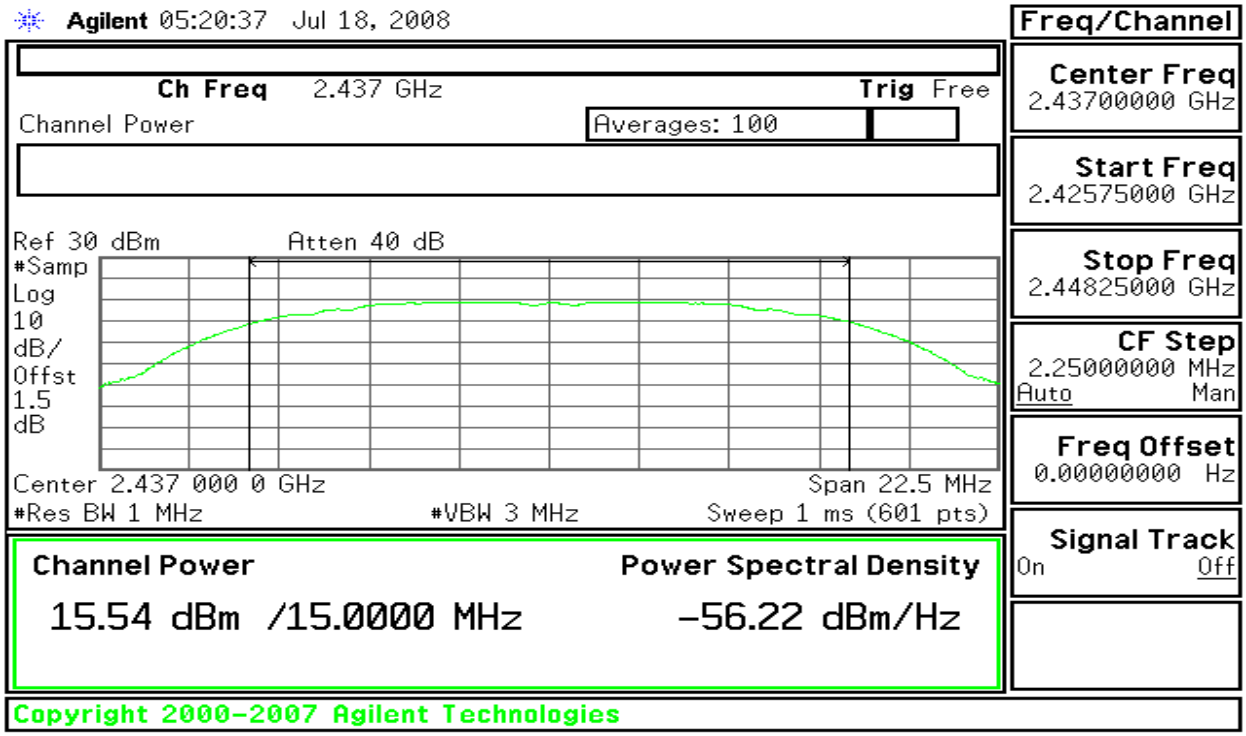
Test Plot

IEEE 802.11b mode

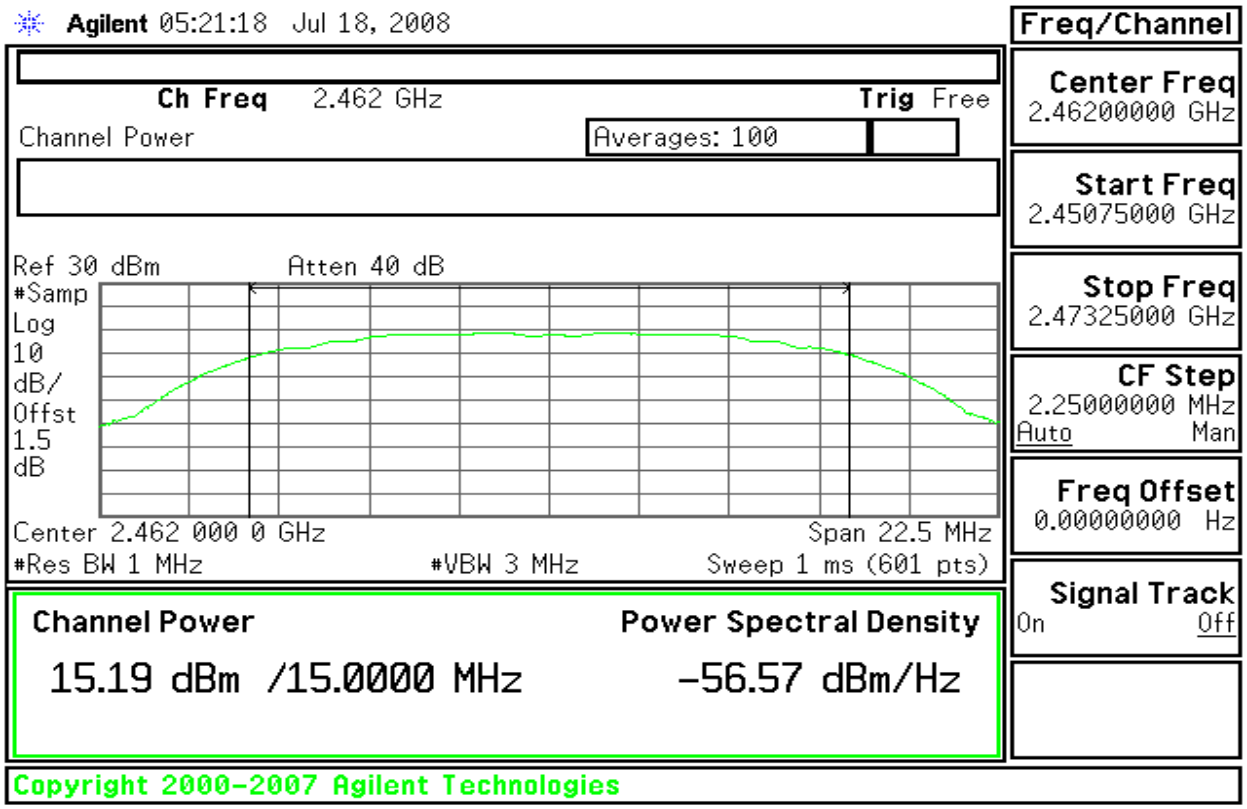
Peak Power (CH Low)



Peak Power (CH Mid)

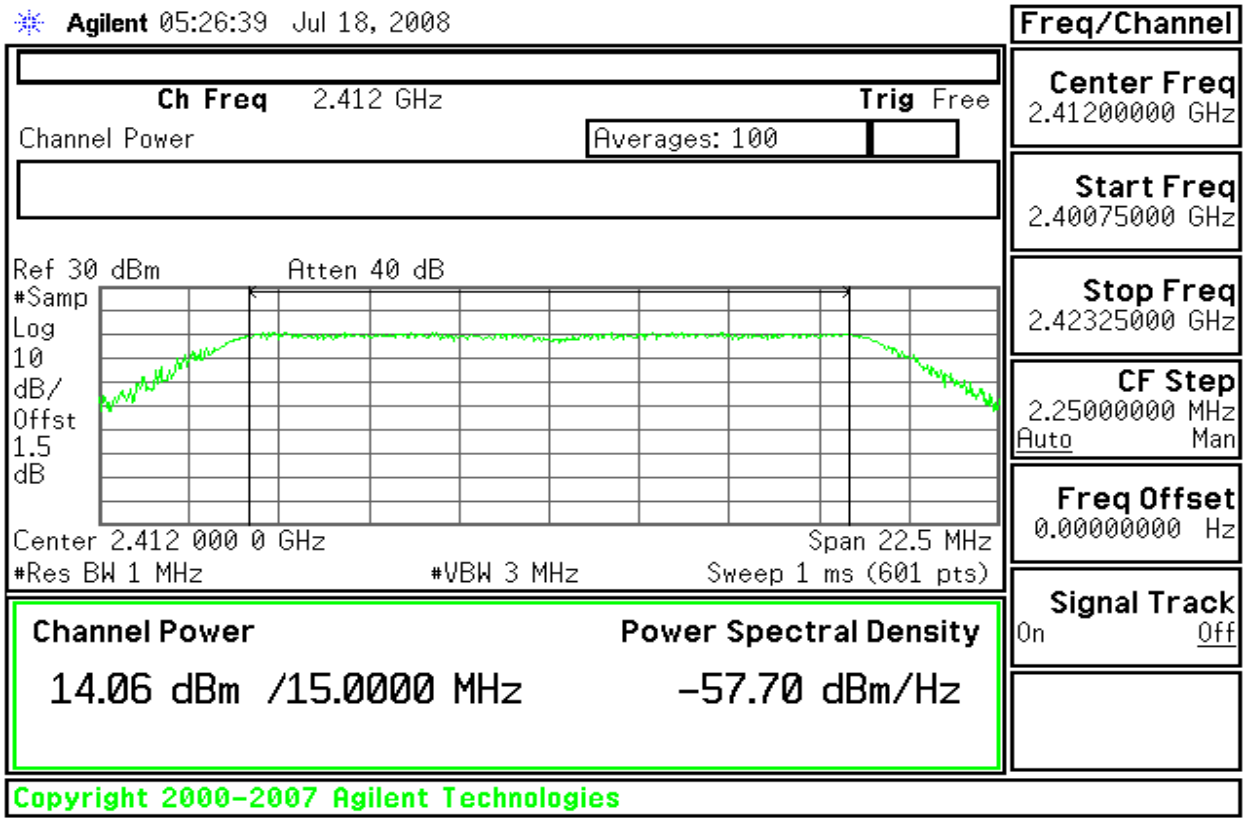


Peak Power (CH High)

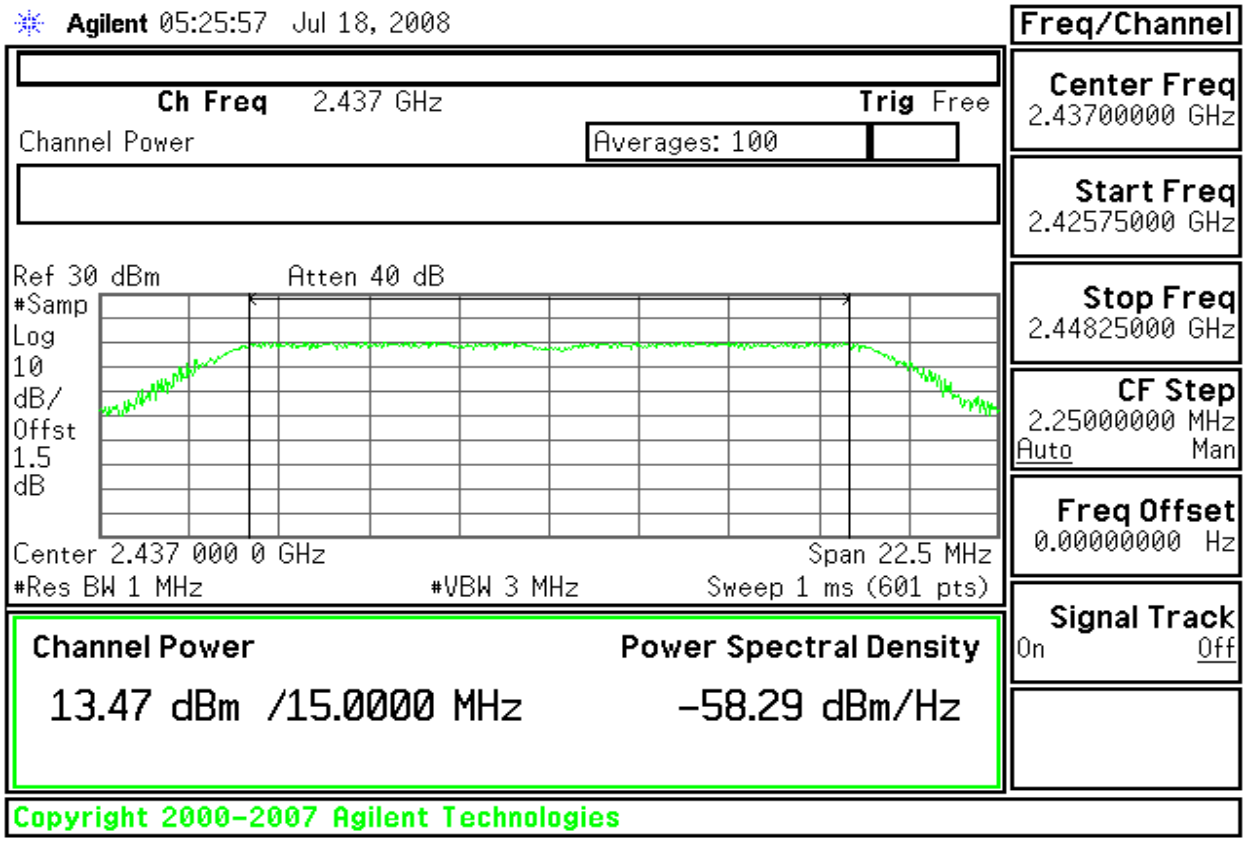


IEEE 802.11g mode

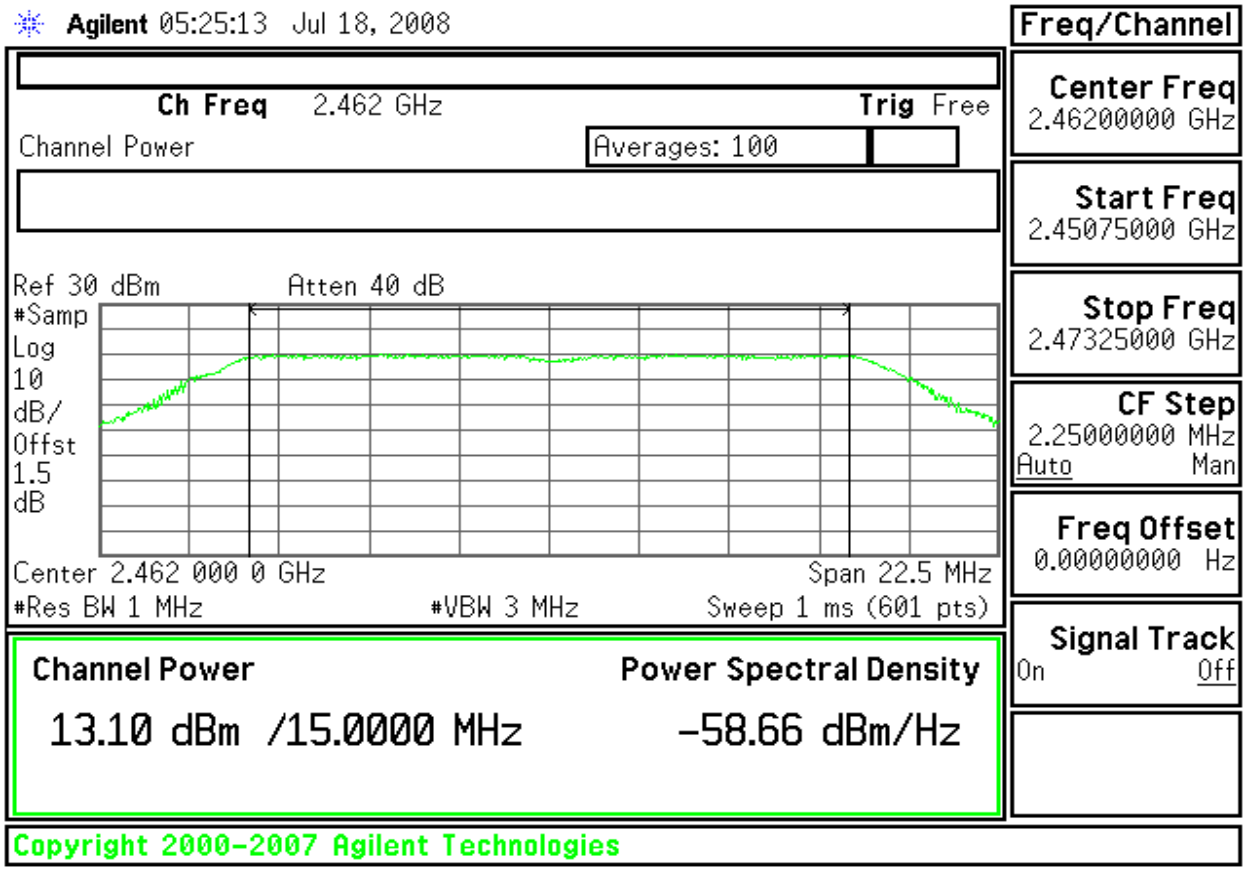
Peak Power (CH Low)



Peak Power (CH Mid)

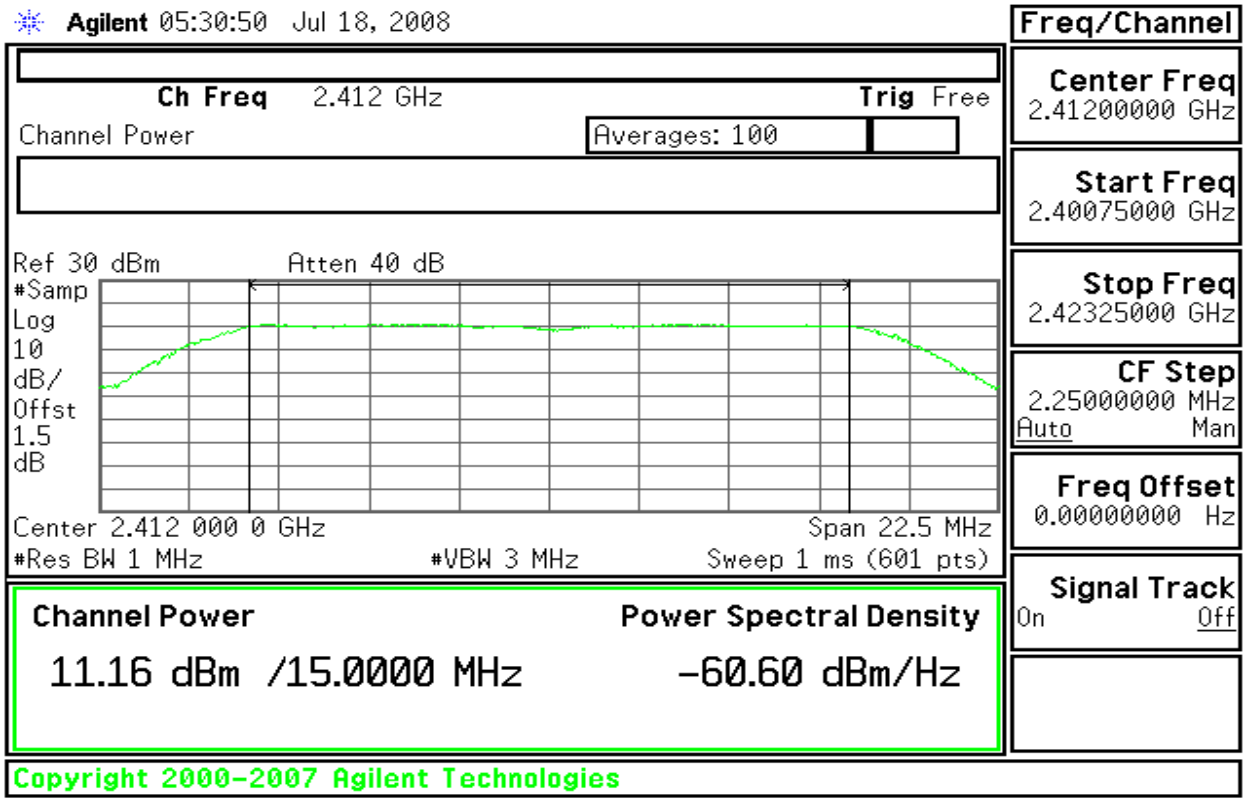


Peak Power (CH High)

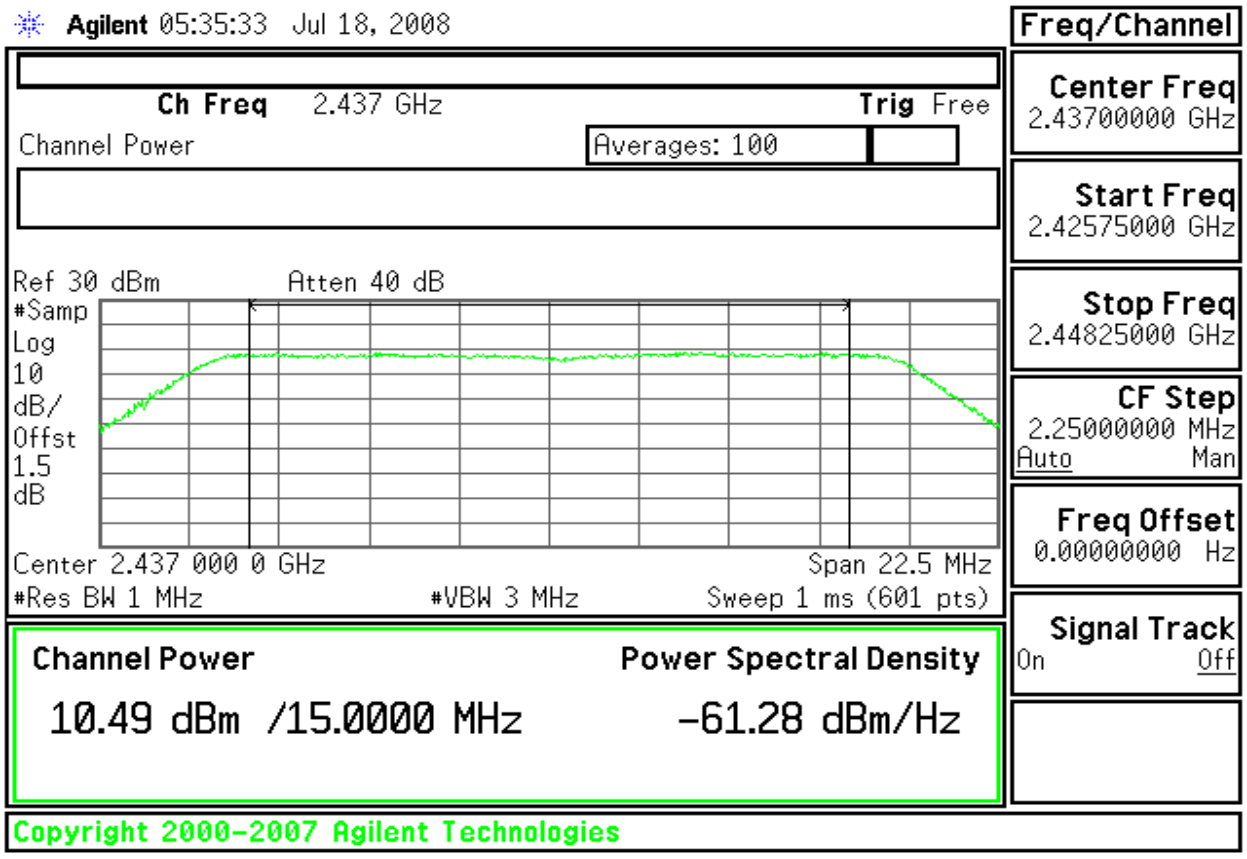


draft 802.11n Standard-20 MHz Channel mode / Chain 0

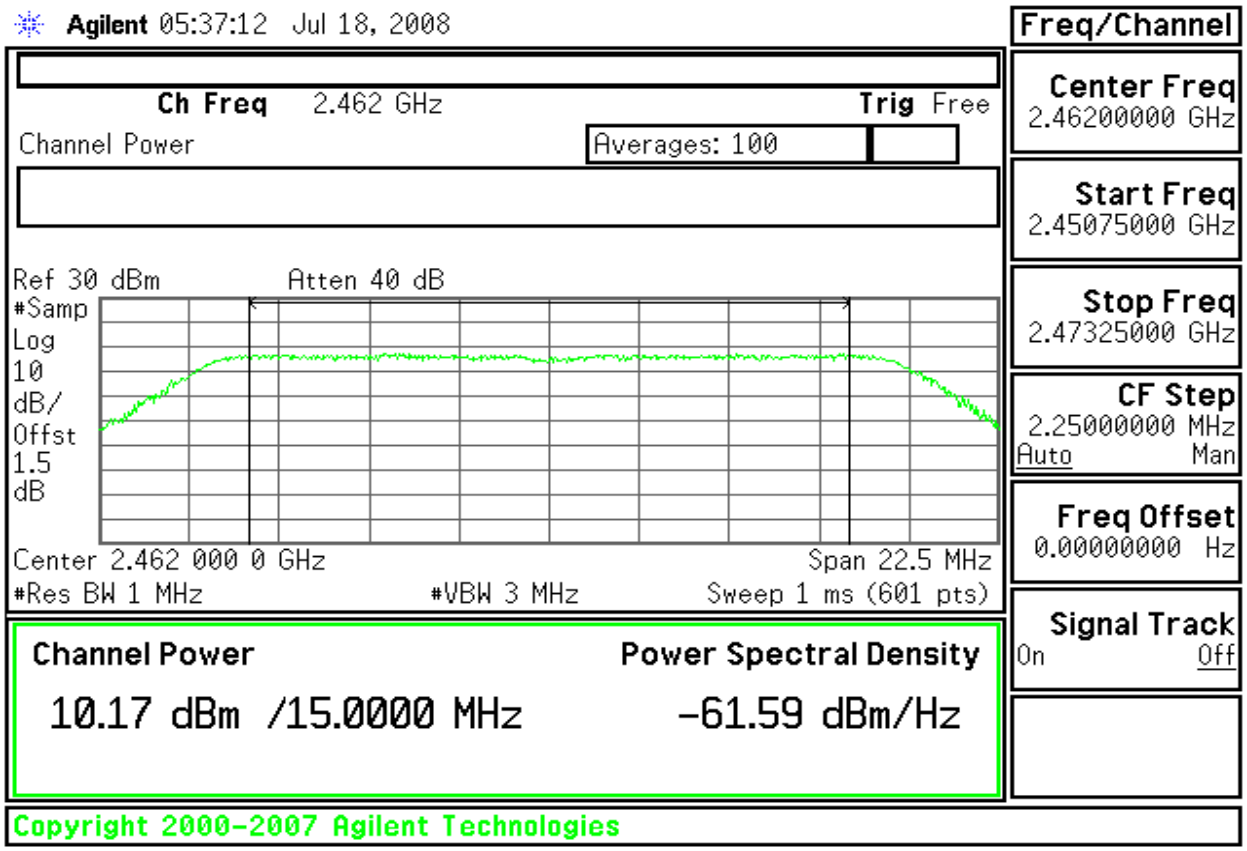
Peak Power (CH Low)



Peak Power (CH Mid)

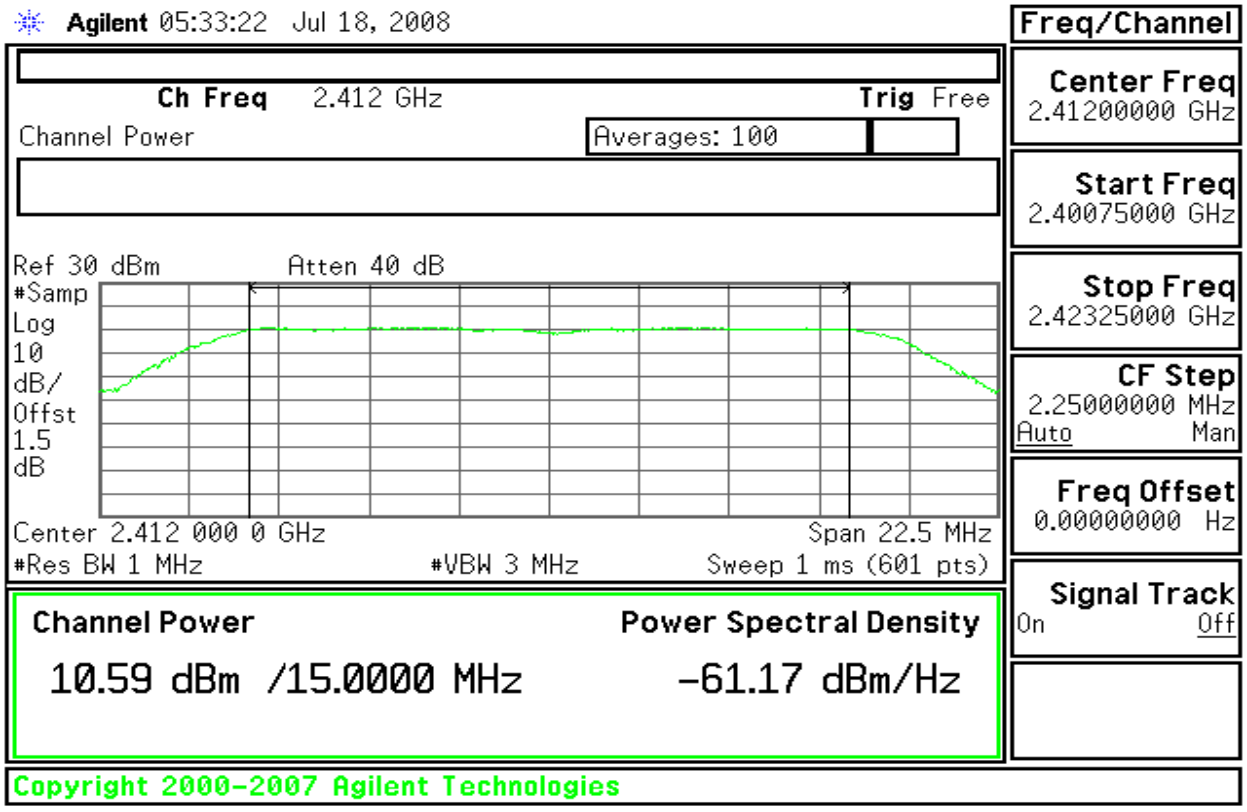


Peak Power (CH High)

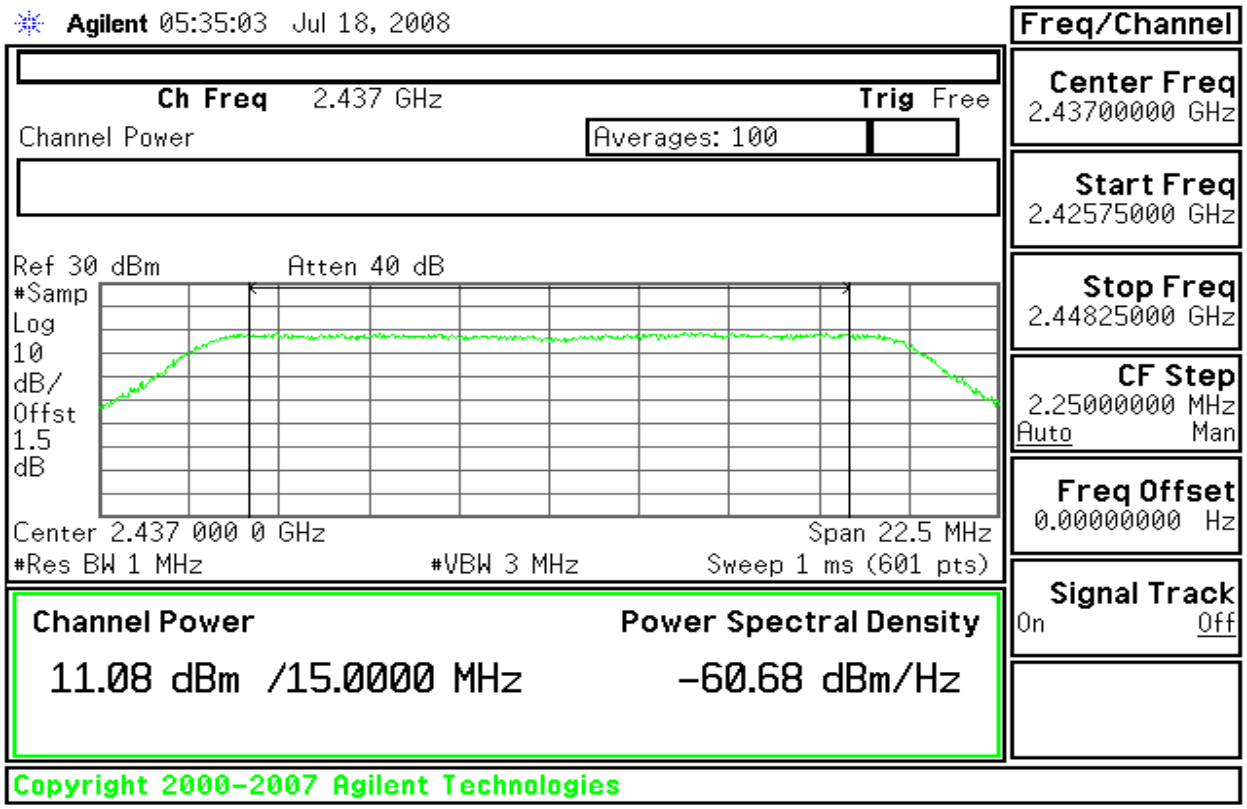


draft 802.11n Standard-20 MHz Channel mode / Chain 1

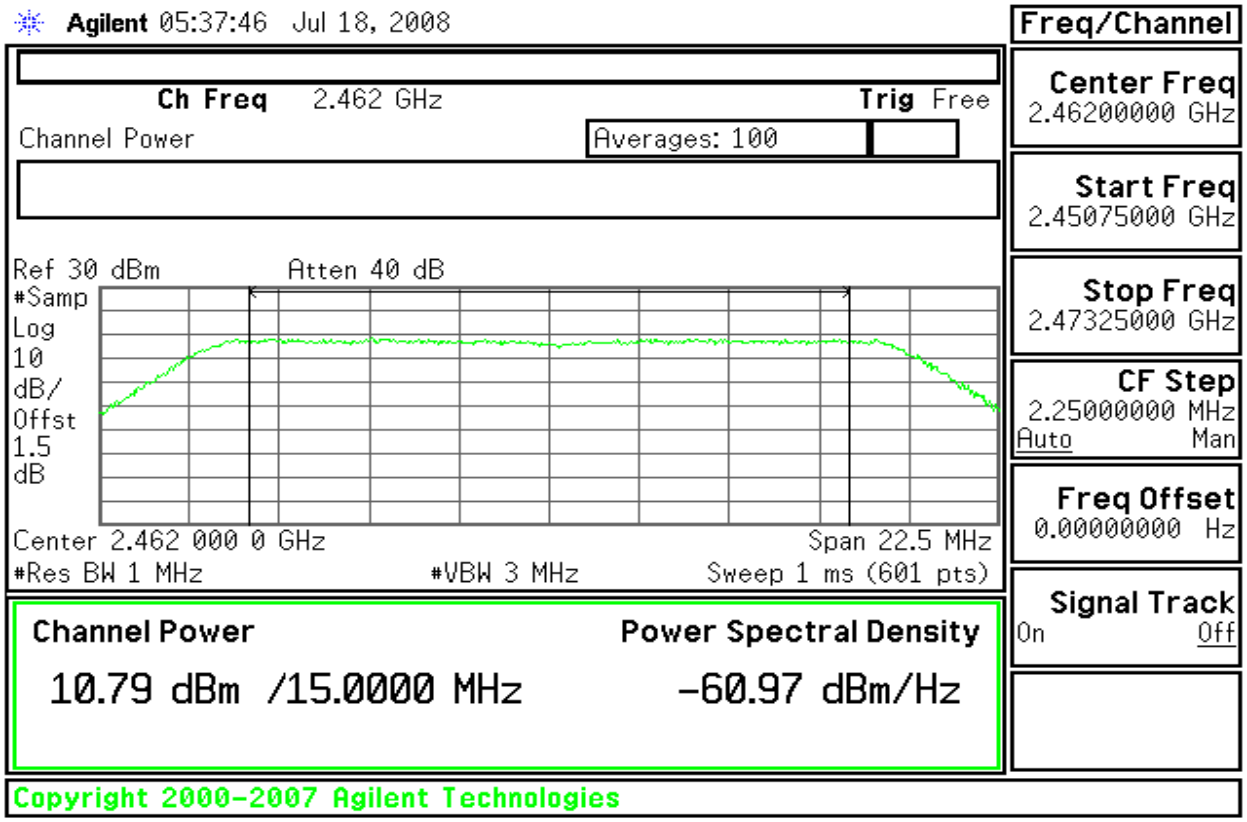
Peak Power (CH Low)



Peak Power (CH Mid)

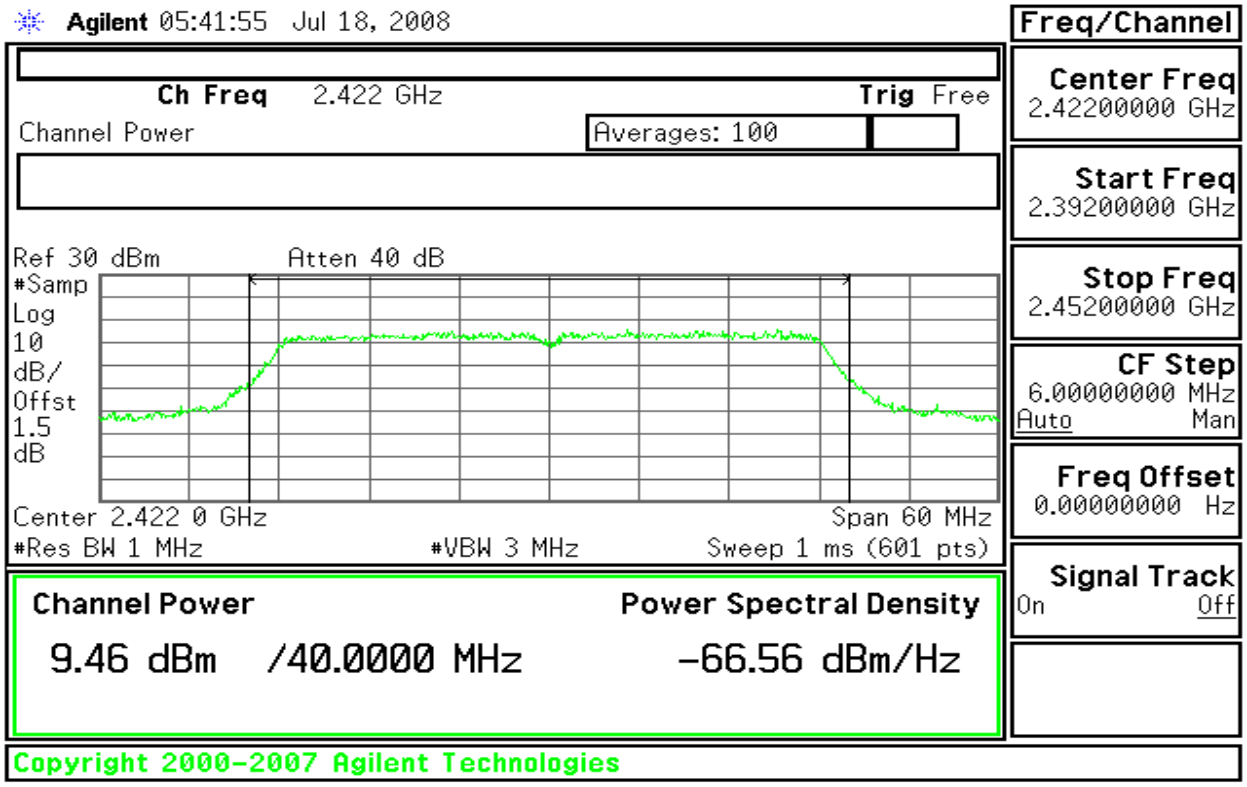


Peak Power (CH High)

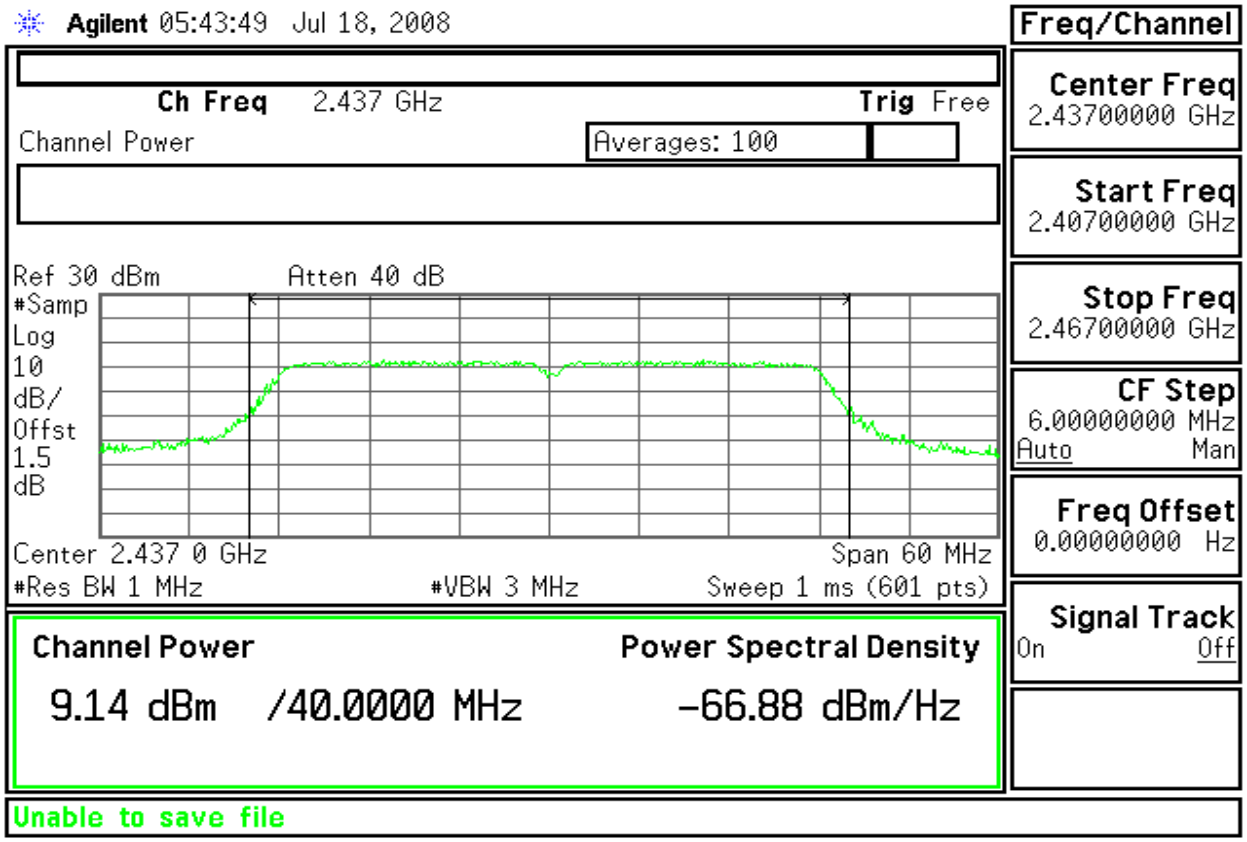


draft 802.11n Wide-40 MHz Channel mode / Chain 0

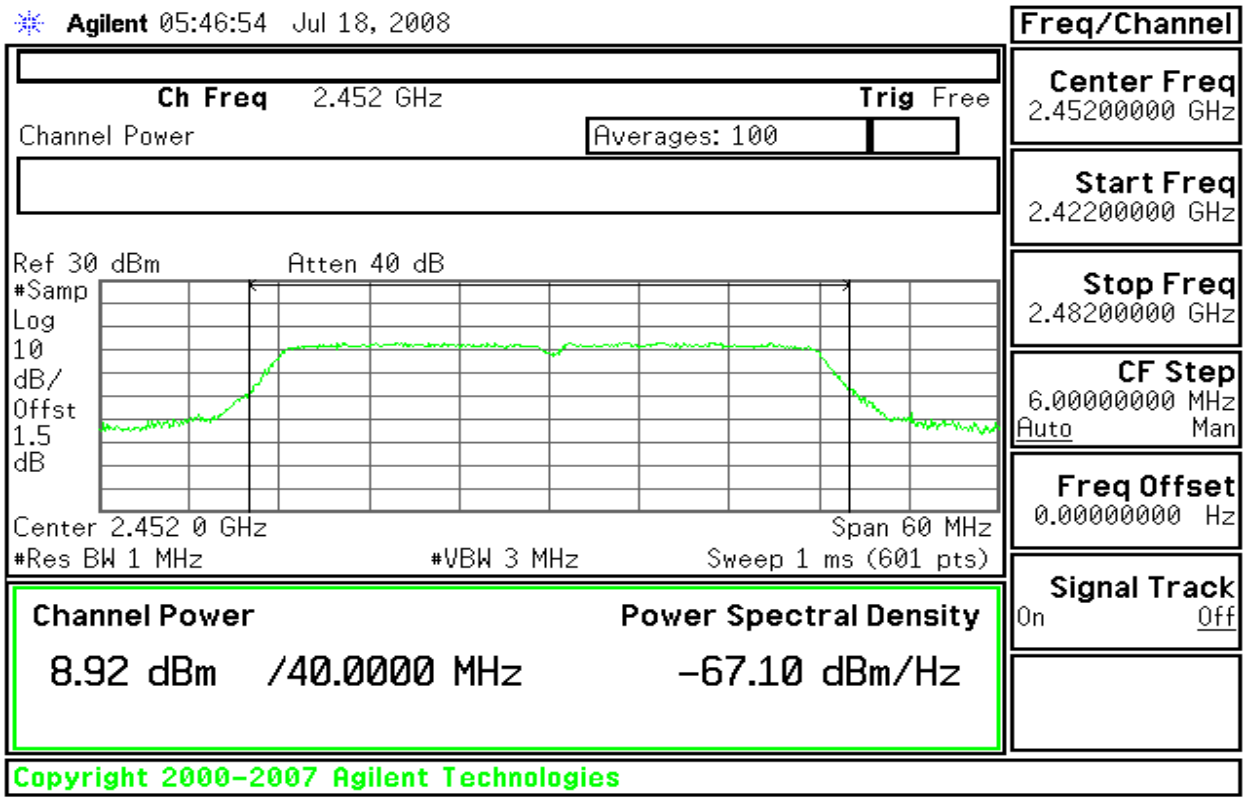
Peak Power (CH Low)



Peak Power (CH Mid)

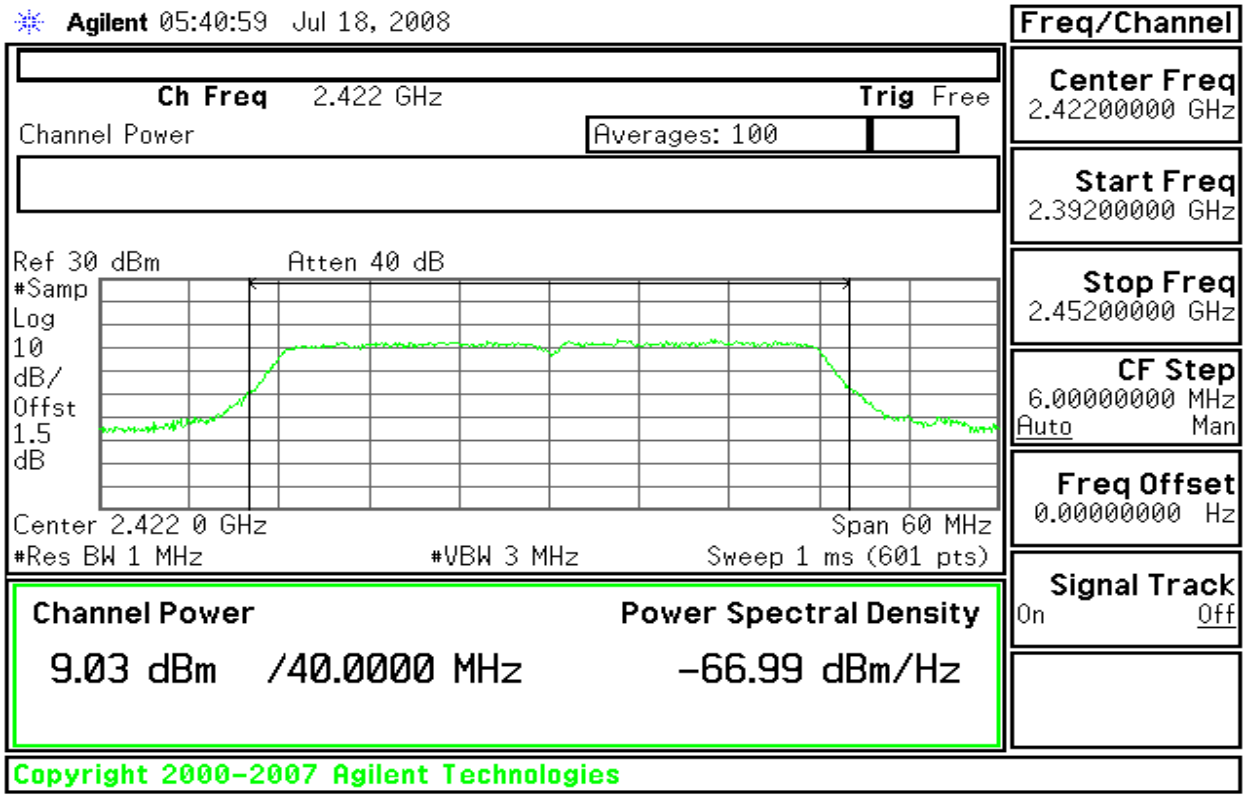


Peak Power (CH High)

