# Elite Pro S1200 Smart Thermostat

**Report #: 24003**

**FCC ID: HS9-THX1200WF01**

**IC: 573R-THX1200WF01**

**FCC 15.247**

**RSS-247 Issue 3**

**RSS-Gen Issue 5 + A1 + A2**

**2.4 GHz Infrared Motion Sensor**

**Issue Date: <2025-06-17>**

*Prepared by and for:*

**Resideo LLC.**

**2 Corporate Center Dr.**

**Suite 100 PO Box 9040**

**Melville, NY 11747**

**Testing**

**NVLAP Lab Code: 600110**

# REVISION HISTORY

| Revision Number | Prepared By | Reviewed By | Revision Detail | Release Date |
|---|---|---|---|---|
| 00 | Jose Badia | Christian Fouth | Original version | 05/30/2025 |
| 1.0 | Jose Badia | Christian Fouth | Updated Band edge data due to lower max power | 06/04/2025 |
| 2.0 | Jose Badia | Christian Fouth | - 99% OBW update<br>- Replaced 802.11b 11mbps CSE side antenna plot<br>- Replaced Max PSD Mid Channel Side antenna plots<br>- Replaced 802.11n HT40 mcs7 Low channel CBE plots | 06/11/2025 |
| 3.0 | Jose Badia | Christian Fouth | Removed the Duty Cycle section | 06/17/2025 |



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END OF REPORT .....105



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# ATTESTATION OF TEST RESULTS

**Company Name:** Resideo LLC., 2 Corporate Center Dr., Melville, NY 11747, USA
**EUT Description:** Smart Thermostat
**Model:** Elite Pro S1200
**Sample Number:** MEL-1175, MEL-1174
**Sample receipt date:** **04/16/2025**
**Last Date of test:** **06/11/2025**

**Standards**

| Specification | Method |
|---|---|
| CFR 47 Pt 15 Subpart C, Section 15.247:2023 | ANSI C63.10: 2013 |
| RSS-247 Issue 3 | |
| RSS-GEN Issue 5 +A1 +A2 | |

**Guidance**

FCC KDB 558074 V05R02:2019

***Resideo LLC. tested the above equipment in accordance with the requirements set forth in the listed standards. All indications of Pass/Fail in the report are opinions expressed by Resideo LLC. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.***

***This document is a record of the FCC/ISED Test Report for Resideo LLC. products. It demonstrates the data required to be analyzed to certify a product according to the requirements of the FCC & ISED.***

***The results in the report reflect only the tested samples, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only.***

***This document may not be altered or revised in any way unless done so by Resideo LLC. and all revisions are duly noted in the revisions section. Any alterations of this document not carried out by Resideo LLC. will constitute fraud and shall nullify the document.***

***Resideo LLC. is the legal entity name for Honeywell Home / Resideo. All three names can be used interchangeably within this test report.***

**Report Prepared By:**

Jose Badia

Name: Jose Badia
Title: Regulatory Certification Engineer
Resideo LLC.

**Reviewed & Approved By:**

Christian Fouth

Name: Christian Fouth
Title: Sr. Wireless Certification Engineer
Resideo LLC.



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# TEST RESULT SUMMARY

| Test Description | Result | FCC Section (s) | RSS Section (s) | Comments |
|---|---|---|---|---|
| Emissions Bandwidth (6dB) | Pass | 15.247 | RSS-247 5.2 | |
| Occupied Bandwidth (99%) | Evaluated | 15.247 | RSS-Gen 6.7 | There is no compliance requirement for this test |
| Output Power | Pass | 15.247 | RSS-247 5.4 | |
| Power Spectral Density | Pass | 15.247 | RSS-247 5.2 | |
| Spurious Conducted Emissions | Pass | 15.247 | RSS-247 5.5 | |
| Band Edge Compliance | Pass | 15.247 | RSS-247 5.5 | |

## Deviations from test standard

None



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# ACCREDITATIONS AND AUTHORIZATIONS

| USA |
| --- |
| **FCC** - test site and measurement facility used to collect data are located at 2 Corporate Center Dr., Melville, NY 11747, USA. Resideo LLC. is accredited by **NVLAP, Laboratory Code 600110-0**. The full scope of accreditation can be viewed at the NVLAP website.<br>**Designation Number: US5344** |
| **Canada** |
| **ISED** - test site and measurement facility used to collect data are located at 2 Corporate Center Dr., Melville, NY 11747, USA. Resideo LLC. is accredited by **NVLAP, Laboratory Code 600110-0**. The full scope of accreditation can be viewed at the NVLAP website.<br>**CAB Identifier: US0242** |



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# MEASUREMENT UNCERTAINTY

The measuring equipment utilized to perform the tests documented in this report have been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Parameter | Uncertainty (+/-) |
|---|---|
| Frequency Accuracy | 0.0007 |
| Amplitude Accuracy (dB) | 1.2 |
| Conducted Power (dB) | 1.2 |
| Temperature (°C) | 0.7 |
| Humidity (% RH) | 2.5 |
| DC Supply Voltages | 0.7 |
| AC Supply Voltages | 1 |

*Uncertainty figures are valid to a confidence level of 95%.*



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# Test Setup Block Diagrams

## Measurement Bandwidths

| Frequency Range (MHz) | Peak Data (kHz) | Quasi-Peak Data (kHz) | Average Data (kHz) |
|---|---|---|---|
| 0.01 – 0.15 | 1.0 | 0.2 | 0.2 |
| 0.15 – 30.0 | 10.0 | 9.0 | 9.0 |
| 30.0 - 1000 | 100.0 | 120.0 | 120.0 |
| Above 1000 | 1000.0 | N/A | 1000.0 |

*Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used*

## Antenna Port Conducted Measurements

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## Sample Calculation

Where relevant, the following sample calculation is provided:

Conducted Emissions:

Adjusted Level (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Transducer Factor (dB)

# EQUIPMENT UNDER TEST

## Test Item Description

The THX1200WF01 is a Redlink, Wi-Fi, BLE (Bluetooth Low Energy), and Radar enabled thermostat operating in the, 900MHz, 2.4GHz, 5Ghz ISM band and 60GHz band for Radar.

This report covers only the 802.11 b/g/n 2.4 GHz portion of the device.

## Test Sample Identification

| Sample ID Number | Date Received |
|---|---|
| MEL-1175 (Antenna port testing) | 04/16/2025 |
| MEL-1174 (Conducted AC Line testing) | 04/16/2025 |

## Worst-Case Configuration & Mode

Testing was performed with the EUT set to transmit at the low/middle/high channels with the output power settings shown in the Power Setting section of this report.

## Antenna description

| Antenna | Type | Frequency Range (MHz) | Gain (dBi) |
|---|---|---|---|
| Side Antenna | PCB | 2412 - 2462 | 2.4 |
| Top Antenna | PCB | 2412 - 2462 | 1.3 |



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## Test & Measurement Equipment

The following test and measurement equipment was utilized for the tests documented in this report:

**Equipment List**

| Instrument Type | ID # | Serial # | Manufacturer | Model | Cal Date | Cal Due Date |
|---|---|---|---|---|---|---|
| RF Lab (Power & Antenna Port Measurements) | | | | | | |
| Spectrum Analyzer | 11549 | MY46187211 | Agilent | E4440A | 3/5/2024 | 3/5/2026 |
| Power Sensor | 11568 | 105317 | Rohde & Schwarz | NRP-Z81 | 11/3/2023 | 11/3/2025 |
| Attenuator | - | 1624 | Pasternack | PE7087-6 | 03/25/2025 | 03/25/2026 |
| Misc. | | | | | | |
| Measurement Software | 11543 | Version 9.5 | UL | UL EMC | N/A | N/A |
| Environmental Meter | 11548 | A078188 | Extech Instruments | SD700 | 3/29/2024 | 3/31/2027 |

*-Passive devices & Preamps are characterized in-house, not calibrated.



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# ANTENNA PORT MEASUREMENTS

## 6dB Emission Bandwidth (DTS Bandwidth)

### Test Description

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Refer to KDB 558074 D01 15.247 Meas Guidance v05.

### Test Criteria

| Reference | Method | Limit |
|---|---|---|
| CFR 47 Subpart C 15.247 (a)(2)<br>RSS-247 Section 5.2 (a) | ANSI C63.10:2013 | ≥ 500kHz |

### Test Information

| Tester | Test Location | Date | Temperature (ºC) | Humidity (%RH) | Pressure (mbar) | Results (P/F) |
|---|---|---|---|---|---|---|
| Jose Badia | RF Lab | 5/15/2025 | 23.33 | 51 | 1021.0 | P |

### Test Results

### 802.11b – 1Mbps

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 10.13 | 10.12 |
| Mid | 2437 | 10.12 | 10.10 |
| High | 2462 | 10.11 | 10.09 |

### 802.11b – 11Mbps

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 10.47 | 10.39 |
| Mid | 2437 | 10.44 | 10.47 |
| High | 2462 | 10.63 | 10.34 |



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### 802.11g – 6Mbps

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 16.41 | 16.41 |
| Mid | 2437 | 16.44 | 16.41 |
| High | 2462 | 16.44 | 16.48 |

### 802.11g – 36Mbps

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 16.55 | 16.52 |
| Mid | 2437 | 16.51 | 16.53 |
| High | 2462 | 16.52 | 16.55 |

### 802.11g – 54Mbps

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 16.51 | 16.49 |
| Mid | 2437 | 16.46 | 16.51 |
| High | 2462 | 16.48 | 16.53 |

### 802.11n HT20 – msc0

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 17.60 | 17.59 |
| Mid | 2437 | 17.59 | 17.61 |
| High | 2462 | 17.51 | 17.59 |

### 802.11n HT20 – msc7

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 17.70 | 17.69 |
| Mid | 2437 | 17.74 | 17.71 |
| High | 2462 | 17.69 | 17.73 |



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## 802.11n HT40 – msc0

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2422 | 35.97 | 35.91 |
| Mid | 2437 | 36.04 | 36.08 |
| High | 2452 | 36.34 | 36.23 |

## 802.11n HT40 – msc7

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2422 | 36.39 | 36.43 |
| Mid | 2437 | 36.43 | 36.41 |
| High | 2452 | 36.46 | 36.43 |



