FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

802.11a/b/g/n access point

Model: HiveAP 320

Trade Name: Aerohive

Issued to

Aerohive Networks, Inc.

3150-C Coronado Drive Santa Clara, California 95054

Prepared by

COMPLIANCE CERTIFICATION SERVICES (KUNSHAN) INC.
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Kunshan city JiangSu, (215300) CHINA
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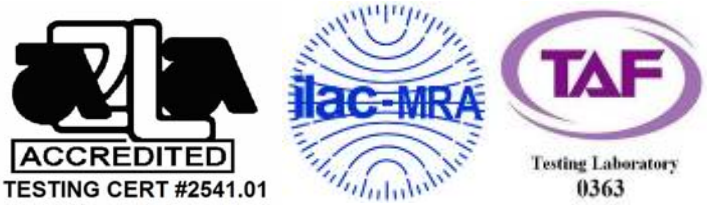


TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION

Applicant:	Aerohive Networks, Inc. 3150-C Coronado Drive Santa Clara, California 95054
Equipment Under Test:	802.11a/b/g/n access point
Trade Name:	Aerohive
Model:	HiveAP 320
Date of Test:	August 22, 2008 ~ February 2,2009

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Miro Chueh
EMC Manager
Compliance Certification Service Inc.

Reviewed by:

Lin Zhang
EMC Section Manager
Compliance Certification Service Inc.

2. EUT DESCRIPTION

Product	802.11a/b/g/n access point
Trade Name	Aerohive
Model Number	HiveAP 320
Frequency Range	2412 ~ 2462 MHz 5725 ~ 5825 MHz
Transmit Power	IEEE 802.11b mode: 15.38dBm IEEE 802.11g mode: 15.92dBm draft 802.11gn Standard-20 MHz Channel mode: 20.18 dBm draft 802.11gn Wide-40 MHz Channel mode: 21.23 dBm IEEE 802.11a mode: 16.91dBm draft 802.11an Standard-20 MHz Channel mode:21.38 dBm draft 802.11an Wide-40 MHz Channel mode: 22.85 dBm (the EUT transmitting and receiving with three antennas simultaneously working at n mode)
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) IEEE 802.11a 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 IEEE 802.11a mode: 4 Channels draft 802.11n Standard-20 MHz Channel mode: 11 Channels draft 802.11n Wide-40 MHz Channel mode: 7 Channels
Antenna Specification	Three Puck antennas for 2.4GHz Gain 2dBi /Total gain 6.77 dBi and Three Puck antennas for 5 GHz Gain 3 dBi/Total gain 7.77 dBi

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: **WBV-HIVEAP320DFS** 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 2003and FCC CFR 47 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 2003 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4 2003.

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 EUT transmitting and receiving with one (chain 0) antenna working at a/b/g mode, so one antenna working configuration was used for a/b/g mode testing in this report.

The EUT transmitting and receiving with three antennas simultaneously working at n mode, so 3x3 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.

EEE802.11a: Channel low(5745MHz), Channel middle(5785MHz) and Channel high(5805MHz) with preliminary test 54/48/36/24/18/12/9/6 Mbps, After the preliminary scan , the following test mode 6Mbps data rate (the worst case) are chosen for the final testing.

draft 802.11gn 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 802.11gn Wide-40 MHz Channel mode: Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with MCS8 data rate were chosen for full testing.

draft 802.11an Wide-40 MHz Channel mode: Channel Low (5755MHz), Channel High (5795MHz) with MCS8 data rate were chosen for full testing.

The following test mode was scanned during the preliminary test:

Mode 1: Wall, ceiling mounting, set the EUT vertically on the table top with power from AC power.
Mode 2: Wall, ceiling mounting, set the EUT vertically on the table top with power from Ethernet .
Mode 3: Table top mounting, set the EUT horizontally on the table top with power from AC power.
Mode 4: Table top mounting, set the EUT horizontally on the table top with power from Ethernet.

After the preliminary scan, the following test mode was found to produce the highest emission level.

Mode 3: Table top mounting, set the EUT horizontally on the table top with power from AC power.

Then, the EUT configuration and cable configuration of the above highest emission mode was recorded for all final test items.

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	11/12/2009
Peak and Avg Power Sensor	Agilent	E9327A	US40441788	09/11/2009
EPM-P Series Power Meter	Agilent	E4416A	QB41292714	09/11/2009

3M Semi Anechoic Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	11/12/2009
Pre-Amplfier	Miteq	NSP4000-NF	870731	01/21/2010
Horn Antenna	Austriah	BBHA9120D	D267	05/09/2009
SHF-EHF Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170171	04/12/2009
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	12/11/2009
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	11/22/2009

Remark: *The measurement uncertainty is less than +/-2.0065dB (30MHz ~ 1GHz), +/-3.0958dB (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.The measurement uncertainty is less than +/-2.50dB (30MHz ~ 1GHz), +/-3.169dB (Above 1GHz)*

Expanded Uncertainty (95% CONFIDENCE INTERVAL): K=2

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

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

Expanded Uncertainty (95% CONFIDENCE INTERVAL): K=2

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 2003 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.	Device Type	Brand	Model	Series No.	FCC ID
1.	Notebook pc	IBM	X31	32P4413	DOC
2.	Notebook pc	DELL	4150	CN-04P20	DOC

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.*

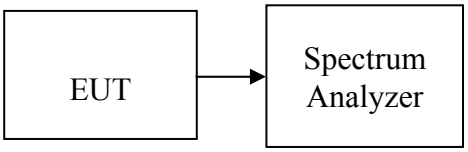
7. FCC PART 15.247 REQUIREMENTS

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	11.142	>500	PASS
Mid	2437	11.254		PASS
High	2462	11.527		PASS

IEEE 802.11g mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.407	>500	PASS
Mid	2437	16.409		PASS
High	2462	16.427		PASS

TRANSMIT CHAIN 0

draft 802.11gn Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.247	>500	PASS
Mid	2437	17.614		PASS
High	2462	17.575		PASS

draft 802.11gn Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.378	>500	PASS
Mid	2437	36.254		PASS
High	2452	36.243		PASS

TRANSMIT CHAIN 1

draft 802.11gn Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.604	>500	PASS
Mid	2437	17.274		PASS
High	2462	17.630		PASS

draft 802.11gn Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.378	>500	PASS
Mid	2437	36.420		PASS
High	2452	36.141		PASS

TRANSMIT CHAIN 2

draft 802.11gn Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.745	>500	PASS
Mid	2437	17.662		PASS
High	2462	17.379		PASS

draft 802.11gn Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.114	>500	PASS
Mid	2437	36.379		PASS
High	2452	36.389		PASS

IEEE 802.11a mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.646	>500	PASS
Mid	5785	17.423		PASS
High	5805	17.173		PASS

TRANSMIT CHAIN 0

draft 802.11an Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.651	>500	PASS
Mid	5785	17.635		PASS
High	5805	17.696		PASS

draft 802.11an Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	5755	35.796	>500	PASS
High	5795	36.406		PASS

TRANSMIT CHAIN 1

draft 802.11an Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.672	>500	PASS
Mid	5785	17.014		PASS
High	5805	17.660		PASS

draft 802.11an Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	5755	35.825	>500	PASS
High	5795	36.494		PASS

TRANSMIT CHAIN 2

draft 802.11an Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.616	>500	PASS
Mid	5785	17.652		PASS
High	5805	17.671		PASS

draft 802.11an Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	5755	35.505	>500	PASS
High	5795	35.974		PASS

TRANSMIT CHAIN 0+ CHAIN 1+ CHAIN 2

draft 802.11gn Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.089	>500	PASS
Mid	2437	17.576		PASS
High	2462	17.641		PASS

draft 802.11gn Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.396	>500	PASS
Mid	2437	36.408		PASS
High	2452	36.337		PASS

TRANSMIT CHAIN 0+ CHAIN 1+ CHAIN 2

draft 802.11an Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.319	>500	PASS
Mid	5785	17.634		PASS
High	5805	16.915		PASS

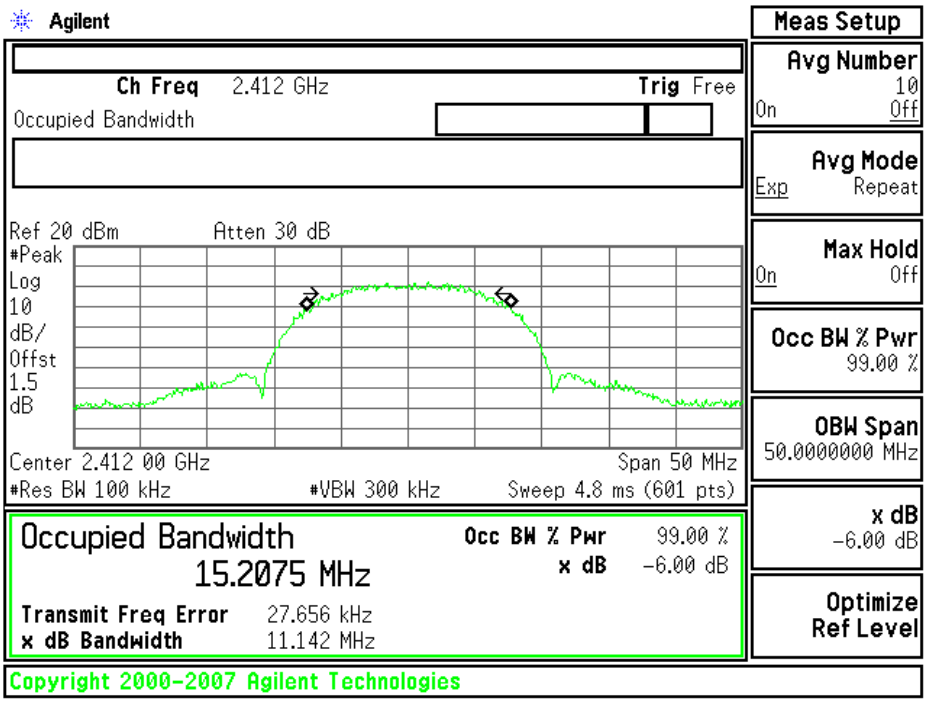
draft 802.11an Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	5755	35.769	>500	PASS
High	5795	36.314		PASS

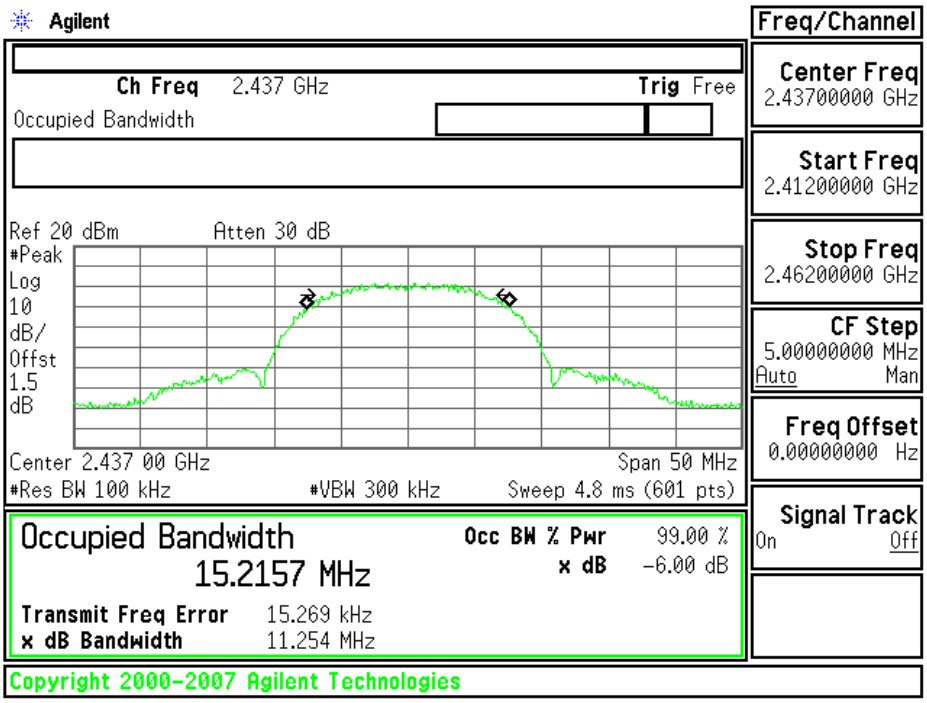
Test Plot

IEEE 802.11b MODE

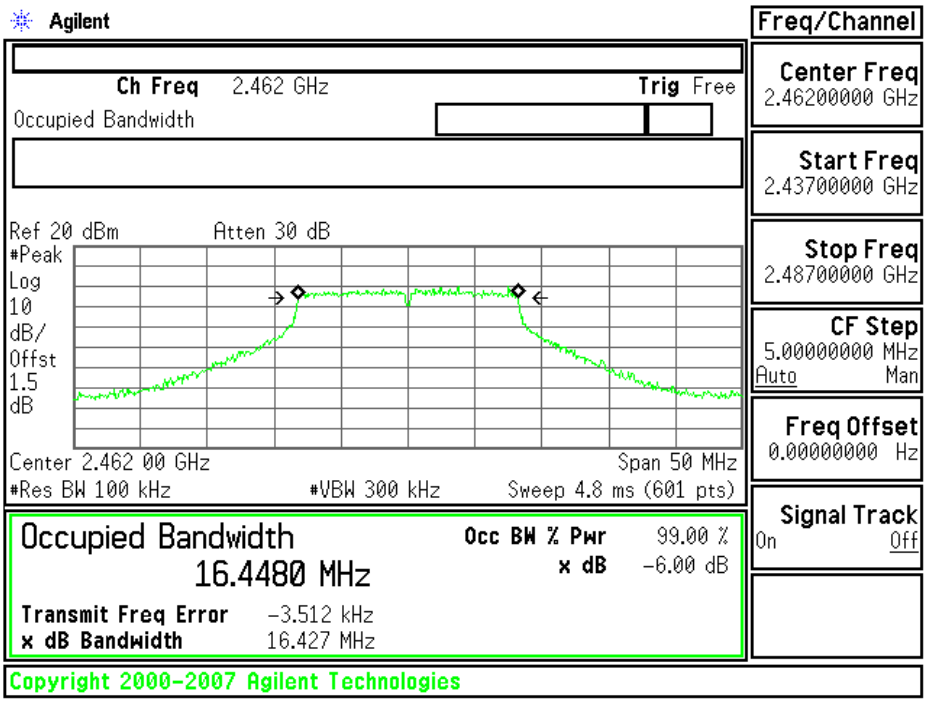
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

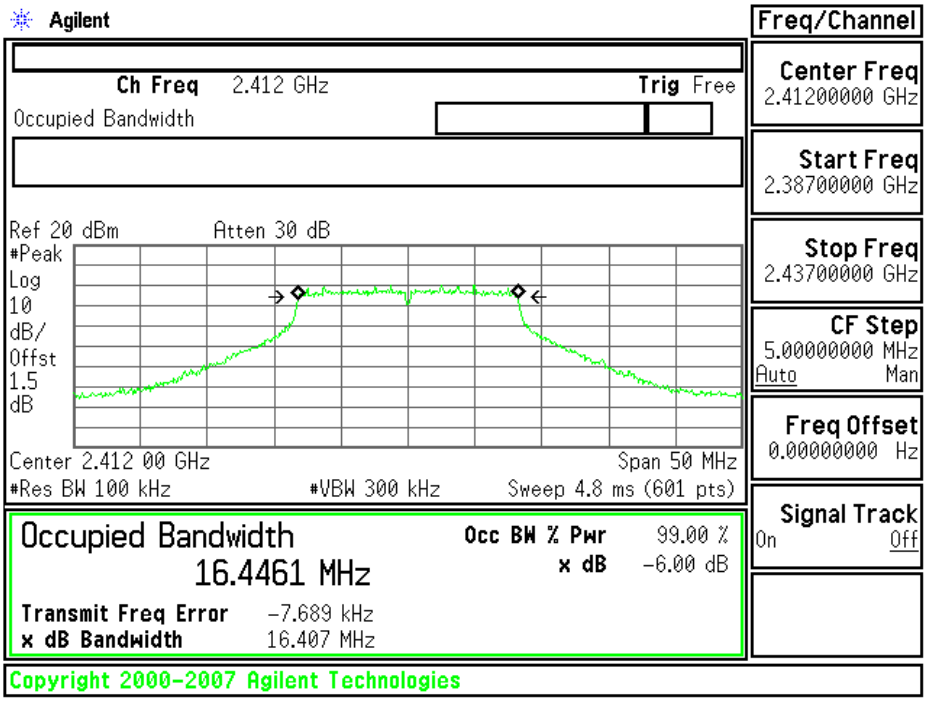


6dB Bandwidth (CH High)

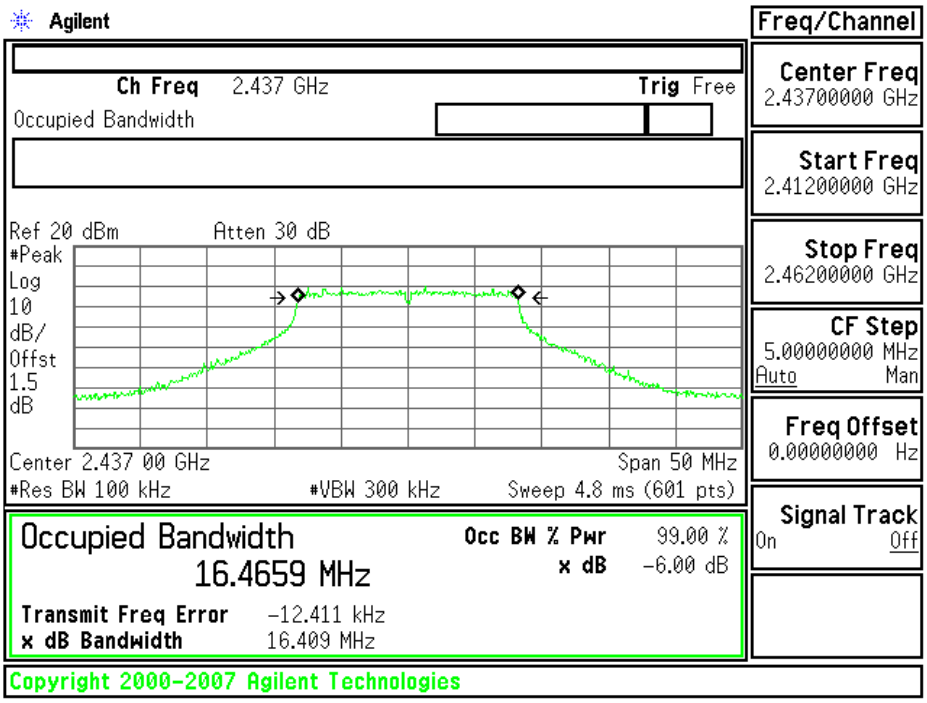


IEEE 802.11g MODE

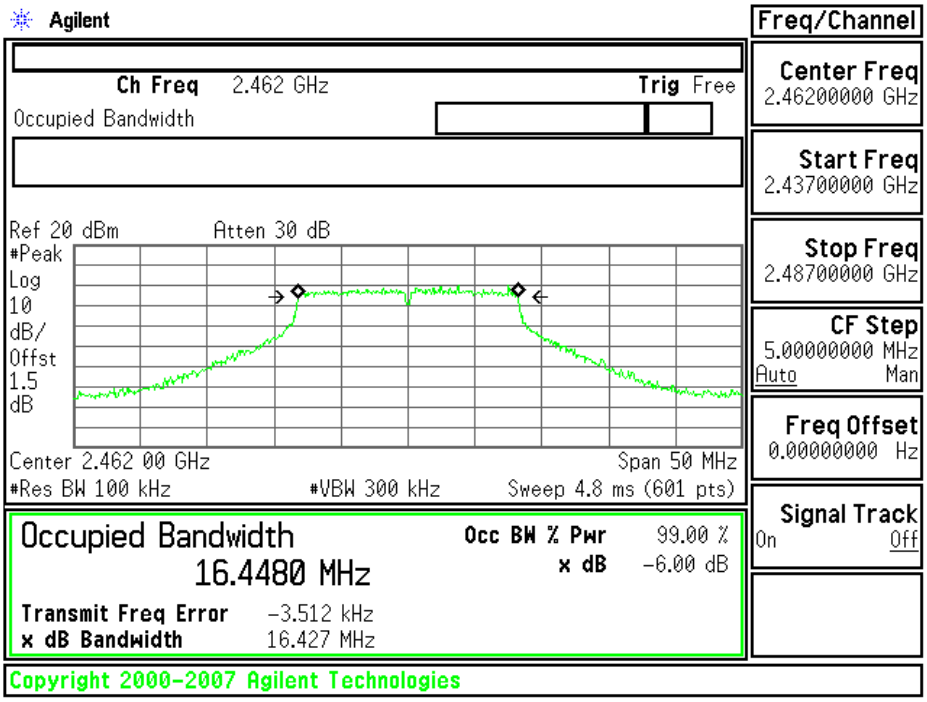
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

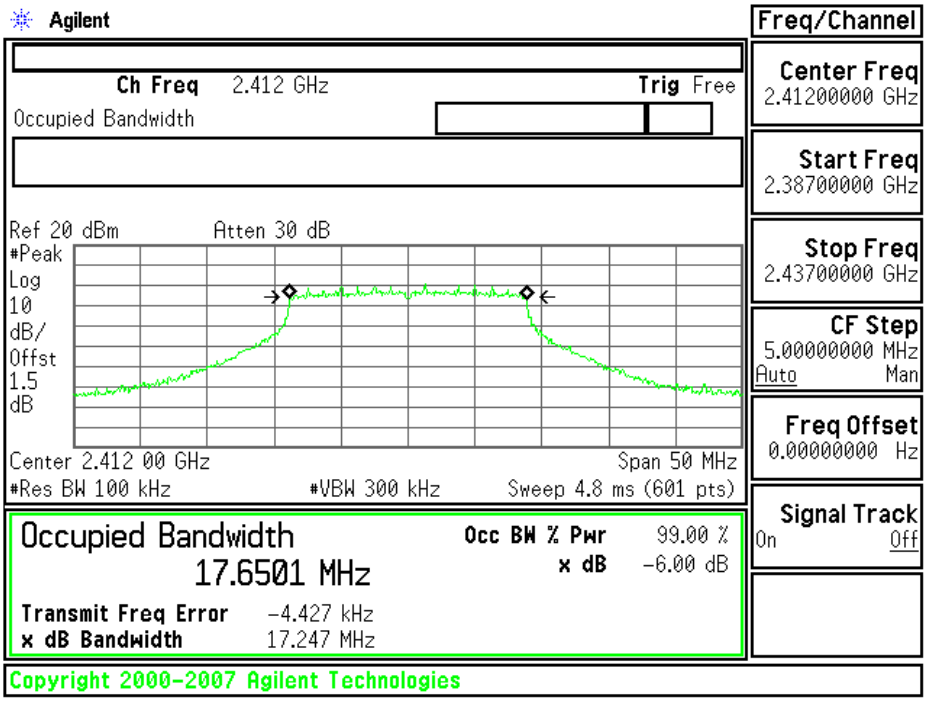


6dB Bandwidth (CH High)

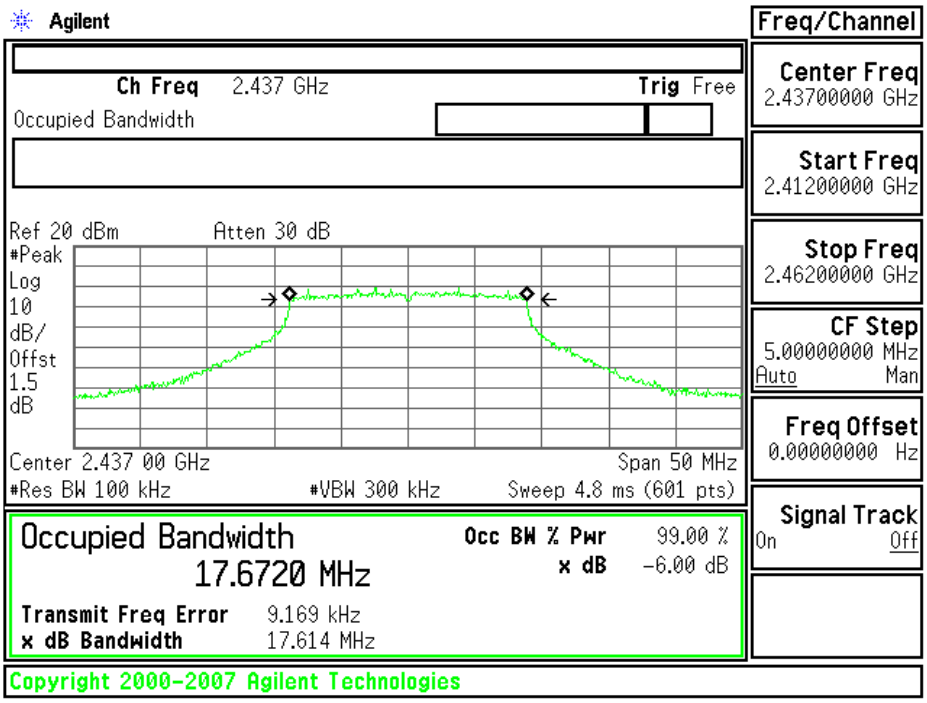


draft 802.11gn Standard-20 MHz Channel mode / Chain 0

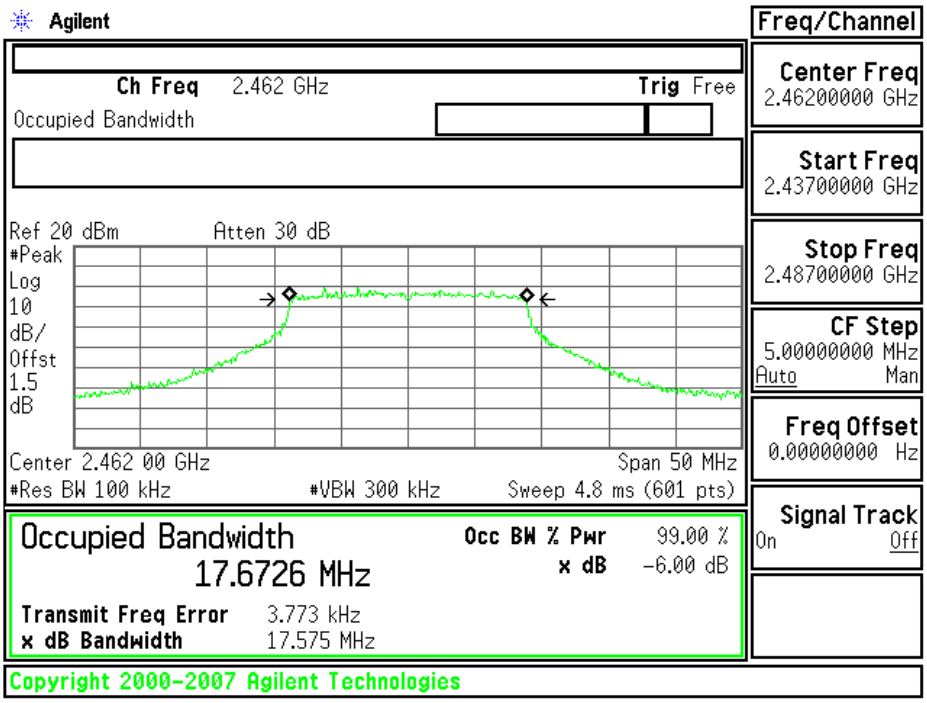
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

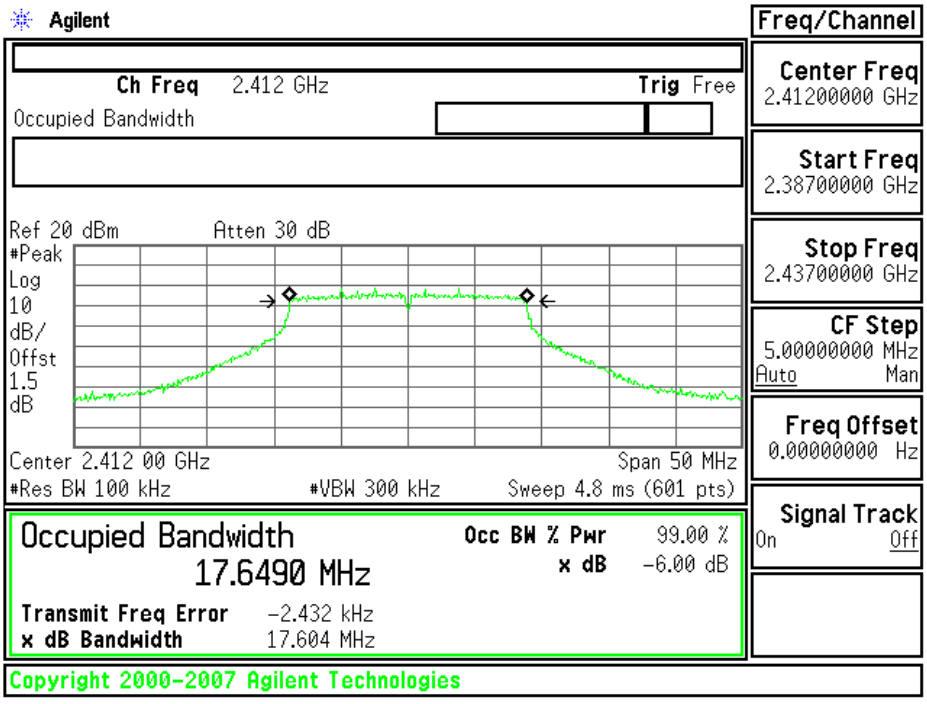


6dB Bandwidth (CH High)

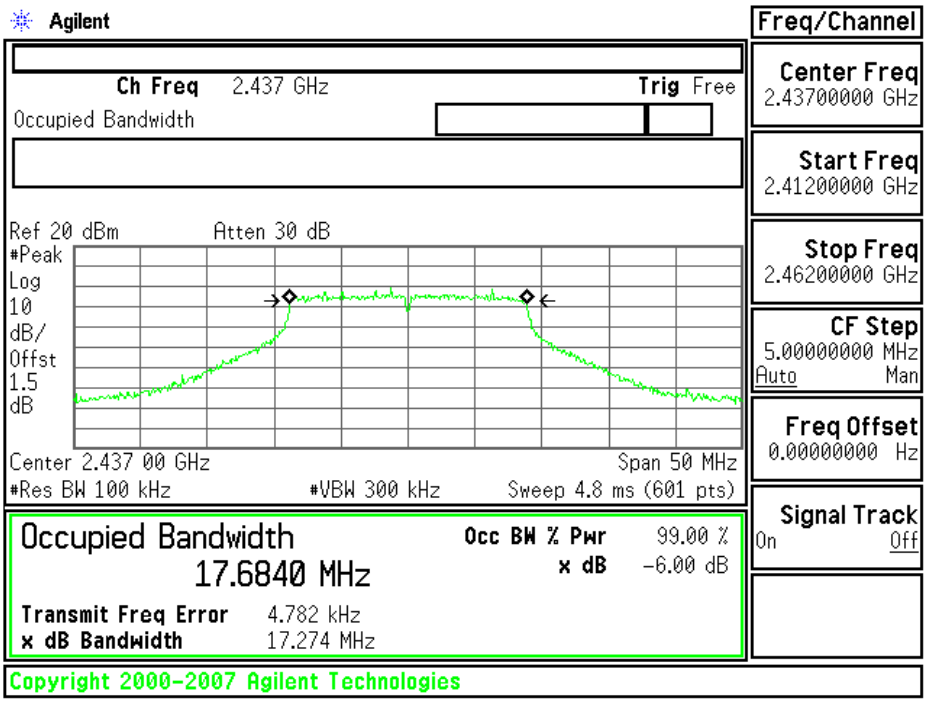


draft 802.11gn Standard-20 MHz Channel mode / Chain 1

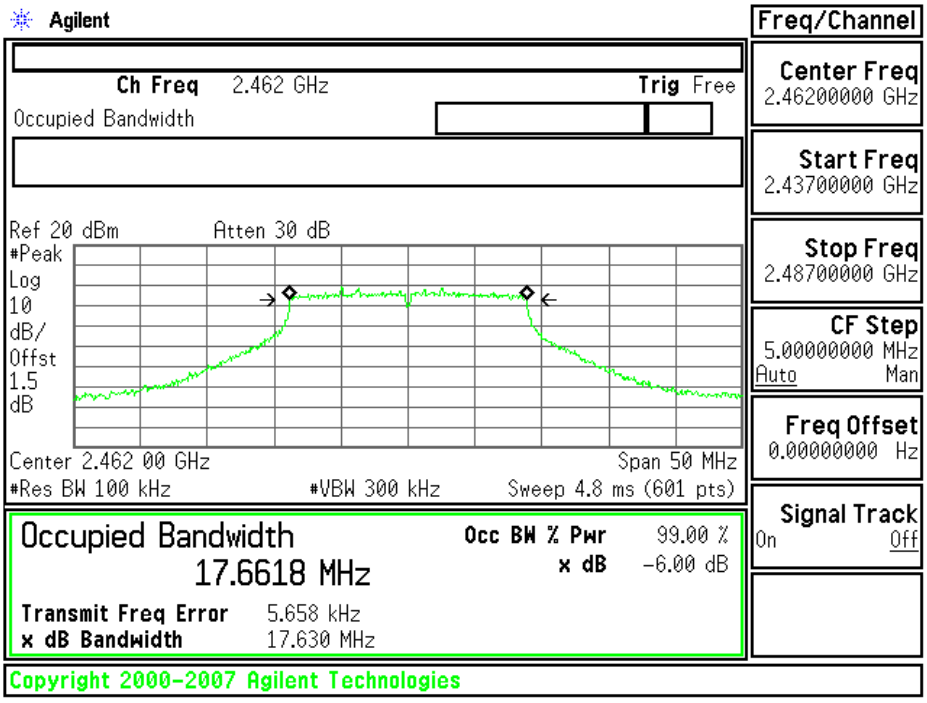
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

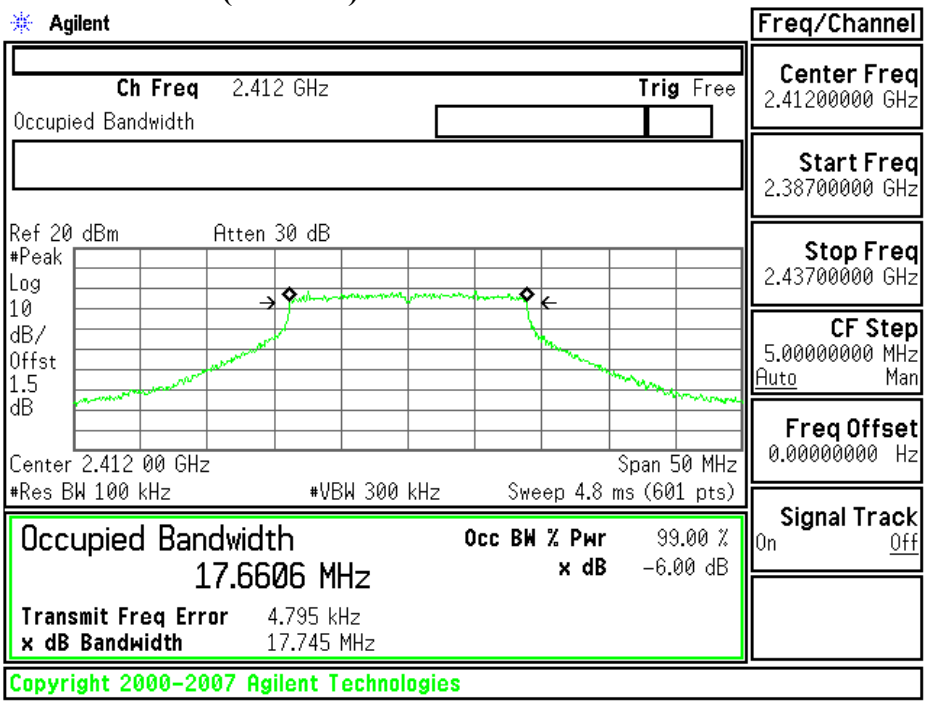


6dB Bandwidth (CH High)

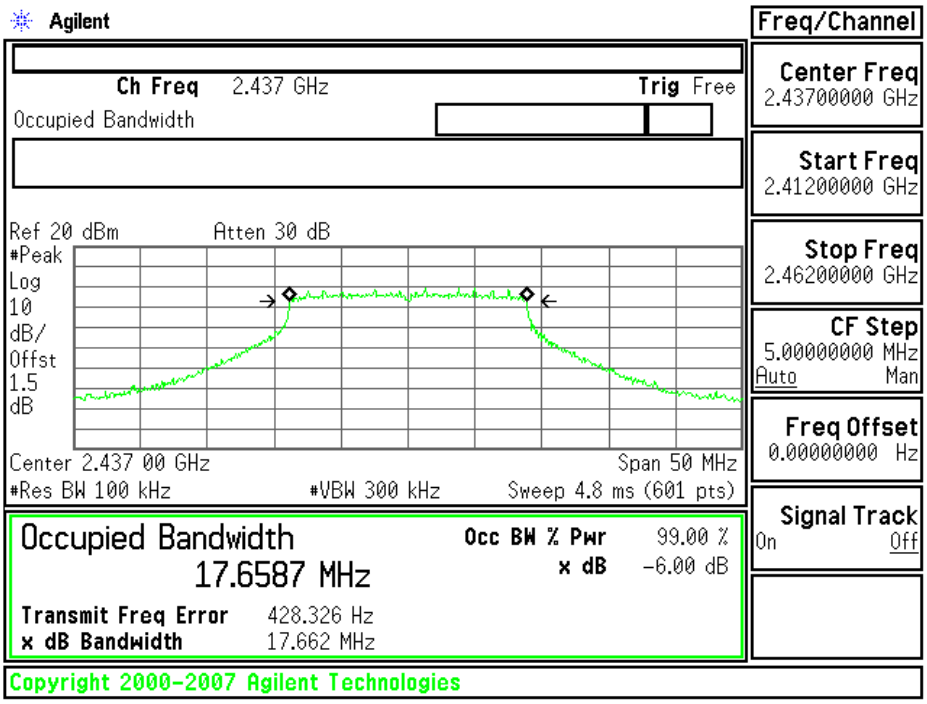


draft 802.11gn Standard-20 MHz Channel mode / Chain 2

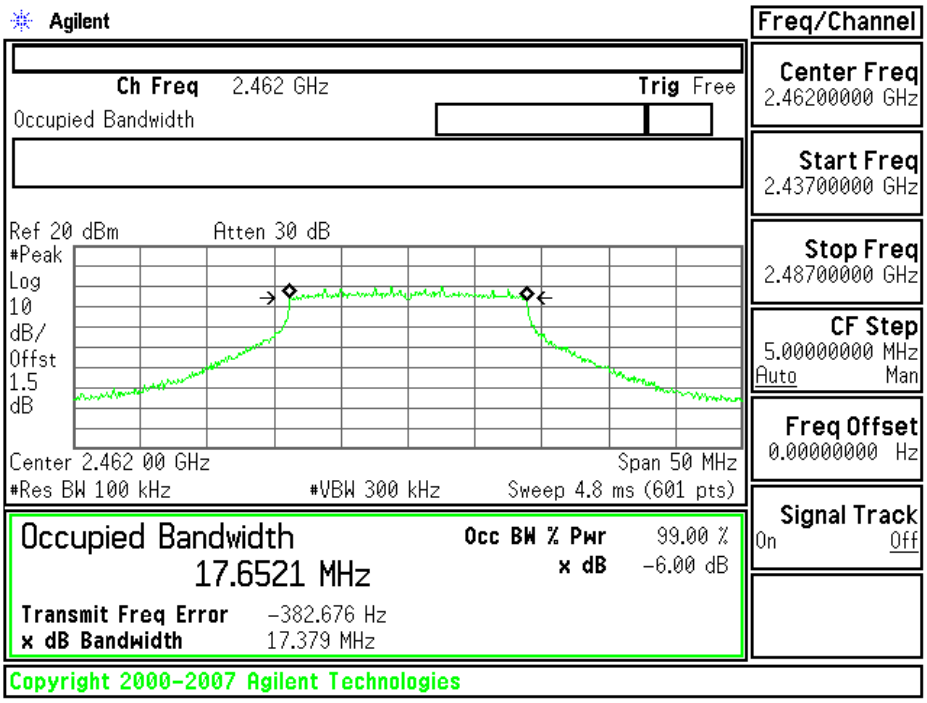
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

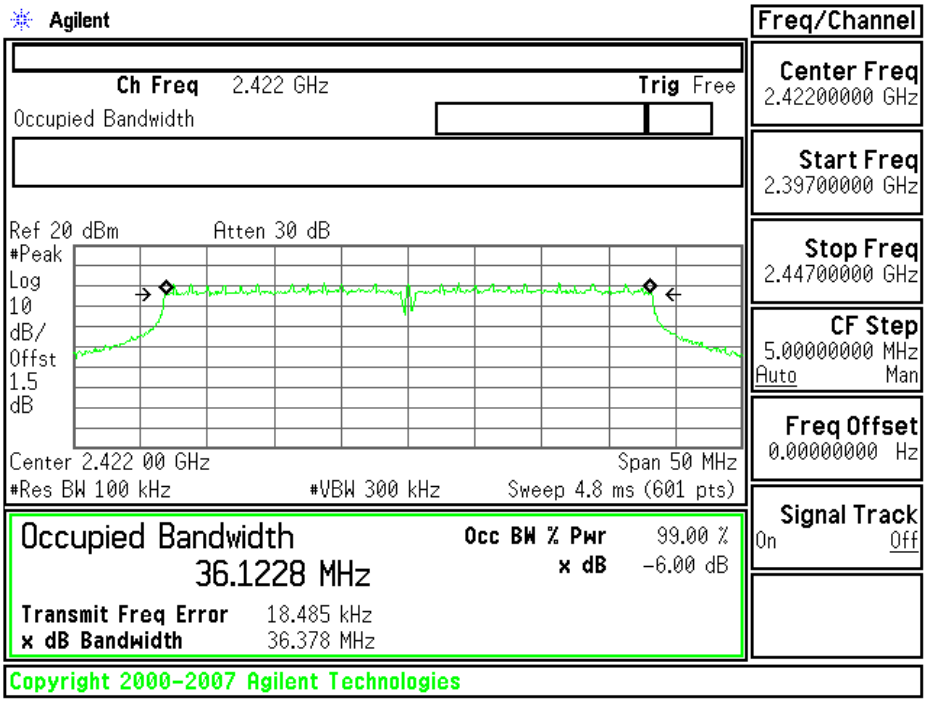


6dB Bandwidth (CH High)

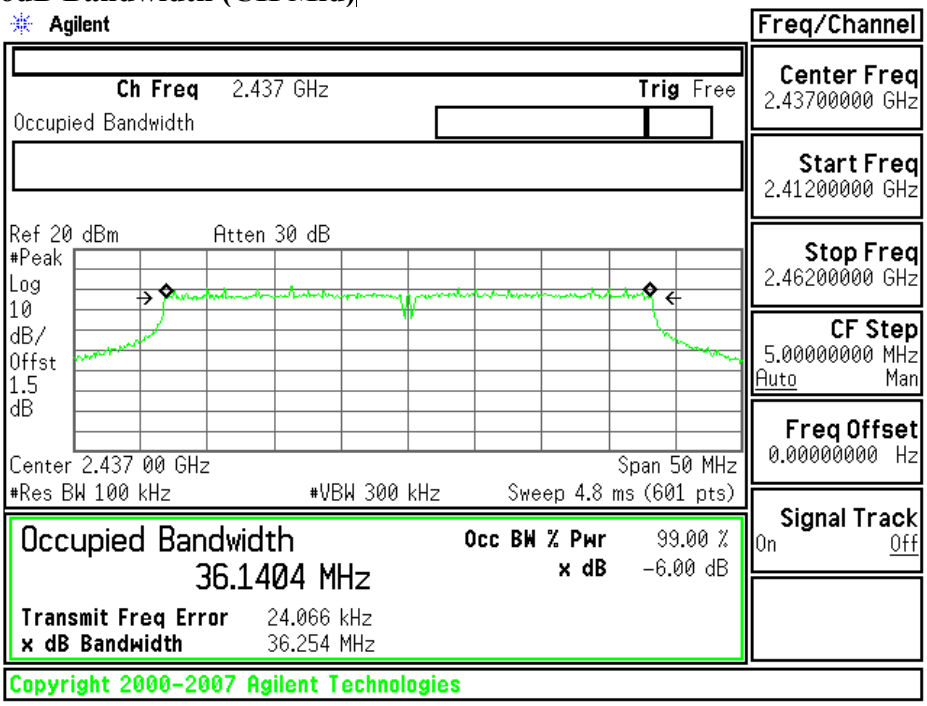


draft 802.11gn Wide-40 MHz Channel mode / Chain 0

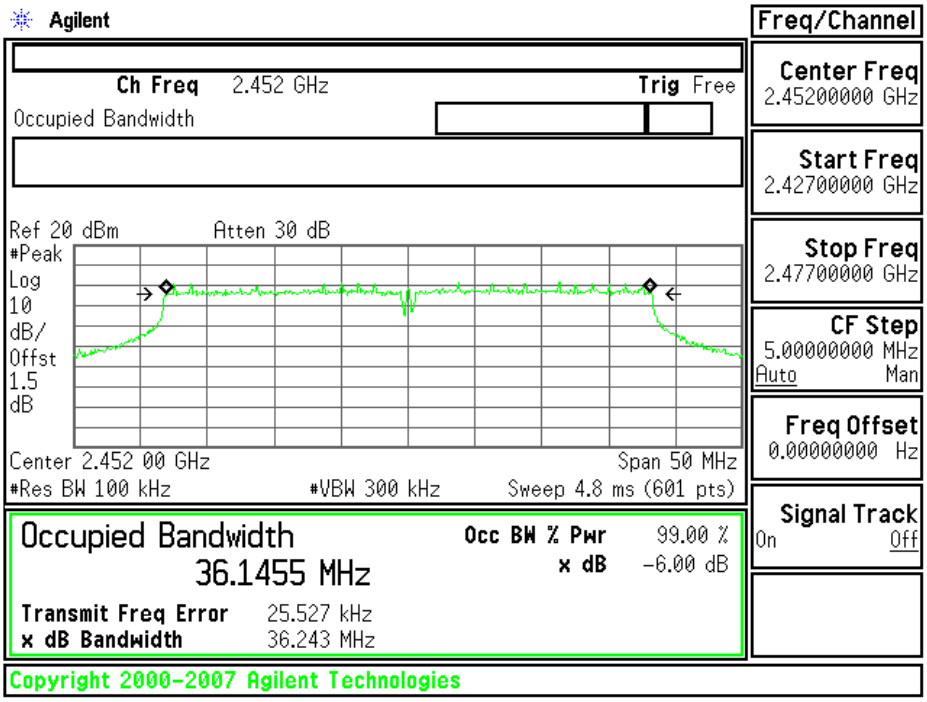
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

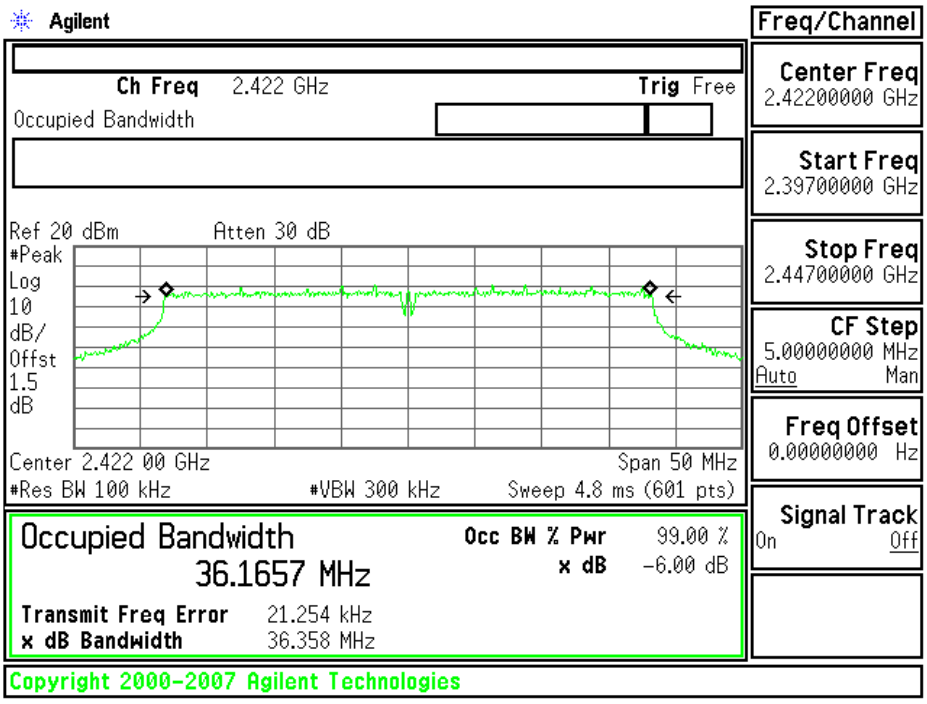


6dB Bandwidth (CH High)

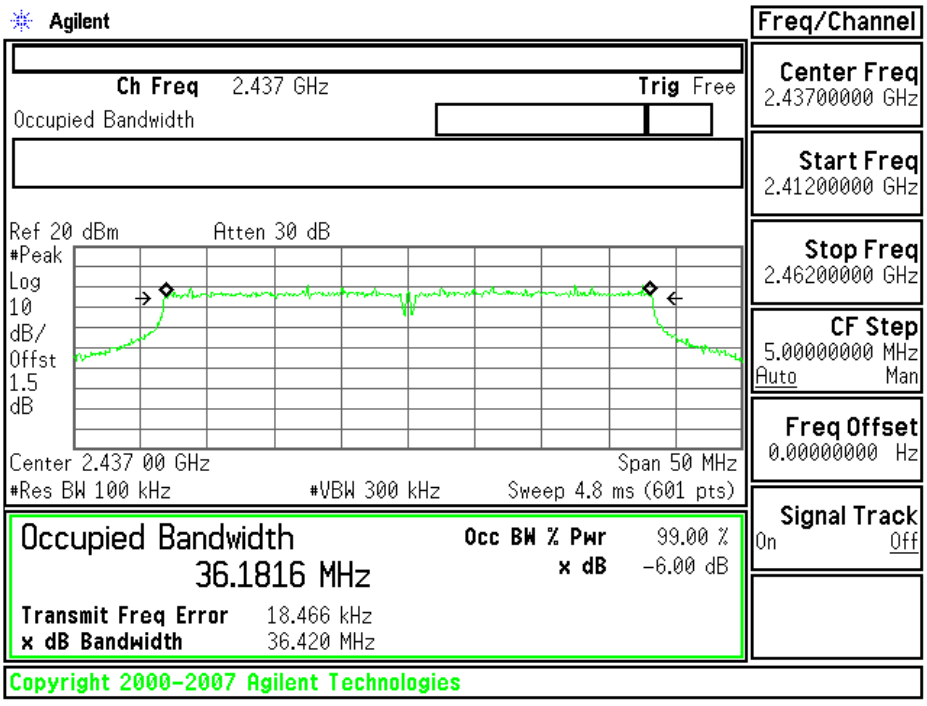


draft 802.11gn Wide-40 MHz Channel mode / Chain 1

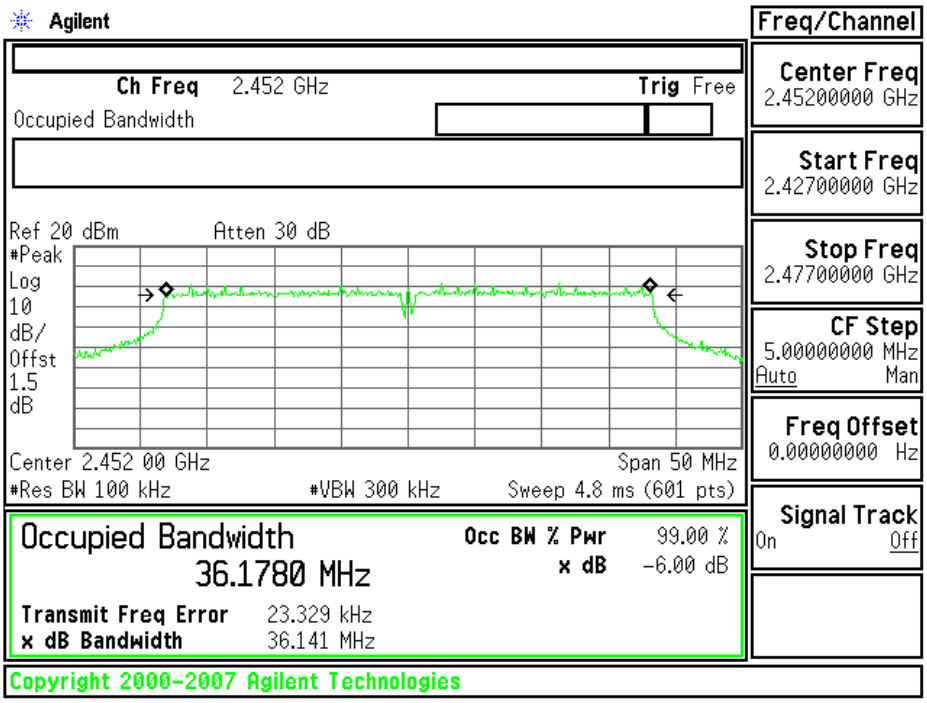
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

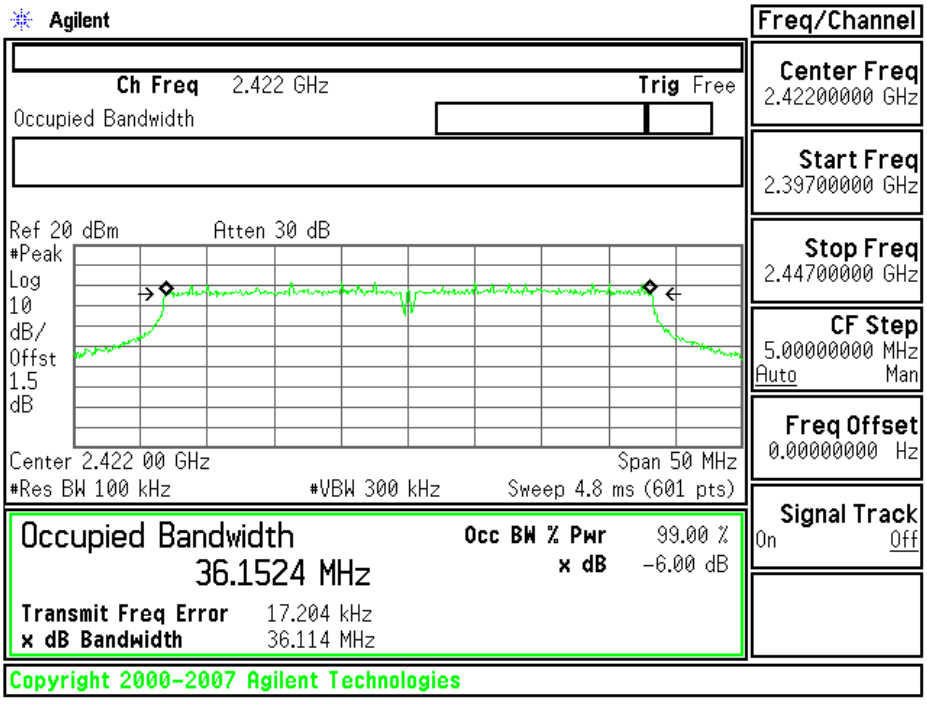


6dB Bandwidth (CH High)

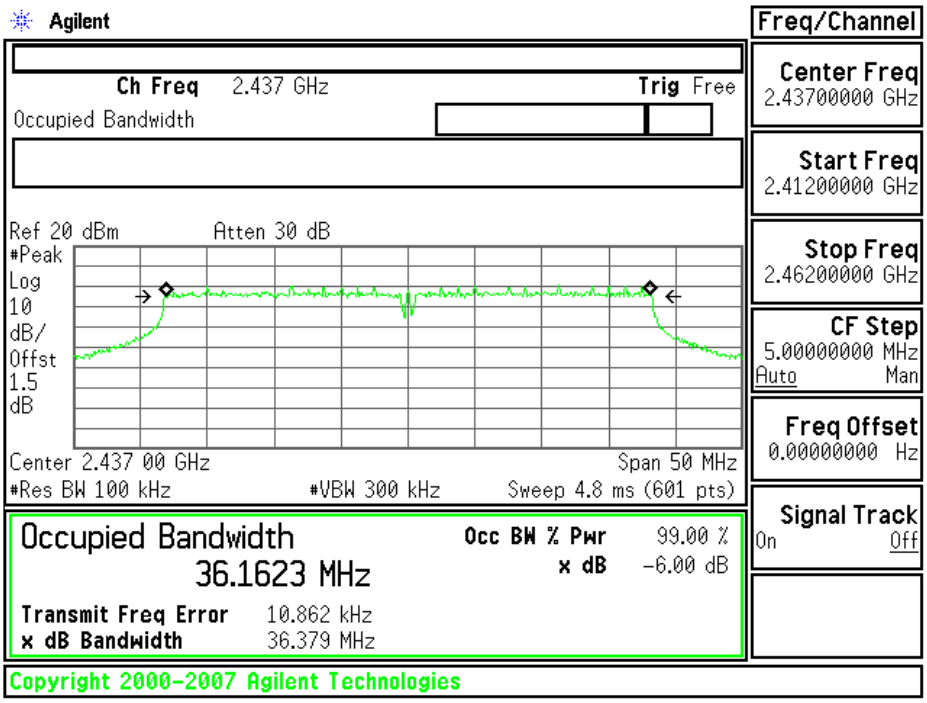


draft 802.11gn Wide-40 MHz Channel mode / Chain 2

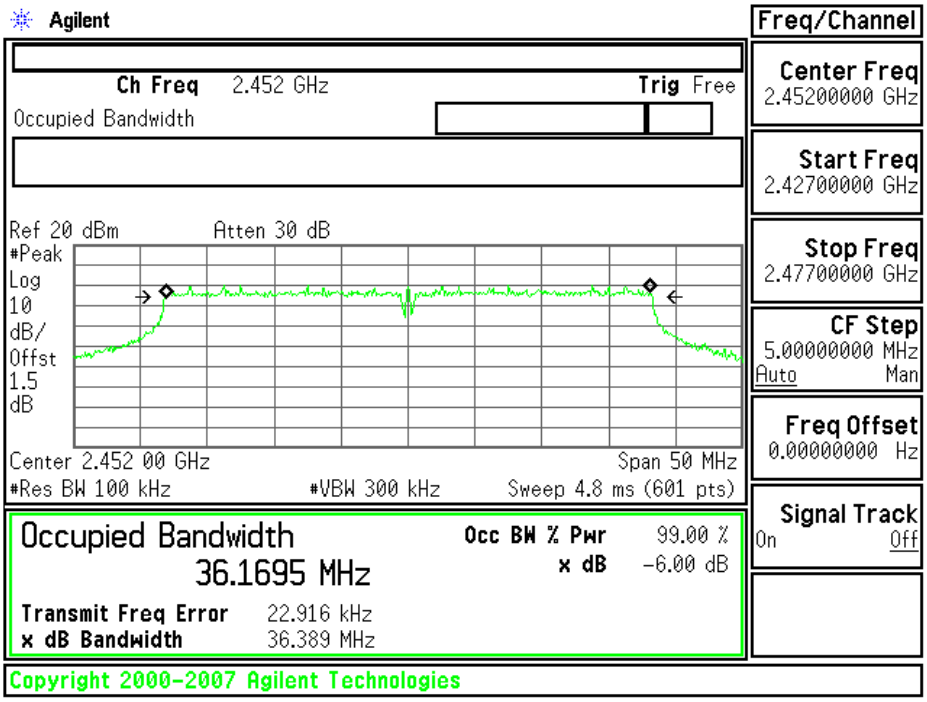
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



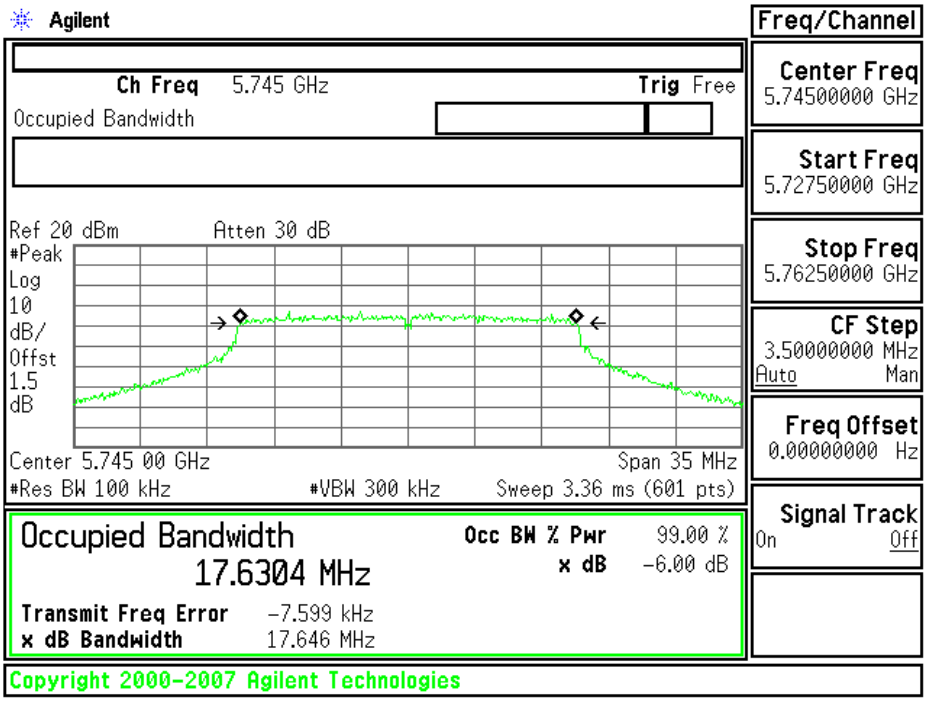
6dB Bandwidth (CH High)



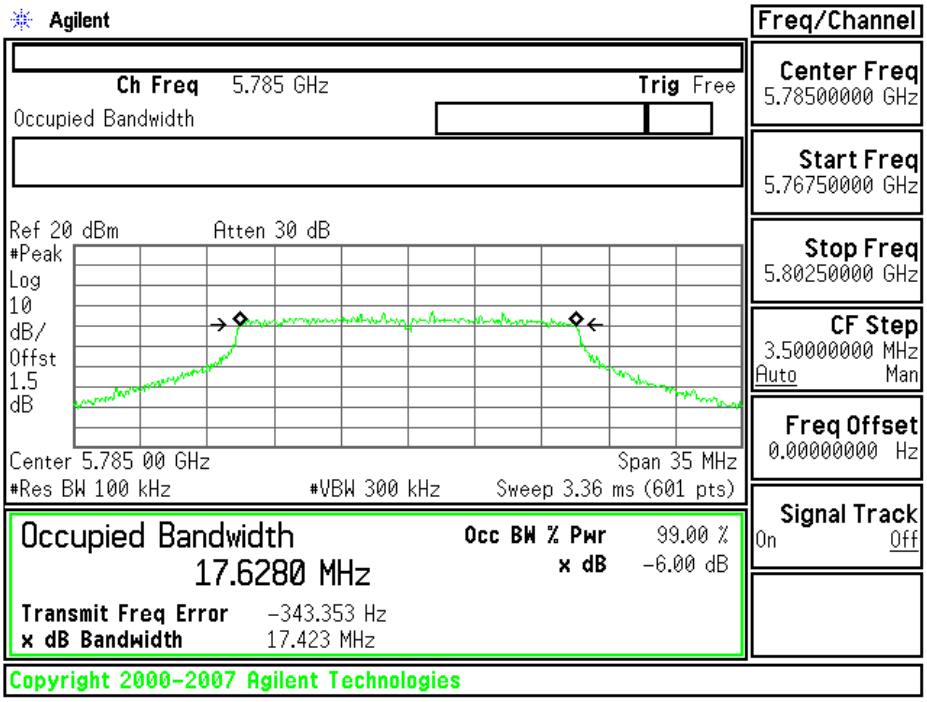
5725MHz-5825MHz

IEEE 802.11a mode

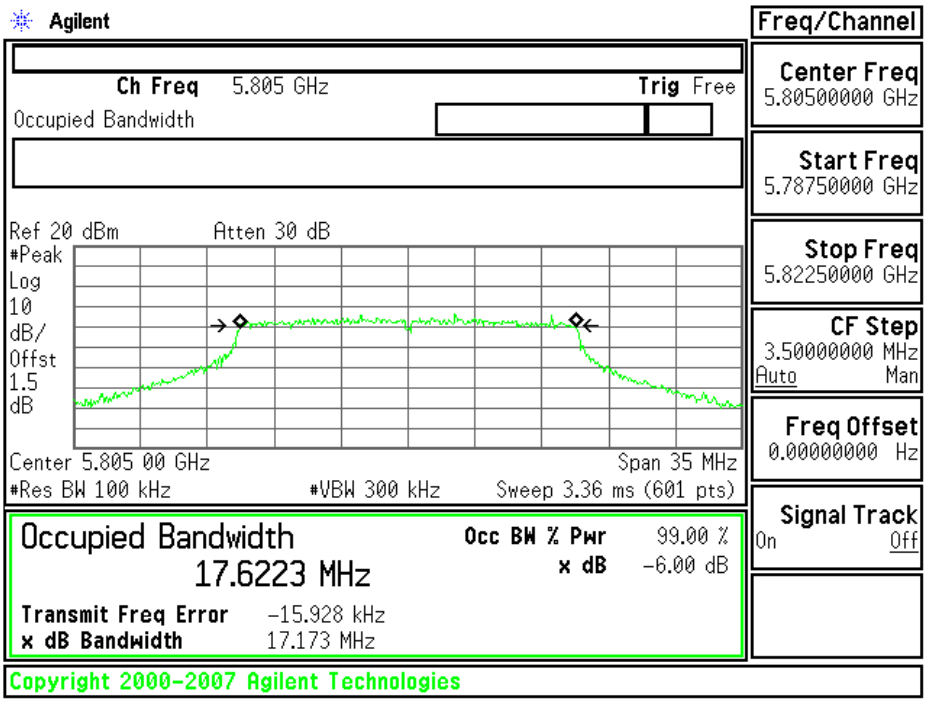
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

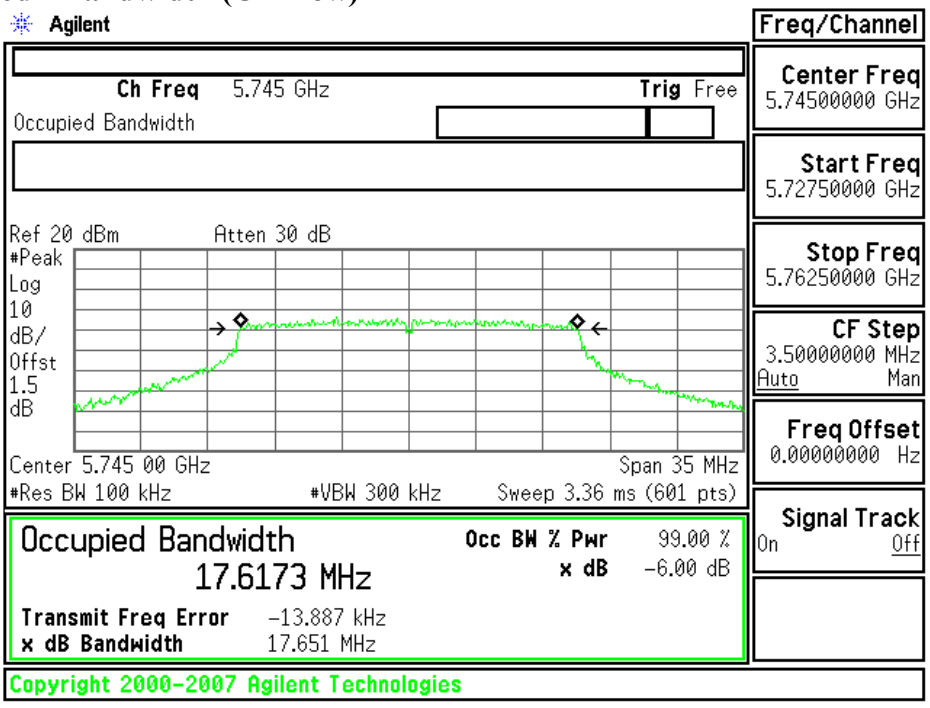


6dB Bandwidth (CH High)

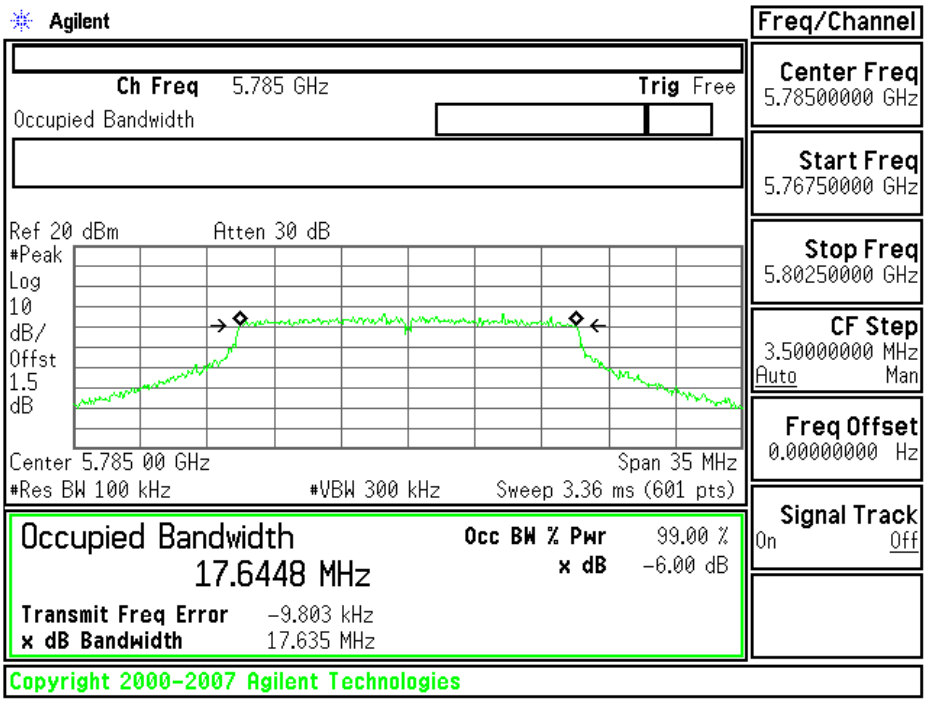


draft 802.11an Standard-20 MHz Channel mode / Chain 0

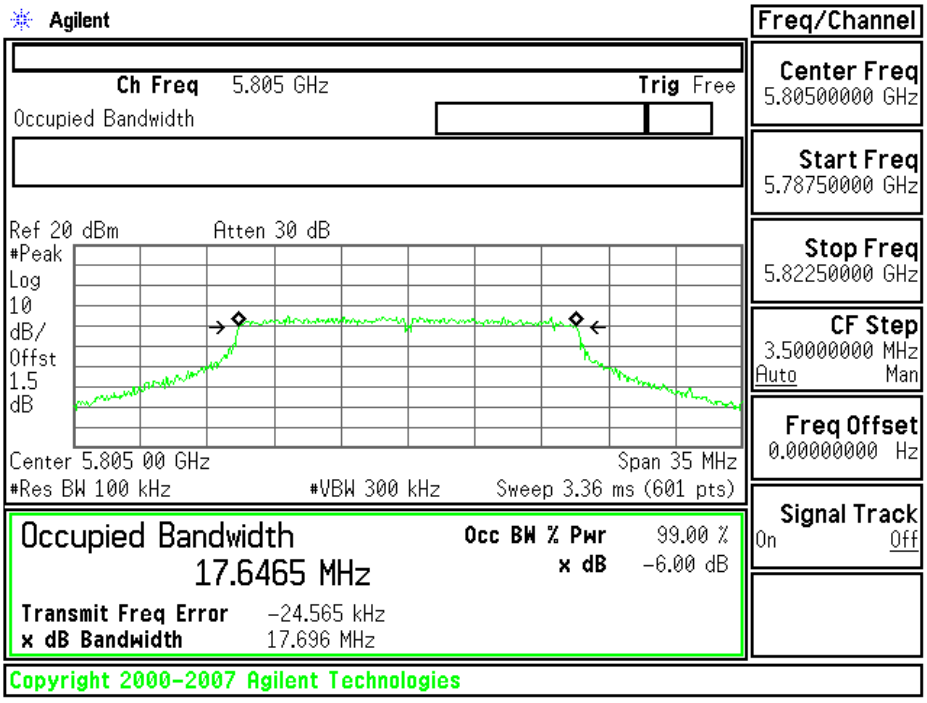
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

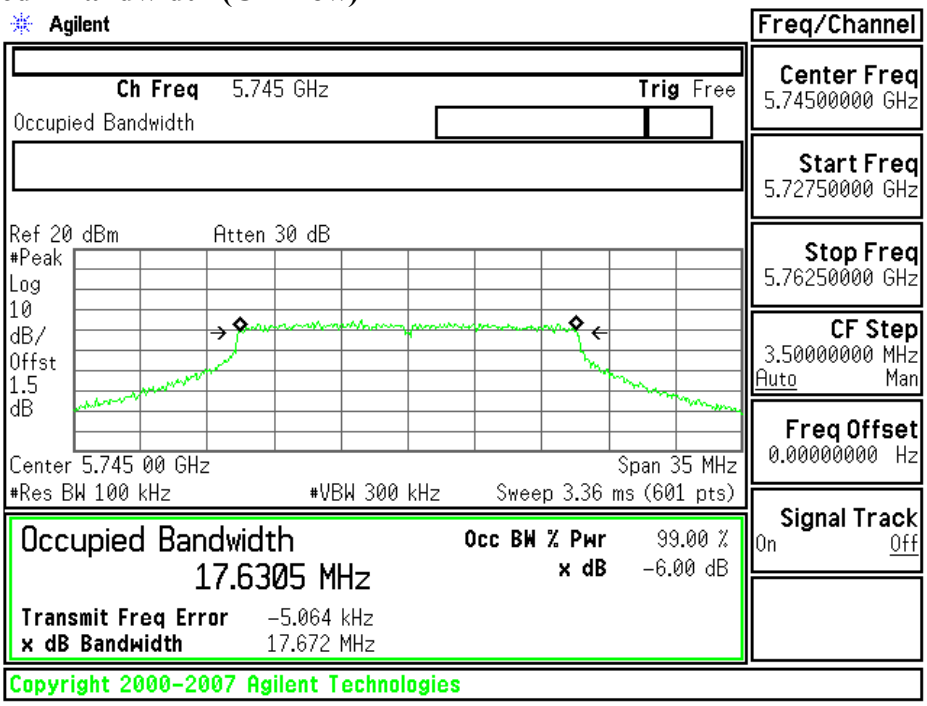


6dB Bandwidth (CH High)

