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

For

Ruckus Wireless, Inc.

880 West Maude Avenue, Suite 101,
Sunnyvale, CA 94085, USA

FCC ID: S9G-MPE5N33A
IC: 5912A-MPE5N33A

Report Type:	**Product Type:**
Original	802.11 a/n Wireless Module

Test Engineers:	Quinn Jiang Jeffery Wu
Report Number:	R1110211-W5356
Report Date:	2012-05-21
Reviewed By:	Victor Zhang EMC/RF Lead

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

TABLE OF CONTENTS

1 GENERAL DESCRIPTION 6

1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 6
1.2 MECHANICAL DESCRIPTION OF EUT 6
1.3 OBJECTIVE 6
1.4 RELATED SUBMITTAL(S)/GRANT(S) 6
1.5 TEST METHODOLOGY 6
1.6 MEASUREMENT UNCERTAINTY 6
1.7 TEST FACILITY 7

2 EUT TEST CONFIGURATION 8

2.1 JUSTIFICATION 8
2.2 EUT EXERCISE SOFTWARE 8
2.3 EQUIPMENT MODIFICATIONS 8
2.4 SPECIAL ACCESSORIES 8
2.5 LOCAL SUPPORT EQUIPMENT 8
2.6 EUT INTERNAL CONFIGURATION 8

3 SUMMARY OF TEST RESULTS 9

4 FCC §15.407(F), §2.1091 & IC RSS-102 - RF EXPOSURE 10

4.1 APPLICABLE STANDARD 10
4.2 MPE PREDICTION 11
4.3 MPE RESULTS 11

5 FCC §15.203 & IC RSS-GEN §7.1.2 – ANTENNA REQUIREMENTS 12

5.1 APPLICABLE STANDARD 12
5.2 ANTENNA LIST 12

6 FCC §15.207 & IC RSS-GEN §7.2.4 - AC POWER LINE CONDUCTED EMISSIONS 13

6.1 APPLICABLE STANDARDS 13
6.2 TEST SETUP 13
6.3 TEST PROCEDURE 13
6.4 TEST SETUP BLOCK DIAGRAM 14
6.5 CORRECTED AMPLITUDE & MARGIN CALCULATION 14
6.6 TEST EQUIPMENT LIST AND DETAILS 15
6.7 TEST ENVIRONMENTAL CONDITIONS 15
6.8 SUMMARY OF TEST RESULTS 15
6.9 CONDUCTED EMISSIONS TEST PLOTS AND DATA 16

7 FCC §15.209, §15.407(B) & IC RSS-210 §A9.2 - SPURIOUS RADIATED EMISSIONS 20

7.1 APPLICABLE STANDARD 20
7.2 TEST SETUP 21
7.3 TEST PROCEDURE 21
7.4 CORRECTED AMPLITUDE & MARGIN CALCULATION 21
7.5 TEST EQUIPMENT LIST AND DETAILS 22
7.6 TEST ENVIRONMENTAL CONDITIONS 22
7.7 SUMMARY OF TEST RESULTS 23
7.8 RADIATED EMISSIONS TEST RESULT DATA 24

8 FCC §15.407(A) & IC RSS-210 §A9.2 – 26 DB & 99% EMISSION BANDWIDTH 38

8.1 APPLICABLE STANDARD 38

8.2 MEASUREMENT PROCEDURE 38
8.3 TEST EQUIPMENT LIST AND DETAILS 38
8.4 TEST ENVIRONMENTAL CONDITIONS 38
8.5 TEST RESULTS 39

9 FCC §407(A)(1) & IC RSS-210 §A9.2 - PEAK OUTPUT POWER MEASUREMENT 59

9.1 APPLICABLE STANDARD 59
9.2 MEASUREMENT PROCEDURE 59
9.3 TEST EQUIPMENT LIST AND DETAILS 60
9.4 TEST ENVIRONMENTAL CONDITIONS 60
9.5 TEST RESULTS 60

10 FCC §15.407(B) & IC RSS-210 §A9.2 - OUT OF BAND EMISSIONS 62

10.1 APPLICABLE STANDARD 62
10.2 MEASUREMENT PROCEDURE 62
10.3 TEST EQUIPMENT LIST AND DETAILS 62
10.4 TEST ENVIRONMENTAL CONDITIONS 63
10.5 TEST RESULTS 63

11 FCC §15.407(A)(1) & IC RSS-210 §A9.2 - POWER SPECTRAL DENSITY 81

11.1 APPLICABLE STANDARD 81
11.2 MEASUREMENT PROCEDURE 81
11.3 TEST EQUIPMENT LIST AND DETAILS 81
11.4 TEST ENVIRONMENTAL CONDITIONS 81
11.5 TEST RESULTS 82

12 FCC §15.407(A)(6) – PEAK EXCURSION RATIO 100

12.1 APPLICABLE STANDARD 100
12.2 TEST PROCEDURE 100
12.3 TEST EQUIPMENT LIST AND DETAILS 100
12.4 TEST ENVIRONMENTAL CONDITIONS 100
12.5 TEST RESULTS 101

13 IC RSS-210 §2.3 & RSS-GEN §6 - RECEIVER SPURIOUS RADIATED EMISSIONS 102

13.1 APPLICABLE STANDARD 102
13.2 EUT SETUP 102
13.3 TEST PROCEDURE 102
13.4 CORRECTED AMPLITUDE & MARGIN CALCULATION 103
13.5 TEST EQUIPMENT LISTS AND DETAILS 103
13.6 TEST ENVIRONMENTAL CONDITIONS 103
13.7 SUMMARY OF TEST RESULTS 104
13.8 RADIATED EMISSIONS TEST RESULT DATA 105

14 FCC §15.407(B) & IC RSS-210 §A9.2 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 108

14.1 APPLICABLE STANDARD 108
14.2 MEASUREMENT PROCEDURE 108
14.3 TEST EQUIPMENT LIST AND DETAILS 108
14.4 TEST ENVIRONMENTAL CONDITIONS 108
14.5 TEST RESULTS 109

15 EXHIBIT A – FCC & IC EQUIPMENT LABELLING REQUIREMENTS 154

15.1 FCC ID LABEL REQUIREMENTS 154
15.2 IC LABEL REQUIREMENTS 154
15.3 FCC ID & IC LABEL CONTENTS AND LOCATION 155
15.4 FCC ID & IC LABEL CONTENTS AND LOCATION 155

16 EXHIBIT B – TEST SETUP PHOTOGRAPHS 156

16.1 AC LINE CONDUCTED EMISSION FRONT VIEW 156

16.2 AC LINE CONDUCTED EMISSION SIDE VIEW 156
16.3 RADIATED EMISSION FRONT VIEW 157
16.4 RADIATED EMISSION BELOW 1 GHZ REAR VIEW 157
16.5 RADIATED EMISSION ABOVE 1 GHZ REAR VIEW 158
16.6 RADIATED EMISSION FRONT VIEW (CO-LOCATION) 158
16.7 RADIATED EMISSION BELOW 1 GHZ REAR VIEW (CO-LOCATION) 159
16.8 RADIATED EMISSION ABOVE 1 GHZ REAR VIEW (CO-LOCATION) 159
16.9 BENCH MEASUREMENT VIEW 160

17 EXHIBIT C – EUT PHOTOGRAPHS 161

17.1 EUT – TOP VIEW WITH SHIELDING 161
17.2 EUT - BOTTOM VIEW 161
17.3 ANTENNA TOP VIEW 162
17.4 ANTENNA BOTTOM VIEW 162
17.5 SUPPORTING BOARD WITH SHIELD TOP VIEW 163
17.6 SUPPORTING BOARD WITHOUT SHIELD TOP VIEW 163
17.7 SUPPORTING BOARD WITH SHIELD BOTTOM VIEW 164
17.8 SUPPORTING BOARD WITHOUT SHIELD BOTTOM VIEW 164
17.9 EUT – TOP VIEW WITHOUT SHIELDING 165
17.10 AC/DC POWER SUPPLY VIEW 165

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1110211-W5356	Original Report	2012-05-21

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: *MPE5N33A, FCC ID: S9G-MPE5N33A; IC: 5912A-MPE5N33A* or the "EUT" as referred to in this report. The EUT is a 5 GHz 802.11a/n wireless module.

1.2 Mechanical Description of EUT

The "EUT" measures approximately 6.*9cm (L) x 3.9cm (W) x 1.0cm (H)*, and weighs approximately 16.*0*g.

The test data gathered are from typical production sample, serial number: 114321113005 and 115121086007 were provided by the manufacturer.

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/IC rules for Conducted Emissions, Occupied Bandwidth, Maximum Peak Output Power, Power Spectral Density, Radiated and Conducted Spurious Emissions, and Band Edge for adding DFS band 5250-5350 MHz and 5470-5725 MHz.

1.4 Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS with FCC ID: S9G-MPE5N33A
IC RSS-210 with IC: 5912A-MPE5N33A

1.5 Test Methodology

FCC CFR 47 Part2, Part15.407 and IC RSS-210 Issue 8, Dec 2010.

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 C63.4-2003.

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

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

2.2 EUT Exercise Software

The software used, Snoop Art version 2.18.2 were provided by client and verified by Quinn Jiang to comply with the standard requirements being tested against.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Special Accessories

Manufacturer	Description	Model No.	Serial No.
Ruckus Wireless	Module Supporting Board	SNOOP DOGG	1201D1000002

2.5 Local Support Equipment

Manufacturer	Description	Model No.	Serial No.
Dell	Laptop	Latitude E5420	CHZMLQ1

2.6 EUT Internal Configuration

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

3 Summary of Test Results

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	Receiver Spurious Radiated Emissions	Compliant
FCC §2.1051, §15.407(b) IC RSS-210 §A9.2	Spurious Emissions at Antenna Terminals	Compliant
FCC §15.407(h) IC RSS-210 §A9.3	DFS	Note: 1

- **Note:** [1] *Please refer to DFS report, Report number:R1110211-DFS.*

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 (minutes)
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

5250-5350 MHz

Maximum peak output power at antenna input terminal (dBm):	23.66
Maximum peak output power at antenna input terminal (mW):	232.27
Prediction distance (cm):	20
Prediction frequency (MHz):	5270
Maximum Antenna Gain, typical (dBi):	3
Maximum Antenna Gain (numeric):	1.995
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.092
Power density of prediction frequency at 20.0 cm (W/m^2):	0.92
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

5470-5725 MHz

Maximum peak output power at antenna input terminal (dBm):	23.69
Maximum peak output power at antenna input terminal (mW):	233.88
Prediction distance (cm):	1.995
Prediction frequency (MHz):	5550
Maximum Antenna Gain, typical (dBi):	3
Maximum Antenna Gain (numeric):	1.995
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.093
Power density of prediction frequency at 20.0 cm (W/m^2):	0.93
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 meets FCC/IC MPE requirement for uncontrolled exposure environment at 20 cm distance.

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.

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

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

Antenna model	5 GHz Antenna Gain (dBi)
FAB 100-11204-001 REV 4	3.0

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 Note 1	56 to 46 Note 1
0.5-5	56	46
5-30	60	50

Note 1 Decreases with the logarithm of the frequency.

6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.4-2003 measurement procedure. The specification used was FCC §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 test support board was connected with LISN-1 which provided 120 V / 60 Hz AC power.

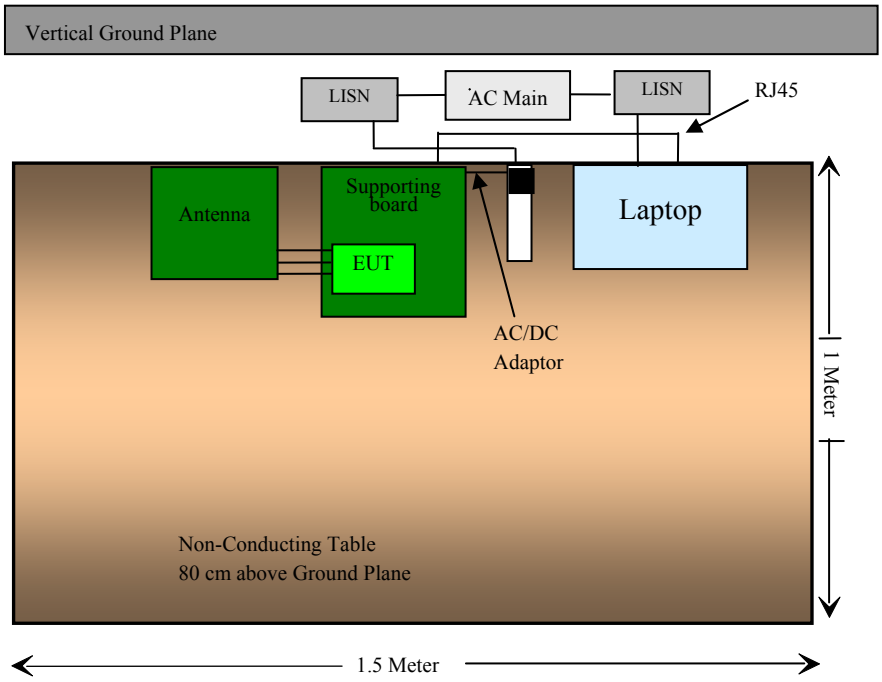
6.3 Test Procedure

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

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

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

6.4 Test Setup Block Diagram



6.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the 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

6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100338	2011-09-14
Solar Electronics	LISN	9252-R-24-BNC	511205	2011-06-25
TTE	Filter, High Pass	H9962-150K-50-21378	K7133	2011-06-10

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

6.7 Test Environmental Conditions

Temperature:	22 °C
Relative Humidity:	43 %
ATM Pressure:	101.3 kPa

The testing was performed by Quinn Jiang on 2012-05-10 in 5 meter chamber 2.

6.8 Summary of Test Results

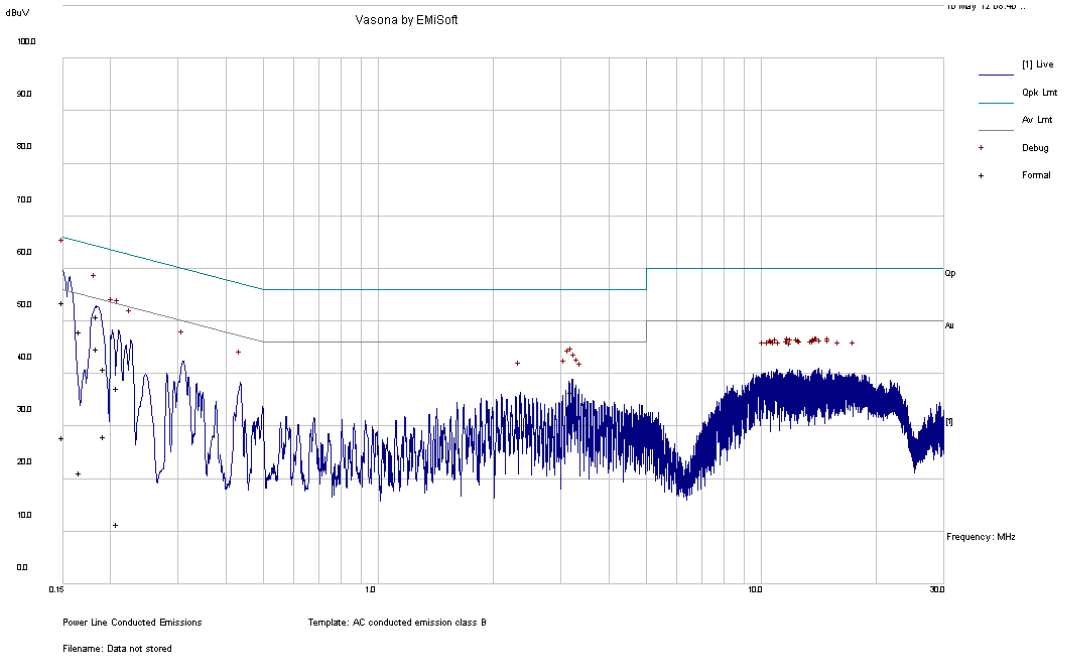
According to the recorded data in following table, the EUT complied with the FCC/IC standard's conducted emissions limits, with the margin reading of:

Connection: 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor (Line/Neutral)**	**Range (MHz)**
-9.47	0.185076	Line	0.15 to 30

6.9 Conducted Emissions Test Plots and Data

5270 MHz

120 V, 60 Hz – Line



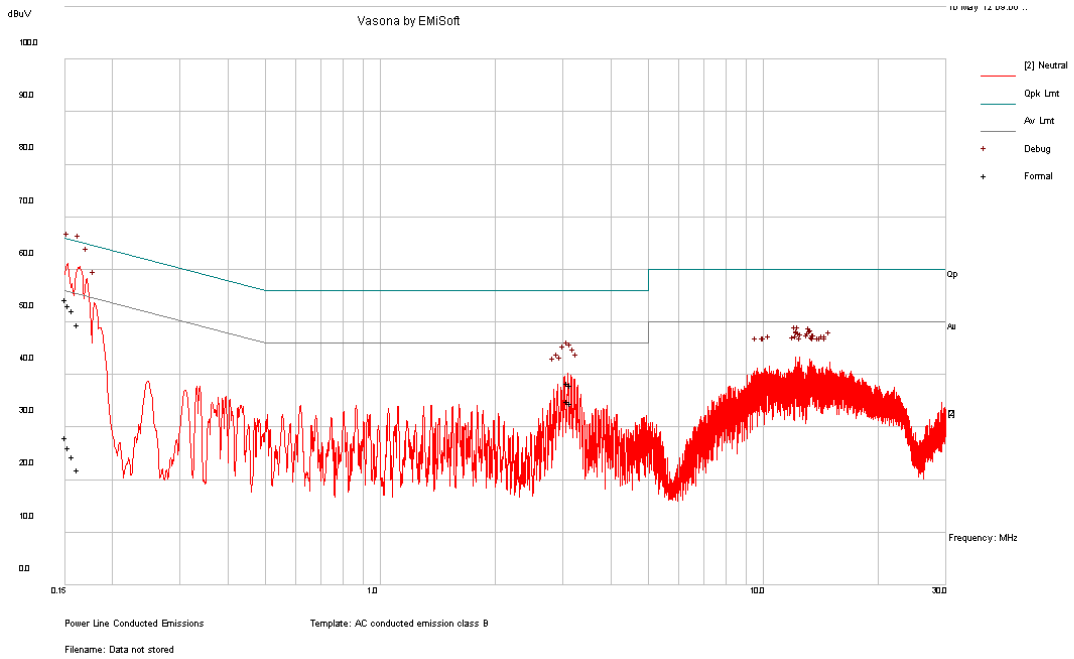
Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150251	53.63	Line	65.99	-12.36
0.166869	48.02	Line	65.11	-17.09
0.192774	40.93	Line	63.92	-22.99
0.185076	50.84	Line	64.25	-13.41
0.208779	37.23	Line	63.25	-26.03
3.207717	36.55	Line	56	-19.45

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150251	27.95	Line	55.99	-28.04
0.166869	21.13	Line	55.11	-33.99
0.192774	28.11	Line	53.92	-25.81
0.185076	44.79	Line	54.25	-9.47
0.208779	11.34	Line	53.25	-41.92
3.207717	30.37	Line	46	-15.63

120 V, 60 Hz – Neutral



Quasi-Peak Measurements

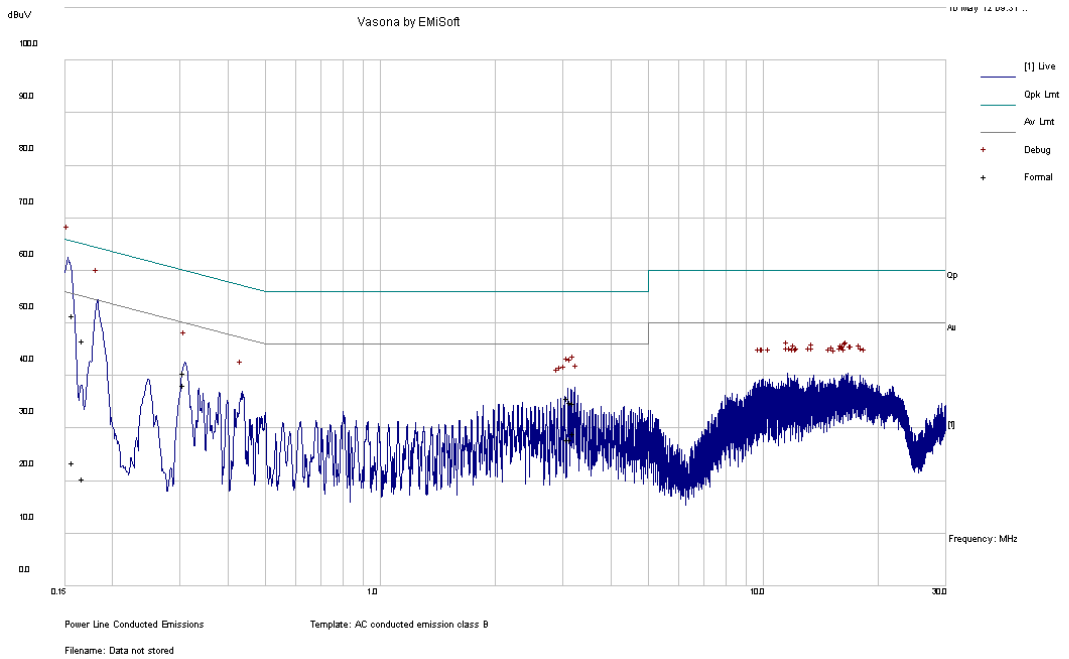
Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150999	54.38	Neutral	65.94	-11.56
0.157425	52.24	Neutral	65.6	-13.35
0.153693	53.12	Neutral	65.8	-12.68
0.162579	49.55	Neutral	65.33	-15.78
3.085981	38.4	Neutral	56	-17.6
3.148149	38.1	Neutral	56	-17.9

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150999	28	Neutral	55.94	-27.94
0.157425	24.5	Neutral	55.6	-31.1
0.153693	26.24	Neutral	55.8	-29.56
0.162579	21.98	Neutral	55.33	-33.35
3.085981	34.95	Neutral	46	-11.05
3.148149	34.63	Neutral	46	-11.37

5550 MHz

120 V, 60 Hz – Line



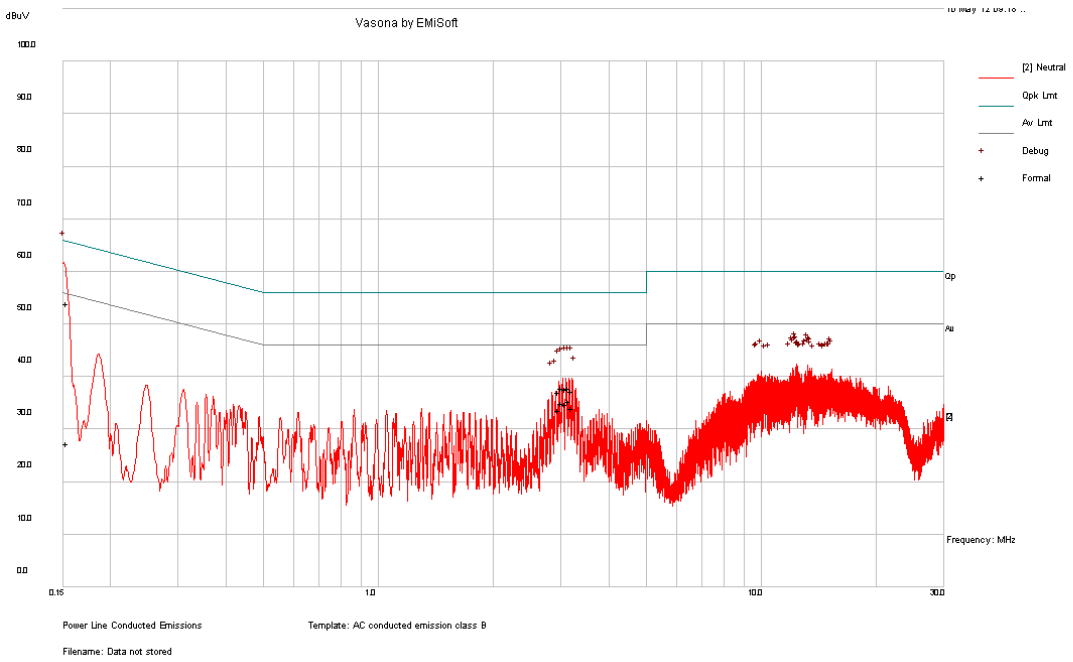
Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.158073	51.4	Line	65.56	-14.17
0.167409	46.57	Line	65.09	-18.51
0.307854	40.62	Line	60.03	-19.41
3.208495	34.81	Line	56	-21.19
3.088177	35.72	Line	56	-20.28
3.15167	34.88	Line	56	-21.12

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.158073	23.44	Line	55.56	-32.13
0.167409	20.4	Line	55.09	-34.69
0.307854	38.24	Line	50.03	-11.79
3.208495	28.95	Line	46	-17.05
3.088177	27.89	Line	46	-18.11
3.15167	27.96	Line	46	-18.04

120 V, 60 Hz – Neutral



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.153561	54.03	Neutral	65.81	-11.77
3.089599	37.66	Neutral	56	-18.34
3.212293	37.17	Neutral	56	-18.83
3.150557	37.92	Neutral	56	-18.08
3.024015	37.79	Neutral	56	-18.21
2.96279	36.99	Neutral	56	-19.01

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.153561	27.25	Neutral	55.81	-28.56
3.089599	34.81	Neutral	46	-11.19
3.212293	33.95	Neutral	46	-12.05
3.150557	35.31	Neutral	46	-10.69
3.024015	34.99	Neutral	46	-11.01
2.96279	33.62	Neutral	46	-12.38

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		

7.2 Test Setup

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

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
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100338	2011-09-14
Agilent	Spectrum Analyzer	E4446A	US44300386	2011-08-11
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB3	A0020106-3	2011-06-29
EMCO	Horn antenna	3115	9511-4627	2011-10-03
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2011-06-09
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2012-05-09

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

7.6 Test Environmental Conditions

Temperature:	20~24 °C
Relative Humidity:	37~45 %
ATM Pressure:	101-102 kPa

The testing was performed by Quinn Jiang on 2012-05-01 and 2012-05-08 in 5 meter chamber 3.

7.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15, Subpart C, section 15.205, 15.209 and 15.407 & IC RSS-210, RSS-Gen standard's radiated emissions limits, and had the worst margin of:

30-1000 MHz:

5250-5350 MHz

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Channel, Range**
-13.41	257.702	Horizontal	30 MHz-1 GHz

5470-5725 MHz

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Channel, Range**
-12.91	257.7043	Horizontal	30 MHz-1 GHz

Above 1 GHz:

5250-5350 MHz

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Channel, Range**
-4.634	5000	Vertical	Above 1 GHz

5470-5725 MHz

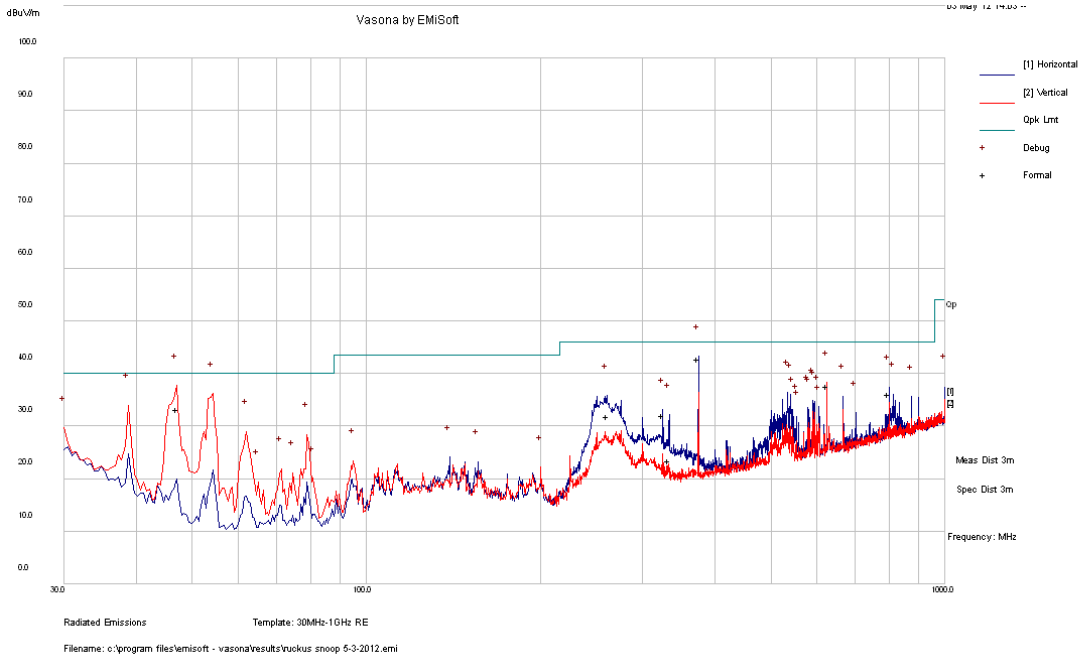
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Channel, Range**
-0.430	5000	Vertical	Above 1 GHz

7.8 Radiated Emissions Test Result Data

(1) Radiated Emission at 3 meters, 30 MHz – 1 GHz

5250-5350 MHz Band

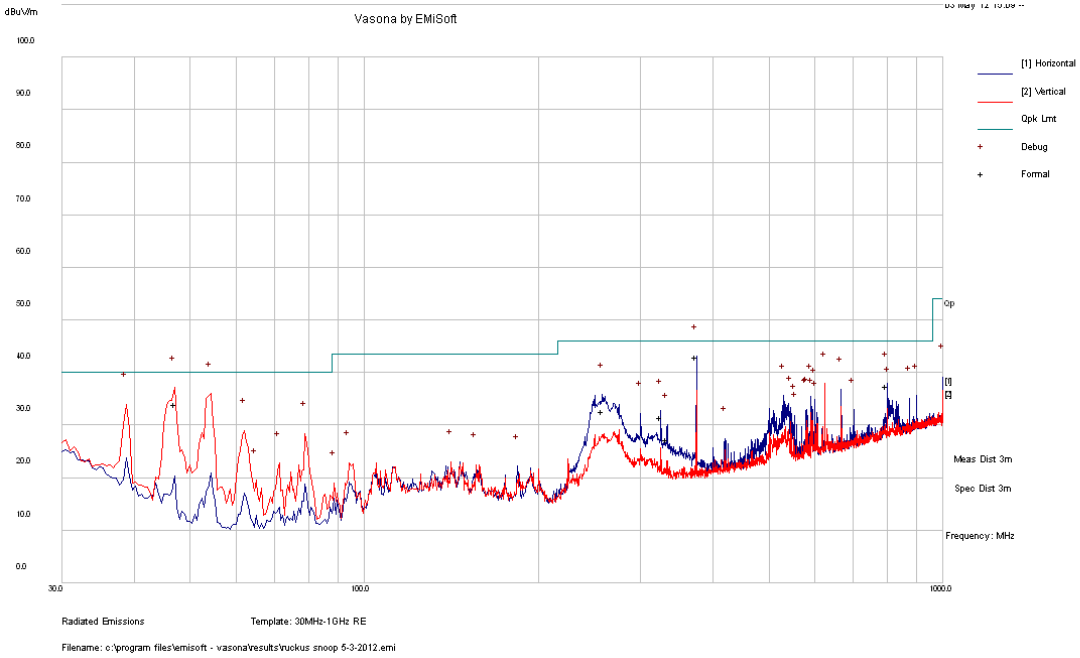
802.11n HT20 mode, 5260 MHz



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dB)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
260.4478	31.86	109	H	30	46	-14.14
325.2815	32.11	99	H	125	46	-13.89
333.3783	23.4	110	H	72	46	-22.6

802.11n HT40 mode, 5270 MHz

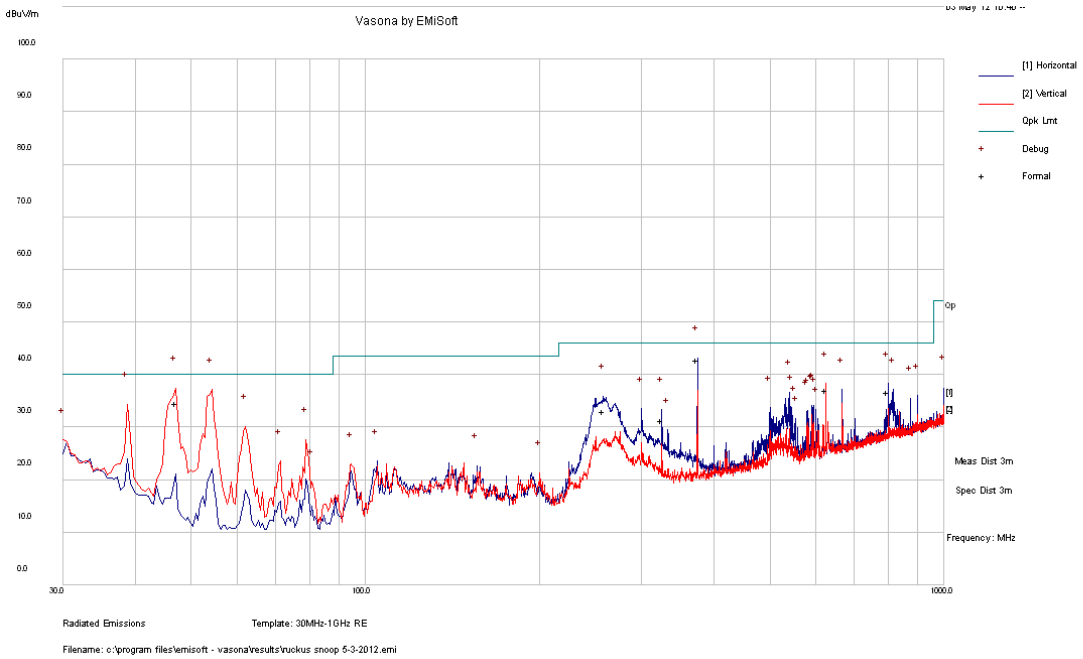


Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dB)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
257.702	32.59	101	H	20	46	-13.41
325.2663	31.51	105	H	121	46	-14.49
333.3695	27.21	119	H	112	46	-18.79

5470-5725 MHz Band

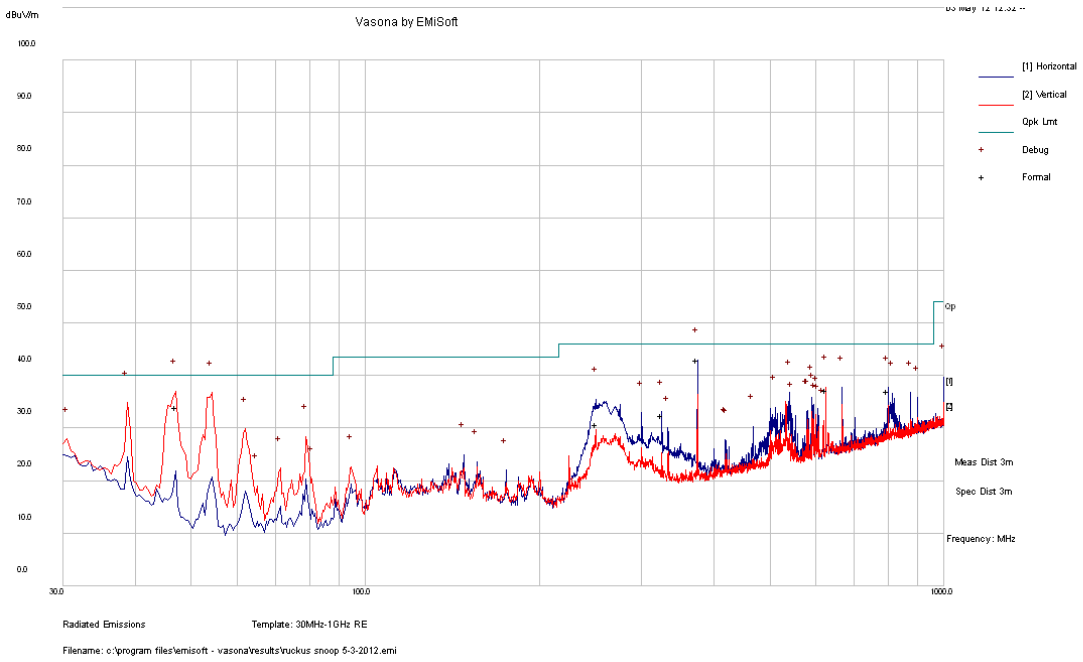
802.11n HT20 mode, 5500 MHz



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dB)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
257.7043	33.09	122	H	13	46	-12.91
325.2588	31.32	99	H	124	46	-14.68

802.11n HT40 mode, 5550 MHz



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dB)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
250.2045	30.72	186	H	34	46	-15.28
325.2923	32.54	99	H	118	46	-13.46

(2) Radiated Emission at 3 meters, above 1 GHz

5250-5350 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 5260 MHz, measured at 3 meters											
5000	40.850	338	164	V	33.9	4.76	27.43	52.096	74	-21.904	Peak
5000	36.67	172	193	H	33.9	4.76	27.43	47.916	74	-26.084	Peak
5000	35.520	338	164	V	33.9	4.76	27.43	46.766	54	-7.234	Ave
5000	29.260	172	193	H	33.9	4.76	27.43	40.506	54	-13.494	Ave
15790	41.710	8	112	V	37.7	8.44	25.51	62.337	74	-11.663	Peak
15790	37.98	358	108	H	37.7	8.44	25.51	58.607	74	-15.393	Peak
15790	22.330	8	112	V	37.7	8.44	25.51	42.957	54	-11.043	Ave
15790	19.710	358	108	H	37.7	8.44	25.51	40.337	54	-13.663	Ave
Middle Channel 5280 MHz measured at 3 meters											
5000	42.670	225	167	V	33.9	4.76	27.43	53.916	74	-20.084	Peak
5000	35.18	173	192	H	33.9	4.76	27.43	46.426	74	-27.574	Peak
5000	36.860	225	167	V	33.9	4.76	27.43	48.106	54	-5.894	Ave
5000	27.160	173	192	H	33.9	4.76	27.43	38.406	54	-15.594	Ave
15840	43.350	360	107	V	37.7	8.44	25.51	63.977	74	-10.023	Peak
15840	39.57	358	108	H	37.7	8.44	25.51	60.197	74	-13.803	Peak
15840	23.970	360	107	V	37.7	8.44	25.51	44.597	54	-9.403	Ave
15840	21.000	358	108	H	37.7	8.44	25.51	41.627	54	-12.373	Ave
High Channel 5320 MHz measured at 3 meters											
5000	42.130	230	154	V	33.9	4.76	27.43	53.376	74	-20.624	Peak
5000	34.57	216	153	H	33.9	4.76	27.43	45.816	74	-28.184	Peak
5000	36.740	230	154	V	33.9	4.76	27.43	47.986	54	-6.014	Ave
5000	25.890	216	153	H	33.9	4.76	27.43	37.136	54	-16.864	Ave
10637	47.560	339	130	V	38.1	7.10	27.74	65.060	74	-8.940	Peak
10637	42.470	223	157	H	38.1	7.10	27.74	59.970	74	-14.030	Peak
10637	26.110	339	130	V	38.1	7.10	27.74	43.610	54	-10.390	Ave
10637	25.060	223	157	H	38.1	7.10	27.74	42.560	54	-11.440	Ave
15960	35.830	360	100	V	37.7	8.40	25.40	56.480	74	-17.520	Peak
15960	32.41	21	100	H	37.7	8.40	25.40	53.060	74	-20.940	Peak
15960	20.180	360	100	V	37.7	8.40	25.40	40.830	54	-13.170	Ave
15960	18.210	21	100	H	37.7	8.40	25.40	38.860	54	-15.140	Ave

Note: Emissions of 5000 MHz are digital emissions

5250-5350 MHz Band

802.11n HT20 Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5260 MHz, measured at 3 meters											
5000	40.940	327	160	V	33.9	4.76	27.43	52.186	74	-21.814	Peak
5000	36.48	197	173	H	33.9	4.76	27.43	47.726	74	-26.274	Peak
5000	35.530	327	160	V	33.9	4.76	27.43	46.776	54	-7.224	Ave
5000	29.270	197	173	H	33.9	4.76	27.43	40.516	54	-13.484	Ave
15790	39.130	339	102	V	37.7	8.44	25.51	59.757	74	-14.243	Peak
15790	35.17	19	105	H	37.7	8.44	25.51	55.797	74	-18.203	Peak
15790	22.290	339	102	V	37.7	8.44	25.51	42.917	54	-11.083	Ave
15790	18.910	19	105	H	37.7	8.44	25.51	39.537	54	-14.463	Ave
Middle Channel 5280 MHz measured at 3 meters											
5000	42.270	228	164	V	33.9	4.76	27.43	53.516	74	-20.484	Peak
5000	35.27	219	163	H	33.9	4.76	27.43	46.516	74	-27.484	Peak
5000	36.730	228	164	V	33.9	4.76	27.43	47.976	54	-6.024	Ave
5000	26.170	219	163	H	33.9	4.76	27.43	37.416	54	-16.584	Ave
15840	41.570	5	115	V	37.7	8.44	25.51	62.197	74	-11.803	Peak
15840	38.93	317	113	H	37.7	8.44	25.51	59.557	74	-14.443	Peak
15840	22.630	5	115	V	37.7	8.44	25.51	43.257	54	-10.743	Ave
15840	20.270	317	113	H	37.7	8.44	25.51	40.897	54	-13.103	Ave
High Channel 5320 MHz measured at 3 meters											
5000	41.370	227	165	V	33.9	4.76	27.43	52.616	74	-21.384	Peak
5000	34.91	173	165	H	33.9	4.76	27.43	46.156	74	-27.844	Peak
5000	35.280	227	165	V	33.9	4.76	27.43	46.526	54	-7.474	Ave
5000	26.390	173	165	H	33.9	4.76	27.43	37.636	54	-16.364	Ave
10637	44.150	338	124	V	38.1	7.10	27.74	61.650	74	-12.350	Peak
10637	40.200	225	166	H	38.1	7.10	27.74	57.700	74	-16.300	Peak
10637	23.520	338	124	V	38.1	7.10	27.74	41.020	54	-12.980	Ave
10637	23.790	225	166	H	38.1	7.10	27.74	41.290	54	-12.710	Ave

Note: Emissions of 5000 MHz are digital emissions

5250-5350 MHz Band

802.11n HT40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5270 MHz, measured at 3 meters											
5000	43.350	224	163	V	33.9	4.76	27.43	54.596	74	-19.404	Peak
5000	36.07	165	200	H	33.9	4.76	27.43	47.316	74	-26.684	Peak
5000	38.120	224	163	V	33.9	4.76	27.43	49.366	54	-4.634	Ave
5000	28.040	165	200	H	33.9	4.76	27.43	39.286	54	-14.714	Ave
15816	37.130	351	109	V	37.7	8.44	25.51	57.757	74	-16.243	Peak
15816	33.19	20	108	H	37.7	8.44	25.51	53.817	74	-20.183	Peak
15816	21.050	351	109	V	37.7	8.44	25.51	41.677	54	-12.323	Ave
15816	19.180	20	108	H	37.7	8.44	25.51	39.807	54	-14.193	Ave
High Channel 5310 MHz measured at 3 meters											
5000	40.100	220	160	V	33.9	4.76	27.43	51.346	74	-22.654	Peak
5000	34.65	191	180	H	33.9	4.76	27.43	45.896	74	-28.104	Peak
5000	34.510	220	160	V	33.9	4.76	27.43	45.756	54	-8.244	Ave
5000	26.430	191	180	H	33.9	4.76	27.43	37.676	54	-16.324	Ave

Note: Emissions of 5000 MHz are digital emissions

5470-5725 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 5500 MHz, measured at 3 meters											
5000	48.180	63	111	V	33.0	5.44	27.43	59.190	74	-14.810	Peak
5000	41.32	255	101	H	33.0	5.44	27.43	52.330	74	-21.670	Peak
5000	41.670	63	111	V	33.0	5.44	27.43	52.680	54	-1.320	Ave
5000	36.220	255	101	H	33.0	5.44	27.43	47.230	54	-6.770	Ave
11000	44.940	350	161	V	38.1	8.66	26.78	64.920	74	-9.080	Peak
11000	45.9	184	157	H	38.1	8.66	26.78	65.880	74	-8.120	Peak
11000	27.630	350	161	V	38.1	8.66	26.78	47.610	54	-6.390	Ave
11000	28.580	184	157	H	38.1	8.66	26.78	48.560	54	-5.440	Ave
Middle Channel 5580 MHz measured at 3 meters											
5000	48.210	63	113	V	33.0	5.44	27.43	59.220	74	-14.780	Peak
5000	41.32	255	102	H	33.0	5.44	27.43	52.330	74	-21.670	Peak
5000	42.020	63	113	V	33.0	5.44	27.43	53.030	54	-0.970	Ave
5000	36.380	255	102	H	33.0	5.44	27.43	47.390	54	-6.610	Ave
11157	49.180	345	142	V	38.2	8.80	27.14	69.040	74	-4.960	Peak
11157	48.82	183	150	H	38.2	8.80	27.14	68.680	74	-5.320	Peak
11157	30.600	345	142	V	38.2	8.80	27.14	50.460	54	-3.540	Ave
11157	31.090	183	150	H	38.2	8.80	27.14	50.950	54	-3.050	Ave
High Channel 5700 MHz measured at 3 meters											
5000	47.740	63	113	V	33.0	5.44	27.43	58.750	74	-15.250	Peak
5000	43.28	255	101	H	33.0	5.44	27.43	54.290	74	-19.710	Peak
5000	42.310	63	113	V	33.0	5.44	27.43	53.320	54	-0.680	Ave
5000	38.180	255	101	H	33.0	5.44	27.43	49.190	54	-4.810	Ave
11400	49.980	324	144	V	38.5	8.97	27.57	69.910	74	-4.090	Peak
11400	48.120	130	166	H	38.5	8.97	27.57	68.050	74	-5.950	Peak
11400	31.300	324	144	V	38.5	8.97	27.57	51.230	54	-2.770	Ave
11400	31.430	130	166	H	38.5	8.97	27.57	51.360	54	-2.640	Ave

Note: Emissions of 5000 MHz are digital emissions

5470-5725 MHz Band

802.11n HT20 Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5500 MHz, measured at 3 meters											
5000	48.290	63	112	V	33.0	5.44	27.43	59.300	74	-14.700	Peak
5000	40.61	255	100	H	33.0	5.44	27.43	51.620	74	-22.380	Peak
5000	42.560	63	112	V	33.0	5.44	27.43	53.570	54	-0.430	Ave
5000	34.790	255	100	H	33.0	5.44	27.43	45.800	54	-8.200	Ave
11000	46.620	340	159	V	38.1	8.66	26.78	66.600	74	-7.400	Peak
11000	43.83	316	152	H	38.1	8.66	26.78	63.810	74	-10.190	Peak
11000	27.000	340	159	V	38.1	8.66	26.78	46.980	54	-7.020	Ave
11000	27.420	316	152	H	38.1	8.66	26.78	47.400	54	-6.600	Ave
Middle Channel 5580 MHz measured at 3 meters											
5000	46.690	64	100	V	33.0	5.44	27.43	57.700	74	-16.300	Peak
5000	40.39	312	113	H	33.0	5.44	27.43	51.400	74	-22.600	Peak
5000	40.740	64	100	V	33.0	5.44	27.43	51.750	54	-2.250	Ave
5000	31.400	312	113	H	33.0	5.44	27.43	42.410	54	-11.590	Ave
11160	51.120	344	148	V	38.2	8.80	27.14	70.690	74	-3.310	Peak
11160	48.25	184	150	H	38.2	8.80	27.14	67.820	74	-6.180	Peak
11160	29.940	344	148	V	38.2	8.80	27.14	49.510	54	-4.490	Ave
11160	31.040	184	150	H	38.2	8.80	27.14	50.610	54	-3.390	Ave
High Channel 5700 MHz measured at 3 meters											
5000	49.110	63	114	V	33.0	5.44	27.43	60.120	74	-13.880	Peak
5000	43.78	255	101	H	33.0	5.44	27.43	54.790	74	-19.210	Peak
5000	41.880	63	114	V	33.0	5.44	27.43	52.890	54	-1.110	Ave
5000	38.420	255	114	H	33.0	5.44	27.43	49.430	54	-4.570	Ave
11400	50.480	319	145	V	38.5	8.97	27.57	70.550	74	-3.450	Peak
11400	49.1	183	160	H	38.5	8.97	27.57	69.170	74	-4.830	Peak
11400	29.370	319	145	V	38.5	8.97	27.57	49.440	54	-4.560	Ave
11400	29.780	183	160	H	38.5	8.97	27.57	49.850	54	-4.150	Ave

Note: Emissions of 5000 MHz are digital emissions

5470-5725 MHz Band

802.11n HT40 Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5510 MHz, measured at 3 meters											
5000	46.860	65	100	V	33.0	5.44	27.43	57.870	74	-16.130	Peak
5000	40.09	255	100	H	33.0	5.44	27.43	51.100	74	-22.900	Peak
5000	41.260	65	100	V	33.0	5.44	27.43	52.270	54	-1.730	Ave
5000	33.300	255	100	H	33.0	5.44	27.43	44.310	54	-9.690	Ave
11000	38.870	123	150	V	38.1	8.66	26.78	58.850	74	-15.150	Peak
11020	40.74	182	156	H	38.1	8.66	26.78	60.720	74	-13.280	Peak
11020	24.660	123	150	V	38.1	8.66	26.78	44.640	54	-9.360	Ave
11020	25.840	182	156	H	38.1	8.66	26.78	45.820	54	-8.180	Ave
Middle Channel 5550 MHz measured at 3 meters											
5000	46.680	64	100	V	33.0	5.44	27.43	57.690	74	-16.310	Peak
5000	41.78	254	129	H	33.0	5.44	27.43	52.790	74	-21.210	Peak
5000	40.970	64	100	V	33.0	5.44	27.43	51.980	54	-2.020	Ave
5000	35.270	254	129	H	33.0	5.44	27.43	46.280	54	-7.720	Ave
11100	46.420	344	148	V	38.2	8.85	26.96	66.510	74	-7.490	Peak
11100	42.49	182	140	H	38.2	8.85	26.96	62.580	74	-11.420	Peak
11100	27.930	344	148	V	38.2	8.85	26.96	48.020	54	-5.980	Ave
11100	27.790	182	140	H	38.2	8.85	26.96	47.880	54	-6.120	Ave
High Channel 5670 MHz measured at 3 meters											
5000	49.710	65	100	V	33.0	5.44	27.43	60.720	74	-13.280	Peak
5000	42.13	255	104	H	33.0	5.44	27.43	53.140	74	-20.860	Peak
5000	42.540	65	100	V	33.0	5.44	27.43	53.550	54	-0.450	Ave
5000	36.220	255	104	H	33.0	5.44	27.43	47.230	54	-6.770	Ave
11340	47.020	318	134	V	38.5	9.73	27.62	67.610	74	-6.390	Peak
11340	43.64	181	160	H	38.5	9.73	27.62	64.230	74	-9.770	Peak
11340	29.520	318	134	V	38.5	9.73	27.62	50.110	54	-3.890	Ave
11340	28.040	181	160	H	38.5	9.73	27.62	48.630	54	-5.370	Ave

