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

For

## Ruckus Wireless, Inc.

350 West Java Drive,

Sunnyvale, CA 94089, USA

**FCC ID: S9GT300**
**IC: 5912A-T300**

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

| | |
|---|---|
| **Prepared By:** | Chen Ge |
| **Report Number:** | R1403261-407 W5356 |
| **Report Date:** | 2014-06-05 |
| **Reviewed By:** | Bo Li<br>Test Engineer |

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# DOCUMENT REVISION HISTORY

| Revision Number | Report Number | Description of Revision | Date of Revision |
|---|---|---|---|
| 0 | R1403261-407 W5356 | Original Report | 2014-06-05 |

# 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: *T300, FCC ID: S9GT300, IC: 5912A-T300* or the "EUT" as referred to in this report. The EUT is a dual band 2x2 MIMO 802.11 a/b/g/n/ac RLAN Access Point.

## 1.2 Mechanical Description of EUT

The EUT measures approximately 18.1 cm (L) x 15.1 cm (W) x 8.0 cm (H) and weighs 400 g.
Note: The EUT was tested without enclosure.

*The test data gathered are from typical production sample, serial number: 21406000005 assigned by Client.*

## 1.3 Objective

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

This project is a Permissive Change II submission for the purpose of adding DFS frequency bands (5250-5350 MHz; 5470-5725 MHz) to the certified device (FCC ID: S9GT300). The objective is to determine compliance with FCC/IC rules for Antenna Requirments, AC Line Conducted Emissions, Occupied Bandwidth, Maximum Peak Output Power, Power Spectral Density, Radiated and Conducted Spurious Emissions, and Band Edge for adding DFS bands 5250-5350 MHz and 5470-5725 MHz.

## 1.4 Related Submittal(s)/Grant(s)

FCC Part 15.247, IC RSS-210 DTS submission with FCC ID: S9GT300 and IC: 5912A-T300.

## 1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz and FCC KDB 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

## 1.6 Measurement Uncertainty

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

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

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

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

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

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

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

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

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

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

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

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

# 2 EUT Test Configuration

## 2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2009.

## 2.2 EUT Exercise Software

The test utility used was *T300 ART* was provided by Ruckus Wireless Inc., and was verified by *Chen Ge* to comply with the standard requirements being tested against.

## 2.3 Equipment Modifications

No modifications were made to the EUT.

## 2.4 Special Accessories

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

## 2.5 Local Support Equipment

| Manufacturer | Description | Model | Serial Number |
|---|---|---|---|
| Ruckus | DC Adaptor/POE | NPE-5818 | 740-64157-001 |
| Ruckus | AC Adaptor | PA10244HUB | 740-64125-010 |

## 2.6 EUT Internal Configuration Details

| Manufacturer | Description | Model | Serial Number |
|---|---|---|---|
| Ruckus | Main Board (SANTORINI) | ASM 120-11257-001 rev. 3.1 | RUK01946 |
| Ruckus | RJ45 Port Board | ASM 120-11264-001 rev. 2.1 | RUK01957 |
| Ruckus | Ruckus Board | ASM 120-11229-002 rev. A | RUK01329 |
| Ruckus | IZAR Board | ASM 120-11261-001 rev. 3 | RUK00727 |
| Ruckus | IZAR CROSS Board | ASM 120-11262-001 rev. 3 | RUK00908 |

## 2.7 Interface Ports and Cables

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

## 2.8 Power Supply List and Details

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

# 3 Summary of Test Results

| FCC & IC Rules | Description of Test | Result |
|---|---|---|
| FCC §15.407(f), §2.1091<br>IC RSS-102 | RF Exposure | Compliant |
| FCC §15.203<br>IC RSS-Gen §7.1.2 | Antenna Requirement | Compliant |
| FCC §15.207<br>IC RSS-Gen §7.2.4 | AC Power Line Conducted Emissions | Compliant |
| FCC §15.209(a), 15.407(b)<br>IC RSS-210 §A9.2 | Spurious Radiated Emissions | Compliant |
| FCC §15.407(a)<br>IC RSS-210 §A9.2 | 26 dB and 99% Emission Bandwidth | Compliant |
| FCC §407(a)(1)<br>IC RSS-210 §A9.2 | Peak Output Power Measurement | Compliant |
| FCC §2.1051, §15.407(b)<br>IC RSS-210 §A9.2 | Band Edges | Compliant |
| FCC §15.407(a)(1)<br>IC RSS-210 §A9.2 | Power Spectral Density | Compliant |
| FCC §15.407(a)(6) | Peak Excursion Ratio | Compliant |
| IC RSS-210 §2.3<br>IC RSS-Gen §6 | Receiver Spurious Radiated Emissions | Compliant |
| FCC §2.1051, §15.407(b)<br>IC RSS-210 §A9.2 | Spurious Emissions at Antenna Terminals | Compliant |
| FCC §15.407(h)<br>IC RSS-210 §A9.3 | DFS | Note[1] |

**Note**[1] *please refers to DFS report, Report number: R1403261-DFS.*

# 4 FCC §2.1091, §15.407(f) & 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): | 23.55 |
| Maximum peak output power at antenna input terminal (mW): | 226.464 |
| Prediction distance (cm): | 20 |
| Prediction frequency (MHz): | 5270 |
| Maximum Antenna Gain, typical (dBi): | 3.5 |
| Maximum Antenna Gain (numeric): | 2.238 |
| Power density of prediction frequency at 20.0 cm ($mW/cm^2$): | 0.0898 |
| Power density of prediction frequency at 20.0 cm ($W/m^2$): | 0.898 |
| 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): | 23.48 |
| Maximum peak output power at antenna input terminal (mW): | 222.84 |
| Prediction distance (cm): | 20 |
| Prediction frequency (MHz): | 5700 |
| Maximum Antenna Gain, typical (dBi): | 3.5 |
| Maximum Antenna Gain (numeric): | 2.238 |
| Power density of prediction frequency at 20.0 cm ($mW/cm^2$): | 0.0993 |
| Power density of prediction frequency at 20.0 cm ($W/m^2$): | 0.993 |
| 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

| Manufacturers | Antenna Type/Pattern | Antenna Gain (dBi) @ 5 GHz |
|---|---|---|
| Ruckus | Omni | 3.5 |

Note: The power setting was controlled by manufacture with different antenna configuration. The power setting of the different antenna will be set with the corresponded value and no more then the level reported.

The antenna consists of non standard (UFL) connectors with less 6 dBi gain; therefore, it complies with the antenna requirement.

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

## 6.1 Applicable Standards

As per FCC §15.207 Conducted limits:

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

As per IC RSS-Gen §7.2.4 Conducted limits:

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

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

**Decreases with the logarithm of the frequency.*

## 6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.4-2009 measurement procedure. The specification used was FCC §15.207 and IC RSS-Gen §7.2.4 limits.

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

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

## 6.3 Test Procedure

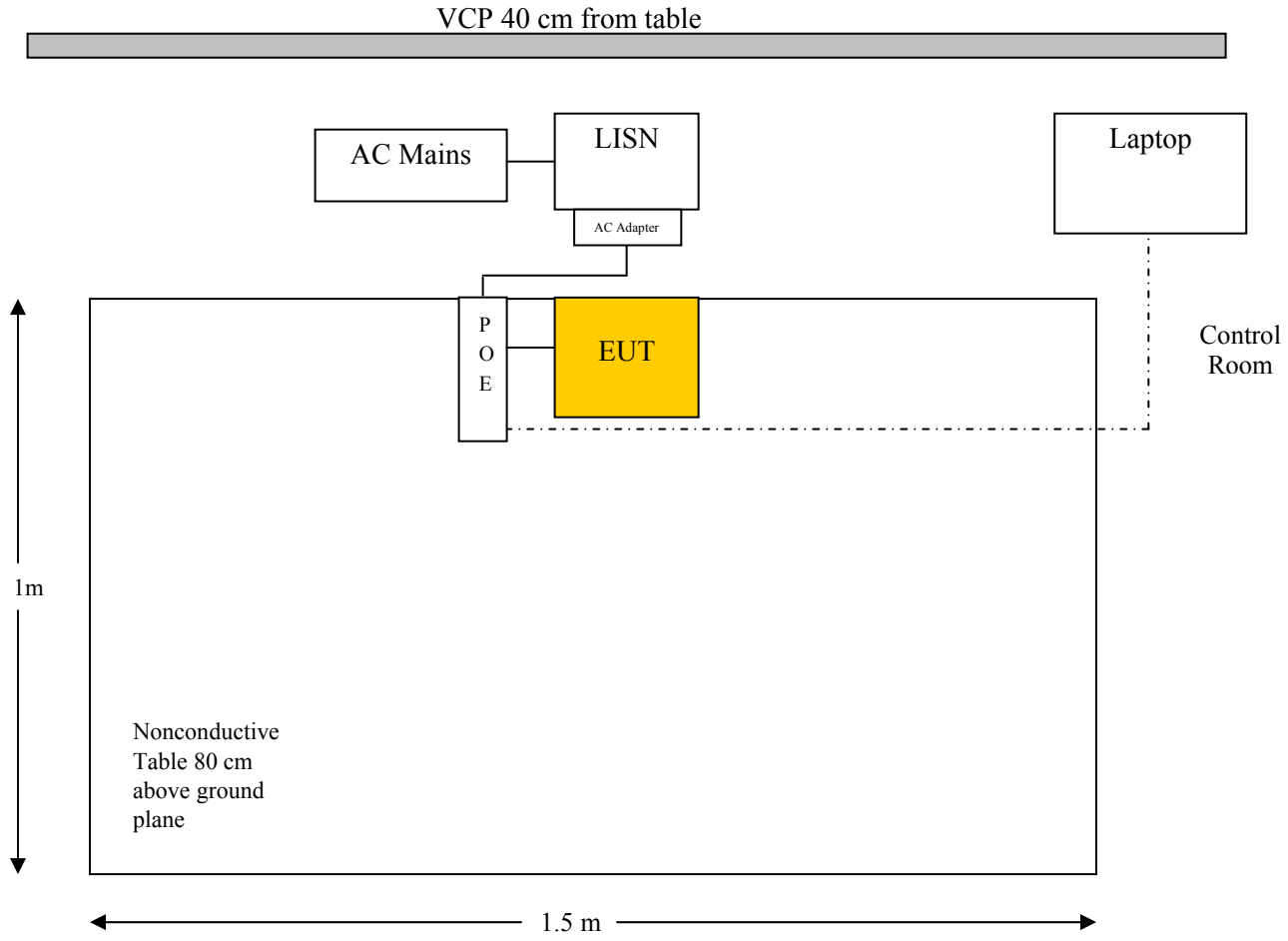
During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-1 and the power cord of the support equipment was connected to LISN-2.

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

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

## 6.4 Test Setup Block Diagram

POE




## 6.5 Corrected Amplitude & Margin Calculation

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

CA = Ai + CL + Atten

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

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

Margin = Corrected Amplitude - Limit

## 6.6 Test Equipment List and Details

| Manufacturer | Description | Model No. | Serial No. | Calibration Date | Calibration Interval |
|---|---|---|---|---|---|
| Rohde & Schwarz | EMI Test Receiver | ESCI 1166.5950K03 | 100337 | 2014-03-28 | 1 year |
| TTE | Filter, High Pass | H9962-150K-50-21378 | K7133 | 2013-05-30 | 1 year |
| Solar Electronics | LISN | 9252-50-R-24-N | 511205 | 2013-06-25 | 1 year |

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

## 6.7 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 22 ºC |
| **Relative Humidity:** | 52 % |
| **ATM Pressure:** | 101.89 kPa |

*The testing was performed by Chen Ge on 2014-05-01 in 5 m chamber 3.*

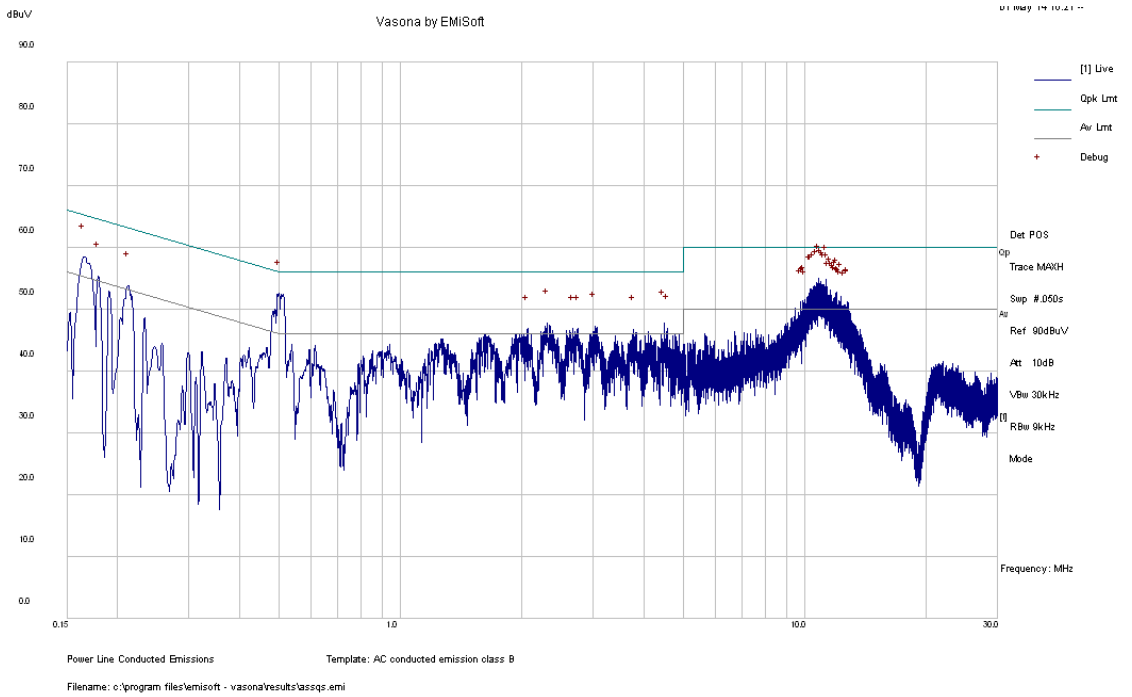
## 6.8 Summary of Test Results

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

| **Connection: AC/DC adapter connected to 120 V/60 Hz, AC** | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Conductor Mode (Line/Neutral)** | **Range (MHz)** |
| -1.91 | 10.96065 | Neutral | 0.15-30 |

## 6.9 Conducted Emissions Test Plots and Data

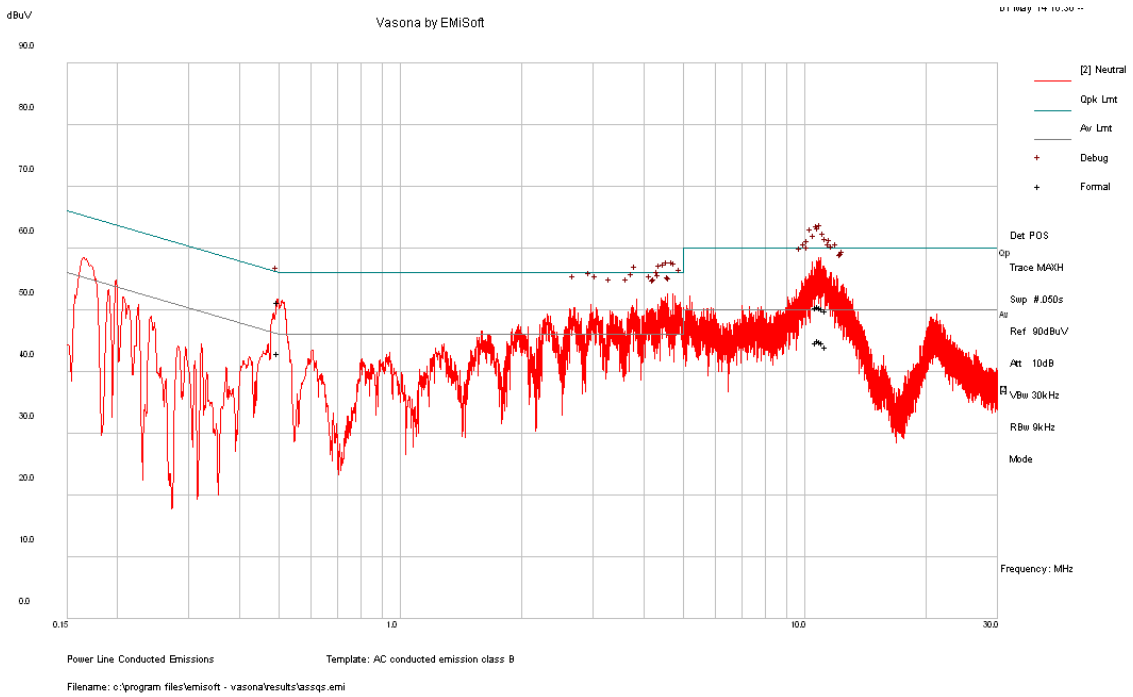
120 V, 60 Hz – Line, POE




| Frequency (MHz) | Corrected Amplitude (dBµV) | Conductor (Line/Neutral) | Limit (dBµV) | Margin (dB) | Detector (QP/Ave.) |
|---|---|---|---|---|---|
| 0.500016 | 51.26 | Line | 56 | -4.74 | QP |
| 10.85379 | 50.65 | Line | 60 | -9.35 | QP |
| 11.29702 | 49.86 | Line | 60 | -10.14 | QP |
| 10.97747 | 50.52 | Line | 60 | -9.48 | QP |
| 10.72043 | 50.38 | Line | 60 | -9.62 | QP |
| 11.10669 | 50.31 | Line | 60 | -9.69 | QP |

| Frequency (MHz) | Corrected Amplitude (dBµV) | Conductor (Line/Neutral) | Limit (dBµV) | Margin (dB) | Detector (QP/Ave.) |
|---|---|---|---|---|---|
| 0.500016 | 42.95 | Line | 46 | -3.05 | Ave. |
| 10.85379 | 45.06 | Line | 50 | -4.94 | Ave. |
| 11.29702 | 44.06 | Line | 50 | -5.94 | Ave. |
| 10.97747 | 44.85 | Line | 50 | -5.15 | Ave. |
| 10.72043 | 44.68 | Line | 50 | -5.32 | Ave. |
| 11.10669 | 44.76 | Line | 50 | -5.24 | Ave. |

120 V, 60 Hz – Neutral, POE




| Frequency (MHz) | Corrected Amplitude (dBµV) | Conductor (Line/Neutral) | Limit (dBµV) | Margin (dB) | Detector (QP/Ave.) |
|---|---|---|---|---|---|
| 10.96065 | 53.63 | Neutral | 60 | -6.37 | QP |
| 10.78804 | 53.54 | Neutral | 60 | -6.46 | QP |
| 10.87897 | 53.79 | Neutral | 60 | -6.21 | QP |
| 10.40451 | 52.55 | Neutral | 60 | -7.45 | QP |
| 11.18884 | 53.1 | Neutral | 60 | -6.9 | QP |
| 10.56529 | 52.91 | Neutral | 60 | -7.09 | QP |

| Frequency (MHz) | Corrected Amplitude (dBµV) | Conductor (Line/Neutral) | Limit (dBµV) | Margin (dB) | Detector (QP/Ave.) |
|---|---|---|---|---|---|
| 10.96065 | 48.09 | Neutral | 50 | -1.91 | Ave. |
| 10.78804 | 48.08 | Neutral | 50 | -1.92 | Ave. |
| 10.87897 | 48.16 | Neutral | 50 | -1.84 | Ave. |
| 10.40451 | 46.76 | Neutral | 50 | -3.24 | Ave. |
| 11.18884 | 47.57 | Neutral | 50 | -2.43 | Ave. |
| 10.56529 | 47.22 | Neutral | 50 | -2.78 | Ave. |

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

## 7.1 Applicable Standard

FCC §15.205, §15.209, §15.407 (b)

IC RSS-210, §2.2, §A9.2, RSS-Gen §7.2.2

## 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

The measurements are base on FCC KDB 789033 D01 General UNII Test Procedures v01r03: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E section H: Unwanted Emissions Measurement. As well as ANSI C63.4: 2009 as described below:

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

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

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

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

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

Above 1000 MHz:

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

## 7.4 Corrected Amplitude & Margin Calculation

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

CA = Ai + CL + Atten

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

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

Margin = Corrected Amplitude - Limit

## 7.5 Test Equipment List and Details

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

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

## 7.6 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 21 ºC |
| **Relative Humidity:** | 45 % |
| **ATM Pressure:** | 101.6 kPa |

*The testing was performed by Chen Ge on 2014-04-15 in 5 m 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:

5250-5350 MHz

| Mode: Transmitting | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Channel, Range** |
| -1.88 | 43.82475 | Vertical | 30 MHz -40 GHz |

5470-5725 MHz

| Mode: Transmitting | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Channel, Range** |
| -0.06 | 42.819 | Vertical | 30 MHz -40 GHz |

## 7.8 Radiated Emissions Test Result Data

### 1) 30 MHz–1 GHz, Measured at 3 meters

5250-5350 MHz Band, Quasi-Peak Measurements @ 3m, worst case

| Frequency (MHz) | Corrected Amplitude (dBµV/m) | Antenna Height (cm) | Antenna Polarity (H/V) | Turntable Azimuth (degrees) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| 43.82475 | 38.12 | 184 | V | 56 | 40 | -1.88 |
| 48.45525 | 32.38 | 158 | V | 360 | 40 | -7.62 |
| 55.32125 | 29.61 | 178 | V | 46 | 40 | -10.39 |
| 77.19025 | 30.05 | 100 | V | 125 | 40 | -9.95 |
| 81.17275 | 27.26 | 139 | V | 360 | 40 | -12.74 |
| 151.4988 | 31.62 | 189 | H | 273 | 43.5 | -11.88 |

5470-5725 MHz Band, Quasi-Peak Measurements@ 3m, worst case

| Frequency (MHz) | Corrected Amplitude (dBµV/m) | Antenna Height (cm) | Antenna Polarity (H/V) | Turntable Azimuth (degrees) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| 42.819 | 39.94 | 148 | V | 307 | 40 | -0.06 |
| 48.45425 | 34.31 | 148 | V | 262 | 40 | -5.69 |
| 58.7025 | 33.63 | 121 | V | 28 | 40 | -6.37 |
| 74.56175 | 32.01 | 105 | V | 11 | 40 | -7.99 |
| 82.0635 | 29.44 | 100 | V | 210 | 40 | -10.56 |
| 98.49625 | 34.72 | 123 | V | 132 | 43.5 | -8.78 |

**2) 1–40 GHz, Measured at 3 meters**

Note: Restricted bands limits are used for non-restricted band, which is most stringent.

**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 | | | | | | | | | | | |
| 5150 | 49.15 | 0 | 100 | V | 33.426 | 4.56 | 34.74 | 52.396 | 74 | -21.604 | Peak |
| 5150 | 49.48 | 0 | 100 | H | 33.446 | 4.56 | 34.74 | 52.746 | 74 | -21.254 | Peak |
| 5150 | 33.91 | 0 | 100 | V | 33.426 | 4.56 | 34.74 | 37.156 | 54 | -16.844 | Ave |
| 5150 | 33.59 | 0 | 100 | H | 33.446 | 4.56 | 34.74 | 36.856 | 54 | -17.144 | Ave |
| 10520 | 49.26 | 0 | 100 | V | 38.343 | 7 | 34.49 | 60.113 | 74 | -13.887 | Peak |
| 10520 | 48.99 | 0 | 100 | H | 38.343 | 7 | 34.49 | 59.843 | 74 | -14.157 | Peak |
| 10520 | 33.81 | 0 | 100 | V | 38.343 | 7 | 34.49 | 44.663 | 54 | -9.337 | Ave |
| 10520 | 34.29 | 0 | 100 | H | 38.343 | 7 | 34.49 | 45.143 | 54 | -8.857 | Ave |
| 15780 | 47.07 | 0 | 100 | V | 37.928 | 8.35 | 34.61 | 58.738 | 74 | -15.262 | Peak |
| 15780 | 46.19 | 0 | 100 | H | 37.928 | 8.35 | 34.61 | 57.858 | 74 | -16.142 | Peak |
| 15780 | 32.07 | 0 | 100 | V | 37.928 | 8.35 | 34.61 | 43.738 | 54 | -10.262 | Ave |
| 15780 | 31.5 | 0 | 100 | H | 37.928 | 8.35 | 34.61 | 43.168 | 54 | -10.832 | Ave |
| 21040 | 47.78 | 0 | 100 | V | 34.6 | 9.79 | 34 | 58.17 | 74 | -15.83 | Peak |
| 21040 | 48.13 | 0 | 100 | H | 34.6 | 9.79 | 34 | 58.52 | 74 | -15.48 | Peak |
| 21040 | 33.33 | 0 | 100 | V | 34.6 | 9.79 | 34 | 43.72 | 54 | -10.28 | Ave |
| 21040 | 33.43 | 0 | 100 | H | 34.6 | 9.79 | 34 | 43.82 | 54 | -10.18 | Ave |
| Middle Channel 5280 MHz, measured at 3 meters | | | | | | | | | | | |
| 10560 | 46.33 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 57.328 | 74 | -16.672 | Peak |
| 10560 | 46.71 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 57.708 | 74 | -16.292 | Peak |
| 10560 | 32.14 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 43.138 | 54 | -10.862 | Ave |
| 10560 | 32.42 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 43.418 | 54 | -10.582 | Ave |
| 15840 | 47.67 | 0 | 100 | V | 37.914 | 8.38 | 34.61 | 59.354 | 74 | -14.646 | Peak |
| 15840 | 47.52 | 0 | 100 | H | 37.914 | 8.38 | 34.61 | 59.204 | 74 | -14.796 | Peak |
| 15840 | 32.31 | 0 | 100 | V | 37.914 | 8.38 | 34.61 | 43.994 | 54 | -10.006 | Ave |
| 15840 | 32.3 | 0 | 100 | H | 37.914 | 8.38 | 34.61 | 43.984 | 54 | -10.016 | Ave |
| 21120 | 48.94 | 0 | 100 | V | 34.6 | 9.8 | 34 | 59.34 | 74 | -14.66 | Peak |
| 21120 | 48.44 | 0 | 100 | H | 34.6 | 9.8 | 34 | 58.84 | 74 | -15.16 | Peak |
| 21120 | 33.31 | 0 | 100 | V | 34.6 | 9.8 | 34 | 43.71 | 54 | -10.29 | Ave |
| 21120 | 33.4 | 0 | 100 | H | 34.6 | 9.8 | 34 | 43.8 | 54 | -10.2 | Ave |

| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| High Channel 5320 MHz, measured at 3 meters | | | | | | | | | | | |
| 5350 | 48.38 | 0 | 100 | V | 33.628 | 4.71 | 34.61 | 52.108 | 74 | -21.892 | Peak |
| 5350 | 48.6 | 0 | 100 | H | 33.688 | 4.71 | 34.61 | 52.388 | 74 | -21.612 | Peak |
| 5350 | 33.65 | 0 | 100 | V | 33.628 | 4.71 | 34.61 | 37.378 | 54 | -16.622 | Ave |
| 5350 | 33.68 | 0 | 100 | H | 33.688 | 4.71 | 34.61 | 37.468 | 54 | -16.532 | Ave |
| 10640 | 46.19 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 57.188 | 74 | -16.812 | Peak |
| 10640 | 45.65 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 56.648 | 74 | -17.352 | Peak |
| 10640 | 33.35 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 44.348 | 54 | -9.652 | Ave |
| 10640 | 33.47 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 44.468 | 54 | -9.532 | Ave |
| 15960 | 47.99 | 0 | 100 | V | 37.902 | 8.39 | 34.61 | 59.672 | 74 | -14.328 | Peak |
| 15960 | 46.69 | 0 | 100 | H | 37.902 | 8.39 | 34.61 | 58.372 | 74 | -15.628 | Peak |
| 15960 | 32.58 | 0 | 100 | V | 37.902 | 8.39 | 34.61 | 44.262 | 54 | -9.738 | Ave |
| 15960 | 32.31 | 0 | 100 | H | 37.902 | 8.39 | 34.61 | 43.992 | 54 | -10.008 | Ave |
| 21280 | 46.89 | 0 | 100 | V | 34.6 | 9.79 | 34 | 57.28 | 74 | -16.72 | Peak |
| 21280 | 47.52 | 0 | 100 | H | 34.6 | 9.79 | 34 | 57.91 | 74 | -16.09 | Peak |
| 21280 | 33.1 | 0 | 100 | V | 34.6 | 9.79 | 34 | 43.49 | 54 | -10.51 | Ave |
| 21280 | 33.25 | 0 | 100 | H | 34.6 | 9.79 | 34 | 43.64 | 54 | -10.36 | Ave |

802.11n-HT20 mode

| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| Low Channel 5260 MHz, measured at 3 meters | | | | | | | | | | | |
| 5150 | 48.41 | 0 | 100 | V | 33.426 | 4.56 | 34.74 | 51.656 | 74 | -22.344 | Peak |
| 5150 | 48.63 | 0 | 100 | H | 33.446 | 4.56 | 34.74 | 51.896 | 74 | -22.104 | Peak |
| 5150 | 32.54 | 0 | 100 | V | 33.426 | 4.56 | 34.74 | 35.786 | 54 | -18.214 | Ave |
| 5150 | 32.63 | 0 | 100 | H | 33.446 | 4.56 | 34.74 | 35.896 | 54 | -18.104 | Ave |
| 10520 | 44.95 | 0 | 100 | V | 38.343 | 7 | 34.49 | 55.803 | 74 | -18.197 | Peak |
| 10520 | 45.19 | 0 | 100 | H | 38.343 | 7 | 34.49 | 56.043 | 74 | -17.957 | Peak |
| 10520 | 30.39 | 0 | 100 | V | 38.343 | 7 | 34.49 | 41.243 | 54 | -12.757 | Ave |
| 10520 | 30.58 | 0 | 100 | H | 38.343 | 7 | 34.49 | 41.433 | 54 | -12.567 | Ave |
| 15780 | 46.93 | 0 | 100 | V | 37.928 | 8.35 | 34.61 | 58.598 | 74 | -15.402 | Peak |
| 15780 | 46.76 | 0 | 100 | H | 37.928 | 8.35 | 34.61 | 58.428 | 74 | -15.572 | Peak |
| 15780 | 31.66 | 0 | 100 | V | 37.928 | 8.35 | 34.61 | 43.328 | 54 | -10.672 | Ave |
| 15780 | 31.83 | 0 | 100 | H | 37.928 | 8.35 | 34.61 | 43.498 | 54 | -10.502 | Ave |
| 21040 | 48 | 0 | 100 | V | 34.6 | 9.79 | 34 | 58.39 | 74 | -15.61 | Peak |
| 21040 | 48.63 | 0 | 100 | H | 34.6 | 9.79 | 34 | 59.02 | 74 | -14.98 | Peak |
| 21040 | 33.09 | 0 | 100 | V | 34.6 | 9.79 | 34 | 43.48 | 54 | -10.52 | Ave |
| 21040 | 33.41 | 0 | 100 | H | 34.6 | 9.79 | 34 | 43.8 | 54 | -10.2 | Ave |
| Middle Channel 5280 MHz, measured at 3 meters | | | | | | | | | | | |
| 10560 | 45.77 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 56.768 | 74 | -17.232 | Peak |
| 10560 | 45.8 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 56.798 | 74 | -17.202 | Peak |
| 10560 | 31.08 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 42.078 | 54 | -11.922 | Ave |
| 10560 | 31.53 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 42.528 | 54 | -11.472 | Ave |
| 15840 | 47.21 | 0 | 100 | V | 37.914 | 8.38 | 34.61 | 58.894 | 74 | -15.106 | Peak |
| 15840 | 47.57 | 0 | 100 | H | 37.914 | 8.38 | 34.61 | 59.254 | 74 | -14.746 | Peak |
| 15840 | 32.65 | 0 | 100 | V | 37.914 | 8.38 | 34.61 | 44.334 | 54 | -9.666 | Ave |
| 15840 | 32.54 | 0 | 100 | H | 37.914 | 8.38 | 34.61 | 44.224 | 54 | -9.776 | Ave |
| 21120 | 48.32 | 0 | 100 | V | 34.6 | 9.8 | 34 | 58.72 | 74 | -15.28 | Peak |
| 21120 | 48.19 | 0 | 100 | H | 34.6 | 9.8 | 34 | 58.59 | 74 | -15.41 | Peak |
| 21120 | 33.72 | 0 | 100 | V | 34.6 | 9.8 | 34 | 44.12 | 54 | -9.88 | Ave |
| 21120 | 33.68 | 0 | 100 | H | 34.6 | 9.8 | 34 | 44.08 | 54 | -9.92 | Ave |

| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| High Channel 5320 MHz, measured at 3 meters | | | | | | | | | | | |
| 5350 | 48.89 | 32 | 100 | V | 33.628 | 4.71 | 34.61 | 52.618 | 74 | -21.382 | Peak |
| 5350 | 48.61 | 12 | 100 | H | 33.688 | 4.71 | 34.61 | 52.398 | 74 | -21.602 | Peak |
| 5350 | 33.97 | 32 | 100 | V | 33.628 | 4.71 | 34.61 | 37.698 | 54 | -16.302 | Ave |
| 5350 | 33.54 | 12 | 100 | H | 33.688 | 4.71 | 34.61 | 37.328 | 54 | -16.672 | Ave |
| 10640 | 45.53 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 56.528 | 74 | -17.472 | Peak |
| 10640 | 45.62 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 56.618 | 74 | -17.382 | Peak |
| 10640 | 31.2 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 42.198 | 54 | -11.802 | Ave |
| 10640 | 31.41 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 42.408 | 54 | -11.592 | Ave |
| 15960 | 46.62 | 0 | 100 | V | 37.902 | 8.39 | 34.61 | 58.302 | 74 | -15.698 | Peak |
| 15960 | 46.96 | 0 | 100 | H | 37.902 | 8.39 | 34.61 | 58.642 | 74 | -15.358 | Peak |
| 15960 | 32.69 | 0 | 100 | V | 37.902 | 8.39 | 34.61 | 44.372 | 54 | -9.628 | Ave |
| 15960 | 32.77 | 0 | 100 | H | 37.902 | 8.39 | 34.61 | 44.452 | 54 | -9.548 | Ave |
| 21280 | 48.16 | 0 | 100 | V | 34.6 | 9.79 | 34 | 58.55 | 74 | -15.45 | Peak |
| 21280 | 48.96 | 0 | 100 | H | 34.6 | 9.79 | 34 | 59.35 | 74 | -14.65 | Peak |
| 21280 | 33.77 | 0 | 100 | V | 34.6 | 9.79 | 34 | 44.16 | 54 | -9.84 | Ave |
| 21280 | 33.82 | 0 | 100 | H | 34.6 | 9.79 | 34 | 44.21 | 54 | -9.79 | Ave |

802.11n-HT40 mode

| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| Low Channel 5270 MHz, measured at 3 meters | | | | | | | | | | | |
| 5150 | 48.75 | 36 | 108 | V | 33.426 | 4.56 | 34.74 | 51.996 | 74 | -22.004 | Peak |
| 5150 | 48.24 | 0 | 100 | H | 33.446 | 4.56 | 34.74 | 51.506 | 74 | -22.494 | Peak |
| 5150 | 33.96 | 36 | 108 | V | 33.426 | 4.56 | 34.74 | 37.206 | 54 | -16.794 | Ave |
| 5150 | 34.05 | 0 | 100 | H | 33.446 | 4.56 | 34.74 | 37.316 | 54 | -16.684 | Ave |
| 10540 | 46.62 | 0 | 100 | V | 38.343 | 7.05 | 34.49 | 57.523 | 74 | -16.477 | Peak |
| 10540 | 47.17 | 0 | 100 | H | 38.343 | 7.05 | 34.49 | 58.073 | 74 | -15.927 | Peak |
| 10540 | 31.86 | 0 | 100 | V | 38.343 | 7.05 | 34.49 | 42.763 | 54 | -11.237 | Ave |
| 10540 | 31.93 | 0 | 100 | H | 38.343 | 7.05 | 34.49 | 42.833 | 54 | -11.167 | Ave |
| 15810 | 46.62 | 0 | 100 | V | 37.928 | 8.35 | 34.61 | 58.288 | 74 | -15.712 | Peak |
| 15810 | 47.56 | 0 | 100 | H | 37.928 | 8.35 | 34.61 | 59.228 | 74 | -14.772 | Peak |
| 15810 | 32.26 | 0 | 100 | V | 37.928 | 8.35 | 34.61 | 43.928 | 54 | -10.072 | Ave |
| 15810 | 32.24 | 0 | 100 | H | 37.928 | 8.35 | 34.61 | 43.908 | 54 | -10.092 | Ave |
| 21080 | 48.85 | 0 | 100 | V | 34.6 | 9.84 | 34 | 59.29 | 74 | -14.71 | Peak |
| 21080 | 48.52 | 0 | 100 | H | 34.6 | 9.84 | 34 | 58.96 | 74 | -15.04 | Peak |
| 21080 | 33.96 | 0 | 100 | V | 34.6 | 9.84 | 34 | 44.4 | 54 | -9.6 | Ave |
| 21080 | 34.02 | 0 | 100 | H | 34.6 | 9.84 | 34 | 44.46 | 54 | -9.54 | Ave |
| High Channel 5310 MHz, measured at 3 meters | | | | | | | | | | | |
| 5350 | 48.58 | 0 | 100 | V | 34.853 | 4.71 | 34.61 | 53.533 | 74 | -20.467 | Peak |
| 5350 | 48.36 | 0 | 100 | H | 34.853 | 4.71 | 34.61 | 53.313 | 74 | -20.687 | Peak |
| 5350 | 34.32 | 0 | 100 | V | 34.853 | 4.71 | 34.61 | 39.273 | 54 | -14.727 | Ave |
| 5350 | 34.04 | 0 | 100 | H | 34.853 | 4.71 | 34.61 | 38.993 | 54 | -15.007 | Ave |
| 10620 | 46.01 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 57.008 | 74 | -16.992 | Peak |
| 10620 | 46.32 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 57.318 | 74 | -16.682 | Peak |
| 10620 | 31.41 | 0 | 100 | V | 38.418 | 7.07 | 34.49 | 42.408 | 54 | -11.592 | Ave |
| 10620 | 31.37 | 0 | 100 | H | 38.418 | 7.07 | 34.49 | 42.368 | 54 | -11.632 | Ave |
| 15930 | 46.31 | 0 | 100 | V | 37.914 | 8.38 | 34.61 | 57.994 | 74 | -16.006 | Peak |
| 15930 | 46.24 | 0 | 100 | H | 37.914 | 8.38 | 34.61 | 57.924 | 74 | -16.076 | Peak |
| 15930 | 31.31 | 0 | 100 | V | 37.914 | 8.38 | 34.61 | 42.994 | 54 | -11.006 | Ave |
| 15930 | 31.45 | 0 | 100 | H | 37.914 | 8.38 | 34.61 | 43.134 | 54 | -10.866 | Ave |

802.11ac-80 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) | |
| High Channel 5290 MHz, measured at 3 meters | | | | | | | | | | | |
| 5150 | 48.65 | 0 | 100 | V | 33.426 | 4.56 | 34.74 | 51.896 | 74 | -22.104 | Peak |
| 5150 | 48.36 | 0 | 103 | H | 33.446 | 4.56 | 34.74 | 51.626 | 74 | -22.374 | Peak |
| 5150 | 33.54 | 0 | 100 | V | 33.426 | 4.56 | 34.74 | 36.786 | 54 | -17.214 | Ave |
| 5150 | 33.41 | 0 | 103 | H | 33.446 | 4.56 | 34.74 | 36.676 | 54 | -17.324 | Ave |
| 5350 | 48.81 | 0 | 105 | V | 33.628 | 4.56 | 34.61 | 52.388 | 74 | -21.612 | Peak |
| 5350 | 48.67 | 0 | 105 | H | 33.688 | 4.56 | 34.61 | 52.308 | 74 | -21.692 | Peak |
| 5350 | 33.95 | 0 | 105 | V | 33.628 | 4.56 | 34.61 | 37.528 | 54 | -16.472 | Ave |
| 5350 | 33.87 | 0 | 105 | H | 33.688 | 4.56 | 34.61 | 37.508 | 54 | -16.492 | Ave |
| 10580 | 45.2 | 0 | 100 | V | 38.343 | 7.05 | 34.49 | 56.103 | 74 | -17.897 | Peak |
| 10580 | 45.76 | 0 | 100 | H | 38.343 | 7.05 | 34.49 | 56.663 | 74 | -17.337 | Peak |
| 10580 | 31.43 | 0 | 100 | V | 38.343 | 7.05 | 34.49 | 42.333 | 54 | -11.667 | Ave |
| 10580 | 31.24 | 0 | 100 | H | 38.343 | 7.05 | 34.49 | 42.143 | 54 | -11.857 | Ave |
| 15870 | 46.45 | 0 | 100 | V | 37.928 | 8.35 | 34.61 | 58.118 | 74 | -15.882 | Peak |
| 15870 | 46.09 | 0 | 100 | H | 37.928 | 8.35 | 34.61 | 57.758 | 74 | -16.242 | Peak |
| 15870 | 31.6 | 0 | 100 | V | 37.928 | 8.35 | 34.61 | 43.268 | 54 | -10.732 | Ave |
| 15870 | 31.42 | 0 | 100 | H | 37.928 | 8.35 | 34.61 | 43.088 | 54 | -10.912 | Ave |
| 21160 | 48.57 | 0 | 100 | V | 34.6 | 9.84 | 34 | 59.01 | 74 | -14.99 | Peak |
| 21160 | 48.49 | 0 | 100 | H | 34.6 | 9.84 | 34 | 58.93 | 74 | -15.07 | Peak |
| 21160 | 33.93 | 0 | 100 | V | 34.6 | 9.84 | 34 | 44.37 | 54 | -9.63 | Ave |
| 21160 | 34.05 | 0 | 100 | H | 34.6 | 9.84 | 34 | 44.49 | 54 | -9.51 | Ave |

## 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 | | | | | | | | | | | |
| 5460 | 44.28 | 0 | 100 | V | 34.821 | 4.76 | 34.5 | 49.361 | 74 | -24.639 | Peak |
| 5460 | 44.79 | 0 | 100 | H | 34.044 | 4.76 | 34.5 | 49.094 | 74 | -24.906 | Peak |
| 5460 | 31.02 | 0 | 100 | V | 34.821 | 4.76 | 34.5 | 36.101 | 54 | -17.899 | Ave |
| 5460 | 30.24 | 0 | 100 | H | 34.044 | 4.76 | 34.5 | 34.544 | 54 | -19.456 | Ave |
| 11000 | 45.84 | 0 | 100 | V | 38.382 | 7.36 | 34.05 | 57.532 | 74 | -16.468 | Peak |
| 11000 | 46.08 | 0 | 100 | H | 38.382 | 7.36 | 34.05 | 57.772 | 74 | -16.228 | Peak |
| 11000 | 31.68 | 0 | 100 | V | 38.382 | 7.36 | 34.05 | 43.372 | 54 | -10.628 | Ave |
| 11000 | 31.66 | 0 | 100 | H | 38.382 | 7.36 | 34.05 | 43.352 | 54 | -10.648 | Ave |
| 16500 | 47.57 | 0 | 100 | V | 38.768 | 8.5 | 34.64 | 60.198 | 74 | -13.802 | Peak |
| 16500 | 47.43 | 0 | 100 | H | 38.768 | 8.5 | 34.64 | 60.058 | 74 | -13.942 | Peak |
| 16500 | 33.19 | 0 | 100 | V | 38.768 | 8.5 | 34.64 | 45.818 | 54 | -8.182 | Ave |
| 16500 | 33.23 | 0 | 100 | H | 38.768 | 8.5 | 34.64 | 45.858 | 54 | -8.142 | Ave |
| 22000 | 48.03 | 0 | 100 | V | 34.9 | 9.94 | 34.69 | 58.18 | 74 | -15.82 | Peak |
| 22000 | 48.45 | 0 | 100 | H | 34.9 | 9.94 | 34.69 | 58.6 | 74 | -15.4 | Peak |
| 22000 | 34.16 | 0 | 100 | V | 34.9 | 9.94 | 34.69 | 44.31 | 54 | -9.69 | Ave |
| 22000 | 34.22 | 0 | 100 | H | 34.9 | 9.94 | 34.69 | 44.37 | 54 | -9.63 | Ave |
| Middle Channel 5580 MHz, measured at 3 meters | | | | | | | | | | | |
| 11160 | 45.42 | 0 | 100 | V | 38.511 | 7.52 | 34.05 | 57.401 | 74 | -16.599 | Peak |
| 11160 | 45.64 | 0 | 100 | H | 38.511 | 7.52 | 34.05 | 57.621 | 74 | -16.379 | Peak |
| 11160 | 31.13 | 0 | 100 | V | 38.511 | 7.52 | 34.05 | 43.111 | 54 | -10.889 | Ave |
| 11160 | 31.21 | 0 | 100 | H | 38.511 | 7.52 | 34.05 | 43.191 | 54 | -10.809 | Ave |
| 16740 | 47.98 | 0 | 100 | V | 39.94 | 8.63 | 34.64 | 61.91 | 74 | -12.09 | Peak |
| 16740 | 47.68 | 0 | 100 | H | 39.94 | 8.63 | 34.64 | 61.61 | 74 | -12.39 | Peak |
| 16740 | 33.15 | 0 | 100 | V | 39.94 | 8.63 | 34.64 | 47.08 | 54 | -6.92 | Ave |
| 16740 | 33.23 | 0 | 100 | H | 39.94 | 8.63 | 34.64 | 47.16 | 54 | -6.84 | Ave |
| 22320 | 47.68 | 0 | 100 | V | 34.9 | 9.92 | 34.69 | 57.81 | 74 | -16.19 | Peak |
| 22320 | 48.48 | 0 | 100 | H | 34.9 | 9.92 | 34.69 | 58.61 | 74 | -15.39 | Peak |
| 22320 | 33.58 | 0 | 100 | V | 34.9 | 9.92 | 34.69 | 43.71 | 54 | -10.29 | Ave |
| 22320 | 33.47 | 0 | 100 | H | 34.9 | 9.92 | 34.69 | 43.6 | 54 | -10.4 | Ave |

| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| High Channel 5700 MHz, measured at 3 meters | | | | | | | | | | | |
| 11400 | 46.12 | 0 | 100 | V | 38.882 | 7.57 | 34.05 | 58.522 | 74 | -15.478 | Peak |
| 11400 | 46.39 | 0 | 100 | H | 38.882 | 7.57 | 34.05 | 58.792 | 74 | -15.208 | Peak |
| 11400 | 32.54 | 0 | 100 | V | 38.882 | 7.57 | 34.05 | 44.942 | 54 | -9.058 | Ave |
| 11400 | 32.65 | 0 | 100 | H | 38.882 | 7.57 | 34.05 | 45.052 | 54 | -8.948 | Ave |
| 17100 | 47.84 | 0 | 100 | V | 42.637 | 8.66 | 34.64 | 64.497 | 74 | -9.503 | Peak |
| 17100 | 47.73 | 0 | 100 | H | 42.637 | 8.66 | 34.64 | 64.387 | 74 | -9.613 | Peak |
| 17100 | 33.21 | 0 | 100 | V | 42.637 | 8.66 | 34.64 | 49.867 | 54 | -4.133 | Ave |
| 17100 | 33.29 | 0 | 100 | H | 42.637 | 8.66 | 34.64 | 49.947 | 54 | -4.053 | Ave |
| 22800 | 48.11 | 0 | 100 | V | 34.9 | 10.17 | 34.69 | 58.49 | 74 | -15.51 | Peak |
| 22800 | 47.94 | 0 | 100 | H | 34.9 | 10.17 | 34.69 | 58.32 | 74 | -15.68 | Peak |
| 22800 | 33.32 | 0 | 100 | V | 34.9 | 10.17 | 34.69 | 43.7 | 54 | -10.3 | Ave |
| 22800 | 33.01 | 0 | 100 | H | 34.9 | 10.17 | 34.69 | 43.39 | 54 | -10.61 | Ave |
| 11400 | 46.12 | 0 | 100 | V | 38.882 | 7.57 | 34.05 | 58.522 | 74 | -15.478 | Peak |
| 11400 | 46.39 | 0 | 100 | H | 38.882 | 7.57 | 34.05 | 58.792 | 74 | -15.208 | Peak |
| 11400 | 32.54 | 0 | 100 | V | 38.882 | 7.57 | 34.05 | 44.942 | 54 | -9.058 | Ave |
| 11400 | 32.65 | 0 | 100 | H | 38.882 | 7.57 | 34.05 | 45.052 | 54 | -8.948 | Ave |

