



FCC PART 15.247



TEST AND MEASUREMENT REPORT

For

Actiontec Electronics, Inc.

760 N. Mary Avenue,
Sunnyvale, CA 94085, USA

FCC ID: LNQ802DRN
Model: 802DRN

Report Type: Original Report	Product Type: 802.11 a/b/g/n WLAN Module
Prepared By: Wei Sun <i>Wei Sun</i>	
Report Number: R1203021-247	
Report Date: 2012-06-04	
Reviewed By: Victor Zhang <i>Victor Zhang</i> EMC/RF Lead	
Bay Area Compliance Laboratories Corp. 1274 Anvilwood Avenue Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732-9164	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by A2LA*, NIST, or any agency of the Federal Government.

* This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “*” (Rev. 2)

TABLE OF CONTENTS

1	GENERAL DESCRIPTION.....	6
1.1	PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	6
1.2	MECHANICAL DESCRIPTION OF EUT	6
1.3	OBJECTIVE.....	6
1.4	RELATED SUBMITTAL(S)/GRANT(S)	6
1.5	TEST METHODOLOGY	6
1.6	MEASUREMENT UNCERTAINTY	6
1.7	TEST FACILITY	7
2	SYSTEM TEST CONFIGURATION.....	8
2.1	JUSTIFICATION	8
2.2	EUT EXERCISE SOFTWARE.....	8
2.3	EQUIPMENT MODIFICATIONS	8
2.4	SPECIAL ACCESSORIES	8
2.5	LOCAL SUPPORT EQUIPMENT	8
2.6	POWER SUPPLY AND LINE FILTERS.....	8
2.7	EUT INTERNAL CONFIGURATION	8
2.8	EXTERNAL I/O CABLING LIST AND DETAILS	9
3	SUMMARY OF TEST RESULTS	10
4	FCC §15.247(I), §2.1091 - RF EXPOSURE.....	11
4.1	APPLICABLE STANDARD	11
4.2	MPE PREDICTION	11
4.3	MPE RESULTS	12
5	FCC §15.203 – ANTENNA REQUIREMENTS.....	13
5.1	APPLICABLE STANDARD	13
5.2	ANTENNA LIST	13
6	FCC §15.207 – AC LINE CONDUCTED EMISSIONS.....	15
6.1	APPLICABLE STANDARD	15
6.2	TEST SETUP	15
6.3	TEST PROCEDURE	15
6.4	TEST SETUP BLOCK DIAGRAM.....	16
6.5	CORRECTED AMPLITUDE & MARGIN CALCULATION	16
6.6	TEST EQUIPMENT LIST AND DETAILS	17
6.7	TEST ENVIRONMENTAL CONDITIONS.....	17
6.8	SUMMARY OF TEST RESULTS.....	17
6.9	CONDUCTED EMISSIONS TEST PLOTS AND DATA	18
7	FCC §15.247(D) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	22
7.1	APPLICABLE STANDARD	22
7.2	MEASUREMENT PROCEDURE	22
7.3	TEST SETUP BLOCK DIAGRAM.....	22
7.4	TEST EQUIPMENT LIST AND DETAILS	22
7.5	TEST ENVIRONMENTAL CONDITIONS.....	22
7.6	TEST RESULTS	23
8	FCC §15.205, §15.209, §15.247(D) – SPURIOUS RADIATED EMISSIONS	103
8.1	APPLICABLE STANDARD	103
8.2	TEST SETUP	104
8.3	EUT SETUP.....	104

8.4	TEST PROCEDURE	104
8.5	TEST SETUP BLOCK DIAGRAM.....	105
8.6	CORRECTED AMPLITUDE & MARGIN CALCULATION	105
8.7	TEST EQUIPMENT LIST AND DETAILS	106
8.8	TEST ENVIRONMENTAL CONDITIONS.....	106
8.9	SUMMARY OF TEST RESULTS.....	107
8.10	RADIATED EMISSIONS TEST RESULT DATA	108
9	FCC §15.247(A)(2) – 6 DB & 99% BANDWIDTH.....	126
9.1	APPLICABLE STANDARD	126
9.2	MEASUREMENT PROCEDURE	126
9.3	TEST SETUP BLOCK DIAGRAM.....	126
9.4	TEST EQUIPMENT LIST AND DETAILS	126
9.5	TEST ENVIRONMENTAL CONDITIONS.....	127
9.6	TEST RESULTS	127
10	FCC §15.247(B) - PEAK OUTPUT POWER MEASUREMENT.....	174
10.1	APPLICABLE STANDARD	174
10.2	MEASUREMENT PROCEDURE	174
10.3	TEST SET UP BLOCK DIAGRAM.....	174
10.4	TEST EQUIPMENT LIST AND DETAILS	174
10.5	TEST ENVIRONMENTAL CONDITIONS.....	175
10.6	TEST RESULTS	175
11	FCC §15.247(D) - 100 KHZ BANDWIDTH OF BAND EDGES	177
11.1	APPLICABLE STANDARD	177
11.2	MEASUREMENT PROCEDURE	177
11.3	TEST SETUP BLOCK DIAGRAM.....	177
11.4	TEST EQUIPMENT LIST AND DETAILS	177
11.5	TEST ENVIRONMENTAL CONDITIONS.....	178
11.6	TEST RESULTS	179
12	FCC §15.247(E) - POWER SPECTRAL DENSITY	207
12.1	APPLICABLE STANDARD	207
12.2	MEASUREMENT PROCEDURE	207
12.3	TEST SETUP BLOCK DIAGRAM.....	207
12.4	TEST EQUIPMENT LIST AND DETAILS	207
12.5	TEST ENVIRONMENTAL CONDITIONS.....	208
12.6	TEST RESULTS	208
13	EXHIBIT A - FCC ID LABEL INFORMATION	249
13.1	FCC ID LABEL REQUIREMENTS	249
13.2	FCC ID LABEL CONTENT	249
13.3	FCC ID LABEL LOCATION ON EUT	250
14	EXHIBIT B - TEST SETUP PHOTOGRAPHS.....	251
14.1	CONDUCTED EMISSION FRONT VIEW.....	251
14.2	CONDUCTED EMISSION SIDE VIEW	251
14.3	RADIATED EMISSION BELOW 1GHZ FRONT VIEW	252
14.4	RADIATED EMISSION BELOW 1 GHZ REAR VIEW	252
14.5	RADIATED EMISSION ABOVE 1 GHZ FRONT VIEW	253
14.6	RADIATED EMISSION ABOVE 1 GHZ REAR VIEW	253
14.7	CONDUCTED TEST	254
15	EXHIBIT C - EUT PHOTOGRAPHS	255
15.1	EUT–TOP VIEW WITH HEAT SINK.....	255
15.2	EUT–TOP VIEW WITH HEAT SINK AND SHIELDING REMOVED	255
15.3	EUT–TOP VIEW WITH HEAT SINK, SHIELDING AND FOAM REMOVED.....	256
15.4	EUT–BOTTOM VIEW	256
15.5	EUT–FRONT VIEW WITH ANTENNA PLACEMENT SHOWN	257

15.6	GALTRONICS ANTENNAS	257
15.7	SUPPORTING BOARD COMPONENT VIEW	258
15.8	SUPPORTING BOARD SOLDER VIEW.....	258
15.9	AC/DC POWER SUPPLY	259

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1203021-247	Original Report	2012-06-04

1 General Description

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of Actiontec Electronics, Inc., and their product model: *802DRN*, *FCC ID:LNQ802DRN* or the “EUT” as referred to in this report. The EUT is an 802.11 a/b/g/n Wireless module with 4 antenna ports; however, only 3 antenna ports were tested, which was requested by the Actiontec.

1.2 Mechanical Description of EUT

The “EUT” measures approximately 7.4cm (L) x 5.1cm (W) x 1.6cm (H), and weighs approximately 57.5g.

The test data gathered are from typical production sample, serial number: 20700018, provided by the manufacturer.

1.3 Objective

This report is prepared on behalf of Actiontec Electronics, Inc., in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commissions rules for 2400-2483.5 MHz and 5745-5825 MHz bands.

The objective is to determine compliance with FCC rules for Antenna Requirements, AC Line Conducted Emissions, Occupied Bandwidth, Output Power, Power Spectral Density, Radiated and Conducted Spurious Emissions, and Band Edge.

1.4 Related Submittal(s)/Grant(s)

FCC ID: LNQ802DRN, 5.2 GHz Band

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2:2003, The Treatment of Uncertainty in EMC Measurements, the values ranging from ± 2.0 dB for Conducted Emissions tests and ± 4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.7 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2003, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: A-0027. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is an American Association for Laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at <http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b>

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2003.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

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

2.2 EUT Exercise Software

The software used, Tera Term, Marvell Labtool were provided by client and verified by Wei Sun to comply with the standard requirements being tested against.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Special Accessories

Manufacturer	Description	Model No.	Serial No.
Marvell Semiconductor Inc.	Module Supporting Board	AC2KING120301	GFC421110076

2.5 Local Support Equipment

Manufacturer	Description	Model No.	Serial No.
-	-	-	-

2.6 Power Supply and Line Filters

Manufacturer	Description	Model No.	Serial No.
Actiontec Electronics Inc.	AC/DC Adaptor	STD-12018U1	K2434258

2.7 EUT Internal Configuration

NA: Only the module card was tested the s/n can be found in section 1.2.

2.8 External I/O Cabling List and Details

Cable Description	Length (m)	From	To
-	-	-	-

3 Summary of Test Results

Results reported relate only to the product tested.

FCC & IC Rules	Description of Test	Results
FCC §15.247(i), §2.1091	RF Exposure	Compliant
FCC §15.203	Antenna Requirement	Compliant
FCC §15.207(a)	AC Line Conducted Emissions	Compliant
FCC §15.247(d)	Spurious Emissions at Antenna Port	Compliant
FCC §15.205	Restricted Bands	Compliant
FCC §15.209, §15.247	Radiated Spurious Emissions	Compliant
FCC §15.247(a)(2)	6 dB Emission Bandwidth	Compliant
FCC §15.247(b)(3)	Maximum Peak Output Power	Compliant
FCC §15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
FCC §15.247(e)	Power Spectral Density	Compliant

4 FCC §15.247(i), §2.1091 - RF Exposure

4.1 Applicable Standard

According to FCC §15.247(i) and §1.1307(b)(1), 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 level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Before equipment certification is granted, the procedure of IC RSS-102 must be followed concerning the exposure of humans to RF fields.

4.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

4.3 MPE Results

2.4 GHz Band

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>23.9</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>245.47</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>2437</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>5.59</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>3.62</u>
<u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u>	<u>0.177</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>1.0</u>

5.8 GHz Band

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>21.07</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>127.94</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>5745</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>4.82</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>3.033</u>
<u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u>	<u>0.077</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>1.0</u>

Device is compliance with the requirement MPE limit at 20 cm distance for the uncontrolled exposure.

Note: MPE calculations were calculated on worst case.

5 FCC §15.203 – Antenna Requirements

5.1 Applicable Standard

According to FCC §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to FCC §15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

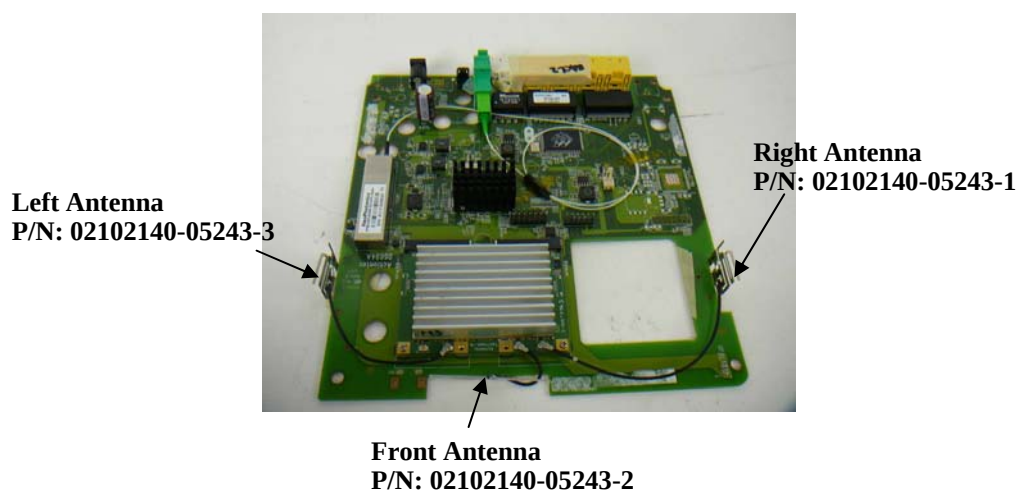
5.2 Antenna List

The antenna used on the device has a unique connector – U.F.L – and the antenna gain is less than 6dBi, therefore the antenna used fulfilled the antenna requirement above.

EUT has two configurations, one with three Galtronics antennas, one with three Airgain antennas, since Galtronics antennas has higher gain with the same type, therefore only Galtronics antenna was tested with the unit during radiated emissions.

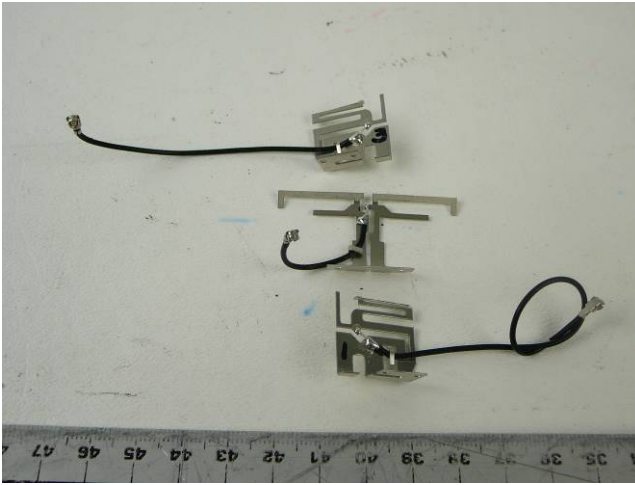
Manufacture/Antenna Model	Antenna Product Number/ Antenna Model	Antenna Gain (dBi)
Galtronics	02102140-05243-1	3.5 (at 2.4GHz) 4.21 (at 5GHz)
Galtronics	02102140-05243-2	5.59 (at 2.4GHz) 4.82 (at 5GHz)
Galtronics	02102140-05243-3	3.5 (at 2.4GHz) 4.21 (at 5GHz)
Airgain	M2450DLCB	3.5 (at 2.4 GHz) 4.0 (at 5 GHz)
Airgain	N2420DS	3.1 (at 2.44 GHz) 3.2 (at 5.2 GHz)

Please refer to the below pictures for detail:

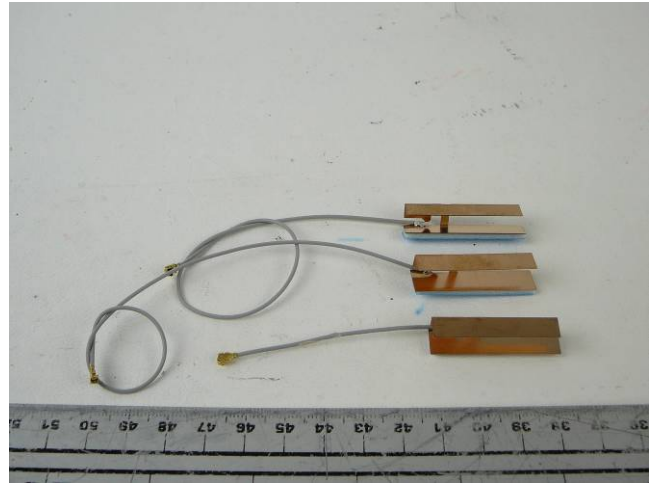


Testing configuration with Galtronics Antennas

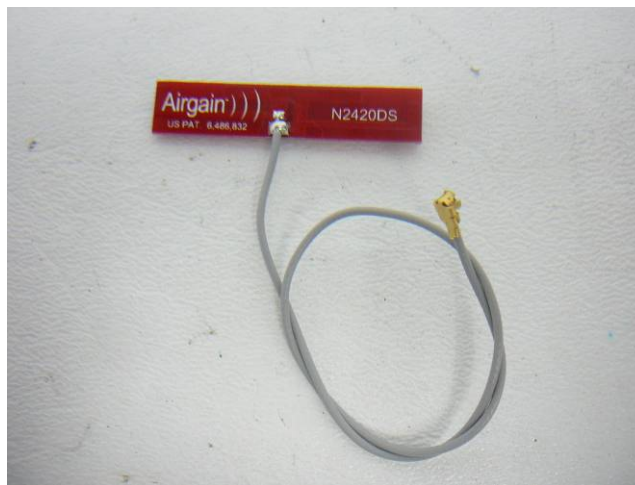
Tested Galtronics Antennas



Airgain M2450DLCB Antennas



Airgain N2420DS Antenna



6 FCC §15.207 – AC Line Conducted Emissions

6.1 Applicable Standard

As per FCC §15.207 Conducted limits:

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Decreases with the logarithm of the frequency.

6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.4-2003 measurement procedure. The specification used was FCC limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The AC/DC power adapter of the Support Board was connected with LISN-1 which provided 120 V/60 Hz AC power.

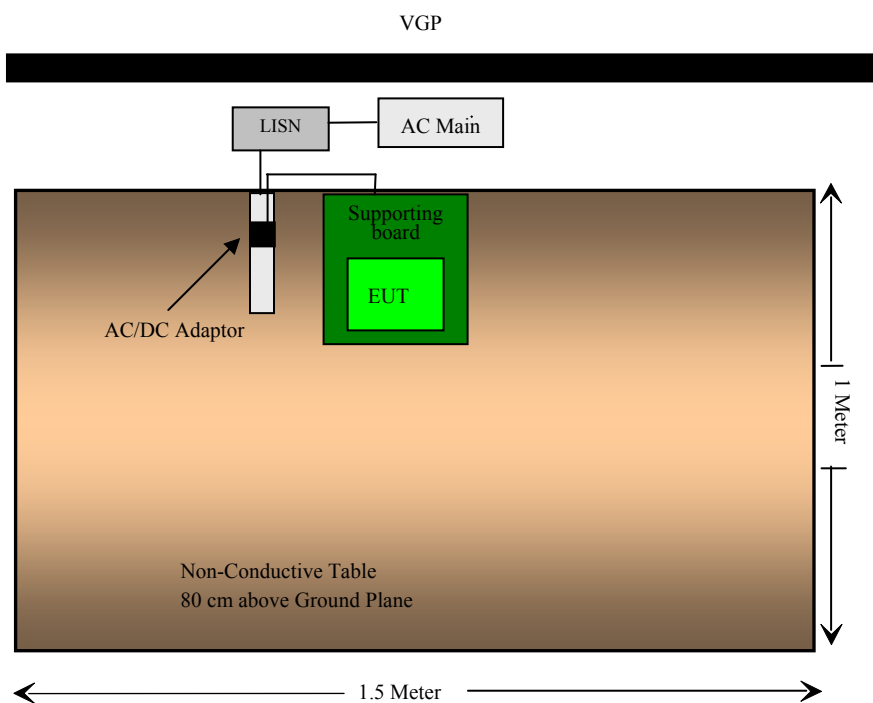
6.3 Test Procedure

During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-2

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the peak detection mode, quasi-peak and average. Quasi-Peak readings are distinguished with a “QP.” Average readings are distinguished with an “Ave”.

6.4 Test Setup Block Diagram



6.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Cable Loss (CL) plus the High Pass Filter/Attenuator value (HA) and subtracting the Amplifier Gain (Ga) to the indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + CL + HA - Ga$$

For example, a corrected amplitude (CA) of 36 dBuV = Indicated Amplitude reading (Ai) of 50.0 dBuV + Cable Loss (CL) 1.0 dB + High Pass Filter/Attenuator (IA) 5 dB - Amplifier Gain (Ga) 20 dB

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Corrected Amplitude (dBuV)} - \text{Limit (dBuV)}$$

6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100044	2012-04-14
Solar Electronics	LISN	9252-R-24-BNC	511205	2011-06-25
TTE	Filter, High Pass	H9962-150K-50-21378	K7133	2011-06-10

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.

6.7 Test Environmental Conditions

Temperature:	19~23 °C
Relative Humidity:	37~45 %
ATM Pressure:	101-102 kPa

The testing was performed by Wei Sun on 05-01-2012 in 5 meter chamber 3.

6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC standard's conducted emissions limits, with the margin reading of:

For 2.4 GHz Band, 502.11b mode Middle Channel

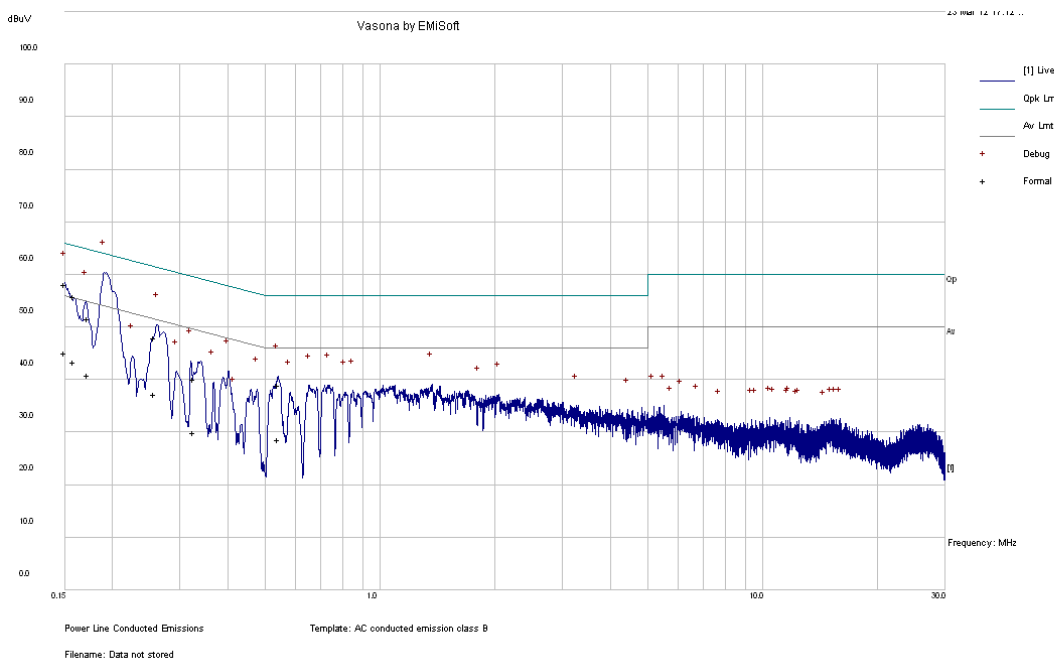
Connection: 120 V/60 Hz, AC			
Margin (dB)	Frequency (MHz)	Conductor (Line/Neutral)	Range (MHz)
-7.82	0.150246	Line	0.15 to 30

For 5.8 GHz Band, 802.11n 20 MHz mode Middle Channel

Connection: 120 V/60 Hz, AC			
Margin (dB)	Frequency (MHz)	Conductor (Line/Neutral)	Range (MHz)
-6.85	0.189405	Neutral	0.15 to 30

6.9 Conducted Emissions Test Plots and Data

2.4 GHz Band, 802.11b middle channel 120 V, 60 Hz – Line

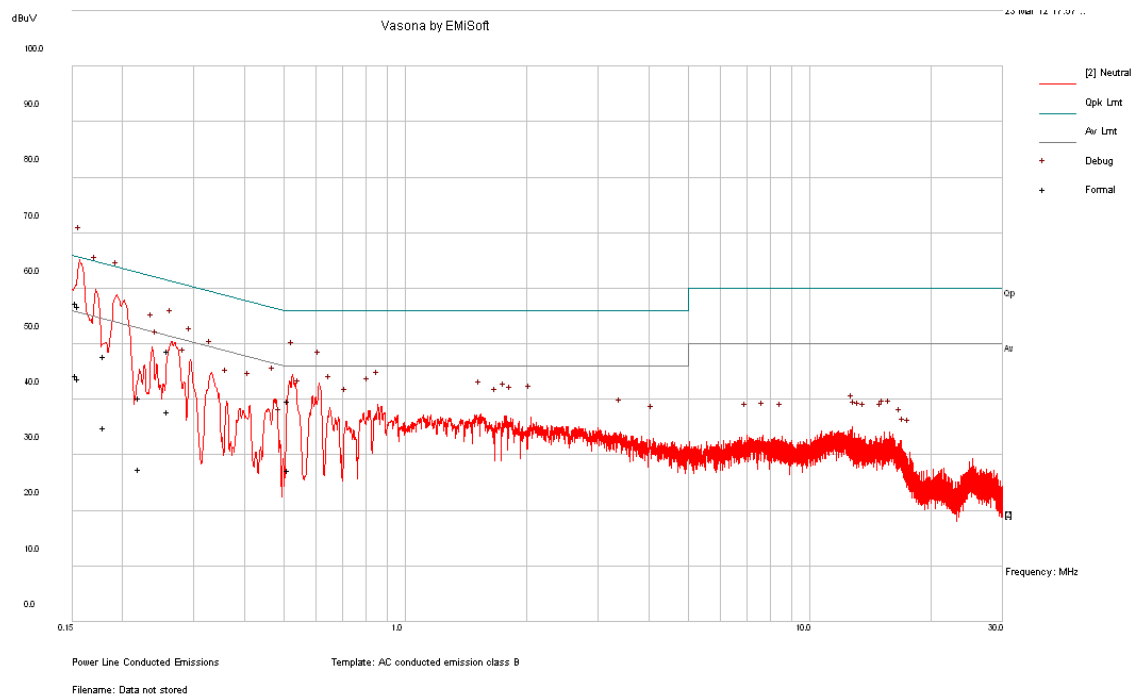


Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
0.150246	58.16	Line	65.99	-7.82
0.159006	55.91	Line	65.52	-9.61
0.172299	51.68	Line	64.85	-13.17
0.257802	48.04	Line	61.5	-13.46
0.541683	39	Line	56	-17.00
0.325869	40.16	Line	59.56	-19.40

Average Measurements

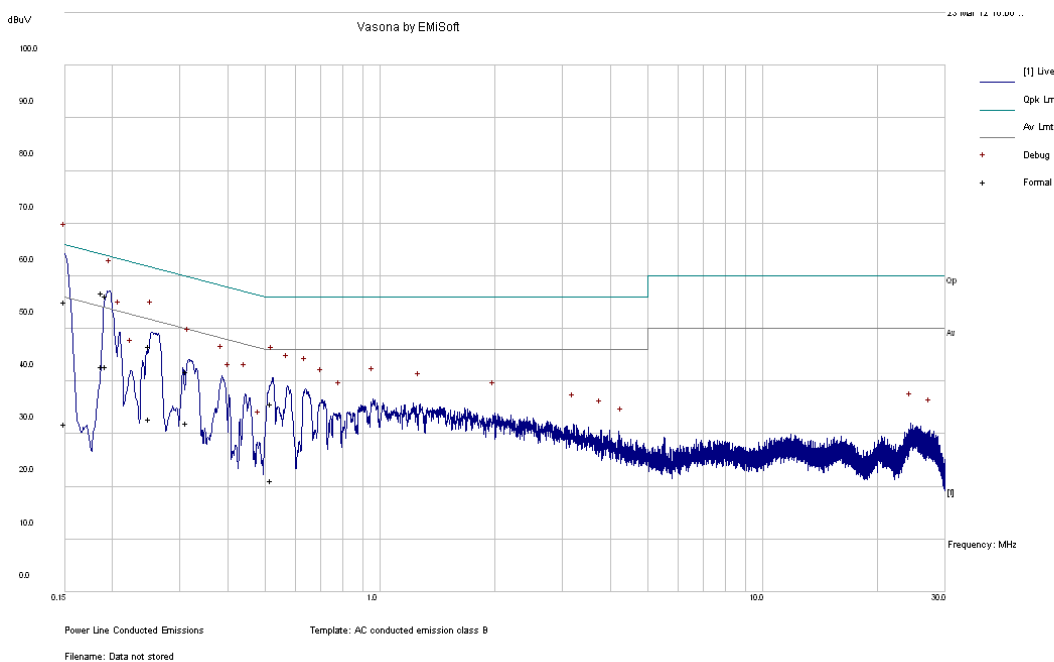
Frequency (MHz)	Corrected Amplitude (dBμV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
0.150246	45.2	Line	55.99	-10.79
0.159006	43.45	Line	55.52	-12.07
0.172299	40.86	Line	54.85	-13.99
0.257802	37.22	Line	51.5	-14.28
0.541683	28.7	Line	46	-17.30
0.325869	29.95	Line	49.56	-19.60

120 V, 60 Hz – Neutral**Quasi-Peak Measurements**

Frequency (MHz)	Corrected Amplitude (dBμV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
0.153963	57.41	Neutral	65.78	-8.37
0.155829	56.86	Neutral	65.68	-8.82
0.259632	48.67	Neutral	61.44	-12.77
0.514893	39.82	Neutral	56	-16.18
0.180261	47.82	Neutral	64.47	-16.65
0.220155	40.27	Neutral	62.81	-22.55

Average Measurements

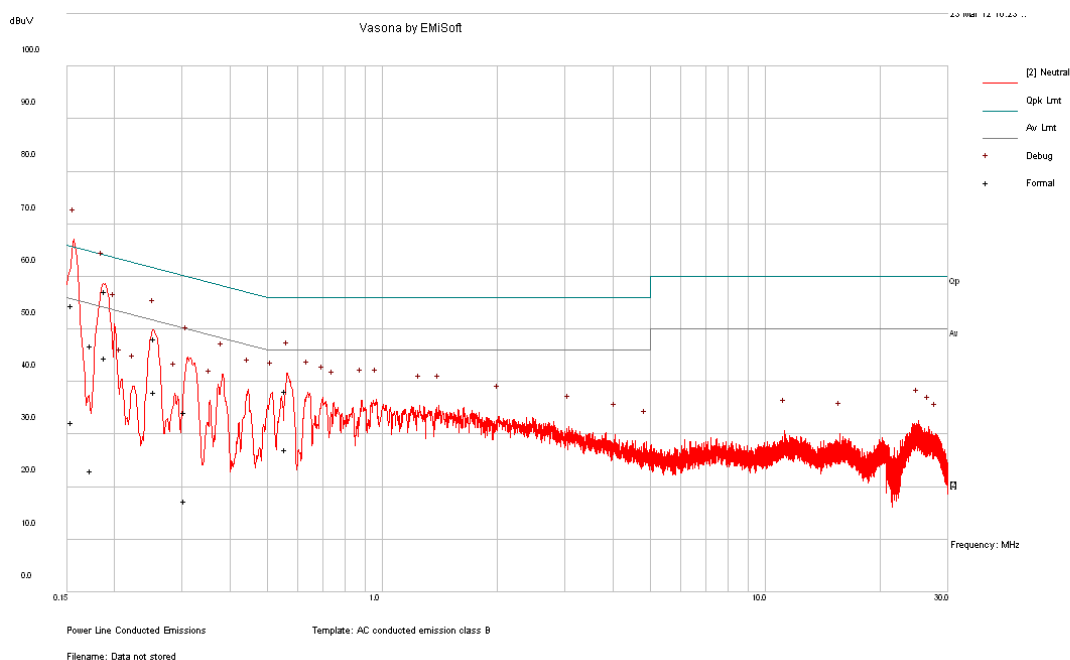
Frequency (MHz)	Corrected Amplitude (dBμV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
0.153963	44.32	Neutral	55.78	-11.46
0.155829	43.8	Neutral	55.68	-11.88
0.259632	37.94	Neutral	51.44	-13.50
0.514893	27.36	Neutral	46	-18.64
0.180261	34.96	Neutral	54.47	-19.51
0.220155	27.49	Neutral	52.81	-25.32

5.8 GHz Band, 802.11n 20MHz Low channel**120 V, 60 Hz – Line****Quasi-Peak Measurements**

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
0.188043	56.86	Line	64.12	-7.26
0.193119	56.2	Line	63.9	-7.70
0.150163	55.1	Line	65.99	-10.89
0.249387	46.75	Line	61.78	-15.03
0.313536	41.88	Line	59.88	-17.99
0.520209	35.65	Line	56	-20.35

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
0.193119	42.92	Line	53.9	-10.98
0.188043	42.79	Line	54.12	-11.34
0.313536	32.15	Line	49.88	-17.73
0.249387	32.91	Line	51.78	-18.87
0.150163	31.91	Line	55.99	-24.08
0.520209	21.15	Line	46	-24.85

120 V, 60 Hz – Neutral**Quasi-Peak Measurements**

Frequency (MHz)	Corrected Amplitude (dBμV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
0.189405	57.21	Neutral	64.06	-6.85
0.154857	54.44	Neutral	65.74	-11.29
0.254358	48.13	Neutral	61.61	-13.49
0.559965	38.2	Neutral	56	-17.80
0.174273	46.88	Neutral	64.75	-17.87
0.305367	34.16	Neutral	60.1	-25.93

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBμV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
0.189405	44.58	Neutral	54.06	-9.49
0.254358	38.11	Neutral	51.61	-13.50
0.559965	27.1	Neutral	46	-18.90
0.154857	32.25	Neutral	55.74	-23.49
0.174273	23.07	Neutral	54.75	-31.69
0.305367	17.38	Neutral	50.1	-32.72

7 FCC §15.247(d) - Spurious Emissions at Antenna Terminals

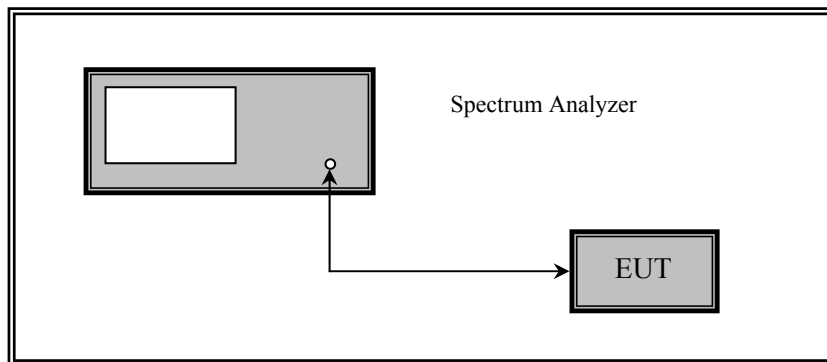
7.1 Applicable Standard

For FCC §15.247(d) in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

7.2 Measurement Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

7.3 Test Setup Block Diagram



7.4 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4446A	US44300386	2011-08-11

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.

7.5 Test Environmental Conditions

Temperature:	19~24 °C
Relative Humidity:	38~48 %
ATM Pressure:	101.2-102 kPa

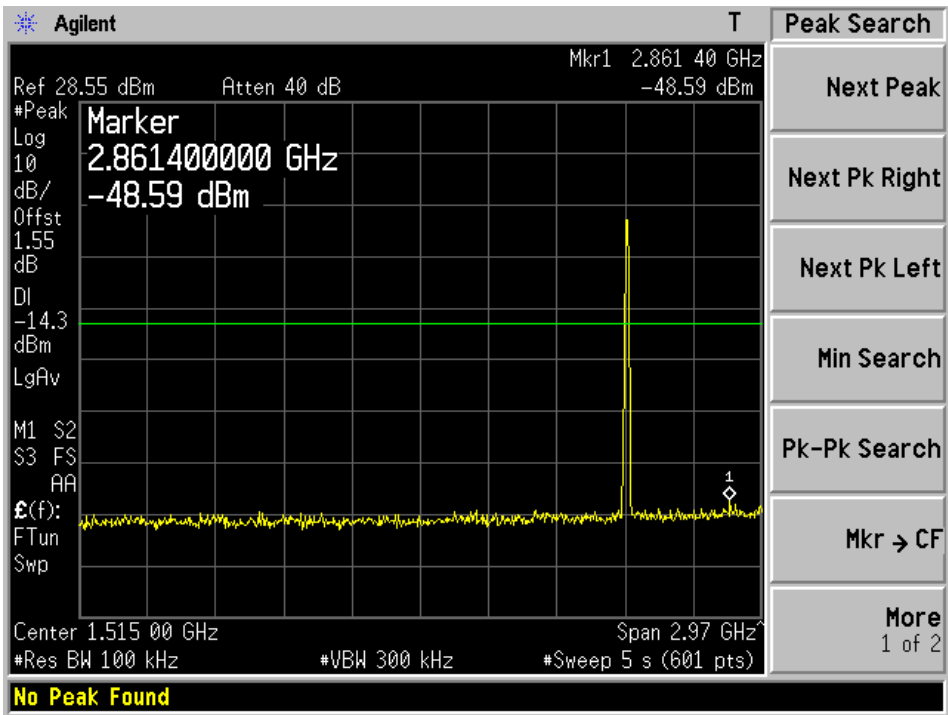
The testing was performed by Wei Sun on 2012-05-01 in RF site.

7.6 Test Results

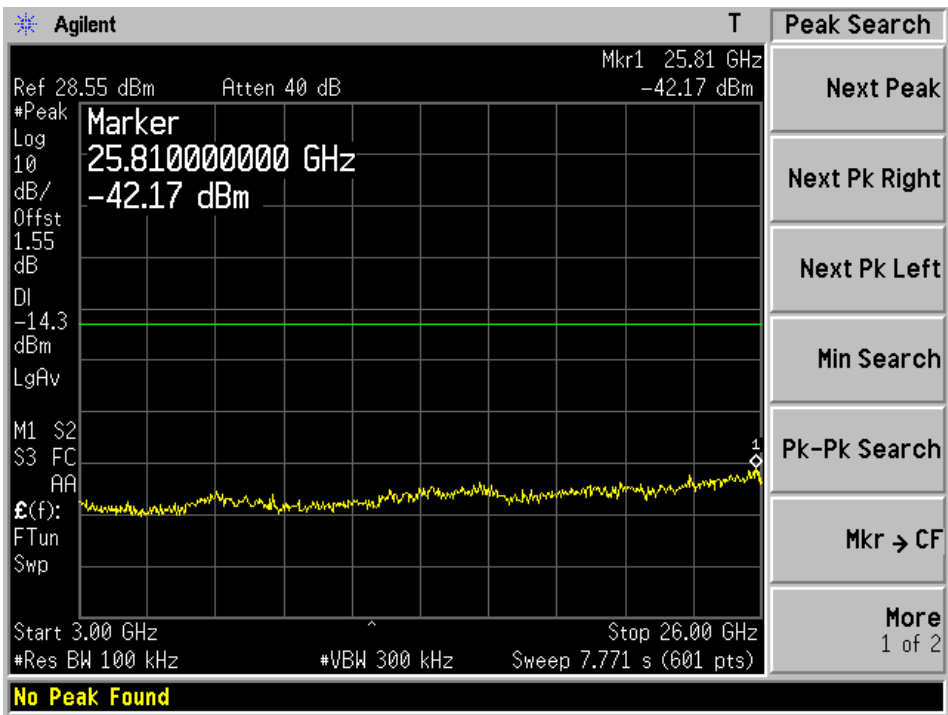
Please refer to following plots.

2.4 GHz Band

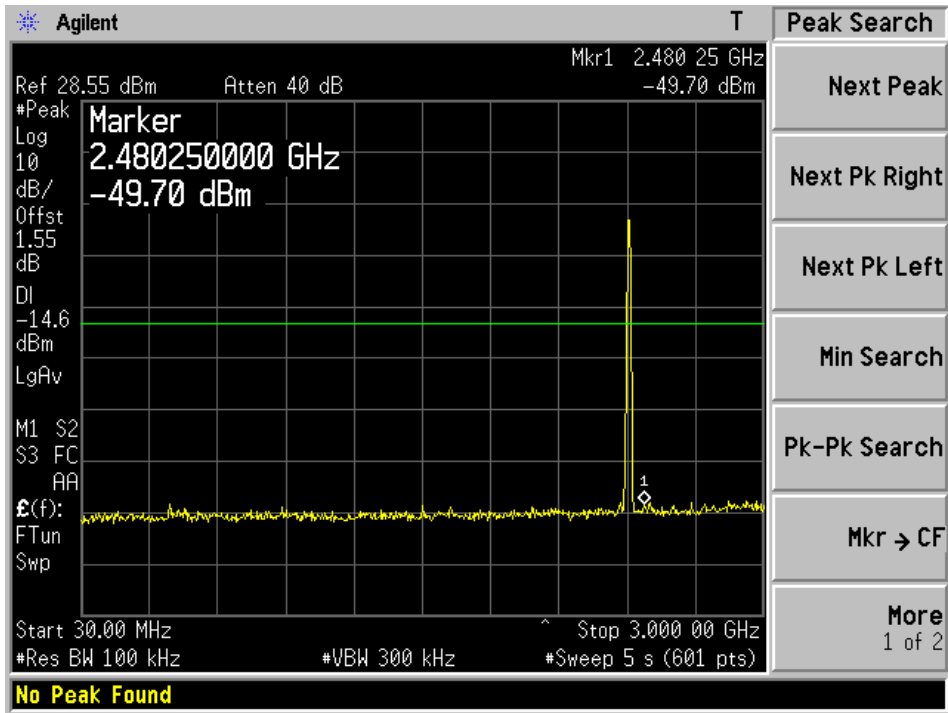
802.11b Low channel, Chain J1, below 3GHz



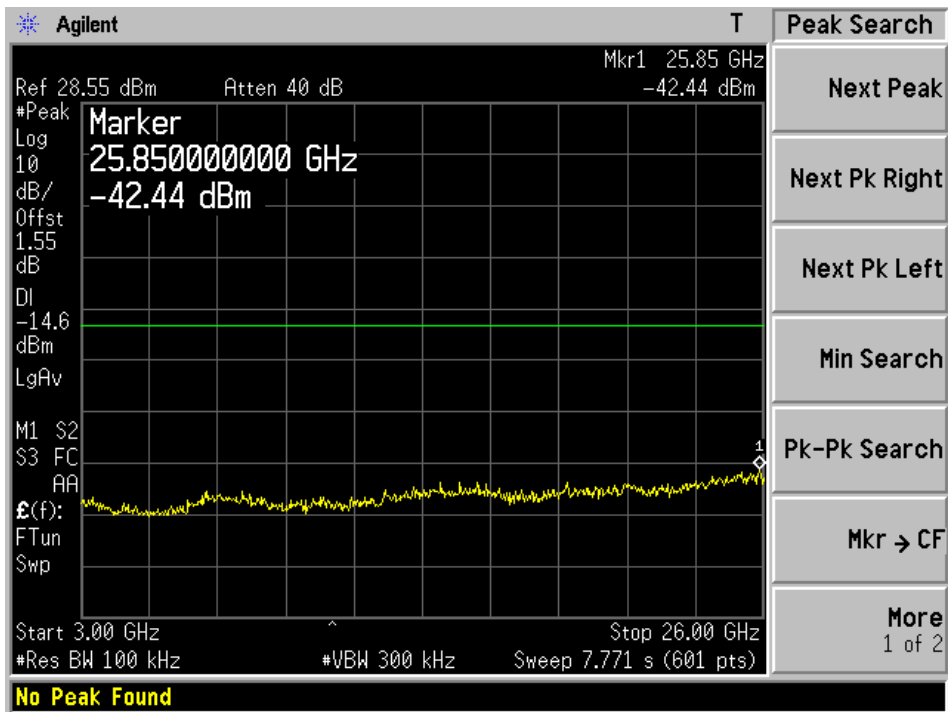
802.11b Low channel, Chain J1, above 3GHz



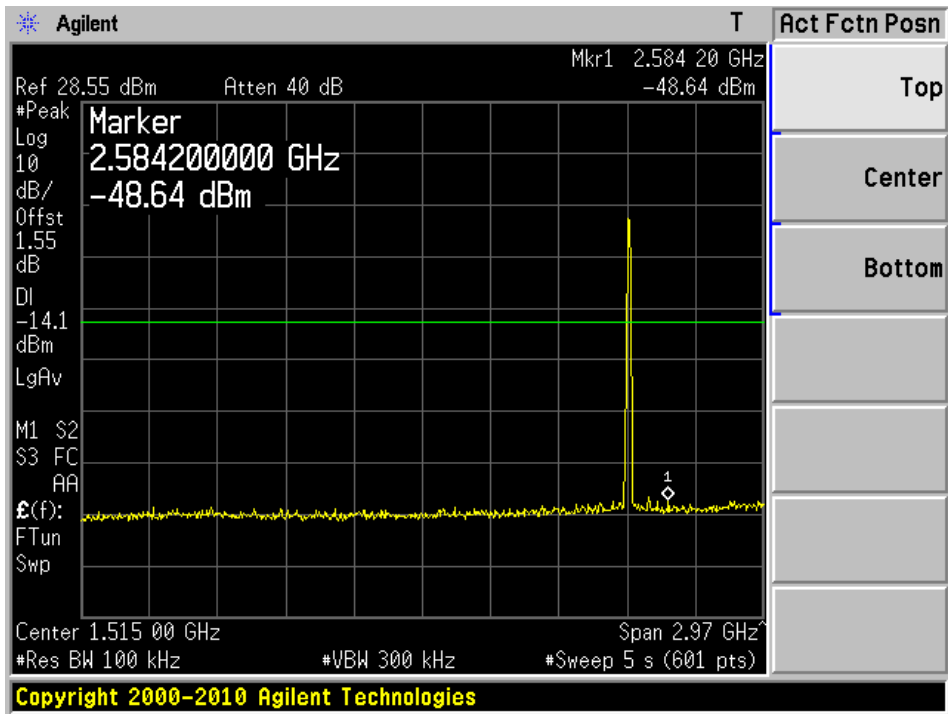
802.11b Low channel, Chain J2, below 3GHz



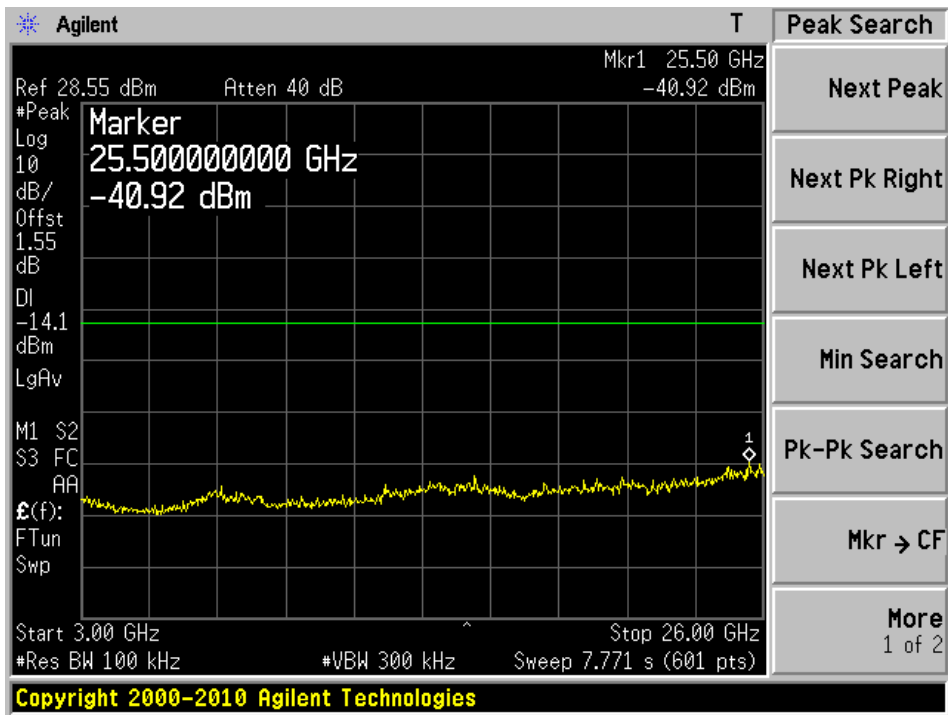
802.11b Low channel, Chain J2, above 3GHz



802.11b Low channel, Chain J3, below 3GHz

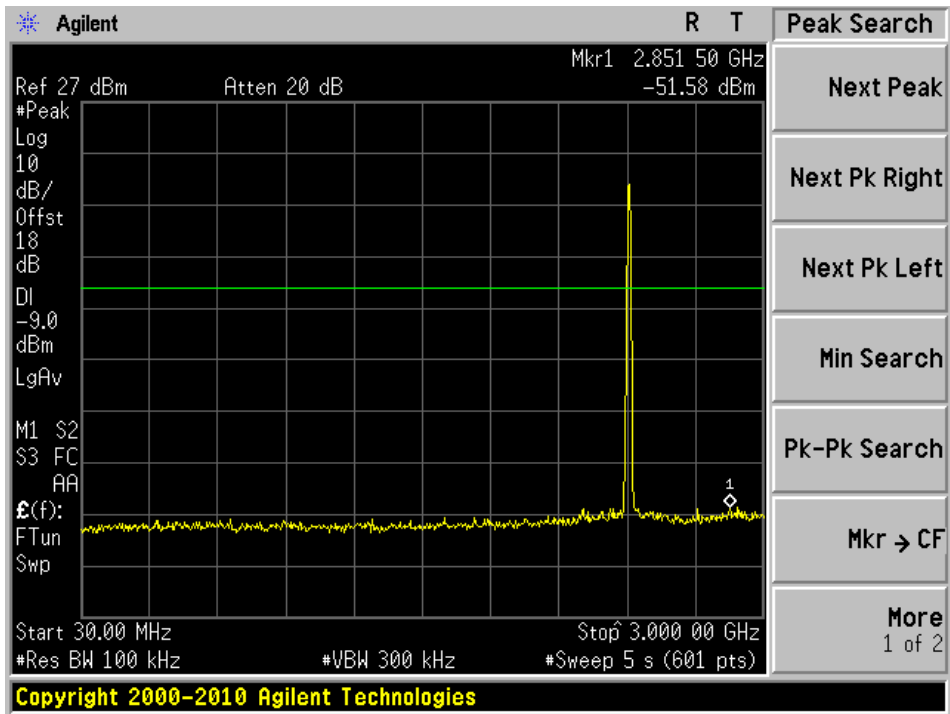


802.11b Low channel, Chain J3, above 3GHz

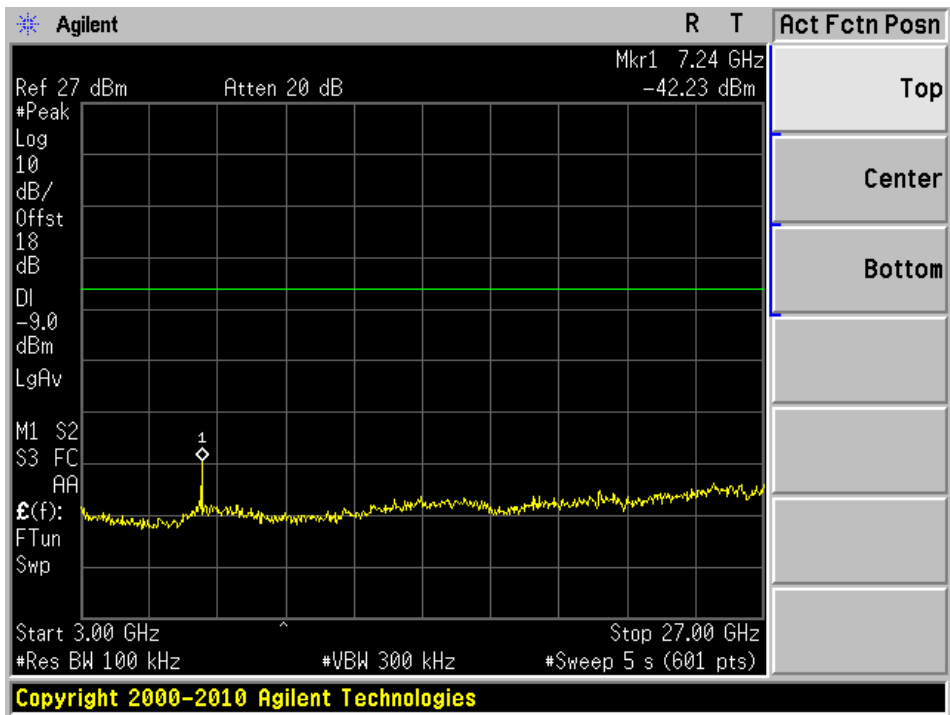


Chain J4 is not active during test

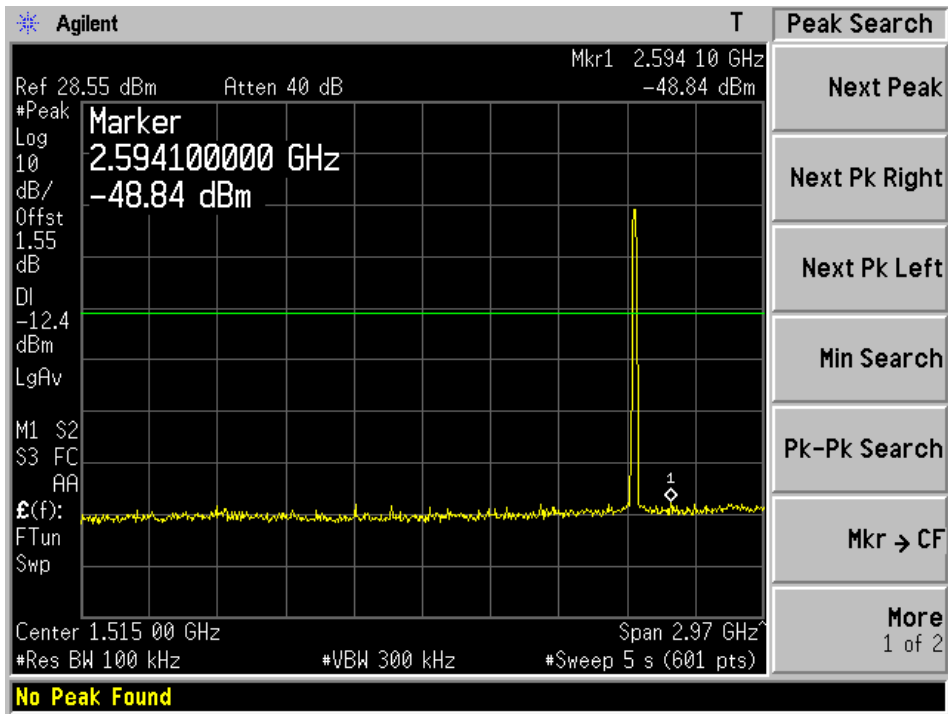
802.11b Low channel, Chain J1+J2+J3, below 3GHz



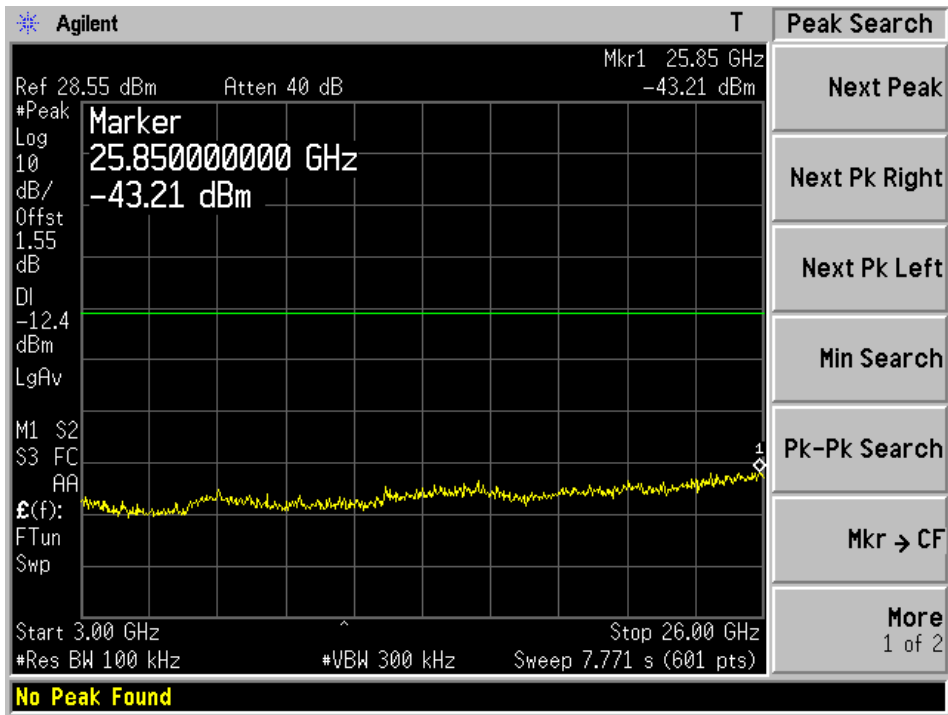
802.11b Low channel, Chain J1+J2+J3, above 3GHz



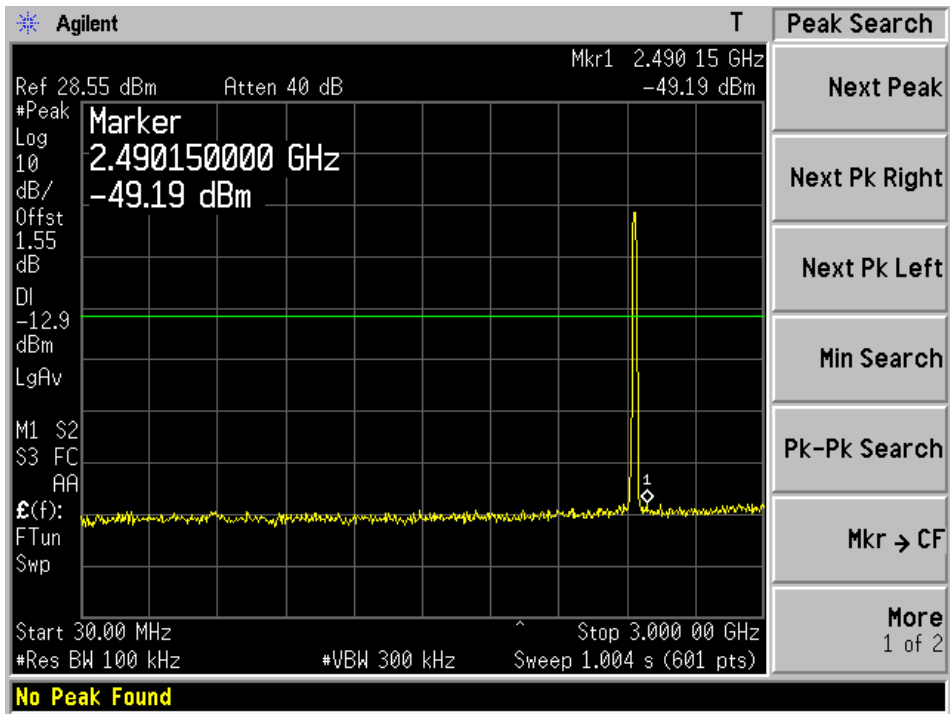
802.11b Middle channel, Chain J1, below 3GHz



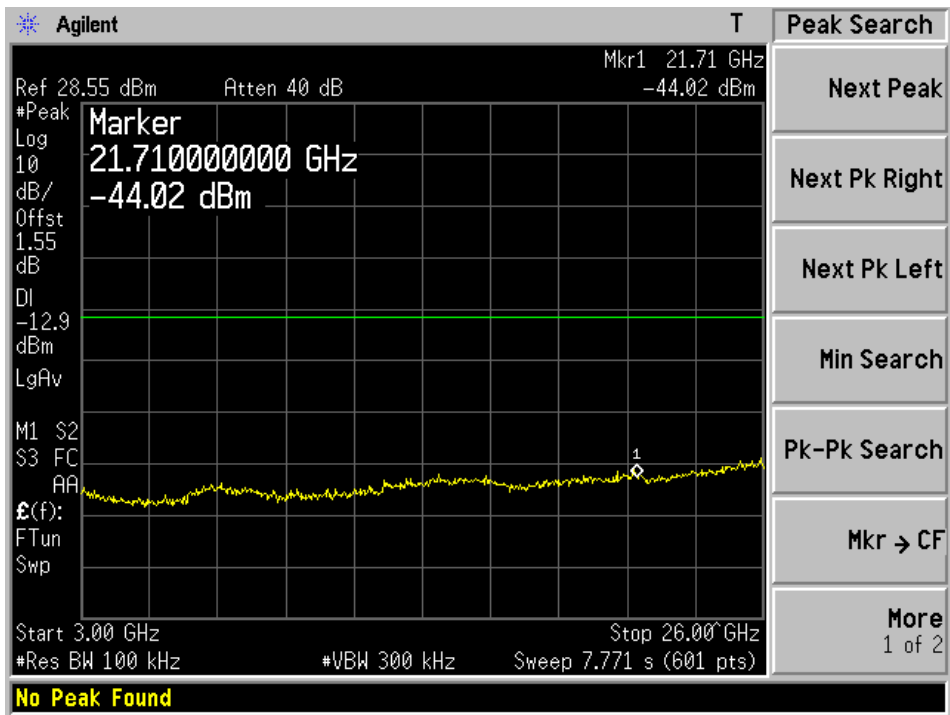
802.11b Middle channel, Chain J1, above 3GHz



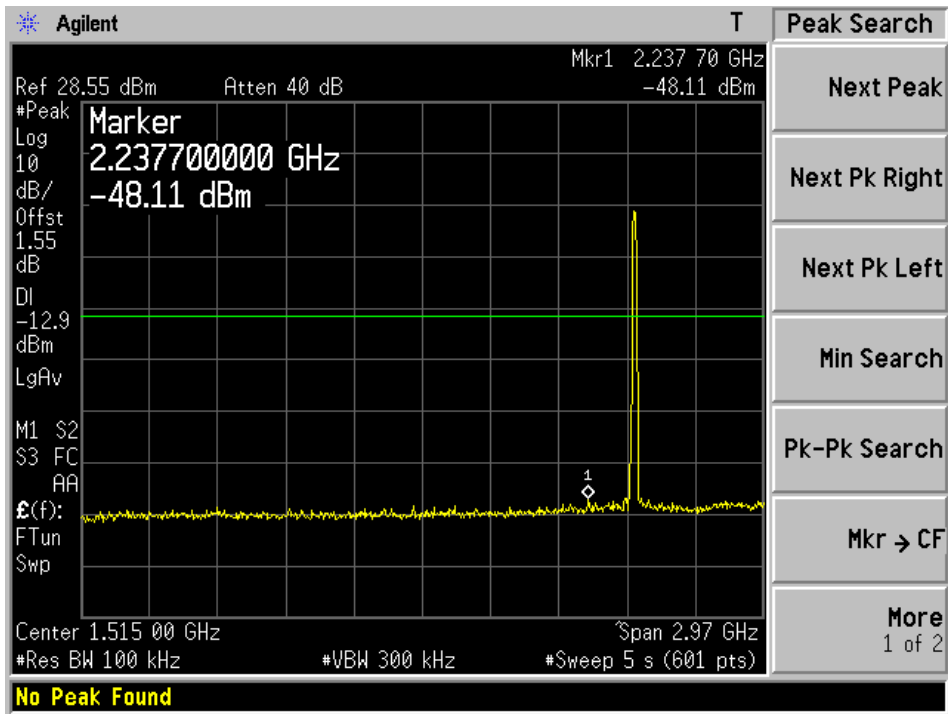
802.11b Middle channel, Chain J2, below 3GHz



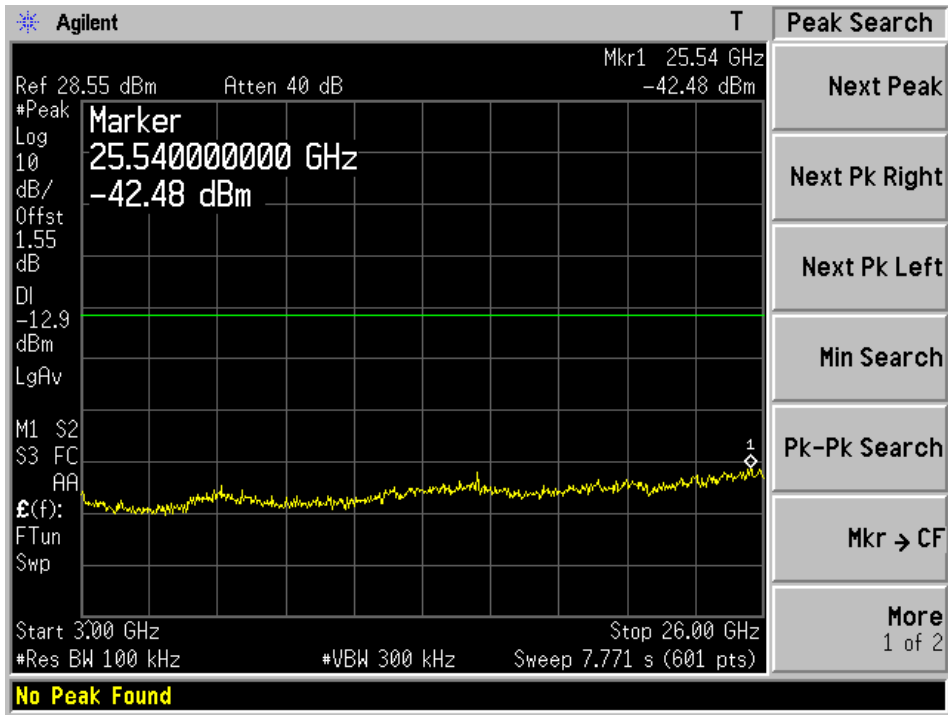
802.11b Middle channel, Chain J2, above 3GHz



802.11b Middle channel, Chain J3, below 3GHz

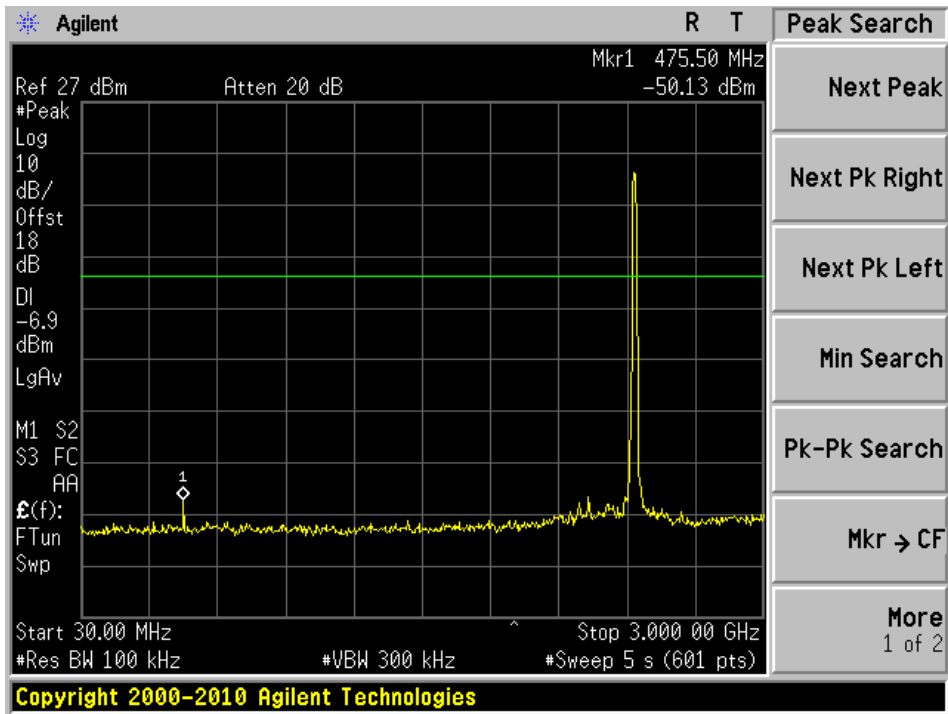


802.11b Middle channel, Chain J3, above 3GHz

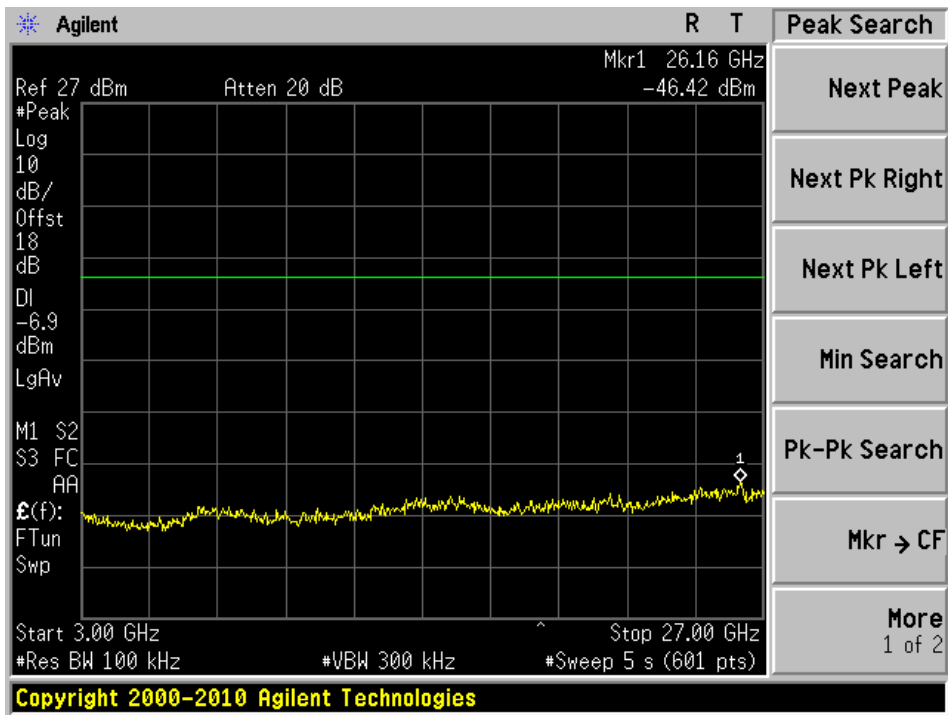


Chain J4 is not active during test

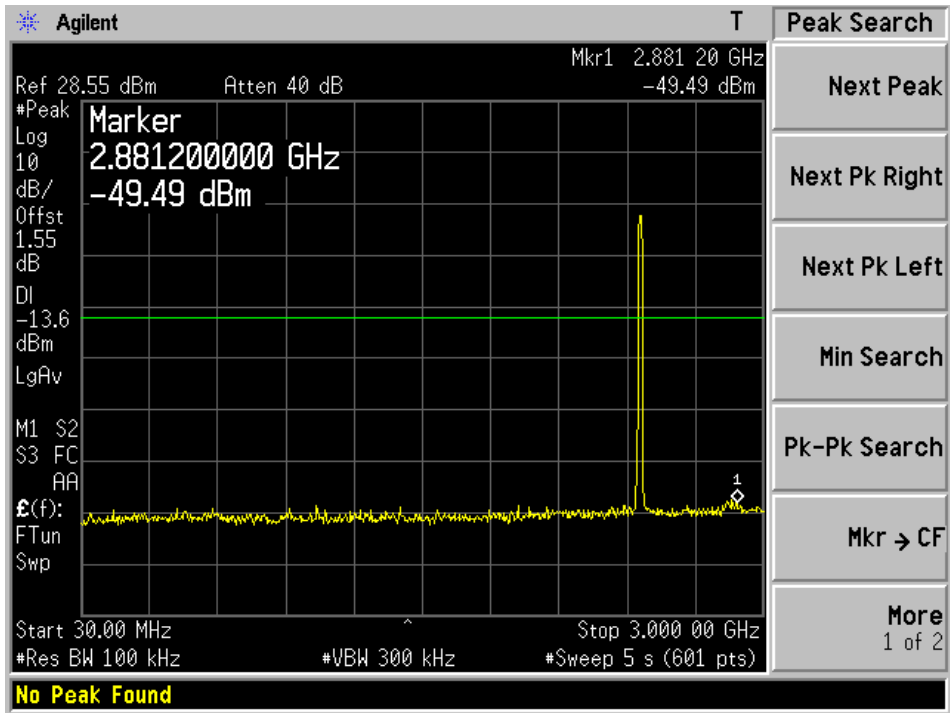
802.11b Middle channel, Chain J1+J2+J3, below 3GHz



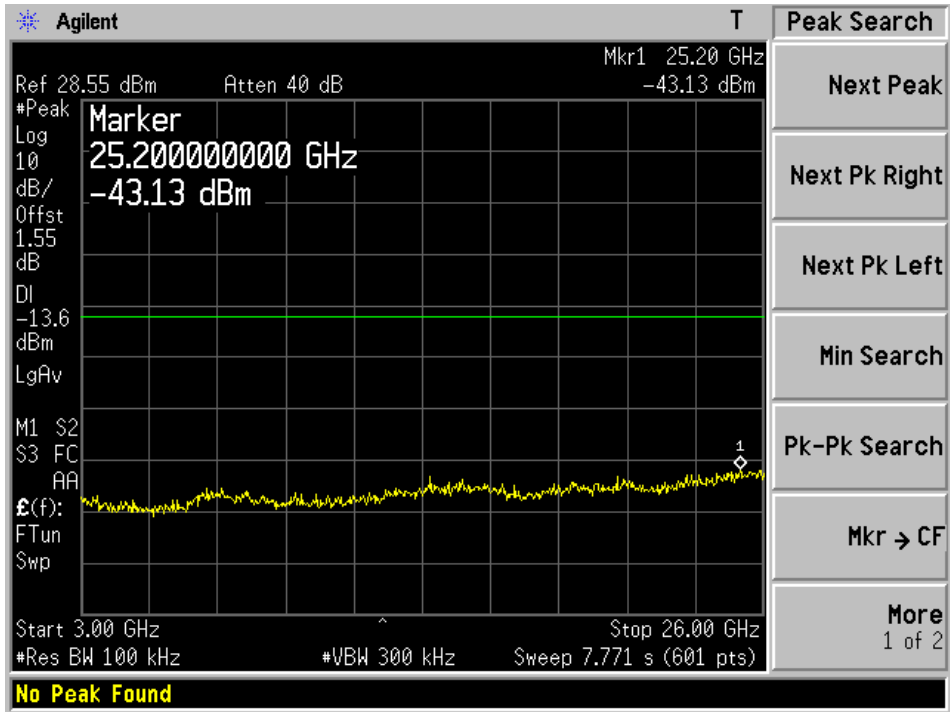
802.11b Middle channel, Chain J1+J2+J3, above 3GHz



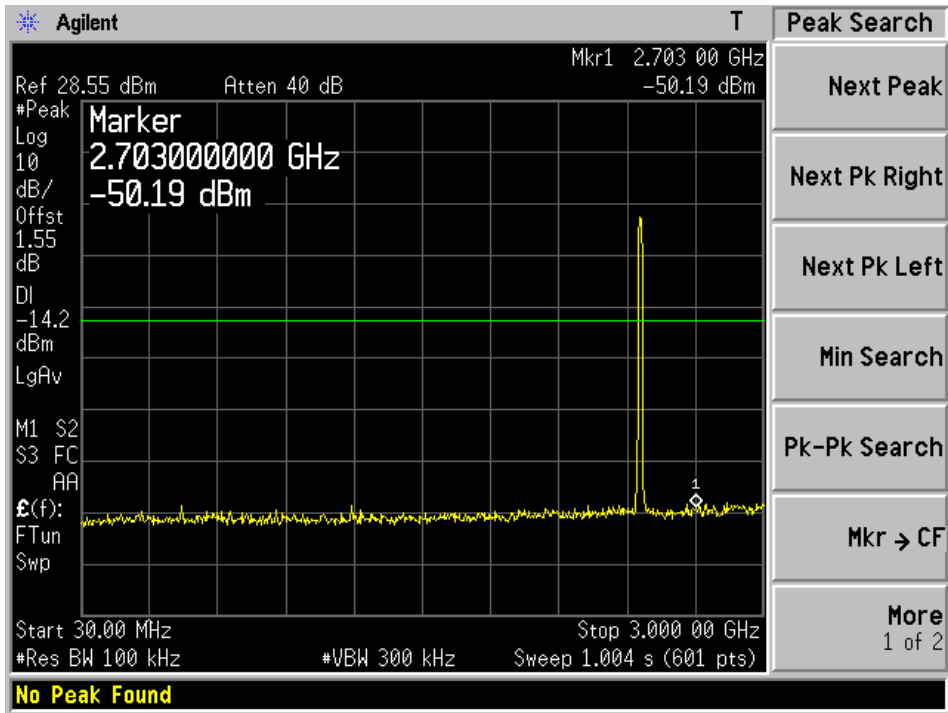
802.11b High channel, Chain J1, below 3GHz



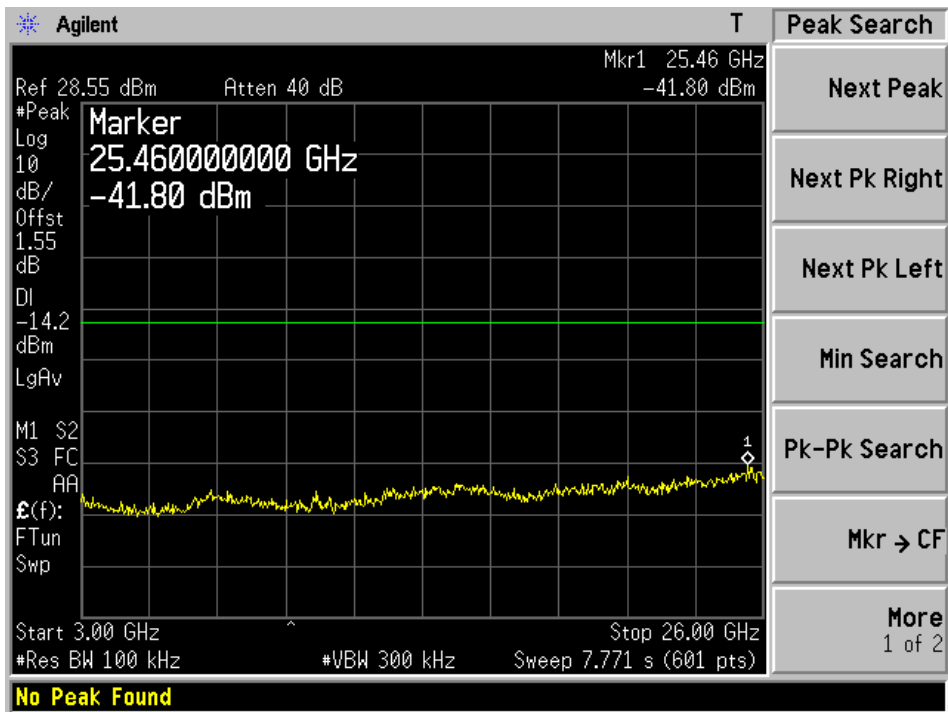
802.11b High channel, Chain J1, above 3GHz



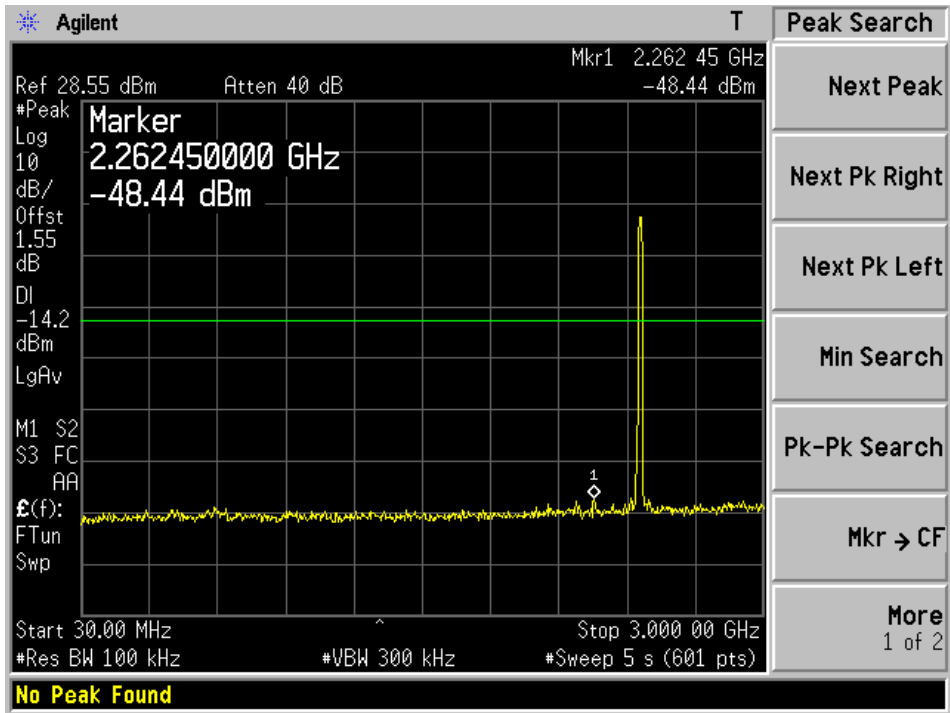
802.11b High channel, Chain J2, below 3GHz



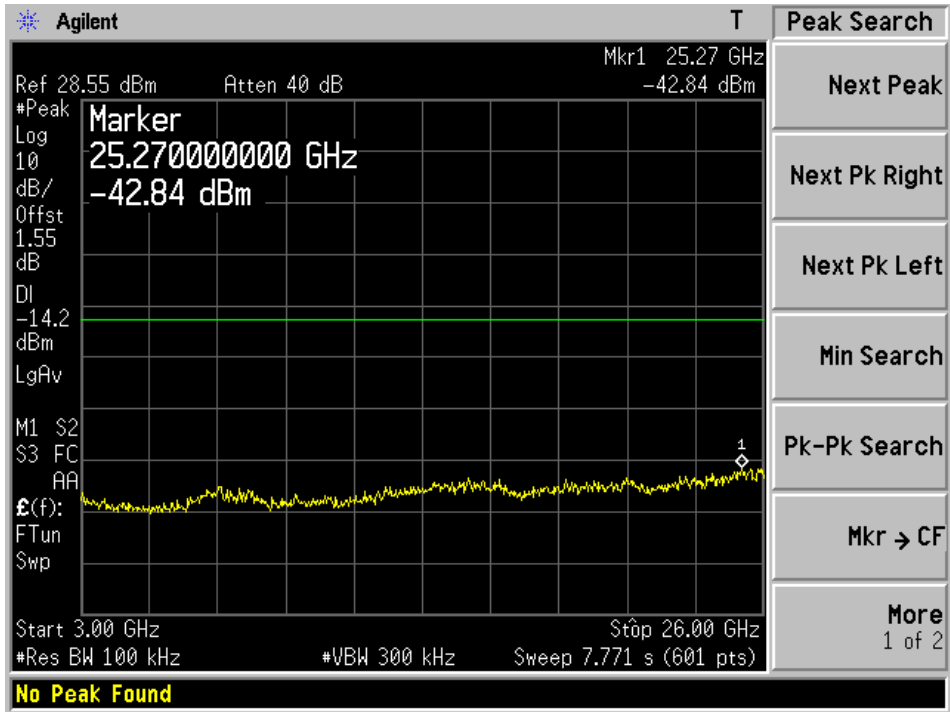
802.11b High channel, Chain J2, above 3GHz



802.11b High channel, Chain J3, below 3GHz

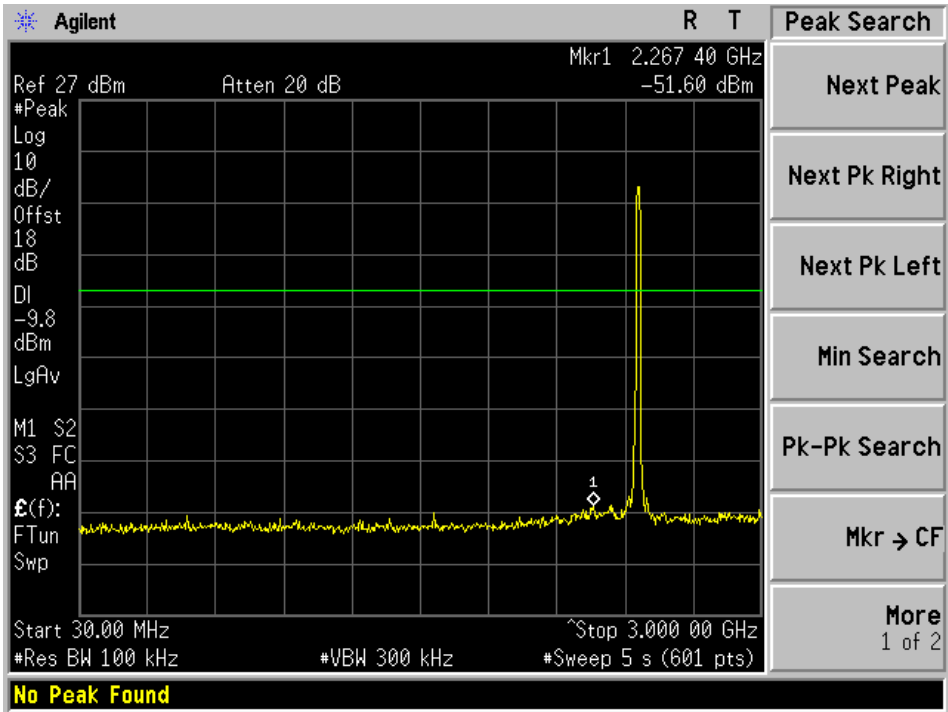


802.11b High channel, Chain J3, above 3GHz

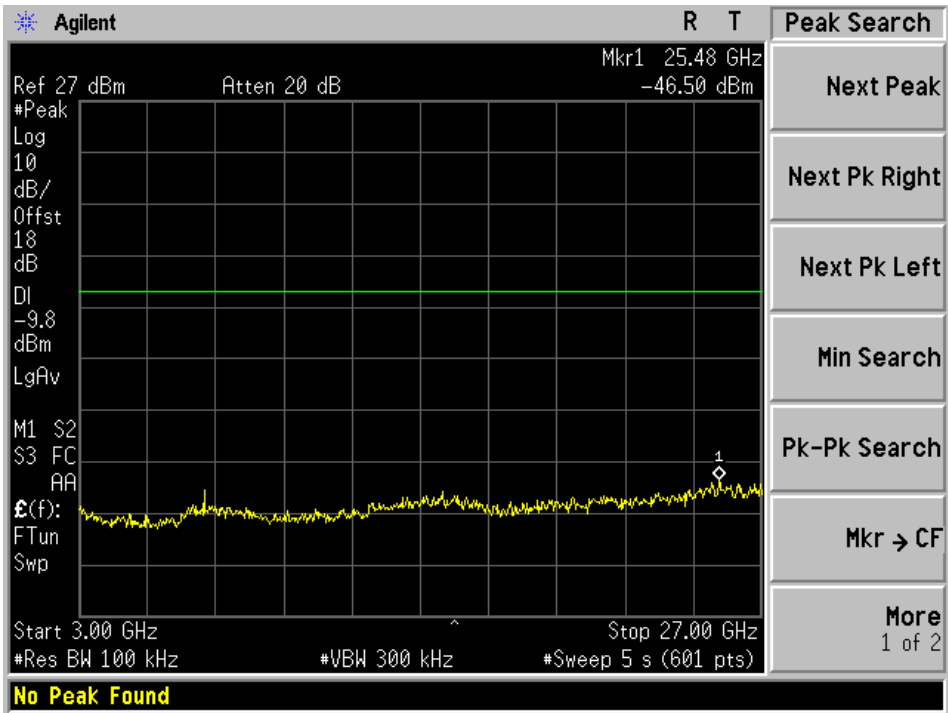


Chain J4 is not active during test

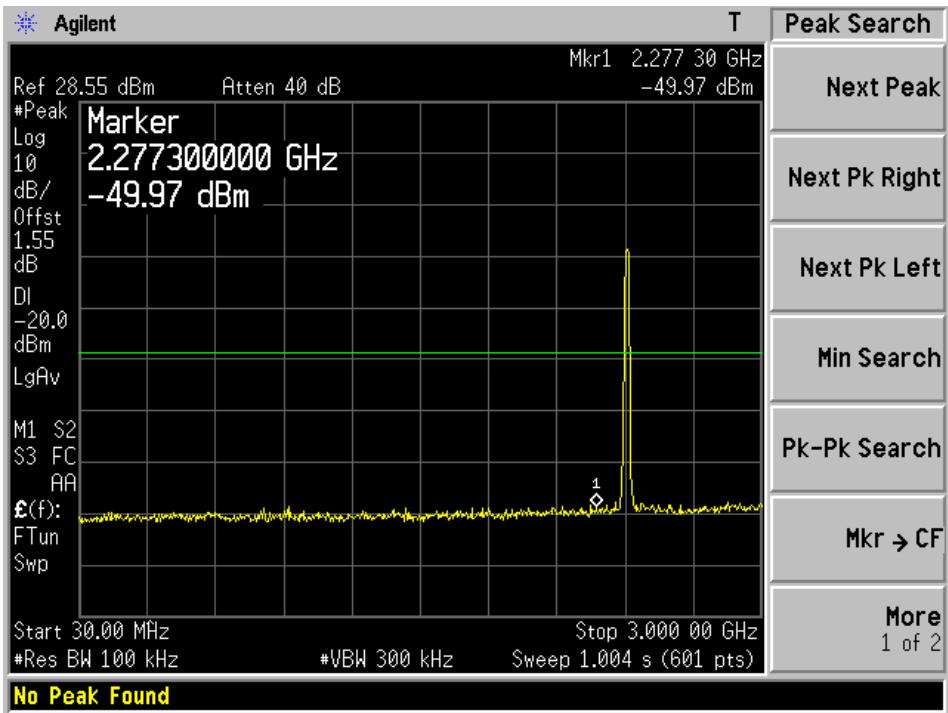
802.11b High channel, Chain J1+J2+J3, below 3GHz



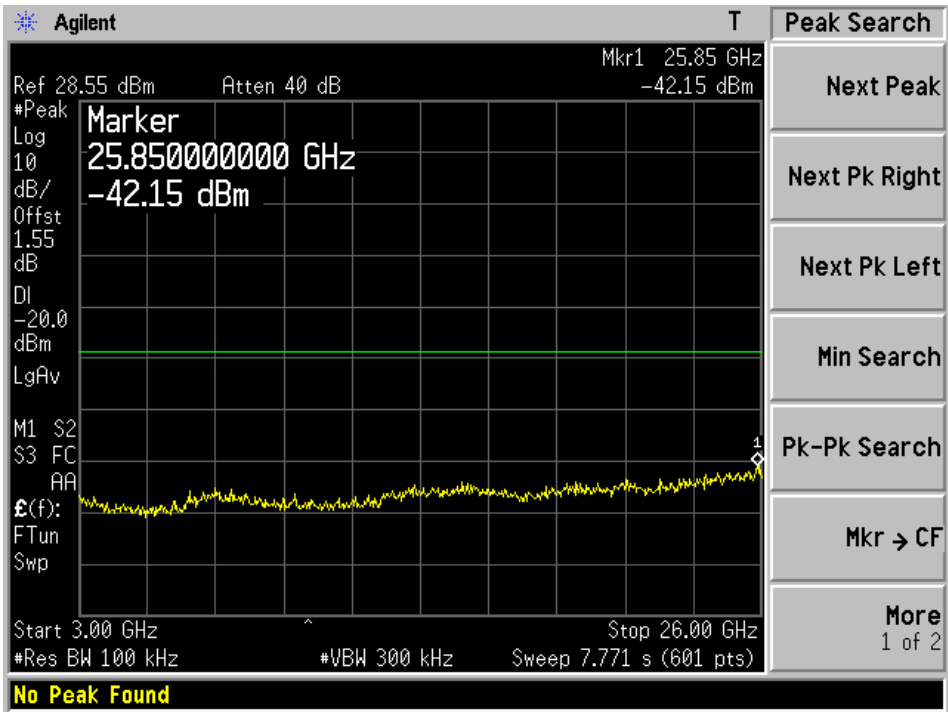
802.11b High channel, Chain J1+J2+J3, above 3GHz



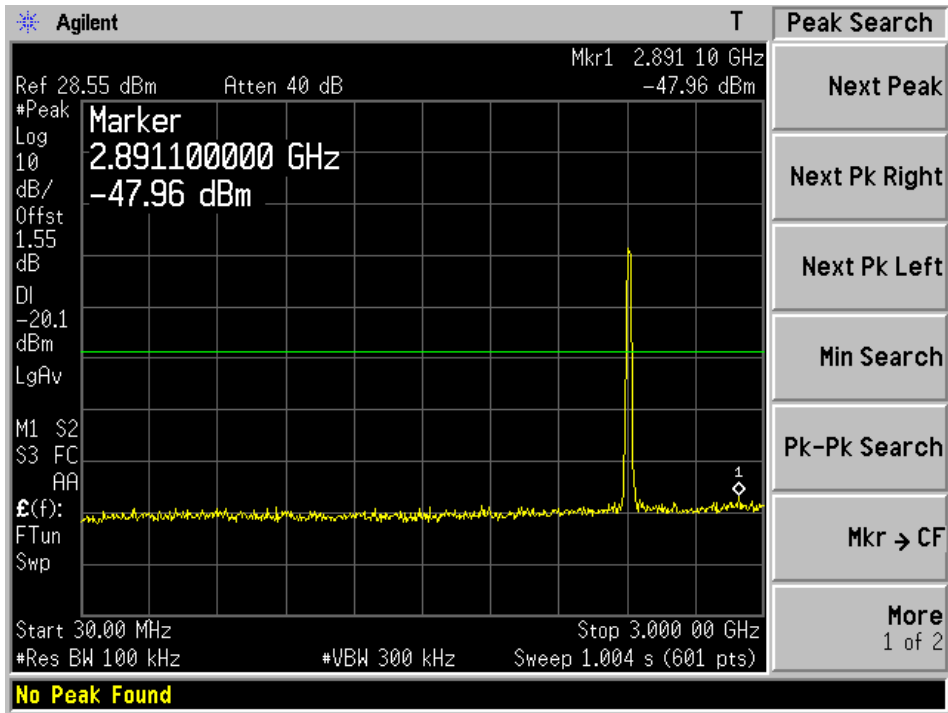
802.11g Low channel, Chain J1, below 3GHz



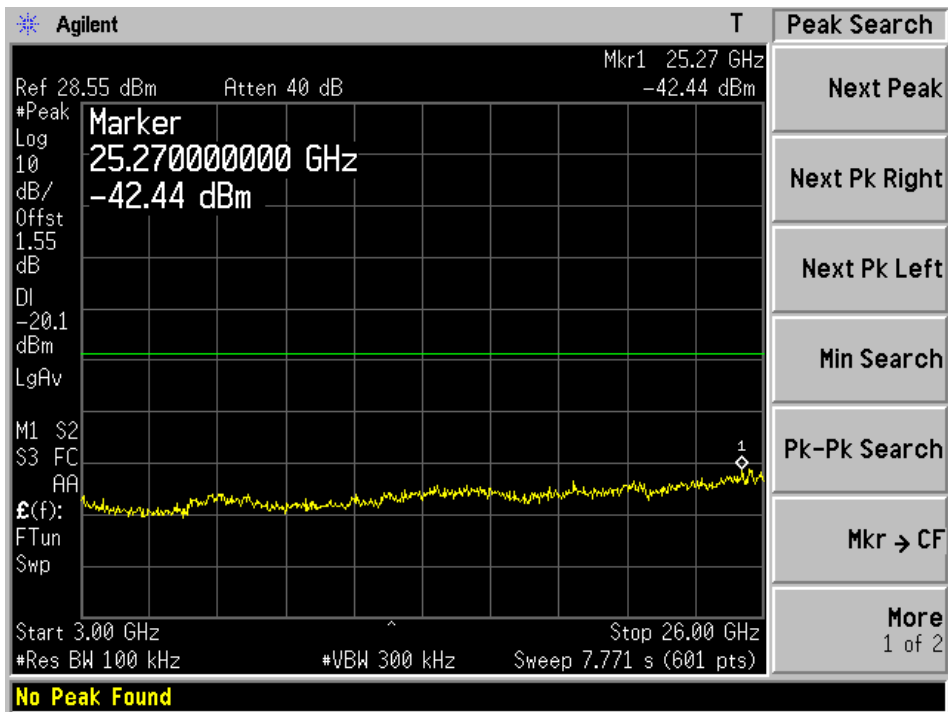
802.11g Low channel, Chain J1, above 3GHz



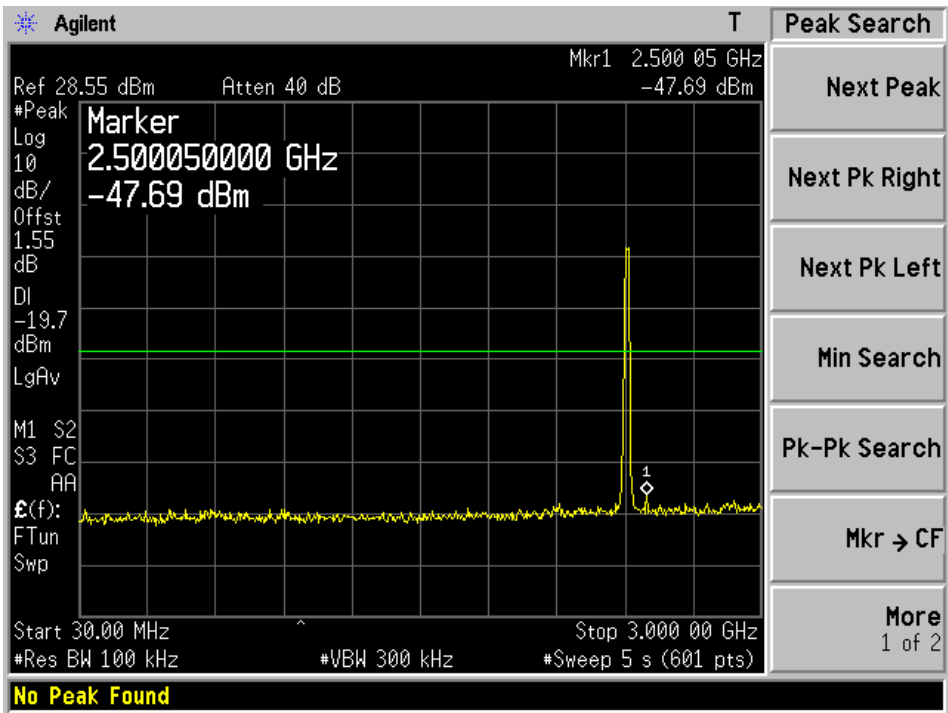
802.11g Low channel, Chain J2, below 3GHz



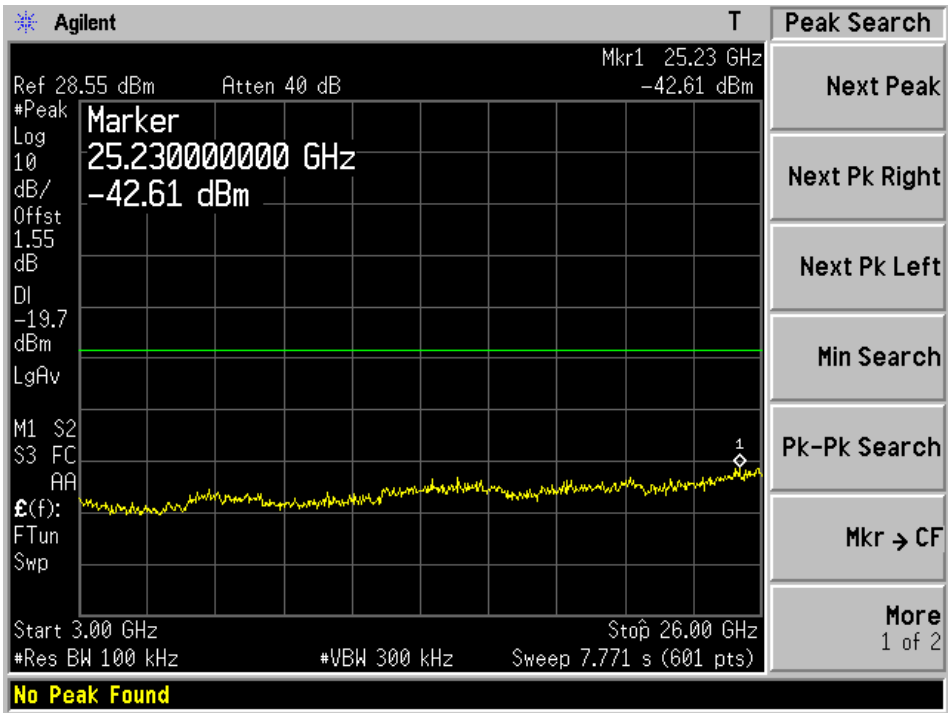
802.11g Low channel, Chain J2, above 3GHz



