FCC PART 15.407
IC RSS-210, ISSUE 8, DEC 2010
TEST AND MEASUREMENT REPORT

For

Ruckus Wireless, Inc.

350 West Java Drive,

Sunnyvale, CA 94089, USA

FCC ID: S9GR300
IC: 5912A-R300

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

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Report Number:	R1305151-407 W52
Report Date:	2013-08-13
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1305151-407 W52	Original Report	2013-08-13

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: *ZoneFlex R300, FCC ID: S9GR300, IC: 5912A-R300* or the "EUT" as referred to in this report. The EUT is a 2x2 MIMO 802.11 a/b/g/n RLAN Access Point.

1.2 Mechanical Description of EUT

The EUT measures approximately 13 cm (L) x 13 cm (W) x 2.8 cm (H) and weighs 198 g.

The test data gathered are from typical production sample, serial number: 201302003637 assigned by Client

1.3 Objective

This report is prepared on behalf of *Ruckus Wireless, Inc., in* accordance with FCC CFR47 §15.407 and IC RSS-210 Issue 8, Dec 2010.

The objective is to determine compliance with FCC Part 15.407 and IC RSS-210 rules for Antenna Requirements, Conducted Emissions, Occupied Bandwidth, Output Power, Power Spectral Density, Radiated and Conducted Spurious Emissions, and Band Edge. Please refer to the detail antenna list in the antenna requirement section.

1.4 Related Submittal(s)/Grant(s)

FCC Part 15.247, IC RSS-210 DTS submission with FCC ID: S9GR300 and IC: 5912A-R300.

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 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

1.6 Measurement Uncertainty

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

Based on CISPR16-4-2: 2003, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\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.

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

1.7 Test Facility

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

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

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

Additionally, BACL Corp. is an American Association for laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b

2 EUT Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2009 and FCC KDB 789033 D01 General UNII Test Procedures v01r03

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 *R300 ART* was provided by Ruckus Wireless Inc., and was verified *Jeffery wu* to comply with the standard requirements being tested against.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Special Accessories

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

2.5 Local Support Equipment

Manufacturer	Description	Model	Serial Number
Dell	Laptop	Latitude E5420	-

2.6 EUT Internal Configuration Details

Manufacturer	Description	Model	Serial Number
Ruckus	Motherboard	ASM 120-11255 REV 1	-
Ruckus	Antenna	ASM 120-11258 REV 2	-
Ruckus	Antenna	ASM 120-11259 REV 2	-

2.7 Interface Ports and Cables

Cable Description	Length (m)	To	From
RF Cable	<1.0	PSA	EUT
RJ 45 Cable	<1.0	LAPTOP	EUT

2.8 Power Supply List and Details

Manufacturer	Description	Model	Part Number
Ruckus	Power Supply cord	HK-AD-120A100-CN	-
Ruckus	POE Power Adapter	PA1024-4HU	740-64125-010

3 Summary of Test Results

Results reported relate only to the product tested.

FCC & IC Rules	Description of Test	Result
FCC §15.407(f), §2.1091 IC RSS-102	RF Exposure	Compliant
FCC §15.203 IC RSS-Gen §7.1.2	Antenna Requirement	Compliant
FCC §15.207 IC RSS-Gen §7.2.4	AC Power Line Conducted Emissions	Compliant
FCC §15.209(a), 15.407(b) IC RSS-210 §A9.2	Spurious Radiated Emissions	Compliant
FCC §15.407(a) IC RSS-210 §A9.2	26 dB and 99% Emission Bandwidth	Compliant
FCC §407(a)(1) IC RSS-210 §A9.2	Peak Output Power Measurement	Compliant
FCC §2.1051, §15.407(b) IC RSS-210 §A9.2	Band Edges	Compliant
FCC §15.407(a)(1) IC RSS-210 §A9.2	Power Spectral Density	Compliant
FCC §15.407(a)(6)	Peak Excursion Ratio	Compliant
IC RSS-210 §2.3 IC RSS-Gen §6.1	Receiver Spurious Radiated Emissions	Compliant
FCC §2.1051, §15.407(b) IC RSS-210 §A9.2	Spurious Emissions at Antenna Terminals	Compliant

4 FCC §15.407(f), §2.1091 & IC RSS-102 - RF Exposure

4.1 Applicable Standard

According to FCC §15.407(f) 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

W52 Band:

Maximum peak output power at antenna input terminal (dBm):	14.07
Maximum peak output power at antenna input terminal (mW):	25.52701
Prediction distance (cm):	20
Prediction frequency (MHz):	5230
Maximum Antenna Gain, typical (dBi):	3
Maximum Antenna Gain (numeric):	1.995262
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.0101
Power density of prediction frequency at 20.0 cm (W/m^2):	0.101
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 device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.0101 mW/cm^2 (0.101 W/m^2). Limit is 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.

As per 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.
When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

5.2 Antenna List

Manufacturers	Antenna Type/Pattern	Antenna Gain (dBi) @ 5 GHz
Ruckus	Omni	3

The antenna consists of non-standard (UFL) connectors 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 Power Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 and IC RSS-Gen §7.2.4 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.

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

6.3 Test Procedure

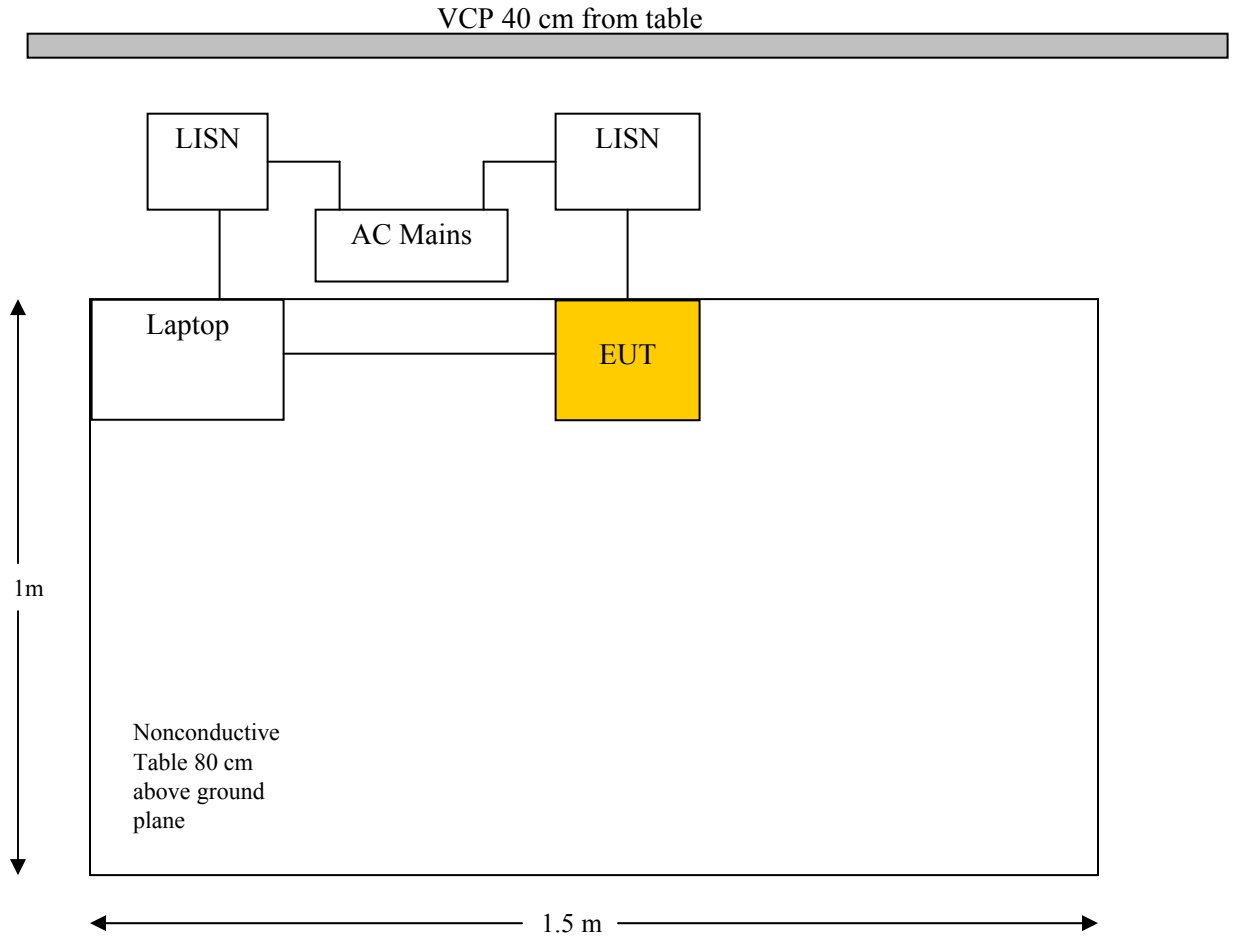
During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-1 and the power cord of the support equipment was connected to LISN-2.

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

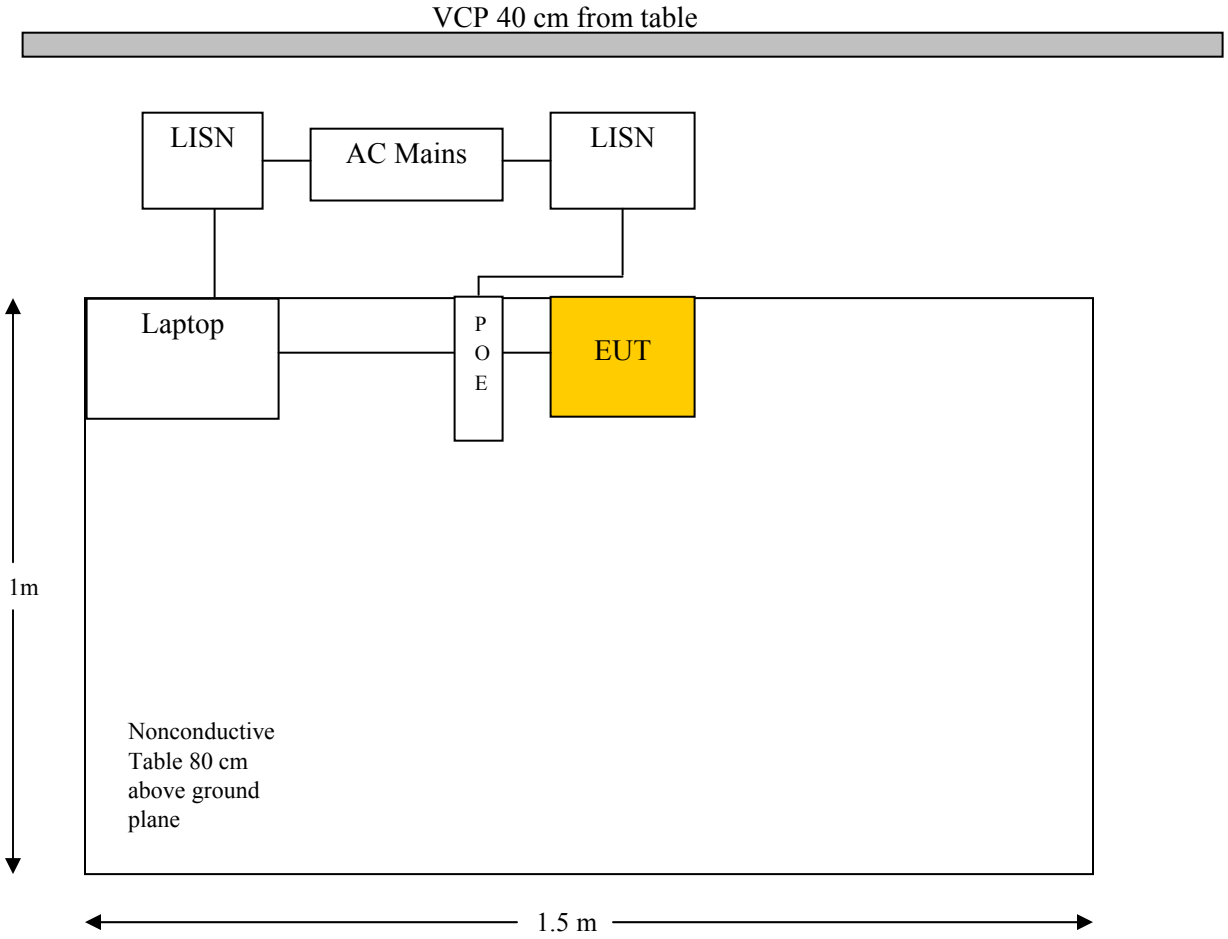
All data was recorded in the peak detection mode, quasi-peak and average. Quasi-Peak readings are distinguished with a “QP.” Average readings are distinguished with an “Ave”.

6.4 Test Setup Block Diagram

AC/DC Adaptor:



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	2013-03-28	1 year
Solar Electronics	LISN	9252-50-R-24-N	511205	2013-06-25	1 year
Solar Electronics	LISN	9252-50-R-24-N	511213	2013-06-25	1 year
TTE	Filter, High Pass	H9962-150K-50-21378	K7133	2013-05-30	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:	22 ºC
Relative Humidity:	52 %
ATM Pressure:	101.89 kPa

The testing was performed by Jeffery Wu on 2013-05-08 in 5 m chamber 3.

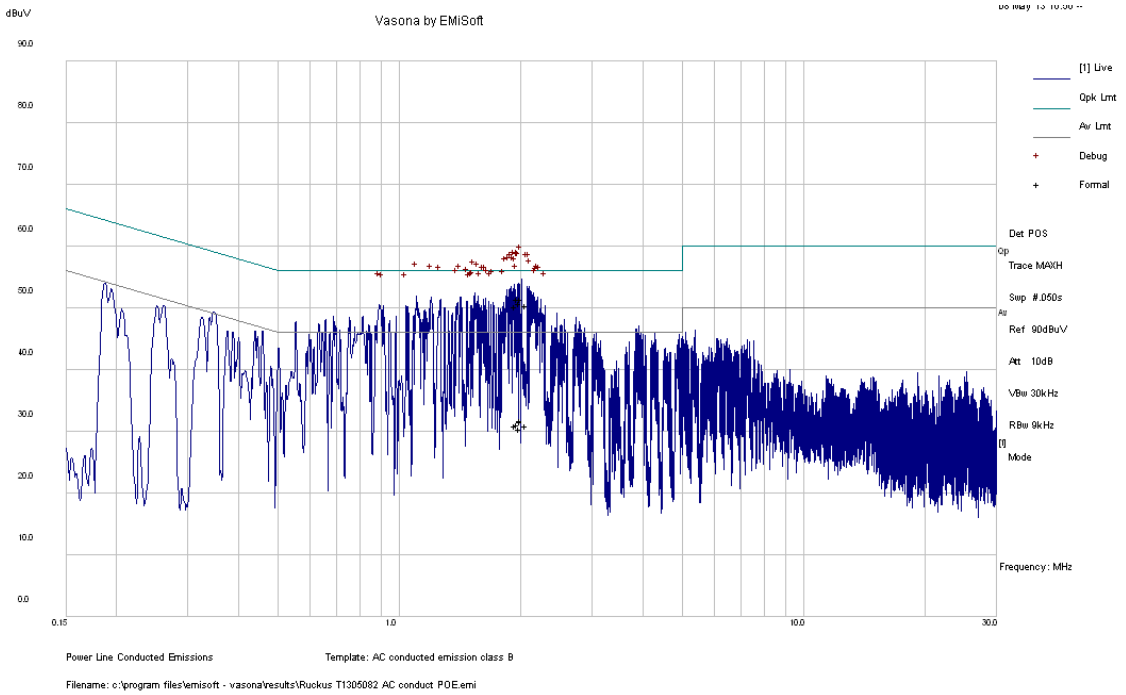
6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC 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)**
-3.65	2.00681	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

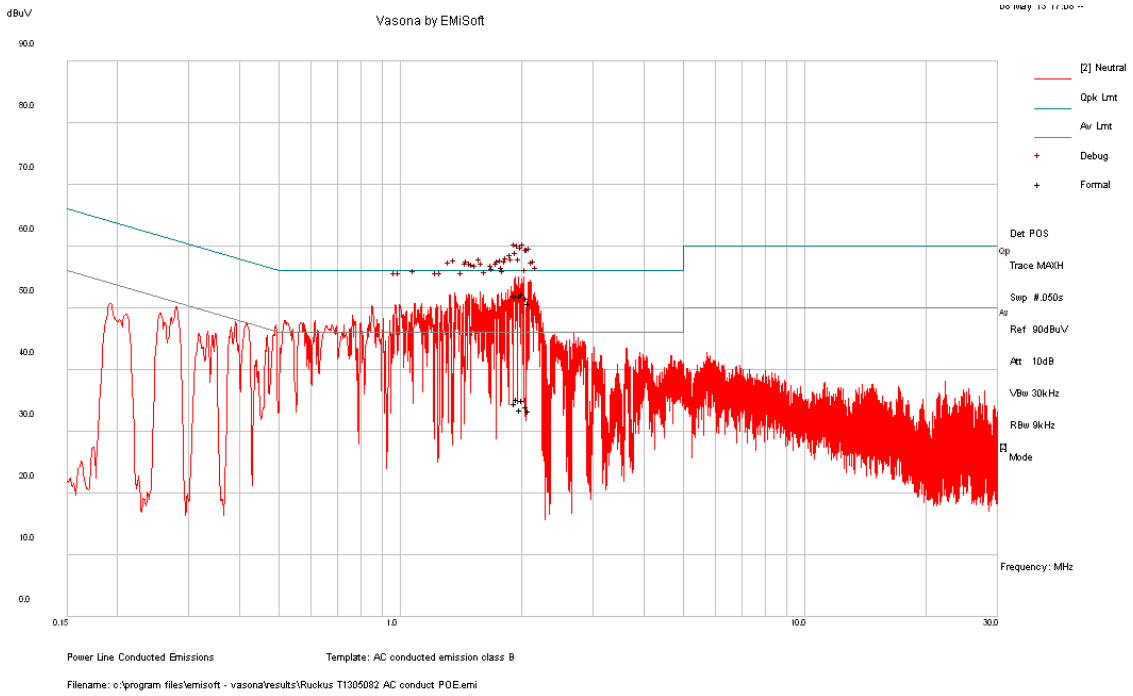
120 V, 60 Hz – Line, AC/DC Adaptor



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
1.993797	51.46	Line	56	-4.54	QP
1.983882	50.74	Line	56	-5.26	QP
1.938192	50.2	Line	56	-5.8	QP
1.995867	51.51	Line	56	-4.49	QP
1.967007	51.41	Line	56	-4.59	QP
2.058526	50.48	Line	56	-5.52	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
1.993797	31.63	Line	46	-14.37	Ave.
1.983882	30.39	Line	46	-15.61	Ave.
1.938192	30.89	Line	46	-15.11	Ave.
1.995867	31.85	Line	46	-14.15	Ave.
1.967007	31.19	Line	46	-14.81	Ave.
2.058526	30.88	Line	46	-15.12	Ave.

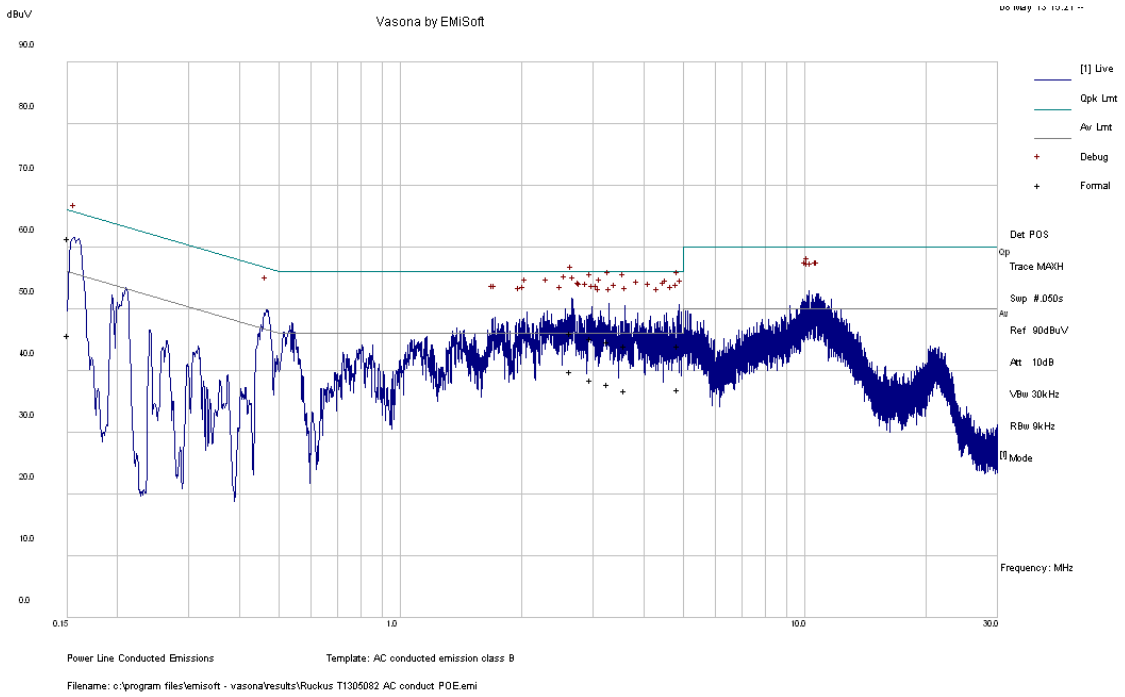
120 V, 60 Hz – Neutral, AC/DC Adaptor



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
1.931607	52.02	Neutral	56	-3.98	QP
2.00681	52.35	Neutral	56	-3.65	QP
1.953114	51.94	Neutral	56	-4.06	QP
1.985331	52.07	Neutral	56	-3.93	QP
2.080974	50.74	Neutral	56	-5.26	QP
2.057612	51.62	Neutral	56	-4.38	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
1.931607	34.56	Neutral	46	-11.44	Ave.
2.00681	35.01	Neutral	46	-10.99	Ave.
1.953114	35.28	Neutral	46	-10.72	Ave.
1.985331	33.55	Neutral	46	-12.45	Ave.
2.080974	33.36	Neutral	46	-12.64	Ave.
2.057612	34.12	Neutral	46	-11.88	Ave.

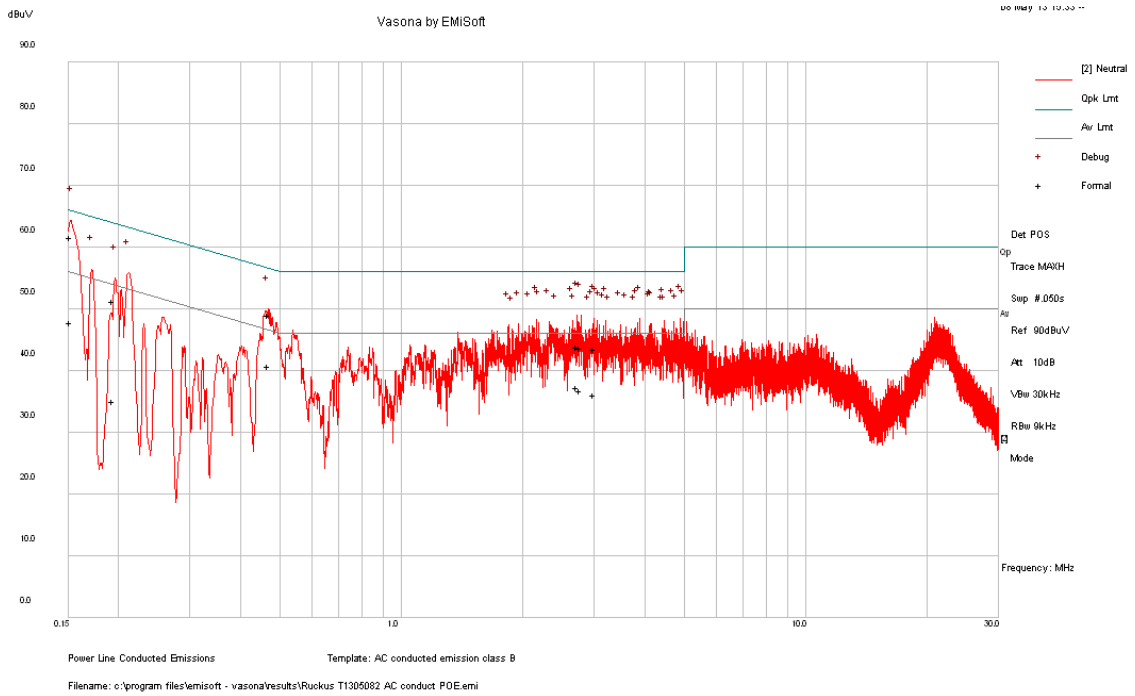
120 V, 60 Hz – Line, POE



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.150969	61.49	Line	65.95	-4.46	QP
2.647171	46.14	Line	56	-9.86	QP
3.271222	44.77	Line	56	-11.23	QP
4.865042	44.13	Line	56	-11.87	QP
3.59664	44.06	Line	56	-11.94	QP
2.97209	45.28	Line	56	-10.72	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.150969	45.83	Line	55.95	-10.12	Ave.
2.647171	39.97	Line	46	-6.03	Ave.
3.271222	37.92	Line	46	-8.08	Ave.
4.865042	37	Line	46	-9	Ave.
3.59664	36.88	Line	46	-9.12	Ave.
2.97209	38.5	Line	46	-7.5	Ave.

120 V, 60 Hz – Neutral, POE



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.151899	61.61	Neutral	65.9	-4.29	QP
0.469308	49.1	Neutral	56.53	-7.43	QP
2.727608	43.86	Neutral	56	-12.14	QP
2.778594	43.64	Neutral	56	-12.36	QP
0.193578	51.23	Neutral	63.88	-12.66	QP
2.992292	43.6	Neutral	56	-12.4	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.151899	47.93	Neutral	55.9	-7.96	Ave.
0.469308	40.75	Neutral	46.53	-5.77	Ave.
2.727608	37.37	Neutral	46	-8.63	Ave.
2.778594	36.85	Neutral	46	-9.15	Ave.
0.193578	35.11	Neutral	53.88	-18.77	Ave.
2.992292	36.08	Neutral	46	-9.92	Ave.

7 FCC §15.209, §15.407(b) & IC RSS-210 §A9.2 - Spurious Radiated Emissions

7.1 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 IC 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 Note 1	3
88 - 216	150 Note 1	3
216 - 960	200 Note 1	3
Above 960	500	3

Note 1: 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 §15.407(b)(1) and IC RSS-210, For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

7.2 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 15C/15E and IC RSS-210/RSS-Gen 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.

7.3 Test Procedure

The measurements are base on FCC KDB 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E Section H: Unwanted emissions measurement 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

7.4 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

7.5 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	2013-06-18	1 year
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2013-06-09	1 year
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2013-05-09	1 year
Agilent	Spectrum Analyzer	E4446A	US44300386	2012-09-29	1 year
EMCO	Horn Antenna	3315	9511-4627	2012-10-17	1 year
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2013-03-28	1 year

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

7.6 Test Environmental Conditions

Temperature:	23 °C
Relative Humidity:	46 %
ATM Pressure:	101.5 kPa

The testing was performed by Bo Li from 2013-7-18 at 5 meter 3.

7.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15.205, 15.209 and 15.407 & IC RSS-210, RSS-Gen standard's radiated emissions limits, and had the worst margin of:

5150-5250 MHz

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Channel, Range**
-1.57	57.7715	Vertical	Below 1 GHz
-14.811	10360	Horizontal	Above 1 GHz

7.8 Radiated Emissions Test Results

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

5150-5250 MHz Band, Quasi-Peak Measurements @ 3m

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
802.11a mode						
42.90225	38.37	110	V	253	40	-1.63
57.31725	37.52	116	V	270	40	-2.48
500.00175	41.7	100	H	43	46	-4.3
374.98875	41.05	100	H	252	46	-4.95
115.60675	24.5	124	V	360	43.5	-19
249.95225	21.15	134	H	32	46	-24.85
319.99475	29.15	100	H	326	46	-16.85
802.11n-HT20 mode						
43.01775	38.23	100	V	214	40	-1.77
499.99775	41.76	100	H	39	46	-4.24
749.99125	38.58	188	H	235	46	-7.42
374.99775	40.89	107	H	264	46	-5.11
119.96925	29.18	116	V	344	43.5	-14.32
239.98675	33.1	101	H	256	46	-12.9
802.11n-HT40 mode						
42.4535	38.37	110	V	241	40	-1.63
56.775	36.26	169	V	75	40	-3.74
374.99775	40.88	101	H	254	46	-5.12
144.00075	34.38	197	H	257	43.5	-9.12
249.9465	26.48	108	H	231	46	-19.52

Note: All 30 MHz – 1 GHz spurious are digital, other emissions are on the noise floor level. The worst case result was reported.