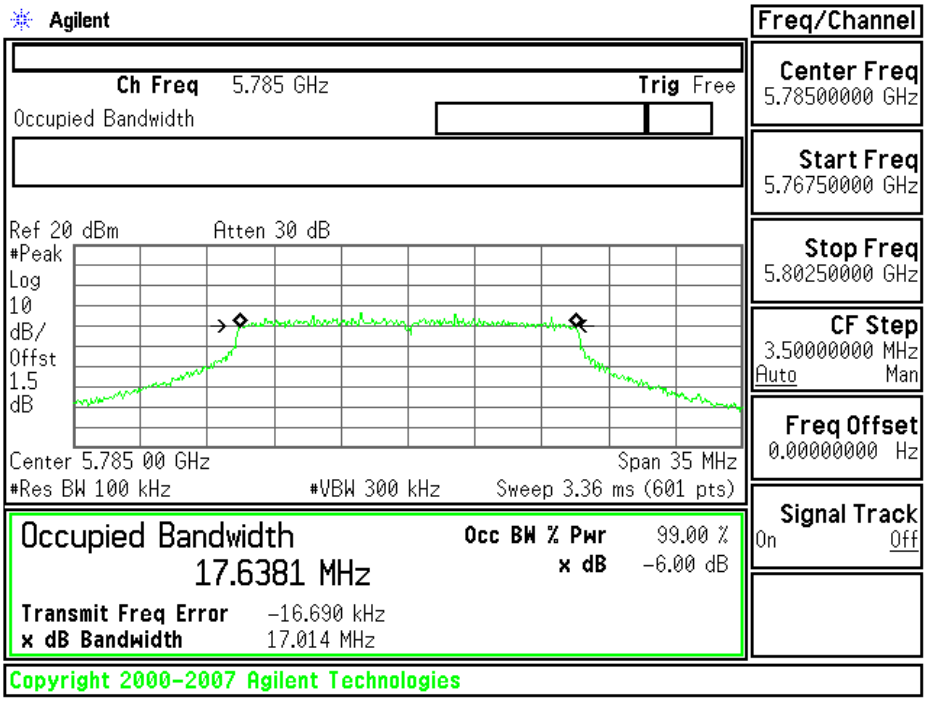


draft 802.11an Standard-20 MHz Channel mode / Chain 1

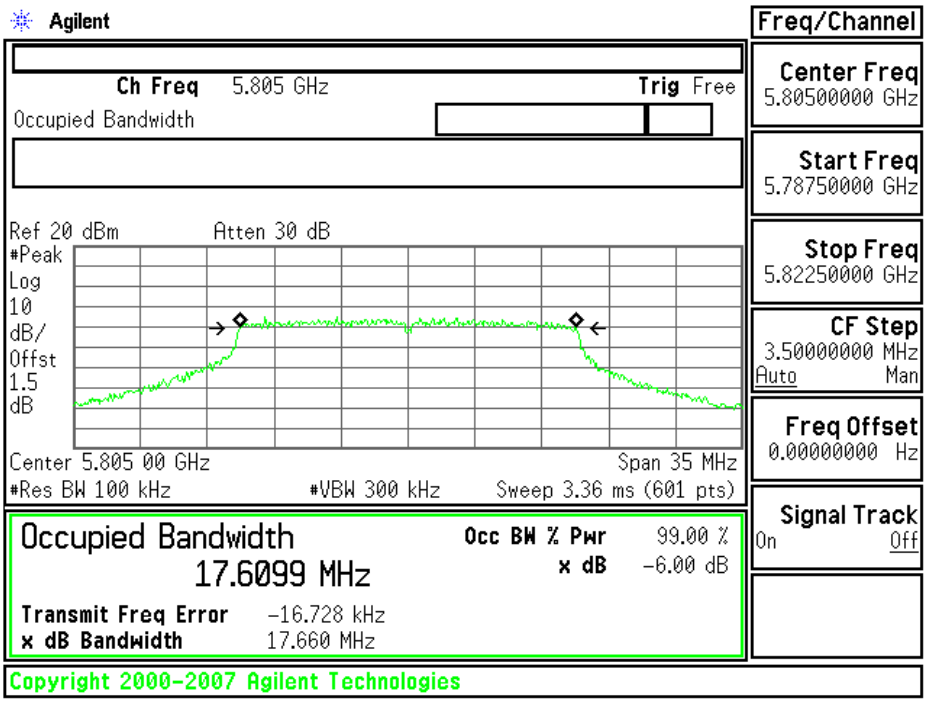
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

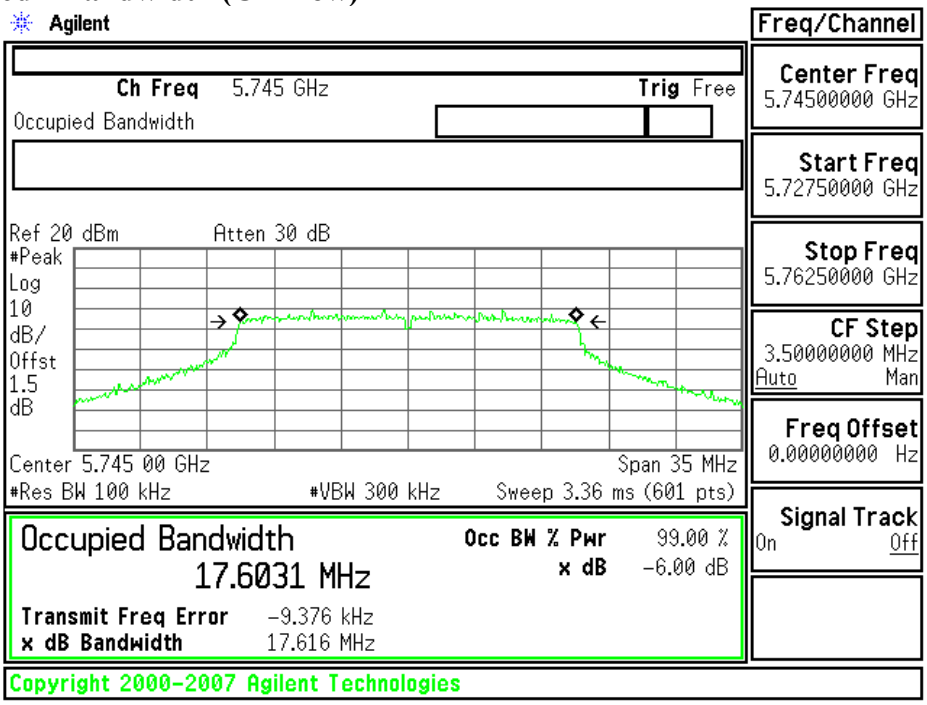


6dB Bandwidth (CH High)

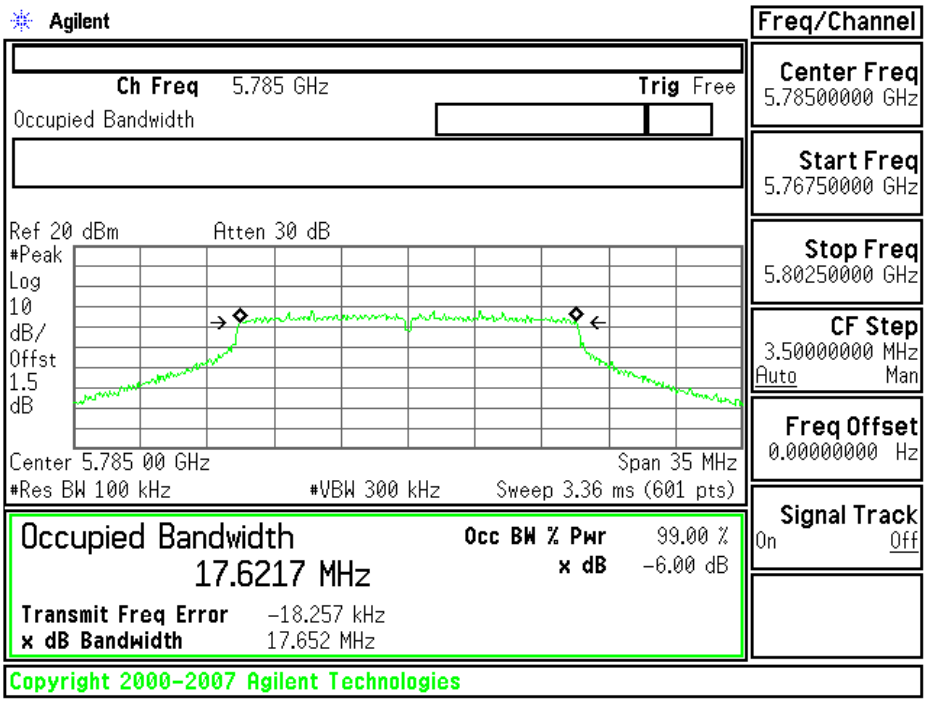


draft 802.11an Standard-20 MHz Channel mode / Chain 2

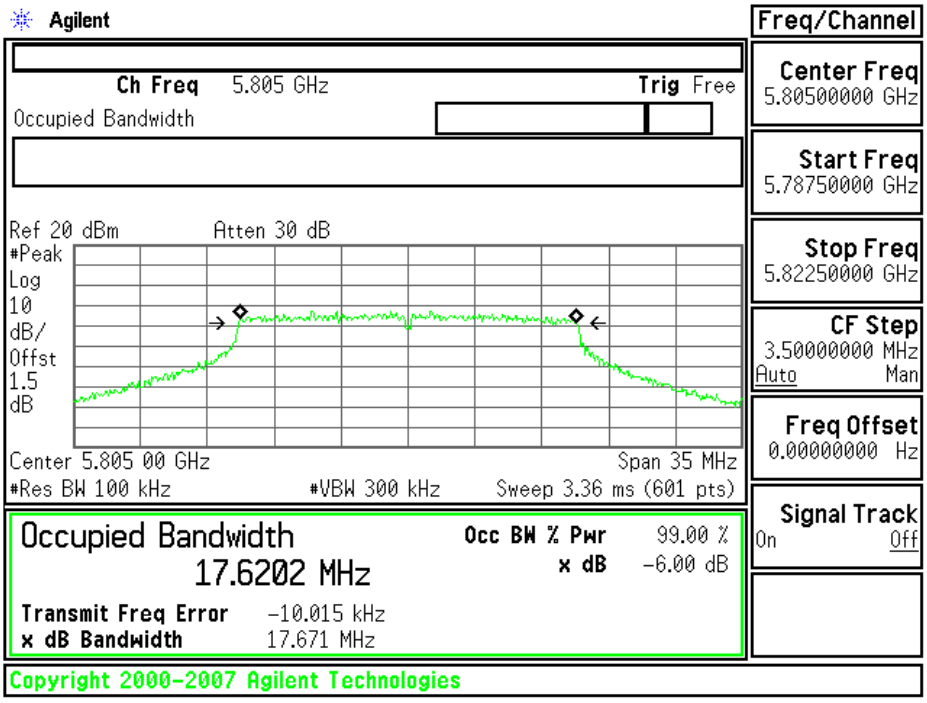
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

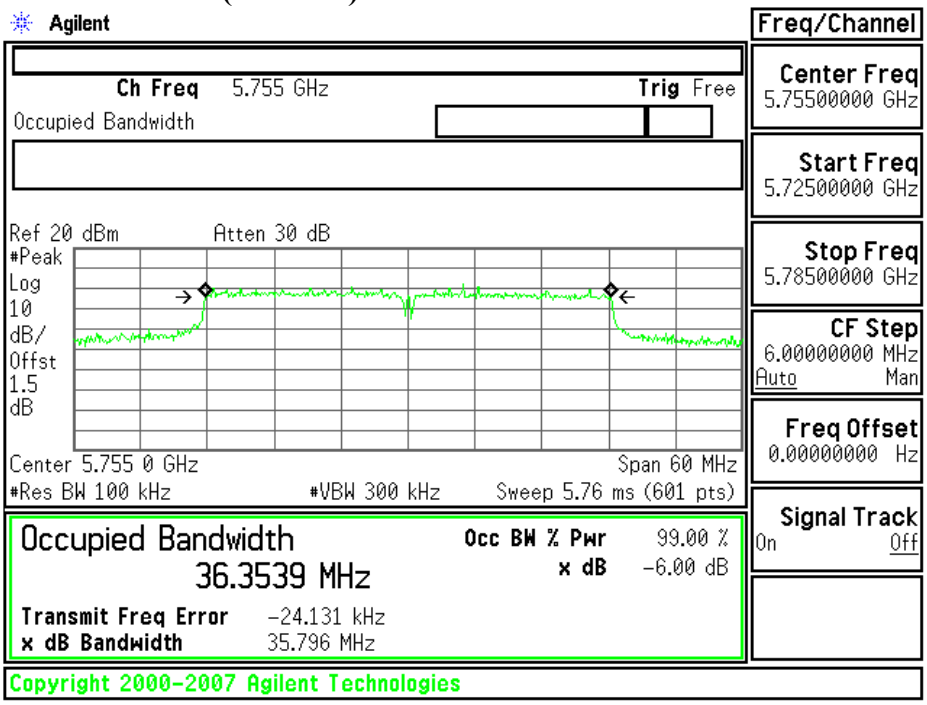


6dB Bandwidth (CH High)

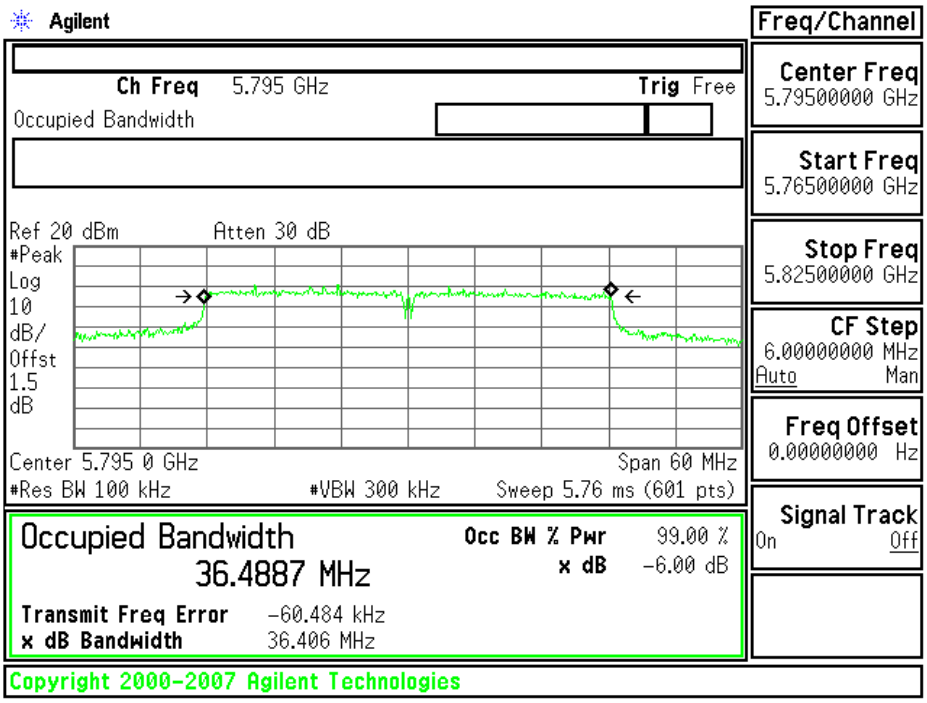


draft 802.11an Standard-40 MHz Channel mode / Chain 0

6dB Bandwidth (CH Low)

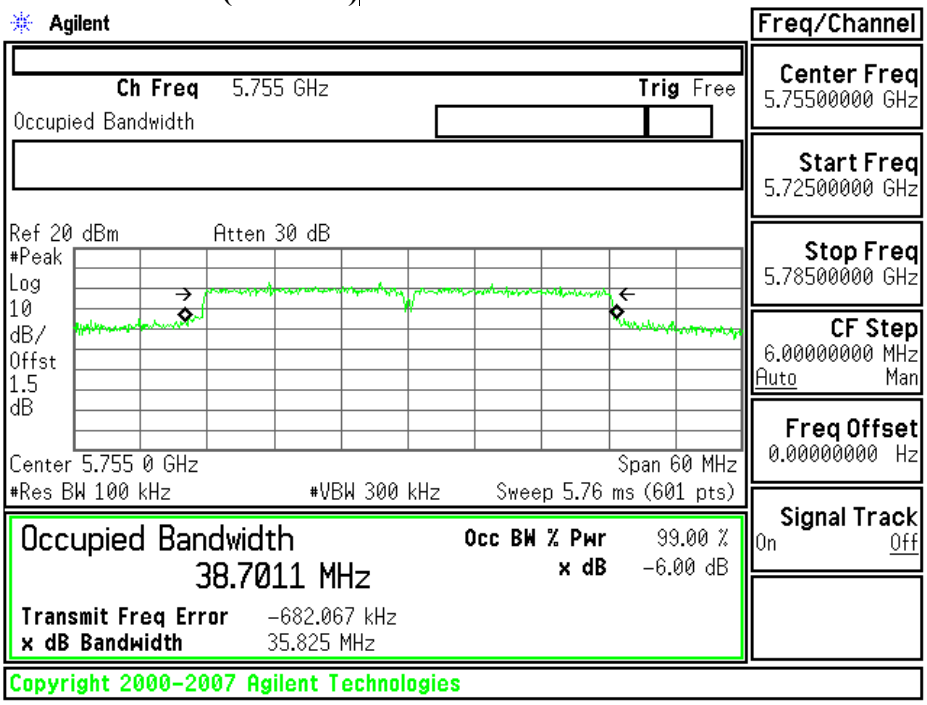


6dB Bandwidth (CH High)

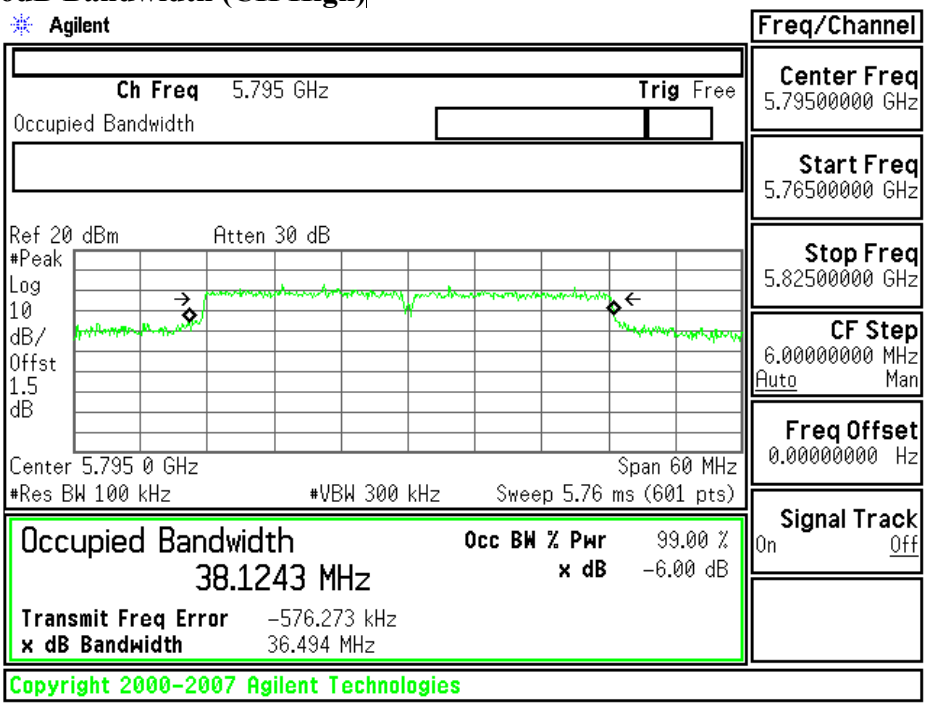


draft 802.11an Standard-40 MHz Channel mode / Chain 1

6dB Bandwidth (CH Low)

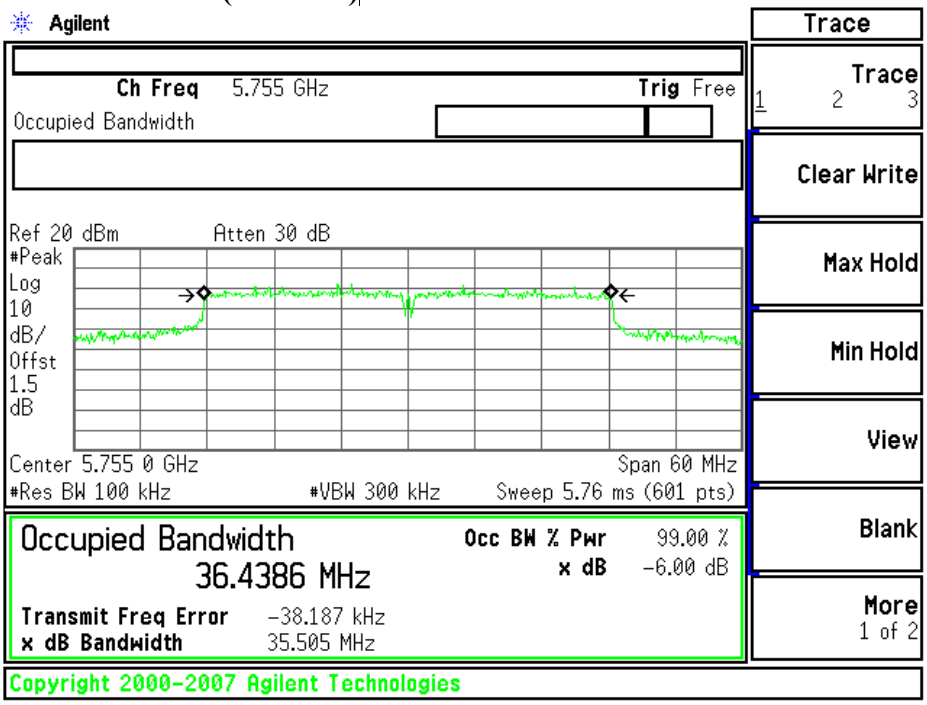


6dB Bandwidth (CH High)

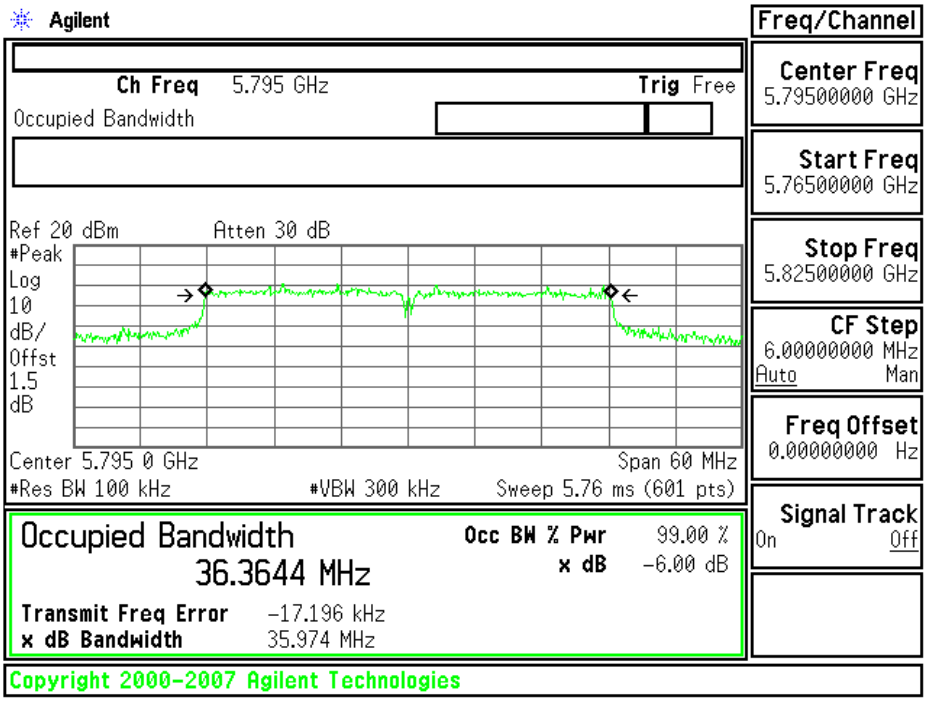


draft 802.11an Standard-40 MHz Channel mode / Chain 2

6dB Bandwidth (CH Low)

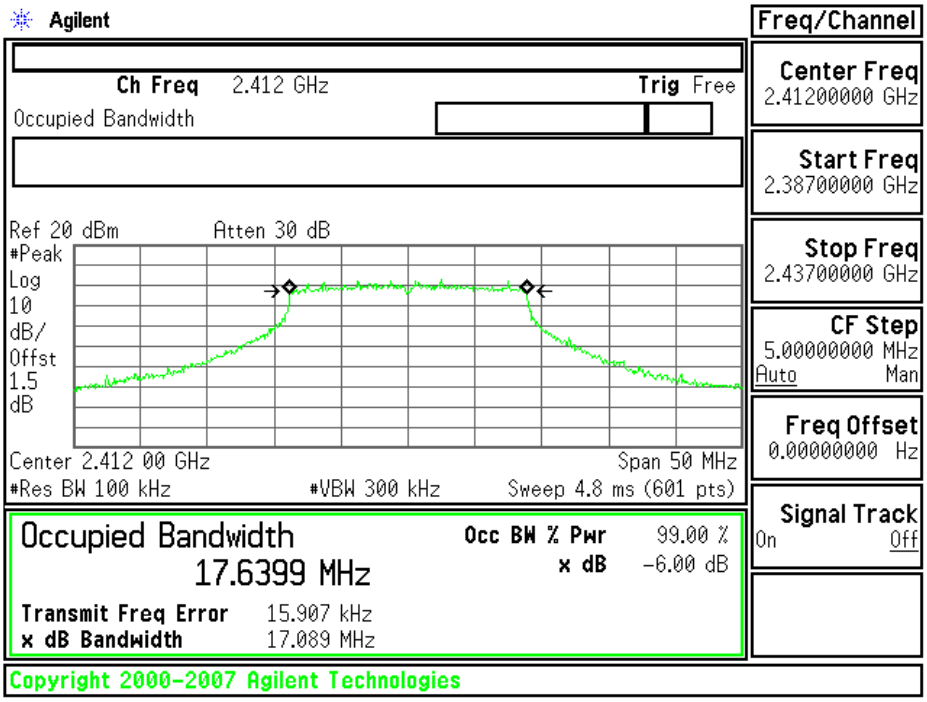


6dB Bandwidth (CH High)

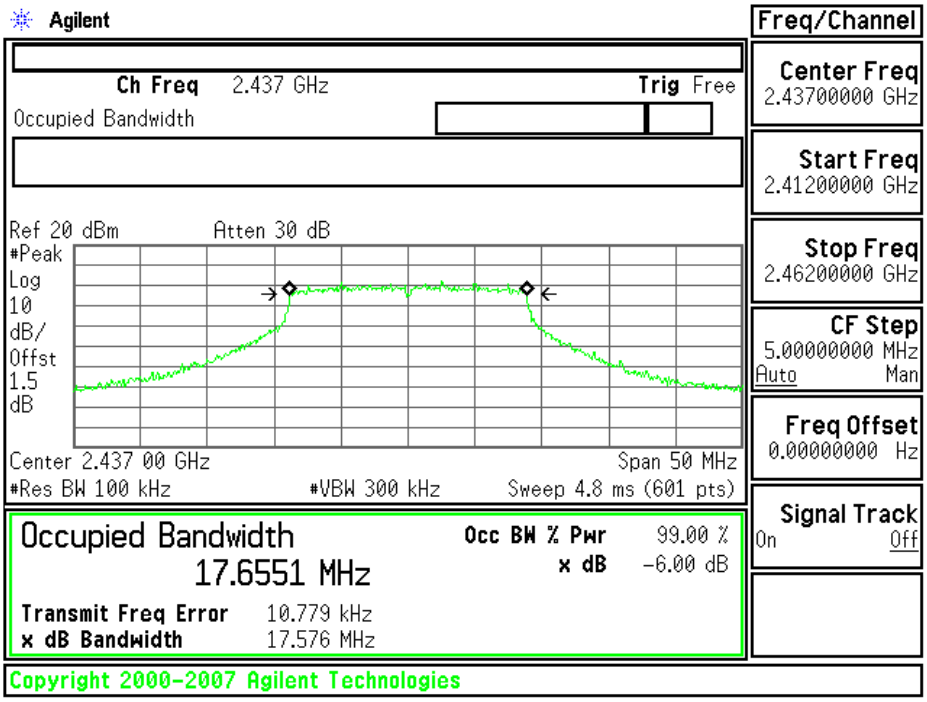


draft 802.11gn Standard-20 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

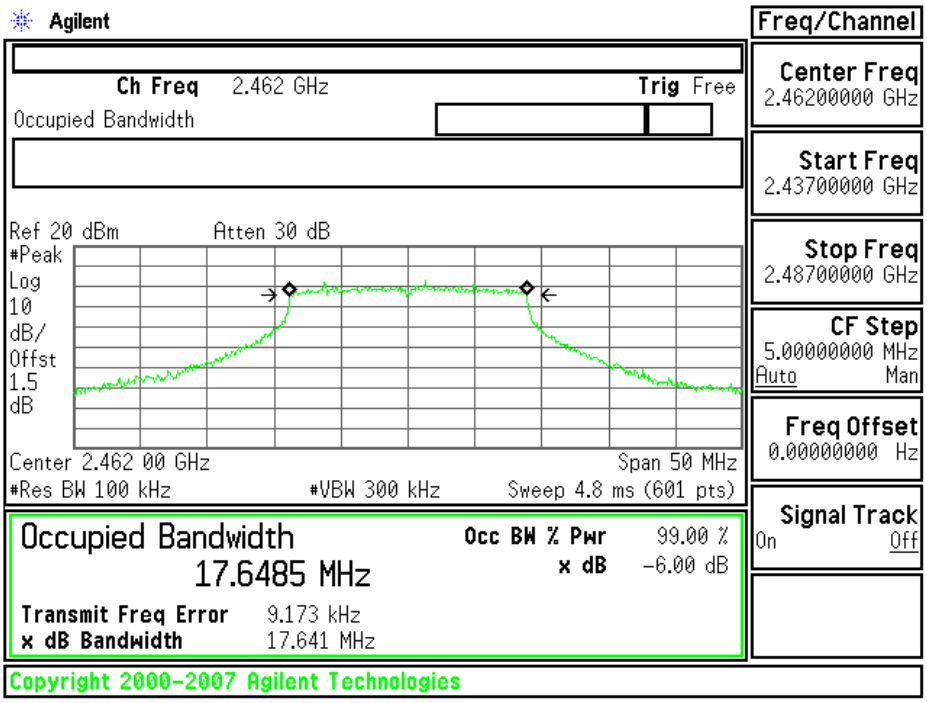
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

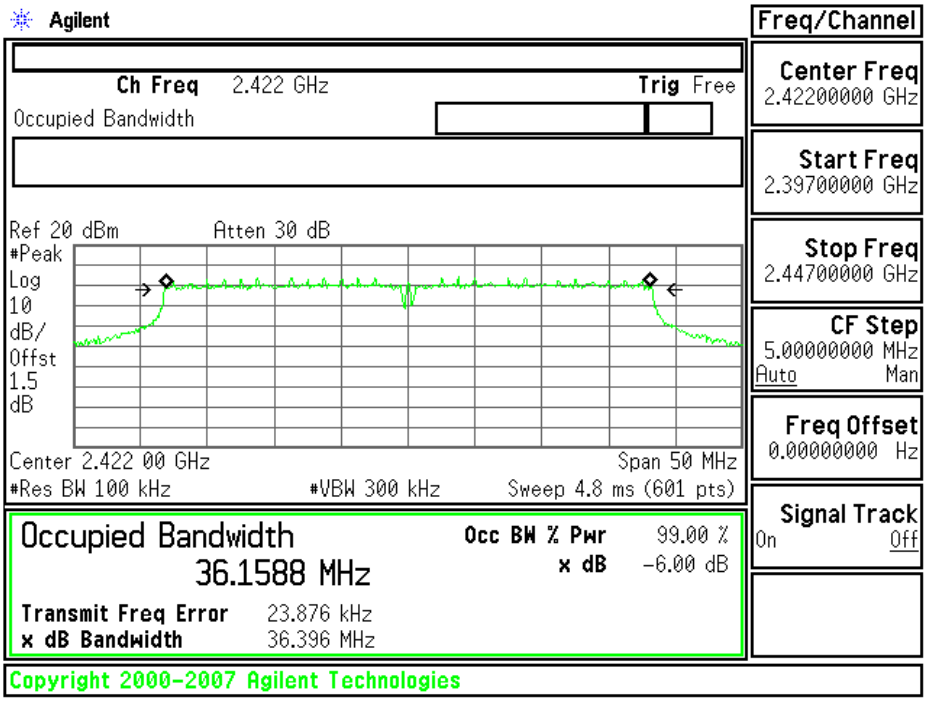


6dB Bandwidth (CH High)

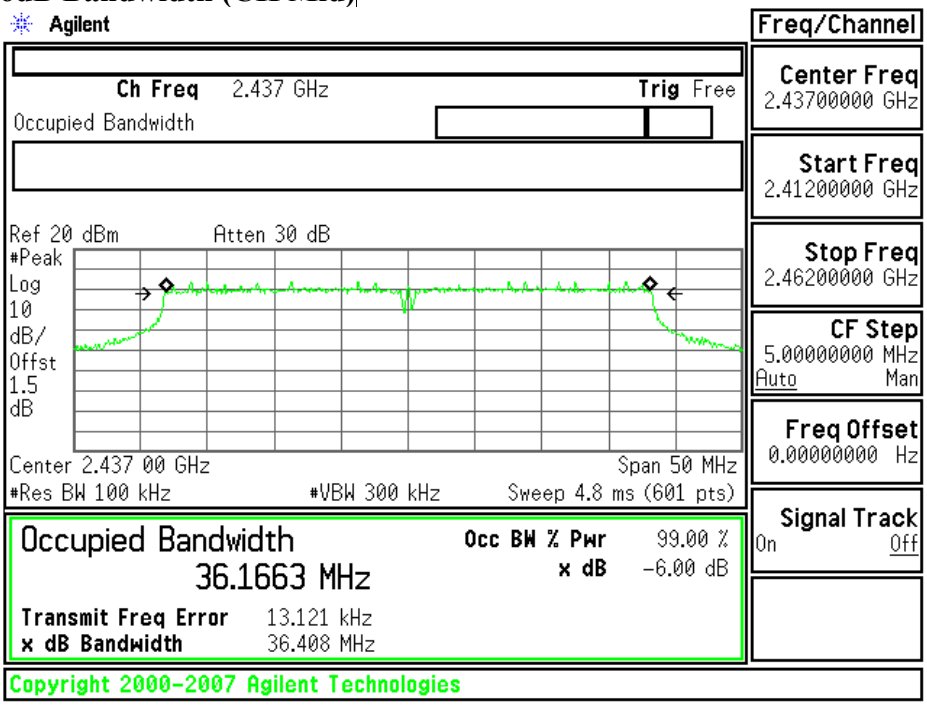


draft 802.11gn Wide-40 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

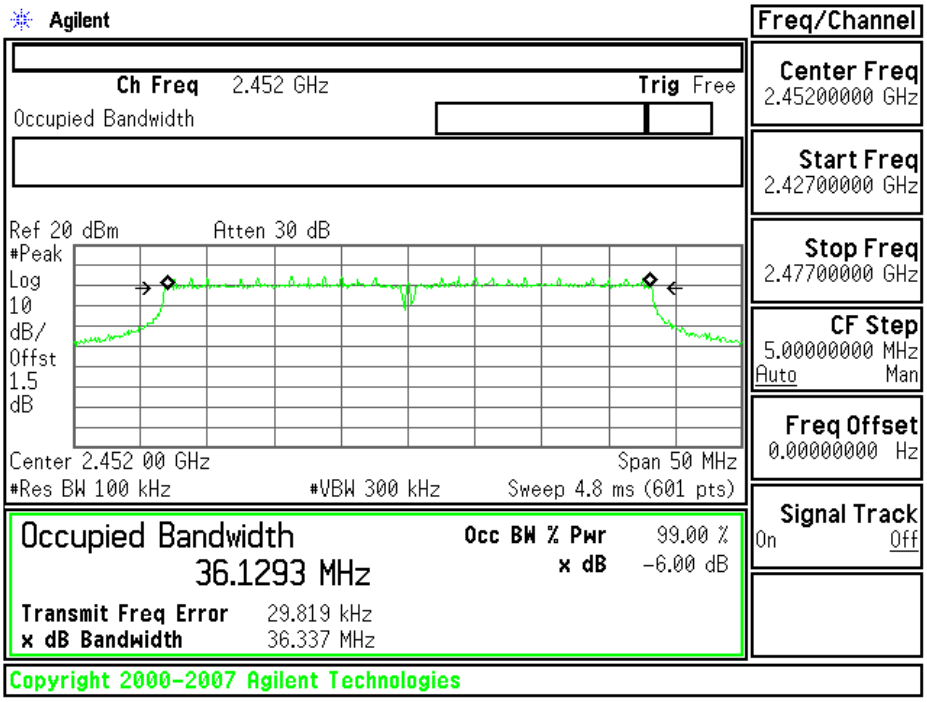
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



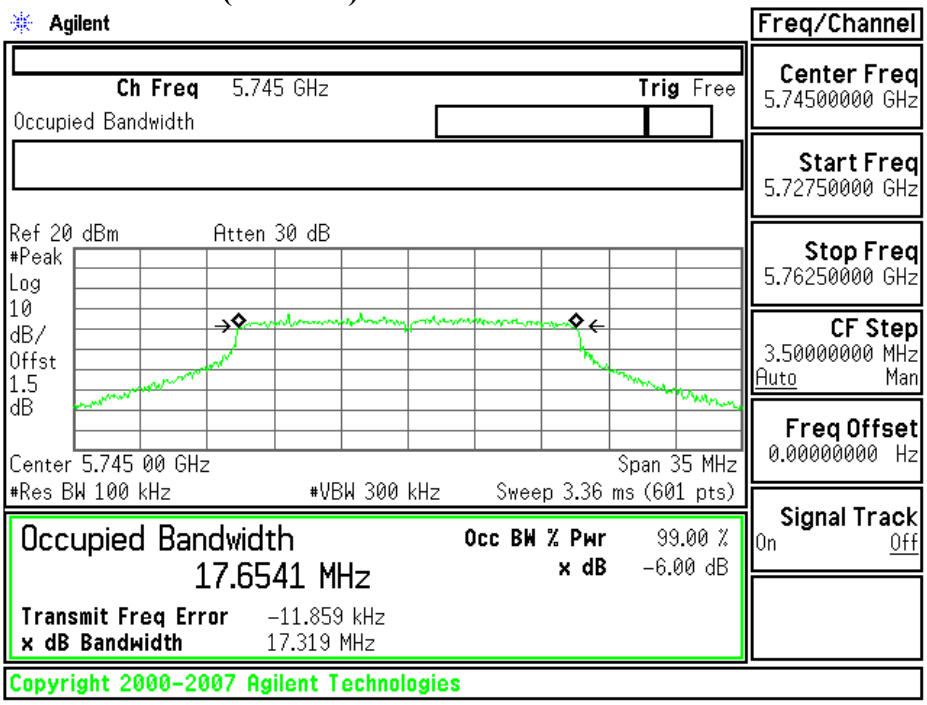
6dB Bandwidth (CH High)



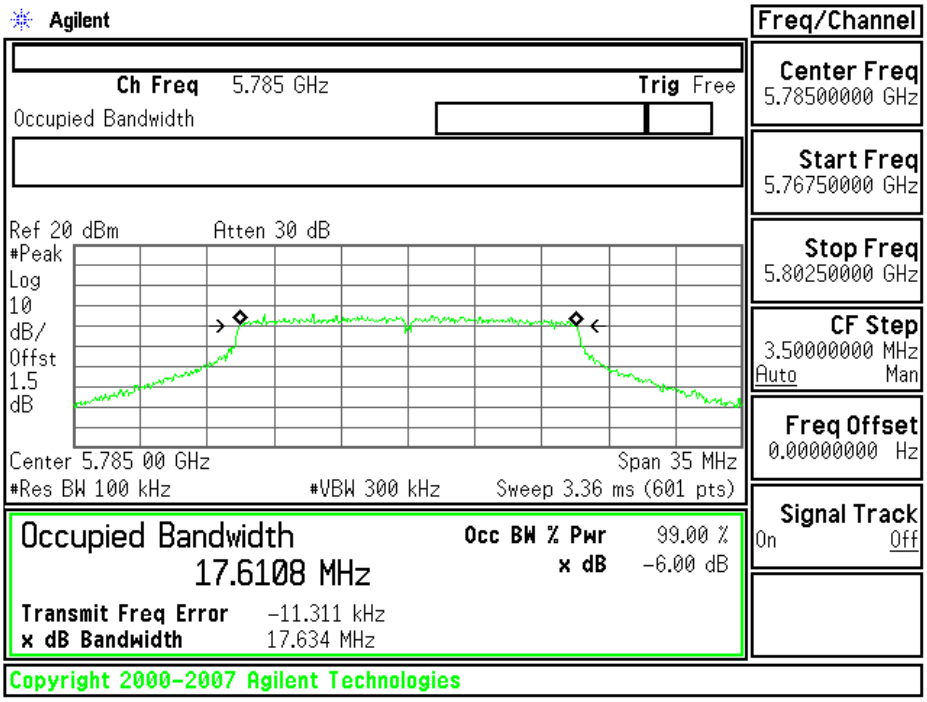
5725MHz-5825MHz

draft 802.11an Standard-20 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

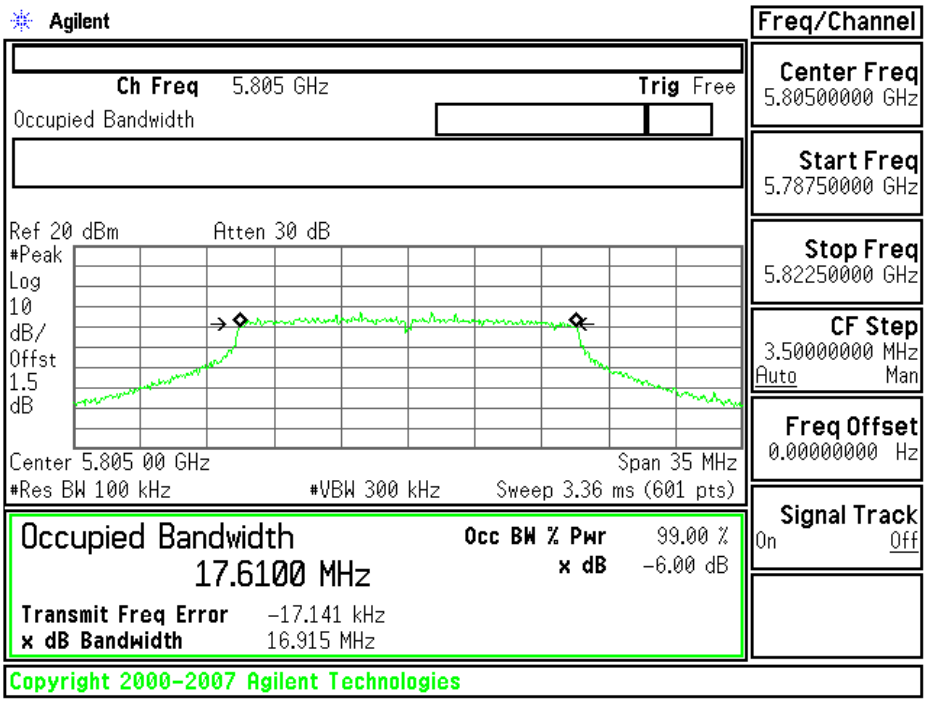
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

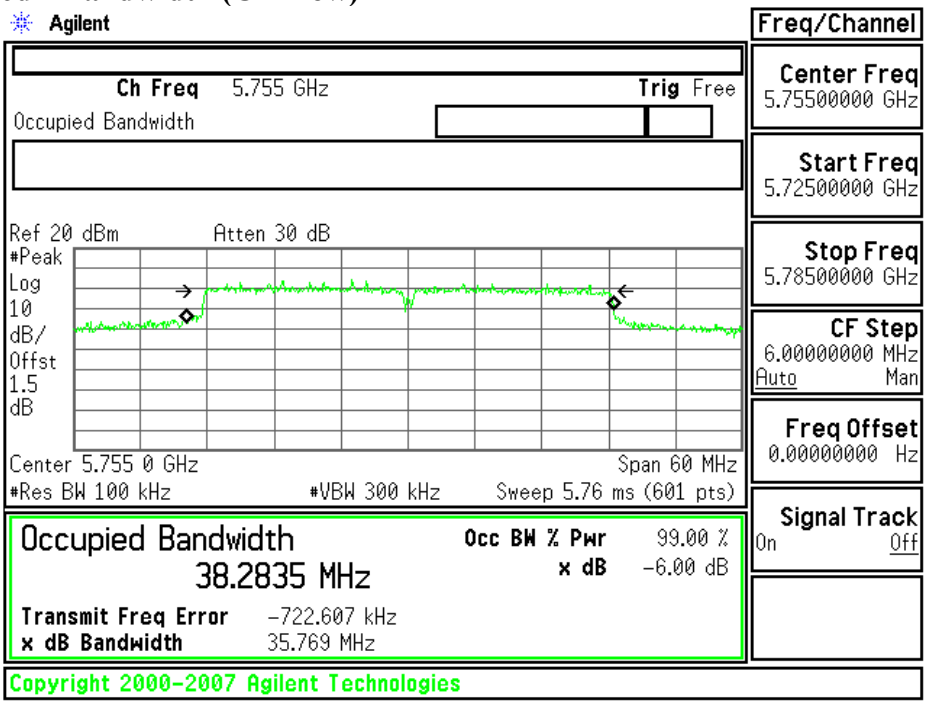


6dB Bandwidth (CH High)

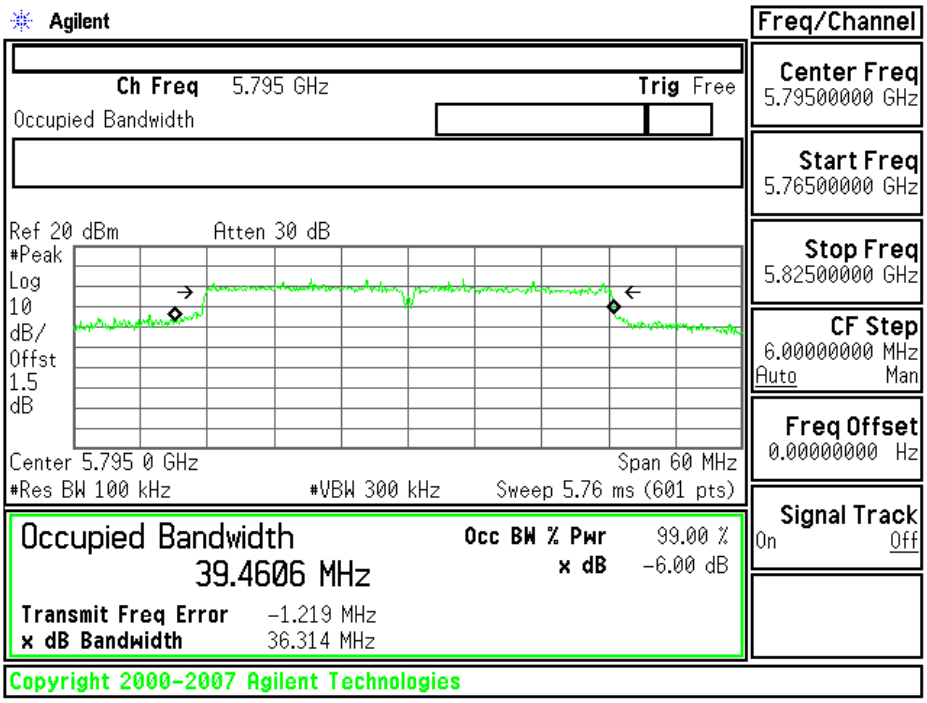


draft 802.11an Standard-40 MHz Channel mode / Chain0 + Chain1 + Chain 2

6dB Bandwidth (CH Low)



6dB Bandwidth (CH High)



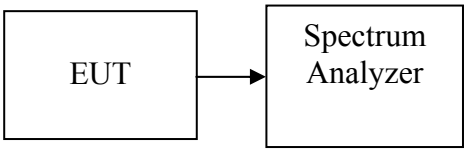
PEAK POWER

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.

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	15.38	0.0345	1.00	PASS
Mid	2437	15.26	0.0336		PASS
High	2462	15.29	0.0338		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.72	0.0373	1.00	PASS
Mid	2437	15.60	0.0363		PASS
High	2462	15.92	0.0391		PASS

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.85	15.10	15.24	20.18	0.1042	1.00	PASS
Mid	2437	15.26	14.85	14.68	19.71	0.0935		PASS
High	2462	15.57	15.16	15.31	20.12	0.1028		PASS

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	16.56	16.40	16.42	21.23	0.1327	1.00	PASS
Mid	2437	16.35	16.26	16.24	21.05	0.1274		PASS
High	2452	16.33	16.42	16.30	21.12	0.1294		PASS

Test mode: draft 802.11gn Standard-20 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	19.40	0.0871	1.00	PASS
Mid	2437	19.35	0.0861		PASS
High	2462	19.51	0.0893		PASS

Test mode: draft 802.11gn Wide-40 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	19.61	0.0914	1.00	PASS
Mid	2437	19.68	0.0929		PASS
High	2452	19.57	0.0906		PASS

Test mode: IEEE 802.11a mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5745	16.91	0.0491	1.00	PASS
Mid	5785	16.80	0.0479		PASS
High	5805	15.36	0.0344		PASS

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5745	17.25	15.46	16.93	21.38	0.1374	1.00	PASS
Mid	5785	15.93	15.84	16.65	20.93	0.1239		PASS
High	5805	16.96	16.22	16.25	21.26	0.1337		PASS

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5755	14.99	14.87	14.93	19.70	0.0933	1.00	PASS
Mid	5795	14.92	14.76	14.72	19.57	0.0906		PASS

Test mode: draft 802.11an Standard-20 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5745	18.24	0.0667	1.00	PASS
Mid	5785	17.07	0.0509		PASS
High	5805	17.10	0.0513		PASS

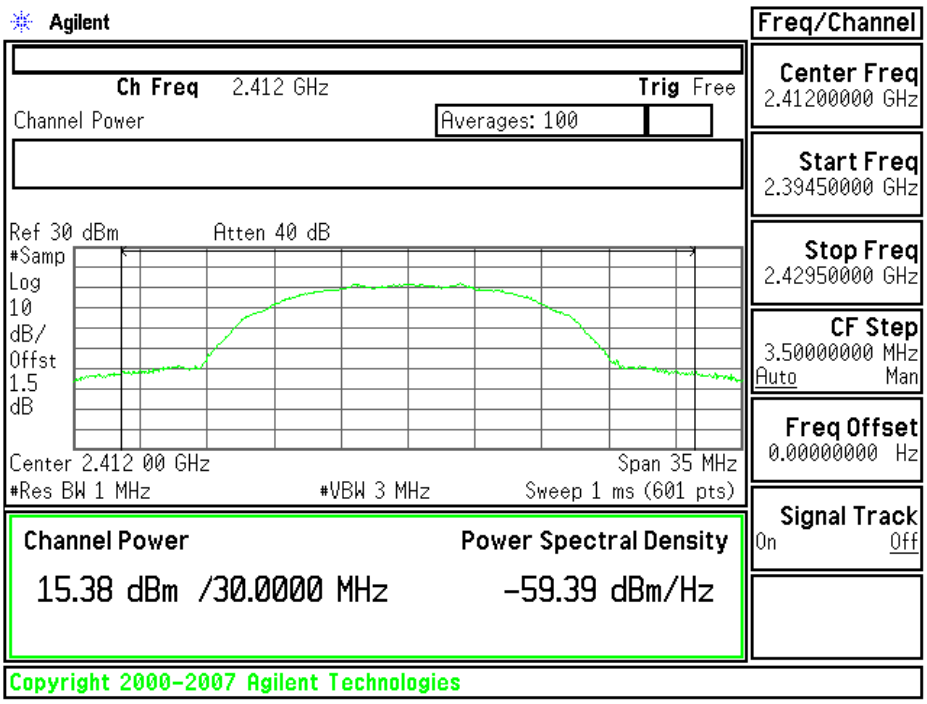
Test mode: draft 802.11an Wide-40 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5755	21.85	0.1531	1.00	PASS
Mid	5795	22.85	0.1928		PASS

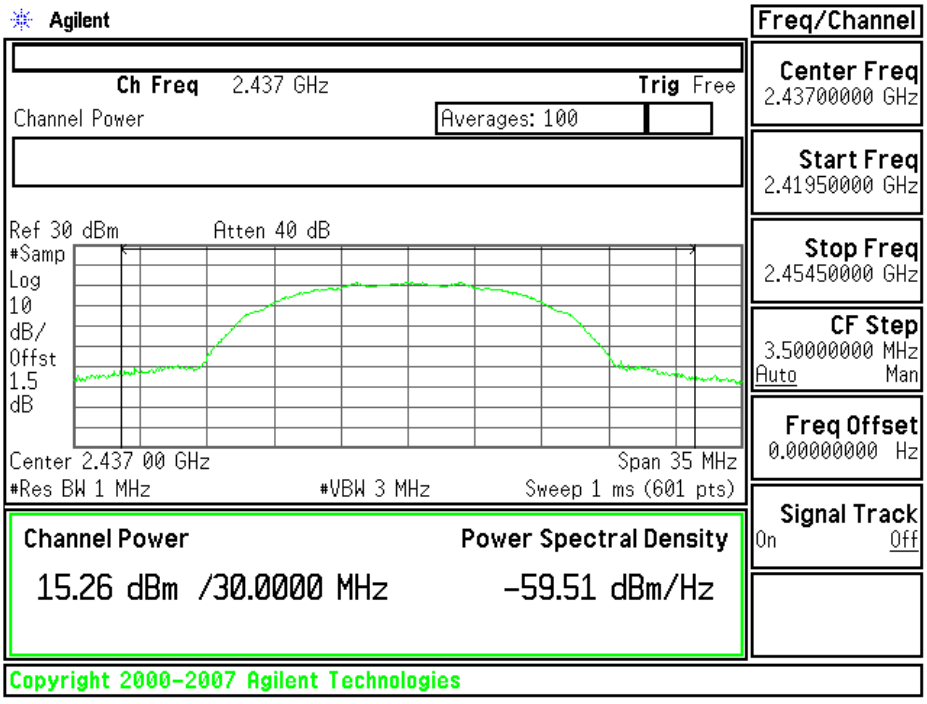
Test Plot

IEEE 802.11b mode

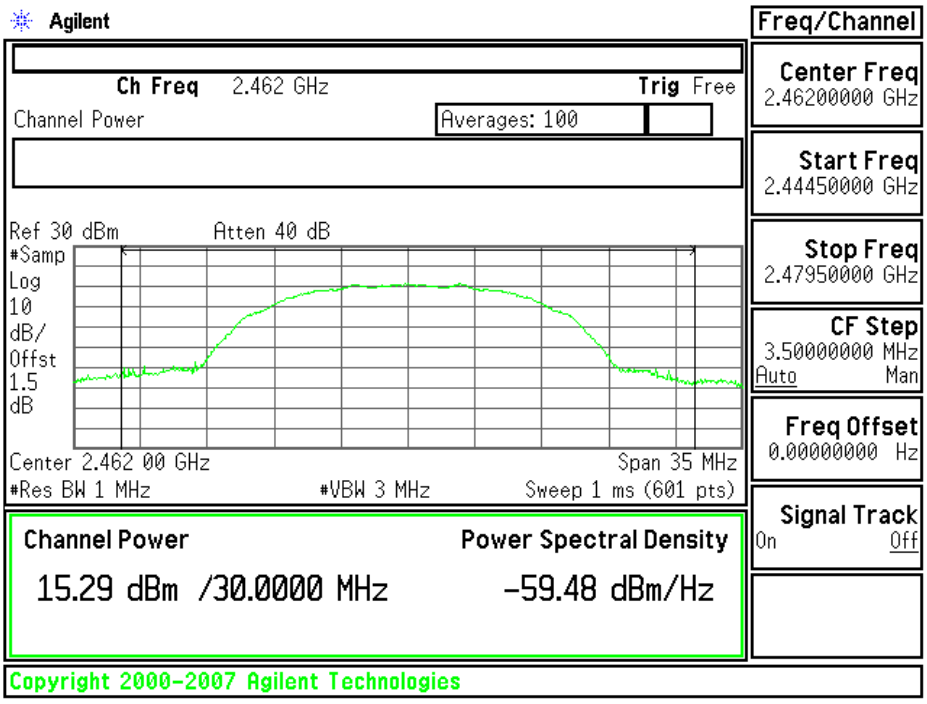
Peak Power (CH Low)



Peak Power (CH Mid)

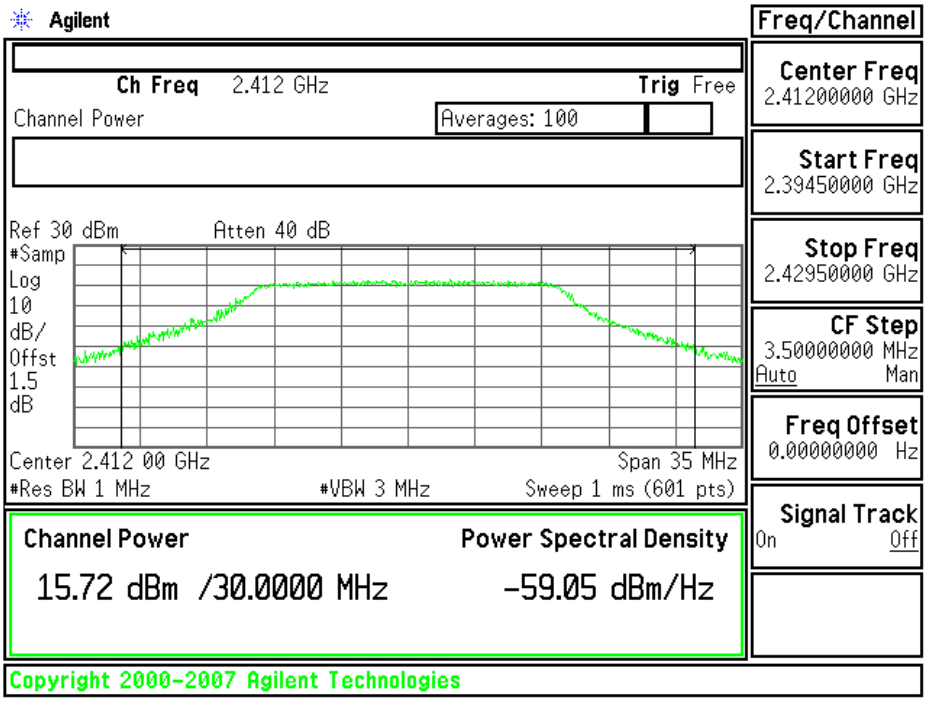


Peak Power (CH High)

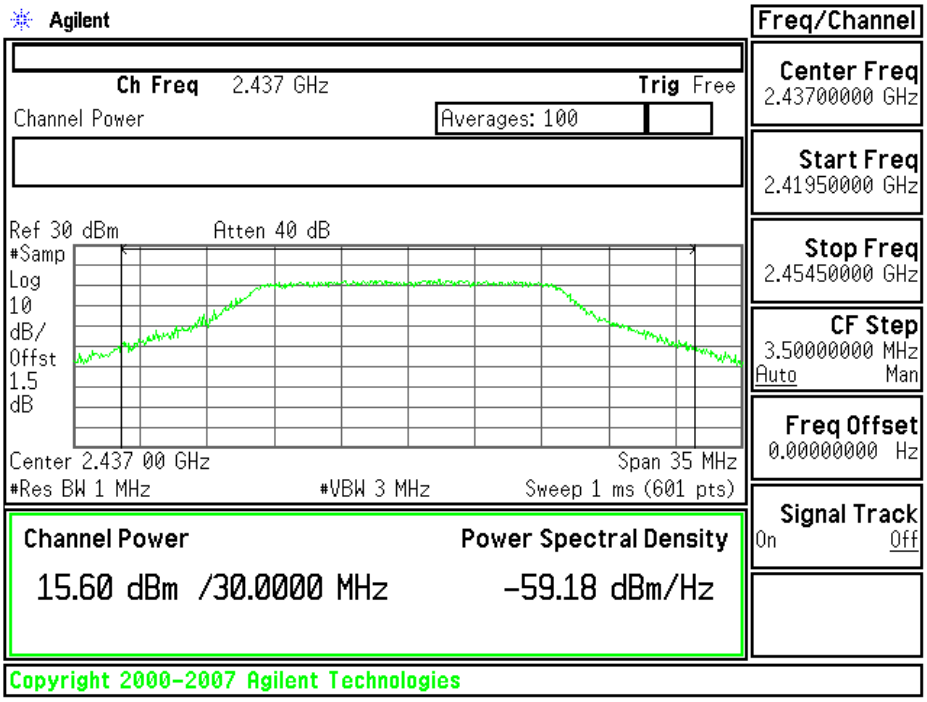


IEEE 802.11g mode

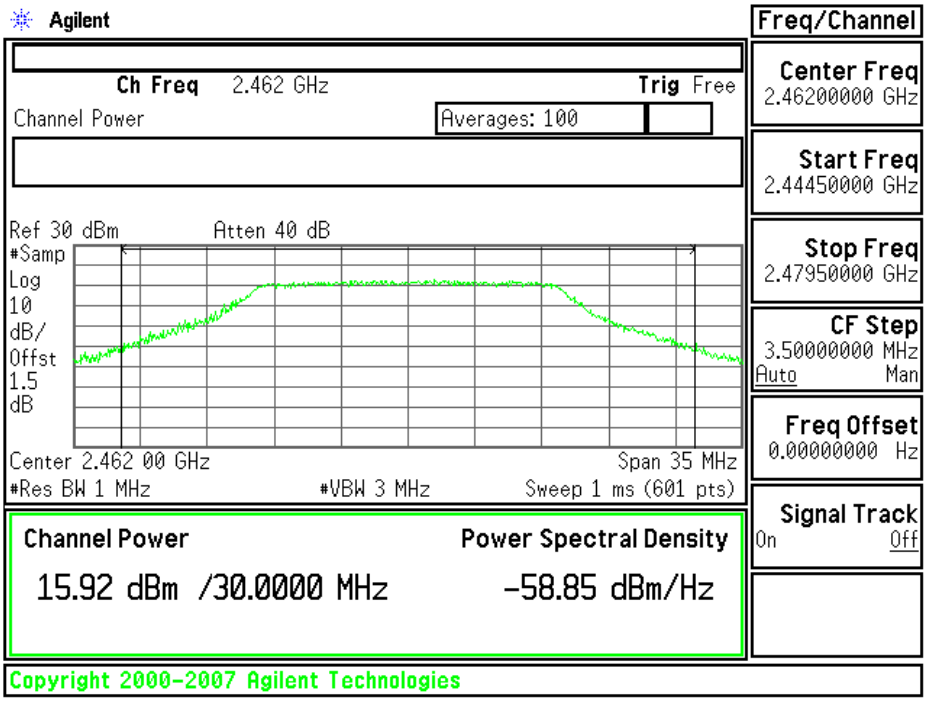
Peak Power (CH Low)



Peak Power (CH Mid)

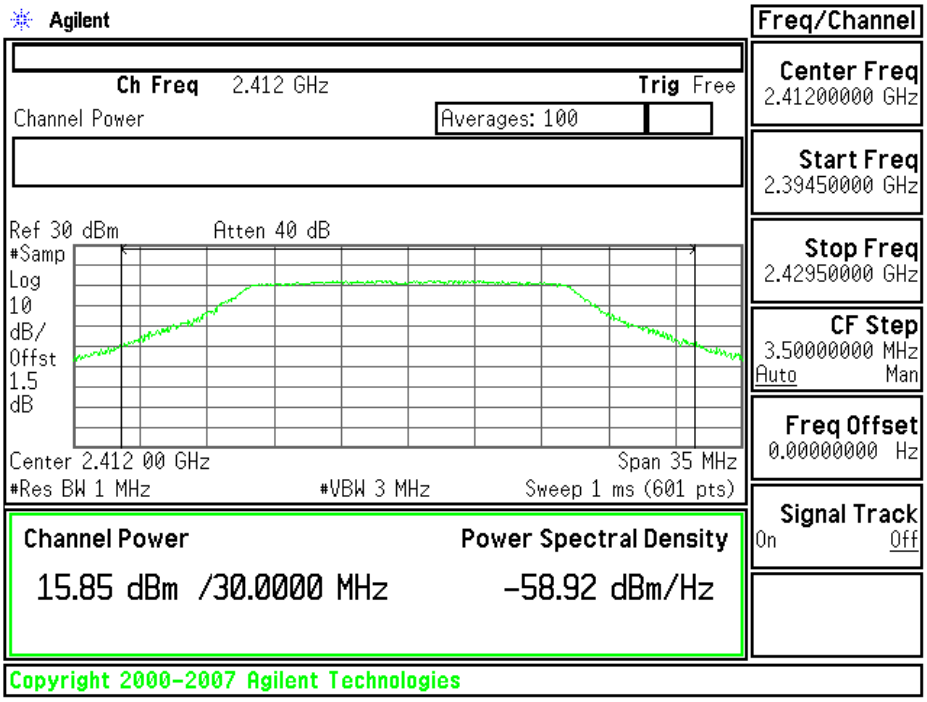


Peak Power (CH High)

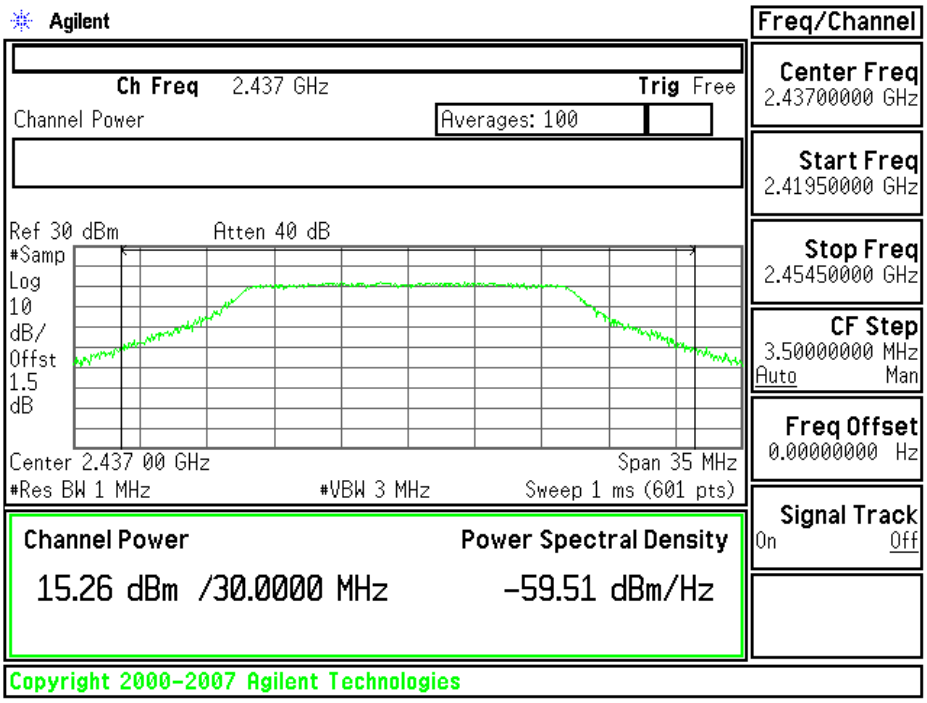


draft 802.11gn Standard-20 MHz Channel mode / Chain 0

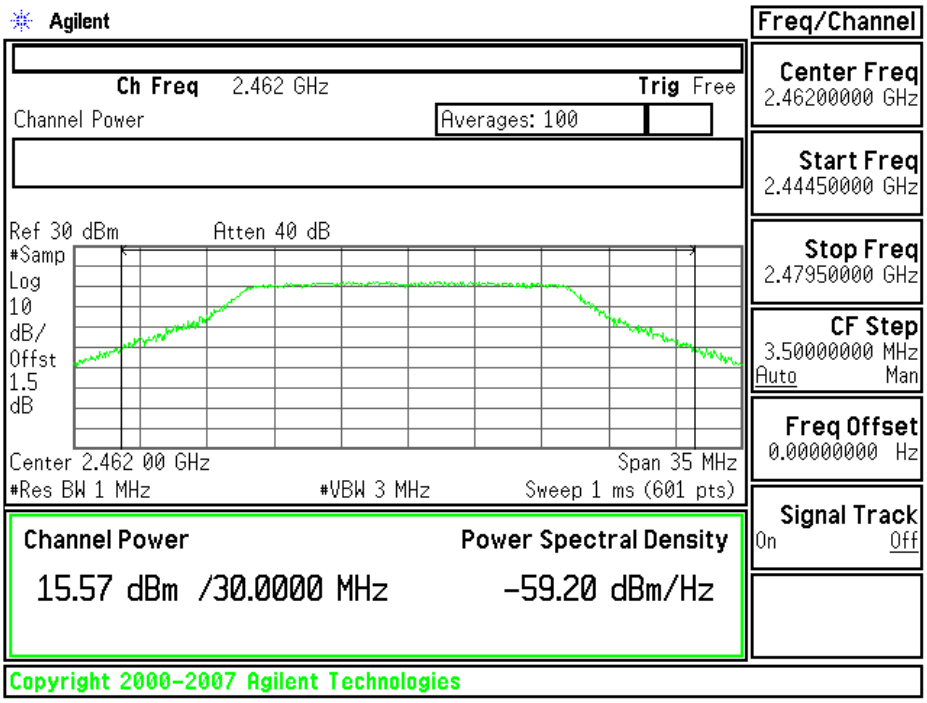
Peak Power (CH Low)



Peak Power (CH Mid)

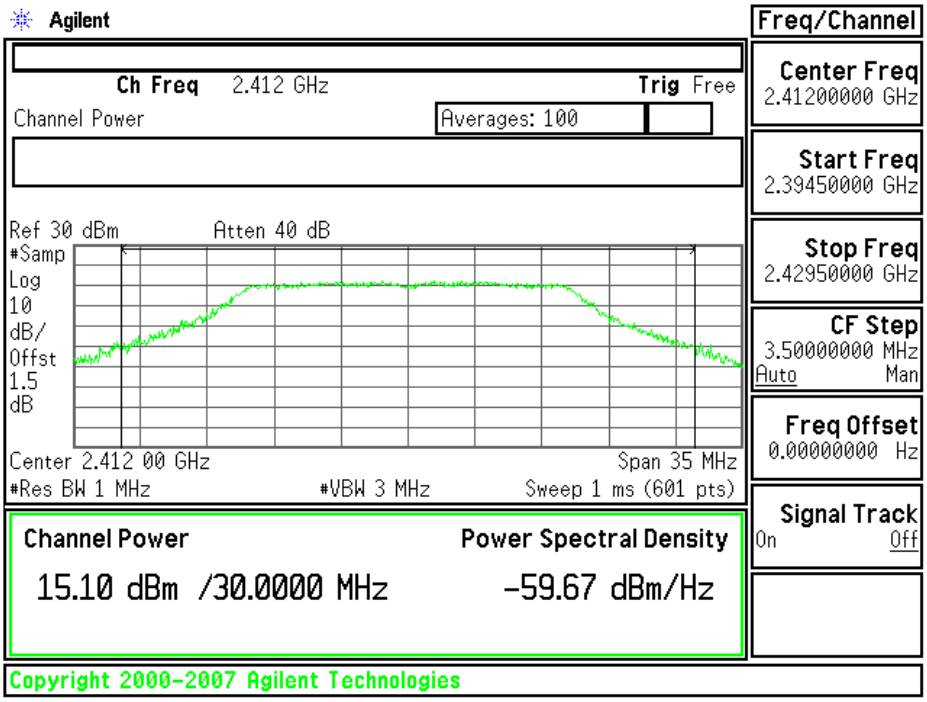


Peak Power (CH High)

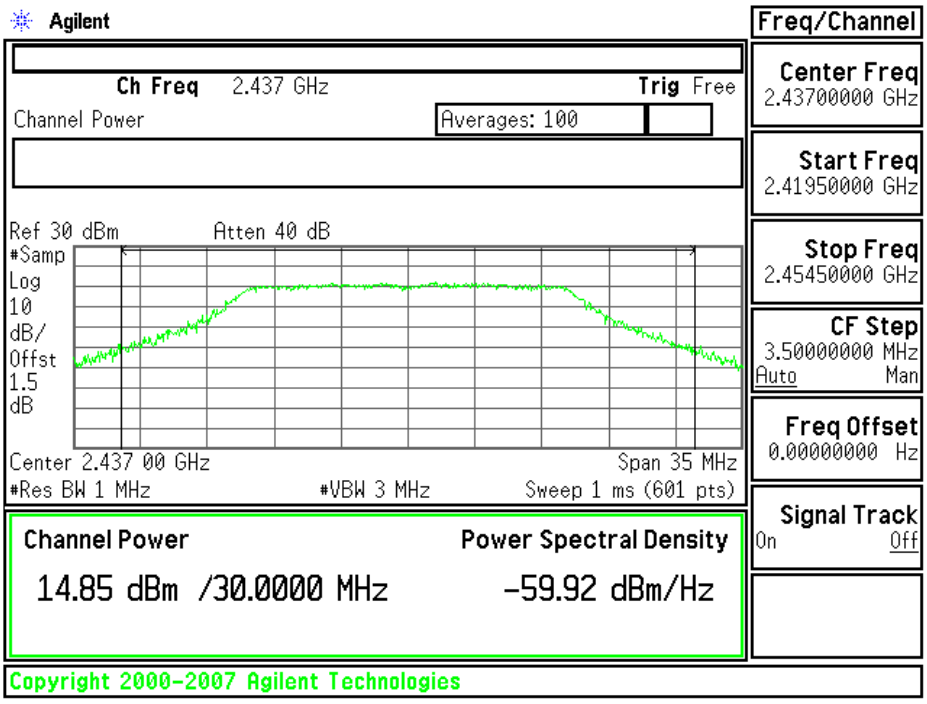


draft 802.11gn Standard-20 MHz Channel mode / Chain 1

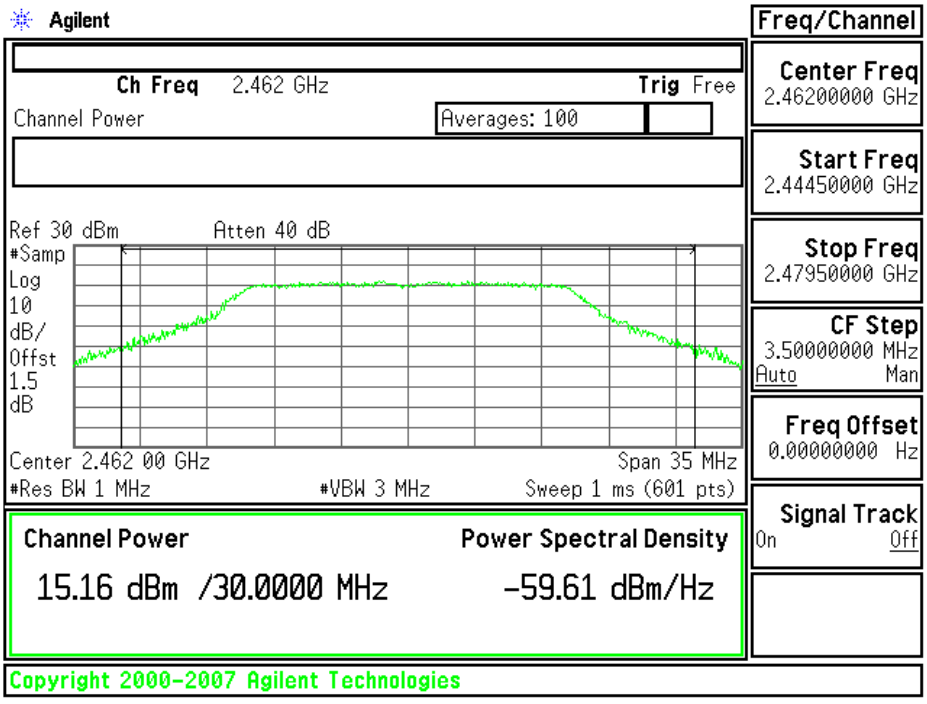
Peak Power (CH Low)



