FCC PART 15, SUBPART C
IC RSS-210, ISSUE 8, DECEMBER 2010

TEST AND MEASUREMENT REPORT

For

Ruckus Wireless, Inc.

350 West Java Drive, Sunnyvale, CA 94089, USA

Model: R500
FCC ID: S9GR500
IC: 5912A-R500

Report Type:	**Product Type:**
Original Report	802.11a/b/g/n/ac Wireless Access Point

Prepared By:	Chen Ge
Report Number:	R1403241-247 Rev B
Report Date:	2014-09-02
Reviewed By:	Ivan Cao RF Lead

Bay Area Compliance Laboratories Corp.
1274 Anvilwood Avenue,
Sunnyvale, CA 94089, USA
Tel: (408) 732-9162
Fax: (408) 732-9164

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1403241-247	Original Report	2014-08-08
1	R1403241-247 Rev A	Revised report to show similarity to product xClaim Xi-3	2014-08-18
2	R1403241-247 Rev B	Revised MPE	2014-09-02

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *Ruckus Wireless, Inc*., and their product model: *R500, FCC ID: S9GR500, IC: 5912A-R500* or the "EUT" as referred to in this report. The EUT is a dual band 2x2 MIMO 802.11 a/b/g/n/ac RLAN Access Point.

1.2 Mechanical Description of EUT

The EUT measures approximately 160 mm (L) x 160 mm (W) x 35 mm (H) and weighs approximately 400 g.

The data gathered are from a typical production sample provided by the manufacturer with serial number assigned by BACL: R1403241

1.3 Objective

This report is prepared on behalf of *Ruckus Wireless, Inc*. in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commissions rules and IC RSS-210 Issue 8, Dec 2010.

The objective is to determine compliance with FCC Part 15.247 and IC RSS-210 rule.

1.4 Related Submittal(s)/Grant(s)

FCC Part 15.407 NII, RSS-210 submissions with FCC ID: S9GR500, IC: 5912A-R500

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2009, 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 and FCC KDB 558074 D01 DTS Meas Guidance v03r01: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

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 CISPR16-4-2:2011, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$2.0 dB for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

1.7 Test Facility

Bay area compliance Laboratories Corp. (BACL) is:
1- An independent Commercial Test Laboratory accredited to **ISO 17025: 2005** by **A2LA**, in the fields of: Electromagnetic Compatibility & Telecommunications covering Emissions, Immunity, Radio, RF Exposure, Safety and Telecom. This includes NEBS (Network Equipment Building System), Wireless RF, Telecommunications Terminal Equipment (TTE); Network Equipment; Information Technology Equipment (ITE); Medical Electrical Equipment; Industrial, Commercial, and Medical Test Equipment; Professional Audio and Video Equipment; Electronic (Digital) Products; Industrial and Scientific Instruments; Cabled Distribution Systems and Energy Efficiency Lighting.

2- An ENERGY STAR Recognized Laboratory, for the LM80 Testing, a wide variety of Luminares and Computers.

3- A NIST Designated Phase-I and Phase-II CAB including: ACMA (Australian Communication and Media Authority), BSMI (Bureau of Standards, Metrology and Inspection of Taiwan), IDA (Infocomm Development Authority of Singapore), IC(Industry Canada), Korea (Ministry of Communications Radio Research Laboratory), NCC (Formerly DGT; Directorate General of Telecommunication of Chinese Taipei) OFTA (Office of the Telecommunications Authority of Hong Kong), Vietnam, VCCI - Voluntary Control Council for Interference of Japan and a designated EU CAB (Conformity Assessment Body) (Notified Body) for the EMC and R&TTE Directives.

4- A Product Certification Body accredited to **ISO Guide 65: 1996** by **A2LA** to certify:
1- Unlicensed, Licensed radio frequency devices and Telephone Terminal Equipment for the FCC. Scope A1, A2, A3, A4, B1, B2, B3, B4 & C.
2. Radio Standards Specifications (RSS) in the Category I Equipment Standards List and All Broadcasting Technical Standards (BETS) in Category I Equipment Standards List for Industry Canada.
3. Radio Communication Equipment for Singapore.
4. Radio Equipment Specifications, GMDSS Marine Radio Equipment Specifications, and Fixed Network Equipment Specifications for Hong Kong.
5. Japan MIC Telecommunication Business Law (A1, A2) and Radio Law (B1, B2 and B3).
6. Audio/Video, Battery Charging Systems, Computers, Displays, Enterprise Servers, Imaging Equipment, Set-Top Boxes, Telephony, Televisions, Ceiling Fans, CFLs (Including GU24s),Decorative Light Strings, Integral LED Lamps, Luminaires, Residential Ventilating Fans.

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 C63.4-2009, 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 C63.4-2009 and FCC KDB 558074 D01 DTS Meas Guidance v03r01.

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 test utility used was *R500 ART* was provided by Ruckus Wireless Inc., and was verified by *Chen Ge* to comply with the standard requirements being tested against.

2.3 Special Equipment

There were no special accessories were required, included, or intended for use with EUT during these tests.

2.4 Equipment Modifications

No modifications were made to the EUT.

2.5 Local Support Equipment

Manufacturer	Description	Model	Serial Number
Ruckus	DC Adaptor/POE	NPE-5818	740-64157-001
Ruckus	AC Adaptor	PA10244HUB	740-64125-010
Lenovo	Laptop	Ideapad U310	QB04927703

2.6 EUT Internal Configuration Details

Manufacturer	Description	Model	Serial Number
Ruckus	Main Board	ASM 120-11267-001 rev. 3.1	RUK03752

2.7 Interface Ports and Cables

Cable Description	Length (m)	From	To
RJ45	1m	DC Adaptor/POE	EUT
RJ45	1m	Laptop	DC Adaptor/POE

2.8 Power Supply List and Details

Manufacturer	Description	Model	Part Number
Ruckus	Power Supply cord	PA1024-4HU	-
Ruckus	POE Power Adapter	NPE-5818	740-64157-001

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 IC RSS-102	RF Exposure	Compliant
FCC §15.203 IC RSS-Gen §7.1.2	Antenna Requirement	Compliant
FCC §15.207(a) IC RSS-Gen §7.2.4	AC Line Conducted Emissions	Compliant
FCC §15.247 (d) IC RSS-210 §A8.5	Spurious Emissions at Antenna Port	Compliant
FCC §15.205 IC RSS-210 §2.2	Restricted Bands	Compliant
FCC §15.209, §15.247 (d) IC RSS-210 §A8.5	Radiated Spurious Emissions	Compliant
FCC §15.247(a)(2) IC RSS-210 §A8.2	6 dB Emission Bandwidth	Compliant
FCC §15.247(b)(3) IC RSS-210 §A8.4	Maximum Peak Output Power	Compliant
FCC §15.247(d) IC RSS-210 §A8.5	100 kHz Bandwidth of Frequency Band Edge	Compliant
FCC §15.247(e) IC RSS-210 §A8.2(b)	Power Spectral Density	Compliant

4 FCC §15.247 (i), §2.1091 & IC RSS-102 – 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.

According to IC RSS-102 Issue 2 section 4.1, RF limits used for general public will be applied to the EUT.

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Time Averaging (min)
0.003 - 1	280	2.19	-	6
1 - 10	280 / f	2.19 / f	-	6
10 - 30	28	2.19 / f	-	6
30 – 300	28	0.073	2*	6
300 – 1 500	$1.585\ f^{0.5}$	$0.0042\ f^{0.5}$	f / 150	6
1 500 – 15 000	61.4	0.163	10	6
15 000 – 150 000	61.4	0.163	10	$616000 / f^{1.2}$
150 000- 300 000	$0.158\ f^{0.5}$	$4.21 \times 10\ -4\ f^{0.5}$	$6.67 \times 10^{-5}\ f$	$616000 / f^{1.2}$

Note: f is frequency in MHz
* = Power density limit is applicable at frequencies greater than 100 MHz

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:

Maximum peak output power at antenna input terminal (dBm):	23.12
Maximum peak output power at antenna input terminal (mW):	205.1162
Prediction distance (cm):	20
Prediction frequency (MHz):	2437
Maximum Antenna Gain, typical (dBi):	1.0
Maximum Antenna Gain (numeric):	1.258
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.0513
Power density of prediction frequency at 20.0 cm (W/m^2):	0.513
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0
MPE limit for uncontrolled exposure at prediction frequency (W/m^2):	10

5.8 GHz band:

Maximum peak output power at antenna input terminal (dBm):	25.14
Maximum peak output power at antenna input terminal (mW):	326.5878
Prediction distance (cm):	20
Prediction frequency (MHz):	5785
Maximum Antenna Gain, typical (dBi):	3.0
Maximum Antenna Gain (numeric):	1.995
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.1296
Power density of prediction frequency at 20.0 cm (W/m^2):	1.296
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0
MPE limit for uncontrolled exposure at prediction frequency (W/m^2):	10

The total exposure level of 2.4 GHz and 5.8 GHz band co-location at 20 cm distance is 0.1296+0.0513= 0.1809 mW/cm^2 (1.809 W/m^2) which is less than limit of 1.0 mW/cm^2 (10 W/m^2)

5 FCC §15.203 & IC RSS-Gen §7.1.2 – 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.

According to IC RSS-Gen §7.1.2: Transmitter Antenna

A transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

5.2 Antenna information

Manufacturers	Antenna Type/Pattern	Antenna Gain (dBi) @ 2.4 GHz
Ruckus	Internal PCB	1.0

The antenna is an internal antenna with less 6 dBi gain; therefore, it complies with the antenna requirement. Please refer to the internal photos.

6 FCC §15.207 & IC RSS-Gen §7.2.4 – AC Line Conducted Emissions

6.1 Applicable Standards

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 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

As per IC RSS-Gen §7.2.4 Conducted limits:

Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with abattery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The more stringent limit applies at the frequency range boundaries. The conducted emissions shall be measured with a 50 ohm/50 microhenry line impedance stabilization network (LISN).

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 C63.4-2009 measurement procedure. The specification used was FCC §15.207 and IC RSS-Gen §7.2.4 limits.

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

The POE power adapter of the EUT was connected with LISN which provided 120 V / 60 Hz AC power.

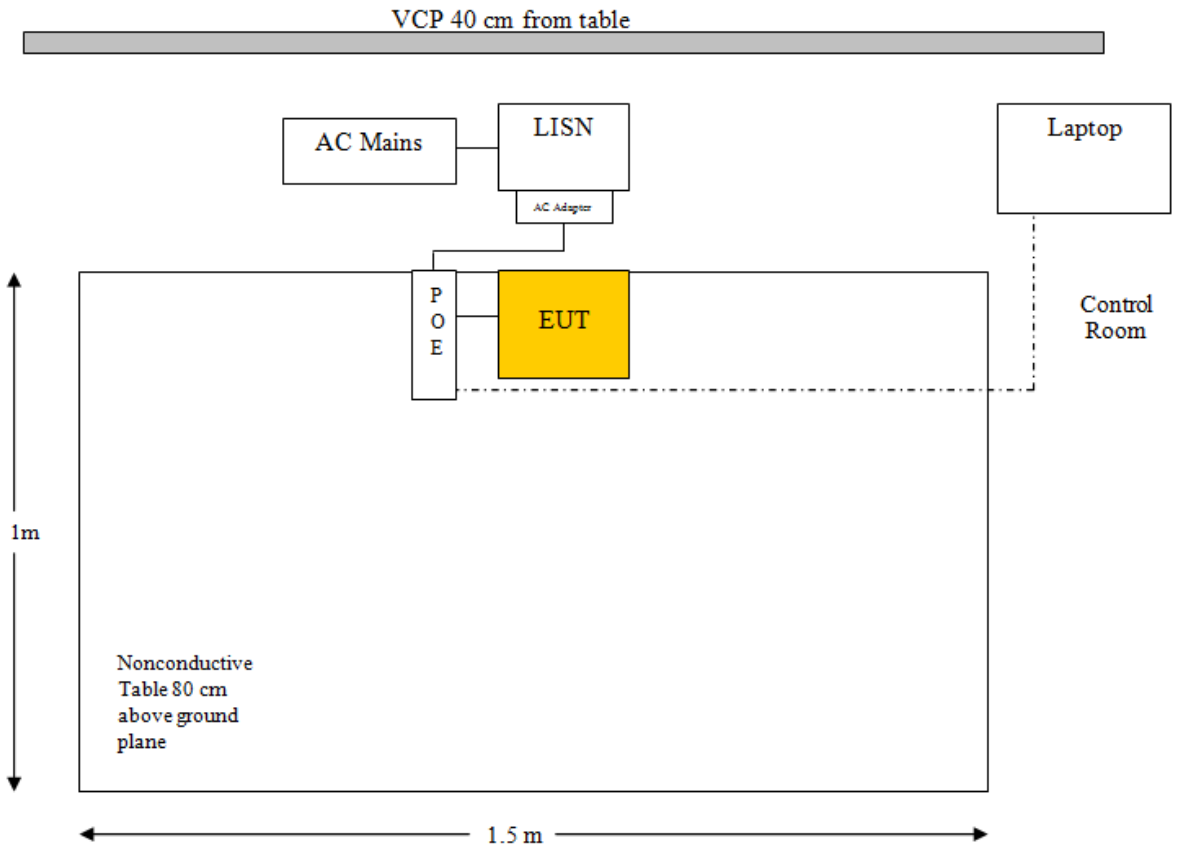
6.3 Test Procedure

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

POE



6.5 Corrected Amplitude & Margin Calculation

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

CA = Ai + CL + Atten

For example, a corrected amplitude of 46.2 dBuV = Indicated Reading (32.5 dBuV) + Cable Loss (3.7 dB) + Attenuator (10 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:

Margin = Corrected Amplitude - Limit

6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2014-03-28	1 year
Solar Electronics	LISN	9252-50-R-24-N	511205	2014-06-25	1 year
TTE	Filter, High Pass	H9962-150K-50-21378	K7133	2014-05-30	1 year

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:	26º C
Relative Humidity:	46 %
ATM Pressure:	101.62 kPa

The testing was performed by Chen Ge on 2014-07-07 in 5 m chamber 3.

6.8 Summary of Test Results

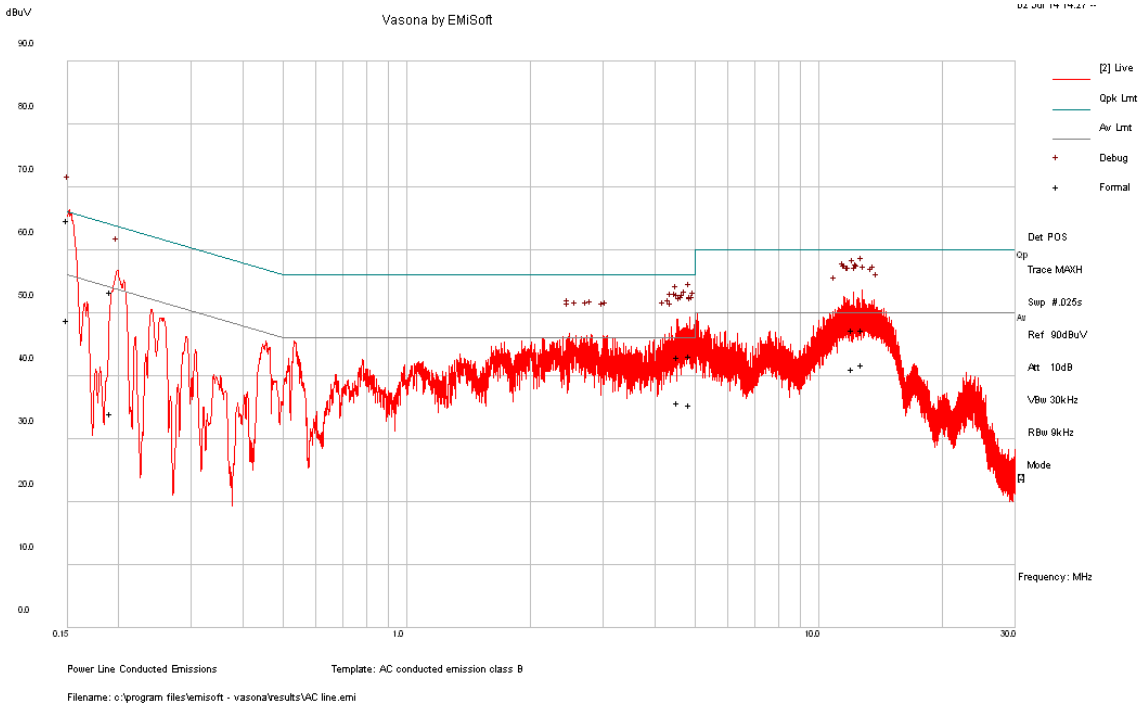
According to the recorded data in following table, the EUT complied with the FCC/IC standard's conducted emissions limits, with the margin reading of:

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-0.49	0.1505	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

Worst case: 2.4 GHz and 5 GHz transmitting at same time

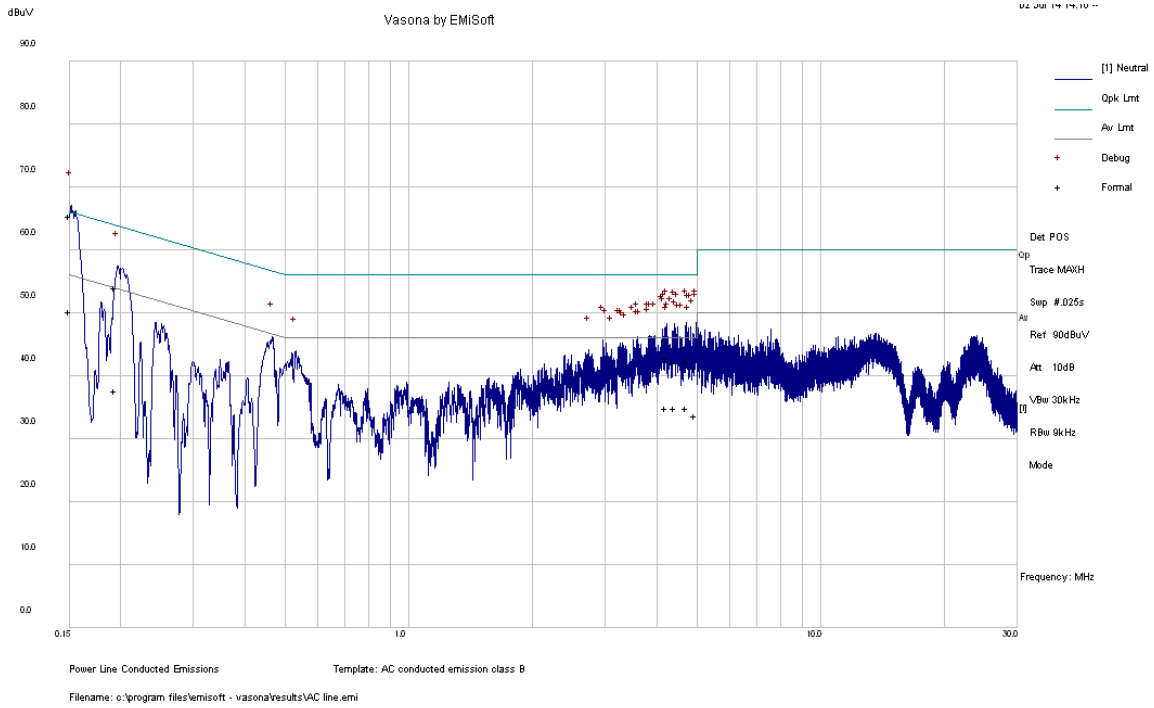
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.150032	64.8	Line	66	-1.2	QP
12.76115	47.33	Line	60	-12.67	QP
4.877971	43.28	Line	56	-12.72	QP
12.12168	47.27	Line	60	-12.73	QP
0.191963	53.3	Line	63.95	-10.65	QP
4.544114	43	Line	56	-13	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.150032	48.96	Line	56	-7.04	Ave.
12.76115	41.74	Line	50	-8.26	Ave.
4.877971	35.47	Line	46	-10.53	Ave.
12.12168	41.07	Line	50	-8.93	Ave.
0.191963	34.05	Line	53.95	-19.9	Ave.
4.544114	35.71	Line	46	-10.29	Ave.

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.1505	65.48	Neutral	65.97	-0.49	QP
0.194094	54.01	Neutral	63.86	-9.85	QP
4.963619	41.26	Neutral	56	-14.74	QP
4.733461	42.4	Neutral	56	-13.6	QP
4.222255	42.89	Neutral	56	-13.11	QP
4.413713	42.11	Neutral	56	-13.89	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.1505	50.19	Neutral	55.97	-5.78	Ave.
0.194094	37.6	Neutral	53.86	-16.26	Ave.
4.963619	33.68	Neutral	46	-12.32	Ave.
4.733461	34.88	Neutral	46	-11.12	Ave.
4.222255	35	Neutral	46	-11	Ave.
4.413713	34.86	Neutral	46	-11.14	Ave.

7 FCC §2.1051, §15.247(d) & IC RSS-210 §A8.5 – Spurious Emissions at Antenna Terminals

7.1 Applicable Standard

For FCC §15.247(d) and IC RSS-210 §A8.5 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 30 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 measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r01: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 11: Emissions in non-restricted frequency bands and section 12: Emissions in restricted frequency bands.

7.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2013-09-29	1 year

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

7.4 Test Environmental Conditions

Temperature:	21-24º C
Relative Humidity:	40-43 %
ATM Pressure:	103.1-104.1 kPa

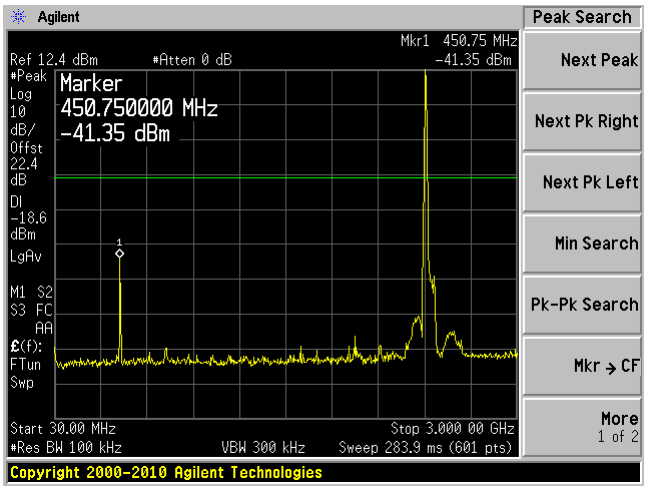
The testing was performed by Chen Ge on 2014-06-26 to 2014-06-27 at RF site.

7.5 Test Results

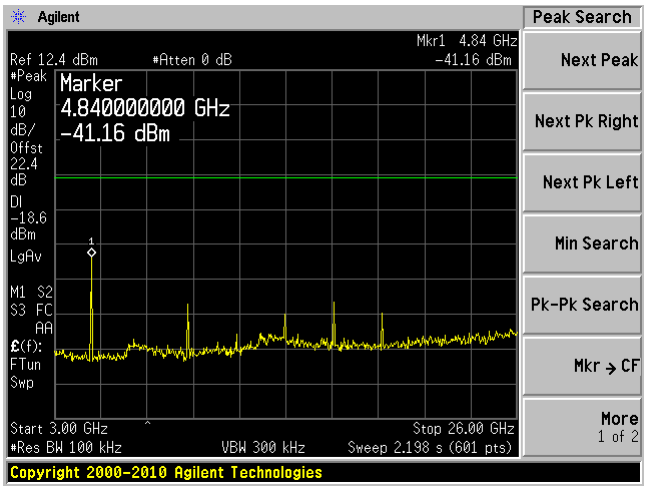
Please refer to following plots of spurious emissions.

802.11b, Low Channel, 2412 MHz

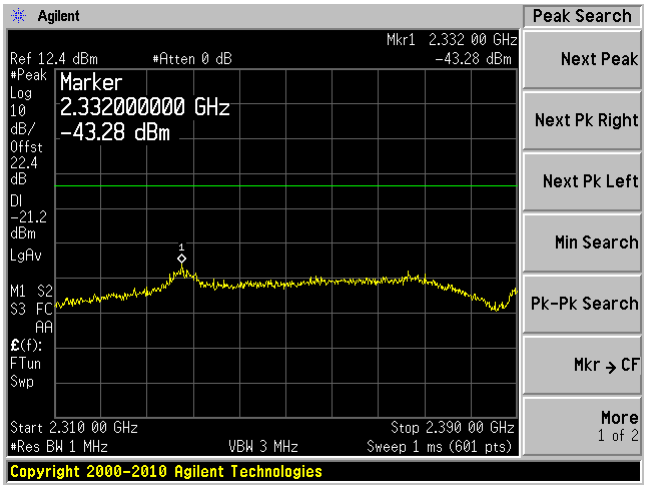
Chain J0, Plot: 30 MHz – 3 GHz



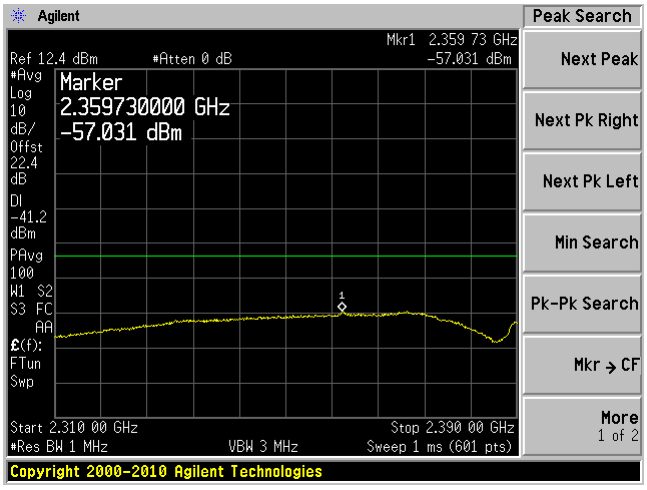
Chain J0, Plot: 3 GHz – 26 GHz



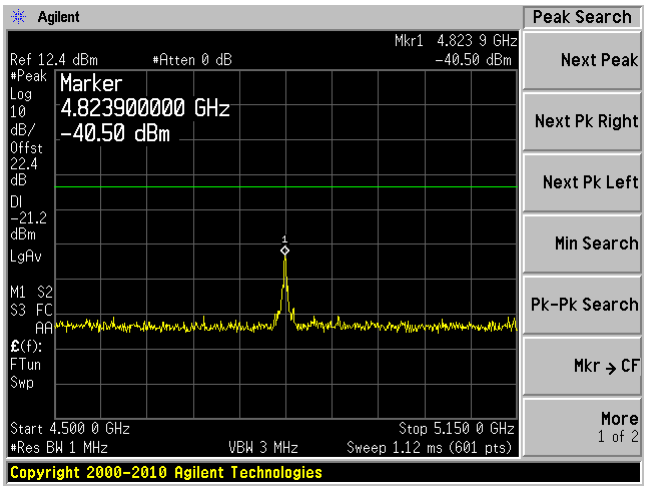
Chain J0, Plot: 2310 MHz – 2390 MHz Peak



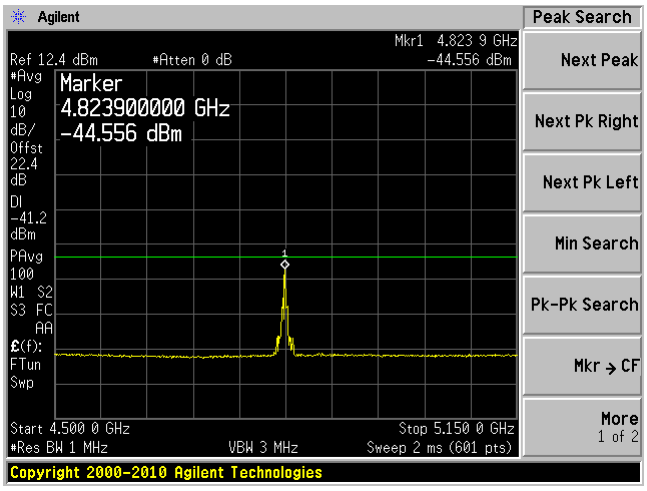
Chain J0, Plot: 2310 MHz – 2390 MHz Ave



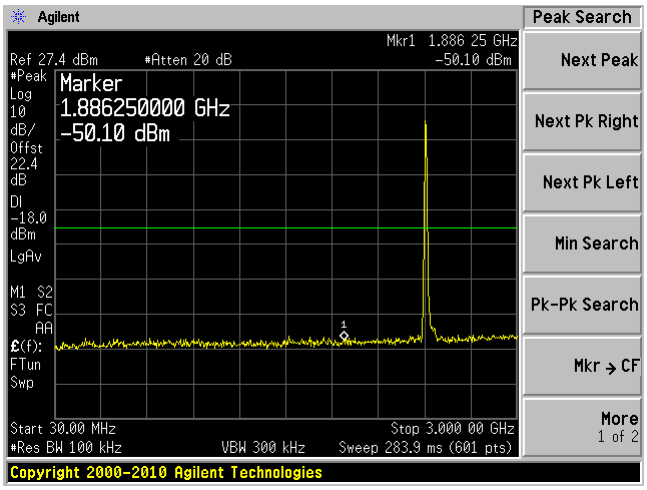
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



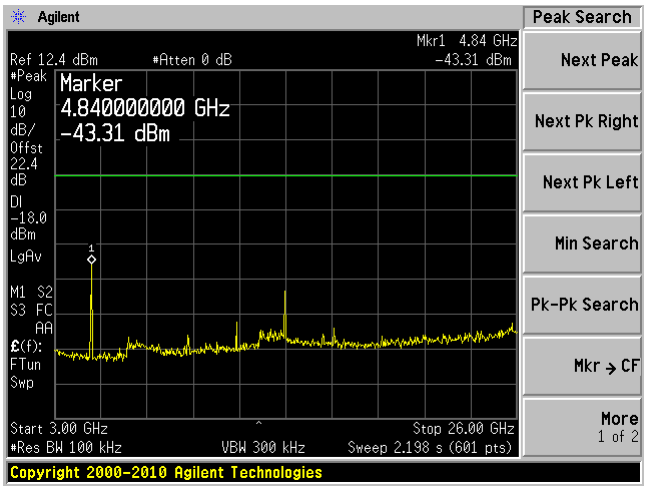
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



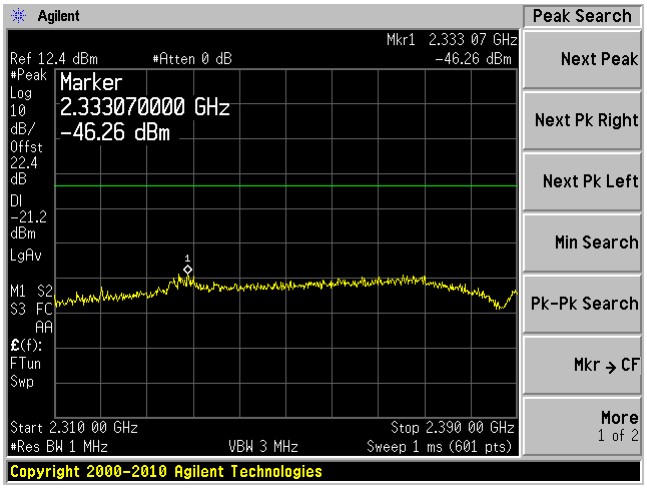
Chain J1, Plot: 30 MHz – 3 GHz



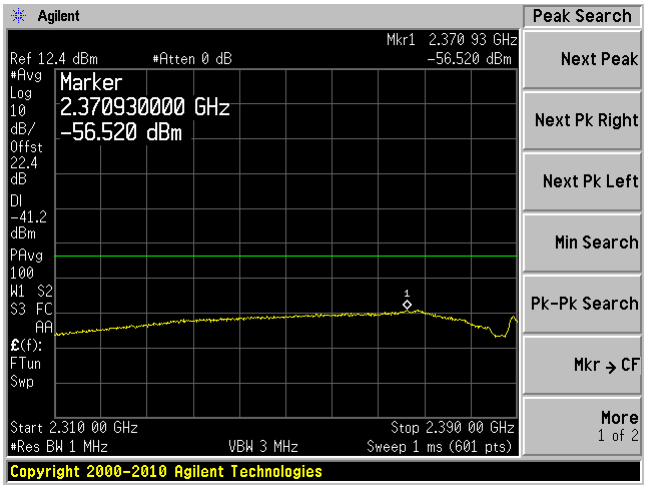
Chain J1, Plot: 3 GHz – 26 GHz



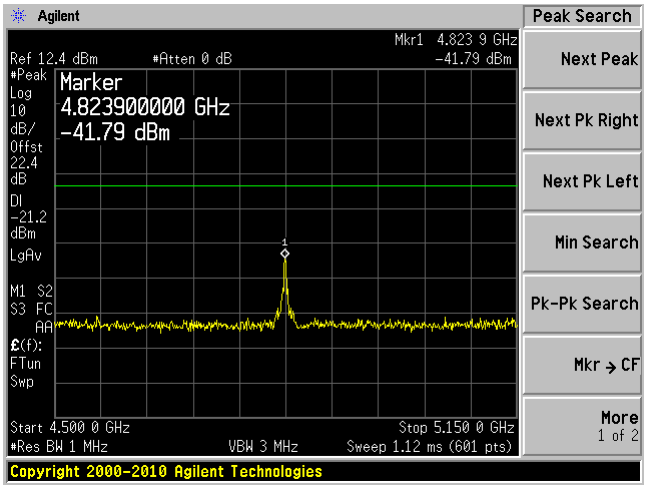
Chain J1, Plot: 2310 MHz – 2390 MHz Peak