802.11g Low channel, Chain J3, below 3GHz

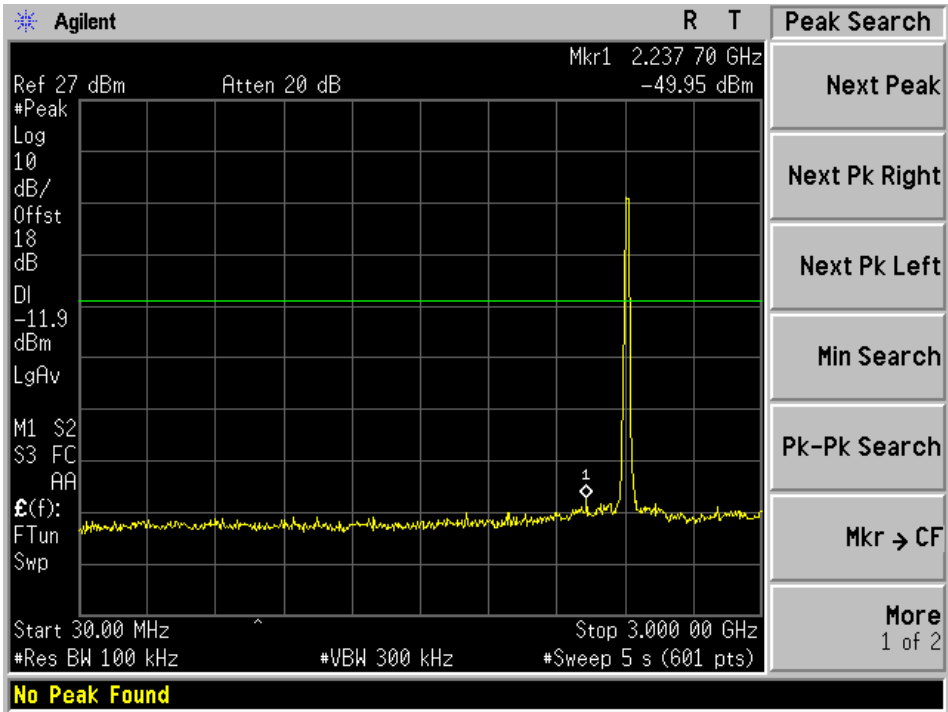


802.11g Low channel, Chain J3, above 3GHz

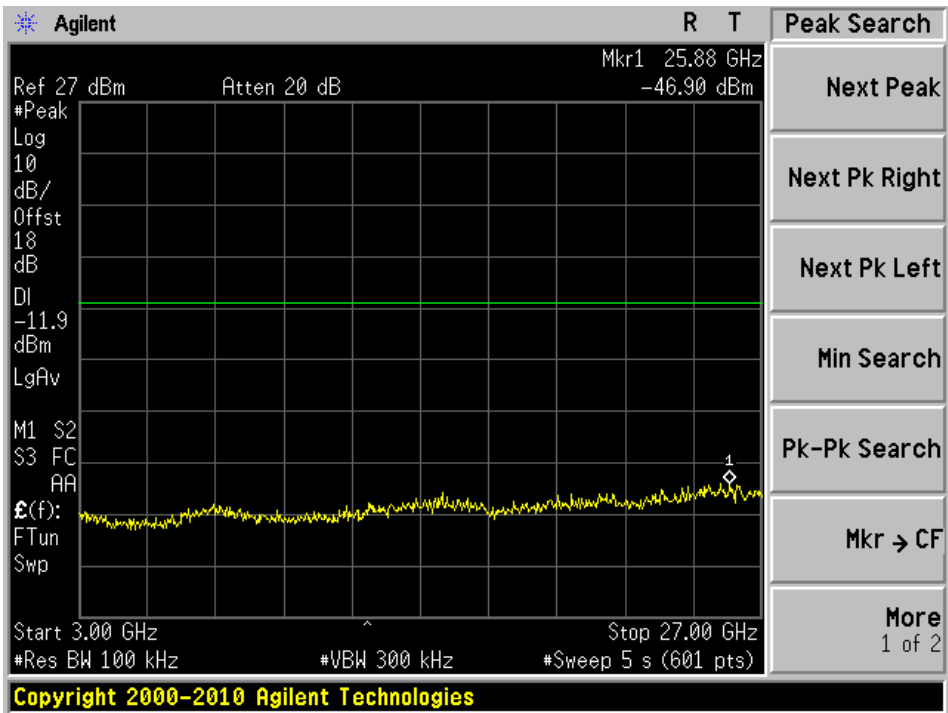


Chain J4 is not active during test

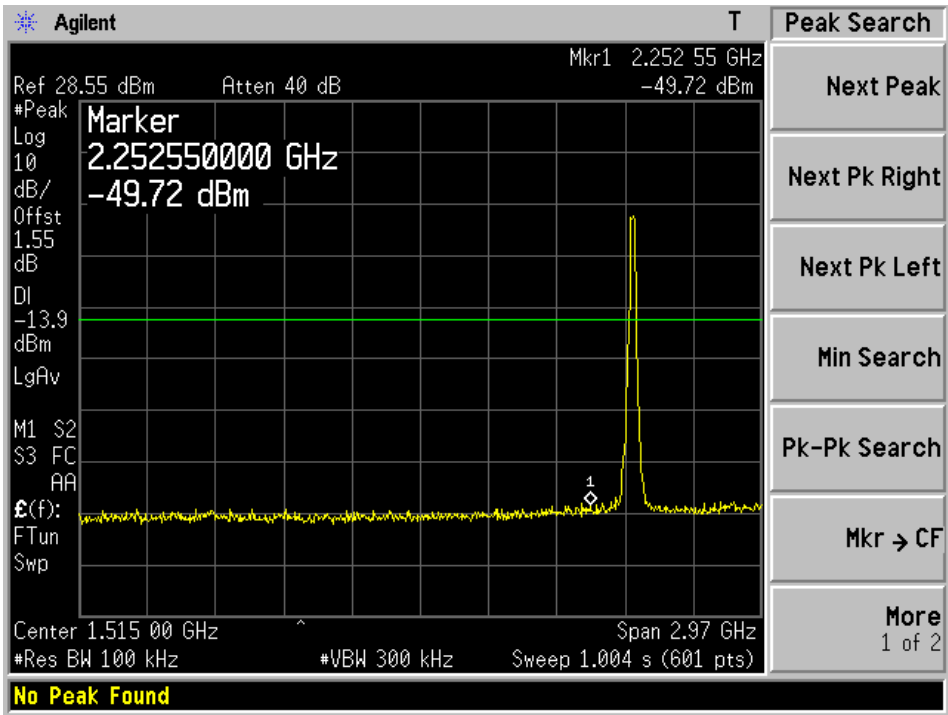
802.11g Low channel, Chain J1+J2+J3, below 3GHz



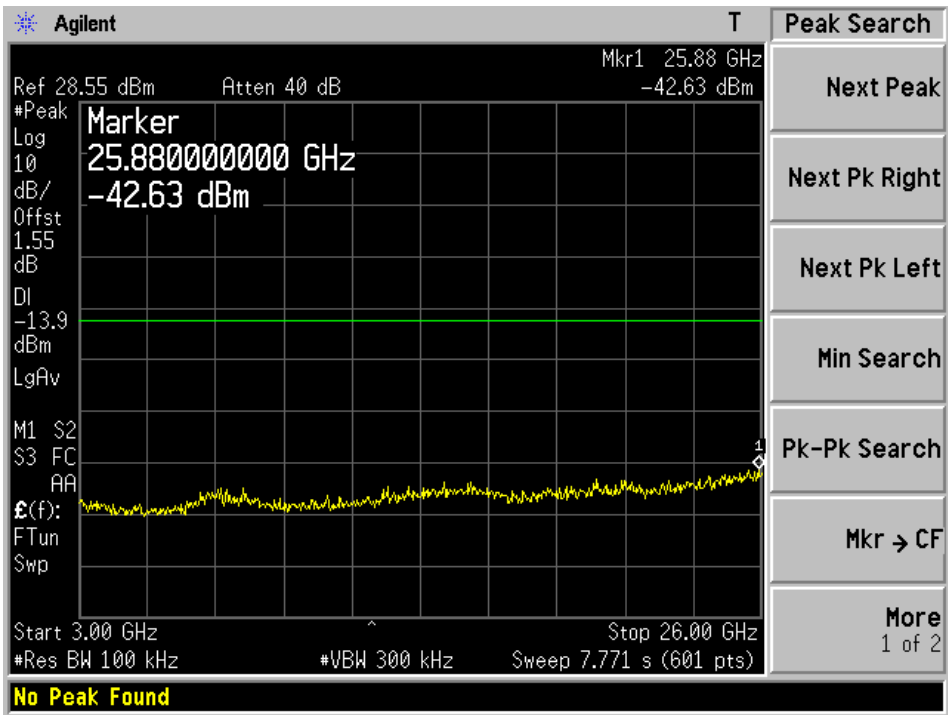
802.11g Low channel, Chain J1+J2+J3, above 3GHz



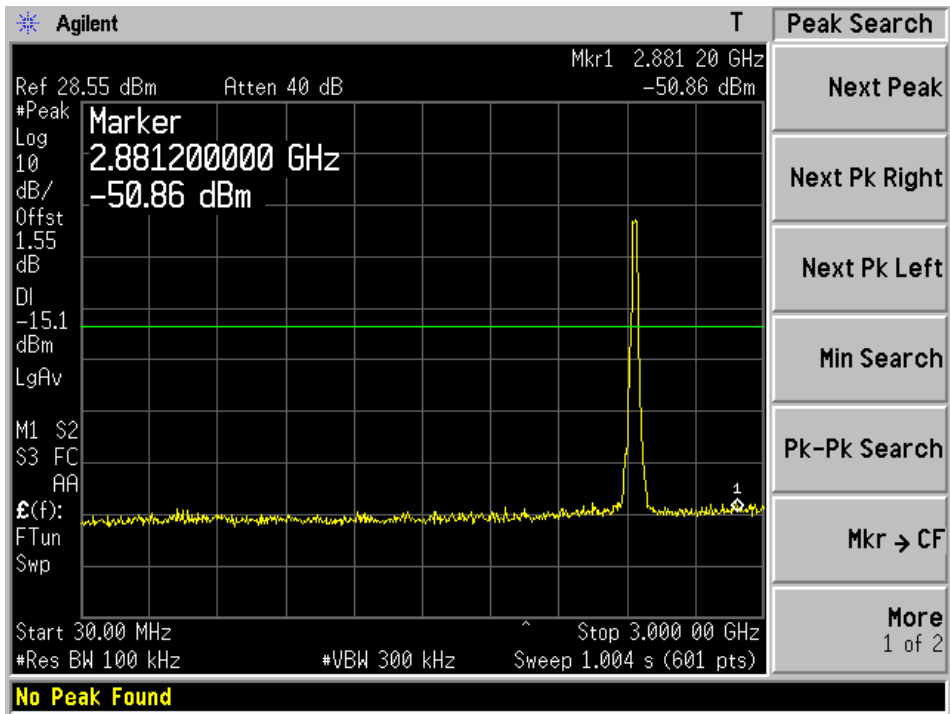
802.11g Middle channel, Chain J1, below 3GHz



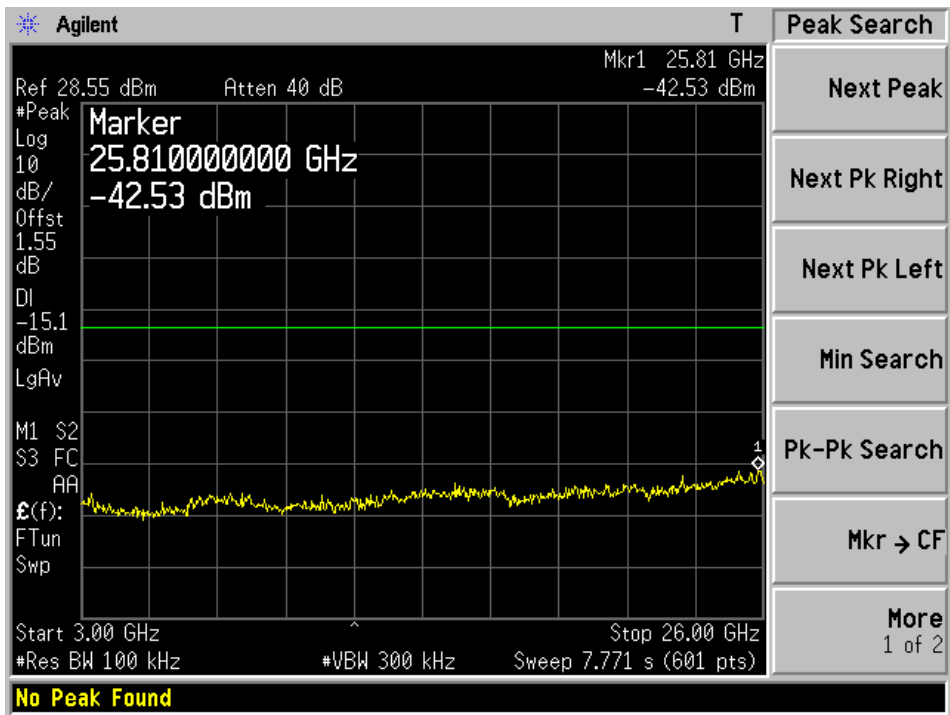
802.11g Middle channel, Chain J1, above 3GHz



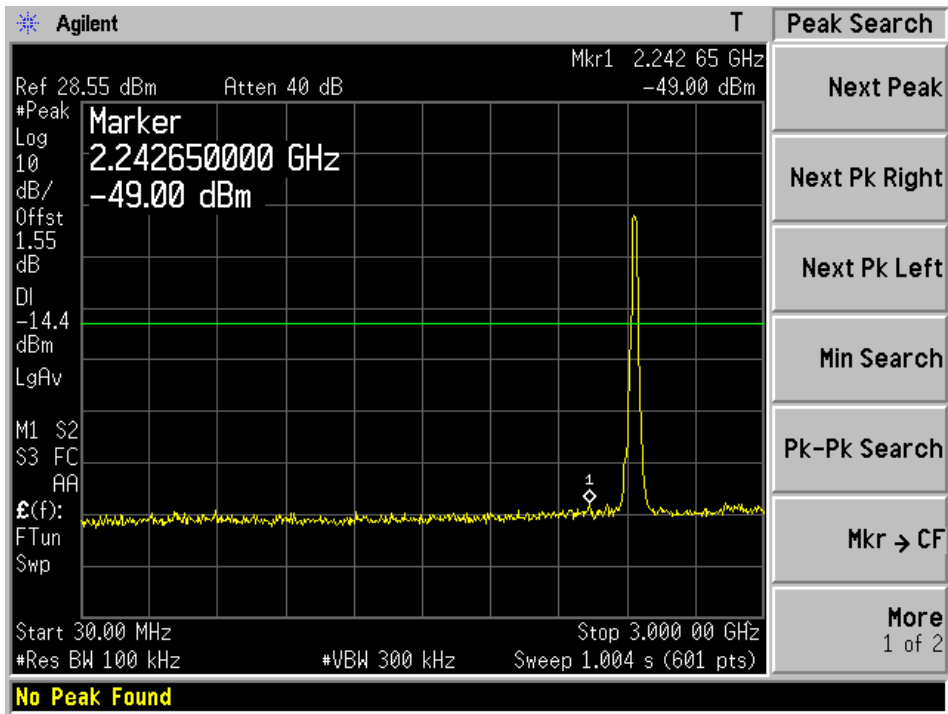
802.11g Middle channel, Chain J2, below 3GHz



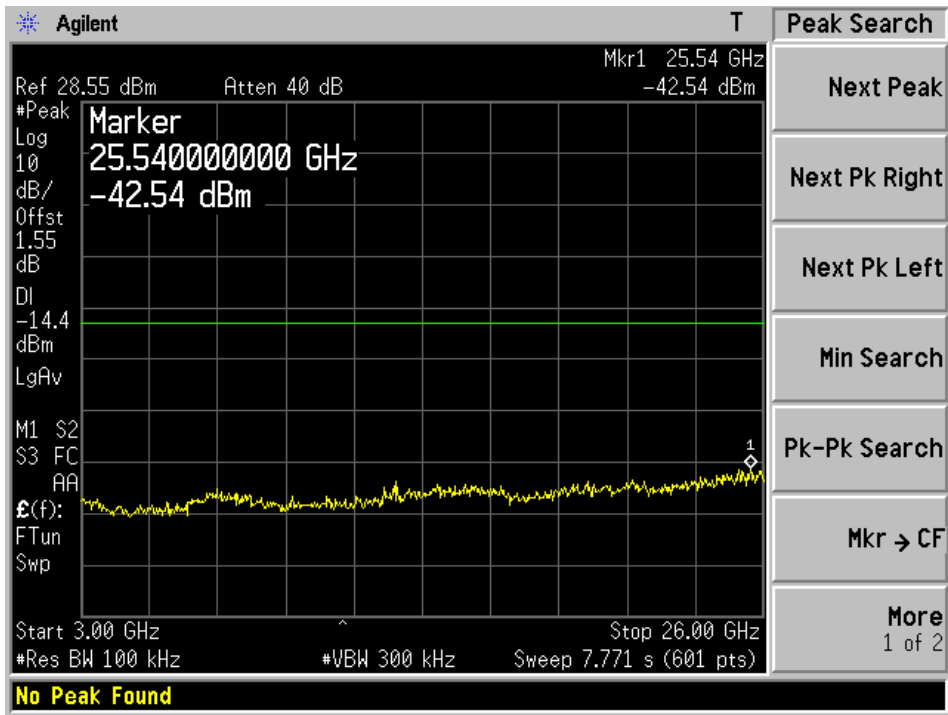
802.11g Middle channel, Chain J2, above 3GHz



802.11g Middle channel, Chain J3, below 3GHz

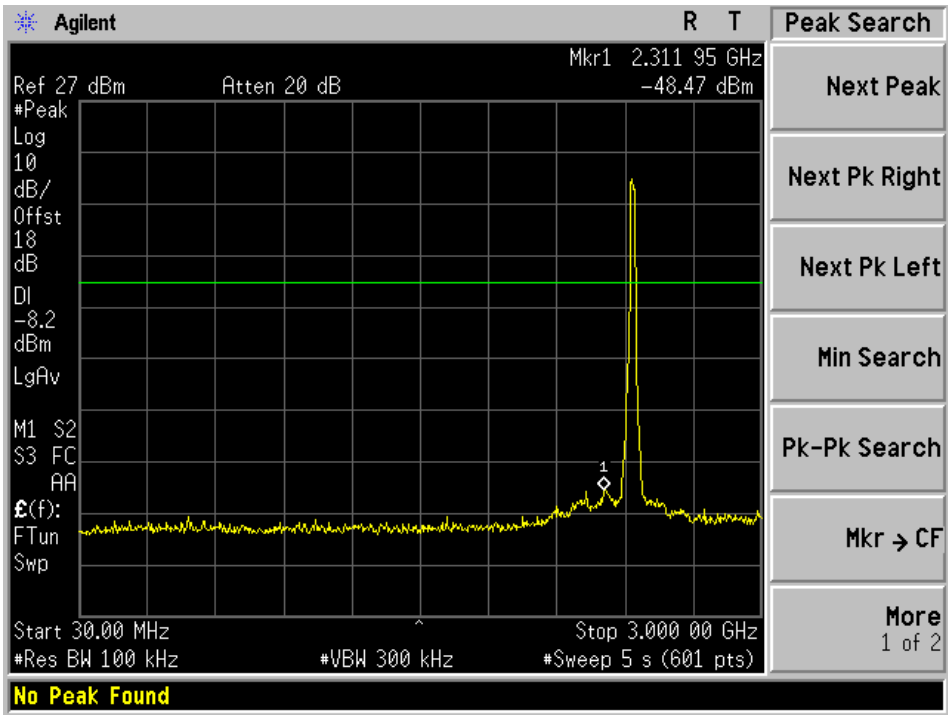


802.11g Middle channel, Chain J3, above 3GHz

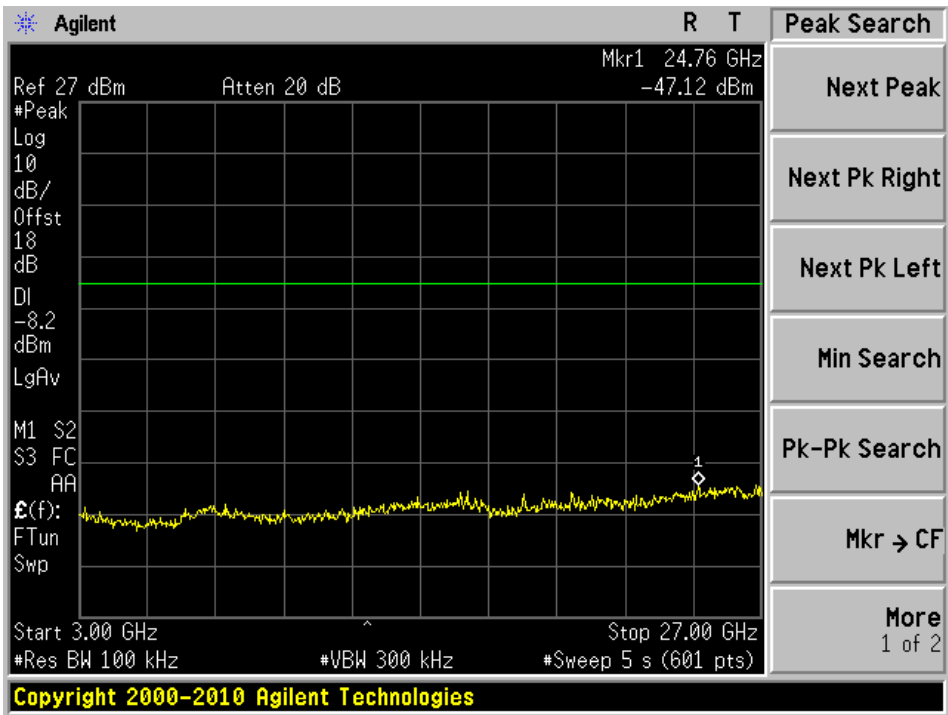


Chain J4 is not active during test.

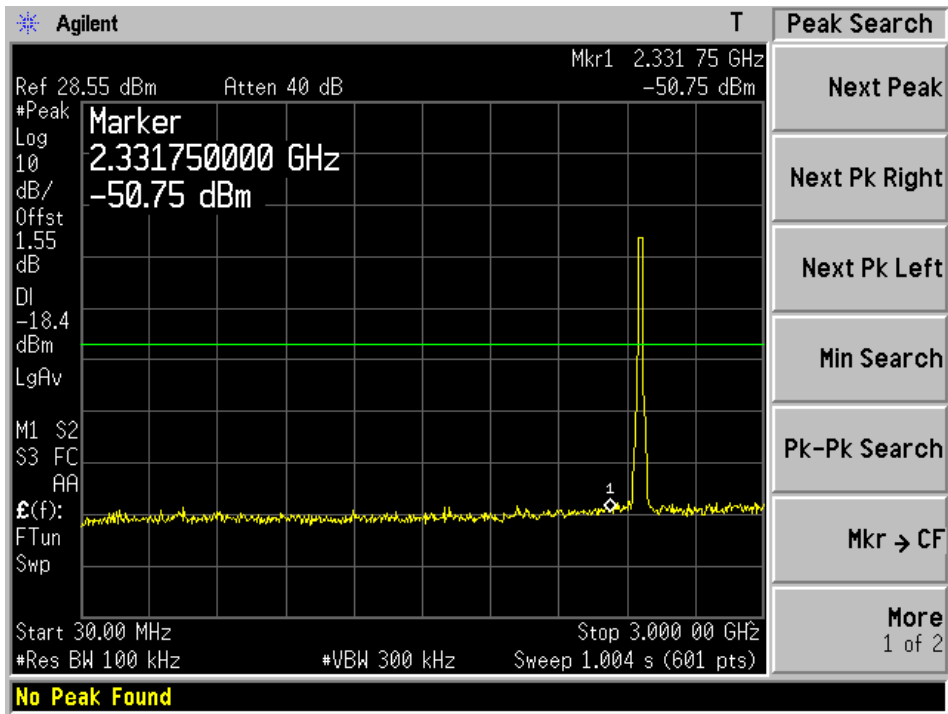
802.11g Middle channel, Chain J1+J2+J3, below 3GHz



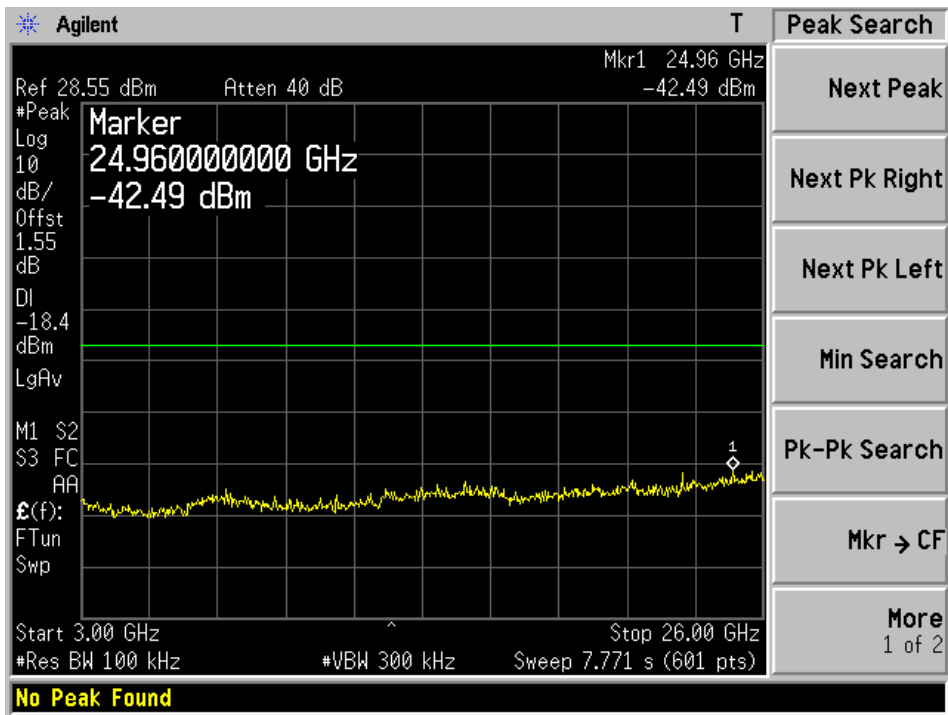
802.11g Middle channel, Chain J1+J2+J3, above 3GHz



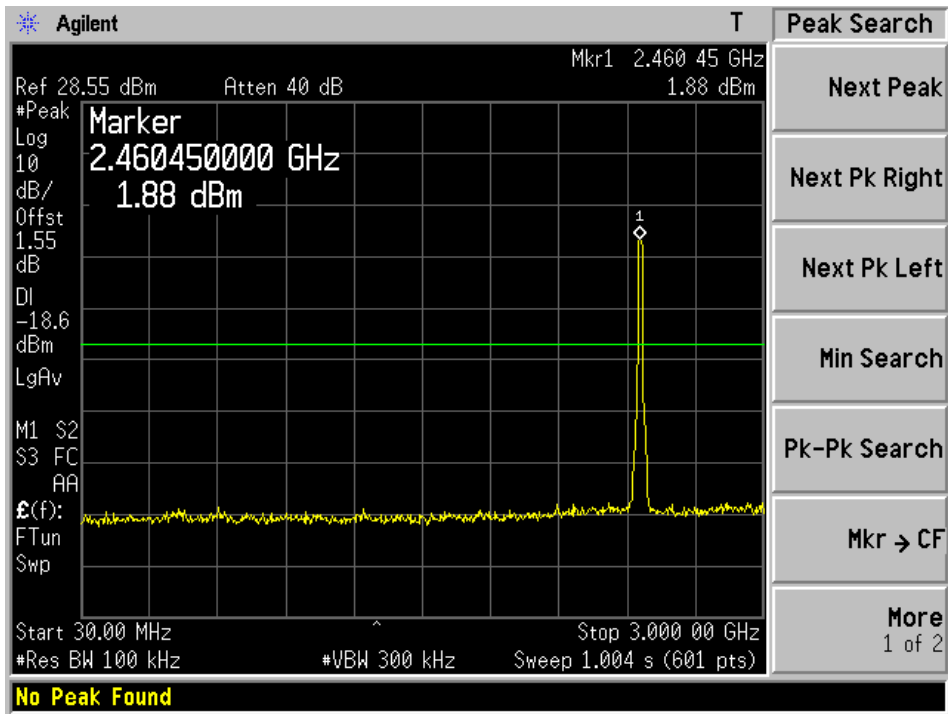
802.11g High channel, Chain J1, below 3GHz



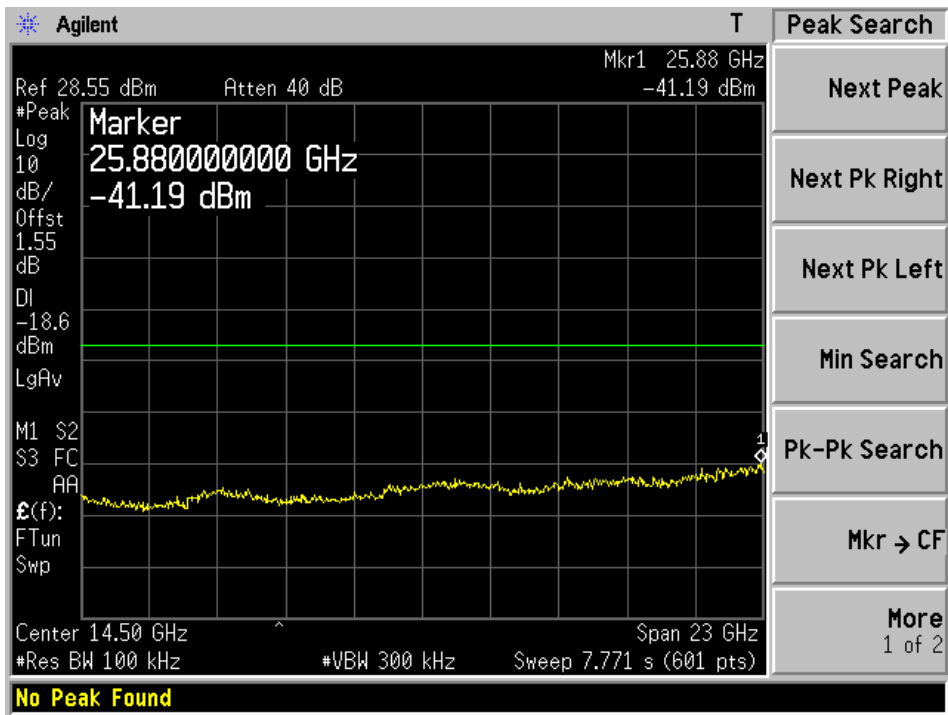
802.11g High channel, Chain J1, above 3GHz



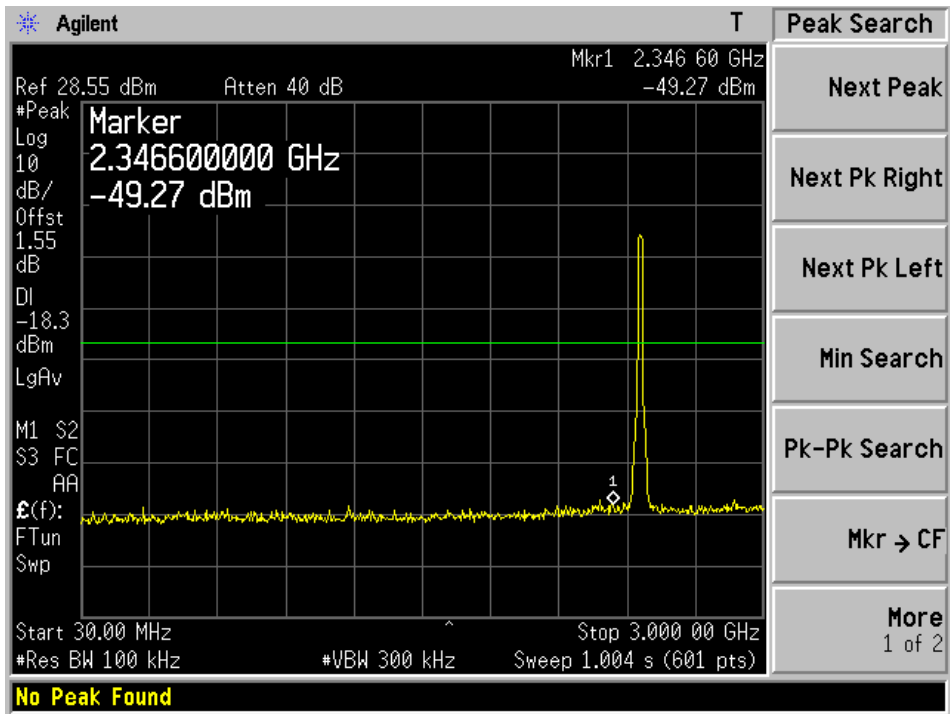
802.11g High channel, Chain J2, below 3GHz



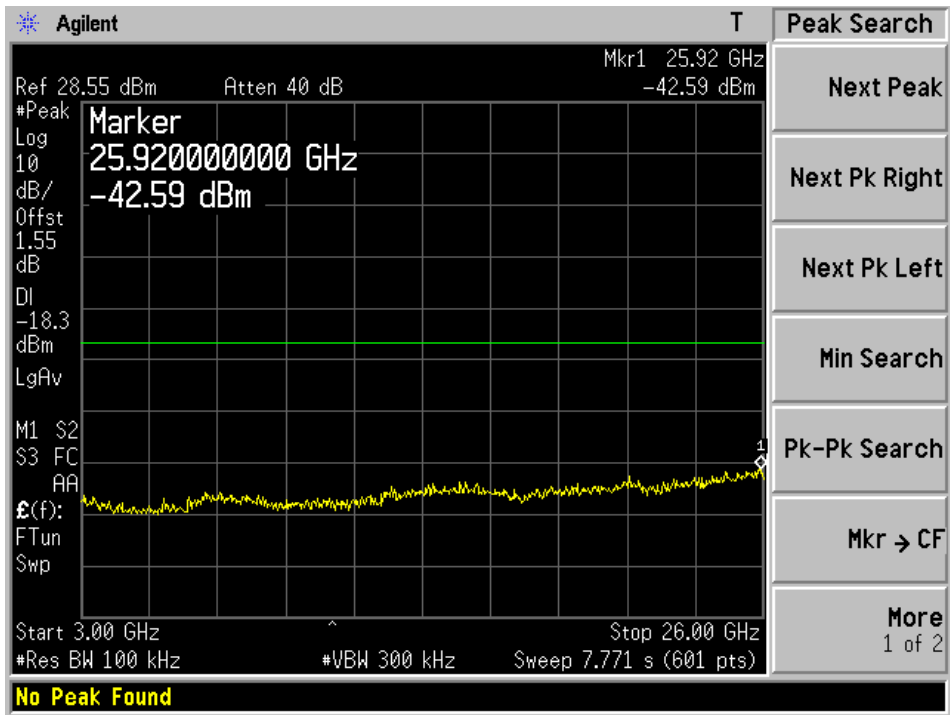
802.11g High channel, Chain J2, above 3GHz



802.11g High channel, Chain J3, below 3GHz

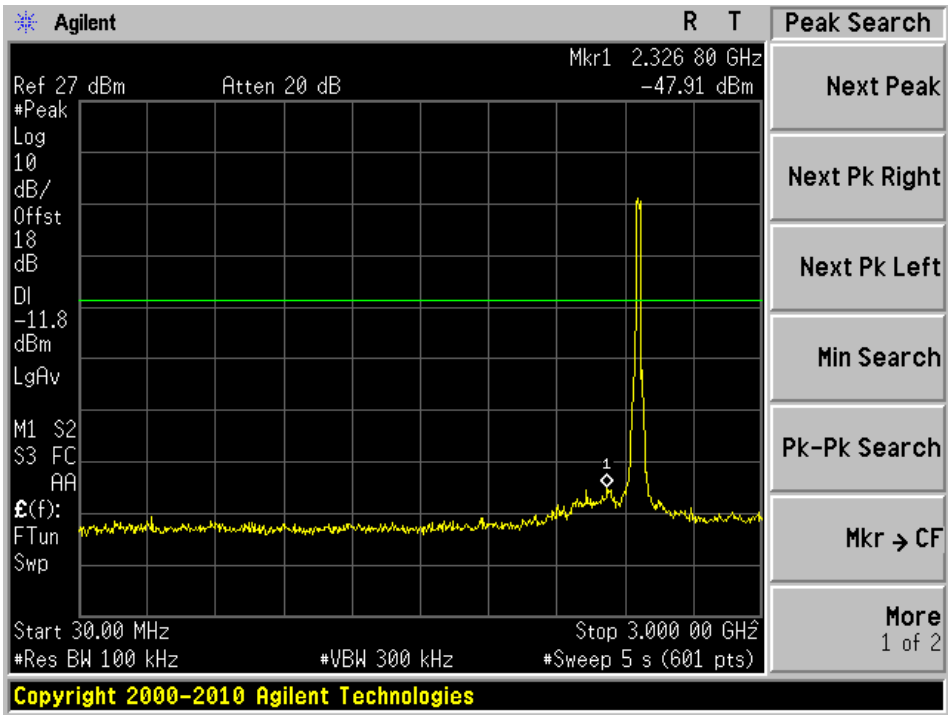


802.11g High channel, Chain J3, above 3GHz

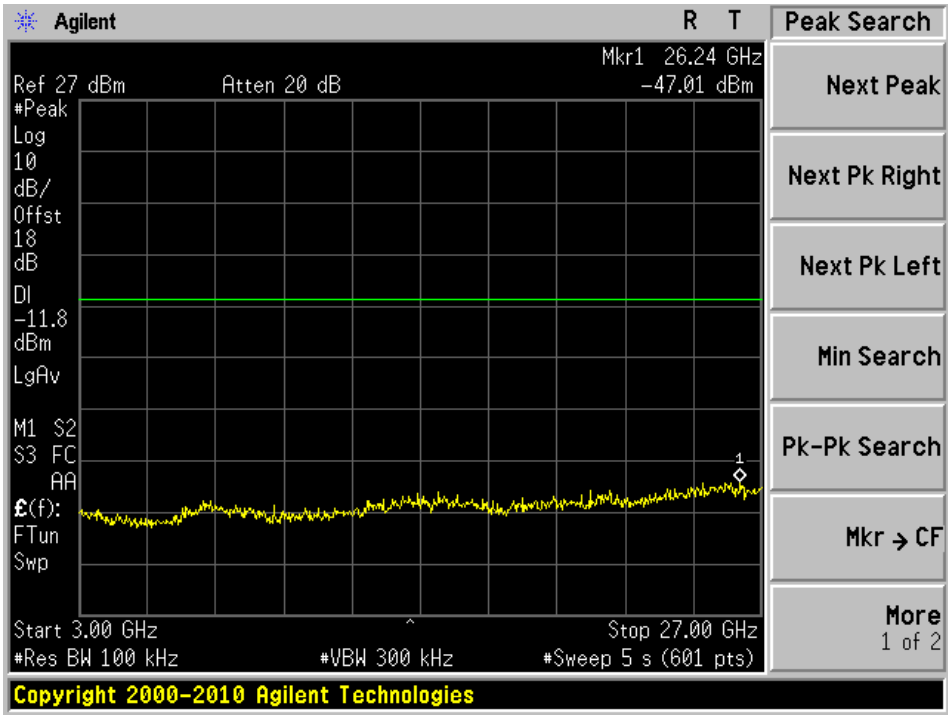


Chain J4 is not active during test

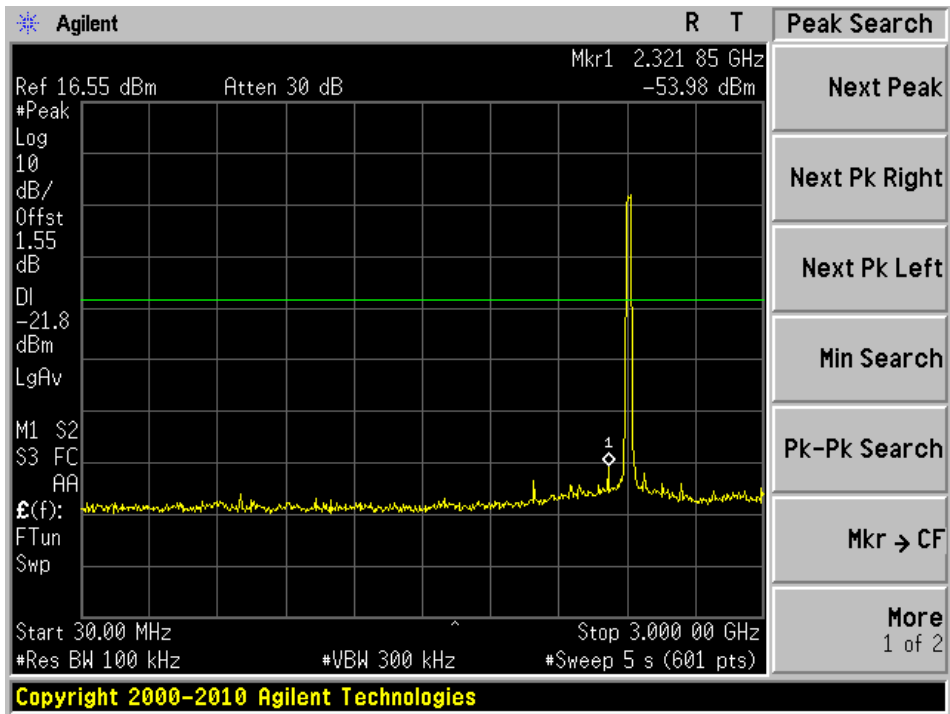
802.11g High channel, Chain J1+J2+J3, below 3GHz



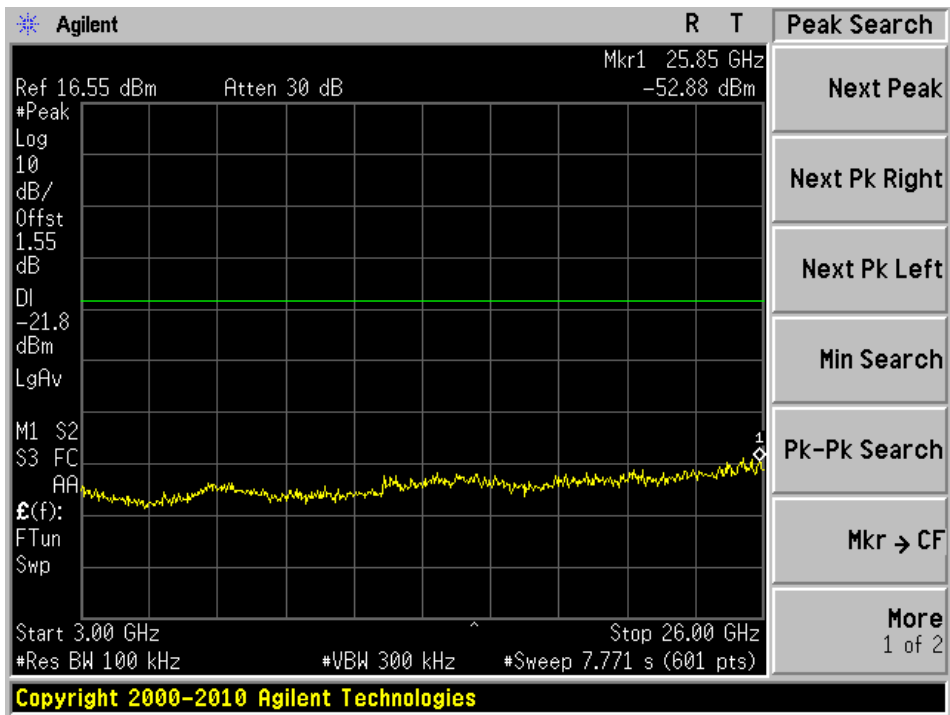
802.11g High channel, Chain J1+J2+J3, above 3GHz



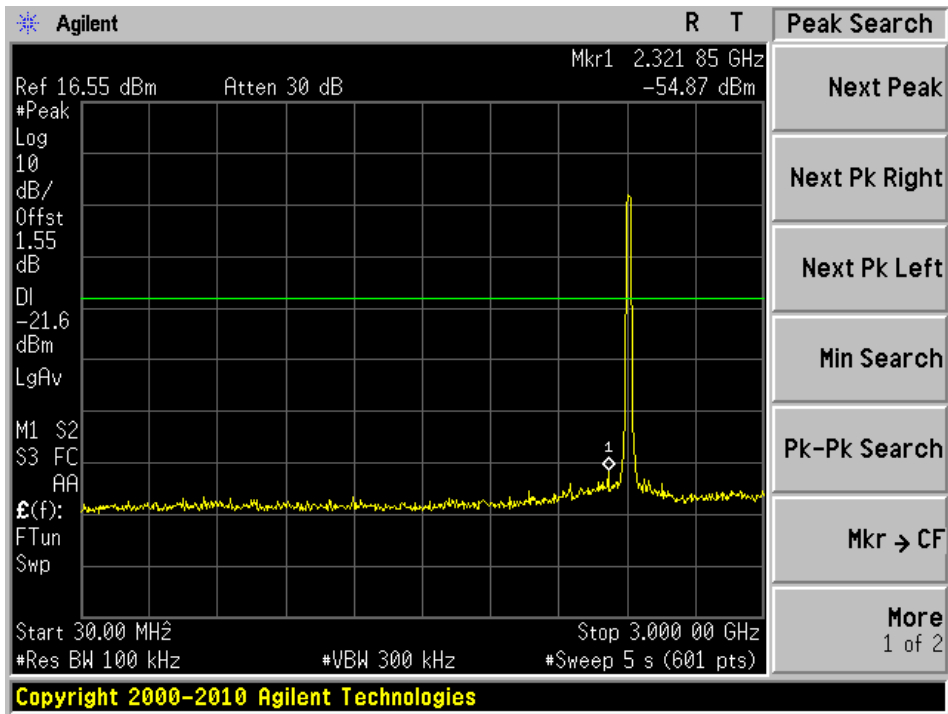
802.11n 20 MHz Low channel, Chain J1, below 3GHz



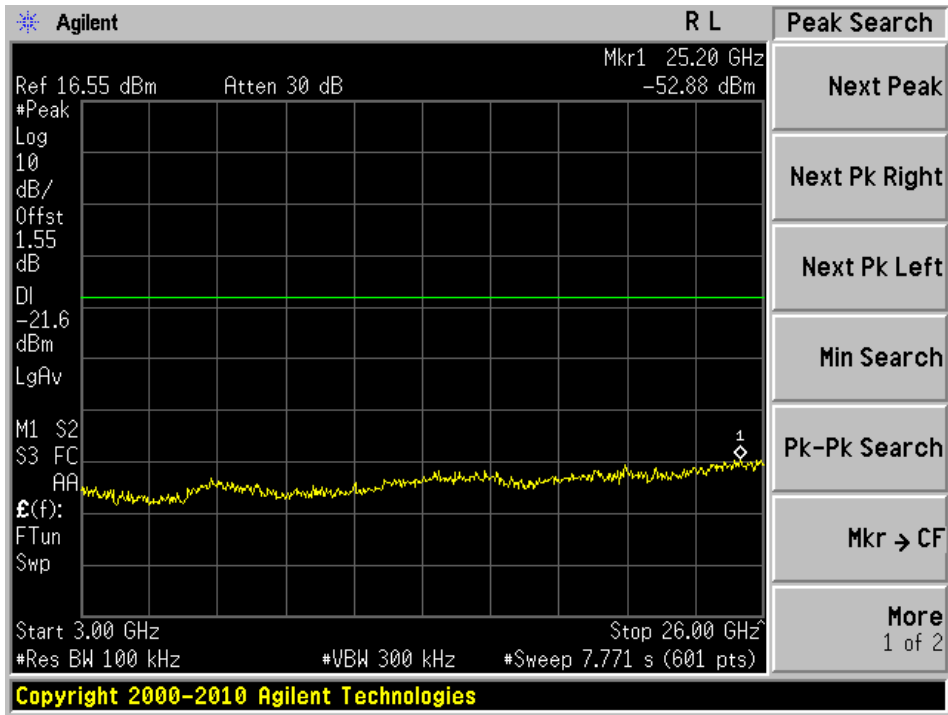
802.11n 20 MHz Low channel, Chain J1, above 3GHz



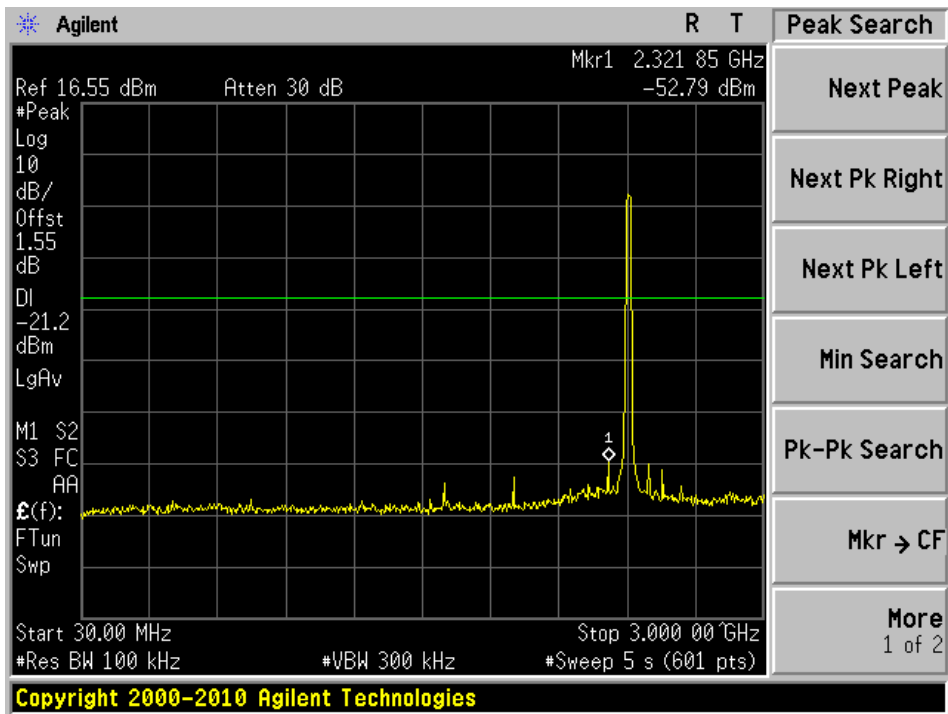
802.11n 20 MHz Low channel, Chain J2, below 3GHz



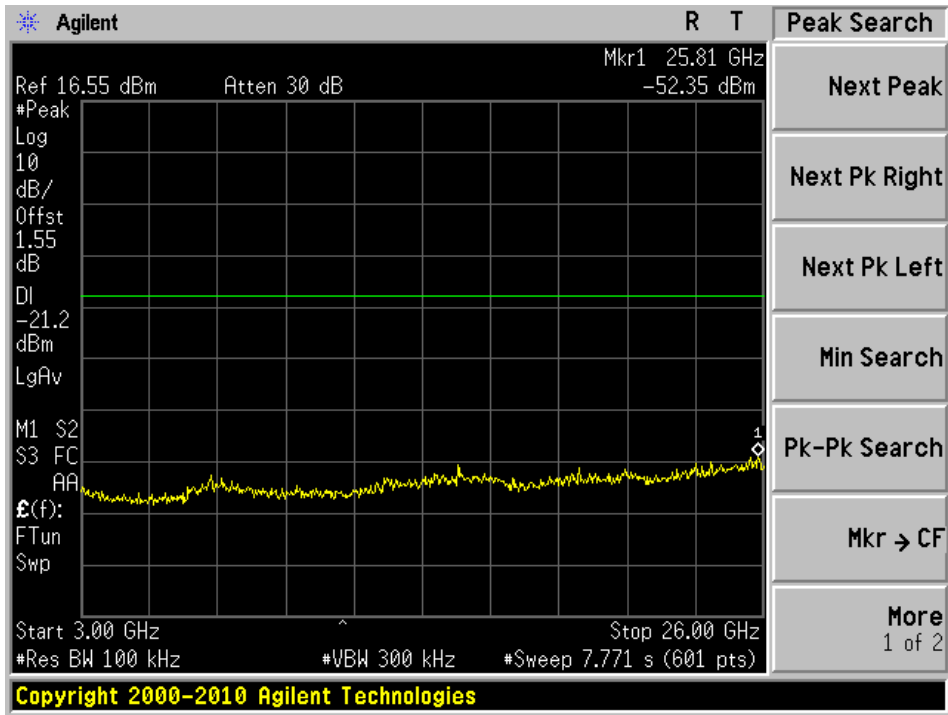
802.11n 20 MHz Low channel, Chain J2, above 3GHz



802.11n 20 MHz Low channel, Chain J3, below 3GHz

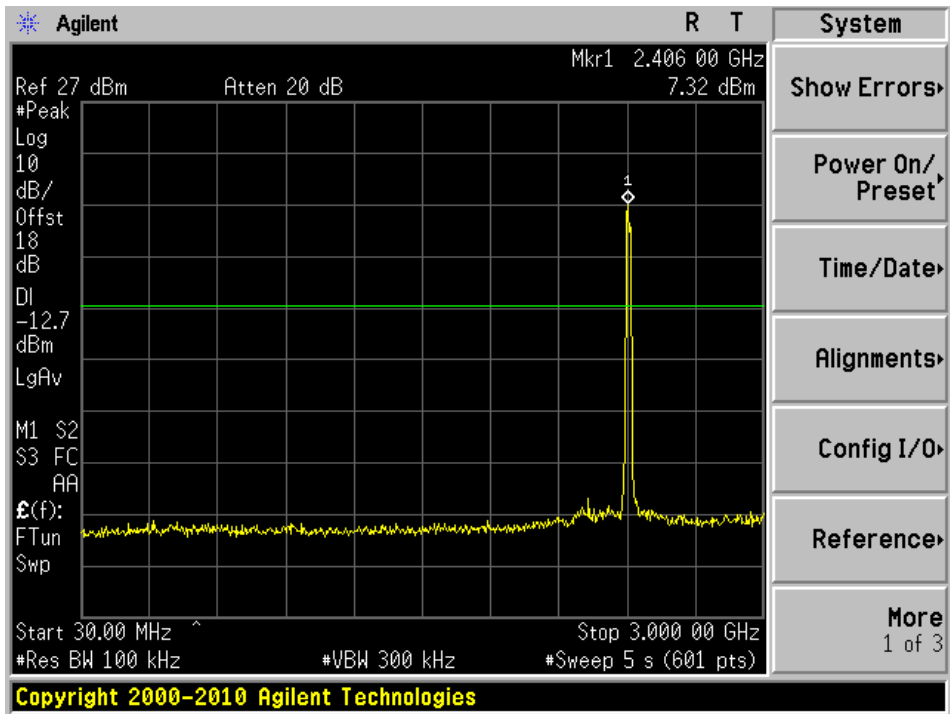


802.11n 20 MHz Low channel, Chain J3, above 3GHz

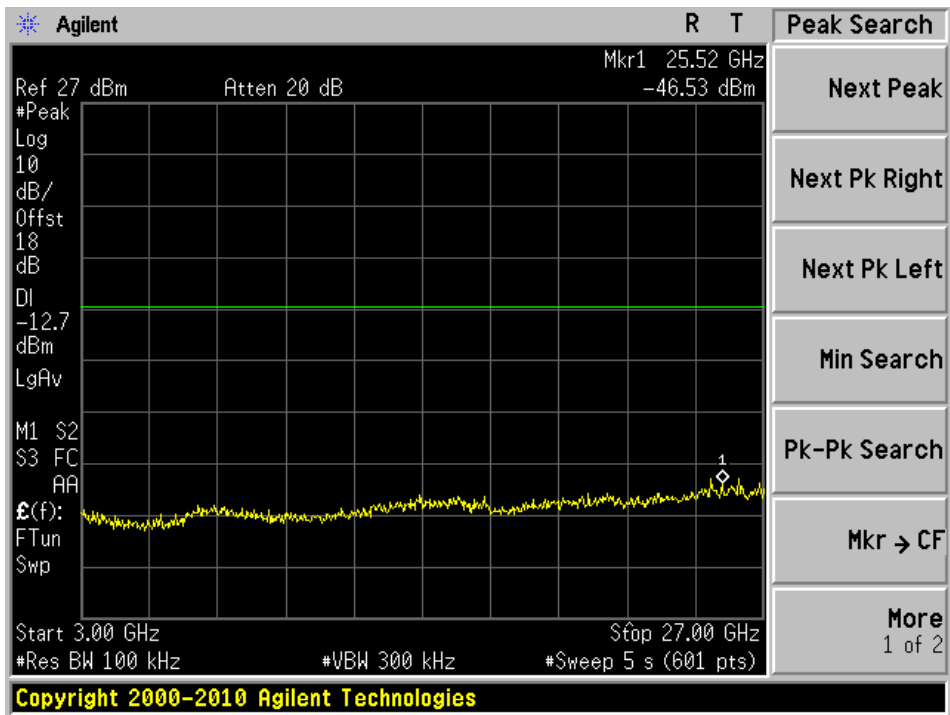


Chain J4 is not active during test

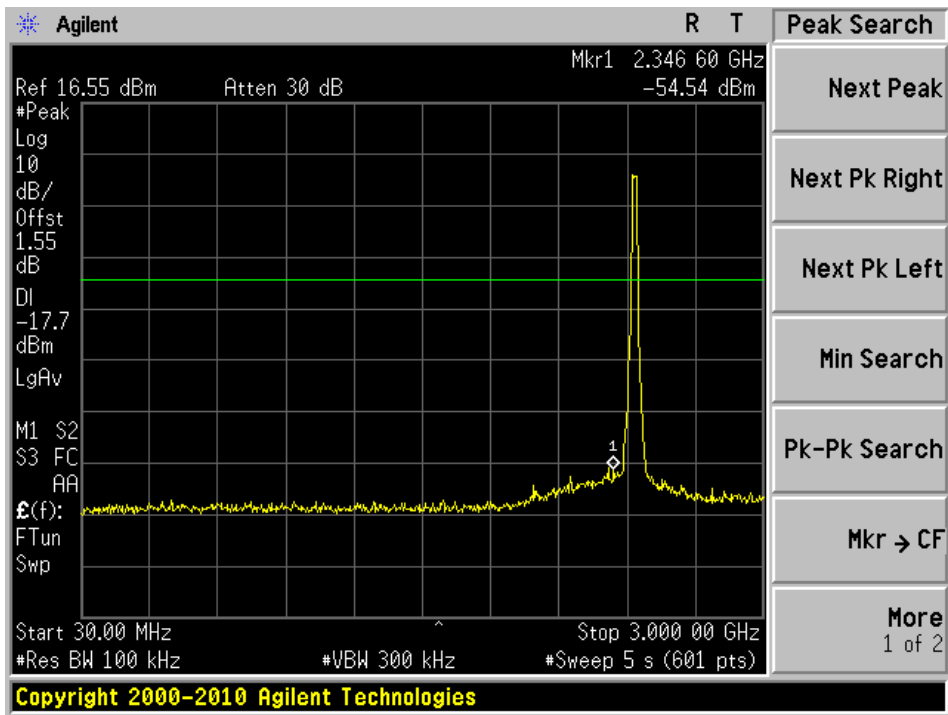
802.11n 20 MHz Low channel, Chain J1+J2+J3, below 3GHz



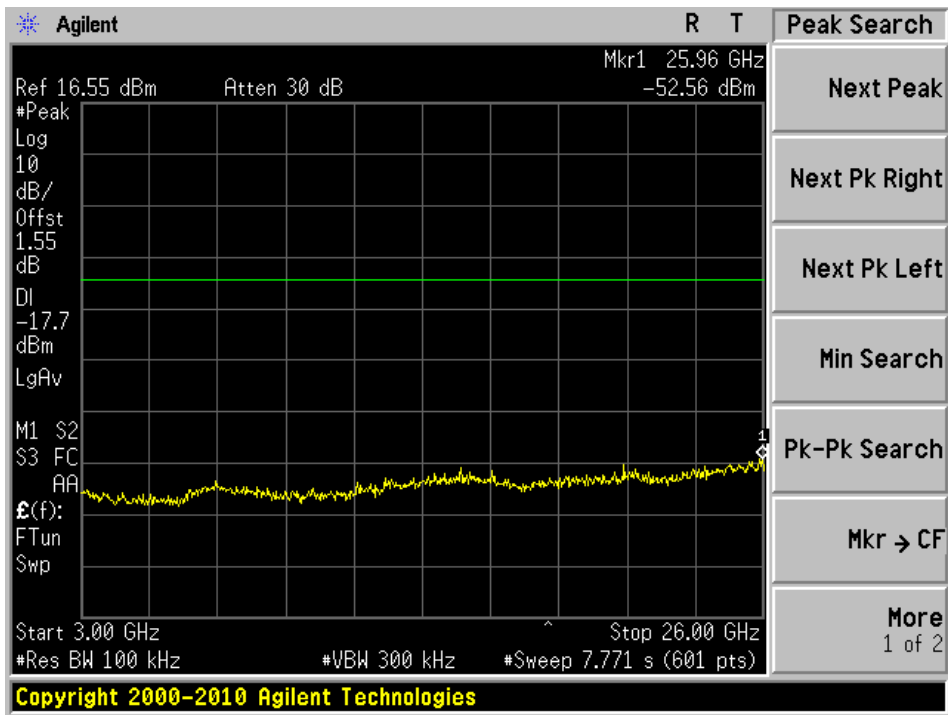
802.11n 20 MHz Low channel, Chain J1+J2+J3, above 3GHz



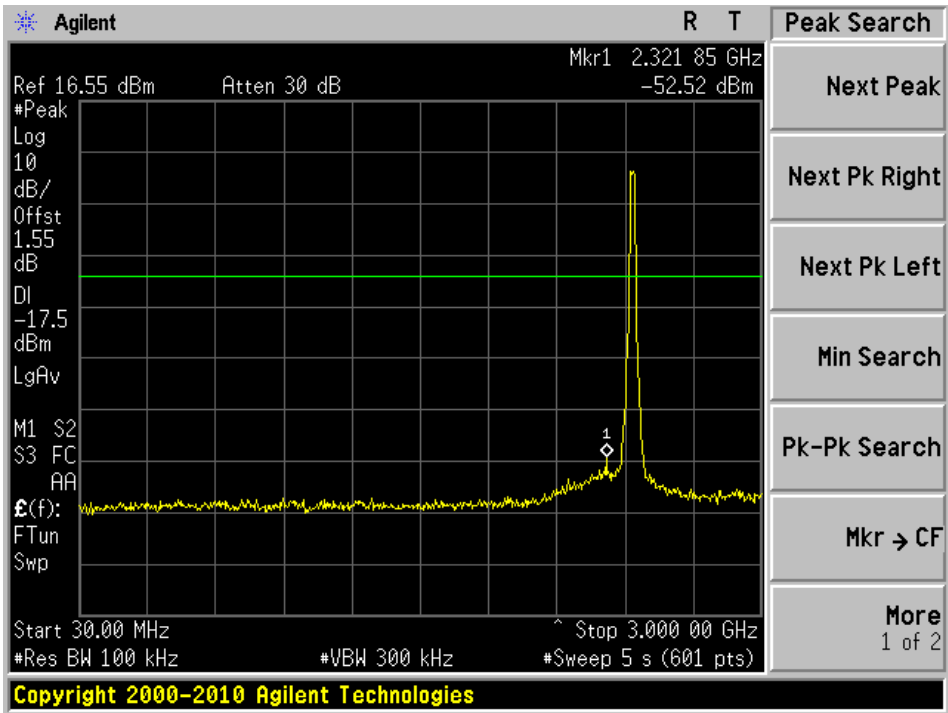
802.11n 20 MHz Middle channel, Chain J1, below 3GHz



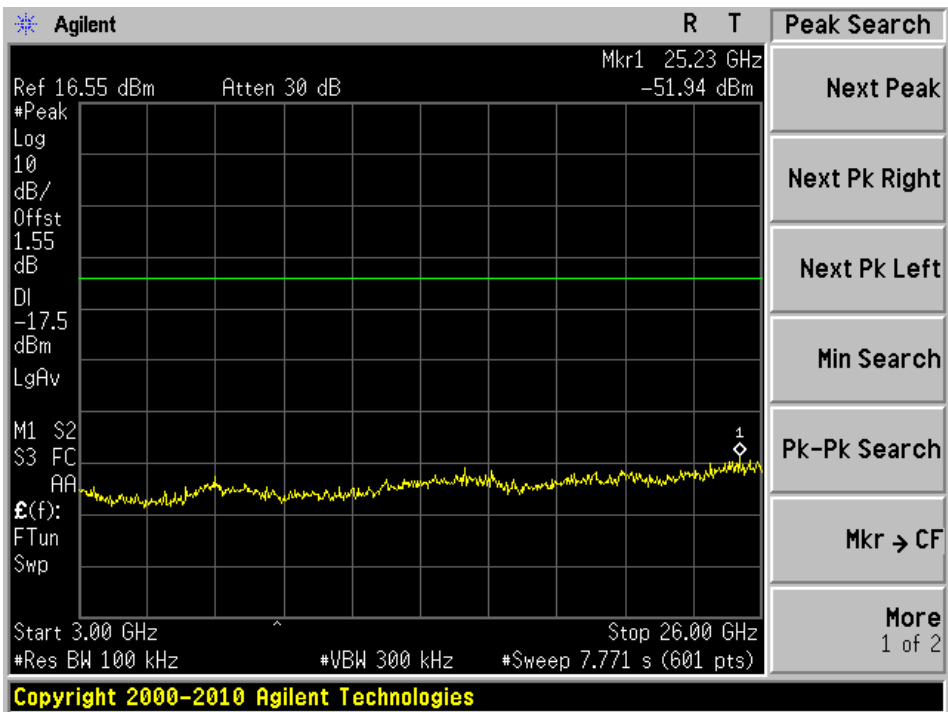
802.11n 20 MHz Middle channel, Chain J1, above 3GHz



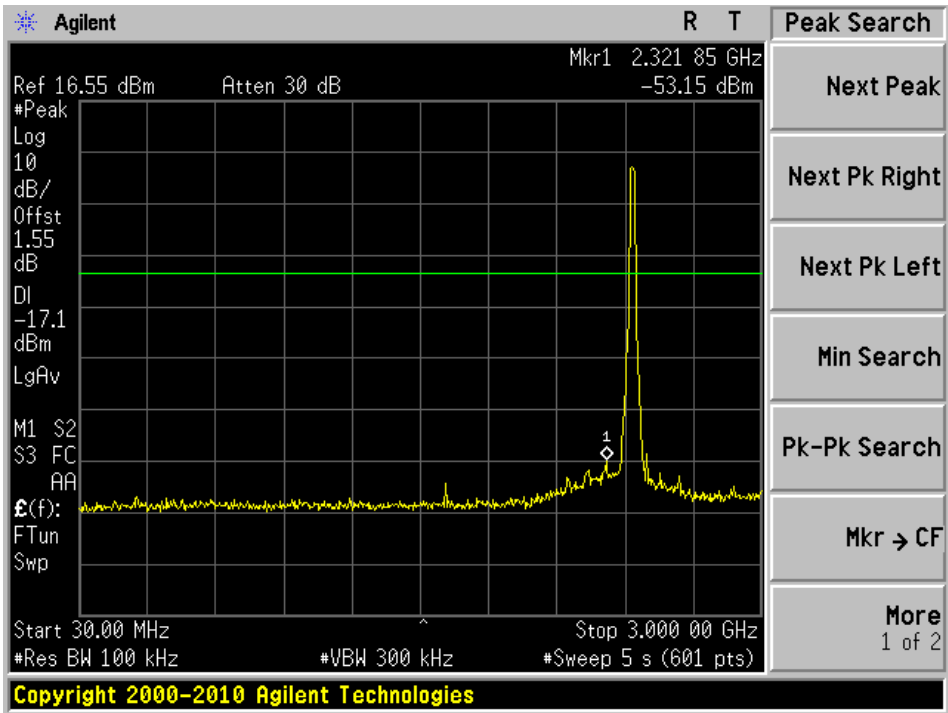
802.11n 20 MHz Middle channel, Chain J2, below 3GHz



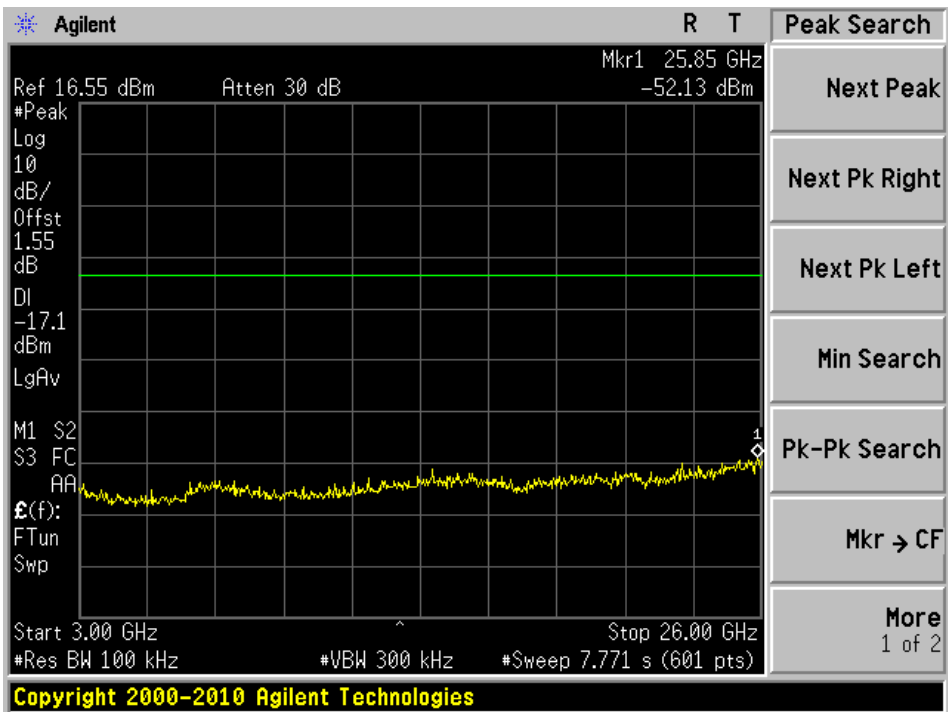
802.11n 20 MHz Middle channel, Chain J2, above 3GHz



802.11n 20 MHz Middle channel, Chain J3, below 3GHz

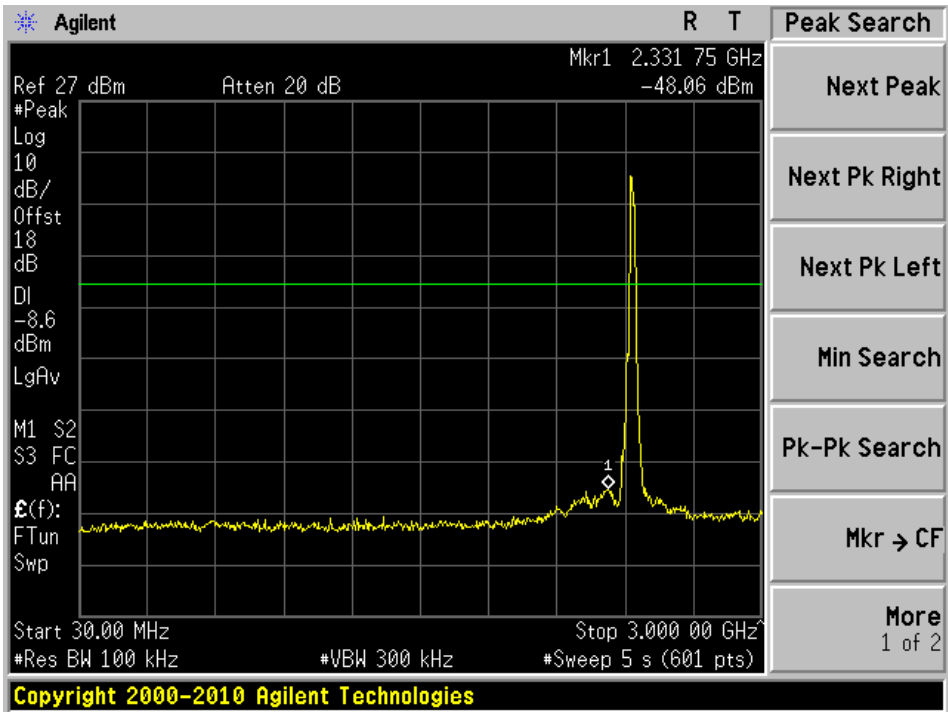


802.11n 20 MHz Middle channel, Chain J3, above 3GHz

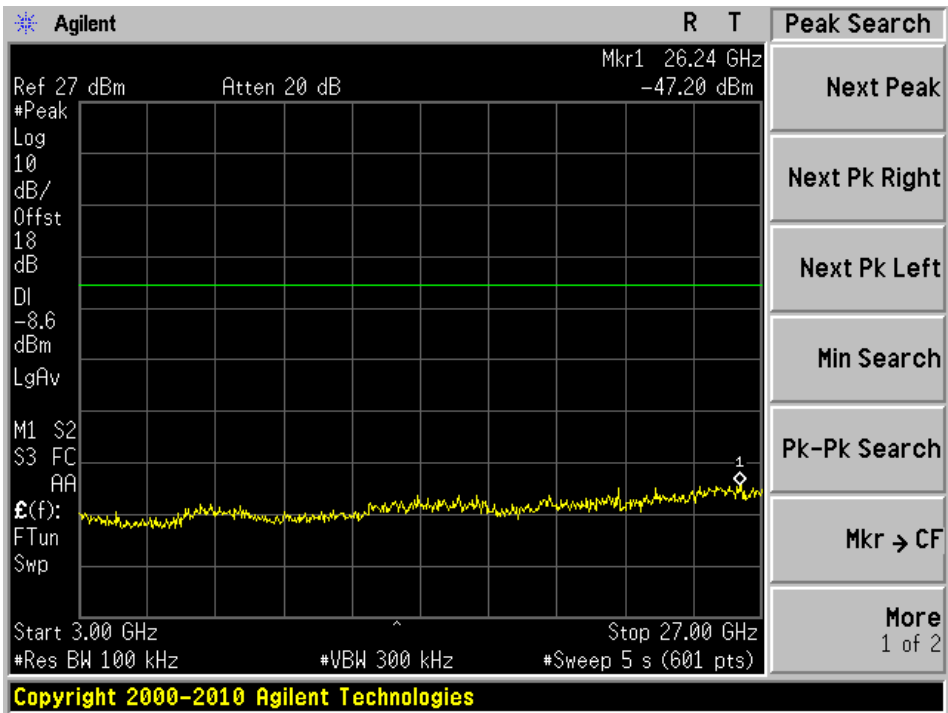


Chain J4 is not active during test

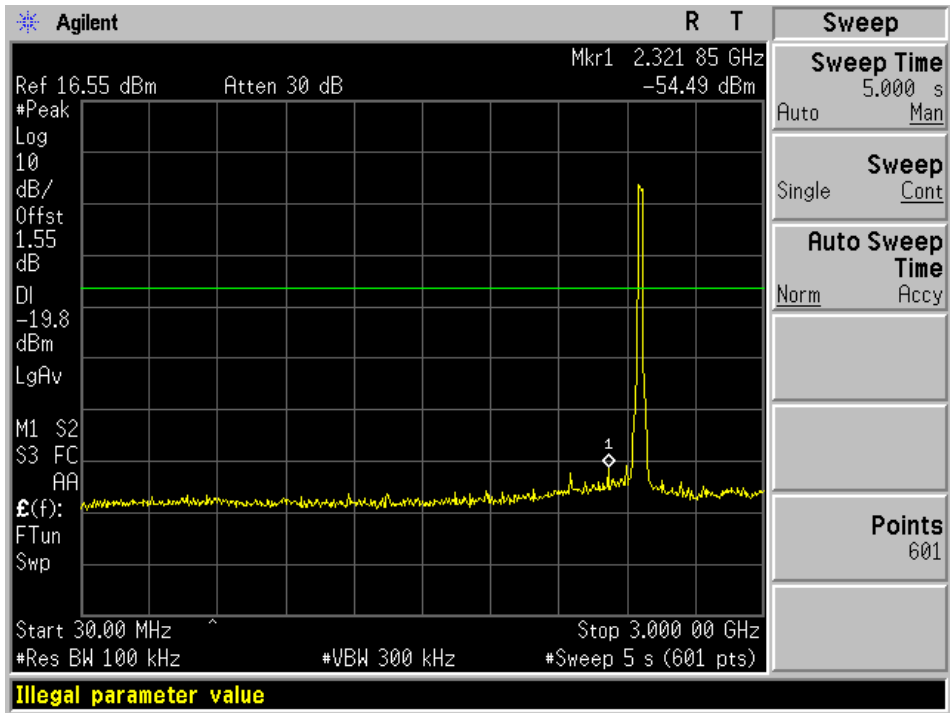
802.11n 20 MHz Middle channel, Chain J1+J2+J3, below 3GHz



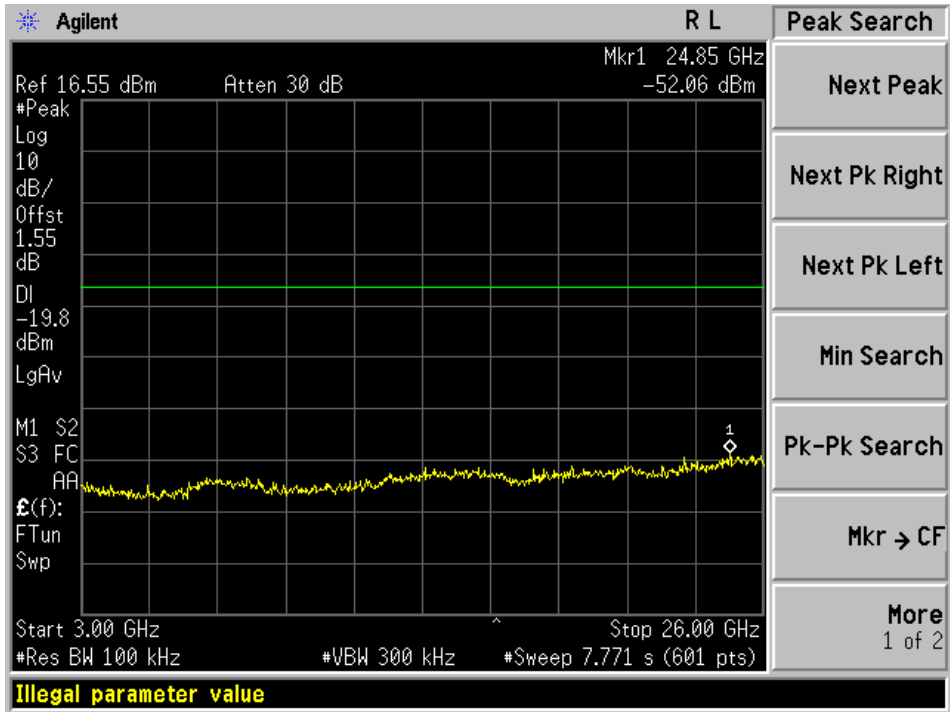
802.11n 20 MHz Middle channel, Chain J1+J2+J3, above 3GHz



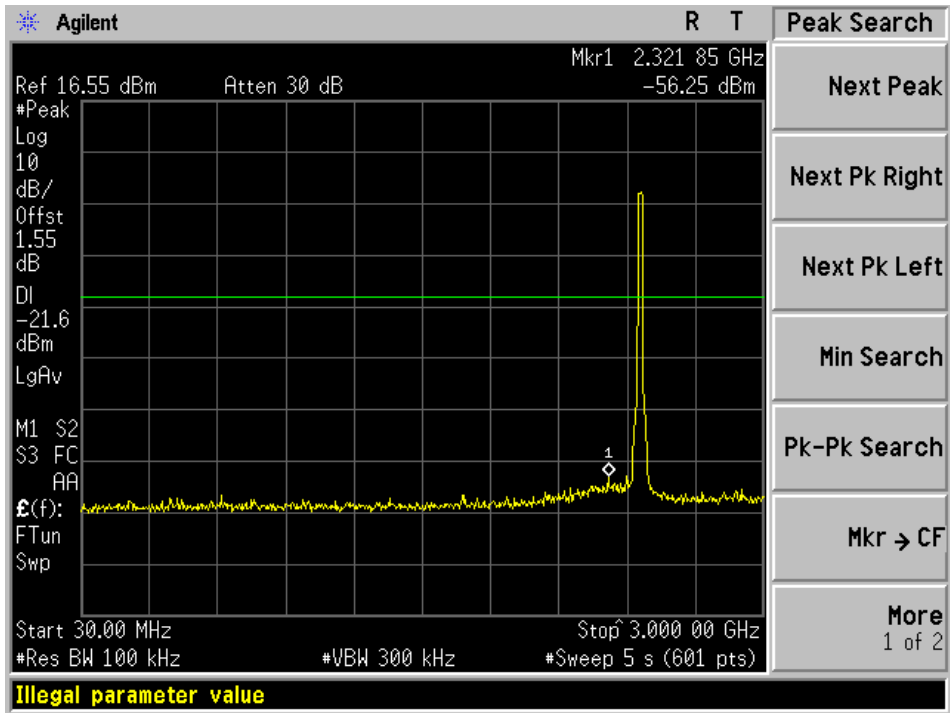
802.11n 20 MHz High channel, Chain J1, below 3GHz



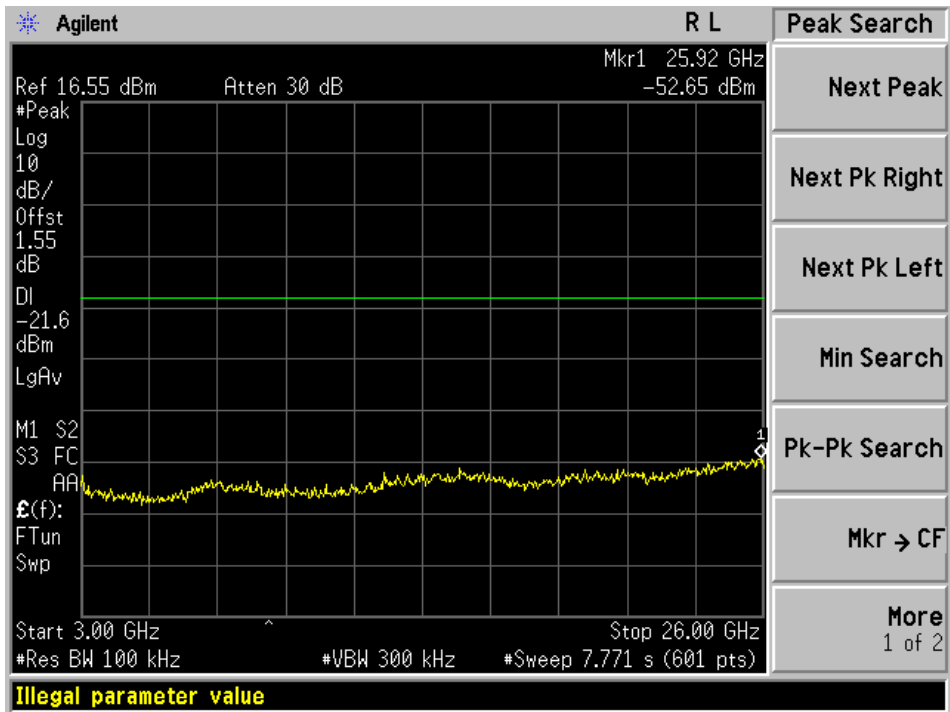
802.11n 20 MHz High channel, Chain J1, above 3GHz



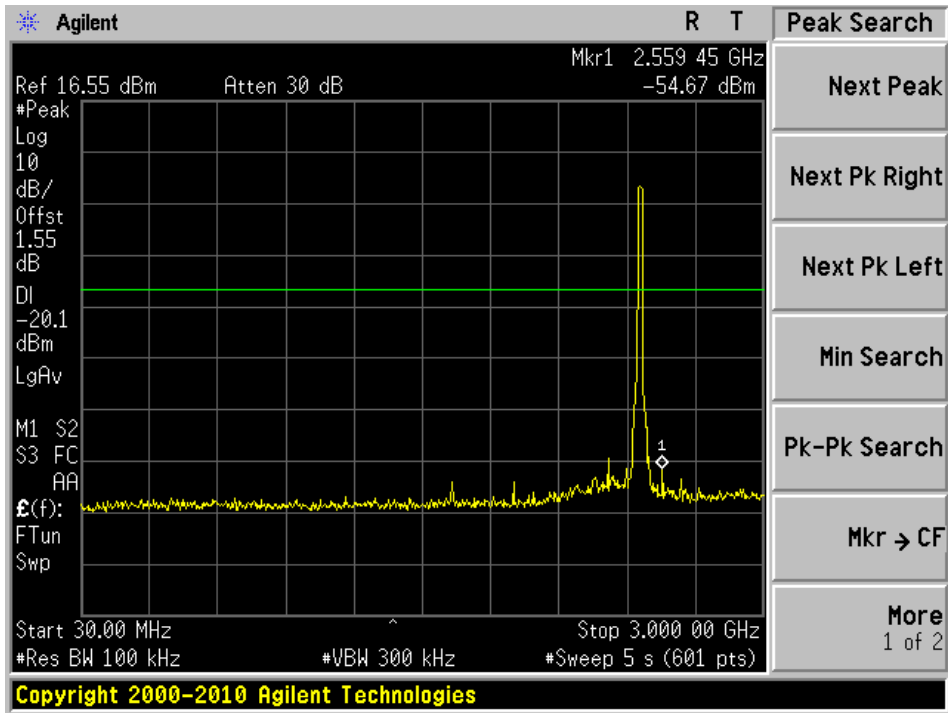
802.11n 20 MHz High channel, Chain J2, below 3GHz



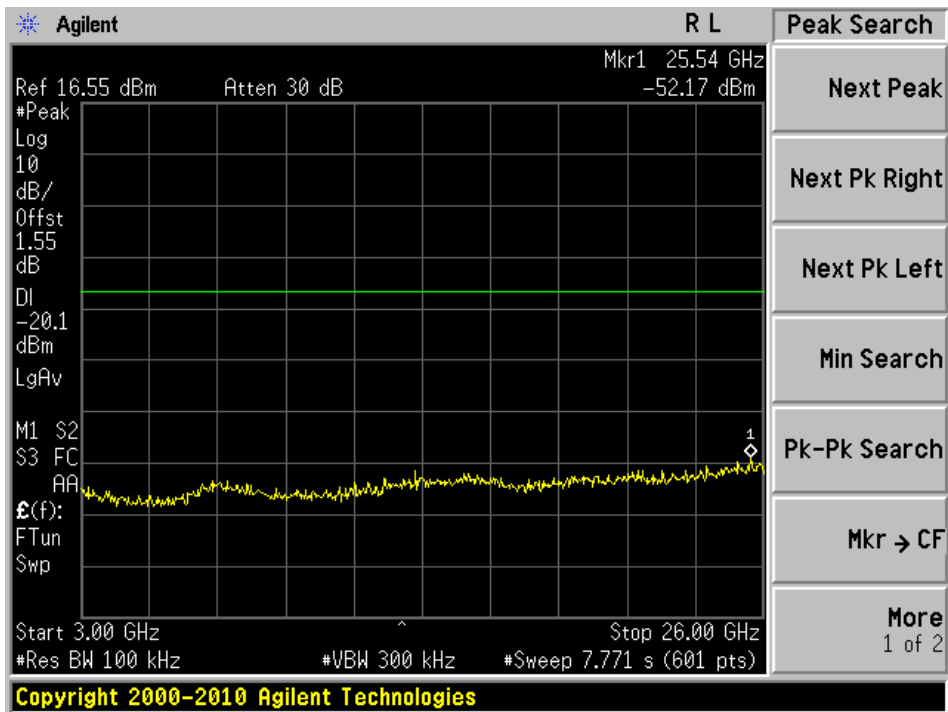
802.11n 20 MHz High channel, Chain J2, above 3GHz



802.11n 20 MHz High channel, Chain J3, below 3GHz

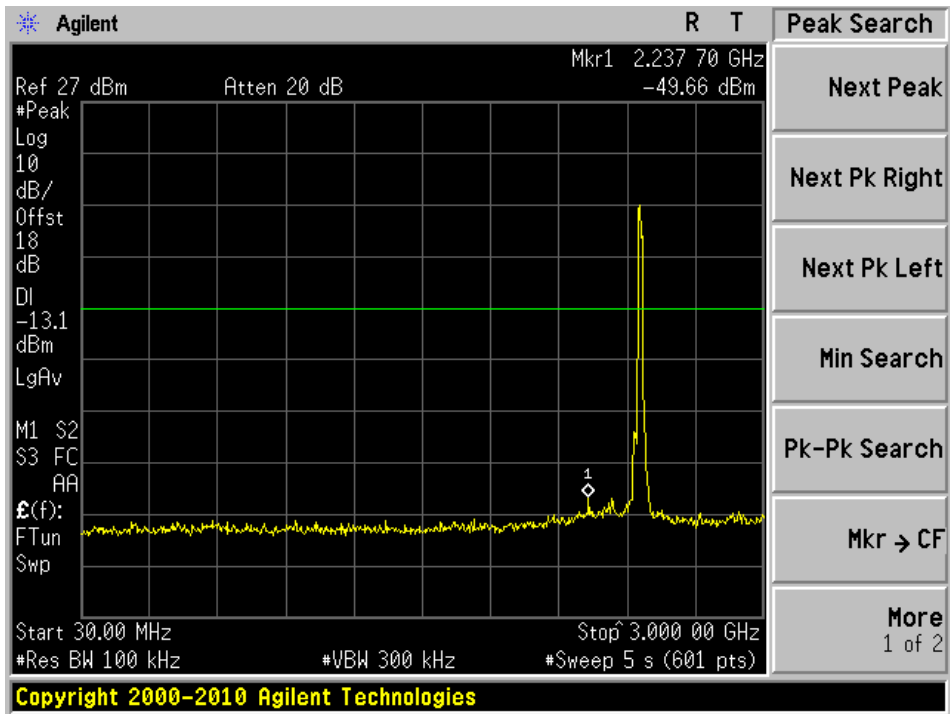


802.11n 20 MHz High channel, Chain J3, above 3GHz

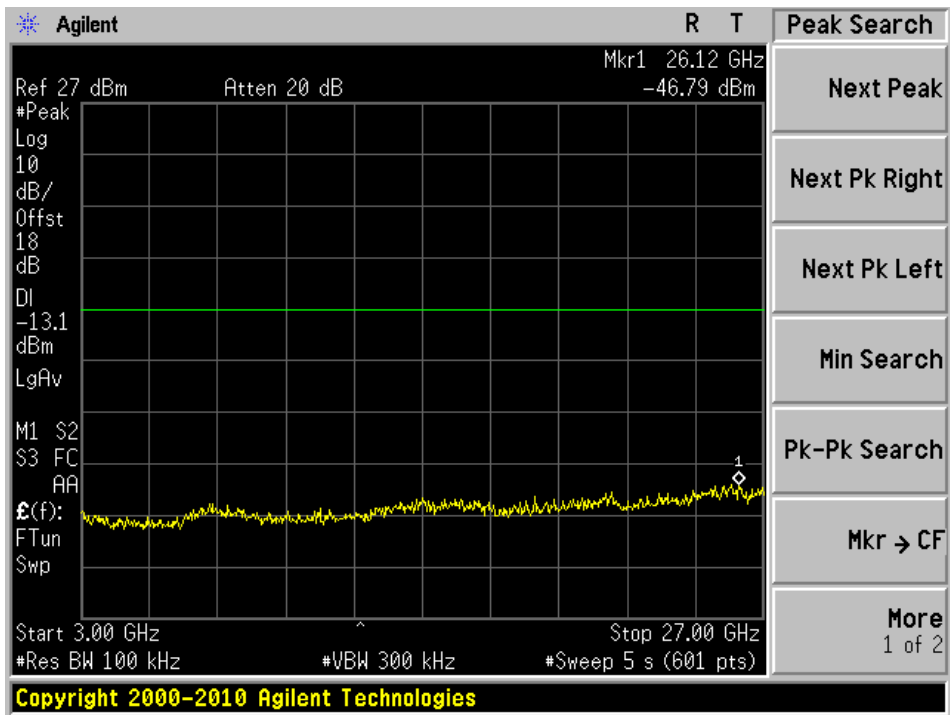


Chain J4 is not active during test

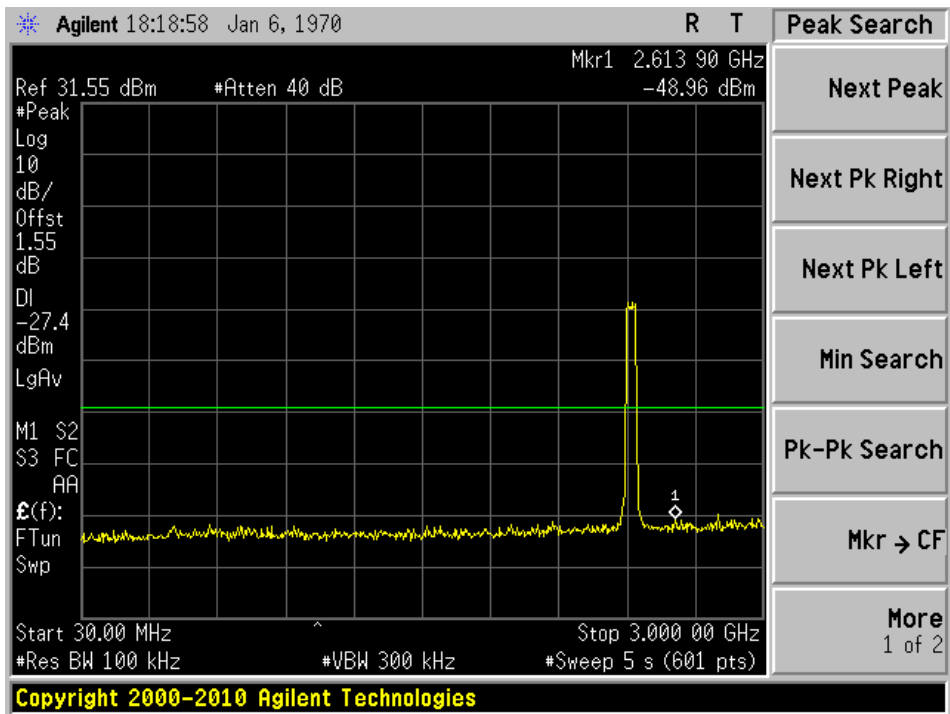
802.11n 20 MHz High channel, Chain J1+J2+J3, below 3GHz



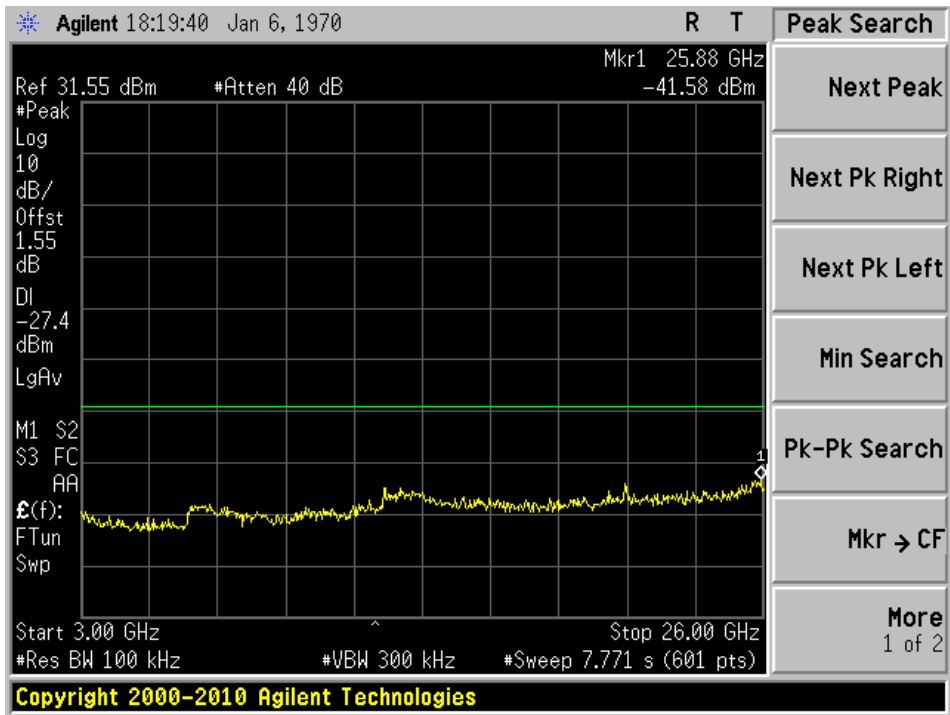
802.11n 20 MHz High channel, Chain J1+j2+J3, above 3GHz



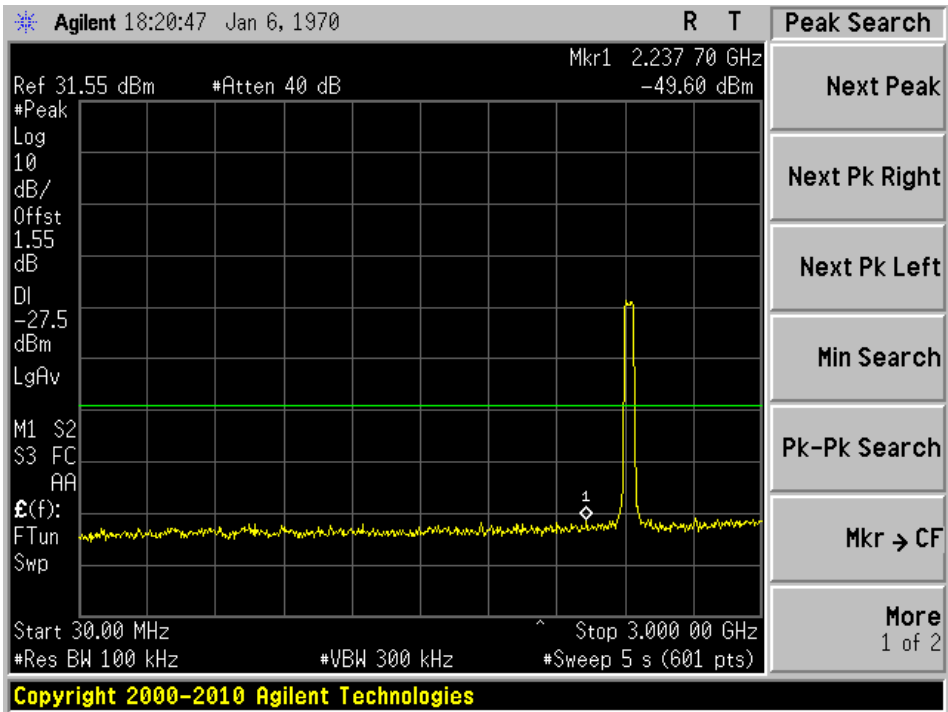
802.11n 40 MHz Low channel, Chain J1, below 3GHz



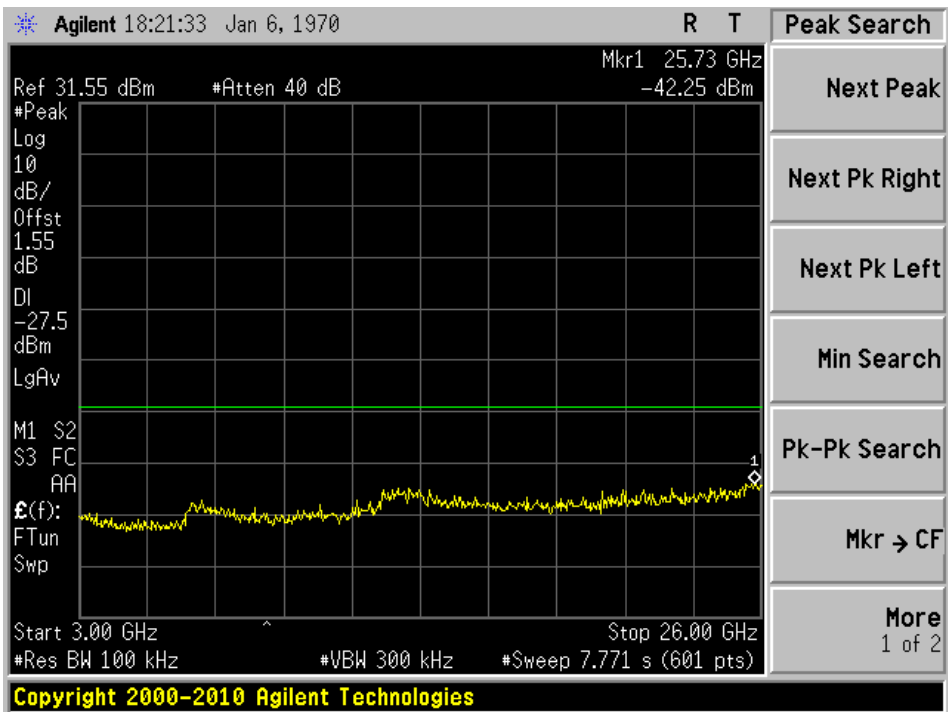
802.11n 40 MHz Low channel, Chain J1, above 3GHz



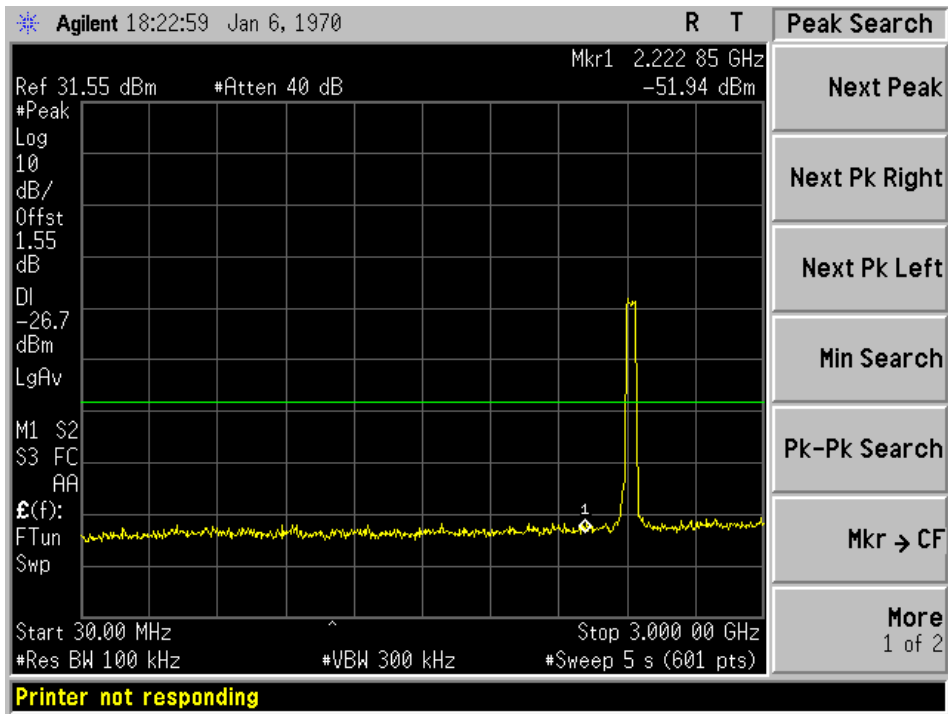
802.11n 40 MHz Low channel, Chain J2, below 3GHz