Peak Power (CH Mid)

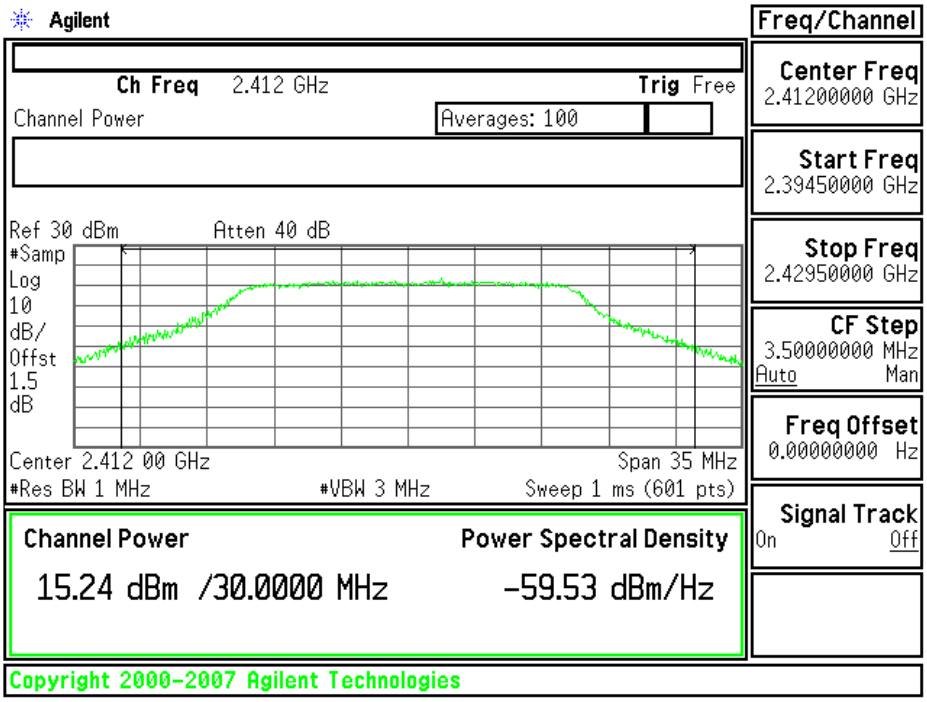


Peak Power (CH High)

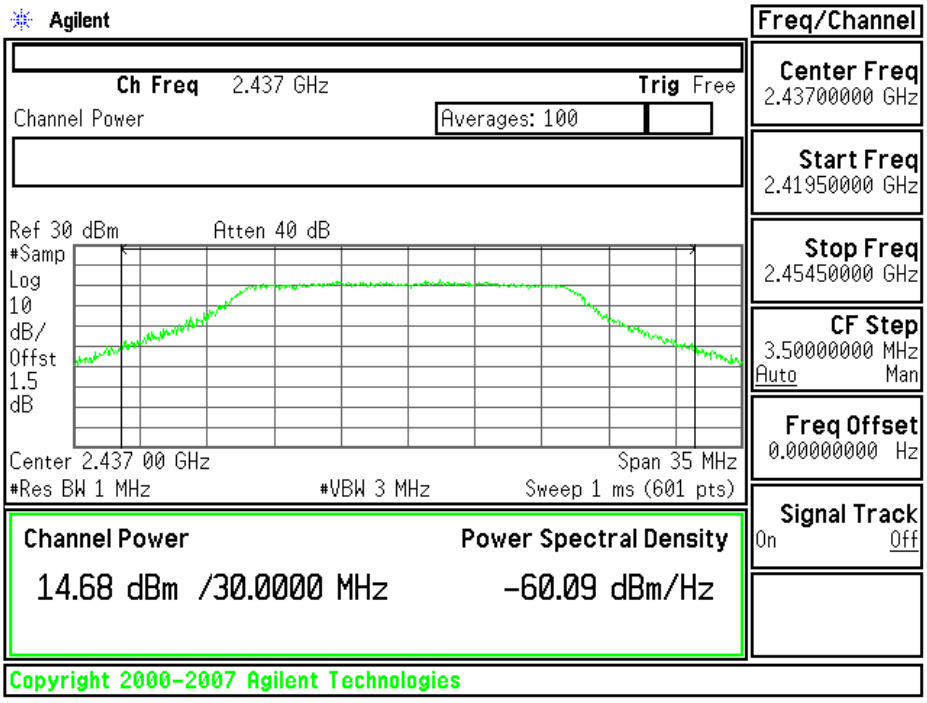


draft 802.11gn Standard-20 MHz Channel mode / Chain 2

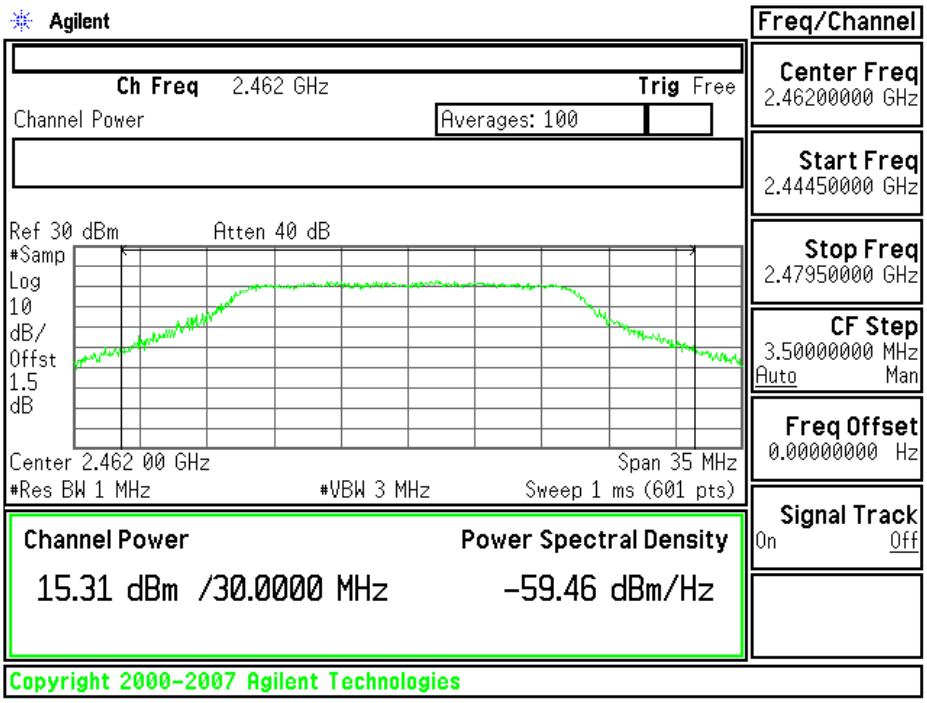
Peak Power (CH Low)



Peak Power (CH Mid)

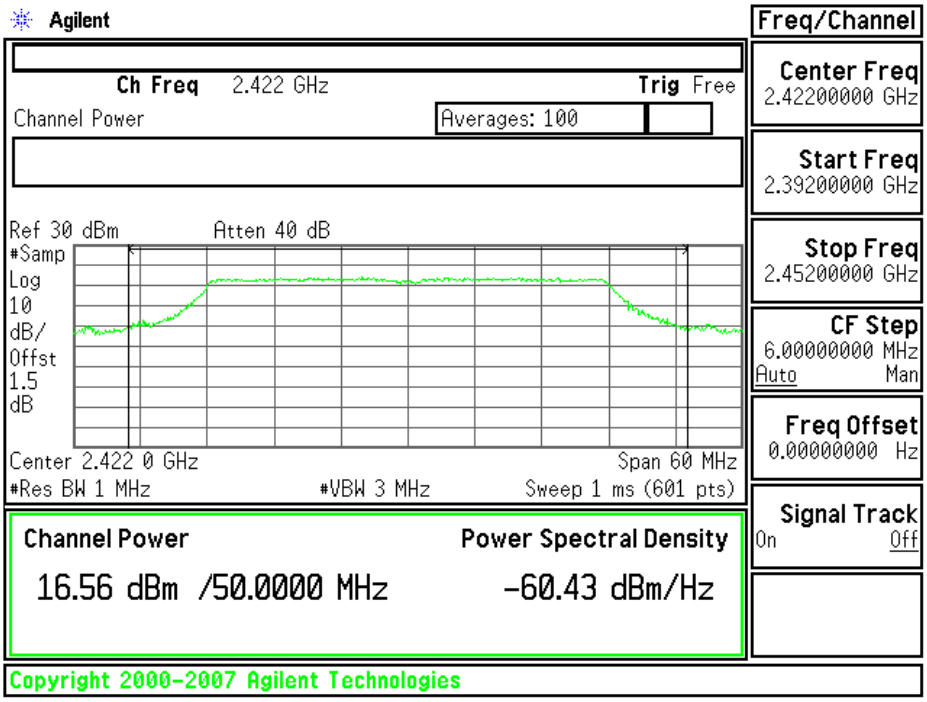


Peak Power (CH High)

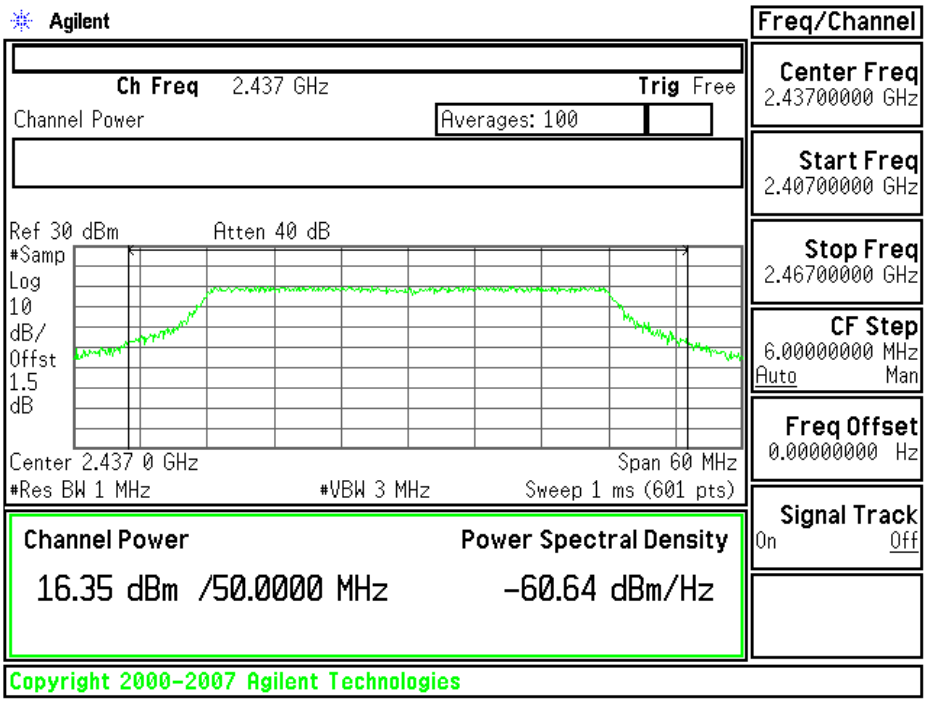


draft 802.11gn Wide-40 MHz Channel mode / Chain 0

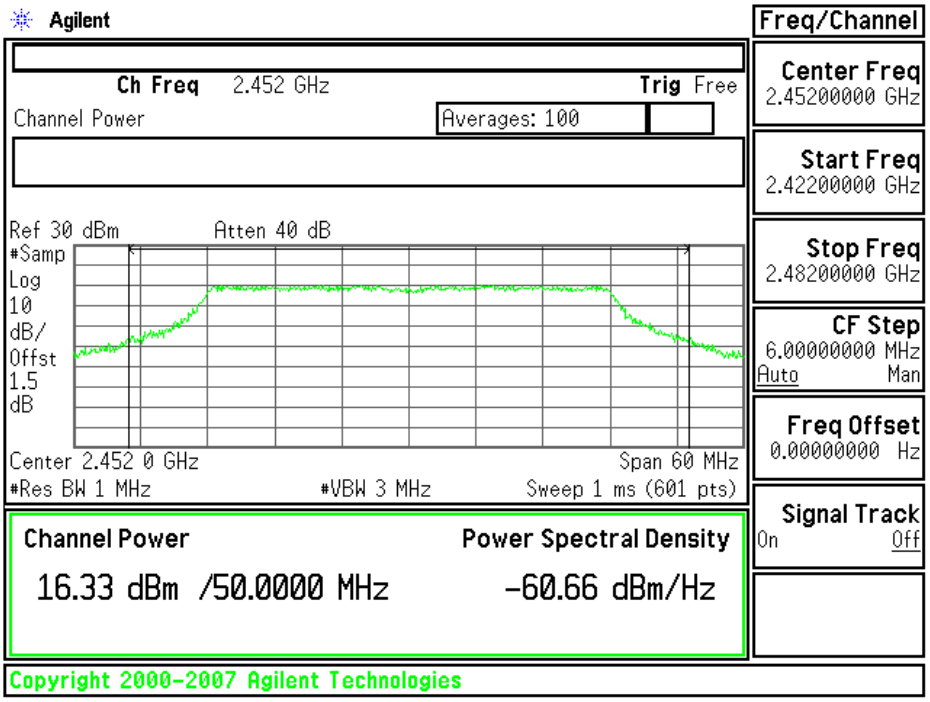
Peak Power (CH Low)



Peak Power (CH Mid)

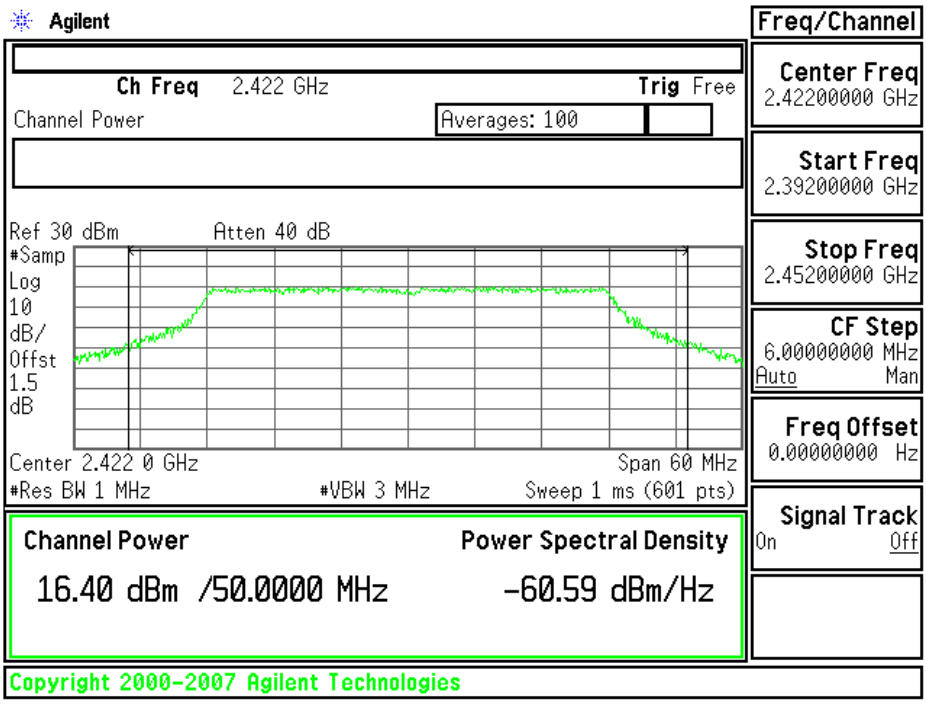


Peak Power (CH High)

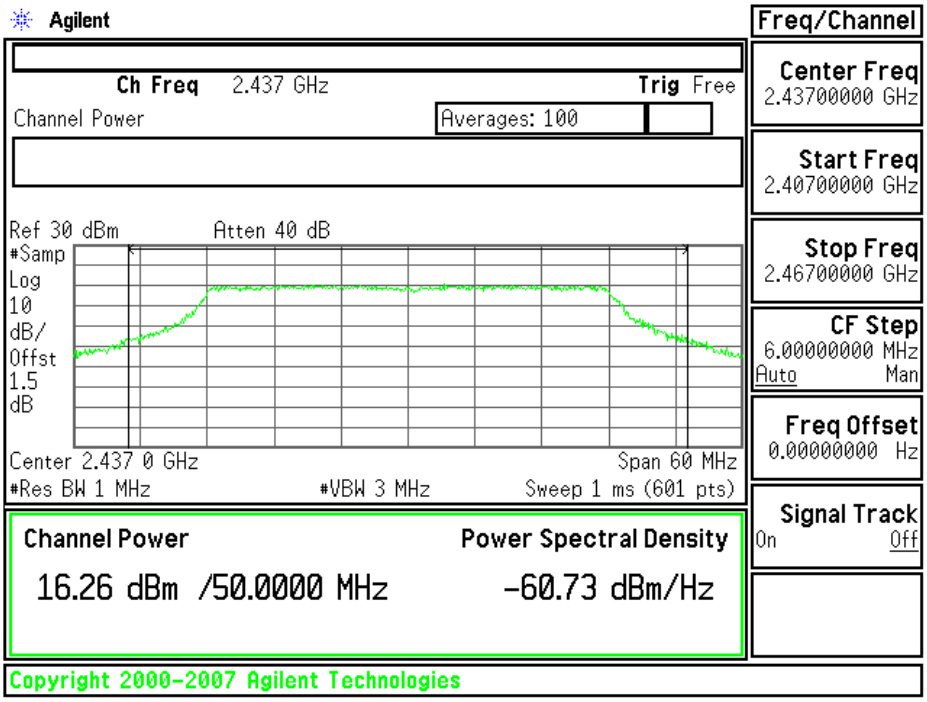


draft 802.11gn Wide-40 MHz Channel mode / Chain 1

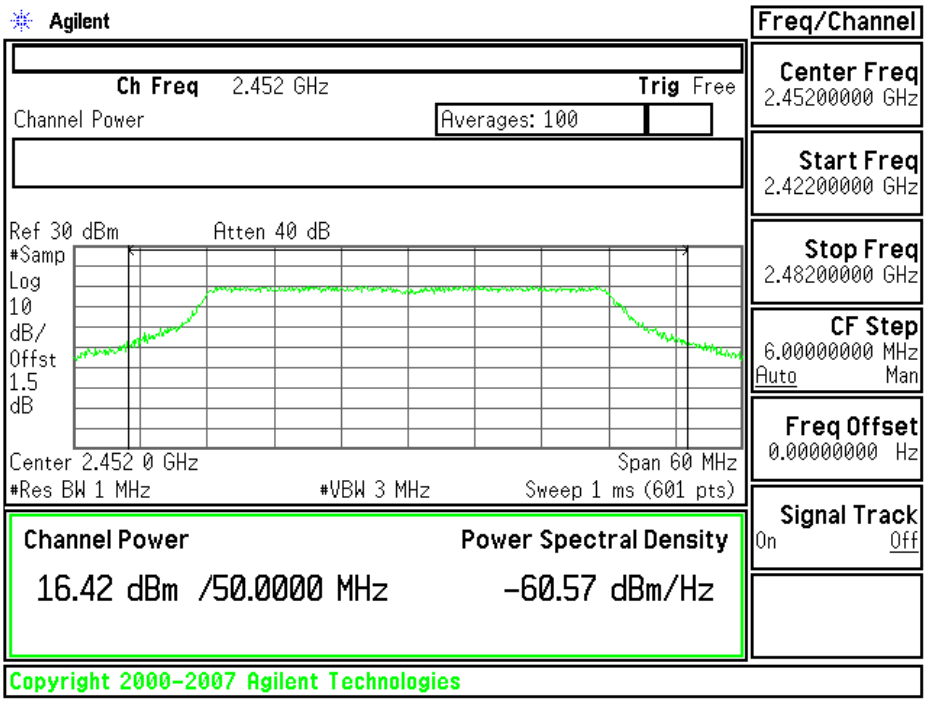
Peak Power (CH Low)



Peak Power (CH Mid)

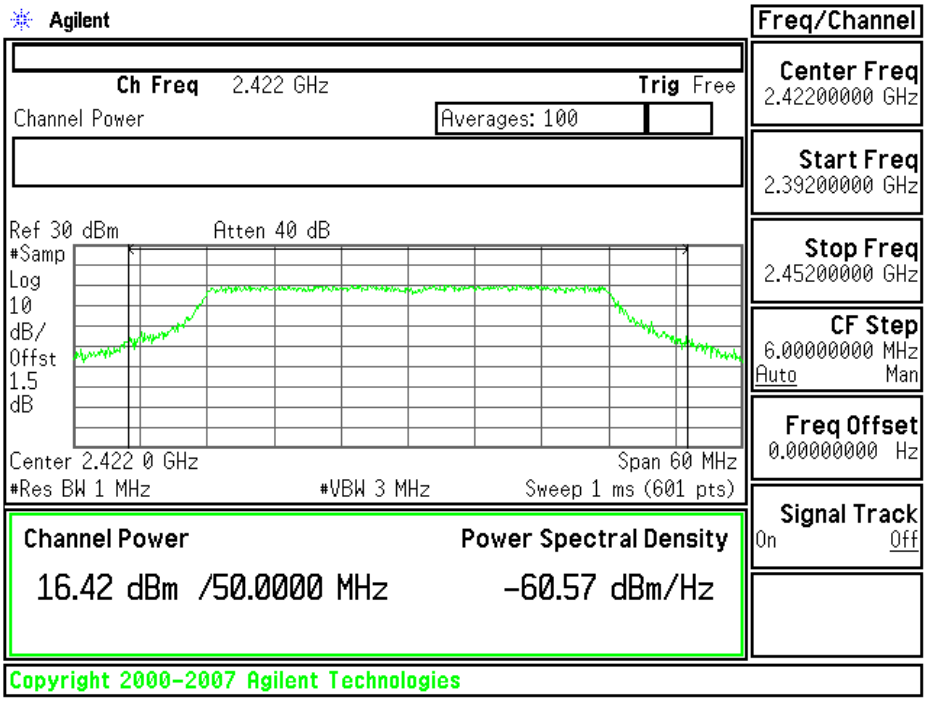


Peak Power (CH High)

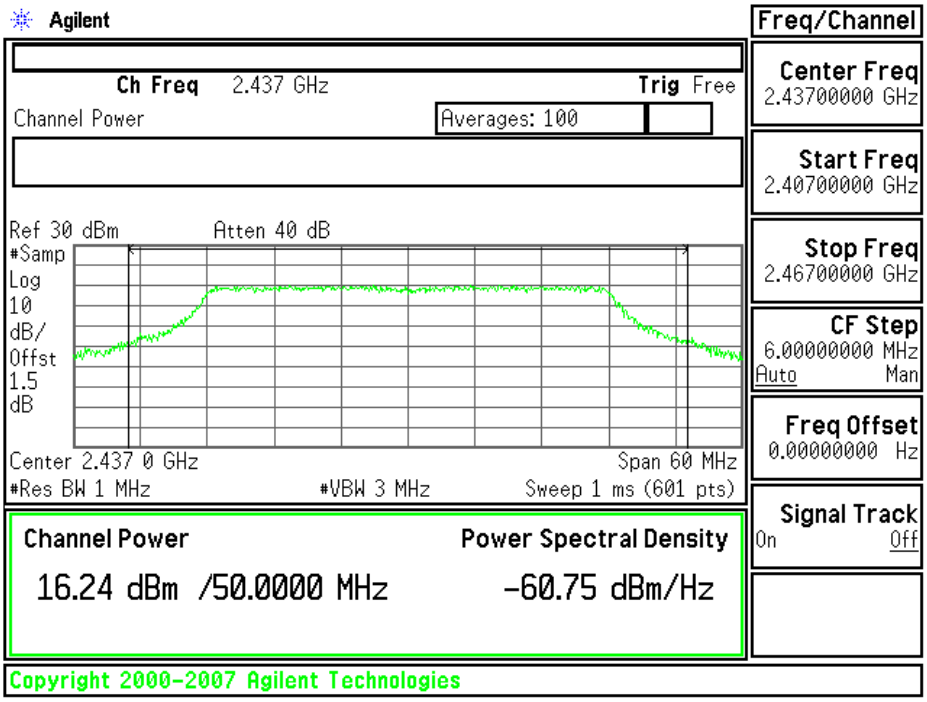


draft 802.11gn Wide-40 MHz Channel mode / Chain 2

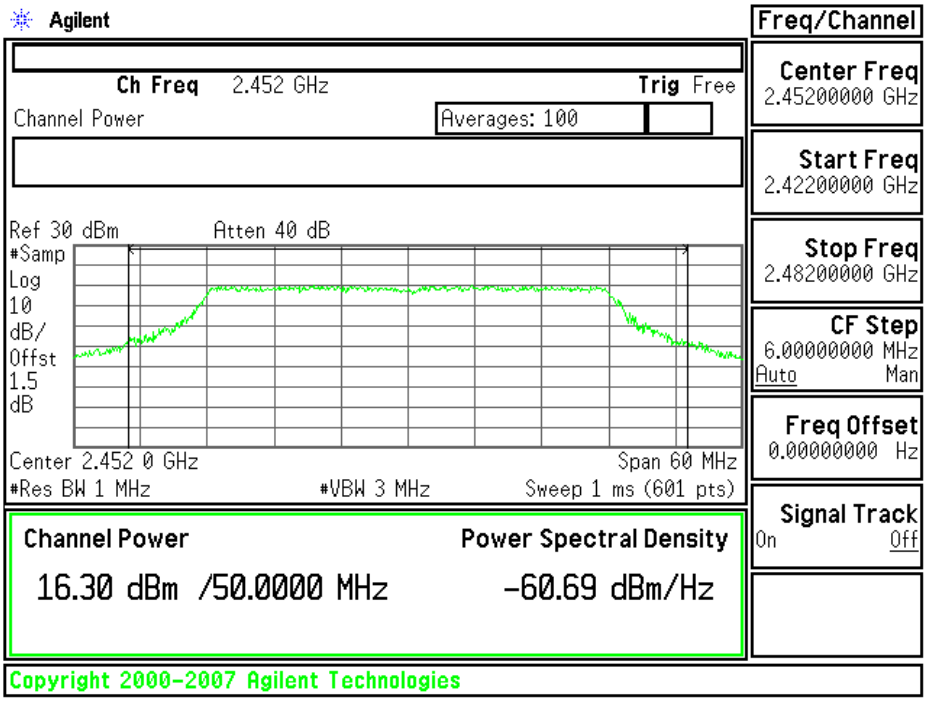
Peak Power (CH Low)



Peak Power (CH Mid)

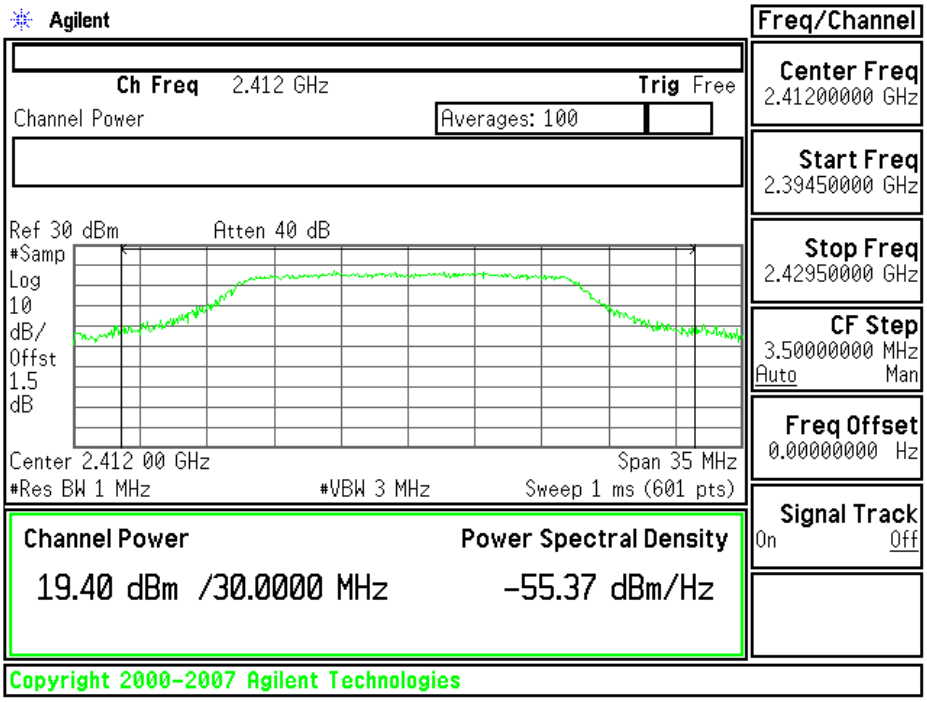


Peak Power (CH High)

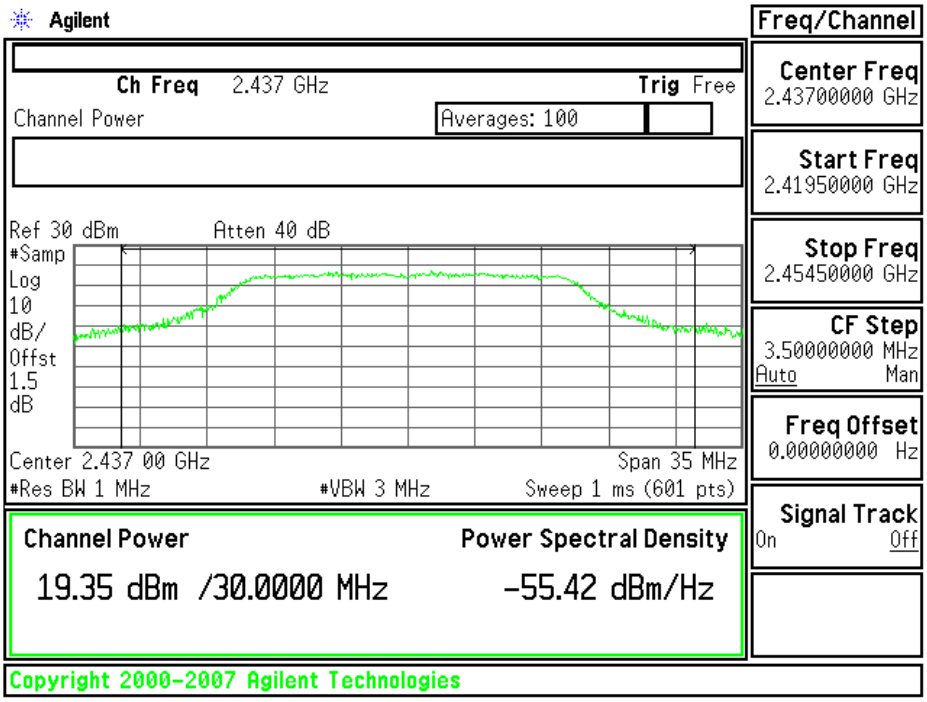


draft 802.11gn Standard-20 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

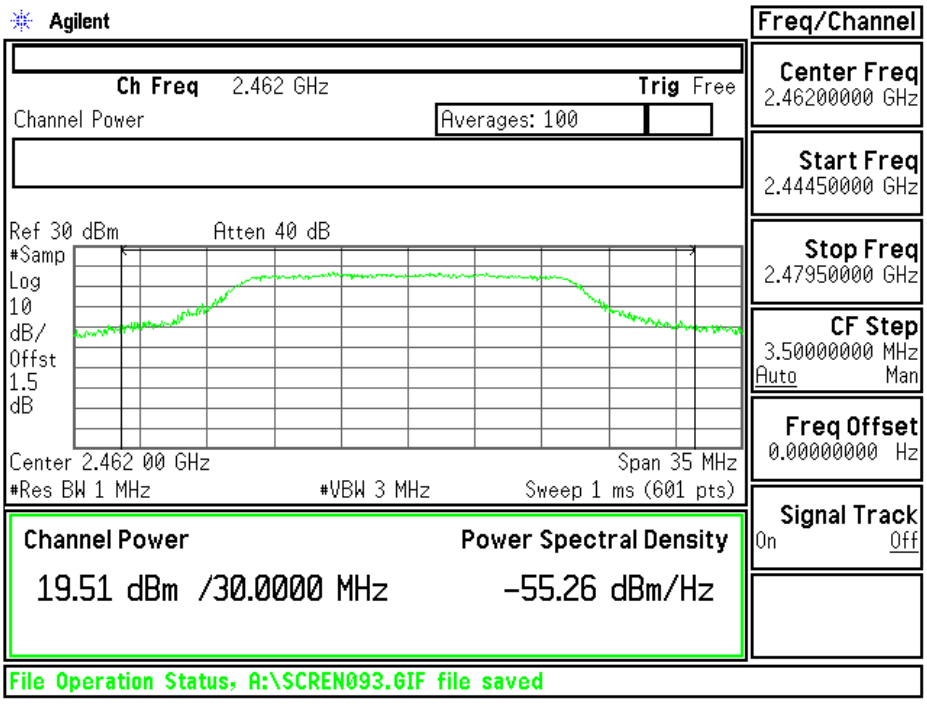
Peak Power (CH Low)



Peak Power (CH Mid)

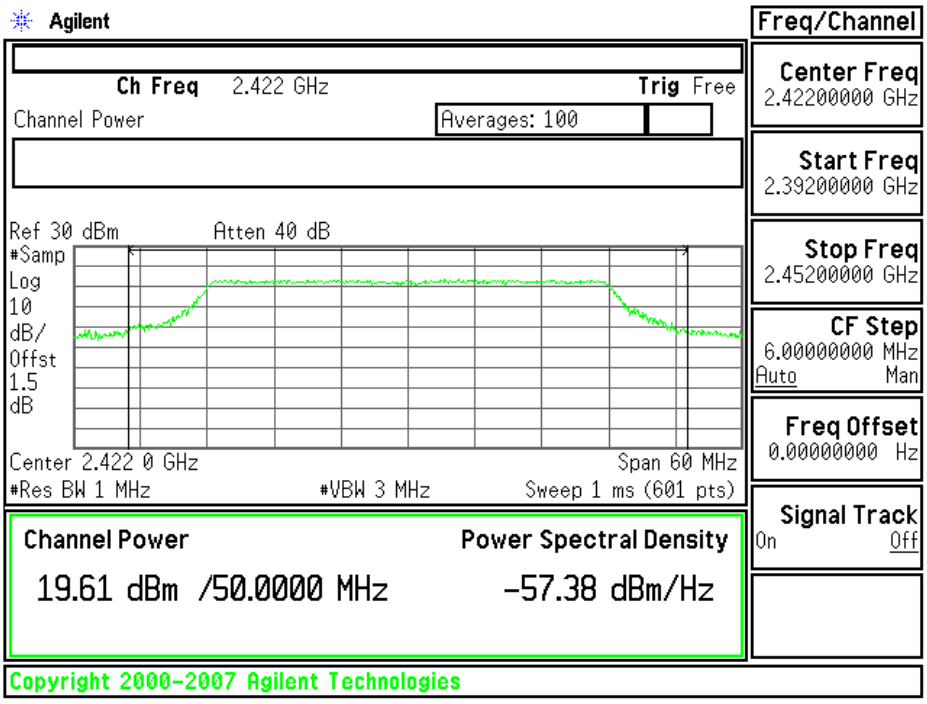


Peak Power (CH High)

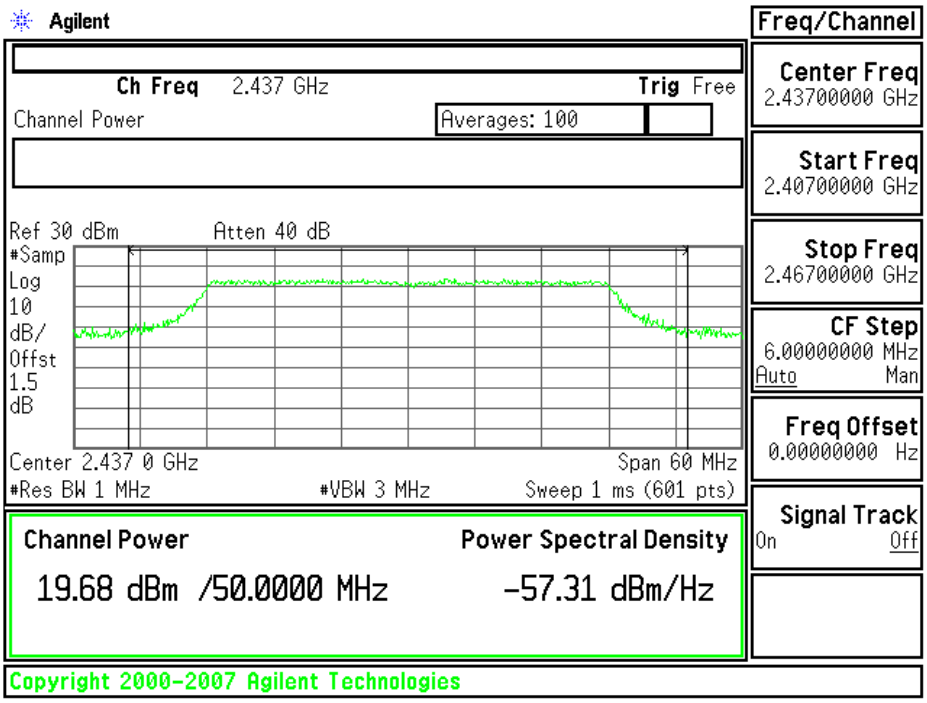


draft 802.11gn Wide-40 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

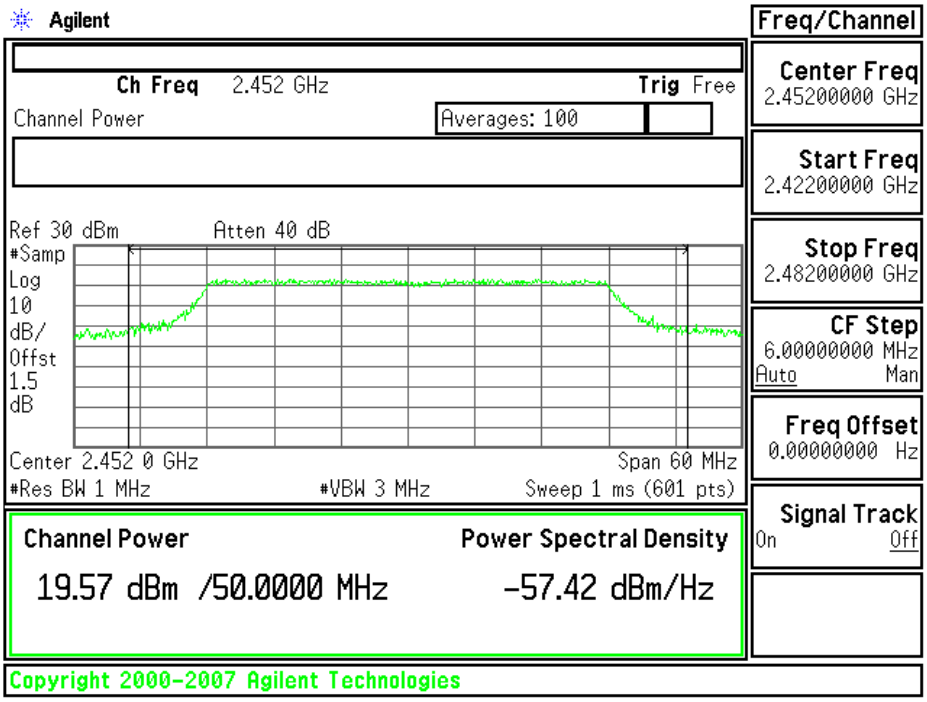
Peak Power (CH Low)



Peak Power (CH Mid)



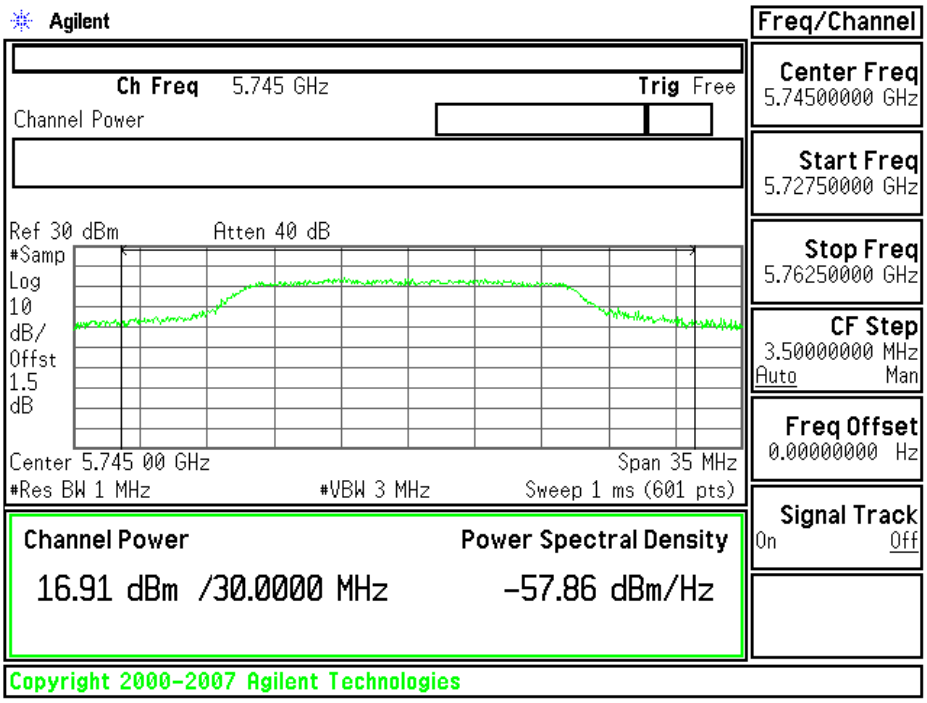
Peak Power (CH High)



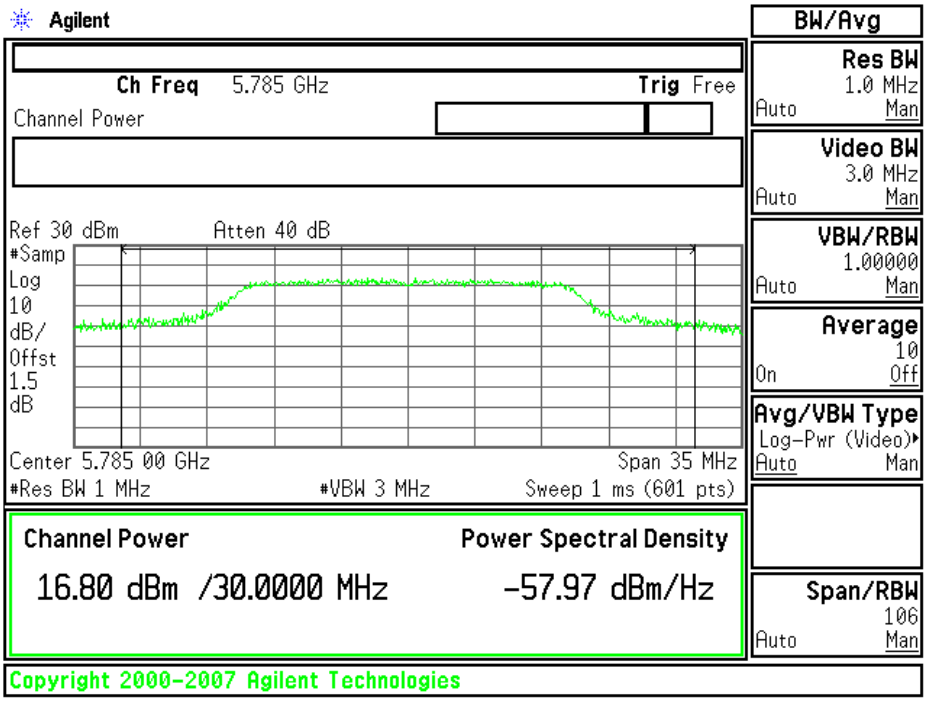
5725-5825

IEEE 802.11a mode

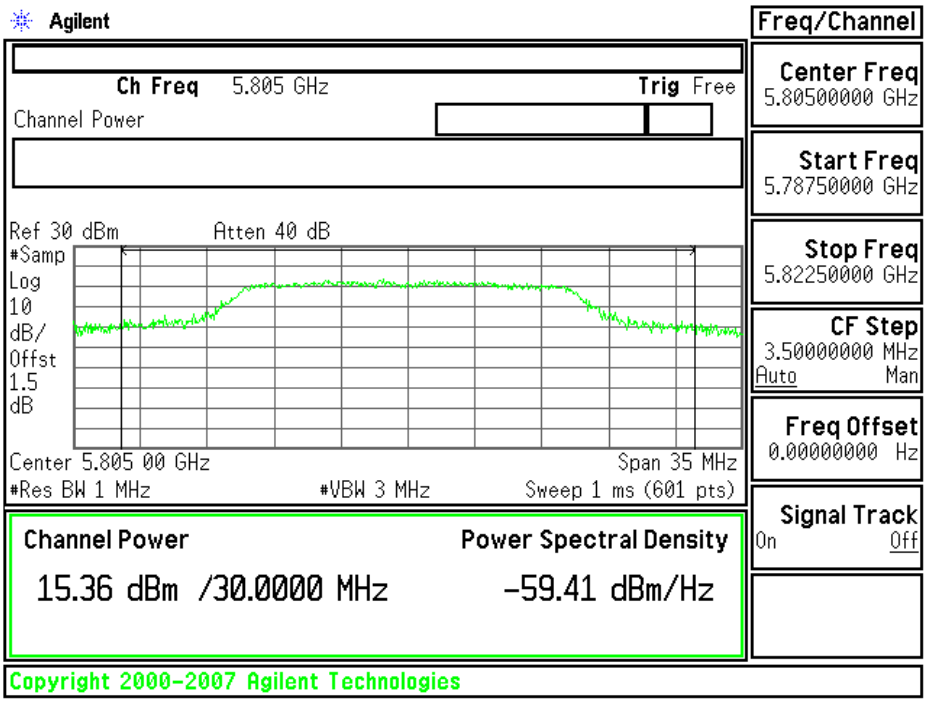
Peak Power (CH Low)



Peak Power (CH Mid)

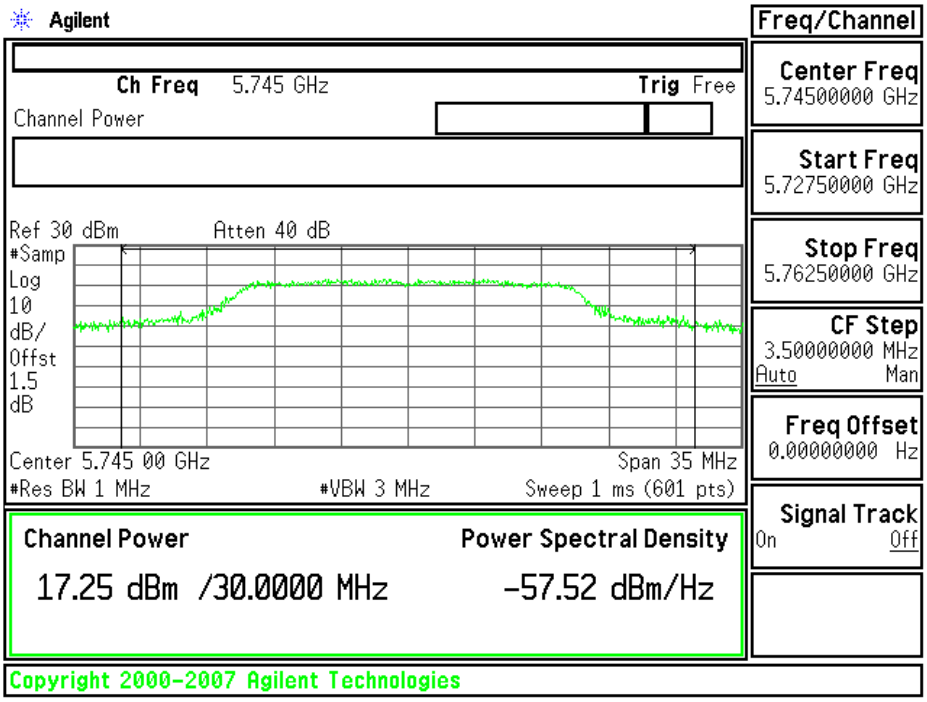


Peak Power (CH Hgih)

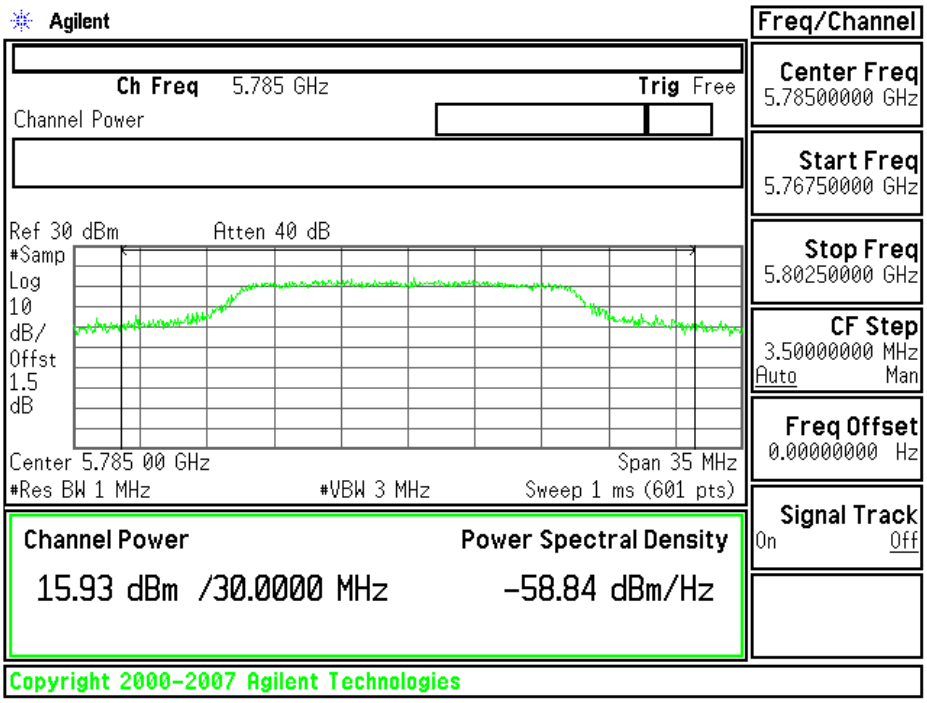


draft 802.11an Standard-20 MHz Channel mode / Chain 0

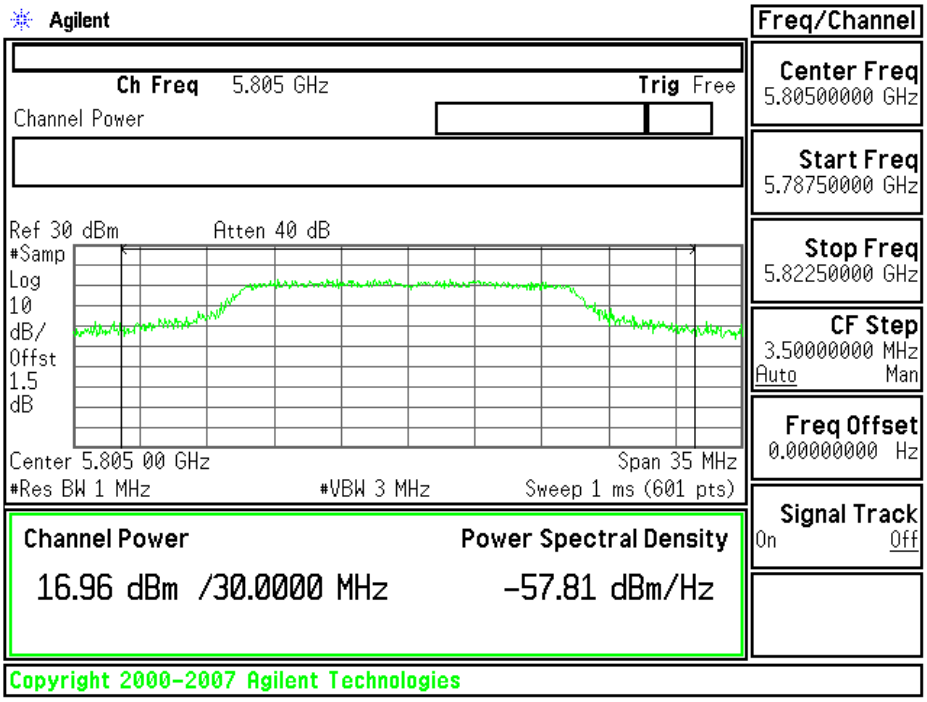
Peak Power (CH Low)



Peak Power (CH Mid)

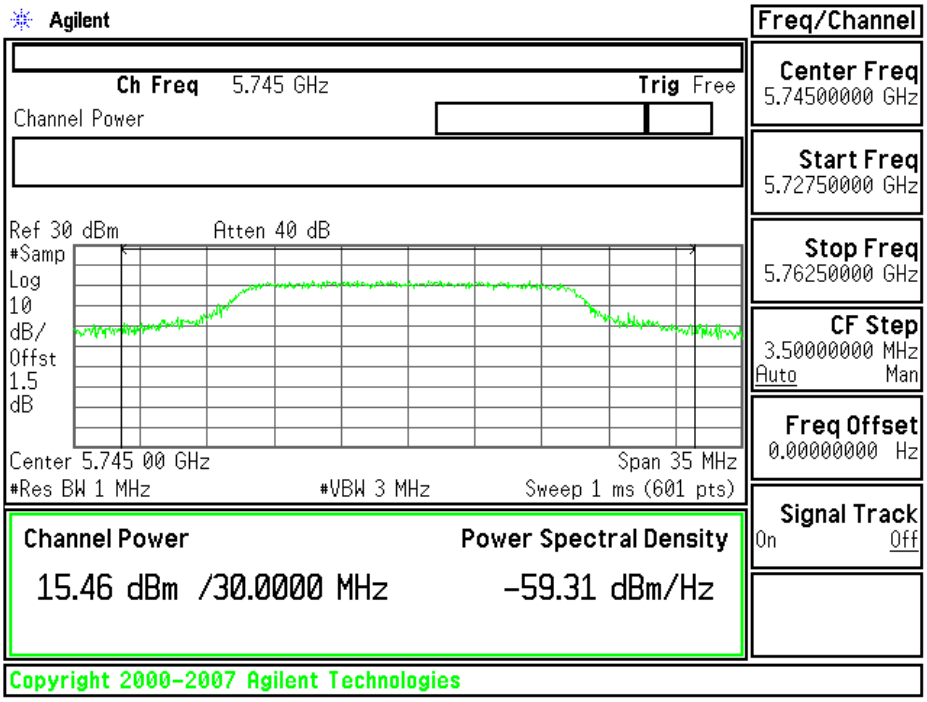


Peak Power (CH High)

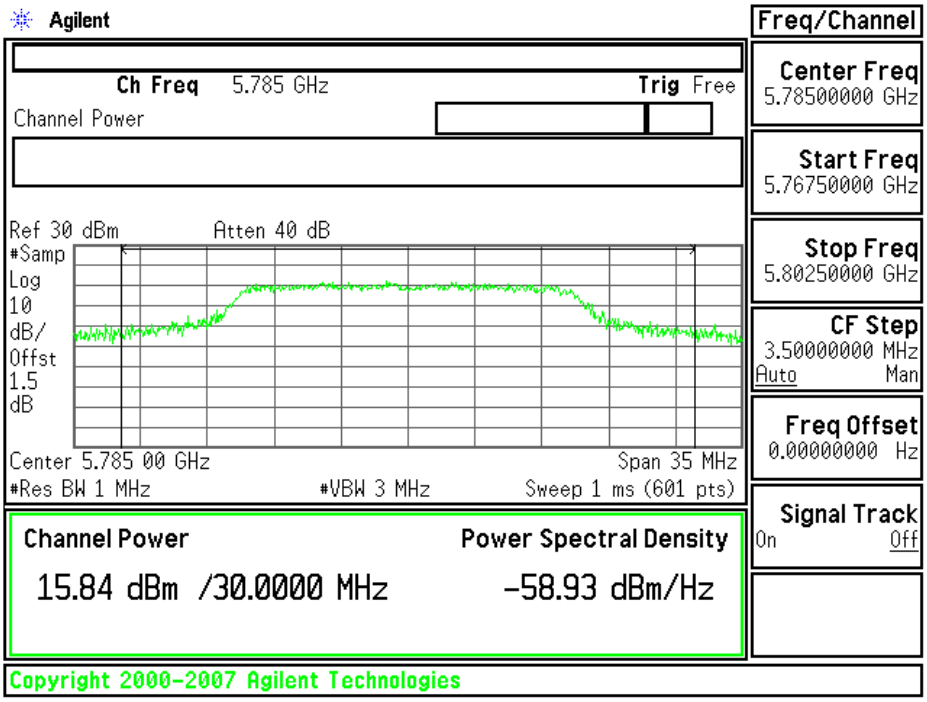


draft 802.11an Standard-20 MHz Channel mode / Chain 1

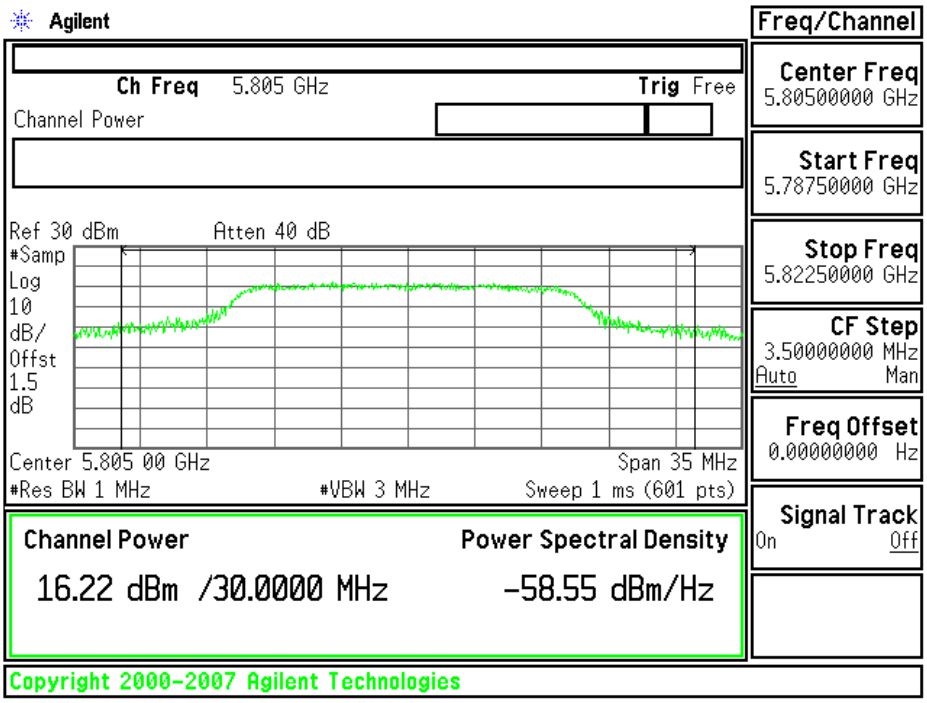
Peak Power (CH Low)



Peak Power (CH Mid)

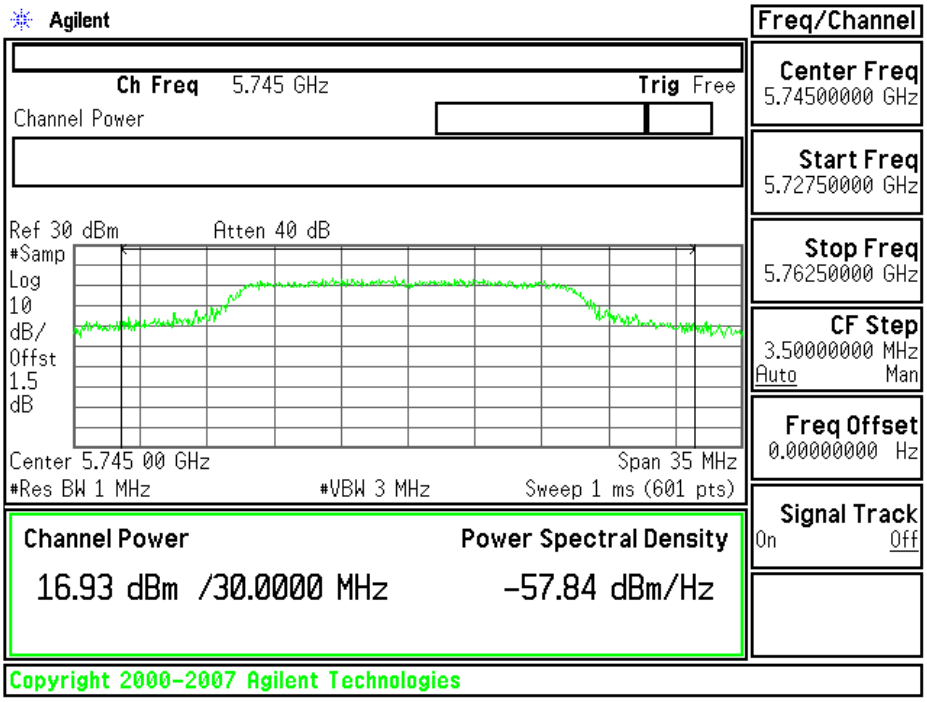


Peak Power (CH High)

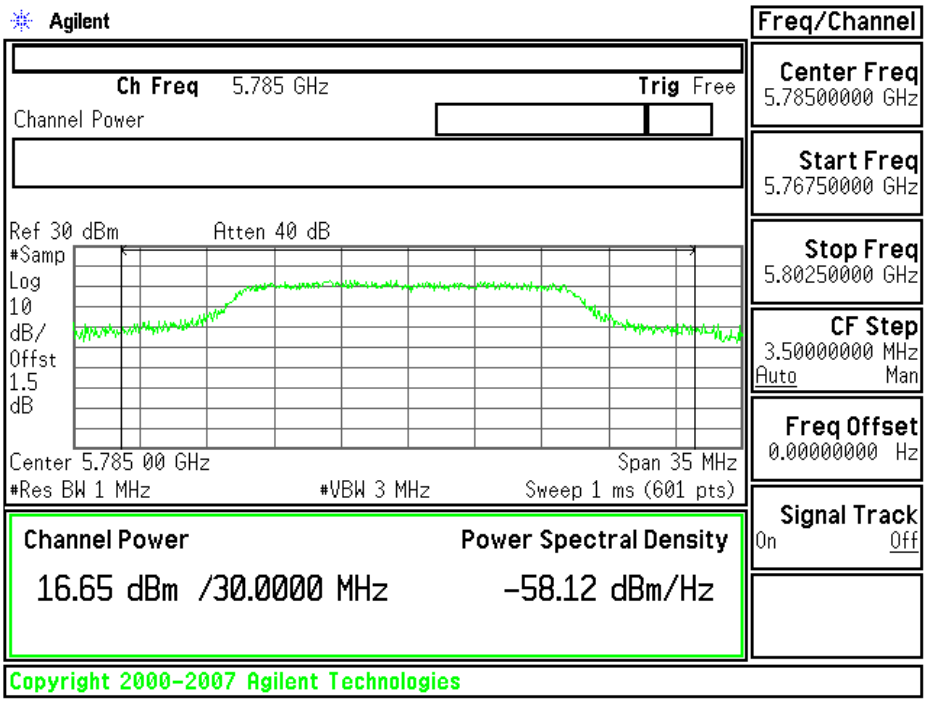


draft 802.11an Standard-20 MHz Channel mode / Chain 2

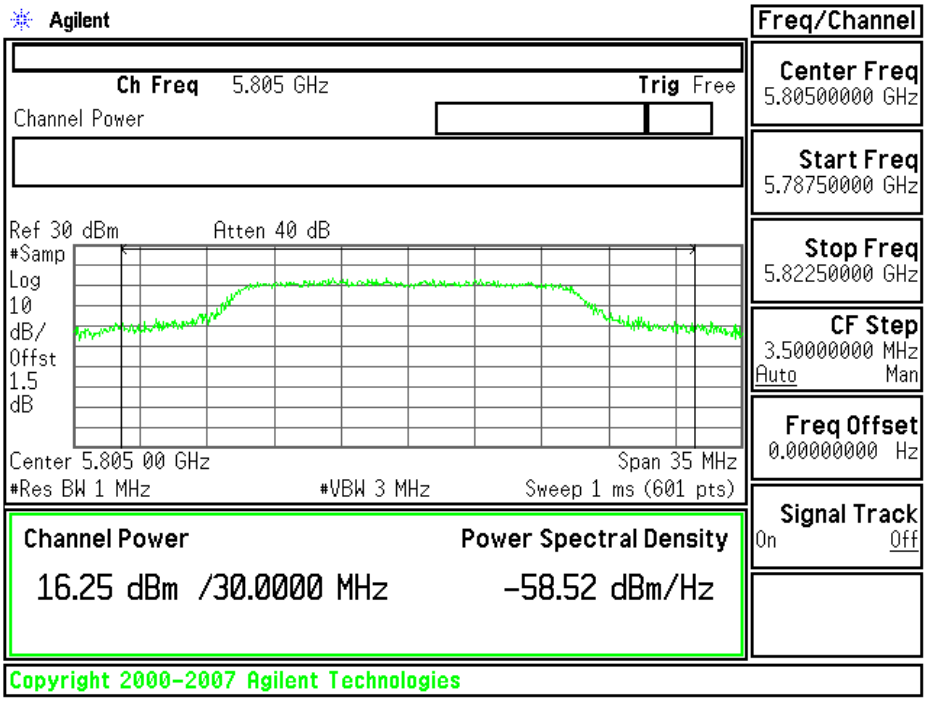
Peak Power (CH Low)



Peak Power (CH Mid)

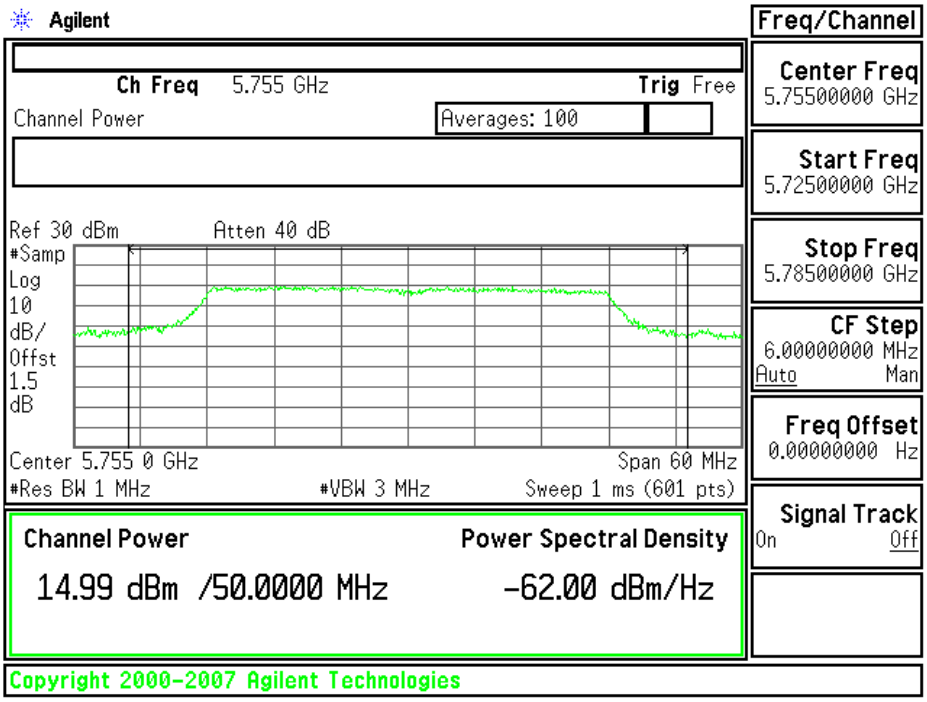


Peak Power (CH High)

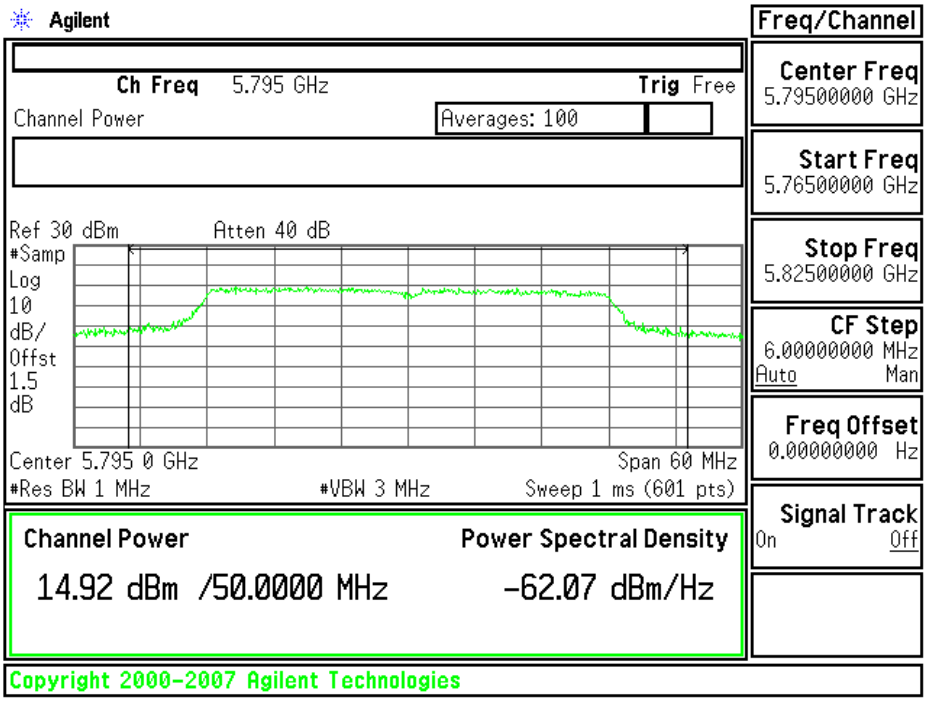


draft 802.11an Standard-40 MHz Channel mode / Chain 0

Peak Power (CH Low)

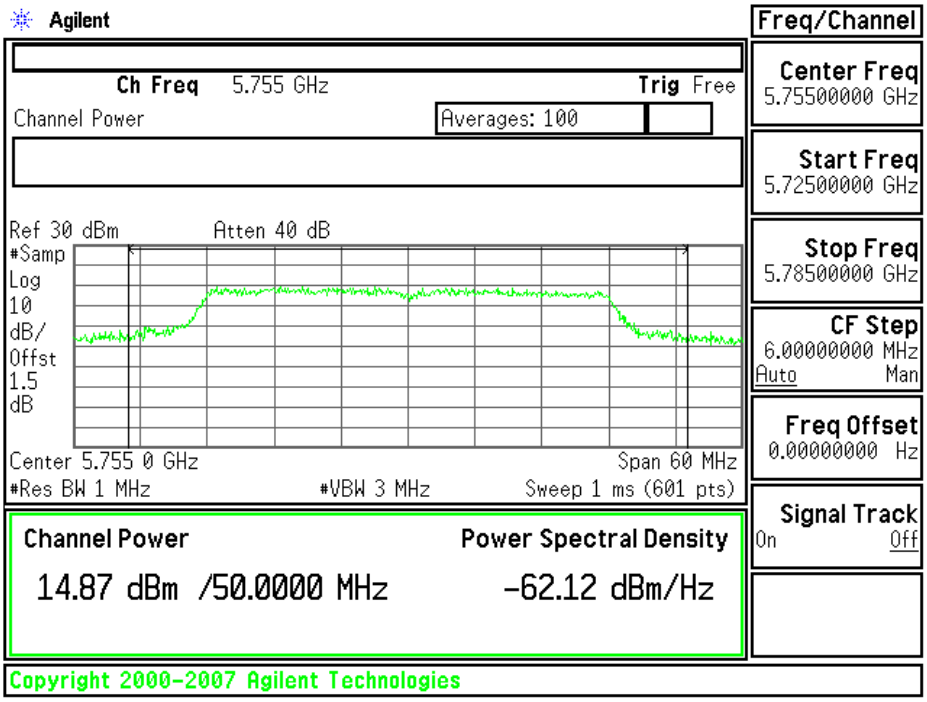


Peak Power (CH High)