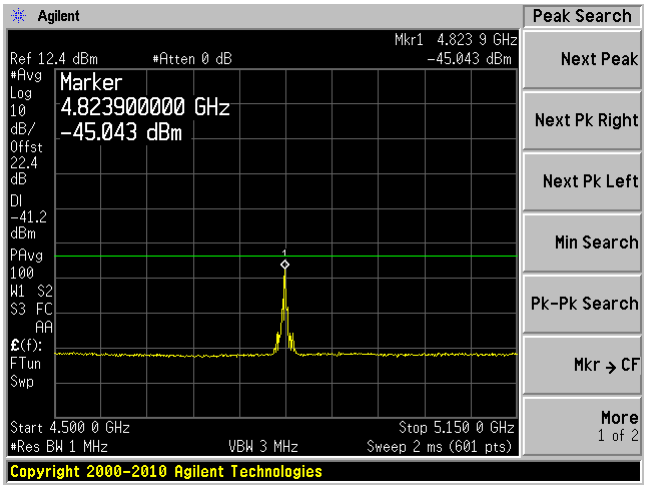
Chain J1, Plot: 2310 MHz – 2390 MHz Ave



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

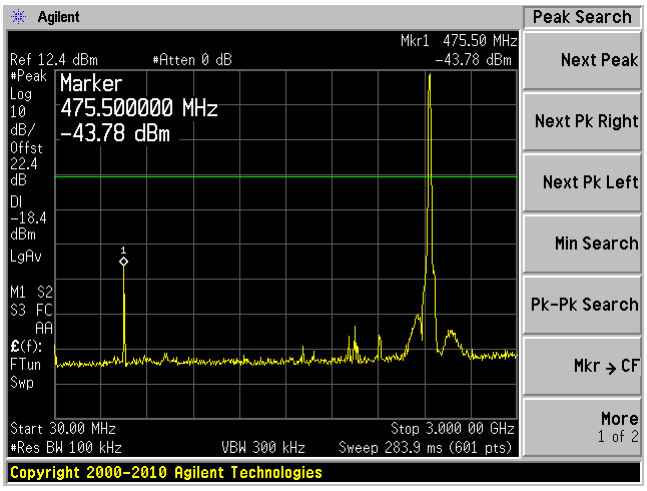


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

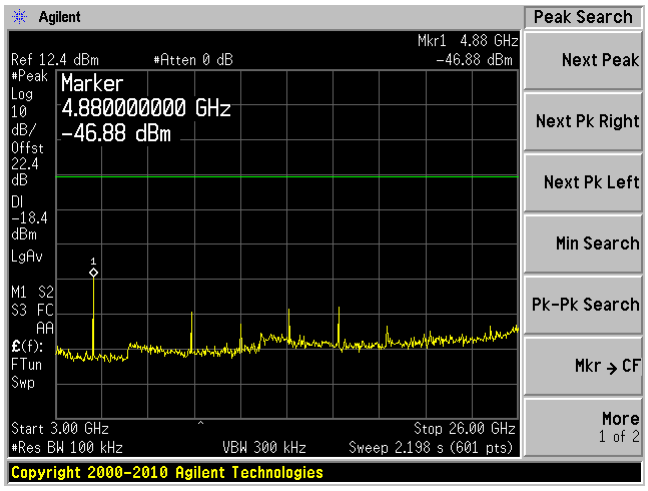


802.11b, Middle Channel, 2437 MHz

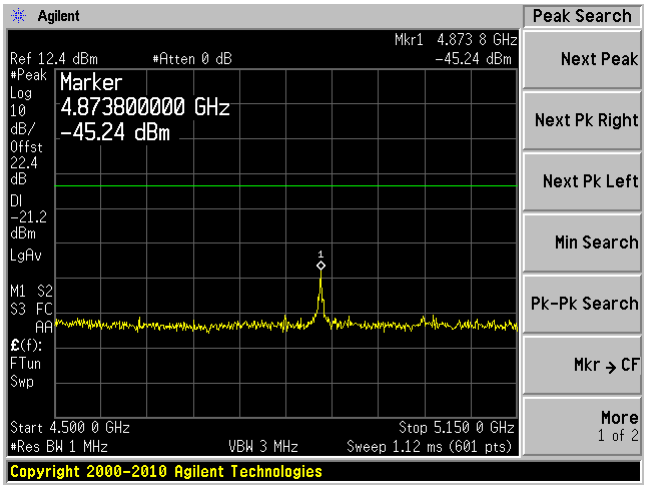
Chain J0, Plot: 30 MHz – 3 GHz



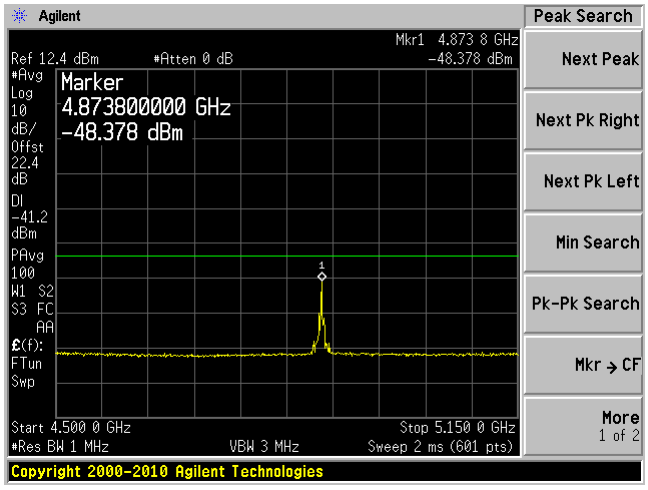
Chain J0, Plot: 3 GHz – 26 GHz



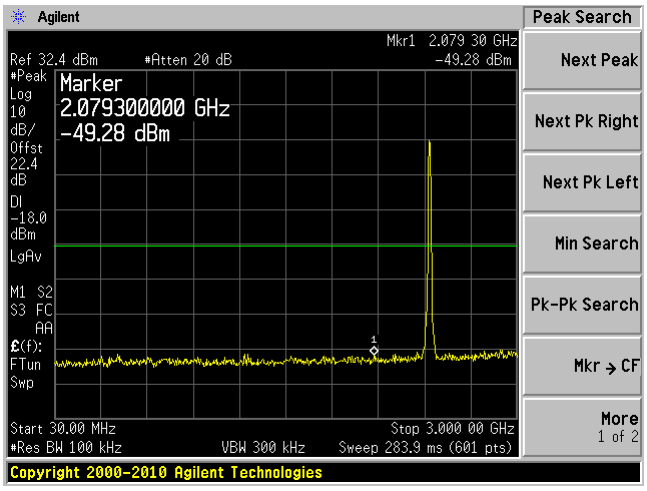
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



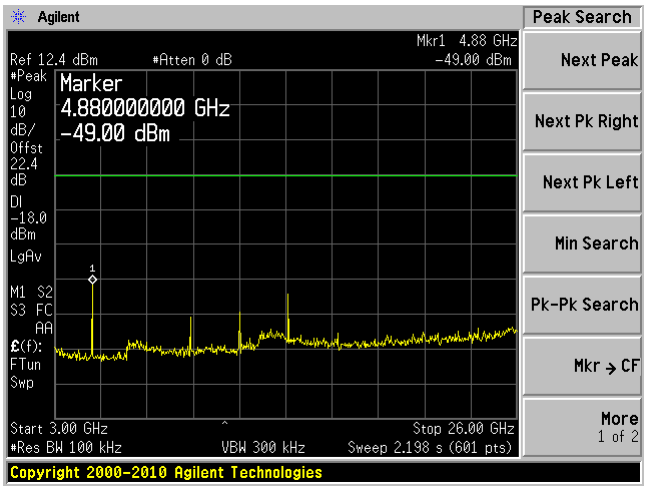
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



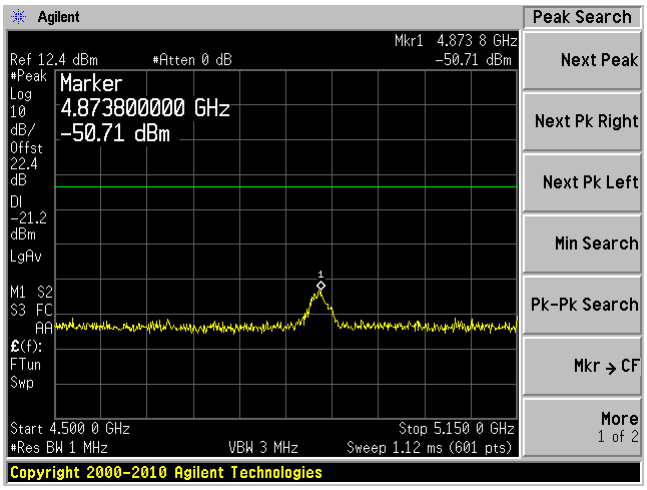
Chain J1, Plot: 30 MHz – 3 GHz



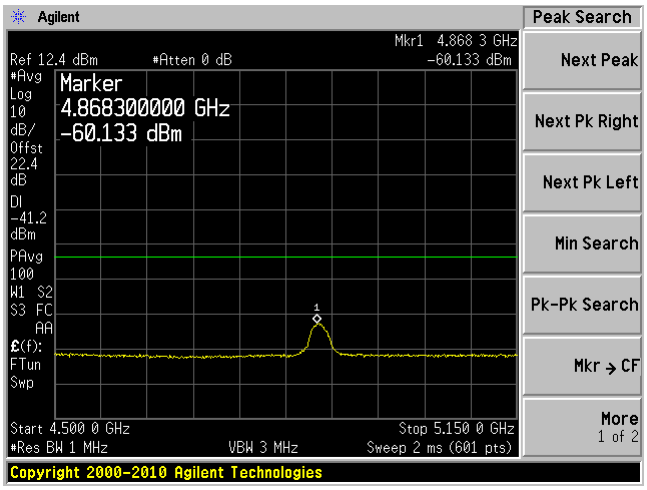
Chain J1, Plot: 3 GHz – 26 GHz



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

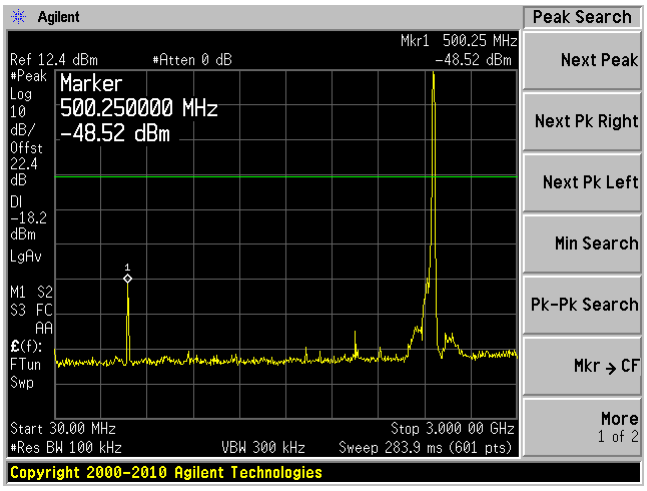


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

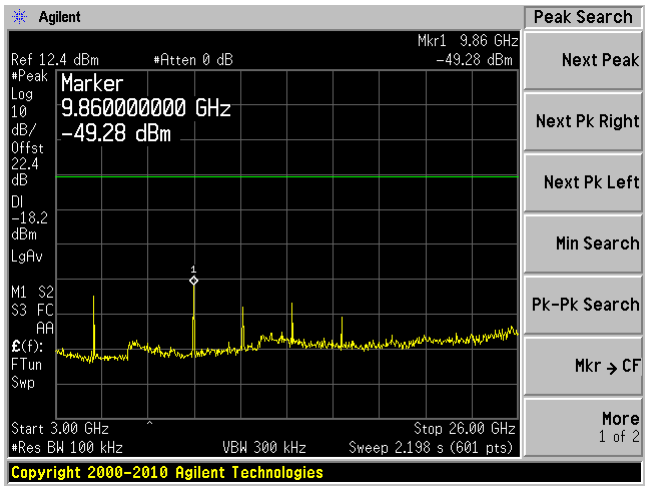


802.11b, High Channel, 2462 MHz

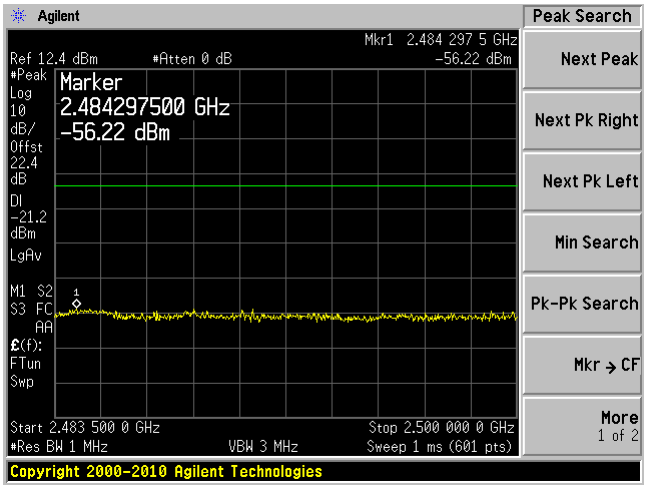
Chain J0, Plot: 30 MHz – 3 GHz



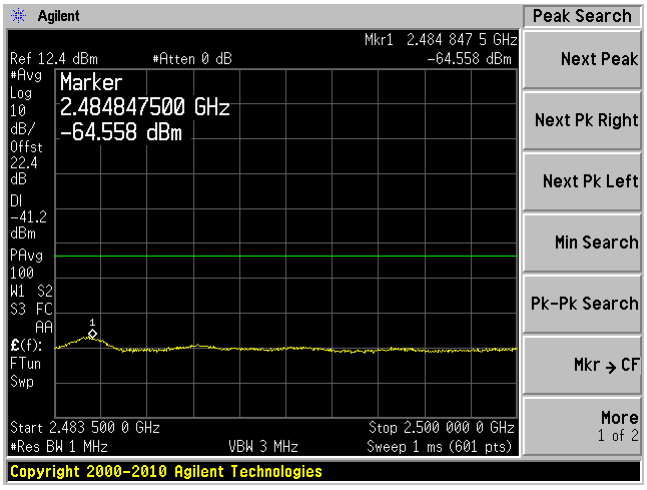
Chain J0, Plot: 3 GHz – 26 GHz



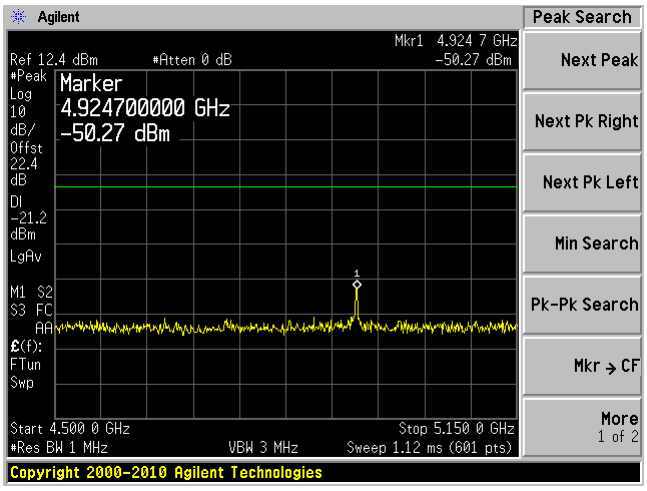
Chain J0, Plot: 2483.5 MHz – 2500 MHz Peak



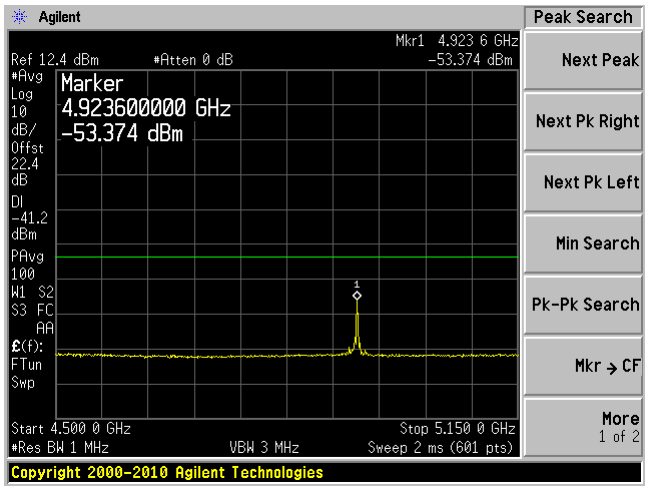
Chain J0, Plot: 2483.5 MHz – 2500 MHz Ave



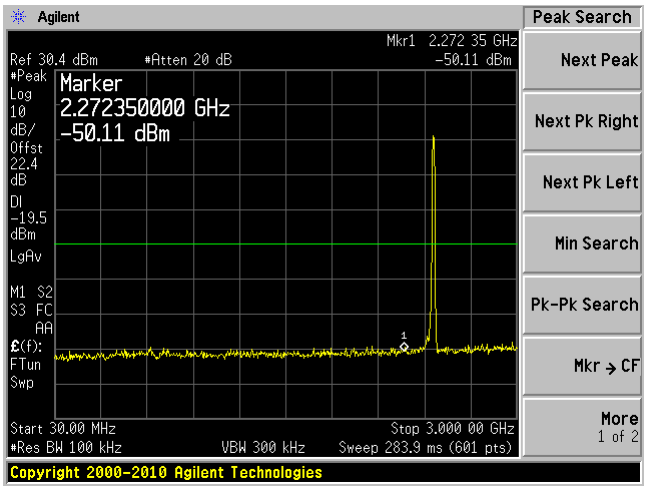
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



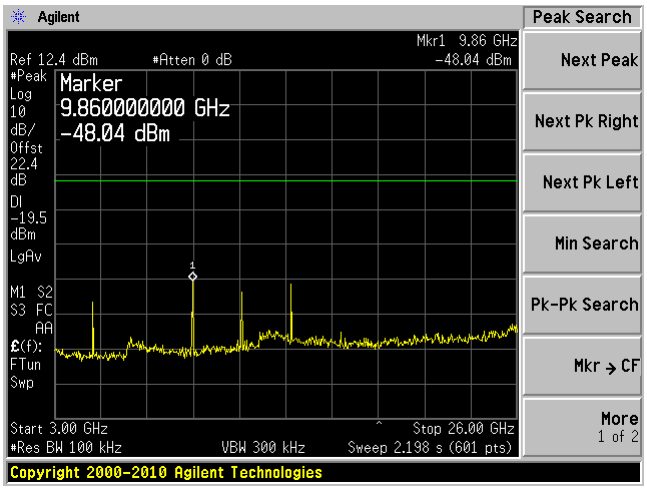
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



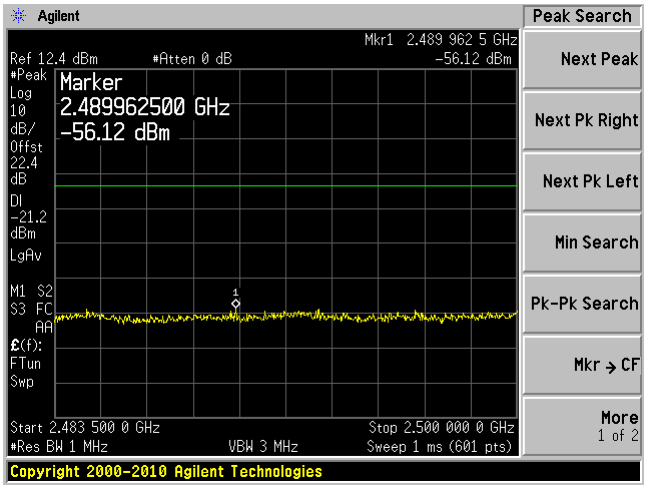
Chain J1, Plot: 30 MHz – 3 GHz



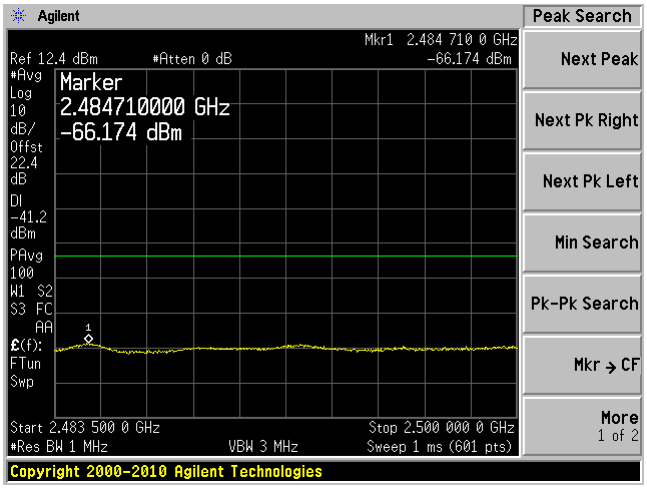
Chain J1, Plot: 3 GHz – 26 GHz



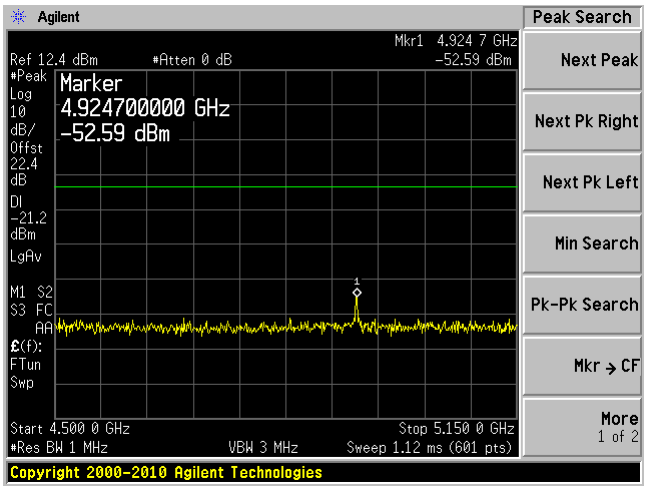
Chain J1, Plot: 2483.5 MHz – 2500 MHz Peak



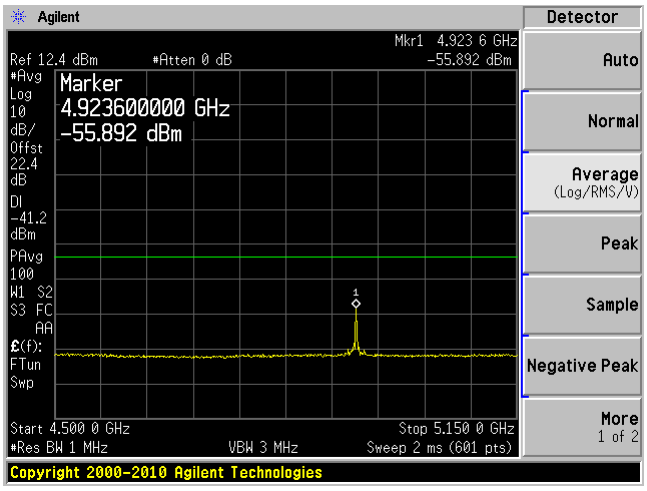
Chain J1, Plot: 2483.5 MHz – 2500 MHz Ave



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

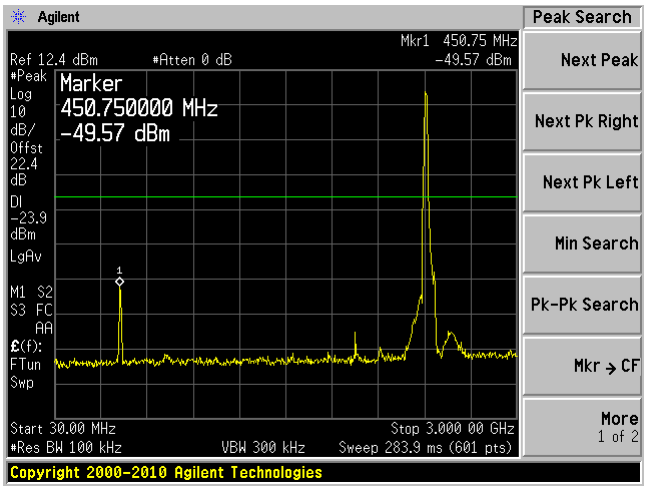


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

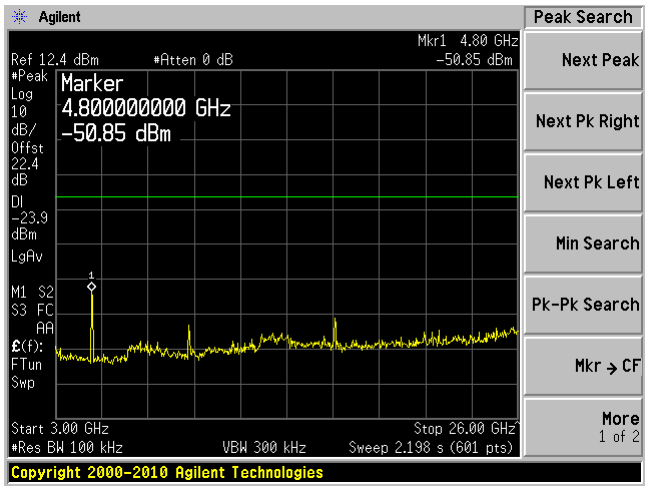


802.11g, Low Channel 2412 MHz

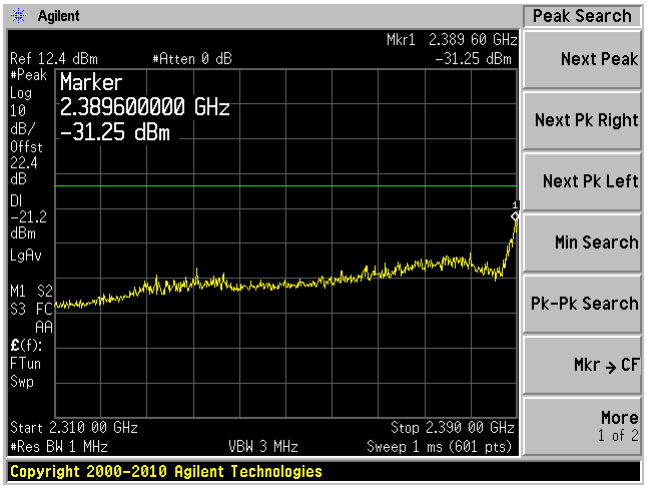
Chain J0, Plot: 30 MHz – 3 GHz



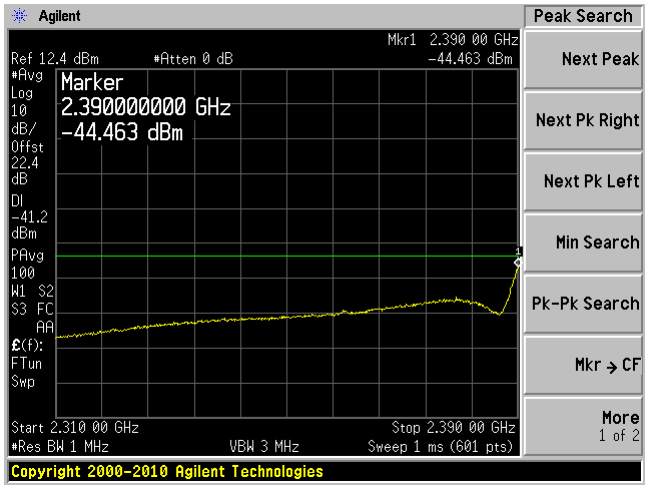
Chain J0, Plot: 3 GHz – 26 GHz



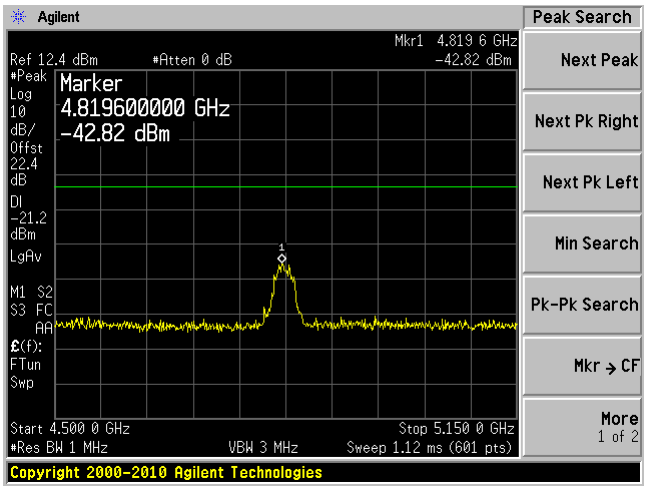
Chain J0, Plot: 2310 MHz – 2390 MHz Peak



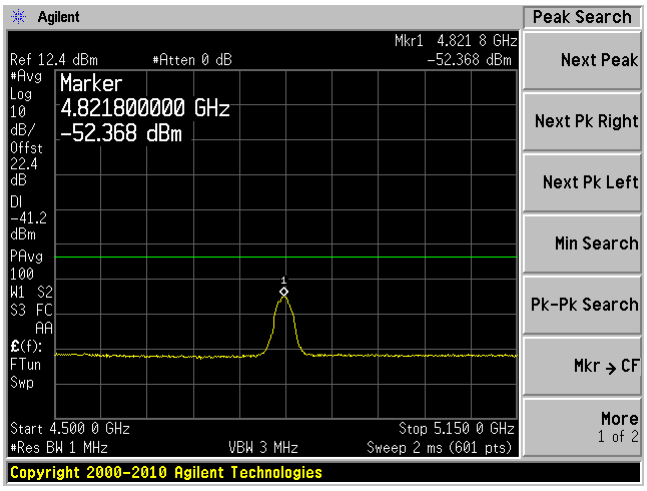
Chain J0, Plot: 2310 MHz – 2390 MHz Ave



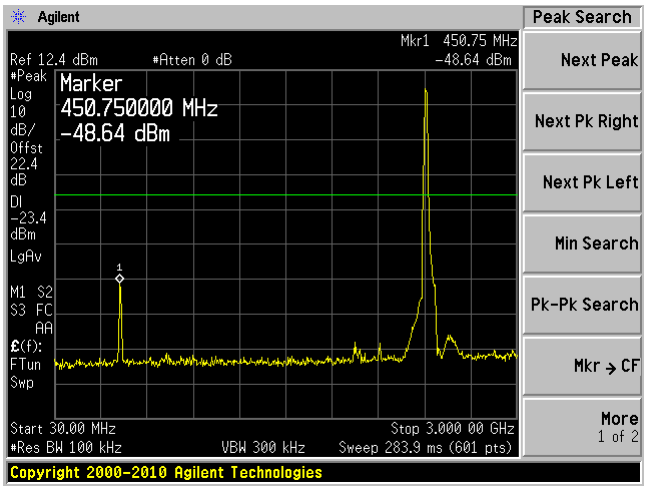
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



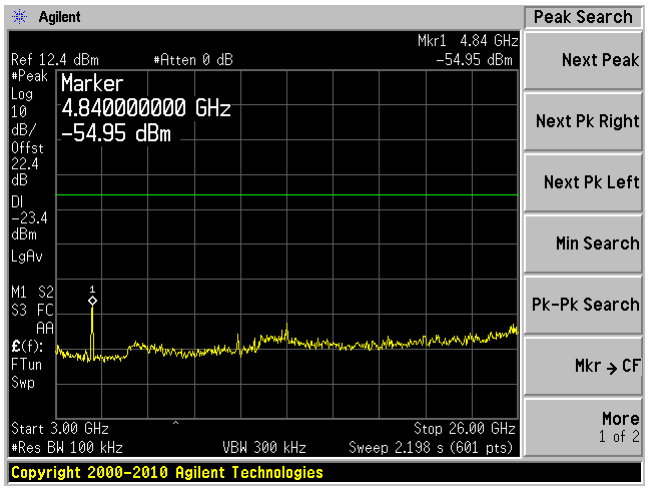
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



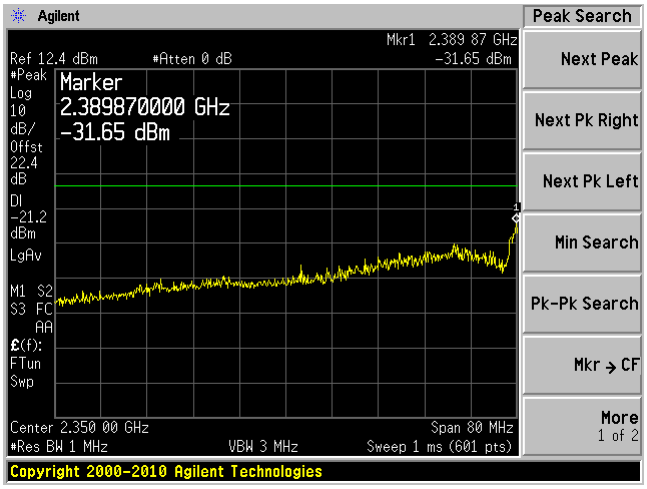
Chain J1, Plot: 30 MHz – 3 GHz



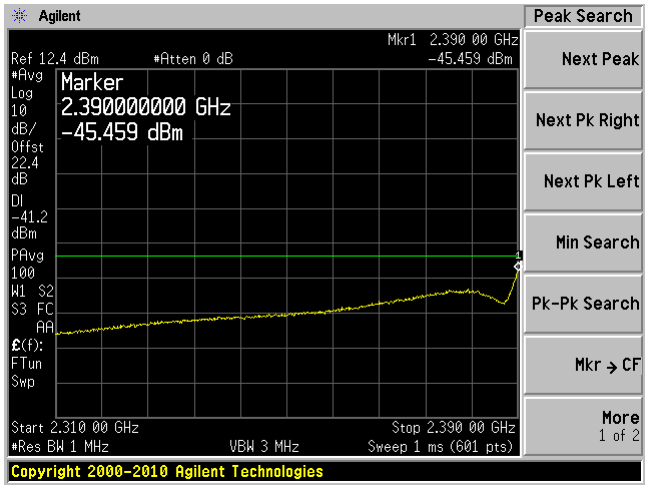
Chain J1, Plot: 3 GHz – 26 GHz



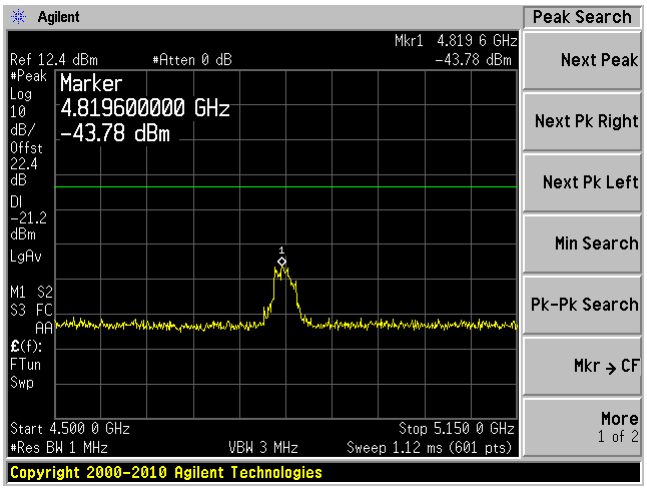
Chain J1, Plot: 2310 MHz – 2390 MHz Peak