802.11n-HT20 mode

| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| Low Channel 5500 MHz, measured at 3 meters | | | | | | | | | | | |
| 5460 | 47.61 | 0 | 100 | V | 33.904 | 4.76 | 34.5 | 51.774 | 74 | -22.226 | Peak |
| 5460 | 47.99 | 0 | 100 | H | 34.044 | 4.76 | 34.5 | 52.294 | 74 | -21.706 | Peak |
| 5460 | 33.25 | 0 | 100 | V | 33.904 | 4.76 | 34.5 | 37.414 | 54 | -16.586 | Ave |
| 5460 | 33.62 | 0 | 100 | H | 34.044 | 4.76 | 34.5 | 37.924 | 54 | -16.076 | Ave |
| 11000 | 46.74 | 0 | 100 | V | 38.382 | 7.36 | 34.05 | 58.432 | 74 | -15.568 | Peak |
| 11000 | 46.57 | 0 | 100 | H | 38.382 | 7.36 | 34.05 | 58.262 | 74 | -15.738 | Peak |
| 11000 | 32.54 | 0 | 100 | V | 38.382 | 7.36 | 34.05 | 44.232 | 54 | -9.768 | Ave |
| 11000 | 31.99 | 0 | 100 | H | 38.382 | 7.36 | 34.05 | 43.682 | 54 | -10.318 | Ave |
| 16500 | 47.68 | 0 | 100 | V | 38.768 | 8.5 | 34.64 | 60.308 | 74 | -13.692 | Peak |
| 16500 | 47.01 | 0 | 100 | H | 38.768 | 8.5 | 34.64 | 59.638 | 74 | -14.362 | Peak |
| 16500 | 33.54 | 0 | 100 | V | 38.768 | 8.5 | 34.64 | 46.168 | 54 | -7.832 | Ave |
| 16500 | 33.14 | 0 | 100 | H | 38.768 | 8.5 | 34.64 | 45.768 | 54 | -8.232 | Ave |
| 22000 | 48.24 | 0 | 100 | V | 34.9 | 9.94 | 34.69 | 58.39 | 74 | -15.61 | Peak |
| 22000 | 48.36 | 0 | 100 | H | 34.9 | 9.94 | 34.69 | 58.51 | 74 | -15.49 | Peak |
| 22000 | 34.58 | 0 | 100 | V | 34.9 | 9.94 | 34.69 | 44.73 | 54 | -9.27 | Ave |
| 22000 | 34.16 | 0 | 100 | H | 34.9 | 9.94 | 34.69 | 44.31 | 54 | -9.69 | Ave |
| Middle Channel 5580 MHz, measured at 3 meters | | | | | | | | | | | |
| 11160 | 45.24 | 0 | 100 | V | 38.511 | 7.52 | 34.05 | 57.221 | 74 | -16.779 | Peak |
| 11160 | 45.36 | 0 | 100 | H | 38.511 | 7.52 | 34.05 | 57.341 | 74 | -16.659 | Peak |
| 11160 | 31.21 | 0 | 100 | V | 38.511 | 7.52 | 34.05 | 43.191 | 54 | -10.809 | Ave |
| 11160 | 31.54 | 0 | 100 | H | 38.511 | 7.52 | 34.05 | 43.521 | 54 | -10.479 | Ave |
| 16740 | 47.54 | 0 | 100 | V | 39.94 | 8.63 | 34.64 | 61.47 | 74 | -12.53 | Peak |
| 16740 | 47.89 | 0 | 100 | H | 39.94 | 8.63 | 34.64 | 61.82 | 74 | -12.18 | Peak |
| 16740 | 33.41 | 0 | 100 | V | 39.94 | 8.63 | 34.64 | 47.34 | 54 | -6.66 | Ave |
| 16740 | 33.24 | 0 | 100 | H | 39.94 | 8.63 | 34.64 | 47.17 | 54 | -6.83 | Ave |
| 22320 | 47.24 | 0 | 100 | V | 34.9 | 9.92 | 34.69 | 57.37 | 74 | -16.63 | Peak |
| 22320 | 48.32 | 0 | 100 | H | 34.9 | 9.92 | 34.69 | 58.45 | 74 | -15.55 | Peak |
| 22320 | 33.69 | 0 | 100 | V | 34.9 | 9.92 | 34.69 | 43.82 | 54 | -10.18 | Ave |
| 22320 | 33.47 | 0 | 100 | H | 34.9 | 9.92 | 34.69 | 43.6 | 54 | -10.4 | Ave |

| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| High Channel 5700 MHz, measured at 3 meters | | | | | | | | | | | |
| 11400 | 46.52 | 0 | 100 | V | 38.882 | 7.57 | 34.05 | 58.922 | 74 | -15.078 | Peak |
| 11400 | 46.78 | 0 | 100 | H | 38.882 | 7.57 | 34.05 | 59.182 | 74 | -14.818 | Peak |
| 11400 | 32.98 | 0 | 100 | V | 38.882 | 7.57 | 34.05 | 45.382 | 54 | -8.618 | Ave |
| 11400 | 33.11 | 0 | 100 | H | 38.882 | 7.57 | 34.05 | 45.512 | 54 | -8.488 | Ave |
| 17100 | 47.68 | 0 | 100 | V | 42.637 | 8.66 | 34.64 | 64.337 | 74 | -9.663 | Peak |
| 17100 | 47.94 | 0 | 100 | H | 42.637 | 8.66 | 34.64 | 64.597 | 74 | -9.403 | Peak |
| 17100 | 33.36 | 0 | 100 | V | 42.637 | 8.66 | 34.64 | 50.017 | 54 | -3.983 | Ave |
| 17100 | 33.58 | 0 | 100 | H | 42.637 | 8.66 | 34.64 | 50.237 | 54 | -3.763 | Ave |
| 22800 | 48.26 | 0 | 100 | V | 34.9 | 10.17 | 34.69 | 58.64 | 74 | -15.36 | Peak |
| 22800 | 48.57 | 0 | 100 | H | 34.9 | 10.17 | 34.69 | 58.95 | 74 | -15.05 | Peak |
| 22800 | 33.23 | 0 | 100 | V | 34.9 | 10.17 | 34.69 | 43.61 | 54 | -10.39 | Ave |
| 22800 | 33.4 | 0 | 100 | H | 34.9 | 10.17 | 34.69 | 43.78 | 54 | -10.22 | Ave |

802.11n-HT40 mode

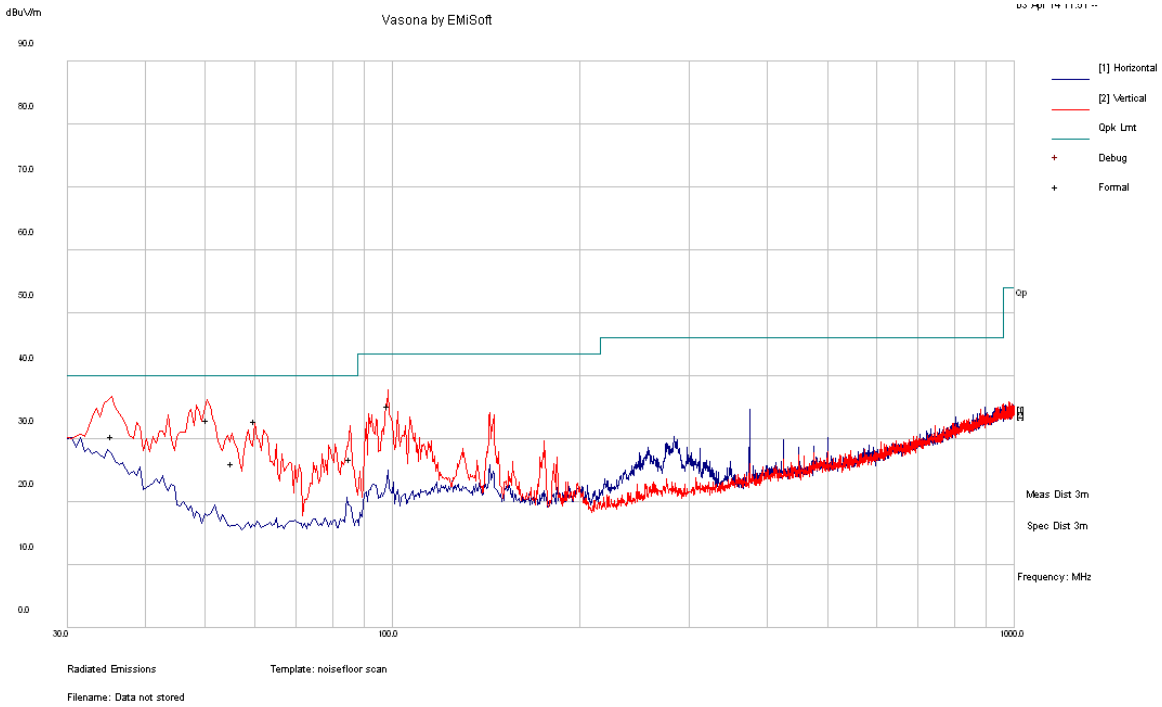
| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| Low Channel 5510 MHz, measured at 3 meters | | | | | | | | | | | |
| 5460 | 44.63 | 0 | 100 | V | 34.821 | 4.76 | 34.5 | 49.711 | 74 | -24.289 | Peak |
| 5460 | 44.54 | 0 | 100 | H | 34.821 | 4.76 | 34.5 | 49.621 | 74 | -24.379 | Peak |
| 5460 | 31.25 | 0 | 100 | V | 34.821 | 4.76 | 34.5 | 36.331 | 54 | -17.669 | Ave |
| 5460 | 31.41 | 0 | 100 | H | 34.821 | 4.76 | 34.5 | 36.491 | 54 | -17.509 | Ave |
| 11020 | 47.29 | 0 | 100 | V | 38.382 | 7.36 | 34.05 | 58.982 | 74 | -15.018 | Peak |
| 11020 | 47.28 | 0 | 100 | H | 38.382 | 7.36 | 34.05 | 58.972 | 74 | -15.028 | Peak |
| 11020 | 32.53 | 0 | 100 | V | 38.382 | 7.36 | 34.05 | 44.222 | 54 | -9.778 | Ave |
| 11020 | 32.48 | 0 | 100 | H | 38.382 | 7.36 | 34.05 | 44.172 | 54 | -9.828 | Ave |
| 16530 | 46.87 | 0 | 100 | V | 38.768 | 8.5 | 34.64 | 59.498 | 74 | -14.502 | Peak |
| 16530 | 46.78 | 0 | 100 | H | 38.768 | 8.5 | 34.64 | 59.408 | 74 | -14.592 | Peak |
| 16530 | 32.54 | 0 | 100 | V | 38.768 | 8.5 | 34.64 | 45.168 | 54 | -8.832 | Ave |
| 16530 | 32.65 | 0 | 100 | H | 38.768 | 8.5 | 34.64 | 45.278 | 54 | -8.722 | Ave |
| 22040 | 47.85 | 0 | 100 | V | 34.9 | 9.76 | 34.69 | 57.82 | 74 | -16.18 | Peak |
| 22040 | 47.98 | 0 | 100 | H | 34.9 | 9.76 | 34.69 | 57.95 | 74 | -16.05 | Peak |
| 22040 | 33.21 | 0 | 100 | V | 34.9 | 9.76 | 34.69 | 43.18 | 54 | -10.82 | Ave |
| 22040 | 33.53 | 0 | 100 | H | 34.9 | 9.76 | 34.69 | 43.5 | 54 | -10.5 | Ave |
| Middle Channel 5550 MHz, measured at 3 meters | | | | | | | | | | | |
| 11100 | 45.36 | 0 | 100 | V | 38.511 | 7.39 | 34.05 | 57.211 | 74 | -16.789 | Peak |
| 11100 | 45.42 | 0 | 100 | H | 38.511 | 7.39 | 34.05 | 57.271 | 74 | -16.729 | Peak |
| 11100 | 31.56 | 0 | 100 | V | 38.511 | 7.39 | 34.05 | 43.411 | 54 | -10.589 | Ave |
| 11100 | 31.68 | 0 | 100 | H | 38.511 | 7.39 | 34.05 | 43.531 | 54 | -10.469 | Ave |
| 16650 | 47.63 | 0 | 100 | V | 39.256 | 8.55 | 34.64 | 60.796 | 74 | -13.204 | Peak |
| 16650 | 47.54 | 0 | 100 | H | 39.256 | 8.55 | 34.64 | 60.706 | 74 | -13.294 | Peak |
| 16650 | 33.63 | 0 | 100 | V | 39.256 | 8.55 | 34.64 | 46.796 | 54 | -7.204 | Ave |
| 16650 | 33.24 | 0 | 100 | H | 39.256 | 8.55 | 34.64 | 46.406 | 54 | -7.594 | Ave |
| 22200 | 47.36 | 0 | 100 | V | 35 | 9.91 | 34.69 | 57.58 | 74 | -16.42 | Peak |
| 22200 | 47.21 | 0 | 100 | H | 35 | 9.91 | 34.69 | 57.43 | 74 | -16.57 | Peak |
| 22200 | 33.54 | 0 | 100 | V | 35 | 9.91 | 34.69 | 43.76 | 54 | -10.24 | Ave |
| 22200 | 33.78 | 0 | 100 | H | 35 | 9.91 | 34.69 | 44 | 54 | -10 | Ave |

| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| High Channel 5670 MHz, measured at 3 meters | | | | | | | | | | | |
| 11340 | 46.21 | 0 | 100 | V | 38.844 | 7.52 | 34.05 | 58.524 | 74 | -15.476 | Peak |
| 11340 | 46.36 | 0 | 100 | H | 38.844 | 7.52 | 34.05 | 58.674 | 74 | -15.326 | Peak |
| 11340 | 32.68 | 0 | 100 | V | 38.844 | 7.52 | 34.05 | 44.994 | 54 | -9.006 | Peak |
| 11340 | 32.47 | 0 | 100 | H | 38.844 | 7.52 | 34.05 | 44.784 | 54 | -9.216 | Peak |
| 17010 | 47.65 | 0 | 100 | V | 41.889 | 8.61 | 34.64 | 63.509 | 74 | -10.491 | Peak |
| 17010 | 47.24 | 0 | 100 | H | 41.889 | 8.61 | 34.64 | 63.099 | 74 | -10.901 | Peak |
| 17010 | 33.25 | 0 | 100 | V | 41.889 | 8.61 | 34.64 | 49.109 | 54 | -4.891 | Ave |
| 17010 | 33.59 | 0 | 100 | H | 41.889 | 8.61 | 34.64 | 49.449 | 54 | -4.551 | Ave |
| 22680 | 47.51 | 0 | 100 | V | 34.9 | 10.07 | 34.69 | 57.79 | 74 | -16.21 | Peak |
| 22680 | 47.69 | 0 | 100 | H | 34.9 | 10.07 | 34.69 | 57.97 | 74 | -16.03 | Peak |
| 22680 | 33.22 | 0 | 100 | V | 34.9 | 10.07 | 34.69 | 43.5 | 54 | -10.5 | Ave |
| 22680 | 33.87 | 0 | 100 | H | 34.9 | 10.07 | 34.69 | 44.15 | 54 | -9.85 | Ave |

802.11ac-80 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 5530 MHz, measured at 3 meters | | | | | | | | | | | |
| 5460 | 44.36 | 0 | 100 | V | 34.821 | 4.76 | 34.5 | 49.441 | 74 | -24.559 | Peak |
| 5460 | 44.87 | 0 | 100 | H | 34.821 | 4.76 | 34.5 | 49.951 | 74 | -24.049 | Peak |
| 5460 | 31.24 | 0 | 100 | V | 34.821 | 4.76 | 34.5 | 36.321 | 54 | -17.679 | Ave |
| 5460 | 31.65 | 0 | 100 | H | 34.821 | 4.76 | 34.5 | 36.731 | 54 | -17.269 | Ave |
| 11060 | 46.52 | 0 | 100 | V | 38.382 | 7.36 | 34.05 | 58.212 | 74 | -15.788 | Peak |
| 11060 | 46.35 | 0 | 100 | H | 38.382 | 7.36 | 34.05 | 58.042 | 74 | -15.958 | Peak |
| 11060 | 31.95 | 0 | 100 | V | 38.382 | 7.36 | 34.05 | 43.642 | 54 | -10.358 | Ave |
| 11060 | 32.05 | 0 | 100 | H | 38.382 | 7.36 | 34.05 | 43.742 | 54 | -10.258 | Ave |
| 16530 | 47.96 | 0 | 100 | V | 38.768 | 8.5 | 34.64 | 60.588 | 74 | -13.412 | Peak |
| 16530 | 48.21 | 0 | 100 | H | 38.768 | 8.5 | 34.64 | 60.838 | 74 | -13.162 | Peak |
| 16530 | 34.36 | 0 | 100 | V | 38.768 | 8.5 | 34.64 | 46.988 | 54 | -7.012 | Ave |
| 16530 | 34.29 | 0 | 100 | H | 38.768 | 8.5 | 34.64 | 46.918 | 54 | -7.082 | Ave |
| 22040 | 47.95 | 0 | 100 | V | 34.9 | 9.76 | 34.69 | 57.92 | 74 | -16.08 | Peak |
| 22040 | 47.68 | 0 | 100 | H | 34.9 | 9.76 | 34.69 | 57.65 | 74 | -16.35 | Peak |
| 22040 | 34.55 | 0 | 100 | V | 34.9 | 9.76 | 34.69 | 44.52 | 54 | -9.48 | Ave |
| 22040 | 34.36 | 0 | 100 | H | 34.9 | 9.76 | 34.69 | 44.33 | 54 | -9.67 | Ave |
| High Channel 5690 MHz, measured at 3 meters | | | | | | | | | | | |
| 11380 | 47.32 | 0 | 100 | V | 38.844 | 7.52 | 34.05 | 59.634 | 74 | -14.366 | Peak |
| 11380 | 47.55 | 0 | 100 | H | 38.844 | 7.52 | 34.05 | 59.864 | 74 | -14.136 | Peak |
| 11380 | 33.26 | 0 | 100 | V | 38.844 | 7.52 | 34.05 | 45.574 | 54 | -8.426 | Peak |
| 11380 | 32.95 | 0 | 100 | H | 38.844 | 7.52 | 34.05 | 45.264 | 54 | -8.736 | Peak |
| 17070 | 48.35 | 0 | 100 | V | 41.889 | 8.61 | 34.64 | 64.209 | 74 | -9.791 | Peak |
| 17070 | 47.85 | 0 | 100 | H | 41.889 | 8.61 | 34.64 | 63.709 | 74 | -10.291 | Peak |
| 17070 | 33.68 | 0 | 100 | V | 41.889 | 8.61 | 34.64 | 49.539 | 54 | -4.461 | Ave |
| 17070 | 33.65 | 0 | 100 | H | 41.889 | 8.61 | 34.64 | 49.509 | 54 | -4.491 | Ave |

### 3) Co-location with 2.4 GHz and 5 GHz




Quasi-Peak Measurements

| Frequency (MHz) | Corrected Amplitude (dBµV/m) | Antenna Height (cm) | Antenna Polarity (H/V) | Turntable Azimuth (degrees) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| 35.361 | 30.38 | 131 | V | 290 | 40 | -9.62 |
| 50.4415 | 32.98 | 124 | V | 93 | 40 | -7.02 |
| 98.4275 | 35.28 | 128 | V | 117 | 43.5 | -8.22 |
| 60.22175 | 32.91 | 129 | V | 212 | 40 | -7.09 |
| 85.52475 | 26.86 | 118 | V | 250 | 40 | -13.14 |
| 55.29675 | 26.15 | 223 | V | 150 | 40 | -13.85 |

1 to 40 GHz:

| Frequency (MHz) | S.A. Reading (dBµV) | Turntable Azimuth (degrees) | Test Antenna | | | Cable Loss (dB) | Pre-Amp. (dB) | Cord. Reading (dBµV/m) | FCC/IC | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polarity (H/V) | Factor (dB/m) | | | | Limit (dBµV/m) | Margin (dB) | |
| 4874.6 | 53.61 | 76 | 105 | V | 33.2 | 2.72 | 34.33 | 55.2 | 74 | -18.8 | Peak |
| 4874.6 | 50.72 | 46 | 109 | H | 33.2 | 2.72 | 34.33 | 52.31 | 74 | -21.69 | Peak |
| 4874.6 | 39.69 | 76 | 105 | V | 33.2 | 2.72 | 34.33 | 41.28 | 54 | -12.72 | Ave |
| 4874.6 | 36.24 | 46 | 109 | H | 33.2 | 2.72 | 34.33 | 37.83 | 54 | -16.17 | Ave |
| 8187 | 45.28 | 0 | 100 | V | 36.74 | 3.52 | 34.57 | 50.97 | 74 | -23.03 | Peak |
| 8187 | 45.77 | 0 | 100 | H | 36.74 | 3.52 | 34.57 | 51.46 | 74 | -22.54 | Peak |
| 8187 | 31.99 | 0 | 100 | V | 36.74 | 3.52 | 34.57 | 37.68 | 54 | -16.32 | Ave |
| 8187 | 32.58 | 0 | 100 | H | 36.74 | 3.52 | 34.57 | 38.27 | 54 | -15.73 | Ave |
| 11488.17 | 47.63 | 47 | 100 | V | 38.1 | 4.07 | 33.85 | 55.95 | 74 | -18.05 | Peak |
| 11488.17 | 52.58 | 52 | 100 | H | 38.1 | 4.07 | 33.85 | 60.9 | 74 | -13.1 | Peak |
| 11488.17 | 33.91 | 47 | 100 | V | 38.1 | 4.07 | 33.85 | 42.23 | 54 | -11.77 | Ave |
| 11488.17 | 37.27 | 52 | 100 | H | 38.1 | 4.07 | 33.85 | 45.59 | 54 | -8.41 | Ave |
| 16085 | 42.33 | 0 | 100 | V | 37.73 | 4.84 | 34.83 | 50.07 | 74 | -23.93 | Peak |
| 16085 | 43.44 | 0 | 100 | H | 37.73 | 4.84 | 34.83 | 51.18 | 74 | -22.82 | Peak |
| 16085 | 28.72 | 0 | 100 | V | 37.73 | 4.84 | 34.83 | 36.46 | 54 | -17.54 | Ave |
| 16085 | 29.54 | 0 | 100 | H | 37.73 | 4.84 | 34.83 | 37.28 | 54 | -16.72 | Ave |

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

## 8.1 Applicable Standard

FCC §15.407(a) and IC RSS-210 §A9.2.

## 8.2 Measurement Procedure

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

## 8.3 Test Equipment List and Details

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

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

## 8.4 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 21 °C |
| **Relative Humidity:** | 43 % |
| **ATM Pressure:** | 101-102 kPa |

*The testing was performed by Chen Ge from 2014-04-21 at RF site.*

## 8.5 Test Results

Please refer to the following tables and plots.

**5250-5350 MHz Band**

| Radio Mode | Channel | Frequency (MHz) | 26 dB Emission Bandwidth (MHz) | 99% Emission Bandwidth (MHz) |
|---|---|---|---|---|
| 802.11a | Chain J0 | | | |
| | Low | 5260 | 22.190 | 16.8378 |
| | Middle | 5280 | 21.128 | 16.8033 |
| | High | 5320 | 21.364 | 16.8183 |
| | Chain J1 | | | |
| | Low | 5260 | 22.007 | 16.7241 |
| | Middle | 5280 | 21.605 | 16.7389 |
| | High | 5320 | 21.252 | 16.7289 |
| 802.11n-HT20 mode | Chain J0 | | | |
| | Low | 5260 | 22.093 | 17.9362 |
| | Middle | 5280 | 22.958 | 17.9645 |
| | High | 5320 | 22.424 | 17.9998 |
| | Chain J1 | | | |
| | Low | 5260 | 23.573 | 18.0376 |
| | Middle | 5280 | 23.470 | 17.9704 |
| | High | 5320 | 22.566 | 17.8940 |
| 802.11n-HT40 mode | Chain J0 | | | |
| | Low | 5270 | 46.657 | 36.2811 |
| | High | 5310 | 41.680 | 36.2127 |
| | Chain J1 | | | |
| | Low | 5270 | 59.934 | 36.5899 |
| | High | 5310 | 45.704 | 36.2704 |
| 802.11ac 80 mode | Chain J0 | | | |
| | - | 5310 | 83.229 | 75.5421 |
| | Chain J1 | | | |
| | - | 5310 | 85.806 | 75.4532 |

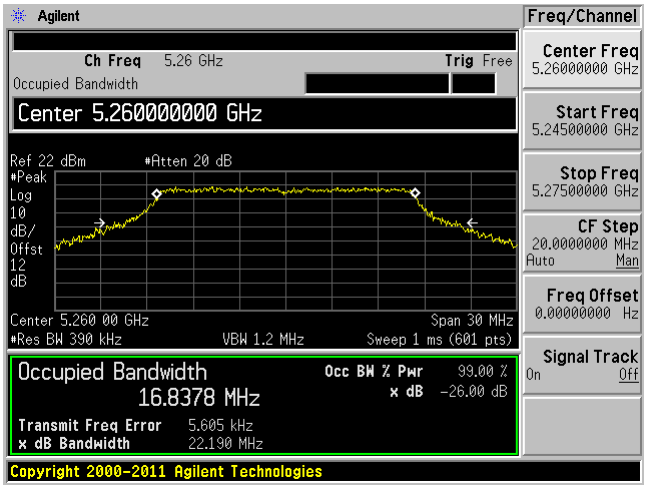
**5470-5725 MHz Band**

| Radio Mode | Channel | Frequency (MHz) | 26 dB Emission Bandwidth (MHz) | 99% Emission Bandwidth (MHz) |
|---|---|---|---|---|
| 802.11a | Chain J0 | | | |
| | Low | 5500 | 20.479 | 16.7620 |
| | Middle | 5580 | 21.378 | 16.7727 |
| | High | 5700 | 21.436 | 16.7849 |
| | Chain J1 | | | |
| | Low | 5500 | 21.029 | 16.7589 |
| | Middle | 5580 | 21.979 | 16.7997 |
| | High | 5700 | 21.916 | 16.7491 |
| 802.11n-HT20 mode | Chain J0 | | | |
| | Low | 5500 | 23.064 | 17.9281 |
| | Middle | 5580 | 22.706 | 17.9832 |
| | High | 5700 | 22.458 | 17.8843 |
| | Chain J1 | | | |
| | Low | 5500 | 22.353 | 17.9711 |
| | Middle | 5580 | 23.223 | 17.9647 |
| | High | 5700 | 22.991 | 17.9458 |
| 802.11n-HT40 mode | Chain J0 | | | |
| | Low | 5510 | 41.373 | 36.1918 |
| | Middle | 5550 | 46.968 | 36.2162 |
| | High | 5670 | 42.899 | 36.2883 |
| | Chain J1 | | | |
| | Low | 5510 | 42.600 | 36.2245 |
| | Middle | 5550 | 46.688 | 36.3159 |
| | High | 5670 | 44.497 | 36.3071 |
| 802.11ac 80 mode | Chain J0 | | | |
| | Low | 5530 | 83.080 | 75.3928 |
| | High | 5690 | 90.591 | 75.9021 |
| | Chain J1 | | | |
| | Low | 5530 | 85.412 | 75.6467 |
| | High | 5690 | 87.251 | 75.6598 |