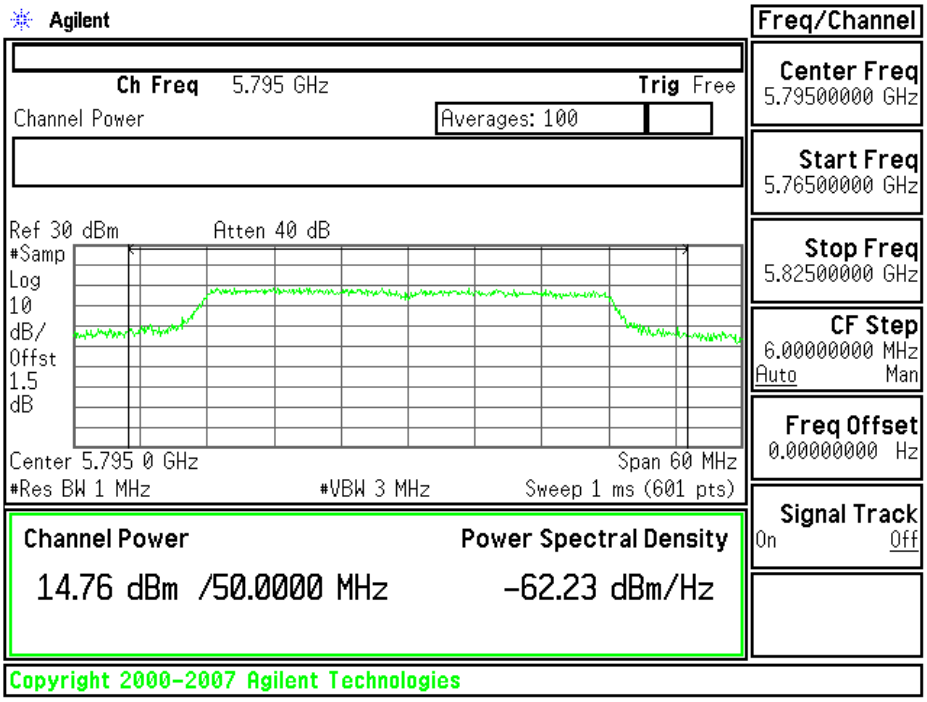


draft 802.11an Standard-40 MHz Channel mode / Chain 1

Peak Power (CH Low)

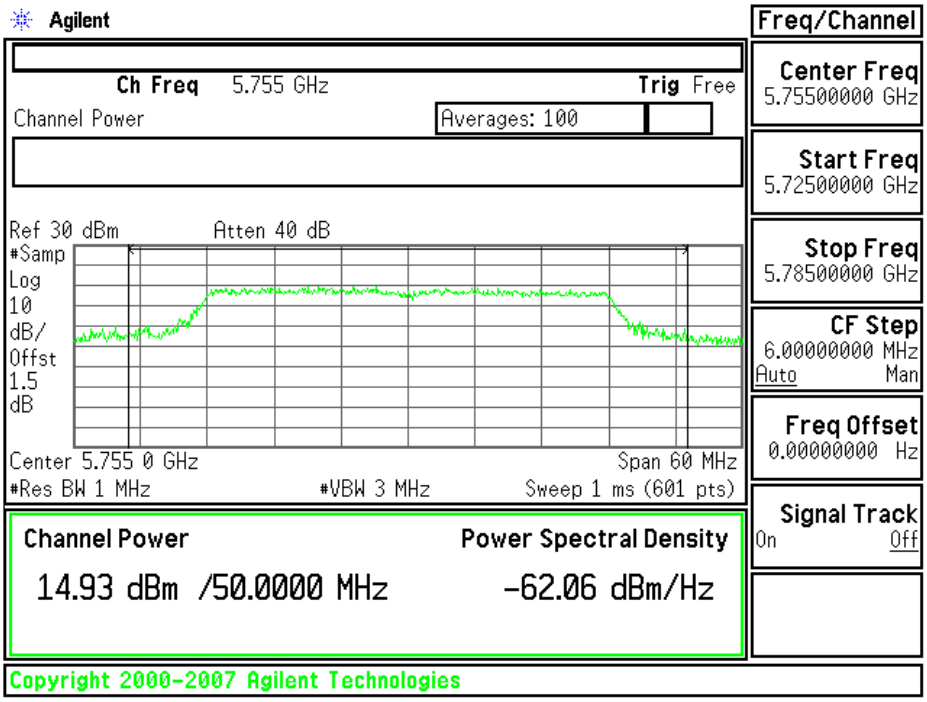


Peak Power (CH High)

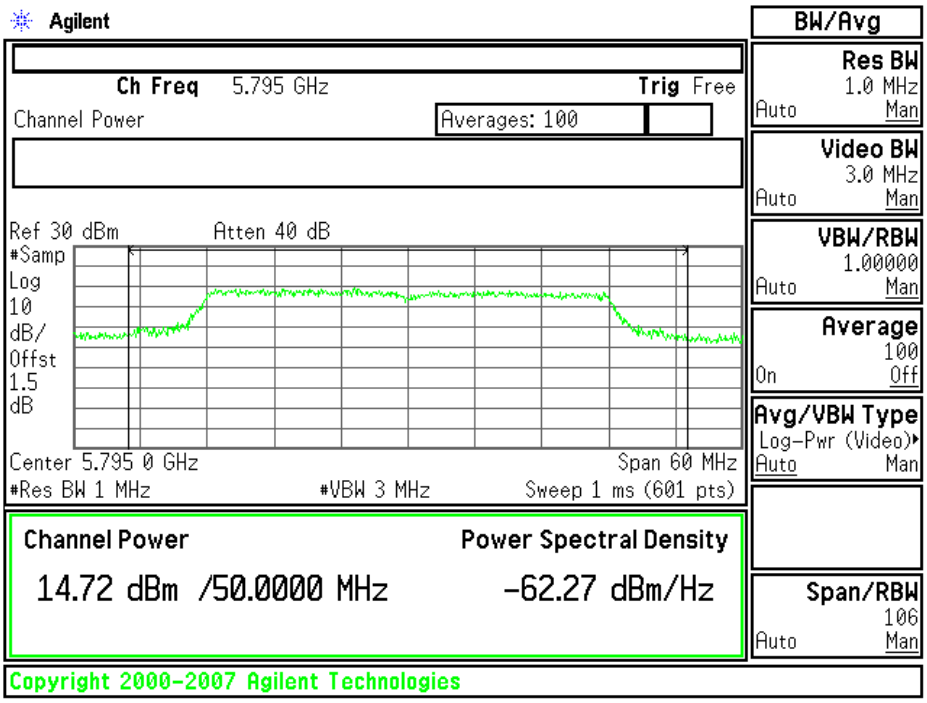


draft 802.11an Standard-40 MHz Channel mode / Chain 2

Peak Power (CH Low)

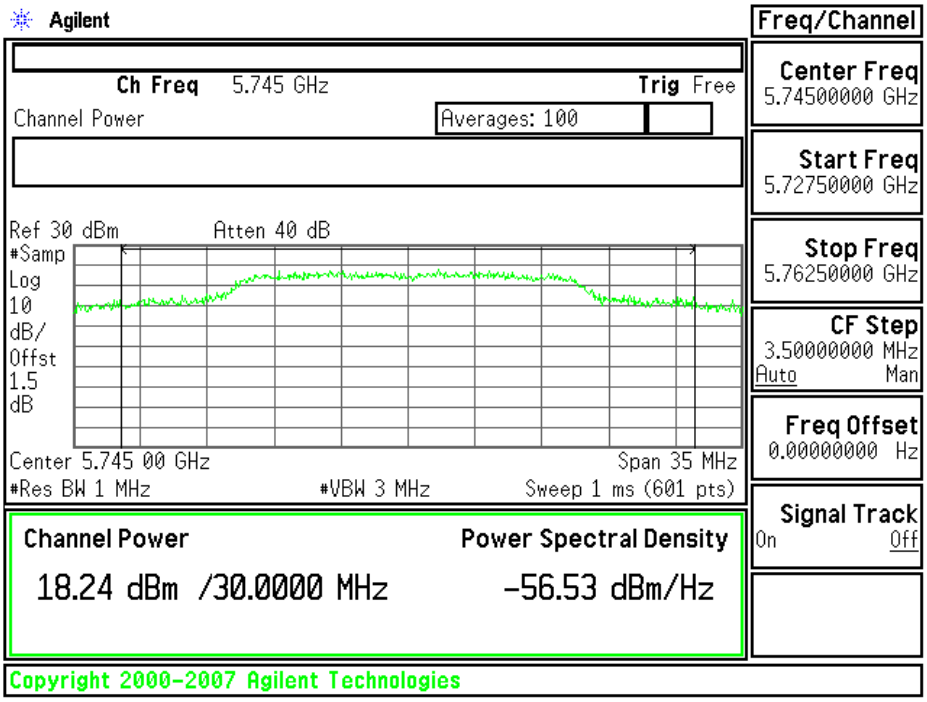


Peak Power (CH High)

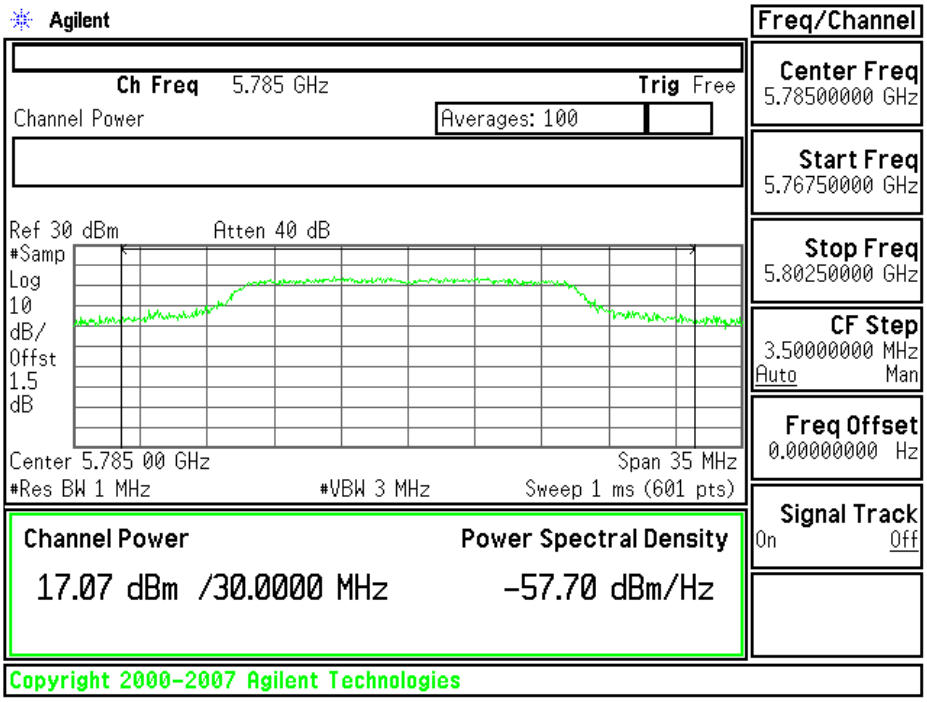


draft 802.11an Standard-20 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

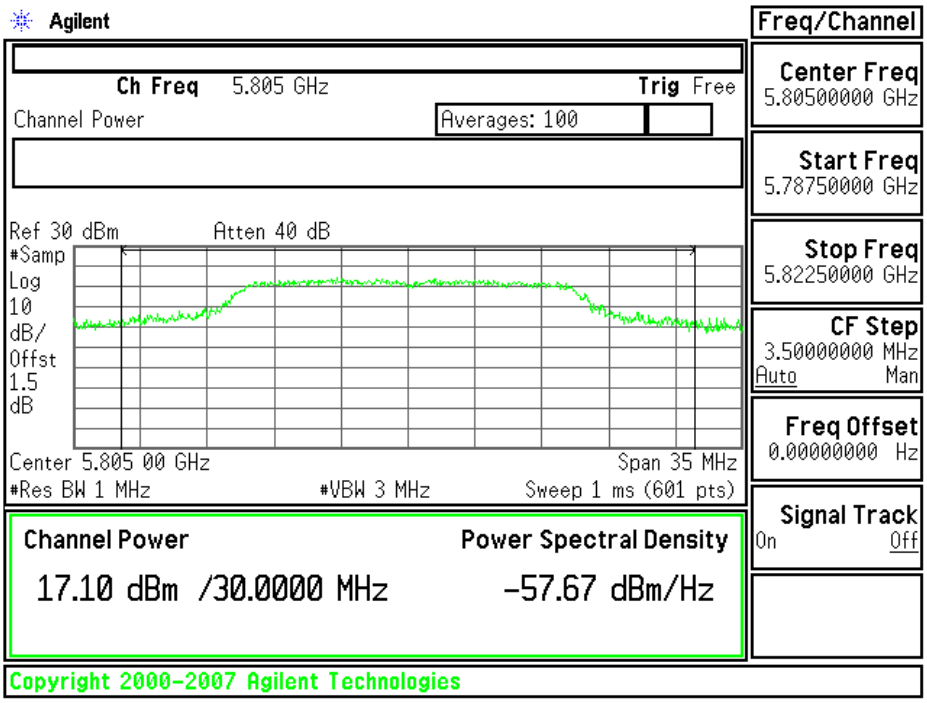
Peak Power (CH Low)



Peak Power (CH Mid)

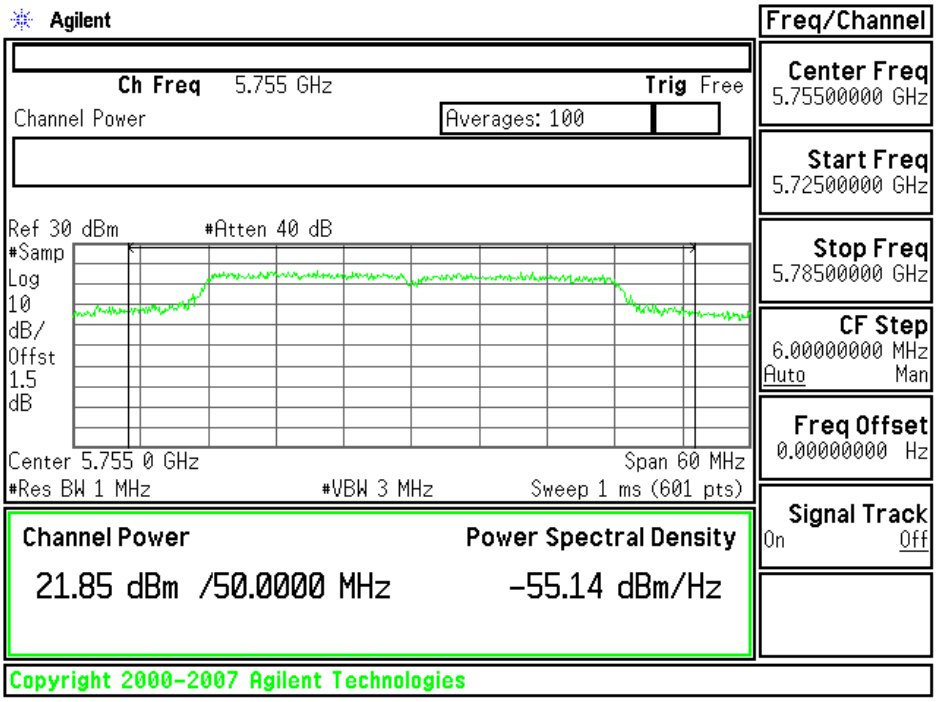


Peak Power (CH High)

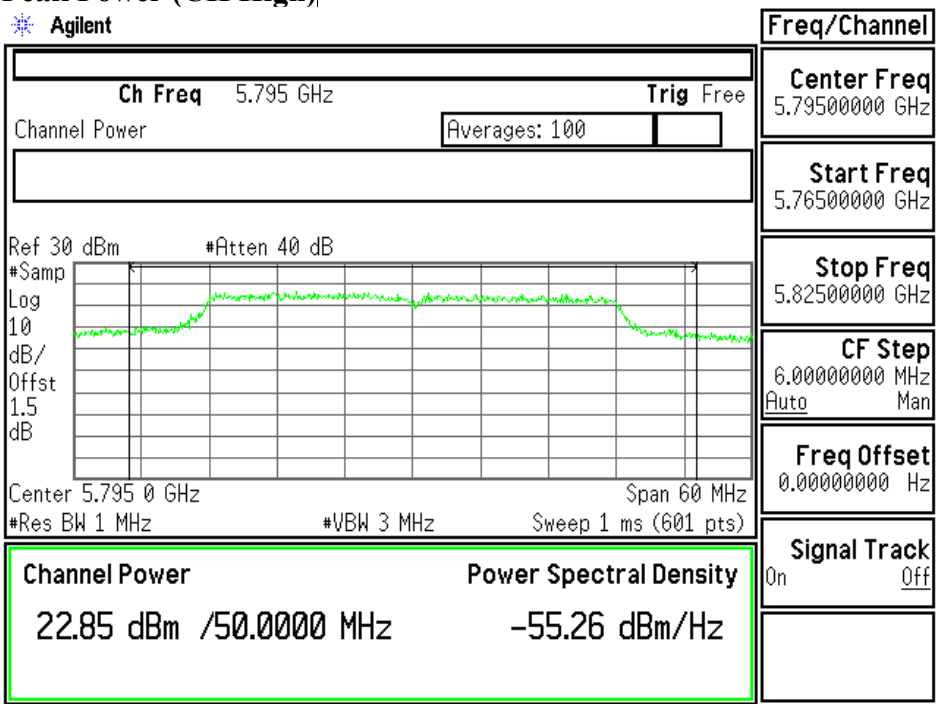


draft 802.11an Standard-40 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

Peak Power (CH Low)



Peak Power (CH High)

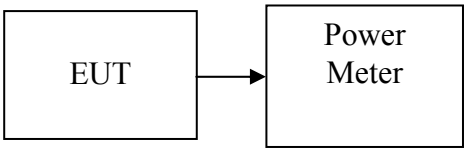


AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power meter.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	13.20
Mid	2437	13.15
High	2462	13.25

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	14.69
Mid	2437	14.47
High	2462	14.74

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)
Low	2412	14.39	14.35	14.19	19.12
Mid	2437	14.27	14.21	14.05	18.90
High	2462	14.32	14.59	14.33	19.23

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)
Low	2422	14.90	14.85	14.98	19.66
Mid	2437	14.81	14.79	14.75	19.52
High	2452	14.72	14.91	14.93	19.59

Test mode: draft 802.11gn Standard-20 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	19.31
Mid	2437	18.75
High	2462	19.41

Test mode: draft 802.11gn Wide-40 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	Output Power (dBm)
Low	2422	19.79
Mid	2437	19.65
High	2452	19.50

Test mode: IEEE 802.11a mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	5745	15.41
Mid	5785	15.33
High	5805	14.98

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)
Low	5745	15.33	15.02	15.16	19.99
Mid	5785	15.02	15.10	14.89	19.69
High	5805	15.13	15.36	15.04	19.77

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Output Power (dBm)
Low	5755	15.57	15.47	15.24	20.10
Mid	5795	15.41	15.12	15.09	19.89

Test mode: draft 802.11an Standard-20 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	Output Power (dBm)
Low	5745	19.88
Mid	5785	19.67
High	5805	19.79

Test mode: draft 802.11an Wide-40 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

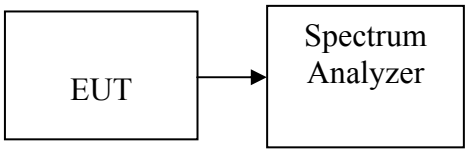
Channel	Frequency (MHz)	Output Power (dBm)
Low	5755	19.68
Mid	5795	19.79

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.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-8.96	8.00	PASS
Mid	2437	-8.92	8.00	PASS
High	2462	-8.84	8.00	PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-5.41	8.00	PASS
Mid	2437	-5.34	8.00	PASS
High	2462	-5.20	8.00	PASS

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

Channel	Frequency (MHz)	PPSD Chain 0 (dBm)	PPSD Chain 1 (dBm)	PPSD Chain 2 (dBm)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2412	-3.48	-5.20	-5.14	0.24	8.00	PASS
Mid	2437	-5.30	-5.66	-4.70	-0.43	8.00	PASS
High	2462	-4.99	-4.43	-5.19	-0.09	8.00	PASS

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

Channel	Frequency (MHz)	PPSD Chain 0 (dBm)	PPSD Chain 1 (dBm)	PPSD Chain 2 (dBm)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2422	-3.10	-2.93	-3.70	1.54	8.00	PASS
Mid	2437	-3.48	-3.52	-3.80	1.17	8.00	PASS
High	2452	-3.59	-2.86	-2.86	1.68	8.00	PASS

Test mode: draft 802.11gn Standard-20 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2412	-4.34	8.00	PASS
Mid	2437	-4.30	8.00	PASS
High	2462	-4.08	8.00	PASS

Test mode: draft 802.11gn Wide-40 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2422	1.84	8.00	PASS
Mid	2437	1.64	8.00	PASS
High	2452	1.39	8.00	PASS

Test mode: IEEE 802.11a mode

Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	5745	-9.81	8.00	PASS
Mid	5785	-10.69	8.00	PASS
High	5805	-11.72	8.00	PASS

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

Channel	Frequency (MHz)	PPSD Chain 0 (dBm)	PPSD Chain 1 (dBm)	PPSD Chain 2 (dBm)	PPSD Total (dBm)	Limit (dBm)	Result
Low	5745	-10.27	-12.26	-12.25	-6.72	8.00	PASS
Mid	5785	-11.52	-11.82	-12.55	-7.17	8.00	PASS
High	5805	-12.23	-12.94	-11.28	-7.33	8.00	PASS

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

Channel	Frequency (MHz)	PPSD Chain 0 (dBm)	PPSD Chain 1 (dBm)	PPSD Chain 2 (dBm)	PPSD Total (dBm)	Limit (dBm)	Result
Low	5755	-7.52	-4.78	-6.02	-1.19	8.00	PASS
Mid	5795	-10.28	-7.12	-7.12	-3.17	8.00	PASS

Test mode: draft 802.11an Standard-20 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	5745	-10.30	8.00	PASS
Mid	5785	-10.24	8.00	PASS
High	5805	-11.57	8.00	PASS

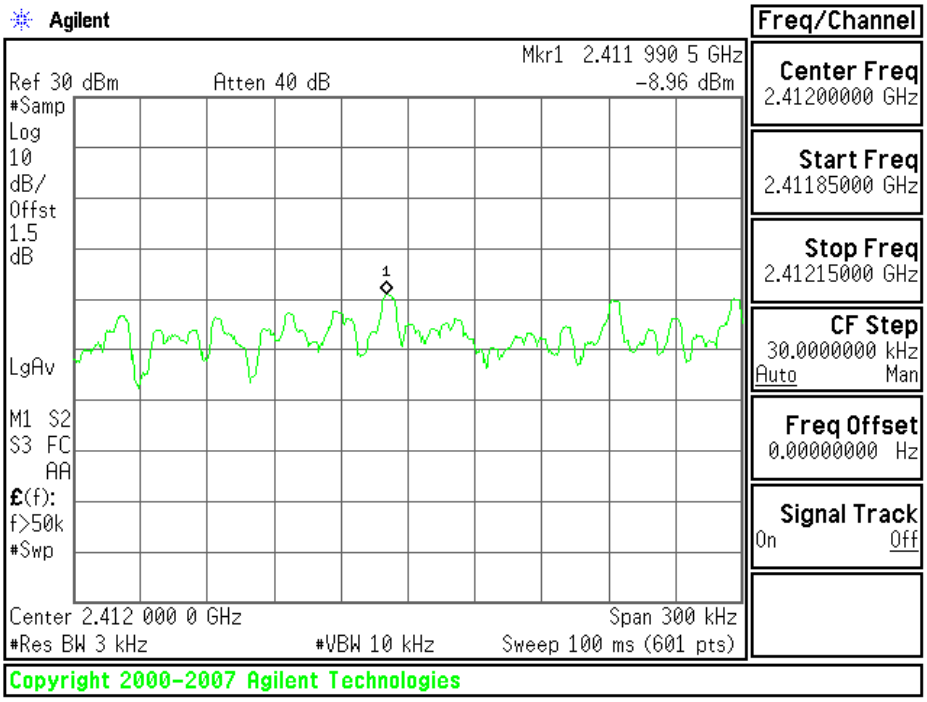
Test mode: draft 802.11an Wide-40 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	5755	-4.73	8.00	PASS
Mid	5795	-7.07	8.00	PASS

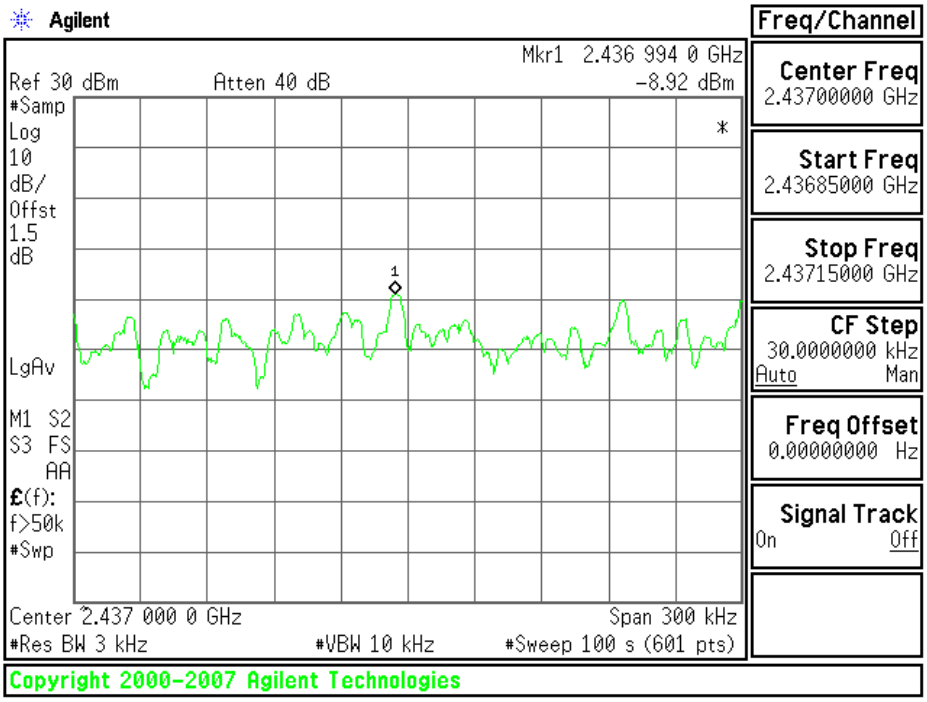
Test Plot

IEEE 802.11b mode

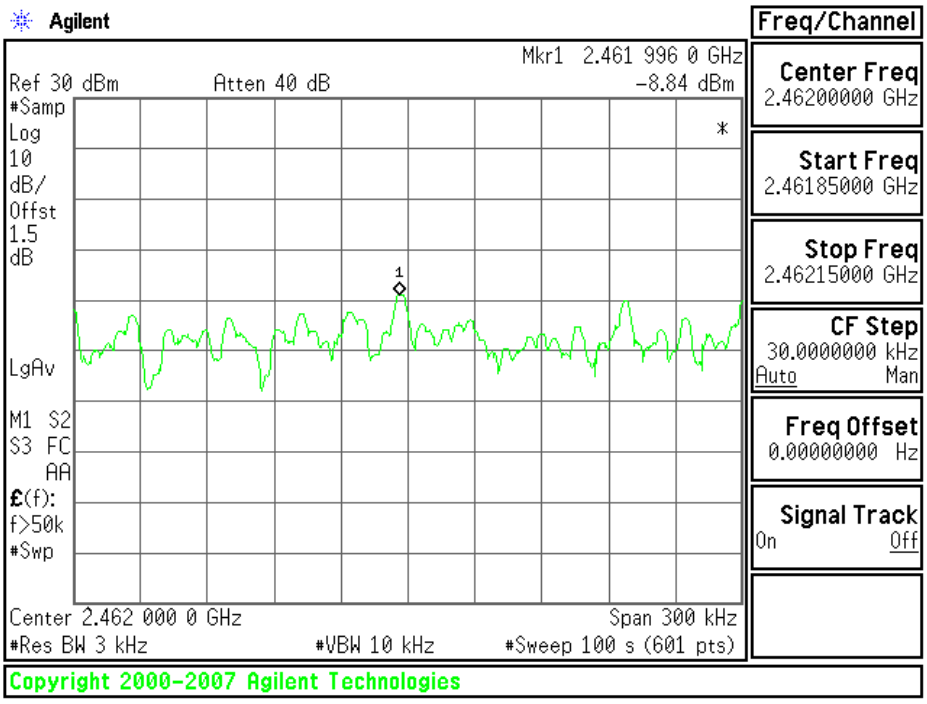
PPSD (CH Low)



PPSD (CH Mid)

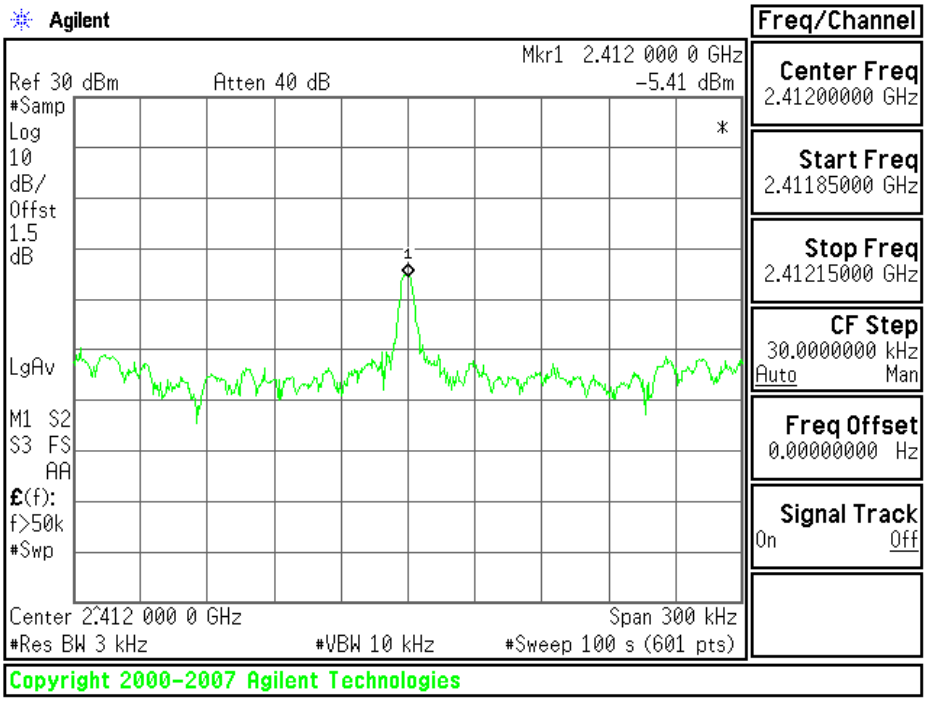


PPSD (CH High)

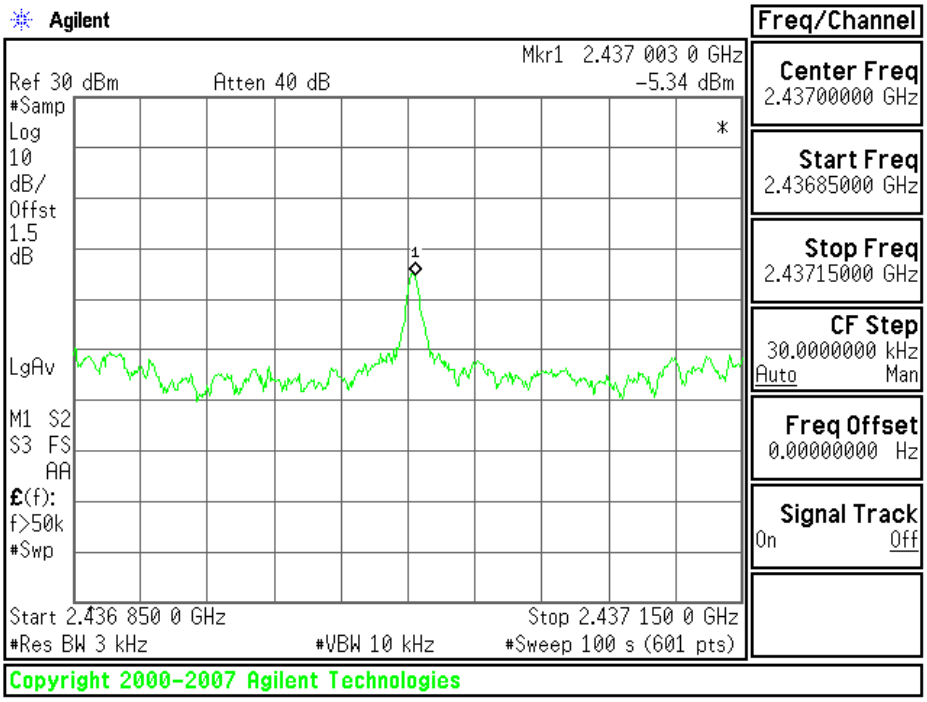


IEEE 802.11g mode

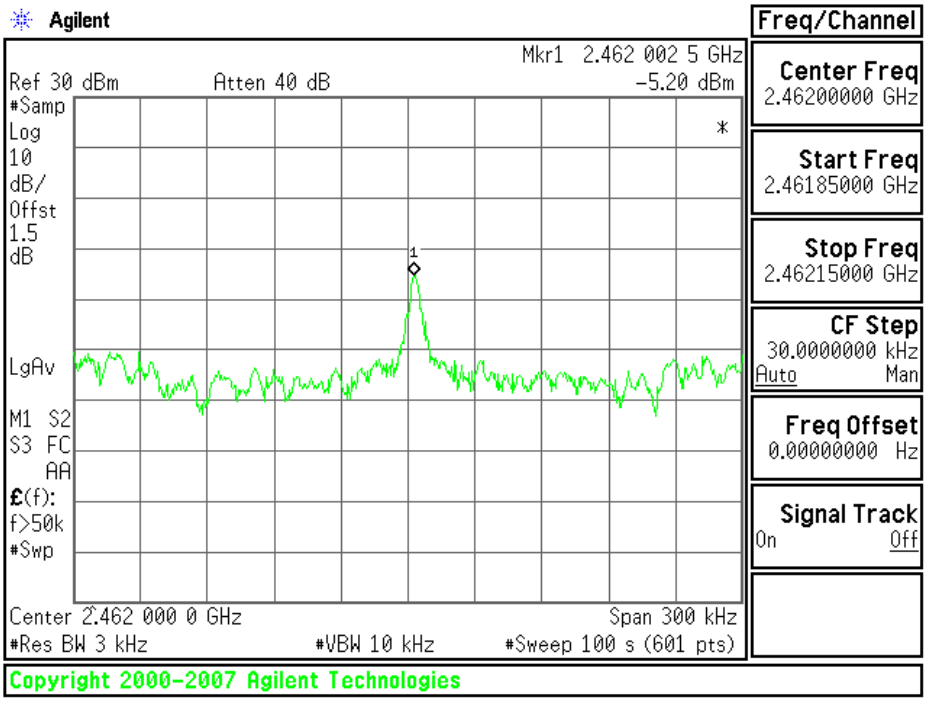
PPSD (CH Low)



PPSD (CH Mid)

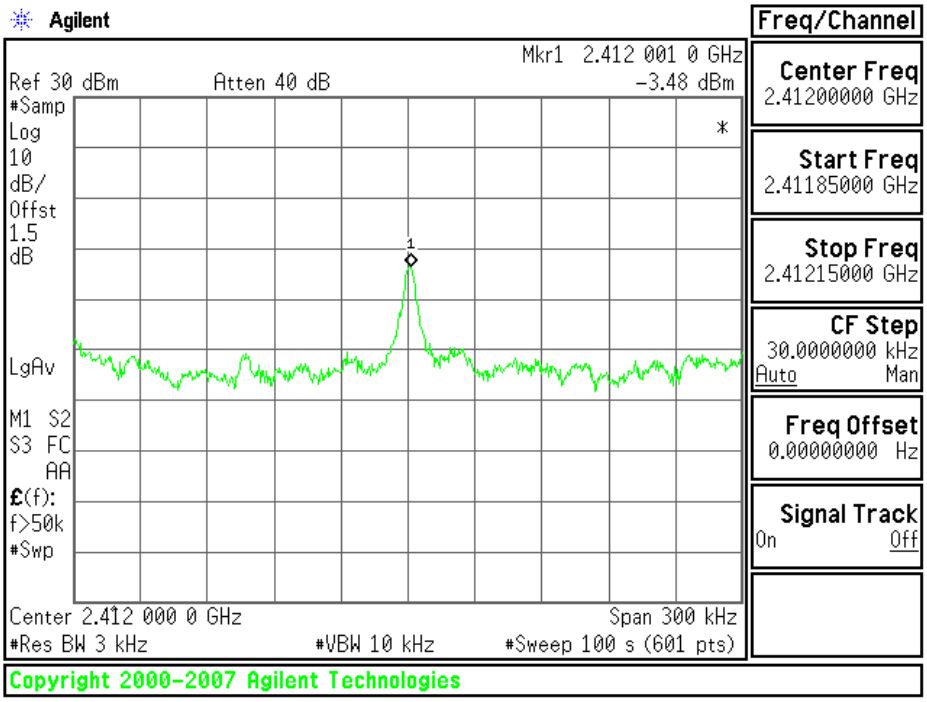


PPSD (CH High)

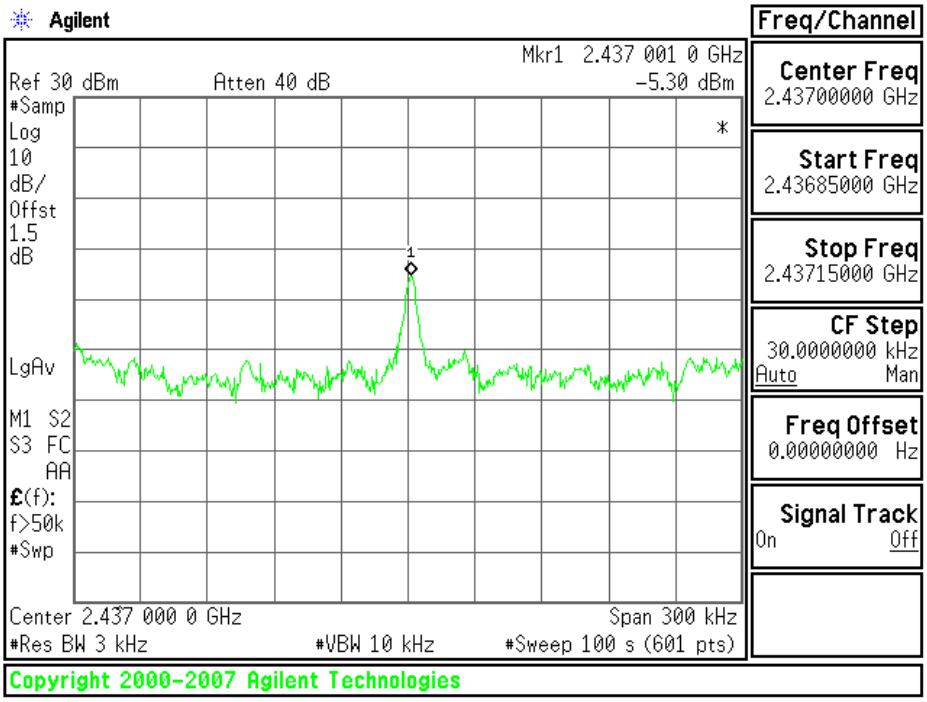


draft 802.11gn Standard-20 MHz Channel mode / Chain 0

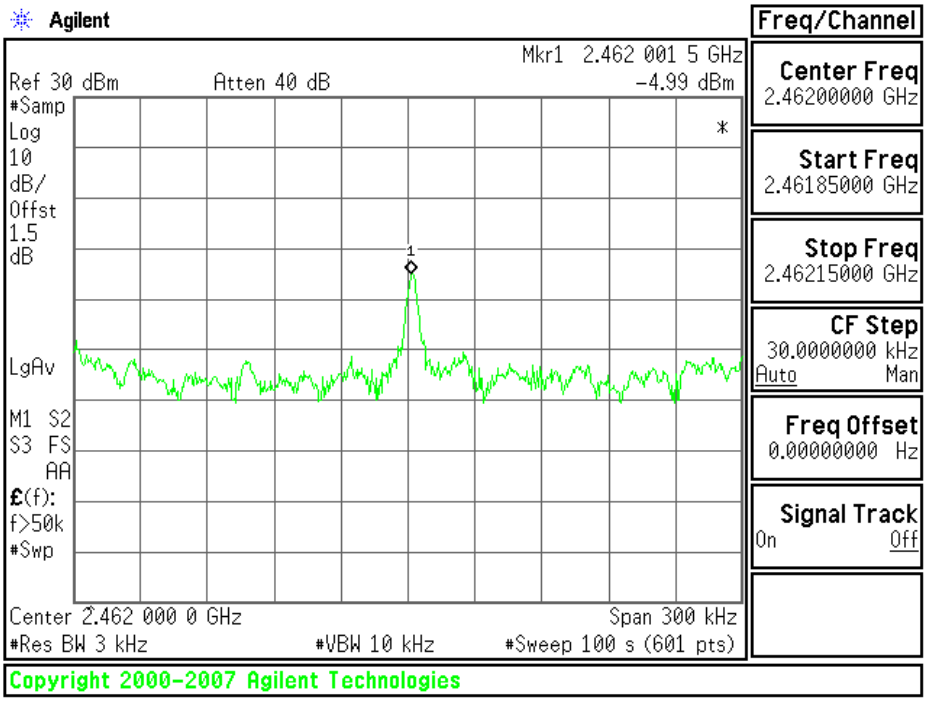
PPSD (CH Low)



PPSD (CH Mid)

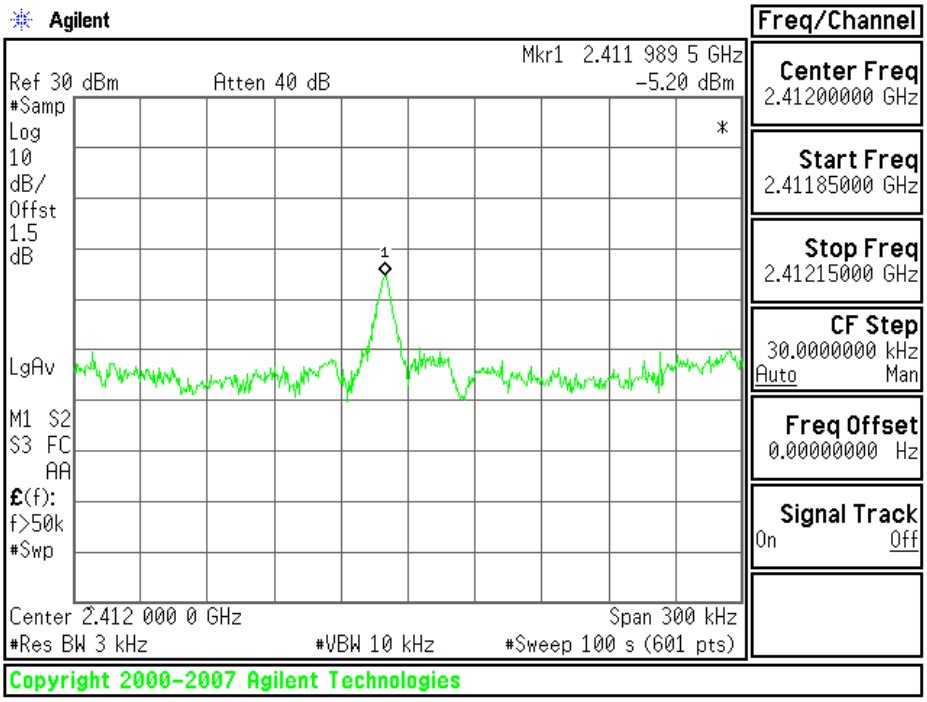


PPSD (CH High)

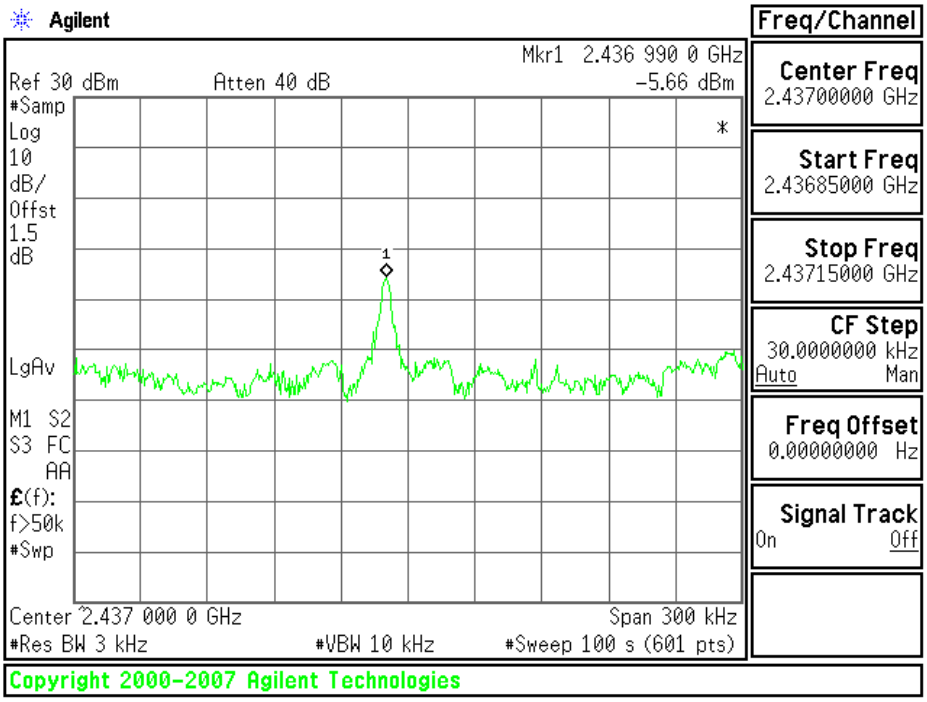


draft 802.11gn Standard-20 MHz Channel mode / Chain 1

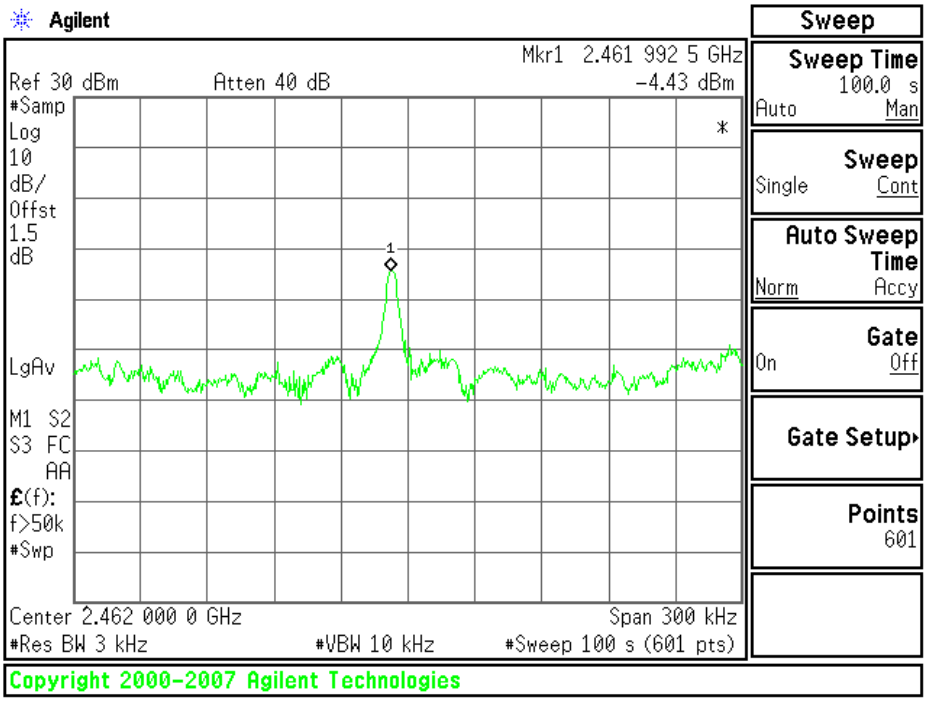
PPSD (CH Low)



PPSD (CH Mid)

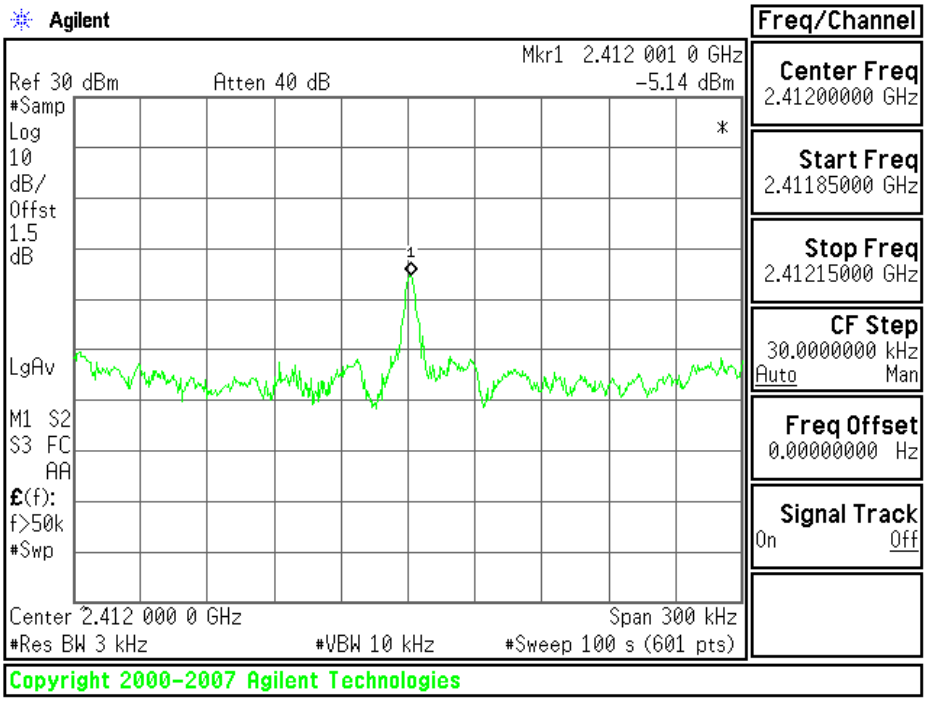


PPSD (CH High)

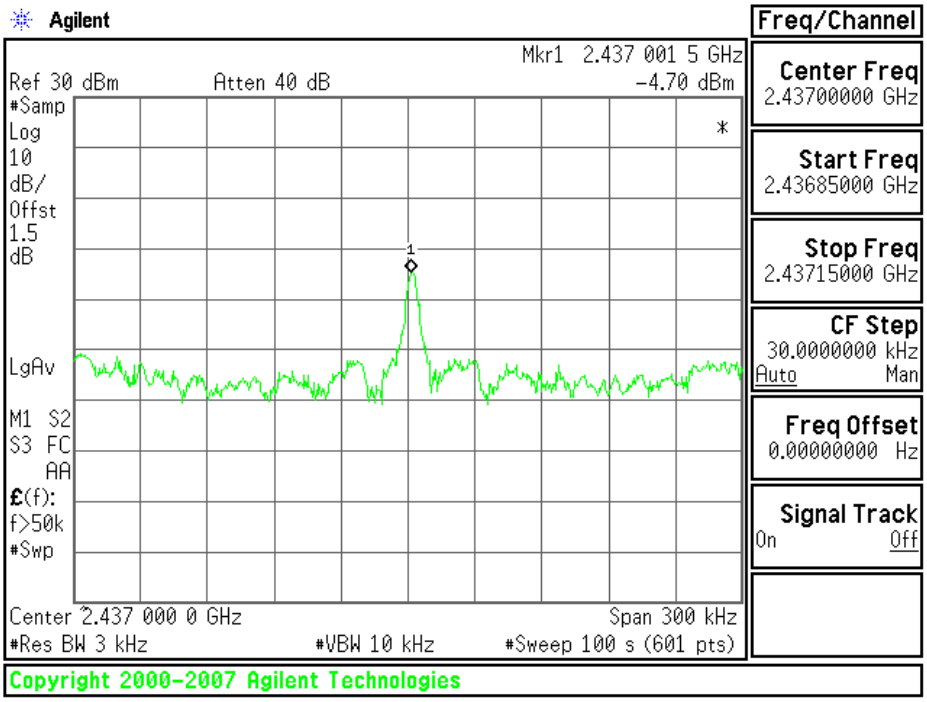


draft 802.11gn Standard-20 MHz Channel mode / Chain 2

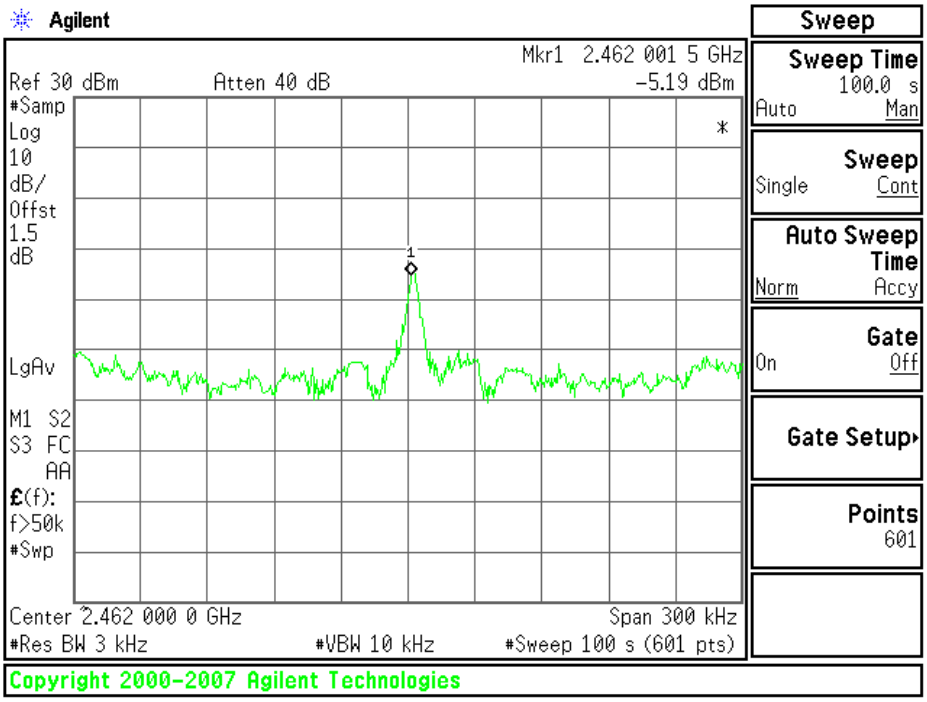
PPSD (CH Low)



PPSD (CH Mid)

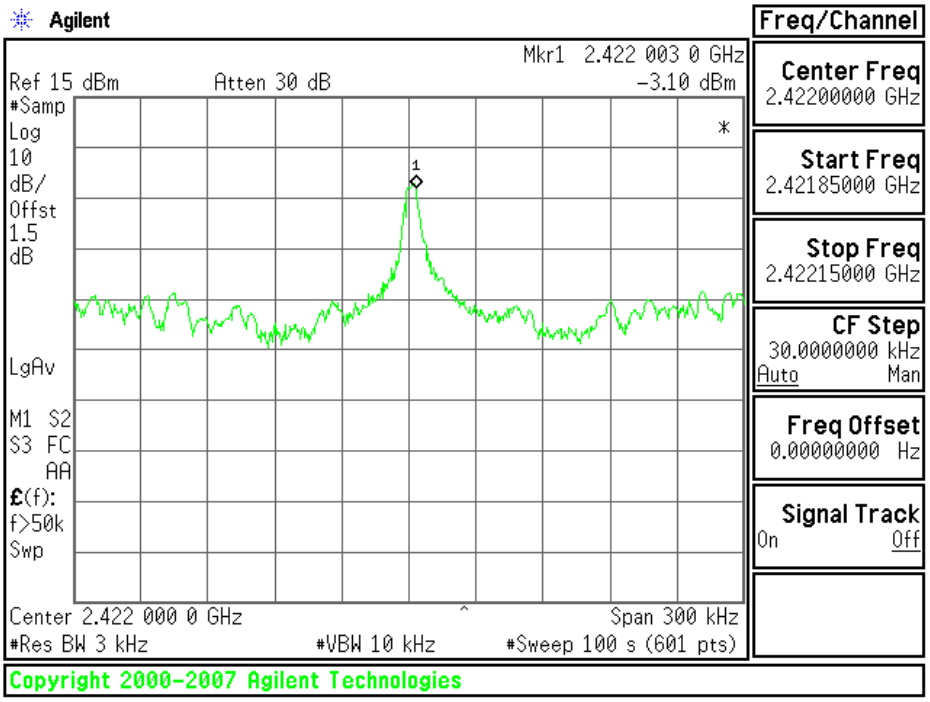


PPSD (CH High)

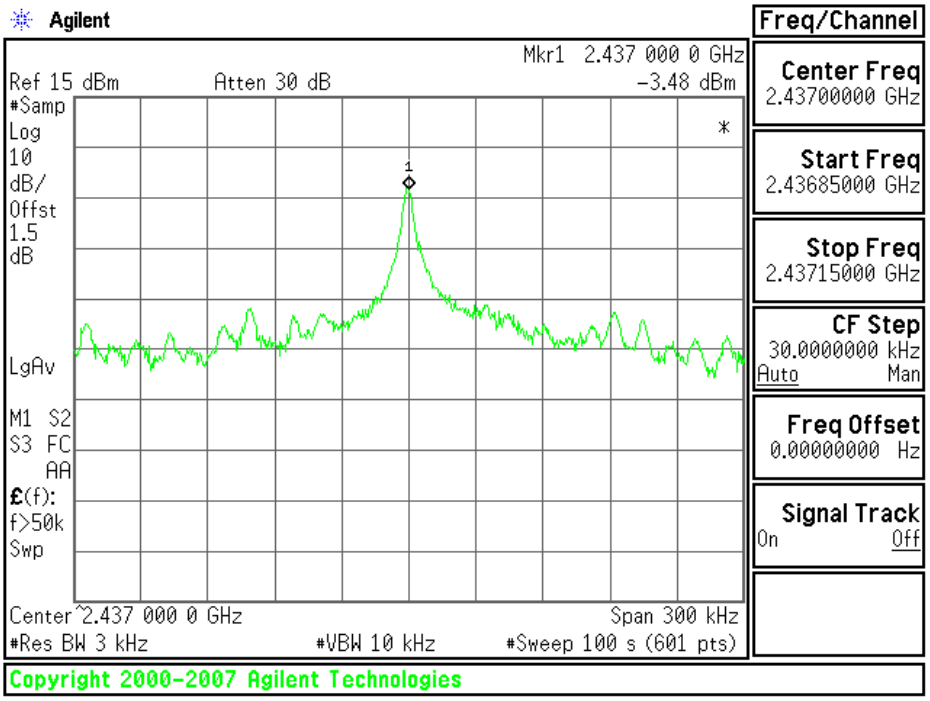


draft 802.11gn Wide-40 MHz Channel mode / Chain 0

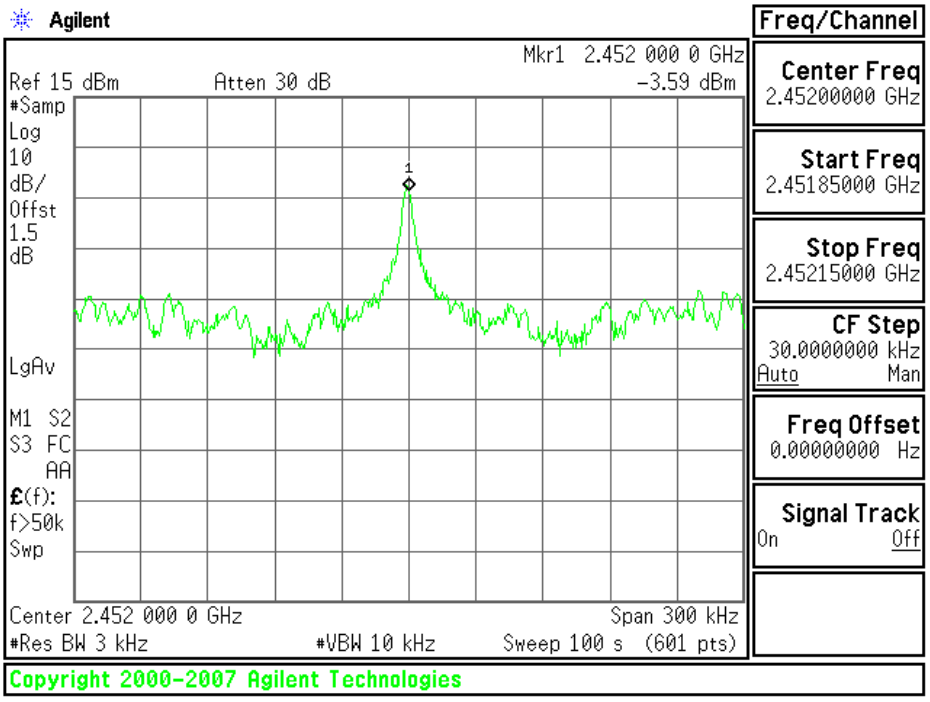
PPSD (CH Low)



PPSD (CH Mid)

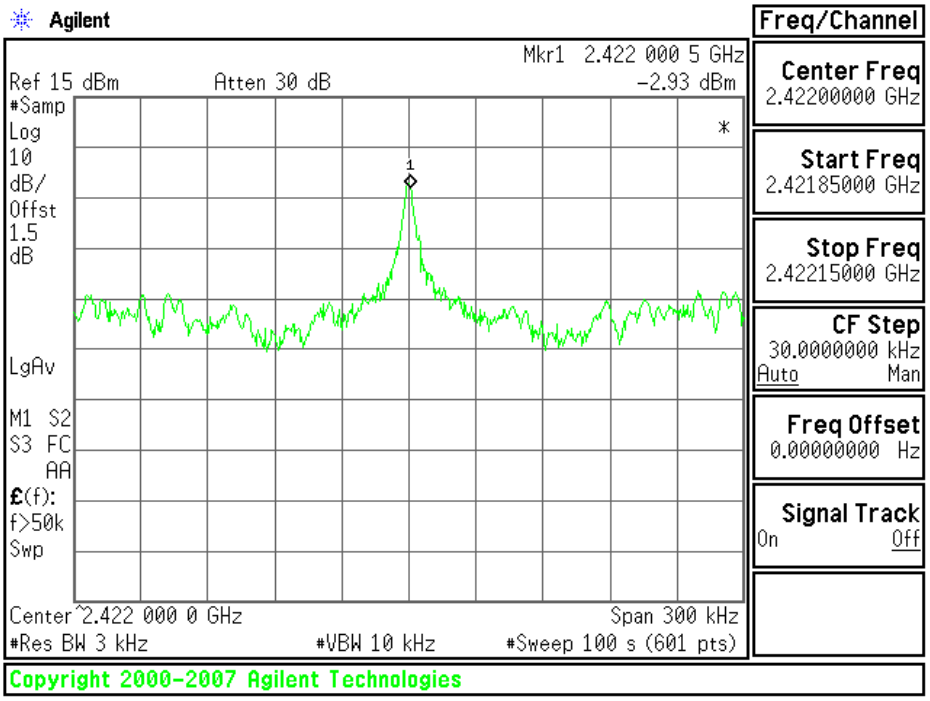


PPSD (CH High)

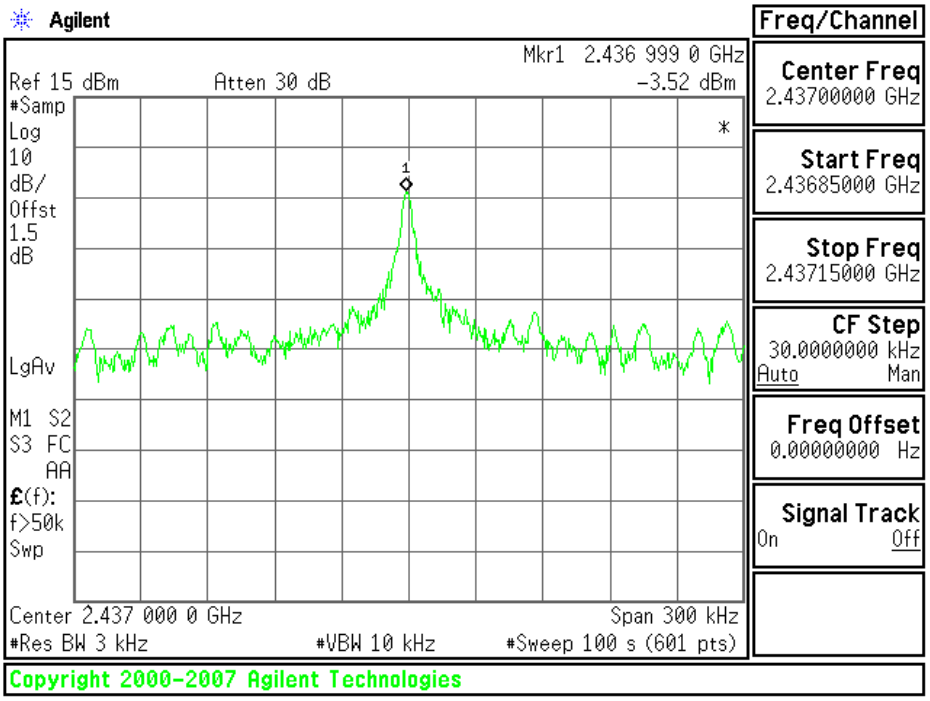


draft 802.11gn Wide-40 MHz Channel mode / Chain 1

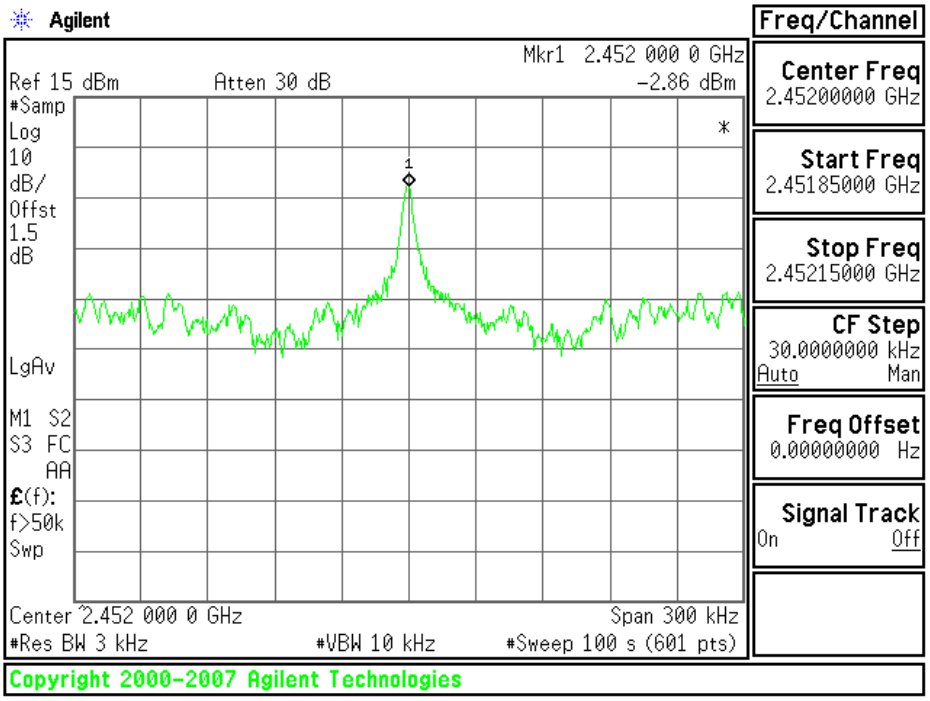
PPSD (CH Low)



PPSD (CH Mid)

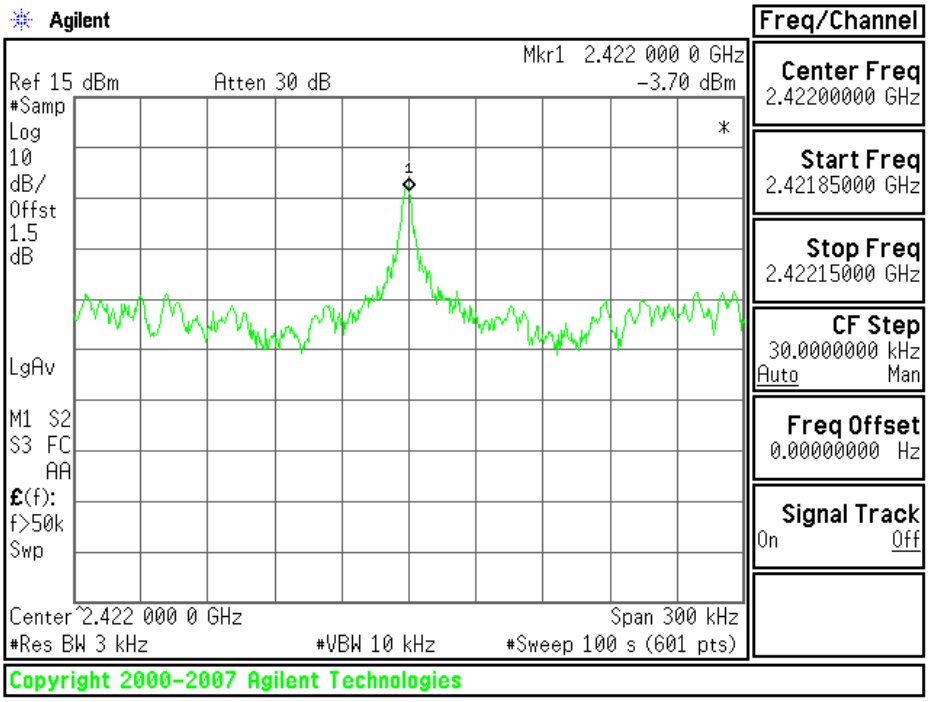


PPSD (CH High)

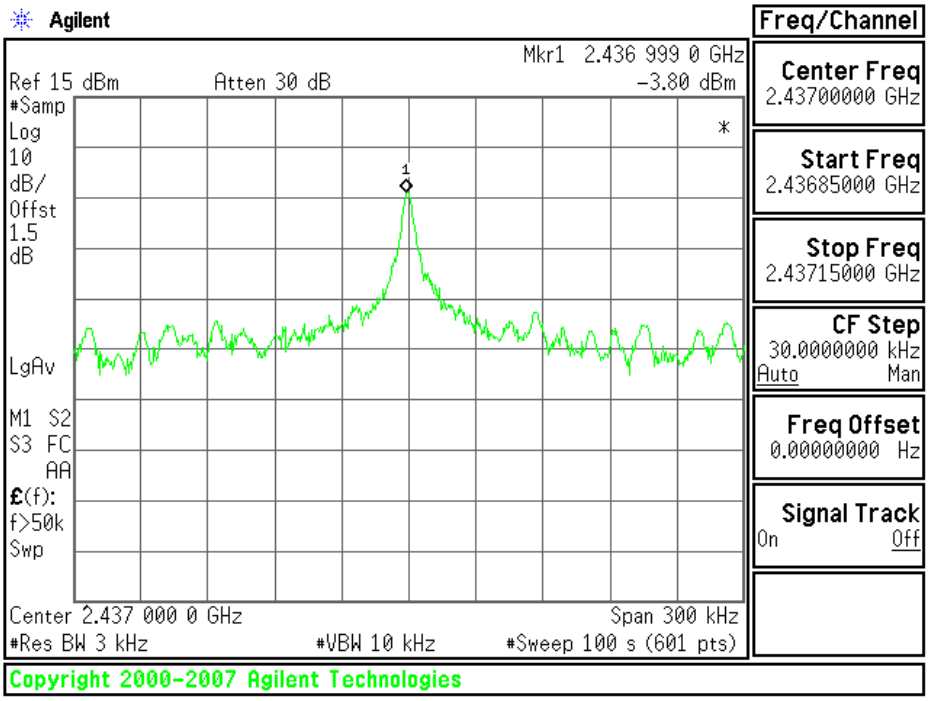


draft 802.11gn Wide-40 MHz Channel mode / Chain 2

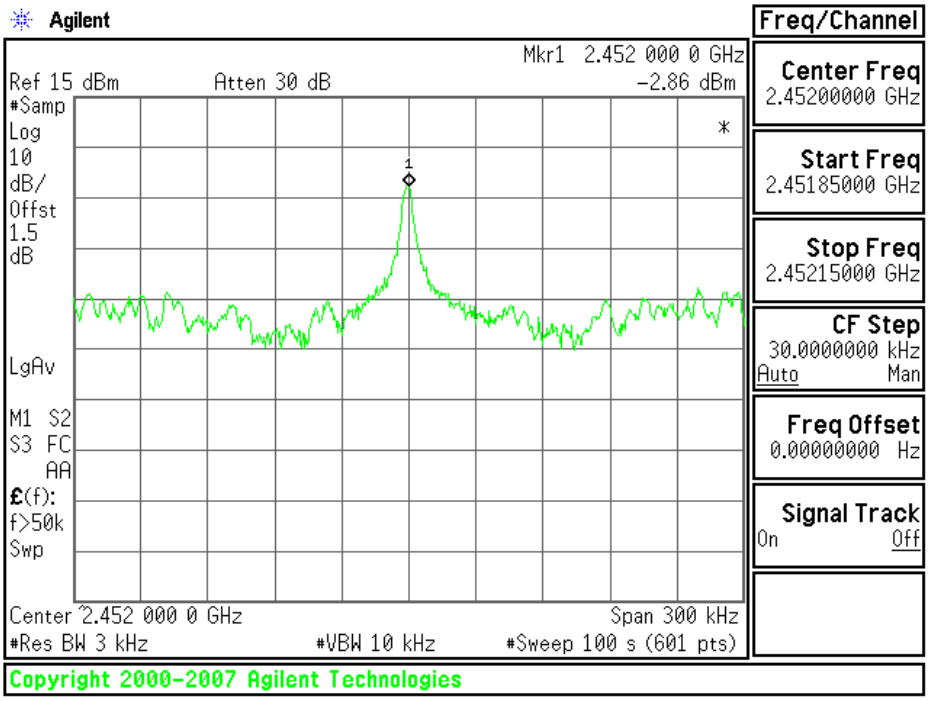
PPSD (CH Low)



PPSD (CH Mid)

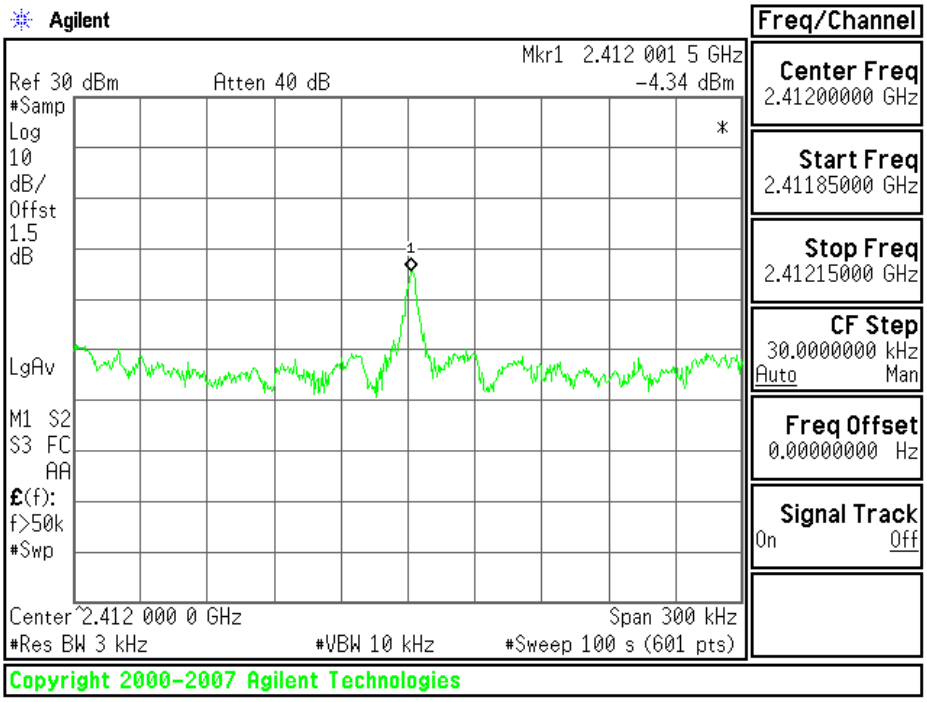


PPSD (CH High)