2) 1–40 GHz, Measured at 3 meters, EUT antenna port was terminated

5150-5250 MHz Band

802.11a mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
10360	34.92	311	100	V	38.329	7.02	26.98	53.289	74	-20.711	Peak
10360	35.13	199	104	H	38.329	7.02	26.98	53.499	74	-20.501	Peak
10360	20.74	311	100	V	38.329	7.02	26.98	39.109	54	-14.891	Ave
10360	20.82	199	104	H	38.329	7.02	26.98	39.189	54	-14.811	Ave
15540	31.99	0	100	V	38.432	8.38	25.92	52.882	74	-21.118	Peak
15540	32.11	0	100	H	38.432	8.38	25.92	53.002	74	-20.998	Peak
15540	17.53	0	100	V	38.432	8.38	25.92	38.422	54	-15.578	Ave
15540	17.53	0	100	H	38.432	8.38	25.92	38.422	54	-15.578	Ave
20720	32.14	0	100	V	34.557	9.68	29	47.377	74	-26.623	Peak
20720	32.75	0	100	H	34.557	9.68	29	47.987	74	-26.013	Peak
20720	17.85	0	100	V	34.557	9.68	29	33.087	54	-20.913	Ave
20720	17.87	0	100	H	34.557	9.68	29	33.107	54	-20.893	Ave

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)	
Middle Channel 5200 MHz, measured at 3 meters											
10400	36.57	313	100	V	38.329	6.99	26.97	54.919	74	-19.081	Peak
10400	34.6	200	100	H	38.329	6.99	26.97	52.949	74	-21.051	Peak
10400	20.31	313	100	V	38.329	6.99	26.97	38.659	54	-15.341	Ave
10400	20.04	200	100	H	38.329	6.99	26.97	38.389	54	-15.611	Ave
15600	32.4	0	100	V	38.325	8.4	25.92	53.205	74	-20.795	Peak
15600	32.26	0	100	H	38.325	8.4	25.92	53.065	74	-20.935	Peak
15600	17.56	0	100	V	38.325	8.4	25.92	38.365	54	-15.635	Ave
15600	17.56	0	100	H	38.325	8.4	25.92	38.365	54	-15.635	Ave
20800	32.59	0	100	V	34.557	9.8	28.9	48.047	74	-25.953	Peak
20800	32.29	0	100	H	34.557	9.8	28.9	47.747	74	-26.253	Peak
20800	18.19	0	100	V	34.557	9.8	28.9	33.647	54	-20.353	Ave
20800	18.21	0	100	H	34.557	9.8	28.9	33.667	54	-20.333	Ave

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)	
High Channel 5240 MHz, measured at 3 meters											
10480	34.99	312	100	V	38.343	7	27.83	52.503	74	-21.497	Peak
10480	36.03	202	100	H	38.343	7	27.83	53.543	74	-20.457	Peak
10480	20.08	312	100	V	38.343	7	27.83	37.593	54	-16.407	Ave
10480	21.6	202	100	H	38.343	7	27.83	39.113	54	-14.887	Ave
15720	32.47	0	100	V	38.188	8.38	25.57	53.468	74	-20.532	Peak
15720	31.65	0	100	H	38.188	8.38	25.57	52.648	74	-21.352	Peak
15720	17.38	0	100	V	38.188	8.38	25.57	38.378	54	-15.622	Ave
15720	17.85	0	100	H	38.188	8.38	25.57	38.848	54	-15.152	Ave
20960	32.84	0	100	V	34.68	9.81	29	48.33	74	-25.67	Peak
20960	32.96	0	100	H	34.68	9.81	29	48.45	74	-25.55	Peak
20960	18.58	0	100	V	34.68	9.81	29	34.07	54	-19.93	Ave
20960	18.57	0	100	H	34.68	9.81	29	34.06	54	-19.94	Ave

802.11n-HT 20 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 5180 MHz, measured at 3 meters											
10360	35.32	311	100	V	38.329	7.02	26.98	53.689	74	-20.311	Peak
10360	33.38	196	100	H	38.329	7.02	26.98	51.749	74	-22.251	Peak
10360	20.44	311	100	V	38.329	7.02	26.98	38.809	54	-15.191	Ave
10360	19.47	196	100	H	38.329	7.02	26.98	37.839	54	-16.161	Ave
15540	31.99	0	100	V	38.432	8.38	25.92	52.882	74	-21.118	Peak
15540	32.12	0	100	H	38.432	8.38	25.92	53.012	74	-20.988	Peak
15540	17.55	0	100	V	38.432	8.38	25.92	38.442	54	-15.558	Ave
15540	17.53	0	100	H	38.432	8.38	25.92	38.422	54	-15.578	Ave
20720	32.64	0	100	V	34.557	9.68	29	47.877	74	-26.123	Peak
20720	32.46	0	100	H	34.557	9.68	29	47.697	74	-26.303	Peak
20720	17.86	0	100	V	34.557	9.68	29	33.097	54	-20.903	Ave
20720	17.87	0	100	H	34.557	9.68	29	33.107	54	-20.893	Ave

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)	
Middle Channel 5200 MHz, measured at 3 meters											
10400	35.16	310	100	V	38.329	6.99	26.97	53.509	74	-20.491	Peak
10400	34.66	199	100	H	38.329	6.99	26.97	53.009	74	-20.991	Peak
10400	19.81	310	100	V	38.329	6.99	26.97	38.159	54	-15.841	Ave
10400	19.41	199	100	H	38.329	6.99	26.97	37.759	54	-16.241	Ave
15600	32.21	0	100	V	38.325	8.4	25.92	53.015	74	-20.985	Peak
15600	32.03	0	100	H	38.325	8.4	25.92	52.835	74	-21.165	Peak
15600	17.56	0	100	V	38.325	8.4	25.92	38.365	54	-15.635	Ave
15600	17.1	0	100	H	38.325	8.4	25.92	37.905	54	-16.095	Ave
20800	32.32	0	100	V	34.557	9.8	28.9	47.777	74	-26.223	Peak
20800	32.43	0	100	H	34.557	9.8	28.9	47.887	74	-26.113	Peak
20800	17.76	0	100	V	34.557	9.8	28.9	33.217	54	-20.783	Ave
20800	17.78	0	100	H	34.557	9.8	28.9	33.237	54	-20.763	Ave

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)	
High Channel 5240 MHz, measured at 3 meters											
10480	35.32	312	100	V	38.343	7	27.83	52.833	74	-21.167	Peak
10480	35.74	198	100	H	38.343	7	27.83	53.253	74	-20.747	Peak
10480	20.3	312	100	V	38.343	7	27.83	37.813	54	-16.187	Ave
10480	20.96	198	100	H	38.343	7	27.83	38.473	54	-15.527	Ave
15720	32.26	0	100	V	38.188	8.38	25.57	53.258	74	-20.742	Peak
15720	32.11	0	100	H	38.188	8.38	25.57	53.108	74	-20.892	Peak
15720	17.85	0	100	V	38.188	8.38	25.57	38.848	54	-15.152	Ave
15720	17.85	0	100	H	38.188	8.38	25.57	38.848	54	-15.152	Ave
20960	32.99	0	100	V	34.68	9.81	29	48.48	74	-25.52	Peak
20960	32.61	0	100	H	34.68	9.81	29	48.1	74	-25.9	Peak
20960	18.54	0	100	V	34.68	9.81	29	34.03	54	-19.97	Ave
20960	18.54	0	100	H	34.68	9.81	29	34.03	54	-19.97	Ave

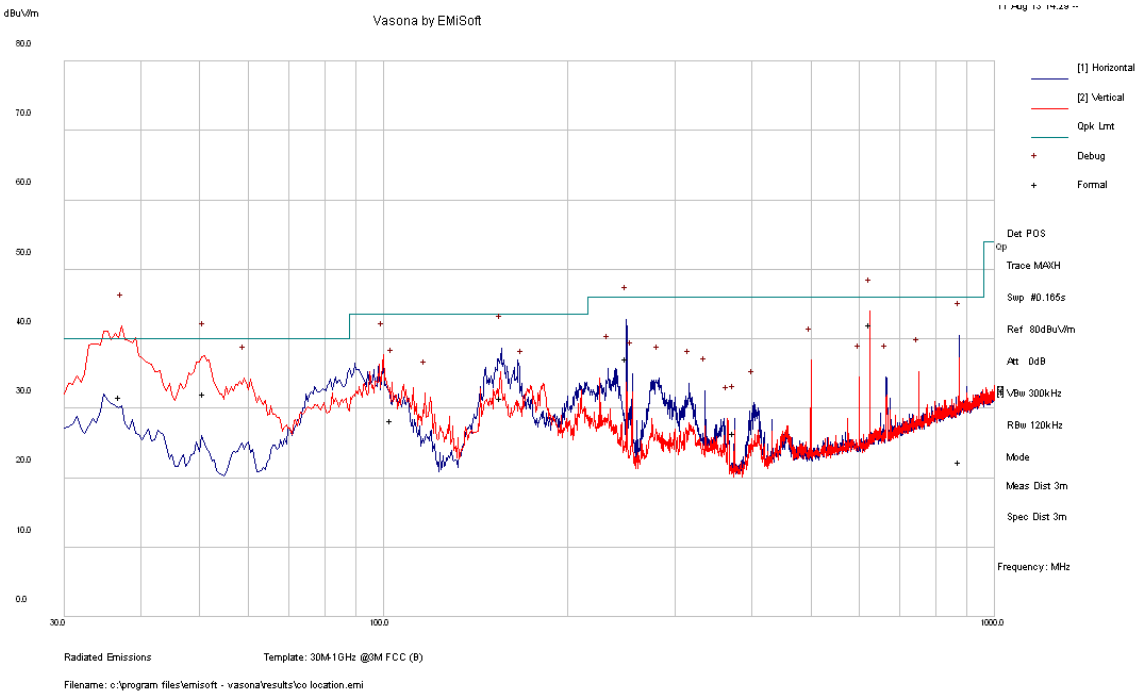
802.11n-HT 40 mode

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 5190 MHz, measured at 3 meters											
10380	31.7	0	100	V	38.329	7.02	27.8	49.249	74	-24.751	Peak
10380	32.5	0	100	H	38.329	7.02	27.8	50.049	74	-23.951	Peak
10380	17.44	0	100	V	38.329	7.02	27.8	34.989	54	-19.011	Ave
10380	17.17	0	100	H	38.329	7.02	27.8	34.719	54	-19.281	Ave
15570	31.74	0	100	V	38.325	8.4	25.66	52.805	74	-21.195	Peak
15570	31.55	0	100	H	38.325	8.4	25.66	52.615	74	-21.385	Peak
15570	17.54	0	100	V	38.325	8.4	25.66	38.605	54	-15.395	Ave
15570	17.54	0	100	H	38.325	8.4	25.66	38.605	54	-15.395	Ave
20760	32.92	0	100	V	34.557	9.75	29	48.227	74	-25.773	Peak
20760	32.56	0	100	H	34.557	9.75	29	47.867	74	-26.133	Peak
20760	18.1	0	100	V	34.557	9.75	29	33.407	54	-20.593	Ave
20760	18.11	0	100	H	34.557	9.75	29	33.417	54	-20.583	Ave

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)	
High Channel 5230 MHz, measured at 3 meters											
10460	33.33	216	100	V	38.343	6.99	27.83	50.833	74	-23.167	Peak
10460	33.83	200	100	H	38.343	6.99	27.83	51.333	74	-22.667	Peak
10460	19.14	216	100	V	38.343	6.99	27.83	36.643	54	-17.357	Ave
10460	19.29	200	100	H	38.343	6.99	27.83	36.793	54	-17.207	Ave
15690	32.69	0	100	V	38.188	8.44	25.46	53.858	74	-20.142	Peak
15690	32.04	0	100	H	38.188	8.44	25.46	53.208	74	-20.792	Peak
15690	17.75	0	100	V	38.188	8.44	25.46	38.918	54	-15.082	Ave
15690	17.32	0	100	H	38.188	8.44	25.46	38.488	54	-15.512	Ave
20920	32.7	0	100	V	34.68	9.76	29	48.14	74	-25.86	Peak
20920	32.53	0	100	H	34.68	9.76	29	47.97	74	-26.03	Peak
20920	18.45	0	100	V	34.68	9.76	29	33.89	54	-20.11	Ave
20920	18.43	0	100	H	34.68	9.76	29	33.87	54	-20.13	Ave

3) Co-location with 2.4 GHz and 5 GHz

Worst Case: 2.4 GHz: 802.11n-HT20, 2437 MHz; 5.2 GHz: 802.11n-HT40, 5230 MHz



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
37.05425	31.68	194	V	352	40	-8.32
624.97875	42.13	100	V	207	46	-3.87
50.79175	32.1	155	V	295	40	-7.9
249.9545	37.11	124	H	11	46	-8.89
155.67325	31.56	230	H	7	43.5	-11.94
875.3875	22.38	390	H	30	46	-23.62
103.01025	28.36	99	V	262	43.5	-15.14
374.9815	26.42	99	H	52	46	-19.58

1 to 40 GHz:

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)	
4874	46.15	60	100	V	33.097	4.56	27.7	56.107	74	-17.893	Peak
4874	51.86	95	103	H	33.097	4.56	27.7	61.817	74	-12.183	Peak
4874	31.87	60	100	V	33.097	4.56	27.7	41.827	54	-12.173	Ave
4874	33.59	95	103	H	33.097	4.56	27.7	43.547	54	-10.453	Ave
1998	59.68	90	100	V	27.856	2.93	27.76	62.706	74	-11.294	Peak
1998	54.77	36	100	H	27.856	2.93	27.76	57.796	74	-16.204	Peak
1998	23.72	90	100	V	27.856	2.93	27.76	26.746	54	-27.254	Ave
1998	22.78	36	100	H	27.856	2.93	27.76	25.806	54	-28.194	Ave

8 FCC §15.407(a) & IC RSS-210 §A9.2 – 26 dB & 99% Emission Bandwidth

8.1 Applicable Standard

FCC §15.407(a) and IC RSS-210 §A9.2.

8.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section C: Emission bandwidth and section D: 99 Percent Occupied Bandwidth

8.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2012-09-29	1 year

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

8.4 Test Environmental Conditions

Temperature:	23-24 °C
Relative Humidity:	42-45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Bo Li from 2013-07-14 to 2013-07-15 in RF site.

8.5 Test Results

Please refer to the following tables and plots.

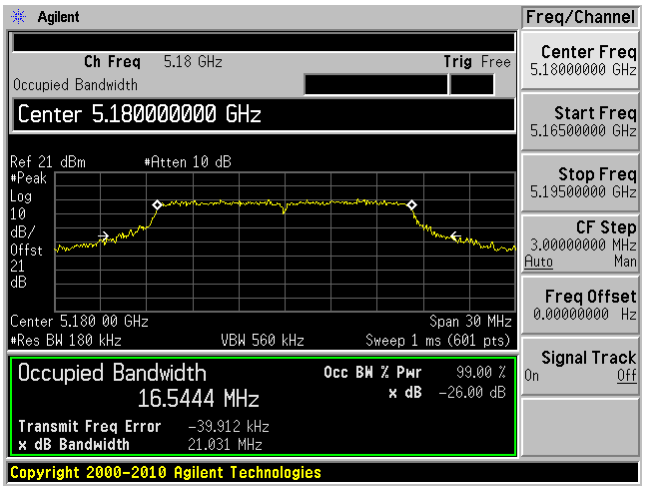
5150-5250 MHz Band:

Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)		99% Emission Bandwidth (MHz)	
		Chain J0	Chain J1	Chain J0	Chain J1
802.11a mode					
Low	5180	21.031	20.798	16.5444	16.4749
Middle	5200	22.074	20.47	16.5336	16.5236
High	5240	22.993	20.447	16.6305	16.4929
802.11n-HT20 mode					
Low	5180	22.248	21.284	17.6703	17.6155
Middle	5200	22.550	21.886	17.7223	17.6962
High	5240	22.826	21.934	17.7028	17.6728
802.11n-HT40 mode					
Low	5190	46.342	43.629	36.3228	36.2377
High	5230	47.902	47.907	36.7229	36.6941