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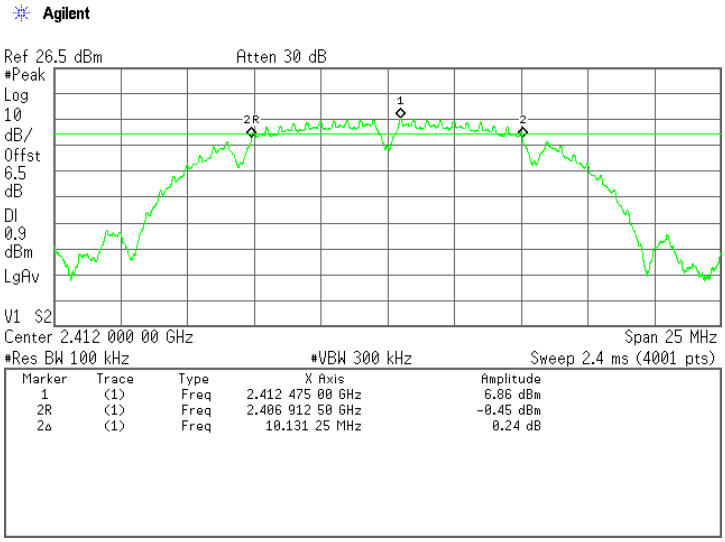
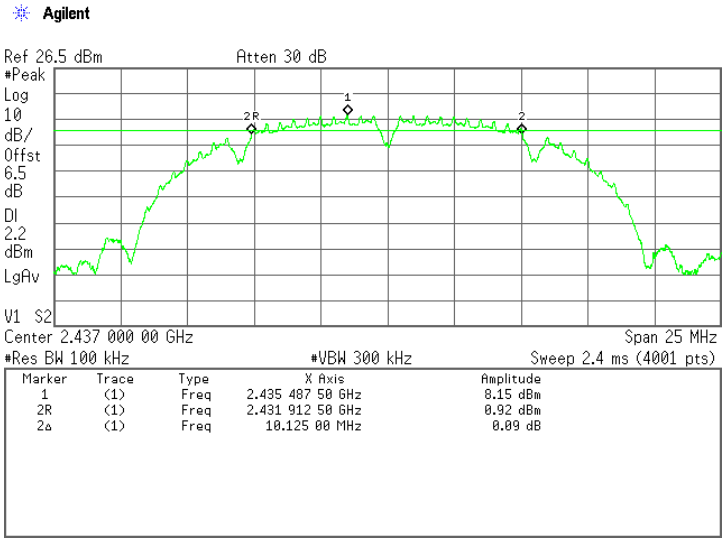
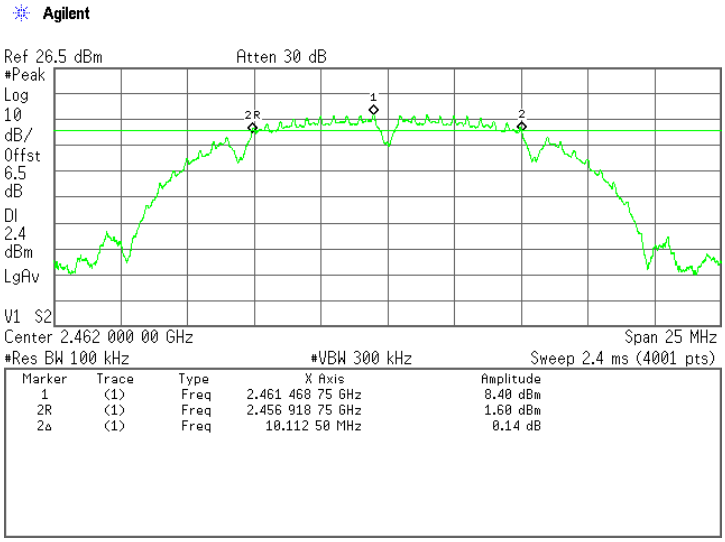
## 802.11b 1Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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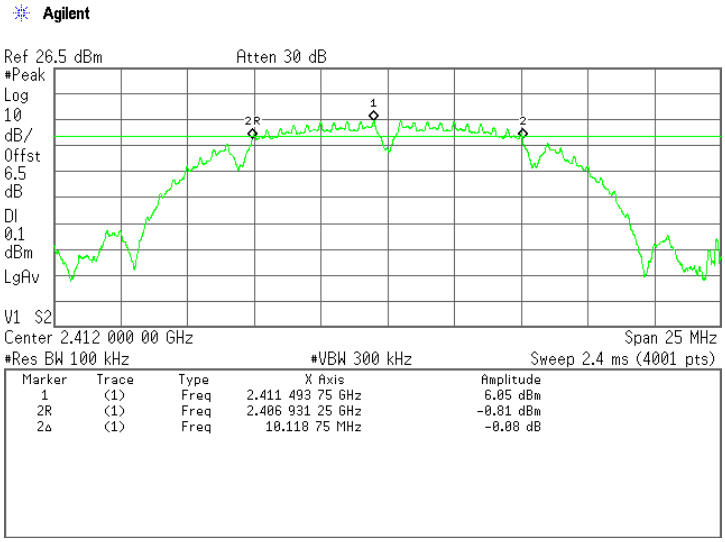
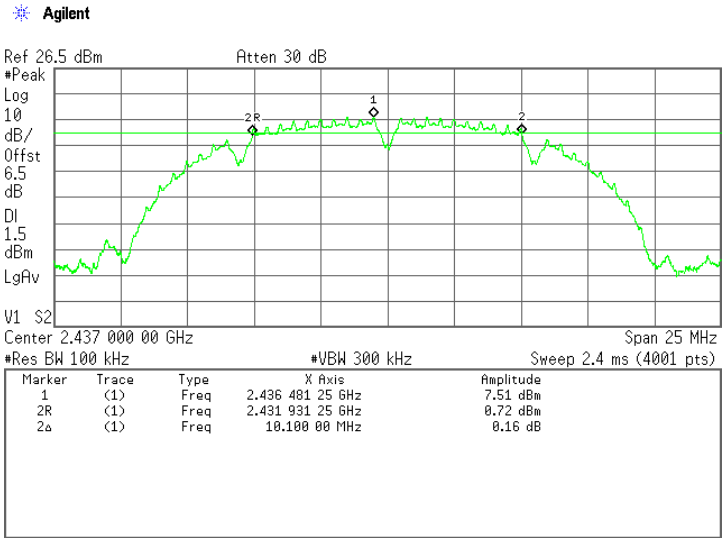
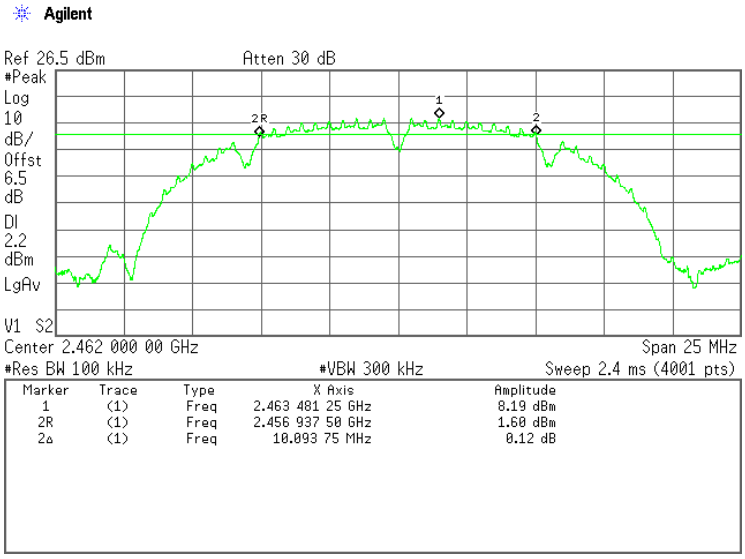
## 802.11b 1Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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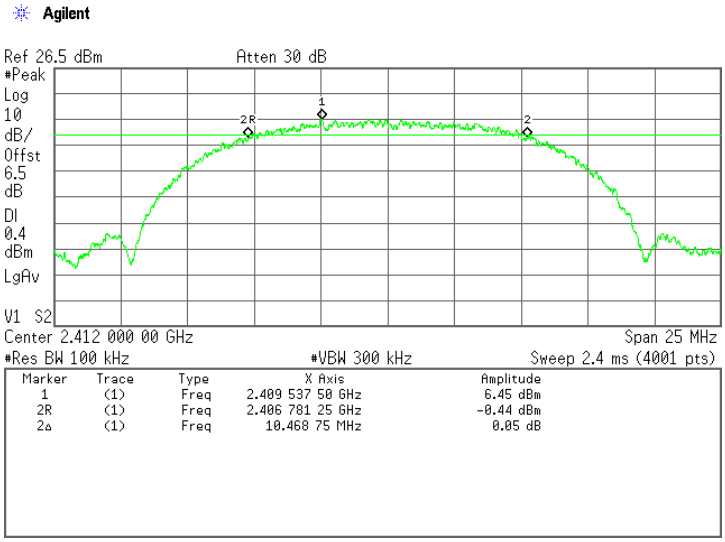
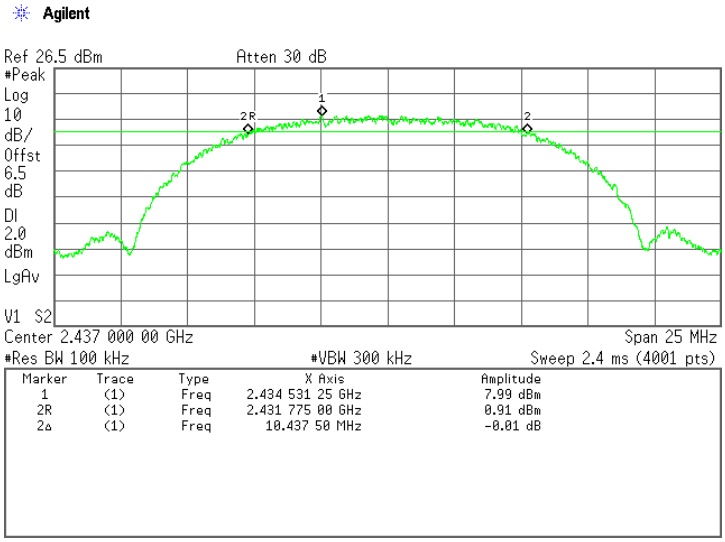
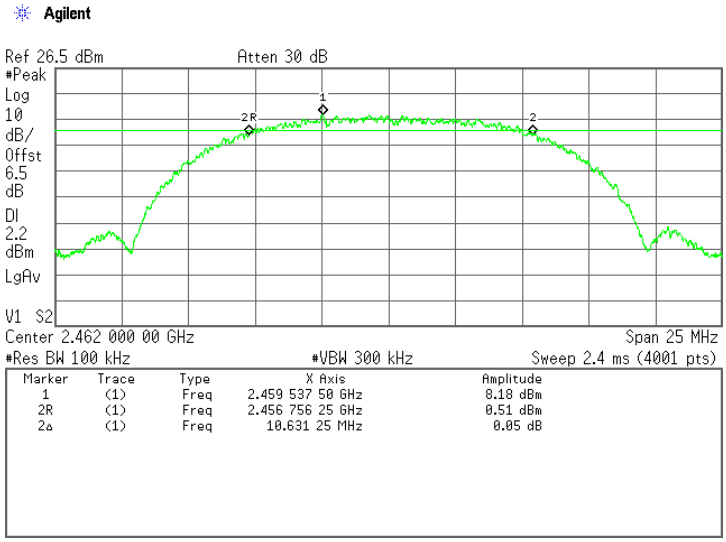
## 802.11b 11Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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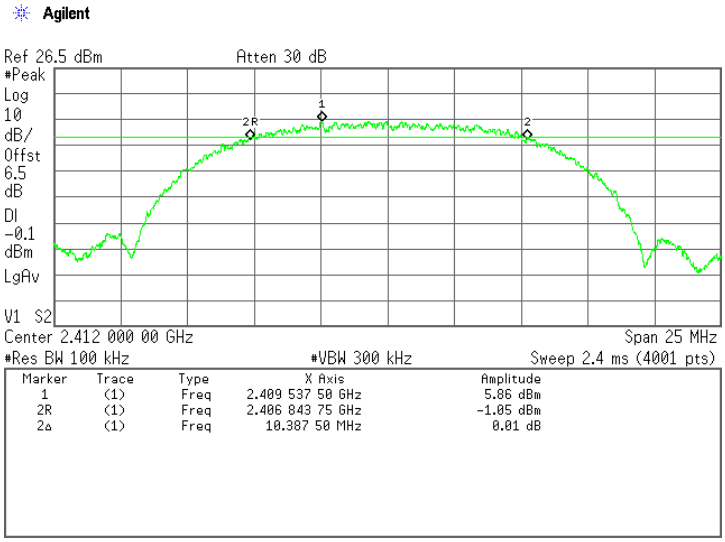
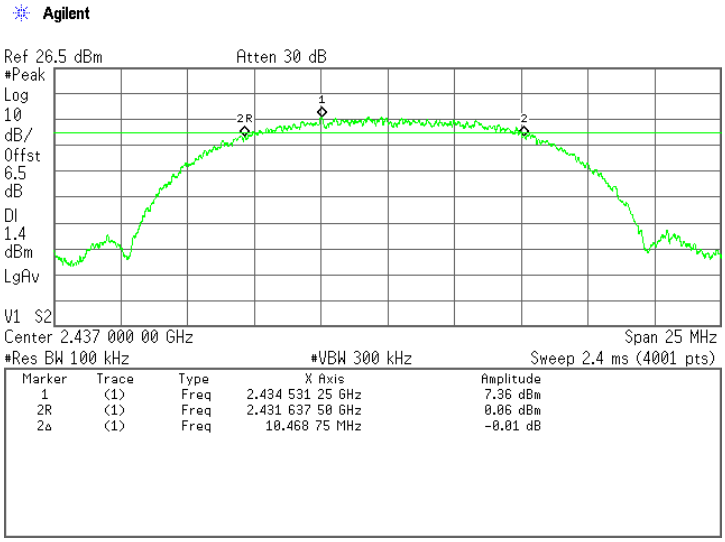
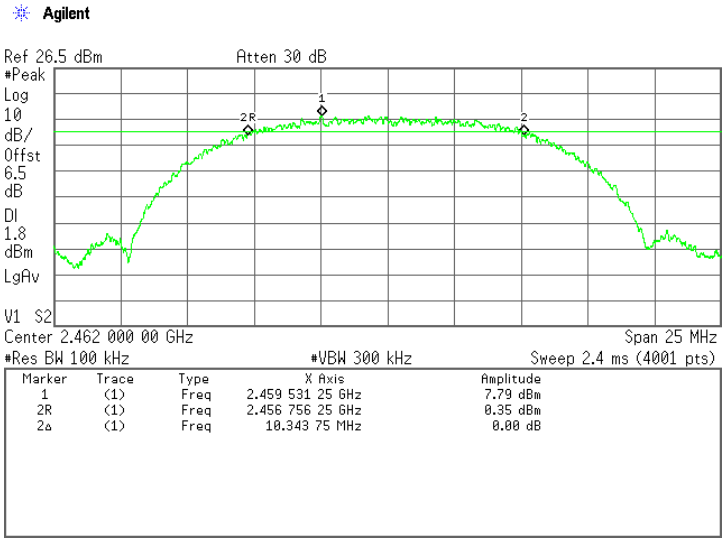
## 802.11b 11Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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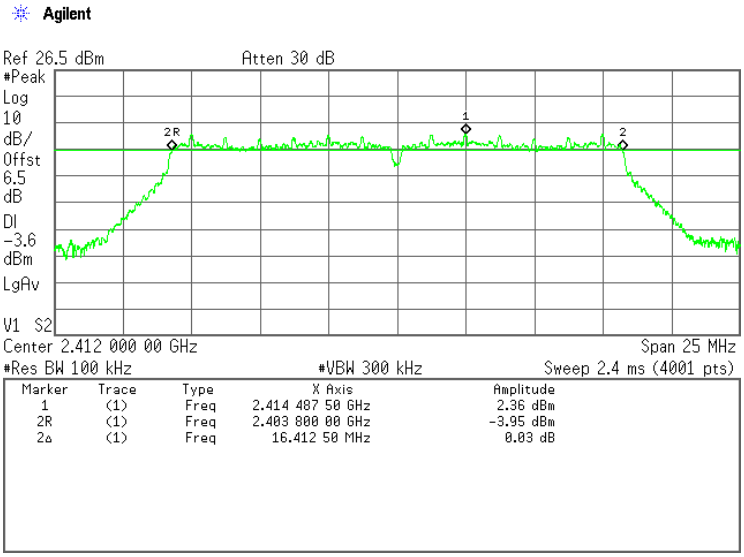
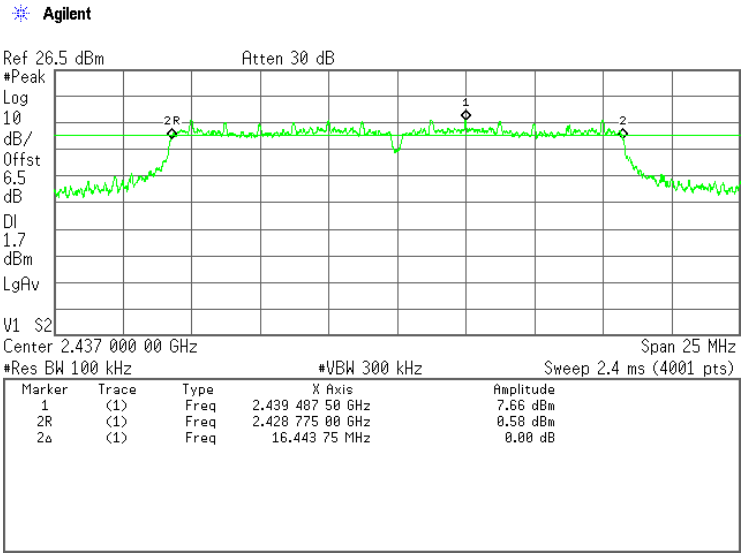
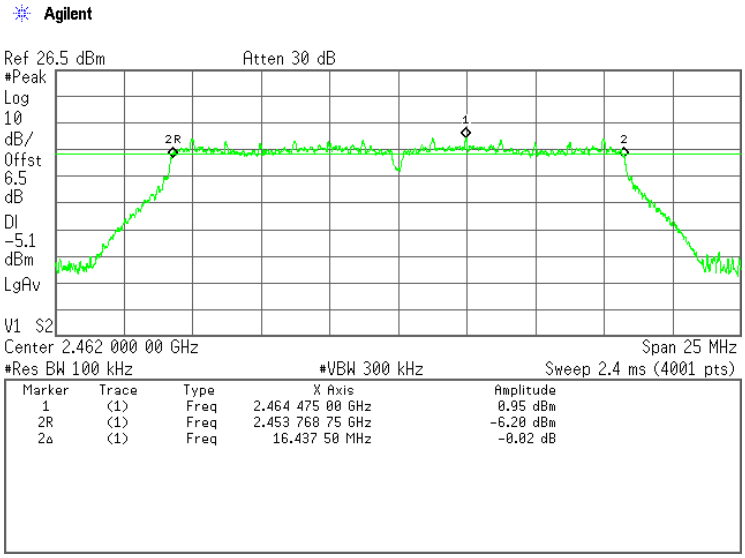
## 802.11g 6Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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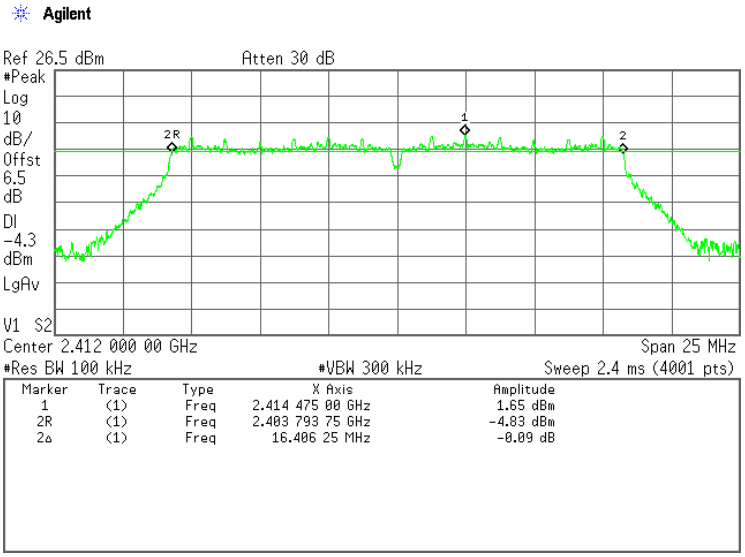
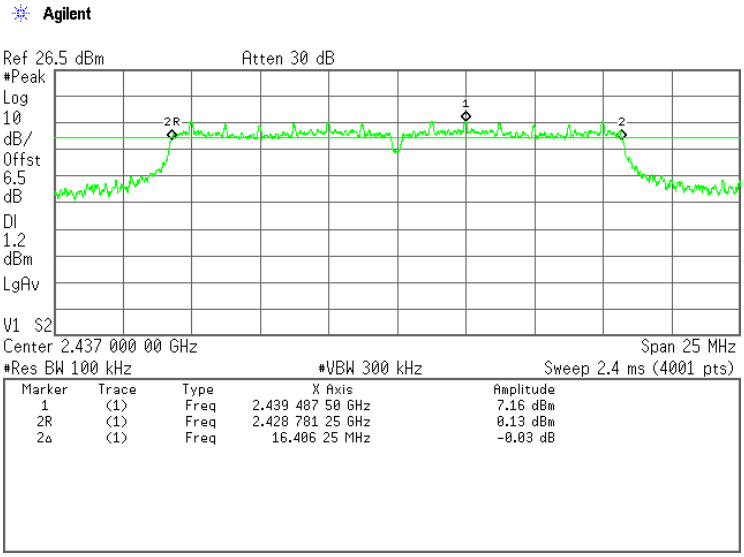
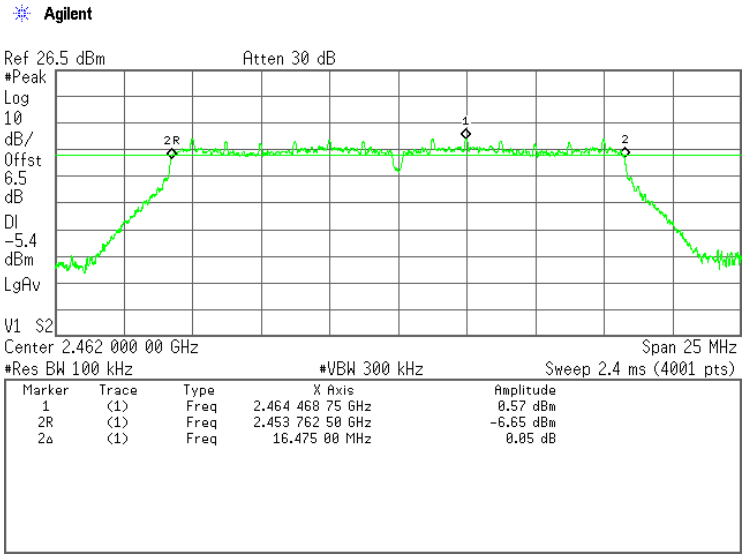
## 802.11g 6Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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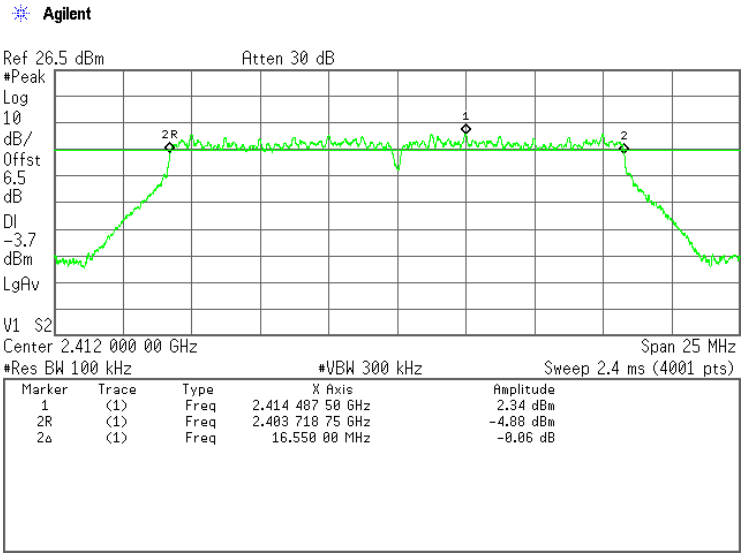
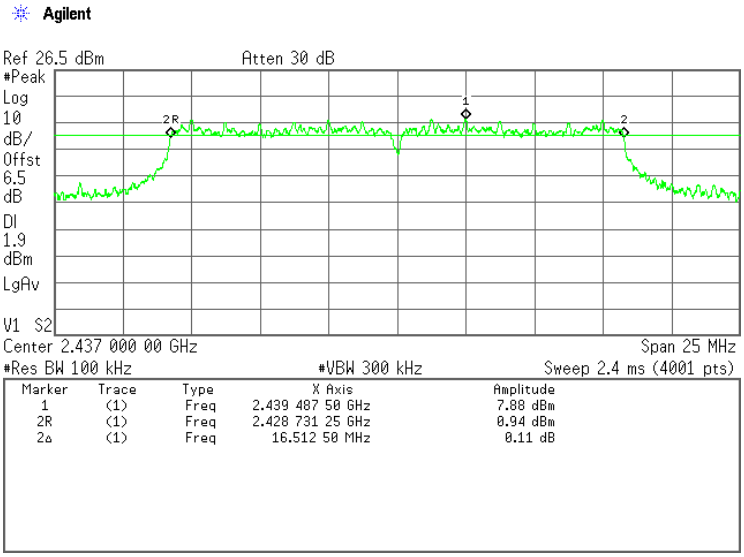
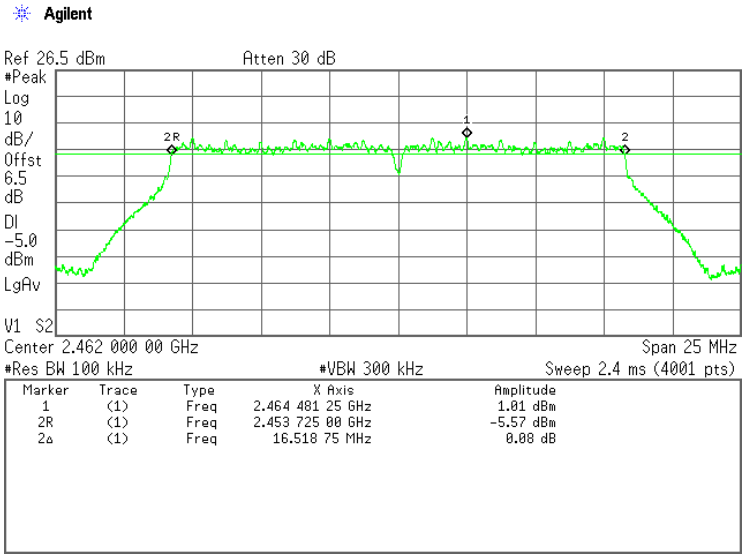
## 802.11g 36Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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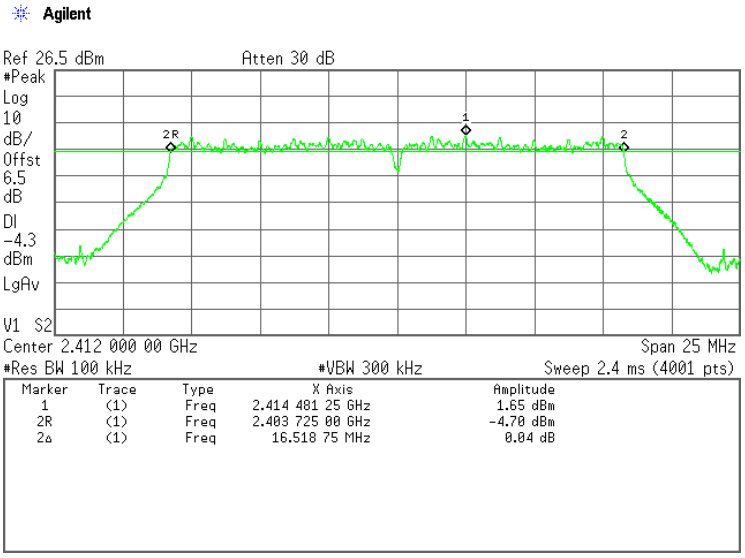
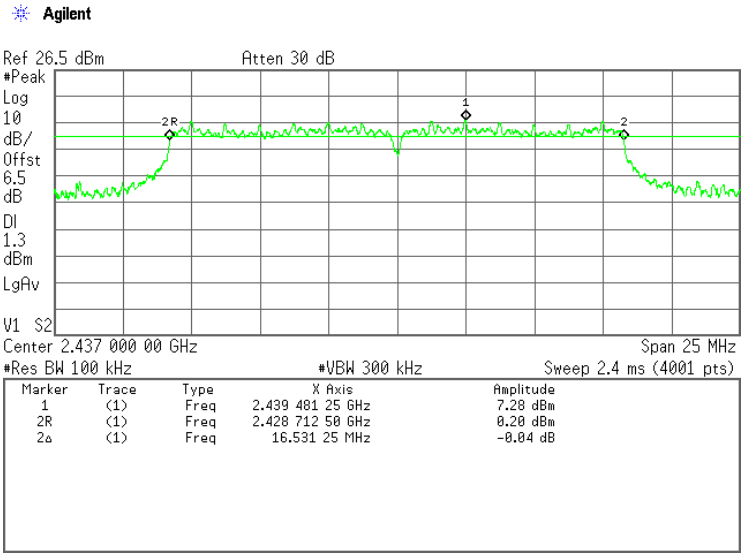
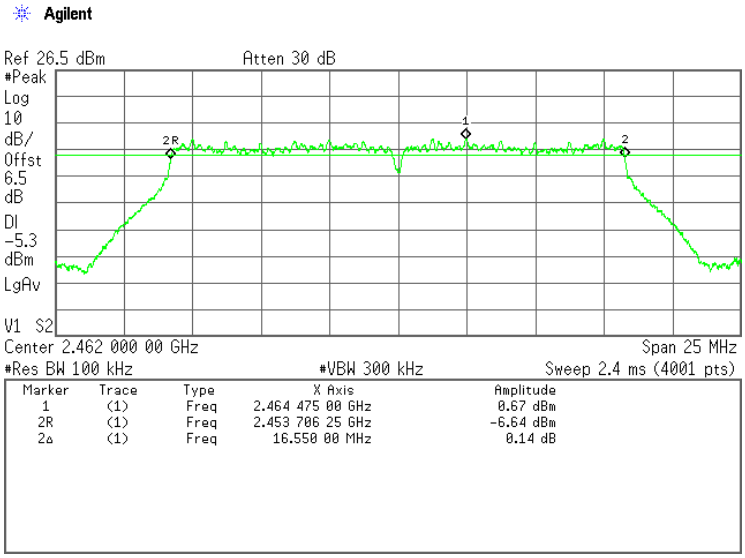
## 802.11g 36Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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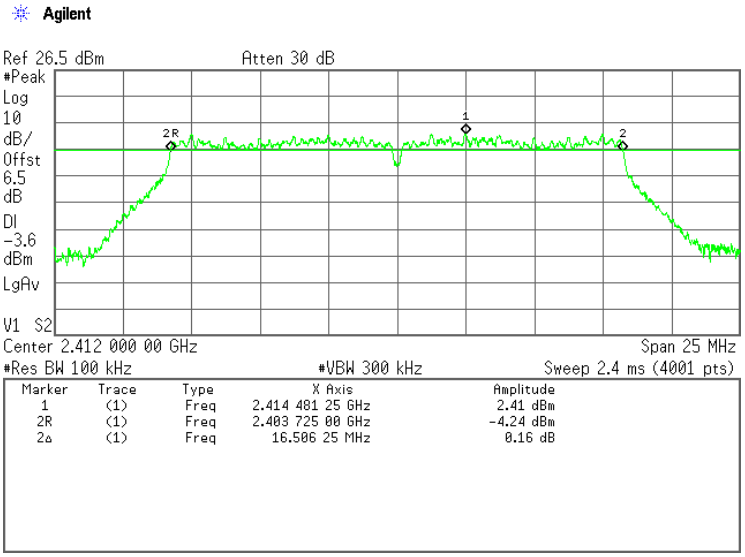
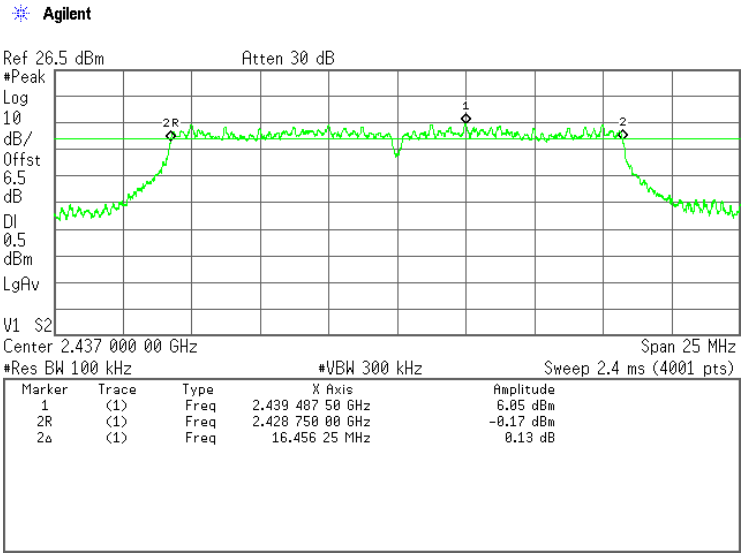
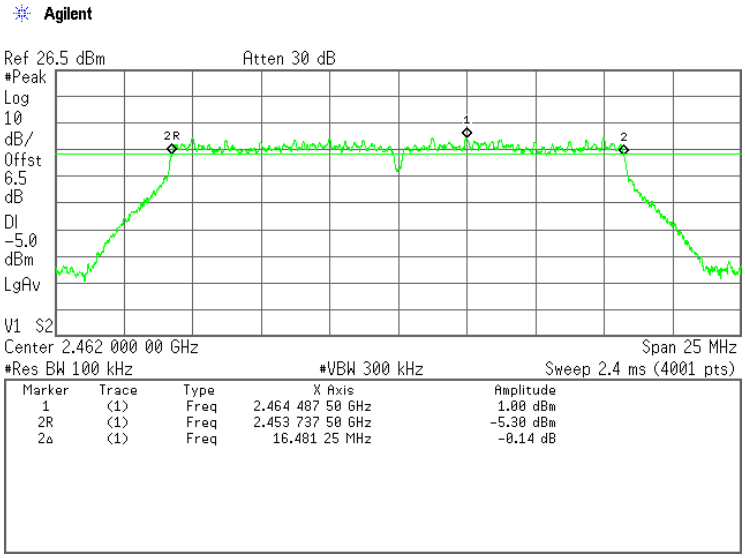
## 802.11g 54Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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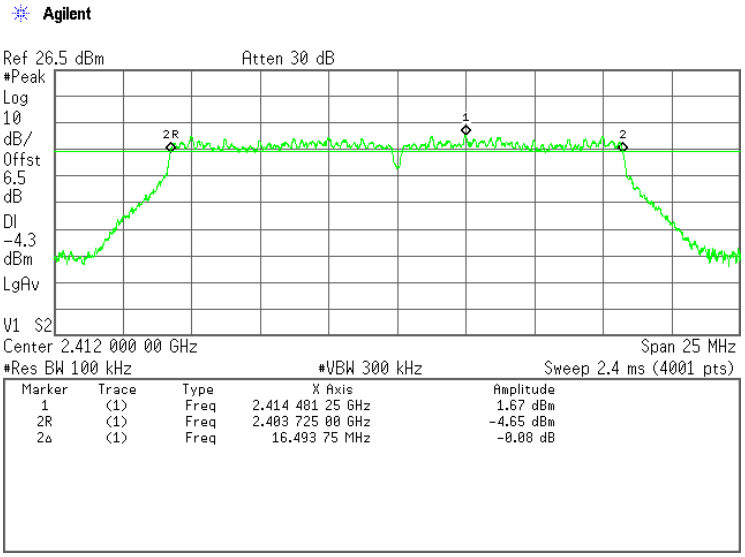
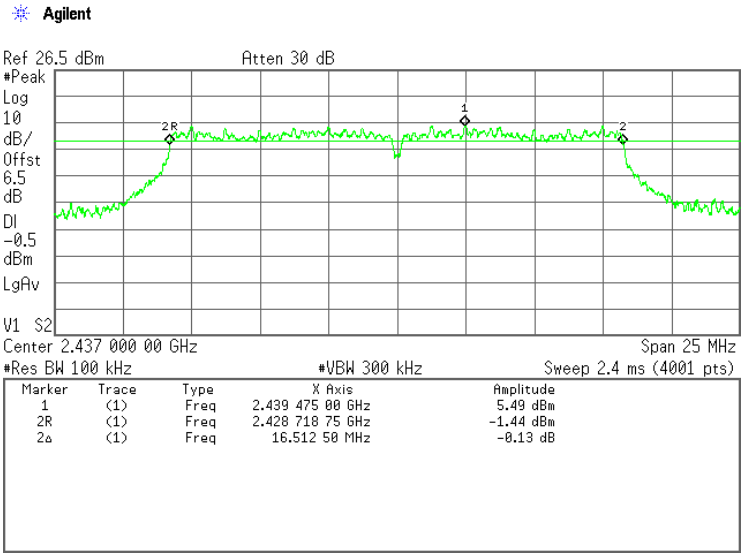
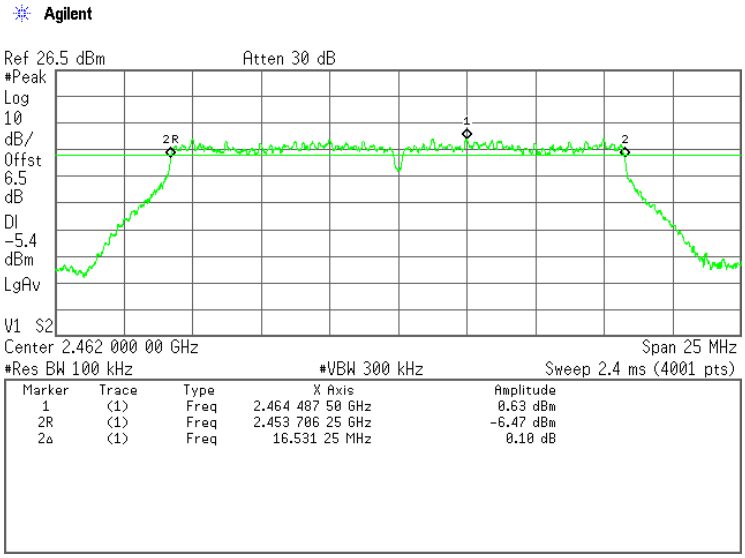
## 802.11g 54Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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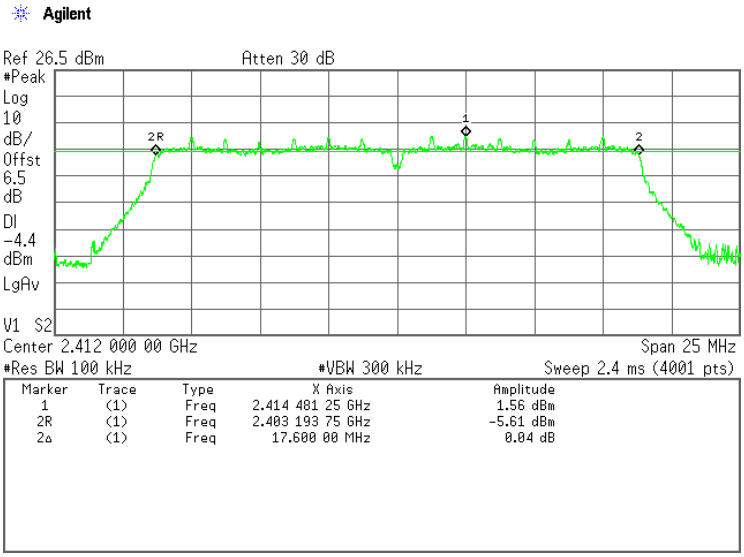
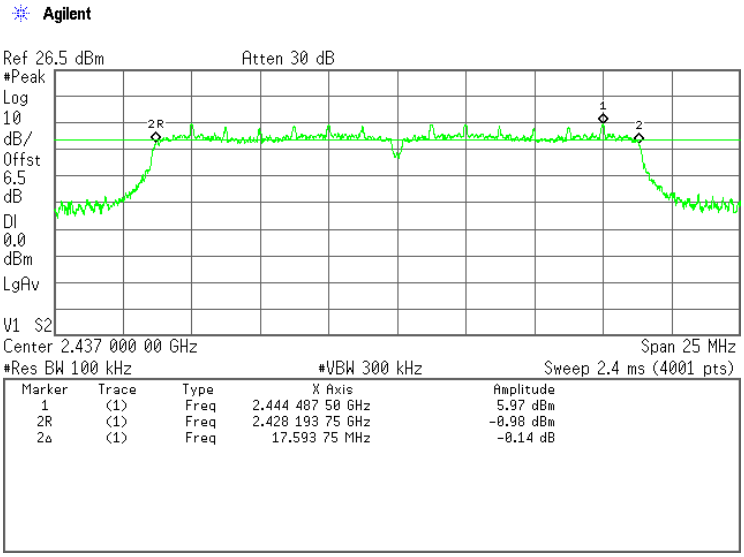
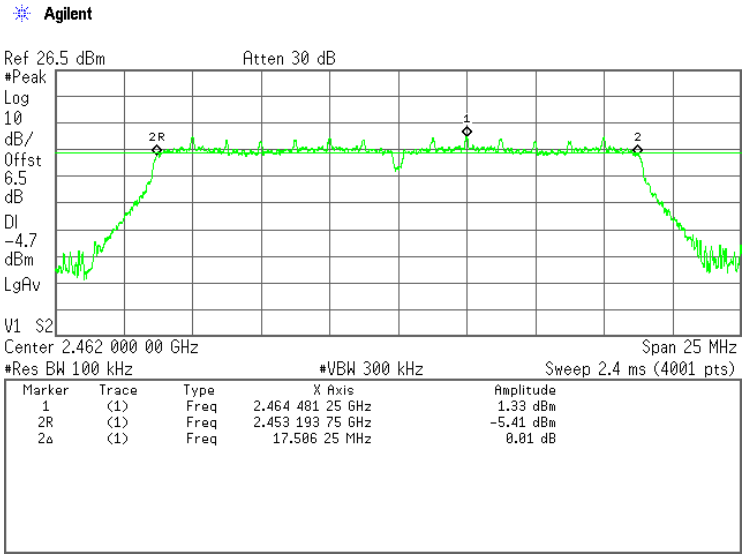
## 802.11n HT20 mcs0 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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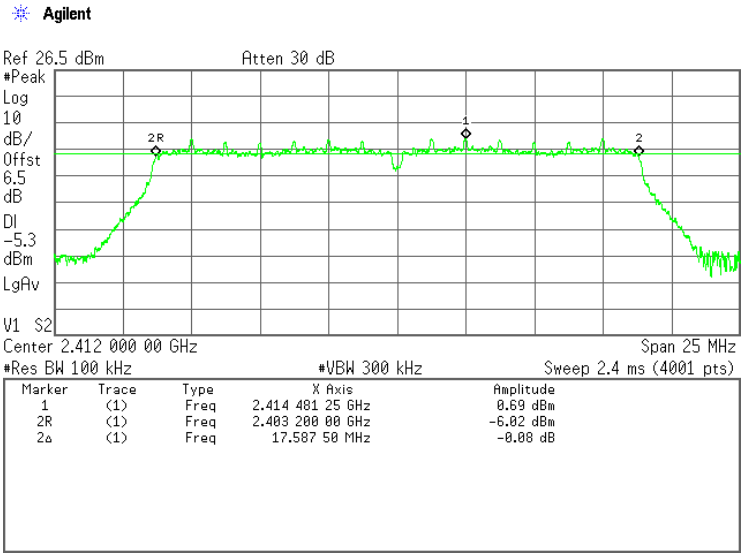
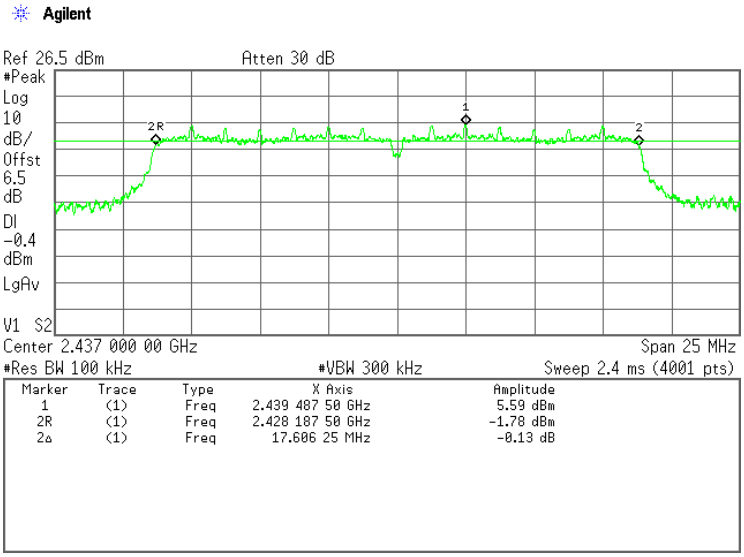
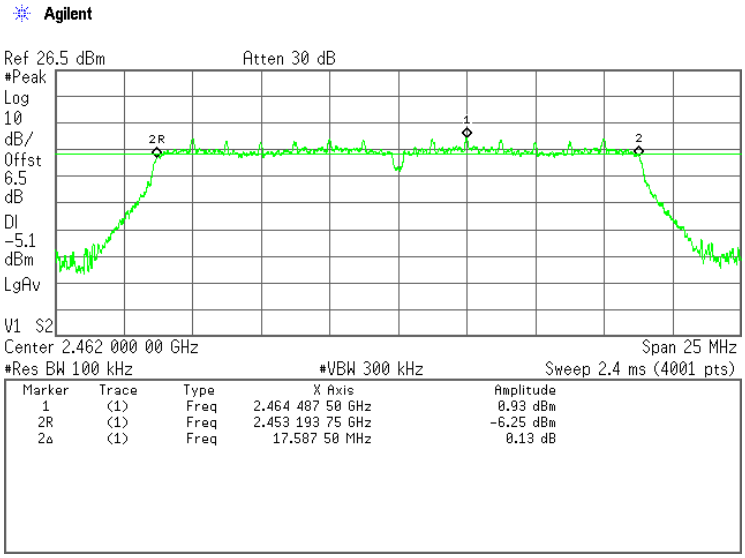
## 802.11n HT20 mcs0 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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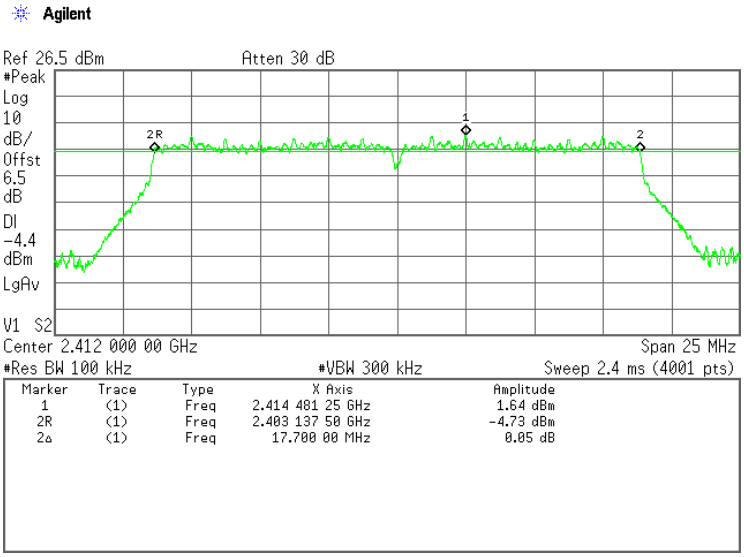
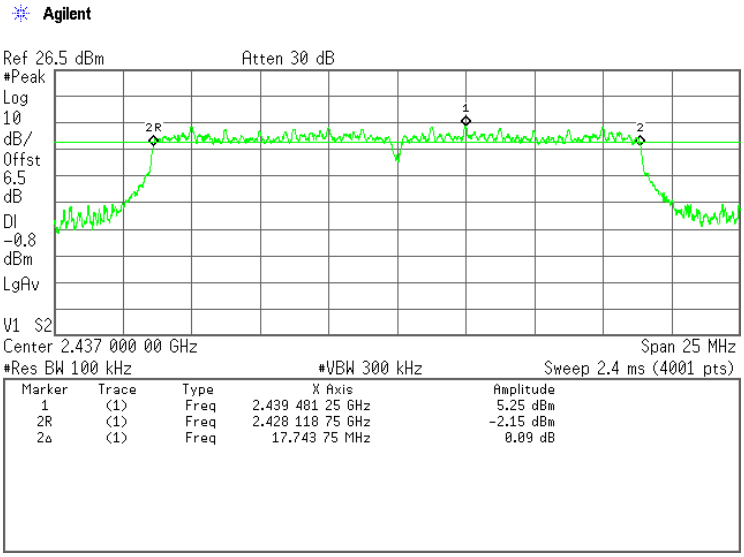
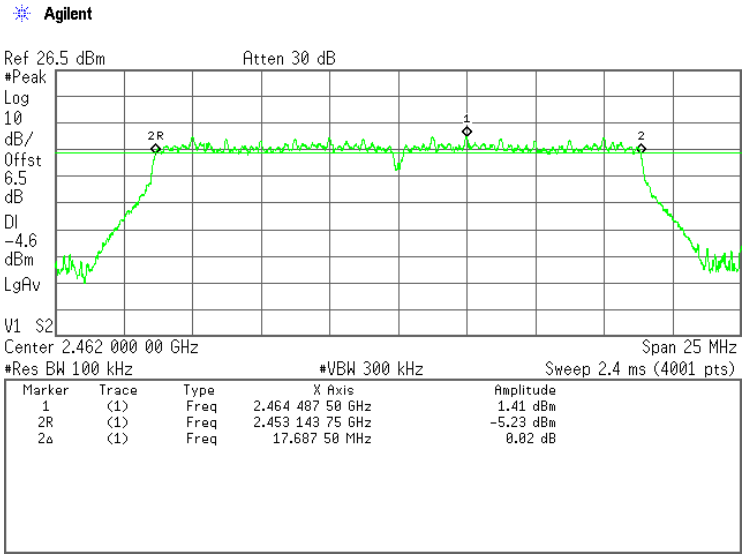
## 802.11n HT20 mcs7 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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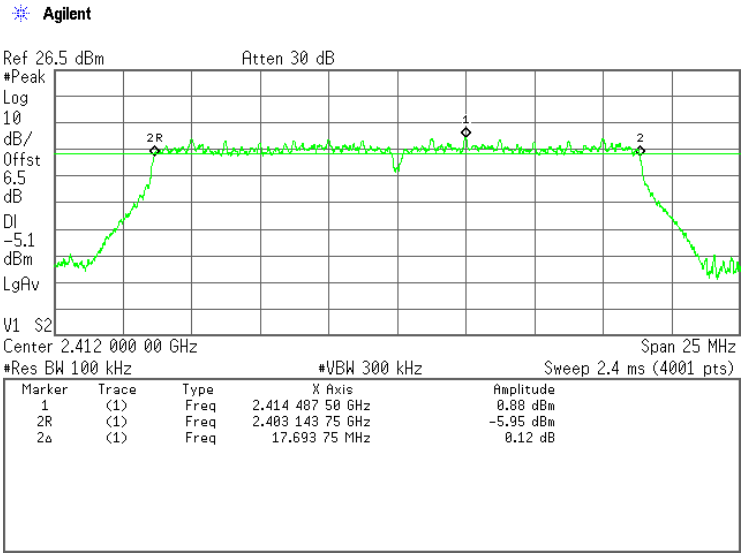
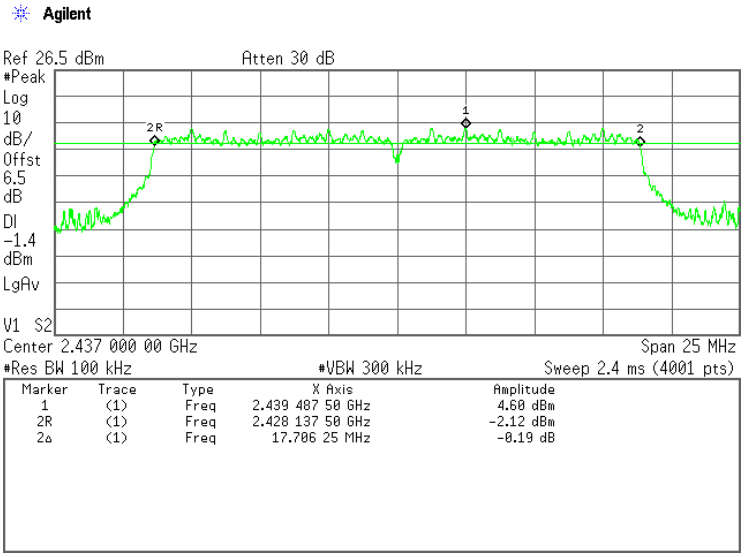
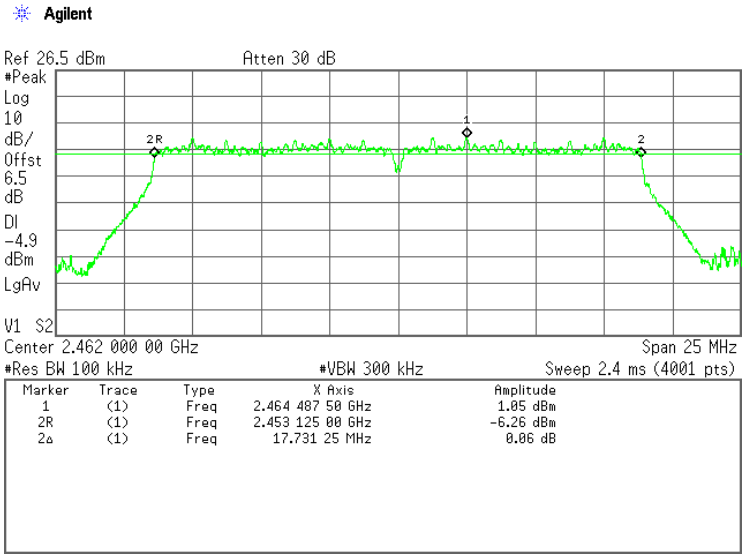
## 802.11n HT20 mcs7 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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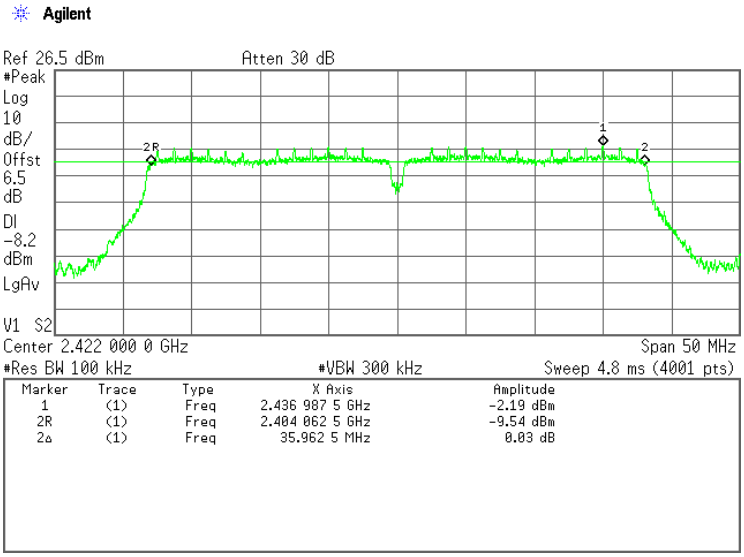
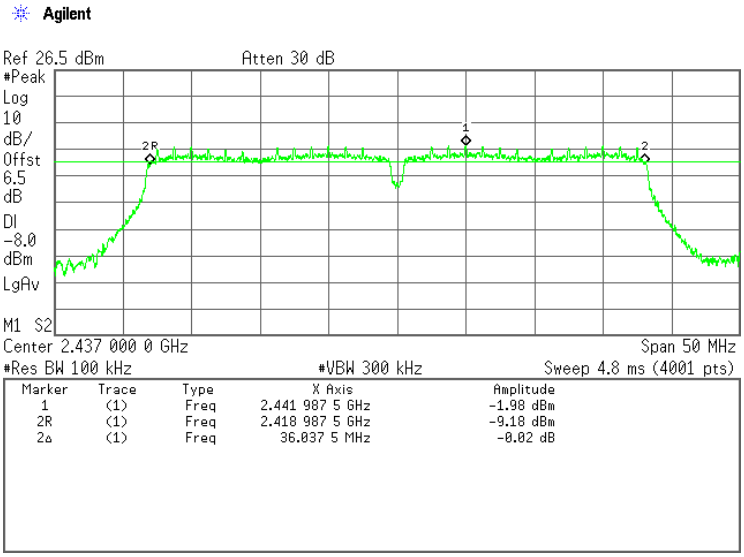
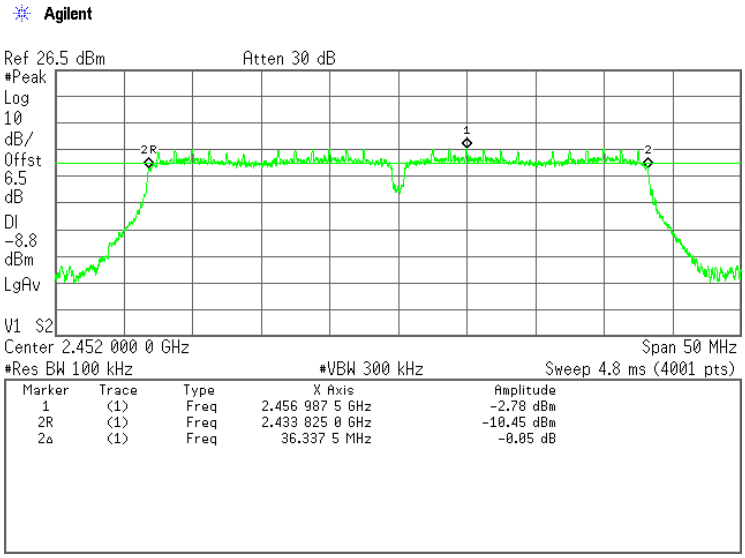
## 802.11n HT40 mcs0 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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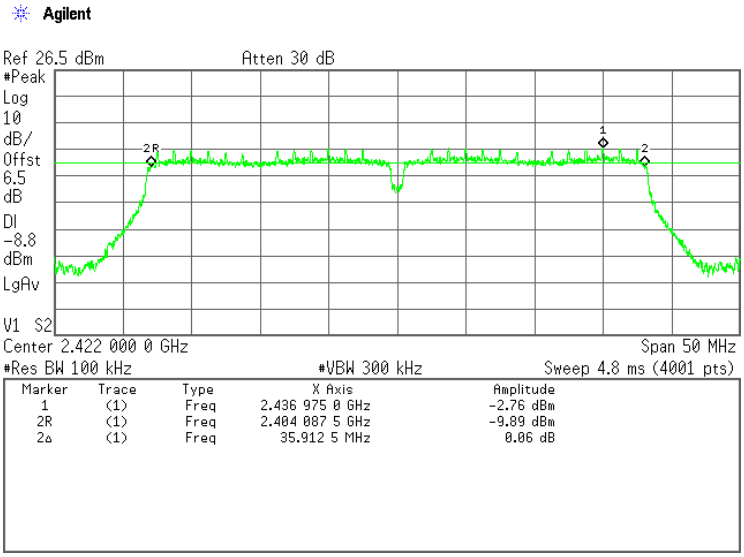
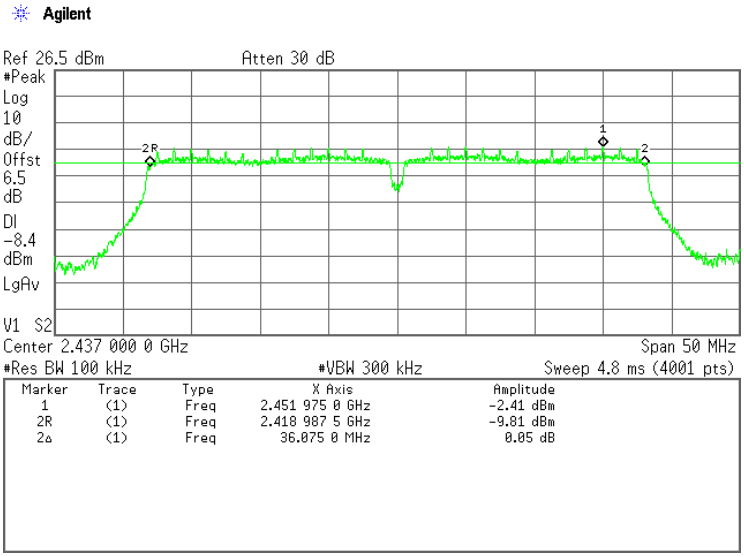
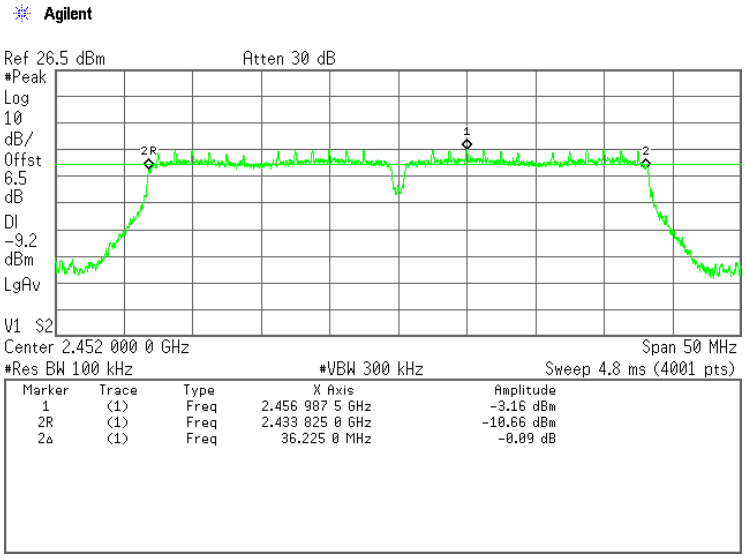
## 802.11n HT40 mcs0 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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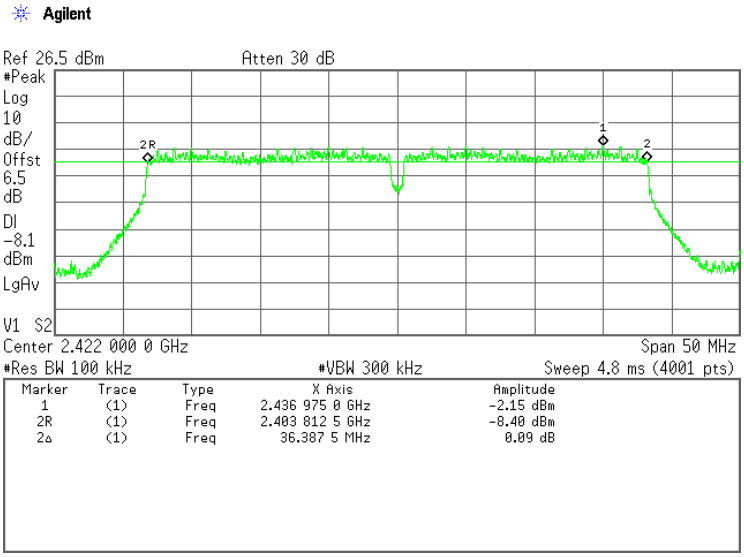
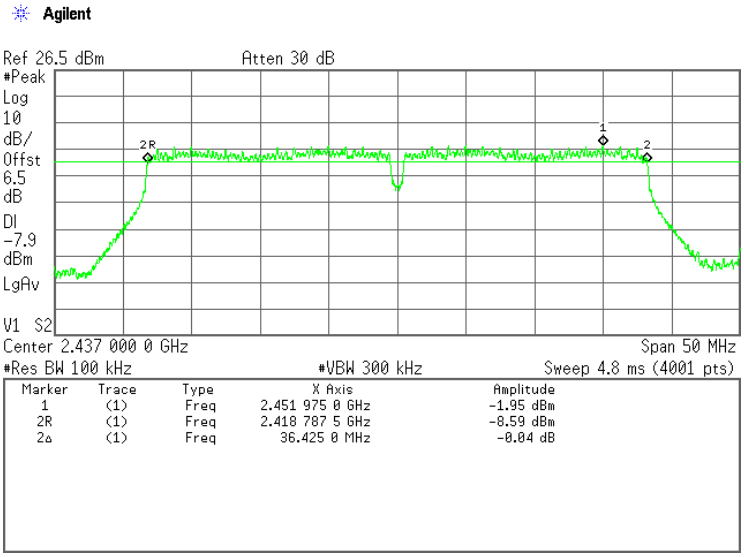
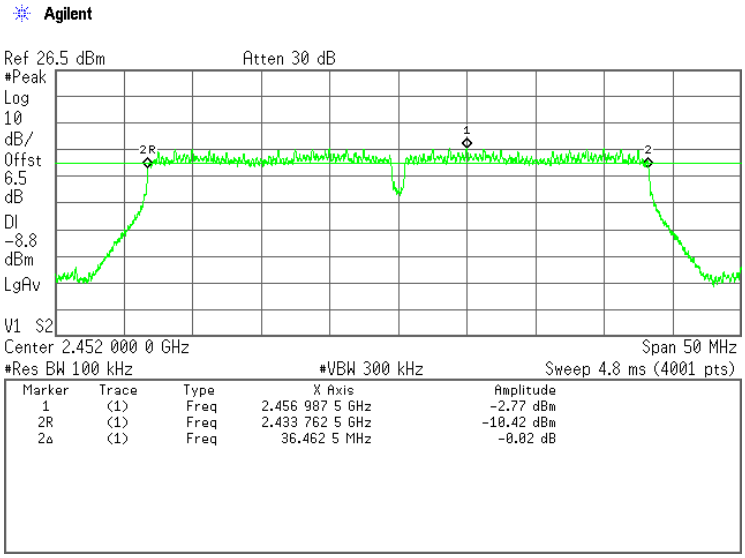
## 802.11n HT40 mcs7 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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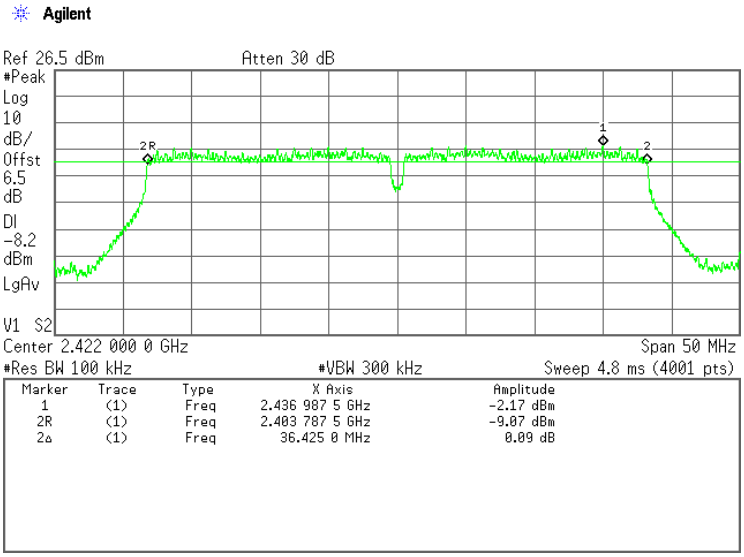
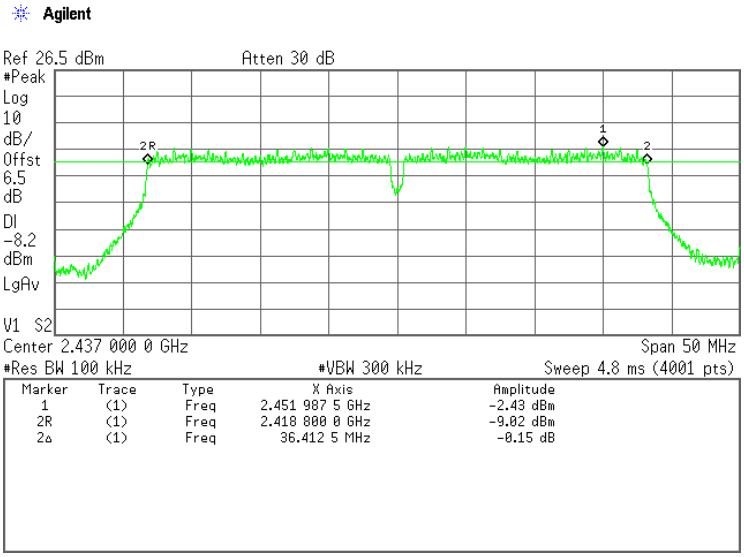
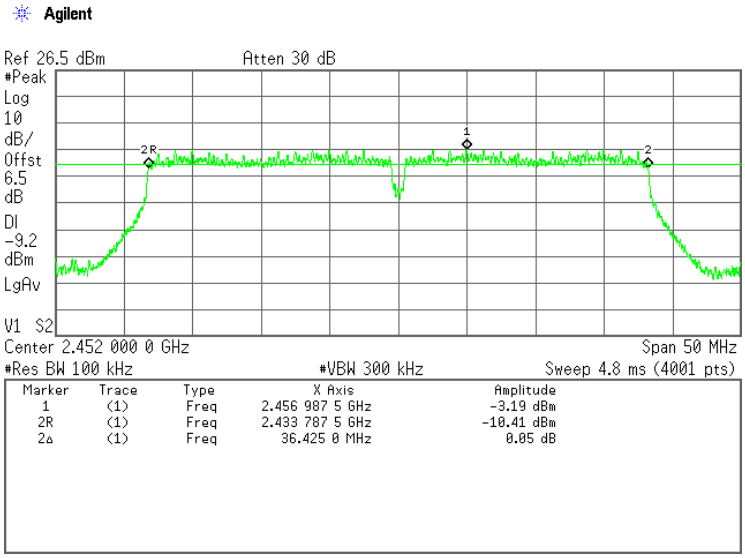
## 802.11n HT40 mcs7 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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# 99% Occupied Bandwidth

## Test Description

The emission bandwidth (x dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated x dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth.
When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

## Worst-Case scenario

The 99% bandwidth was measured only for the data rates with the Maximum Output Power for each mode.