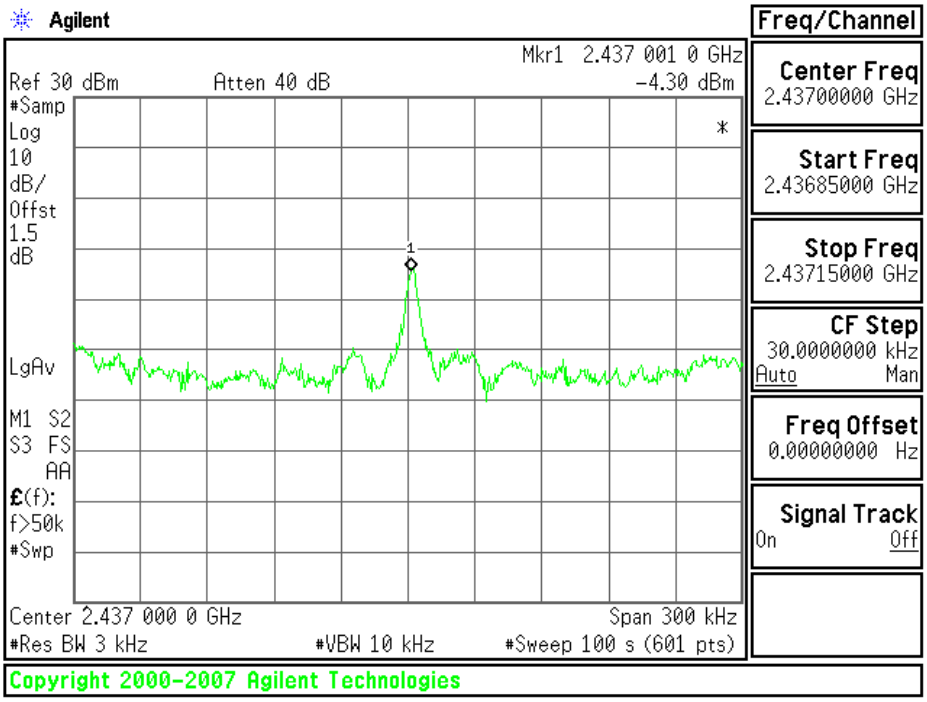


draft 802.11gn Standard-20 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

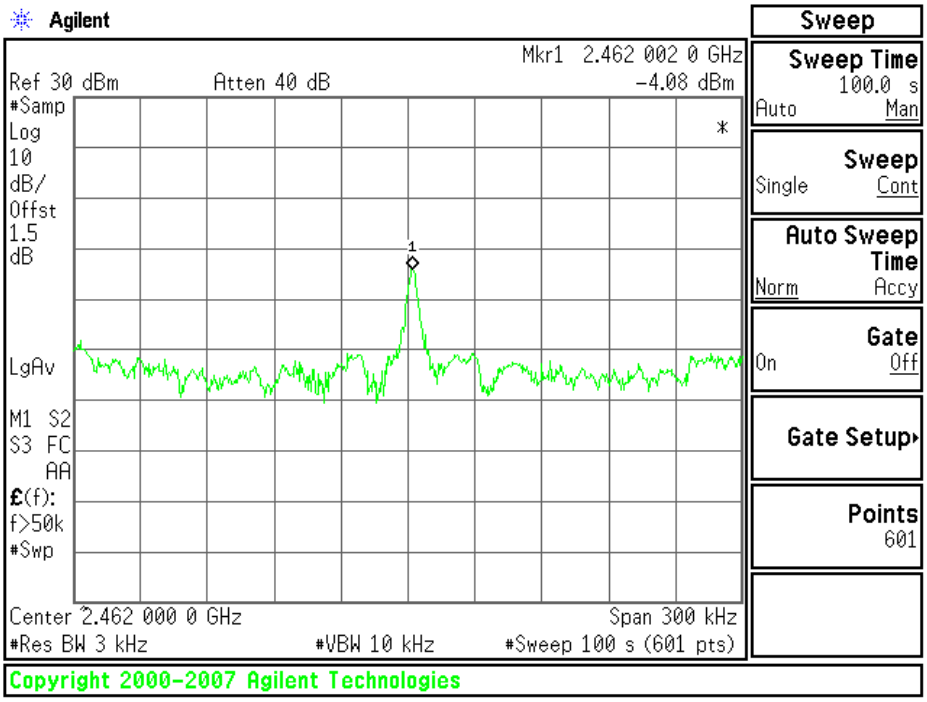
PPSD (CH Low)



PPSD (CH Mid)

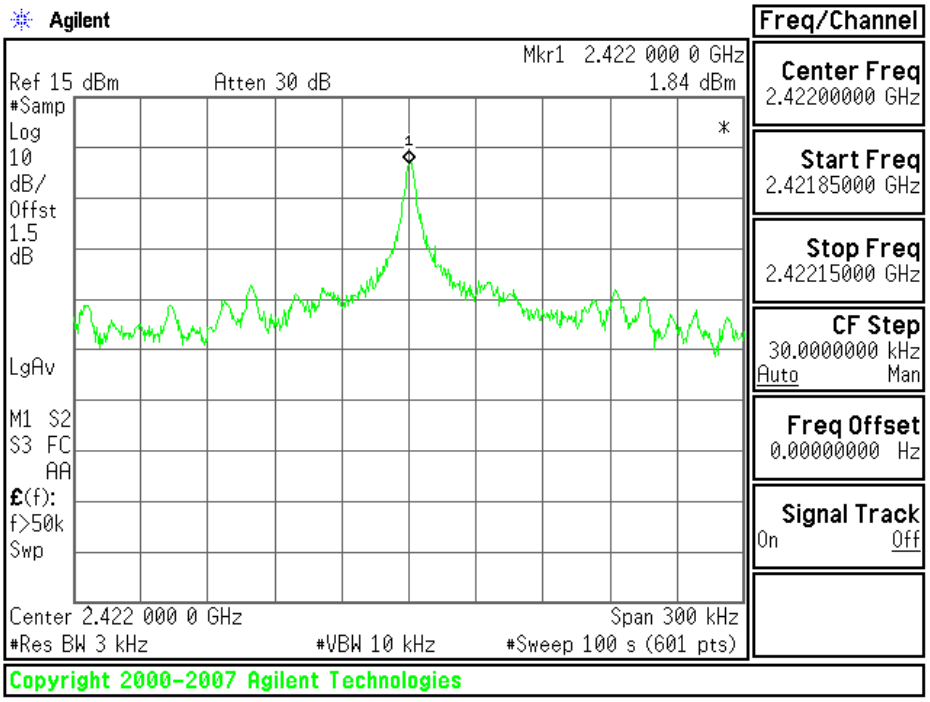


PPSD (CH High)

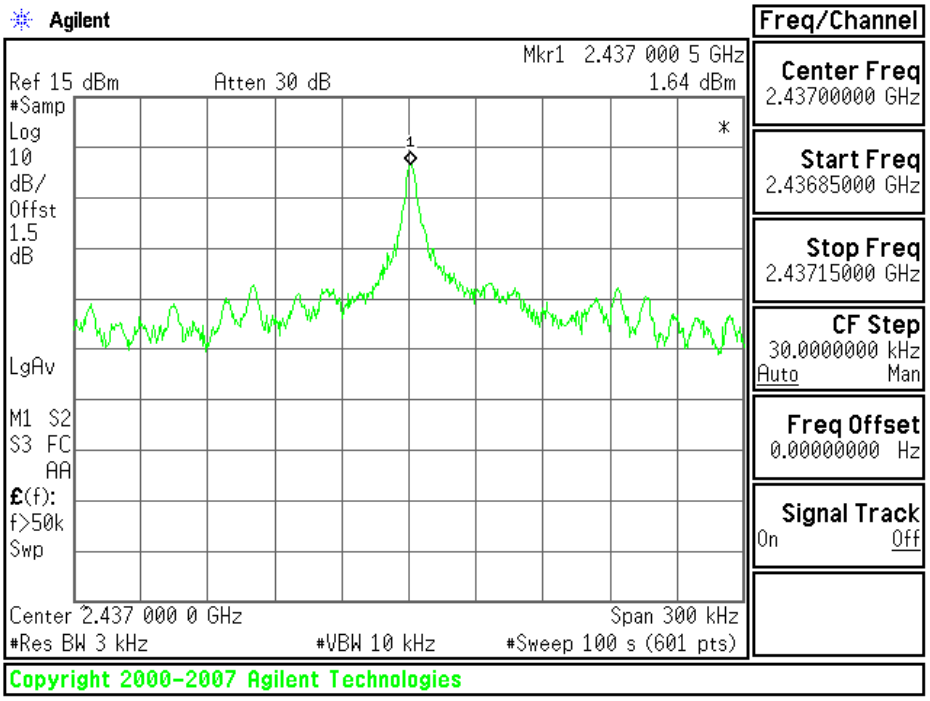


draft 802.11gn Wide-40 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

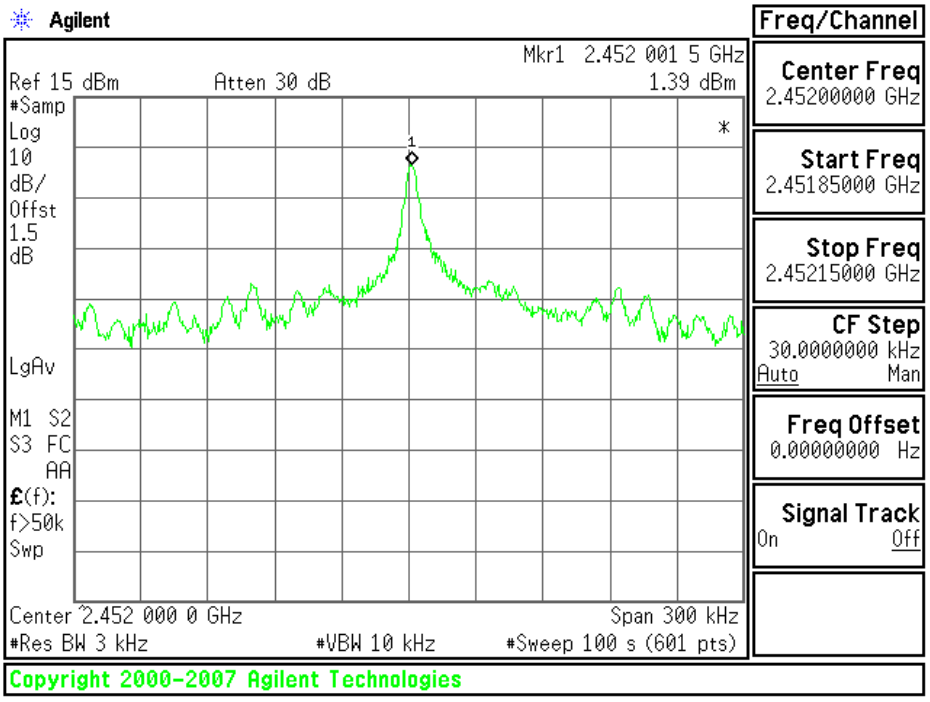
PPSD (CH Low)



PPSD (CH Mid)



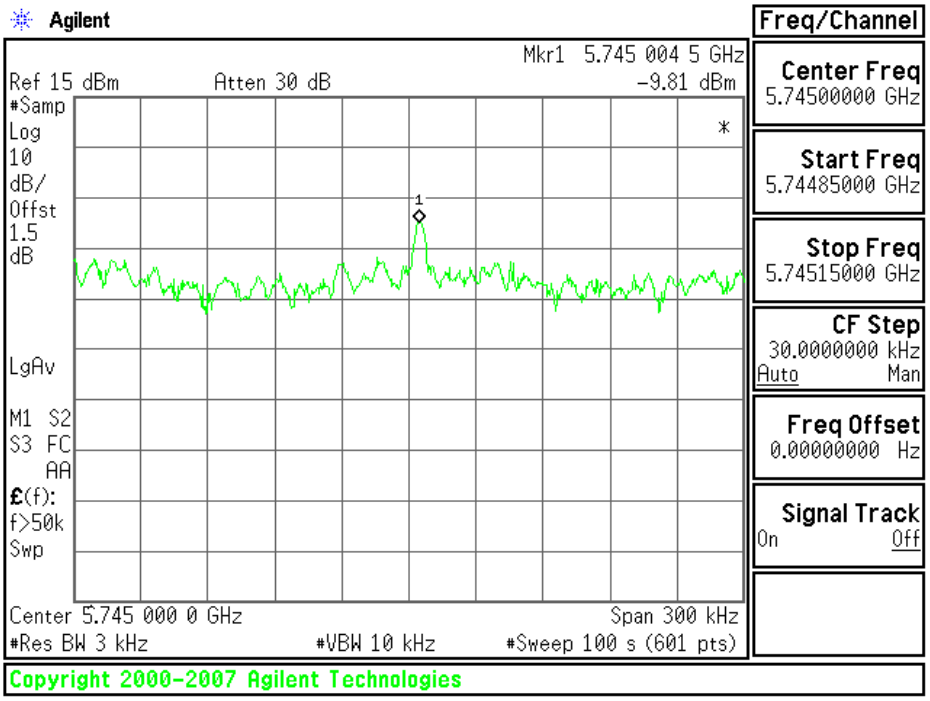
PPSD (CH High)



5725-5825

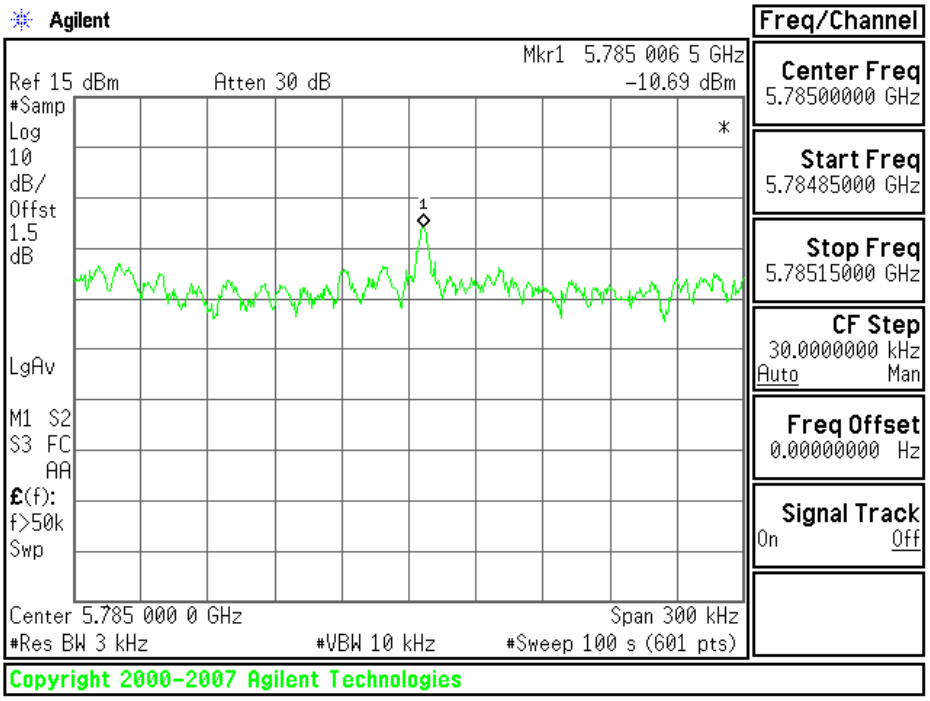
IEEE 802.11a mode

PPSD (CH Low)

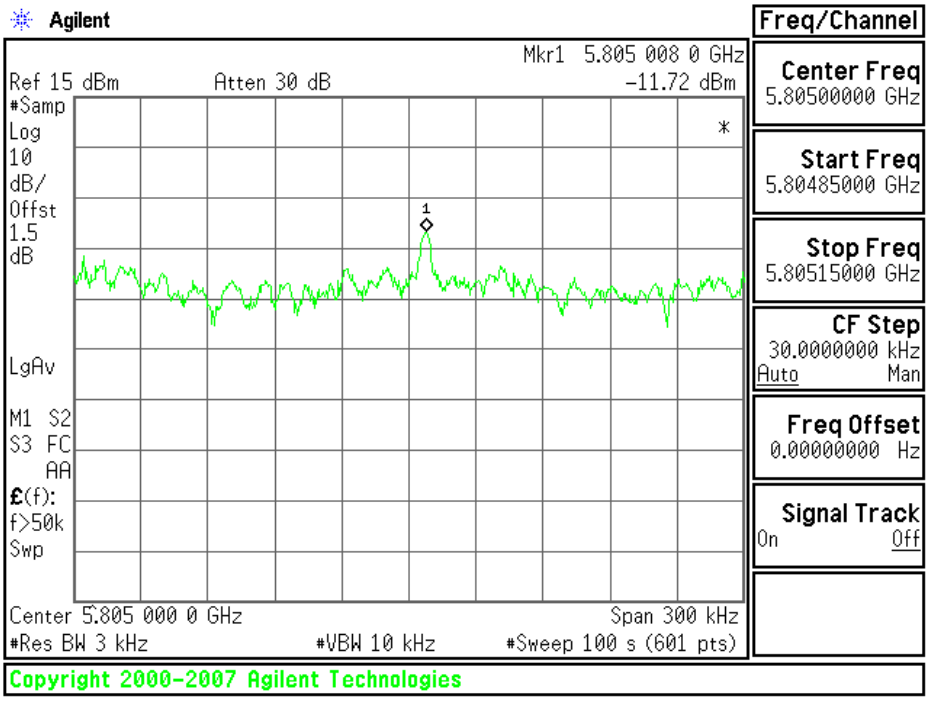


-

PPSD (CH Mid)

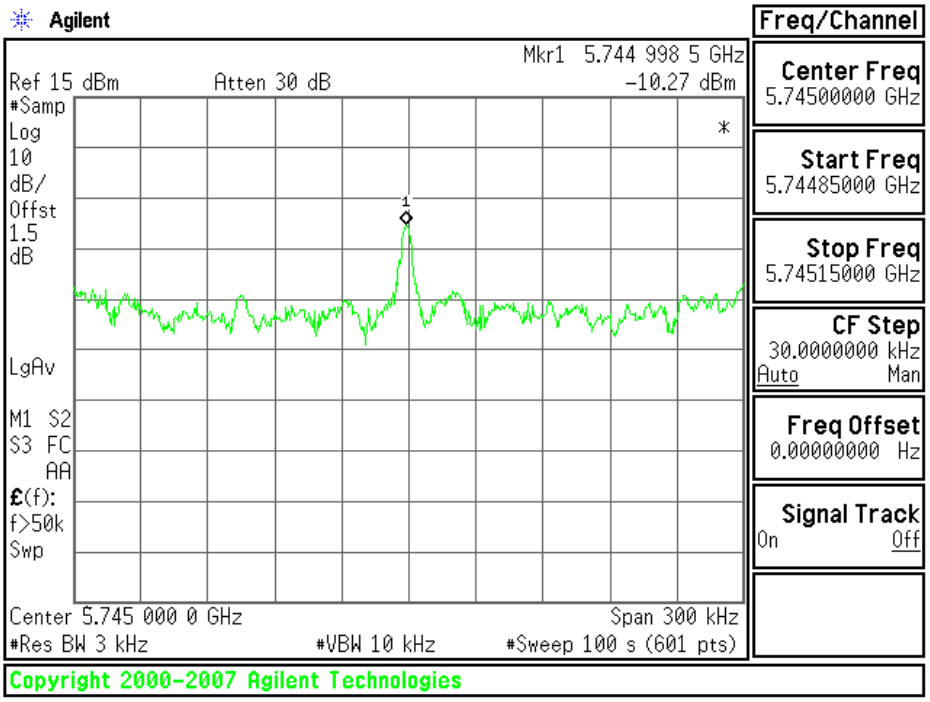


PPSD (CH High)

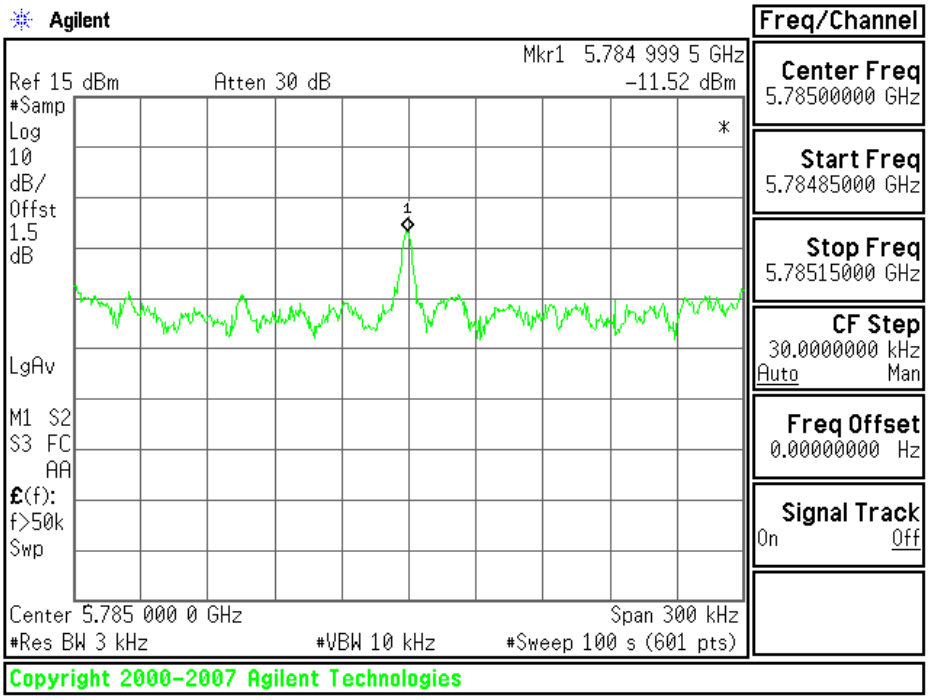


draft 802.11an Standard-20 MHz Channel mode / Chain 0

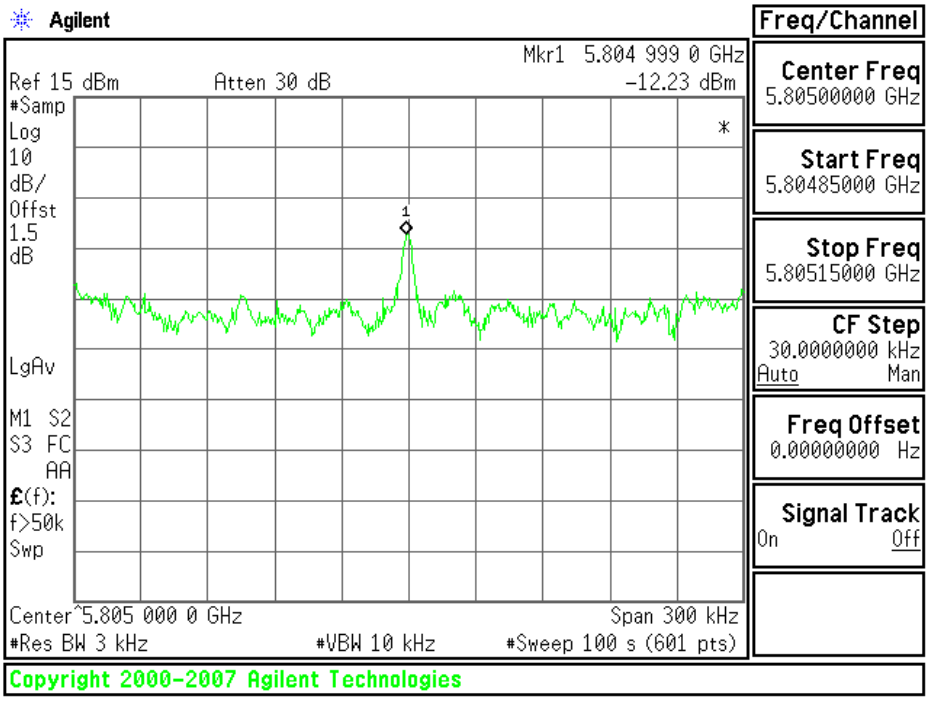
PPSD (CH Low)



PPSD (CH Mid)

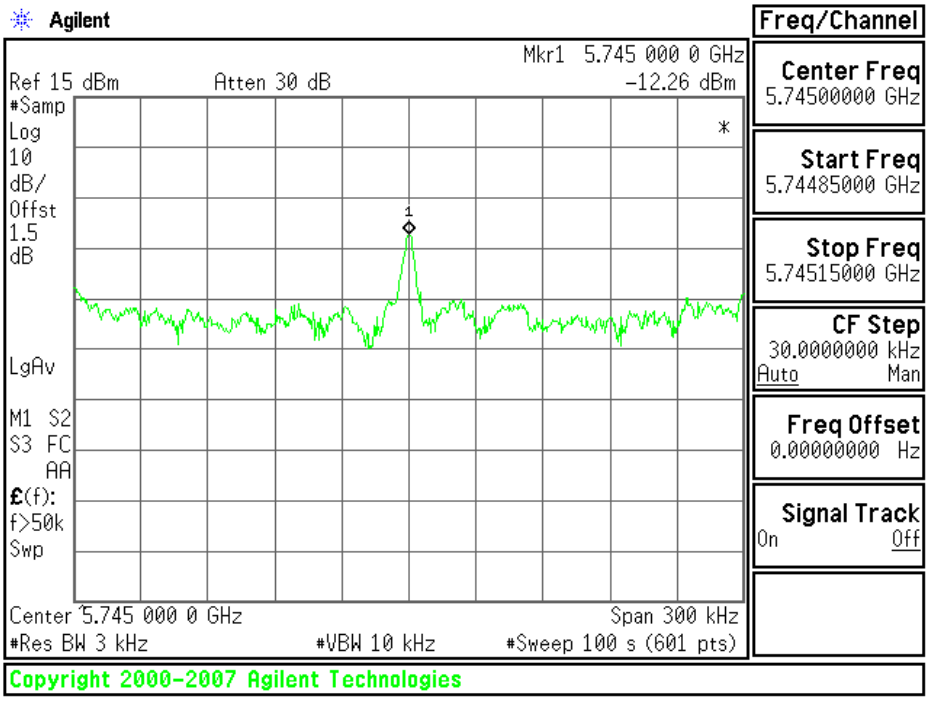


PPSD (CH High)

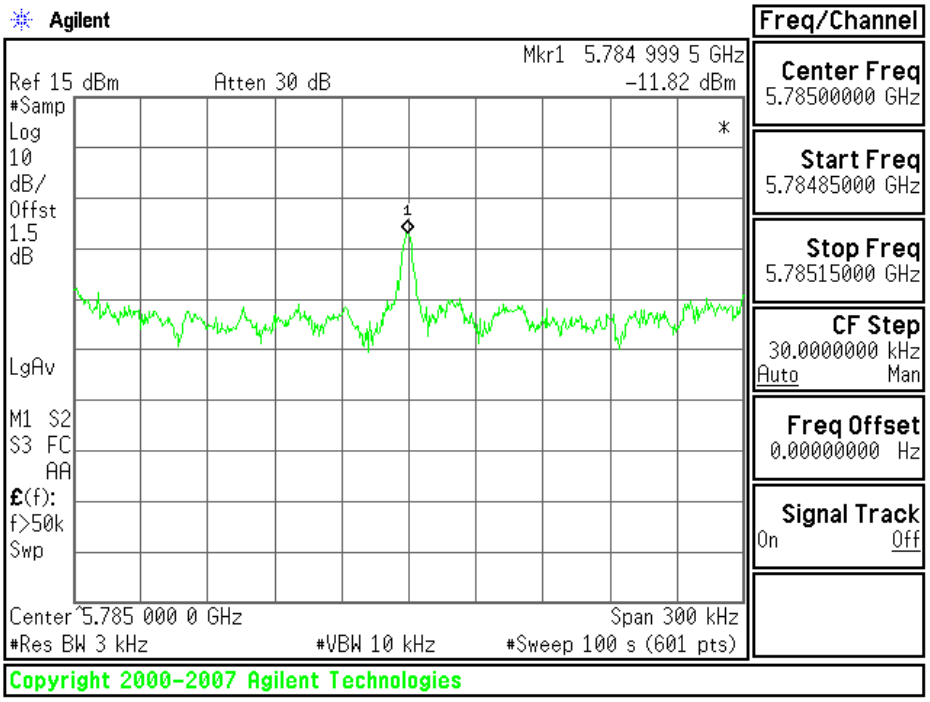


draft 802.11an Standard-20 MHz Channel mode / Chain 1

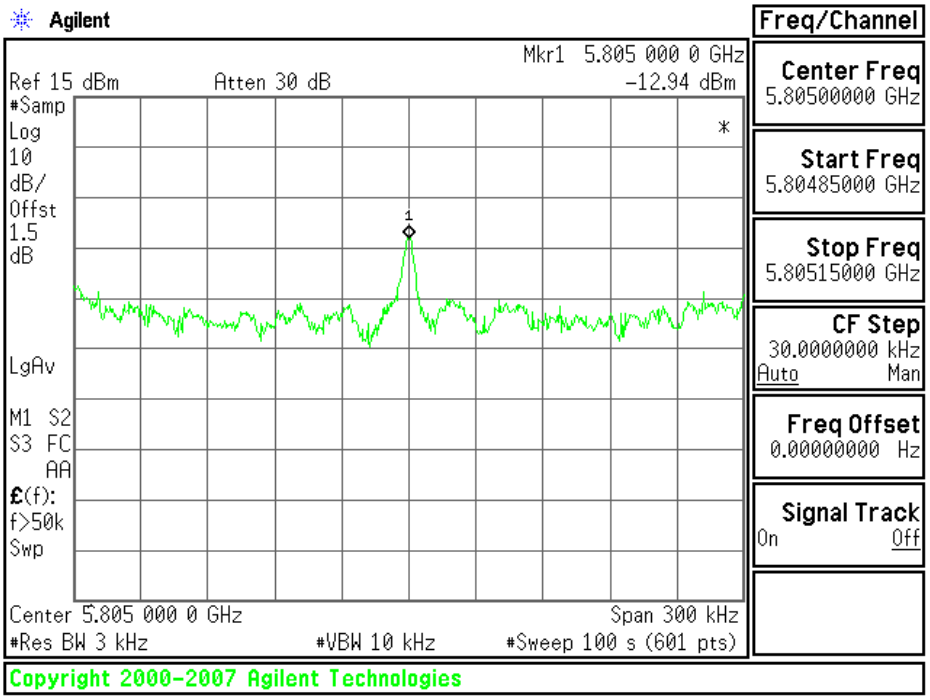
PPSD (CH Low)



PPSD (CH Mid)

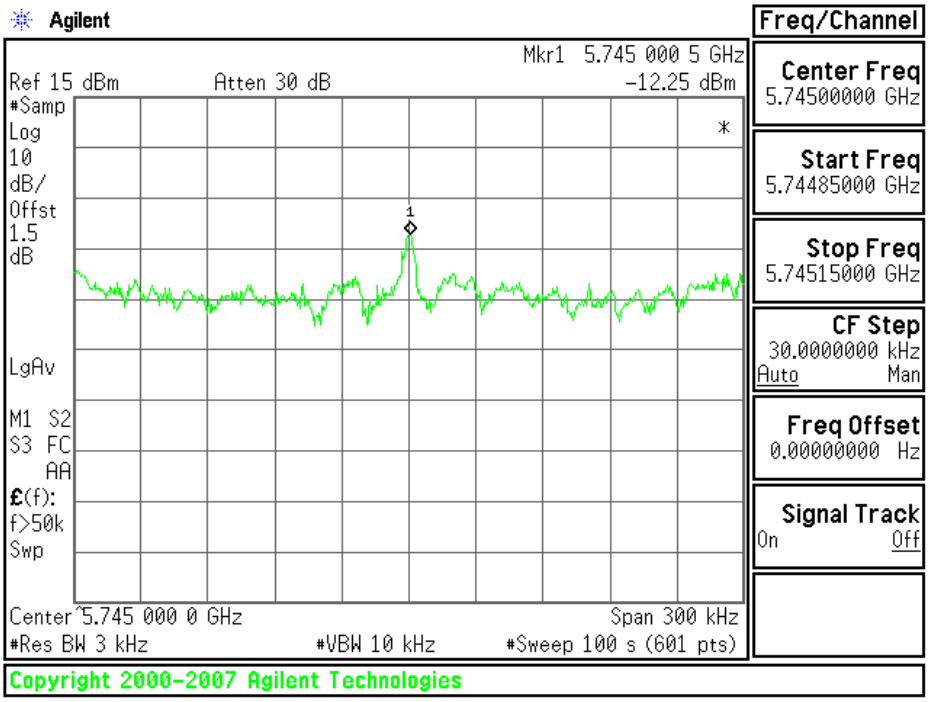


PPSD (CH High)

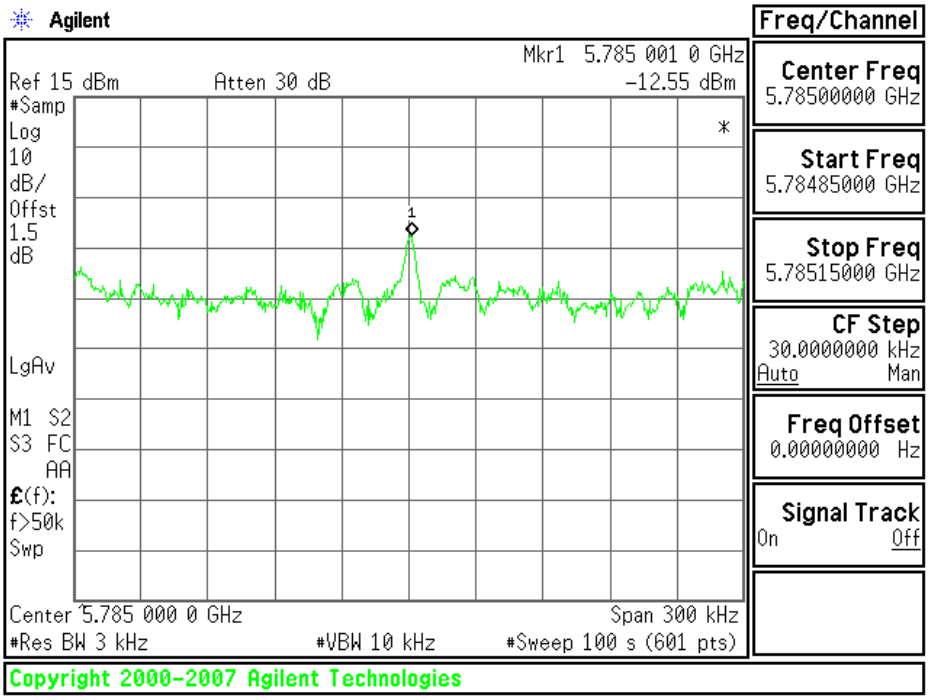


draft 802.11an Standard-20 MHz Channel mode / Chain 2

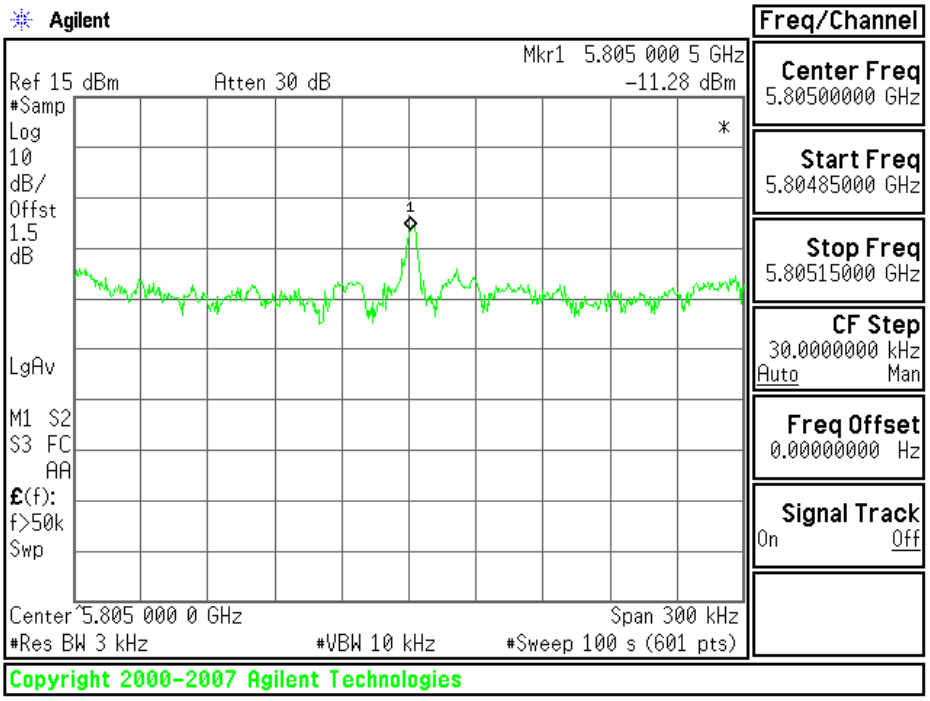
PPSD (CH Low)



PPSD (CH Mid)

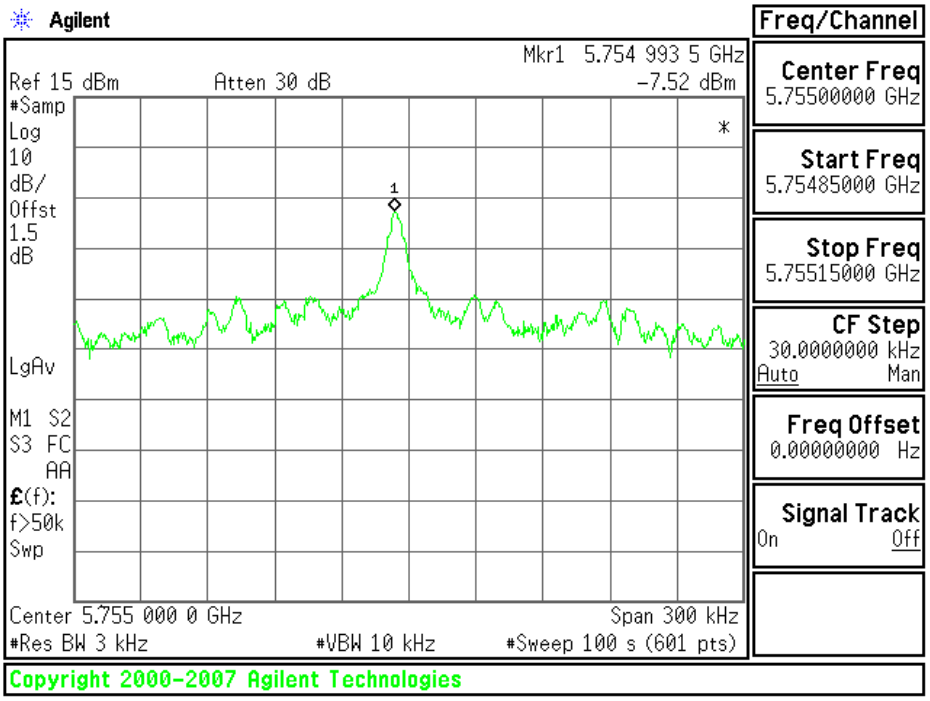


PPSD (CH High)

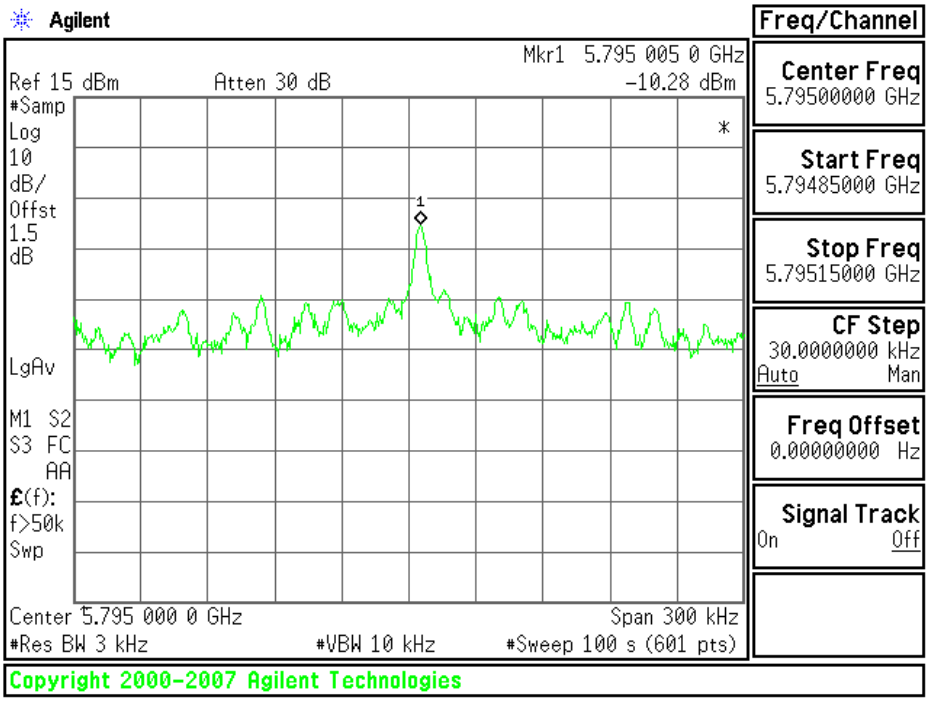


draft 802.11an Standard-40 MHz Channel mode / Chain 0

PPSD (CH Low)

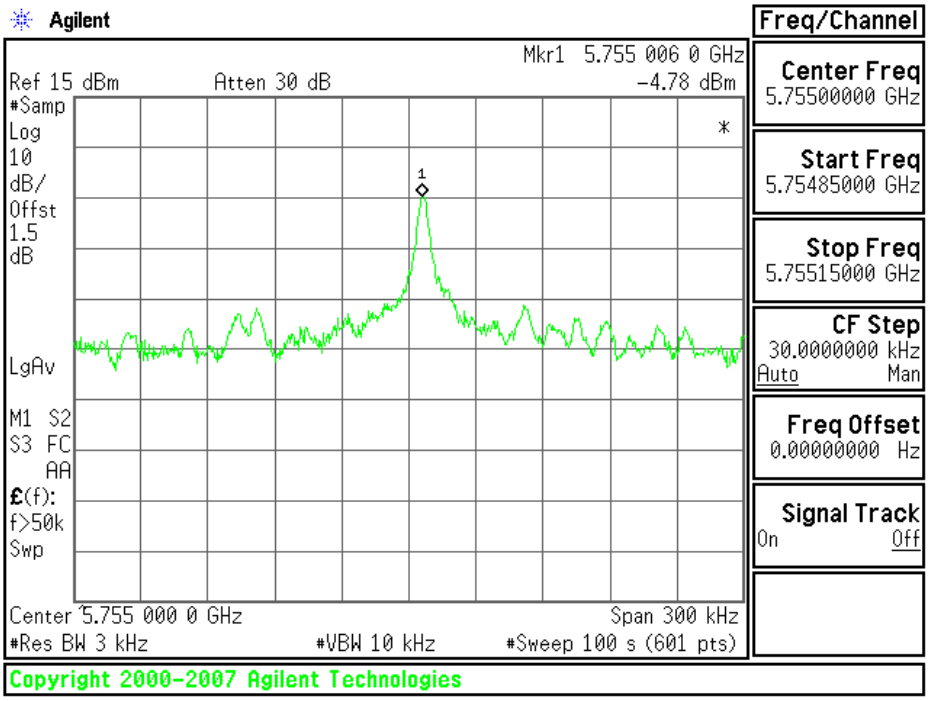


PPSD (CH High)

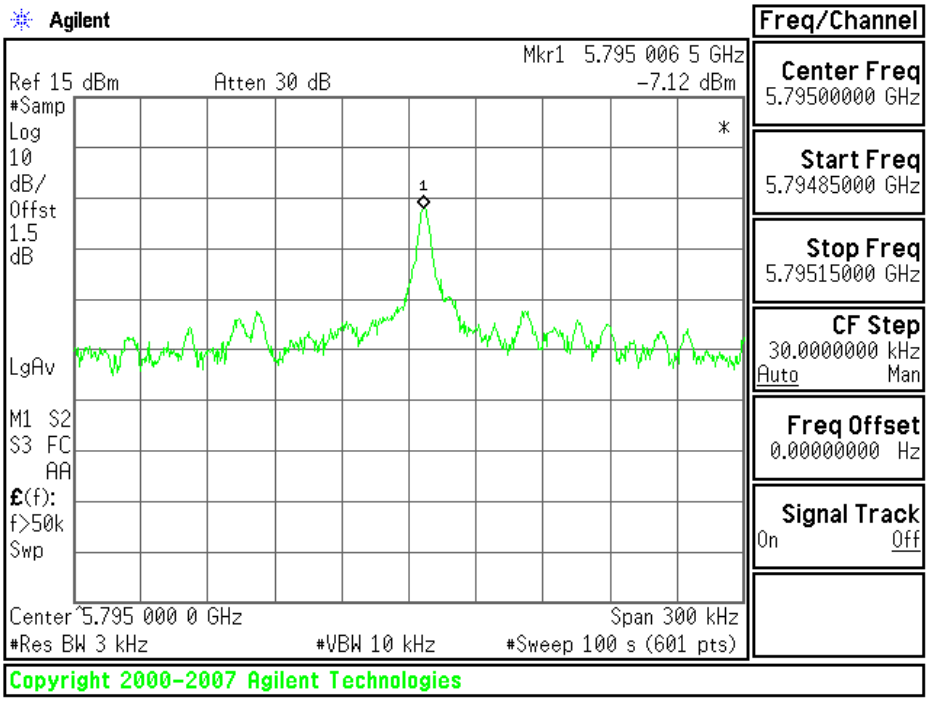


draft 802.11an Standard-40 MHz Channel mode / Chain 1

PPSD (CH Low)

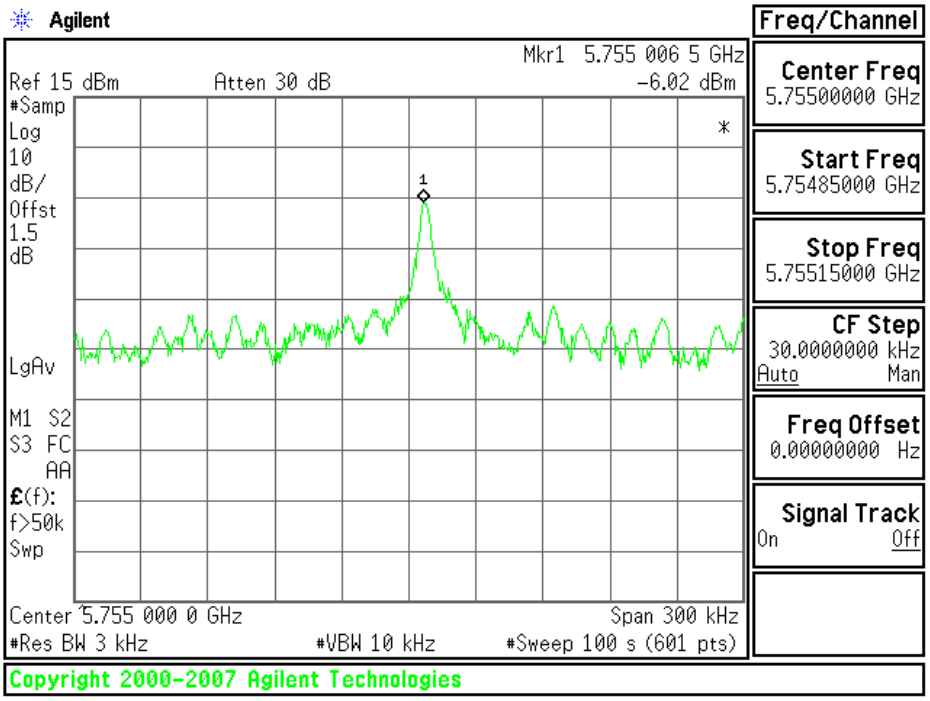


PPSD (CH High)

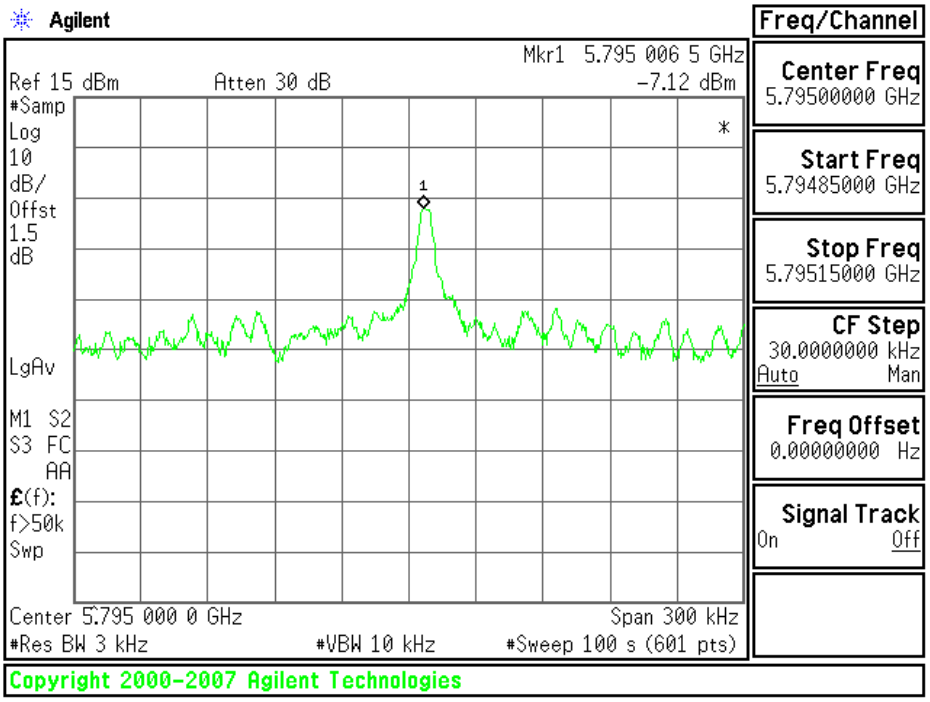


draft 802.11an Standard-40 MHz Channel mode / Chain 2

PPSD (CH Low)

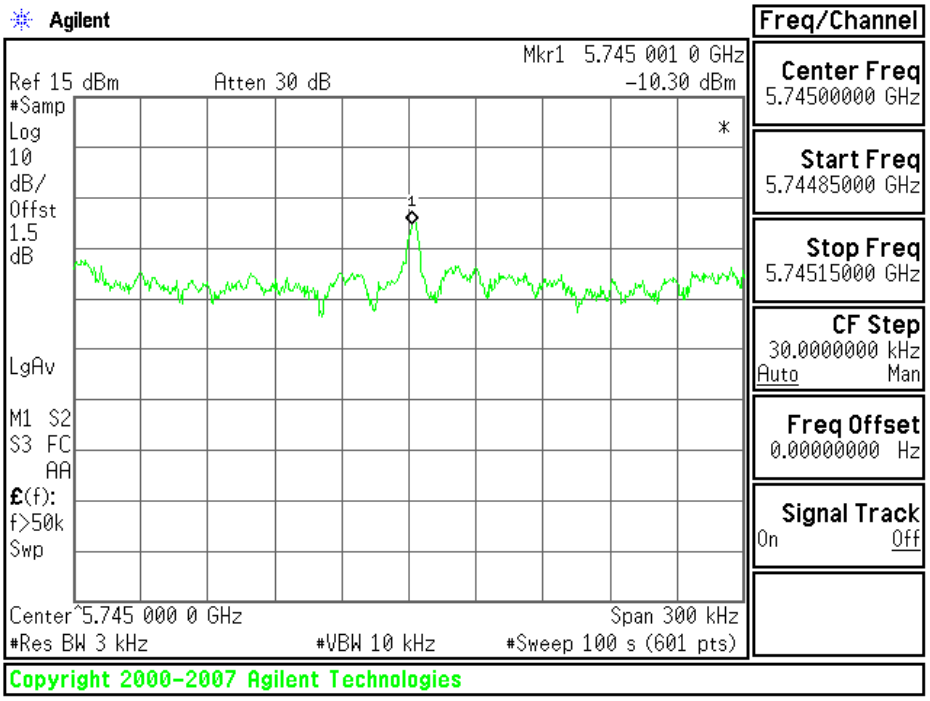


PPSD (CH High)

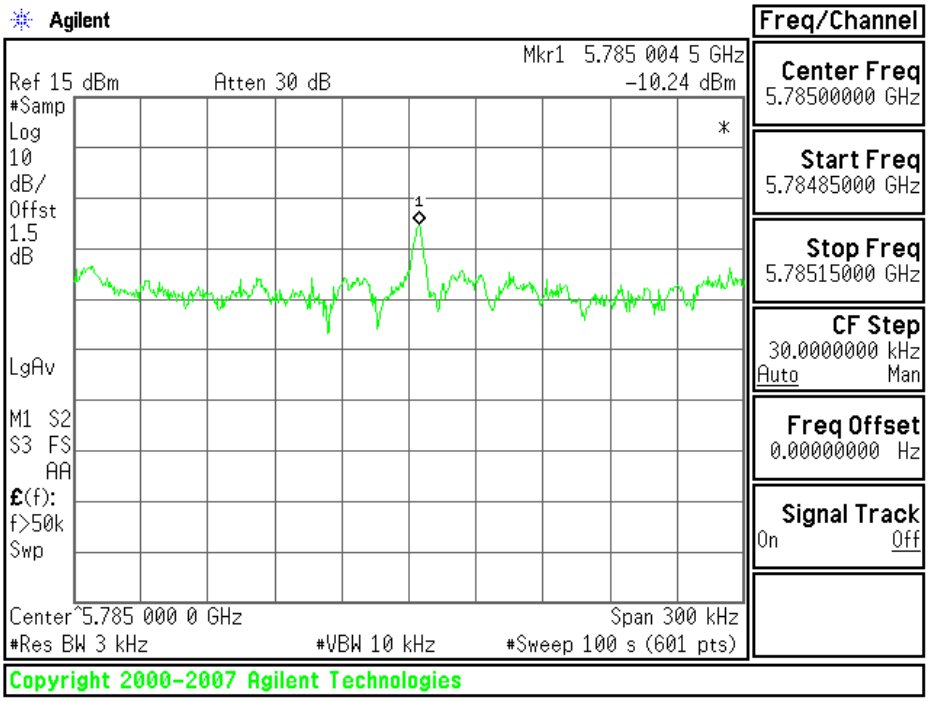


draft 802.11an Standard-20 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

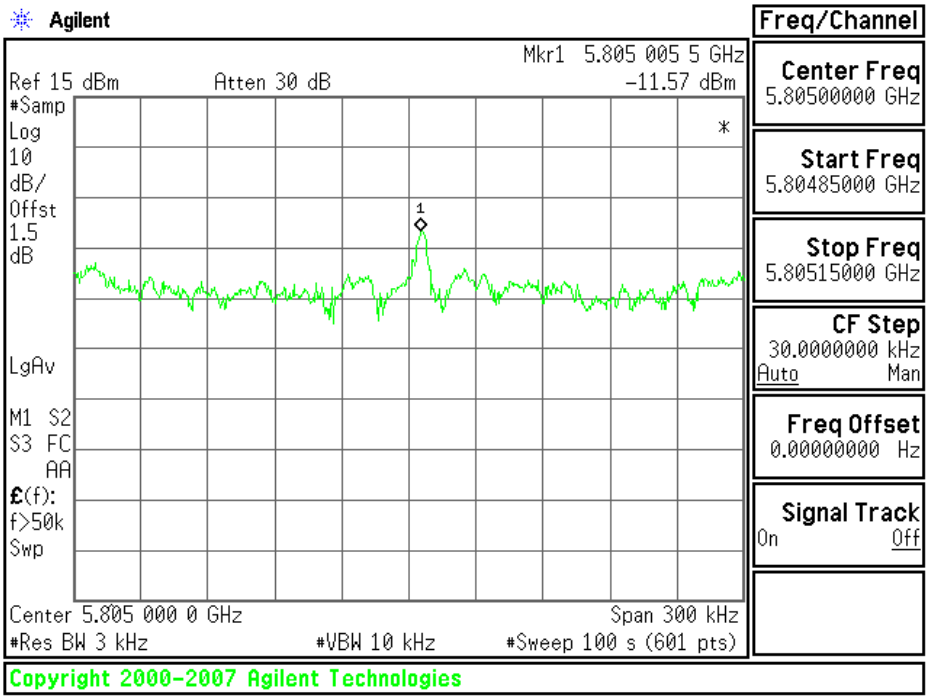
PPSD (CH Low)



PPSD (CH Mid)

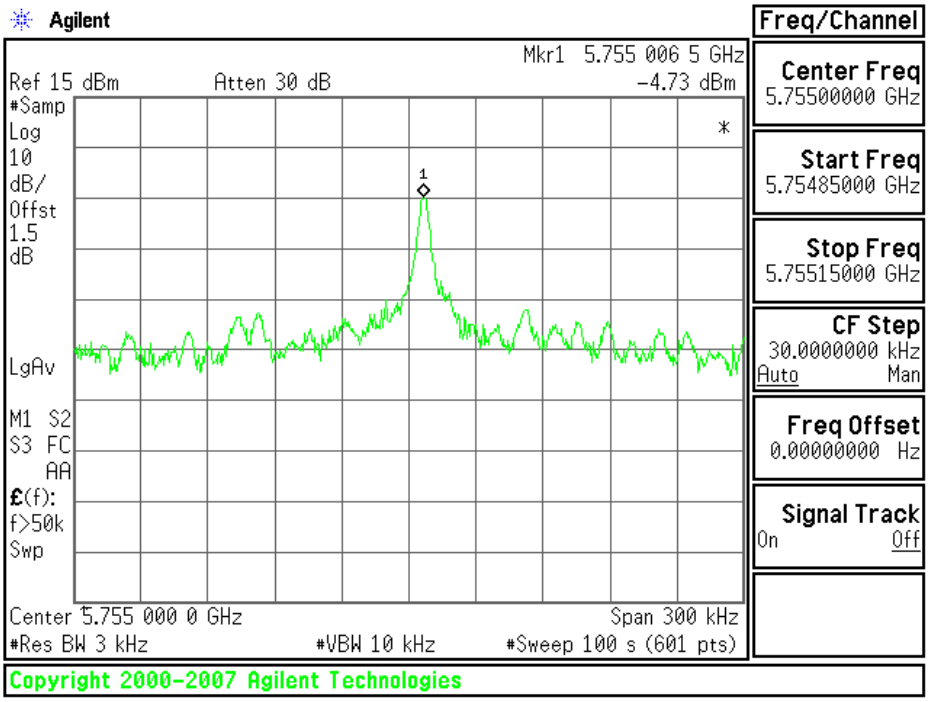


PPSD (CH High)

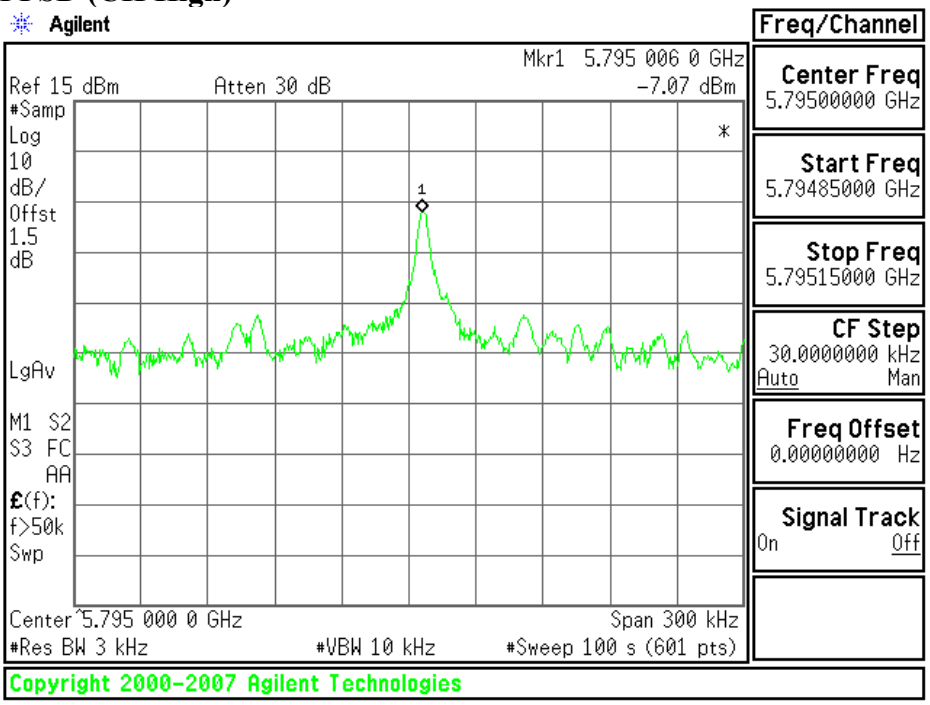


draft 802.11an Standard-40 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

PPSD (CH Low)



PPSD (CH High)


Agilent
Freq/Channel
Mkr1 5.795 006 0 GHz
Ref 15 dBm
Atten 30 dB
-7.07 dBm
#Samp
Log
10
dB/
Offst
1.5
dB
LgAv
M1 S2
S3 FC
AA
£(f):
f>50k
Swp
Center 5.795 000 0 GHz
Span 300 kHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 100 s (601 pts)
Center Freq
5.79500000 GHz
Start Freq
5.79485000 GHz
Stop Freq
5.79515000 GHz
CF Step
30.0000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2007 Agilent Technologies

SPURIOUS EMISSIONS

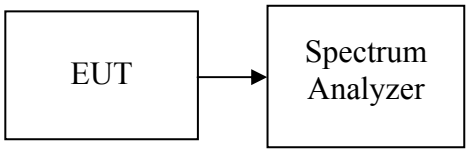
Conducted Measurement

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 40GHz range with the transmitter set to the lowest, middle, and highest channels.