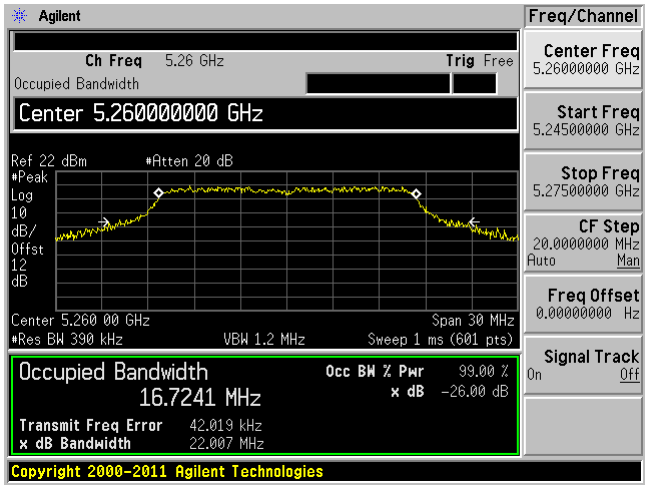
**5250-5350 MHz**

802.11a mode

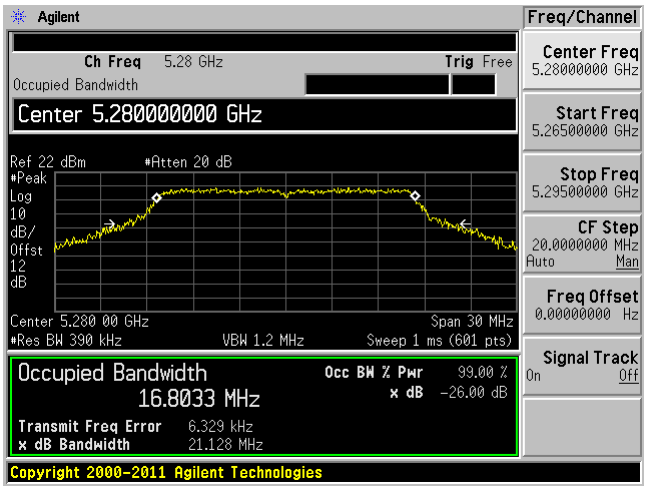
802.11a mode, 5260 MHz, Chain J0



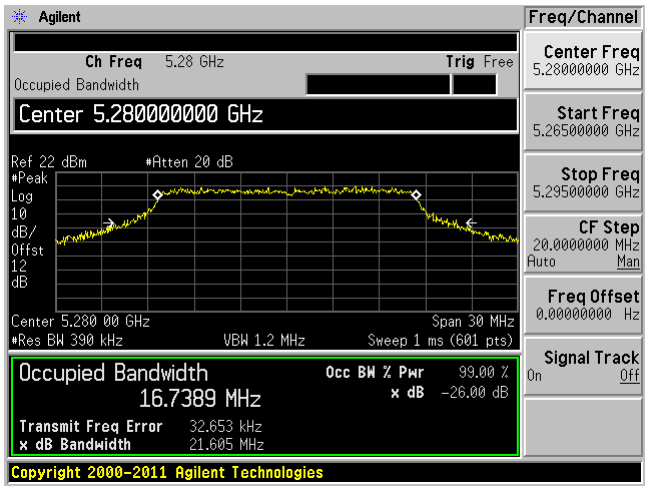

802.11a mode, 5260 MHz, Chain J1



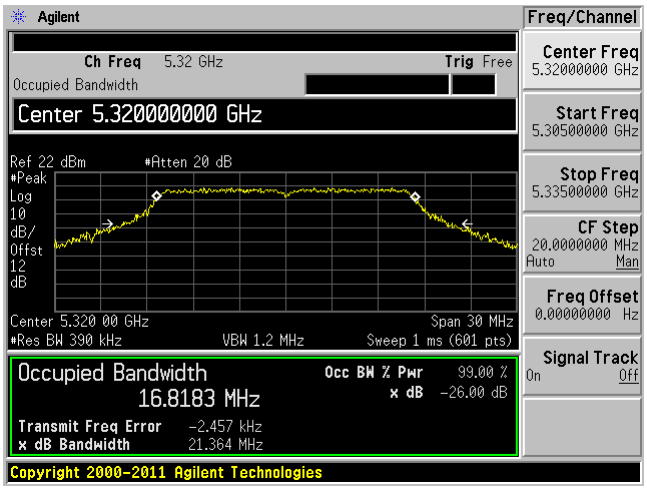

802.11a mode, 5280 MHz, Chain J0



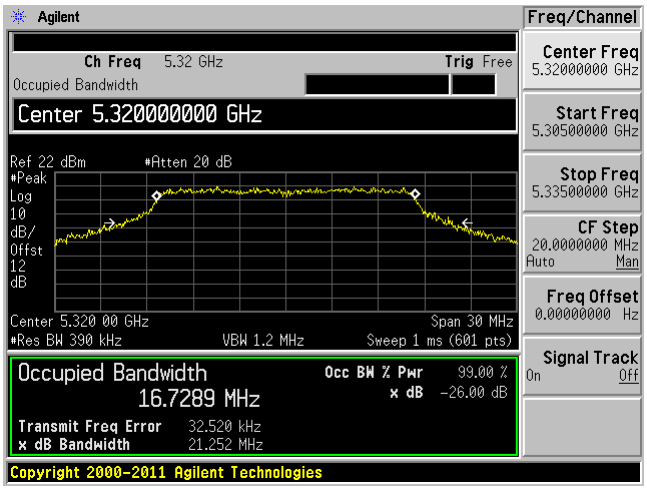

802.11a mode, 5280 MHz, Chain J1



802.11a mode, 5320 MHz, Chain J0

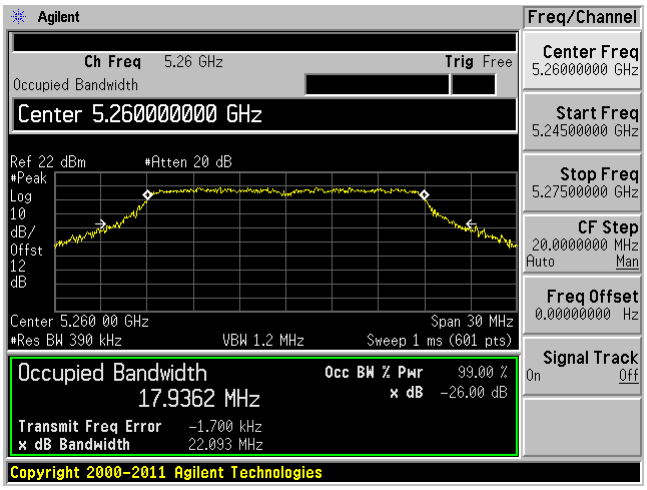



802.11a mode, 5320 MHz, Chain J1

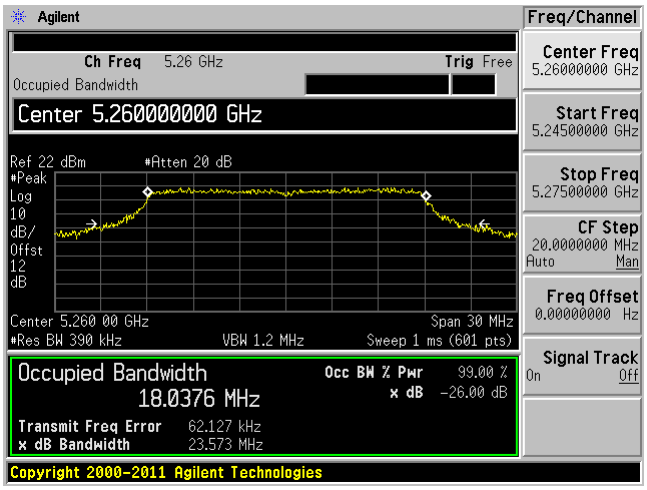


802.11n-HT-20 mode

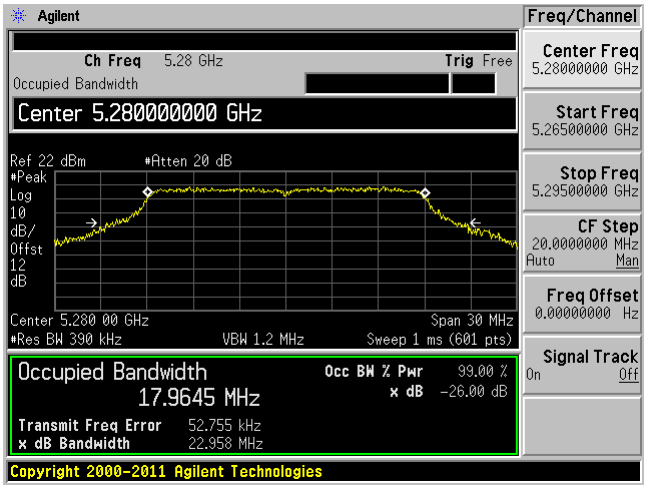
802.11n-HT20 mode, 5260 MHz, Chain J0



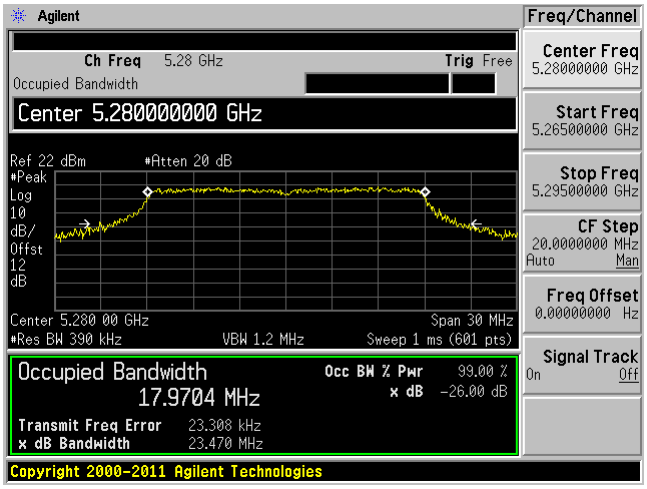

802.11n-HT20 mode, 5260 MHz, Chain J1



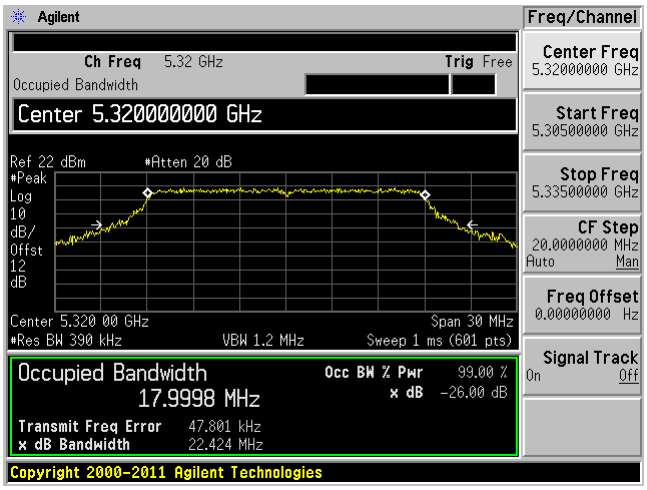

802.11n-HT20 mode, 5280 MHz, Chain J0



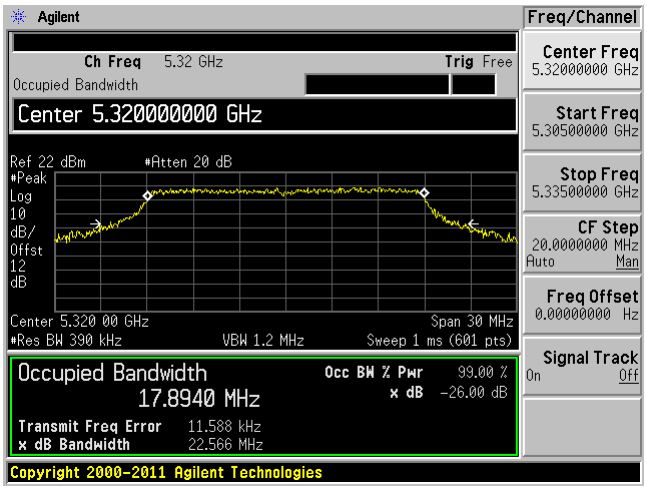

802.11n-HT20 mode, 5280 MHz, Chain J1



802.11n-HT20 mode, 5320 MHz, Chain J0

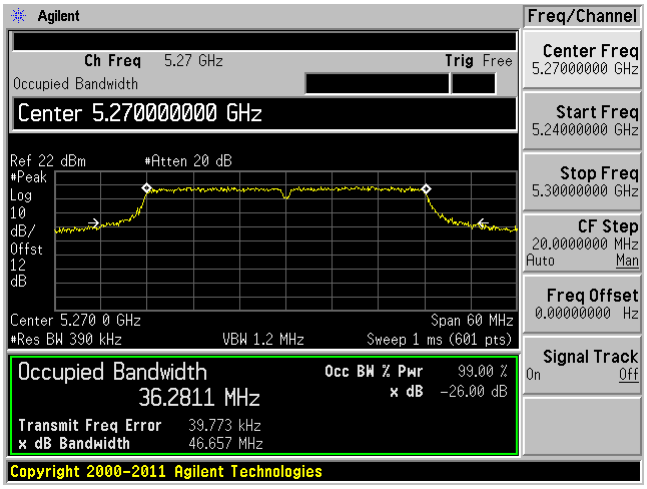



802.11n-HT20 mode, 5320 MHz, Chain J1

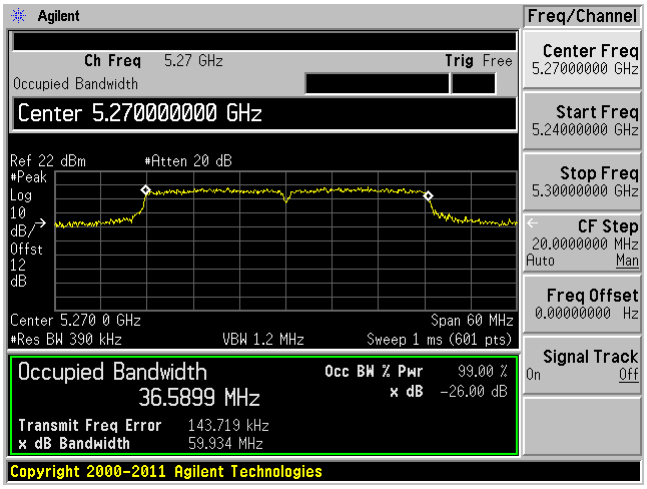


802.11n-HT-40 mode

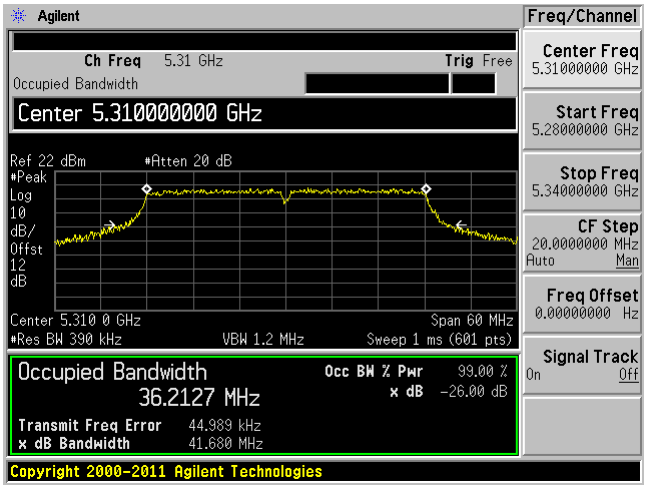
802.11n-HT40 mode, 5270 MHz, Chain J0



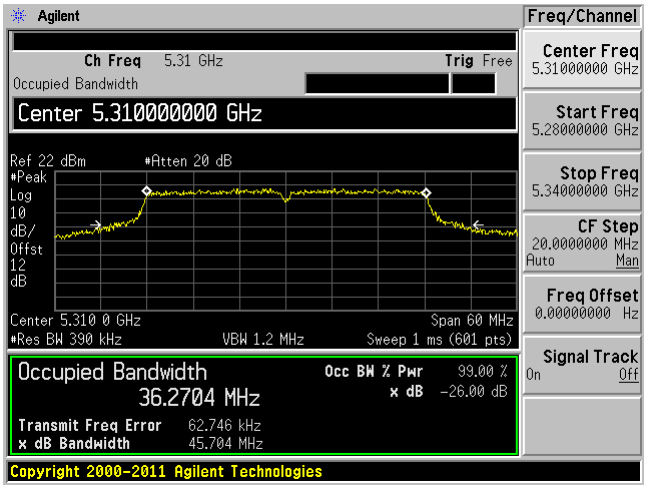

802.11n-HT40 mode, 5270 MHz, Chain J1




802.11n-HT40 mode, 5310 MHz, Chain J0

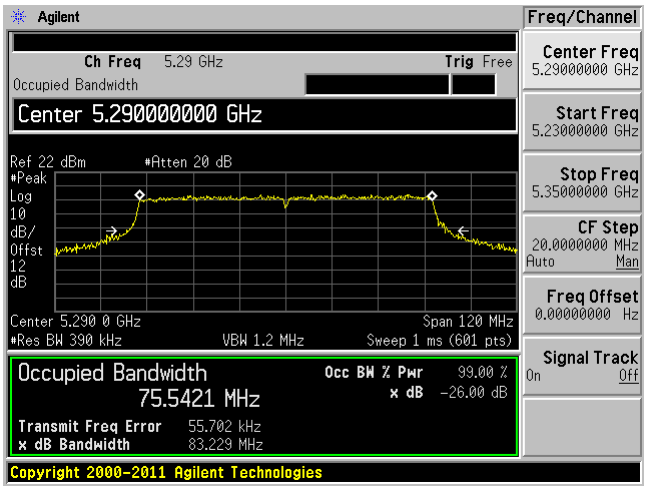



802.11n-HT40 mode, 5310 MHz, Chain J1

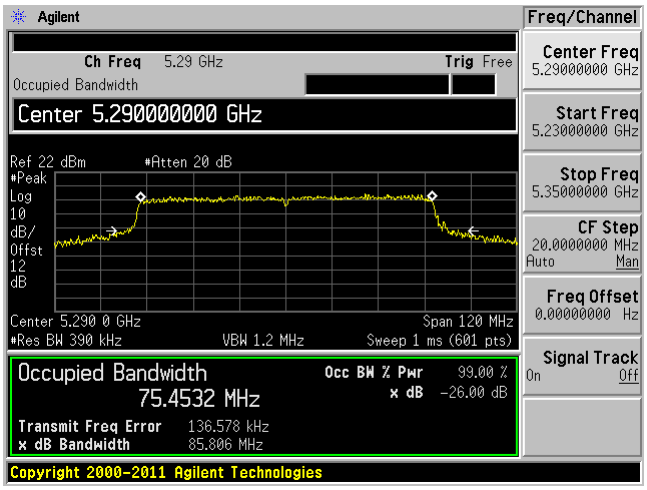


802.11ac 80 mode

802.11ac-80 mode, 5290 MHz, Chain J0



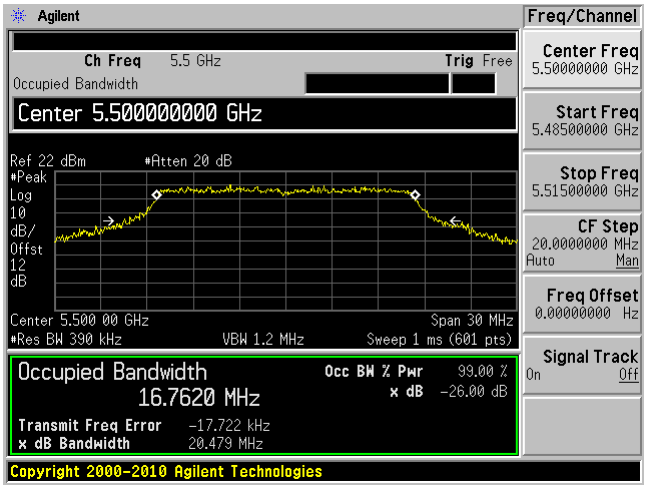

802.11ac-80 mode, 5290 MHz, Chain J1



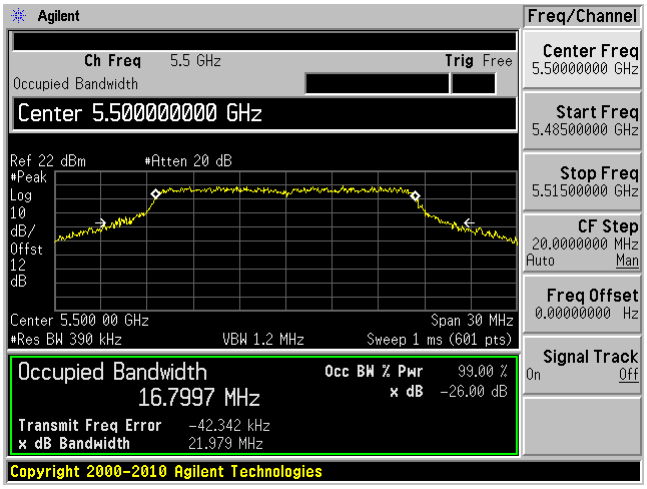
**5470-5725 MHz**

802.11a mode

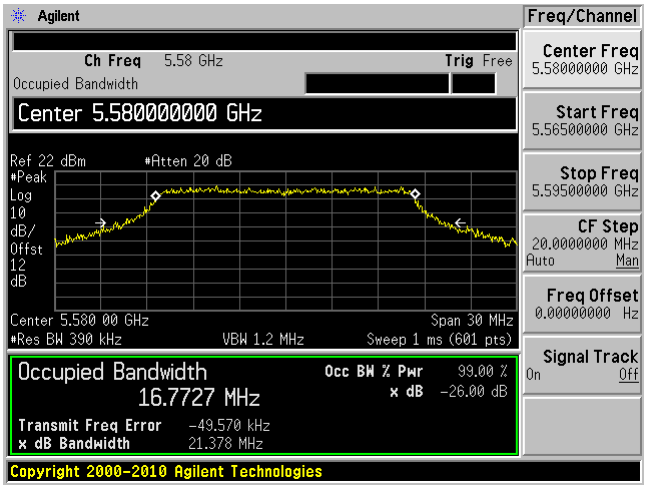
802.11a mode, 5550 MHz, Chain J0



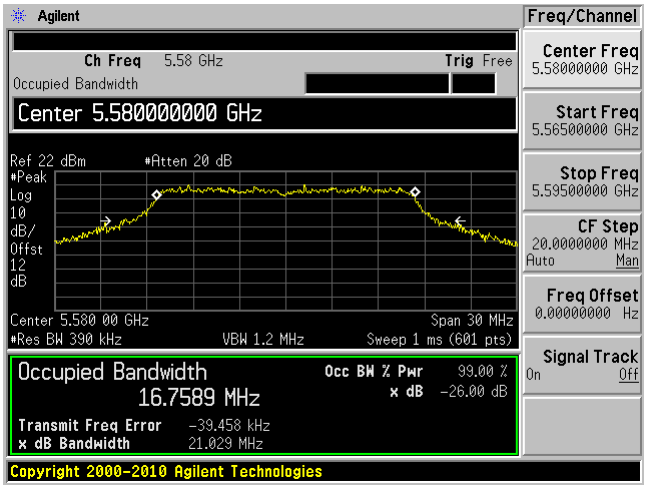

802.11a mode, 5550 MHz, Chain J1



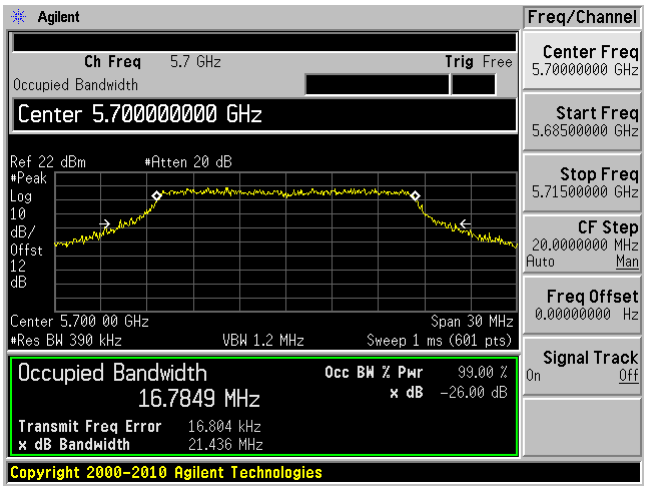

802.11a mode, 5580 MHz, Chain J0



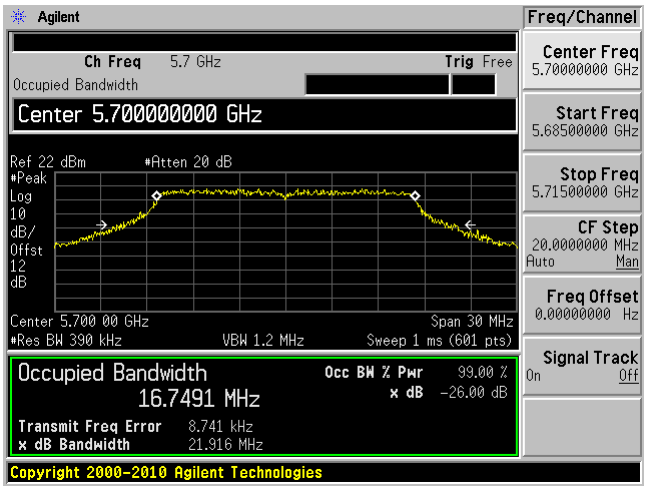

802.11a mode, 5580 MHz, Chain J1



802.11a mode, 5700 MHz, Chain J0

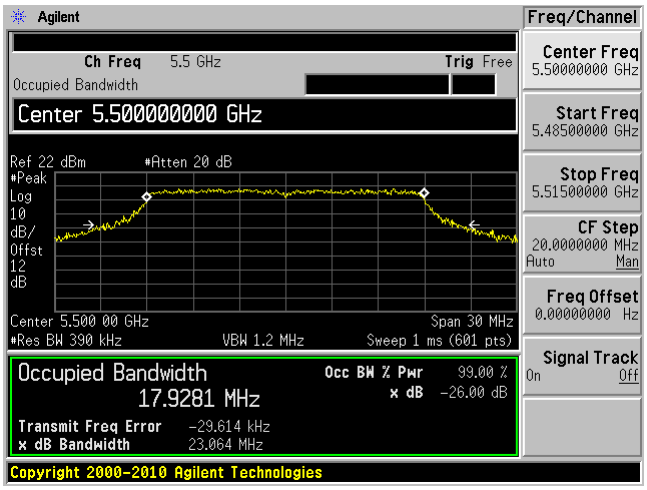



802.11a mode, 5700 MHz, Chain J1

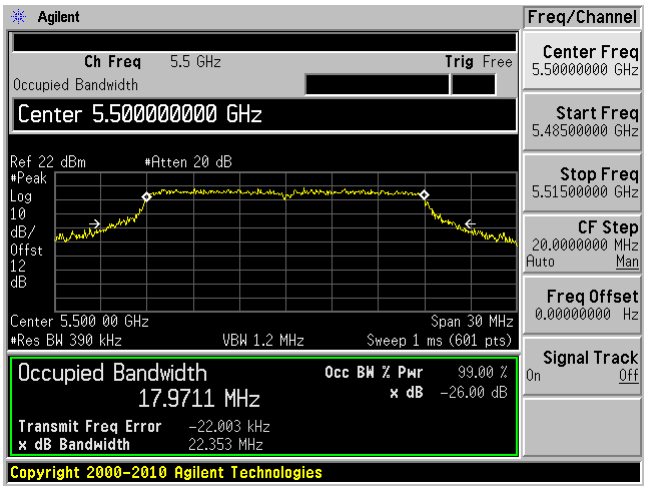


802.11n-HT-20 mode

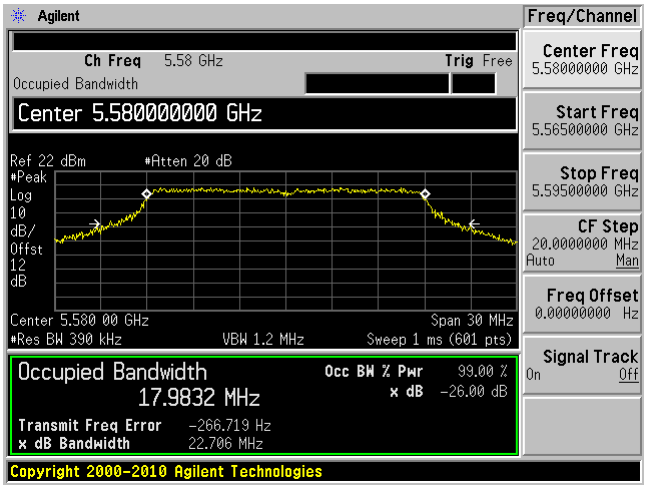
802.11n-HT20 mode, 5500 MHz, Chain J0



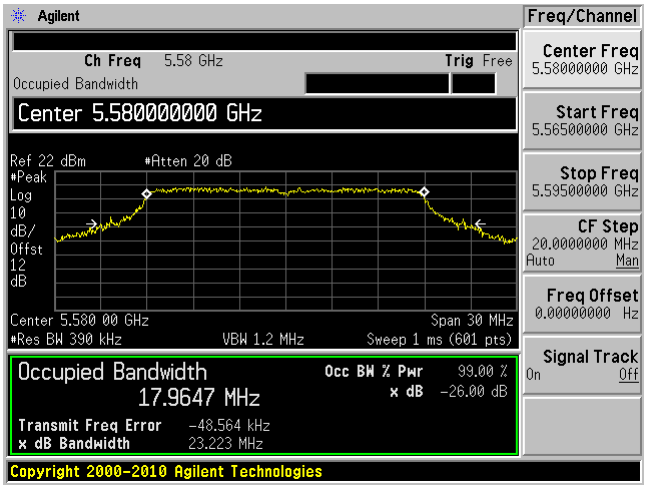

802.11n-HT20 mode, 5500 MHz, Chain J1



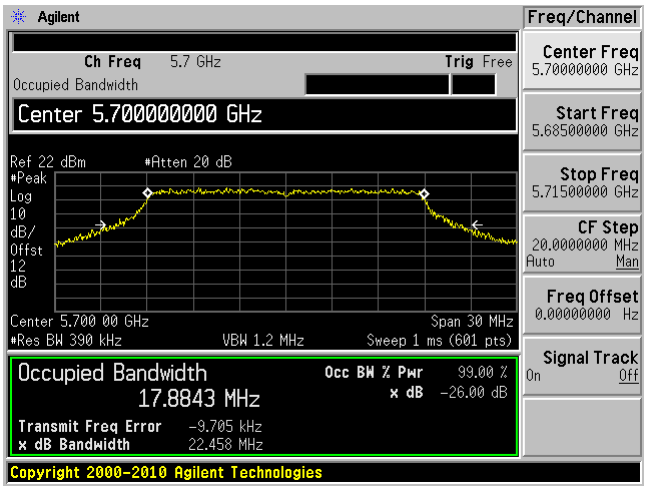

802.11n-HT20 mode, 5580 MHz, Chain J0



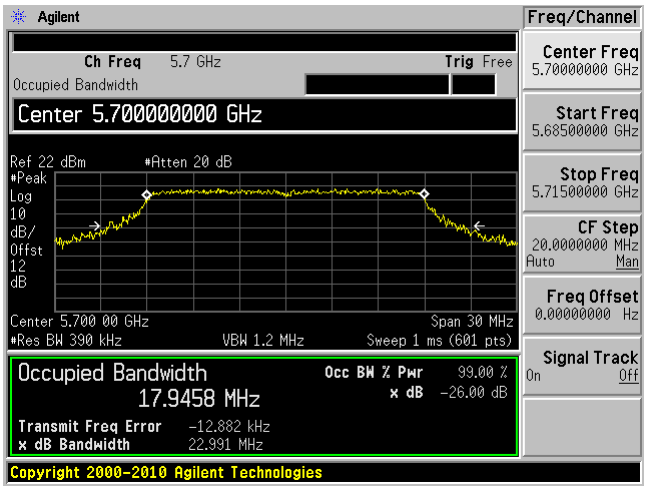

802.11n-HT20 mode, 5580 MHz, Chain J1



802.11n-HT20 mode, 5700 MHz, Chain J0

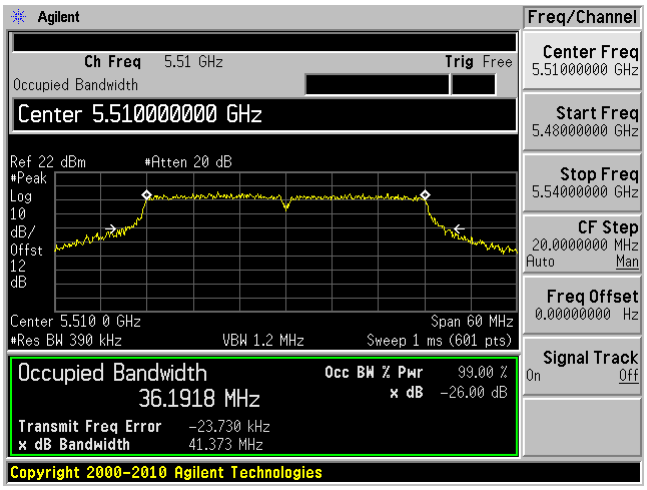



802.11n-HT20 mode, 5700 MHz, Chain J1

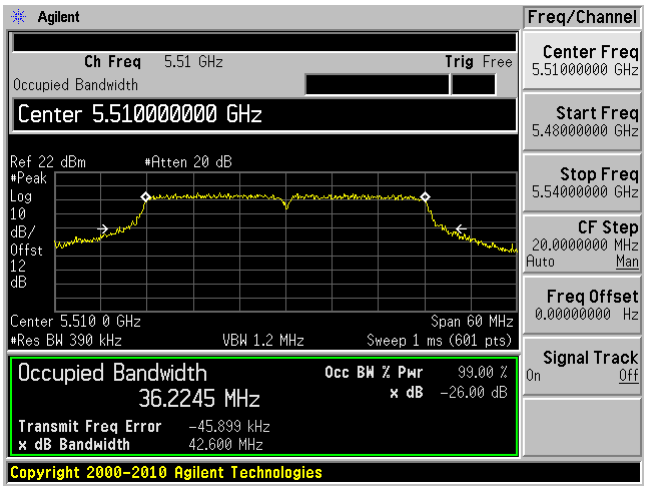


802.11n-HT-40 mode

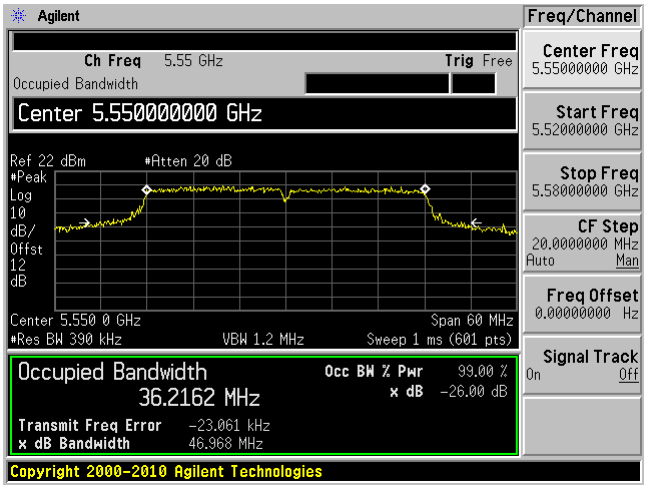
802.11n-HT40 mode, 5510 MHz, Chain J0



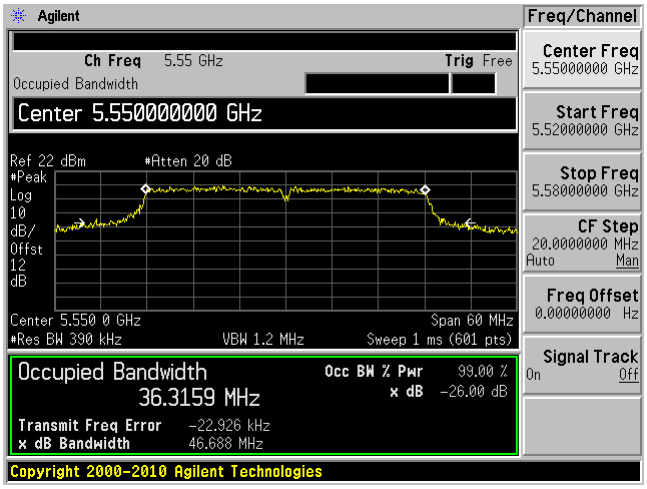

802.11n-HT40 mode, 5510 MHz, Chain J1



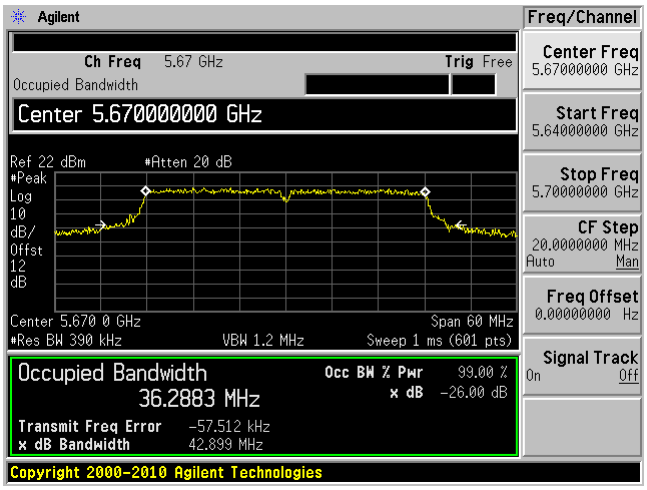

802.11n-HT40 mode, 5550 MHz, Chain J0



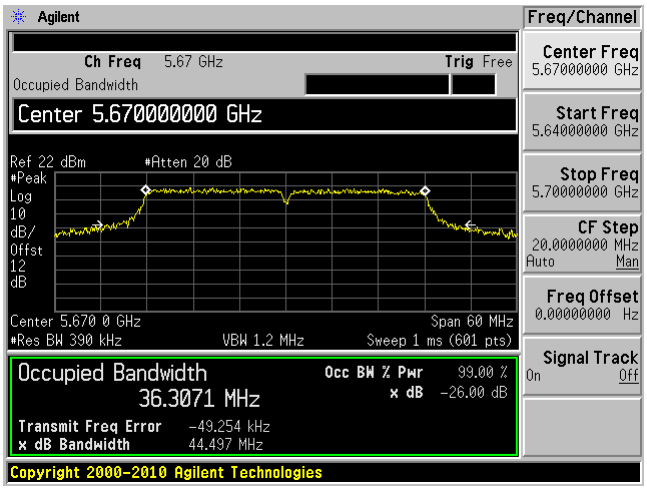

802.11n-HT40 mode, 5550 MHz, Chain J1



802.11n-HT40 mode, 5670 MHz, Chain J0

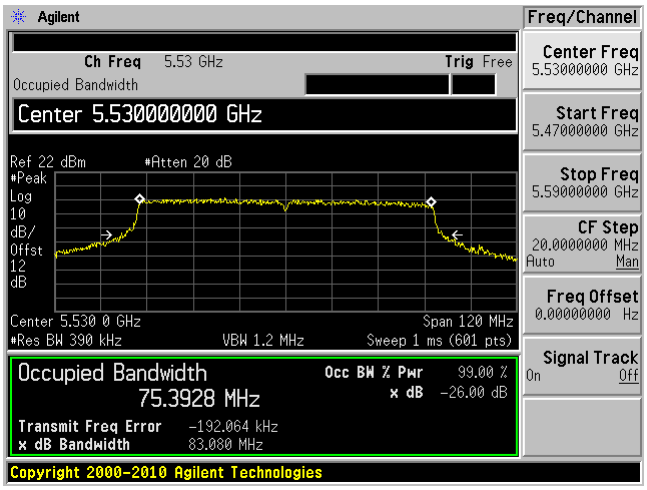



802.11n-HT40 mode, 5670 MHz, Chain J1

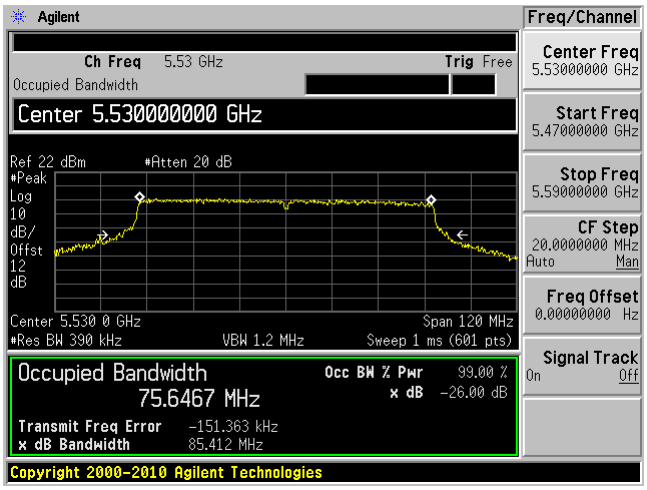


802.11ac 80 mode

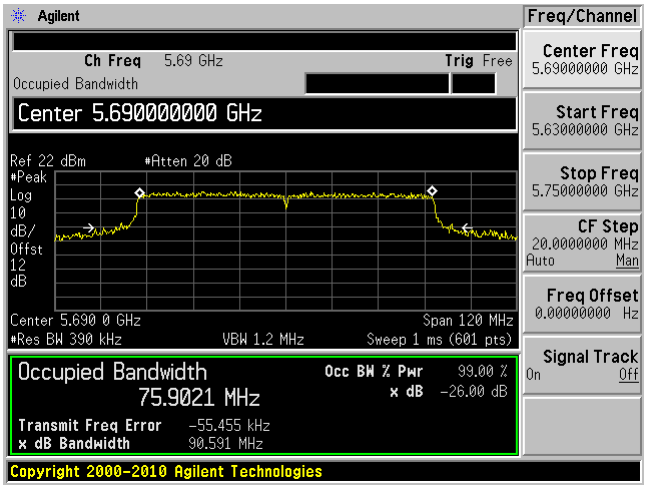
802.11ac-80 mode, 5530 MHz, Chain J0



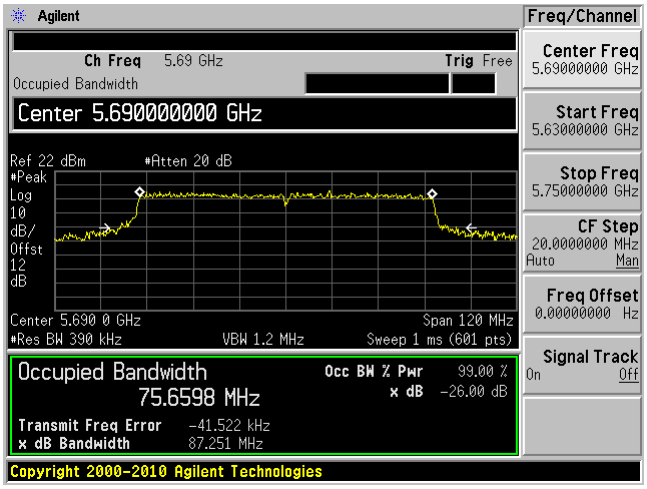

802.11ac-80 mode, 5530 MHz, Chain J1




802.11ac-80 mode, 5690 MHz, Chain J0




802.11ac-80 mode, 5690 MHz, Chain J1



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

## 9.1 Applicable Standard

**According to FCC §15.407(a)(1)**

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

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

**According to IC RSS-210 §A9.2:**

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10 B, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

## 9.2 Measurement Procedure

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

## 9.3 Test Equipment List and Details

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

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

## 9.4 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 21 °C |
| **Relative Humidity:** | 43 % |
| **ATM Pressure:** | 101-102 kPa |

*The testing was performed by Chen Ge from 2014-04-21 at RF site.*

## 9.5 Test Results

**For FCC:**

**5250-5350 MHz Band**

802.11a mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5260 | 18.47 | 18.15 | 21.32 | 24 | -2.68 | 18 |
| Middle | 5280 | 18.29 | 18.23 | 21.27 | 24 | -2.73 | 18 |
| High | 5320 | 18.54 | 18.19 | 21.38 | 24 | -2.62 | 18 |

802.11n-HT20 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5260 | 18.87 | 18.55 | 21.72 | 24 | -2.28 | 18.5 |
| Middle | 5280 | 18.81 | 18.58 | 21.71 | 24 | -2.29 | 18.5 |
| High | 5320 | 18.93 | 18.62 | 21.79 | 24 | -2.21 | 18.5 |

802.11n-HT40 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5270 | 20.78 | 20.28 | 23.55 | 24 | -0.45 | 20.5 |
| High | 5310 | 17.28 | 17.18 | 20.24 | 24 | -3.76 | 17 |

802.11ac-80 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| - | 5290 | 14.89 | 15.08 | 18.00 | 24 | -6.00 | 15 |

**5470-5725 MHz Band**

802.11a mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5500 | 18.15 | 18.17 | 21.17 | 24 | -2.83 | 17 |
| Middle | 5580 | 17.99 | 18.12 | 21.07 | 24 | -2.93 | 18 |
| High | 5700 | 17.95 | 17.68 | 20.83 | 24 | -3.17 | 18 |

802.11n-HT20 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5500 | 18.01 | 18.03 | 21.03 | 24 | -2.97 | 21 |
| Middle | 5580 | 18.44 | 18.53 | 21.50 | 24 | -2.50 | 21 |
| High | 5700 | 18.42 | 18.48 | 21.46 | 24 | -2.54 | 21 |

802.11n-HT40 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5510 | 17.37 | 17.66 | 20.53 | 24 | -3.47 | 17 |
| Middle | 5550 | 20.23 | 20.67 | 23.47 | 24 | -0.53 | 20 |
| High | 5670 | 20.2 | 20.72 | 23.48 | 24 | -0.52 | 20 |

802.11ac-80 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5530 | 16.19 | 16.53 | 19.37 | 24 | -4.63 | 16.5 |
| High | 5690 | 20.26 | 20.46 | 23.37 | 24 | -0.63 | 20 |

**For IC:**

**5250-5350 MHz Band**

802.11a mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5260 | 5.04 | 4.97 | 8.02 | 24 | -15.98 | 8 |
| Middle | 5280 | 18.29 | 18.23 | 21.27 | 24 | -2.73 | 18 |
| High | 5320 | 18.54 | 18.19 | 21.38 | 24 | -2.62 | 18 |

802.11n-HT20 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5260 | -0.11 | -0.05 | 2.93 | 24 | -21.07 | 3 |
| Middle | 5280 | 18.81 | 18.58 | 21.71 | 24 | -2.29 | 18.5 |
| High | 5320 | 18.93 | 18.62 | 21.79 | 24 | -2.21 | 18.5 |

802.11n-HT40 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5270 | 6.77 | 6.86 | 9.83 | 24 | -14.17 | 10 |
| High | 5310 | 17.28 | 17.18 | 20.24 | 24 | -3.76 | 17 |

802.11ac-80 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| - | 5290 | 14.89 | 15.08 | 18.00 | 24 | -6.00 | 15 |

**5470-5725 MHz Band**

802.11a mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5500 | 18.15 | 18.17 | 21.17 | 24 | -2.83 | 17 |
| Middle | 5580 | 17.99 | 18.12 | 21.07 | 24 | -2.93 | 18 |
| High | 5700 | 17.95 | 17.68 | 20.83 | 24 | -3.17 | 18 |

802.11n-HT20 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5500 | 18.01 | 18.03 | 21.03 | 24 | -2.97 | 21 |
| Middle | 5580 | 18.44 | 18.53 | 21.50 | 24 | -2.50 | 21 |
| High | 5700 | 18.42 | 18.48 | 21.46 | 24 | -2.54 | 21 |

802.11n-HT40 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5510 | 17.37 | 17.66 | 20.53 | 24 | -3.47 | 17 |
| Middle | 5550 | 20.23 | 20.67 | 23.47 | 24 | -0.53 | 20 |
| High | 5670 | 20.2 | 20.72 | 23.48 | 24 | -0.52 | 20 |

802.11ac-80 mode

| Channel | Frequency (MHz) | TX Chain J0 Power (dBm) | TX Chain J1 Power (dBm) | Total Power (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5530 | 16.19 | 16.53 | 19.37 | 24 | -4.63 | 16.5 |
| High | 5690 | 20.26 | 20.46 | 23.37 | 24 | -0.63 | 20 |

Note: The maximum antenna gain at 5 GHz band is 3.5 dBi. The TPC is not required due to the maximum e.i.r.p is lower than 500 mW (27 dBm).

# 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 §A9.2**

Emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p.

## 10.2 Measurement Procedure

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

## 10.3 Test Equipment List and Details

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

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

## 10.4 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 21 °C |
| **Relative Humidity:** | 43 % |
| **ATM Pressure:** | 101-102 kPa |

*The testing was performed by Chen Ge from 2014-04-21 at RF site.*

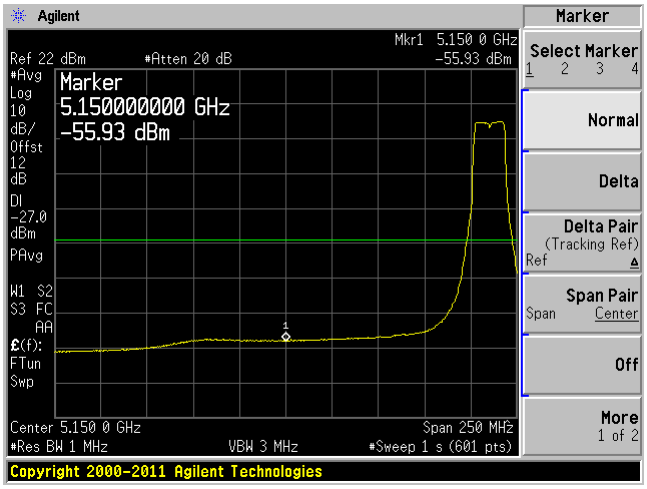
## 10.5 Test Results

Please refer to following pages for plots of band edge.

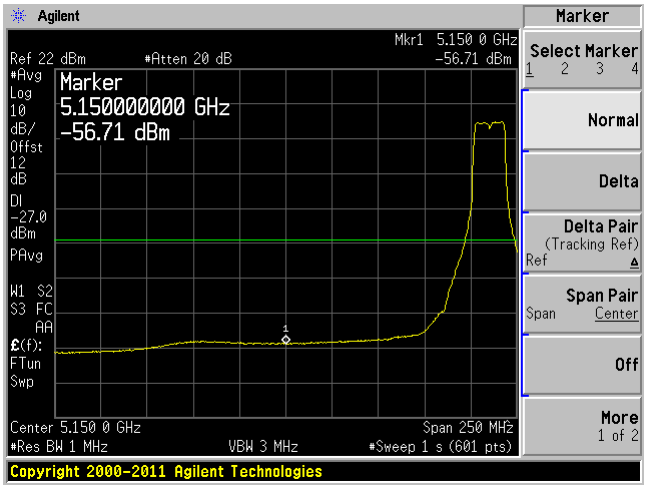
**5250-5350 MHz**

For FCC :

802.11a mode, 5260 MHz, Chain J0

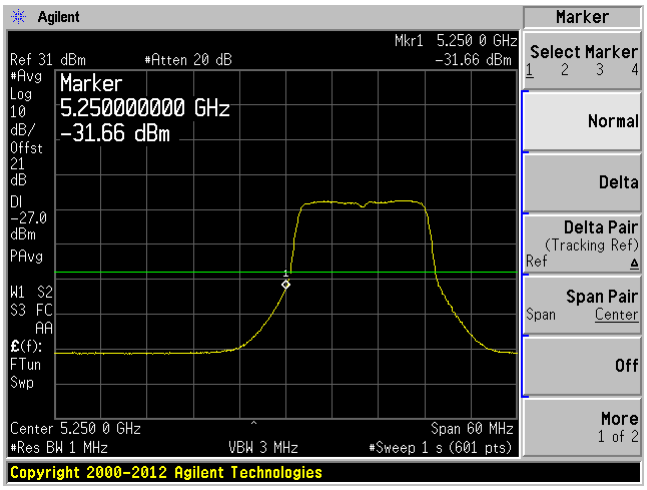



802.11a mode, 5260 MHz, Chain J1

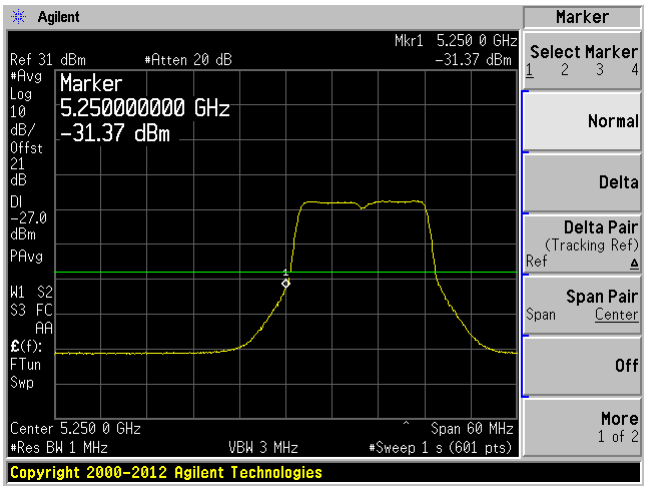



For IC :

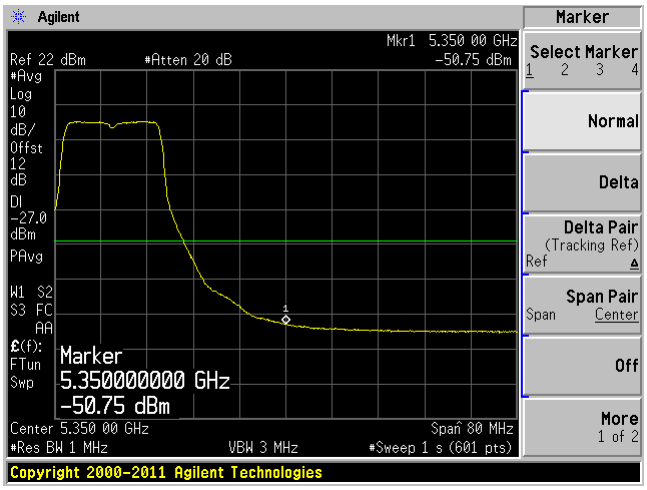
802.11a mode, 5260 MHz, Chain J0



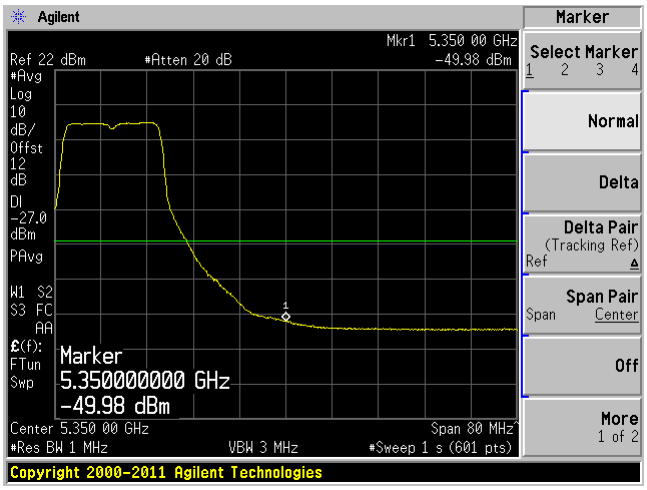

802.11a mode, 5260 MHz, Chain J1



802.11a mode, 5320 MHz, Chain J0

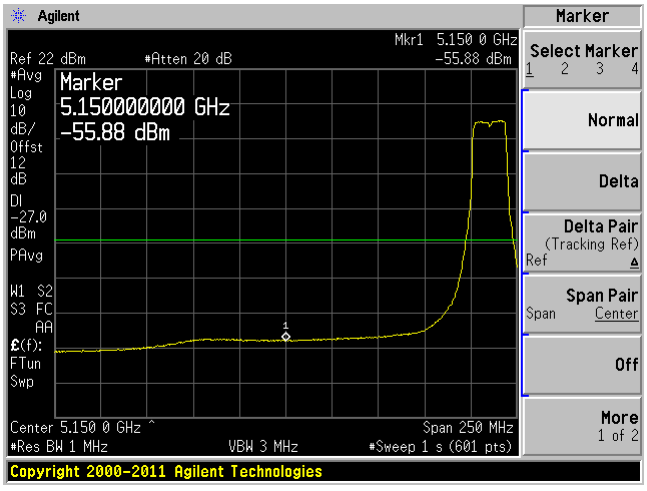



802.11a mode, 5320 MHz, Chain J1

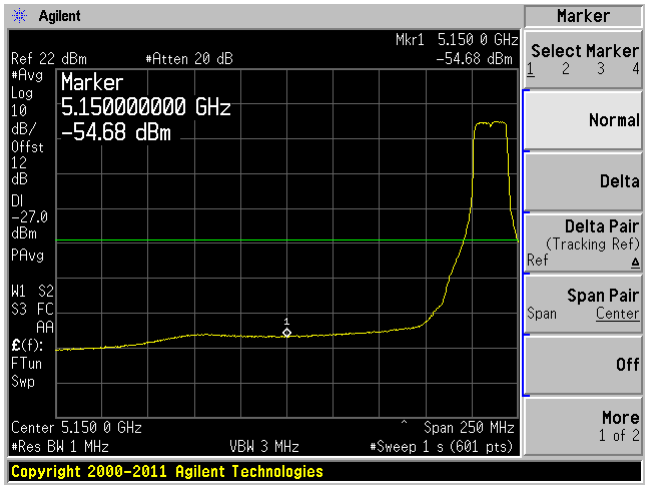



For FCC :

802.11n-HT20 mode, 5260 MHz, Chain J0

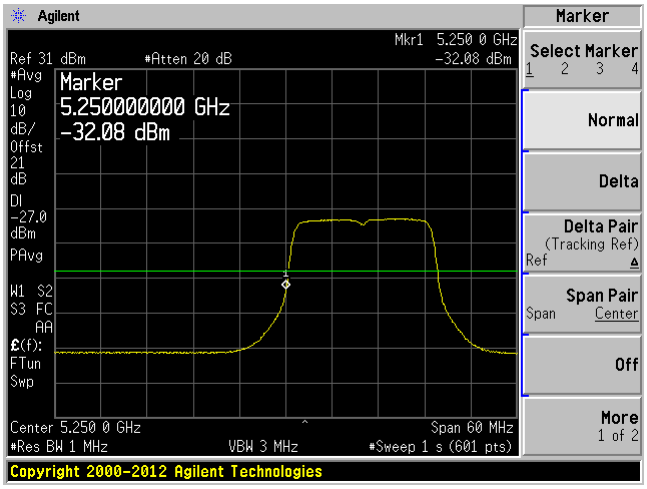



802.11n-HT20 mode, 5260 MHz, Chain J1

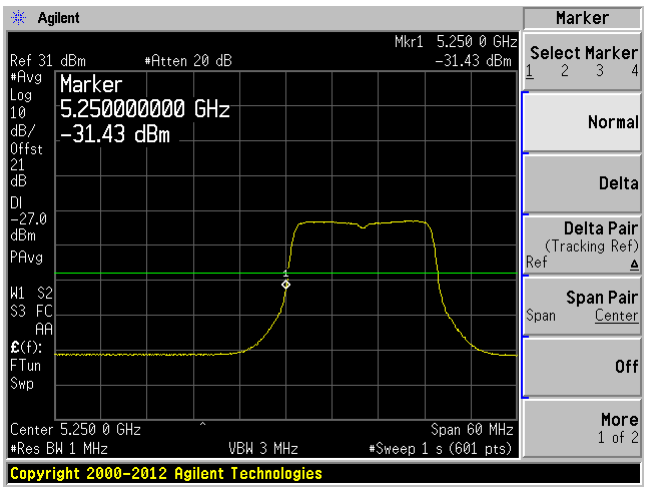


For IC :

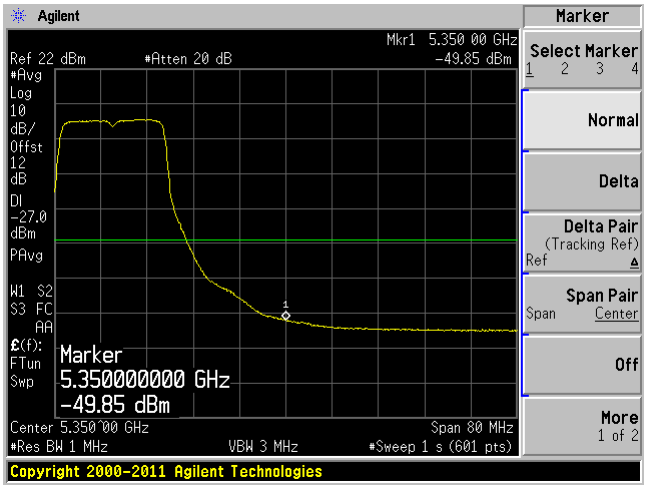
802.11n-HT20 mode, 5260 MHz, Chain J0



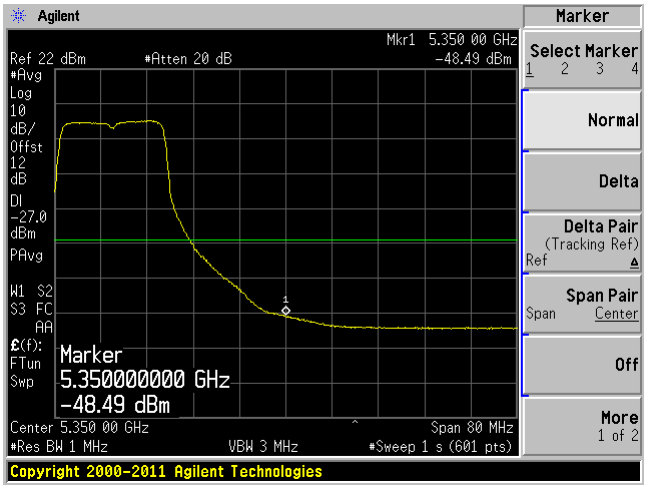

802.11n-HT20 mode, 5260 MHz, Chain J1




802.11n-HT20 mode, 5320 MHz, Chain J0

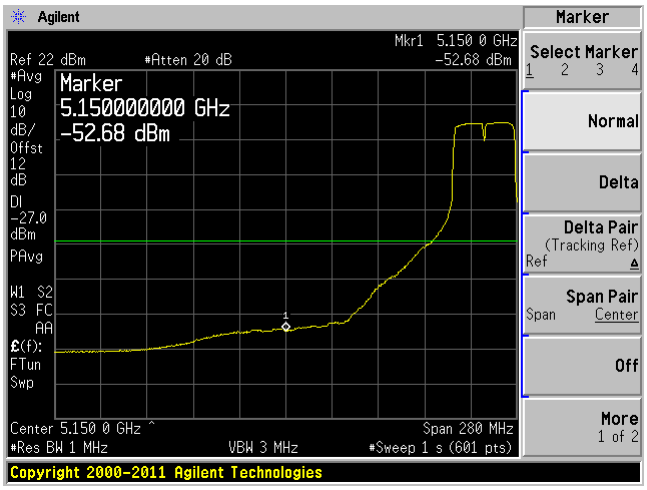



802.11n-HT20 mode, 5320 MHz, Chain J1

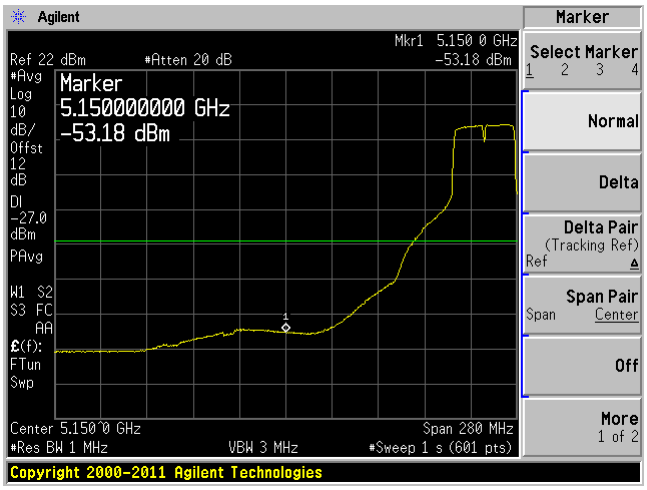


For FCC :

802.11n-HT40 mode, 5270 MHz, Chain J0

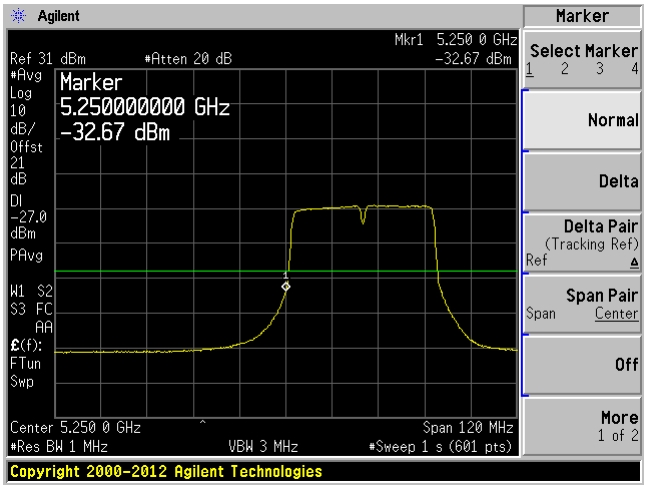



802.11n-HT40 mode, 5270 MHz, Chain J1

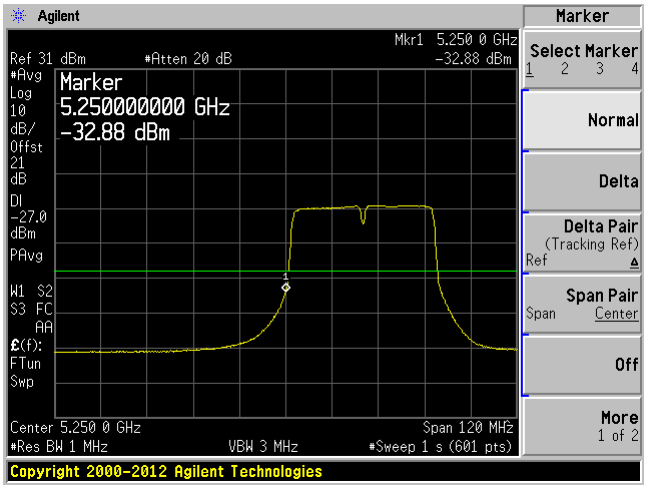



For IC :

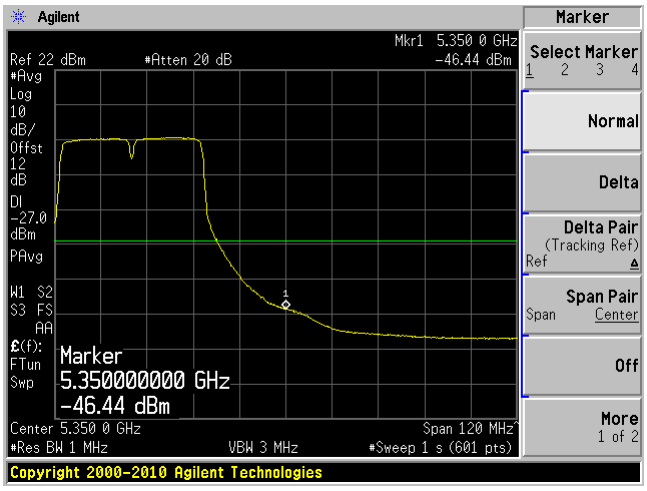
802.11n-HT40 mode, 5270 MHz, Chain J0



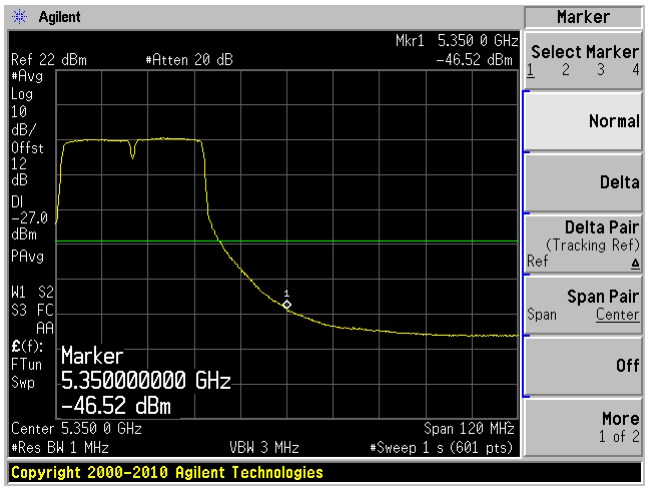

802.11n-HT40 mode, 5270 MHz, Chain J1



802.11n-HT40 mode, 5310 MHz, Chain J0

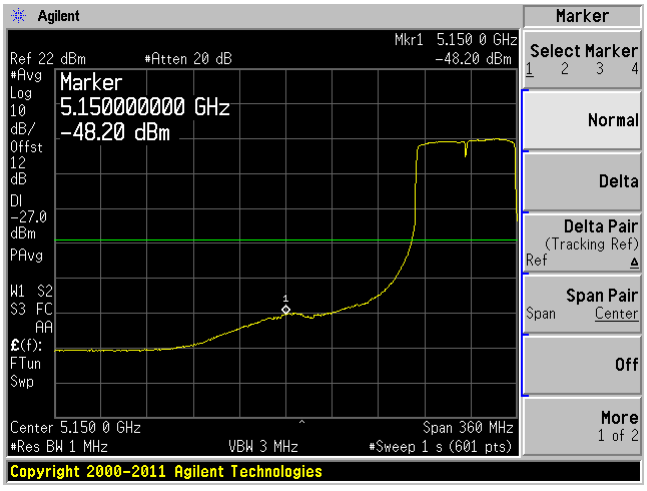



802.11n-HT40 mode, 5310 MHz, Chain J1

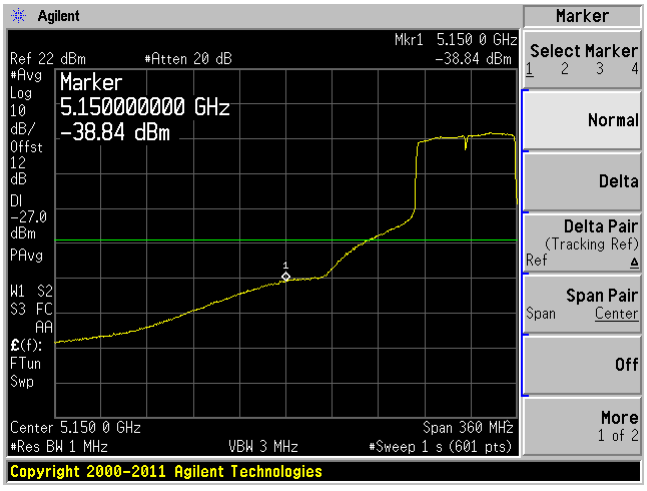



For FCC :