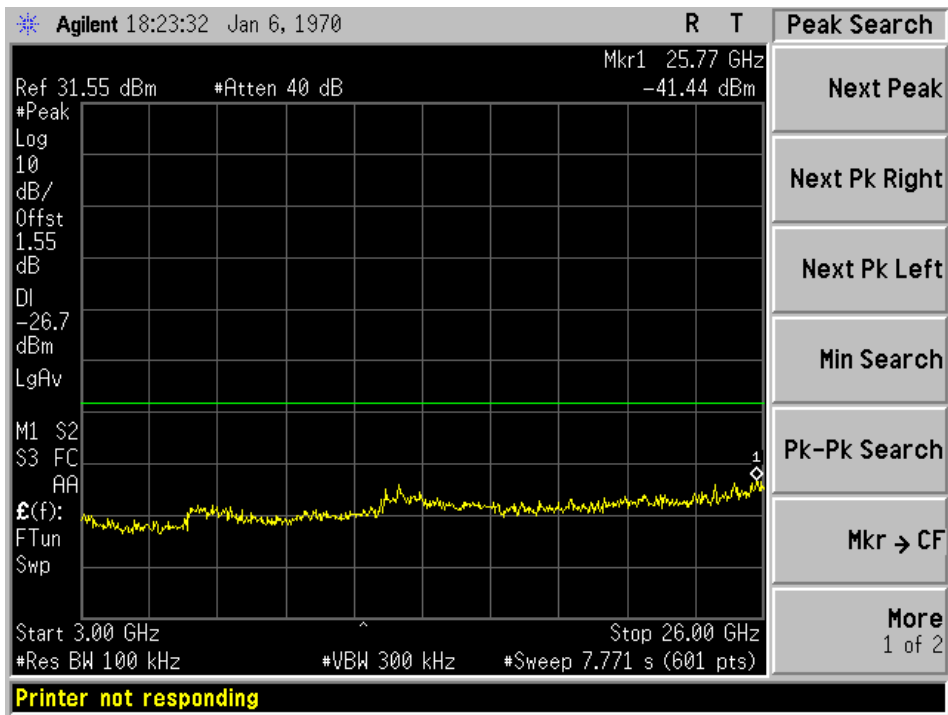
802.11n 40 MHz Low channel, Chain J2, above 3GHz



802.11n 40 MHz Low channel, Chain J3, below 3GHz

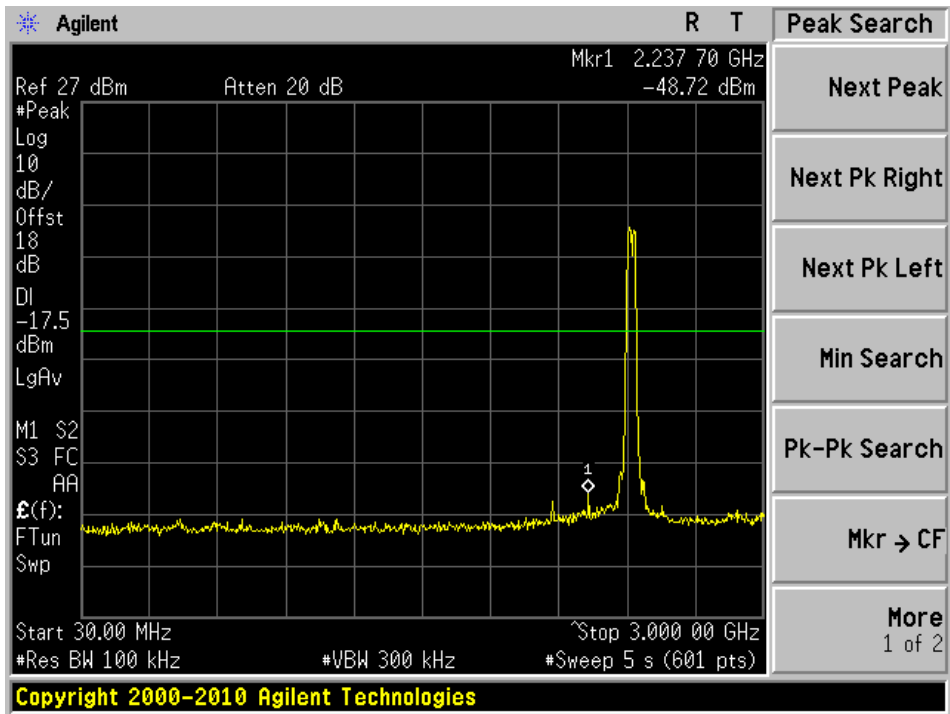


802.11n 40 MHz Low channel, Chain J3, above 3GHz

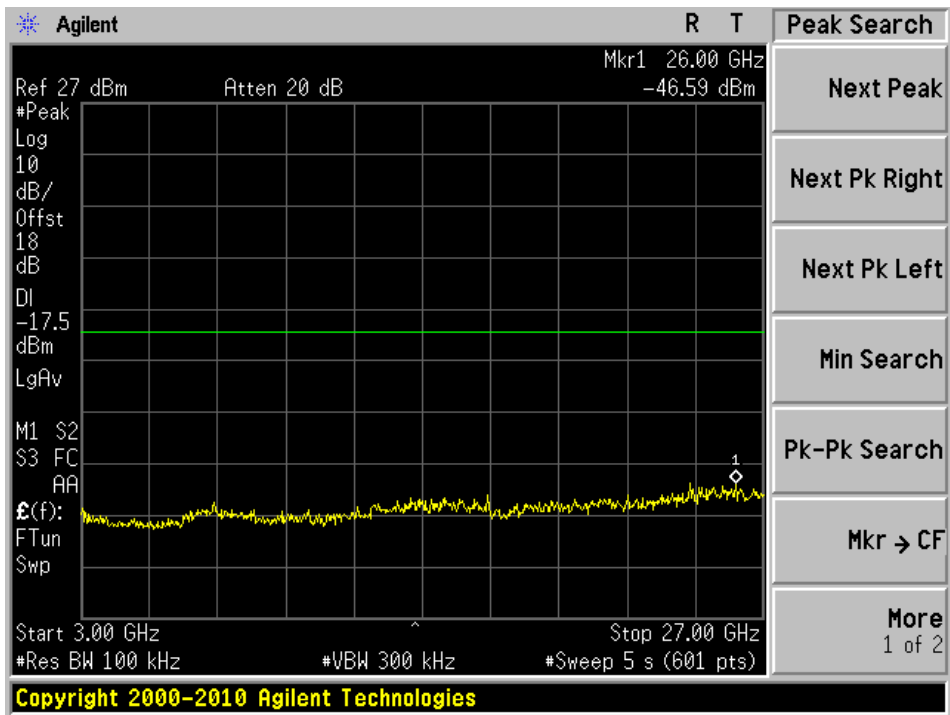


Chain J4 is not active during test

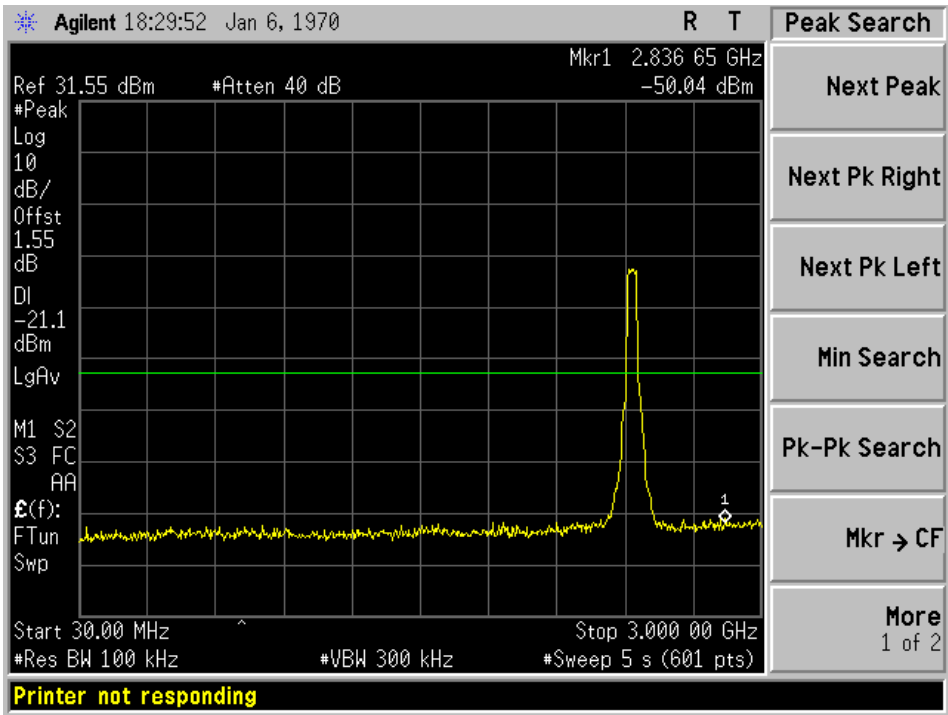
802.11n 40 MHz Low channel, Chain J1+J2+J3, below 3GHz



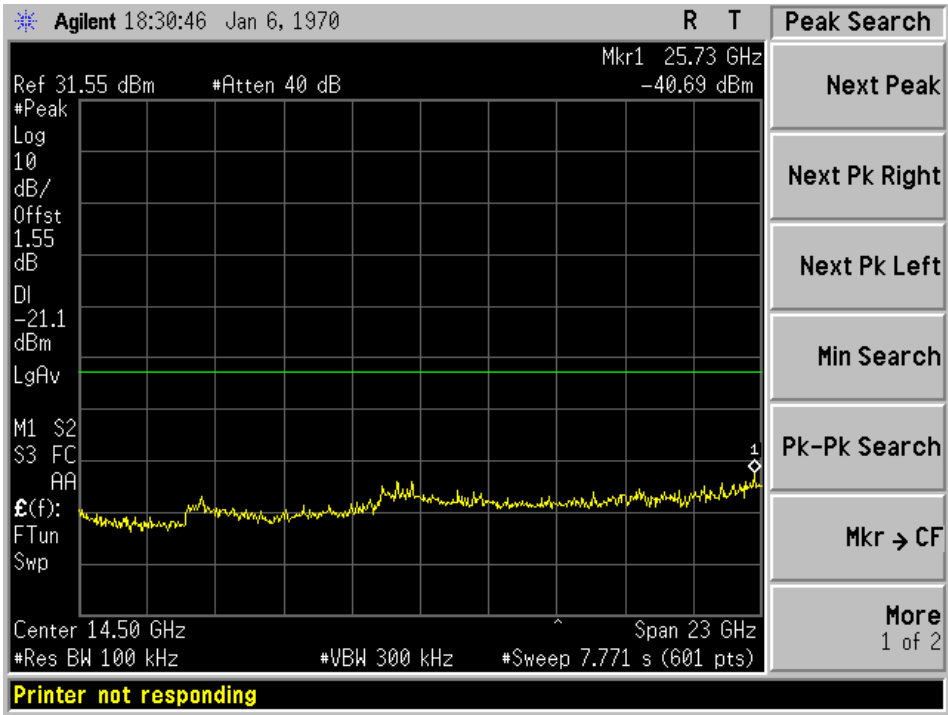
802.11n 40 MHz Low channel, Chain J1+J2+J3, above 3GHz



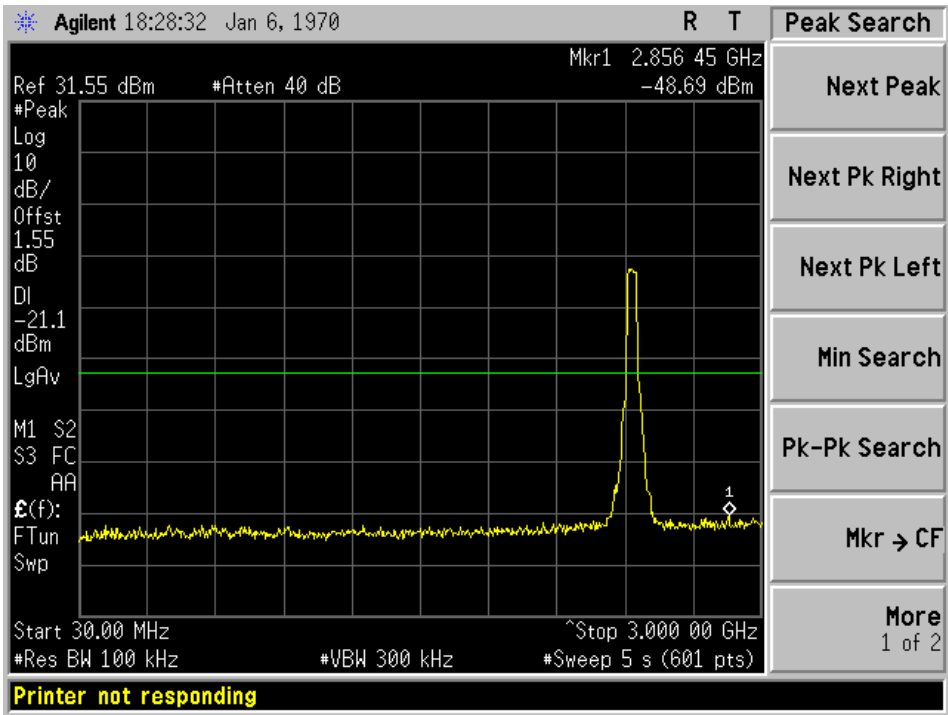
802.11n 40 MHz Middle channel, Chain J1, below 3GHz



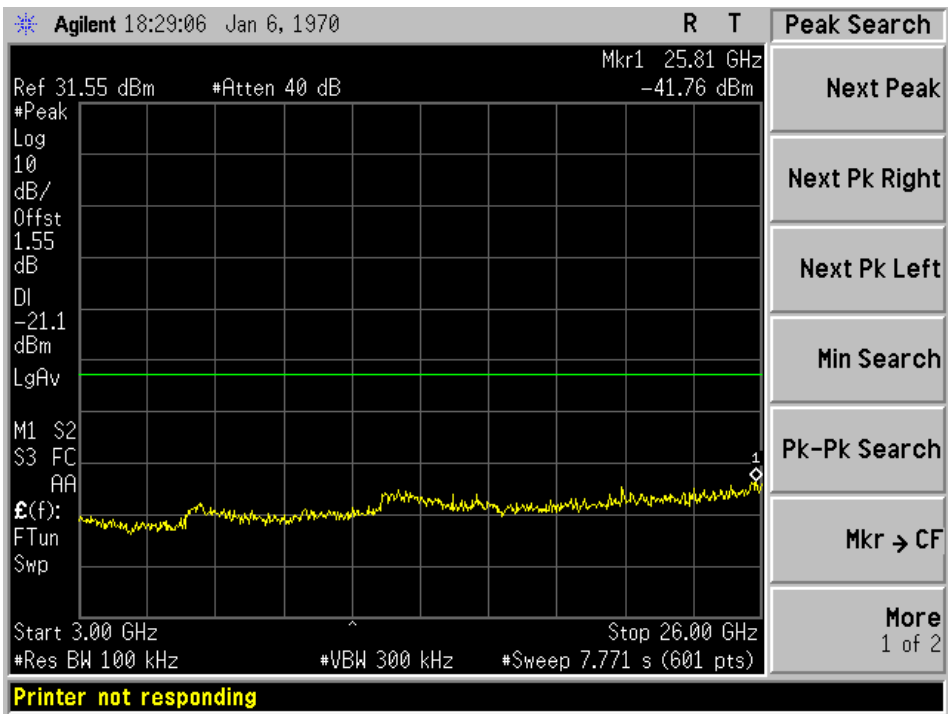
802.11n 40 MHz Middle channel, Chain J1, above 3GHz



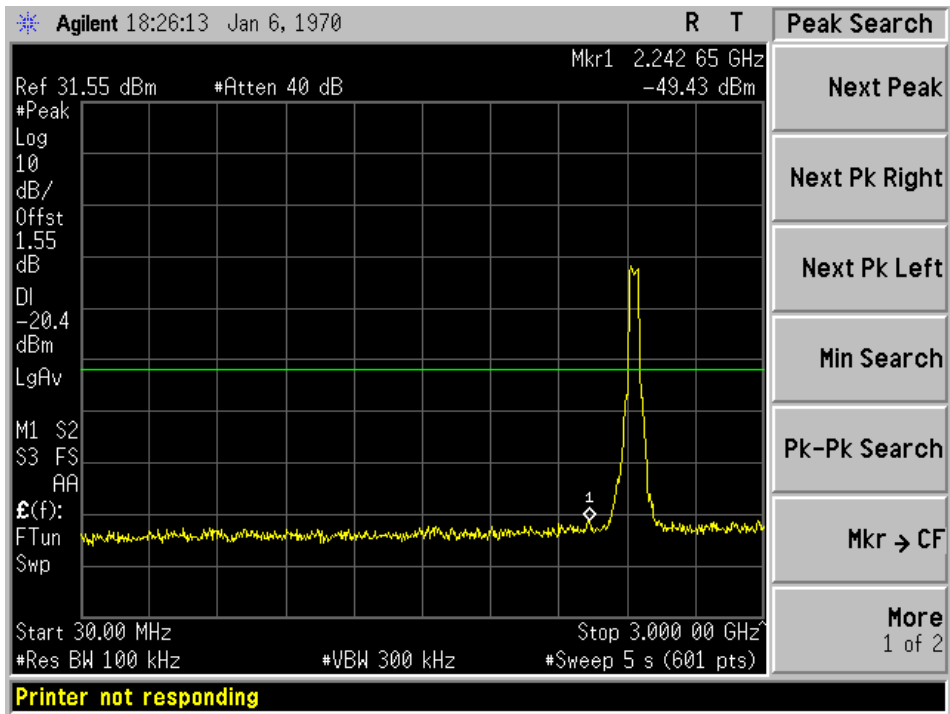
802.11n 40 MHz Middle channel, Chain J2, below 3GHz



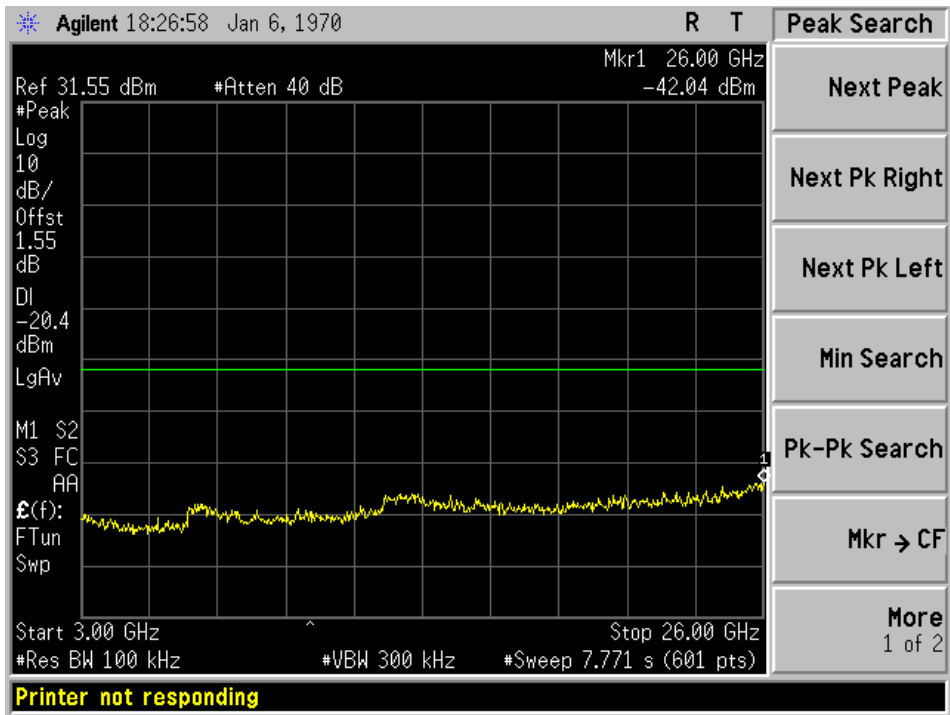
802.11n 40 MHz Middle channel, Chain J2, above 3GHz



802.11n 40 MHz Middle channel, Chain J3, below 3GHz

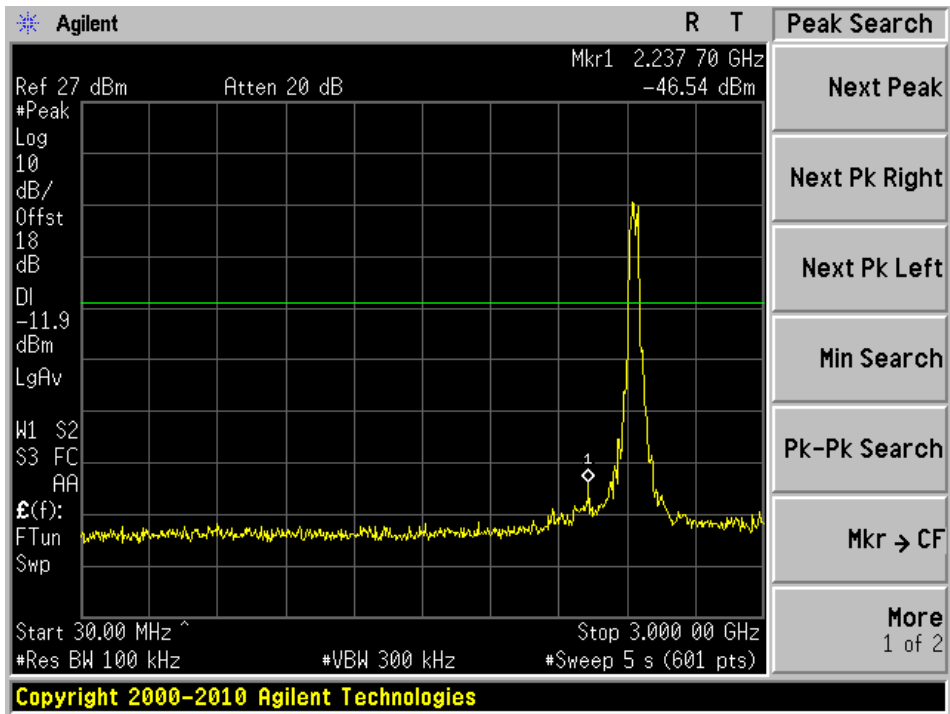


802.11n 40 MHz Middle channel, Chain J3, above 3GHz

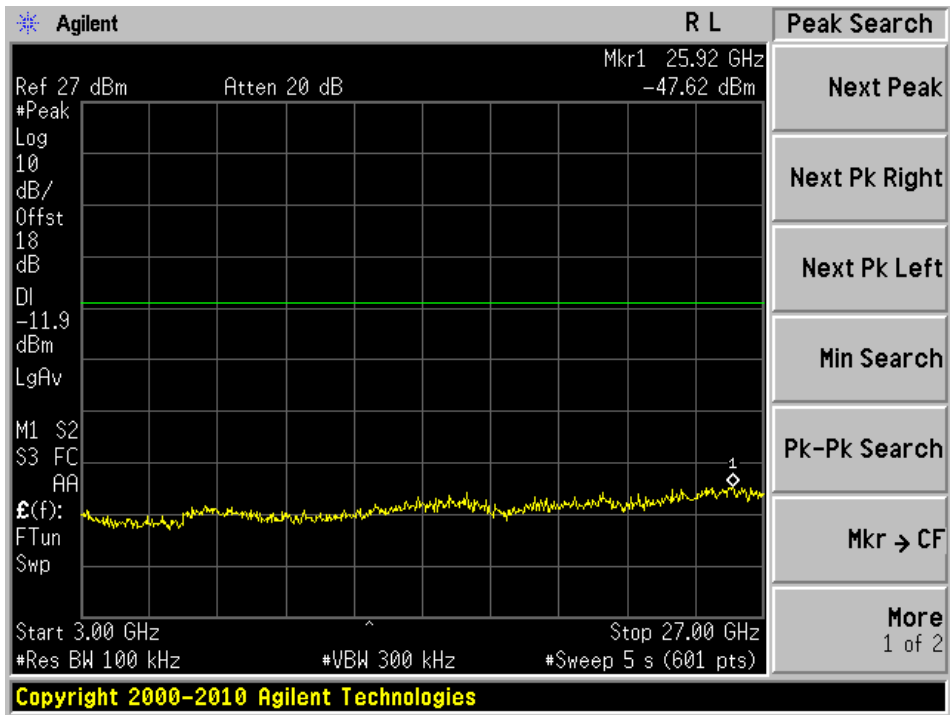


Chain J4 is not active during test

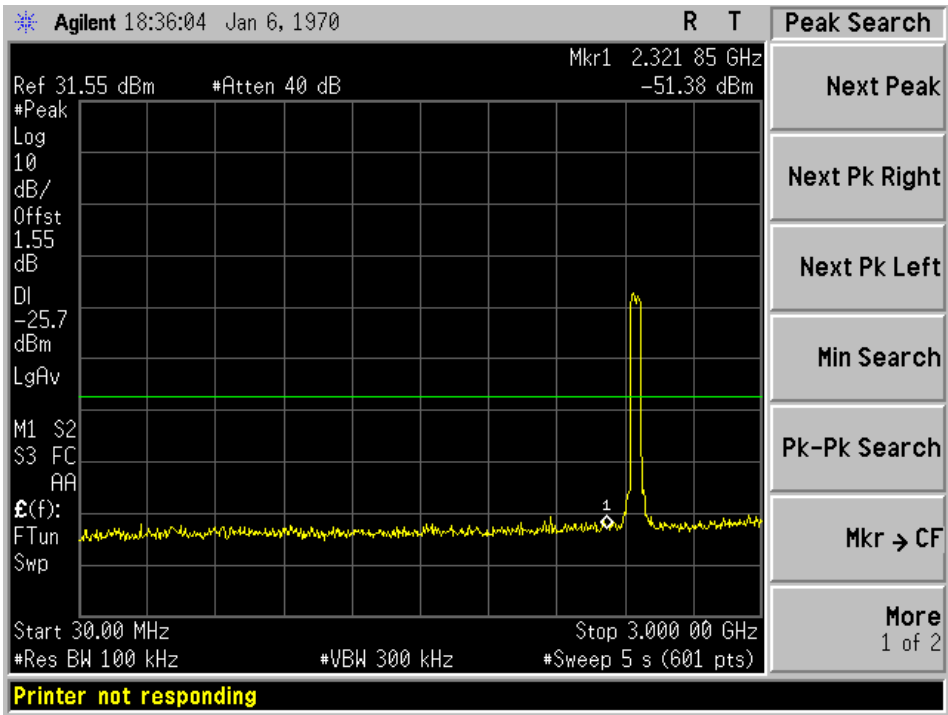
802.11n 40 MHz Middle channel, Chain J1+J2+J3, below 3GHz



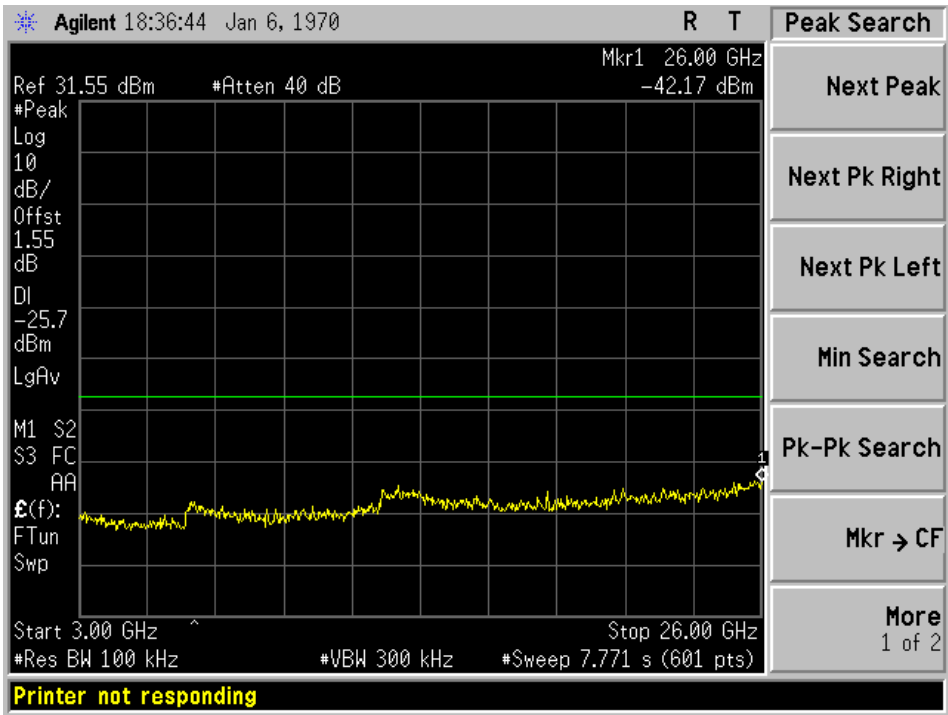
802.11n 40 MHz Middle channel, Chain J1+J2+J3, above 3GHz



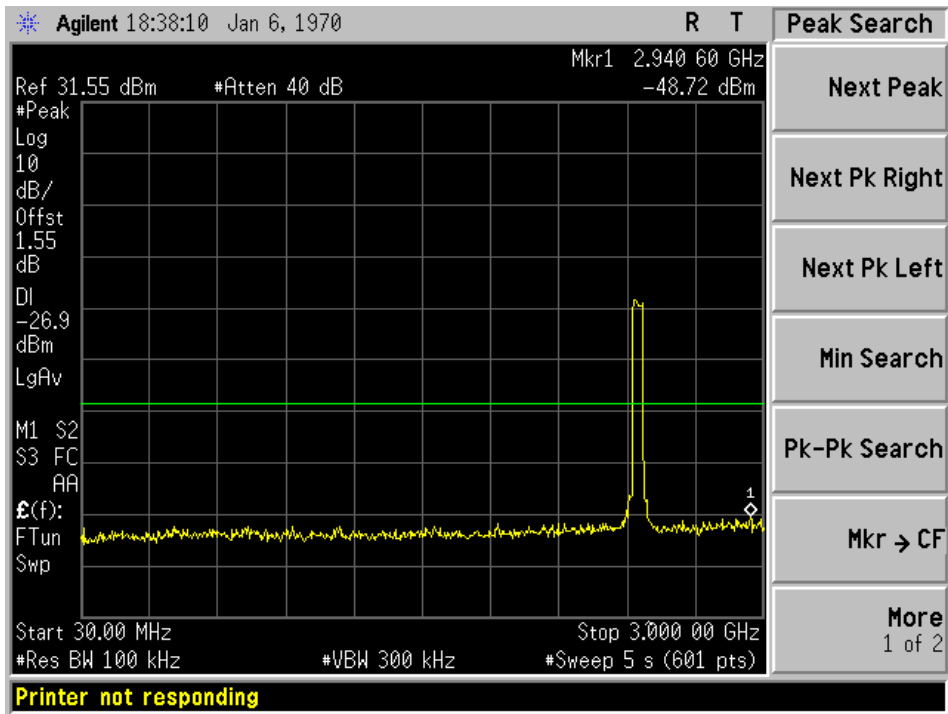
802.11n 40 MHz High channel, Chain J1, below 3GHz



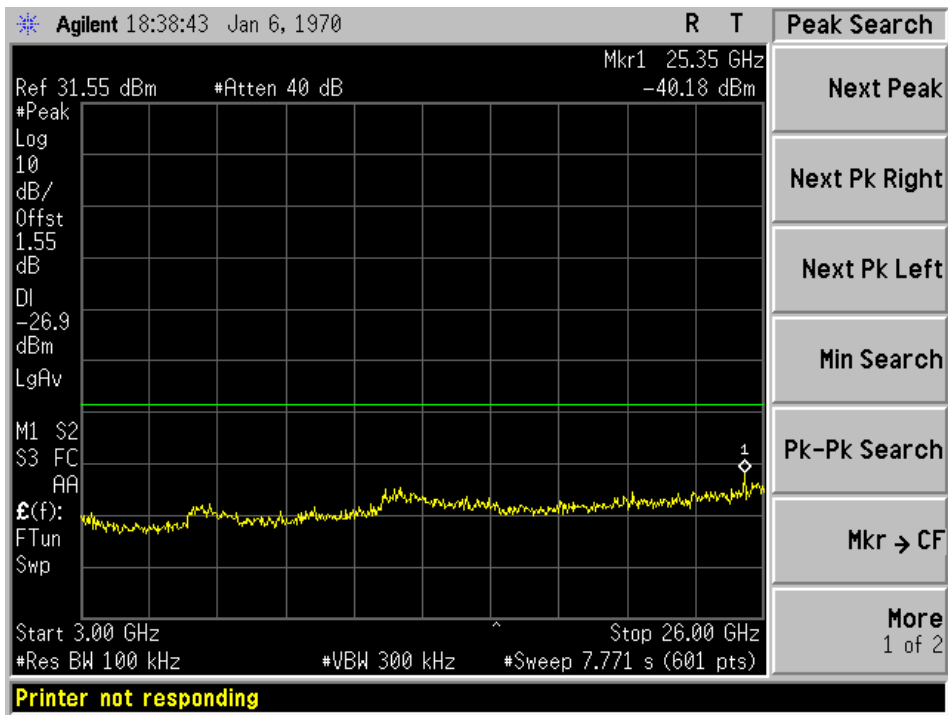
802.11n 40 MHz High channel, Chain J1, above 3GHz



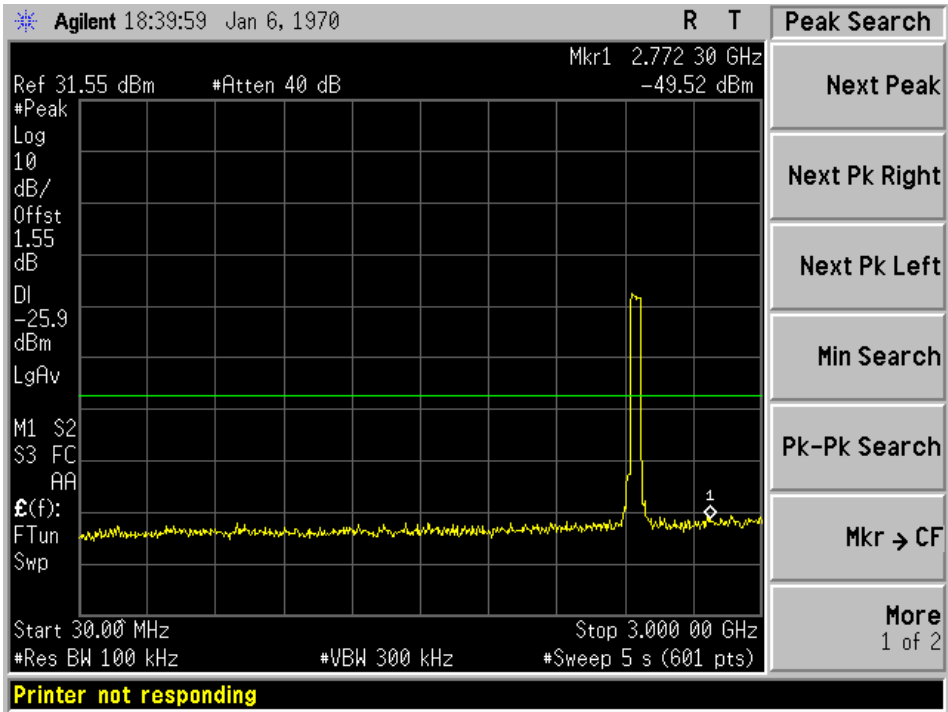
802.11n 40 MHz High channel, Chain J2, below 3GHz



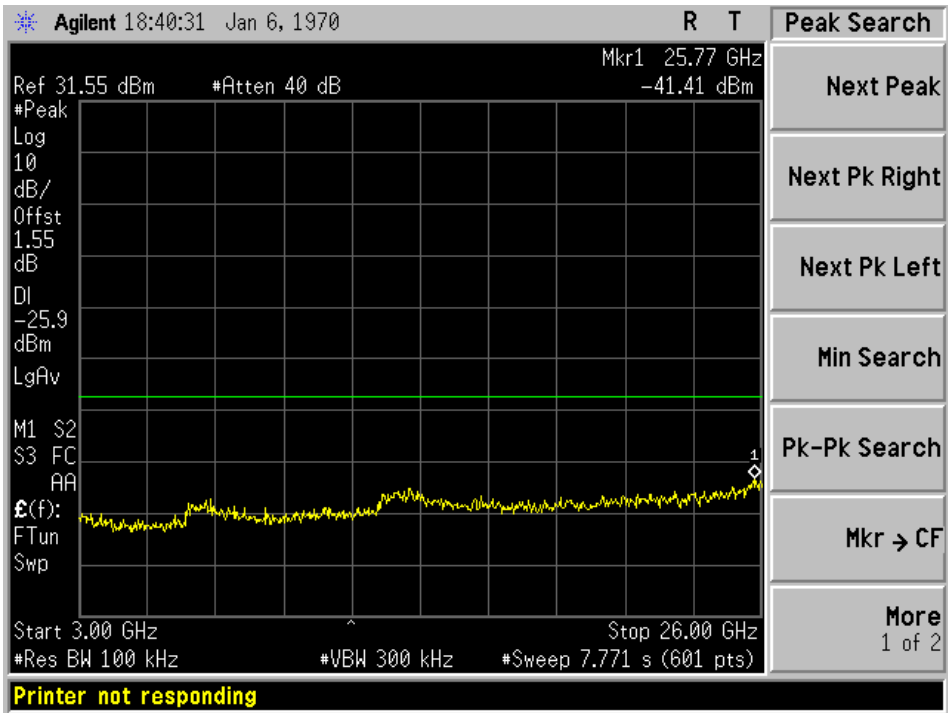
802.11n 40 MHz High channel, Chain J2, above 3GHz



802.11n 40 MHz High channel, Chain J3, below 3GHz

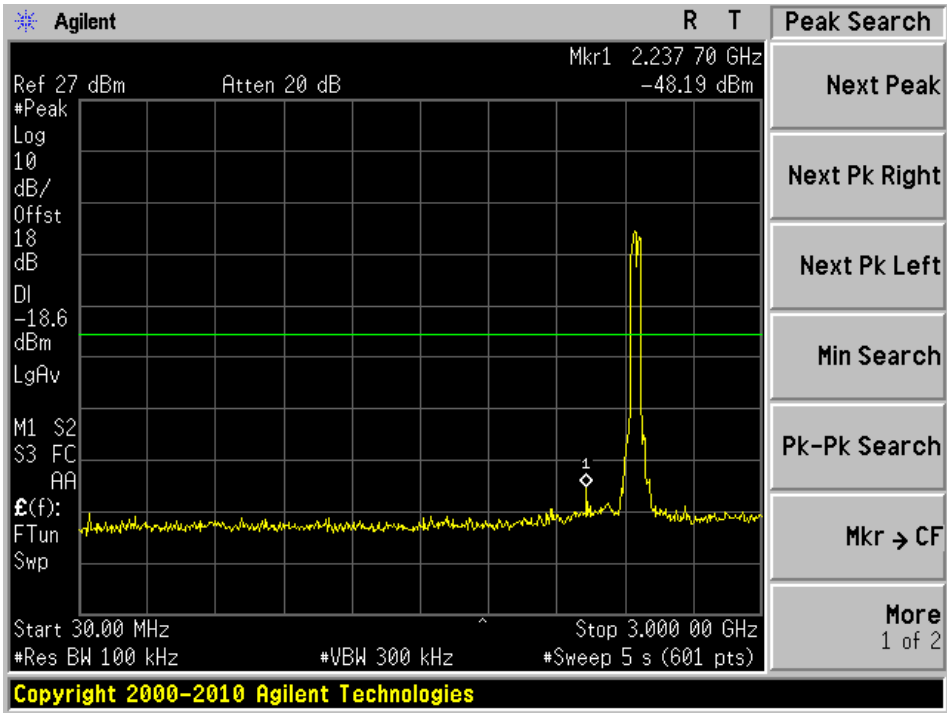


802.11n 40 MHz High channel, Chain J3, above 3GHz

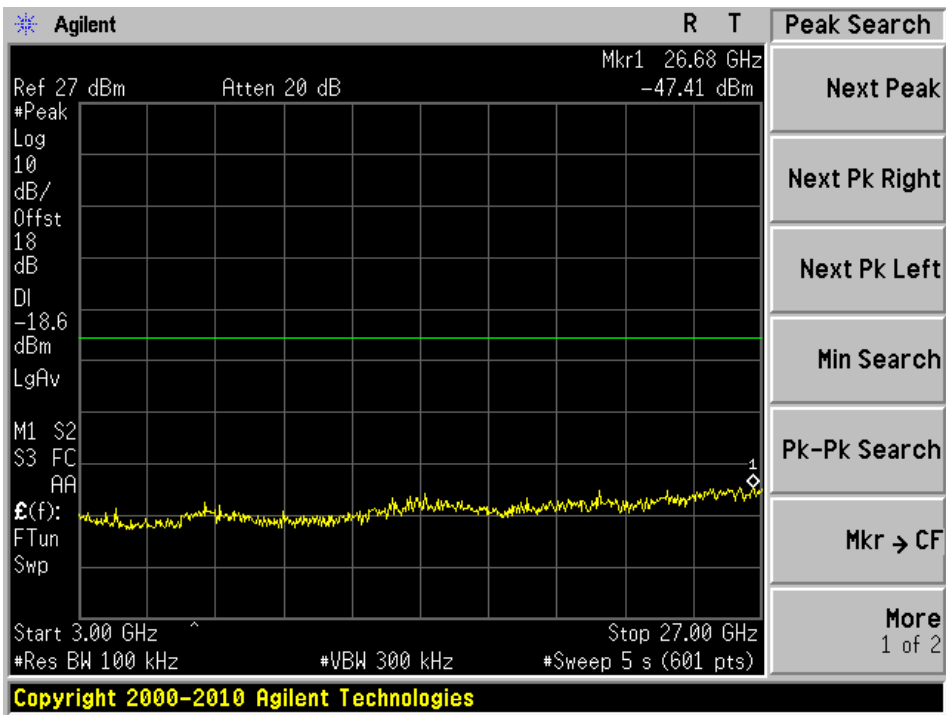


Chain J4 is not active during test

802.11n 40 MHz High channel, Chain J1+J2+J3, below 3GHz

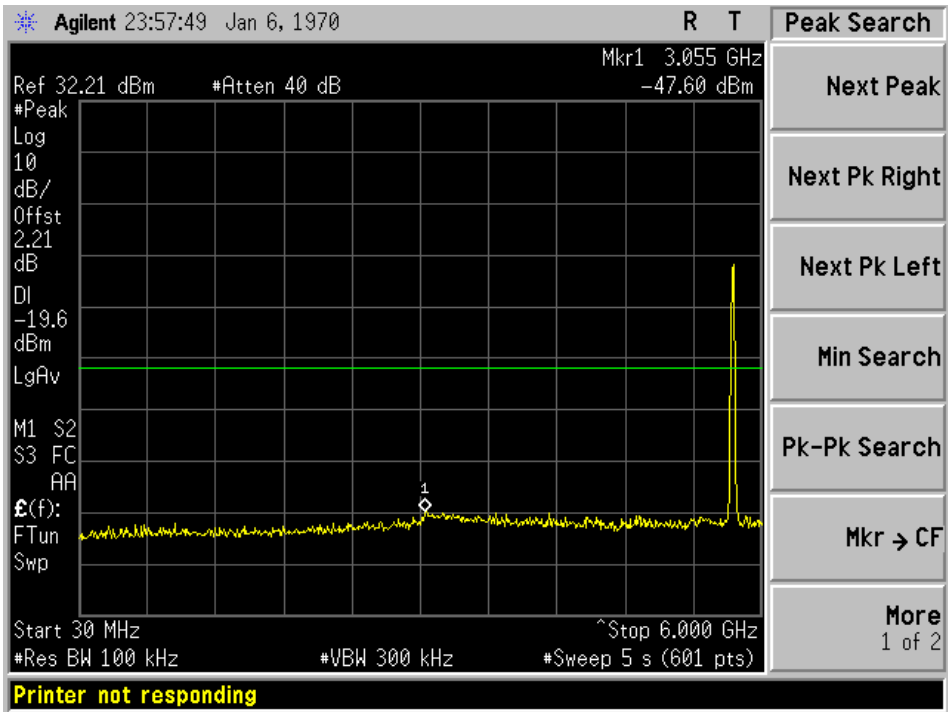


802.11n 40 MHz High channel, Chain J1+J2+J3, above 3GHz

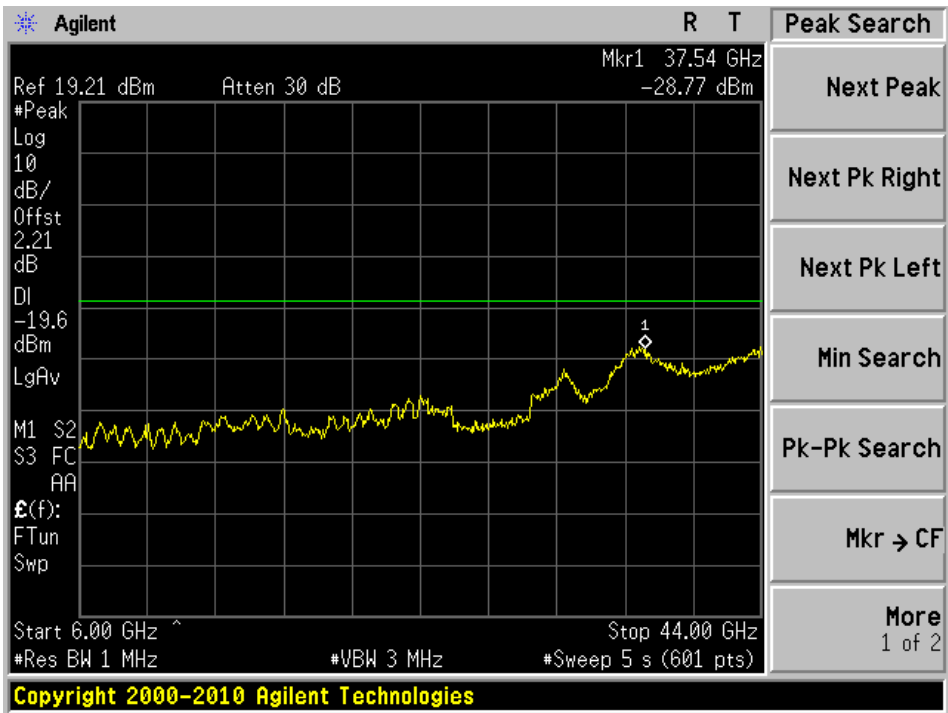


5.8 GHz Band

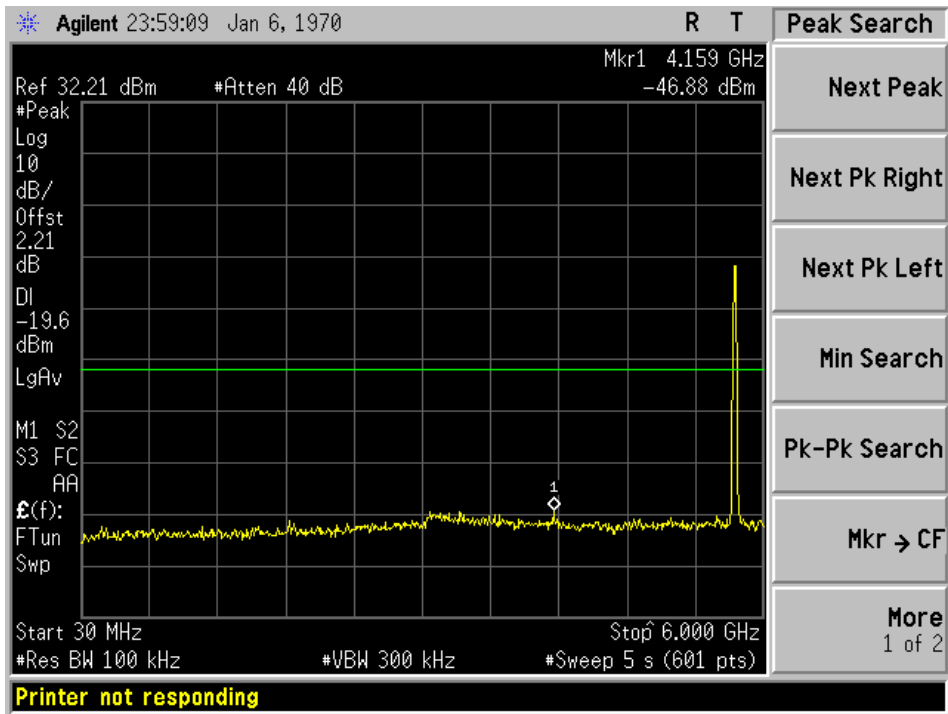
802.11a Low channel, Chain J1, below 6GHz



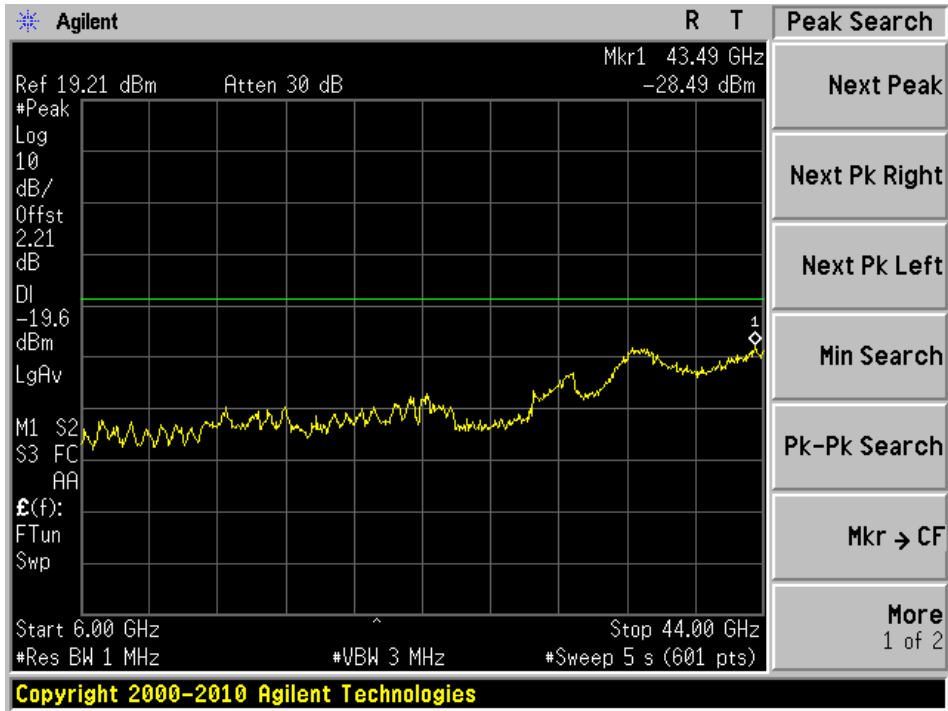
802.11a Low channel, Chain J1, above 6GHz



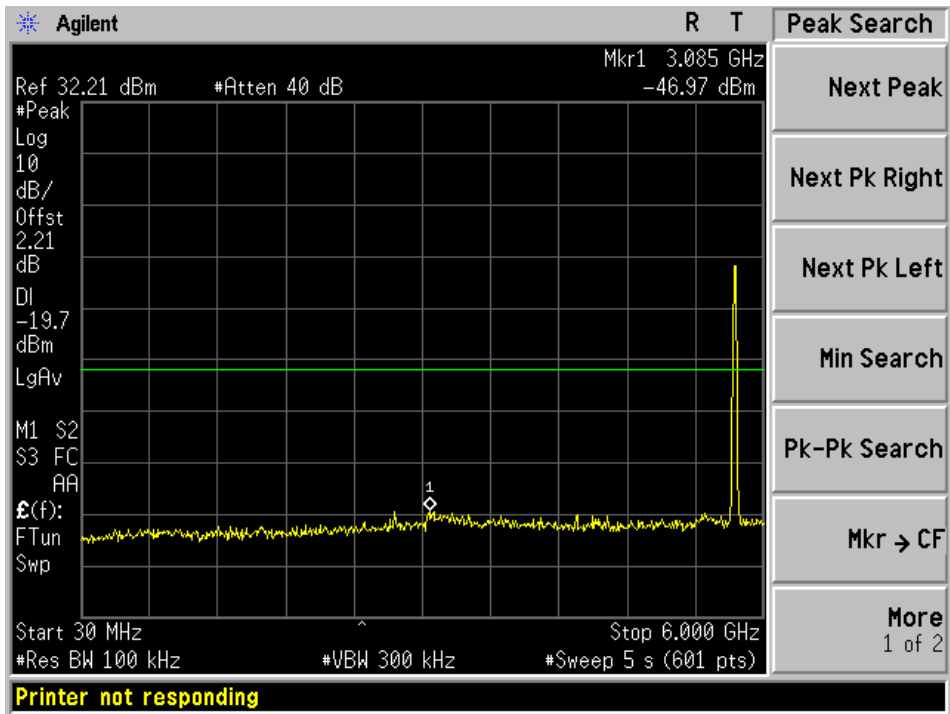
802.11a Low channel, Chain J2, below 6GHz



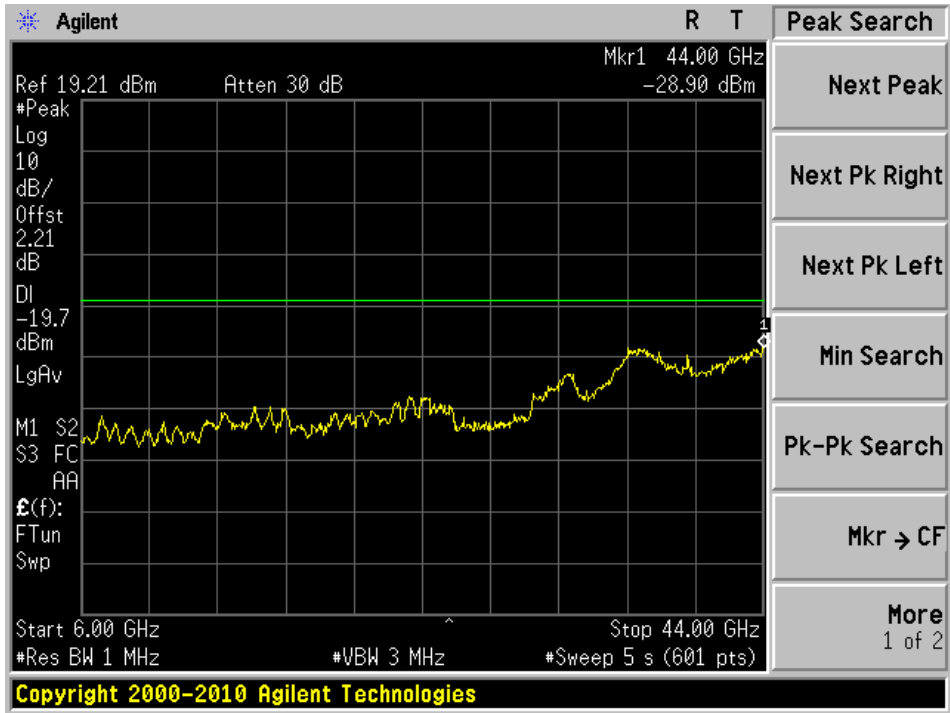
802.11a Low channel, Chain J2, above 6GHz



802.11a Low channel, Chain J3, below 6GHz

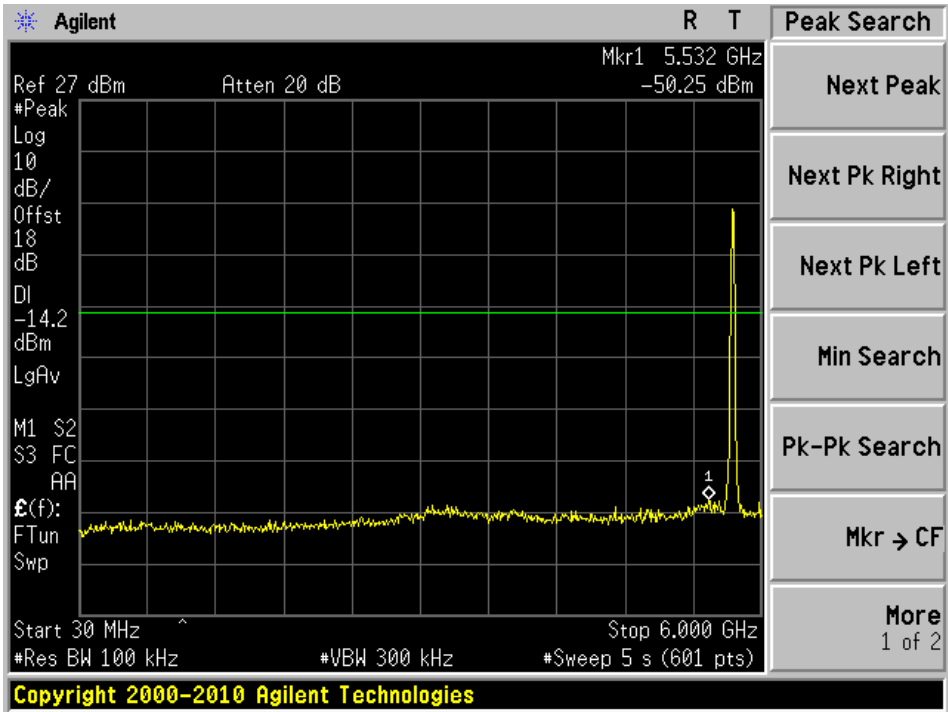


802.11a Low channel, Chain J3, above 6GHz

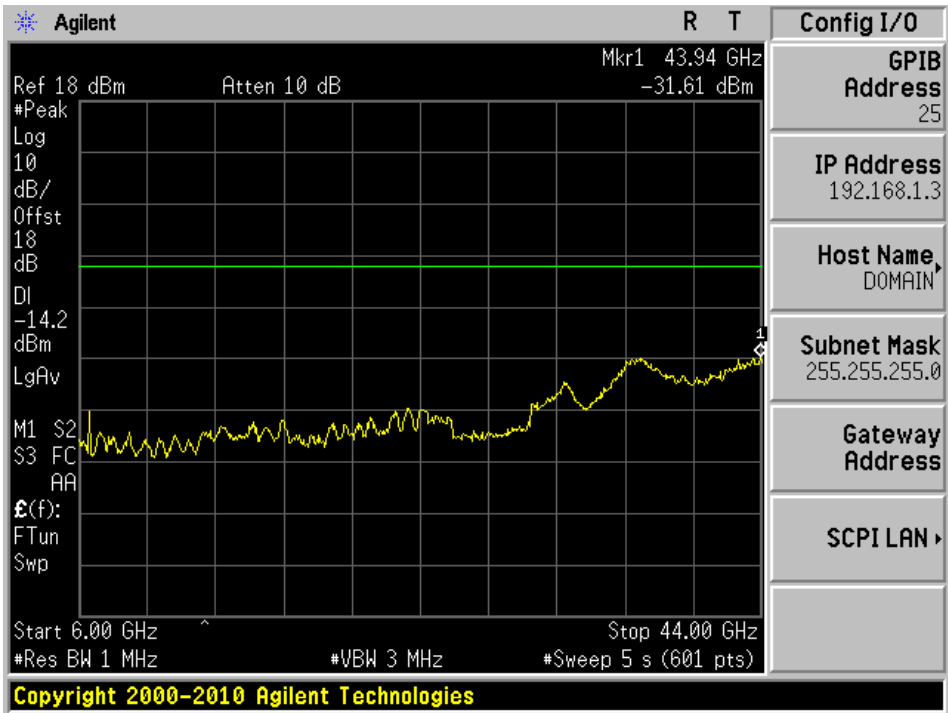


Chain J4 is not active during test

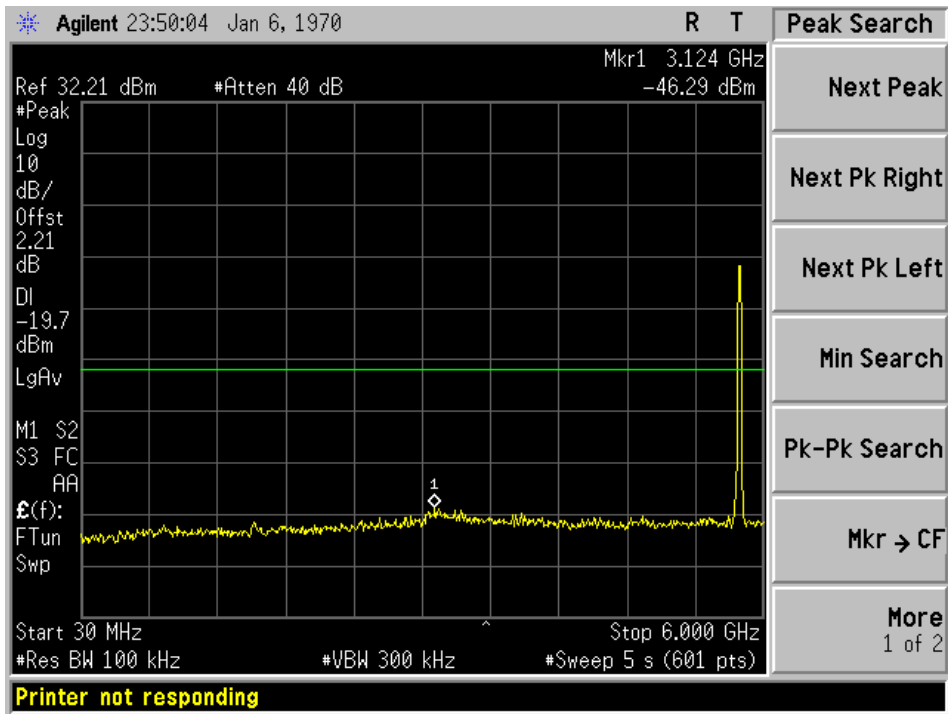
802.11a Low channel, Chain J1+J2+J3, below 6GHz



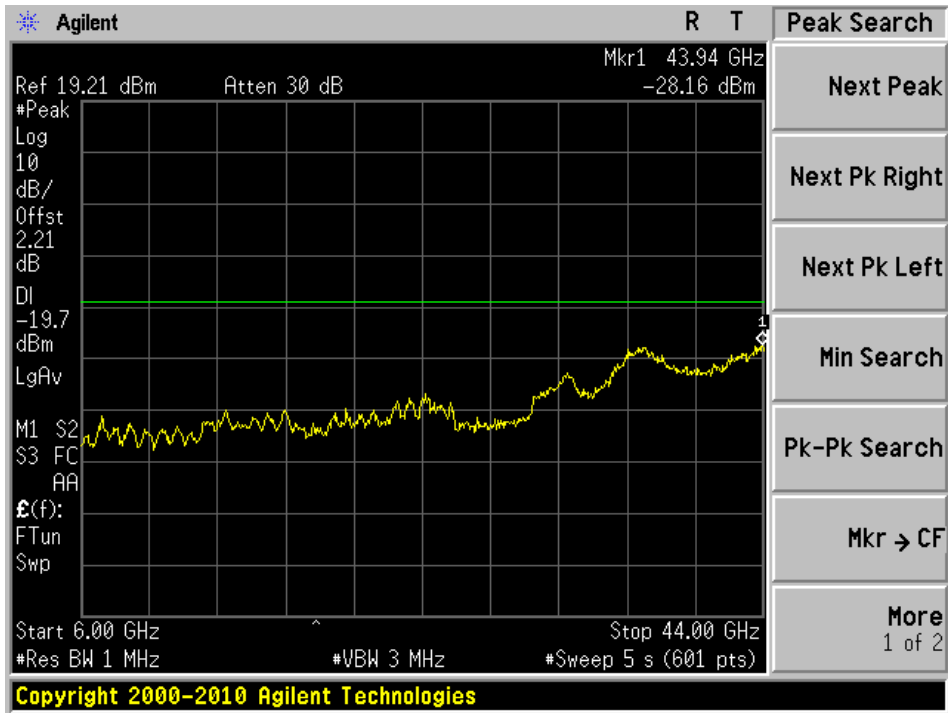
802.11a Low channel, Chain J1+J2+J3, above 6GHz



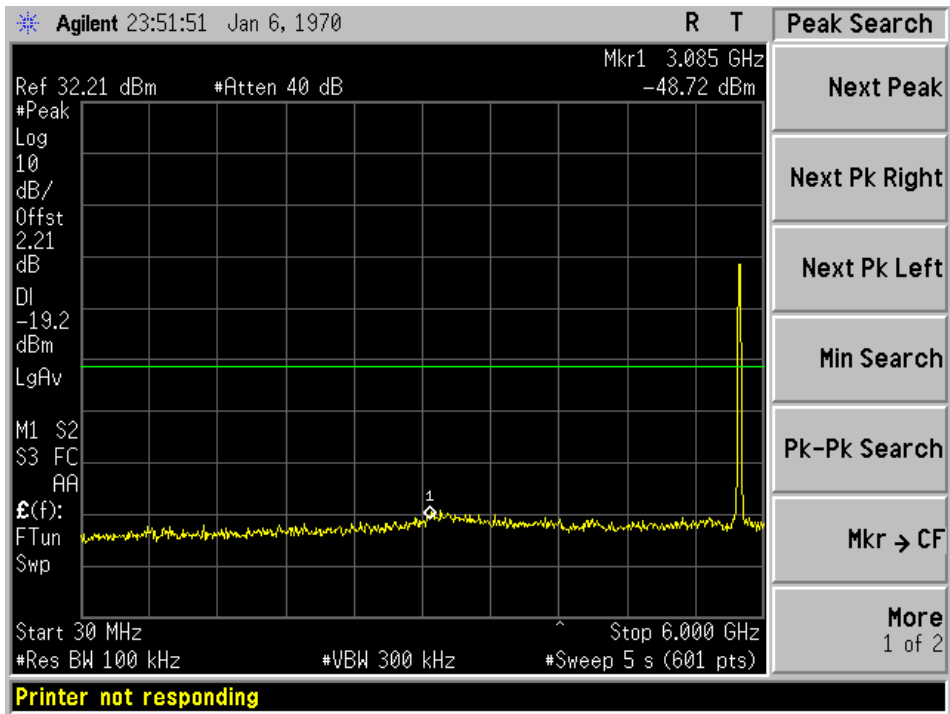
802.11a Middle channel, Chain J1, below 6GHz



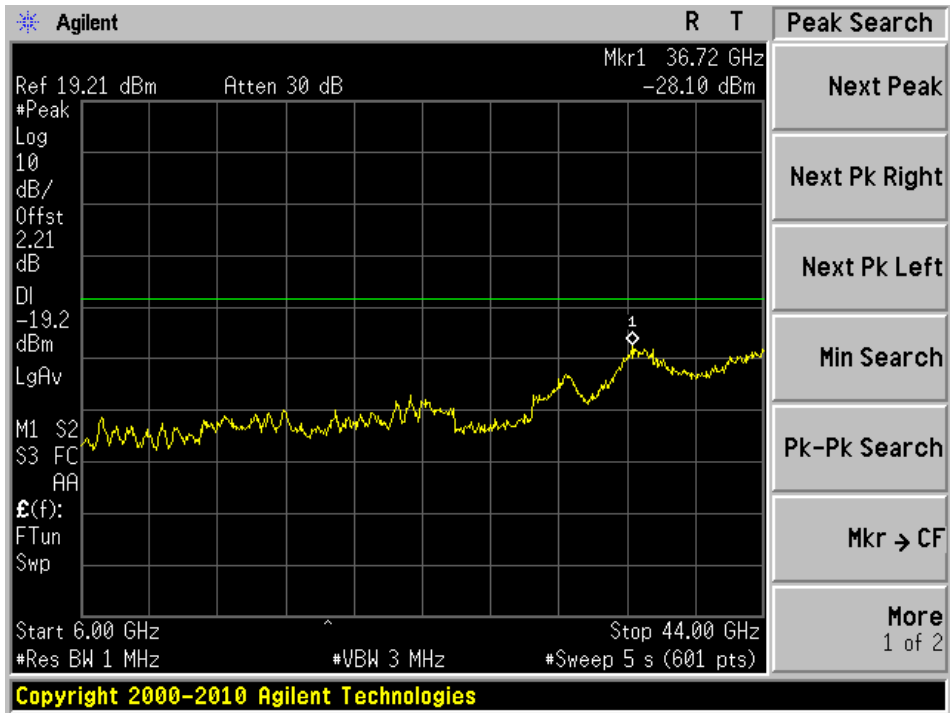
802.11a Middle channel, Chain J1, above 6GHz



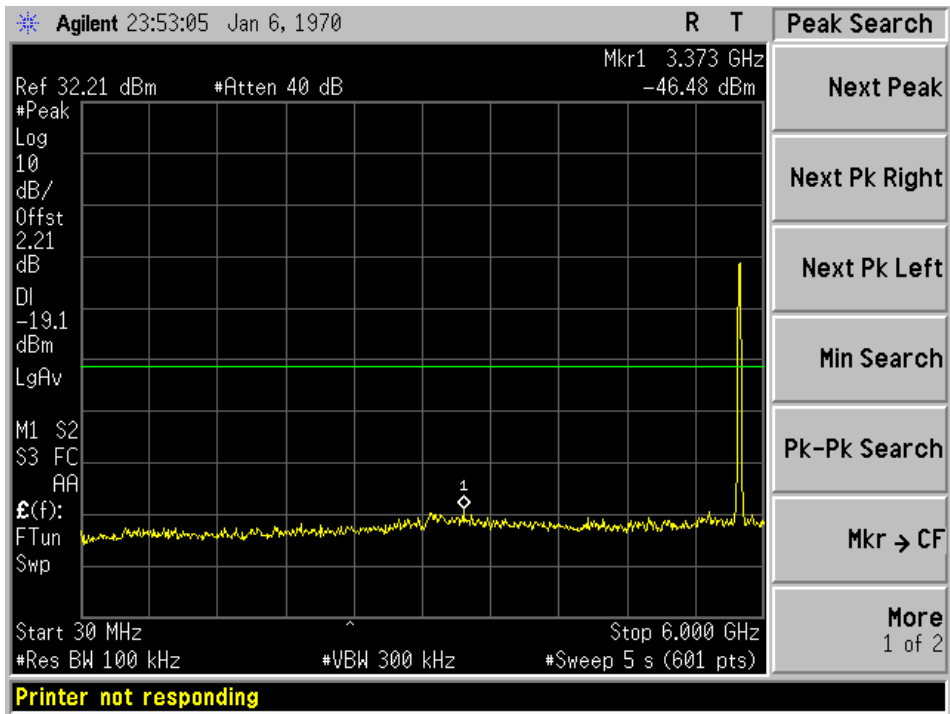
802.11a Middle channel, Chain J2, below 6GHz



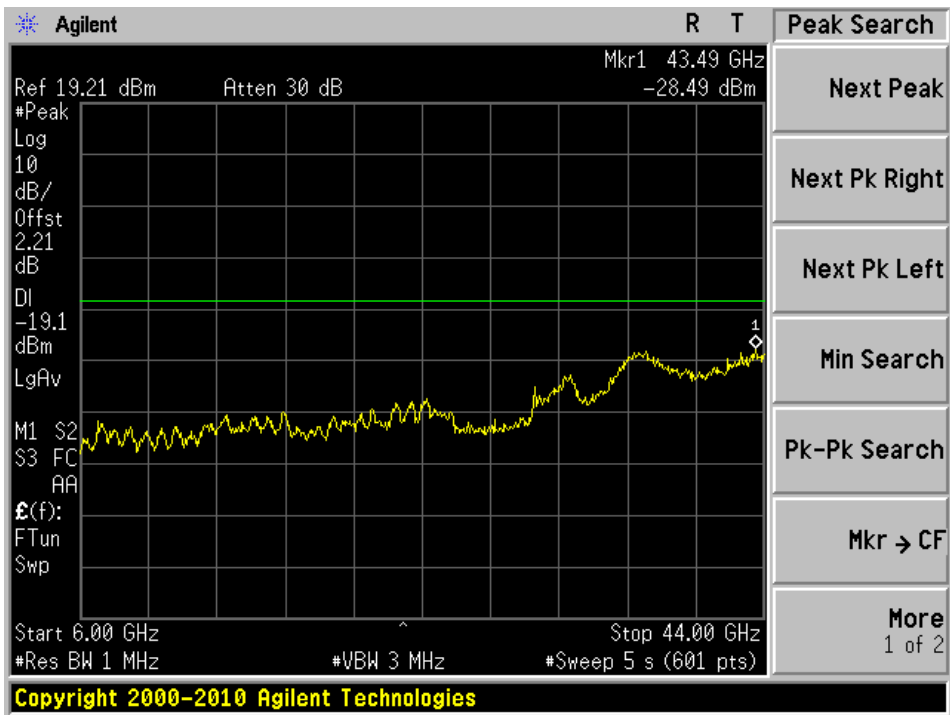
802.11a Middle channel, Chain J2, above 6GHz



802.11a Middle channel, Chain J3, below 6GHz

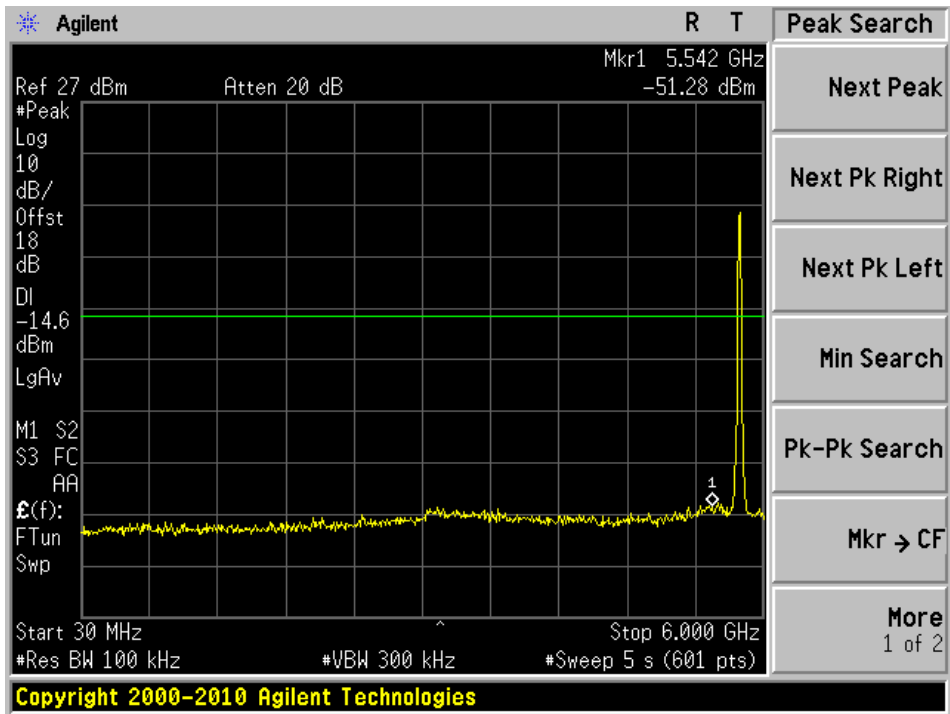


802.11a Middle channel, Chain J3, above 6GHz

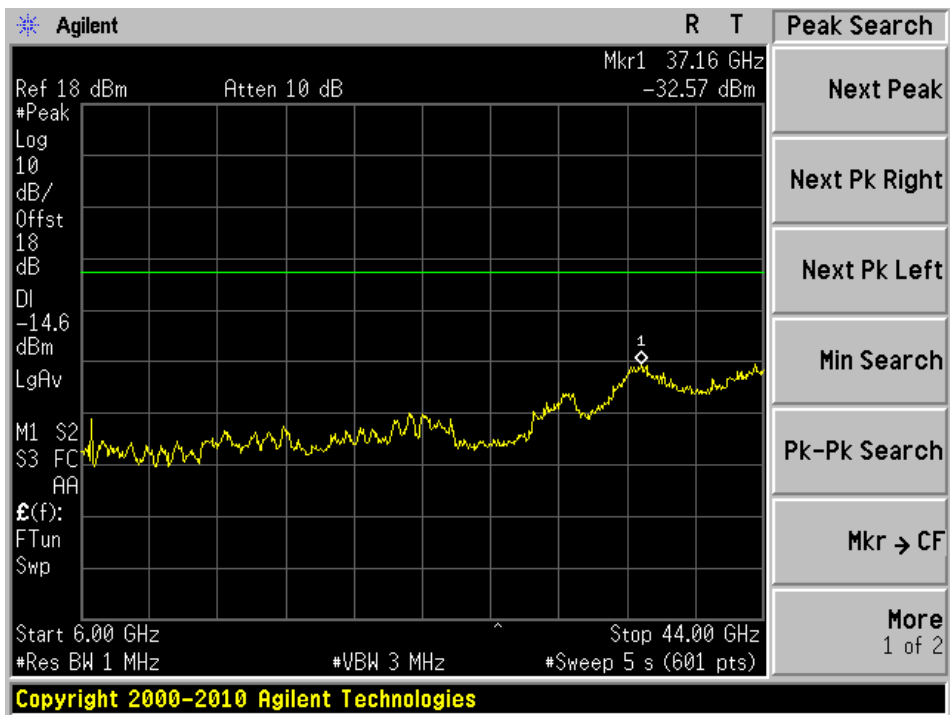


Chain J4 is not active during test

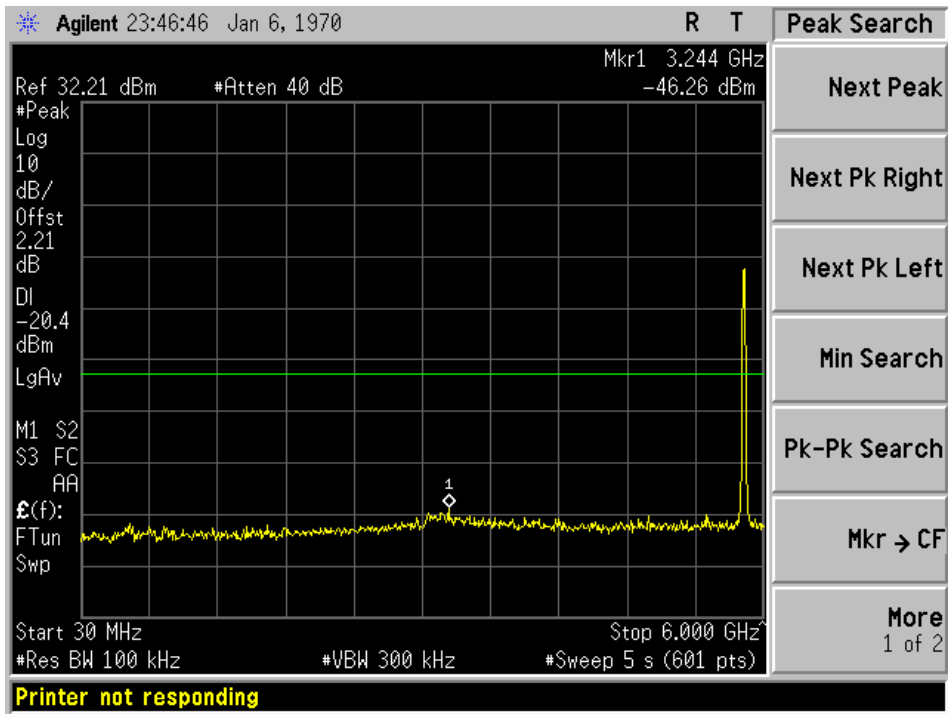
802.11a Middle channel, Chain J1+J2+J3, below 6GHz



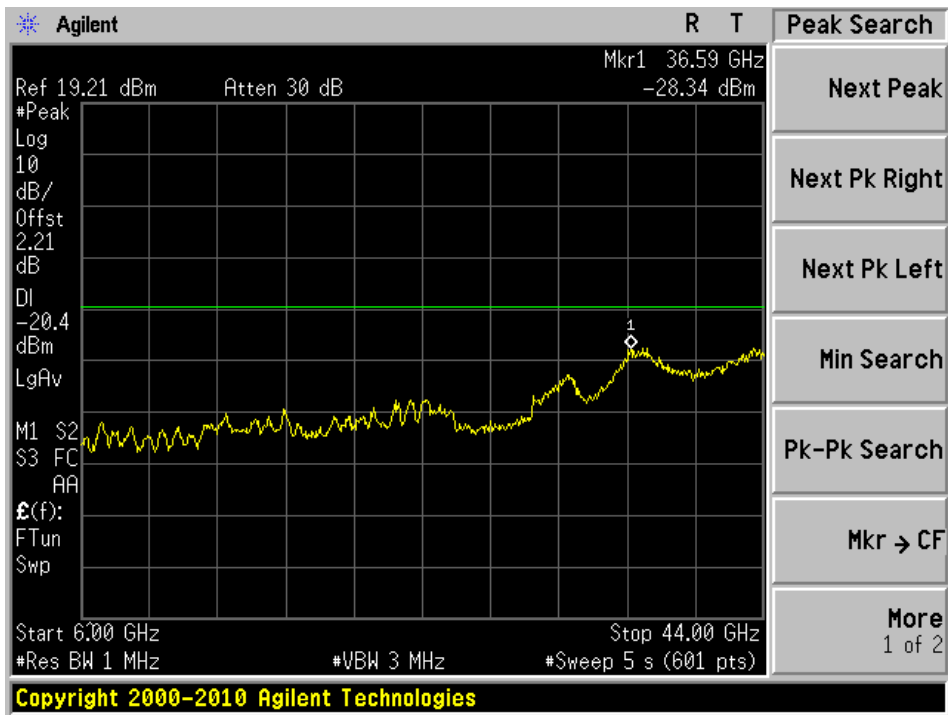
802.11a Middle channel, Chain J1+J2+J3, above 6GHz



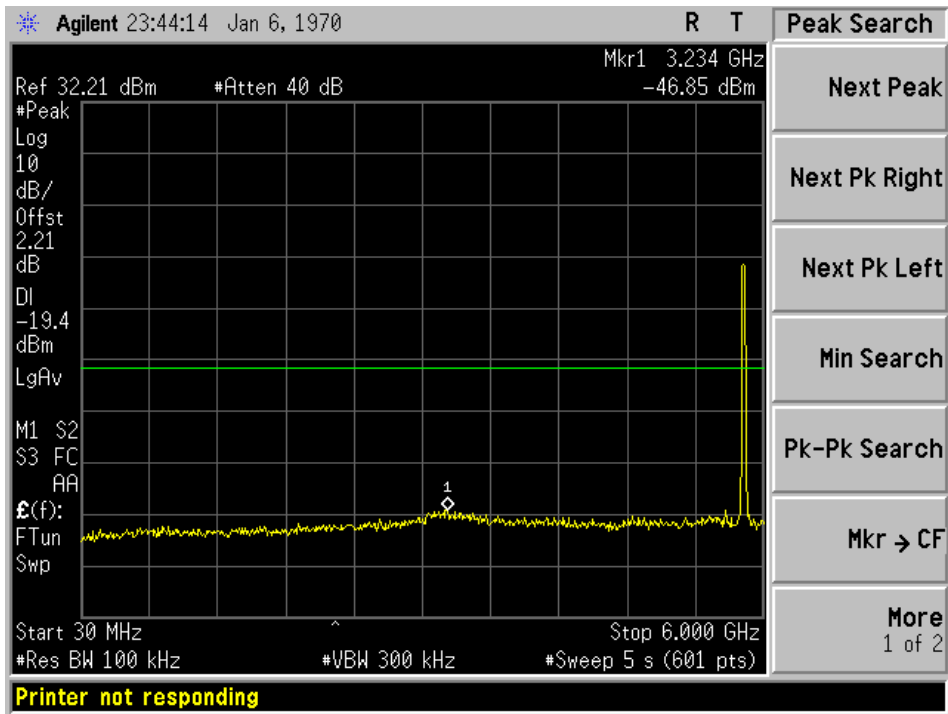
802.11a High channel, Chain J1, below 6GHz



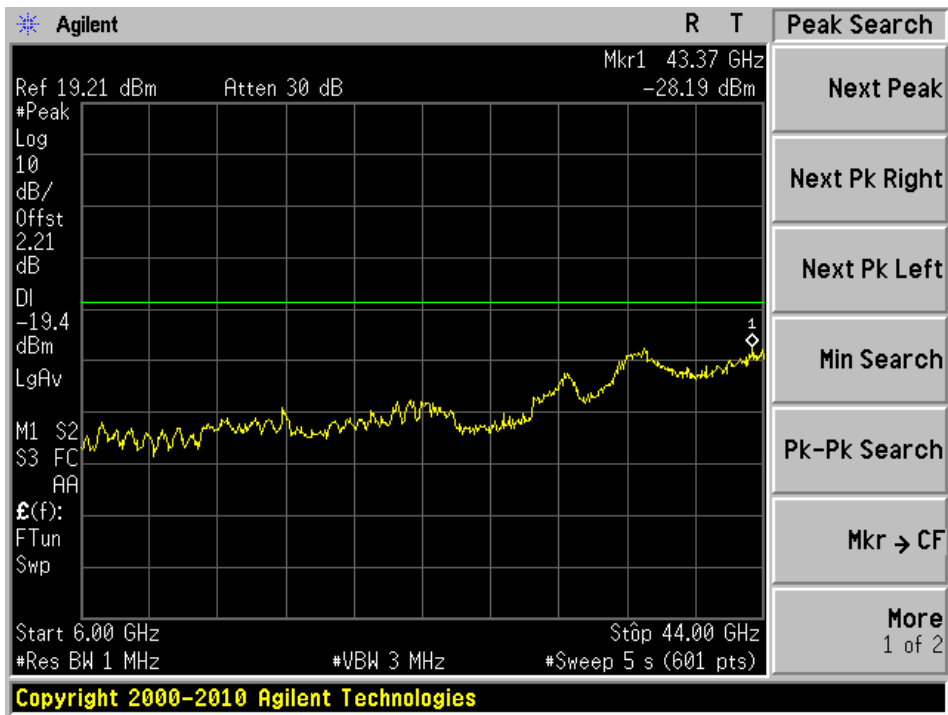
802.11a High channel, Chain J1, above 6GHz



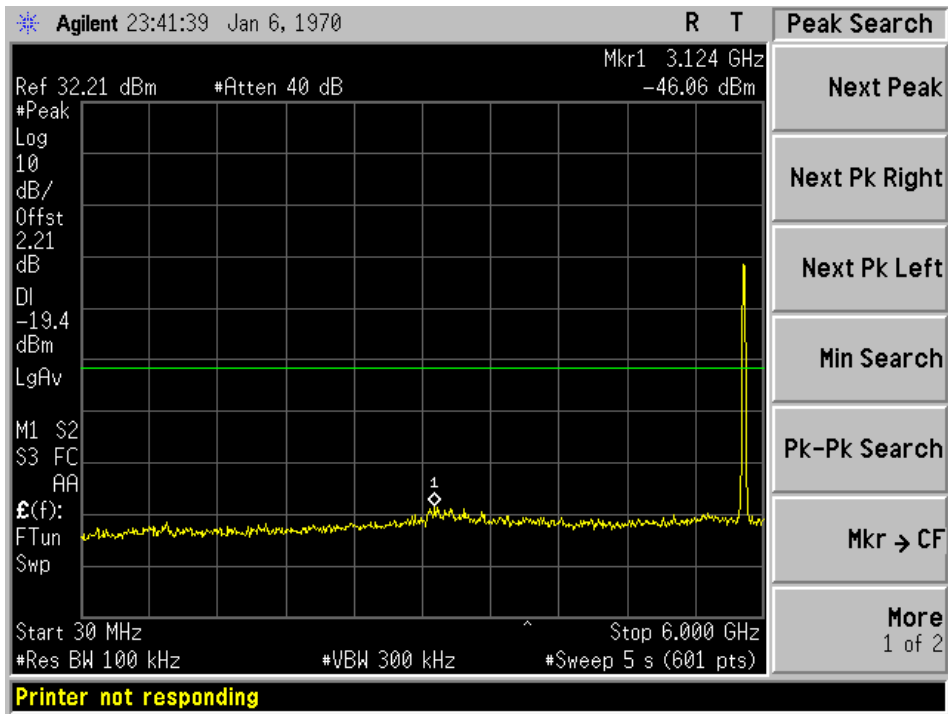
802.11a High channel, Chain J2, below 6GHz



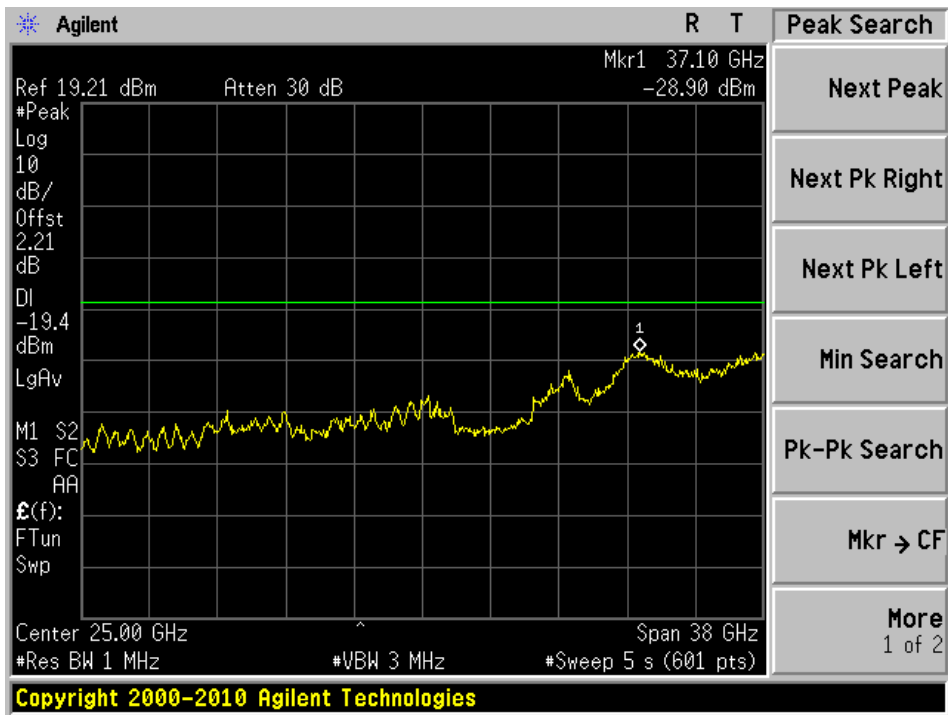
802.11a High channel, Chain J2, above 6GHz



802.11a High channel, Chain J3, below 6GHz

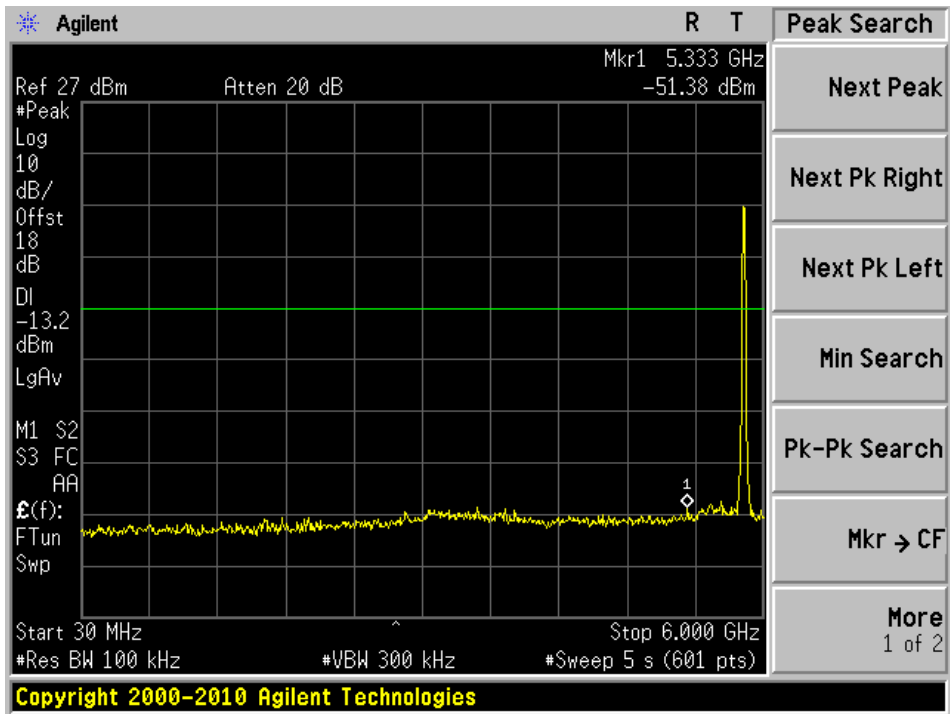


802.11a High channel, Chain J3, above 6GHz

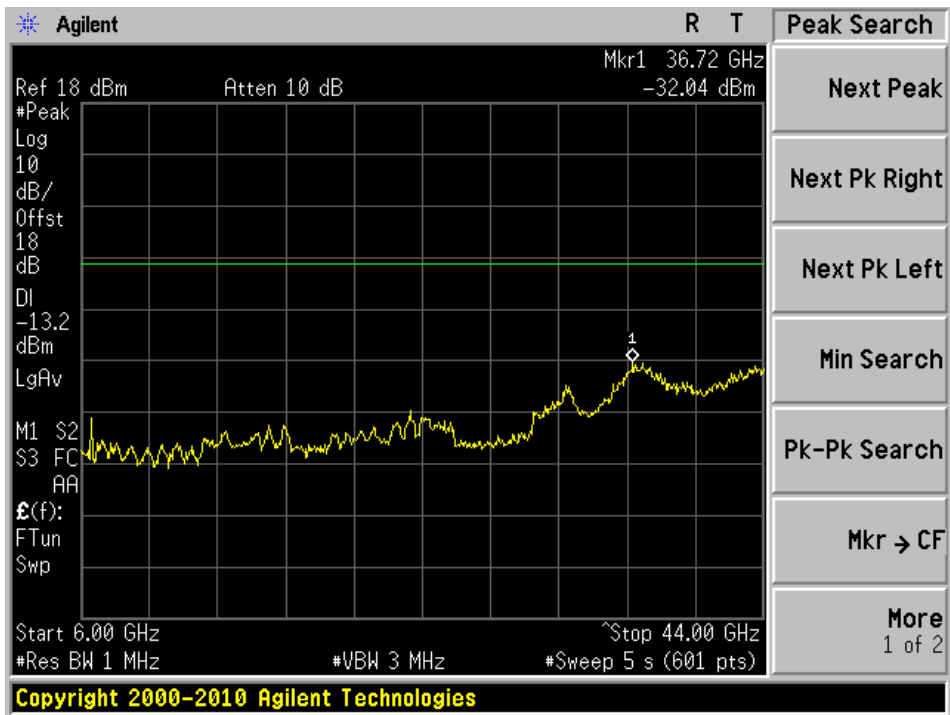


Chain J4 is not active during test

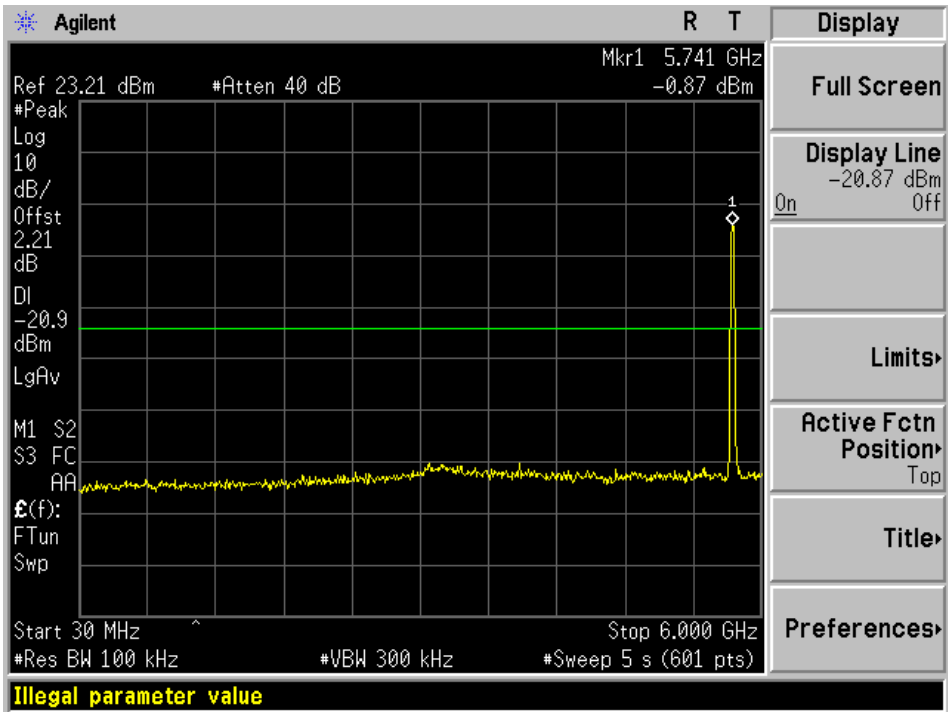
802.11a High channel, Chain J1+J2+J3, below 6GHz



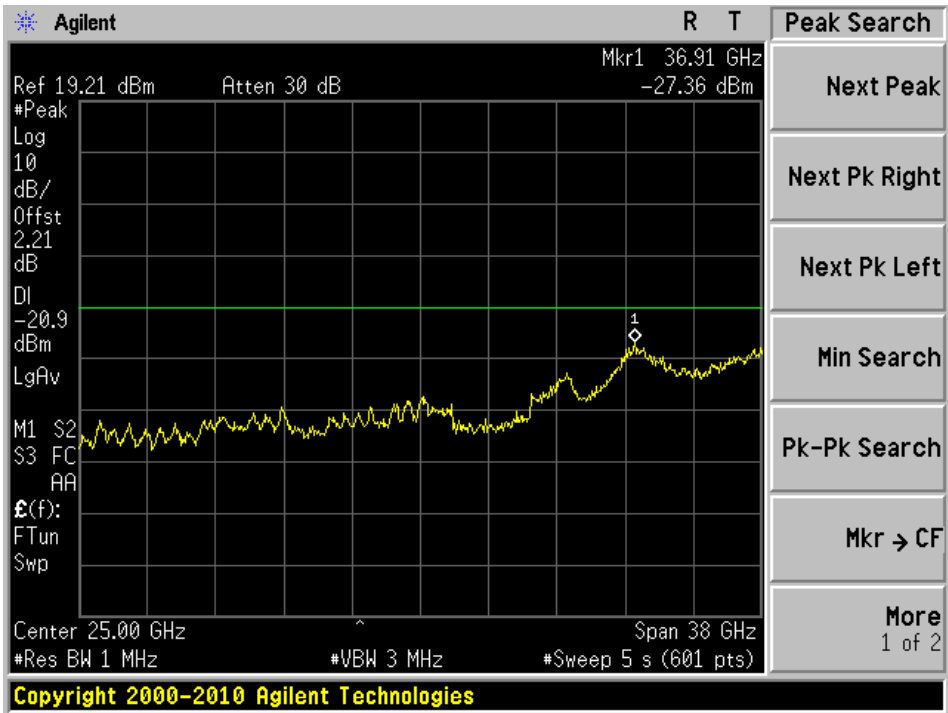
802.11a High channel, Chain J1+J2+J3, above 6GHz



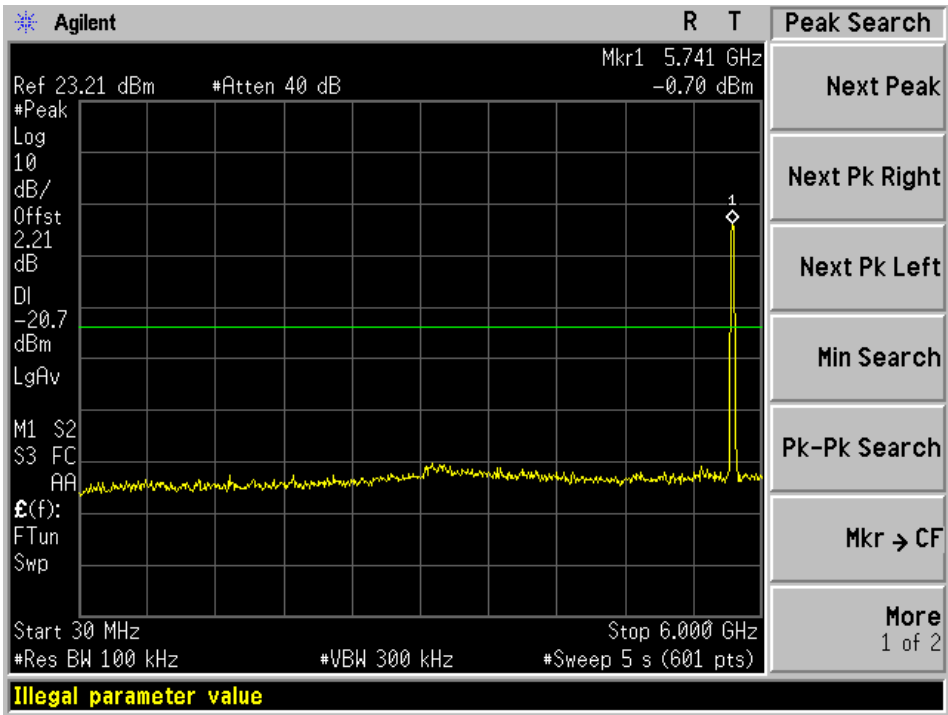
802.11n 20MHz Low channel, Chain J1, below 6GHz