## Test Criteria

| Reference | Limit |
|---|---|
| RSS-GEN, Section 6.6 | N/A |

## Test Information

| Tester | Test Location | Date | Temperature (ºC) | Humidity (%RH) | Pressure (mbar) | Results (P/F) |
|---|---|---|---|---|---|---|
| Jose Badia | RF Lab | 6/11/2025 | 23.33 | 51 | 1021.0 | P |

## Test Results

### 802.11b – 1Mbps

| Channel | Frequency (MHz) | 99% Bandwidth (in MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| **Low** | 2412 | 13.49 | 13.31 |
| **Mid** | 2437 | 13.55 | 13.67 |
| **High** | 2462 | 13.62 | 13.42 |

### 802.11g – 54Mbps

| Channel | Frequency (MHz) | 99% Bandwidth (in MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| **Low** | 2412 | 16.71 | 16.62 |
| **Mid** | 2437 | 16.78 | 16.50 |
| **High** | 2462 | 16.68 | 16.56 |



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### 802.11n HT20 – msc0

| Channel | Frequency (MHz) | 99% Bandwidth (in MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 17.79 | 17.84 |
| Mid | 2437 | 17.78 | 17.76 |
| High | 2462 | 17.75 | 17.80 |

### 802.11n HT40 – msc7

| Channel | Frequency (MHz) | 99% Bandwidth (in MHz) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2422 | 36.22 | 36.32 |
| Mid | 2437 | 36.15 | 36.15 |
| High | 2452 | 36.41 | 36.15 |



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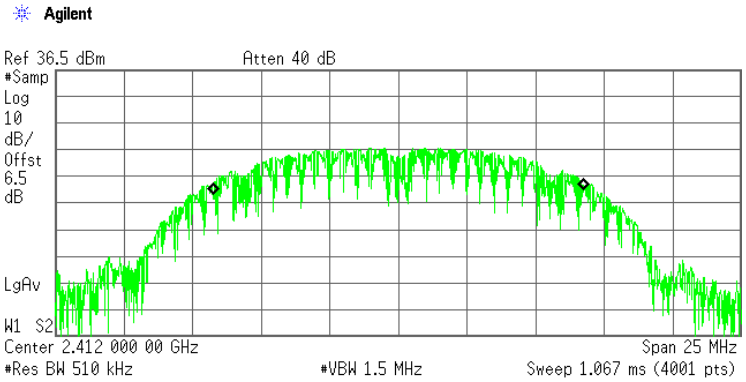
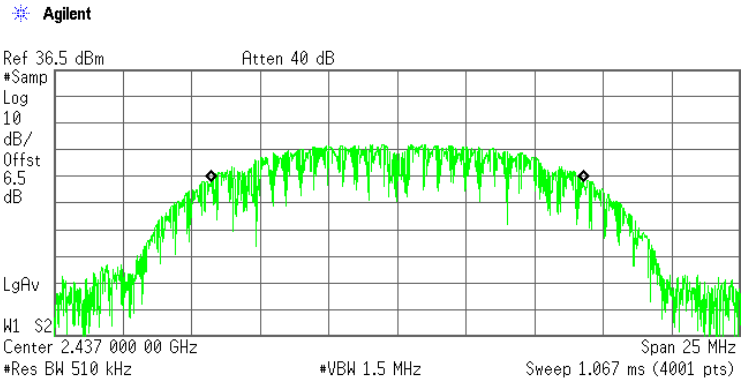
## 99% Occupied Bandwidth plots

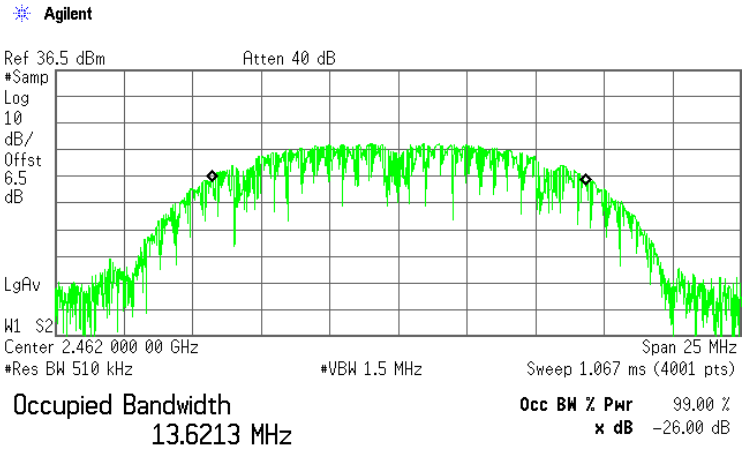
### 802.11b 1Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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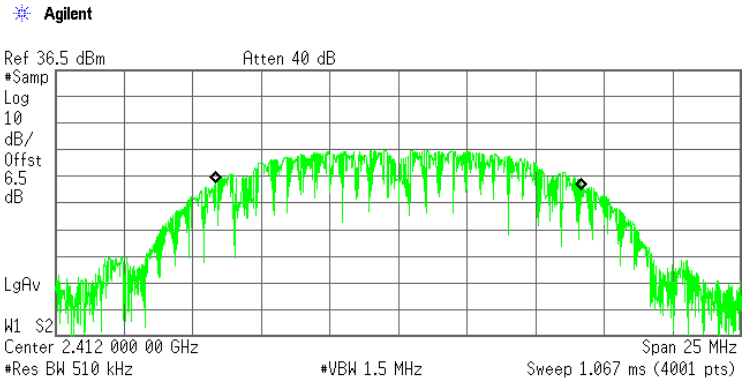
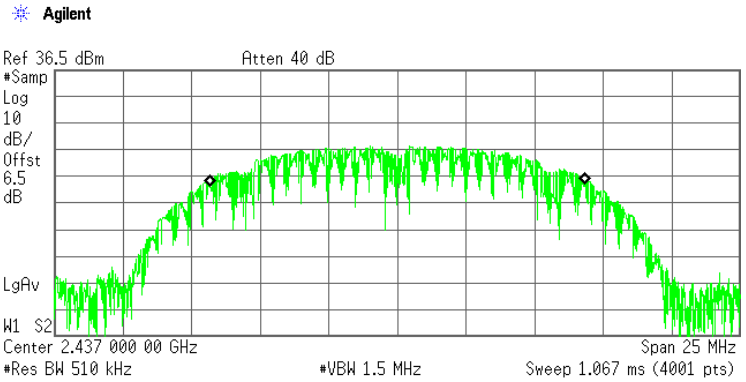
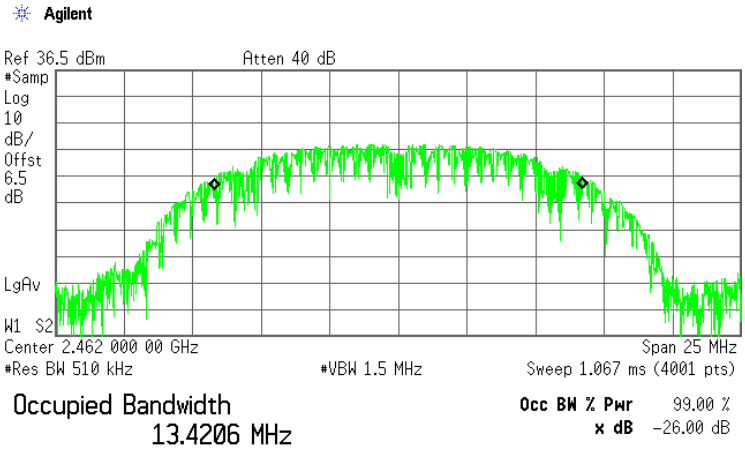
## 802.11b 1Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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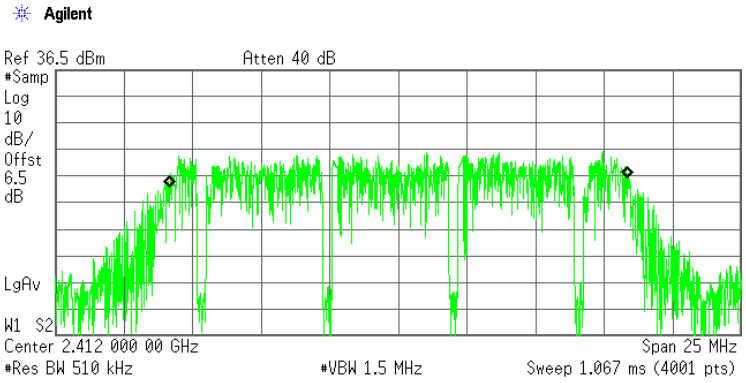
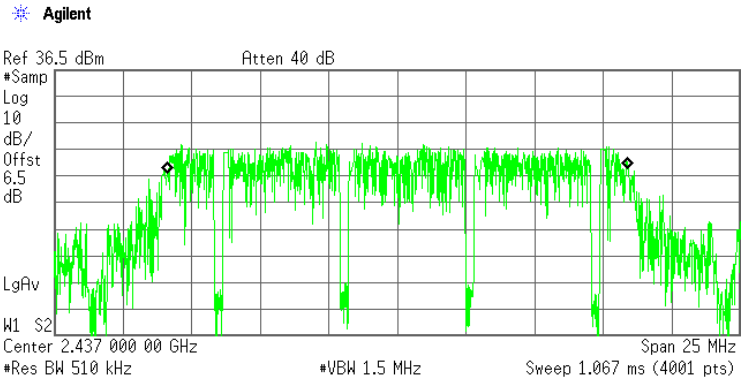
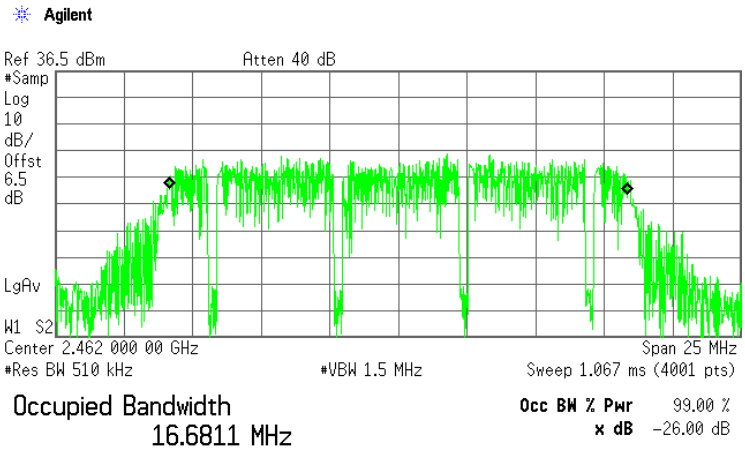
## 802.11g 54Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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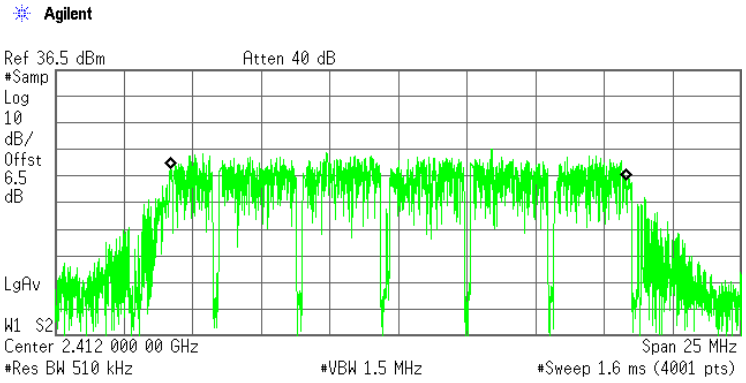
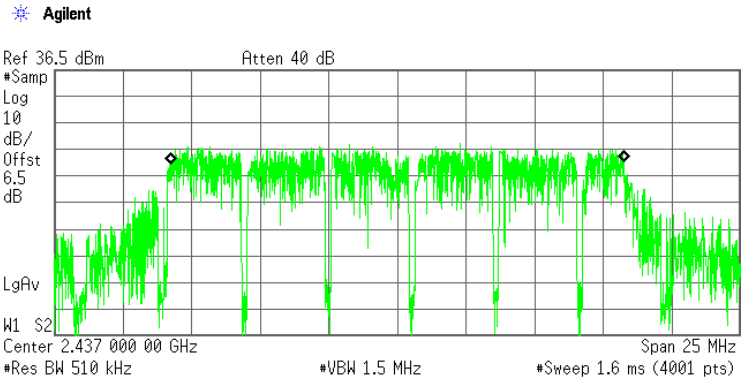
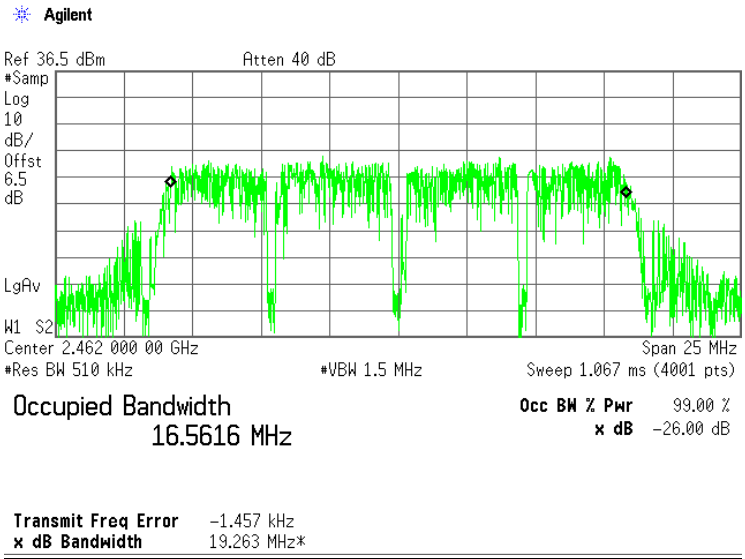
## 802.11g 54Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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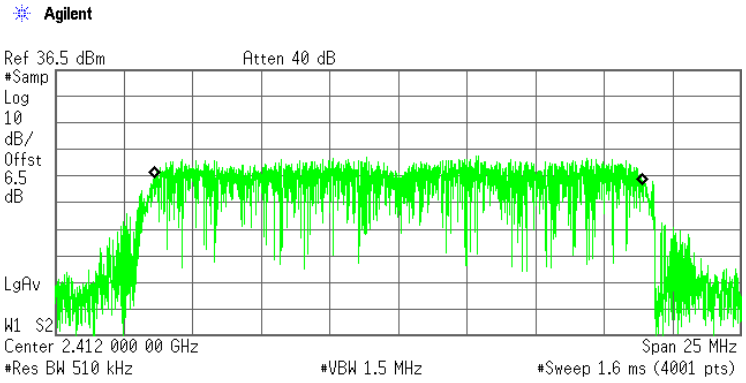
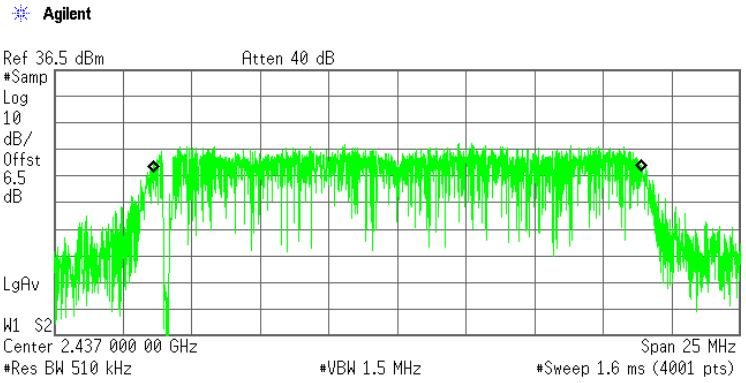
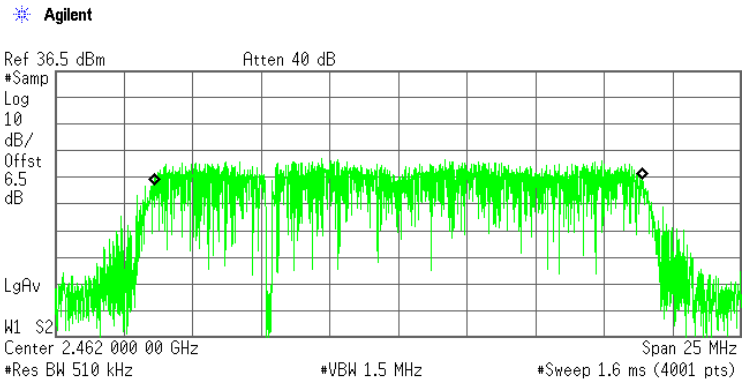
## 802.11n HT20 mcs0 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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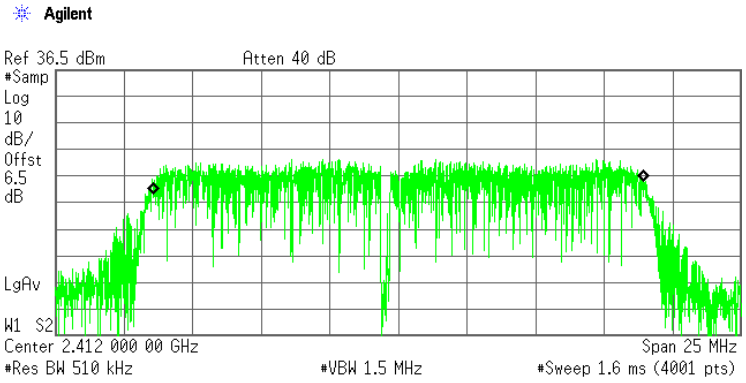
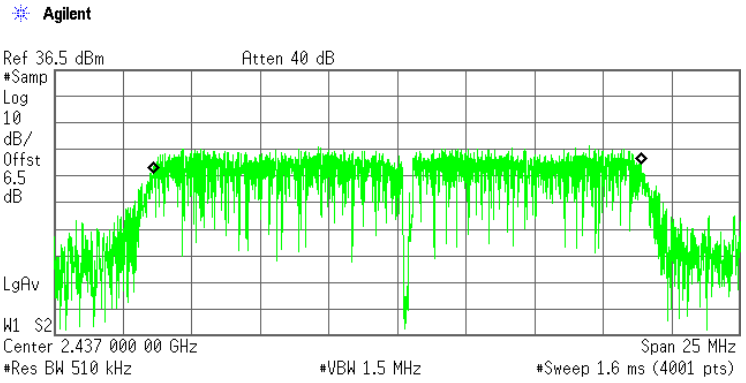
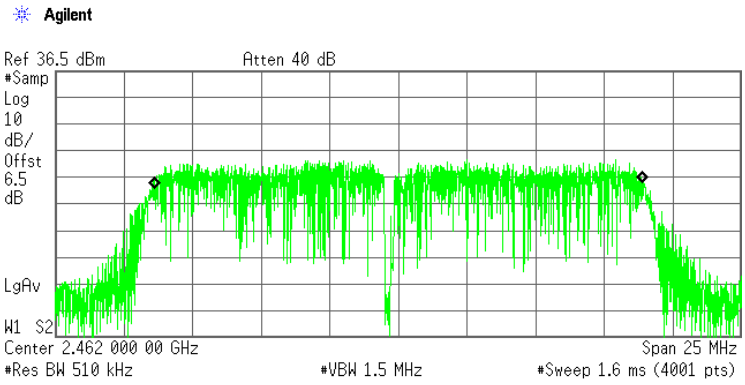
## 802.11n HT20 mcs0 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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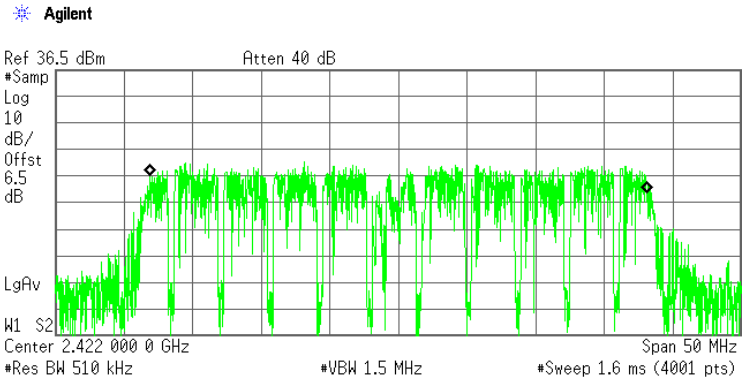
## 802.11n HT40 mcs7 – Side Antenna

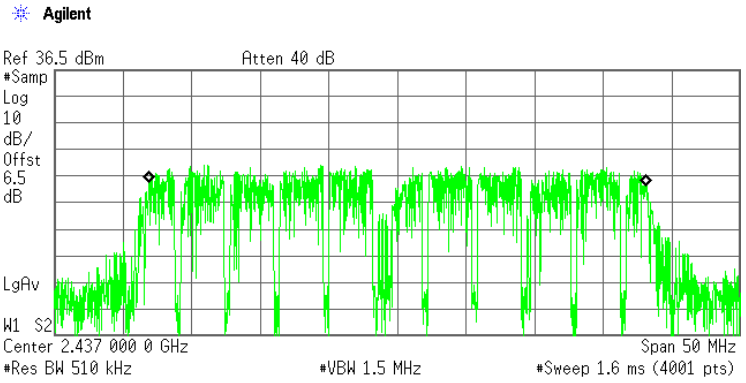



Occupied Bandwidth
36.2172 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -1.201 kHz
x dB Bandwidth 39.326 MHz*

Low Channel - Plot

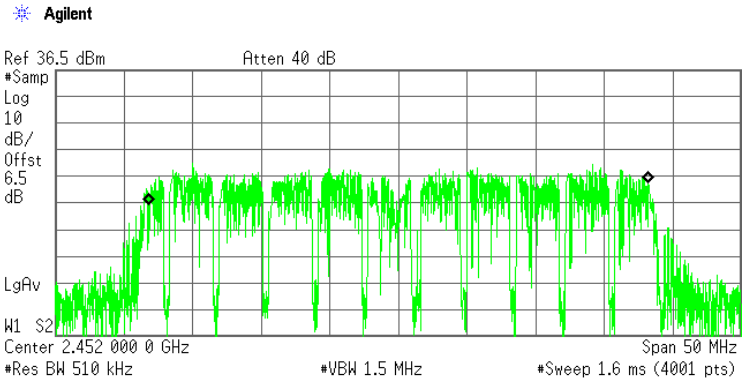



Occupied Bandwidth
36.1503 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 2.330 kHz
x dB Bandwidth 38.221 MHz*

Mid Channel - Plot




Occupied Bandwidth
36.4136 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 2.512 kHz
x dB Bandwidth 39.325 MHz*

High Channel - Plot



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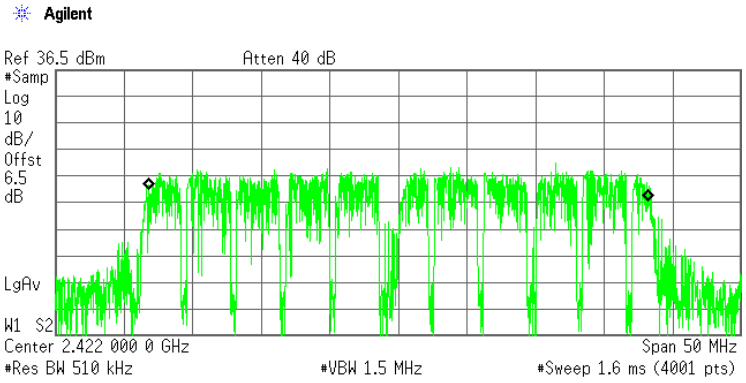
## 802.11n HT40 mcs7 – Top Antenna

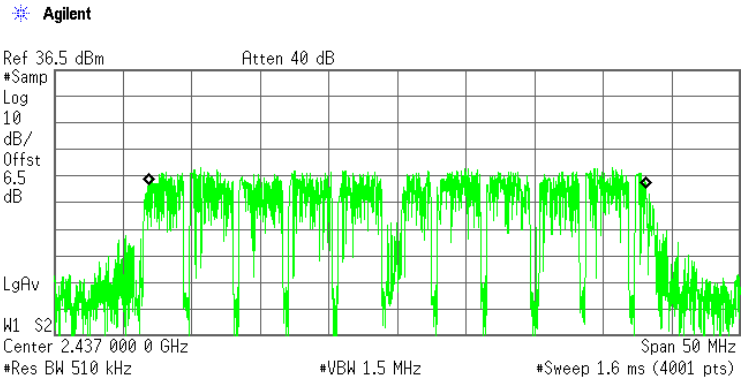



Occupied Bandwidth
36.3178 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -2.500 kHz
x dB Bandwidth 37.971 MHz*

Low Channel - Plot

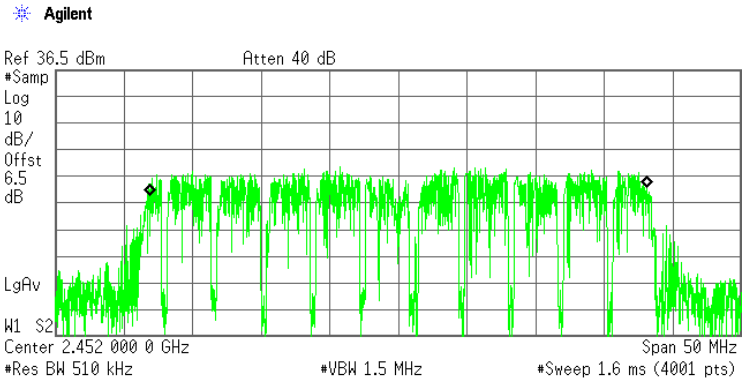



Occupied Bandwidth
36.1518 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -1.229 kHz
x dB Bandwidth 39.437 MHz*

Mid Channel - Plot




Occupied Bandwidth
36.1535 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 2.025 kHz
x dB Bandwidth 39.566 MHz*

High Channel - Plot



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# Maximum Conducted Output Power

## Test Description

For systems using digital modulation in the 902-928MHz, 2400-2483,5MHz and 5725-5850MHz bands, the conducted output power limit (specified below) is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Maximum peak conducted output power was the method employed to determine fundamental emission output power.

Method PKPM1 per C63.10 and KDB 558074 was utilized for this test program.

## Test Criteria

| Reference | Limit |
|---|---|
| CFR 47 Subpart C 15.247 (b)(3)<br>RSS-247 Section 5.4 (d) | 1W (30dBm) |

## Test Information

| Tester | Test Location | Date | Temperature (ºC) | Humidity (%RH) | Pressure (mbar) | Results (P/F) |
|---|---|---|---|---|---|---|
| Jose Badia | RF Lab | 6/03/2025 | 21.11 | 28 | 1002.9 | P |

## Test Results

### 802.11b – 1Mbps

| Channel | Frequency (MHz) | Tx Channel Power (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 18.42 | 18.45 |
| Mid | 2437 | 17.32 | 16.81 |
| High | 2462 | 19.97 | 20.40 |

### 802.11b – 11Mbps

| Channel | Frequency (MHz) | Tx Channel Power (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 18.33 | 18.58 |
| Mid | 2437 | 17.22 | 16.81 |
| High | 2462 | 19.95 | 20.63 |



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## 802.11g – 6Mbps

| Channel | Frequency (MHz) | Tx Channel Power (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 21.76 | 21.20 |
| Mid | 2437 | 22.26 | 22.26 |
| High | 2462 | 20.80 | 20.33 |

## 802.11g – 36Mbps

| Channel | Frequency (MHz) | Tx Channel Power (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 21.45 | 21.20 |
| Mid | 2437 | 22.26 | 22.26 |
| High | 2462 | 20.34 | 20.16 |

## 802.11g – 54Mbps

| Channel | Frequency (MHz) | Tx Channel Power (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 21.12 | 21.28 |
| Mid | 2437 | 22.26 | 22.26 |
| High | 2462 | 20.16 | 20.50 |

## 802.11n HT20 – msc0

| Channel | Frequency (MHz) | Tx Channel Power (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 21.61 | 21.56 |
| Mid | 2437 | 22.26 | 22.26 |
| High | 2462 | 21.13 | 22.04 |

## 802.11n HT20 – msc7

| Channel | Frequency (MHz) | Tx Channel Power (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 21.81 | 20.29 |
| Mid | 2437 | 22.26 | 22.26 |
| High | 2462 | 21.38 | 20.81 |

**802.11n HT40 – msc0**

| Channel | Frequency (MHz) | Tx Channel Power (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2422 | 20.24 | 20.68 |
| Mid | 2437 | 22.26 | 22.26 |
| High | 2452 | 20.26 | 19.92 |

**802.11n HT40 – msc7**

| Channel | Frequency (MHz) | Tx Channel Power (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2422 | 20.87 | 21.17 |



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| | | | |
|---|---|---|---|
| **Mid** | 2437 | 21.22 | 22.26 |
| **High** | 2452 | 20.81 | 19.65 |

**Output Power Plots:**

Note: PKPM1 method uses a power meter for measurement and therefore no plots are produced.

## Maximum Power Spectral Density

### Test Description

The DTS rules specify a conducted PSD limit within the *DTS bandwidth* during any time interval of continuous transmission. Such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. Therefore, if maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used.

Since maximum peak conducted output power was the method employed to determine fundamental emission output power, then the peak power spectral density method was utilized.

Method PKPSD per C63.10 and KDB 558074 was utilized for this test program.

### Test Criteria

| Reference | Limit |
|---|---|
| CFR 47 Subpart C 15.247 (e)<br>RSS-247 Section 5.2 (b) | < 8 dBm in any 3 kHz Band |

### Test Information

| Tester | Test Location | Date | Temperature (ºC) | Humidity (%RH) | Pressure (mbar) | Results (P/F) |
|---|---|---|---|---|---|---|
| Jose Badia | RF Lab | 6/02/2025 | 21.67 | 40 | 1017 | P |

### Test Results

### 802.11b – 1Mbps

| Channel | Frequency (MHz) | Max PSD (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| **Low** | 2412 | -3.92 | -3.63 |
| **Mid** | 2437 | -4.87 | -6.81 |
| **High** | 2462 | -3.34 | -3.23 |



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## 802.11b – 11Mbps

| Channel | Frequency (MHz) | Max PSD (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | 0.00 | 0.93 |
| Mid | 2437 | -0.10 | 0.43 |
| High | 2462 | 3.37 | 4.09 |

## 802.11g – 6Mbps

| Channel | Frequency (MHz) | Max PSD (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | -11.92 | -12.56 |
| Mid | 2437 | -6.97 | -7.61 |
| High | 2462 | -12.48 | -13.85 |

## 802.11g – 36Mbps

| Channel | Frequency (MHz) | Max PSD (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | -11.51 | -12.98 |
| Mid | 2437 | -5.57 | -7.42 |
| High | 2462 | -14.16 | -12.75 |

## 802.11g – 54Mbps

| Channel | Frequency (MHz) | Max PSD (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | -9.95 | -10.94 |
| Mid | 2437 | -6.91 | -7.79 |
| High | 2462 | -13.56 | -13.81 |

## 802.11n HT20 – msc0

| Channel | Frequency (MHz) | Max PSD (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | -12.92 | -13.85 |
| Mid | 2437 | -7.86 | -8.90 |
| High | 2462 | -13.39 | -13.13 |

**802.11n HT20 – msc7**

| Channel | Frequency (MHz) | Max PSD (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2412 | -12.10 | -13.87 |
| Mid | 2437 | -8.74 | -9.88 |
| High | 2462 | -12.48 | -12.89 |

**802.11n HT40 – msc0**

| Channel | Frequency (MHz) | Max PSD (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| Low | 2422 | -16.47 | -16.89 |
| Mid | 2437 | -16.55 | -12.62 |



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| | | | |
|---|---|---|---|
| **High** | 2452 | -11.97 | -11.22 |

## 802.11n HT40 – msc7

| Channel | Frequency (MHz) | Max PSD (dBm) | |
|---|---|---|---|
| | | Side Antenna | Top Antenna |
| **Low** | 2422 | -13.87 | -14.92 |
| **Mid** | 2437 | -15.00 | -14.65 |
| **High** | 2452 | -15.72 | -16.06 |



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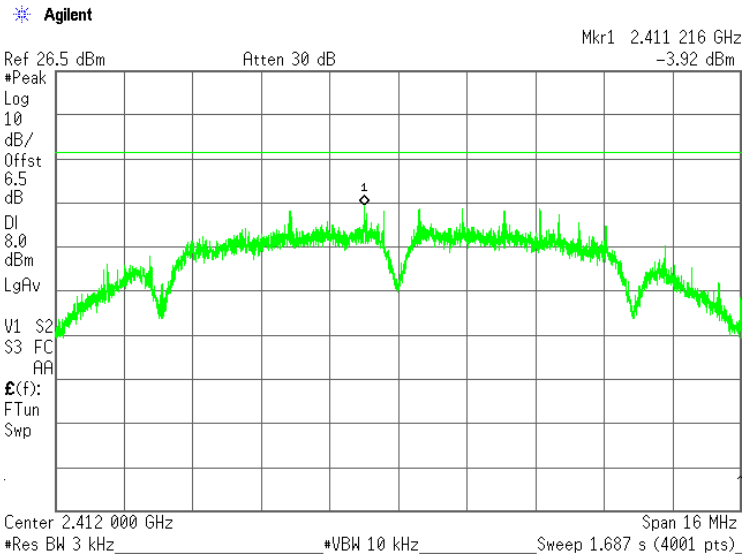
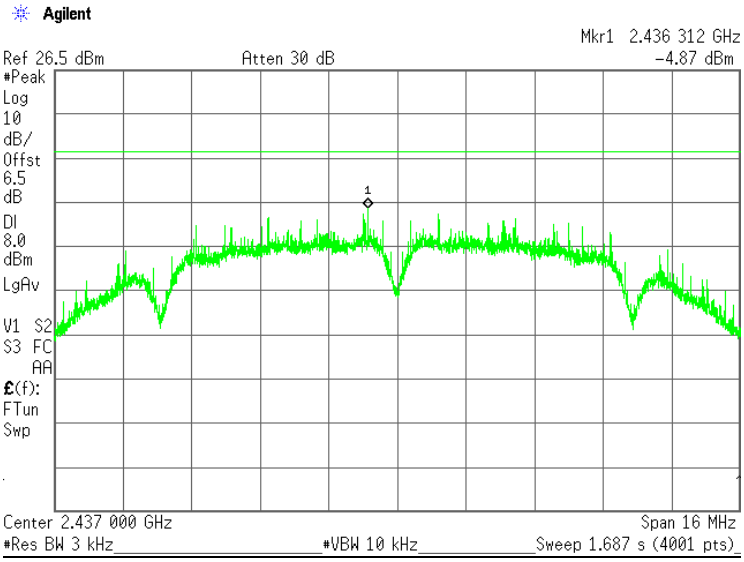
## PSD plots

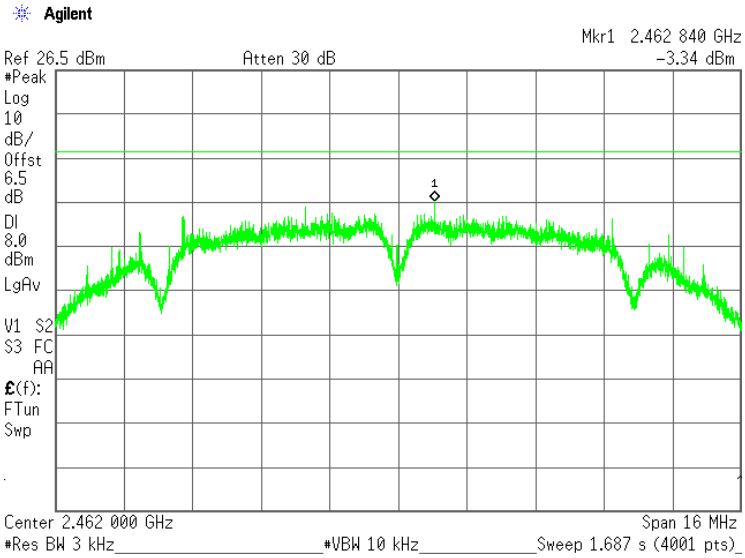
### 802.11b 1Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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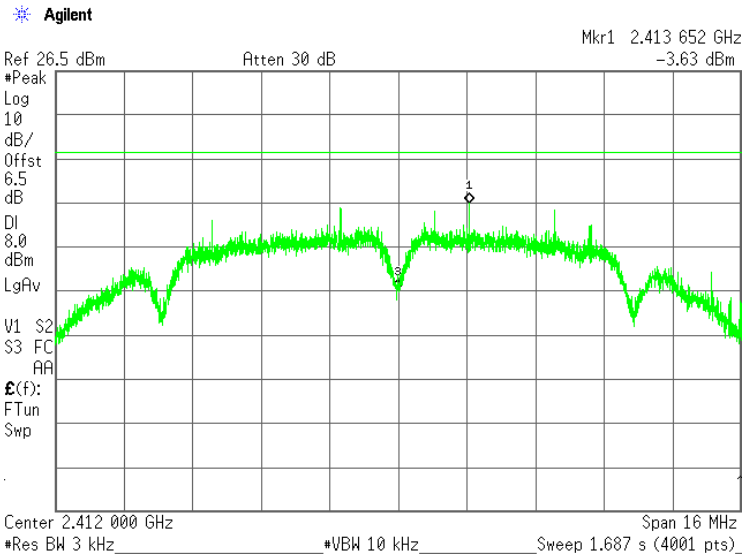
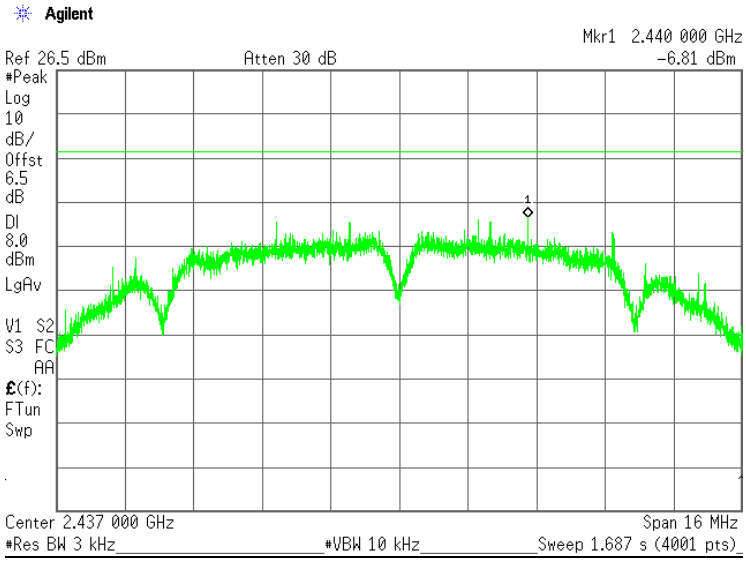
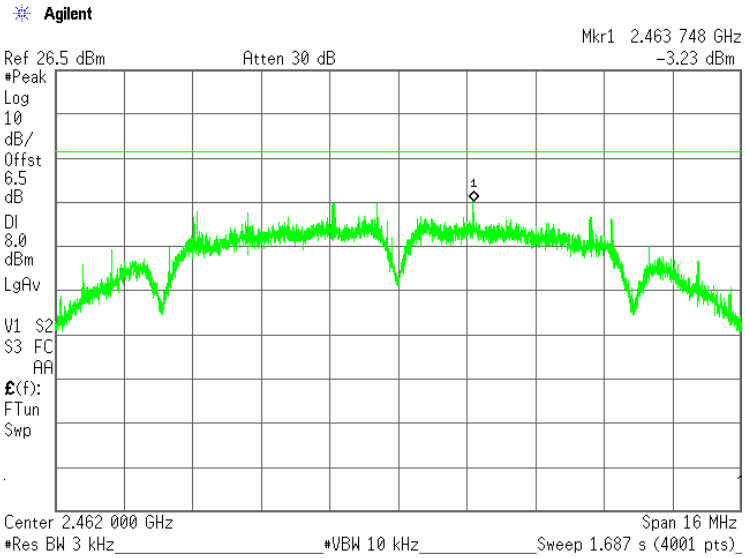
## 802.11b 1Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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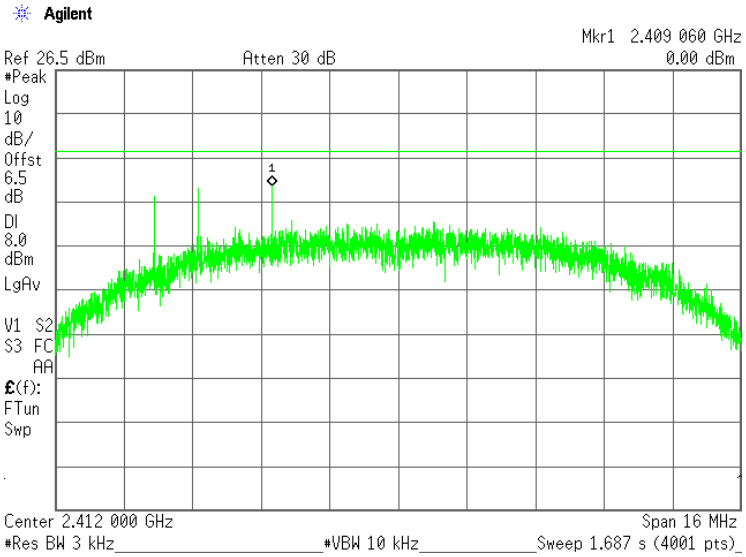
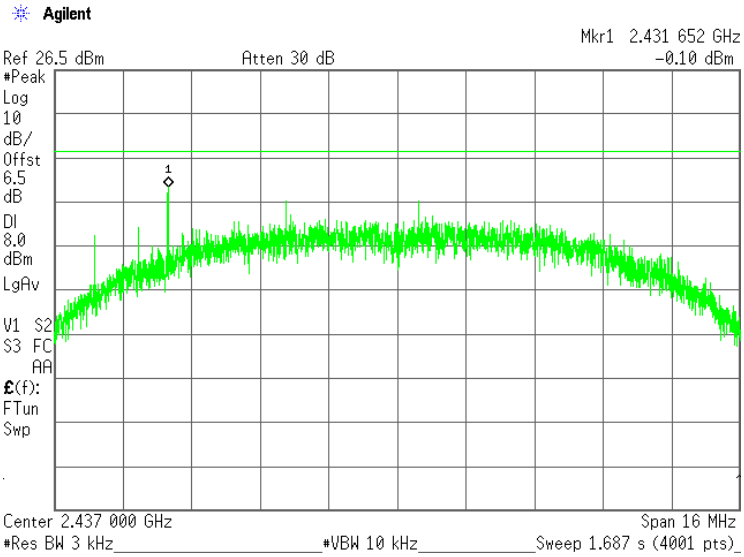
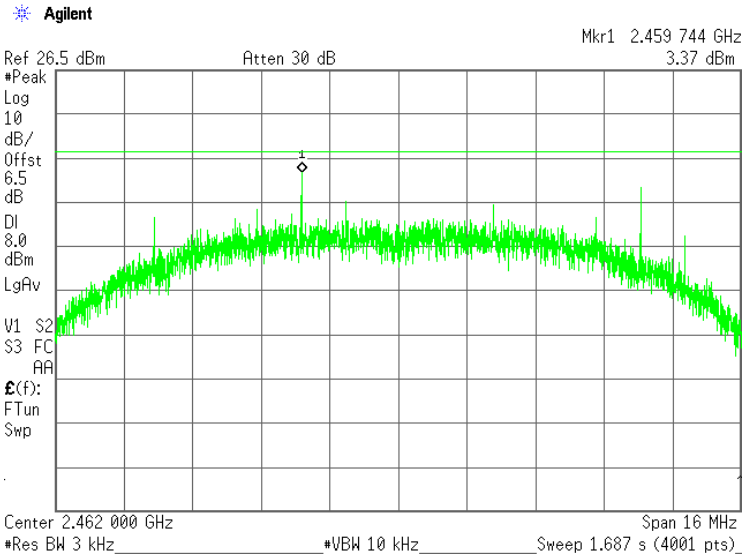
## 802.11b 11Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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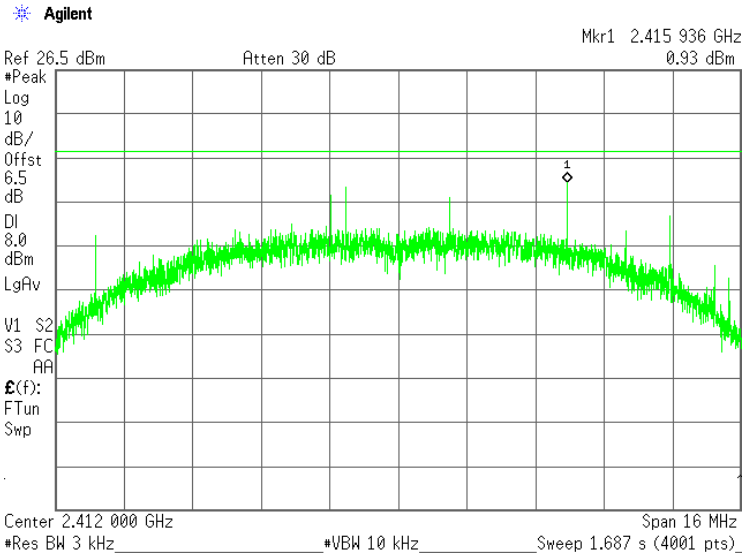
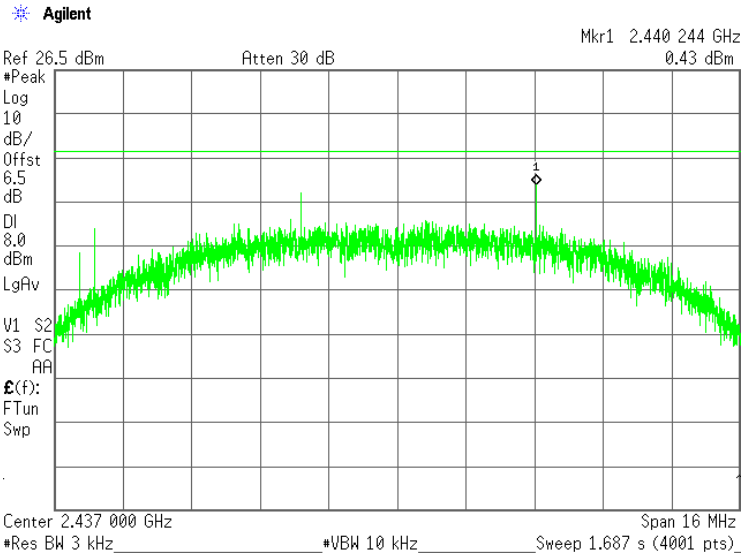
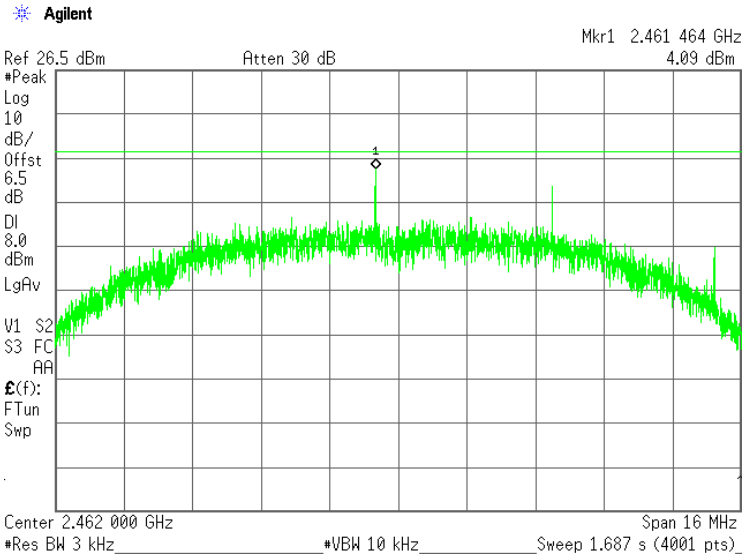
## 802.11b 11Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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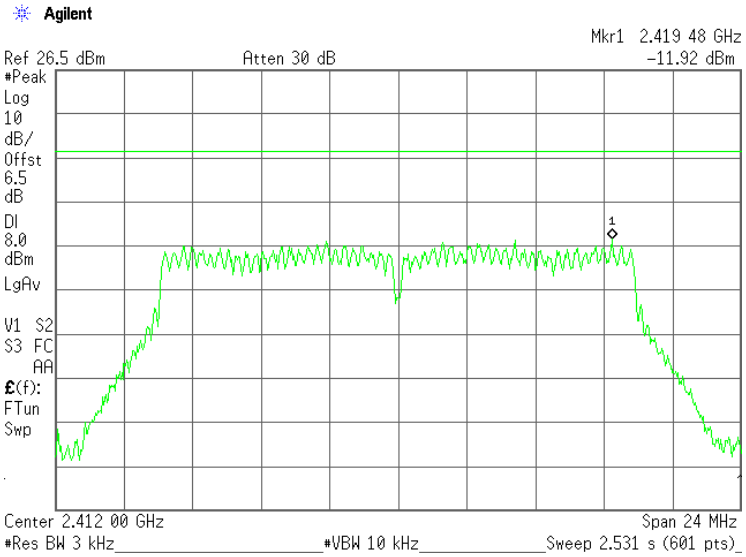
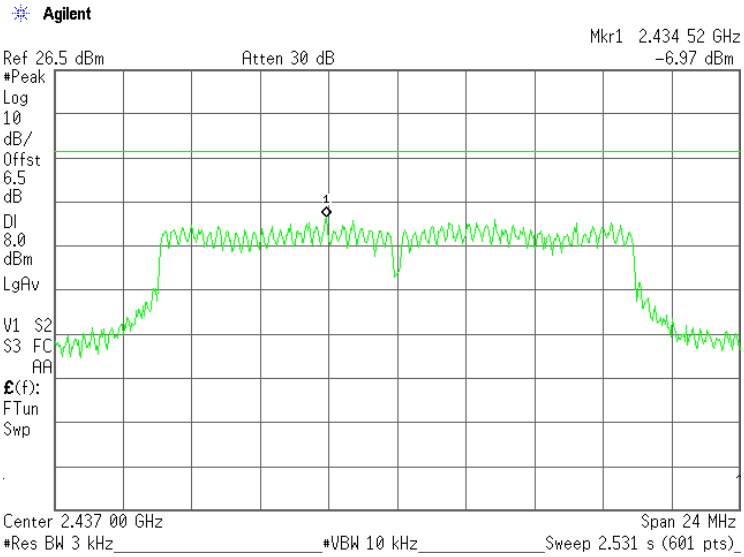
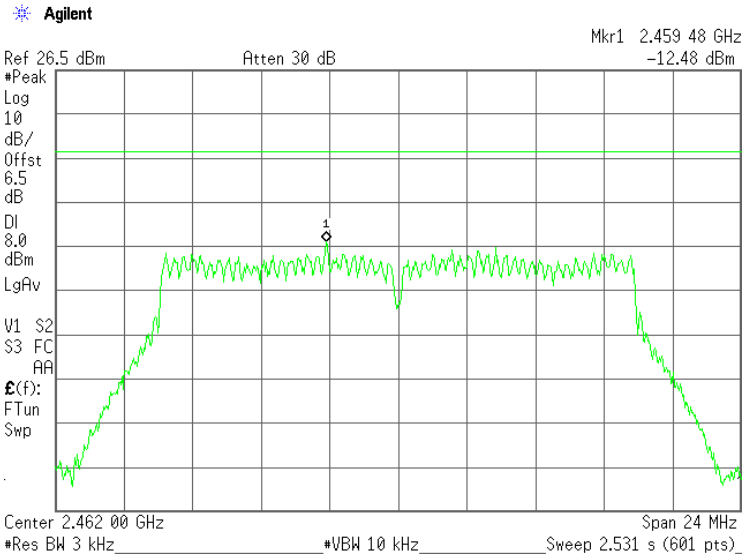
## 802.11g 6Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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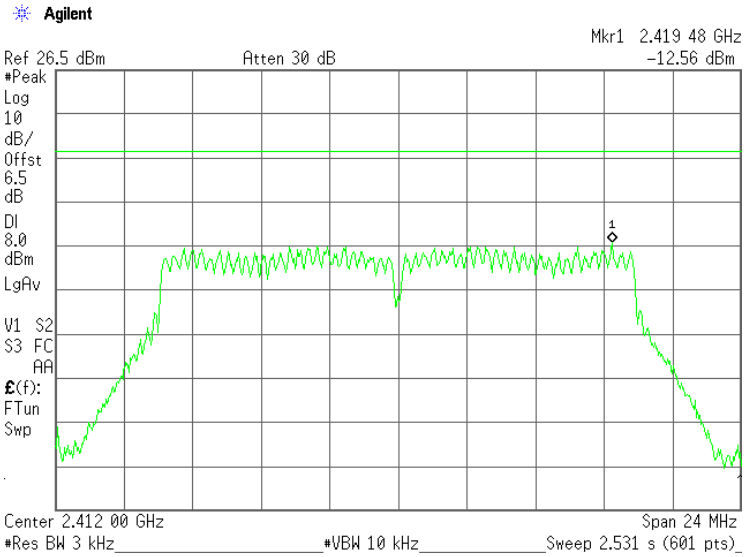
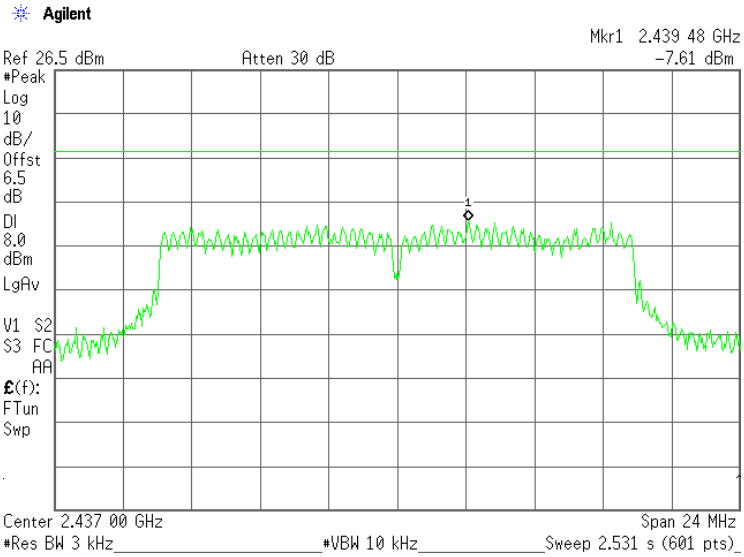
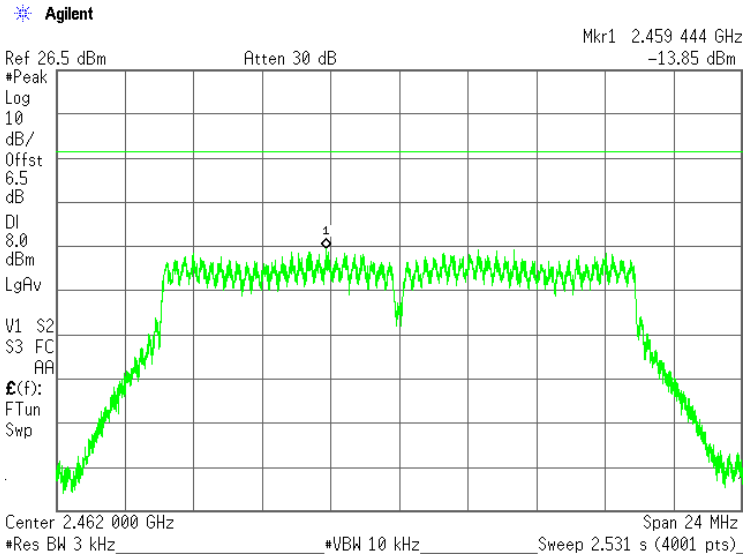
## 802.11g 6Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel – Plot