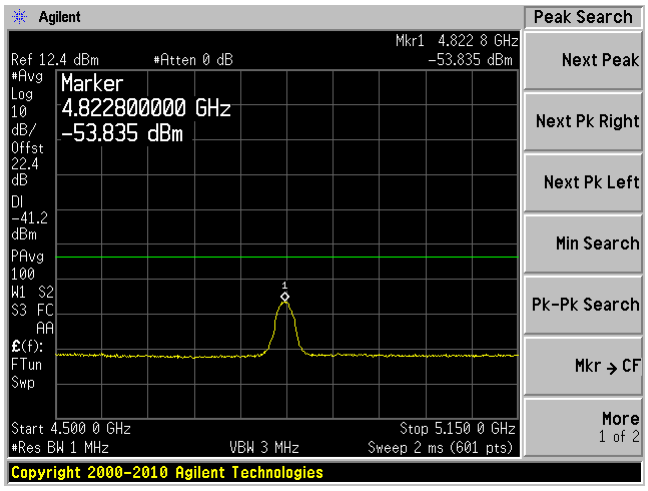
Chain J1, Plot: 2310 MHz – 2390 MHz Ave



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

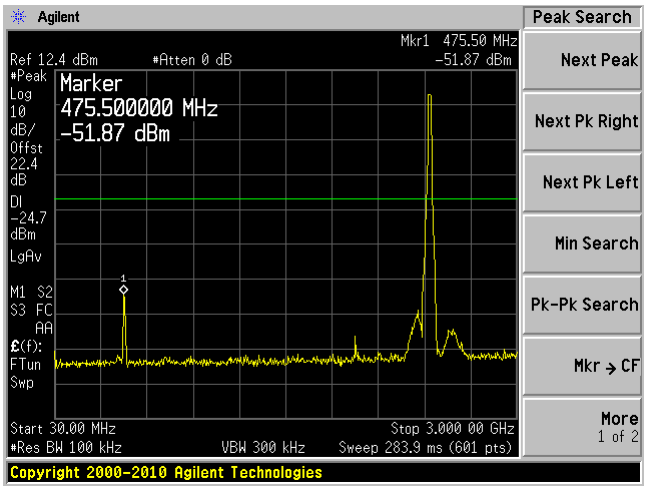


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

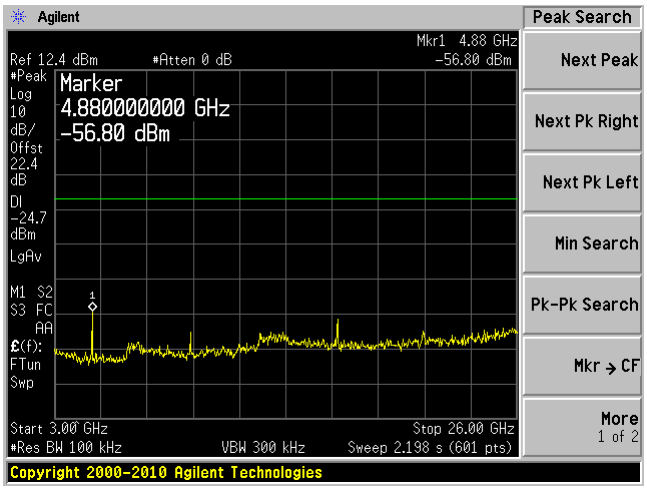


802.11g, Middle Channel 2437 MHz

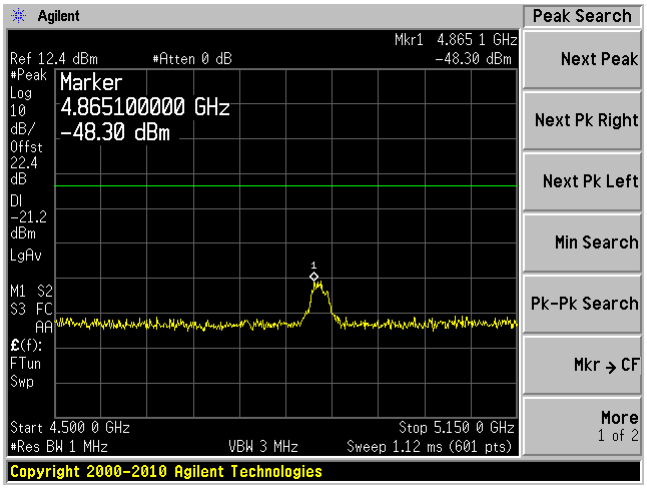
Chain J0, Plot: 30 MHz – 3 GHz



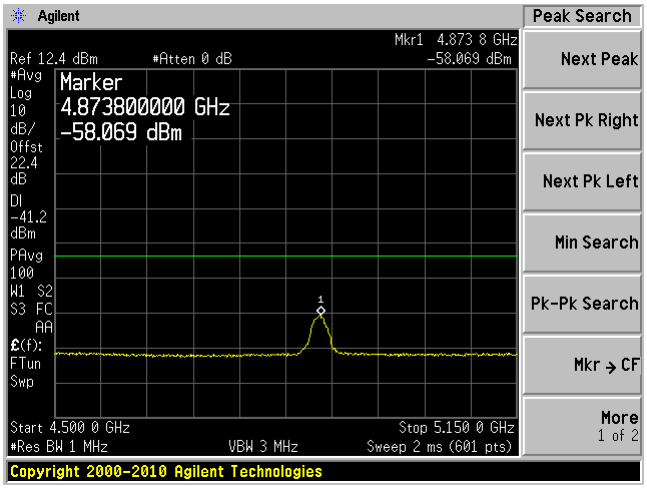
Chain J0, Plot: 3 GHz – 26 GHz



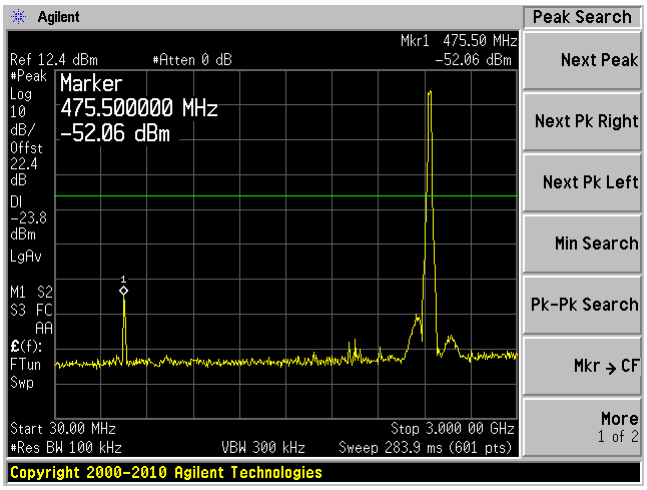
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



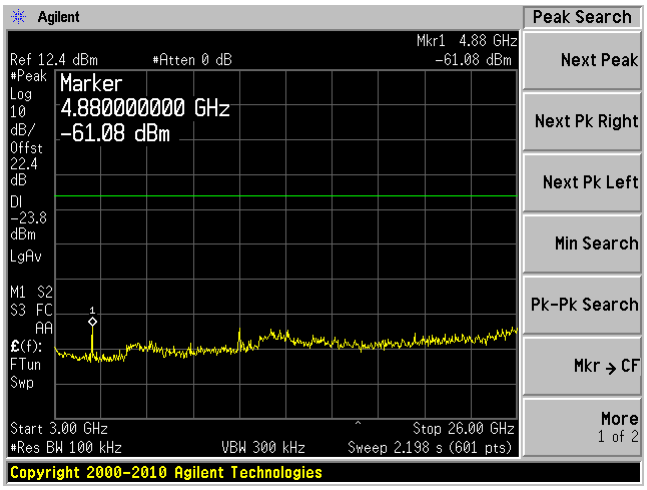
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



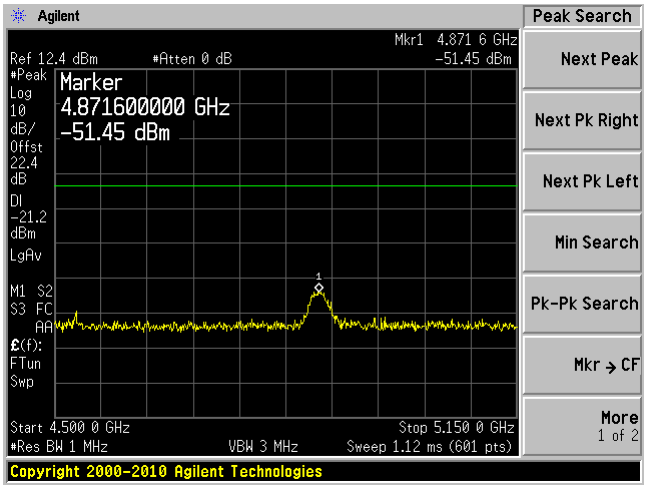
Chain J1, Plot: 30 MHz – 3 GHz



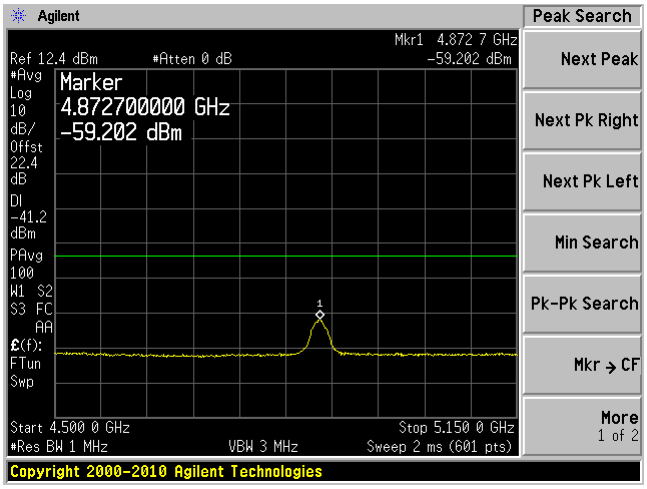
Chain J1, Plot: 3 GHz – 26 GHz



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

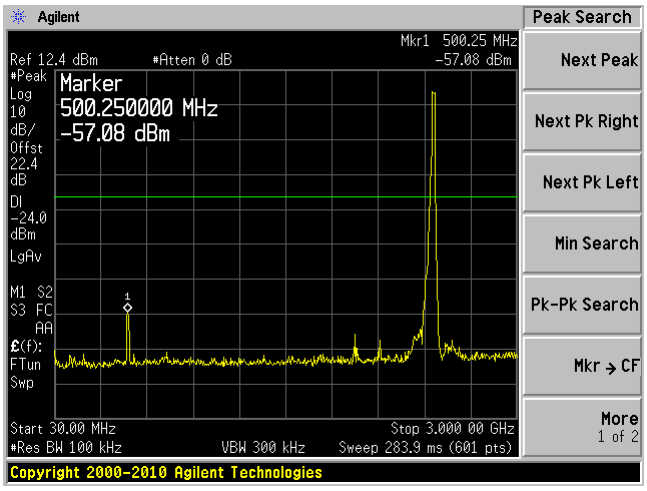


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

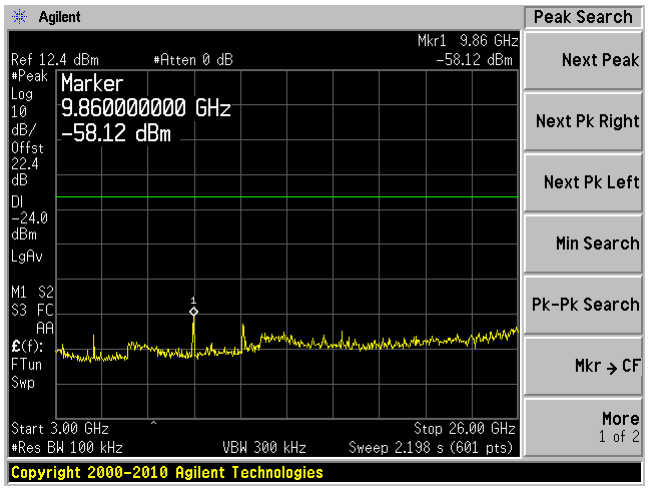


802.11g, High Channel 2462 MHz

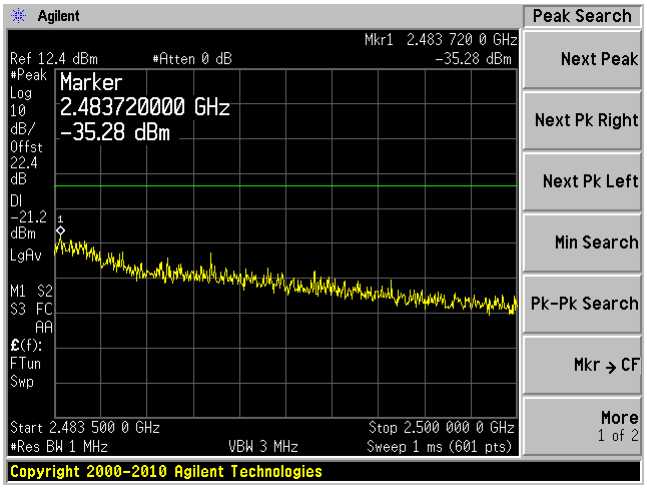
Chain J0, Plot: 30 MHz – 3 GHz



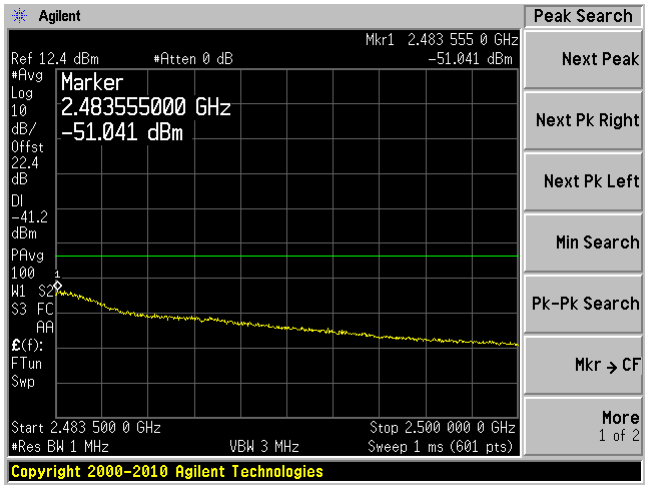
Chain J0, Plot: 3 GHz – 26 GHz



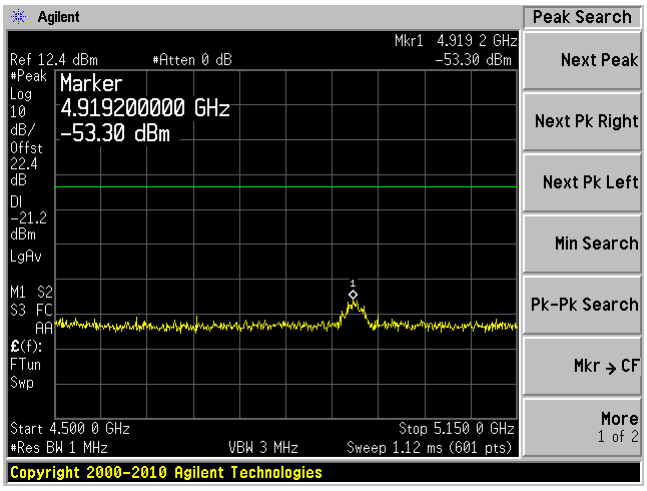
Chain J0, Plot: 2483.5 MHz – 2500 MHz Peak



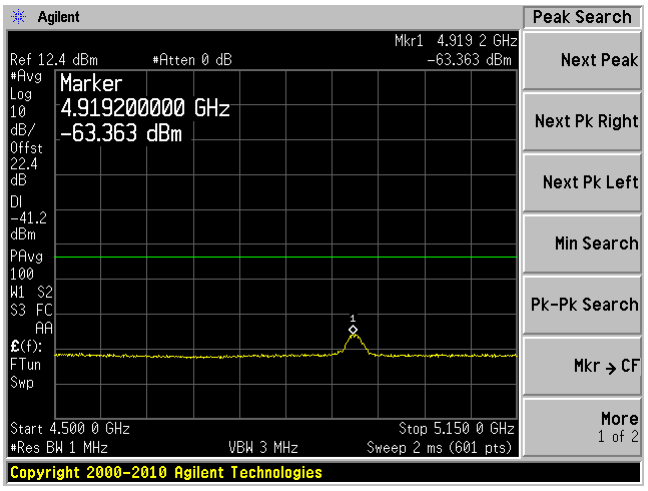
Chain J0, Plot: 2483.5 MHz – 2500 MHz Ave



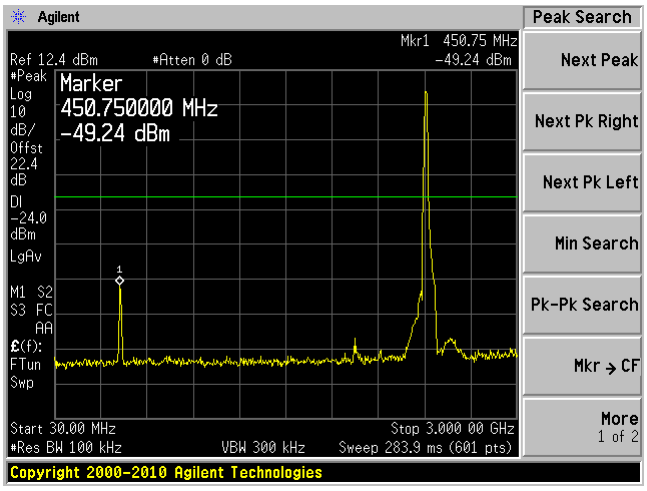
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



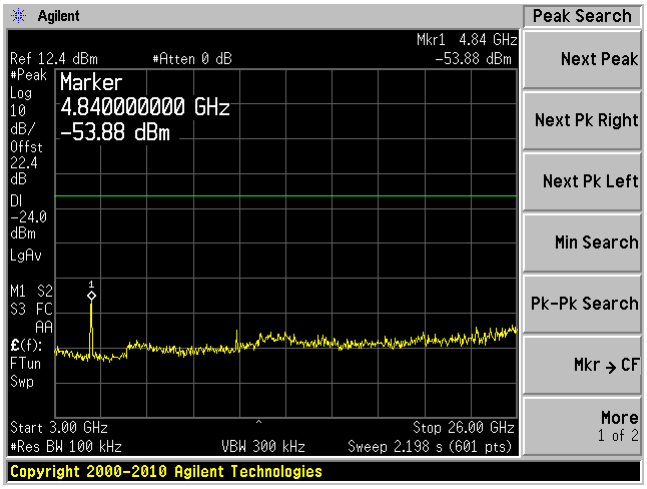
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



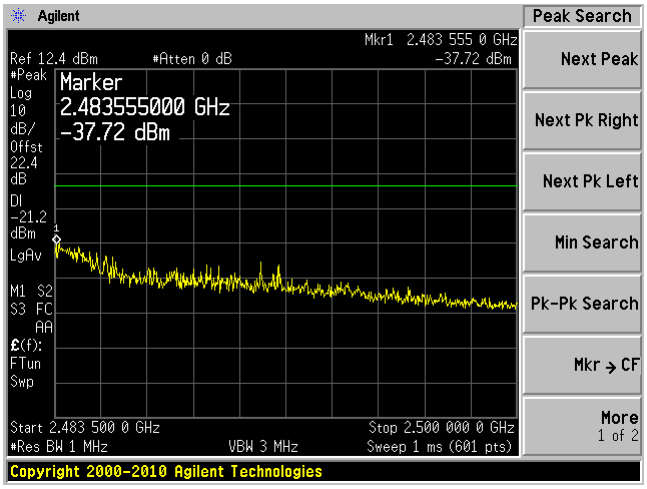
Chain J1, Plot: 30 MHz – 3 GHz



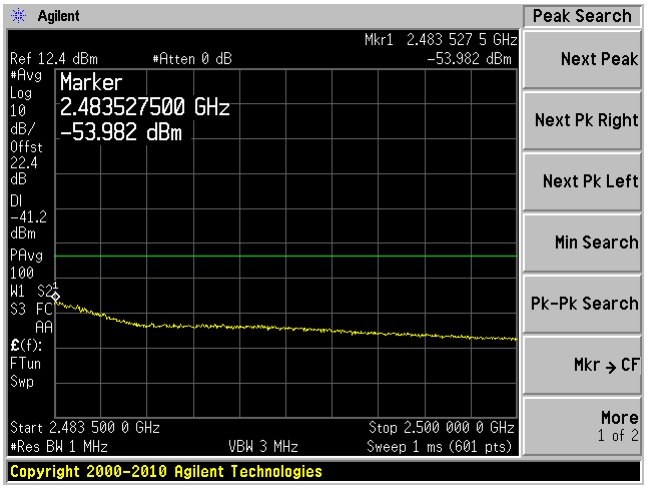
Chain J1, Plot: 3 GHz – 26 GHz



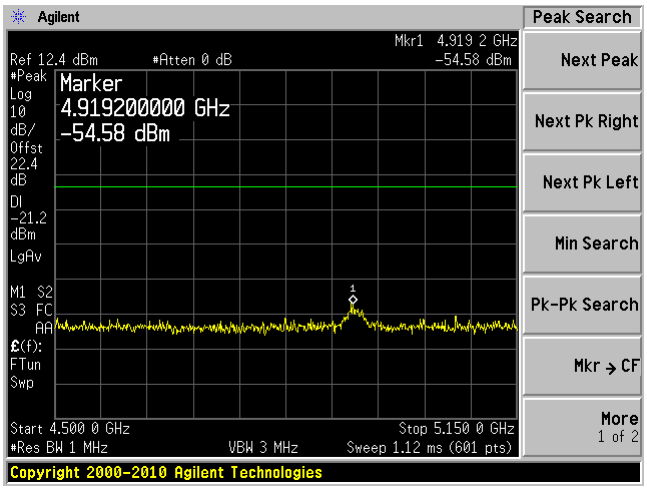
Chain J1, Plot: 2483.5 MHz – 2500 MHz Peak



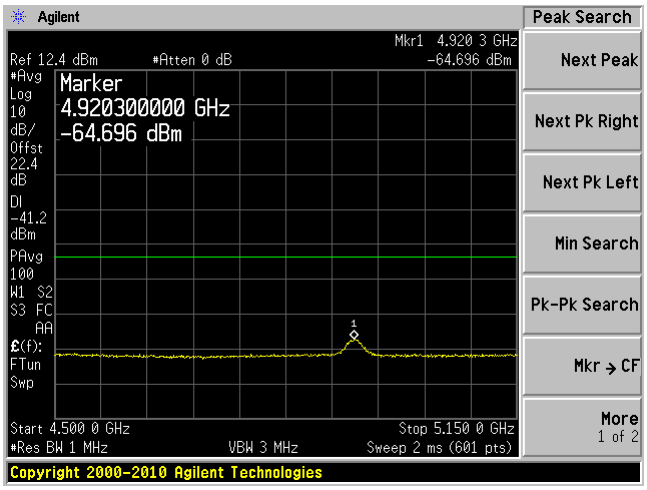
Chain J1, Plot: 2483.5 MHz – 2500 MHz Ave



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

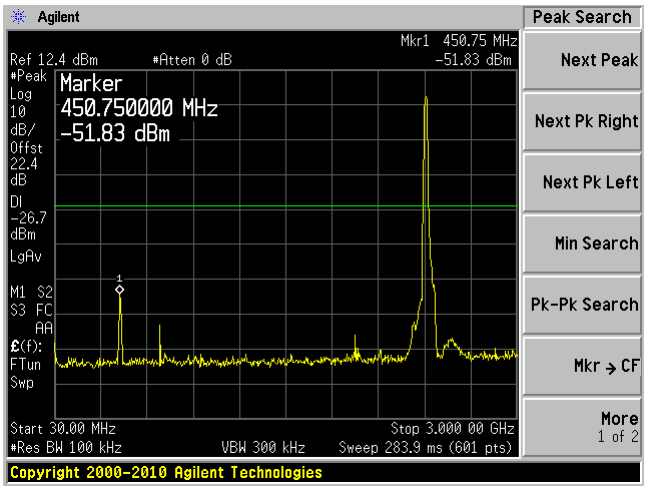


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

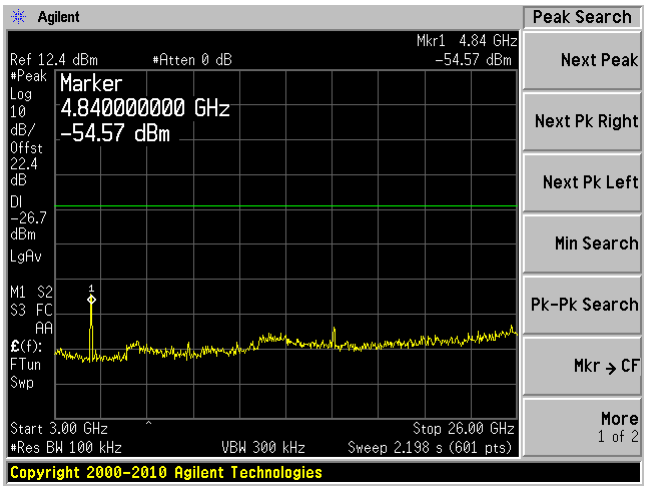


802.11n-HT20, Low Channel 2412 MHz

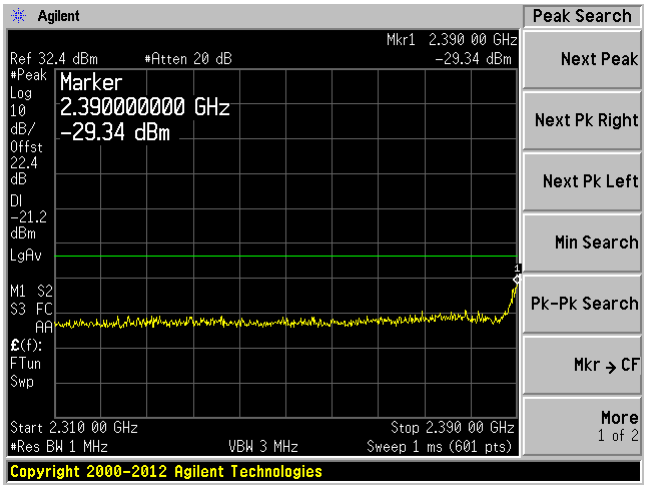
Chain J0, Plot: 30 MHz – 3 GHz



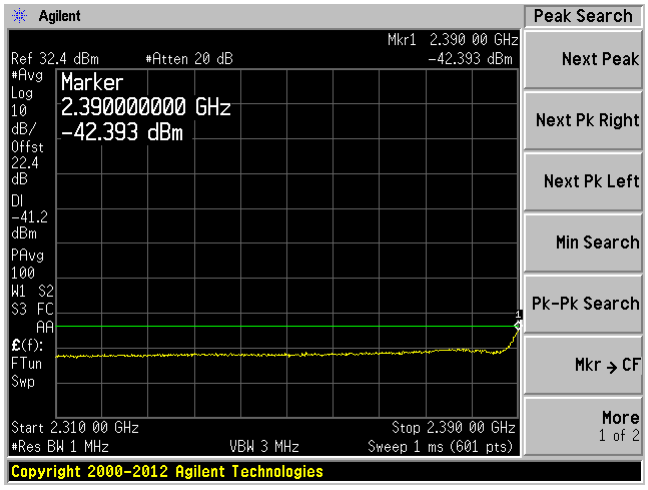
Chain J0, Plot: 3 GHz – 26 GHz



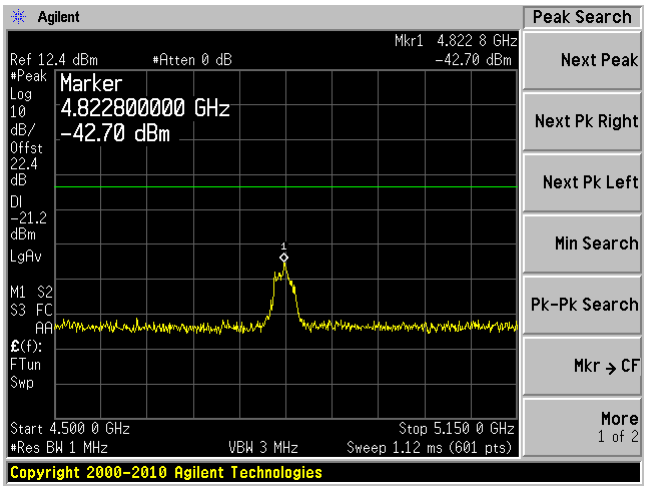
Chain J0, Plot: 2310 MHz – 2390 MHz Peak



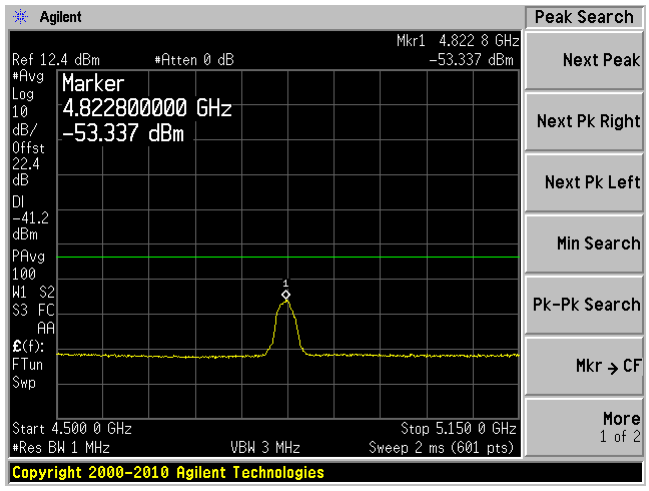
Chain J0, Plot: 2310 MHz – 2390 MHz Ave



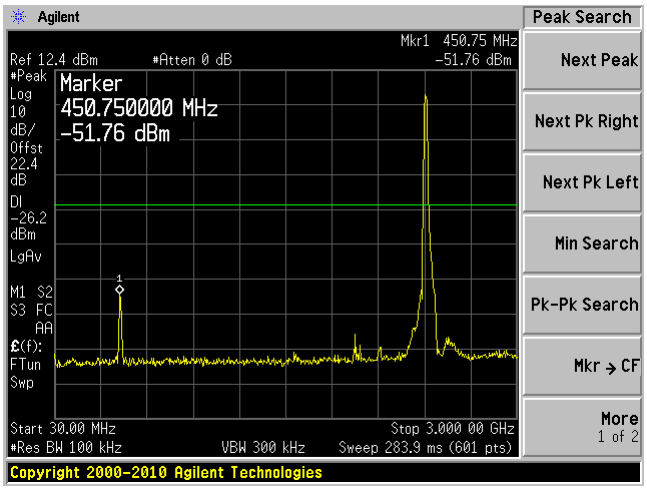
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



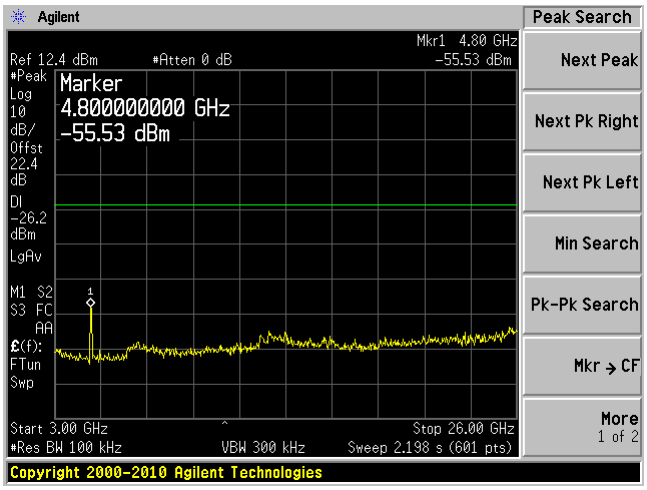
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



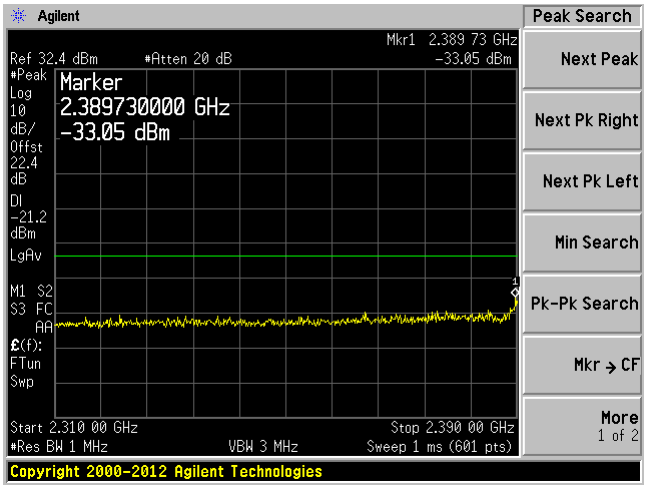
Chain J1, Plot: 30 MHz – 3 GHz



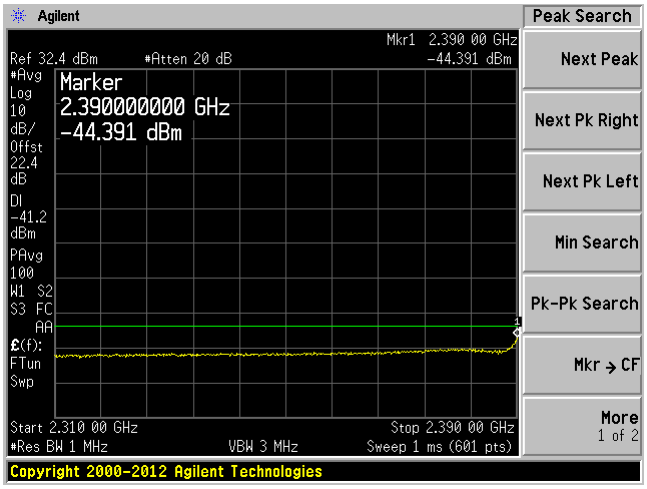
Chain J1, Plot: 3 GHz – 26 GHz



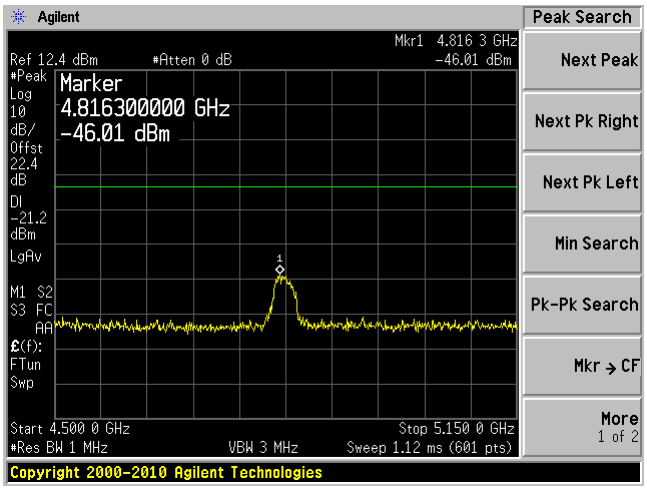
Chain J1, Plot: 2310 MHz – 2390 MHz Peak