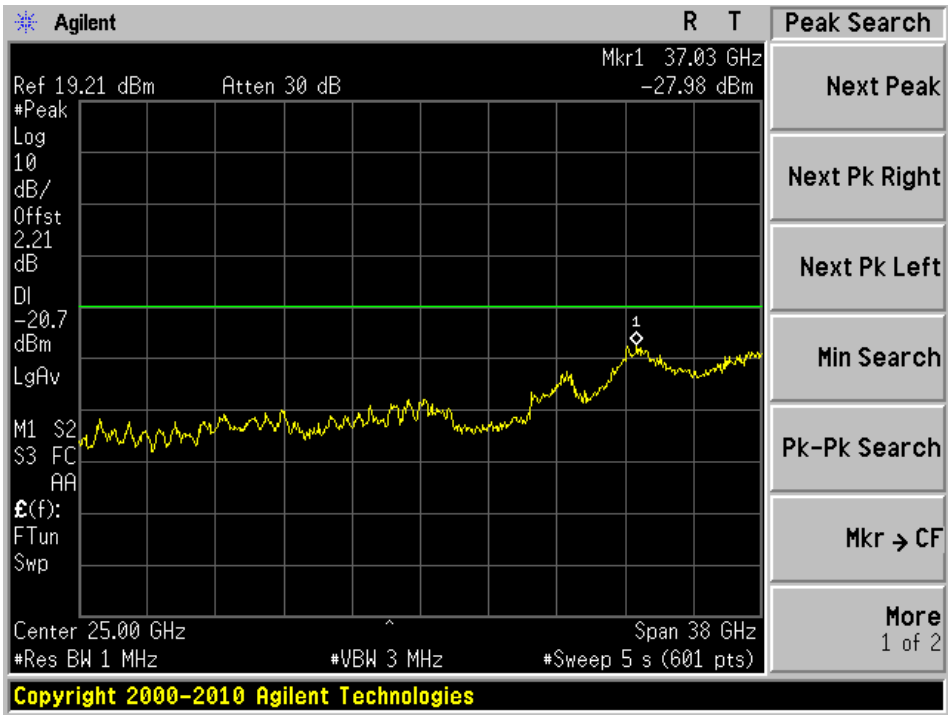
802.11n 20MHz Low channel, Chain J1, above 6GHz



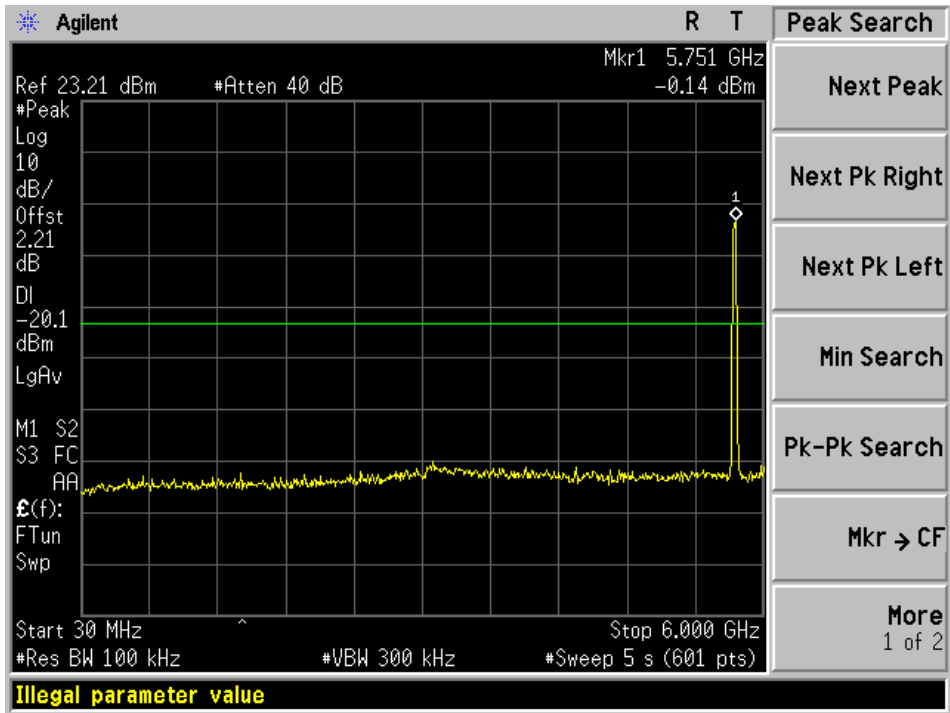
802.11n 20MHz Low channel, Chain J2, below 6GHz



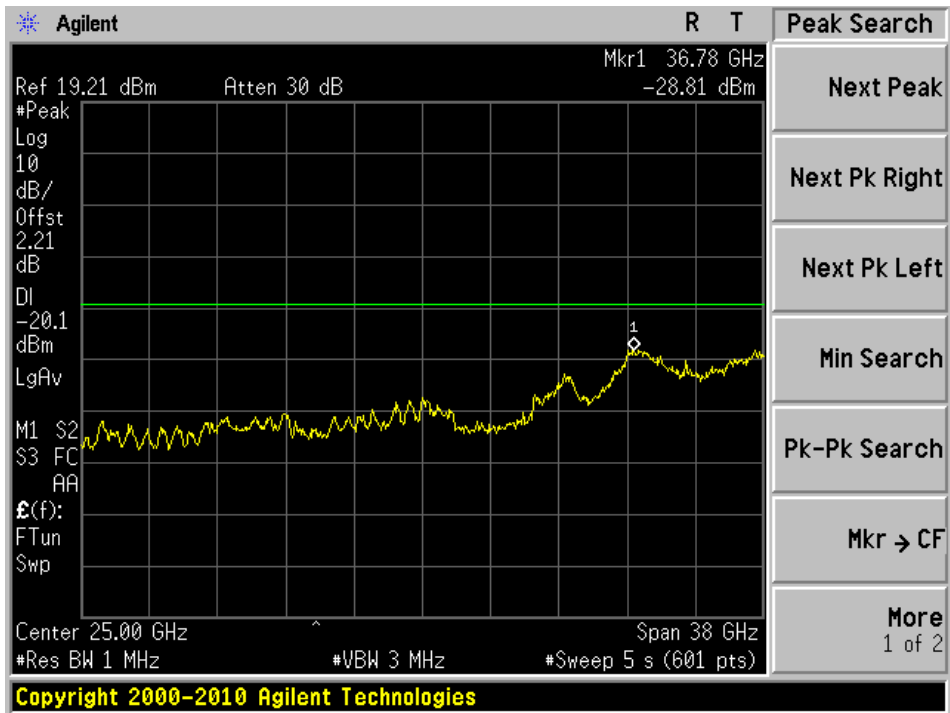
802.11n 20MHz Low channel, Chain J2, above 6GHz



802.11n 20MHz Low channel, Chain J3, below 6GHz

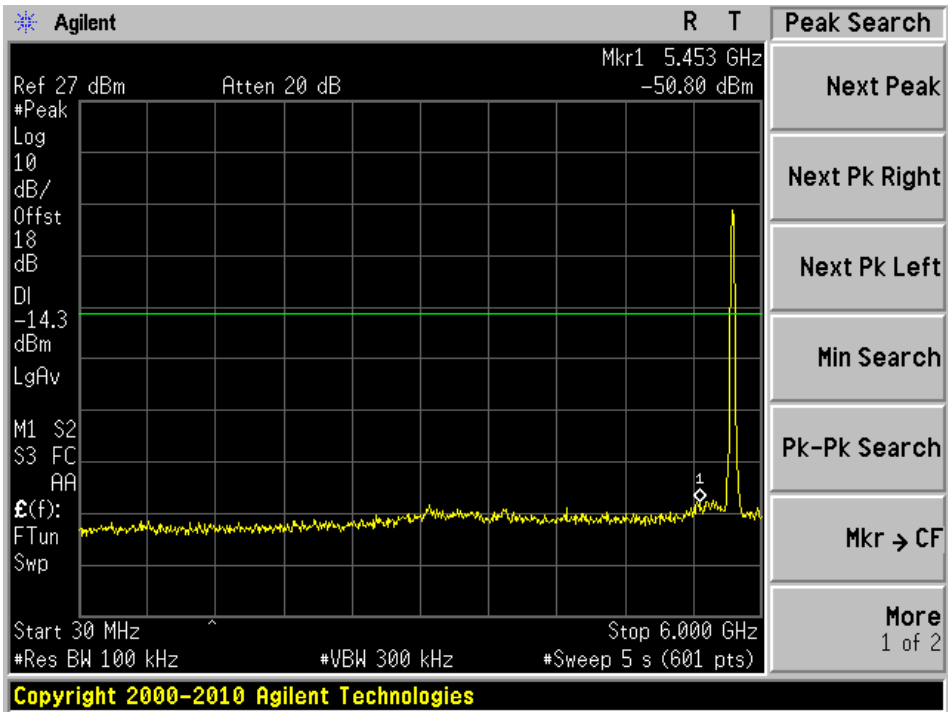


802.11n 20MHz Low channel, Chain J3, above 6GHz

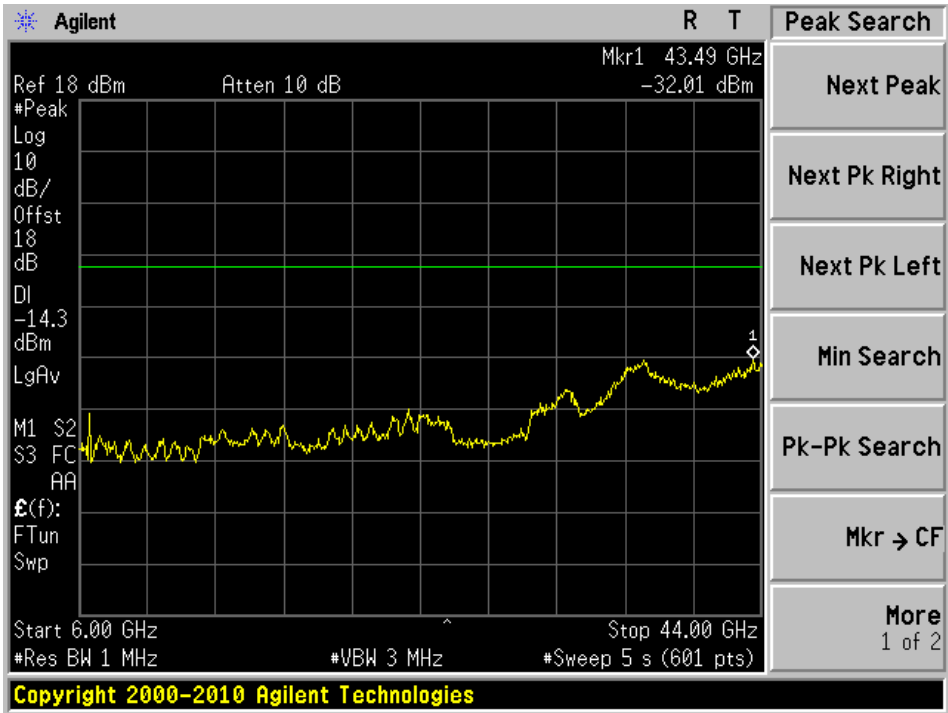


Chain J4 is not active during test

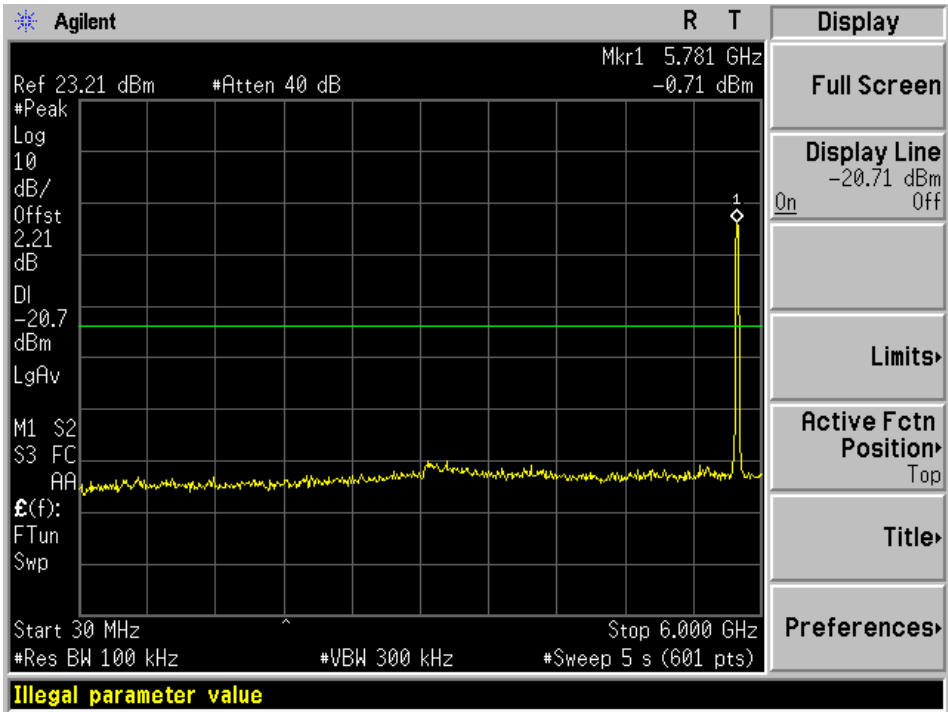
802.11n 20MHz Low channel, Chain J1+J2+J3, below 6GHz



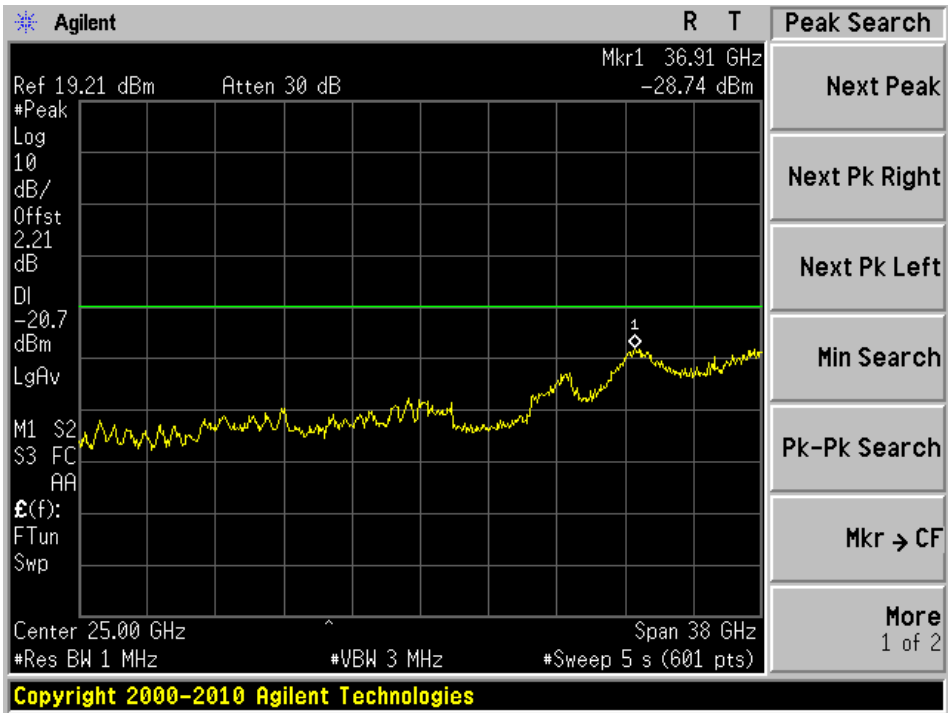
802.11n 20MHz Low channel, Chain J1+J2+J3, above 6GHz



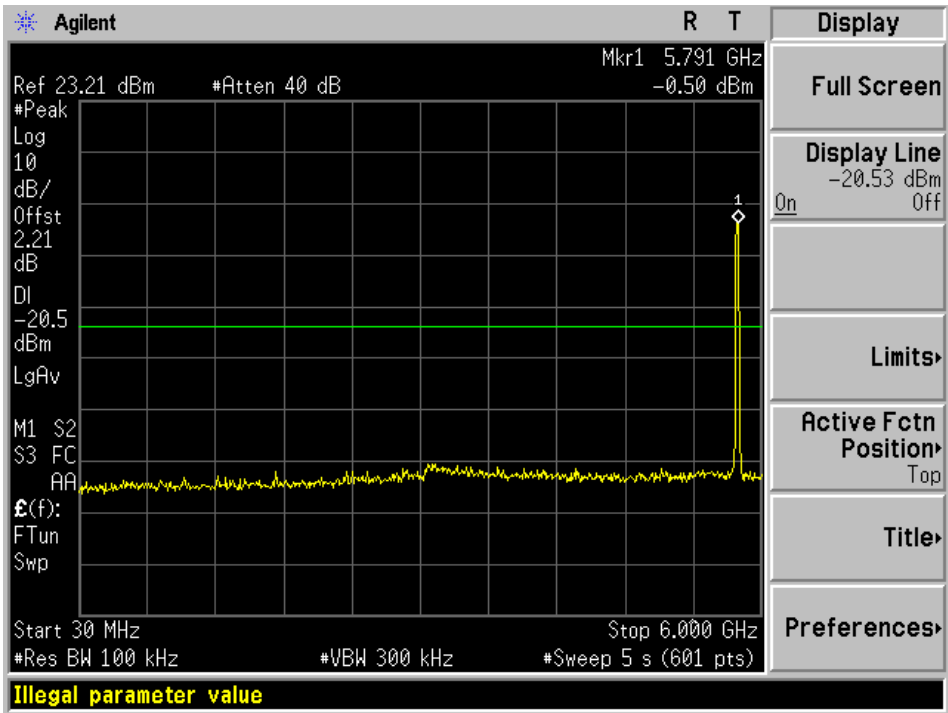
802.11n 20MHz Middle channel, Chain J1, below 6GHz



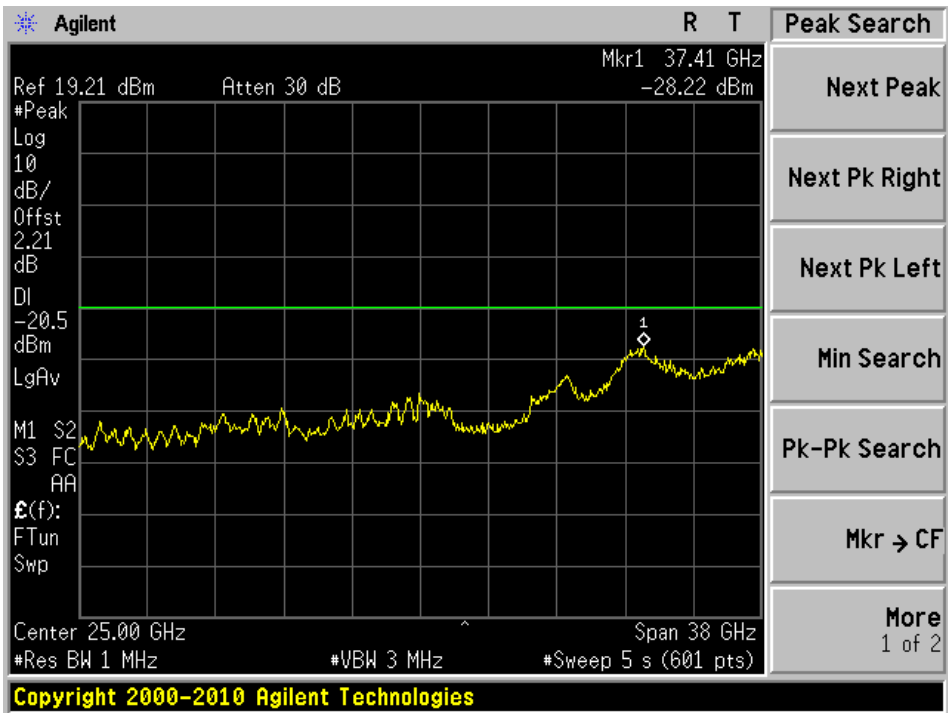
802.11n 20MHz Middle channel, Chain J1, above 6GHz



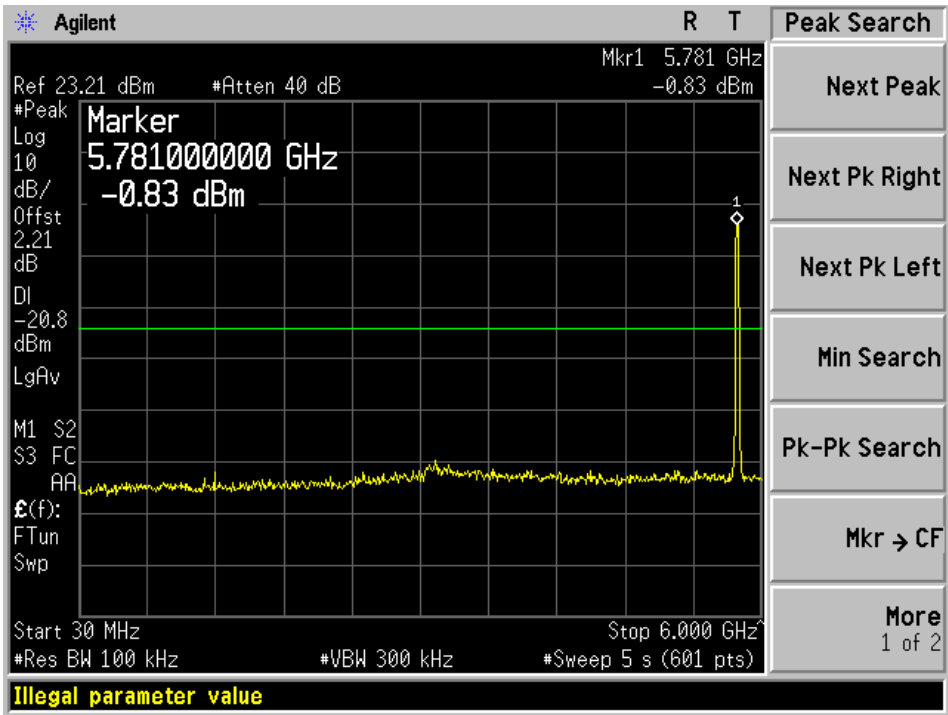
802.11n 20MHz Middle channel, Chain J2, below 6GHz



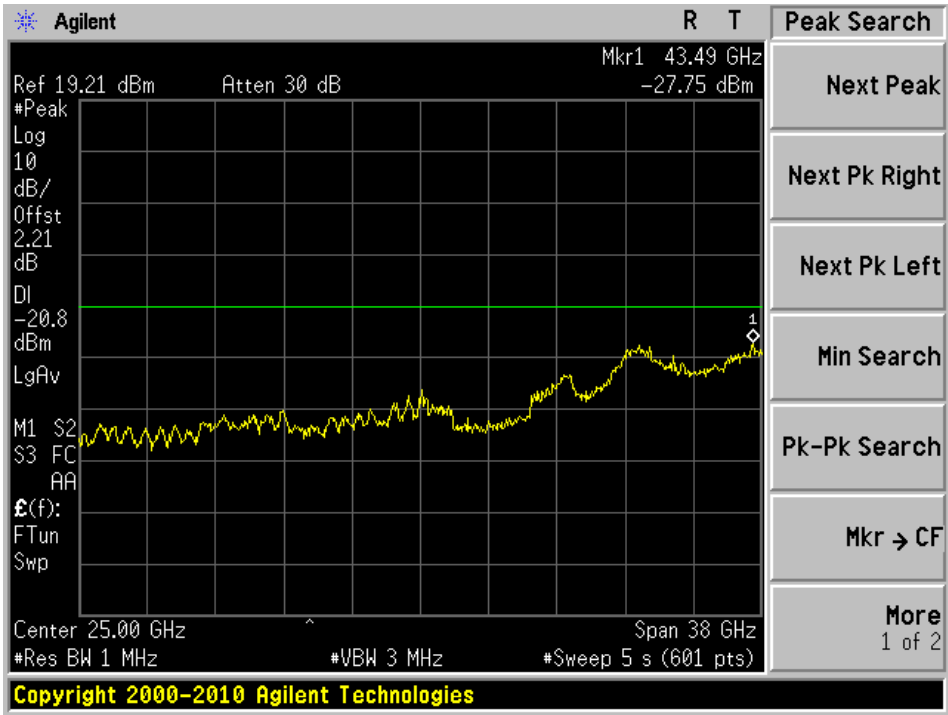
802.11n 20MHz Middle channel, Chain J2, above 6GHz



802.11n 20MHz Middle channel, Chain J3, below 6GHz

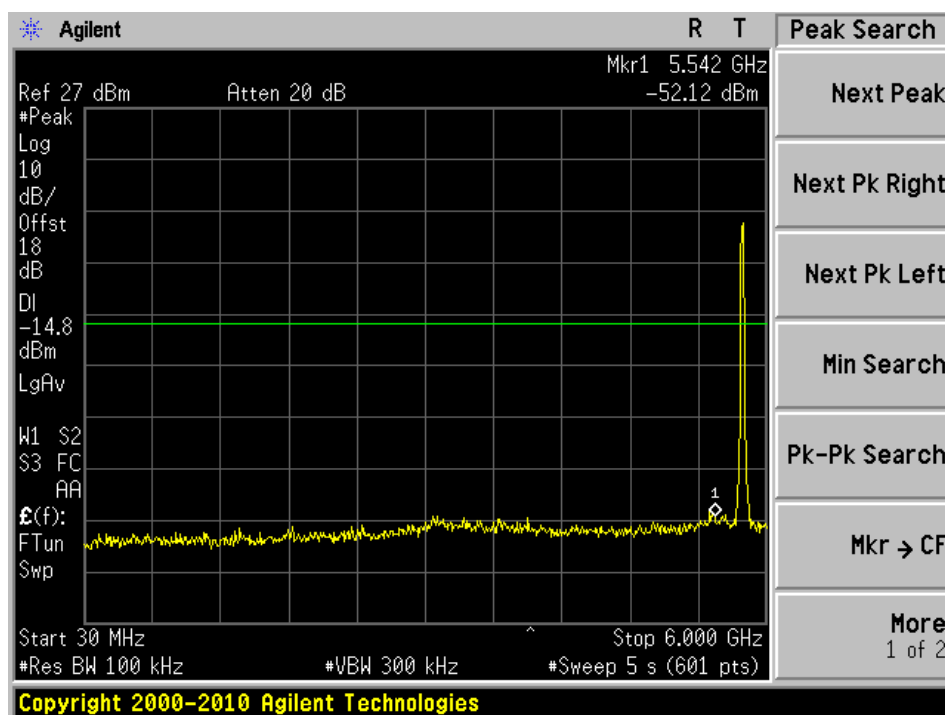


802.11n 20MHz Middle channel, Chain J3, above 6GHz

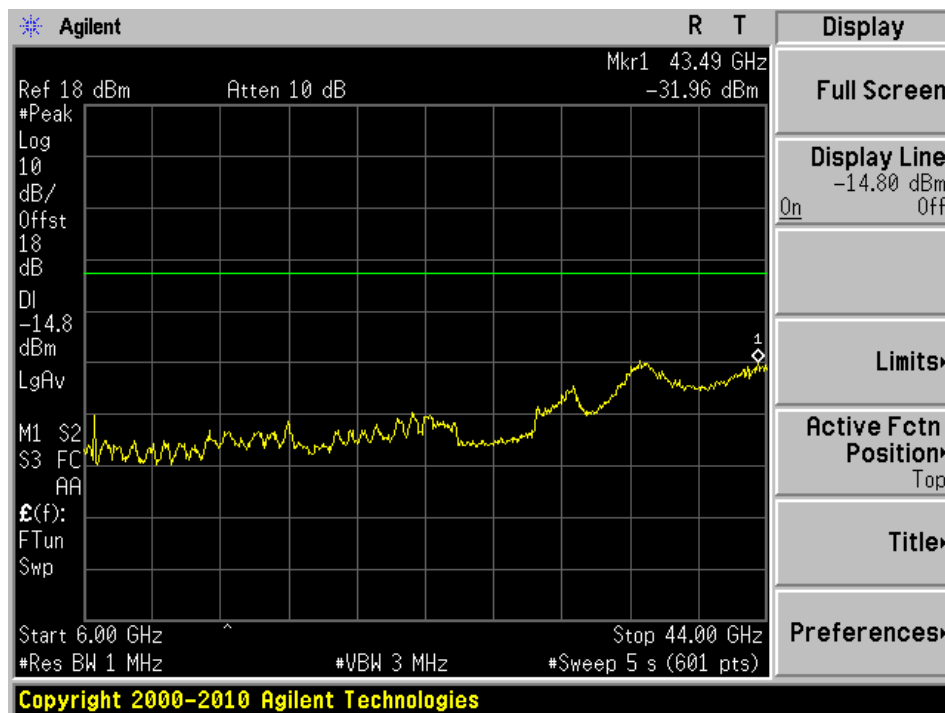


Chain J4 is not active during test

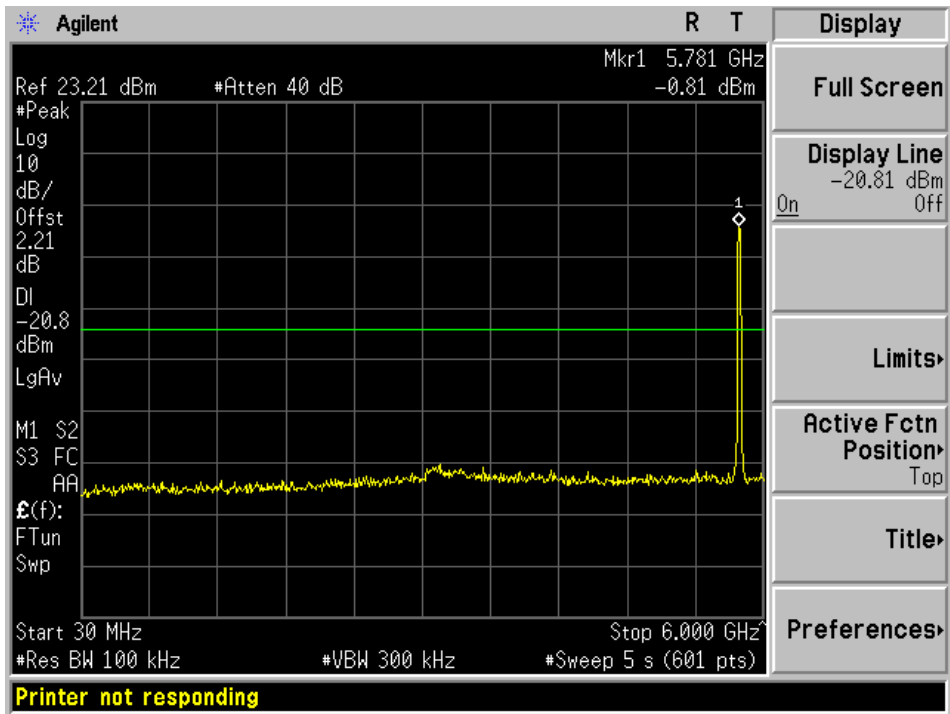
802.11n 20MHz Middle channel, Chain J1+J2+J3, below 6GHz



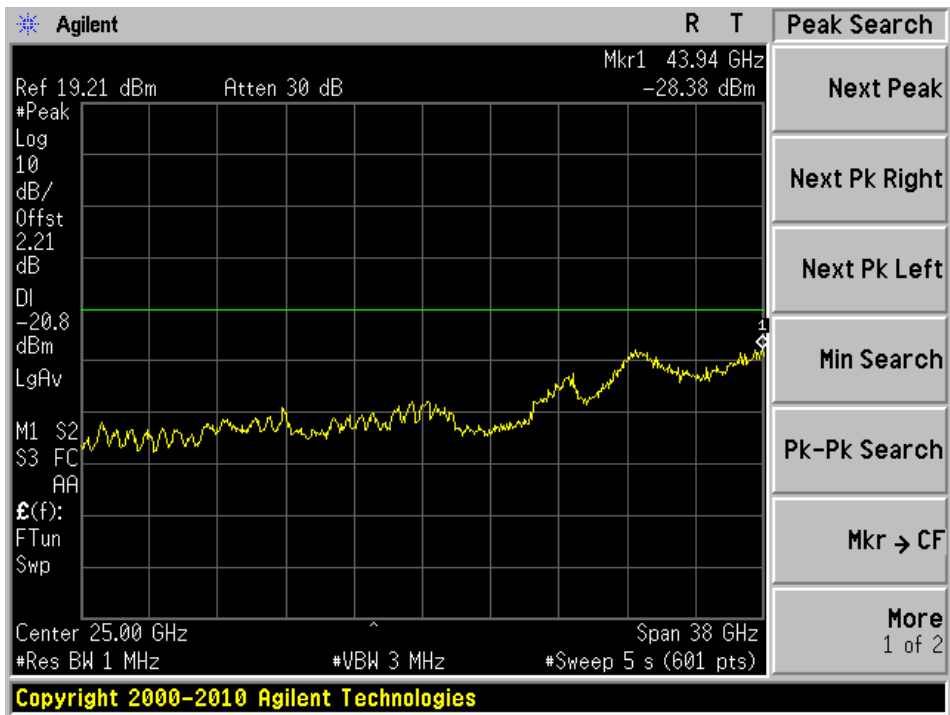
802.11n 20MHz Middle channel, Chain J1+J2+J3, above 6GHz



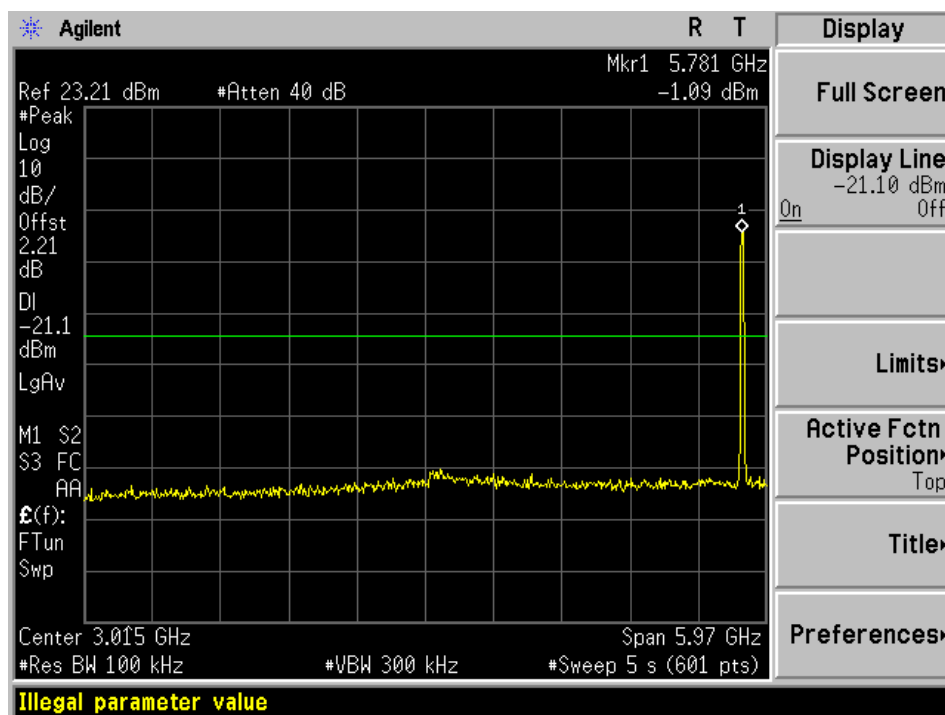
802.11n 20MHz High channel, Chain J1, below 6GHz



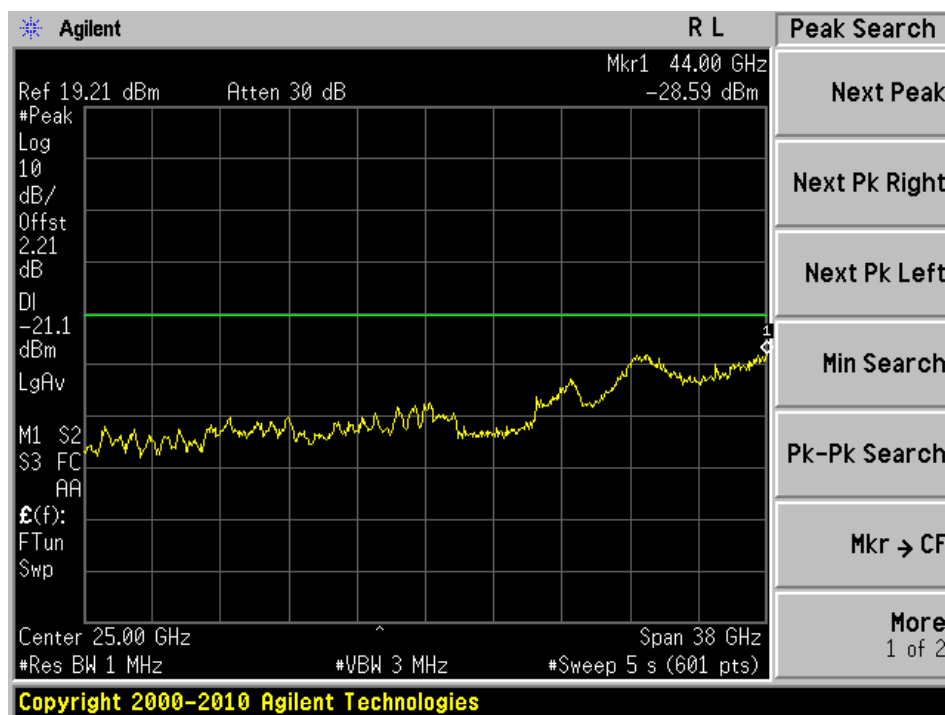
802.11n 20MHz High channel, Chain J1, above 6GHz



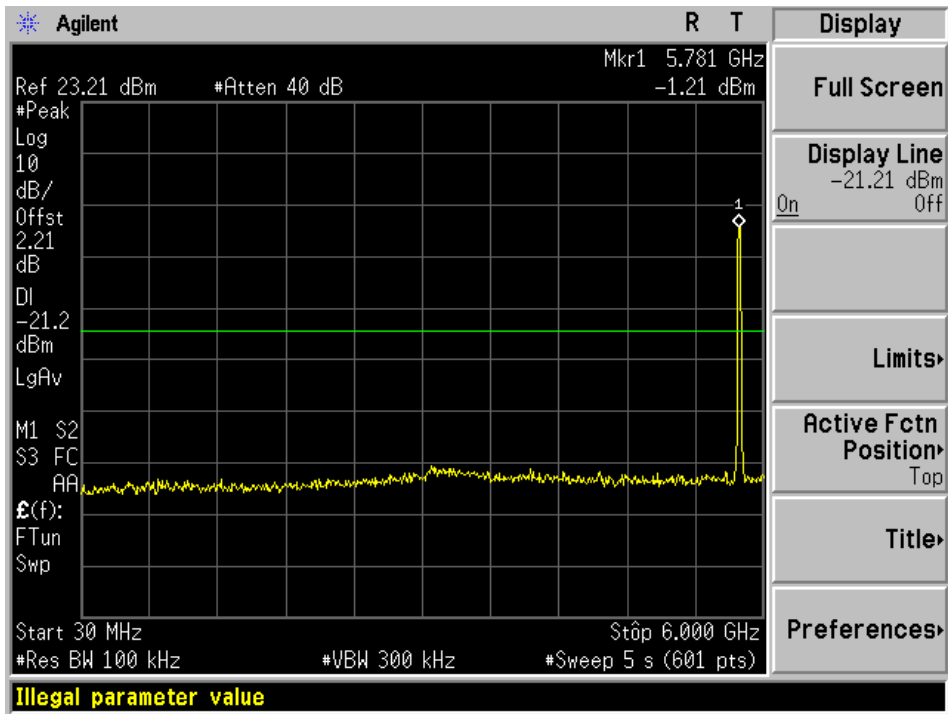
802.11n 20MHz High channel, Chain J2, below 6GHz



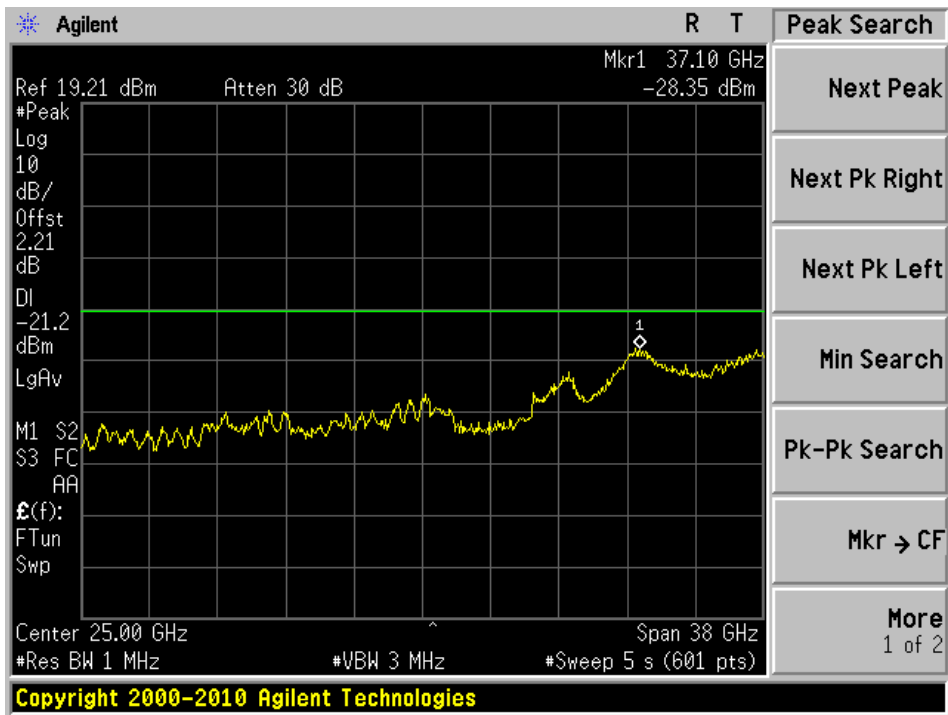
802.11n 20MHz High channel, Chain J2, above 6GHz



802.11n 20MHz High channel, Chain J3, below 6GHz

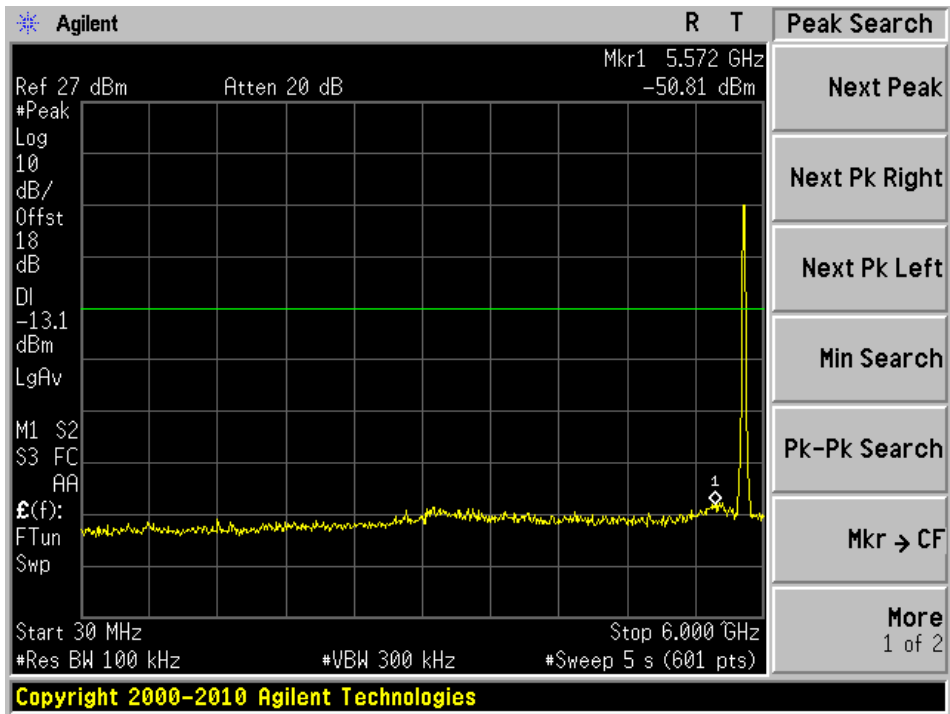


802.11n 20MHz High channel, Chain J3, above 6GHz

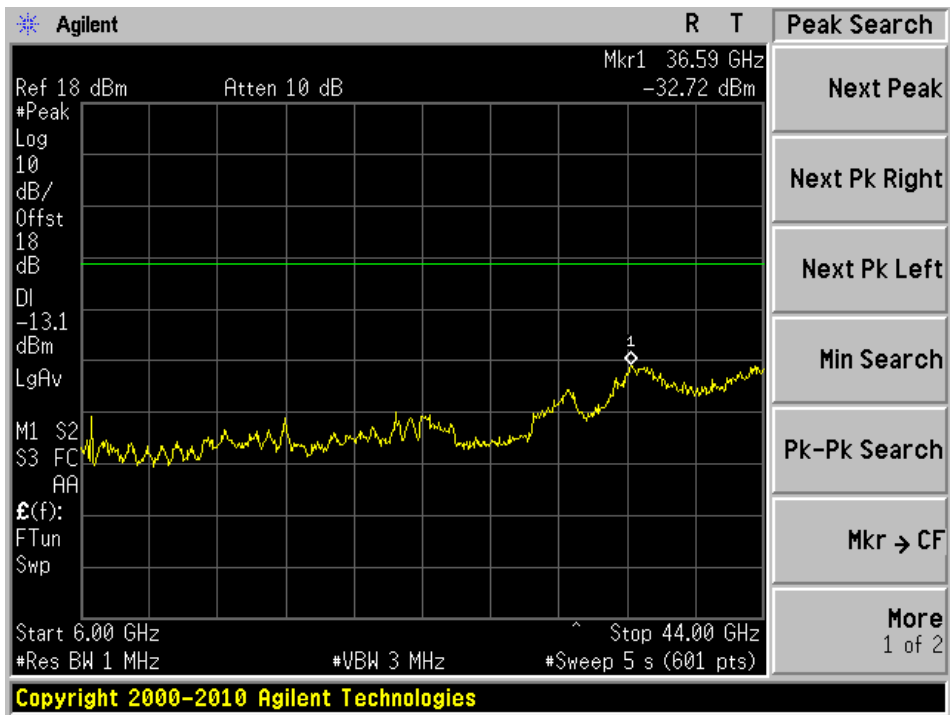


Chain J4 is not active during test

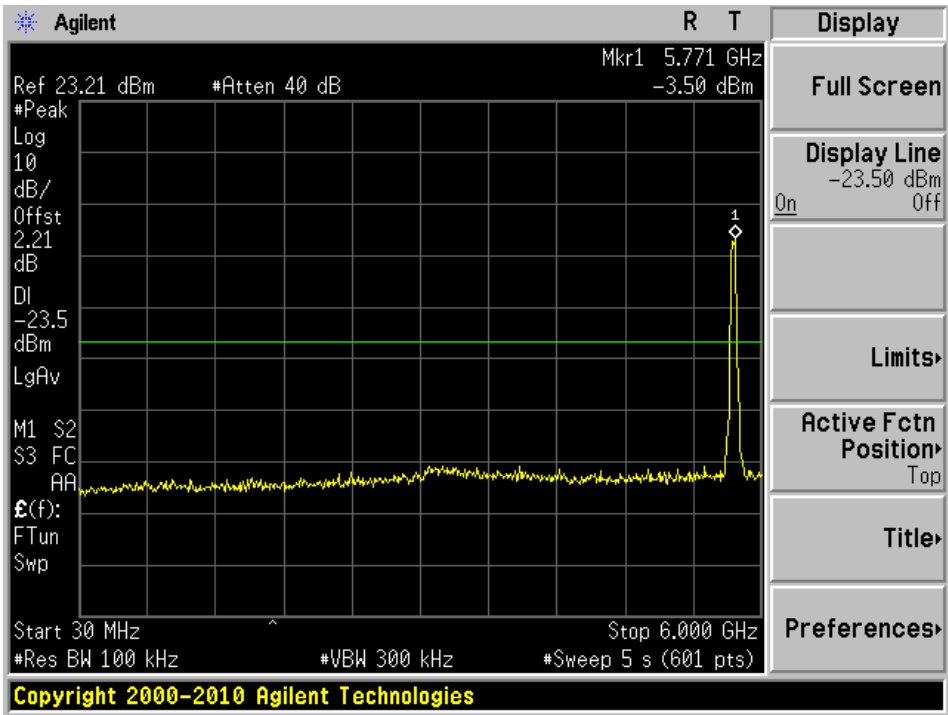
802.11n 20MHz High channel, Chain J1+J2+J3, below 6GHz



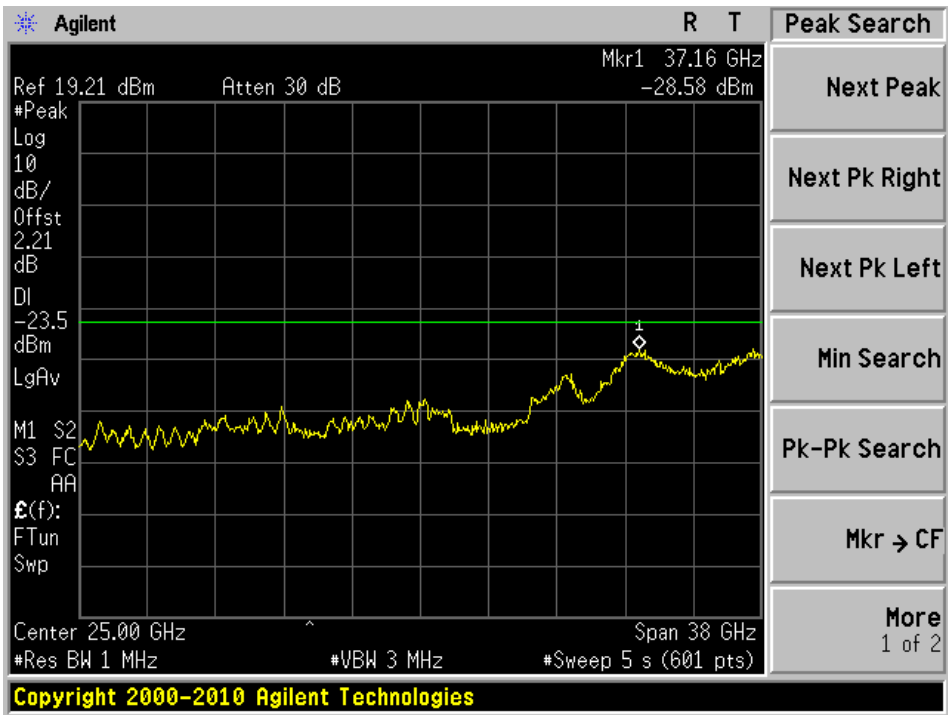
802.11n 20MHz High channel, Chain J1+J2+J3, above 6GHz



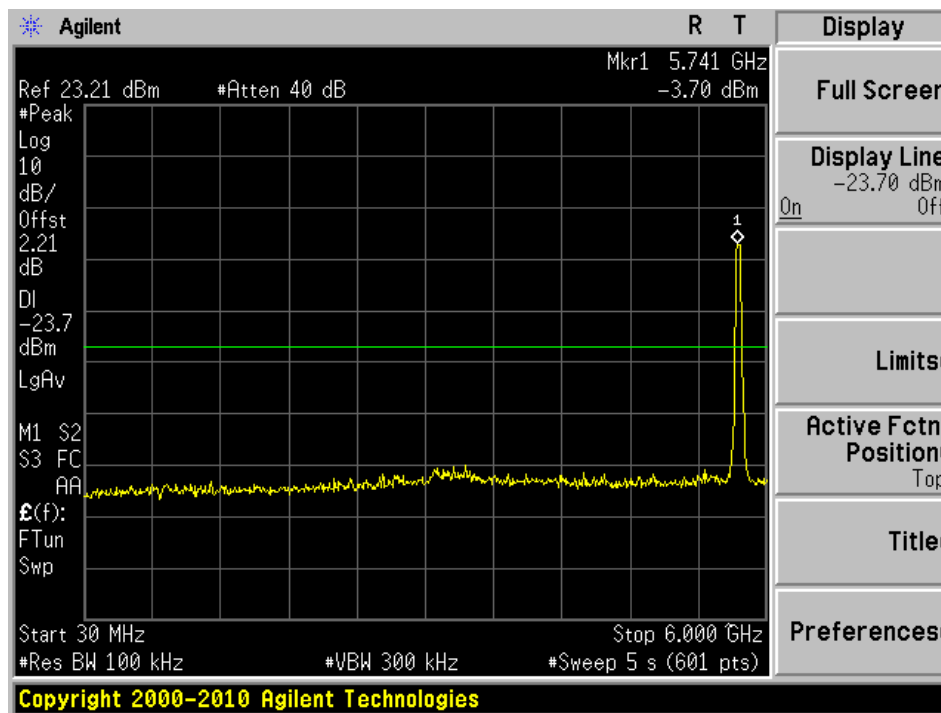
802.11n 40MHz Low channel, Chain J1, below 6GHz



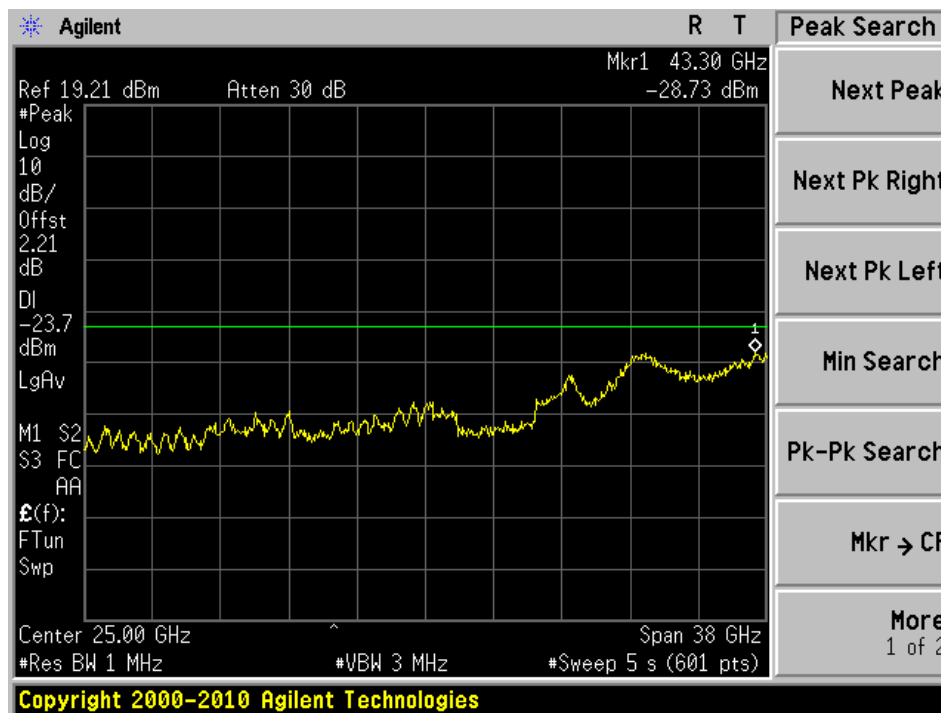
802.11n 40MHz Low channel, Chain J1, above 6GHz



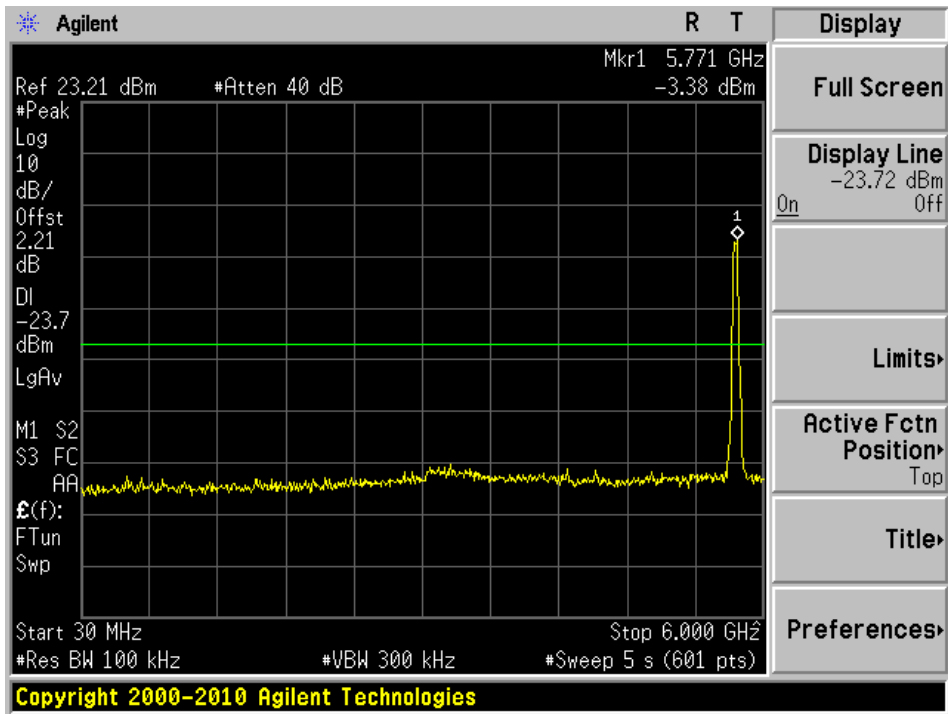
802.11n 40MHz Low channel, Chain J2, below 6GHz



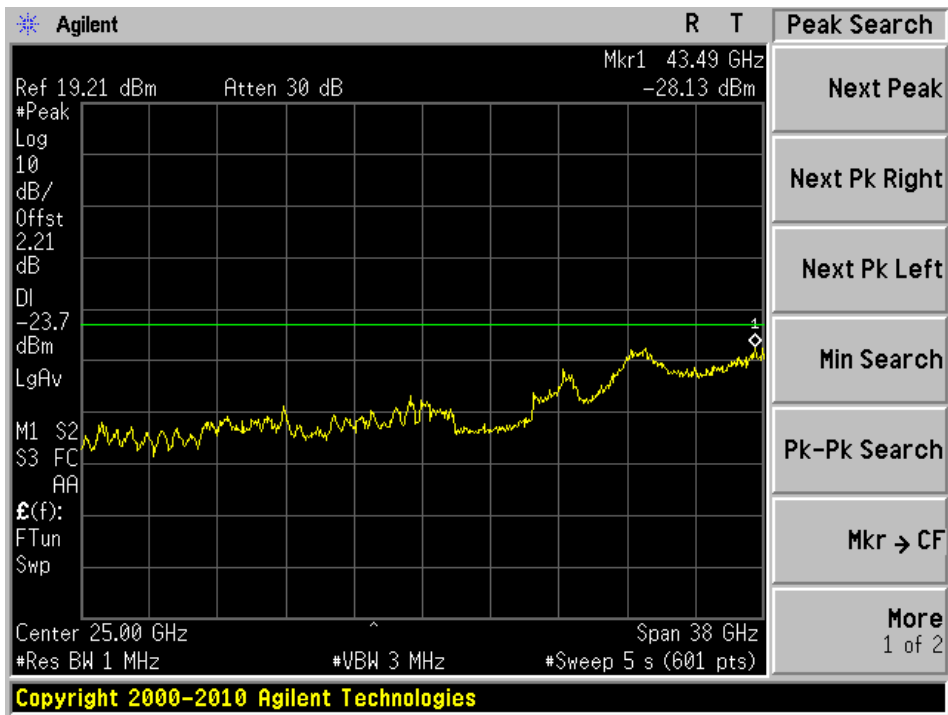
802.11n 40MHz Low channel, Chain J2, above 6GHz



802.11n 40MHz Low channel, Chain J3, below 6GHz

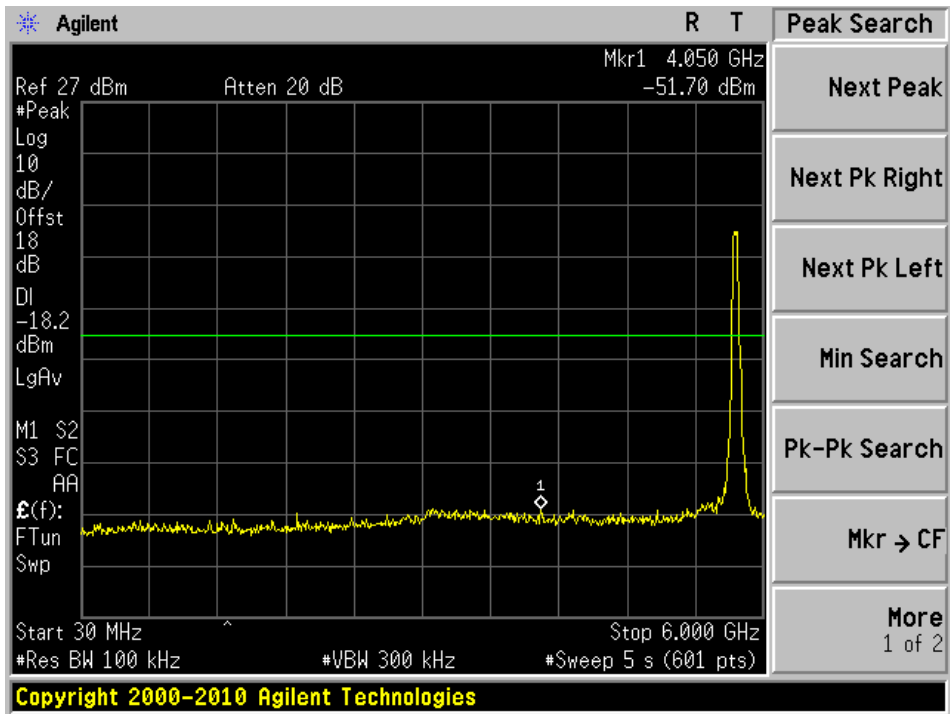


802.11n 40MHz Low channel, Chain J3, above 6GHz

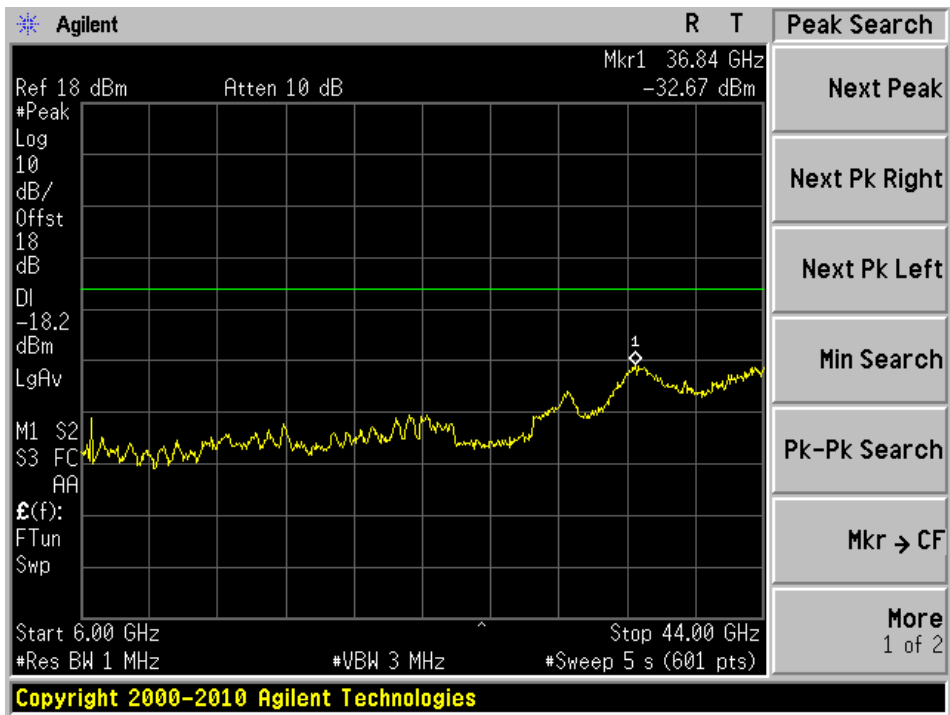


Chain J4 is not active during test

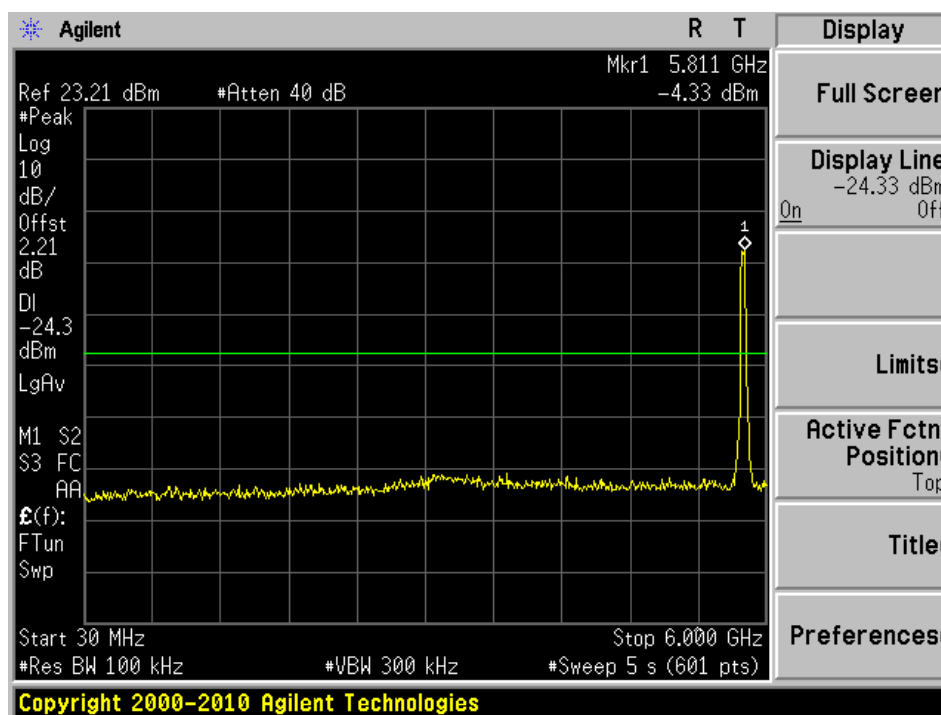
802.11n 40MHz Low channel, Chain J1+J2+J3, below 6GHz



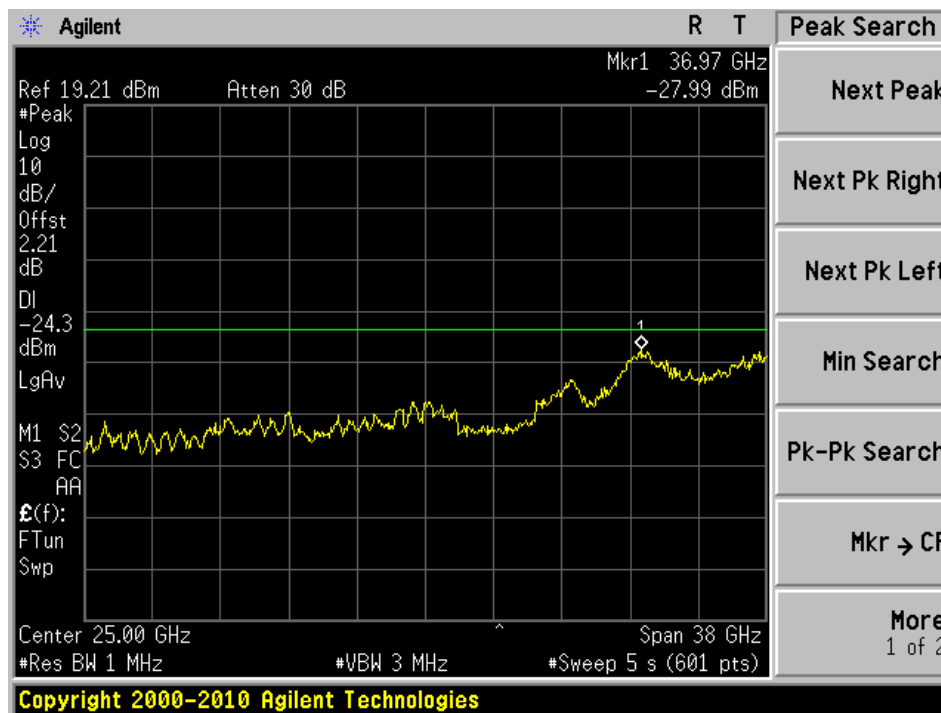
802.11n 40MHz Low channel, Chain J1+J2+J3, above 6GHz



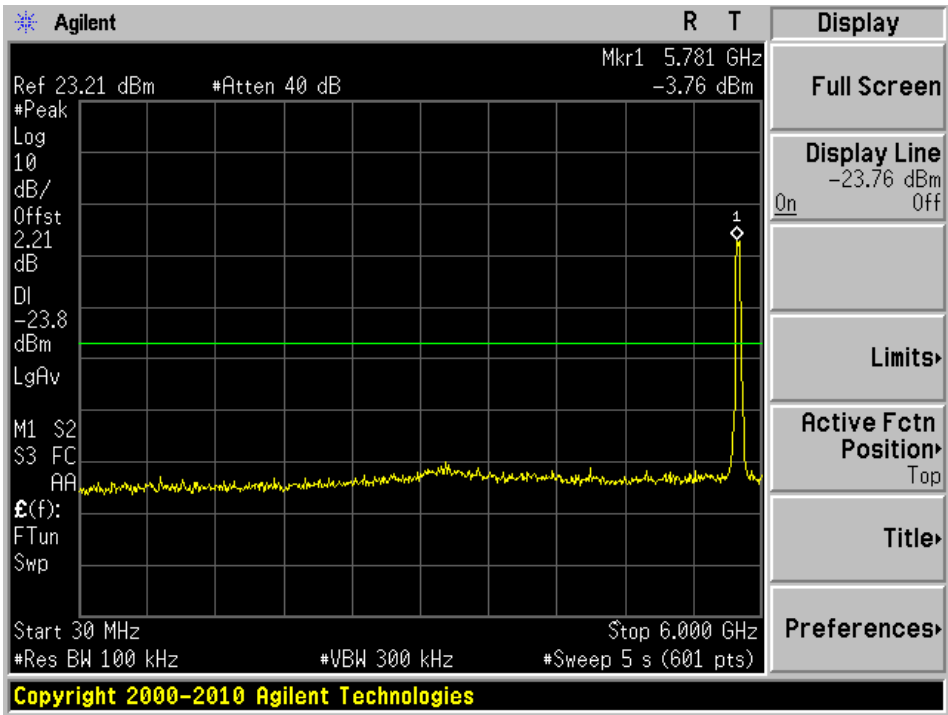
802.11n 40MHz High channel, Chain J1, below 6GHz



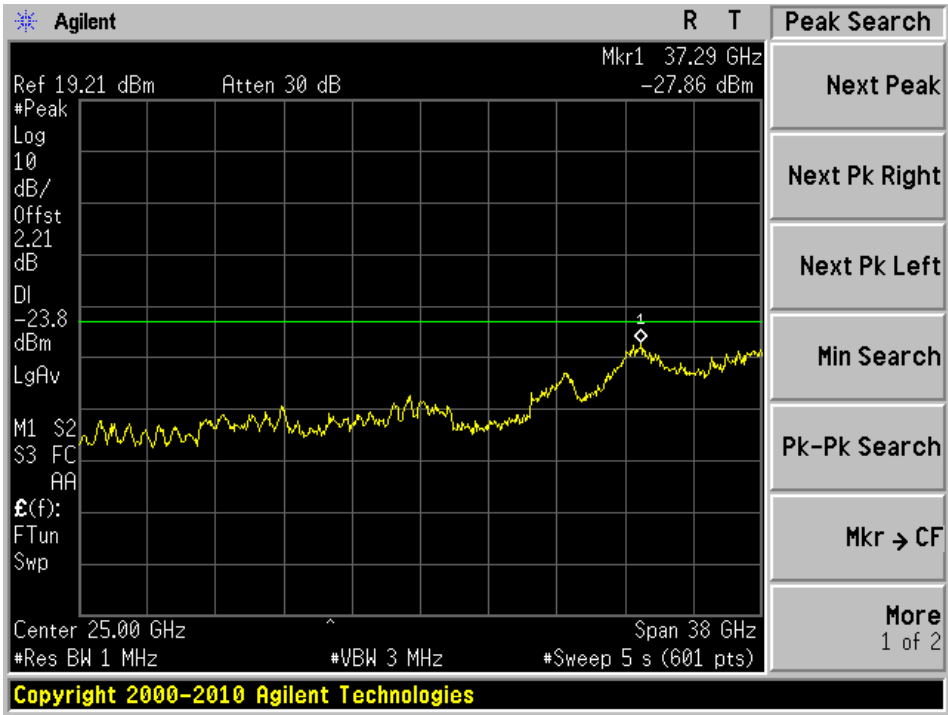
802.11n 40MHz High channel, Chain J1, above 6GHz



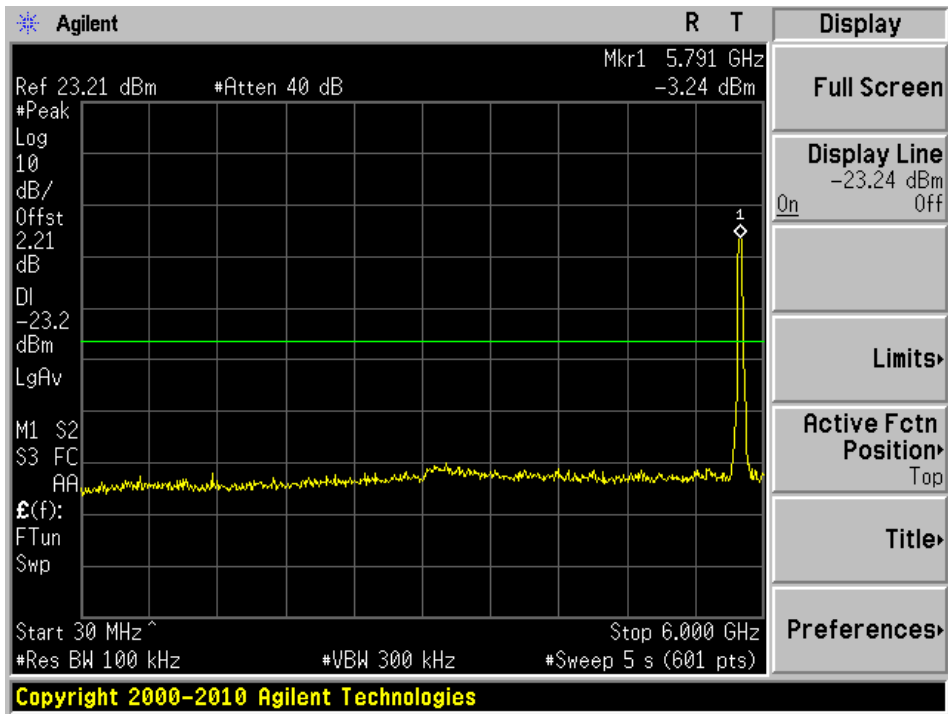
802.11n 40MHz High channel, Chain J2, below 6GHz



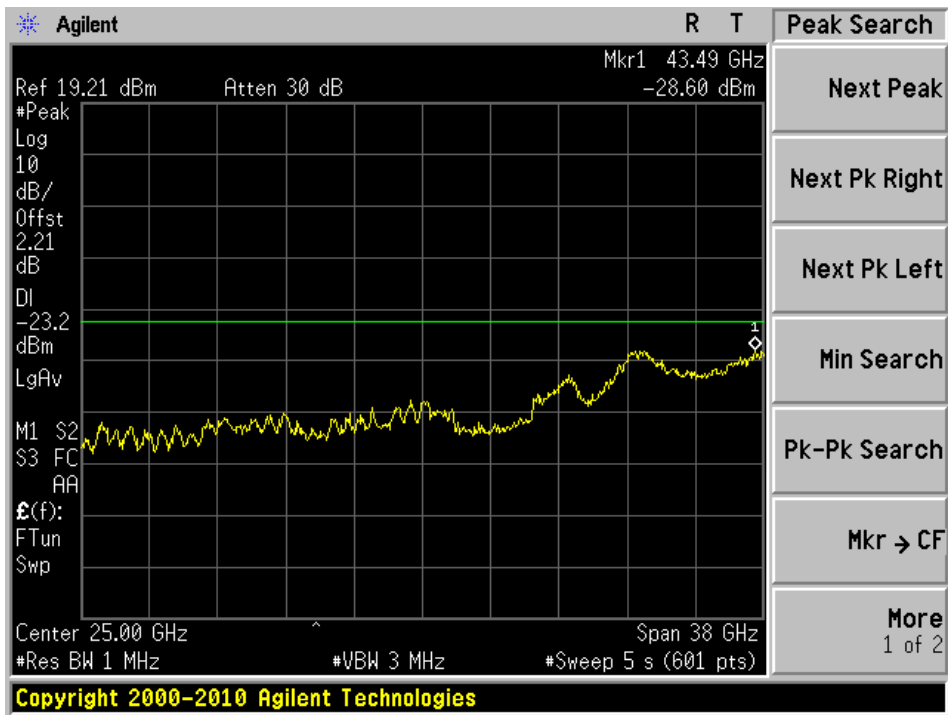
802.11n 40MHz High channel, Chain J2, above 6GHz



802.11n 40MHz High channel, Chain J3, below 6GHz

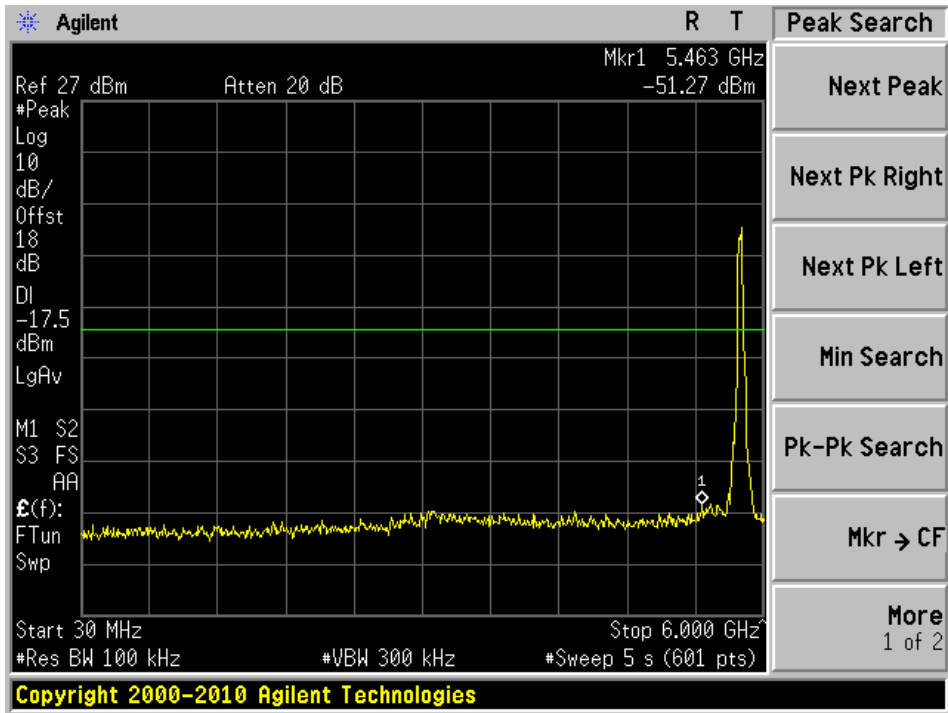


802.11n 40MHz High channel, Chain J3, above 6GHz

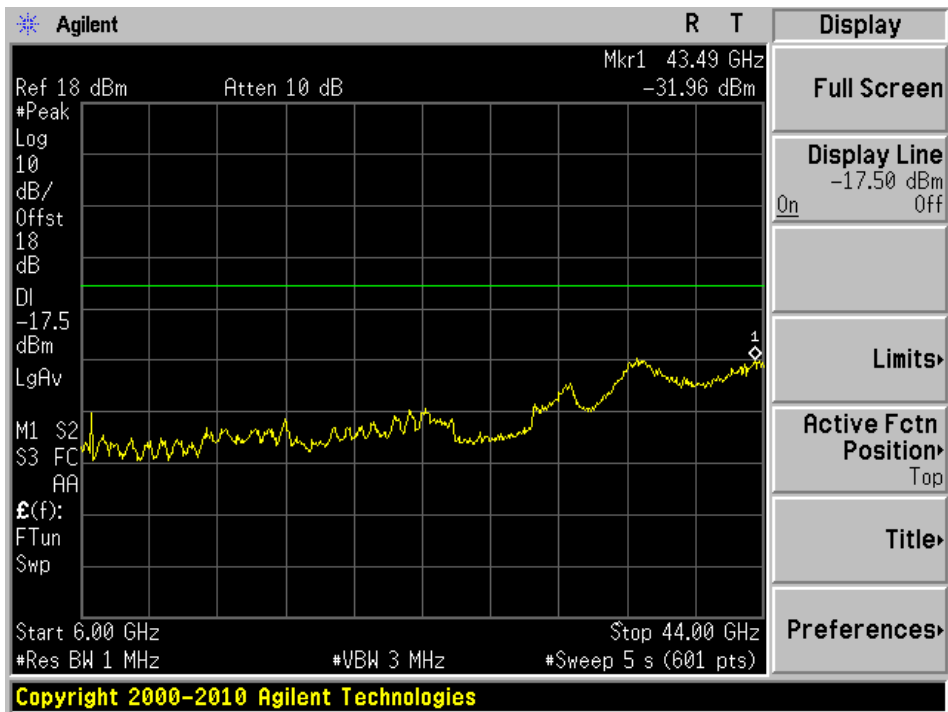


Chain J4 is not active during test

802.11n 40MHz High channel, Chain J1+J2+J3, below 6GHz



802.11n 40MHz High channel, Chain J1+J2+J3, above 6GHz



8 FCC §15.205, §15.209, §15.247(d) – Spurious Radiated Emissions

8.1 Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As per FCC §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 (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** 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.

As Per FCC §15.205(a) except as show 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	960 – 1240	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5.35 – 5.46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 – 167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3.3458 – 3.358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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 §15.205(c)).

8.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C limits.

8.3 EUT Setup

The radiated emissions tests were performed using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

8.4 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

The spectrum analyzer or receiver is set as:

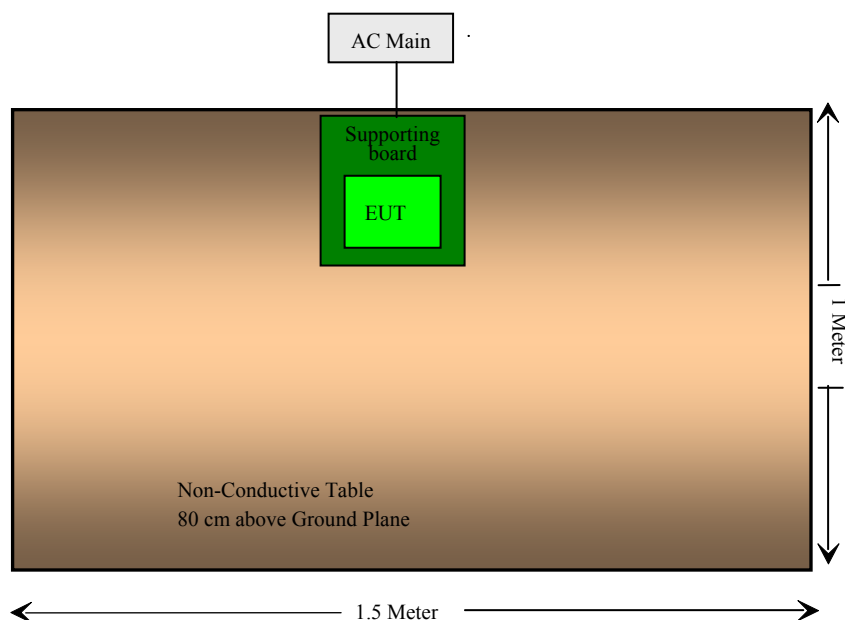
Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

- (1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
- (2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

8.5 Test Setup Block Diagram



8.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to the indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + AF + CL + Atten - Ga$$

For example, the Corrected Amplitude (CA) of 40.3 dBuV/m = indicated Amplitude reading (Ai) 32.5 dBuV + Antenna Factor (AF) 23.5dB + Cable Loss (CL) 3.7 dB + Attenuator (Atten) 10 dB - Amplifier Gain (Ga) 29.4 dB

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Limit}$$

8.7 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Hewlett Packard	Pre amplifier	8447D	2944A07030	2012-03-18
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100044	2012-04-14
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-3	2011-06-29
HP	Pre Amplifier	8449B	3147A00400	2012-02-03
Agilent	PSA Series Spectrum Analyzer	E4440A	MY44303352	2011-05-10
EMCO	Horn antenna	DRG-1181A	3315	2011-10-03

Statement of Traceability: BACL attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.

8.8 Test Environmental Conditions

Temperature:	18~25 °C
Relative Humidity:	38~50 %
ATM Pressure:	101-102 kPa

The testing was performed by Wei Sun on 2012-05-02 in 5 meters chamber 2.

8.9 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15, Subpart C, section 15.205, 15.209 and 15.247 standard's radiated emissions limits, and had the worst margin of:

Emissions within Restricted Bands

For 2.4 GHz Band

Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Mode
-0.11	2390	Vertical	N 40 MHz mode Low Channel

For 5.8 GHz Band

Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range
-9.49	273	Vertical	N 20 MHz mode Middle Channel

Harmonic Emissions

For 2.4 GHz Band

Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range
-0.28	4874	Vertical	B mode Middle Channel

For 5.8 GHz Band

Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range
_*	_*	_*	-

* **Note:** All harmonic emissions for 5.8 GHz band are in the level of noise floor.

Please refer to the following table and plots for specific test result details

8.10 Radiated Emissions Test Result Data

Emission in Restricted Bands, 2.4 GHz Band, 802.11b Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2390	26.18	292	100	V	27.79	3.01	0	56.98	74	-17.02	Peak
2390	28.26	11	234	H	27.79	3.01	0	59.06	74	-14.94	Peak
2390	13.86	292	100	V	27.79	3.01	0	44.66	54	-9.34	Ave
2390	18.33	11	234	H	27.79	3.01	0	49.13	54	-4.87	Ave
273	31.6	5	260	V	13.1	10.95	27.39	28.26	46	-17.74	QP
273	27.01	112	104	H	13.1	10.95	27.39	23.67	46	-22.33	QP
73.65	29.08	288	230	V	8.1	10.52	28.51	19.19	40	-20.81	QP
73.65	26.14	300	115	H	8.1	10.52	28.51	16.25	40	-23.75	QP
Middle Channel 2437 MHz measured at 3 meters											
322.94	33.46	29	106	V	13.7	11.05	26.99	31.22	46	-14.78	Peak
322.94	34.05	118	111	H	13.7	11.05	26.99	31.81	46	-14.19	Peak
273	33.78	116	260	V	13.1	10.95	27.39	30.44	46	-15.56	QP
273	29.09	221	140	H	13.1	10.95	27.39	25.75	46	-20.25	QP
73.65	28.17	203	161	V	8.1	10.52	28.51	18.28	40	-21.72	QP
73.65	25.15	0	170	H	8.1	10.52	28.51	15.26	40	-24.74	QP
High Channel 2462 MHz measured at 3 meters											
2483.5	26.15	0	100	V	28.48	3.1	0	57.73	74	-16.27	Peak
2483.5	29.75	357	217	H	28.48	3.1	0	61.33	74	-12.67	Peak
2483.5	13.51	0	100	V	28.48	3.1	0	45.09	54	-8.91	Ave
2483.5	21.03	357	217	H	28.48	3.1	0	52.61	54	-1.39	Ave
273	32.76	180	100	V	13.1	10.95	27.39	29.42	46	-16.58	QP
273	27.82	349	129	H	13.1	10.95	27.39	24.48	46	-21.52	QP
73.65	27.99	177	151	V	8.1	10.52	28.51	18.1	40	-21.9	QP
73.65	24.79	352	100	H	8.1	10.52	28.51	14.9	40	-25.1	QP

2.4 GHz Band, 802.11g Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2390	34.72	313	100	V	27.79	3.01	0	65.52	74	-8.48	Peak
2390	38.87	0	158	H	27.79	3.01	0	69.67	74	-4.33	Peak
2390	17.83	313	100	V	27.79	3.01	0	48.63	54	-5.37	Ave
2390	20.82	0	158	H	27.79	3.01	0	51.62	54	-2.38	Ave
273	32.06	32	224	V	13.1	10.95	27.39	28.72	46	-17.28	QP
273	28.91	166	103	H	13.1	10.95	27.39	25.57	46	-20.43	QP
73.65	31.35	300	212	V	8.1	10.52	28.51	21.46	40	-18.54	QP
73.65	29.77	291	177	H	8.1	10.52	28.51	19.88	40	-20.12	QP
Middle Channel 2437 MHz measured at 3 meters											
322.94	34.06	27	105	V	13.7	11.05	26.99	31.82	46	-14.18	QP
322.94	32.78	199	174	H	13.7	11.05	26.99	30.54	46	-15.46	QP
273	34.15	197	224	V	13.1	10.95	27.39	30.81	46	-15.19	QP
273	29.72	284	103	H	13.1	10.95	27.39	26.38	46	-19.62	QP
73.65	31.89	201	188	V	8.1	10.52	28.51	22	40	-18	QP
73.65	29.3	314	143	H	8.1	10.52	28.51	19.41	40	-20.59	QP
High Channel 2462 MHz measured at 3 meters											
2483.5	38.56	306	100	V	28.48	3.1	0	70.14	74	-3.86	Peak
2483.5	35.99	182	152	H	28.48	3.1	0	67.57	74	-6.43	Peak
2483.5	21.92	306	100	V	28.48	3.1	0	53.5	54	-0.5	Ave
2483.5	19.78	182	152	H	28.48	3.1	0	51.36	54	-2.64	Ave
273	33.9	186	180	V	13.1	10.95	27.39	30.56	46	-15.44	QP
273	30.18	329	161	H	13.1	10.95	27.39	26.84	46	-19.16	QP
73.65	30.08	186	180	V	8.1	10.52	28.51	20.19	40	-19.81	QP
73.65	28.33	329	161	H	8.1	10.52	28.51	18.44	40	-21.56	QP

2.4 GHz Band, 802.11n 20 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBpV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBpV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2390	32.39	41	100	V	27.79	3.01	0	63.19	74	-10.81	Peak
2390	39.45	0	161	H	27.79	3.01	0	70.25	74	-3.75	Peak
2390	14.69	41	100	V	27.79	3.01	0	45.49	54	-8.51	Ave
2390	17.73	0	161	H	27.79	3.01	0	48.53	54	-5.47	Ave
273	33.06	16	206	V	13.1	10.95	27.39	29.72	46	-16.28	QP
273	27.1	119	147	H	13.1	10.95	27.39	23.76	46	-22.24	QP
73.65	37.18	261	203	V	8.1	10.52	28.51	27.29	40	-12.71	QP
73.65	32.05	373	116	H	8.1	10.52	28.51	22.16	40	-17.84	QP
Middle Channel 2437 MHz measured at 3 meters											
322.94	31.11	23	106	V	13.7	11.05	26.99	28.87	46	-17.13	QP
322.94	30.15	194	111	H	13.7	11.05	26.99	27.91	46	-18.09	QP
273	34.63	105	260	V	13.1	10.95	27.39	31.29	46	-14.71	QP
273	28.66	234	140	H	13.1	10.95	27.39	25.32	46	-20.68	QP
73.65	34.87	200	161	V	8.1	10.52	28.51	24.98	40	-15.02	QP
73.65	31.12	36	170	H	8.1	10.52	28.51	21.23	40	-18.77	QP
High Channel 2462 MHz measured at 3 meters											
2483.5	35.52	0	100	V	28.48	3.1	0	67.1	74	-6.9	Peak
2483.5	42.11	349	147	H	28.48	3.1	0	73.69	74	-0.31	Peak
2483.5	15.72	0	100	V	28.48	3.1	0	47.3	54	-6.7	Ave
2483.5	20.485	349	147	H	28.48	3.1	0	52.065	54	-1.935	Ave
273	37.04	116	108	V	13.1	10.95	27.39	33.7	46	-12.3	QP
273	33.01	304	121	H	13.1	10.95	27.39	29.67	46	-16.33	QP
73.65	33.09	150	149	V	8.1	10.52	28.51	23.2	40	-16.8	QP
73.65	33.17	356	100	H	8.1	10.52	28.51	23.28	40	-16.72	QP

2.4 GHz Band, 802.11n 40 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2422 MHz, measured at 3 meters											
2390	40.6	0	109	V	27.79	3.01	0	71.4	74	-2.6	Peak
2390	40.05	176	108	H	27.79	3.01	0	70.85	74	-3.15	Peak
2390	23.09	0	109	V	27.79	3.01	0	53.89	54	-0.11	Ave
2390	19	176	108	H	27.79	3.01	0	49.8	54	-4.2	Ave
273	33.06	71	229	V	13.1	10.95	27.39	29.72	46	-16.28	QP
273	26.1	120	114	H	13.1	10.95	27.39	22.76	46	-23.24	QP
73.65	30.18	271	231	V	8.1	10.52	28.51	20.29	40	-19.71	QP
73.65	27.05	307	108	H	8.1	10.52	28.51	17.16	40	-22.84	QP
Middle Channel 2437 MHz measured at 3 meters											
322.94	30.2	53	161	V	13.7	11.05	26.99	27.96	46	-18.04	QP
322.94	32.56	113	121	H	13.7	11.05	26.99	30.32	46	-15.68	QP
273	34.63	174	209	V	13.1	10.95	27.39	31.29	46	-14.71	QP
273	28.66	270	128	H	13.1	10.95	27.39	25.32	46	-20.68	QP
73.65	34.87	212	172	V	8.1	10.52	28.51	24.98	40	-15.02	QP
73.65	31.12	93	110	H	8.1	10.52	28.51	21.23	40	-18.77	QP
High Channel 2452 MHz measured at 3 meters											
2483.5	33.32	0	131	V	28.48	3.1	0	64.9	74	-9.1	Peak
2483.5	40.29	6	139	H	28.48	3.1	0	71.87	74	-2.13	Peak
2483.5	18.46	0	131	V	28.48	3.1	0	50.04	54	-3.96	Ave
2483.5	20.71	6	139	H	28.48	3.1	0	52.29	54	-1.71	Ave
273	35.74	108	113	V	13.1	10.95	27.39	32.4	46	-13.6	QP
273	31.17	379	142	H	13.1	10.95	27.39	27.83	46	-18.17	QP
73.65	32.94	155	173	V	8.1	10.52	28.51	23.05	40	-16.95	QP
73.65	31.78	311	100	H	8.1	10.52	28.51	21.89	40	-18.11	QP

5.8 GHz Band, 802.11a Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 5745 MHz, measured at 3 meters											
322.94	30.92	116	234	V	13.7	11.05	26.99	28.68	46	-17.32	QP
322.94	30.68	160	311	H	13.7	11.05	26.99	28.44	46	-17.56	QP
273	31.7	118	209	V	13.1	10.95	27.39	28.36	46	-17.64	QP
273	26.31	224	190	H	13.1	10.95	27.39	22.97	46	-23.03	QP
73.65	31.31	109	134	V	8.1	10.52	28.51	21.42	40	-18.58	QP
73.65	30.87	279	270	H	8.1	10.52	28.51	20.98	40	-19.02	QP
Middle Channel 5785 MHz measured at 3 meters											
322.94	26.43	183	210	V	13.7	11.05	26.99	24.19	46	-21.81	QP
322.94	30	206	233	H	13.7	11.05	26.99	27.76	46	-18.24	QP
273	33.51	96	177	V	13.1	10.95	27.39	30.17	46	-15.83	QP
273	26.1	155	88	H	13.1	10.95	27.39	22.76	46	-23.24	QP
73.65	30.9	197	271	V	8.1	10.52	28.51	21.01	40	-18.99	QP
73.65	27.12	100	223	H	8.1	10.52	28.51	17.23	40	-22.77	QP
High Channel 5825 MHz measured at 3 meters											
322.94	26.63	94	101	V	13.7	11.05	26.99	24.39	46	-21.61	QP
322.94	29.14	297	334	H	13.7	11.05	26.99	26.9	46	-19.1	QP
273	29.37	180	123	V	13.1	10.95	27.39	26.03	46	-19.97	QP
273	25.47	337	112	H	13.1	10.95	27.39	22.13	46	-23.87	QP
73.65	27.36	198	109	V	8.1	10.52	28.51	17.47	40	-22.53	QP
73.65	25.43	112	201	H	8.1	10.52	28.51	15.54	40	-24.46	QP

5.8 GHz Band, 802.11n 20 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 5745 MHz, measured at 3 meters											
322.94	28.77	132	200	V	13.7	11.05	26.99	26.53	46	-19.47	QP
322.94	28.9	148	100	H	13.7	11.05	26.99	26.66	46	-19.34	QP
273	33.85	177	132	V	13.1	10.95	27.39	36.51	46	-9.49	QP
273	29.12	236	177	H	13.1	10.95	27.39	25.78	46	-20.22	QP
73.65	34.47	125	187	V	8.1	10.52	28.51	24.58	40	-15.42	QP
73.65	29.16	265	262	H	8.1	10.52	28.51	19.27	40	-20.73	QP
Middle Channel 5785 MHz measured at 3 meters											
322.94	26.64	203	271	V	13.7	11.05	26.99	24.4	46	-21.6	QP
322.94	28.75	215	245	H	13.7	11.05	26.99	26.51	46	-19.49	QP
273	33.8	143	113	V	13.1	10.95	27.39	30.46	46	-15.54	QP
273	28.16	205	123	H	13.1	10.95	27.39	24.82	46	-21.18	QP
73.65	32.77	184	268	V	8.1	10.52	28.51	22.88	40	-17.12	QP
73.65	27.71	116	214	H	8.1	10.52	28.51	17.82	40	-22.18	QP
High Channel 5825 MHz measured at 3 meters											
322.94	24.07	99	109	V	13.7	11.05	26.99	21.83	46	-24.17	QP
322.94	27.1	187	304	H	13.7	11.05	26.99	24.86	46	-21.14	QP
273	29.12	180	132	V	13.1	10.95	27.39	25.78	46	-20.22	QP
273	25.08	306	108	H	13.1	10.95	27.39	21.74	46	-24.26	QP
73.65	27.37	196	117	V	8.1	10.52	28.51	17.48	40	-22.52	QP
73.65	25.54	212	229	H	8.1	10.52	28.51	15.65	40	-24.35	QP

5.8 GHz Band, 802.11n 40 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 5755 MHz, measured at 3 meters											
322.94	30.17	116	100	V	13.7	11.05	26.99	27.93	46	-18.07	QP
322.94	31.28	122	334	H	13.7	11.05	26.99	29.04	46	-16.96	QP
273	32.78	156	271	V	13.1	10.95	27.39	29.44	46	-16.56	QP
273	29	237	126	H	13.1	10.95	27.39	25.66	46	-20.34	QP
73.65	34.55	105	177	V	8.1	10.52	28.51	24.66	40	-15.34	QP
73.65	28.73	287	269	H	8.1	10.52	28.51	18.84	40	-21.16	QP
High Channel 5795 MHz measured at 3 meters											
322.94	27.15	11	101	V	13.7	11.05	26.99	24.91	46	-21.09	QP
322.94	30.02	112	322	H	13.7	11.05	26.99	27.78	46	-18.22	QP
273	30.4	134	117	V	13.1	10.95	27.39	27.06	46	-18.94	QP
273	27.15	255	143	H	13.1	10.95	27.39	23.81	46	-22.19	QP
73.65	28.11	131	126	V	8.1	10.52	28.51	18.22	40	-21.78	QP
73.65	27.16	326	105	H	8.1	10.52	28.51	17.27	40	-22.73	QP

Harmonic Emissions, 2.4 GHz Band, 802.11b Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
4824	46.27	338	159	V	32.88	4.06	27.5	55.71	74	-18.29	Peak
4824	43.57	70	118	H	32.88	4.06	27.5	53.01	74	-20.99	Peak
4824	44.28	338	159	V	32.88	4.06	27.5	53.72	54	-0.28	Ave
4824	40.72	70	118	H	32.88	4.06	27.5	50.16	54	-3.84	Ave
7236	22.95	378	127	V	37.35	4.93	27.7	37.53	74	-36.47	Peak
7236	19.31	21	102	H	37.35	4.93	27.7	33.89	74	-40.11	Peak
7236	12.19	378	127	V	37.35	4.93	27.7	26.77	54	-27.23	Ave
7236	9.77	21	102	H	37.35	4.93	27.7	24.35	54	-29.65	Ave
9648	9.64	0	100	NA*	38.92	5.82	27.4	26.98	94.44	-70.46	Peak
9648	0.33	0	100	NA*	38.92	5.82	27.4	17.67	86.54	-68.87	Ave
Middle Channel 2437 MHz measured at 3 meters											
4874	45.76	344	138	V	32.96	4.1	27.4	55.42	74	-18.58	Peak
4874	41.46	73	113	H	32.96	4.1	27.4	51.12	74	-22.88	Peak
4874	43.86	344	138	V	32.96	4.1	27.4	53.52	54	-0.48	Ave
4874	38.18	73	113	H	32.96	4.1	27.4	47.84	54	-6.16	Ave
7311	35.09	0	100	V	37.59	4.88	27.7	49.86	74	-24.14	Peak
7311	31.6	74	100	H	37.59	4.88	27.7	46.37	74	-27.63	Peak
7311	25.16	0	100	V	37.59	4.88	27.7	39.93	54	-14.07	Ave
7311	23.91	74	100	H	37.59	4.88	27.7	38.68	54	-15.32	Ave
9748	9.05	0	100	NA*	39.1	5.74	27.4	26.49	96.83	-70.34	Peak
9748	0.11	0	100	NA*	39.1	5.74	27.4	17.55	85.88	-67.33	Ave
High Channel 2462 MHz measured at 3 meters											
4924	45.88	348	135	V	32.88	4.06	27.5	55.32	74	-18.68	Peak
4924	39.21	73	113	H	32.88	4.06	27.5	48.65	74	-25.35	Peak
4924	44.27	348	135	V	32.88	4.06	27.5	53.71	54	-0.29	Ave
4924	34.7	73	113	H	32.88	4.06	27.5	44.14	54	-9.86	Ave
7386	27.41	22	168	V	37.35	4.93	27.7	41.99	74	-32.01	Peak
7386	24.04	290	100	H	37.35	4.93	27.7	38.62	74	-35.38	Peak
7386	17.1	22	168	V	37.35	4.93	27.7	31.68	54	-22.32	Ave
7386	14.14	290	100	H	37.35	4.93	27.7	28.72	54	-25.28	Ave
9848	9.77	0	100	NA*	38.92	5.82	27.4	27.11	96.57	-69.46	Peak
9848	0.21	0	100	NA*	38.92	5.82	27.4	17.55	85.48	-67.93	Peak

* Note: Emissions are in the level of noise floor.