Note: Emissions of 5000 MHz are digital emissions

(3) Radiated Emission in the Restricted Bands

802.11a Mode

High Channel 5320 MHz, measured at 3 meters

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)	
5350	33.380	140	225	V	33.9	4.76	0.0	72.060	74	-1.940	Peak
5350	30.09	172	205	H	33.9	4.76	0.0	68.770	74	-5.230	Peak
5350	14.840	140	225	V	33.9	4.76	0.0	53.520	54	-0.480	Ave
5350	13.460	172	205	H	33.9	4.76	0.0	52.140	54	-1.860	Ave

802.11n HT20 Mode

High Channel 5320 MHz, measured at 3 meters

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)	
5350	32.750	217	156	V	33.9	4.76	0.0	71.430	74	-2.570	Peak
5350	25.68	338	150	H	33.9	4.76	0.0	64.360	74	-9.640	Peak
5350	14.820	217	156	V	33.9	4.76	0.0	53.500	54	-0.500	Ave
5350	12.870	338	150	H	33.9	4.76	0.0	51.550	54	-2.450	Ave

802.11n HT40 Mode

High Channel 5310 MHz, measured at 3 meters

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)	
5350	28.580	232	142	V	33.9	4.76	0.0	67.260	74	-6.740	Peak
5350	27.27	191	195	H	33.9	4.76	0.0	65.950	74	-8.050	Peak
5350	14.810	232	142	V	33.9	4.76	0.0	53.490	54	-0.510	Ave
5350	13.680	191	195	H	33.9	4.76	0.0	52.360	54	-1.640	Ave

802.11a Mode

Low Channel 5500 MHz, measured at 3 meters

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)	
5460	32.350	61	115	V	33.9	4.76	0.0	71.040	74	-2.960	Peak
5460	27.52	39	101	H	33.9	4.76	0.0	66.210	74	-7.790	Peak
5460	14.950	61	115	V	33.9	4.76	0.0	53.640	54	-0.360	Ave
5460	13.720	39	101	H	33.9	4.76	0.0	52.410	54	-1.590	Ave

802.11n HT20 Mode

Low Channel 5500 MHz, measured at 3 meters

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)	
5460	30.900	250	180	V	33.9	4.76	0.0	69.590	74	-4.410	Peak
5460	27.48	39	100	H	33.9	4.76	0.0	66.170	74	-7.830	Peak
5460	14.520	250	180	V	33.9	4.76	0.0	53.210	54	-0.790	Ave
5460	13.330	39	100	H	33.9	4.76	0.0	52.020	54	-1.980	Ave

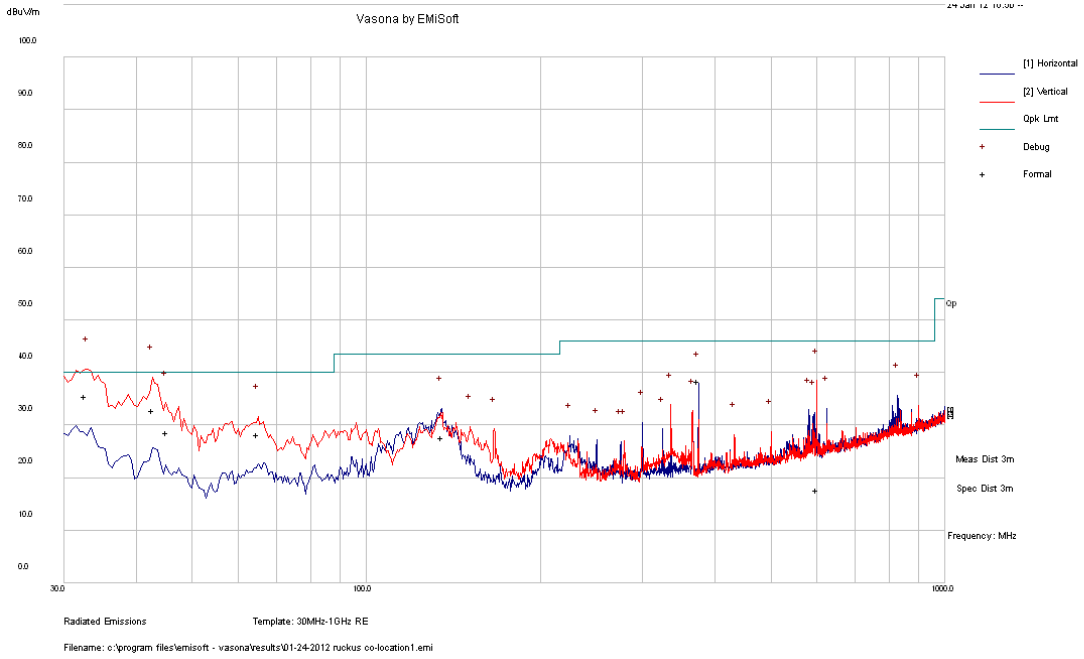
802.11n HT40 Mode

Low Channel 5510 MHz, measured at 3 meters

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)	
5460	28.610	58	100	V	33.9	4.76	0.0	67.300	74	-6.700	Peak
5460	27.45	71	100	H	33.9	4.76	0.0	66.140	74	-7.860	Peak
5460	14.870	58	100	V	33.9	4.76	0.0	53.560	54	-0.440	Ave
5460	17.710	71	100	H	33.9	4.76	0.0	56.400	54	2.400	Ave

(4) Co-location with 2.4 GHz module (FCC ID: S9G-MPE2N33A) and Ruckus 2.4/5 GHz Snoop Dogg antenna

2.4 GHz: 2462 MHz; 5.3 GHz: 5270 MHz



30-1000 MHz:

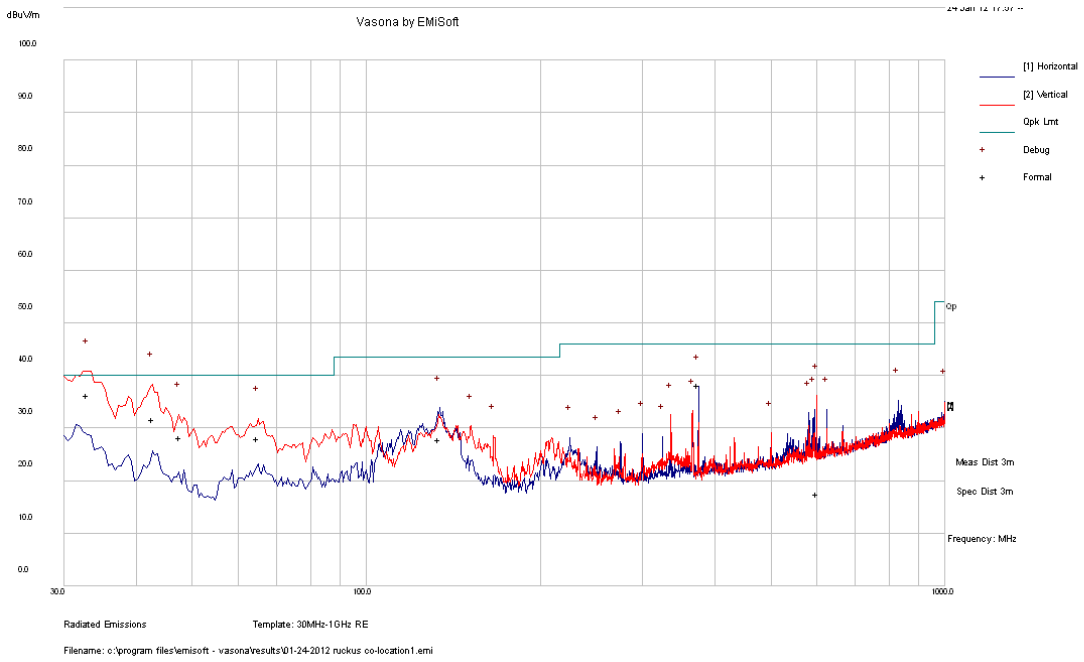
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
32.67125	35.56	121	V	147	40	-4.44
42.818	32.88	99	V	67	40	-7.12
45.26825	28.61	161	V	147	40	-11.39
600.3318	17.64	112	V	141	46	-28.36
374.998	38.37	99	H	129	46	-7.63
64.77925	28.36	123	V	9	40	-11.64

Above 1 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 (m)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
-	-	-	-	-	-	-	-	-	-	-	-

Note: All the Restricted Band Frequencies are more than 20 dB below the margin

2.4 GHz: 2462 MHz; 5.6 GHz: 5550 MHz



30-1000 MHz:

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
32.91425	36.35	99	V	124	40	-3.65
42.7795	31.62	126	V	319	40	-8.38
47.57225	28.33	123	V	360	40	-11.67
64.78675	28.16	139	V	36	40	-11.84
375.0028	38.22	99	H	135	46	-7.78
133.6705	27.89	138	H	88	43.5	-15.61

Above 1 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 (m)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
-	-	-	-	-	-	-	-	-	-	-	-

Note: All the Restricted Band Frequencies are more than 20 dB below the margin

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

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 26 dB from the reference level. Record the frequency difference as the emissions bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

8.3 Test Equipment List and Details

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

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

8.4 Test Environmental Conditions

Temperature:	20~24 °C
Relative Humidity:	37~45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Quinn Jiang and Jeffery Wu on 2012-05-04, 2012-05-07, and 2012-05-09 in RF site.

8.5 Test Results

5250-5350 MHz

802.11a mode

Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Chain J10					
Low	5260	21.617	16.5464	> 500	Compliant
Middle	5280	21.646	16.5455	> 500	Compliant
High	5320	21.439	16.5462	> 500	Compliant
Chain J8					
Low	5260	21.891	16.5462	> 500	Compliant
Middle	5280	21.666	16.5455	> 500	Compliant
High	5320	21.344	16.5392	> 500	Compliant
Chain J6					
Low	5260	21.961	16.5549	> 500	Compliant
Middle	5280	21.613	16.5466	> 500	Compliant
High	5320	21.441	16.5415	> 500	Compliant

802.11n HT20 mode

Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Chain J10					
Low	5260	22.391	17.7522	> 500	Compliant
Middle	5280	22.471	17.7538	> 500	Compliant
High	5320	22.338	17.7476	> 500	Compliant
Chain J8					
Low	5260	22.526	17.7594	> 500	Compliant
Middle	5280	22.477	17.7594	> 500	Compliant
High	5320	22.490	17.7535	> 500	Compliant
Chain J6					
Low	5260	23.019	17.770	> 500	Compliant
Middle	5280	22.605	17.7517	> 500	Compliant
High	5320	22.165	17.7389	> 500	Compliant

802.11n HT40 mode

Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Chain J10					
Low	5270	42.956	36.3677	> 500	Compliant
High	5310	43.027	36.3195	> 500	Compliant
Chain J8					
Low	5270	43.680	36.3399	> 500	Compliant
High	5310	42.650	36.3287	> 500	Compliant
Chain J6					
Low	5270	44.884	36.3985	> 500	Compliant
High	5310	42.559	36.3393	> 500	Compliant

5470-5725 MHz

802.11a mode

Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Chain J10					
Low	5500	21.600	16.5573	> 500	Compliant
Middle	5580	21.881	16.5683	> 500	Compliant
High	5700	22.386	16.5872	> 500	Compliant
Chain J8					
Low	5500	22.478	16.5708	> 500	Compliant
Middle	5580	22.560	16.5786	> 500	Compliant
High	5700	22.922	16.5829	> 500	Compliant
Chain J6					
Low	5500	23.753	16.5995	> 500	Compliant
Middle	5580	23.127	16.5840	> 500	Compliant
High	5700	23.097	16.5804	> 500	Compliant

802.11n HT20 mode

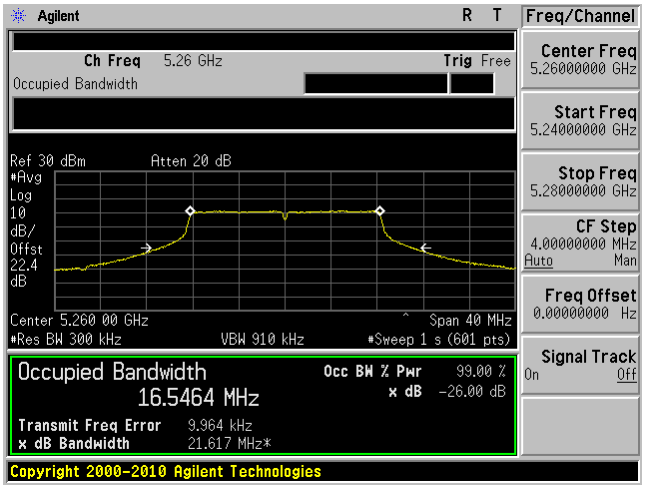
Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Chain J10					
Low	5500	22.511	17.7559	> 500	Compliant
Middle	5580	22.624	17.7419	> 500	Compliant
High	5700	22.878	17.7663	> 500	Compliant
Chain J8					
Low	5500	22.629	17.7873	> 500	Compliant
Middle	5580	23.459	17.7907	> 500	Compliant
High	5700	23.895	17.7770	> 500	Compliant
Chain J6					
Low	5500	23.290	17.7725	> 500	Compliant
Middle	5580	23.618	17.7745	> 500	Compliant
High	5700	23.605	17.7919	> 500	Compliant

802.11n HT40 mode

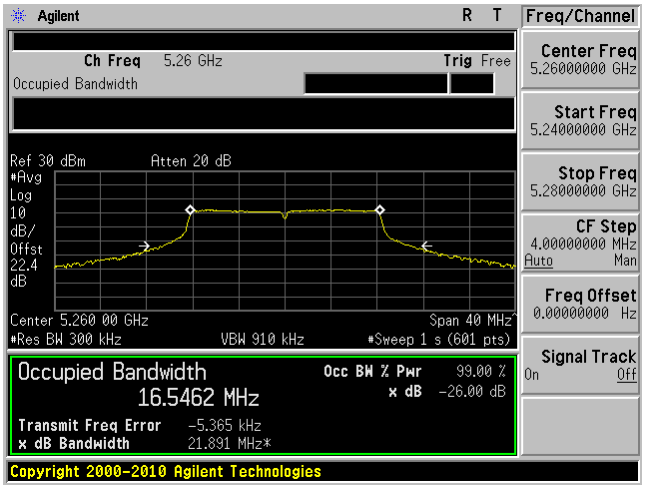
Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Results
Chain J10					
Low	5510	42.976	36.3461	> 500	Compliant
Middle	5550	42.957	36.3513	> 500	Compliant
High	5670	53.924	36.3767	> 500	Compliant
Chain J8					
Low	5510	42.627	36.3621	> 500	Compliant
Middle	5550	43.732	36.4122	> 500	Compliant
High	5670	47.798	36.3928	> 500	Compliant
Chain J6					
Low	5510	42.883	36.3467	> 500	Compliant
Middle	5550	45.429	36.3900	> 500	Compliant
High	5670	45.917	36.4133	> 500	Compliant