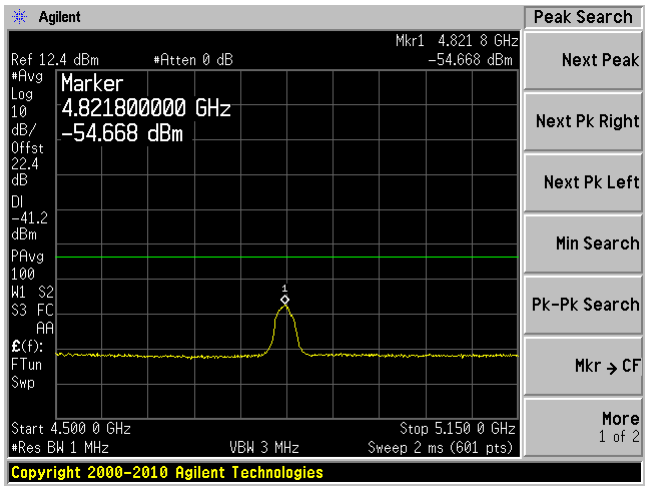
Chain J1, Plot: 2310 MHz – 2390 MHz Ave



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

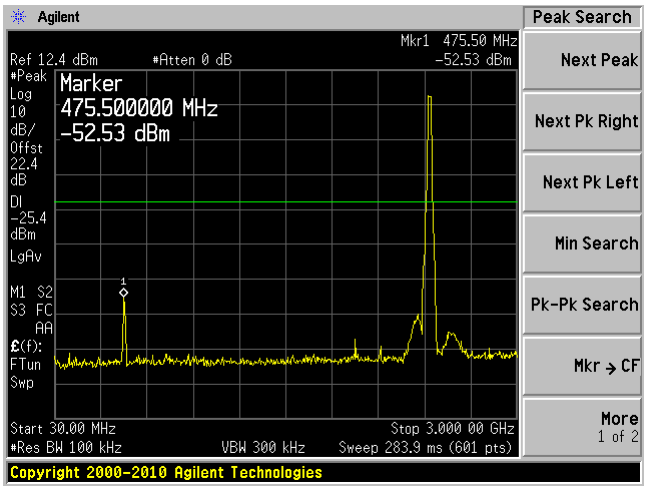


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

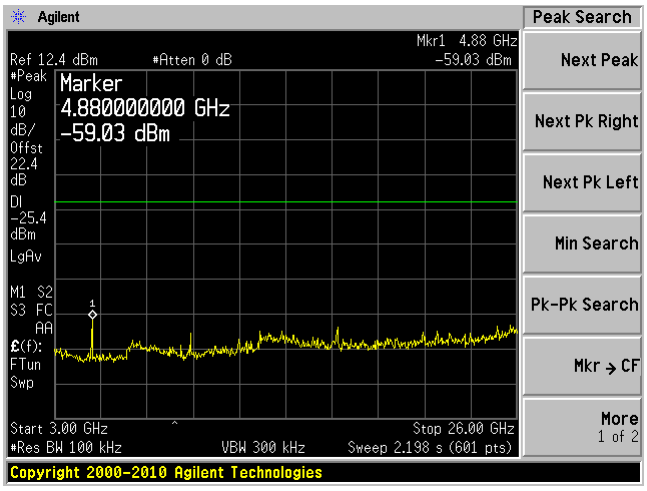


802.11n-HT20, Middle Channel 2437 MHz

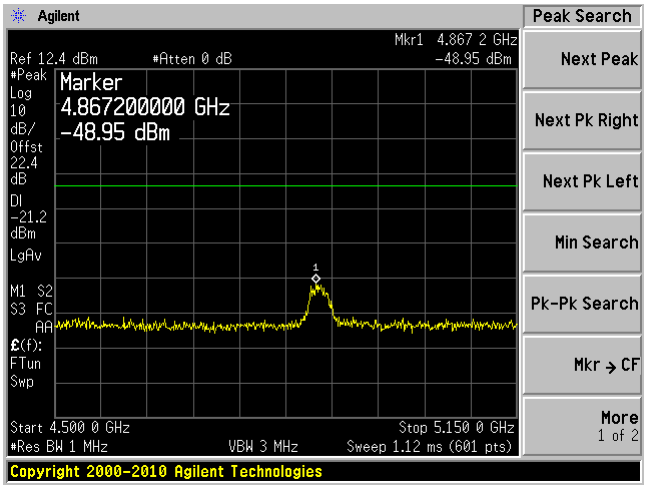
Chain J0, Plot: 30 MHz – 3 GHz



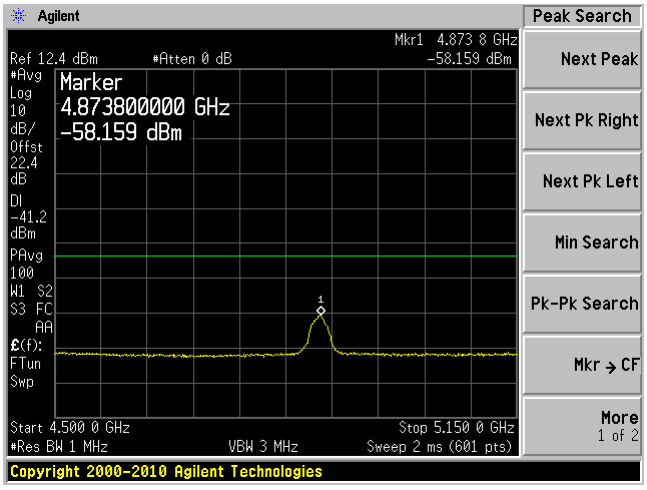
Chain J0, Plot: 3 GHz – 26 GHz



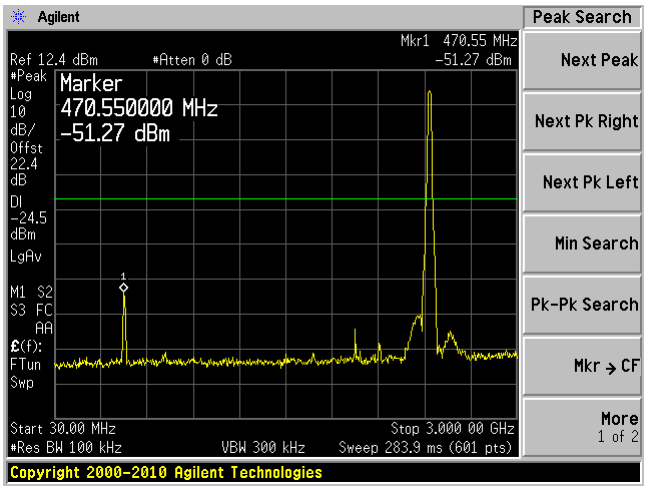
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



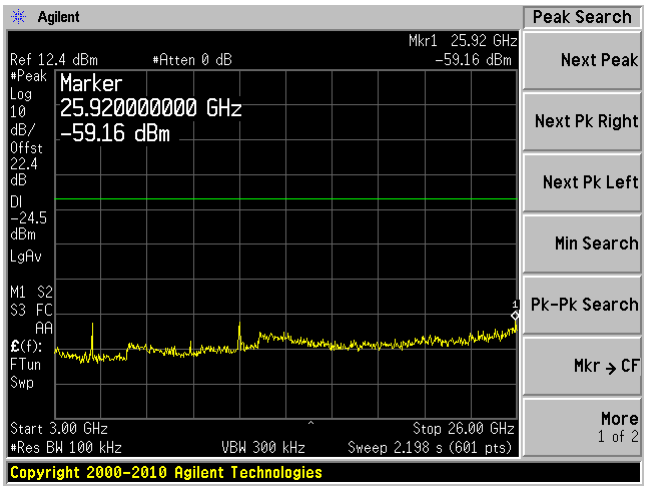
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



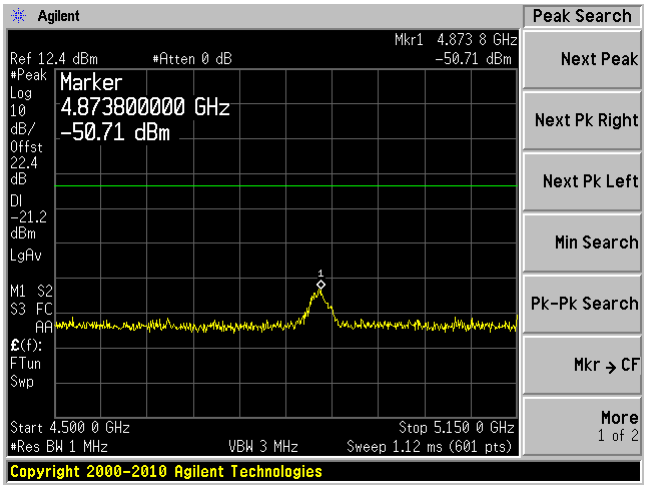
Chain J1, Plot: 30 MHz – 3 GHz



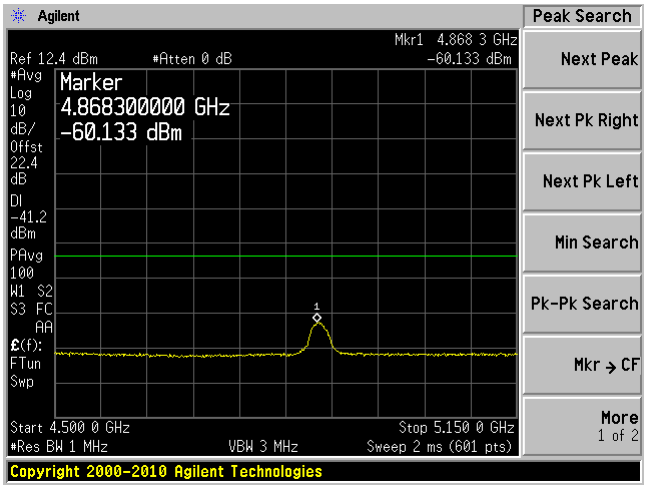
Chain J1, Plot: 3 GHz – 26 GHz



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

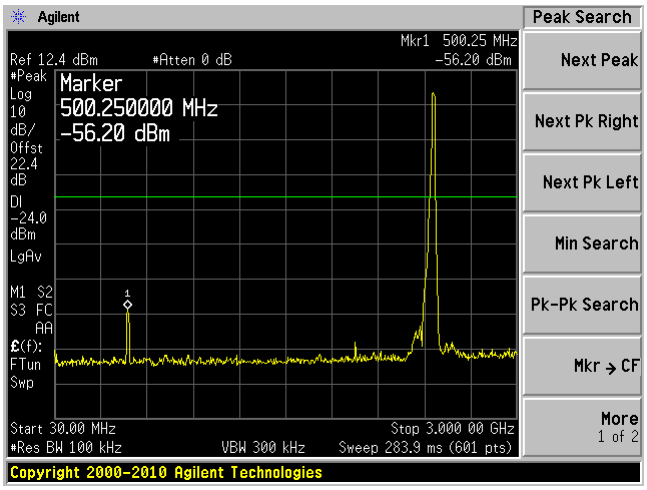


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

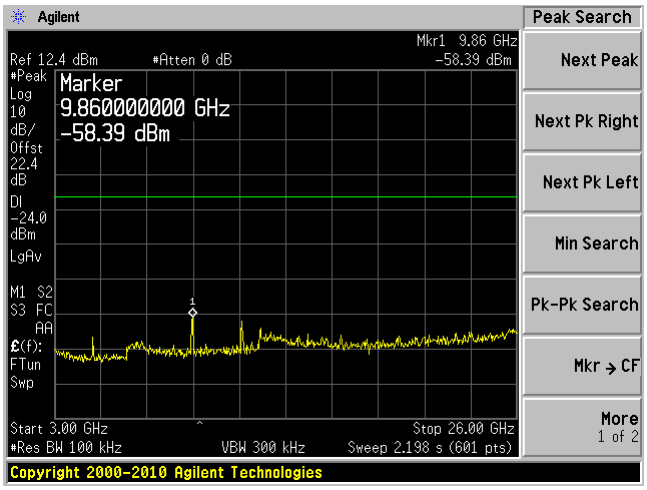


802.11n-HT20, High Channel 2462 MHz

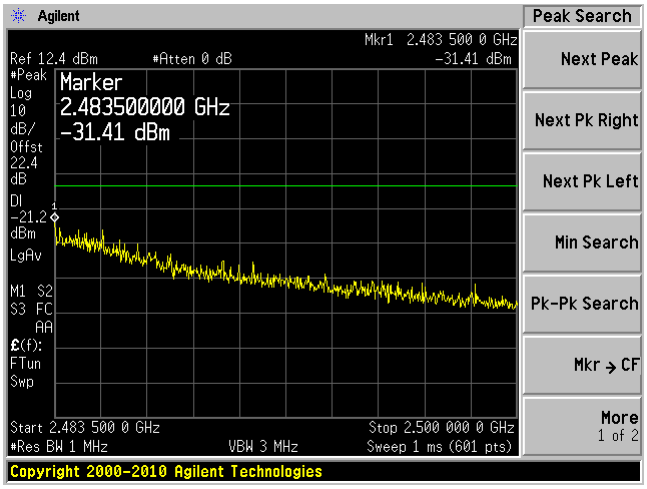
Chain J0, Plot: 30 MHz – 3 GHz



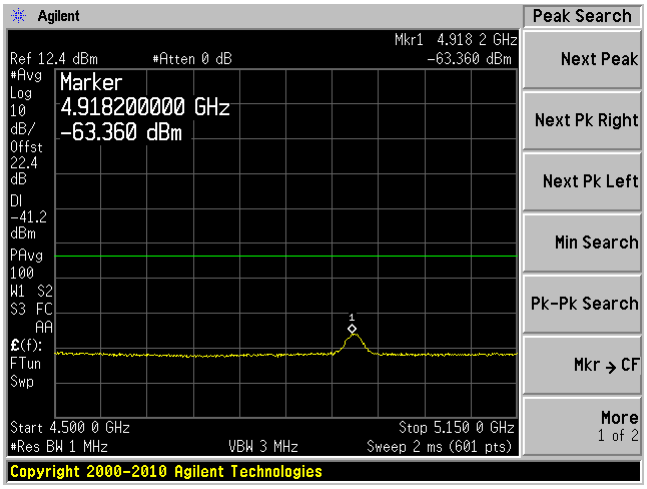
Chain J0, Plot: 3 GHz – 26 GHz



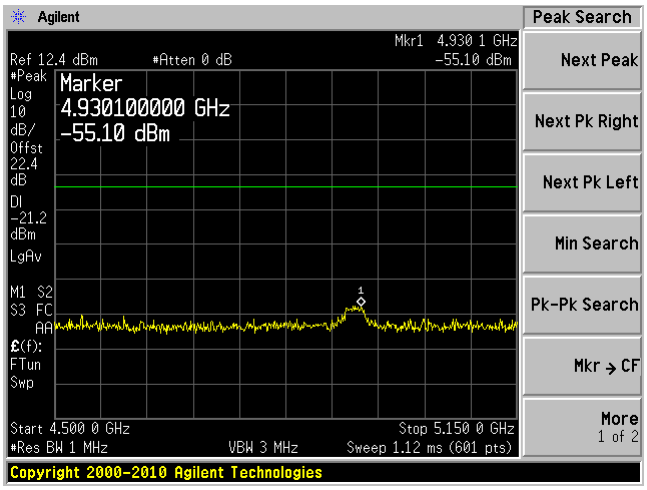
Chain J0, Plot: 2483.5 MHz – 2500 MHz Peak



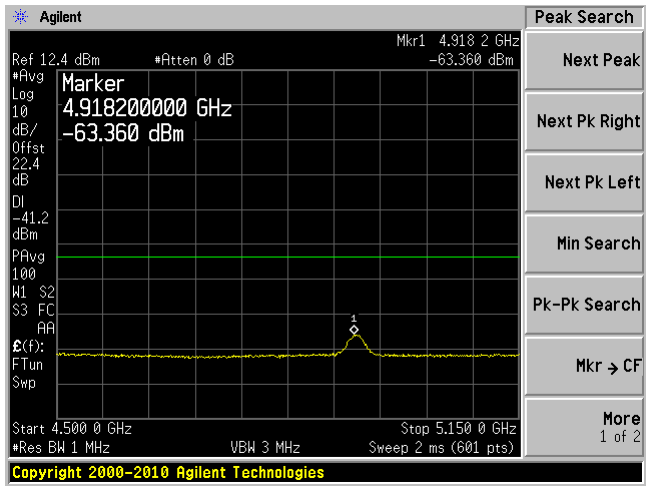
Chain J0, Plot: 2483.5 MHz – 2500 MHz Ave



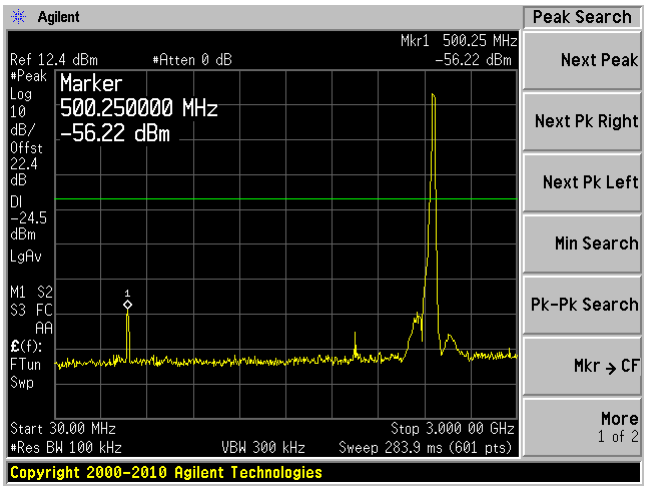
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



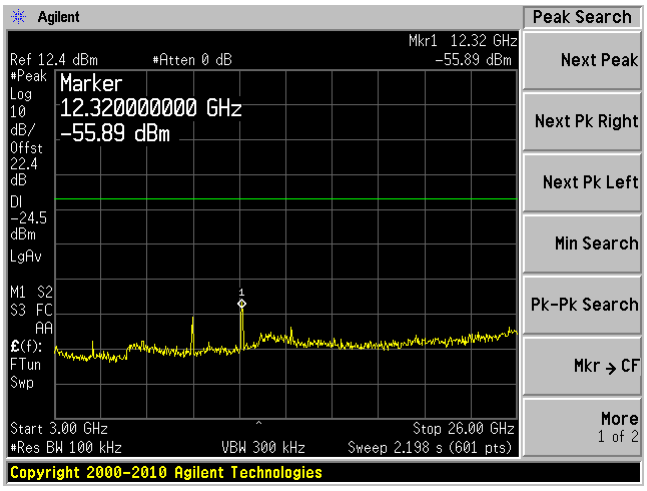
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



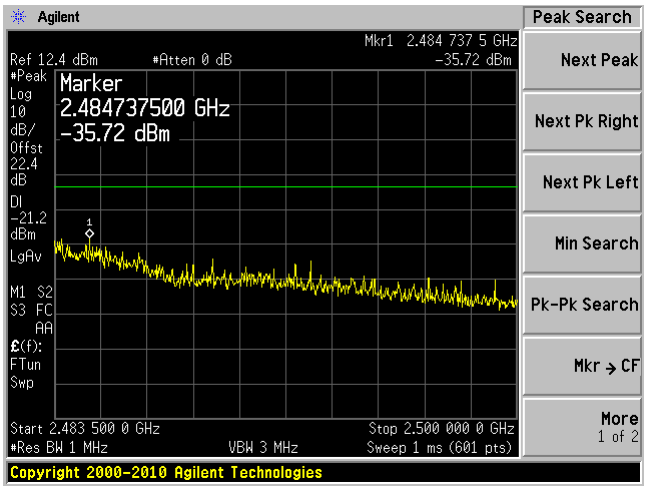
Chain J1, Plot: 30 MHz – 3 GHz



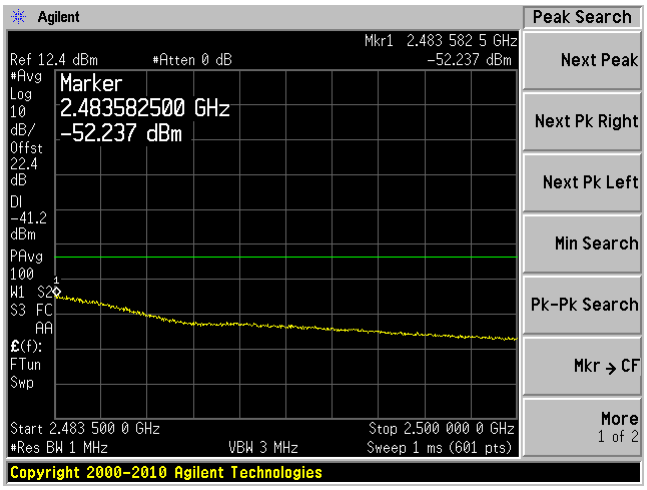
Chain J1, Plot: 3 GHz – 26 GHz



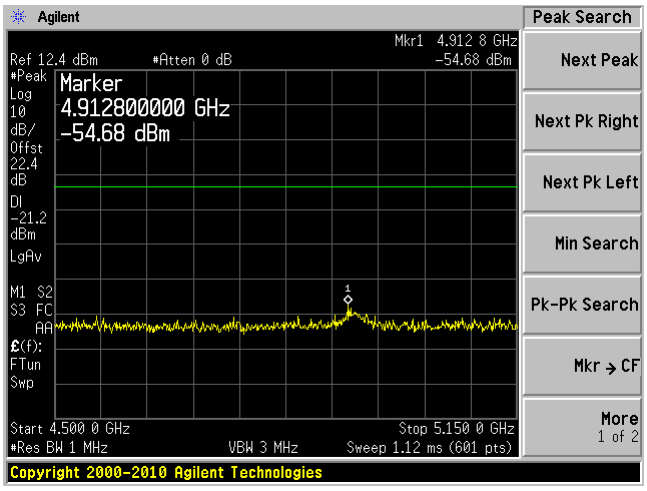
Chain J1, Plot: 2483.5 MHz – 2500 MHz Peak



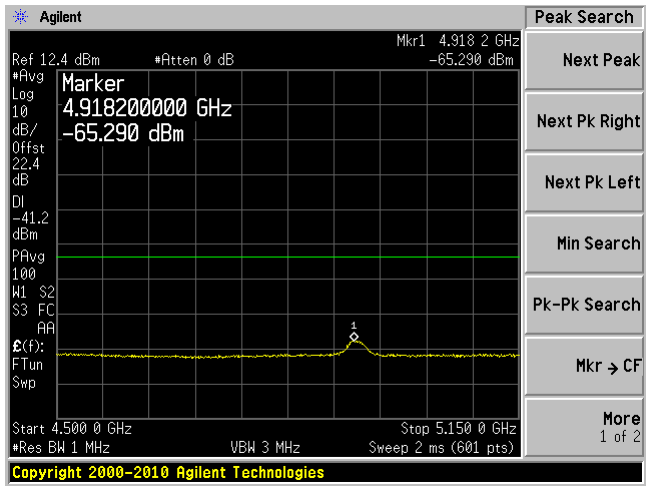
Chain J1, Plot: 2483.5 MHz – 2500 MHz Ave



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

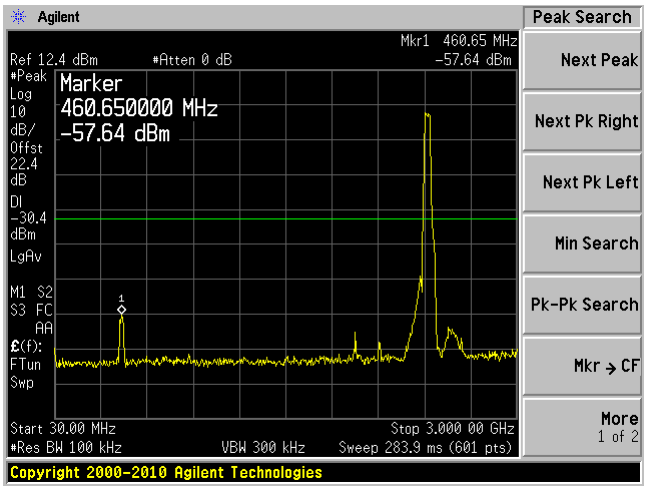


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

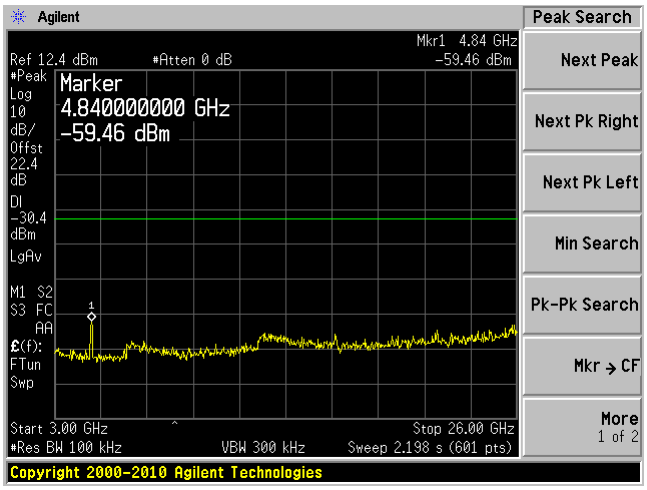


802.11n HT40, Low Channel 2422 MHz

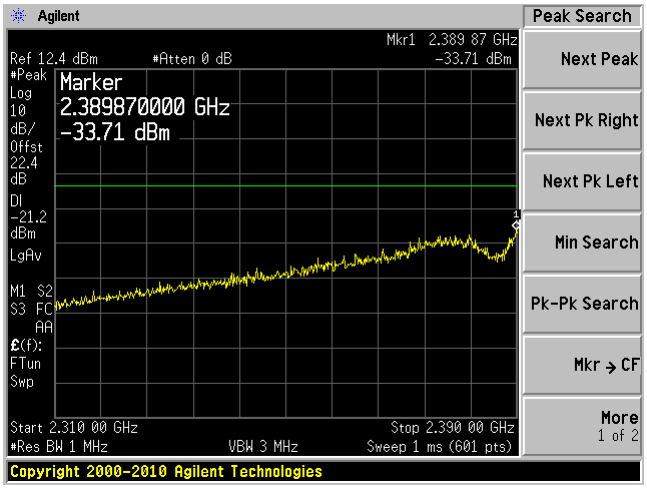
Chain J0, Plot: 30 MHz – 3 GHz



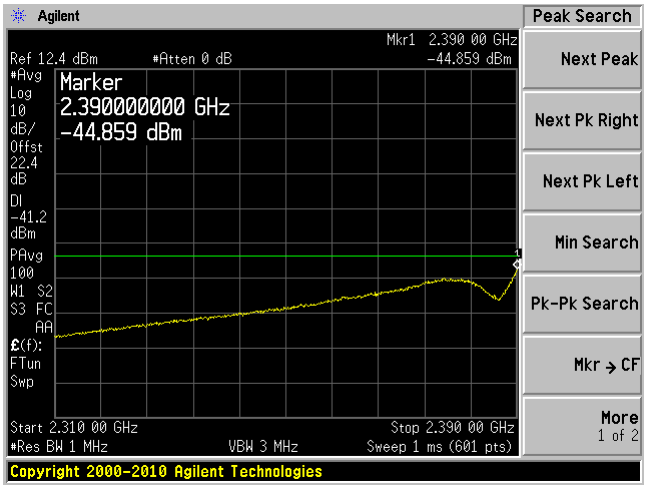
Chain J0, Plot: 3 GHz – 26 GHz



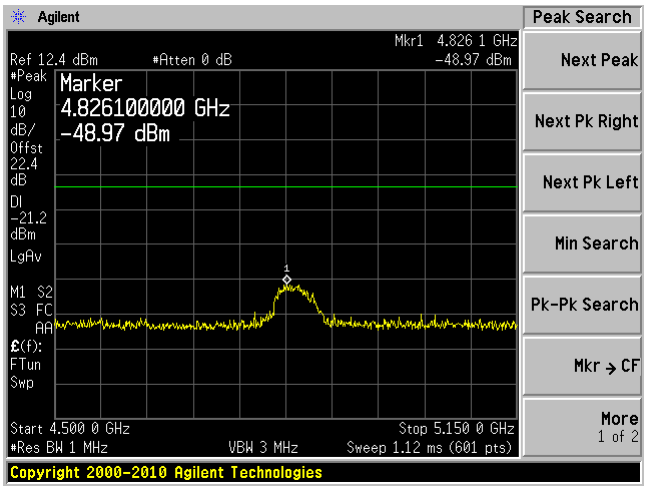
Chain J0, Plot: 2310 MHz – 2390 MHz Peak



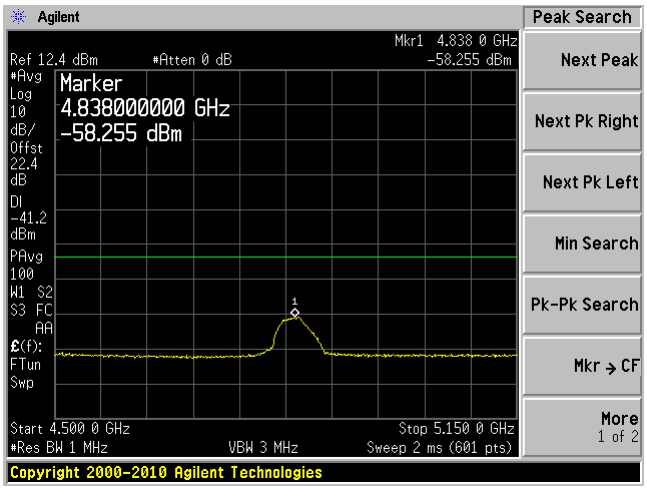
Chain J0, Plot: 2310 MHz – 2390 MHz Ave



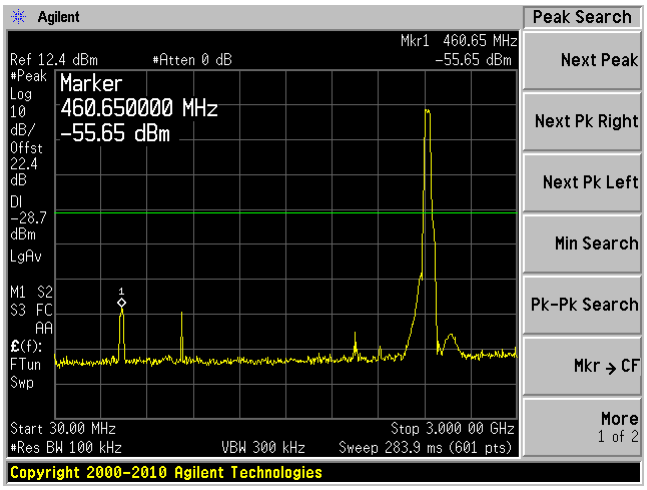
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



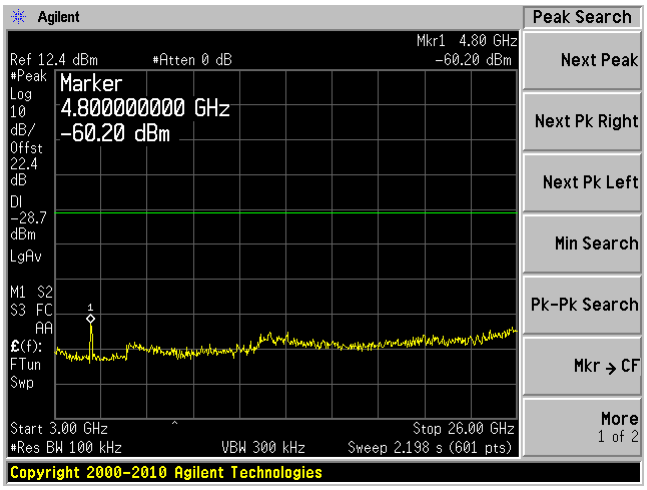
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



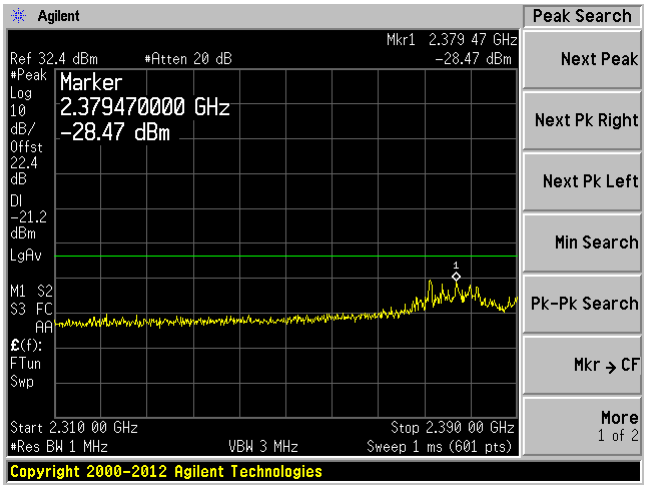
Chain J1, Plot: 30 MHz – 3 GHz



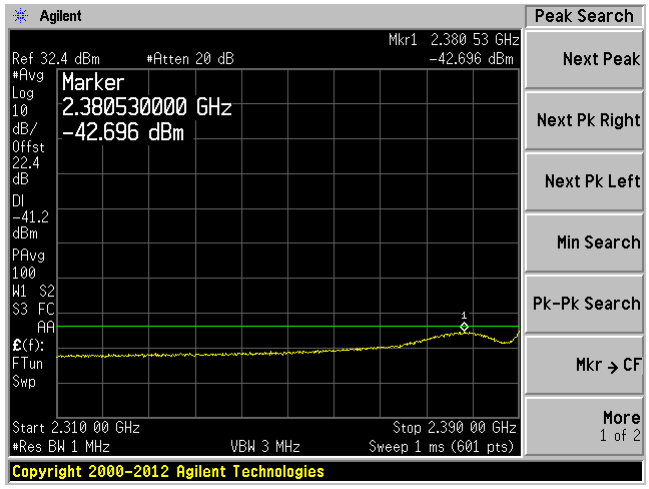
Chain J1, Plot: 3 GHz – 26 GHz



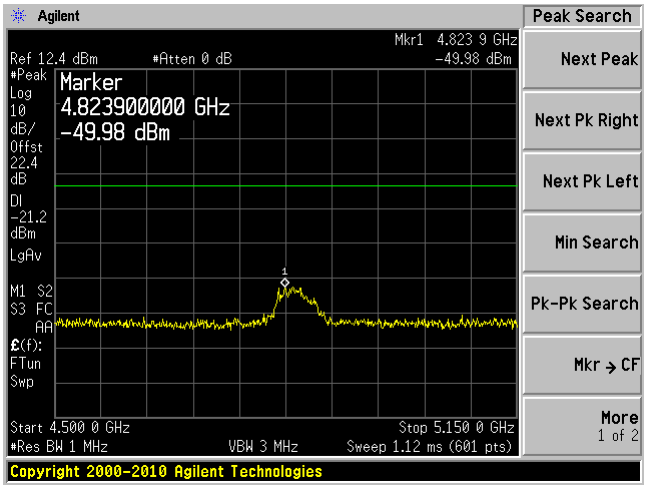
Chain J1, Plot: 2310 MHz – 2390 MHz Peak