2.4 GHz Band, 802.11g Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
4824	36.42	342	100	V	32.88	4.06	27.5	45.86	74	-28.14	Peak
4824	33.5	60	100	H	32.88	4.06	27.5	42.94	74	-31.06	Peak
4824	22.76	342	100	V	32.88	4.06	27.5	32.2	54	-21.8	Ave
4824	20.1	60	100	H	32.88	4.06	27.5	29.54	54	-24.46	Ave
7236	22.95	378	127	V	37.35	4.93	27.7	37.53	74	-36.47	Peak
7236	19.31	21	102	H	37.35	4.93	27.7	33.89	74	-40.11	Peak
7236	12.19	378	127	V	37.35	4.93	27.7	26.77	54	-27.23	Ave
7236	9.77	21	102	H	37.35	4.93	27.7	24.35	54	-29.65	Ave
9648	9.71	0	100	NA*	38.92	5.82	27.4	27.05	92.88	-65.83	Peak
9648	0.01	0	100	NA*	38.92	5.82	27.4	17.35	83.46	-66.11	Ave
Middle Channel 2437 MHz measured at 3 meters											
4874	43.67	149	197	V	32.96	4.1	27.4	53.33	74	-20.67	Peak
4874	39.79	74	122	H	32.96	4.1	27.4	49.45	74	-24.55	Peak
4874	29.71	149	197	V	32.96	4.1	27.4	39.37	54	-14.63	Ave
4874	25.02	74	122	H	32.96	4.1	27.4	34.68	54	-19.32	Ave
7311	25.72	0	100	V	37.59	4.88	27.7	40.49	74	-33.51	Peak
7311	21.06	77	100	H	37.59	4.88	27.7	35.83	74	-38.17	Peak
7311	15.79	0	100	V	37.59	4.88	27.7	30.56	54	-23.44	Ave
7311	13	77	100	H	37.59	4.88	27.7	27.77	54	-26.23	Ave
9748	9.78	0	100	NA*	39.1	5.74	27.4	27.22	96.74	-70.52	Peak
9748	0.56	0	100	NA*	39.1	5.74	27.4	18	85.96	-67.96	Ave
High Channel 2462 MHz measured at 3 meters											
4924	36.21	345	160	V	32.88	4.06	27.5	45.65	74	-28.35	Peak
4924	32.34	192	100	H	32.88	4.06	27.5	41.78	74	-32.22	Peak
4924	22.8	345	160	V	32.88	4.06	27.5	32.24	54	-21.76	Ave
4924	18.81	192	100	H	32.88	4.06	27.5	28.25	54	-25.75	Ave
7386	22.95	11	168	V	37.35	4.93	27.7	37.53	74	-36.47	Peak
7386	19.31	218	100	H	37.35	4.93	27.7	33.89	74	-40.11	Peak
7386	12.19	11	168	V	37.35	4.93	27.7	26.77	54	-27.23	Ave
7386	9.77	218	100	H	37.35	4.93	27.7	24.35	54	-29.65	Ave
9848	9.6	0	100	NA*	38.92	5.82	27.4	26.94	96.66	-69.72	Peak
9848	0.36	0	100	NA*	38.92	5.82	27.4	17.7	86.23	-67.53	Ave

* Note: Emissions are in the level of noise floor.

2.4 GHz Band, 802.11n 20 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
4824	9.19	0	100	NA*	32.88	4.06	27.5	18.63	74	-55.37	Peak
4824	0.11	0	100	NA*	32.88	4.06	27.5	9.55	54	-44.45	Ave
7236	9.53	0	100	NA*	37.35	4.93	27.7	24.11	74	-49.89	Peak
7236	0.16	0	100	NA*	37.35	4.93	27.7	14.74	54	-39.26	Ave
9648	9.71	0	100	NA*	38.92	5.82	27.4	27.05	92.81	-65.76	Peak
9648	0.55	0	100	NA*	38.92	5.82	27.4	17.89	82.64	-64.75	Ave
Middle Channel 2437 MHz measured at 3 meters											
4874	9.19	0	100	NA*	32.96	4.1	27.4	18.85	74	-55.15	Peak
4874	0.51	0	100	NA*	32.96	4.1	27.4	10.17	54	-43.83	Ave
7311	9.53	0	100	NA*	37.59	4.88	27.7	24.3	74	-49.7	Peak
7311	0.39	0	100	NA*	37.59	4.88	27.7	15.16	54	-38.84	Ave
9748	9.71	0	100	NA*	39.1	5.74	27.4	27.15	97.47	-70.32	Peak
9748	0.14	0	100	NA*	39.1	5.74	27.4	17.58	85.92	-67.34	Ave
High Channel 2462 MHz measured at 3 meters											
4924	9.62	0	100	NA*	32.88	4.06	27.5	19.06	74	-54.94	Peak
4924	0.77	0	100	NA*	32.88	4.06	27.5	10.21	54	-43.79	Ave
7386	9.54	0	100	NA*	37.35	4.93	27.7	24.12	74	-49.88	Peak
7386	0.32	0	100	NA*	37.35	4.93	27.7	14.9	54	-39.1	Ave
9848	9.71	0	100	NA*	38.92	5.82	27.4	27.05	94.49	-67.44	Peak
9848	0.31	0	100	NA*	38.92	5.82	27.4	17.65	82.75	-65.1	Ave

* Note: Emissions are in the level of noise floor.

2.4 GHz Band, 802.11n 40 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2422 MHz, measured at 3 meters											
4844	9.19	0	100	NA*	32.88	4.06	27.5	18.63	74	-55.37	Peak
4844	0.1	0	100	NA*	32.88	4.06	27.5	9.54	54	-44.46	Ave
7266	9.53	0	100	NA*	37.35	4.93	27.7	24.11	74	-49.89	Peak
7266	0.08	0	100	NA*	37.35	4.93	27.7	14.66	54	-39.34	Ave
9688	9.71	0	100	NA*	38.92	5.82	27.4	27.05	90.87	-63.82	Peak
9688	0.17	0	100	NA*	38.92	5.82	27.4	17.51	80.29	-62.78	Ave
Middle Channel 2437 MHz measured at 3 meters											
4874	53.43	294	163	V	32.96	4.1	27.4	63.09	74	-10.91	Peak
4874	50.95	0	182	H	32.96	4.1	27.4	60.61	74	-13.39	Peak
4874	41.13	294	163	V	32.96	4.1	27.4	50.79	54	-3.21	Ave
4874	38.02	0	182	H	32.96	4.1	27.4	47.68	54	-6.32	Ave
7311	9.77	0	100	NA*	37.59	4.88	27.7	24.54	74	-49.46	Peak
7311	0.14	0	100	NA*	37.59	4.88	27.7	14.91	54	-39.09	Ave
9748	9.81	0	100	NA*	39.1	5.74	27.4	27.25	98.27	-71.02	Peak
9748	0.09	0	100	NA*	39.1	5.74	27.4	17.53	86.37	-68.84	Ave
High Channel 2452 MHz measured at 3 meters											
4904	9.61	0	100	NA*	32.88	4.06	27.5	19.05	74	-54.95	Peak
4904	0.07	0	100	NA*	32.88	4.06	27.5	9.51	74	-64.49	Ave
7356	9.87	0	100	NA*	37.35	4.93	27.7	24.45	74	-49.55	Peak
7356	0.15	0	100	NA*	37.35	4.93	27.7	14.73	54	-39.27	Ave
9808	9.09	0	100	NA*	38.92	5.82	27.4	26.43	93.43	-67	Peak
9808	0.18	0	100	NA*	38.92	5.82	27.4	17.52	81.1	-63.58	Ave

* Note: Emissions are in the level of noise floor.

5.8 GHz Band, 802.11a Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 5745 MHz, measured at 3 meters											
11490	9.11	0	100	NA*	43.87	6.2	27.1	32.08	74	-41.92	Peak
11490	0.15	0	100	NA*	43.87	6.2	27.1	23.12	54	-30.88	Ave
17255	9.46	0	100	NA*	44.91	8.31	25.9	36.78	92.13	-55.35	Peak
17255	0.33	0	100	NA*	44.91	8.31	25.9	27.65	82.64	-54.99	Ave
22980	9.91	0	100	NA*	46.47	9.74	25.3	40.82	74	-33.18	Peak
22980	0.19	0	100	NA*	46.47	9.74	25.3	31.1	54	-22.9	Ave
Middle Channel 5785 MHz measured at 3 meters											
11570	9.16	0	100	NA*	40.14	6.2	27.1	28.4	74	-45.6	Peak
11570	0.18	0	100	NA*	40.14	6.2	27.1	19.42	74	-54.58	Ave
17355	9.13	0	100	NA*	45.87	8.31	25.9	37.41	92.42	-55.01	Peak
17355	0.41	0	100	NA*	45.87	8.31	25.9	28.69	82.67	-53.98	Ave
23140	9.8	0	100	NA*	46.47	9.74	25.3	40.71	92.42	-51.71	Peak
23140	0.78	0	100	NA*	46.47	9.74	25.3	31.69	82.67	-50.98	Ave
High Channel 5825 MHz measured at 3 meters											
11650	9.2	0	100	NA*	40.14	6.2	27.1	28.44	74	-45.56	Peak
11650	0.14	0	100	NA*	40.14	6.2	27.1	19.38	54	-34.62	Ave
17475	9.36	0	100	NA*	46.21	8.31	25.9	37.98	90.17	-52.19	Peak
17475	0.27	0	100	NA*	46.21	8.31	25.9	28.89	82.44	-53.55	Ave
23330	9.69	0	100	NA*	46.47	9.74	25.3	40.6	90.17	-49.57	Peak
23330	0.3	0	100	NA*	46.47	9.74	25.3	31.21	82.44	-51.23	Ave

* Note: Emissions are in the level of noise floor.

5.8 GHz Band, 802.11n 20 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 5745 MHz, measured at 3 meters											
11490	9.23	0	100	NA*	43.87	6.2	27.1	32.2	74	-41.8	Peak
11490	0.37	0	100	NA*	43.87	6.2	27.1	23.34	54	-30.66	Ave
17255	9.36	0	100	NA*	44.91	8.31	25.9	36.68	90.72	-54.04	Peak
17255	0.29	0	100	NA*	44.91	8.31	25.9	27.61	80.46	-52.85	Ave
22980	9.57	0	100	NA*	46.47	9.74	25.3	40.48	74	-33.52	Peak
22980	0.66	0	100	NA*	46.47	9.74	25.3	31.57	54	-22.43	Ave
Middle Channel 5785 MHz measured at 3 meters											
11570	9.26	0	100	NA*	40.14	6.2	27.1	28.5	74	-45.5	Peak
11570	0.31	0	100	NA*	40.14	6.2	27.1	19.55	74	-54.45	Ave
17355	9.24	0	100	NA*	45.87	8.31	25.9	37.52	91.53	-54.01	Peak
17355	0.18	0	100	NA*	45.87	8.31	25.9	28.46	79.55	-51.09	Ave
23140	9.66	0	100	NA*	46.47	9.74	25.3	40.57	91.53	-50.96	Peak
23140	0.1	0	100	NA*	46.47	9.74	25.3	31.01	79.55	-48.54	Ave
High Channel 5825 MHz measured at 3 meters											
11650	9.54	0	100	NA*	40.14	6.2	27.1	28.78	74	-45.22	Peak
11650	0.39	0	100	NA*	40.14	6.2	27.1	19.63	74	-54.37	Ave
17475	9.12	0	100	NA*	46.21	8.31	25.9	37.74	90.7	-52.96	Peak
17475	0.46	0	100	NA*	46.21	8.31	25.9	29.08	77.81	-48.73	Ave
23330	9.15	0	100	NA*	46.47	9.74	25.3	40.06	90.7	-50.64	Peak
23330	0.61	0	100	NA*	46.47	9.74	25.3	31.52	77.81	-46.29	Ave

* Note: Emissions are in the level of noise floor.

5.8 GHz Band, 802.11n 40 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 5755 MHz, measured at 3 meters											
11510	9.33	0	100	NA*	40.47	6.2	27.1	28.9	74	-45.1	Peak
11510	0.71	0	100	NA*	40.47	6.2	27.1	20.28	54	-33.72	Ave
17265	9.13	0	100	NA*	45.87	8.31	25.9	37.41	86.8	-51.39	Peak
17265	0.56	0	100	NA*	45.87	8.31	25.9	28.84	78.16	-49.32	Ave
23020	9.16	0	100	NA*	46.47	9.28	25.3	39.61	86.8	-49.19	Peak
23020	0.41	0	100	NA*	46.47	9.28	25.3	30.86	78.16	-47.3	Ave
High Channel 5795 MHz measured at 3 meters											
11590	9.12	0	100	NA*	40.14	6.14	27.1	28.3	74	-45.7	Peak
17385	9.08	0	100	NA*	46.51	8.49	25.9	38.18	88.8	-50.62	Peak
23180	9.36	0	100	NA*	46.47	9.36	25.3	39.89	88.8	-48.91	Peak
11590	0.41	0	100	NA*	40.14	6.14	27.1	19.59	54	-34.41	Ave
17385	0.23	0	100	NA*	46.51	8.49	25.9	29.33	78.63	-49.3	Ave
23180	0.37	0	100	NA*	46.47	9.36	25.3	30.9	78.63	-47.73	Ave

* Note: Emissions are in the level of noise floor.

Fundamental Emissions, 2.4 GHz Band, 802.11b Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2412	96.71	0	100	V	27.79	2.94	0	117.44	NA	117.44	Peak
2412	84.8	0	100	H	27.79	2.94	0	115.53	NA	115.53	Peak
2412	75.81	0	100	V	27.79	2.94	0	106.54	NA	106.54	Ave
2412	74.17	0	100	H	27.79	2.94	0	104.9	NA	104.9	Ave
Middle Channel 2437 MHz measured at 3 meters											
2437	96.1	0	100	V	27.79	2.94	0	116.83	NA	116.83	Peak
2437	95.41	0	100	H	27.79	2.94	0	116.14	NA	116.14	Peak
2437	73.05	0	100	V	27.79	2.94	0	104.78	NA	104.78	Ave
2437	75.15	0	100	H	27.79	2.94	0	105.88	NA	105.88	Ave
High Channel 2462 MHz measured at 3 meters											
2462	95.08	0	100	V	28.48	3.01	0	116.57	NA	116.57	Peak
2462	84.12	0	100	H	28.48	3.01	0	115.61	NA	115.61	Peak
2462	64.11	0	100	V	28.48	3.01	0	95.6	NA	95.6	Ave
2462	73.99	0	100	H	28.48	3.01	0	105.48	NA	105.48	Ave

2.4 GHz Band, 802.11g Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2412	82.15	0	100	V	27.79	2.94	0	112.88	NA	112.88	Peak
2412	81.26	0	100	H	27.79	2.94	0	111.99	NA	111.99	Peak
2412	72.73	0	100	V	27.79	2.94	0	103.46	NA	103.46	Ave
2412	71.61	0	100	H	27.79	2.94	0	103.34	NA	103.34	Ave
Middle Channel 2437 MHz measured at 3 meters											
2437	87.01	0	100	V	27.79	2.94	0	117.74	NA	117.74	Peak
2437	86.77	0	100	H	27.79	2.94	0	117.5	NA	117.5	Peak
2437	75.23	0	100	V	27.79	2.94	0	105.96	NA	105.96	Ave
2437	74.96	0	100	H	27.79	2.94	0	105.69	NA	105.69	Ave
High Channel 2462 MHz measured at 3 meters											
2462	85.17	0	100	V	28.48	3.01	0	116.66	NA	116.66	Peak
2462	84.39	0	100	H	28.48	3.01	0	115.88	NA	115.88	Peak
2462	74.74	0	100	V	28.48	3.01	0	106.23	NA	106.23	Ave
2462	74	0	100	H	28.48	3.01	0	105.49	NA	105.49	Ave

2.4 GHz Band, 802.11n 20 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2412	82.08	0	100	V	27.79	2.94	0	112.81	NA	112.81	Peak
2412	81.55	0	100	H	27.79	2.94	0	112.28	NA	112.28	Peak
2412	71.91	0	100	V	27.79	2.94	0	103.64	NA	103.64	Ave
2412	69.8	0	100	H	27.79	2.94	0	101.53	NA	101.53	Ave
Middle Channel 2437 MHz measured at 3 meters											
2437	86.74	0	100	V	27.79	2.94	0	117.47	NA	117.47	Peak
2437	85.05	0	100	H	27.79	2.94	0	115.78	NA	115.78	Peak
2437	74.56	0	100	V	27.79	2.94	0	105.29	NA	105.29	Ave
2437	75.19	0	100	H	27.79	2.94	0	105.92	NA	105.92	Ave
High Channel 2462 MHz measured at 3 meters											
2462	83	0	100	V	28.48	3.01	0	114.49	NA	114.49	Peak
2462	81.93	0	100	H	28.48	3.01	0	113.42	NA	113.42	Peak
2462	71.26	0	100	V	28.48	3.01	0	102.75	NA	102.75	Ave
2462	71.06	0	100	H	28.48	3.01	0	102.55	NA	102.55	Ave

2.4 GHz Band, 802.11n 40 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 2422 MHz, measured at 3 meters											
2422	80.14	0	100	V	27.79	2.94	0	110.87	NA	110.87	Peak
2422	79.79	0	100	H	27.79	2.94	0	110.52	NA	110.52	Peak
2422	69.56	0	100	V	27.79	2.94	0	100.29	NA	100.29	Ave
2422	66.14	0	100	H	27.79	2.94	0	96.87	NA	96.87	Ave
Middle Channel 2437 MHz measured at 3 meters											
2437	87.54	0	100	V	27.79	2.94	0	118.27	NA	118.27	Peak
2437	86.09	0	100	H	27.79	2.94	0	116.82	NA	116.82	Peak
2437	72.65	0	100	V	27.79	2.94	0	103.38	NA	103.38	Ave
2437	75.64	0	100	H	27.79	2.94	0	96.37	NA	96.37	Ave
High Channel 2452 MHz measured at 3 meters											
2452	81.94	0	100	V	28.48	3.01	0	113.43	NA	113.43	Peak
2452	79.15	0	100	H	28.48	3.01	0	110.64	NA	110.64	Peak
2452	59.37	0	100	V	28.48	3.01	0	90.86	NA	90.86	Ave
2452	69.61	0	100	H	28.48	3.01	0	101.1	NA	101.1	Ave

5.8 GHz Band, 802.11a Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 5745 MHz, measured at 3 meters											
5745	73.45	0	100	V	33.71	4.62	0	111.78	NA	111.78	Peak
5745	73.8	0	100	H	33.71	4.62	0	112.13	NA	112.13	Peak
5745	66.31	0	100	V	33.71	4.62	0	102.64	NA	102.64	Ave
5745	57.6	0	100	H	33.71	4.62	0	95.93	NA	95.93	Ave
Middle Channel 5785 MHz measured at 3 meters											
5785	74.06	0	100	V	33.64	4.72	0	112.42	NA	112.42	Peak
5785	72.1	0	100	H	33.64	4.72	0	110.46	NA	110.46	Peak
5785	64.31	0	100	V	33.64	4.72	0	102.67	NA	102.67	Ave
5785	62.43	0	100	H	33.64	4.72	0	100.79	NA	100.79	Ave
High Channel 5825 MHz measured at 3 meters											
5825	71.81	0	100	V	33.64	4.72	0	110.17	NA	110.17	Peak
5825	69.14	0	100	H	33.64	4.72	0	109.5	NA	109.5	Peak
5825	66.08	0	100	V	33.64	4.72	0	102.44	NA	102.44	Ave
5825	59.7	0	100	H	33.64	4.72	0	98.06	NA	98.06	Ave

5.8 GHz Band, 802.11n 20 MHz Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5745 MHz, measured at 3 meters											
5745	72.39	0	100	V	33.71	4.62	0	110.72	NA	110.72	Peak
5745	72.11	0	100	H	33.71	4.62	0	110.44	NA	110.44	Peak
5745	62.13	0	100	V	33.71	4.62	0	100.46	NA	100.46	Ave
5745	58.32	0	100	H	33.71	4.62	0	96.65	NA	96.65	Ave
Middle Channel 5785 MHz measured at 3 meters											
5785	73.17	0	100	V	33.64	4.72	0	111.53	NA	111.53	Peak
5785	71.97	0	100	H	33.64	4.72	0	110.33	NA	110.33	Peak
5785	61.19	0	100	V	33.64	4.72	0	99.55	NA	99.55	Ave
5785	60.98	0	100	H	33.64	4.72	0	99.34	NA	99.34	Ave
High Channel 5825 MHz measured at 3 meters											
5825	72.34	0	100	V	33.64	4.72	0	110.7	NA	110.7	Peak
5825	68.7	0	100	H	33.64	4.72	0	107.06	NA	107.06	Peak
5825	59.45	0	100	V	33.64	4.72	0	97.81	NA	97.81	Ave
5825	58.37	0	100	H	33.64	4.72	0	96.73	NA	96.73	Ave

5.8 GHz Band, 802.11n 40 MHz Mode

Frequency (MHz)	S.A. Reading (dBμV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre- Amp. (dB)	Cord. Reading (dBμV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	
Low Channel 5755 MHz, measured at 3 meters											
5755	72.43	0	100	V	33.64	4.72	0	110.79	NA	110.79	Peak
5755	72.03	0	100	H	33.64	4.72	0	110.39	NA	110.39	Peak
5755	59.8	0	100	V	33.64	4.72	0	98.16	NA	98.16	Ave
5755	56.25	0	100	H	33.64	4.72	0	94.61	NA	94.61	Ave
High Channel 5795 MHz measured at 3 meters											
5795	70.17	0	100	V	33.91	4.72	0	108.8	NA	108.8	Peak
5795	69.77	0	100	H	33.91	4.72	0	106.4	NA	106.4	Peak
5795	60	0	100	V	33.91	4.72	0	98.63	NA	98.63	Ave
5795	59.33	0	100	H	33.91	4.72	0	96.96	NA	96.96	Ave

9 FCC §15.247(a)(2) – 6 dB & 99% Bandwidth

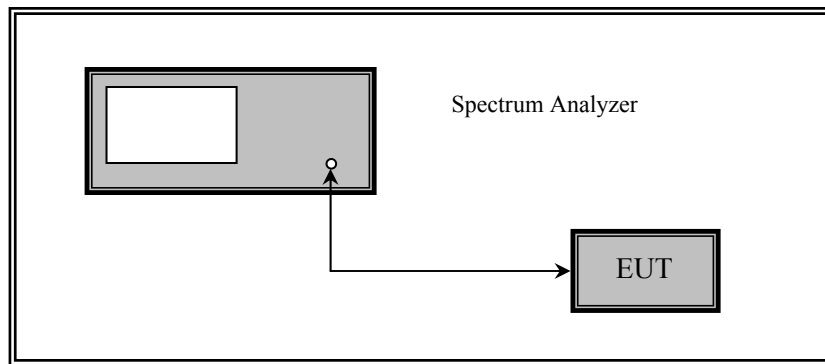
9.1 Applicable Standard

According to FCC §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 6 dB bandwidth shall be at least 500 kHz

9.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emissions bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

9.3 Test Setup Block Diagram



9.4 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.

9.5 Test Environmental Conditions

Temperature:	19~24 °C
Relative Humidity:	38~48 %
ATM Pressure:	101.2-102 kPa

The testing was performed by Wei Sun on 2012-05-02 in RF site.

9.6 Test Results

2.4 GHz Band 802.11b mode

Chain J1

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	10.461	14.0696	> 500	Compliant
Middle	2437	10.503	14.0609	> 500	Compliant
High	2462	10.449	13.4716	> 500	Compliant

Chain J2

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	10.425	13.4246	> 500	Compliant
Middle	2437	10.486	13.9979	> 500	Compliant
High	2462	10.422	13.4222	> 500	Compliant

Chain J3

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	10.431	13.4337	> 500	Compliant
Middle	2437	10.424	13.4935	> 500	Compliant
High	2462	10.415	13.3940	> 500	Compliant

802.11g mode

Chain J1

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	17.546	18.2532	> 500	Compliant
Middle	2437	17.053	18.0632	> 500	Compliant
High	2462	17.393	18.5048	> 500	Compliant

Chain J2

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	16.816	17.6760	> 500	Compliant
Middle	2437	16.941	18.0238	> 500	Compliant
High	2462	16.823	17.8657	> 500	Compliant

Chain J3

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	16.760	17.7508	> 500	Compliant
Middle	2437	16.814	17.8629	> 500	Compliant
High	2462	16.776	17.7946	> 500	Compliant

802.11n 20 MHz mode

Chain J1

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	17.837	18.3987	> 500	Compliant
Middle	2437	17.859	18.5993	> 500	Compliant
High	2462	18.074	18.4250	> 500	Compliant

Chain J2

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	18.063	18.4070	> 500	Compliant
Middle	2437	18.022	18.6628	> 500	Compliant
High	2462	17.969	18.3897	> 500	Compliant

Chain J3

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	18.045	18.4012	> 500	Compliant
Middle	2437	17.891	18.5668	> 500	Compliant
High	2462	17.866	18.3406	> 500	Compliant

802.11n 40 MHz mode

Chain J1

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2422	38.129	38.0812	> 500	Compliant
Middle	2437	38.282	39.6321	> 500	Compliant
High	2452	38.214	38.2719	> 500	Compliant

Chain J2

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2422	38.084	38.1011	> 500	Compliant
Middle	2437	38.286	39.3651	> 500	Compliant
High	2452	38.185	38.2053	> 500	Compliant

Chain J3

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	2422	37.988	38.0512	> 500	Compliant
Middle	2437	38.147	39.0009	> 500	Compliant
High	2452	38.010	38.0489	> 500	Compliant

**5.8 GHz Band
802.11a mode**

Chain J1

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	5745	17.057	17.8489	> 500	Compliant
Middle	5785	16.790	17.8433	> 500	Compliant
High	5825	16.700	17.9277	> 500	Compliant

Chain J2

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	5745	16.709	17.7408	> 500	Compliant
Middle	5785	16.782	17.7113	> 500	Compliant
High	5825	16.810	17.5945	> 500	Compliant

Chain J3

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	5745	16.760	17.8095	> 500	Compliant
Middle	5785	16.863	17.7477	> 500	Compliant
High	5825	16.790	17.6473	> 500	Compliant

802.11n 20 MHz mode**Chain J1**

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	5745	17.867	18.4485	> 500	Compliant
Middle	5785	17.896	18.4570	> 500	Compliant
High	5825	17.939	18.2852	> 500	Compliant

Chain J2

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	5745	17.936	18.3263	> 500	Compliant
Middle	5785	17.895	18.3647	> 500	Compliant
High	5825	18.038	18.3431	> 500	Compliant

Chain J3

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	5745	17.812	18.4244	> 500	Compliant
Middle	5785	17.934	18.3845	> 500	Compliant
High	5825	17.963	18.3307	> 500	Compliant

802.11n 40 MHz mode

Chain J1

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	5755	38.139	38.5544	> 500	Compliant
High	5795	37.989	38.3270	> 500	Compliant

Chain J2

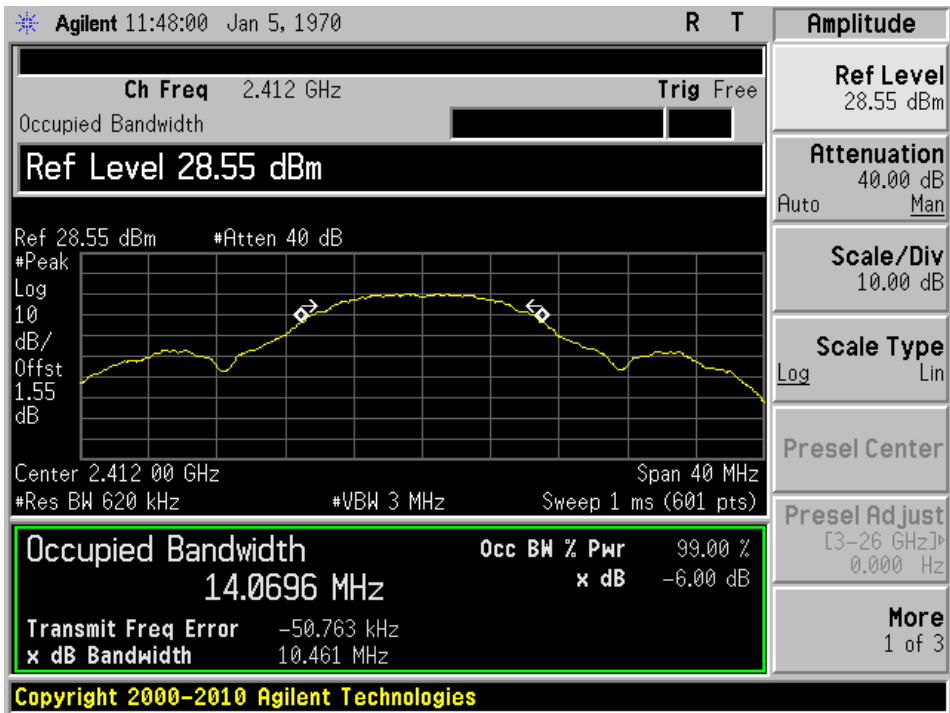
Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	5755	37.807	38.2960	> 500	Compliant
High	5795	38.212	38.1600	> 500	Compliant

Chain J3

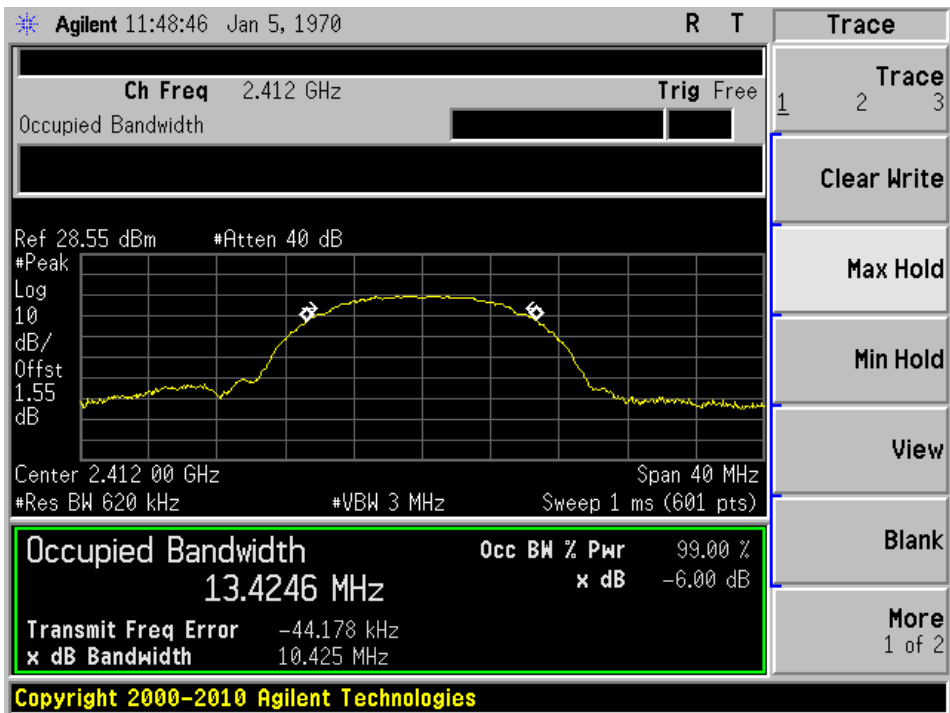
Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Low	5755	37.880	38.2345	> 500	Compliant
High	5795	37.906	38.0617	> 500	Compliant

2.4 GHz Band

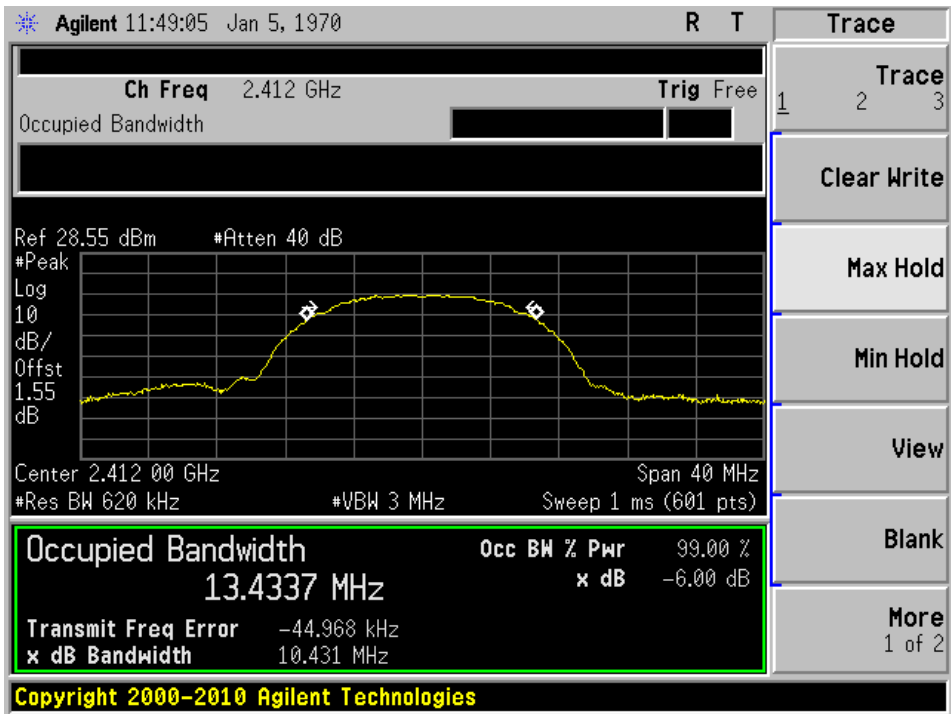
802.11b Low channel, Chain J1



802.11b Low channel, Chain J2

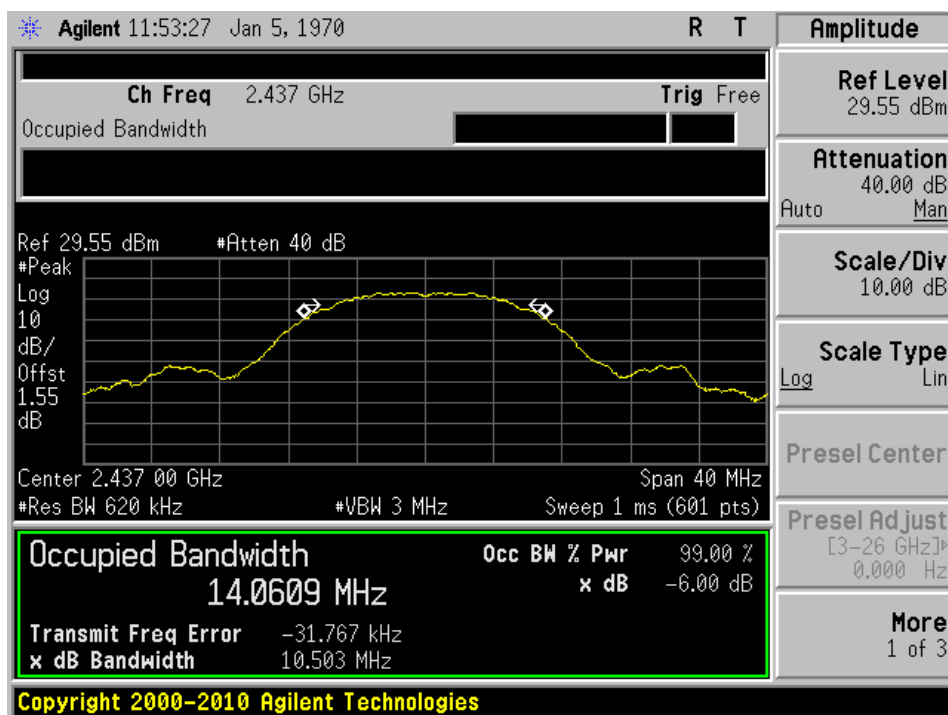


802.11b Low channel, Chain J3

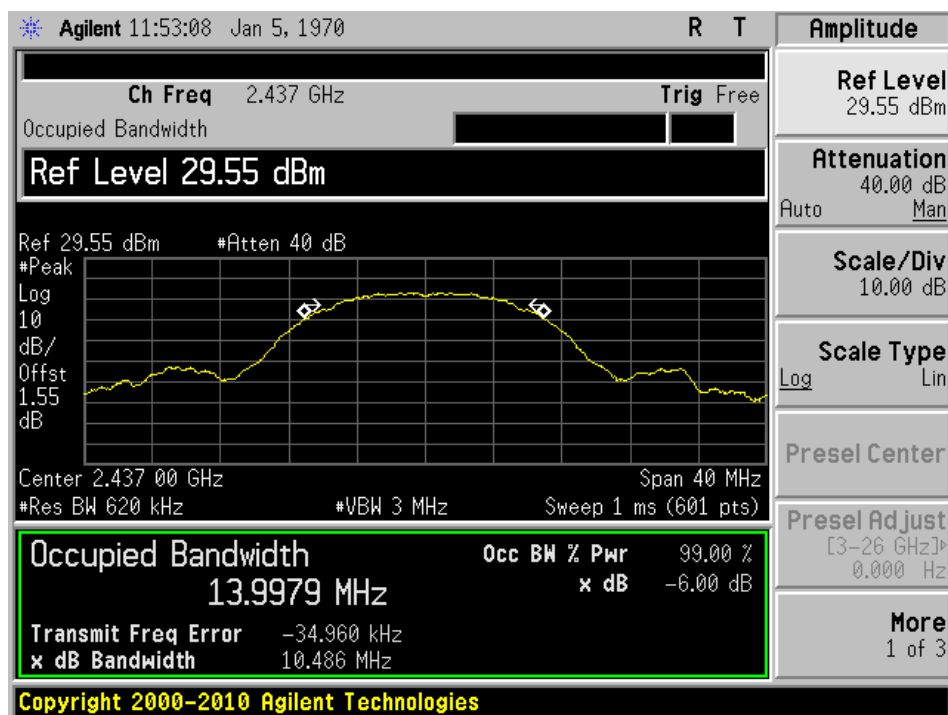


Chain J4 is not active during test

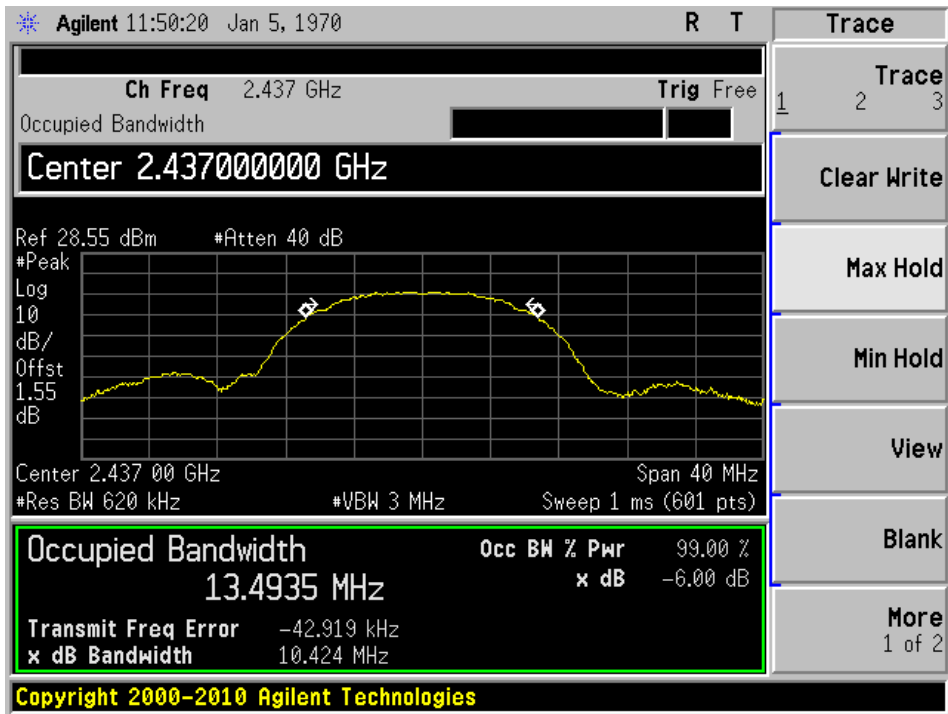
802.11b Middle channel, Chain J1



802.11b Middle channel, Chain J2

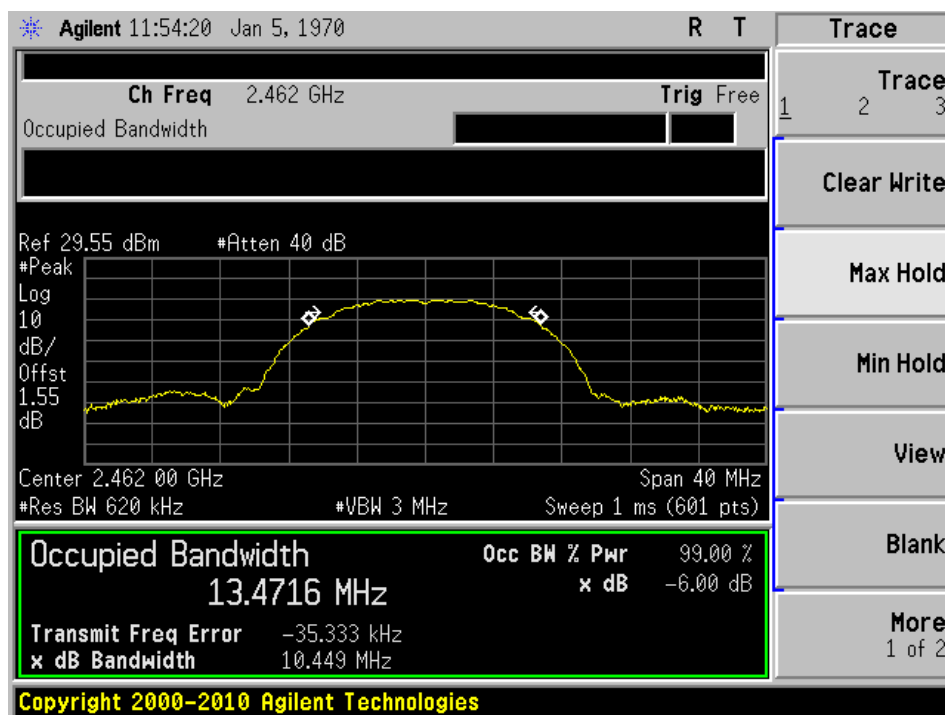


802.11b Middle channel, Chain J3

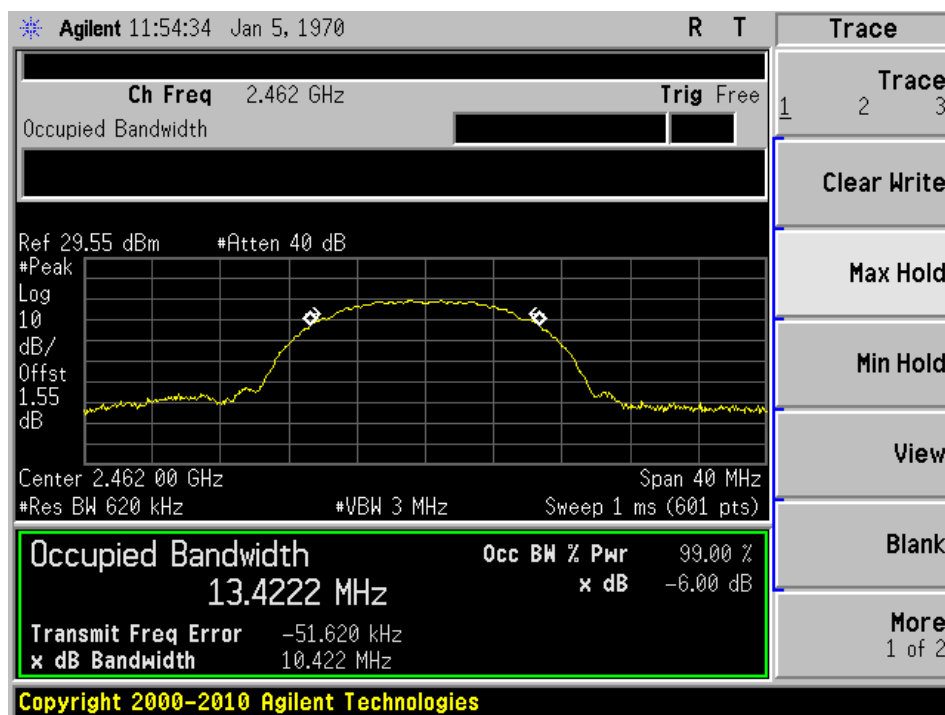


Chain J4 is not active during test

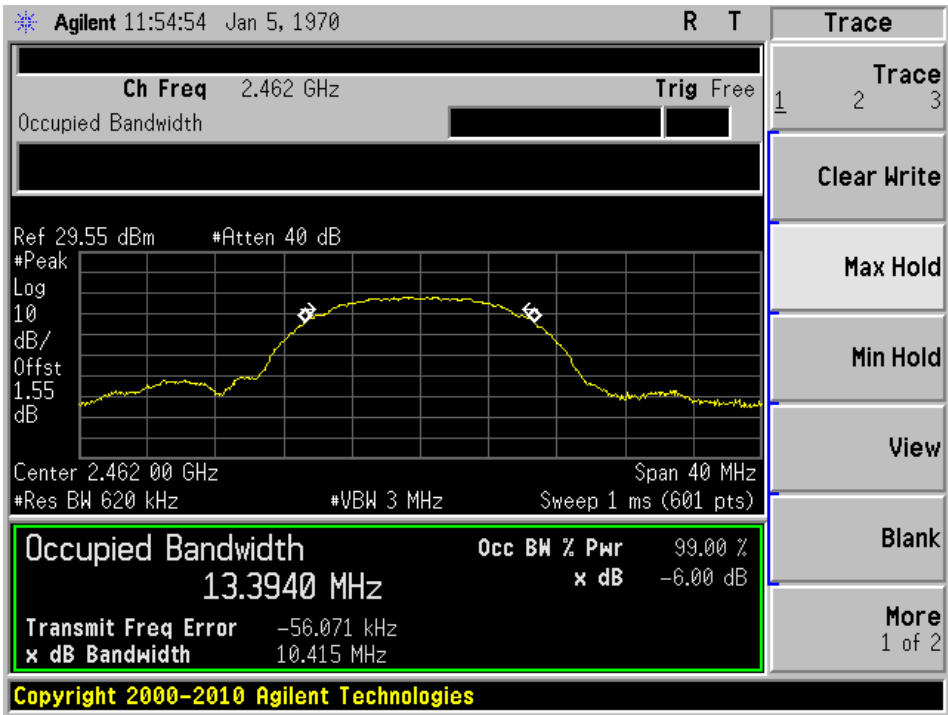
802.11b High channel, Chain J1



802.11b High channel, Chain J2

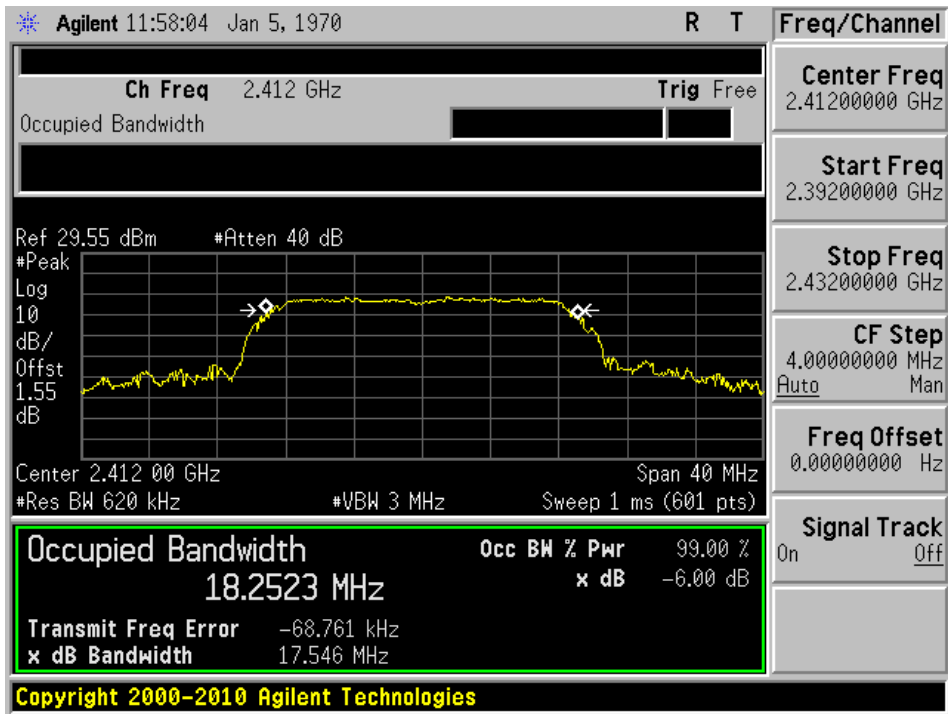


802.11b High channel, Chain J3

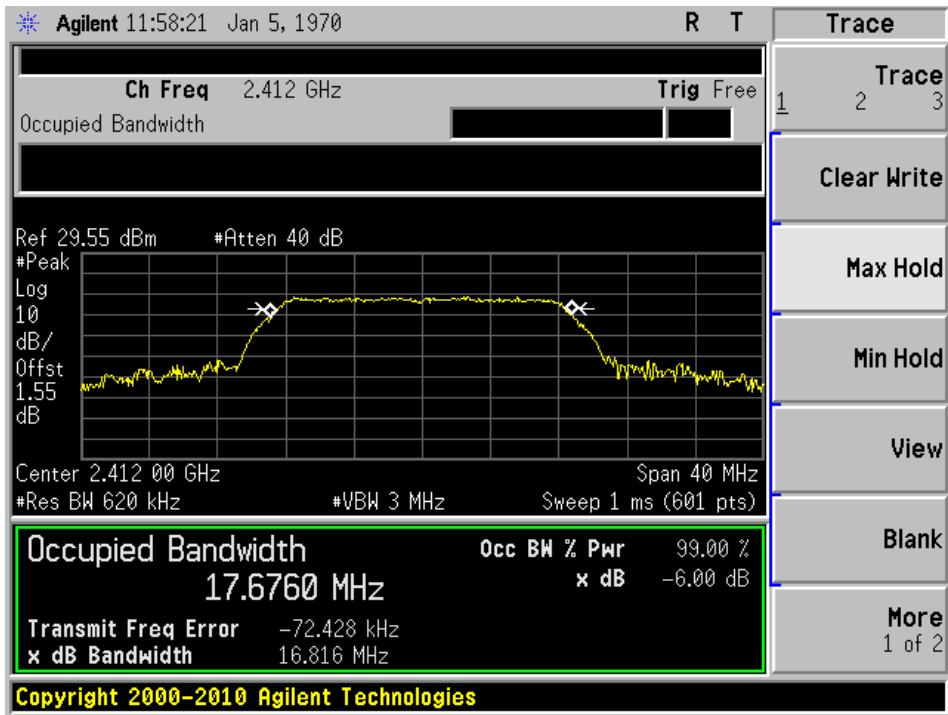


Chain J4 is not active during test

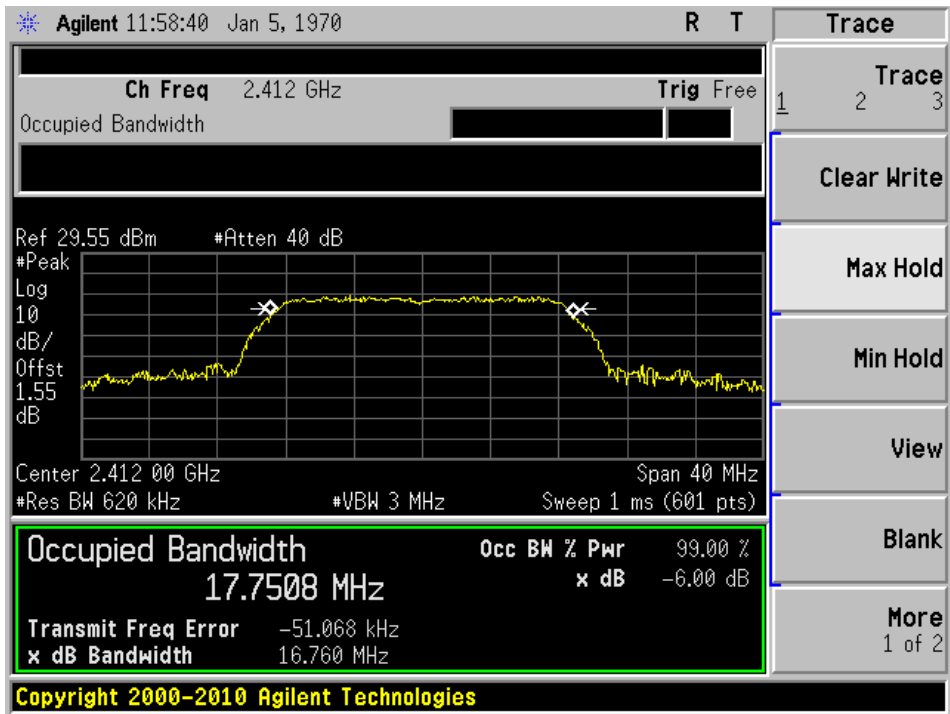
802.11g Low channel, Chain J1



802.11g Low channel, Chain J2

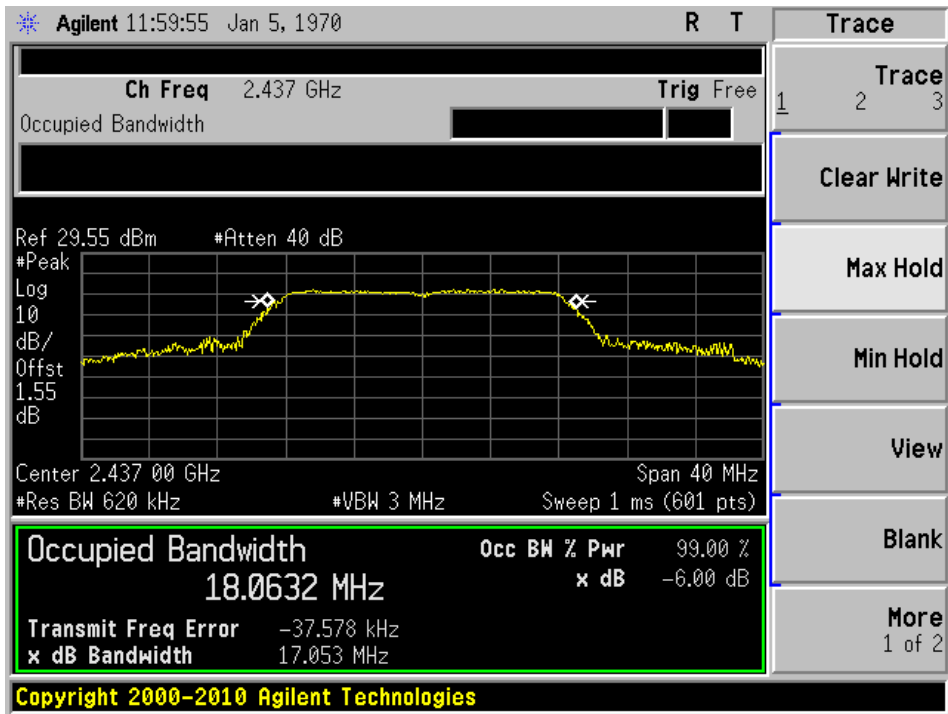


802.11g Low channel, Chain J3

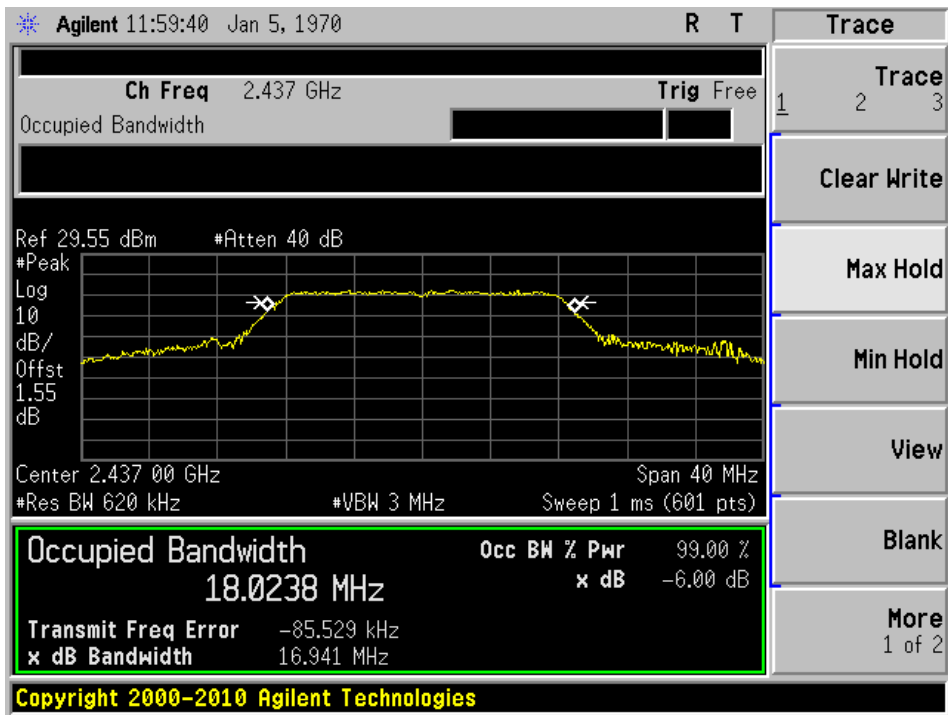


Chain J4 is not active during test

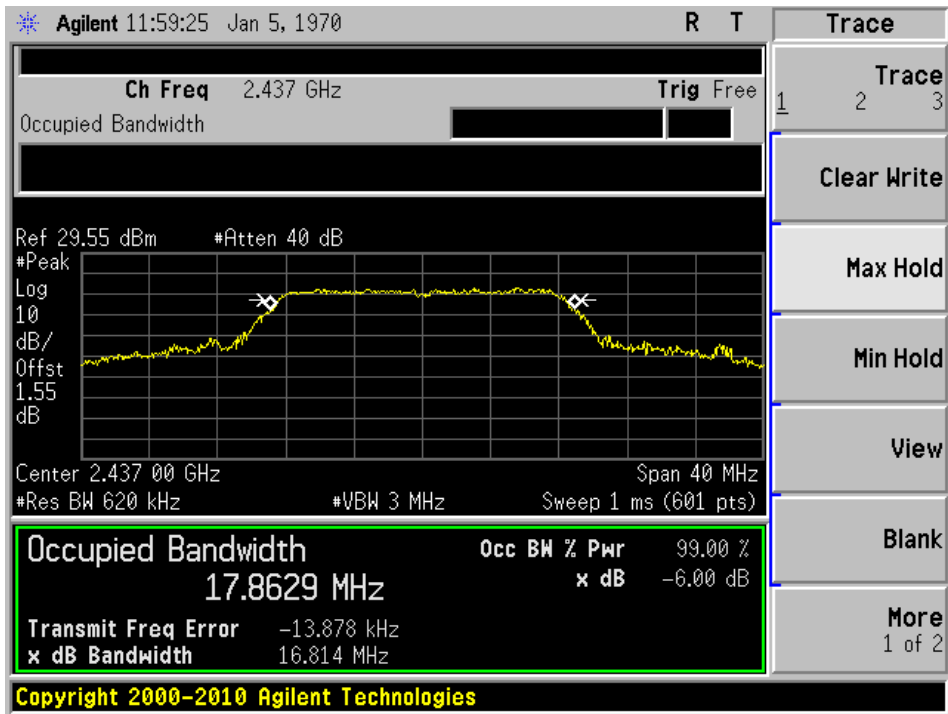
802.11g Middle channel, Chain J1



802.11g Middle channel, Chain J2

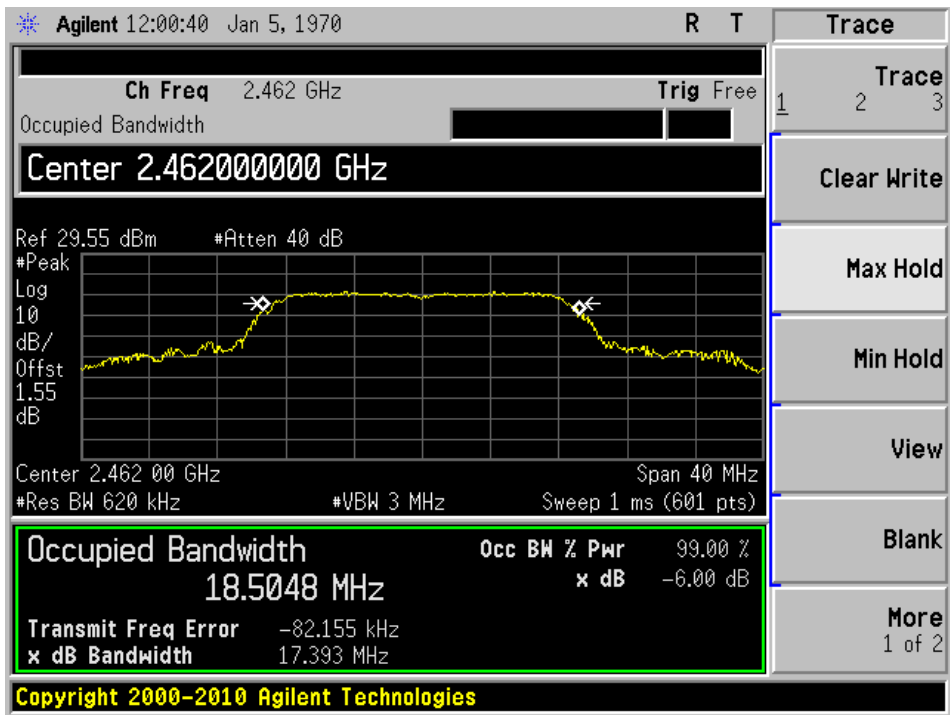


802.11g Middle channel, Chain J3

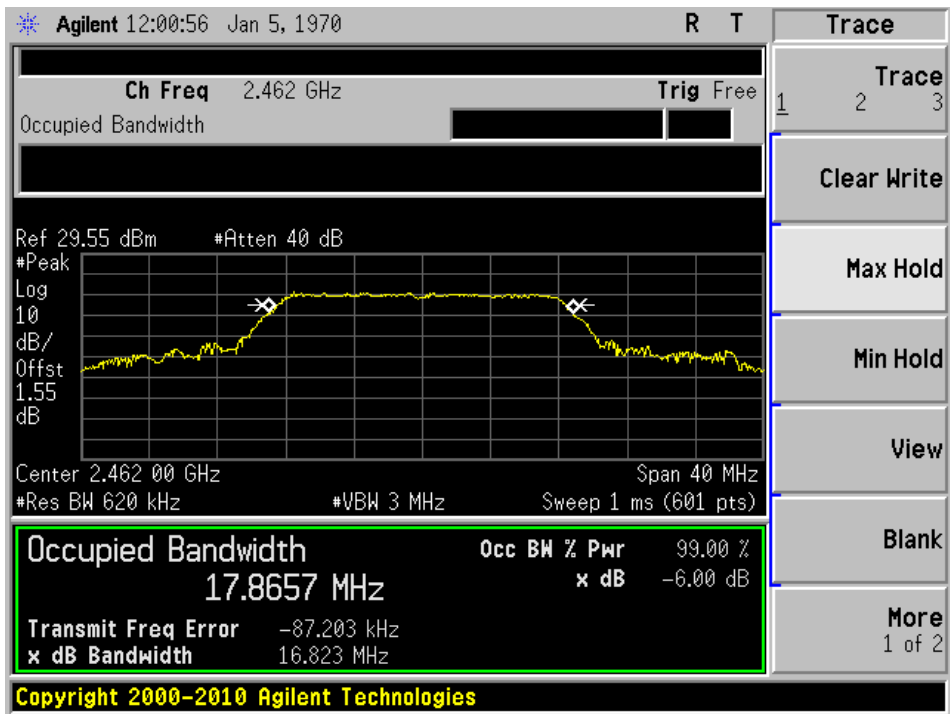


Chain J4 is not active during test

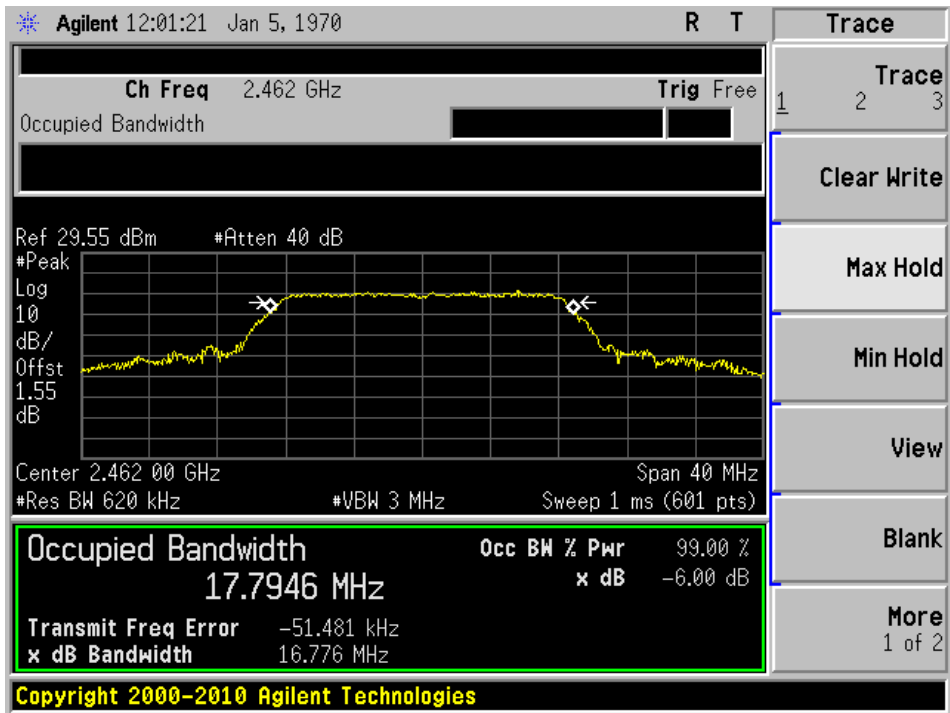
802.11g High channel, Chain J1



802.11g High channel, Chain J2

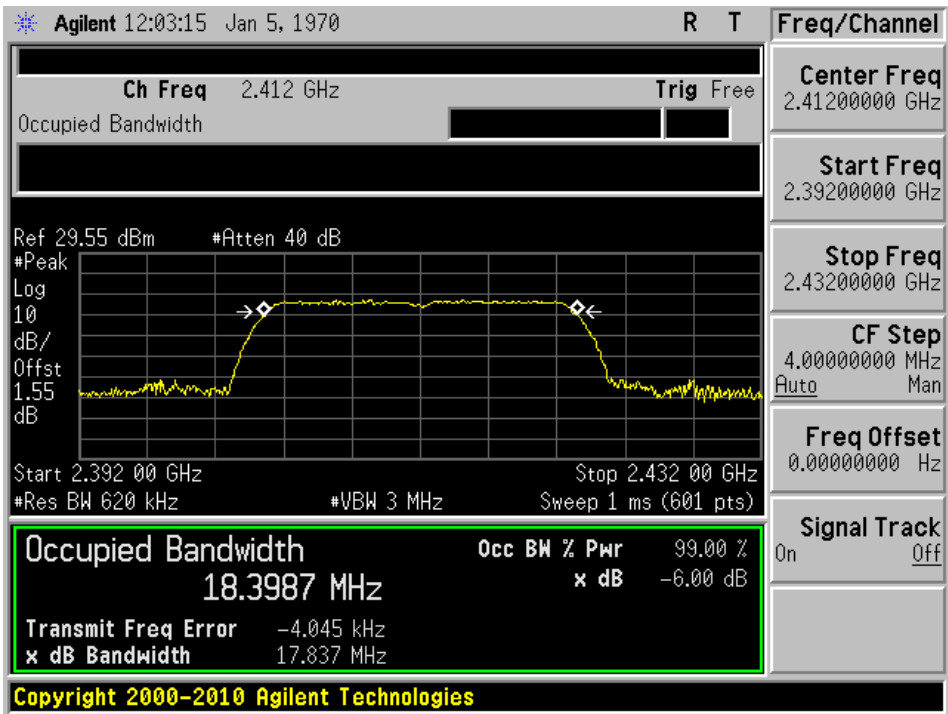


802.11g High channel, Chain J3

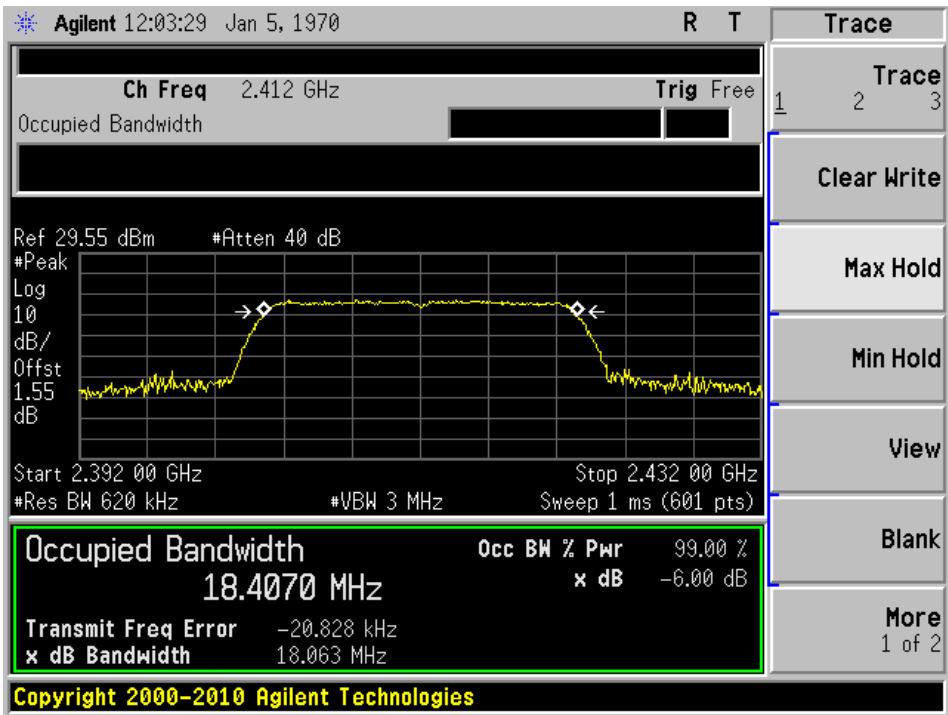


Chain J4 is not active during test

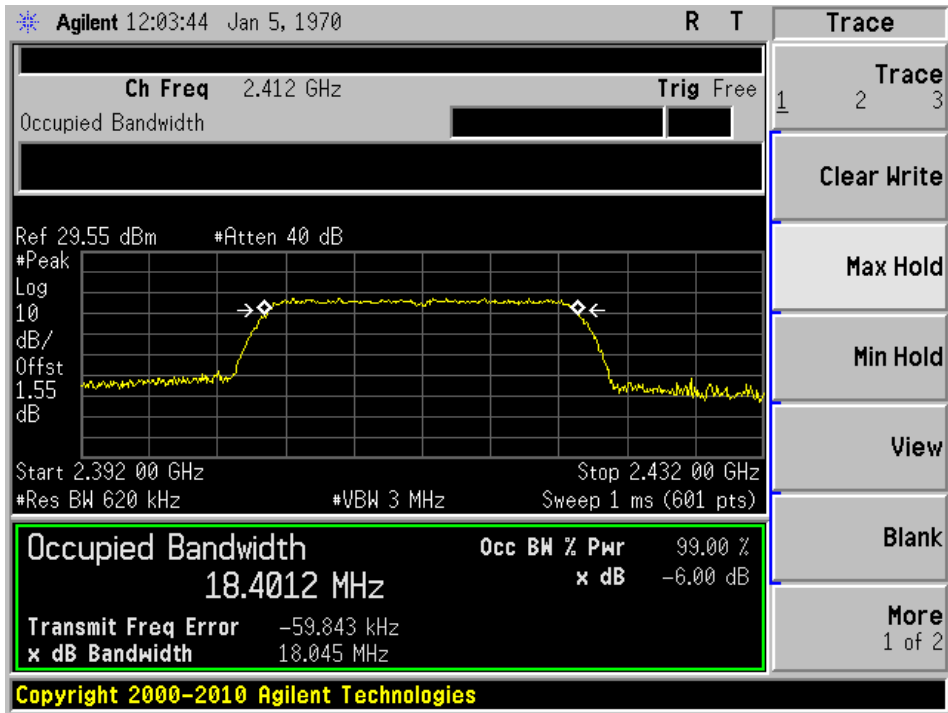
802.11n 20MHz Low channel, Chain J1



802.11n 20MHz Low channel, Chain J2

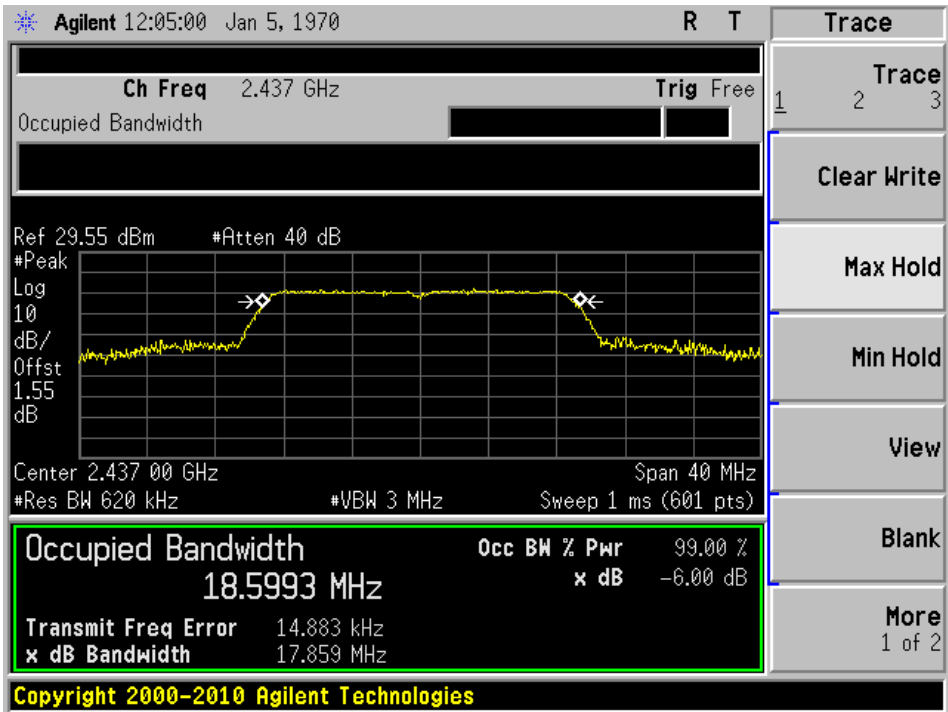


802.11n 20MHz Low channel, Chain J3

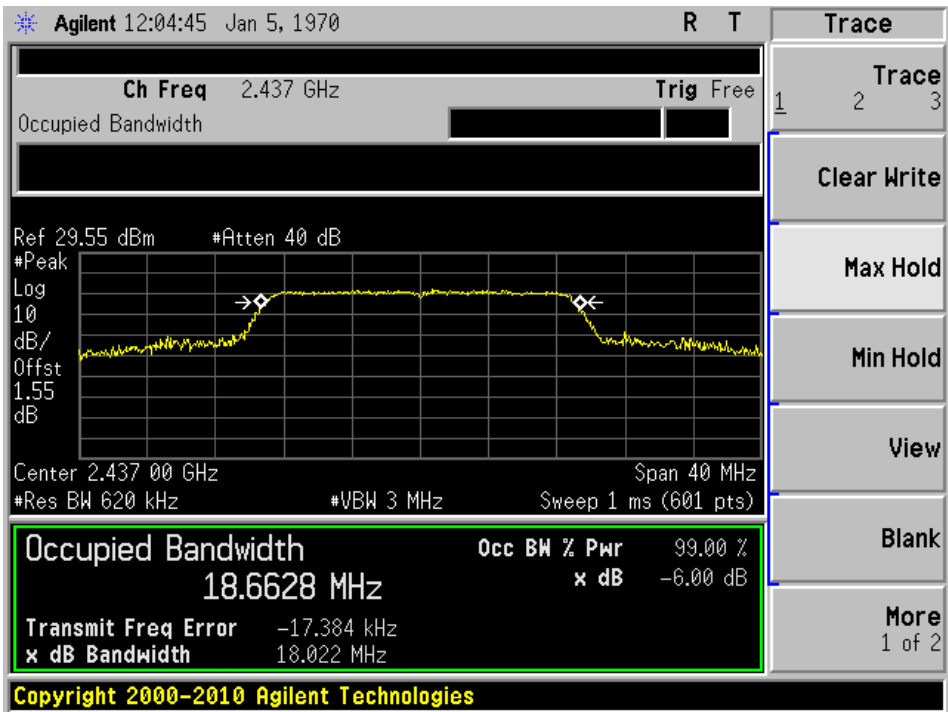


Chain J4 is not active during test

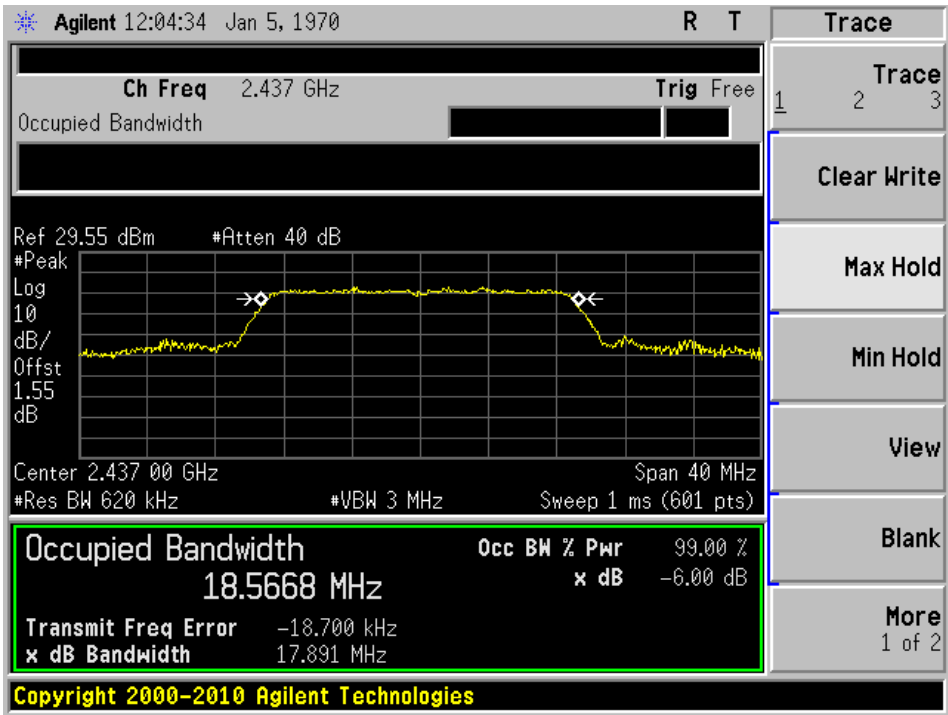
802.11n 20MHz Middle channel, Chain J1



802.11n 20MHz Middle channel, Chain J2

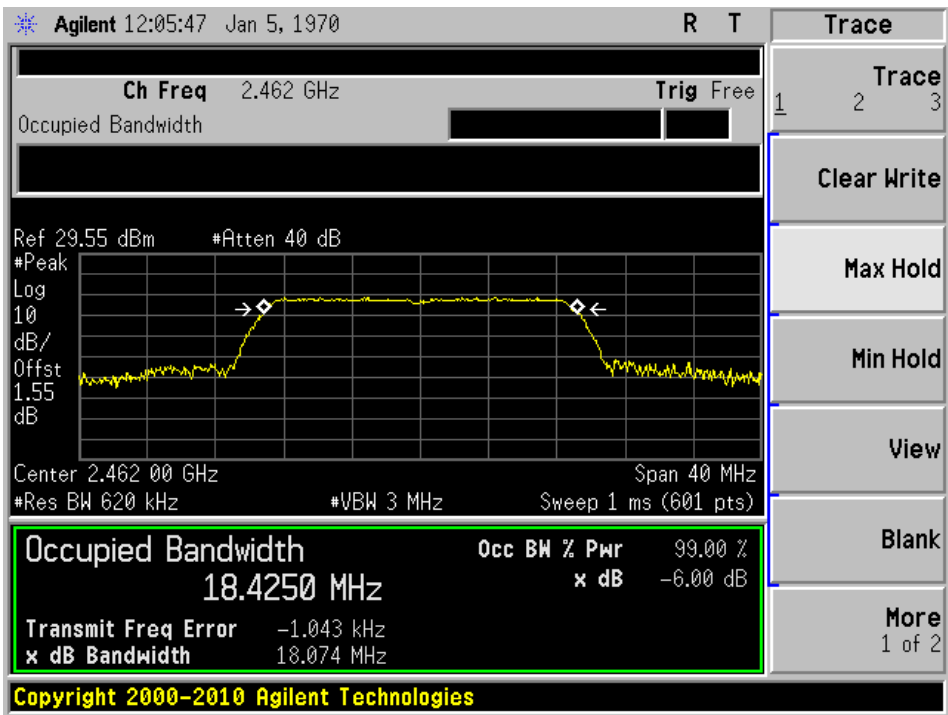


802.11n 20MHz Middle channel, Chain J3

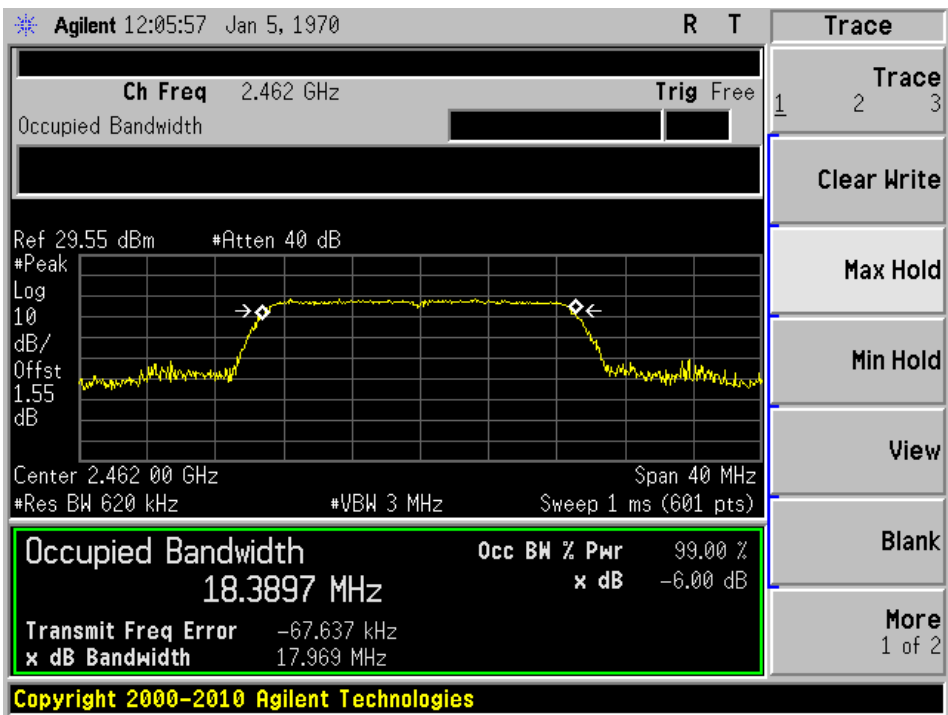


Chain J4 is not active during test

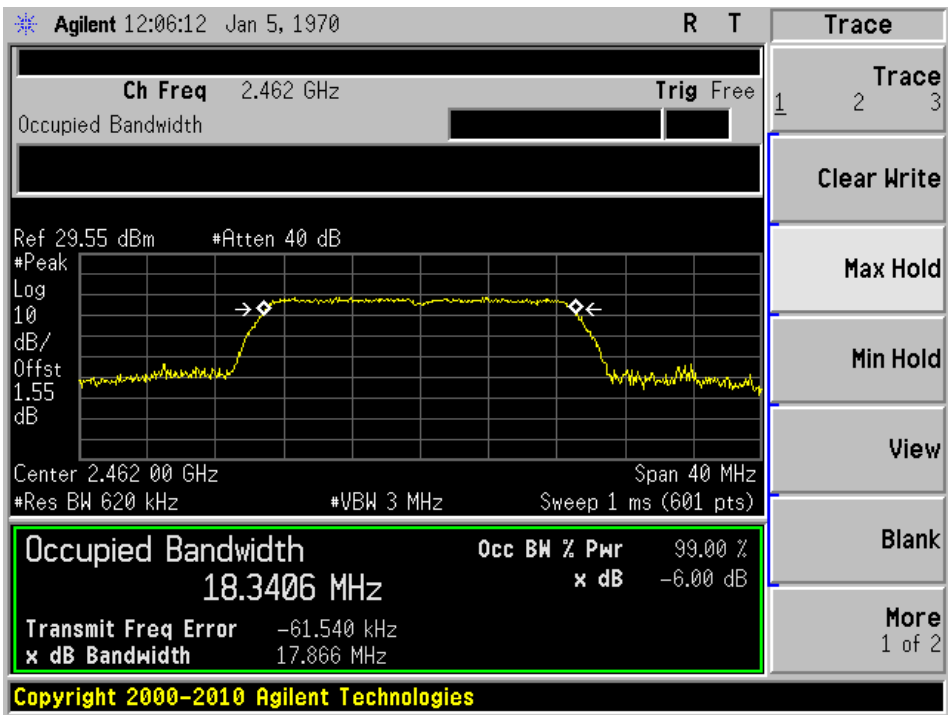
802.11n 20MHz High channel, Chain J1



802.11n 20MHz High channel, Chain J2

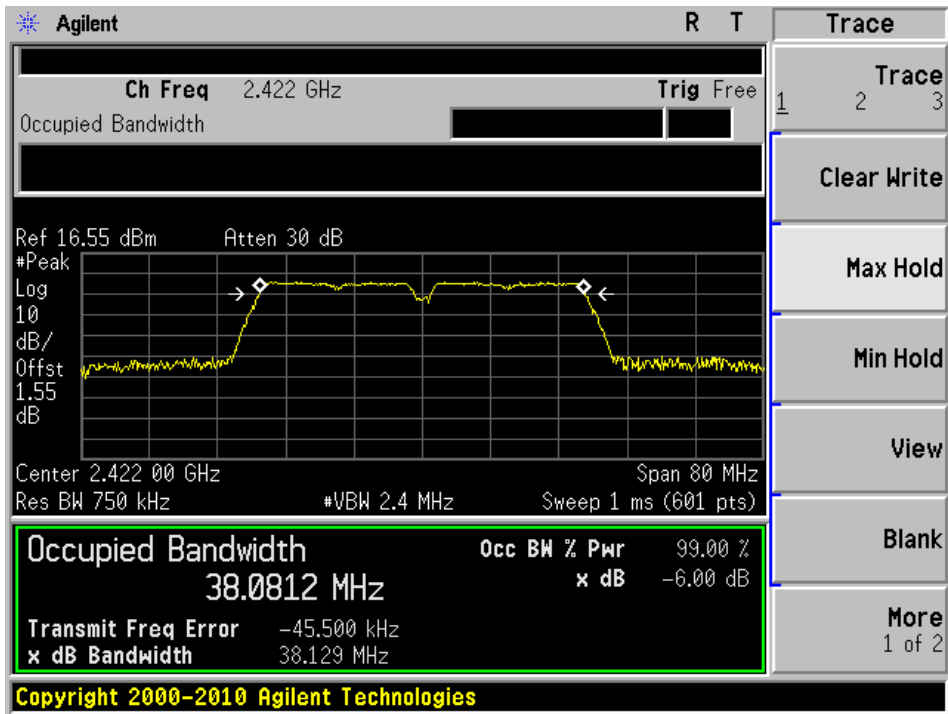


802.11n 20MHz High channel, Chain J3

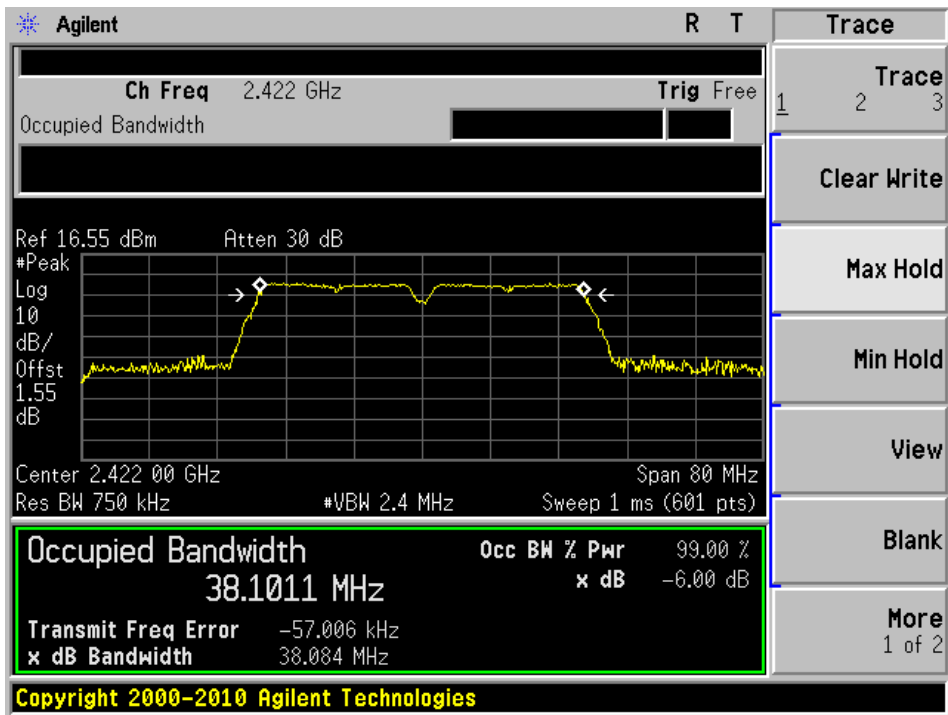


Chain J4 is not active during test

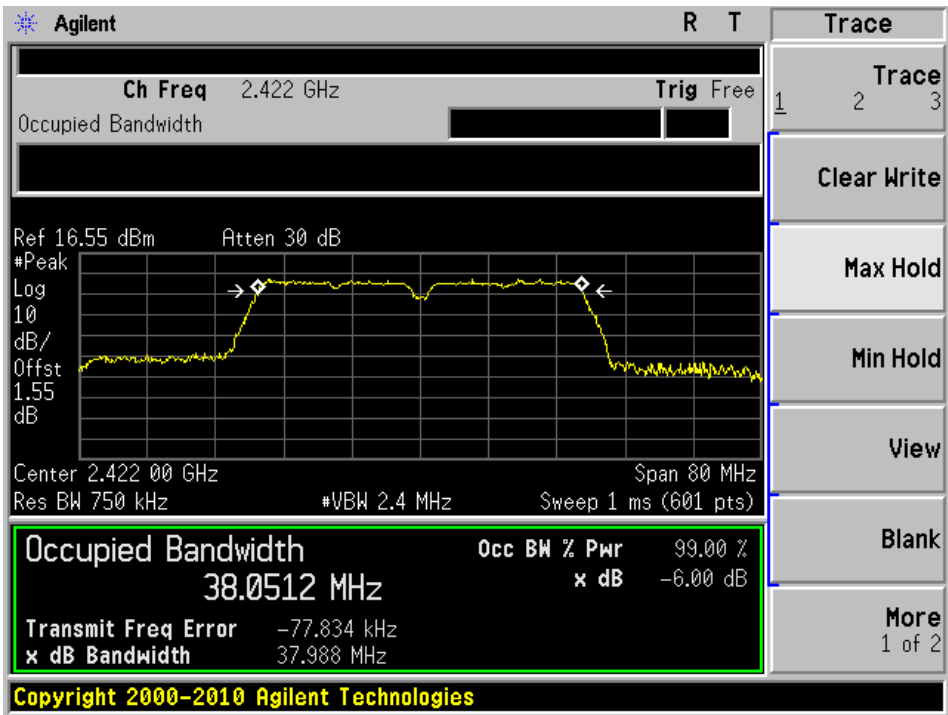
802.11n 40MHz Low channel, Chain J1



802.11n 40MHz Low channel, Chain J2

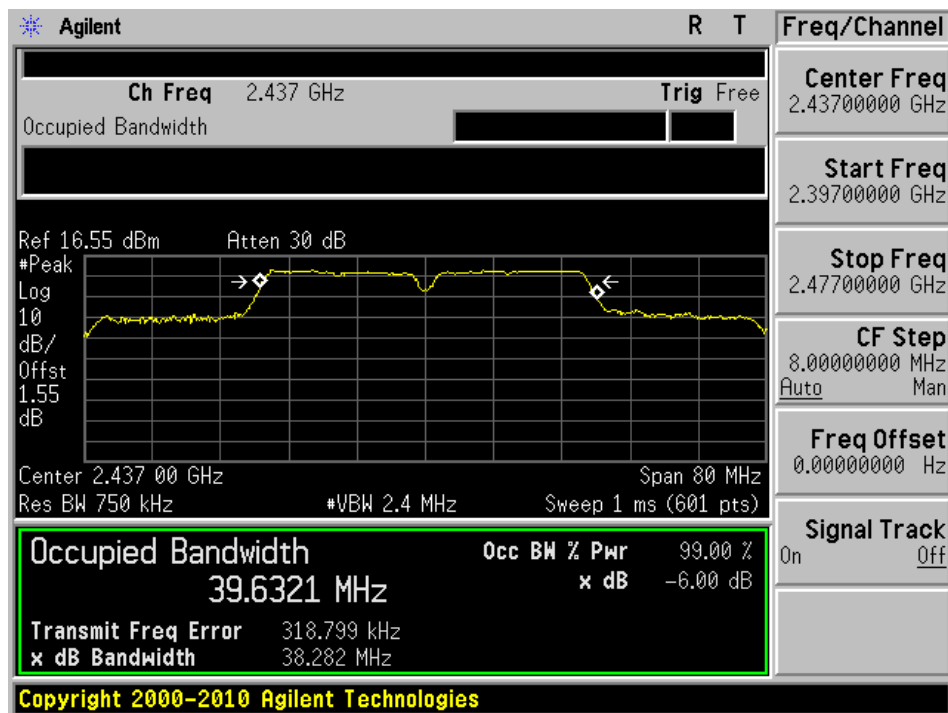


802.11n 40MHz Low channel, Chain J3

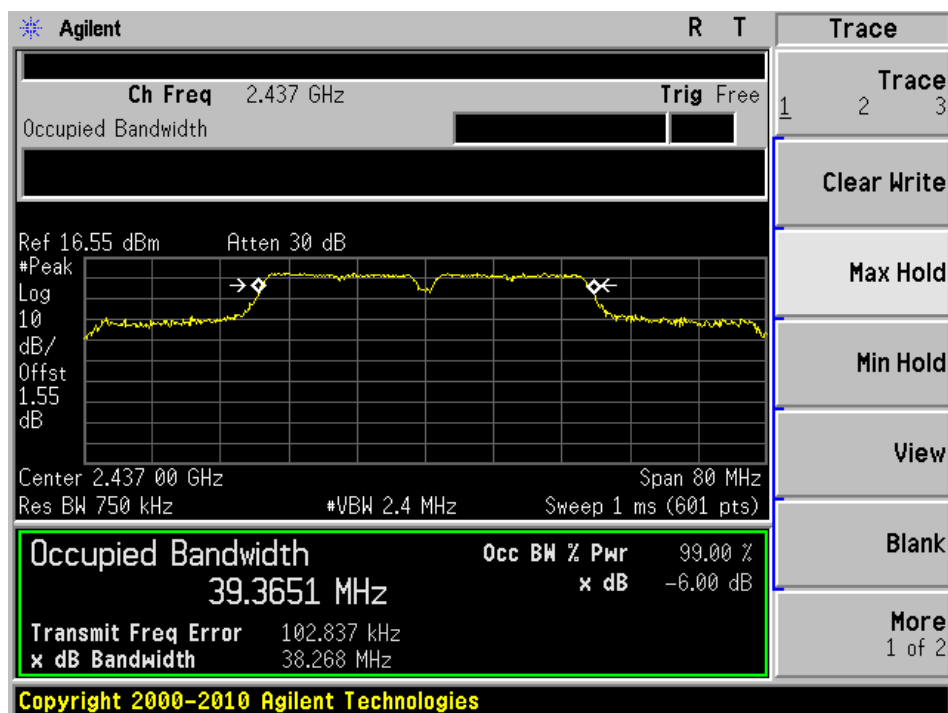


Chain J4 is not active during test

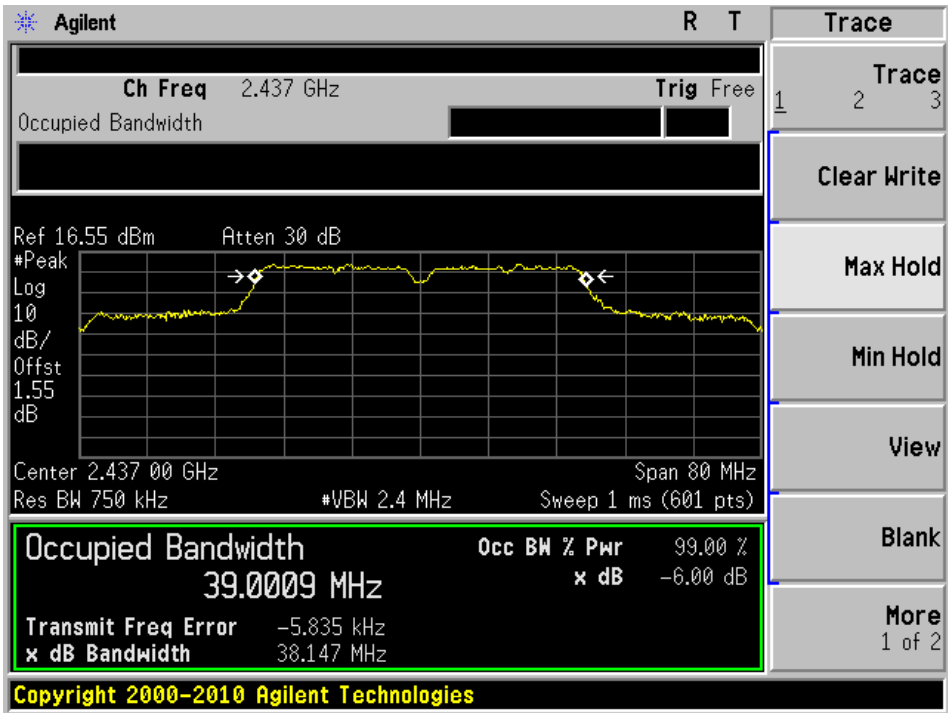
802.11n 40MHz Middle channel, Chain J1



802.11n 40MHz Middle channel, Chain J2

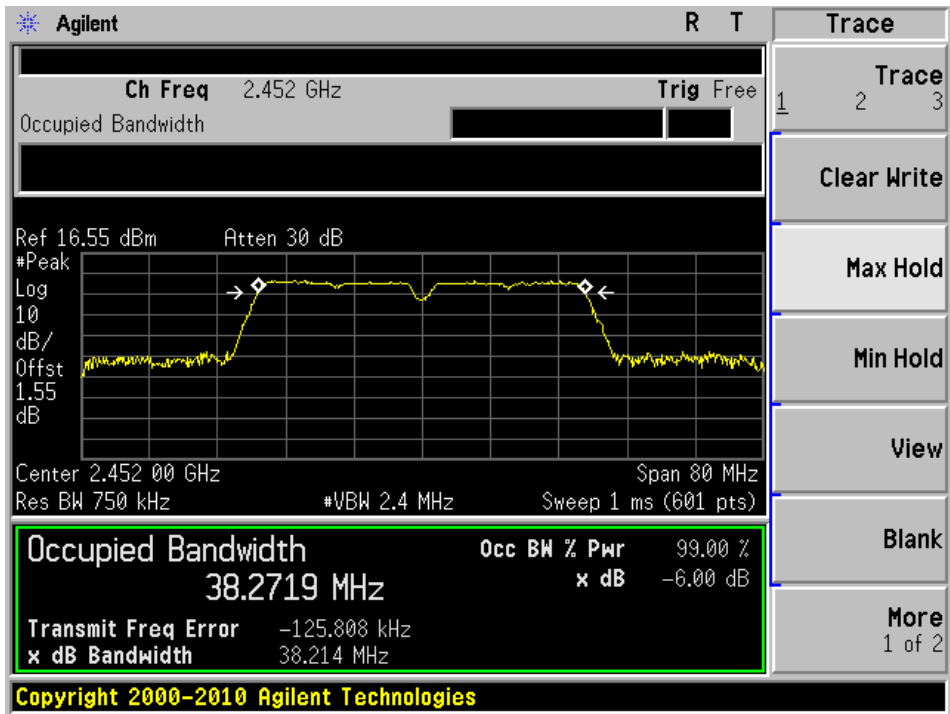


802.11n 40MHz Middle channel, Chain J3

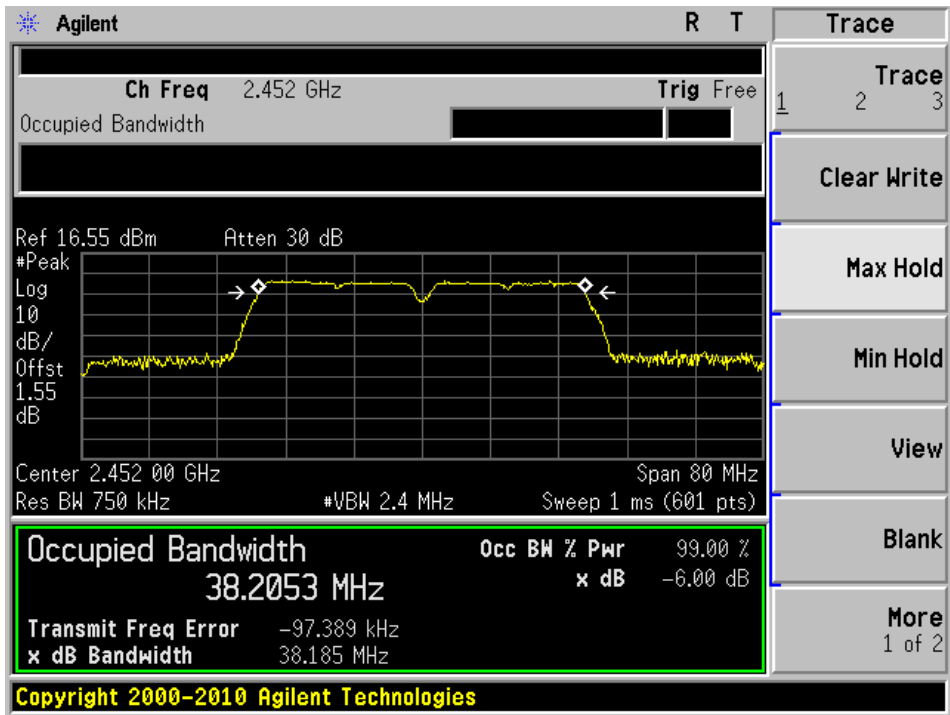


Chain J4 is not active during test

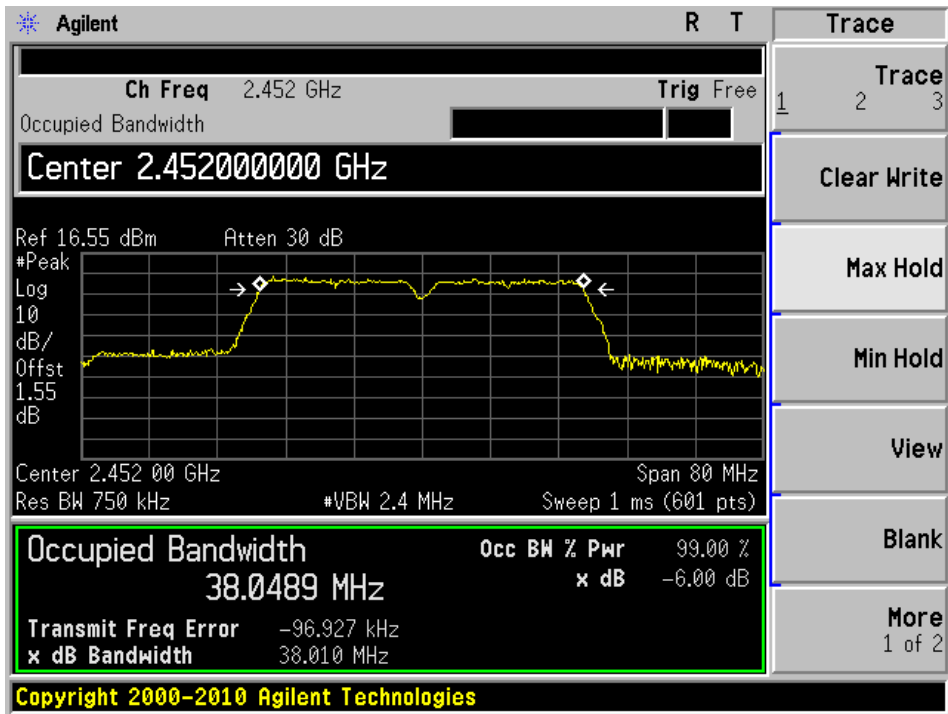
802.11n 40MHz High channel, Chain J1



802.11n 40MHz High channel, Chain J2

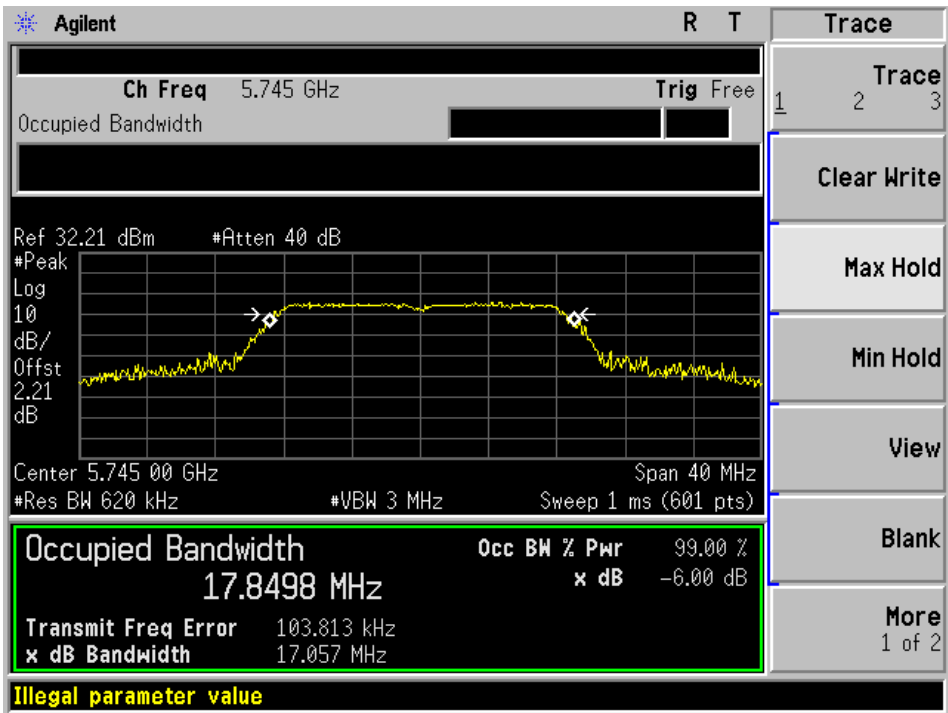


802.11n 40MHz High channel, Chain J3

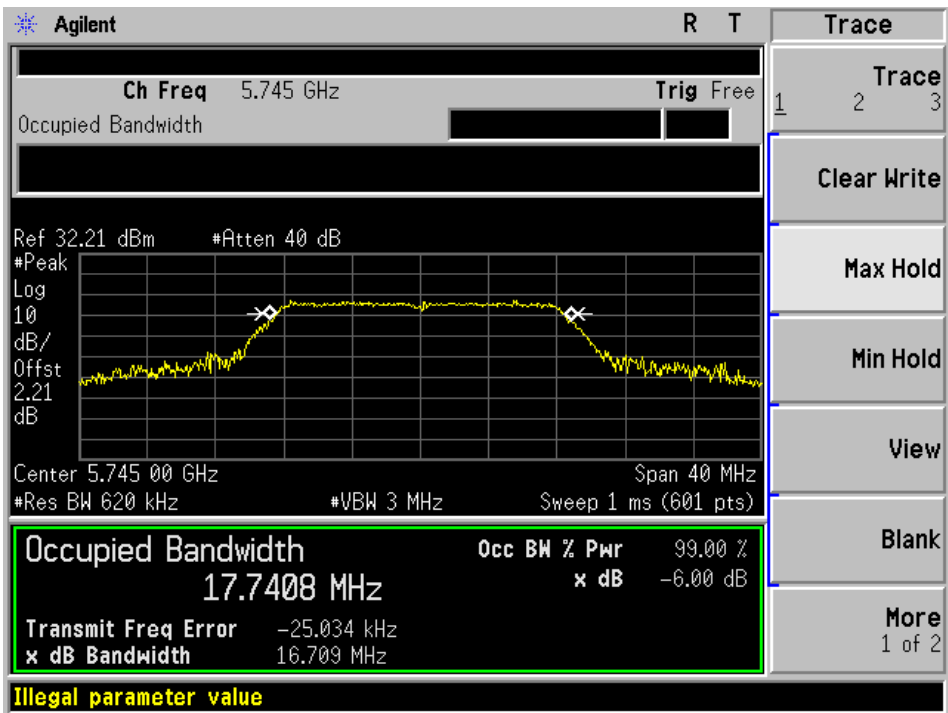


Chain J4 is not active during test

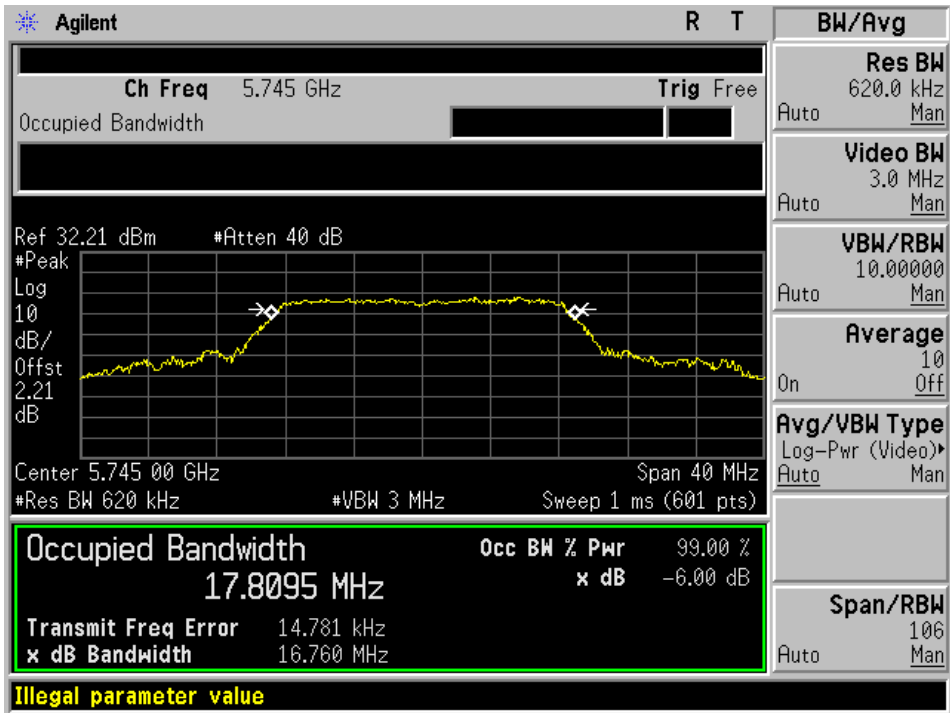
5.8 GHz Band
802.11a Low channel, Chain J1