5250-5350 MHz

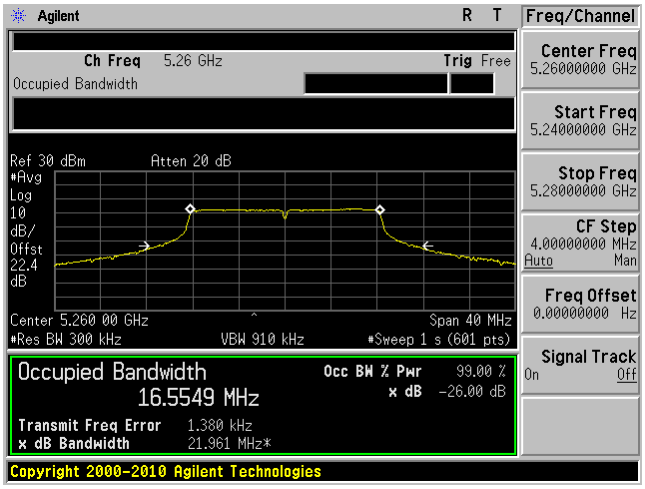
802.11a mode, 5260 MHz, Chain J10



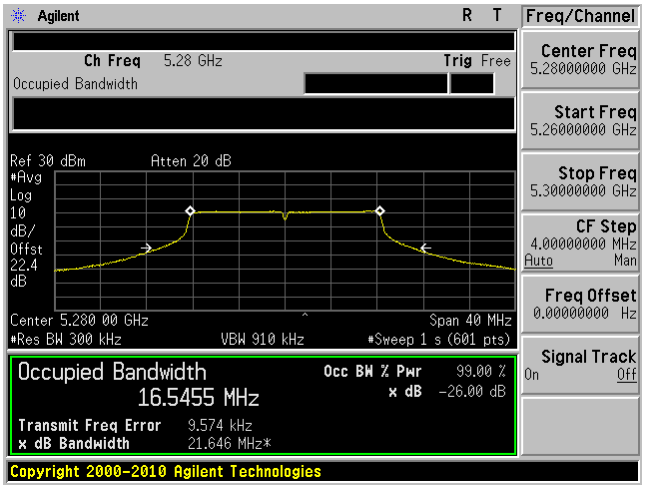
802.11a mode, 5260 MHz, Chain J8



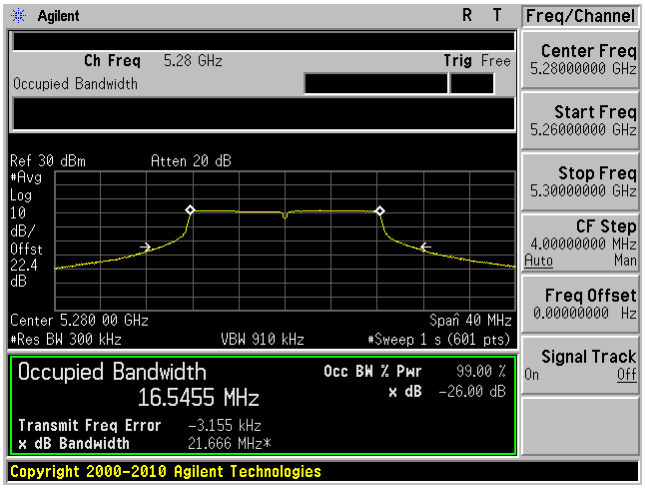
802.11a mode, 5260 MHz, Chain J6



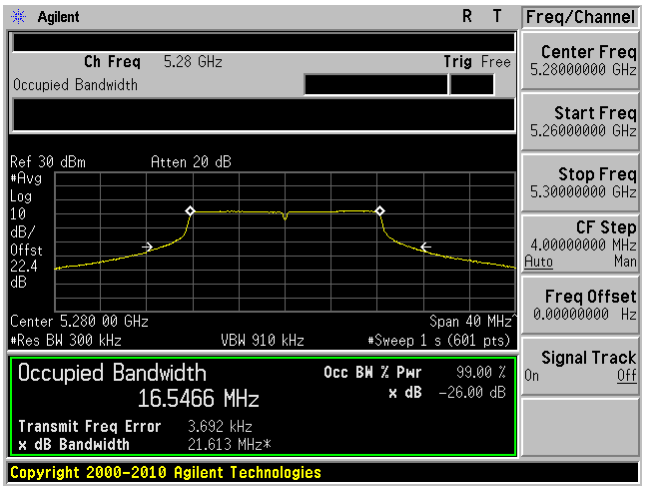
802.11a mode, 5280 MHz, Chain J10



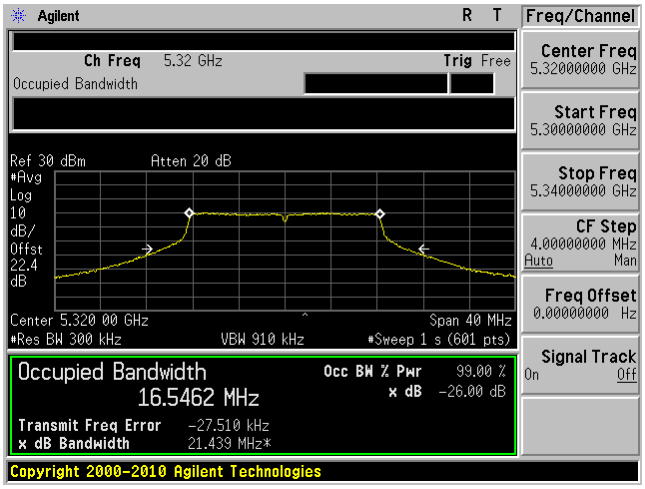
802.11a mode, 5280 MHz, Chain J8



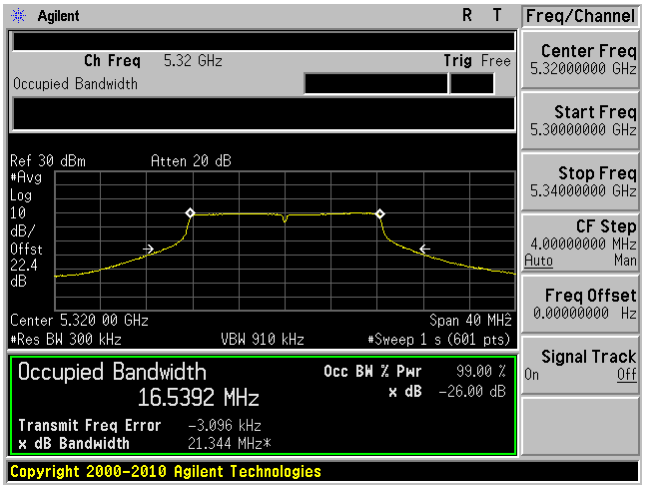
802.11a mode, 5280 MHz, Chain J6



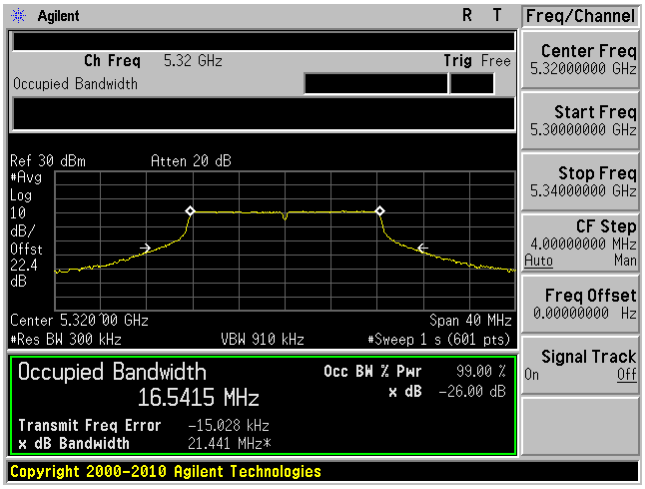
802.11a mode, 5320 MHz, Chain J10



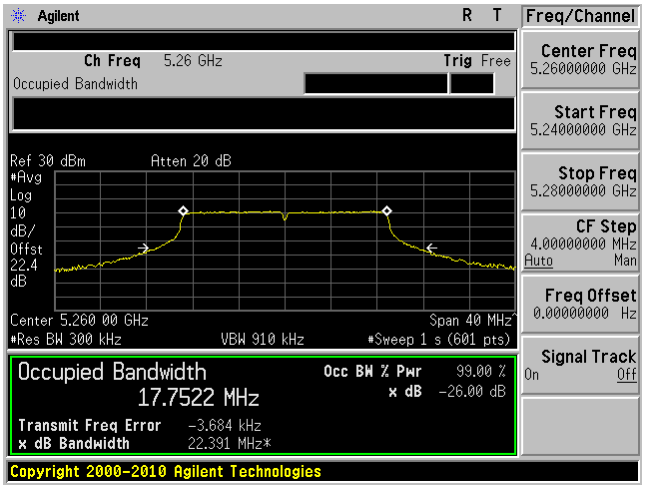
802.11a mode, 5320 MHz, Chain J8



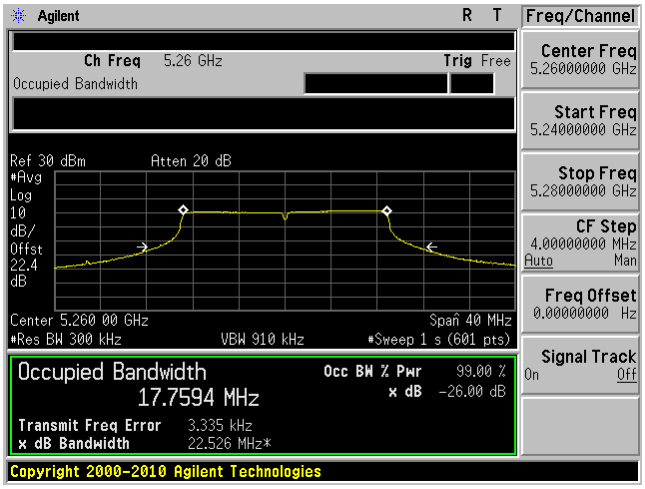
802.11a mode, 5320 MHz, Chain J6



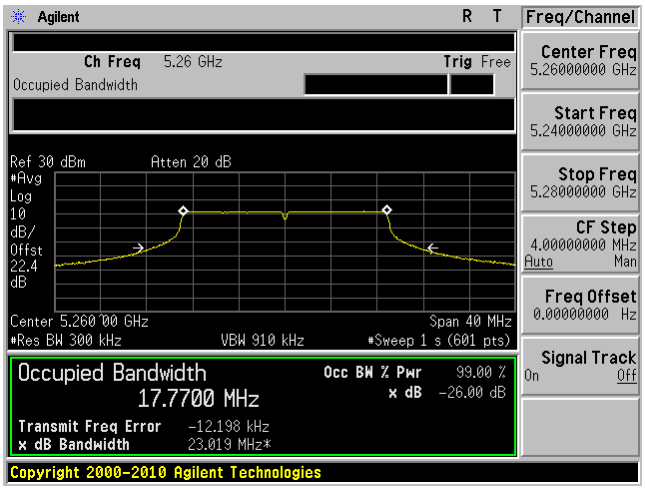
802.11n HT20 mode, 5260 MHz, Chain J10



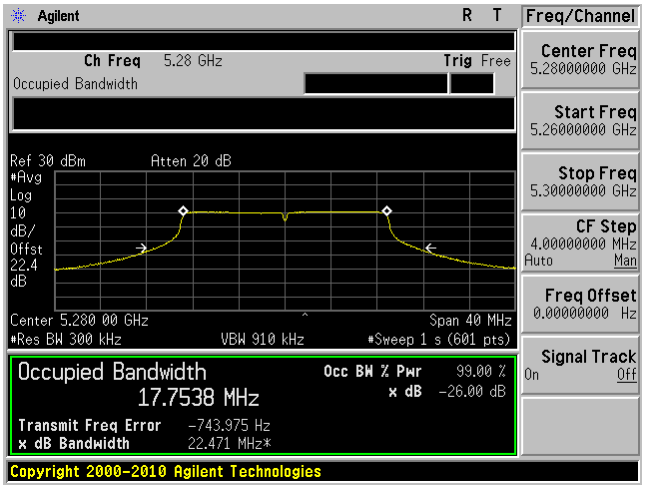
802.11n HT20 mode, 5260 MHz, Chain J8



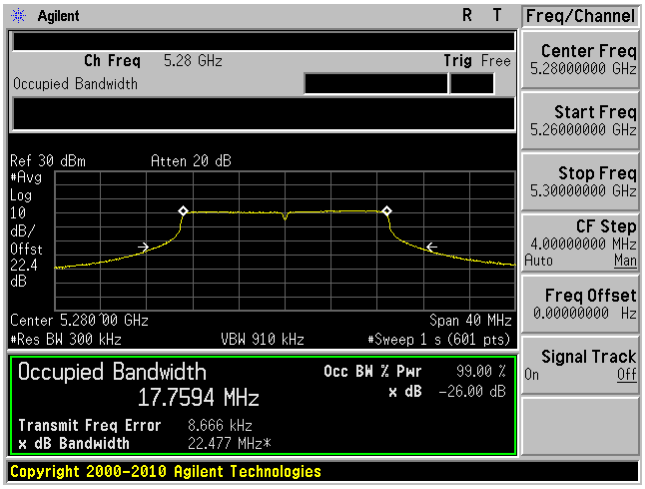
802.11n HT20 mode, 5260 MHz, Chain J6



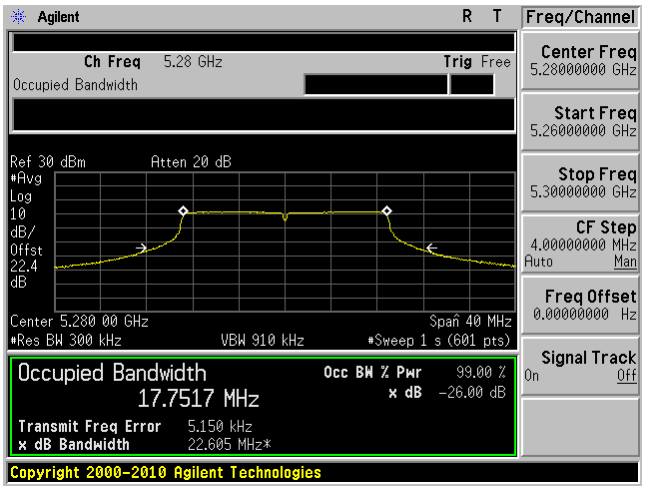
802.11n HT20 mode, 5280 MHz, Chain J10



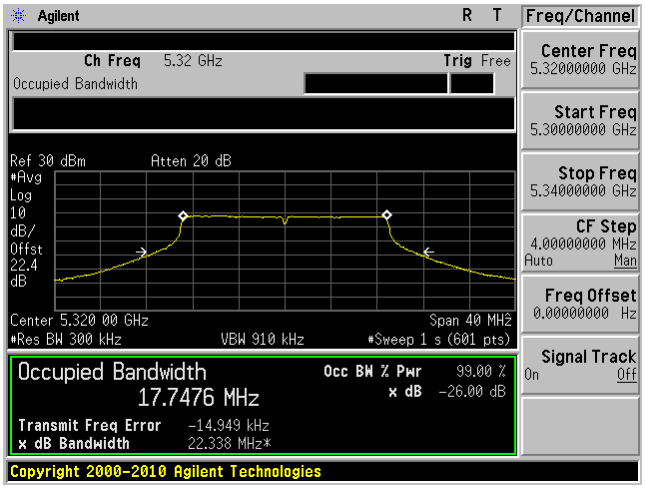
802.11n HT20 mode, 5280 MHz, Chain J8



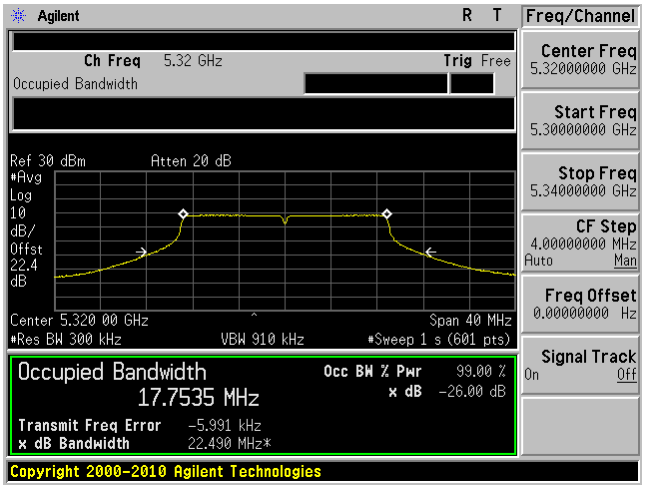
802.11n HT20 mode, 5280 MHz, Chain J6



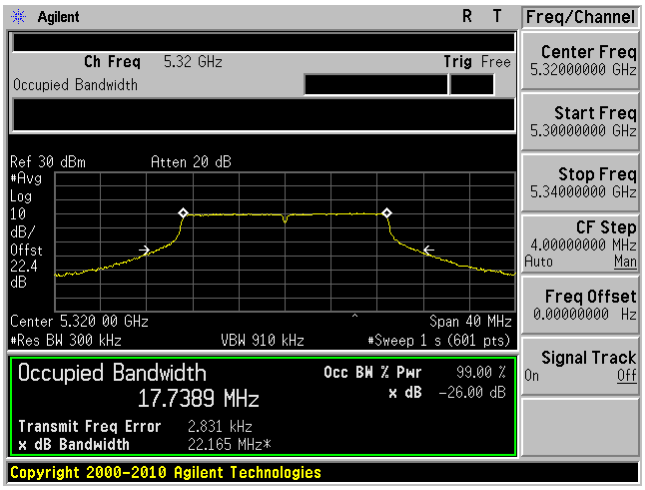
802.11n HT20 mode, 5320 MHz, Chain J10



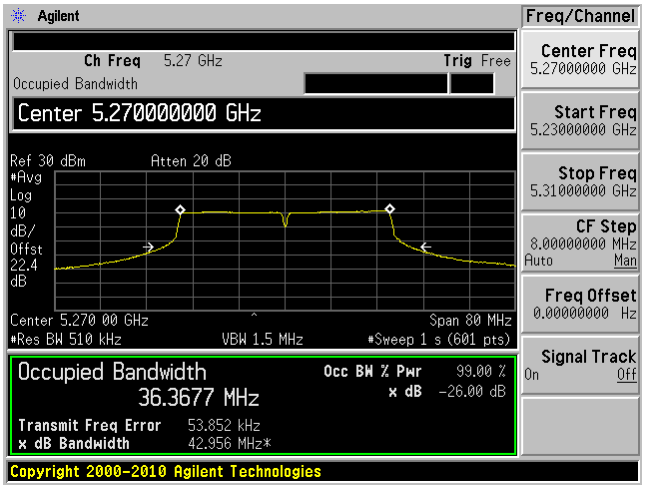
802.11n HT20 mode, 5320 MHz, Chain J8



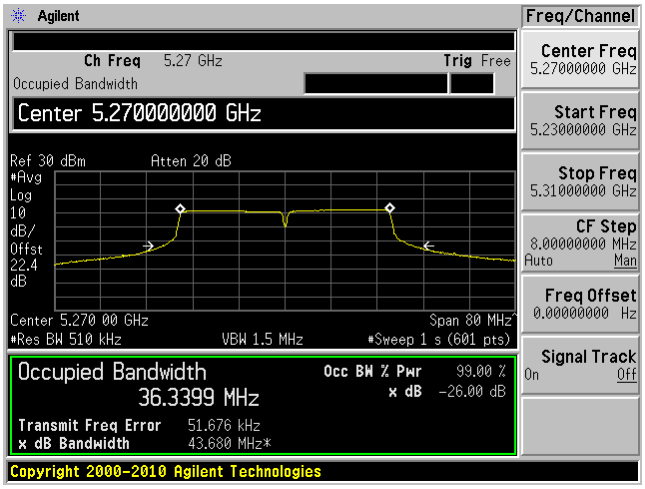
802.11n HT20 mode, 5320 MHz, Chain J6



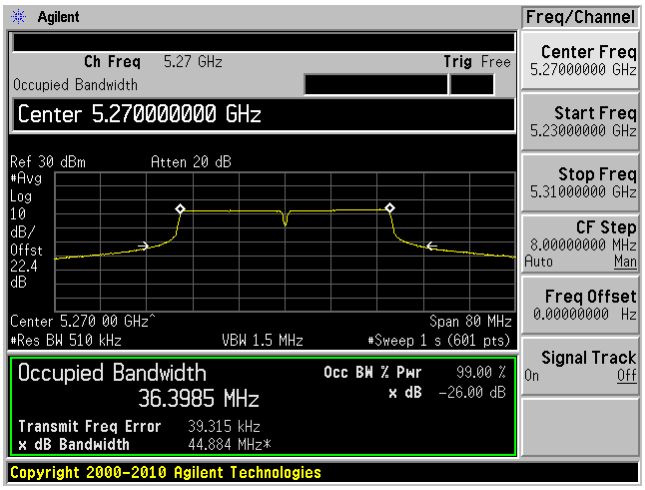
802.11n HT40 mode, 5270 MHz, Chain J10



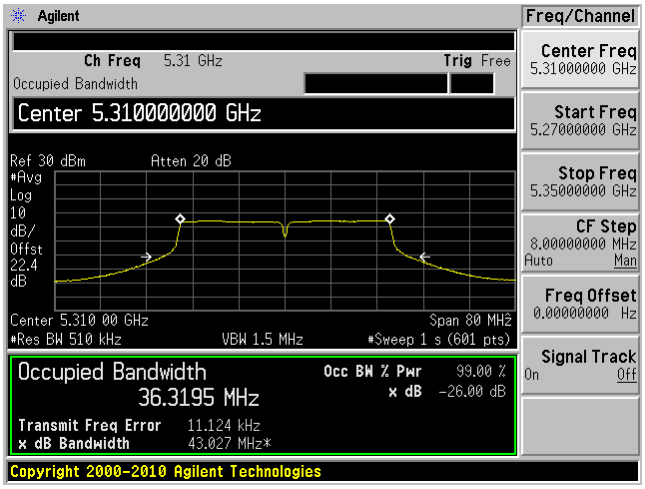
802.11n HT40 mode, 5270 MHz, Chain J8



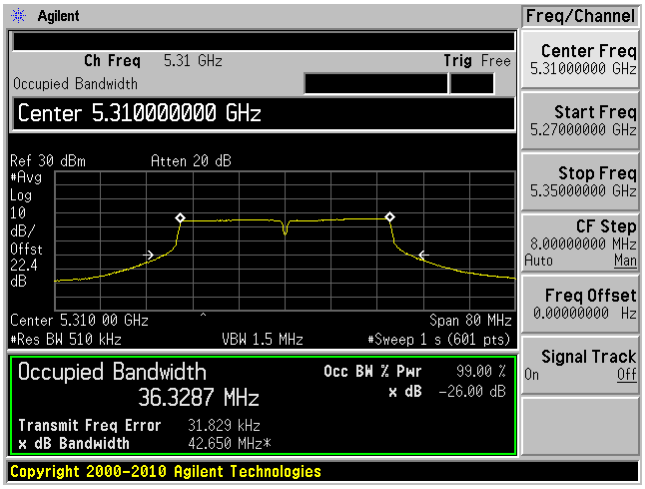
802.11n HT40 mode, 5270 MHz, Chain J6



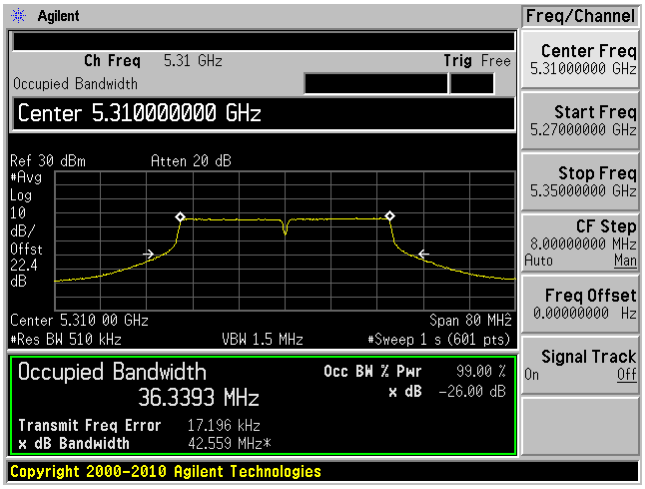
802.11n HT40 mode, 5310 MHz, Chain J10



802.11n HT40 mode, 5310 MHz, Chain J8

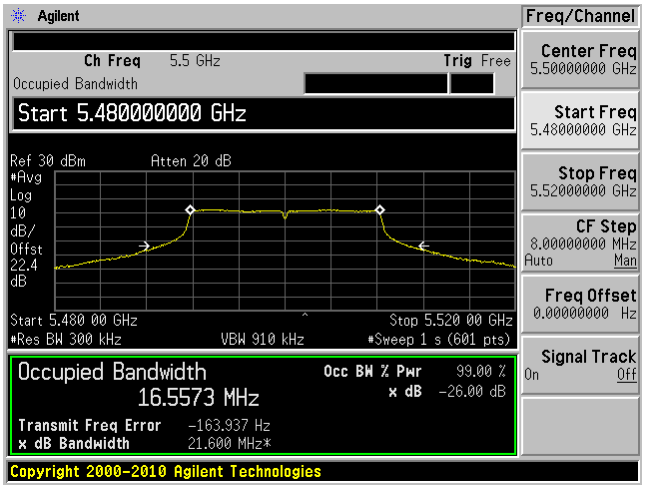


802.11n HT40 mode, 5310 MHz, Chain J6

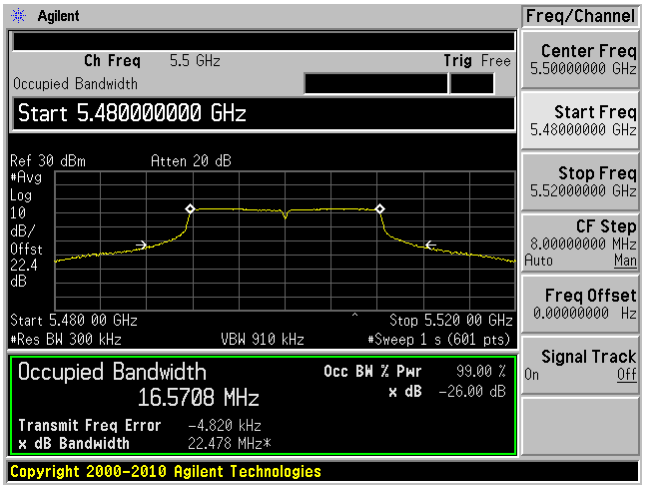


5470-5725 MHz

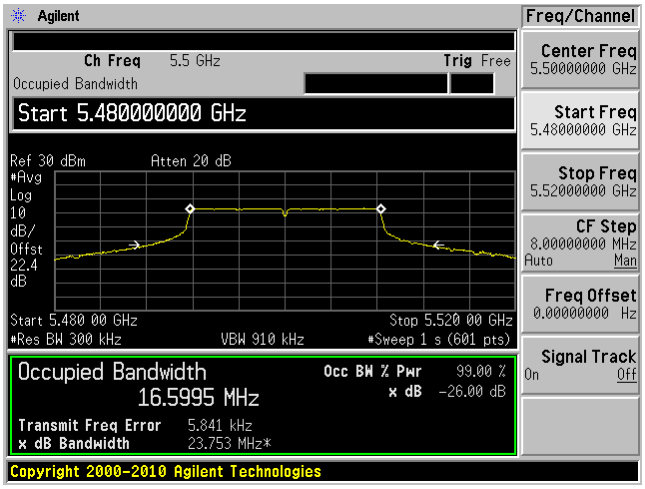
802.11a mode, 5500 MHz, Chain J10



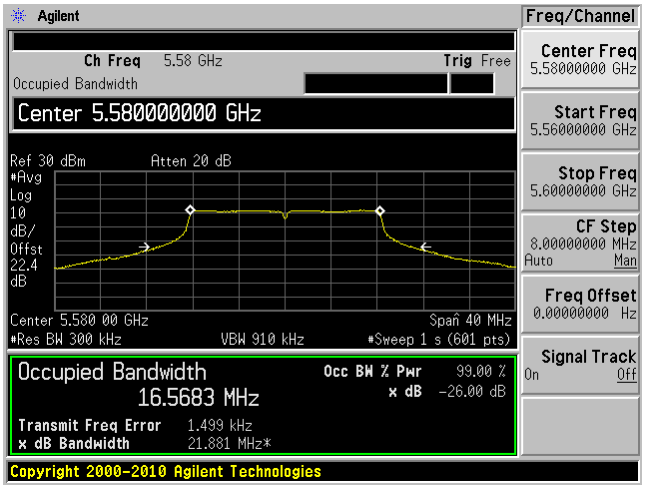
802.11a mode, 5500 MHz, Chain J8



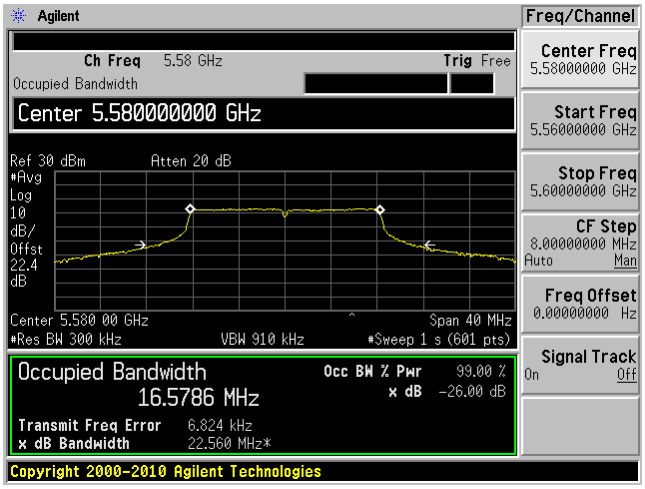
802.11a mode, 5500 MHz, Chain J6



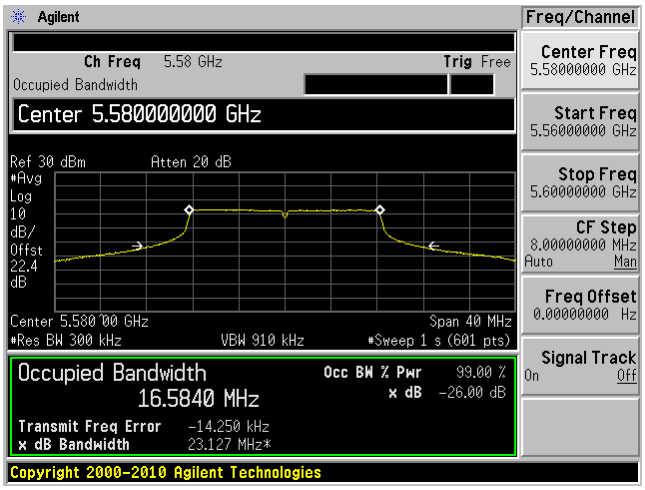
802.11a mode, 5580 MHz, Chain J10



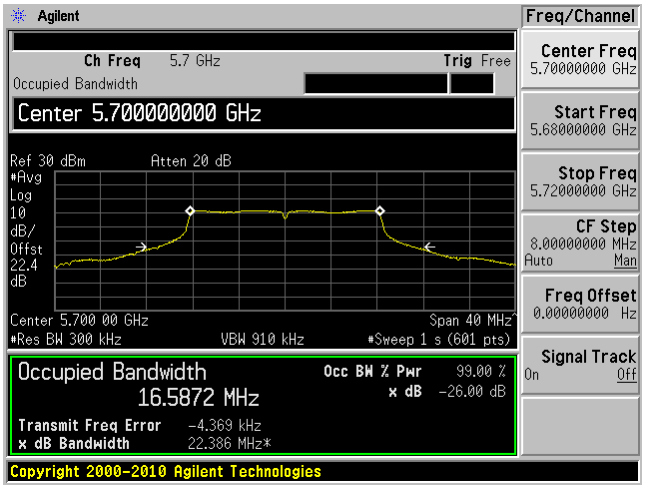
802.11a mode, 5580 MHz, Chain J8



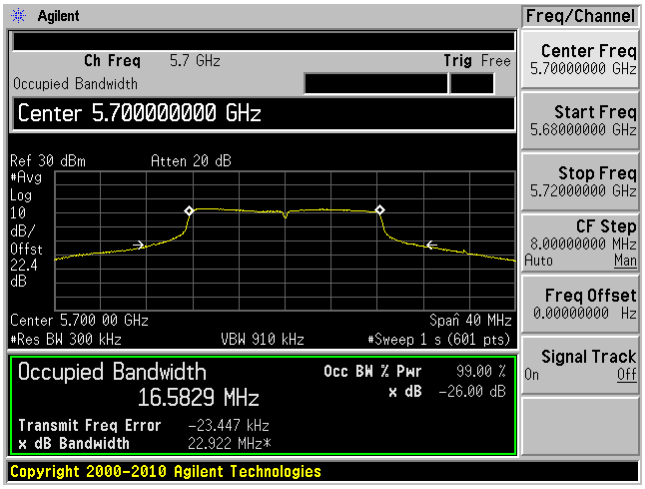
802.11a mode, 5580 MHz, Chain J6



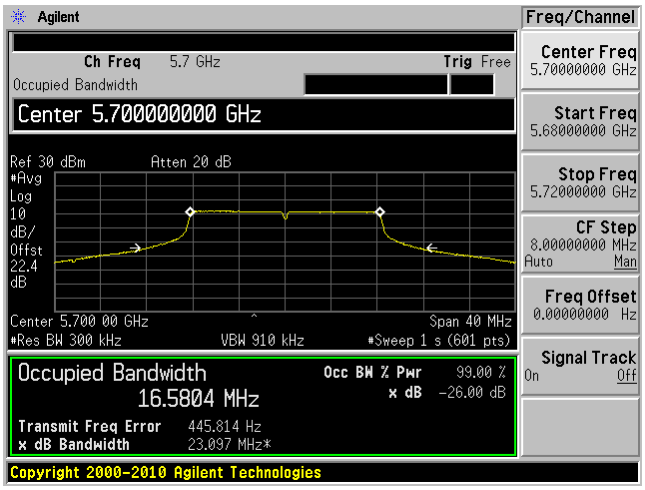
802.11a mode, 5700 MHz, Chain J10



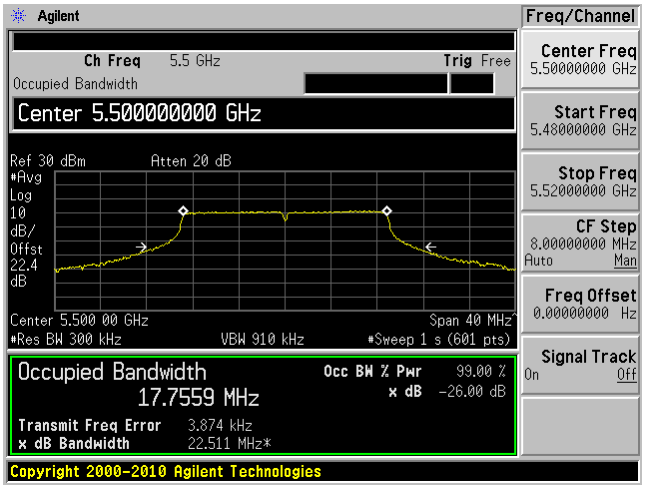
802.11a mode, 5700 MHz, Chain J8



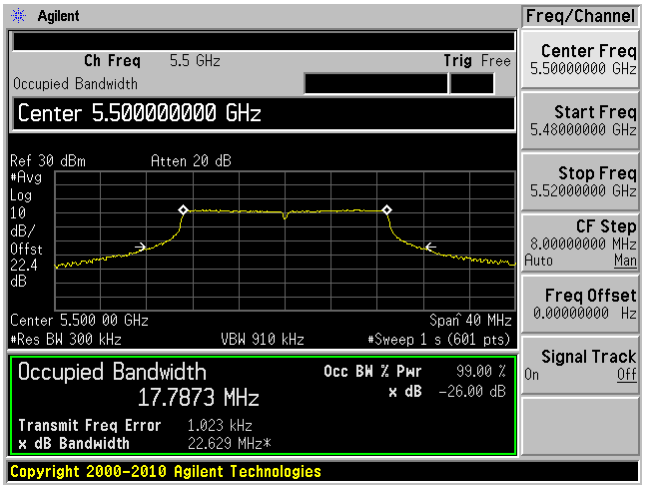
802.11a mode, 5700 MHz, Chain J6



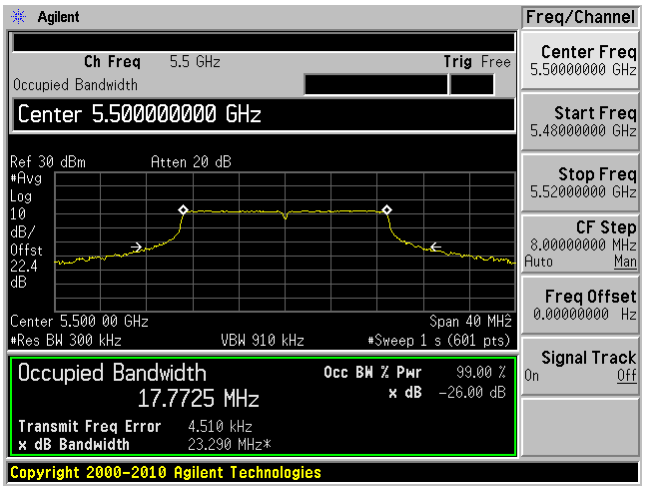
802.11n HT20 mode, 5500 MHz, Chain J10



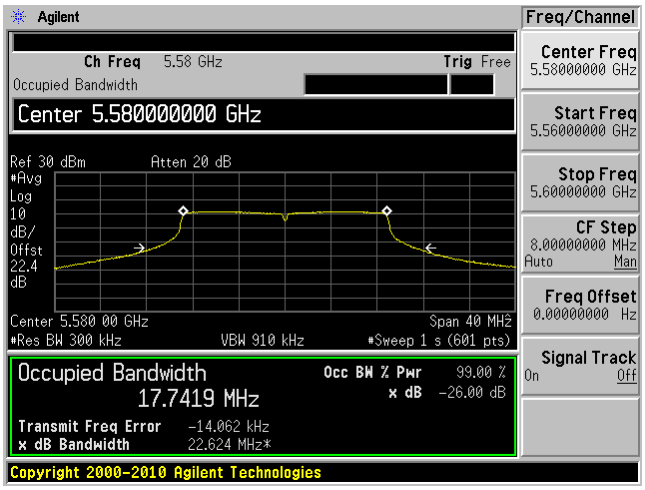
802.11n HT20 mode, 5500 MHz, Chain J8



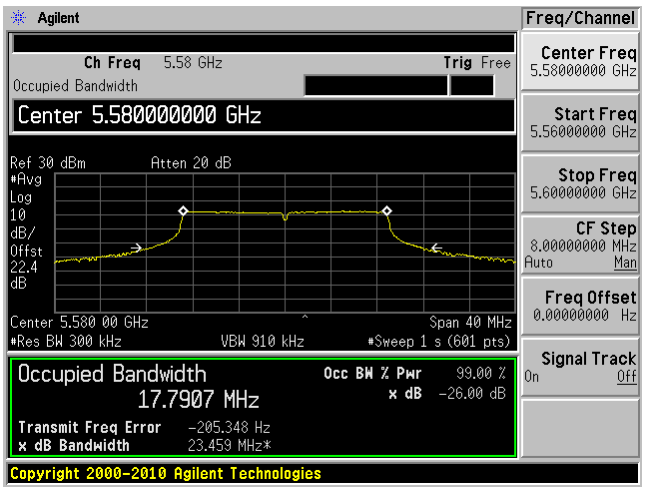
802.11n HT20 mode, 5500 MHz, Chain J6



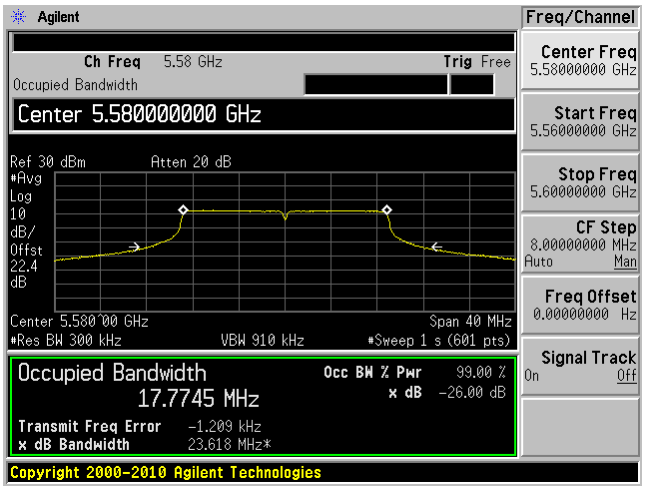
802.11n HT20 mode, 5580 MHz, Chain J10



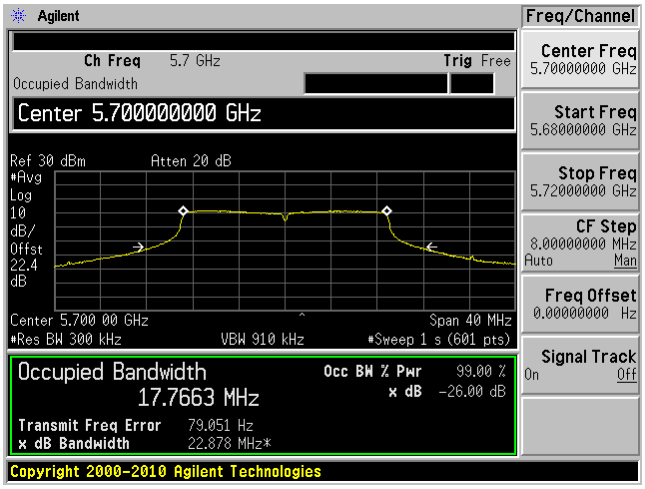
802.11n HT20 mode, 5580 MHz, Chain J8



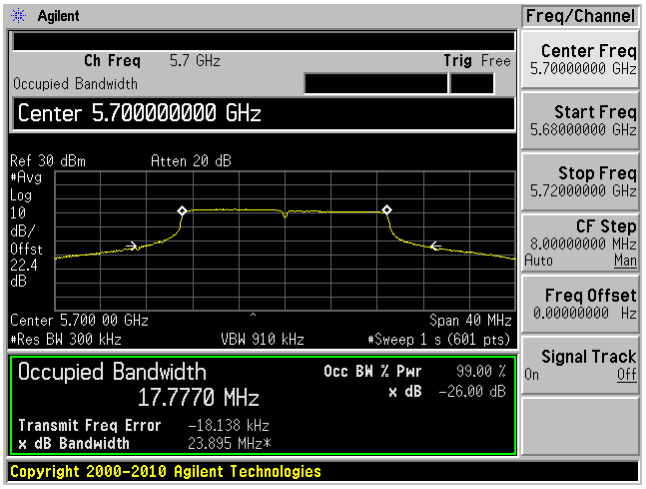
802.11n HT20 mode, 5580 MHz, Chain J6



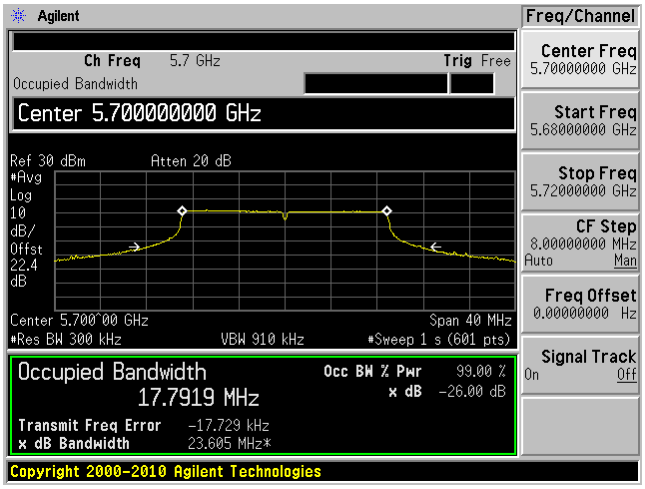
802.11n HT20 mode, 5700 MHz, Chain J10



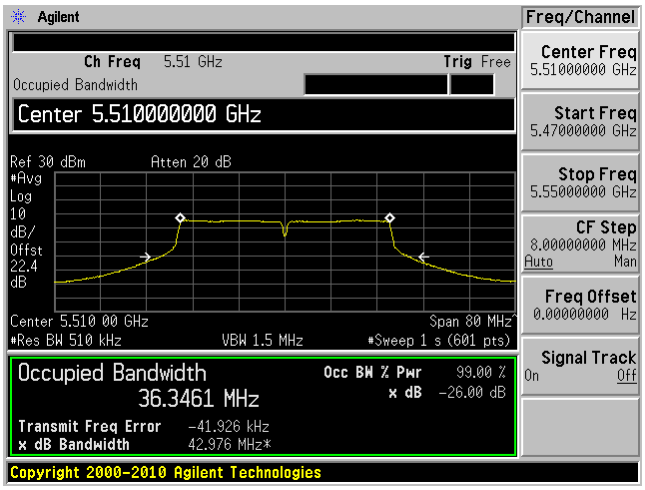
802.11n HT20 mode, 5700 MHz, Chain J8



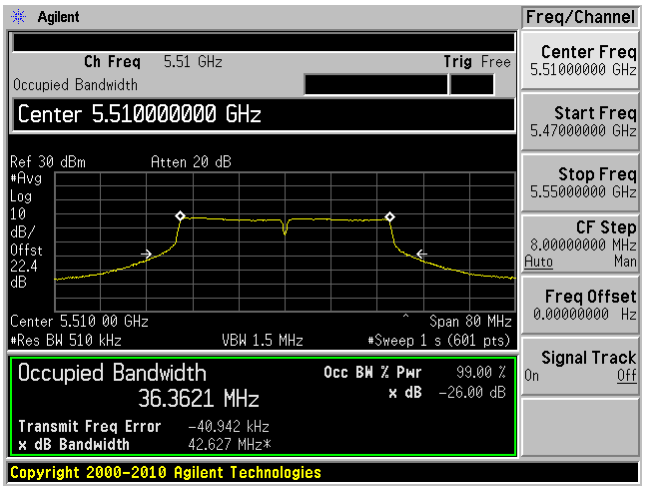
802.11n HT20 mode, 5700 MHz, Chain J6



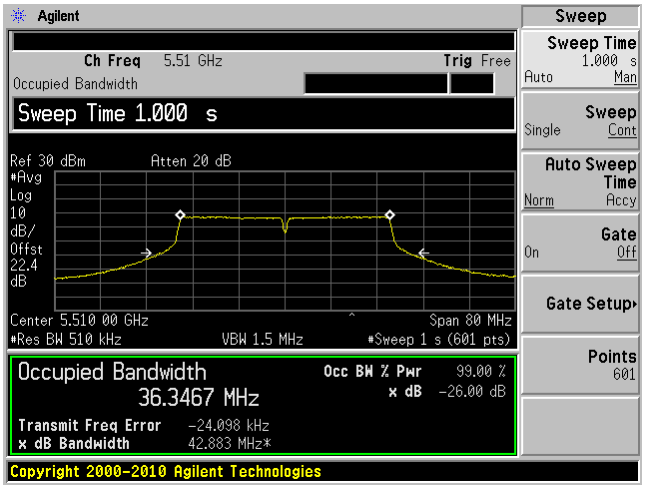
802.11n HT40 mode, 5510 MHz, Chain J10



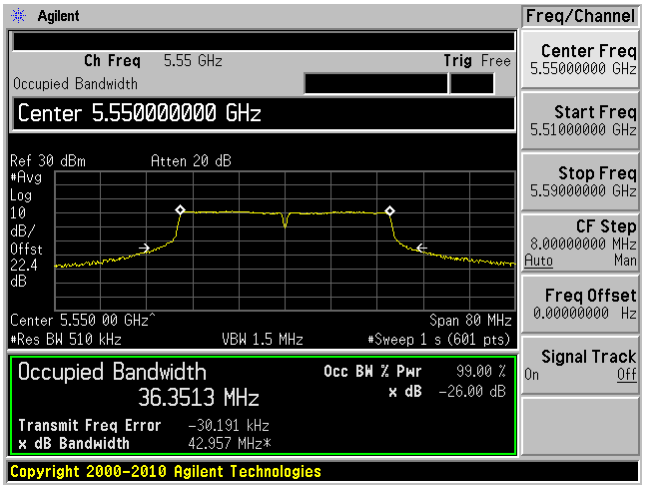
802.11n HT40 mode, 5510 MHz, Chain J8



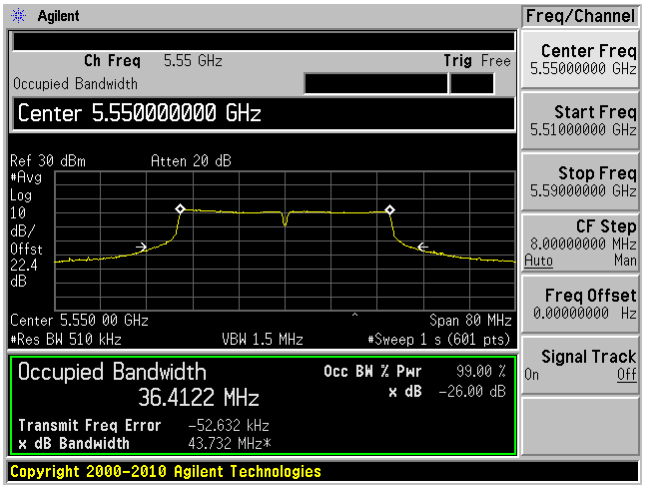
802.11n HT40 mode, 5510 MHz, Chain J6



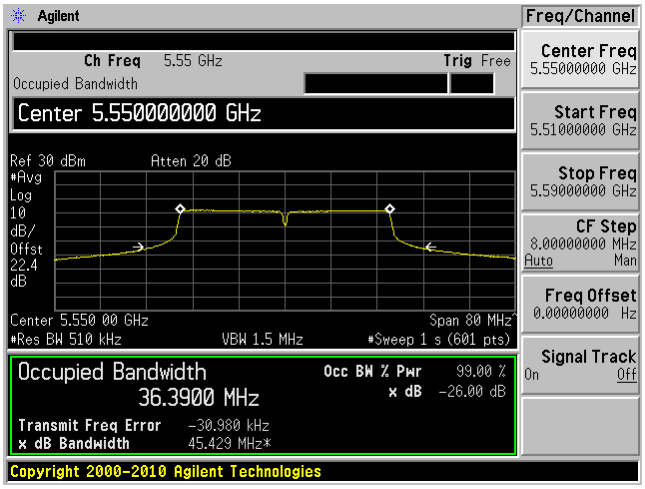
802.11n HT40 mode, 5550 MHz, Chain J10



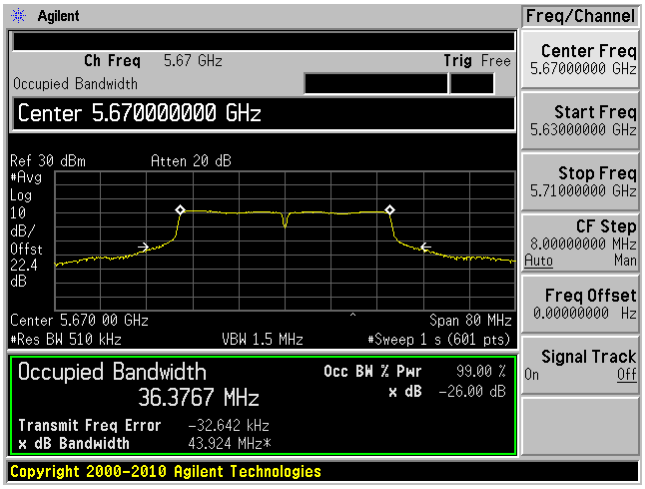
802.11n HT40 mode, 5550 MHz, Chain J8



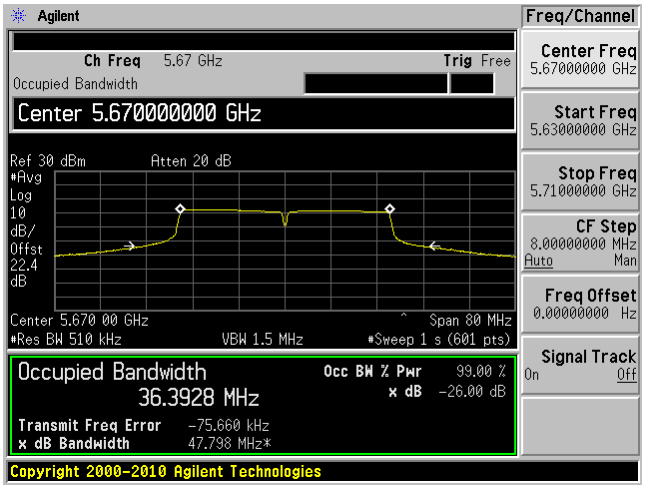
802.11n HT40 mode, 5550 MHz, Chain J6



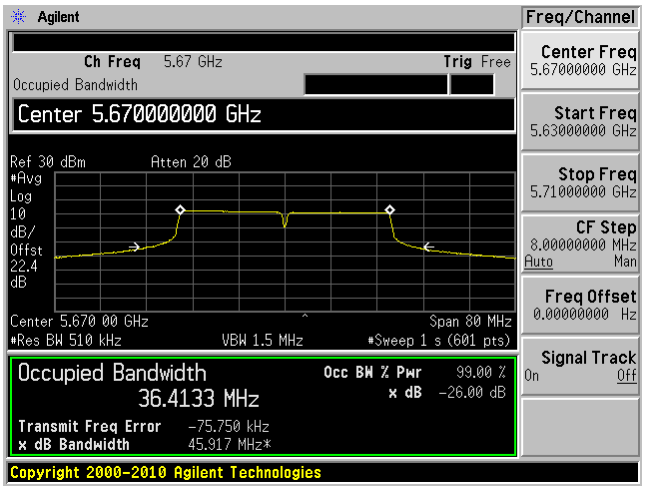
802.11n HT40 mode, 5670 MHz, Chain J10



802.11n HT40 mode, 5670 MHz, Chain J8



802.11n HT40 mode, 5670 MHz, Chain J6



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)

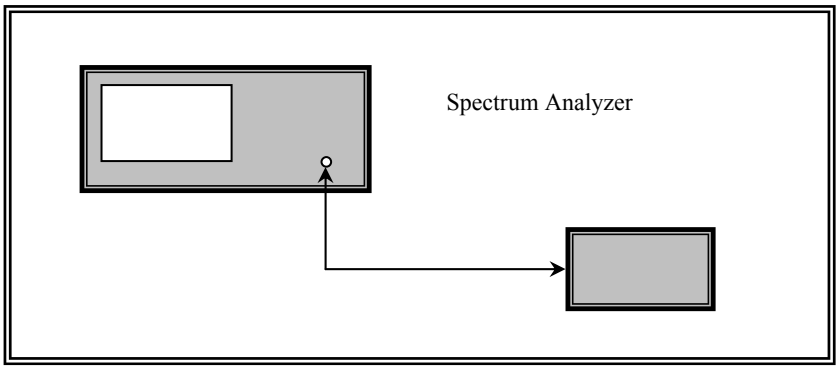
For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm 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 5.25–5.35 GHz, 5.47-5.6 GHz, and 5.650–5.725 GHz bands, the maximum conducted output power shall not exceed 250 mW or 11 dBm + 10 log B, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1 megahertz band. The maximum e.i.r.p shall not exceed 1.0W or 17 + 10 10B, dbm, whichever is less. B is the 99% emission bandwidth in MHz.

9.2 Measurement Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer.
3. Add a correction factor to the display.



9.3 Test Equipment List and Details

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

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

9.4 Test Environmental Conditions

Temperature:	20~24 °C
Relative Humidity:	37~45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Quinn Jiang and Jeffery Wu on 2012-05-04, 2012-05-07, and 2012-05-09 in RF site.

9.5 Test Results

5250-5350 MHz

Channel	Frequency (MHz)	TX Chain J10 Power (dBm)	TX Chain J8 Power (dBm)	TX Chain J6 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
802.11a mode								
Low	5260	14.33	15.4	16.21	20.15	24	-3.85	16
Middle	5280	15	15.84	16.4	20.56	24	-3.44	16.5
High	5320	14.2	14.77	15.41	19.59	24	-4.41	16
802.11n HT20 mode								
Low	5260	15.02	16.42	16.52	20.81	24	-3.19	16.5
Middle	5280	15.21	15.85	16.54	20.67	24	-3.33	16.5
High	5320	15.15	15.81	16.9	20.79	24	-3.21	17
802.11n HT40 mode								
Low	5270	18.13	18.99	19.45	23.66	24	-0.34	18.5
High	5310	11.75	12.52	13.32	17.35	24	-6.65	13

5470-5725 MHz

Channel	Frequency (MHz)	TX Chain J10 Power (dBm)	TX Chain J8 Power (dBm)	TX Chain J6 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
802.11a mode								
Low	5500	15.1	16.57	17.03	21.08	24	-2.92	17.5
Middle	5580	15.28	16.49	16.71	20.98	24	-3.02	17.5
High	5700	15.58	16.3	16.14	20.79	24	-3.21	18
802.11n HT20 mode								
Low	5500	15.73	17.15	17.37	21.58	24	-2.42	18
Middle	5580	15.54	17.14	17.17	21.45	24	-2.55	18
High	5700	15.52	16.54	16.21	20.88	24	-3.12	18
802.11n HT40 mode								
Low	5510	13.42	14.06	14.45	18.77	24	-5.23	15
Middle	5550	18.08	18.95	19.59	23.69	24	-0.31	20
High	5700	17.54	18.96	18.01	22.98	24	-1.02	20

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 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. Devices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all applicable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm/MHz in the 5.15–5.25 GHz band. For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.

For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 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

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

10.3 Test Equipment List and Details

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

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

10.4 Test Environmental Conditions

Temperature:	20~24 °C
Relative Humidity:	37~45 %
ATM Pressure:	101.1-102 kPa

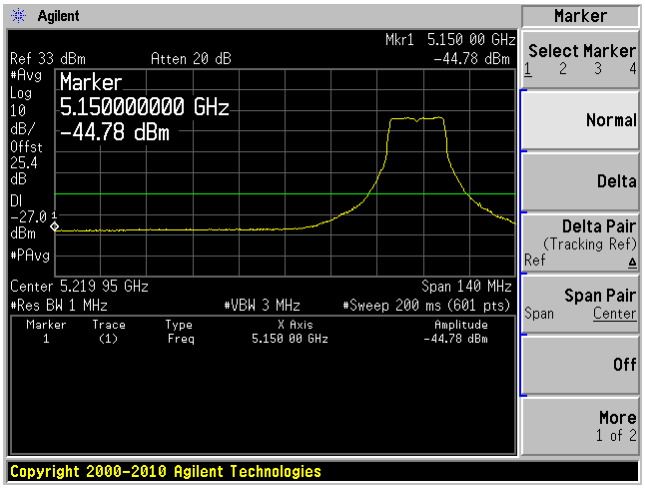
The testing was performed by Quinn Jiang and Jeffery Wu on 2012-05-04, 2012-05-07, and 2012-05-09 in RF site.

10.5 Test Results

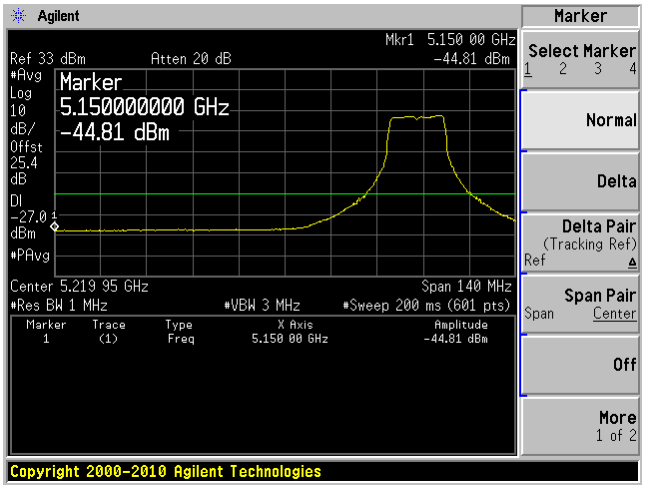
Please refer to following pages for plots of band edge.

5250-5350 MHz

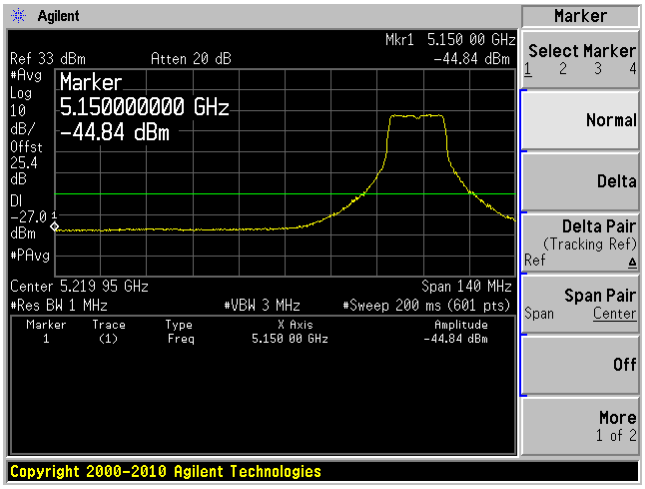
802.11a mode, Lowest Channel, Chain J10



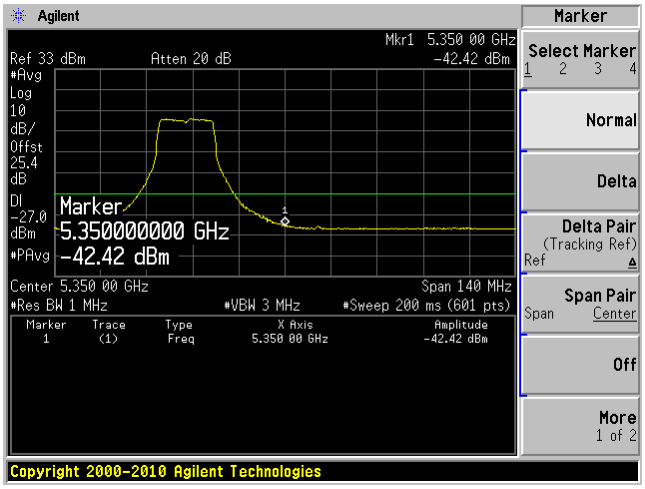
802.11a mode, Lowest Channel, Chain J8



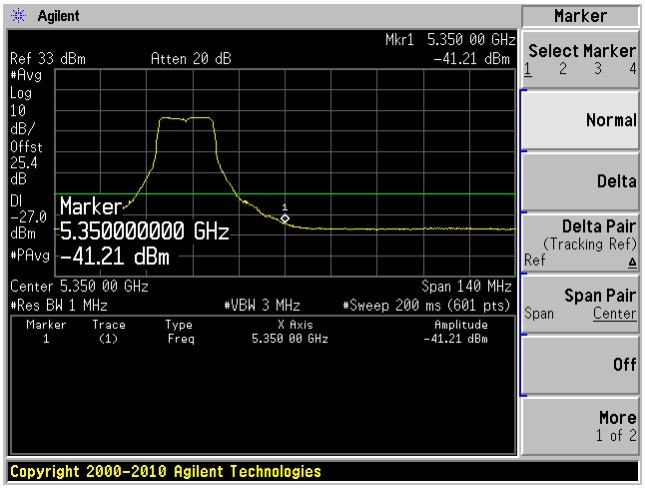
802.11a mode, Lowest Channel, Chain J6



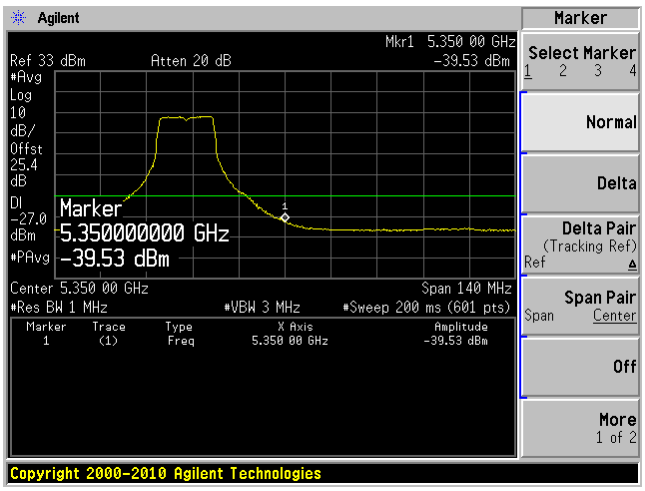
802.11a mode, Highest Channel, Chain J10



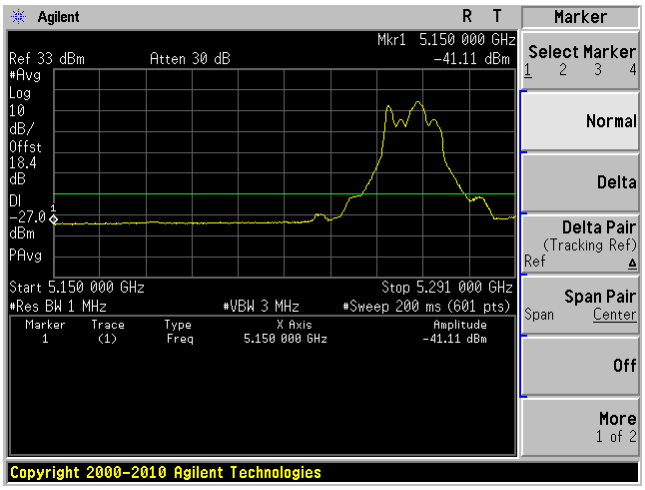
802.11a mode, Highest Channel, Chain J8



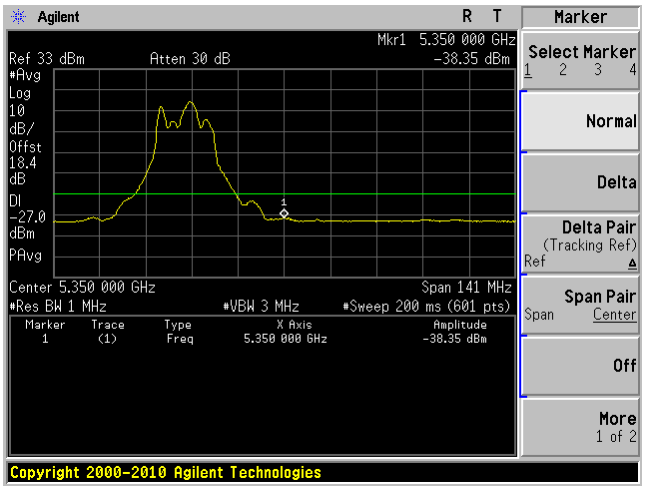
802.11a mode, Highest Channel, Chain J6



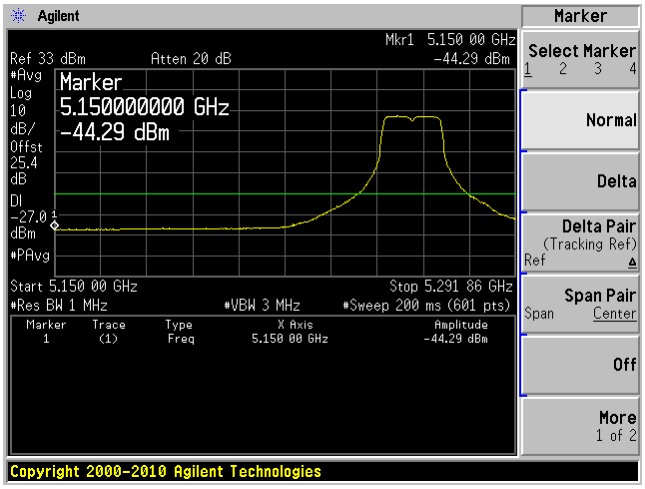
802.11a mode, Lowest Channel, Combiner



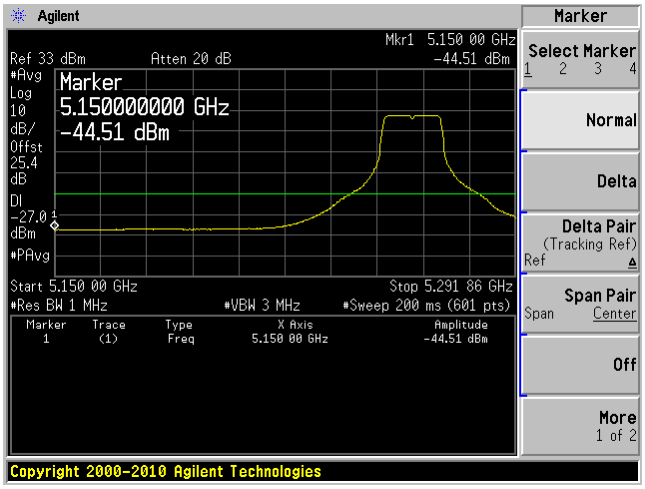
802.11a mode, Highest Channel, Combiner



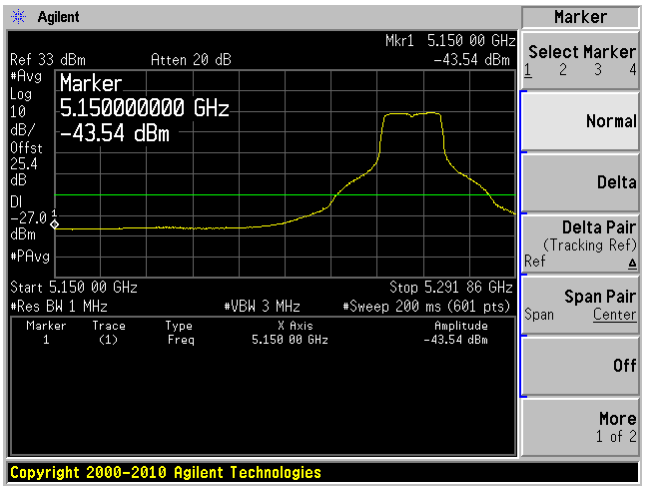
802.11n HT20 mode, Lowest Channel, Chain J10



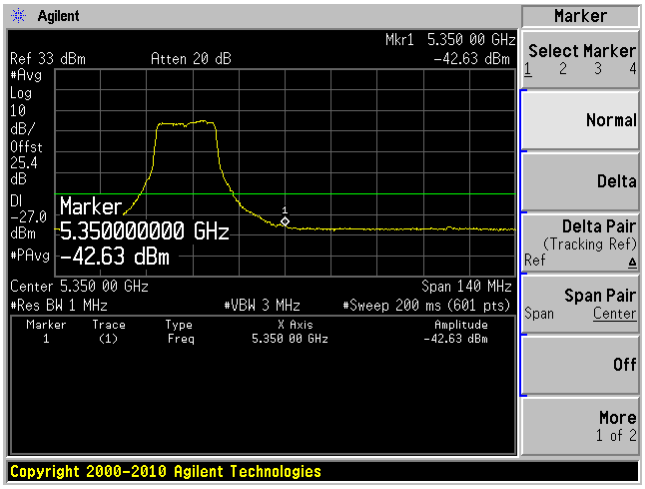
802.11n HT20 mode, Lowest Channel, Chain J8



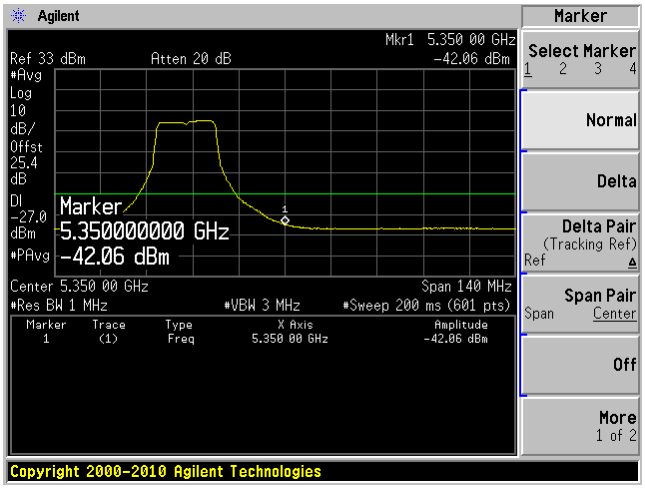
802.11n HT20 mode, Lowest Channel, Chain J6



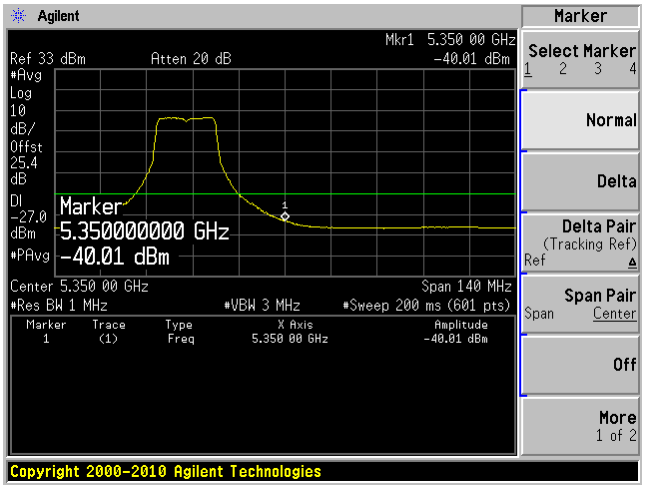
802.11n HT20 mode, Highest Channel, Chain J10



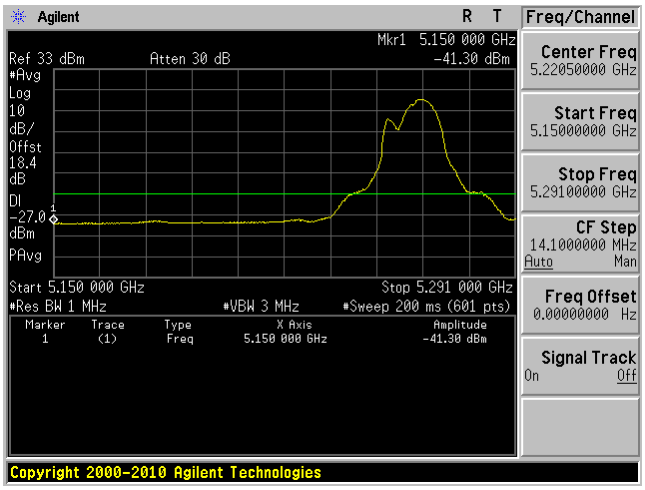
802.11n HT20 mode, Highest Channel, Chain J8



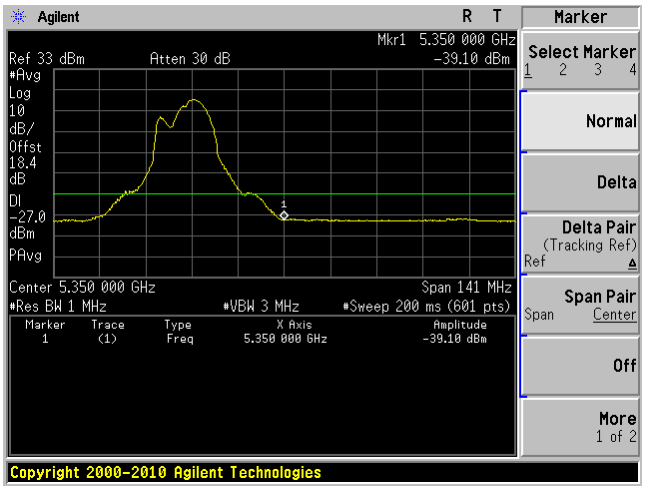
802.11n HT20 mode, Highest Channel, Chain J6



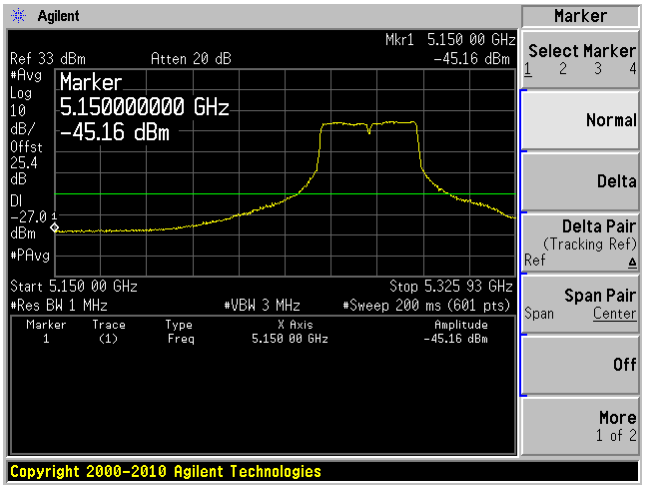
802.11n HT20 mode, Lowest Channel, Combiner



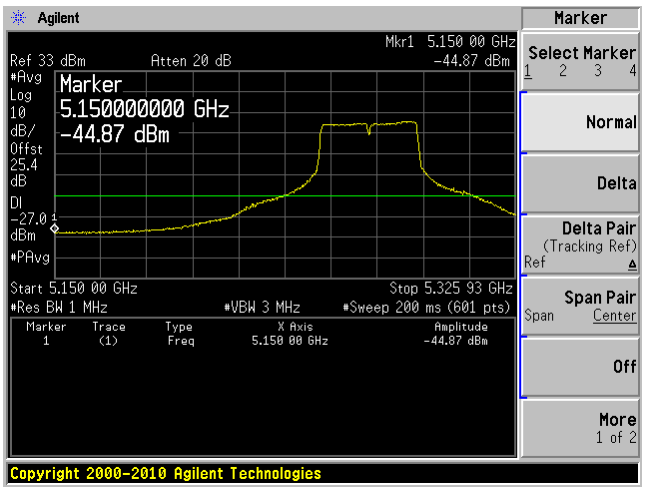
802.11n HT20 mode, Highest Channel, Combiner



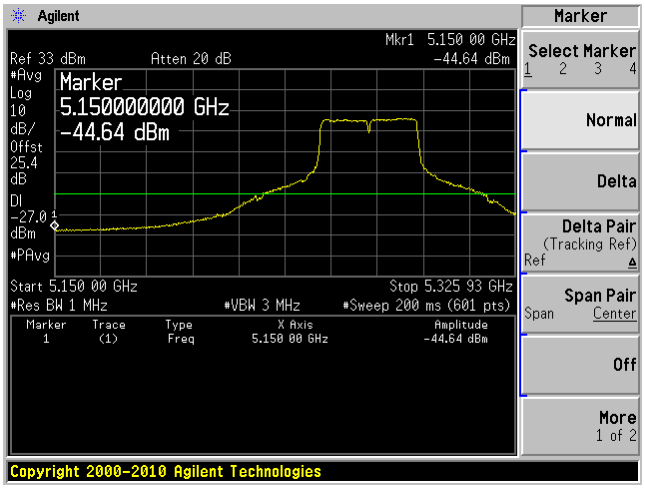
802.11n HT40 mode, Lowest Channel, Chain J10



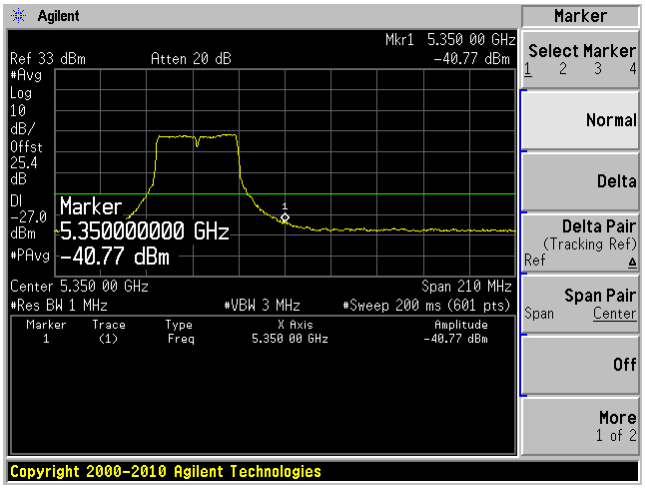
802.11n HT40 mode, Lowest Channel, Chain J8



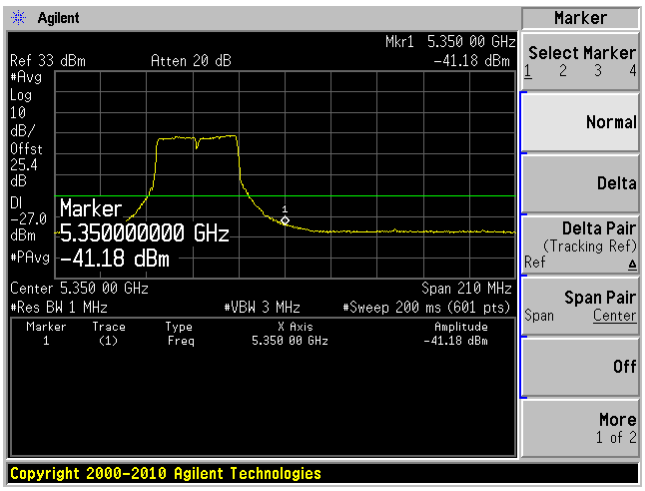
802.11n HT40 mode, Lowest Channel, Chain J6



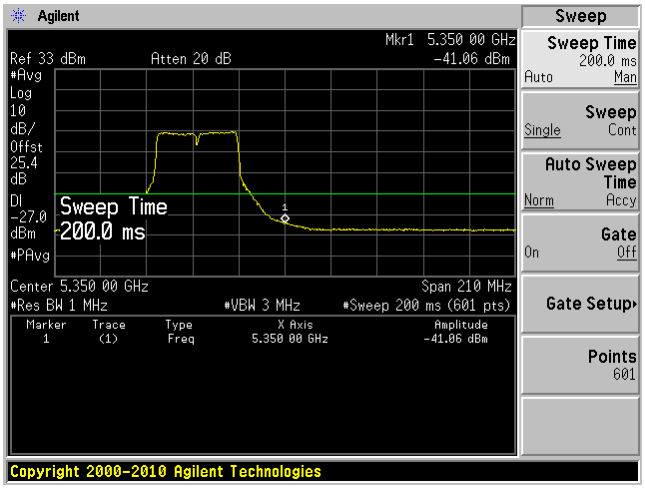
802.11n HT40 mode, Highest Channel, Chain J10



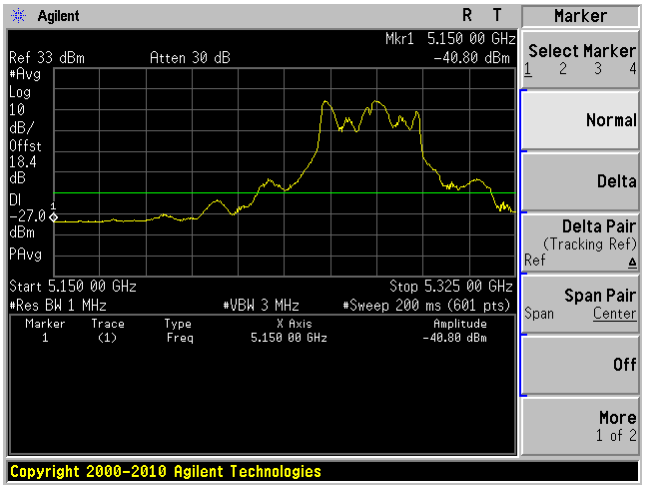
802.11n HT40 mode, Highest Channel, Chain J8



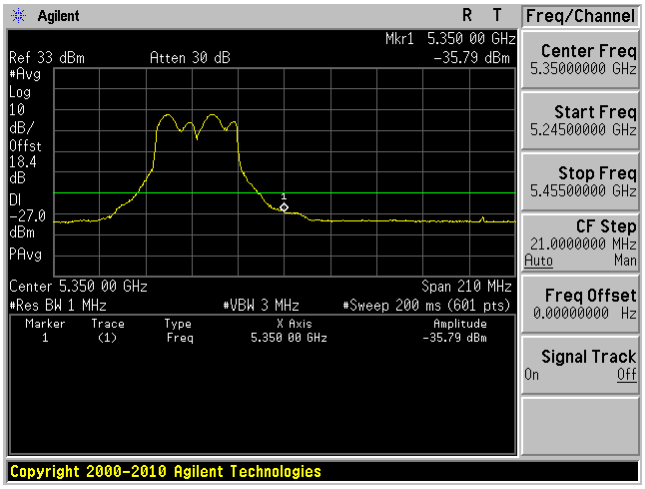
802.11n HT40 mode, Highest Channel, Chain J6