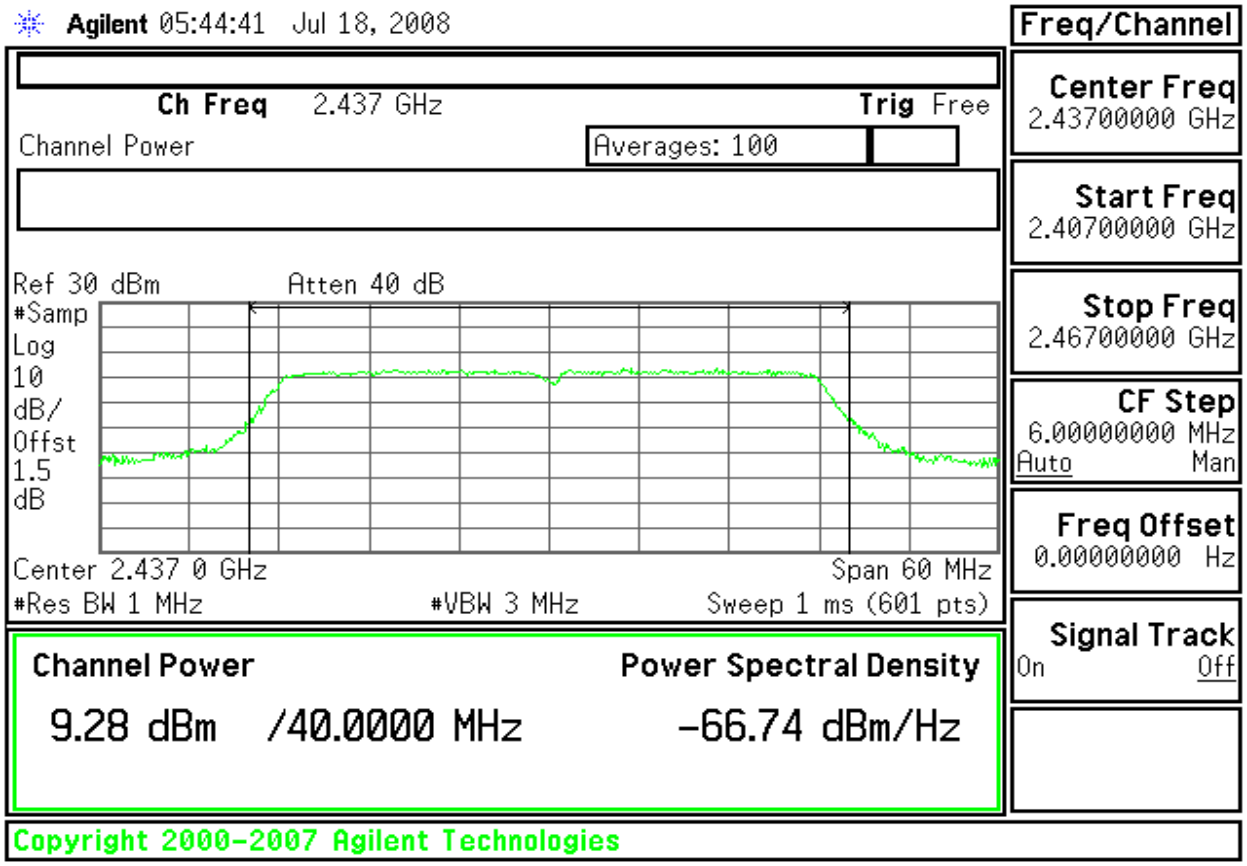


draft 802.11n Wide-40 MHz Channel mode / Chain 1

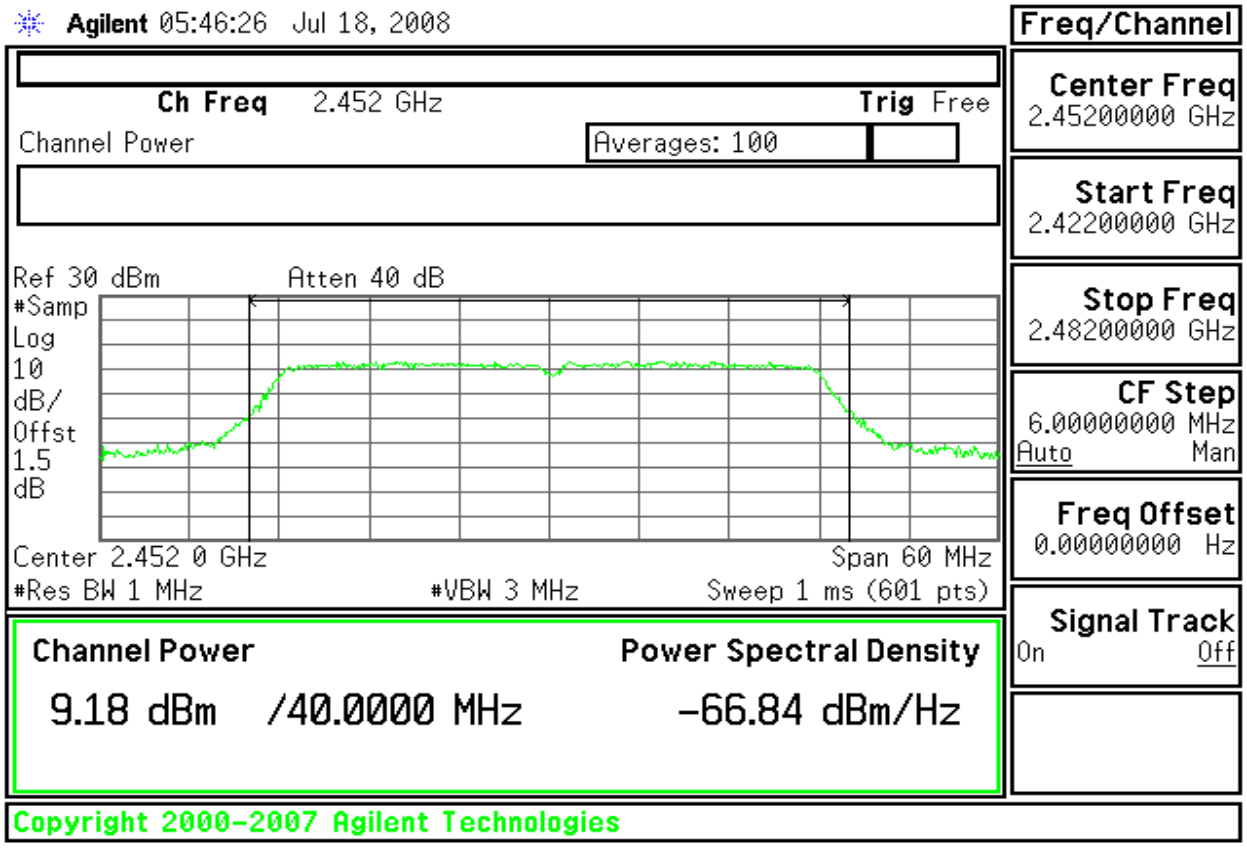
Peak Power (CH Low)



Peak Power (CH Mid)



Peak Power (CH High)

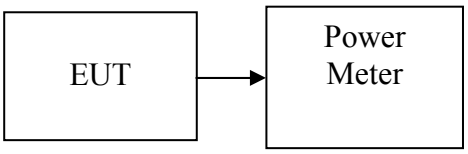


AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power meter.

Output Power=10 log (10^(Chain 0 Output Power / 10) + 10^(Chain 1 Output Power / 10))

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	***15.92**
Mid	2437	15. 27
High	2462	14.85

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	***14.17**
Mid	2437	13. 56
High	2462	13. 24

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)
Low	2412	11.63	11.52	***14.59**
Mid	2437	10.97	11.96	14.50
High	2462	10.55	11.71	14.18

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

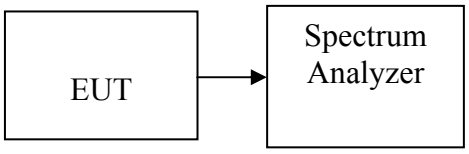
Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)
Low	2422	9.32	8.88	***12.12**
Mid	2437	8.98	9.04	12.02
High	2452	8.77	8.95	11.87

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 = 100 s
3. Record the max reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.
5. PPSD Total=10 log (10^(PPSD Chain 0 / 10) + 10^(PPSD Chain 1 / 10))

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2412	-14.38	8.00	PASS
Mid	2437	-14.95	8.00	PASS
High	2462	-15.21	8.00	PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2412	-14.97	8.00	PASS
Mid	2437	-16.26	8.00	PASS
High	2462	-16.45	8.00	PASS

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

Channel	Frequency (MHz)	PPSD Chain 0 (dBm)	PPSD Chain 1 (dBm)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2412	-18.21	-18.61	-15.40	8.00	PASS
Mid	2437	-17.41	-15.48	-13.33	8.00	PASS
High	2462	-19.26	-17.50	-15.28	8.00	PASS

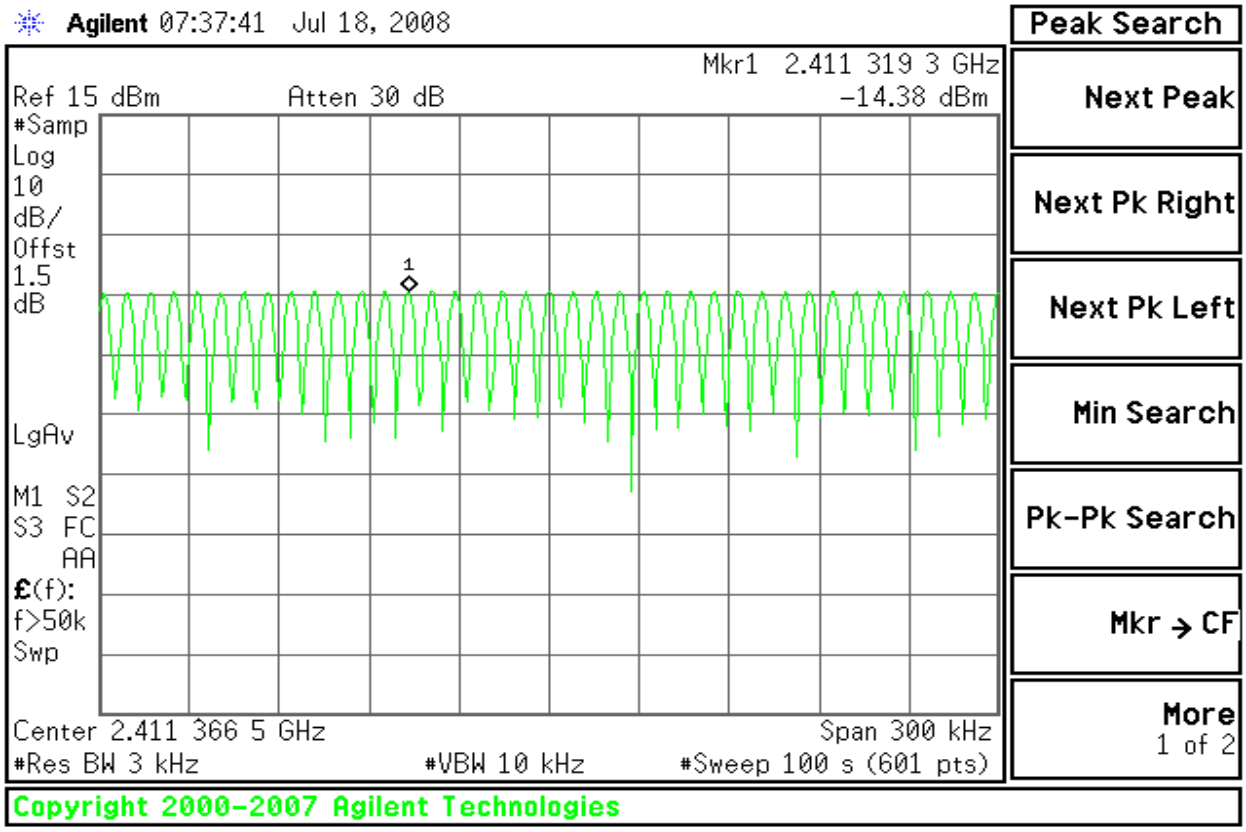
Test mode: draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	PPSD Chain 0 (dBm)	PPSD Chain 1 (dBm)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2422	-19.97	-21.31	-17.58	8.00	PASS
Mid	2437	-22.17	-21.23	-18.66	8.00	PASS
High	2452	-22.75	-22.38	-19.55	8.00	PASS

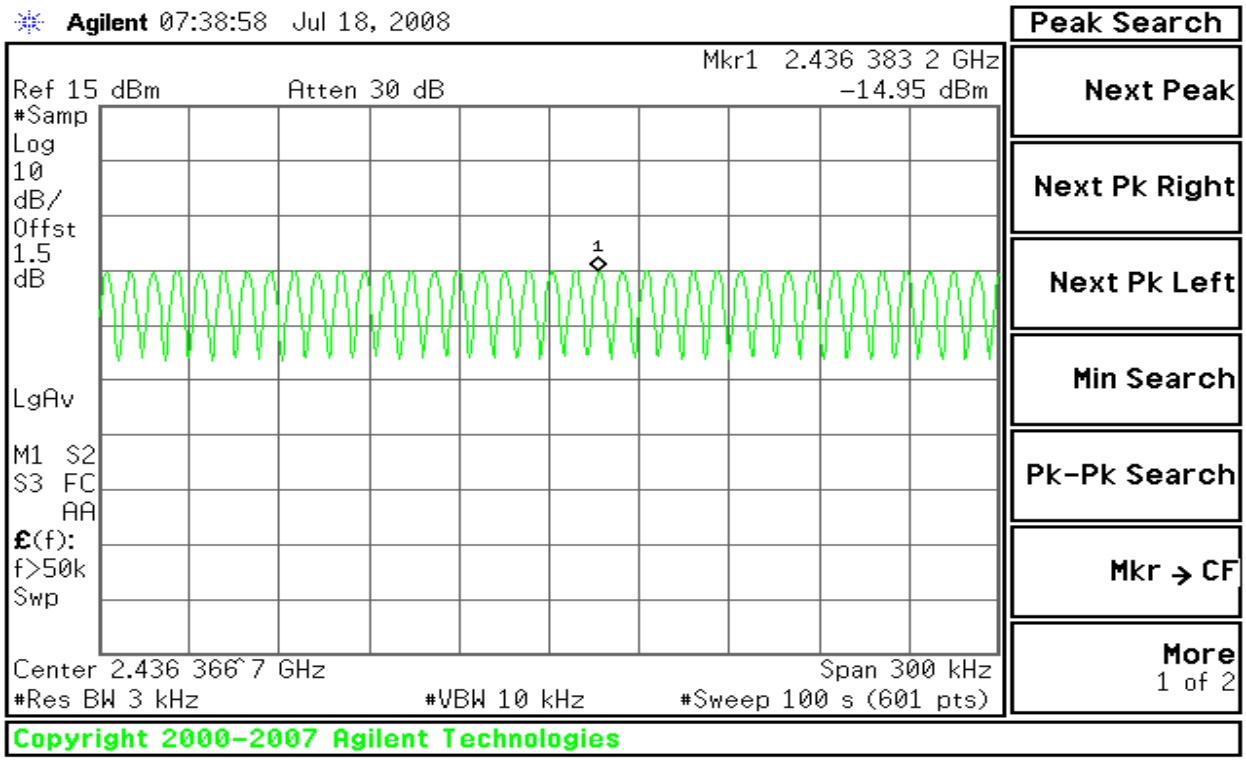
Test Plot

IEEE 802.11b mode

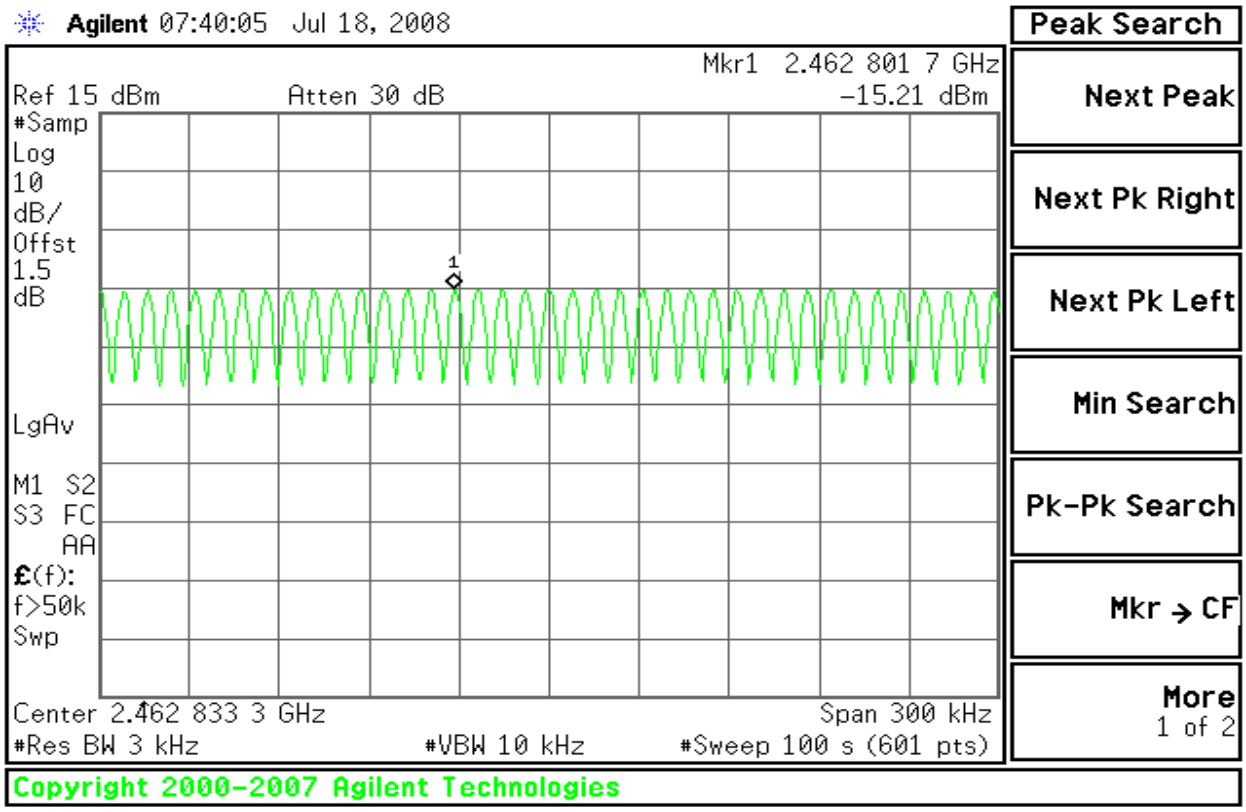
PPSD (CH Low)



PPSD (CH Mid)

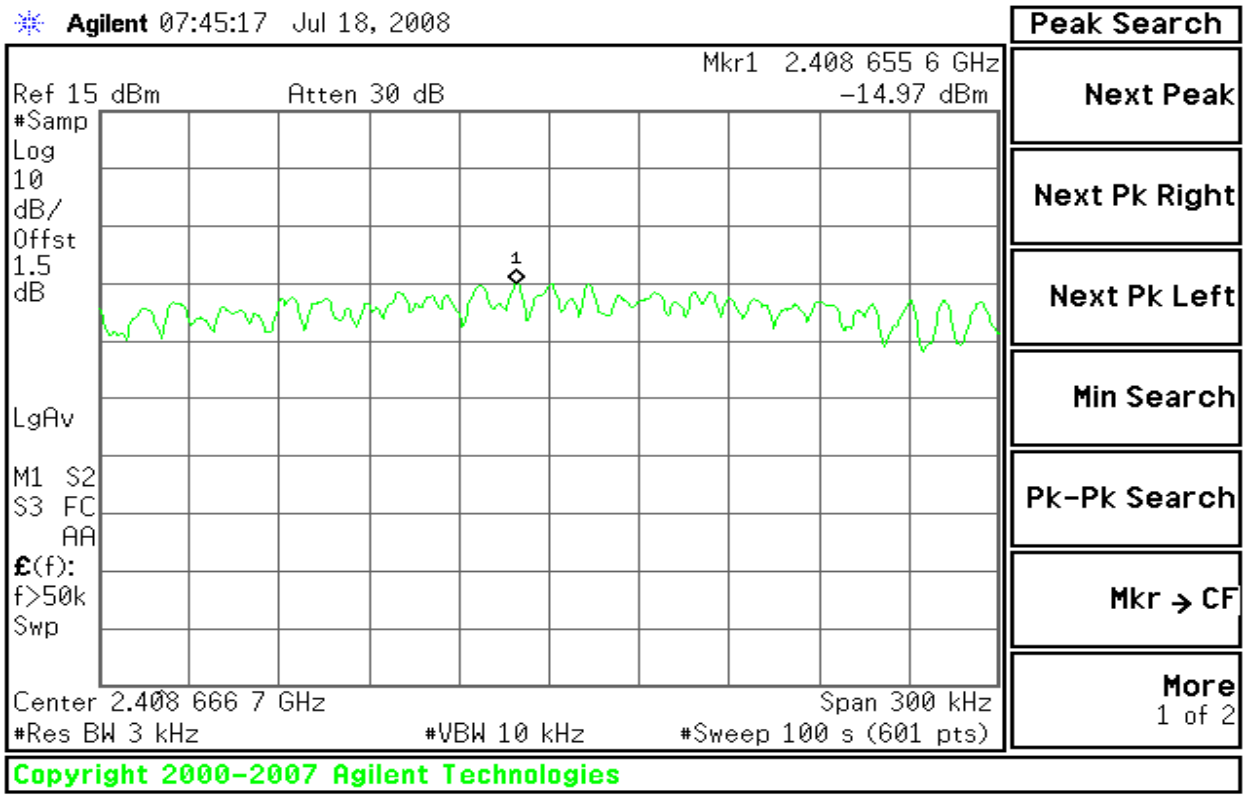


PPSD (CH High)

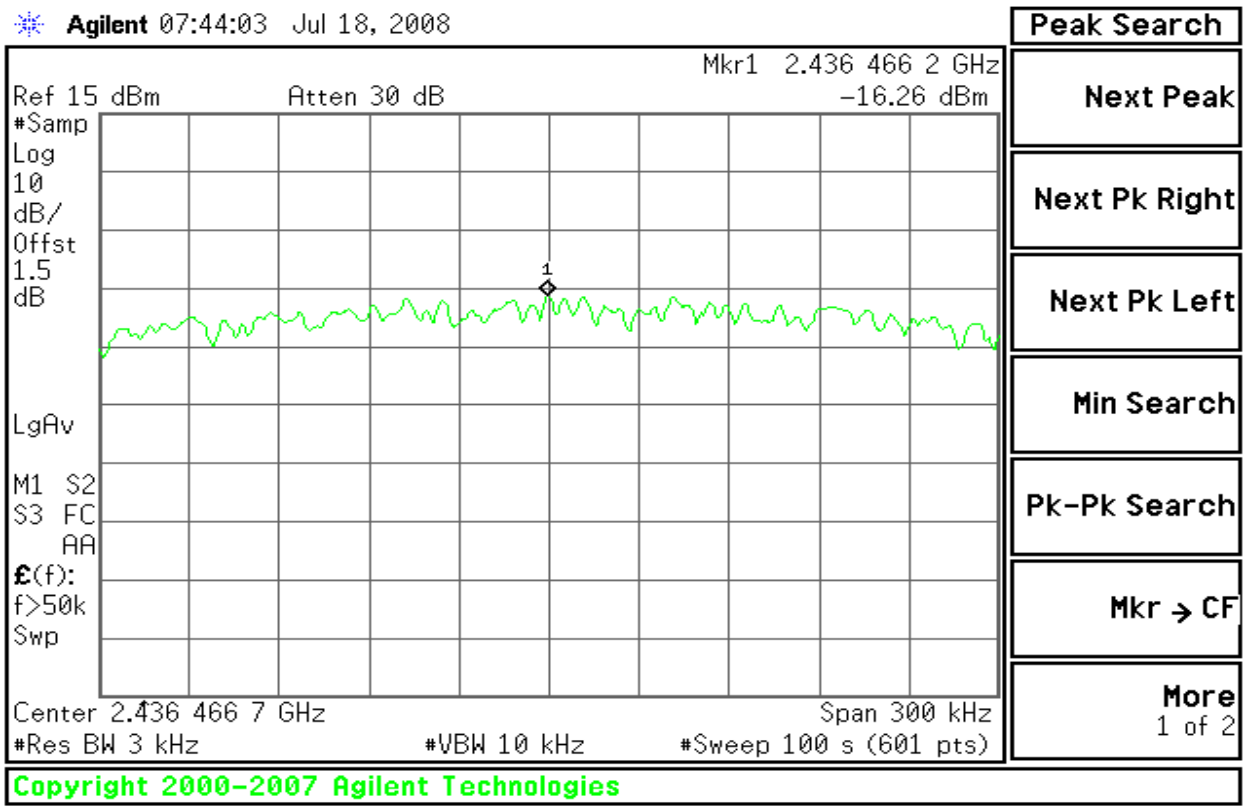


IEEE 802.11g mode

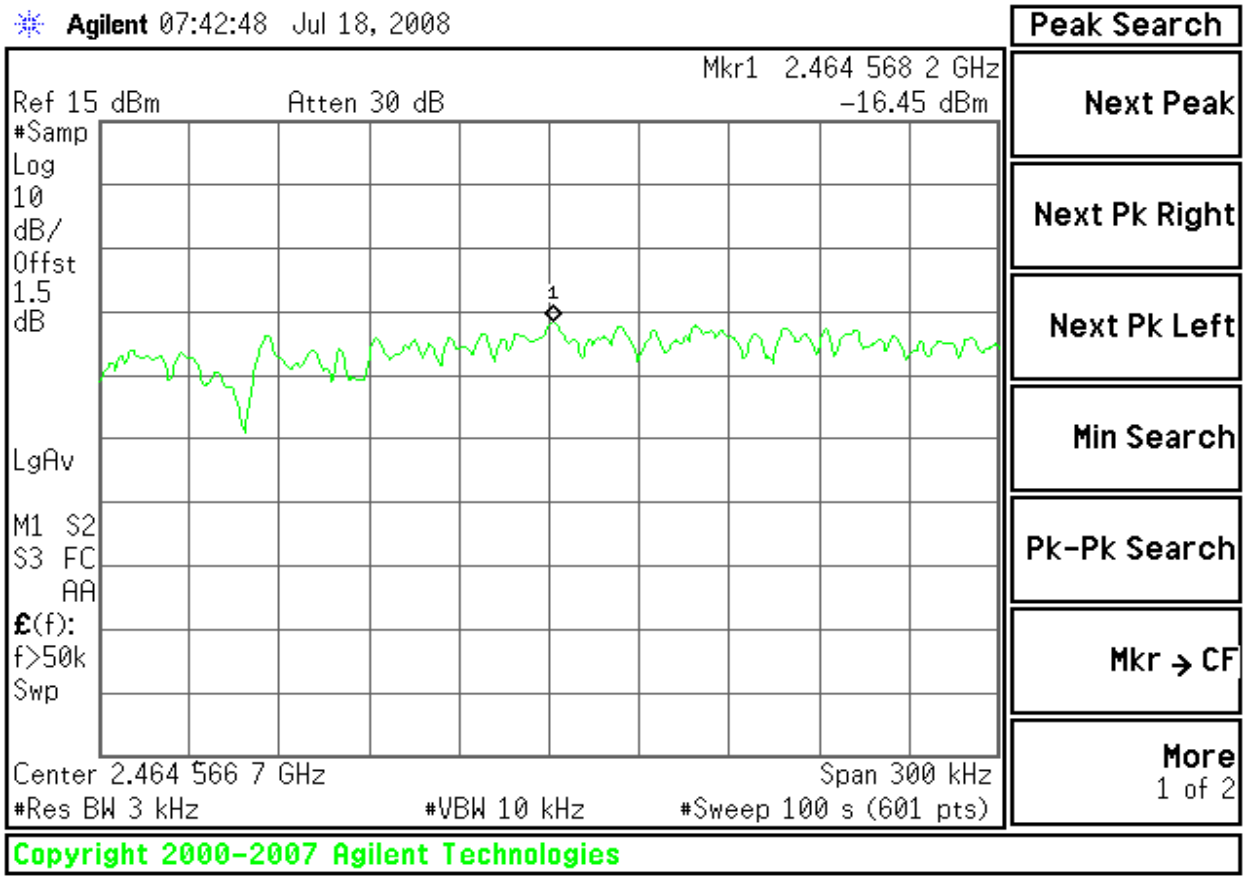
PPSD (CH Low)



PPSD (CH Mid)

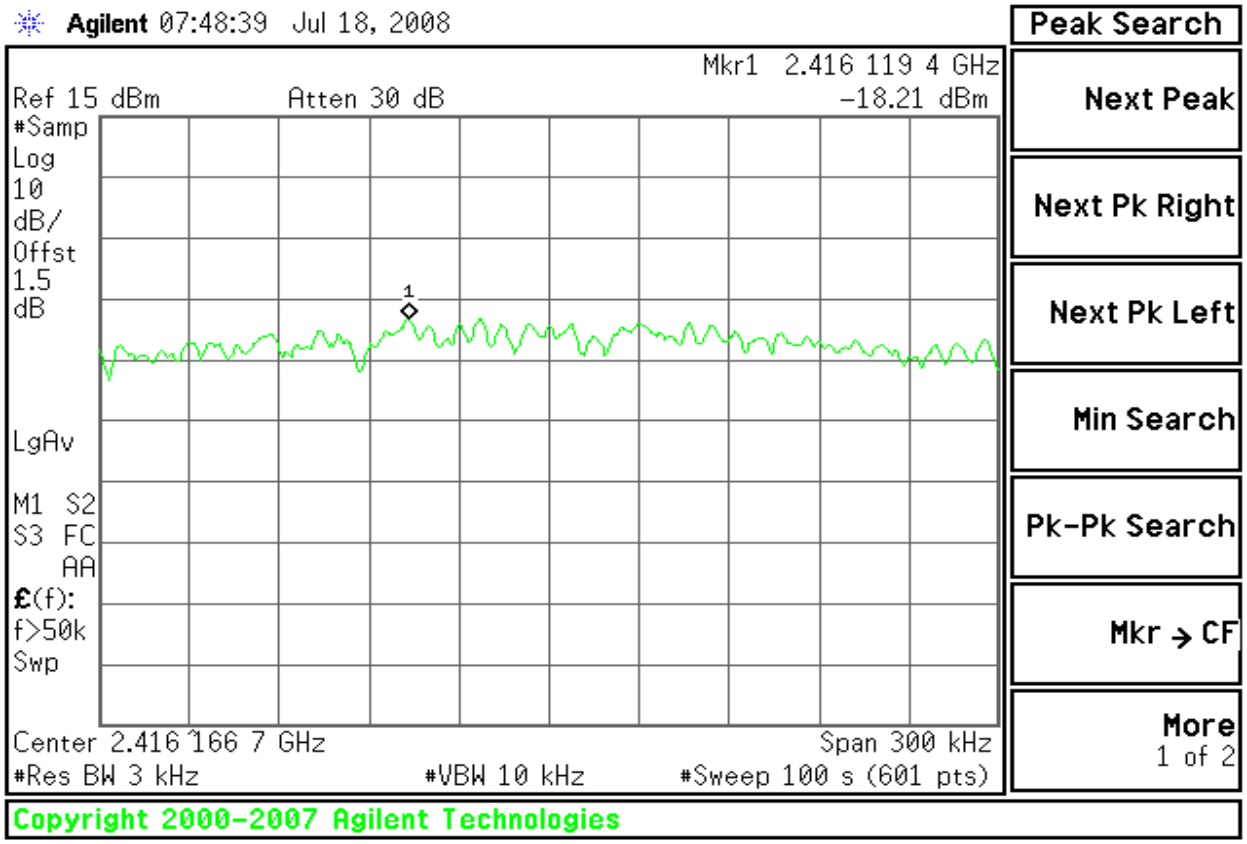


PPSD (CH High)

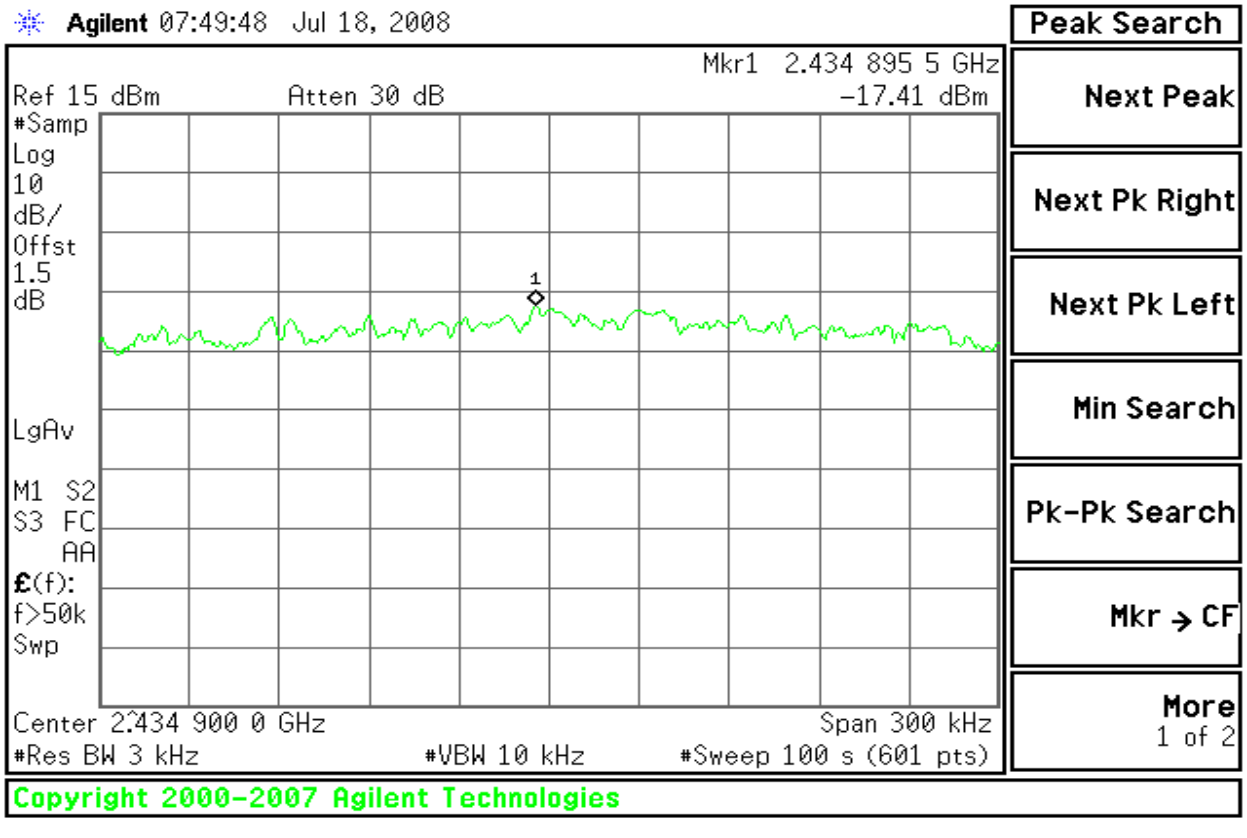


draft 802.11n Standard-20 MHz Channel mode / Chain 0

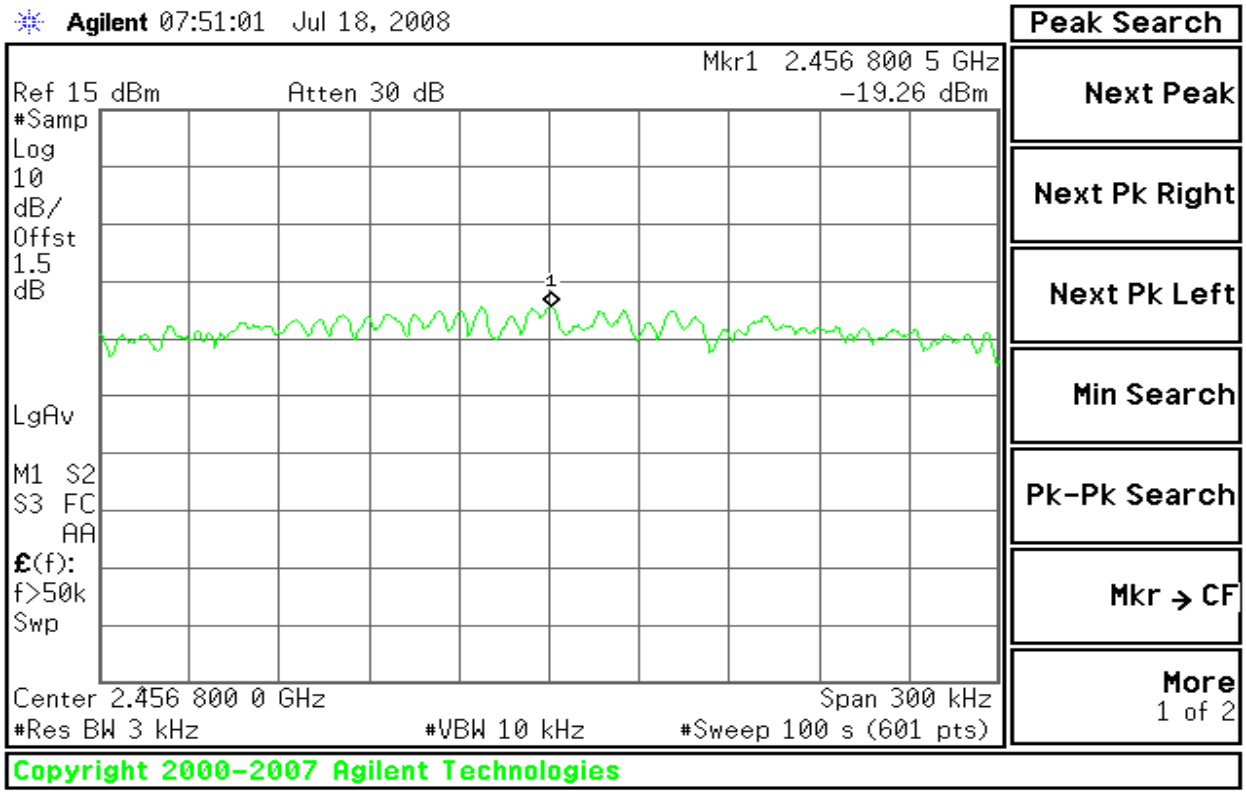
PPSD (CH Low)



PPSD (CH Mid)

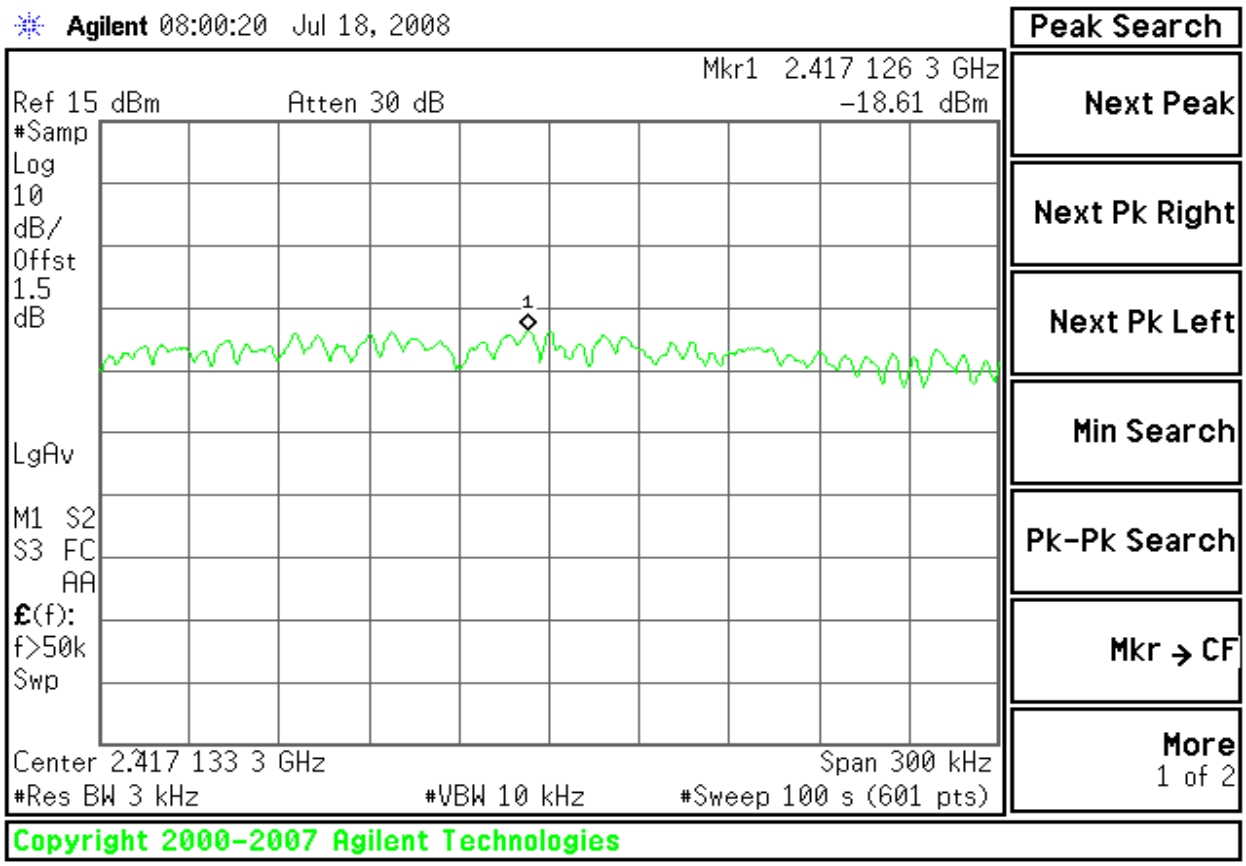


PPSD (CH High)

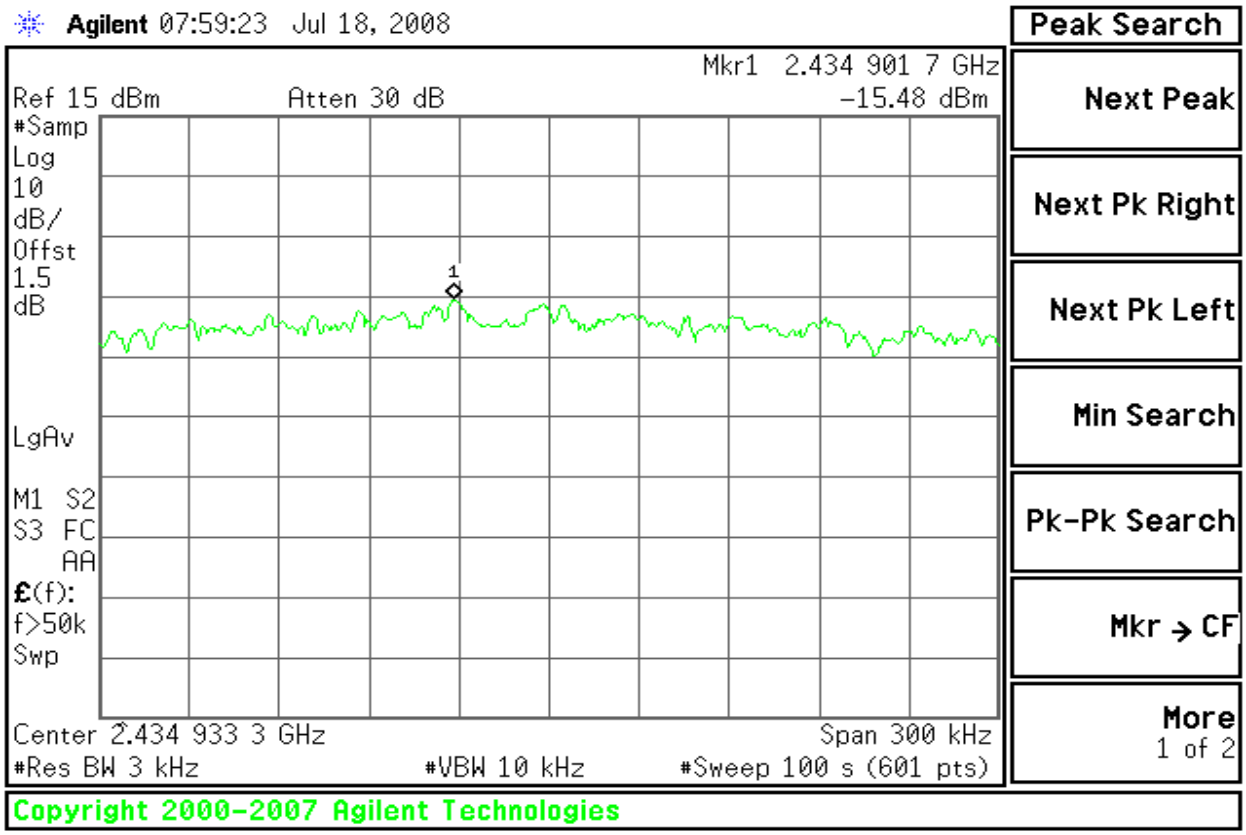


draft 802.11n Standard-20 MHz Channel mode / Chain 1

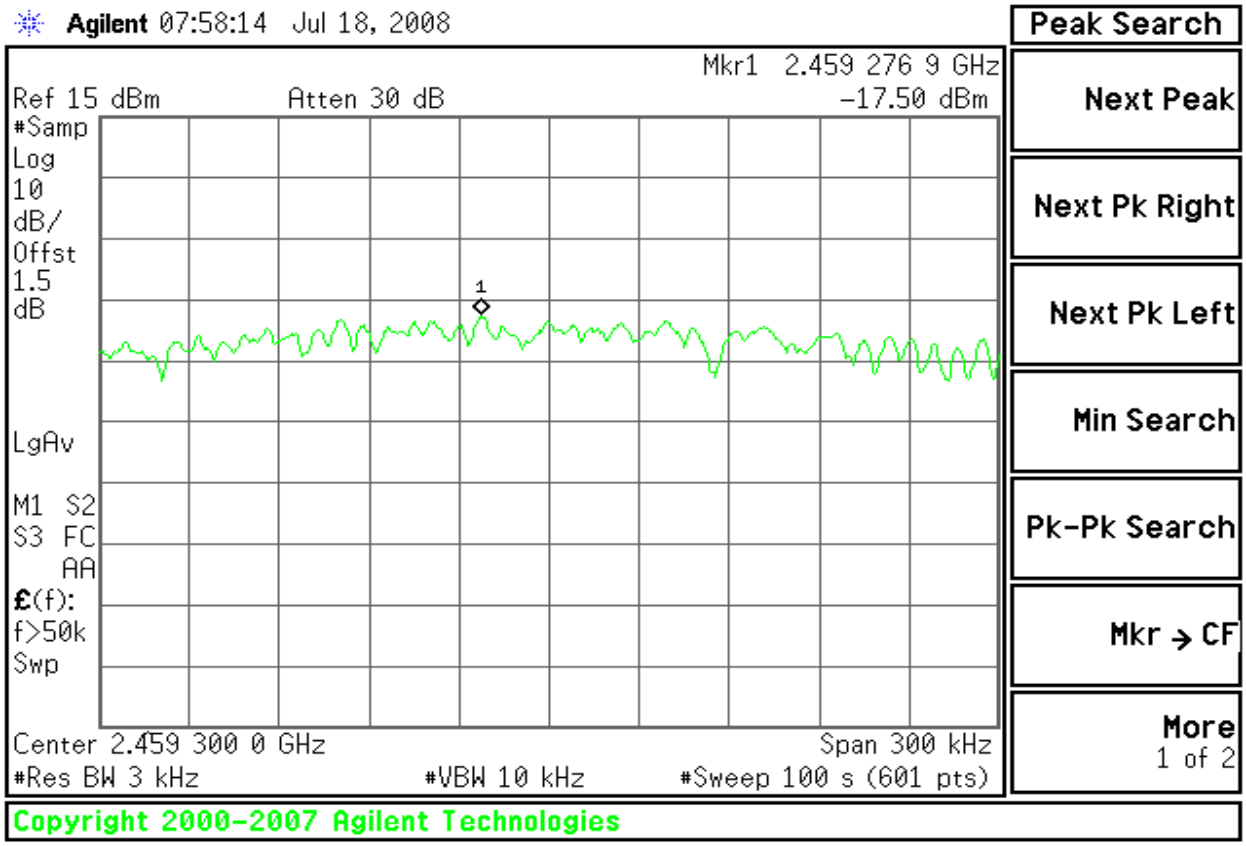
PPSD (CH Low)