802.11a Low channel, Chain J2

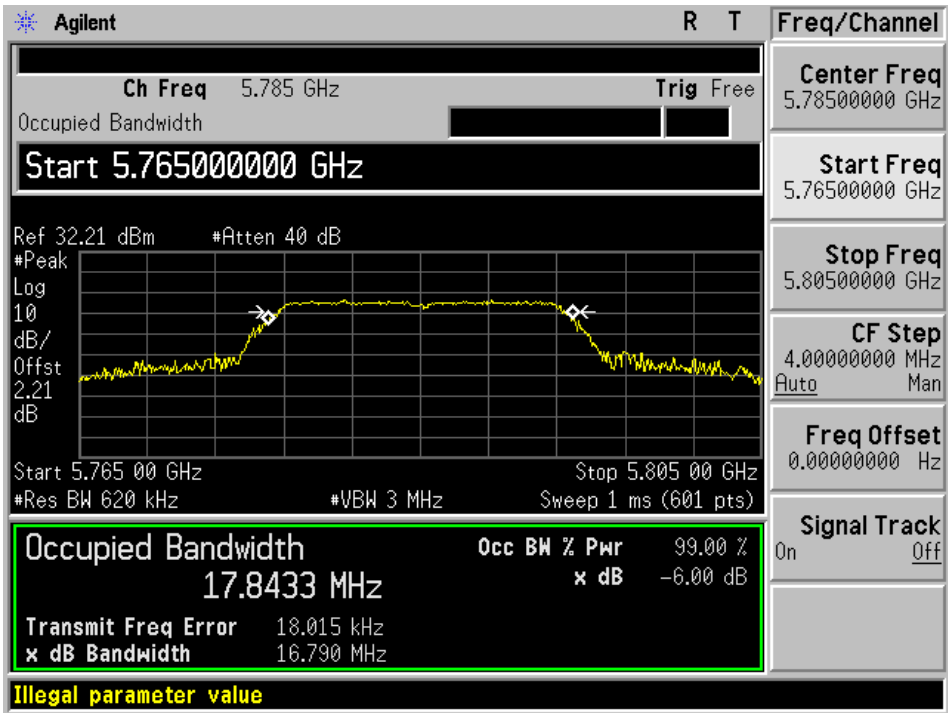


802.11a Low channel, Chain J3

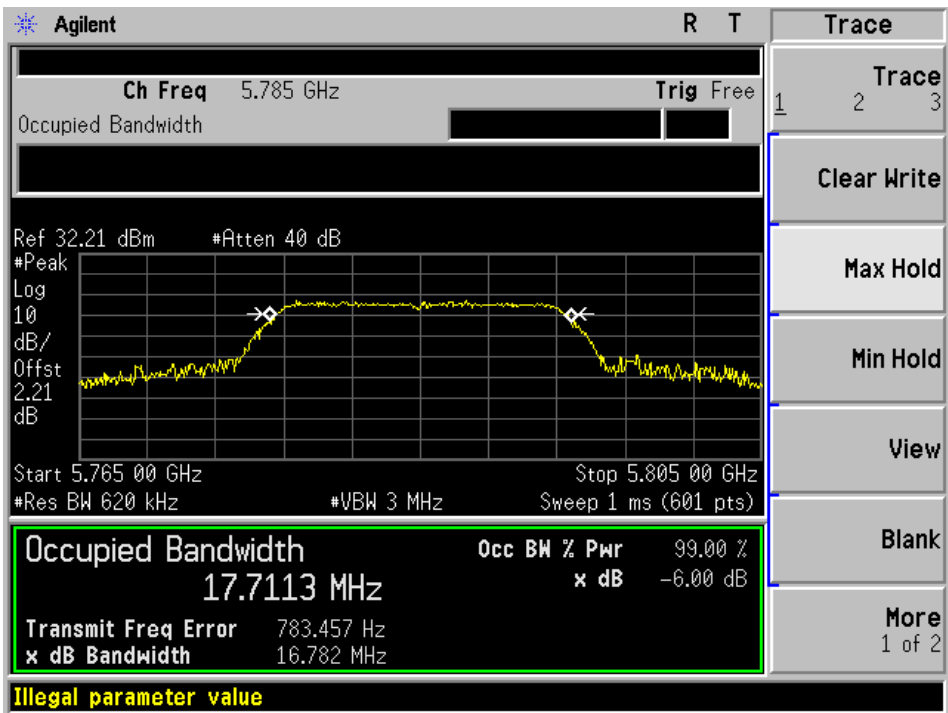


Chain J4 is not active during test

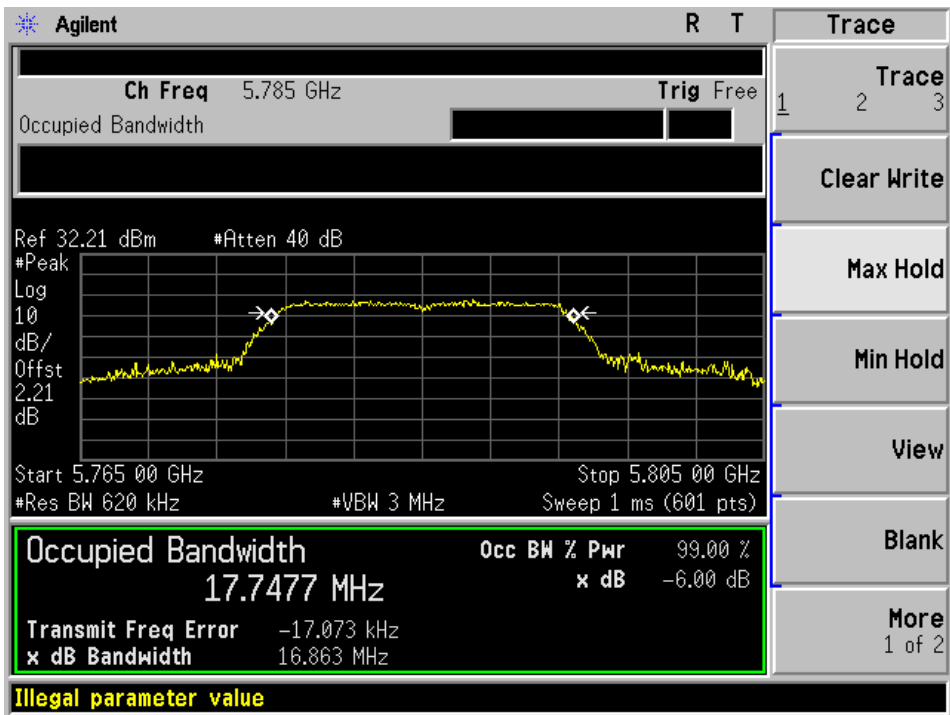
802.11a Middle channel, Chain J1



802.11a Middle channel, Chain J2

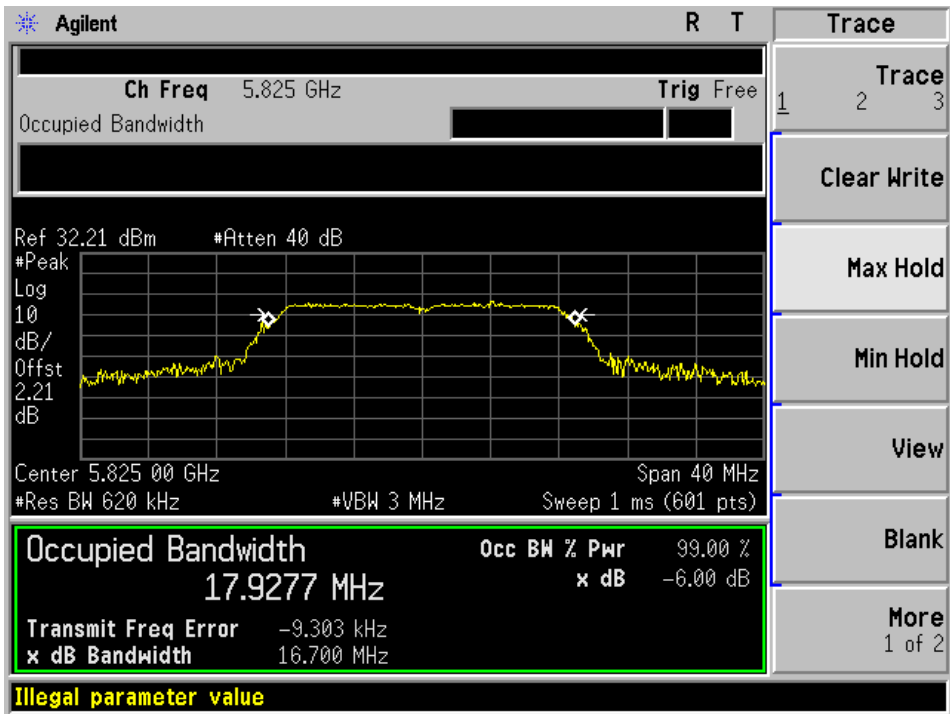


802.11a Middle channel, Chain J3

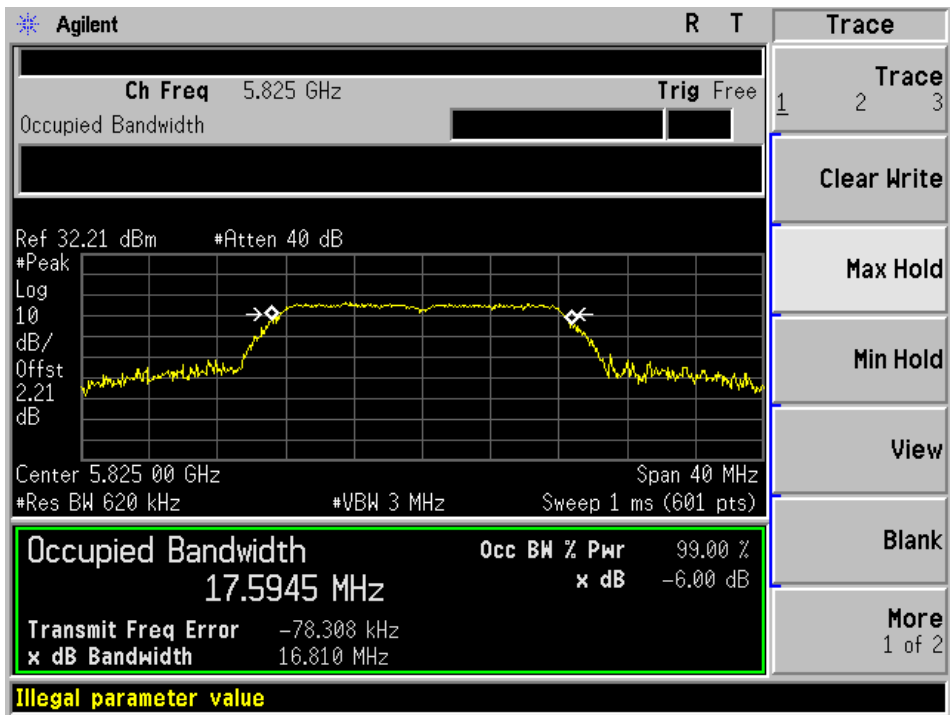


Chain J4 is not active during test

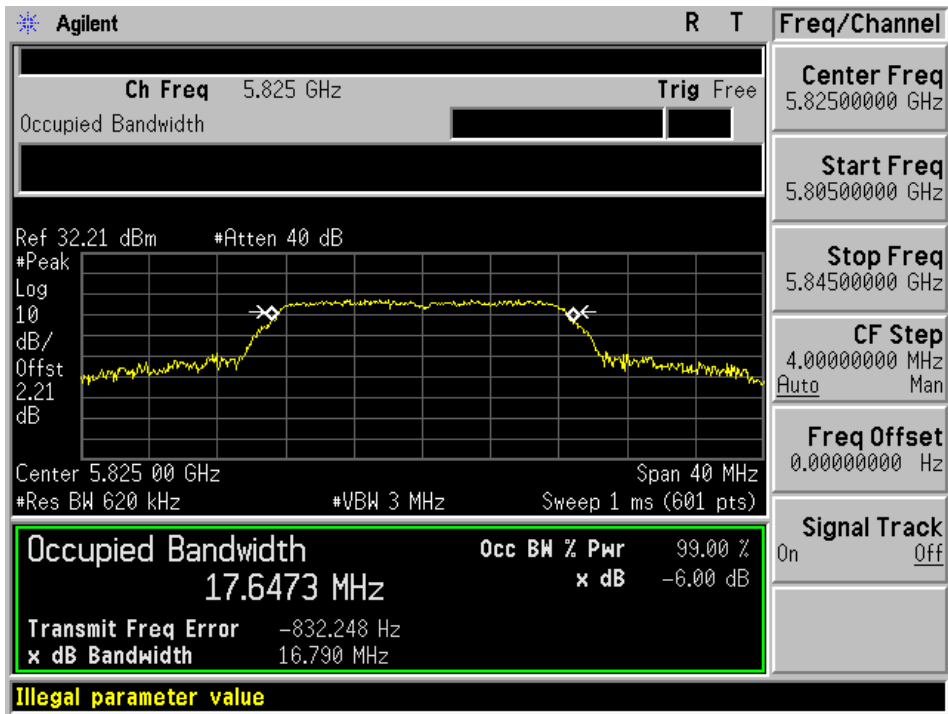
802.11a High channel, Chain J1



802.11a High channel, Chain J2

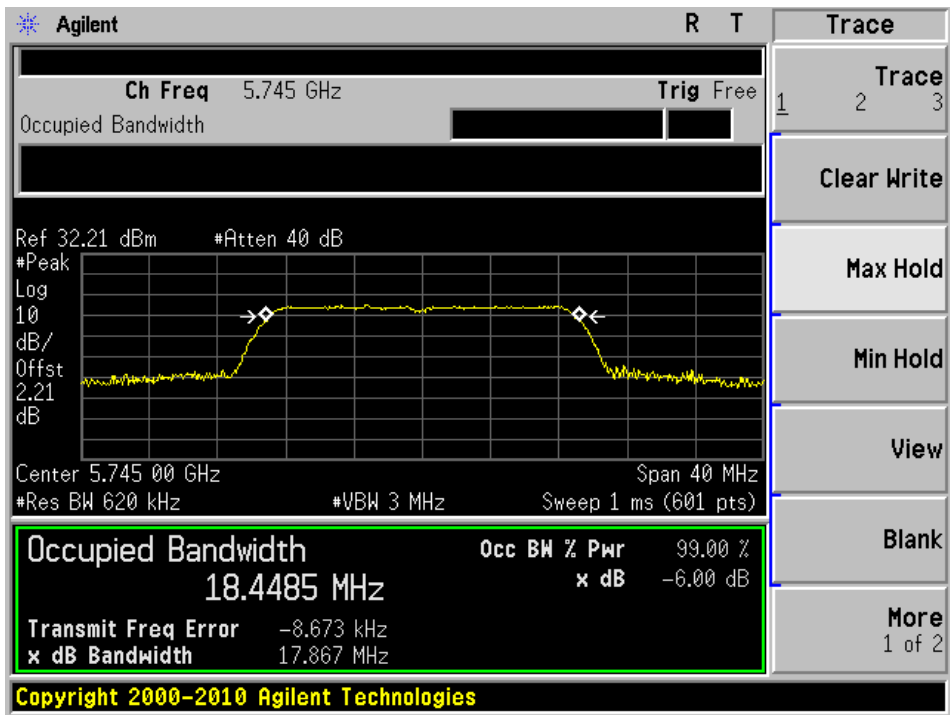


802.11a High channel, Chain J3

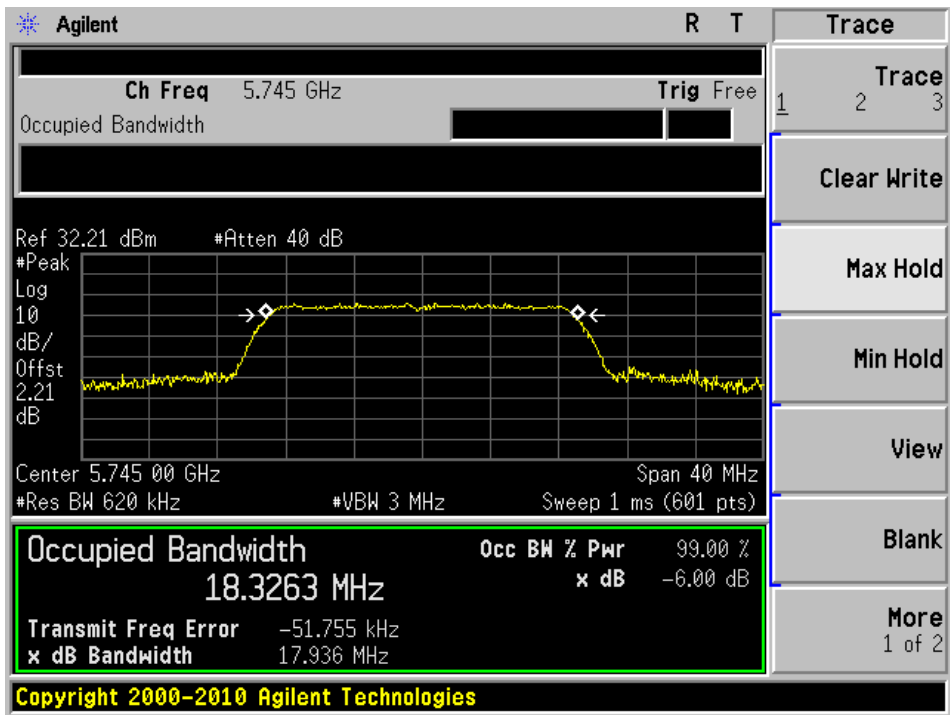


Chain J4 is not active during test

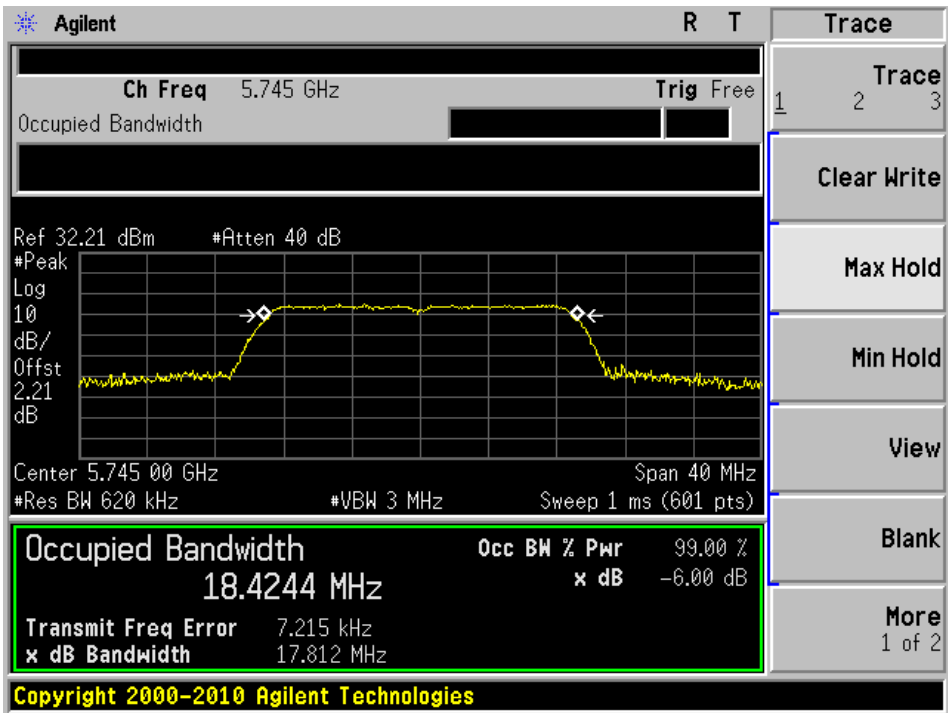
802.11n 20 MHz Low channel, Chain J1



802.11n 20 MHz Low channel, Chain J2

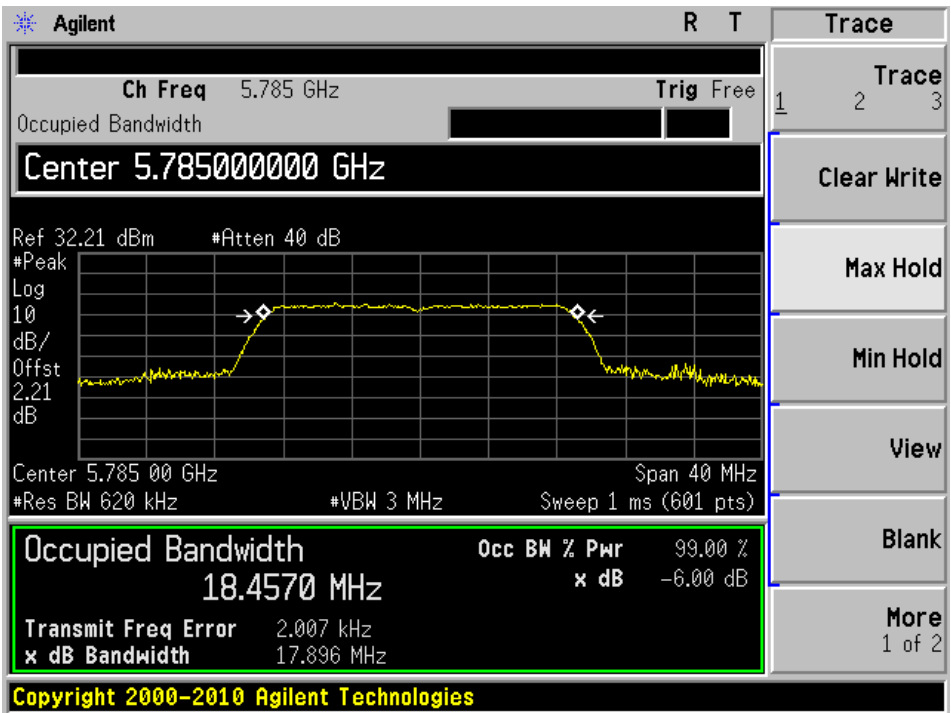


802.11n 20 MHz Low channel, Chain J3

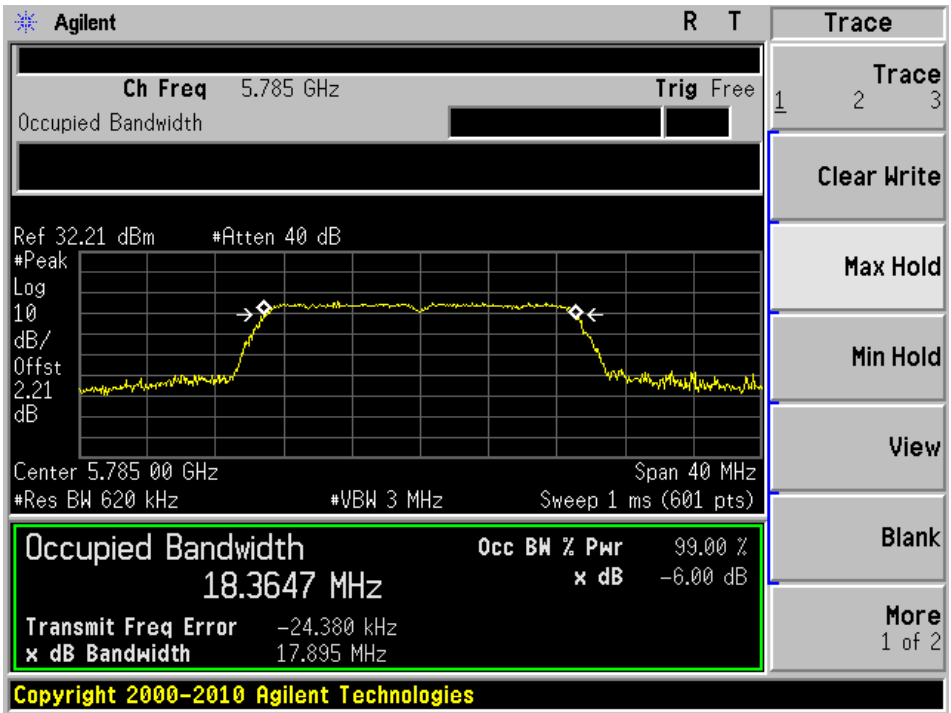


Chain J4 is not active during test

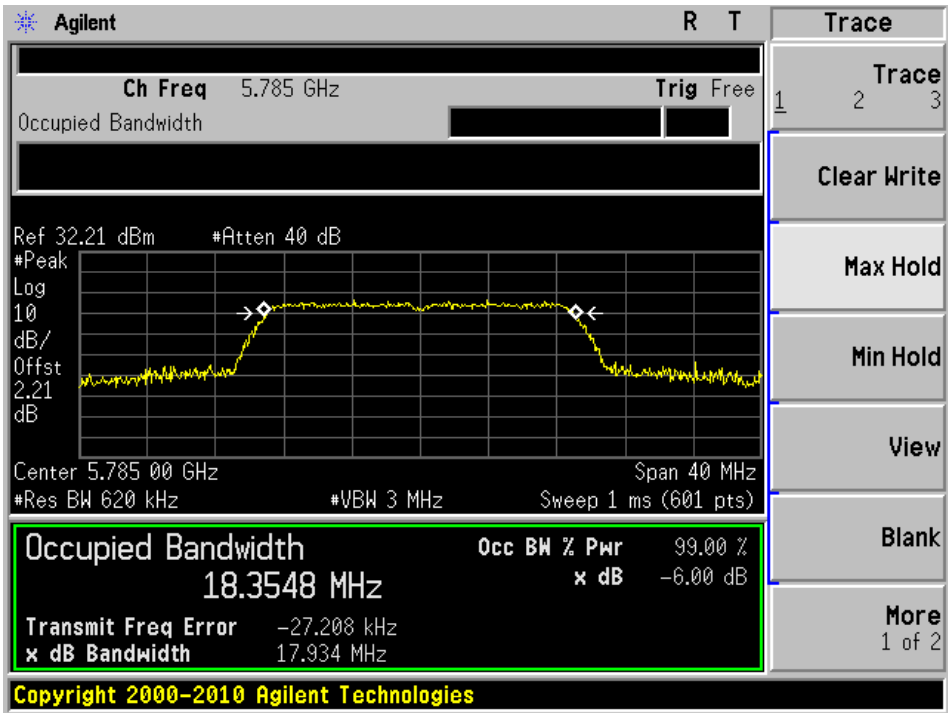
802.11n 20 MHz Middle channel, Chain J1



802.11n 20 MHz Middle channel, Chain J2

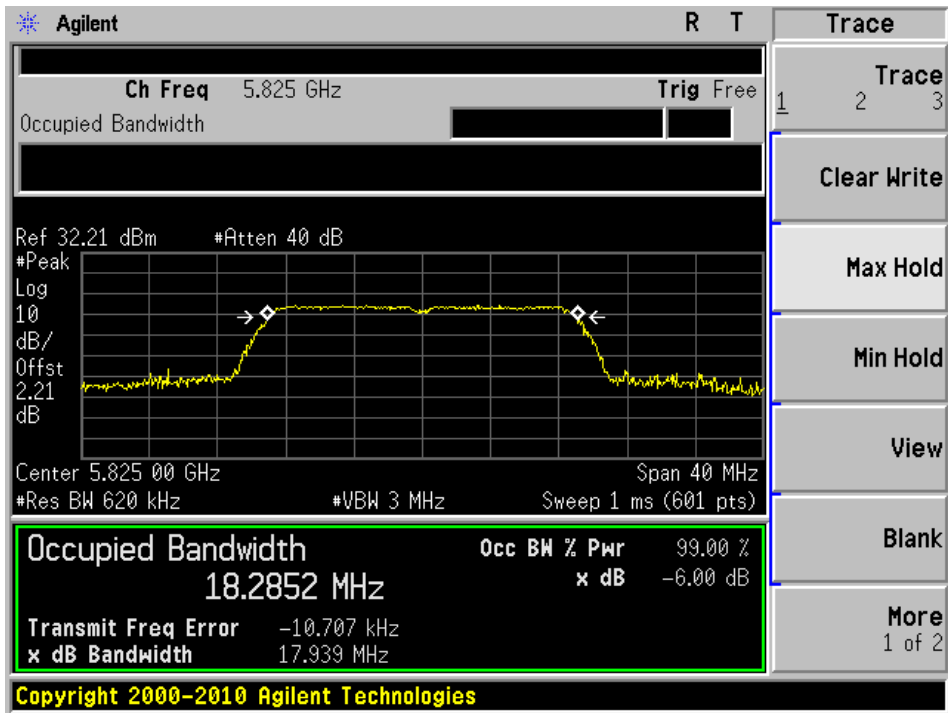


802.11n 20 MHz Middle channel, Chain J3

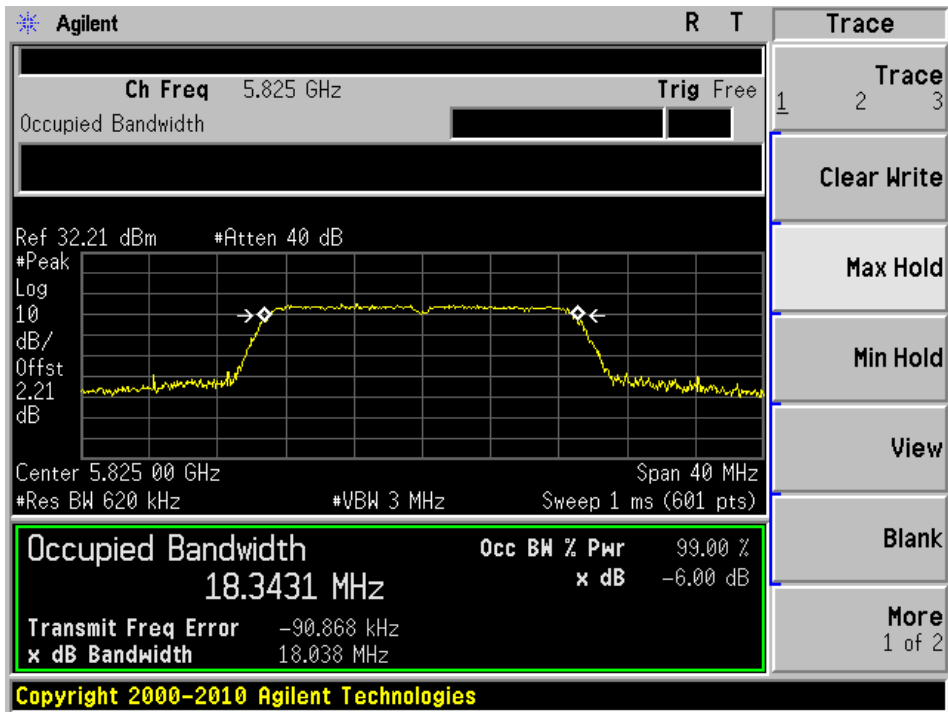


Chain J4 is not active during test

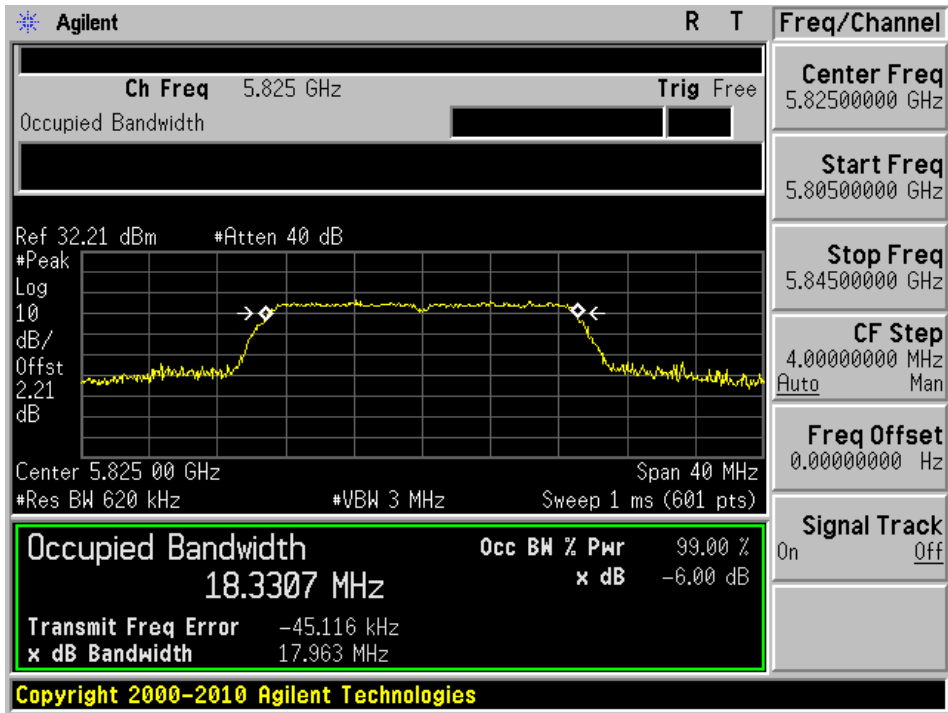
802.11n 20 MHz High channel, Chain J1



802.11n 20 MHz High channel, Chain J2

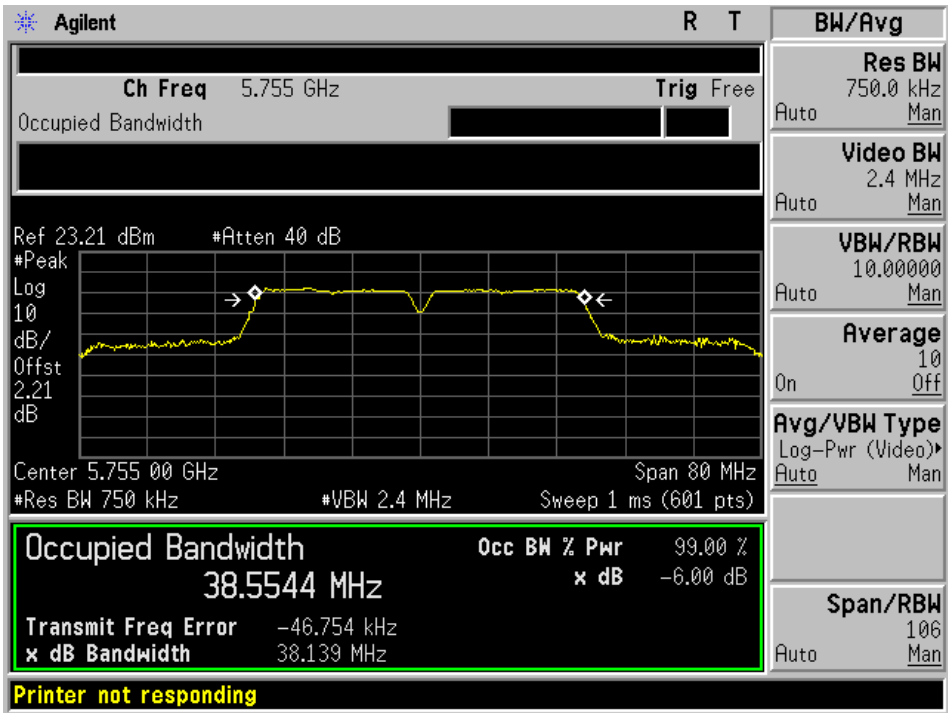


802.11n 20 MHz High channel, Chain J3

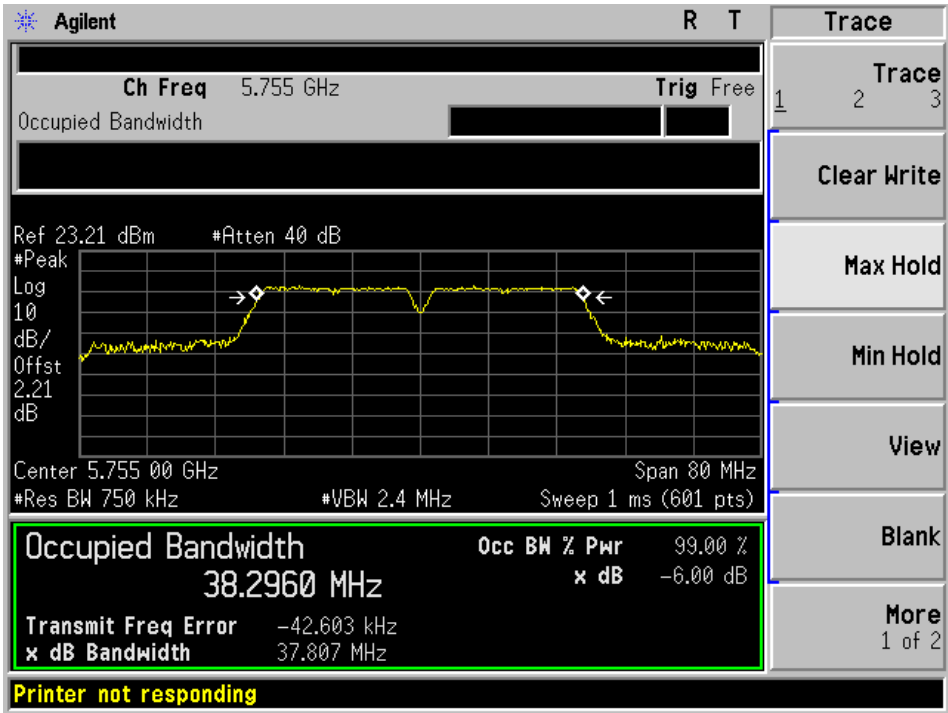


Chain J4 is not active during test

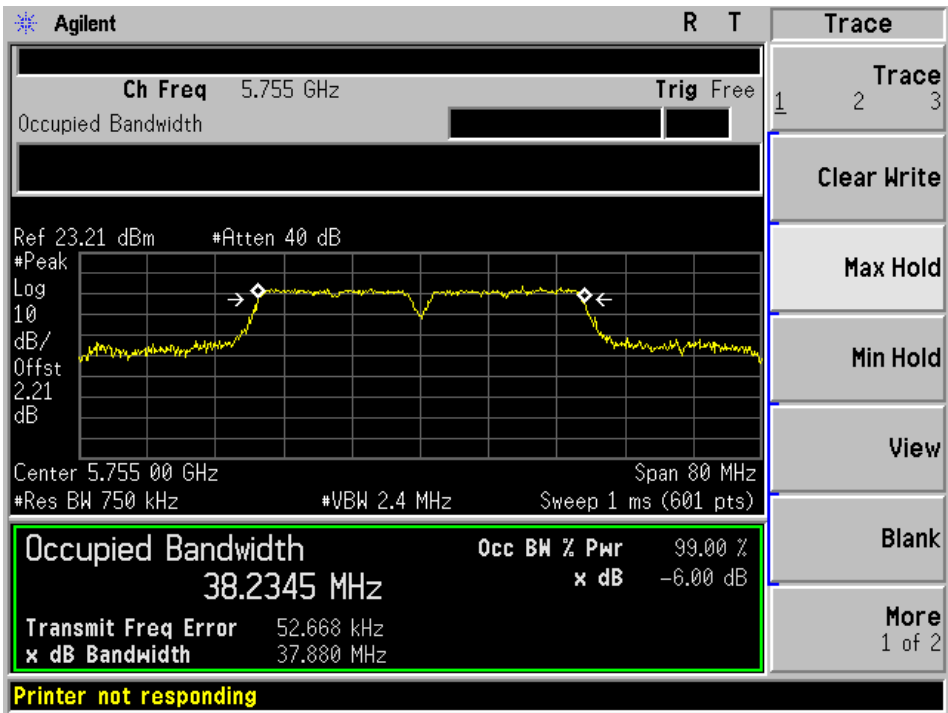
802.11n 40 MHz Low channel, Chain J1



802.11n 40 MHz Low channel, Chain J2

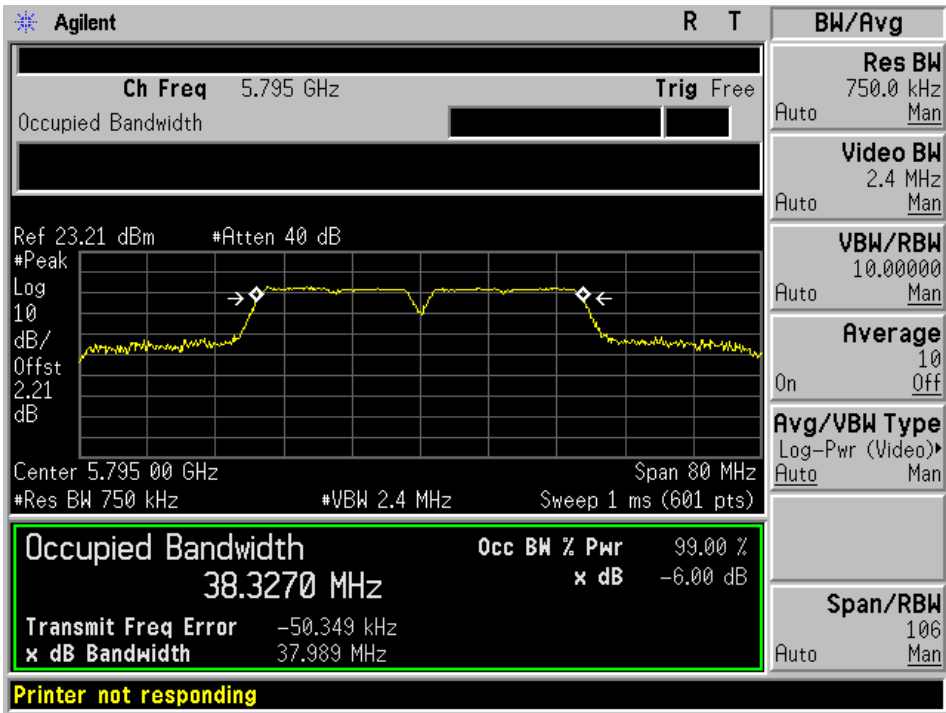


802.11n 40 MHz Low channel, Chain J3

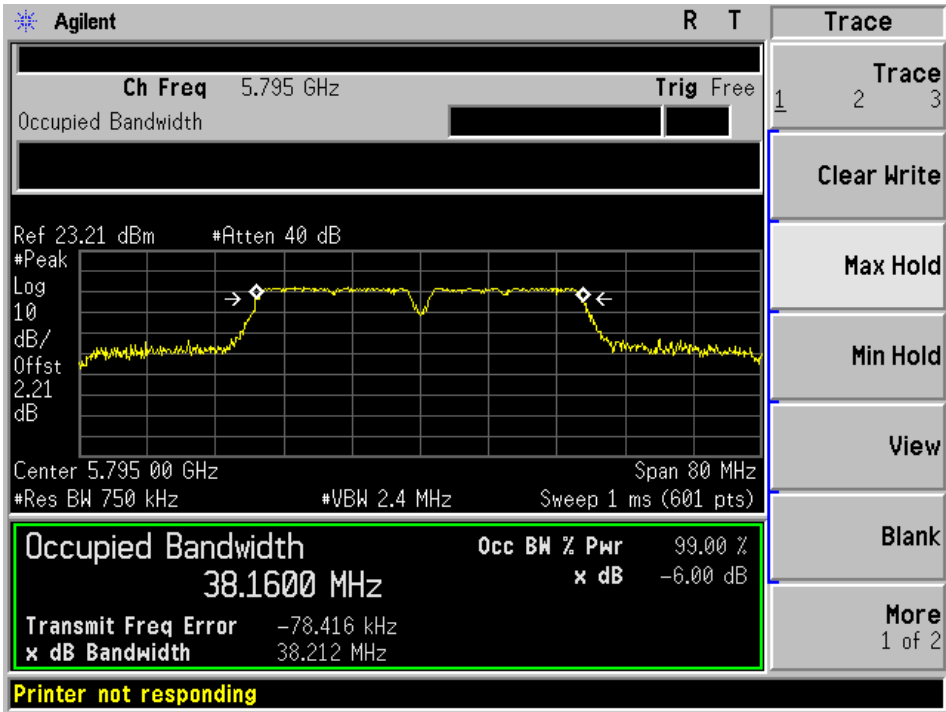


Chain J4 is not active during test

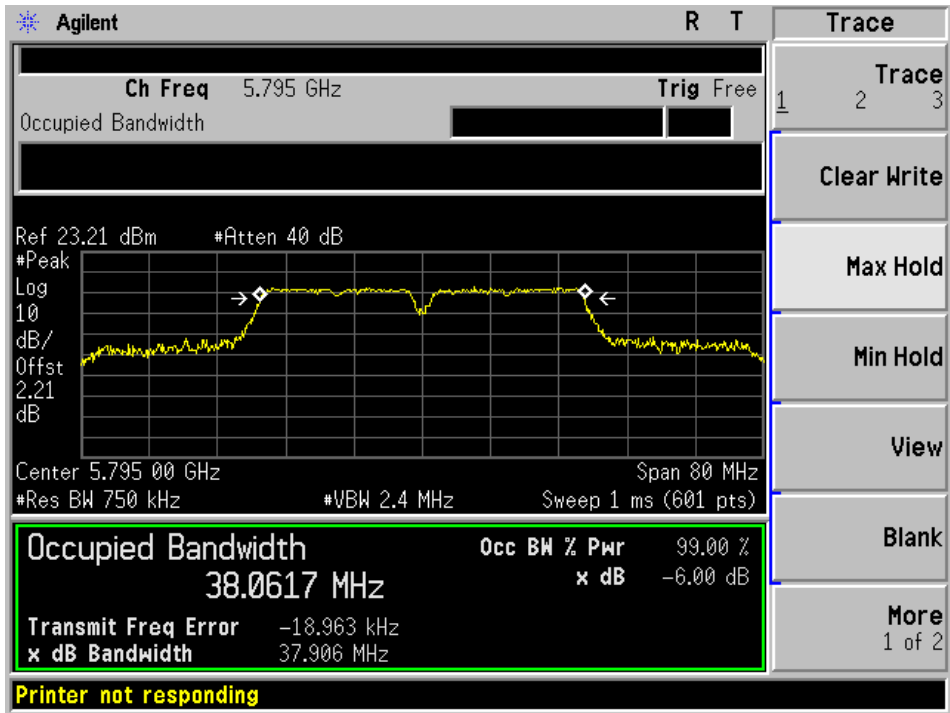
802.11n 40 MHz High channel, Chain J1



802.11n 40 MHz High channel, Chain J2



802.11n 40 MHz High channel, Chain J3



Chain J4 is not active during test

10 FCC §15.247(b) - Peak Output Power Measurement

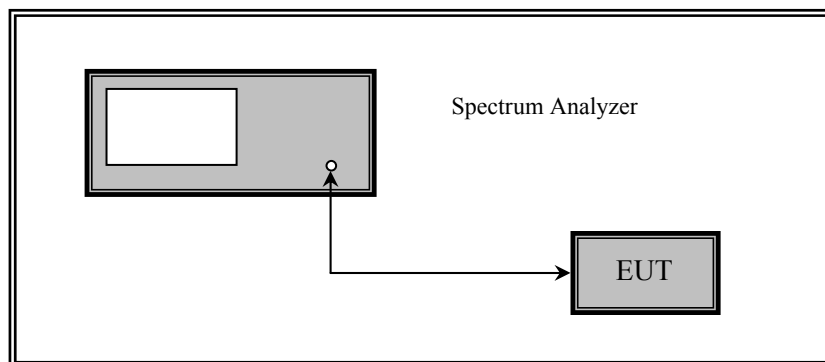
10.1 Applicable Standard

According to FCC §15.247(b) (3) for systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

10.2 Measurement Procedure

1. This procedure provides an integrated measurement alternative when the maximum available $RBW < EBW$.
2. Set the $RBW = 1$ MHz.
3. Set the $VBW = 3$ MHz.
4. Set the span to a value that is 5-30 % greater than the EBW .
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges (for some analyzers, this may require a manual override to ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.

10.3 Test Set up Block Diagram



10.4 Test Equipment List and Details

Manufacturers	Description	Models	Serial Numbers	Calibration Dates
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.

10.5 Test Environmental Conditions

Temperature:	19~24 °C
Relative Humidity:	38~48 %
ATM Pressure:	101.2-102 kPa

The testing was performed by Wei Sun on 2012-05-03 in RF site.

10.6 Test Results

2.4 GHz Band

802.11b mode

Channel	Frequency (MHz)	TX Chain J1 Power (dBm)	TX Chain J2 Power (dBm)	TX Chain J3 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
Low	2412	17.4	17.23	17.37	22.11	30	7.81	20
Middle	2437	19.3	19.09	19.01	23.9	30	6.1	22
High	2462	18.13	17.16	17.7	22.45	30	7.55	21

802.11g mode

Channel	Frequency (MHz)	TX Chain J1 Power (dBm)	TX Chain J2 Power (dBm)	TX Chain J3 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
Low	2412	14.88	15.08	15.1	19.79	30	10.21	18
Middle	2437	18.74	18.79	18.84	23.56	30	6.44	22
High	2462	17.7	17.38	17.54	22.31	30	7.69	21

802.11n 20 MHz mode

Channel	Frequency (MHz)	TX Chain J1 Power (dBm)	TX Chain J2 Power (dBm)	TX Chain J3 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
Low	2412	14.19	14.24	14.57	19.11	30	10.89	17
Middle	2437	19.1	18.99	19.17	23.86	30	6.14	22
High	2462	15.88	15.6	15.76	20.52	30	9.48	19

802.11n 40 MHz mode

Channel	Frequency (MHz)	TX Chain J1 Power (dBm)	TX Chain J2 Power (dBm)	TX Chain J3 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
Low	2422	12.99	12.87	13.12	17.77	30	12.23	16
Middle	2437	18.5	18.34	18.75	23.3	30	6.7	22
High	2452	13.73	13.38	13.68	18.37	30	11.63	17

5.8 GHz Band

802.11a mode

Channel	Frequency (MHz)	TX Chain J1 Power (dBm)	TX Chain J2 Power (dBm)	TX Chain J3 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
Low	5745	15.75	16.11	15.93	20.70	30	9.30	23
Middle	5785	15.66	16.09	16.17	20.75	30	9.25	23
High	5825	15.01	15.32	15.58	20.08	30	9.92	23

802.11n 20 MHz mode

Channel	Frequency (MHz)	TX Chain J1 Power (dBm)	TX Chain J2 Power (dBm)	TX Chain J3 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
Low	5745	16.09	16.38	16.43	21.07	30	8.93	23
Middle	5785	16.17	16.30	16.22	21.00	30	9.00	23
High	5825	15.69	15.99	15.84	20.61	30	9.39	23

802.11n 40 MHz mode

Channel	Frequency (MHz)	TX Chain J1 Power (dBm)	TX Chain J2 Power (dBm)	TX Chain J3 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
Low	5755	15.44	15.72	15.93	20.47	30	9.53	23
High	5795	15.89	15.79	15.91	20.63	30	9.37	23

11 FCC §15.247(d) - 100 kHz Bandwidth of Band Edges

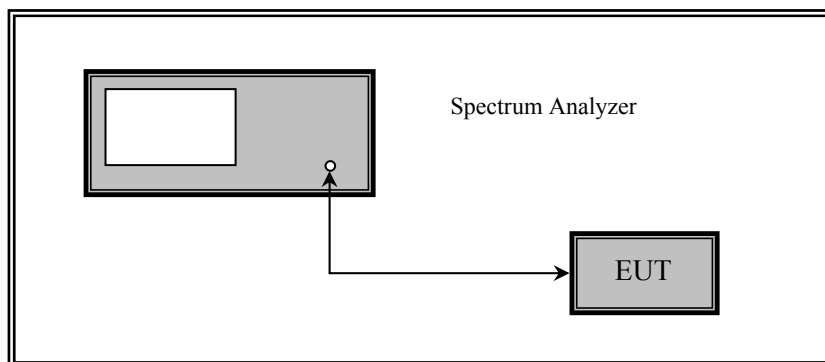
11.1 Applicable Standard

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

11.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

11.3 Test Setup Block Diagram



11.4 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.

11.5 Test Environmental Conditions

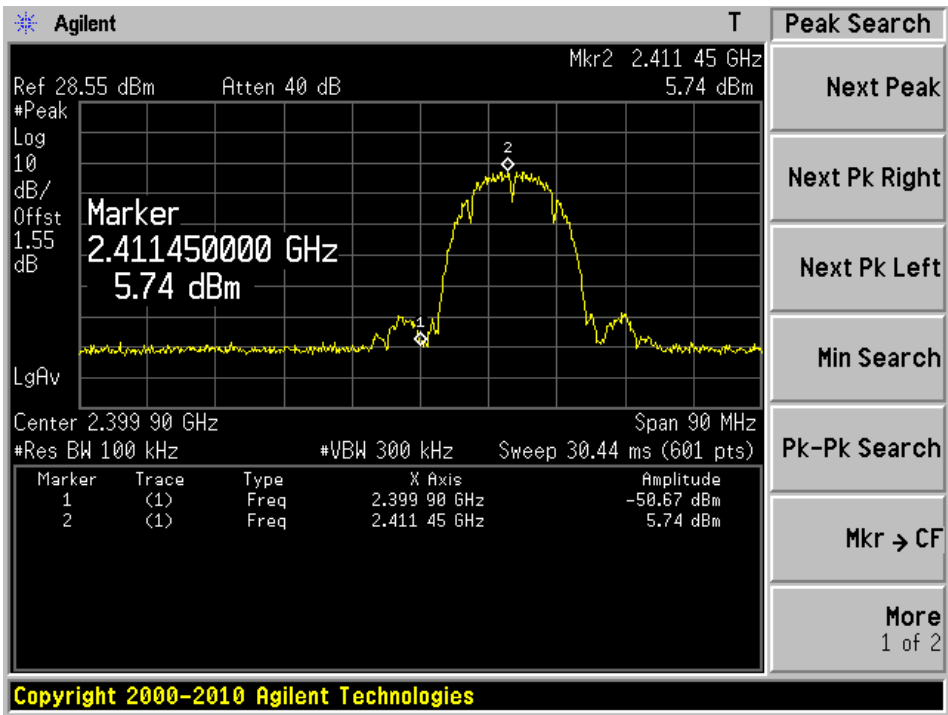
Temperature:	19~24 °C
Relative Humidity:	38~48 %
ATM Pressure:	101.2-102 kPa

The testing was performed by Wei Sun on 2012-05-05 in RF site.

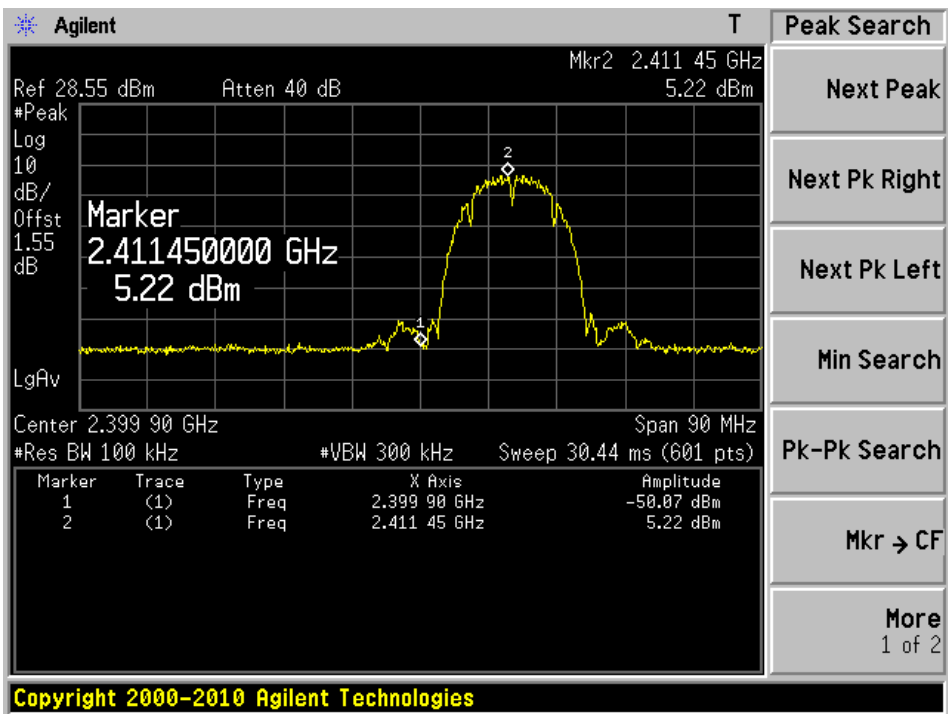
11.6 Test Results

2.4 GHz Band

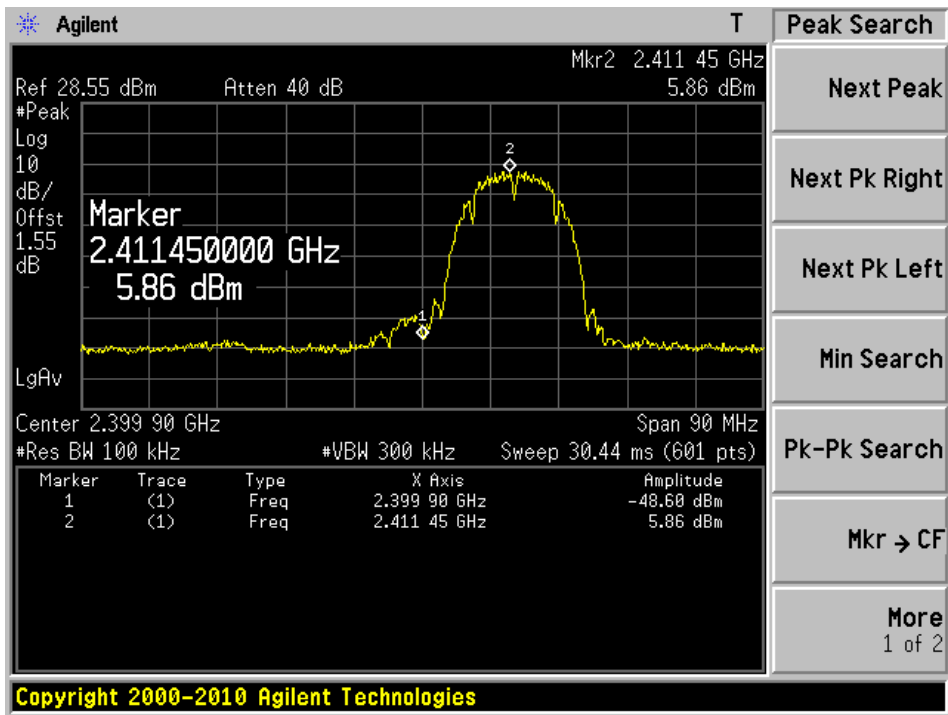
802.11b mode Low channel, Chain J1



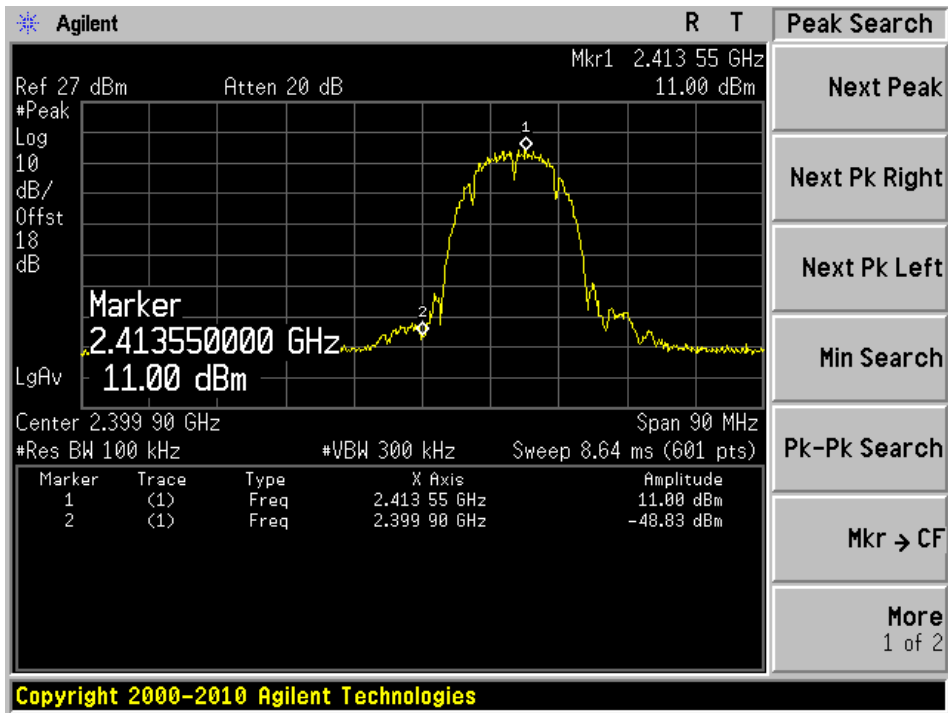
802.11b mode Low channel, Chain J2



802.11b mode Low channel, Chain J3

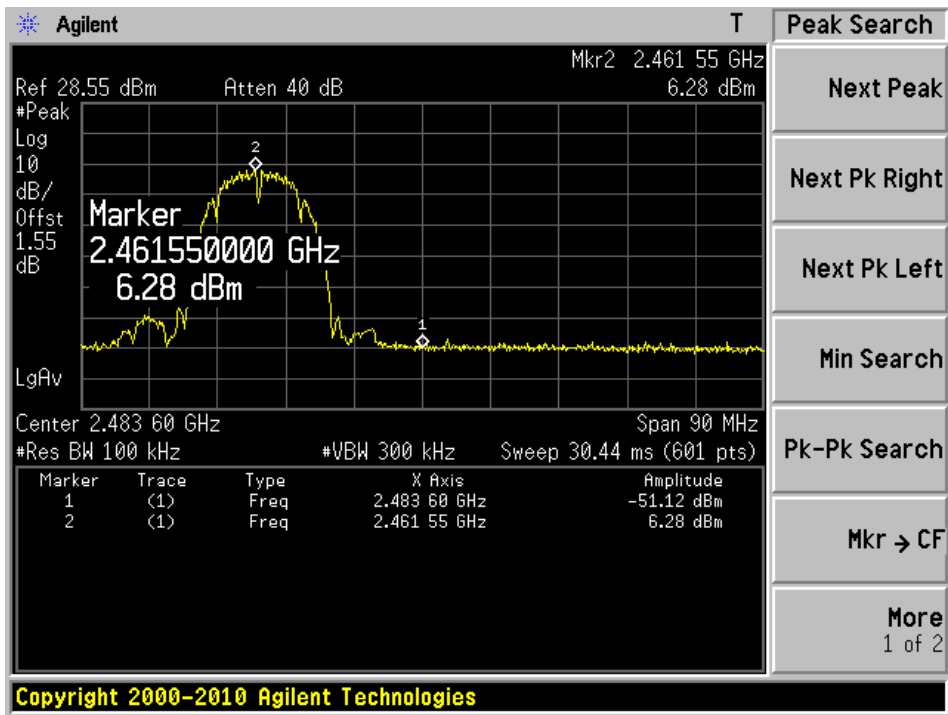


802.11b mode Low channel, Chain J1+J2+3

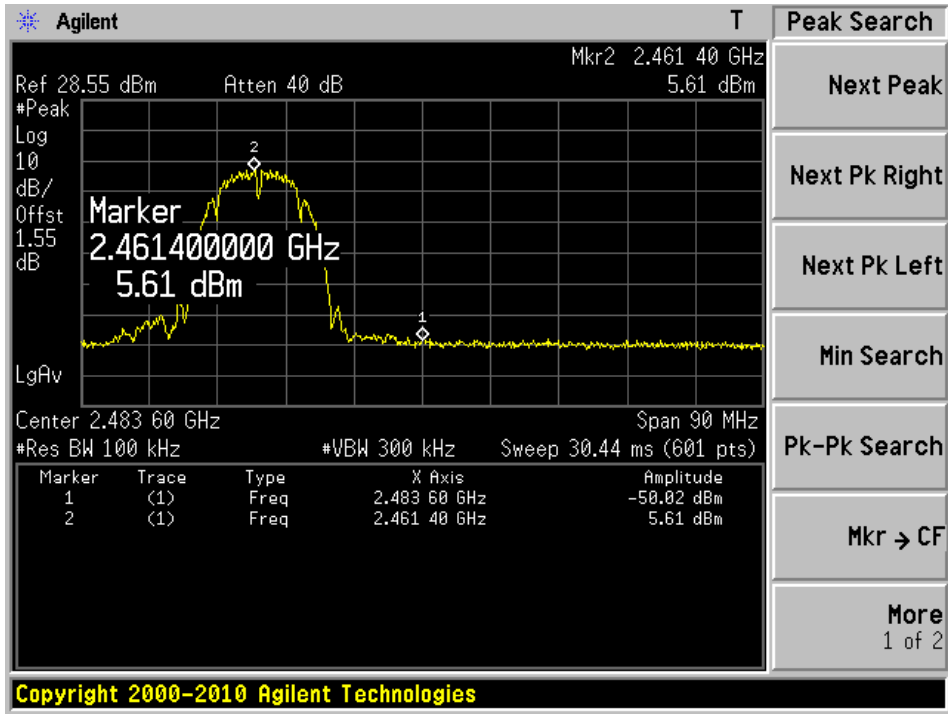


Chain J4 is not active during test

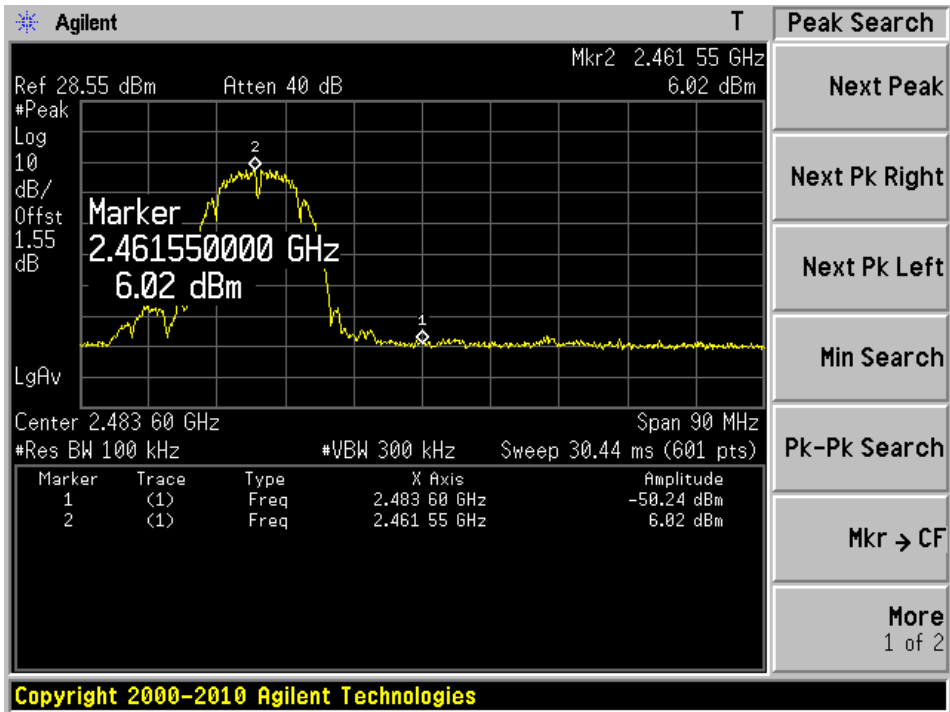
802.11b mode High channel, Chain J1



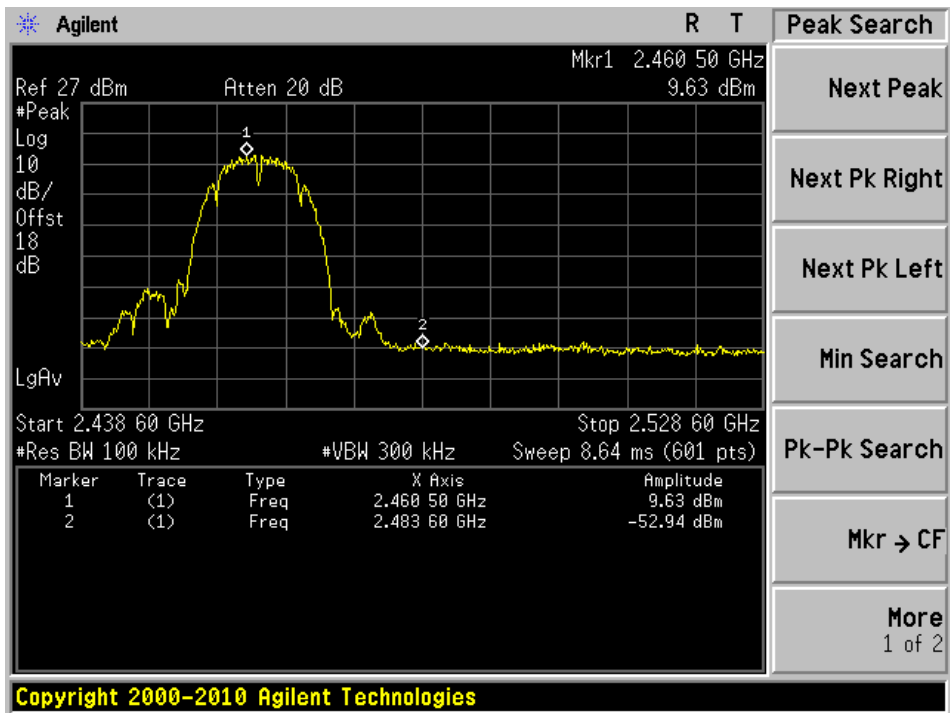
802.11b mode High channel, Chain J2



802.11b mode High channel, Chain J3

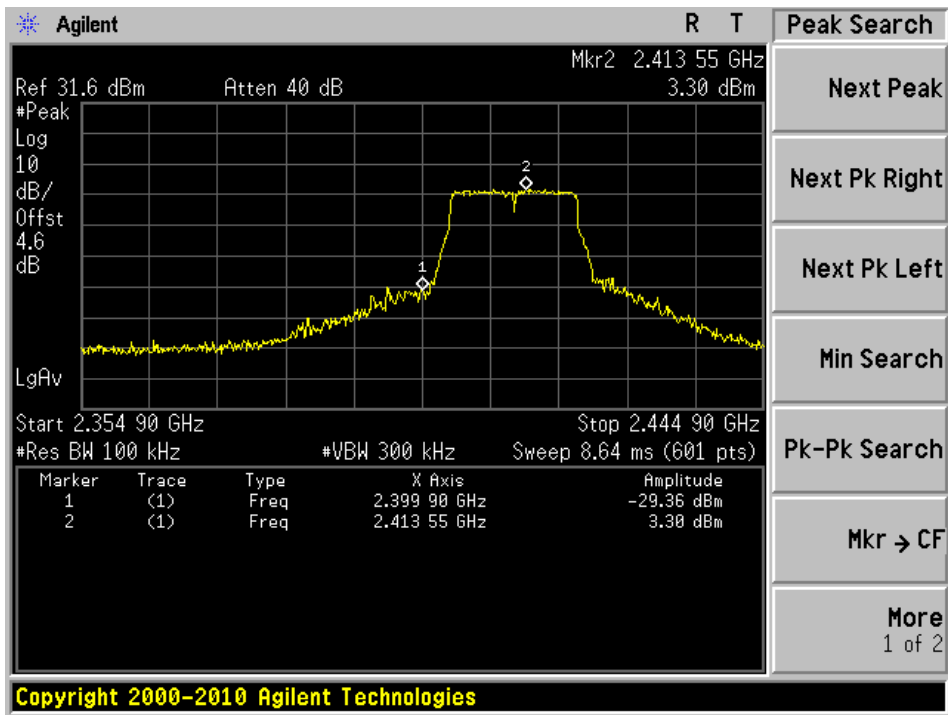


802.11b mode High channel, Chain J1+J2+J3

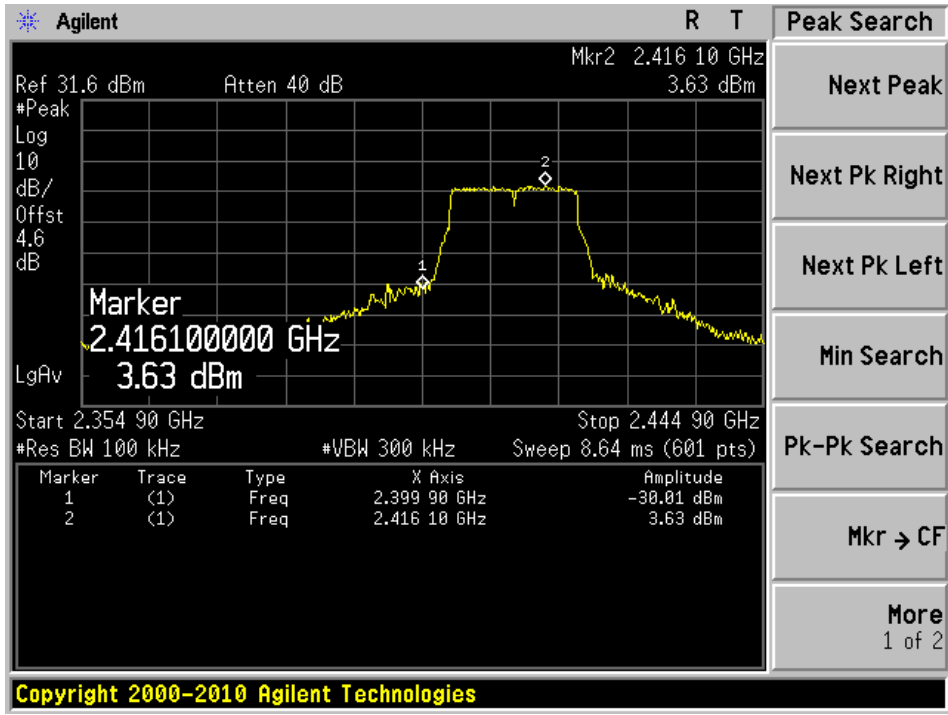


Chain J4 is not active during test

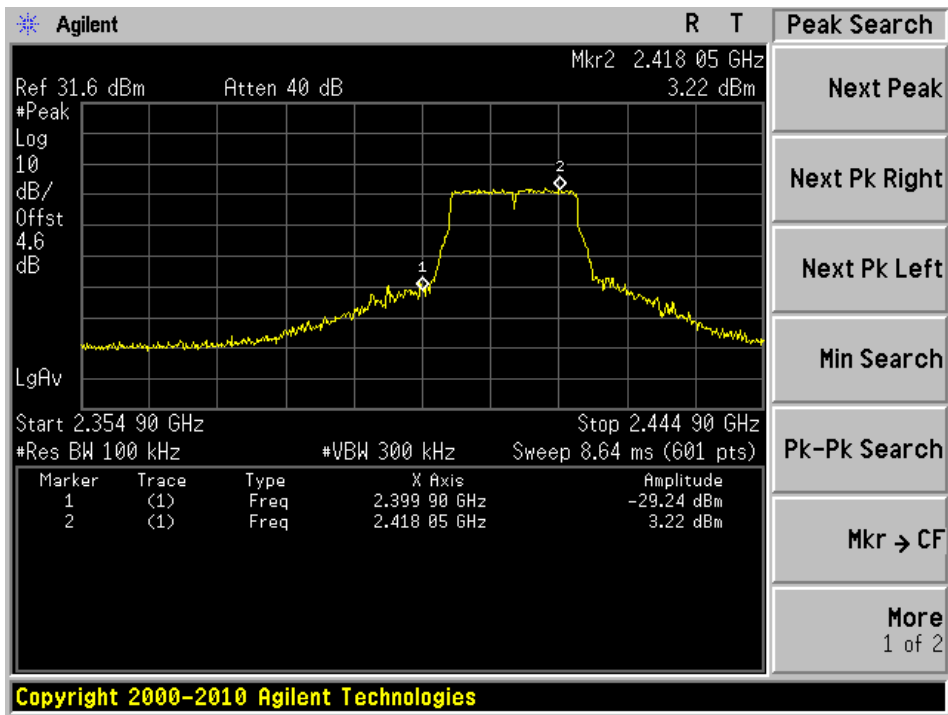
802.11g mode Low channel, Chain J1



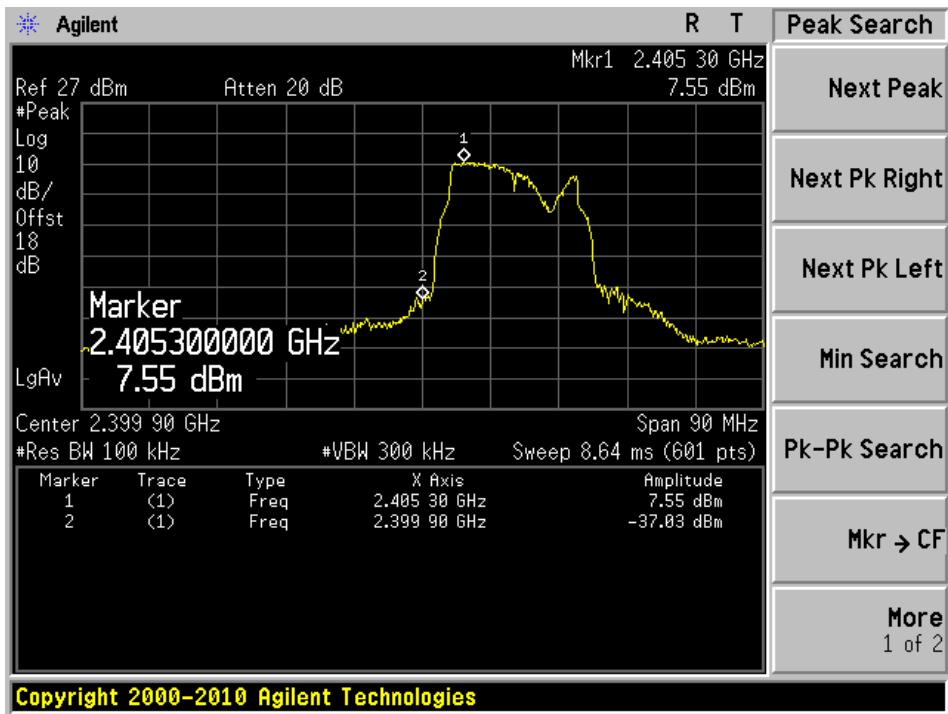
802.11g mode Low channel, Chain J2



802.11g mode Low channel, Chain J3

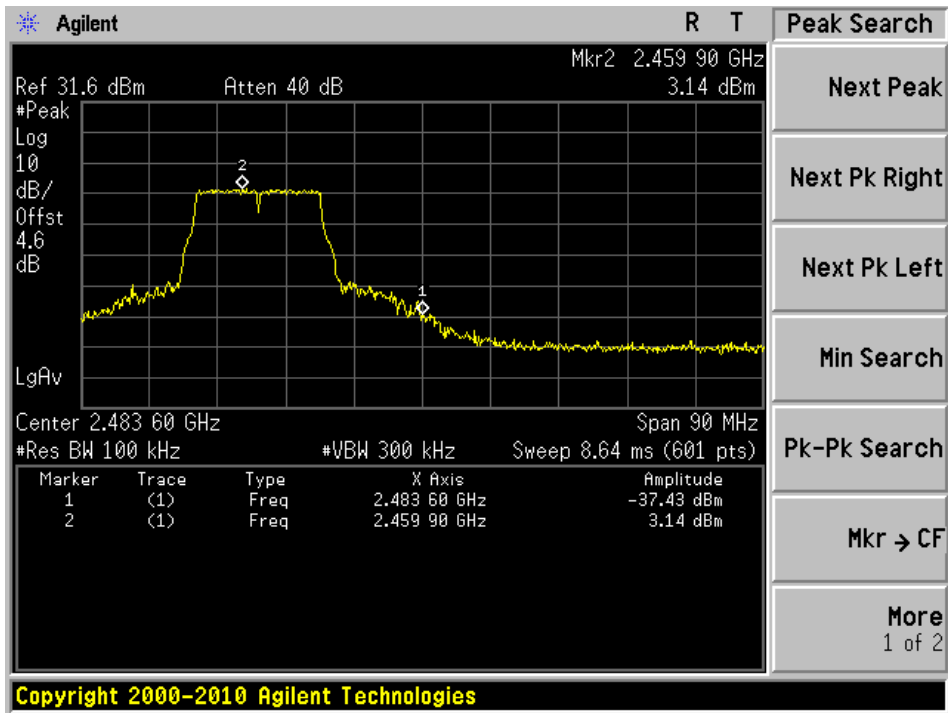


802.11g mode Low channel, Chain J1+J2+J3

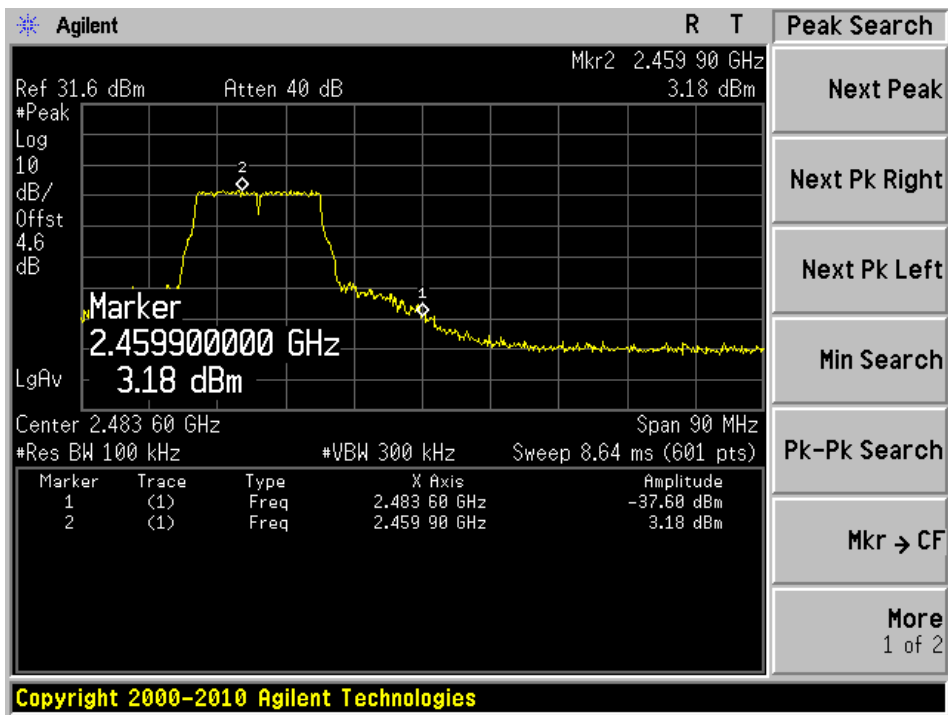


Chain J4 is not active during test

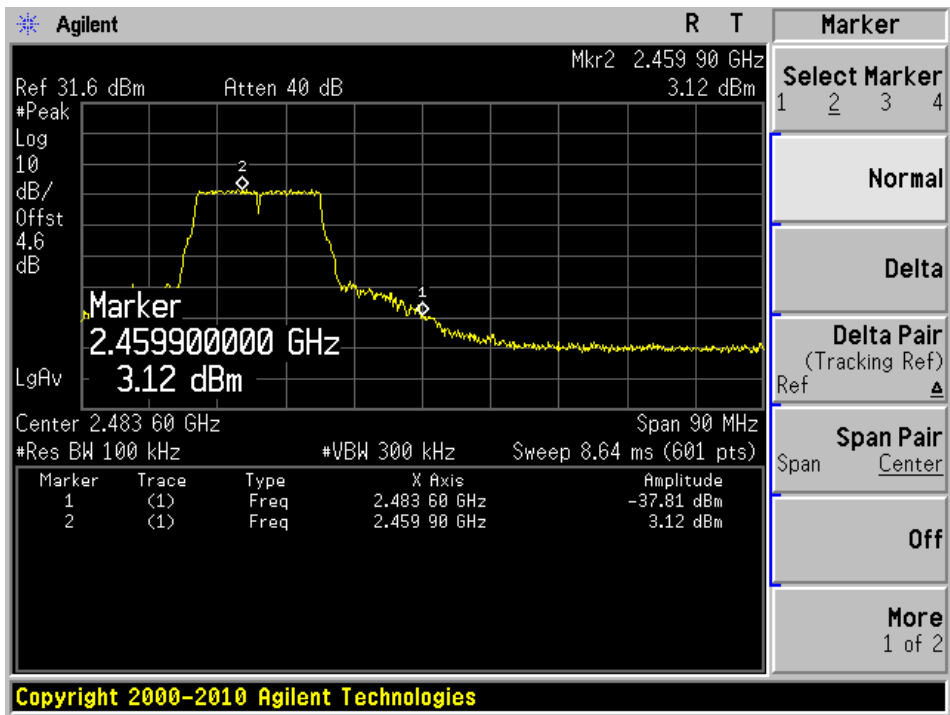
802.11g mode High channel, Chain J1



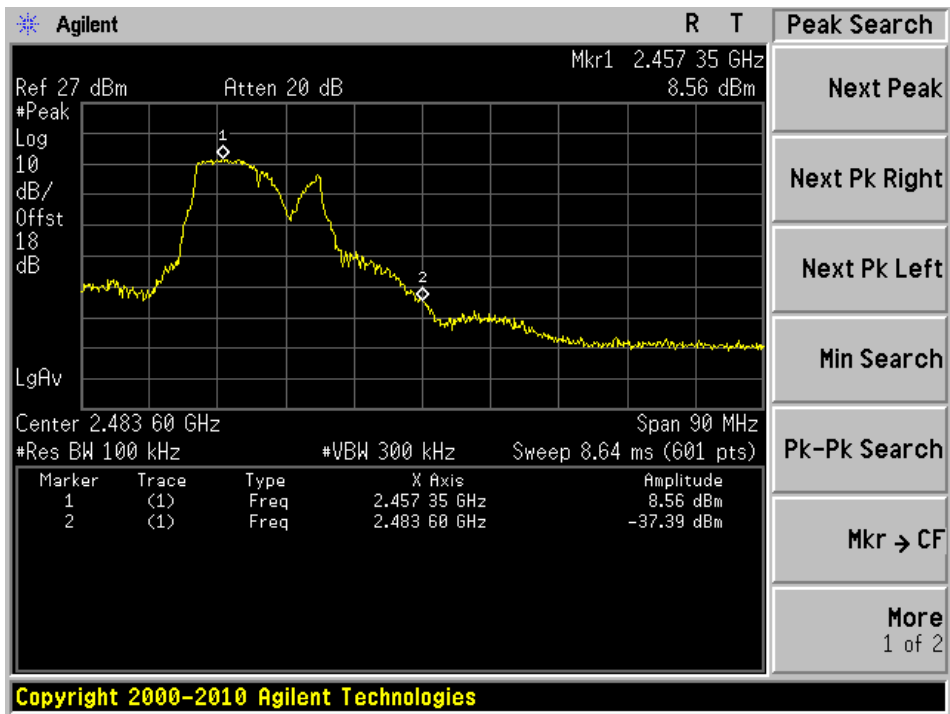
802.11g mode High channel, Chain J2



802.11g mode High channel, Chain J3

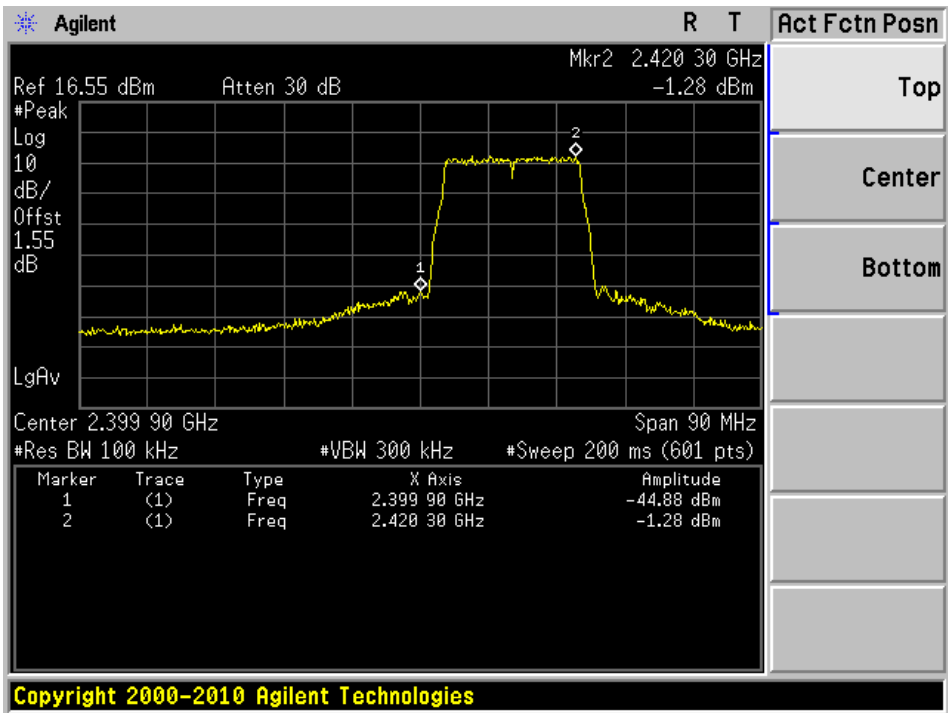


802.11g mode High channel, Chain J1+J2+J3

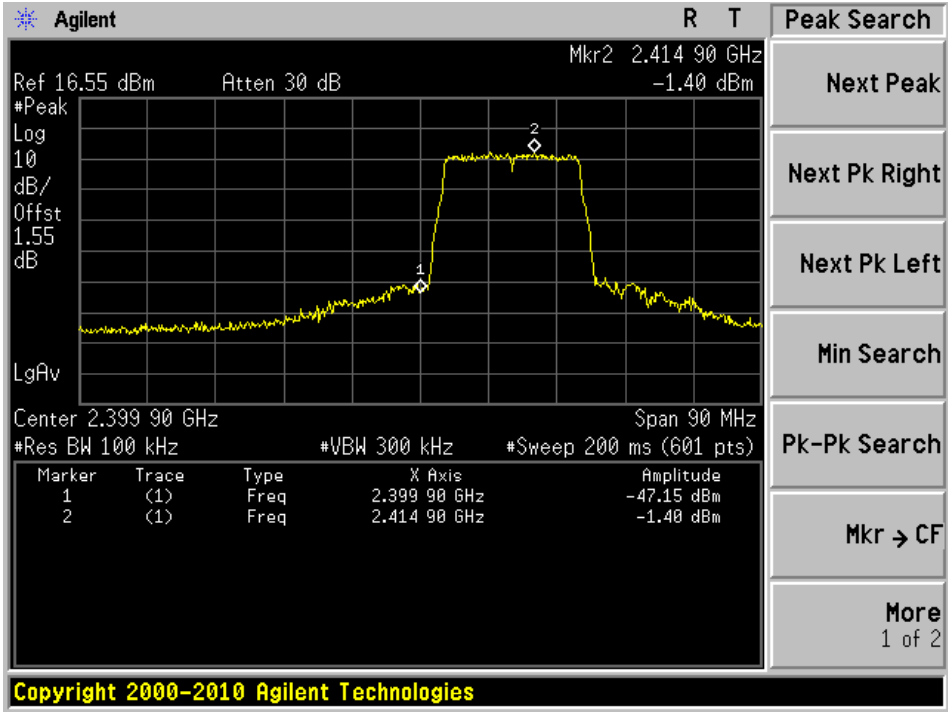


Chain J4 is not active during test

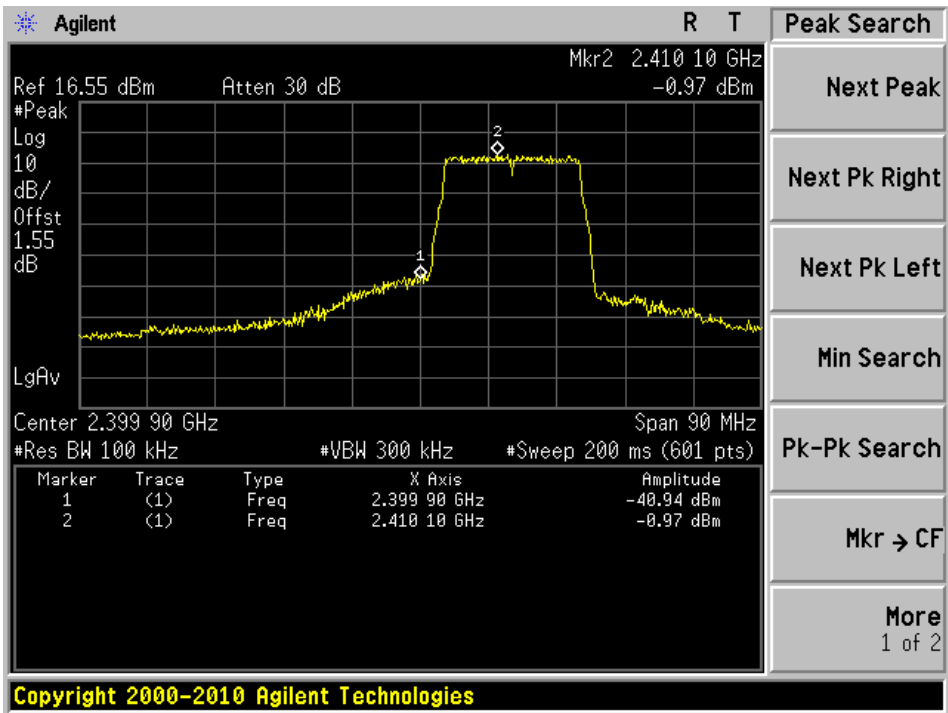
802.11n 20 MHz mode Low channel, Chain J1