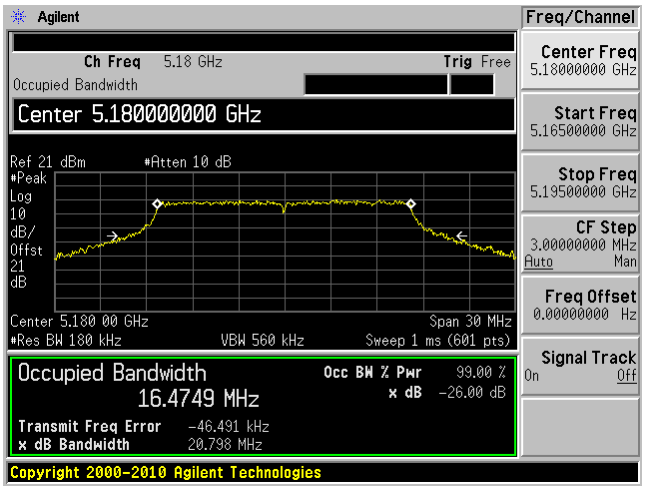
5150-5250 MHz Band

802.11a mode

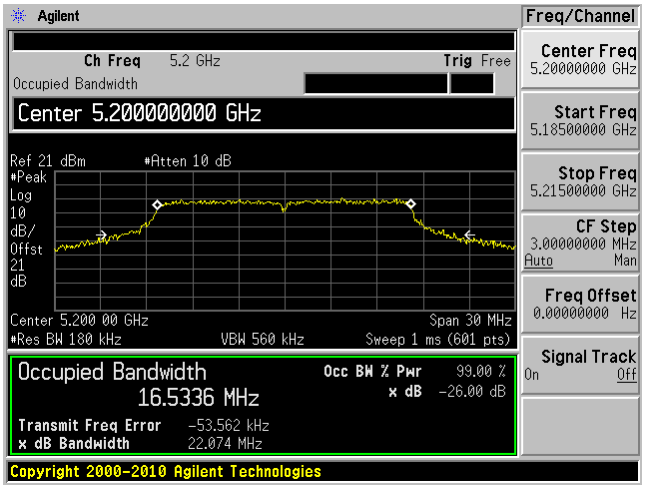
Low channel: 5180 MHz Chain J0



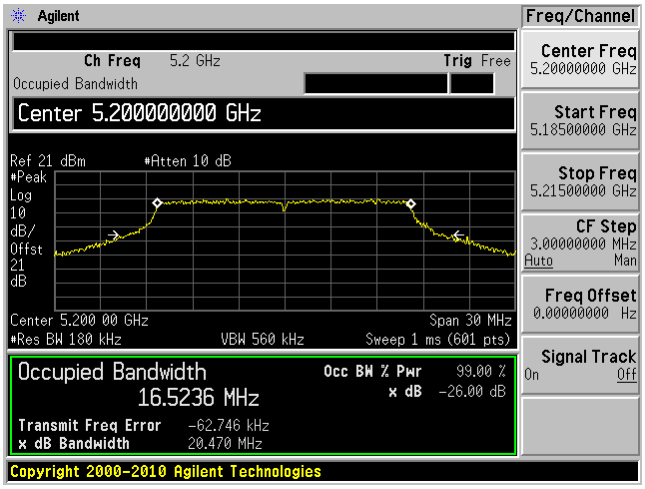
Low channel: 5180 MHz Chain J1



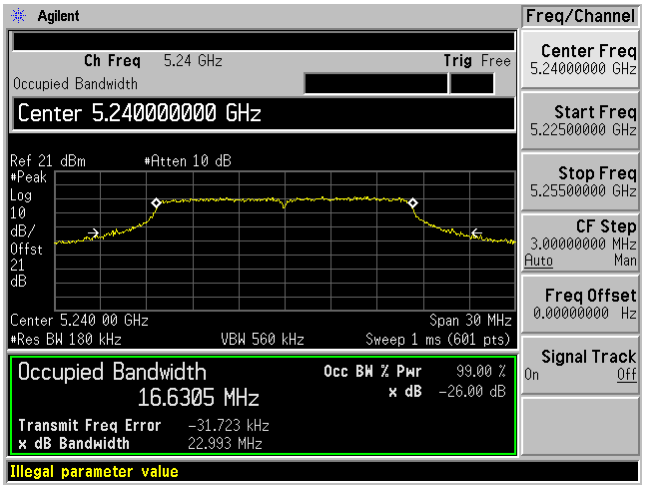
Middle channel: 5200 MHz Chain J0



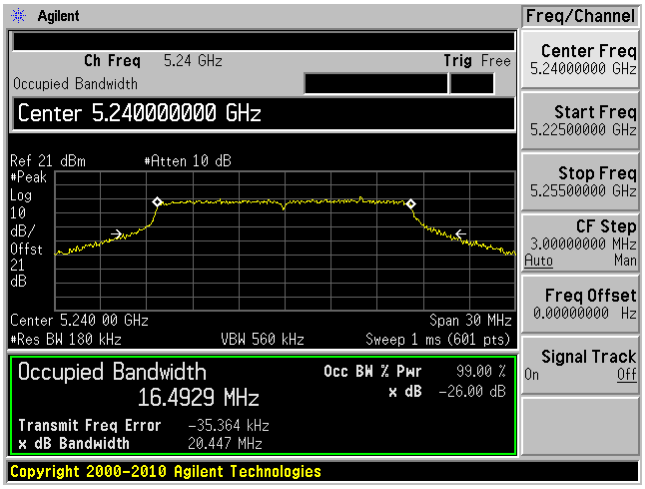
Middle channel: 5200 MHz Chain J1



High channel: 5240 MHz Chain J0

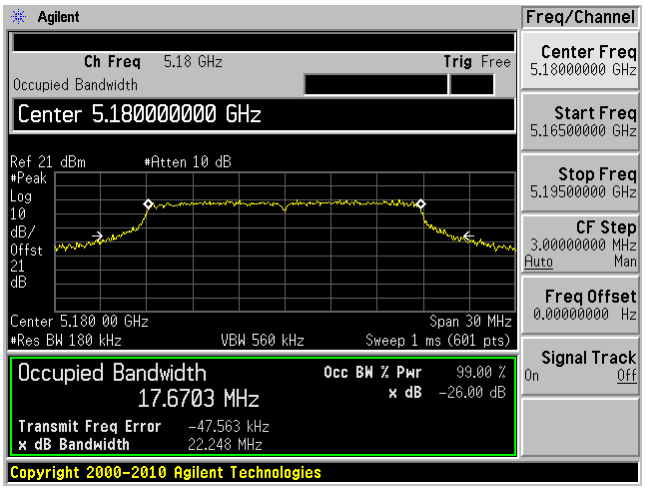


High channel: 5240 MHz Chain J1

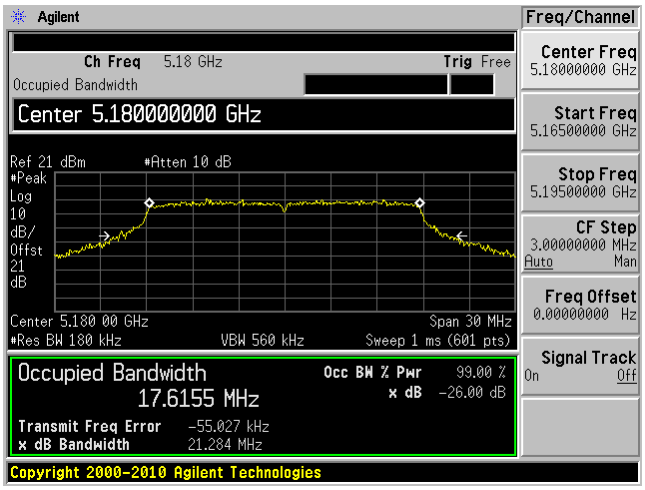


802.11n-HT20 mode

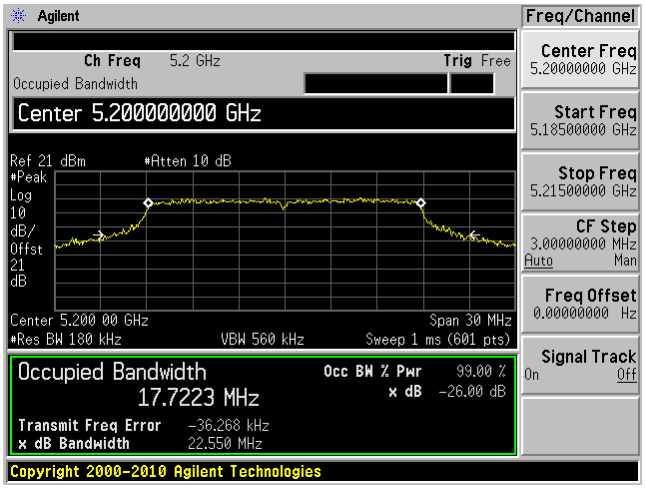
Low channel: 5180 MHz Chain J0



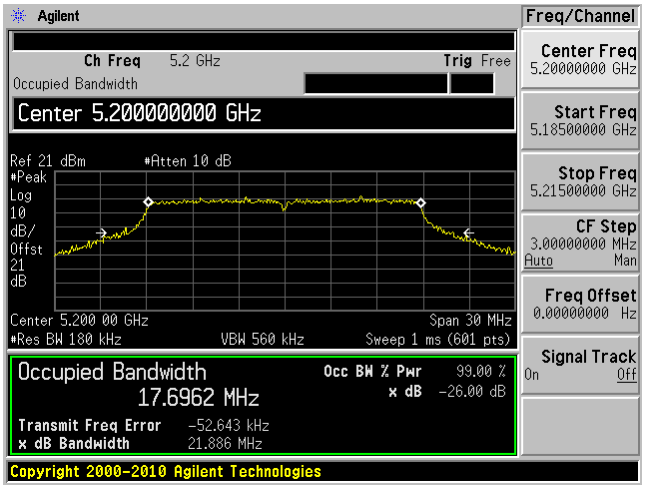
Low channel: 5180 MHz Chain J1



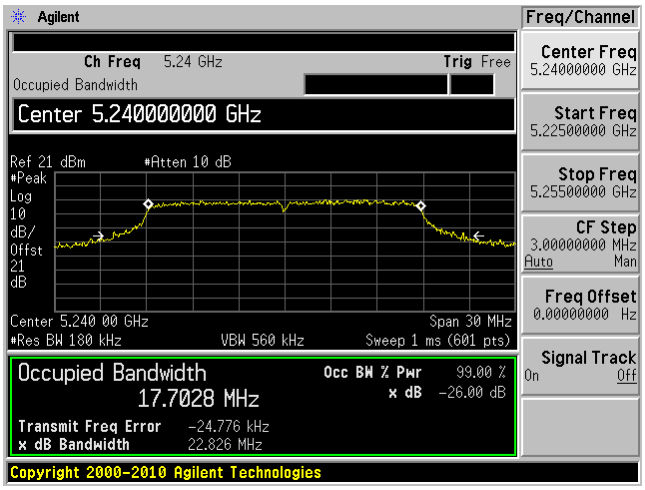
Middle channel: 5200 MHz Chain J0



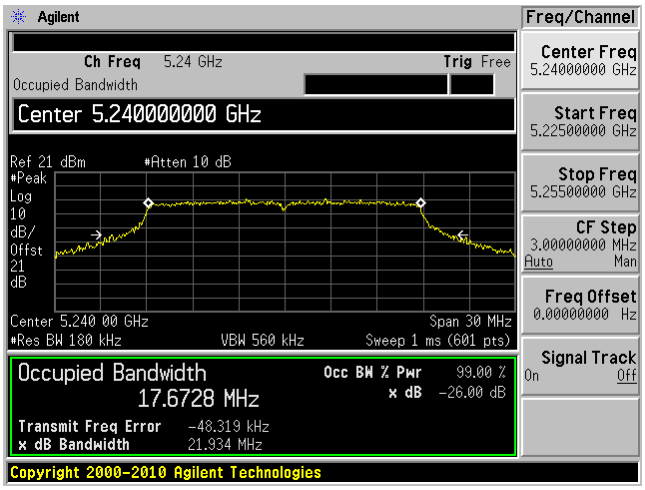
Middle channel: 5200 MHz Chain J1



High channel: 5240 MHz Chain J0

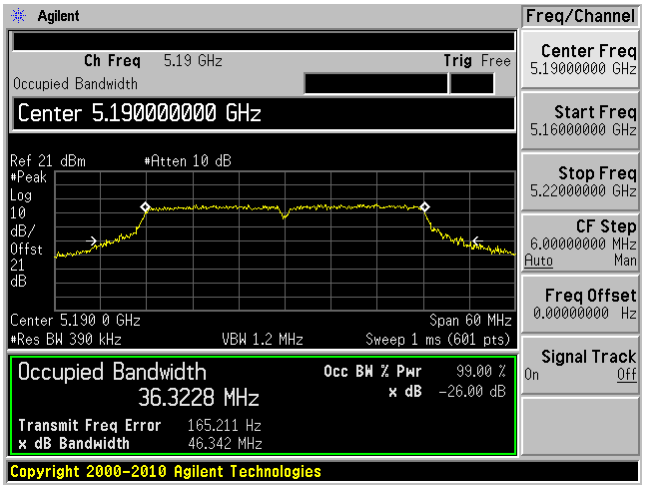


High channel: 5240 MHz Chain J1

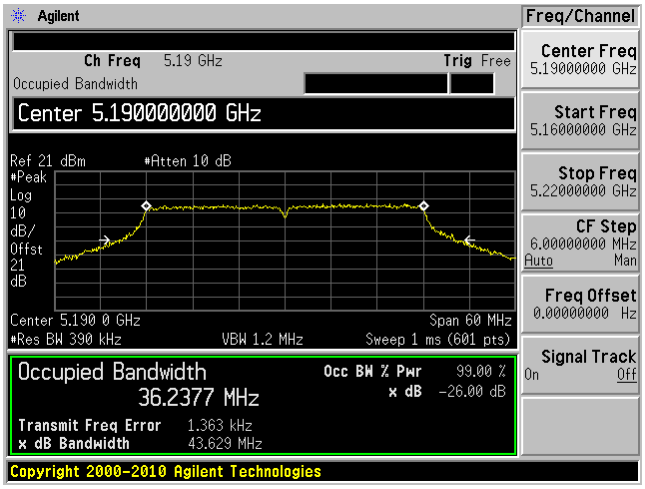


802.11n-HT40 mode

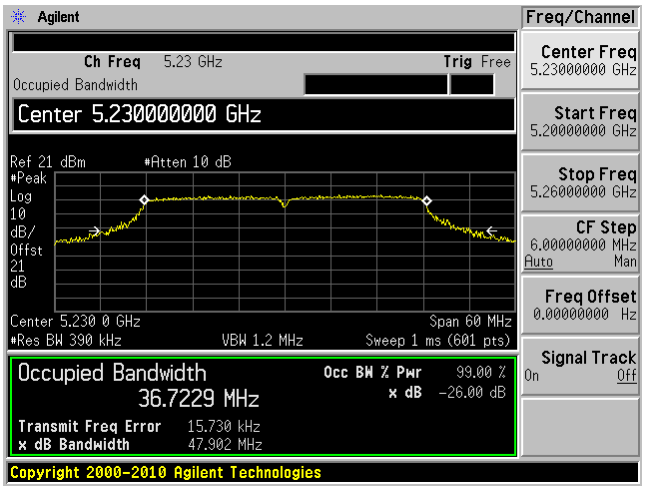
Low channel: 5190 MHz Chain J0



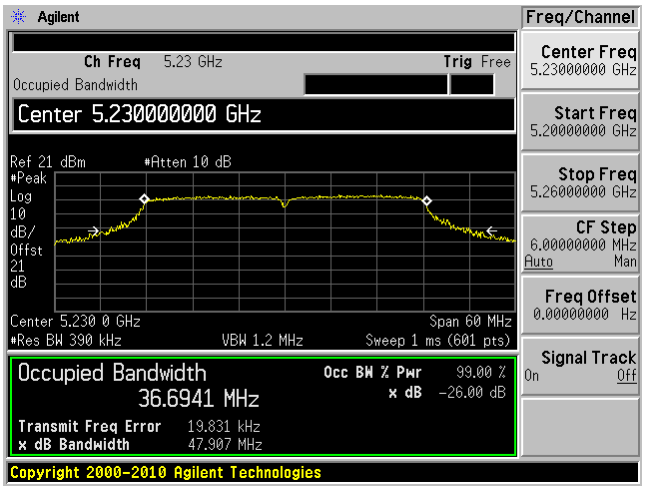
Low channel: 5190 MHz Chain J1



High channel: 5230 MHz Chain J0



High channel: 5230 MHz Chain J1



9 FCC §407(a)(1) & IC RSS-210 §A9.2 - Peak Output Power Measurement

9.1 Applicable Standard

According to FCC §15.407(a)(1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to IC RSS-210 §A9.2:

For the 5.15–5.250 GHz bands, the maximum e.i.r.p shall not exceed 200 mW or 10 + 10 log B, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p spectral density shall not exceed 10 dBm in any 1.0 MHz band.

9.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section E: Maximum conducted output power

9.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2012-09-29	1 year

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

9.4 Test Environmental Conditions

Temperature:	23-24 °C
Relative Humidity:	42-45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Bo Li from 2013-07-14 to 2013-07-15 in RF site.

9.5 Test Results

5150-5250 MHz Band:

Channel	Frequency (MHz)	Conducted Output Power (dBm)		Total Output Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
		Chain J0	Chain J1				
802.11a mode							
Low	5180	12.94	12.96	15.96	17	-1.04	15
Middle	5200	12.31	12.3	15.32	17	-1.68	15
High	5240	12.77	12.48	15.64	17	-1.36	15.5
802.11n-HT20 mode							
Low	5180	12.94	12.96	15.96	17	-1.04	15
Middle	5200	12.31	12.3	15.32	17	-1.68	15
High	5240	12.77	12.48	15.64	17	-1.36	15.5
802.11n-HT40 mode							
Low	5190	10.46	10.35	13.42	17	-3.58	12.5
High	5230	14.07	13.81	16.95	17	-0.05	17

10 FCC §15.407(b) & IC RSS-210 §A9.2 - Out of Band Emissions

10.1 Applicable Standard

According to FCC §15.407(b)

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of −27 dBm/MHz

According to 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.

10.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section H: Unwanted emissions measurement

10.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2012-09-29	1 year

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

10.4 Test Environmental Conditions

Temperature:	23-24 °C
Relative Humidity:	42-45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Bo Li from 2013-07-14 to 2013-07-15 in RF site.

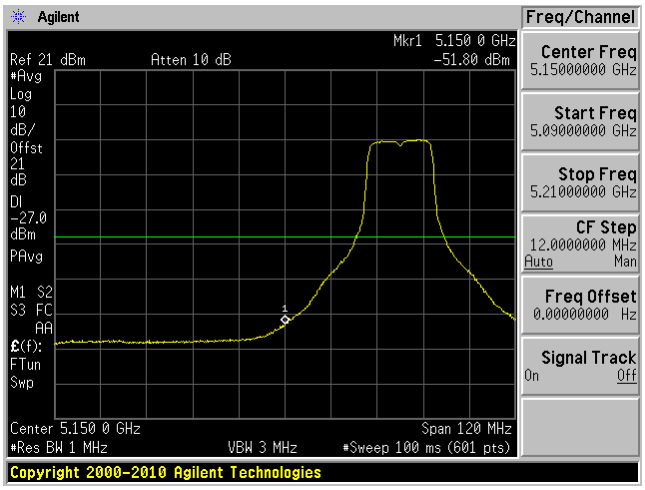
10.5 Test Results

Please refer to following pages for plots of band edge.

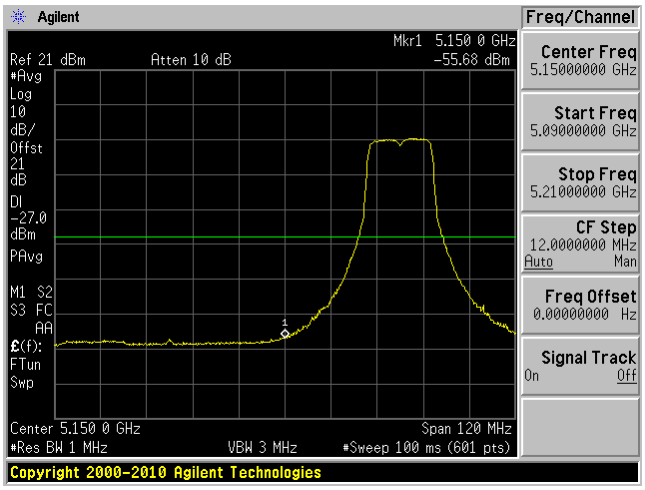
5150-5250 MHz Band

802.11a mode

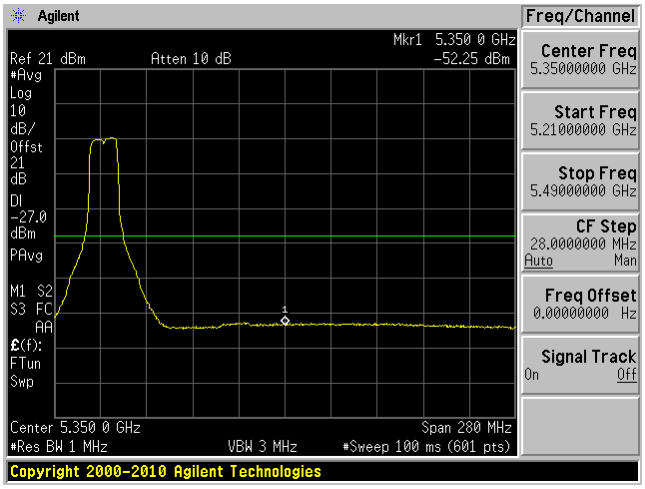
Low channel: 5180 MHz Chain J0



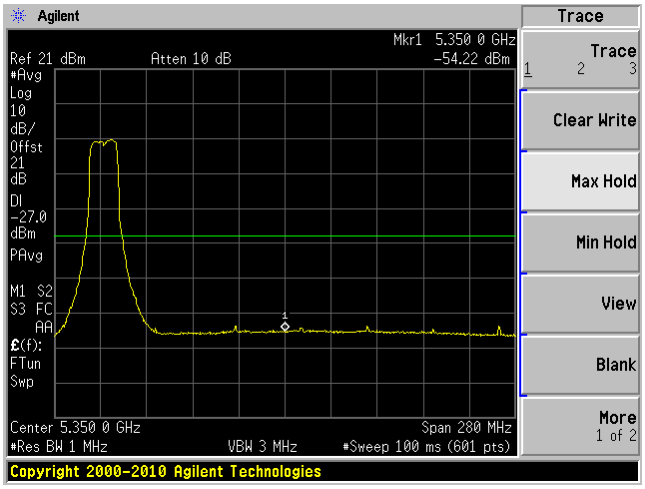
Low channel: 5180 MHz Chain J1



High channel: 5240 MHz Chain J0

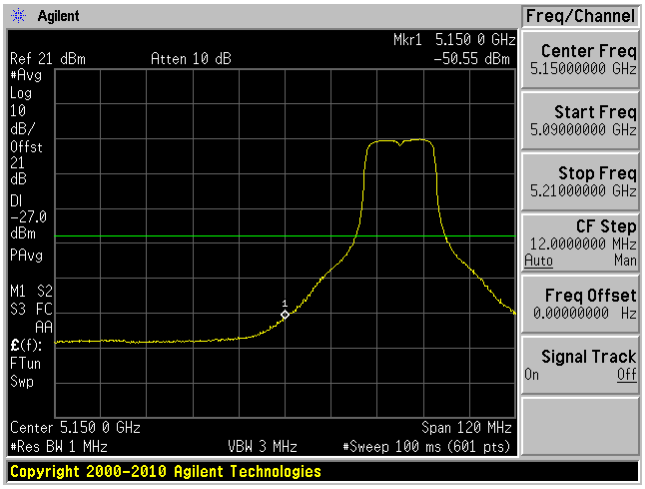


High channel: 5240 MHz Chain J1

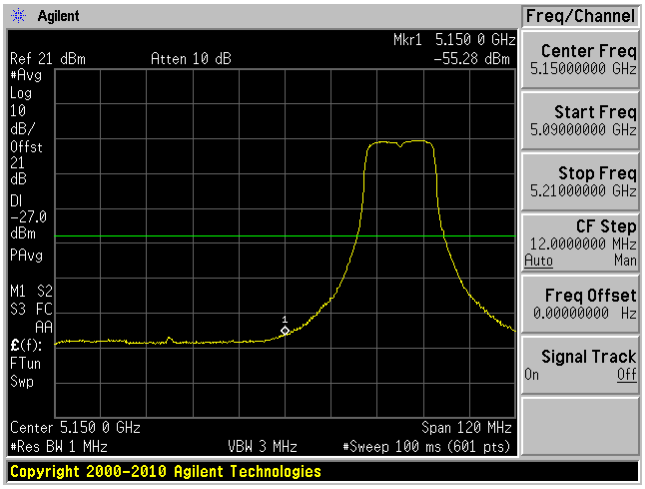


802.11n-HT20 mode

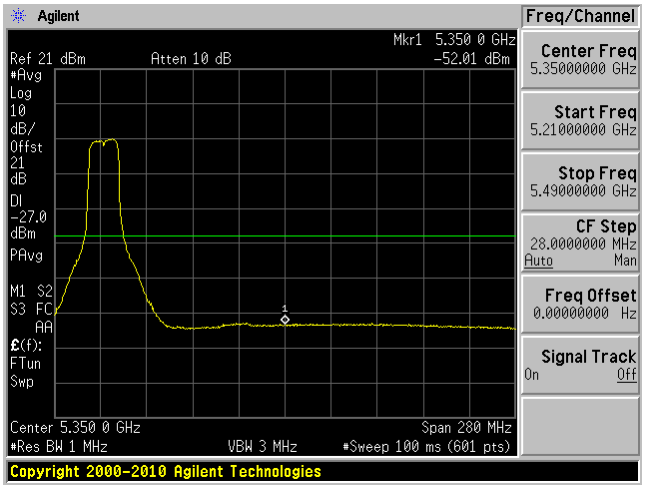
Low channel: 5180 MHz Chain J0



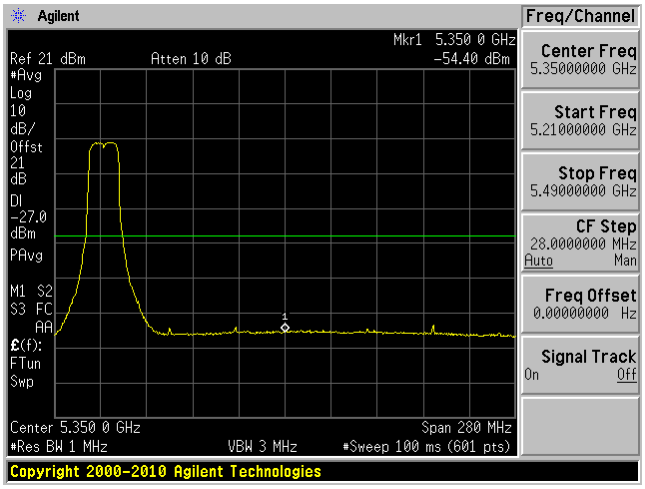
Low channel: 5180 MHz Chain J1



High channel: 5240 MHz Chain J0

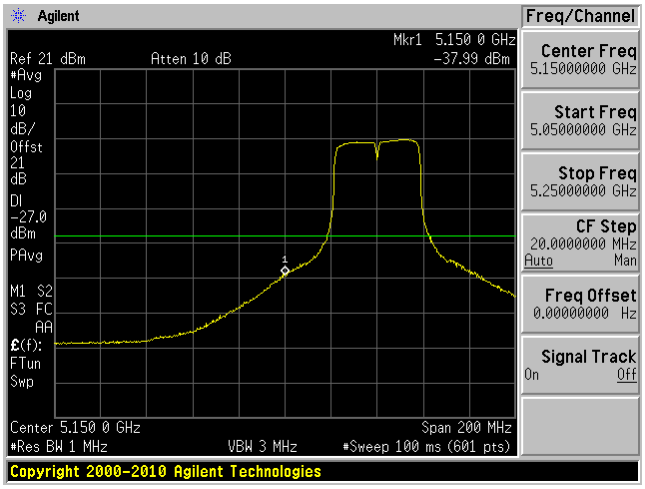


High channel: 5240 MHz Chain J1

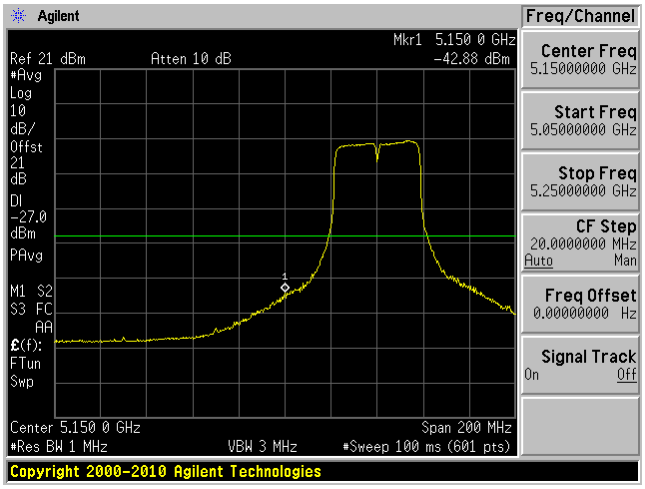


802.11n-HT40 mode

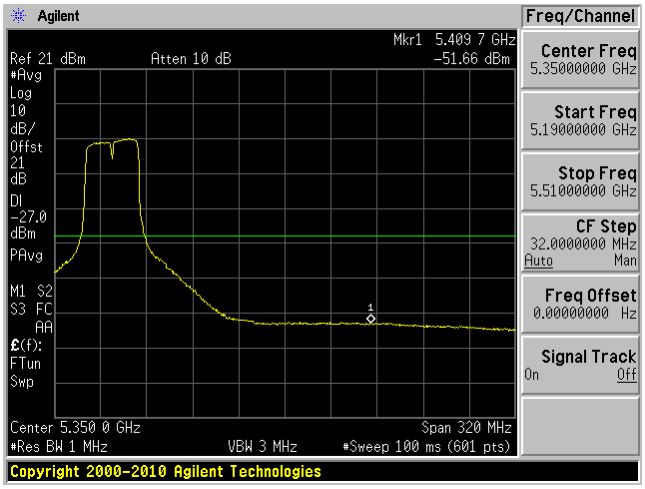
Low channel: 5190 MHz Chain J0



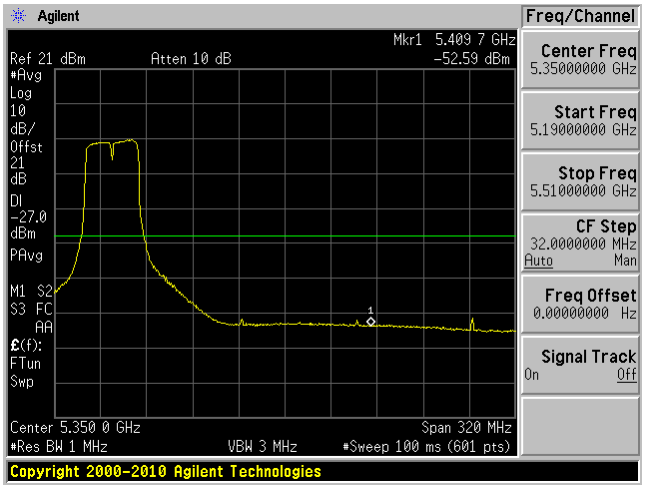
Low channel: 5190 MHz Chain J1



High channel: 5230 MHz Chain J0



High channel: 5230 MHz Chain J1



11 FCC §15.407(a)(1) & IC RSS-210 §A9.2 - Power Spectral Density

11.1 Applicable Standard

According to FCC §15.407(a)(1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to IC RSS-210 §A9.2:

5150-5250MHz the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

11.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section F:
Peak power spectral density (PPSD)

11.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2012-09-29	1 year

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

11.4 Test Environmental Conditions

Temperature:	23-24 °C
Relative Humidity:	42-45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Bo Li from 2013-07-14 to 2013-07-15 in RF site.

11.5 Test Results

5150-5250 MHz Band

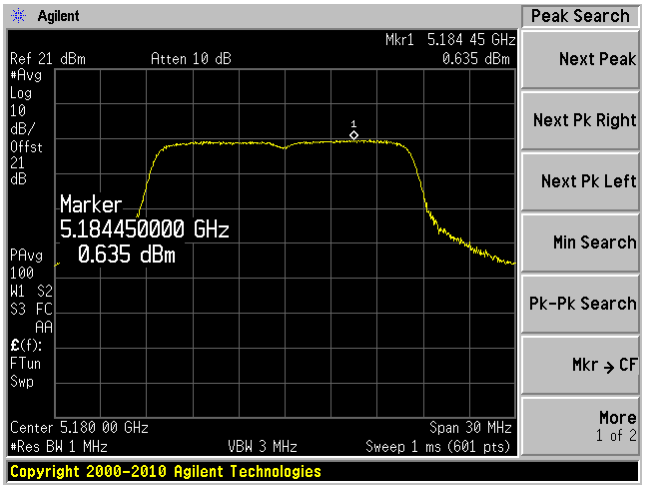
Channel	Frequency (MHz)	PSD (dBm)		Total PSD (dBm)	Limit (dBm)	Margin (dB)
		Chain J0	Chain J1			
802.11a mode						
Low	5180	0.635	0.641	3.65	4	-0.35
Middle	5200	0.476	0.871	3.69	4	-0.31
High	5240	1.131	0.587	3.88	4	-0.12
802.11n-HT20 mode						
Low	5180	0.643	0.388	3.53	4	-0.47
Middle	5200	0.867	0.784	3.84	4	-0.16
High	5240	0.911	0.452	3.7	4	-0.30
802.11n-HT40 mode						
Low	5190	-3.656	-3.845	-0.74	4	-4.74
High	5230	0.946	0.712	3.84	4	-0.16

Please refer to the following plots.