PPSD (CH Mid)

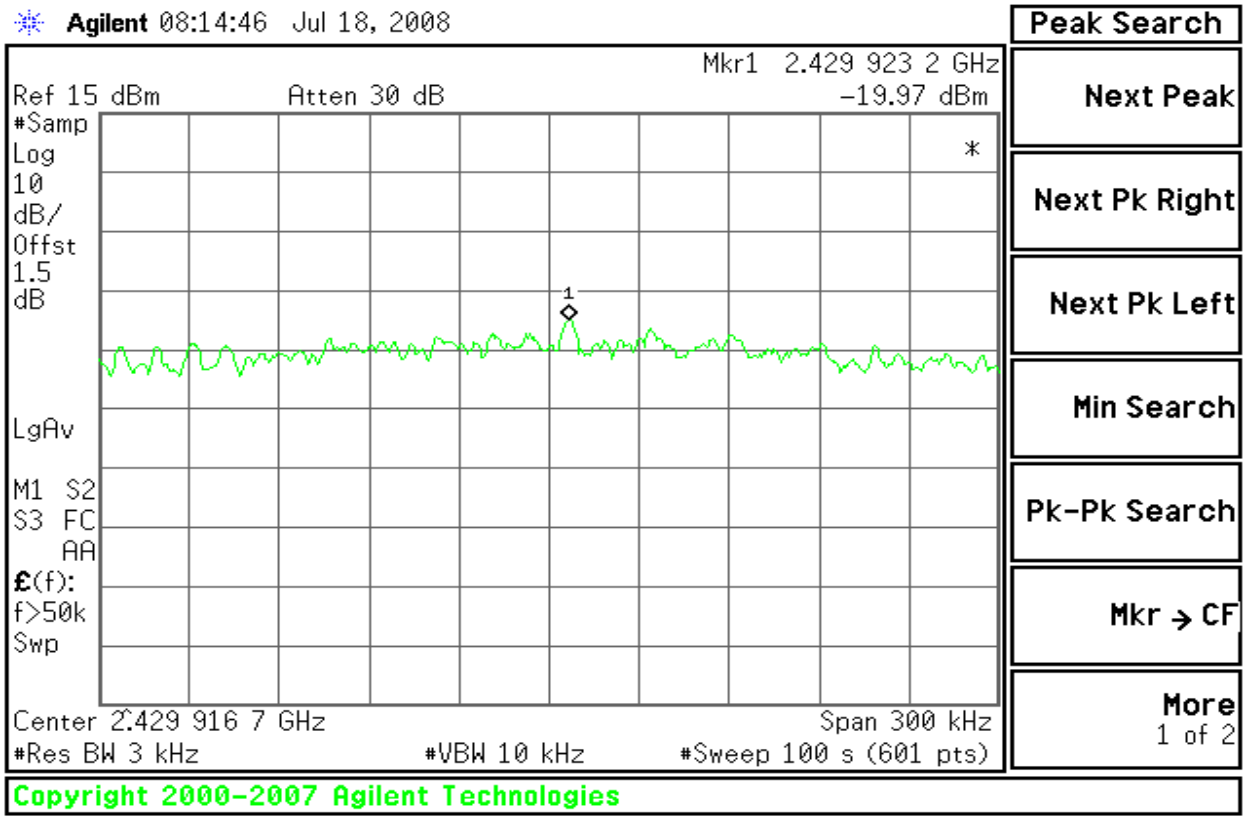


PPSD (CH High)

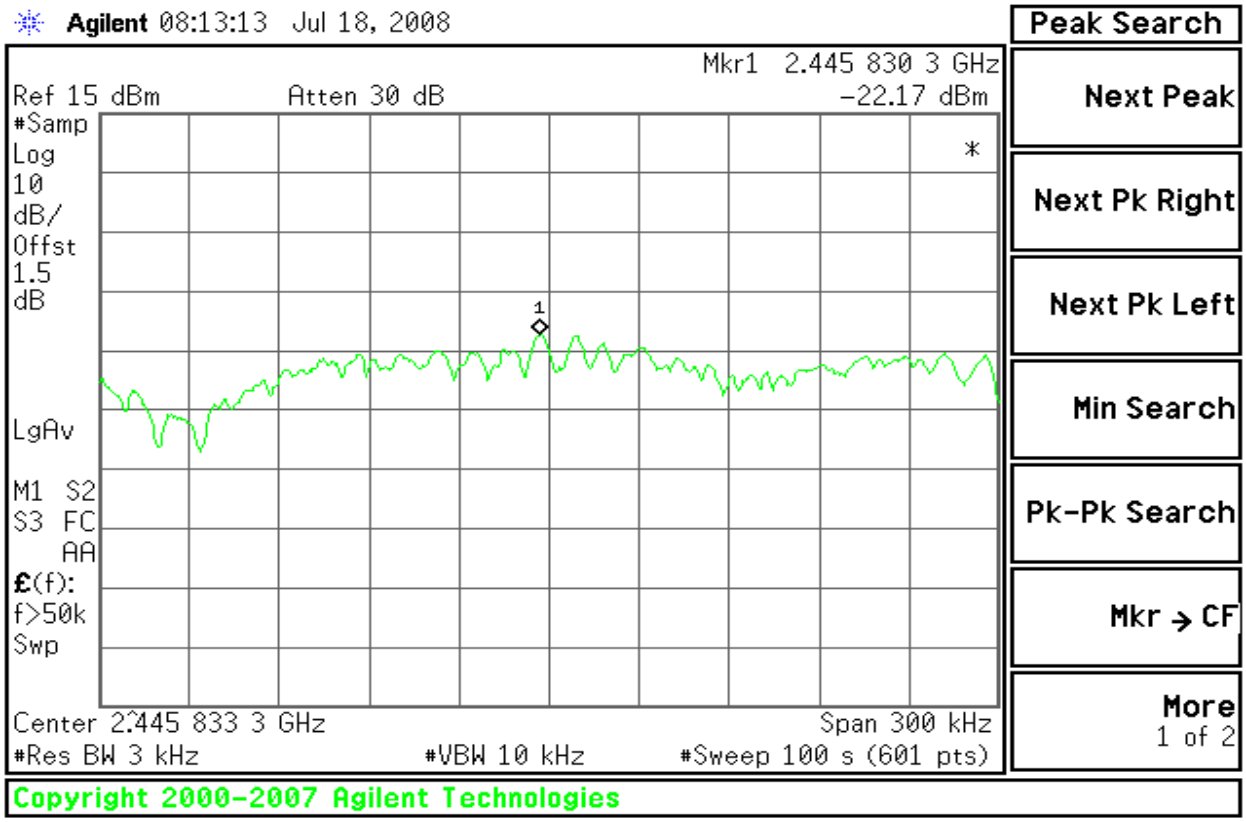


draft 802.11n Wide-40 MHz Channel mode / Chain 0

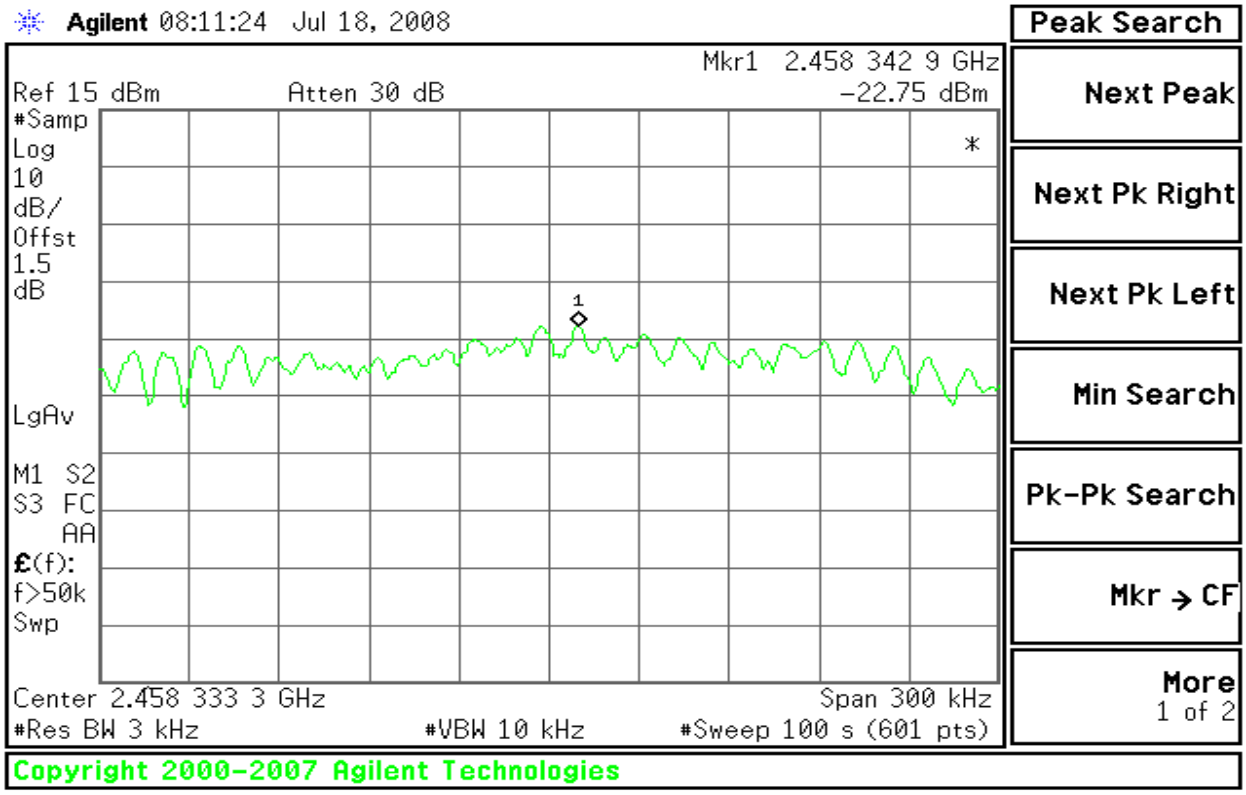
PPSD (CH Low)



PPSD (CH Mid)

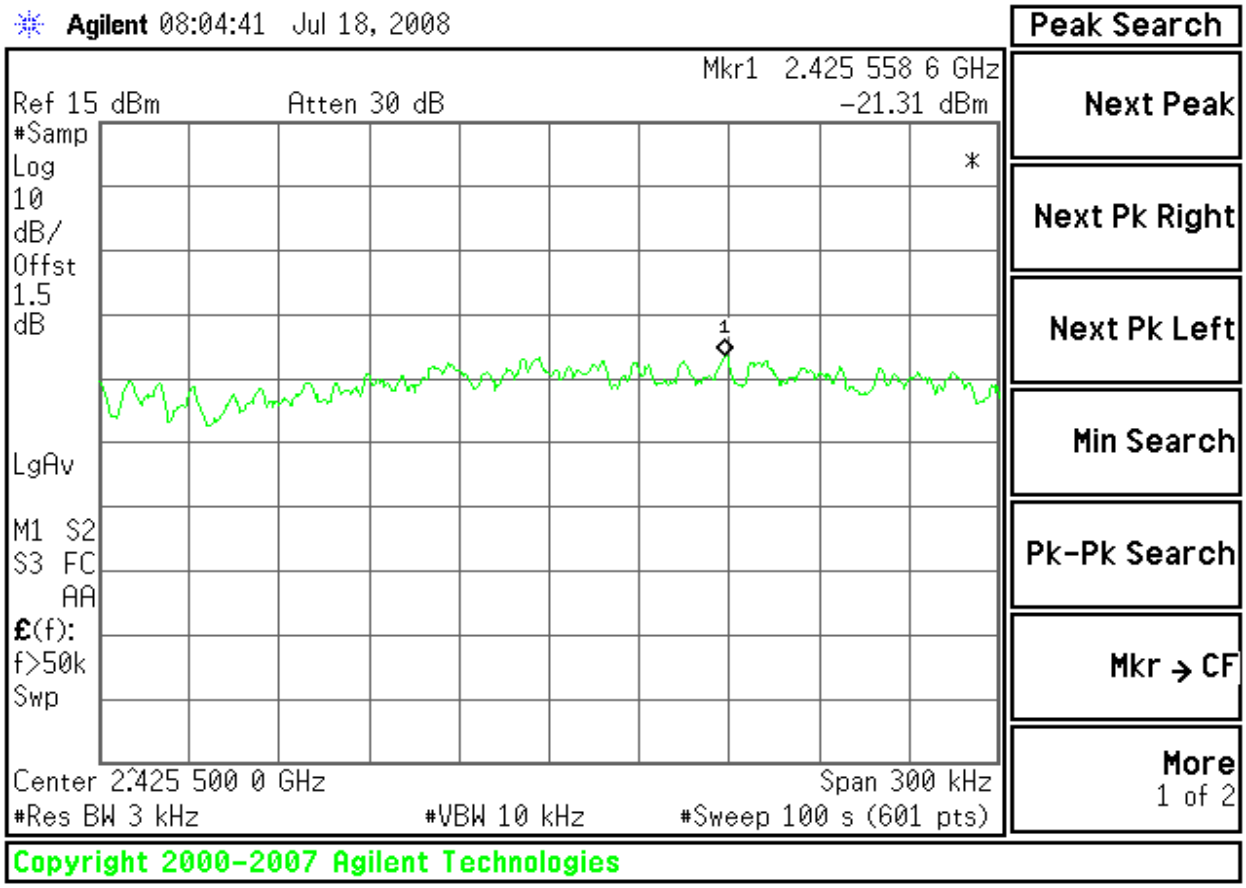


PPSD (CH High)

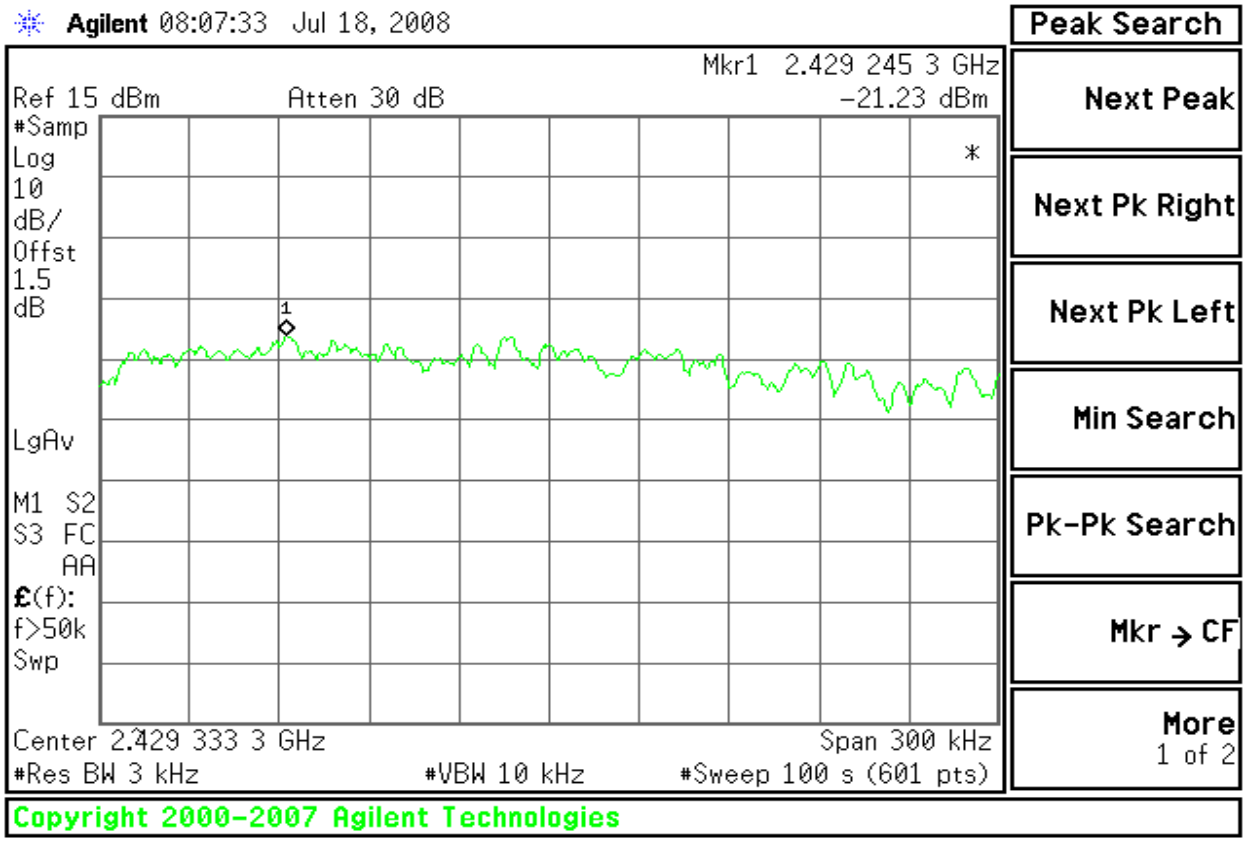


draft 802.11n Wide-40 MHz Channel mode / Chain 1

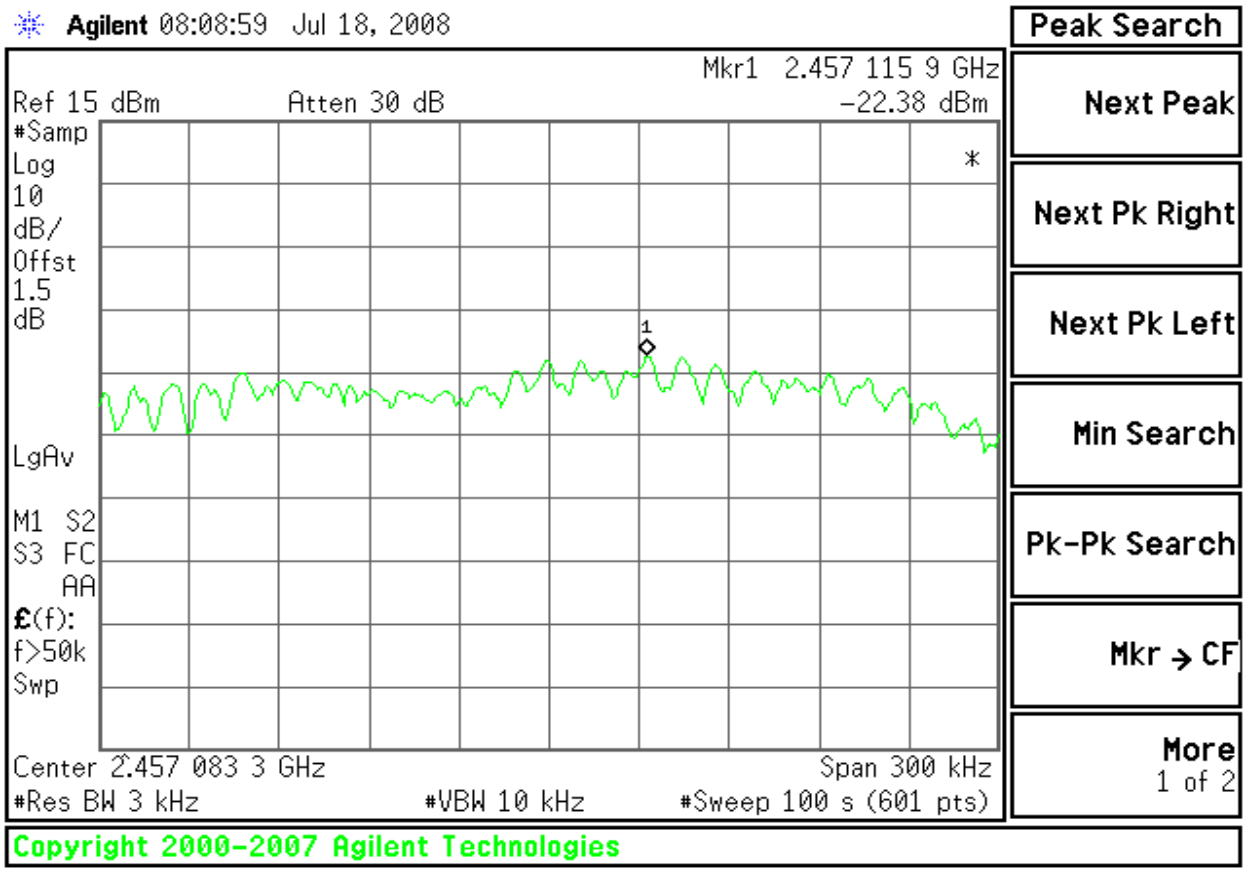
PPSD (CH Low)



PPSD (CH Mid)



PPSD (CH High)



SPURIOUS EMISSIONS

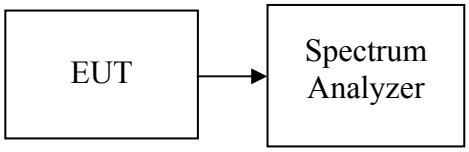
Conducted Measurement

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)).

Conducted power was measured based on the use of RMS averaging over a time interval,therefore the required attenuntion is 30 dB.

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 300 kHz.

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

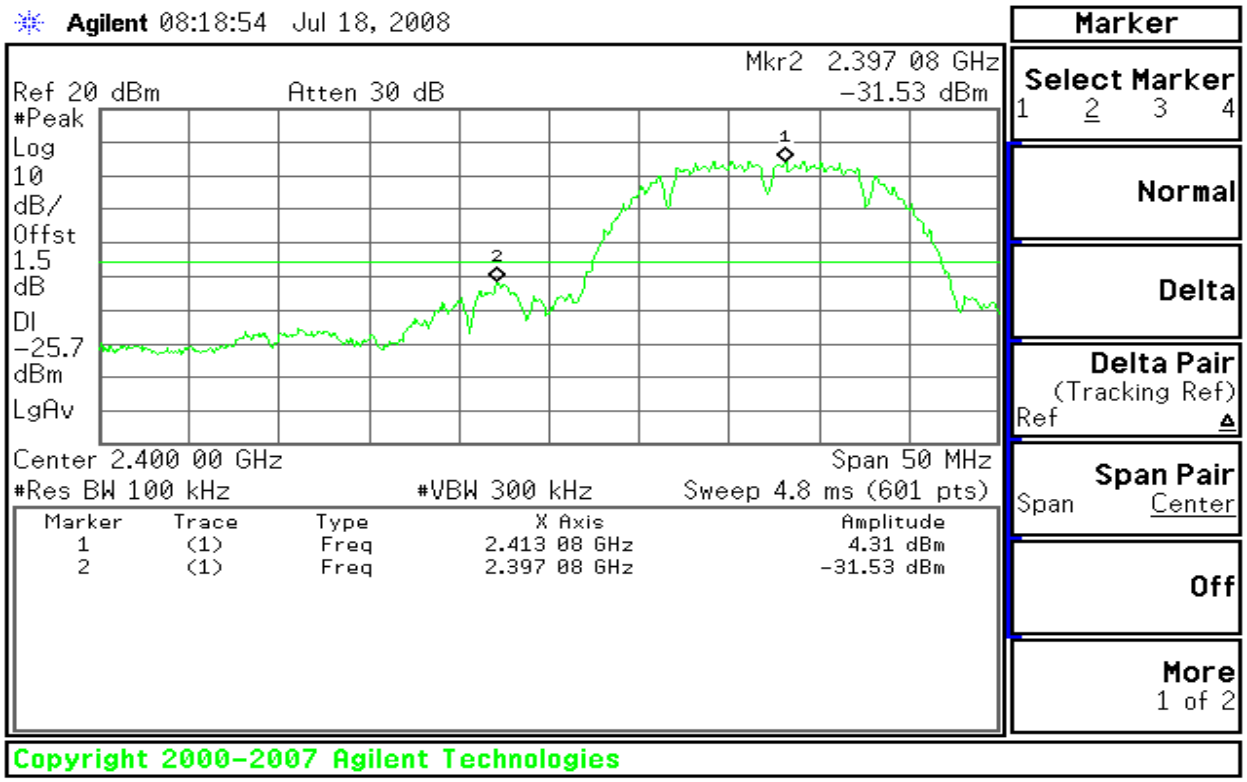
TEST RESULTS

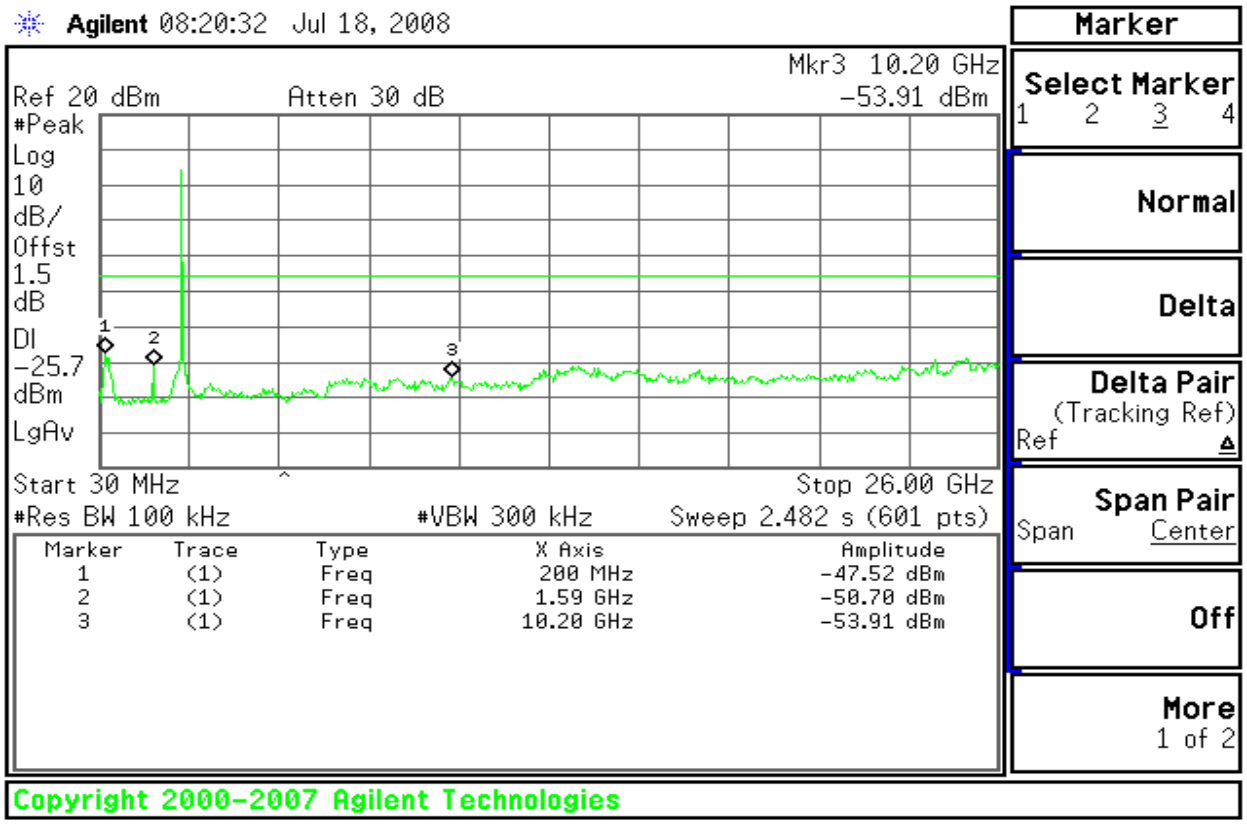
No non-compliance noted

Test Plot

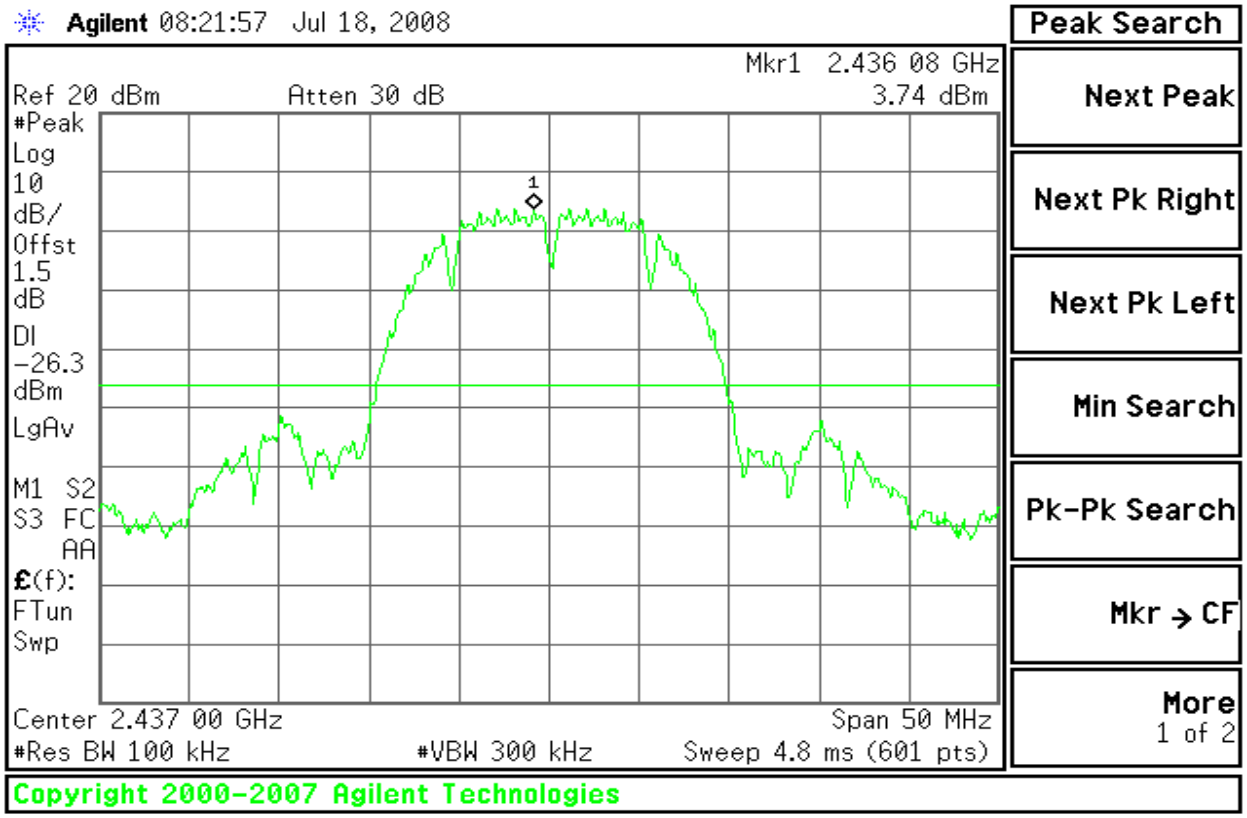
IEEE 802.11b mode

CH Low





CH Mid


Agilent 08:21:57 Jul 18, 2008
Mkr1 2.436 08 GHz
Ref 20 dBm
Atten 30 dB
3.74 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-26.3
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 2.437 00 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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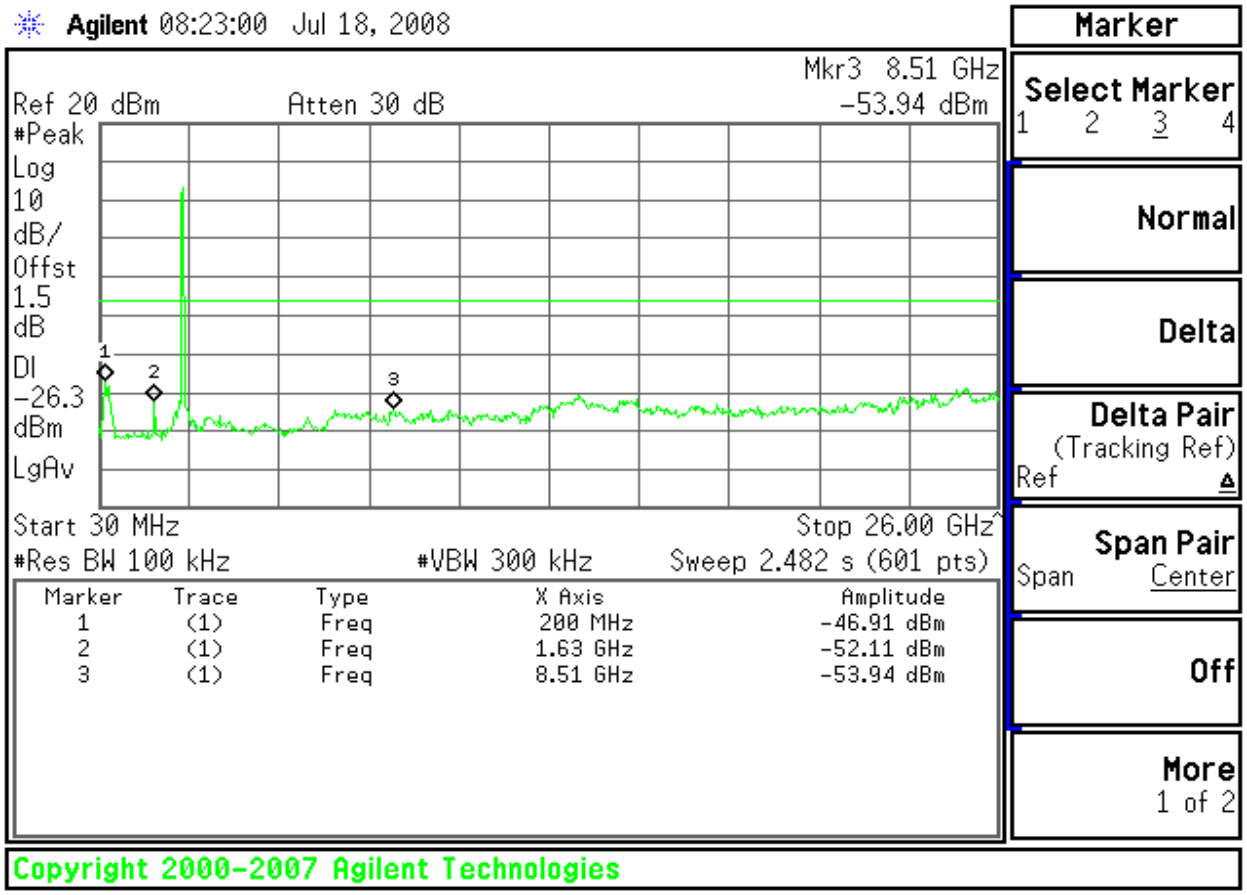
Agilent 08:23:00 Jul 18, 2008
Mkr3 8.51 GHz
Ref 20 dBm
Atten 30 dB
-53.94 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-26.3
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 200 MHz -46.91 dBm
2 (1) Freq 1.63 GHz -52.11 dBm
3 (1) Freq 8.51 GHz -53.94 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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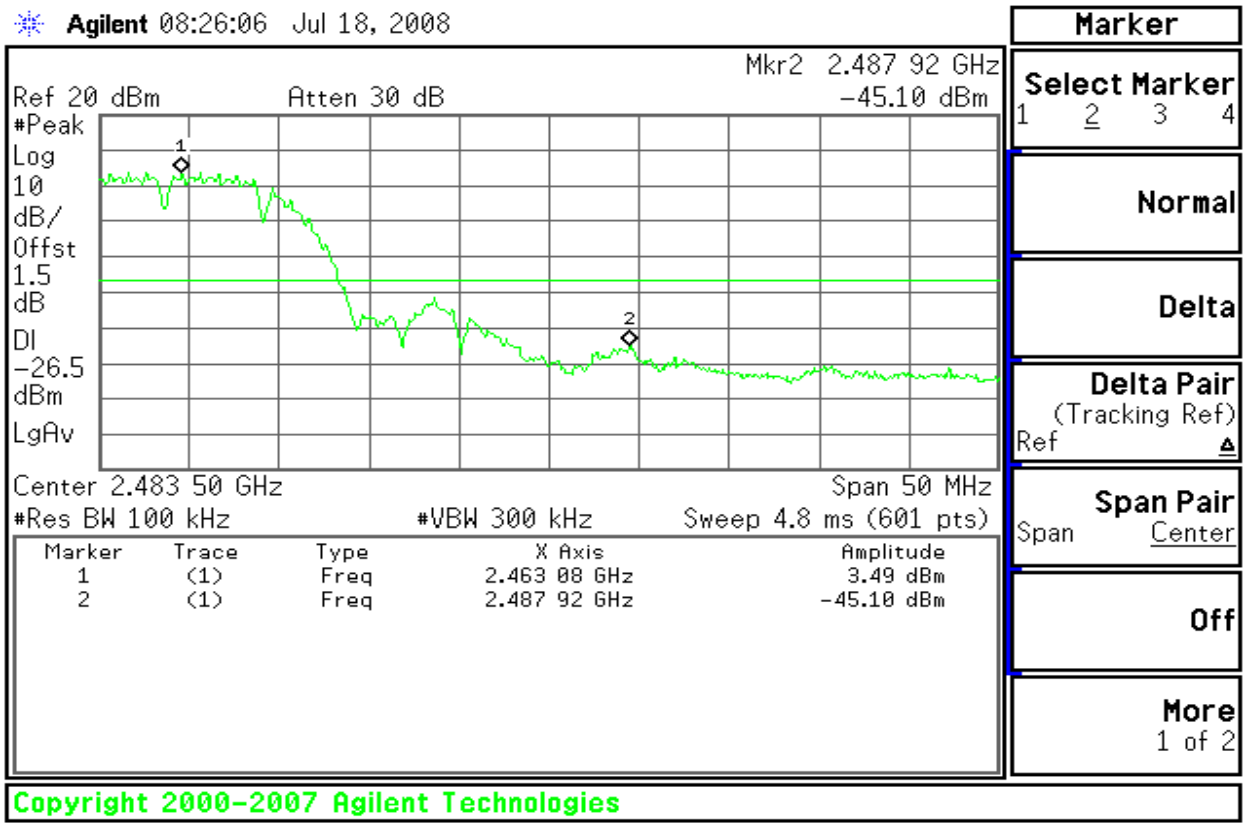
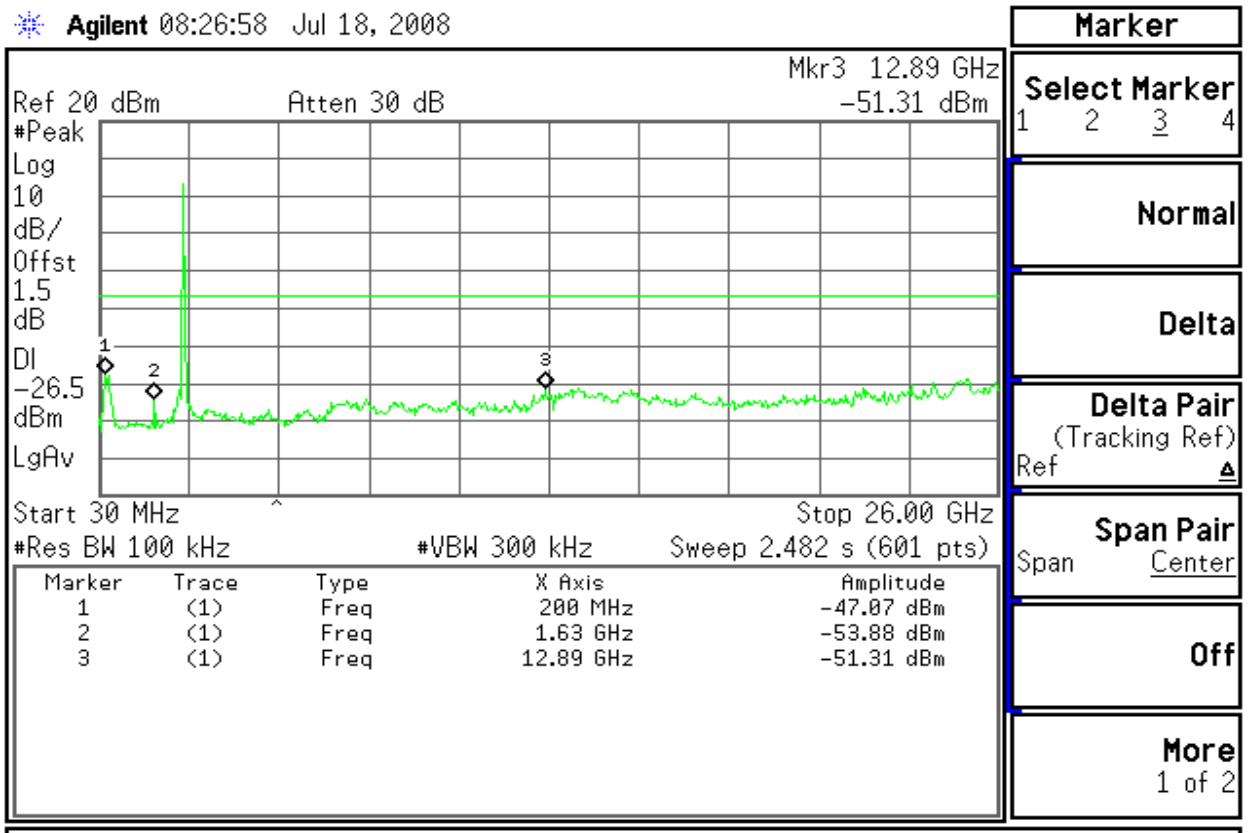
CH High


Agilent 08:26:06 Jul 18, 2008
Mkr2 2.487 92 GHz
Ref 20 dBm
Atten 30 dB
-45.10 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-26.5
dBm
LgAv
Center 2.483 50 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.463 08 GHz 3.49 dBm
2 (1) Freq 2.487 92 GHz -45.10 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Copyright 2000-2007 Agilent Technologies


Agilent 08:26:58 Jul 18, 2008
Mkr3 12.89 GHz
Ref 20 dBm
Atten 30 dB
-51.31 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-26.5
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 200 MHz -47.07 dBm
2 (1) Freq 1.63 GHz -53.88 dBm
3 (1) Freq 12.89 GHz -51.31 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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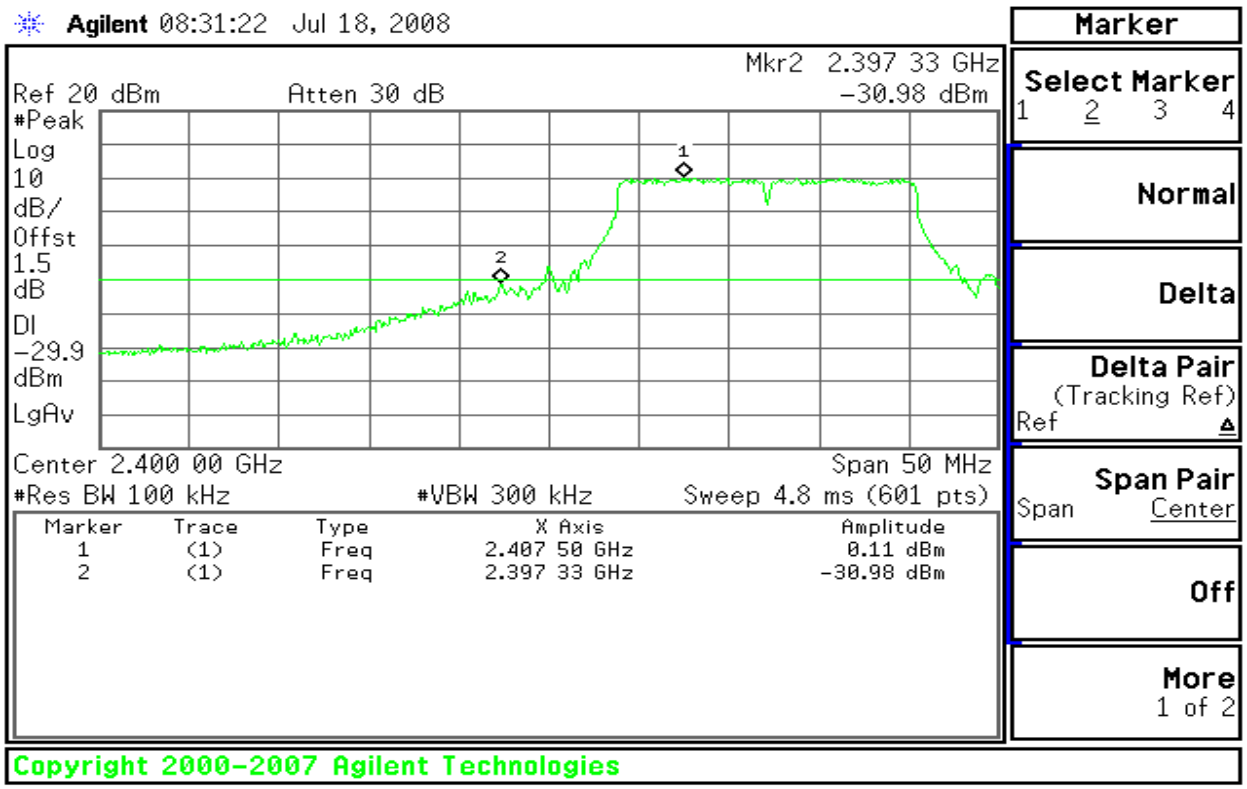
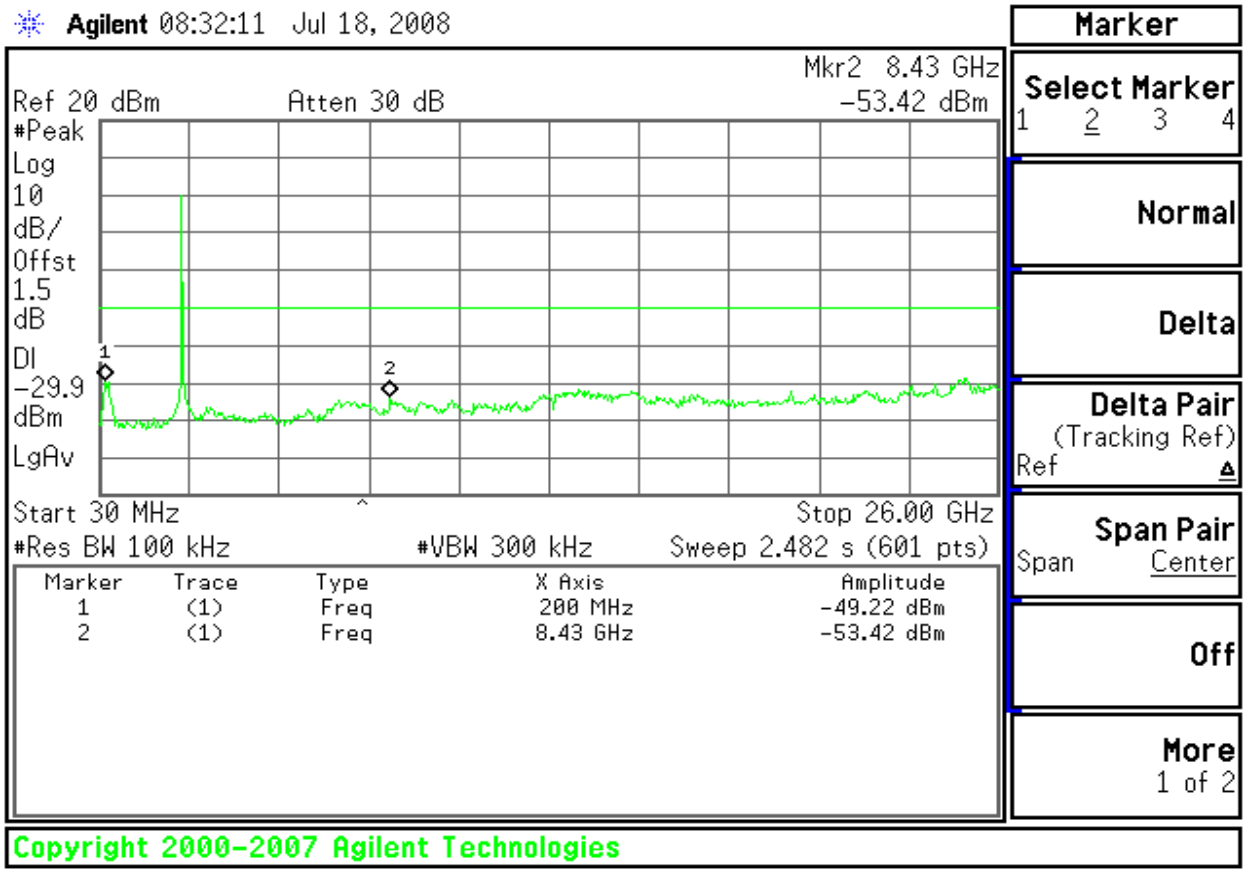
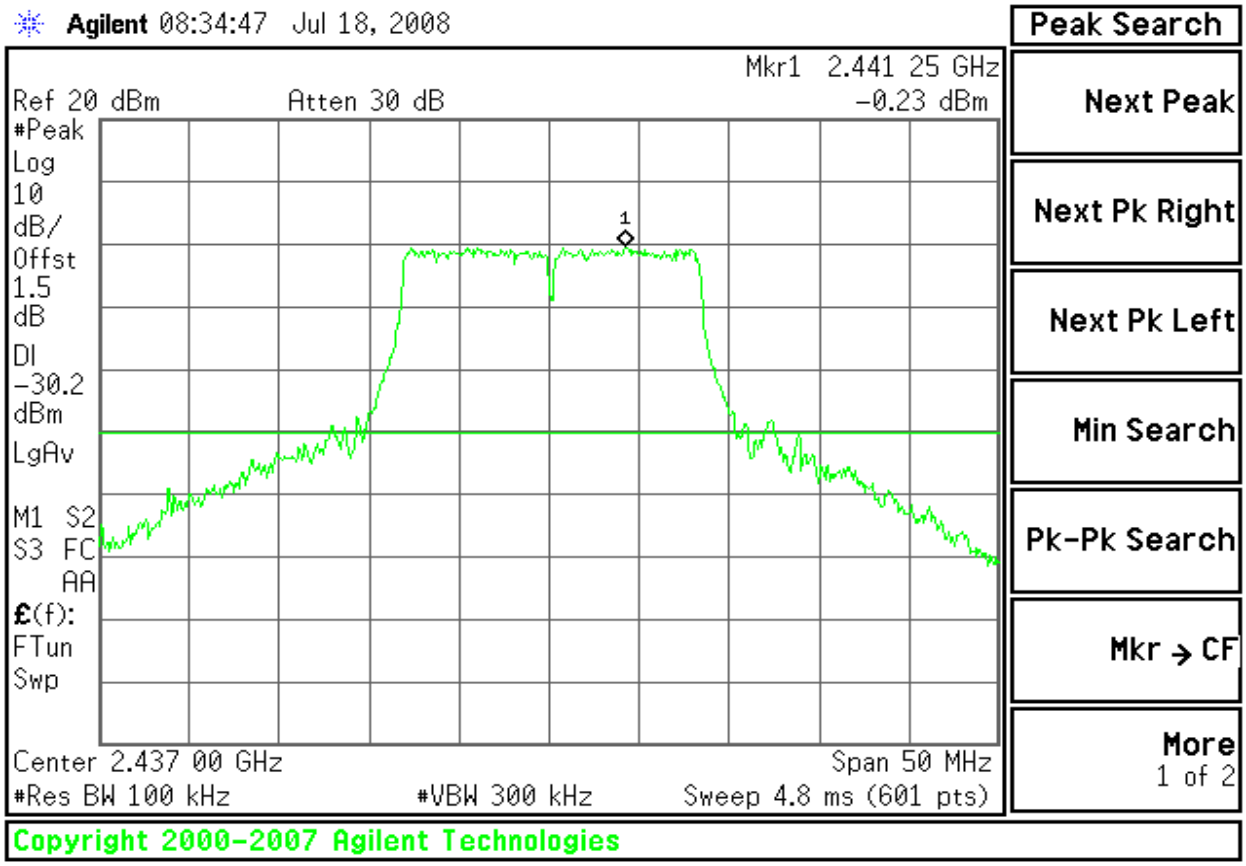
IEEE 802.11g mode