802.11n HT40 mode, Lowest Channel, Combiner

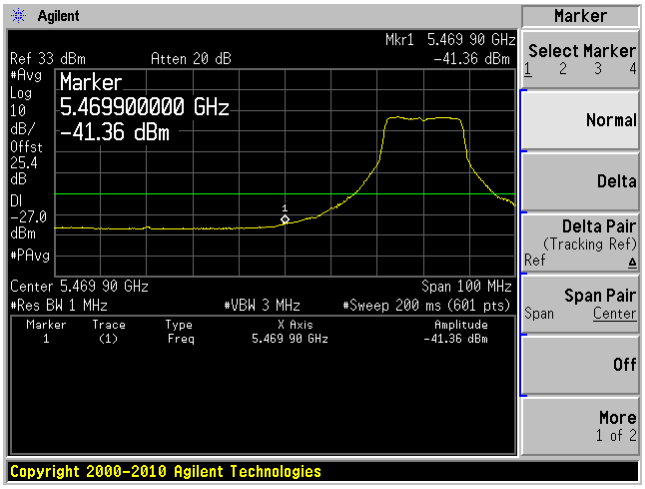


802.11n HT40 mode, Highest Channel, Combiner

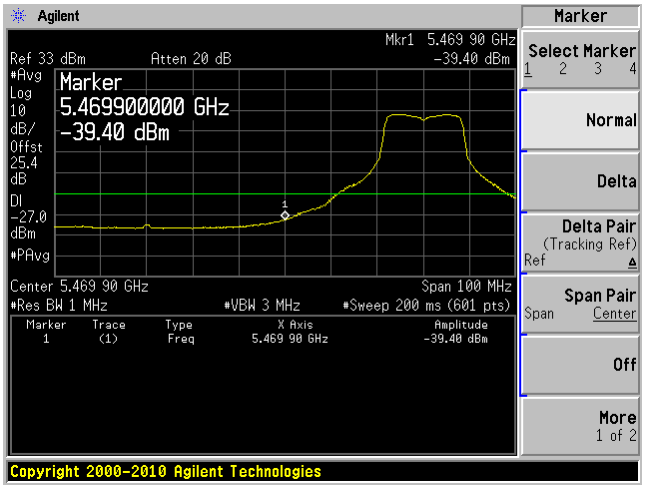


5470-5725 MHz

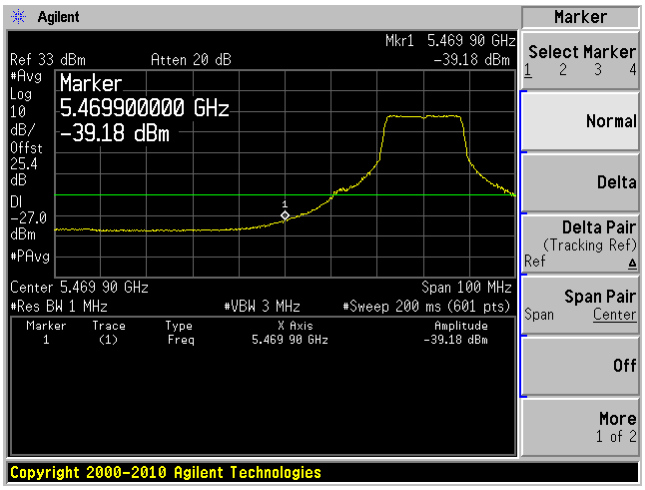
802.11a mode, Lowest Channel, Chain J10



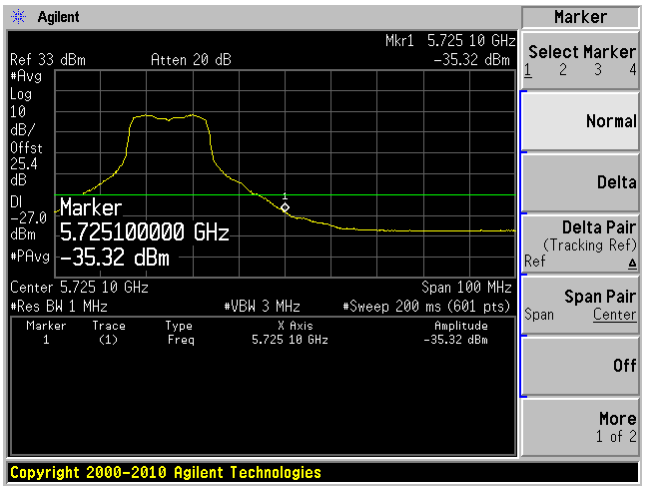
802.11a mode, Lowest Channel, Chain J8



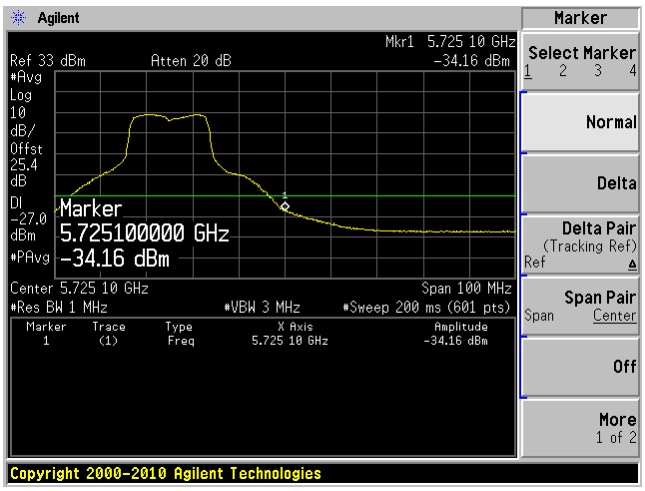
802.11a mode, Lowest Channel, Chain J6



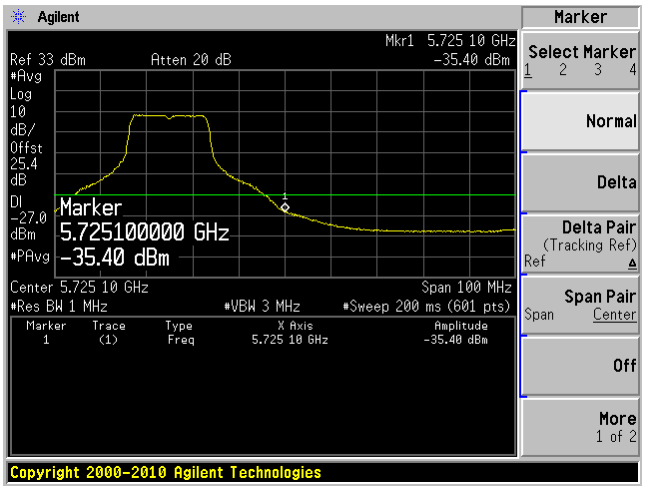
802.11a mode, Highest Channel, Chain J10



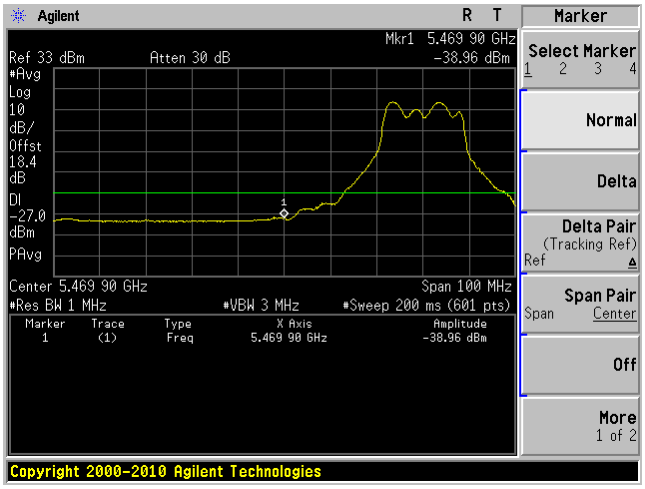
802.11a mode, Highest Channel, Chain J8



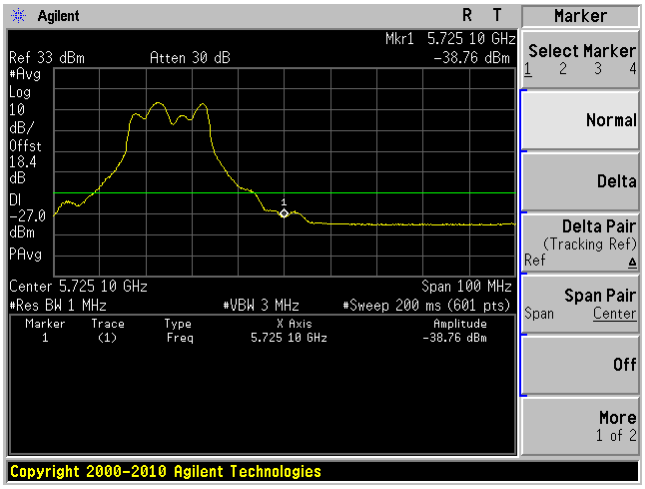
802.11a mode, Highest Channel, Chain J6



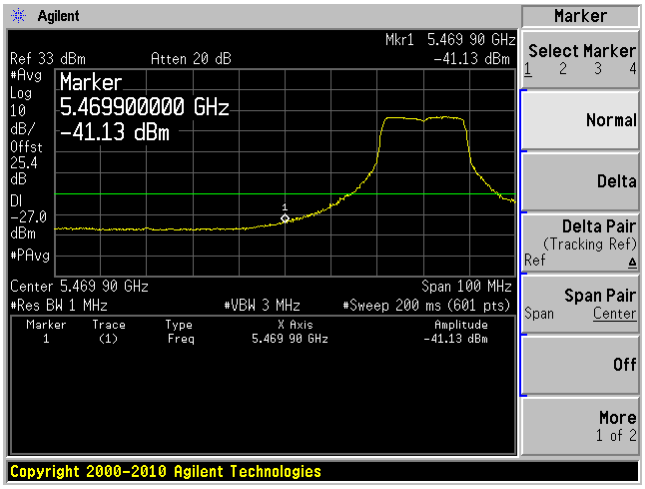
802.11a mode, Lowest Channel, Combiner



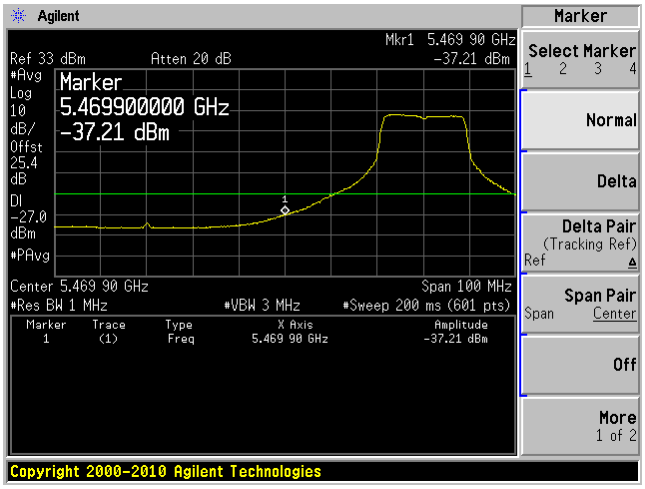
802.11a mode, Highest Channel, Combiner



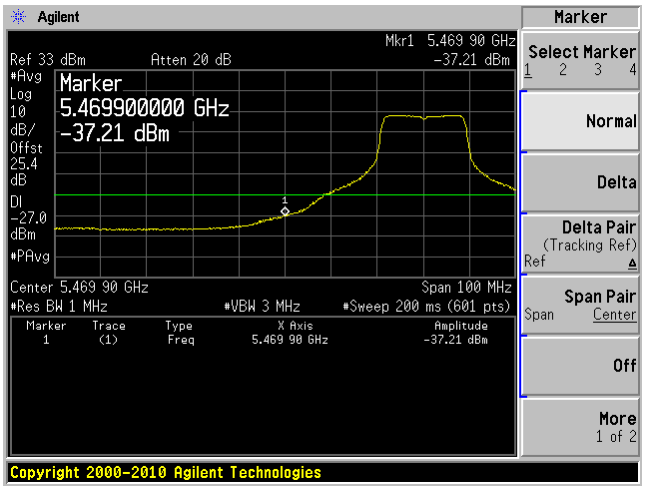
802.11n HT20 mode, Lowest Channel, Chain J10



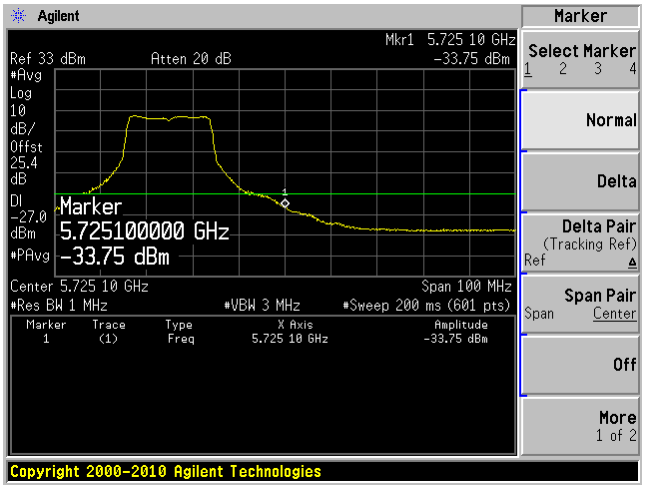
802.11n HT20 mode, Lowest Channel, Chain J8



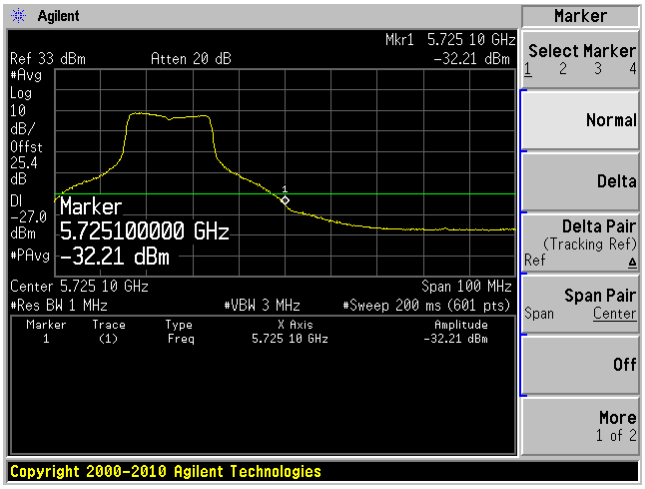
802.11n HT20 mode, Lowest Channel, Chain J6



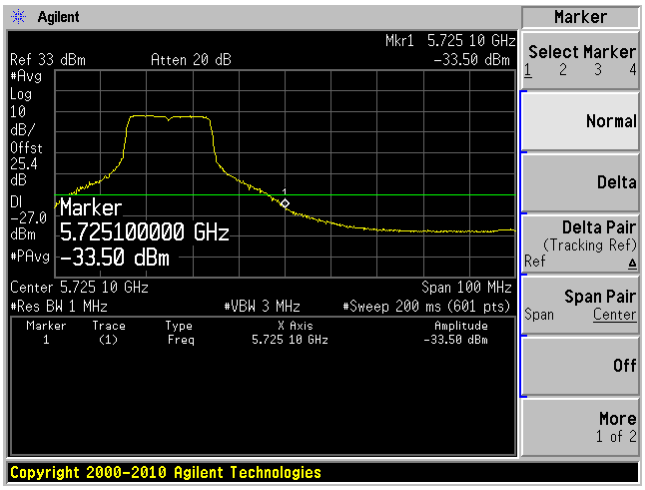
802.11n HT20 mode, Highest Channel, Chain J10



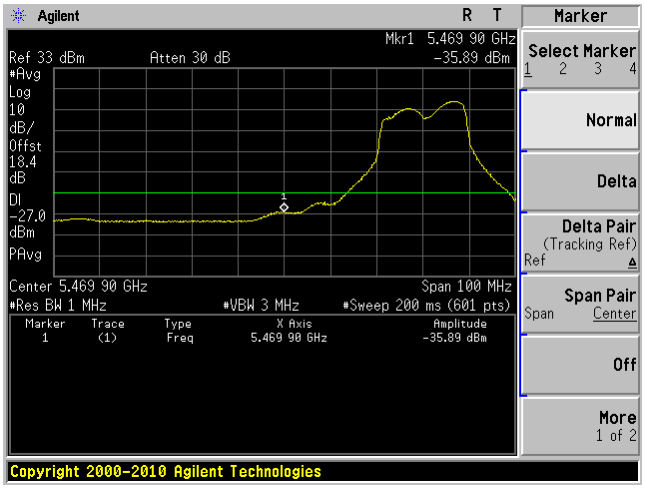
802.11n HT20 mode, Highest Channel, Chain J8



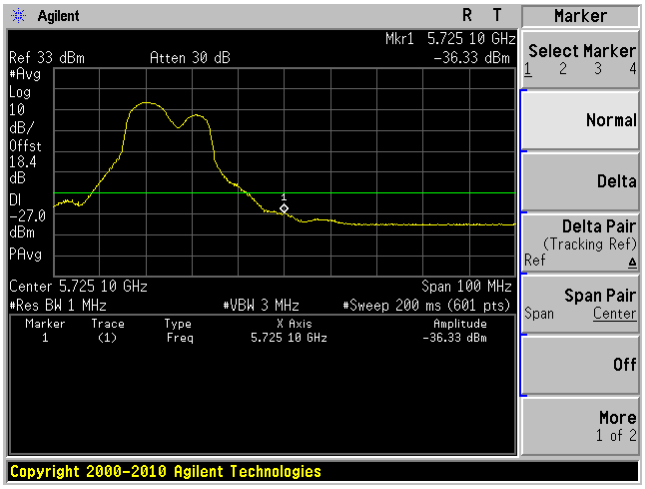
802.11n HT20 mode, Highest Channel, Chain J6



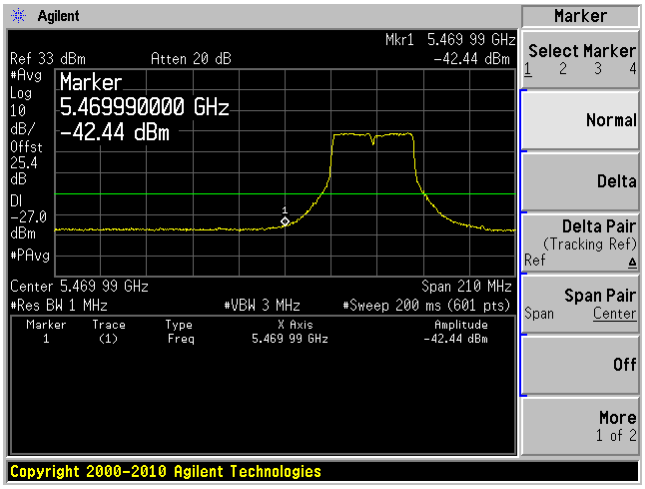
802.11n HT20 mode, Lowest Channel, Combiner



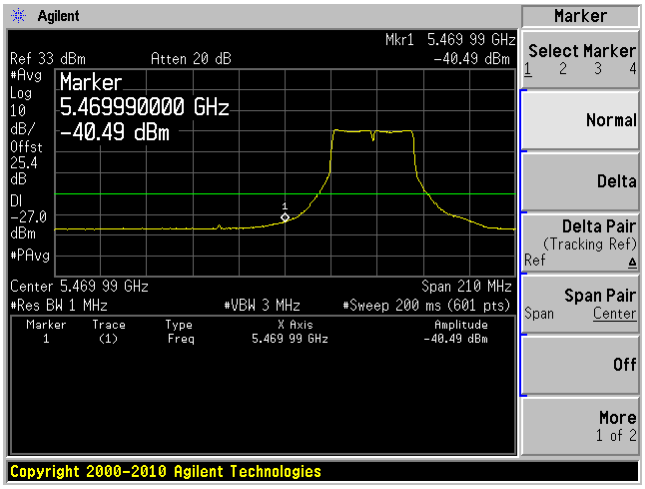
802.11n HT20 mode, Highest Channel, Combiner



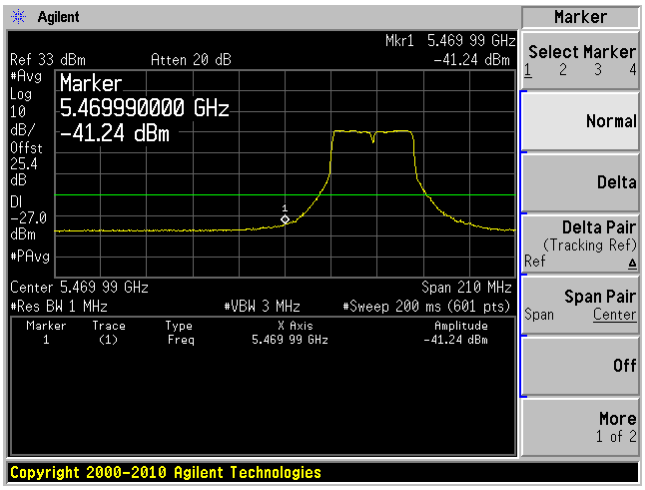
802.11n HT40 mode, Lowest Channel, Chain J10



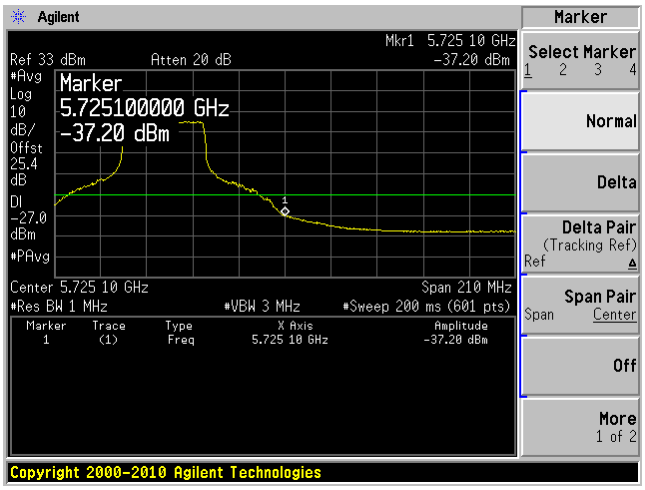
802.11n HT40 mode, Lowest Channel, Chain J8



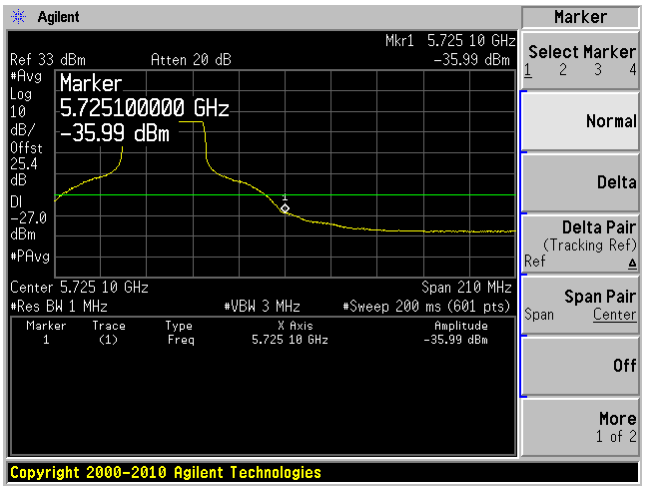
802.11n HT40 mode, Lowest Channel, Chain J6



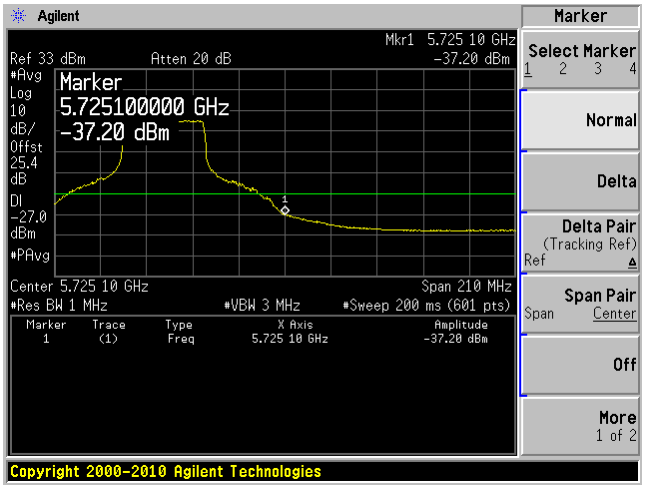
802.11n HT40 mode, Highest Channel, Chain J10



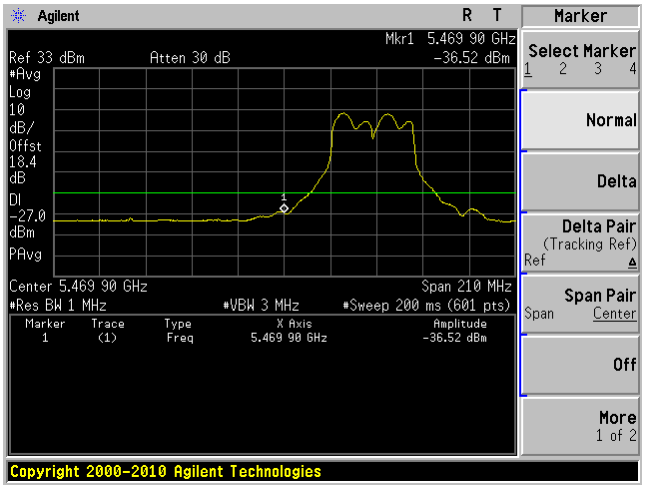
802.11n HT40 mode, Highest Channel, Chain J8



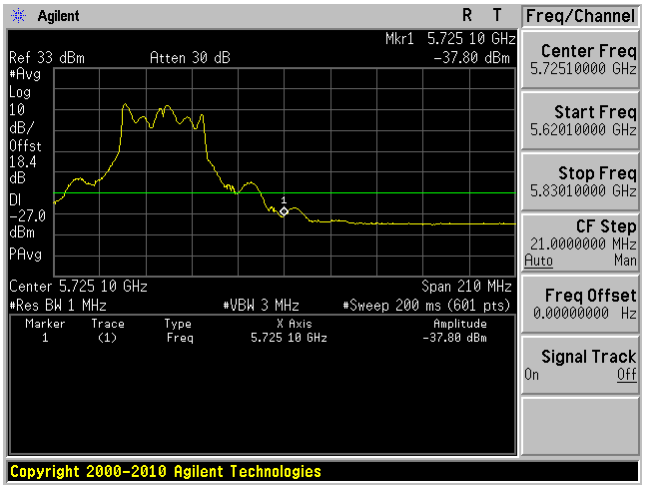
802.11n HT40 mode, Highest Channel, Chain J6



802.11n HT40 mode, Lowest Channel, Combiner



802.11n HT40 mode, Highest Channel, Combiner



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 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 5.25–5.35 GHz, 5.47-5.6 GHz, and 5.650–5.725 GHz bands, the maximum conducted output power shall not exceed 250 mW or 11 dBm + 10 log B, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1 megahertz band. The maximum e.i.r.p shall not exceed 1.0W or 17 + 10 10B, dbm, whichever is less. B is the 99% emission bandwidth in MHz.

11.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 1.5MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Repeat above procedures until all frequencies measured were complete.

11.3 Test Equipment List and Details

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

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

11.4 Test Environmental Conditions

Temperature:	20~24 °C
Relative Humidity:	37~45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Quinn Jiang and Jeffery Wu on 2012-05-04, 2012-05-07, and 2012-05-09 in RF site

11.5 Test Results

5250-5350 MHz

Channel	Frequency (MHz)	TX Chain J10 PSD (dBm)	TX Chain J8 PSD (dBm)	TX Chain J6 PSD (dBm)	Total Power PSD (dBm)	Limit (dBm/MHz)	Margin (dB)
802.11a mode							
Low	5260	4.019	5.871	6.582	10.39	11	-0.61
Middle	5280	5.097	5.92	6.161	10.52	11	-0.48
High	5320	5.209	4.8	6.872	10.49	11	-0.51
802.11n HT20 mode							
Low	5260	4.413	5.86	6.751	10.55	11	-0.45
Middle	5280	5.235	6.049	6.196	10.62	11	-0.38
High	5320	4.559	5.324	6.34	10.24	11	-0.76
802.11n HT40 mode							
Low	5270	4.171	5.945	6.217	10.31	11	-0.69
High	5310	-1.846	-1.083	-0.429	3.69	11	-7.31

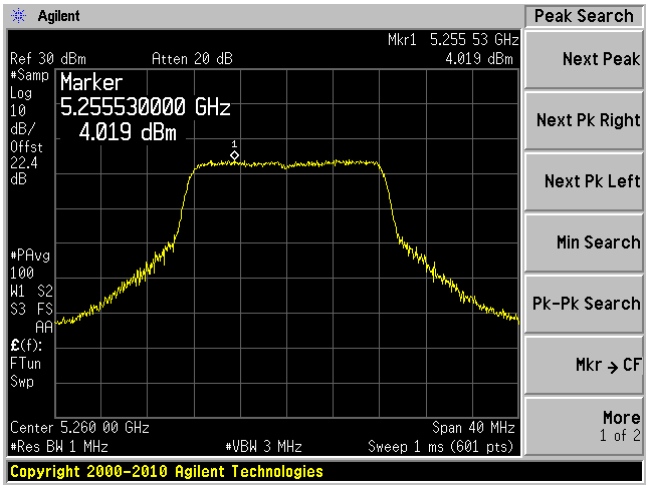
5470-5725 MHz

Channel	Frequency (MHz)	TX Chain J10 PSD (dBm)	TX Chain J8 PSD (dBm)	TX Chain J6 PSD (dBm)	Total Power PSD (dBm)	Limit (dBm/MHz)	Margin (dB)
802.11a mode							
Low	5500	4.696	5.892	6.233	10.43	11	-0.57
Middle	5580	4.463	6.1105	5.968	10.35	11	-0.65
High	5700	5.675	6.183	5.891	10.69	11	-0.31
802.11n HT20 mode							
Low	5500	5.136	6.163	6.37	10.69	11	-0.31
Middle	5580	4.805	5.912	6.38	10.52	11	-0.48
High	5700	5.005	5.98	5.231	10.20	11	-0.8
802.11n HT40 mode							
Low	5510	-0.614	-0.096	0.297	4.65	11	-6.35
Middle	5550	4.405	4.939	5.163	9.62	11	-1.38
High	5670	4.344	5.694	4.646	9.71	11	-1.29

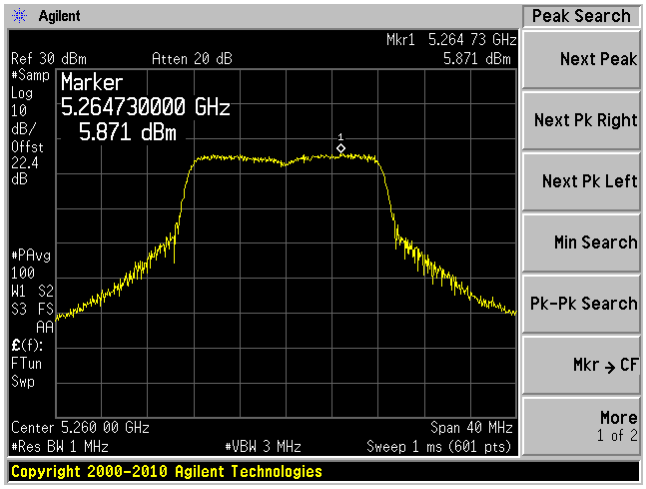
Please refer to the following plots.