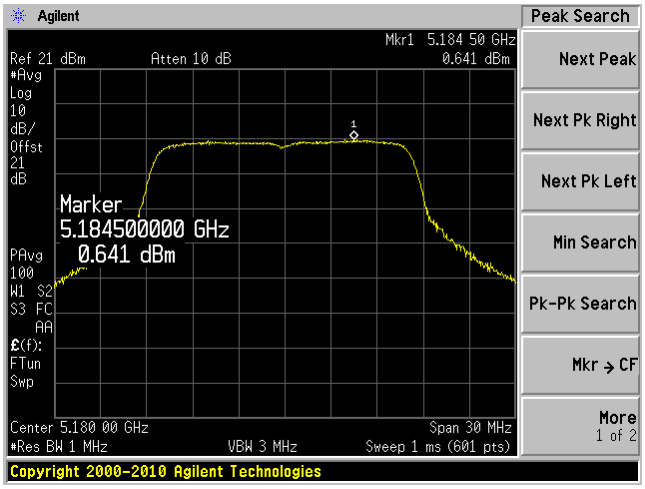
5150-5250 MHz Band

802.11a mode

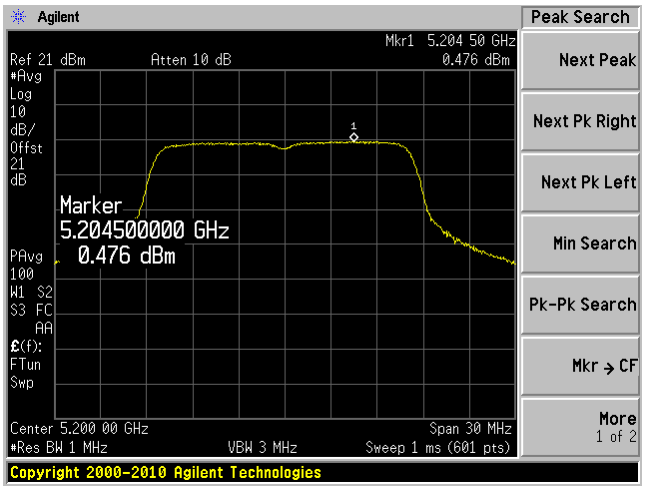
Low channel: 5180 MHz Chain J0



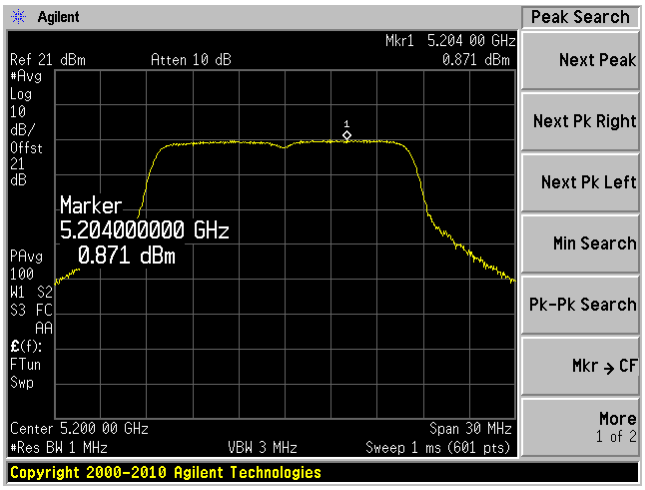
Low channel: 5180 MHz Chain J1



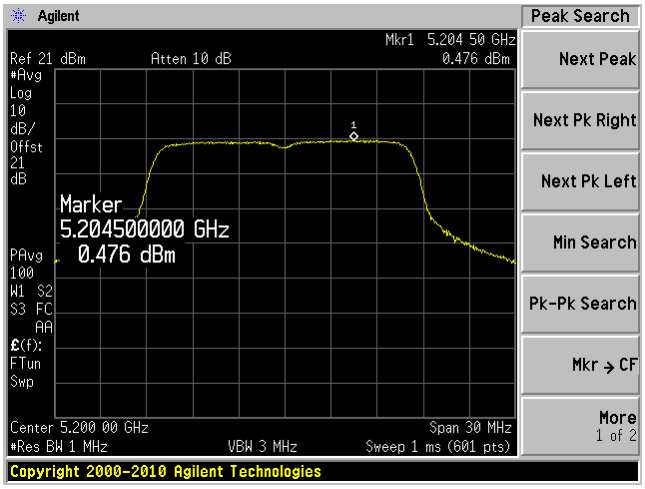
Middle channel: 5200 MHz Chain J0



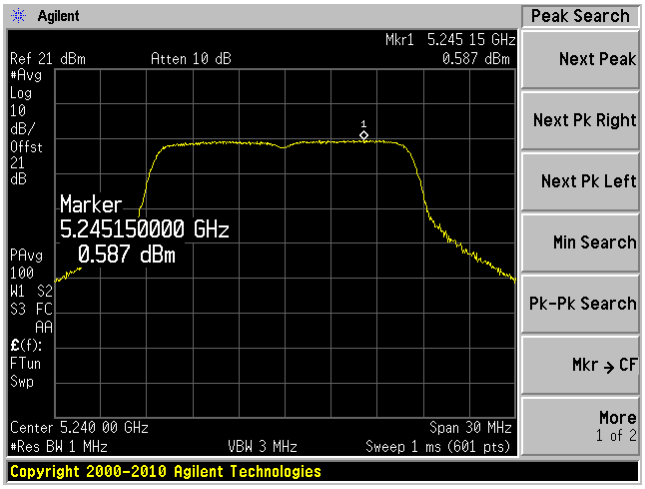
Middle channel: 5200 MHz Chain J1



High channel: 5240 MHz Chain J0

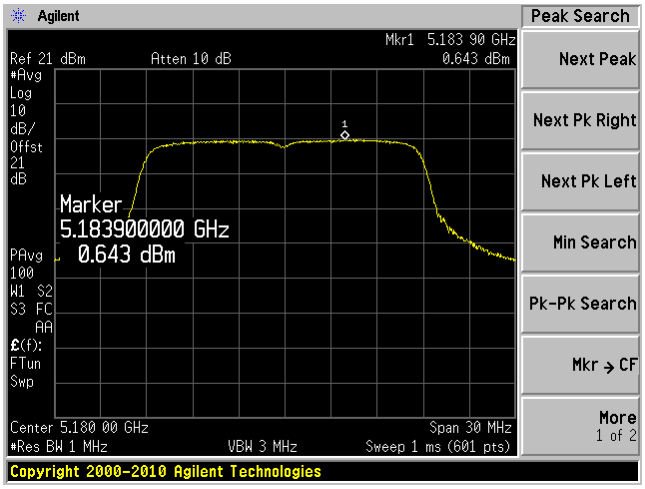


High channel: 5240 MHz Chain J1

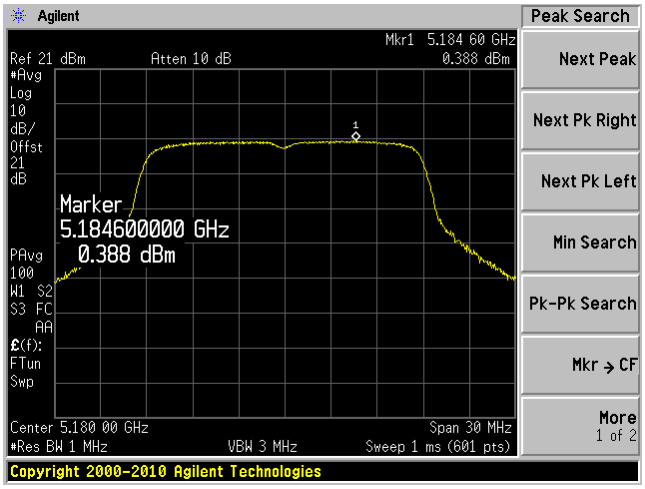


802.11n-HT20 mode

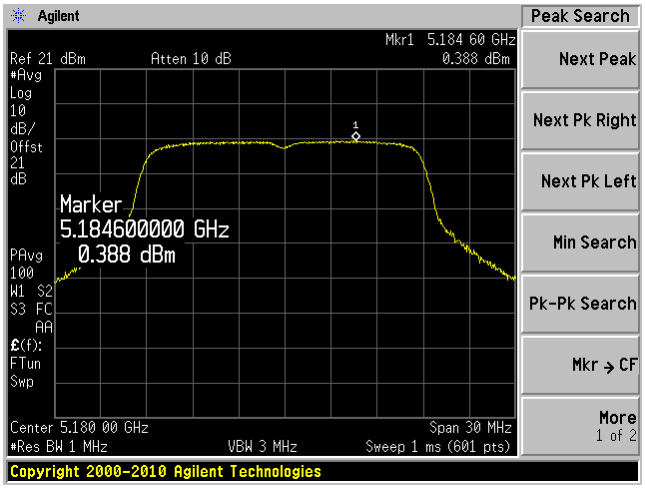
Low channel: 5180 MHz Chain J0



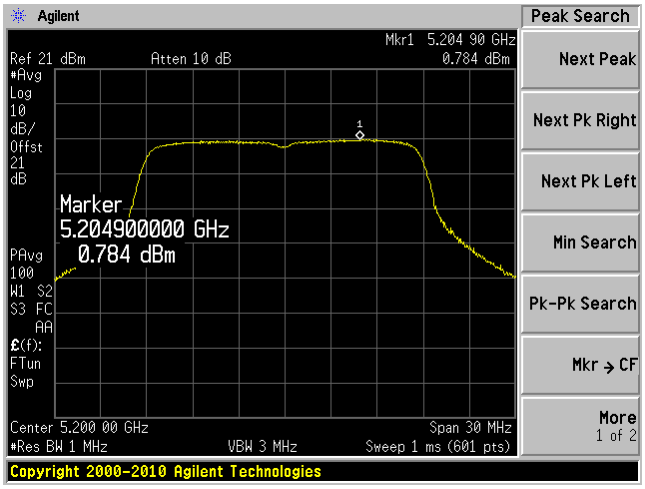
Low channel: 5180 MHz Chain J1



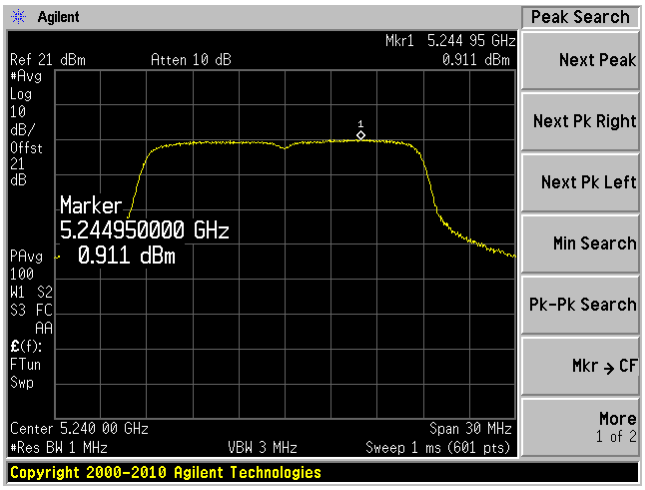
Middle channel: 5200 MHz Chain J0



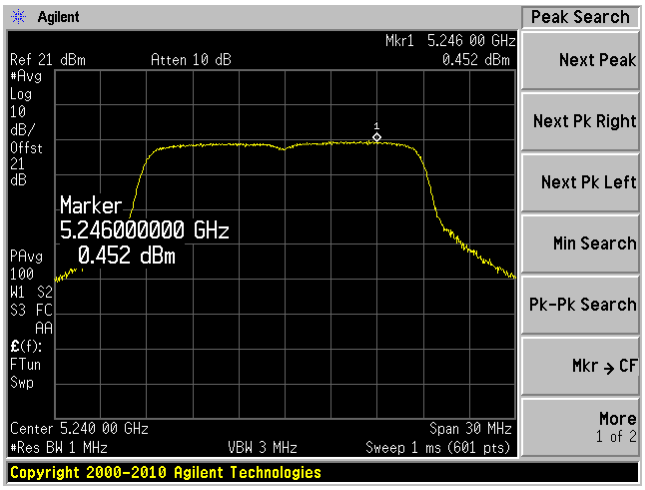
Middle channel: 5200 MHz Chain J1



High channel: 5240 MHz Chain J0

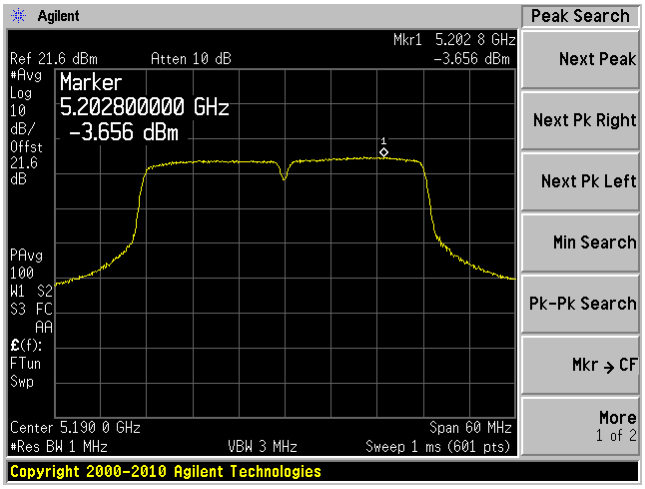


High channel: 5240 MHz Chain J1

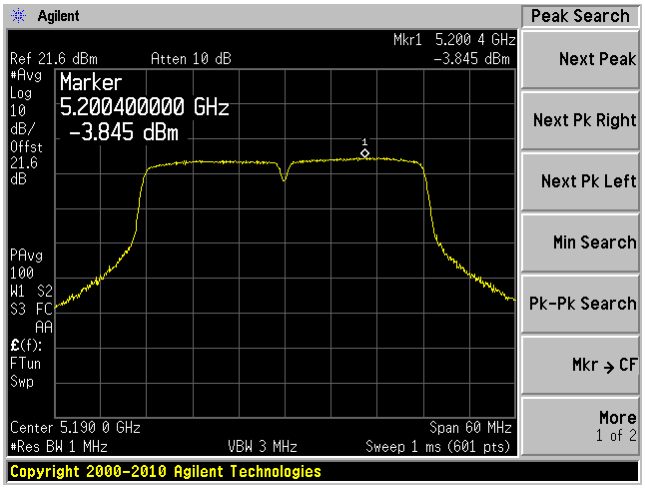


802.11n-HT40 mode

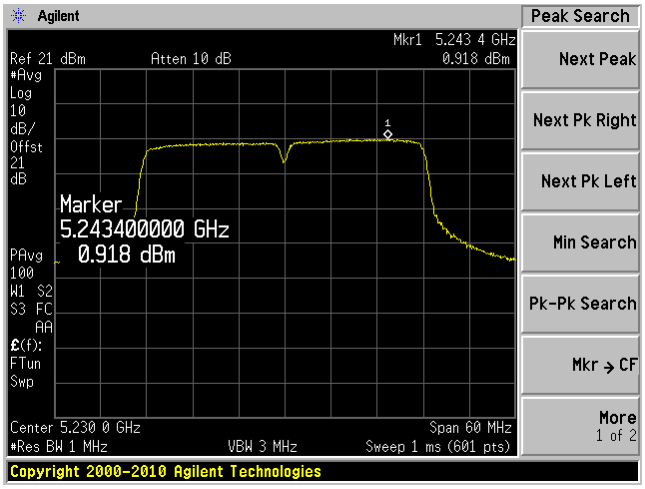
Low channel: 5190 MHz Chain J0



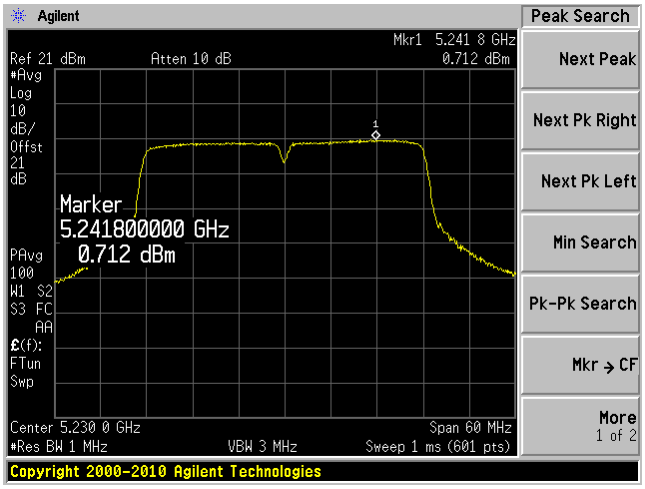
Low channel: 5190 MHz Chain J1



High channel: 5230 MHz Chain J0



High channel: 5230 MHz Chain J1



12 FCC §15.407(a)(6) – Peak Excursion Ratio

12.1 Applicable Standard

According to FCC §15.407(a) (6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

12.2 Test Procedure

The measurements are base on FCC KDB 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section G: Peak excursion measurement

12.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2012-09-29	1 year

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

12.4 Test Environmental Conditions

Temperature:	23-24 °C
Relative Humidity:	42-45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Bo Li from 2013-07-14 to 2013-07-15 in RF site.

12.5 Test Results

5150-5250 MHz Band

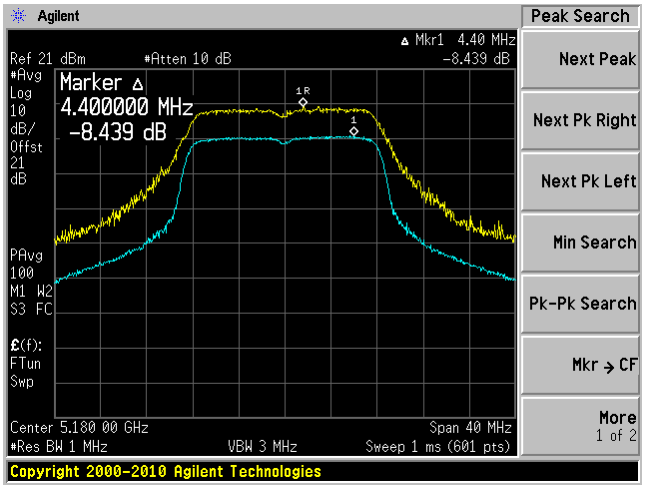
Channel	Frequency (MHz)	TX Chain J0 (dB)	TX ChainJ1 (dB)	Limit (dB)
802.11a mode				
Low	5180	8.439	8.483	13
Middle	5200	7.817	8.539	
High	5240	8.079	9.274	
802.11n HT20 mode				
Low	5180	7.919	8.427	13
Middle	5200	8.459	8.067	
High	5240	8.102	8.224	
802.11n HT40 mode				
Low	5190	7.894	8.706	13
High	5230	8.092	7.83	

Please refer to the following plots for detailed test results:

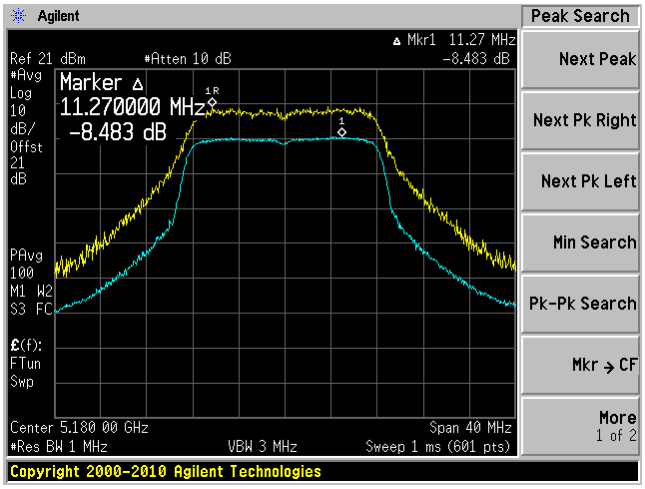
5150-5250 MHz Band

802.11a mode

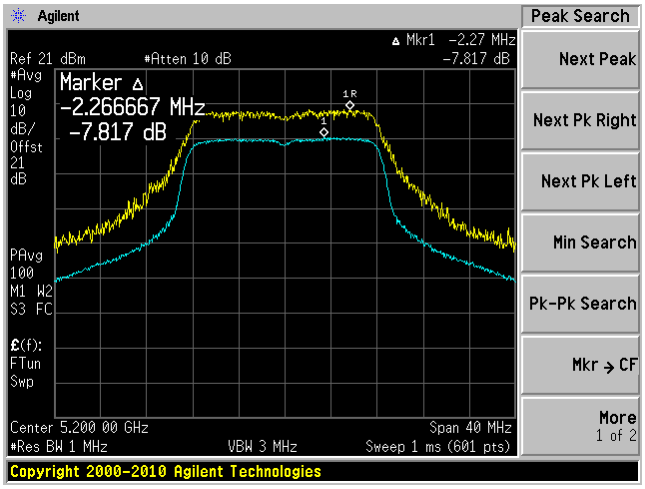
Low channel: 5180 MHz Chain J0



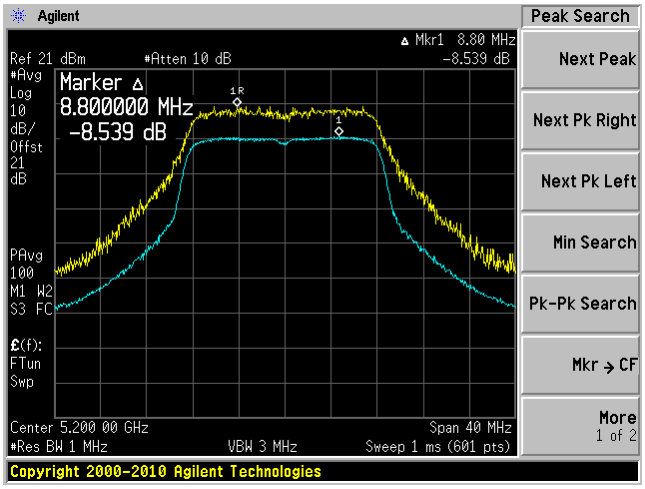
Low channel: 5180 MHz Chain J1



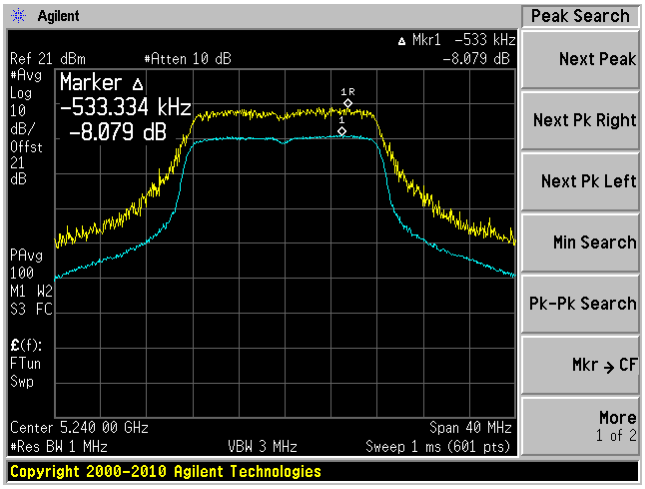
Middle channel: 5200 MHz Chain J0



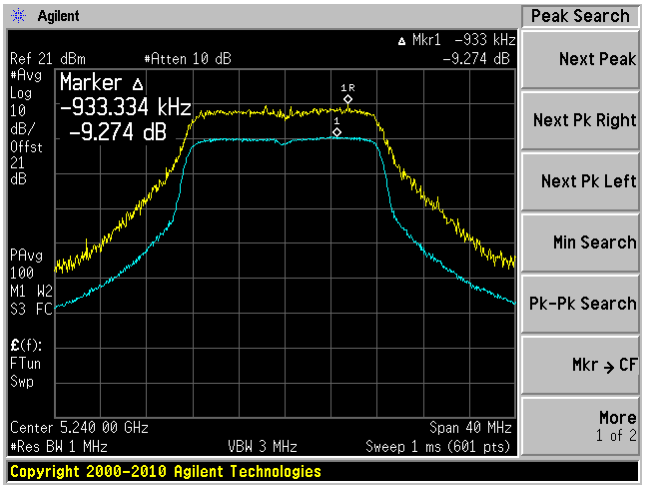
Middle channel: 5200 MHz Chain J1



High channel: 5240 MHz Chain J0

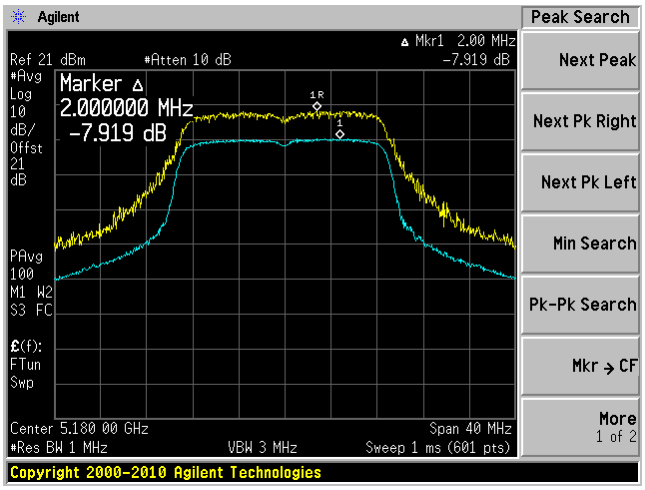


High channel: 5240 MHz Chain J1

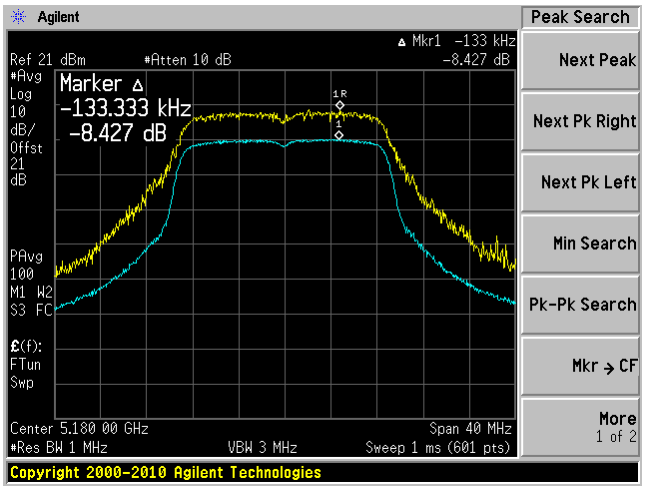


802.11n-HT20 mode

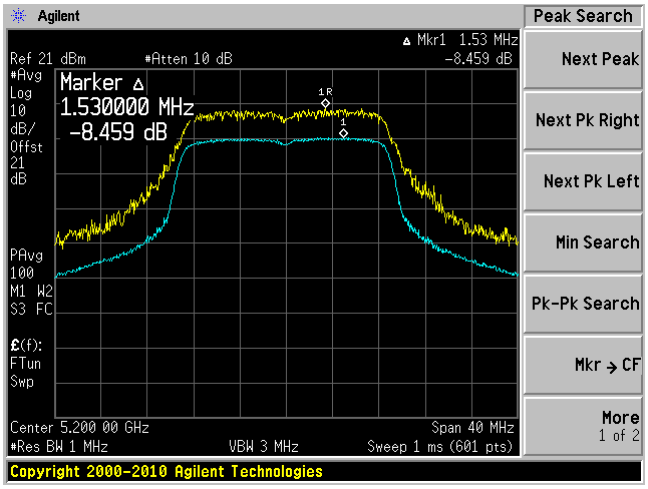
Low channel: 5180 MHz Chain J0



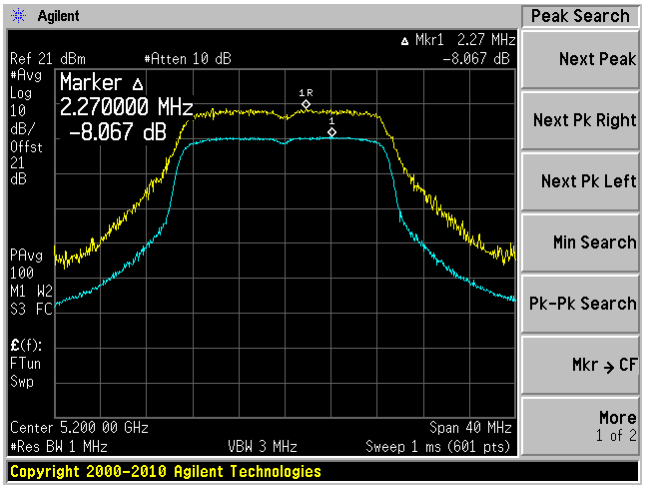
Low channel: 5180 MHz Chain J1



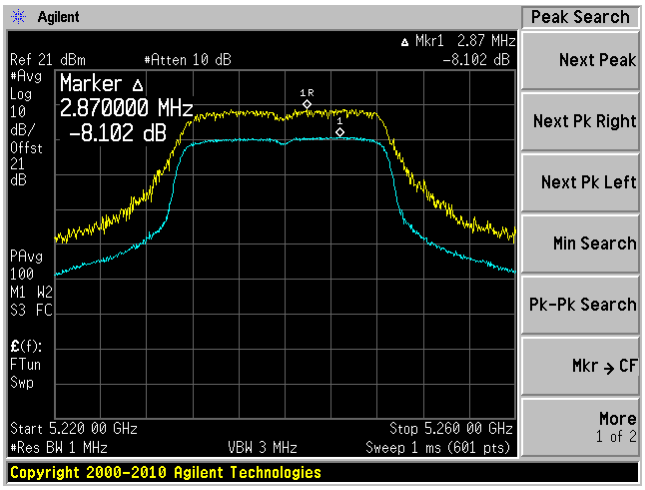
Middle channel: 5200 MHz Chain J0



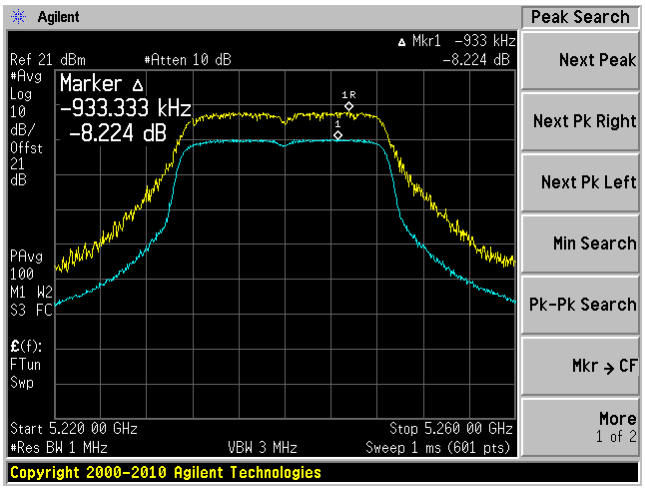
Middle channel: 5200 MHz Chain J1



High channel: 5240 MHz Chain J0

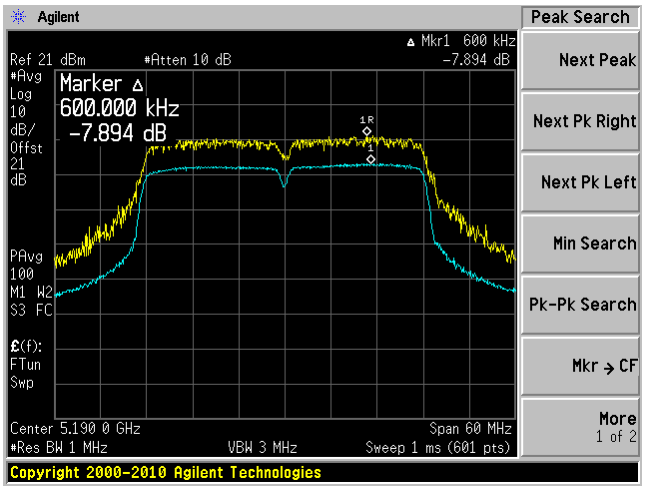


High channel: 5240 MHz Chain J1

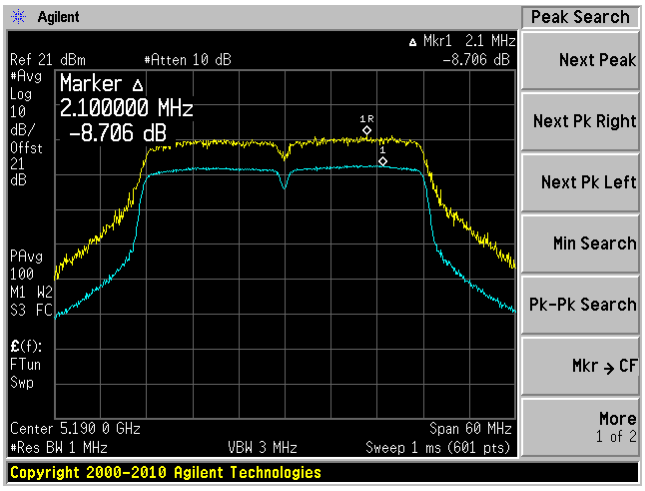


802.11n-HT40 mode

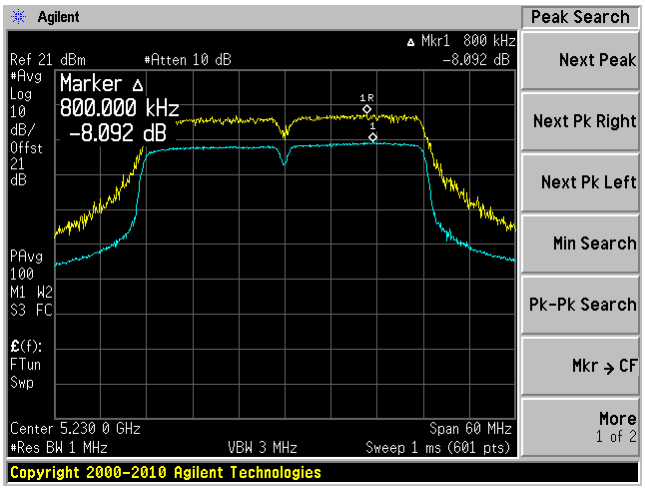
Low channel: 5190 MHz Chain J0



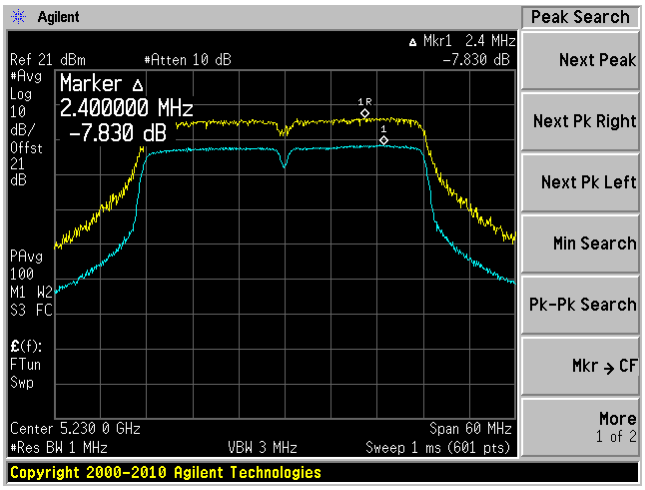
Low channel: 5190 MHz Chain J1



High channel: 5230 MHz Chain J0



High channel: 5230 MHz Chain J1



13 IC RSS-210 §2.3 & RSS-Gen §6.1 - Receiver Spurious Radiated Emissions

13.1 Applicable Standard

According to IC RSS-Gen §6.1, spurious emissions from receivers shall not exceed the radiated limits shown in the table below.