CH Low





CH Mid


Agilent 08:34:47 Jul 18, 2008
Mkr1 2.441 25 GHz
Ref 20 dBm
Atten 30 dB
-0.23 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-30.2
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 2.437 00 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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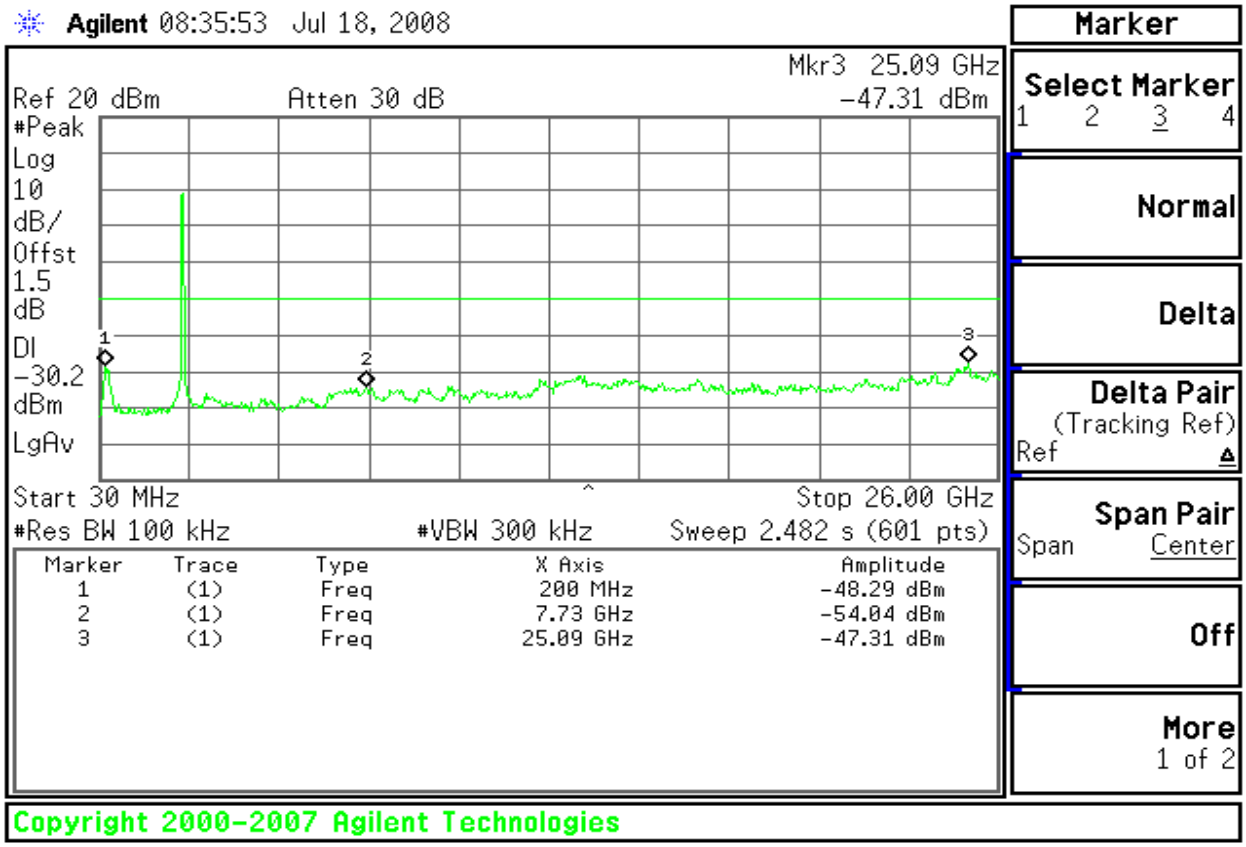
Agilent 08:35:53 Jul 18, 2008
Mkr3 25.09 GHz
Ref 20 dBm
Atten 30 dB
-47.31 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-30.2
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 200 MHz -48.29 dBm
2 (1) Freq 7.73 GHz -54.04 dBm
3 (1) Freq 25.09 GHz -47.31 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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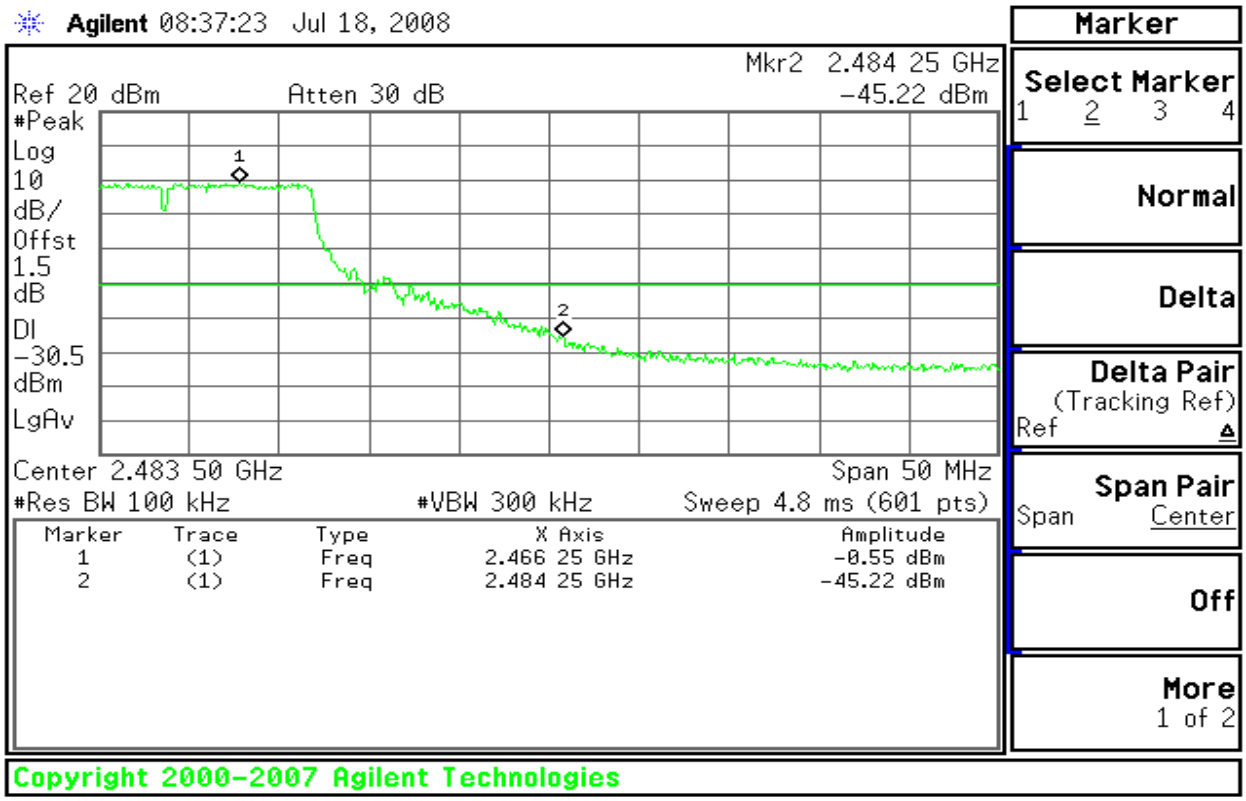
CH High


Agilent 08:37:23 Jul 18, 2008
Mkr2 2.484 25 GHz
Ref 20 dBm
Atten 30 dB
-45.22 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-30.5
dBm
LgAv
Center 2.483 50 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.466 25 GHz -0.55 dBm
2 (1) Freq 2.484 25 GHz -45.22 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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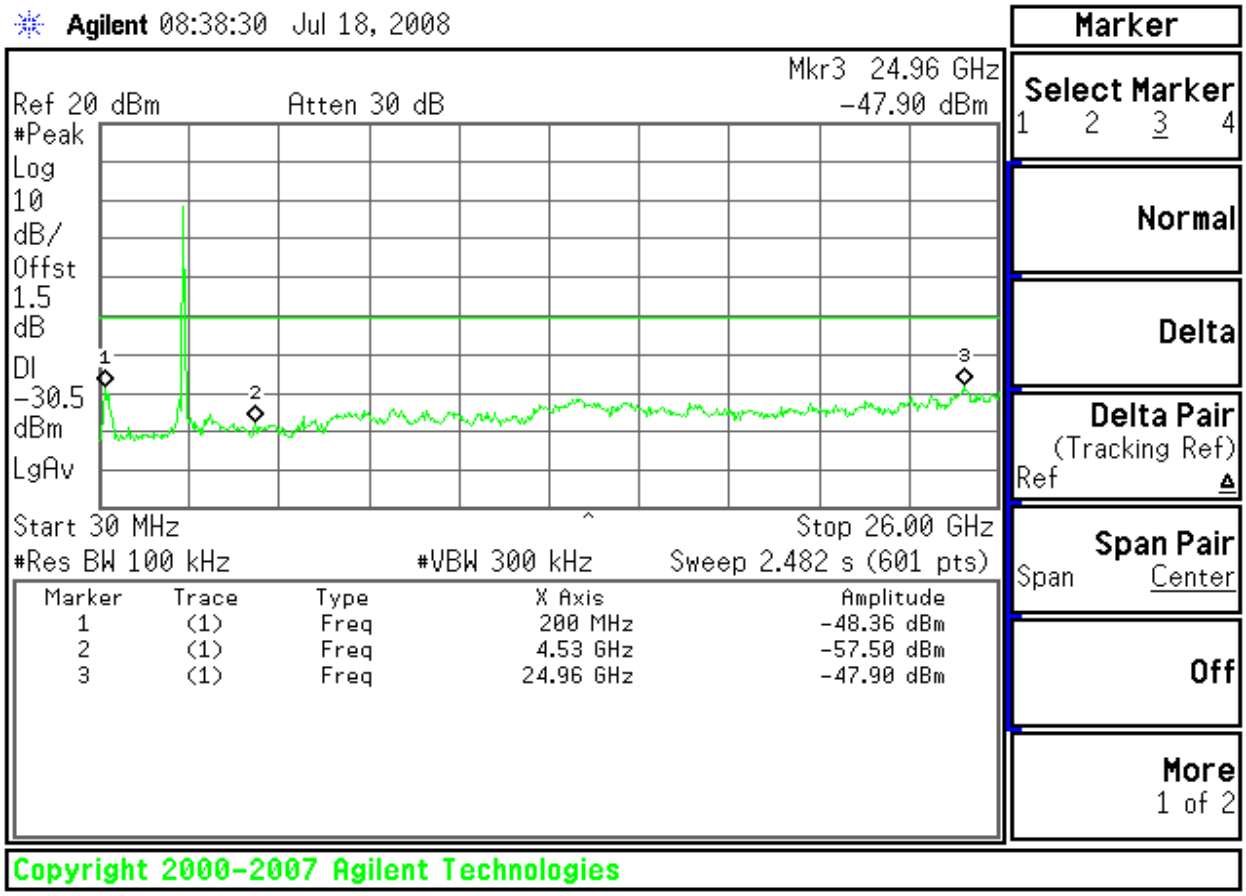
Agilent 08:38:30 Jul 18, 2008
Mkr3 24.96 GHz
Ref 20 dBm
Atten 30 dB
-47.90 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-30.5
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 200 MHz -48.36 dBm
2 (1) Freq 4.53 GHz -57.50 dBm
3 (1) Freq 24.96 GHz -47.90 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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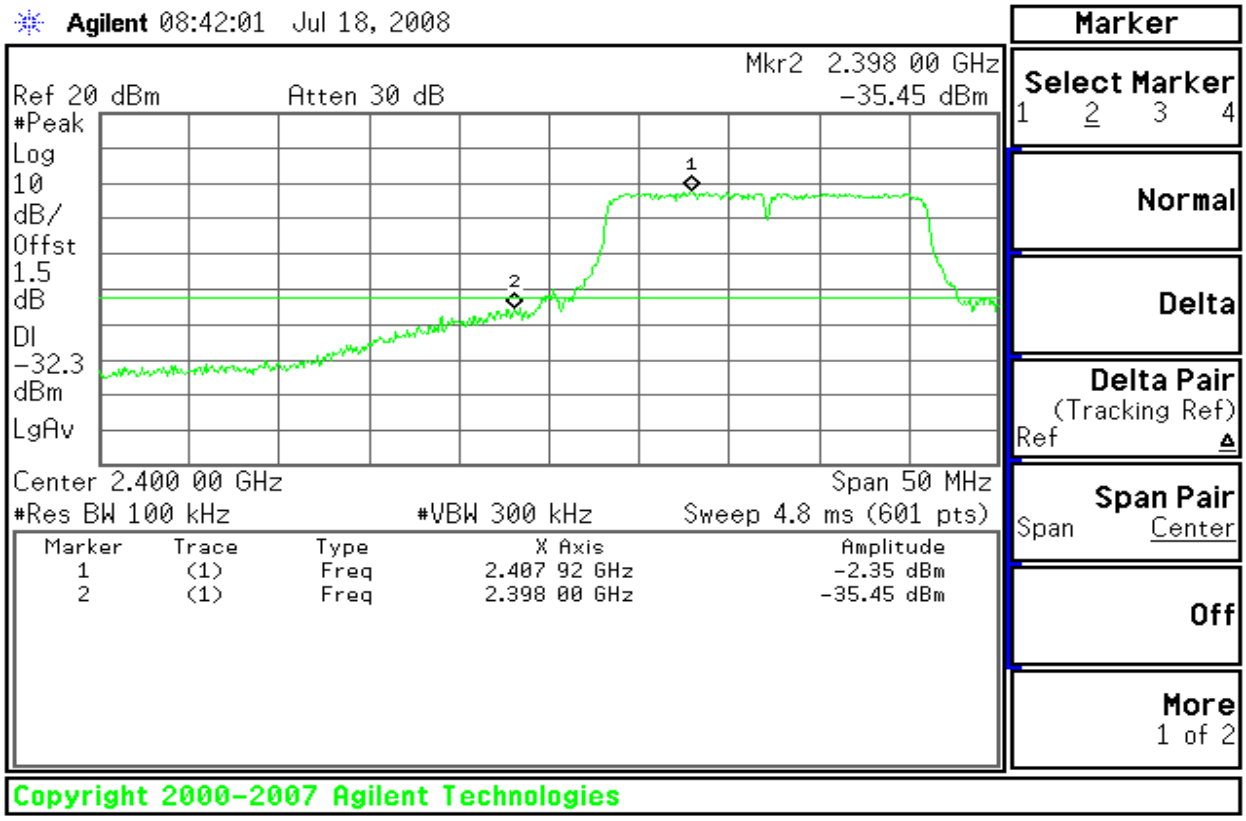
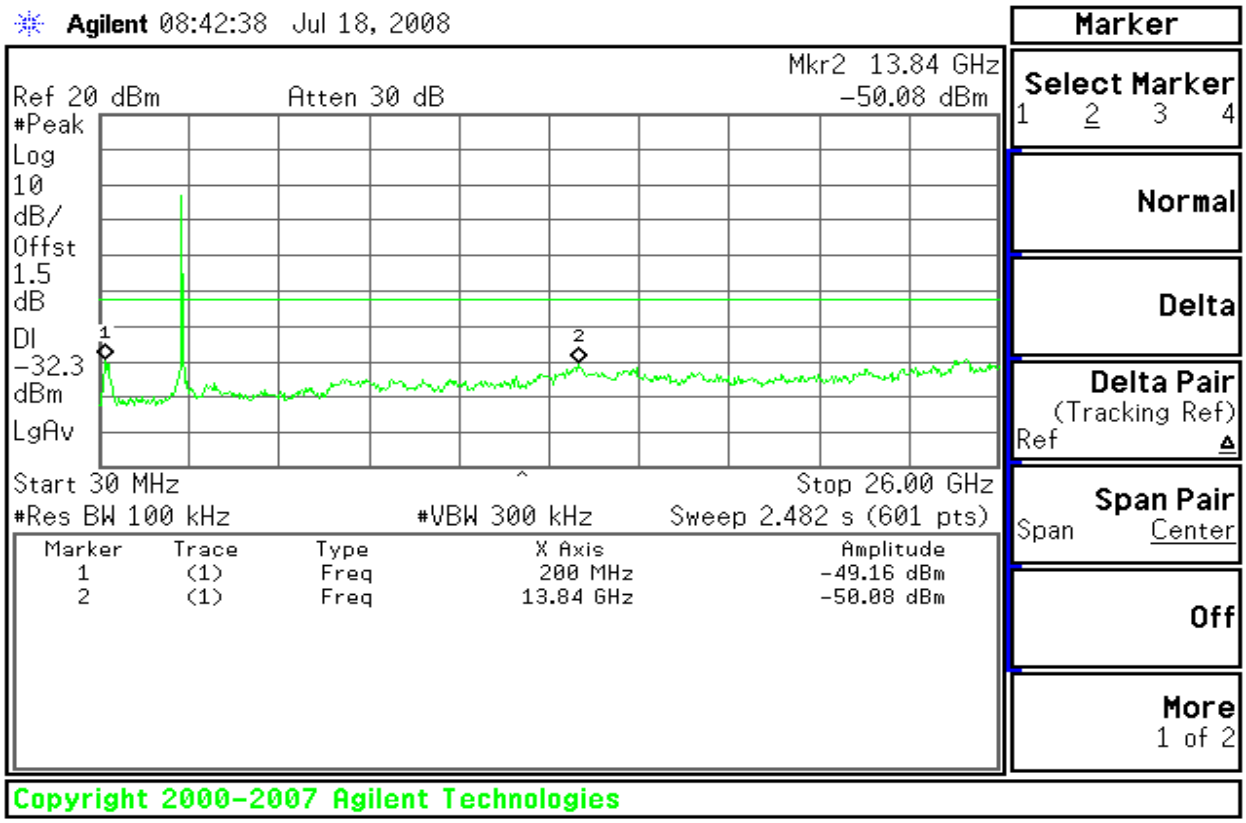
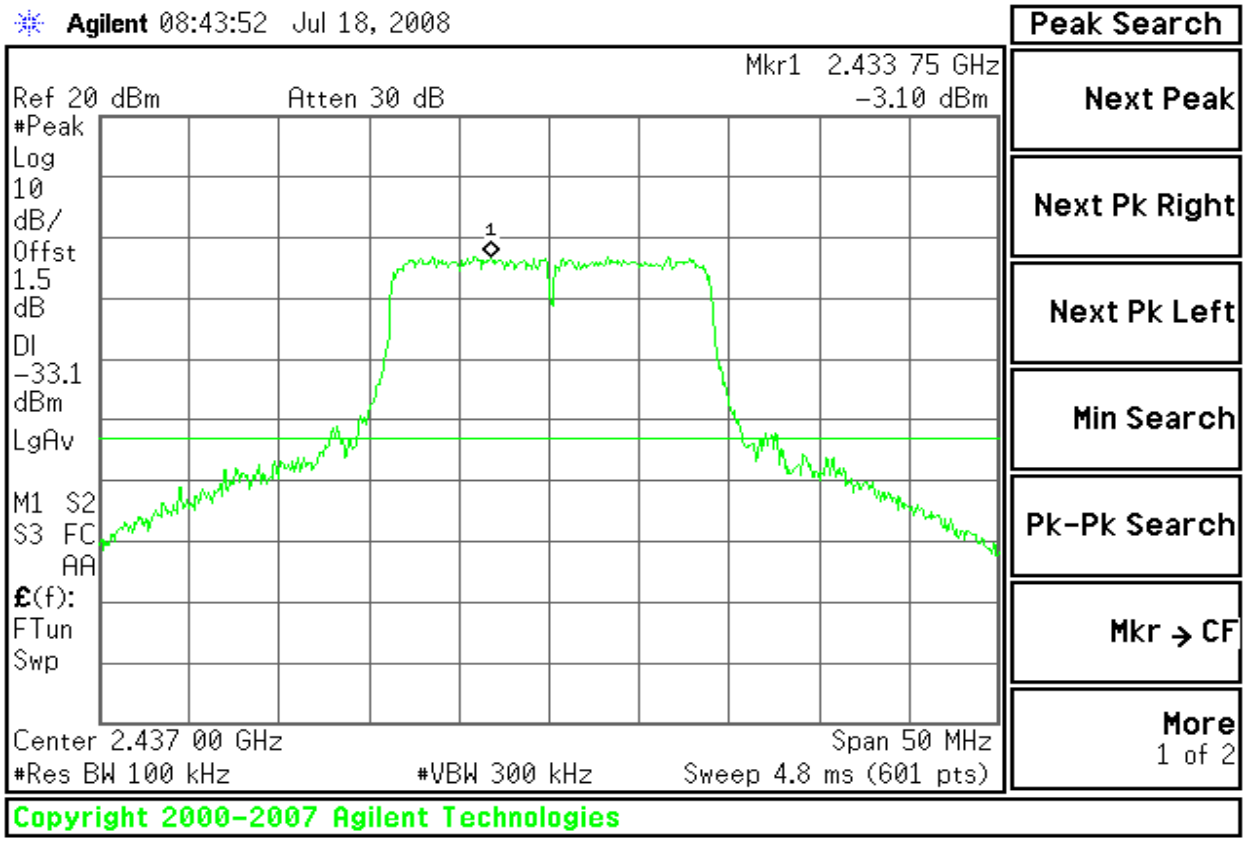
draft 802.11n Standard-20 MHz Channel mode / Chain 0

CH Low





CH Mid


Agilent 08:43:52 Jul 18, 2008
Mkr1 2.433 75 GHz
Ref 20 dBm
Atten 30 dB
-3.10 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-33.1
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 2.437 00 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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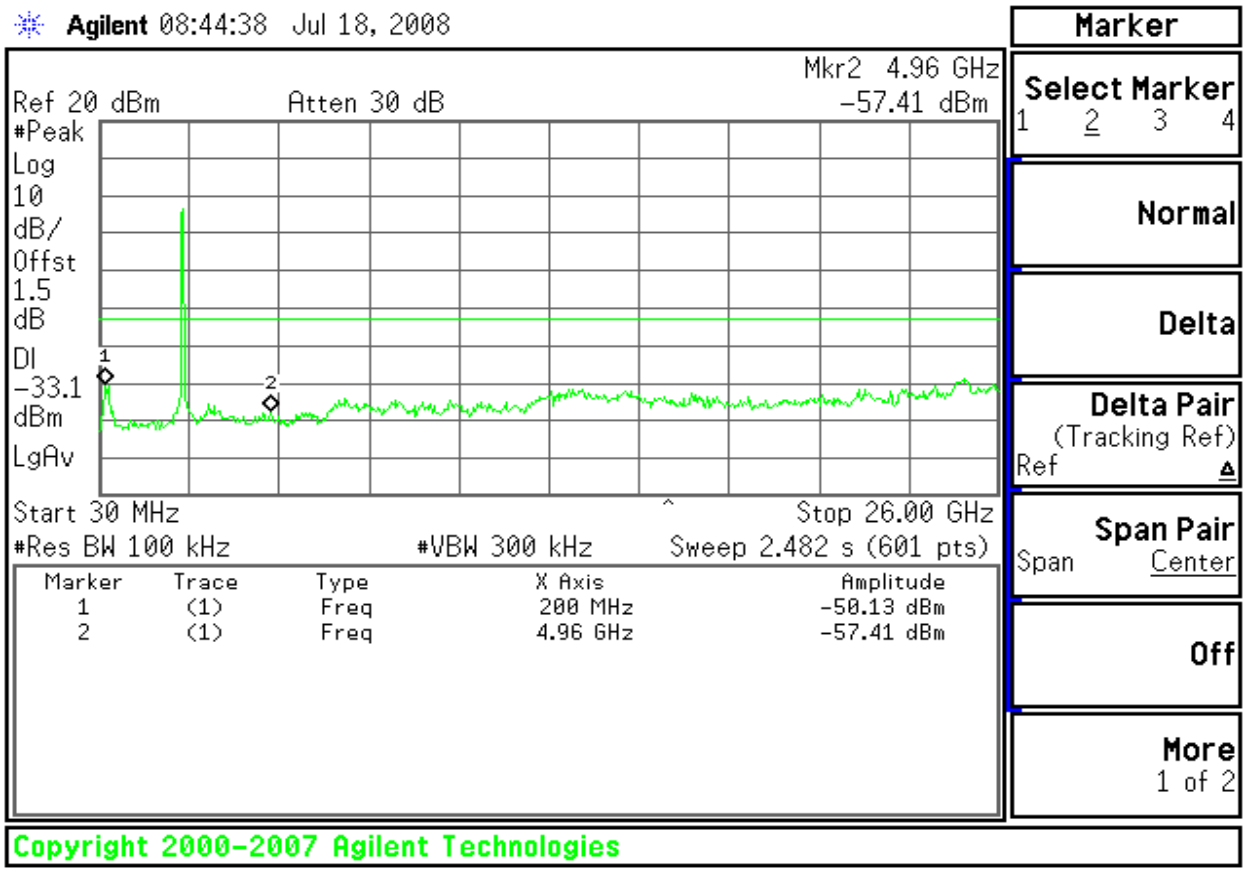
Agilent 08:44:38 Jul 18, 2008
Mkr2 4.96 GHz
Ref 20 dBm
Atten 30 dB
-57.41 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-33.1
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 200 MHz -50.13 dBm
2 (1) Freq 4.96 GHz -57.41 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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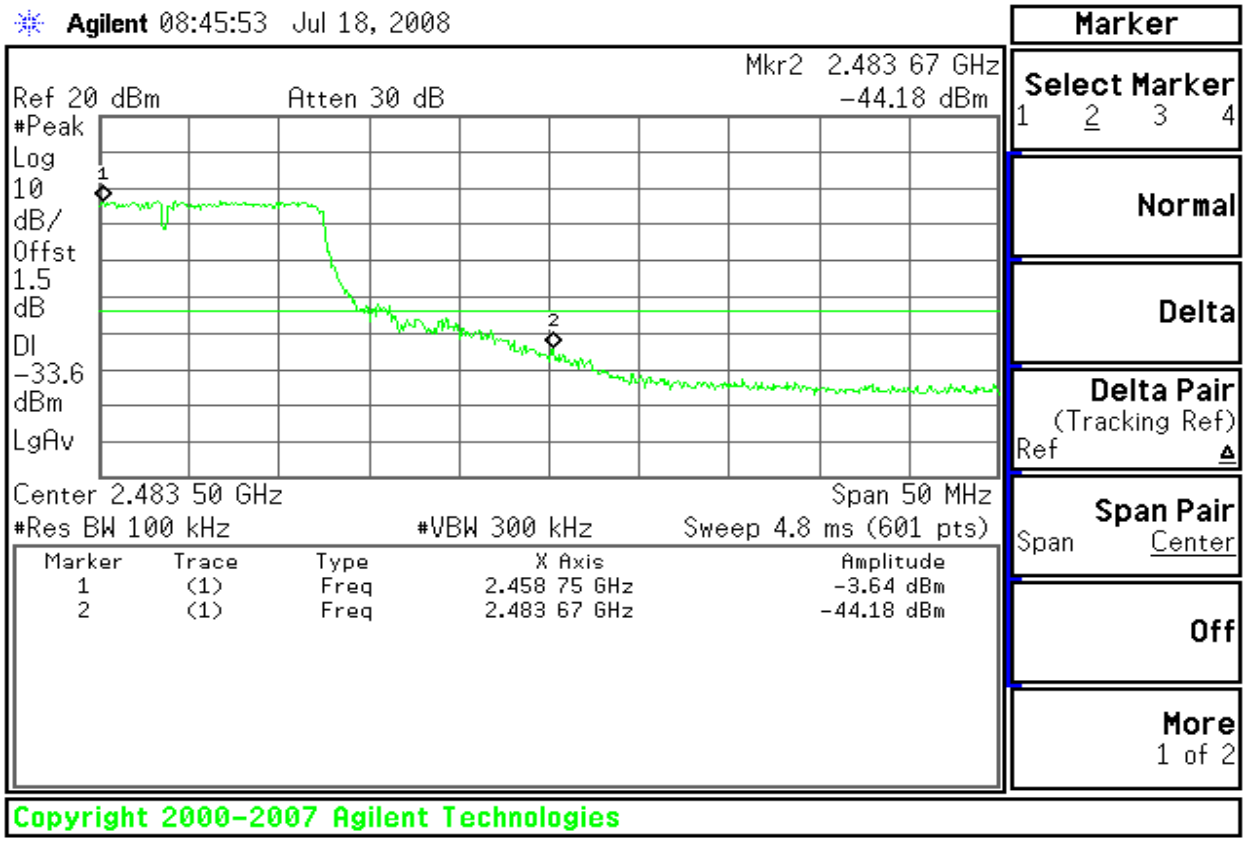
CH High


Agilent 08:45:53 Jul 18, 2008
Mkr2 2.483 67 GHz
Ref 20 dBm
Atten 30 dB
-44.18 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-33.6
dBm
LgAv
Center 2.483 50 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.458 75 GHz -3.64 dBm
2 (1) Freq 2.483 67 GHz -44.18 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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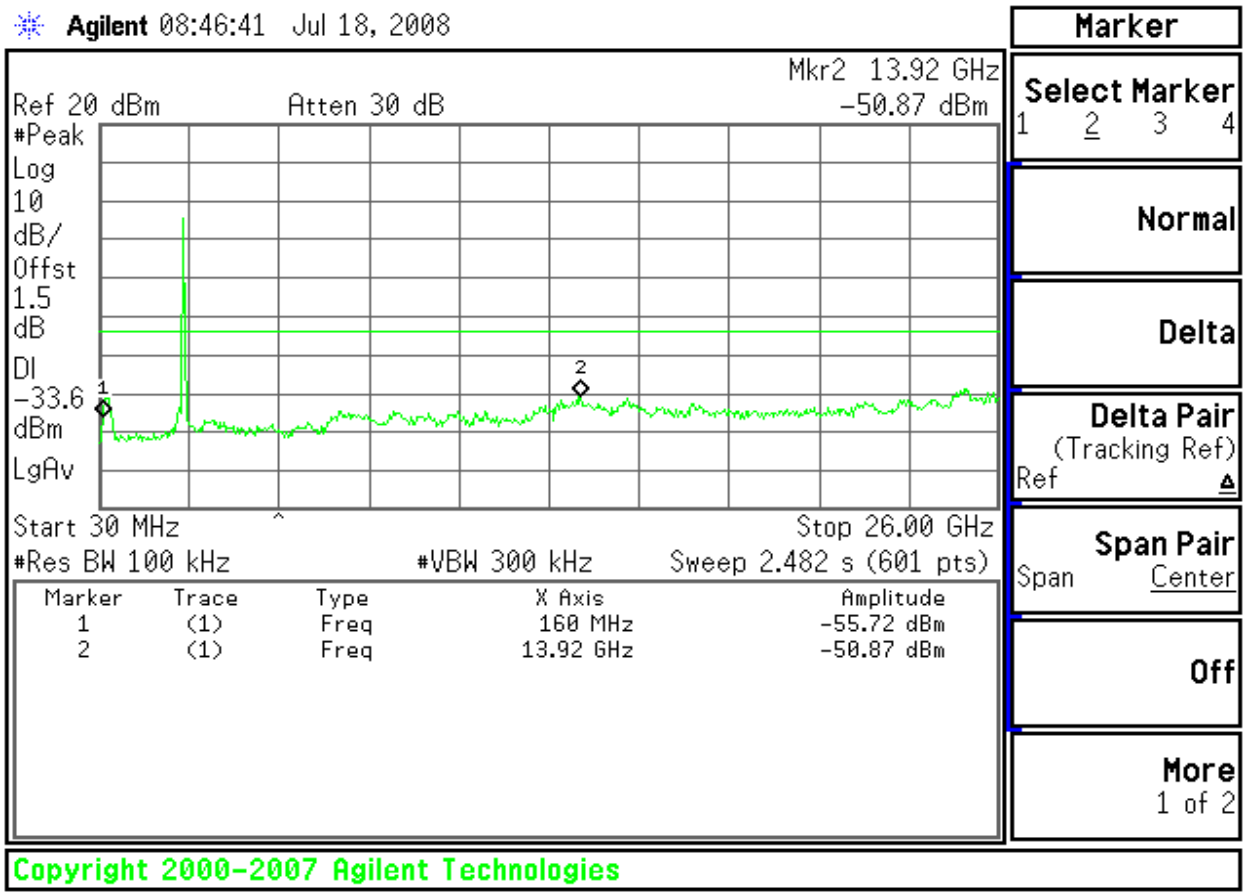
Agilent 08:46:41 Jul 18, 2008
Mkr2 13.92 GHz
Ref 20 dBm
Atten 30 dB
-50.87 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-33.6
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 160 MHz -55.72 dBm
2 (1) Freq 13.92 GHz -50.87 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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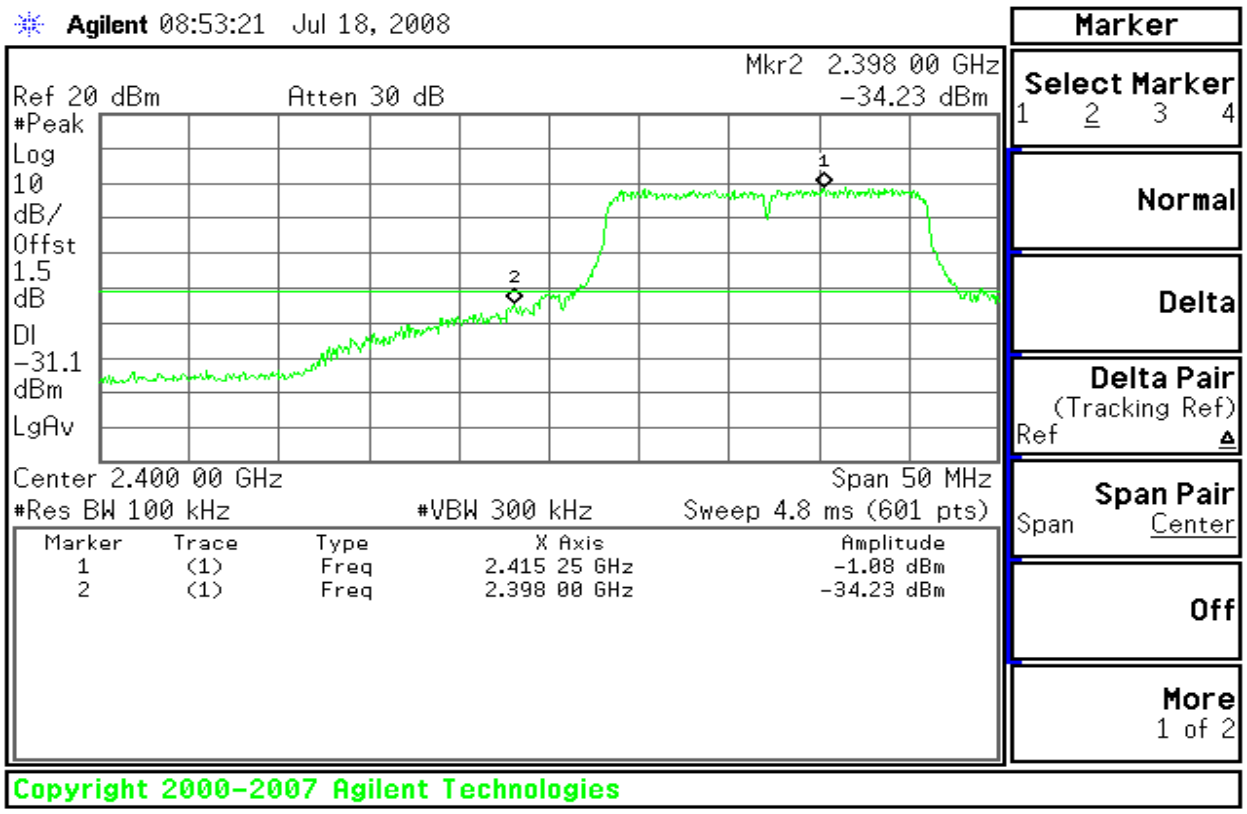
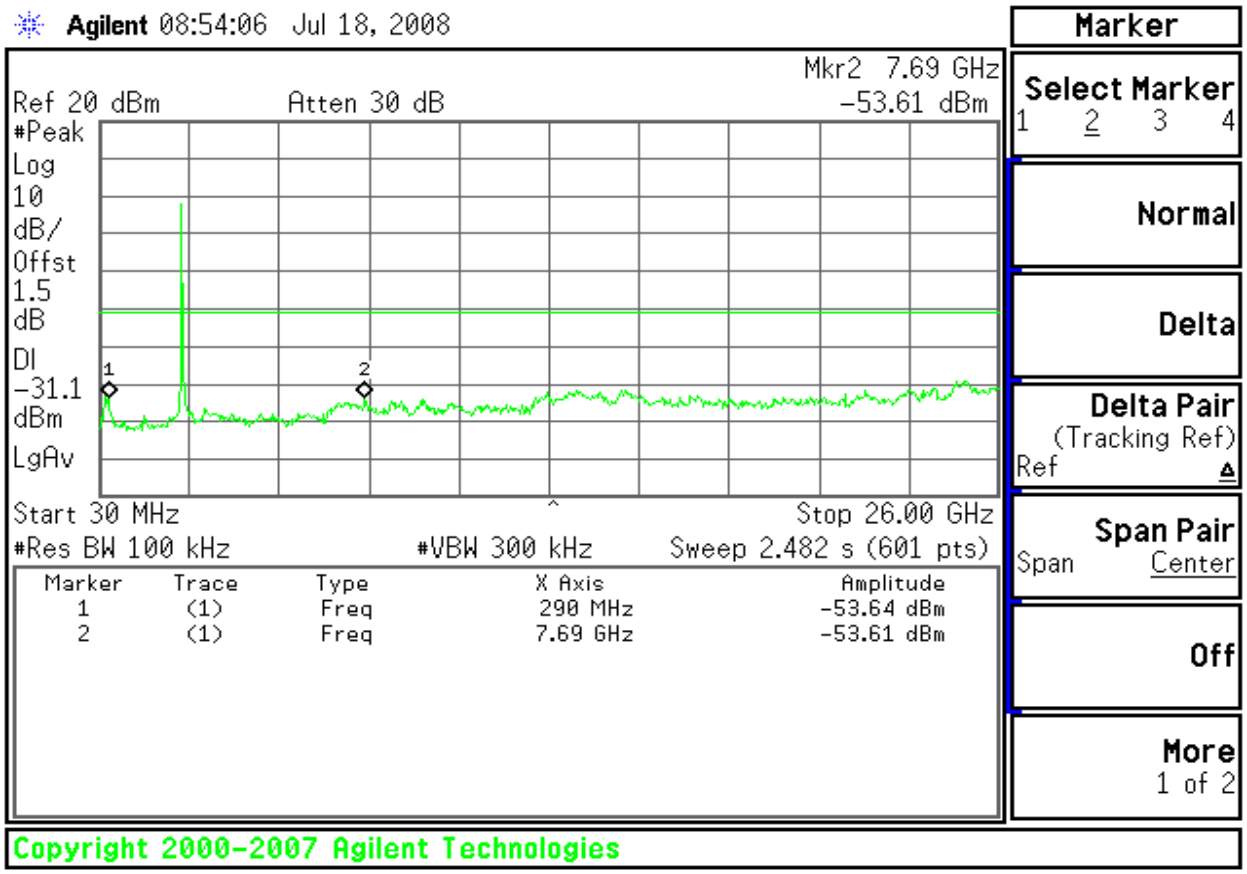
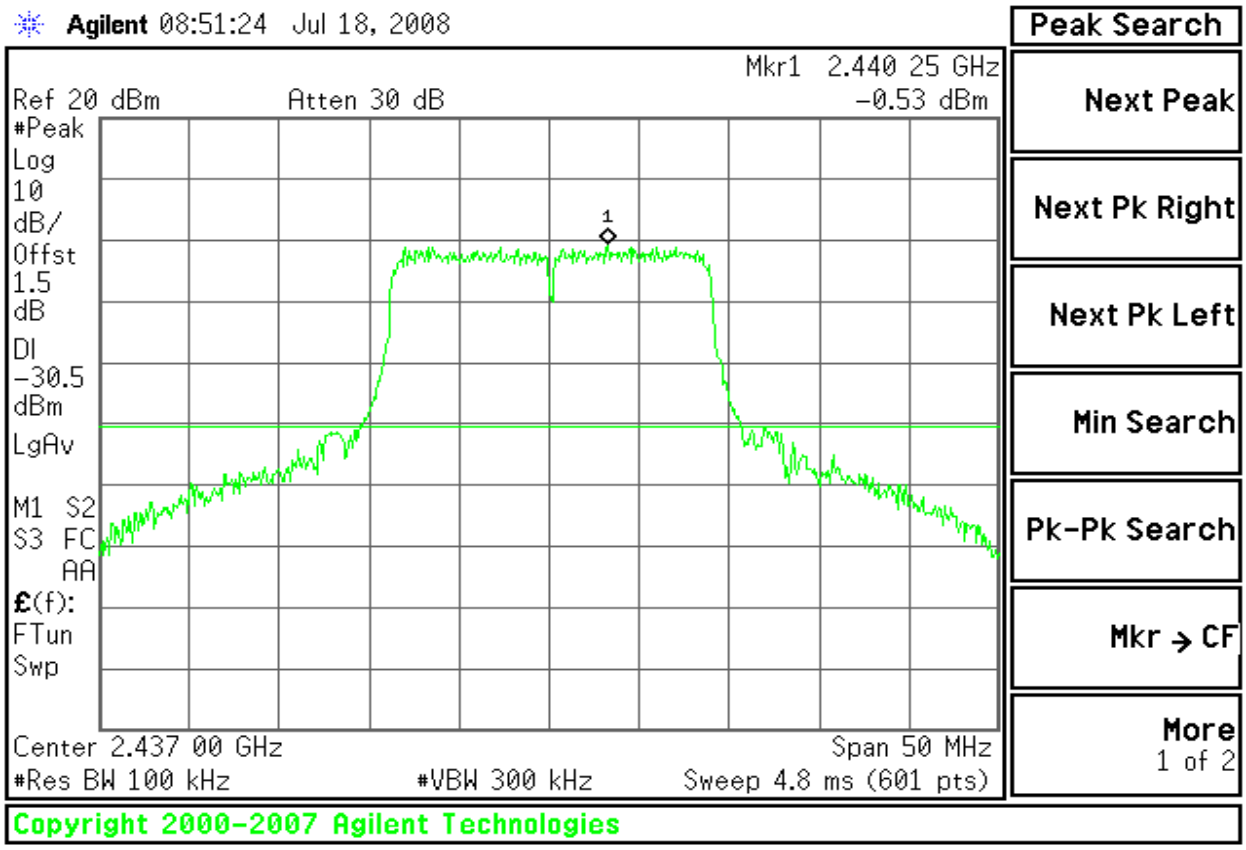
draft 802.11n Standard-20 MHz Channel mode / Chain 1