5250-5350 MHz

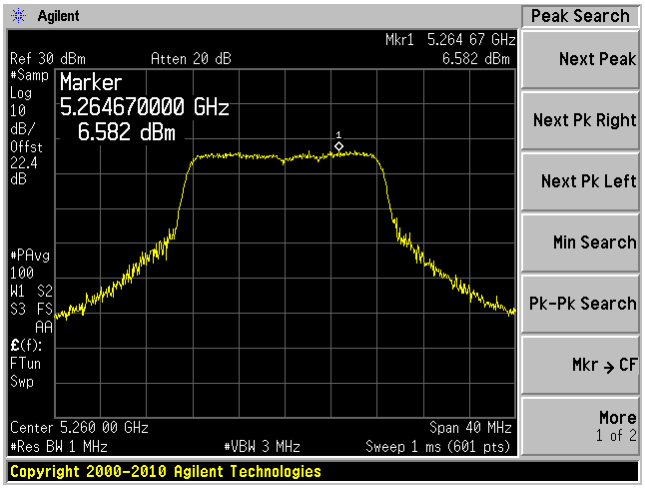
802.11a mode, 5260 MHz, Chain J10



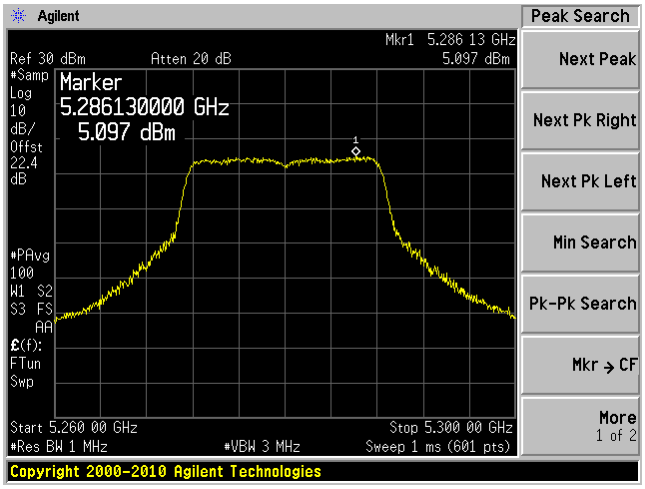
802.11a mode, 5260 MHz, Chain J8



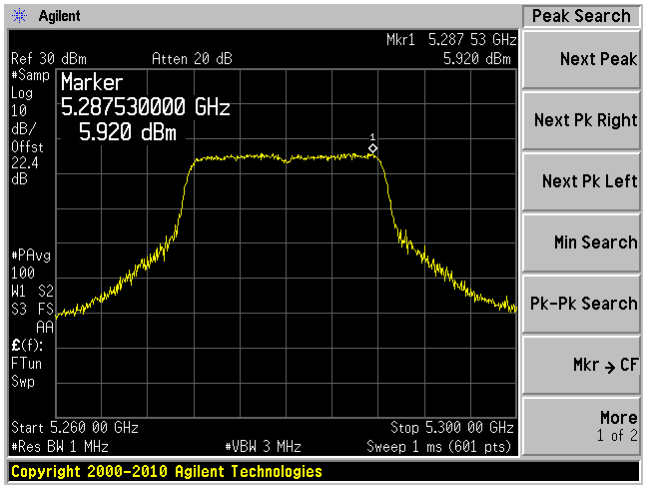
802.11a mode, 5260 MHz, Chain J6



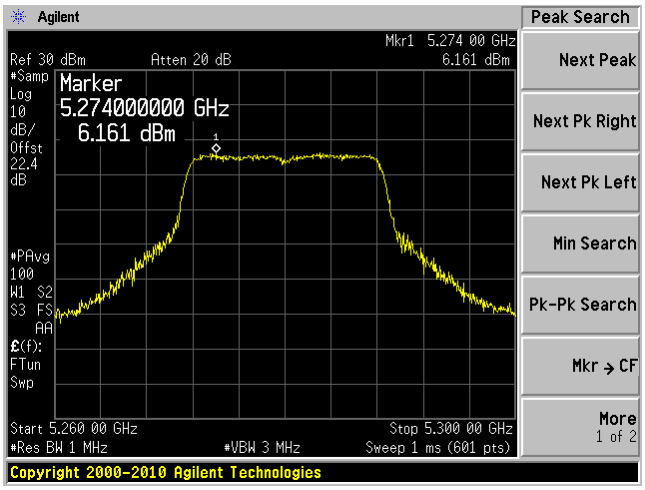
802.11a mode, 5280 MHz, Chain J10



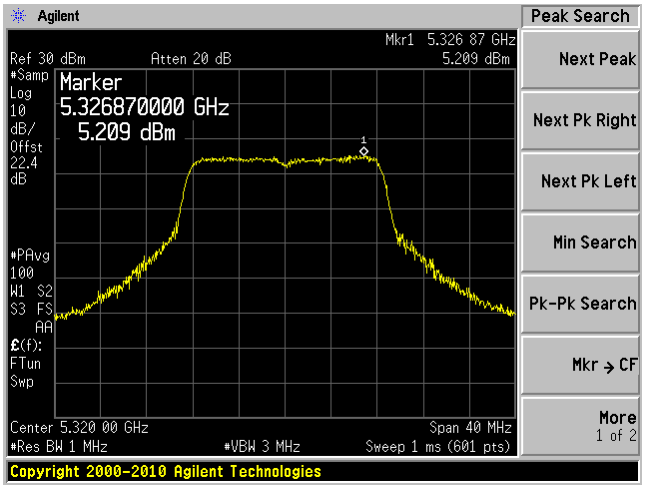
802.11a mode, 5280 MHz, Chain J8



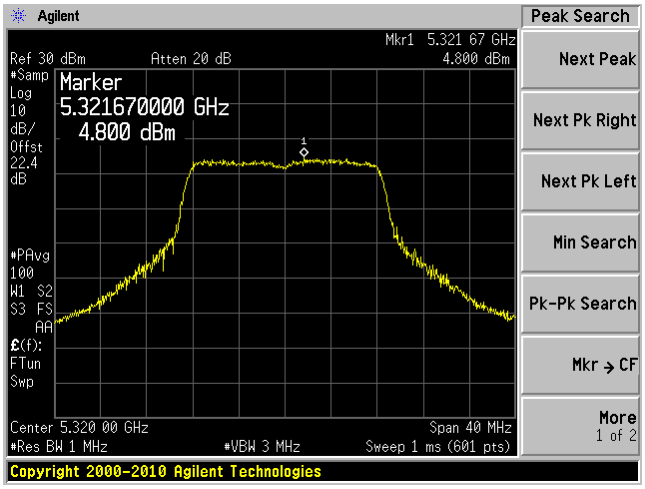
802.11a mode, 5280 MHz, Chain J6



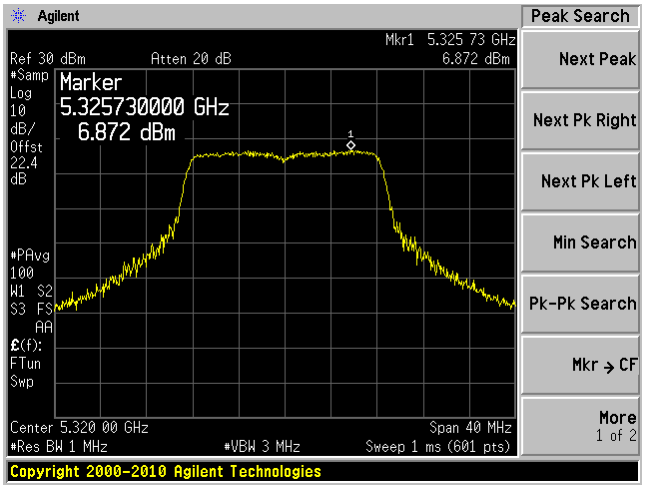
802.11a mode, 5320 MHz, Chain J10



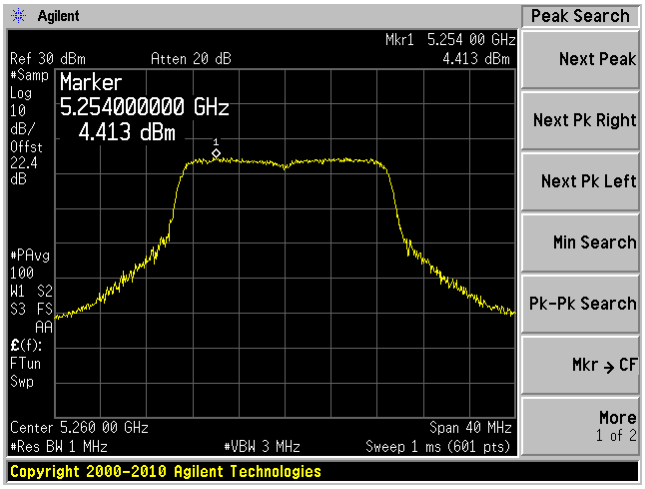
802.11a mode, 5320 MHz, Chain J8



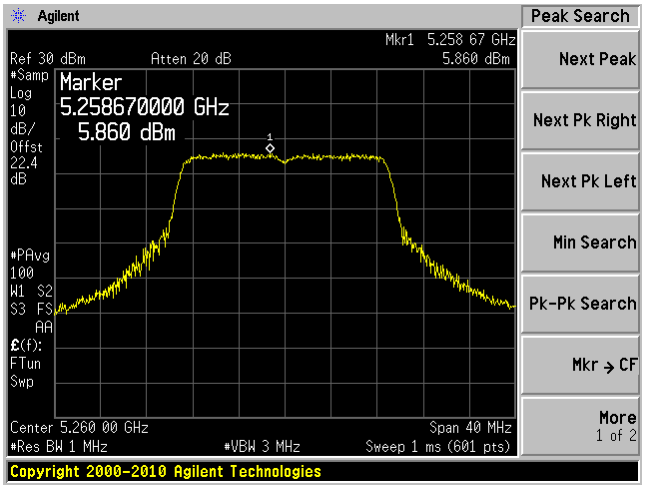
802.11a mode, 5320 MHz, Chain J6



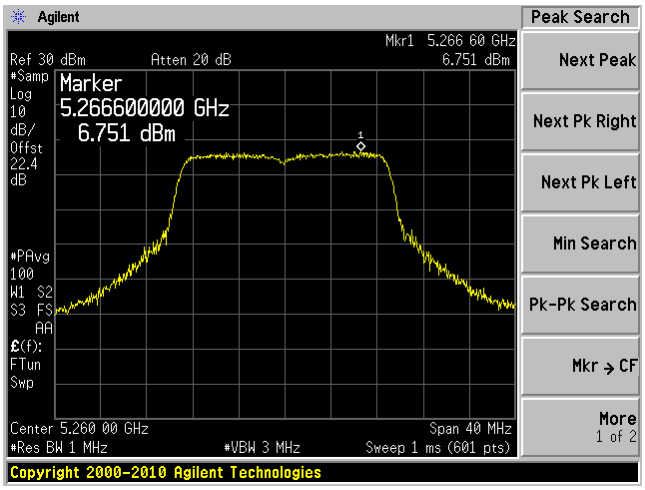
802.11n HT20 mode, 5260 MHz, Chain J10



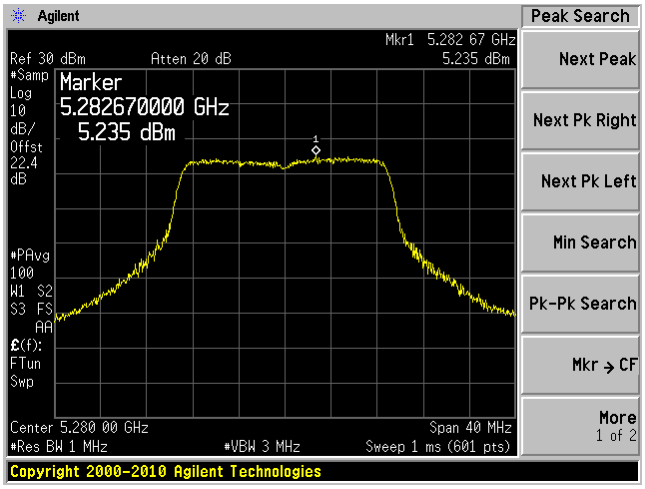
802.11n HT20 mode, 5260 MHz, Chain J8



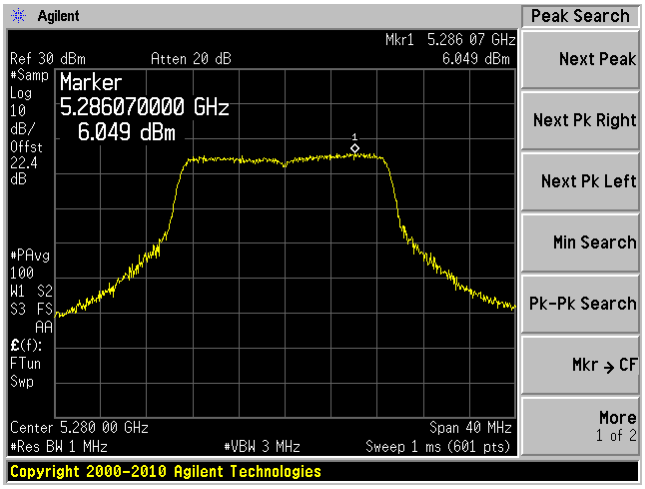
802.11n HT20 mode, 5260 MHz, Chain J6



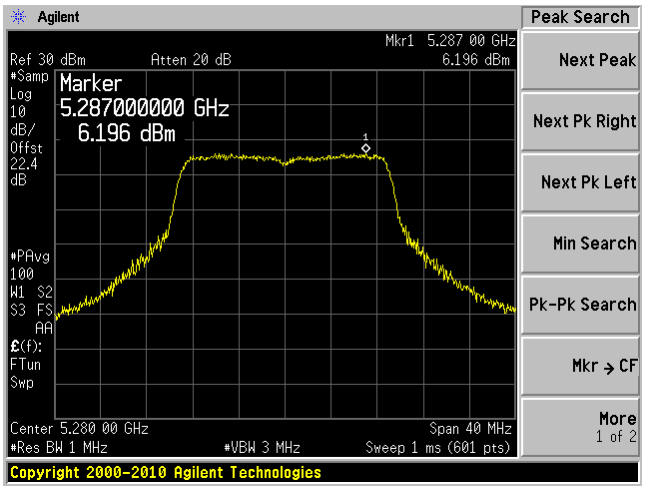
802.11n HT20 mode, 5280 MHz, Chain J10



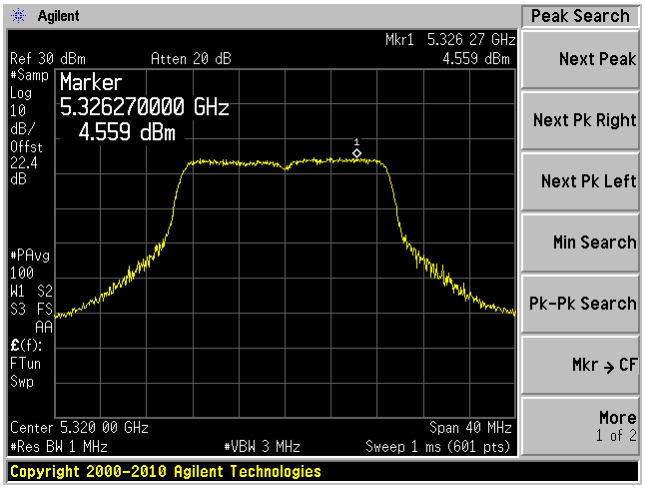
802.11n HT20 mode, 5280 MHz, Chain J8



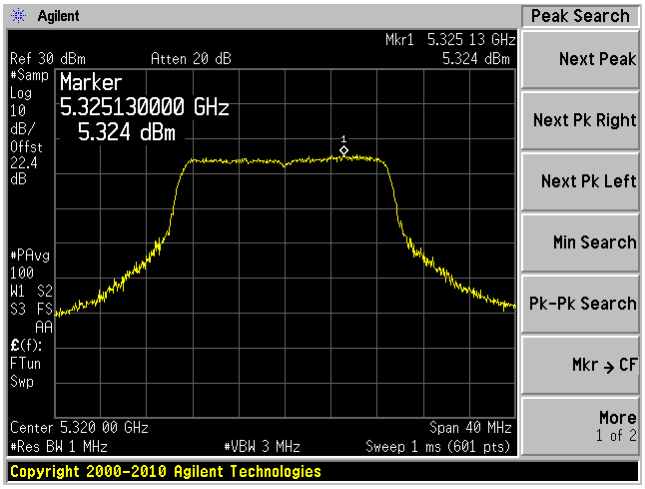
802.11n HT20 mode, 5280 MHz, Chain J6



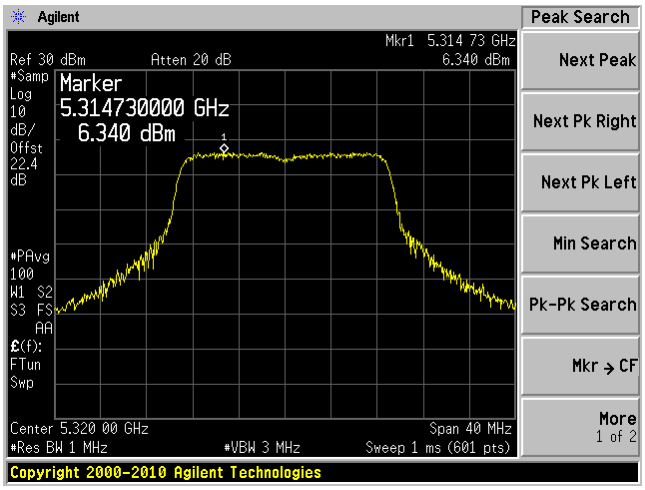
802.11n HT20 mode, 5320 MHz, Chain J10



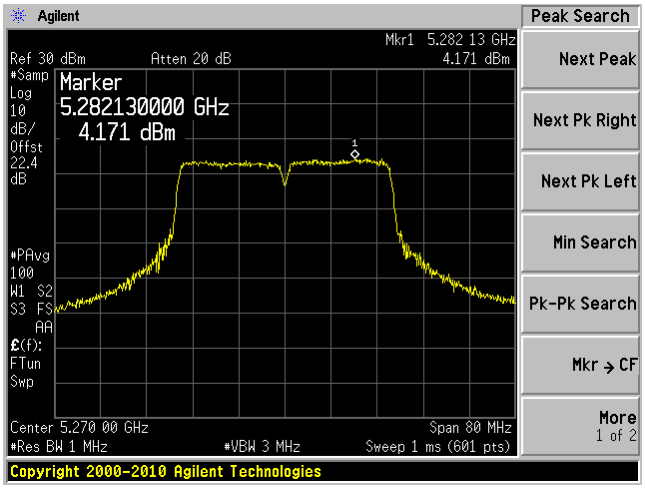
802.11n HT20 mode, 5320 MHz, Chain J8



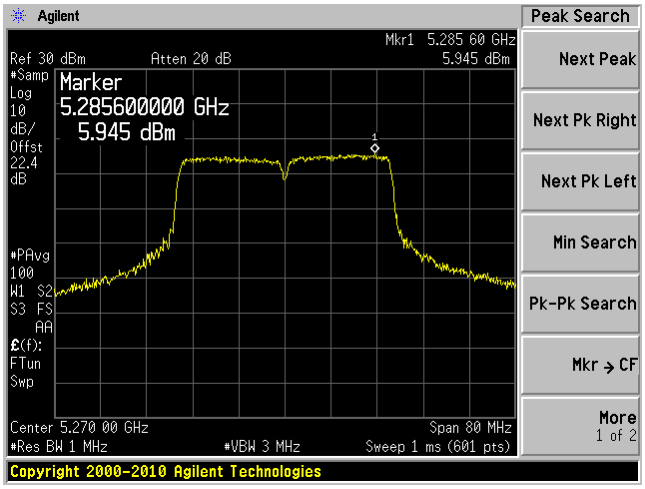
802.11n HT20 mode, 5320 MHz, Chain J6



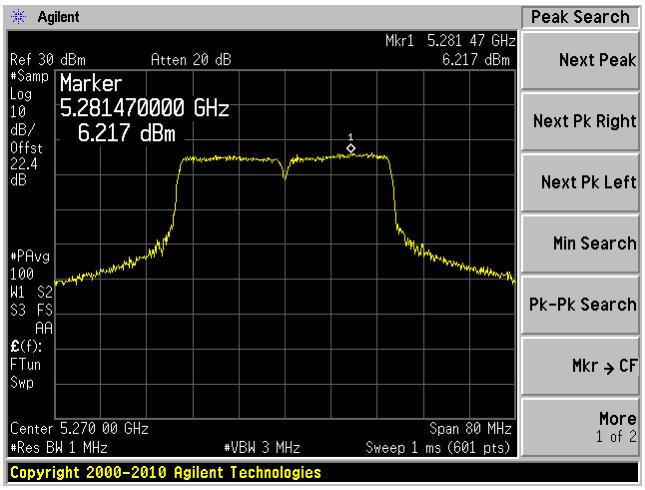
802.11n HT40 mode, 5270 MHz, Chain J10



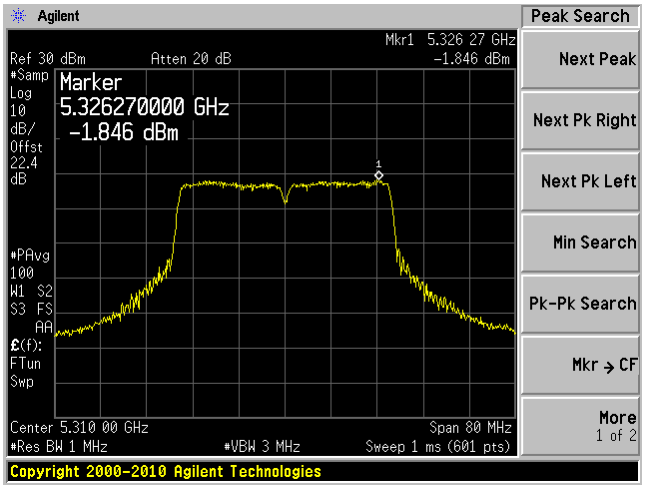
802.11n HT40 mode, 5270 MHz, Chain J8



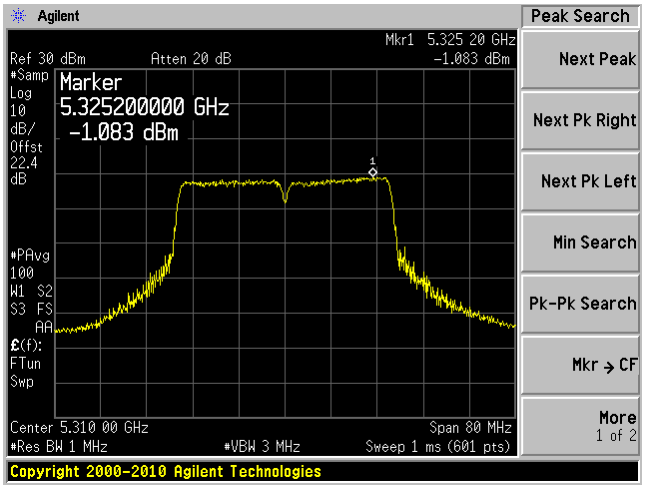
802.11n HT40 mode, 5270 MHz, Chain J6



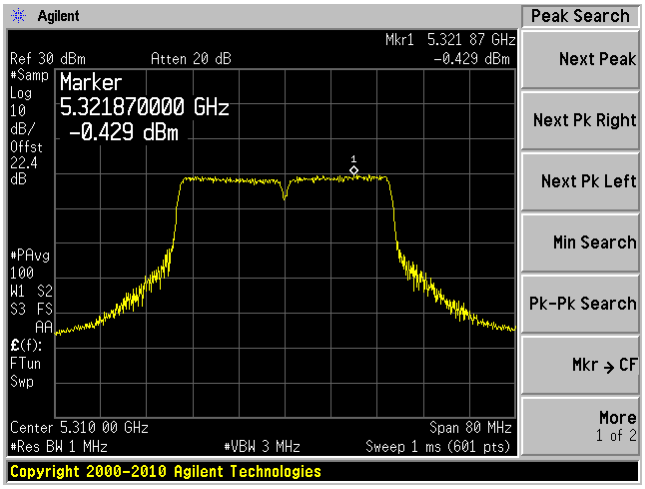
802.11n HT40 mode, 5310 MHz, Chain J10



802.11n HT40 mode, 5310 MHz, Chain J8

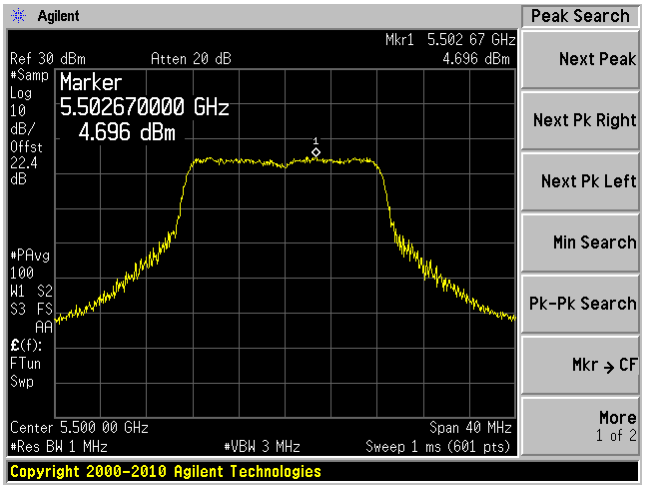


802.11n HT40 mode, 5310 MHz, Chain J6

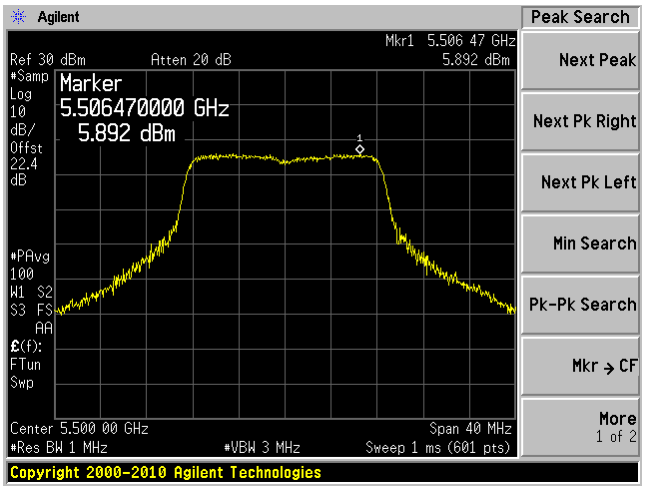


5470-5725 MHz

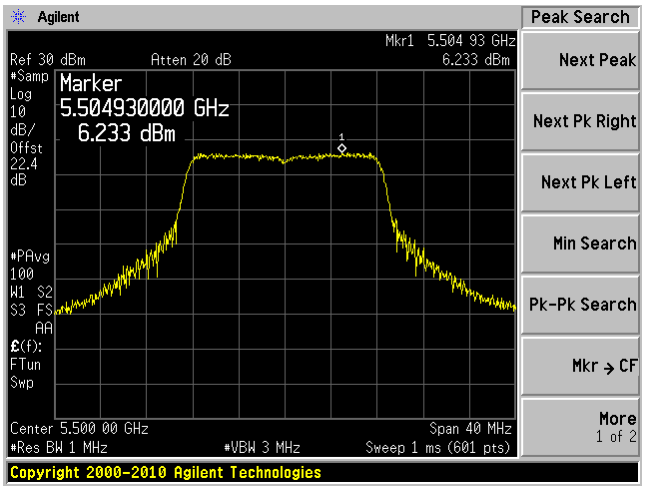
802.11a mode, 5500 MHz, Chain J10



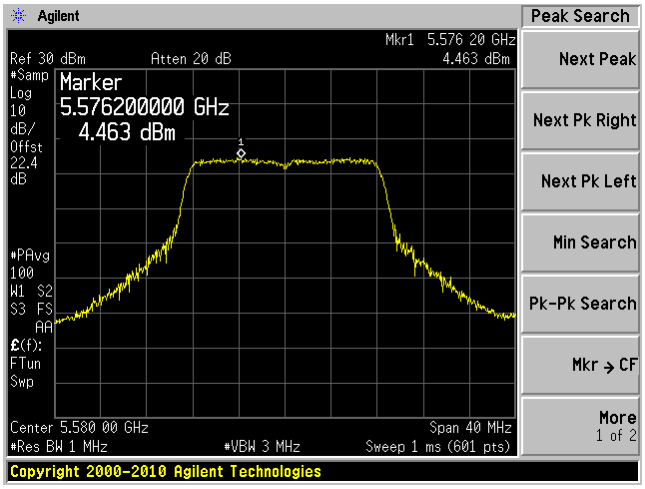
802.11a mode, 5500 MHz, Chain J8



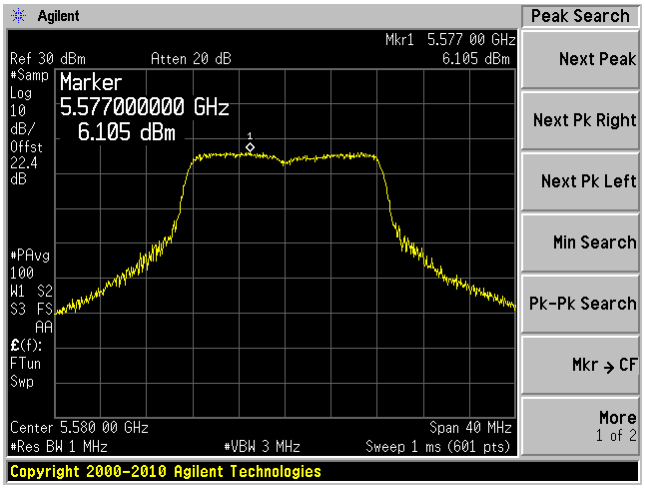
802.11a mode, 5500 MHz, Chain J6



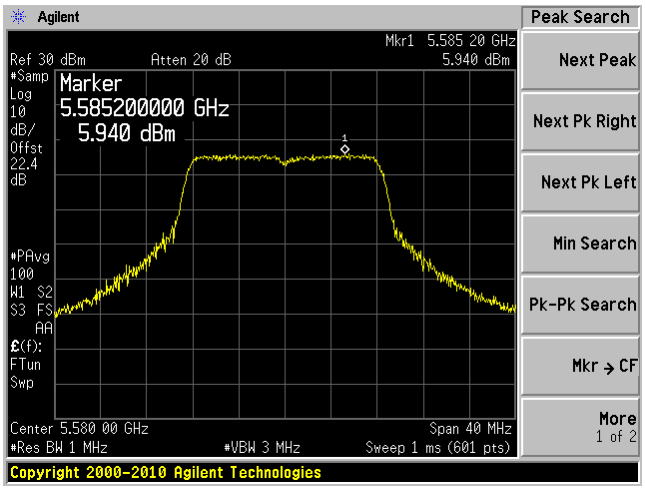
802.11a mode, 5580 MHz, Chain J10



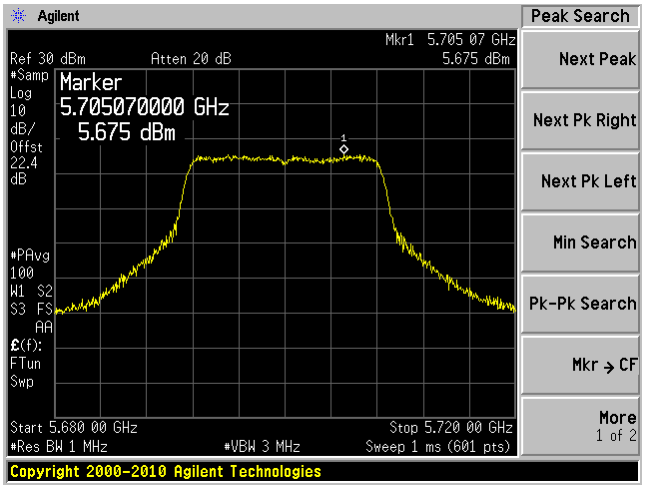
802.11a mode, 5580 MHz, Chain J8



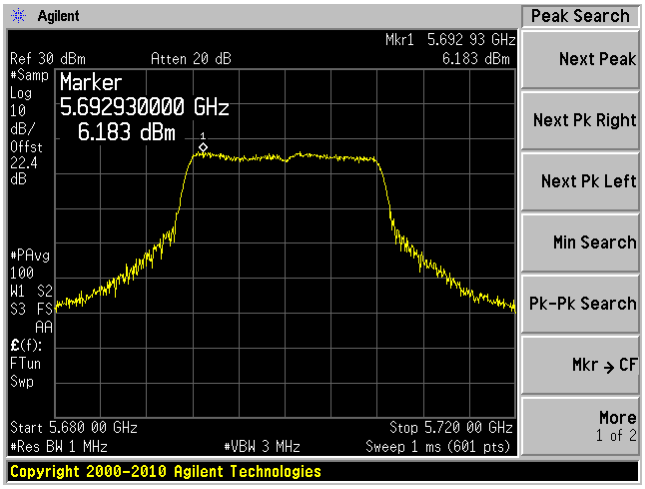
802.11a mode, 5580 MHz, Chain J6



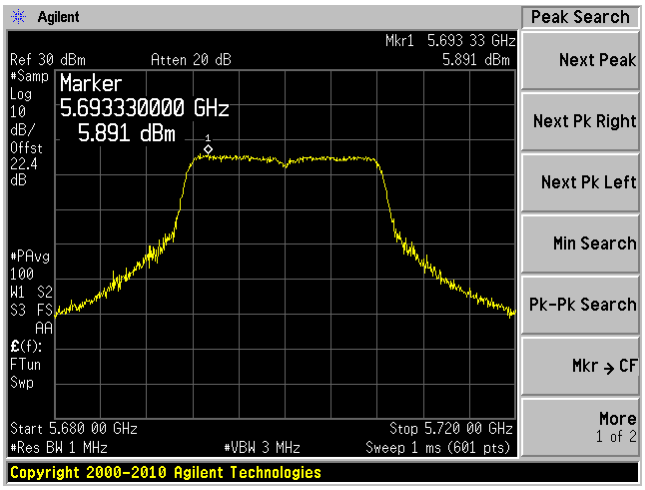
802.11a mode, 5700 MHz, Chain J10



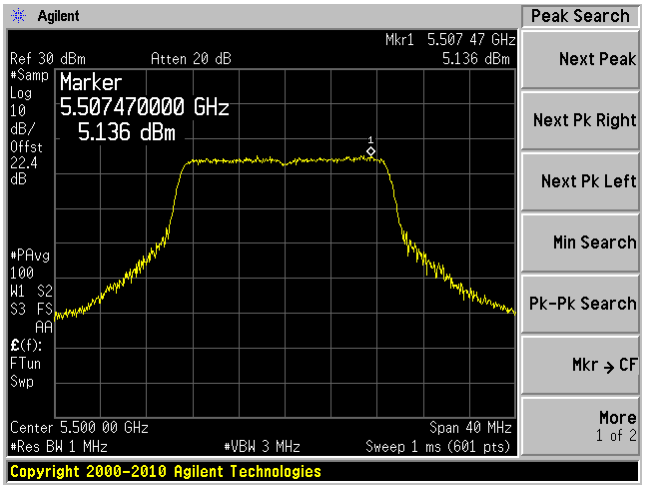
802.11a mode, 5700 MHz, Chain J8



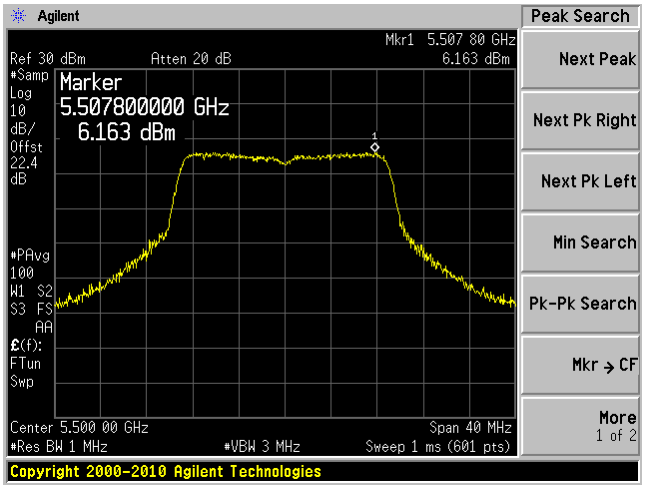
802.11a mode, 5700 MHz, Chain J6



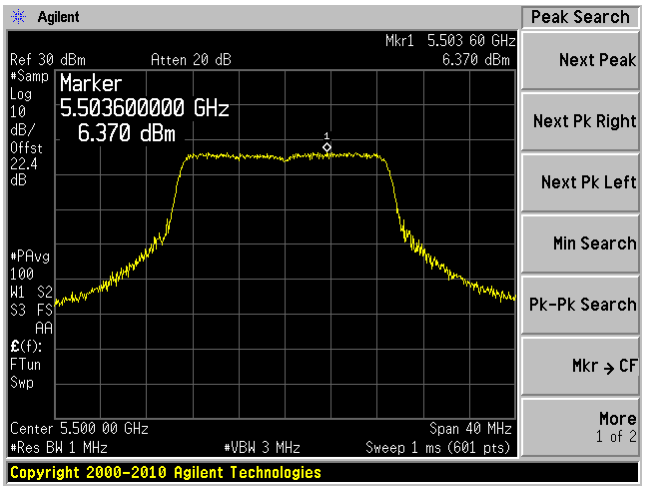
802.11n HT20 mode, 5500 MHz, Chain J10



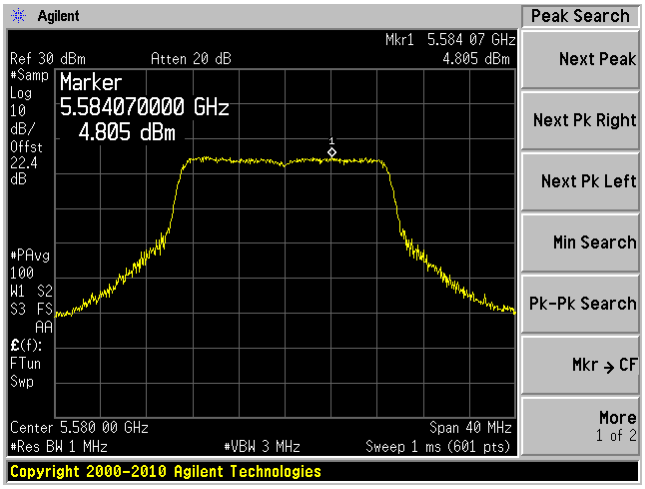
802.11n HT20 mode, 5500 MHz, Chain J8



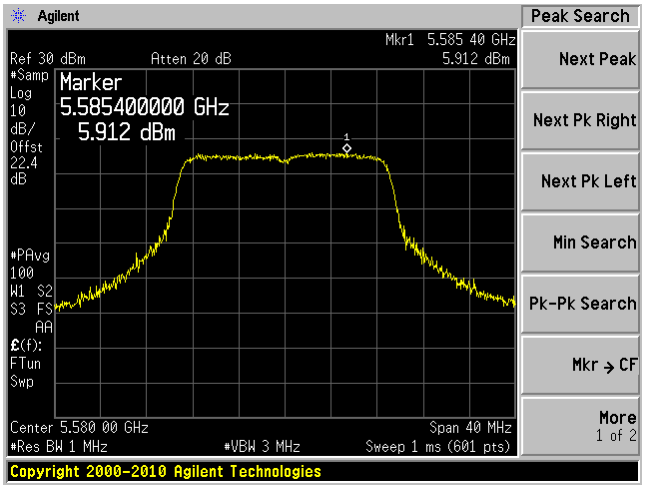
802.11n HT20 mode, 5500 MHz, Chain J6



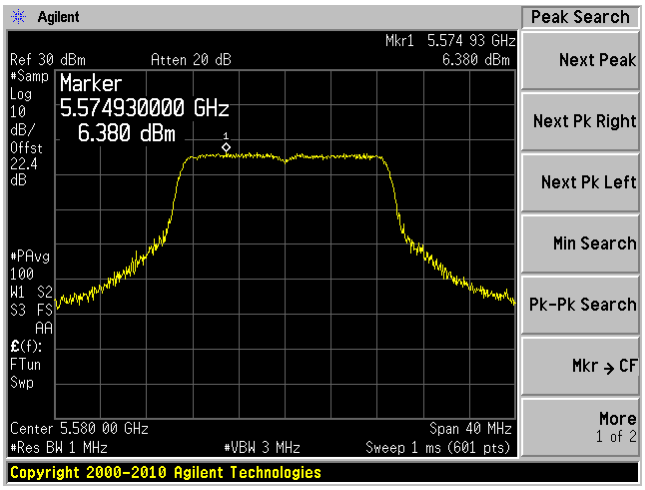
802.11n HT20 mode, 5580 MHz, Chain J10



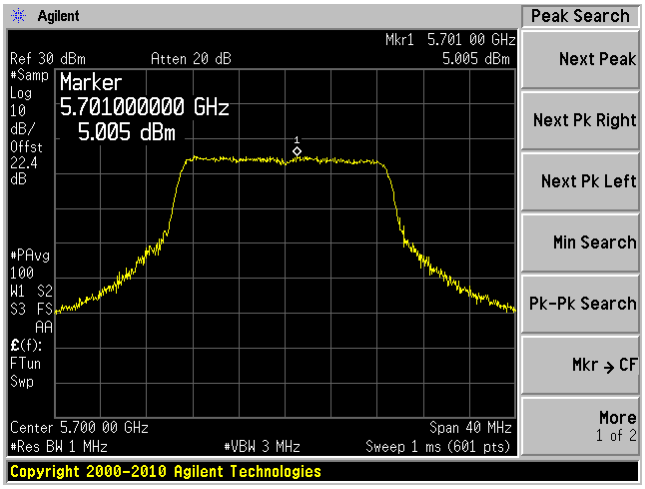
802.11n HT20 mode, 5580 MHz, Chain J8



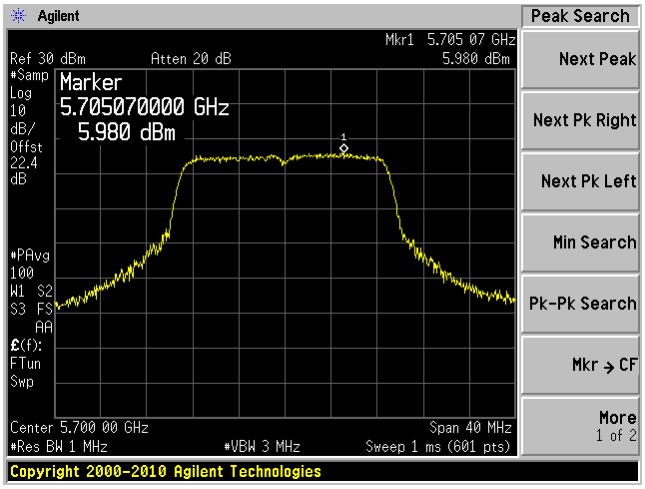
802.11n HT20 mode, 5580 MHz, Chain J6



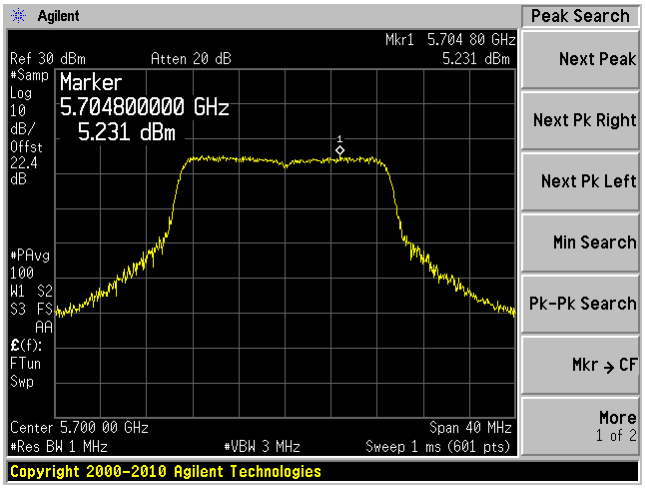
802.11n HT20 mode, 5700 MHz, Chain J10



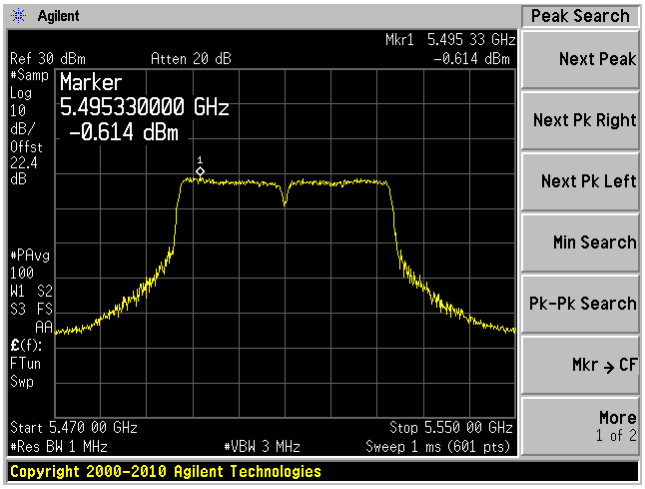
802.11n HT20 mode, 5700 MHz, Chain J8



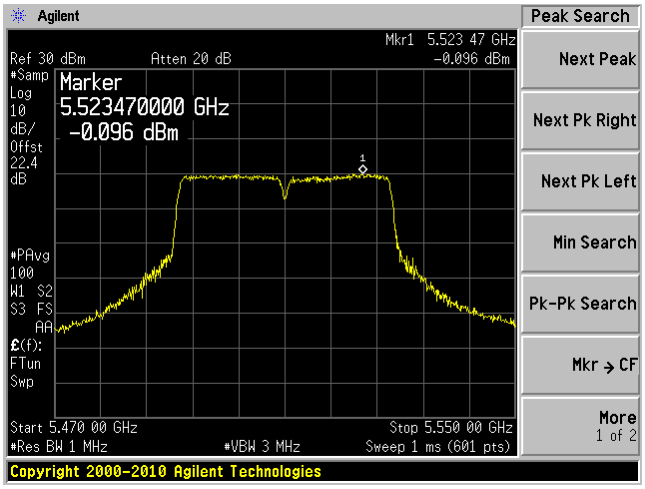
802.11n HT20 mode, 5700 MHz, Chain J6



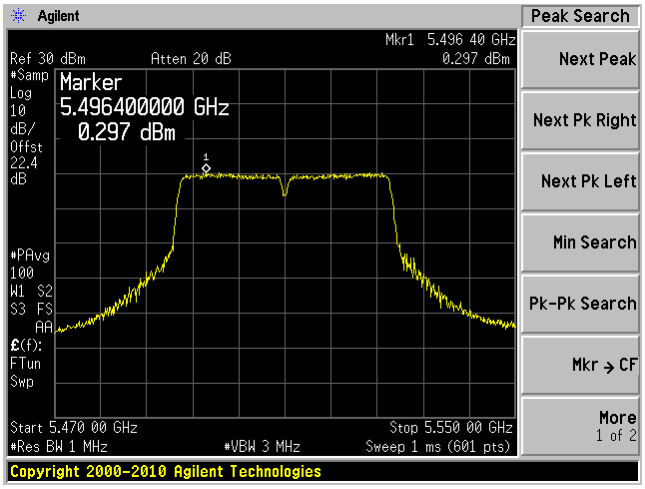
802.11n HT40 mode, 5510 MHz, Chain J10



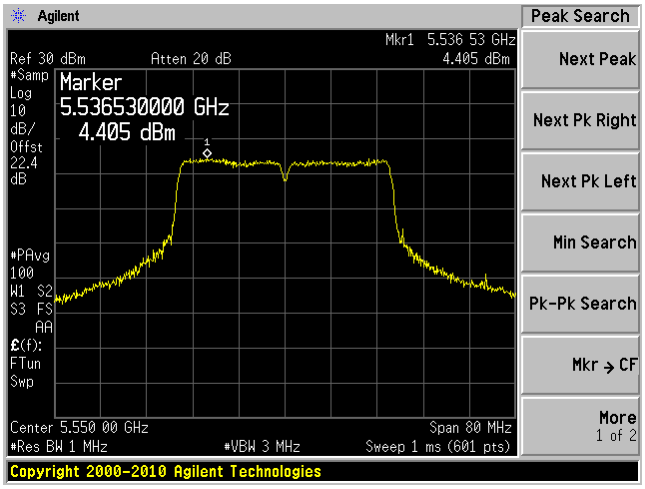
802.11n HT40 mode, 5510 MHz, Chain J8



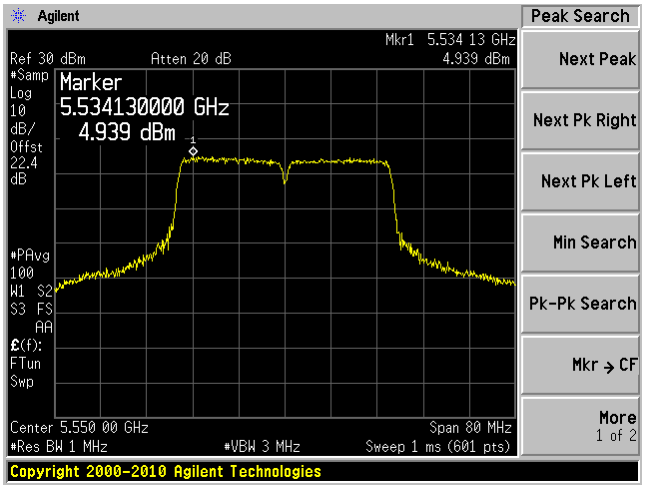
802.11n HT40 mode, 5510 MHz, Chain J6



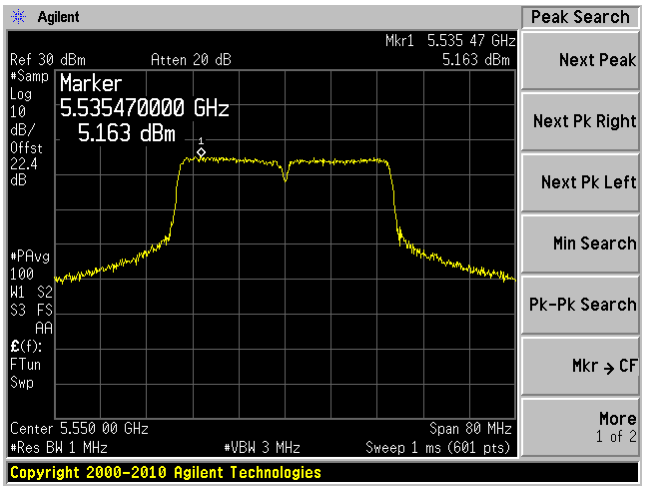
802.11n HT40 mode, 5550 MHz, Chain J10



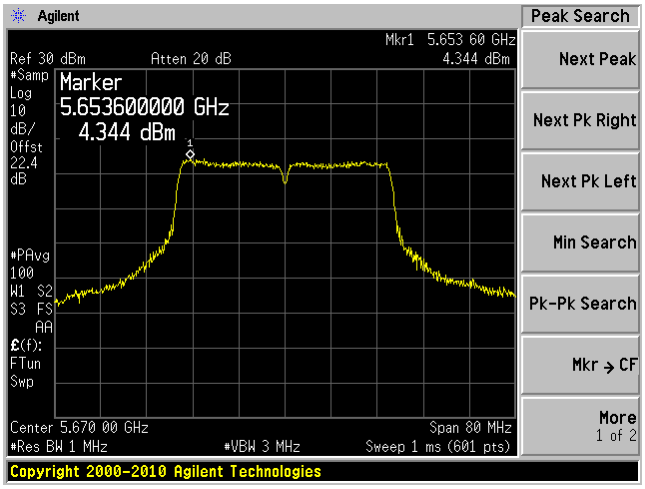
802.11n HT40 mode, 5550 MHz, Chain J8



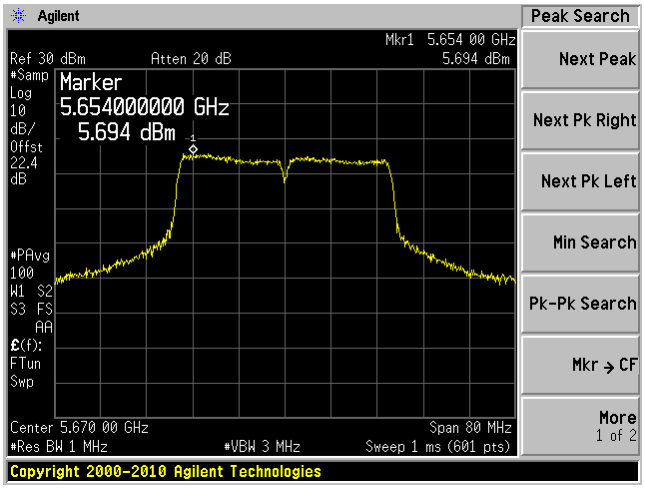
802.11n HT40 mode, 5550 MHz, Chain J6



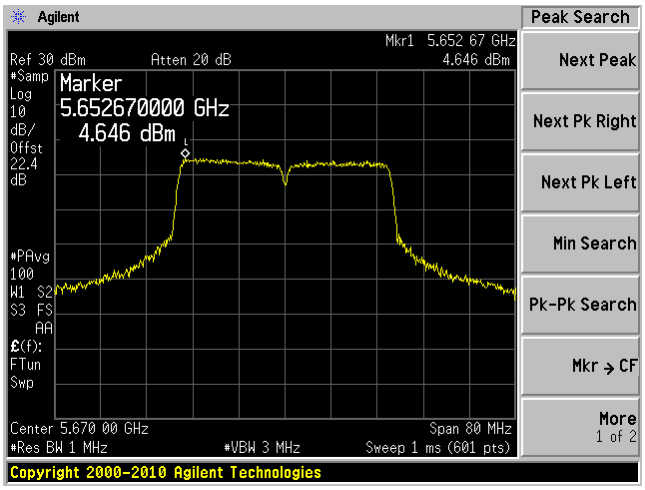
802.11n HT40 mode, 5670 MHz, Chain J10



802.11n HT40 mode, 5670 MHz, Chain J8



802.11n HT40 mode, 5670 MHz, Chain J6



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

Set the spectrum analyzer span to view the entire emission bandwidth.
The largest difference between the following two traces must be ≤ 13 dB for all frequencies across the emission bandwidth. Submit a plot.

1st Trace:
• Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and maxhold settings.

2nd Trace:
• create the 2nd trace using the settings described in the setion "FCC §15.407(a)(1)(2) – CONDUCTED TRANSMITTER OUTPUT POWER".

12.3 Test Equipment List and Details

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

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

12.4 Test Environmental Conditions

Temperature:	20~24 °C
Relative Humidity:	37~45 %
ATM Pressure:	101.1-102 kPa

The testing was performed by Quinn Jiang and Jeffery Wu on 2012-05-04, 2012-05-07, and 2012-05-09 in RF site

12.5 Test Results

5250-5350 MHz

Channel	Frequency (MHz)	TX Chain J10 PER (dB)	TX Chain J8 PER (dB)	TX Chain J6 PER (dB)	Limit (dB)
802.11a mode					
Low	5260	8.413	8.137	7.702	13
Middle	5280	7.884	7.02	7.427	
High	5320	8.004	8.129	7.265	
802.11n HT20 mode					
Low	5260	7.686	8.589	7.867	13
Middle	5280	7.349	8.215	7.372	
High	5320	7.256	7.809	7.352	
802.11n HT40 mode					
Low	5270	7.471	8.372	7.081	13
High	5310	7.71	7.596	7.443	

5470-5725 MHz

Channel	Frequency (MHz)	TX Chain J10 PER (dB)	TX Chain J8 PER (dB)	TX Chain J6 PER (dB)	Limit (dB)
802.11a mode					
Low	5500	8.195	8.184	7.295	13
Middle	5580	8.219	7.73	7.643	
High	5700	8.42	7.865	7.345	
802.11n HT20 mode					
Low	5500	7.415	7.497	7.669	13
Middle	5580	8.723	7.674	7.463	
High	5700	8.535	6.917	7.22	
802.11n HT40 mode					
Low	5510	7.017	7.846	7.759	13
Middle	5550	7.616	7.581	7.358	
High	5670	8.34	8.534	7.512	

13 IC RSS-210 §2.3 & RSS-Gen §6 - Receiver Spurious Radiated Emissions

13.1 Applicable Standard

According to IC RSS-Gen §4.10, the receiver shall be operated in the normal receive mode near the mid-point of the band over which the receiver is designed to operate.

Unless otherwise specified in the applicable RSS, the radiated emission measurement is the standard measurement method (with the device's antenna in place) to measure receiver spurious emissions.

Radiated emission measurements are to be performed using a calibrated open-area test site.

For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

For emissions below 1 GHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector with the same measurement bandwidth as that for CISPR quasi-peak measurements. Above 1 GHz, measurements shall be performed using an average detector and a resolution bandwidth of 300 kHz to 1 MHz.

According to RSS-Gen §6.1, Table 2, the radiated limit of receiver spurious emissions

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 C63.4-2003.

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
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100338	2011-09-14
Agilent	Spectrum Analyzer	E4446A	US44300386	2011-08-11
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB3	A0020106-3	2011-06-29
EMCO	Horn antenna	3115	9511-4627	2011-10-03
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2011-06-09
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2012-05-09

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

13.6 Test Environmental Conditions

Temperature:	20~24 °C
Relative Humidity:	37~45 %
ATM Pressure:	101-102 kPa

The testing was performed by Quinn Jiang on 2012-05-01 and 2012-05-08 in 5 meter chamber 3.

13.7 Summary of Test Results

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

Unwanted Emissions and Receiving Spurious Emission, (30MHz - 40 GHz):

30-1000 MHz:

5250-5350 MHz Band

Mode: Receiving			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-2.57	374.9985	Horizontal	30 to 1000

5470-5725 MHz Band

Mode: Receiving			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-1.68	375.007	Horizontal	30 to 1000

Above 1 GHz:

5250-5350 MHz Band

Mode: Receiving			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-30.110	1165	Vertical	Above 1 GHz

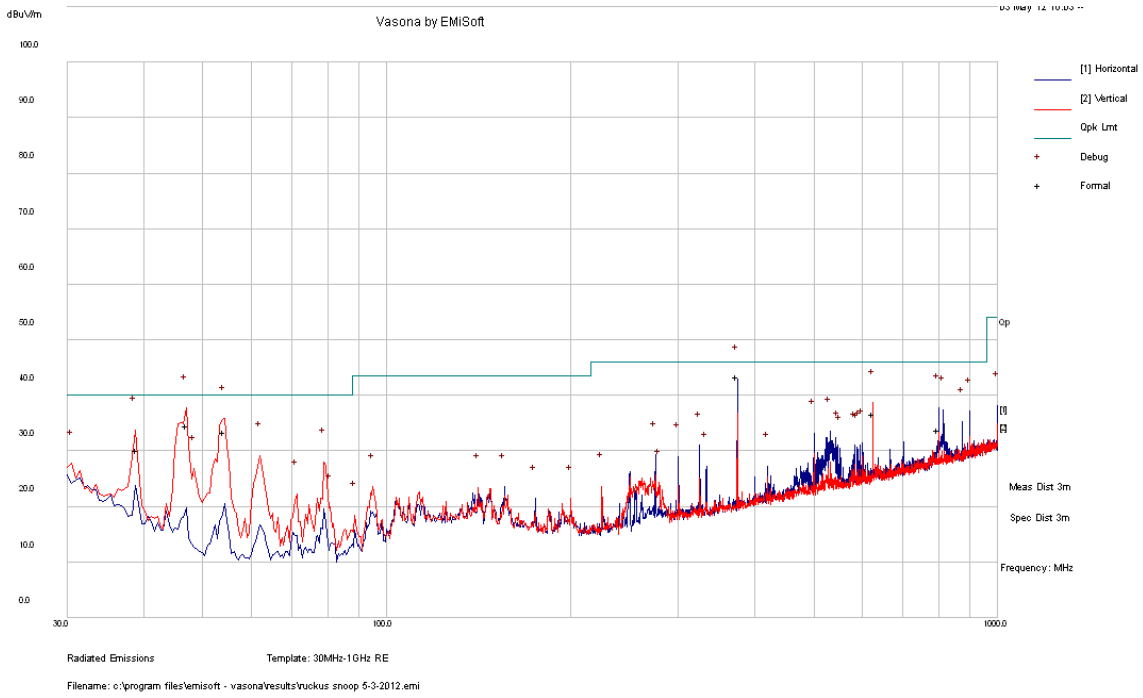
5470-5725 MHz Band

Mode: Receiving			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-29.830	1165	Vertical	Above 1 GHz

13.8 Radiated Emissions Test Result Data

(1) Radiated Emission at 3 meters, 30 MHz – 1 GHz

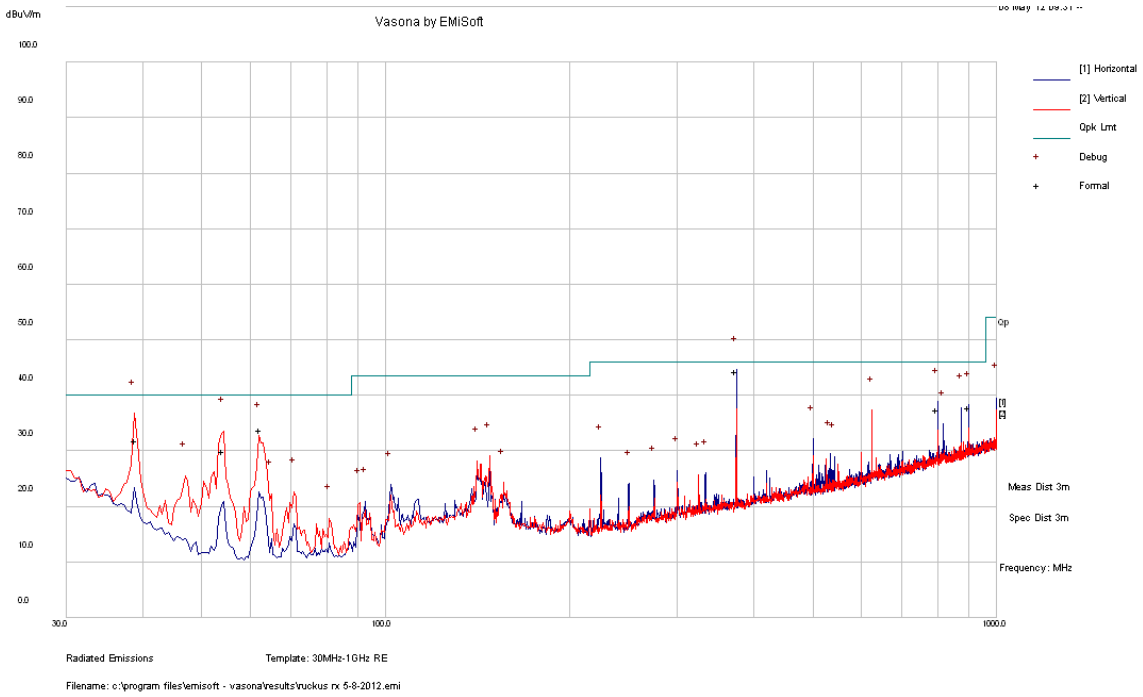
5250-5350 MHz Band



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
47.05725	34.52	139	V	55	40	-5.48
374.9985	43.43	99	H	88	46	-2.57
54.187	33.36	212	V	0	40	-6.64
38.9385	30.22	102	V	21	40	-9.78
624.986	36.73	118	V	360	46	-9.27
800.0118	33.87	99	H	209	46	-12.13

5470-5725 MHz Band



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
375.007	44.32	99	H	56	46	-1.68
38.946	31.83	203	V	309	40	-8.17
54.17775	29.91	139	V	300	40	-10.09
800.0138	37.52	100	H	193	46	-8.48
62.24125	33.9	188	V	23	40	-6.1
900.0363	37.78	99	H	261	46	-8.22

(2) Radiated Emission at 3 meters, above 1 GHz

5250-5350 MHz Band

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)	
1165	42.320	14	100	V	24.8	2.00	27.26	41.810	74	-32.190	Peak
1165	40.41	79	100	H	24.8	2.00	27.26	39.900	74	-34.100	Peak
1165	24.400	14	100	V	24.8	2.00	27.26	23.890	54	-30.110	Ave
1165	23.690	79	100	H	24.8	2.00	27.26	23.180	54	-30.820	Ave

5470-5725 MHz Band

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)	
1165	42.750	19	100	V	24.8	2.00	27.26	42.240	74	-31.760	Peak
1165	40.18	79	100	H	24.8	2.00	27.26	39.670	74	-34.330	Peak
1165	24.680	19	100	V	24.8	2.00	27.26	24.170	54	-29.830	Ave
1165	23.400	79	100	H	24.8	2.00	27.26	22.890	54	-31.110	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 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. Devices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all applicable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm/MHz in the 5.15–5.25 GHz band. For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.

For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 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 RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1 MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

14.3 Test Equipment List and Details

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

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

14.4 Test Environmental Conditions

Temperature:	20~24 °C
Relative Humidity:	37~45 %
ATM Pressure:	101.1-102 kPa

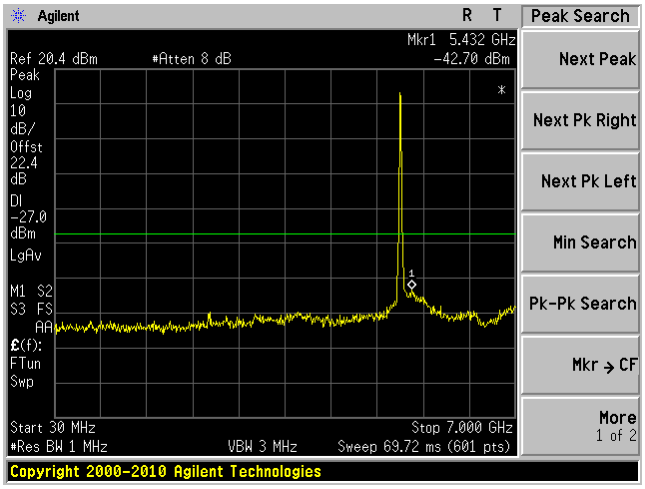
The testing was performed by Quinn Jiang and Jeffery Wu on 2012-05-04, 2012-05-07, and 2012-05-09 in RF site.

14.5 Test Results

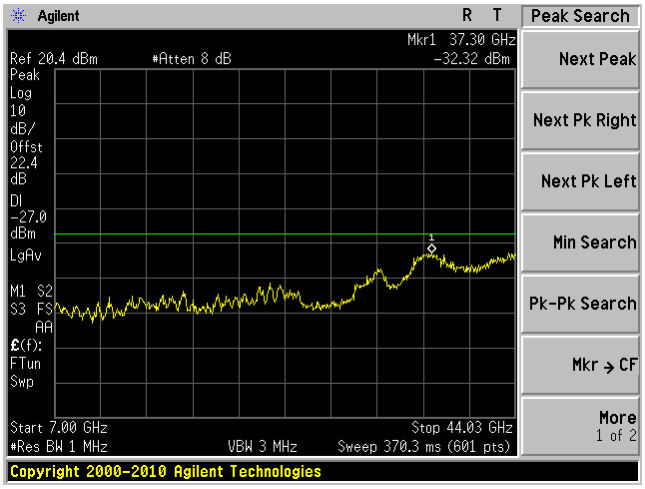
Please refer to following plots of spurious emissions.