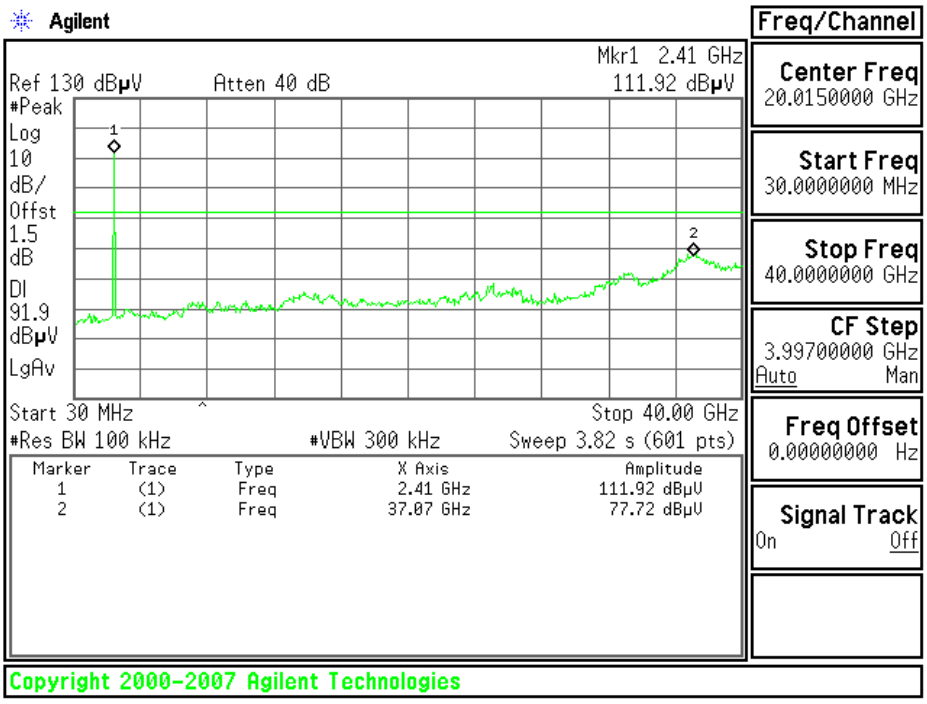
TEST RESULTS

No non-compliance noted

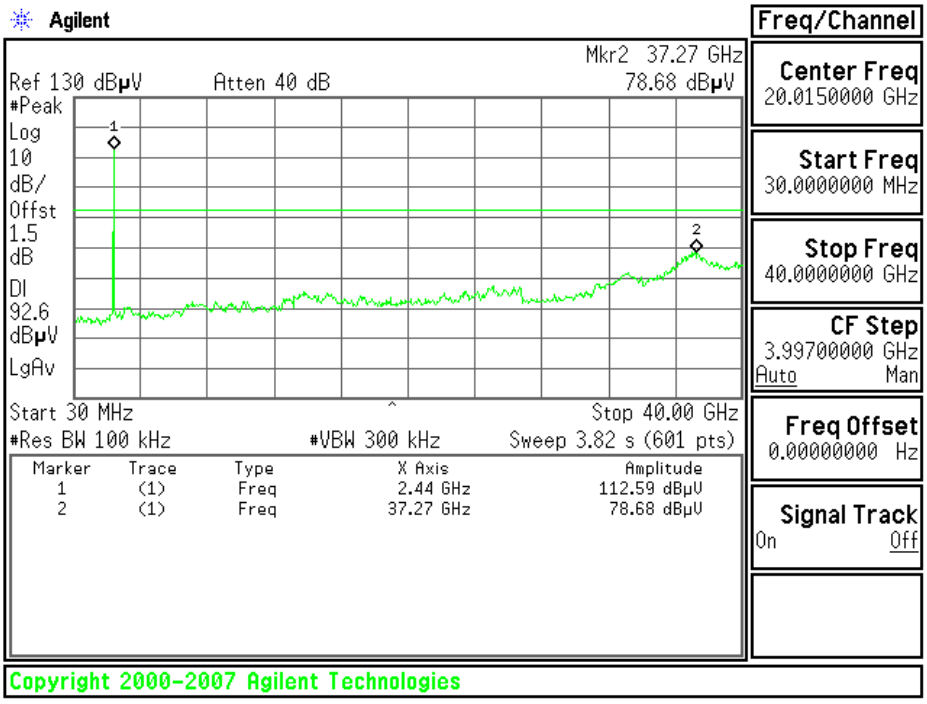
Test Plot

IEEE 802.11b mode

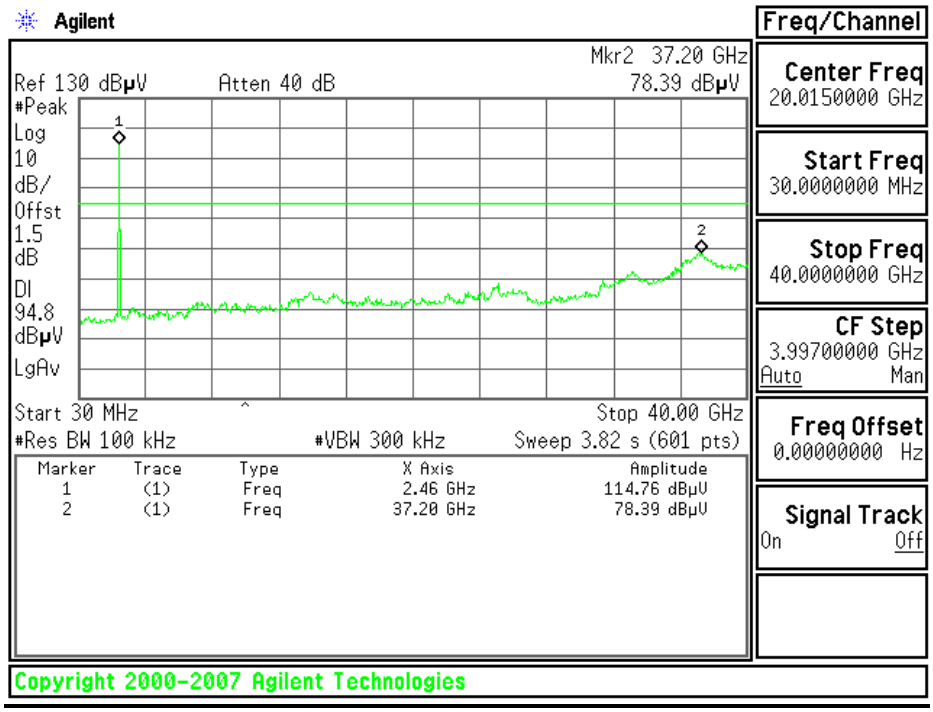
CH Low



CH Mid

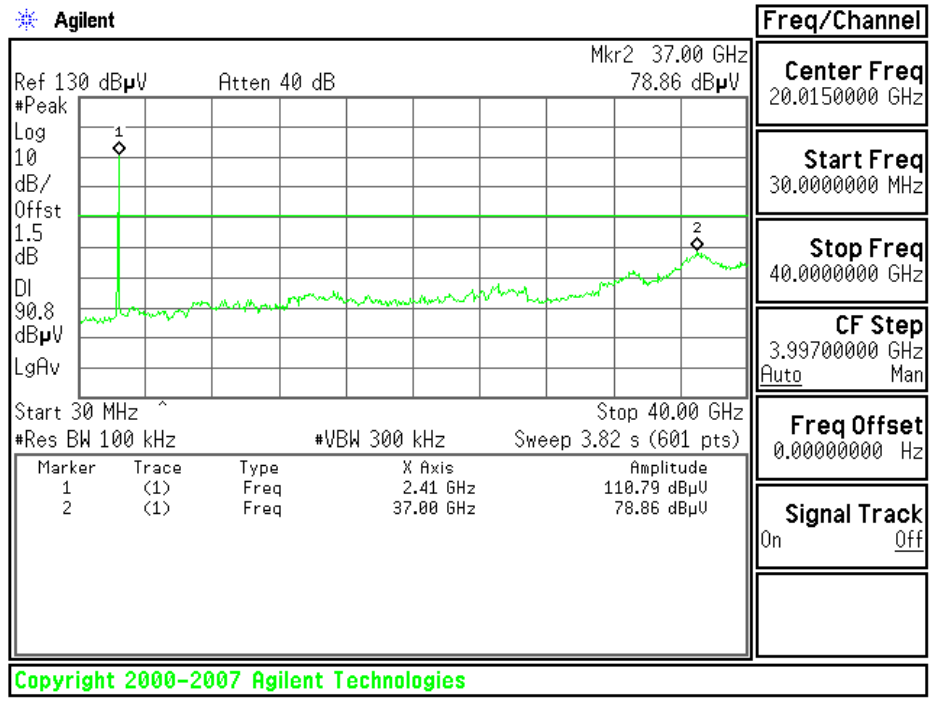


CH High

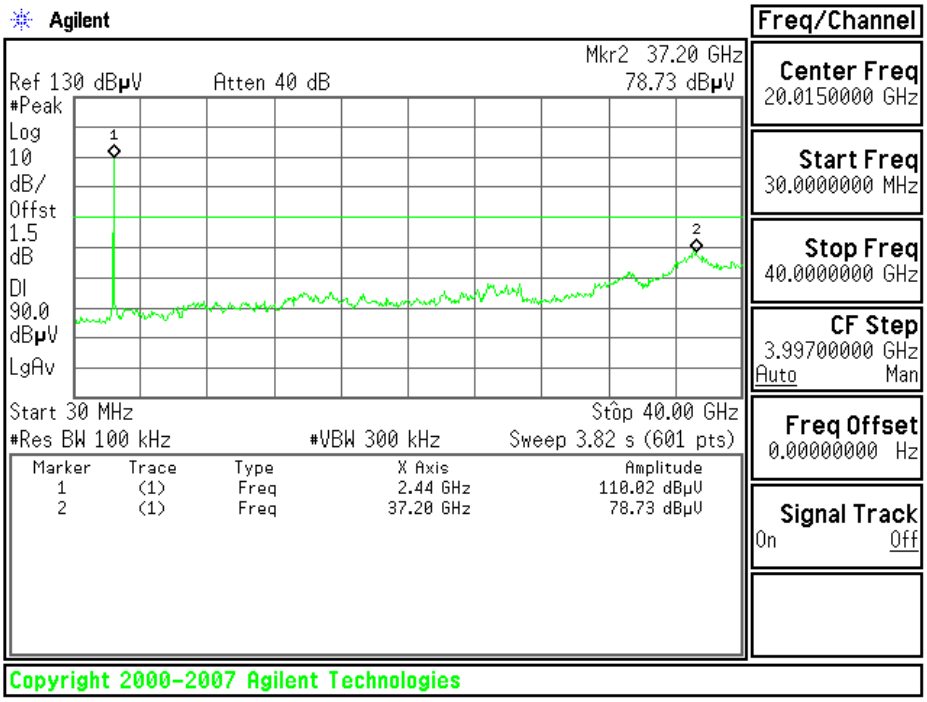


IEEE 802.11g mode

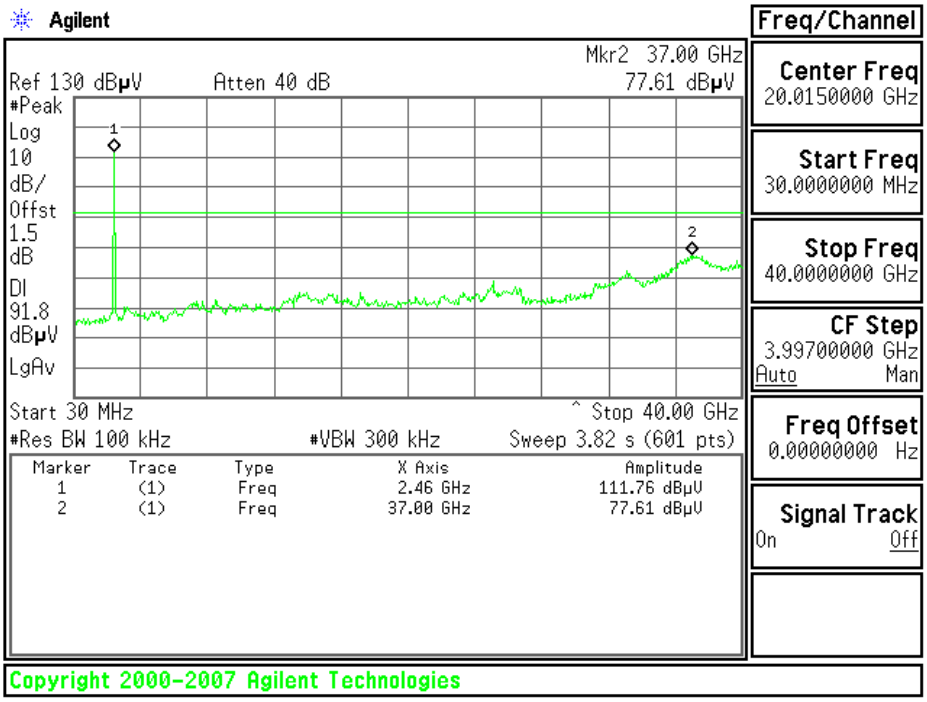
CH Low



CH Mid

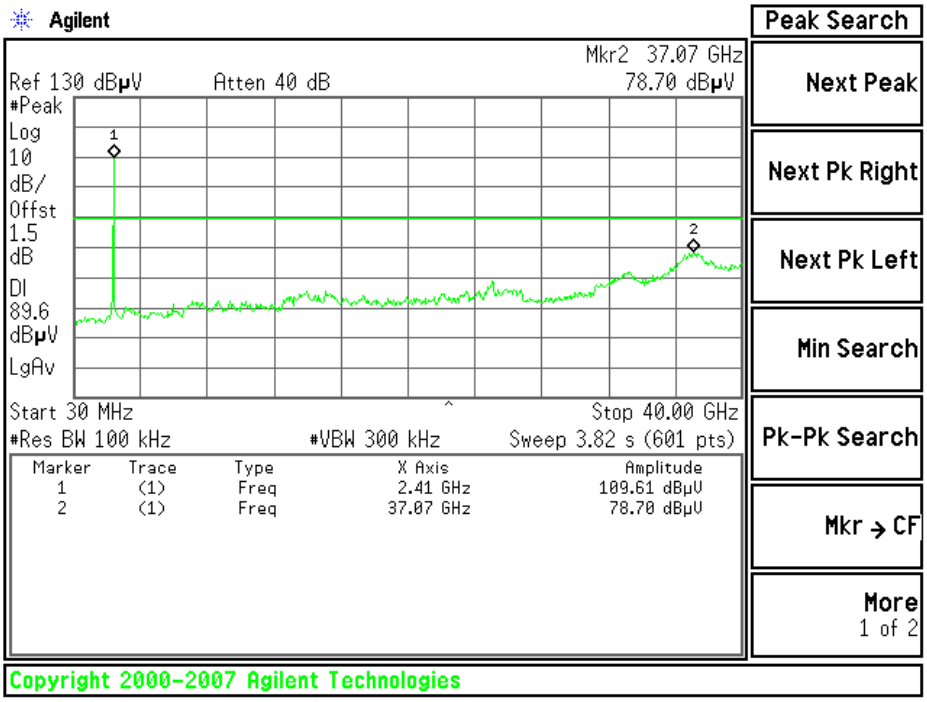


CH High

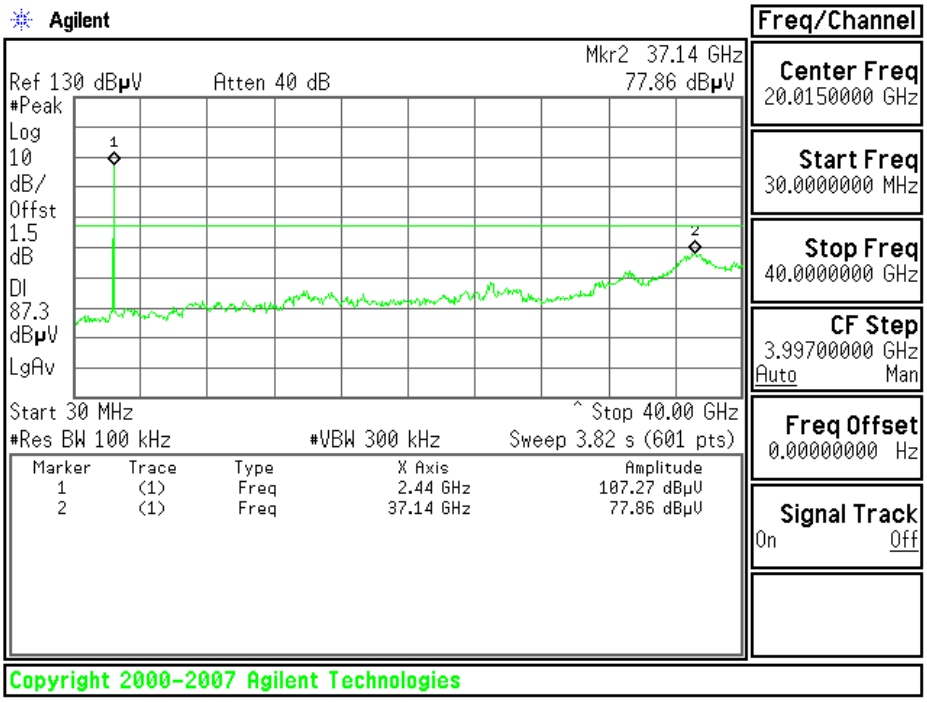


draft 802.11gn Standard-20 MHz Channel mode / Chain 0

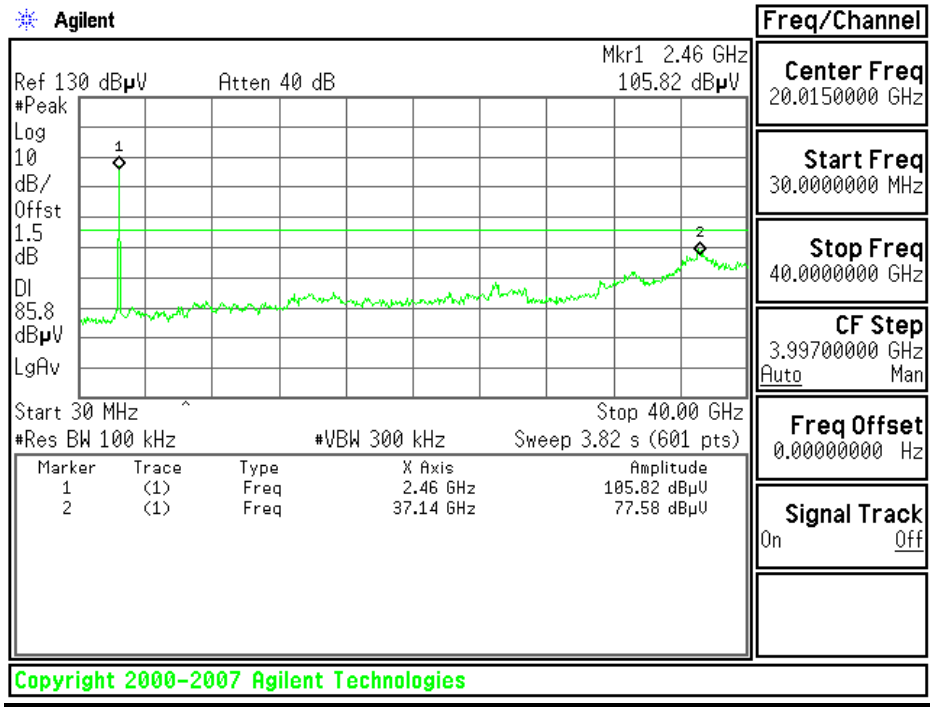
CH Low



CH Mid

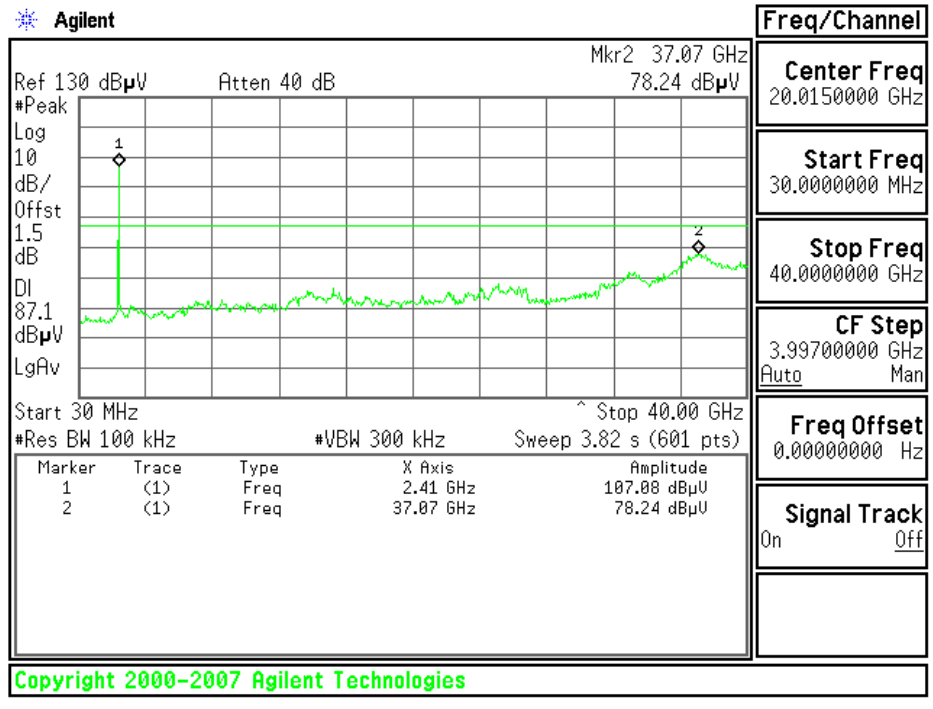


CH High

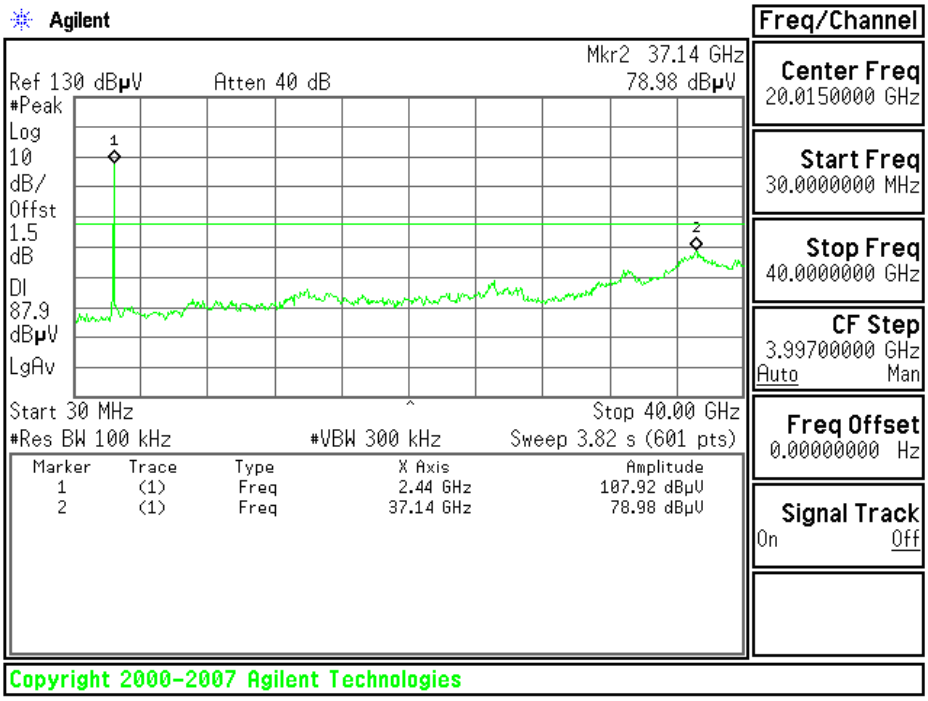


draft 802.11gn Standard-20 MHz Channel mode / Chain 1

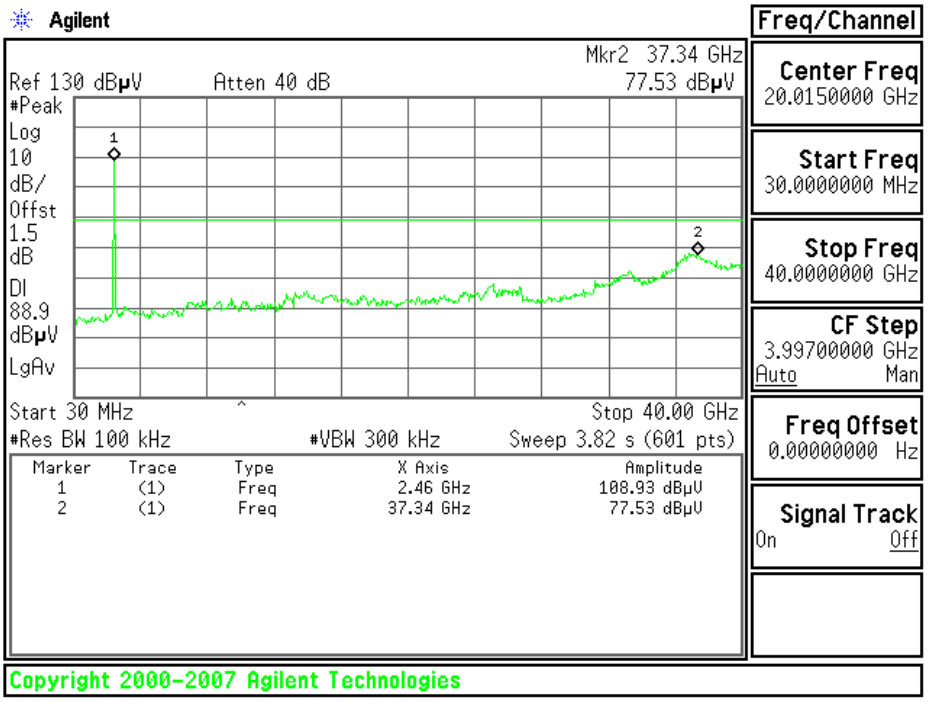
CH Low



CH Mid

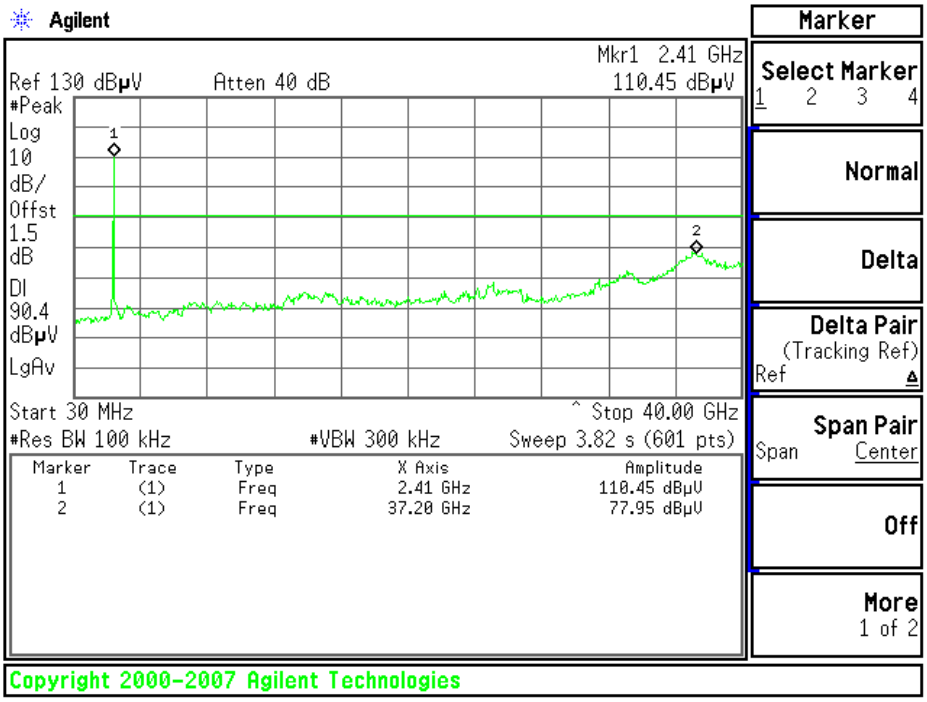


CH High

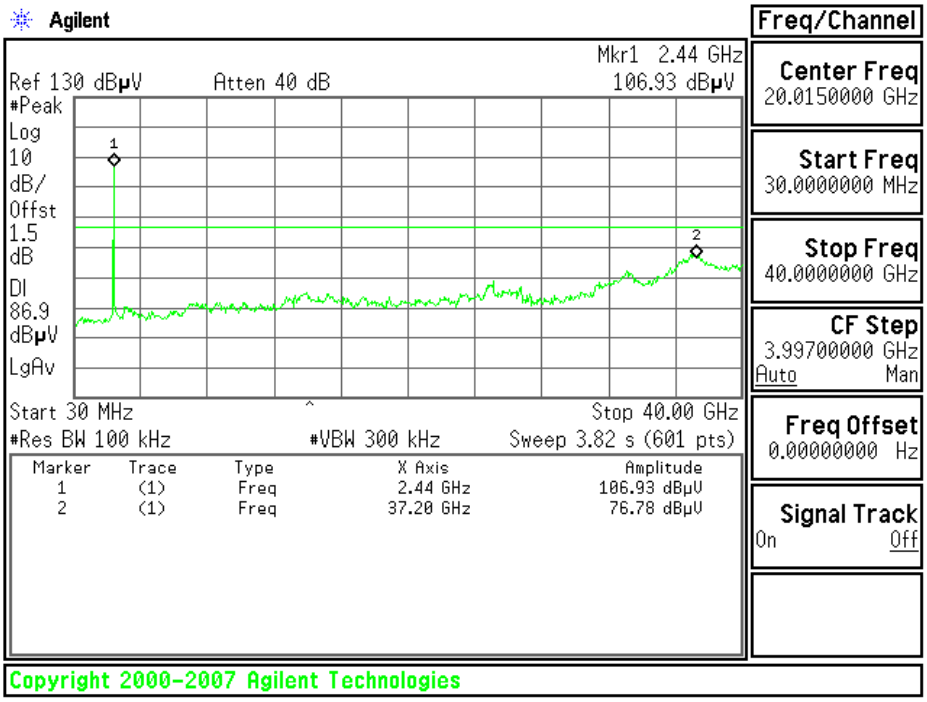


draft 802.11gn Standard-20 MHz Channel mode / Chain 2

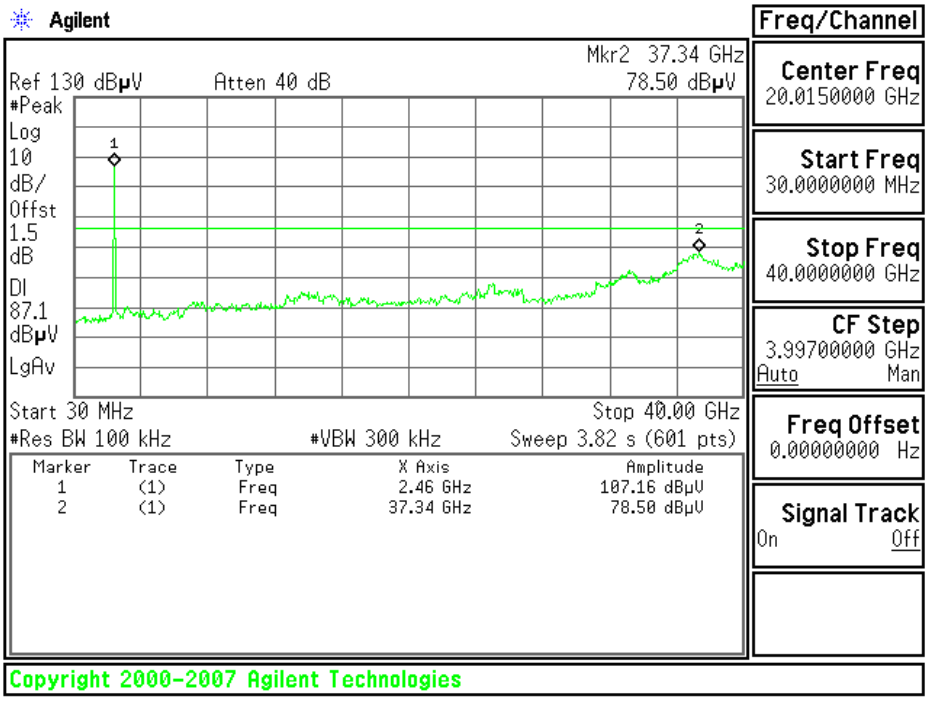
CH Low



CH Mid

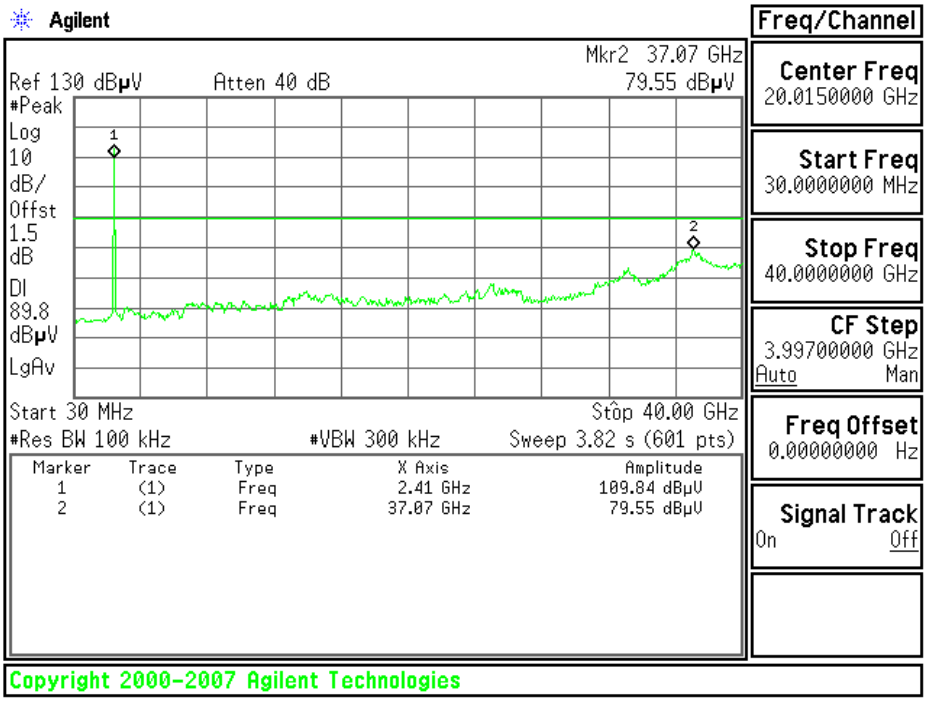


CH High

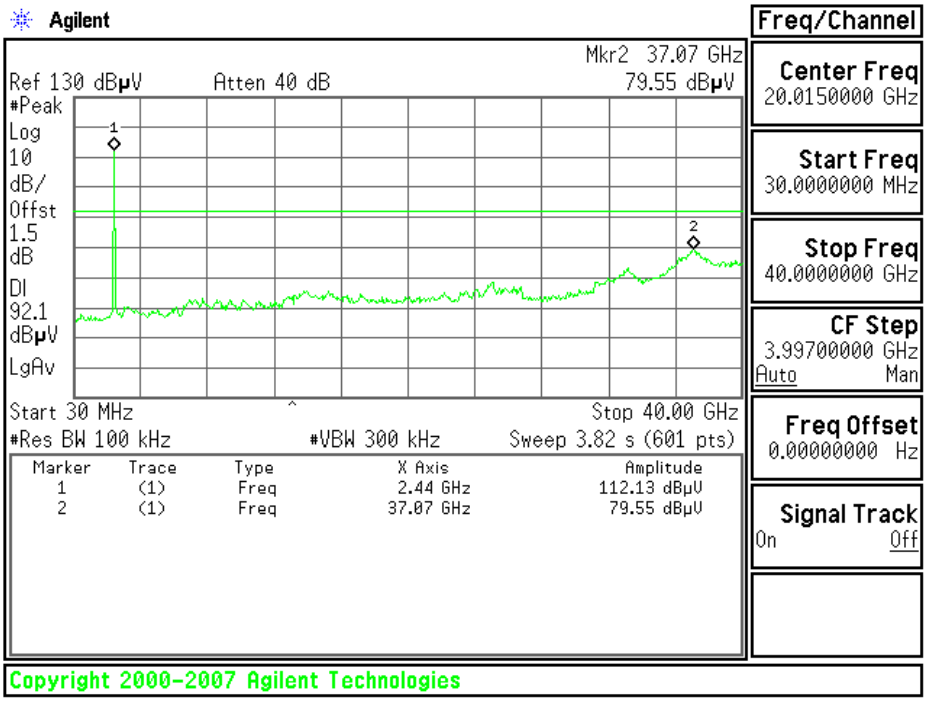


draft 802.11gn Standard-20 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

CH Low



CH Mid



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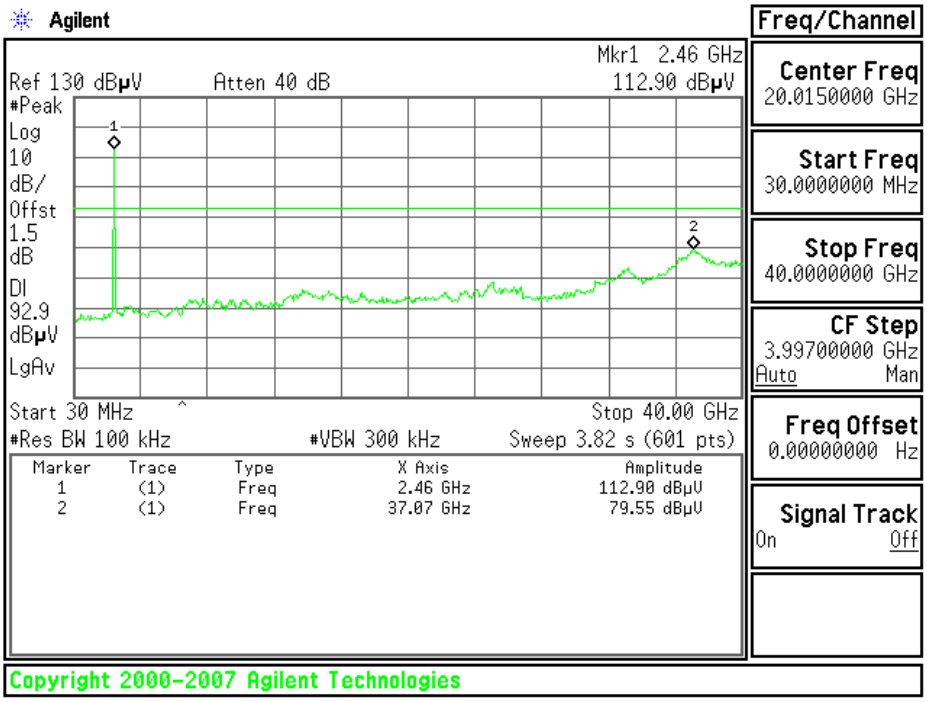
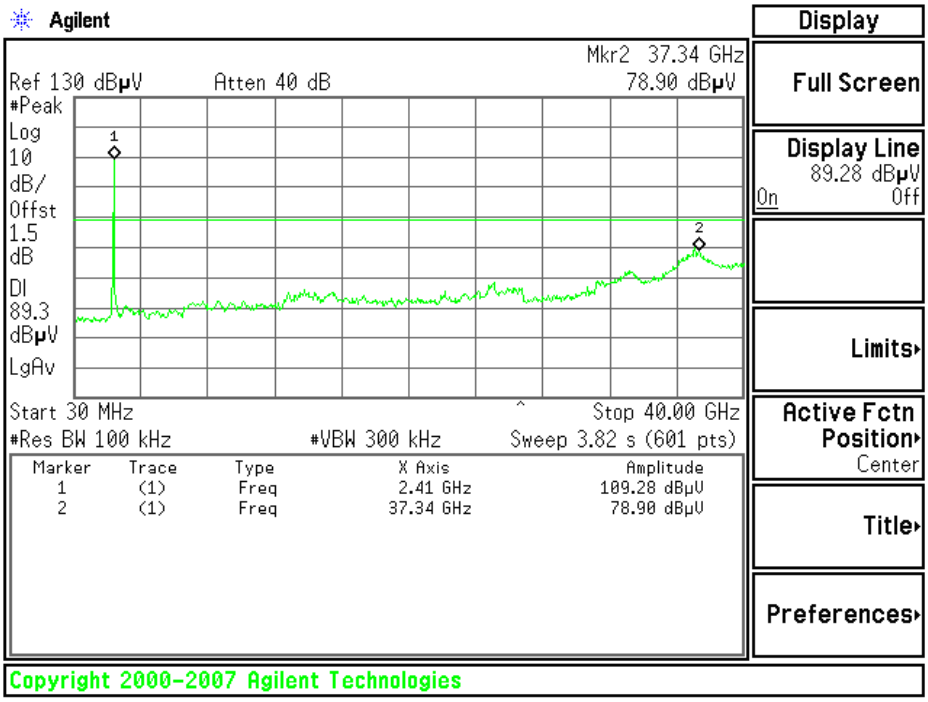


draft 802.11gn Wide-40 MHz Channel mode / Chain 0

CH Low



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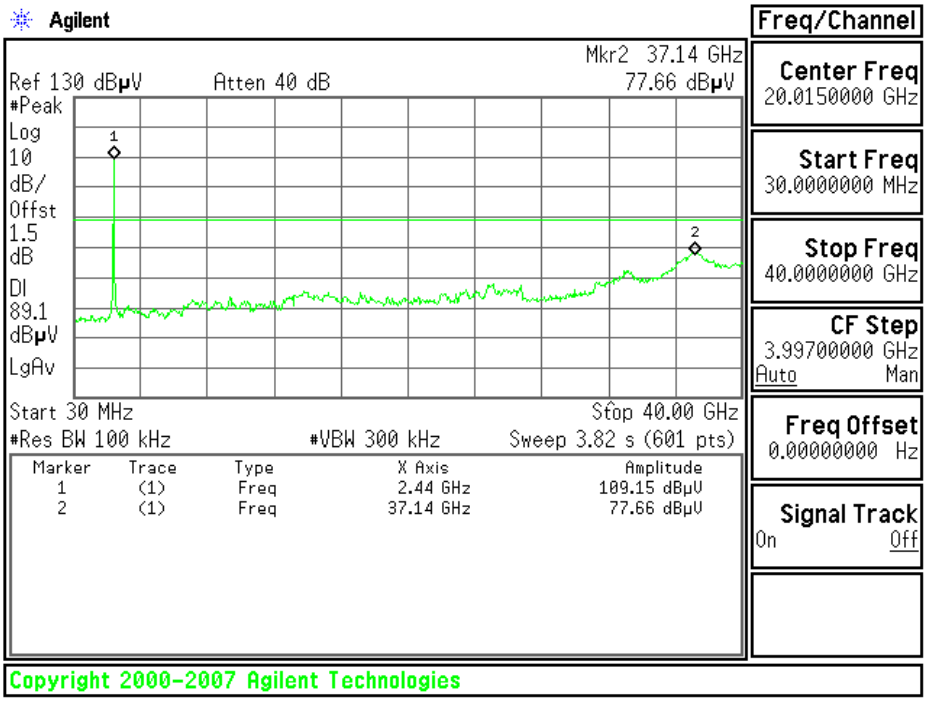

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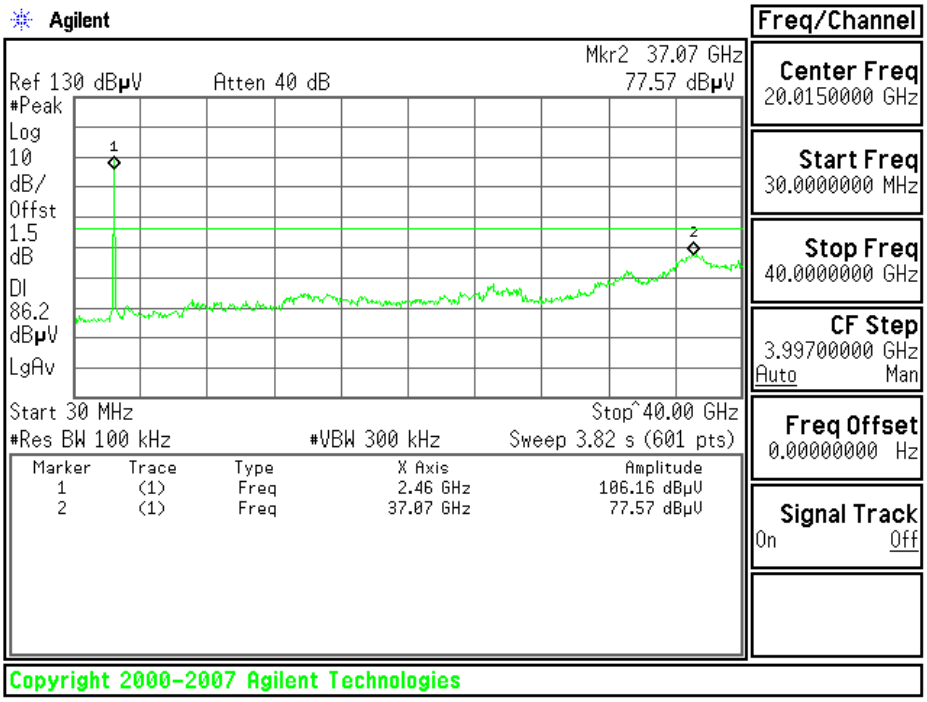
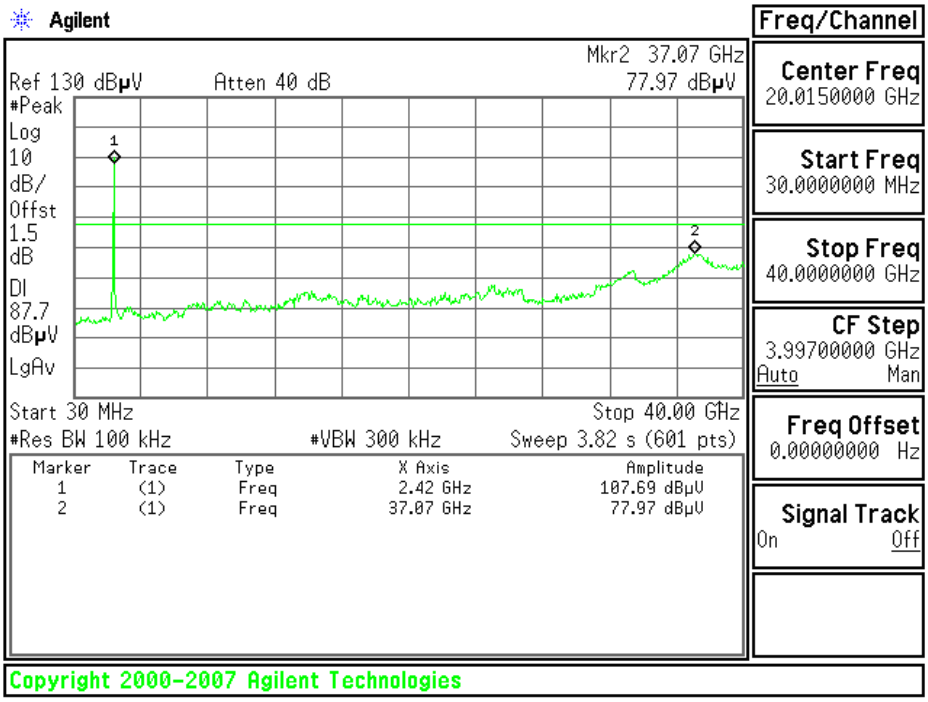
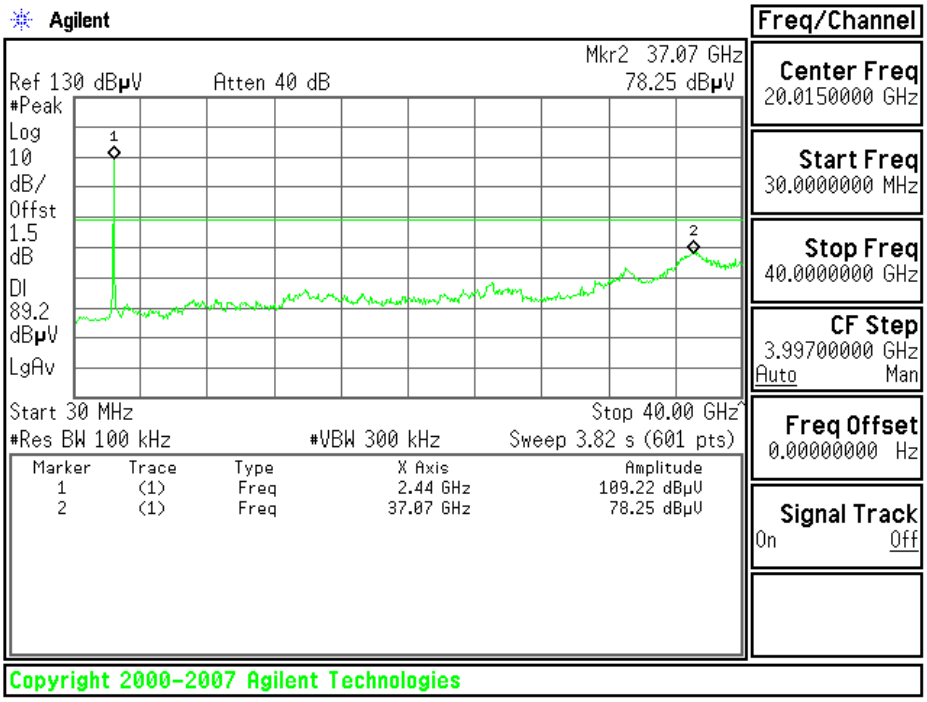


draft 802.11gn Wide-40 MHz Channel mode / Chain 1

CH Low



CH Mid



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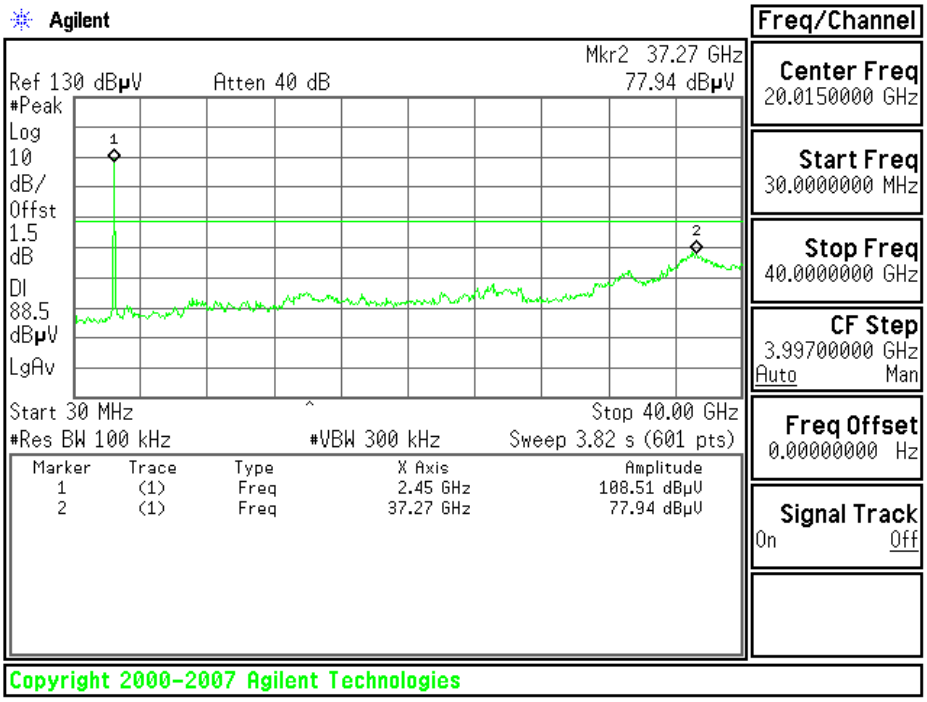
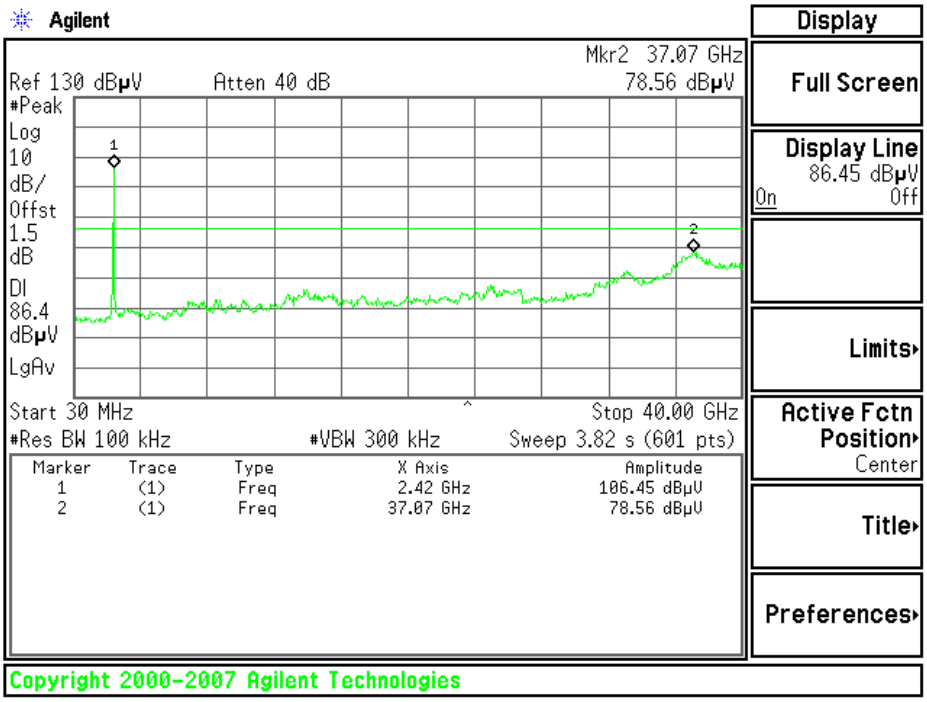
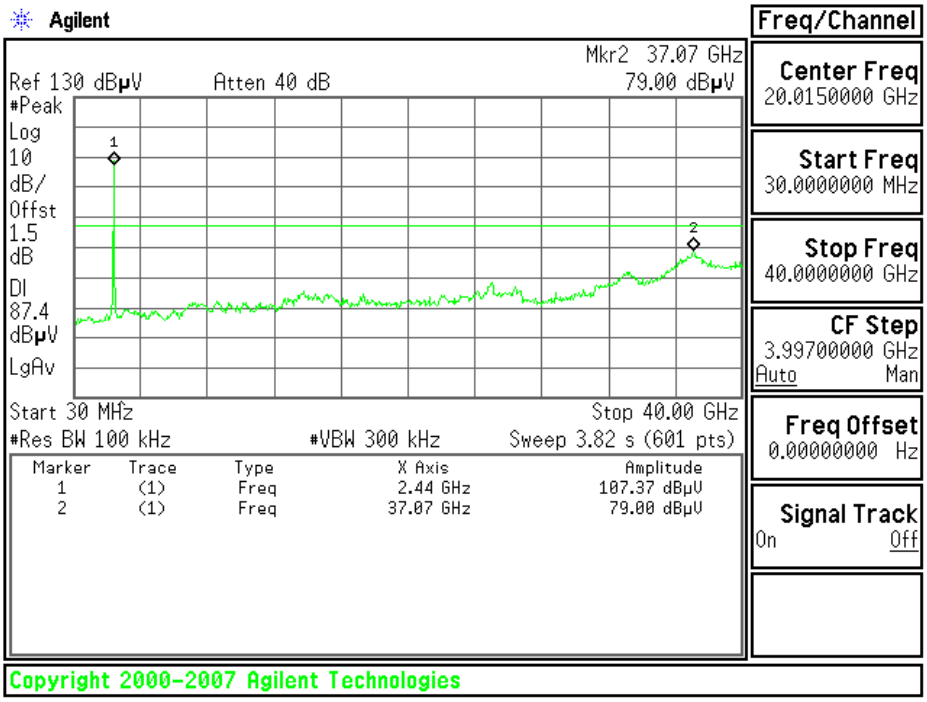


draft 802.11gn Wide-40 MHz Channel mode / Chain 2

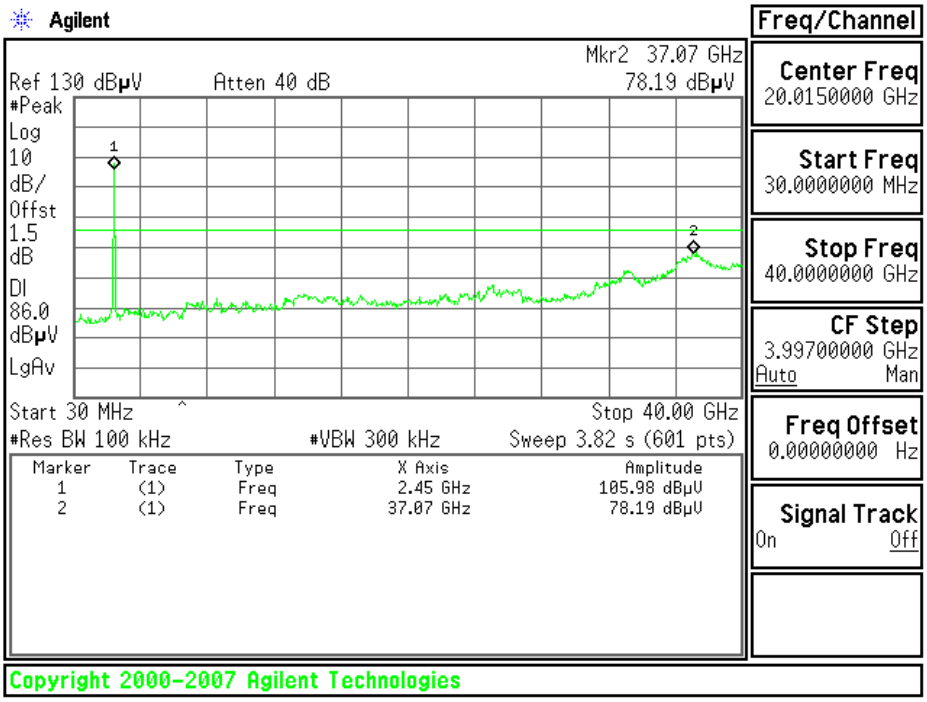
CH Low



CH Mid

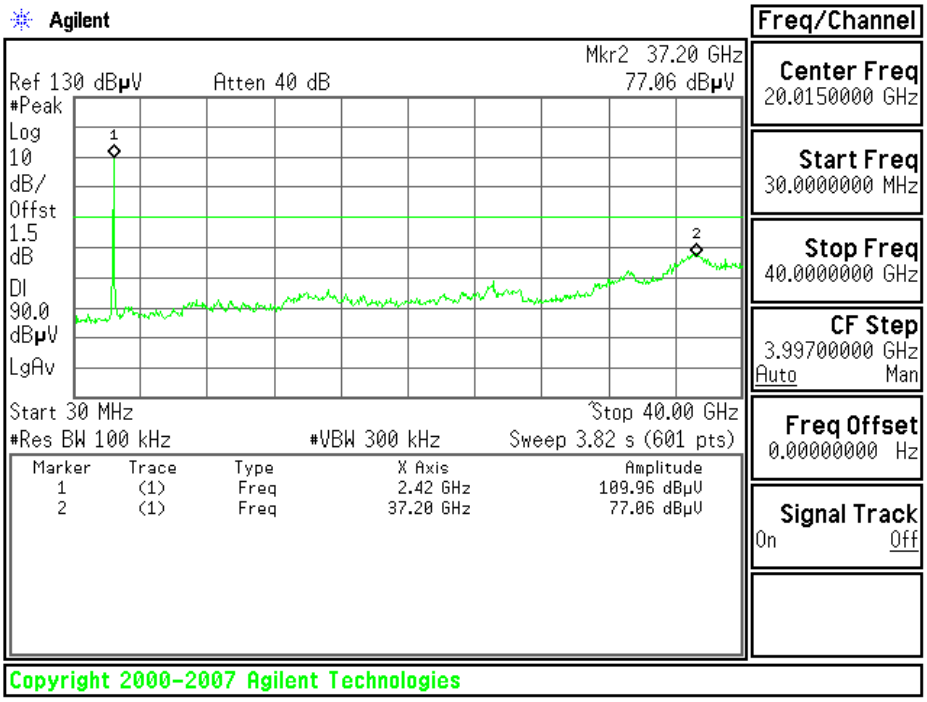


CH High

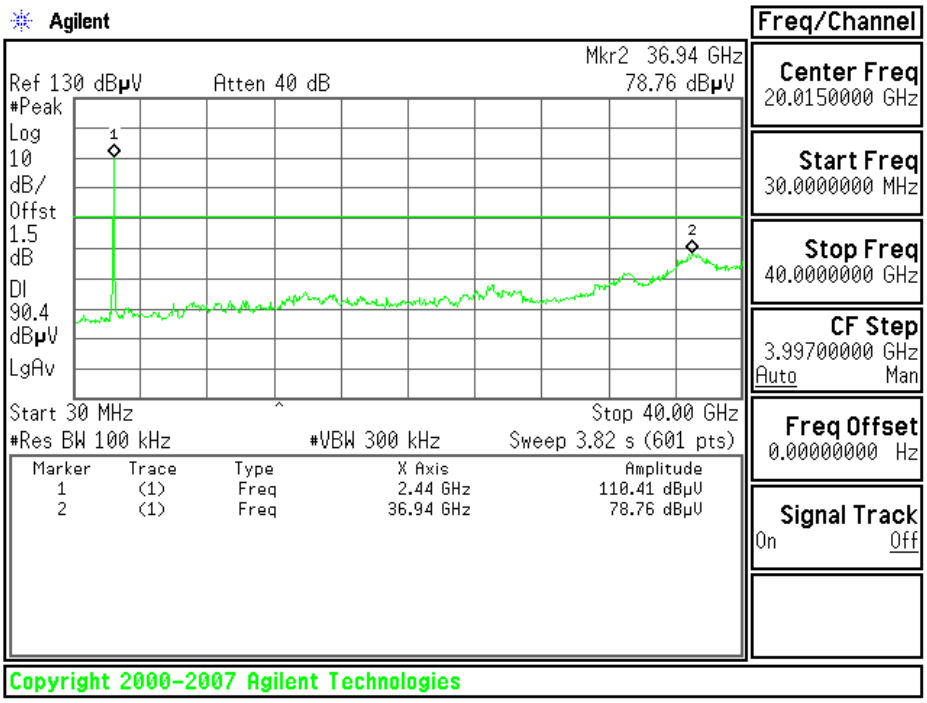


draft 802.11gn Wide-40 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

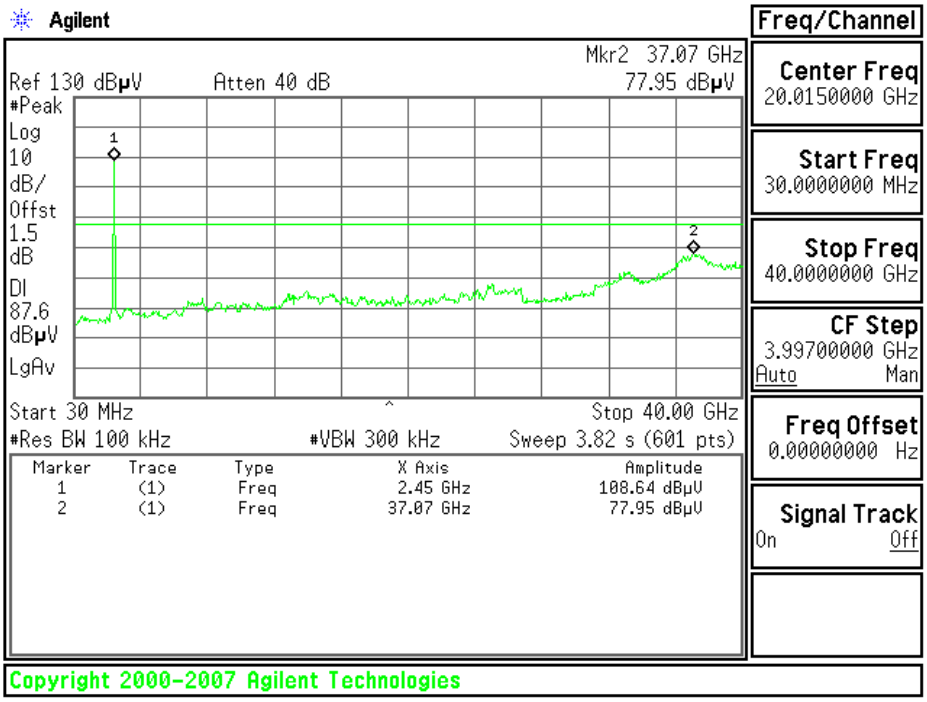
CH Low



CH Mid



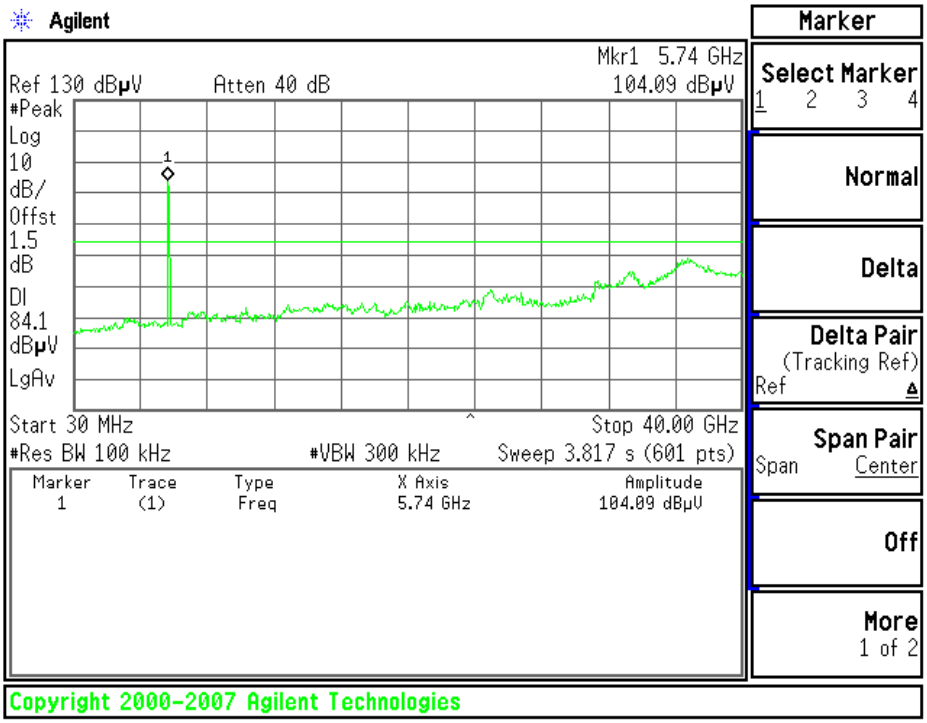
CH High



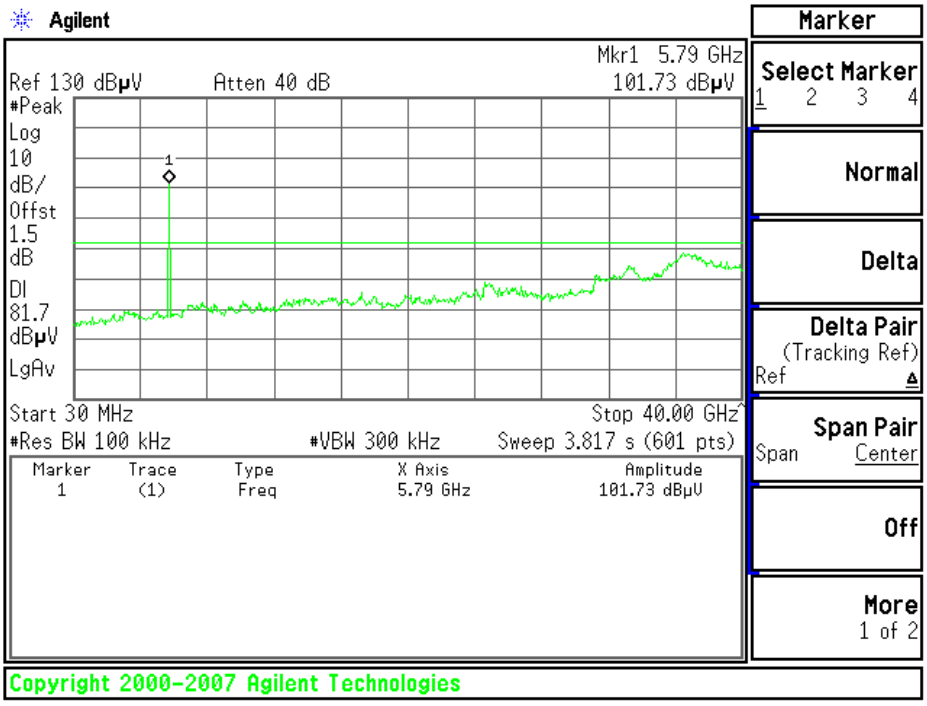
5725-5825

IEEE 802.11a mode

CH Low



CH Mid



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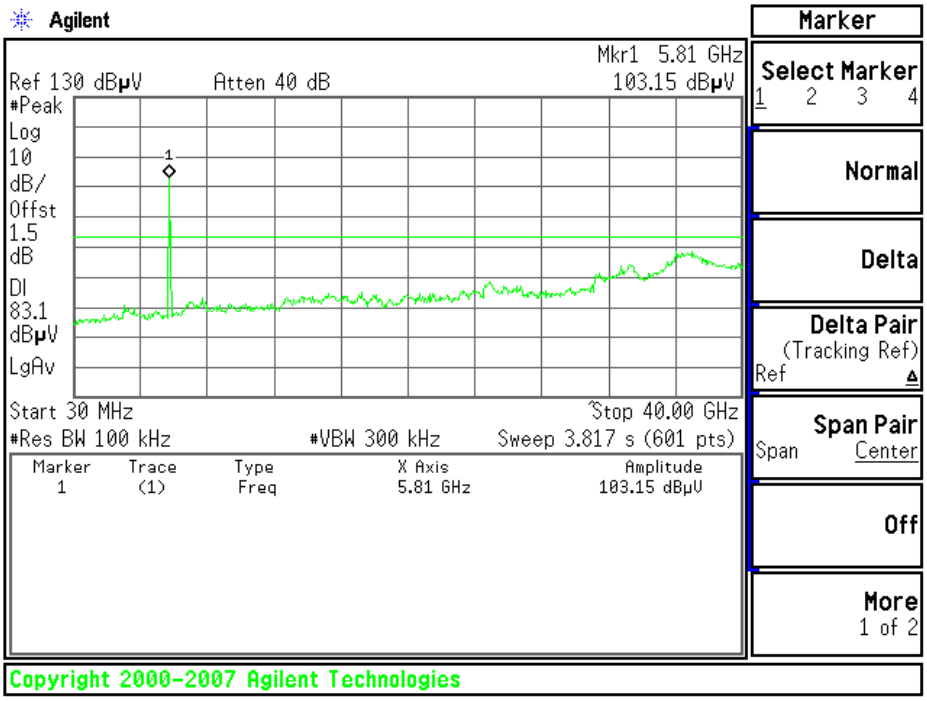
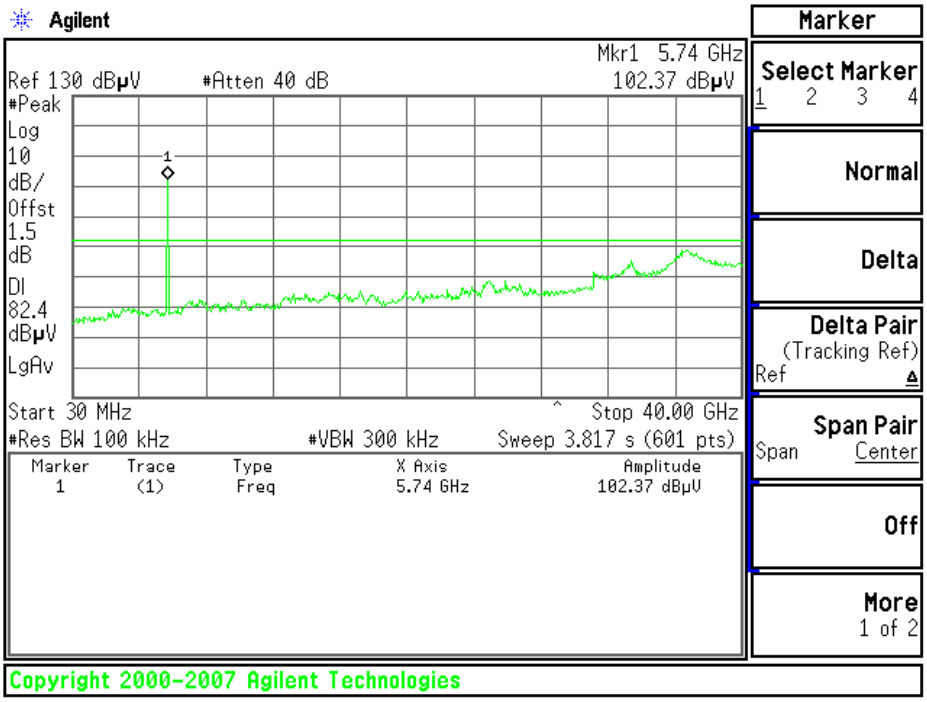
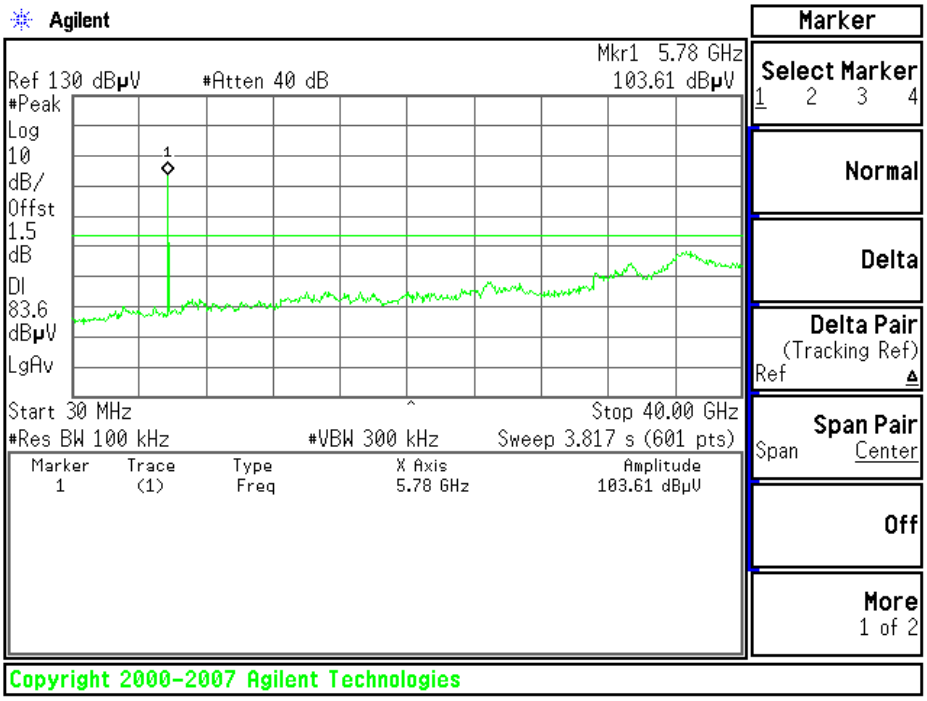


draft 802.11an Standard-20 MHz Channel mode / Chain 0

CH Low



CH Mid



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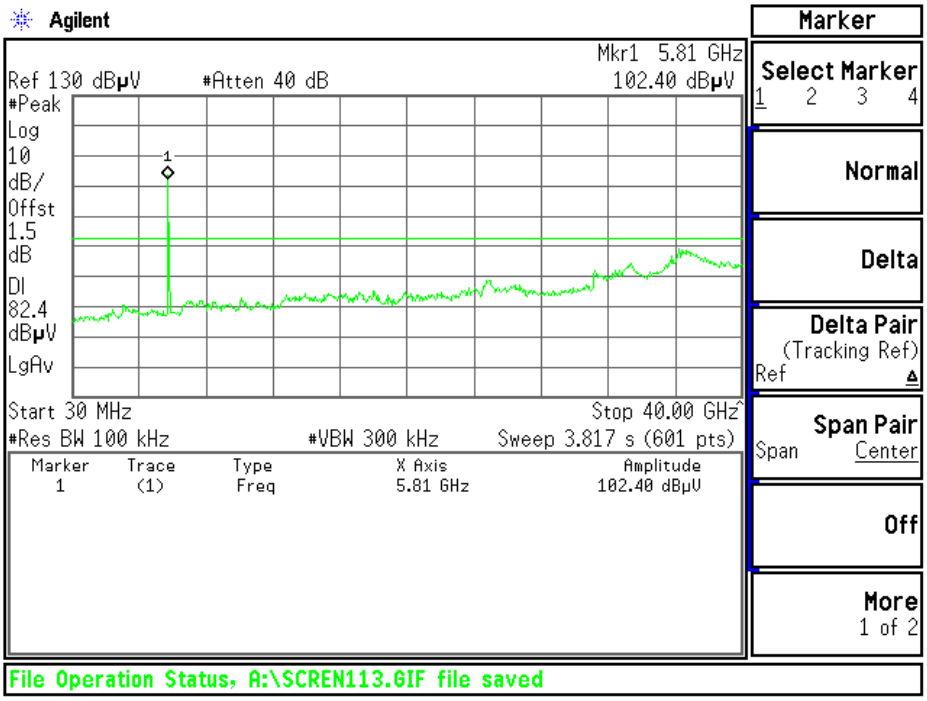
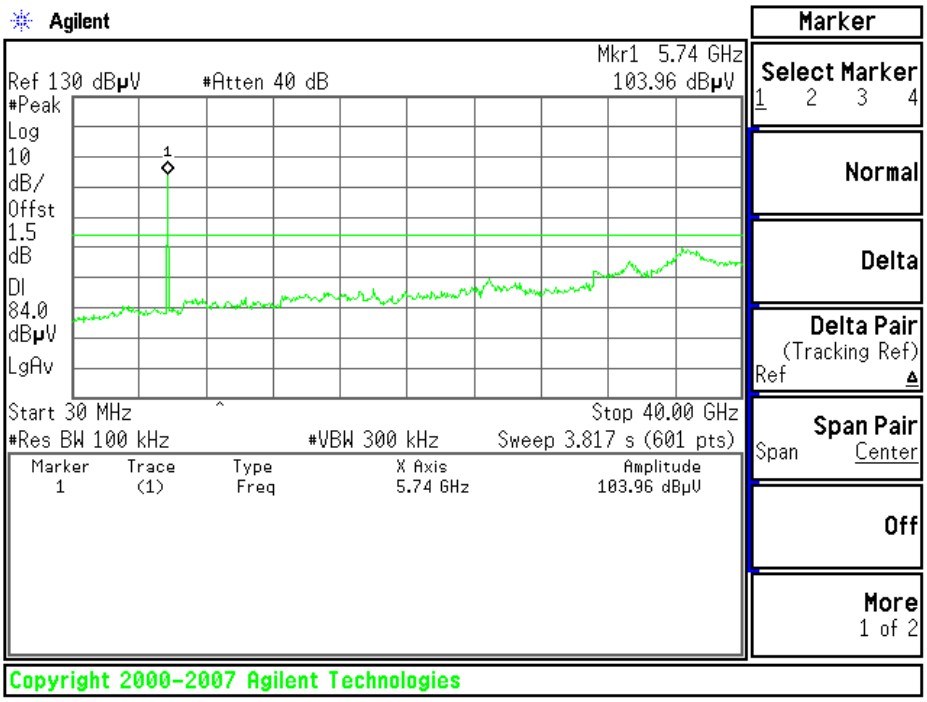
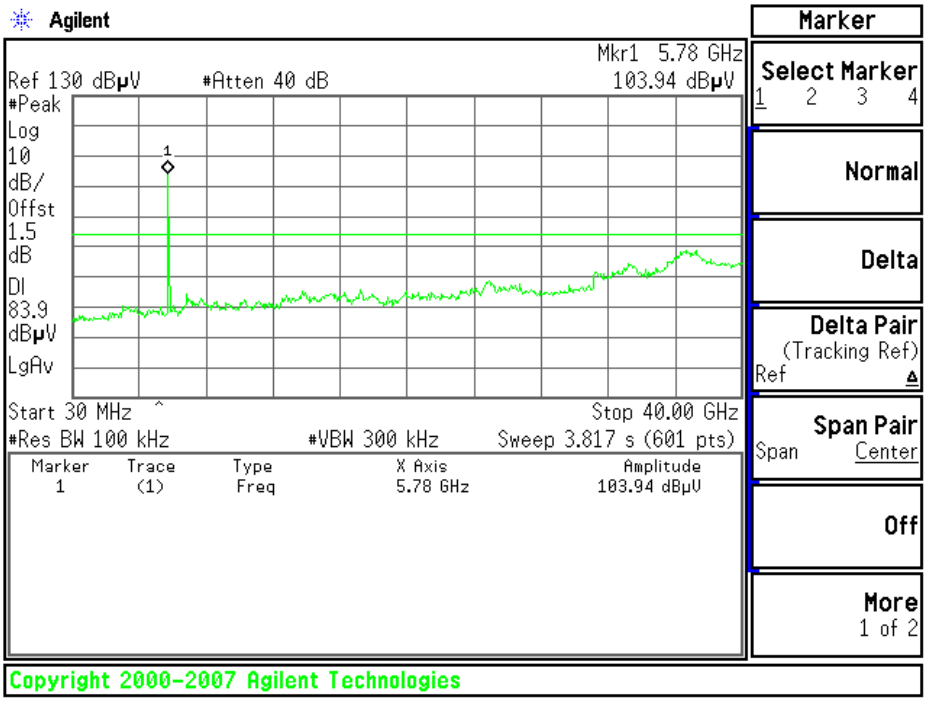