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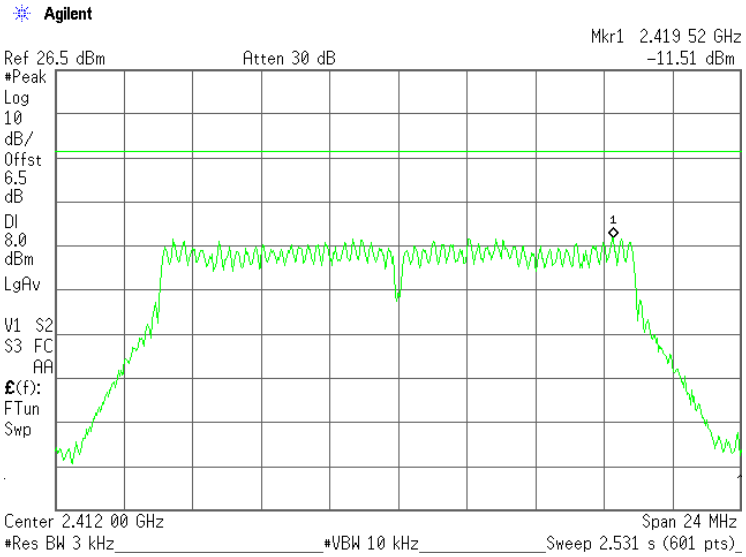
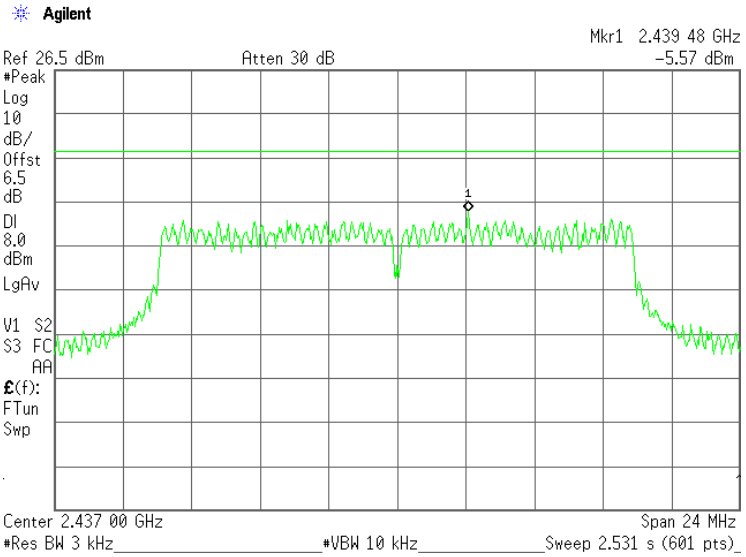
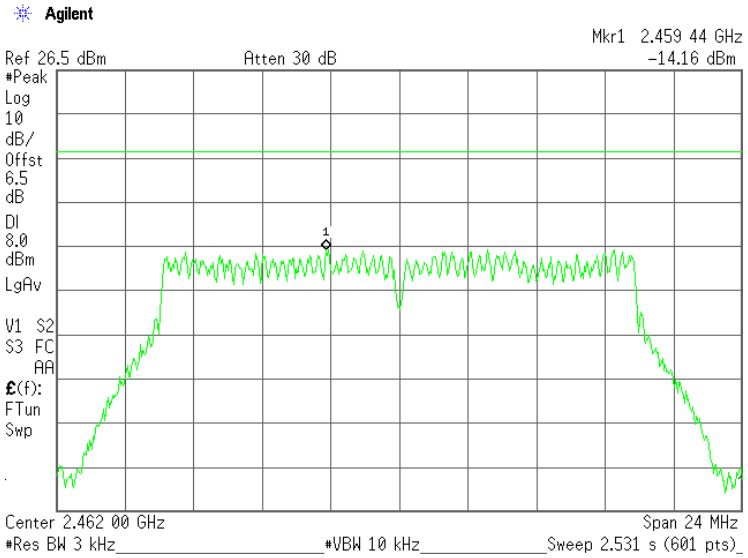
## 802.11g 36Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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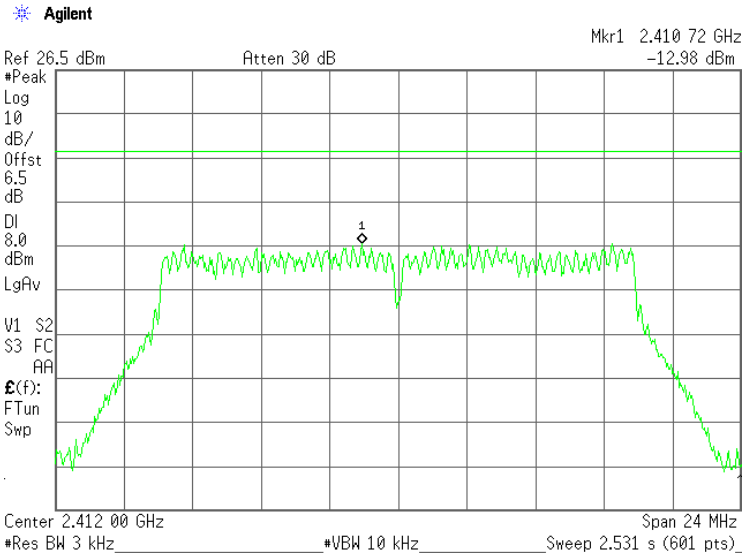
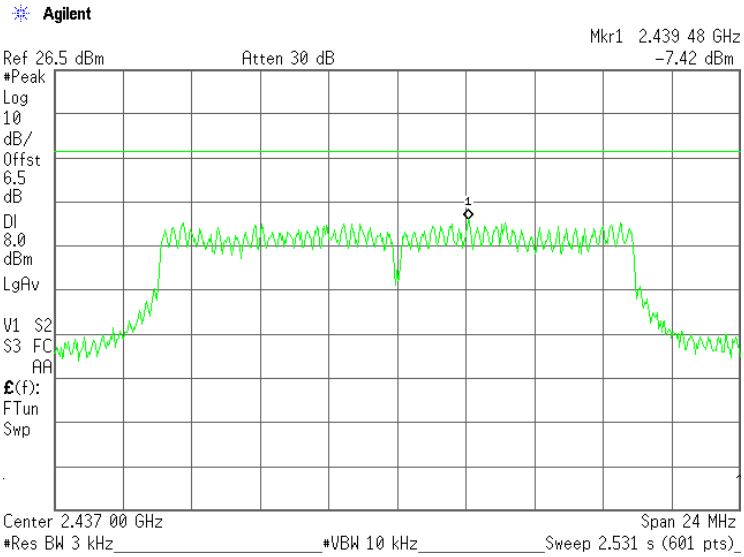
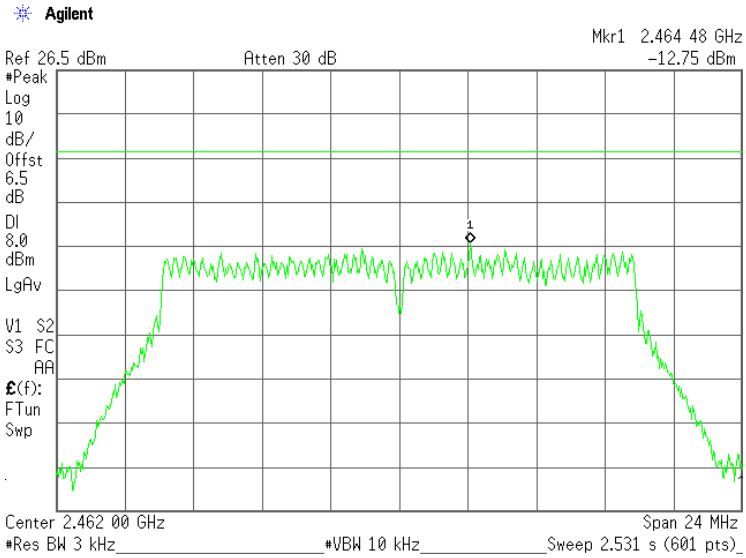
## 802.11g 36Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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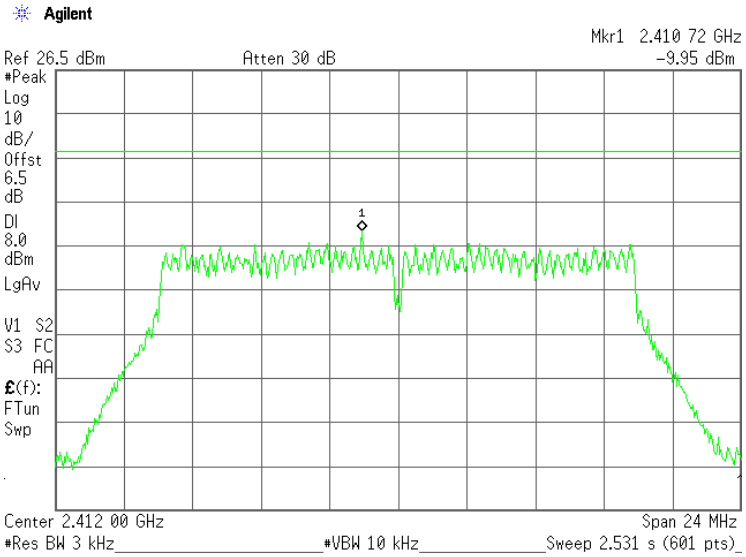
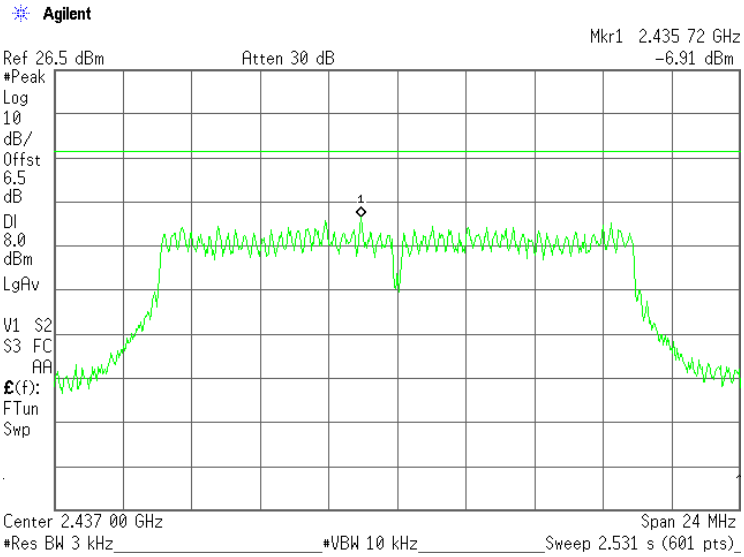
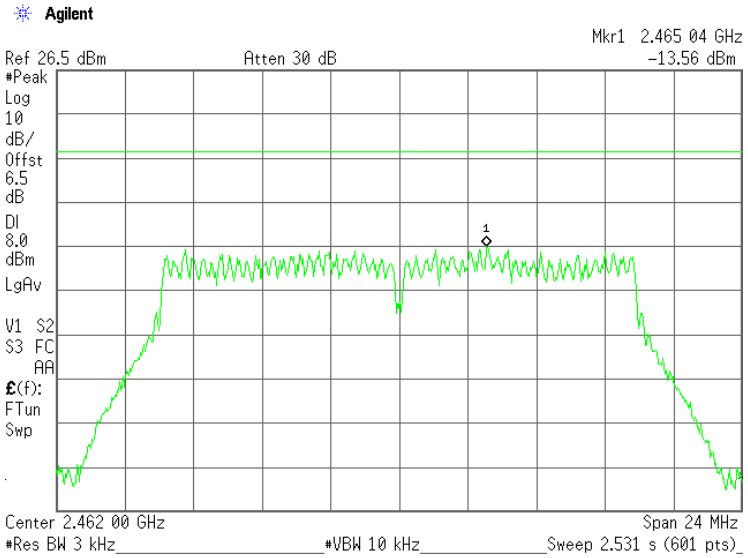
## 802.11g 54Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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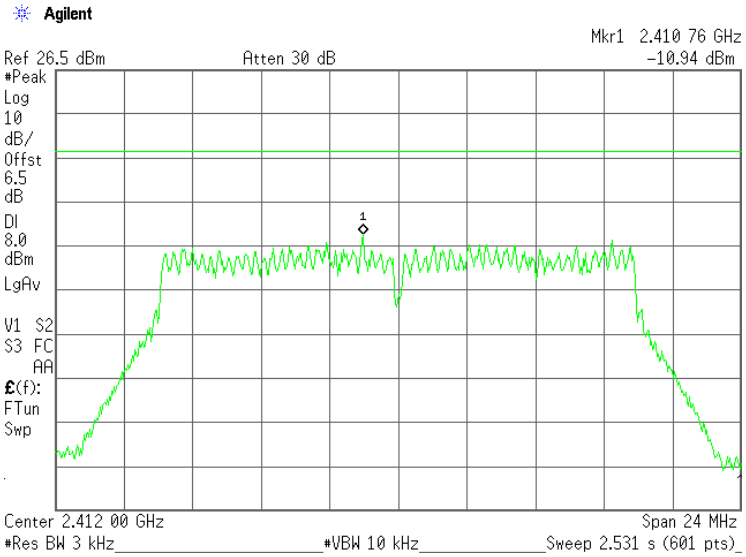
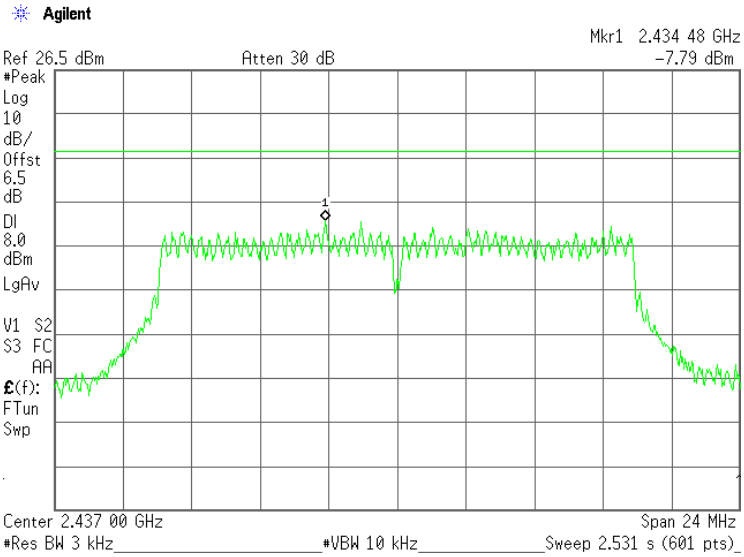
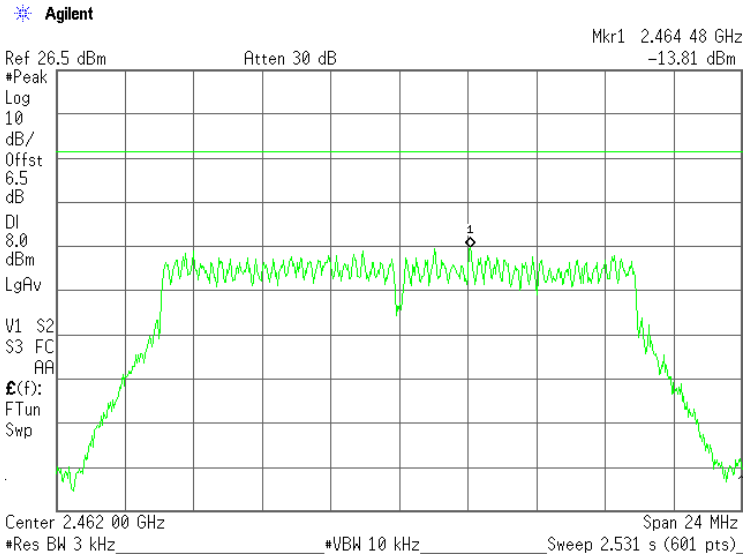
## 802.11g 54Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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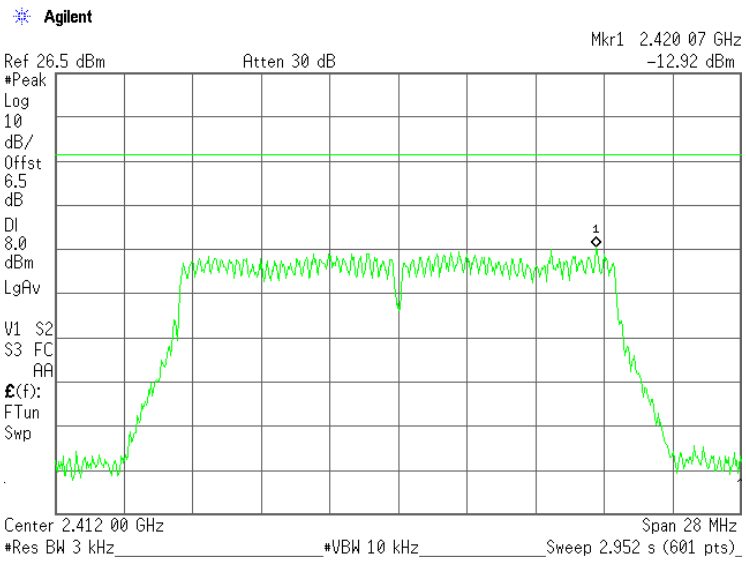
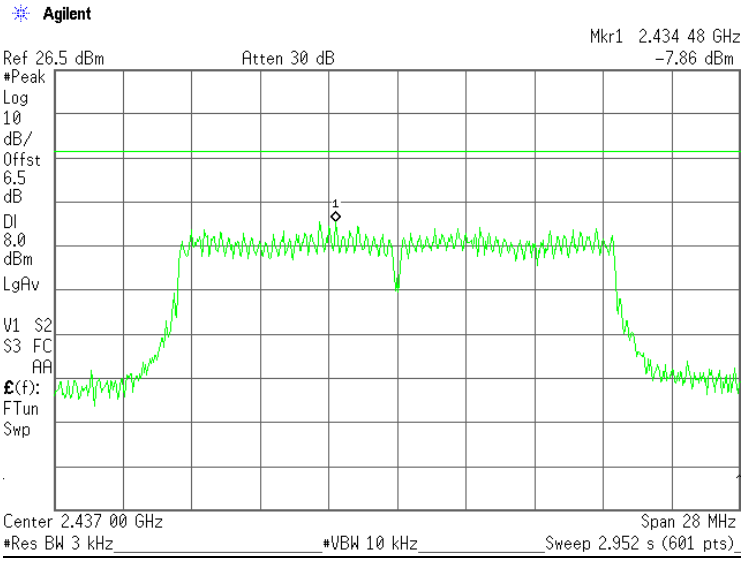
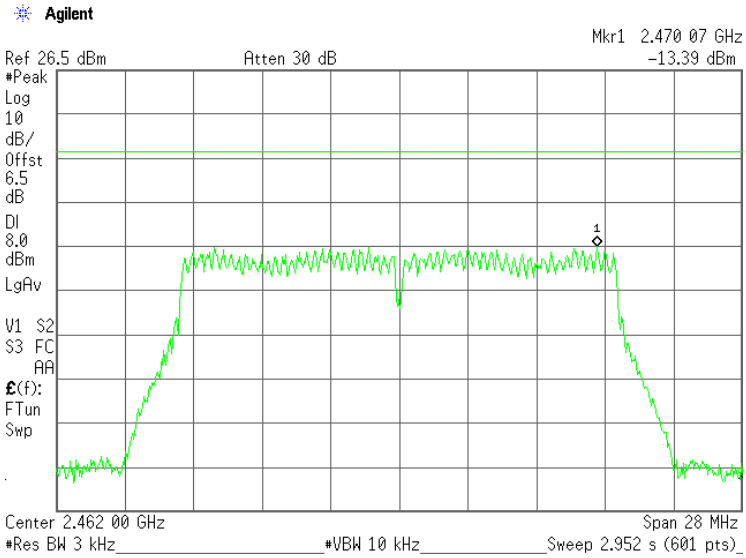
## 802.11n HT20 mcs0 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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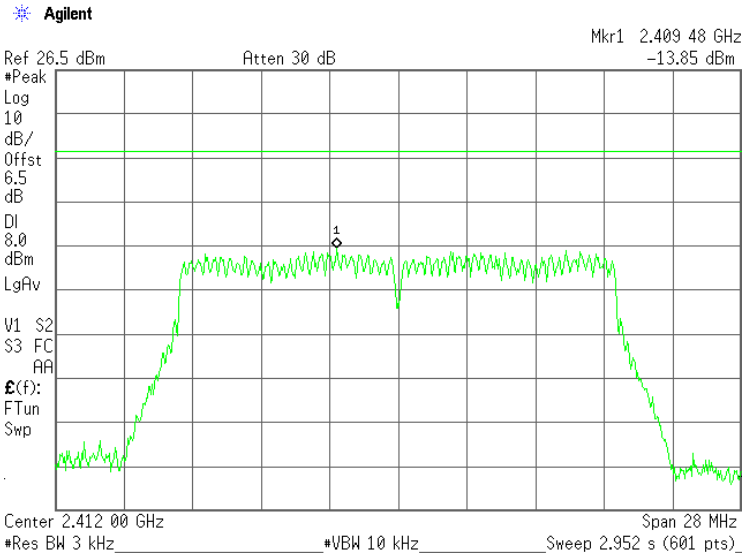
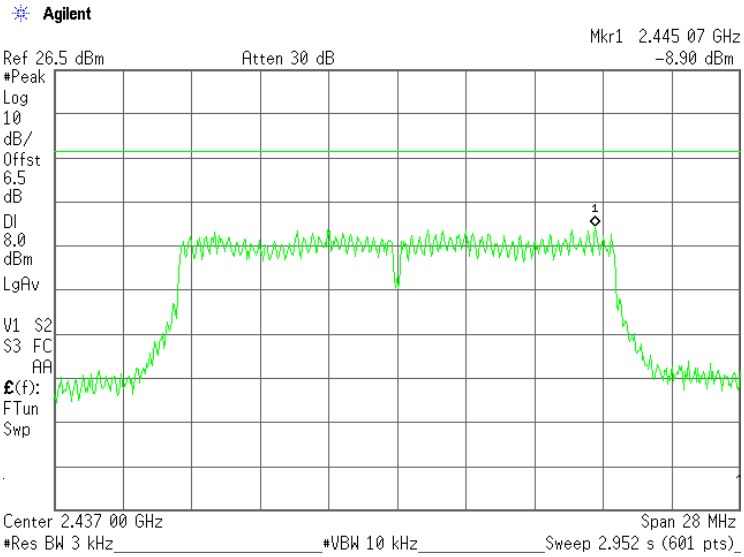
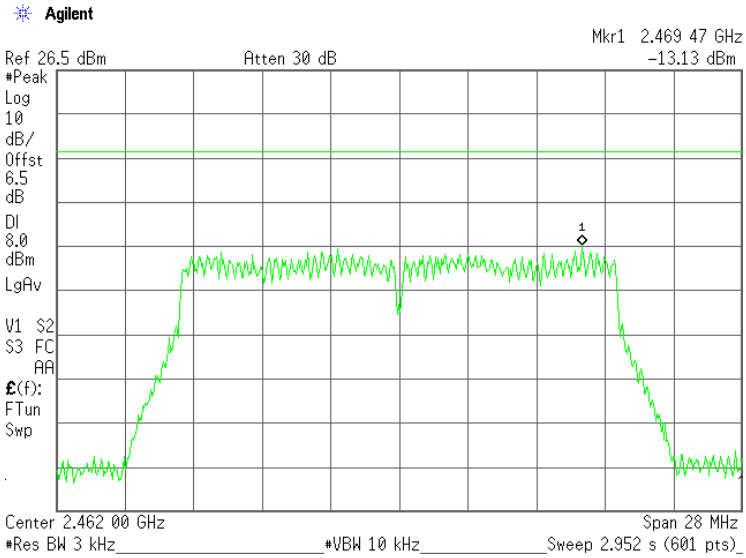
## 802.11n HT20 mcs0 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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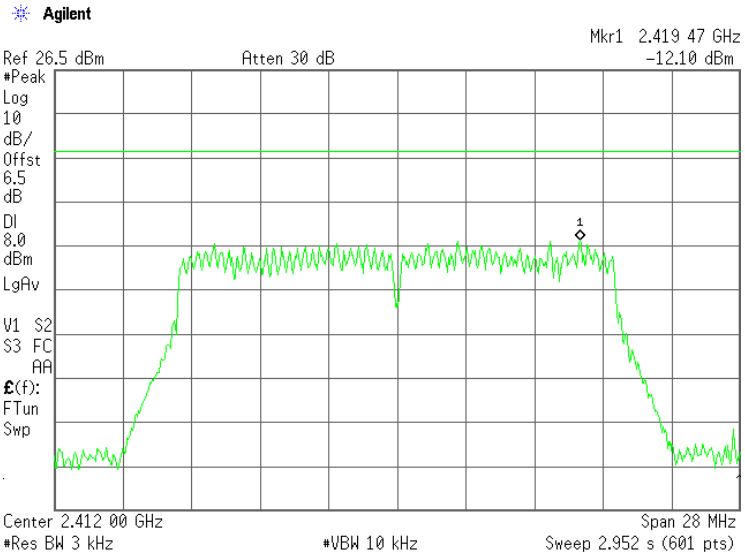
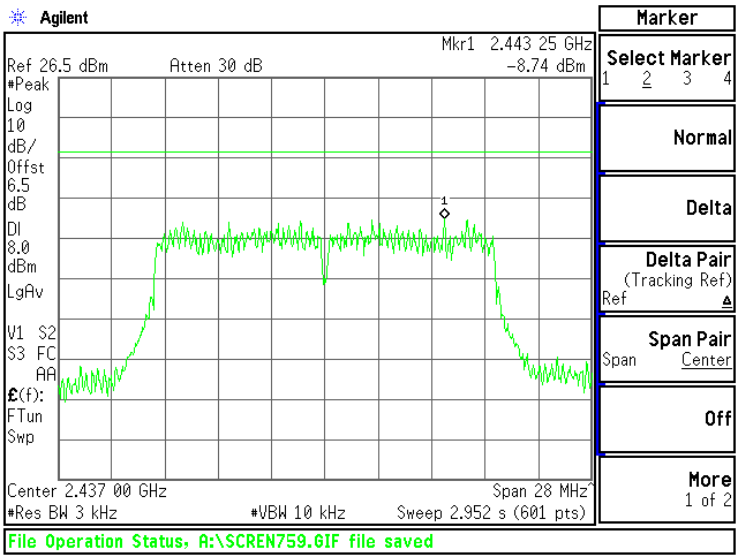
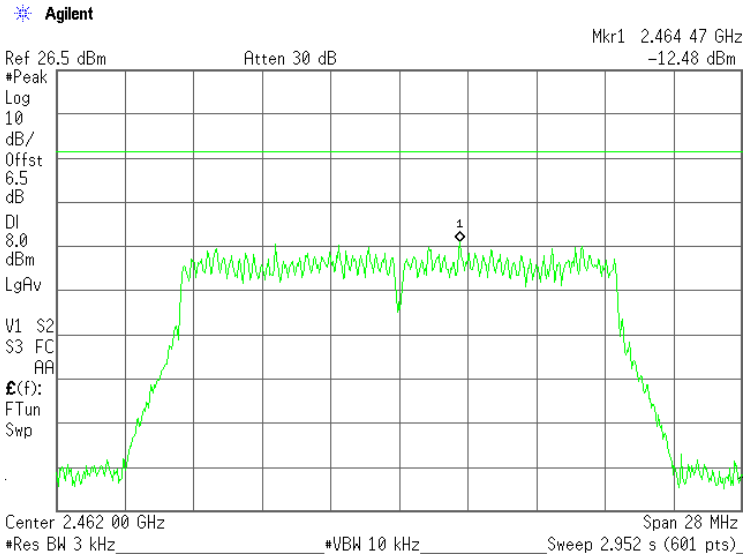
## 802.11n HT20 mcs7 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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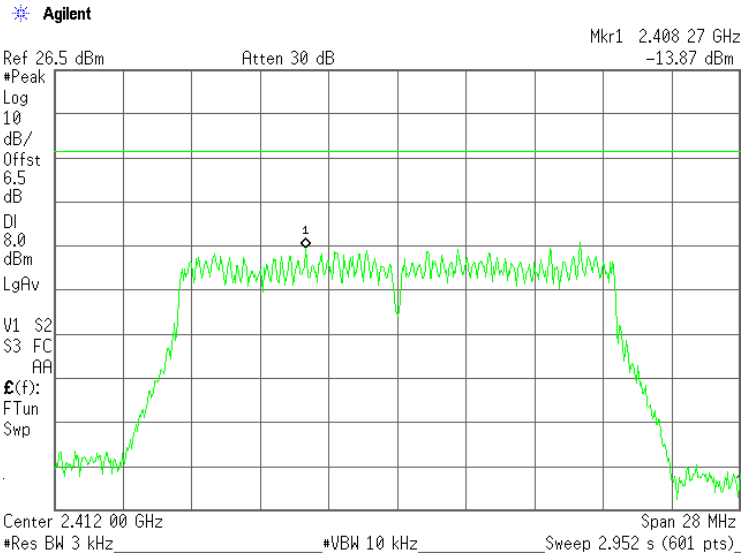
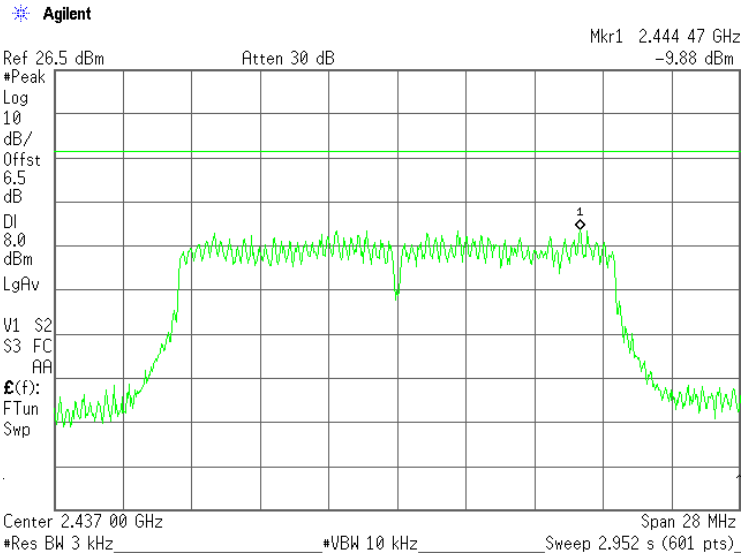
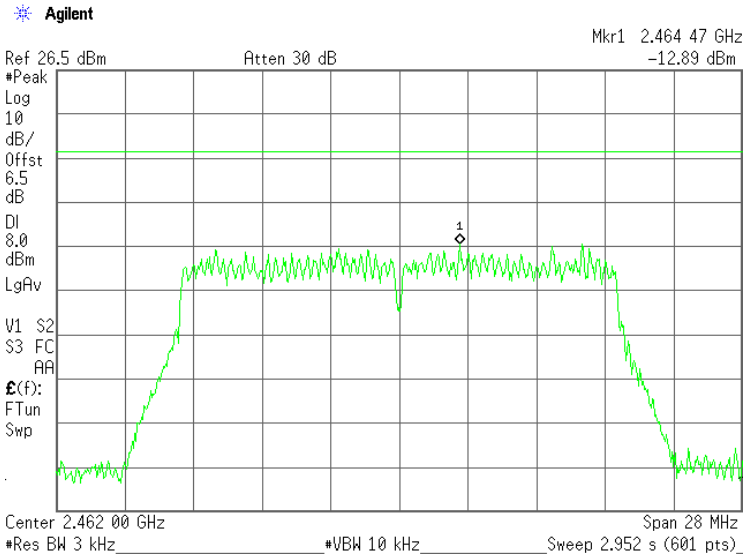
## 802.11n HT20 mcs7 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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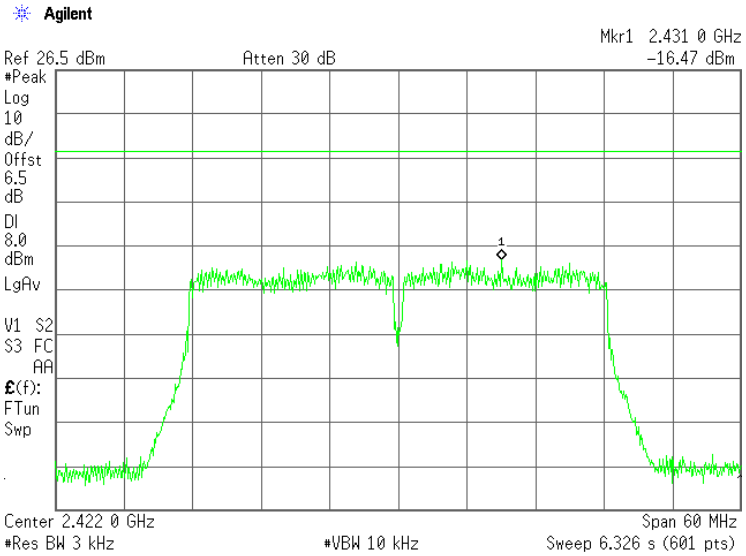
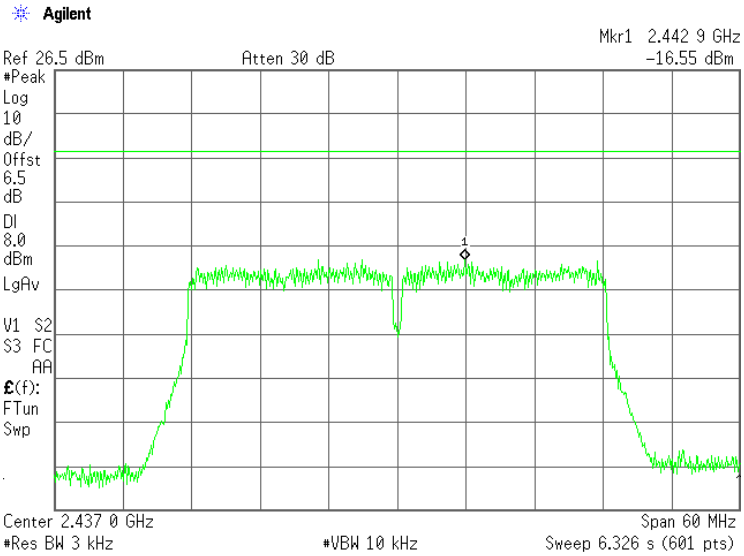
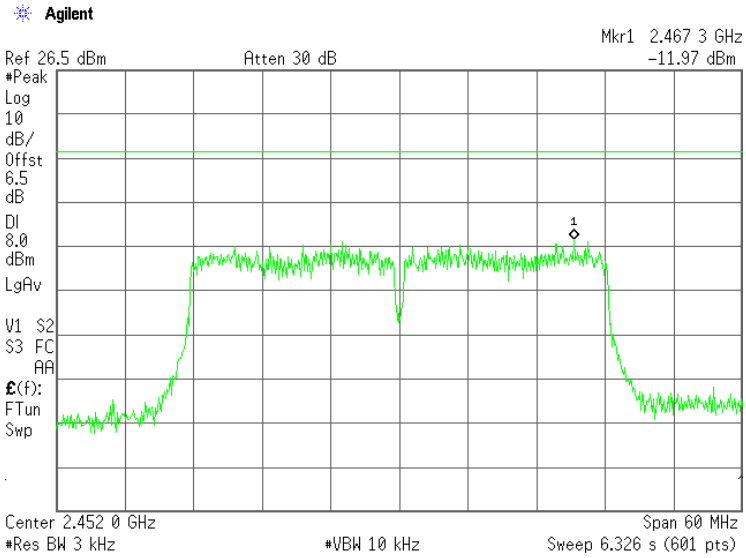
## 802.11n HT40 mcs0 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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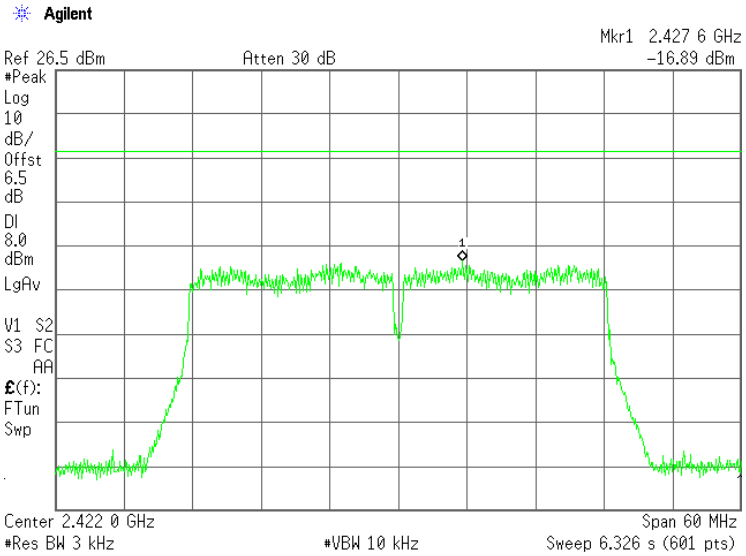
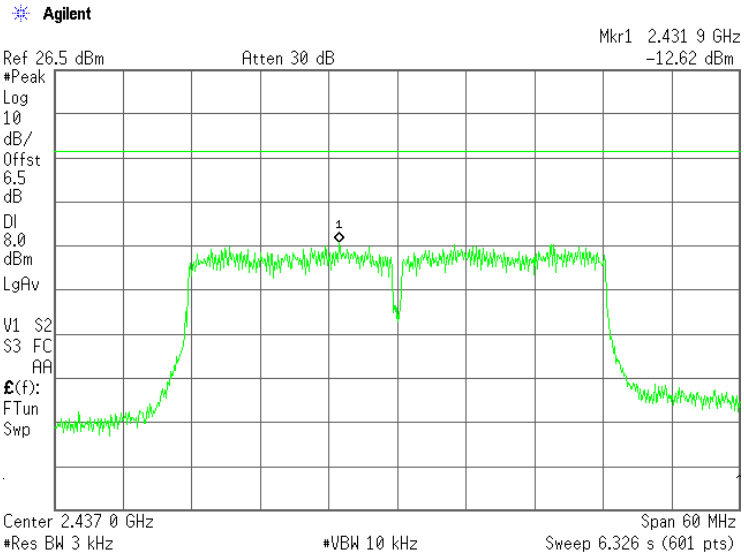
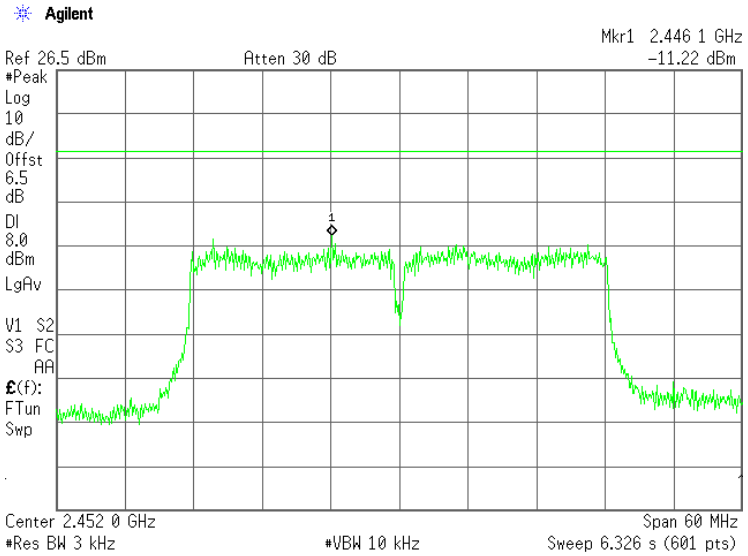
## 802.11n HT40 mcs0 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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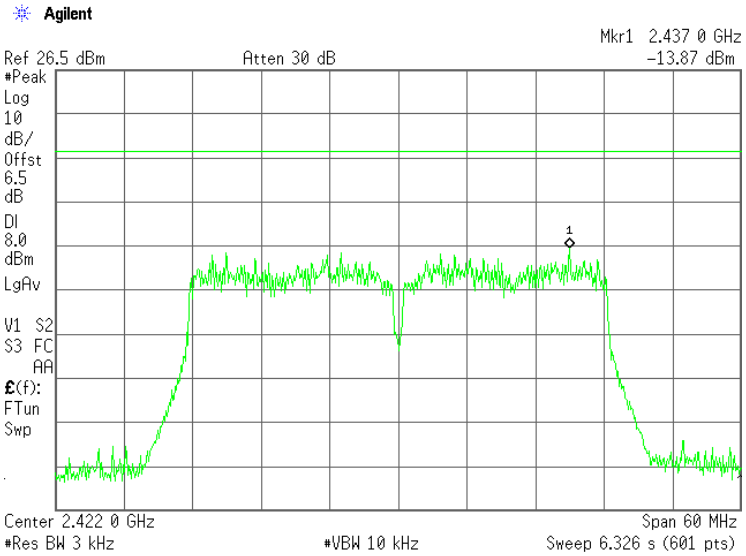
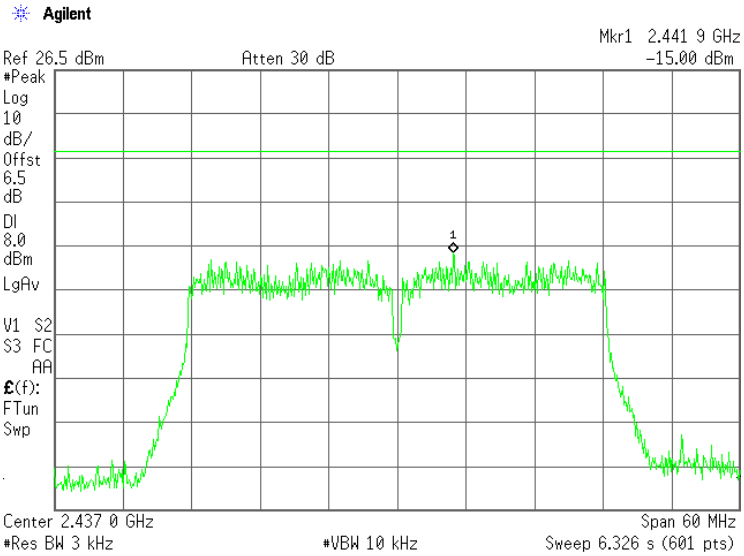
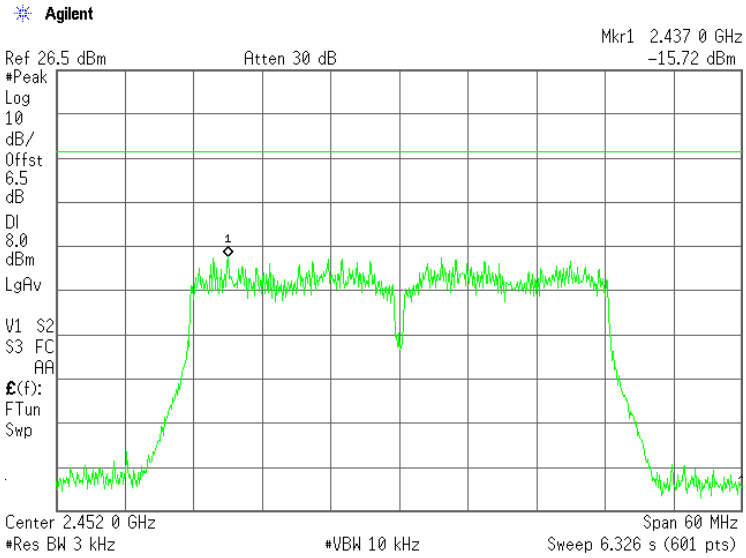
## 802.11n HT40 mcs7 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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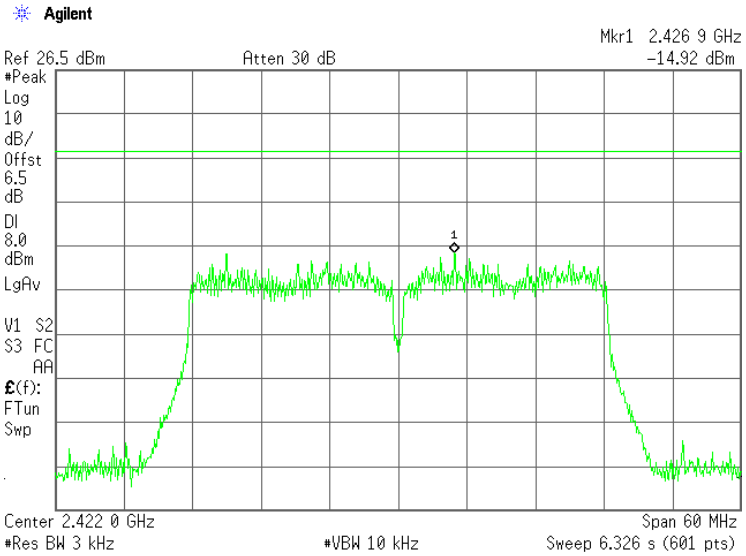
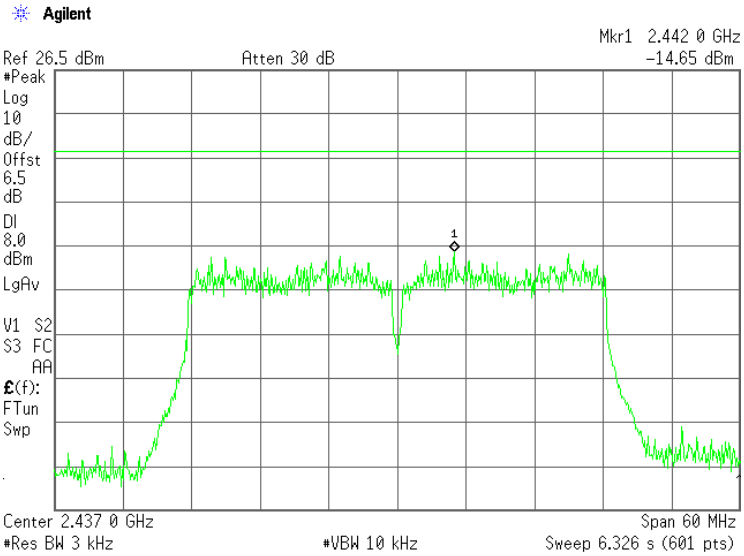
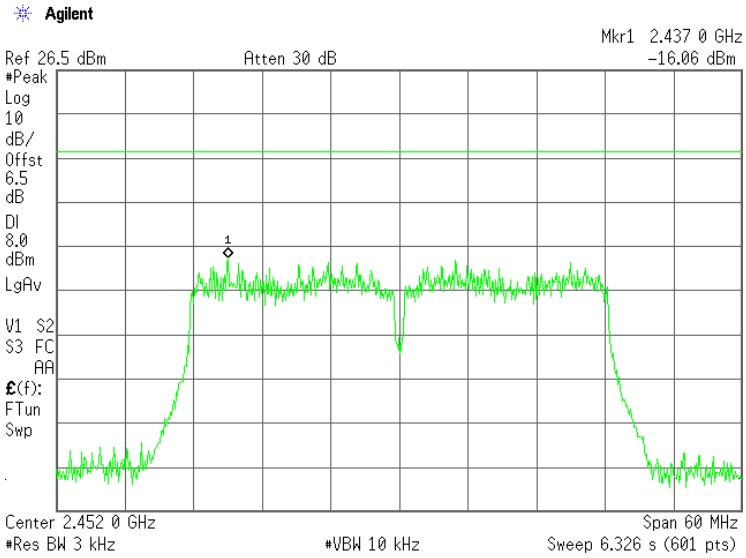
## 802.11n HT40 mcs7 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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# Spurious Conducted Emissions

