# FCC 47 CFR PART 15 SUBPART C & INDUSTRY CANADA RSS-210 (Class II Permissive Change)

# TEST REPORT

**For**

## 802.11n 1x2 PCIe Minicard transceiver

**Model: AR5B91**

**Trade Name: Atheros**

*Issued to*

**Atheros Communications, Inc.**
**5480 Great America Parkway**
**Santa Clara, CA 95054**

*Issued by*

**Compliance Certification Services Inc.**
**No. 11, Wu-Gong 6th Rd., Wugu Industrial Park,**
**Taipei Hsien 248, Taiwan (R.O.C.)**
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Testing Laboratory
1309

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# 1. TEST RESULT CERTIFICATION

| | |
|---|---|
| **Applicant:** | Atheros Communications, Inc.<br>5480 Great America Parkway<br>Santa Clara, CA 95054 |
| **Manufacturer:** | Atheros Communications, Inc.<br>5480 Great America Parkway<br>Santa Clara, CA 95054 |
| **Equipment Under Test:** | 802.11n 1x2 PCIe Minicard transceiver |
| **Trade Name:** | AR5B91 |
| **Model Number:** | Atheros |
| **Date of Test:** | November 13 ~ December 29, 2008 |

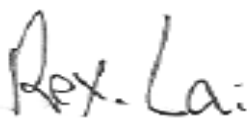
| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULT** |
| FCC 47 CFR Part 15 Subpart C<br>&<br>INDUSTRY CANADA RSS-210 Issue 7 | No non-compliance noted |

## We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247 and Industry Canada RSS-210 Issue 7.

The test results of this report relate only to the tested sample EUT identified in this report.

*Approved by:* *Reviewed by:*



Rex Lai
Section Manager
Compliance Certification Services Inc.

Amanda Wu
Section Manager
Compliance Certification Services Inc.

# 2. EUT DESCRIPTION

| | |
|---|---|
| **Product** | 802.11n 1x2 PCIe Minicard transceiver |
| **Trade Name** | Atheros |
| **Model Number** | AR5B91 |
| **Model Discrepancy** | N/A |
| **Power Adapter** | IBM / Model: 92P1016<br>AC: Connector Type: US 115V<br>Cable Type: Un-shielded, 2m<br>DC: Connector Type: US 115V<br>Cable Type: Un-shielded, 2m |
| **Frequency Range** | 2412 ~ 2462 MHz |
| **Transmit Power** | PIFA Antenna:<br>Original:<br>IEEE 802.11b: 22.78 dBm<br>IEEE 802.11g: 25.97 dBm<br>IEEE 802.11n HT20 mode: 25.25dBm<br>IEEE 802.11n HT40 mode: 26.06 dBm<br>New:<br>IEEE 802.11b mode: 22.64 dBm<br>IEEE 802.11g mode: 24.90 dBm<br>IEEE 802.11n HT20 mode: 25.65 dBm<br>IEEE 802.11n HT40 mode: 25.59 dBm |

<table>
<tr><td>Antenna Specification</td><td>Approved Antenna:<br>PIFA Antenna / Gain: 3.62 dBi<br>*Added Antenna:
<table>
<tr><th>No.</th><th>Antenna Part Number</th><th>Manufacture</th><th>Type</th><th>Peak Gain</th></tr>
<tr><td>1</td><td>CAN4313 717 012501B<br>(Main / Aux)</td><td>YAGEO</td><td>PIFA</td><td>1.39 dBi</td></tr>
<tr><td>2</td><td>APP6P-700136 (L) /<br>APP6P-700137 (R)</td><td>ACON</td><td>PIFA</td><td>-1.08 dBi</td></tr>
<tr><td>3</td><td>CAN4313 794 012501B (Main)/<br>CAN4313 794 022501B(Aux) /<br>CAN4313 583 032501B (MIMO)</td><td>YAGEO</td><td>PIFA</td><td>1.45 dBi</td></tr>
<tr><td>4</td><td>APP6P-700189 (Main) /<br>APP6P-700192 (Aux)</td><td>ACON</td><td>PIFA</td><td>1.11 dBi</td></tr>
<tr><td>5</td><td>2023666-1 (R) / 2023665-1 (L) /<br>2023667-1 (MIMO)</td><td>TYCO</td><td>PIFA</td><td>-0.28 dBi</td></tr>
<tr><td>6</td><td>CAN4313 810 012501B(Main)/<br>CAN4313 810 022501B (Aux)</td><td>YAGEO</td><td>PIFA</td><td>1.47 dBi</td></tr>
<tr><td>7</td><td>APP6P-700093 (R)/<br>APP6P-700098 (L)</td><td>ACON</td><td>PIFA</td><td>1.00 dBi</td></tr>
<tr><td>8</td><td>CAN4313 770 012501B(Main) /<br>CAN4313 770 022501B(Aux) /<br>CAN4313 770 032501B(MIMO)</td><td>YAGEO</td><td>PIFA</td><td>1.75 dBi</td></tr>
<tr><td>9</td><td>CAN4313 659 022501B<br>(Main / Aux) /<br>CAN4313 659 032501B (MIMO)</td><td>YAGEO</td><td>PIFA</td><td>0.10 dBi</td></tr>
<tr><td>10</td><td>90ZLAATA0039A</td><td>ASLINK</td><td>PIFA</td><td>1.7 dBi</td></tr>
<tr><td>11</td><td>2023840-1</td><td>TYCO</td><td>PIFA</td><td>0.53 dBi</td></tr>
<tr><td>12</td><td>CAN4313 748 012501B (Main) /<br>CAN4313748032501B<br>(2 END Cable)</td><td>YAGEO</td><td>PIFA</td><td>-0.56 dBi</td></tr>
<tr><td>13</td><td>90ZLARFC0023A</td><td>ASLINK</td><td>Dipole<br>(white)</td><td>2.00 dBi</td></tr>
<tr><td>14</td><td>90ZLARFC0022A</td><td>ASLINK</td><td>Dipole<br>(black)</td><td>2.00 dBi</td></tr>
<tr><td>15</td><td>DAMA1BM3000402</td><td>INPAQ</td><td>Dipole<br>(black)</td><td>3.20 dBi</td></tr>
<tr><td>16</td><td>2023901-1</td><td>TYCO</td><td>Dipole<br>(black)</td><td>0.53 dBi</td></tr>
<tr><td>17</td><td>EAM-S-13-003</td><td>INPAQ</td><td>PIFA</td><td>1.22dBi</td></tr>
</table></td></tr>
<tr><td>Class II Permissive change</td><td>1. Added the other alternative pin to pin PA, detail please refer to PA datasheet.<br>2. Added 13 type of PIFA antenna and 4 type of Dipole antenna, please see ”*” in this report, the detail information please refer to antenna specification and internal photos.</td></tr>
</table>

***Remark:*** *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

## Original Maximum Output Power:

| Frequency Band (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|---|---|---|---|
| 2412-2462 | 802.11b | 22.78 | 189.67 |
| 2412-2462 | 802.11g | 25.97 | 395.37 |
| 2412-2462 | 802.11n HT20 | 25.25 | 334.97 |
| 2422-2452 | 802.11n HT40 | 26.06 | 403.65 |

# 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2003 and FCC CFR 47 Part 15.207, 15.209, 15.247, RSS-GEN Issue 2 and RSS-210 Issue 7.

## 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

## 3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

The tests documented in this report were performed in accordance with IC RSS-210, IC RSS-Gen, IC RSS-102, and ANSI C63.4: 2003.

## 3.3 GENERAL TEST PROCEDURES

**Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

**Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003.

## 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| [1]0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.52525 | 2655 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 156.7 - 156.9 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 162.0125 - 167.17 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 167.72 - 173.2 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 240 - 285 | 3600 - 4400 | ([2]) |
| 13.36 - 13.41 | 322 - 335.4 | | |

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

## 3.5 DESCRIPTION OF TEST MODES

The EUT is an 802.11n 1*2 PCIe Mini card transceiver, with both full length and half length boards.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

The worst-case data rates are determined to be as follows for each mode,

All final tests in the 802.11b mode were made at 1 Mb/s.

All final tests in the 802.11g mode were made at 6 Mb/s.

All final tests in the 802.11n HT20 mode were made at MCS1.

All final tests in the 802.11n HT40 mode were made at MCS0.

For RF conducted emissions, all tests were performed on half length and full length board excepted conducted peak power to use half length board only.

For RF radiated emissions, all tests were performed on half length and full length board.

# 4. INSTRUMENT CALIBRATION

## 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

## 4.2 MEASUREMENT EQUIPMENT USED

**Equipment Used for Emissions Measurement**

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

| Conducted Emissions Test Site | | | | |
|---|---|---|---|---|
| **Name of Equipment** | **Manufacturer** | **Model** | **Serial Number** | **Calibration Due** |
| Spectrum Analyzer | Agilent | E4446A | MY43360131 | 02/24/2009 |

| 3M Semi Anechoic Chamber | | | | |
|---|---|---|---|---|
| **Name of Equipment** | **Manufacturer** | **Model** | **Serial Number** | **Calibration Due** |
| Spectrum Analyzer | Agilent | E4446A | US42510252 | 10/07/2009 |
| Test Receiver | Rohde&Schwarz | ESCI | 100064 | 11/29/2009 |
| Switch Controller | TRC | Switch Controller | SC94050010 | 05/03/2009 |
| 4 Port Switch | TRC | 4 Port Switch | SC94050020 | 05/03/2009 |
| Horn-Antenna | TRC | HA-0502 | 06 | 06/04/2009 |
| Horn-Antenna | TRC | HA-0801 | 04 | 10/20/2009 |
| Horn-Antenna | TRC | HA-1201A | 01 | 10/15/2009 |
| Horn-Antenna | TRC | HA-1301A | 01 | 10/15/2009 |
| Bilog- Antenna | Sunol Sciences | JB3 | A030205 | 03/28/2009 |
| Turn Table | Max-Full | MFT-120S | T120S940302 | N.C.R. |
| Antenna Tower | Max-Full | MFA-430 | A440940302 | N.C.R. |
| Controller | Max-Full | MF-CM886 | CC-C-1F-13 | N.C.R. |
| Site NSA | CCS | N/A | FCC MRA: TW1039<br>IC: 2324G-1/-2 | 10/17/2010<br>11/04/2010 |
| Test S/W | LABVIEW (V 6.1) | | | |

***Remark:*** *The measurement uncertainty is less than +/-3.7046dB (30MHz ~ 1GHz), +/-3.0958dB (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

# 5. FACILITIES AND ACCREDITATIONS

## 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

## 5.3 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, 2324G-2 for 3M Semi Anechoic Chamber B.

## 5.4 TABLE OF ACCREDITATIONS AND LISTINGS

| Country | Agency | Scope of Accreditation | Logo |
|---|---|---|---|
| USA | FCC | 3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements | FCC MRA: TW1039 |
| Taiwan | TAF | LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310<br>IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12,2,<br>ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328,<br>ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893,<br>ETSI EN 301 489-1/3/7/17<br>FCC OET Bulletin 65 + Supplement C,<br>EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385,<br>EN 50392, IEC 62209, CNS 14958-1, CNS 14959<br>FCC Method –47 CFR Part 15 Subpart B<br>IEC / EN 61000-3-2, IEC / EN 61000-3-3,<br>IEC / EN 61000-4-2/3/4/5/6/8/11 | Testing Laboratory 1309 |
| Canada | Industry Canada | 3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform | IC 2324G-1<br>IC 2324G-2 |

** No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*

# 6. SETUP OF EQUIPMENT UNDER TEST

## 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

## 6.2 SUPPORT EQUIPMENT

| No | Equipment | Brand | Model | Series No. | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|---|
| 1. | Notebook PC | DELL | PP05L | 7T390 A03 | E2K5HCKT | N/A | AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core |
| 2. | Test Kit | N/A | N/A | N/A | N/A | N/A | N/A |

***Remark:***

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

# 7. APPLICABLE RULES FOR INDUSTRY CANADA RSS-210

## RSS-210 §2 General Certification Requirements and Specifications

### RSS-210 §2.1 Frequency Stability

When the carrier frequency stability is not specified, it need not be tested, provided that the carrier frequency is chosen such that the fundamental modulation products (meaning the nominal bandwidth) lie totally within the bands listed in Tables 2, 3, 4 and 5 and do not fall into any restricted band listed in Table 1. Due account shall be taken of carrier frequency drift as a result of aging, temperature, humidity, and supply voltage variations when using frequencies near the band edges.

### RSS-210 §2.2 Restricted Bands and Unwanted Emission Frequencies

Restricted bands, identified in Table 1, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy, and some government uses. Except where otherwise indicated, the following restrictions apply:
(a) Fundamental components of modulation of LPDs shall not fall within the restricted bands of Table 1.
(b) Unwanted emissions falling into restricted bands of Table 1 shall meet Tables 2 and 3 limits. It should also be noted that unwanted emissions falling in non-restricted bands do not need to be suppressed to a level lower than the Table 2 and 3 limits.
(c) Unwanted emissions not falling within restricted frequency bands may also use the limits specified in the applicable annex.

### RSS-210 §2.3 Licence-exempt Receivers

Category I licence-exempt receivers are required to have their spurious emissions comply with Section 7.2.3 of RSS-Gen.

### RSS-210 §2.6 General Field Strength Limits

Table 2 and 3 list the permissible levels of unwanted emissions of transmitters and receivers. However, transmitters with field strengths that do not exceed the limits in these tables may also operate in these frequency bands, other than the restricted bands of Table 1 and the TV bands (i.e. unwanted emissions of transmitters and receivers are permitted to fall into Table 1 and TV frequencies but intentional emissions are prohibited). See the note of Table 2 for further details.

## RSS-210 §2.7 Tables

### RSS-210 Table 1: Restricted Frequency Bands (Note)

| MHz | MHz | MHz | MHz | GHz |
|---|---|---|---|---|
| 0.090-0.110 | 8.37625-8.38675 | -- | 1718.8-1722.2 | 9.0-9.2 |
| -- | 8.41425-8.41475 | 156.52475-156.52525 | 2200-2300 | 9.3-9.5 |
| 2.1735-2.1905 | 12.29-12.293 | 156.7-156.9 | 2310-2390 | 10.6-12.7 |
| 3.020-3.026 | 12.51975-12.52025 | -- | -- | 13.25-13.4 |
| 4.125-4.128 | 12.57675-12.57725 | -- | 2655-2900 | 14.47-14.5 |
| 4.17725-4.17775 | 13.36-13.41 | 240-285 | 3260-3267 | 15.35-16.2 |
| 4.20725-4.20775 | 16.42-16.423 | 322-335.4 | 3332-3339 | 17.7-21.4 |
| 5.677-5.683 | 16.69475-16.69525 | 399.9-410 | 3345.8-3358 | 22.01-23.12 |
| 6.215-6.218 | 16.80425-16.80475 | 608-614 | 3500-4400 | 23.6-24.0 |
| 6.26775-6.26825 | 25.5-25.67 | 960-1427 | 4500-5150 | 31.2-31.8 |
| 6.31175-6.31225 | 37.5-38.25 | 1435-1626.5 | 5350-5460 | 36.43-36.5 |
| 8.291-8.294 | 73-74.6; 74.8-75.2 | 1645.5-1646.5 | 7250-7750 | Above 38.6 |
| 8.362-8.366 | 108-138 | 1660-1710 | 8025-8500 | |

***Note:*** *Certain frequency bands listed in Table 2 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard as well as RSS-310.*

### RSS-210 Table 2: General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz (Note)

| Frequency (MHz) | Field Strength microvolts/m at 3 metres (watts, e.i.r.p.) | |
|---|---|---|
| | Transmitters | Receivers |
| 30-88 | 100 (3 nW) | 100 (3 nW) |
| 88-216 | 150 (6.8 nW) | 150 (6.8 nW) |
| 216-960 | 200 (12 nW) | 200 (12 nW) |
| Above 960 | 500 (75 nW) | 500 (75 nW) |

***Note:*** *Transmitting devices are not permitted in Table 1 bands or in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-806 MHz). Prohibition of operation in TV bands does not apply to momentary devices, or to medical telemetry devices in the band 174-216 MHz, and to perimeter protection systems in the bands 54-72 and 76-88 MHz. The perimeter protection devices are to meet Table 3 field strengths limits.*

**RSS-210 Table 3: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz (Transmit)**

| Frequency (fundamental or spurious) | Field Strength (microvolts/m) | Magnetic H-Field (microamperes/m) | Measurement Distance (metres) |
|---|---|---|---|
| 9-490 kHz | 2,400/F (F in kHz) | 2,400/377F (F in Hz) | 300 |
| 490-1.705 kHz | 24,000/F (F in kHz) | 24,000/377F (F in kHz) | 30 |
| 1.705-30 MHz | 30 | N/A | 30 |

***Note:*** *The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average detector.*

**RSS-210 §Annex 8: Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands**

This section applies to systems that employ frequency hopping (FH) and digital modulation technology in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. Systems in these bands may employ frequency hopping, digital modulation and or a combination (hybrid) of both techniques.

A frequency hopping system that synchronizes with another or several other systems (to avoid frequency collision among them) via off-air sensing or via connecting cables is not hopping randomly and therefore is not in compliance with RSS-210.

**RSS-210 §A8.2 Digital Modulation Systems**

These include systems employing digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to all three bands.

**RSS-210 §A8.4 Transmitter Output Power and e.i.r.p. Requirements**

(4) For systems employing digital modulation techniques operating in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands, the maximum peak conducted power shall not exceed 1 W. Except as provided in Section A8.4(5), the e.i.r.p. shall not exceed 4 W.
As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power (see RSS-Gen)
(5) Point-to-point systems in the bands 2400-2483.5 MHz and 5725-5850 MHz are permitted to have an e.i.r.p. higher than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain directional antennas and not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be allowed to operate at greater than 4 W e.i.r.p, under the same conditions as for point-to- point systems.
**Note:** "Fixed, point-to-point operation", excludes point-to-multipoint systems, omnidirectional applications and multiple co-located transmitters transmitting the same information.