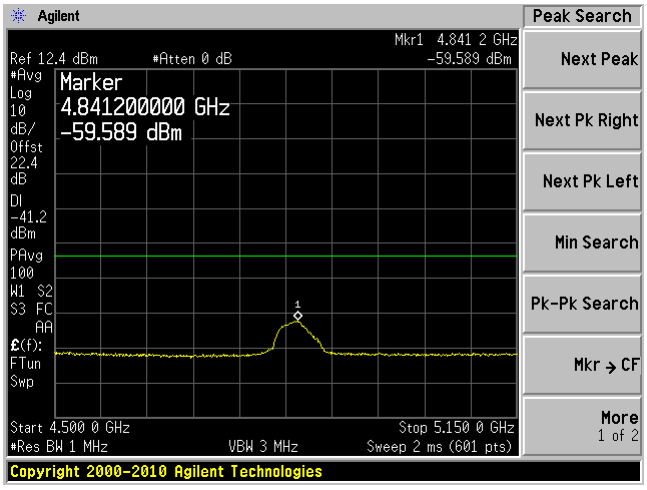
Chain J1, Plot: 2310 MHz – 2390 MHz Ave



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

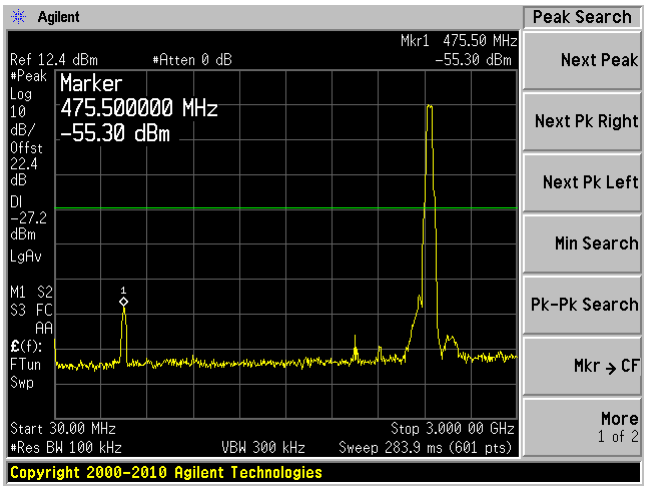


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

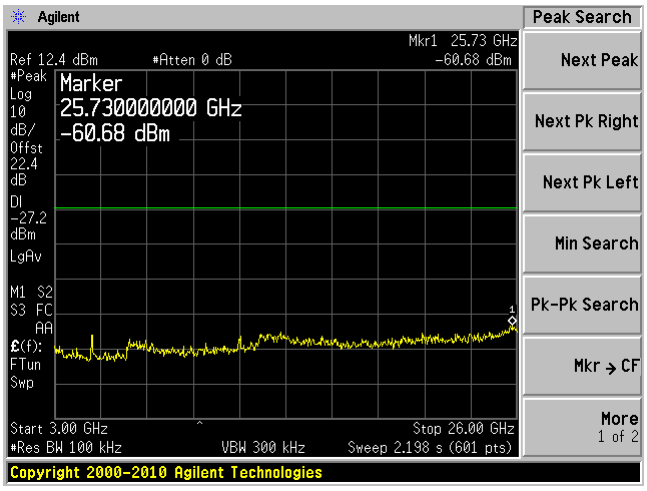


802.11n-HT40, Middle Channel 2437 MHz

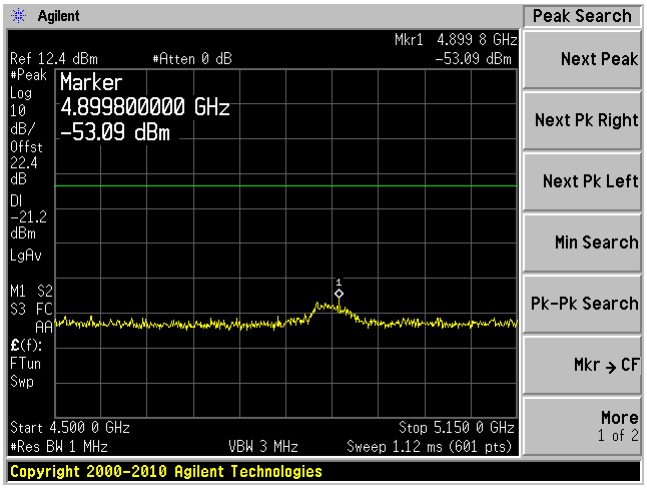
Chain J0, Plot: 30 MHz – 3 GHz



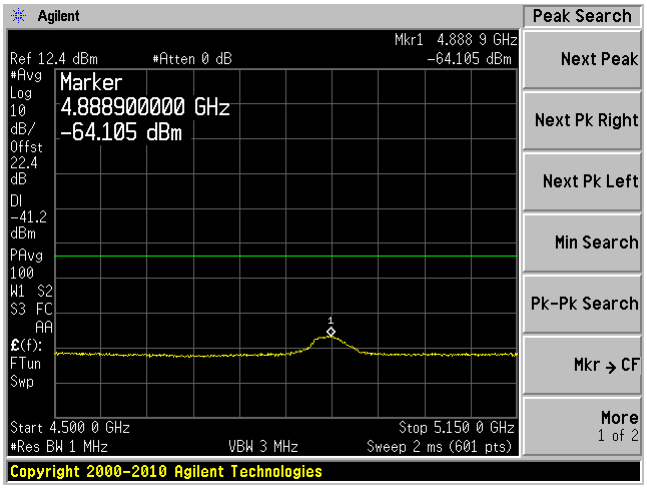
Chain J0, Plot: 3 GHz – 26 GHz



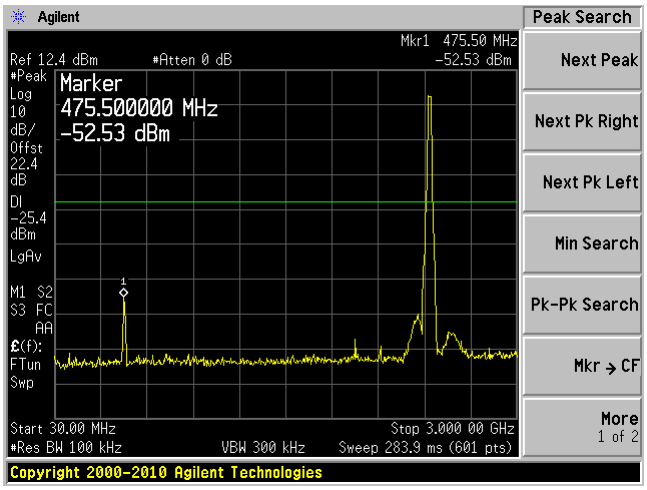
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



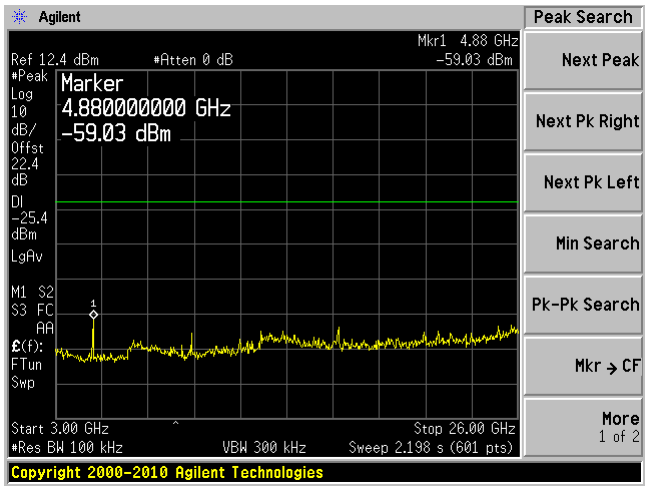
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



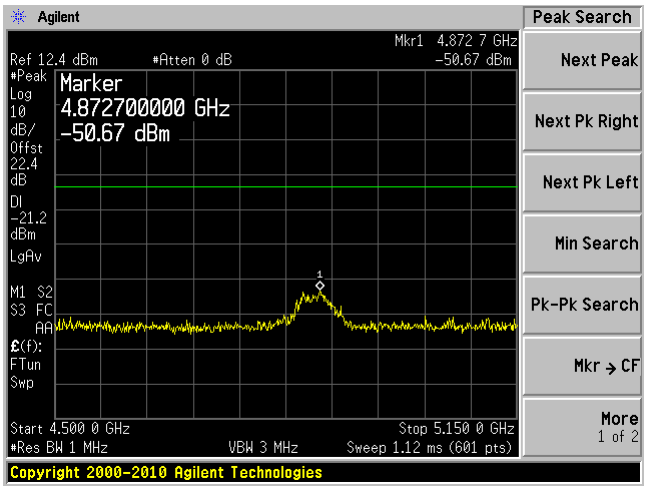
Chain J1, Plot: 30 MHz – 3 GHz



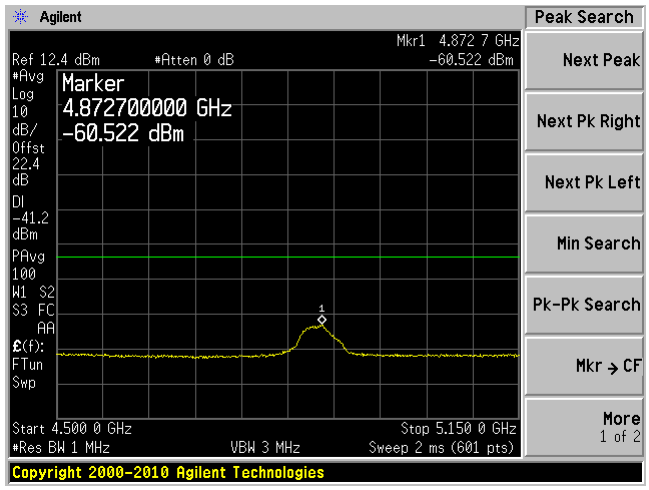
Chain J1, Plot: 3 GHz – 26 GHz



Chain J1, Plot: 4500 MHz – 5150 MHz Peak

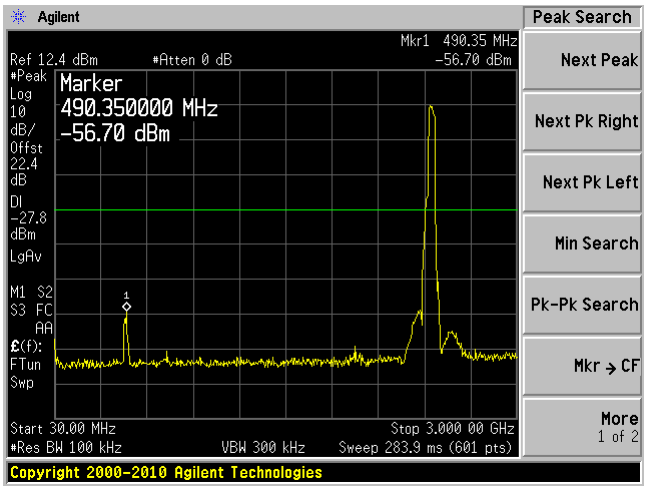


Chain J1, Plot: 4500 MHz – 5150 MHz Ave

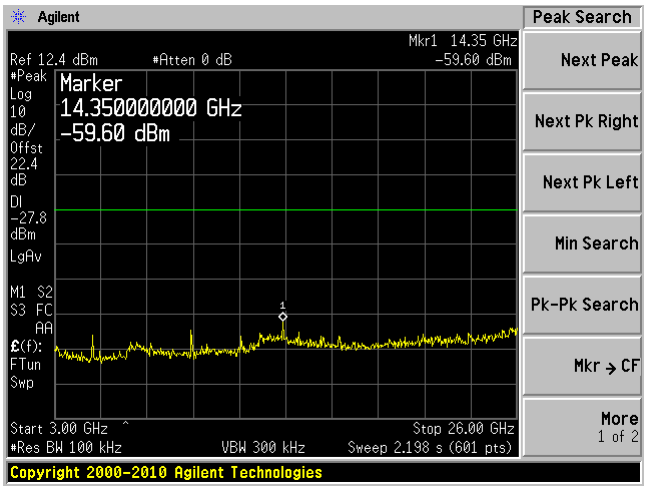


802.11n-HT40, High Channel 2452 MHz

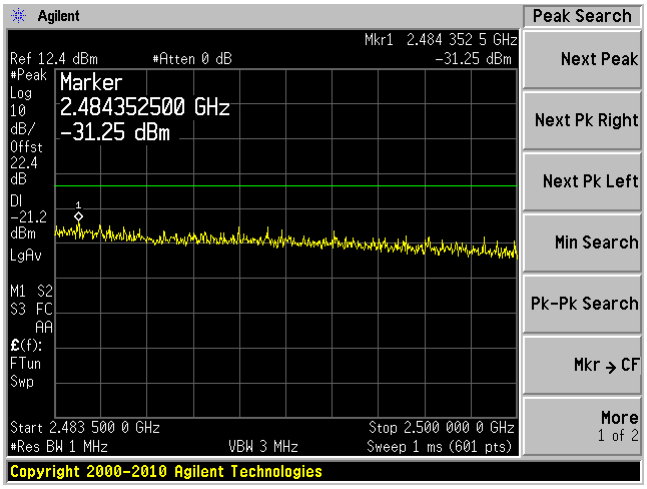
Chain J0, Plot: 30 MHz – 3 GHz



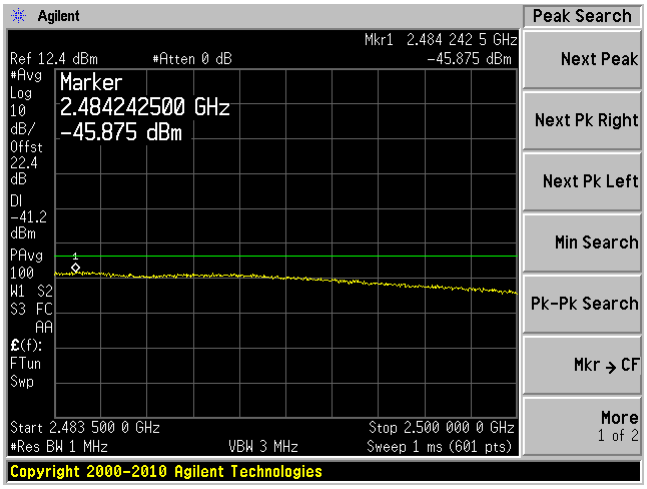
Chain J0, Plot: 3 GHz – 26 GHz



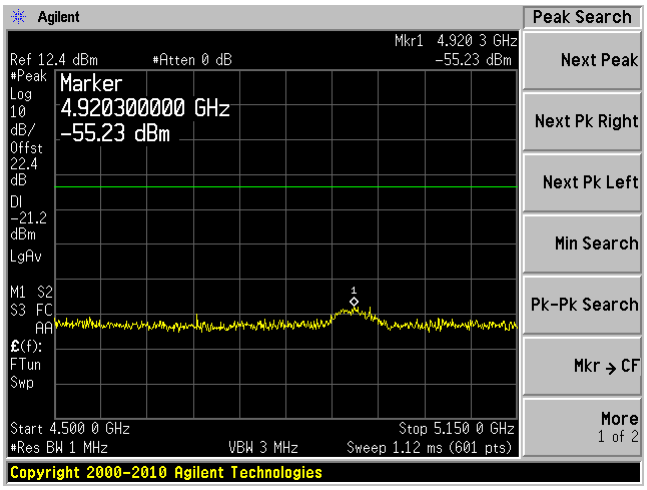
Chain J0, Plot: 2483.5 MHz – 2500 MHz Peak



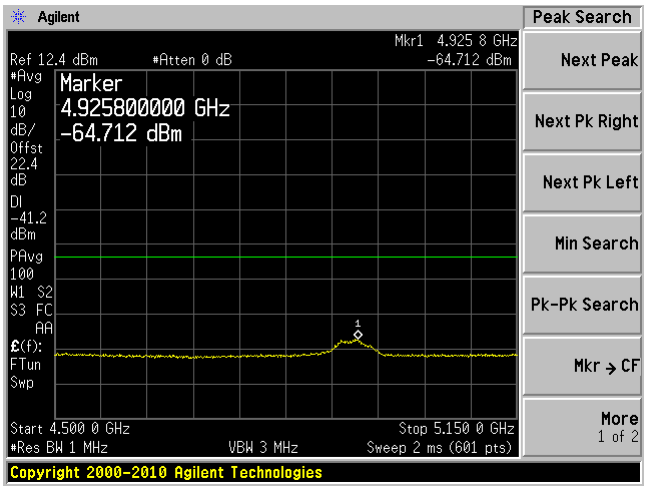
Chain J0, Plot: 2483.5 MHz – 2500 MHz Ave



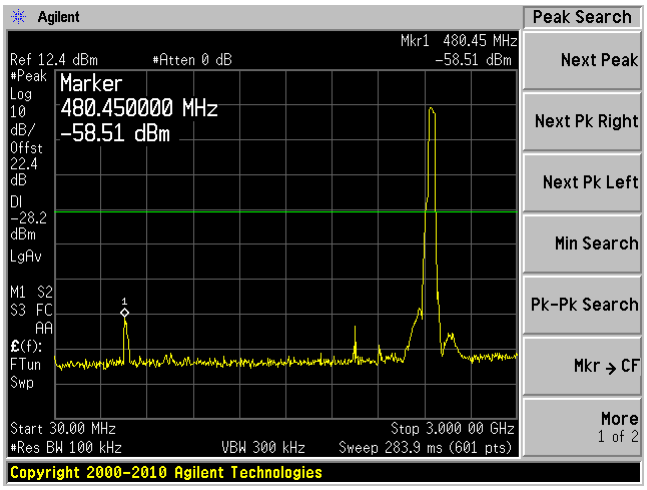
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



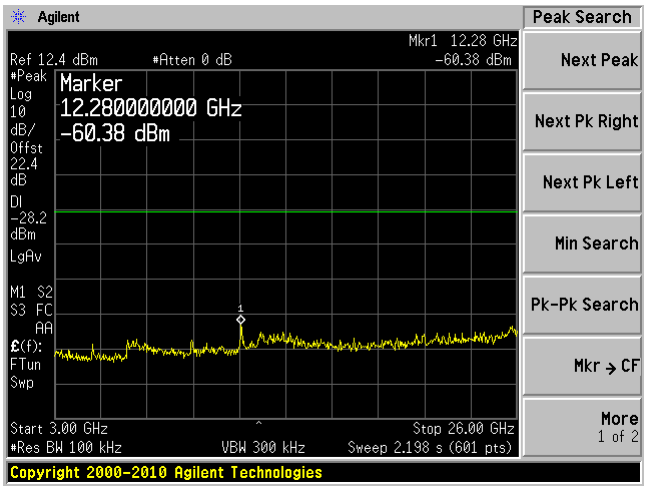
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



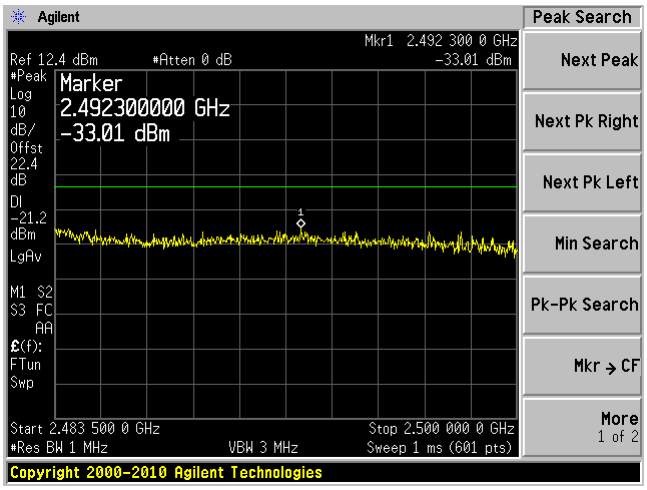
Chain J1, Plot: 30 MHz – 3 GHz



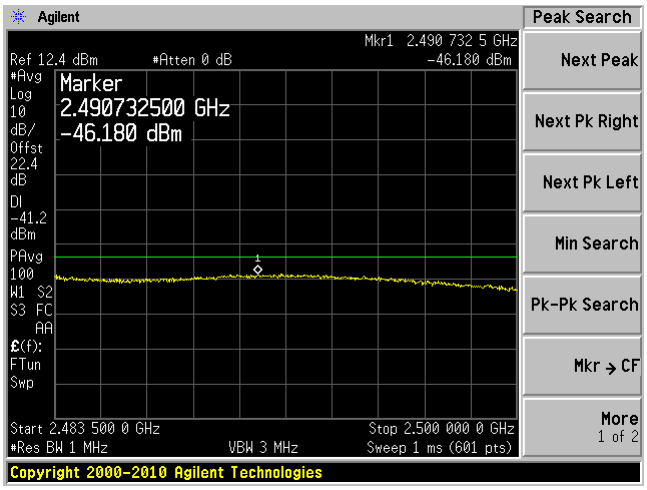
Chain J1, Plot: 3 GHz – 26 GHz



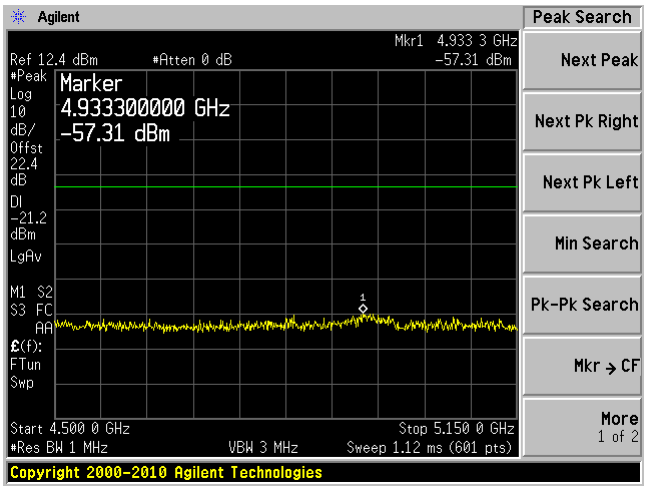
Chain J1, Plot: 2483.5 MHz – 2500 MHz Peak



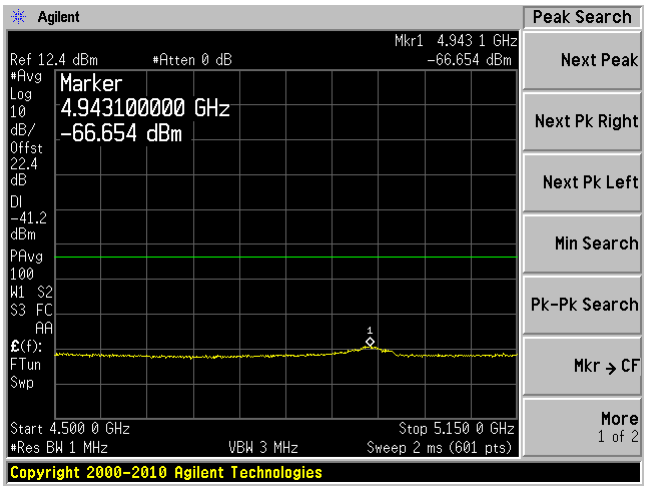
Chain J1, Plot: 2483.5 MHz – 2500 MHz Ave



Chain J1, Plot: 4500 MHz – 5150 MHz Peak



Chain J1, Plot: 4500 MHz – 5150 MHz Ave



8 FCC §15.205, §15.209 & §15.247(d) & IC RSS-210 §A8.5 – 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) and RSS-210: 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).

As per IC RSS-210 A8.5 Out-of-band Emissions, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section A8.4 (4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

8.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.4-2009. The specification used was the FCC 15 Subpart C and IC RSS-210 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.

8.3 Test Procedure

The measurements are base on FCC KDB 558074 D01 DTS Meas Guidance v03r01: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 11: Emissions in non-restricted frequency bands and section 12: Emissions in restricted frequency bands. As well as ANSI C63.4: 2009 as described below:

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

8.4 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 indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (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:

Margin = Corrected Amplitude - Limit

8.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Sunol Science Corp	System Controller	SC99V	122303-1	N/R	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-3	2014-06-18	1 year
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2014-06-09	1 year
Agilent	Pre-amplifier	8449B	3008A01978	2014-02-04	1 year
WiseWave	Horn Antenna	ARH-4223-02	10555-01	2012-08-09	3 years
Agilent	Spectrum Analyzer	E4446A	US44300386	2013-09-29	1 year
EMCO	Horn Antenna	3315	9511-4627	2013-10-17	1 year
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2014-03-28	1 year

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

8.6 Test Environmental Conditions

Temperature:	24º C
Relative Humidity:	46 %
ATM Pressure:	101.66 kPa

The testing was performed by Chen Ge on 2014-07-03 in 5 m chamber 3.

8.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Part 15C and IC RSS-210 standard's radiated emissions limits, and had the worst margin of:

30 MHz-1 GHz

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Channel, Range**
-2.32	37.68	Vertical	30 MHz - 1 GHz

Above 1 GHz:

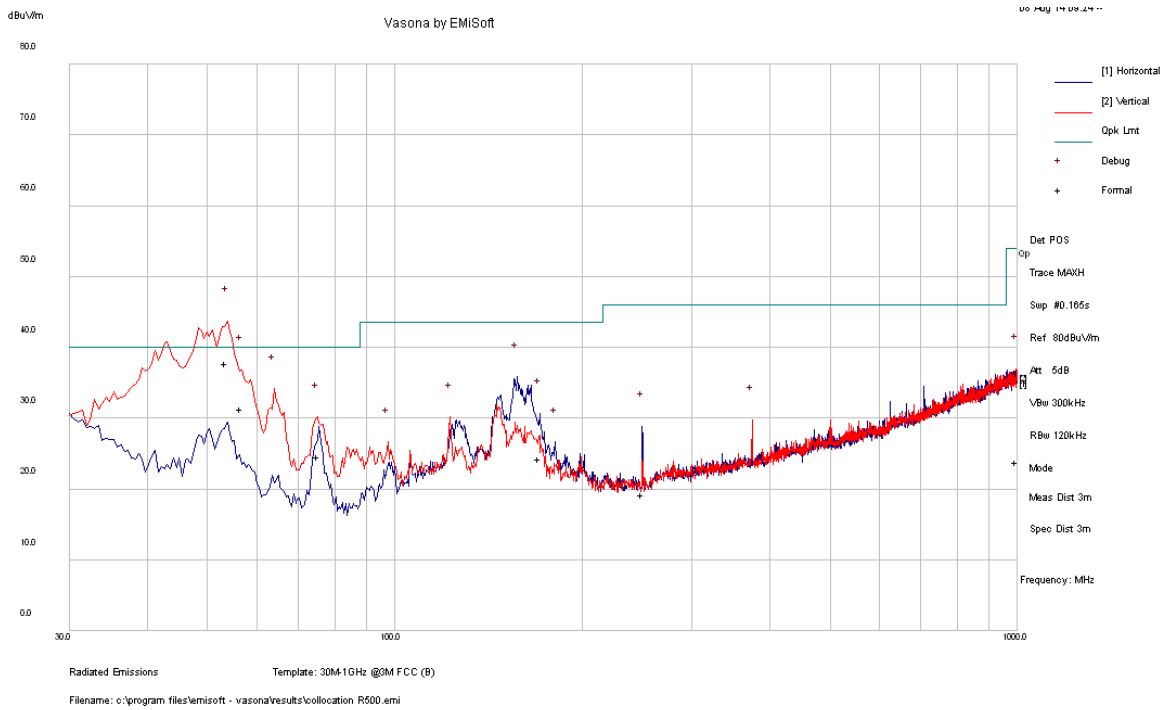
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, Channel**
-1.356	9648	Vertical	802.11b mode Low Channel

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

8.8 Radiated Emissions Test Results

1) 30 MHz – 1 GHz, Measured at 3 meters, EUT antenna port was terminated

2.4 GHz and 5 GHz Co-Location



Frequency MHz	Cord. Reading (dBµV/m)	Measurement Type	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
53.5995	37.78	QP	V	110	263	40	-2.22
56.67525	31.29	QP	V	111	246	40	-8.71
75.209	24.67	QP	V	179	333	40	-15.33
170.4068	24.37	QP	H	170	234	43.5	-19.13
994.134	23.76	QP	V	197	333	54	-30.24

2) Above 1 GHz, Measured at 3 meters, EUT antenna port was terminated

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/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
4824	48	146	100	V	33.097	4.56	34.79	50.867	74	-23.133	Peak
4824	47.86	0	100	H	33.097	4.56	34.79	50.727	74	-23.273	Peak
4824	37.78	146	100	V	33.097	4.56	34.79	40.647	54	-13.353	Ave
4824	32.89	0	100	H	33.097	4.56	34.79	35.757	54	-18.243	Ave
7236	48.67	330	100	V	35.928	5.49	35.23	54.858	74	-19.142	Peak
7236	46.09	0	100	H	35.928	5.49	35.23	52.278	74	-21.722	Peak
7236	38.81	330	100	V	35.928	5.49	35.23	44.998	54	-9.002	Ave
7236	32.81	0	100	H	35.928	5.49	35.23	38.998	54	-15.002	Ave
9648	51.21	299	112	V	37.954	6.54	35.69	60.014	74	-13.986	Peak
9648	48.18	259	118	H	37.954	6.54	35.69	56.984	74	-17.016	Peak
9648	43.84	299	112	V	37.954	6.54	35.69	52.644	54	**-1.356**	Ave
9648	38.91	259	118	H	37.954	6.54	35.69	47.714	54	-6.286	Ave
Middle Channel 2437 MHz, measured at 3 meters											
4874	46.52	230	100	V	33.327	4.54	34.76	49.627	74	-24.373	Peak
4874	45.87	0	100	H	33.327	4.54	34.76	48.977	74	-25.023	Peak
4874	34.85	230	100	V	33.327	4.54	34.76	37.957	54	-16.043	Ave
4874	31.57	0	100	H	33.327	4.54	34.76	34.677	54	-19.323	Ave
7311	45.79	0	100	V	36.369	5.57	35.19	52.539	74	-21.461	Peak
7311	45.3	0	100	H	36.369	5.57	35.19	52.049	74	-21.951	Peak
7311	32.02	0	100	V	36.369	5.57	35.19	38.769	54	-15.231	Ave
7311	31.01	0	100	H	36.369	5.57	35.19	37.759	54	-16.241	Ave
9748	49.37	0	353	V	38.087	6.62	35.7	58.377	74	-15.623	Peak
9748	47.24	0	100	H	38.087	6.62	35.7	56.247	74	-17.753	Peak
9748	40.94	0	353	V	38.087	6.62	35.7	49.947	54	-4.053	Ave
9748	32.11	0	100	H	38.087	6.62	35.7	41.117	54	-12.883	Ave
High Channel 2462 MHz, measured at 3 meters											
4924	45.63	0	100	V	33.327	4.52	34.76	48.717	74	-25.283	Peak
4924	45.75	0	100	H	33.327	4.52	34.76	48.837	74	-25.163	Peak
4924	31.17	0	100	V	33.327	4.52	34.76	34.257	54	-19.743	Ave
4924	31.16	0	100	H	33.327	4.52	34.76	34.247	54	-19.753	Ave
7386	45.91	88	101	V	36.565	5.62	35.06	53.035	74	-20.965	Peak
7386	45.17	0	100	H	36.565	5.62	35.06	52.295	74	-21.705	Peak
7386	32.02	88	100	V	36.565	5.62	35.06	39.145	54	-14.855	Ave
7386	30.66	0	100	H	36.565	5.62	35.06	37.785	54	-16.215	Ave
9848	49.75	89	102	V	38.287	6.55	35.57	59.017	74	-14.983	Peak
9848	47.62	126	143	H	38.287	6.55	35.57	56.887	74	-17.113	Peak
9848	41.78	89	102	V	38.287	6.55	35.57	51.047	54	-2.953	Ave
9848	37.43	126	143	H	38.287	6.55	35.57	46.697	54	-7.303	Ave

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/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
4824	47.27	338	110	V	33.097	4.56	34.79	50.137	74	-23.863	Peak
4824	46.04	0	100	H	33.097	4.56	34.79	48.907	74	-25.093	Peak
4824	33.78	338	110	V	33.097	4.56	34.79	36.647	54	-17.353	Ave
4824	31.9	0	100	H	33.097	4.56	34.79	34.767	54	-19.233	Ave
7236	45.6	0	100	V	35.928	5.49	35.23	51.788	74	-22.212	Peak
7236	46	0	100	H	35.928	5.49	35.23	52.188	74	-21.812	Peak
7236	31.65	0	100	V	35.928	5.49	35.23	37.838	54	-16.162	Ave
7236	31.54	0	100	H	35.928	5.49	35.23	37.728	54	-16.272	Ave
9648	55.05	321	100	V	37.954	6.54	35.69	63.854	74	-10.146	Peak
9648	47.25	0	100	H	37.954	6.54	35.69	56.054	74	-17.946	Peak
9648	38.2	321	100	V	37.954	6.54	35.69	47.004	54	-6.996	Ave
9648	32.93	0	100	H	37.954	6.54	35.69	41.734	54	-12.266	Ave
Middle Channel 2437 MHz, measured at 3 meters											
4874	46.73	0	100	V	33.327	4.54	34.76	49.837	74	-24.163	Peak
4874	45.75	0	100	H	33.327	4.54	34.76	48.857	74	-25.143	Peak
4874	31.64	0	100	V	33.327	4.54	34.76	34.747	54	-19.253	Ave
4874	31.71	0	100	H	33.327	4.54	34.76	34.817	54	-19.183	Ave
7311	45.8	0	100	V	36.369	5.57	35.19	52.549	74	-21.451	Peak
7311	45.24	0	100	H	36.369	5.57	35.19	51.989	74	-22.011	Peak
7311	31.42	0	100	V	36.369	5.57	35.19	38.169	54	-15.831	Ave
7311	31.04	0	100	H	36.369	5.57	35.19	37.789	54	-16.211	Ave
9748	51.83	305	111	V	38.087	6.62	35.7	60.837	74	-13.163	Peak
9748	47.46	0	100	H	38.087	6.62	35.7	56.467	74	-17.533	Peak
9748	36.09	305	111	V	38.087	6.62	35.7	45.097	54	-8.903	Ave
9748	32.42	0	100	H	38.087	6.62	35.7	41.427	54	-12.573	Ave
High Channel 2462 MHz, measured at 3 meters											
4924	45.52	0	100	V	33.327	4.52	34.76	48.607	74	-25.393	Peak
4924	45.03	0	100	H	33.327	4.52	34.76	48.117	74	-25.883	Peak
4924	31.21	0	100	V	33.327	4.52	34.76	34.297	54	-19.703	Ave
4924	31.74	0	100	H	33.327	4.52	34.76	34.827	54	-19.173	Ave
7386	45.63	0	100	V	36.565	5.62	35.06	52.755	74	-21.245	Peak
7386	45.73	0	100	H	36.565	5.62	35.06	52.855	74	-21.145	Peak
7386	31.04	0	100	V	36.565	5.62	35.06	38.165	54	-15.835	Ave
7386	30.99	0	100	H	36.565	5.62	35.06	38.115	54	-15.885	Ave
9848	49.82	80	135	V	38.287	6.55	35.57	59.087	74	-14.913	Peak
9848	46.63	0	100	H	38.287	6.55	35.57	55.897	74	-18.103	Peak
9848	35.29	80	135	V	38.287	6.55	35.57	44.557	54	-9.443	Ave
9848	32.23	0	100	H	38.287	6.55	35.57	41.497	54	-12.503	Ave

802.11n-HT20 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
4824	48.22	338	110	V	33.097	4.56	34.79	51.08	74	-22.92	Peak
4824	46.96	0	100	H	33.097	4.56	34.79	49.83	74	-24.17	Peak
4824	34.46	338	110	V	33.097	4.56	34.79	37.32	54	-16.68	Ave
4824	32.54	0	100	H	33.097	4.56	34.79	35.41	54	-18.60	Ave
7236	46.51	0	100	V	35.928	5.49	35.23	52.70	74	-21.30	Peak
7236	46.92	0	100	H	35.928	5.49	35.23	53.11	74	-20.89	Peak
7236	32.28	0	100	V	35.928	5.49	35.23	38.47	54	-15.53	Ave
7236	32.17	0	100	H	35.928	5.49	35.23	38.36	54	-15.64	Ave
9648	56.15	121	100	V	37.954	6.54	35.69	64.96	74	-9.05	Peak
9648	48.20	0	100	H	37.954	6.54	35.69	57.00	74	-17.00	Peak
9648	38.96	121	100	V	37.954	6.54	35.69	47.77	54	-6.23	Ave
9648	33.59	0	100	H	37.954	6.54	35.69	42.39	54	-11.61	Ave
Middle Channel 2437 MHz, measured at 3 meters											
4874	48.13	0	100	V	33.327	4.54	34.76	51.24	74	-22.76	Peak
4874	47.12	0	100	H	33.327	4.54	34.76	50.23	74	-23.77	Peak
4874	32.59	0	100	V	33.327	4.54	34.76	35.70	54	-18.30	Ave
4874	32.66	0	100	H	33.327	4.54	34.76	35.77	54	-18.23	Ave
7311	47.17	0	100	V	36.369	5.57	35.19	53.92	74	-20.08	Peak
7311	46.60	0	100	H	36.369	5.57	35.19	53.35	74	-20.65	Peak
7311	32.36	0	100	V	36.369	5.57	35.19	39.11	54	-14.89	Ave
7311	31.97	0	100	H	36.369	5.57	35.19	38.72	54	-15.28	Ave
9748	53.38	332	111	V	38.087	6.62	35.7	62.39	74	-11.61	Peak
9748	48.88	0	100	H	38.087	6.62	35.7	57.89	74	-16.11	Peak
9748	37.17	332	111	V	38.087	6.62	35.7	46.18	54	-7.82	Ave
9748	33.39	0	100	H	38.087	6.62	35.7	42.40	54	-11.60	Ave
High Channel 2462 MHz, measured at 3 meters											
4924	45.69	0	100	V	33.327	4.52	34.76	48.777	74	-25.223	Peak
4924	45.22	0	100	H	33.327	4.52	34.76	48.307	74	-25.693	Peak
4924	30.85	0	100	V	33.327	4.52	34.76	33.937	54	-20.063	Ave
4924	31.51	0	100	H	33.327	4.52	34.76	34.597	54	-19.403	Ave
7386	45.66	0	100	V	36.565	5.62	35.06	52.785	74	-21.215	Peak
7386	45.87	0	100	H	36.565	5.62	35.06	52.995	74	-21.005	Peak
7386	31.25	0	100	V	36.565	5.62	35.06	38.375	54	-15.625	Ave
7386	31.29	0	100	H	36.565	5.62	35.06	38.415	54	-15.585	Ave
9848	48.21	68	135	V	38.287	6.55	35.57	57.477	74	-16.523	Peak
9848	47.54	0	100	H	38.287	6.55	35.57	56.807	74	-17.193	Peak
9848	32.54	68	135	V	38.287	6.55	35.57	41.807	54	-12.193	Ave
9848	31.2	0	100	H	38.287	6.55	35.57	40.467	54	-13.533	Ave