Table 2: General Field Strength Limits for Transmitters and Receivers at Frequencies above 30 MHz

Frequency (MHz)	Field Strength Microvolts/m at 3 meters
30-88	100
88-216	150
216-960	200
Above 960	500

13.2 EUT Setup

The radiated emissions tests were performed in the 3 meter chamber, using the setup in accordance with ANSI C63.4-2009.

13.3 Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations.

All data were recorded in the peak detection mode. Quasi-peak readings was performed only when an emissions was found to be marginal (within -4 dB of specification limits), and are distinguished with a "**QP**" in the data table.

13.4 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

13.5 Test Equipment Lists 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	2013-06-18	1 year
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2013-06-09	1 year
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2013-05-09	1 year
Agilent	Spectrum Analyzer	E4446A	US44300386	2012-09-29	1 year
EMCO	Horn Antenna	3315	9511-4627	2012-10-17	1 year
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2013-03-28	1 year

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

13.6 Test Environmental Conditions

Temperature:	22 °C
Relative Humidity:	47 %
ATM Pressure:	102.1 kPa

The testing was performed by Bo Li from 2013-6-11 at 5 meter 3.

13.7 Summary of Test Results

According to the test data, the EUT complied with the RSS-210/RSS-Gen, with the closest margins from the limit listed below:

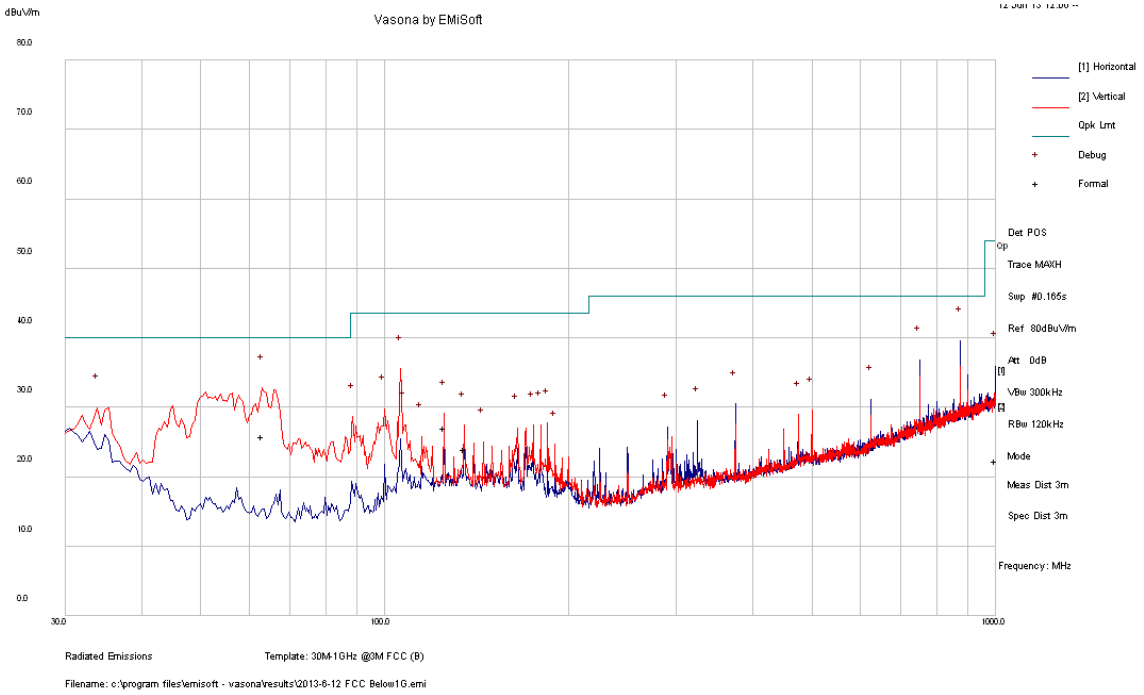
Mode: Receiving			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-11.2	45.223	Vertical	30-1000

Mode: Receiving			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-11.582	14226.3	Horizontal	1000-12750

13.8 Test Results and Plots

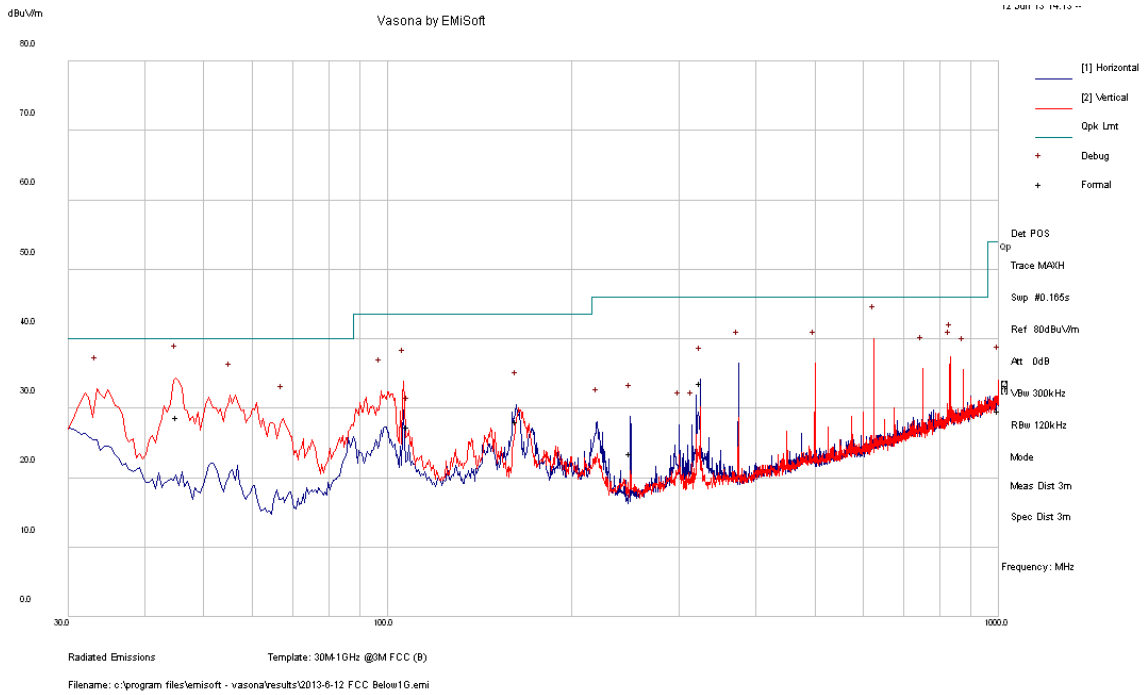
1) 30-1000 MHz, Measured at 3 meters

With AC/DC Adaptor



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector (QP/Ave.)
63.01425	25.76	156	V	306	40	-14.24	QP
125.0055	27.03	156	V	0	43.5	-16.47	QP
135.006	23.96	125	V	1	43.5	-19.54	QP
999.364	22.33	99	H	255	54	-31.67	QP

With POE



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector (QP/Ave.)
45.223	28.8	113	V	76	40	-11.2	QP
325.0035	33.69	110	H	41	46	-12.31	QP
162.52275	28.09	168	H	106	43.5	-15.41	QP
108.01225	27.38	99	V	260	43.5	-16.12	QP
249.95175	23.58	102	H	305	46	-22.42	QP
999.954	29.72	104	V	0	54	-24.28	QP

2) 1 to 12.75 GHz measured at 3 meters

With AC/DC Adaptor

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
14226.3	57.608	100	V	0	74	-16.392	Peak
14226.3	57.108	100	H	0	74	-16.892	Peak
14226.3	42.388	100	V	0	54	-11.612	Ave
14226.3	42.418	100	H	0	54	-11.582	Ave
1184.83	37.378	100	V	0	74	-36.622	Peak
1184.83	38.028	100	H	0	74	-35.972	Peak
1184.83	23.078	100	V	0	54	-30.922	Ave
1184.83	23.018	100	H	0	54	-30.982	Ave

With POE

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
1350	43.794	100	V	141	74	-30.206	Peak
1350	41.384	100	H	206	74	-32.616	Peak
1350	33.224	100	V	141	54	-20.776	Ave
1350	34.544	100	H	206	54	-19.456	Ave
1996	58.766	100	V	141	74	-15.234	Peak
1996	51.936	100	H	251	74	-22.064	Peak
1996	26.166	100	V	141	54	-27.834	Ave
1996	25.196	100	H	251	54	-28.804	Ave

14 FCC §15.407(b) & IC RSS-210 §A9.2 - Spurious Emissions at Antenna Terminals

14.1 Applicable Standard

According to FCC §15.407(b)

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of −27 dBm/MHz

According to 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.

14.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section H: Unwanted emissions measurement

14.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2012-09-29	1 year

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

14.4 Test Environmental Conditions

Temperature:	23-24 °C
Relative Humidity:	42-45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Bo Li from 2013-07-14 to 2013-07-15 in RF site.

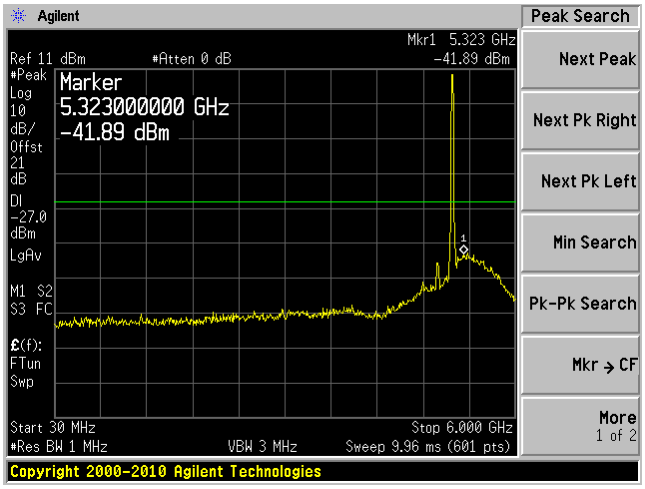
14.5 Test Results

Please refer to following plots of spurious emissions.

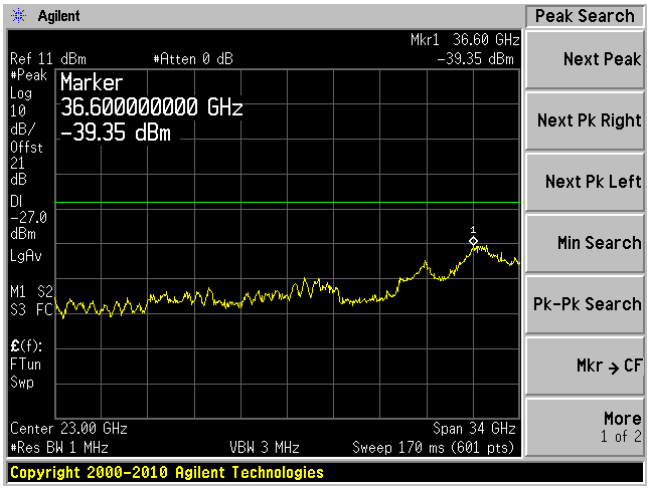
5150-5250 MHz

802.11a, Low Channel, 5180 MHz

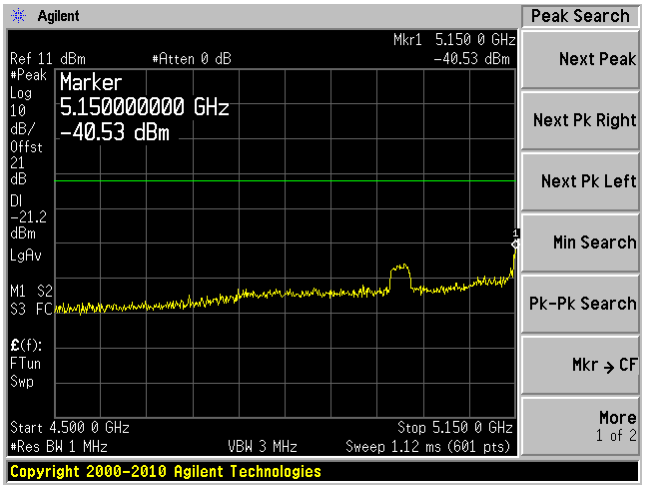
Chain J0, Plot: 30 MHz – 6 GHz



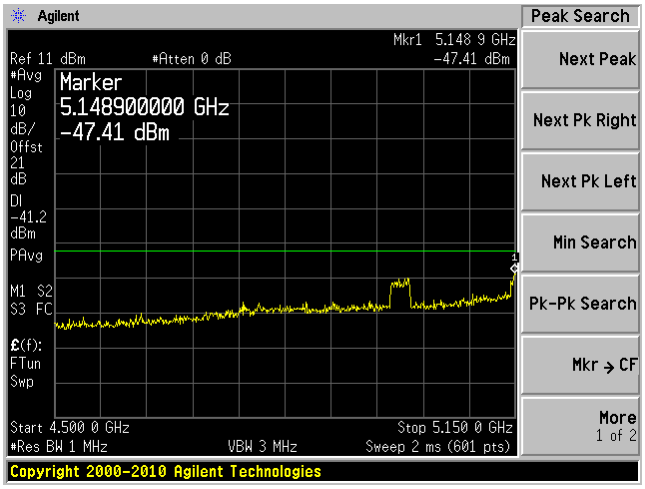
Chain J0, Plot: 6 GHz – 40 GHz



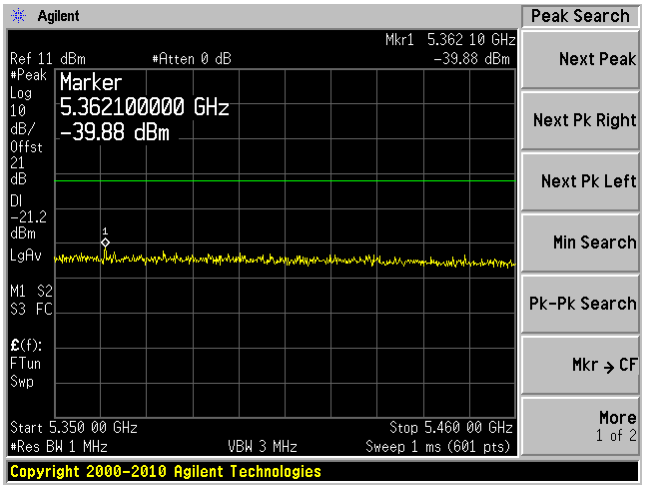
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



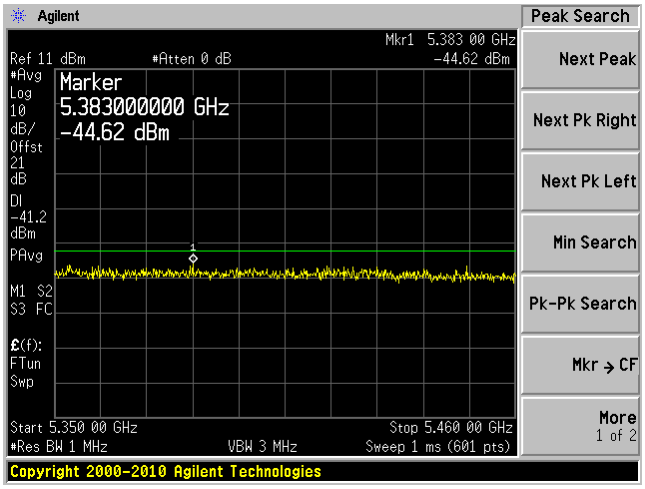
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



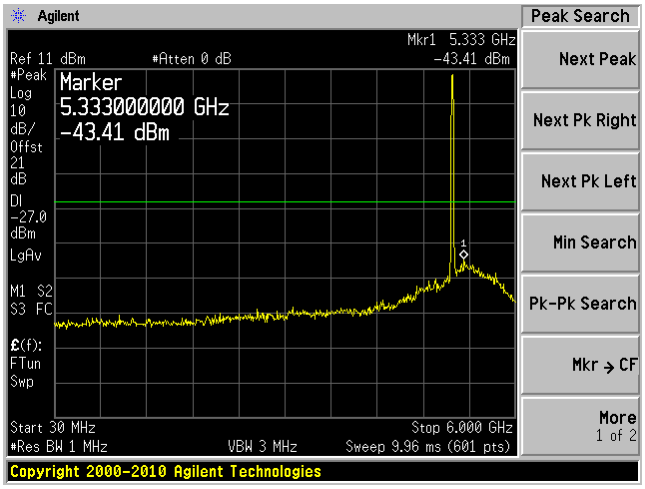
Chain J0, Plot: 5350MHz – 5460 MHz Peak



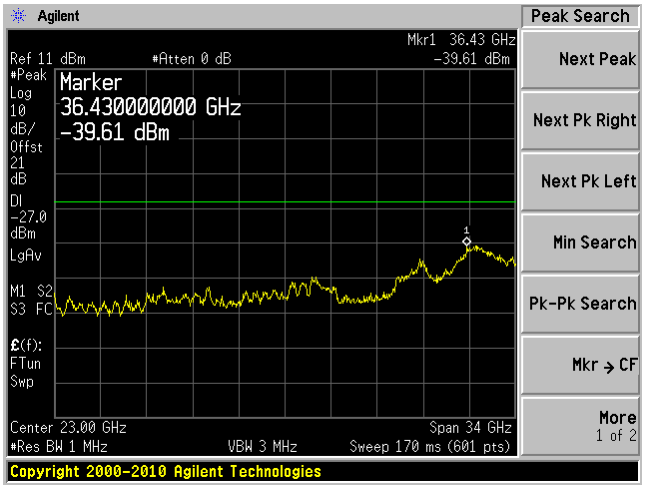
Chain J0, Plot: 5350MHz – 5460 MHz Ave



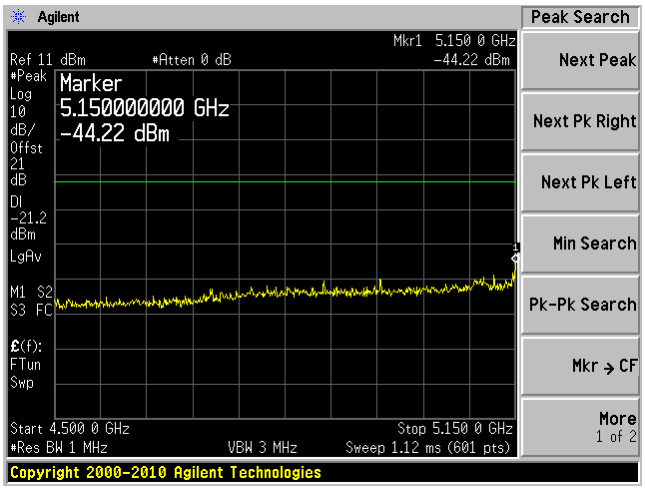
Chain J1, Plot: 30 MHz – 6 GHz



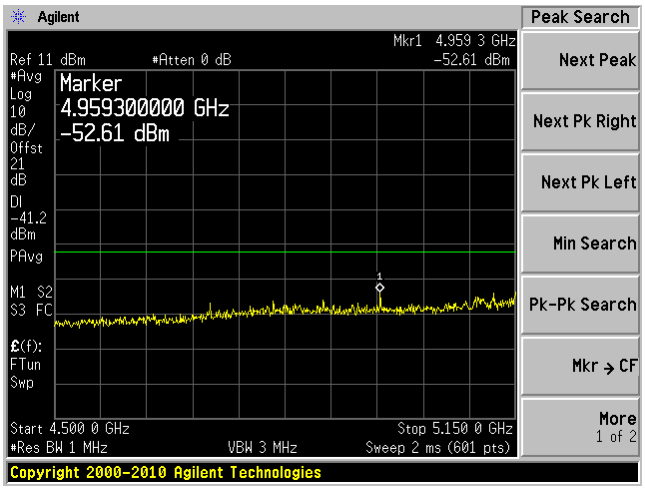
Chain J1, Plot: 6 GHz – 40 GHz



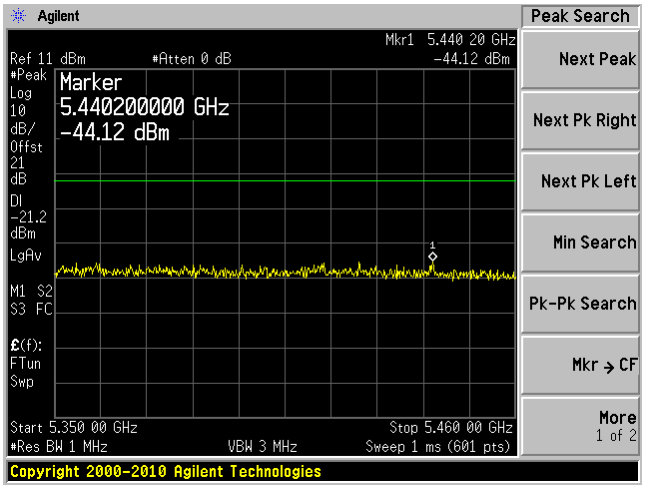
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



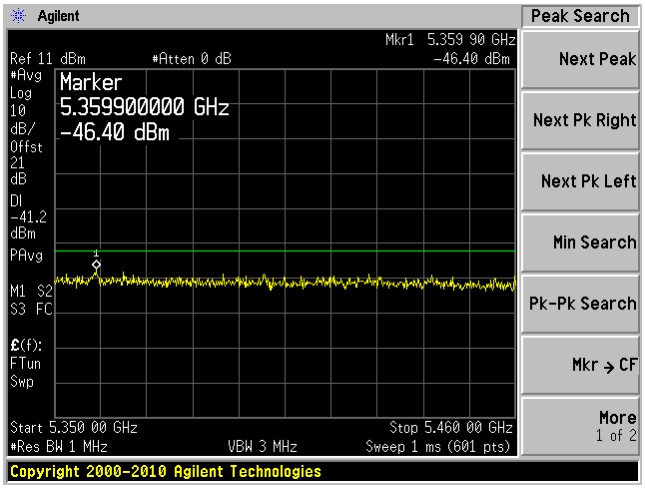
Chain J1, Plot: 4500 MHz – 5150 MHz Ave



Chain J1, Plot: 5350MHz – 5460 MHz Peak

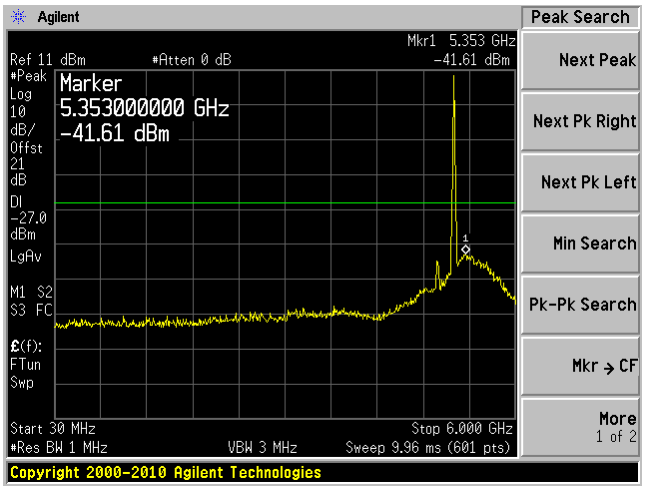


Chain J1, Plot: 5350MHz – 5460 MHz Ave

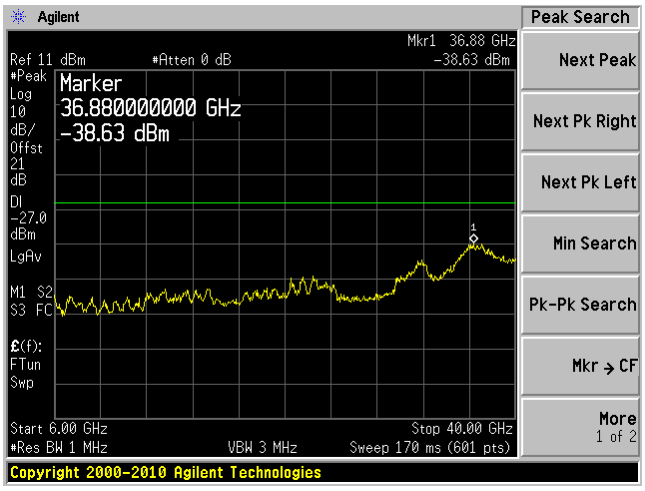


802.11a, Middle Channel, 5200 MHz

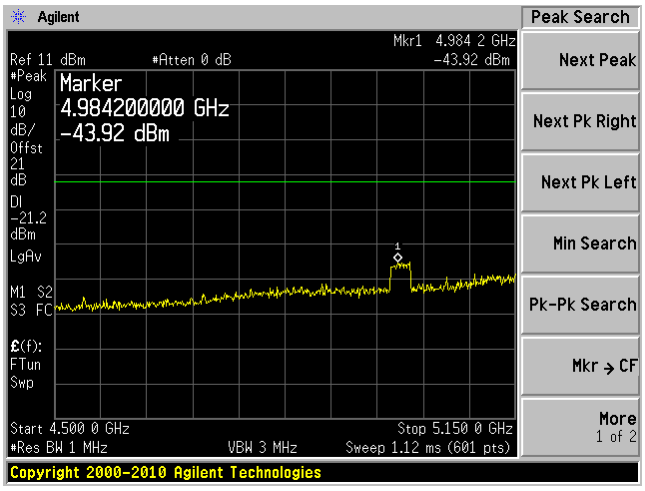
Chain J0, Plot: 30 MHz – 6 GHz



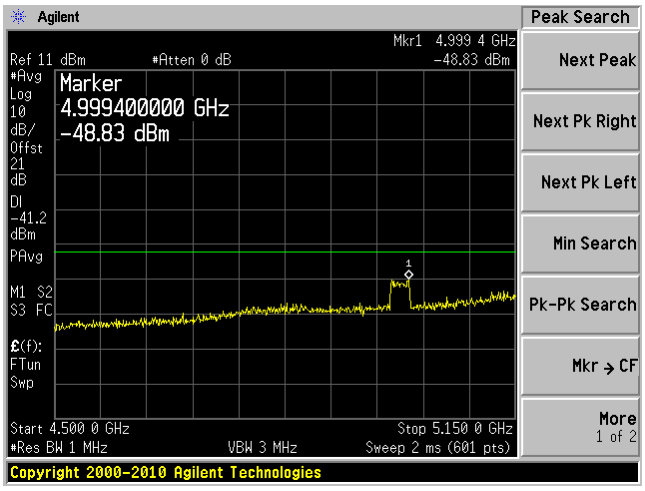
Chain J0, Plot: 6 GHz – 40 GHz



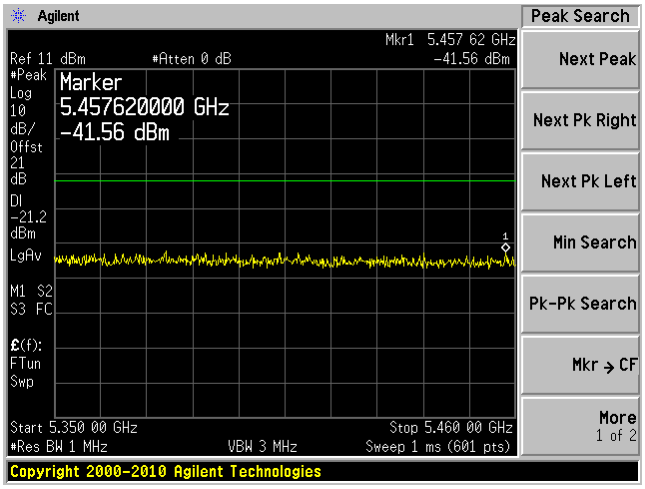
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



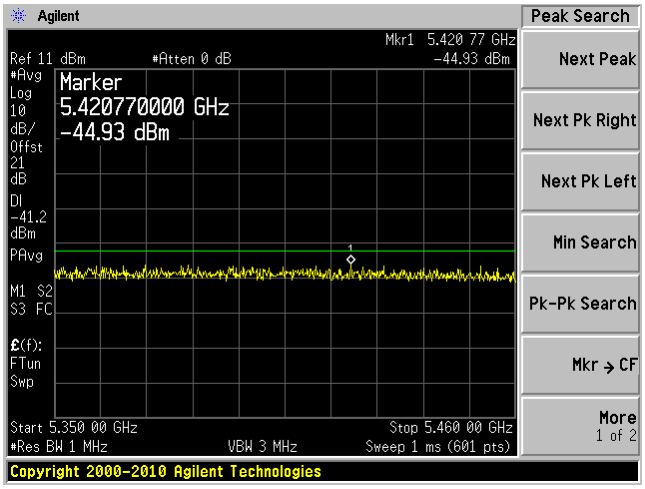
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