CH Low





CH Mid


Agilent 08:51:24 Jul 18, 2008
Mkr1 2.440 25 GHz
Ref 20 dBm
Atten 30 dB
-0.53 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-30.5
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 2.437 00 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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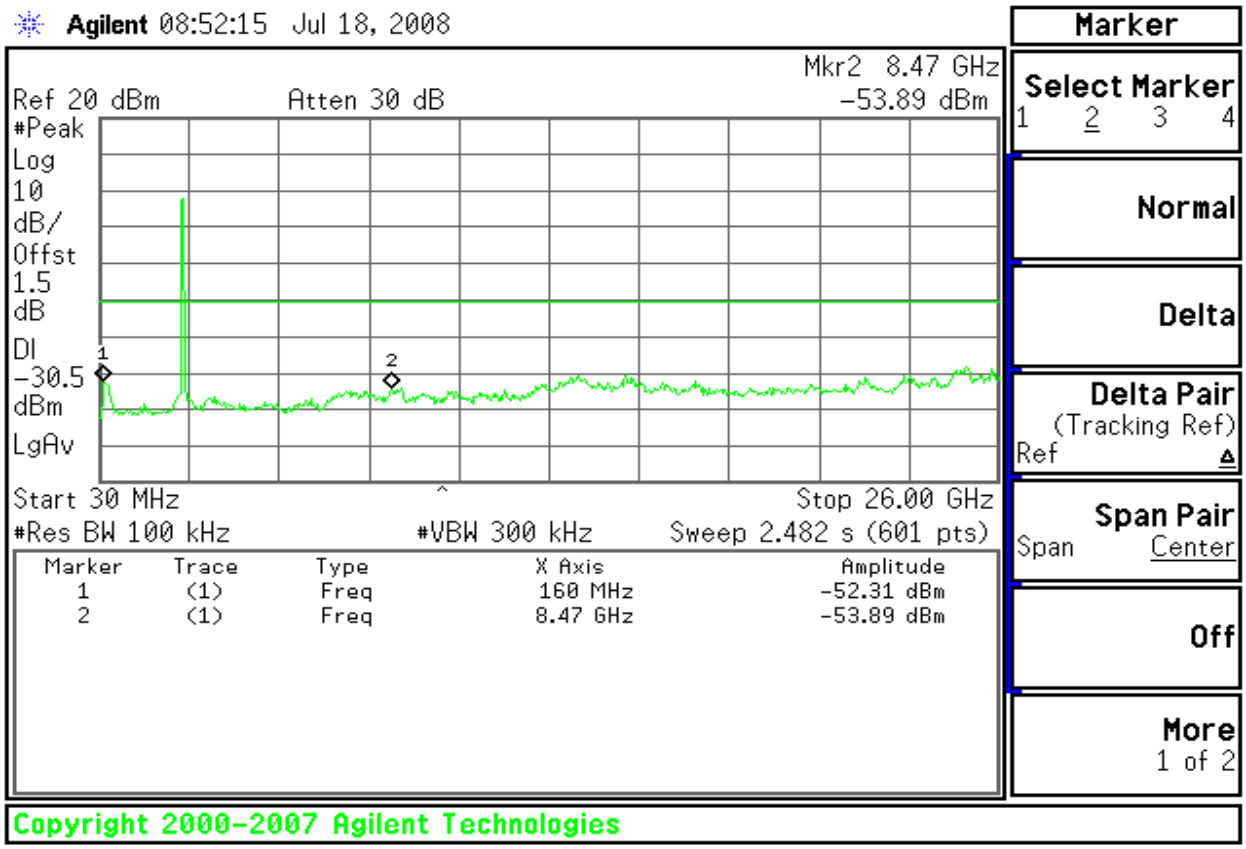
Agilent 08:52:15 Jul 18, 2008
Mkr2 8.47 GHz
Ref 20 dBm
Atten 30 dB
-53.89 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-30.5
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 160 MHz -52.31 dBm
2 (1) Freq 8.47 GHz -53.89 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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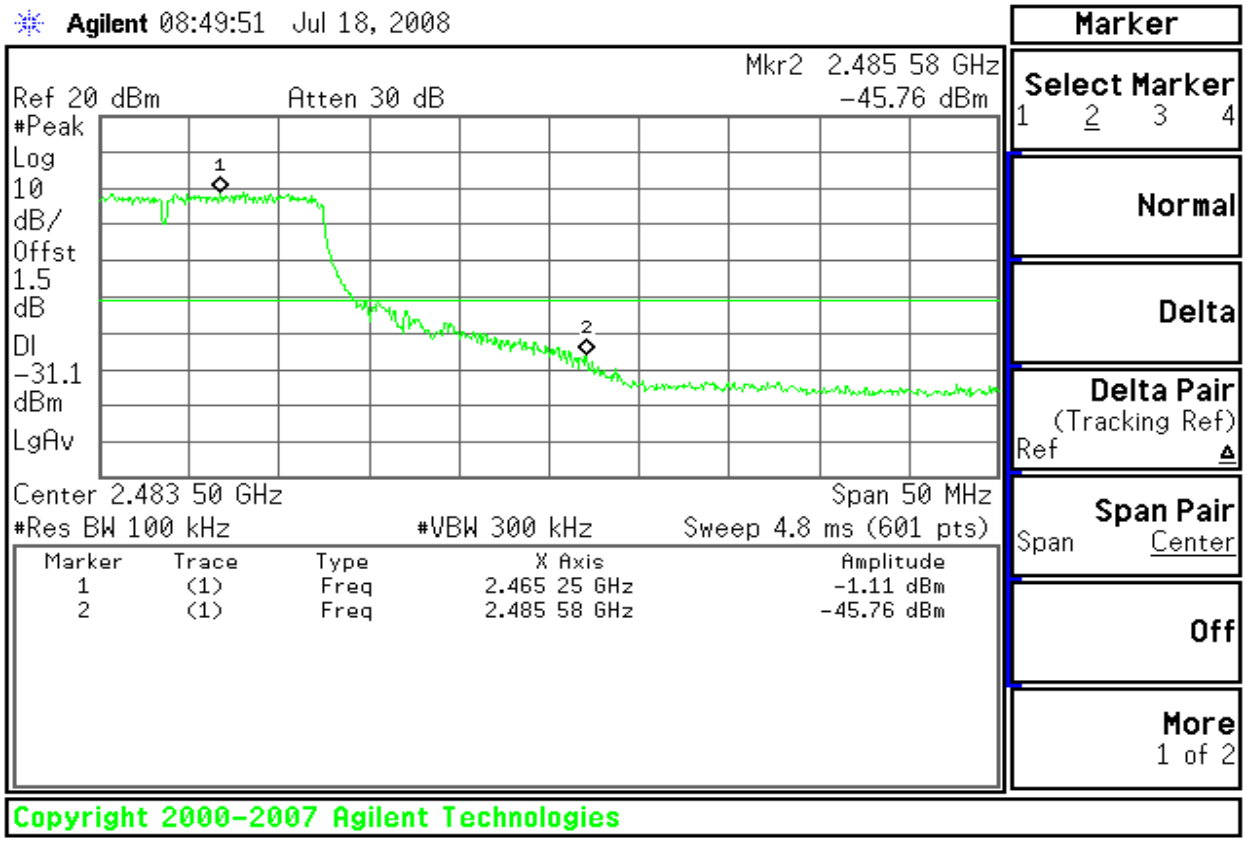
CH High


Agilent 08:49:51 Jul 18, 2008
Mkr2 2.485 58 GHz
Ref 20 dBm
Atten 30 dB
-45.76 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-31.1
dBm
LgAv
Center 2.483 50 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.465 25 GHz -1.11 dBm
2 (1) Freq 2.485 58 GHz -45.76 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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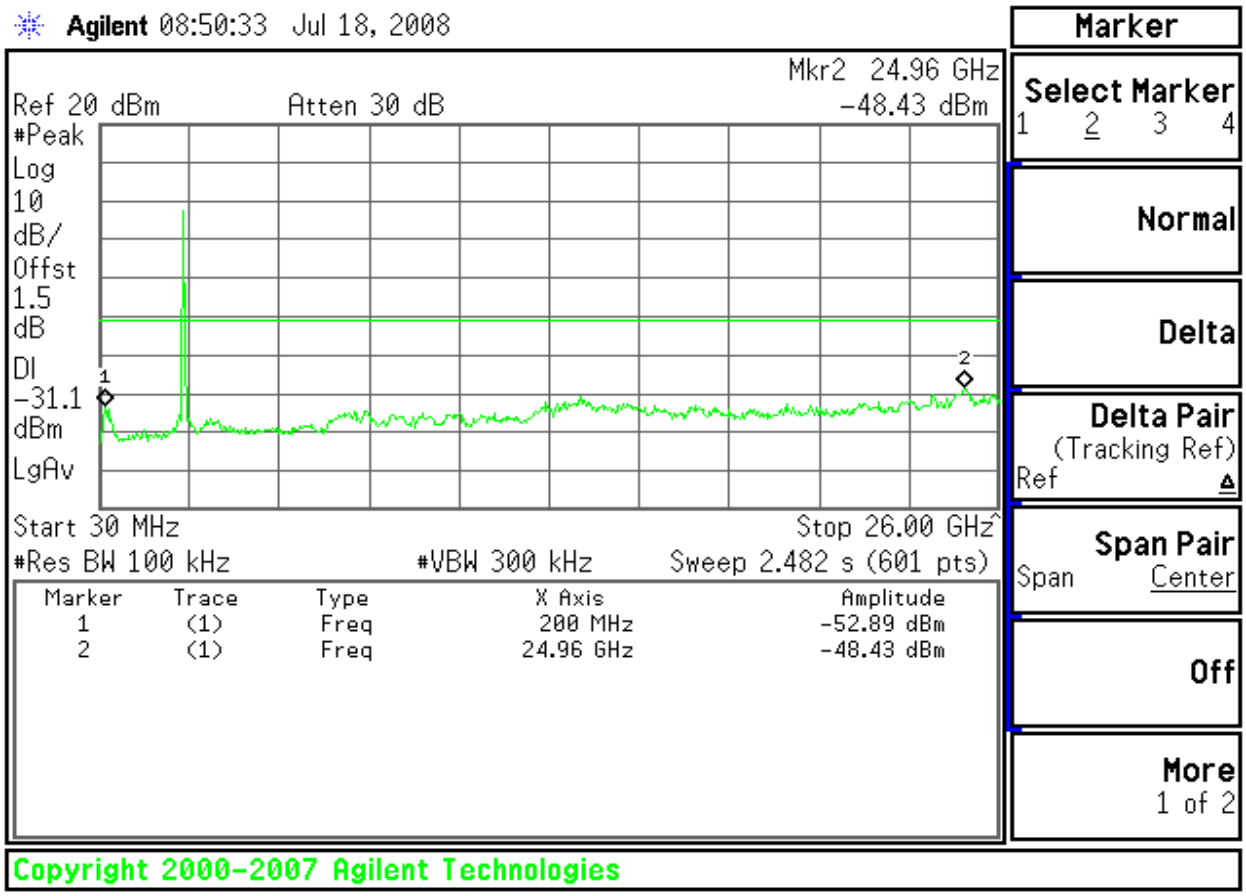
Agilent 08:50:33 Jul 18, 2008
Mkr2 24.96 GHz
Ref 20 dBm
Atten 30 dB
-48.43 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-31.1
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 200 MHz -52.89 dBm
2 (1) Freq 24.96 GHz -48.43 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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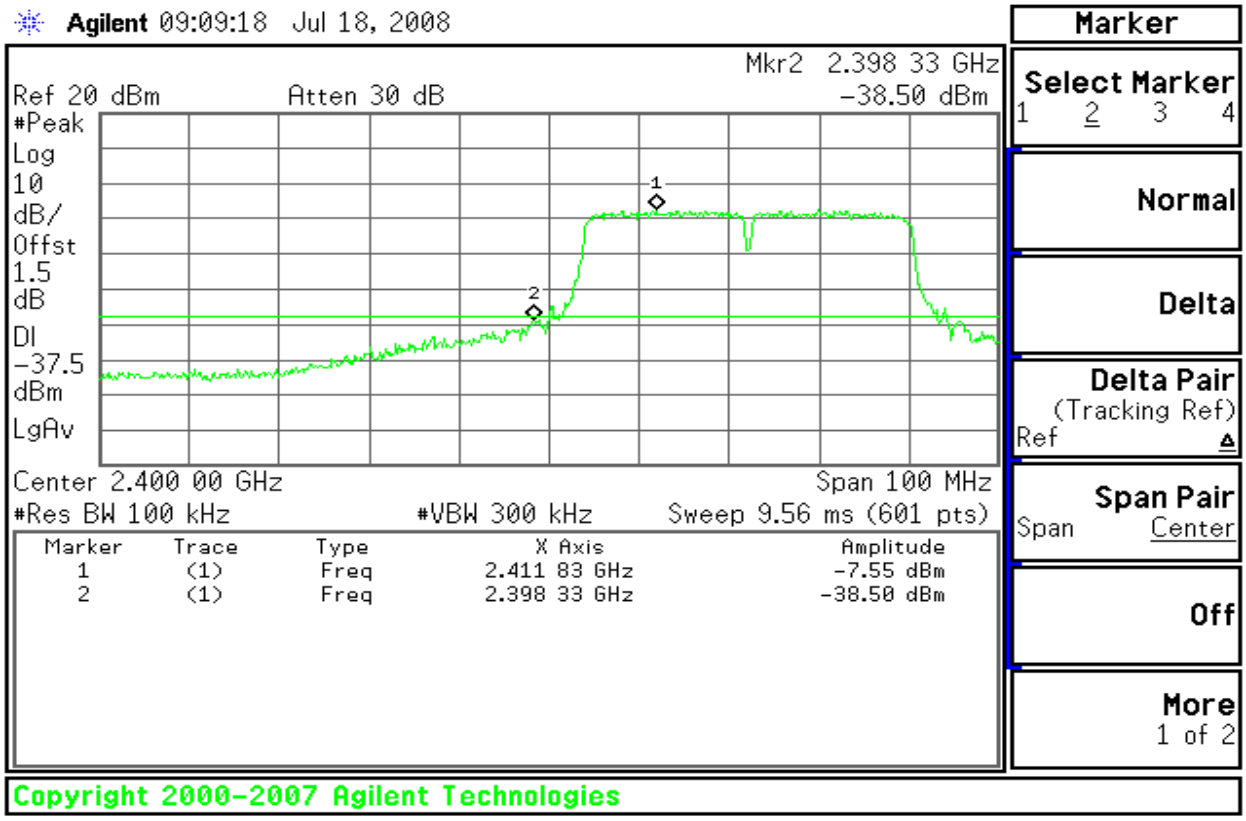
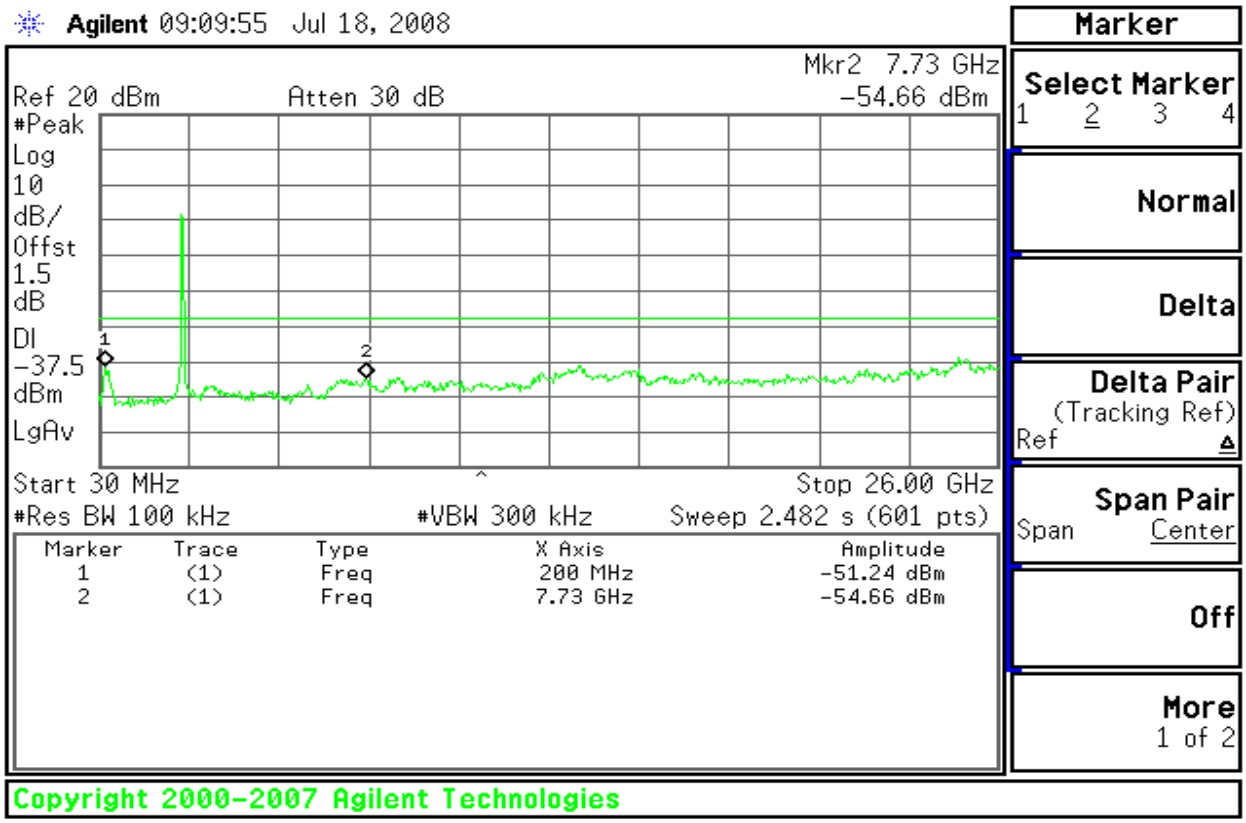
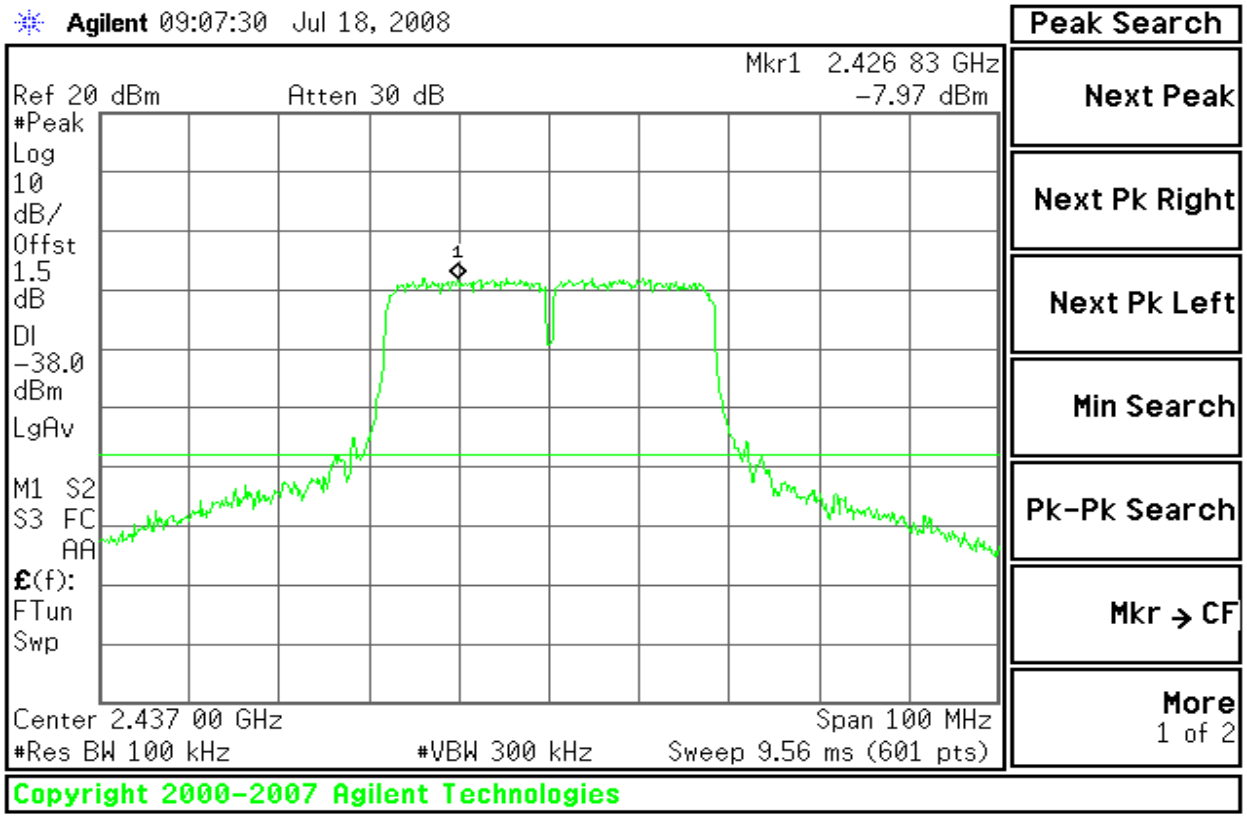
draft 802.11n Wide-40 MHz Channel mode / Chain 0

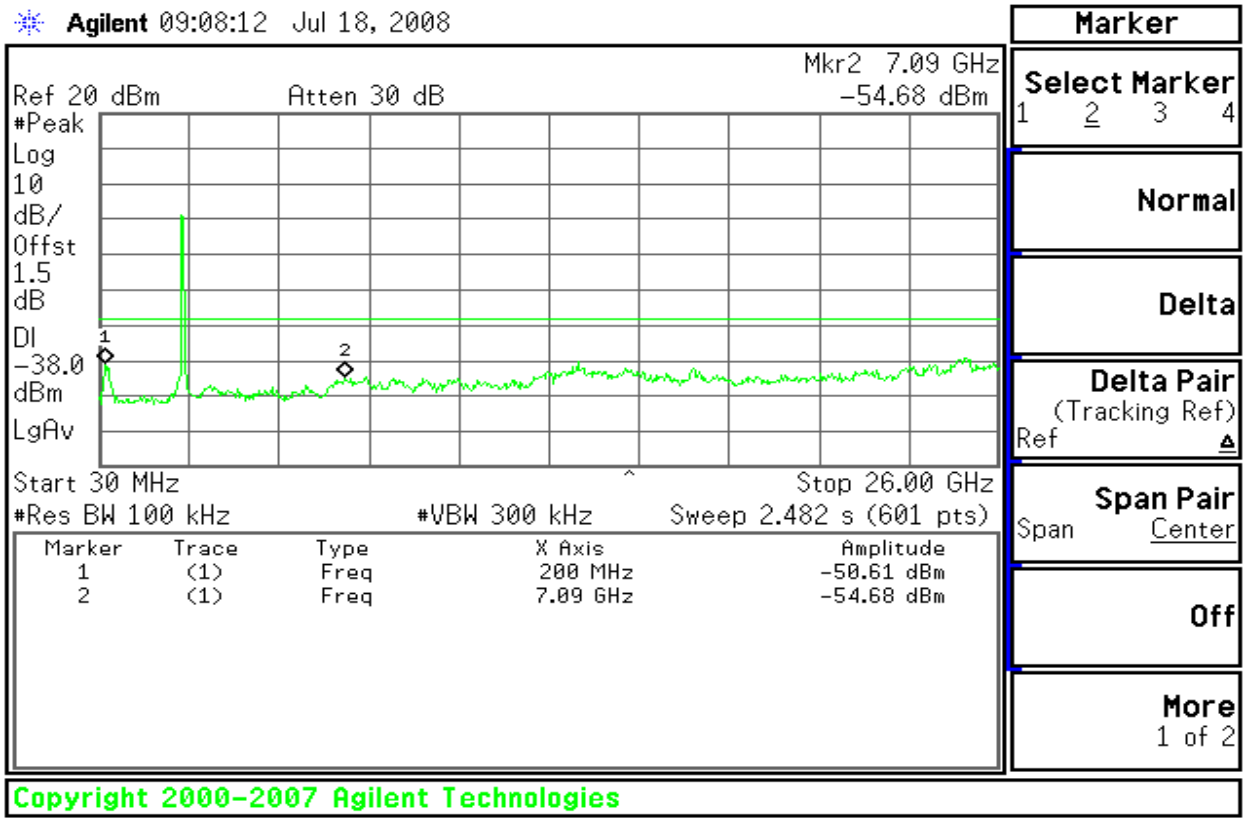
CH Low





CH Mid


Agilent 09:07:30 Jul 18, 2008
Mkr1 2.426 83 GHz
Ref 20 dBm
Atten 30 dB
-7.97 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-38.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 2.437 00 GHz
Span 100 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 9.56 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Copyright 2000-2007 Agilent Technologies


Agilent 09:08:12 Jul 18, 2008
Mkr2 7.09 GHz
Ref 20 dBm
Atten 30 dB
-54.68 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-38.0
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 200 MHz -50.61 dBm
2 (1) Freq 7.09 GHz -54.68 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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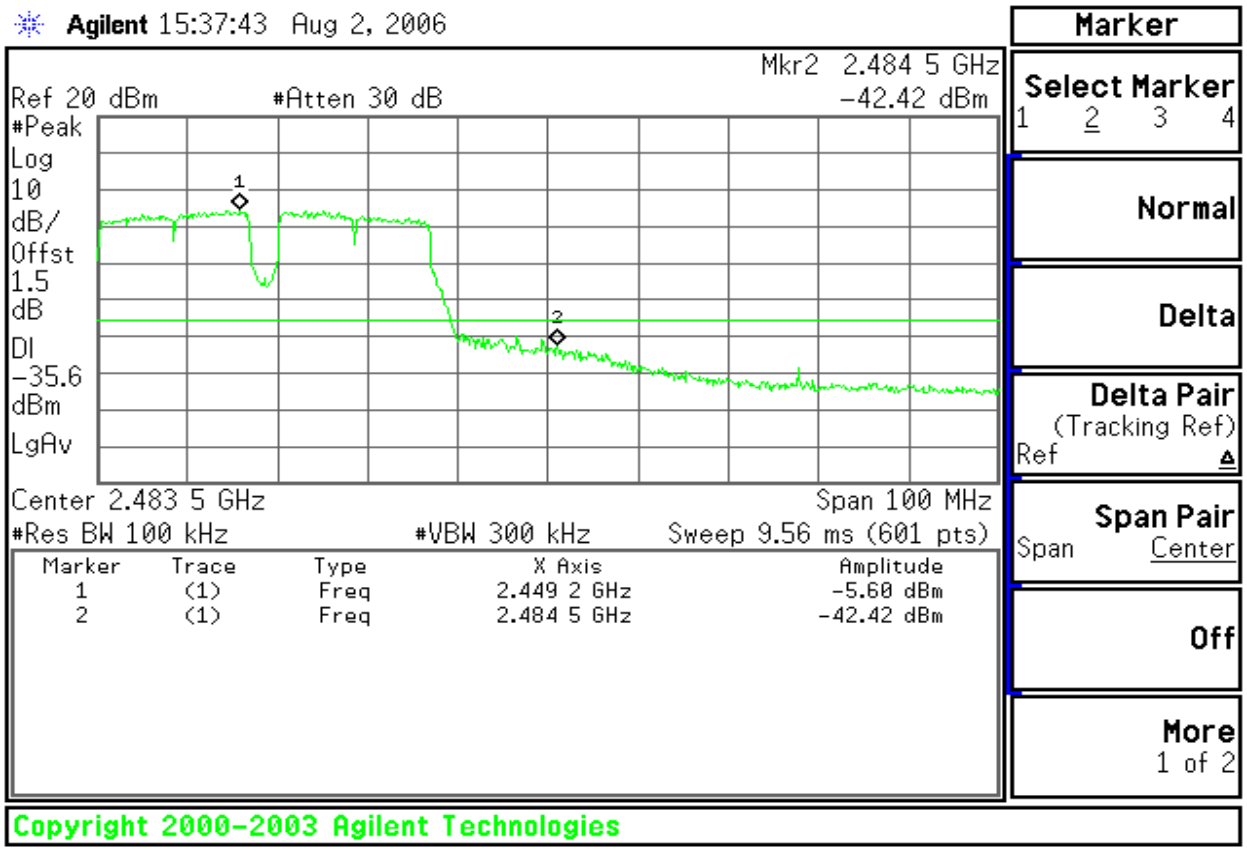
CH High


Agilent 15:37:43 Aug 2, 2006
Marker
Mkr2 2.484 5 GHz
Ref 20 dBm
#Atten 30 dB
-42.42 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-35.6
dBm
LgAv
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Center 2.483 5 GHz
Span 100 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 9.56 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.449 2 GHz -5.60 dBm
2 (1) Freq 2.484 5 GHz -42.42 dBm
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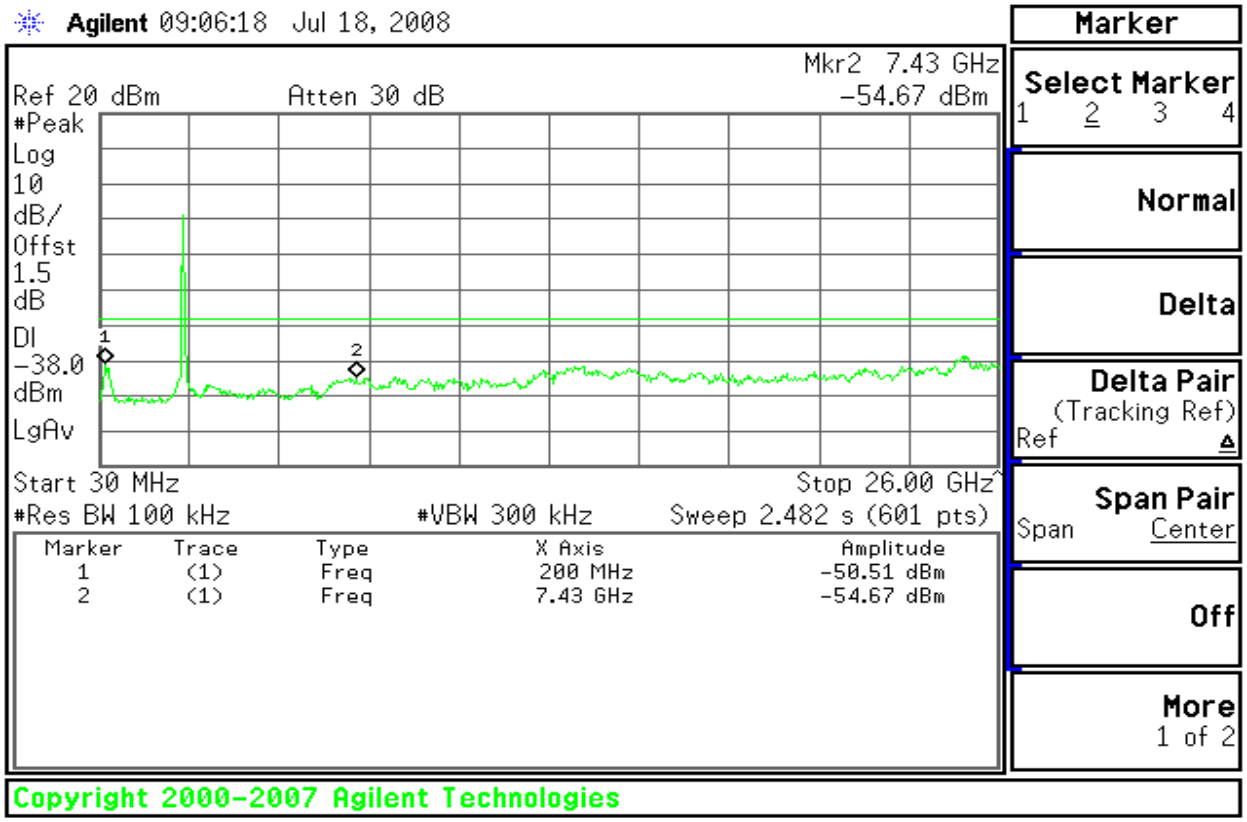
Agilent 09:06:18 Jul 18, 2008
Marker
Mkr2 7.43 GHz
Ref 20 dBm
Atten 30 dB
-54.67 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-38.0
dBm
LgAv
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 200 MHz -50.51 dBm
2 (1) Freq 7.43 GHz -54.67 dBm
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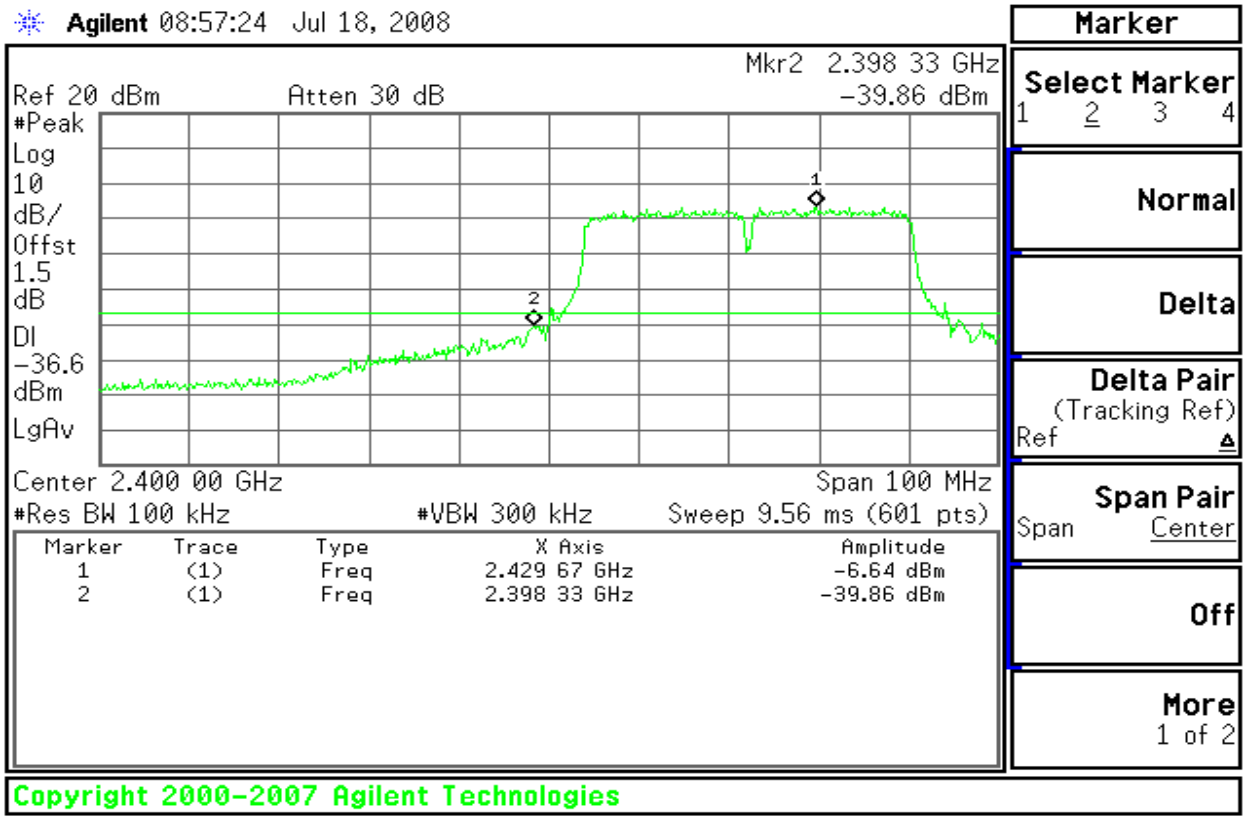
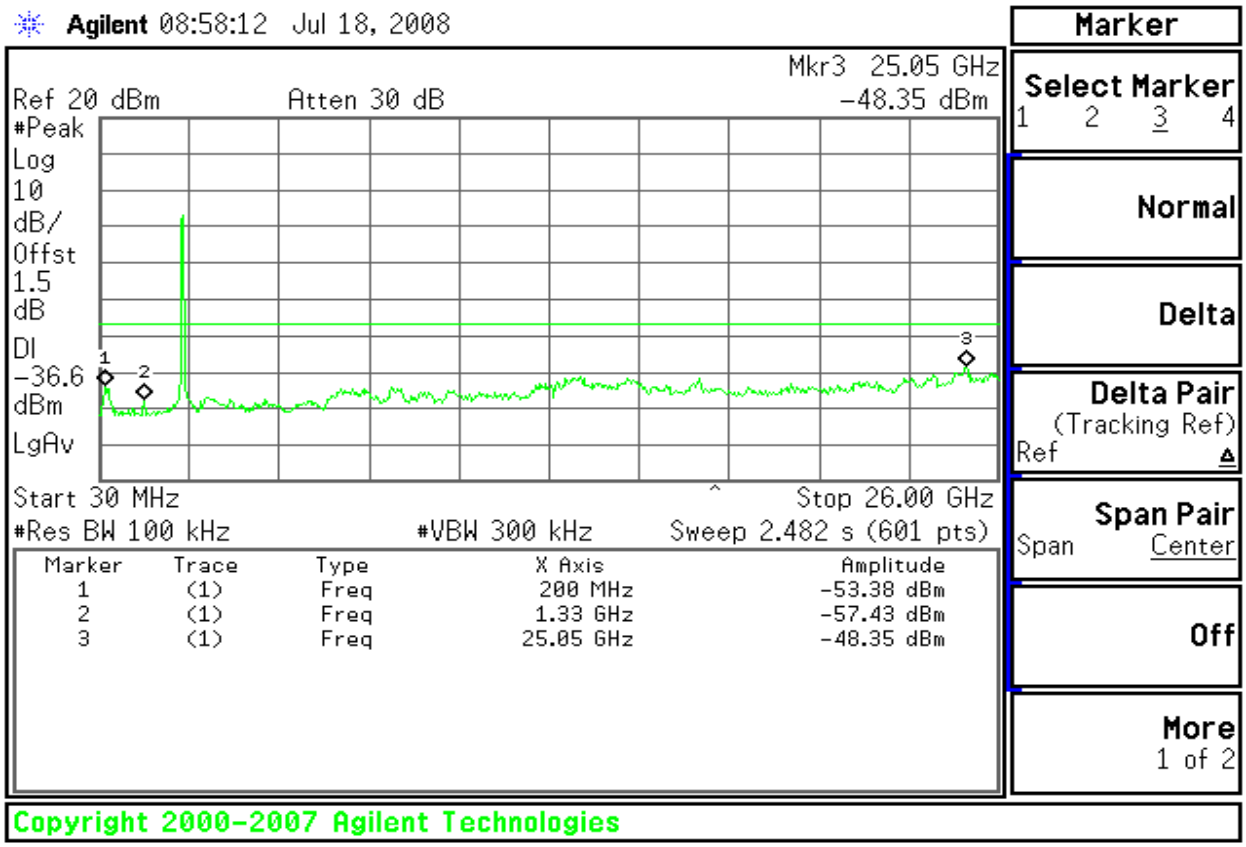
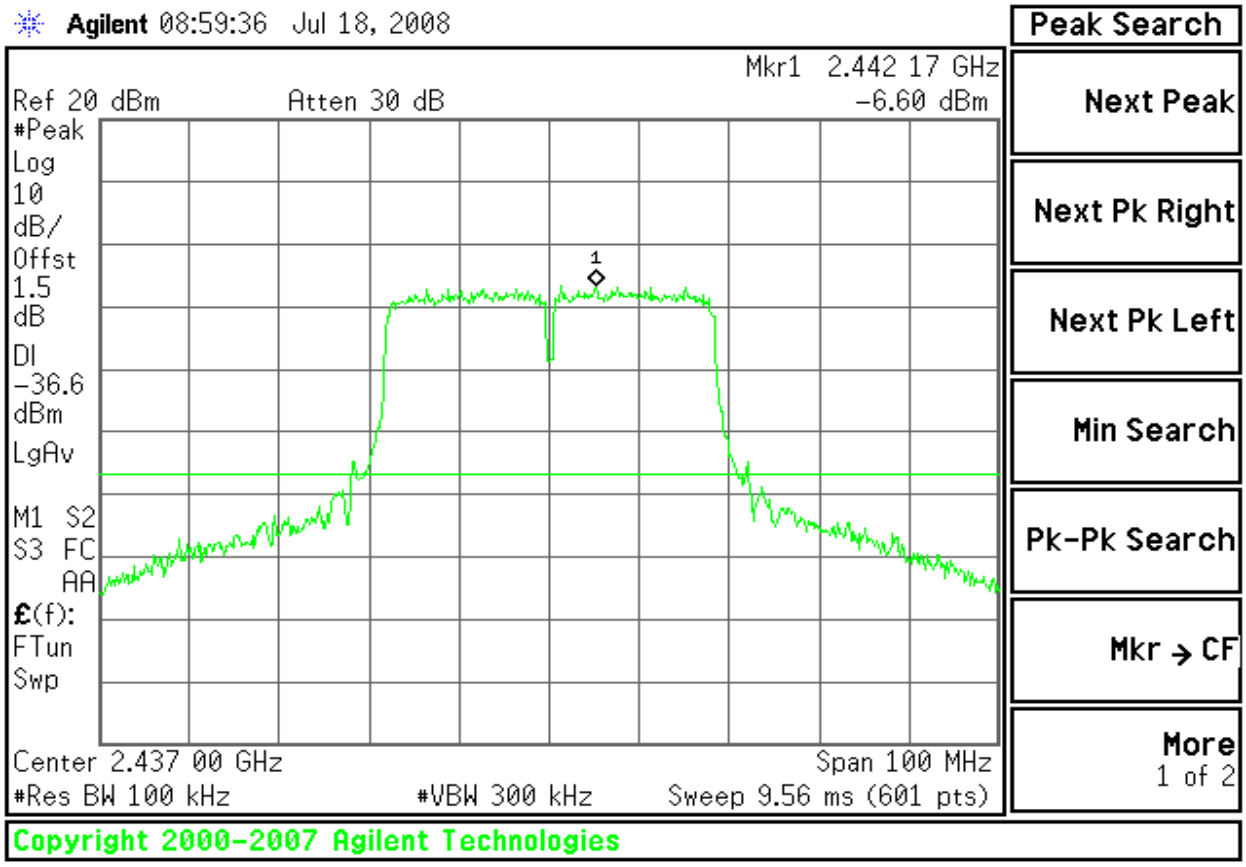
draft 802.11n Wide-40 MHz Channel mode / Chain 1

CH Low





CH Mid


Agilent 08:59:36 Jul 18, 2008
Mkr1 2.442 17 GHz
Ref 20 dBm
Atten 30 dB
-6.60 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-36.6
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 2.437 00 GHz
Span 100 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 9.56 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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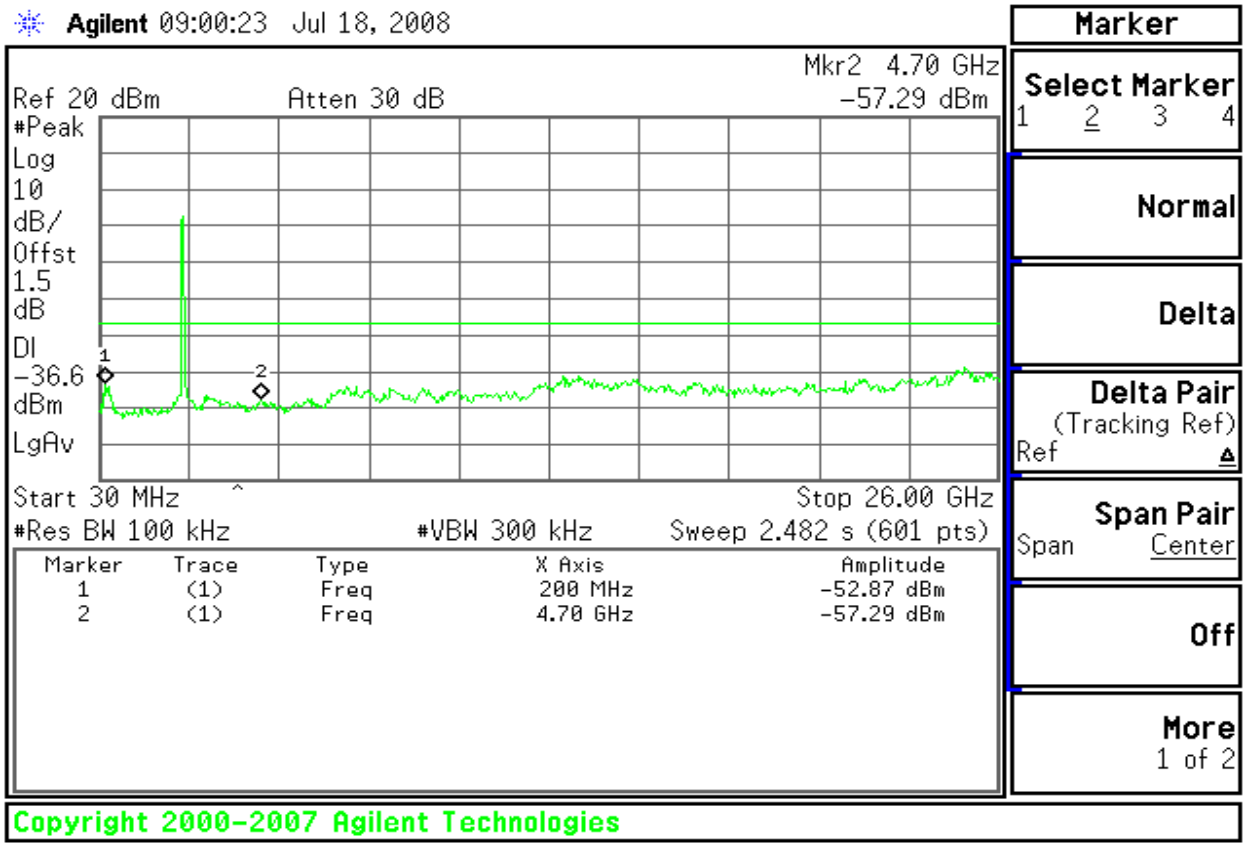
Agilent 09:00:23 Jul 18, 2008
Mkr2 4.70 GHz
Ref 20 dBm
Atten 30 dB
-57.29 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-36.6
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 200 MHz -52.87 dBm
2 (1) Freq 4.70 GHz -57.29 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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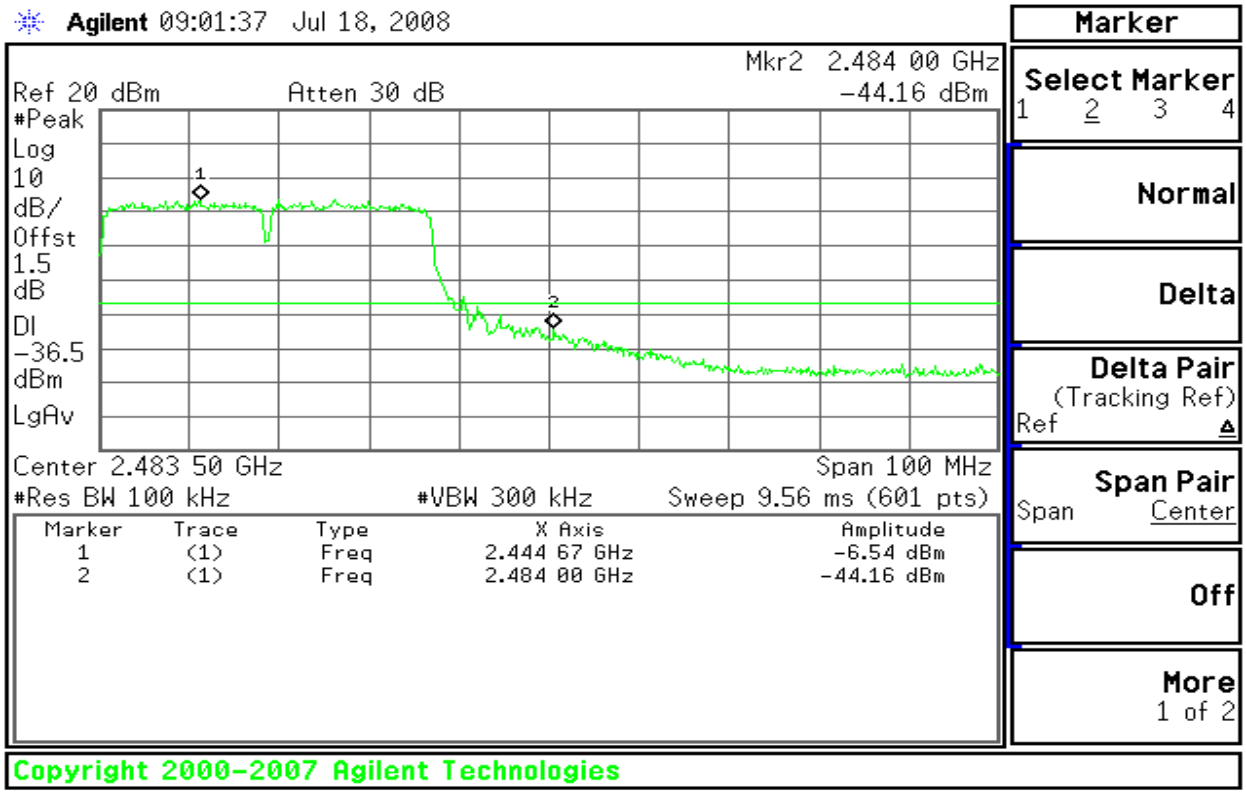
CH High