802.11n-HT40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2422 MHz, measured at 3 meters											
4844	45.9	0	100	V	33.097	4.56	34.76	48.797	74	-25.203	Peak
4844	44.81	0	100	H	33.097	4.56	34.76	47.707	74	-26.293	Peak
4844	31.66	0	100	V	33.097	4.56	34.76	34.557	54	-19.443	Ave
4844	31.56	0	100	H	33.097	4.56	34.76	34.457	54	-19.543	Ave
7266	45.76	0	100	V	35.928	5.49	35.23	51.948	74	-22.052	Peak
7266	46.23	0	100	H	35.928	5.49	35.23	52.418	74	-21.582	Peak
7266	31.58	0	100	V	35.928	5.49	35.23	37.768	54	-16.232	Ave
7266	31.55	0	100	H	35.928	5.49	35.23	37.738	54	-16.262	Ave
9688	49.51	0	100	V	37.954	6.54	35.71	58.294	74	-15.706	Peak
9688	47.48	0	100	H	37.954	6.54	35.71	56.264	74	-17.736	Peak
9688	34.65	0	100	V	37.954	6.54	35.71	43.434	54	-10.566	Ave
9688	32.69	0	100	H	37.954	6.54	35.71	41.474	54	-12.526	Ave
Middle Channel 2437 MHz, measured at 3 meters											
4874	45.68	0	100	V	33.327	4.54	34.76	48.787	74	-25.213	Peak
4874	46.24	0	100	H	33.327	4.54	34.76	49.347	74	-24.653	Peak
4874	31.21	0	100	V	33.327	4.54	34.76	34.317	54	-19.683	Ave
4874	31.19	0	100	H	33.327	4.54	34.76	34.297	54	-19.703	Ave
7311	45.18	0	100	V	36.369	5.57	35.06	52.059	74	-21.941	Peak
7311	45.16	0	100	H	36.369	5.57	35.06	52.039	74	-21.961	Peak
7311	31.11	0	100	V	36.369	5.57	35.06	37.989	54	-16.011	Ave
7311	31.07	0	100	H	36.369	5.57	35.06	37.949	54	-16.051	Ave
9748	47.3	324	100	V	38.087	6.62	35.7	56.307	74	-17.693	Peak
9748	46.36	0	100	H	38.087	6.62	35.7	55.367	74	-18.633	Peak
9748	32.89	324	100	V	38.087	6.62	35.7	41.897	54	-12.103	Ave
9748	32.15	0	100	H	38.087	6.62	35.7	41.157	54	-12.843	Ave
Middle Channel 2452 MHz, measured at 3 meters											
4904	44.85	0	100	V	33.327	4.52	34.76	47.937	74	-26.063	Peak
4904	44.36	0	100	H	33.327	4.52	34.76	47.447	74	-26.553	Peak
4904	30.74	0	100	V	33.327	4.52	34.76	33.827	54	-20.173	Ave
4904	30.77	0	100	H	33.327	4.52	34.76	33.857	54	-20.143	Ave
7356	44.54	0	100	V	36.565	5.62	35.06	51.665	74	-22.335	Peak
7356	44.84	0	100	H	36.565	5.62	35.06	51.965	74	-22.035	Peak
7356	30.7	0	100	V	36.565	5.62	35.06	37.825	54	-16.175	Ave
7356	30.7	0	100	H	36.565	5.62	35.06	37.825	54	-16.175	Ave
9808	46.75	0	100	V	38.287	6.55	35.68	55.907	74	-18.093	Peak
9808	45.21	0	100	H	38.287	6.55	35.68	54.367	74	-19.633	Peak
9808	31.98	0	100	V	38.287	6.55	35.68	41.137	54	-12.863	Ave
9808	31.97	0	100	H	38.287	6.55	35.68	41.127	54	-12.873	Ave

9 FCC§15.247(a)(2) & IC RSS-210 §A8.2 – 6 dB & 99% Emission Bandwidth

9.1 Applicable Standard

According to FCC §15.247(a)(2) and IC RSS-210 A8.2 (a), 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

The measurements are base on FCC KDB 558074 D01 DTS Meas Guidance v03r01: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8: DTS bandwidth

9.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2013-09-29	1 year

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

9.4 Test Environmental Conditions

Temperature:	21-25° C
Relative Humidity:	41-45 %
ATM Pressure:	101-102 kPa

The testing was performed by Chen Ge from 2014-06-30 and 2014-07-03 at RF site.

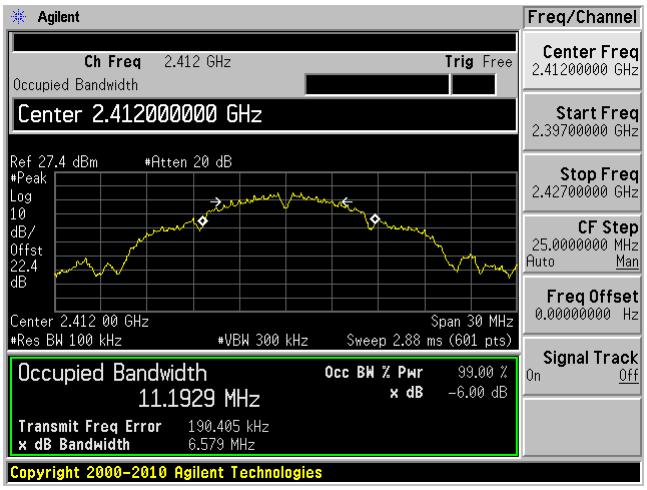
9.5 Test Results and Plots

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz) J0	6 dB Emission Bandwidth (MHz) J1	99% Emission Bandwidth (MHz) J0	99% Emission Bandwidth (MHz) J1	Limit (MHz)	Results
802.11b mode							
Low	2412	6.579	5.210	11.1929	11.4012	> 0.5	Compliant
Middle	2437	5.653	6.586	11.7001	11.9511	> 0.5	Compliant
High	2462	6.507	6.047	12.8631	12.3911	> 0.5	Compliant
802.11g mode							
Low	2412	16.575	16.538	16.5843	16.5250	> 0.5	Compliant
Middle	2437	16.573	16.561	16.6543	16.6018	> 0.5	Compliant
High	2462	16.570	16.549	17.3030	16.9140	> 0.5	Compliant
802.11n-HT20 mode							
Low	2412	17.794	17.804	17.7701	17.7047	> 0.5	Compliant
Middle	2437	17.835	17.822	17.8343	17.8026	> 0.5	Compliant
High	2462	17.819	17.766	17.8299	18.0038	> 0.5	Compliant
802.11n-HT40 mode							
Low	2422	36.582	36.583	36.1836	36.2044	> 0.5	Compliant
Middle	2437	36.555	36.579	36.2273	36.2420	> 0.5	Compliant
High	2452	36.464	36.533	36.1668	36.2081	> 0.5	Compliant

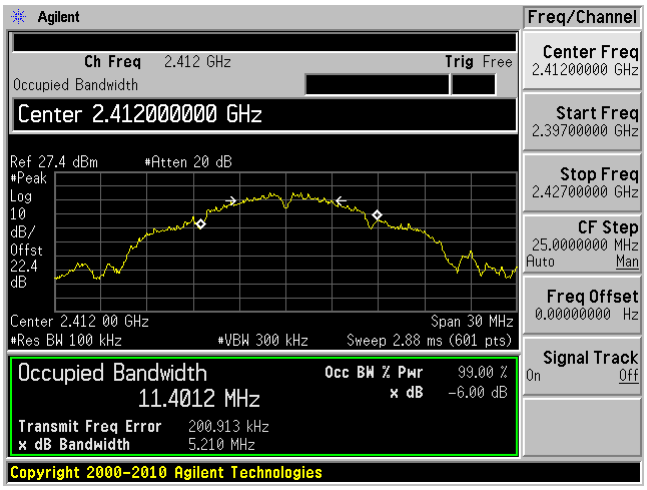
Please refer to the following plots for detailed test results

802.11 b mode

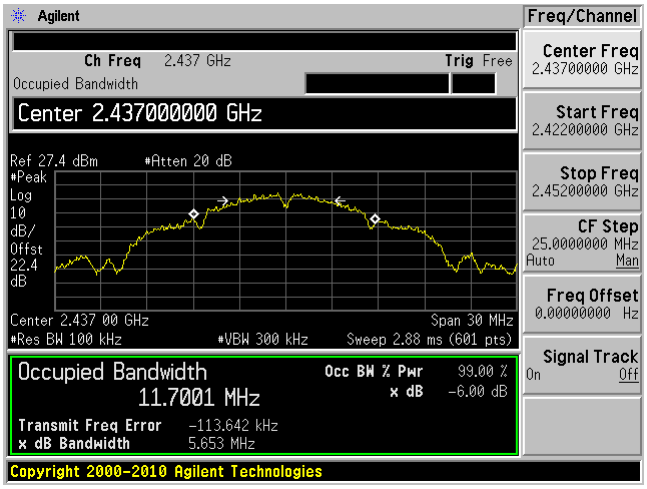
Low channel: 2412 MHz Chain J0



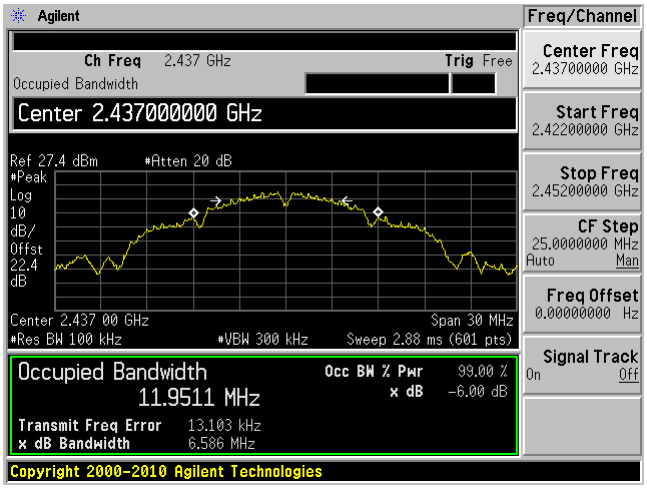
Low channel: 2412 MHz Chain J1



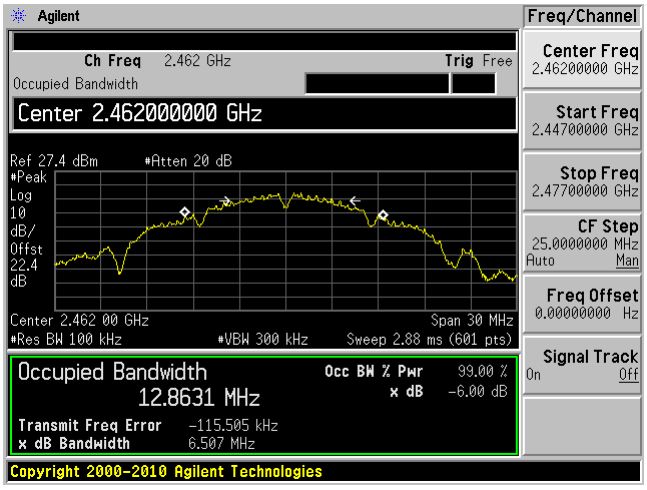
Middle channel: 2437 MHz Chain J0



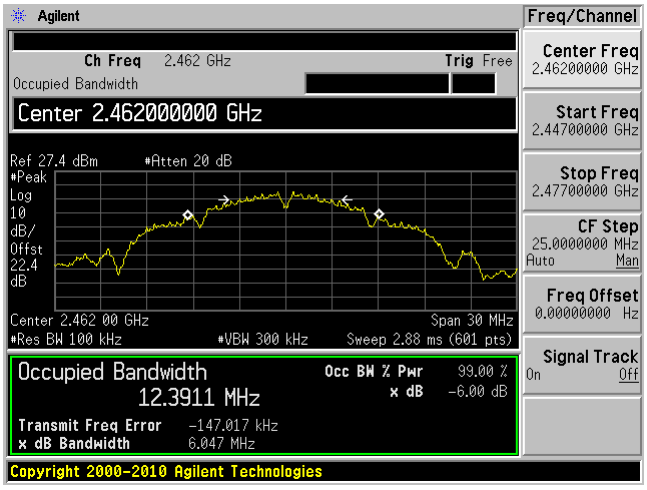
Middle channel: 2437 MHz Chain J1



High channel: 2462 MHz Chain J0

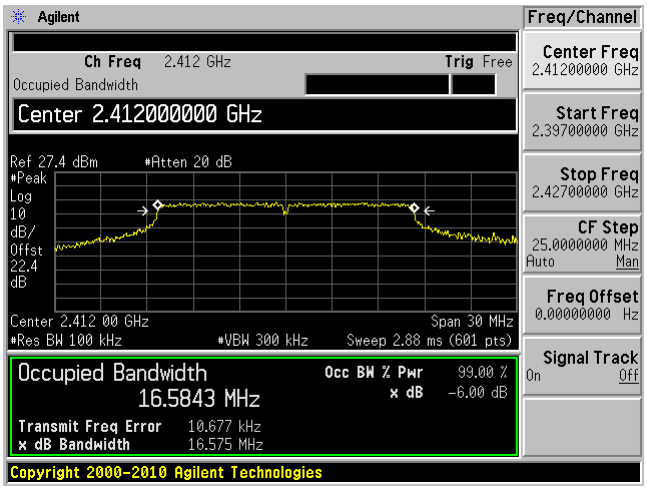


High channel: 2462 MHz Chain J1

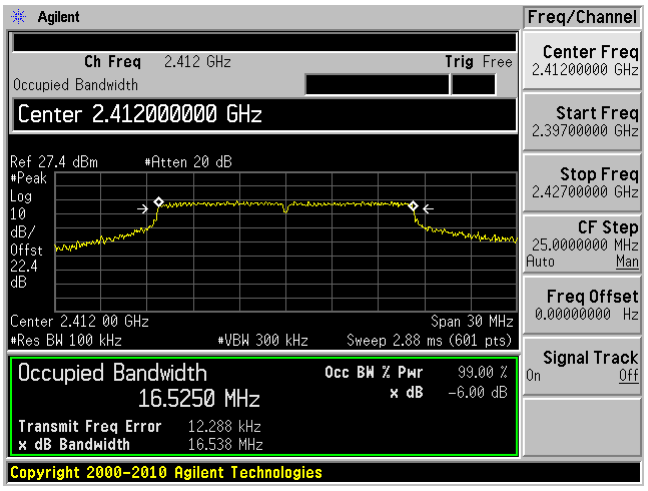


802.11 g mode

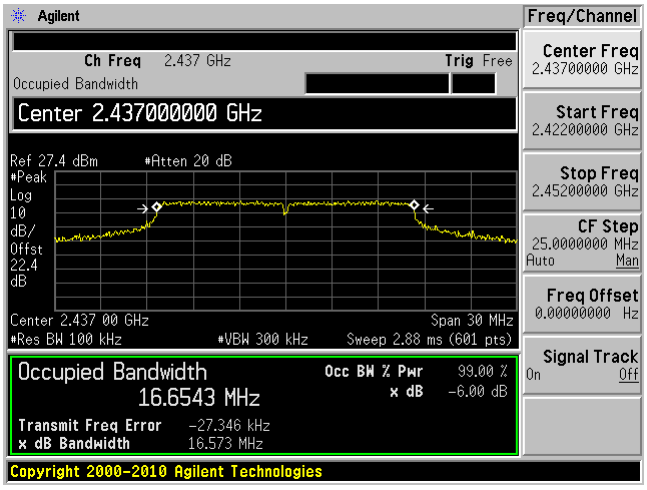
Low channel: 2412 MHz Chain J0



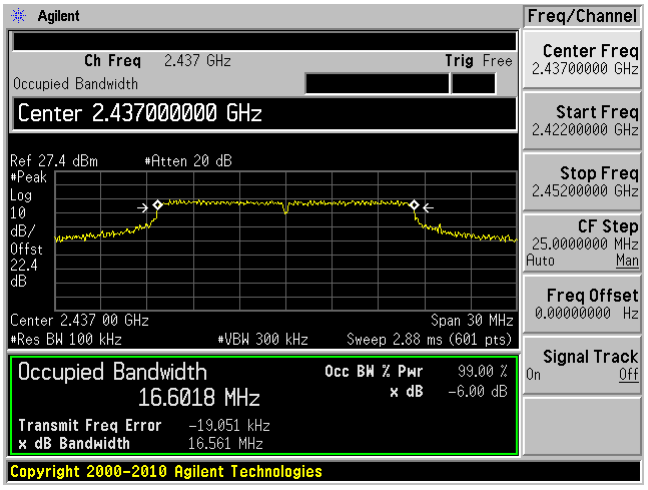
Low channel: 2412 MHz Chain J1



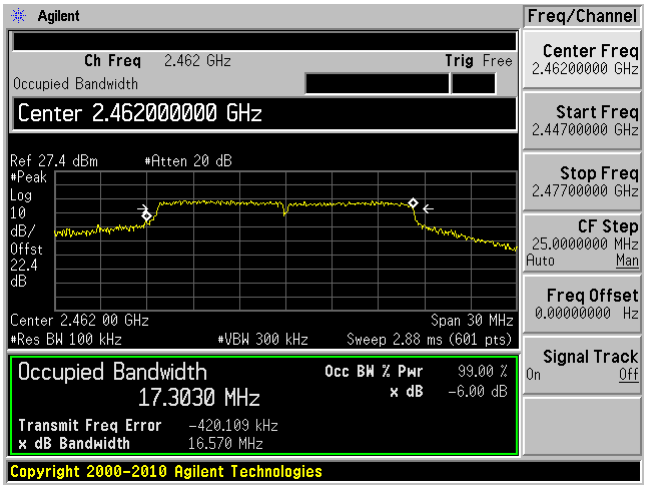
Middle channel: 2437 MHz Chain J0



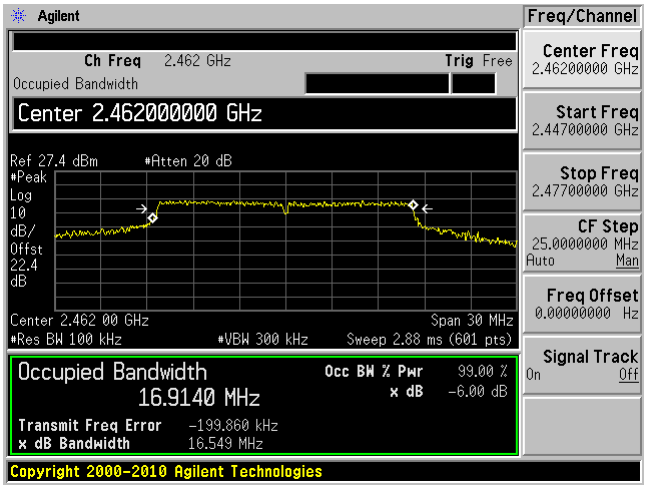
Middle channel: 2437 MHz Chain J1



High channel: 2462 MHz Chain J0

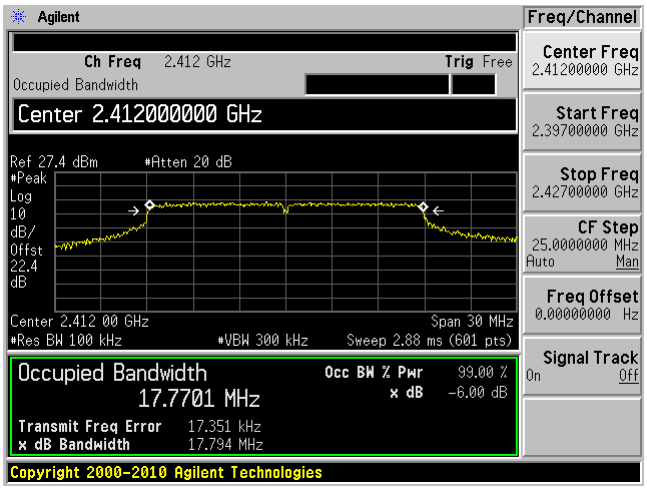


High channel: 2462 MHz Chain J1

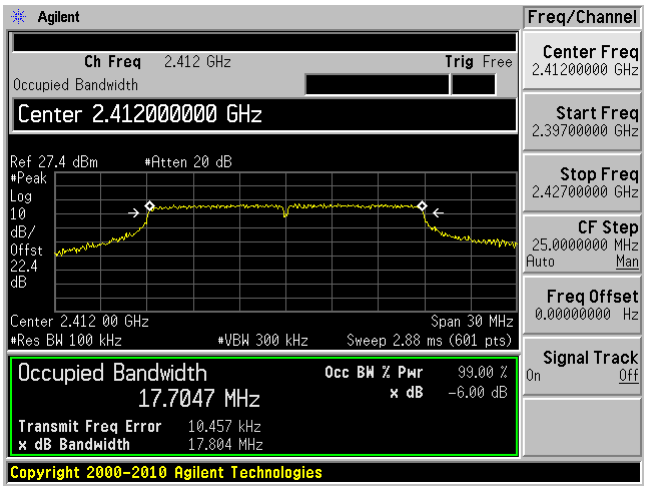


802.11n-HT20 mode

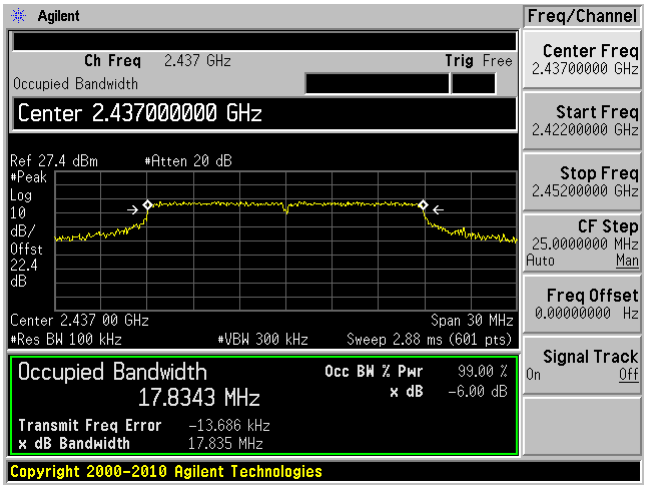
Low channel: 2412 MHz Chain J0



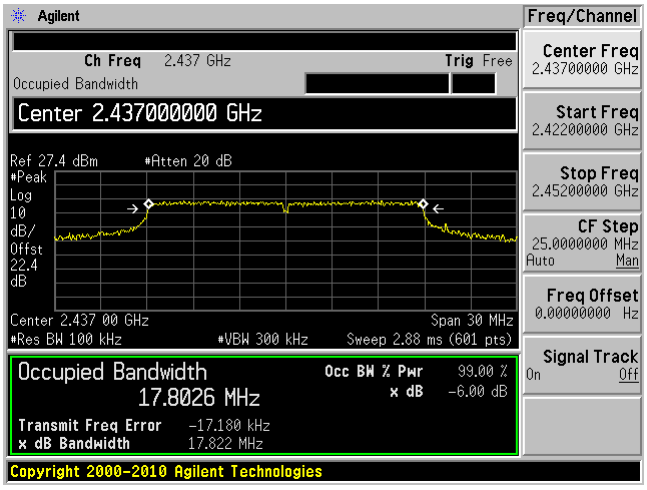
Low channel: 2412 MHz Chain J1



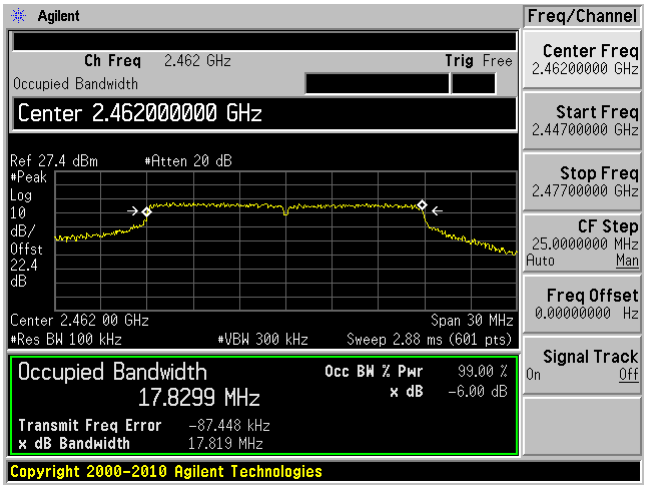
Middle channel: 2437 MHz Chain J0



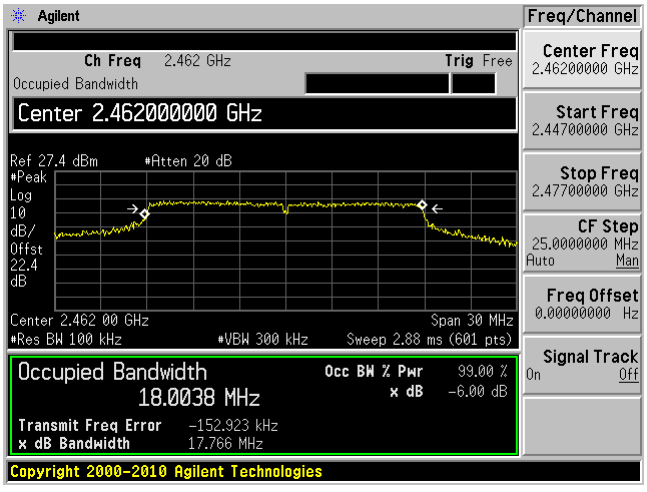
Middle channel: 2437 MHz Chain J1



High channel: 2462 MHz Chain J0

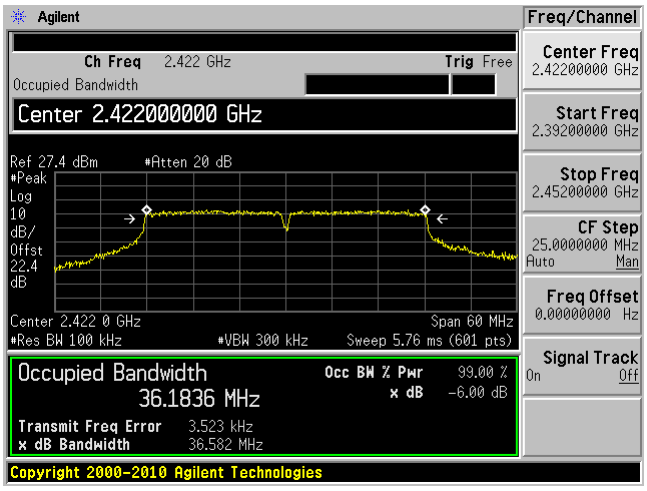


High channel: 2462 MHz Chain J1

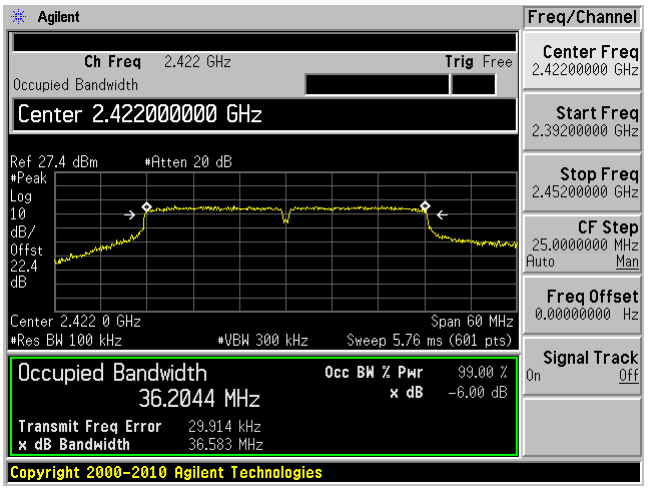


802.11n-HT40 mode

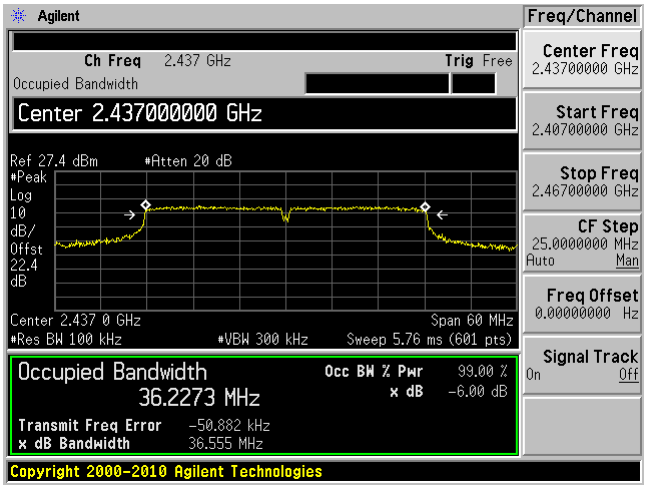
Low channel: 2422 MHz Chain J0



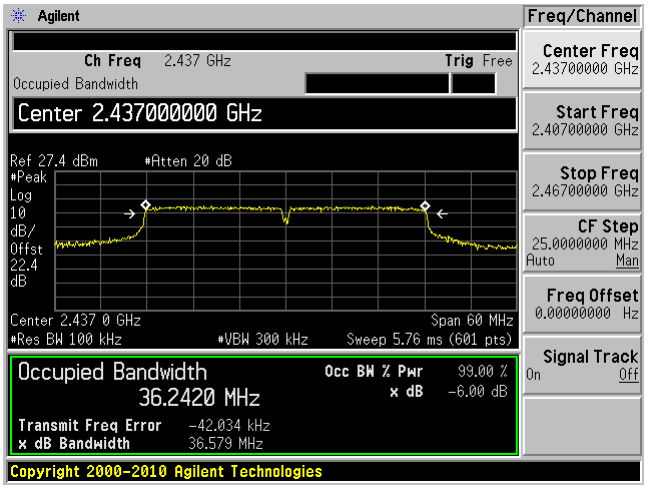
Low channel: 2422 MHz Chain J1



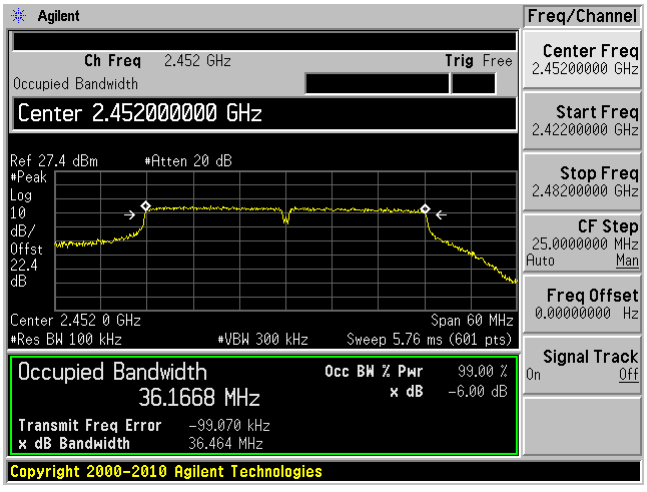
Middle channel: 2437 MHz Chain J0



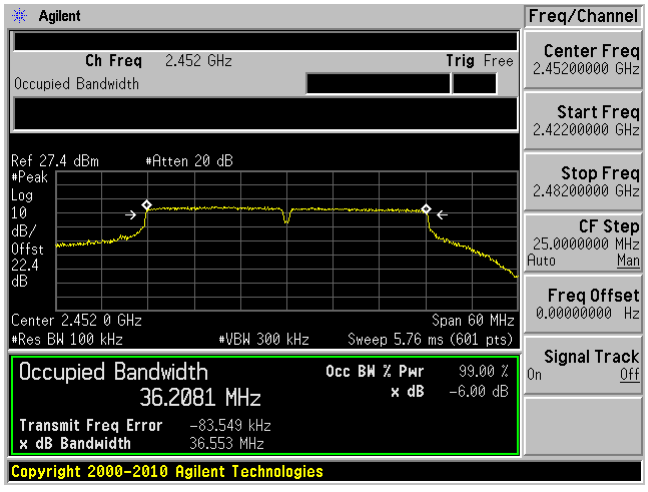
Middle channel: 2437 MHz Chain J1



High channel: 2452 MHz Chain J0



High channel: 2452 MHz Chain J1



10 FCC §15.247(b) & IC RSS-210 §A8.4 – Peak Output Power Measurement

10.1 Applicable Standard

According to FCC §15.247(b) and IC RSS-210 §A8.4 (4) 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

The measurements are base on FCC KDB 558074 D01 DTS Meas Guidance v03r01: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 9: Fundamental emission output power

10.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2013-09-29	1 year

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

10.4 Test Environmental Conditions

Temperature:	22-26° C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Chen Ge from 2014-06-28 and 2014-06-30 at RF site.

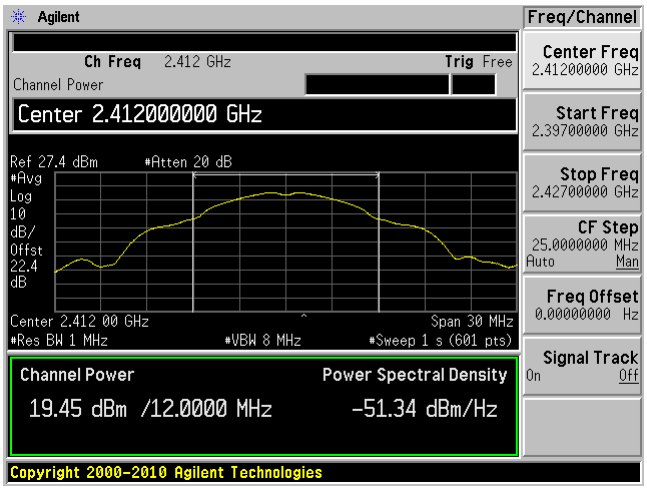
10.5 Test Results

Channel	Frequency (MHz)	Conducted Output Power (dBm)		Total Output Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
		Chain J0	Chain J1				
802.11b mode							
Low	2412	19.45	20.27	22.89	30	-7.11	target
Middle	2437	19.51	20.08	22.81	30	-7.19	target
High	2462	19.62	19.29	22.47	30	-7.53	target
802.11g mode							
Low	2412	19.95	20.23	23.10	30	-6.90	target
Middle	2437	19.89	20.31	23.12	30	-6.88	target
High	2462	19.93	19.88	22.92	30	-7.08	target
802.11n-HT20 mode							
Low	2412	19.57	19.1	22.35	30	-7.65	target
Middle	2437	19.95	20.08	23.03	30	-6.97	target
High	2462	20.16	19.69	22.94	30	-7.06	target
802.11n-HT40 mode							
Low	2422	18.4	18.62	21.52	30	-8.48	target
Middle	2437	19.37	20.36	22.90	30	-7.10	target
High	2452	19.36	19.44	22.41	30	-7.59	target

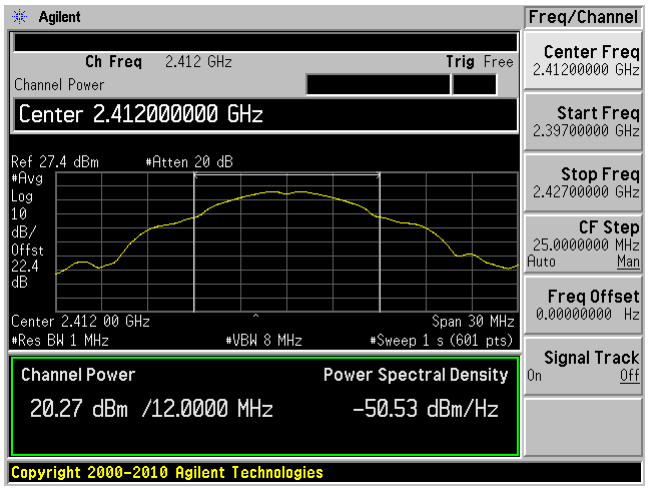
Please refer to the following plots.