## Test Description

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

## Test Criteria

| Reference | Limit |
|---|---|
| CFR 47 Subpart C 15.247 (d)<br>RSS-247, Section 5.5 | 20dBc Below the Fundamental |

Note: 20dBc is in reference to the previously measured PSD measurements as referenced in ANSI C63.10 Section 11.11.2

## Test Information

| Tester | Test Location | Date | Temperature (ºC) | Humidity (%RH) | Pressure (mbar) | Results (P/F) |
|---|---|---|---|---|---|---|
| Jose Badia | RF Lab | 6/03/2025 | 21.11 | 34 | 1021 | P |

## Test Results

### 802.11b – 1Mbps

| Conducted Spurious | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Highest Peak Measurement (dBm) | | 20dBc Limit (dBm) | | Margin (dB) | |
| | | Side Antenna | Top Antenna | Side Antenna | Top Antenna | Side Antenna | Top Antenna |
| Low | 2412 | -50.13 | -50.34 | -3.92 | -3.63 | -46.21 | -46.71 |
| Mid | 2437 | -49.67 | -49.41 | -1.17 | -3.12 | -48.5 | -46.29 |
| High | 2462 | -48.91 | -49.06 | -3.34 | -3.23 | -45.57 | -45.83 |

### 802.11b – 11Mbps

| Conducted Spurious | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Highest Peak Measurement (dBm) | | 20dBc Limit (dBm) | | Margin (dB) | |
| | | Side Antenna | Top Antenna | Side Antenna | Top Antenna | Side Antenna | Top Antenna |
| Low | 2412 | -52.96 | -50.18 | 0.00 | 0.93 | -52.96 | -51.11 |
| Mid | 2437 | -48.62 | -49.58 | -0.10 | 0.43 | -48.52 | -50.01 |



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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| High | 2462 | -49.50 | -51.09 | 3.37 | 4.09 | -52.87 | -55.18 |

## 802.11g – 6Mbps

| Conducted Spurious | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Highest Peak Measurement (dBm) | | 20dBc Limit (dBm) | | Margin (dB) | |
| | | Side Antenna | Top Antenna | Side Antenna | Top Antenna | Side Antenna | Top Antenna |
| Low | 2412 | -48.77 | -52.47 | -11.92 | -12.56 | -36.85 | -39.91 |
| Mid | 2437 | -50.30 | -50.44 | -6.97 | -7.61 | -43.33 | -42.83 |
| High | 2462 | -51.23 | -52.02 | -12.48 | -13.85 | -38.75 | -38.17 |

## 802.11g – 36Mbps

| Conducted Spurious | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Highest Peak Measurement (dBm) | | 20dBc Limit (dBm) | | Margin (dB) | |
| | | Side Antenna | Top Antenna | Side Antenna | Top Antenna | Side Antenna | Top Antenna |
| Low | 2412 | -49.83 | -50.60 | -11.51 | -12.98 | -38.32 | -37.62 |
| Mid | 2437 | -49.68 | -50.04 | -5.57 | -7.42 | -44.11 | -42.62 |
| High | 2462 | -49.04 | -49.55 | -14.16 | -12.75 | -34.88 | -36.8 |

## 802.11g – 54Mbps

| Conducted Spurious | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Highest Peak Measurement (dBm) | | 20dBc Limit (dBm) | | Margin (dB) | |
| | | Side Antenna | Top Antenna | Side Antenna | Top Antenna | Side Antenna | Top Antenna |
| Low | 2412 | -47.80 | -50.26 | -9.95 | -10.94 | -37.85 | -39.32 |
| Mid | 2437 | -45.69 | -49.57 | -6.91 | -7.79 | -38.78 | -41.78 |
| High | 2462 | -47.44 | -45.75 | -13.56 | -13.81 | -33.88 | -31.94 |

## 802.11n HT20 – msc0

| Conducted Spurious | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Highest Peak Measurement (dBm) | | 20dBc Limit (dBm) | | Margin (dB) | |
| | | Side Antenna | Top Antenna | Side Antenna | Top Antenna | Side Antenna | Top Antenna |
| Low | 2412 | -46.16 | -47.83 | -12.92 | -13.85 | -33.24 | -33.98 |
| Mid | 2437 | -46.21 | -46.38 | -7.86 | -8.90 | -38.35 | -37.48 |
| High | 2462 | -46.84 | -46.69 | -13.39 | -13.13 | -33.45 | -33.56 |



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## 802.11n HT20 – msc7

| Conducted Spurious | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Highest Peak Measurement (dBm) | | 20dBc Limit (dBm) | | Margin (dB) | |
| | | Side Antenna | Top Antenna | Side Antenna | Top Antenna | Side Antenna | Top Antenna |
| Low | 2412 | -49.06 | -45.90 | -12.10 | -13.87 | -36.96 | -32.03 |
| Mid | 2437 | -47.28 | -48.24 | -8.74 | -9.88 | -38.54 | -38.36 |
| High | 2462 | -48.92 | -46.73 | -12.48 | -12.89 | -36.44 | -33.84 |

## 802.11n HT40 – msc0

| Conducted Spurious | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Highest Peak Measurement (dBm) | | 20dBc Limit (dBm) | | Margin (dB) | |
| | | Side Antenna | Top Antenna | Side Antenna | Top Antenna | Side Antenna | Top Antenna |
| Low | 2412 | -46.90 | -47.62 | -16.47 | -16.89 | -30.43 | -30.73 |
| Mid | 2437 | -47.01 | -49.31 | -16.55 | -12.62 | -30.46 | -36.69 |
| High | 2462 | -48.55 | -45.33 | -11.97 | -11.22 | -36.58 | -34.11 |

## 802.11n HT40 – msc7

| Conducted Spurious | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Highest Peak Measurement (dBm) | | 20dBc Limit (dBm) | | Margin (dB) | |
| | | Side Antenna | Top Antenna | Side Antenna | Top Antenna | Side Antenna | Top Antenna |
| Low | 2412 | -45.81 | -46.35 | -13.87 | -14.92 | -31.94 | -31.43 |
| Mid | 2437 | -47.02 | -47.51 | -15.00 | -14.65 | -32.02 | -32.86 |
| High | 2462 | -48.29 | -44.96 | -15.72 | -16.06 | -32.57 | -28.9 |



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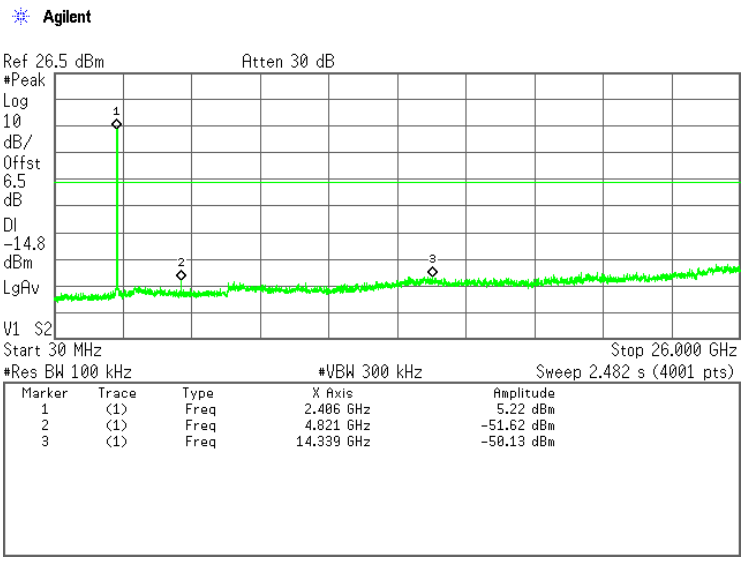
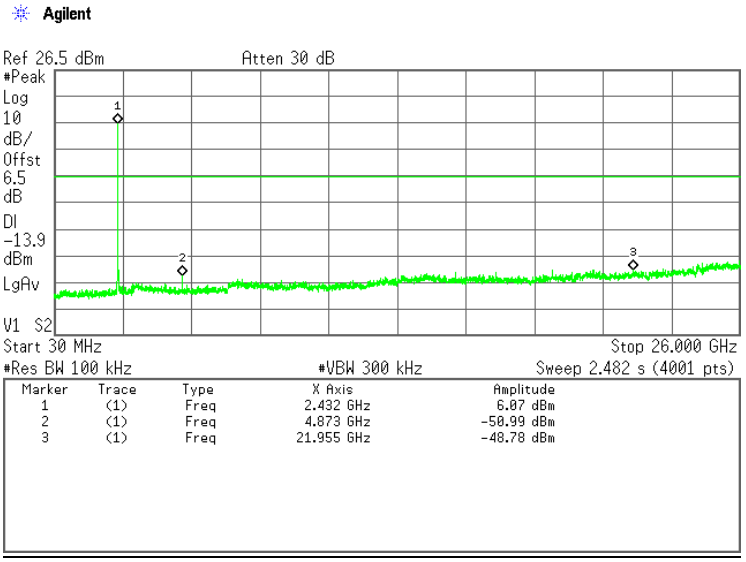
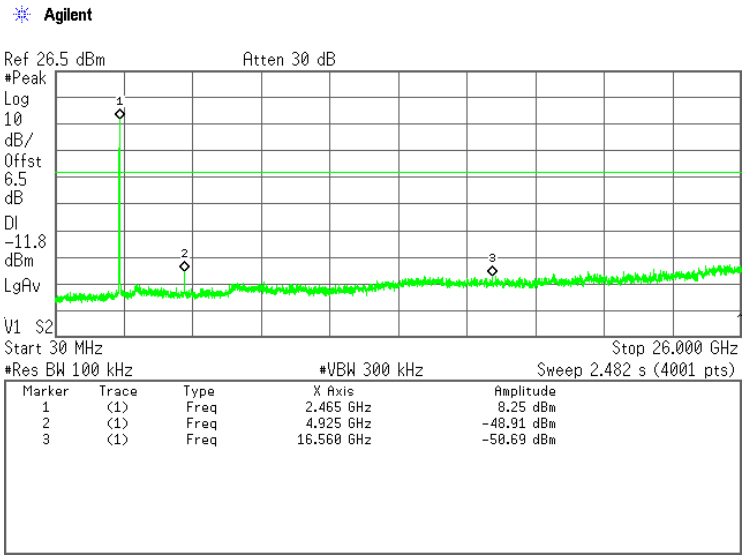
## 802.11b 1Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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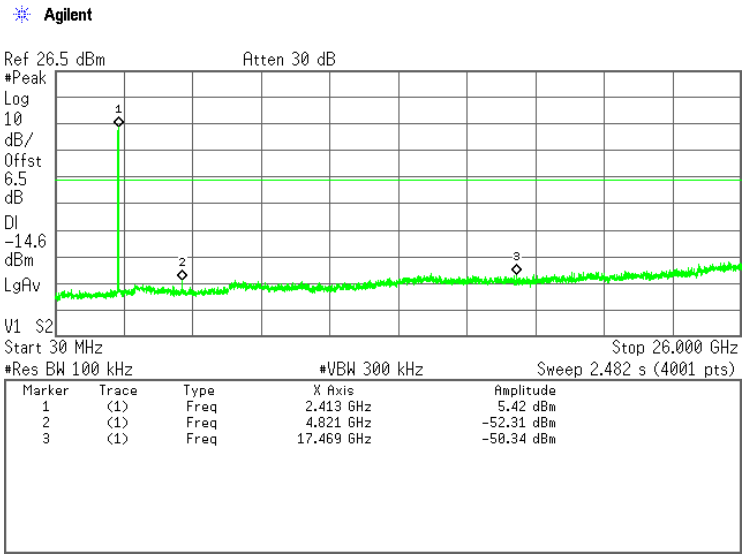
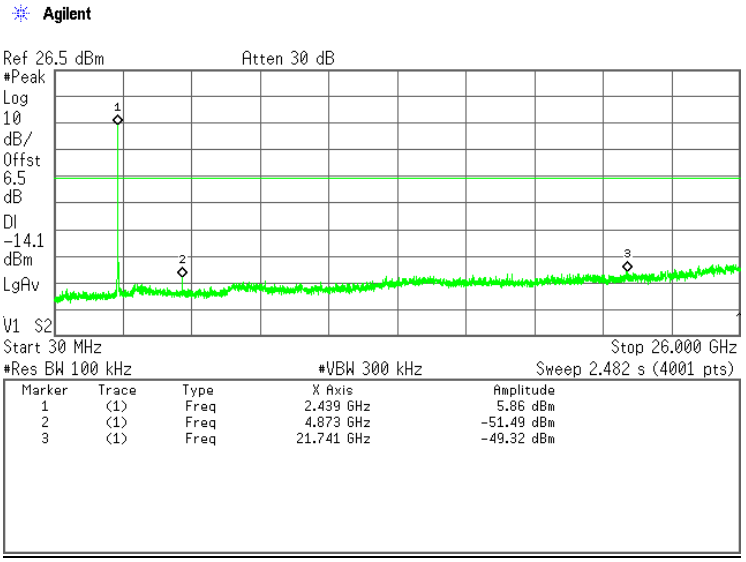
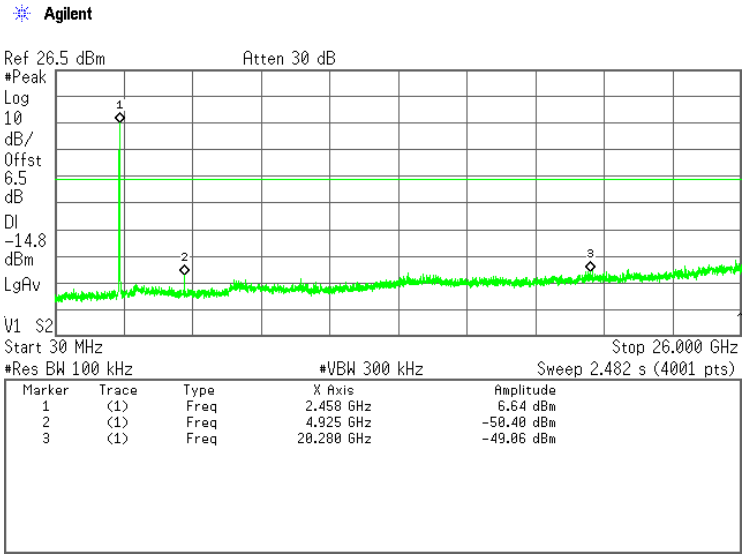
## 802.11b 1Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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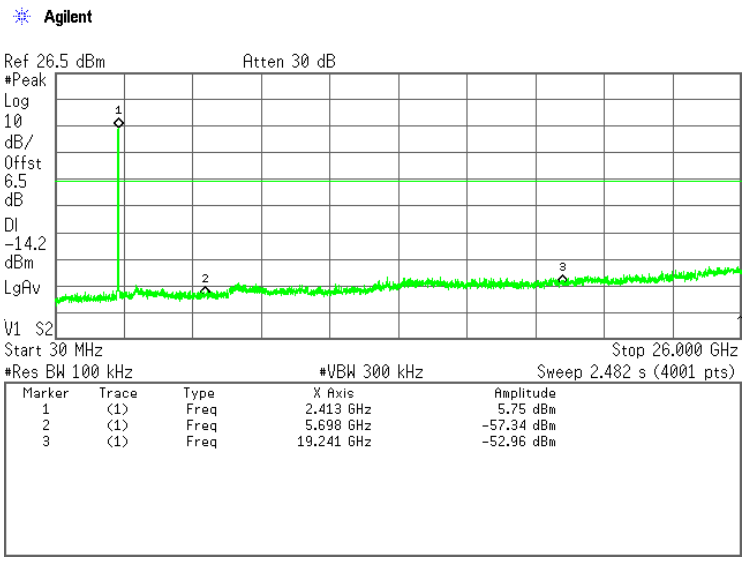
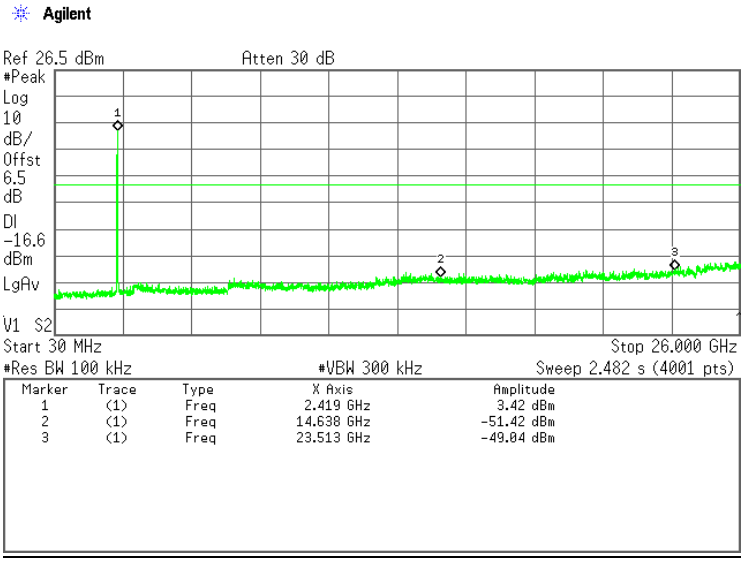
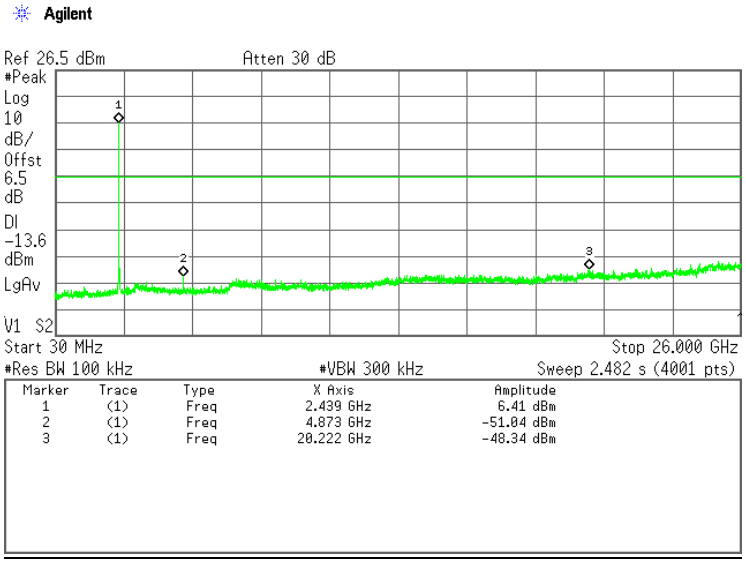
## 802.11b 11Mbps – Side Antenna



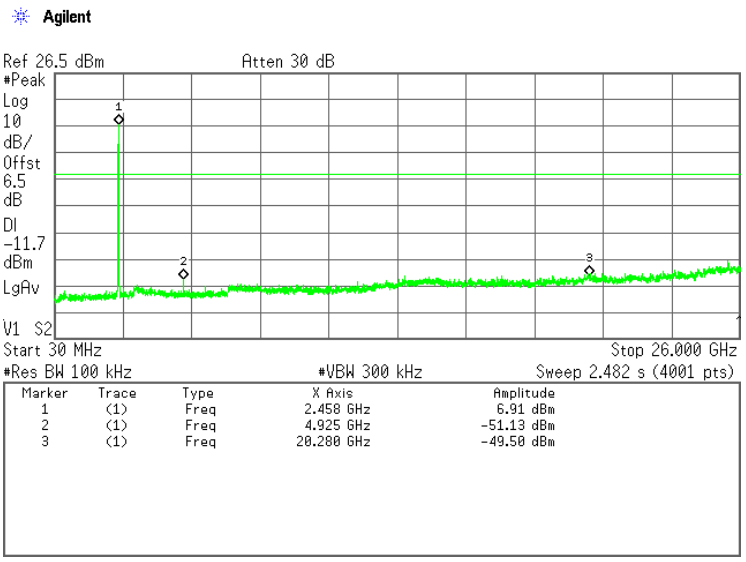

CH 1 - Plot




CH 2 - Plot




Mid - Plot




High Channel - Plot



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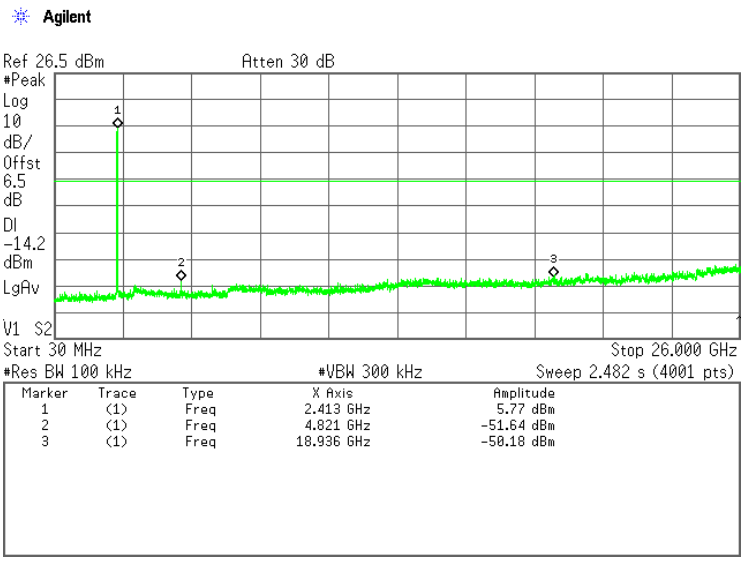
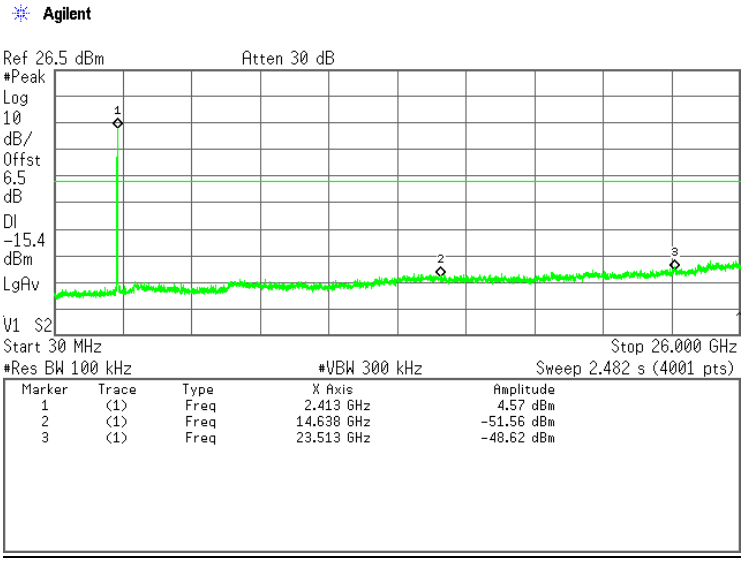
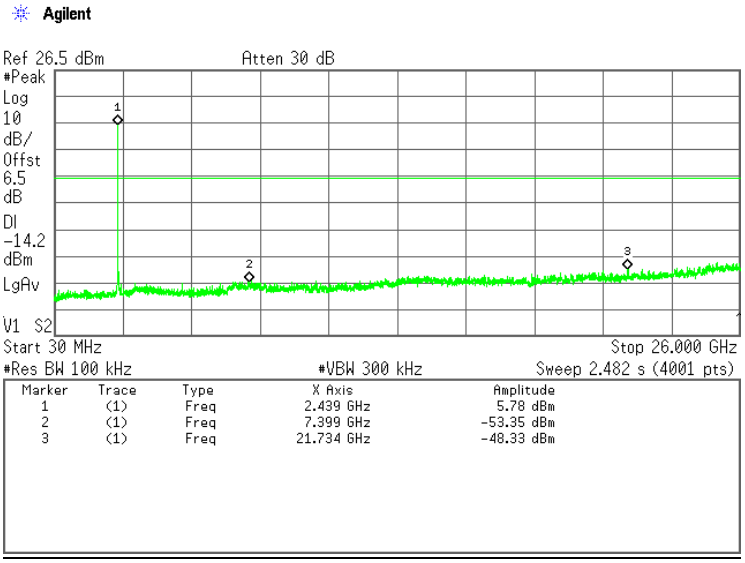
## 802.11b 11Mbps – Top Antenna