Agilent 09:01:37 Jul 18, 2008
Mkr2 2.484 00 GHz
Ref 20 dBm
Atten 30 dB
-44.16 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-36.5
dBm
LgAv
Center 2.483 50 GHz
Span 100 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 9.56 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.444 67 GHz -6.54 dBm
2 (1) Freq 2.484 00 GHz -44.16 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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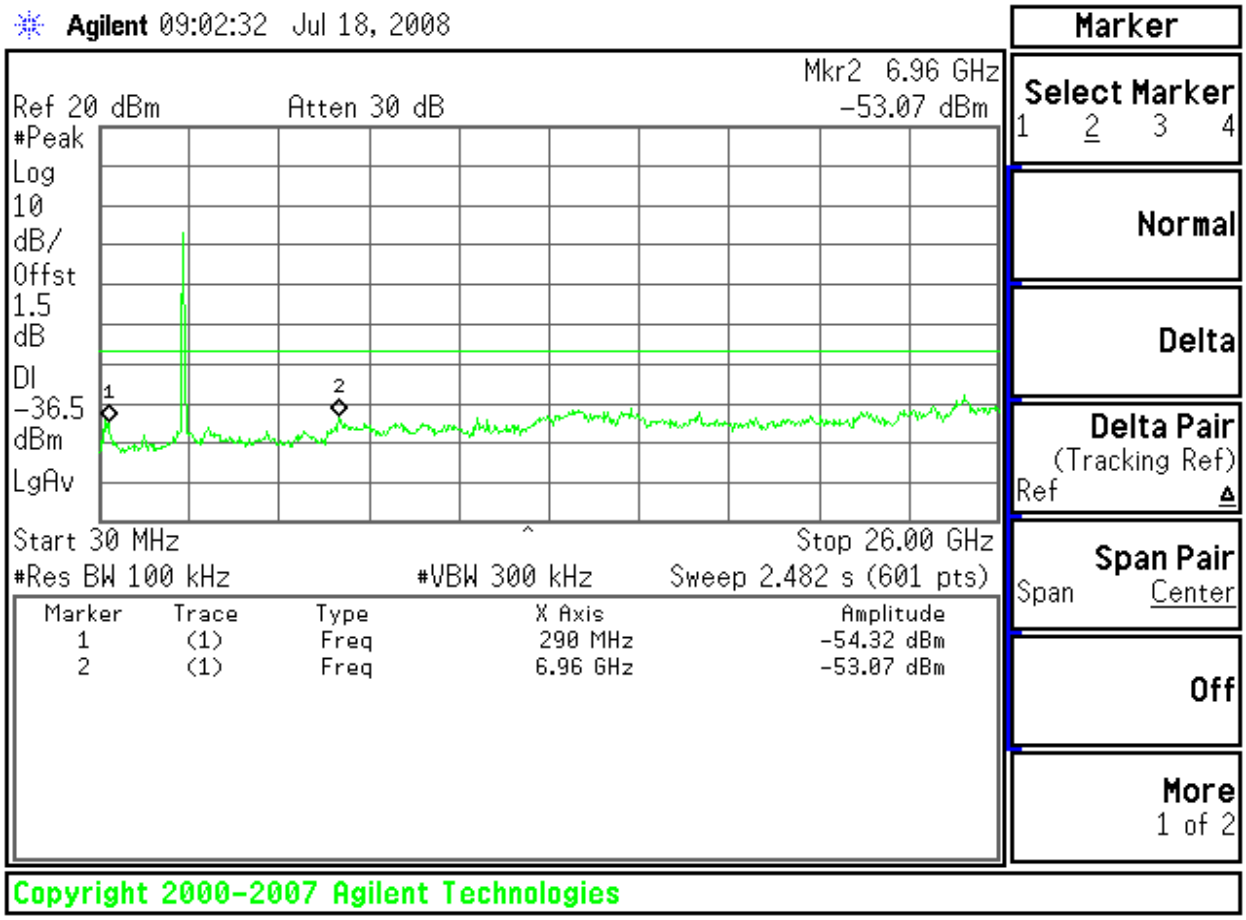
Agilent 09:02:32 Jul 18, 2008
Mkr2 6.96 GHz
Ref 20 dBm
Atten 30 dB
-53.07 dBm
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
-36.5
dBm
LgAv
Start 30 MHz
Stop 26.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.482 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 290 MHz -54.32 dBm
2 (1) Freq 6.96 GHz -53.07 dBm
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
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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

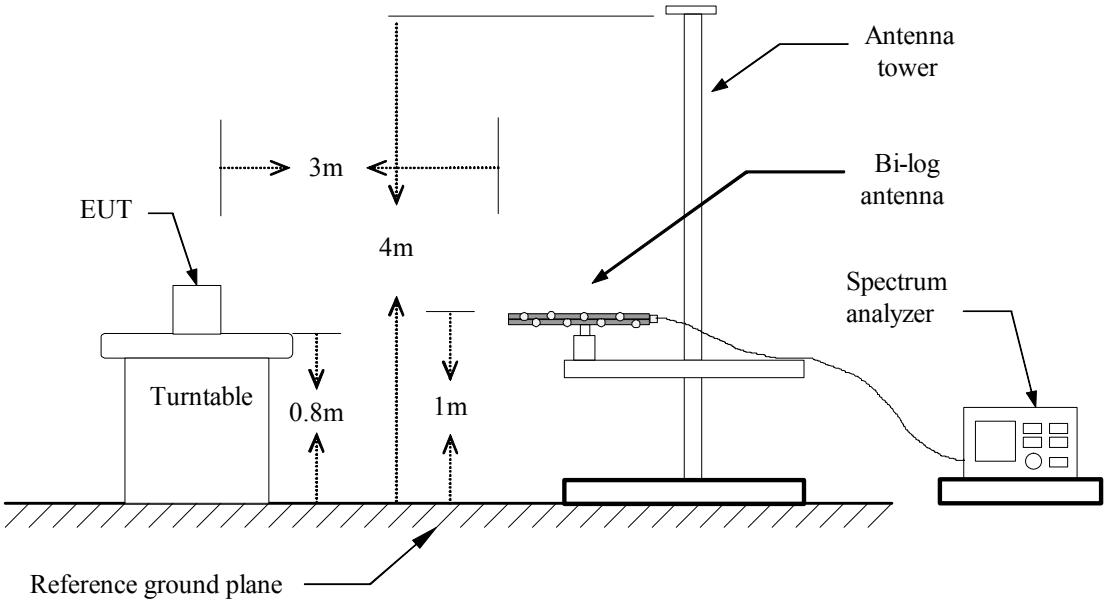
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

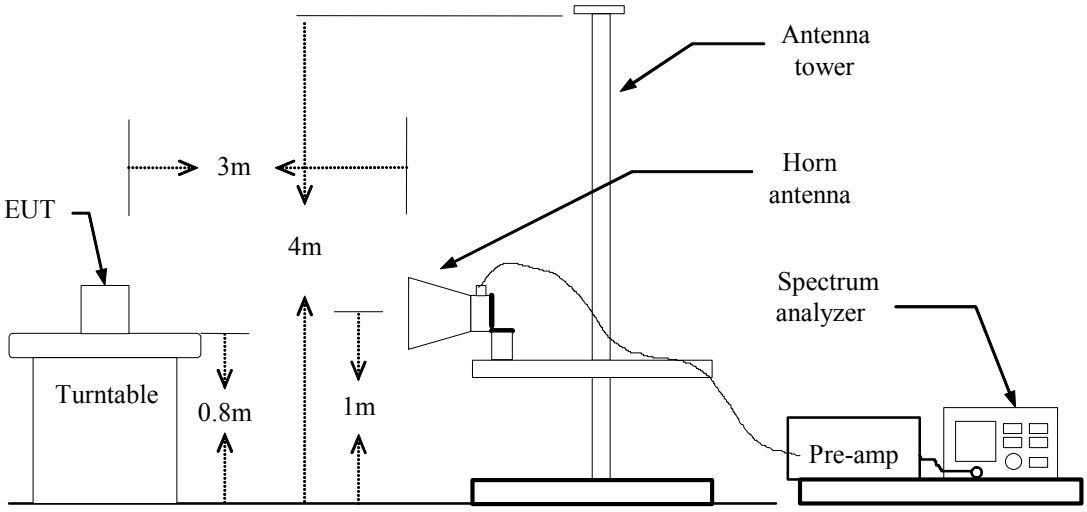
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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:

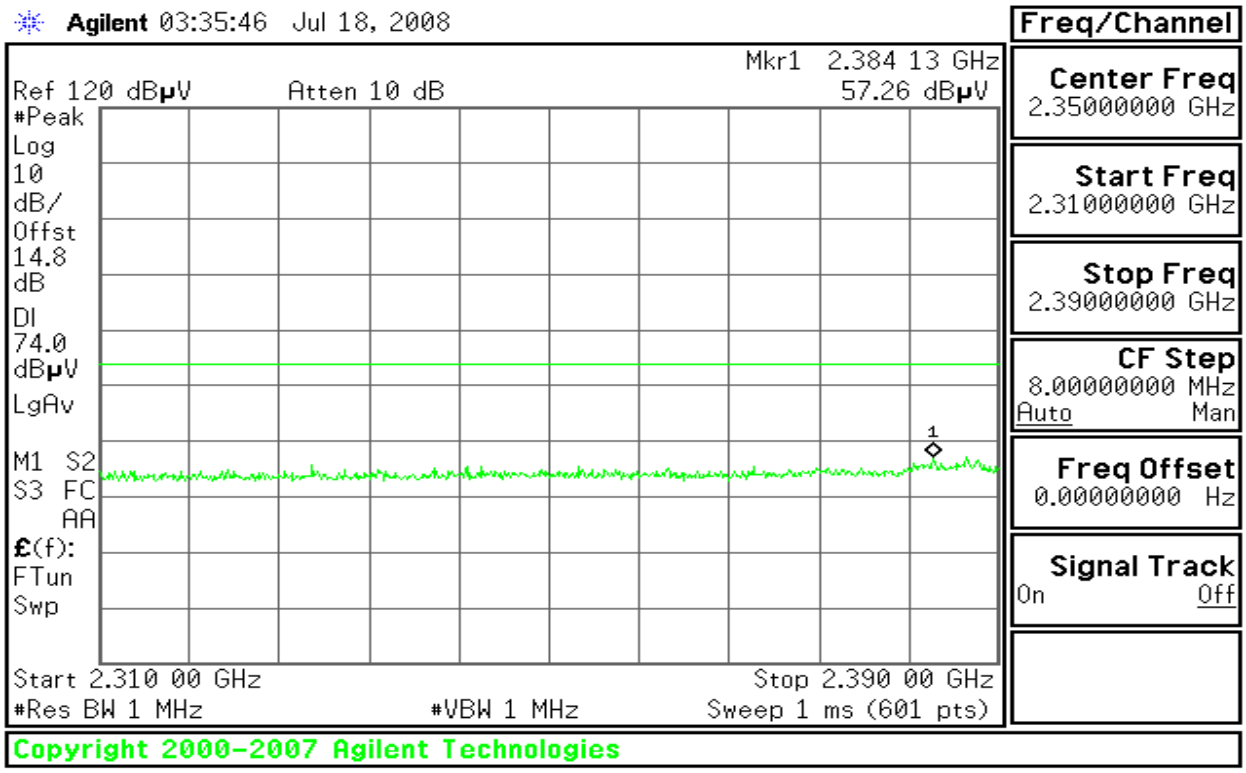
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

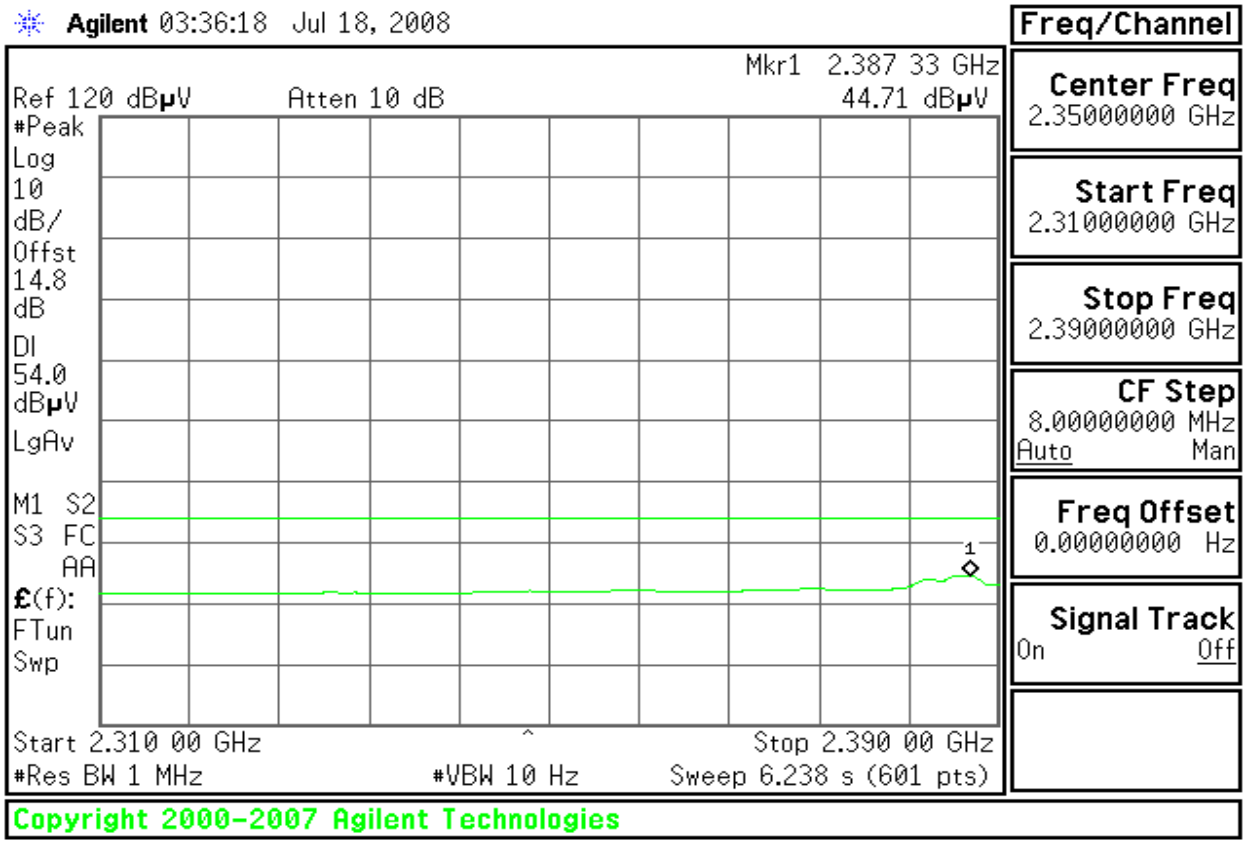
TEST RESULTS

RESTRICTED BANDEDGE (b Mode, Low Channel, Horizontal)

PEAK

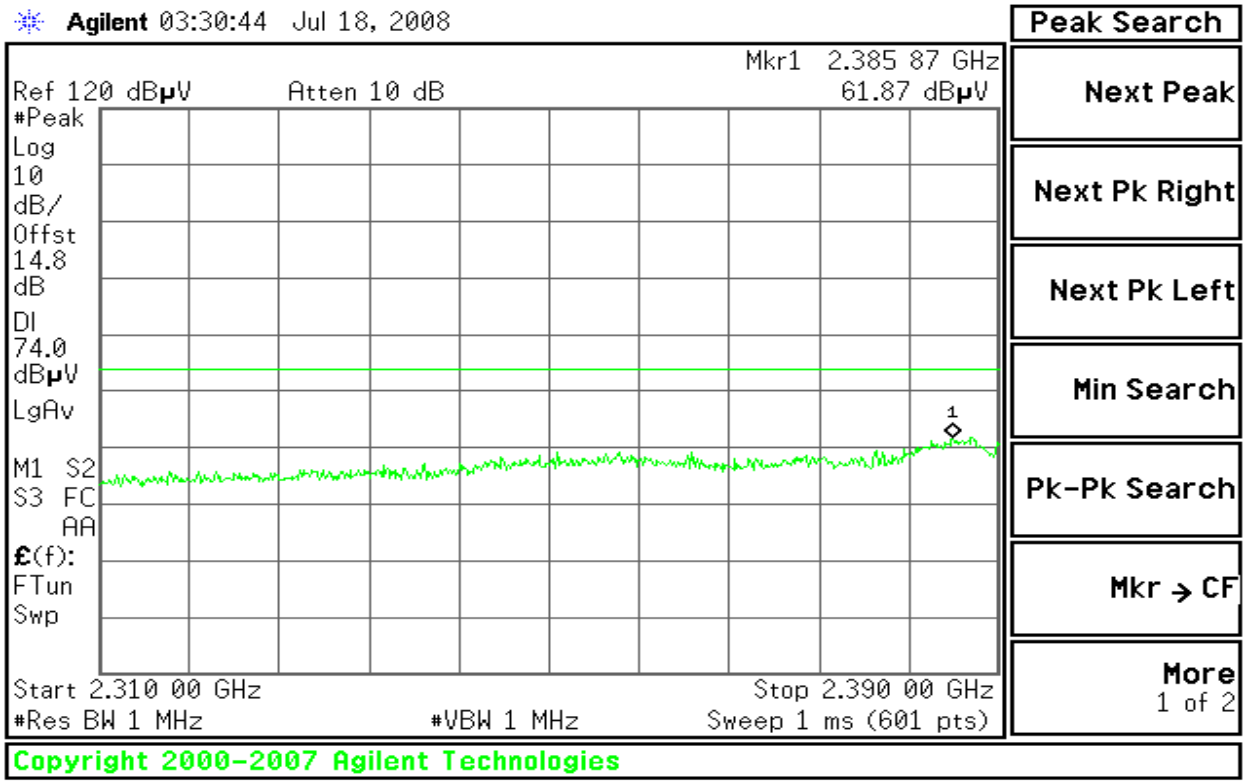


AVG

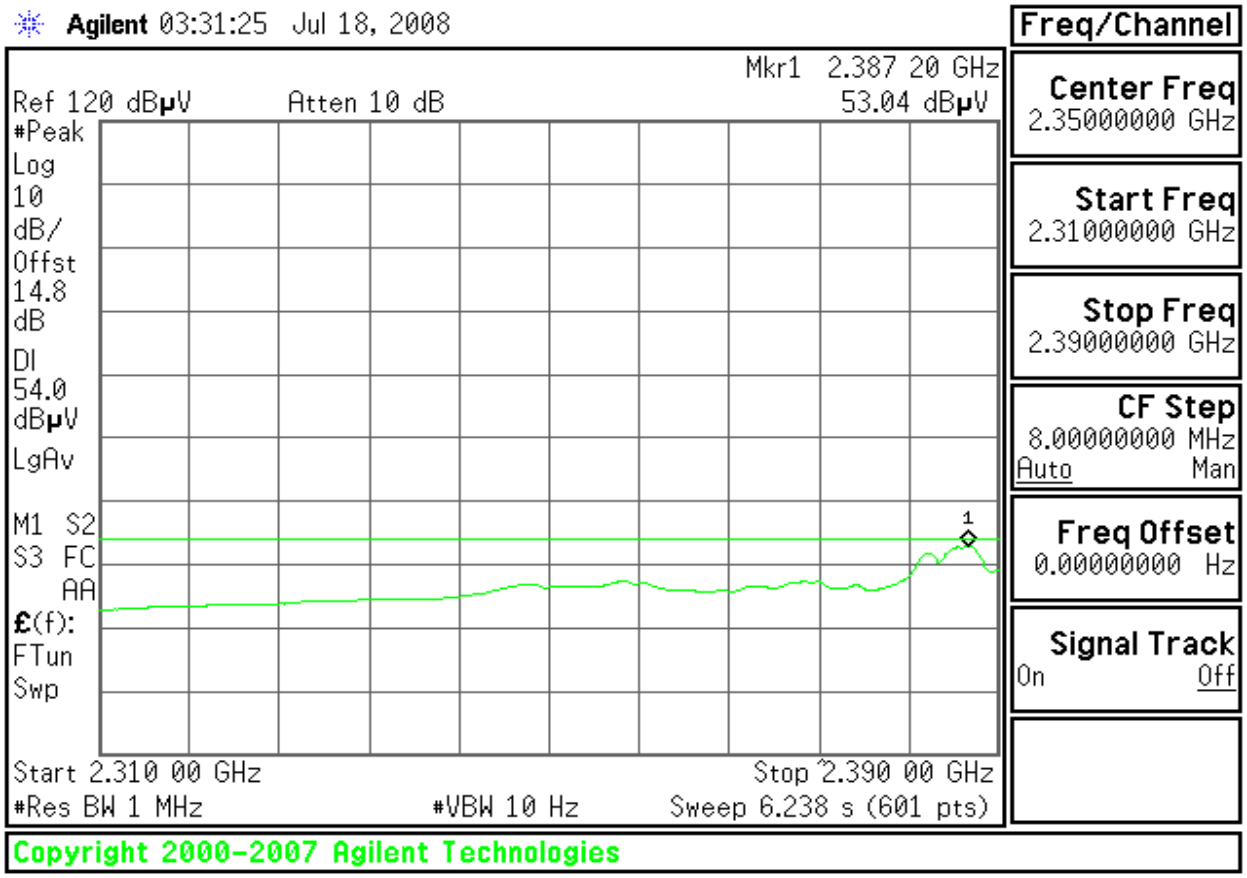


RESTRICTED BANDEDGE (b Mode, Low Channel, Vertical)

PEAK

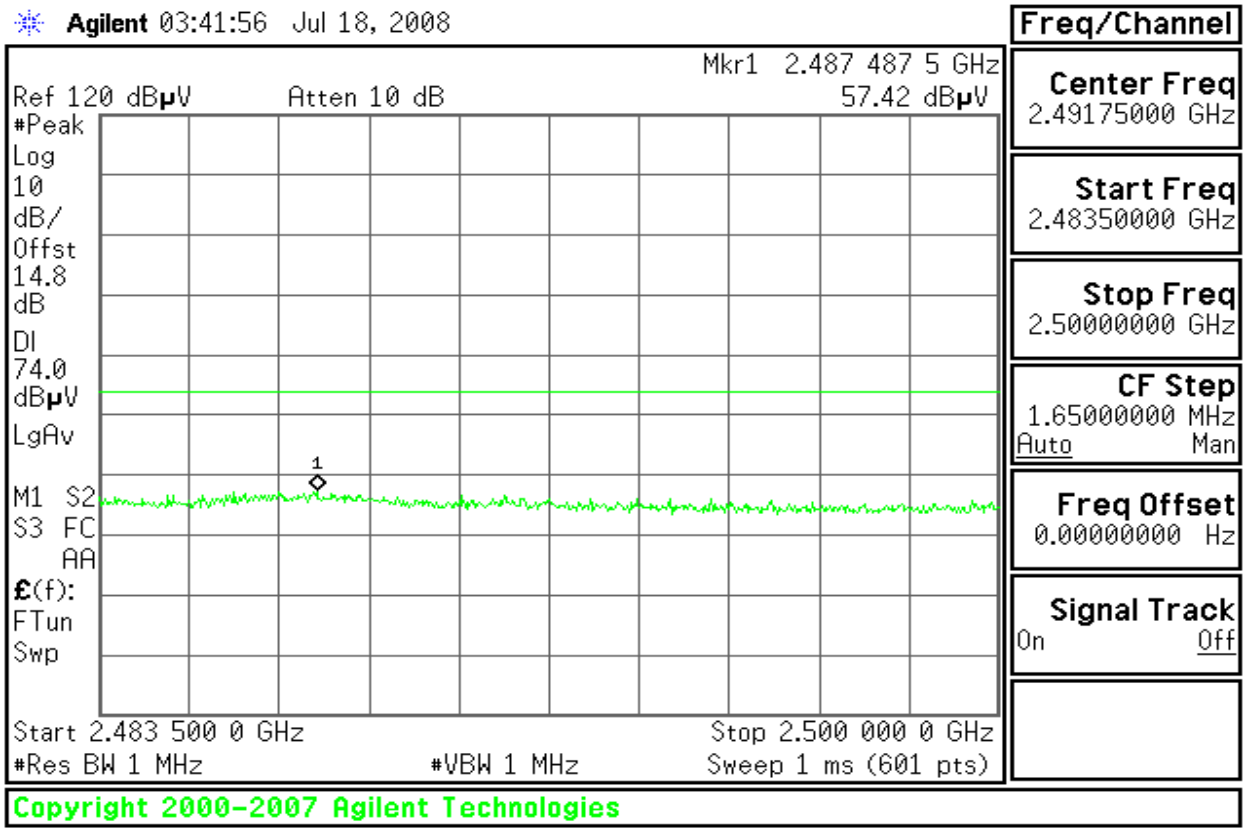


AVG

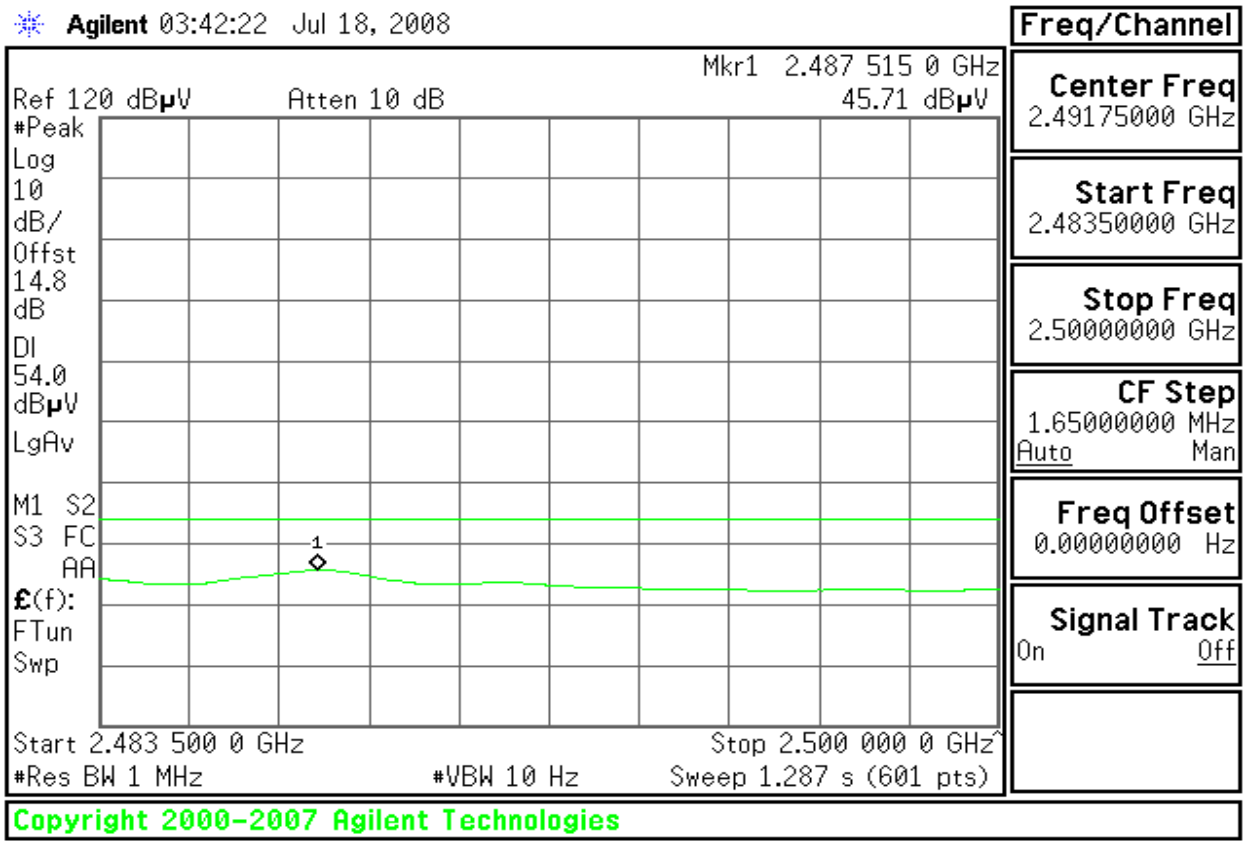


RESTRICTED BANDEDGE (b Mode, High Channel, Horizontal)

PEAK

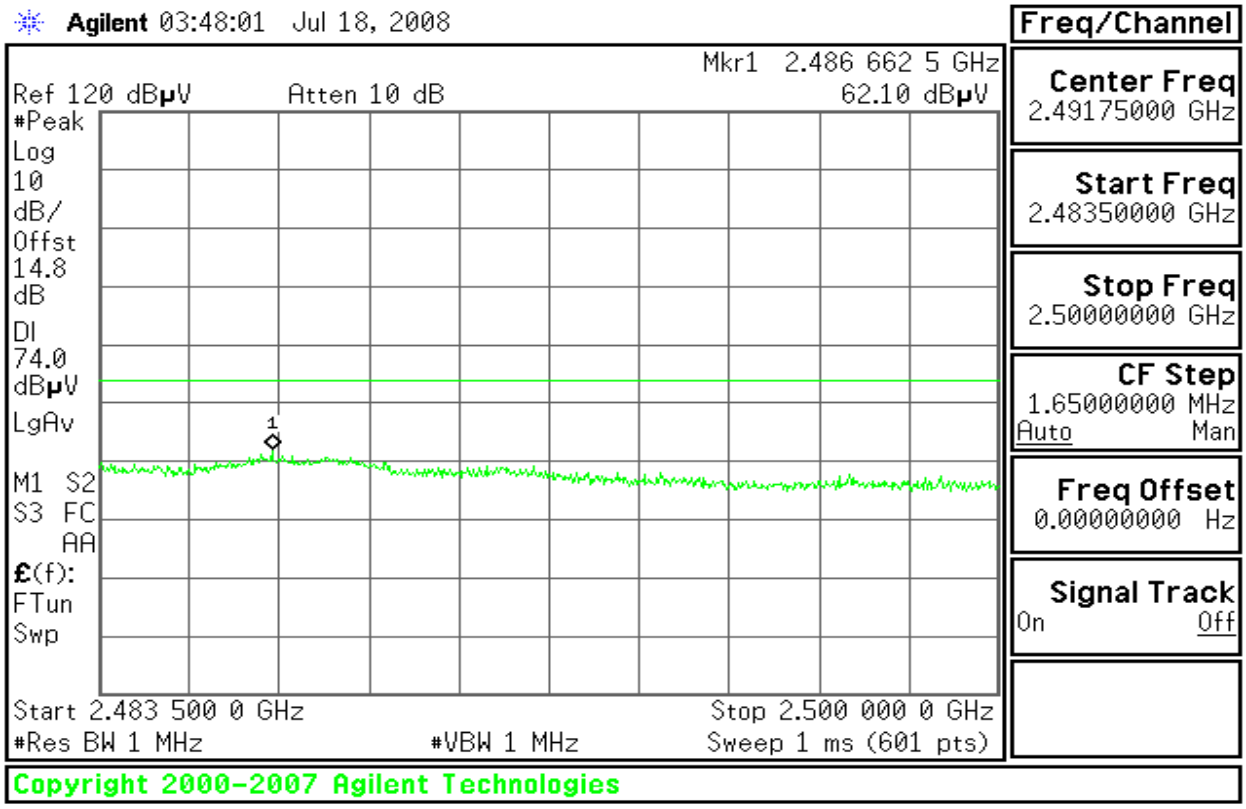


AVG

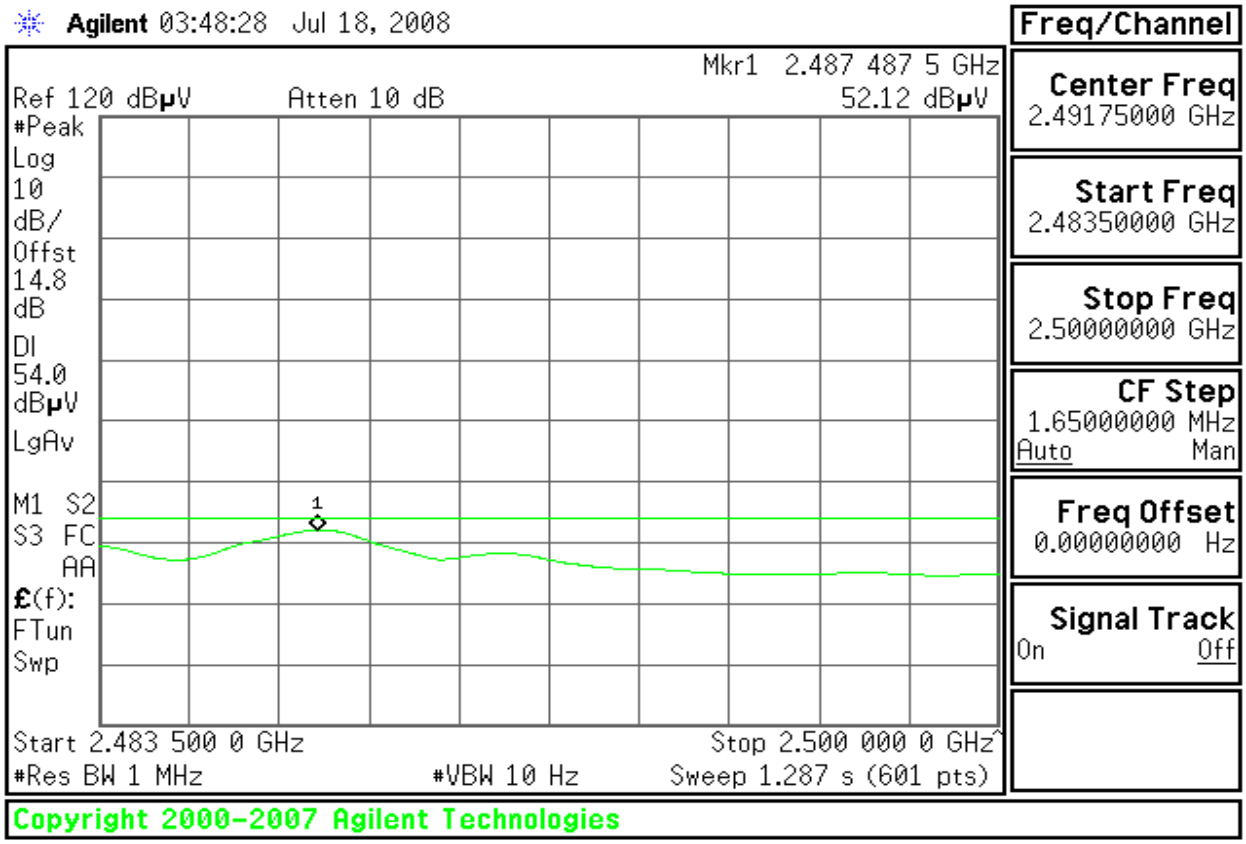


RESTRICTED BANDEDGE (b Mode, High Channel, Vertical)

PEAK

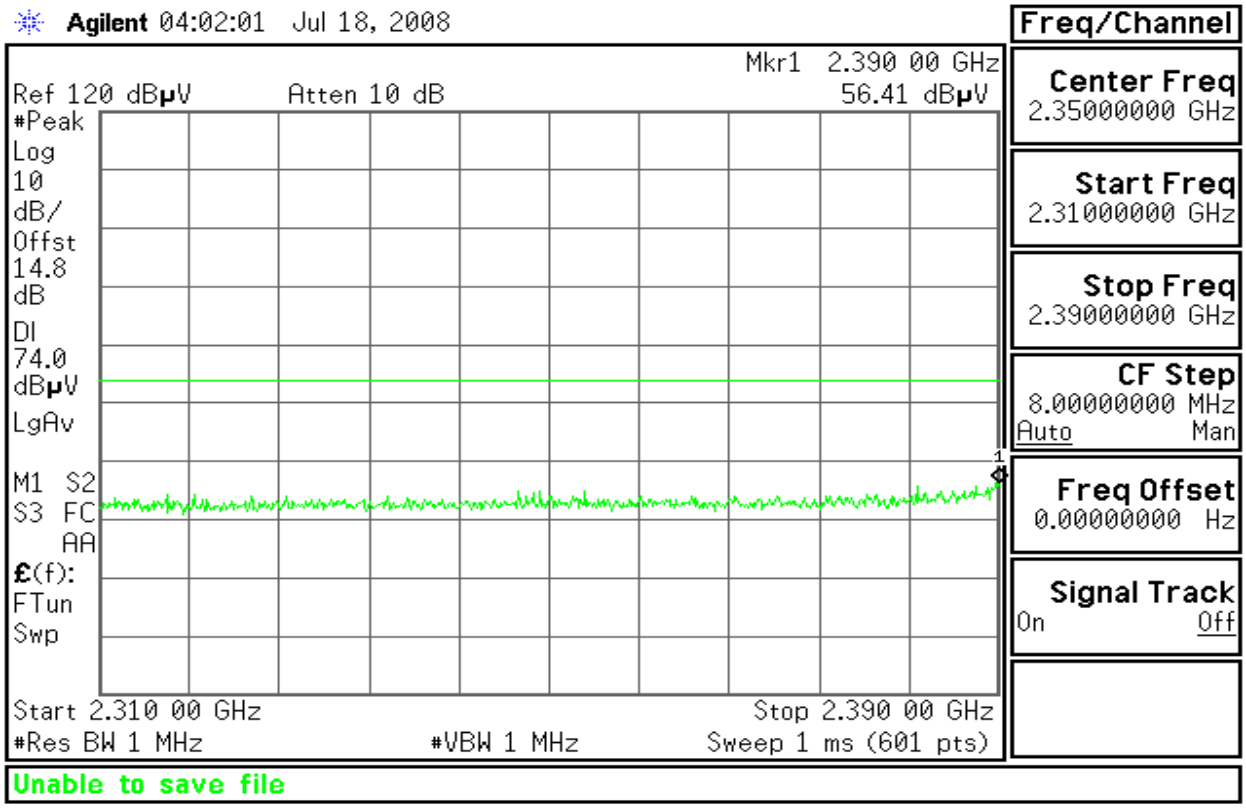


AVG

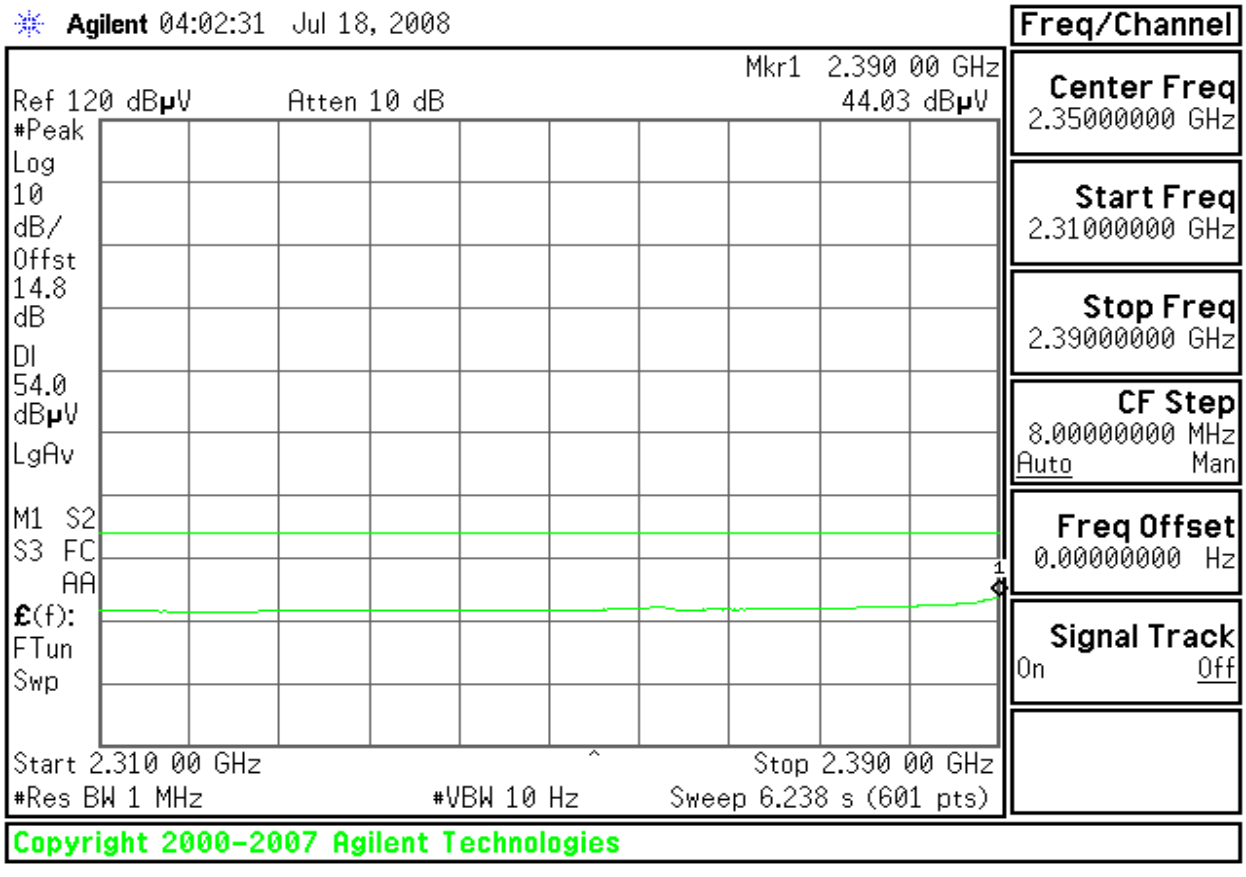


RESTRICTED BANDEDGE (g Mode, Low Channel, Horizontal)

PEAK

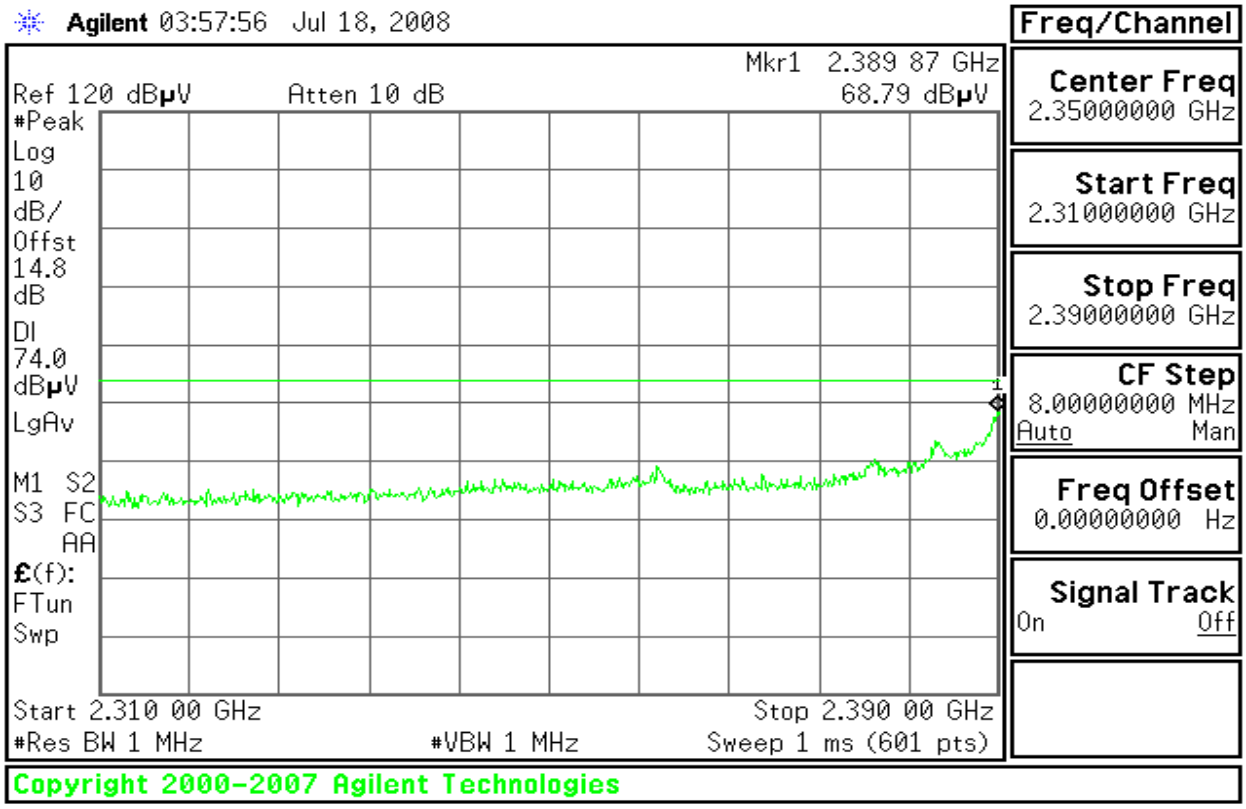


AVG

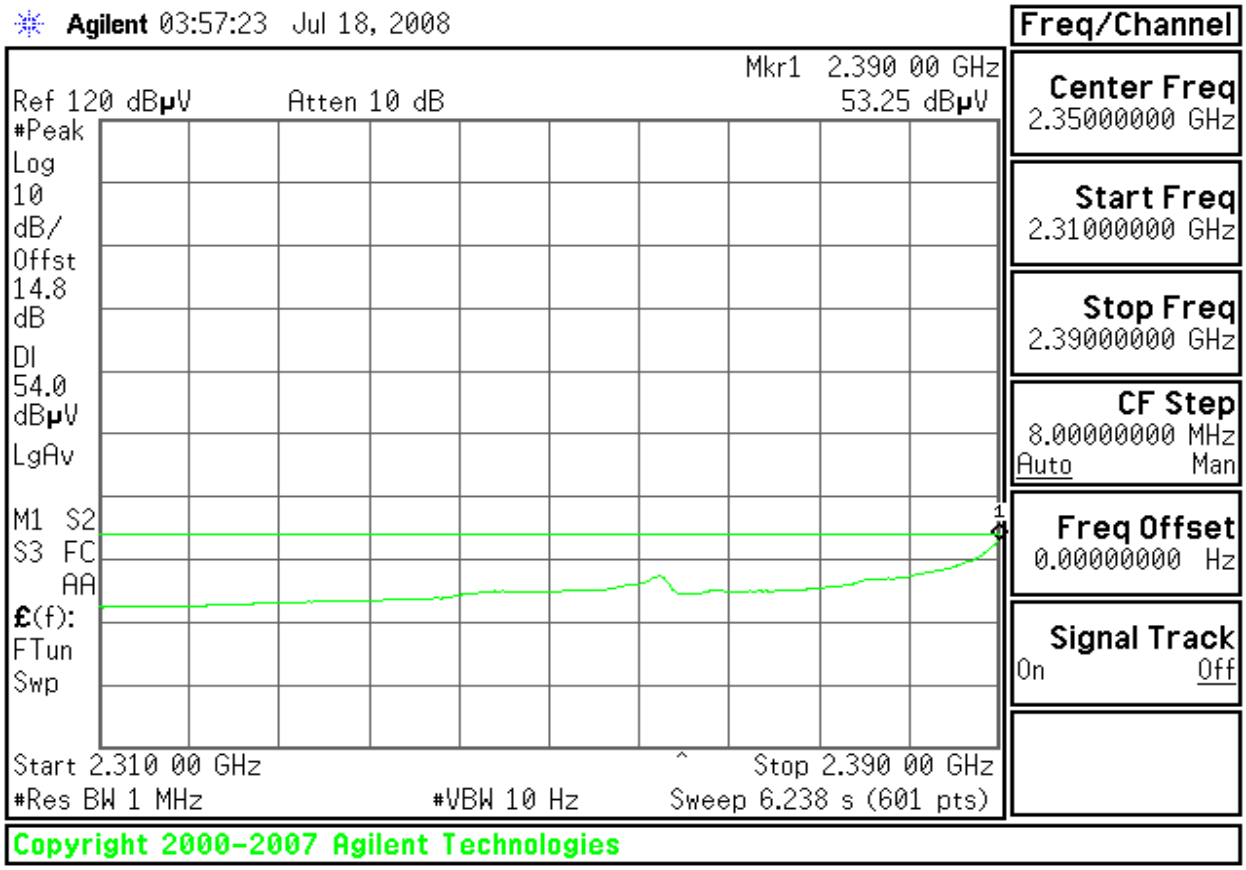


RESTRICTED BANDEDGE (g Mode, Low Channel, Vertical)