802.11 b mode

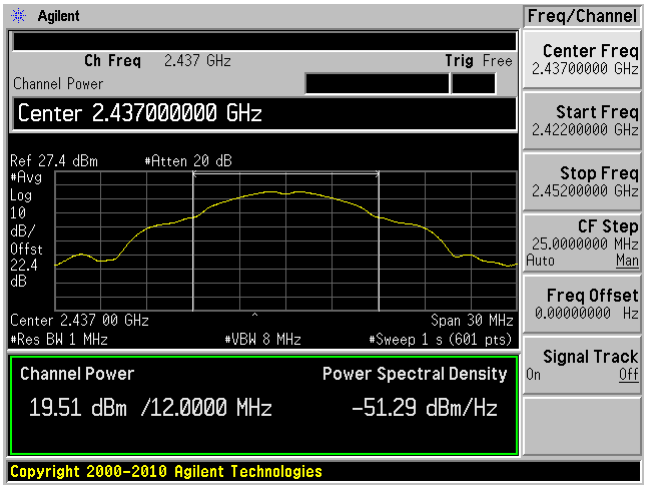
Low channel: 2412 MHz Chain J0



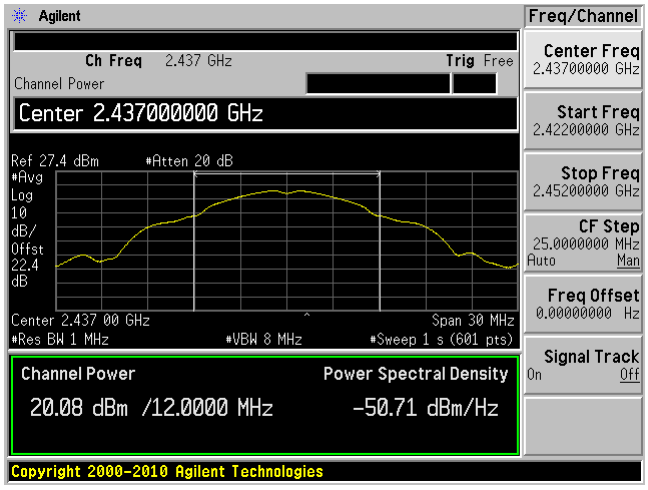
Low channel: 2412 MHz Chain J1



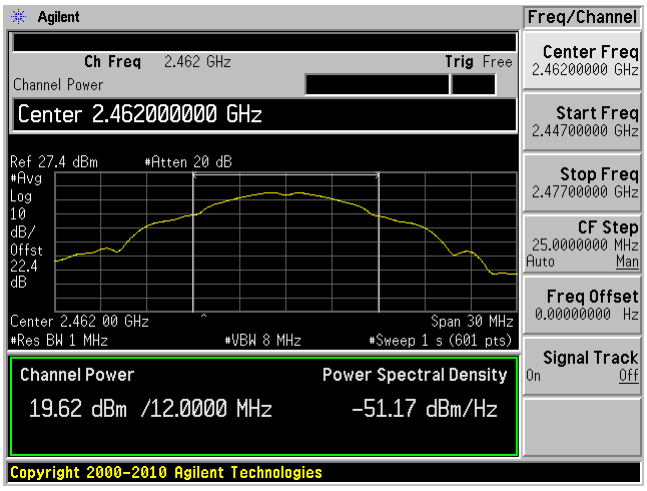
Middle channel: 2437 MHz Chain J0



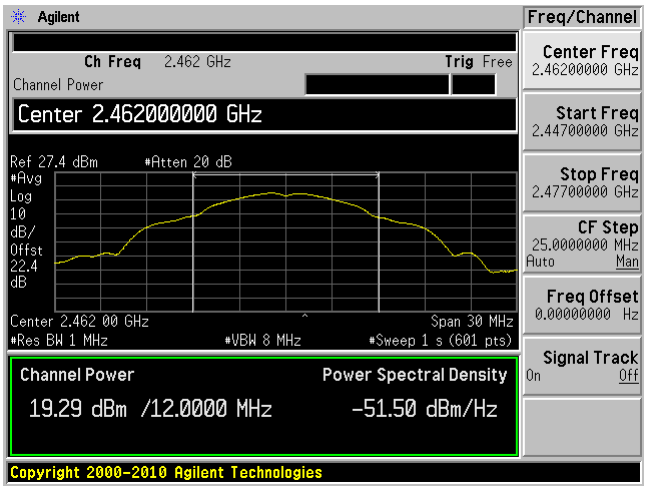
Middle channel: 2437 MHz Chain J1



High channel: 2462 MHz Chain J0

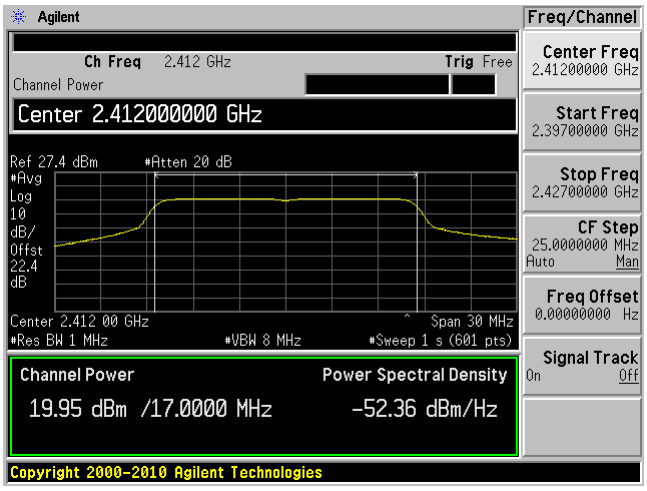


High channel: 2462 MHz Chain J1

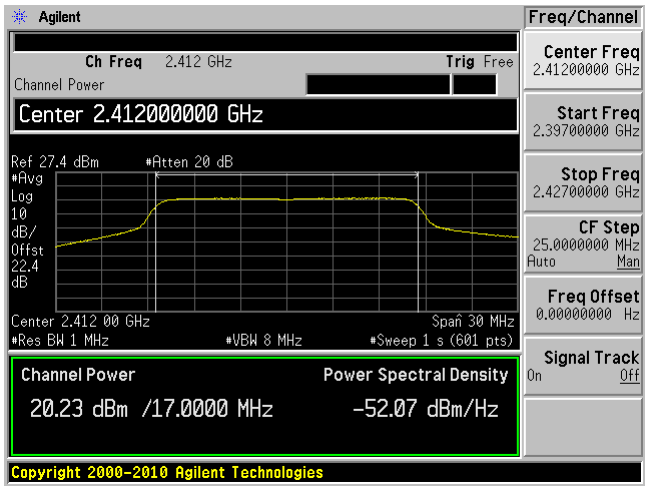


802.11 g mode

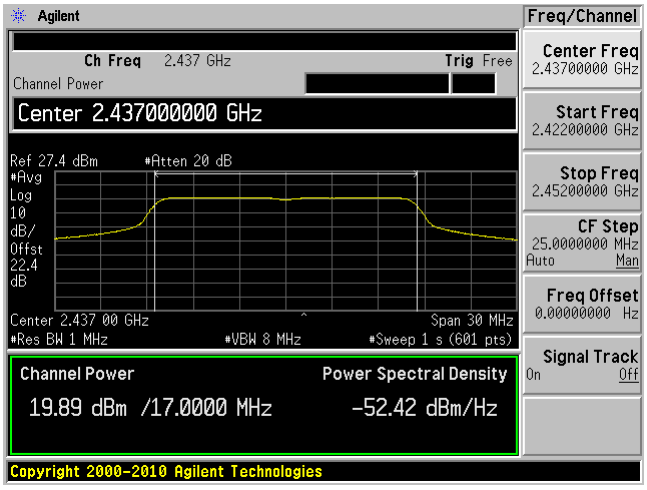
Low channel: 2412 MHz Chain J0



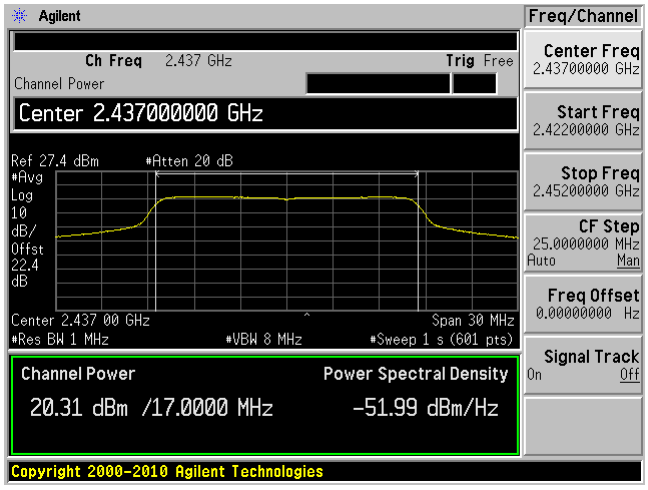
Low channel: 2412 MHz Chain J1



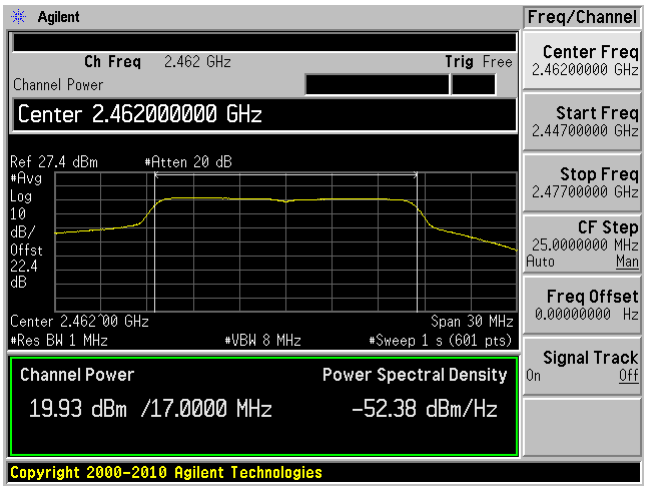
Middle channel: 2437 MHz Chain J0



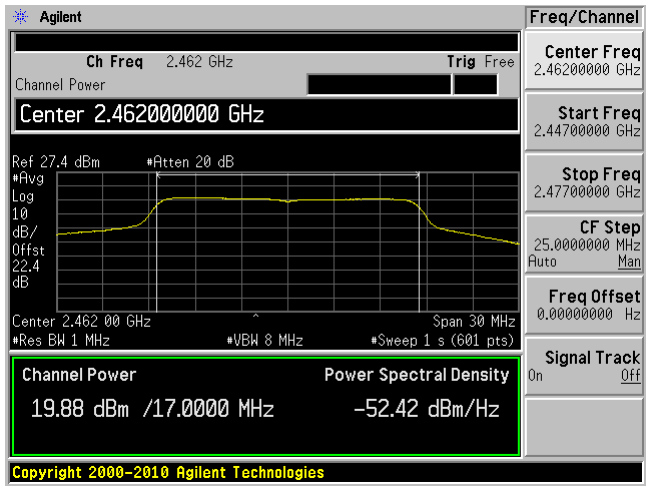
Middle channel: 2437 MHz Chain J1



High channel: 2462 MHz Chain J0

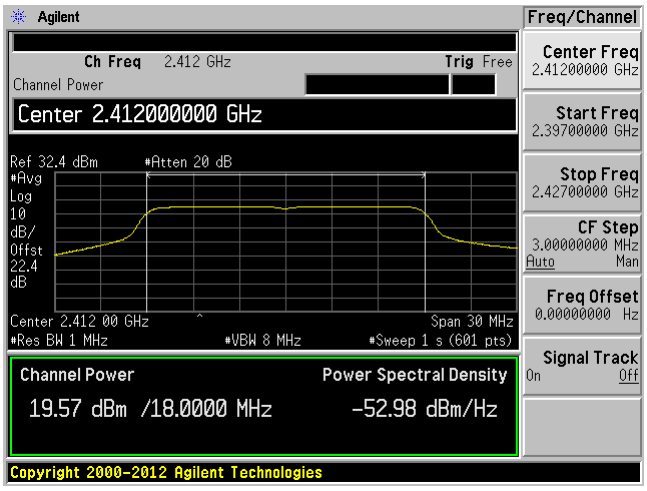


High channel: 2462 MHz Chain J1

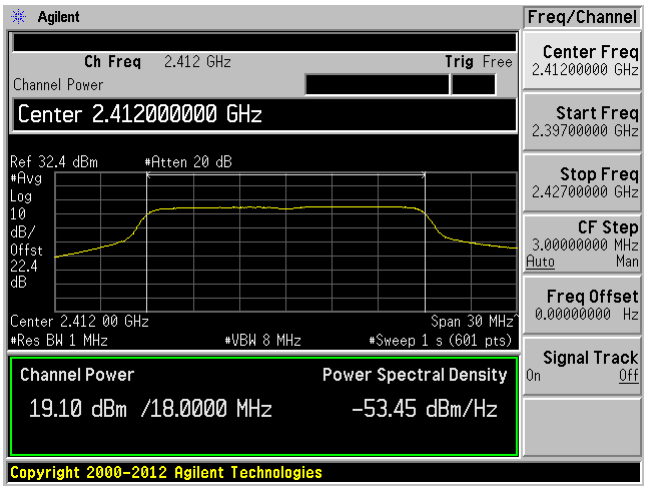


802.11n-HT20 mode

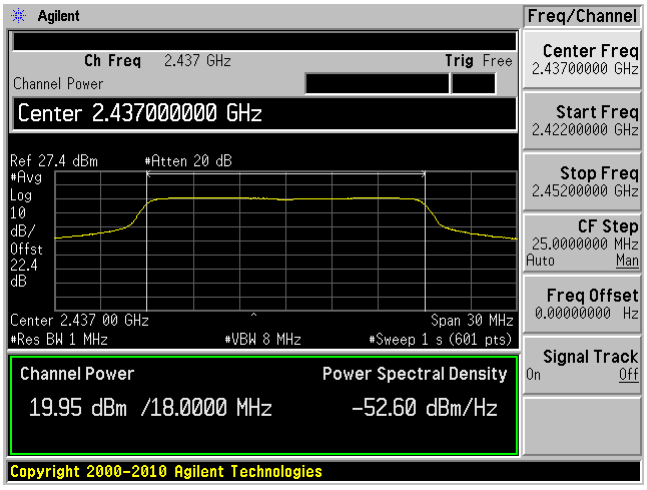
Low channel: 2412 MHz Chain J0



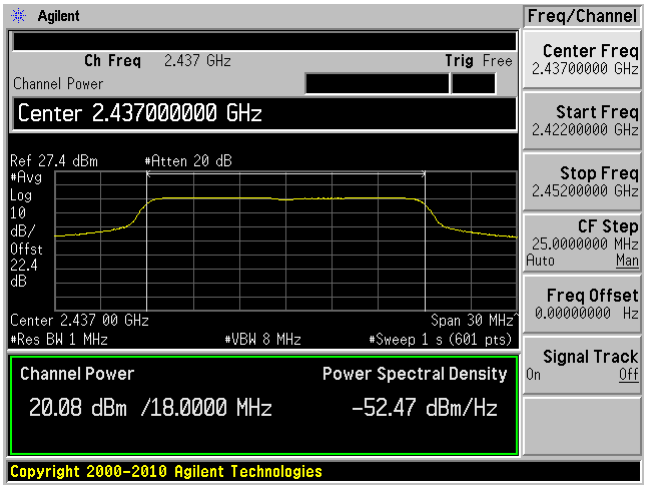
Low channel: 2412 MHz Chain J1



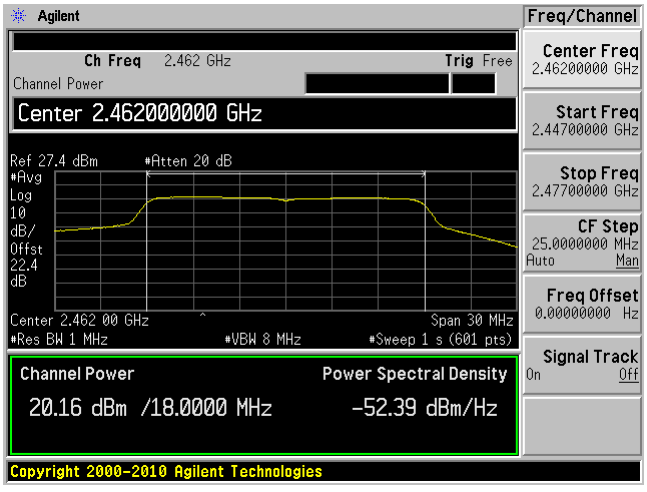
Middle channel: 2437 MHz Chain J0



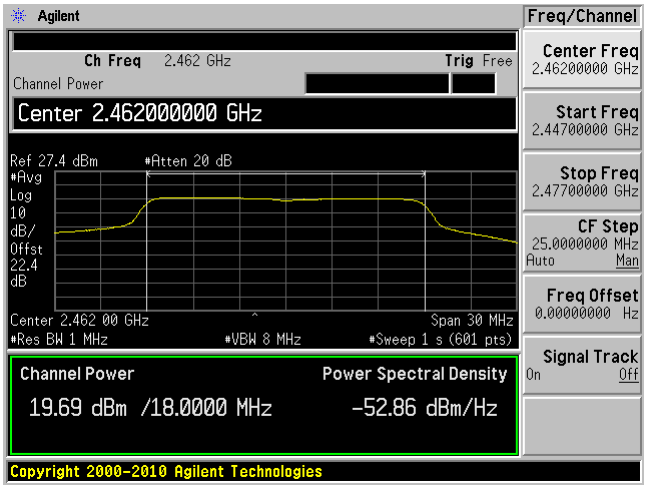
Middle channel: 2437 MHz Chain J1



High channel: 2462 MHz Chain J0

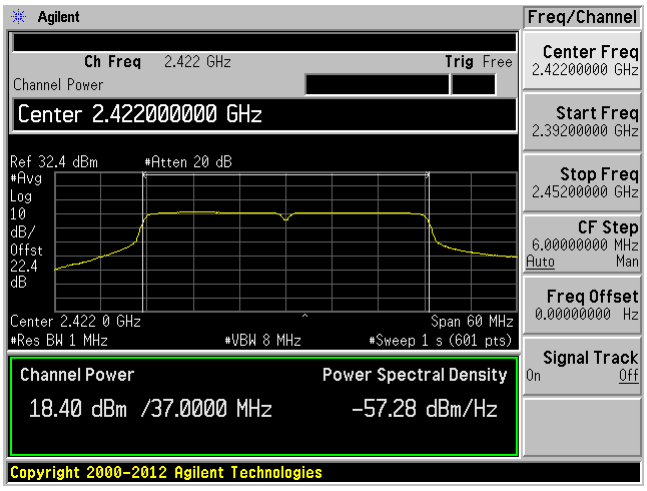


High channel: 2462 MHz Chain J1

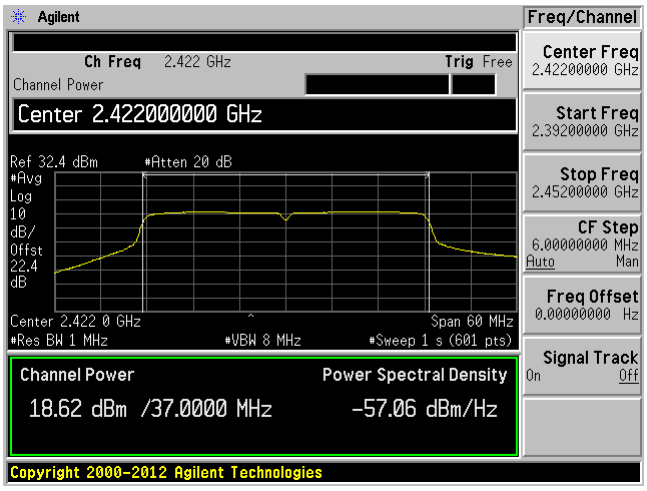


802.11n-HT40 mode

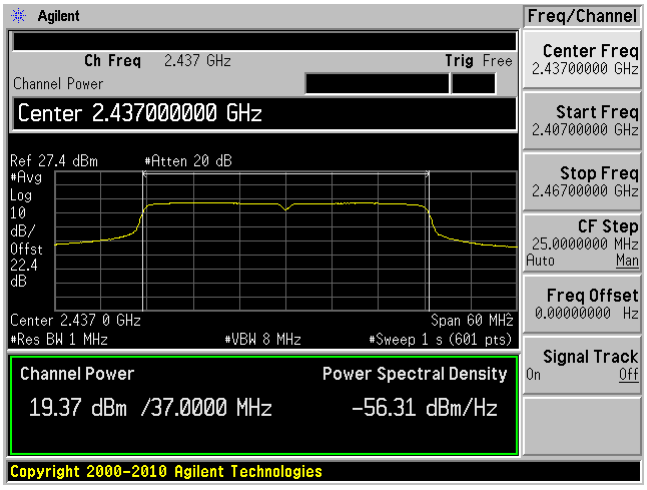
Low channel: 2422 MHz Chain J0



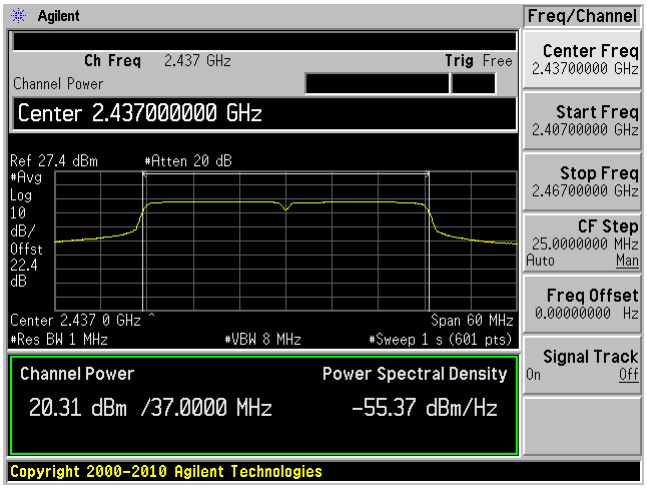
Low channel: 2422 MHz Chain J1



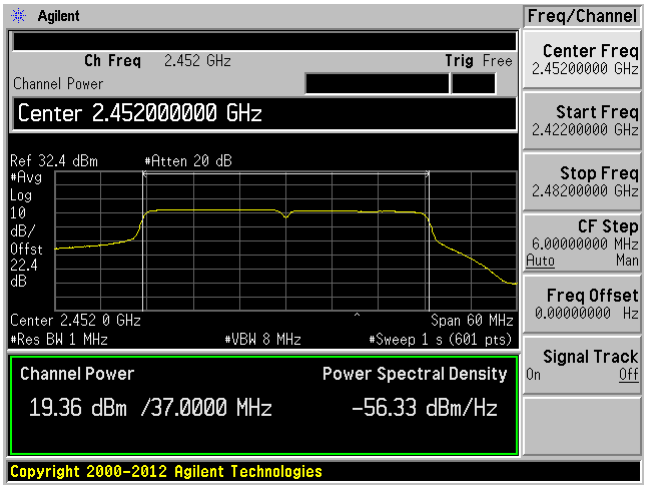
Middle channel: 2437 MHz Chain J0



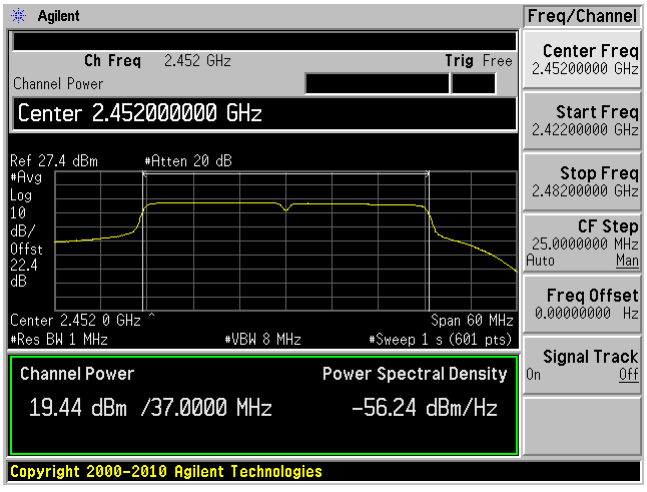
Middle channel: 2437 MHz Chain J1



High channel: 2452 MHz Chain J0



High channel: 2452 MHz Chain J1



11 FCC §15.247(d) & IC RSS-210 §A8.5 – 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).

According to IC Rss-210 §A8.5, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced 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 section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

11.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r01: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 13: Band-edge measurements

11.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2013-09-29	1 year

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

11.4 Test Environmental Conditions

Temperature:	22-26° C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

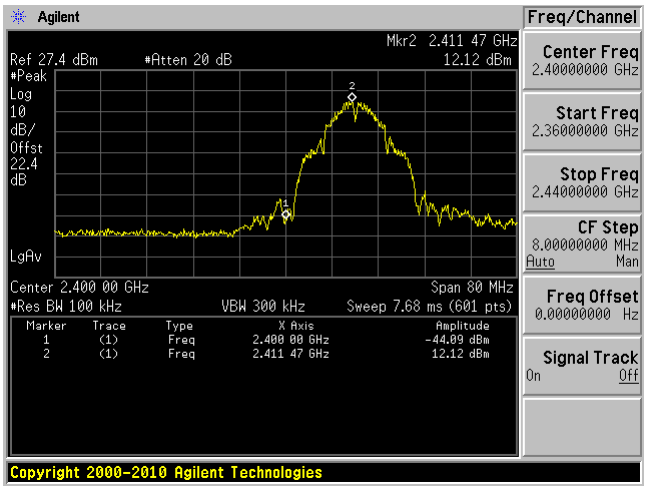
The testing was performed by Chen Ge from 2014-06-28 and 2014-06-30 at RF site.

11.5 Test Results

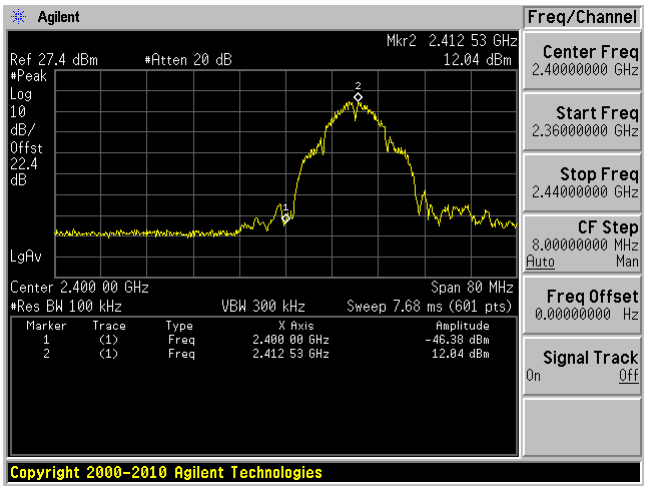
Please refer to following pages for plots of band edge.