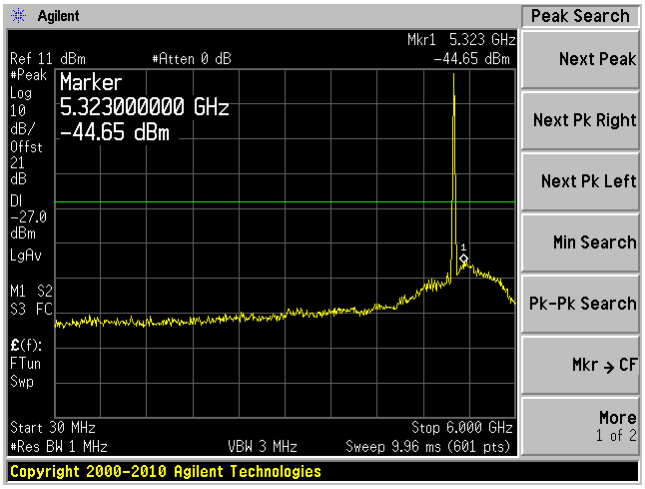
Chain J0, Plot: 5350MHz – 5460 MHz Peak



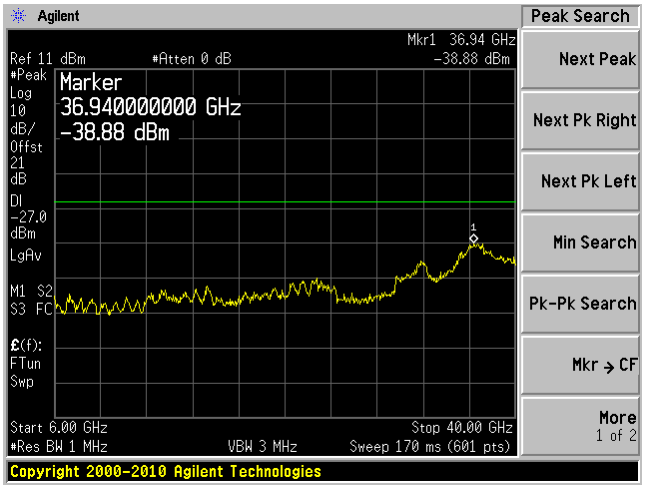
Chain J0, Plot: 5350MHz – 5460 MHz Ave



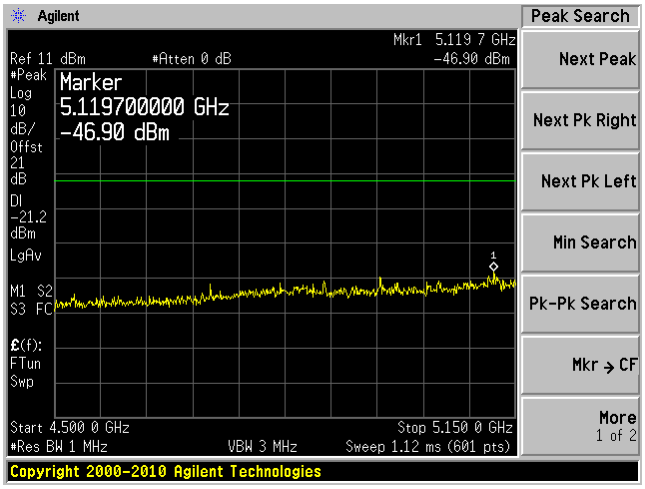
Chain J1, Plot: 30 MHz – 6 GHz



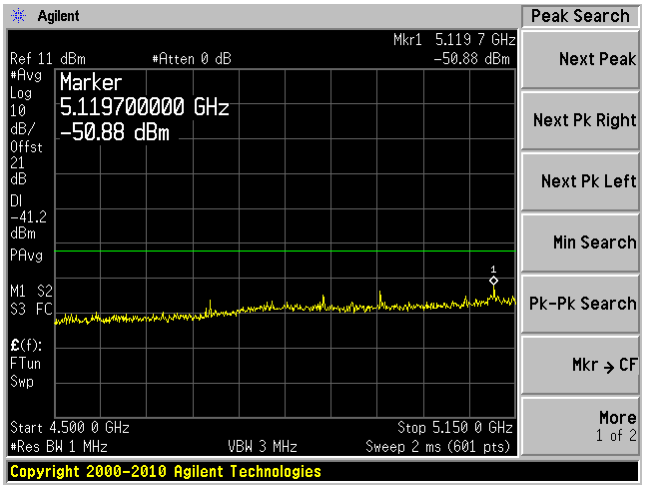
Chain J1, Plot: 6 GHz – 40 GHz



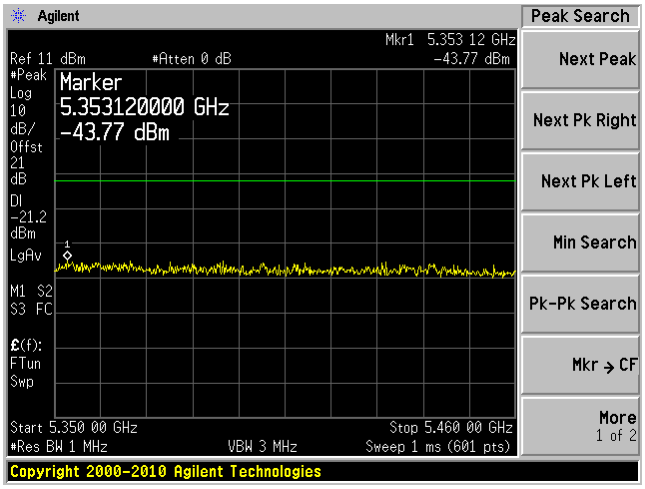
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



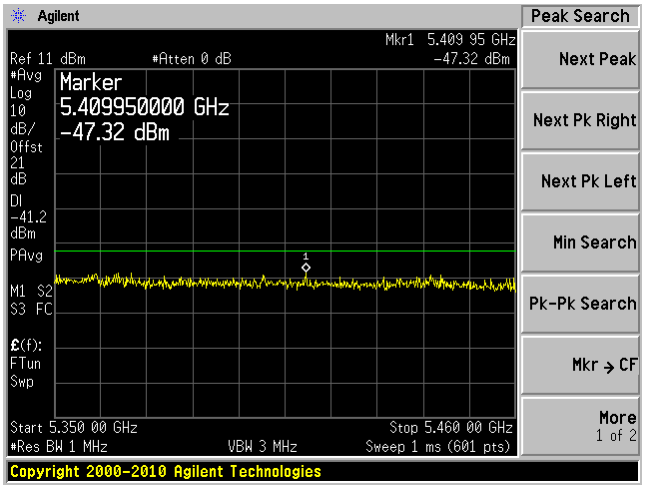
Chain J1, Plot: 4500 MHz – 5150 MHz Ave



Chain J1, Plot: 5350MHz – 5460 MHz Peak

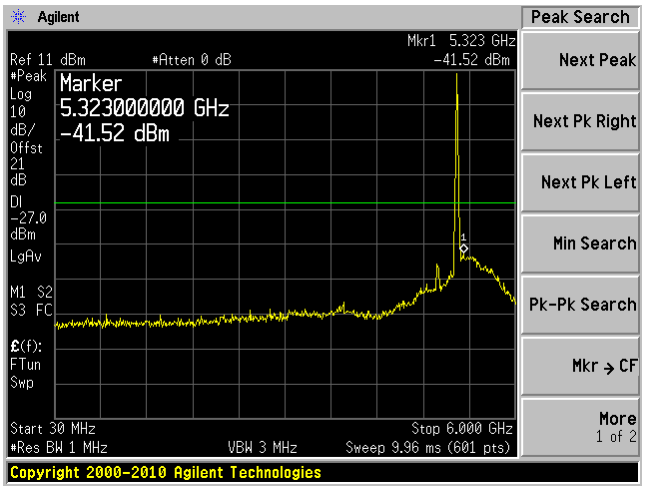


Chain J1, Plot: 5350MHz – 5460 MHz Ave

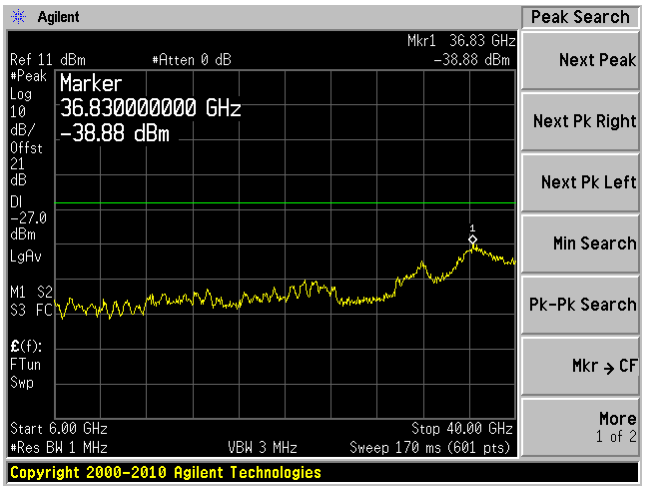


802.11a, High Channel, 5240 MHz

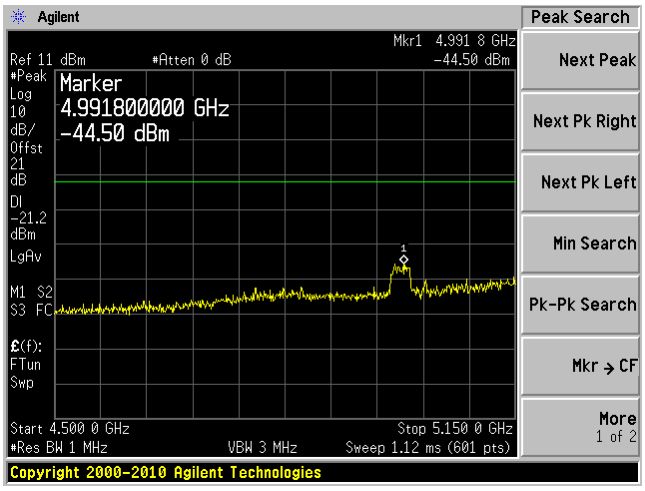
Chain J0, Plot: 30 MHz – 6 GHz



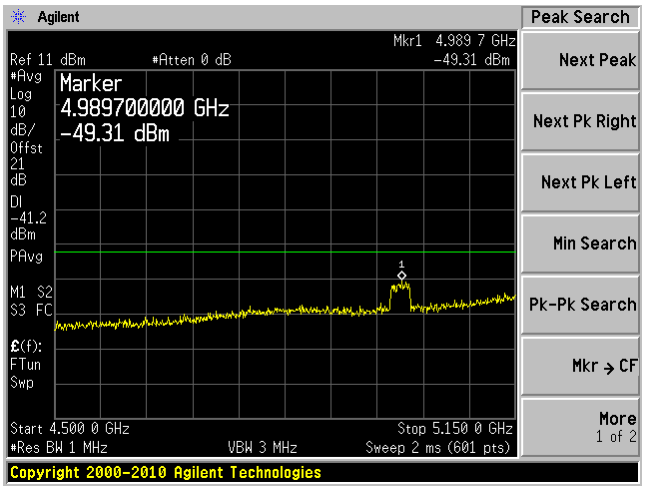
Chain J0, Plot: 6 GHz – 40 GHz



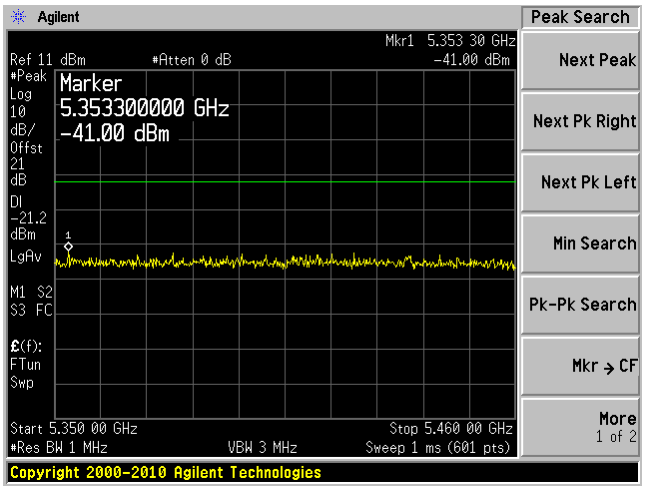
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



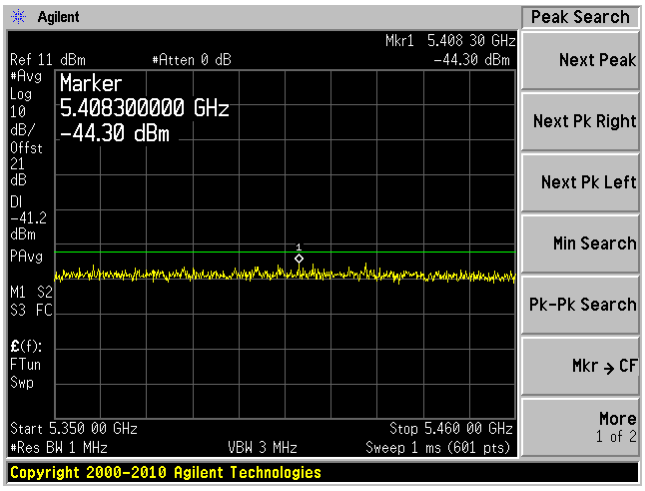
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



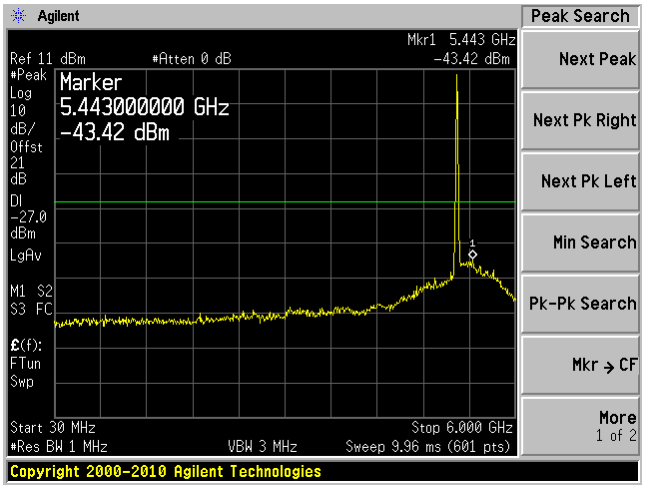
Chain J0, Plot: 5350MHz – 5460 MHz Peak



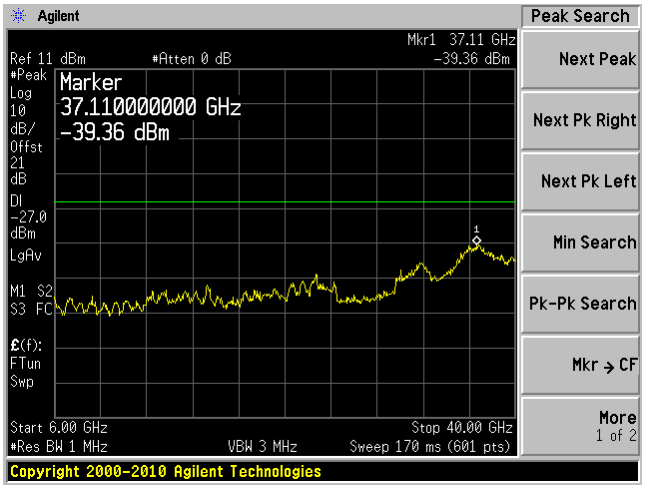
Chain J0, Plot: 5350MHz – 5460 MHz Ave



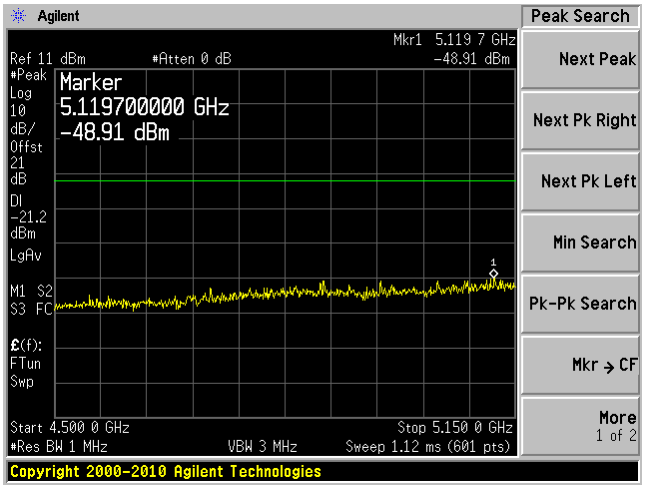
Chain J1, Plot: 30 MHz – 6 GHz



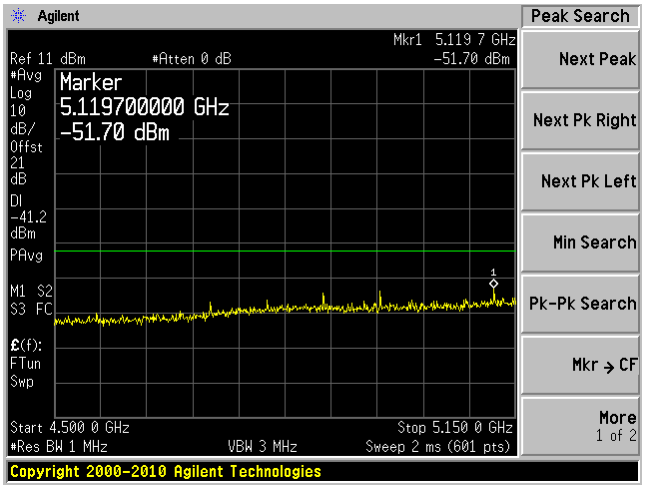
Chain J1, Plot: 6 GHz – 40 GHz



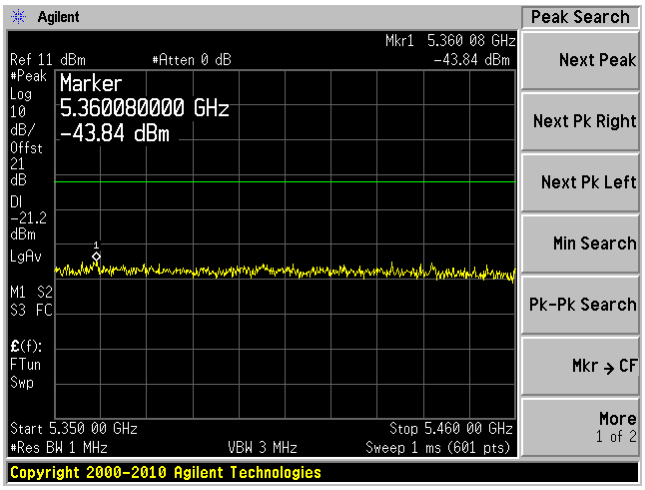
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



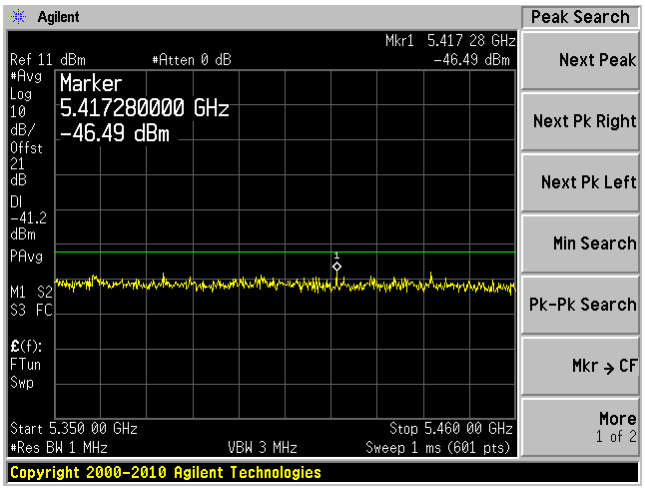
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



Chain J1, Plot: 5350MHz – 5460 MHz Peak

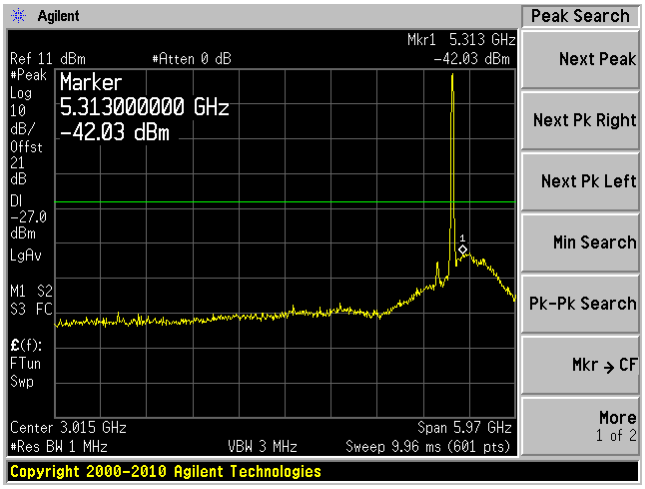


Chain J1, Plot: 5350MHz – 5460 MHz Ave

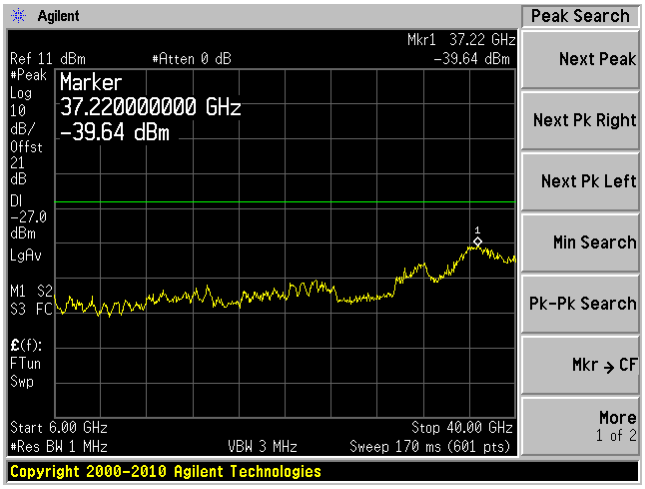


802.11n-HT 20, Low Channel 5180 MHz

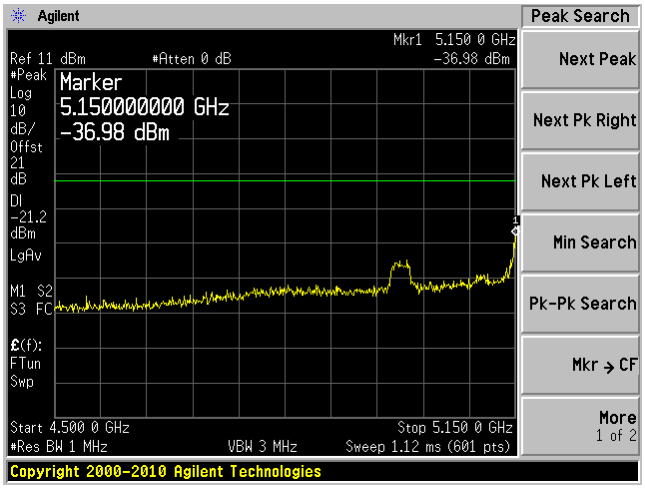
Chain J0, Plot: 30 MHz – 6 GHz



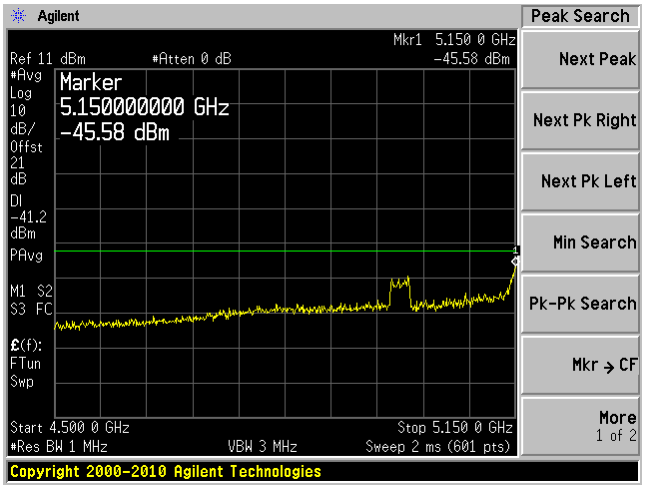
Chain J0, Plot: 6 GHz – 40 GHz



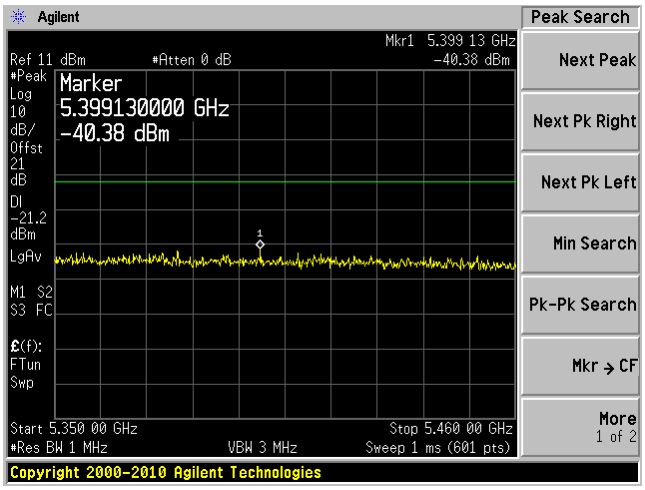
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



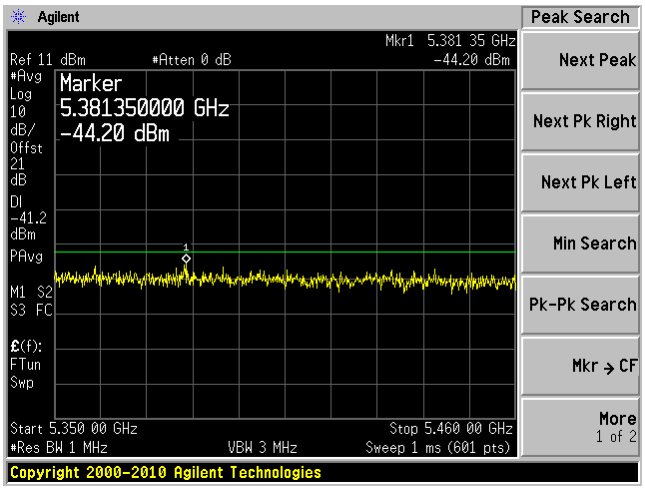
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