**RSS-210 §A8.5 Out-of-band Emissions**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

**RSS-Gen §2 General Information**

Unless otherwise indicated, radiocommunications equipment is subject to licensing pursuant to subsection 4(1) of the *Radiocommunication Act.*

**RSS-Gen §2.1.2 Category II Equipment**

Category II equipment comprises radio devices where a standard has been prescribed but for which a TAC is not required, that is, equipment certification by Industry Canada or a Certification Body (CB) is not required (certification exempt), pursuant to subsection 4(3) of the *Radiocommunication Act*. The manufacturer or importer shall nevertheless ensure that the standards are complied with. A test report shall be available on request and the device shall be properly labelled.

**RSS-Gen §2.2 Receivers**

Radiocommunication receivers are defined as Category I equipment or Category II equipment by the characteristics outlined below.

**RSS-Gen §2.2.1 Category I Equipment Receivers**

A receiver is classified as Category I equipment if it meets one of the following conditions:
(a) is a stand-alone receiver that is tunable to any frequency in the band 30-960 MHz;
(b) is a receiver that is associated with Category I transmitters; or
(c) is a scanner receiver.

Except for scanner receivers, which have their own RSSs, Category I receivers shall comply with the limits for receiver spurious emissions set out in Section 6 of this RSS-Gen, and shall be certified under the RSS applicable to the transmitter type with which the receiver is associated or designed to operate (NOT under RSS-Gen).

**RSS-Gen §2.2.2 Category II Equipment Receivers**

A receiver is classified as Category II equipment if it is not meeting the conditions of Section 2.2.1.

**RSS-Gen §2.2.3 Licence-exempt Receivers**

Paging receivers, “receive-only” earth stations operating with satellites approved by Industry Canada, and stand-alone receivers which are exempted from licensing, can be classified as either Category I or Category II. These receivers shall comply with the requirements of RSS-210 or RSS-310, respectively.

**RSS-Gen §2.3 Licence-exempt Low-power Radiocommunication Devices (LPDs)**

Licence-exempt low-power radiocommunication devices are devices which have intentional and unwanted emissions of very low signal levels such that they can co-exist with licensed radio services. LPDs are required to operate on a **"no-interference no-protection"** basis (i.e. they may not cause radio interference and cannot claim protection from interference). The requirements for LPDs are generally described in Section 7.

**RSS-Gen §5.5 Exposure of Humans to RF Fields**

Before equipment certification is granted, the applicable requirements of RSS-102 shall be met.

**RSS-Gen §6 Receiver Spurious Emission Standard**

The following receiver spurious emission limits shall be complied with:
(a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 1.

**RSS-Gen Table 1 - Spurious Emission Limits for Receivers**

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

(b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5 nanowatts above 1 GHz.

**RSS-Gen §7.1.4 Transmitter Antenna**

A transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.
When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

**RSS-Gen §7.2.2 Transmitter and Receiver AC Power Lines Conducted Emission Limits**

Except when the requirements applicable to a given device state otherwise, for any licence-exempt radiocommunication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 2. The tighter limit applies at the frequency range boundaries.

**RSS-Gen Table 2 – AC Power Lines Conducted Emission Limits**

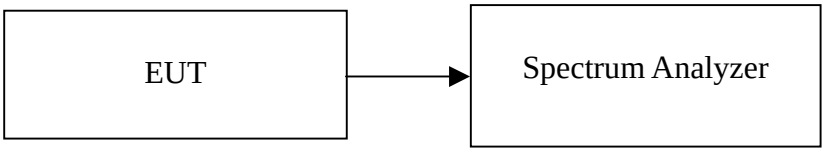
| Frequency Range (MHz) | Conducted limit (dBµV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 to 0.5 | 66 to 56* | 56 to 46* |
| 0.5 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

**Decreases with the logarithm of the frequency*

# 8. FCC PART 15.247 REQUIREMENTS & INDUSTRY CANADA RSS-210 REQUIREMENTS

## 8.1 99%BANDWIDTH

**Test Configuration**




## TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

## TEST RESULTS

**Full Length Board::**

**Test mode: IEEE 802.11b mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 15.6838 |
| Mid | 2437 | 15.6431 |
| High | 2462 | 15.7134 |

**Test mode: IEEE 802.11g mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 16.5203 |
| Mid | 2437 | 16.5286 |
| High | 2462 | 16.5456 |

**Test mode: IEEE 802.11n HT20 mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 17.7354 |
| Mid | 2437 | 17.7143 |
| High | 2462 | 17.7447 |

**Test mode: IEEE 802.11n HT40 mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---|---|---|
| Low | 2422 | 36.1324 |
| Mid | 2437 | 36.1427 |
| High | 2452 | 36.1433 |

## Half Length Board:

**Test mode: IEEE 802.11b mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 15.6611 |
| Mid | 2437 | 15.7147 |
| High | 2462 | 15.6309 |

**Test mode: IEEE 802.11g mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 16.5061 |
| Mid | 2437 | 16.5150 |
| High | 2462 | 16.5397 |

**Test mode: IEEE 802.11n HT20 mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 17.7408 |
| Mid | 2437 | 17.7095 |
| High | 2462 | 17.7393 |

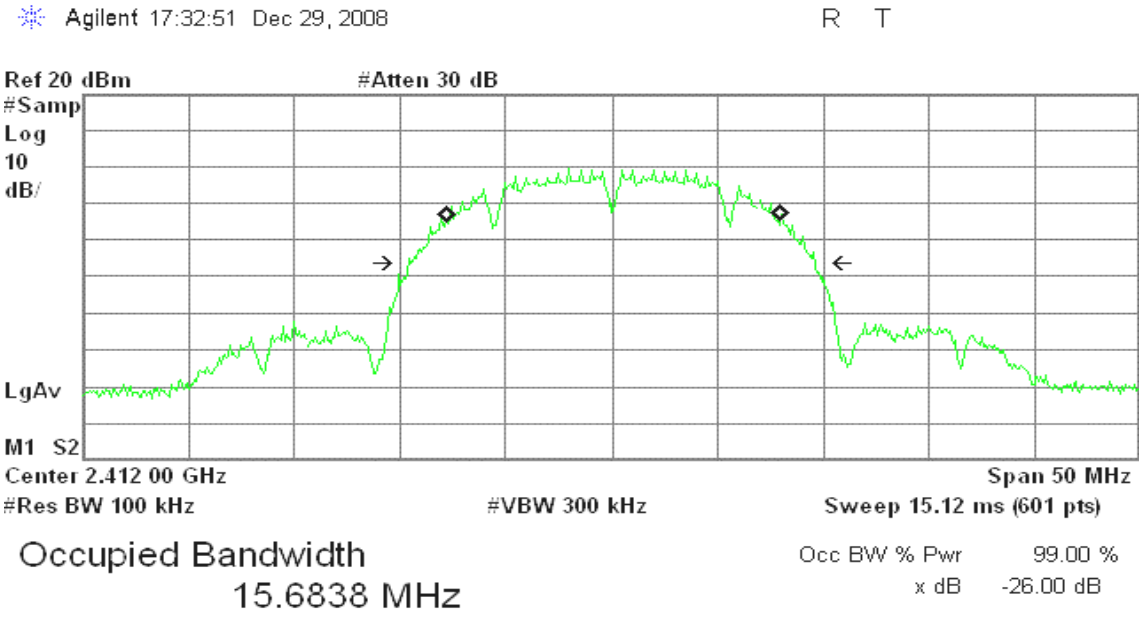
**Test mode: IEEE 802.11n HT40 mode**

| Channel | Frequency (MHz) | Bandwidth (MHz) |
|---|---|---|
| Low | 2422 | 36.1462 |
| Mid | 2437 | 36.1437 |
| High | 2452 | 36.1510 |

## Test Plot

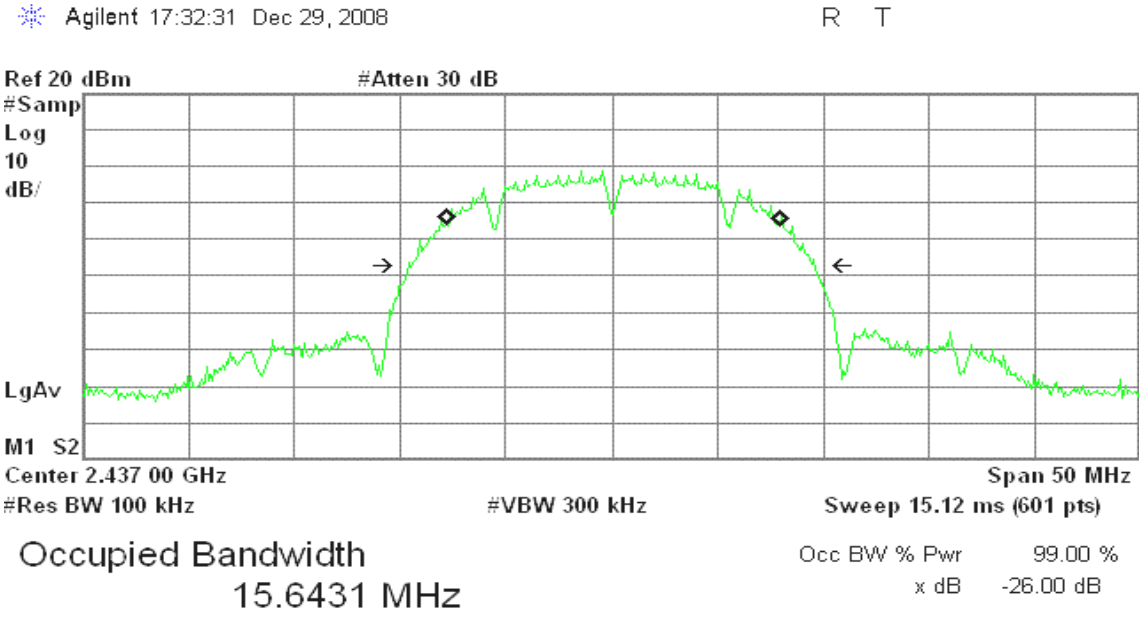
### Full Length Board / IEEE 802.11b mode

### 99% Bandwidth (CH Low)



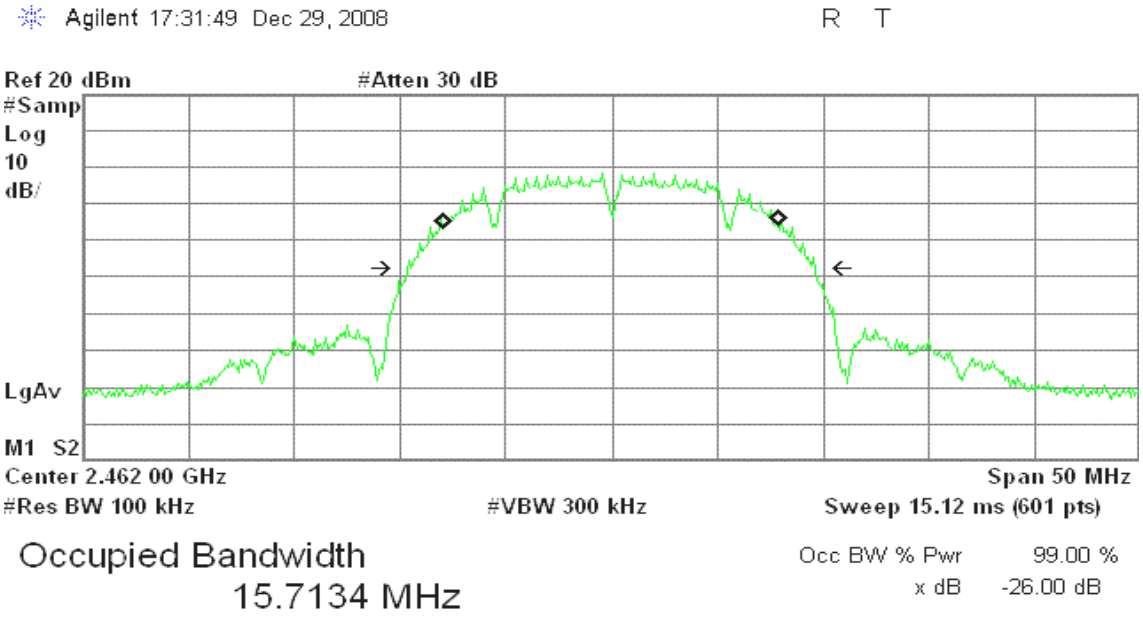

| | |
|---|---|
| Transmit Freq Error | 111.053 kHz |
| x dB Bandwidth | 19.107 MHz* |

### 99% Bandwidth (CH Mid)




| | |
|---|---|
| Transmit Freq Error | 73.362 kHz |
| x dB Bandwidth | 19.080 MHz* |

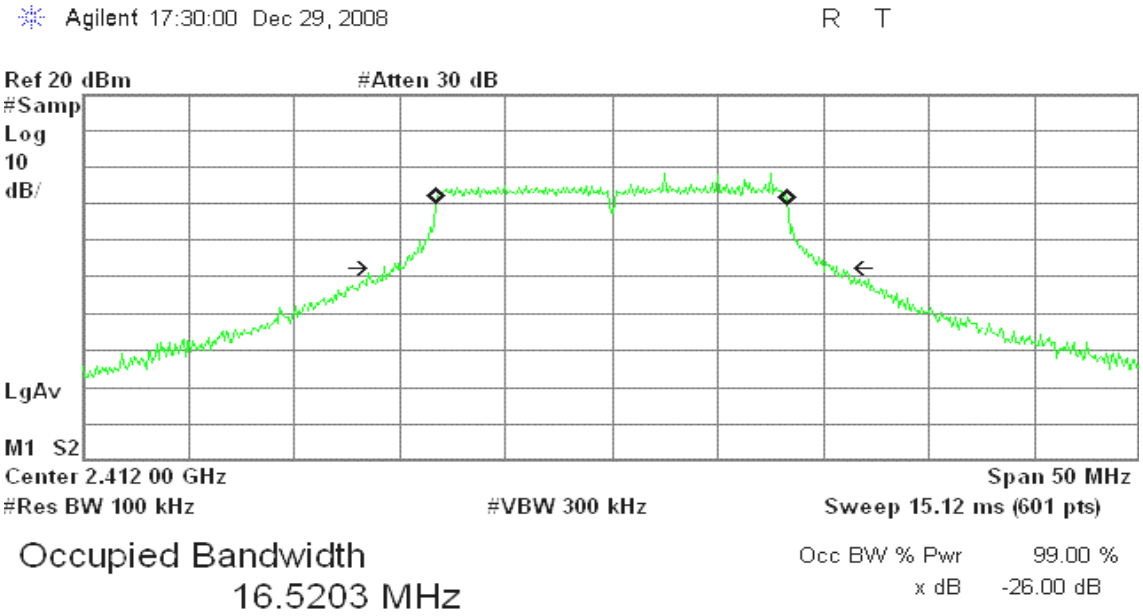
### 99% Bandwidth (CH High)




| | |
|---|---|
| Transmit Freq Error | -19.081 kHz |
| x dB Bandwidth | 19.131 MHz* |

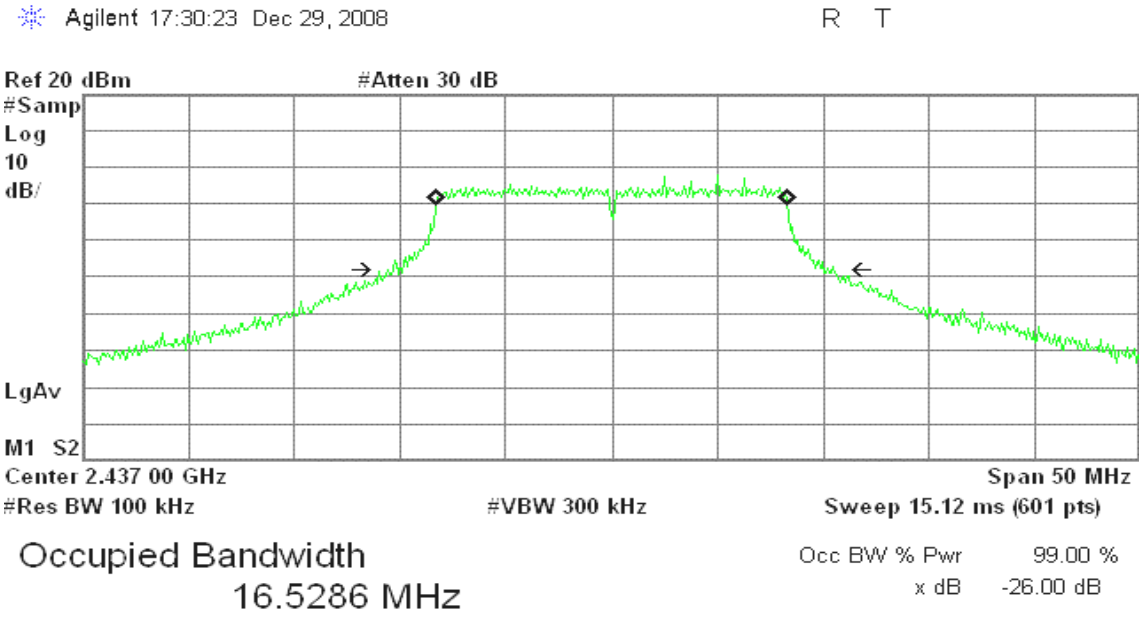
### IEEE 802.11g mode

### 99% Bandwidth (CH Low)



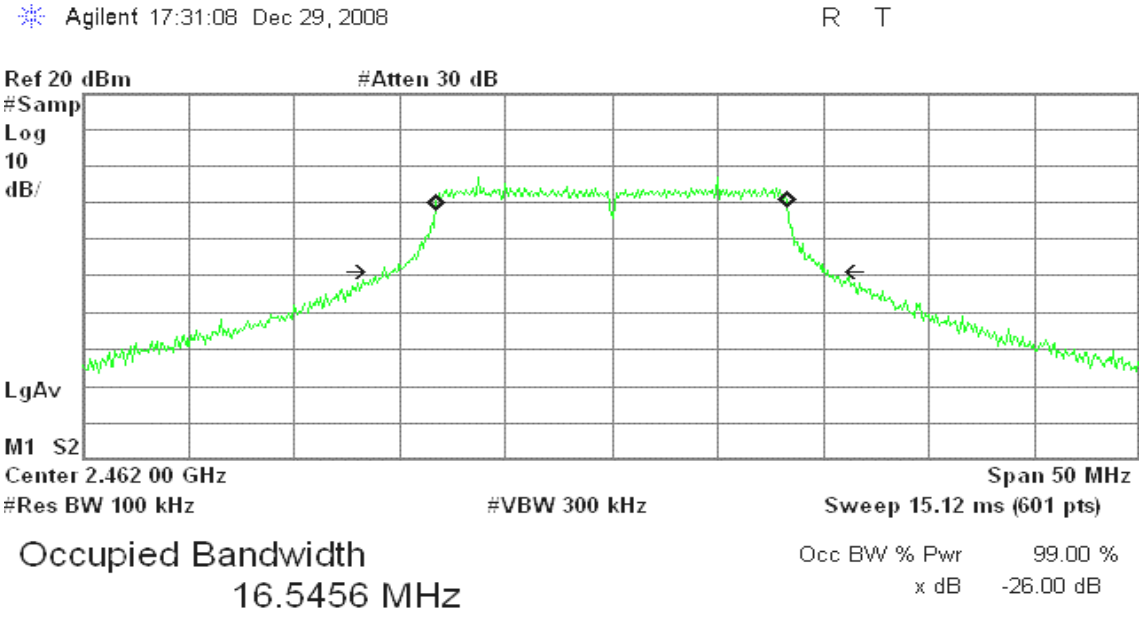

| | |
|---|---|
| Transmit Freq Error | 16.853 kHz |
| x dB Bandwidth | 21.441 MHz* |