802.11b mode

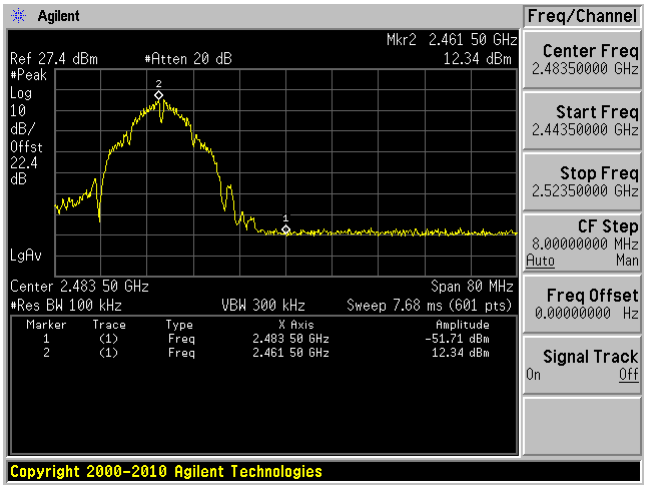
802.11b, Chain J0 Low Band Edge



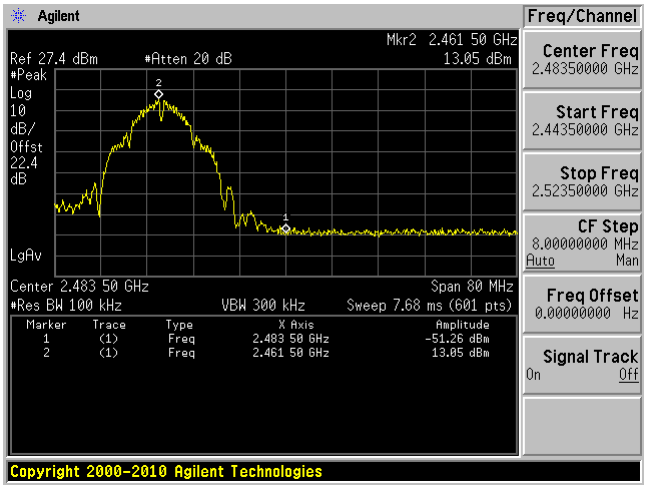
802.11b, Chain J1 Low Band Edge



802.11b, Chain J0 High Band Edge

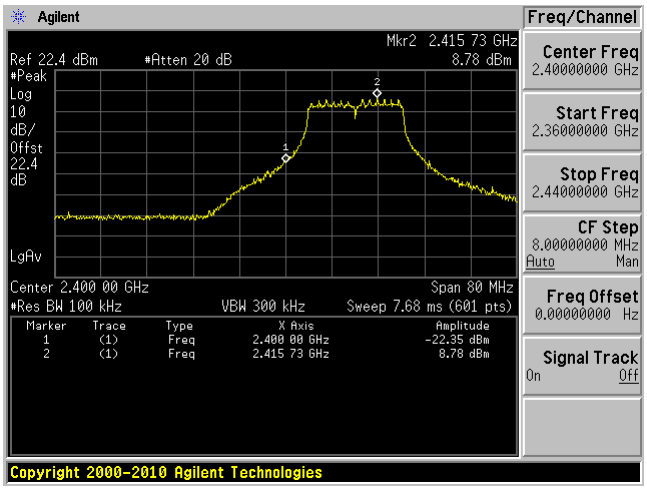


802.11b, Chain J1 High Band Edge

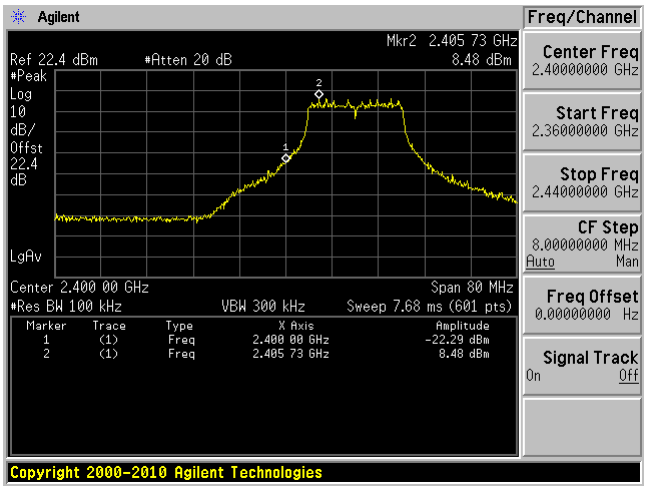


802.11g mode

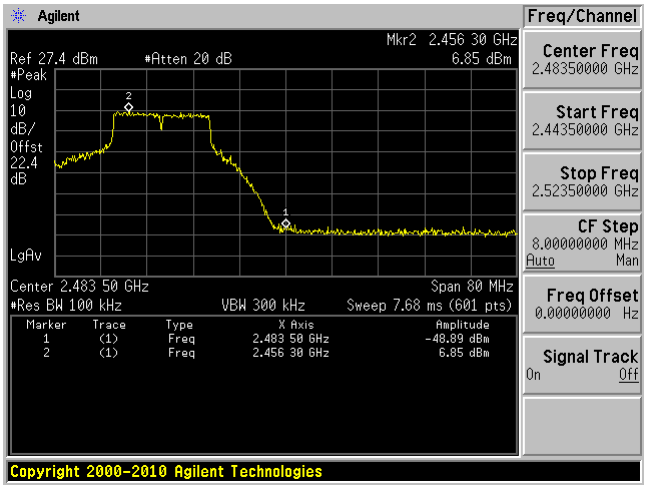
802.11g, Chain J0 Low Band Edge



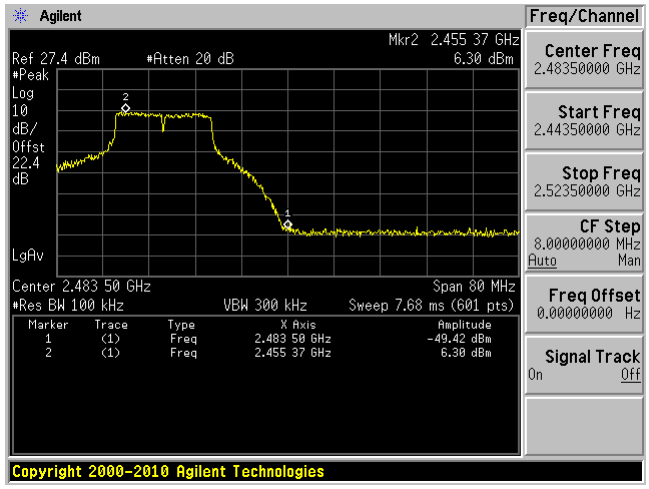
802.11g, Chain J1 Low Band Edge



802.11g, Chain J0 High Band Edge

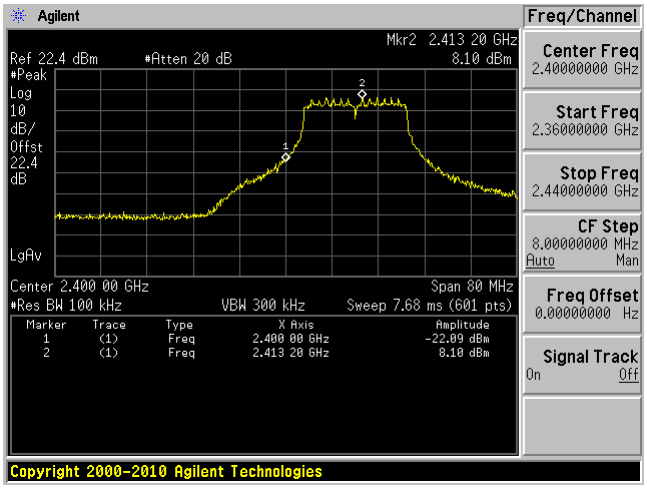


802.11g, Chain J1 High Band Edge

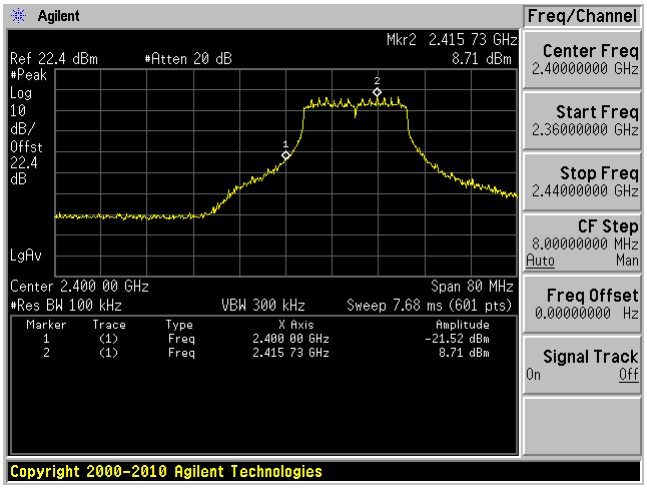


802.11n-HT20 mode

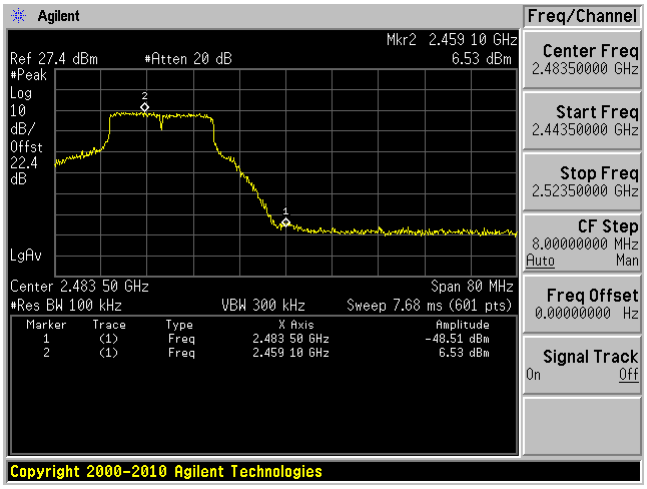
802.11n-HT20, Chain J0 Low Band Edge



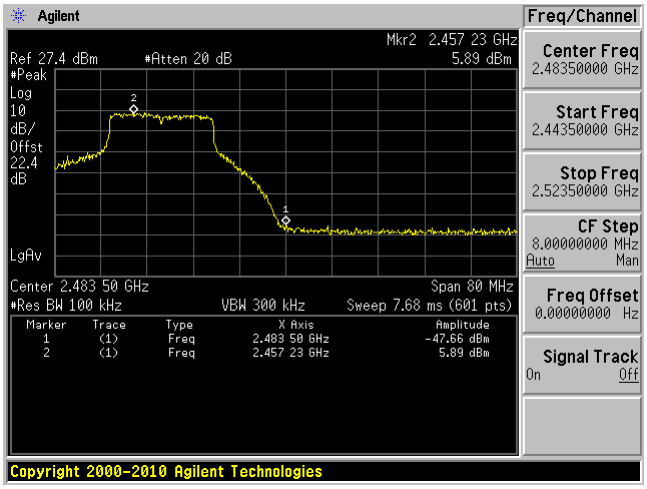
802.11n-HT20, Chain J1 Low Band Edge



802.11n-HT20, Chain J0 High Band Edge

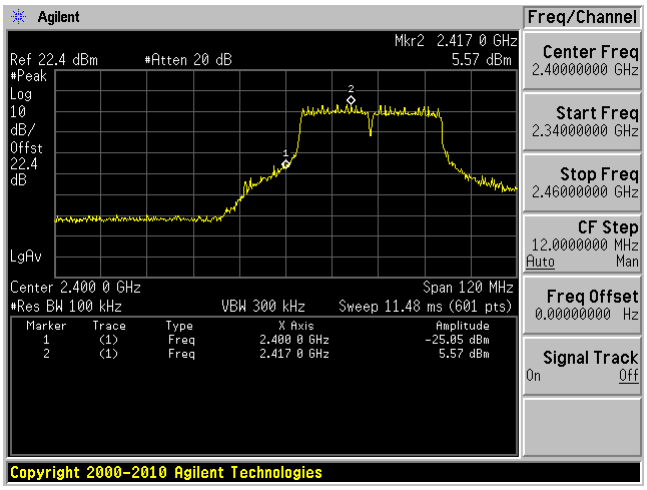


802.11n-HT20, Chain J1 High Band Edge

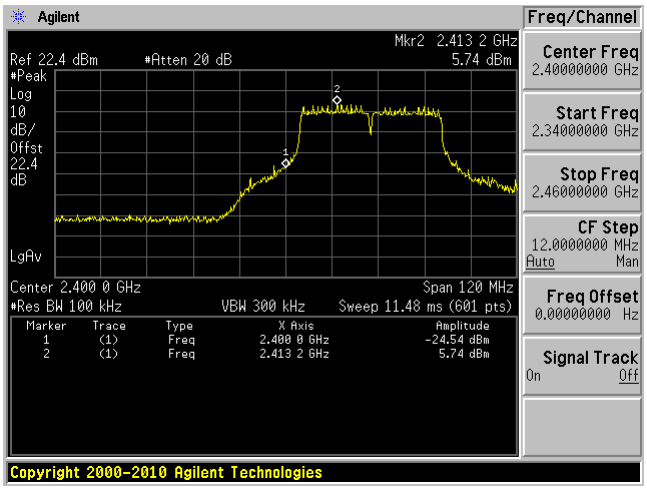


802.11n-HT40 mode

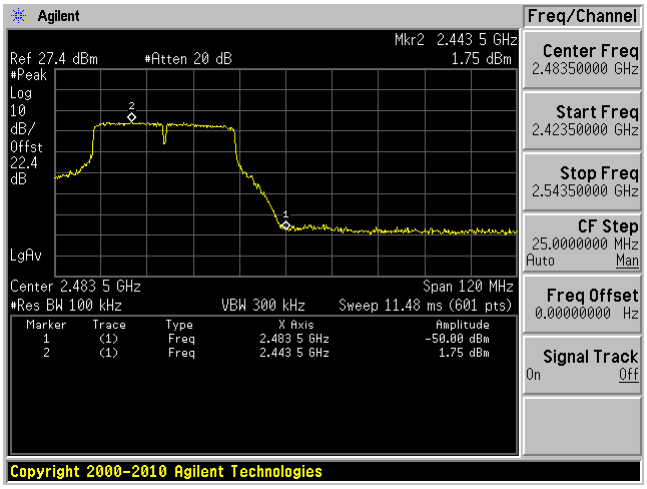
802.11n-HT40, Chain J0 Low Band Edge



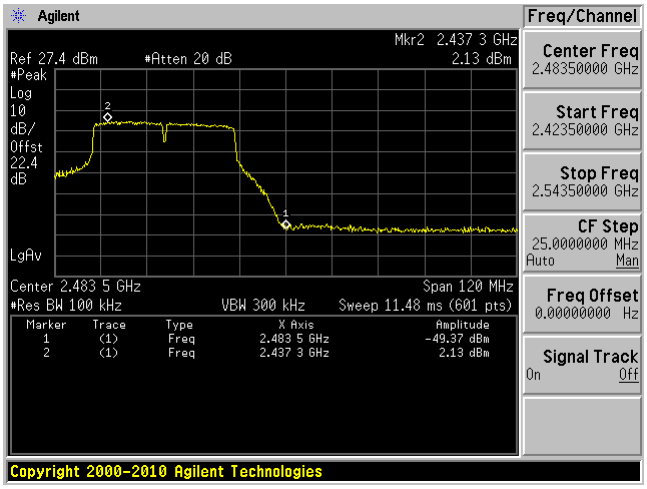
802.11n-HT40, Chain J1 Low Band Edge



802.11n-HT40, Chain J0 High Band Edge



802.11n-HT40, Chain J1 High Band Edge



12 FCC §15.247(e) & IC RSS-210 §A8.2 (b) – Power Spectral Density

12.1 Applicable Standard

According to FCC §15.247(e) and RSS-210 §A8.2 (b) , 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

The measurements are base on FCC KDB 558074 D01 DTS Meas Guidance v03r01: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10: Maximum power spectral density level in the fundamental emission

12.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2013-09-29	1 year

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

12.4 Test Environmental Conditions

Temperature:	22-26° C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Chen Ge from 2014-06-28 and 2014-06-30 at RF site.

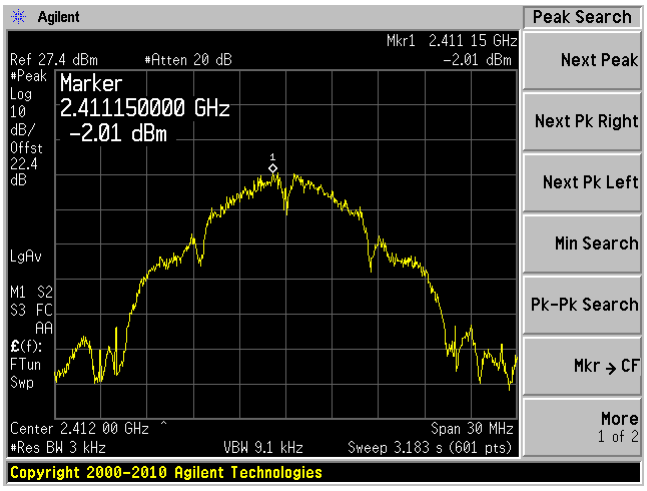
12.5 Test Results

Channel	Frequency (MHz)	PSD (dBm)		Total PSD (dBm)	Limit (dBm)	Margin (dB)
		Chain J0	Chain J1			
802.11b mode						
Low	2412	-2.01	-1.73	1.14	8	-6.86
Middle	2437	-1.61	-0.86	1.79	8	-6.21
High	2462	-1.4	-1.92	1.36	8	-6.64
802.11g mode						
Low	2412	-5.4	-4.86	-2.11	8	-10.11
Middle	2437	-5.53	-5.61	-2.56	8	-10.56
High	2462	-3.82	-5.26	-1.47	8	-9.47
802.11n-HT20 mode						
Low	2412	-5.78	-6.75	-3.23	8	-11.23
Middle	2437	-5.34	-5.38	-2.35	8	-10.35
High	2462	-4.93	-6.6	-2.67	8	-10.67
802.11n-HT40 mode						
Low	2422	-9.78	-10.6	-7.16	8	-15.16
Middle	2437	-8.24	-8.63	-5.42	8	-13.42
High	2452	-8.67	-10.12	-6.32	8	-14.32

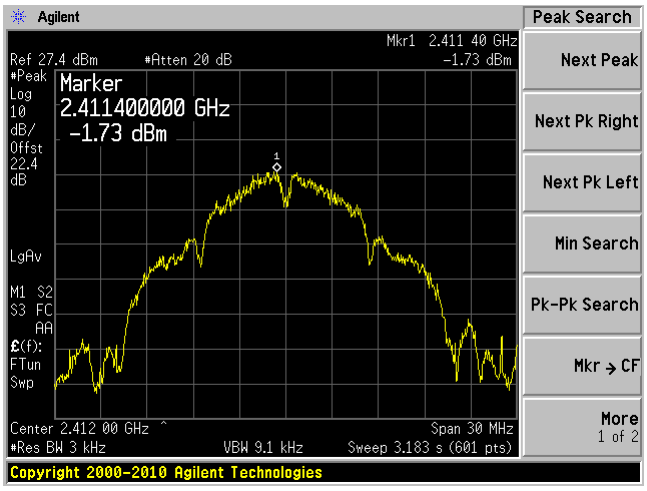
Please refer to the following plots for detailed test results.

802.11b mode

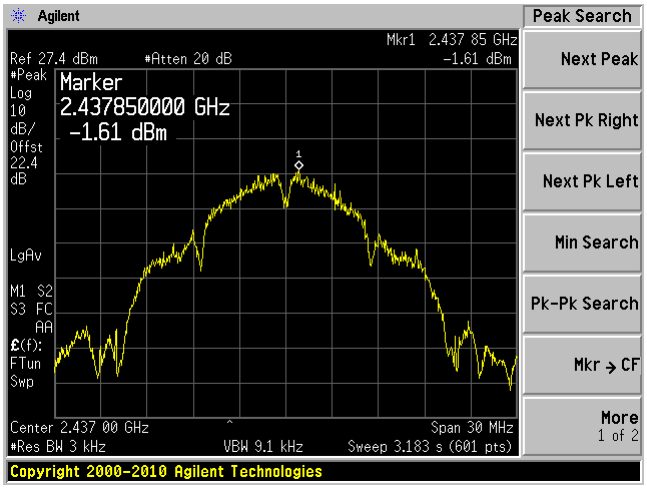
Low channel J0: 2412 MHz



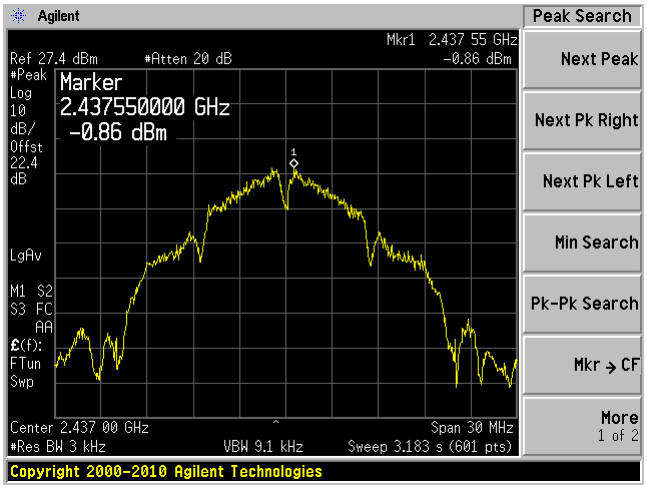
Low channel J1: 2412 MHz



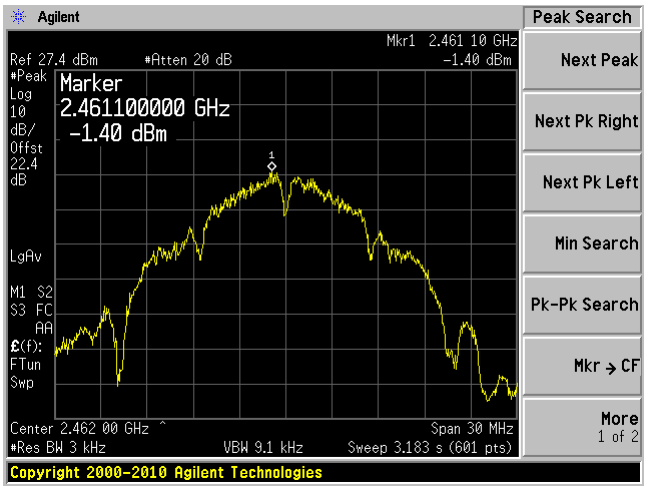
Middle channel J0: 2437 MHz



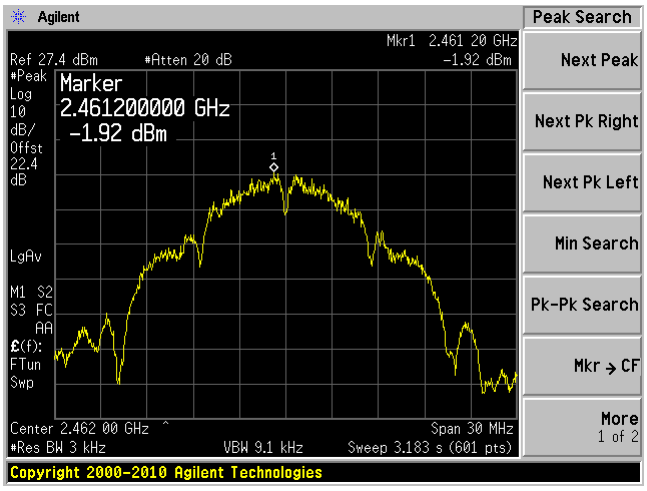
Middle channel J1: 2437 MHz



High channel J0: 2462 MHz

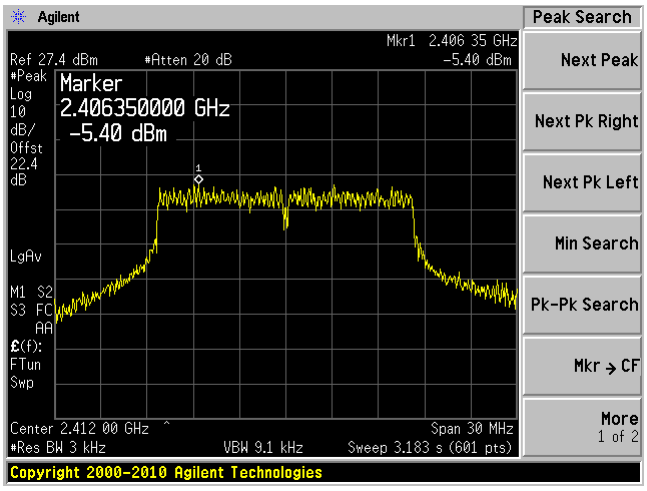


High channel J1: 2462 MHz

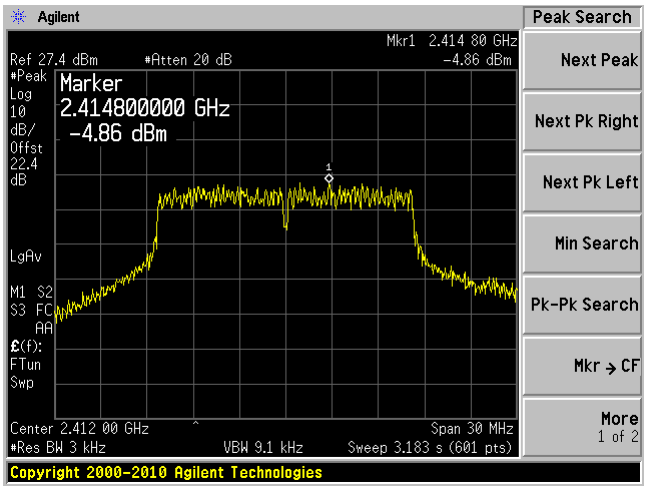


802.11g mode

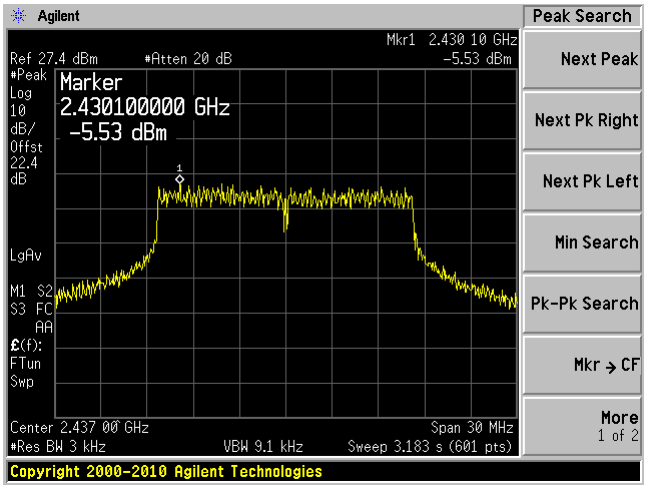
Low channel J0: 2412 MHz



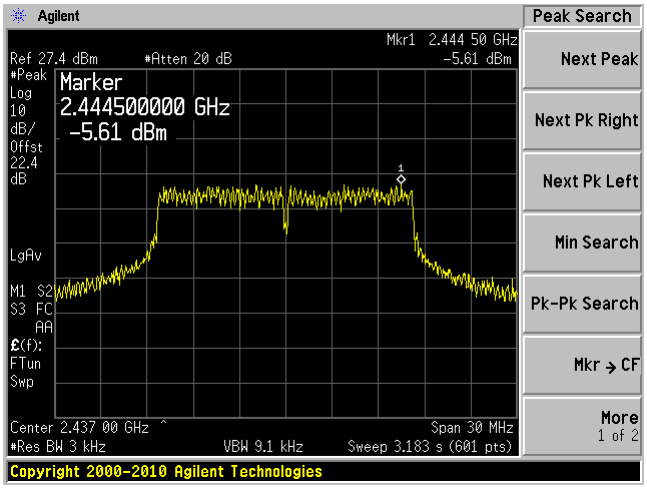
Low channel J1: 2412 MHz



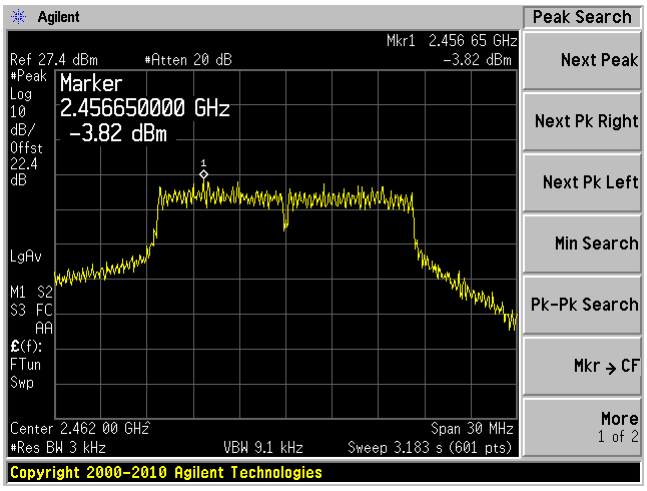
Middle channel J0: 2437 MHz



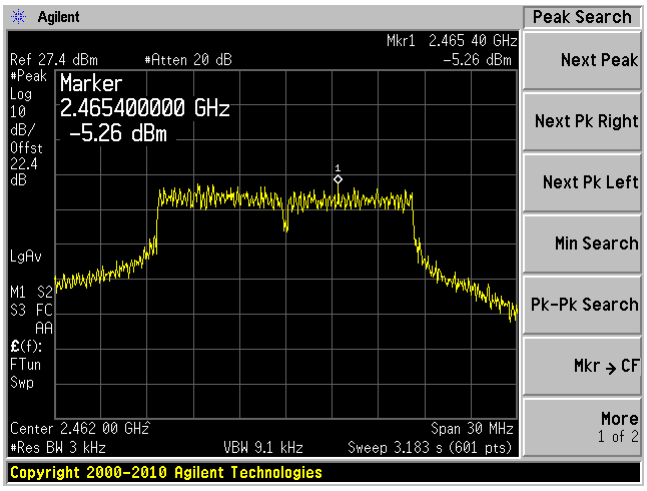
Middle channel J1: 2437 MHz



High channel J0: 2462 MHz

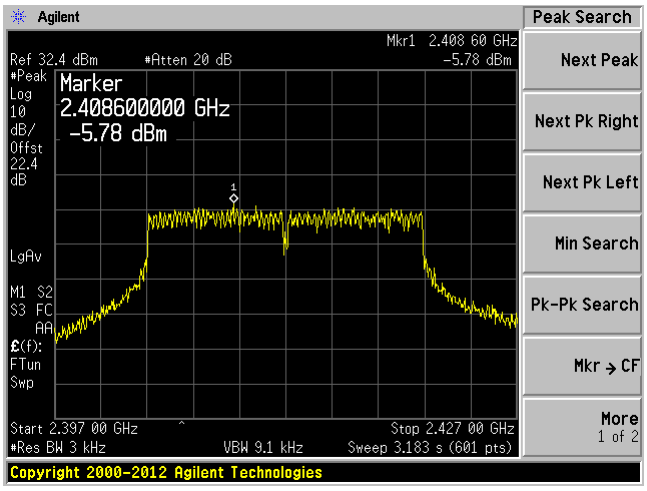


High channel J1: 2462 MHz

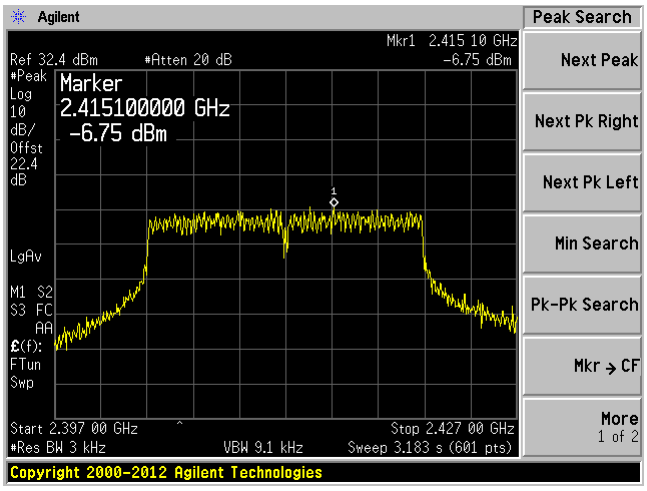


802.11n-HT20 mode

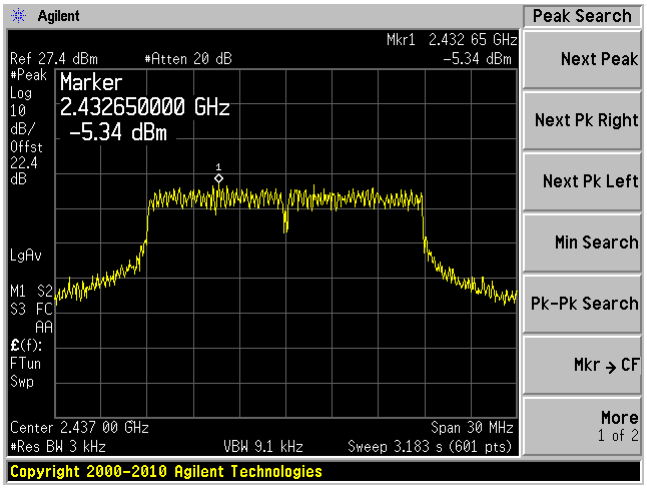
Low channel J0: 2412 MHz



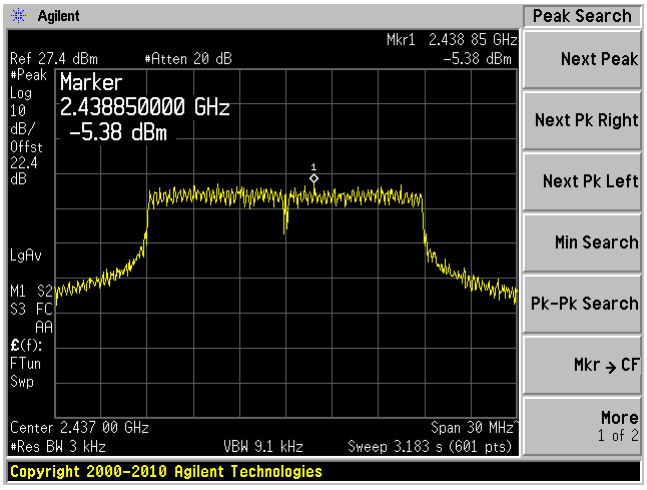
Low channel J1: 2412 MHz



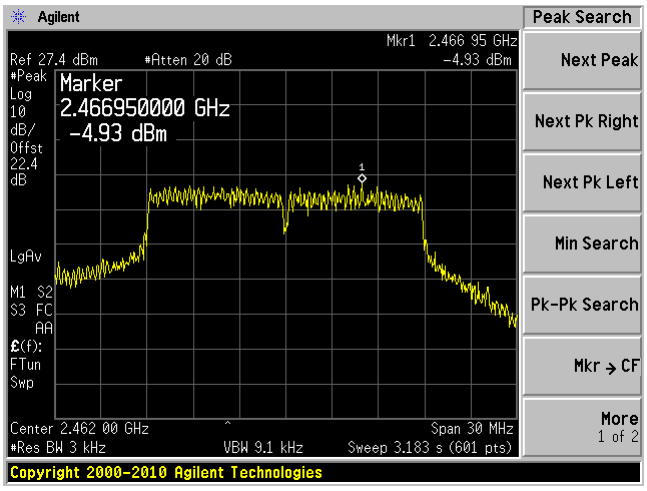
Middle channel J0: 2437 MHz



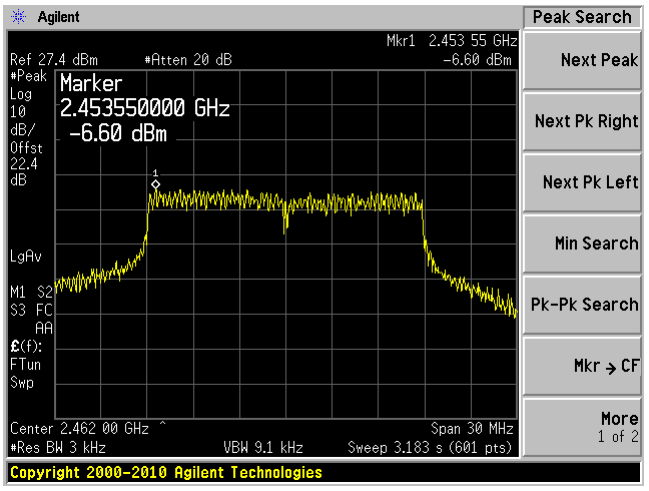
Middle channel J1: 2437 MHz



High channel J0: 2462 MHz

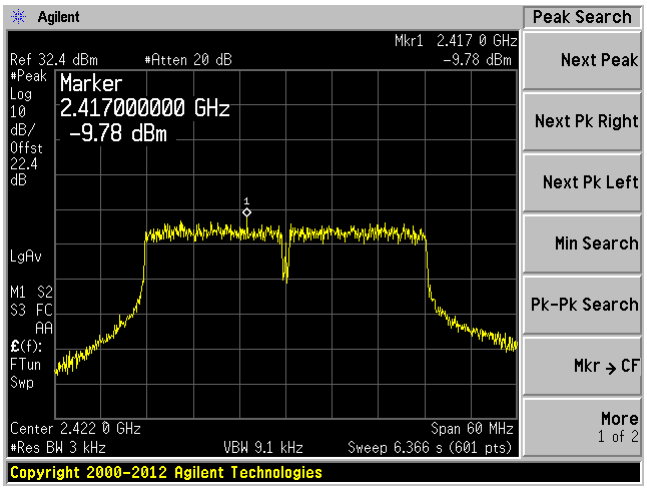


High channel J1: 2462 MHz

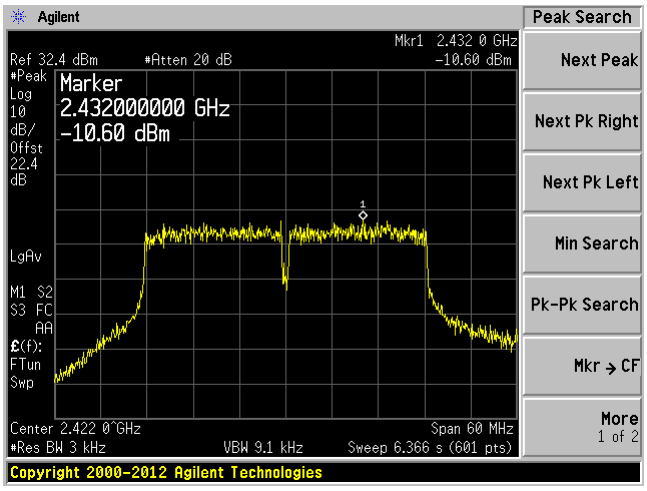


802.11n-HT40 mode

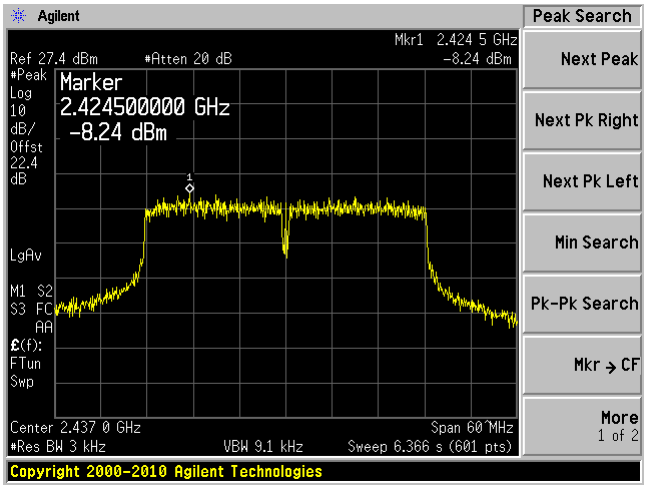
Low channel J0: 2422 MHz



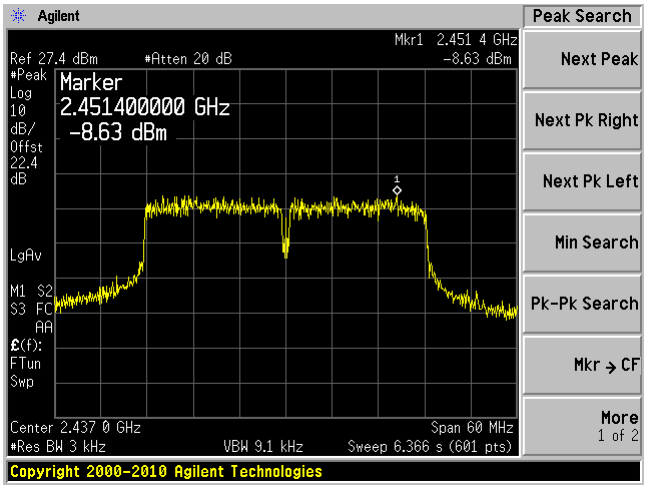
Low channel J1: 2422 MHz



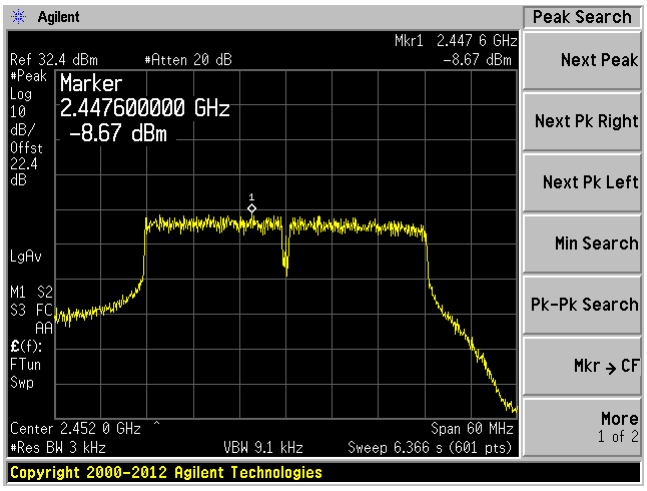
Middle channel J0: 2437 MHz



Middle channel J1: 2437 MHz



High channel J0: 2452 MHz



High channel J1: 2452 MHz