802.11ac-80 mode, 5290 MHz, Chain J0

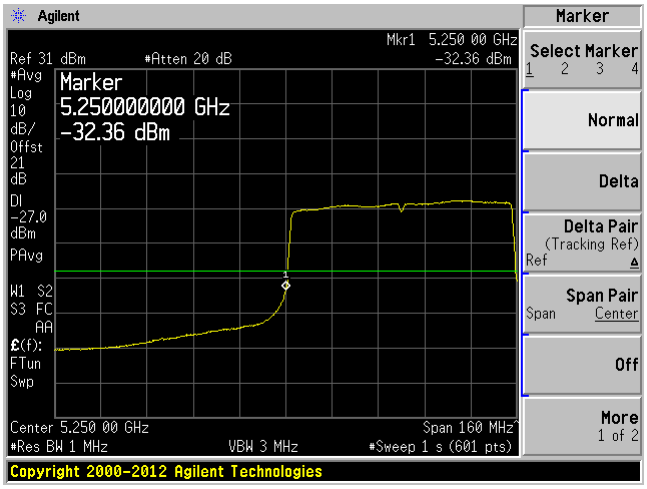



802.11ac-80 mode, 5290 MHz, Chain J1

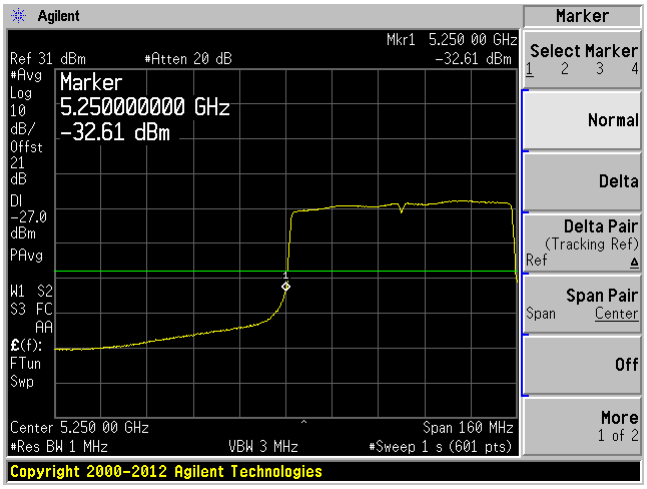


**For IC :**

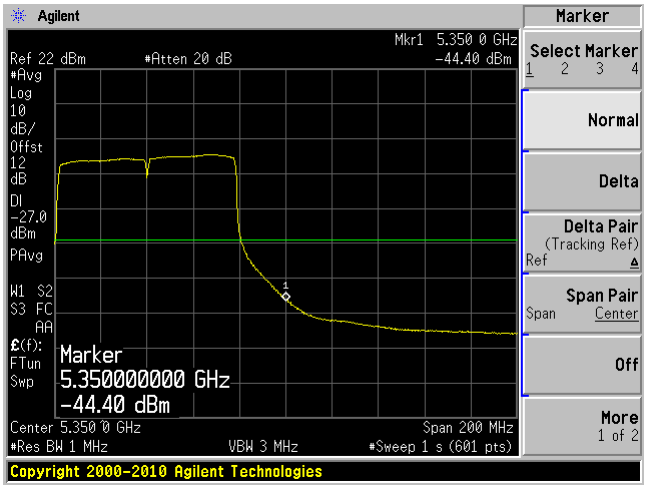
802.11ac-80 mode, 5290 MHz, Chain J0



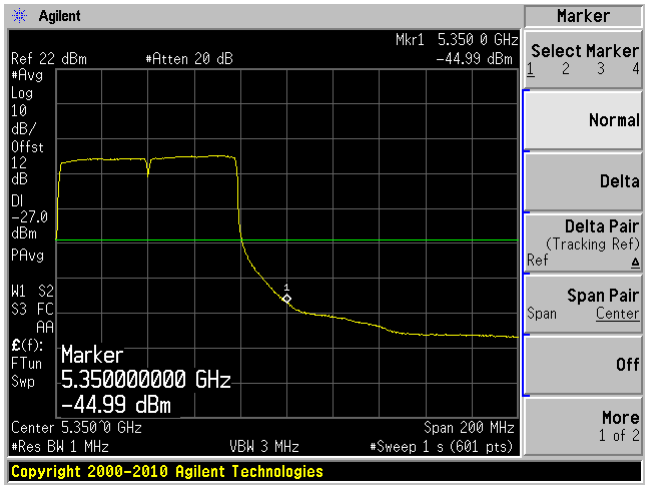

802.11ac-80 mode, 5290 MHz, Chain J1




802.11ac-80 mode, 5290 MHz, Chain J0

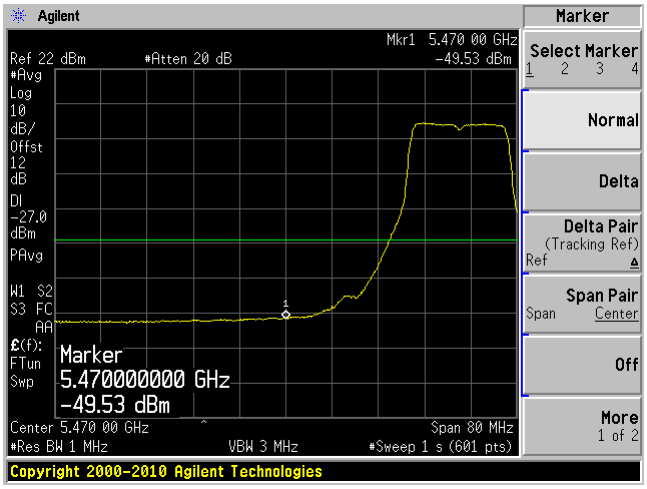



802.11ac-80 mode, 5290 MHz, Chain J1

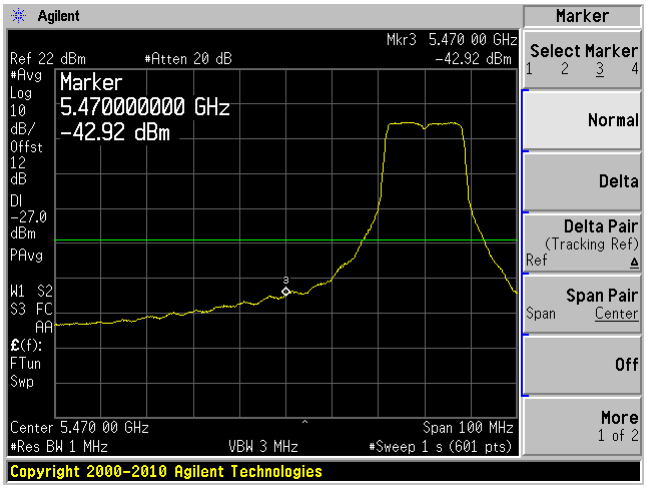


**5470-5725 MHz**

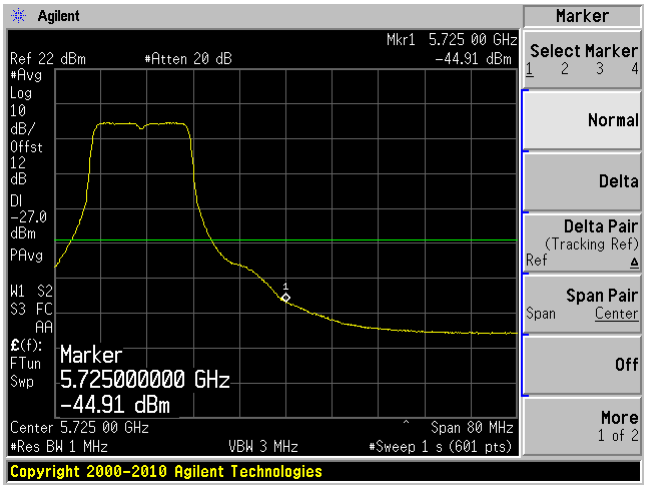
802.11a mode, 5550 MHz, Chain J0



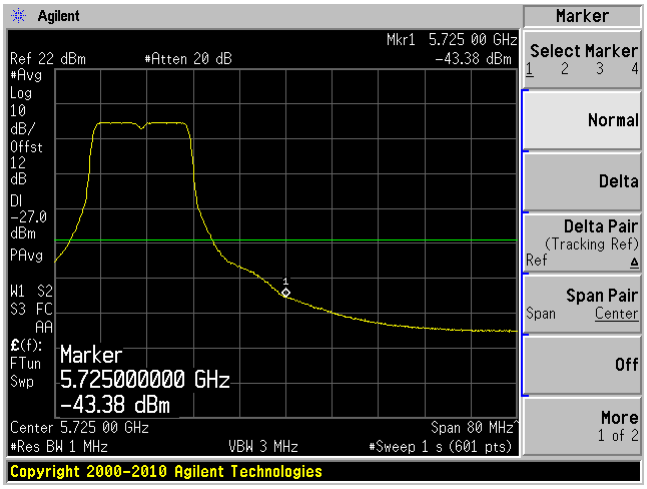

802.11a mode, 5550 MHz, Chain J1



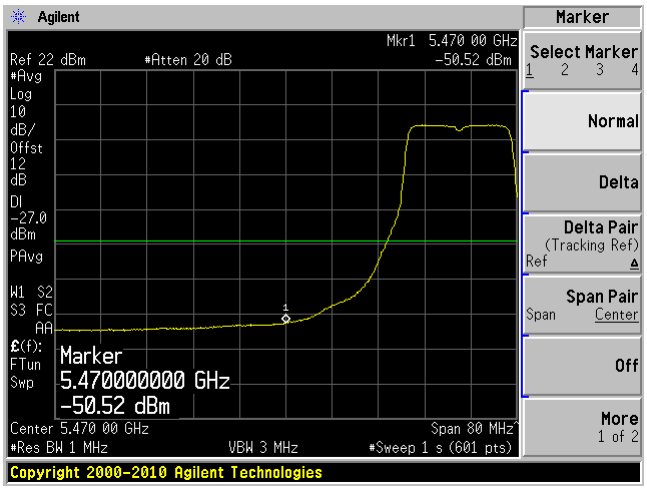

802.11a mode, 5700 MHz, Chain J0



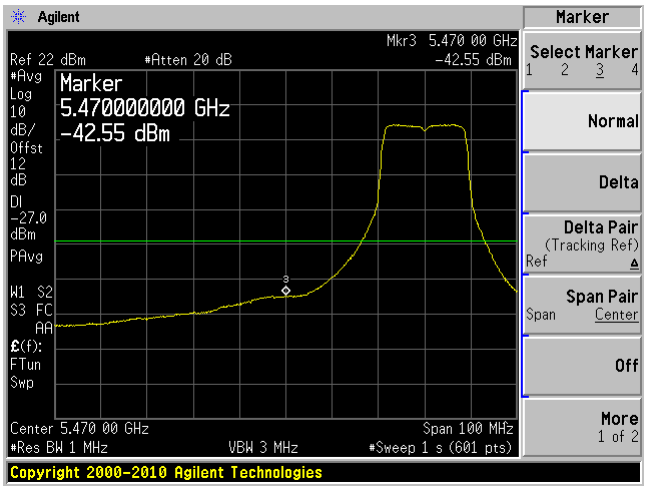

802.11a mode, 5700 MHz, Chain J1



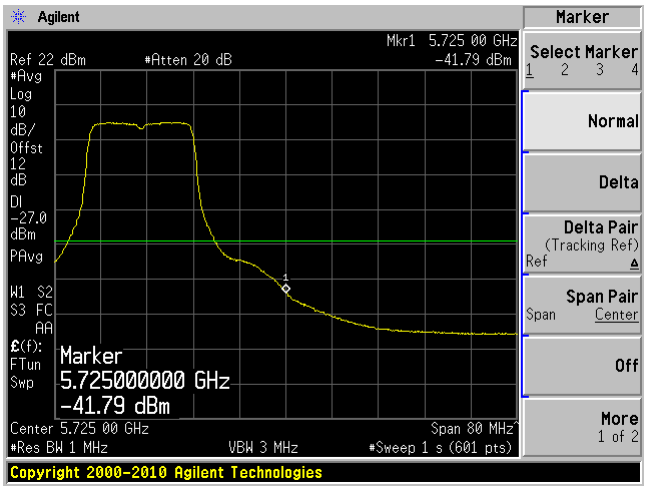
802.11n-HT20 mode, 5500 MHz, Chain J0



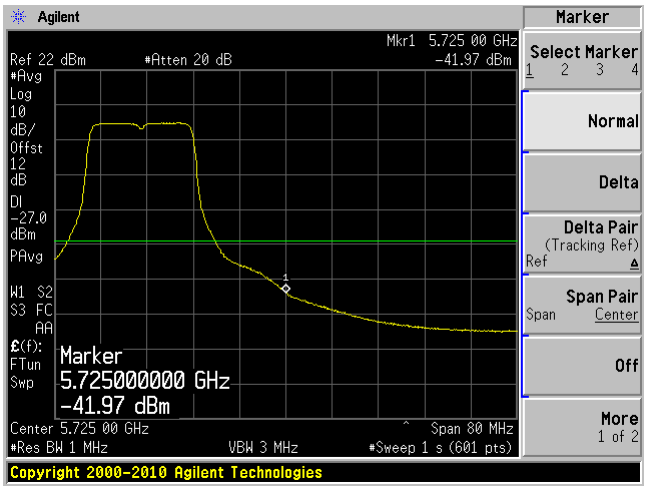

802.11n-HT20 mode, 5500 MHz, Chain J1



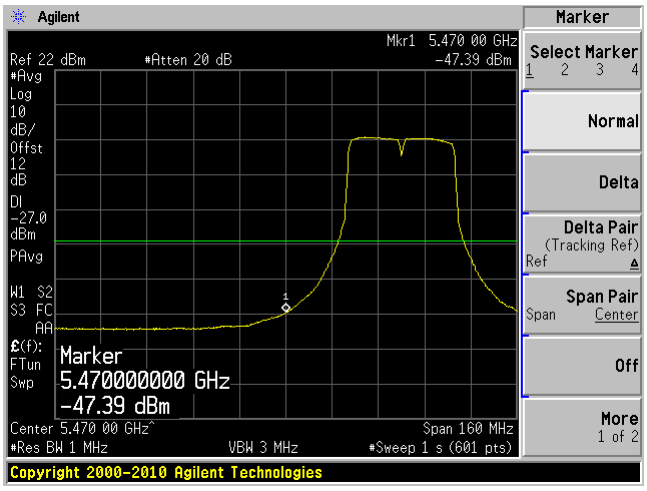

802.11n-HT20 mode, 5700 MHz, Chain J0



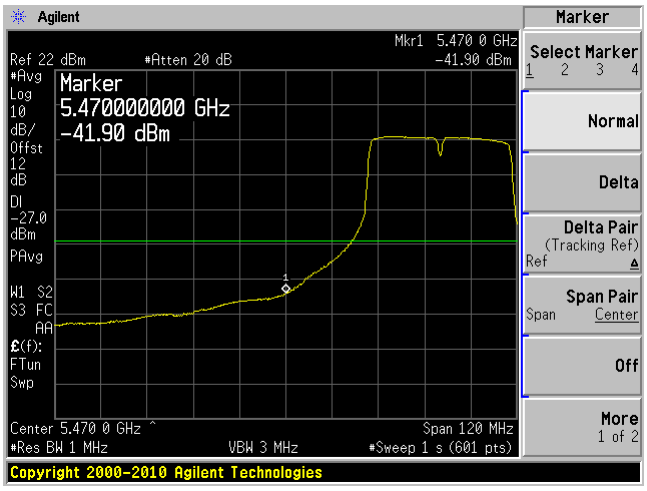

802.11n-HT20 mode, 5700 MHz, Chain J1



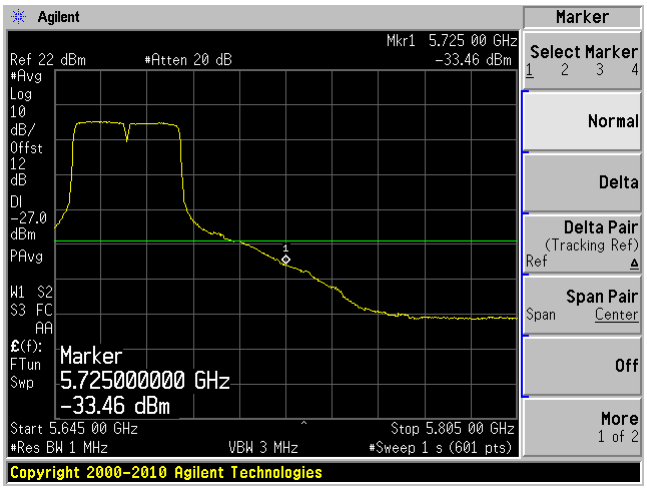
802.11n-HT40 mode, 5510 MHz, Chain J0



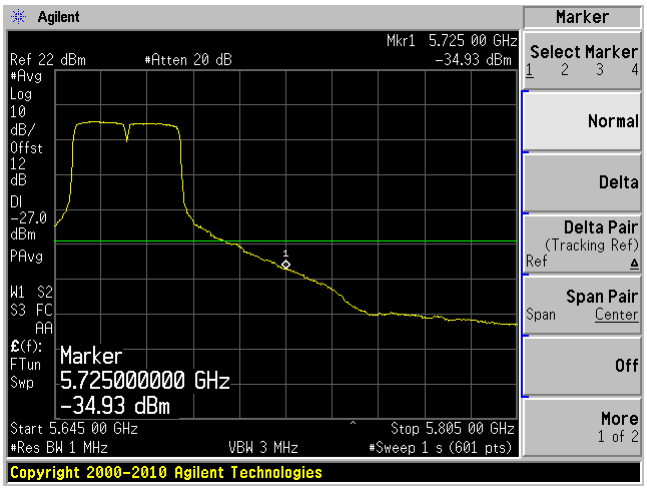

802.11n-HT40 mode, 5510 MHz, Chain J1



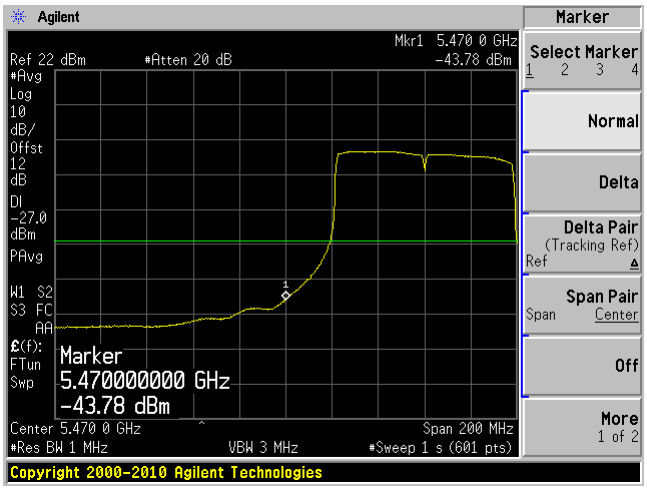

802.11n-HT40 mode, 5670 MHz, Chain J0



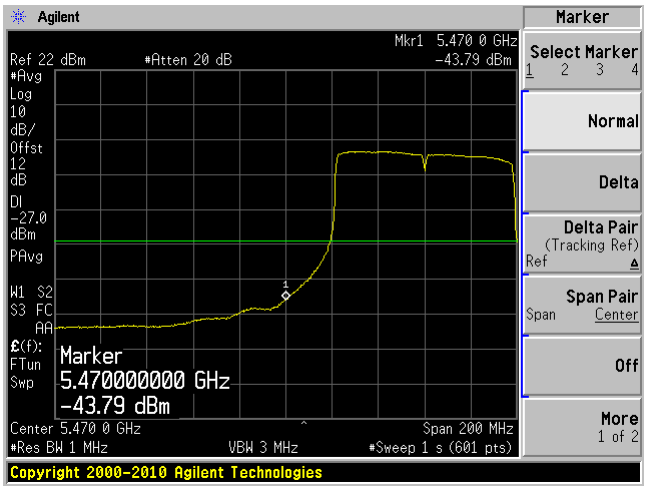

802.11n-HT40 mode, 5670 MHz, Chain J1



802.11ac-80 mode, 5530 MHz, Chain J0




802.11ac-80 mode, 5530 MHz, Chain J1



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

## 11.1 Applicable Standard

**According to FCC §15.407(a)(1)**

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

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:**

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

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

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

## 11.3 Test Equipment List and Details

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

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

## 11.4 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 21 °C |
| **Relative Humidity:** | 43 % |
| **ATM Pressure:** | 101-102 kPa |

*The testing was performed by Chen Ge from 2014-04-21 at RF site*

## 11.5 Test Results

**5250-5350 MHz**

802.11a mode

| Channel | Frequency (MHz) | TX Chain J0 PSD (dBm) | TX Chain J1 PSD (dBm) | Total PSD (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5260 | 7.096 | 7.442 | 10.28 | 11 | -0.72 | 18 |
| Middle | 5280 | 7.189 | 7.224 | 10.22 | 11 | -0.78 | 18 |
| High | 5320 | 7.171 | 7.011 | 10.10 | 11 | -0.90 | 18 |

802.11n-HT20 mode

| Channel | Frequency (MHz) | TX Chain J0 PSD (dBm) | TX Chain J1 PSD (dBm) | Total PSD (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5260 | 7.173 | 7.212 | 10.20 | 11 | -0.80 | 18.5 |
| Middle | 5280 | 7.386 | 7.276 | 10.34 | 11 | -0.66 | 18.5 |
| High | 5320 | 7.389 | 7.311 | 10.36 | 11 | -0.64 | 18.5 |

802.11n-HT40 mode

| Channel | Frequency (MHz) | TX Chain J0 PSD (dBm) | TX Chain J1 PSD (dBm) | Total PSD (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5270 | 5.826 | 5.675 | 8.76 | 11 | -2.24 | 20.5 |
| High | 5310 | 2.284 | 2.632 | 5.47 | 11 | -5.53 | 17 |

802.11ac-80 mode

| Channel | Frequency (MHz) | TX Chain J0 PSD (dBm) | TX Chain J1 PSD (dBm) | Total PSD (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| - | 5290 | -2.991 | -2.349 | 0.35 | 11 | -10.65 | 15 |

**5470-5725 MHz**

802.11a mode

| Channel | Frequency (MHz) | TX Chain J0 PSD (dBm) | TX Chain J1 PSD (dBm) | Total PSD (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5550 | 6.679 | 7.063 | 9.89 | 11 | -1.11 | 17 |
| Middle | 5580 | 6.747 | 7.086 | 9.93 | 11 | -1.07 | 18 |
| High | 5700 | 6.498 | 6.697 | 9.61 | 11 | -1.39 | 18 |

802.11n-HT20 mode

| Channel | Frequency (MHz) | TX Chain J0 PSD (dBm) | TX Chain J1 PSD (dBm) | Total PSD (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5500 | 6.585 | 6.559 | 9.58 | 11 | -1.42 | 17 |
| Middle | 5580 | 6.965 | 7.222 | 10.11 | 11 | -0.89 | 18 |
| High | 5700 | 6.748 | 7.008 | 9.89 | 11 | -1.11 | 18 |

802.11n-HT40 mode

| Channel | Frequency (MHz) | TX Chain J0 PSD (dBm) | TX Chain J1 PSD (dBm) | Total PSD (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5510 | 2.614 | 3.155 | 5.90 | 11 | -5.10 | 17 |
| Middle | 5550 | 5.818 | 6.518 | 9.19 | 11 | -1.81 | 20 |
| High | 5670 | 6.156 | 6.517 | 9.35 | 11 | -1.65 | 20 |

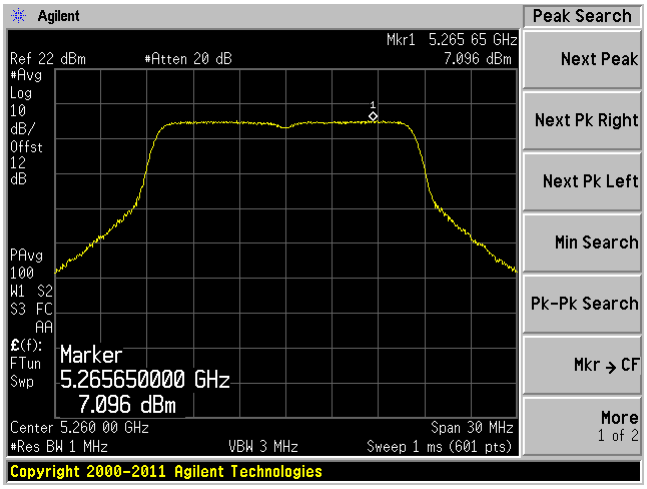
802.11ac-80 mode

| Channel | Frequency (MHz) | TX Chain J0 PSD (dBm) | TX Chain J1 PSD (dBm) | Total PSD (dBm) | Limit (dBm) | Margin (dB) | Power Setting |
|---|---|---|---|---|---|---|---|
| Low | 5530 | -1.327 | -0.783 | 1.96 | 11 | -9.04 | 16.5 |
| High | 5690 | 2.446 | 2.738 | 5.60 | 11 | -5.40 | 20 |

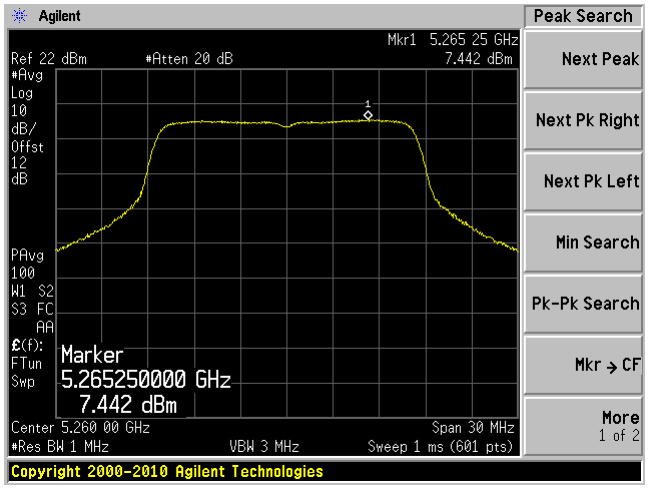
Please refer to the following plots.