## 99% Bandwidth (CH Mid)




| | |
|---|---|
| Transmit Freq Error | 11.049 kHz |
| x dB Bandwidth | 21.138 MHz* |

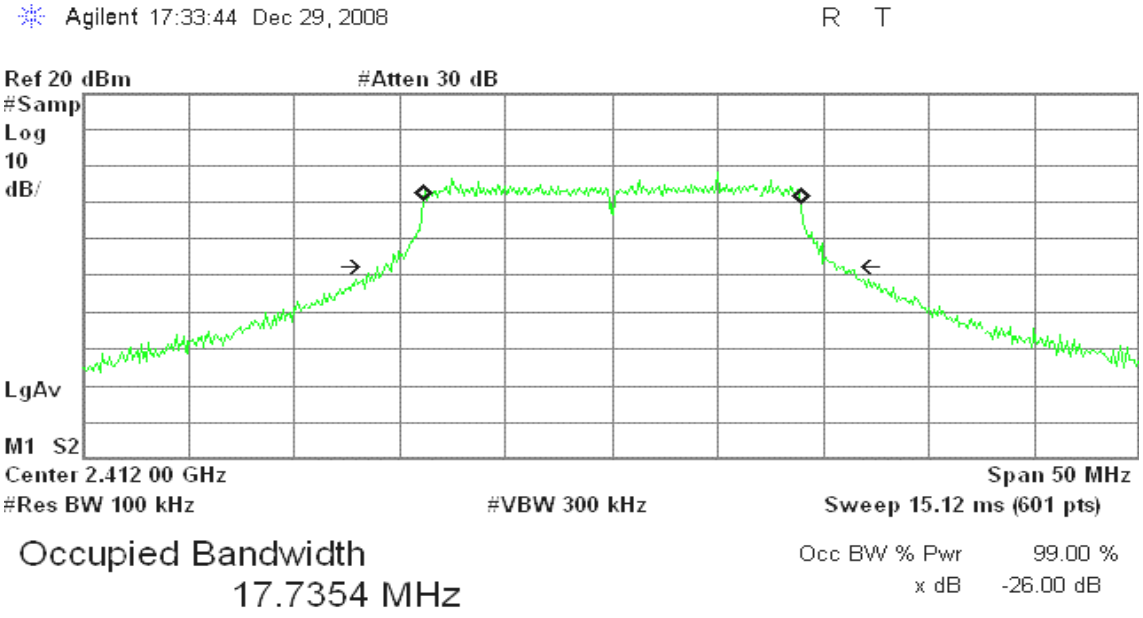
## 99% Bandwidth (CH High)




| | |
|---|---|
| Transmit Freq Error | -3.410 kHz |
| x dB Bandwidth | 21.055 MHz* |

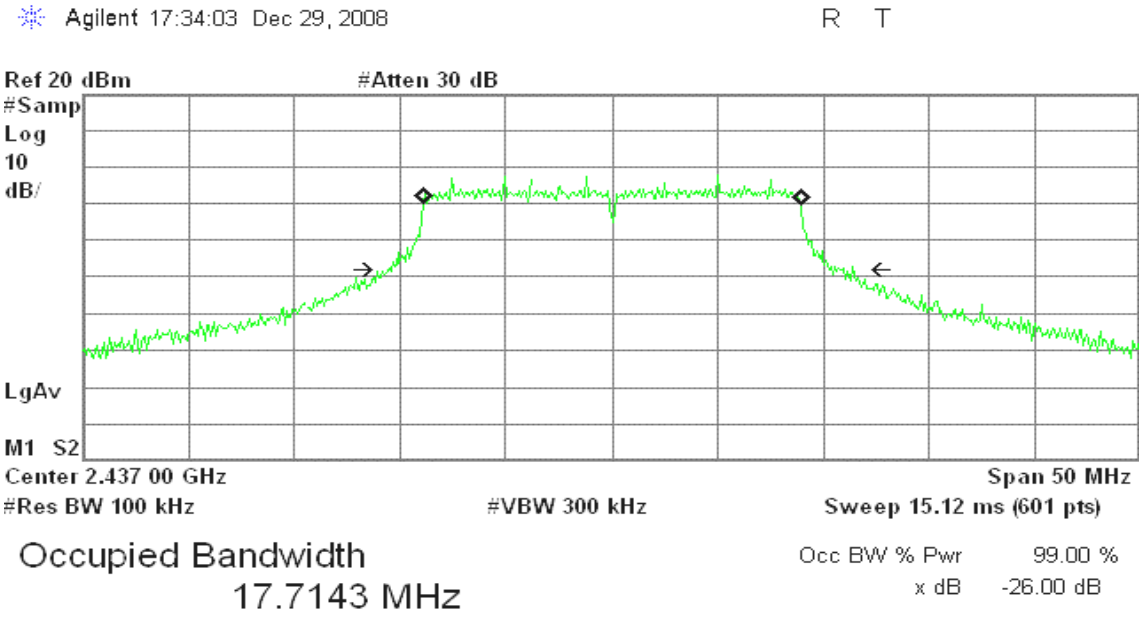
## IEEE 802.11n HT20 mode

### 99% Bandwidth (CH Low)



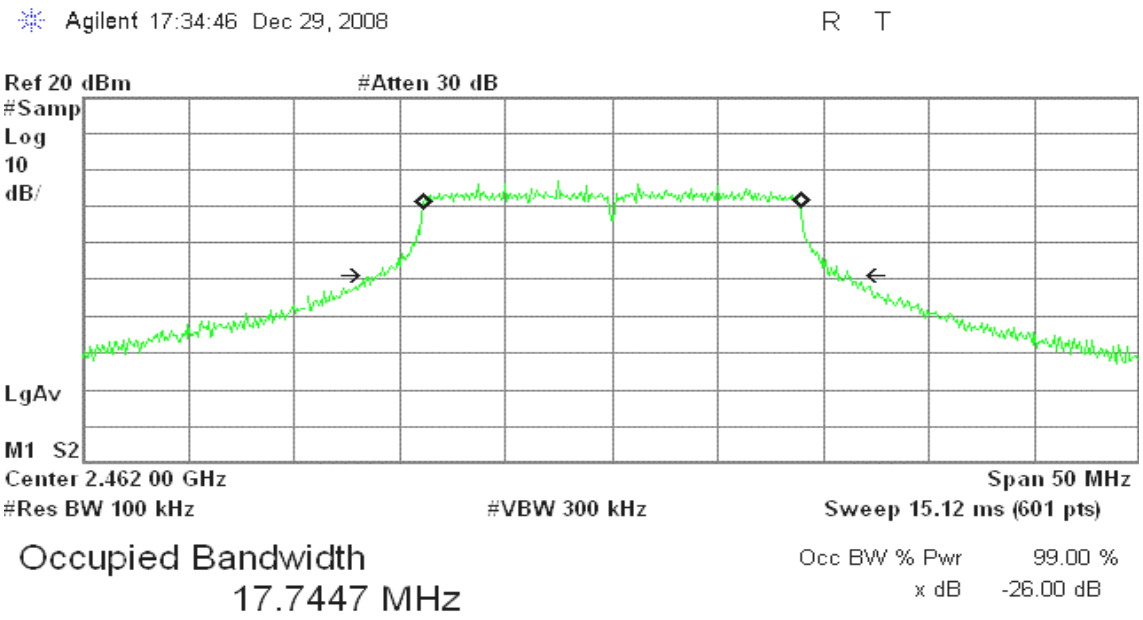

| | |
|---|---|
| Transmit Freq Error | 41.051 kHz |
| x dB Bandwidth | 22.086 MHz* |

### 99% Bandwidth (CH Mid)




| | |
|---|---|
| Transmit Freq Error | 32.457 kHz |
| x dB Bandwidth | 22.002 MHz* |

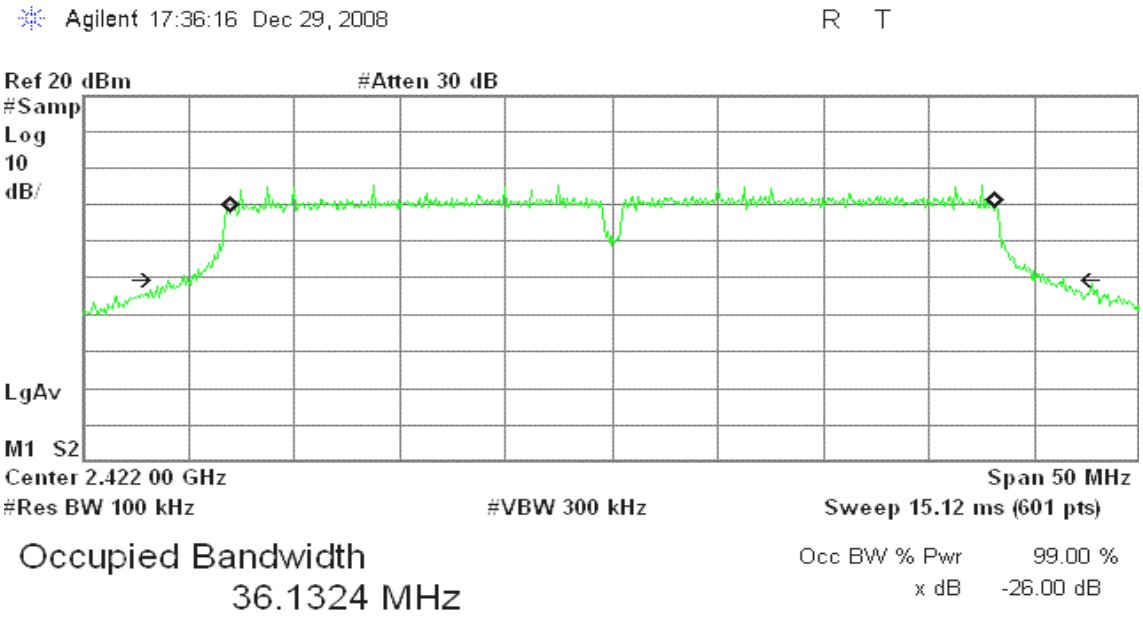
### 99% Bandwidth (CH High)




| | |
|---|---|
| Transmit Freq Error | 14.055 kHz |
| x dB Bandwidth | 22.319 MHz* |

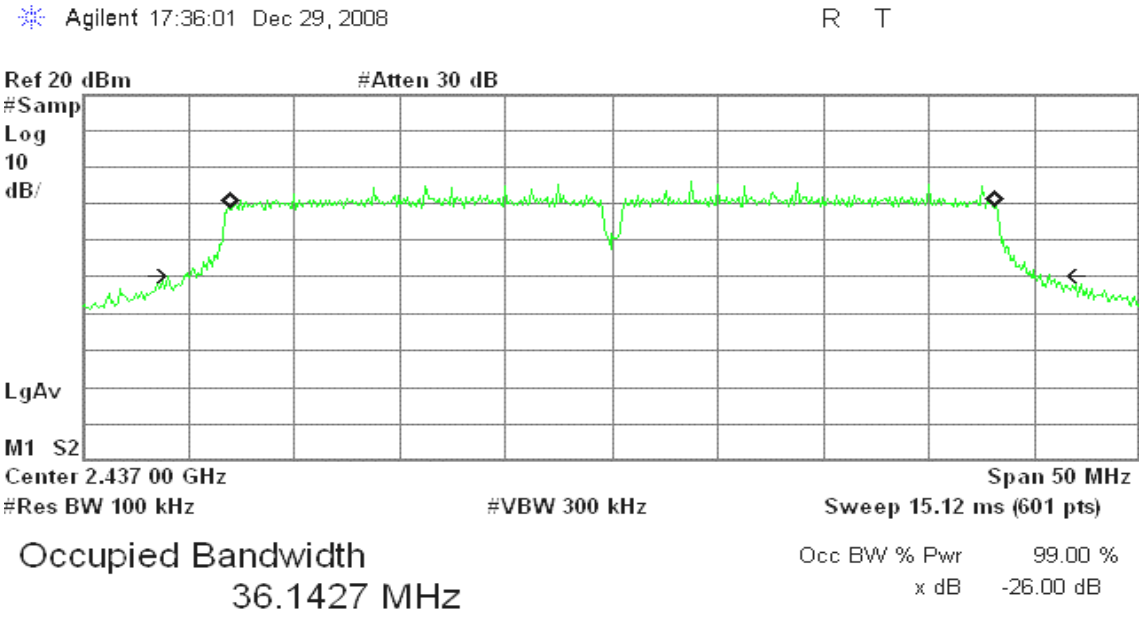
### IEEE 802.11n HT40 mode

### 99% Bandwidth (CH Low)



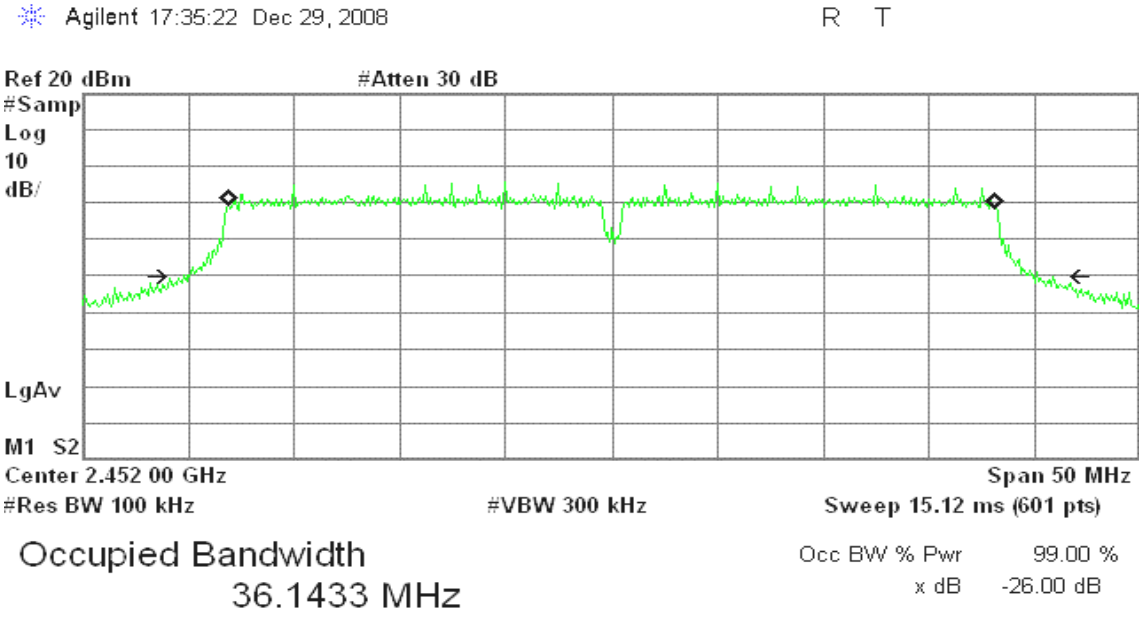

| | |
|---|---|
| Transmit Freq Error | 47.749 kHz |
| x dB Bandwidth | 42.459 MHz* |

## 99% Bandwidth (CH Mid)




| | |
|---|---|
| Transmit Freq Error | 31.703 kHz |
| x dB Bandwidth | 41.020 MHz* |