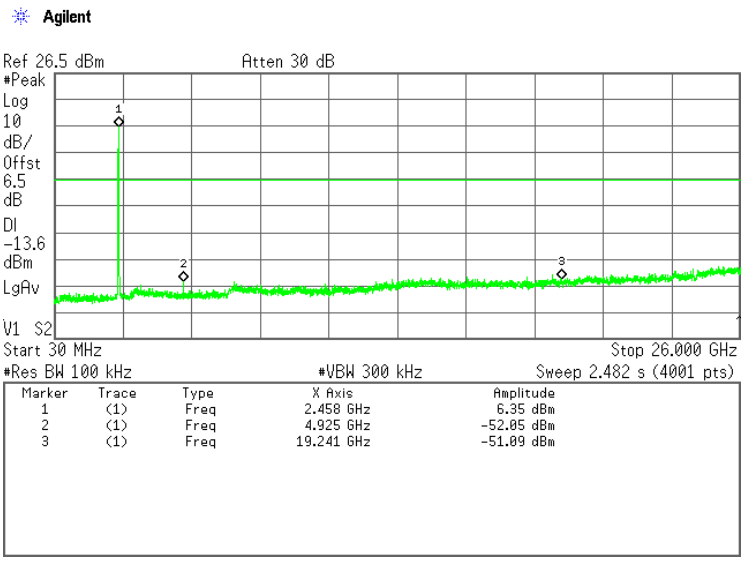

CH 1 - Plot




CH 2 - Plot




Mid Channel - Plot




High Channel - Plot



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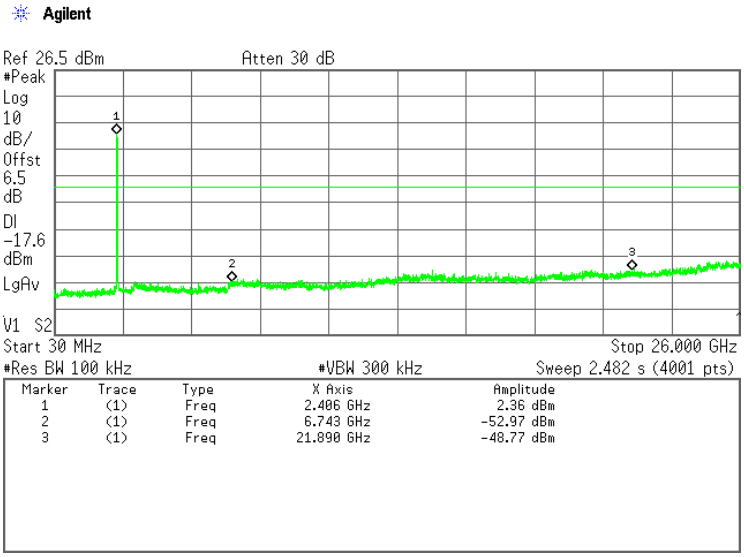
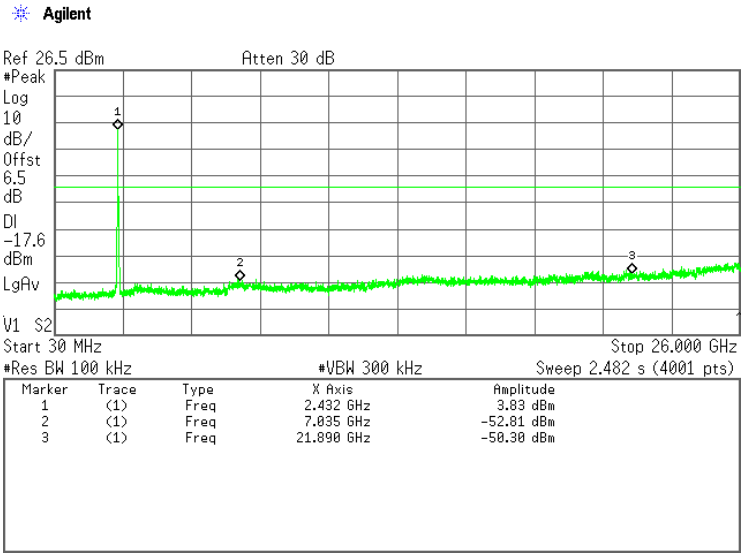
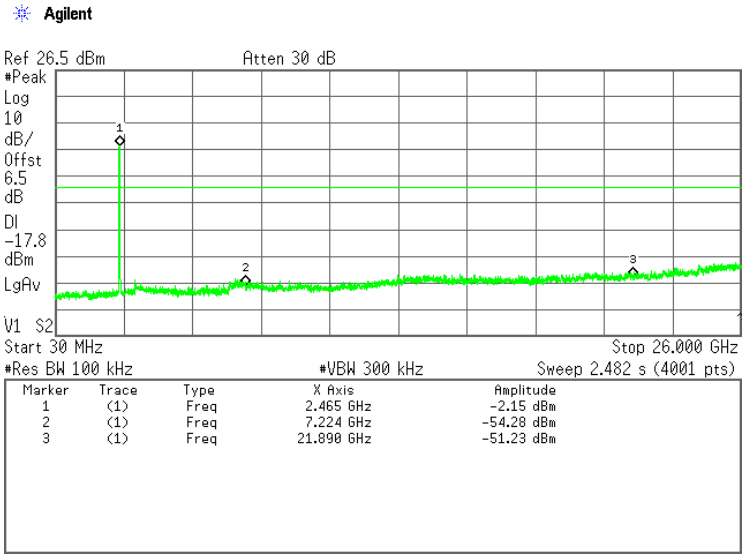
## 802.11g 6Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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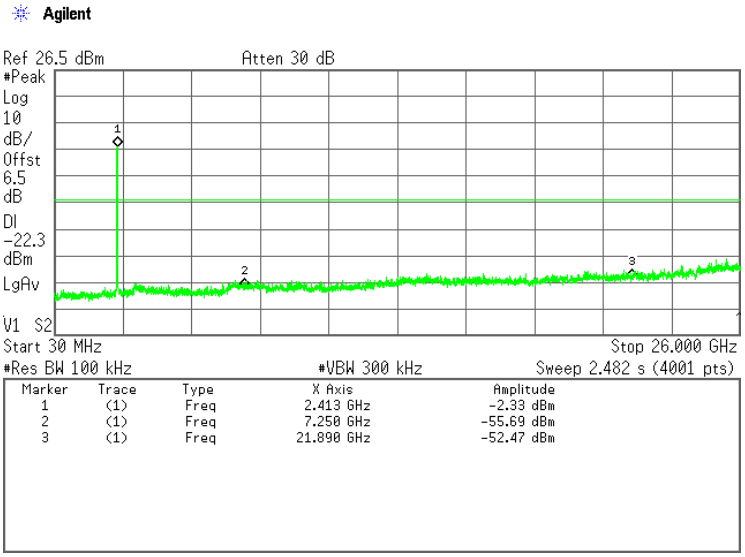
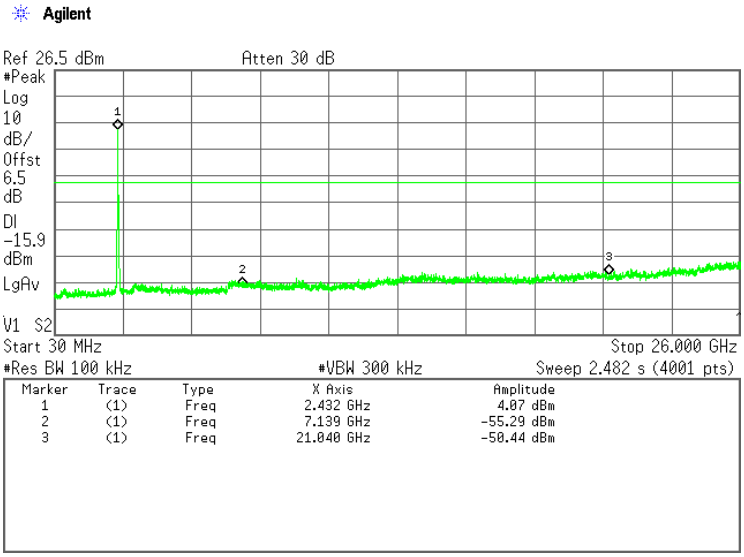
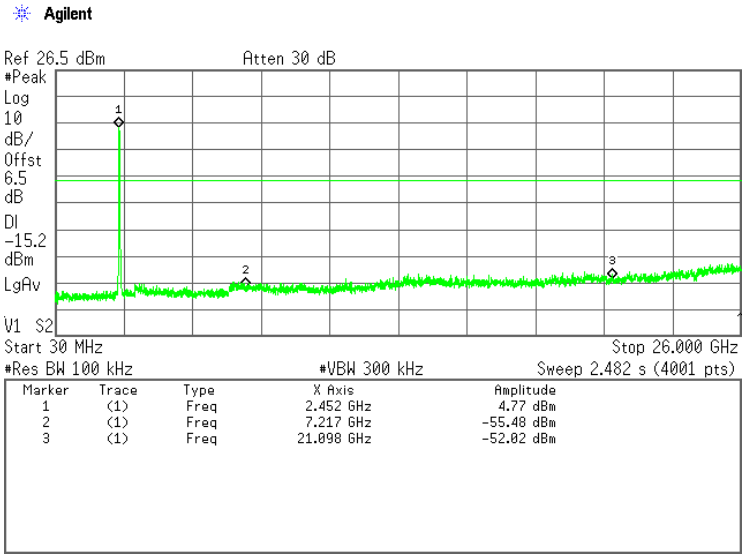
## 802.11g 6Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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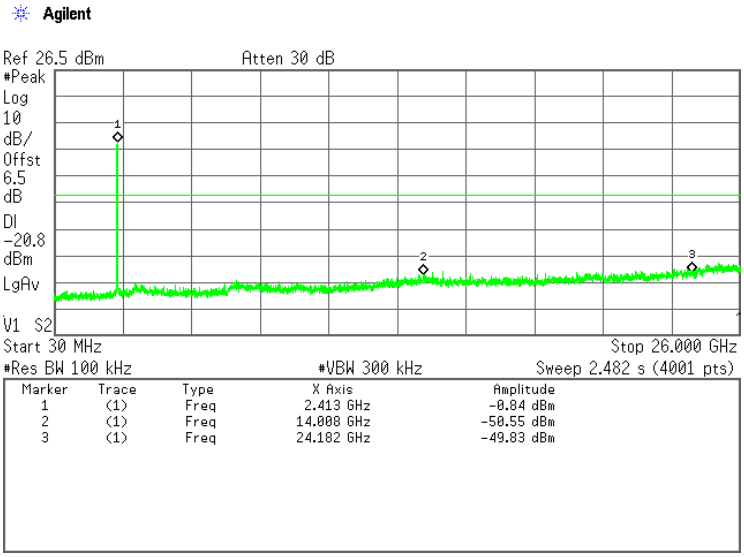
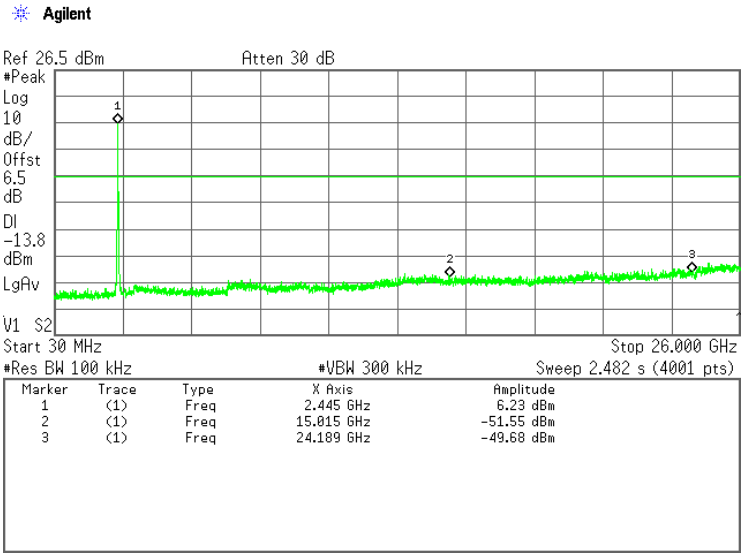
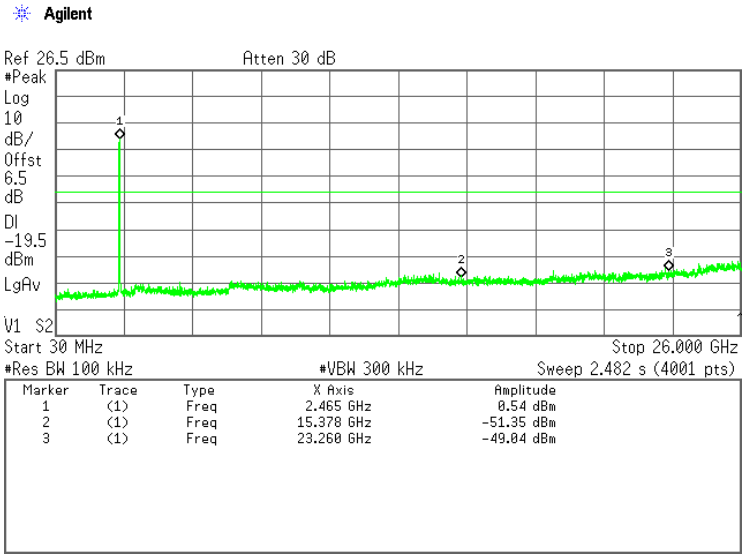
## 802.11g 36Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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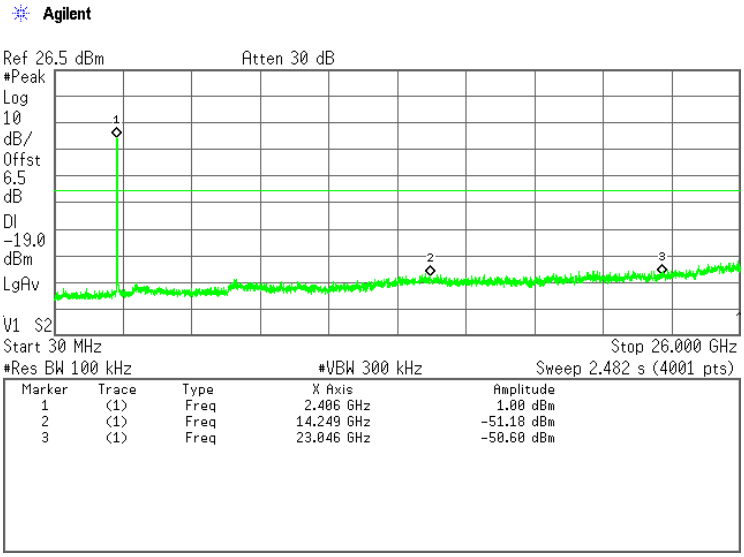
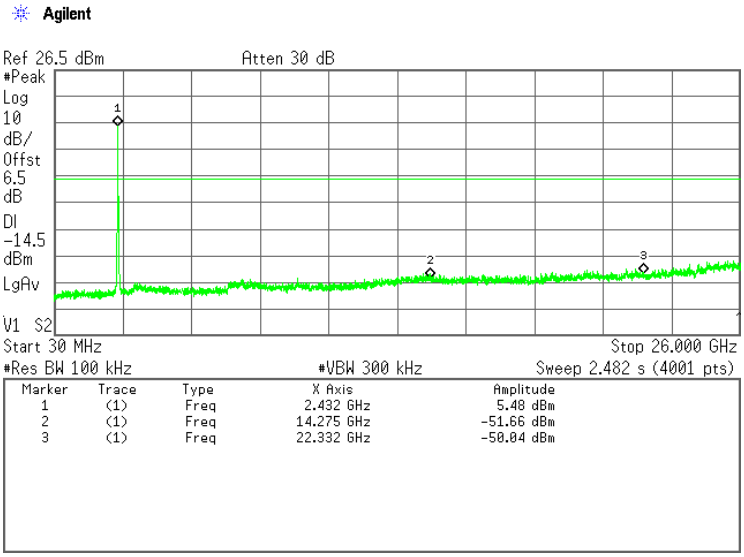
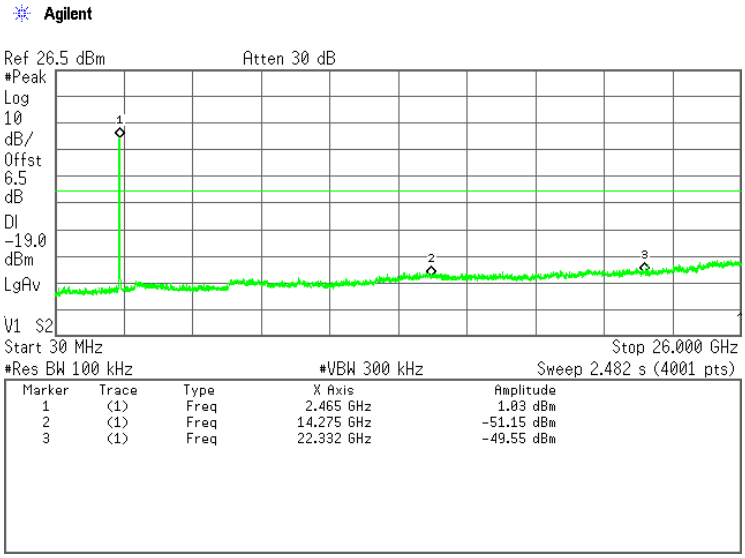
## 802.11g 36Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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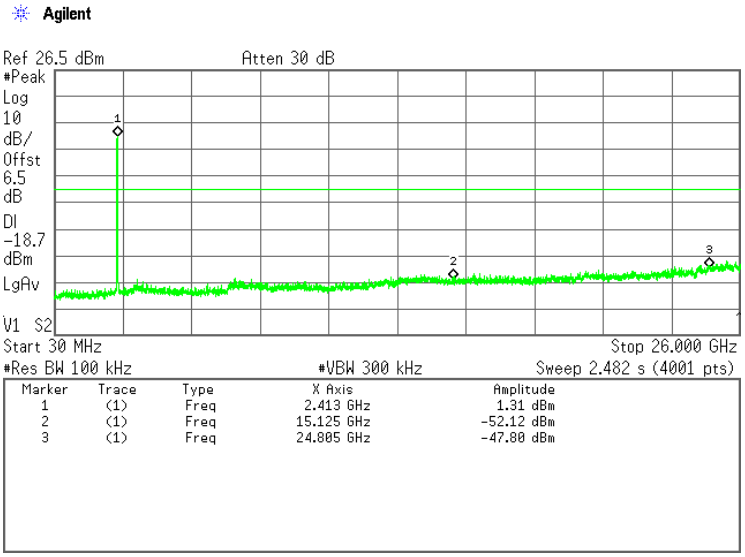
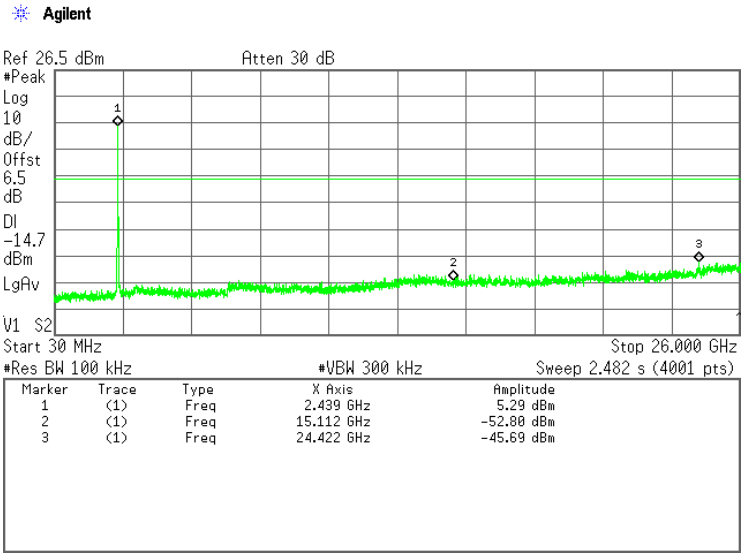
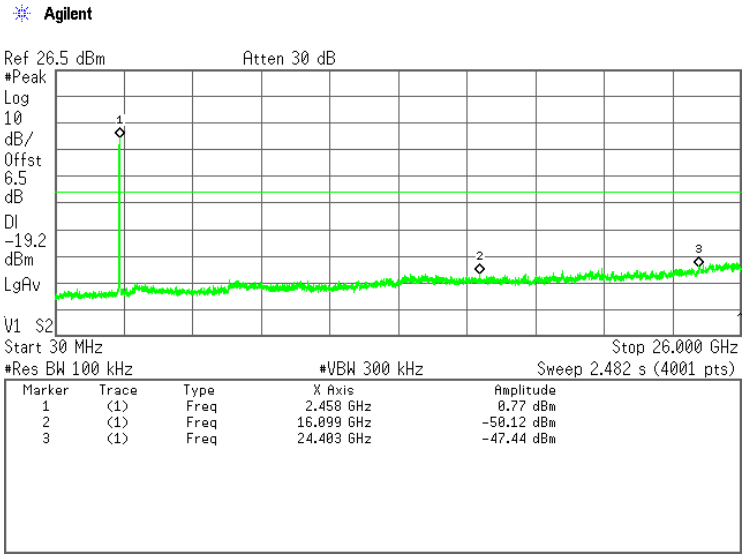
## 802.11g 54Mbps – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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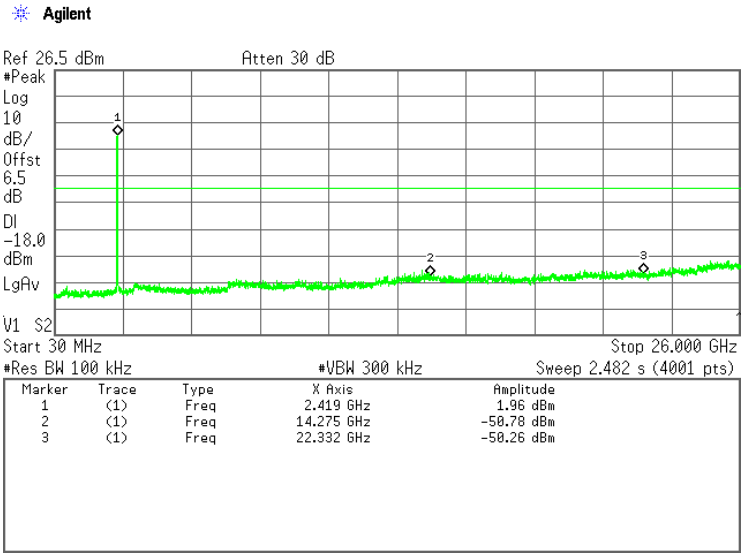
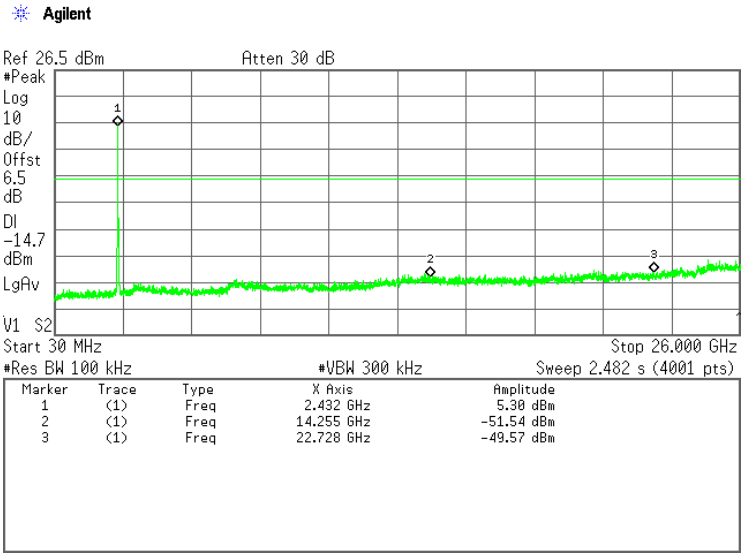
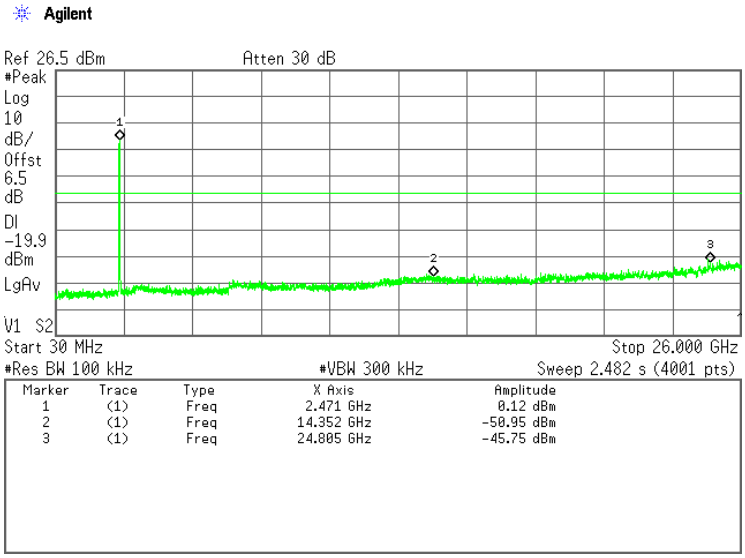
## 802.11g 54Mbps – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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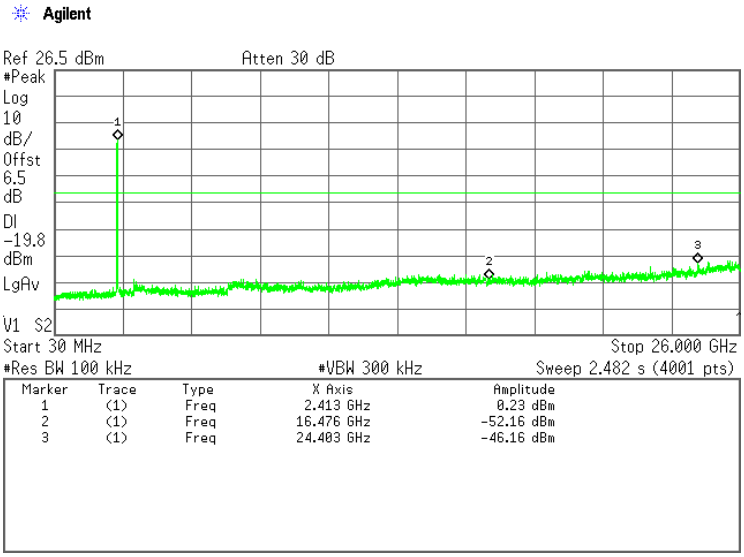
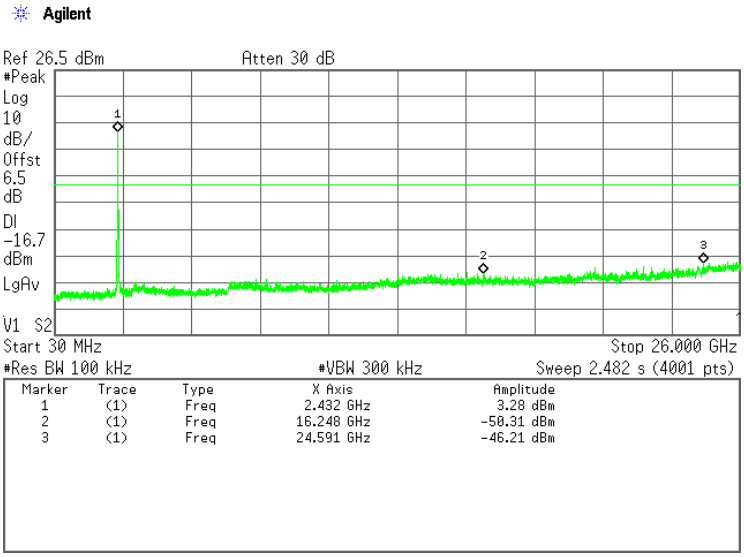
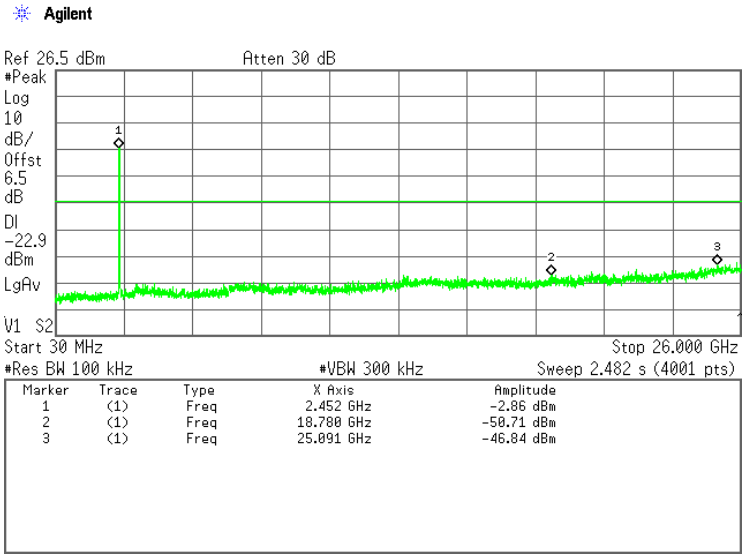
## 802.11n HT20 mcs0 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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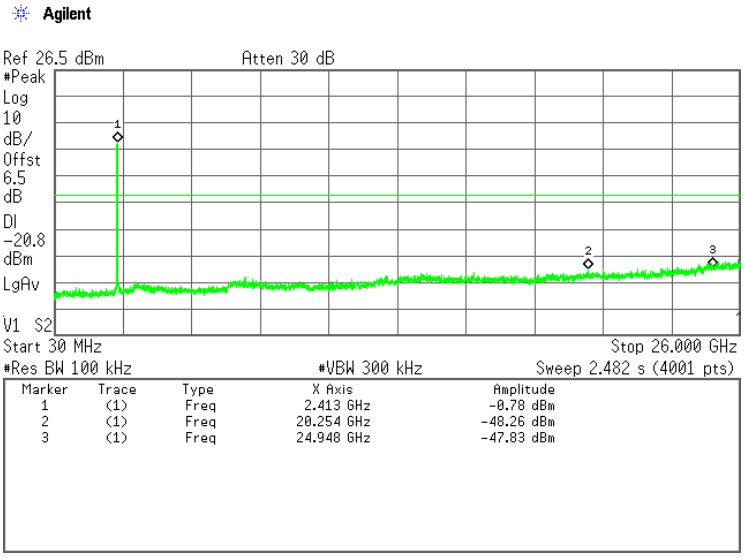
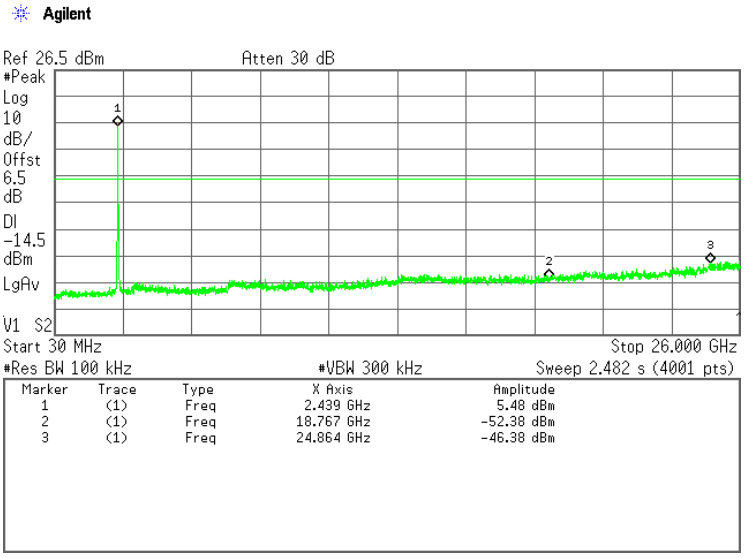
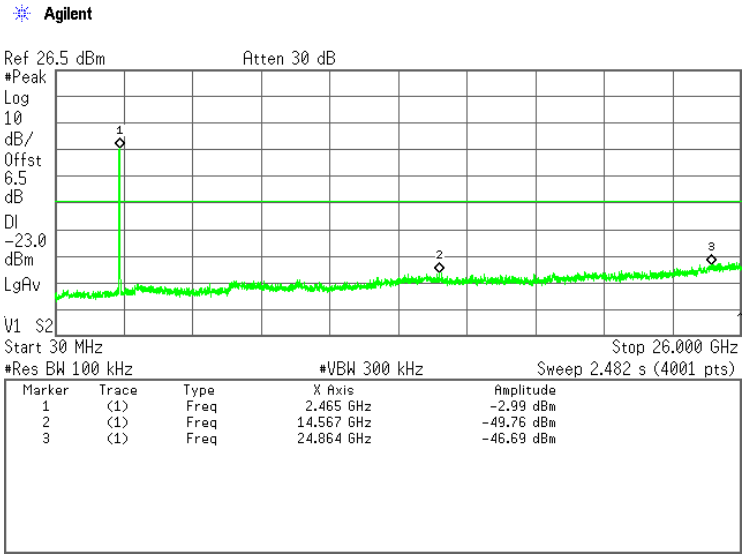
## 802.11n HT20 mcs0 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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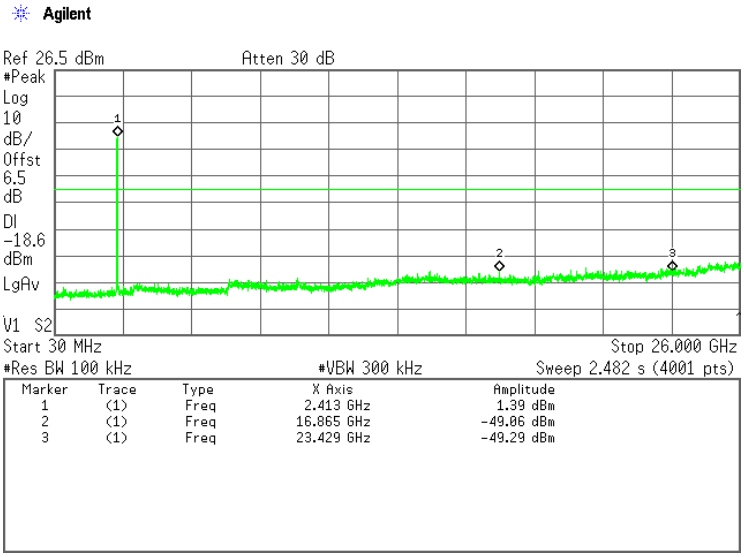
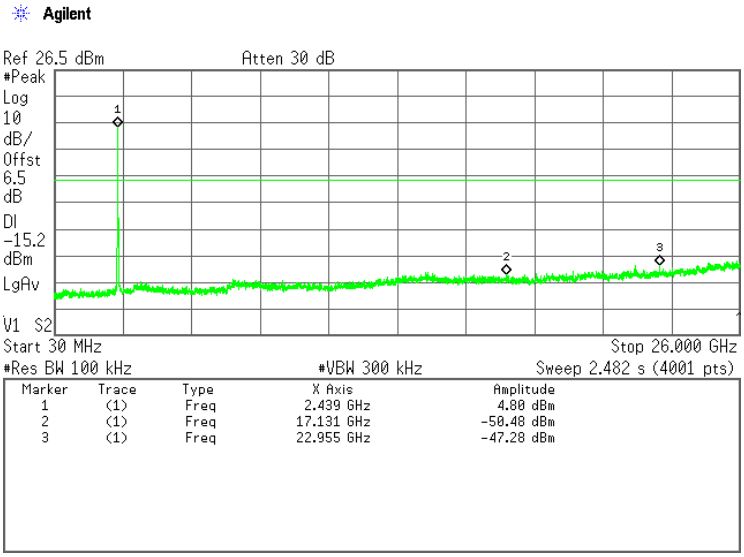
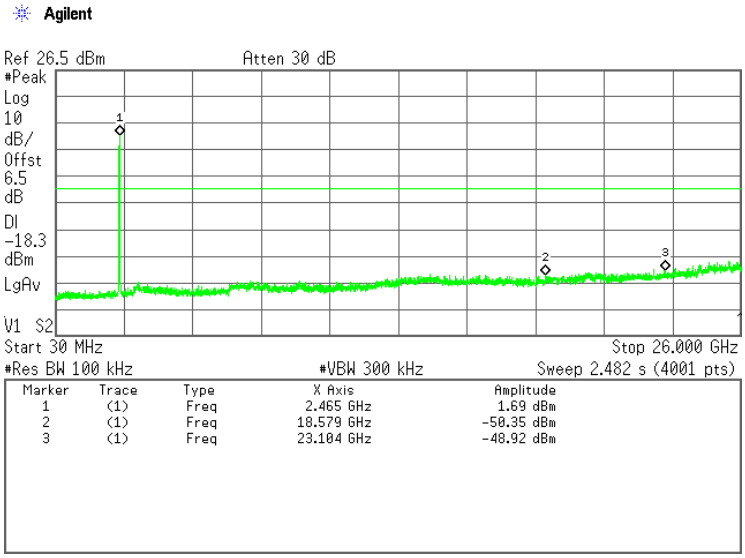
## 802.11n HT20 mcs7 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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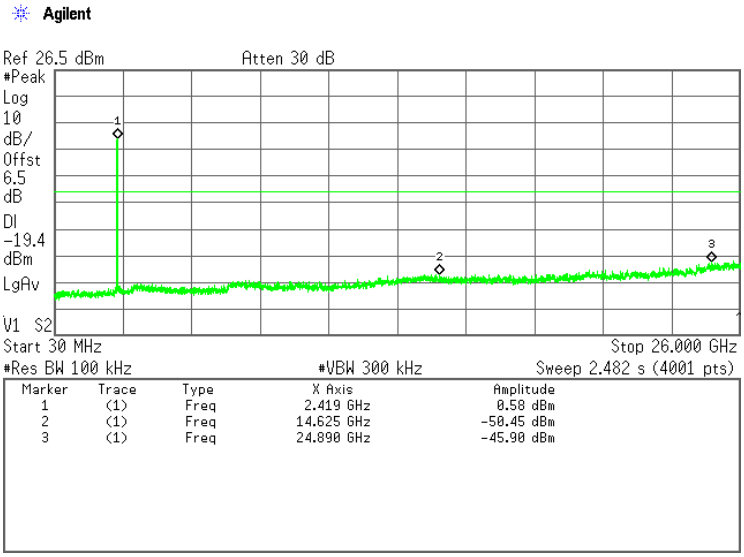
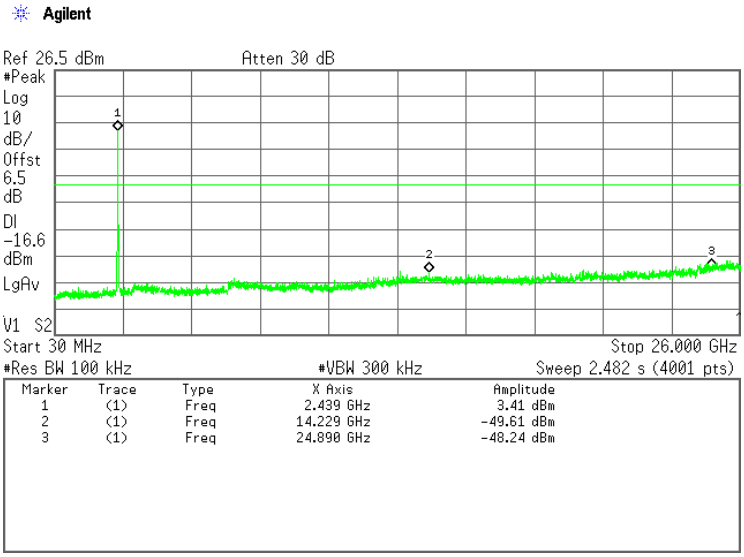
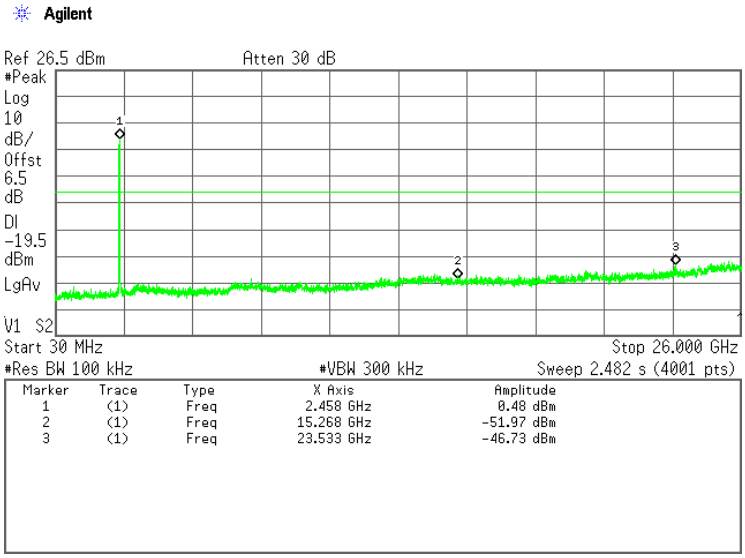
## 802.11n HT20 mcs7 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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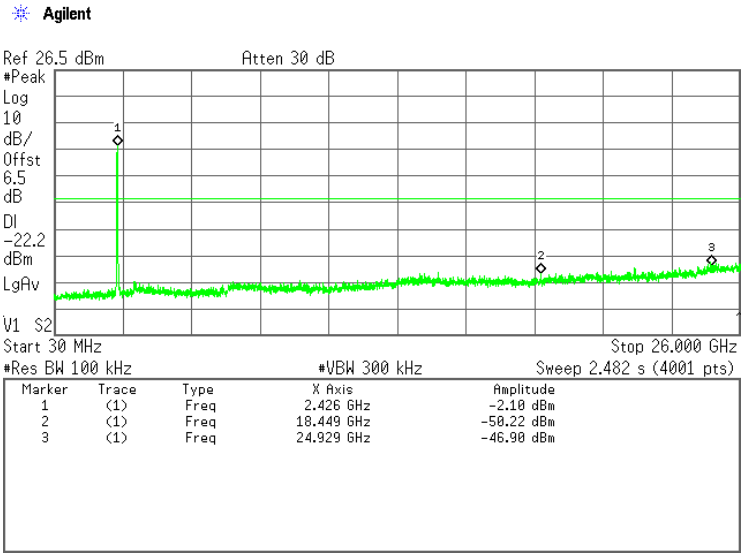
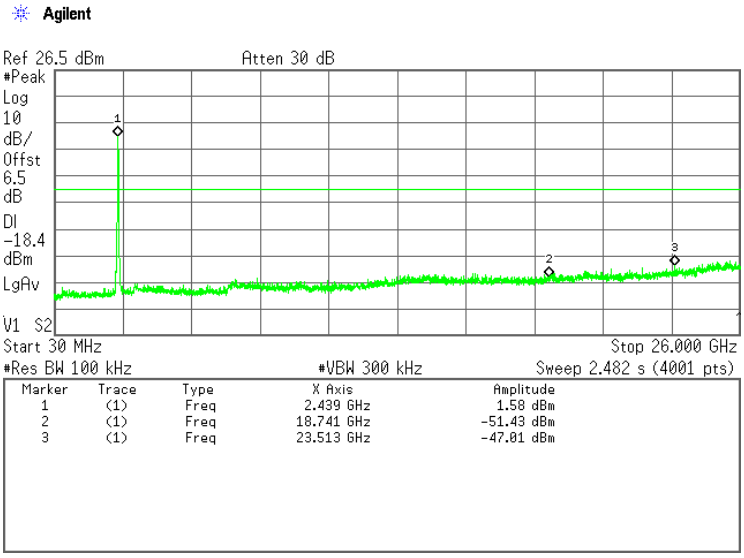
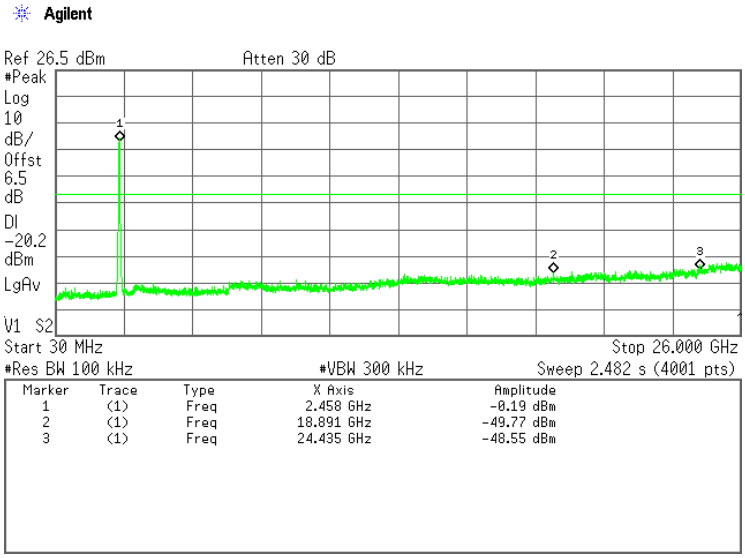
## 802.11n HT40 mcs0 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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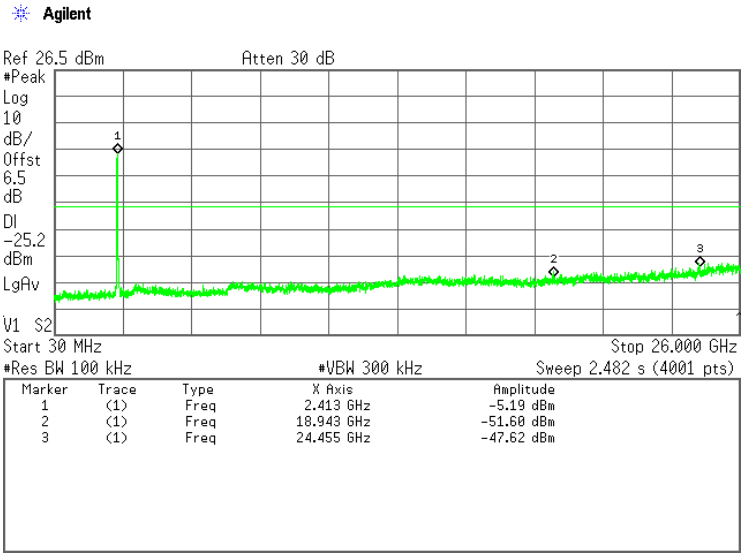
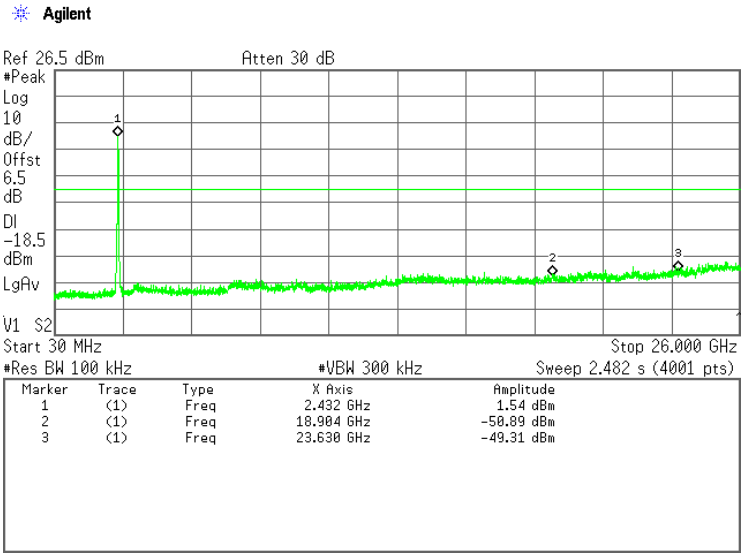
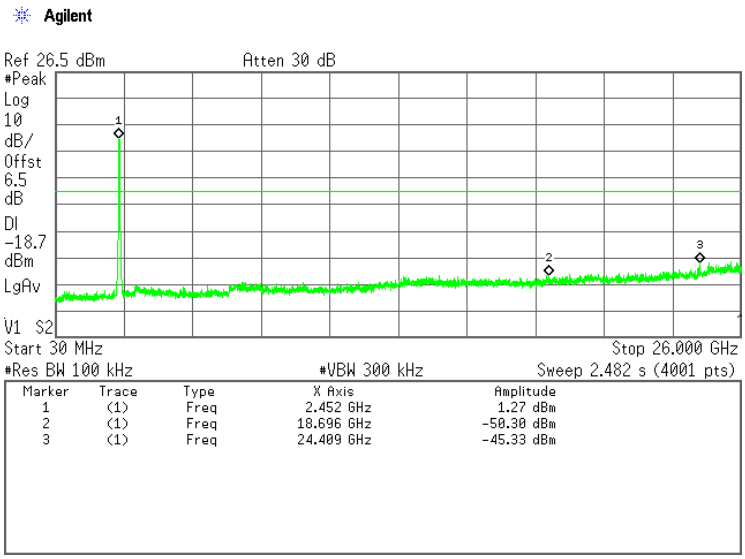
## 802.11n HT40 mcs0 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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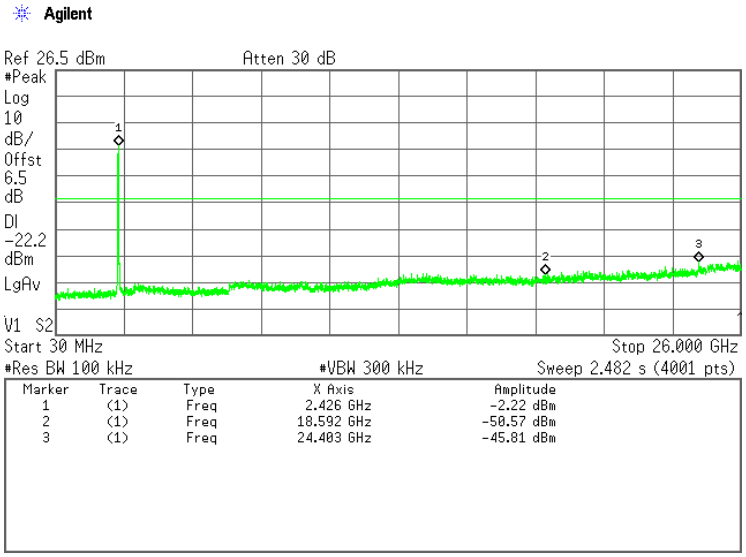
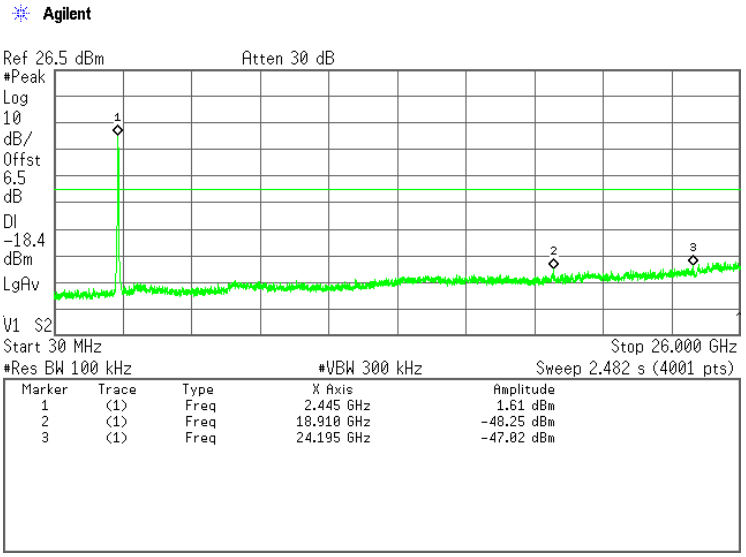
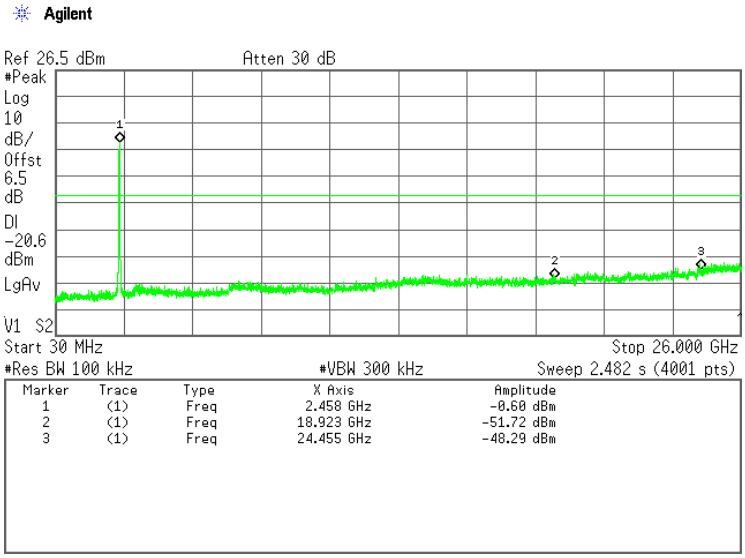
## 802.11n HT40 mcs7 – Side Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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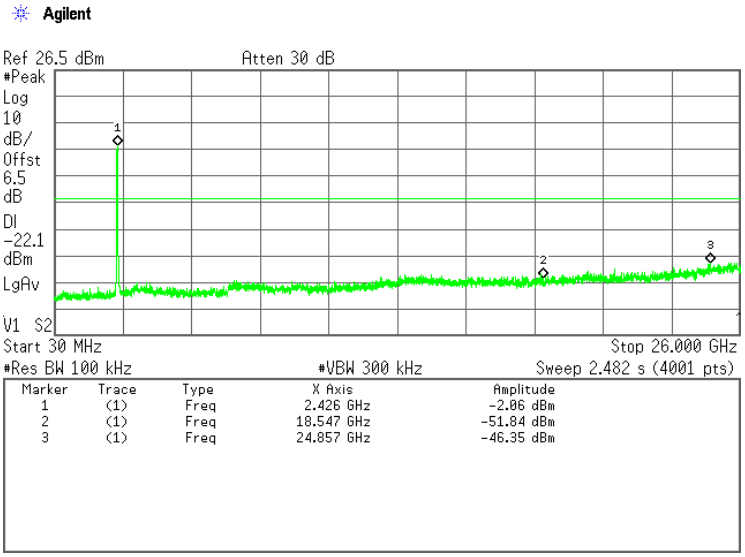
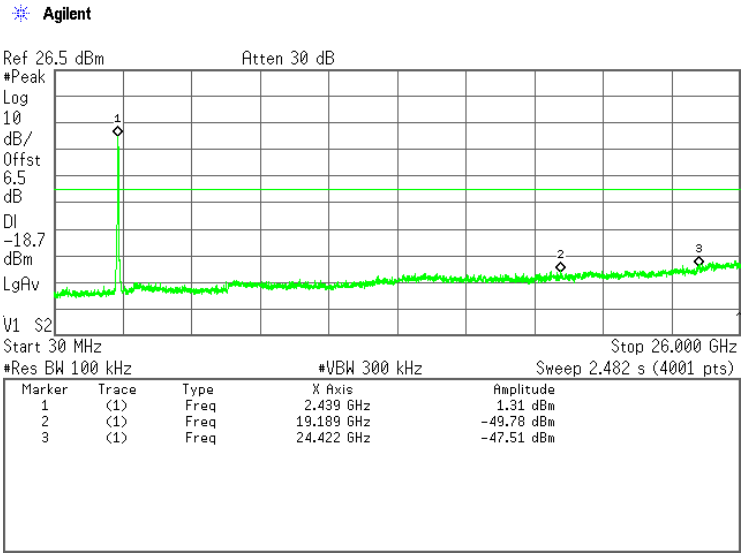
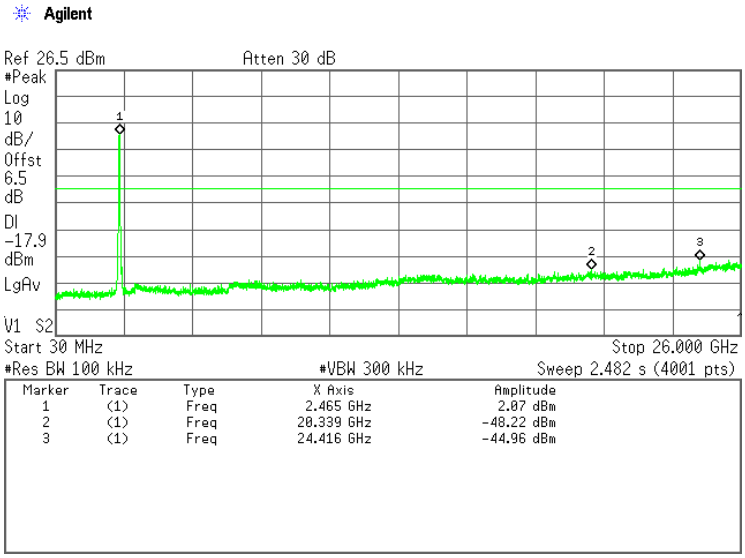
## 802.11n HT40 mcs7 – Top Antenna