PEAK

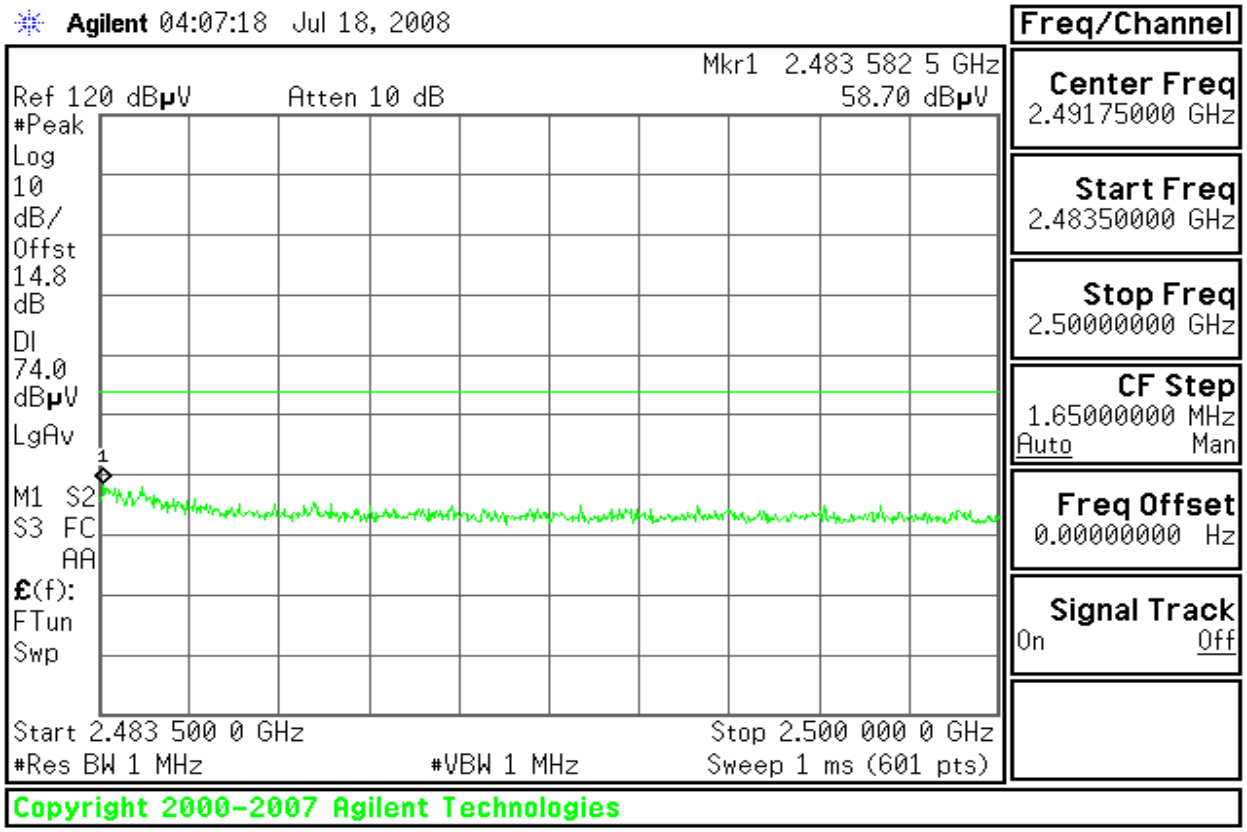


AVG

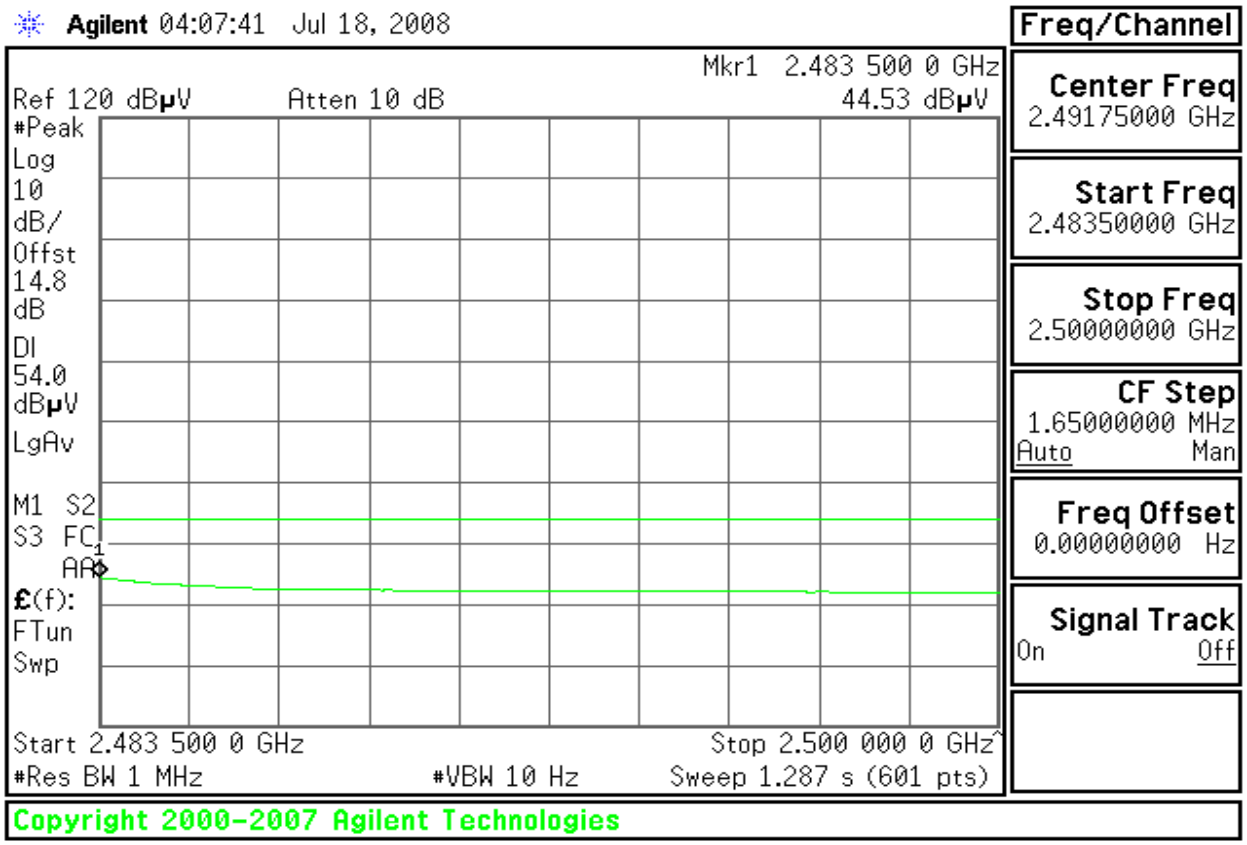


RESTRICTED BANDEDGE (g Mode, High Channel, Horizontal)

PEAK

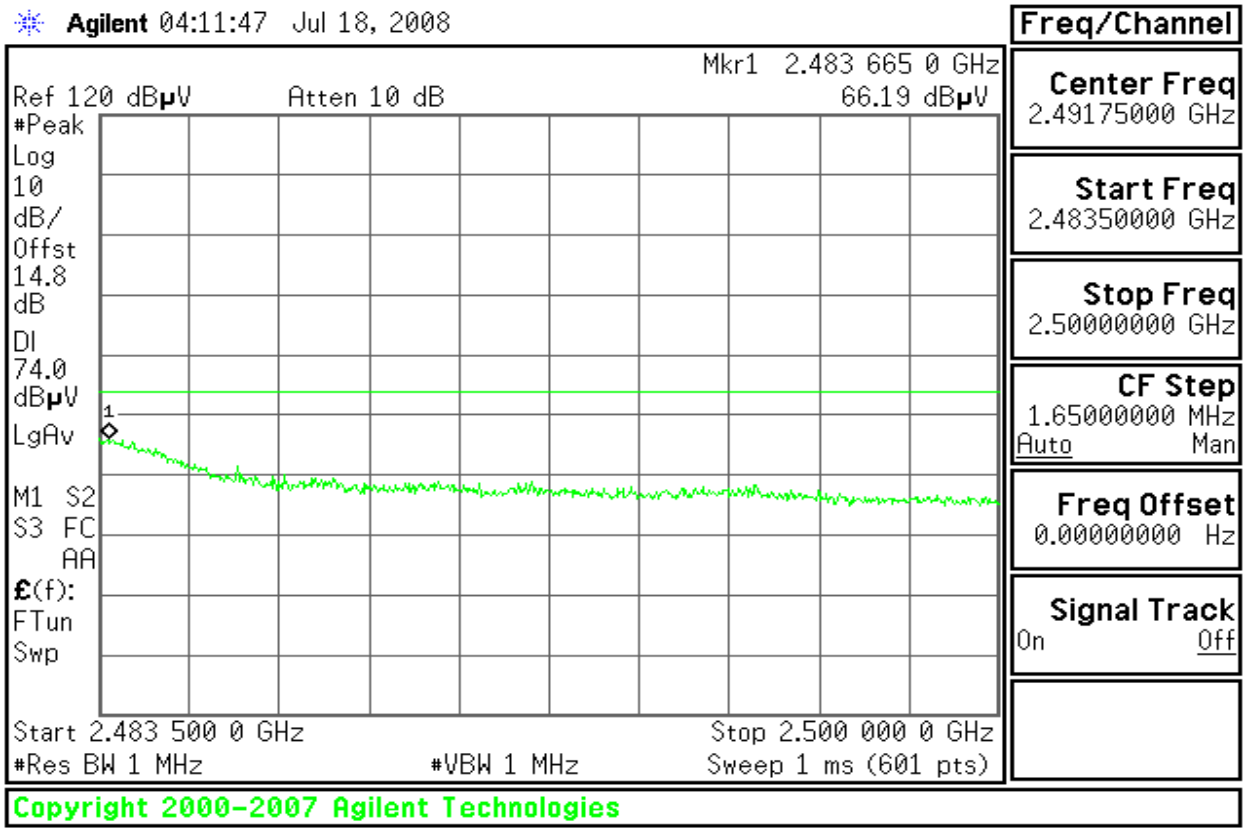


AVG

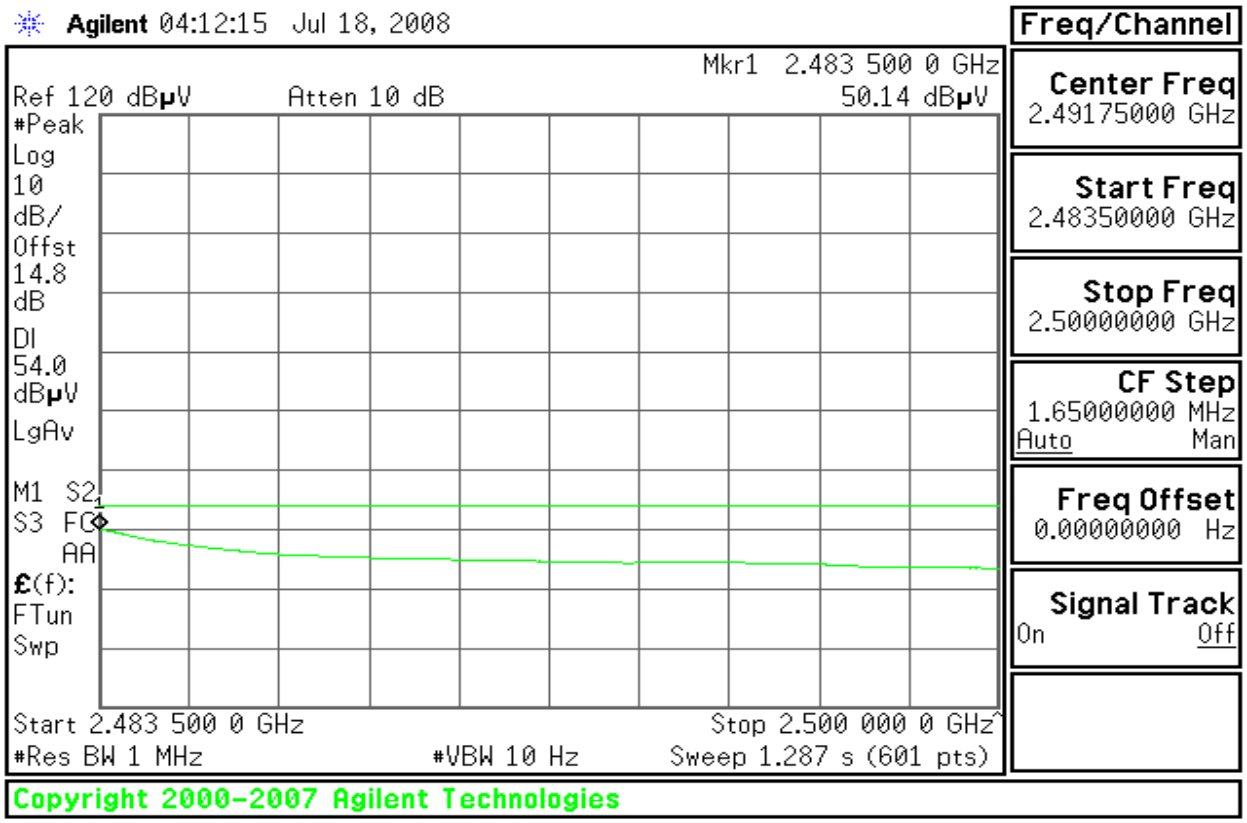


RESTRICTED BANDEDGE (g Mode, High Channel, Vertical)

PEAK

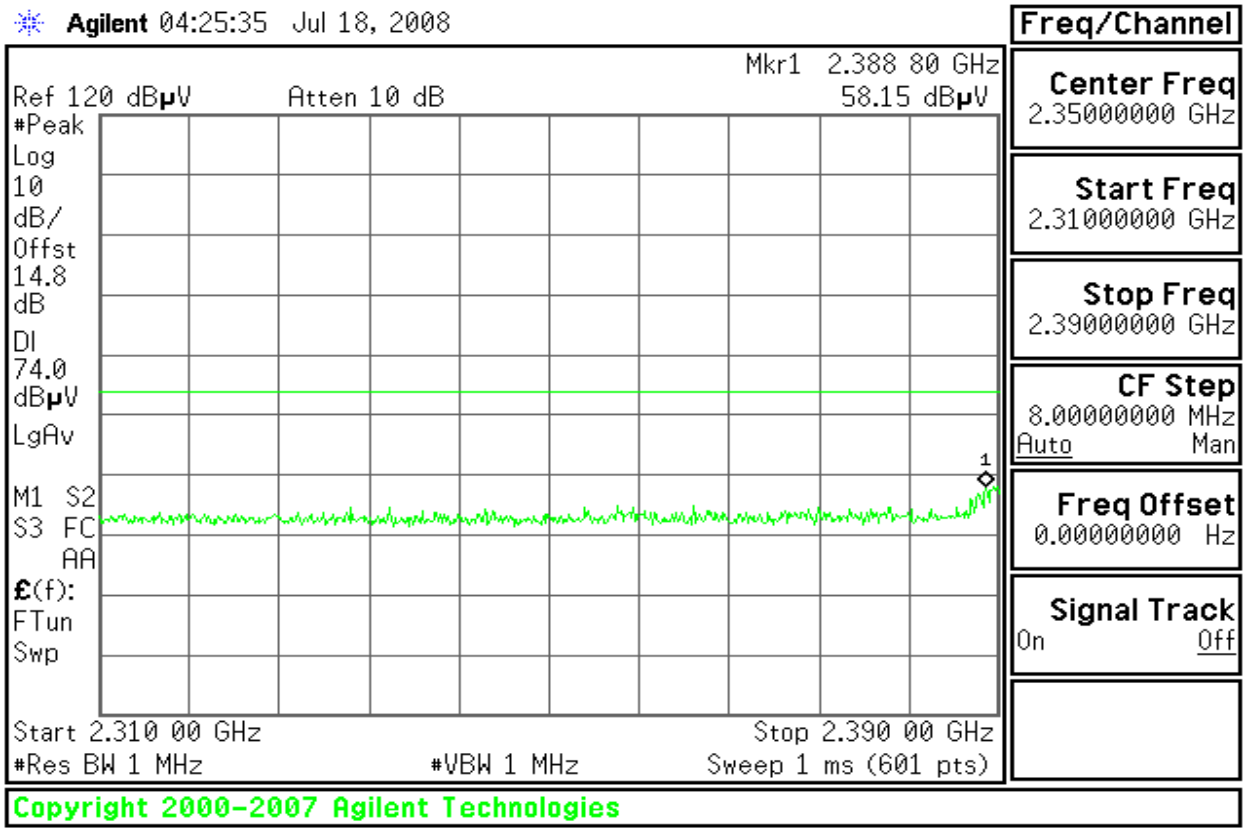


AVG

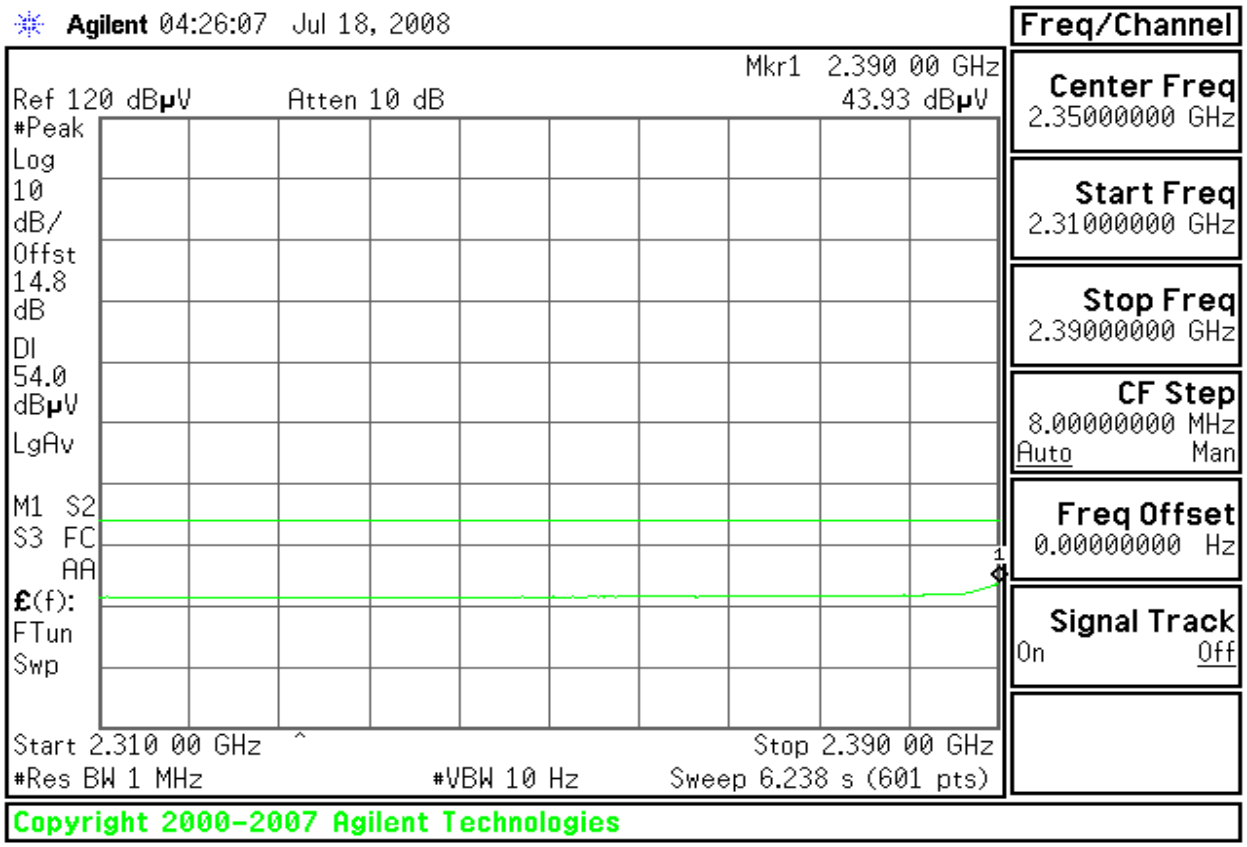


RESTRICTED BANDEDGE (draft 802.11n Standard-20 MHz Channel mode, Low Channel, Horizontal)

PEAK

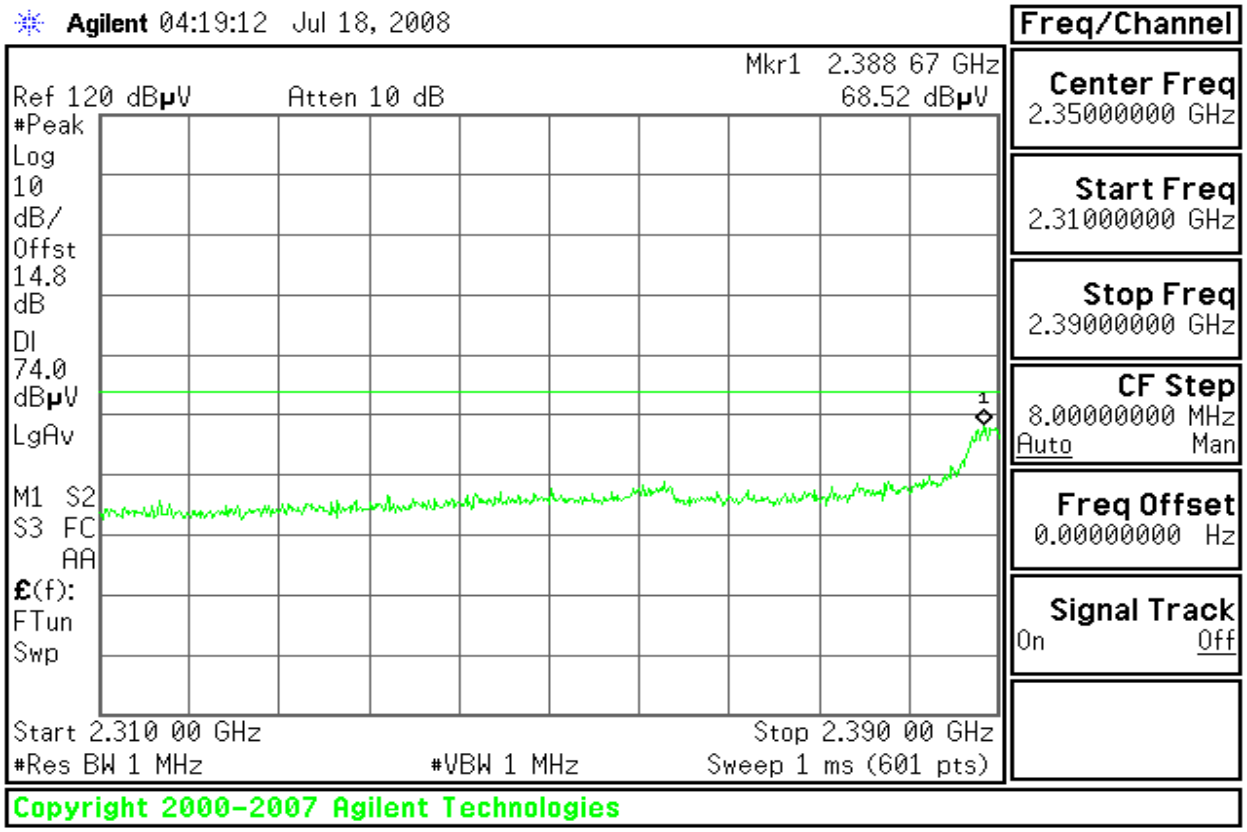


AVG

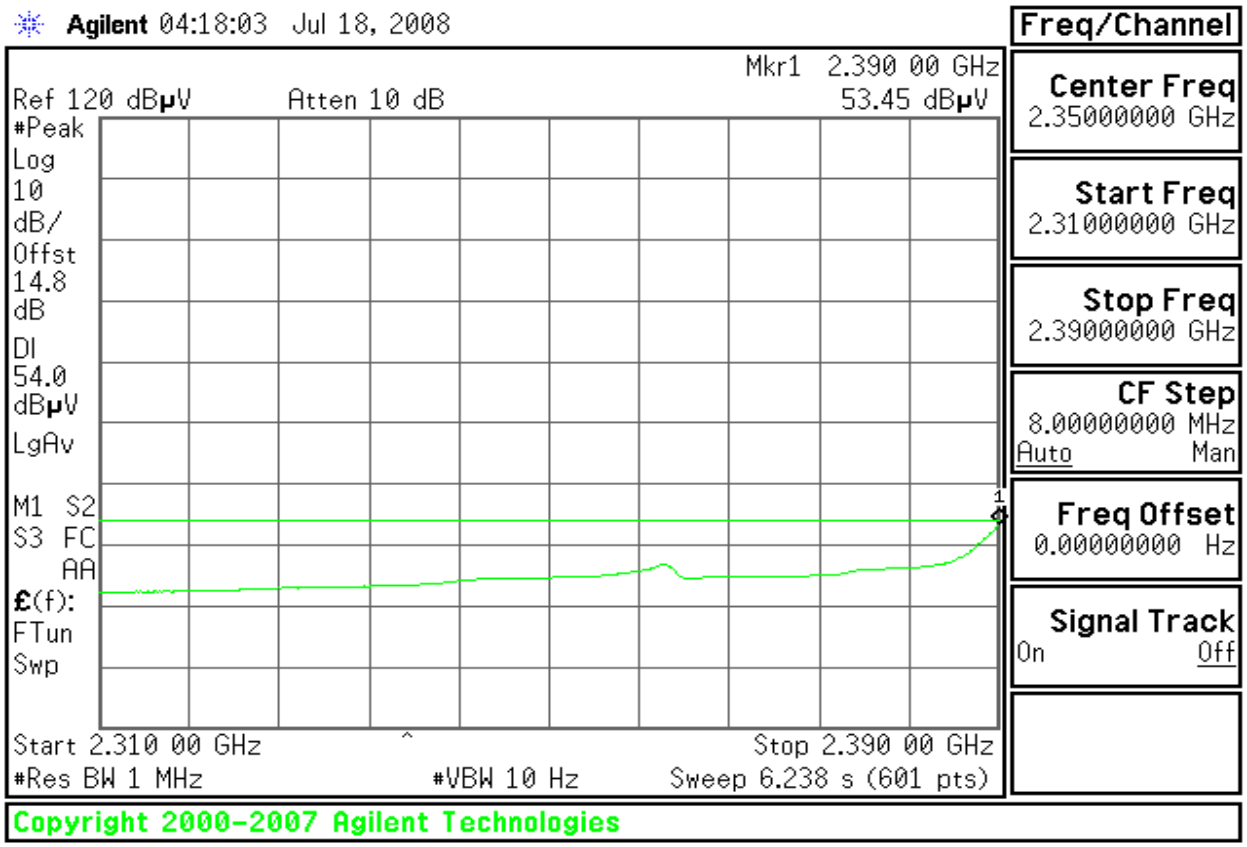


RESTRICTED BANDEDGE (draft 802.11n Standard-20 MHz Channel mode, Low Channel, Vertical)

PEAK

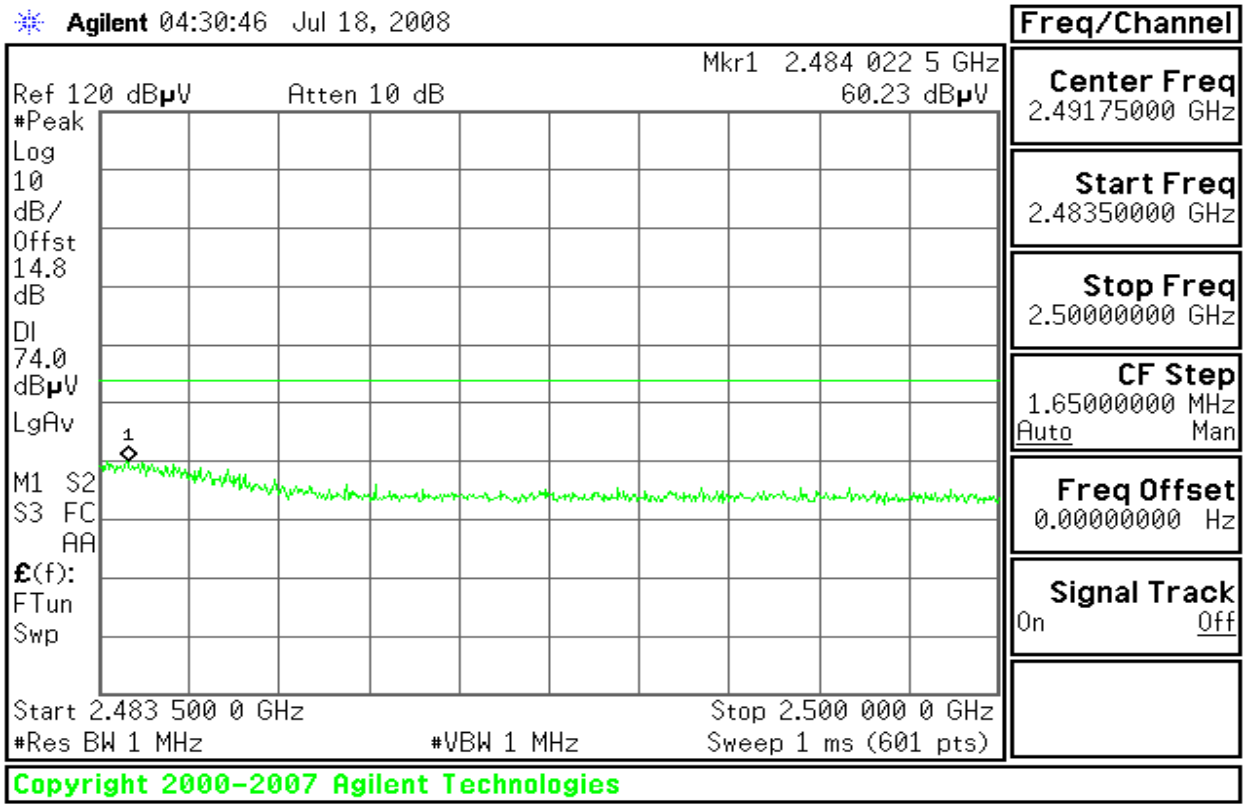


AVG

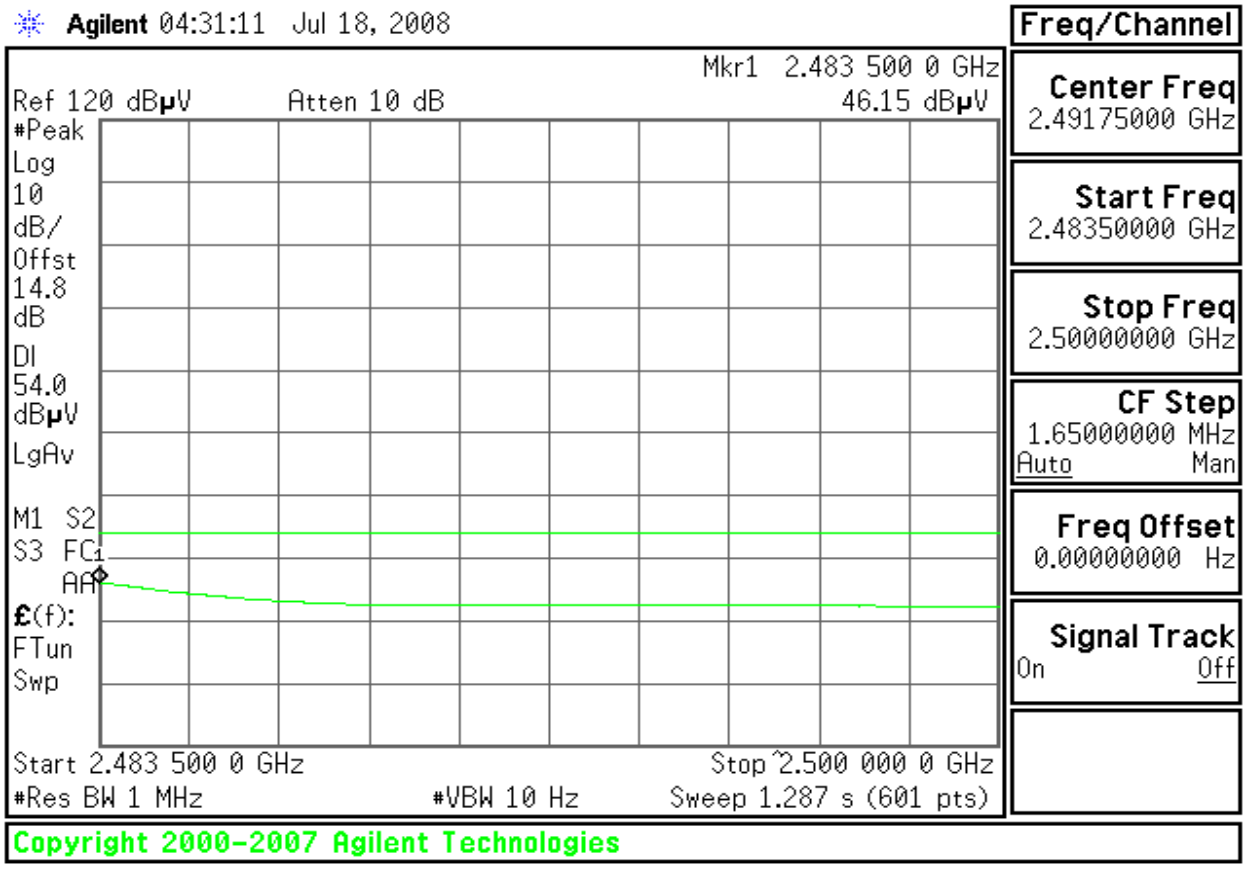


RESTRICTED BANDEDGE (draft 802.11n Standard-20 MHz Channel mode, High Channel, Horizontal)

PEAK

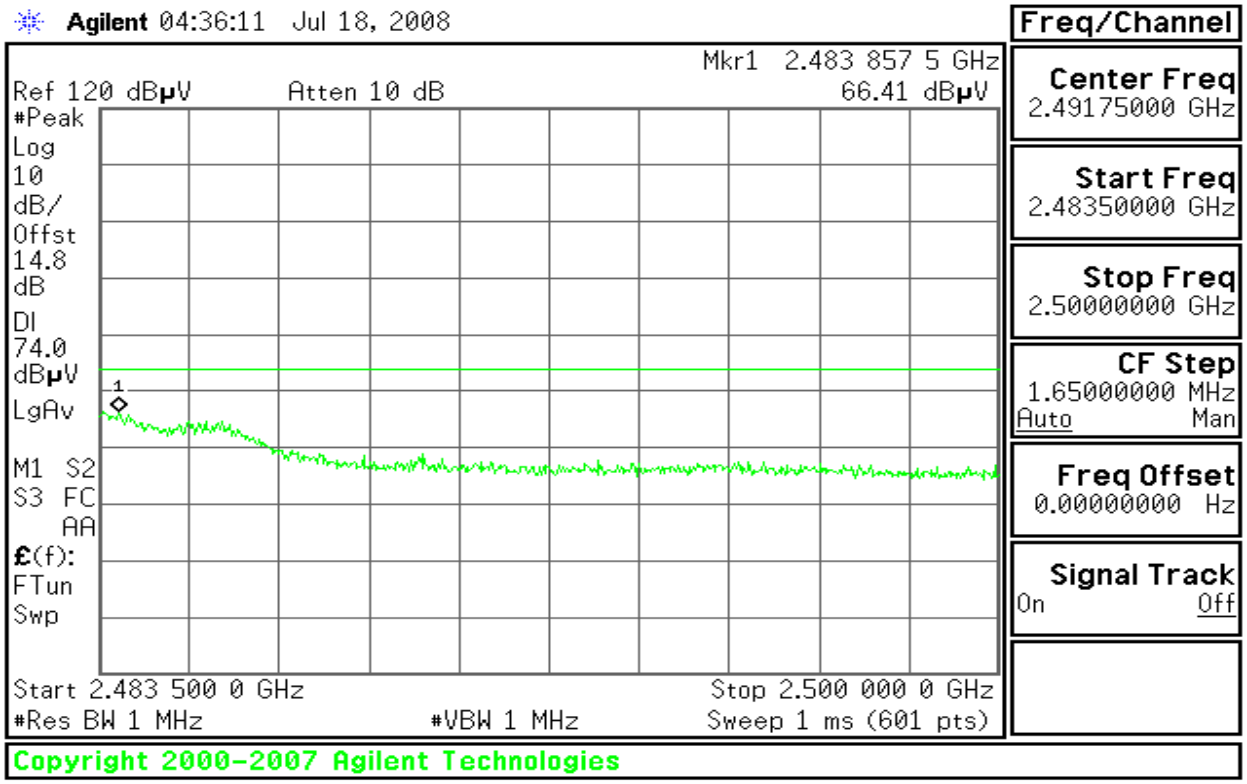


AVG

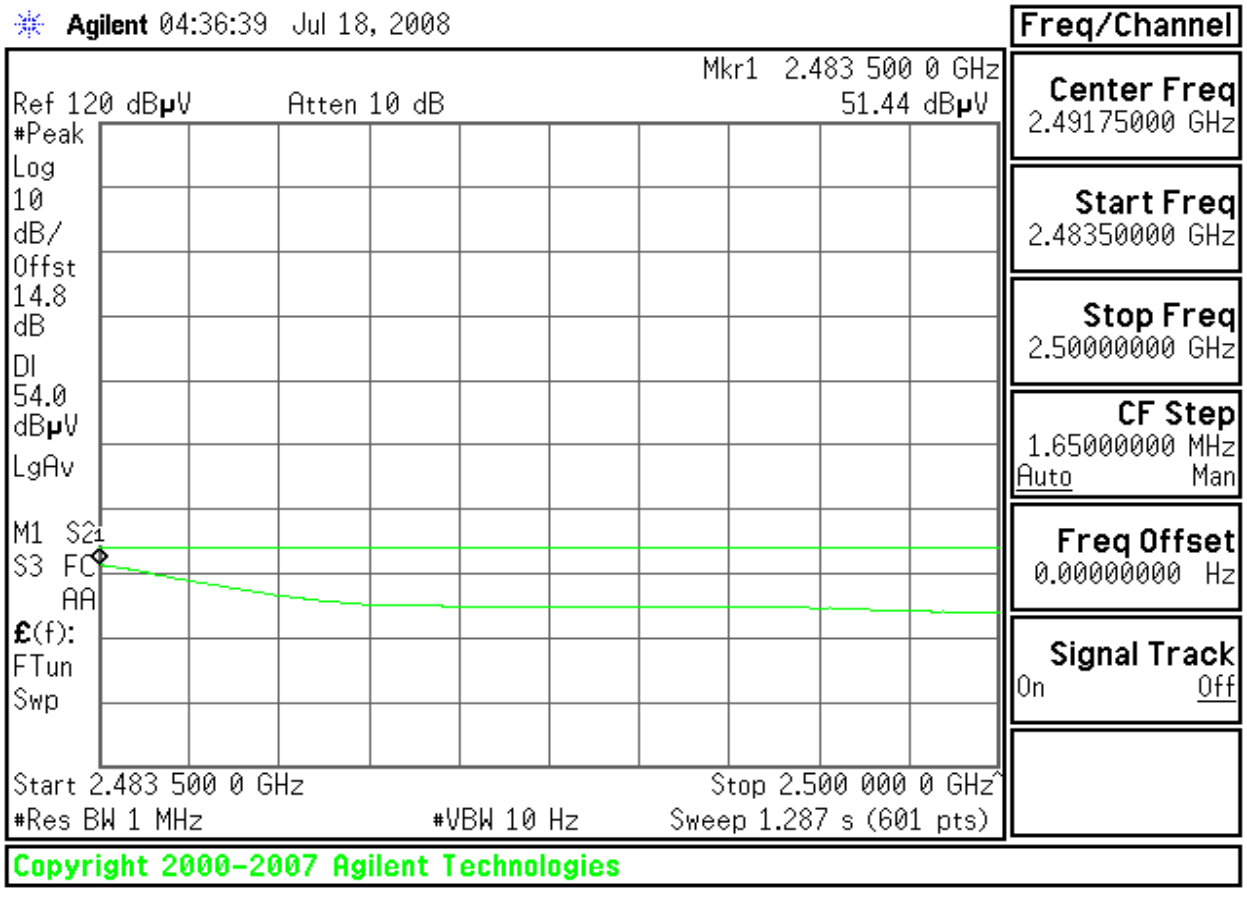


RESTRICTED BANDEDGE (draft 802.11n Standard-20 MHz Channel mode, High Channel, Vertical)

PEAK

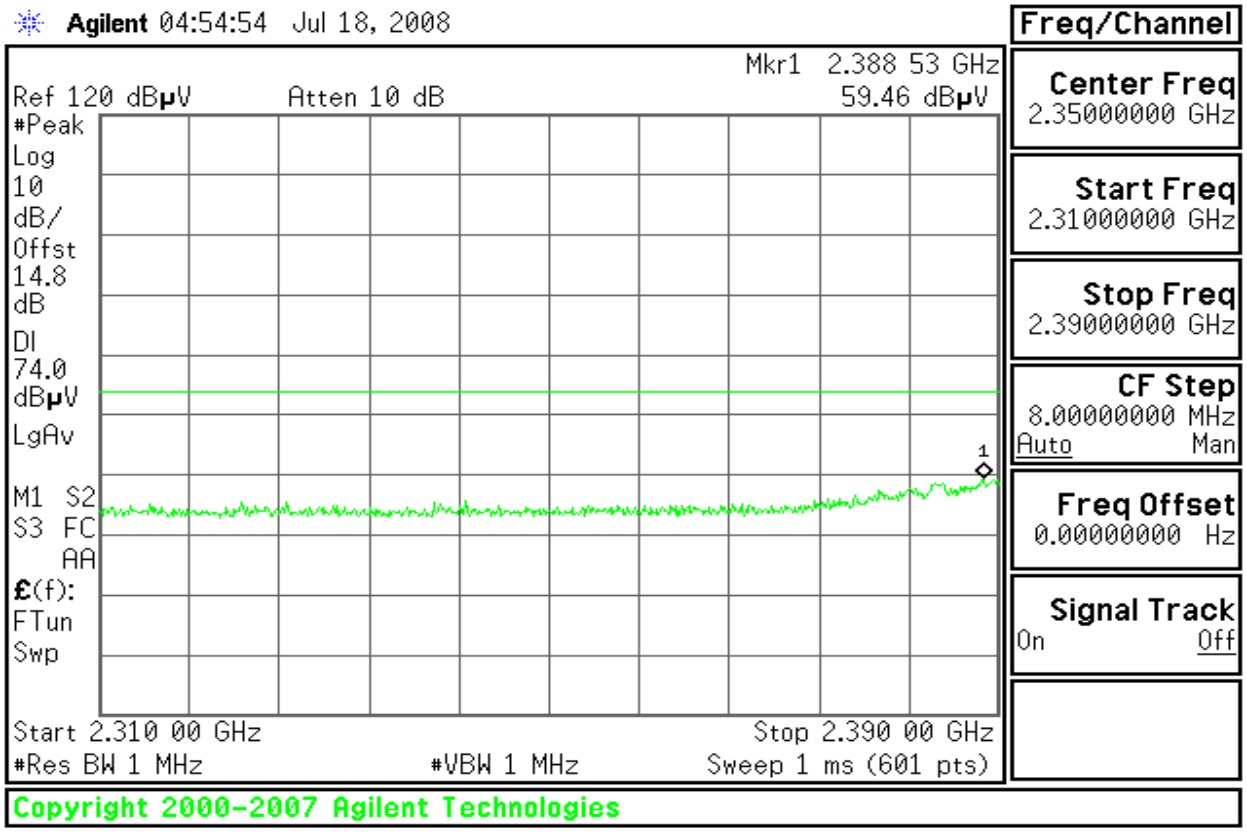


AVG

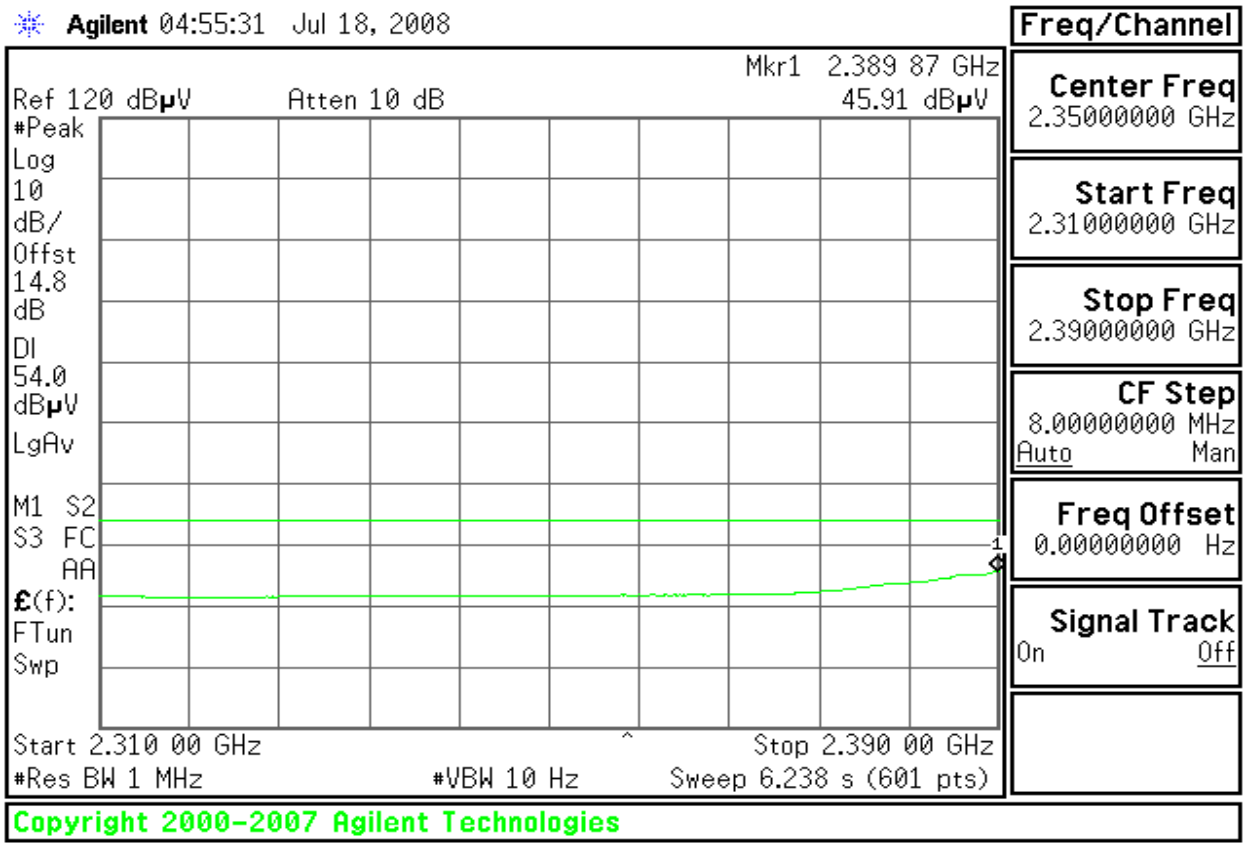


RESTRICTED BANDEDGE (draft 802.11n Wide -40 MHz Channel mode, Low Channel, Horizontal)