5250-5350 MHz

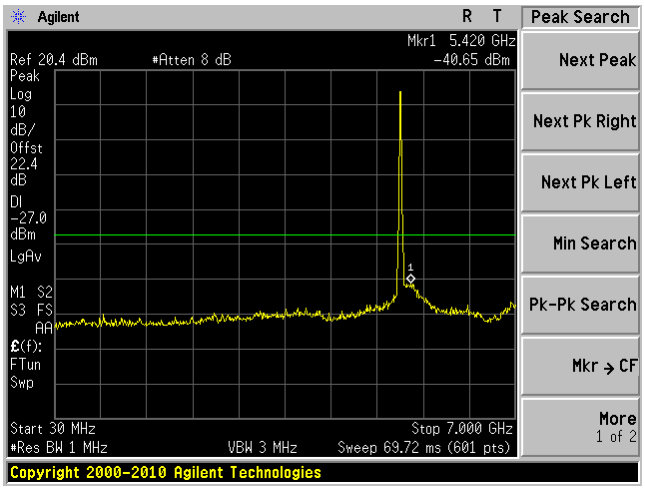
802.11a mode, 5260 MHz, Chain J10
30MHz – 7GHz



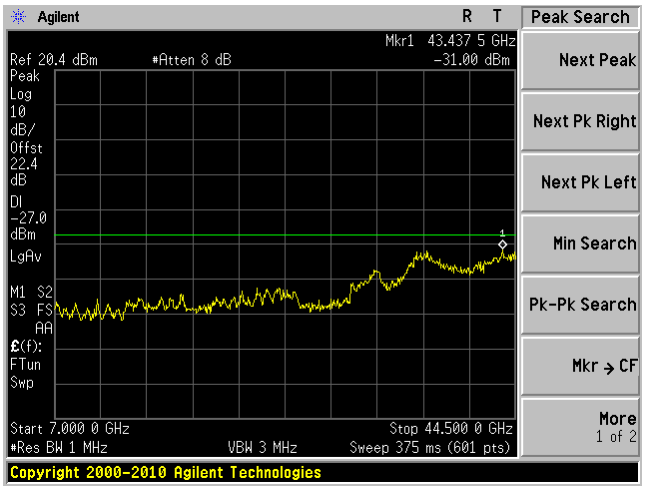
802.11a mode, 5260 MHz, Chain J10
7G – 44.5 GHz



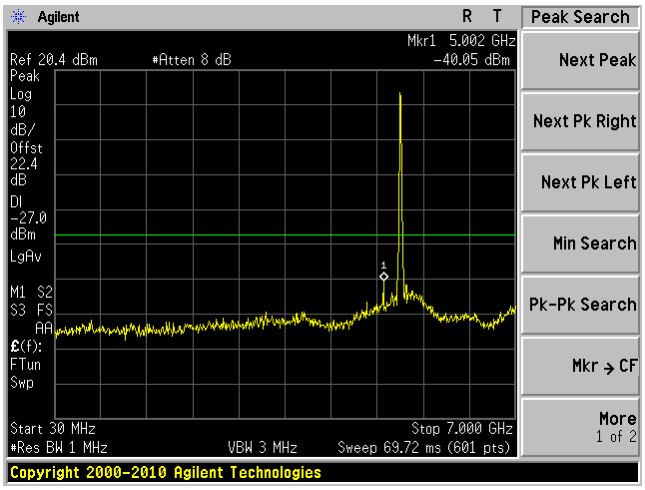
802.11a mode, 5260 MHz, Chain J8
30MHz – 7GHz



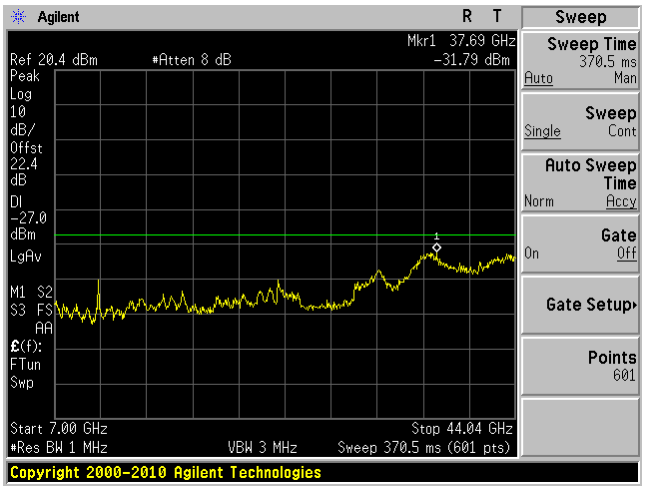
802.11a mode, 5260 MHz, Chain J8
7G – 44.5 GHz



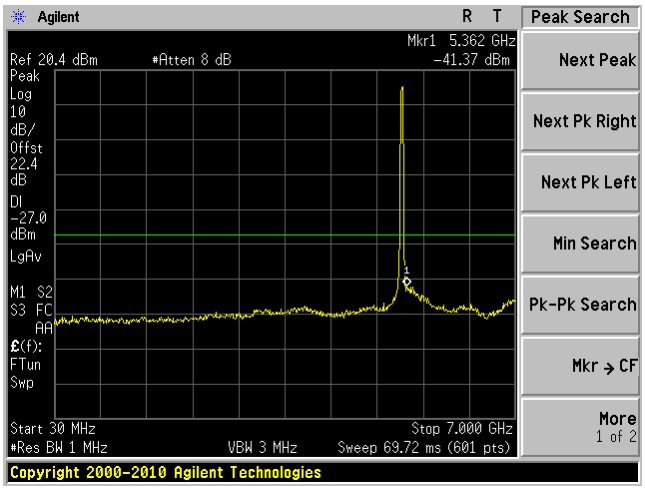
802.11a mode, 5260 MHz, Chain J6
30MHz – 7GHz



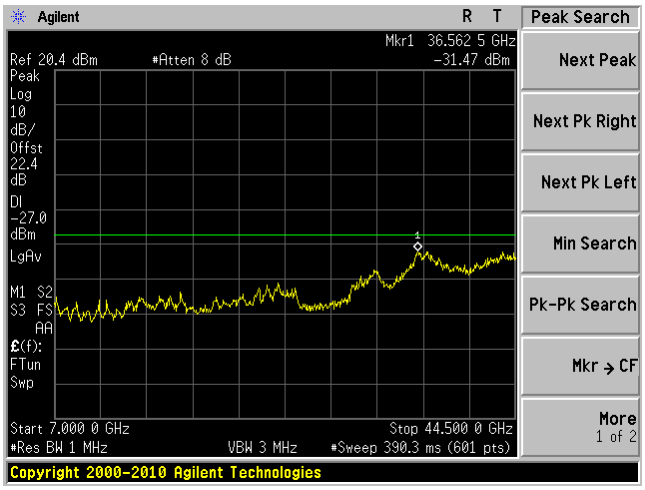
802.11a mode, 5260 MHz, Chain J6
7G – 44.5 GHz



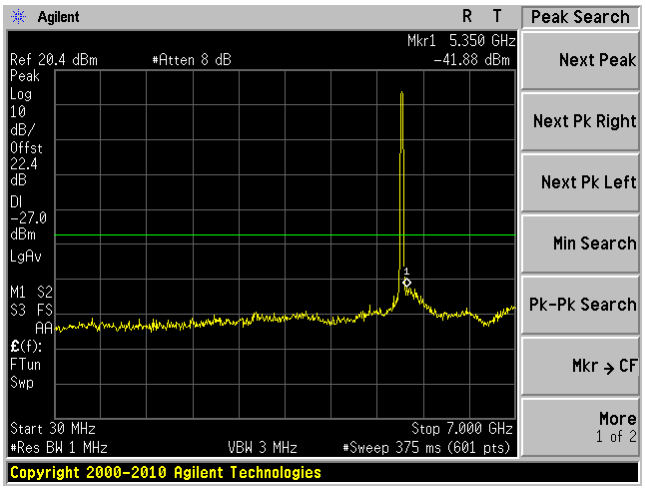
802.11a mode, 5280 MHz, Chain J10
30MHz – 7GHz



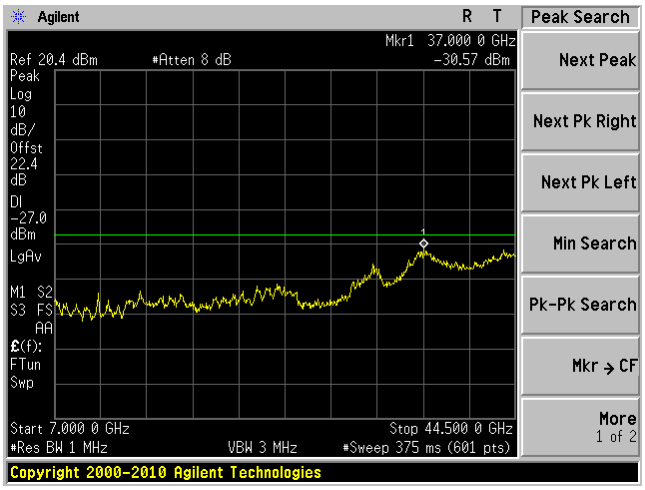
802.11a mode, 5280 MHz, Chain J10
7G – 44.5 GHz



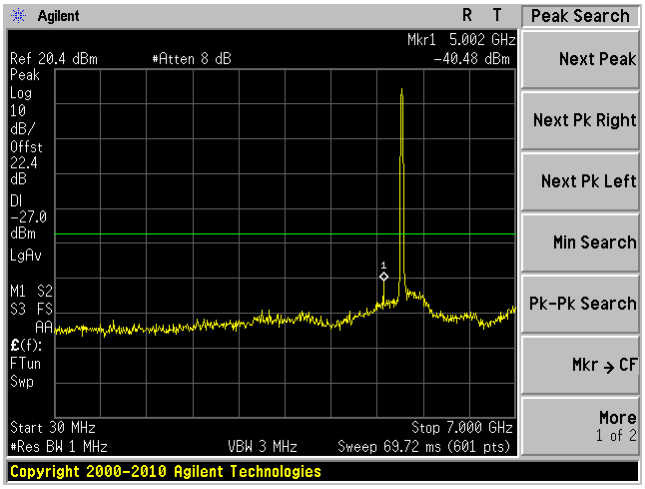
802.11a mode, 5280 MHz, Chain J8
30MHz – 7GHz



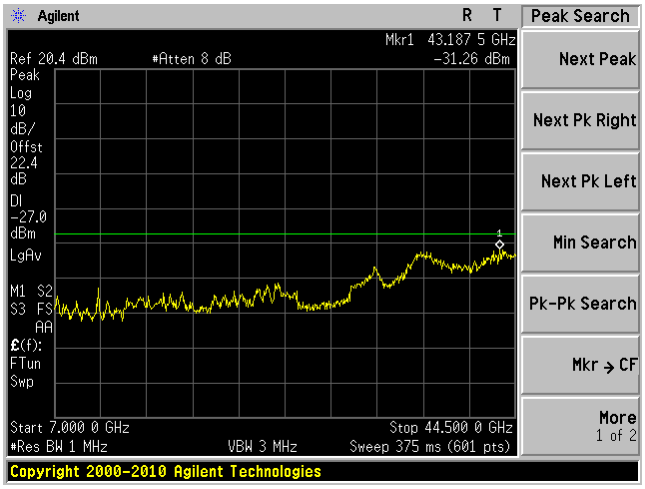
802.11a mode, 5280 MHz, Chain J8
7G – 44.5 GHz



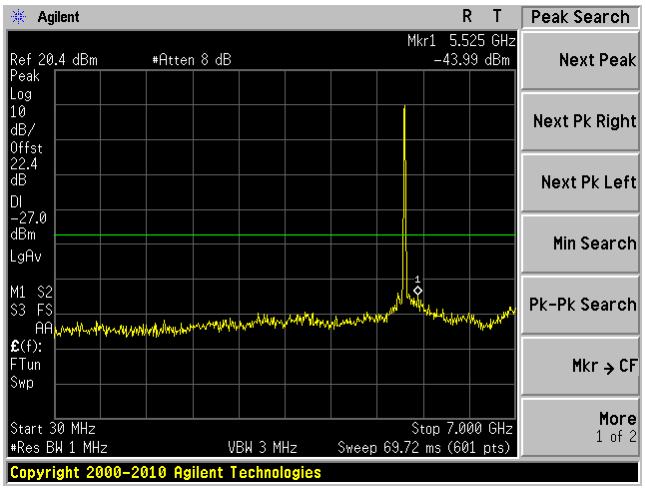
802.11a mode, 5280 MHz, Chain J6
30MHz – 7GHz



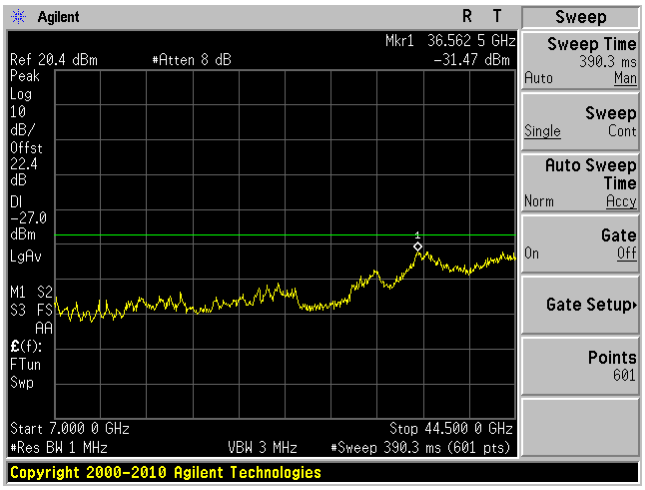
802.11a mode, 5280 MHz, Chain J6
7G – 44.5 GHz



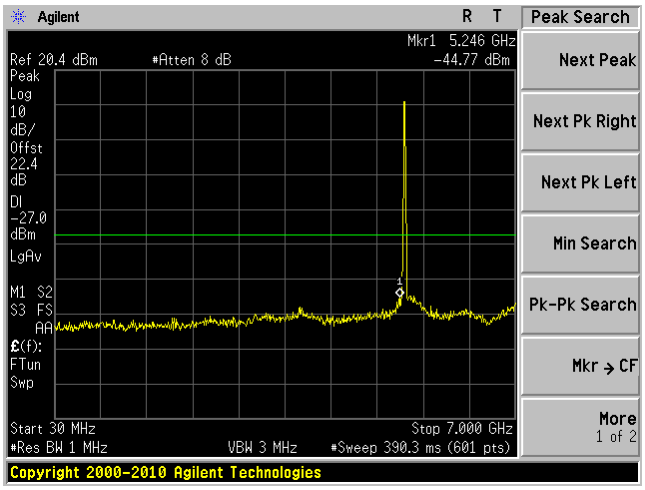
802.11a mode, 5320 MHz, Chain J10
30MHz – 7GHz



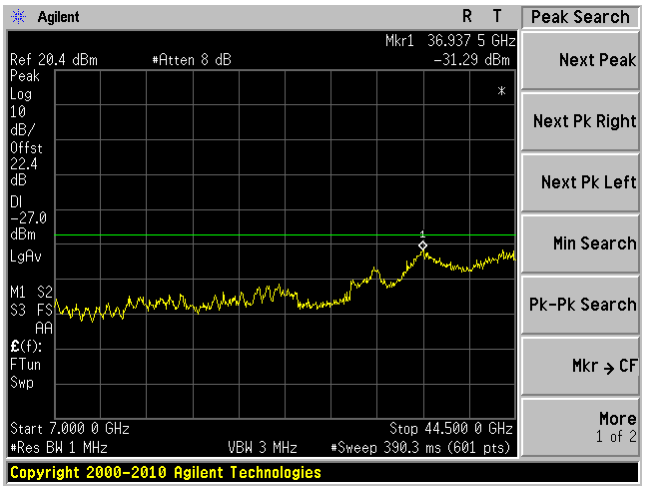
802.11a mode, 5320 MHz, Chain J10
7G – 44.5 GHz



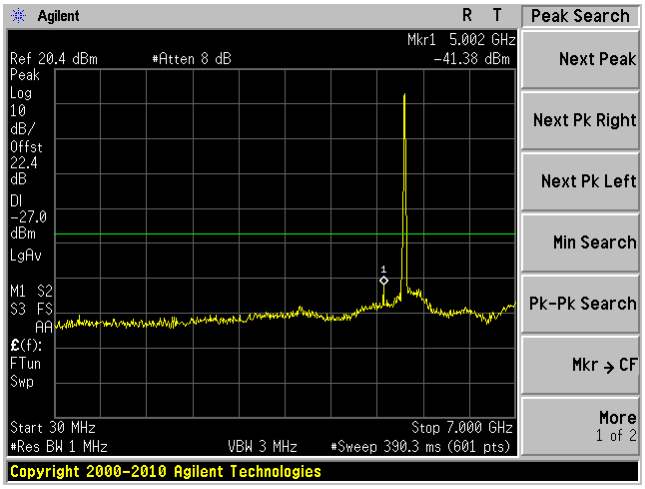
802.11a mode, 5320 MHz, Chain J8
30MHz – 7GHz



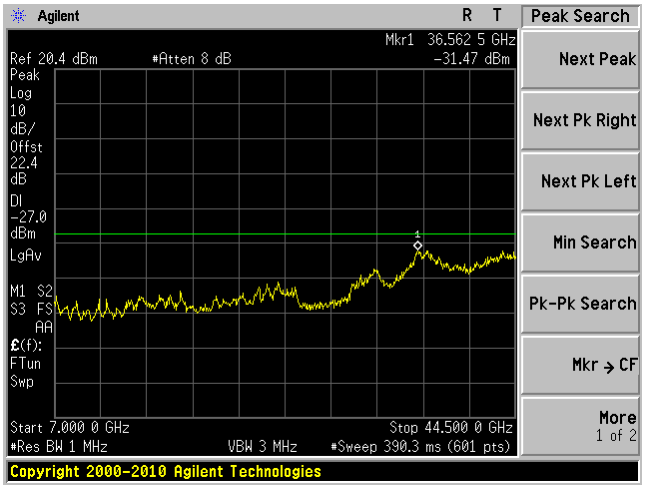
802.11a mode, 5320 MHz, Chain J8
7G – 44.5 GHz



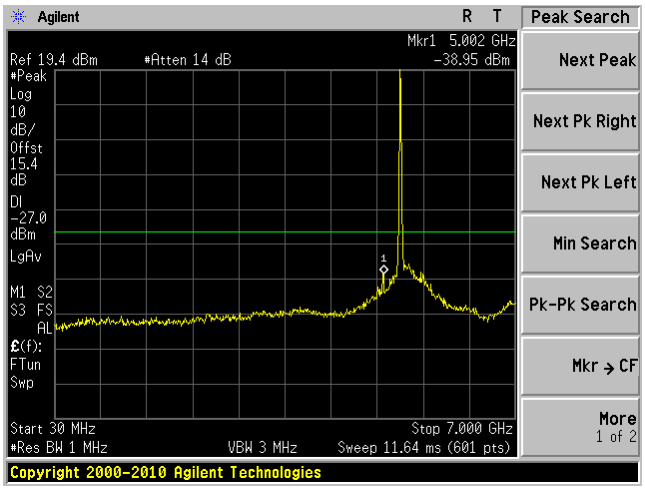
802.11a mode, 5320 MHz, Chain J6
30MHz – 7GHz



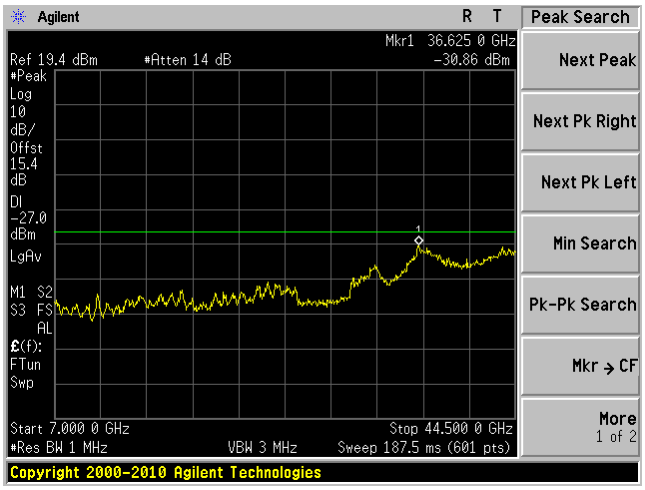
802.11a mode, 5320 MHz, Chain J6
7G – 44.5 GHz



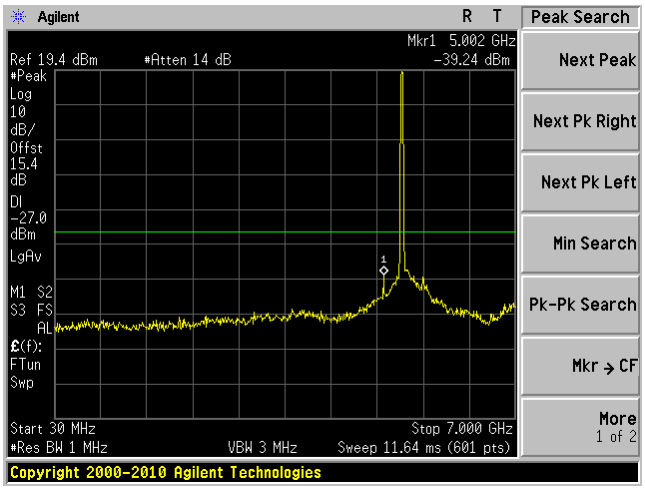
802.11a mode, 5260 MHz, Chain J10, J8, J6
30MHz – 7GHz



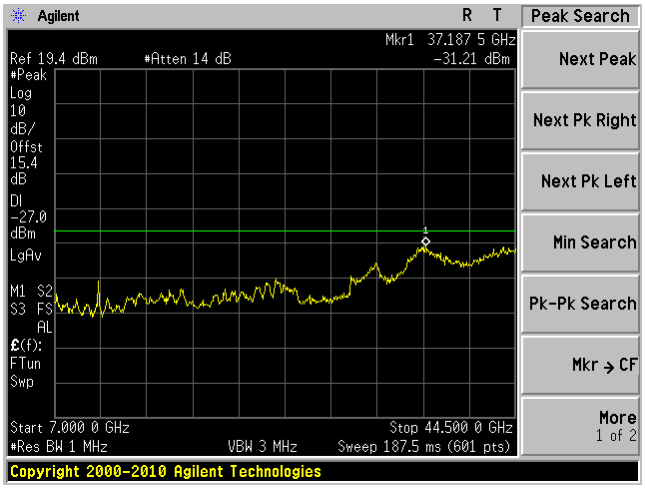
802.11a mode, 5260 MHz, Chain J10, J8, J6
7G – 44.5 GHz



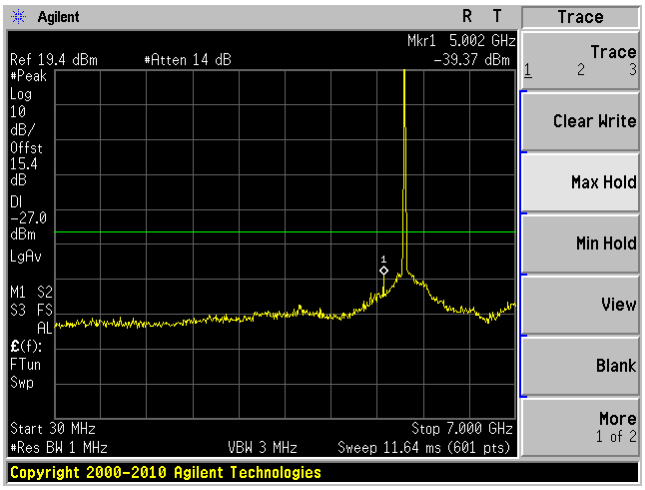
802.11a mode, 5280 MHz, Chain J10, J8, J6
30MHz – 7GHz



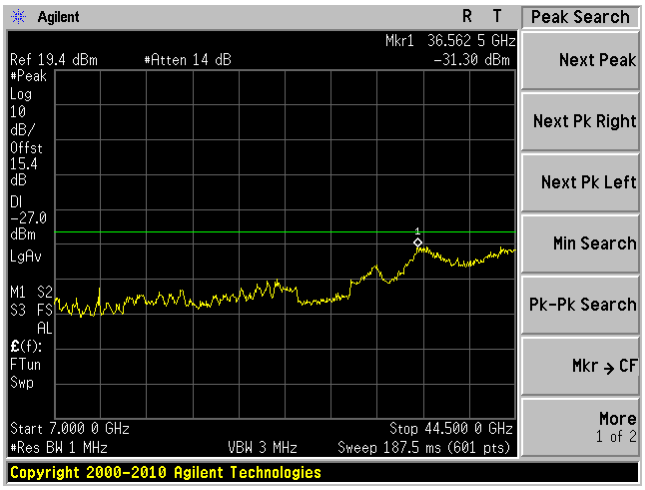
802.11a mode, 5280 MHz, Chain J10, J8, J6
7G – 44.5 GHz



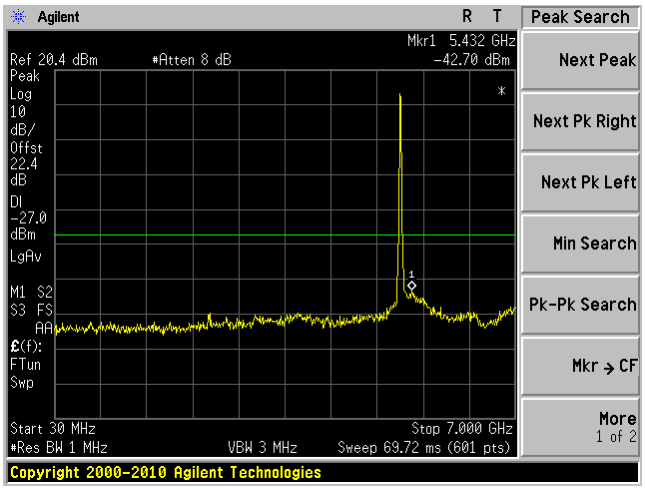
802.11a mode, 5320 MHz, Chain J10, J8, J6
30MHz – 7GHz



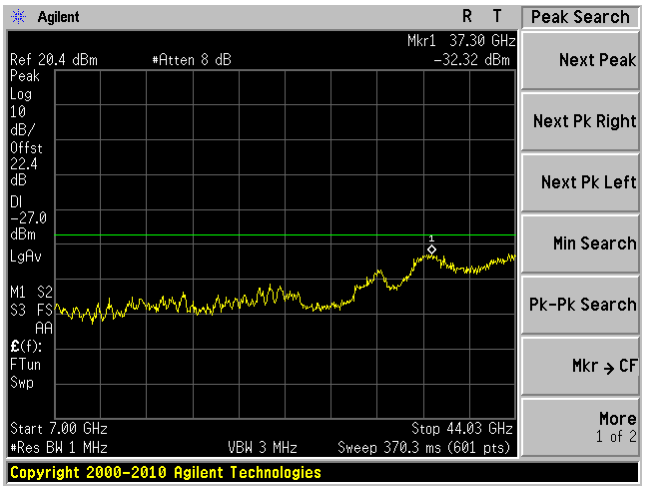
802.11a mode, 5320 MHz, Chain J10, J8, J6
7G – 44.5 GHz



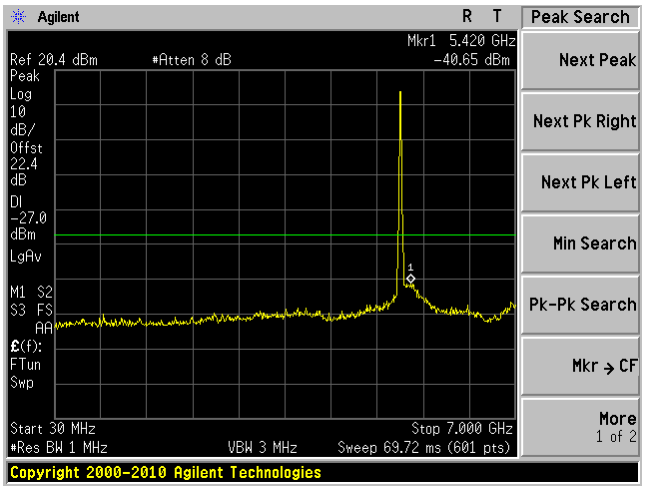
802.11n HT20 mode, 5260 MHz, Chain J10
30MHz – 7GHz



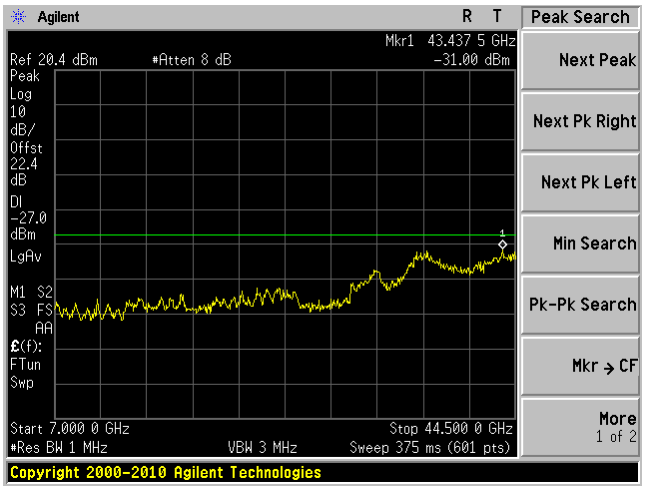
802.11n HT20 mode, 5260 MHz, Chain J10
7G – 44.5 GHz



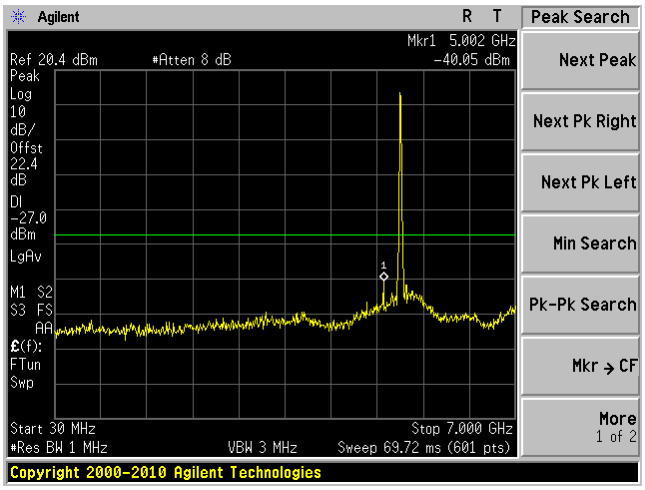
802.11n HT20 mode, 5260 MHz, Chain J8
30MHz – 7GHz



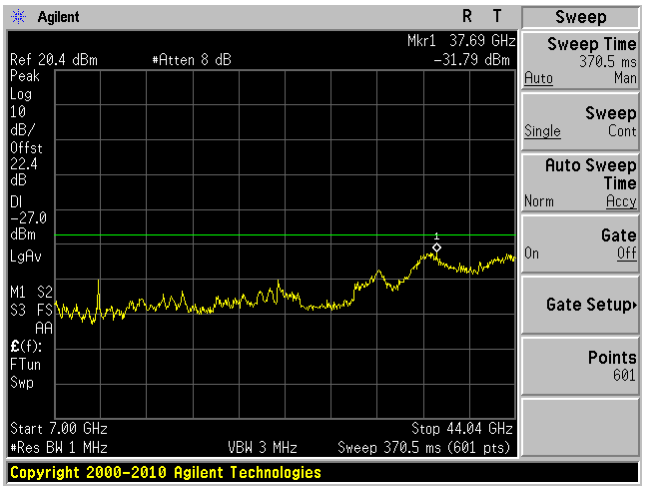
802.11n HT20 mode, 5260 MHz, Chain J8
7G – 44.5 GHz



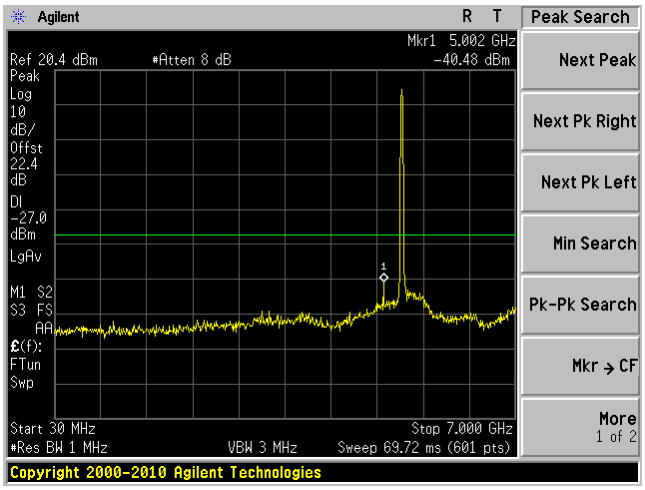
802.11n HT20 mode, 5260 MHz, Chain J6
30MHz – 7GHz



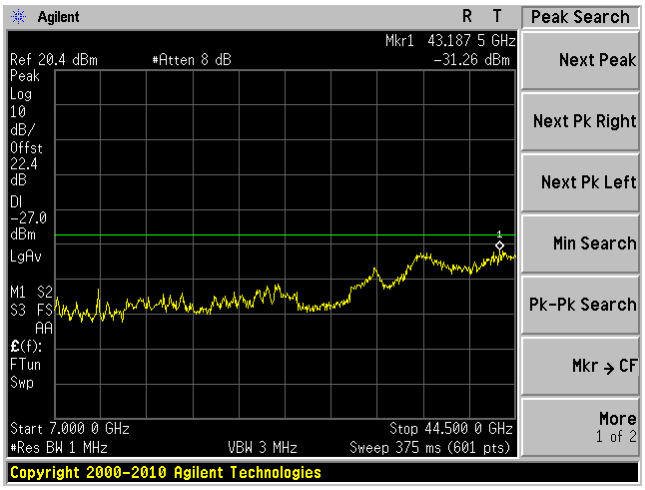
802.11n HT20 mode, 5260 MHz, Chain J6
7G – 44.5 GHz



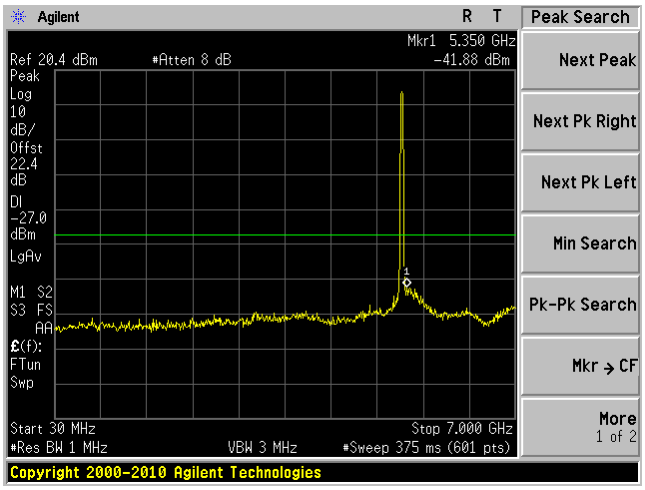
802.11n HT20 mode, 5280 MHz, Chain J10
30MHz – 7GHz



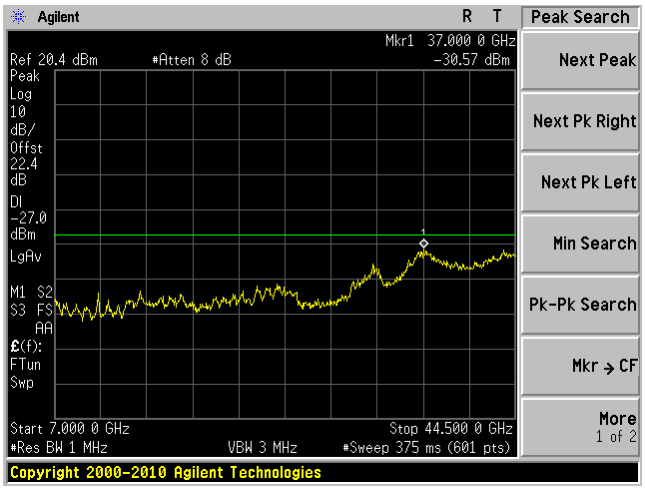
802.11n HT20 mode, 5280 MHz, Chain J10
7G – 44.5 GHz



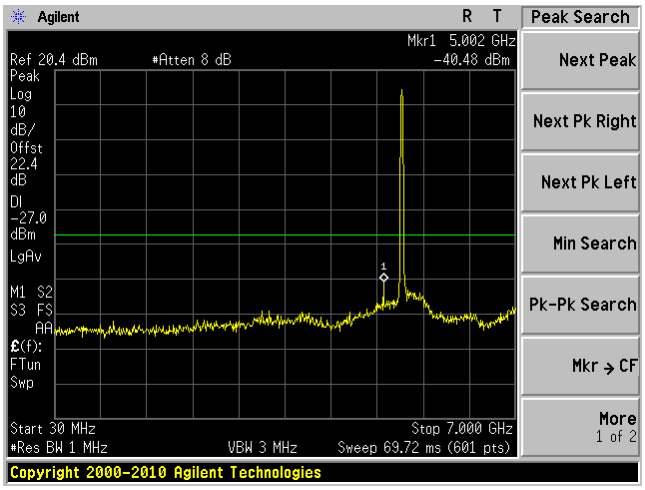
802.11n HT20 mode, 5280 MHz, Chain J8
30MHz – 7GHz



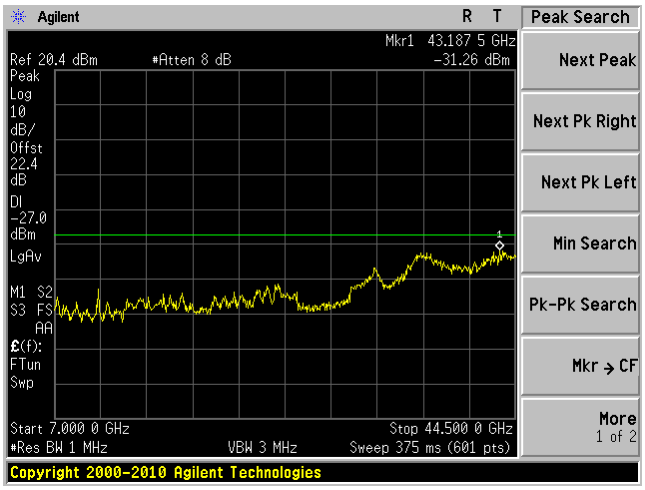
802.11n HT20 mode, 5280 MHz, Chain J8
7G – 44.5 GHz



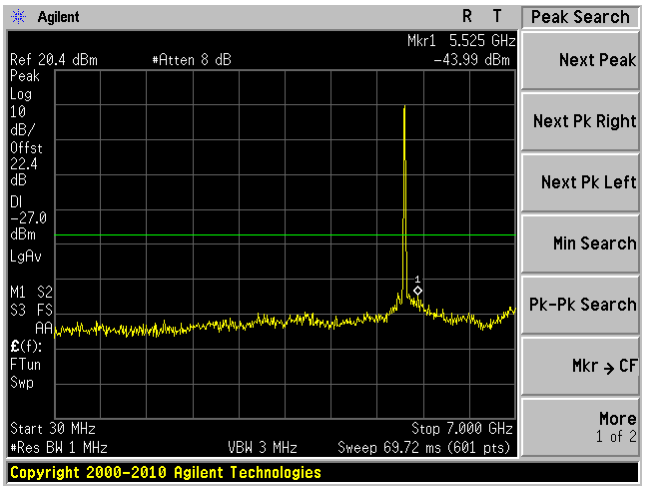
802.11n HT20 mode, 5280 MHz, Chain J6
30MHz – 7GHz



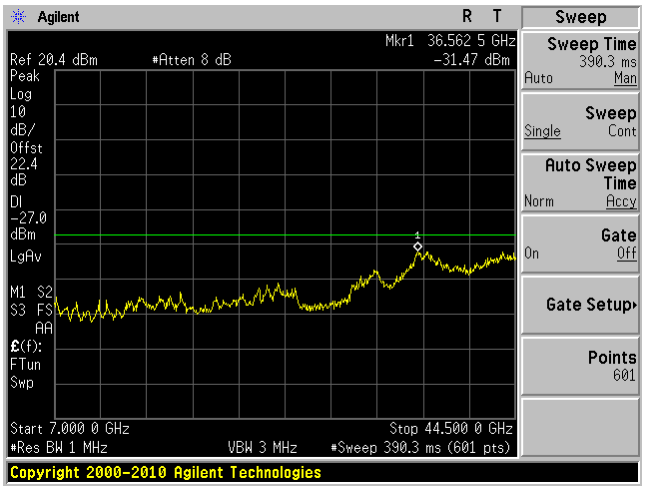
802.11n HT20 mode, 5280 MHz, Chain J6
7G – 44.5 GHz



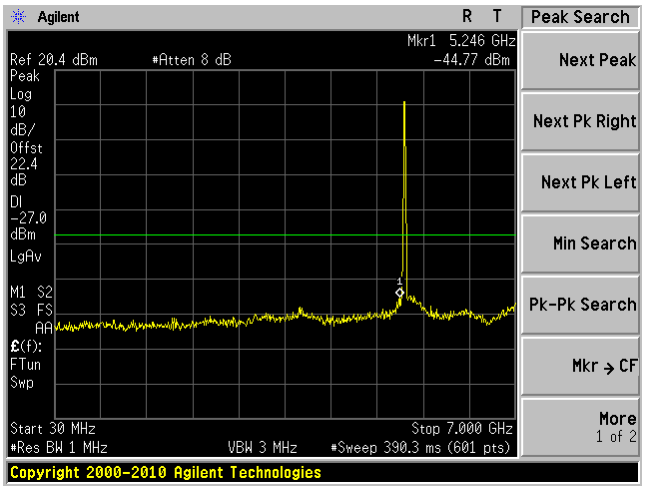
802.11n HT20 mode, 5320 MHz, Chain J10
30MHz – 7GHz



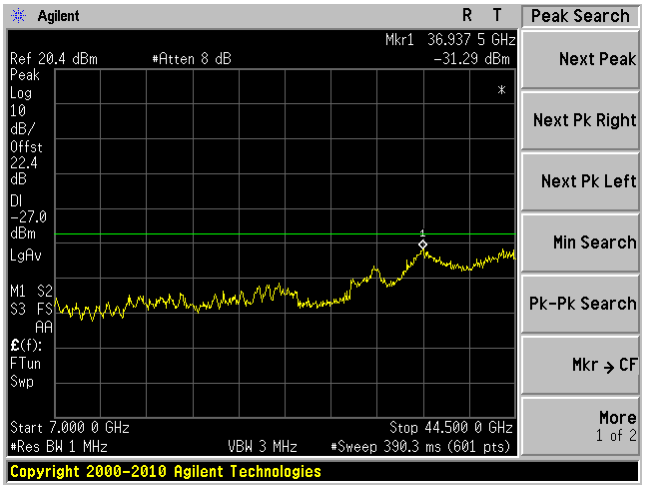
802.11n HT20 mode, 5320 MHz, Chain J10
7G – 44.5 GHz



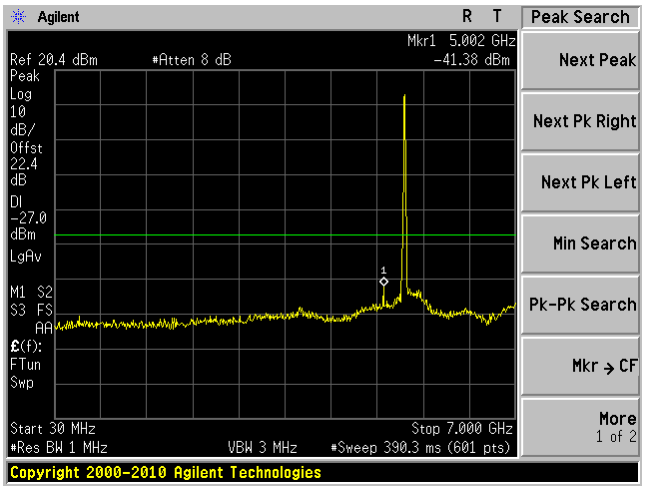
802.11n HT20 mode, 5320 MHz, Chain J8
30MHz – 7GHz



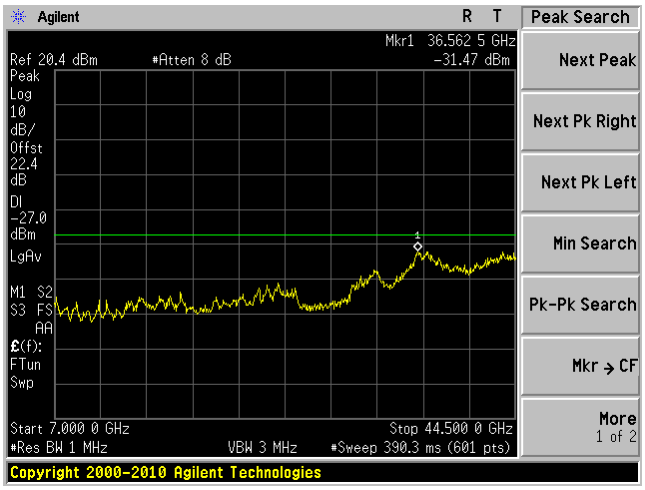
802.11n HT20 mode, 5320 MHz, Chain J8
7G – 44.5 GHz



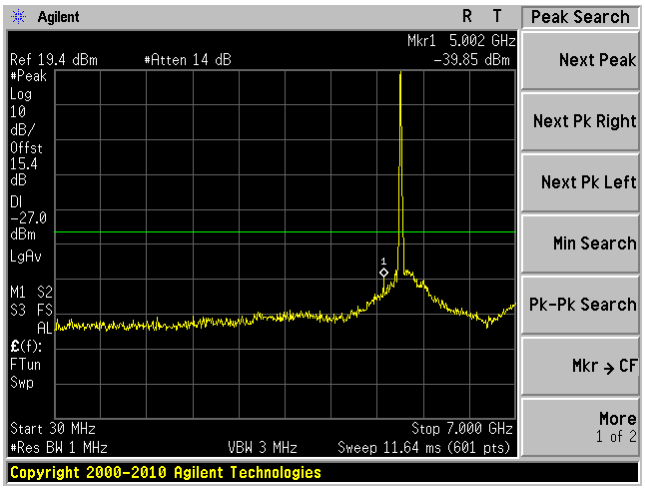
802.11n HT20 mode, 5320 MHz, Chain J6
30MHz – 7GHz



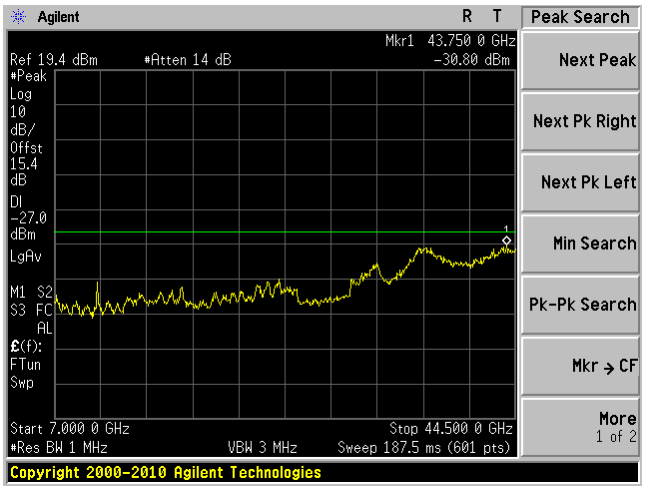
802.11n HT20 mode, 5320 MHz, Chain J6
7G – 44.5 GHz



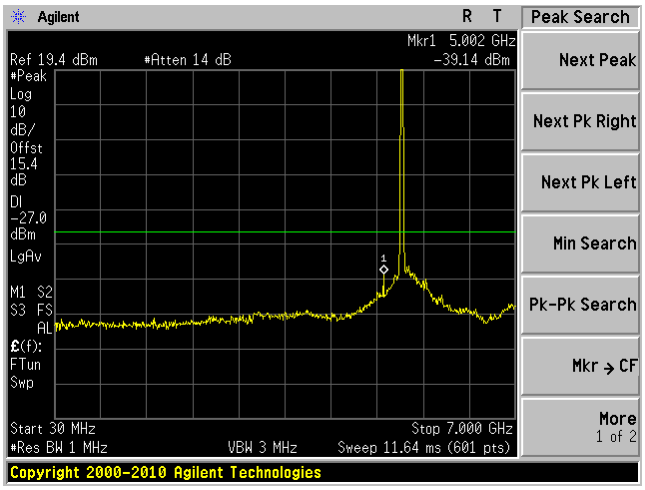
802.11n HT20 mode, 5260 MHz, Chain J10, J8, J6
30MHz – 7GHz



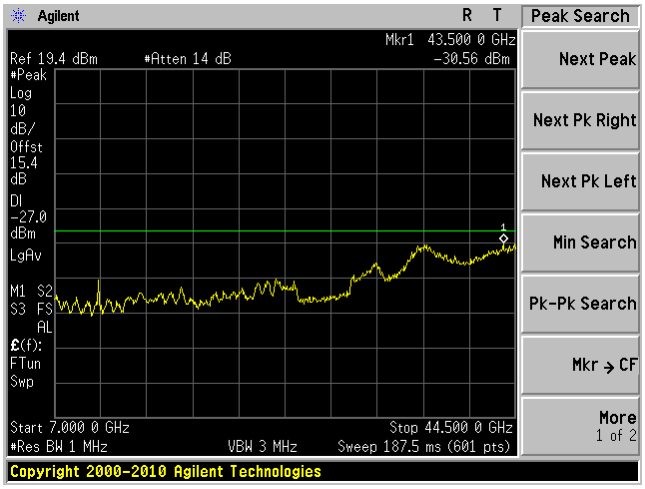
802.11n HT20 mode, 5260 MHz, Chain J10, J8, J6
7G – 44.5 GHz



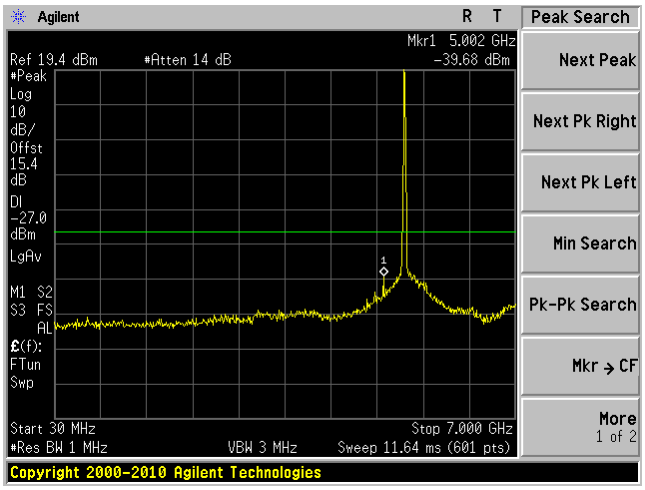
802.11n HT20 mode, 5280 MHz, Chain J10, J8, J6
30MHz – 7GHz