Low Channel - Plot




Mid Channel - Plot




High Channel - Plot



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# Conducted Band Edge

## Test Description

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

## Test Criteria

| Reference | Limit |
|---|---|
| CFR 47 Subpart C 15.247 (d)<br>RSS-247, Section 5.5 | 20dBc Below the Fundamental |

Note: 20dBc is in reference to the previously measured PSD measurements as referenced in ANSI C63.10 Section 11.11.2

## Test Information

| Tester | Test Location | Date | Temperature (ºC) | Humidity (%RH) | Pressure (mbar) | Results (P/F) |
|---|---|---|---|---|---|---|
| Jose Badia | RF Lab | 6/04/2025 | 22.22 | 37 | 1043 | P |

## Test Results



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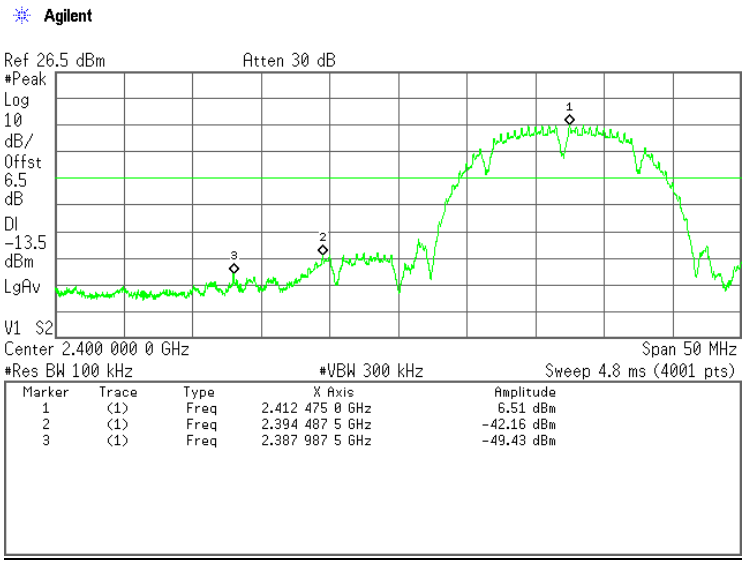
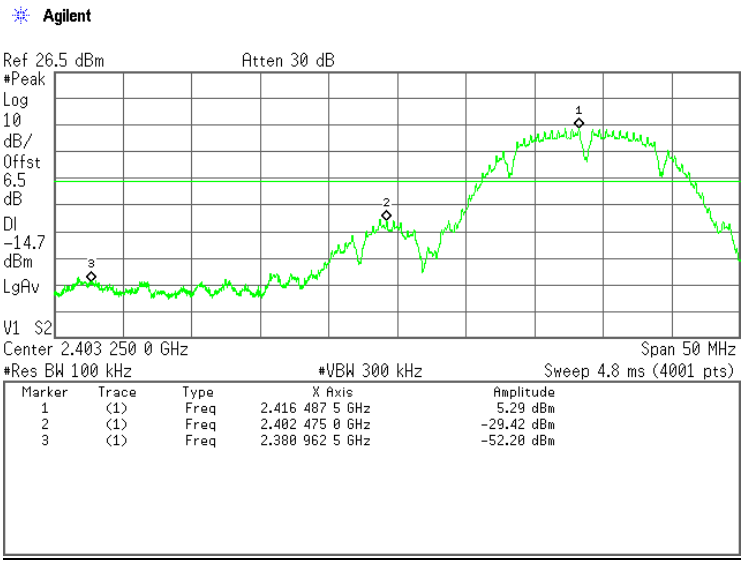
## 802.11b – 1Mbps

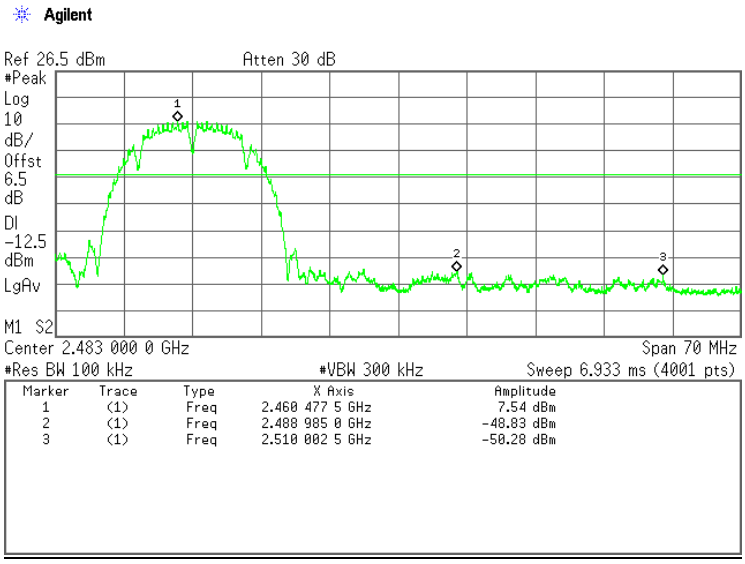
**802.11b 1Mbps – Side Antenna**




CH 1 - Plot




CH 2 - Plot




CH 11 – Plot



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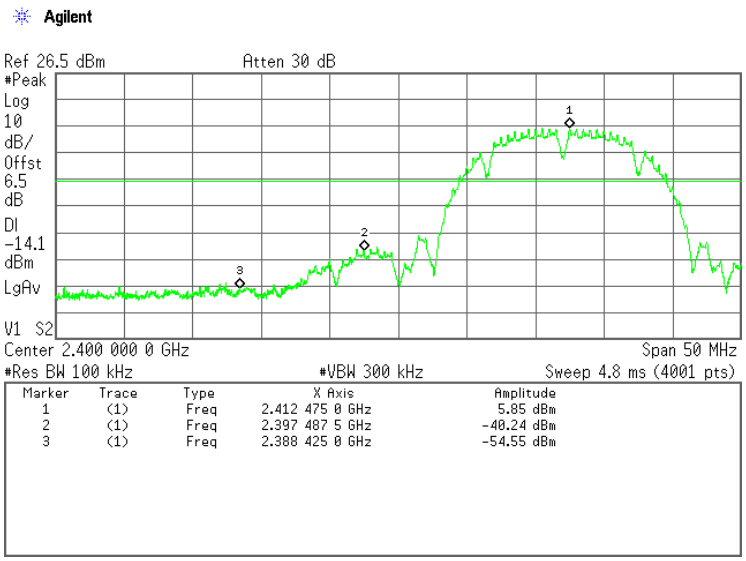
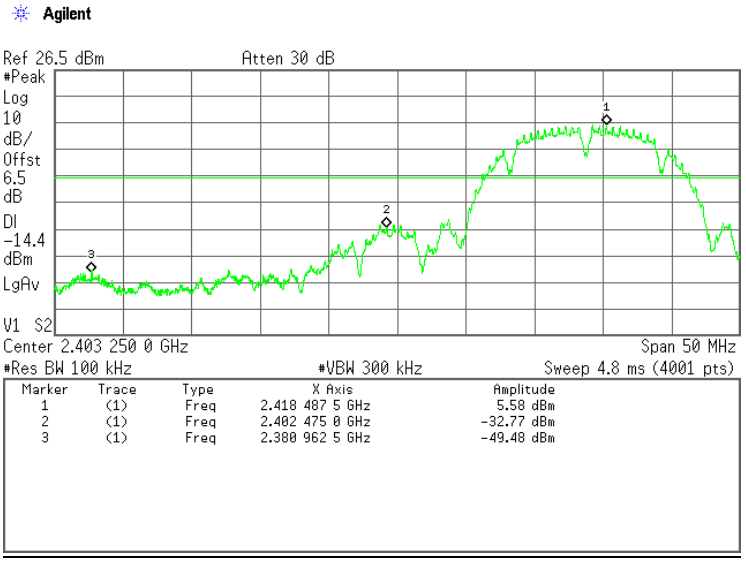
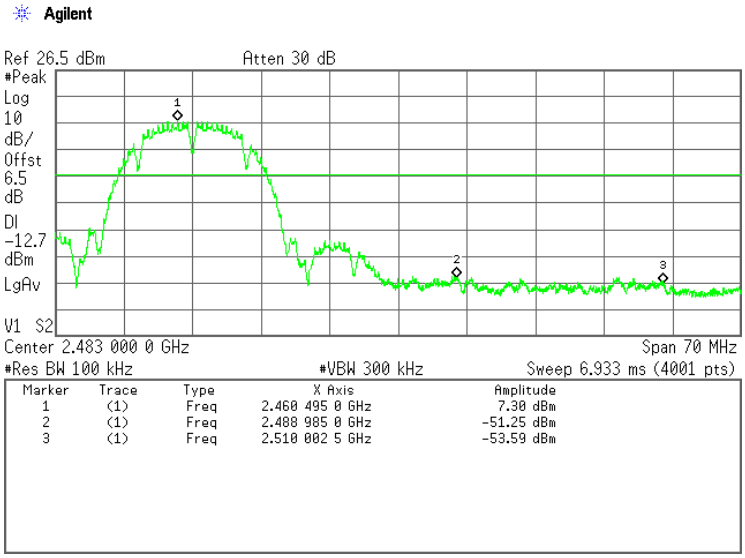
## 802.11b 1Mbps – Top Antenna




CH 1 - Plot




CH 2 - Plot




CH 11 – Plot



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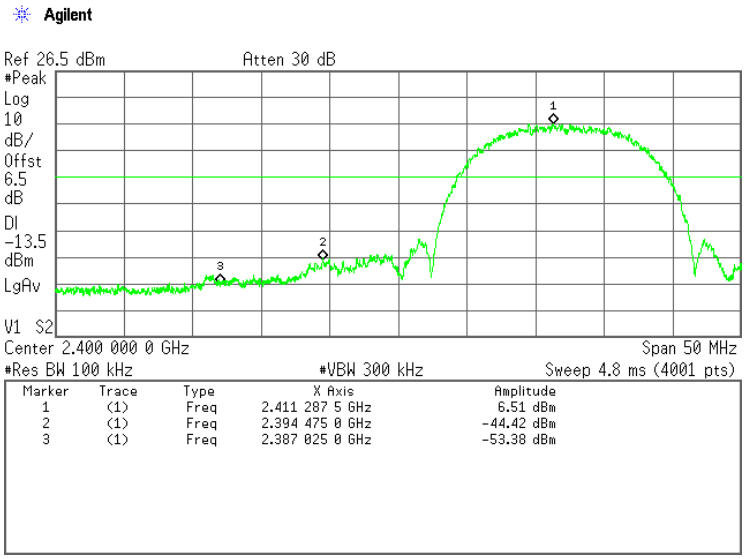
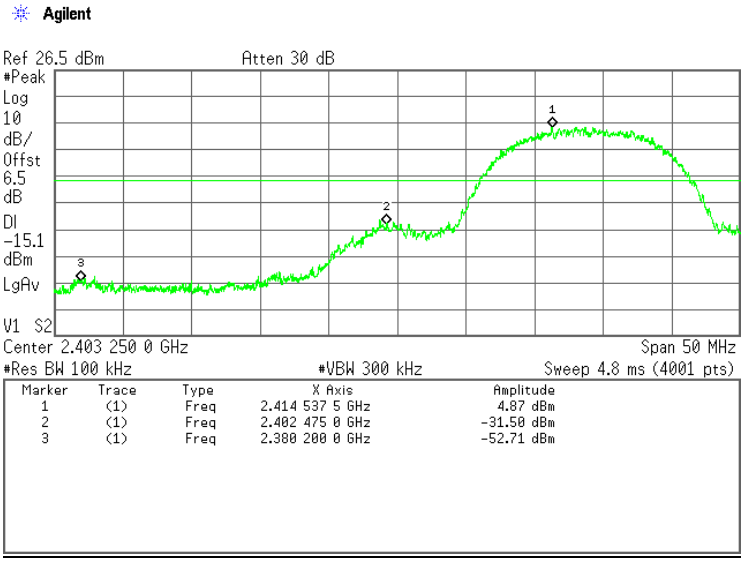
## 802.11b – 11Mbps

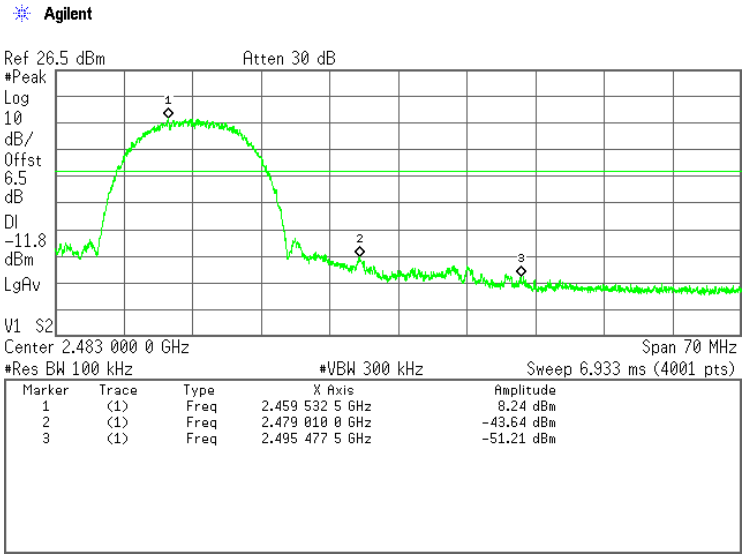
**802.11b 11Mbps – Side Antenna**




CH1 - Plot




CH2 - Plot




High Channel - Plot



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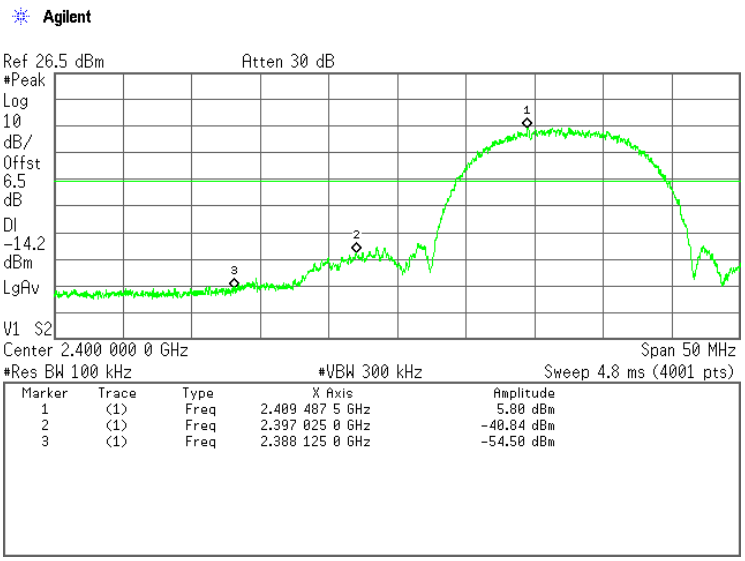
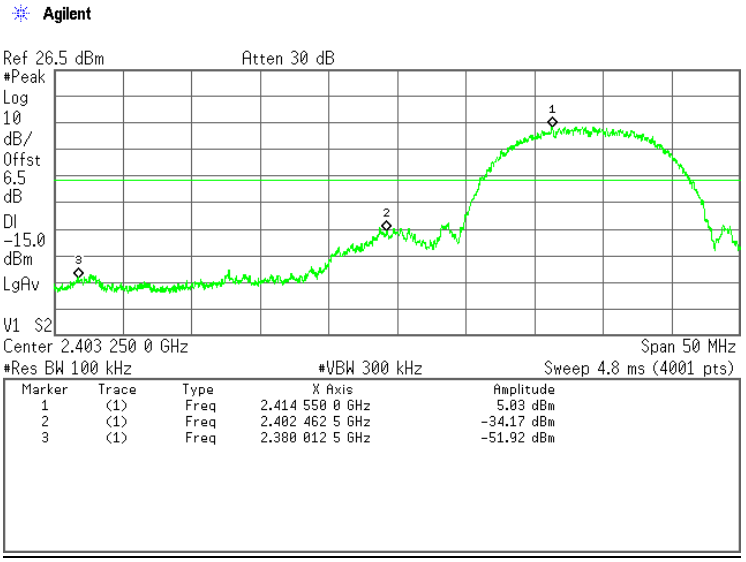
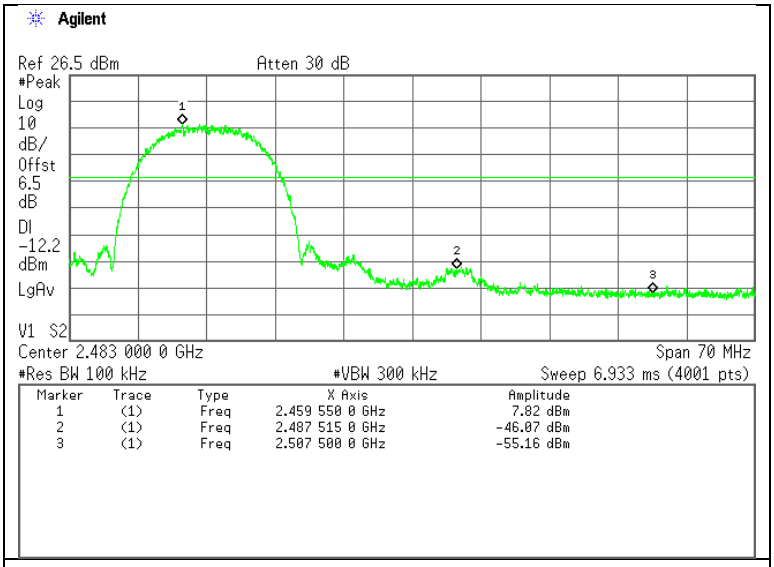
## 802.11b 11Mbps – Top Antenna




CH 1 - Plot




CH 2 - Plot




High Channel - Plot



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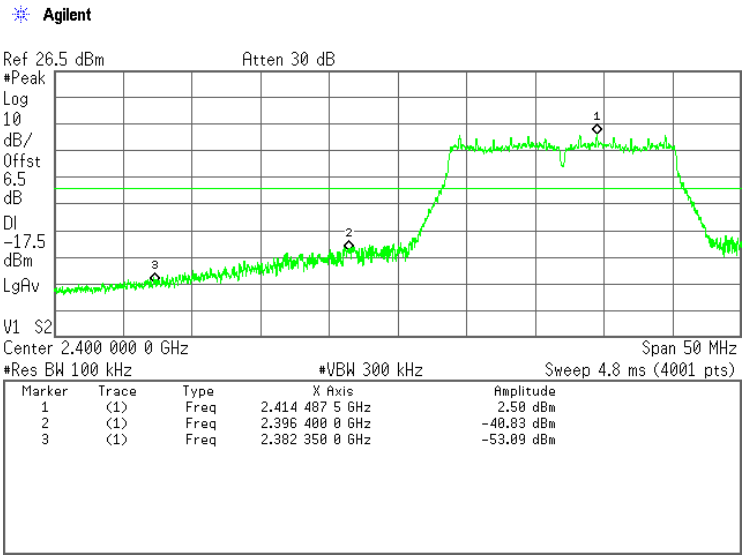
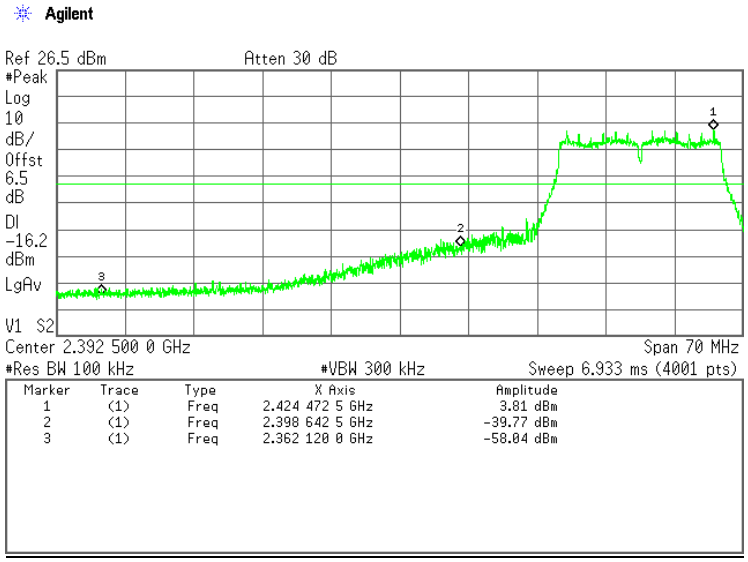
## 802.11g – 6Mbps

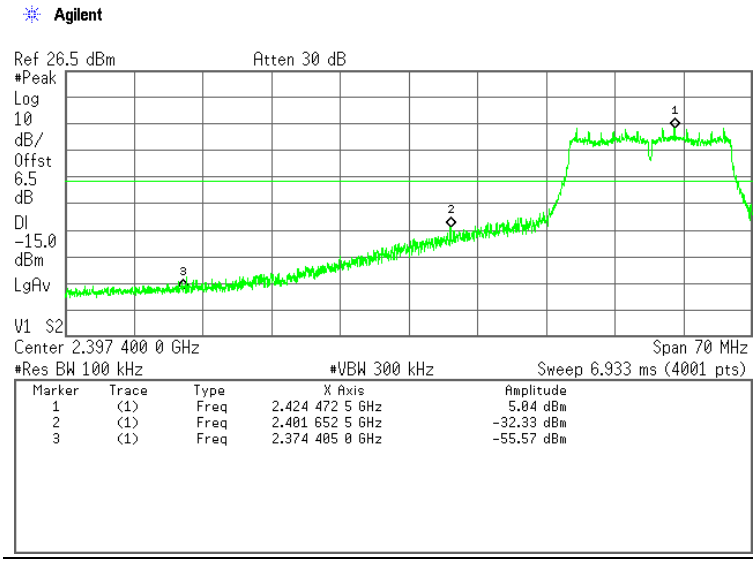
**802.11g 6Mbps – Side Antenna**



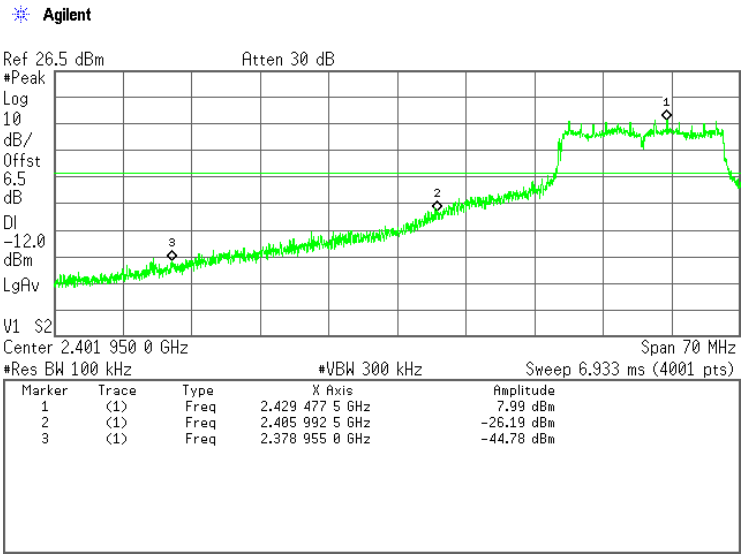

CH1 - Plot




CH2 - Plot




CH3 - Plot




CH4 - Plot



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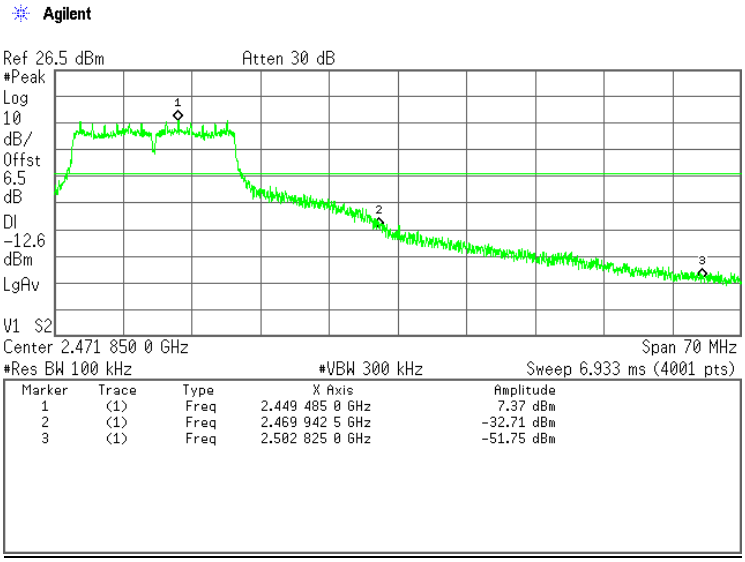
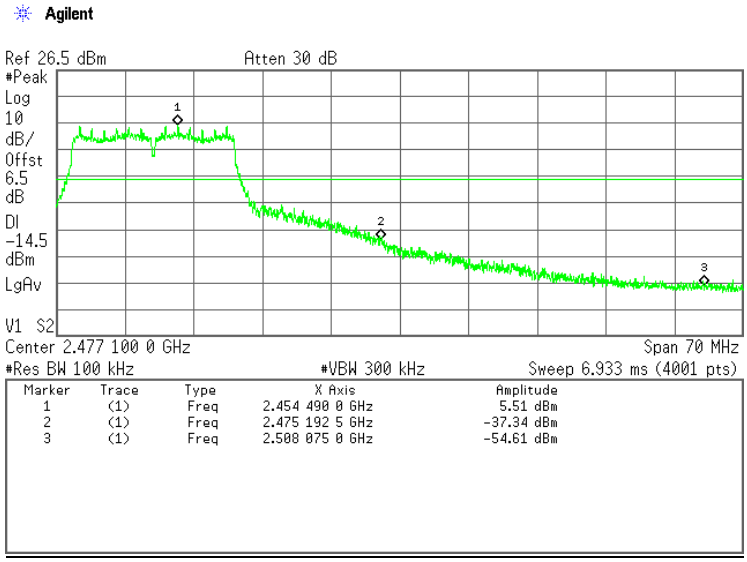
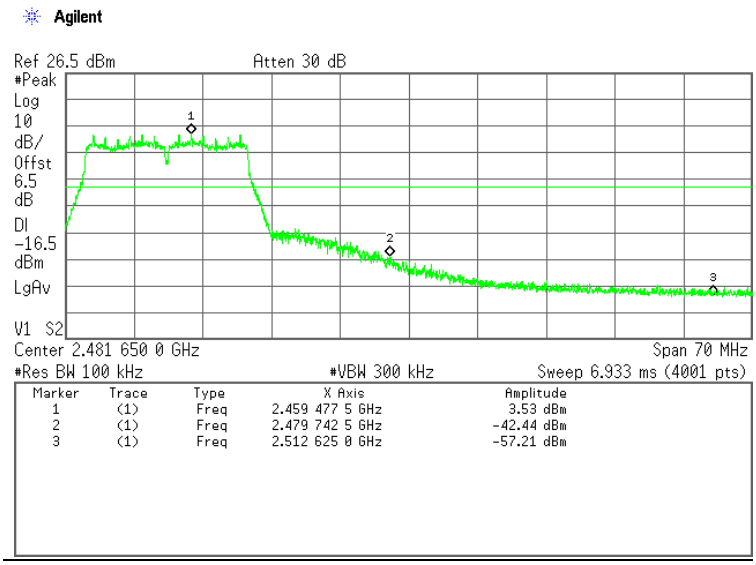


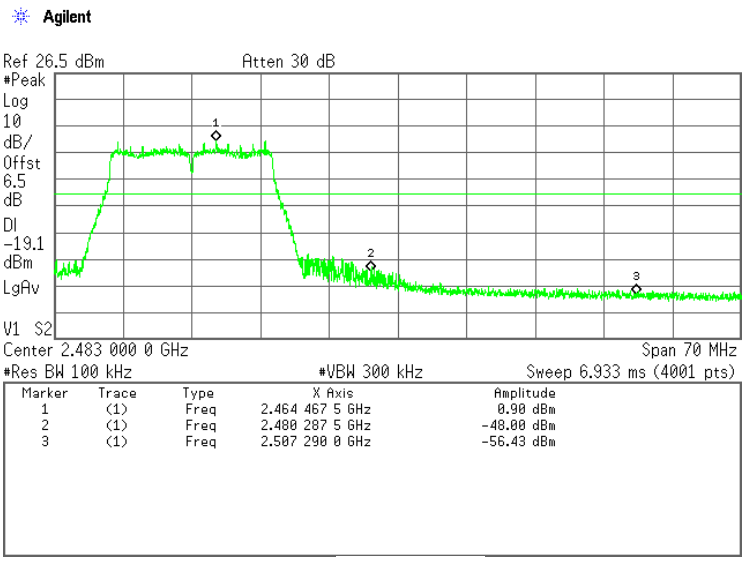

CH8 - Plot




CH9 - Plot




CH10 - Plot




CH11 - Plot



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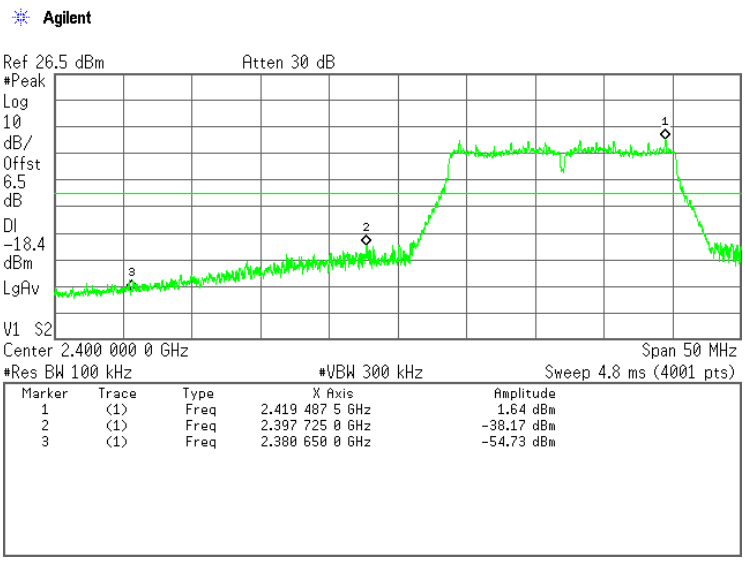
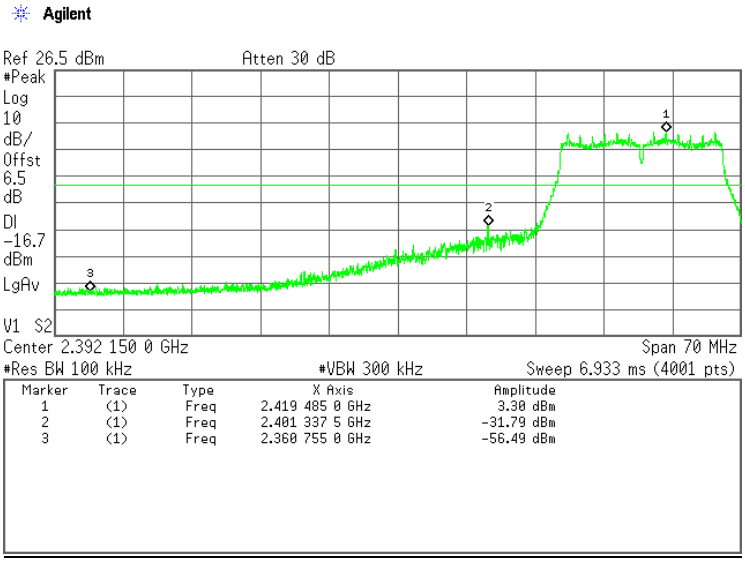
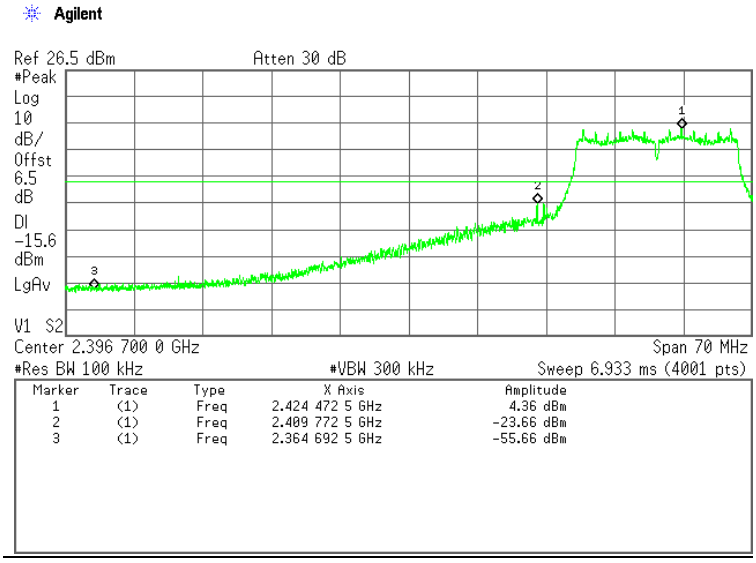
## 802.11g 6Mbps – Top Antenna