draft 802.11an Standard-20 MHz Channel mode / Chain 1

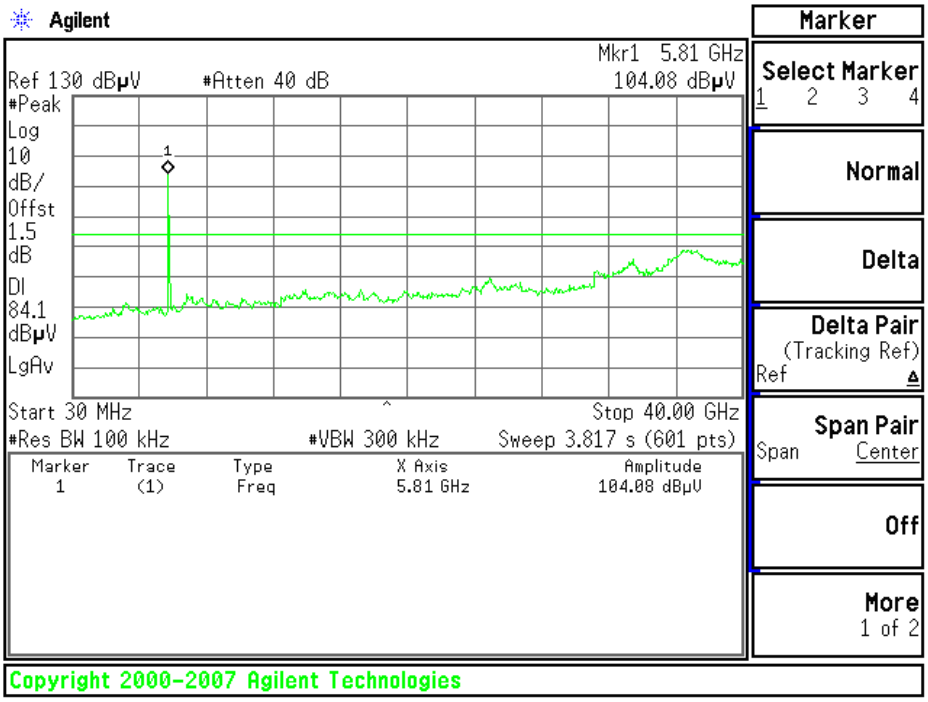
CH Low



CH Mid

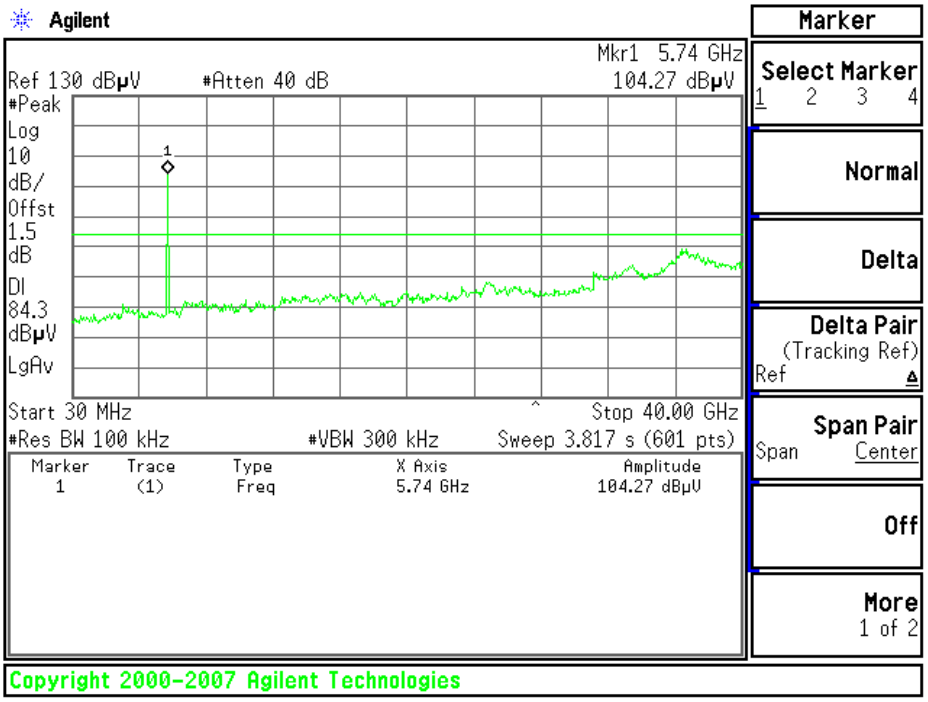


CH High

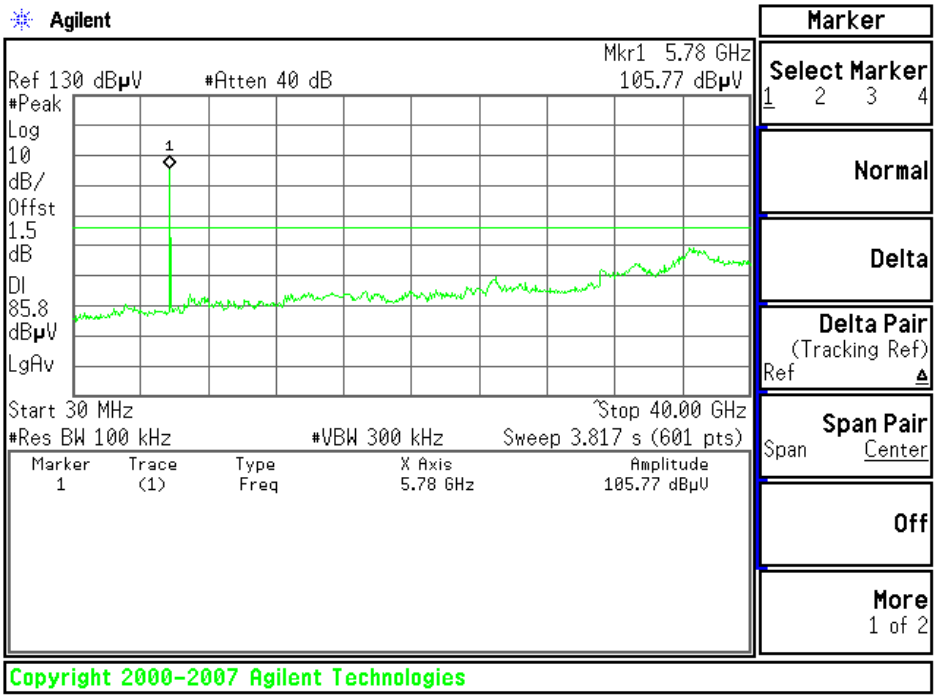


draft 802.11an Standard-20 MHz Channel mode / Chain 2

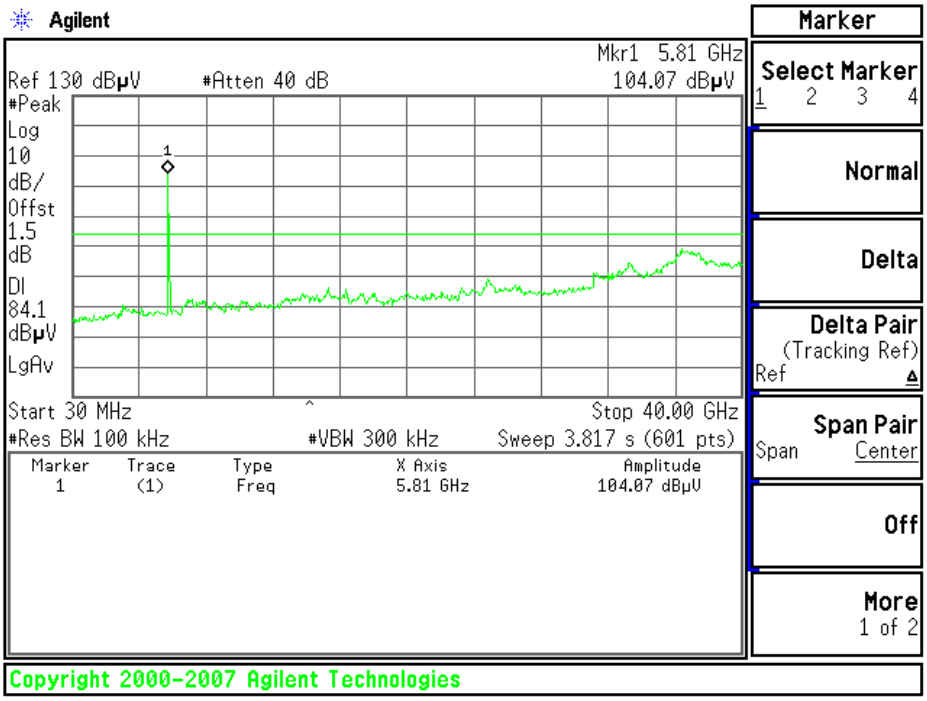
CH Low



CH Mid

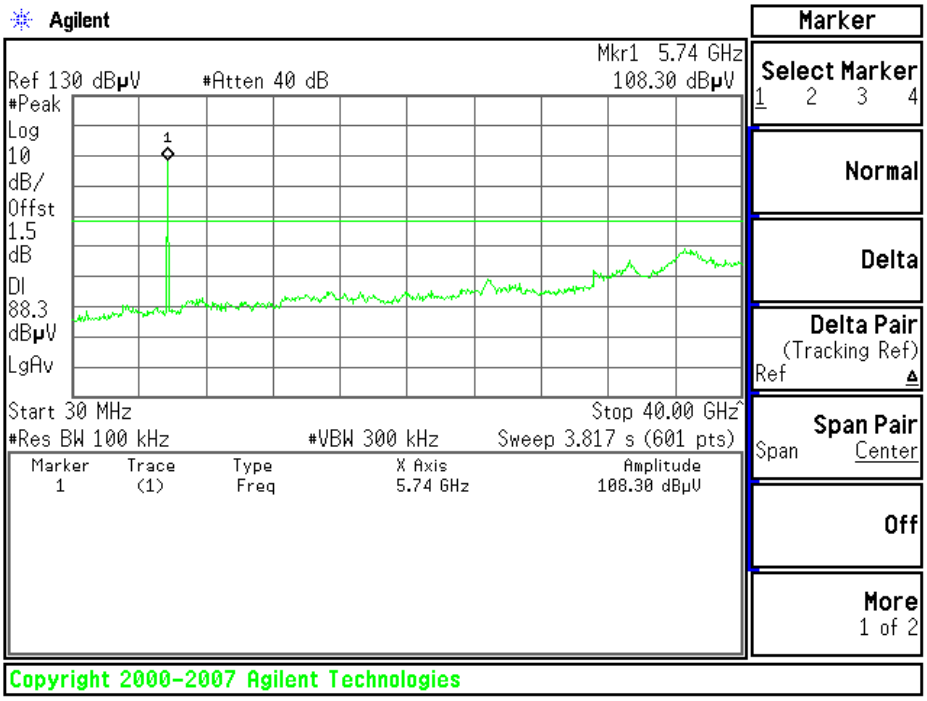


CH High

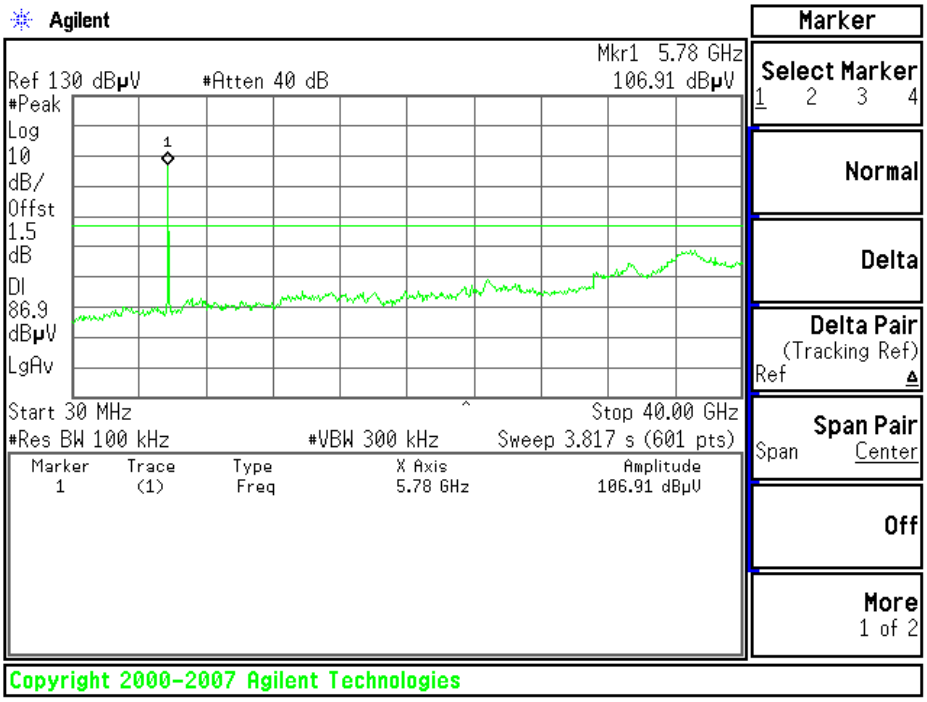


draft 802.11an Standard-20 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

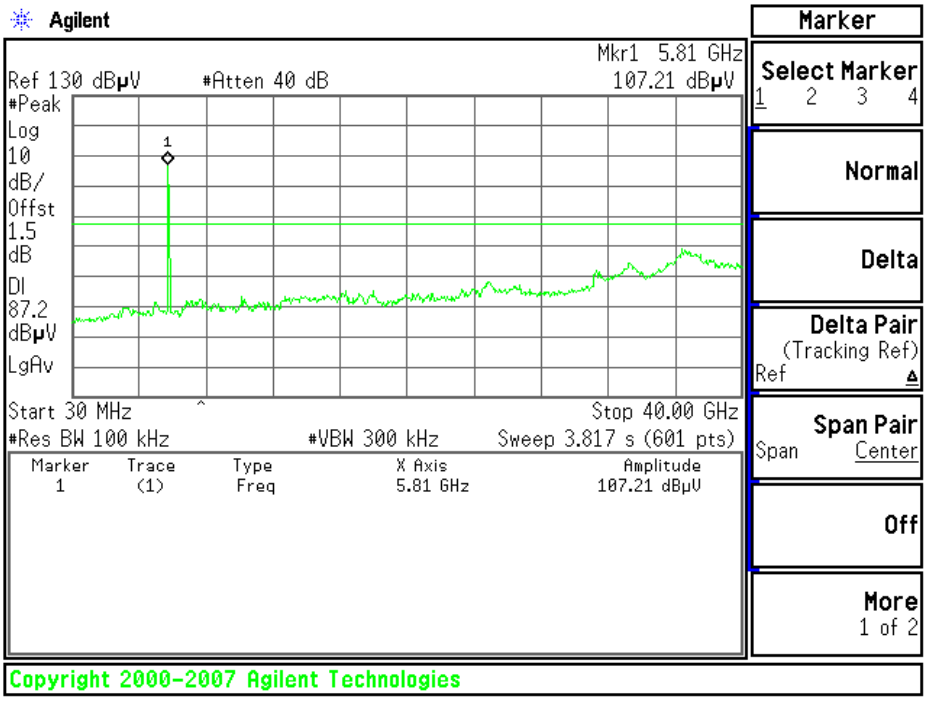
CH Low



CH Mid

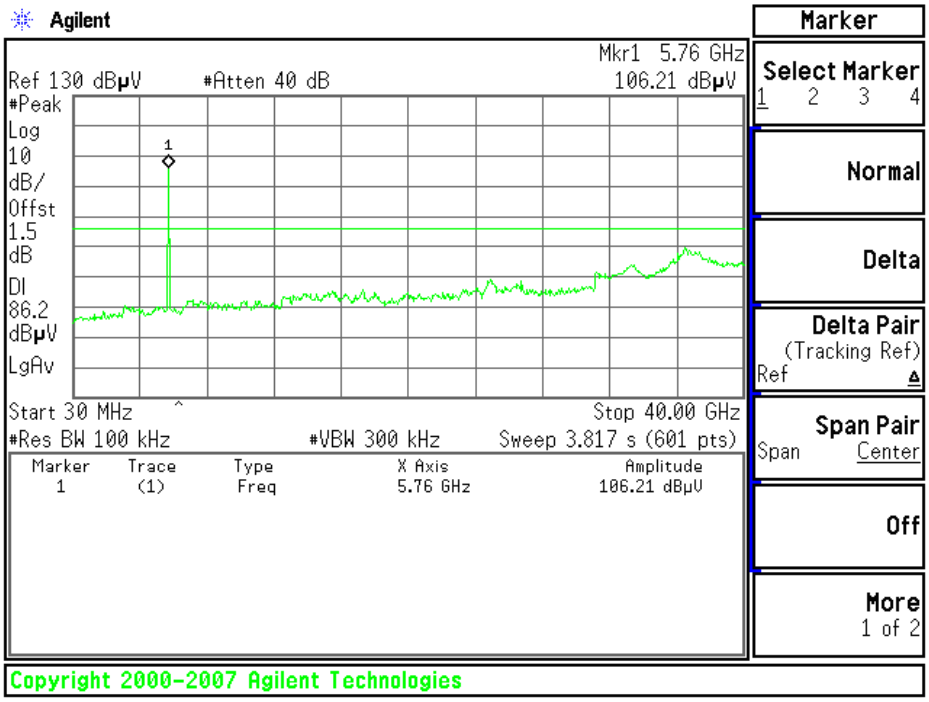


CH High

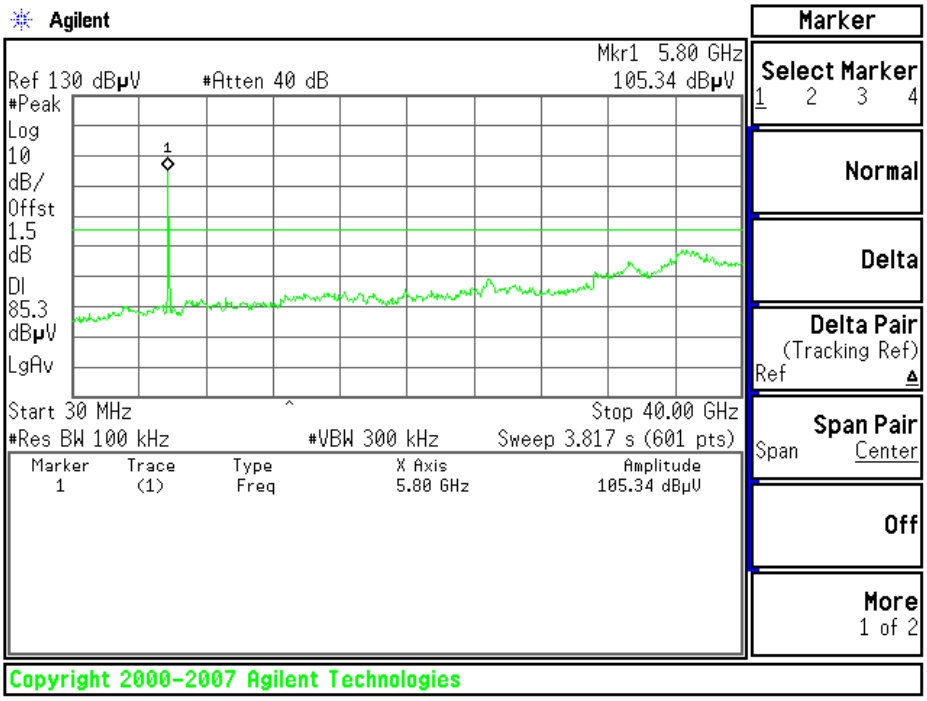


draft 802.11an Standard-40 MHz Channel mode / Chain 0

CH Low

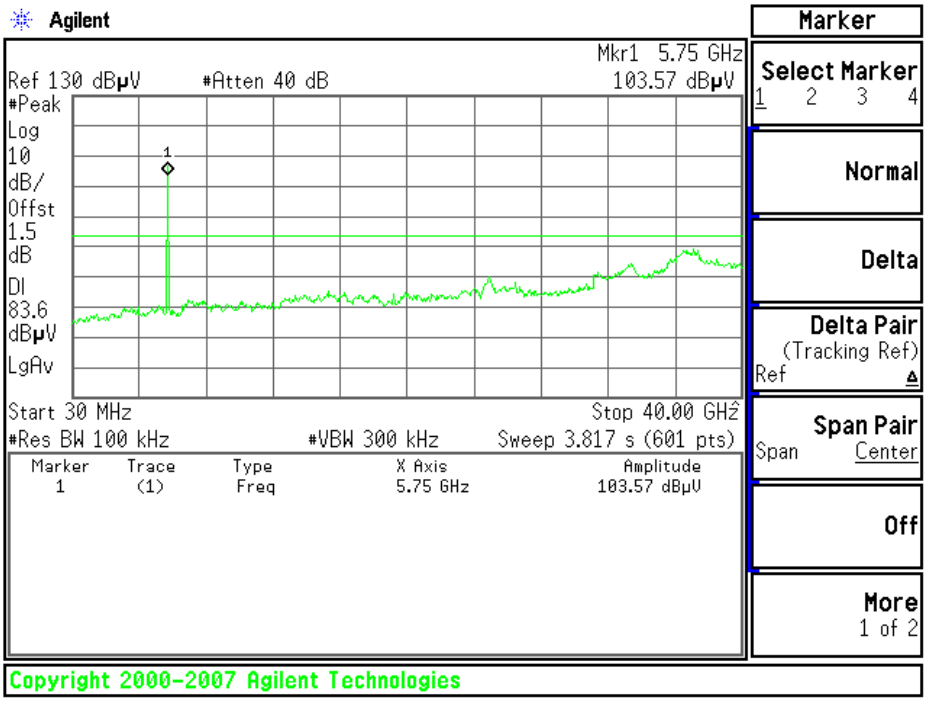


CH High

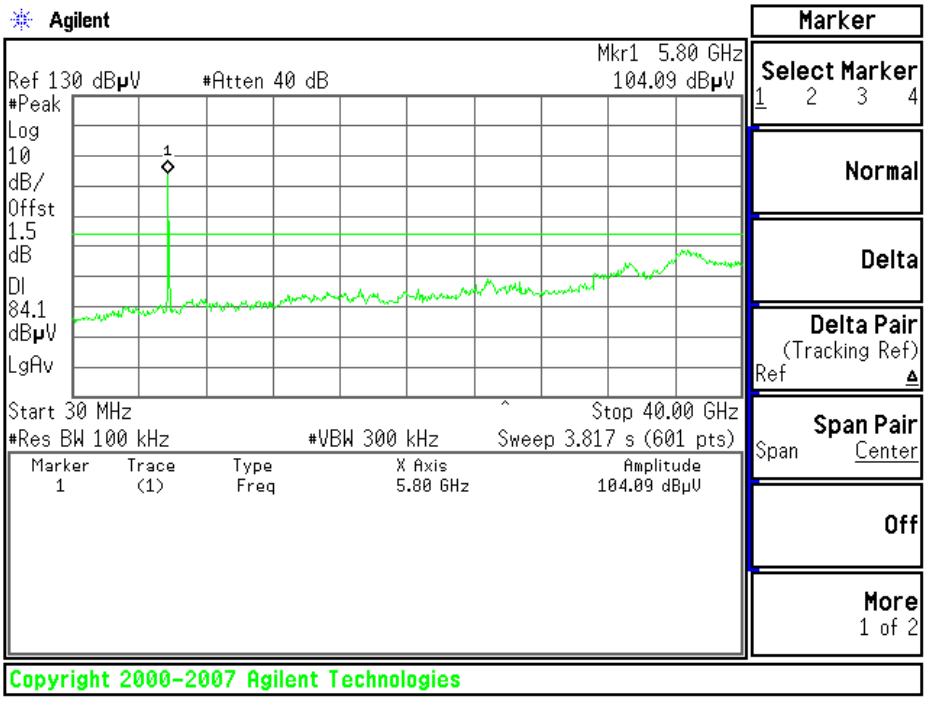


draft 802.11an Standard-40 MHz Channel mode / Chain 1

CH Low

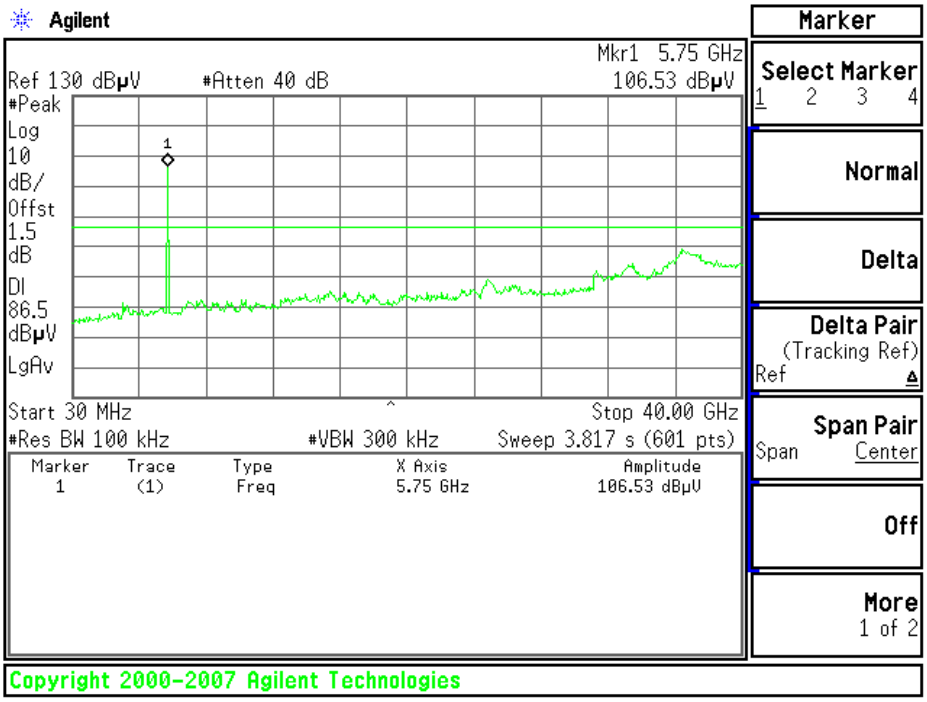


CH High

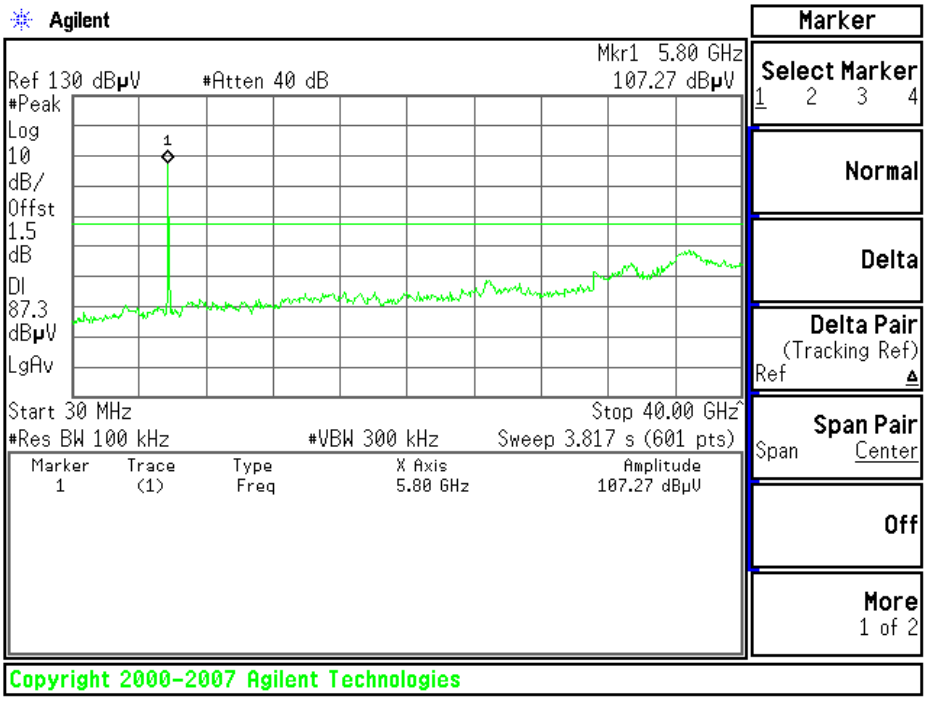


draft 802.11an Standard-40 MHz Channel mode / Chain 2

CH Low

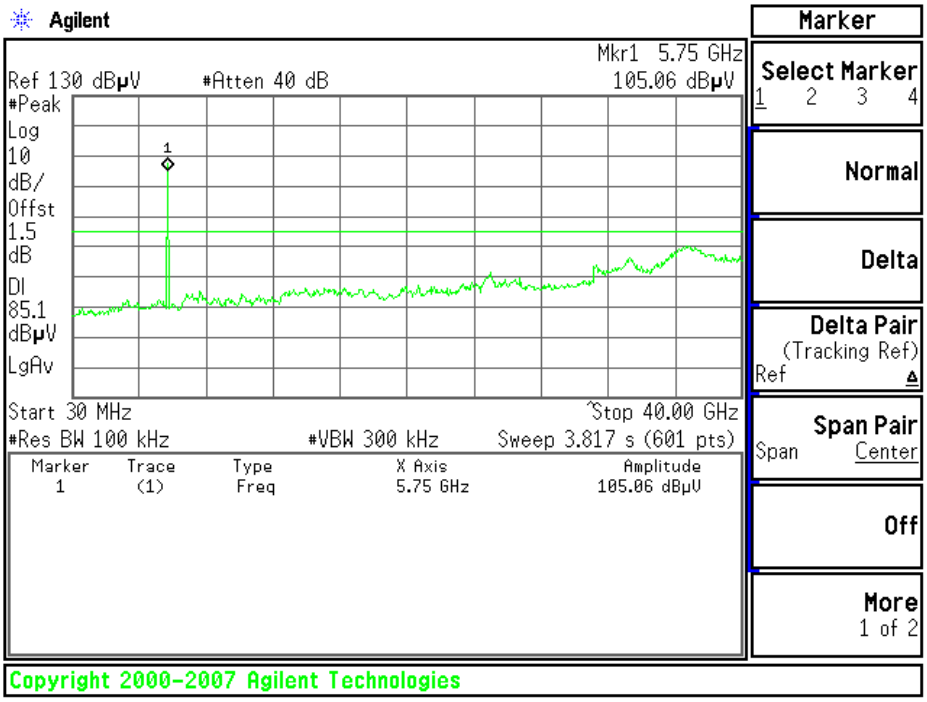


CH High

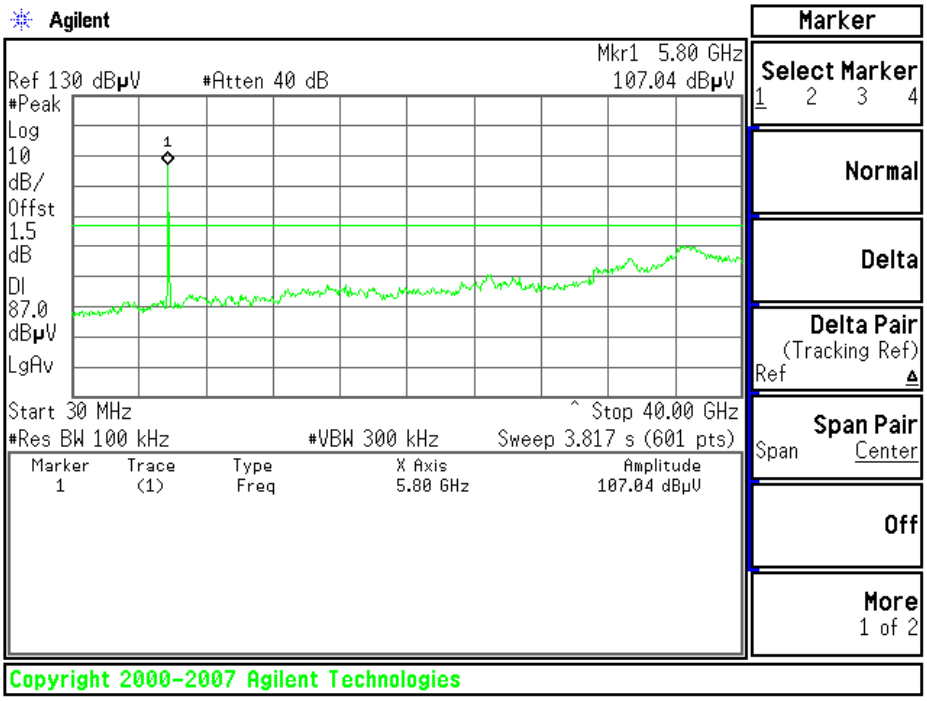


draft 802.11an Standard-40 MHz Channel mode / Chain 0+ Chain 1+ Chain 2

CH Low



CH High


Agilent
Marker
Mkr1 5.80 GHz
Ref 130 dBµV
#Atten 40 dB
107.04 dBµV
#Peak
Log
10
dB/
Offst
1.5
dB
Dl
87.0
dBµV
LgAv
Start 30 MHz
Stop 40.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 3.817 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 5.80 GHz 107.04 dBµV
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

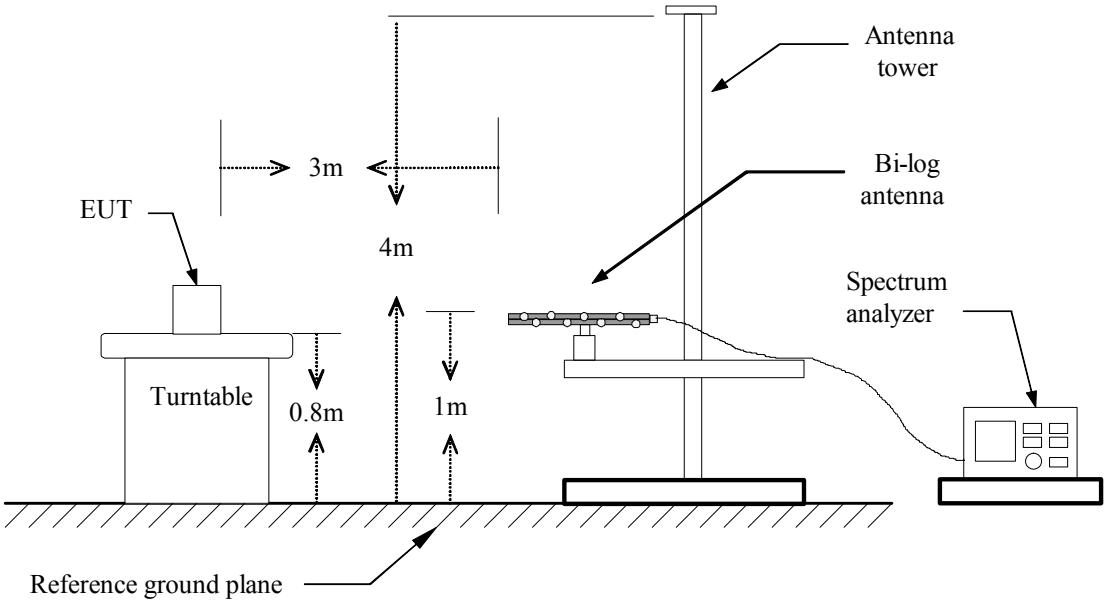
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

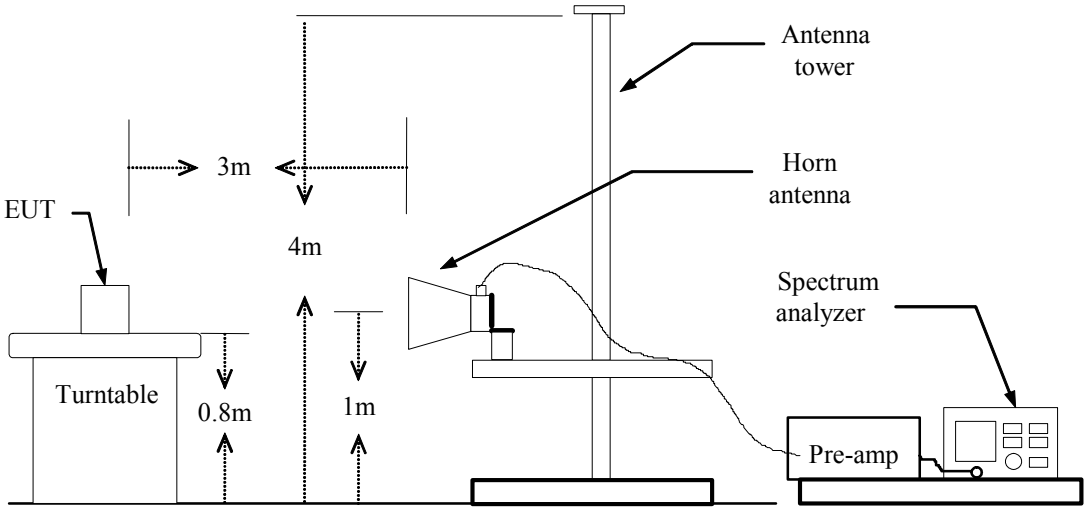
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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:

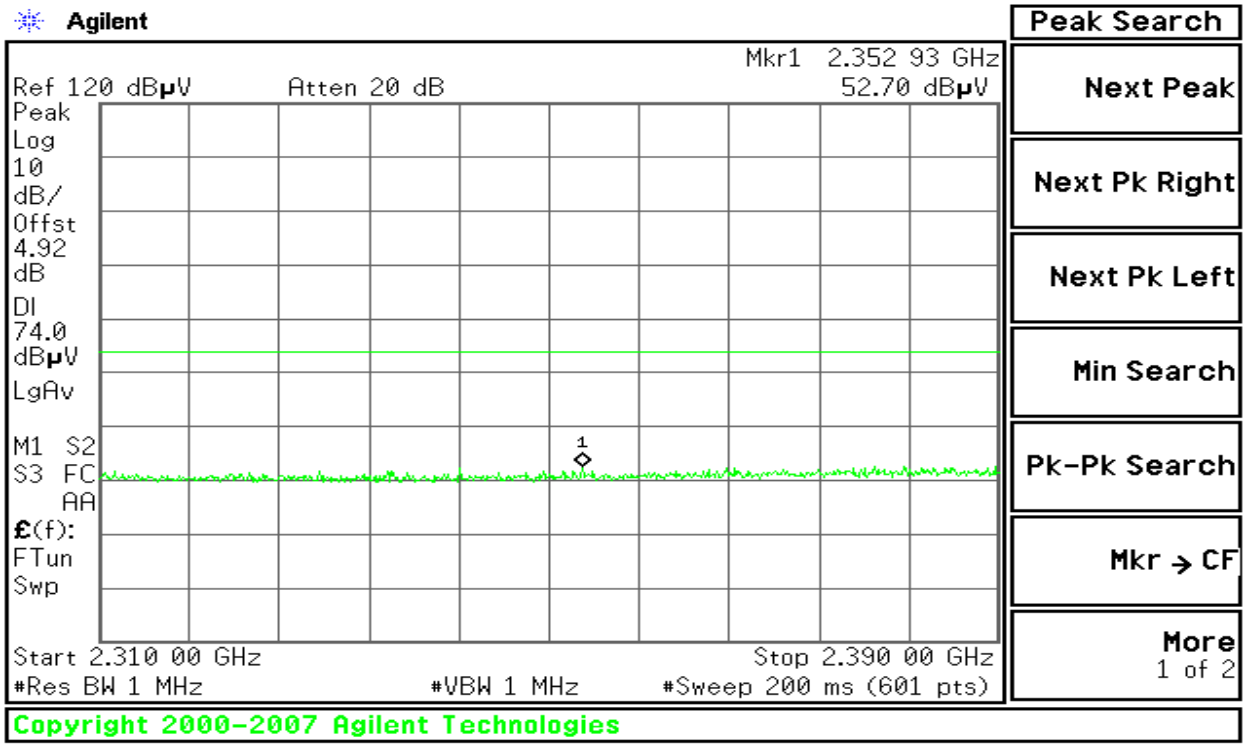
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

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

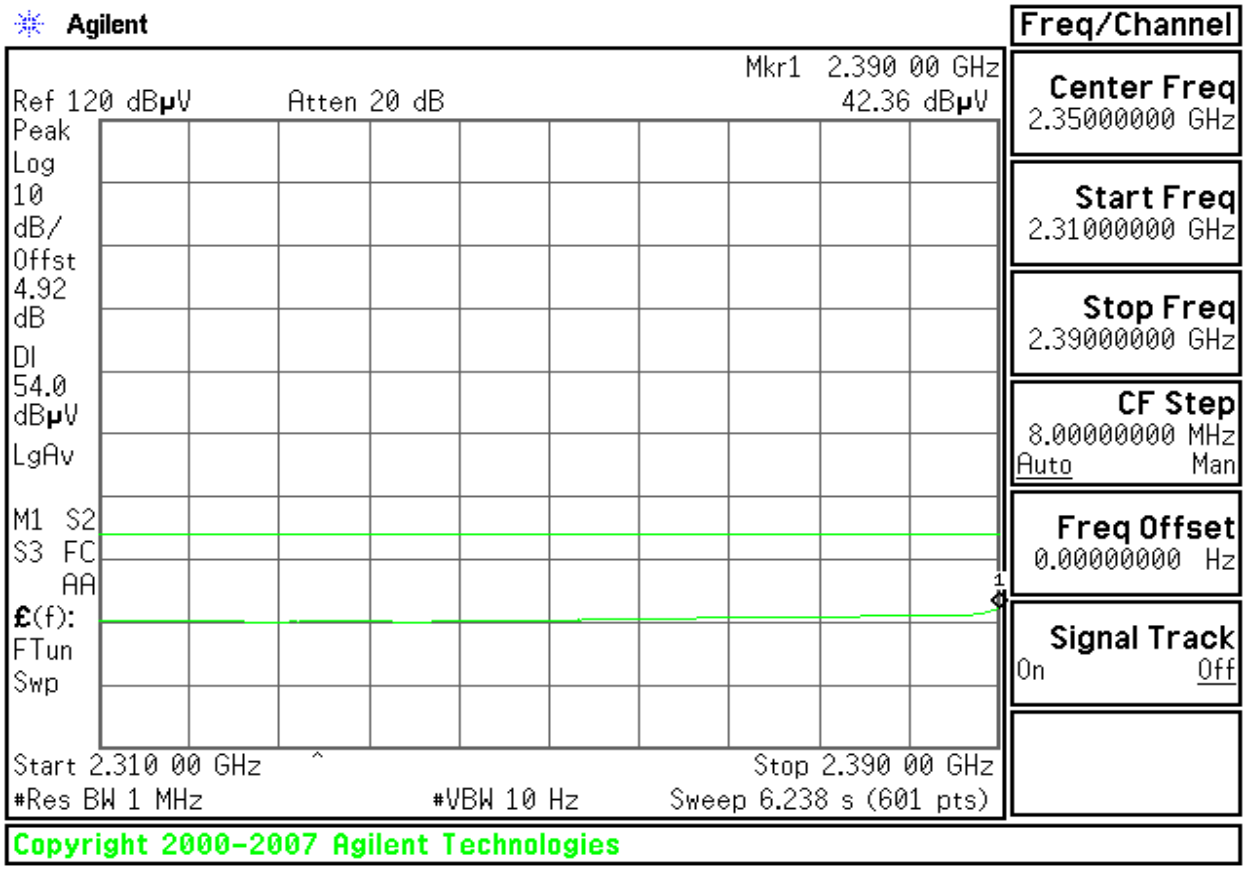
TEST RESULTS

RESTRICTED BANDEDGE (b Mode, Low Channel, Horizontal)

PEAK

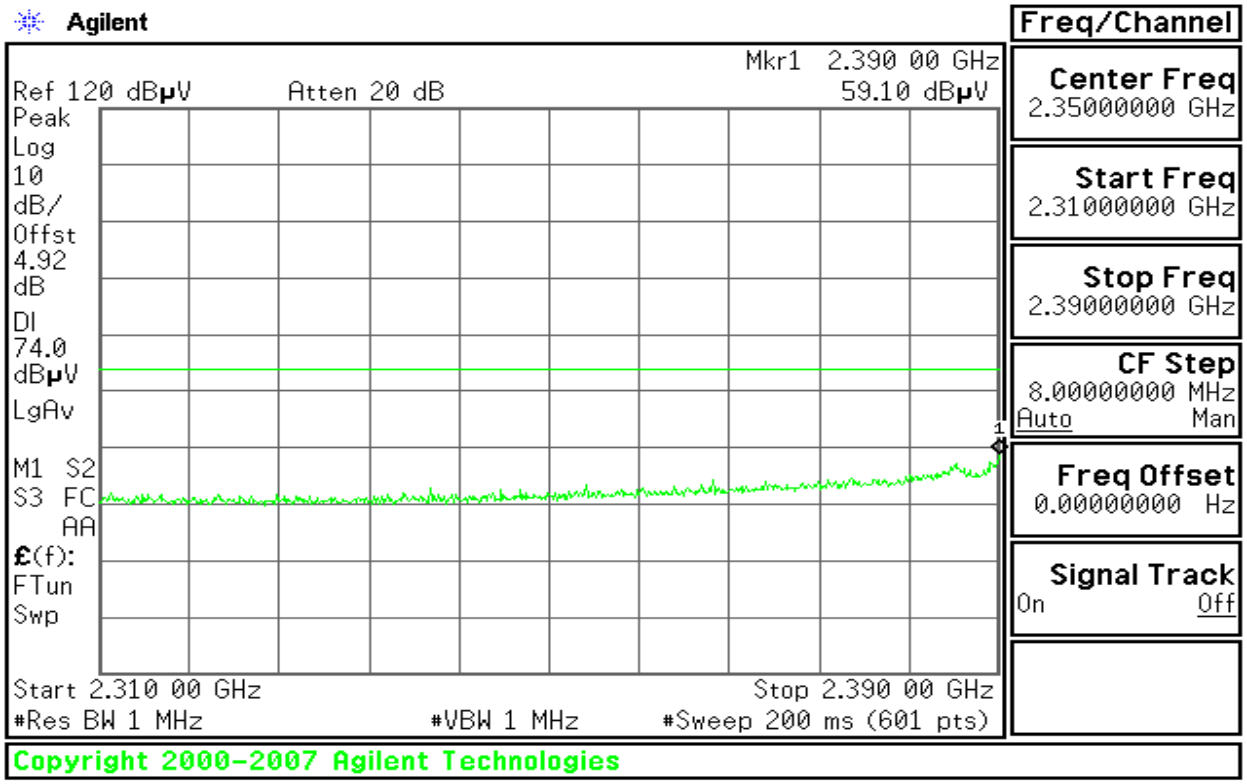


AVG

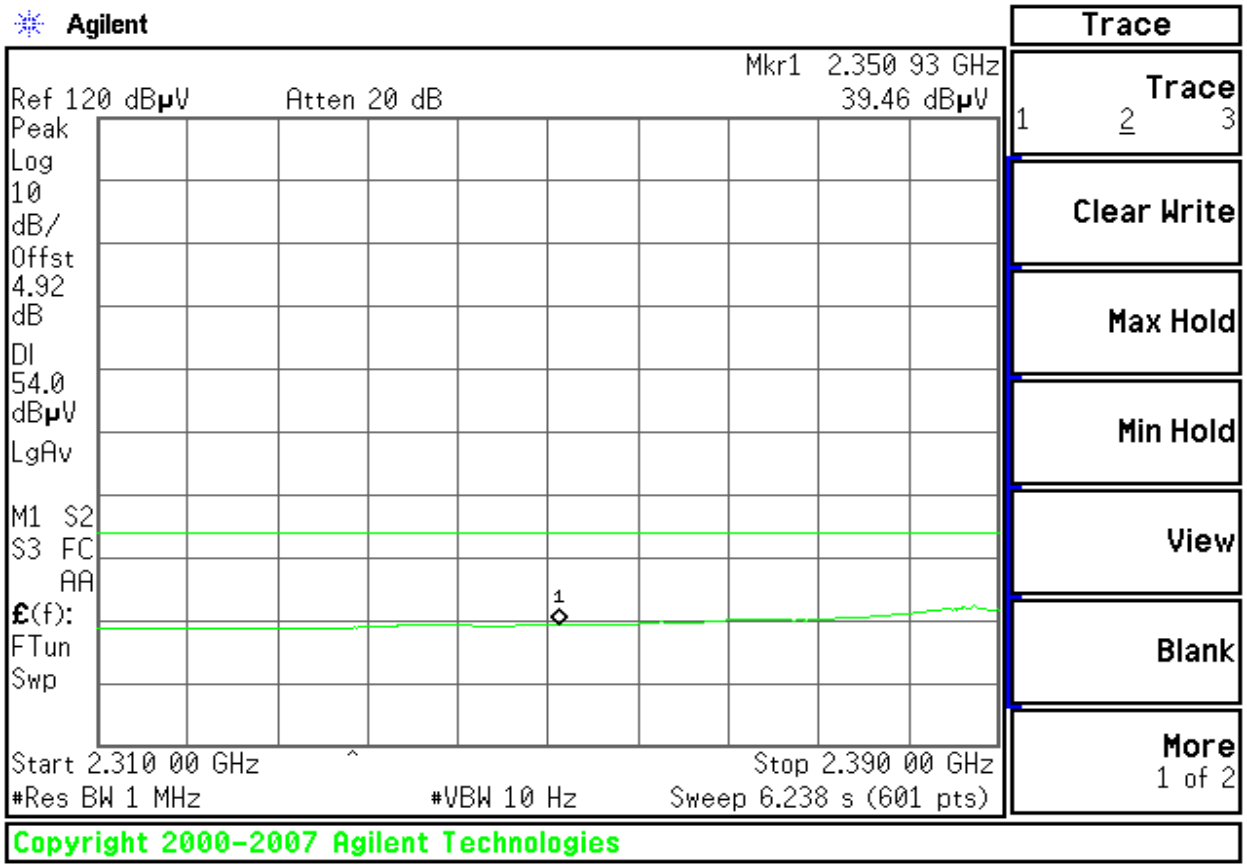


RESTRICTED BANDEDGE (b Mode, Low Channel, Vertical)

PEAK

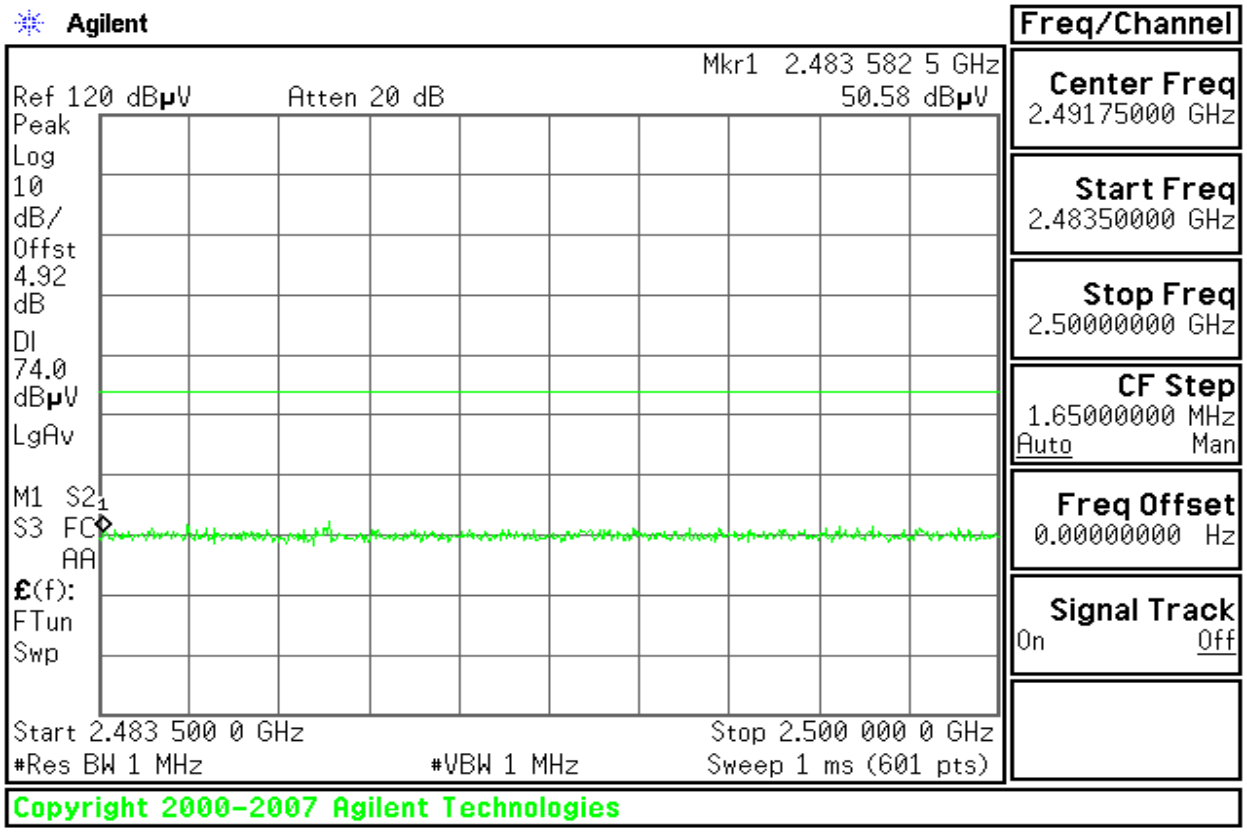


AVG

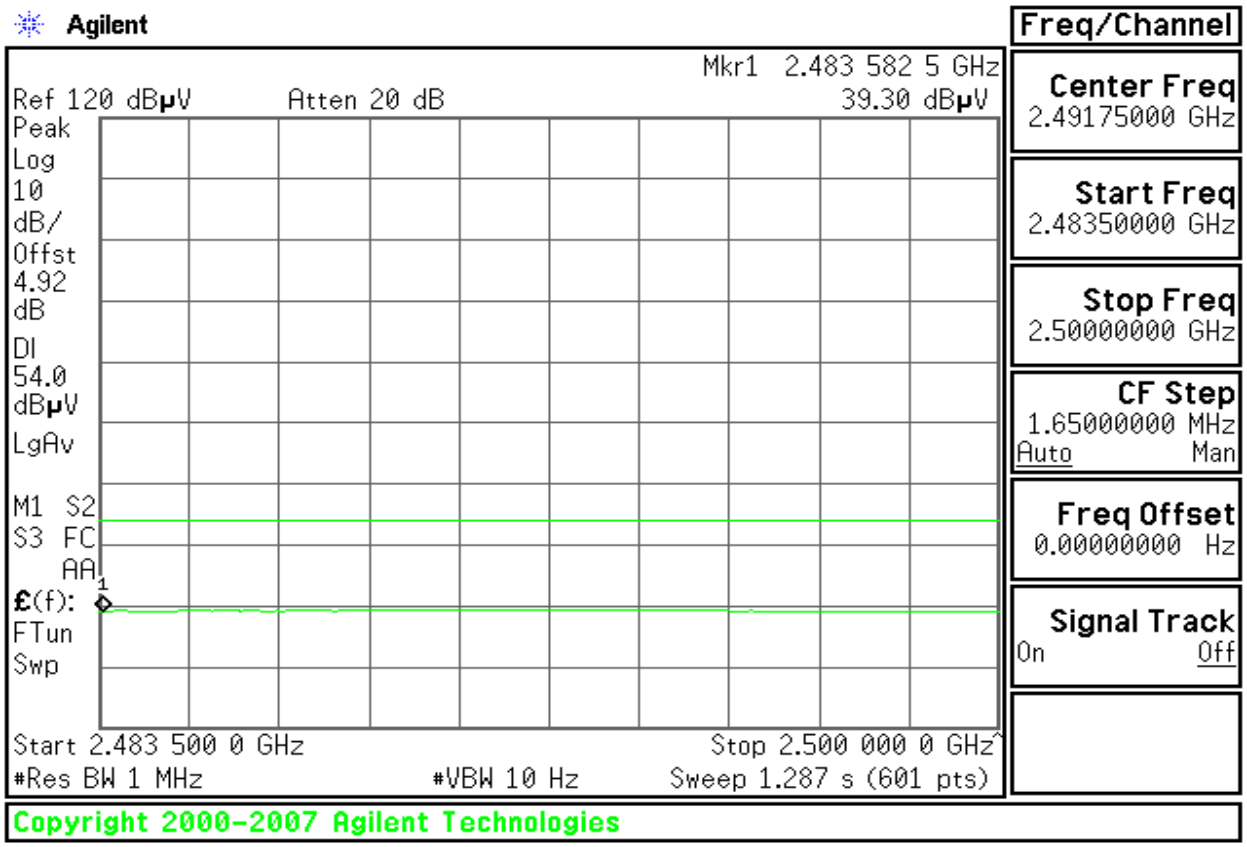


RESTRICTED BANDEDGE (b Mode, High Channel, Horizontal)

PEAK

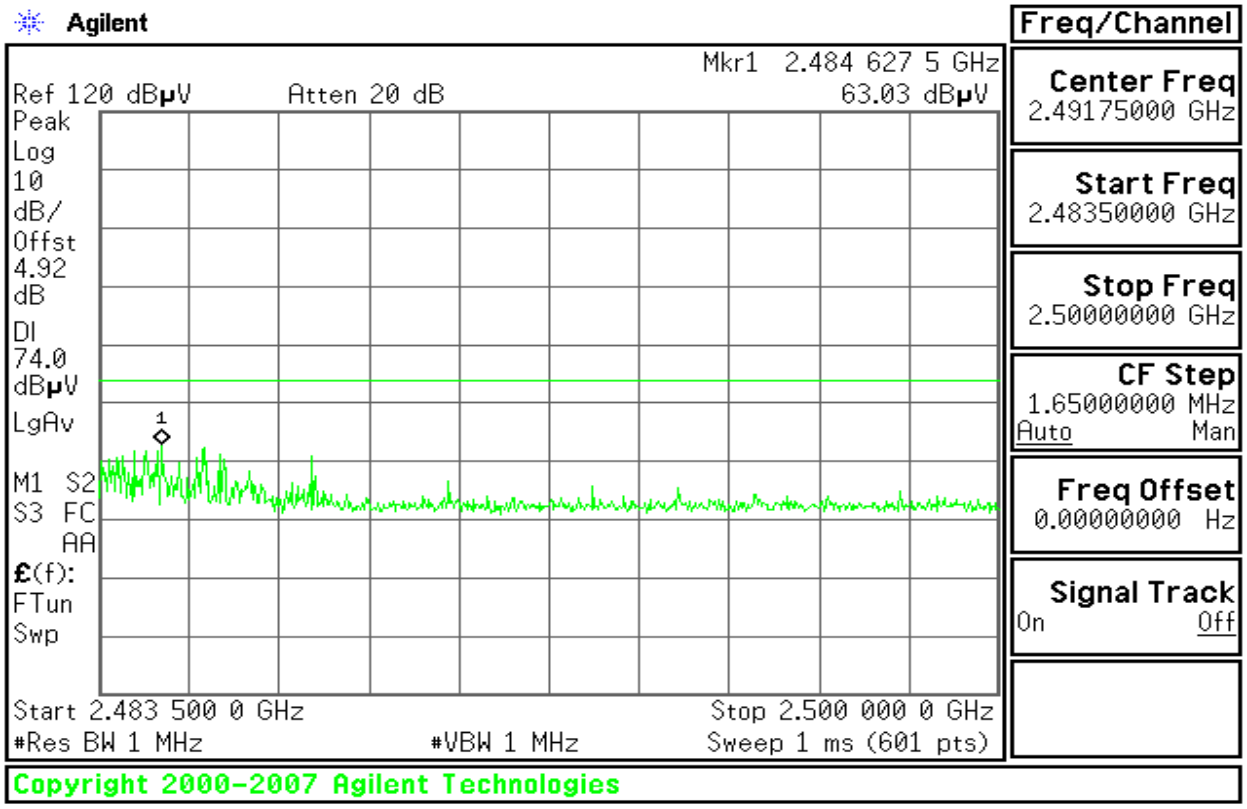


AVG

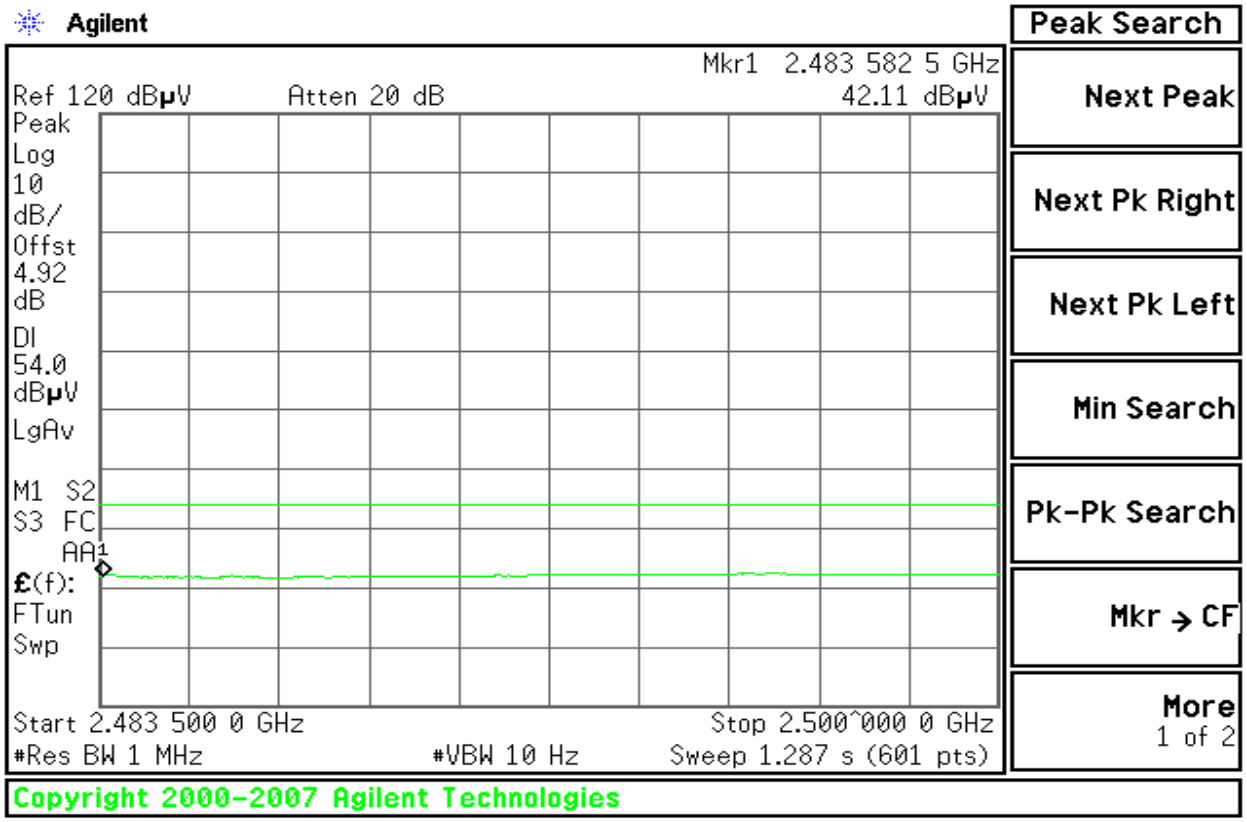


RESTRICTED BANDEDGE (b Mode, High Channel, Vertical)

PEAK

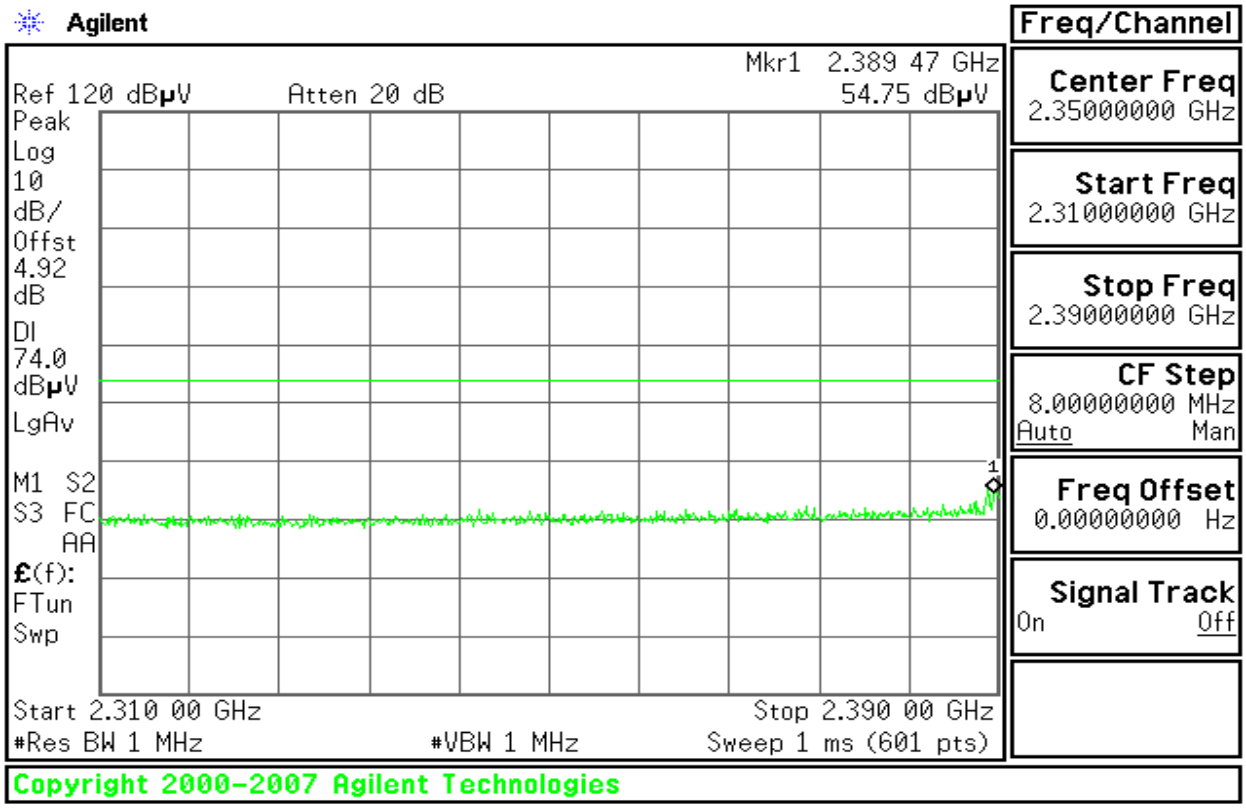


AVG

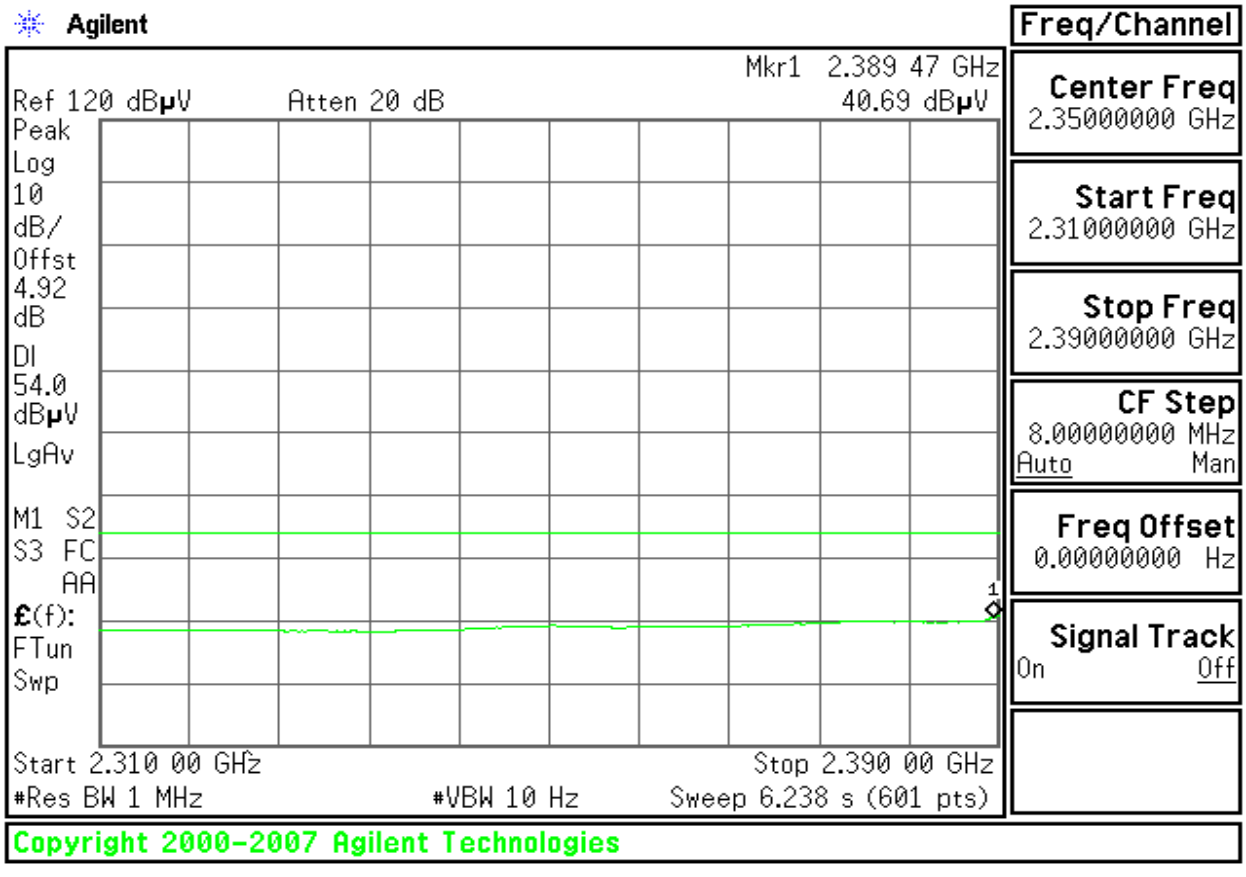


RESTRICTED BANDEDGE (g Mode, Low Channel, Horizontal)

PEAK

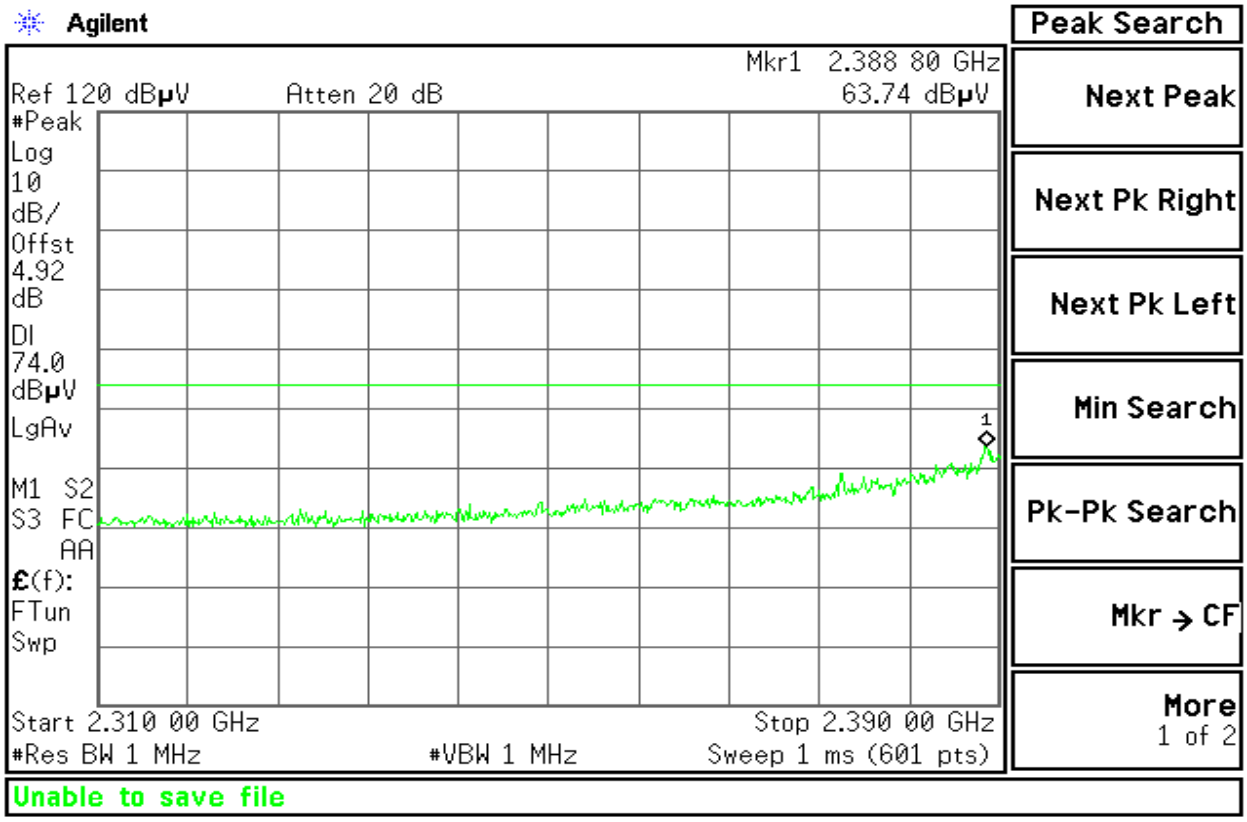


AVG

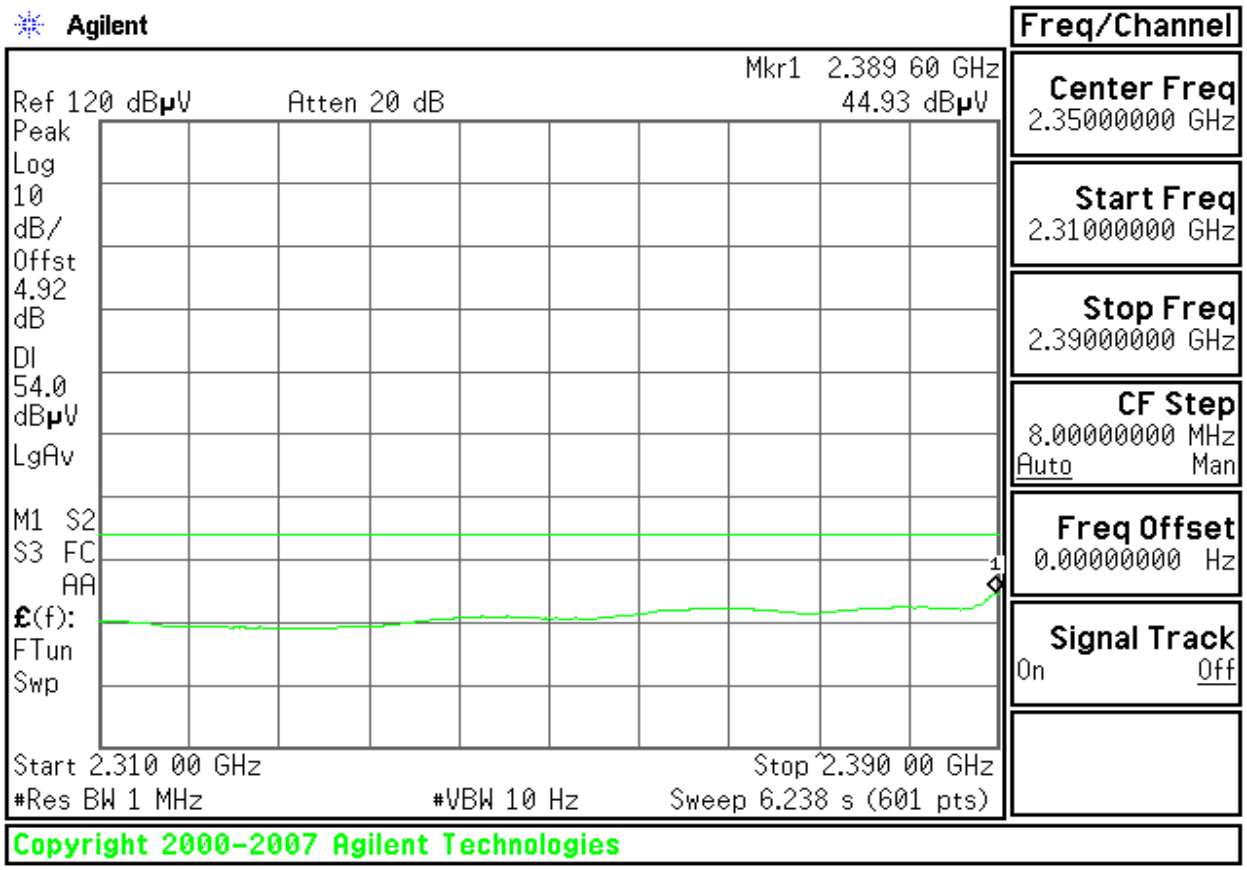


RESTRICTED BANDEDGE (g Mode, Low Channel, Vertical)