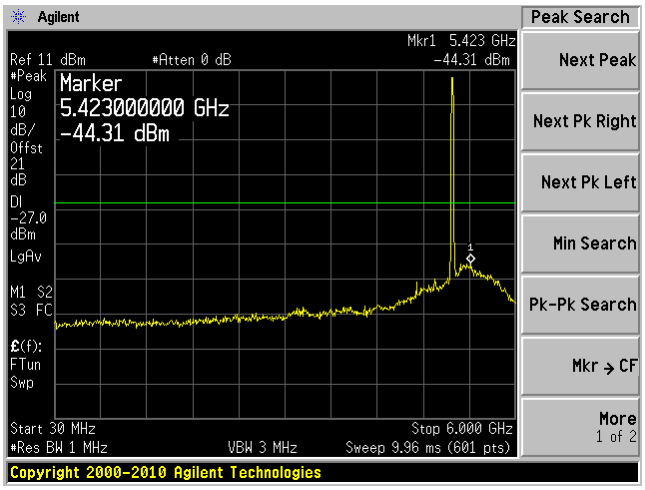
Chain J0, Plot: 5350MHz – 5460 MHz Peak



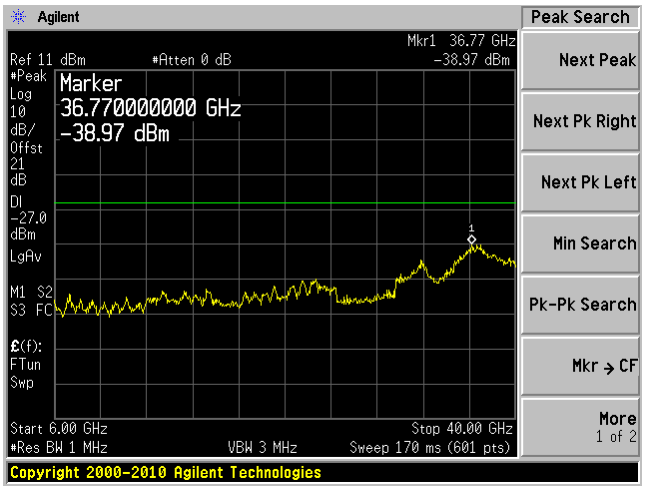
Chain J0, Plot: 5350MHz – 5460 MHz Ave



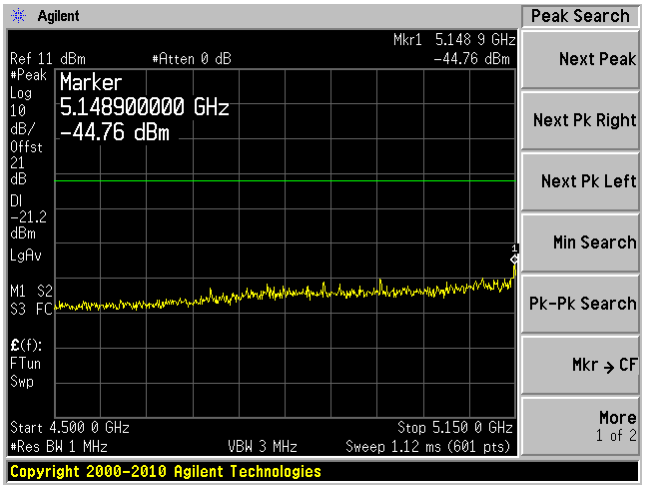
Chain J1, Plot: 30 MHz – 6 GHz



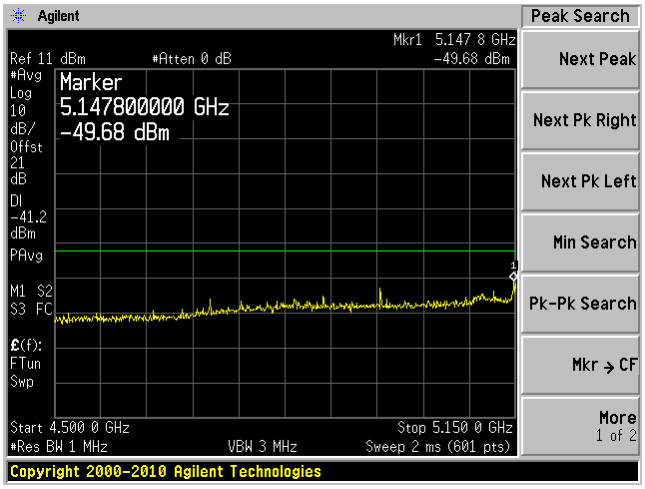
Chain J1, Plot: 6 GHz – 40 GHz



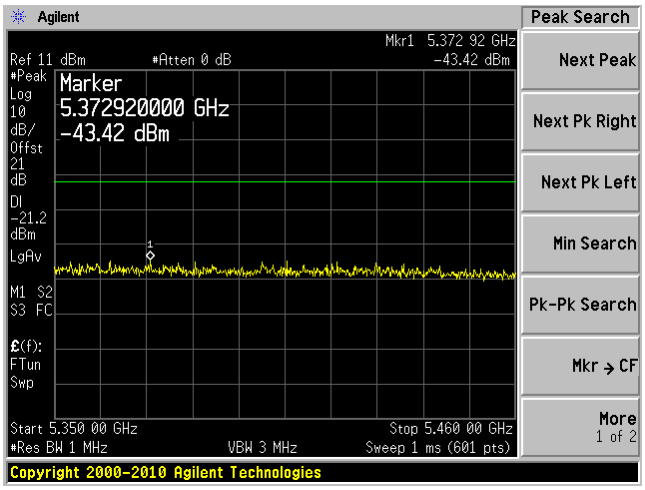
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



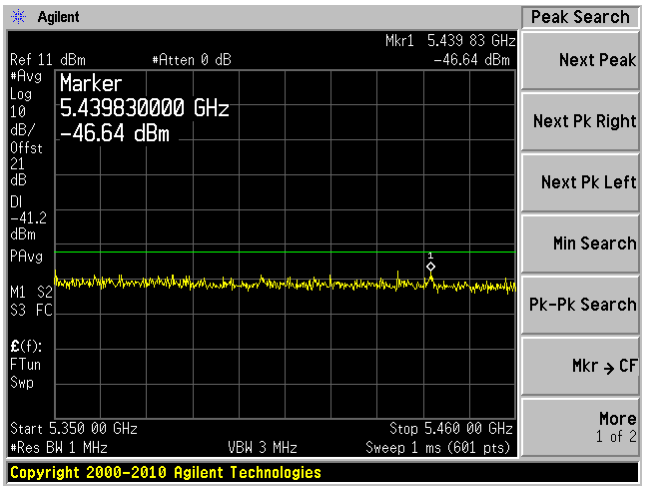
Chain J1, Plot: 4500 MHz – 5150 MHz Ave



Chain J1, Plot: 5350MHz – 5460 MHz Peak

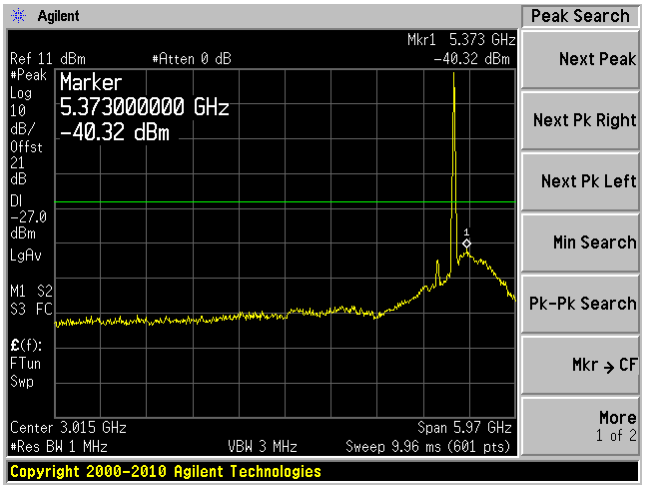


Chain J1, Plot: 5350MHz – 5460 MHz Ave

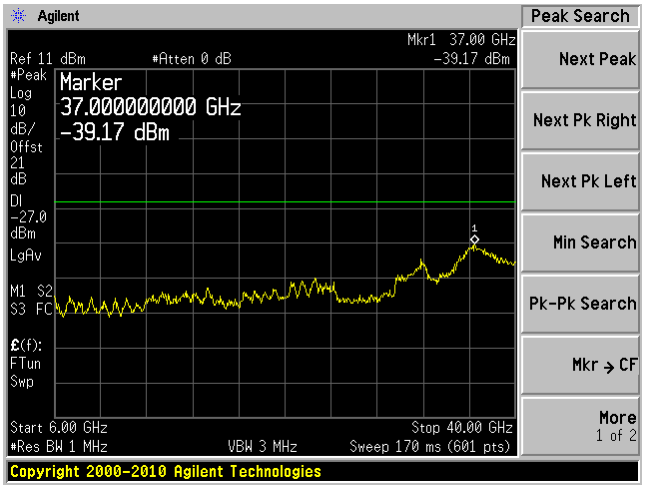


802.11n-HT20, Middle Channel 5200 MHz

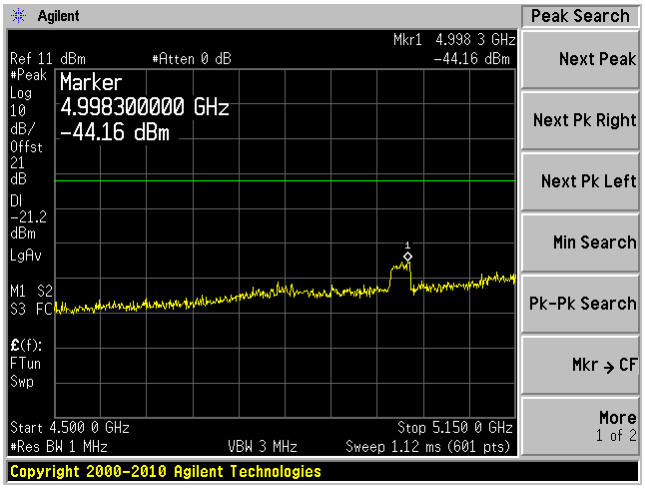
Chain J0, Plot: 30 MHz – 6 GHz



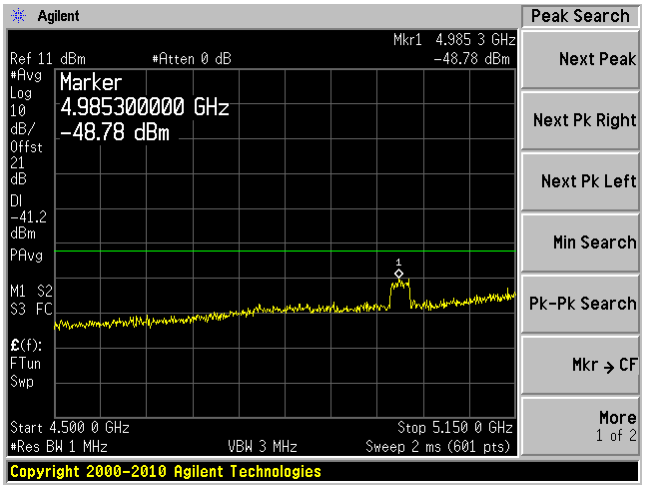
Chain J0, Plot: 6 GHz – 40 GHz



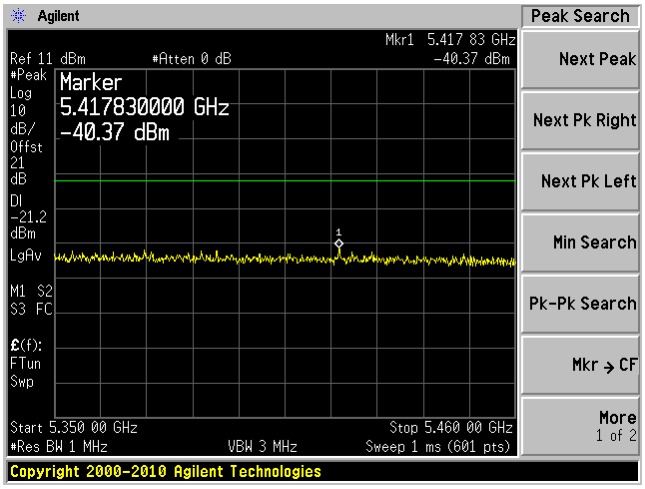
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



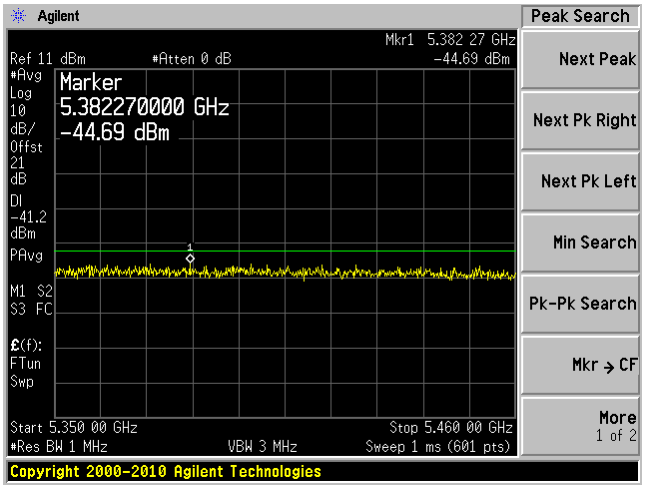
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



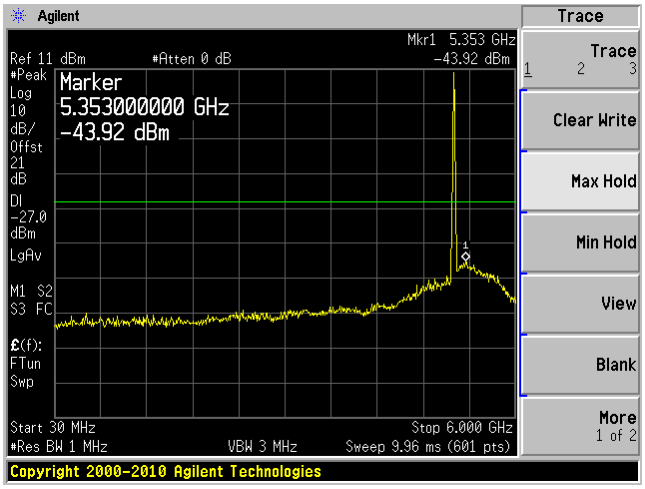
Chain J0, Plot: 5350MHz – 5460 MHz Peak



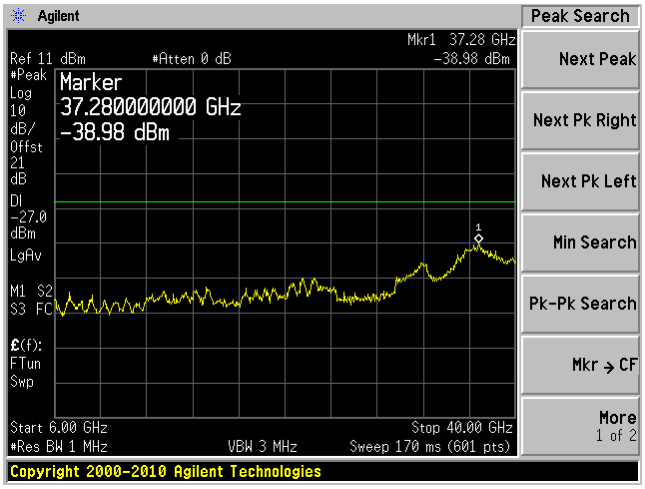
Chain J0, Plot: 5350MHz – 5460 MHz Ave



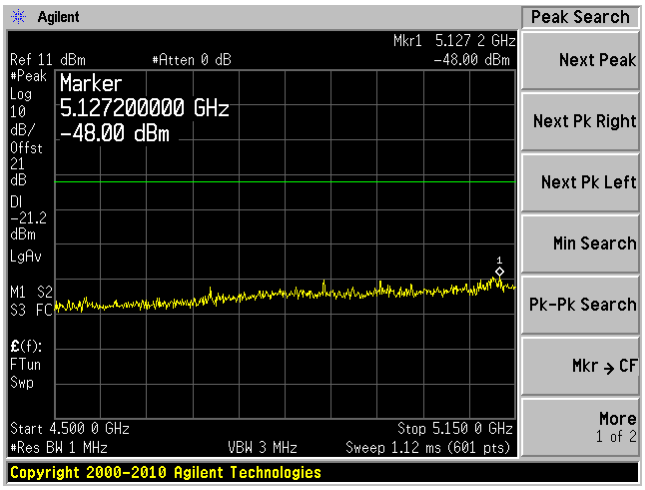
Chain J1, Plot: 30 MHz – 6 GHz



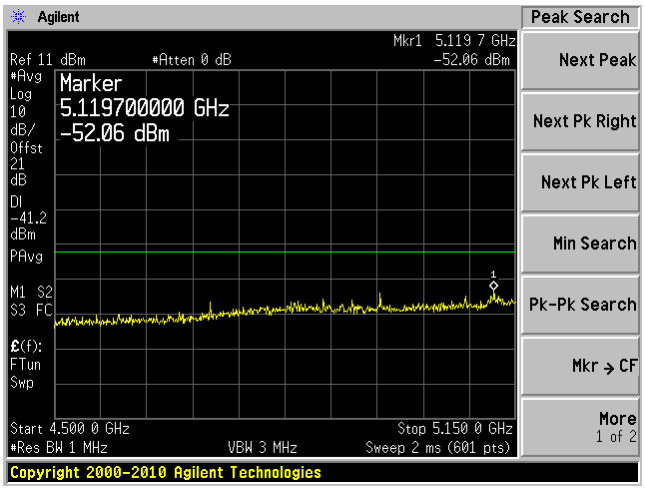
Chain J1, Plot: 6 GHz – 40 GHz



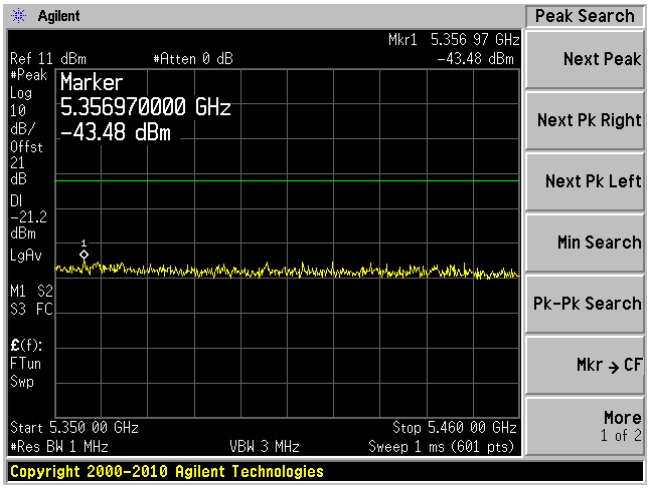
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



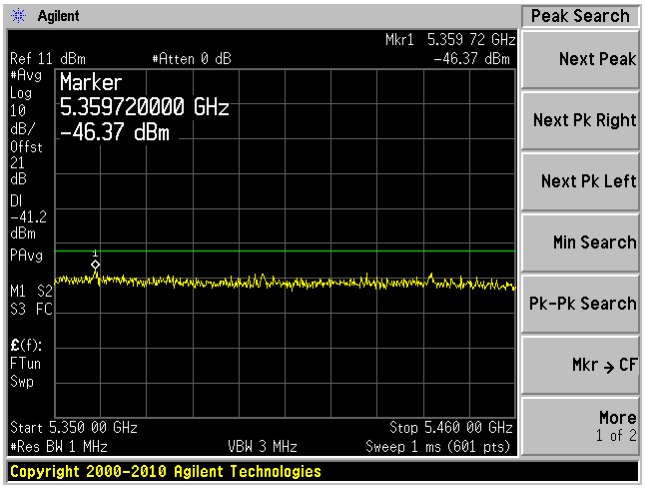
Chain J1, Plot: 4500 MHz – 5150 MHz Ave



Chain J1, Plot: 5350MHz – 5460 MHz Peak

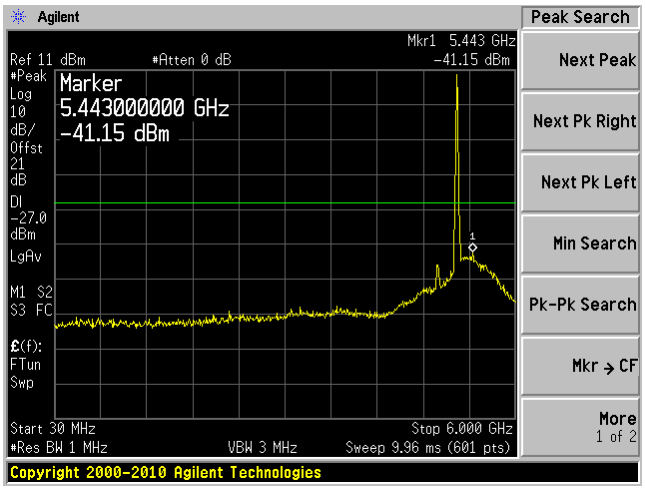


Chain J1, Plot: 5350MHz – 5460 MHz Ave

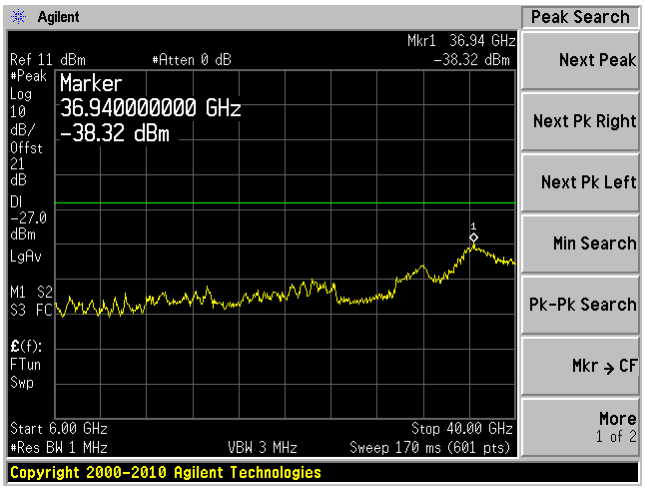


802.11n-HT 20, High Channel 5240 MHz

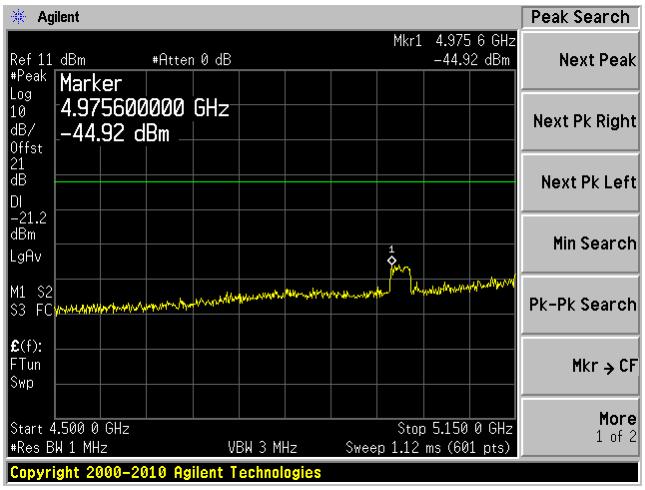
Chain J0, Plot: 30 MHz – 6 GHz



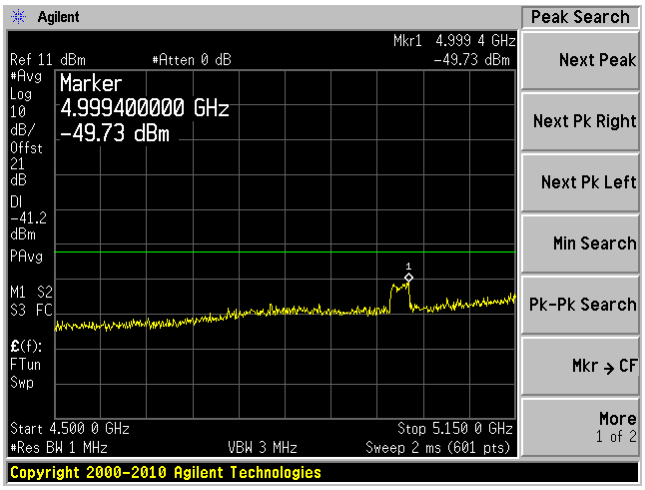
Chain J0, Plot: 6 GHz – 40 GHz



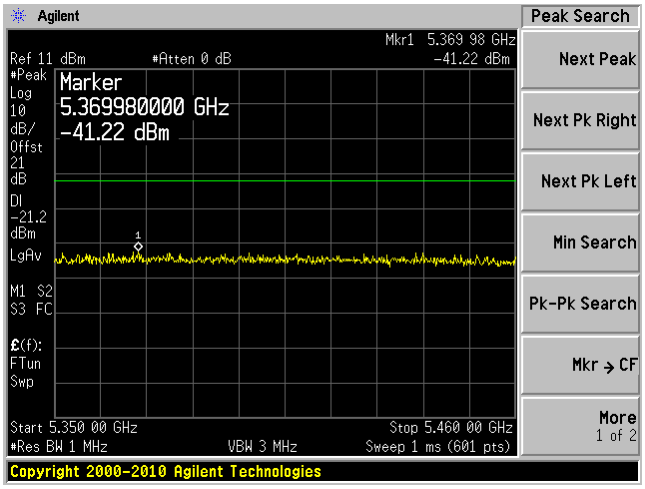
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



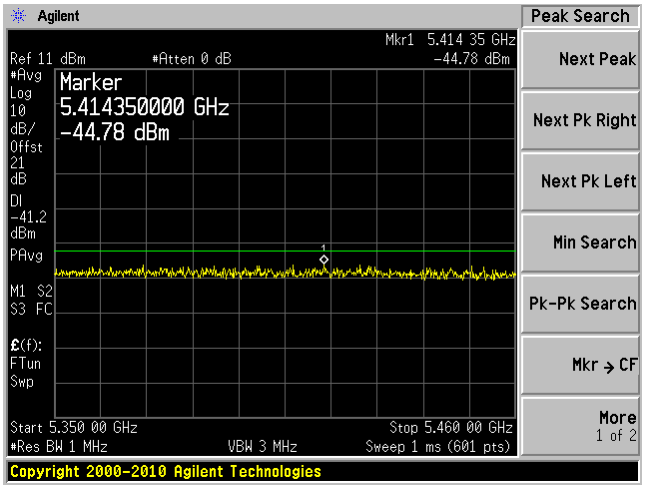
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



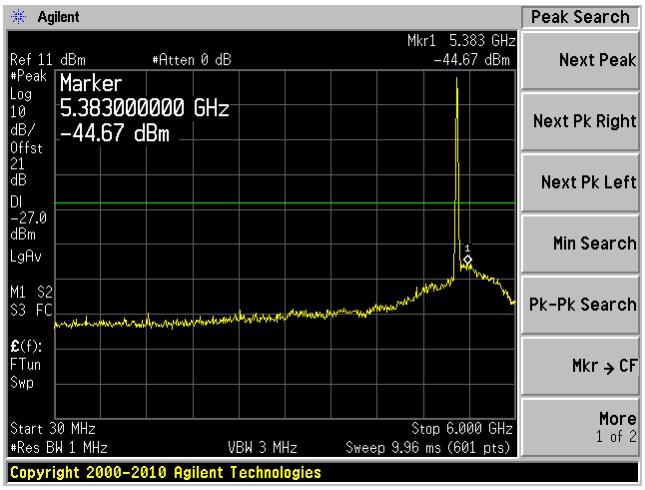
Chain J0, Plot: 5350MHz – 5460 MHz Peak



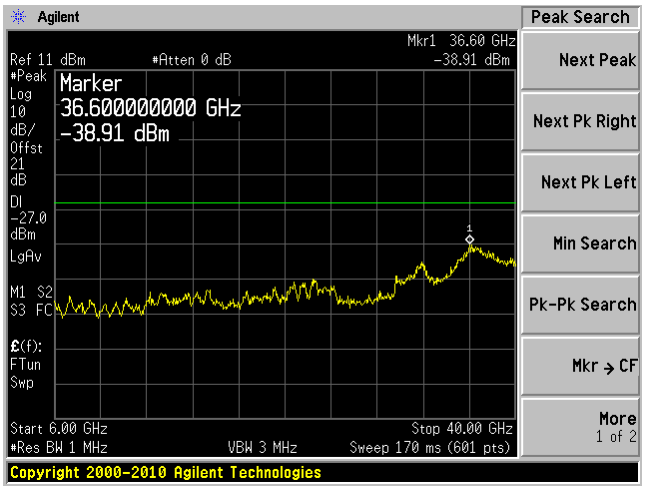
Chain J0, Plot: 5350MHz – 5460 MHz Ave



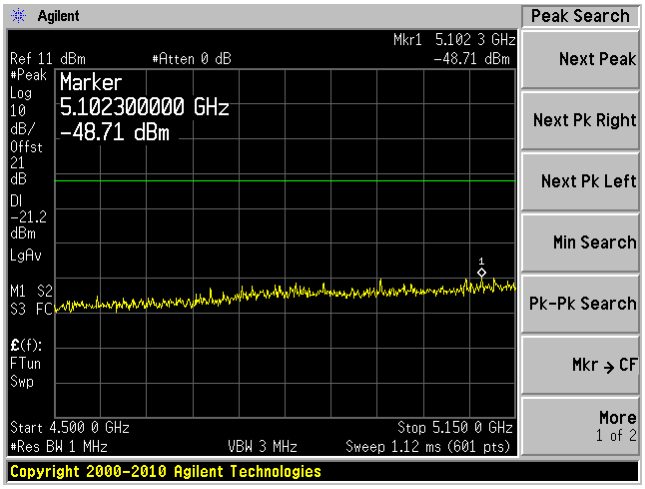
Chain J1, Plot: 30 MHz – 6 GHz



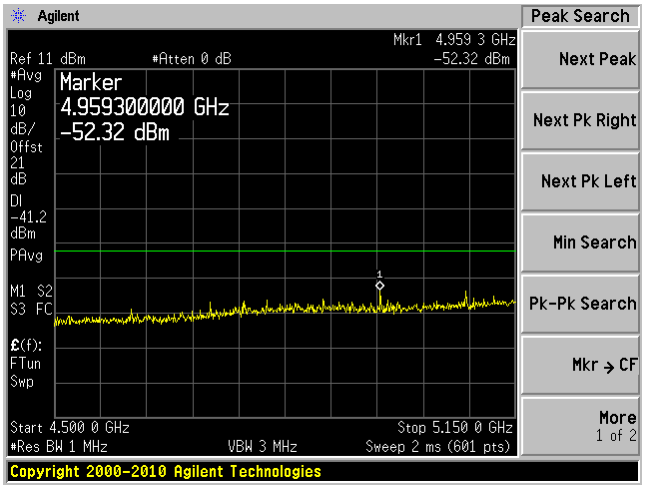
Chain J1, Plot: 6 GHz – 40 GHz



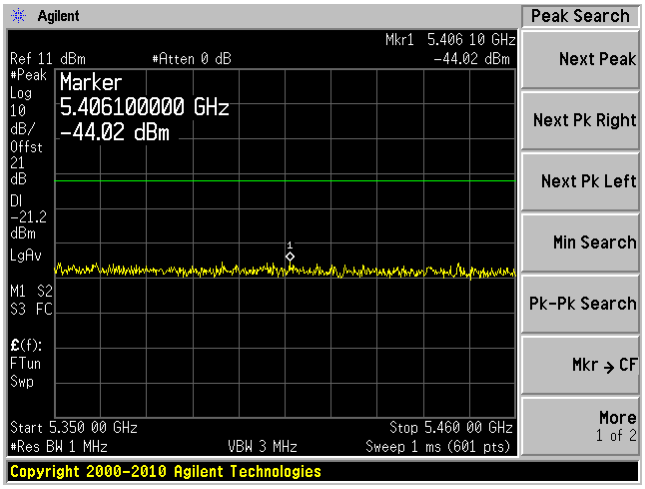
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