**5250-5350 MHz**

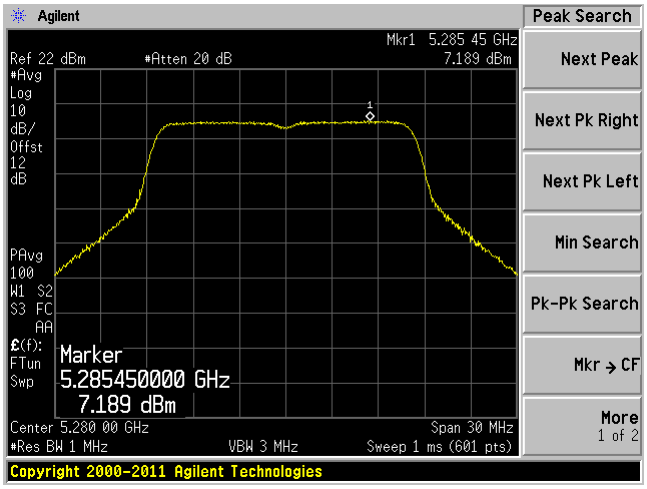
802.11a mode, 5260 MHz, Chain J0



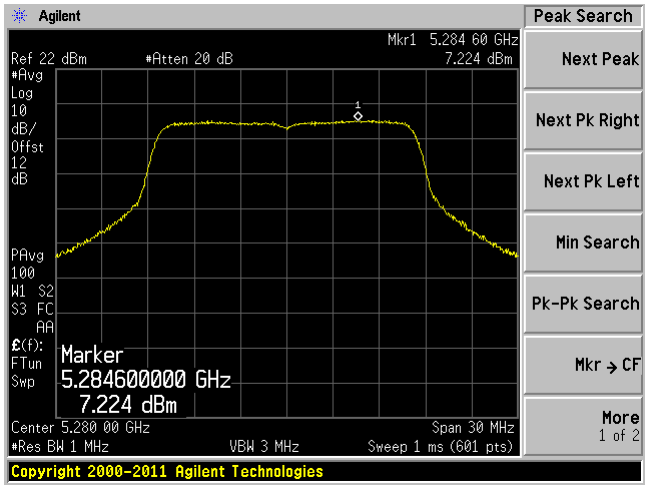

802.11a mode, 5260 MHz, Chain J1



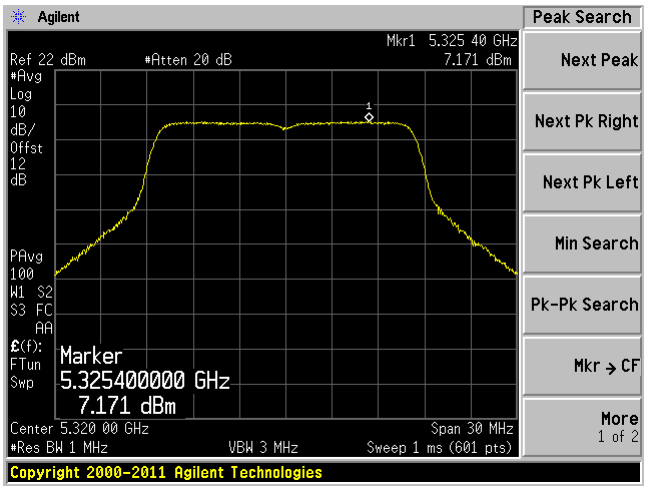

802.11a mode, 5280 MHz, Chain J0



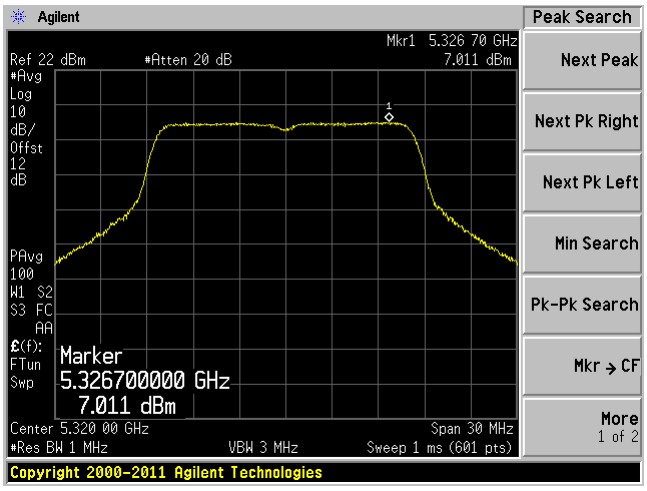

802.11a mode, 5280 MHz, Chain J1



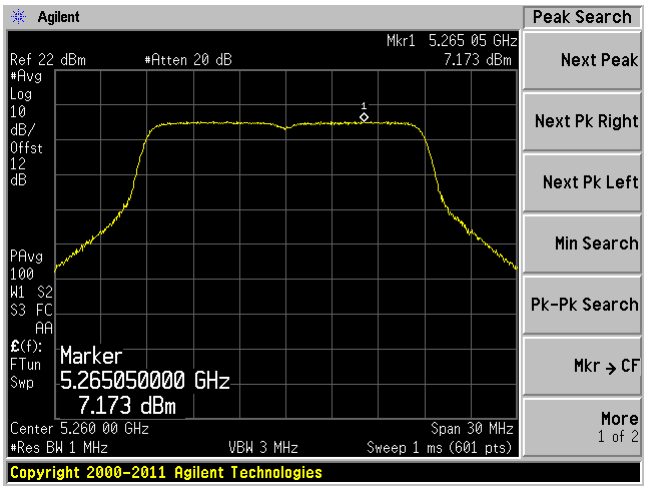
802.11a mode, 5320 MHz, Chain J0



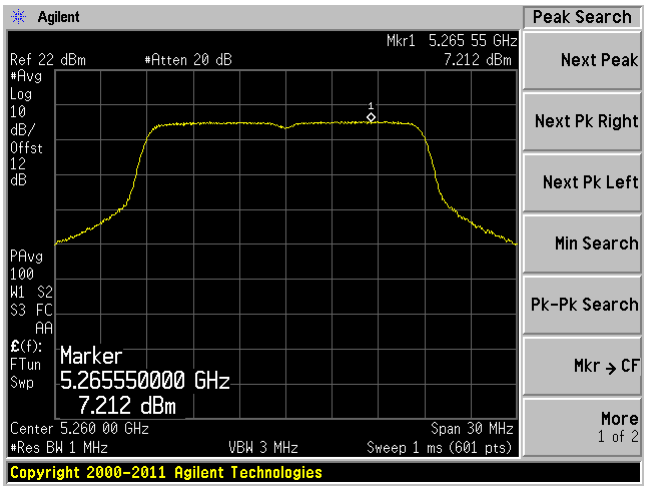

802.11a mode, 5320 MHz, Chain J1



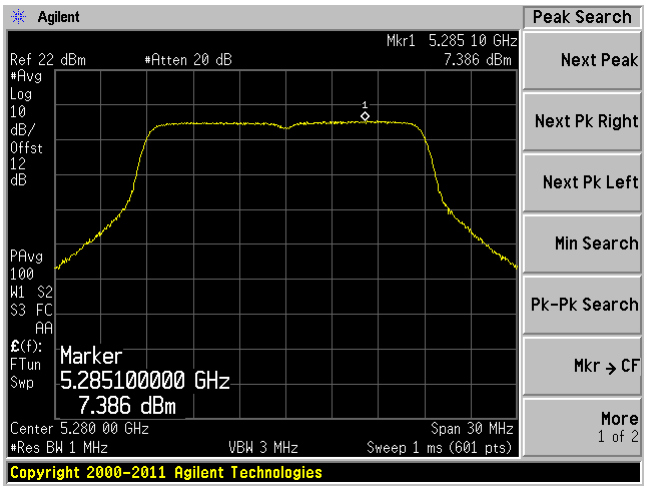

802.11n-HT20 mode, 5260 MHz, Chain J0



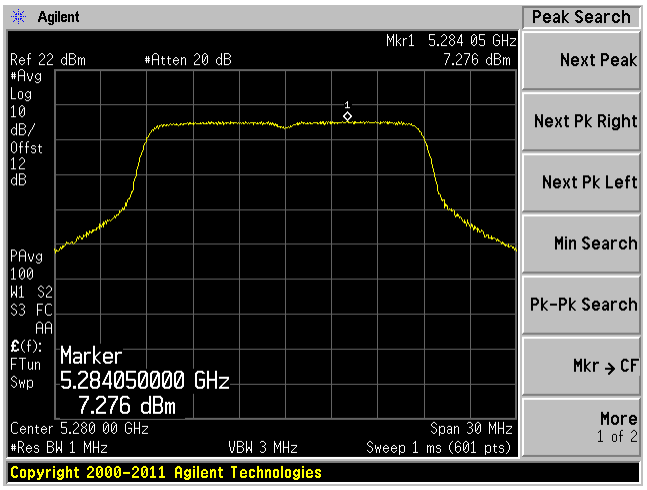

802.11n-HT20 mode, 5260 MHz, Chain J1



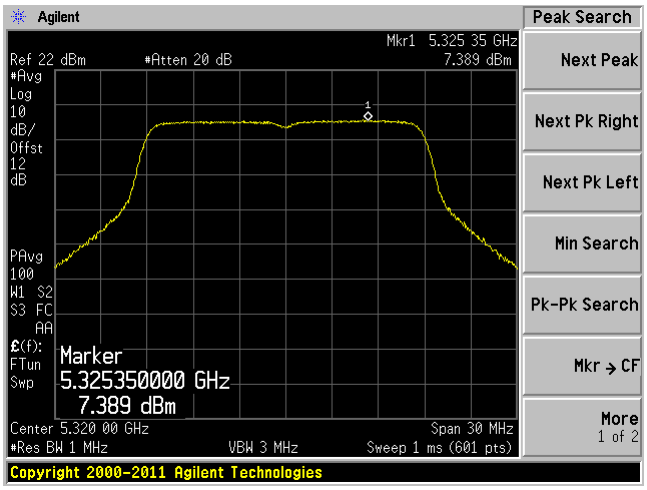
802.11n-HT20 mode, 5280 MHz, Chain J0



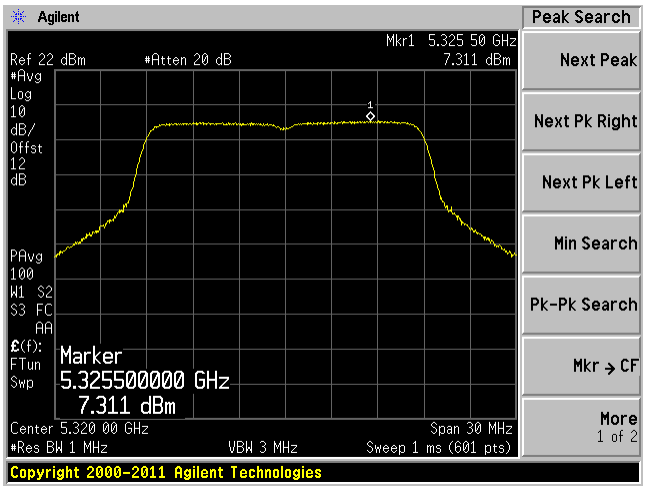

802.11n-HT20 mode, 5280 MHz, Chain J1



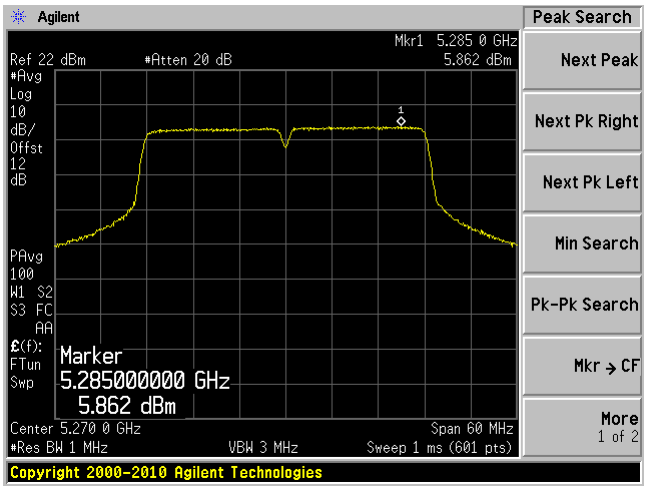

802.11n-HT20 mode, 5320 MHz, Chain J0



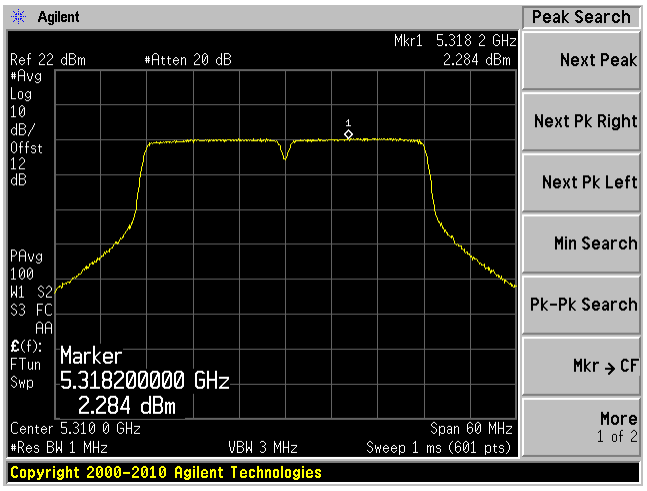

802.11n-HT20 mode, 5320 MHz, Chain J1



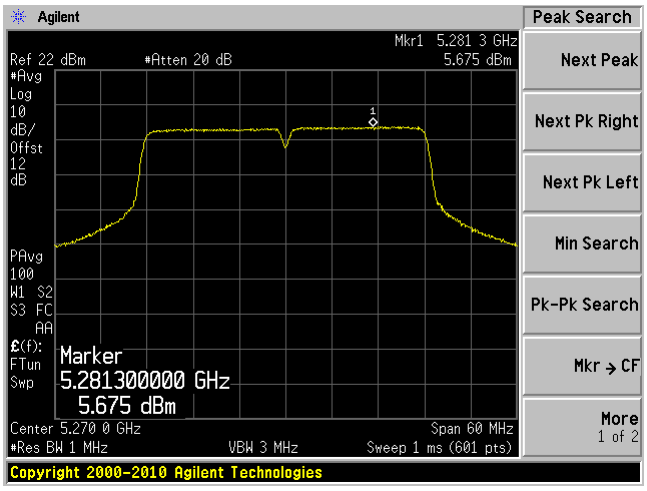
802.11n-HT40 mode, 5270 MHz, Chain J0



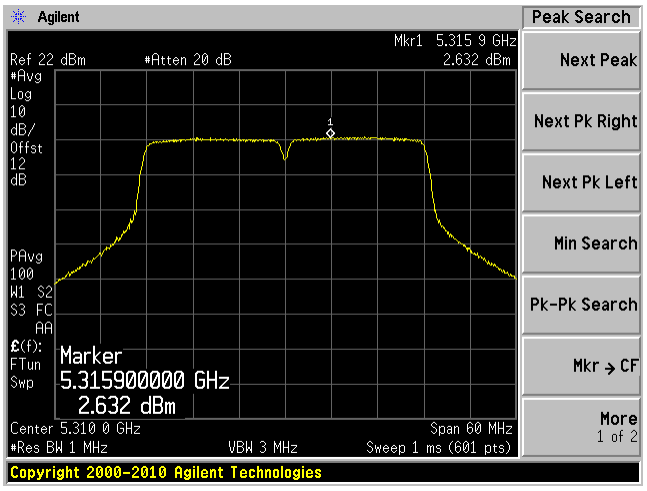

802.11n-HT40 mode, 5270 MHz, Chain J1



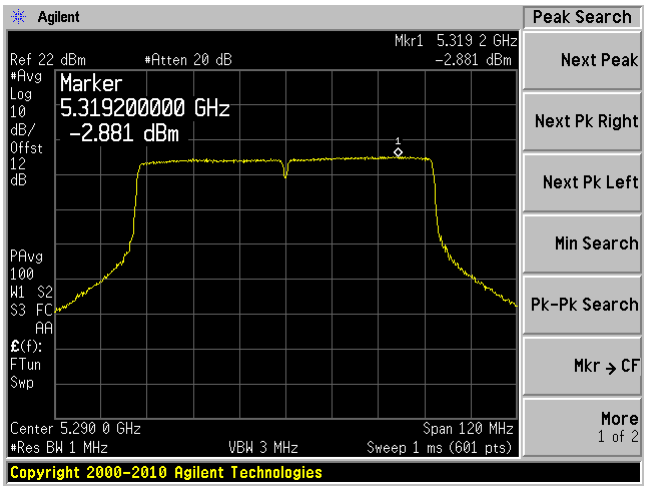

802.11n-HT40 mode, 5310 MHz, Chain J0



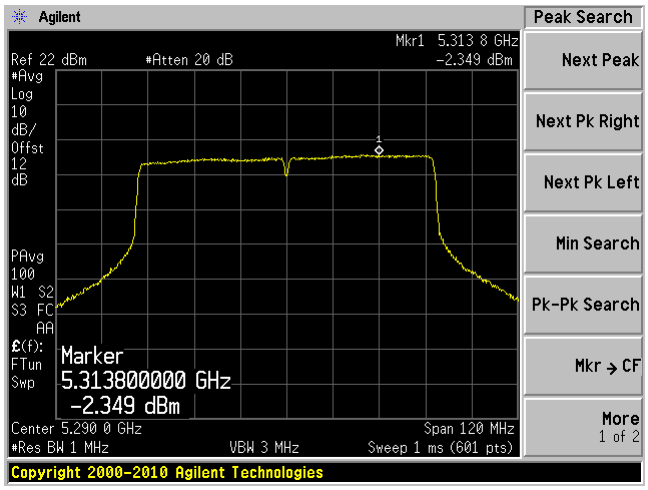

802.11n-HT40 mode, 5310 MHz, Chain J1



802.11ac-80 mode, 5290 MHz, Chain J0

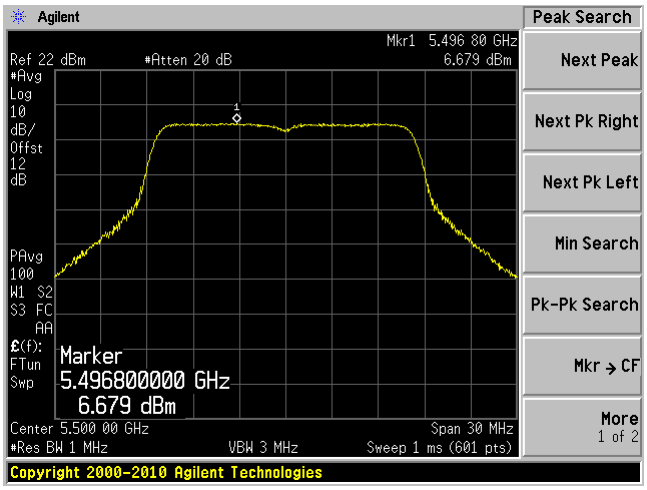



802.11ac-80 mode, 5290 MHz, Chain J1

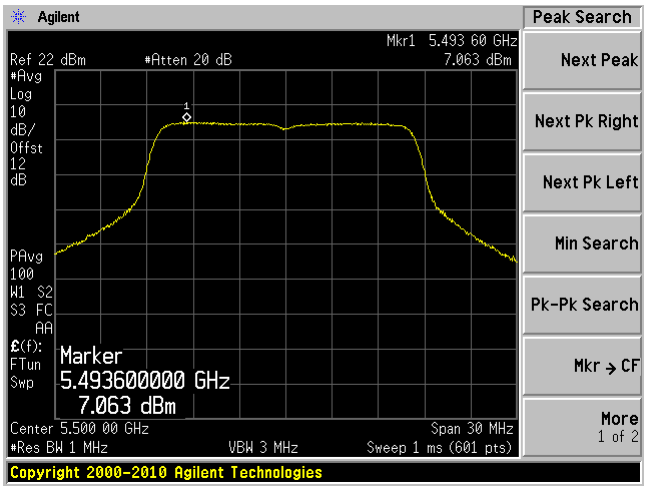


**5470-5725 MHz**

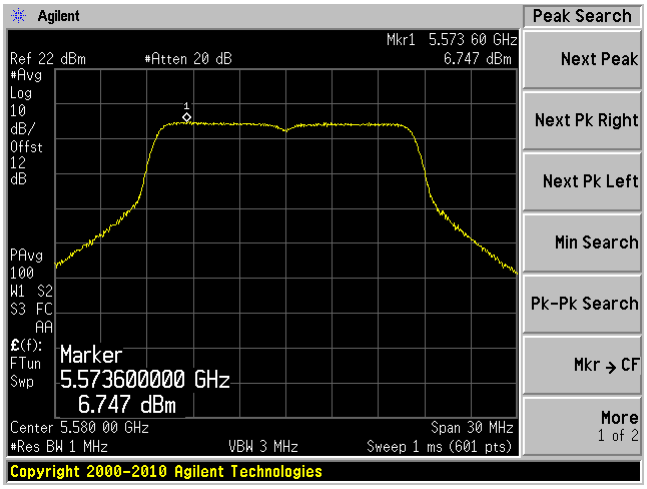
802.11a mode, 5500 MHz, Chain J0



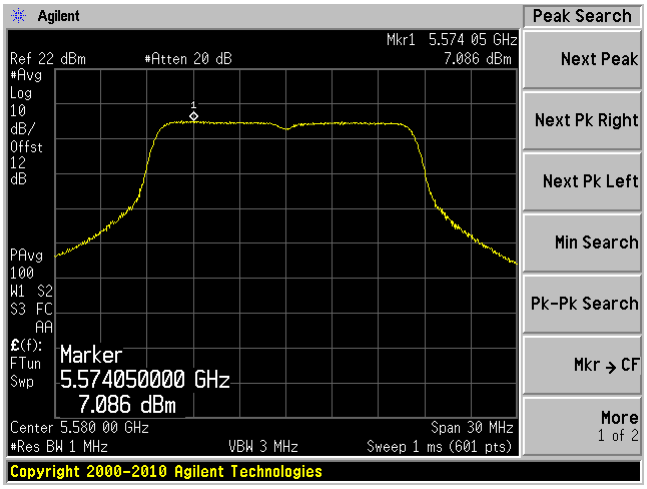

802.11a mode, 5500 MHz, Chain J1



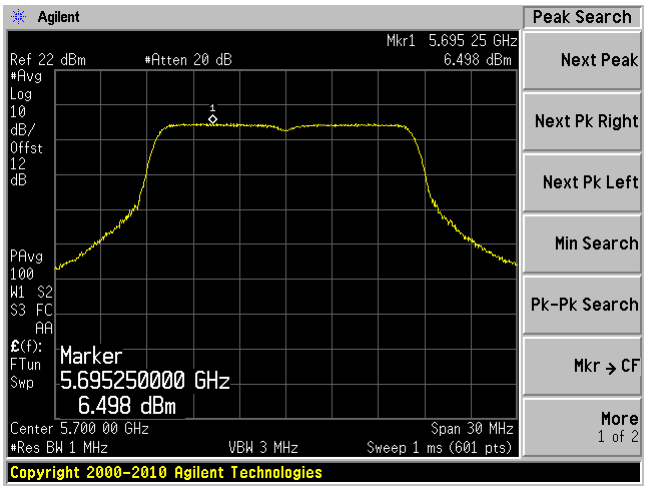

802.11a mode, 5580 MHz, Chain J0



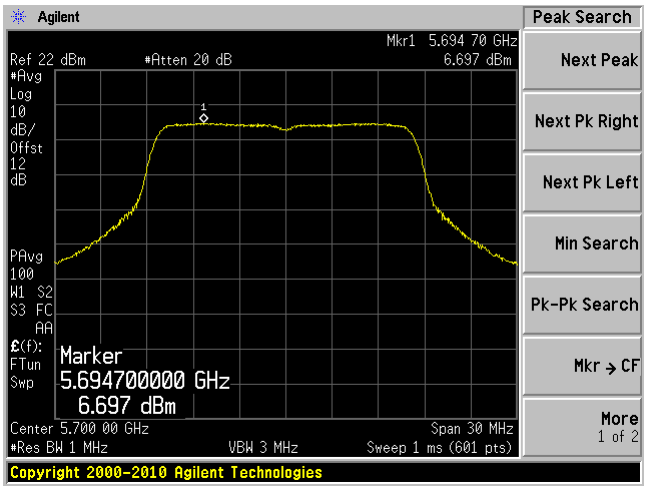

802.11a mode, 5580 MHz, Chain J1



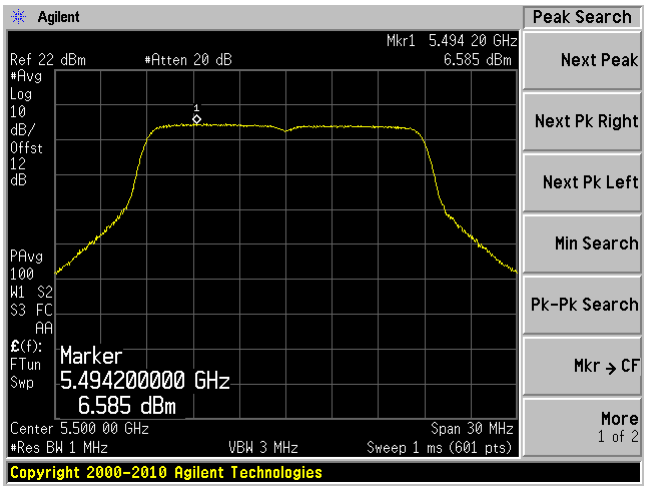
802.11a mode, 5700 MHz, Chain J0



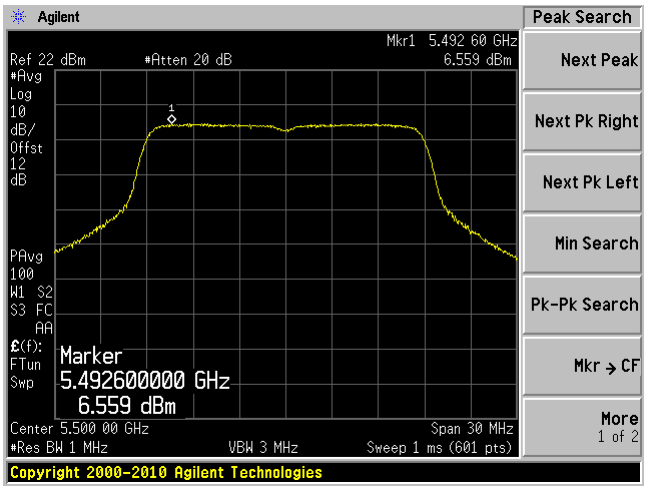

802.11a mode, 5700 MHz, Chain J1



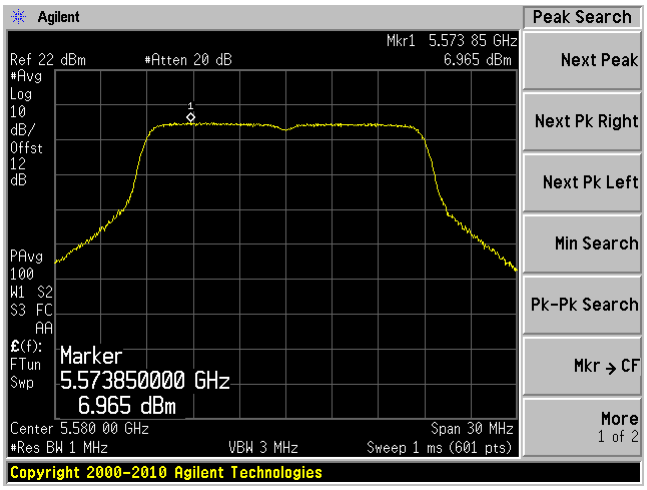

802.11n-HT20 mode, 5500 MHz, Chain J0



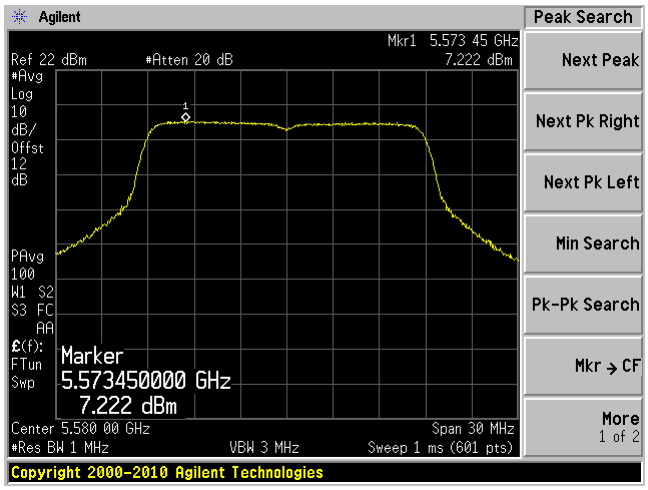

802.11n-HT20 mode, 5500 MHz, Chain J1



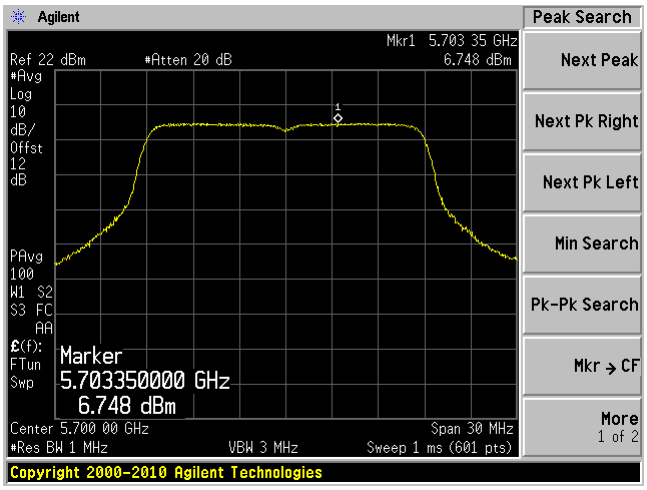
802.11n-HT20 mode, 5580 MHz, Chain J0



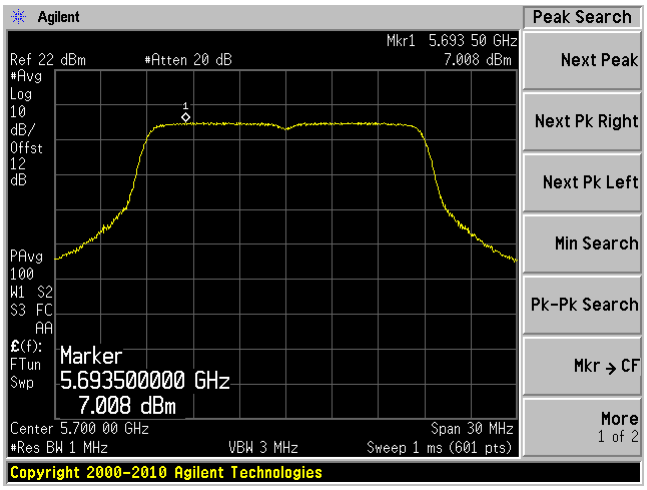

802.11n-HT20 mode, 5580 MHz, Chain J1



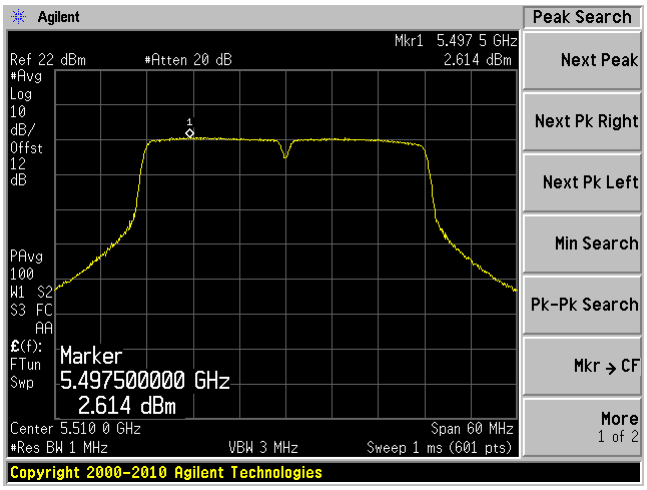

802.11n-HT20 mode, 5700 MHz, Chain J0



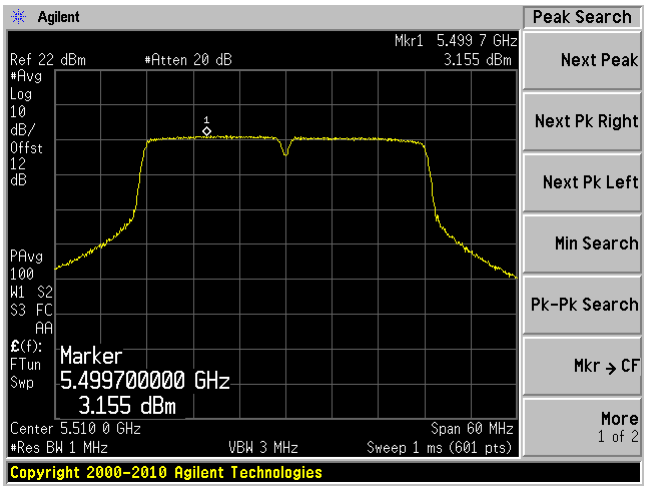

802.11n-HT20 mode, 5700 MHz, Chain J1



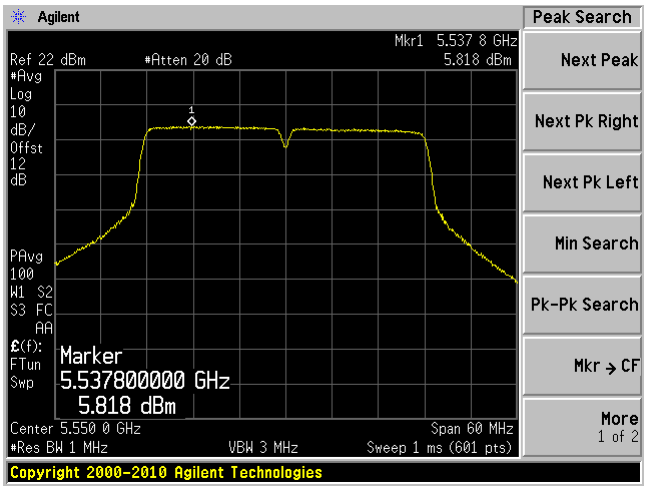
802.11n-HT40 mode, 5510 MHz, Chain J0



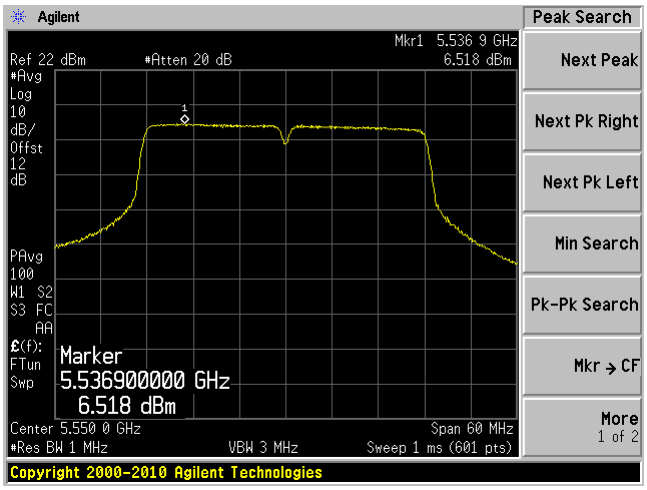

802.11n-HT40 mode, 5510 MHz, Chain J1



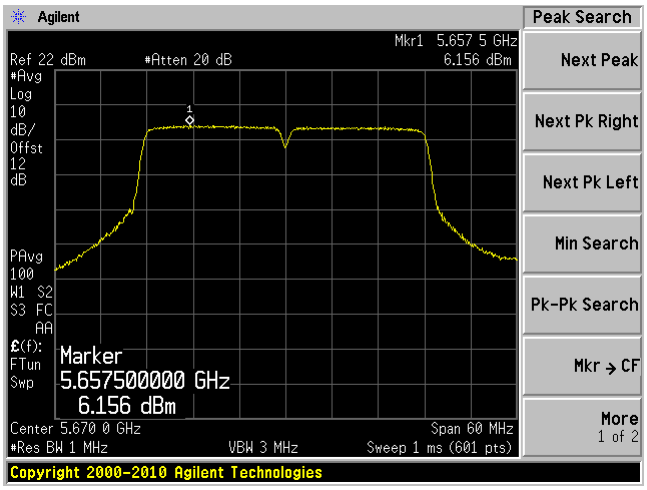

802.11n-HT40 mode, 5550 MHz, Chain J0



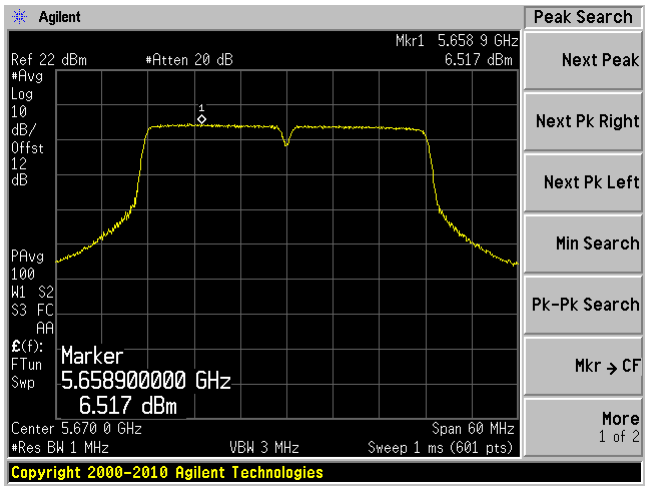

802.11n-HT40 mode, 5550 MHz, Chain J1



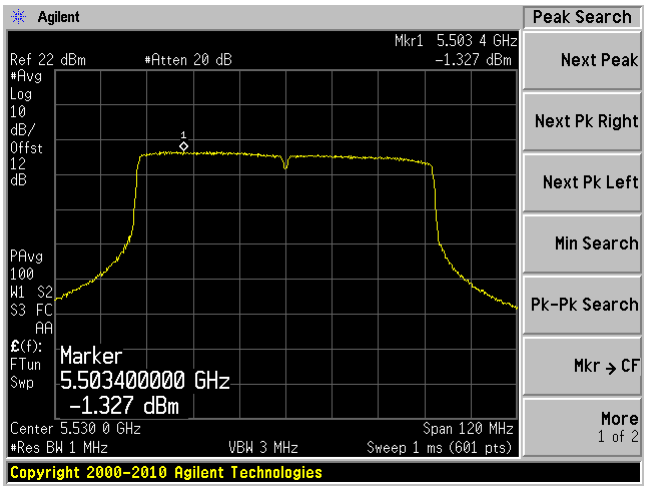
802.11n-HT40 mode, 5670 MHz, Chain J0



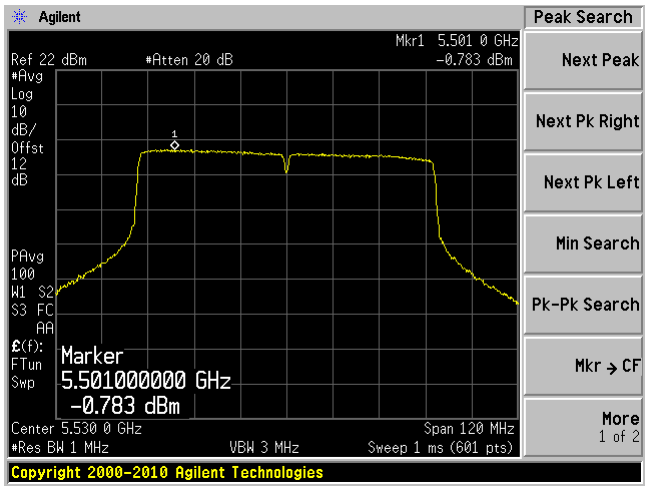

802.11n-HT40 mode, 5670 MHz, Chain J1



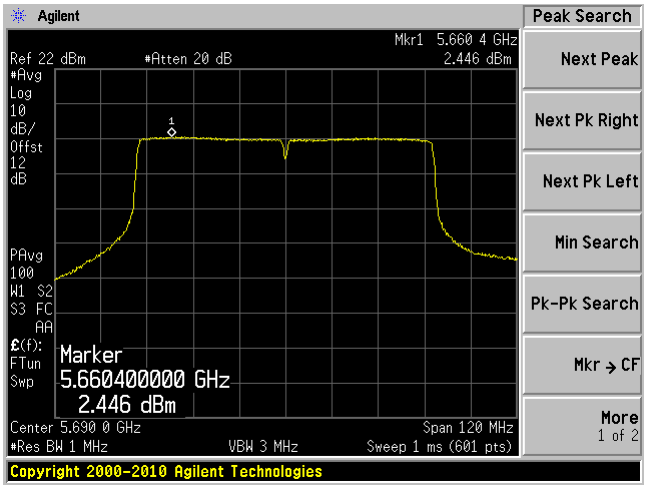
802.11ac-80 mode, 5530 MHz, Chain J0



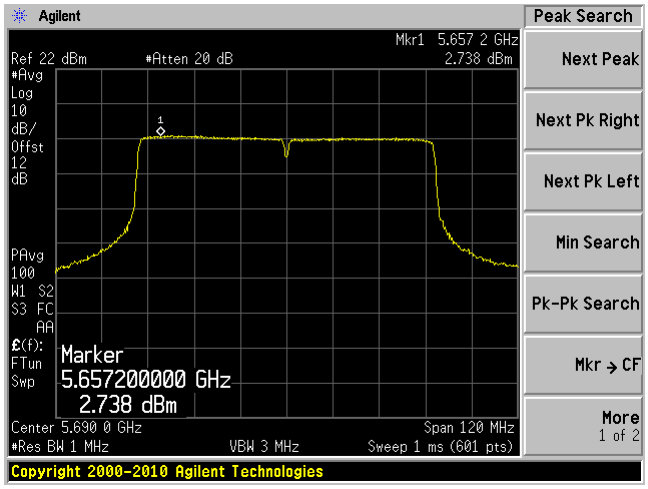

802.11ac-80 mode, 5530 MHz, Chain J1




802.11ac-80 mode, 5690 MHz, Chain J0




802.11ac-80 mode, 5690 MHz, Chain J1



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

## 12.1 Applicable Standard

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

## 12.2 Test Procedure

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

## 12.3 Test Equipment List and Details

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

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

## 12.4 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 21 °C |
| **Relative Humidity:** | 43 % |
| **ATM Pressure:** | 101-102 kPa |

*The testing was performed by Chen Ge from 2014-04-21 at RF site.*

## 12.5 Test Results

**5250-5350 MHz Band**

| Channel | Frequency (MHz) | TX Chain J0 PER (dB) | TX Chain J1 PER (dB) | Limit (dB) |
|---|---|---|---|---|
| 802.11a mode | | | | |
| Low | 5260 | 8.966 | 9.050 | 13 |
| Middle | 5280 | 9.768 | 9.532 | |
| High | 5320 | 10.236 | 9.717 | |
| 802.11n-HT20 mode | | | | |
| Low | 5260 | 7.985 | 7.822 | 13 |
| Middle | 5280 | 8.056 | 7.717 | |
| High | 5320 | 8.571 | 8.977 | |
| 802.11n-HT40 mode | | | | |
| Low | 5270 | 7.478 | 7.897 | 13 |
| High | 5310 | 8.300 | 8.317 | |
| 802.11ac-80 mode | | | | |
| - | 5290 | 8.070 | 8.186 | 13 |

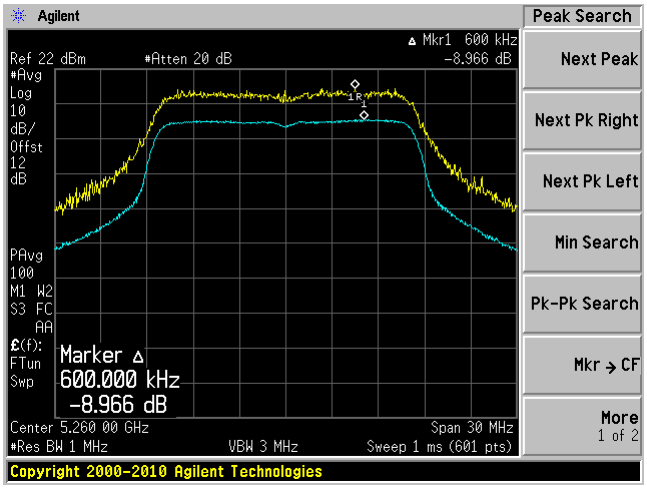
**5470-5725 MHz Band**

| Channel | Frequency (MHz) | TX Chain J10 PER (dB) | TX Chain J8 PER (dB) | Limit (dB) |
|---|---|---|---|---|
| 802.11a mode | | | | |
| Low | 5500 | 8.106 | 8.752 | 13 |
| Middle | 5580 | 9.789 | 8.937 | |
| High | 5700 | 9.232 | 8.581 | |
| 802.11n-HT20 mode | | | | |
| Low | 5500 | 8.957 | 8.242 | 13 |
| Middle | 5580 | 7.838 | 8.030 | |
| High | 5700 | 8.789 | 8.138 | |
| 802.11n-HT40 mode | | | | |
| Low | 5510 | 8.382 | 7.872 | 13 |
| Middle | 5550 | 8.312 | 8.135 | |
| High | 5670 | 7.883 | 8.117 | |
| 802.11ac-80 mode | | | | |
| Low | 5530 | 8.046 | 8.137 | 13 |
| High | 5690 | 8.658 | 8.584 | |

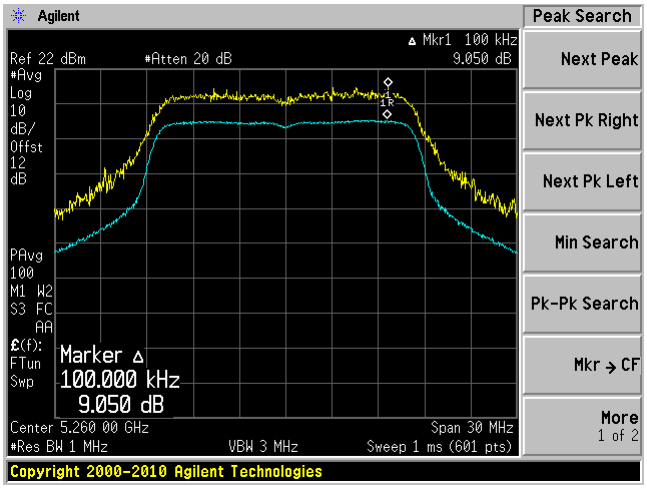
Please refer to the following plots for detailed test results.