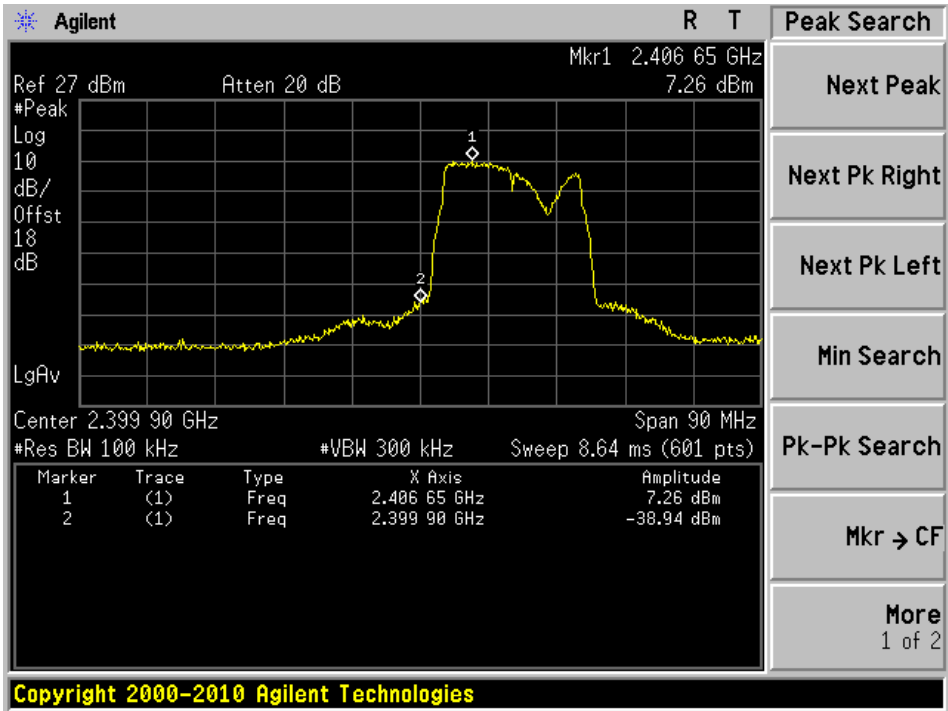
802.11n 20 MHz mode Low channel, Chain J2



802.11n 20 MHz mode Low channel, Chain J3

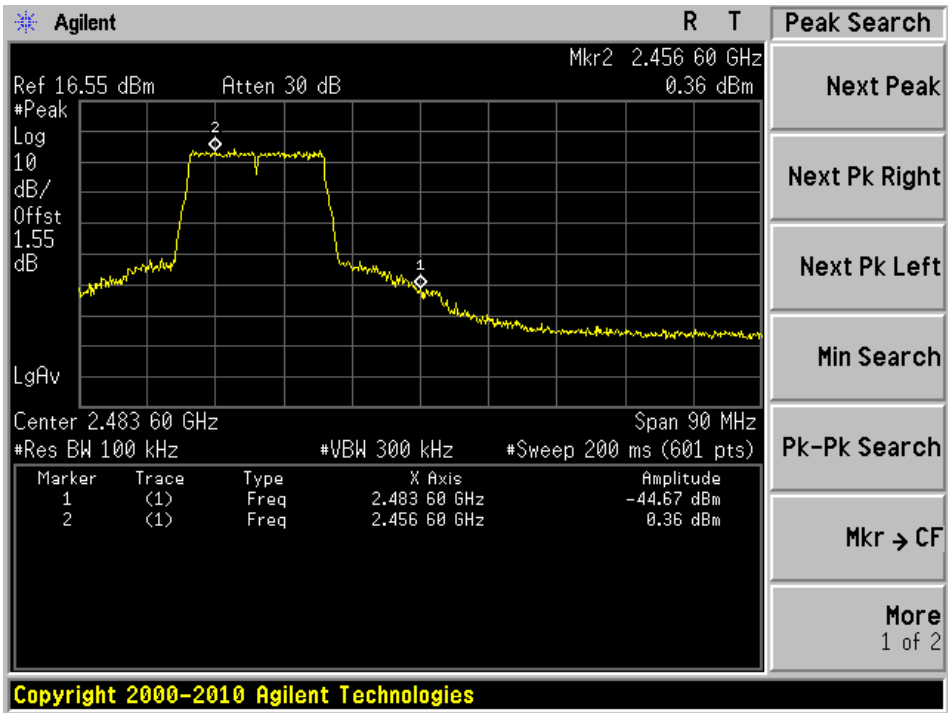


802.11n 20 MHz mode Low channel, Chain J1+J2+J3

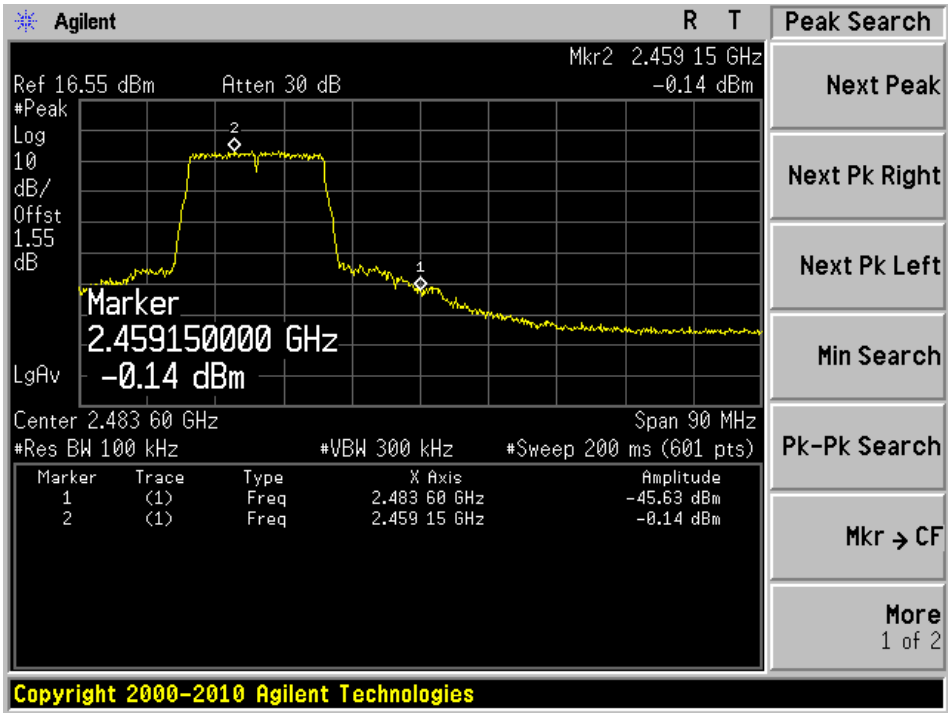


Chain J4 is not active during test

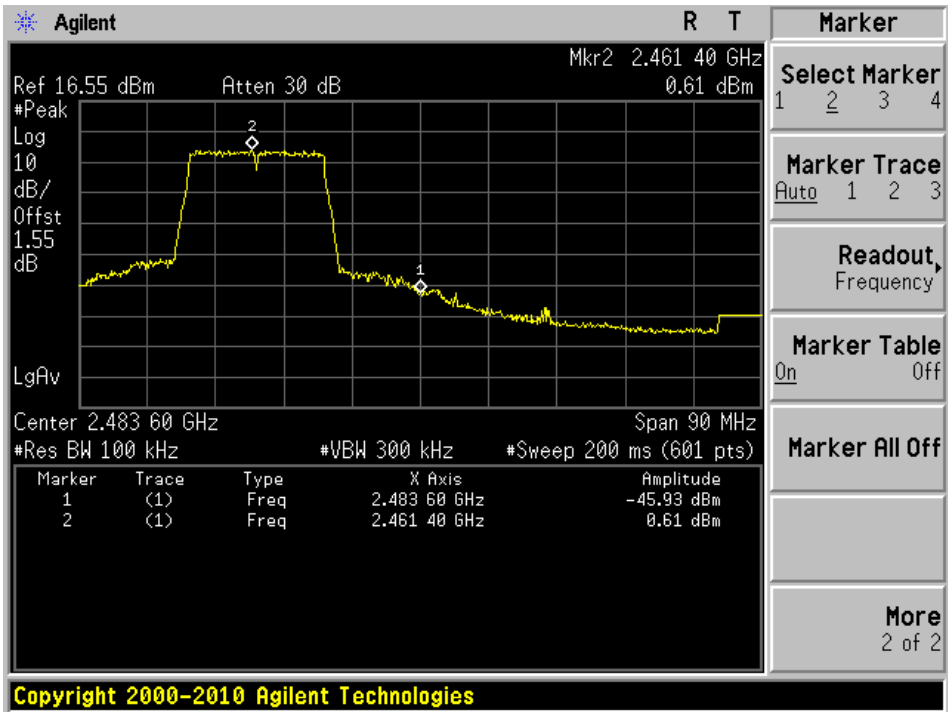
802.11n 20 MHz mode High channel, Chain J1



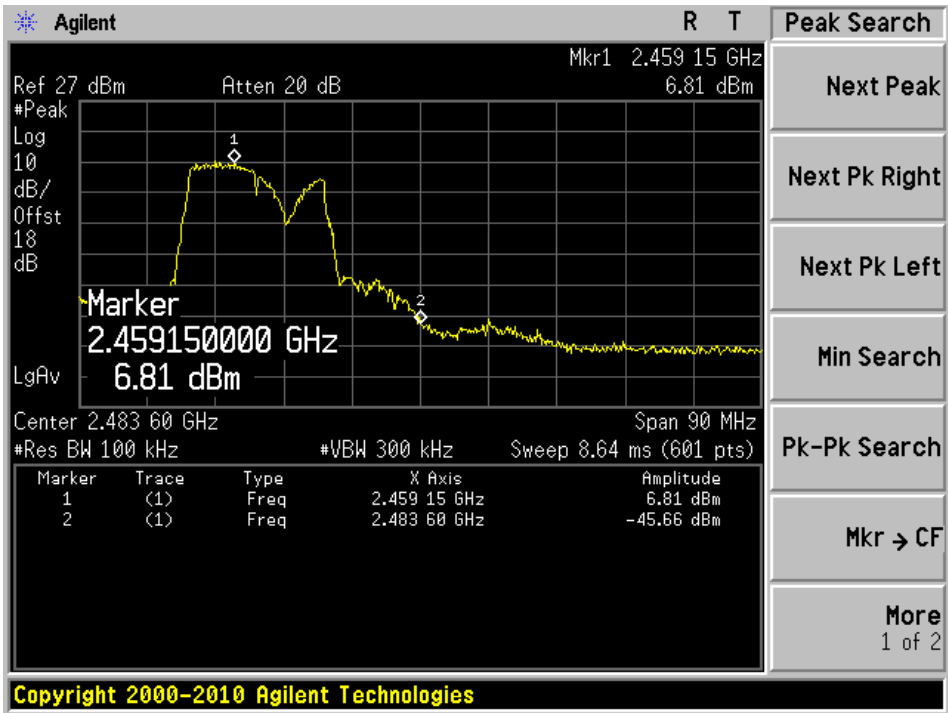
802.11n 20 MHz mode High channel, Chain J2



802.11n 20 MHz mode High channel, Chain J3

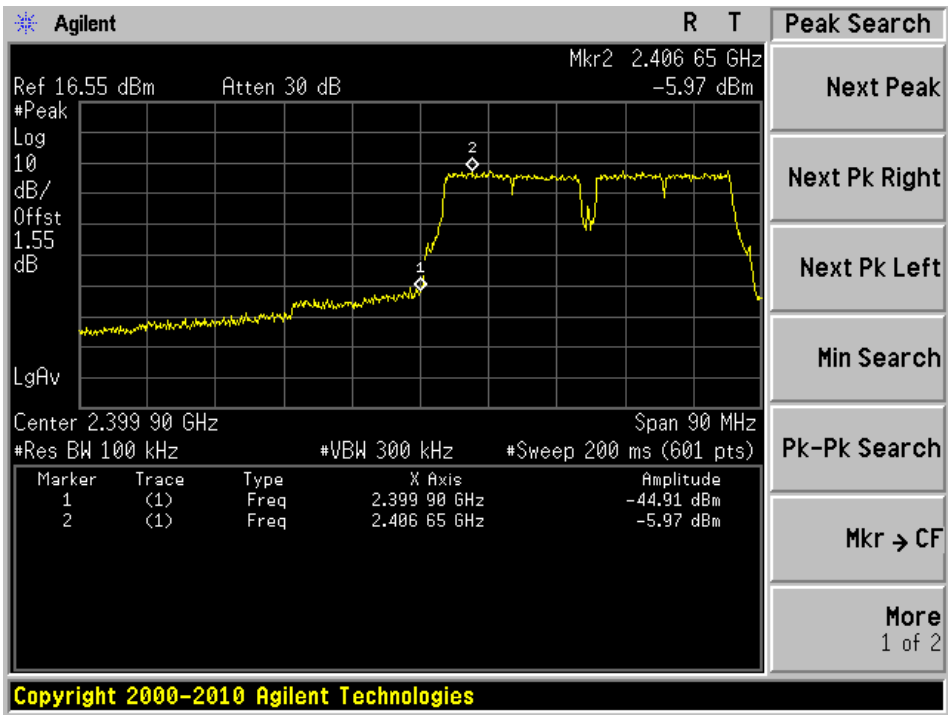


802.11n 20 MHz mode High channel, Chain J1+J2+J3

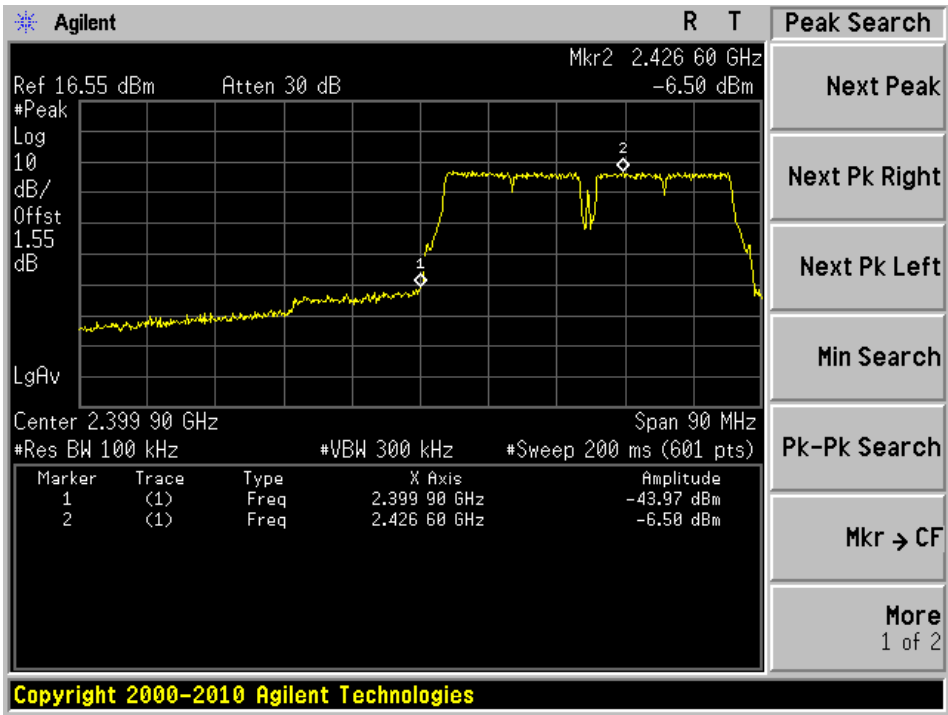


Chain J4 is not active during test

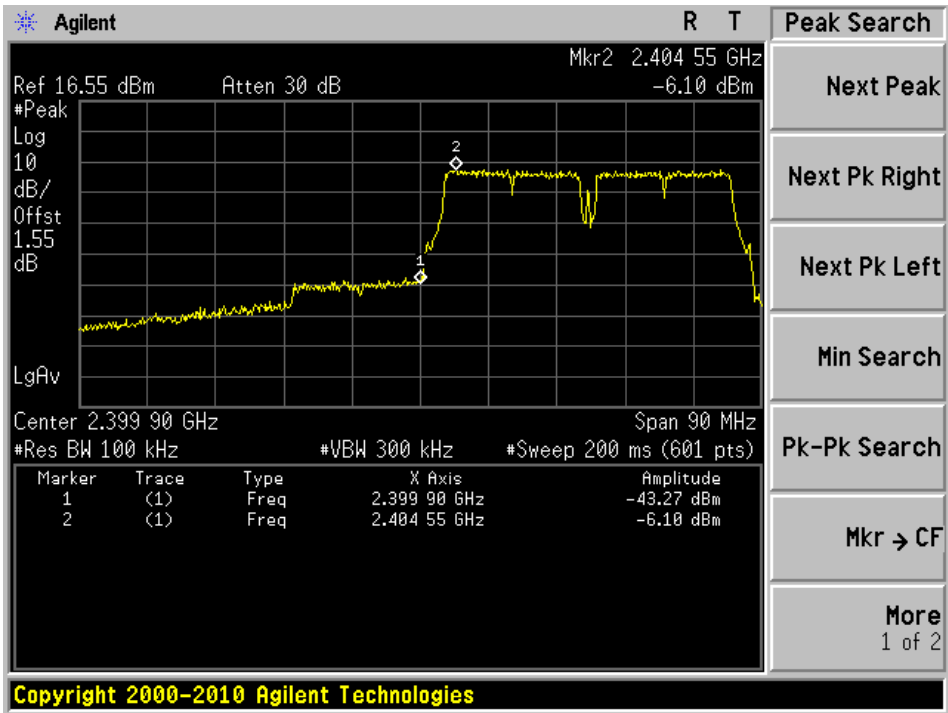
802.11n 40 MHz mode Low channel, Chain J1



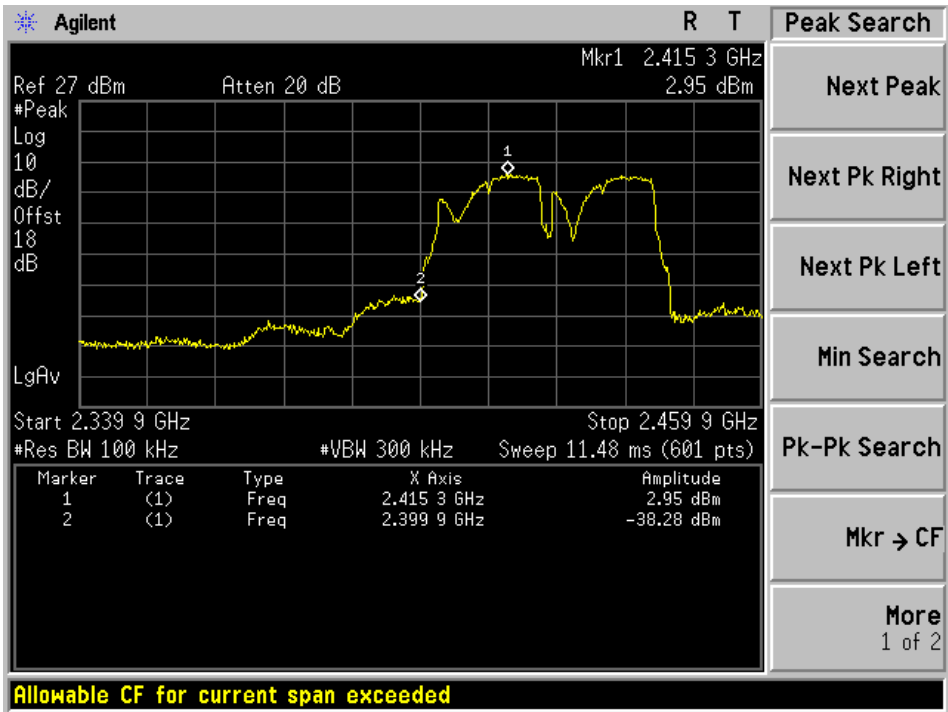
802.11n 40 MHz mode Low channel, Chain J2



802.11n 40 MHz mode Low channel, Chain J3

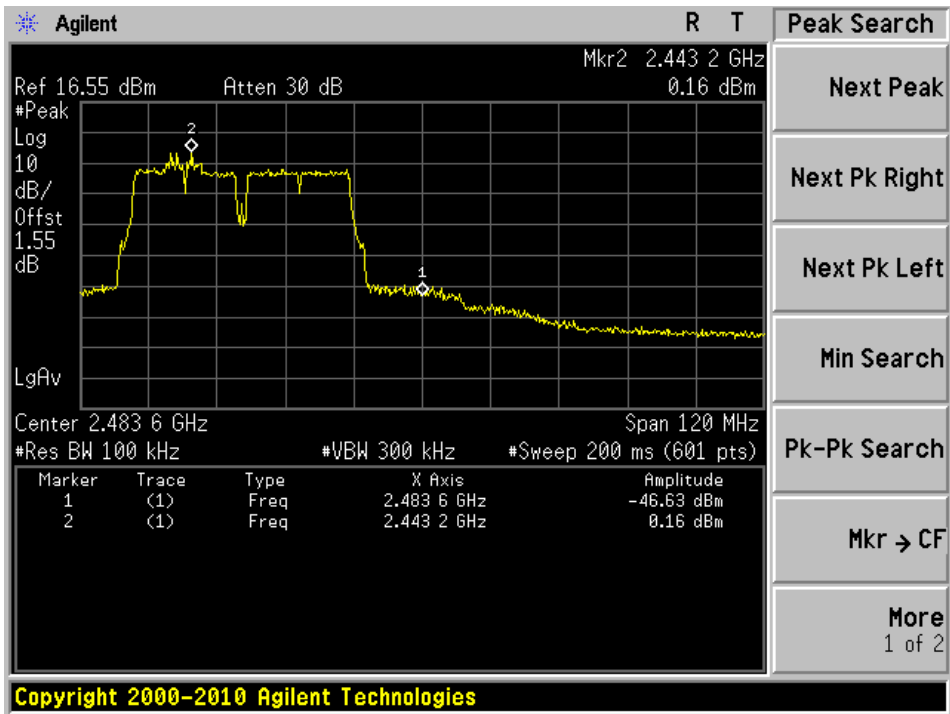


802.11n 40 MHz mode Low channel, Chain J1+J3+J3

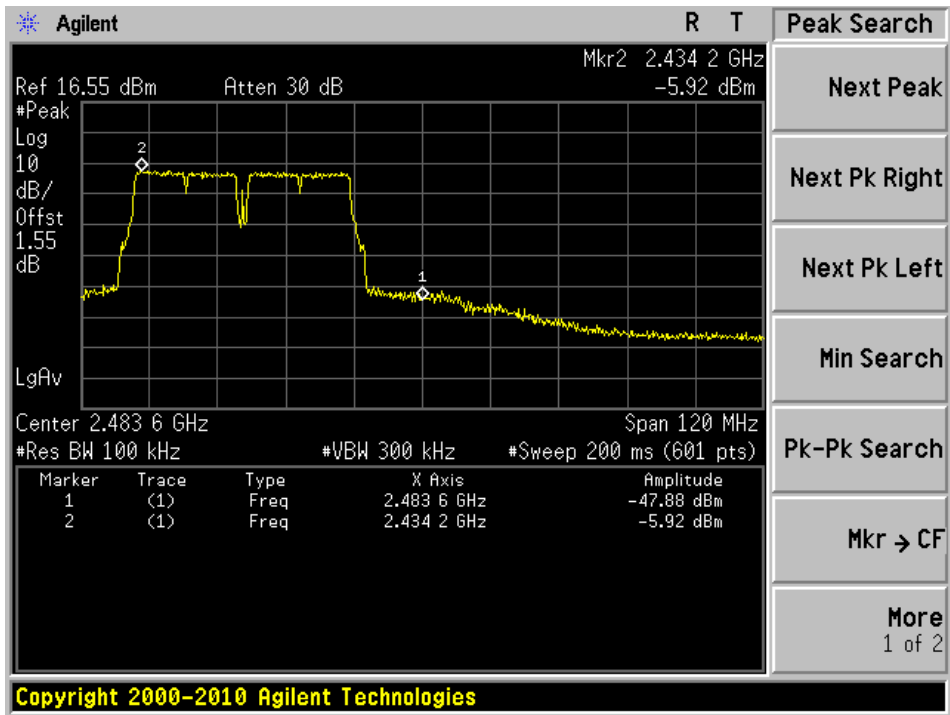


Chain J4 is not active during test

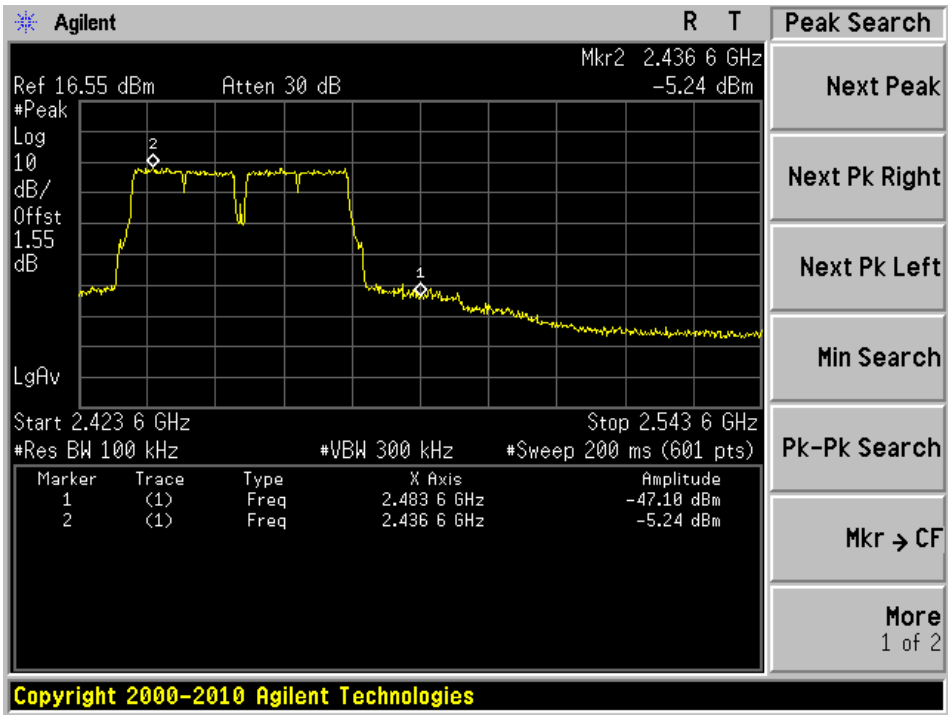
802.11n 40 MHz mode High channel, Chain J1



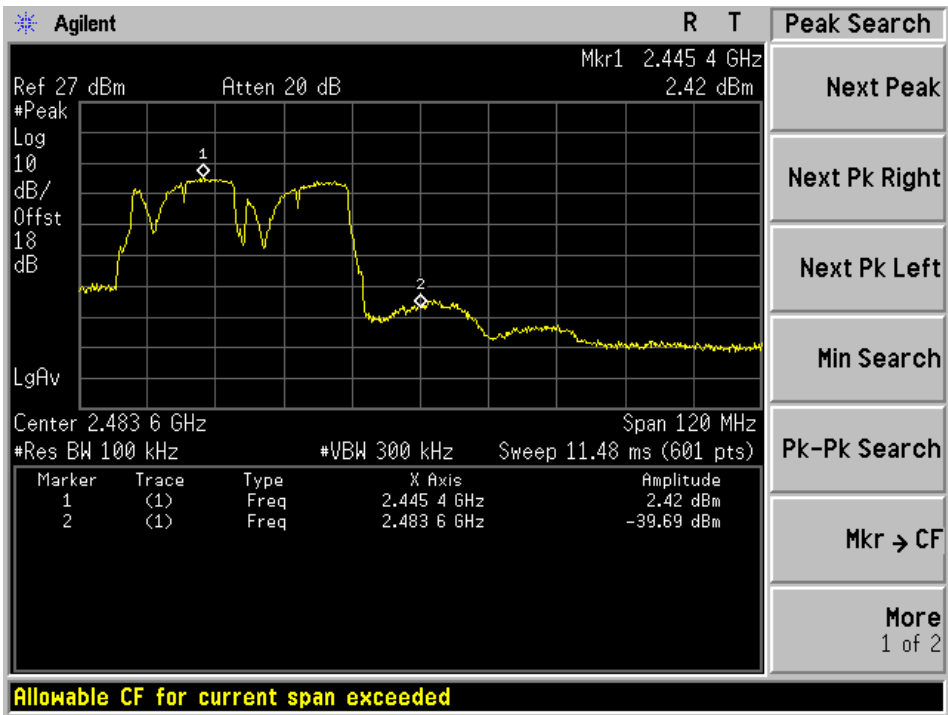
802.11n 40 MHz mode High channel, Chain J2



802.11n 40 MHz mode High channel, Chain J3



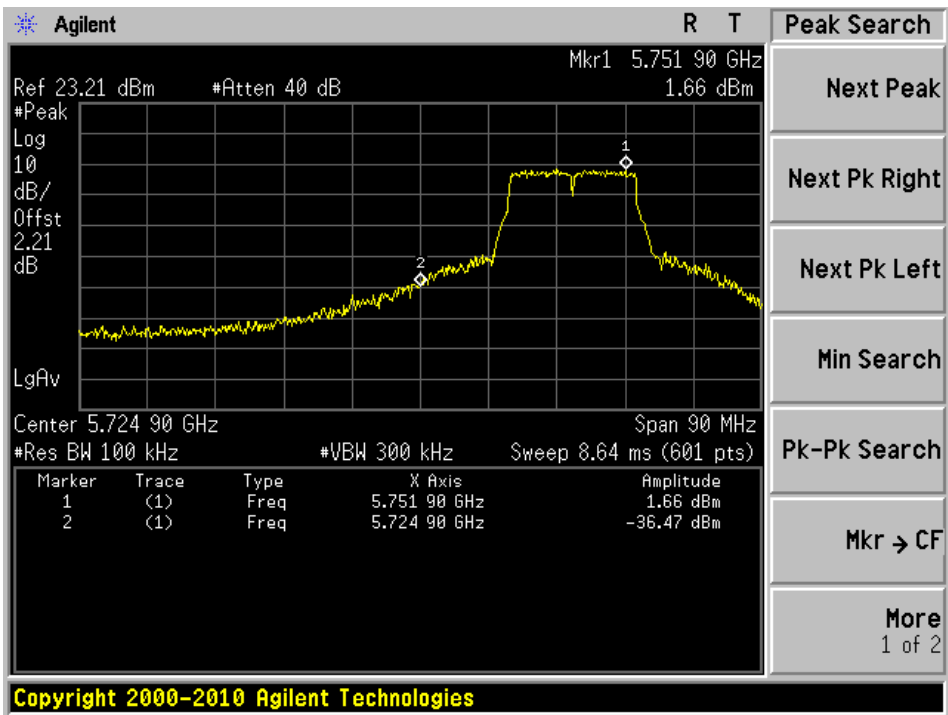
802.11n 40 MHz mode High channel, Chain J1+J2+J3



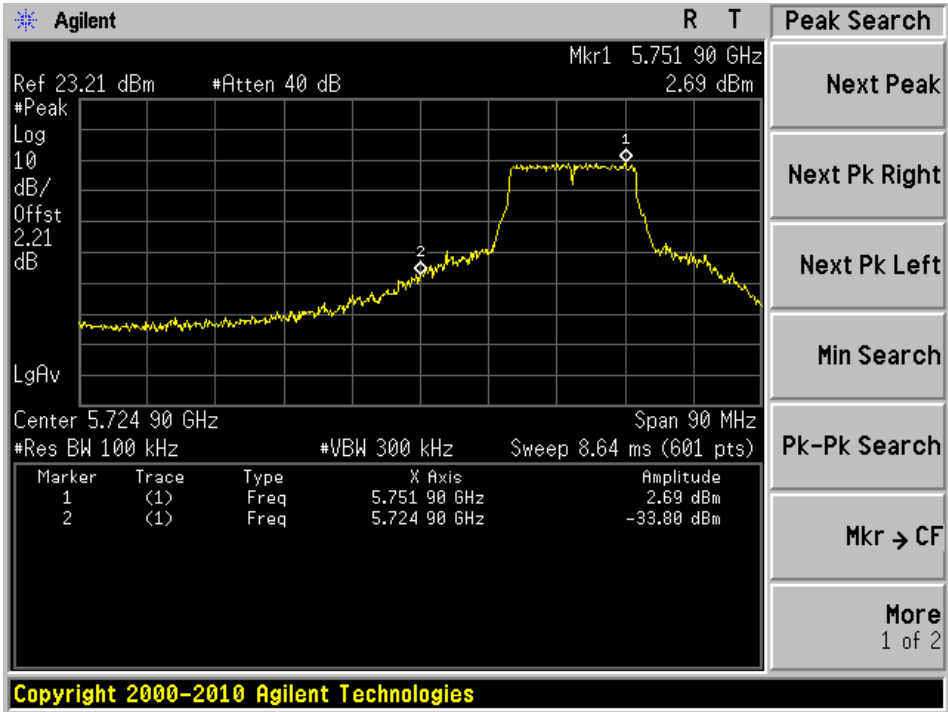
Chain J4 is not active during test

5.8 GHz Band

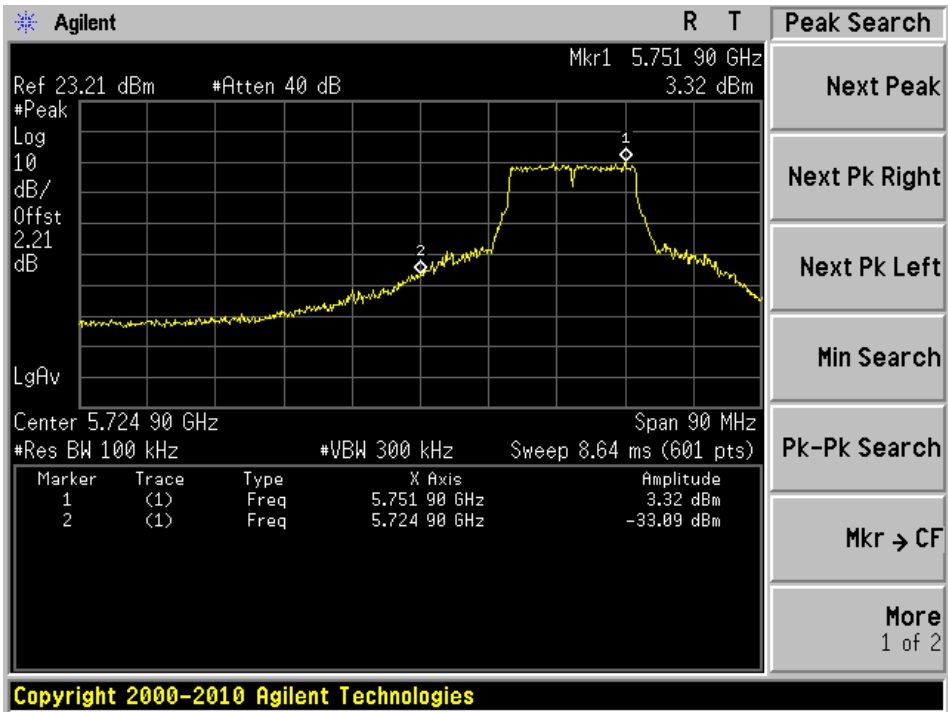
802.11a mode Low channel, Chain J1



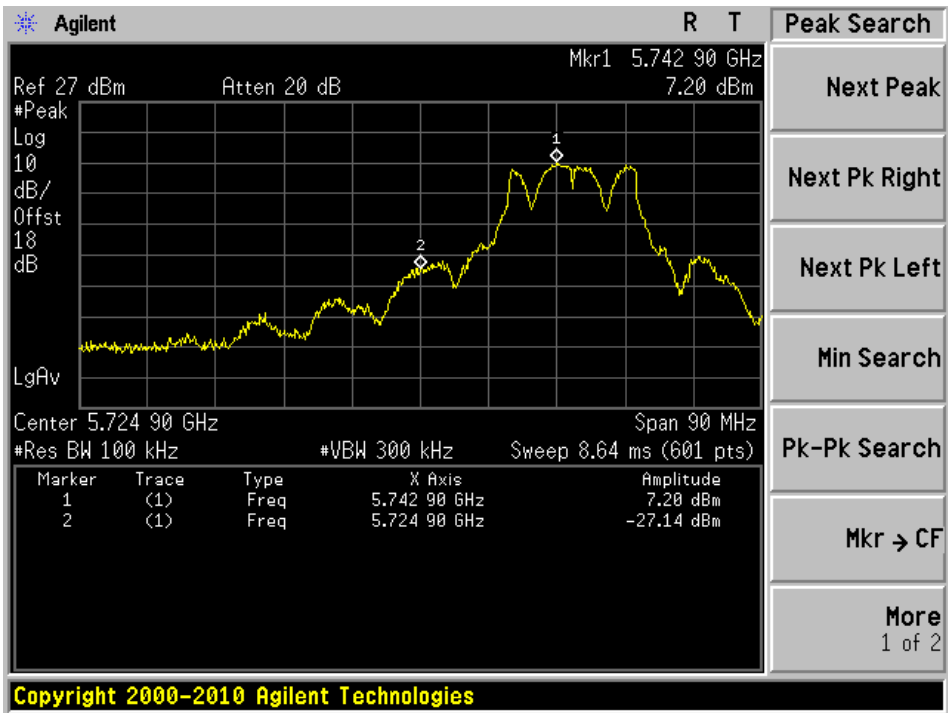
802.11a mode Low channel, Chain J2



802.11a mode Low channel, Chain J3

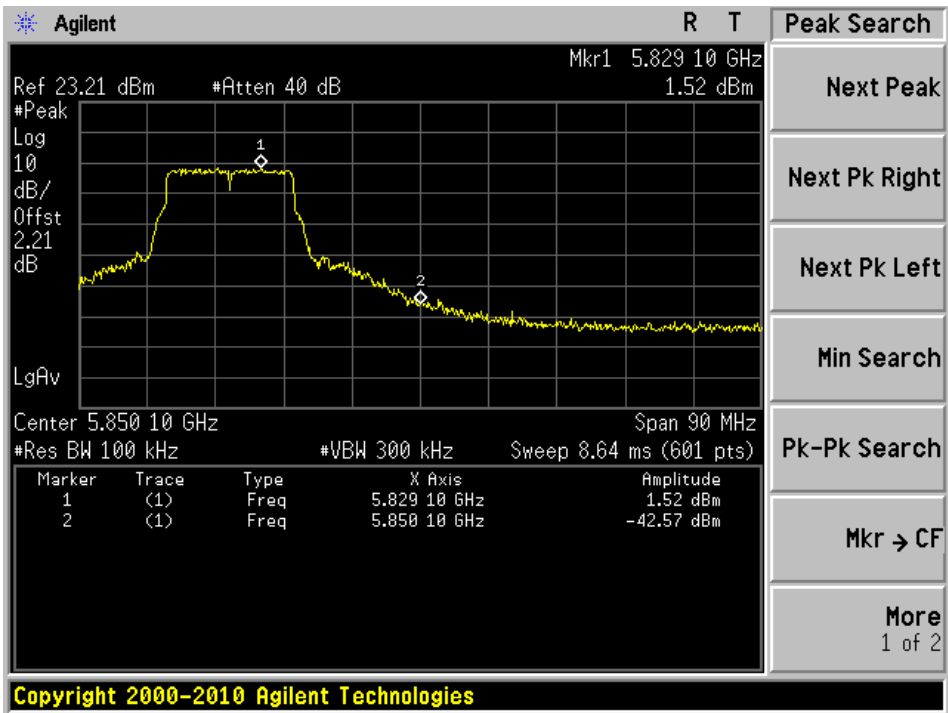


802.11a mode Low channel, Chain J1+J2+J3

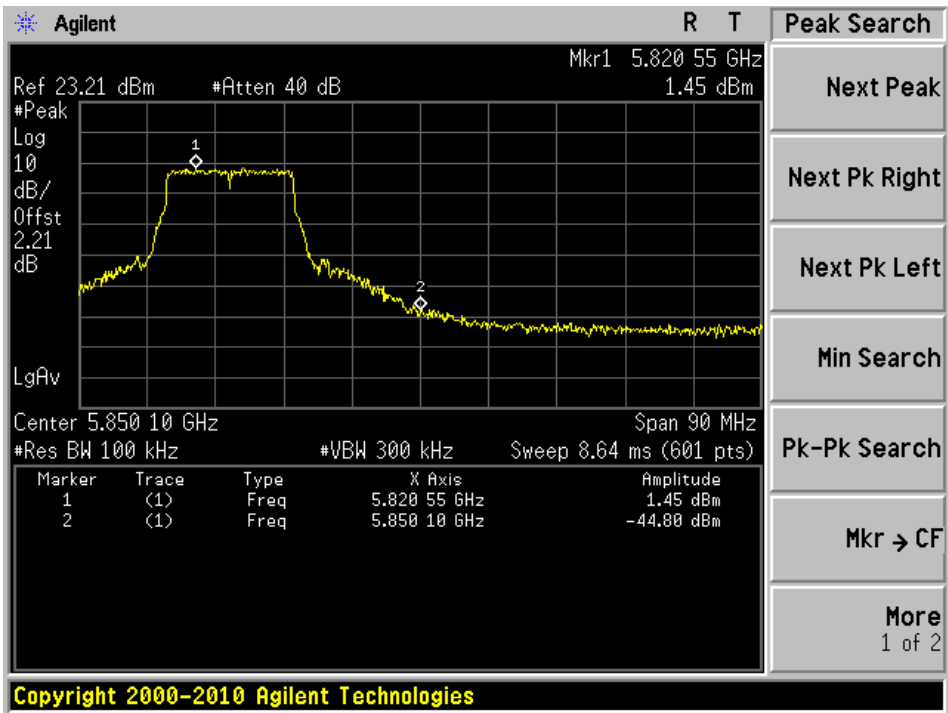


Chain J4 is not active during test

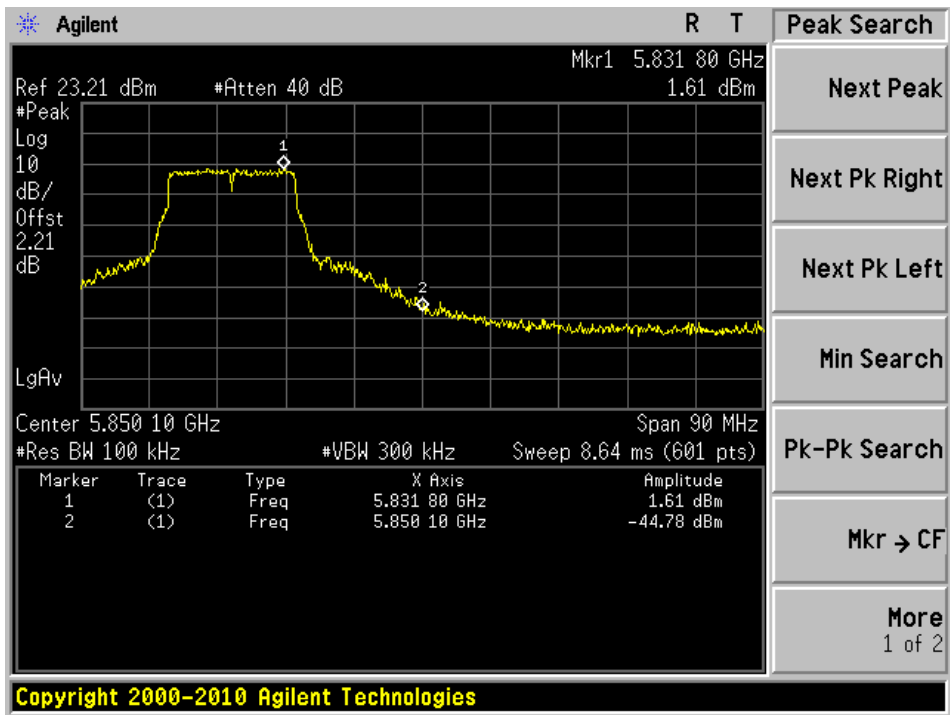
802.11a mode High channel, Chain J1



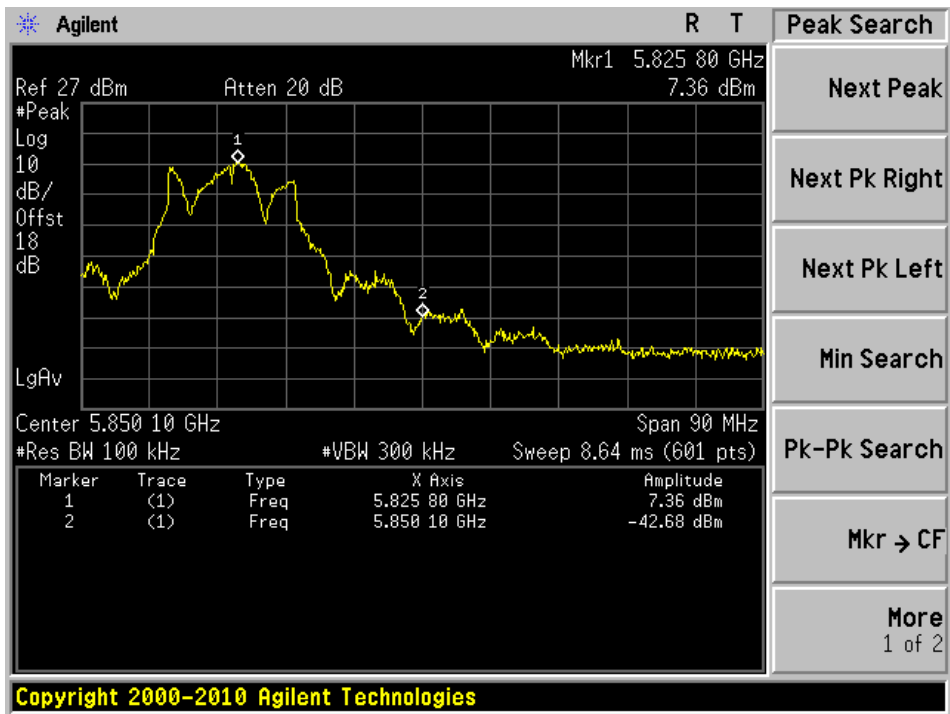
802.11a mode High channel, Chain J2



802.11a mode High channel, Chain J3

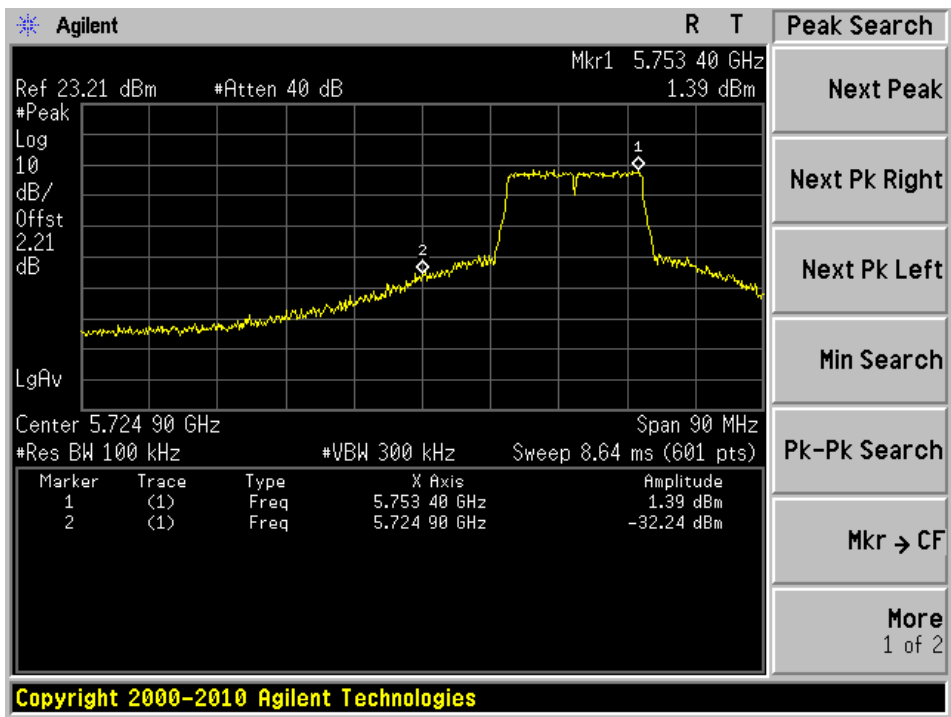


802.11a mode High channel, Chain J1+J2+J3

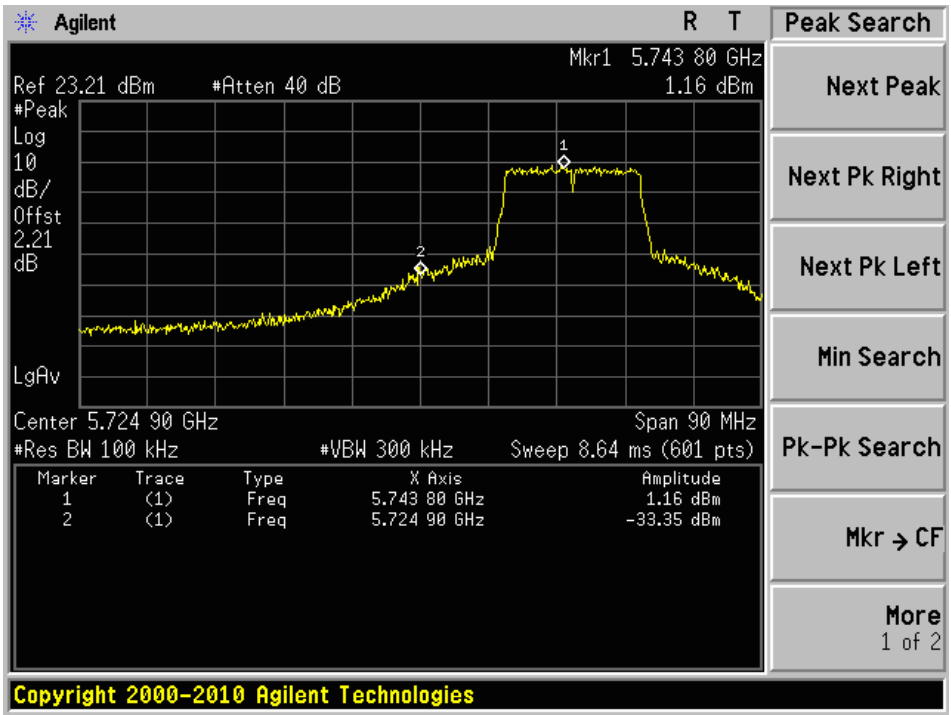


Chain J4 is not active during test

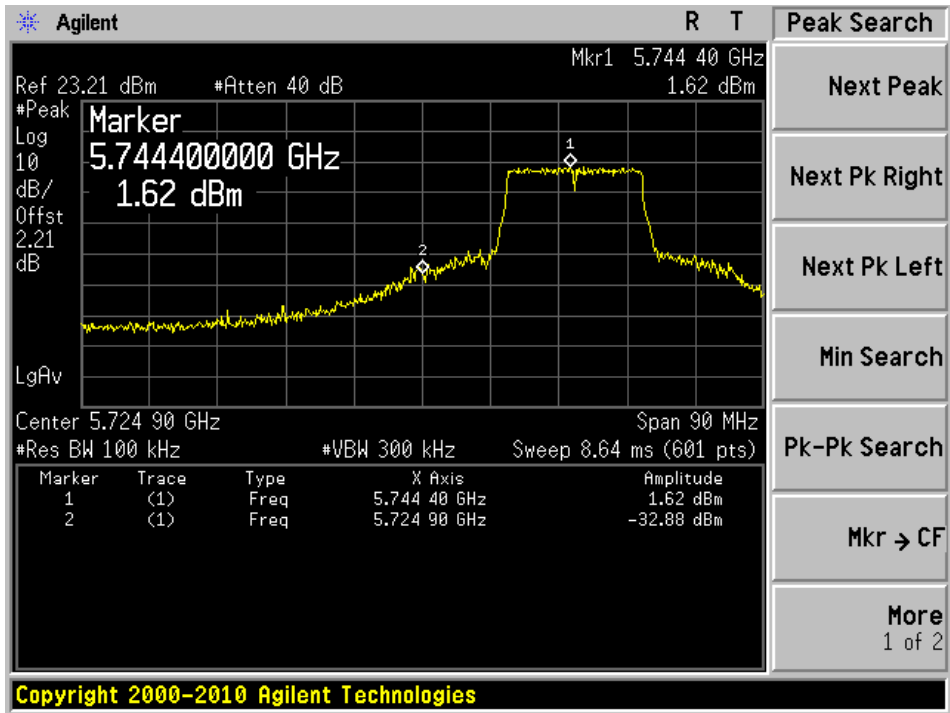
802.11n 20 MHz mode Low channel, Chain J1



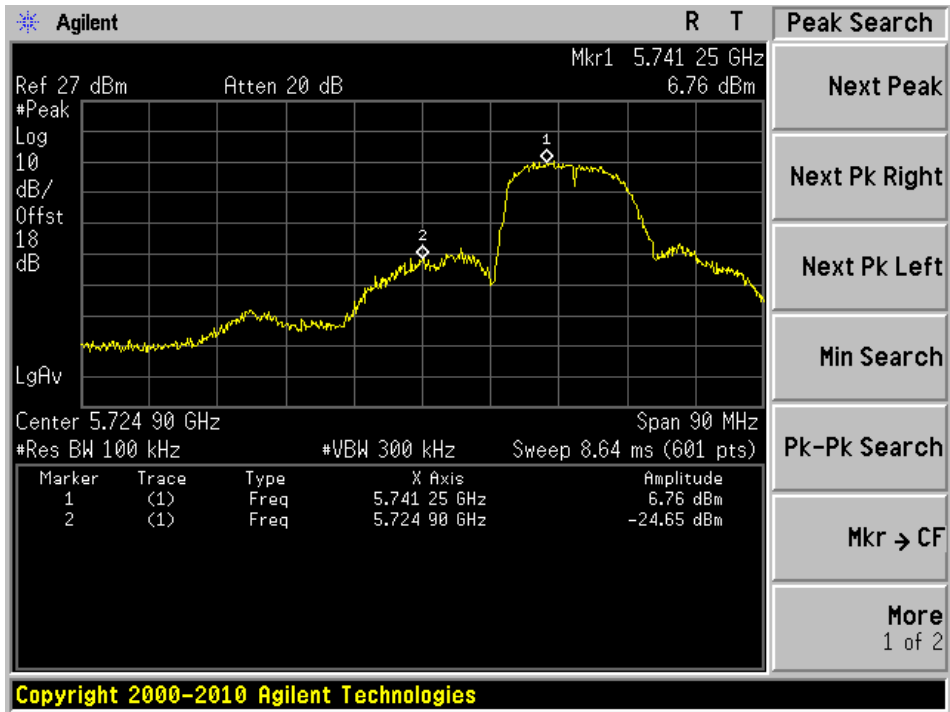
802.11n 20 MHz mode Low channel, Chain J2



802.11n 20 MHz mode Low channel, Chain J3

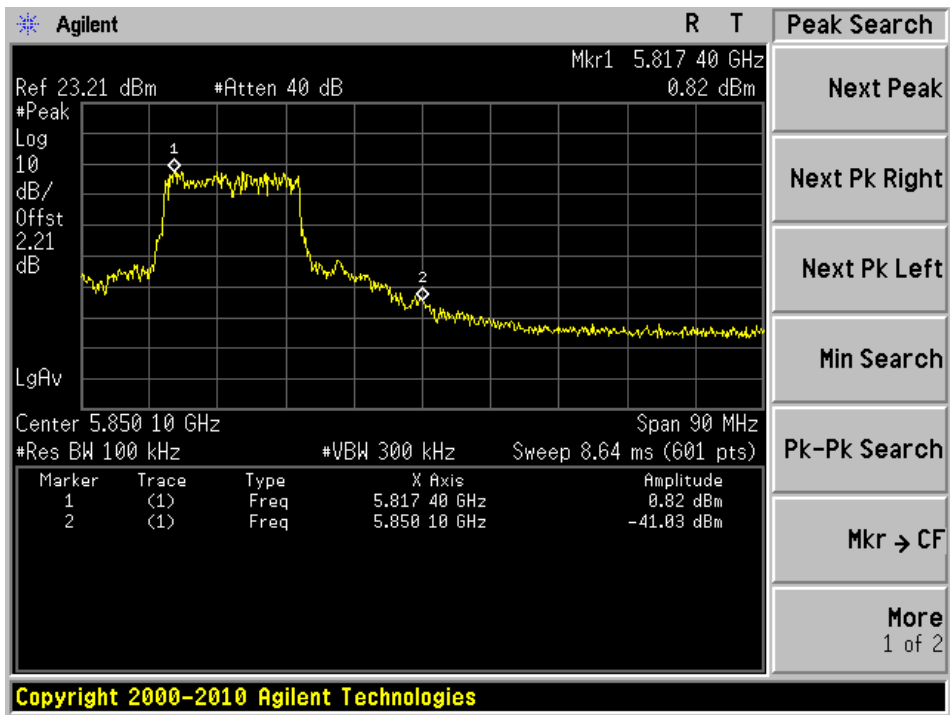


802.11n 20 MHz mode Low channel, Chain J1+J2+J3

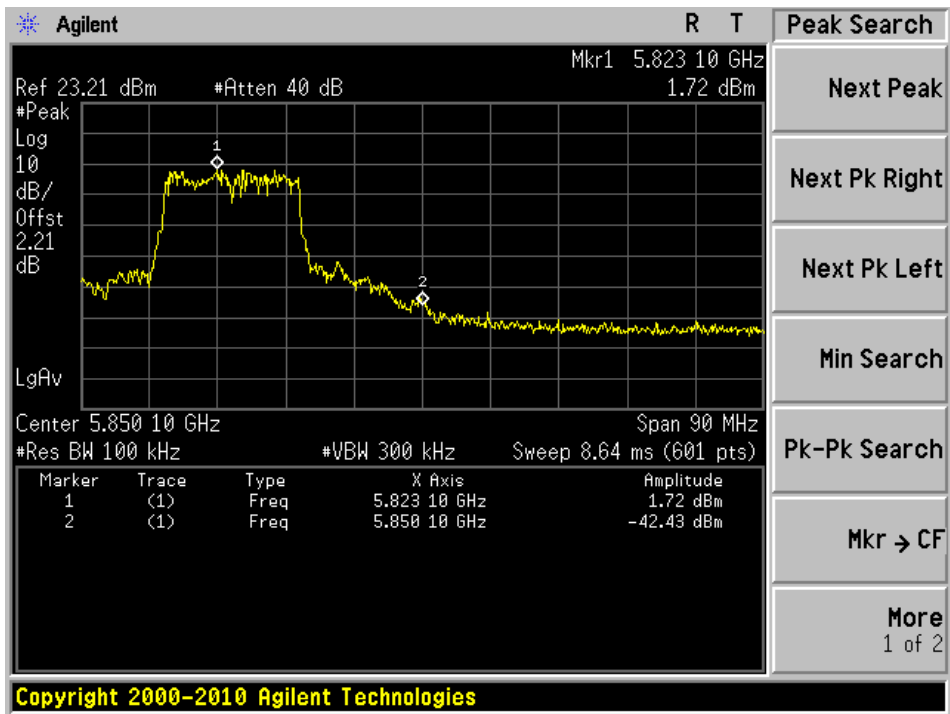


Chain J4 is not active during test

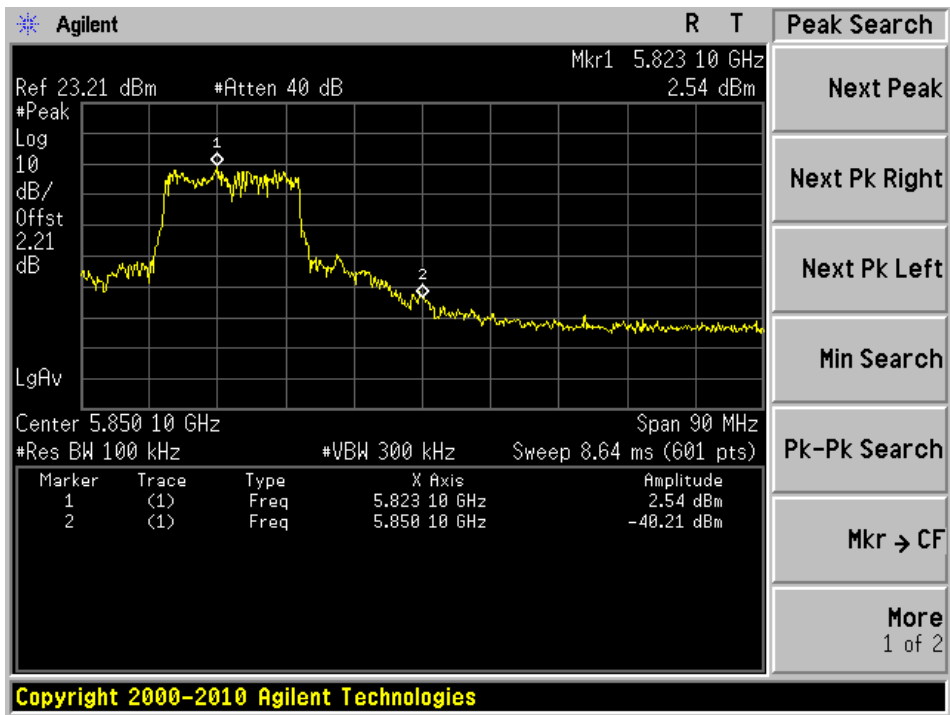
802.11n 20 MHz mode High channel, Chain J1



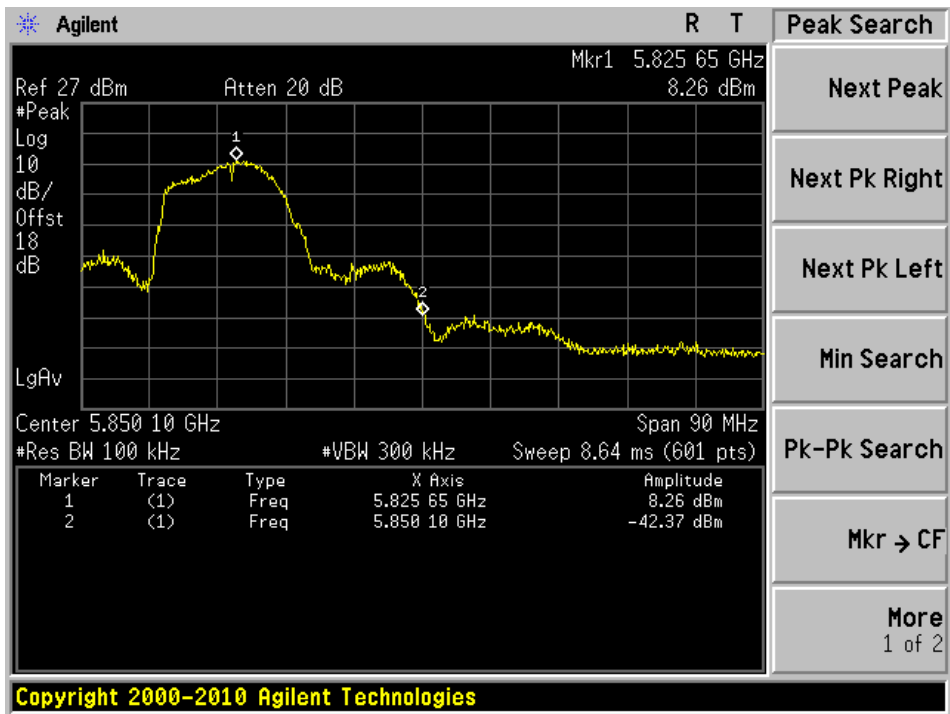
802.11n 20 MHz mode High channel, Chain J2



802.11n 20 MHz mode High channel, Chain J3

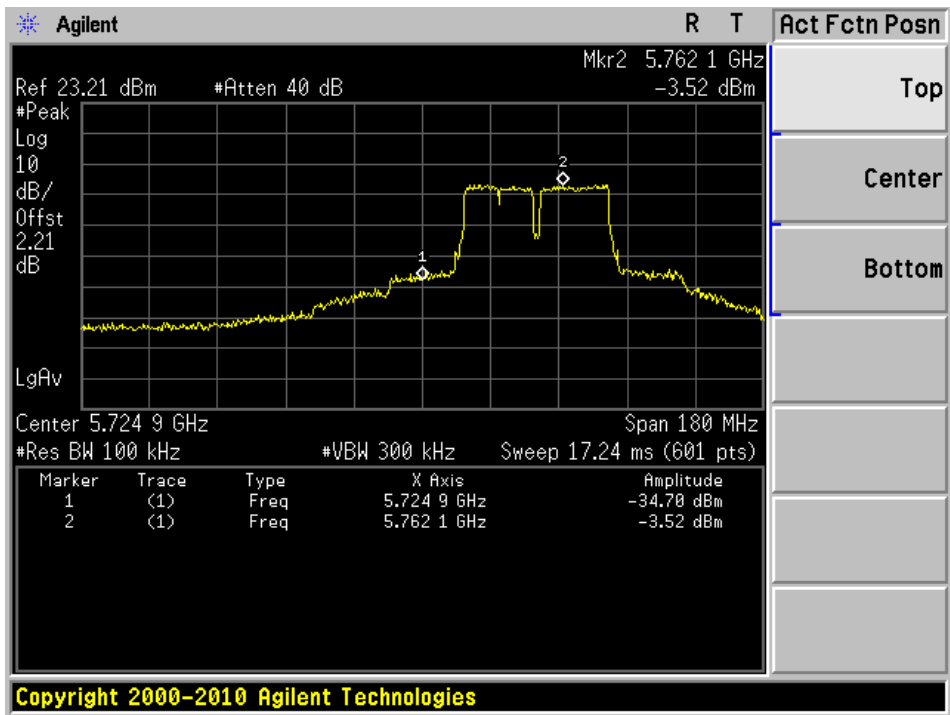


802.11n 20 MHz mode High channel, Chain J1+J2+J3

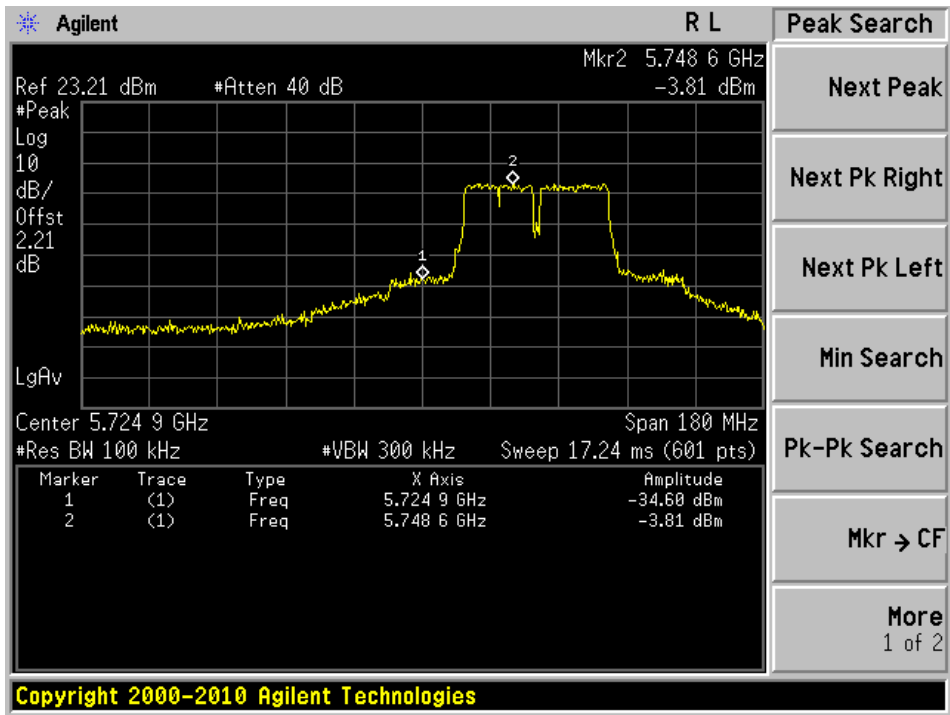


Chain J4 is not active during test

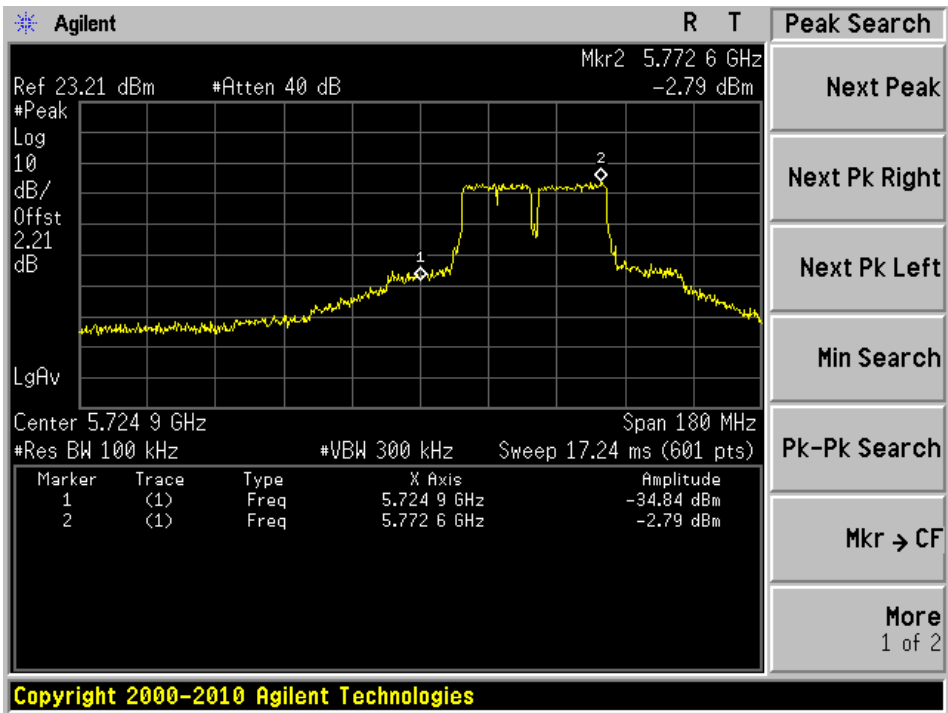
802.11n 40 MHz mode Low channel, Chain J1



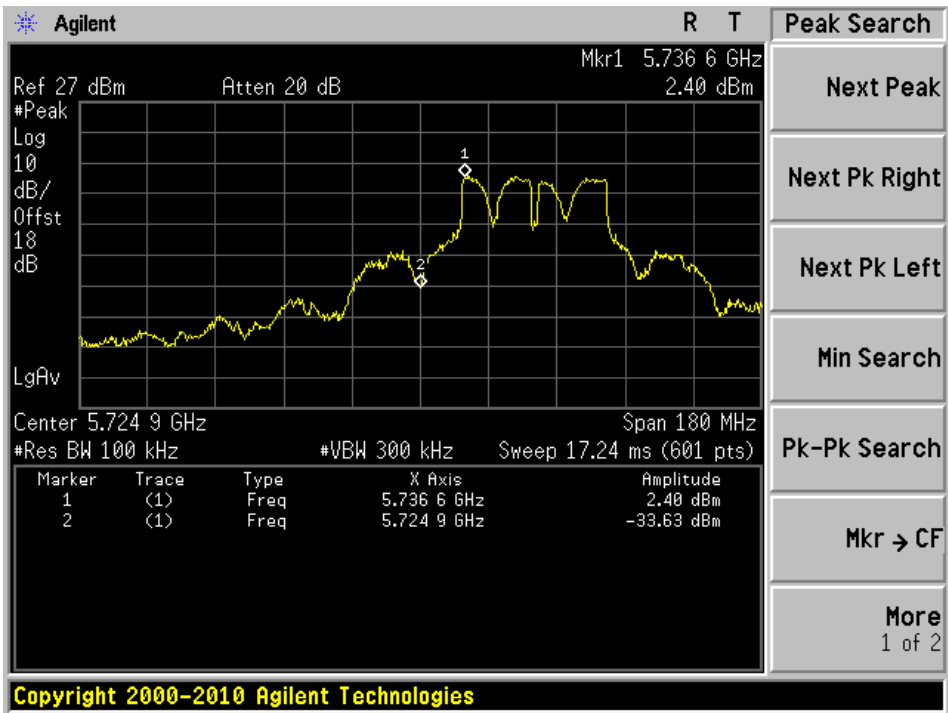
802.11n 40 MHz mode Low channel, Chain J2



802.11n 40 MHz mode Low channel, Chain J3

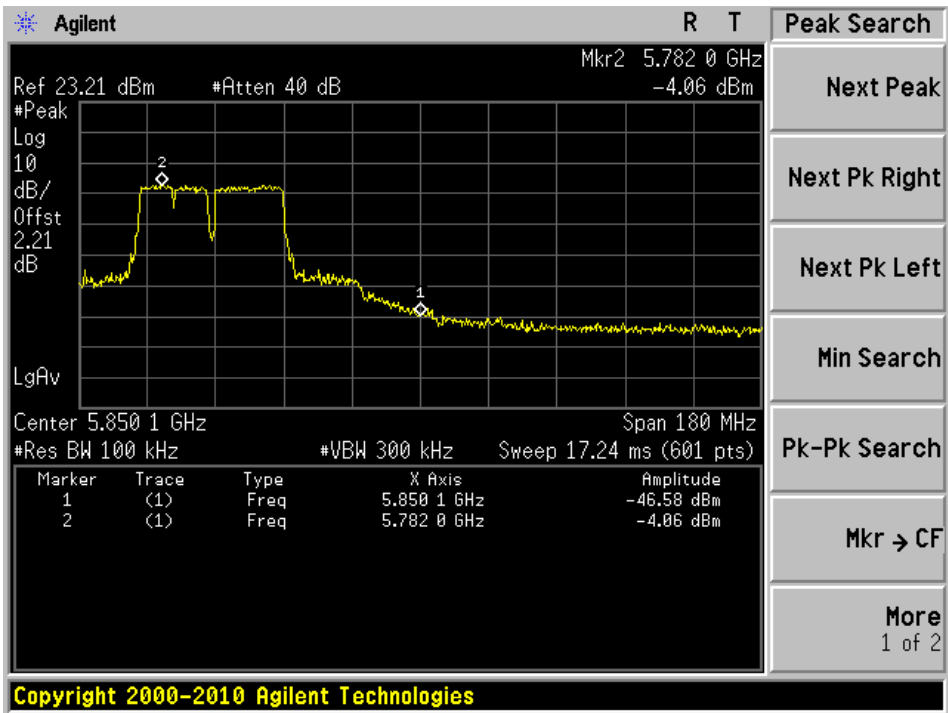


802.11n 40 MHz mode Low channel, Chain J1+J2+J3

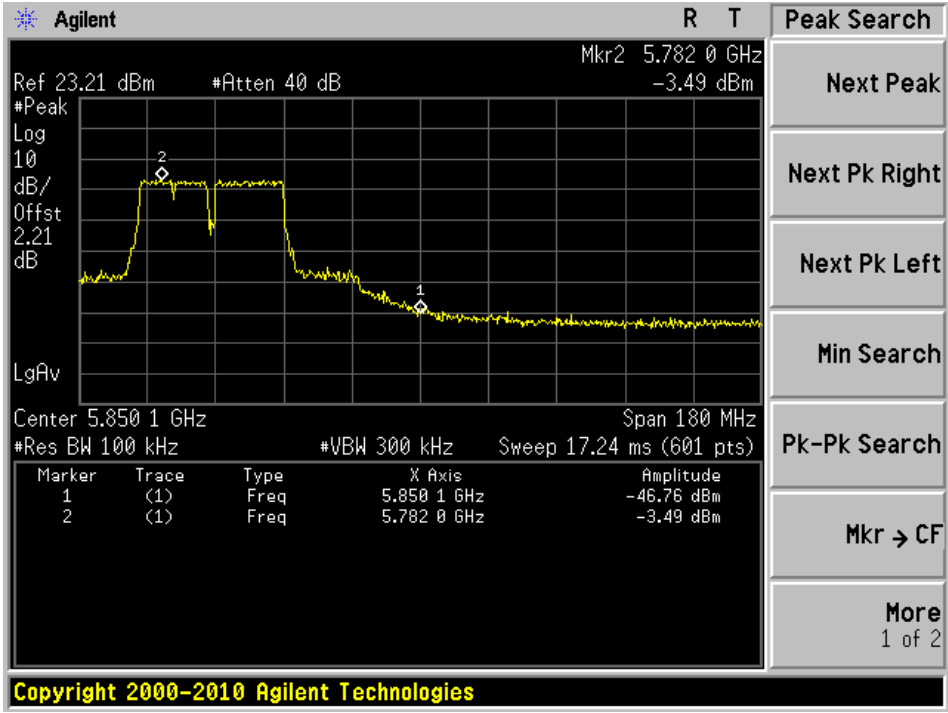


Chain J4 is not active during test

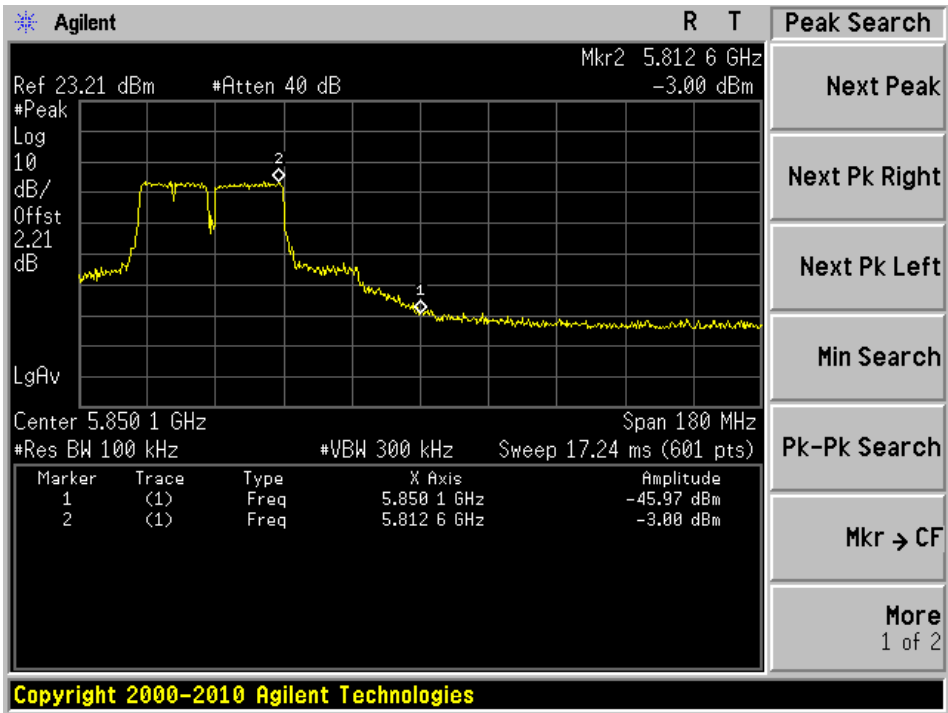
802.11n 40 MHz mode High channel, Chain J1



802.11n 40 MHz mode High channel, Chain J2



802.11n 40 MHz mode High channel, Chain J3



802.11n 40 MHz mode High channel, Chain J1+J2+J3



Chain J4 is not active during test

12 FCC §15.247(e) - Power Spectral Density

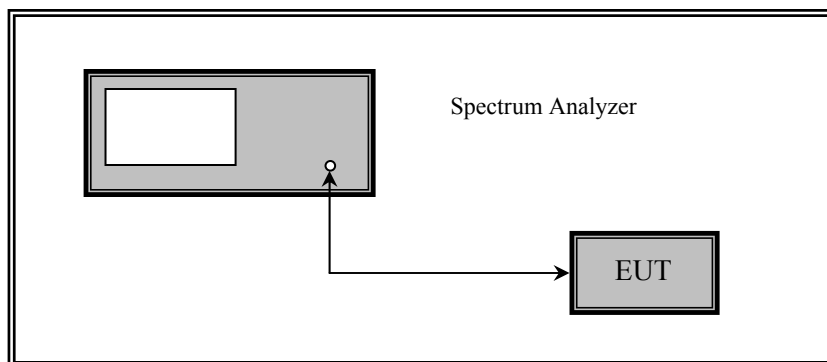
12.1 Applicable Standard

According to FCC §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.

12.2 Measurement Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 100 kHz.
3. Set the VBW $\geq$ 300 kHz.
4. Set the span to 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
10. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3\text{ kHz}/100\text{ kHz} = -15.2\text{ dB})$.
11. The resulting peak PSD level must be $\leq 8\text{ dBm}$

12.3 Test Setup Block Diagram



12.4 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.

12.5 Test Environmental Conditions

Temperature:	19~24 °C
Relative Humidity:	38~48 %
ATM Pressure:	101.2-102 kPa

The testing was performed by Wei Sun on 2012-05-04 in RF site.

12.6 Test Results

2.4 GHZ Band

802.11b mode

All the data can be scaled to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log(3 \text{ kHz}/100 \text{ kHz}) = -15.2 \text{ dB}$.

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
J1	Low	2412	5.34	-9.66	8
	Middle	2437	7.42	-7.58	8
	High	2462	6.23	-8.77	8
J2	Low	2412	4.46	-10.54	8
	Middle	2437	6.05	-8.95	8
	High	2462	5.59	-9.41	8
J3	Low	2412	5.14	-9.41	8
	Middle	2437	7.33	-7.67	8
	High	2462	5.96	-9.04	8

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
All Three Chains Combined	Low	2412	0.31	-5.07	8
	Middle	2437	0.30	-5.25	8
	High	2462	0.37	-4.29	8

802.11g mode

All the data can be scaled to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log (3 \text{ kHz}/100 \text{ kHz}) = -15.2 \text{ dB}$.

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3k Hz)
J1	Low	2412	0.24	-14.76	8
	Middle	2437	3.56	-11.44	8
	High	2462	2.92	-12.08	8
J2	Low	2412	-0.04	-15.04	8
	Middle	2437	3.24	-11.76	8
	High	2462	2.31	-12.69	8
J3	Low	2412	0.44	-14.56	8
	Middle	2437	4.24	-10.76	8
	High	2462	2.29	-12.71	8

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3k Hz)
All Three Chains Combined	Low	2412	0.10	-10.01	8
	Middle	2437	0.15	-8.22	8
	High	2462	0.17	-7.71	8

802.11n 20 MHz mode

All the data can be scaled to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log(3 \text{ kHz}/100 \text{ kHz}) = -15.2 \text{ dB}$.

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3k Hz)
J1	Low	2412	-1.13	-16.13	8
	Middle	2437	3.64	-11.36	8
	High	2462	-0.52	-15.52	8
J2	Low	2412	-0.61	-15.61	8
	Middle	2437	3.25	-11.75	8
	High	2462	-0.19	-15.19	8
J3	Low	2412	0.03	-14.97	8
	Middle	2437	3.80	-11.2	8
	High	2462	0.40	-14.6	8

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3k Hz)
All Three Chains Combined	Low	2412	0.08	-10.77	8
	Middle	2437	0.14	-8.46	8
	High	2462	0.09	-10.32	8

802.11n 40 MHz mode

All the data can be scaled to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log(3 \text{ kHz}/100 \text{ kHz}) = -15.2 \text{ dB}$.

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
J1	Low	2422	-4.43	-19.43	8
	Middle	2437	0.52	-14.48	8
	High	2452	-4.75	-19.75	8
J2	Low	2422	-4.83	-19.83	8
	Middle	2437	-0.13	-15.13	8
	High	2452	-5.0	-20.0	8
J3	Low	2422	-4.39	-19.39	8
	Middle	2437	0.22	-14.78	8
	High	2452	-4.93	-19.93	8

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
All Three Chains Combined	Low	2422	0.03	-14.77	8
	Middle	2437	0.064	-11.94	8
	High	2452	0.031	-15.12	8

5.8 GHZ Band**802.11a mode**

All the data can be scaled to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log (3 \text{ kHz}/100\text{kHz}) = -15.2\text{dB}$.

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
J1	Low	5745	0.83	-14.17	8
	Middle	5785	0.63	-14.37	8
	High	5825	0.35	-14.65	8
J2	Low	5745	1.24	-13.76	8
	Middle	5785	0.58	-14.42	8
	High	5825	0.54	-14.46	8
J3	Low	5745	1.65	-13.35	8
	Middle	5785	1.38	-13.62	8
	High	5825	0.89	-14.11	8

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
All Three Chains Combined	Low	5745	0.13	-8.98	8
	Middle	5785	0.08	-10.99	8
	High	5825	0.11	-9.63	8

802.11n 20 MHz mode

All the data can be scaled to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log(3 \text{ kHz}/100 \text{ kHz}) = -15.2 \text{ dB}$.

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3k Hz)
J1	Low	5745	-0.57	-15.57	8
	Middle	5785	-0.15	-15.15	8
	High	5825	-0.29	-15.29	8
J2	Low	5745	-0.89	-15.89	8
	Middle	5785	-0.23	-15.23	8
	High	5825	-0.91	-15.91	8
J3	Low	5745	-0.46	-15.46	8
	Middle	5785	-0.08	-15.08	8
	High	5825	-0.41	-15.41	8

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3k Hz)
All Three Chains Combined	Low	5745	0.082	-10.87	8
	Middle	5785	0.061	-12.14	8
	High	5825	0.084	-10.76	8

802.11n 40 MHz mode

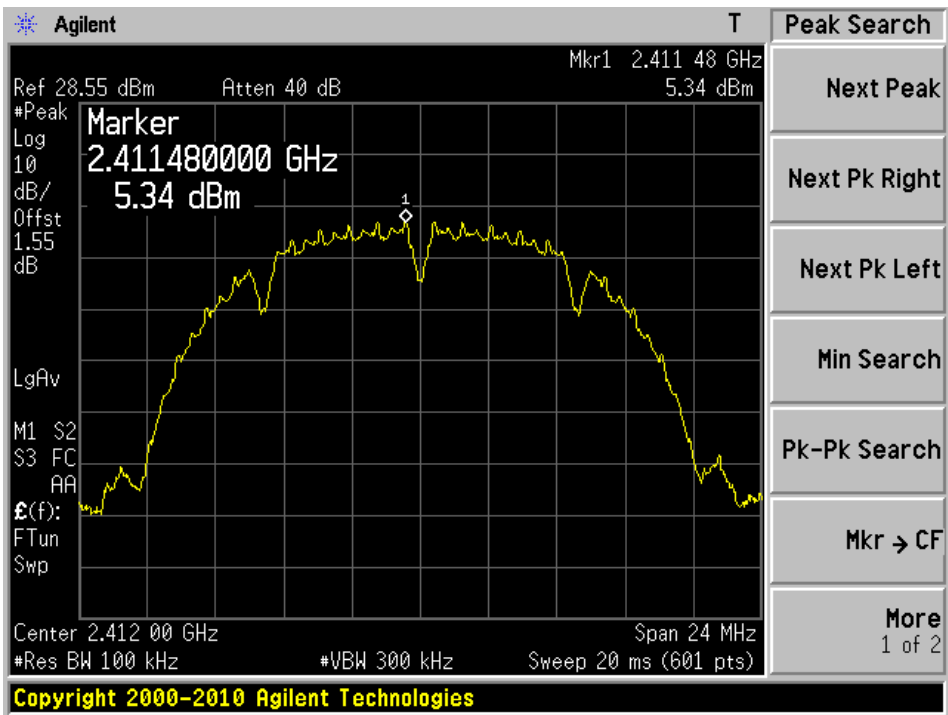
All the data can be scaled to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log(3 \text{ kHz}/100 \text{ kHz}) = -15.2 \text{ dB}$.

Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
J1	Low	5745	-3.72	-18.72	8
	High	5825	-3.26	-18.26	8
J2	Low	5745	-3.92	-18.92	8
	High	5825	-3.39	-18.39	8
J3	Low	5745	-3.52	-18.52	8
	High	5825	-3.69	-18.69	8

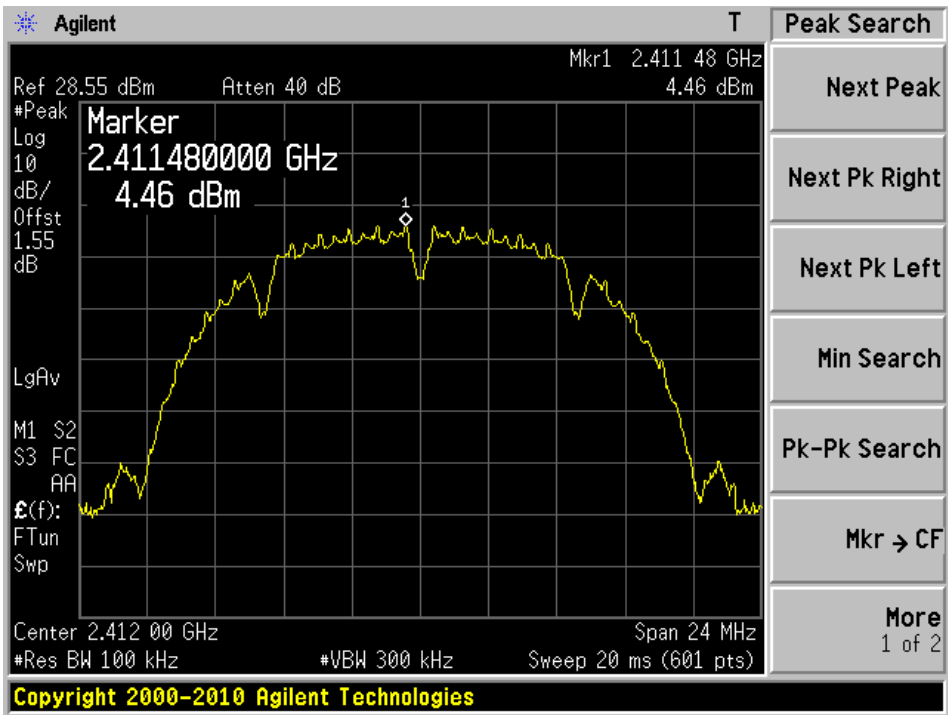
Antenna Port	Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
All three Chains Combined	Low	5745	0.04	-13.95	8
	High	5825	0.043	-13.67	8

2.4 GHZ Band

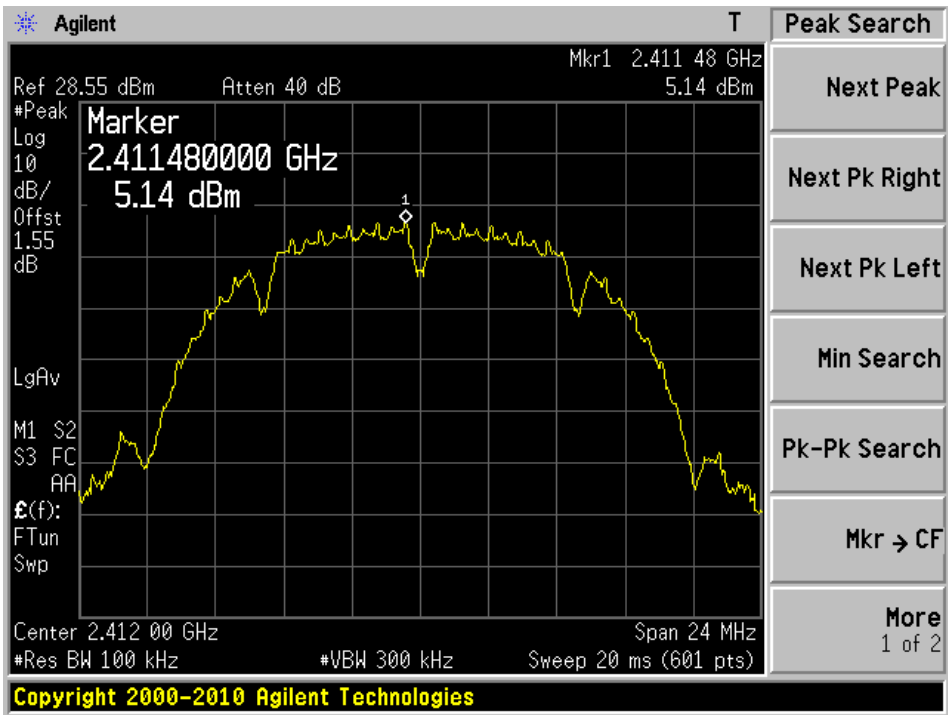
802.11b mode Low Channel, Chain J1



802.11b mode Low Channel, Chain J2

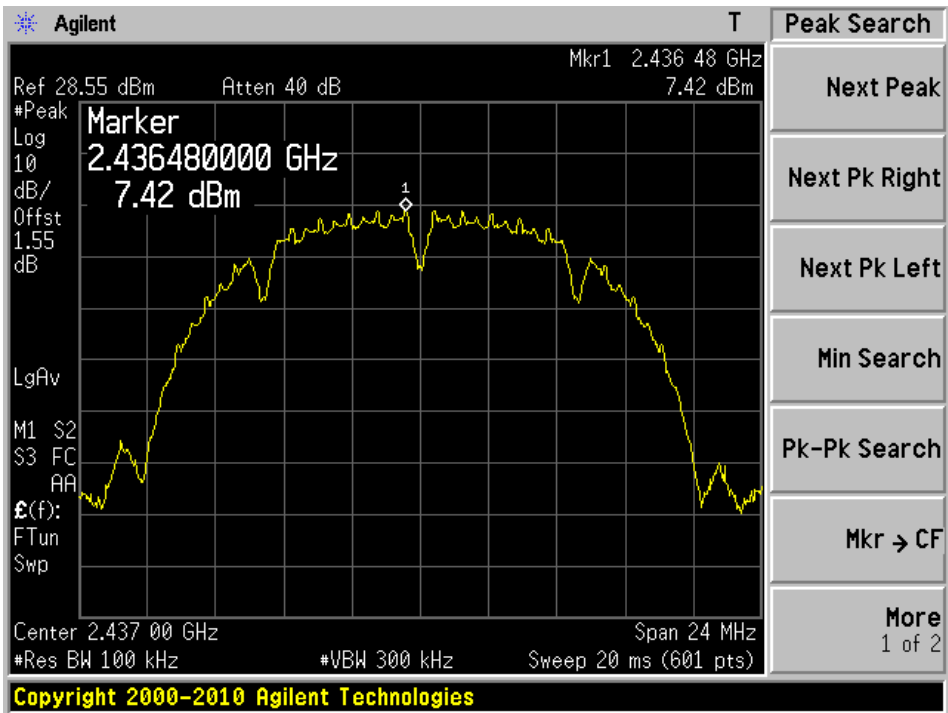


802.11b mode Low Channel, Chain J3

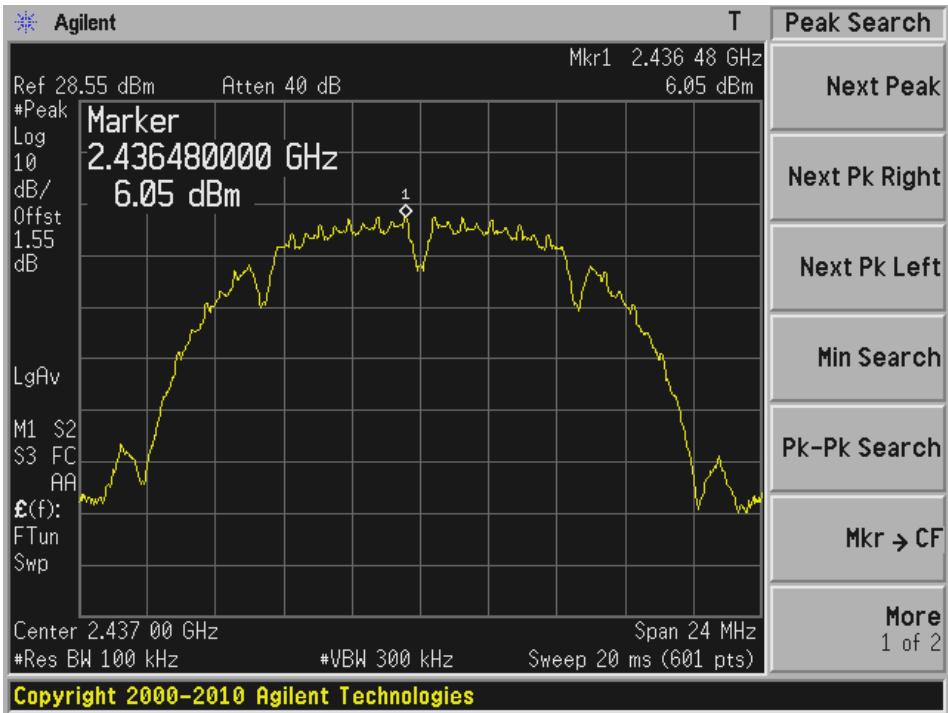


Chain J4 is not active during test

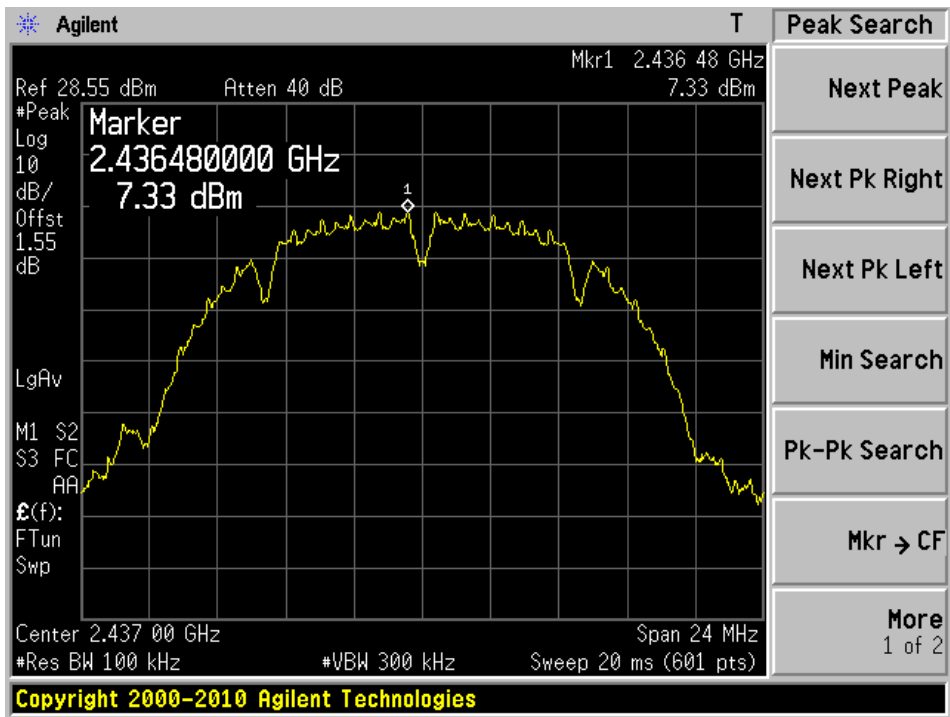
802.11b mode Middle Channel, Chain J1



802.11b mode Middle Channel, Chain J2

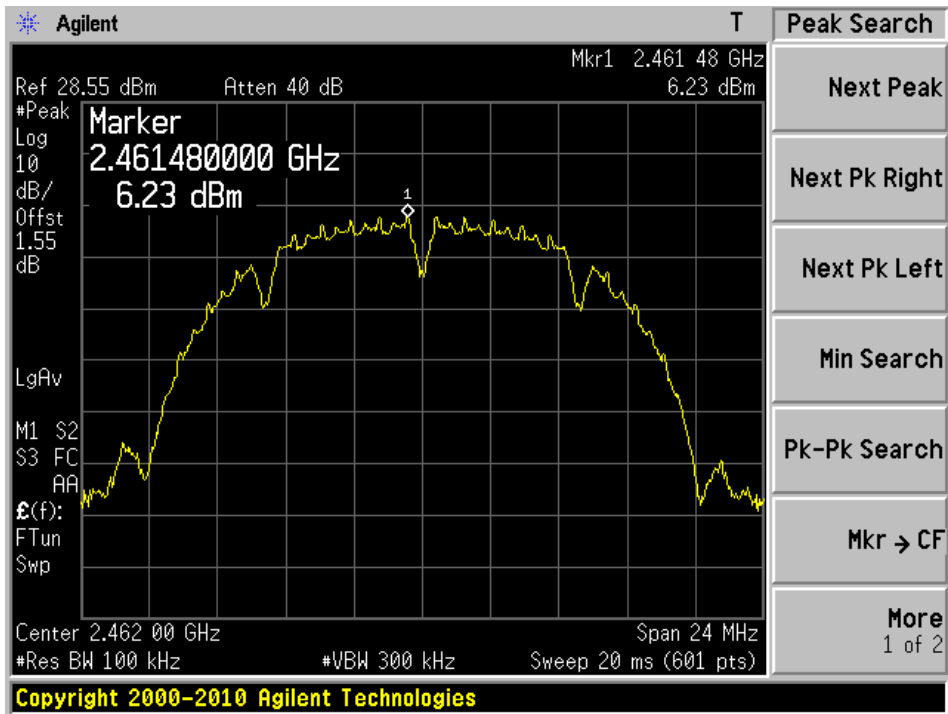


802.11b mode Middle Channel, Chain J3

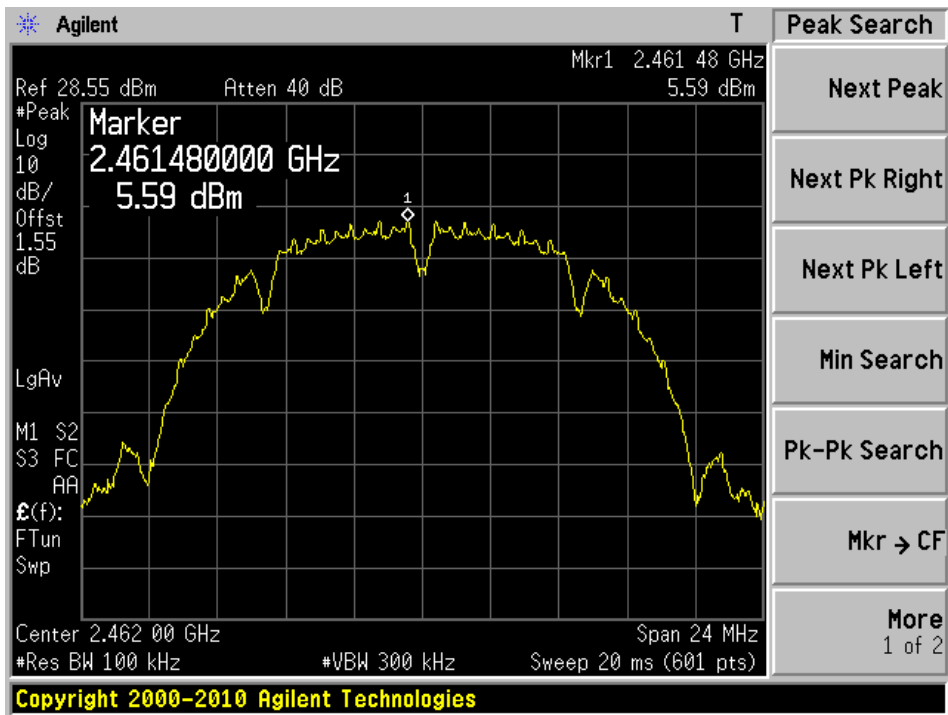


Chain J4 is not active during test

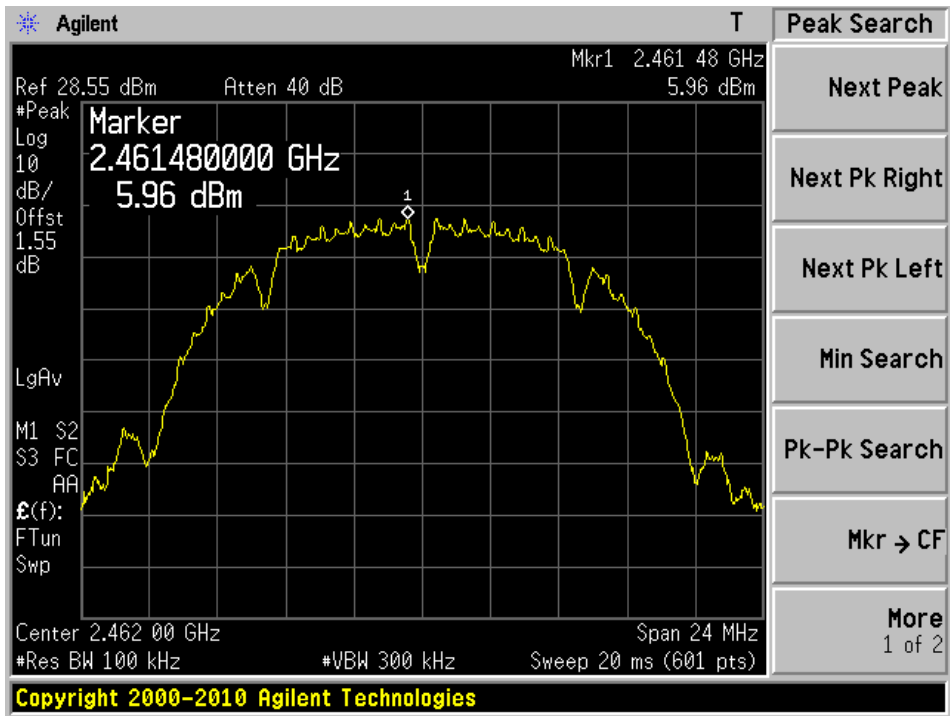
802.11b mode High Channel, Chain J1



802.11b mode High Channel, Chain J2

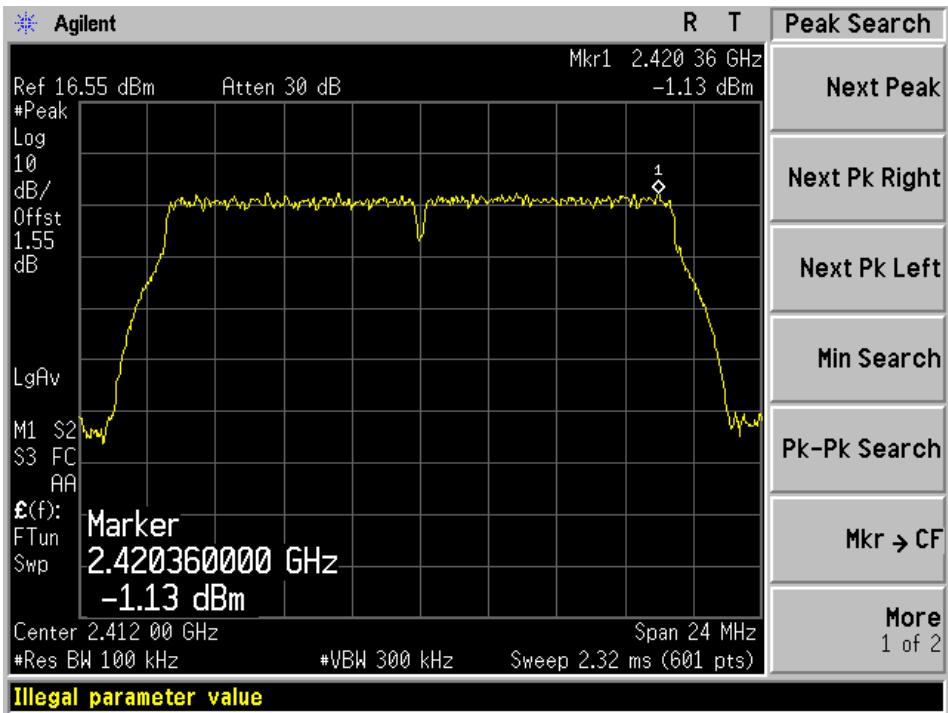


802.11b mode High Channel, Chain J3

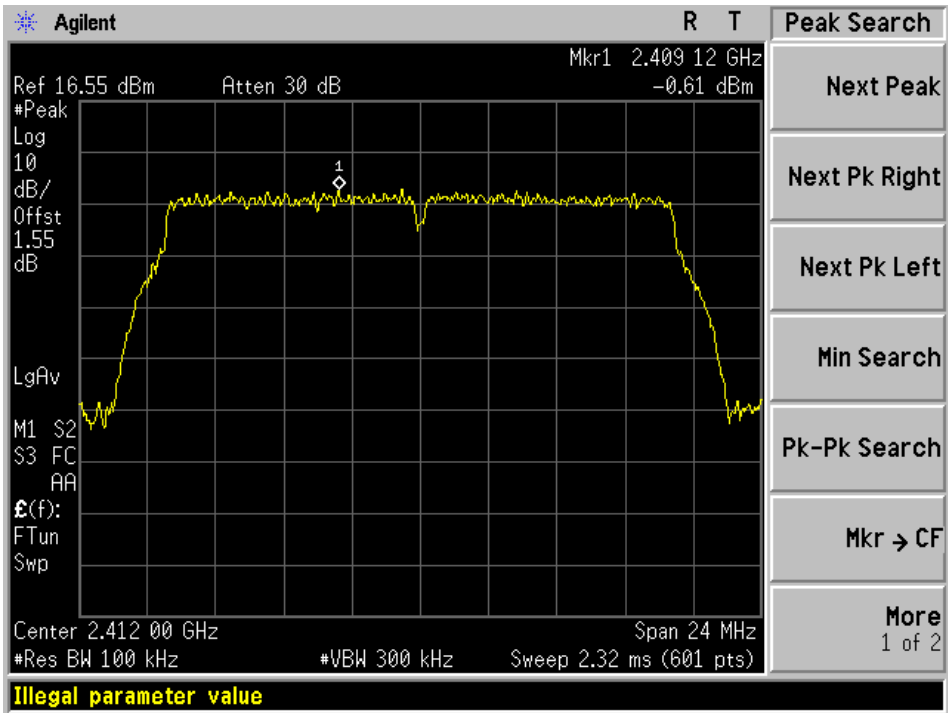


Chain J4 is not active during test

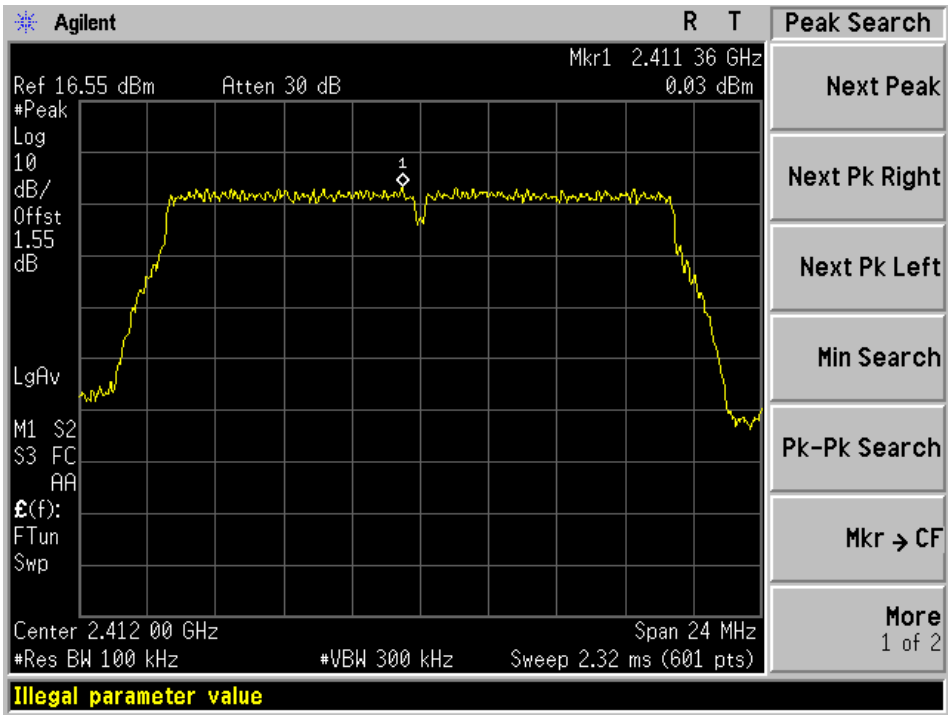
802.11n 20 MHz mode Low Channel, Chain J1



802.11n 20 MHz mode Low Channel, Chain J2

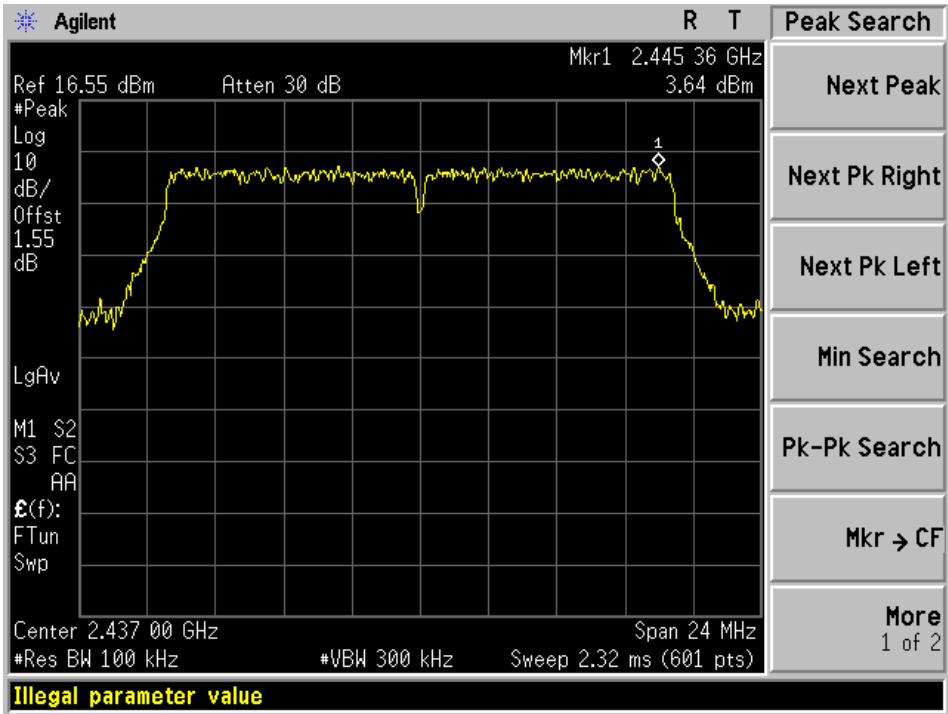


802.11n 20 MHz mode Low Channel, Chain J3

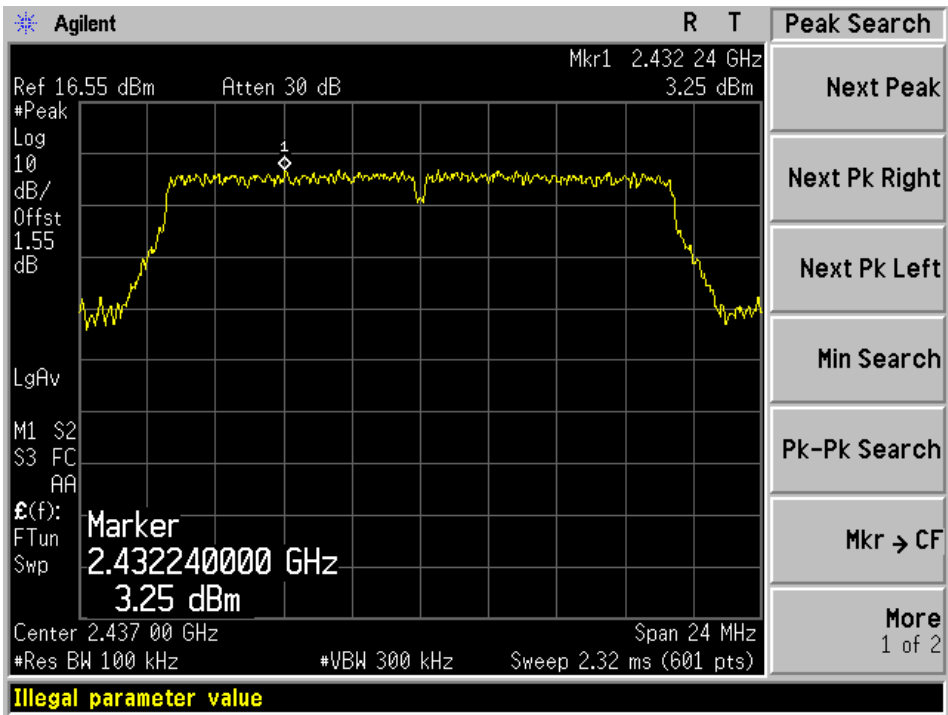


Chain J4 is not active during test

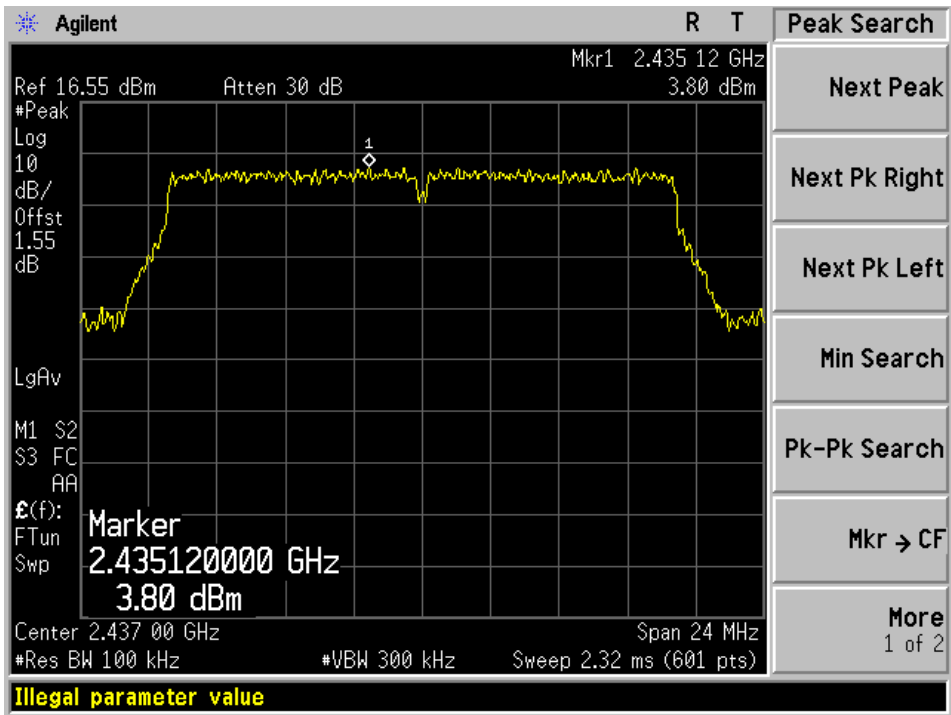
802.11n 20 MHz mode Middle Channel, Chain J1



802.11n 20 MHz mode Middle Channel, Chain J2

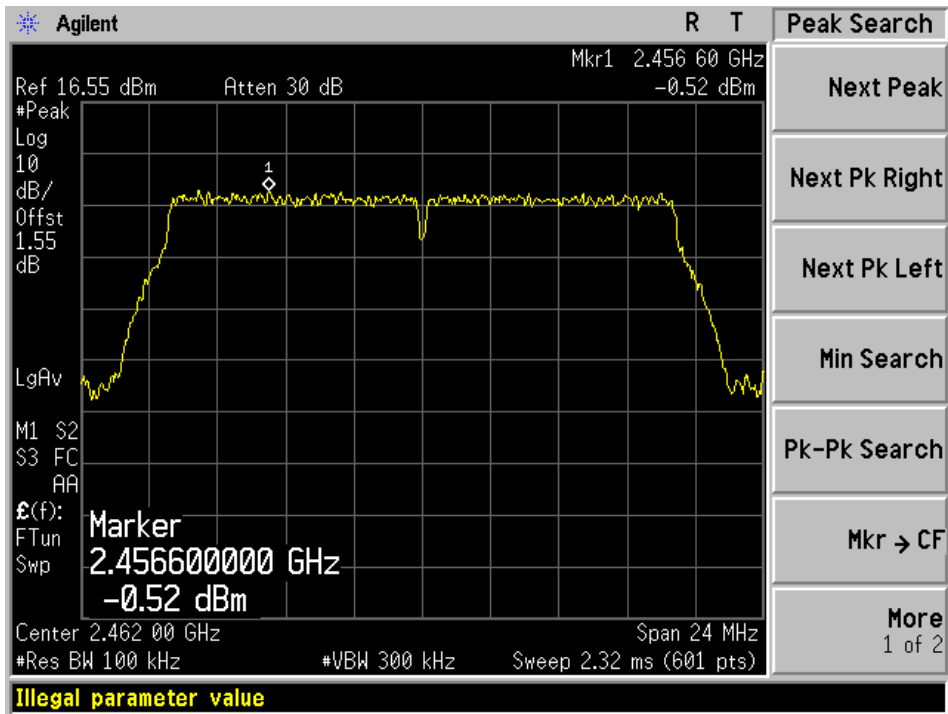


802.11n 20 MHz mode Middle Channel, Chain J3

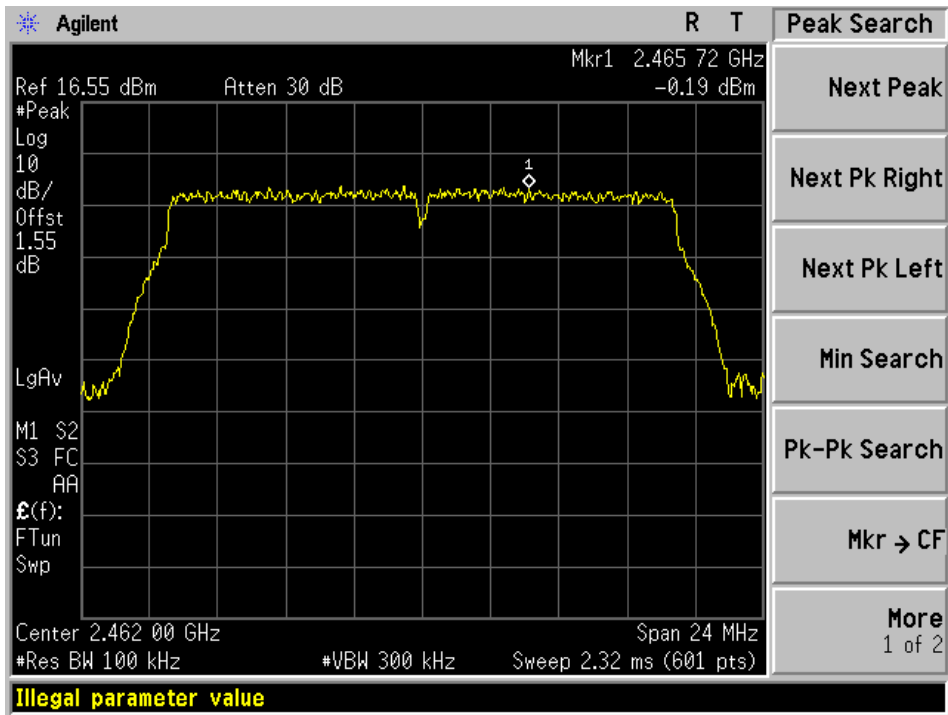


Chain J4 is not active during test

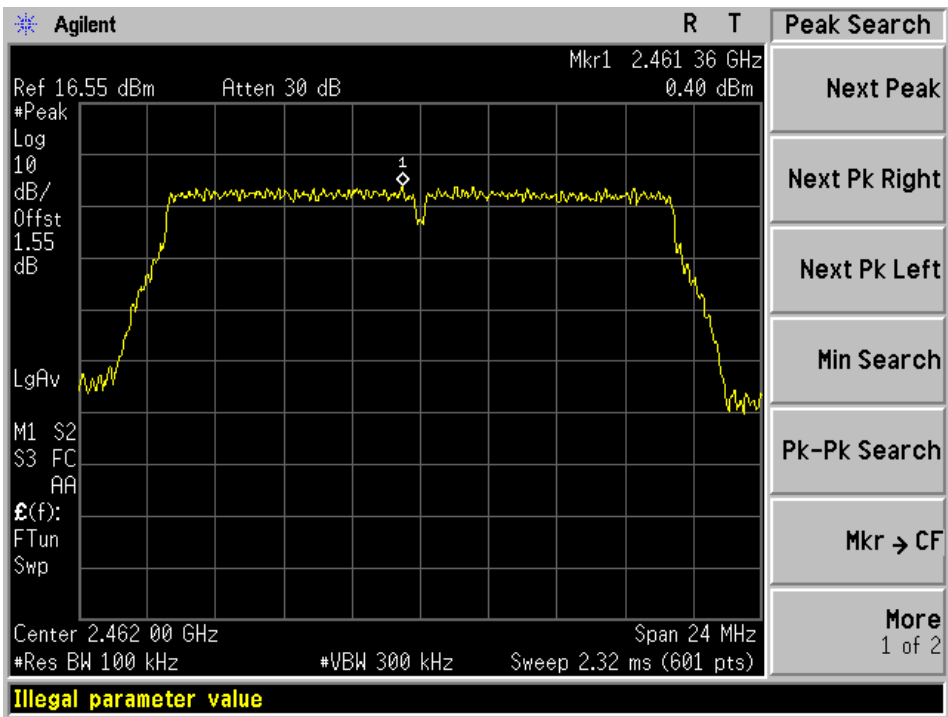
802.11n 20 MHz mode High Channel, Chain J1



802.11n 20 MHz mode High Channel, Chain J2

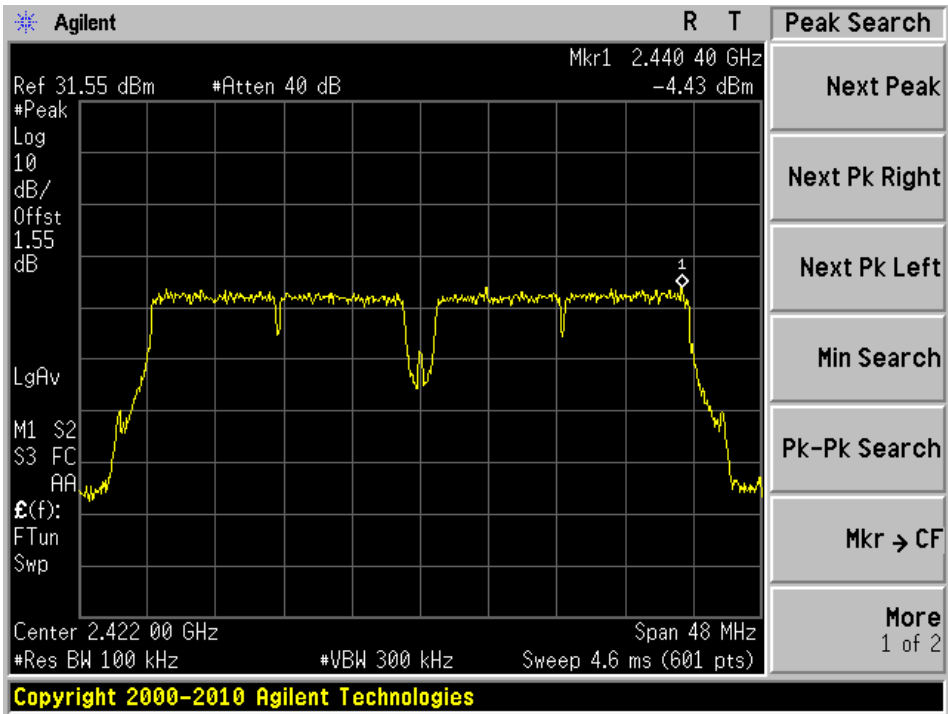


802.11n 20 MHz mode High Channel, Chain J3

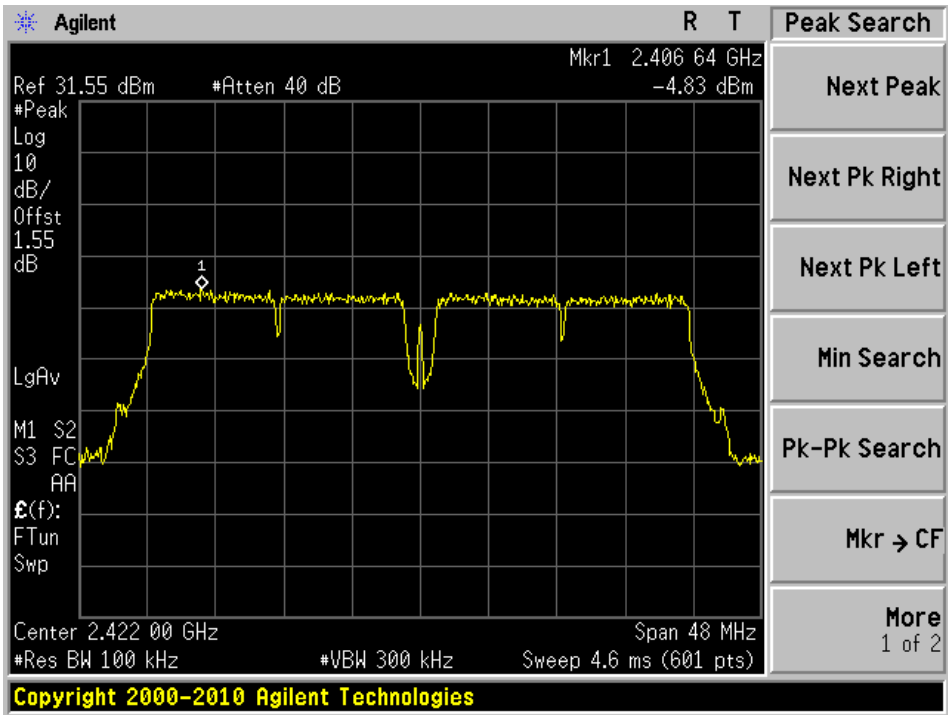


Chain J4 is not active during test

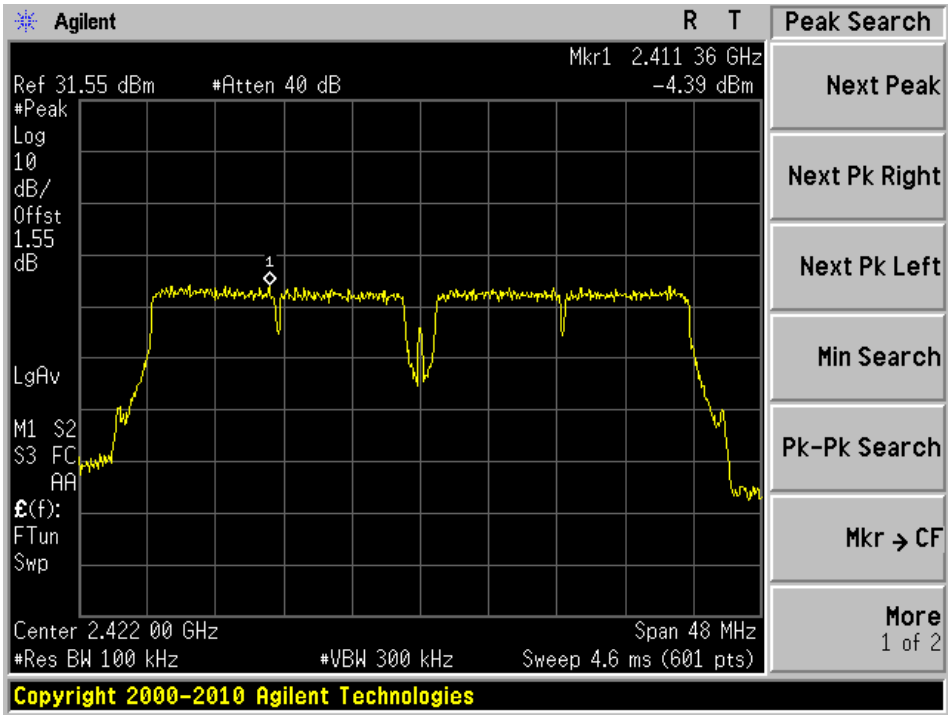
802.11n 40 MHz mode Low Channel, Chain J1



802.11n 40 MHz mode Low Channel, Chain J2

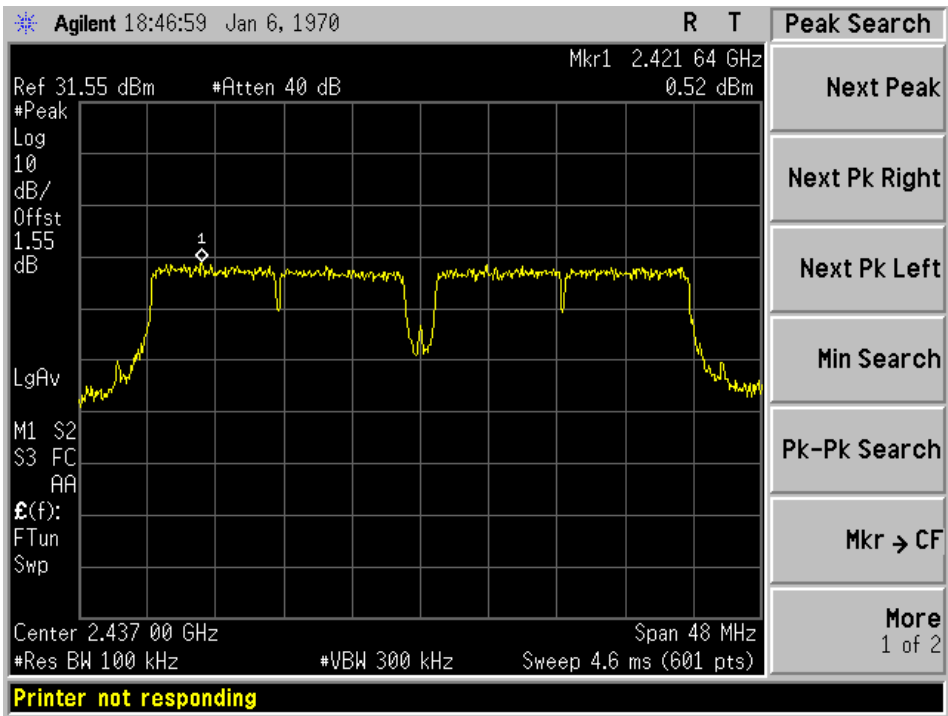


802.11n 40 MHz mode Low Channel, Chain J3

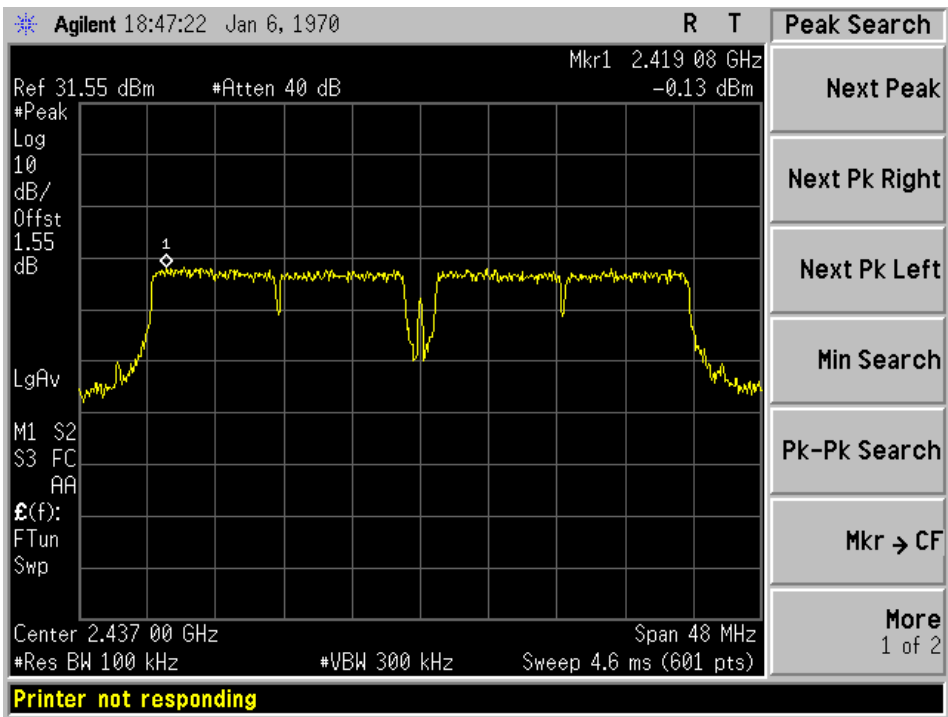


Chain J4 is not active during test

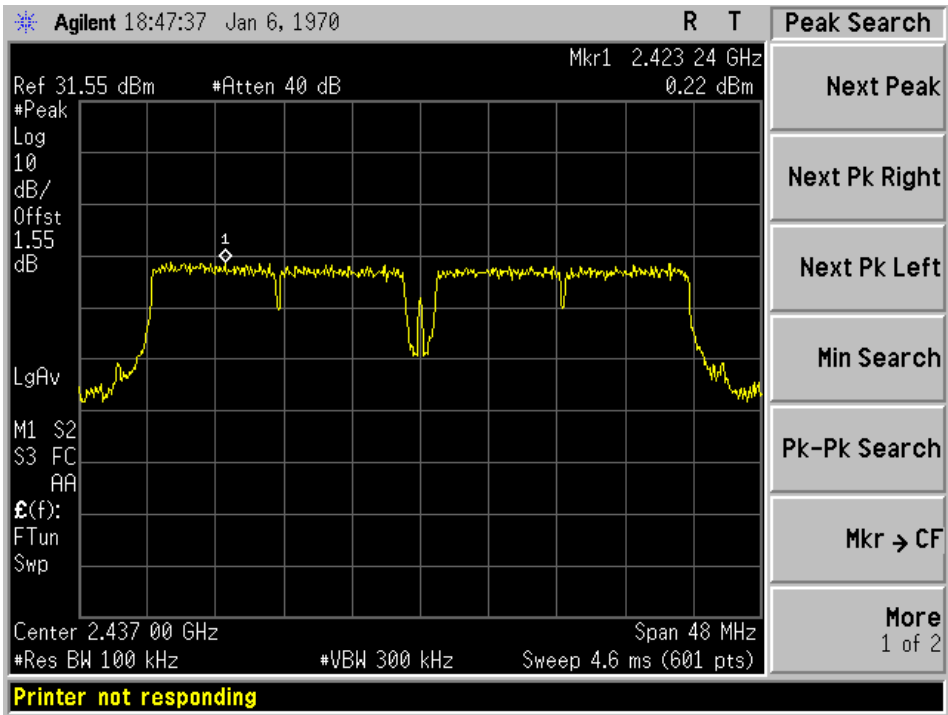
802.11n 40 MHz mode Middle Channel, Chain J1



802.11n 40 MHz mode Middle Channel, Chain J2

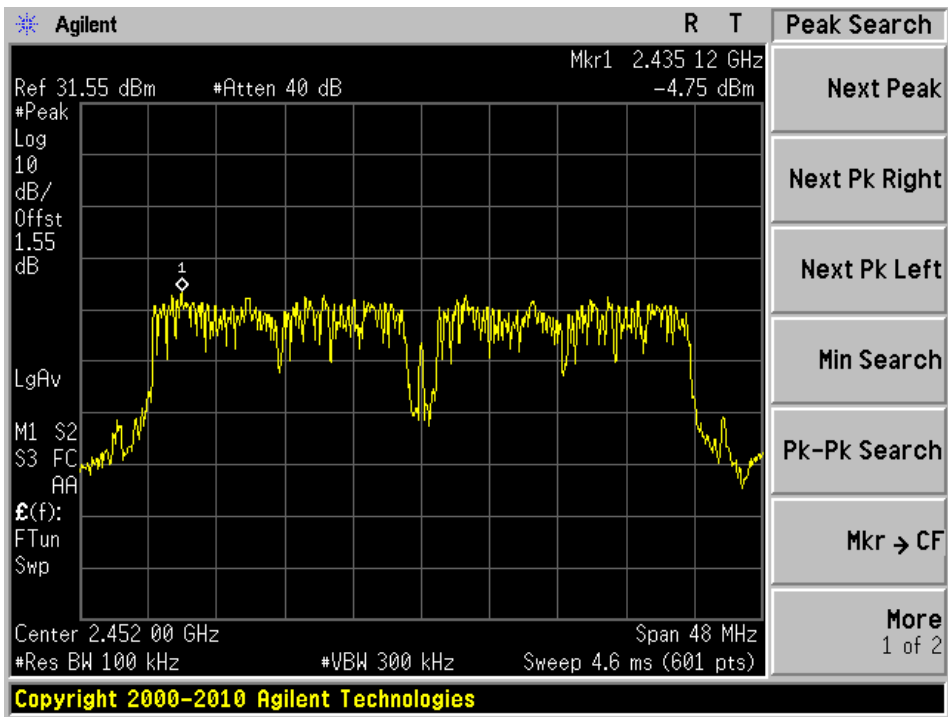


802.11n 40 MHz mode Middle Channel, Chain J3

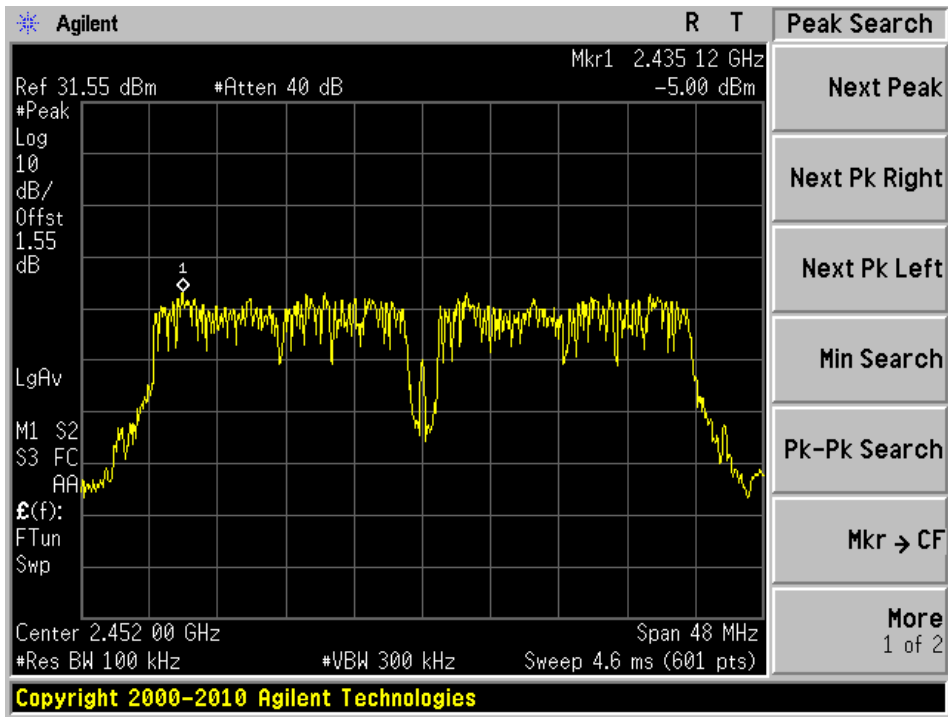


Chain J4 is not active during test

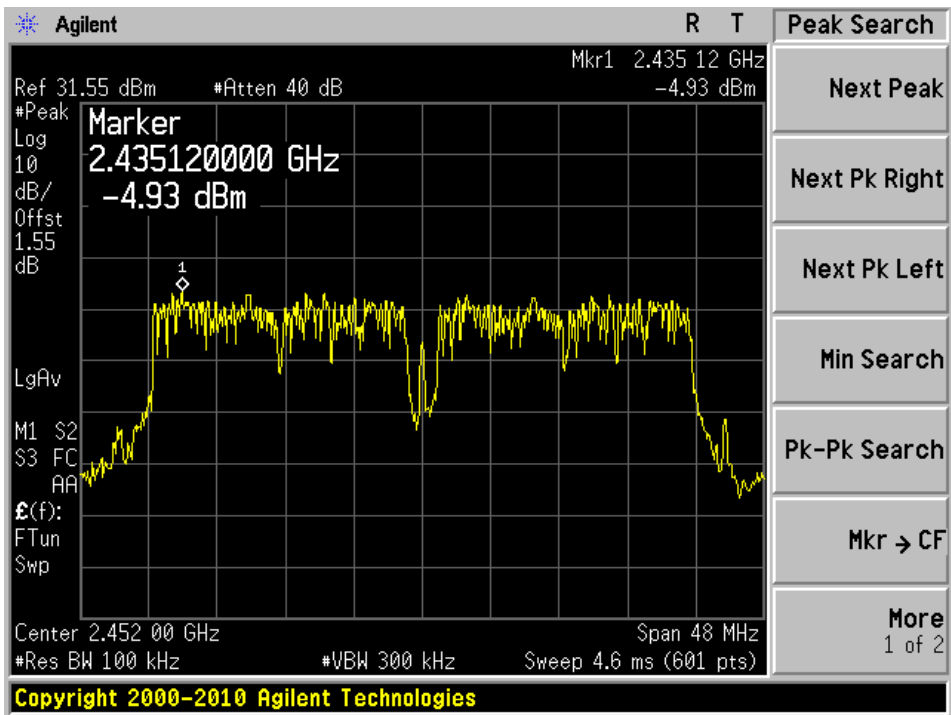
802.11n 40 MHz mode High Channel, Chain J1



802.11n 40 MHz mode High Channel, Chain J2



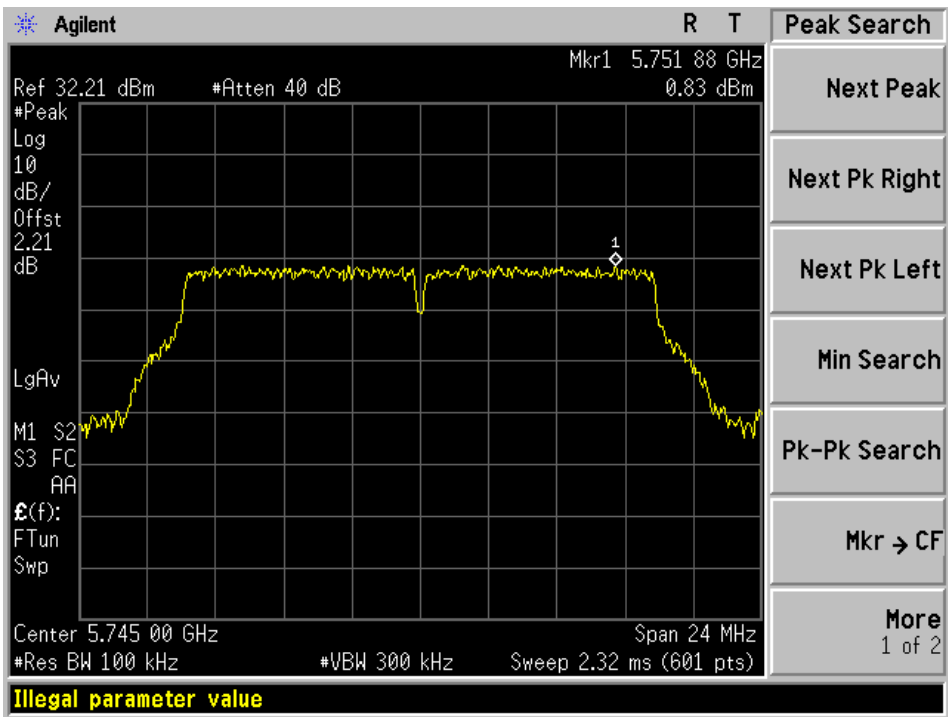
802.11n 40 MHz mode High Channel, Chain J3



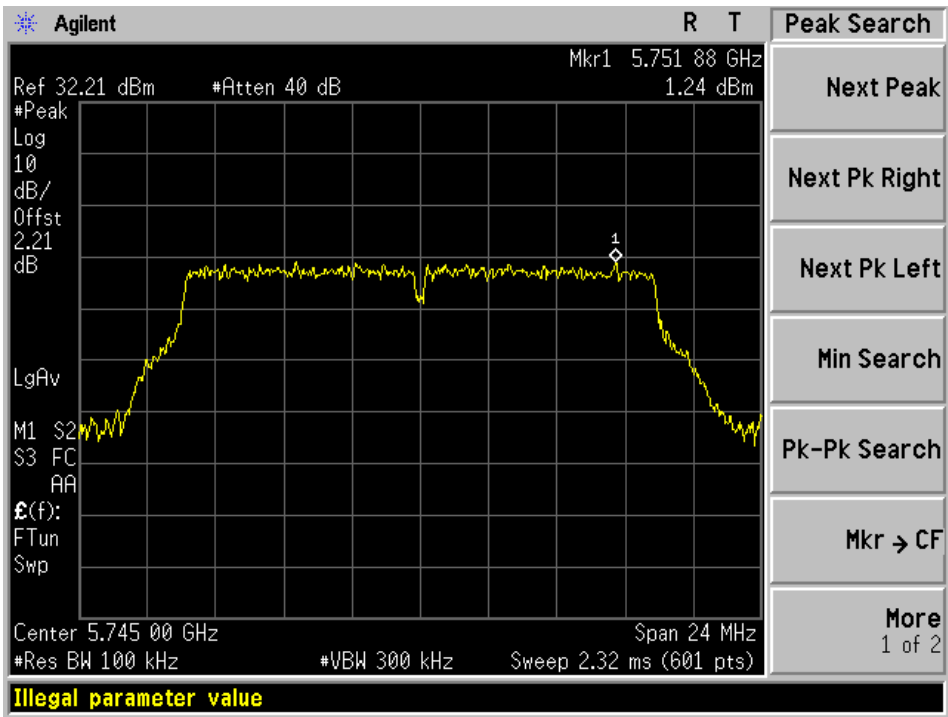
Chain J4 is not active during test

5.8 GHZ Band

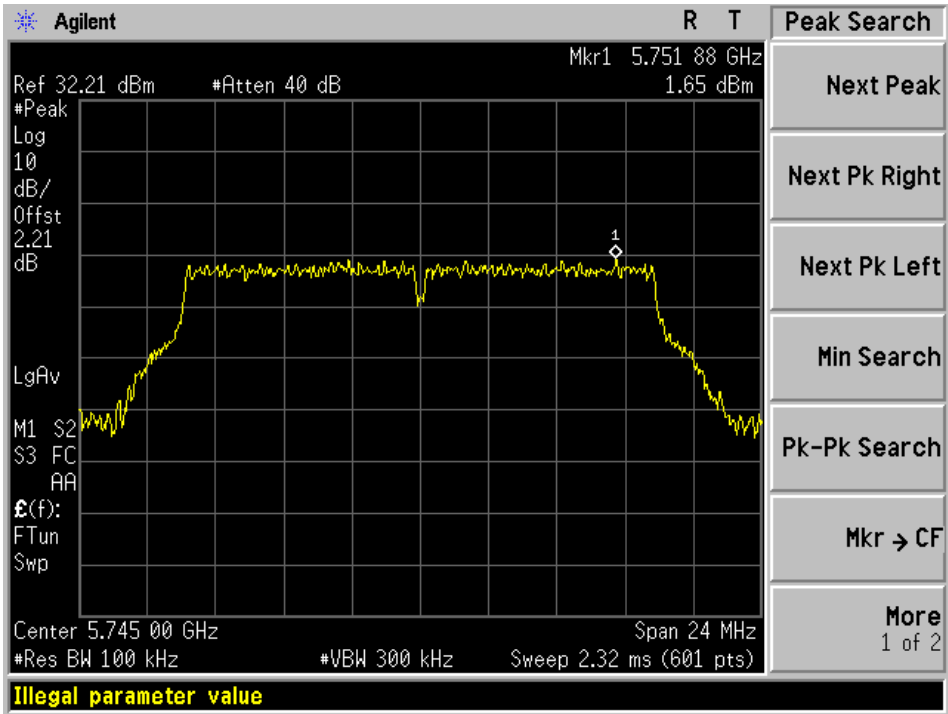
802.11a mode Low Channel, Chain J1



802.11a mode Low Channel, Chain J2

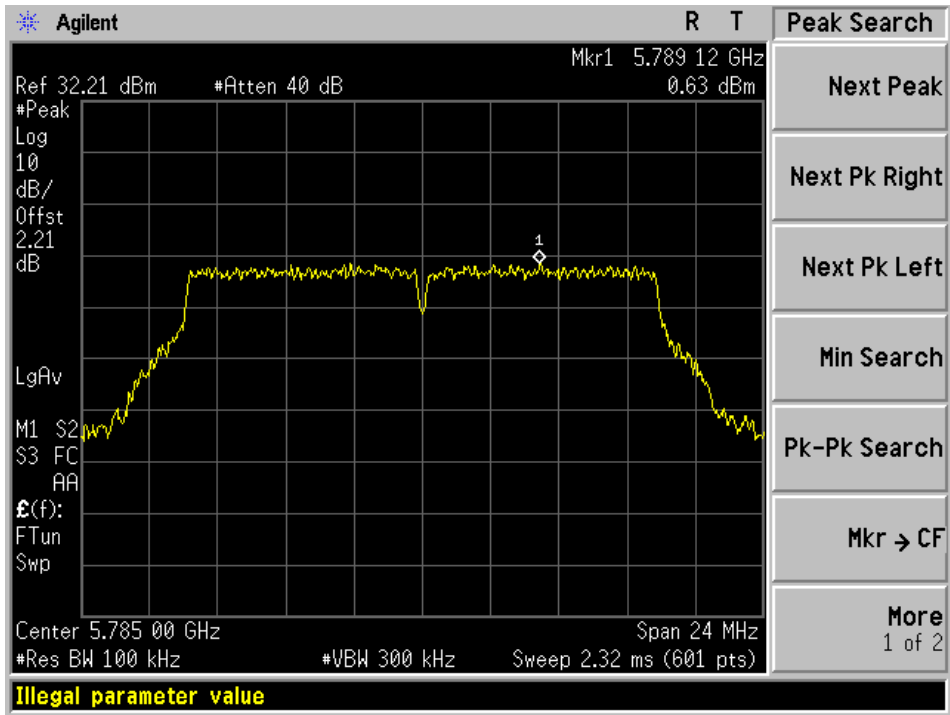


802.11a mode Low Channel, Chain J3

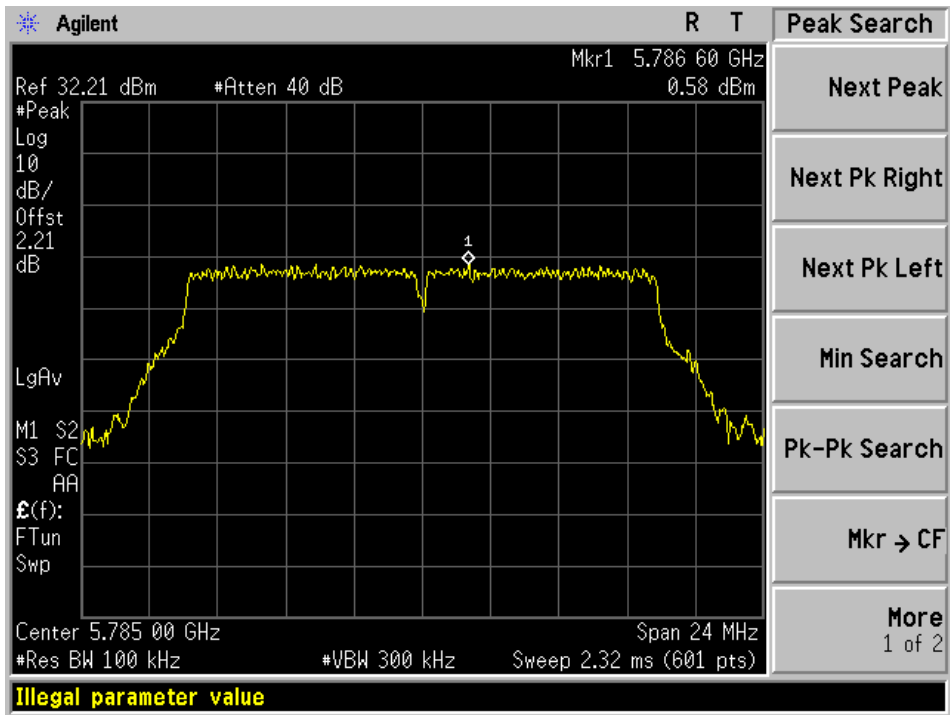


Chain J4 is not active during test

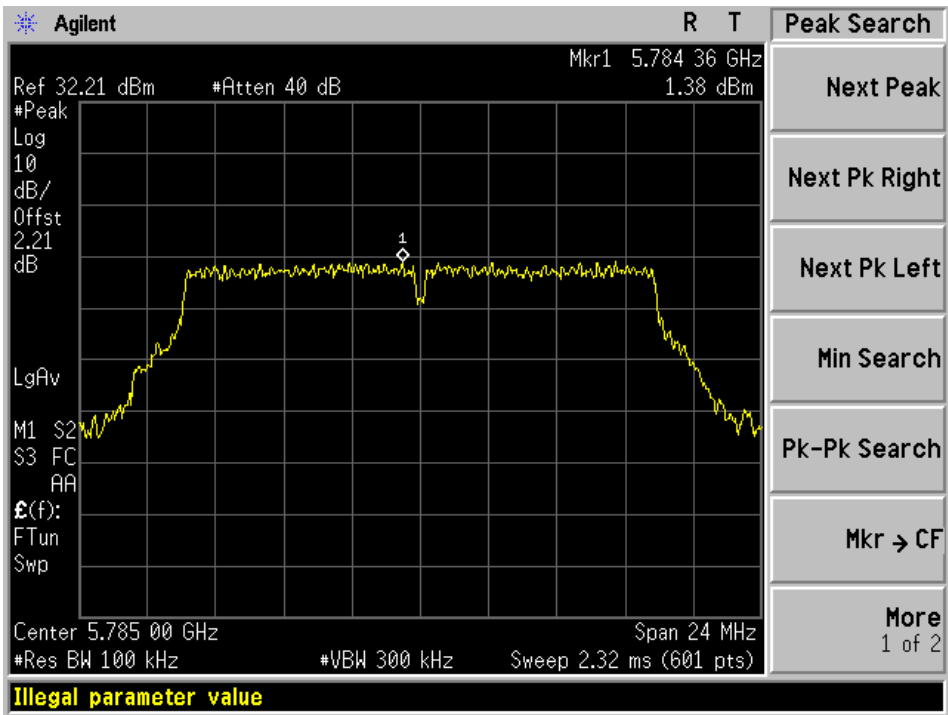
802.11a mode Middle Channel, Chain J1



802.11a mode Middle Channel, Chain J2

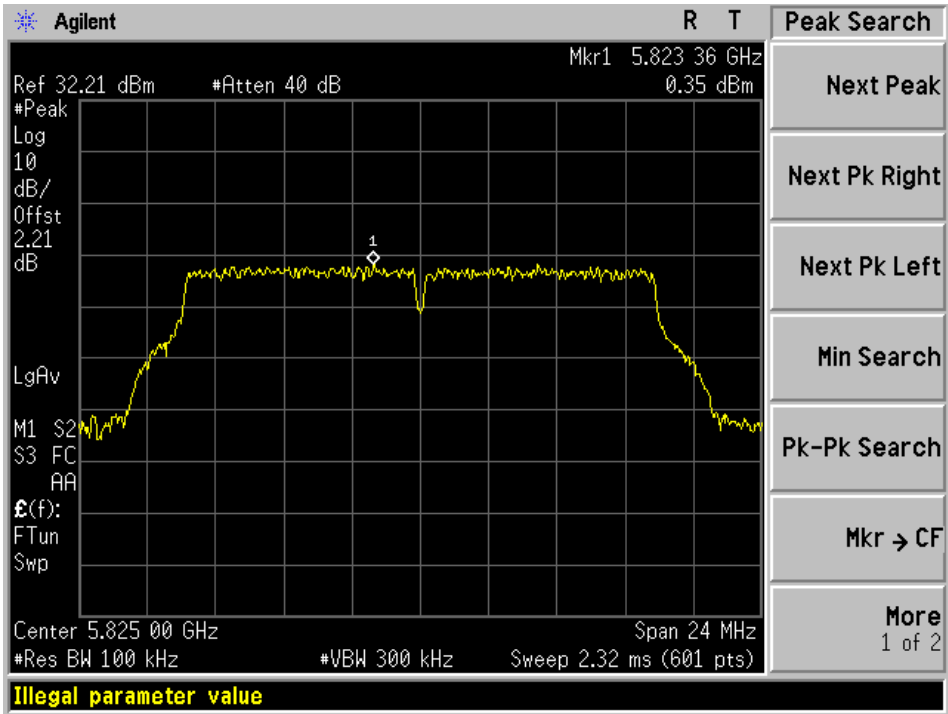


802.11a mode Middle Channel, Chain J3

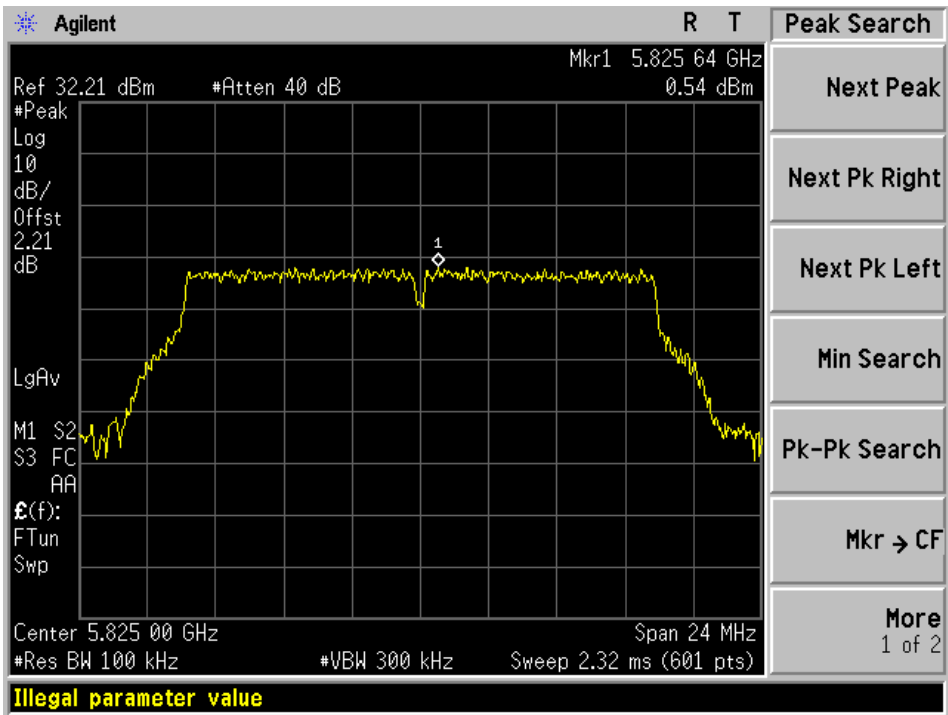


Chain J4 is not active during test

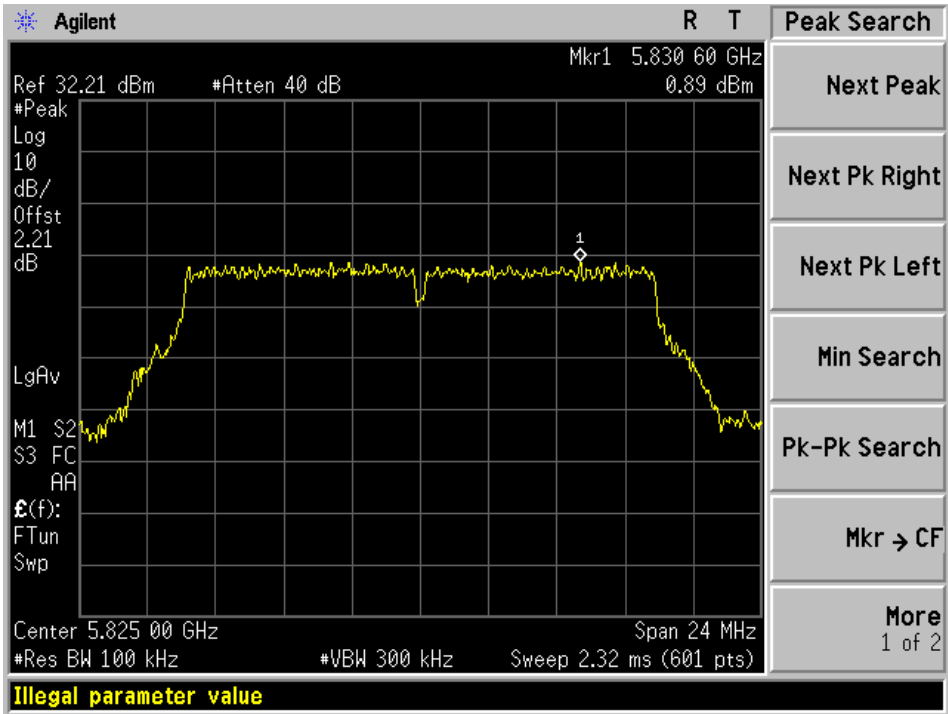
802.11a mode High Channel, Chain J1



802.11a mode High Channel, Chain J2

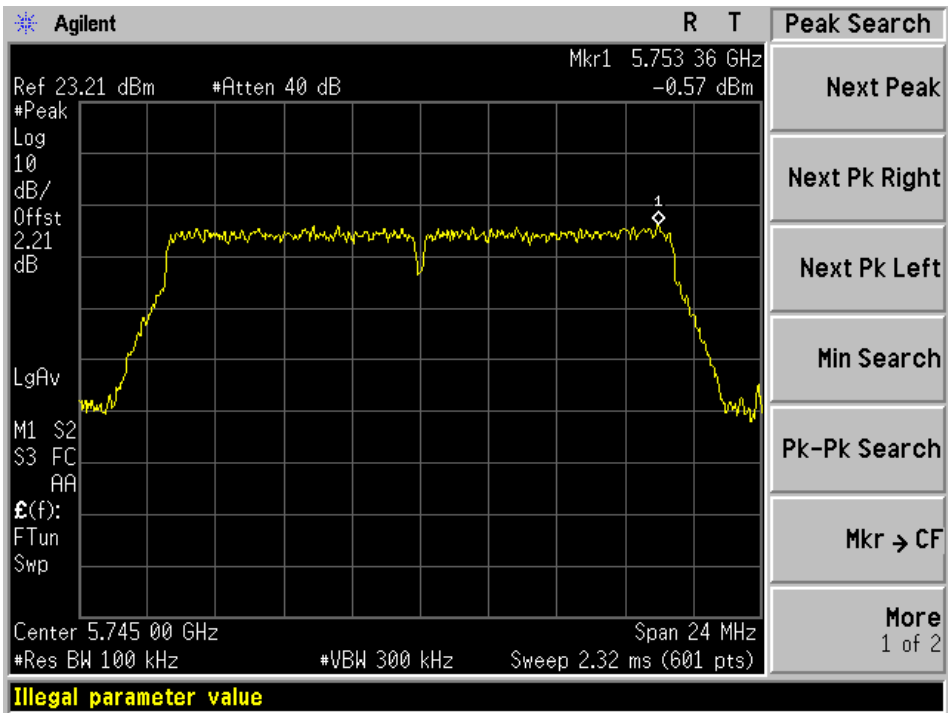


802.11a mode High Channel, Chain J3

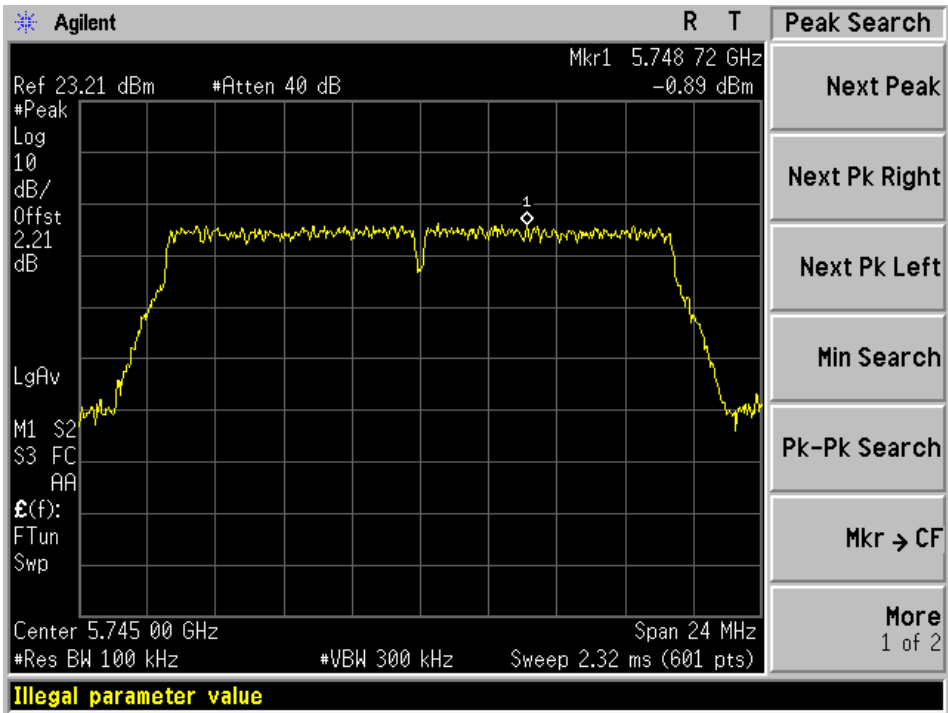


Chain J4 is not active during test

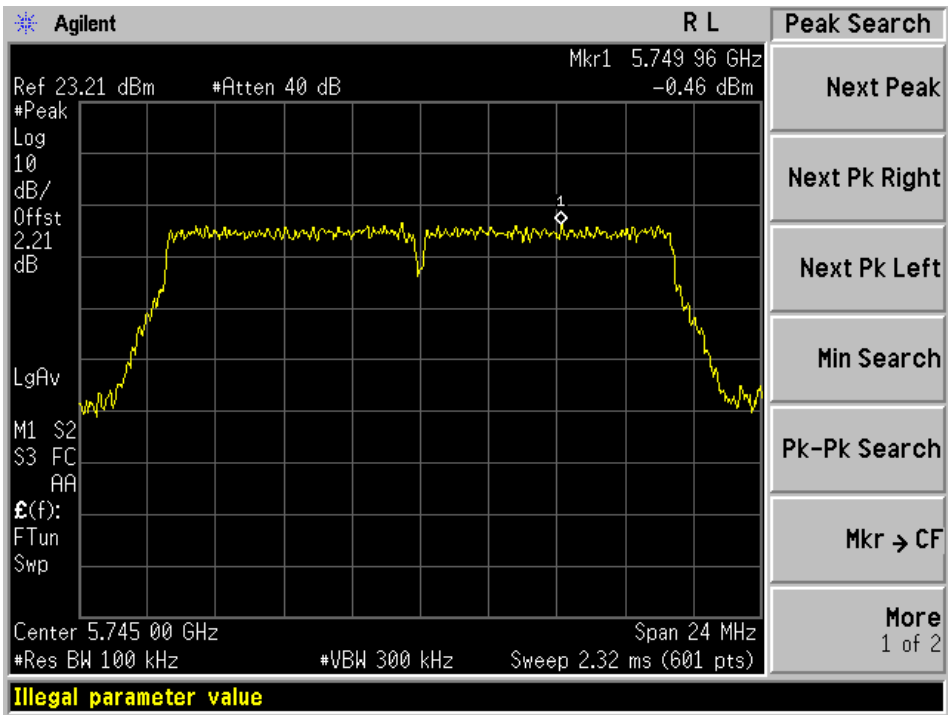
802.11n 20 MHz mode Low Channel, Chain J1



802.11n 20 MHz mode Low Channel, Chain J2

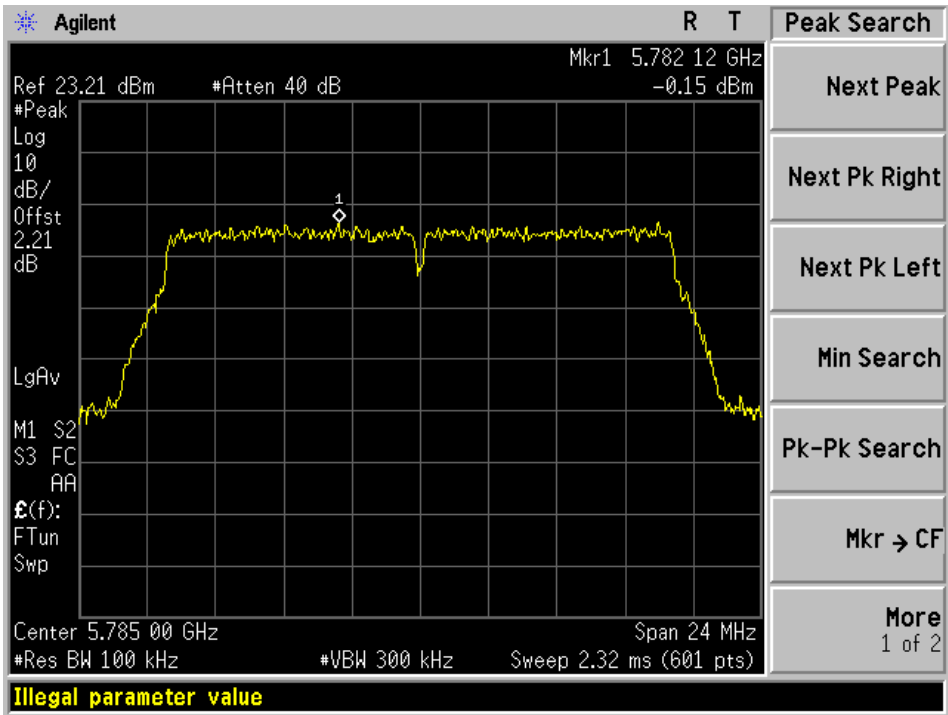


802.11n 20 MHz mode Low Channel, Chain J3

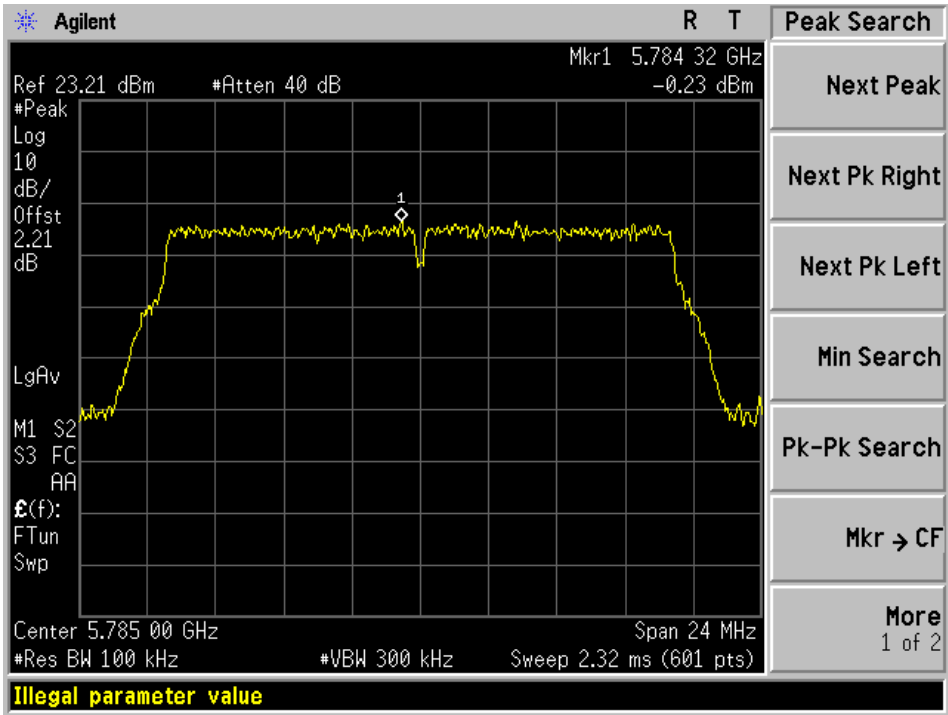


Chain J4 is not active during test

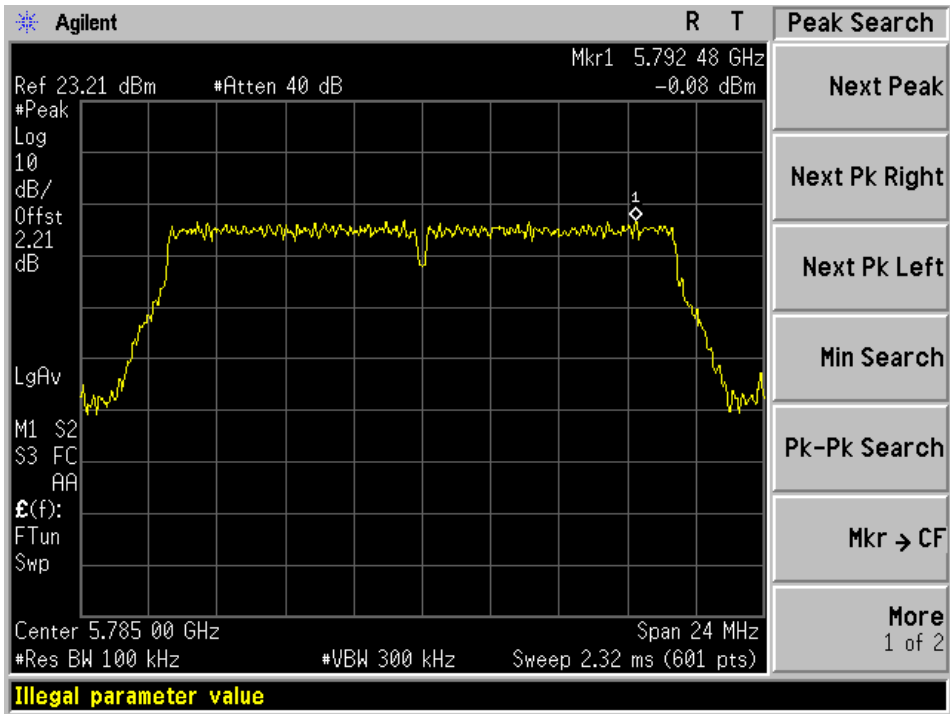
802.11n 20 MHz mode Middle Channel, Chain J1



802.11n 20 MHz mode Middle Channel, Chain J2

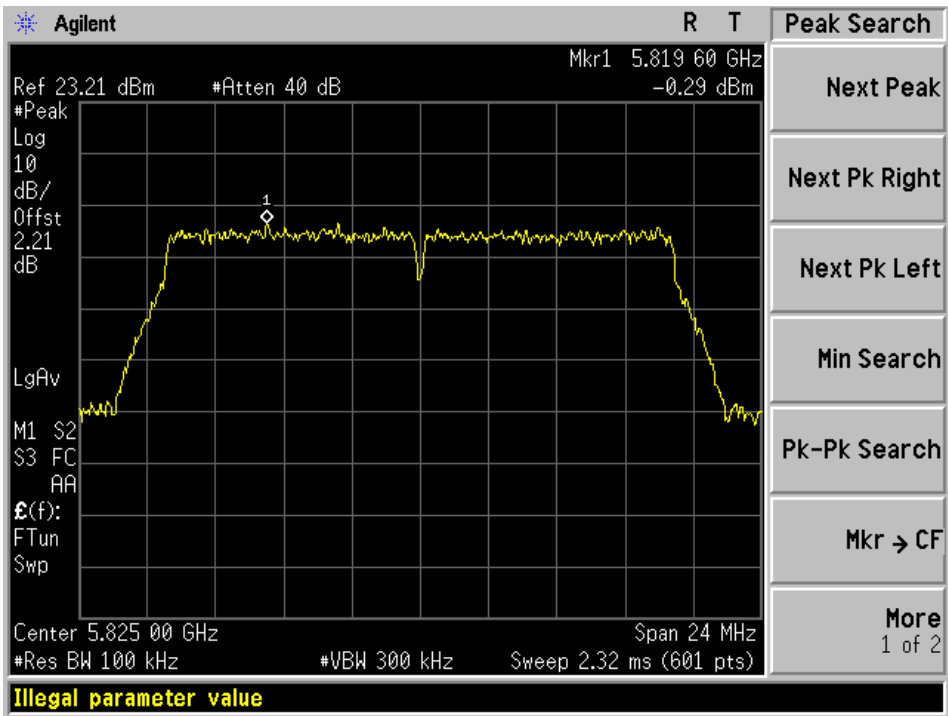


802.11n 20 MHz mode Middle Channel, Chain J3

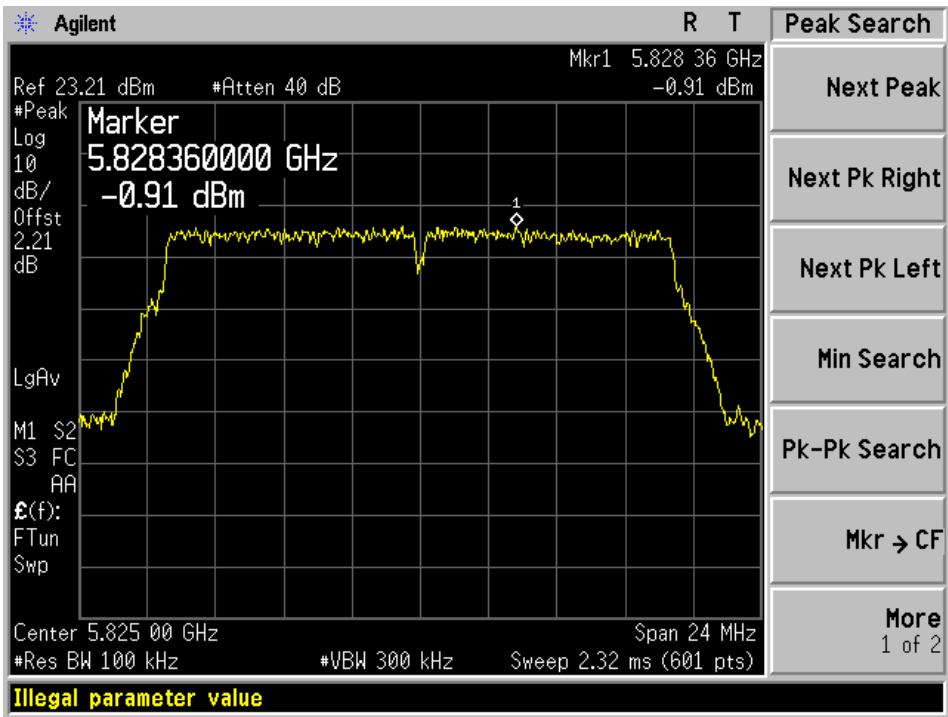


Chain J4 is not active during test

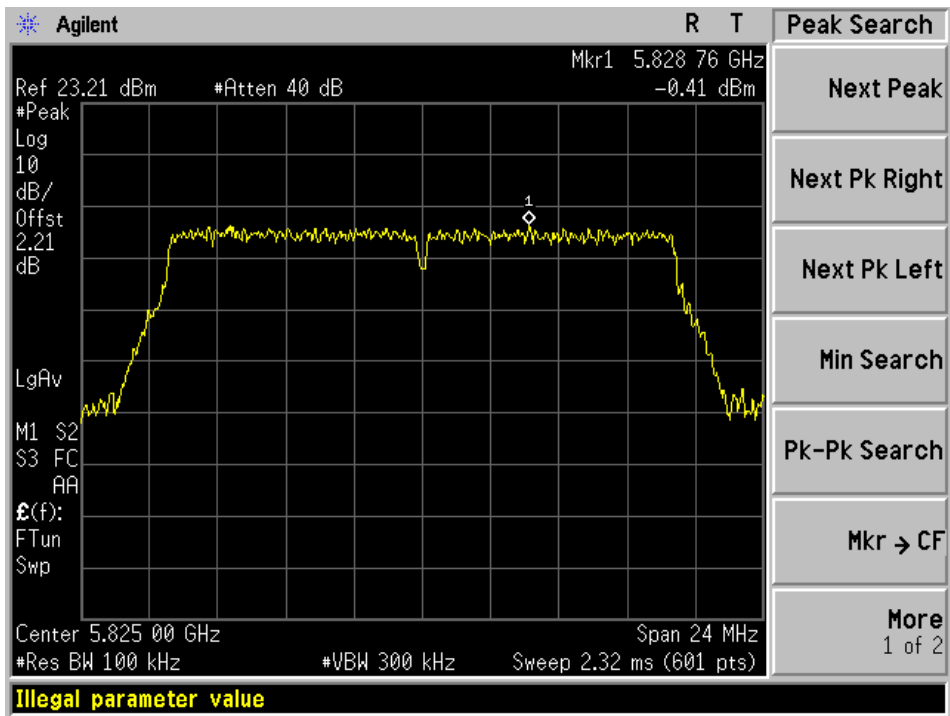
802.11n 20 MHz mode High Channel, Chain J1



802.11n 20 MHz mode High Channel, Chain J2

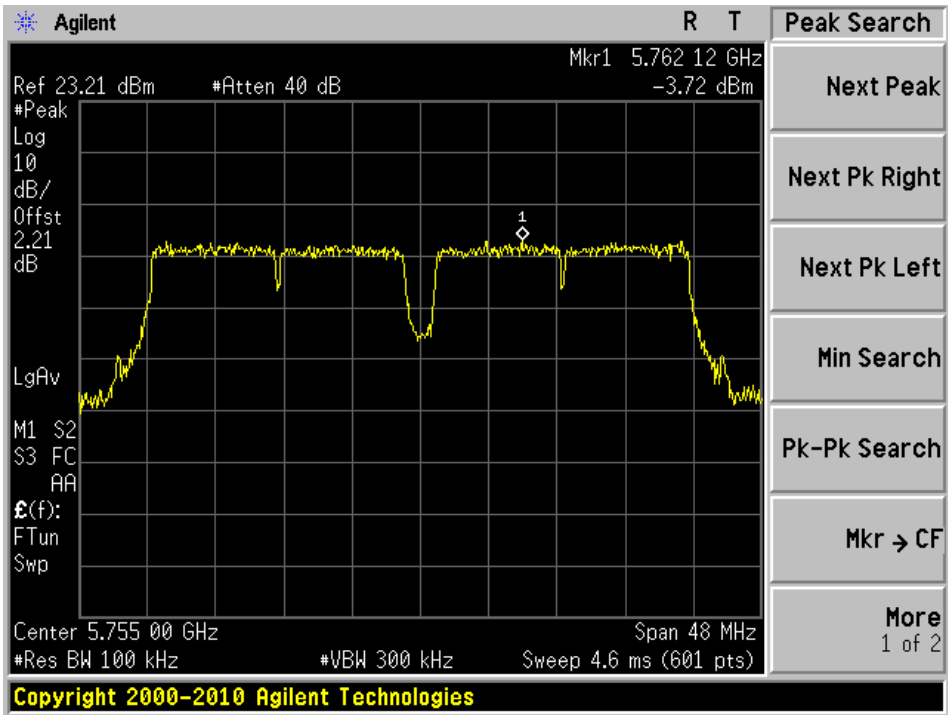


802.11n 20 MHz mode High Channel, Chain J3

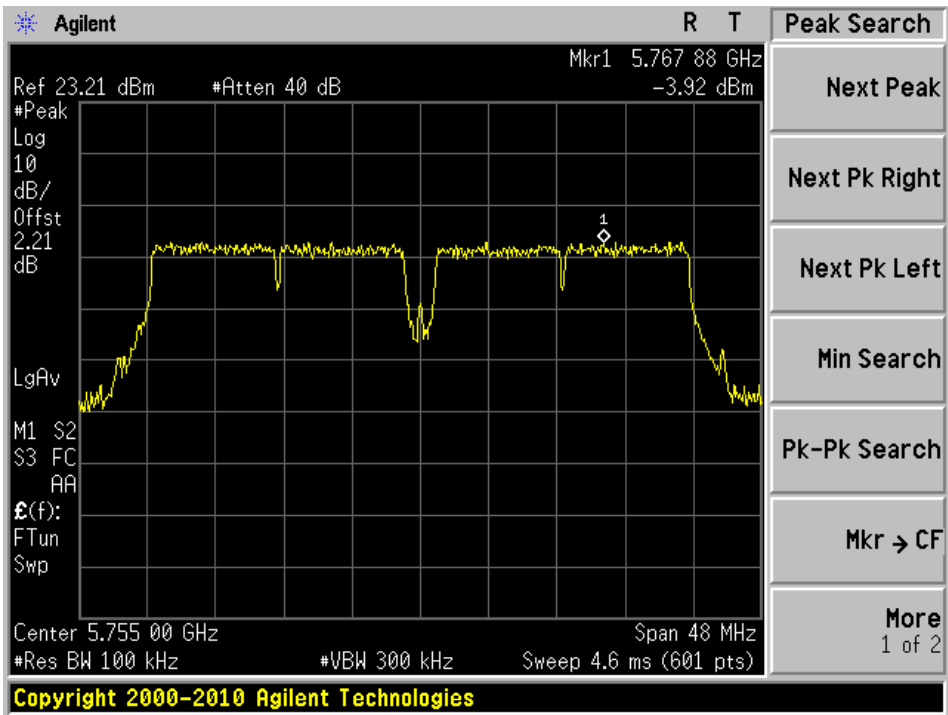


Chain J4 is not active during test

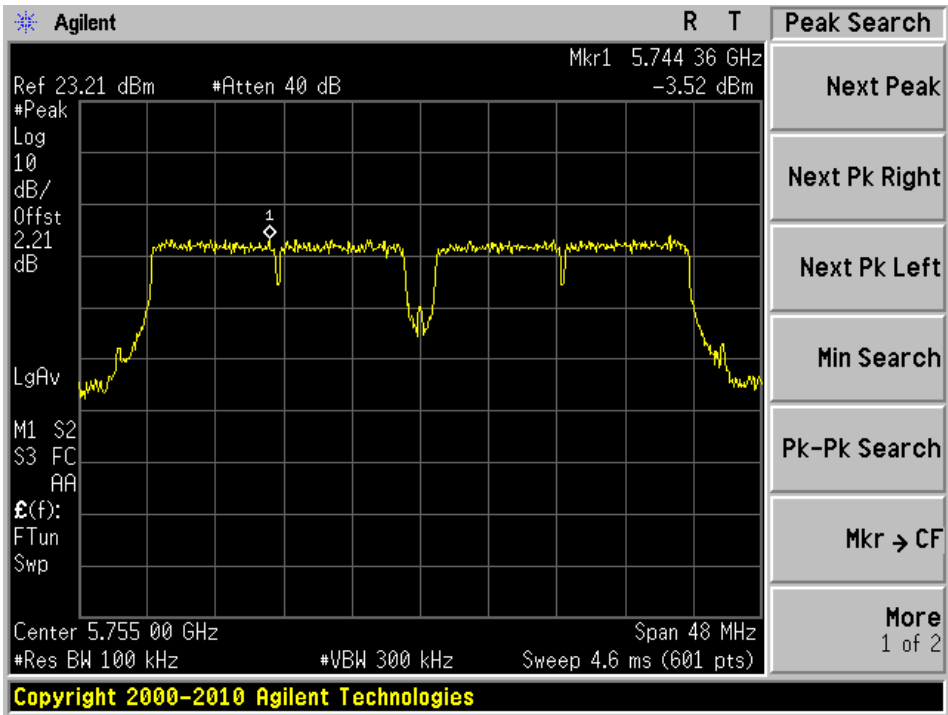
802.11n 40 MHz mode Low Channel, Chain J1



802.11n 40 MHz mode Low Channel, Chain J2

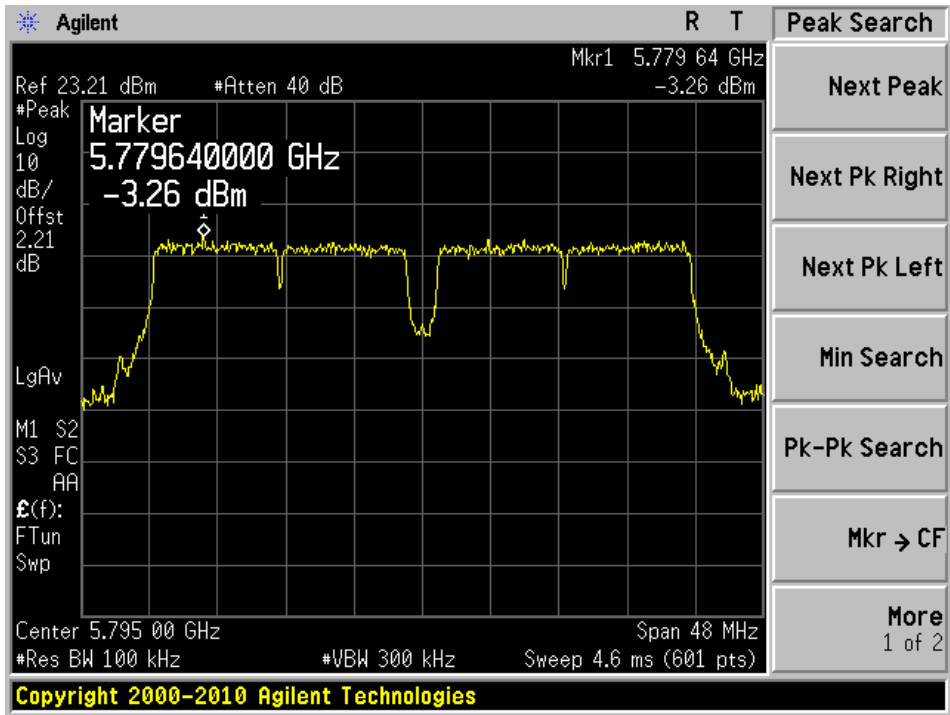


802.11n 40 MHz mode Low Channel, Chain J3

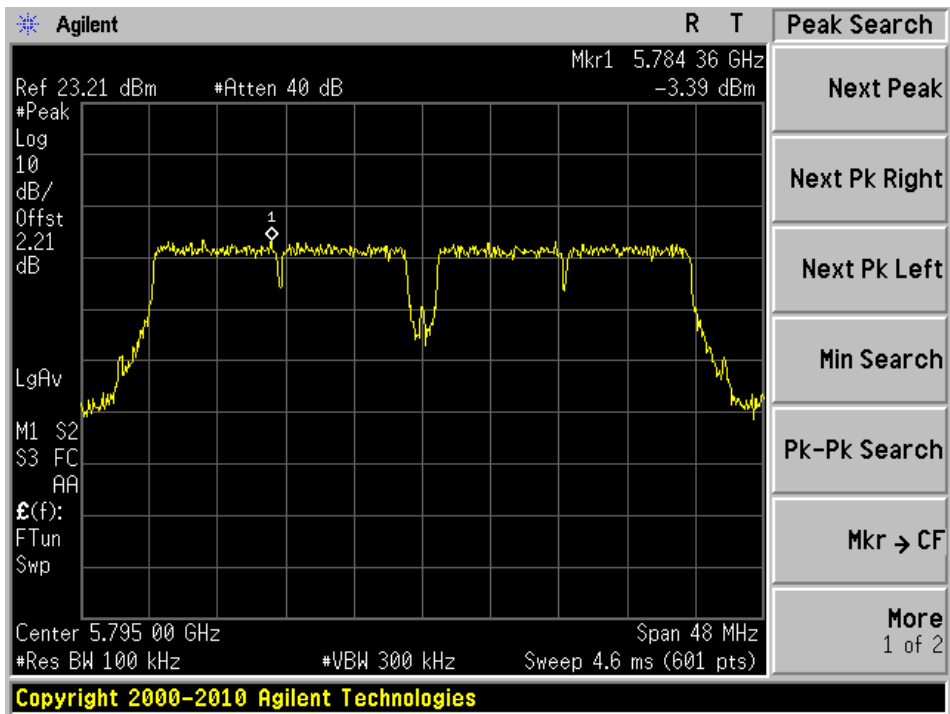


Chain J4 is not active during test

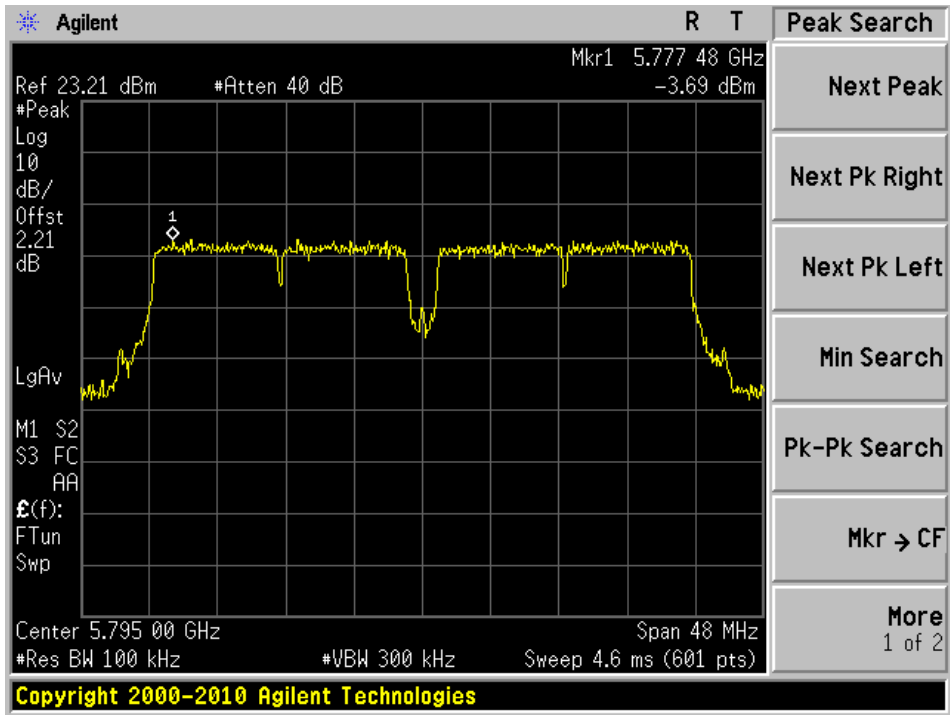
802.11n 40 MHz mode High Channel, Chain J1



802.11n 40 MHz mode High Channel, Chain J2



802.11n 40 MHz mode High Channel, Chain J3



Chain J4 is not active during test