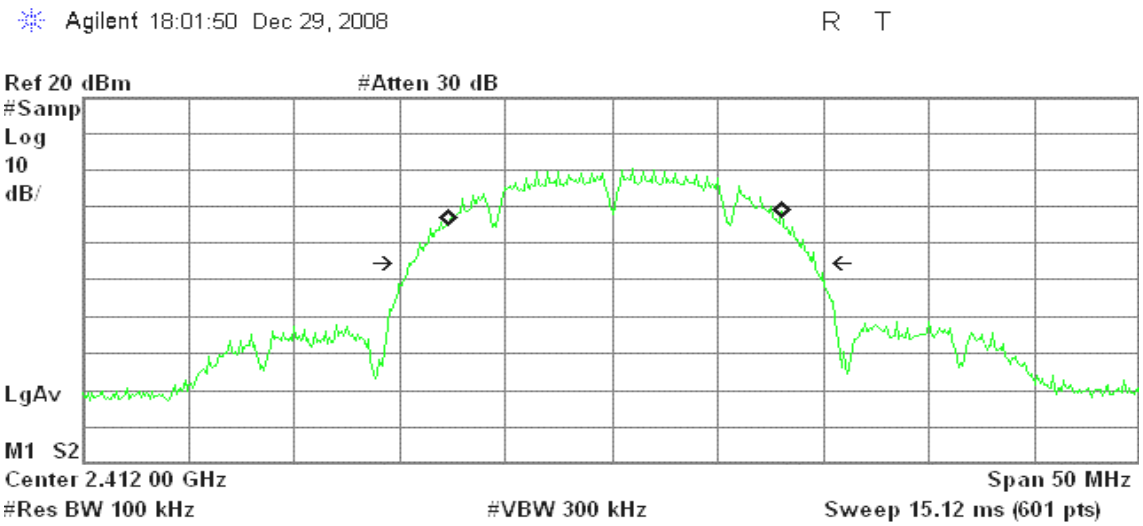
## 99% Bandwidth (CH High)




| | |
|---|---|
| Transmit Freq Error | 14.948 kHz |
| x dB Bandwidth | 41.208 MHz* |

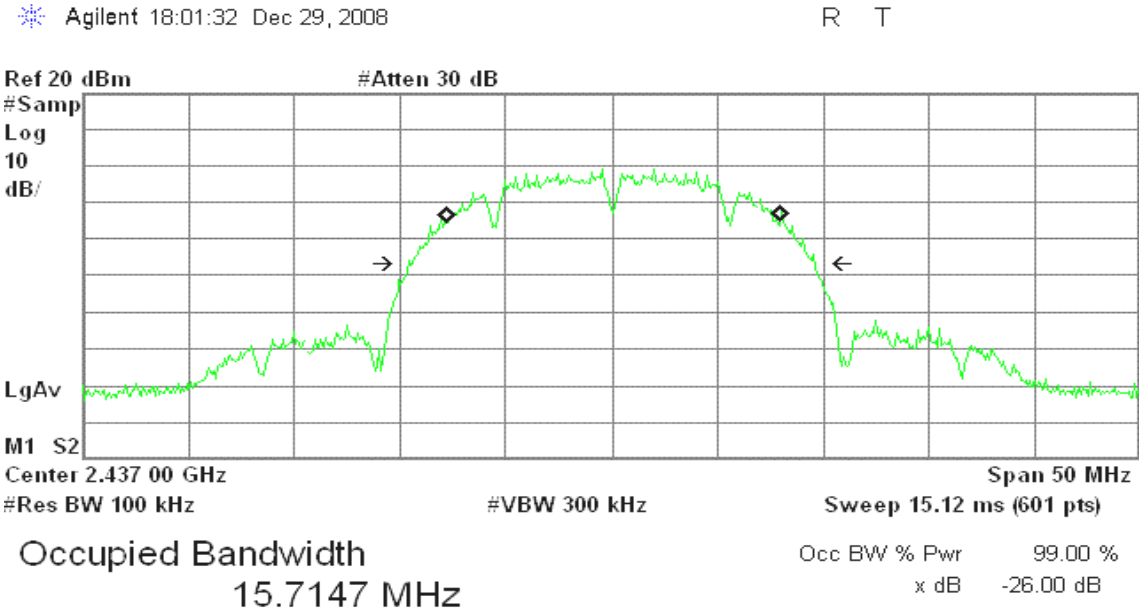
## Half Length Board / IEEE 802.11b mode

### 99% Bandwidth (CH Low)



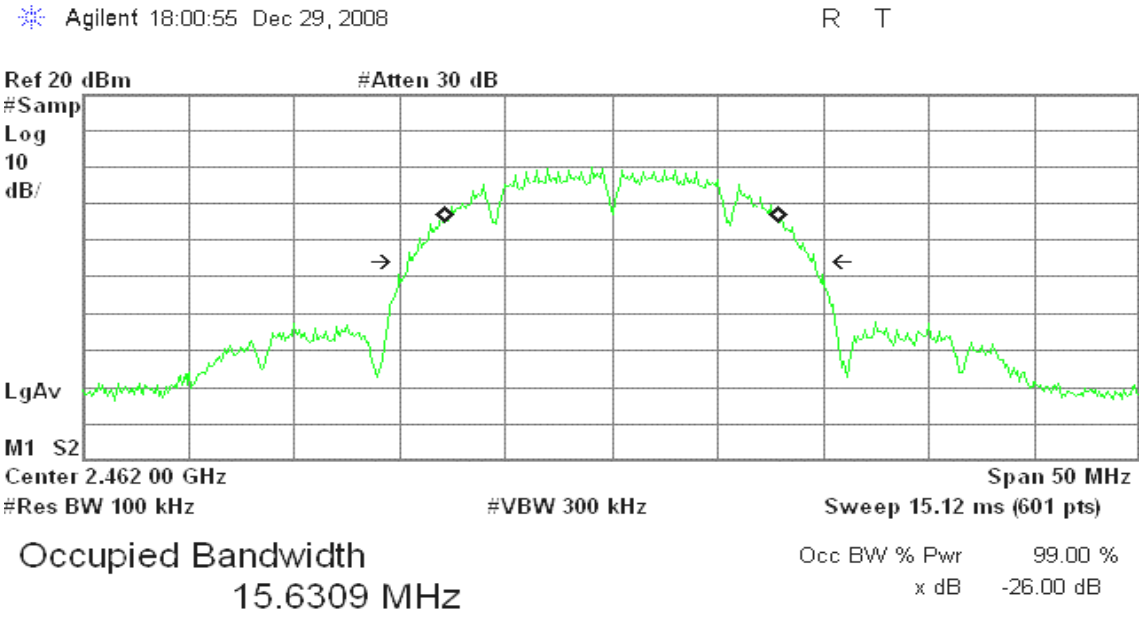

| | |
|---|---|
| Transmit Freq Error | 131.112 kHz |
| x dB Bandwidth | 19.084 MHz* |

### 99% Bandwidth (CH Mid)




| | |
|---|---|
| Transmit Freq Error | 91.323 kHz |
| x dB Bandwidth | 19.090 MHz* |

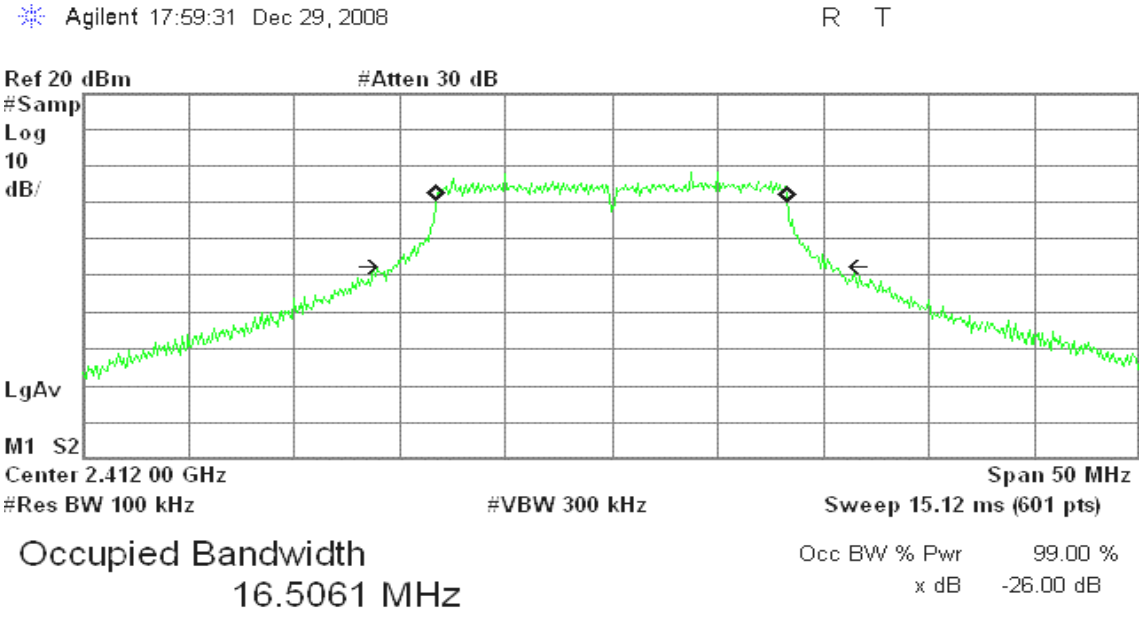
### 99% Bandwidth (CH High)




| | |
|---|---|
| Transmit Freq Error | -14.881 kHz |
| x dB Bandwidth | 19.109 MHz* |

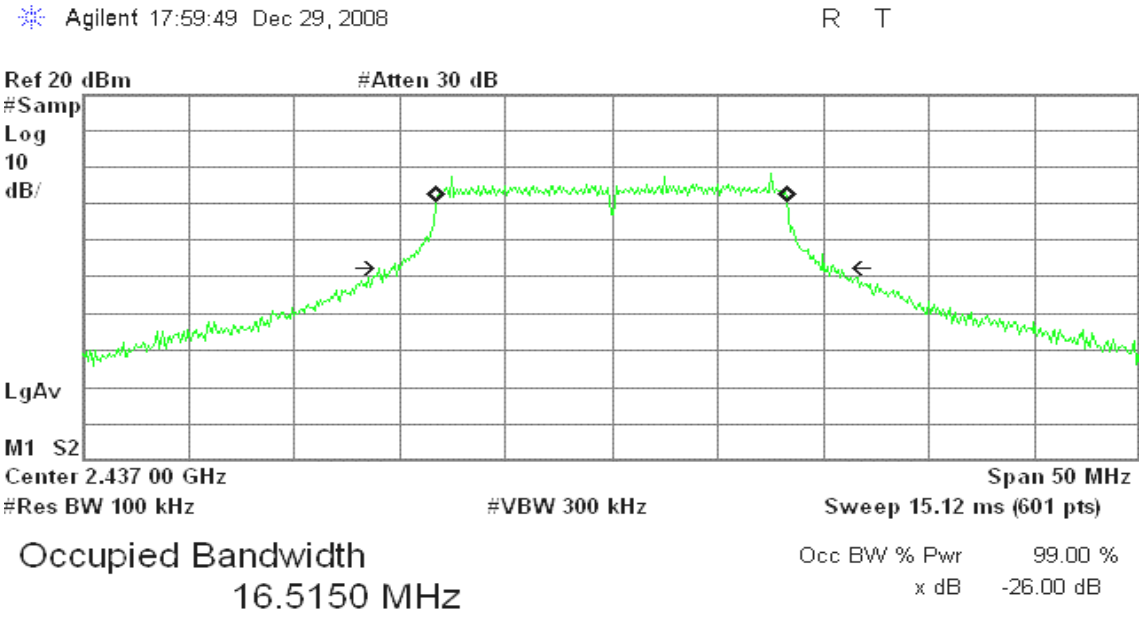
### IEEE 802.11g mode

### 99% Bandwidth (CH Low)



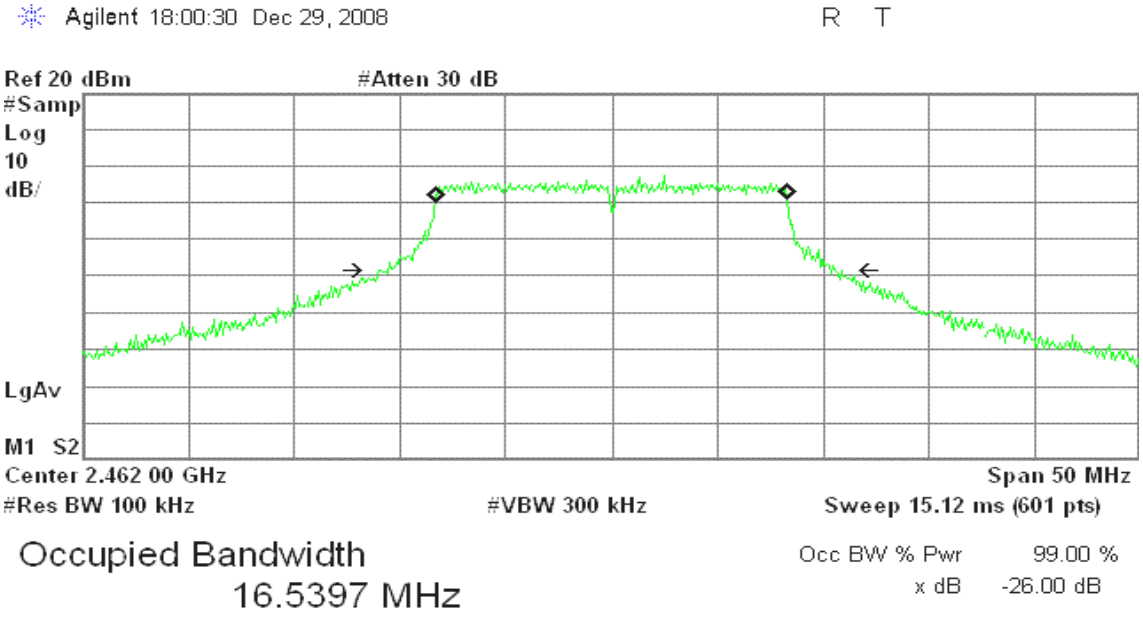

| | |
|---|---|
| Transmit Freq Error | 21.749 kHz |
| x dB Bandwidth | 20.702 MHz* |

## 99% Bandwidth (CH Mid)




| | |
|---|---|
| Transmit Freq Error | 13.575 kHz |
| x dB Bandwidth | 20.920 MHz* |

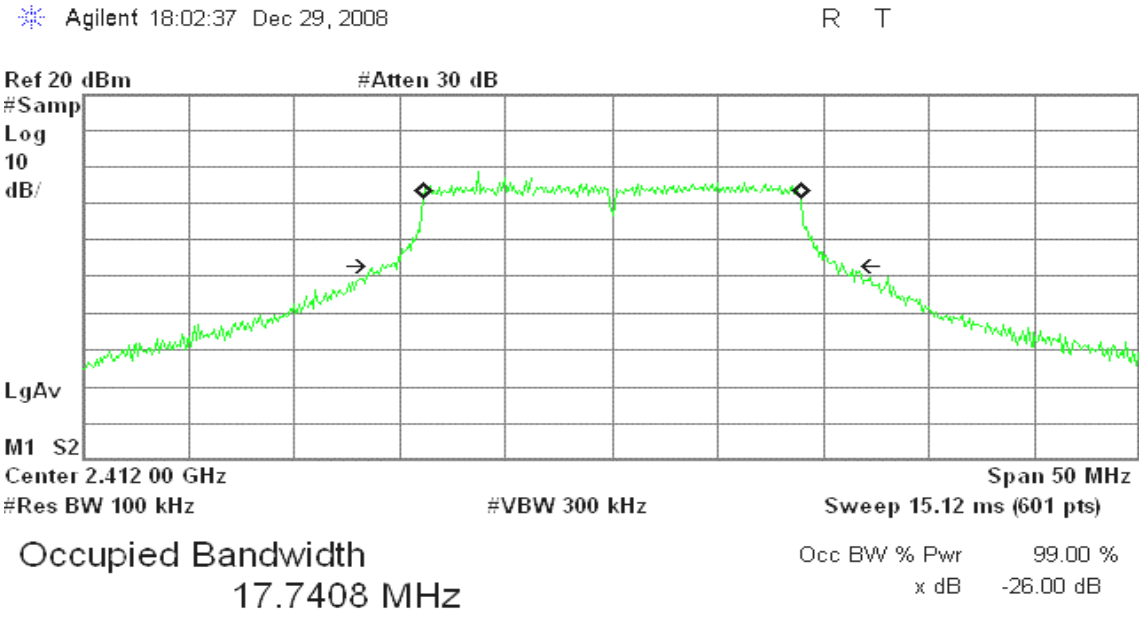
## 99% Bandwidth (CH High)




| | |
|---|---|
| Transmit Freq Error | -7.497 kHz |
| x dB Bandwidth | 21.936 MHz* |