PEAK

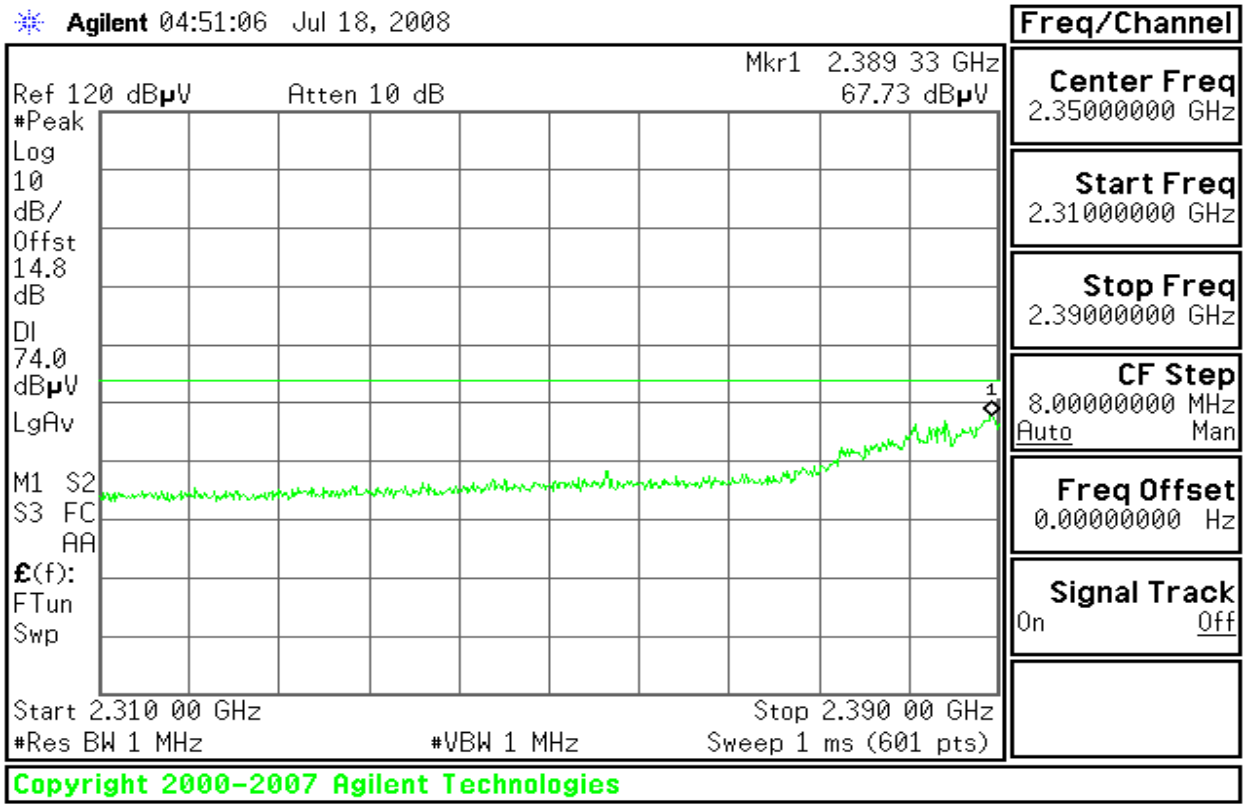


AVG

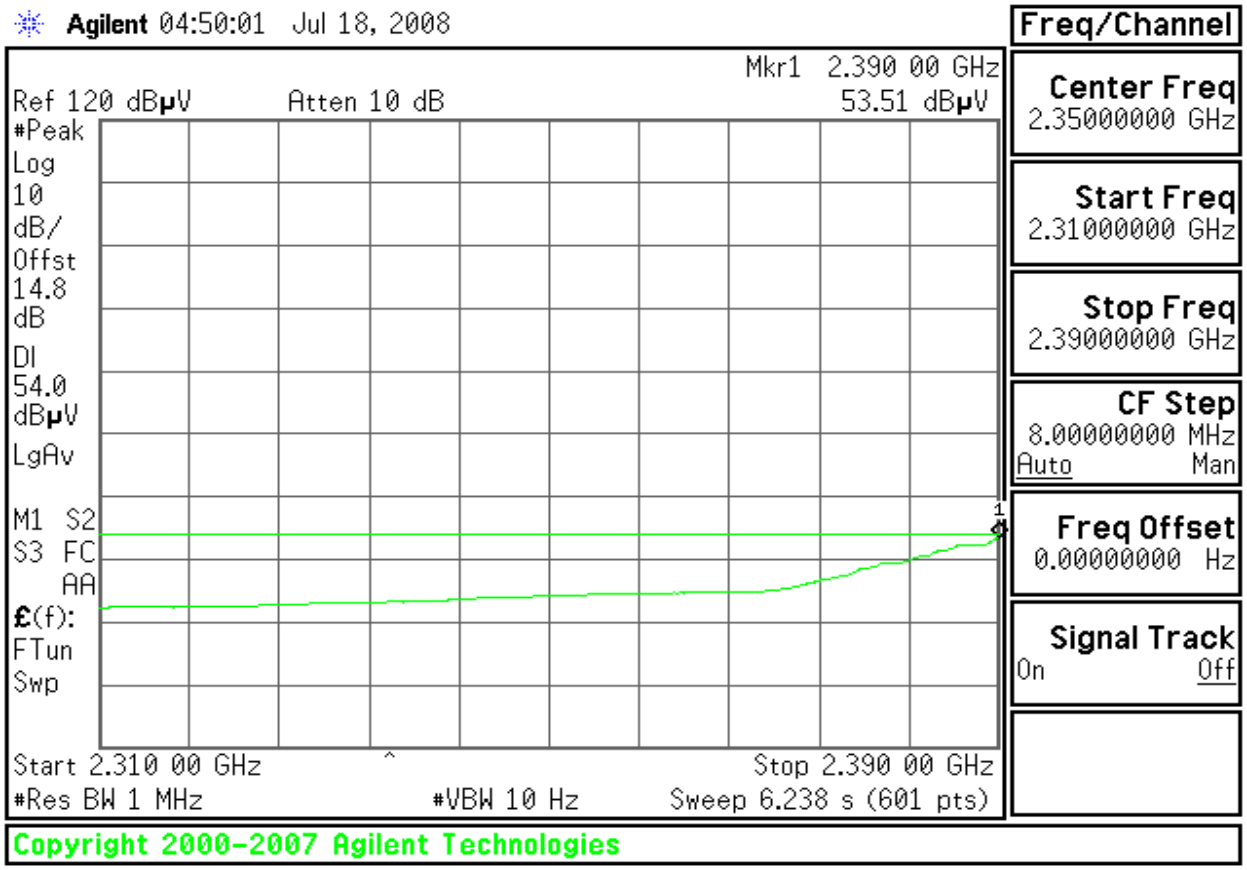


RESTRICTED BANDEDGE (draft 802.11n Wide -40 MHz Channel mode, Low Channel, Vertical)

PEAK

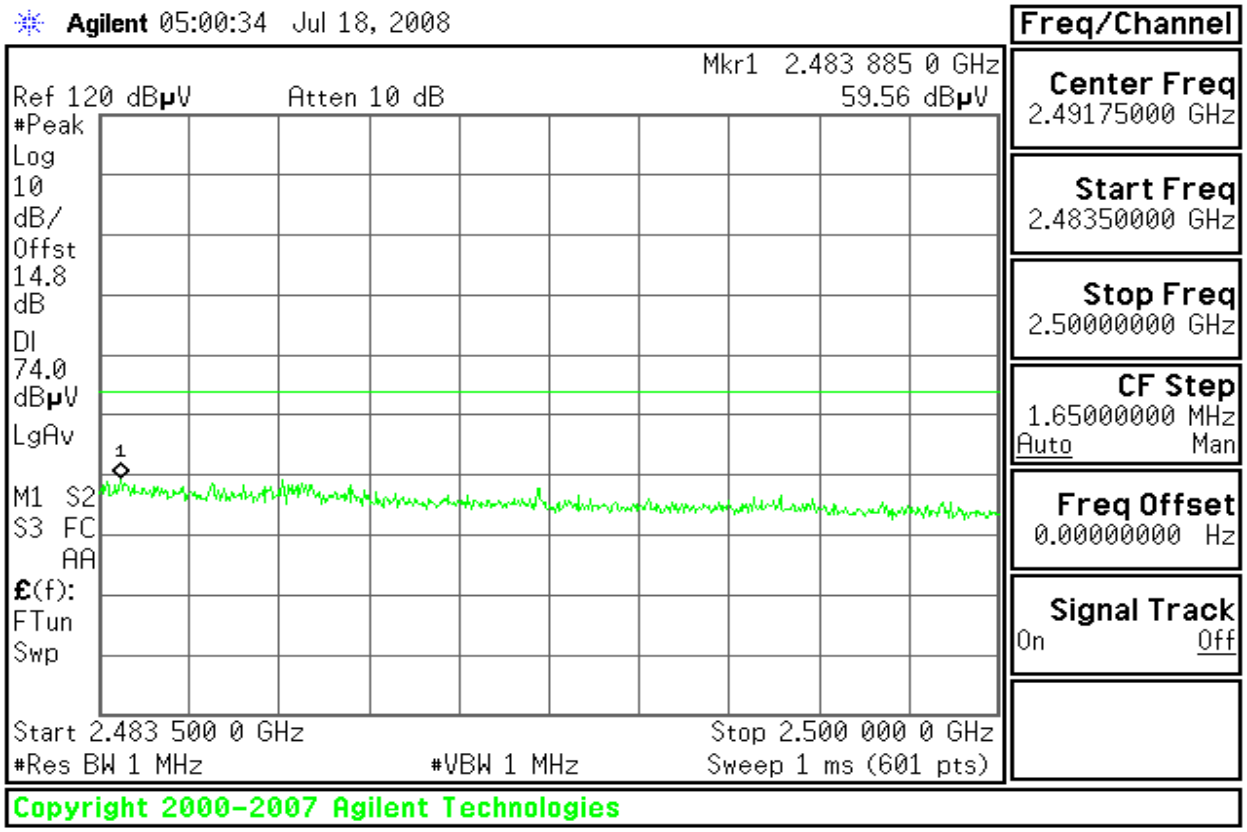


AVG

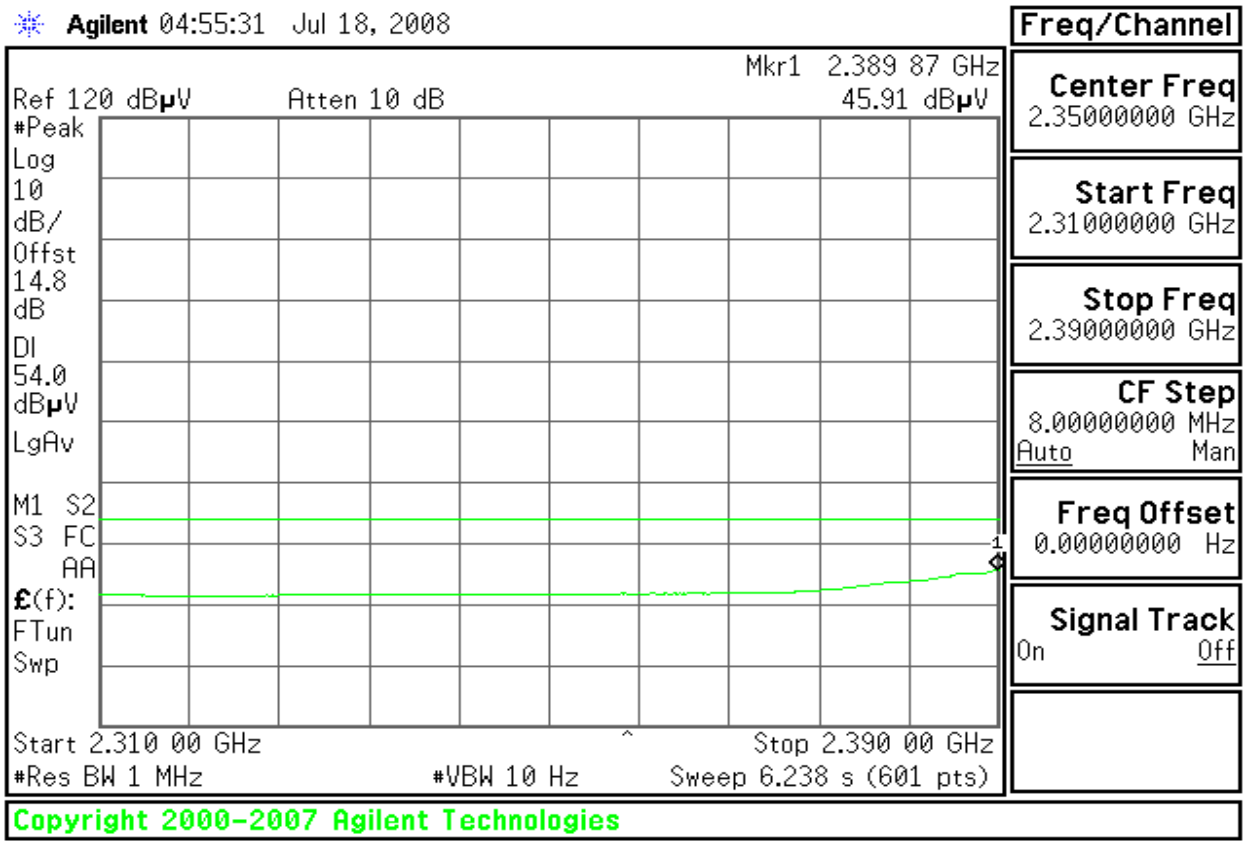


RESTRICTED BANDEDGE (draft 802.11n Wide -40 MHz Channel mode, High Channel, Horizontal)

PEAK

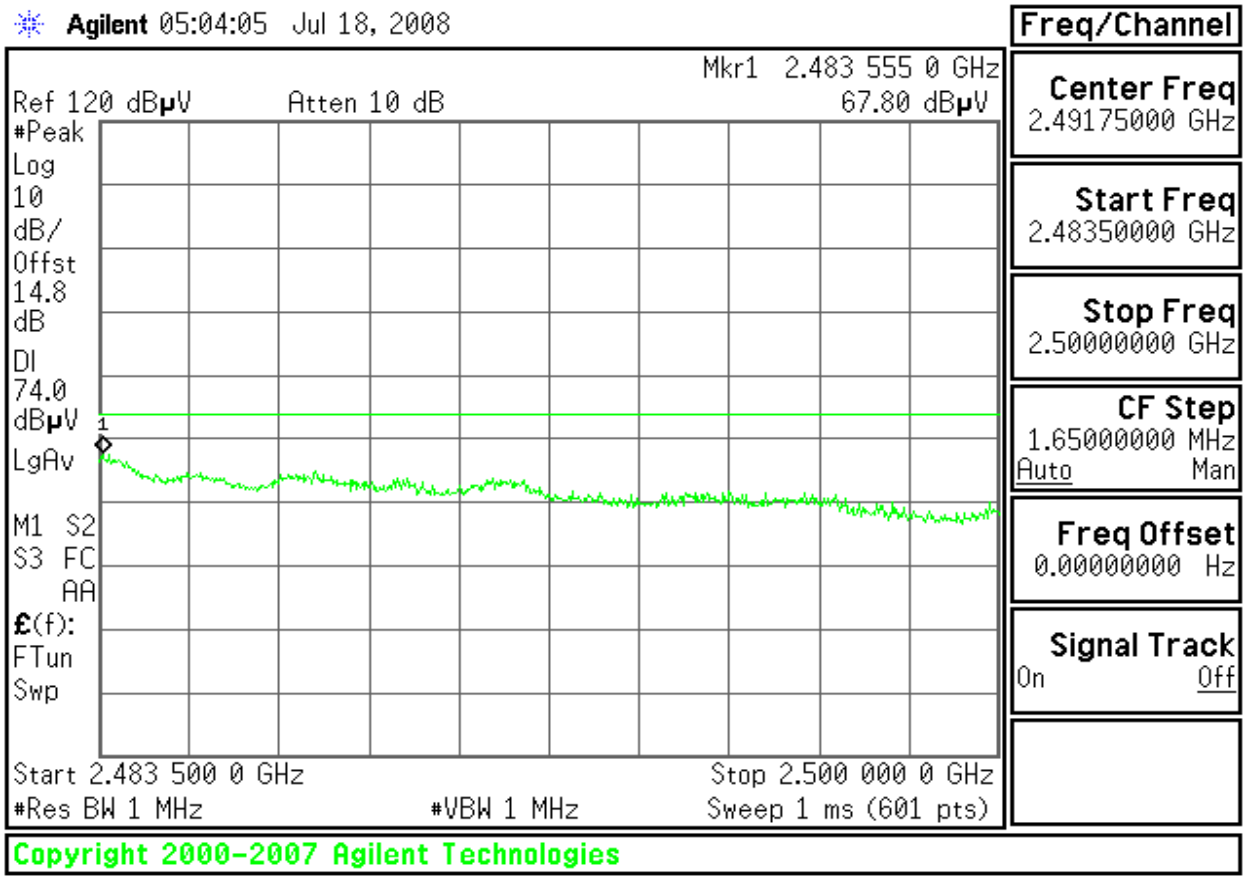


AVG

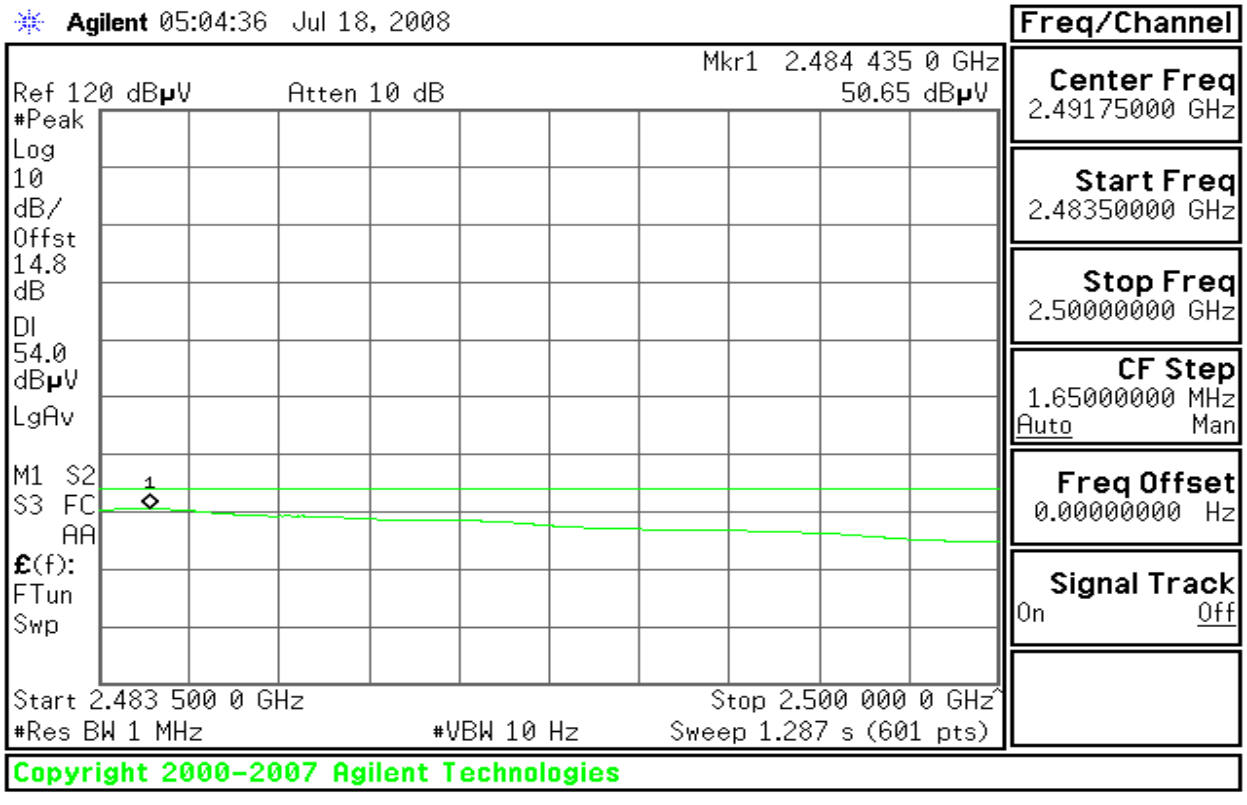


RESTRICTED BANDEDGE (draft 802.11n Wide -40 MHz Channel mode, High Channel, Vertical)

PEAK



AVG



Below 1GHz

Operation Mode: Normal Link **Test Date:** July 20, 2008

Temperature: 22°C **Tested by:** Jeff

Humidity: 48% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.5411	V	35.27	-1.84	33.43	40.00	-6.57	QP
106.8337	V	45.88	-10.58	35.30	43.50	-8.20	Peak
200.4409	V	45.43	-9.20	36.23	43.50	-7.27	Peak
267.5351	V	49.21	-8.05	41.16	46.00	-4.84	Peak
300.0010	V	49.66	-7.41	42.25	46.00	-3.75	QP
500.6012	V	41.82	-2.37	39.45	46.00	-6.55	Peak
30.5411	H	34.12	-1.84	32.28	40.00	-7.72	QP
267.5351	H	43.71	-8.05	35.66	46.00	-10.34	Peak
300.0000	H	48.84	-7.41	41.43	46.00	-4.57	Peak
375.7515	H	41.07	-5.23	35.84	46.00	-10.16	Peak
450.1002	H	38.86	-3.61	35.25	46.00	-10.75	Peak
876.5531	H	33.50	3.39	36.89	46.00	-9.11	Peak

Remark:

1. *Measuring frequencies from 30 MHz to the 1GHz, No emission found between lowest internal used/generated frequency to 30 MHz.*
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:** July 20, 2008

Temperature: 22°C **Tested by:** Jeff

Humidity: 48 % 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
1500.00	V	49.99	---	0.50	50.49	---	74.00	54.00	-3.51	Peak
4825.00	V	36.18	---	12.41	48.59	---	74.00	54.00	-5.74	Peak
7236.67	V	38.85	27.71	15.48	54.33	43.19	74.00	54.00	-10.81	Average
N/A										
1920.00	H	44.02	---	2.22	46.24	---	74.00	54.00	-7.76	Peak
4824.33	H	34.36	---	12.41	46.77	---	74.00	54.00	-7.23	Peak
7233.33	H	38.35	27.48	15.47	53.82	42.95	74.00	54.00	-11.05	Average
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:** July 20, 2008

Temperature: 22°C **Tested by:** Jeff

Humidity: 48 % 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
1280.00	V	40.51	---	0.28	40.79	---	74.00	54.00	-13.21	Peak
4875.00	V	36.43	---	12.68	49.11	---	74.00	54.00	-4.89	Peak
7316.67	V	37.74	26.17	15.72	53.46	41.89	74.00	54.00	-12.11	Average
N/A										
2433.33	H	41.80	---	5.41	47.21	---	74.00	54.00	-6.79	Peak
4876.67	H	35.15	---	12.68	47.83	---	74.00	54.00	-6.17	Peak
7320.67	H	36.82	25.57	15.76	52.58	41.33	74.00	54.00	-12.67	Average
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:** July 20, 2008

Temperature: 22°C **Tested by:** Jeff

Humidity: 48 % 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
1500.00	V	49.32	---	0.50	49.82	---	74.00	54.00	-4.18	Peak
4924.00	V	35.63	---	12.93	48.56	---	74.00	54.00	-5.44	Peak
7386.33	V	39.64	27.89	15.82	55.46	43.71	74.00	54.00	-10.29	Average
N/A										
1920.00	H	44.02	---	2.22	46.24	---	74.00	54.00	-7.76	Peak
4925.33	H	34.28	---	12.93	47.21	---	74.00	54.00	-6.79	Peak
7385.67	H	38.94	26.06	15.82	54.76	41.88	74.00	54.00	-12.12	Average
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:** July 20, 2008

Temperature: 24°C **Tested by:** Jeff

Humidity: 48 % 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
1280.00	V	40.51	---	0.28	40.79	---	74.00	54.00	-13.21	Peak
4825.00	V	35.14	---	12.41	47.55	---	74.00	54.00	-6.45	Peak
7235.82	V	36.85	27.28	15.48	52.33	42.76	74.00	54.00	-11.24	Average
N/A										
1503.34	H	48.29	---	0.50	48.79	---	74.00	54.00	-5.21	Peak
4824.67	H	34.02	---	12.41	46.43	---	74.00	54.00	-7.57	Peak
7236.45	H	35.30	25.54	15.48	50.78	41.02	74.00	54.00	-12.98	Average
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:** July 20, 2008

Temperature: 24°C **Tested by:** Jeff

Humidity: 48 % 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
1466.67	V	43.13	---	0.58	43.71	---	74.00	54.00	-10.29	Peak
4876.34	V	33.61	---	12.68	46.29	---	74.00	54.00	-7.71	Peak
7320.69	V	37.35	25.06	15.76	53.11	40.82	74.00	54.00	-13.18	Average
N/A										
1600.67	H	41.73	---	0.77	42.50	---	74.00	54.00	-11.50	Peak
4875.34	H	32.99	---	12.68	45.67	---	74.00	54.00	-8.33	Peak
7318.25	H	37.14	24.04	15.74	52.88	39.78	74.00	54.00	-14.22	Average
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:** July 20, 2008

Temperature: 24°C **Tested by:** Jeff

Humidity: 48 % 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
1500.00	V	49.83	---	0.50	50.33	---	74.00	54.00	-3.67	Peak
4926.67	V	33.60	---	12.94	46.54	---	74.00	54.00	-7.46	Peak
7386.66	V	37.38	26.35	15.82	53.20	42.17	74.00	54.00	-11.83	Average
N/A										
1920.00	H	42.41	---	2.22	44.63	---	74.00	54.00	-9.37	Peak
4924.58	H	34.38	---	12.93	47.31	---	74.00	54.00	-6.69	Peak
7385.33	H	37.16	25.92	15.82	52.98	41.74	74.00	54.00	-12.26	Average
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 (Chain 0 + Chain 1) / CH Low	**Test Date:**	July 20, 2008
Temperature:	24°C	**Tested by:**	Jeff
Humidity:	48 % 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
1466.67	V	42.38	---	0.58	42.96	---	74.00	54.00	-11.04	Peak
4824.33	V	34.48	---	12.41	46.89	---	74.00	54.00	-7.11	Peak
7235.34	V	37.94	26.68	15.48	53.42	42.16	74.00	54.00	-11.84	Average
N/A										
1500.00	H	46.35	---	0.50	46.85	---	74.00	54.00	-7.15	Peak
4826.33	H	33.32	---	12.41	45.73	---	74.00	54.00	-8.27	Peak
7234.36	H	36.30	23.17	15.48	51.78	38.65	74.00	54.00	-15.35	Average
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 (Chain 0 + Chain 1) / CH Mid	**Test Date:**	July 20, 2008
Temperature:	24°C	**Tested by:**	Jeff
Humidity:	48 % 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
1503.34	V	49.08	---	0.50	49.58	---	74.00	54.00	-4.42	Peak
4876.33	V	34.64	---	12.68	47.32	---	74.00	54.00	-6.68	Peak
7321.23	V	36.89	27.42	15.76	52.65	43.18	74.00	54.00	-10.82	Average
N/A										
1920.33	H	41.23	---	2.22	43.45	---	74.00	54.00	-10.55	Peak
4875.64	H	35.00	---	11.02	46.02	---	74.00	54.00	-7.98	Peak
7316.33	H	39.74	27.50	15.72	55.46	43.22	74.00	54.00	-10.78	Average
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 (Chain 0 + Chain 1) / CH High	**Test Date:**	July 20, 2008
Temperature:	24°C	**Tested by:**	Jeff
Humidity:	48 % 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
1598.67	V	42.69	---	0.76	43.45	---	74.00	54.00	-10.55	Peak
4923.86	V	37.60	---	12.93	46.52	---	74.00	54.00	-7.48	Peak
7385.67	V	38.30	26.99	15.82	54.12	42.81	74.00	54.00	-11.19	Average
N/A										
2433.33	H	41.47	---	5.41	46.88	---	74.00	54.00	-7.12	Peak
4924.67	H	32.74	---	12.93	45.67	---	74.00	54.00	-8.33	Peak
7384.78	H	39.64	28.09	15.82	55.46	43.91	74.00	54.00	-10.09	Average
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 (Chain 0 + Chain 1) / CH Low	**Test Date:**	July 20, 2008
Temperature:	24°C	**Tested by:**	Jeff
Humidity:	48 % 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
1500.33	V	48.07	---	0.50	48.57	---	74.00	54.00	-5.43	Peak
4825.34	V	35.42	---	12.41	47.83	---	74.00	54.00	-6.17	Peak
7235.54	V	39.27	27.80	15.48	54.75	43.28	74.00	54.00	-10.72	Average
N/A										
1920.00	H	44.33	---	2.22	46.55	---	74.00	54.00	-9.75	Peak
4824.67	H	34.38	---	12.41	46.79	---	74.00	54.00	-5.29	Peak
7236.67	H	38.55	26.67	15.48	54.03	42.15	74.00	54.00	-11.85	Average
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 (Chain 0 + Chain 1) / CH Mid	**Test Date:**	July 20, 2008
Temperature:	24°C	**Tested by:**	Jeff
Humidity:	48 % 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
1500.00	V	48.17	---	0.50	48.67	---	74.00	54.00	-5.33	Peak
4874.55	V	33.74	---	12.68	46.42	---	74.00	54.00	-7.58	Peak
7313.34	V	36.77	25.38	15.71	52.48	41.09	74.00	54.00	-12.91	Average
N/A										
1466.63	H	43.99	---	0.58	44.57	---	74.00	54.00	-9.43	Peak
4874.33	H	32.75	---	12.68	45.43	---	74.00	54.00	-8.57	Peak
7314.56	H	36.26	24.11	15.71	51.97	39.82	74.00	54.00	-14.18	Average
N/A										

Remark:

7. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
8. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
9. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
10. *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.*
11. *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.*
12. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	TX / draft 802.11n Wide-40 MHz Channel mode (Chain 0 + Chain 1) / CH High	**Test Date:**	July 20, 2008
Temperature:	24°C	**Tested by:**	Jeff
Humidity:	48 % 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
1500.00	V	48.04	---	0.50	48.54	---	74.00	54.00	-5.46	Peak
4925.34	V	37.72	---	12.93	47.07	---	74.00	54.00	-6.93	Peak
7388.64	V	37.89	26.25	15.83	53.72	42.08	74.00	54.00	-11.92	Average
N/A										
2433.33	H	41.47	---	5.41	46.88	---	74.00	54.00	-7.12	Peak
4924.82	H	33.58	---	12.93	46.51	---	74.00	54.00	-7.49	Peak
7386.56	H	36.35	24.57	15.82	52.17	40.39	74.00	54.00	-13.61	Average
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).*

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:**	July 19, 2008
Temperature:	23°C	Tested by:	Jeff
Humidity:	50% RH		

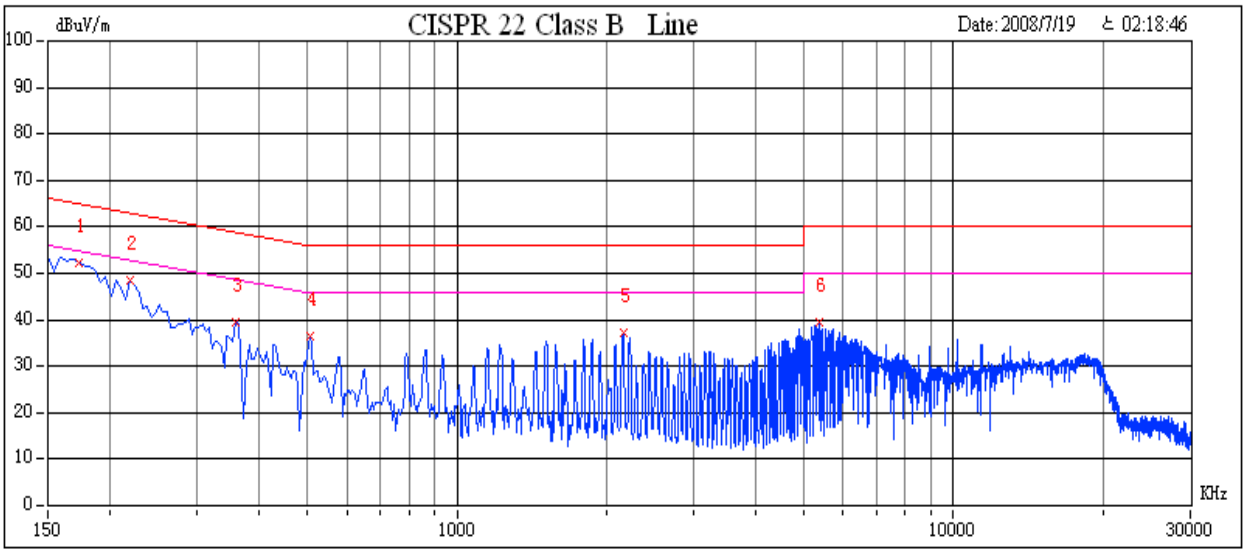
Freq. (MHz)	PEAK. Raw (dBuV)	Q.P. Raw (dBuV)	AVG Raw (dBuV)	Q.P. Limit (dBuV)	AVG Limit (dBuV)	Margin (dB)	Factor (dB)	Remark
0.163	52.60	46.89	16.82	65.63	55.63	-38.81	11.36	Line
0.211	48.63	41.63	26.38	64.26	54.26	-27.88	10.37	Line
0.358	39.40	34.08	27.03	60.07	50.07	-23.04	10.20	Line
0.499	36.41	35.29	33.44	56.01	46.01	-12.57	10.07	Line
2.154	37.33	31.04	14.10	56.00	46.00	-31.90	10.33	Line
5.362	39.44	33.37	25.05	60.00	50.00	-24.95	10.55	Line
0.167	50.76	46.03	16.40	65.53	55.53	-18.11	11.32	Neutral
0.219	49.83	39.35	29.18	64.02	54.02	-24.84	10.28	Neutral
0.500	37.25	36.71	35.04	56.00	46.00	-10.96	10.22	Neutral
0.854	35.84	35.21	32.53	56.00	46.00	-13.47	10.11	Neutral
1.141	36.09	35.25	32.69	56.00	46.00	-13.31	10.11	Neutral
2.216	37.55	33.18	25.96	56.00	46.00	-20.04	10.40	Neutral

Remark:

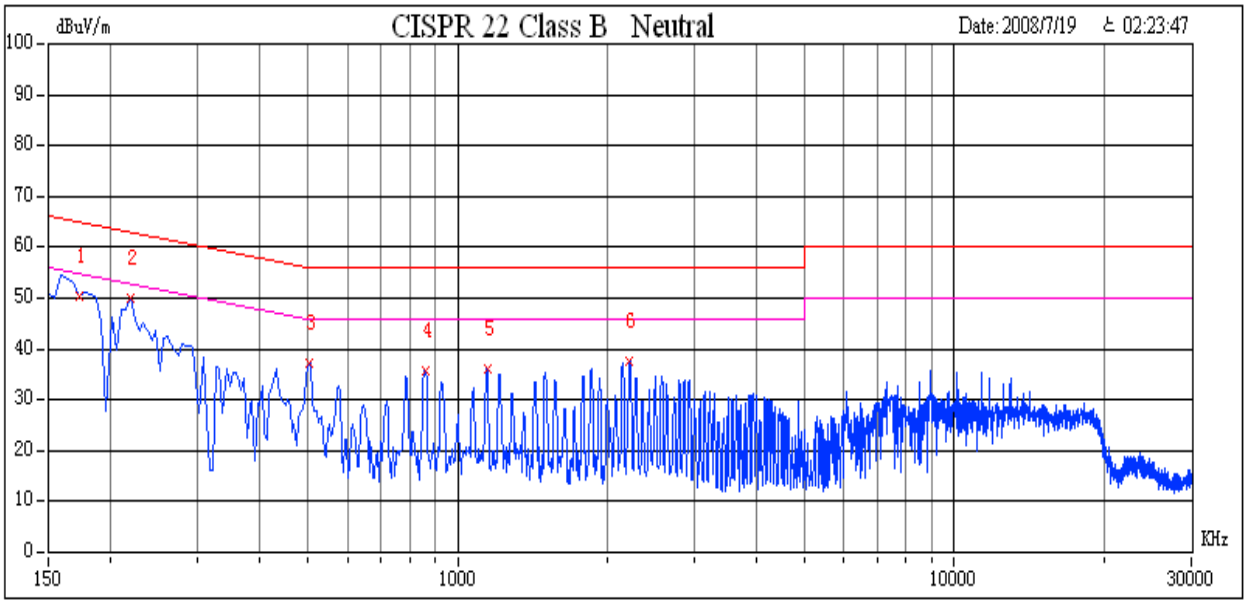
1. *Measuring frequencies from 0.15 MHz to 30MHz.*
2. *The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
3. *The IF bandwidth of SPA between 0.15MHz and 30MHz was 10 kHz; the IF bandwidth of Test Receiver between 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 1
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	iNIC card
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: 16.19 dBm (41.59mW)** **IEEE 802.11g mode: 14.06 dBm (25.47mW)** **draft 802.11n Standard-20 MHz Channel mode: 13.89 dBm (24.49mW)** **draft 802.11n Wide-40 MHz Channel mode: 12.26 dBm (16.83mW)**
Antenna gain (Max)	Dipole Antenna / Gain 5.13dBi (Numeric gain: 3.26)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:

1. *The maximum output power is 16.19dBm (41. 59mW) at 2412MHz (with 3.26 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:

EUT output power = 41.59mW

Numeric Antenna gain = 3.26

→ Power density = 0.0270 mW / cm^2

IEEE 802.11g:

EUT output power = 25.47mW

Numeric Antenna gain = 3.26

→ Power density = 0.0165 mW / cm^2

draft 802.11n Standard-20 MHz Channel mode

EUT output power = 24.49mW

Numeric Antenna gain = 3.26

*→ Power density = 0.0159 mW / cm^2 *2=0.0318 mW / cm^2*

draft 802.11n Wide-40 MHz Channel mode

EUT output power = 16. 83mW

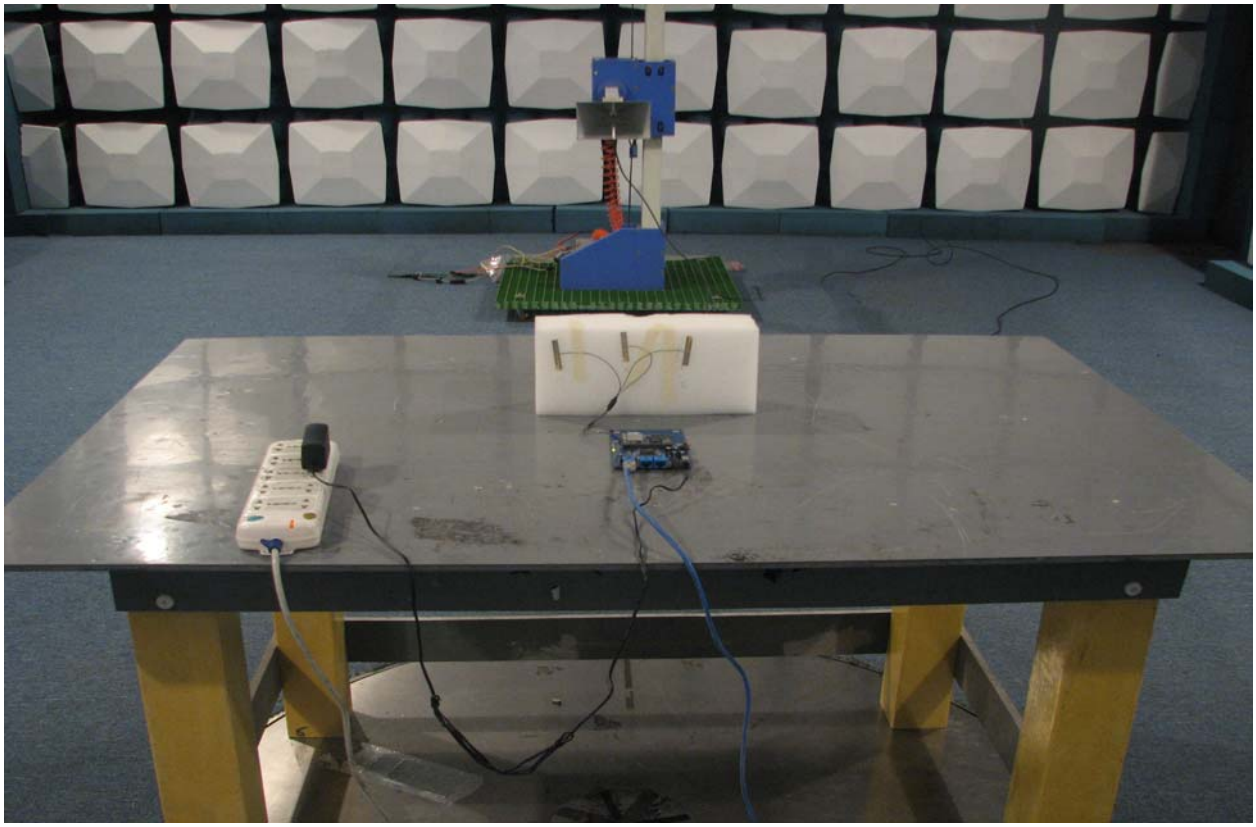
Numeric Antenna gain = 3.26

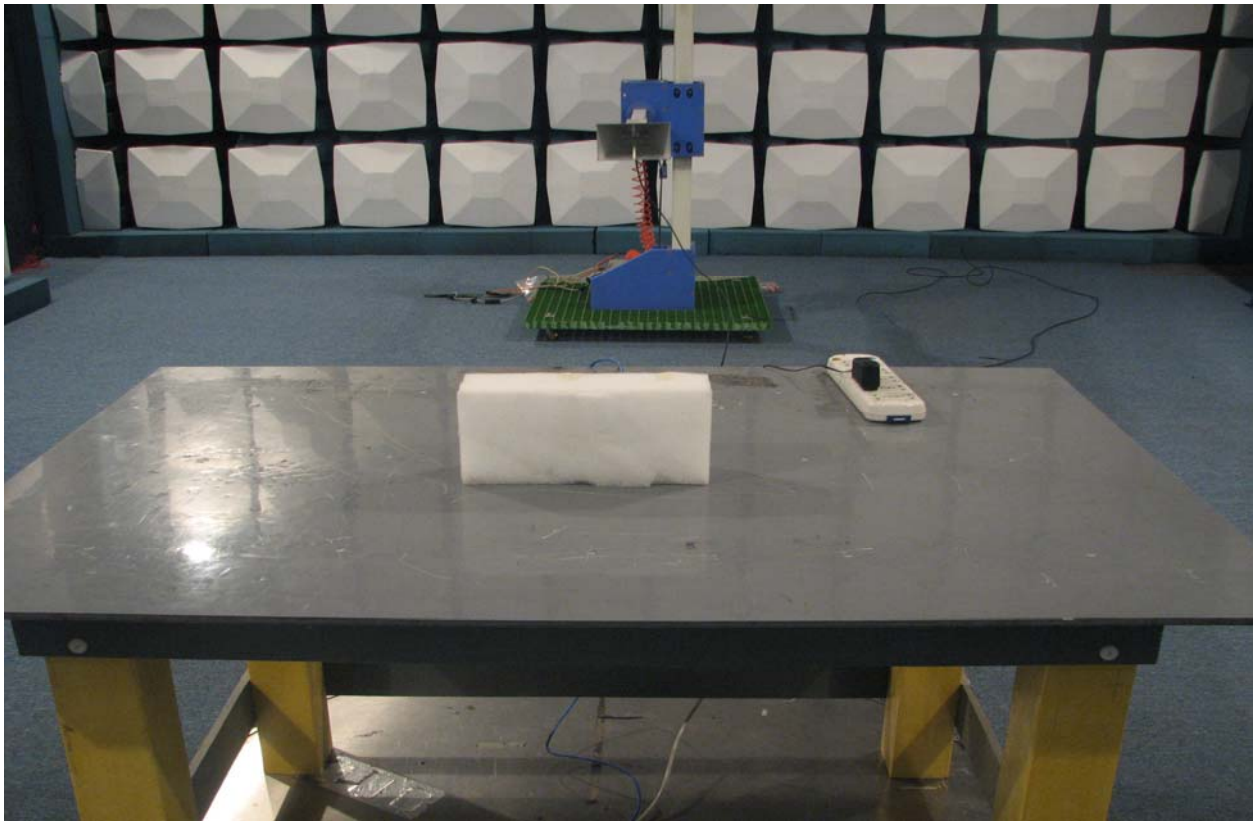
*→ Power density = 0.0109 mW / cm^2 *2=0.0218 mW / cm^2*

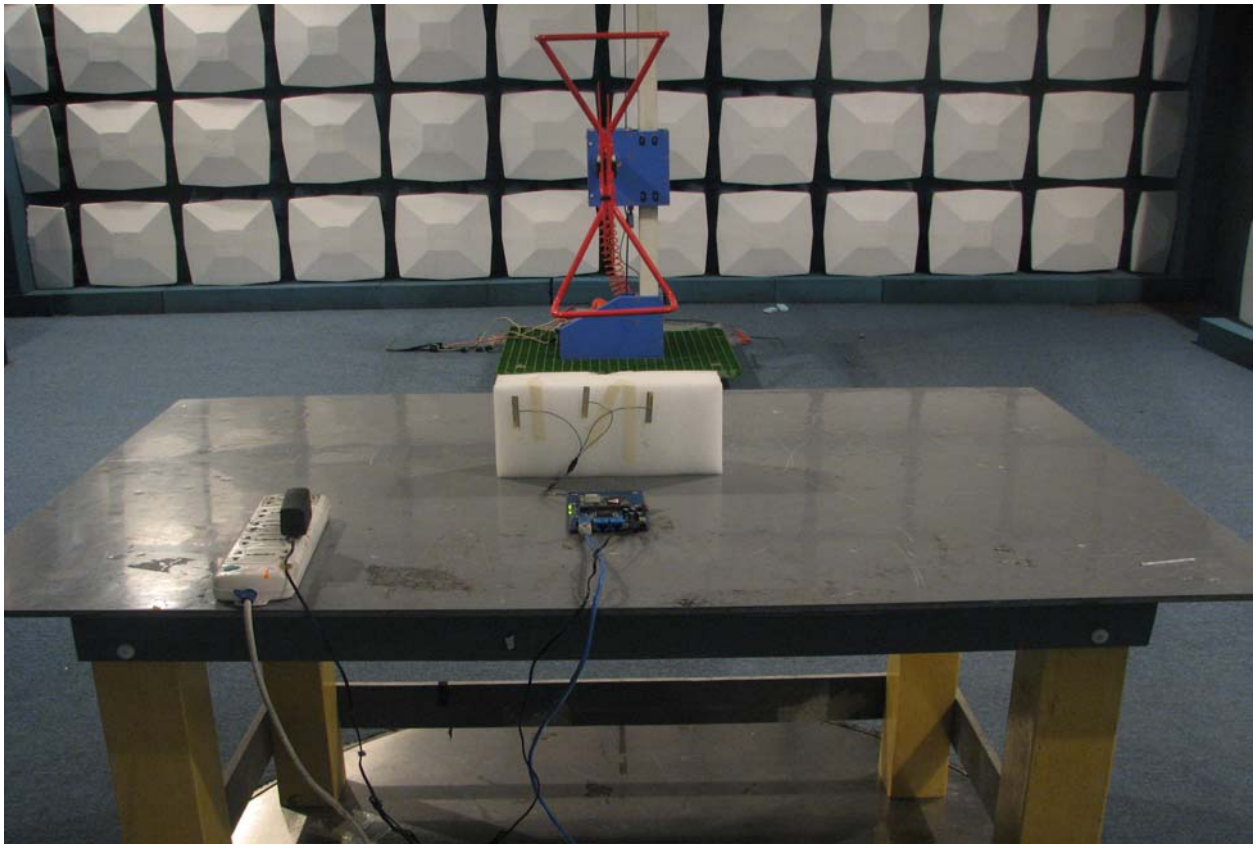
(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.)

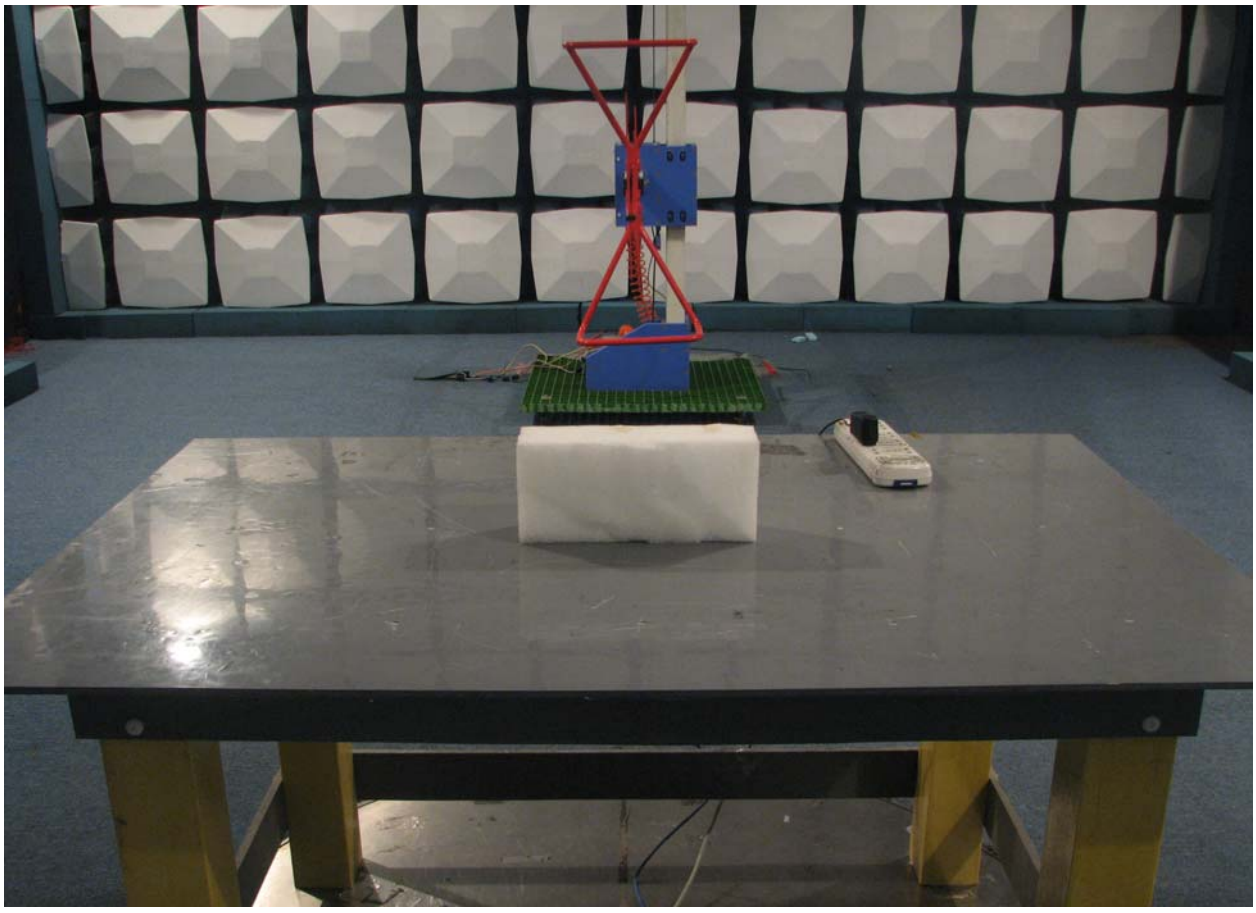
APPENDIX 2
PHOTOGRAPHS OF TEST SETUP

Radiated Emissions Setup Photos









Powerline Conducted Emissions Setup Photos