## 5250-5350 MHz Band

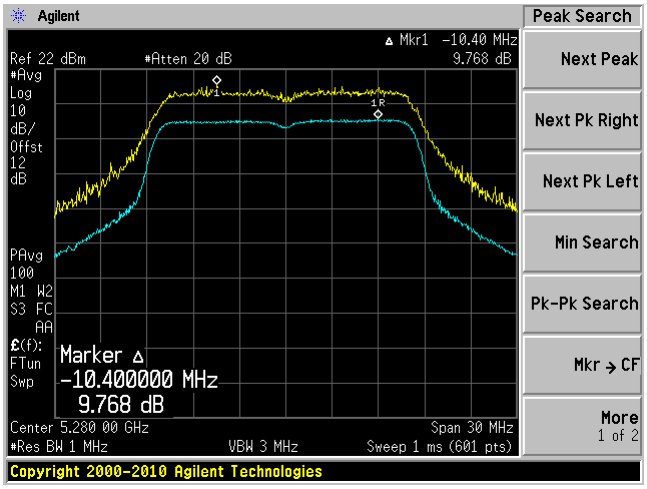
802.11a mode, 5260 MHz, Chain J0



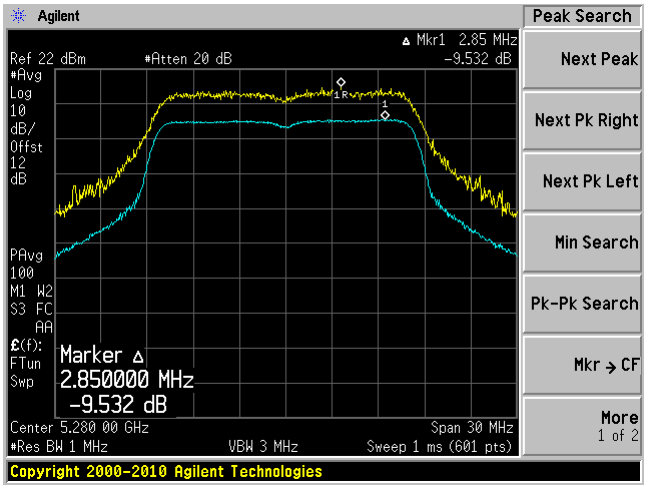

802.11a mode, 5260 MHz, Chain J1



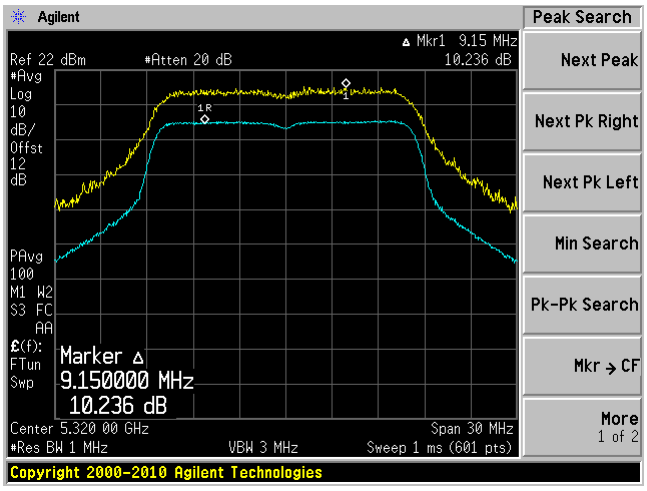

802.11a mode, 5280 MHz, Chain J0



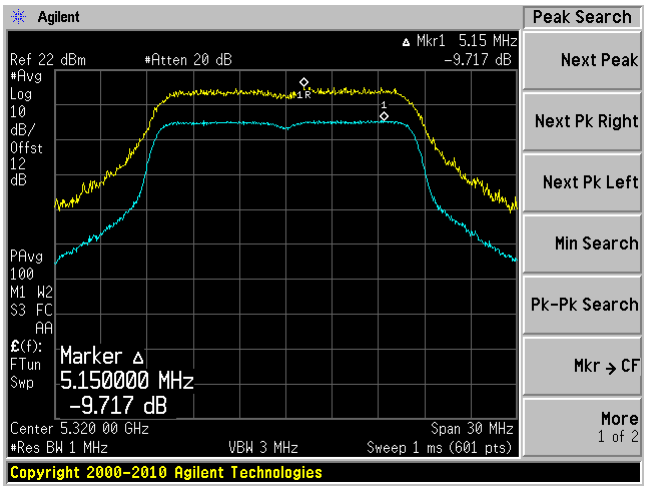

802.11a mode, 5280 MHz, Chain J1



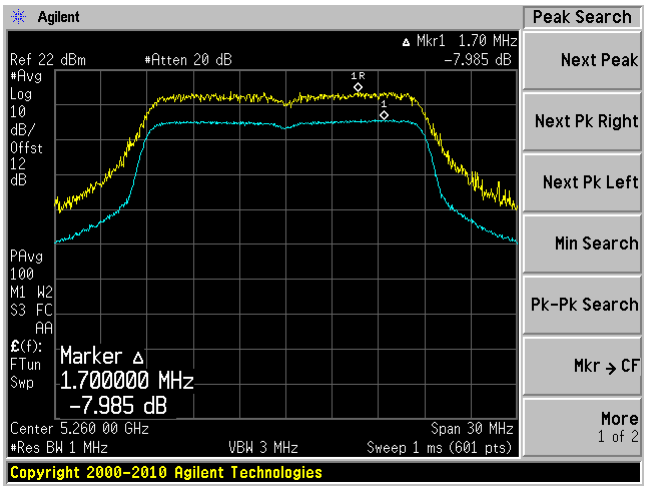
802.11a mode, 5320 MHz, Chain J0



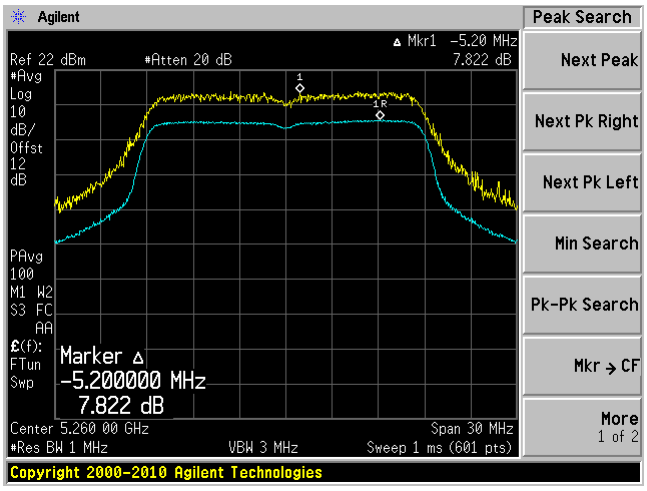

802.11a mode, 5320 MHz, Chain J1



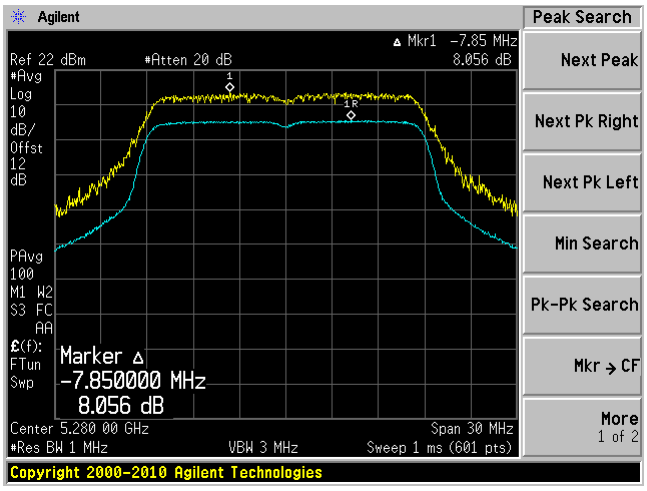

802.11n-HT20 mode, 5260 MHz, Chain J0



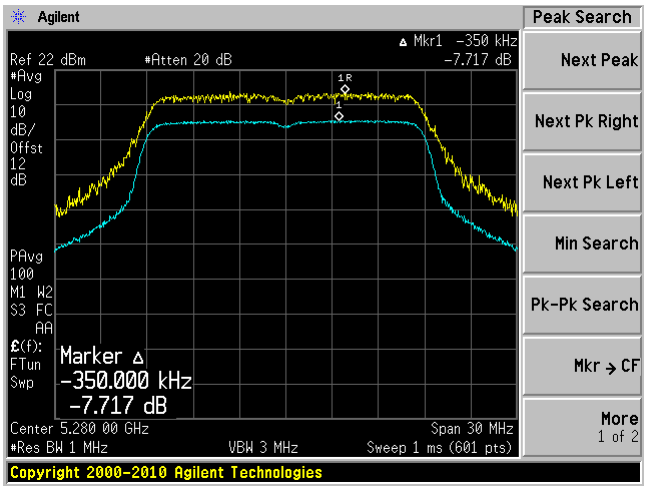

802.11n-HT20 mode, 5260 MHz, Chain J1



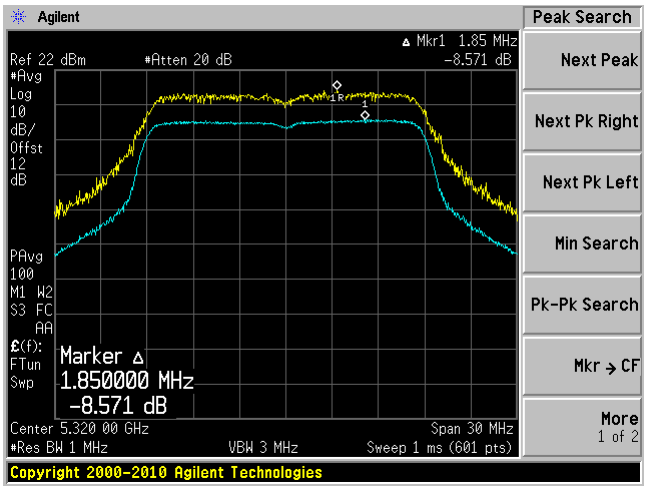
802.11n-HT20 mode, 5280 MHz, Chain J0



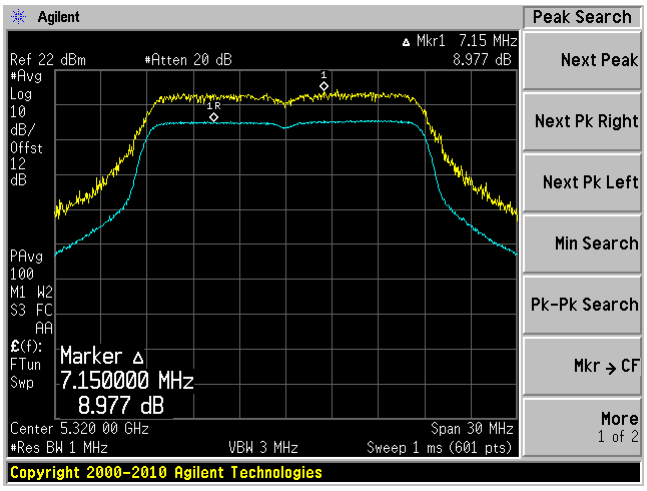

802.11n-HT20 mode, 5280 MHz, Chain J1



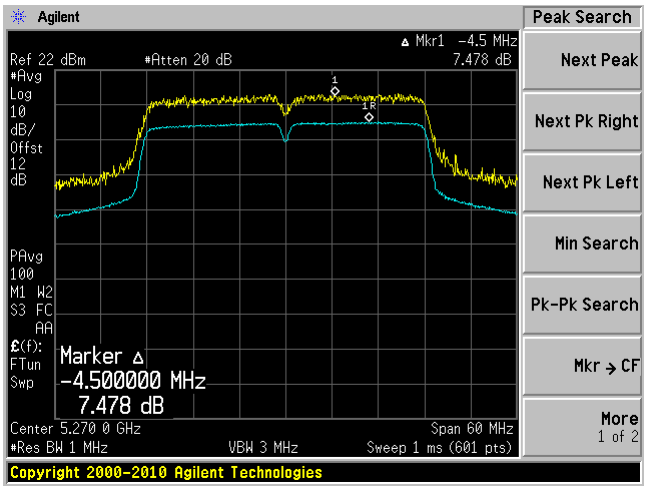

802.11n-HT20 mode, 5320 MHz, Chain J0



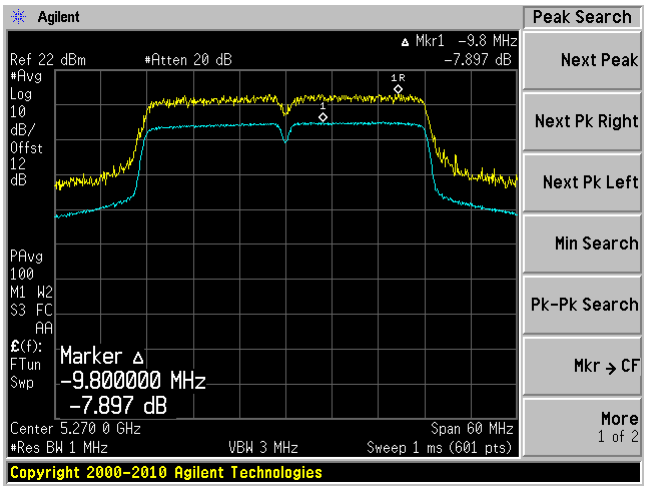

802.11n-HT20 mode, 5320 MHz, Chain J1



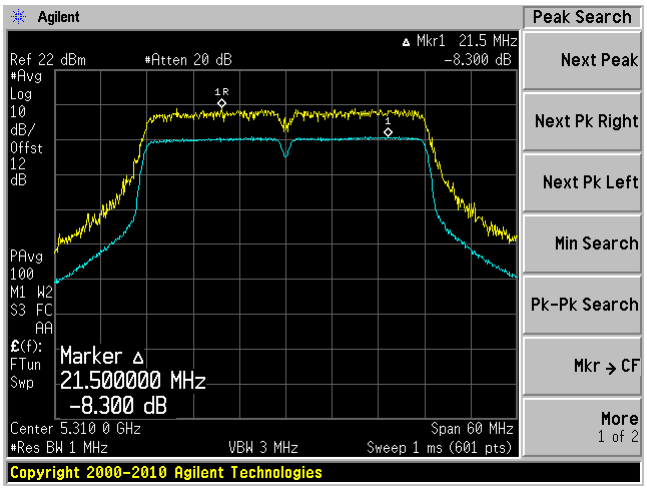
802.11n-HT40 mode, 5270 MHz, Chain J0



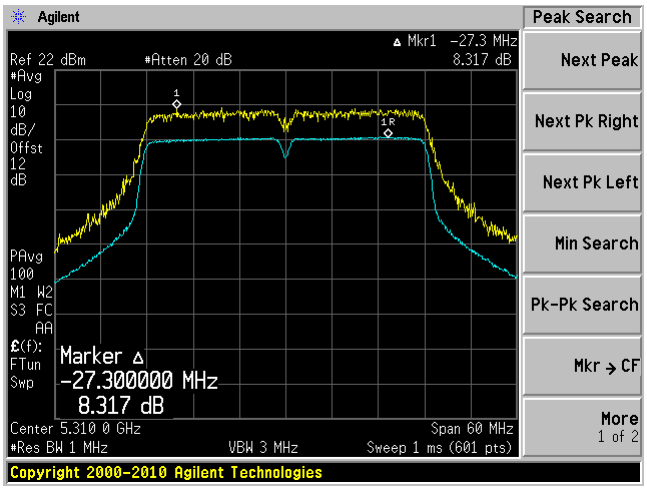

802.11n-HT40 mode, 5270 MHz, Chain J1



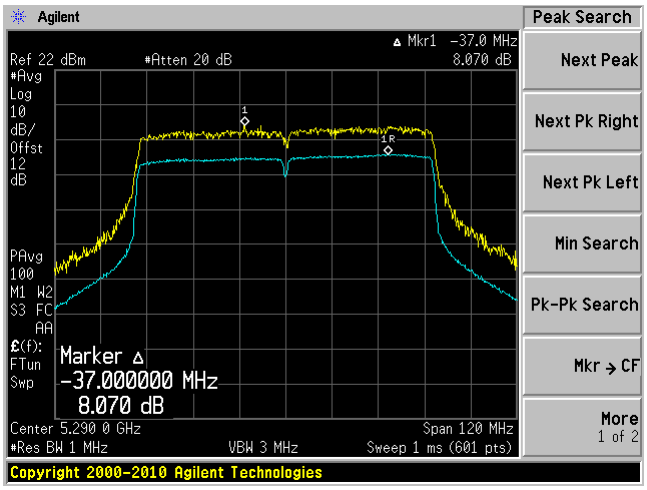

802.11n-HT40 mode, 5310 MHz, Chain J0



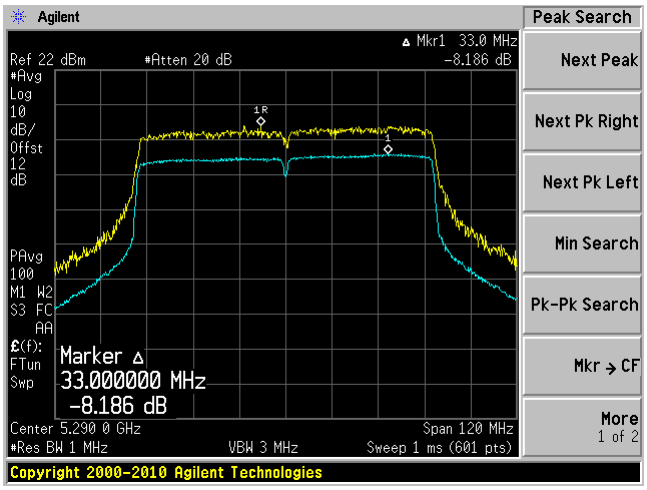

802.11n-HT40 mode, 5310 MHz, Chain J1



802.11ac-80 mode, 5310 MHz, Chain J0

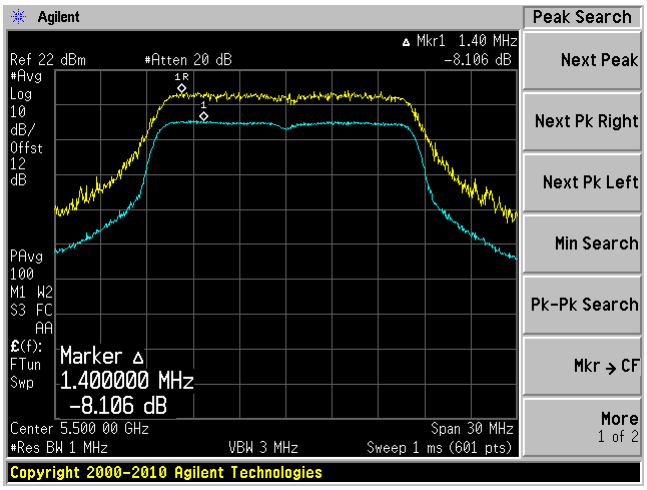



802.11ac-80 mode, 5310 MHz, Chain J1

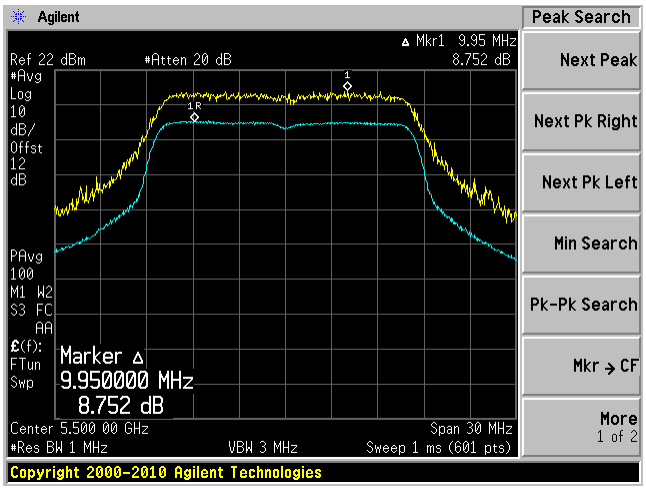


**5470-5725 MHz Band**

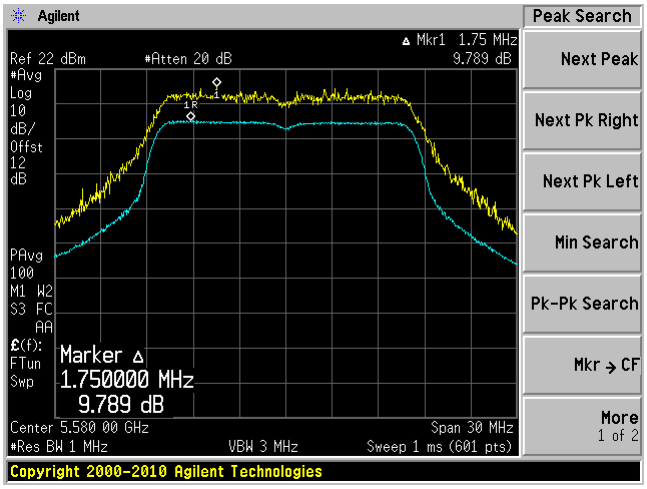
802.11a mode, 5500 MHz, Chain J0



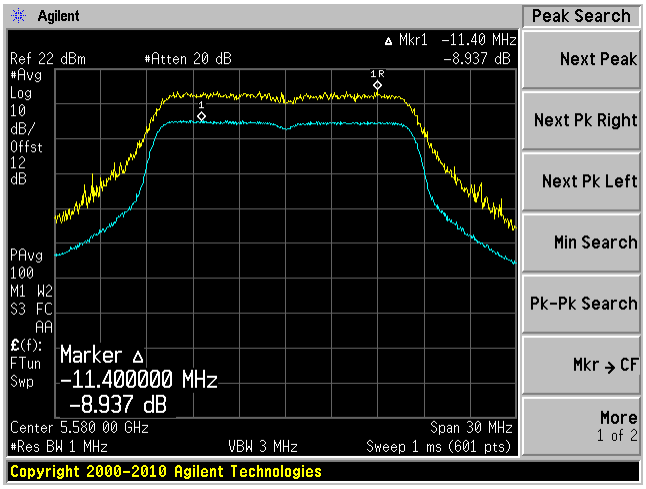

802.11a mode, 5500 MHz, Chain J1



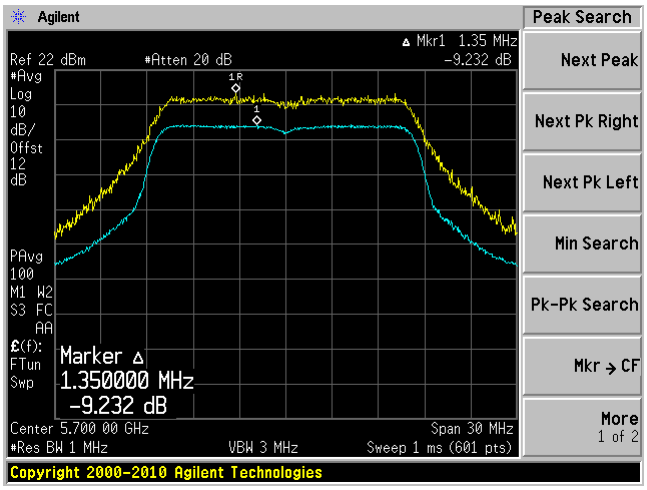

802.11a mode, 5580 MHz, Chain J0



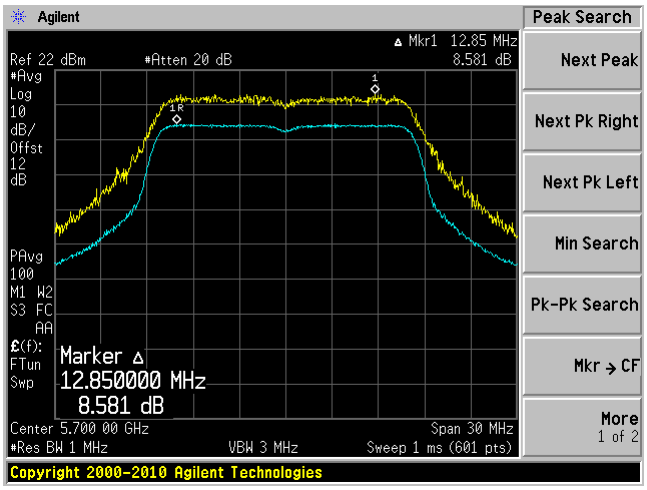

802.11a mode, 5580 MHz, Chain J1



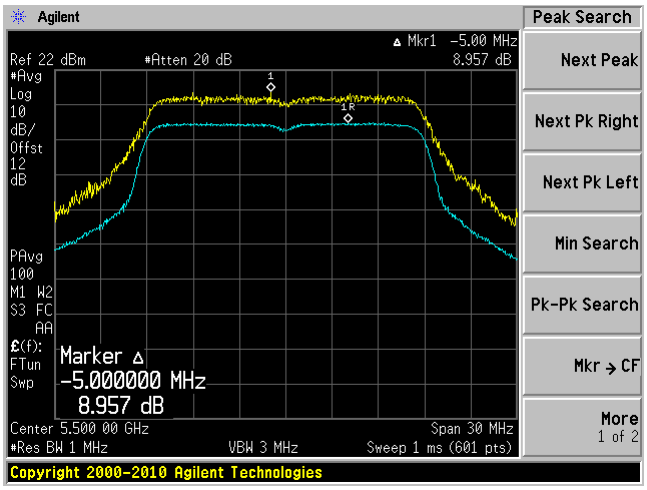
802.11a mode, 5700 MHz, Chain J0



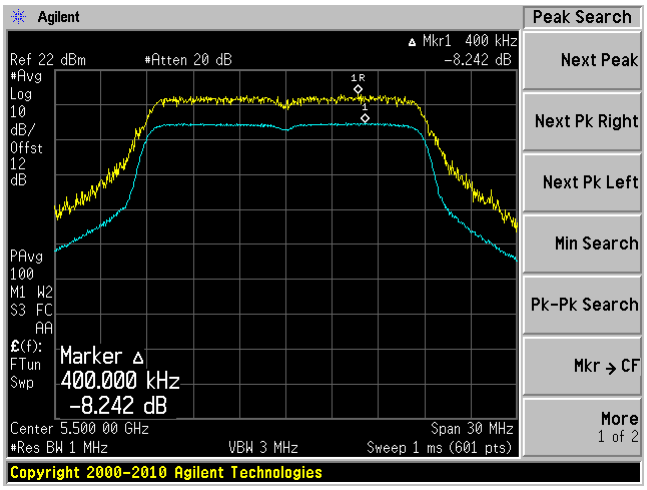

802.11a mode, 5700 MHz, Chain J1



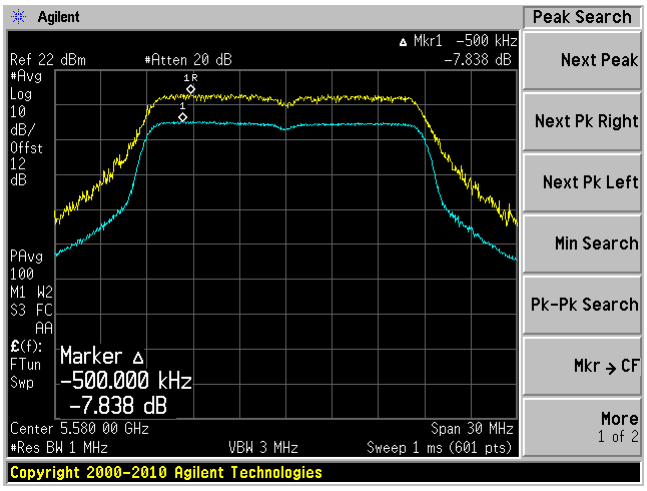

802.11n-HT20 mode, 5500 MHz, Chain J0



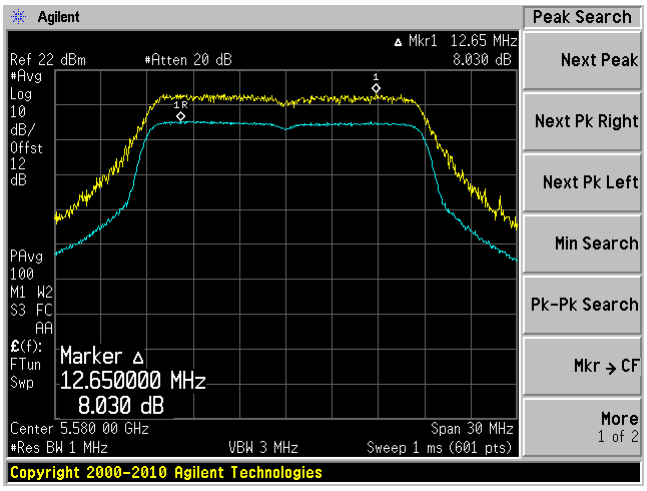

802.11n-HT20 mode, 5500 MHz, Chain J1



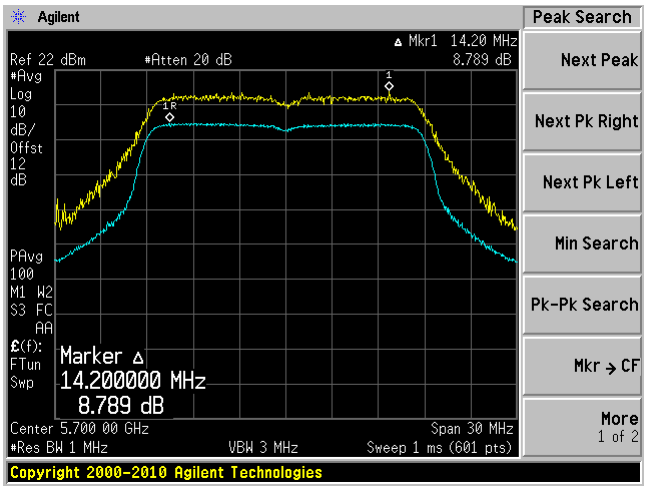
802.11n-HT20 mode, 5580 MHz, Chain J0



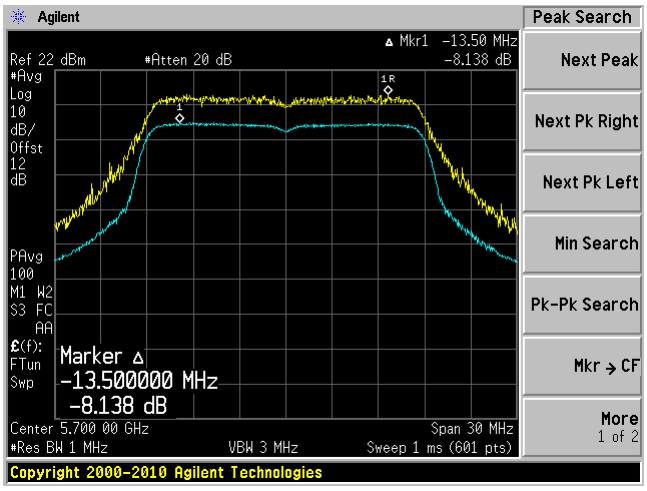

802.11n-HT20 mode, 5580 MHz, Chain J1



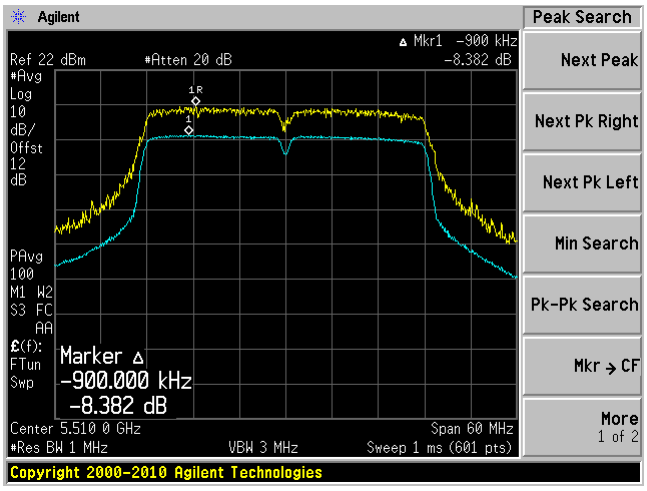

802.11n-HT20 mode, 5700 MHz, Chain J0



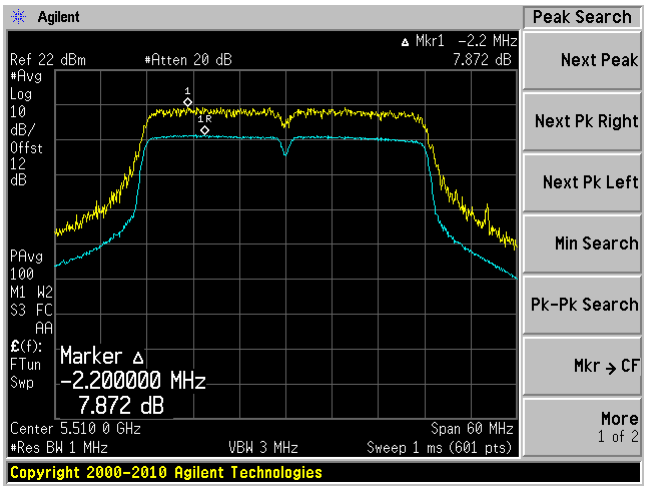

802.11n-HT20 mode, 5700 MHz, Chain J1



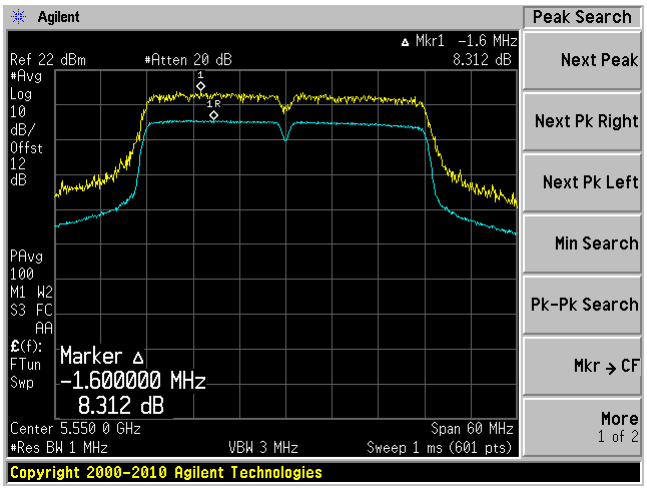
802.11n-HT40 mode, 5510 MHz, Chain J0



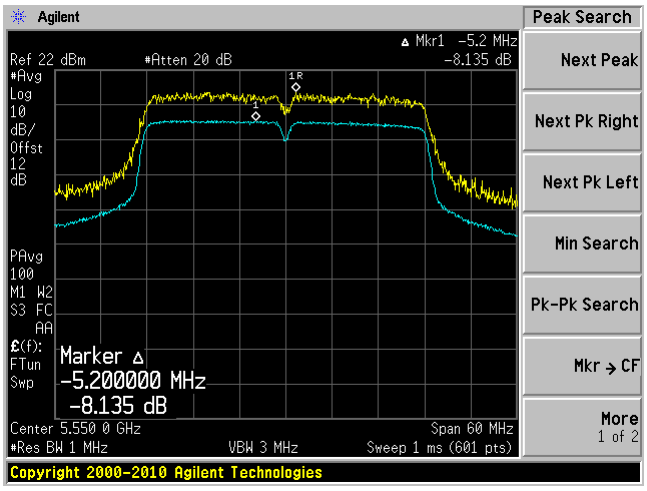

802.11n-HT40 mode, 5510 MHz, Chain J1



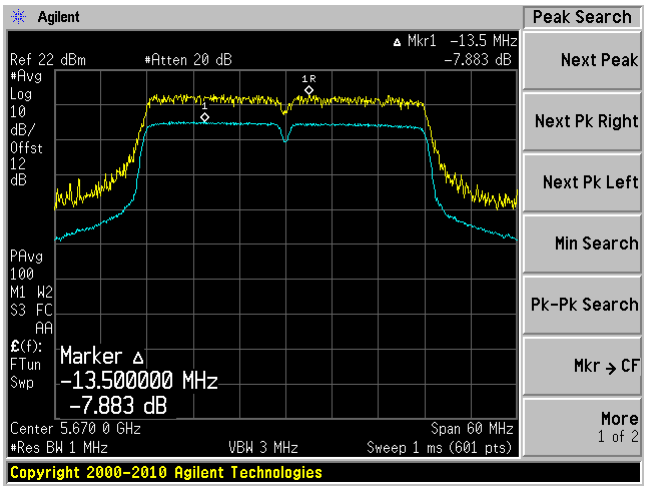

802.11n-HT40 mode, 5550 MHz, Chain J0



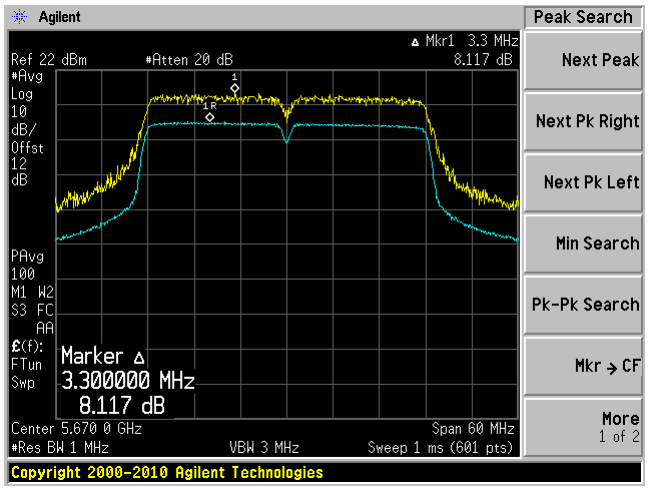

802.11n-HT40 mode, 5550 MHz, Chain J1



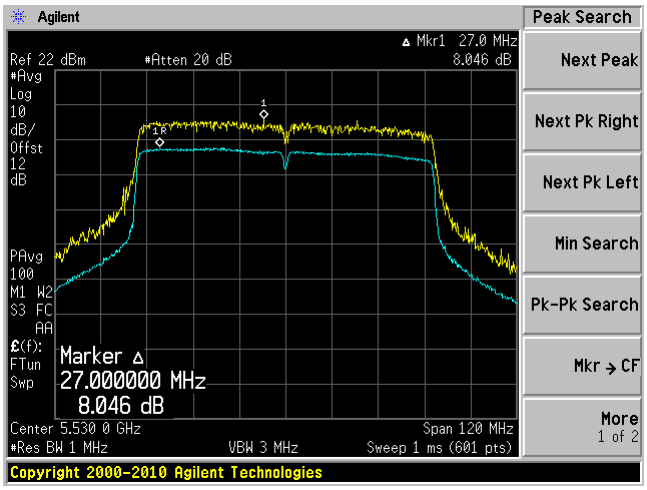
802.11n-HT40 mode, 5670 MHz, Chain J0



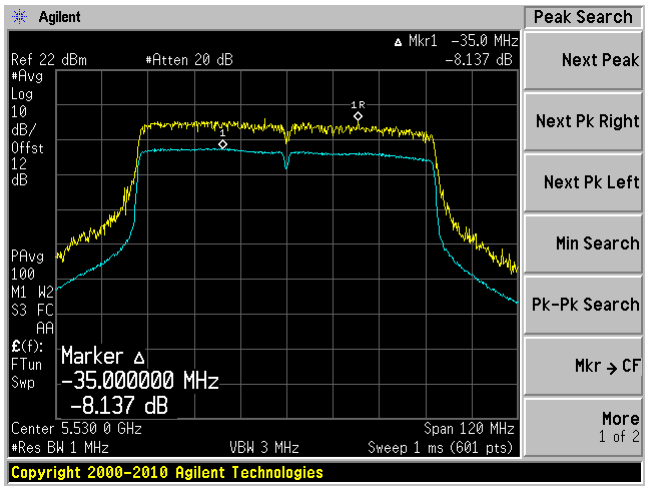

802.11n-HT40 mode, 5670 MHz, Chain J1



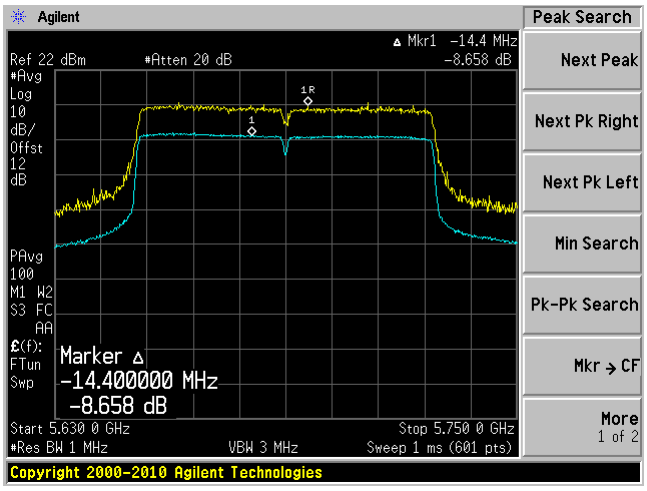

802.11a-80 mode, 5530 MHz, Chain J0



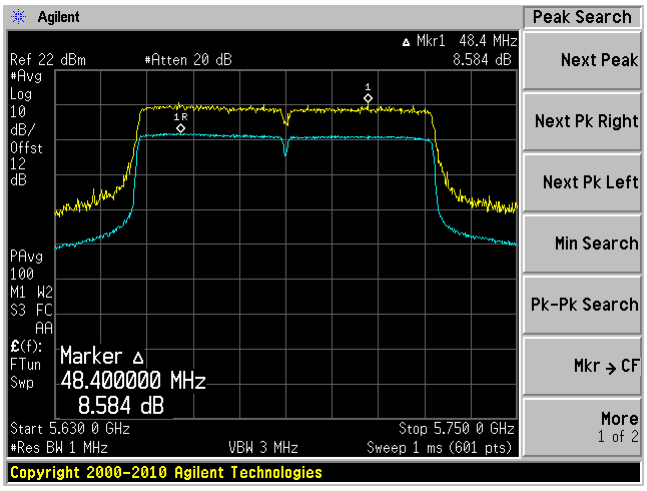

802.11a-80 mode, 5530 MHz, Chain J1



802.11ac-80 mode, 5630 MHz, Chain J0




802.11ac-80 mode, 5630 MHz, Chain J1



# 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 | Calibration Interval |
|---|---|---|---|---|---|
| Sunol Science Corp | System Controller | SC99V | 122303-1 | N/R | N/R |
| Sunol Science Corp | Combination Antenna | JB3 | A020106-3 | 2013-06-18 | 1 year |
| Hewlett Packard | Pre-amplifier | 8447D | 2944A06639 | 2013-06-09 | 1 year |
| Agilent | Pre-amplifier | 8449B | 3008A01978 | 2014-02-04 | 1 year |
| Agilent | Spectrum Analyzer | E4446A | US44300386 | 2013-09-29 | 1 year |
| EMCO | Horn Antenna | 3315 | 9511-4627 | 2013-10-17 | 1 year |
| Rohde & Schwarz | EMI Test Receiver | ESCI 1166.5950K03 | 100337 | 2013-03-28 | 1 year |

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

## 13.6 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 22 ºC |
| **Relative Humidity:** | 52 % |
| **ATM Pressure:** | 101.9 kPa |

*The testing was performed by Chen Ge on 2014-04-13 in 5 m 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:

**30 MHz – 1 GHz**

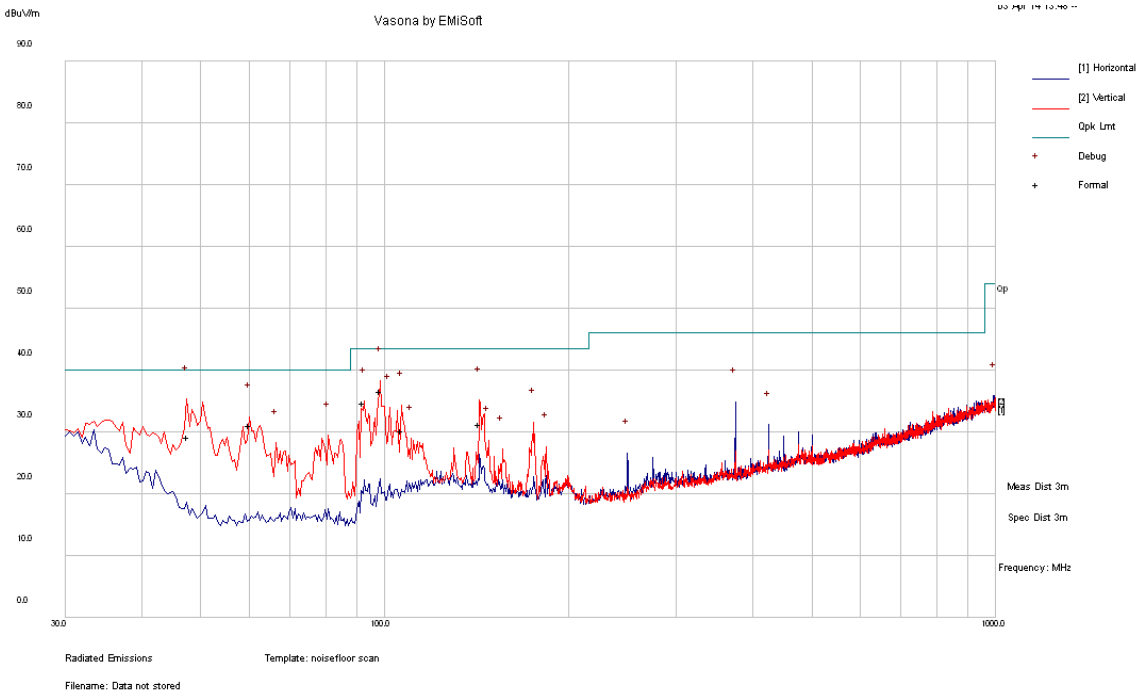
| Mode: Receiving | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Range (MHz)** |
| -6.87 | 98.43825 | Vertical | 30-1000 |

**1 GHz – 12.75 GHz**

| Mode: Receiving | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Range (MHz)** |
| -14.263 | 9241.2 | Horizontal | 1000-12750 |

## 13.8 Test Results and Plots

### 1) 30-1000 MHz, Measured at 3 meters




| Frequency (MHz) | Corrected Amplitude (dBµV/m) | Antenna Height (cm) | Antenna Polarity (H/V) | Turntable Azimuth (degrees) | Limit (dBµV/m) | Margin (dB) | Detector (QP/Ave.) |
|---|---|---|---|---|---|---|---|
| 47.5615 | 29.17 | 129 | V | 0 | 40 | -10.83 | QP |
| 98.43825 | 36.63 | 101 | V | 264 | 43.5 | -6.87 | QP |
| 60.208 | 31.18 | 109 | V | 67 | 40 | -8.82 | QP |
| 143.2545 | 31.37 | 104 | V | 168 | 43.5 | -12.13 | QP |
| 92.3895 | 34.82 | 103 | V | 187 | 43.5 | -8.68 | QP |
| 106.7025 | 30.31 | 137 | V | 140 | 43.5 | -13.19 | QP |

**2) 1 GHz to 12.75 GHz measured at 3 meters**

| Frequency (MHz) | Corrected Amplitude (dBµV/m) | Antenna Height (cm) | Antenna Polarity (H/V) | Turntable Azimuth (degrees) | Limit (dBµV/m) | Margin (dB) | Comment |
|---|---|---|---|---|---|---|---|
| 1187.6 | 39.101 | 100 | V | 0 | 74 | -34.899 | Peak |
| 1187.6 | 38.505 | 100 | H | 0 | 74 | -35.495 | Peak |
| 1187.6 | 24.081 | 100 | V | 0 | 54 | -29.919 | Ave |
| 1187.6 | 24.145 | 100 | H | 0 | 54 | -29.855 | Ave |
| 9241.2 | 53.797 | 100 | V | 0 | 74 | -20.203 | Peak |
| 9241.2 | 54.897 | 100 | H | 0 | 74 | -19.103 | Peak |
| 9241.2 | 38.857 | 100 | V | 0 | 54 | -15.143 | Ave |
| 9241.2 | 39.737 | 100 | H | 0 | 54 | -14.263 | 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

As per IC RSS-210 §A9.2

Emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p.

## 14.2 Measurement Procedure

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

## 14.3 Test Equipment List and Details

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

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

## 14.4 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 21 °C |
| **Relative Humidity:** | 43 % |
| **ATM Pressure:** | 101-102 kPa |

*The testing was performed by Chen Ge from 2014-04-21 at RF site.*

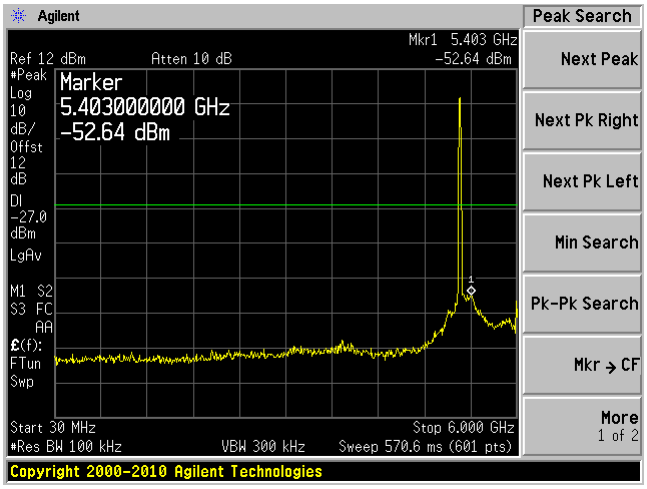
## 14.5 Test Results

Please refer to following plots of spurious emissions.

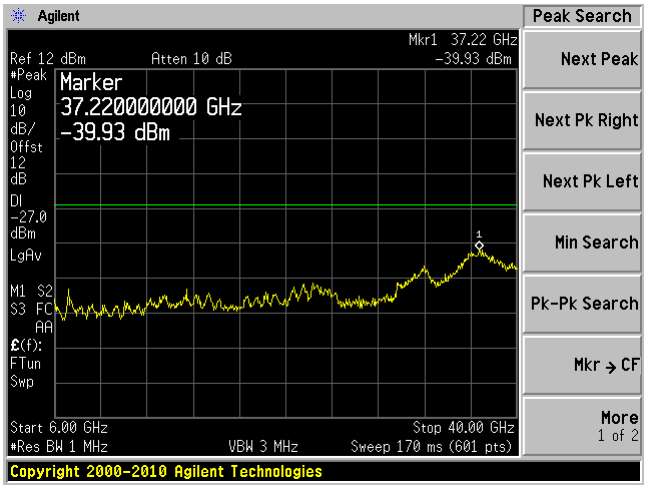
## 5250-5350 MHz Band

### 802.11a, Low Channel, 5260 MHz

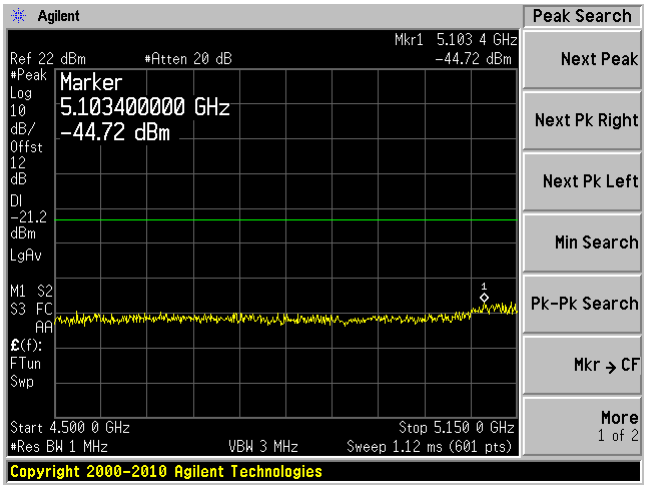
Chain J0, Plot: 30 MHz – 6 GHz



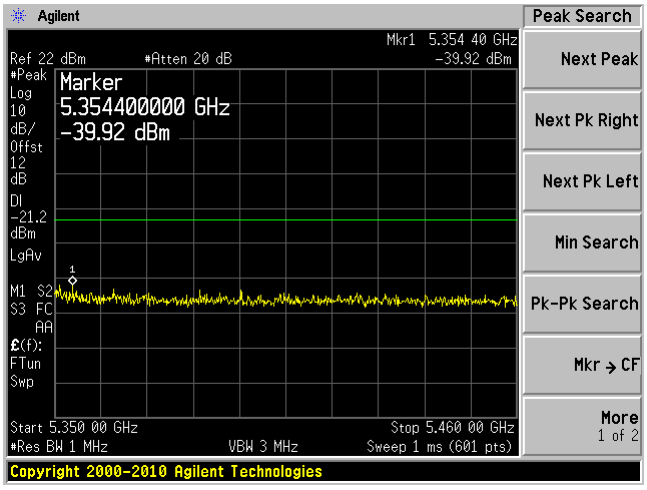

Chain J0, Plot: 6 GHz – 40 GHz



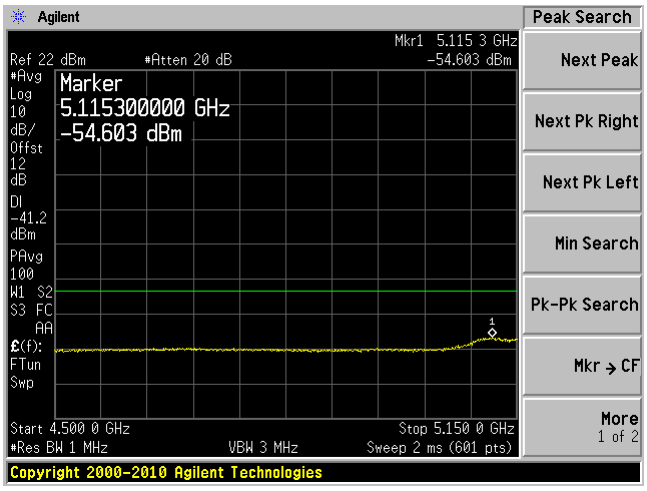

Chain J0, Plot: 4500 MHz – 5150 MHz-Peak



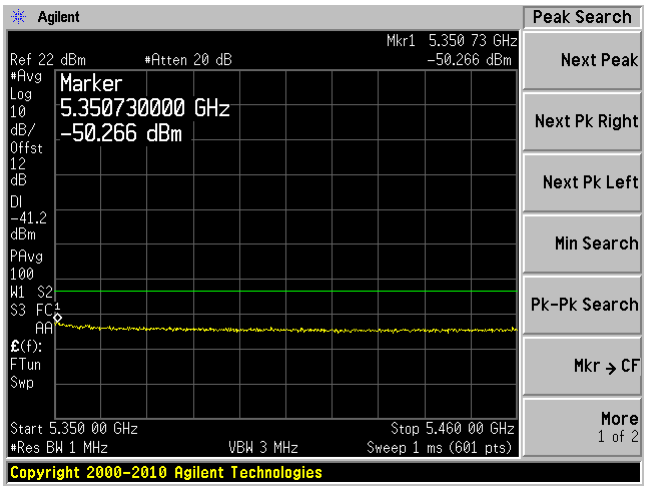

Chain J0, Plot: 5350MHz – 5460 MHz-Peak



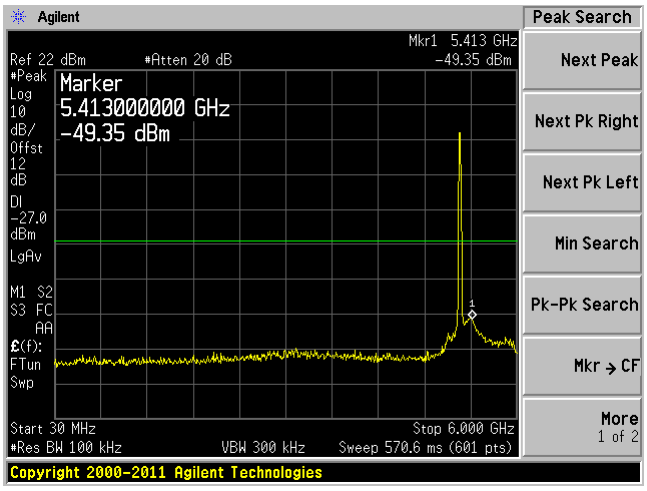
Chain J0, Plot: 4500 MHz – 5150 MHz-Ave



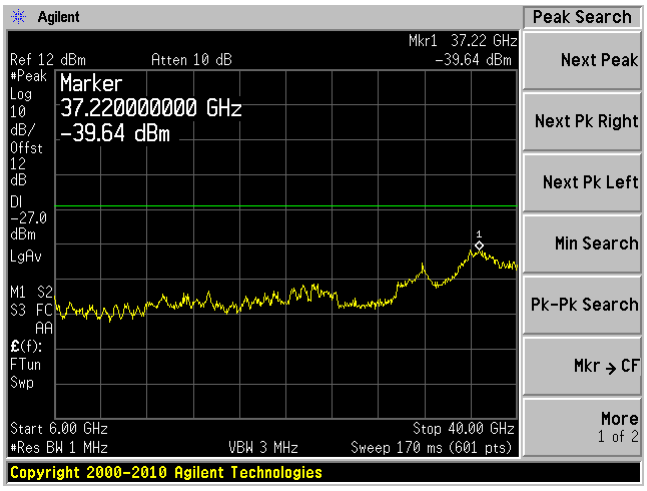

Chain J0, Plot: 5350MHz – 5460 MHz-Ave



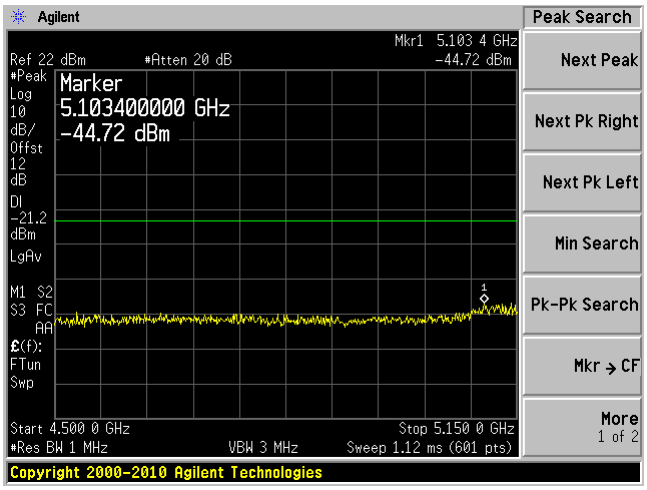

Chain J1, Plot: 30 MHz – 6 GHz



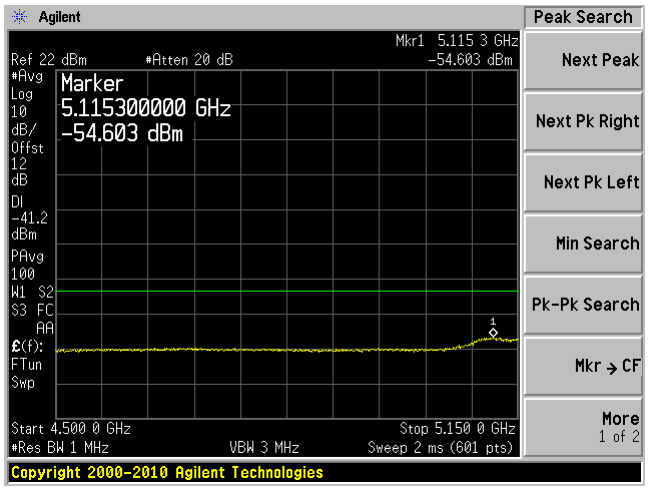

Chain J1, Plot: 6 GHz – 40 GHz



Chain J1, Plot: 4500 MHz – 5150 MHz-Peak

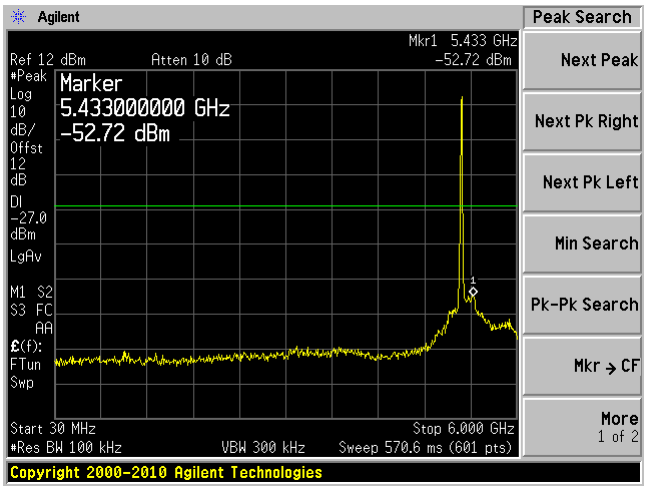



Chain J1, Plot: 4500 MHz – 5150 MHz-Ave

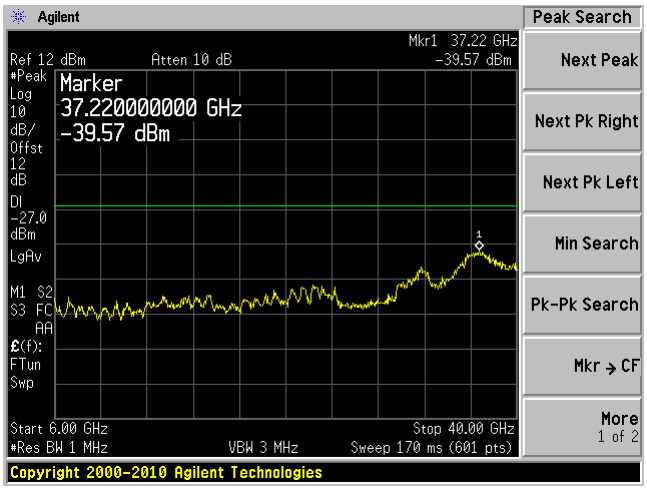


**802.11a, Middle Channel, 5280 MHz**

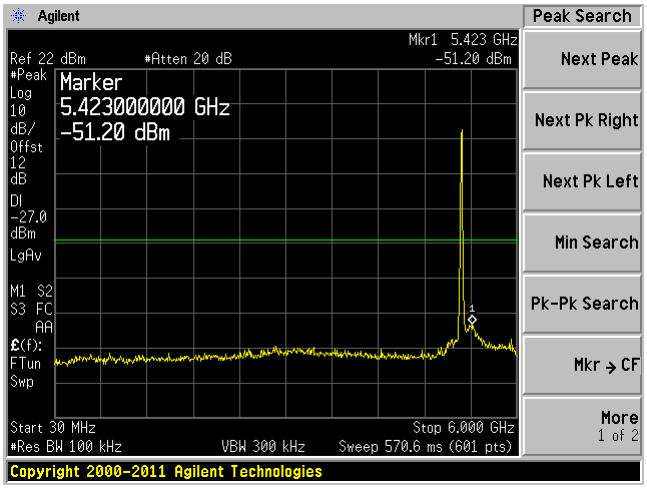
Chain J0, Plot: 30 MHz – 6 GHz



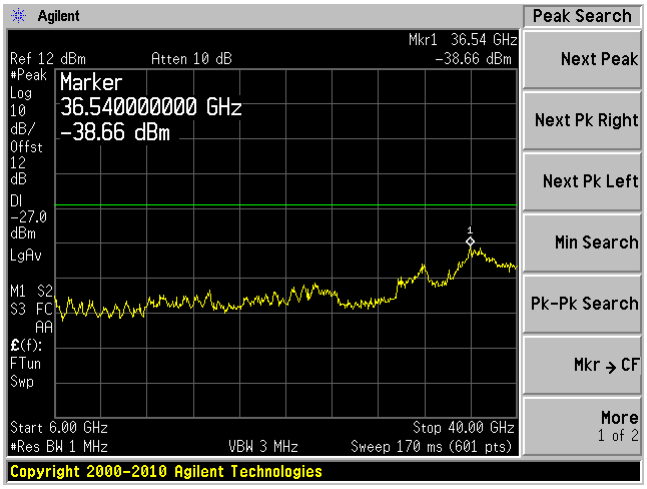

Chain J0, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 30 MHz – 6 GHz

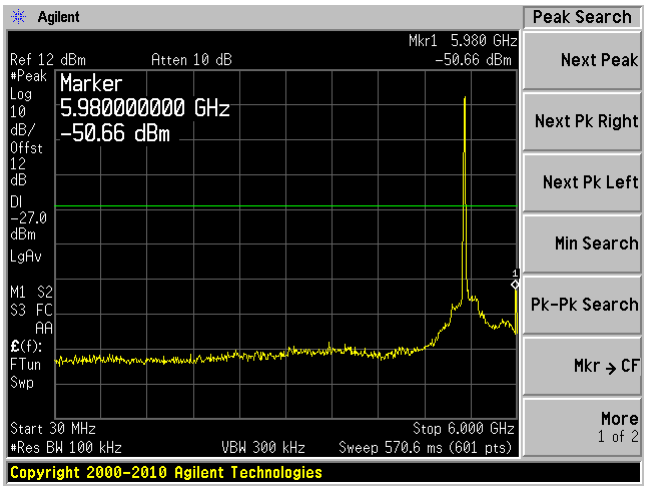



Chain J1, Plot: 6 GHz – 40 GHz

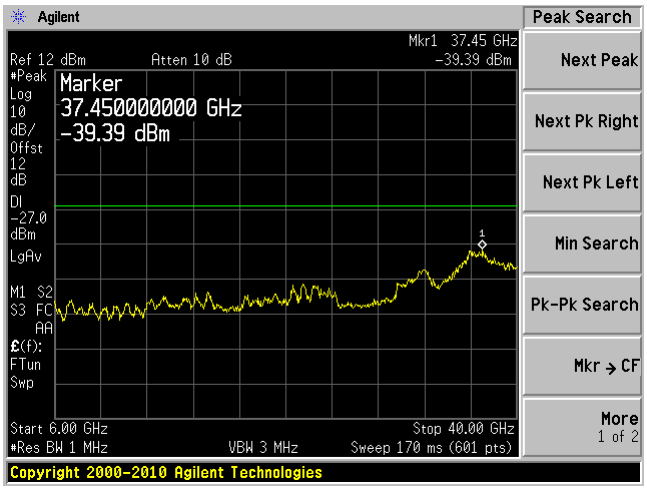


**802.11a, High Channel, 5320 MHz**

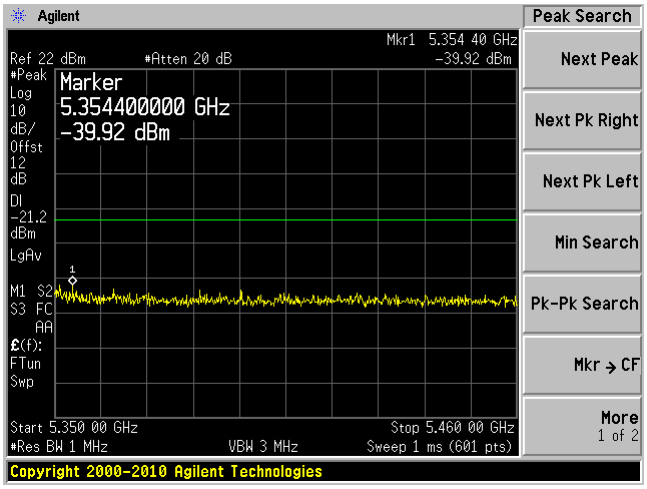
Chain J0, Plot: 30 MHz – 6 GHz



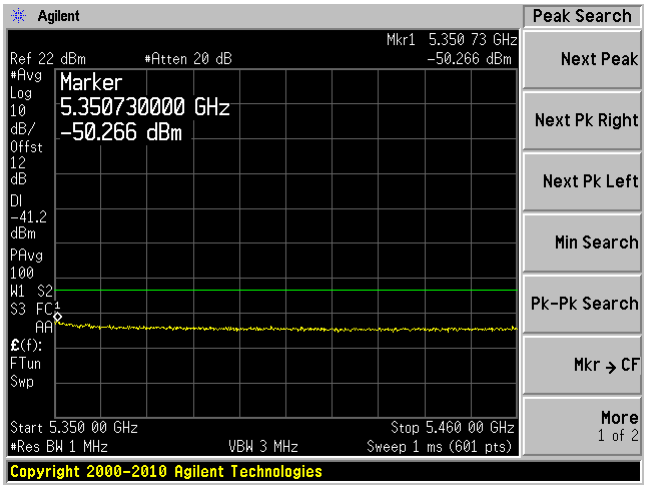

Chain J0, Plot: 6 GHz – 40 GHz



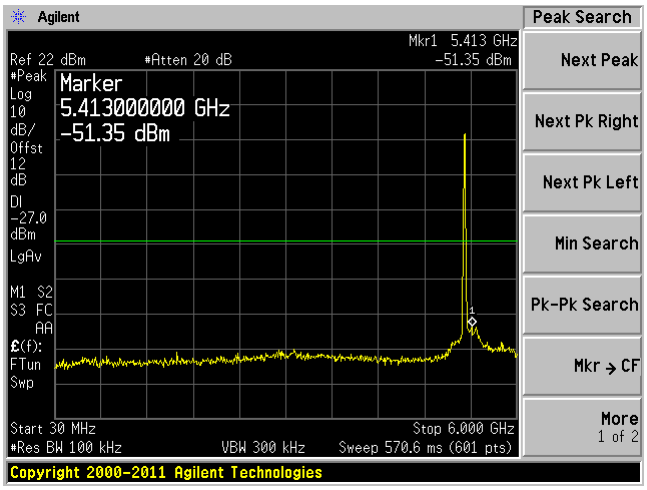

Chain J0, Plot: 5350MHz – 5460 MHz-Peak



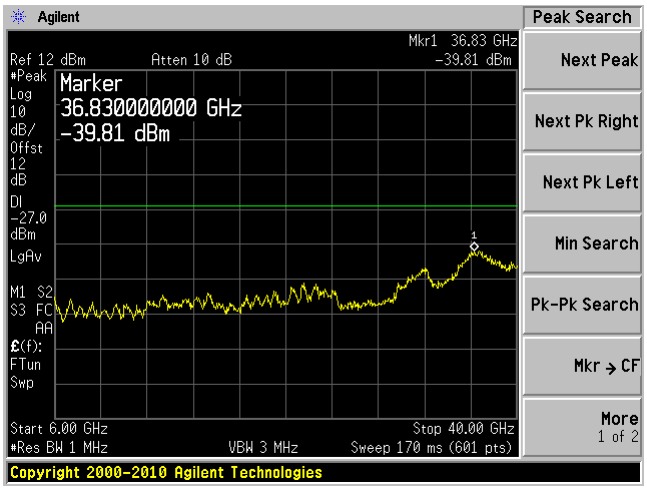

Chain J0, Plot: 5350MHz – 5460 MHz-Ave



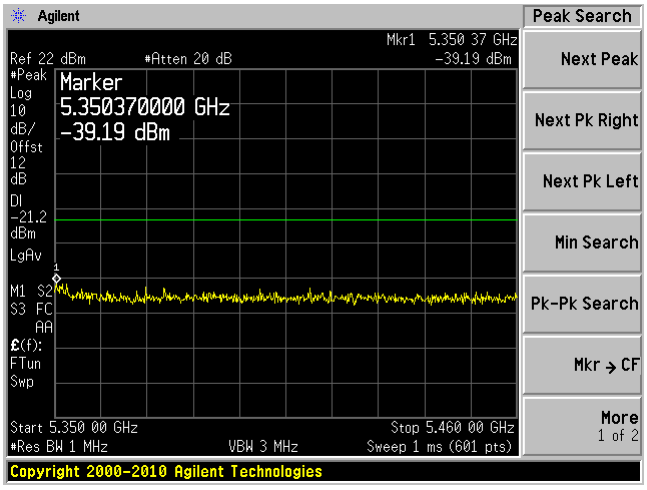
Chain J1, Plot: 30 MHz – 6 GHz



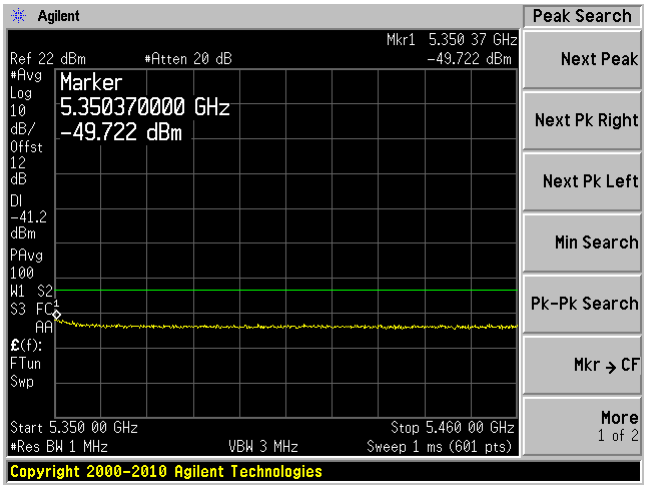

Chain J1, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 5350MHz – 5460 MHz-Ave

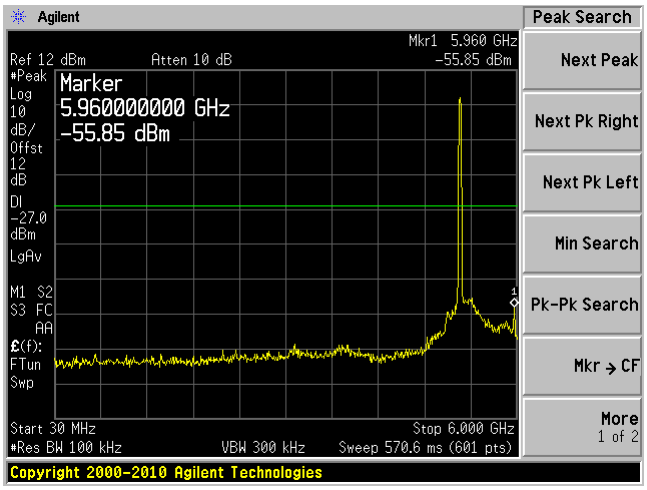



Chain J1, Plot: 5350MHz – 5460 MHz-Ave

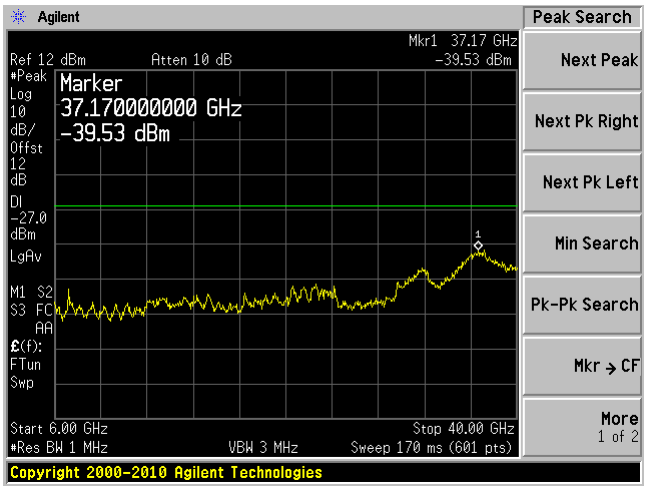


## 802.11n-HT 20, Low Channel 5260 MHz

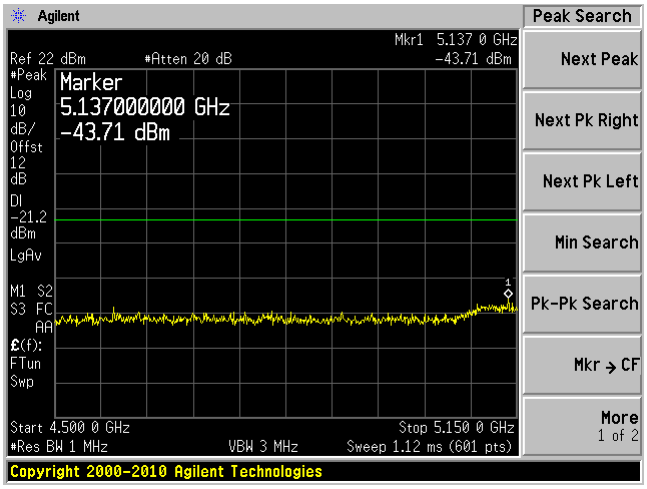
Chain J0, Plot: 30 MHz – 6 GHz



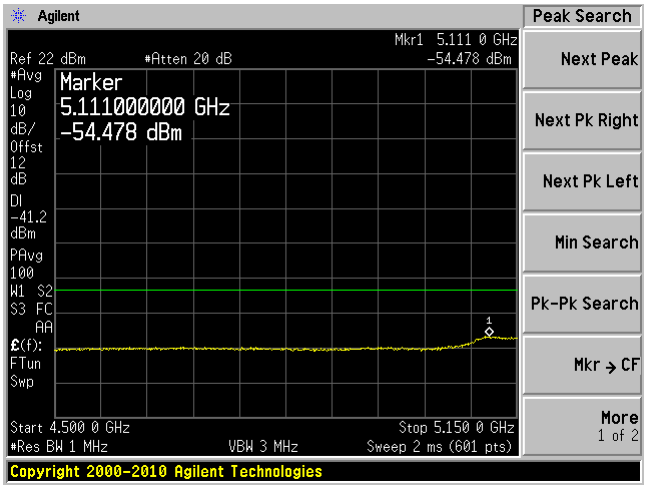

Chain J0, Plot: 6 GHz – 40 GHz



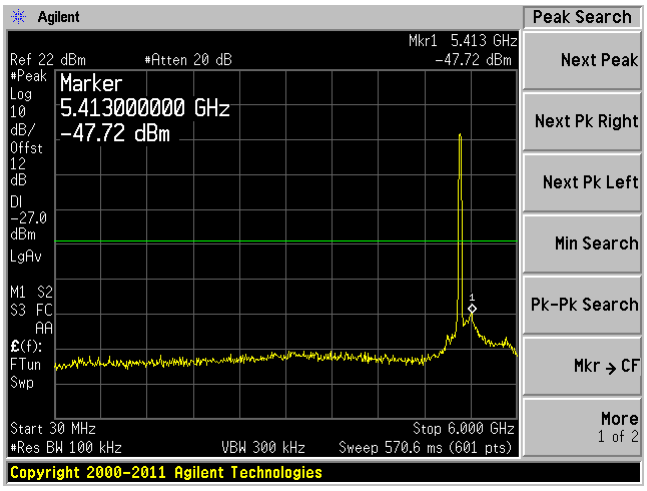

Chain J0, Plot: 4500 MHz – 5150 MHz-Peak



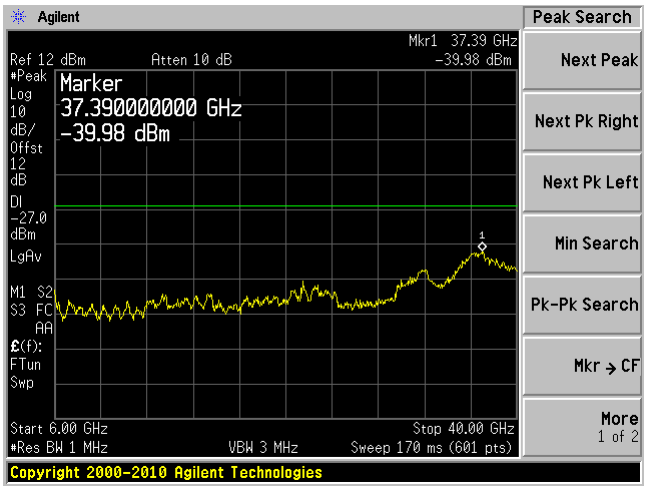

Chain J0, Plot: 4500 MHz – 5150 MHz-Ave



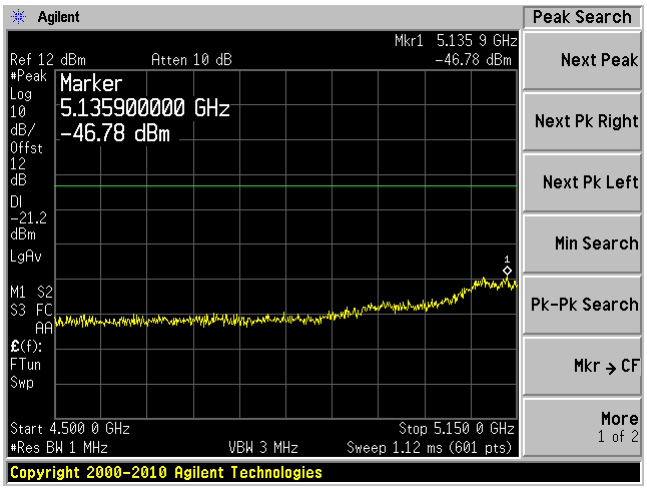
Chain J1, Plot: 30 MHz – 6 GHz



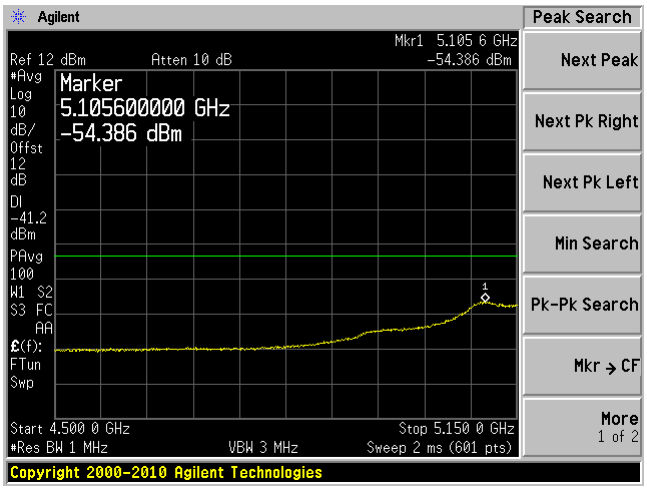

Chain J1, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 4500 MHz – 5150 MHz-Peak