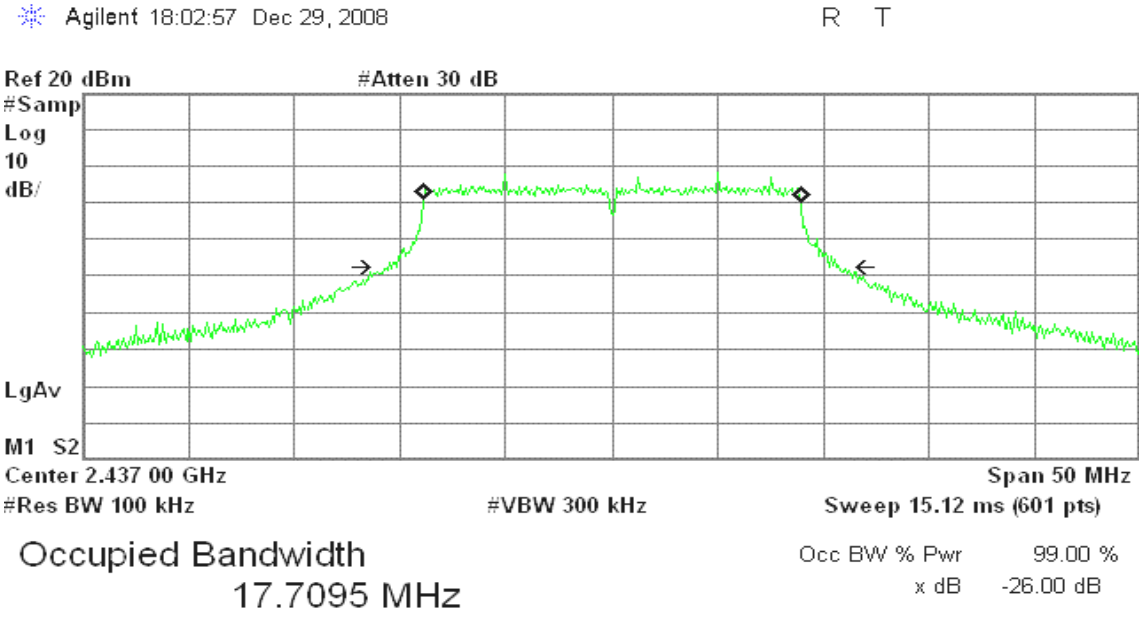
## IEEE 802.11n HT20 mode

### 99% Bandwidth (CH Low)



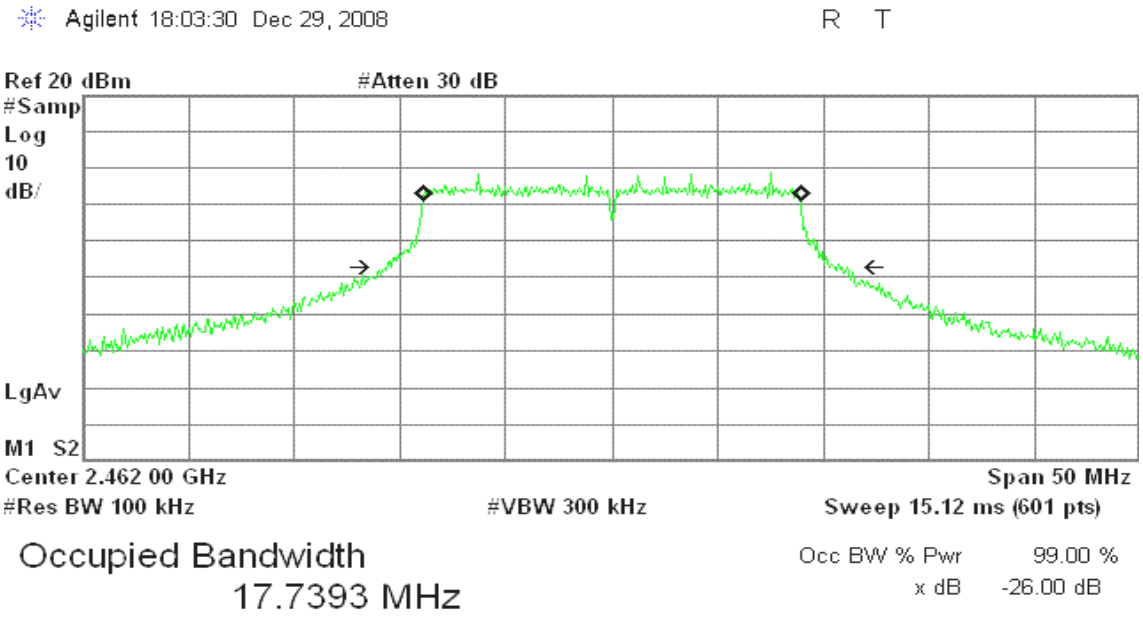

| | |
|---|---|
| Transmit Freq Error | 39.822 kHz |
| x dB Bandwidth | 21.821 MHz* |

### 99% Bandwidth (CH Mid)




| | |
|---|---|
| Transmit Freq Error | 38.505 kHz |
| x dB Bandwidth | 21.324 MHz* |

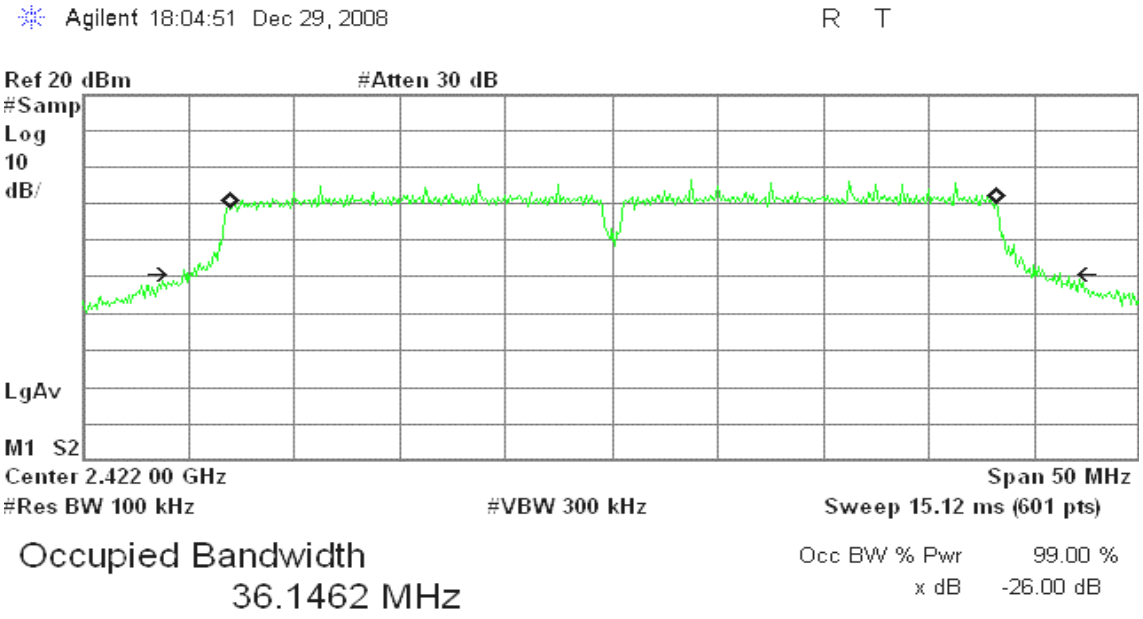
## 99% Bandwidth (CH High)




| | |
|---|---|
| Transmit Freq Error | 23.597 kHz |
| x dB Bandwidth | 21.800 MHz* |

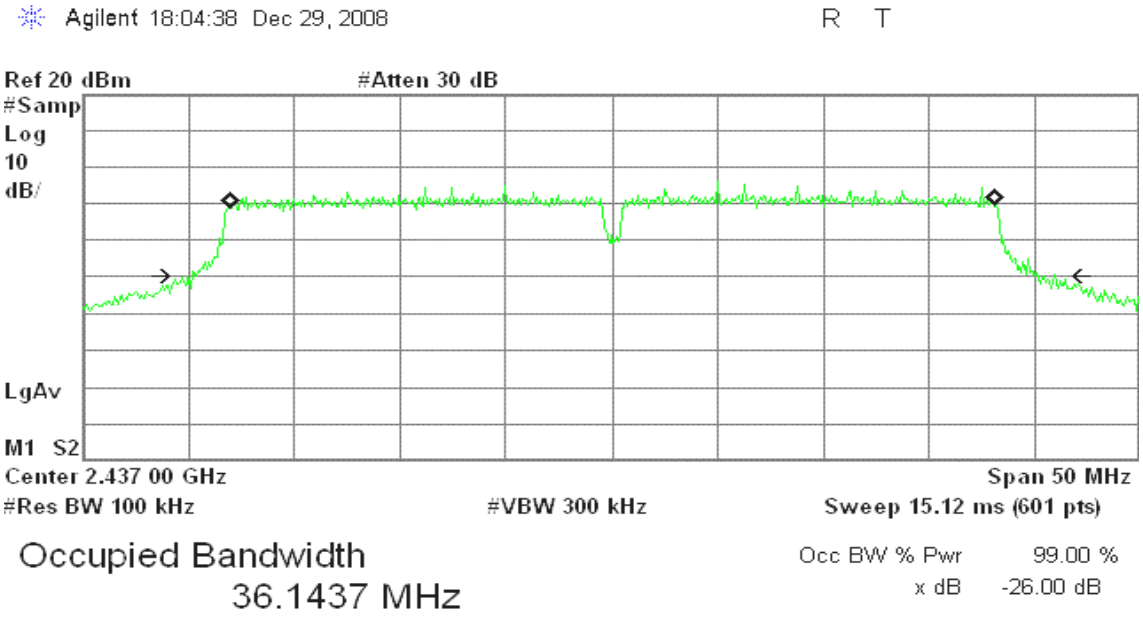
## IEEE 802.11n HT40 mode

## 99% Bandwidth (CH Low)



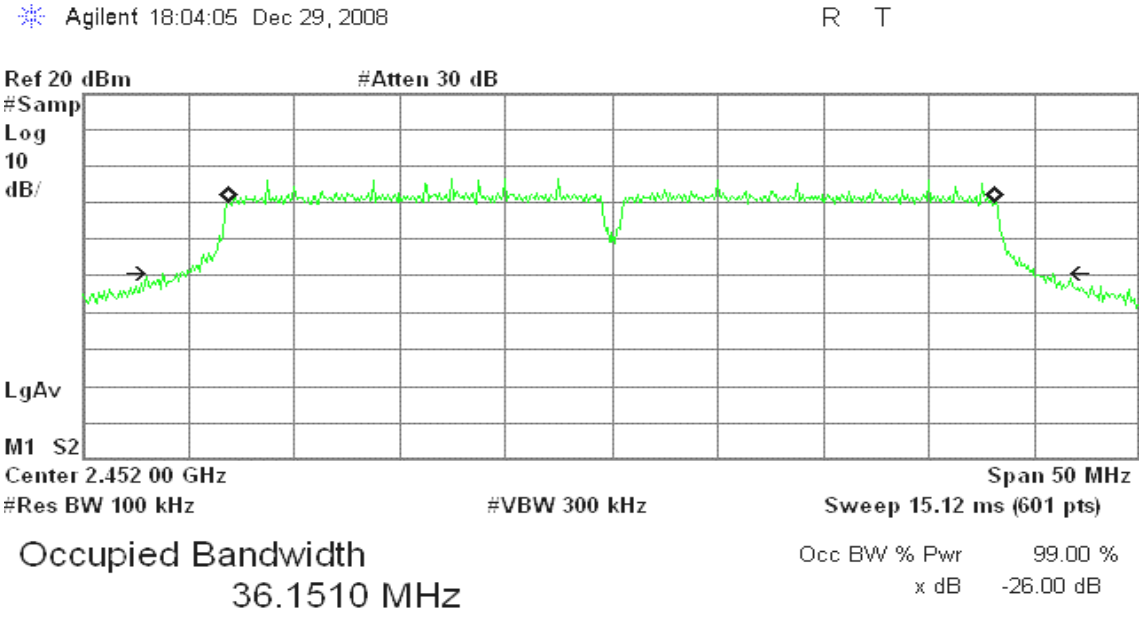

| | |
|---|---|
| Transmit Freq Error | 56.878 kHz |
| x dB Bandwidth | 41.550 MHz* |

## 99% Bandwidth (CH Mid)




| | |
|---|---|
| Transmit Freq Error | 43.733 kHz |
| x dB Bandwidth | 41.030 MHz* |

## 99% Bandwidth (CH High)



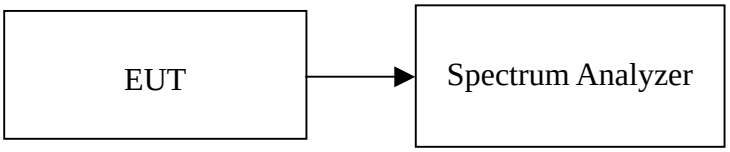

| | |
|---|---|
| Transmit Freq Error | 24.261 kHz |
| x dB Bandwidth | 42.170 MHz* |

## 8.2 6DB BANDWIDTH

### LIMIT

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

**Test Configuration**




### TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100 kHz, VBW = RBW, Span = 50 MHz, Sweep = auto.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

### TEST RESULTS

*No non-compliance noted.*

## Test Data

### Full Length Board:

**Test mode: IEEE 802.11b mode**

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low | 2412 | 12000 | >500 | PASS |
| Mid | 2437 | 12000 | | PASS |
| High | 2462 | 12420 | | PASS |

**Test mode: IEEE 802.11g mode**

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low | 2412 | 16500 | >500 | PASS |
| Mid | 2437 | 16500 | | PASS |
| High | 2462 | 16580 | | PASS |

**Test mode: IEEE 802.11n HT20 mode**

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low | 2412 | 17750 | >500 | PASS |
| Mid | 2437 | 17750 | | PASS |
| High | 2462 | 17750 | | PASS |

**Test mode: IEEE 802.11n HT40 mode**

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low | 2422 | 36330 | >500 | PASS |
| Mid | 2437 | 36420 | | PASS |
| High | 2452 | 36420 | | PASS |

## Half Length Board:

### Test mode: IEEE 802.11b mode

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low | 2412 | 11580 | >500 | PASS |
| Mid | 2437 | 11250 | | PASS |
| High | 2462 | 12500 | | PASS |

### Test mode: IEEE 802.11g mode

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low | 2412 | 16500 | >500 | PASS |
| Mid | 2437 | 16500 | | PASS |
| High | 2462 | 16500 | | PASS |

### Test mode: IEEE 802.11n HT20 mode

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low | 2412 | 17750 | >500 | PASS |
| Mid | 2437 | 17750 | | PASS |
| High | 2462 | 17750 | | PASS |

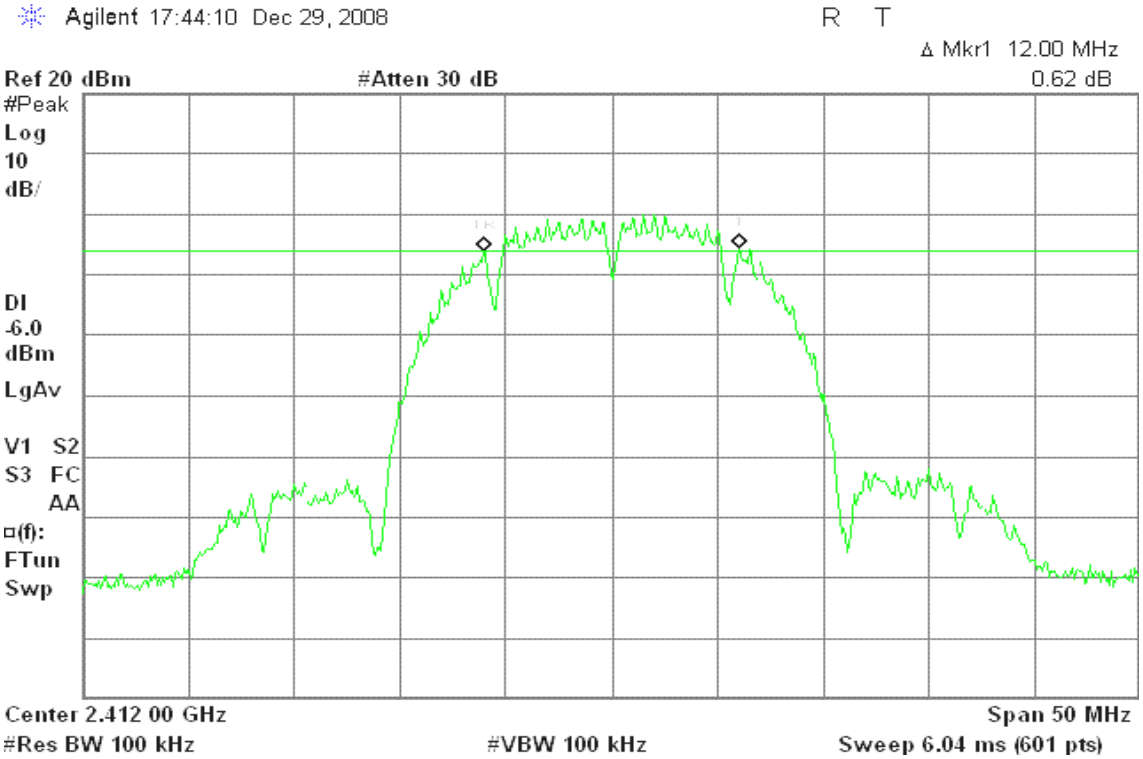
### Test mode: IEEE 802.11n HT40 mode

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low | 2422 | 36250 | >500 | PASS |
| Mid | 2437 | 36420 | | PASS |
| High | 2452 | 36420 | | PASS |