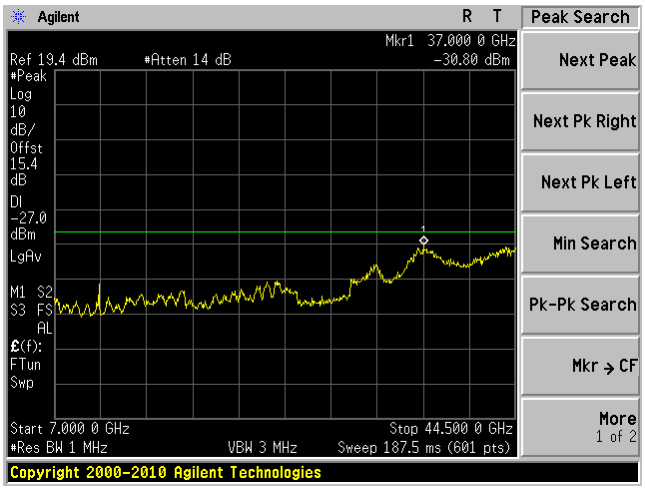
802.11n HT20 mode, 5280 MHz, Chain J10, J8, J6
7G – 44.5 GHz



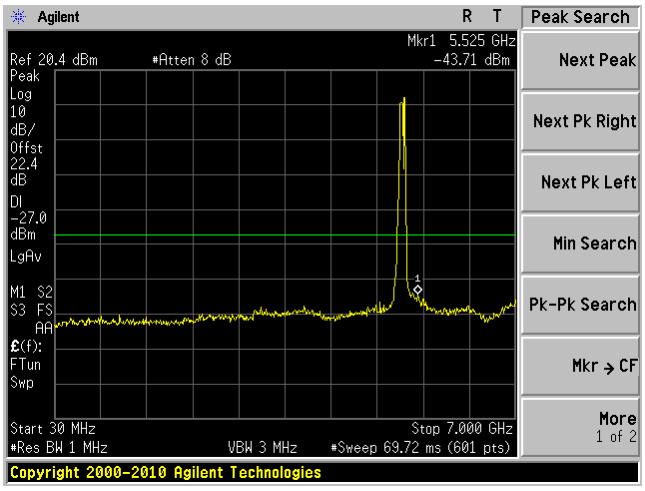
802.11n HT20 mode, 5320 MHz, Chain J10, J8, J6
30MHz – 7GHz



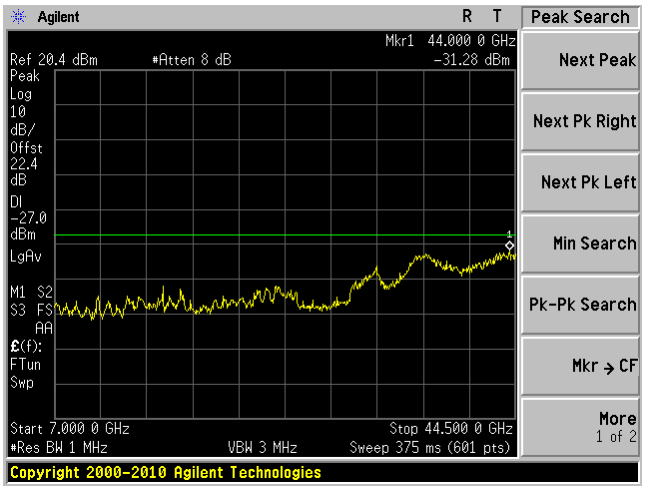
802.11n HT20 mode, 5320 MHz, Chain J10, J8, J6
7G – 44.5 GHz



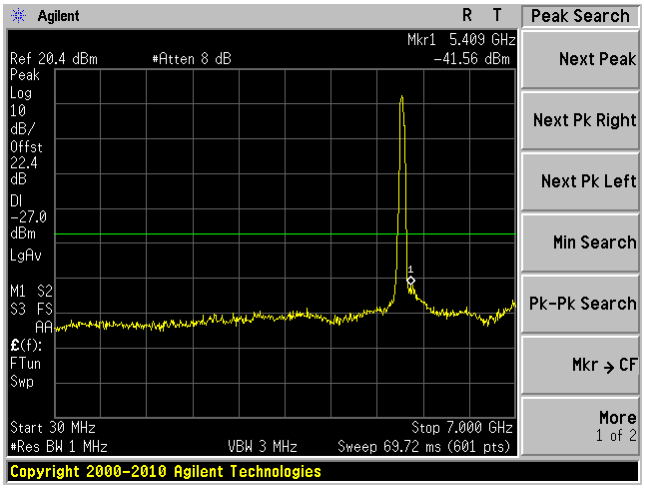
802.11n HT40 mode, 5270 MHz, Chain J10
30MHz – 7GHz



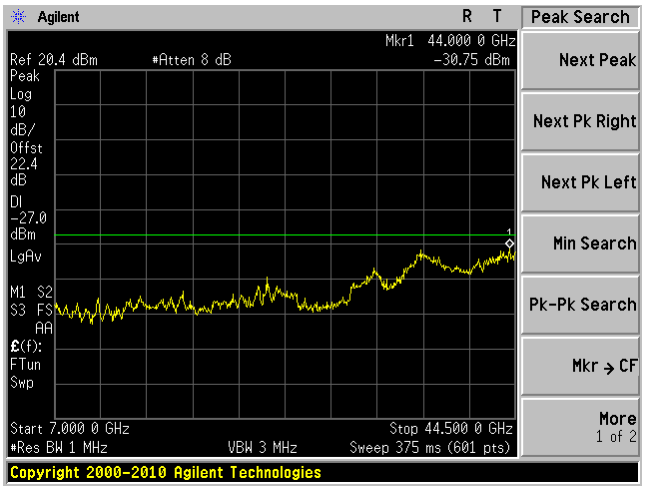
802.11n HT40 mode, 5270 MHz, Chain J10
7G – 44.5 GHz



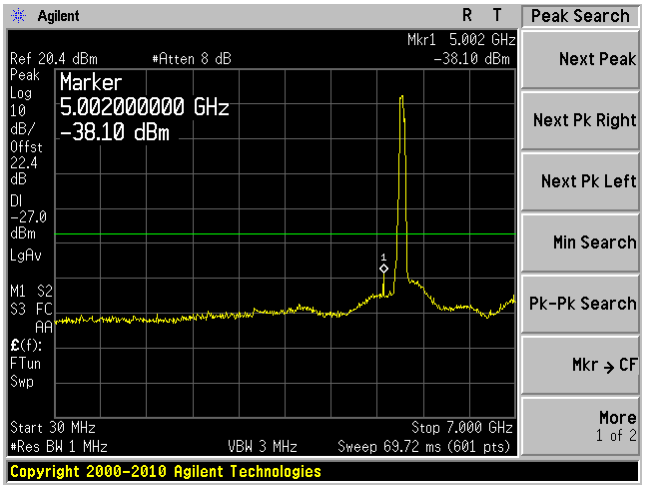
802.11n HT40 mode, 5270 MHz, Chain J8
30MHz – 7GHz



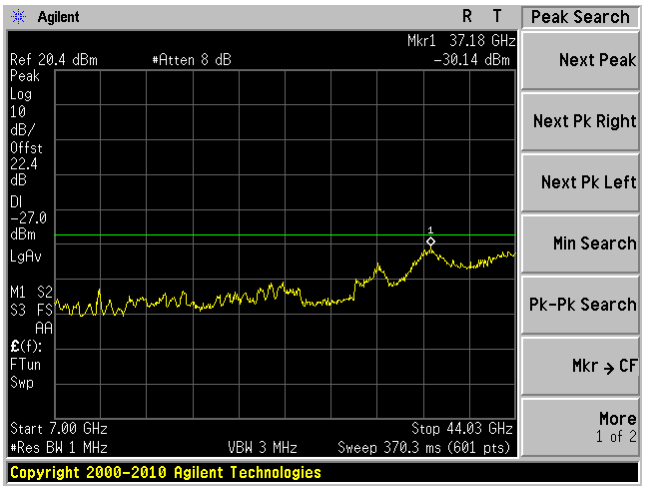
802.11n HT40 mode, 5270 MHz, Chain J8
7G – 44.5 GHz



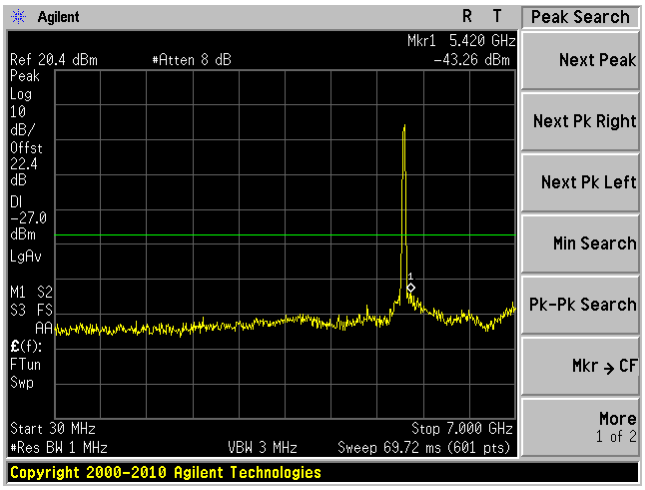
802.11n HT40 mode, 5270 MHz, Chain J6
30MHz – 7GHz



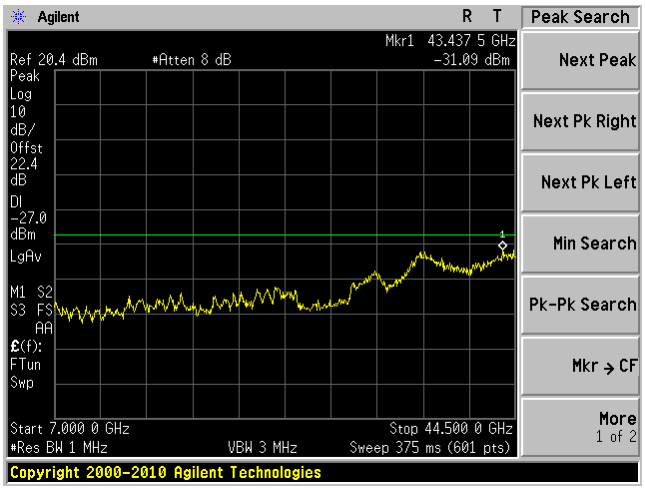
802.11n HT40 mode, 5270 MHz, Chain J6
7G – 44.5 GHz



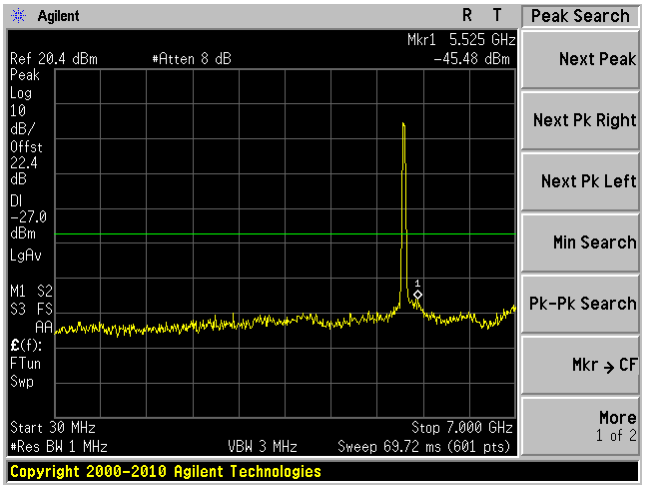
802.11n HT40 mode, 5310 MHz, Chain J10
30MHz – 7GHz



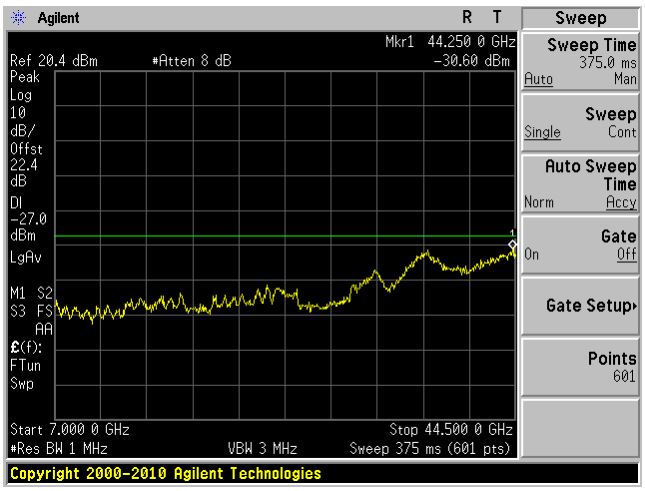
802.11n HT40 mode, 5310 MHz, Chain J10
7G – 44.5 GHz



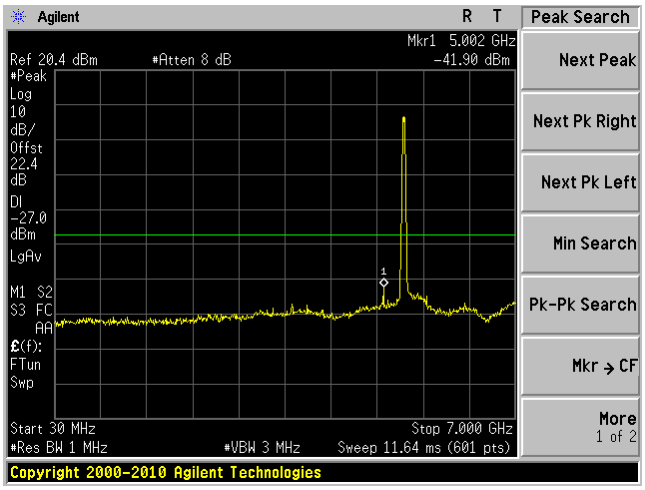
802.11n HT40 mode, 5310 MHz, Chain J8
30MHz – 7GHz



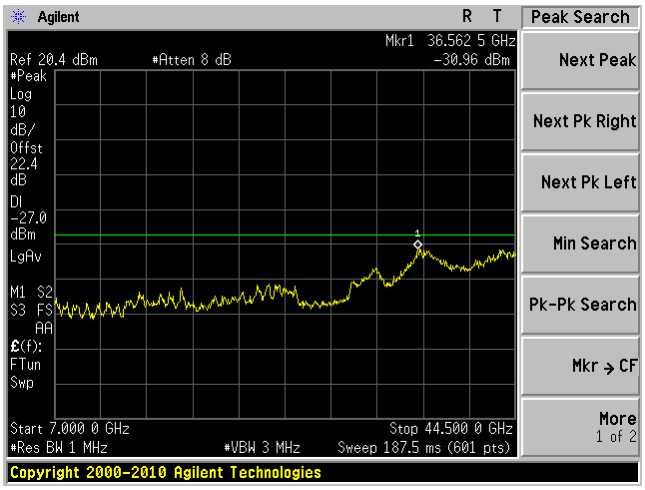
802.11n HT40 mode, 5310 MHz, Chain J8
7G – 44.5 GHz



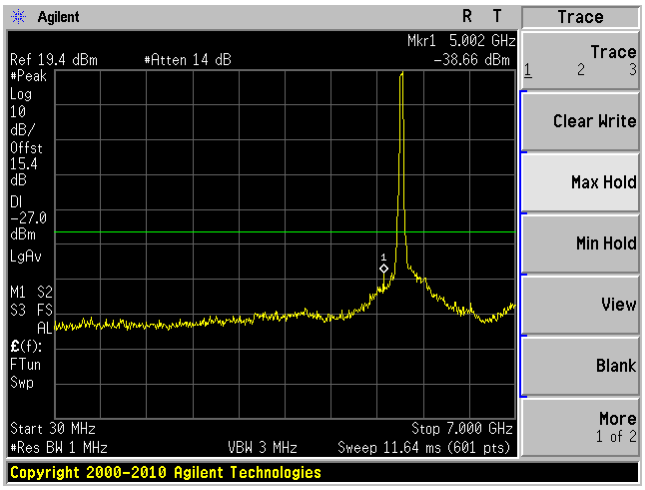
802.11n HT40 mode, 5310 MHz, Chain J6
30MHz – 7GHz



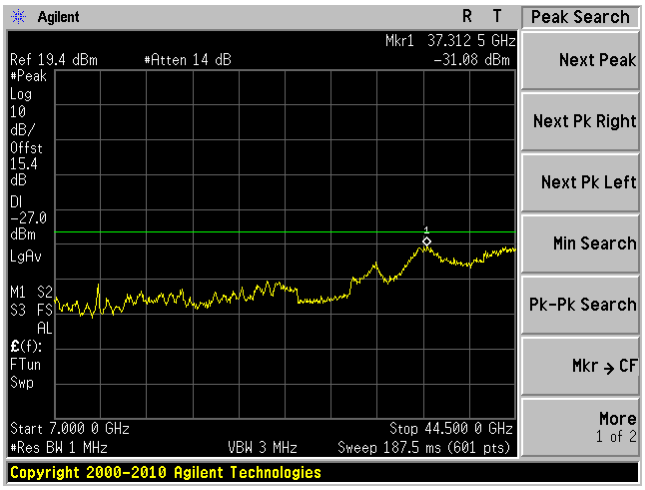
802.11n HT40 mode, 5310 MHz, Chain J6
7G – 44.5 GHz



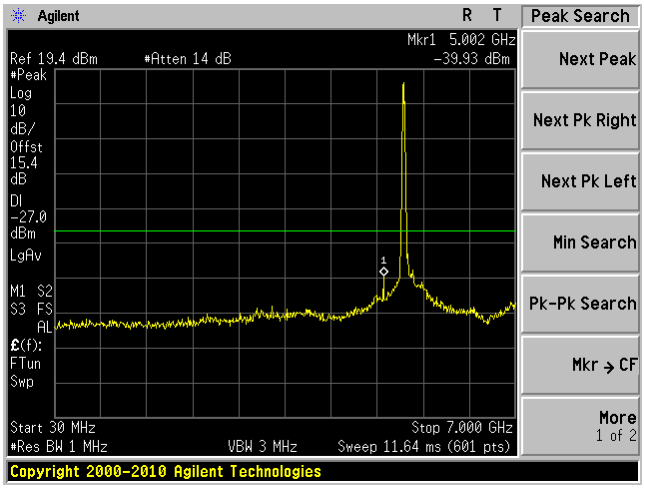
802.11n HT40 mode, 5270 MHz, Chain J10, J8, J6
30MHz – 7GHz



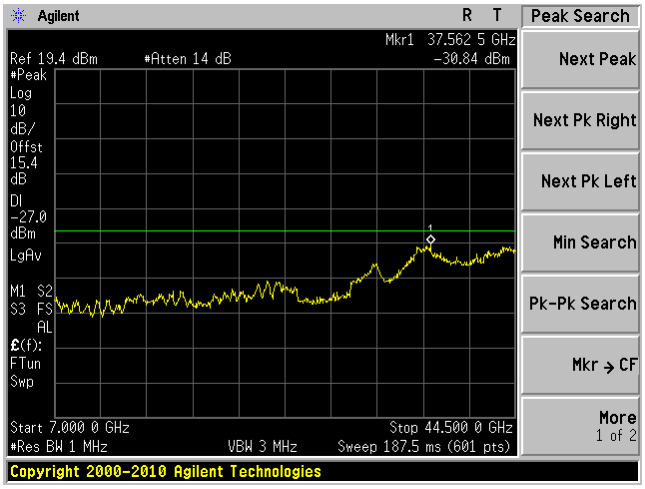
802.11n HT40 mode, 5270 MHz, Chain J10, J8, J6
7G – 44.5 GHz



802.11n HT40 mode, 5310 MHz, Chain J10, J8, J6
30MHz – 7GHz

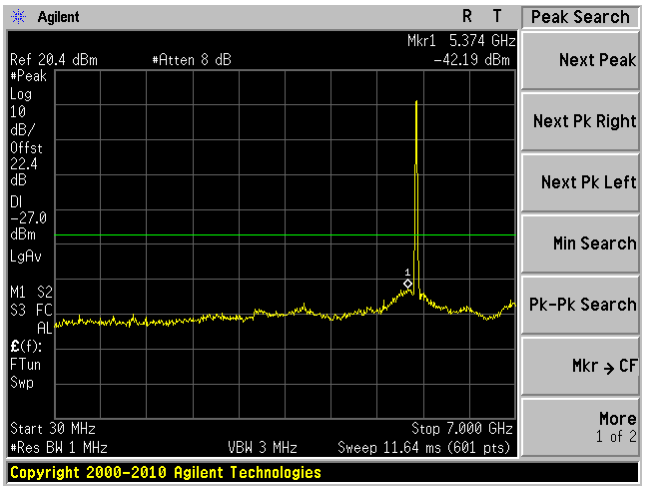


802.11n HT40 mode, 5310 MHz, Chain J10, J8, J6
7G – 44.5 GHz

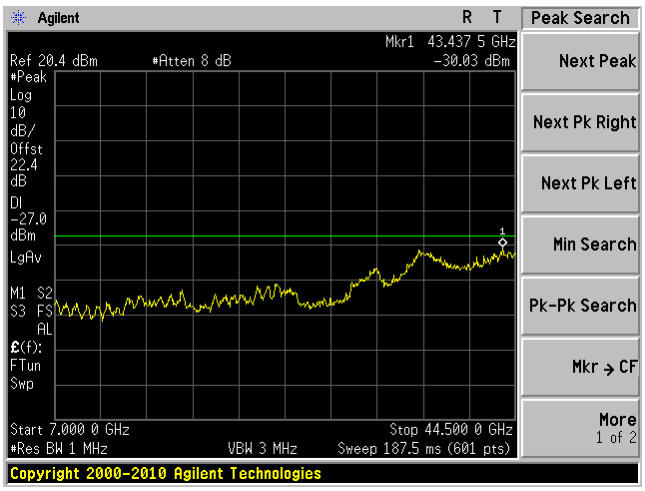


5470-5725 MHz

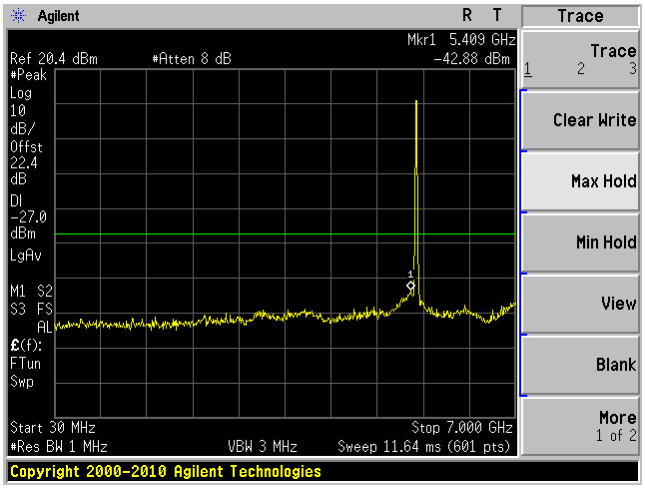
802.11a mode, 5500 MHz, Chain J10
30MHz – 7GHz



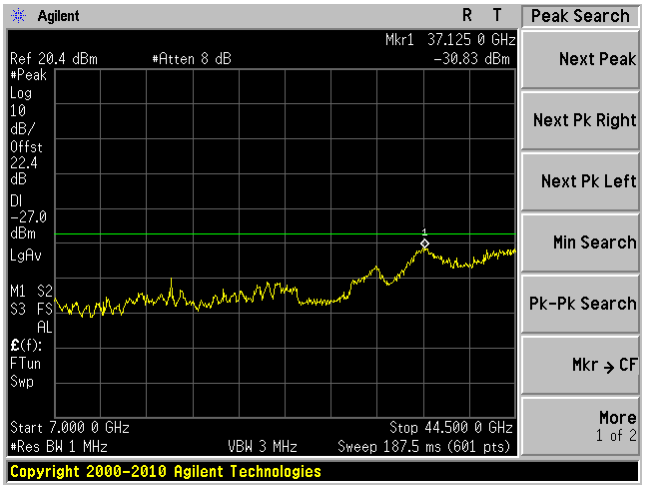
802.11a mode, 5500 MHz, Chain J10
7G – 44.5 GHz



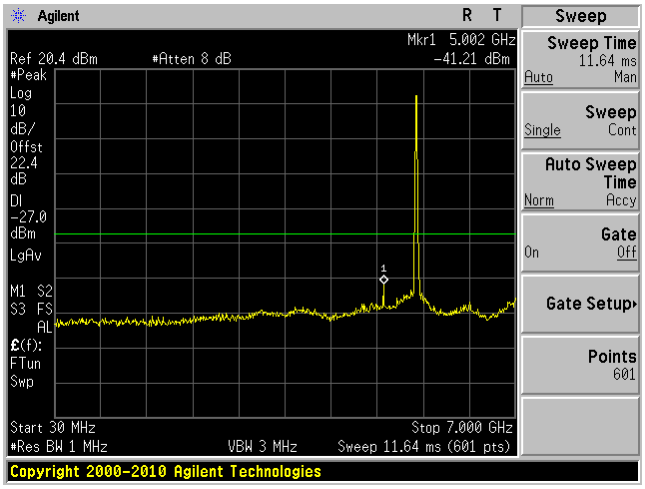
802.11a mode, 5500 MHz, Chain J8
30MHz – 7GHz



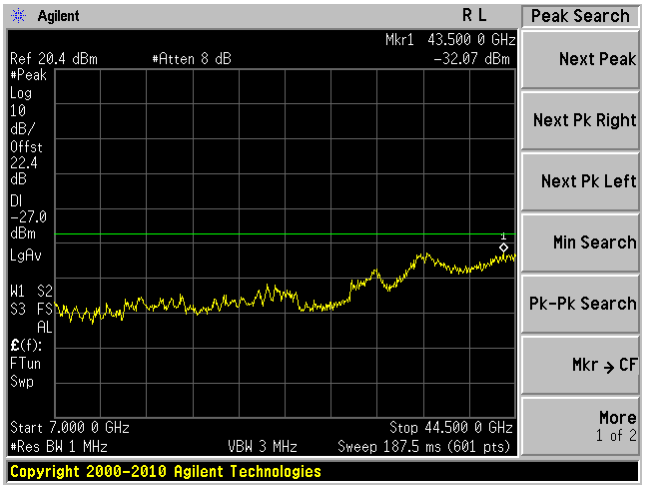
802.11a mode, 5500 MHz, Chain J8
7G – 44.5 GHz



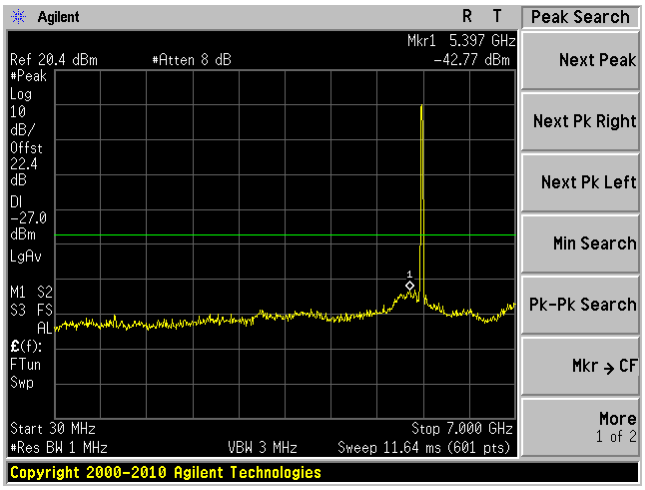
802.11a mode, 5500 MHz, Chain J6
30MHz – 7GHz



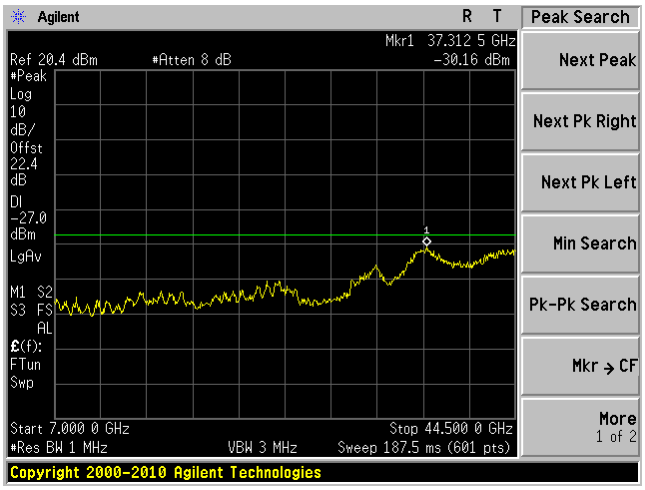
802.11a mode, 5500 MHz, Chain J6
7G – 44.5 GHz



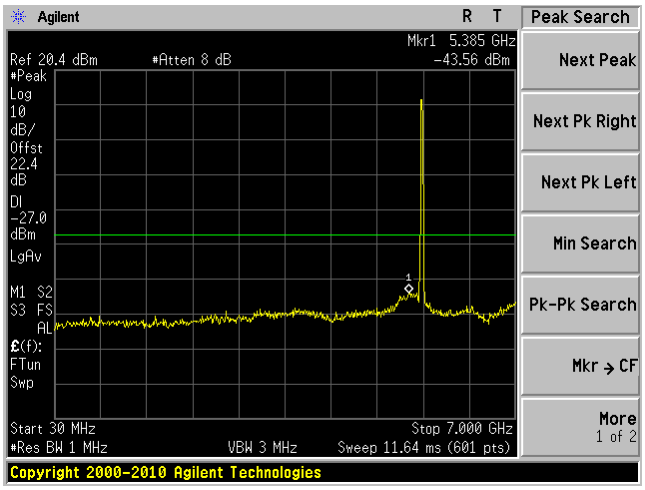
802.11a mode, 5580 MHz, Chain J10
30MHz – 7GHz



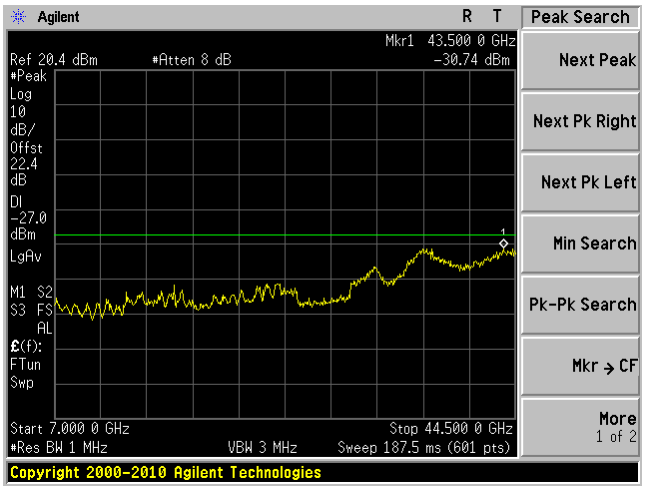
802.11a mode, 5580 MHz, Chain J10
7G – 44.5 GHz



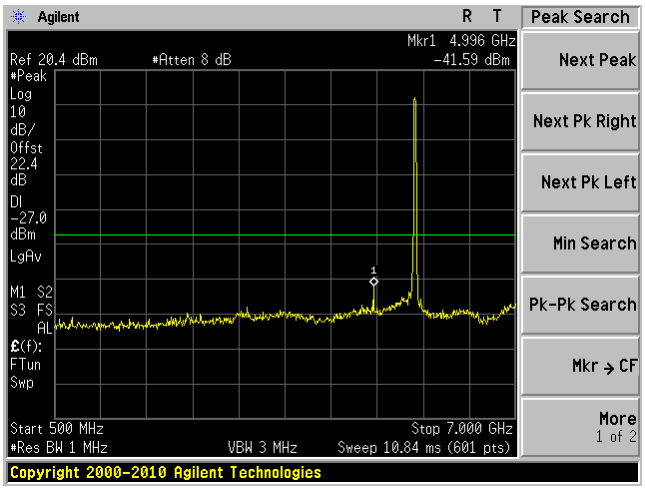
802.11a mode, 5580 MHz, Chain J8
30MHz – 7GHz



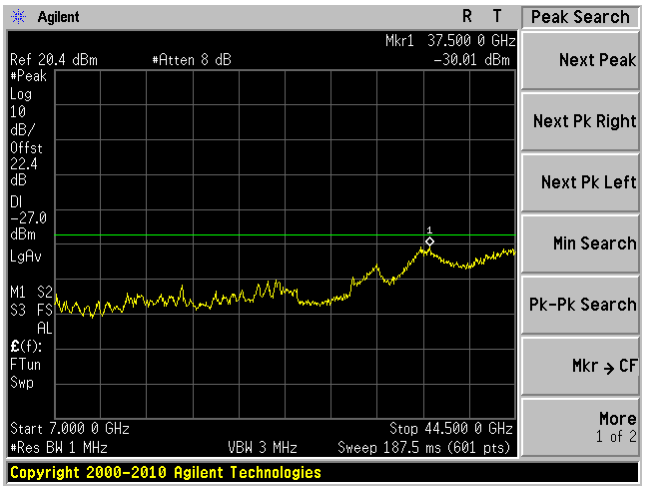
802.11a mode, 5580 MHz, Chain J8
7G – 44.5 GHz



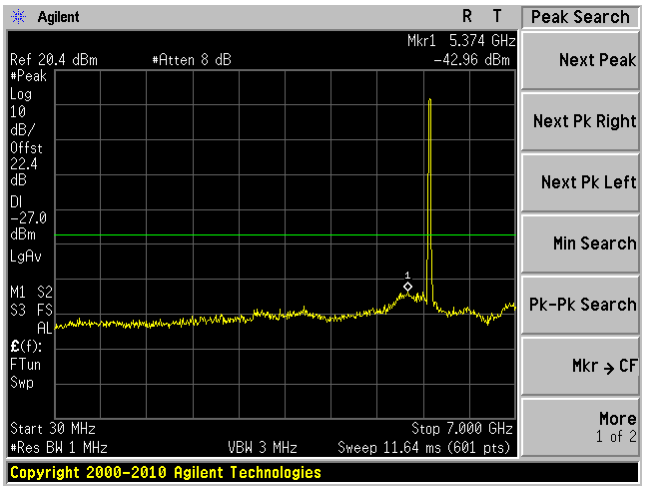
802.11a mode, 5580 MHz, Chain J6
30MHz – 7GHz



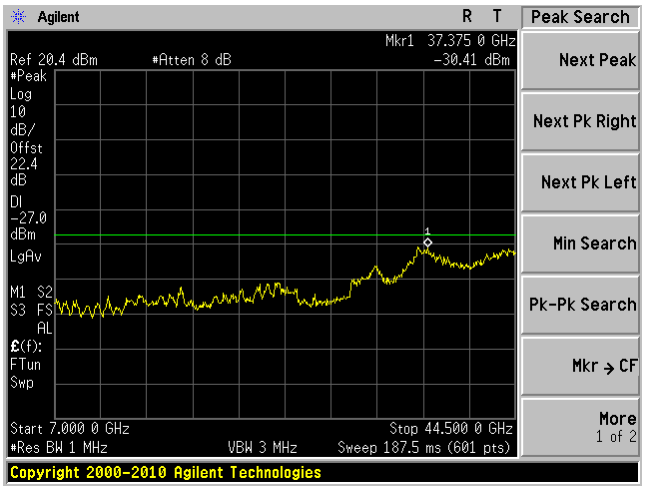
802.11a mode, 5580 MHz, Chain J6
7G – 44.5 GHz



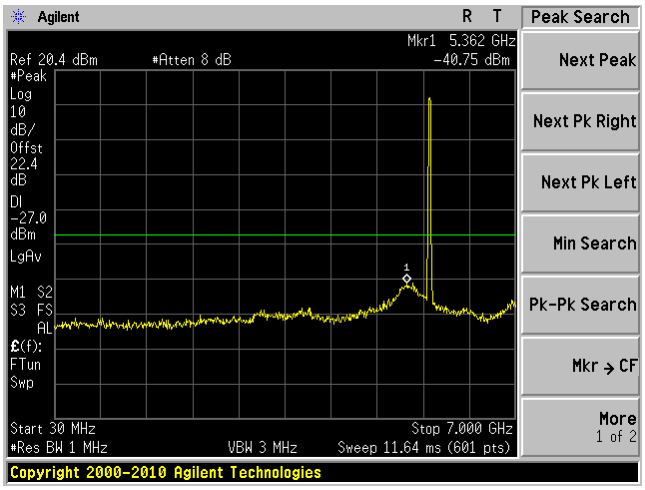
802.11a mode, 5700 MHz, Chain J10
30MHz – 7GHz



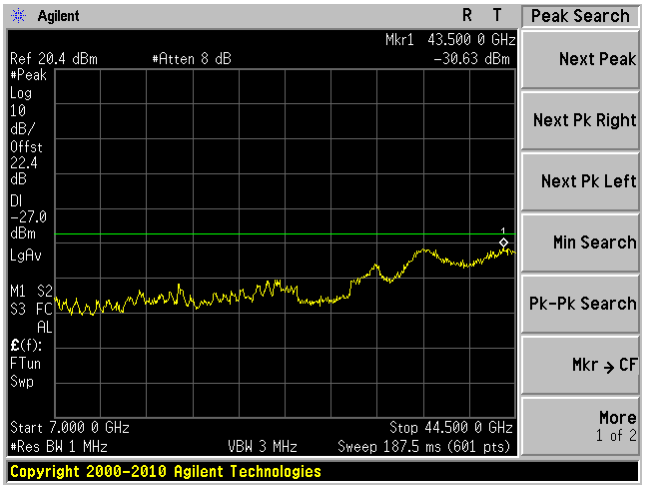
802.11a mode, 5700 MHz, Chain J10
7G – 44.5 GHz



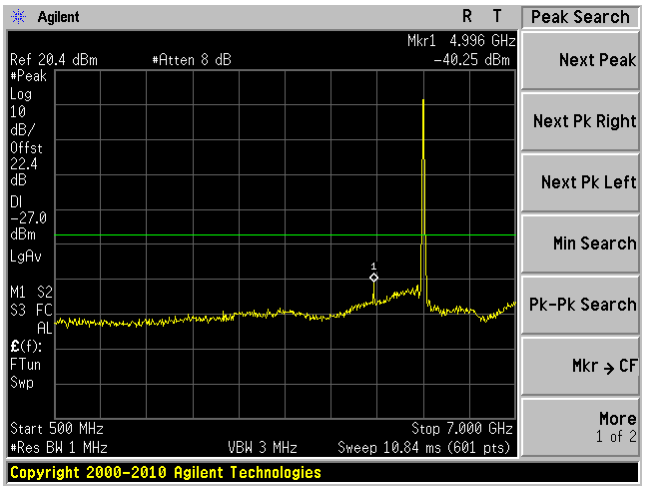
802.11a mode, 5700 MHz, Chain J8
30MHz – 7GHz



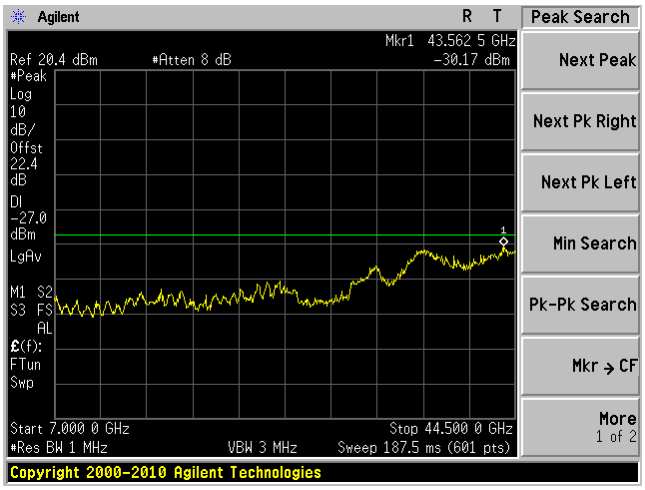
802.11a mode, 5700 MHz, Chain J8
7G – 44.5 GHz



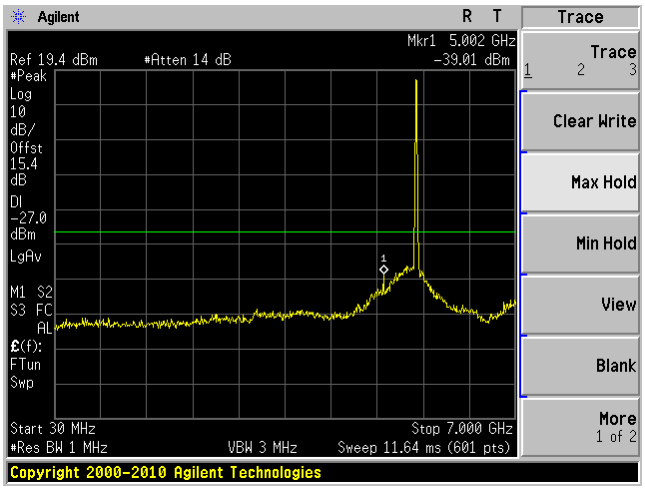
802.11a mode, 5700 MHz, Chain J6
30MHz – 7GHz



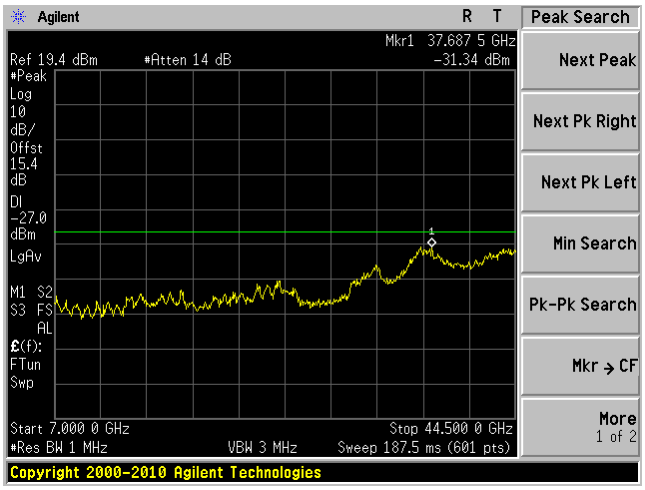
802.11a mode, 5700 MHz, Chain J6
7G – 44.5 GHz



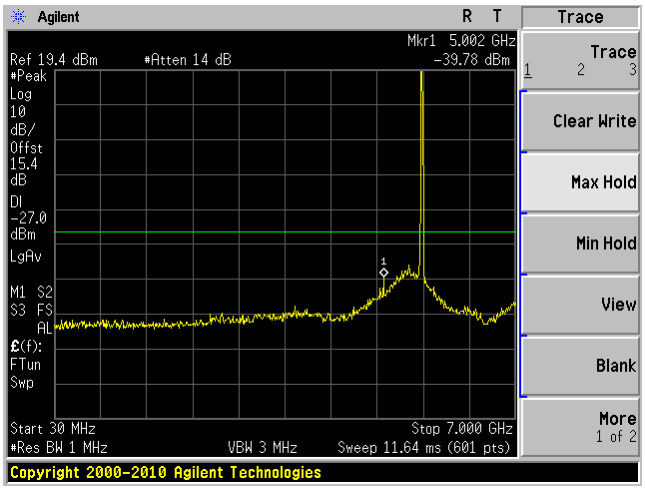
802.11a mode, 5500 MHz, Chain J10, J8, J6
30MHz – 7GHz



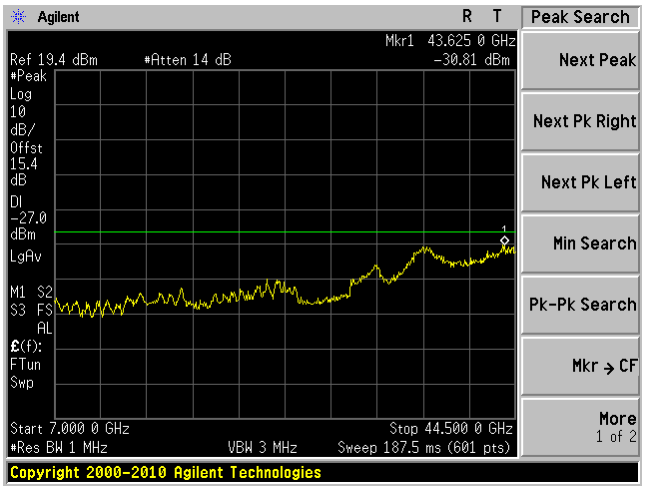
802.11a mode, 5500 MHz, Chain J10, J8, J6
7G – 44.5 GHz



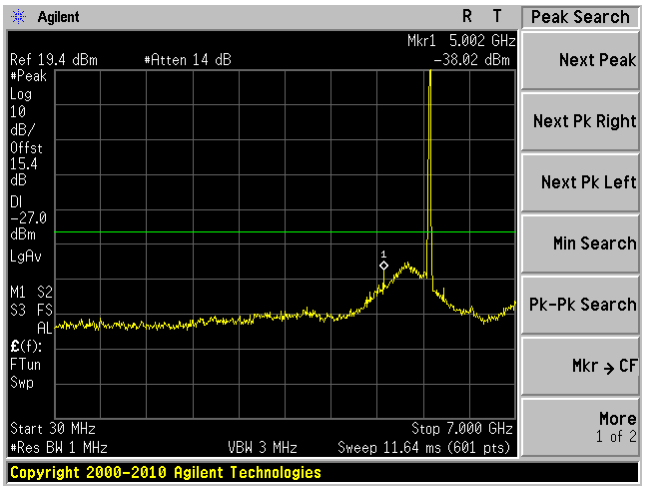
802.11a mode, 5580 MHz, Chain J10, J8, J6
30MHz – 7GHz



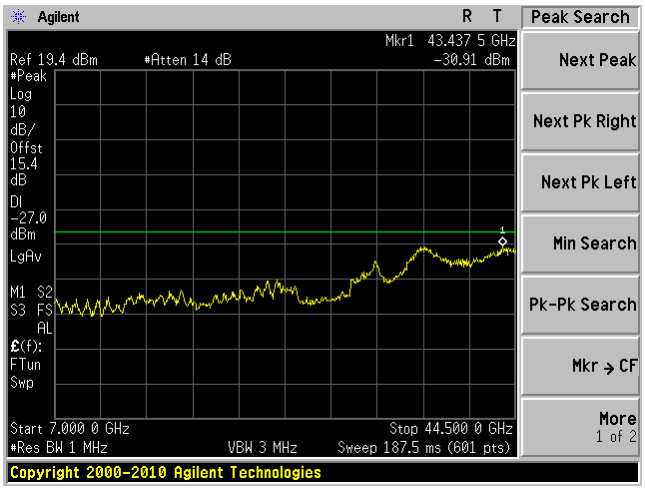
802.11a mode, 5580 MHz, Chain J10, J8, J6
7G – 44.5 GHz



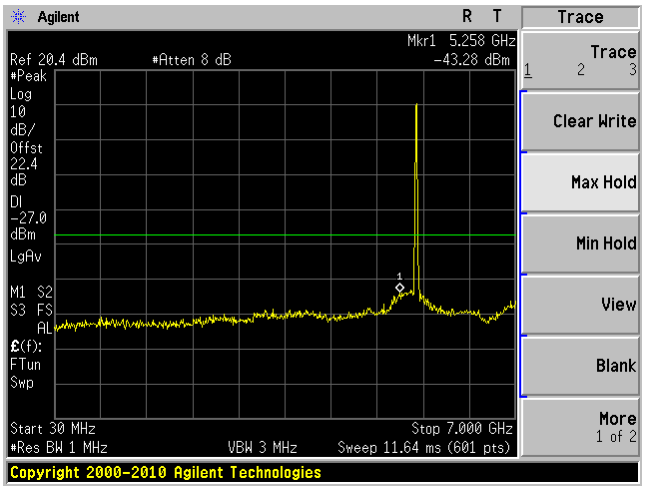
802.11a mode, 5700 MHz, Chain J10, J8, J6
30MHz – 7GHz



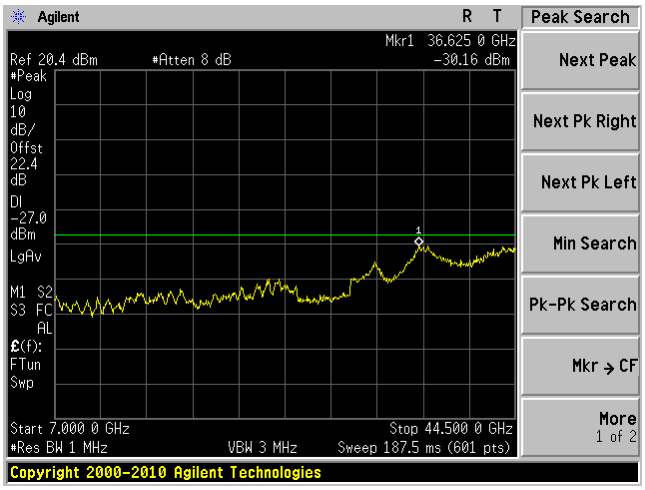
802.11a mode, 5700 MHz, Chain J10, J8, J6
7G – 44.5 GHz



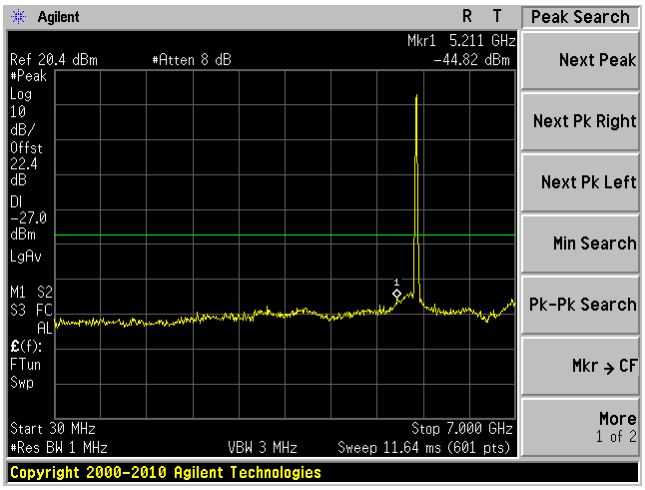
802.11n HT20 mode, 5500 MHz, Chain J10
30MHz – 7GHz