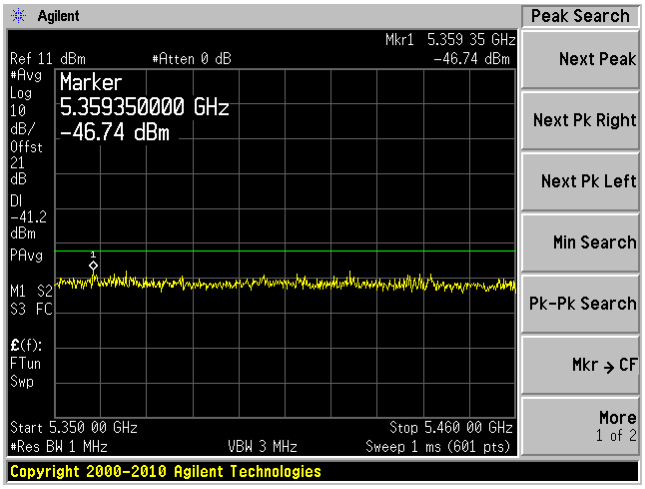
Chain J1, Plot: 4500 MHz – 5150 MHz Ave



Chain J1, Plot: 5350MHz – 5460 MHz Peak

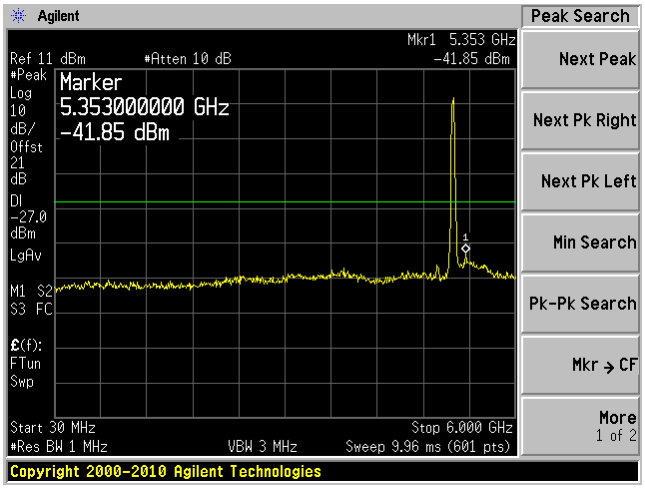


Chain J1, Plot: 5350MHz – 5460 MHz Ave

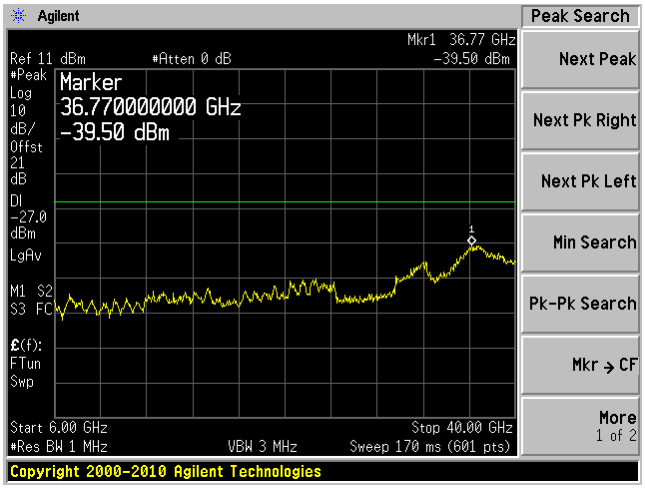


802.11n-HT40, Low Channel 5190 MHz

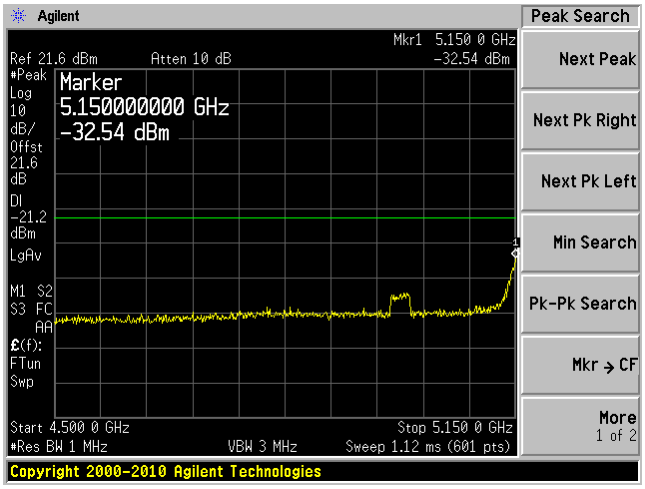
Chain J0, Plot: 30 MHz – 6 GHz



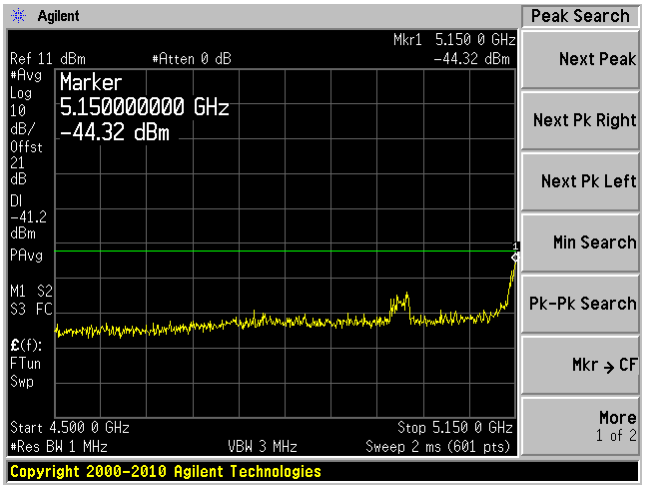
Chain J0, Plot: 6 GHz – 40 GHz



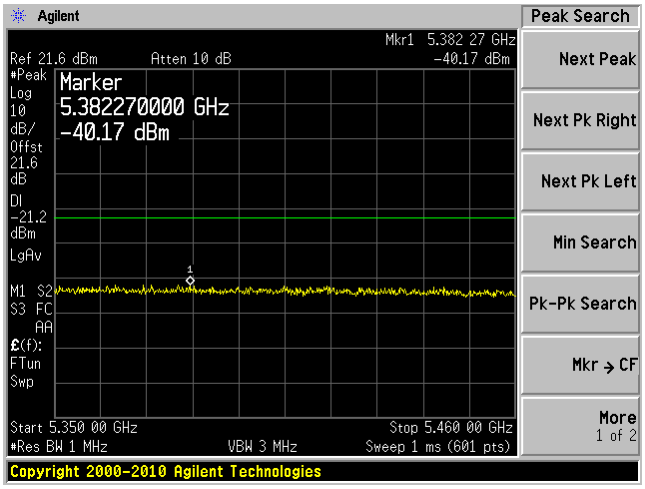
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



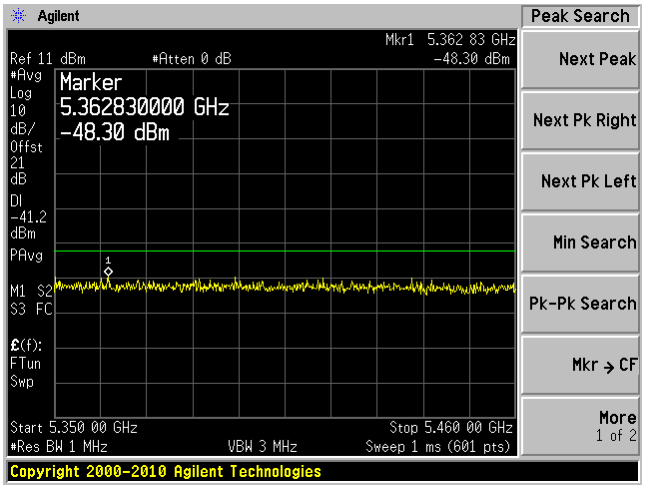
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



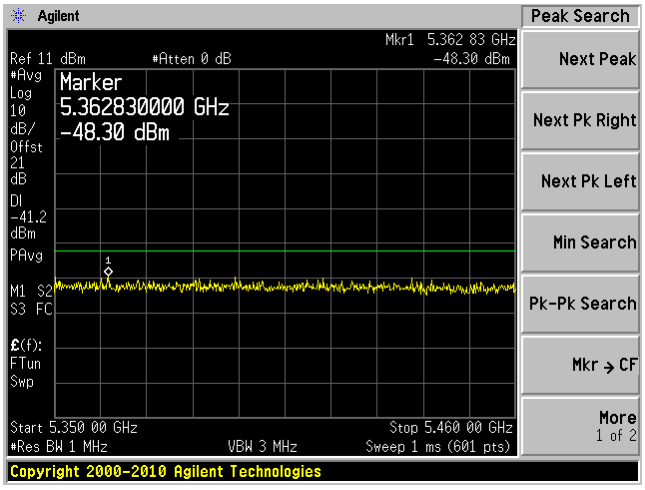
Chain J0, Plot: 5350MHz – 5460 MHz Peak



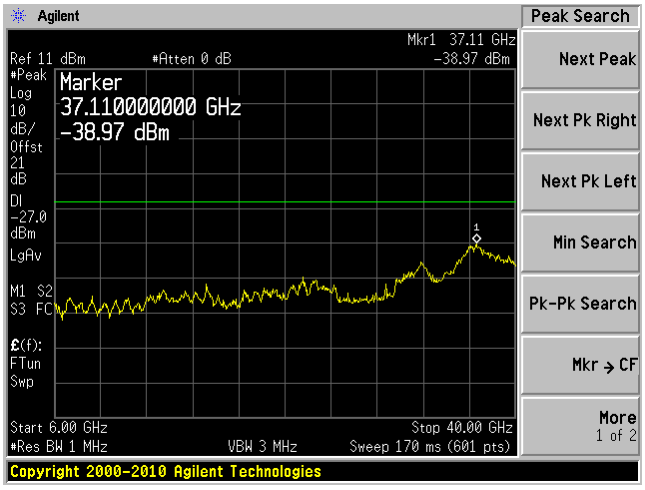
Chain J0, Plot: 5350MHz – 5460 MHz Ave



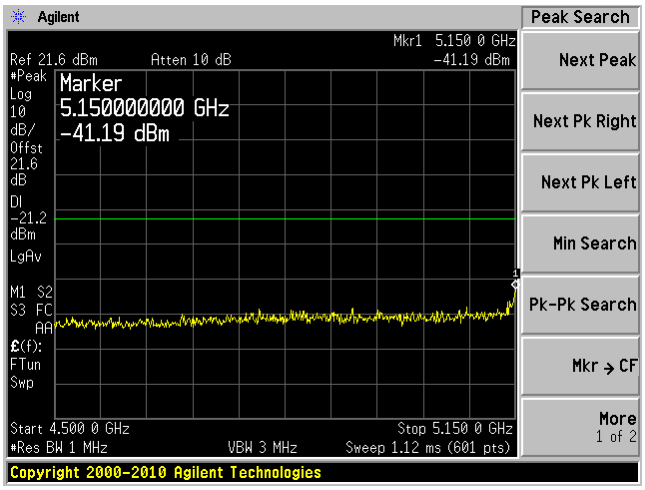
Chain J1, Plot: 30 MHz – 6 GHz



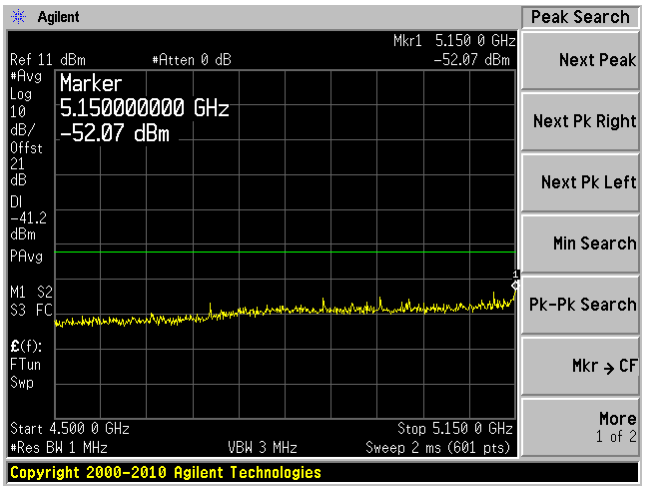
Chain J1, Plot: 6 GHz – 40 GHz



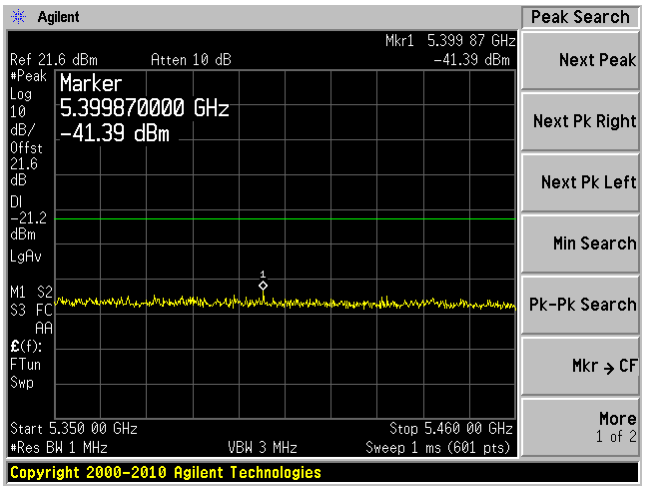
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



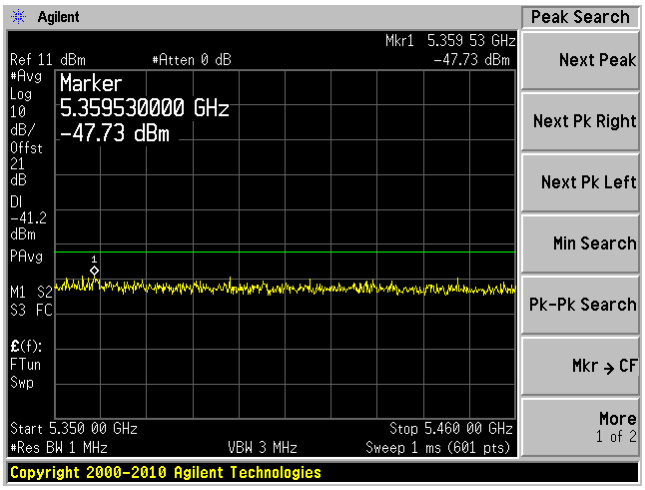
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



Chain J1, Plot: 5350MHz – 5460 MHz Peak

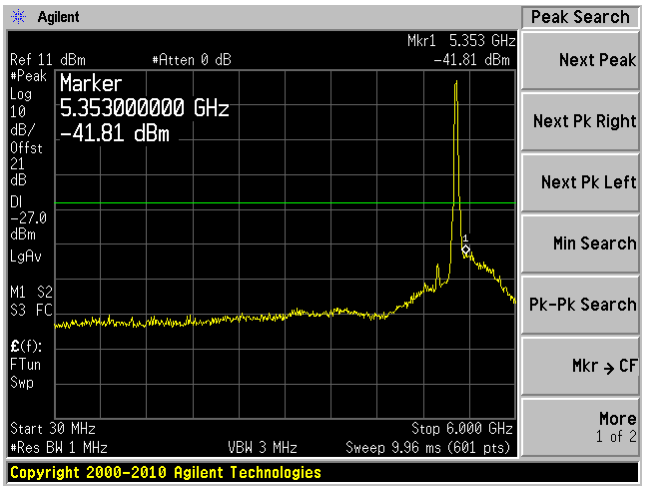


Chain J1, Plot: 5350MHz – 5460 MHz Ave

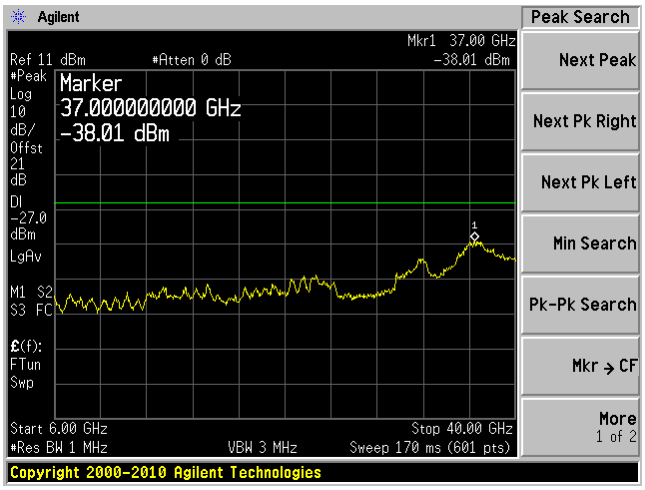


802.11n-HT40, High Channel 5230 MHz

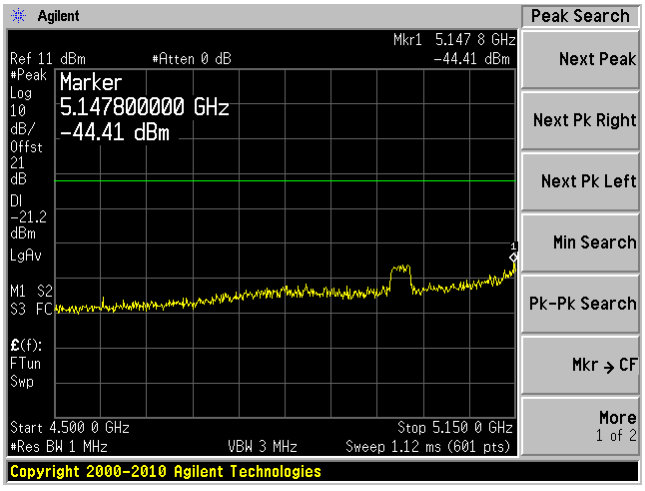
Chain J0, Plot: 30 MHz – 6 GHz



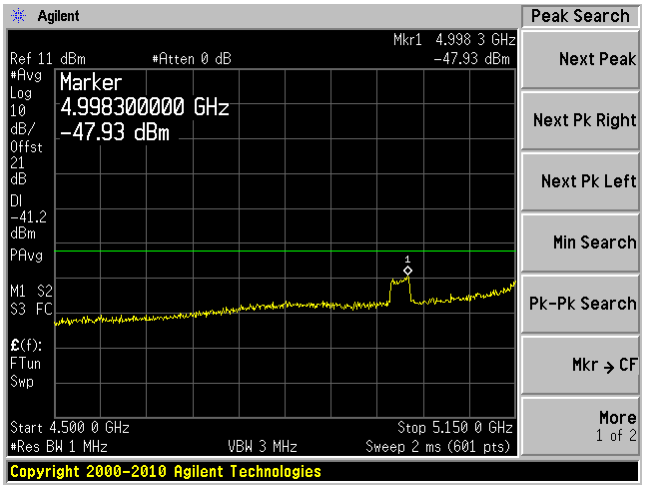
Chain J0, Plot: 6 GHz – 40 GHz



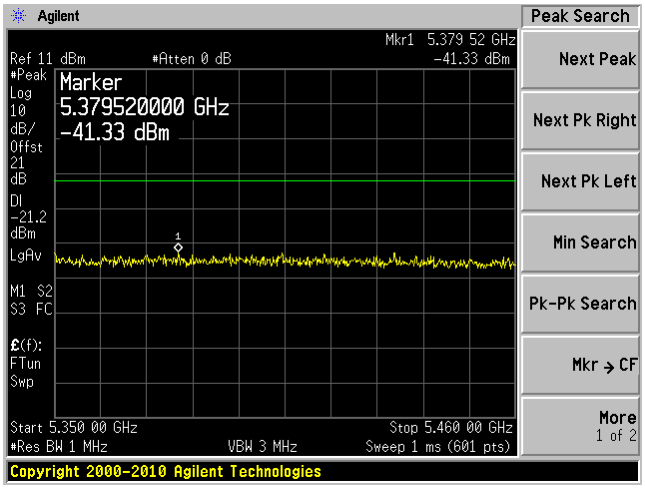
Chain J0, Plot: 4500 MHz – 5150 MHz Peak



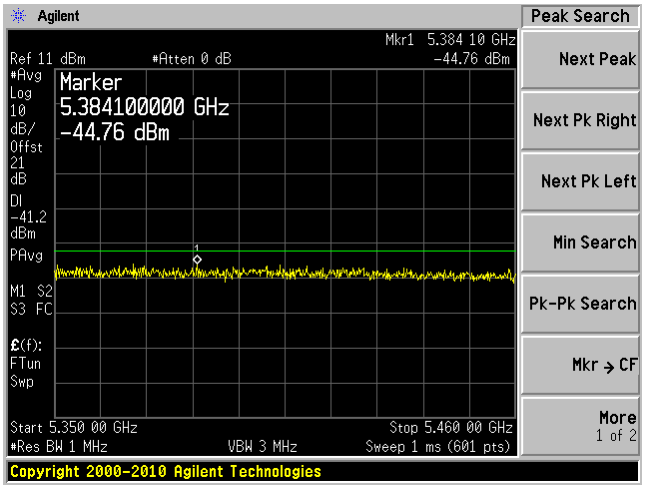
Chain J0, Plot: 4500 MHz – 5150 MHz Ave



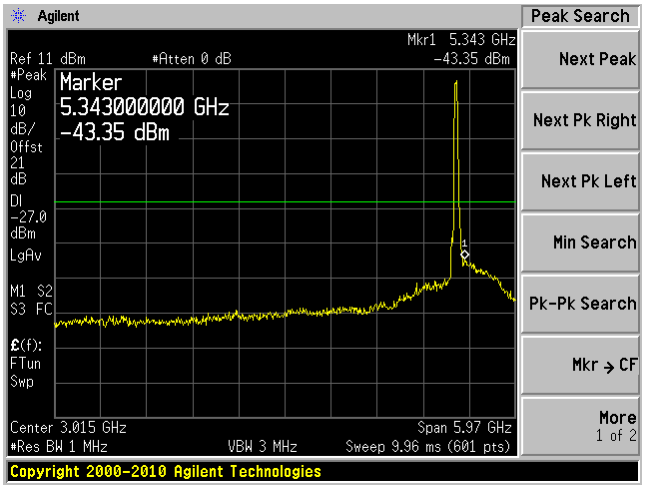
Chain J0, Plot: 5350MHz – 5460 MHz Peak



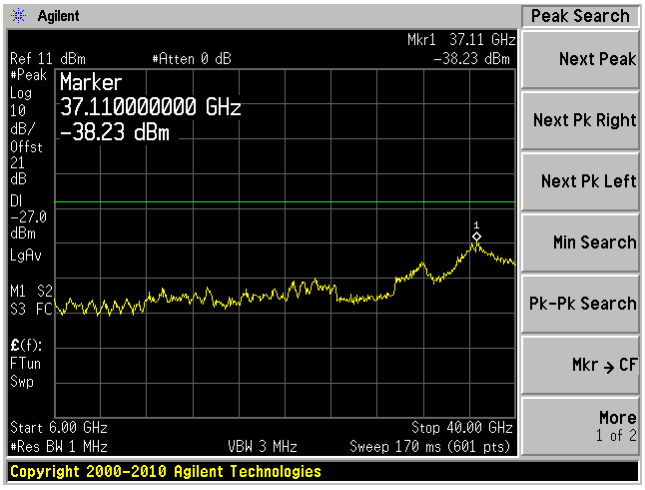
Chain J0, Plot: 5350MHz – 5460 MHz Ave



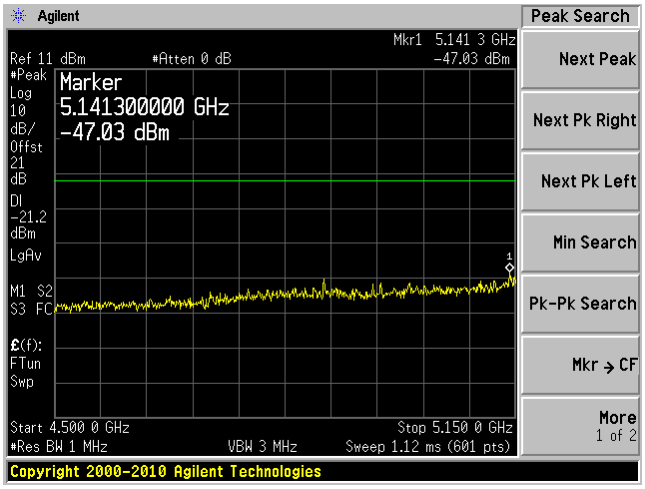
Chain J1, Plot: 30 MHz – 6 GHz



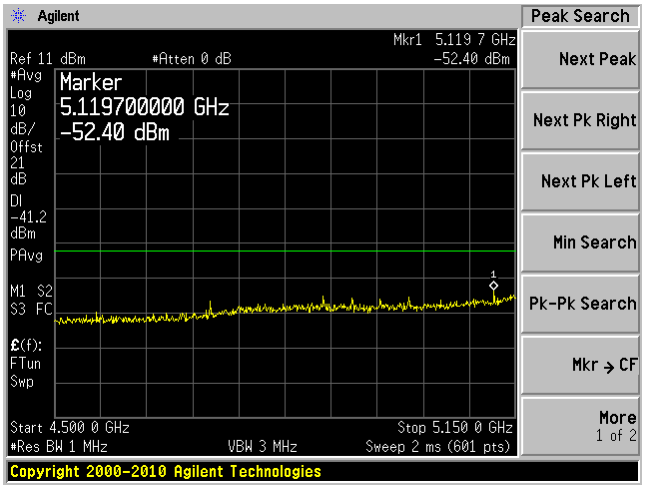
Chain J1, Plot: 6 GHz – 40 GHz



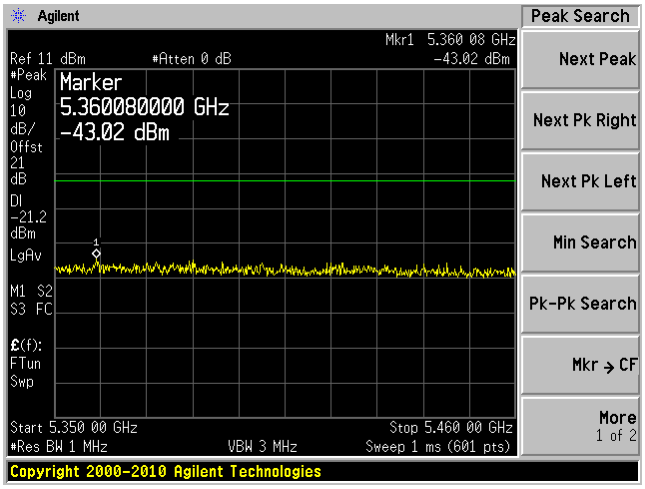
Chain J1, Plot: 4500 MHz – 5150 MHz Peak



Chain J1, Plot: 4500 MHz – 5150 MHz Ave



Chain J1, Plot: 5350MHz – 5460 MHz Peak



Chain J1, Plot: 5350MHz – 5460 MHz Ave