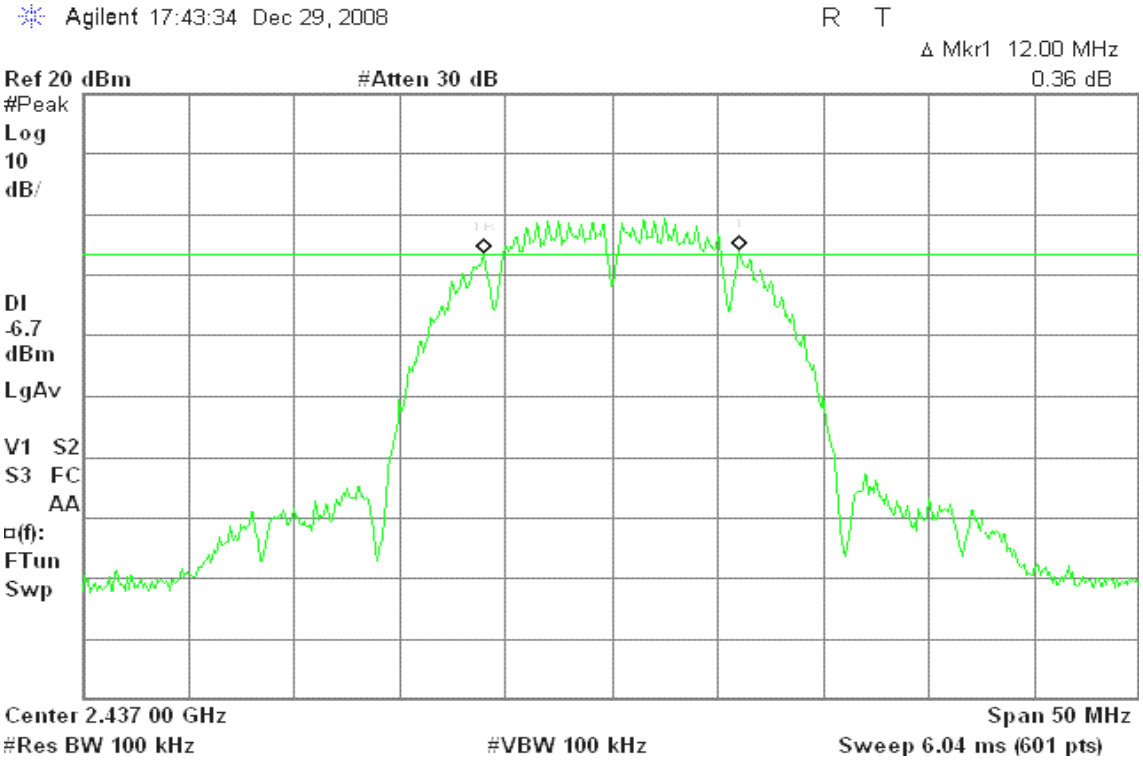
## Test Plot

### Full Length Board / IEEE 802.11b mode

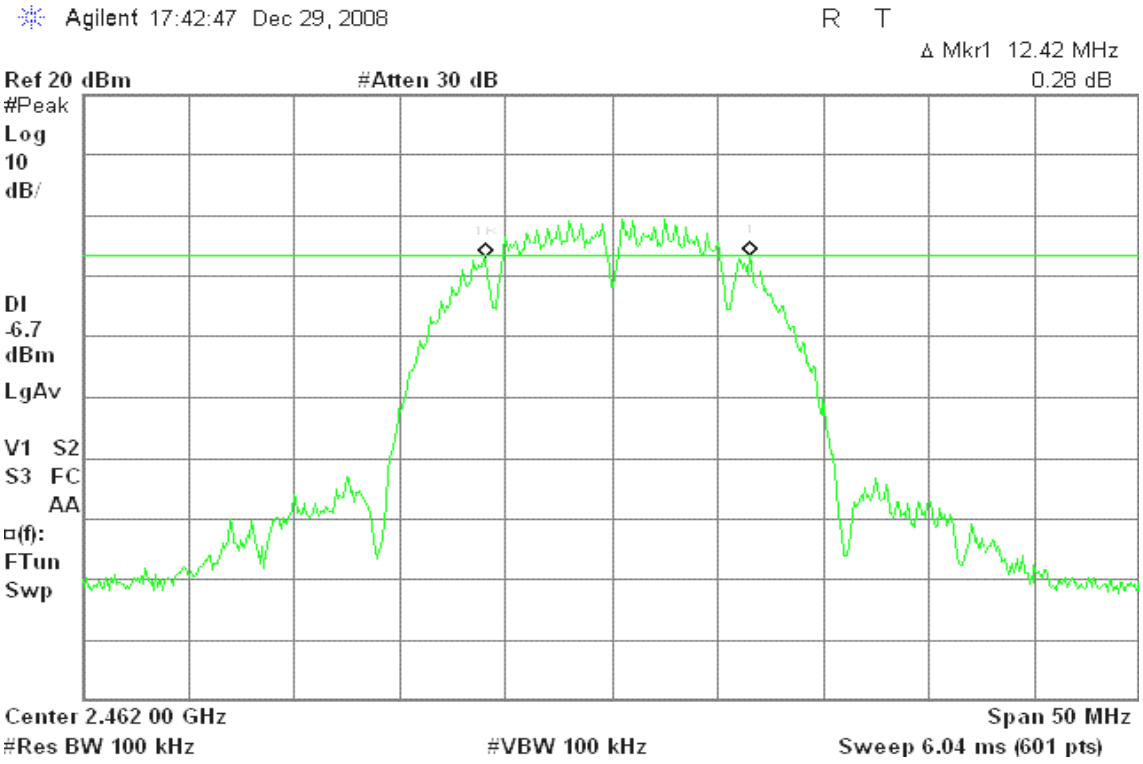
### 6dB Bandwidth (CH Low)




### 6dB Bandwidth (CH Mid)

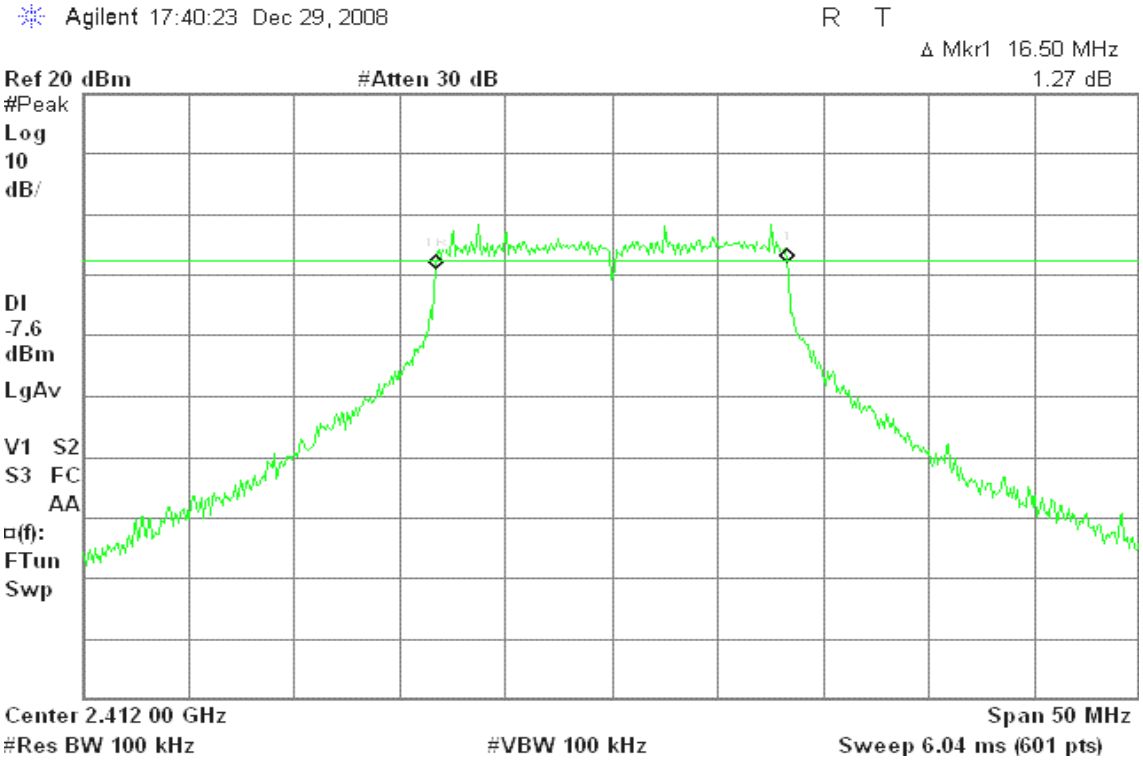


## 6dB Bandwidth (CH High)

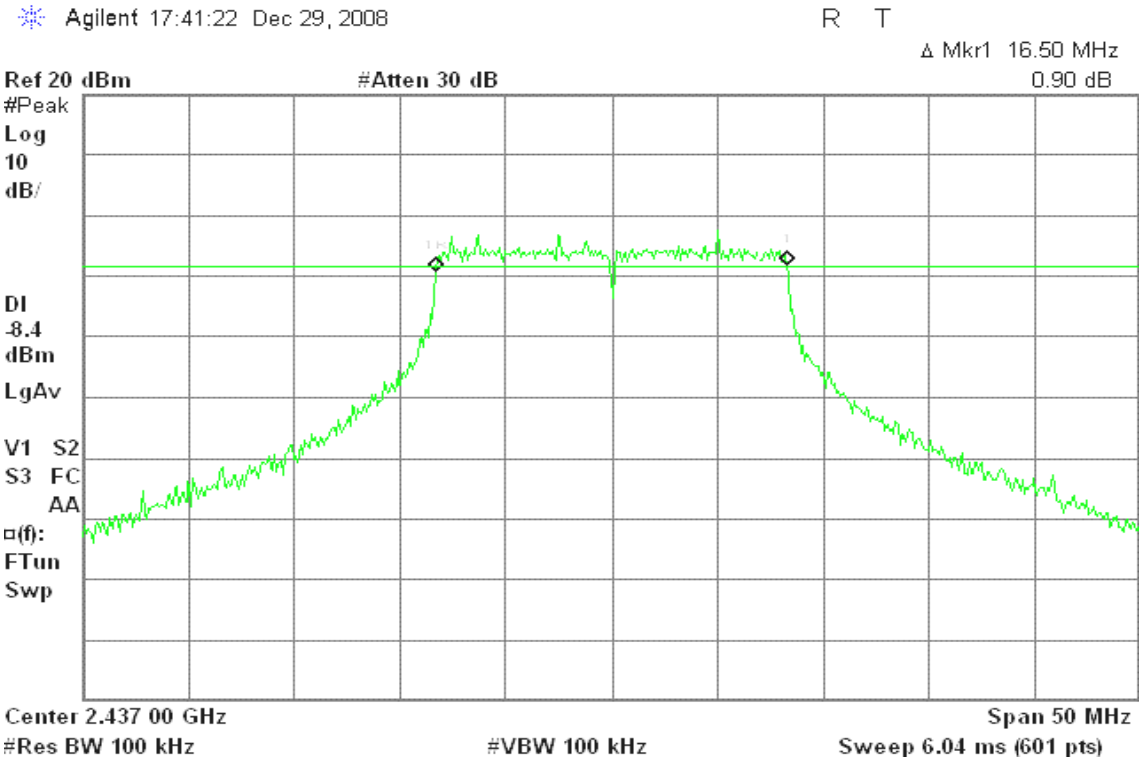



## IEEE 802.11g mode

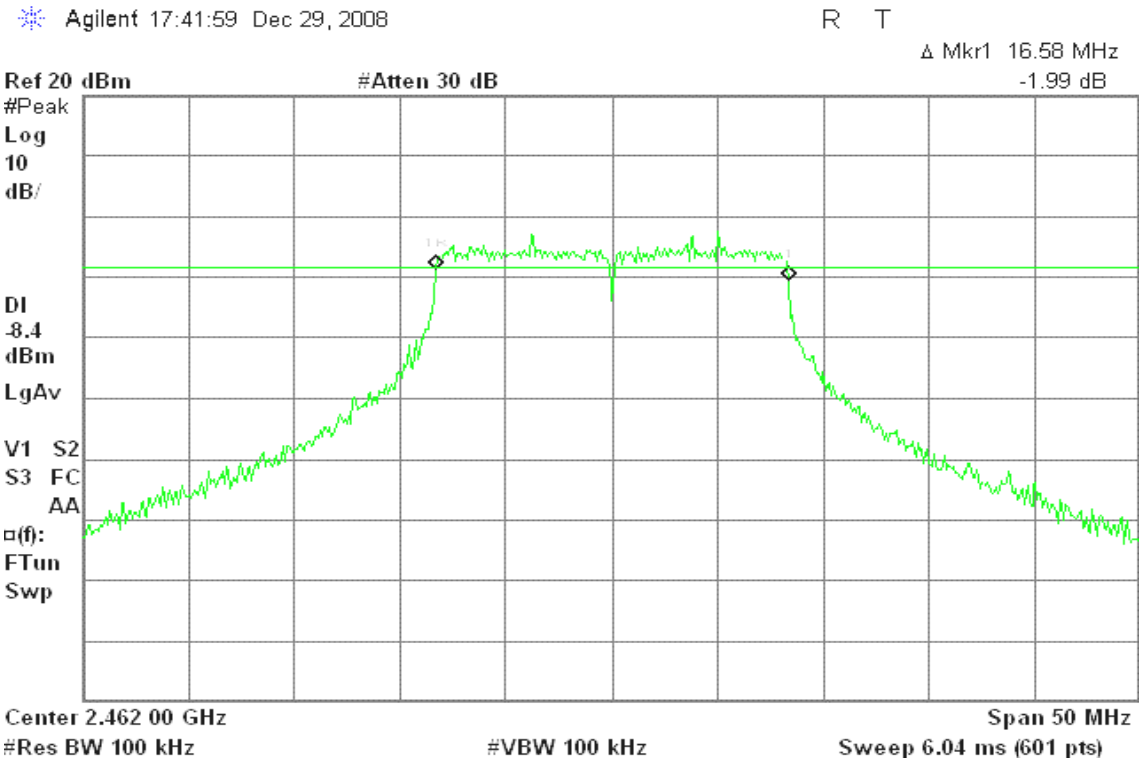
## 6dB Bandwidth (CH Low)