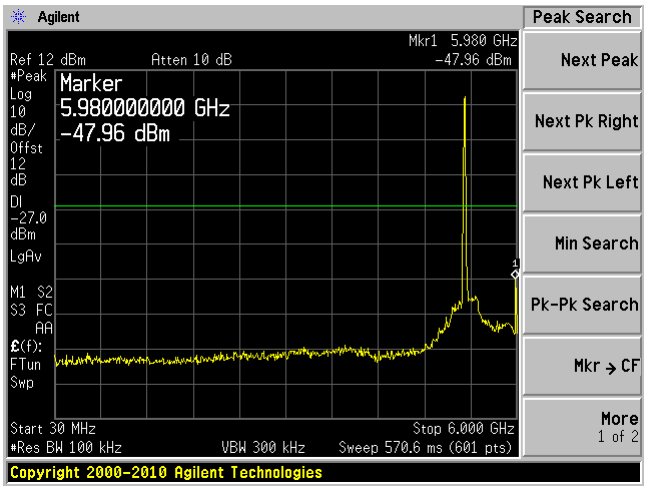



Chain J1, Plot: 4500 MHz – 5150 MHz-Ave

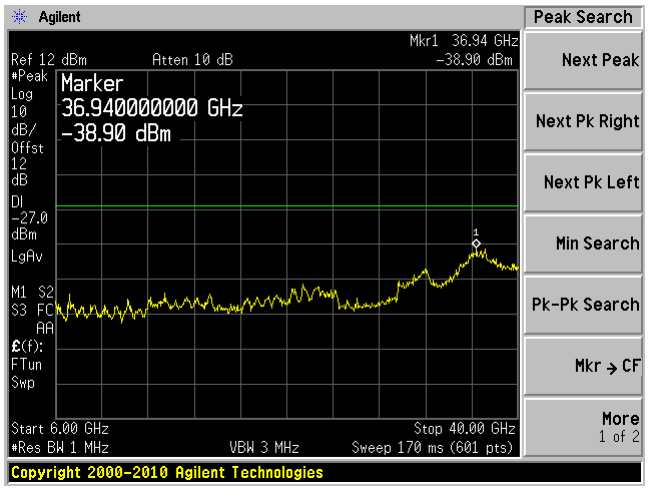


**802.11n-HT20, Middle Channel 5280 MHz**

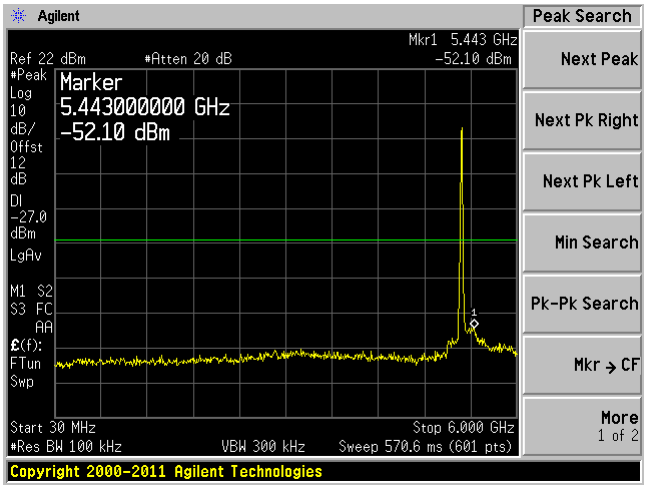
Chain J0, Plot: 30 MHz – 6 GHz



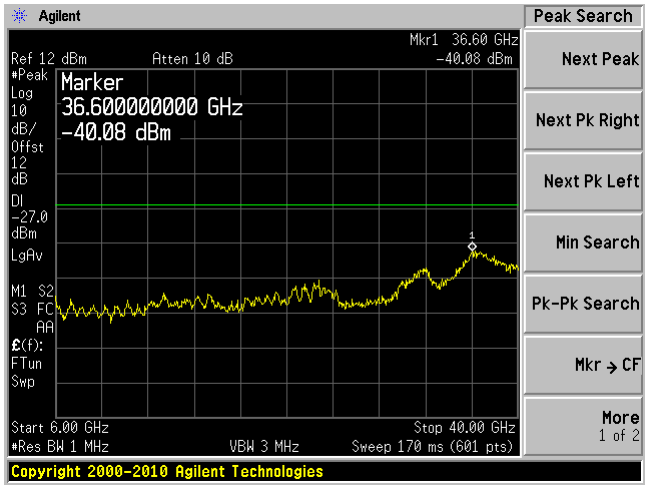

Chain J0, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 30 MHz – 6 GHz

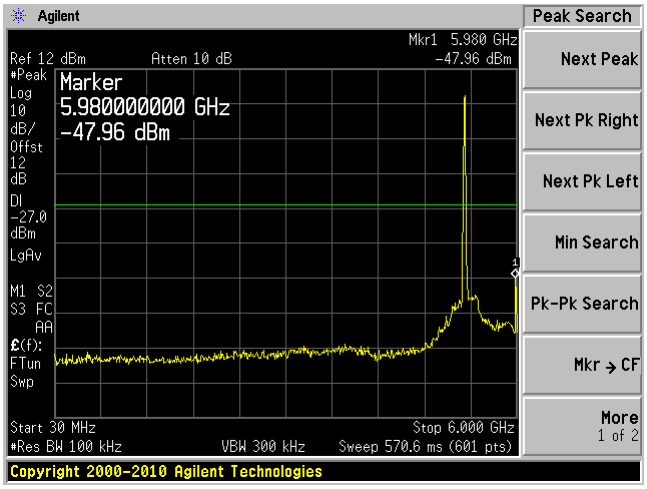



Chain J1, Plot: 6 GHz – 40 GHz

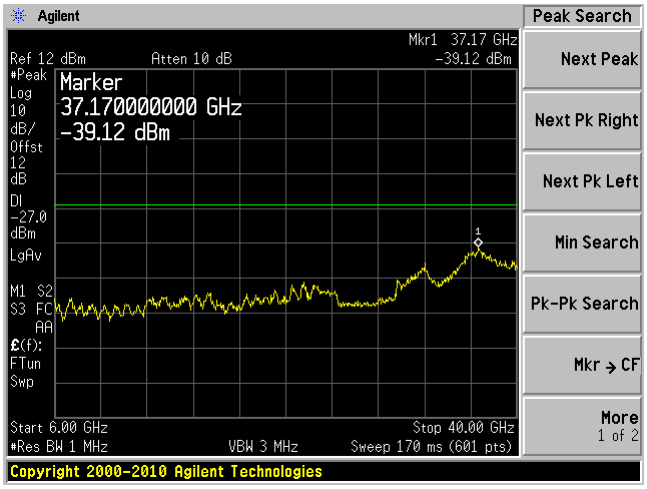


**802.11n-HT20, High Channel, 5320 MHz**

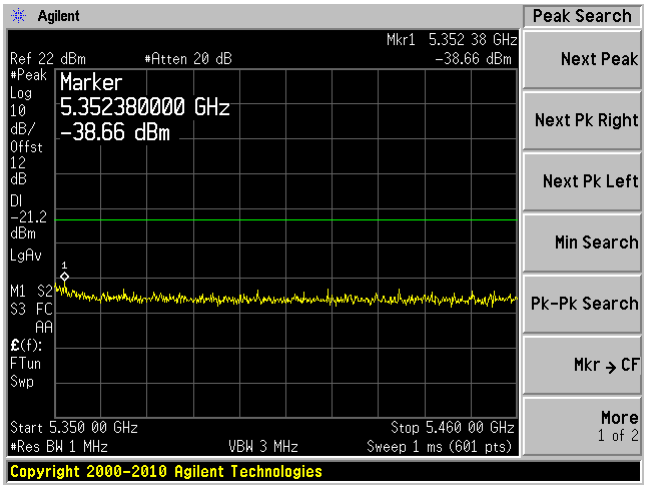
Chain J0, Plot: 30 MHz – 6 GHz



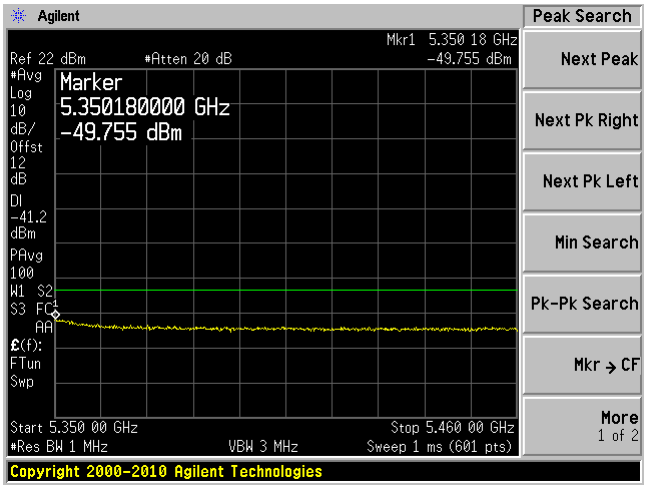

Chain J0, Plot: 6 GHz – 40 GHz



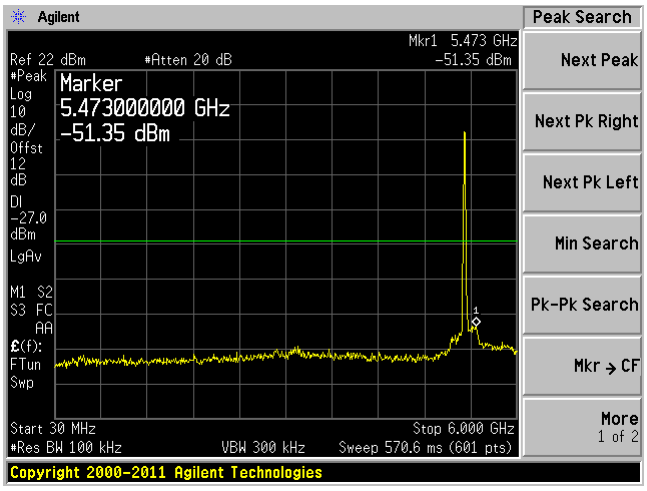

Chain J0, Plot: 5350MHz – 5460 MHz-Peak



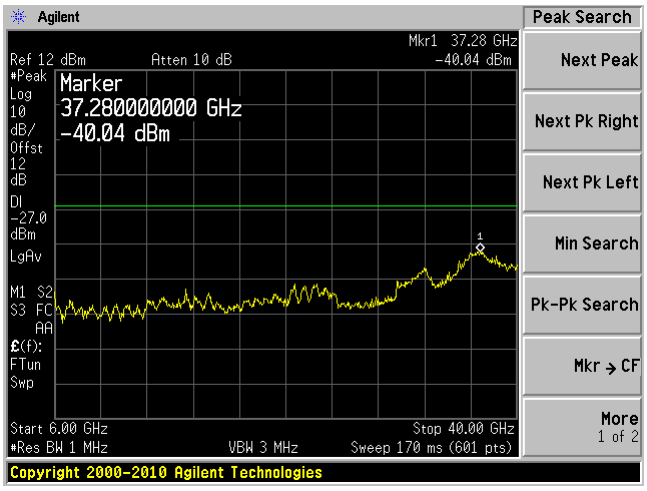

Chain J0, Plot: 5350MHz – 5460 MHz-Ave



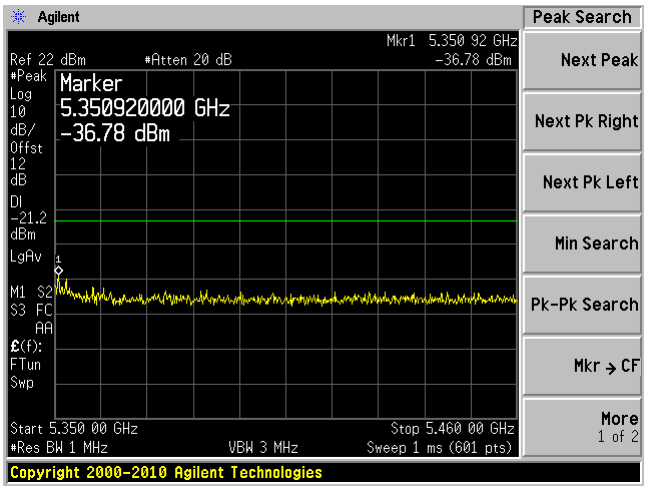
Chain J1, Plot: 30 MHz – 6 GHz



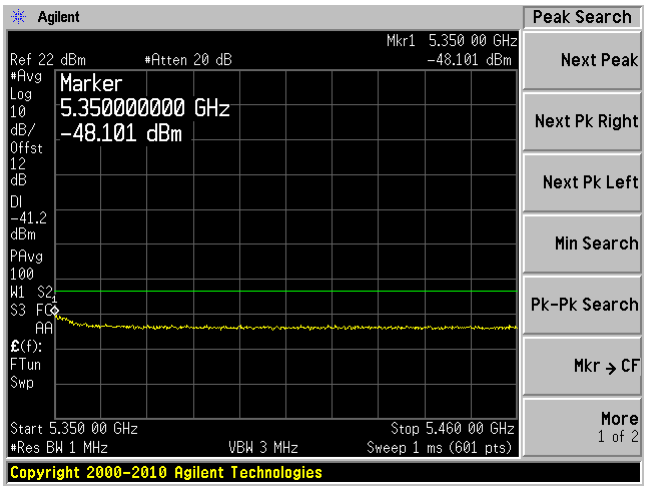

Chain J1, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 5350MHz – 5460 MHz-Peak

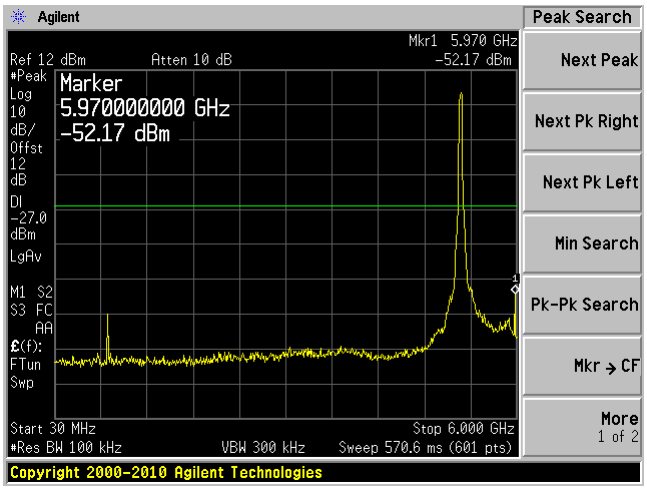



Chain J1, Plot: 5350MHz – 5460 MHz-Peak

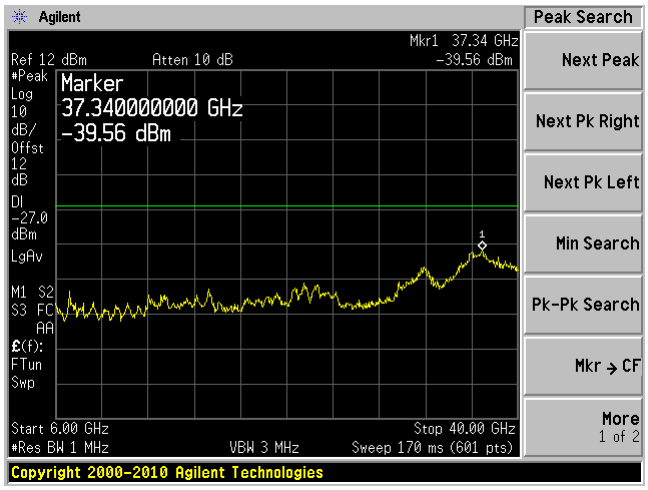


**802.11n-HT40, Low Channel 5270 MHz**

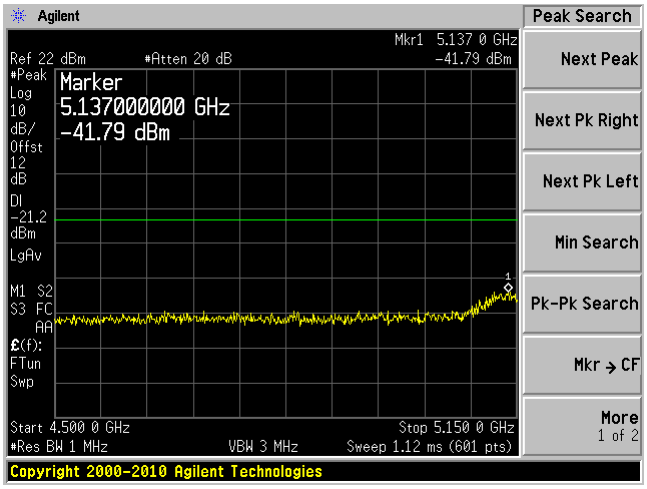
Chain J0, Plot: 30 MHz – 6 GHz



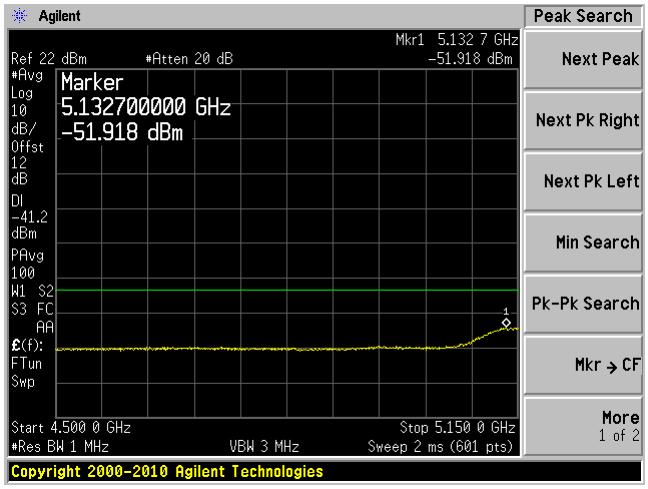

Chain J0, Plot: 6 GHz – 40 GHz



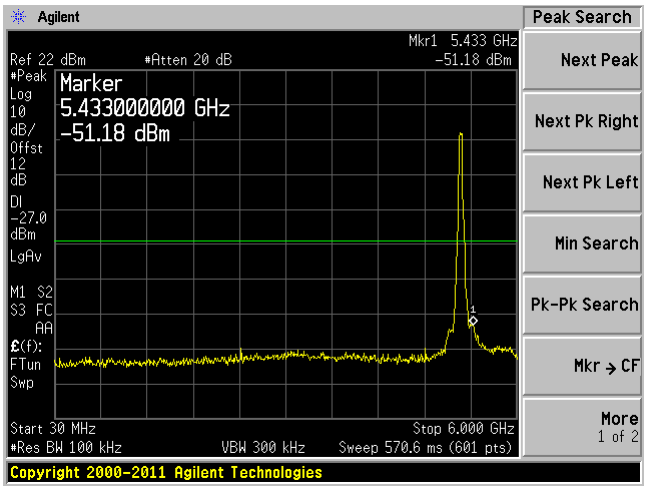

Chain J0, Plot: 4500 MHz – 5150 MHz-Peak



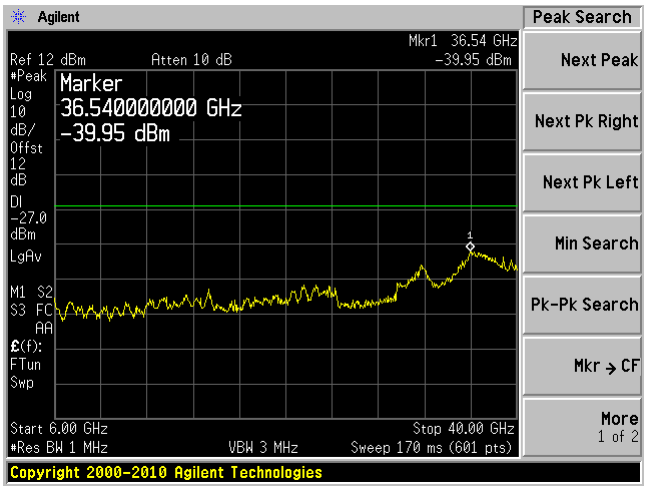

Chain J0, Plot: 4500 MHz – 5150 MHz-Ave



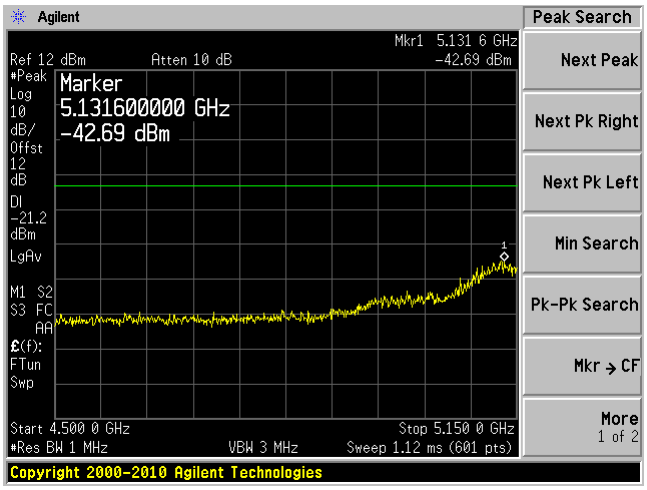
Chain J1, Plot: 30 MHz – 6 GHz



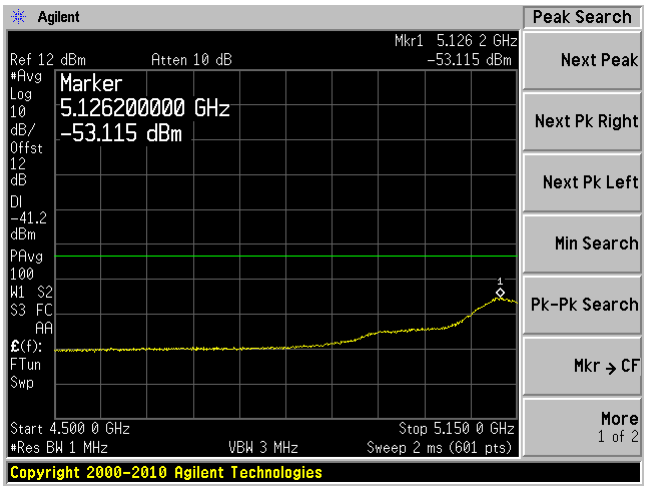

Chain J1, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 4500 MHz – 5150 MHz-Peak

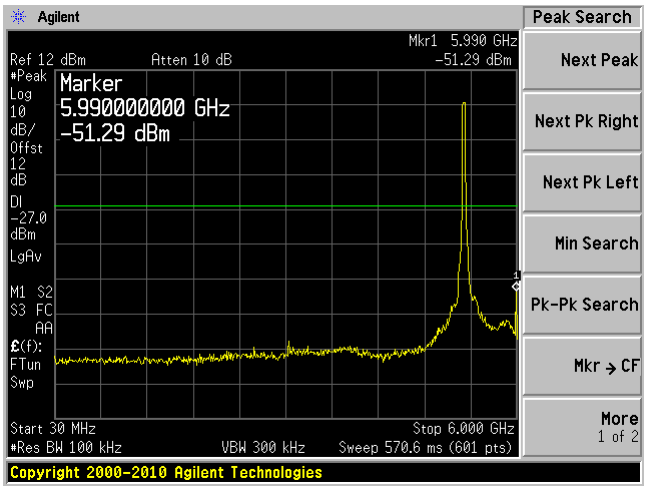



Chain J1, Plot: 4500 MHz – 5150 MHz-Ave

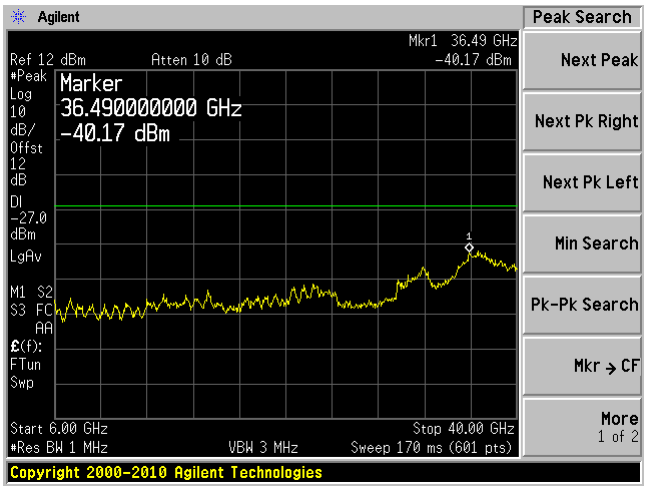


**802.11n-HT40, High Channel 5310 MHz**

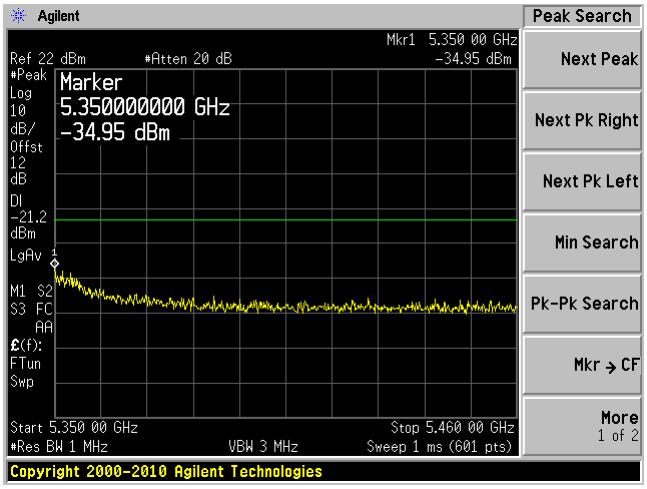
Chain J0, Plot: 30 MHz – 6 GHz



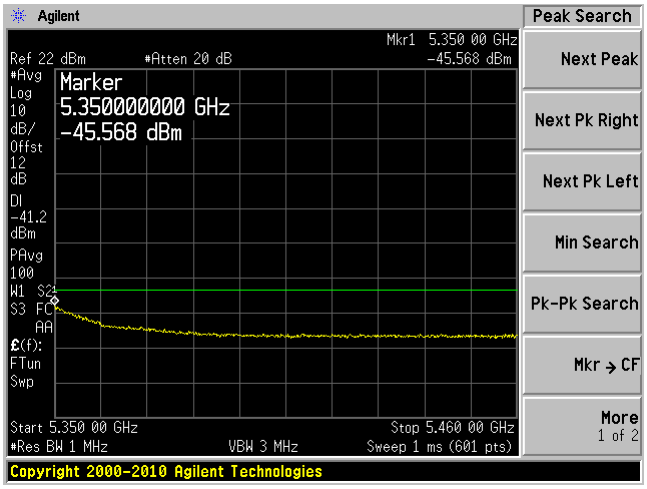

Chain J0, Plot: 6 GHz – 40 GHz



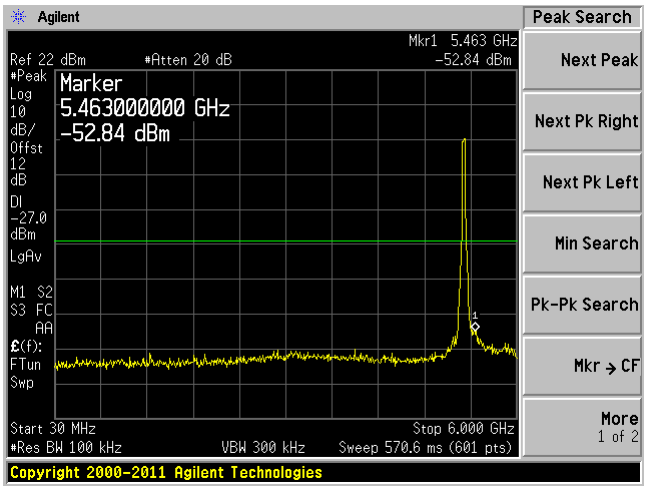

Chain J0, Plot: 5350MHz – 5460 MHz-Peak



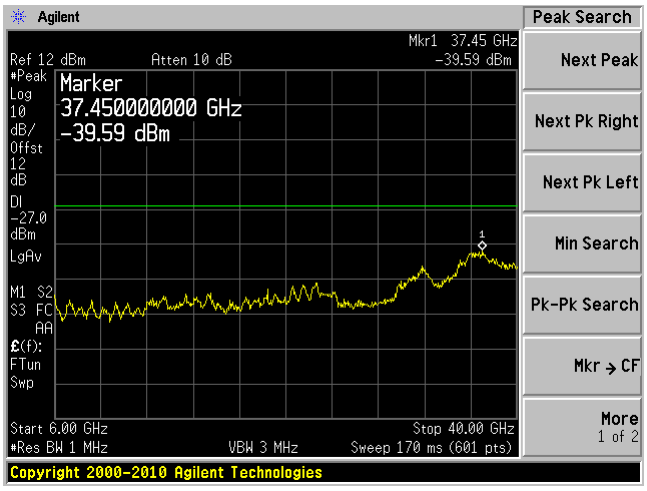

Chain J0, Plot: 5350MHz – 5460 MHz-Ave



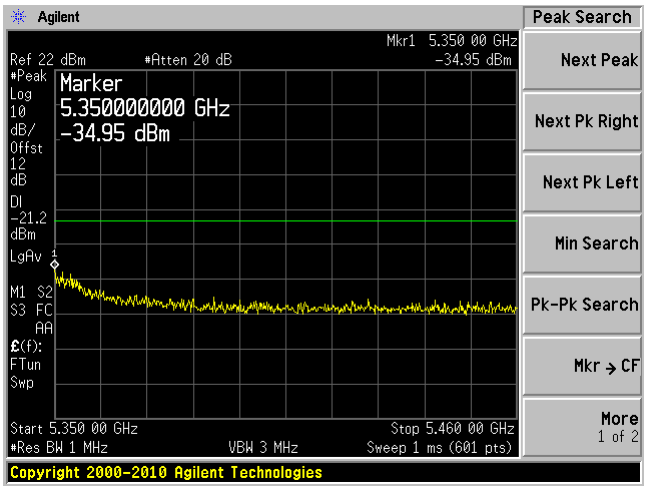
Chain J1, Plot: 30 MHz – 6 GHz



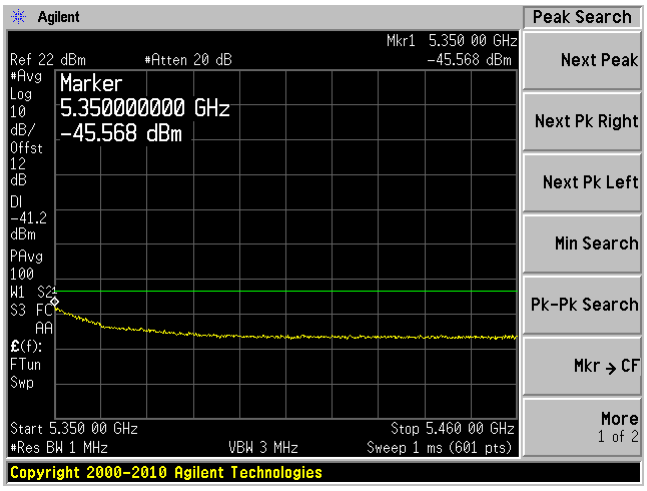

Chain J1, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 5350MHz – 5460 MHz-Peak



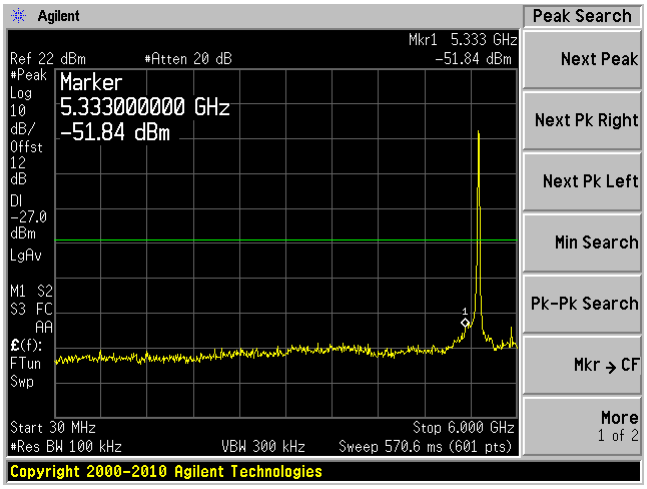

Chain J1, Plot: 5350MHz – 5460 MHz-Ave



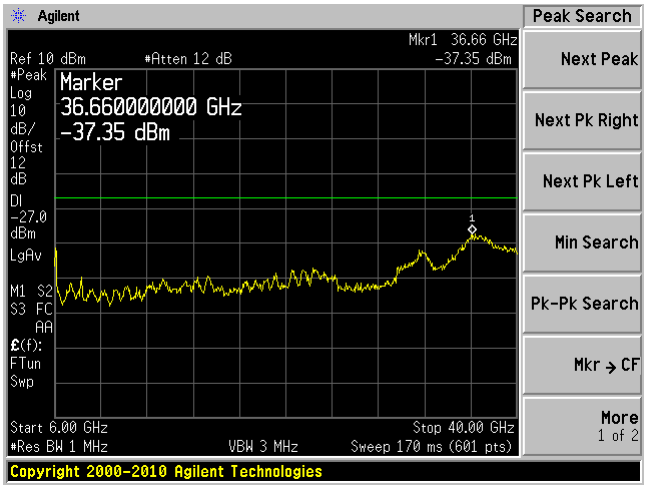
## 5470-5725 MHz Band

### 802.11a, Low Channel, 5500 MHz

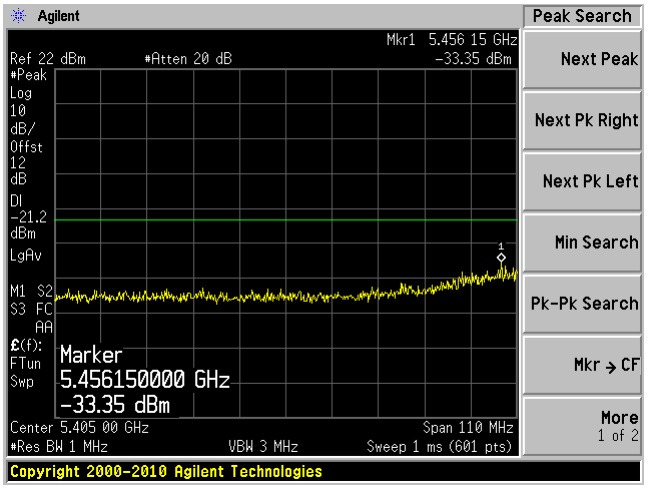
Chain J0, Plot: 30 MHz – 6 GHz



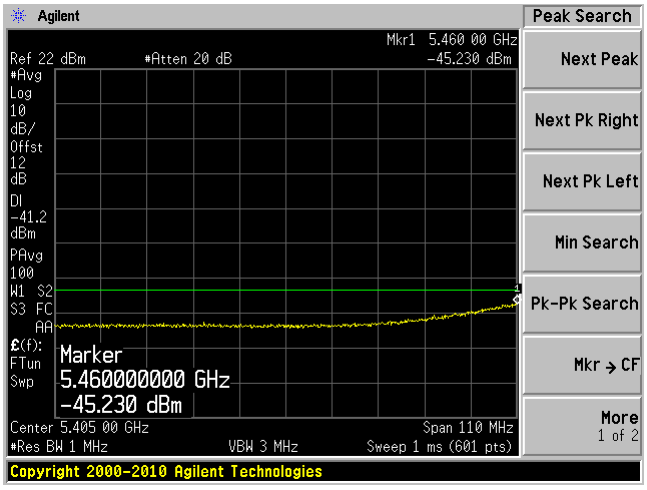

Chain J0, Plot: 6 GHz – 40 GHz



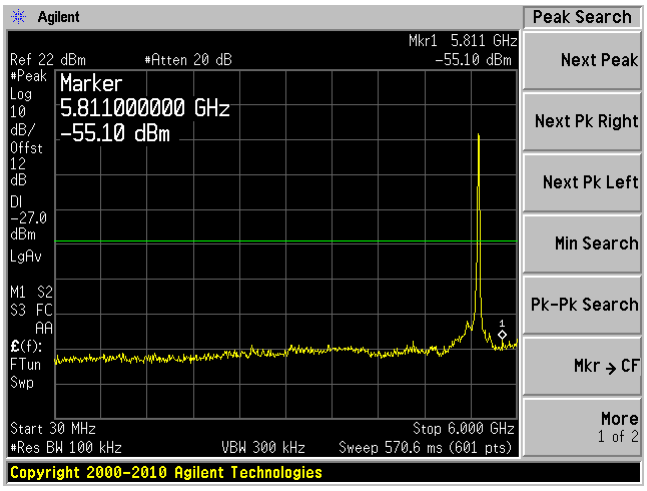

Chain J0, Plot: 5350MHz – 5460 MHz-Peak



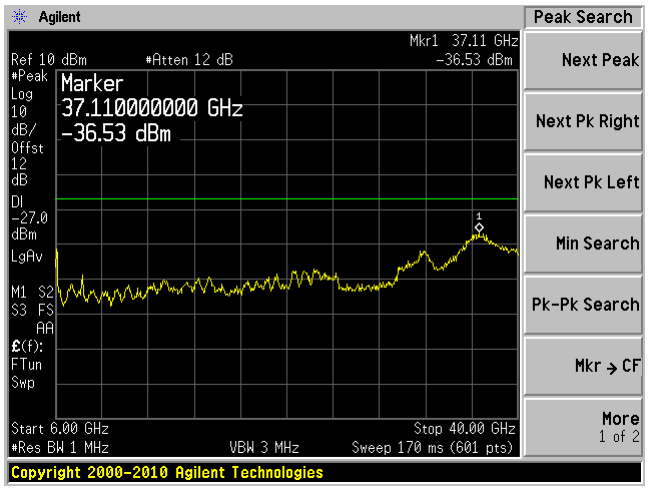

Chain J0, Plot: 5350MHz – 5460 MHz-Ave



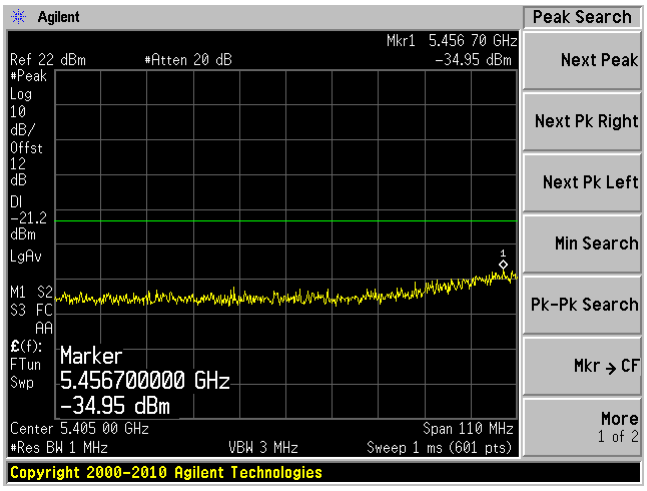
Chain J1, Plot: 30 MHz – 6 GHz



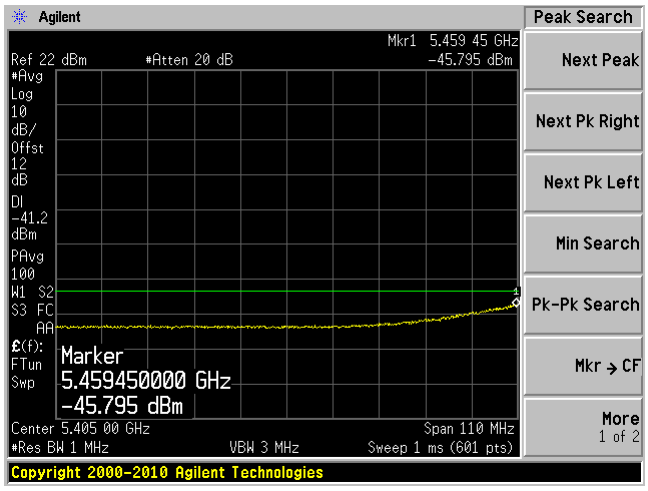

Chain J1, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 5350MHz – 5460 MHz-Peak