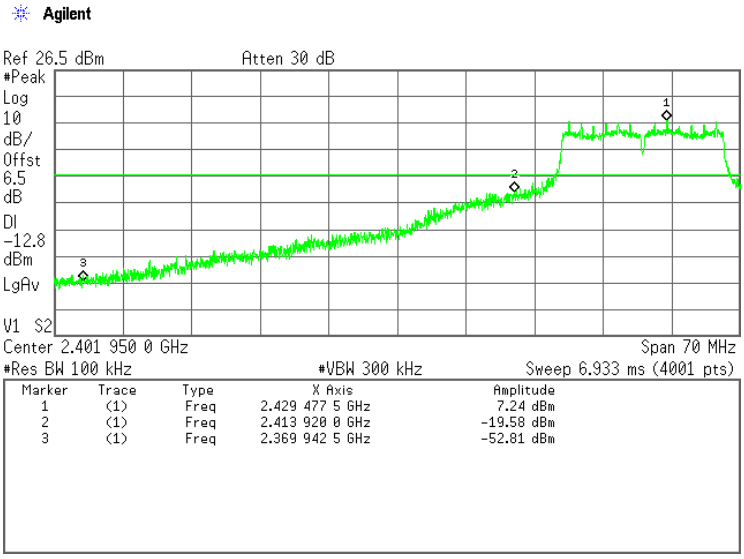

CH1 - Plot




CH2 - Plot




CH3 - Plot




CH4 - Plot



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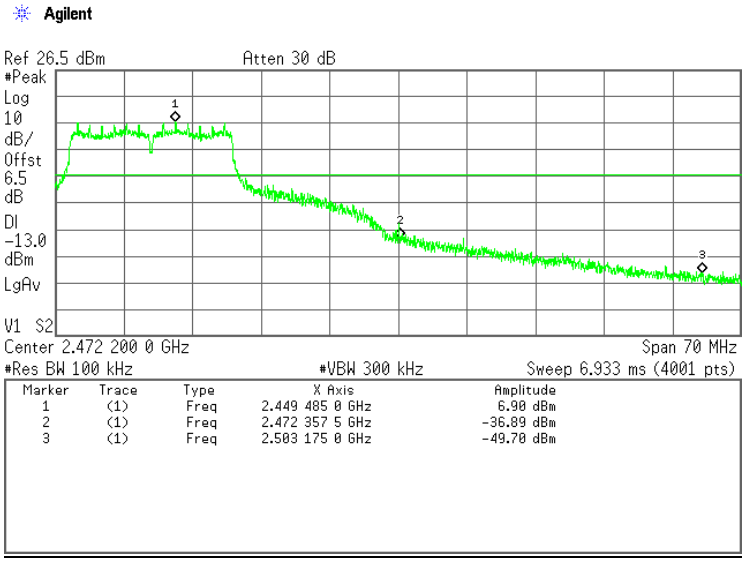
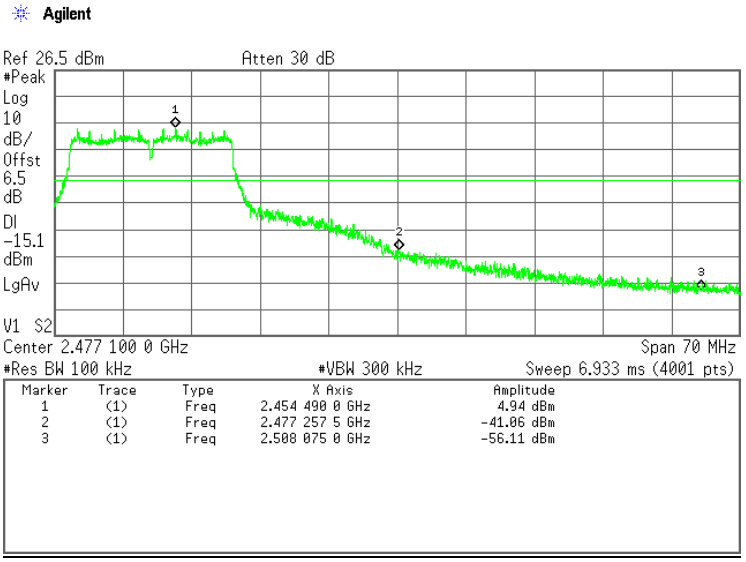
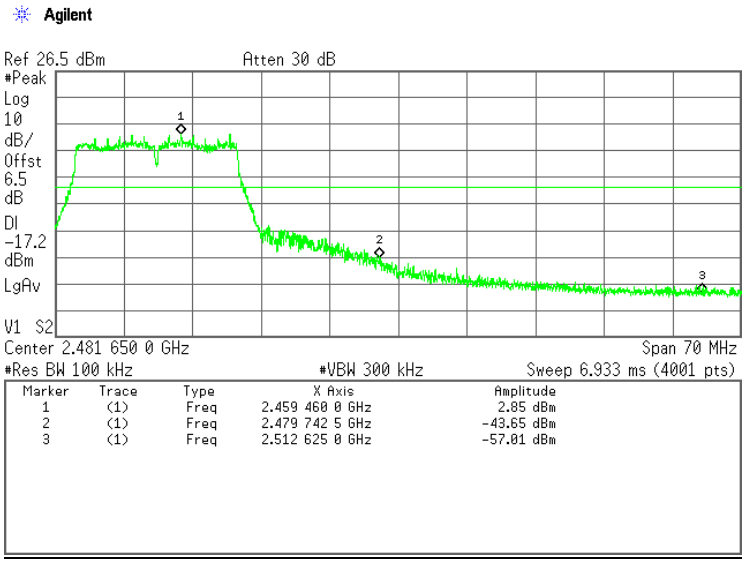


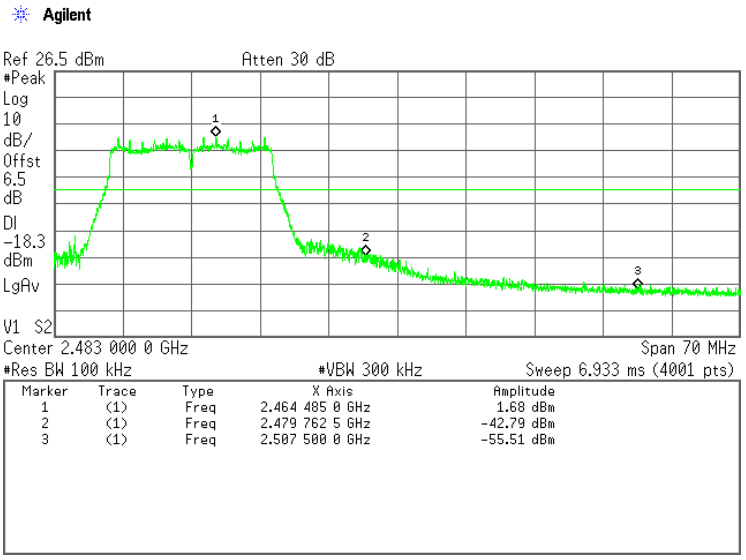

CH8 - Plot




CH9 - Plot




CH10 - Plot




CH11 - Plot



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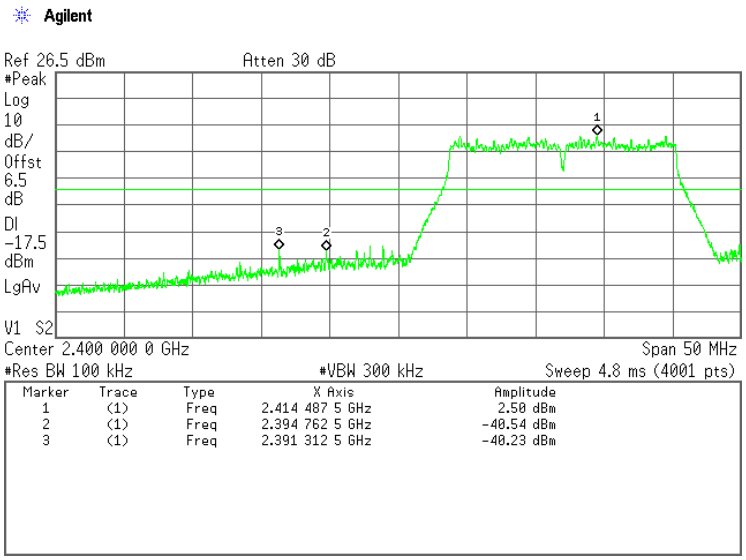
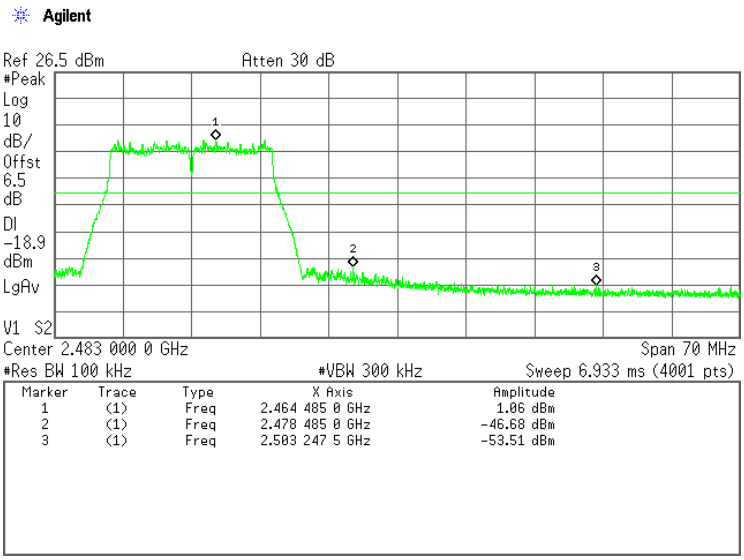
## 802.11g – 36Mbps

### 802.11g 36Mbps – Side Antenna

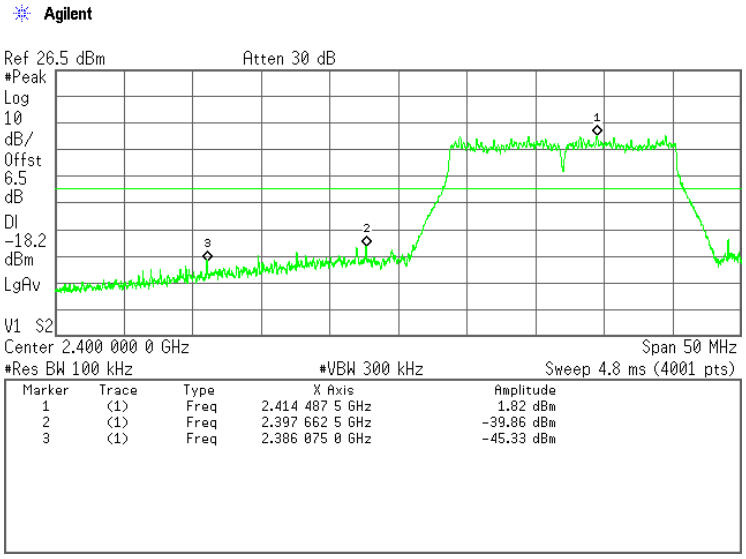



Low Channel - Plot

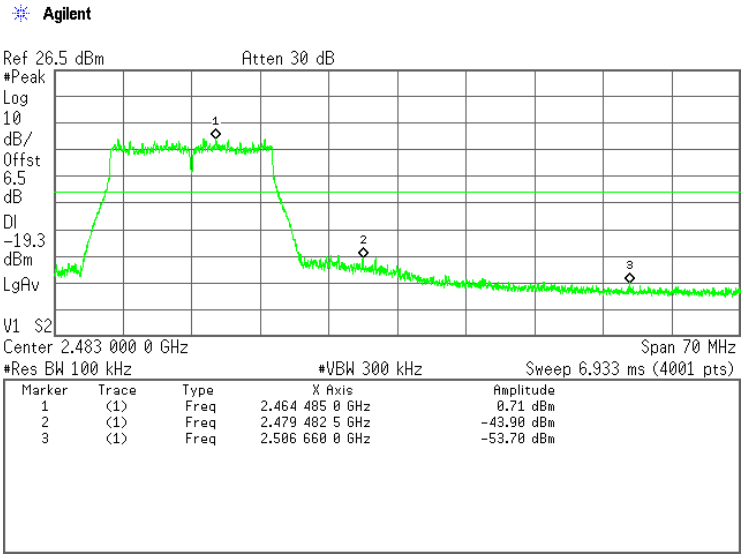



High Channel - Plot

### 802.11g 36Mbps – Top Antenna




Low Channel - Plot




High Channel - Plot



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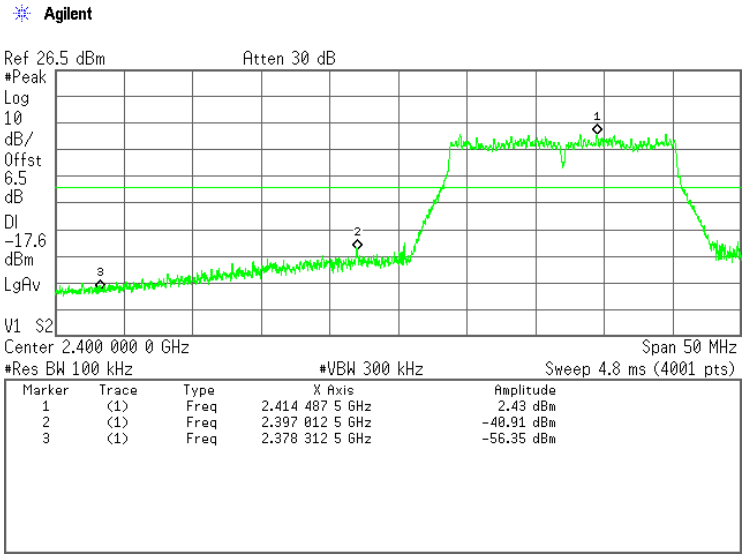
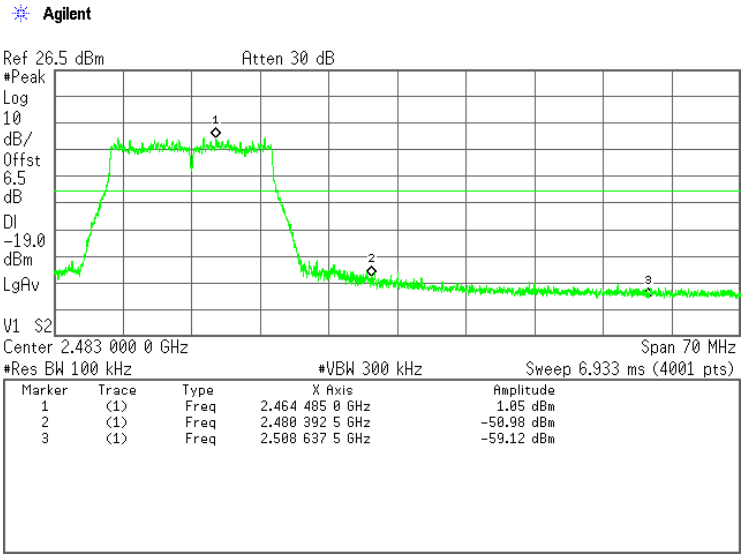
## 802.11g – 54Mbps

### 802.11g 54Mbps – Side Antenna

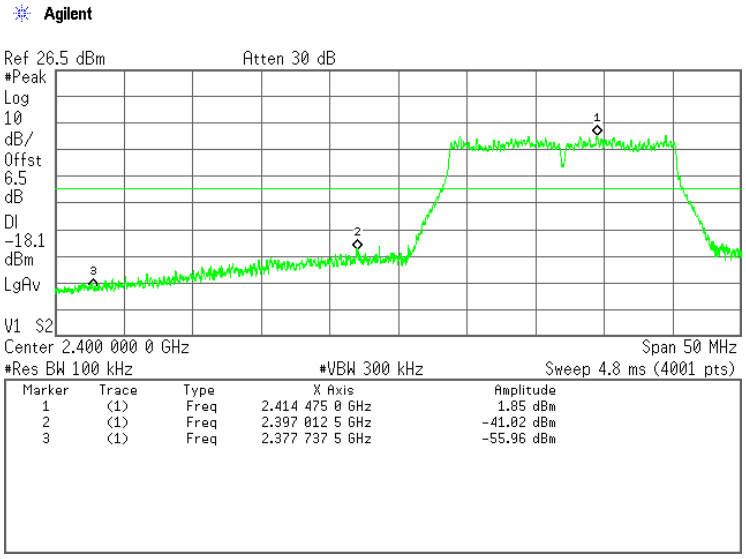



Low Channel – Plot

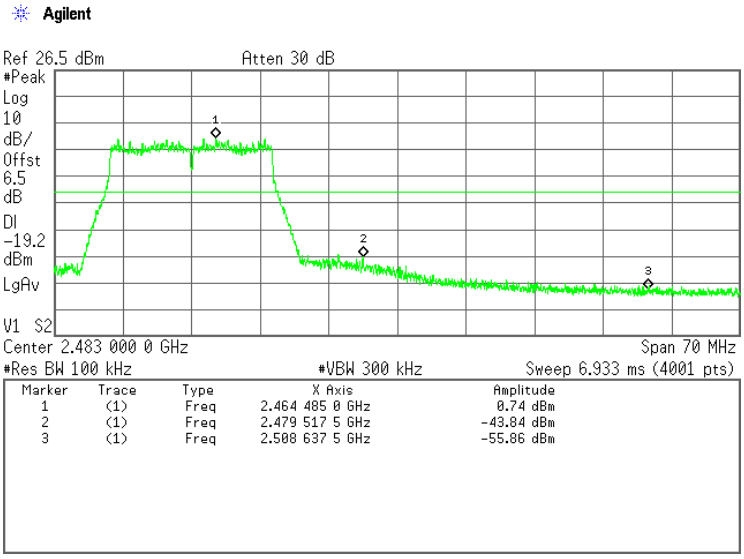



High Channel - Plot

### 802.11g 54Mbps – Top Antenna




Low Channel – Plot




High Channel - Plot



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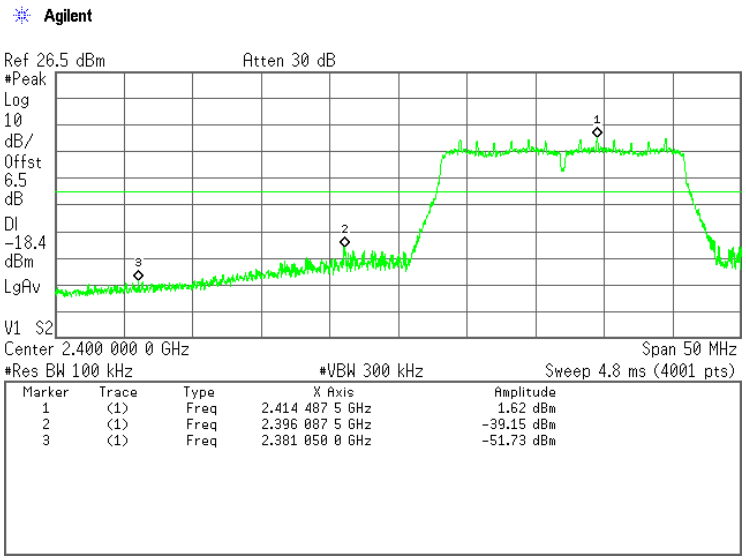
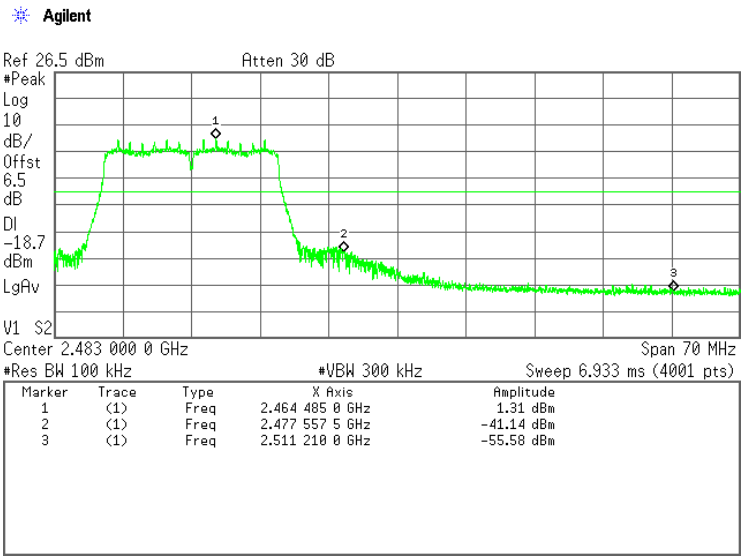
## 802.11n HT20 – msc0

### 802.11n HT20 mcs0 – Side Antenna

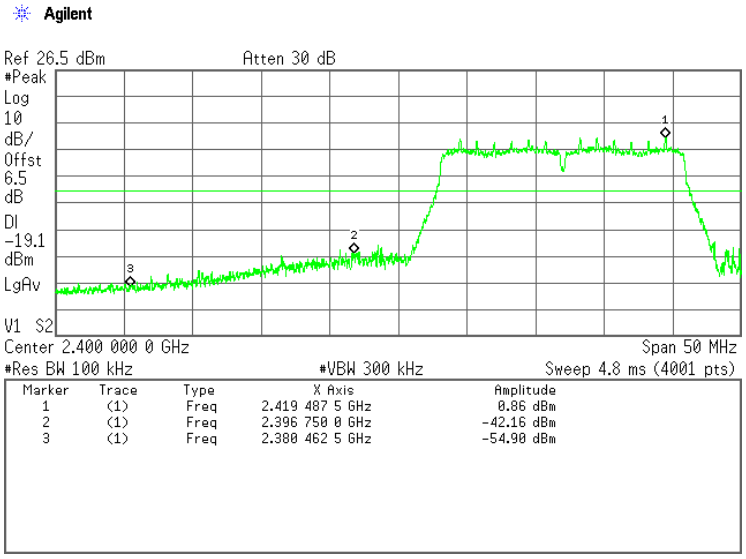



Low Channel – Plot

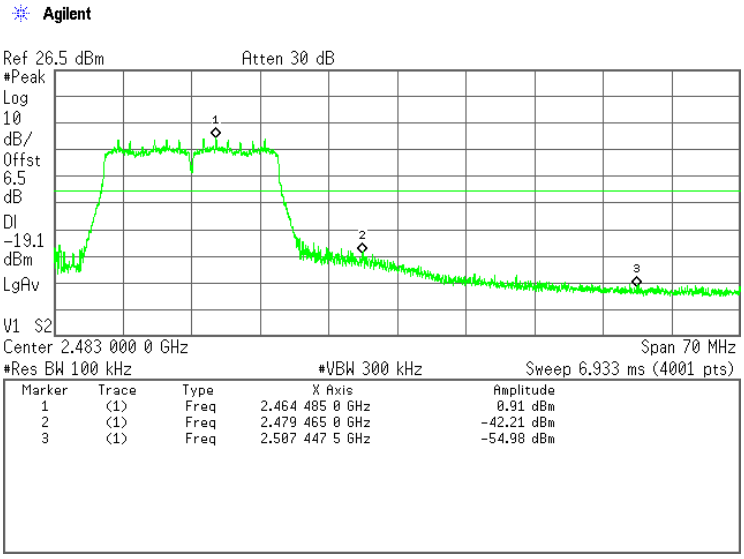



High Channel - Plot

### 802.11n HT20 mcs0 – Top Antenna




Low Channel – Plot




High Channel - Plot



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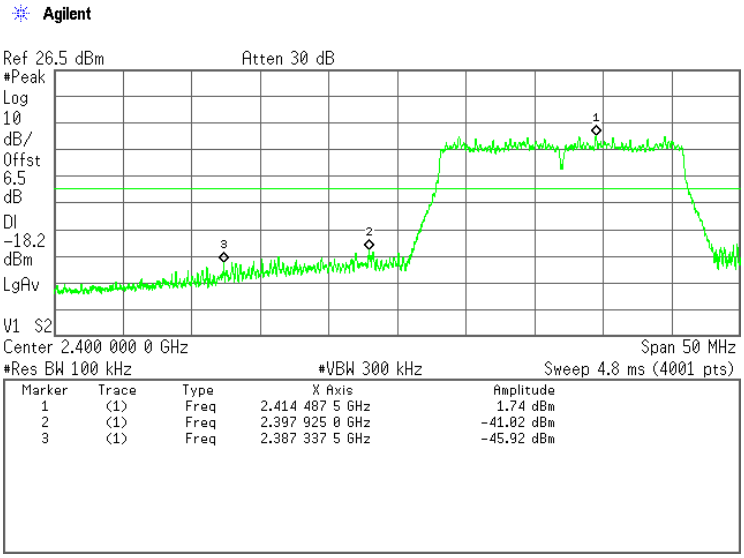
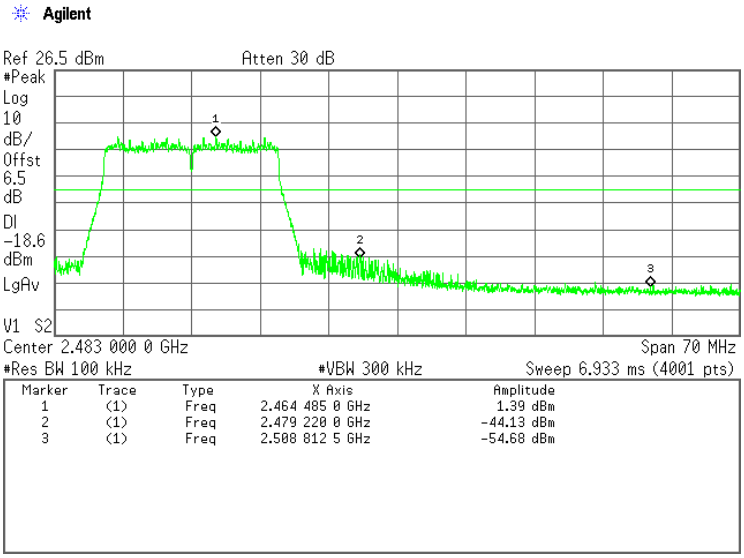
## 802.11n HT20 – msc7

### 802.11n HT20 mcs7 – Side Antenna

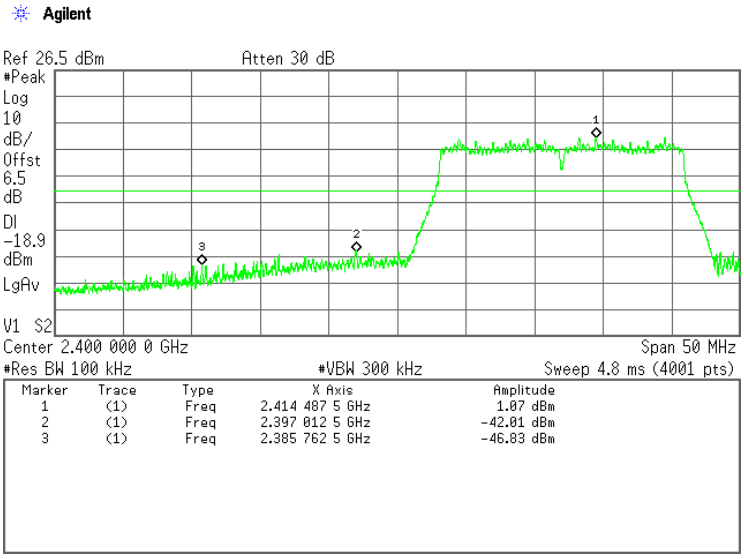



Low Channel - Plot

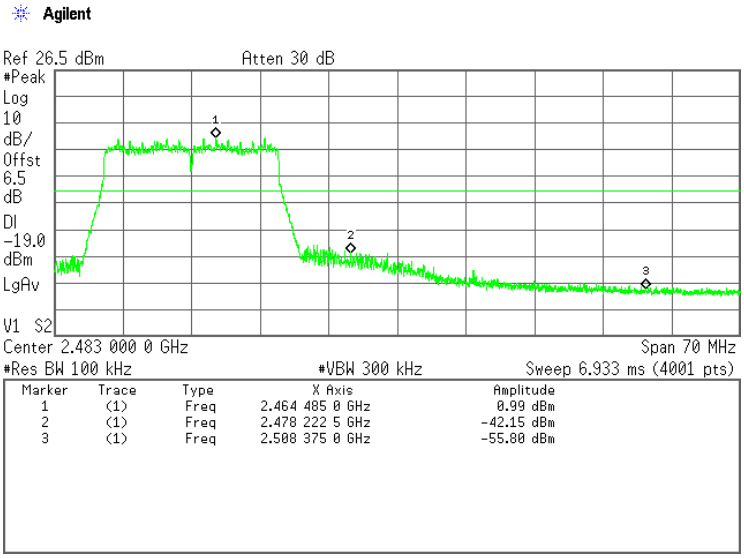



High Channel - Plot

### 802.11n HT20 mcs7 – Top Antenna




Low Channel - Plot




High Channel - Plot



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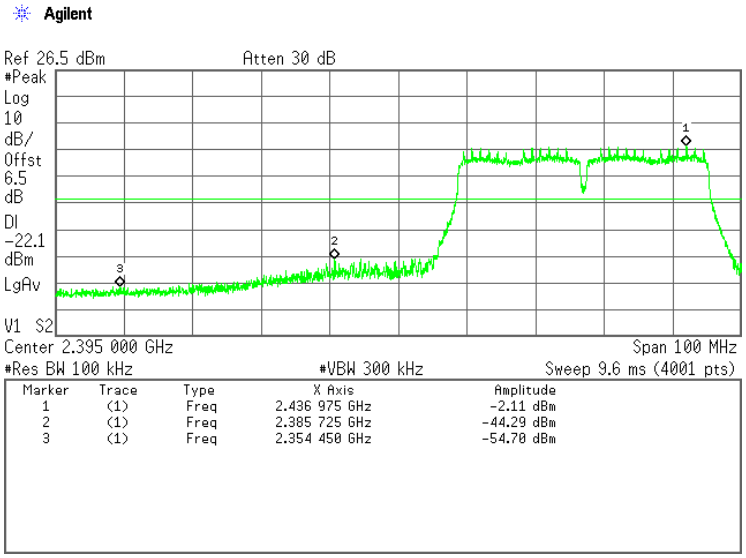
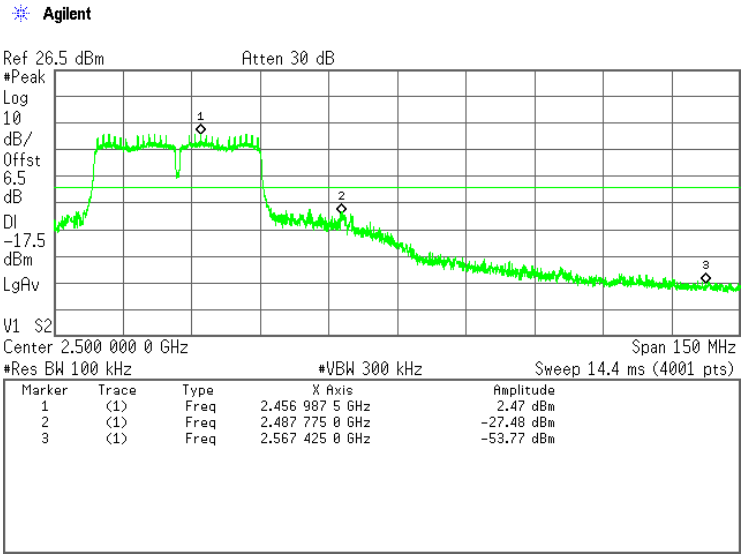
## 802.11n HT40 – msc0

### 802.11n HT40 mcs0 – Side Antenna

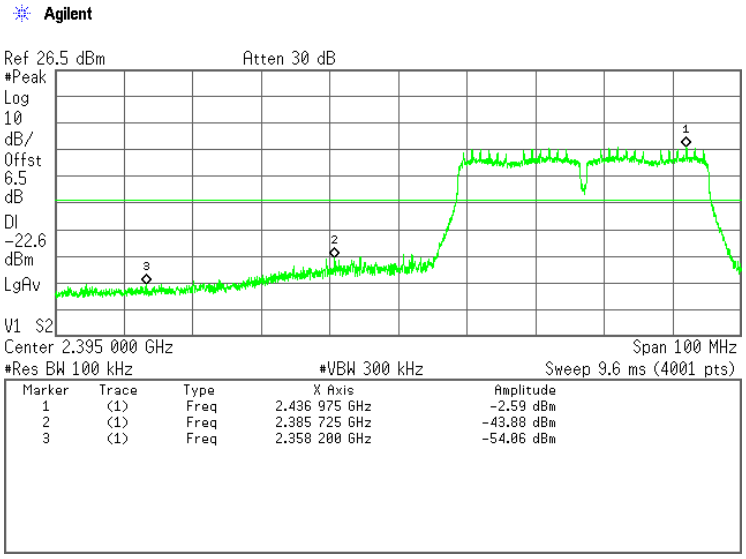



Low Channel - Plot

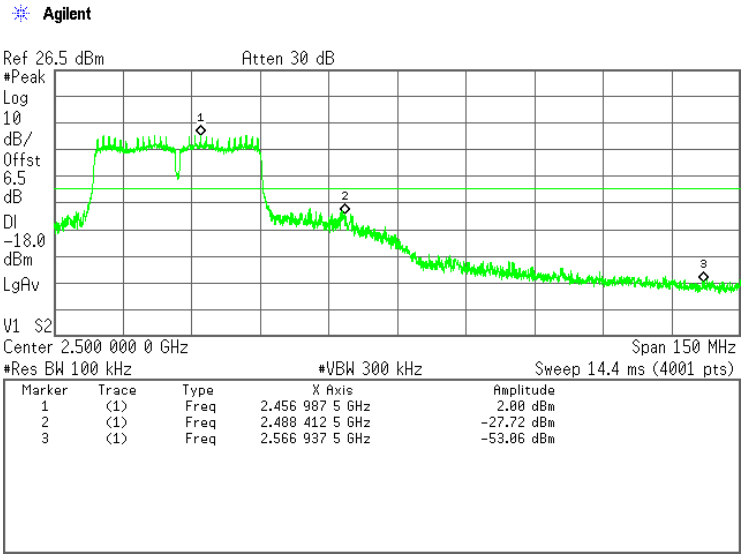



High Channel - Plot

### 802.11n HT40 mcs0 – Top Antenna




Low Channel - Plot




High Channel - Plot



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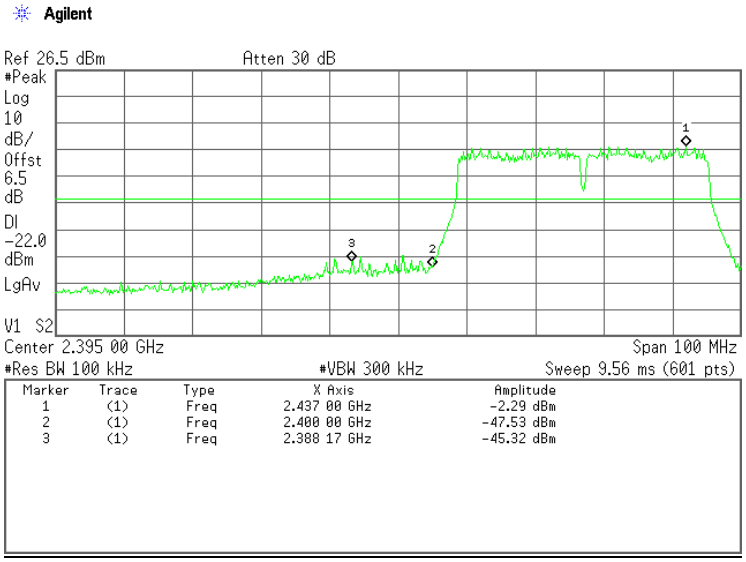
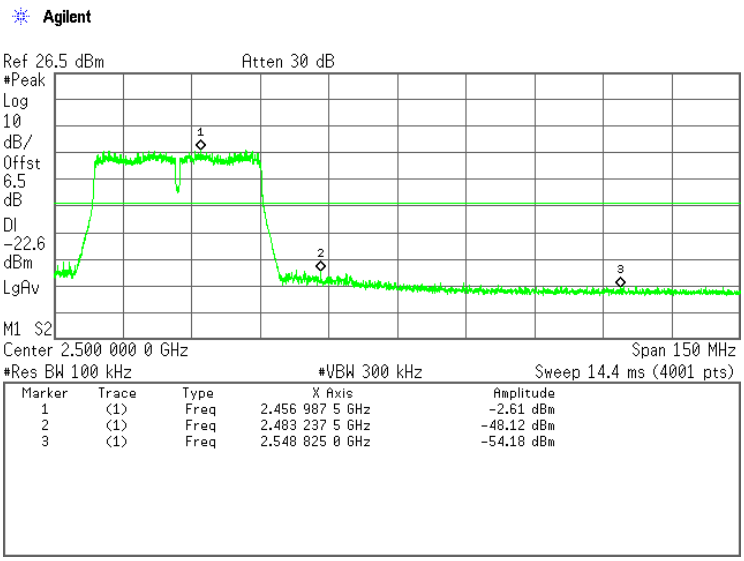
## 802.11n HT40 – msc7

### 802.11n HT40 mcs7 – Side Antenna

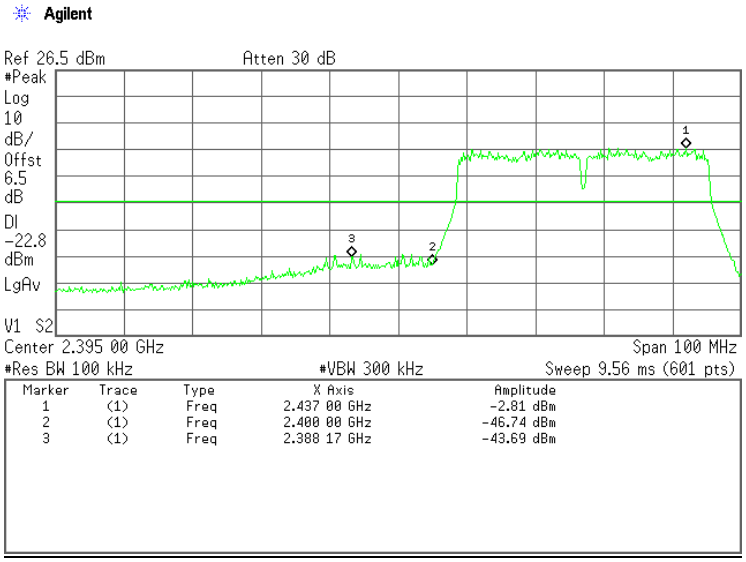



Low Channel - Plot

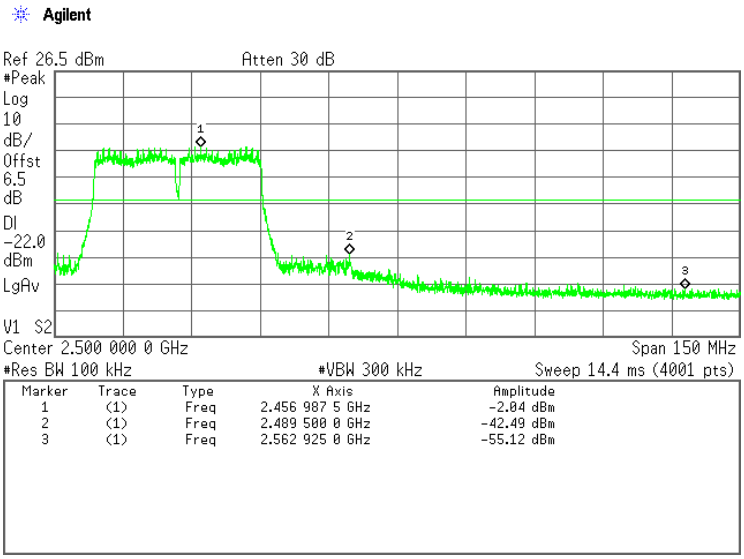



High Channel - Plot

### 802.11n HT40 mcs7 – Top Antenna




Low Channel - Plot




High Channel - Plot



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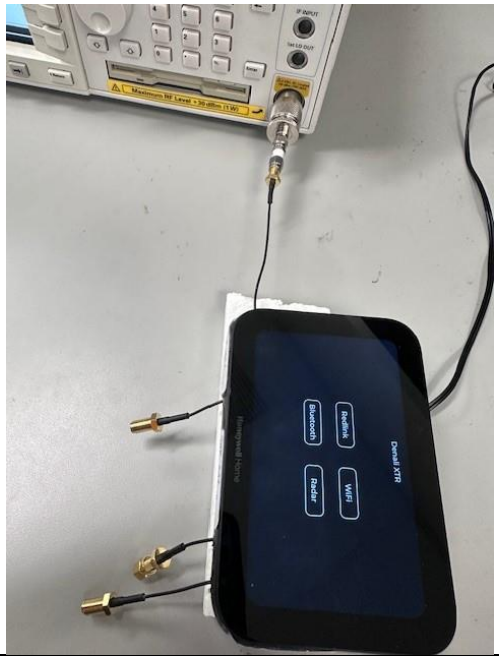
# Setup Photos

## Antenna Port Tests




Note: Above photo is representative of both all tested antenna ports. Only the BLE antenna ports were tested for purposes of this report.



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# END OF REPORT



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