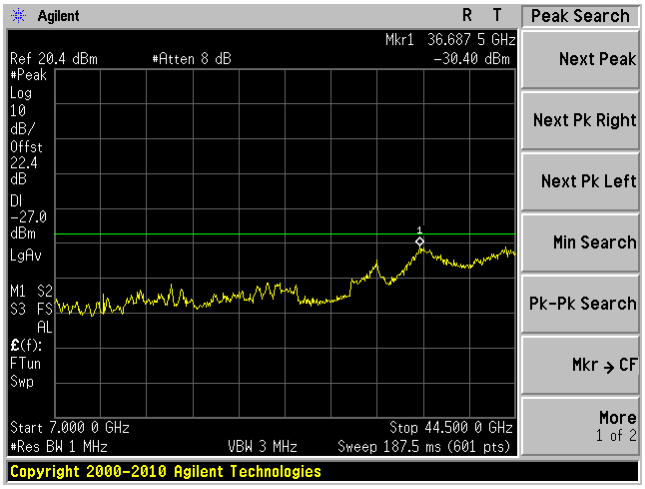
802.11n HT20 mode, 5500 MHz, Chain J10
7G – 44.5 GHz



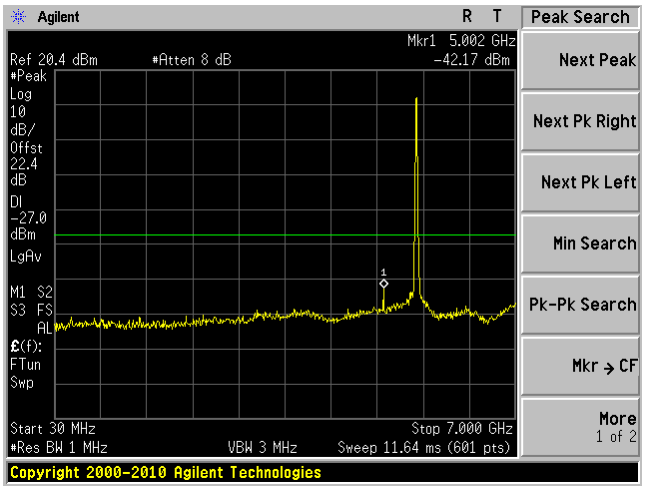
802.11n HT20 mode, 5500 MHz, Chain J8
30MHz – 7GHz



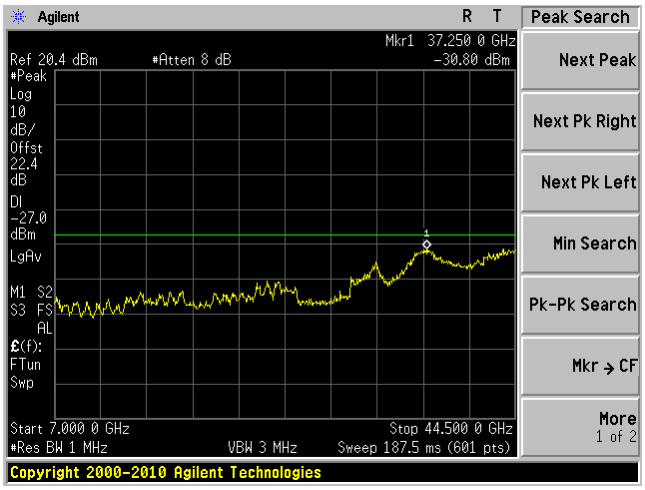
802.11n HT20 mode, 5500 MHz, Chain J8
7G – 44.5 GHz



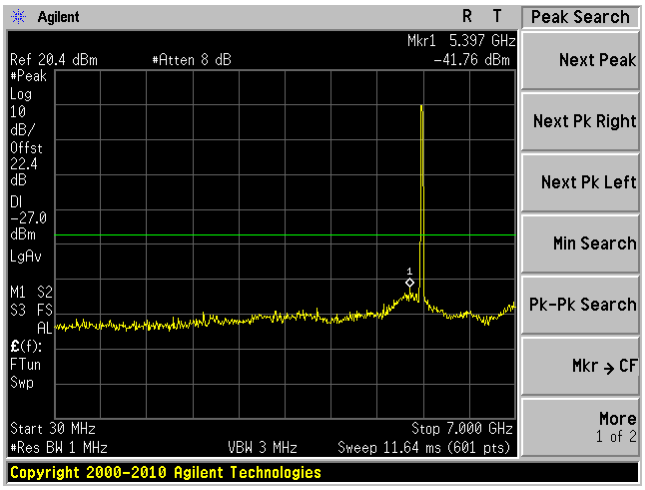
802.11n HT20 mode, 5500 MHz, Chain J6
30MHz – 7GHz



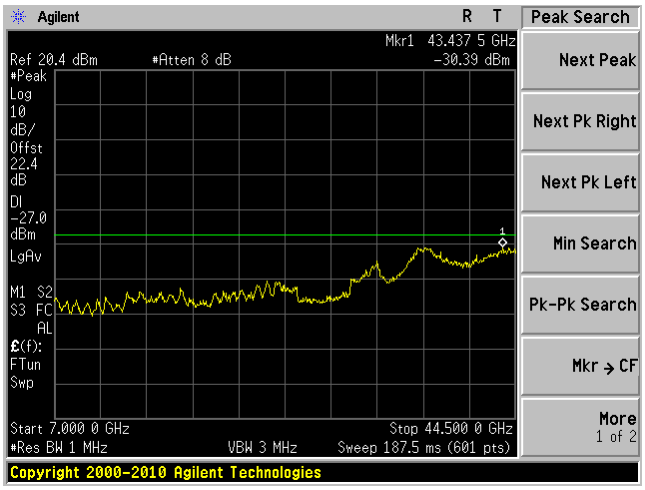
802.11n HT20 mode, 5500 MHz, Chain J6
7G – 44.5 GHz



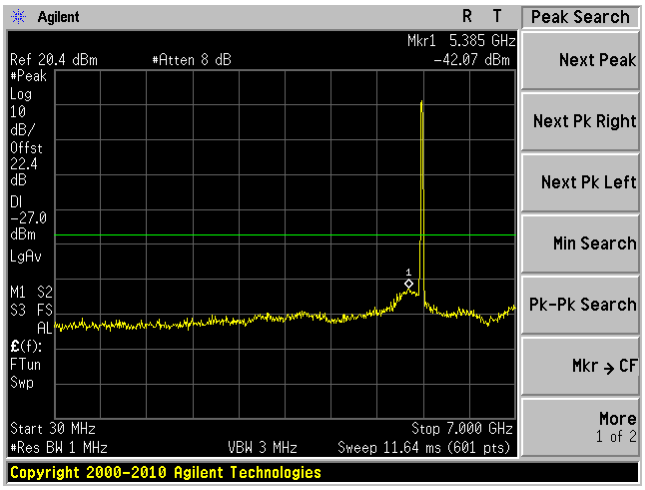
802.11n HT20 mode, 5580 MHz, Chain J10
30MHz – 7GHz



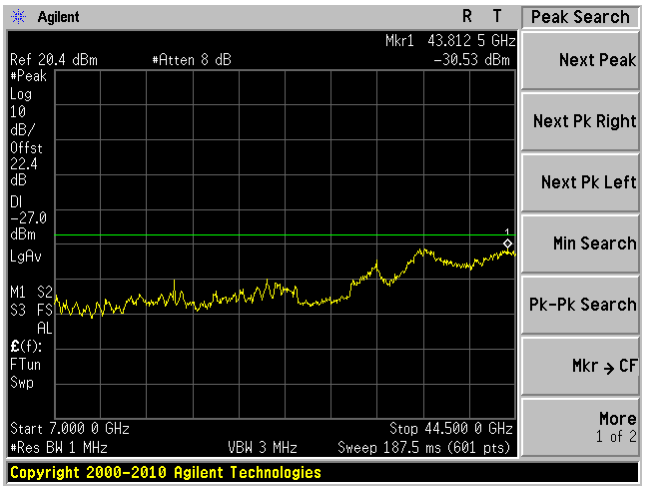
802.11n HT20 mode, 5580 MHz, Chain J10
7G – 44.5 GHz



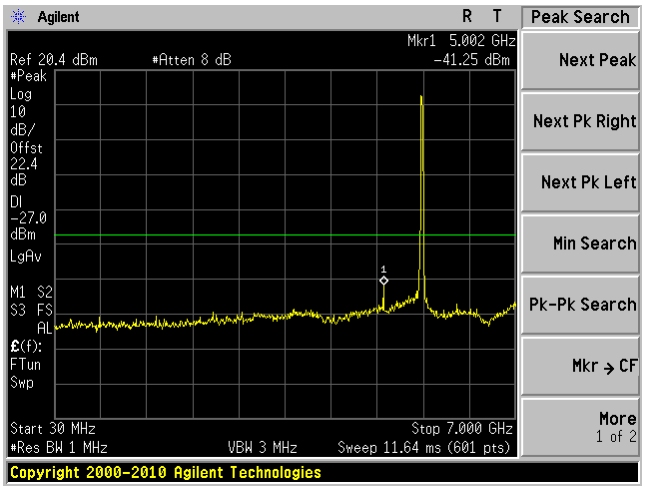
802.11n HT20 mode, 5580 MHz, Chain J8
30MHz – 7GHz



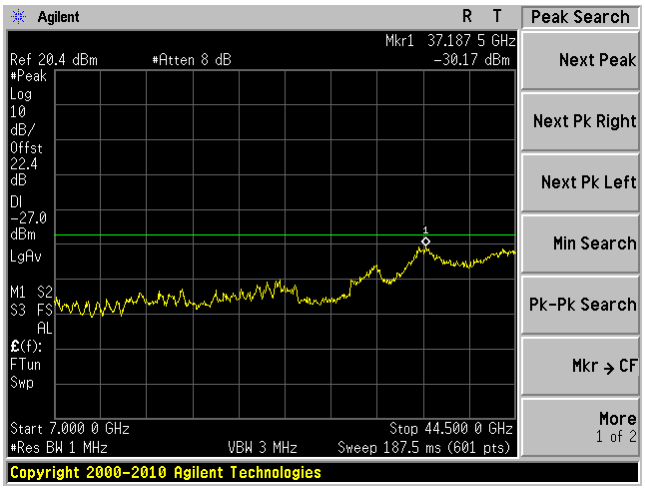
802.11n HT20 mode, 5580 MHz, Chain J8
7G – 44.5 GHz



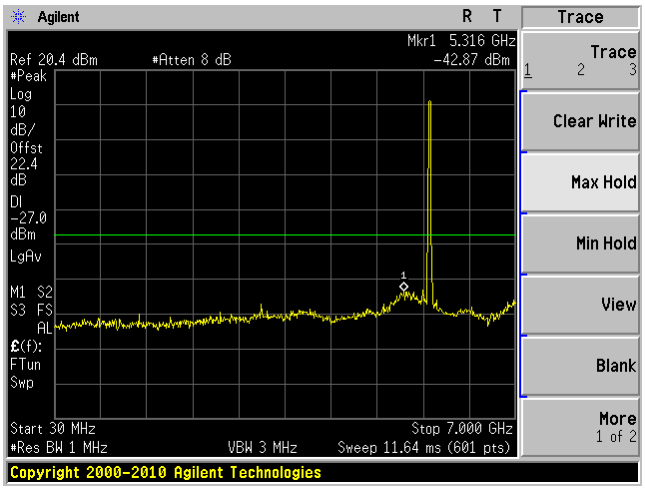
802.11n HT20 mode, 5580 MHz, Chain J6
30MHz – 7GHz



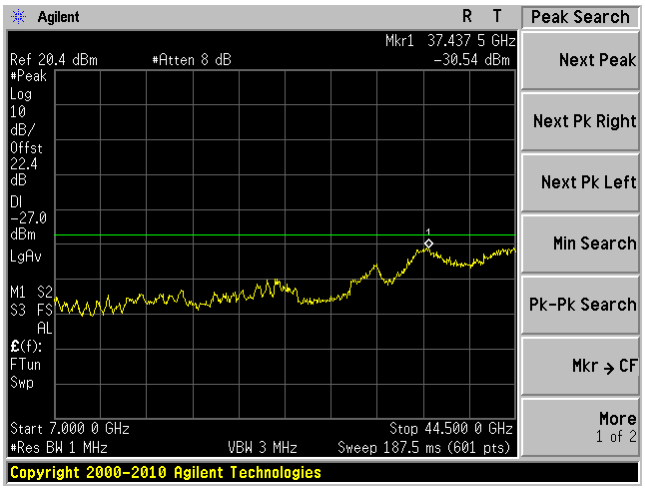
802.11n HT20 mode, 5580 MHz, Chain J6
7G – 44.5 GHz



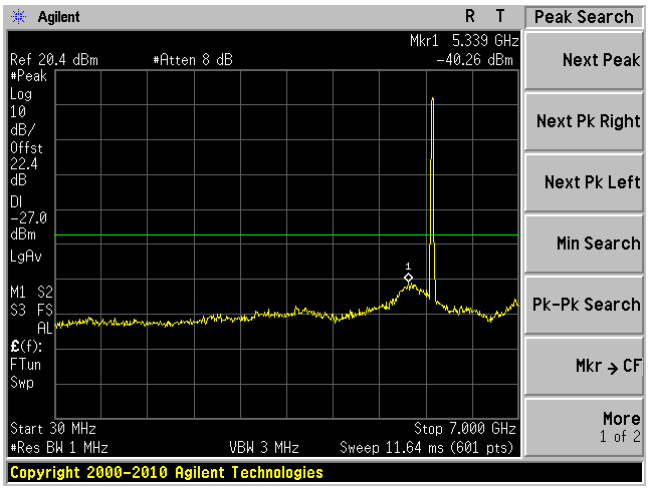
802.11n HT20 mode, 5700 MHz, Chain J10
30MHz – 7GHz



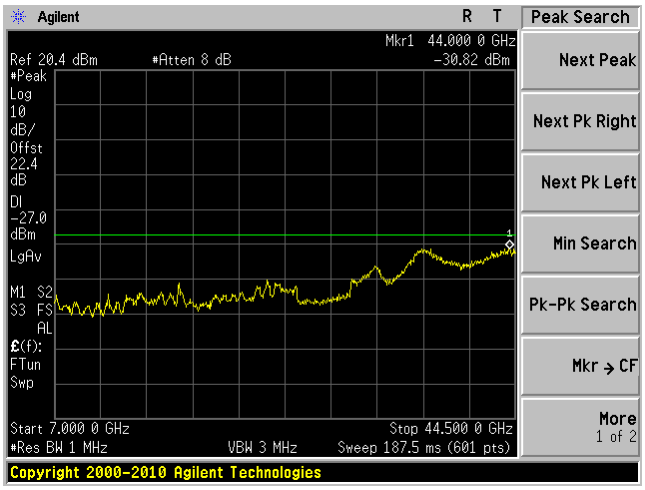
802.11n HT20 mode, 5700 MHz, Chain J10
7G – 44.5 GHz



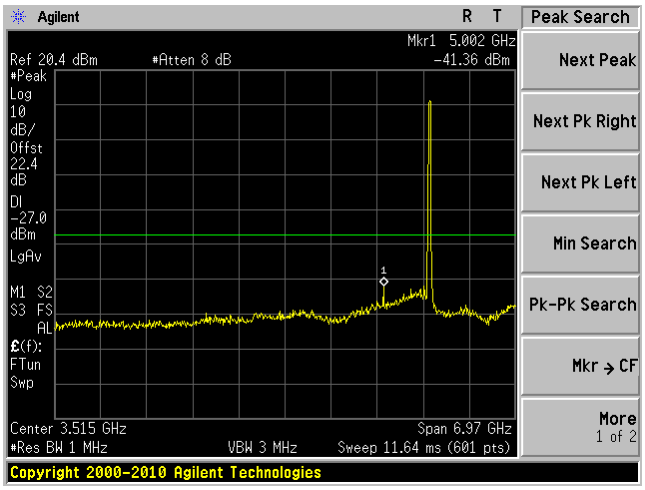
802.11n HT20 mode, 5700 MHz, Chain J8
30MHz – 7GHz



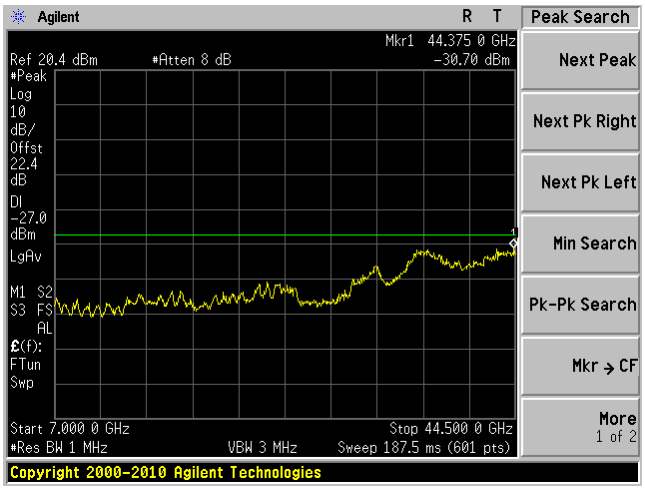
802.11n HT20 mode, 5700 MHz, Chain J8
7G – 44.5 GHz



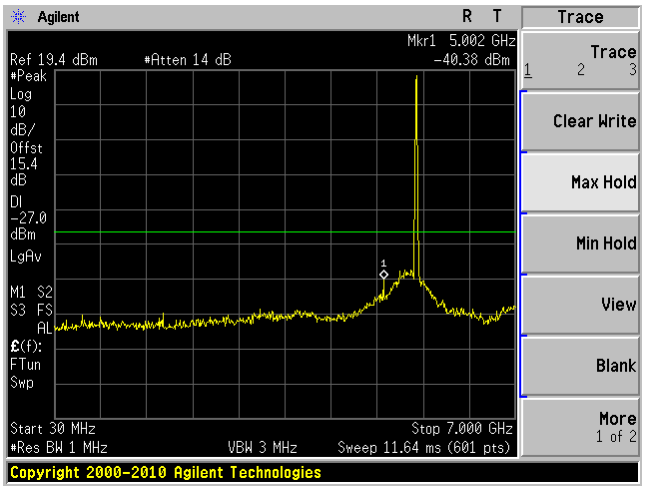
802.11n HT20 mode, 5700 MHz, Chain J6
30MHz – 7GHz



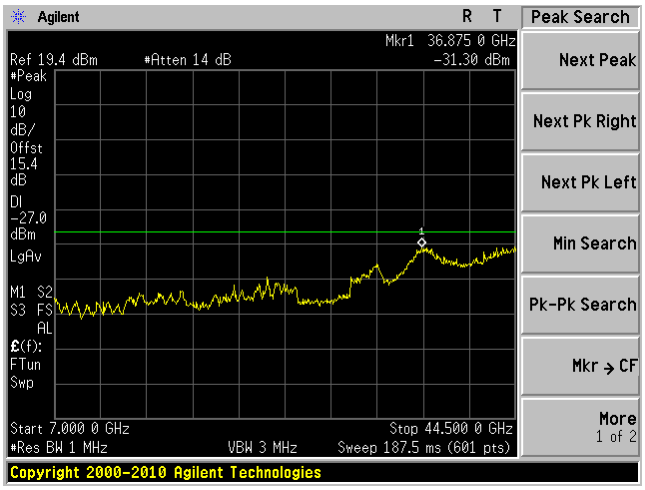
802.11n HT20 mode, 5700 MHz, Chain J6
7G – 44.5 GHz



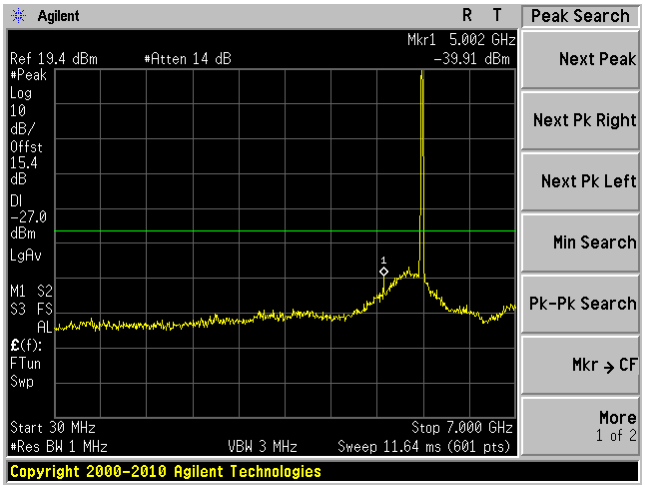
802.11n HT20 mode, 5500 MHz, Chain J10, J8, J6
30MHz – 7GHz



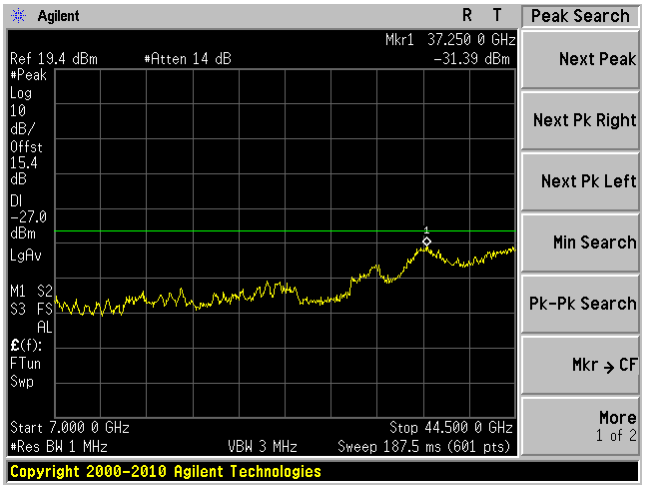
802.11n HT20 mode, 5500 MHz, Chain J10, J8, J6
7G – 44.5 GHz



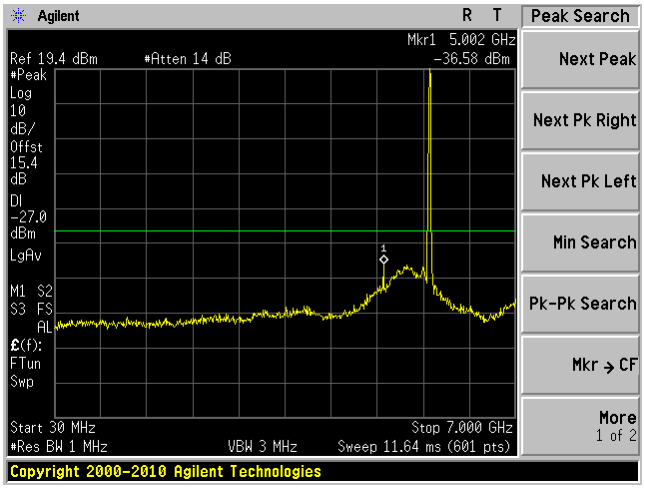
802.11n HT20 mode, 5580 MHz, Chain J10, J8, J6
30MHz – 7GHz



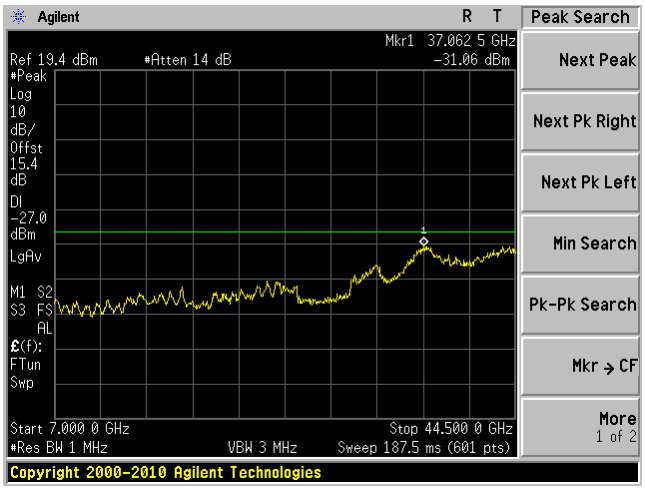
802.11n HT20 mode, 5580 MHz, Chain J10, J8, J6
7G – 44.5 GHz



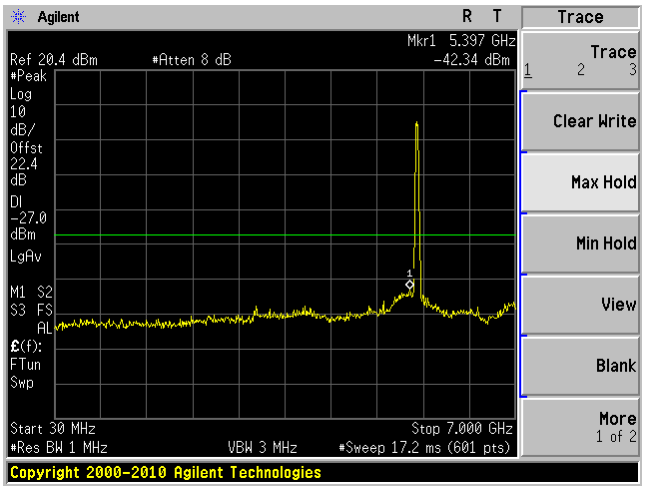
802.11n HT20 mode, 5700 MHz, Chain J10, J8, J6
30MHz – 7GHz



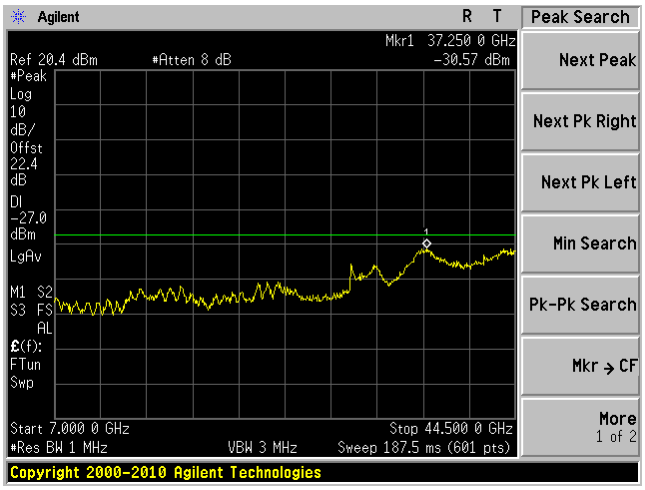
802.11n HT20 mode, 5700 MHz, Chain J10, J8, J6
7G – 44.5 GHz



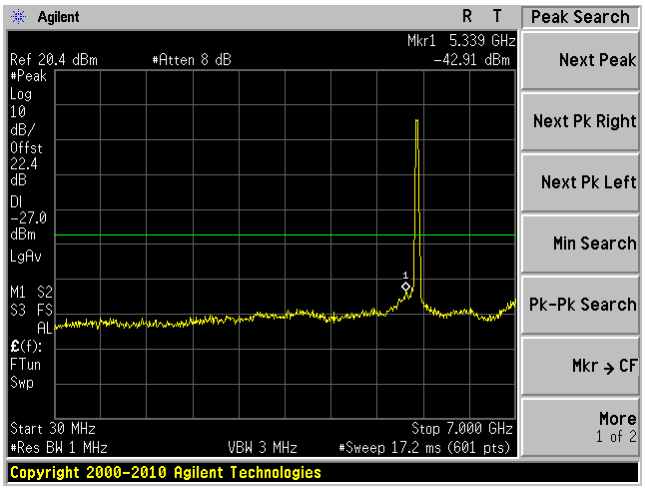
802.11n HT40 mode, 5510 MHz, Chain J10
30MHz – 7GHz



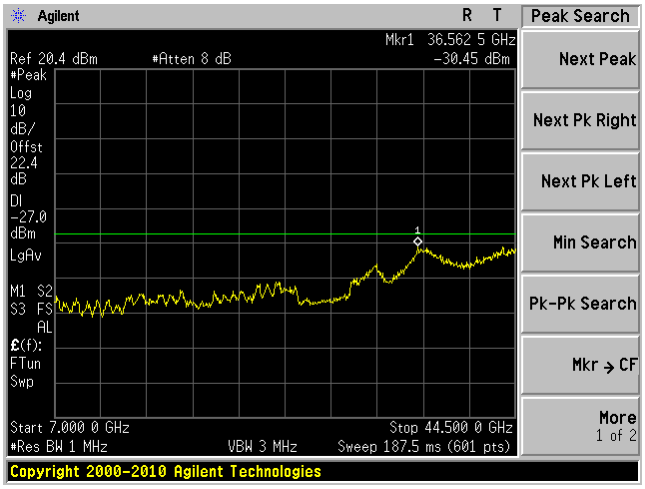
802.11n HT40 mode, 5510 MHz, Chain J10
7G – 44.5 GHz



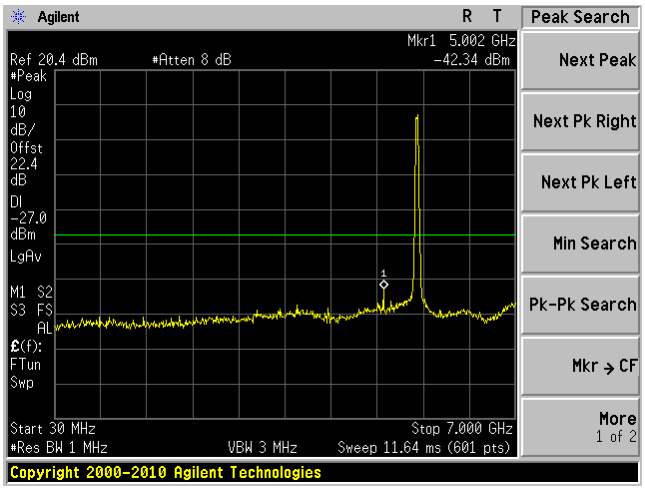
802.11n HT40 mode, 5510 MHz, Chain J8
30MHz – 7GHz



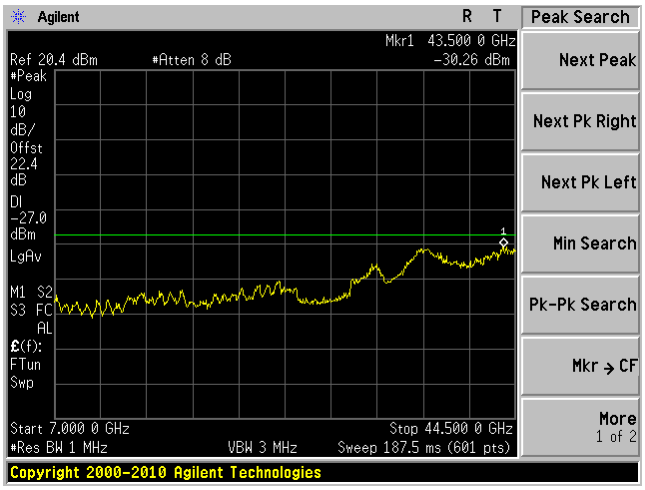
802.11n HT40 mode, 5510 MHz, Chain J8
7G – 44.5 GHz



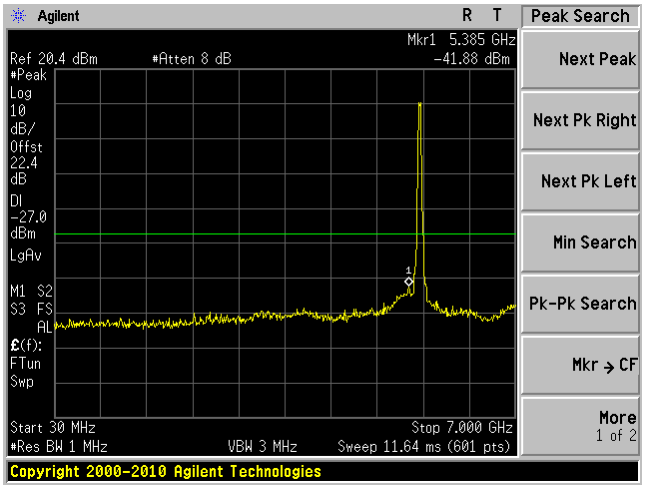
802.11n HT40 mode, 5510 MHz, Chain J6
30MHz – 7GHz



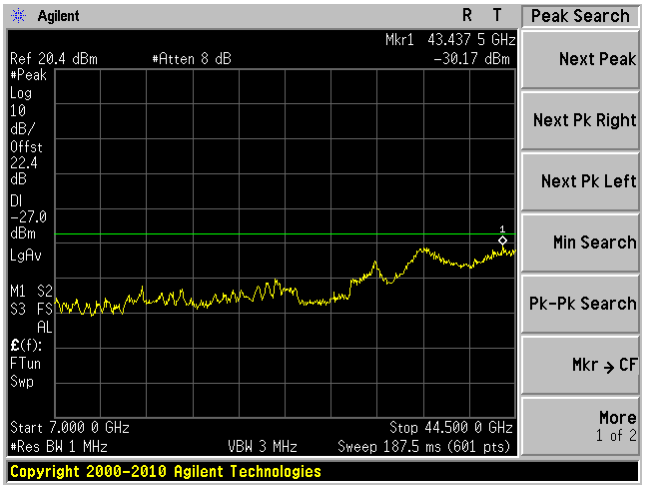
802.11n HT40 mode, 5510 MHz, Chain J6
7G – 44.5 GHz



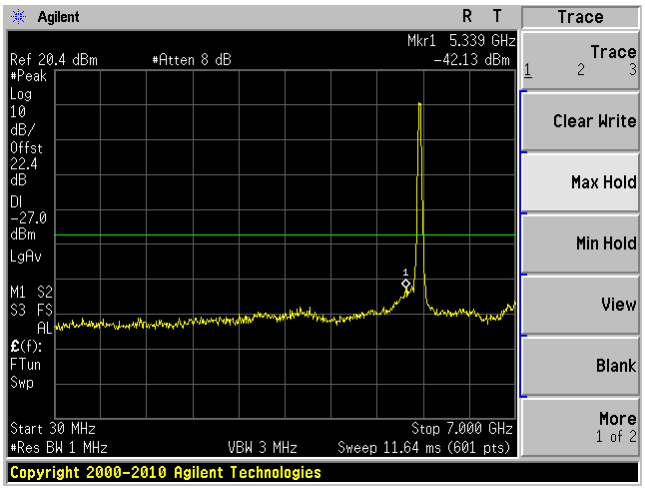
802.11n HT40 mode, 5550 MHz, Chain J10
30MHz – 7GHz



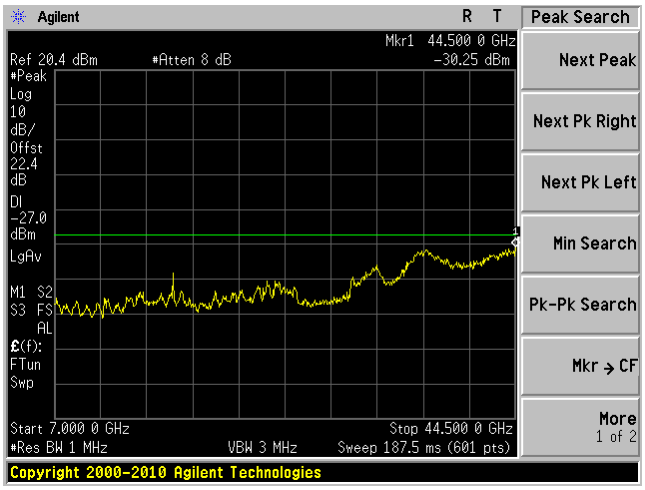
802.11n HT40 mode, 5550 MHz, Chain J10
7G – 44.5 GHz



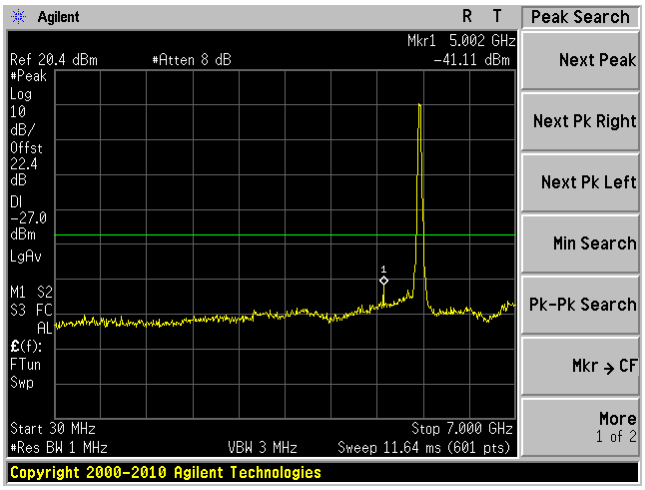
802.11n HT40 mode, 5550 MHz, Chain J8
30MHz – 7GHz



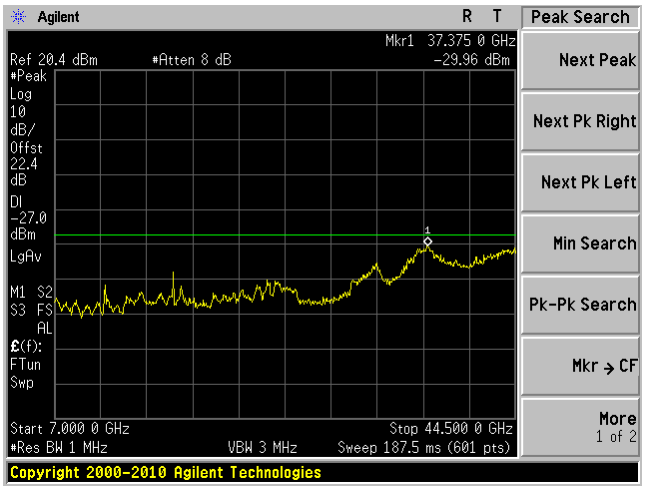
802.11n HT40 mode, 5550 MHz, Chain J8
7G – 44.5 GHz



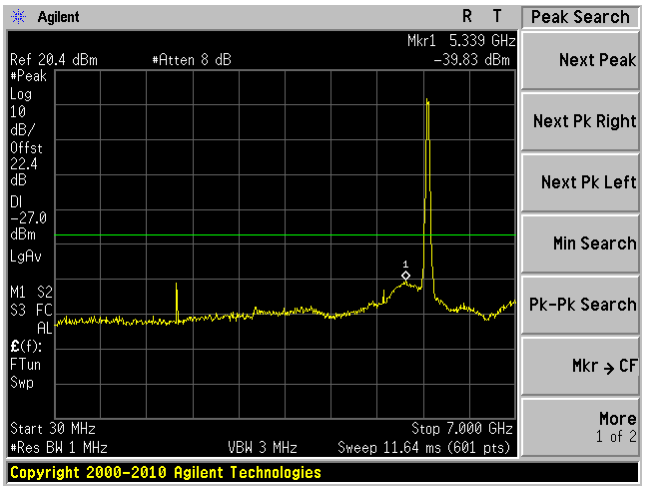
802.11n HT40 mode, 5550 MHz, Chain J6
30MHz – 7GHz



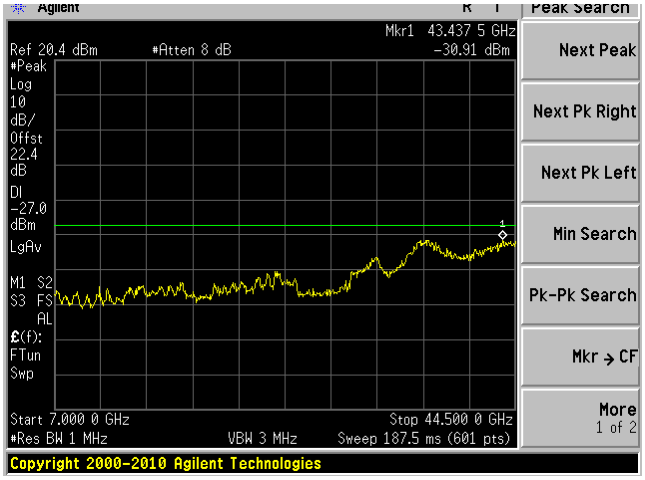
802.11n HT40 mode, 5550 MHz, Chain J6
7G – 44.5 GHz



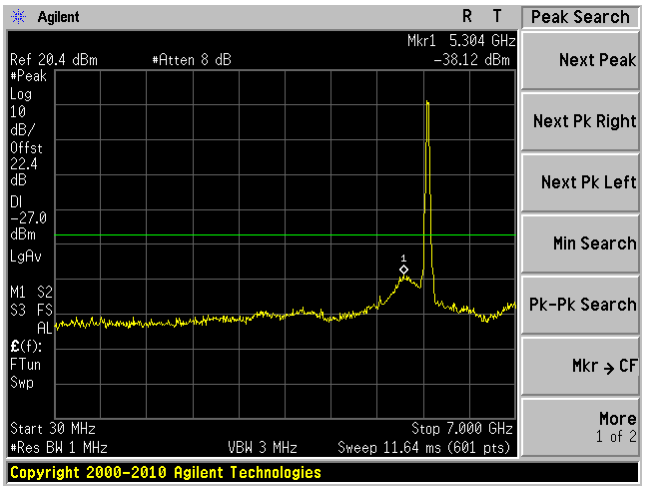
802.11n HT40 mode, 5670 MHz, Chain J10
30MHz – 7GHz



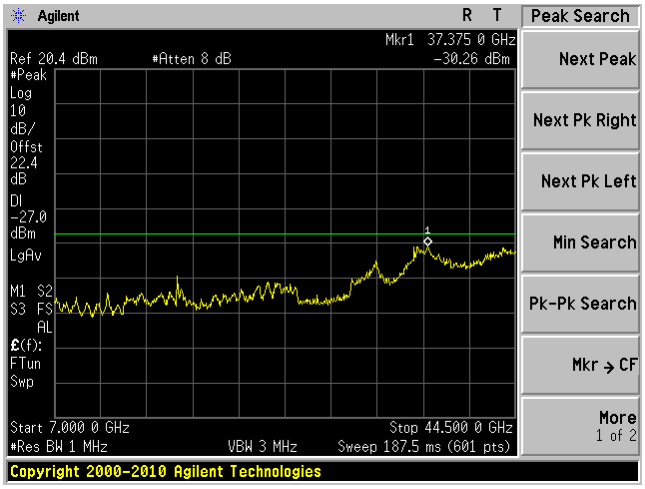
802.11n HT40 mode, 5670 MHz, Chain J10
7G – 44.5 GHz



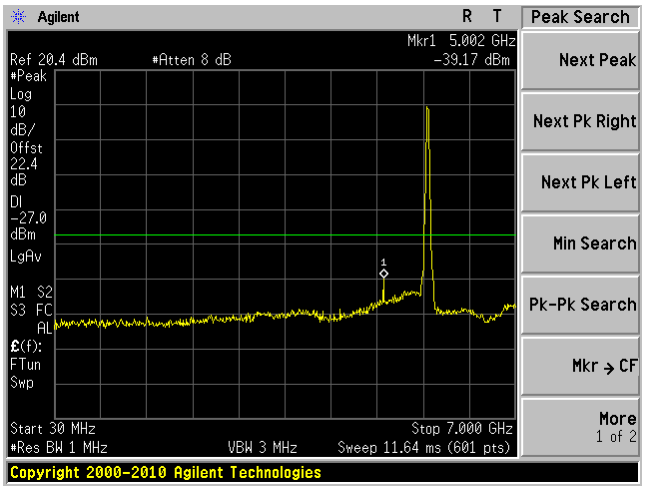
802.11n HT40 mode, 5670 MHz, Chain J8
30MHz – 7GHz



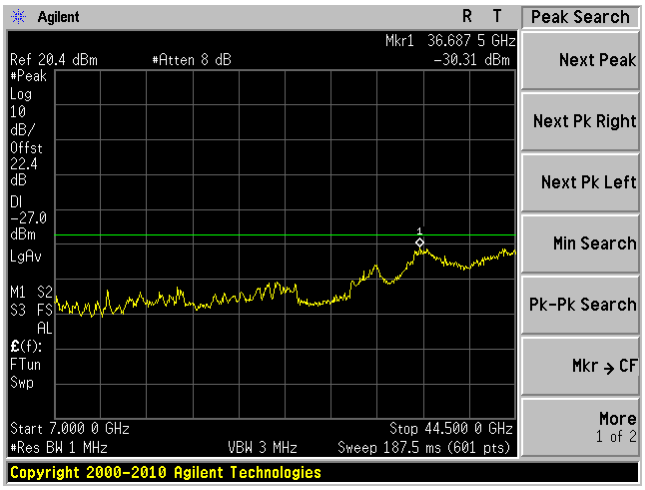
802.11n HT40 mode, 5670 MHz, Chain J8
7G – 44.5 GHz



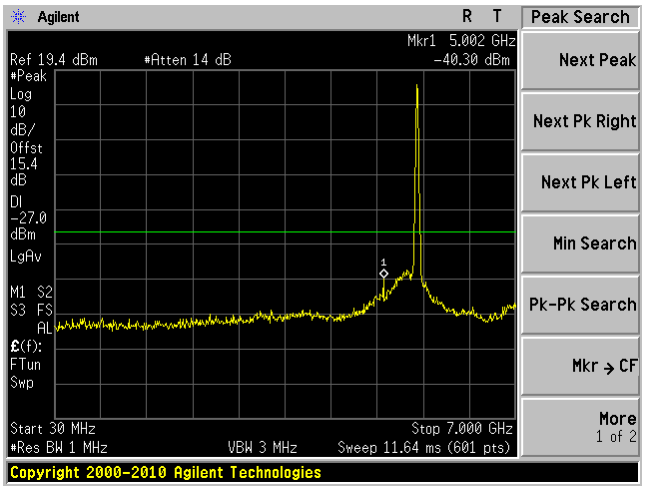
802.11n HT40 mode, 5670 MHz, Chain J6
30MHz – 7GHz



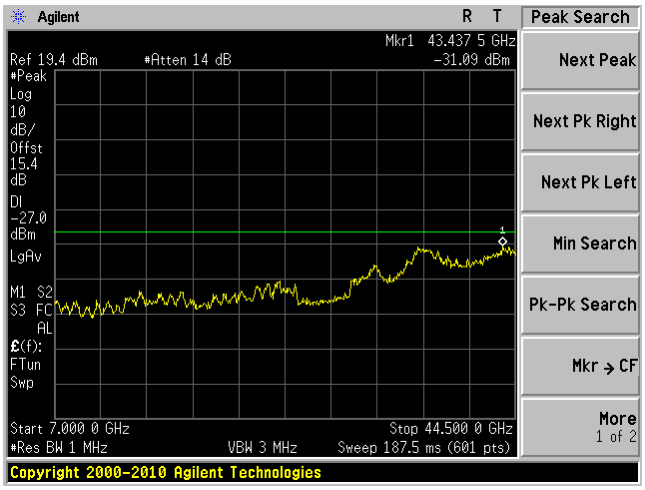
802.11n HT40 mode, 5670 MHz, Chain J6
7G – 44.5 GHz



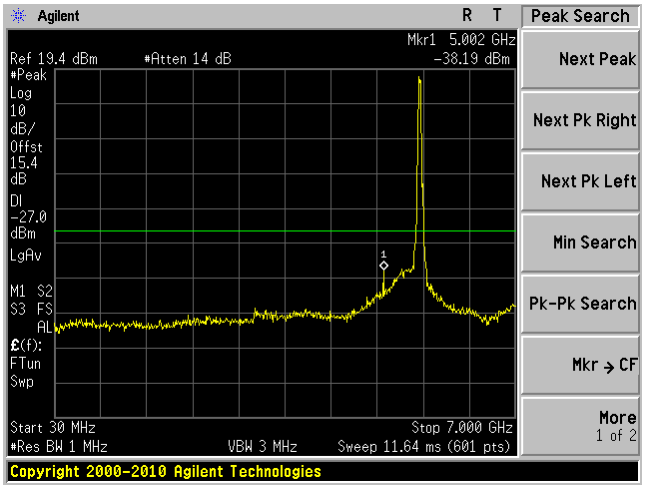
802.11n HT40 mode, 5510 MHz, Chain J10, J8, J6
30MHz – 7GHz



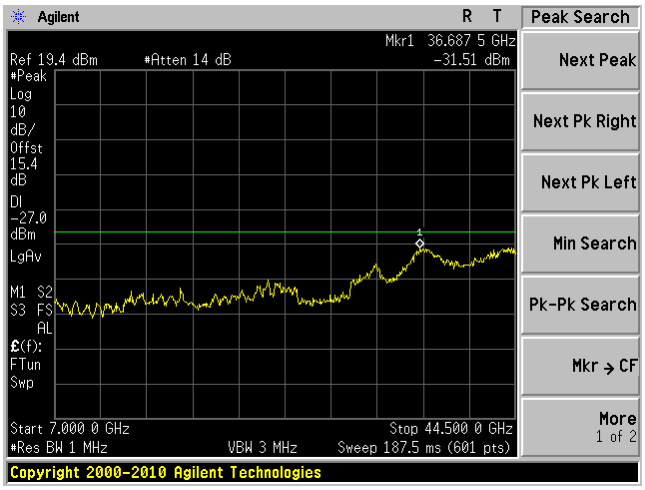
802.11n HT40 mode, 5510 MHz, Chain J10, J8, J6
7G – 44.5 GHz



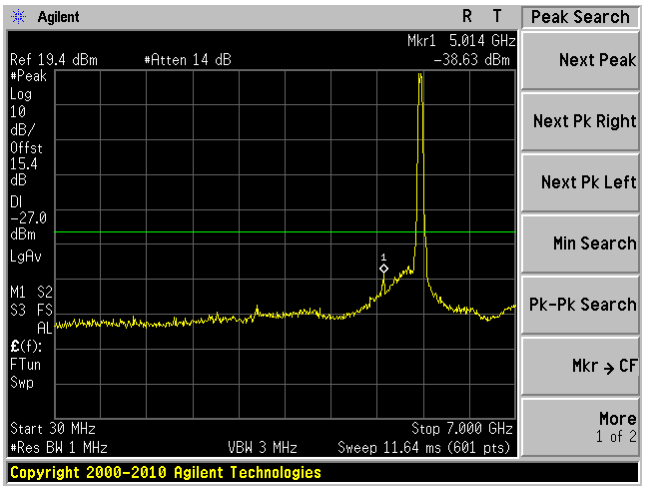
802.11n HT40 mode, 5550 MHz, Chain J10, J8, J6
30MHz – 7GHz



802.11n HT40 mode, 5550 MHz, Chain J10, J8, J6
7G – 44.5 GHz



802.11n HT40 mode, 5670 MHz, Chain J10, J8, J6
30MHz – 7GHz



802.11n HT40 mode, 5670 MHz, Chain J10, J8, J6
7G – 44.5 GHz