PEAK

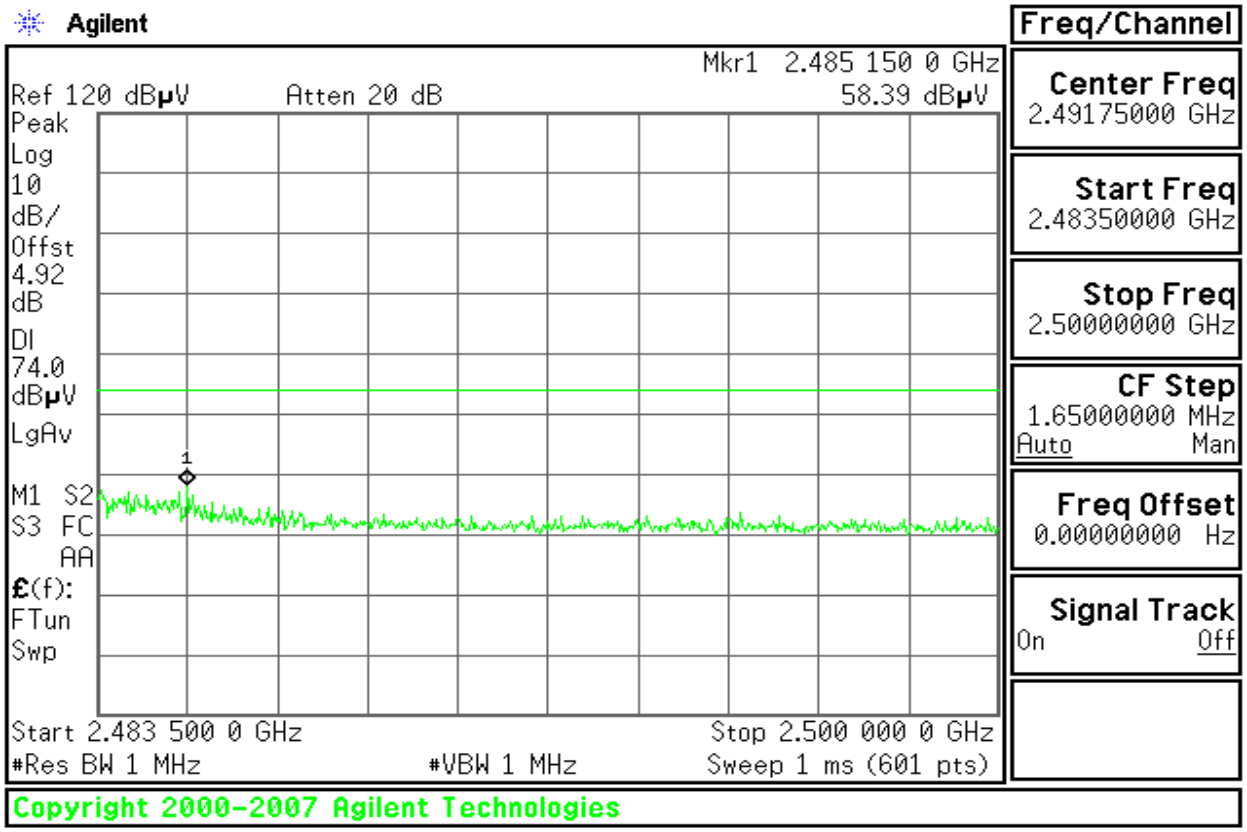


AVG

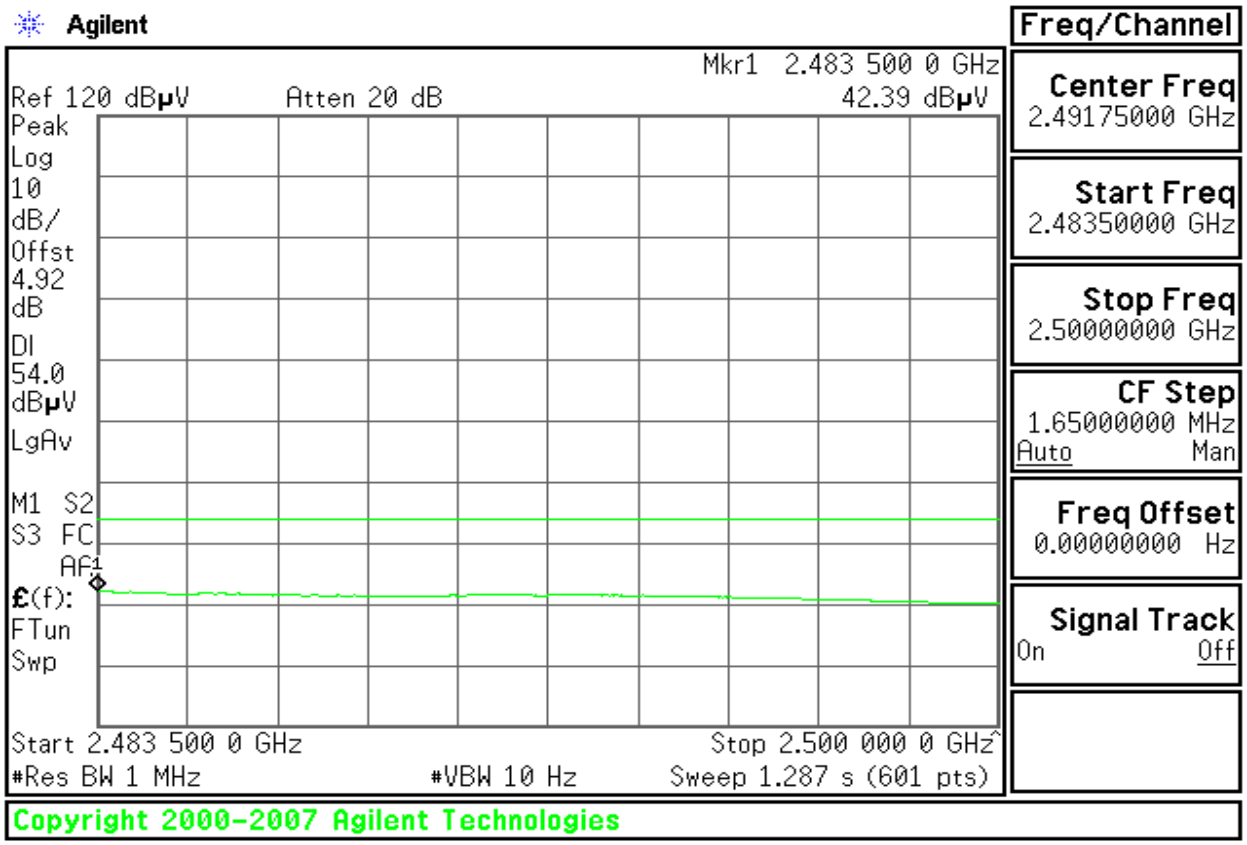


RESTRICTED BANDEDGE (g Mode, High Channel, Horizontal)

PEAK

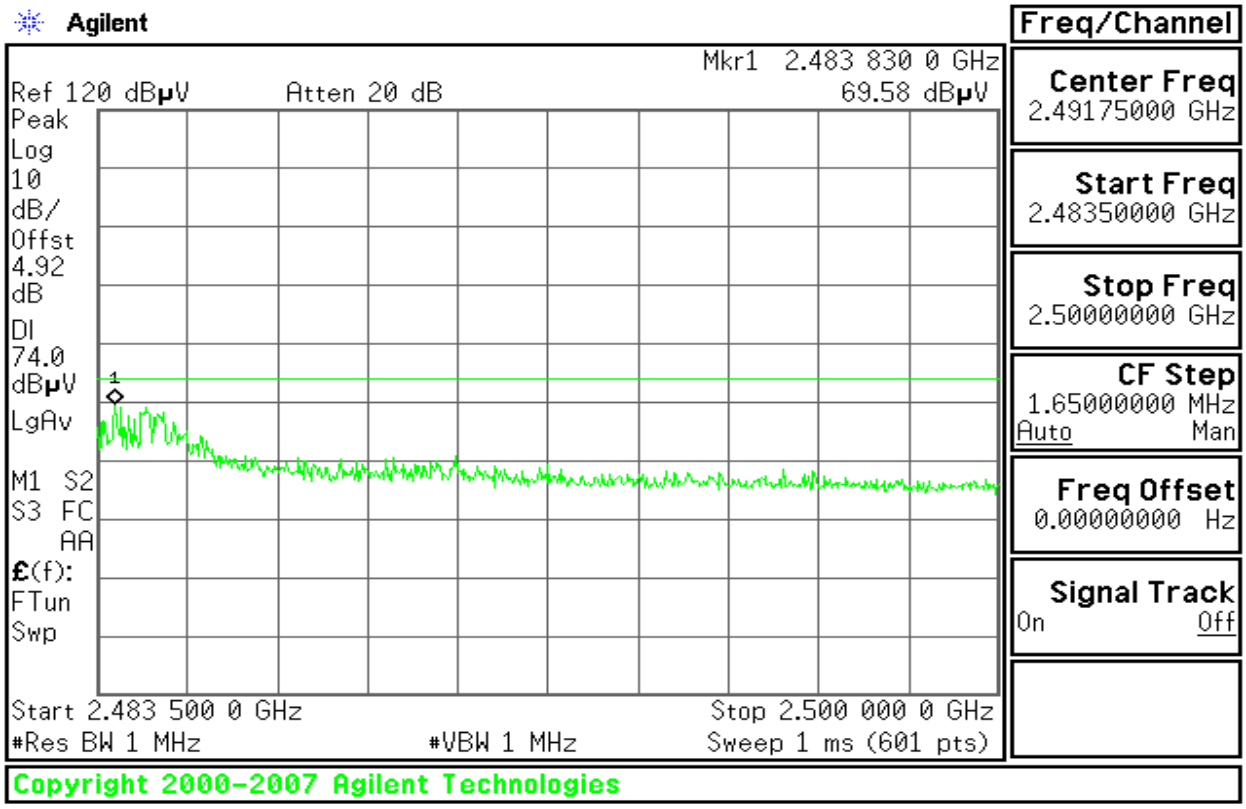


AVG



RESTRICTED BANDEDGE (g Mode, High Channel, Vertical)

PEAK



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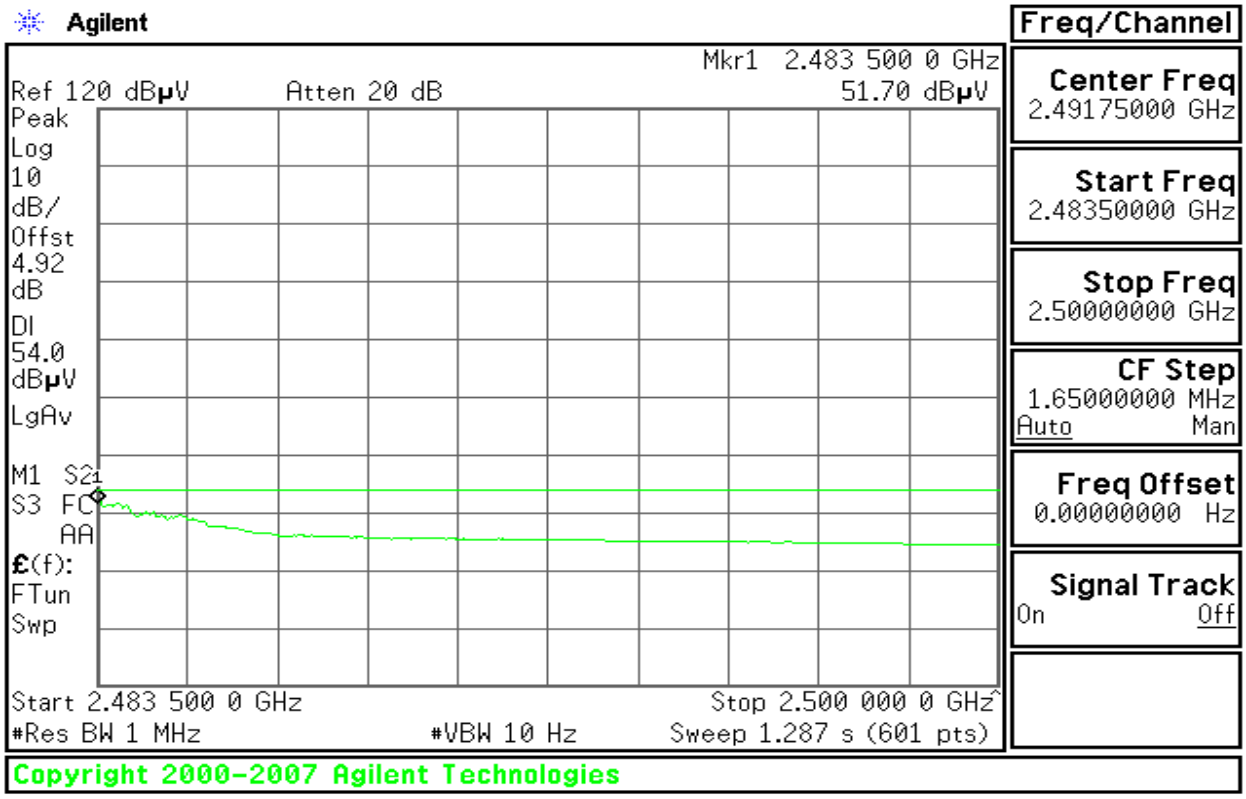
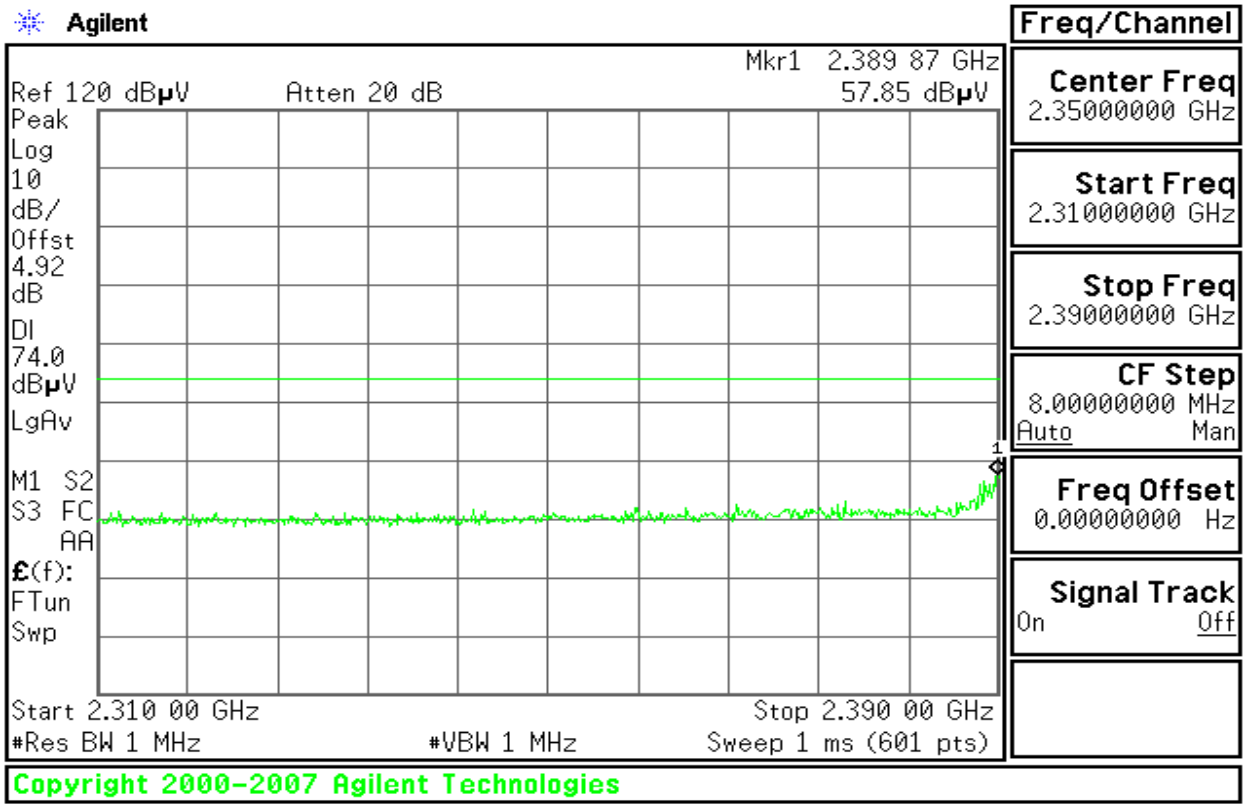


RESTRICTED BANDEDGE (draft 802.11gn Standard-20 MHz Channel mode, Low Channel, Horizontal)

PEAK



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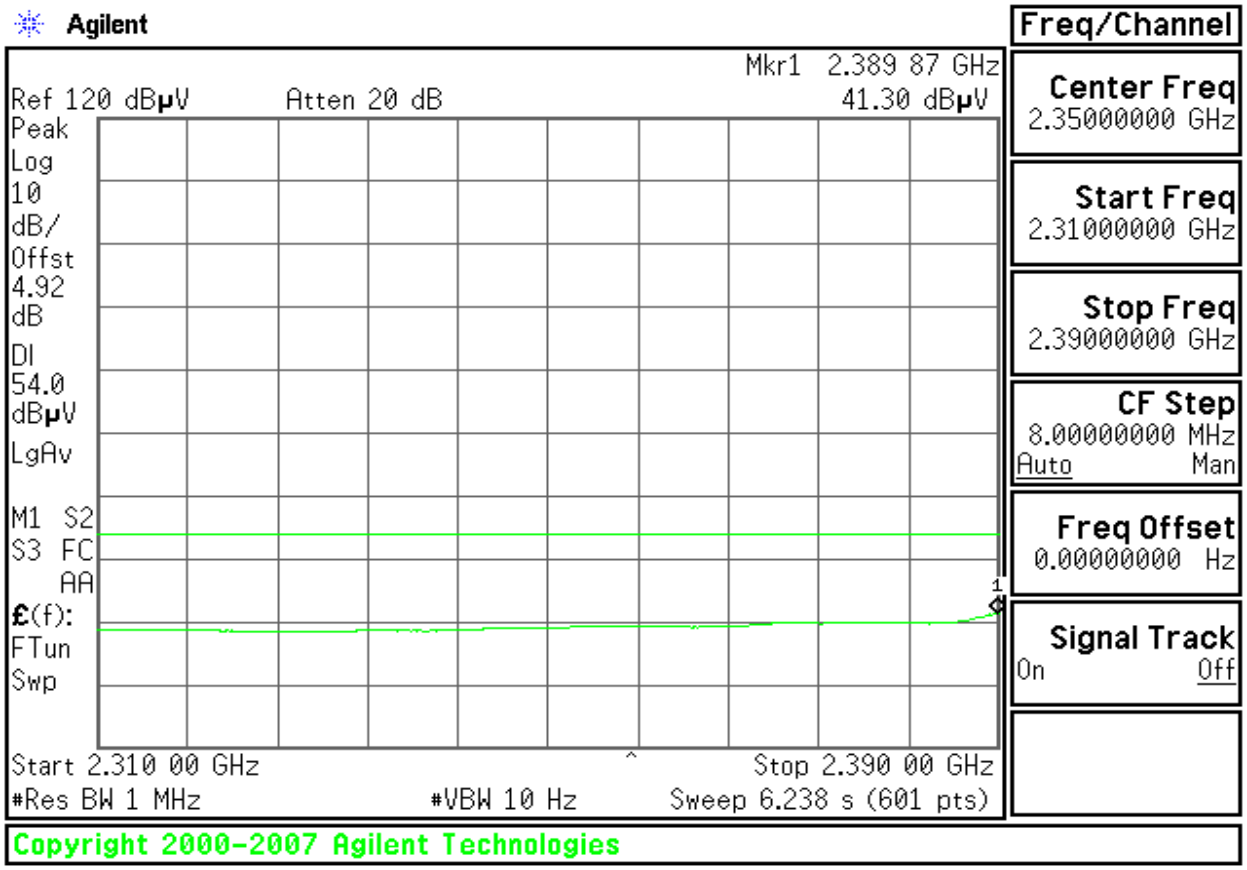
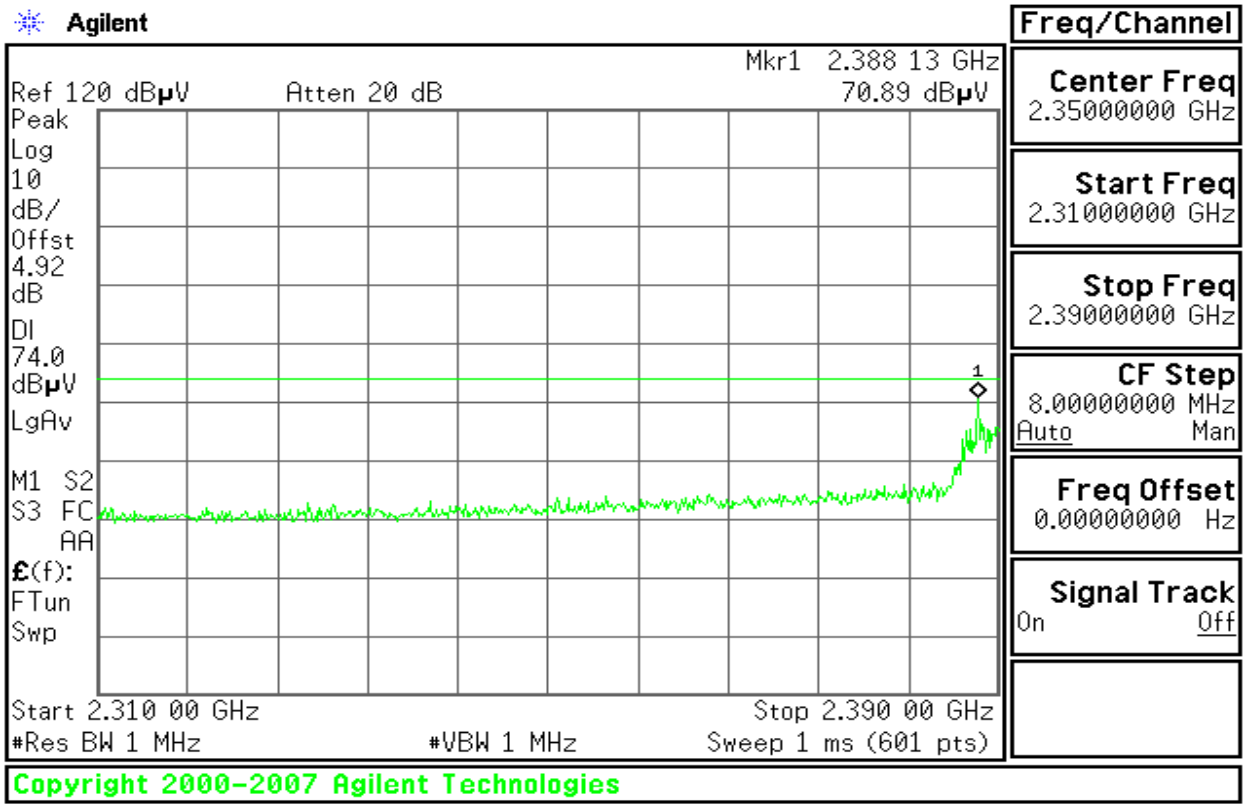


RESTRICTED BANDEDGE (draft 802.11gn Standard-20 MHz Channel mode, Low Channel, Vertical)

PEAK



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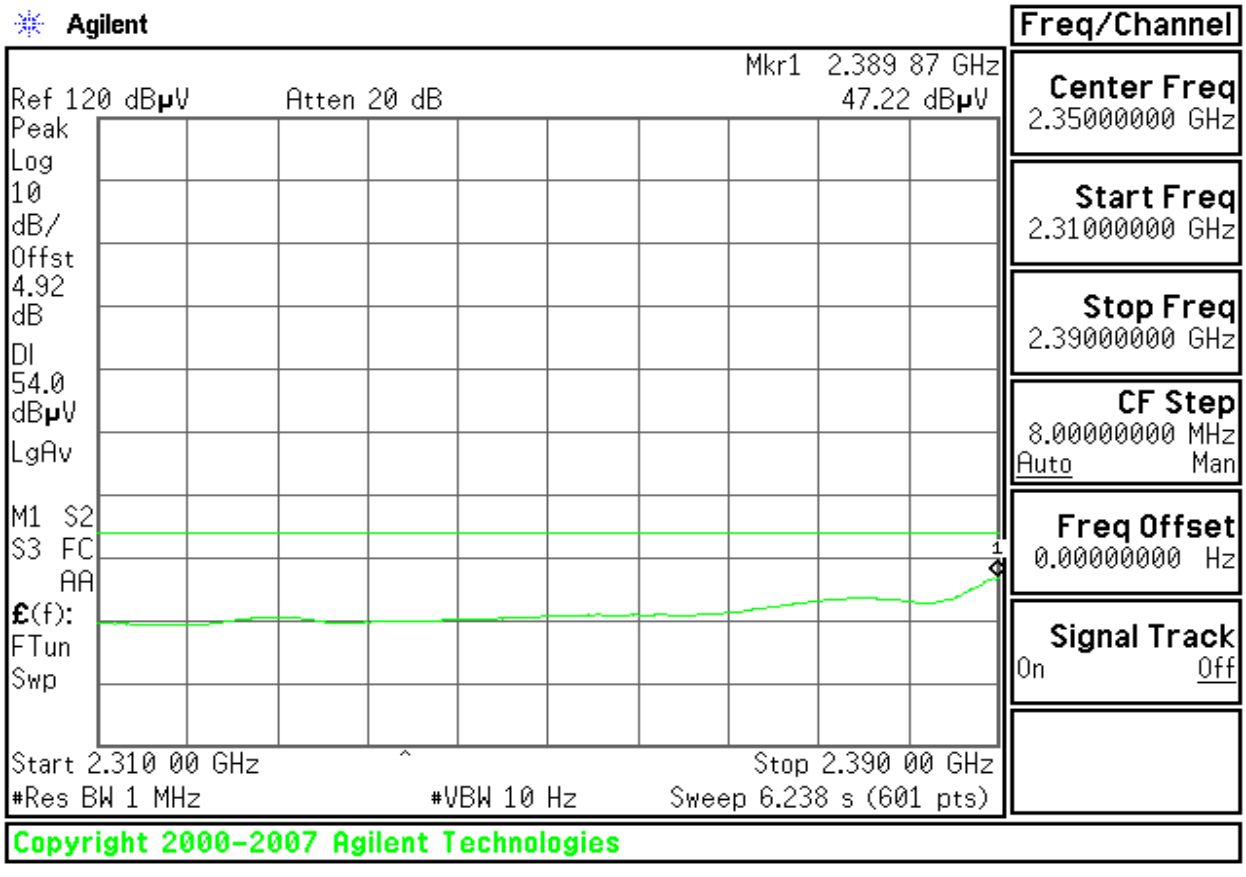
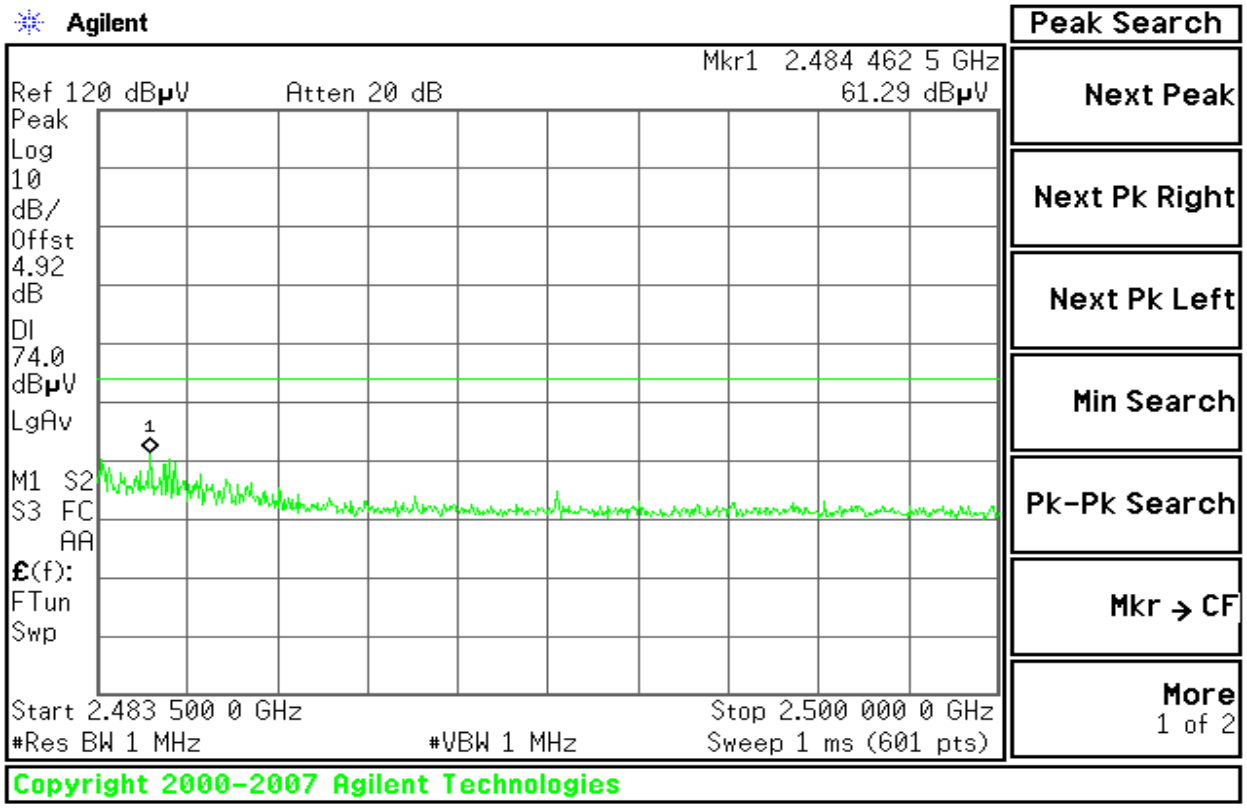


RESTRICTED BANDEDGE (draft 802.11gn Standard-20 MHz Channel mode, High Channel, Horizontal)

PEAK



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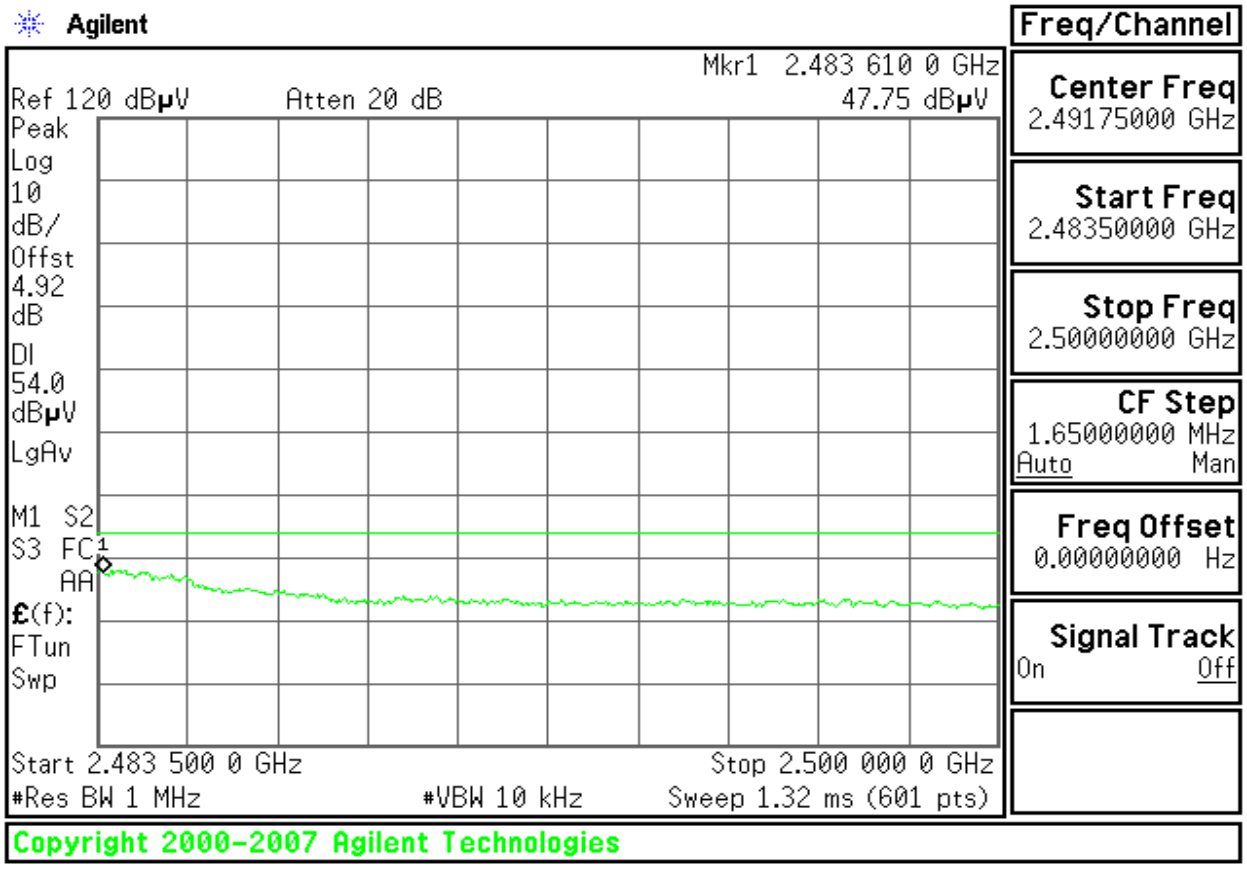
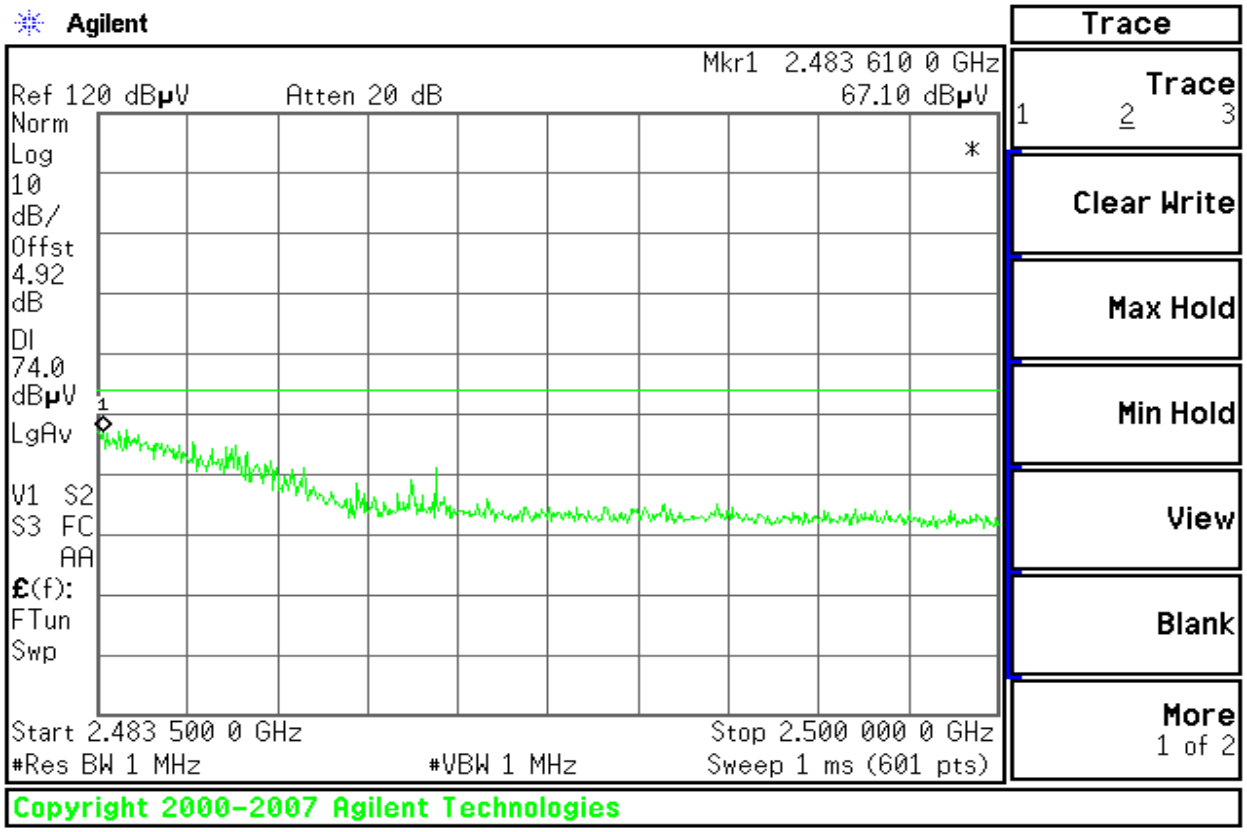
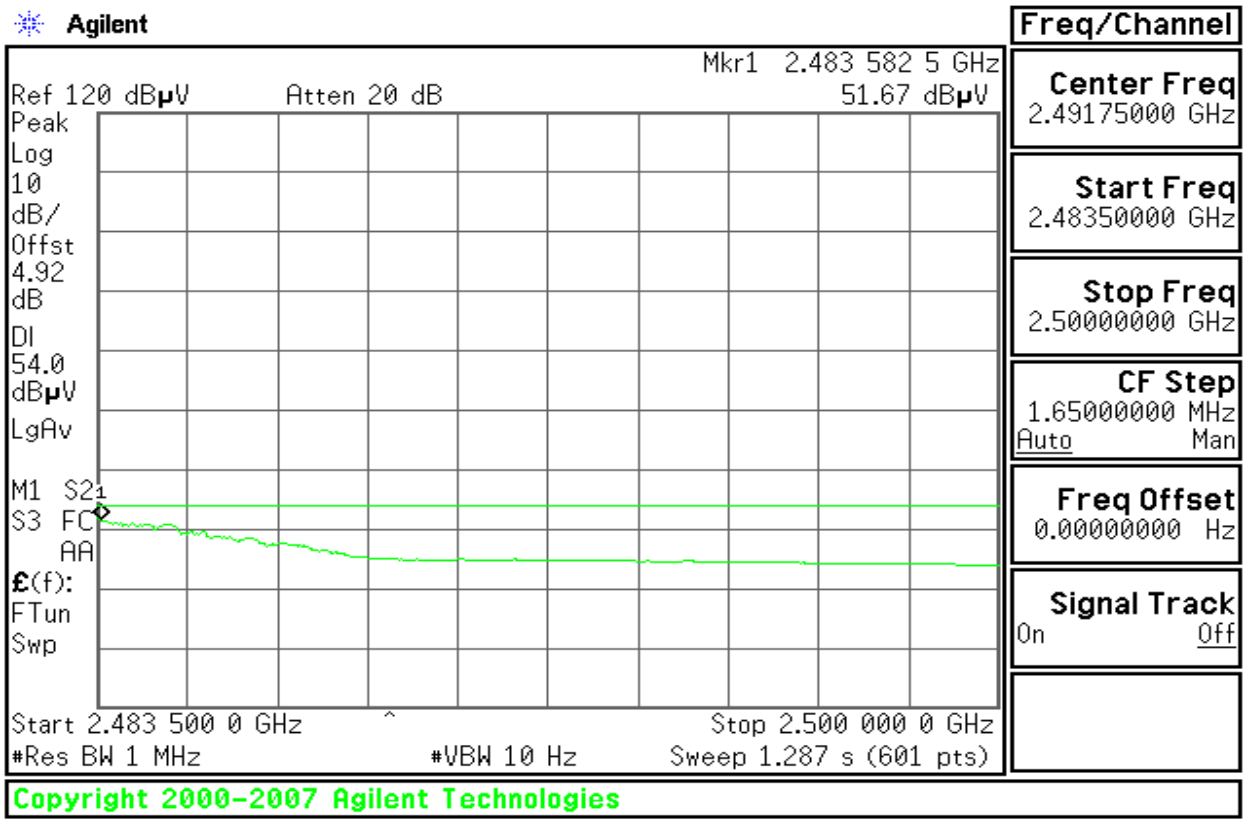


RESTRICTED BANDEDGE (draft 802.11gn Standard-20 MHz Channel mode, High Channel, Vertical)

PEAK

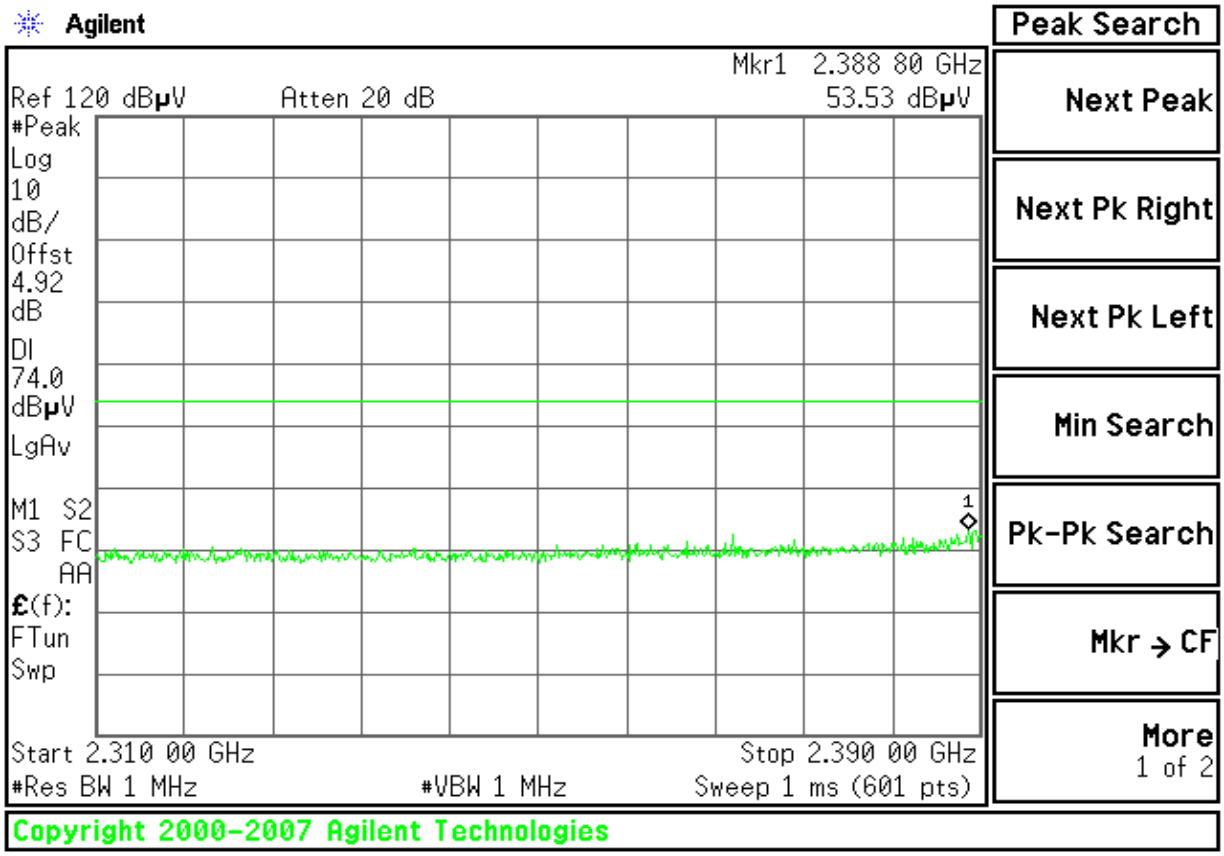


AVG

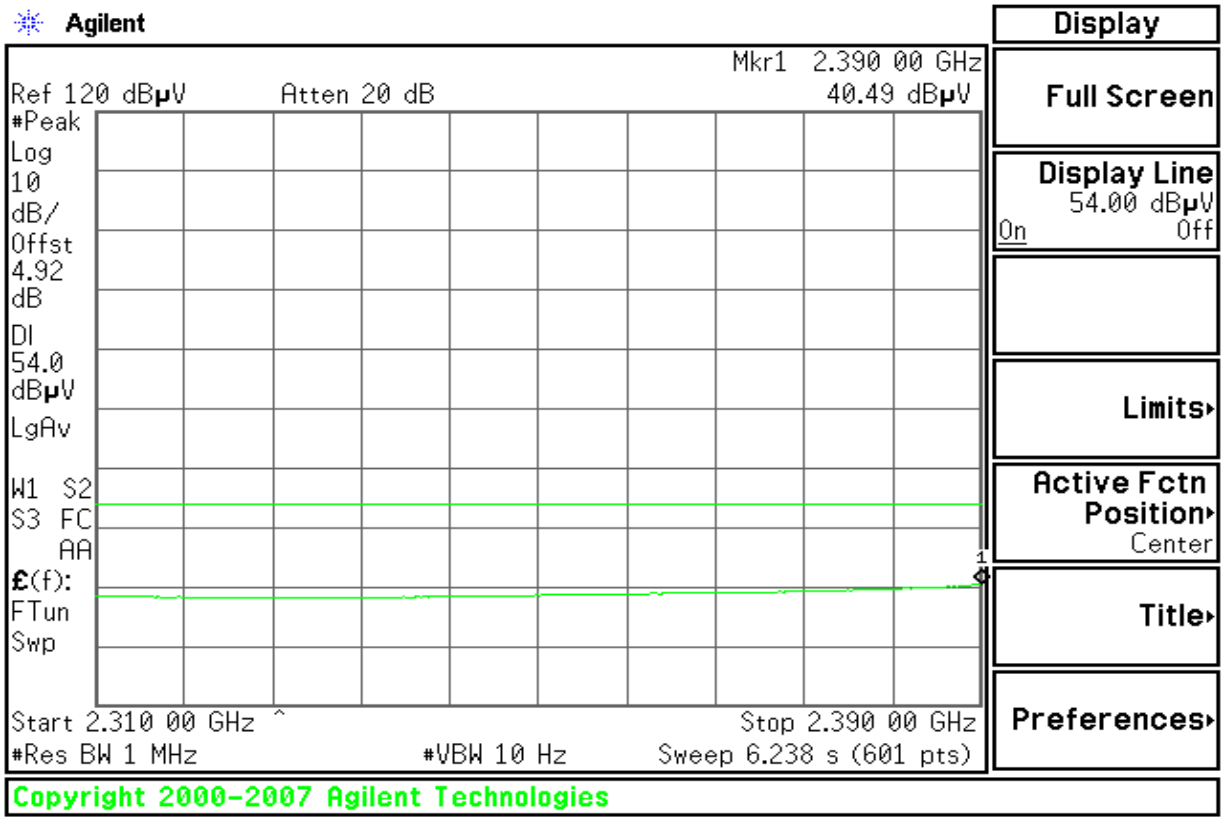


RESTRICTED BANDEDGE (draft 802.11gn Wide -40 MHz Channel mode, Low Channel, Horizontal)

PEAK

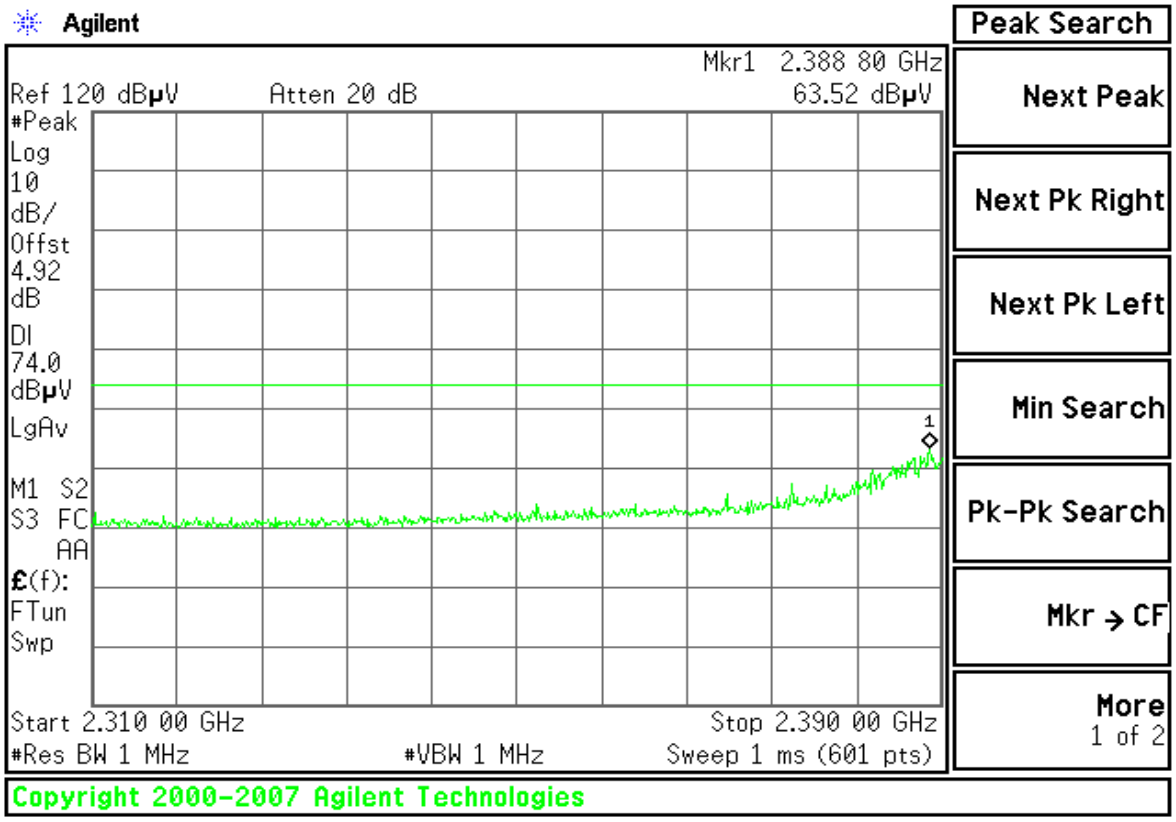


AVG

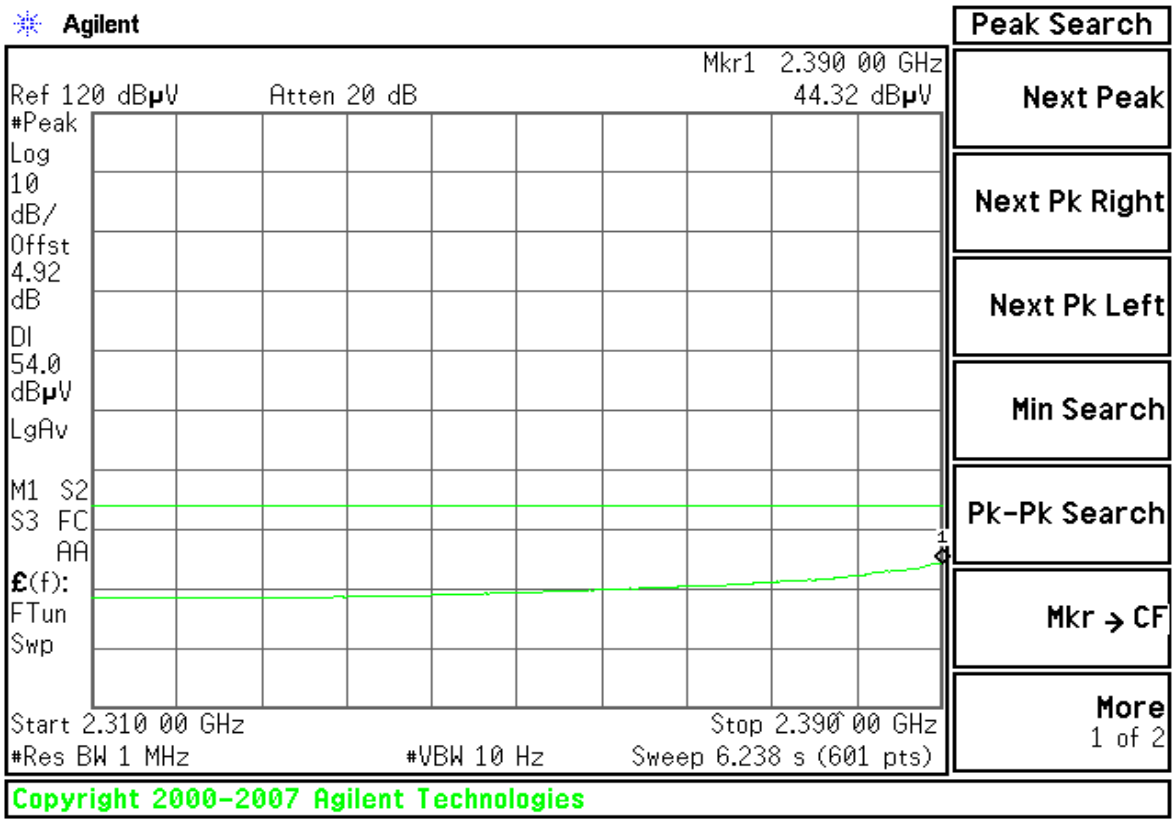


RESTRICTED BANDEDGE (draft 802.11gn Wide -40 MHz Channel mode, Low Channel, Vertical)

PEAK

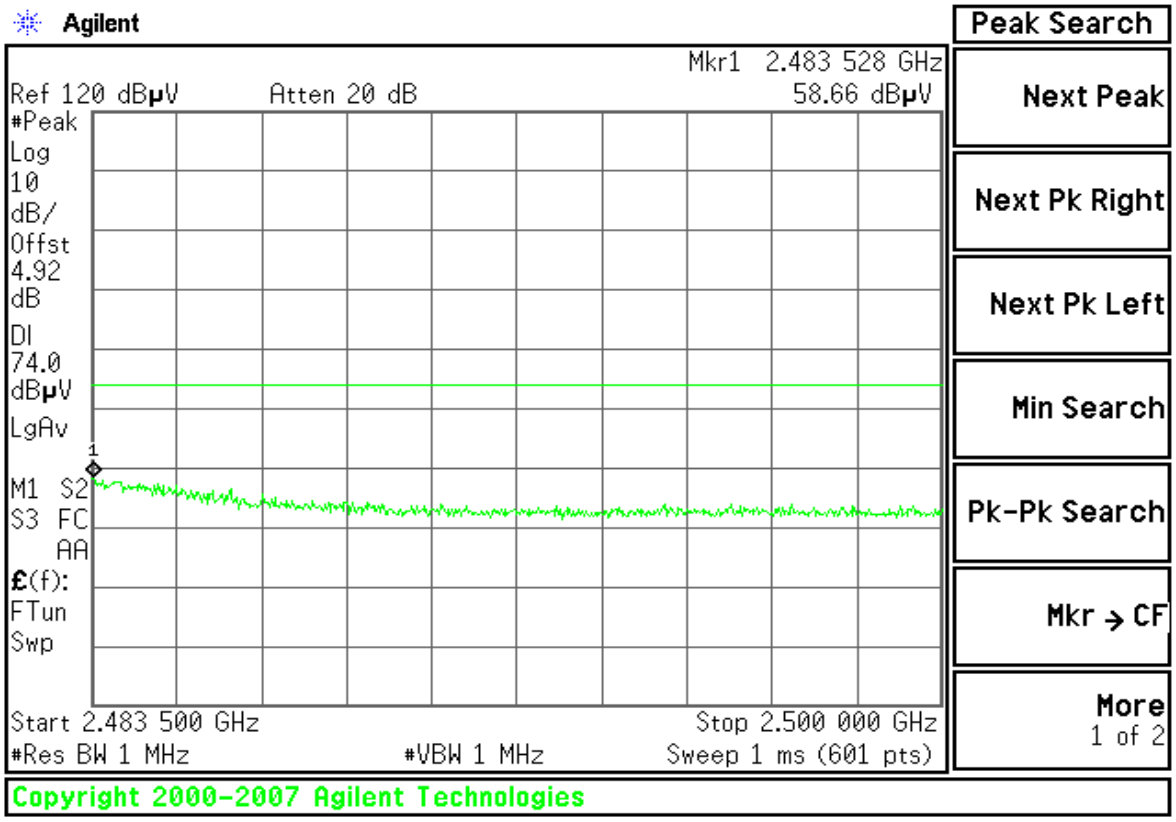


AVG

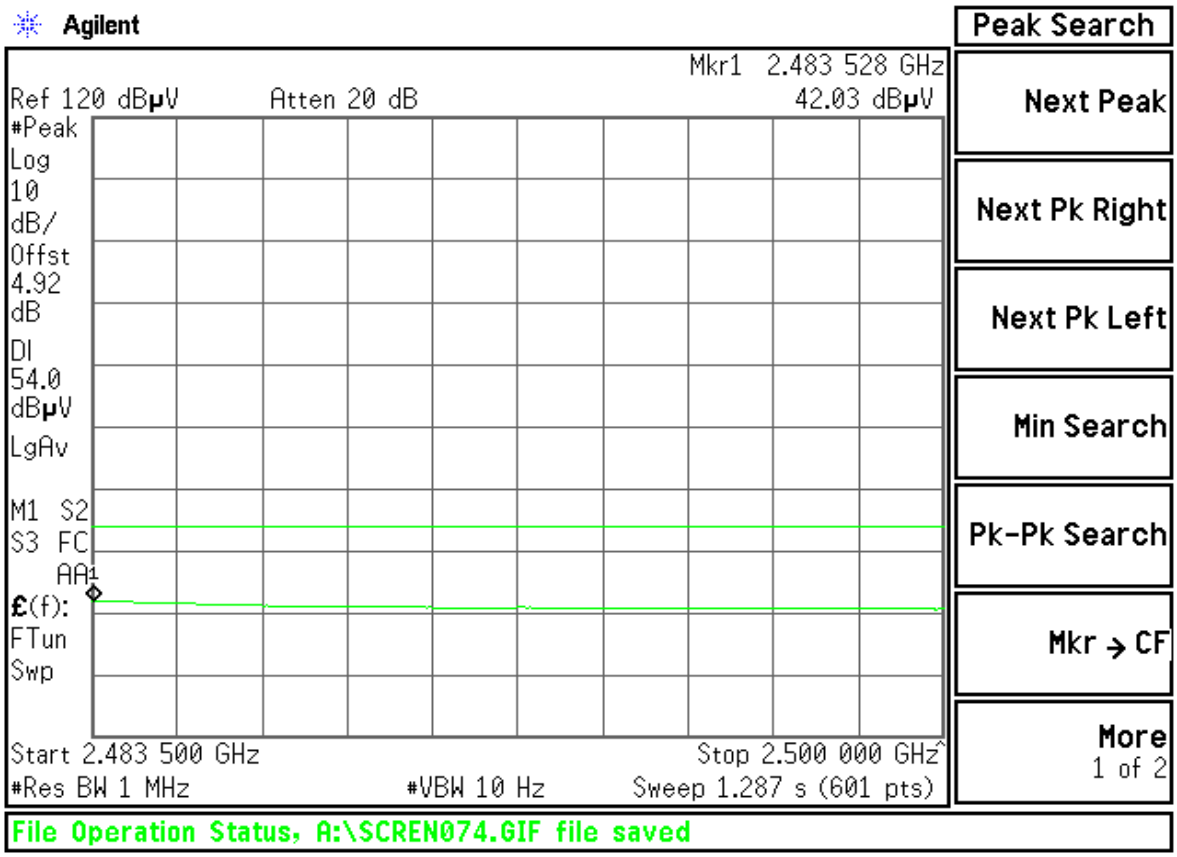


RESTRICTED BANDEDGE (draft 802.11gn Wide -40 MHz Channel mode, High Channel, Horizontal)

PEAK

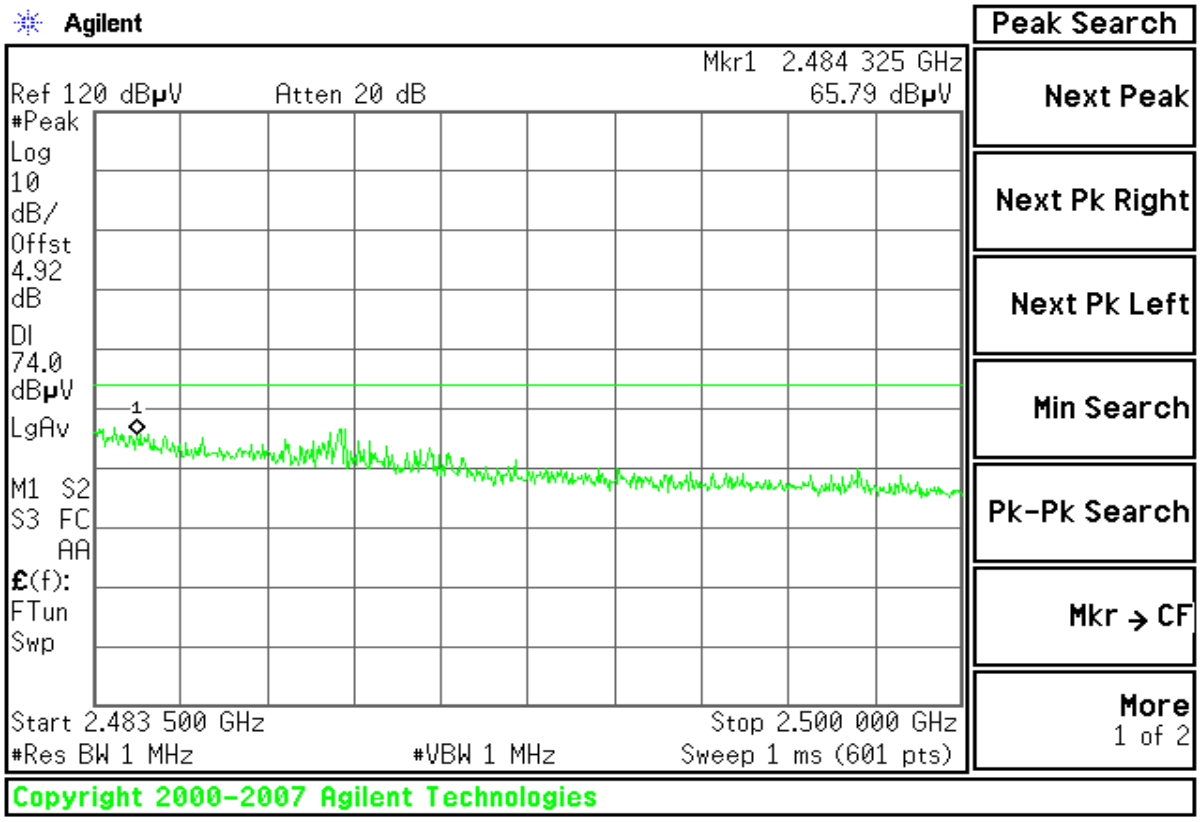


AVG

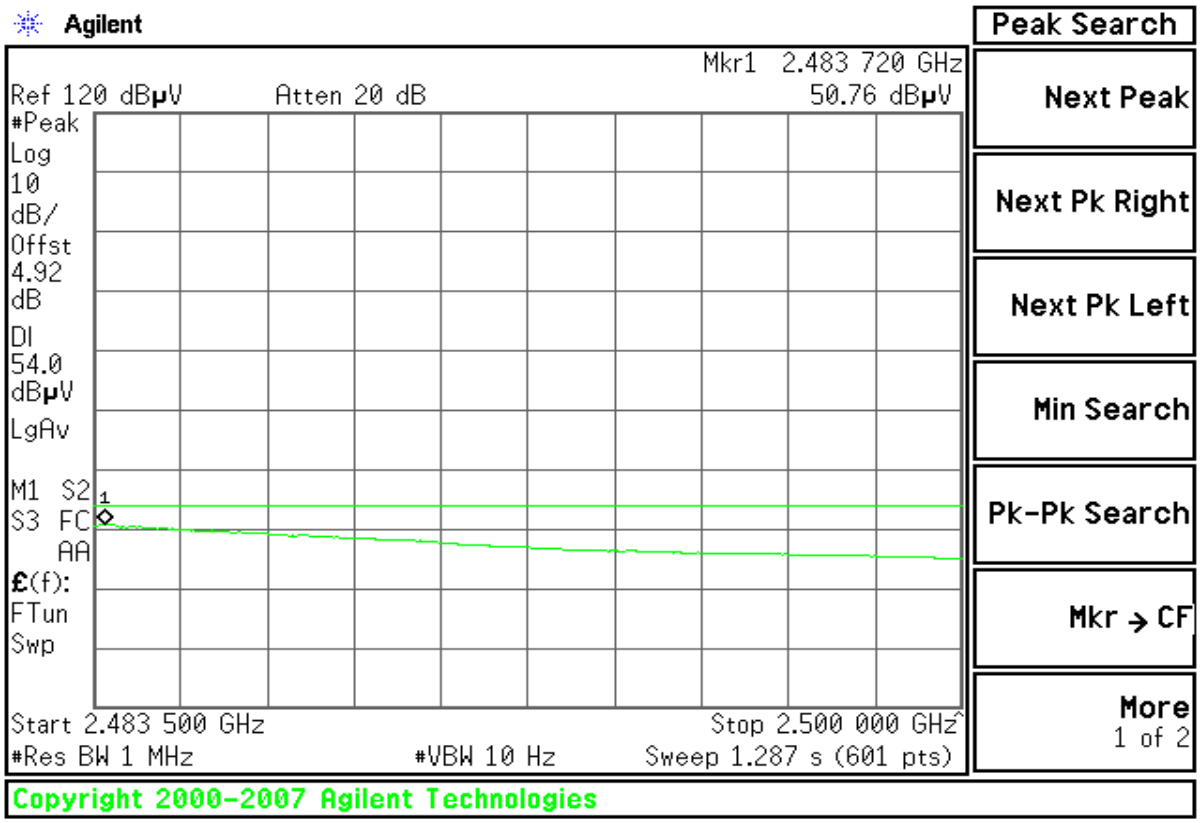


RESTRICTED BANDEDGE (draft 802.11gn Wide -40 MHz Channel mode, High Channel, Vertical)

PEAK



AVG



Below 1GHz

Operation Mode: Normal Link **Test Date:** February 2, 2009

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
65.3258	V	49.17	-12.22	36.95	40.00	-3.05	Peak
71.6033	V	42.79	-14.41	28.38	40.00	-11.62	Peak
199.5741	V	34.53	-9.49	25.04	43.50	-18.46	Peak
399.4669	V	31.90	1.44	33.34	46.00	-12.66	Peak
760.3878	V	30.50	2.38	32.88	46.00	-13.12	Peak
765.3658	V	35.90	3.27	39.17	46.00	-6.83	Peak
66.2535	H	33.96	-5.87	28.09	40.00	-11.91	Peak
70.6471	H	42.67	-14.45	28.22	46.00	-11.78	Peak
198.3694	H	38.03	-9.01	29.02	46.00	-14.48	Peak
398.2554	H	35.63	1.44	37.07	46.00	-8.93	Peak
755.1420	H	34.24	2.38	36.62	46.00	-9.38	Peak
796.2545	H	39.96	3.24	43.20	46.00	-2.80	QP

Remark:

1. *Measuring frequencies from 30 MHz to the 1GHz (No emission found between lowest internal used/generated frequency to 30 MH)z.*
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:** February 2, 2009

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
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
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:** February 2, 2009

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
4865.00	V	36.43	---	12.68	49.11	---	74.00	54.00	-4.89	Peak
7307.67	V	37.74	26.17	15.72	53.46	41.89	74.00	54.00	-12.11	Average
N/A										
4866.67	H	35.15	---	12.68	47.83	---	74.00	54.00	-6.17	Peak
7321.67	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:** February 2, 2009

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
4921.00	V	35.63	---	12.93	48.56	---	74.00	54.00	-5.44	Peak
7378.33	V	39.64	27.89	15.82	55.46	43.71	74.00	54.00	-10.29	Average
N/A										
4923.33	H	34.28	---	12.93	47.21	---	74.00	54.00	-6.79	Peak
7380.67	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:** February 2, 2009

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
4819.00	V	35.14	---	12.41	47.55	---	74.00	54.00	-6.45	Peak
7233.82	V	36.85	27.28	15.48	52.33	42.76	74.00	54.00	-11.24	Average
N/A										
4823.67	H	34.02	---	12.41	46.43	---	74.00	54.00	-7.57	Peak
7238.45	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:** February 2, 2009

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
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										
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:** February 2, 2009

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
4930.33	V	33.60	---	12.94	46.54	---	74.00	54.00	-7.46	Peak
7391.67	V	37.38	26.35	15.82	53.20	42.17	74.00	54.00	-11.83	Average
N/A										
4929.67	H	34.38	---	12.93	47.31	---	74.00	54.00	-6.69	Peak
7389.33	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 / IEEE 802.11a / CH low **Test Date:** February 2, 2009

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
11490.66	V	44.01	35.74	3.56	47.57	39.3	74	54	-14.7	AVG
N/A										
11491.67	H	43.25	35.01	3.56	46.81	38.57	74	54	-15.43	AVG
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 / IEEE 802.11a / CH mid **Test Date:** February 2, 2009

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
11570.33	V	43.36	36.58	2.40	45.76	38.98	74.00	54.00	-19.02	AVG
N/A										
11575.67	H	43.05	37.21	2.40	45.4	39.61	74.00	54.00	-14.39	AVG
N/A										

Remark:

13. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
14. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
15. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
16. *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.*
17. *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.*
18. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode: TX / IEEE 802.11a / CH high **Test Date:** February 2, 2009

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
11611.33	V	42.01	34.02	3.56	45.57	37.58	74	54	-16.42	AVG
N/A										
11615.67	H	41.23	34.14	3.56	44.79	37.7	74	54	-16.30	AVG
N/A										

Remark:

19. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
20. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
21. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
22. *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.*
23. *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.*
24. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	TX / draft 802.11gn Standard-20 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH Low	**Test Date:**	February 2, 2009
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
4832.33	V	34.48	---	12.41	46.89	---	74.00	54.00	-7.11	Peak
7230.34	V	37.94	26.68	15.48	53.42	42.16	74.00	54.00	-11.84	Average
N/A										
4824.33	H	33.32	---	12.41	45.73	---	74.00	54.00	-8.27	Peak
7219.36	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 802.11gn Standard-20 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH Mid	**Test Date:**	February 2, 2009
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
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										
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 802.11gn Standard-20 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH High	**Test Date:**	February 2, 2009
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
4930.66	V	37.60	---	12.93	46.52	---	74.00	54.00	-7.48	Peak
7387.67	V	38.30	26.99	15.82	54.12	42.81	74.00	54.00	-11.19	Average
N/A										
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 802.11gn Wide-40 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH Low	**Test Date:**	February 2, 2009
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
4845.67	V	35.42	---	12.41	47.83	---	74.00	54.00	-6.17	Peak
7385.54	V	39.27	27.80	15.48	54.75	43.28	74.00	54.00	-10.72	Average
N/A										
4850.67	H	34.38	---	12.41	46.79	---	74.00	54.00	-5.29	Peak
7389.67	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 802.11gn Wide-40 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH Mid	**Test Date:**	February 2, 2009
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
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										
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:

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 802.11gn Wide-40 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH High	**Test Date:**	February 2, 2009
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
4910.33	V	37.72	---	12.93	47.07	---	74.00	54.00	-6.93	Peak
7360.67	V	37.89	26.25	15.83	53.72	42.08	74.00	54.00	-11.92	Average
N/A										
4911.67	H	33.58	---	12.93	46.51	---	74.00	54.00	-7.49	Peak
7359.33	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).*

Operation Mode:	TX / draft 802.11an Standard-20 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH Low	**Test Date:**	February 2, 2009
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
11490.33	V	42.36	35.14	3.56	45.92	38.7	74	54	-15.3	AVG
N/A										
11495.00	H	41.85	34.75	3.56	45.41	38.31	74	54	-15.69	AVG
N/A										

Remark:

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

Operation Mode:	TX / draft 802.11an Standard-20 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH Mid	**Test Date:**	February 2, 2009
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
11570.67	V	40.69	34.96	3.56	44.25	38.52	74	54	-15.48	AVG
N/A										
11571.33	H	40.24	34.12	3.56	43.80	37.68	74	54	-16.32	AVG
N/A										

Remark:

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

Operation Mode:	TX / draft 802.11an Standard-20 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH High	**Test Date:**	February 2, 2009
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
11610.00	V	41.02	35.11	3.56	44.58	38.67	74	54	-15.33	AVG
N/A										
11612.67	H	40.79	34.74	3.56	44.35	38.3	74	54	-15.7	AVG
N/A										

Remark:

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

Operation Mode:	TX / draft 802.11an Wide-40 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH Low	**Test Date:**	February 2, 2009
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
11510.00	V	42.55	35.41	3.56	46.11	38.97	74	54	-15.03	AVG
N/A										
11510.67	H	42.35	34.96	3.56	45.91	38.52	74	54	-15.48	AVG
N/A										

Remark:

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

Operation Mode:	TX / draft 802.11an Wide-40 MHz Channel mode (Chain 0 + Chain 1+ Chain 2) / CH High	**Test Date:**	February 2, 2009
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
11590.00	V	42.36	35.17	3.56	45.92	38.73	74	54	-15.27	AVG
N/A										
11595.00	V	42.11	34.47	3.56	45.67	38.03	74	54	-15.97	AVG
N/A										

Remark:

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

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:**	Auguset 22, 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
0.204	53.21	48.61	41.01	64.47	54.47	-13.46	12.65	Line
0.348	54.46	47.28	35.78	60.33	50.33	-14.55	12.89	Line
0.414	56.48	51.41	44.58	58.46	48.46	-3.88	12.94	Line
0.482	54.37	50.83	43.42	56.51	46.51	-3.09	12.96	Line
1.565	53.87	49.83	37.72	56.00	46.00	-8.28	13.18	Line
2.158	51.31	47.48	33.68	56.00	46.00	-12.32	13.27	Line
0.205	51.99	46.77	39.16	64.43	54.43	-15.27	11.57	Neutral
0.345	51.76	45.26	33.05	60.43	50.43	-17.38	11.68	Neutral
0.411	54.66	50.08	43.93	58.55	48.55	-4.62	11.69	Neutral
0.482	52.70	49.13	41.79	56.51	46.51	-4.72	11.71	Neutral
1.046	52.34	45.46	34.08	56.00	46.00	-11.92	11.81	Neutral
2.164	51.96	47.34	33.54	56.00	46.00	-12.46	11.92	Neutral

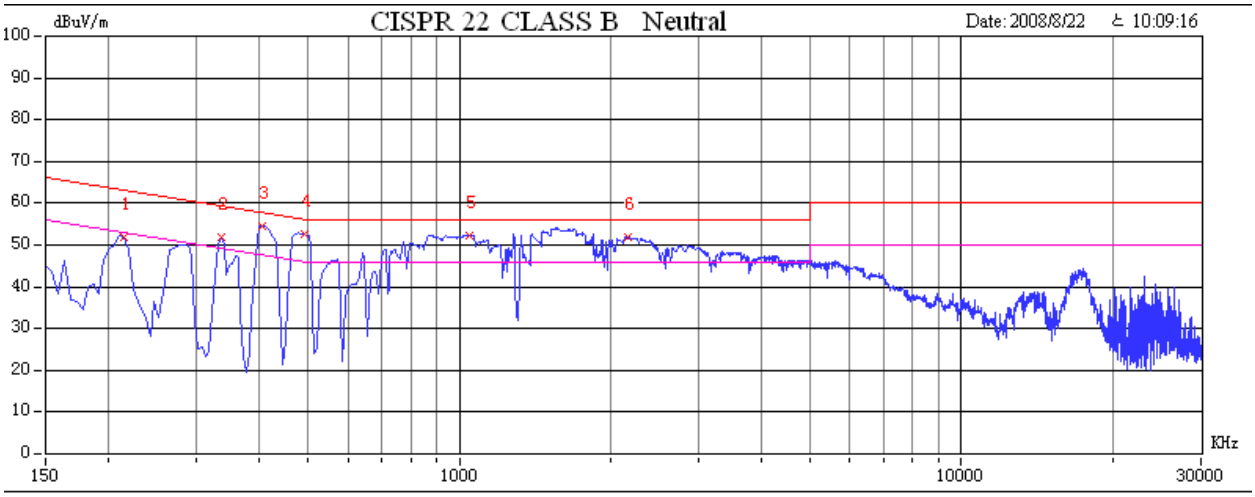
Remark:

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	802.11a/b/g/n access point
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: 15.38dBm(34.51mW) IEEE 802.11g mode: 15.92dBm(39.08mW) draft 802.11gn Standard-20 MHz Channel mode: 20.18 dBm(104.2mW) draft 802.11gn Wide-40 MHz Channel mode: 21.23 dBm(132.7mw) IEEE 802.11a mode: 16.91dBm(49.09mW) draft 802.11an Standard-20 MHz Channel mode: 21.38 dBm(137.4mw) draft 802.11an Wide-40 MHz Channel mode: 22.85 dBm(192.8mw)
Antenna gain (Max)	Gain 2dBi (2.4GHz) /Total gain 6.77(4.75) and Gain 3dBi (5GHz) /Total gain 7.77(5.98)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:

1. *The maximum output power is 21. 23dBm (132. 7mW) at 2422MHz (with 4.75numeric antenna gain.); 22. 85dBm (192. 8mW) at 5795MHz (with 5.98numeric 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 = 34. 5mW

Numeric Antenna gain = 4.75

→ *Power density = 0.0326 mW / cm²*

IEEE 802.11g:

EUT output power = 39. 1mW

Numeric Antenna gain = 4.75

→ *Power density = 0.0370 mW / cm²*

draft 802.11gn Standard-20 MHz Channel mode

EUT output power = 104. 2mW

Numeric Antenna gain = 4.75

→ *Power density = 0.0985 mW / cm²*

draft 802.11gn Wide-40 MHz Channel mode

EUT output power = 132. 7mW

Numeric Antenna gain = 4.75

→ *Power density = 0.1254 mW / cm²*

IEEE 802.11a:

EUT output power = 49. 1mW

Numeric Antenna gain = 5.98

→ *Power density = 0.0584 mW / cm²*

draft 802.11an Standard-20 MHz Channel mode

EUT output power = 137. 4mW

Numeric Antenna gain = 5.98

→ *Power density = 0.1635 mW / cm²*

draft 802.11an Wide-40 MHz Channel mode

EUT output power =192. 8mW

Numeric Antenna gain = 5.98

→ *Power density = 0.2294 mW / cm²*

(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.)