## 6dB Bandwidth (CH Mid)

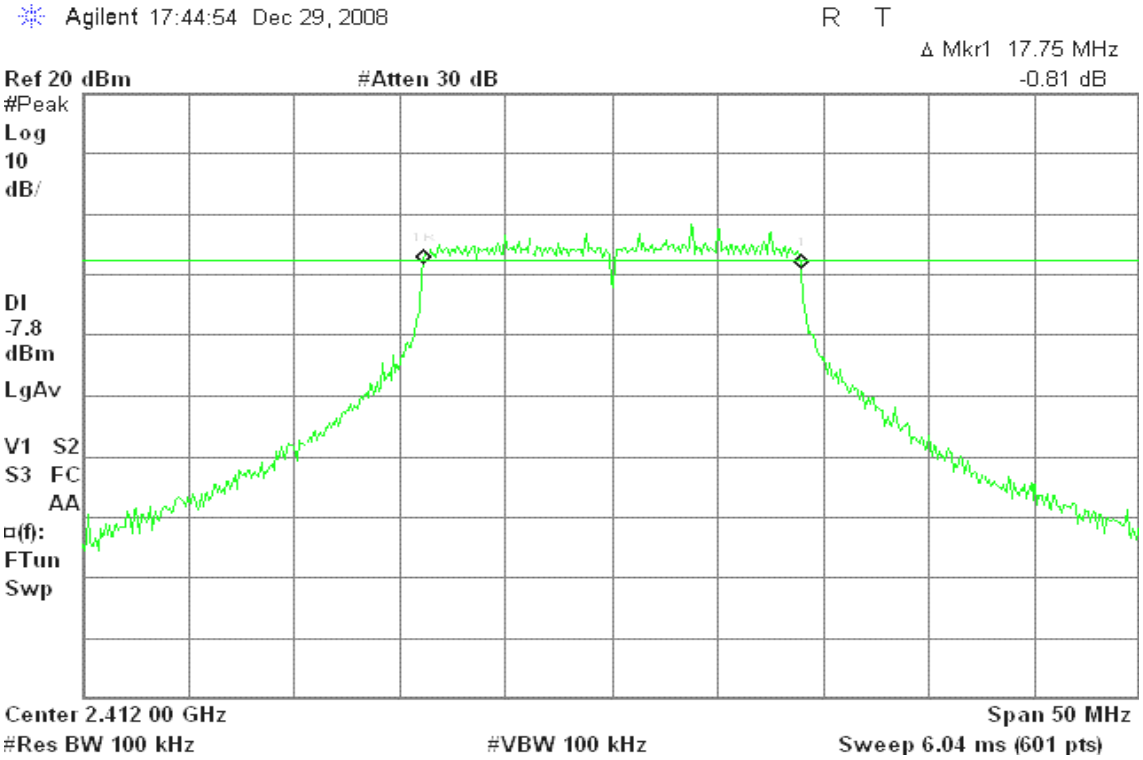



## 6dB Bandwidth (CH High)

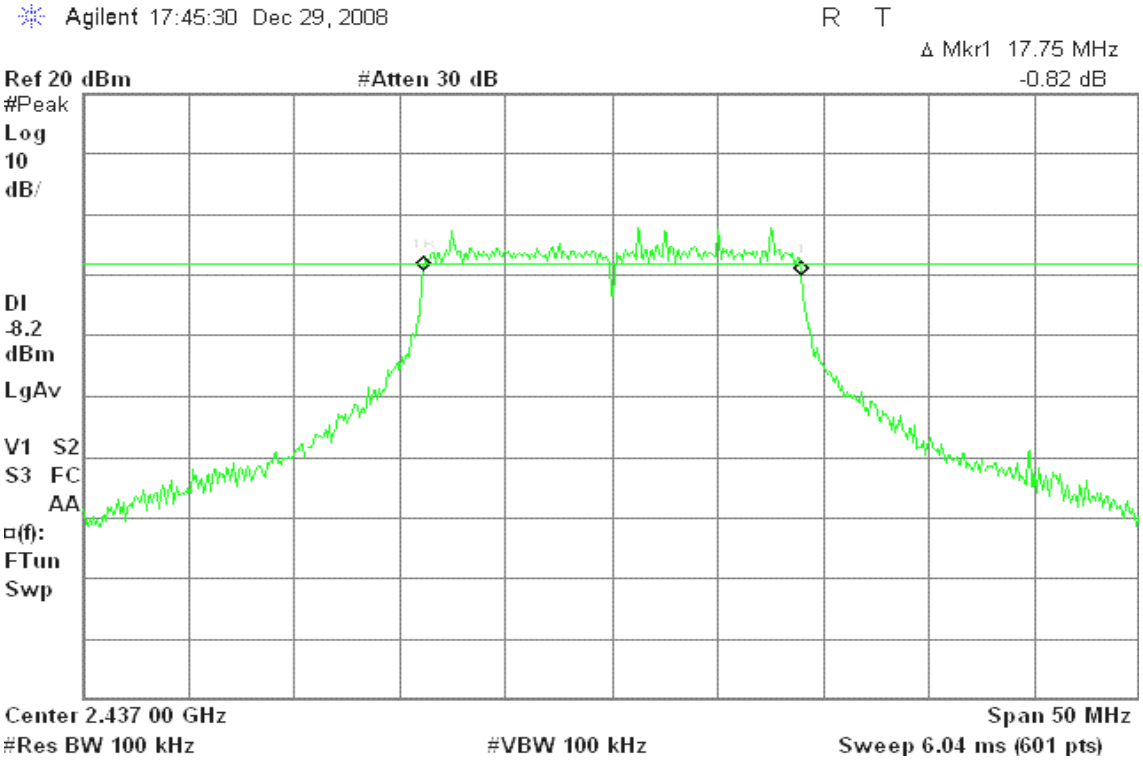


## IEEE 802.11n HT20 mode

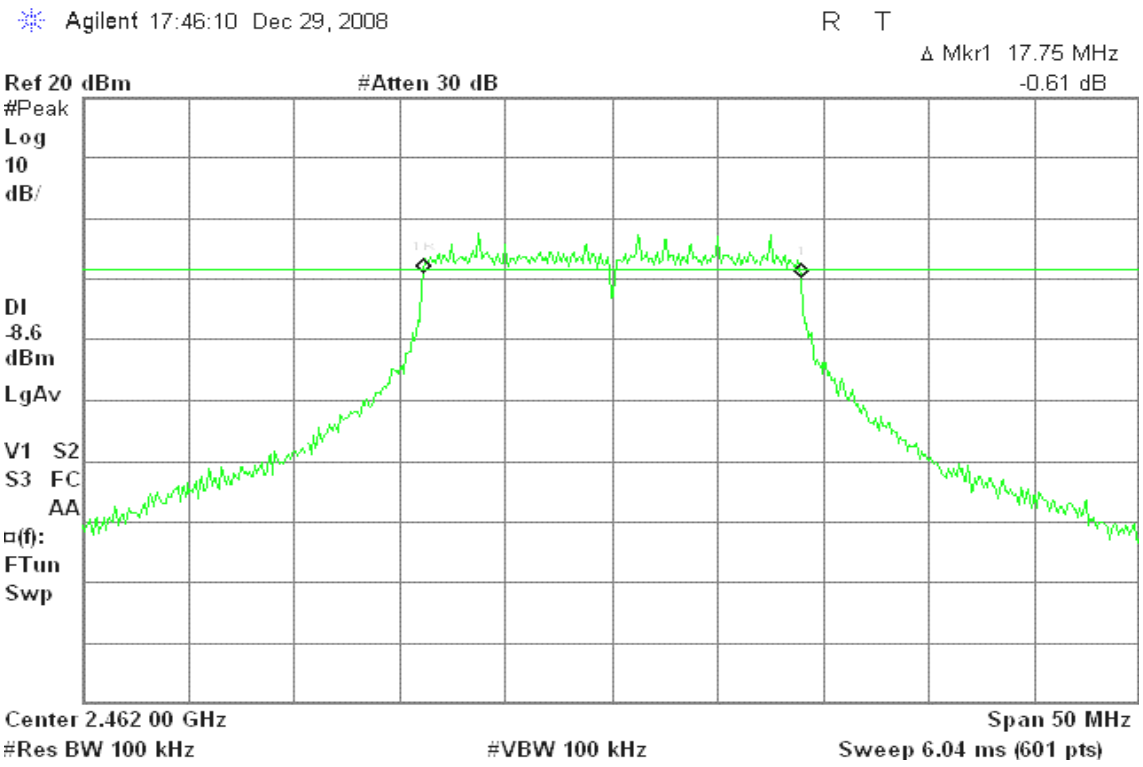
### 6dB Bandwidth (CH Low)




### 6dB Bandwidth (CH Mid)

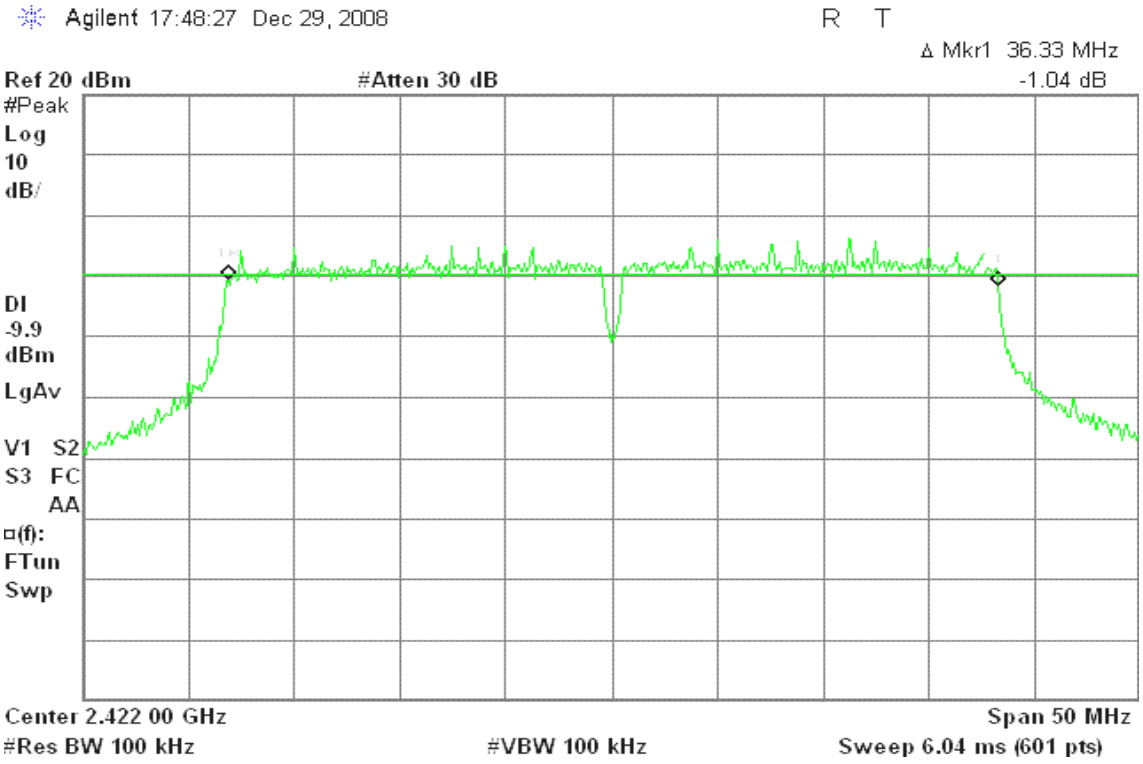


## 6dB Bandwidth (CH High)

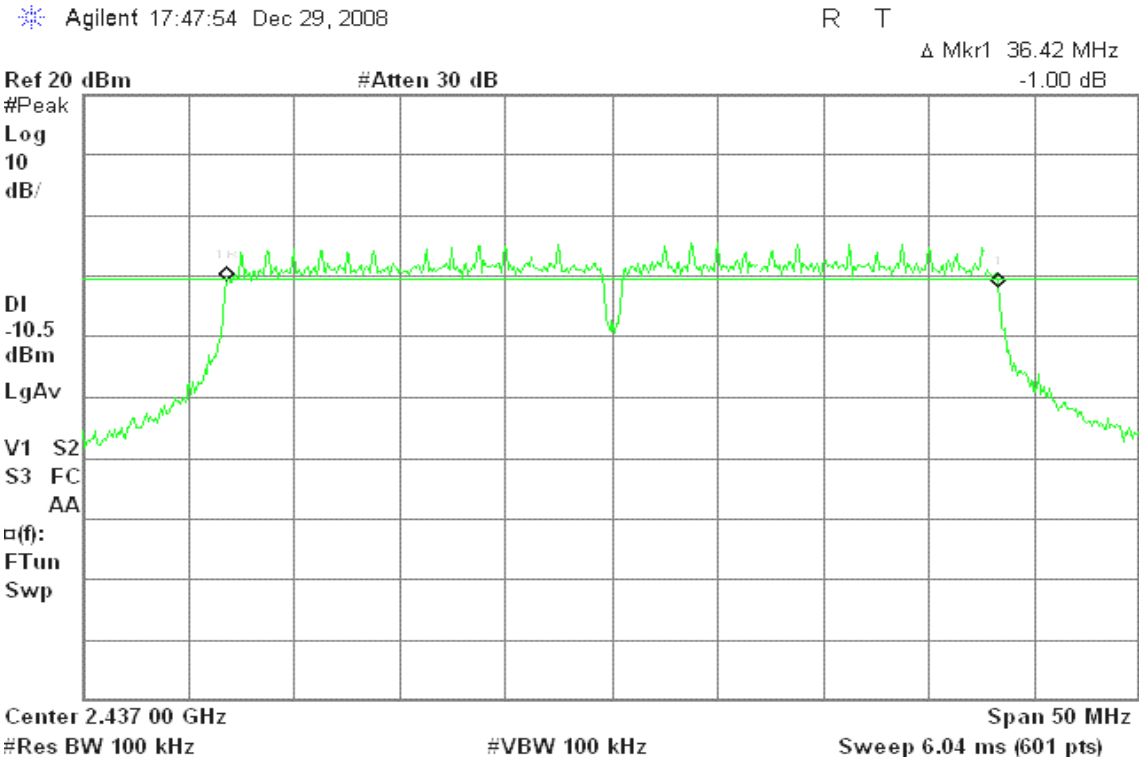



## IEEE 802.11n HT40 mode

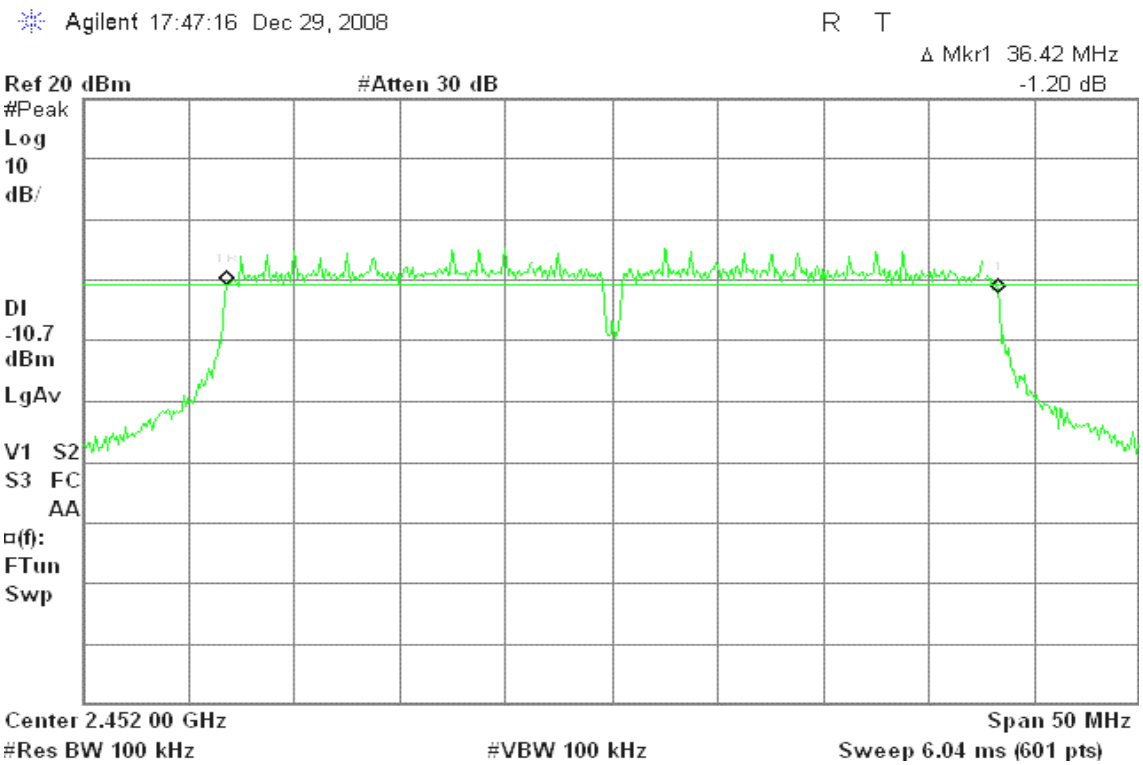
## 6dB Bandwidth (CH Low)