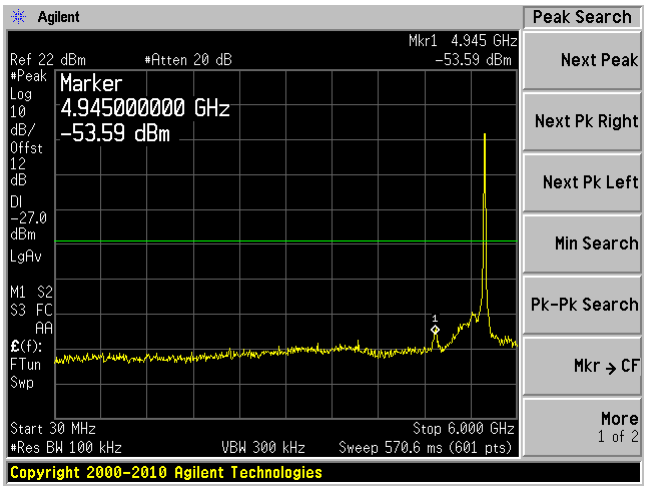



Chain J1, Plot: 5350MHz – 5460 MHz-Ave

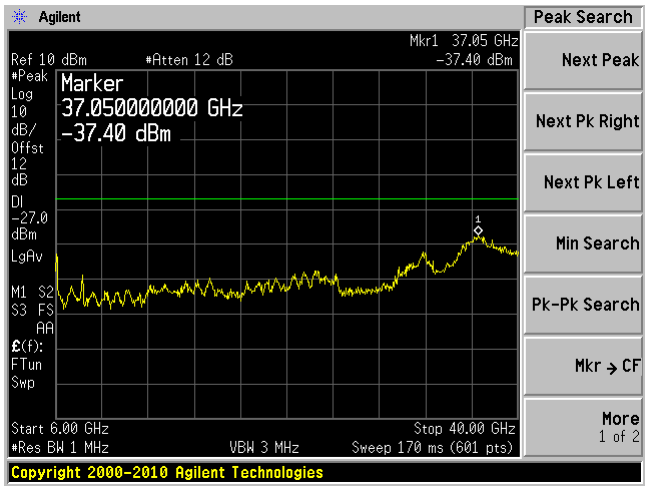


**802.11a, Middle Channel, 5580 MHz**

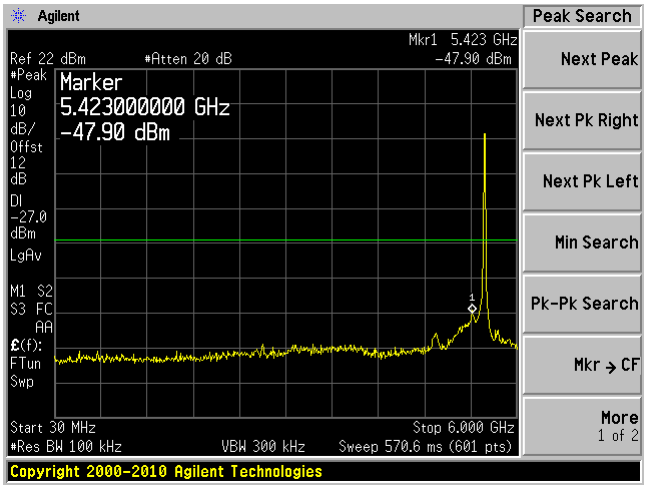
Chain J0, Plot: 30 MHz – 6 GHz



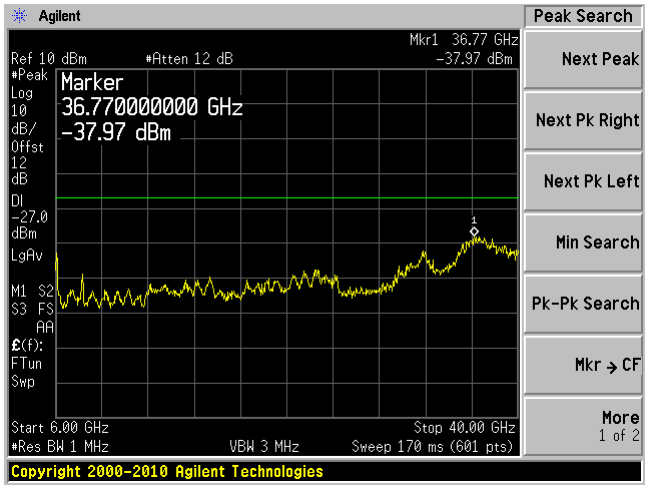

Chain J0, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 30 MHz – 6 GHz

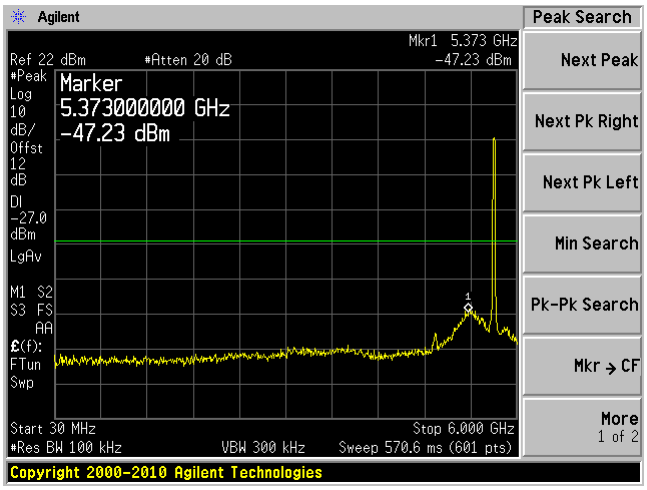



Chain J1, Plot: 6 GHz – 40 GHz

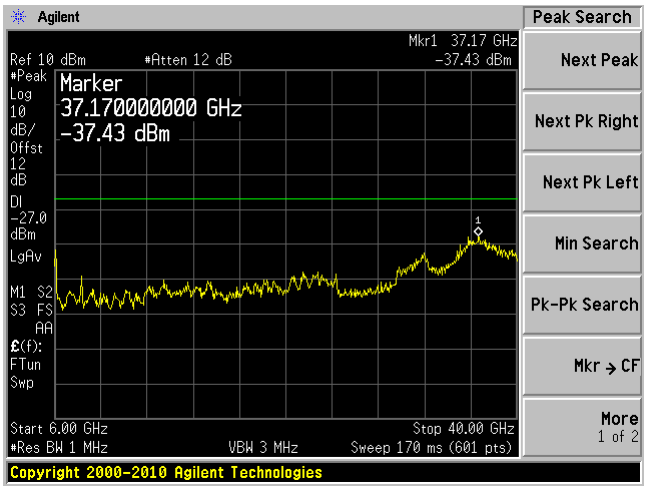


**802.11a, High Channel, 5700 MHz**

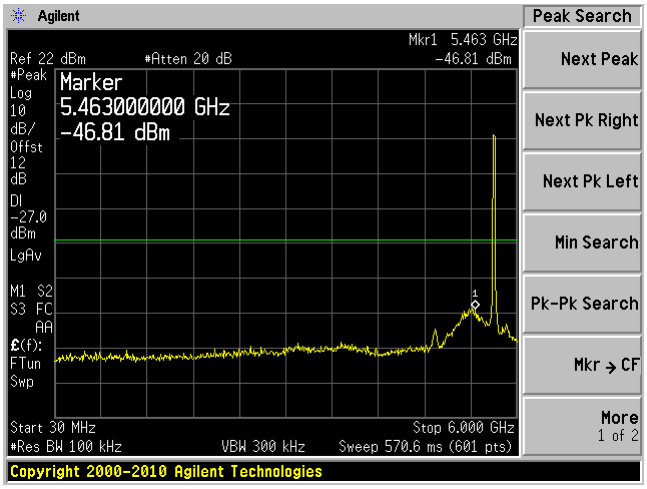
Chain J0, Plot: 30 MHz – 6 GHz



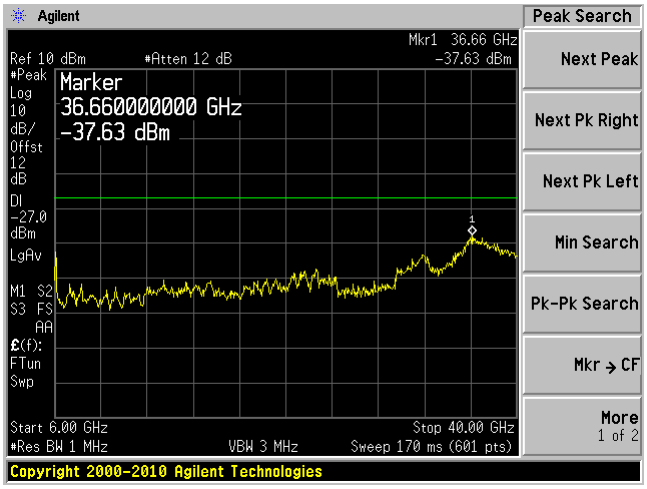

Chain J0, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 30 MHz – 6 GHz

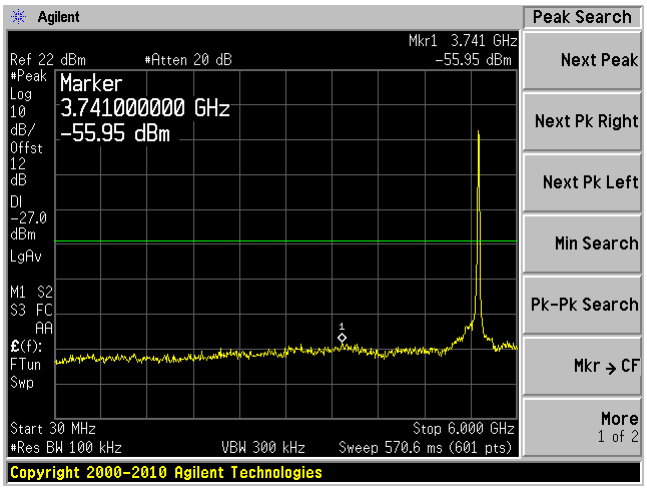



Chain J1, Plot: 6 GHz – 40 GHz

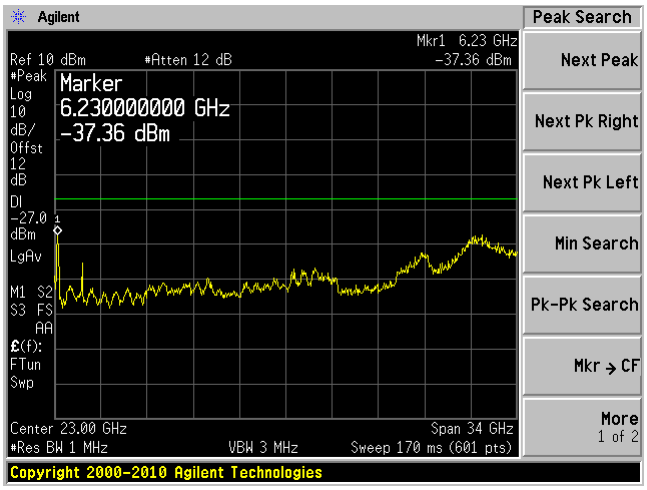


## 802.11n-HT 20, Low Channel 5500 MHz

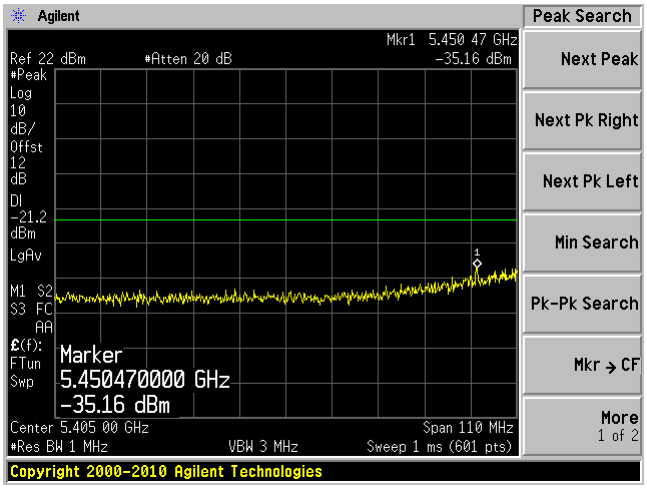
Chain J0, Plot: 30 MHz – 6 GHz



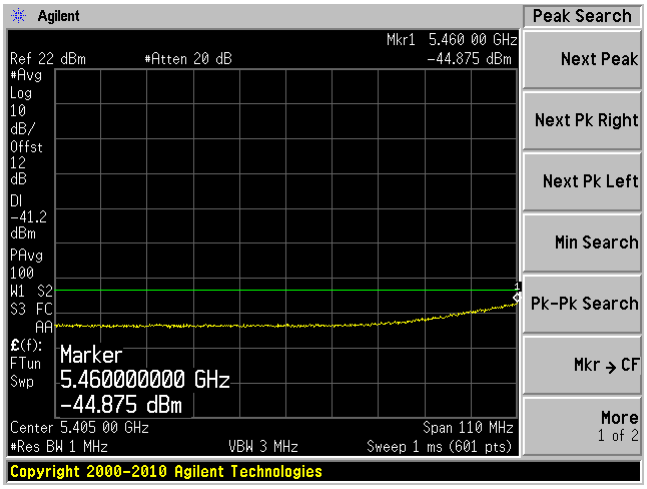

Chain J0, Plot: 6 GHz – 40 GHz



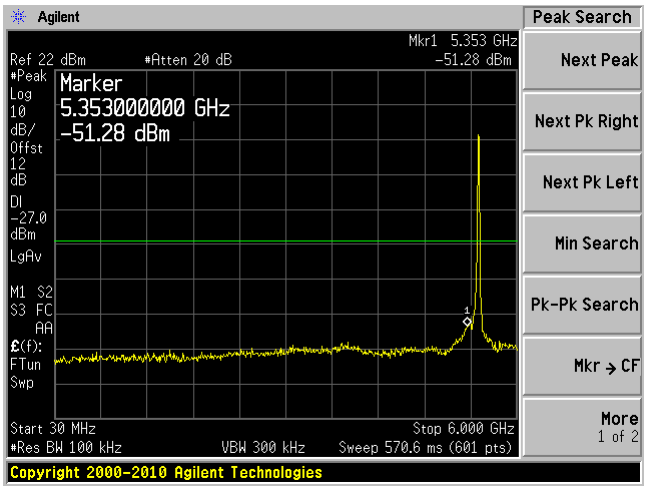

Chain J0, Plot: 5350MHz – 5460 MHz-Peak



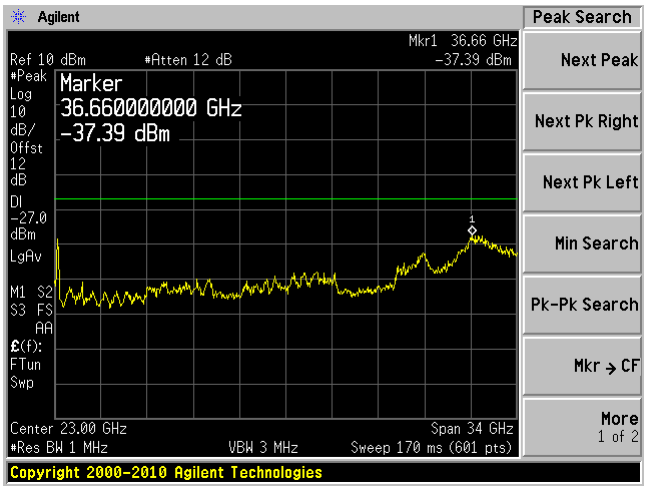

Chain J0, Plot: 5350MHz – 5460 MHz-Ave



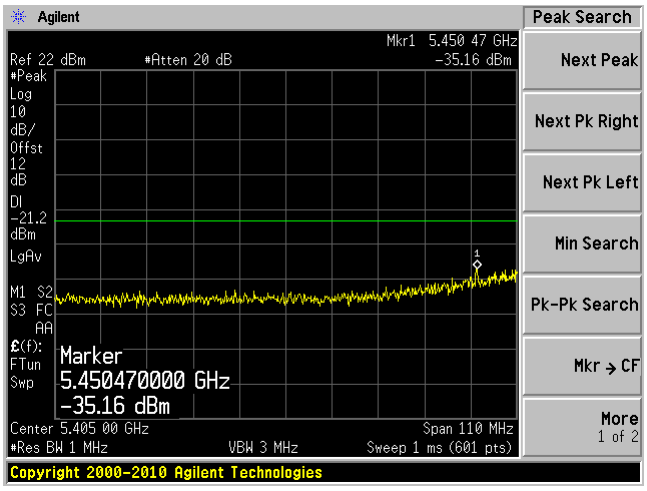
Chain J1, Plot: 30 MHz – 6 GHz



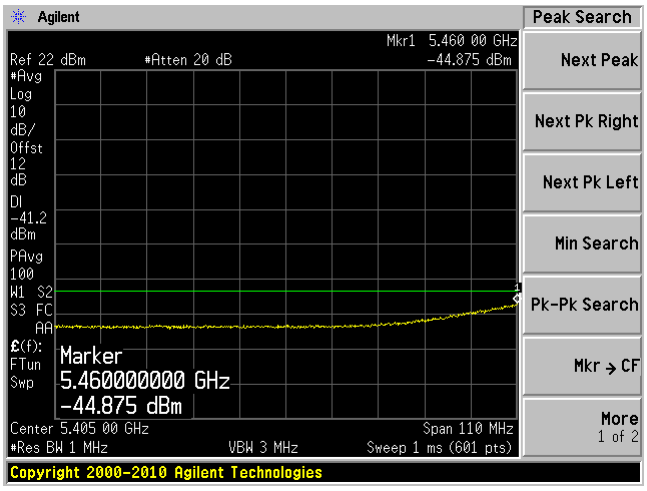

Chain J1, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 5350MHz – 5460 MHz-Peak

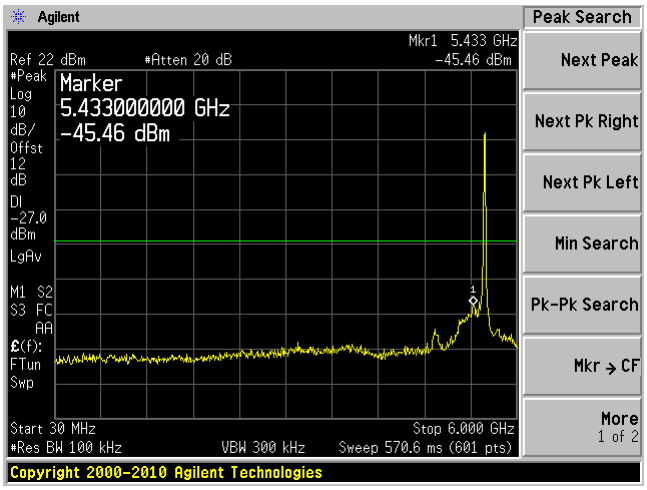



Chain J1, Plot: 5350MHz – 5460 MHz-Ave

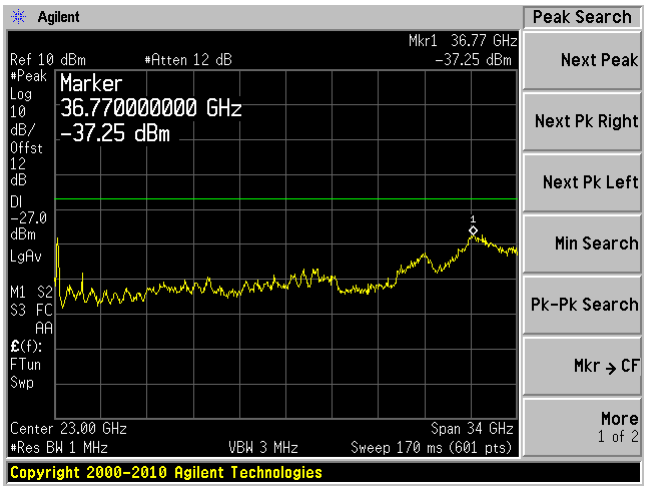


**802.11n-HT20, Middle Channel 5580 MHz**

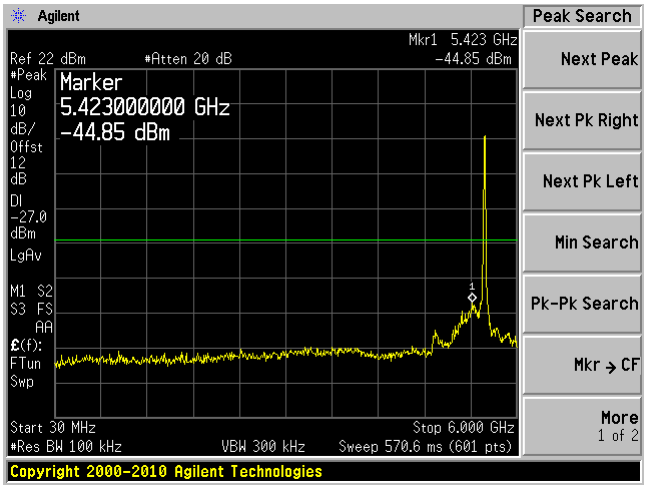
Chain J0, Plot: 30 MHz – 6 GHz



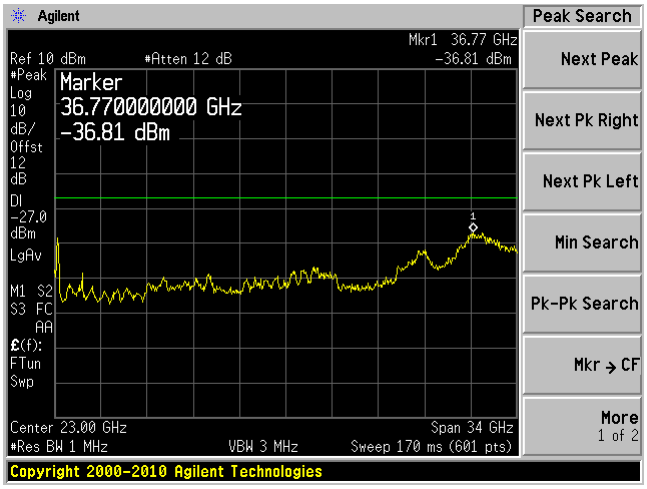

Chain J0, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 30 MHz – 6 GHz

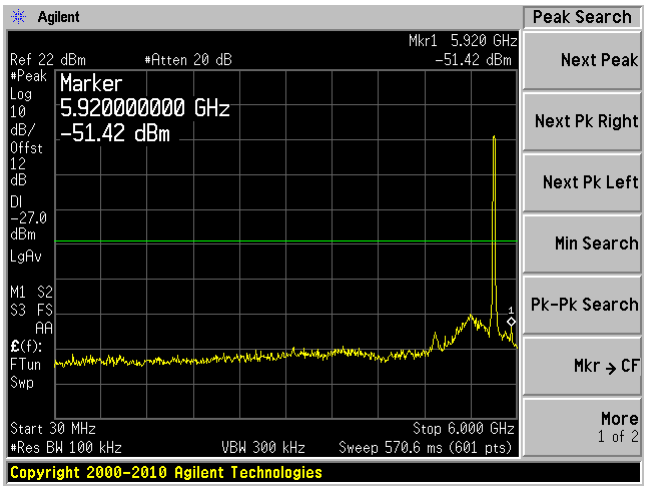



Chain J1, Plot: 6 GHz – 40 GHz

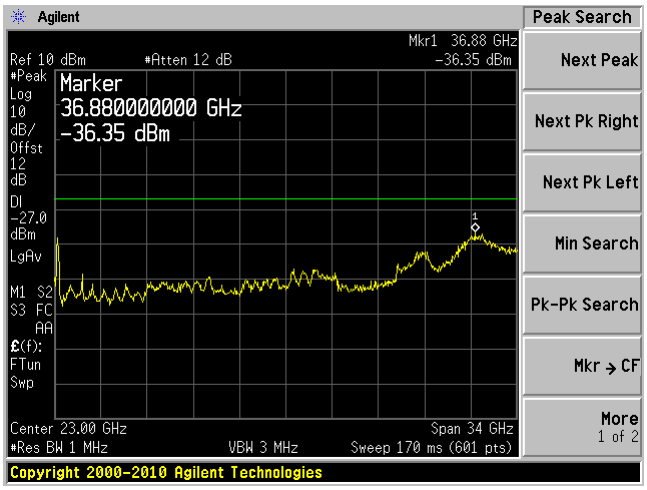


## 802.11n-HT20, High Channel 5700 MHz

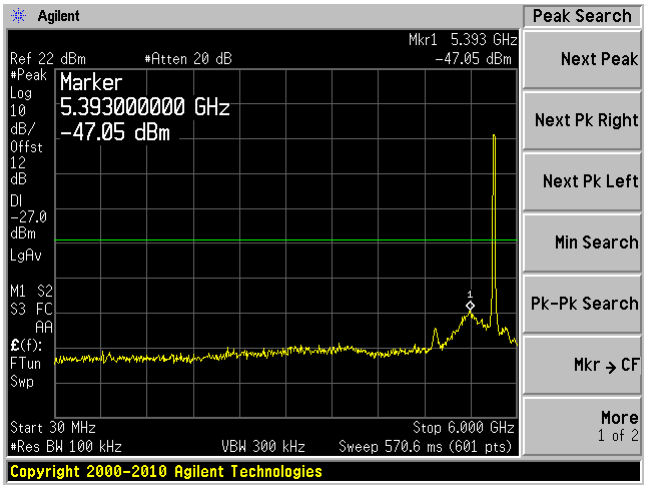
Chain J0, Plot: 30 MHz – 6 GHz



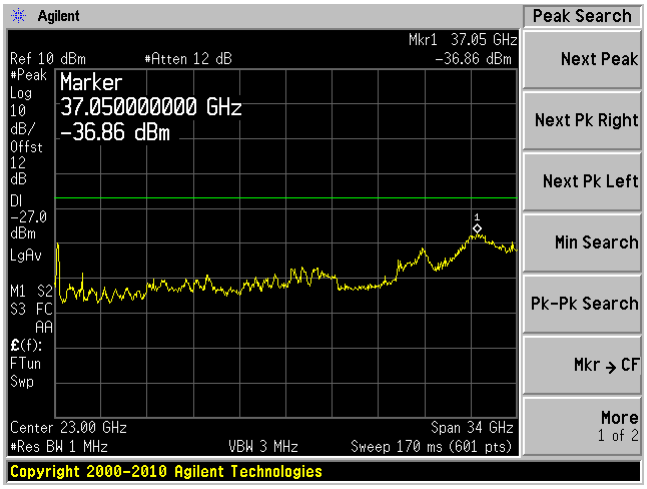

Chain J0, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 30 MHz – 6 GHz

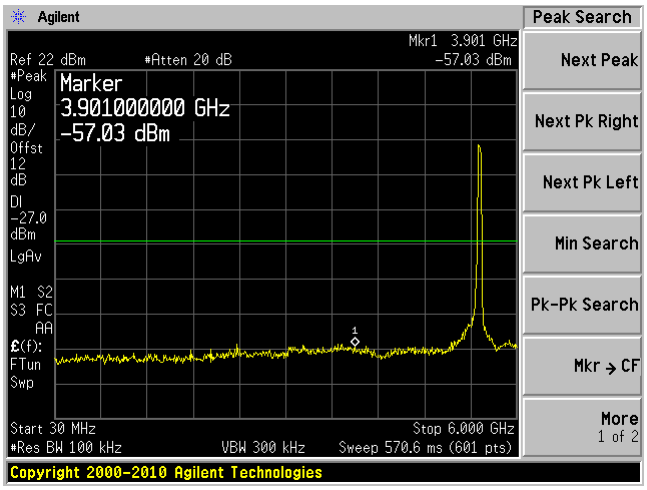



Chain J1, Plot: 6 GHz – 40 GHz

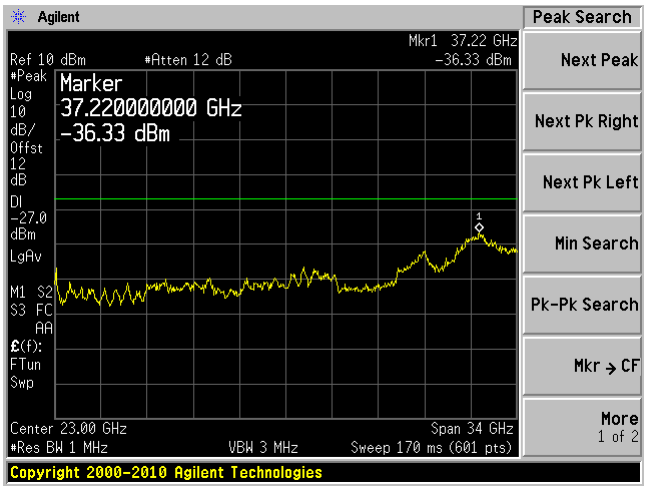


**802.11n-HT40, Low Channel 5510 MHz**

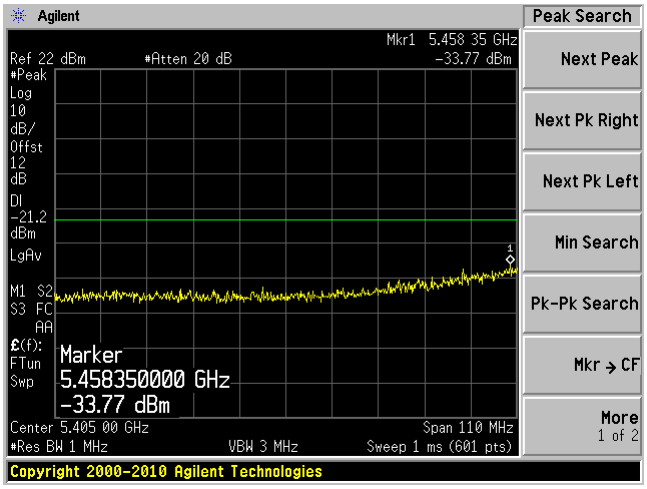
Chain J0, Plot: 30 MHz – 6 GHz



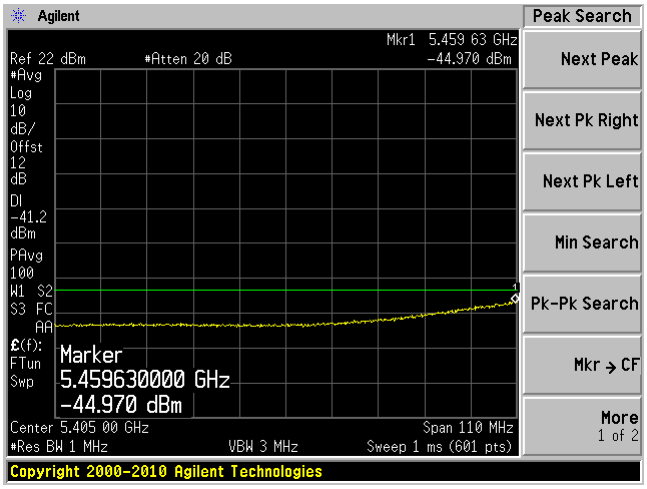

Chain J0, Plot: 6 GHz – 40 GHz



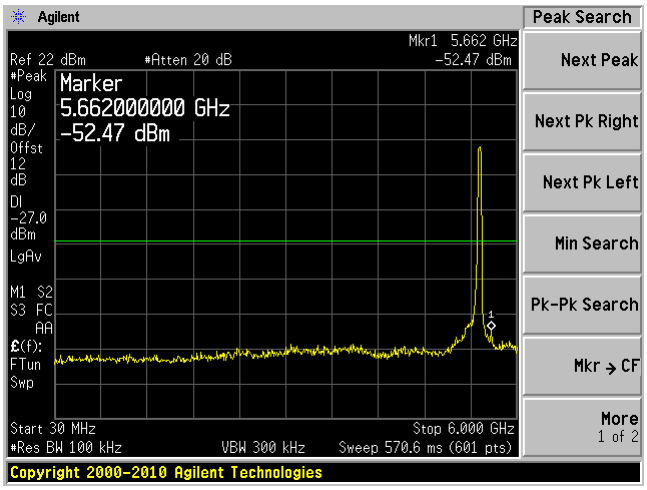

Chain J0, Plot: 5350MHz – 5460 MHz-Peak



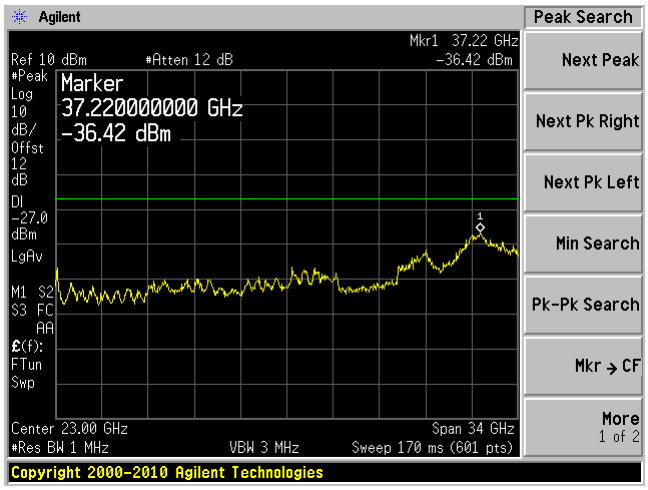

Chain J0, Plot: 5350MHz – 5460 MHz-Ave



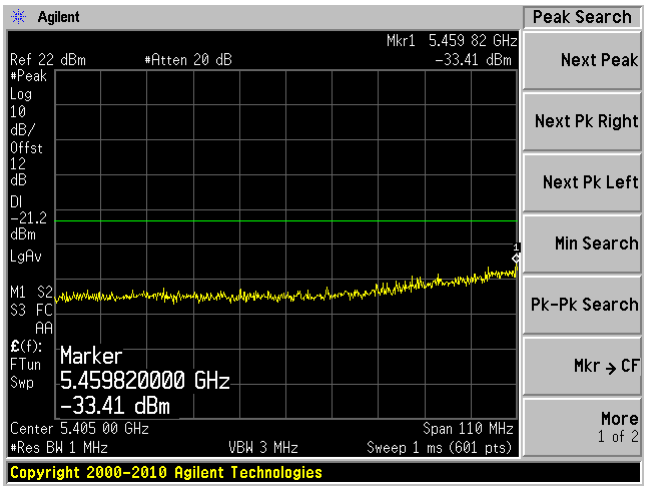
Chain J1, Plot: 30 MHz – 6 GHz



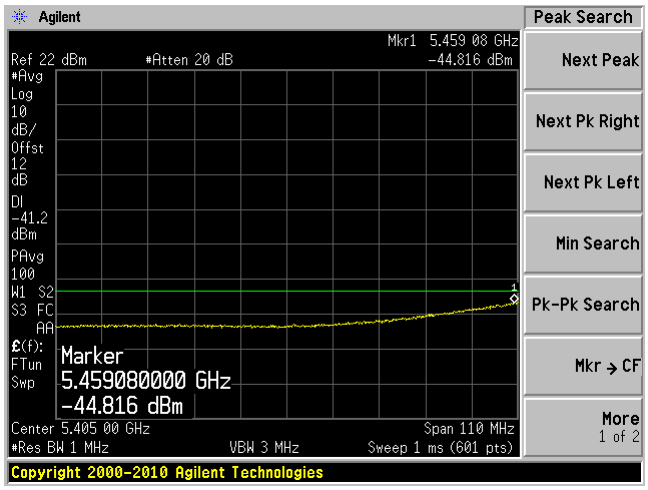

Chain J1, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 5350MHz – 5460 MHz-Peak

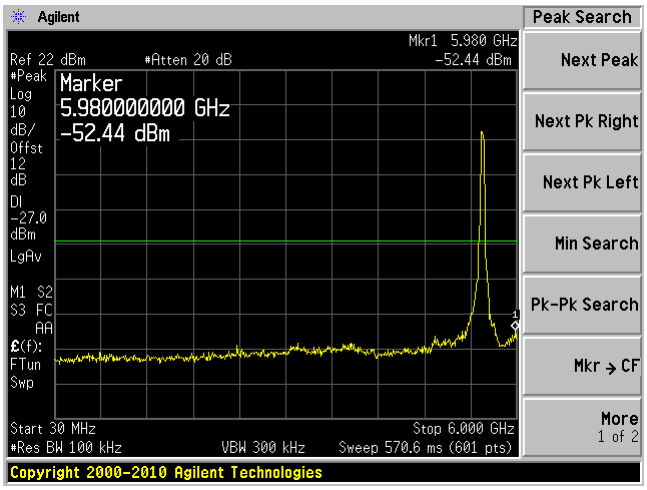



Chain J1, Plot: 5350MHz – 5460 MHz-Ave

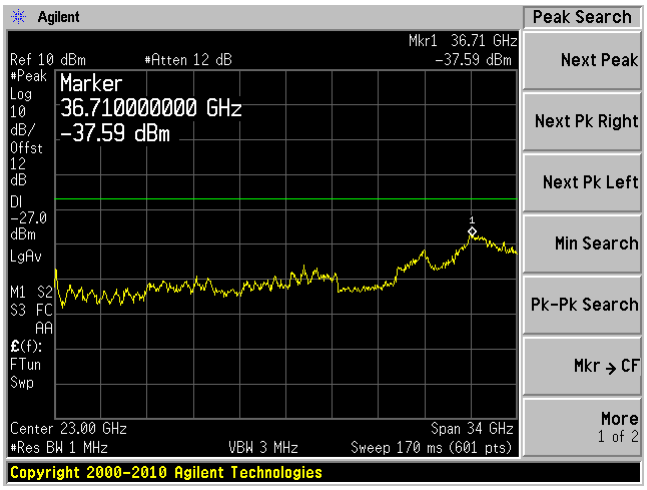


**802.11n-HT40, Middle Channel 5550 MHz**

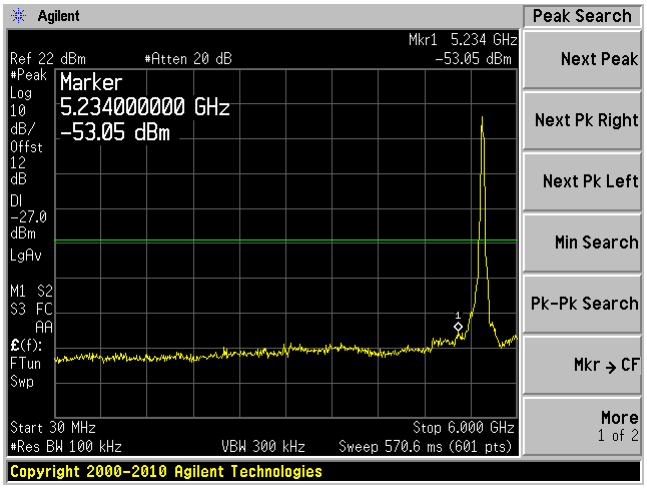
Chain J0, Plot: 30 MHz – 6 GHz



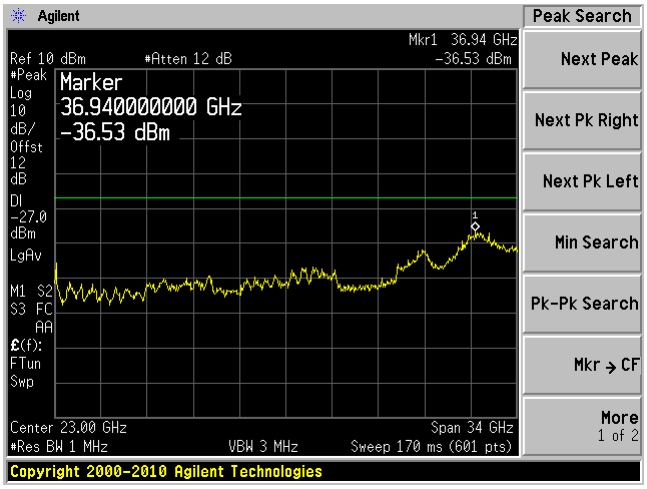

Chain J0, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 30 MHz – 6 GHz

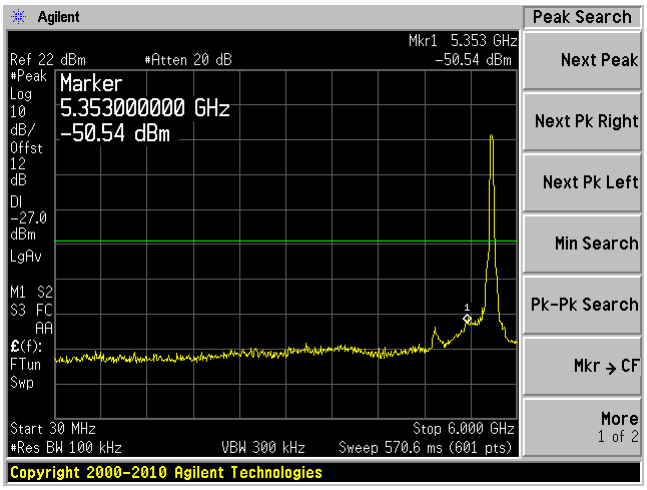



Chain J1, Plot: 6 GHz – 40 GHz

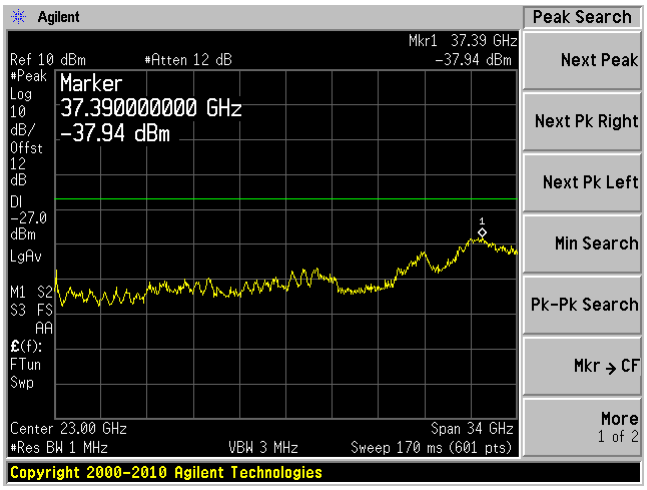


## 802.11n-HT40, High Channel 5670 MHz

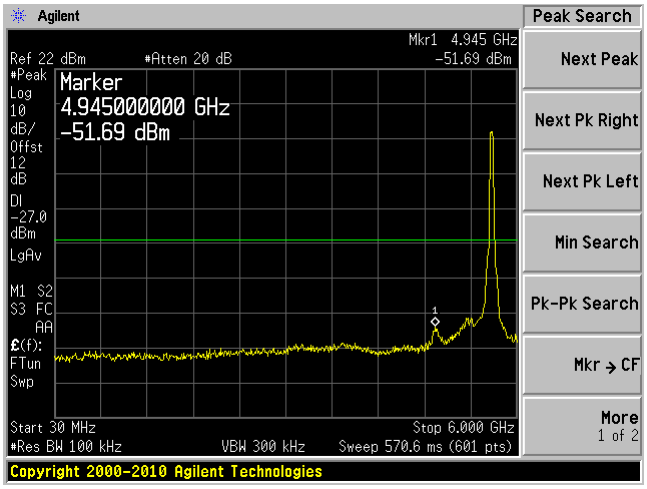
Chain J0, Plot: 30 MHz – 6 GHz



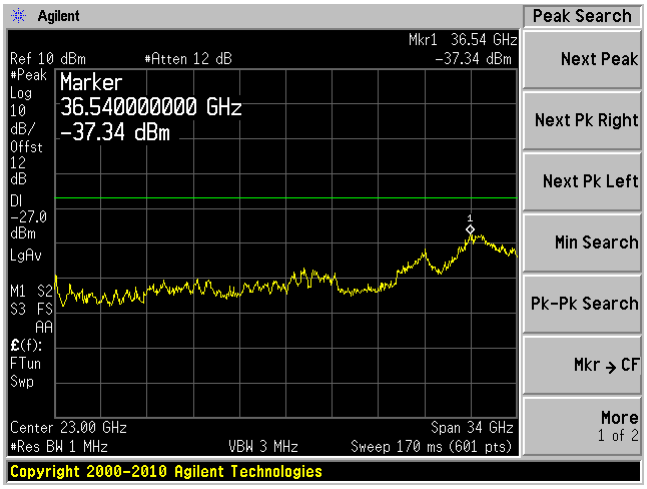

Chain J0, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 30 MHz – 6 GHz

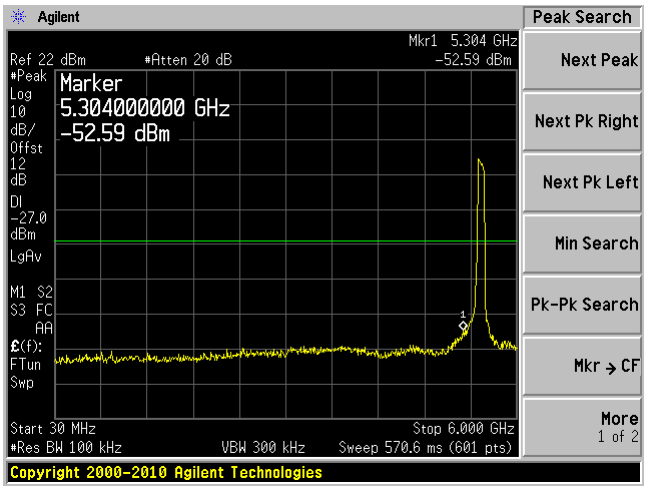



Chain J1, Plot: 6 GHz – 40 GHz

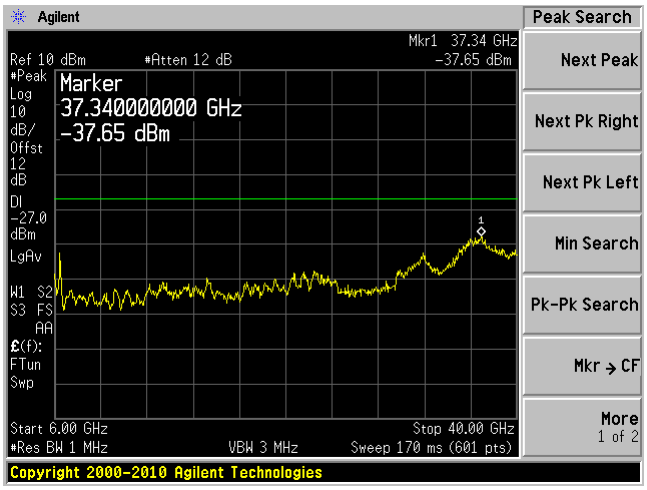


**802.11ac-80, Low Channel 5530 MHz**

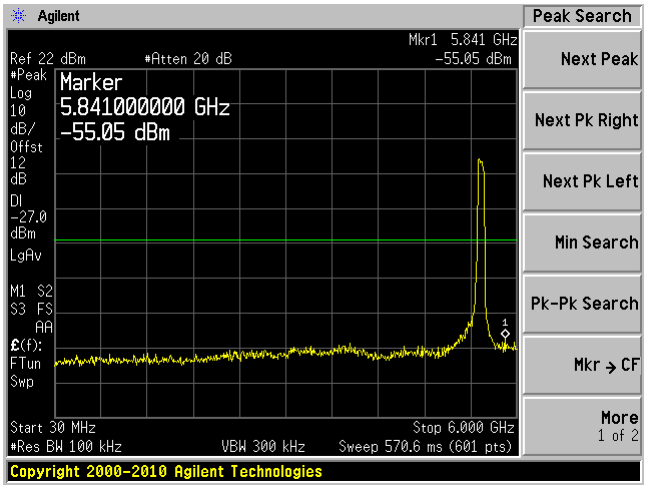
Chain J0, Plot: 30 MHz – 6 GHz



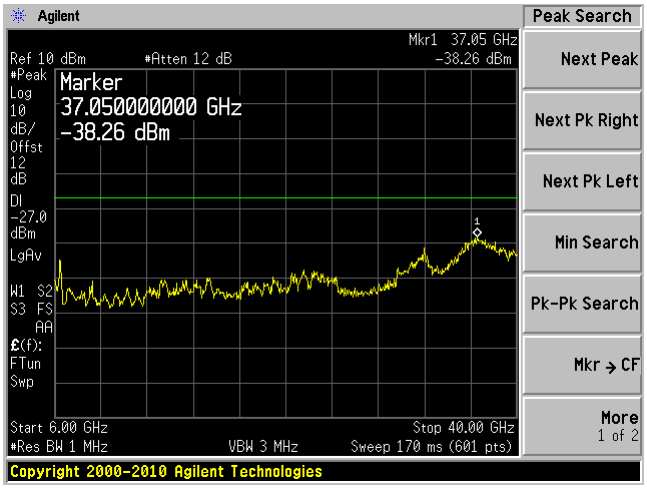

Chain J0, Plot: 6 GHz – 40 GHz



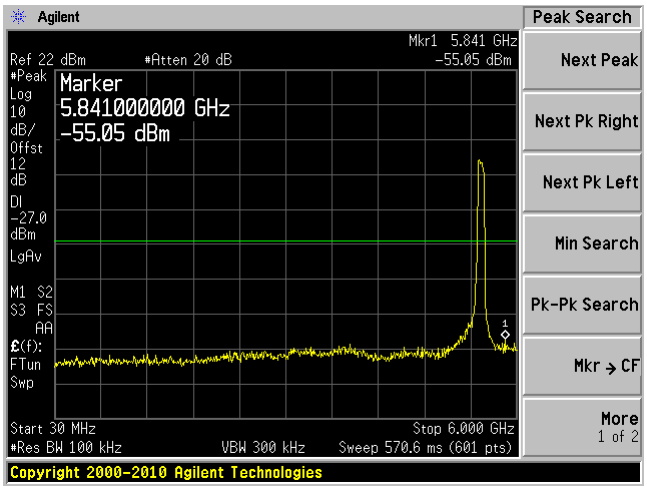

Chain J0, Plot: 5350MHz – 5460 MHz-Peak



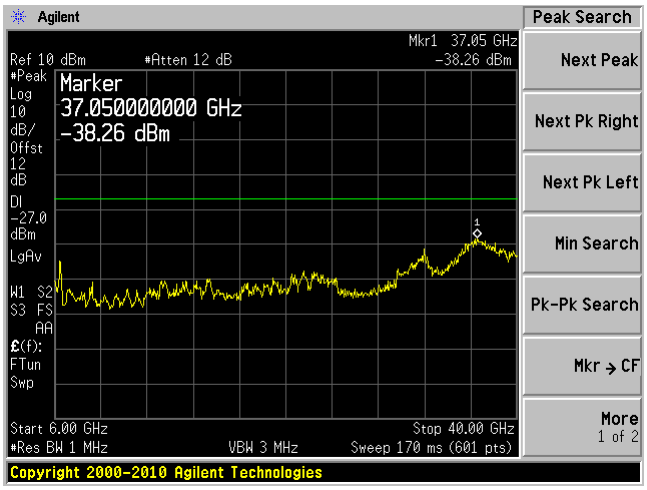

Chain J0, Plot: 5350MHz – 5460 MHz-Ave



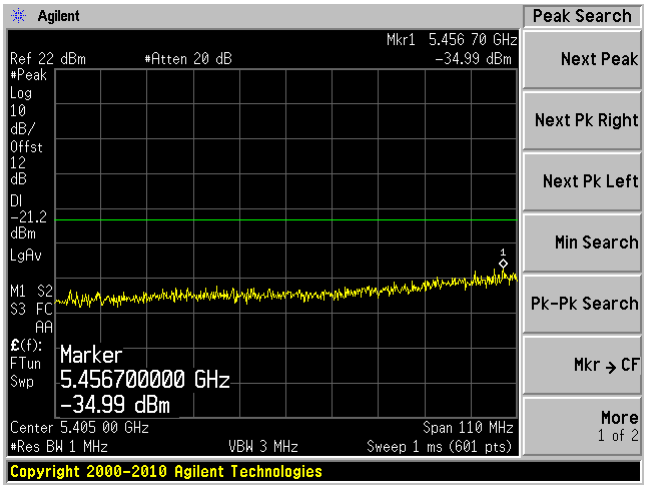
Chain J1, Plot: 30 MHz – 6 GHz



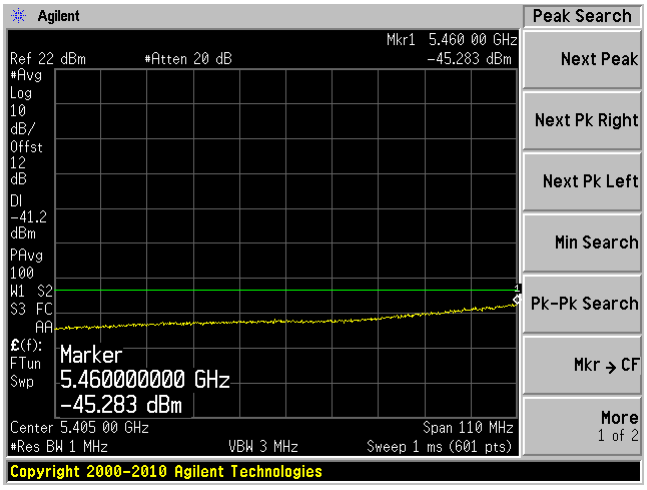

Chain J1, Plot: 6 GHz – 40 GHz




Chain J0, Plot: 5350MHz – 5460 MHz-Peak

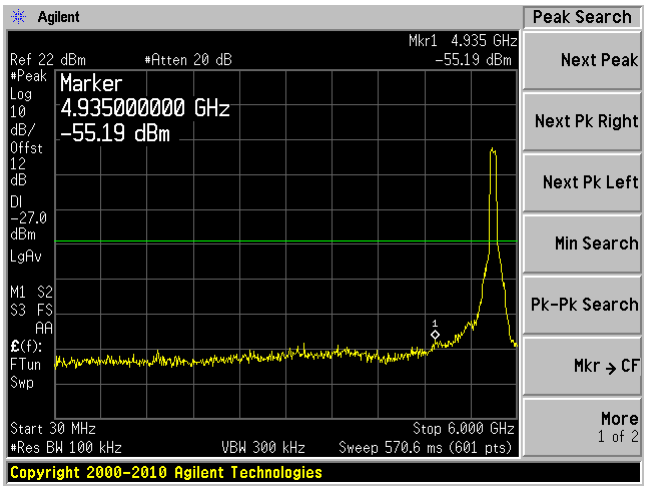



Chain J0, Plot: 5350MHz – 5460 MHz-Ave

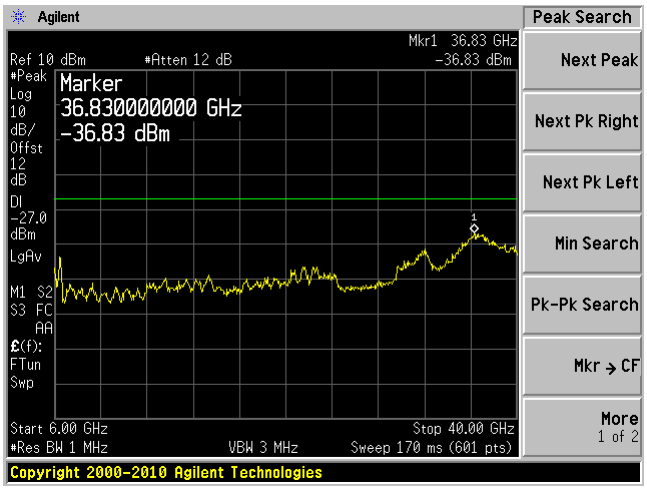


**802.11ac-80, High Channel 5690 MHz**

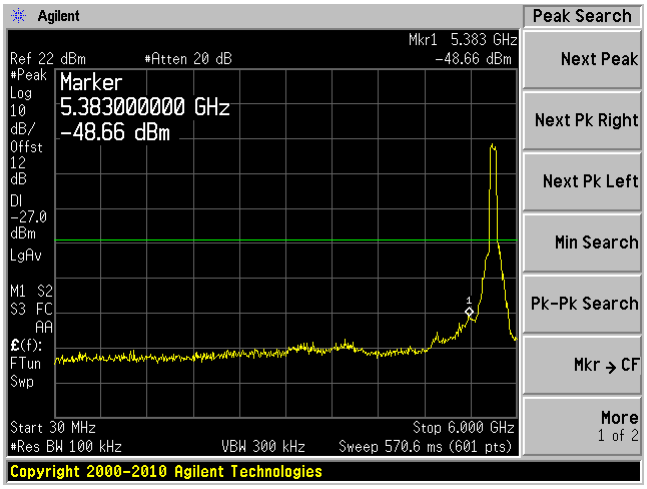
Chain J0, Plot: 30 MHz – 6 GHz




Chain J0, Plot: 6 GHz – 40 GHz




Chain J1, Plot: 30 MHz – 6 GHz




Chain J1, Plot: 6 GHz – 40 GHz