## 6dB Bandwidth (CH Mid)

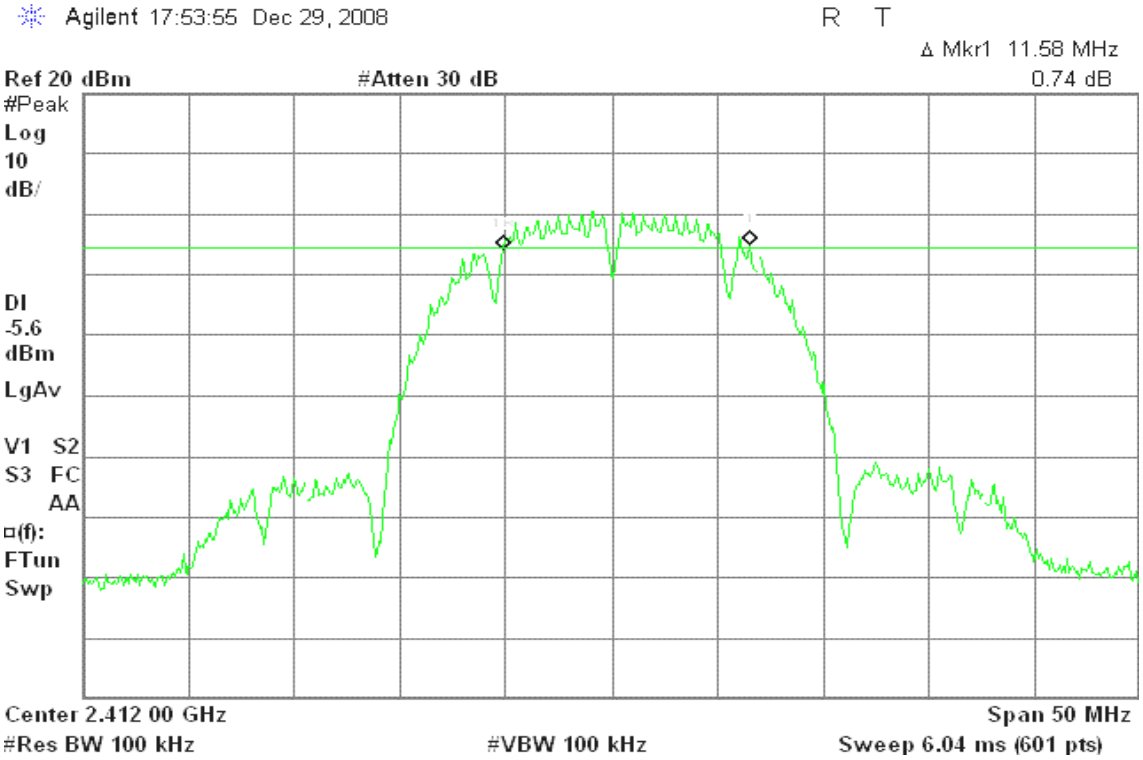



## 6dB Bandwidth (CH High)

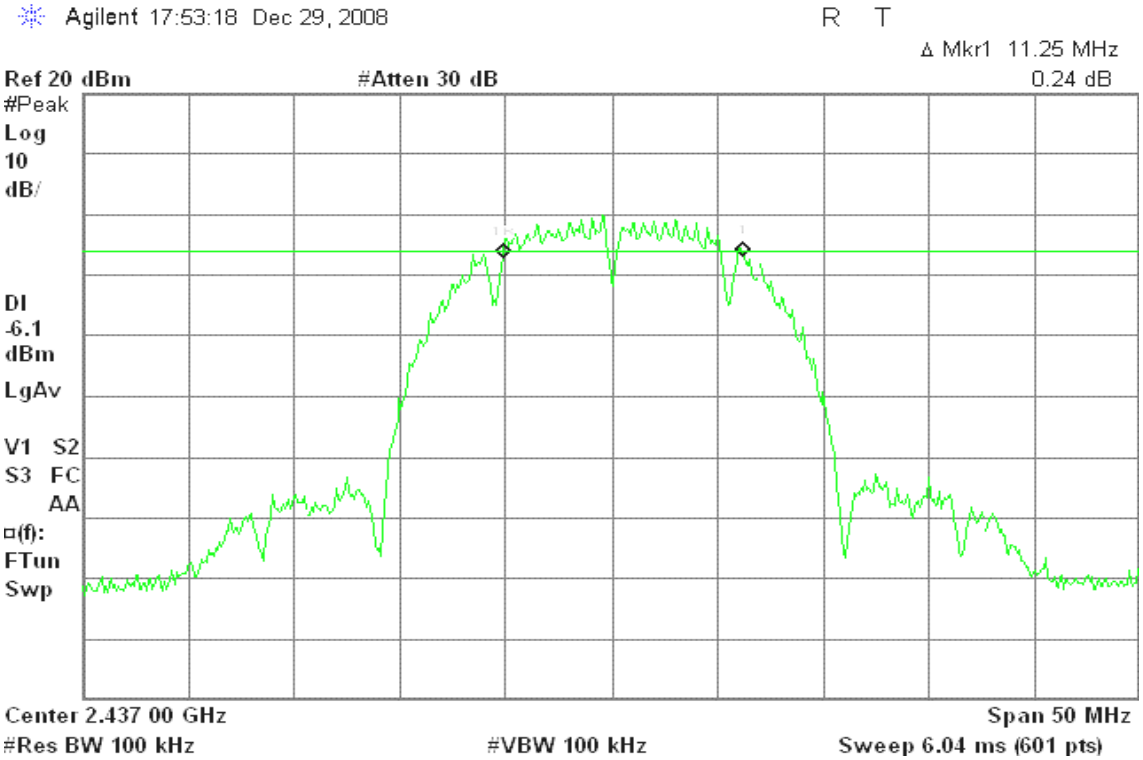


## Half Length Board / IEEE 802.11b mode

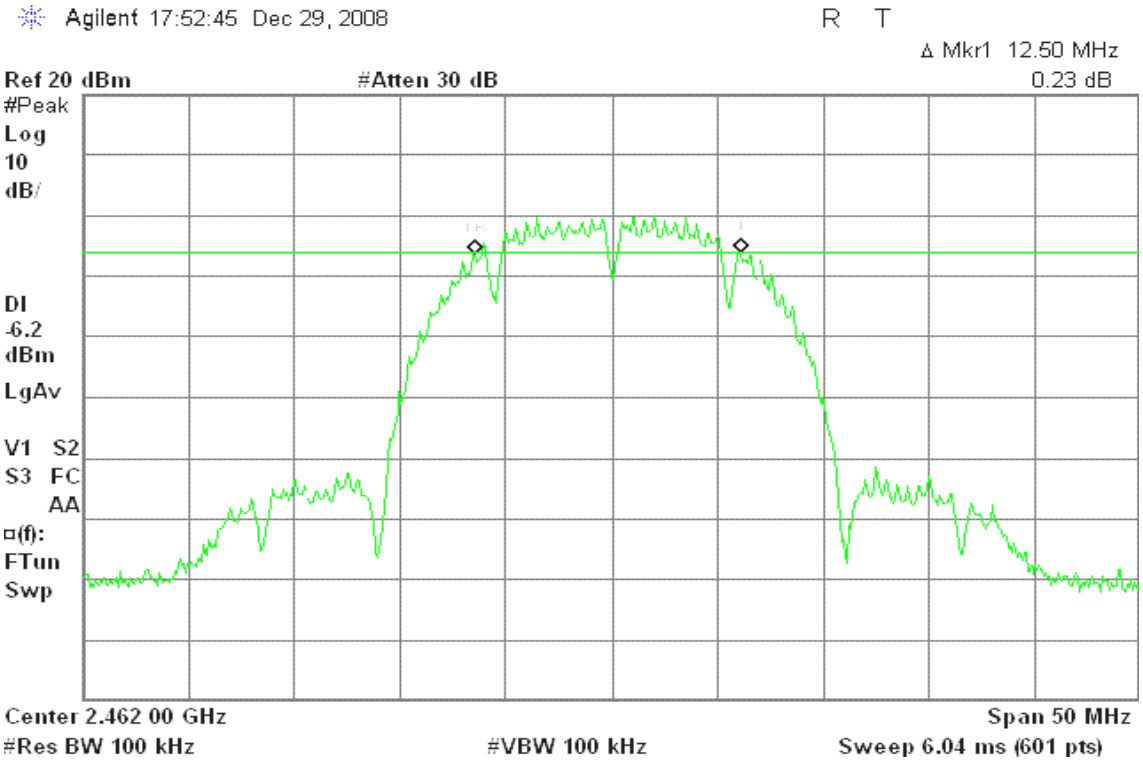
### 6dB Bandwidth (CH Low)




### 6dB Bandwidth (CH Mid)

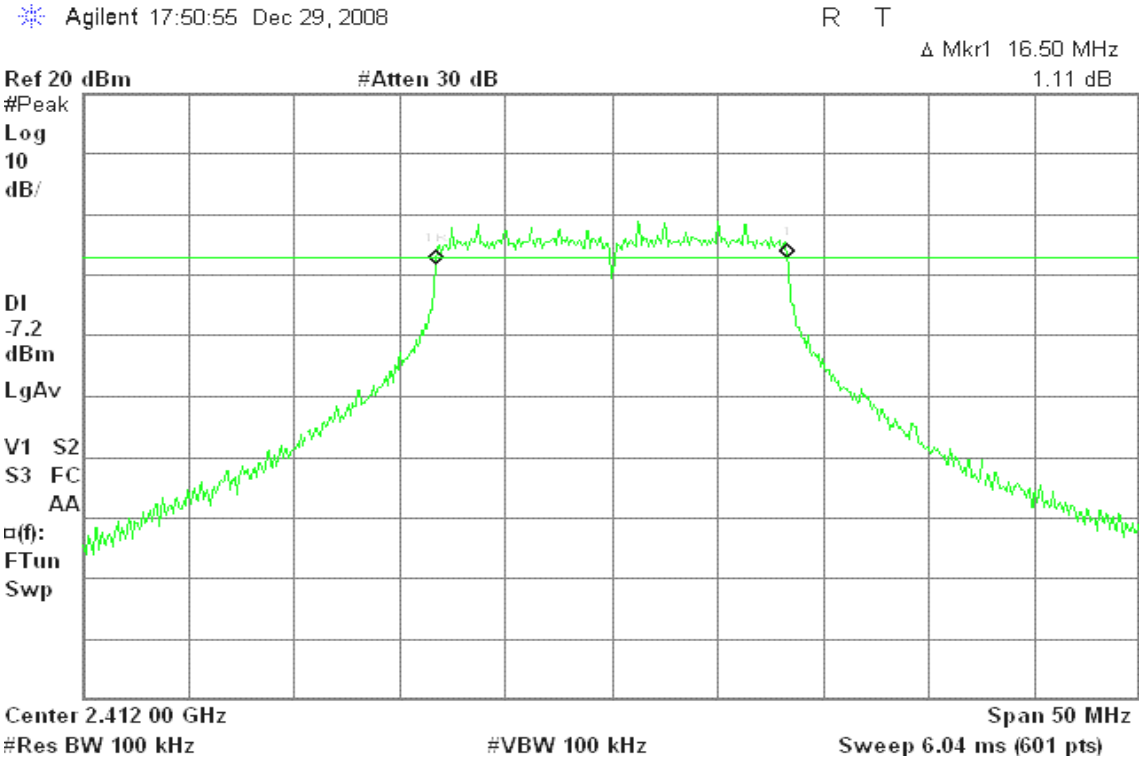


## 6dB Bandwidth (CH High)

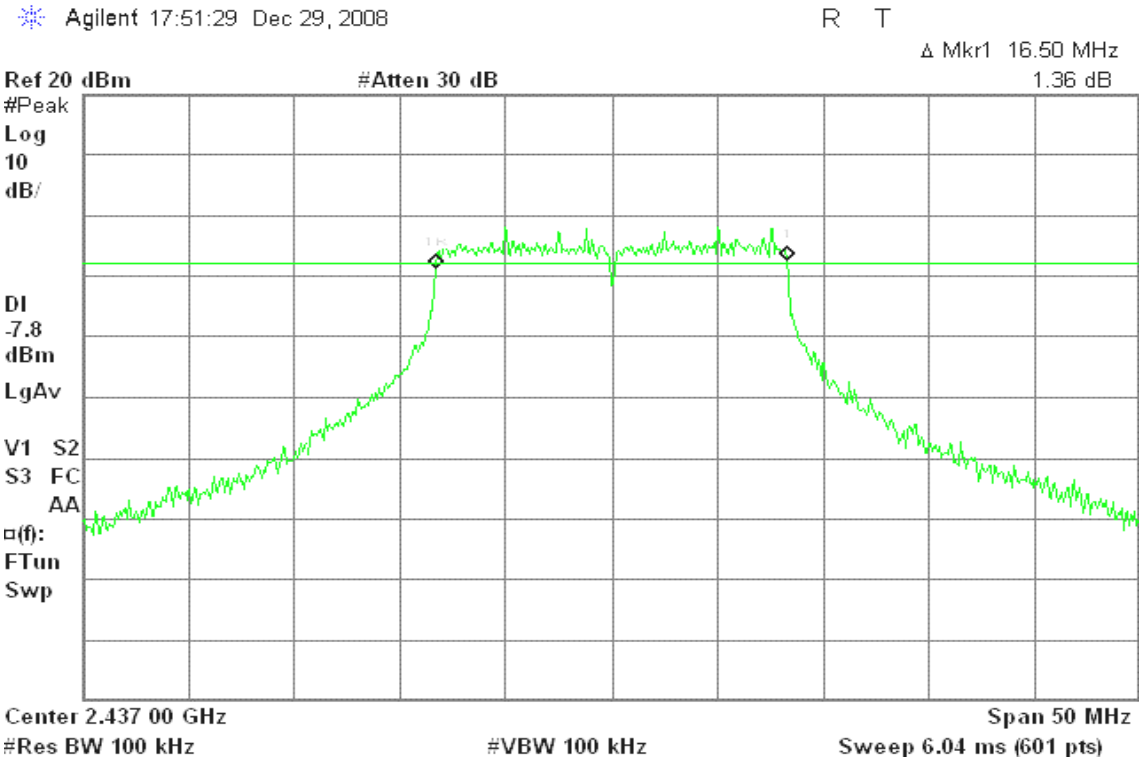



## IEEE 802.11g mode

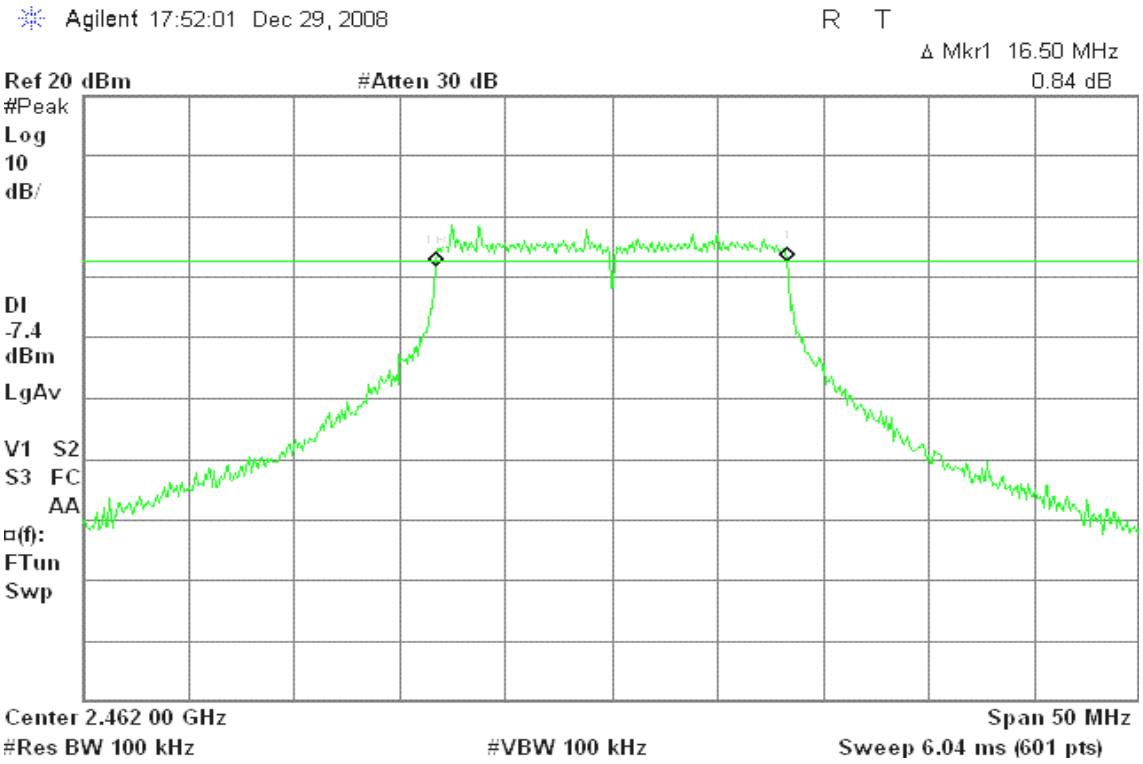
## 6dB Bandwidth (CH Low)



## 6dB Bandwidth (CH Mid)

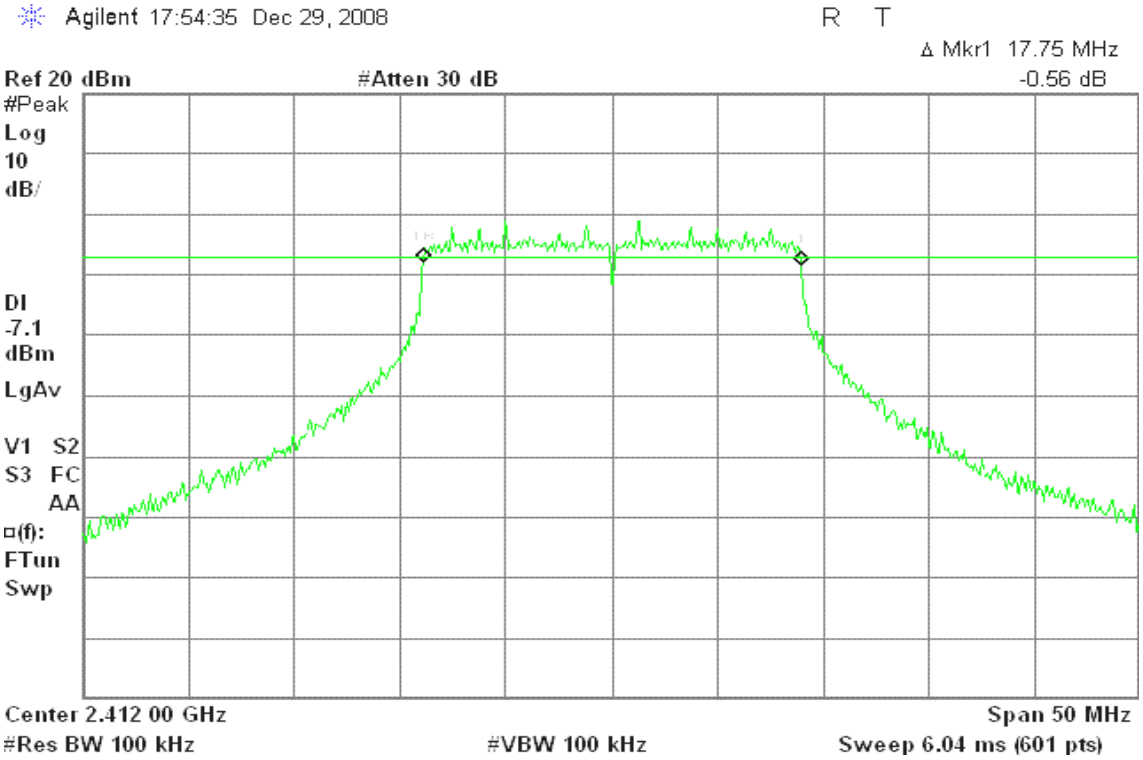



## 6dB Bandwidth (CH High)

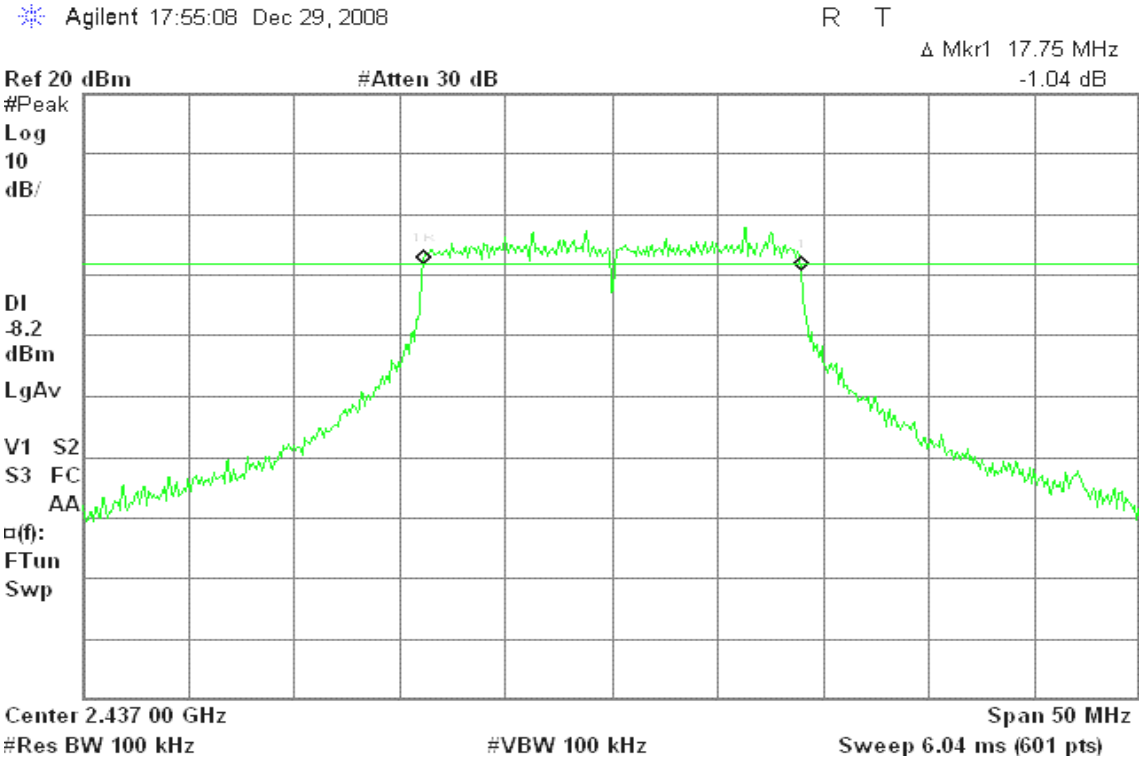


## IEEE 802.11n HT20 mode

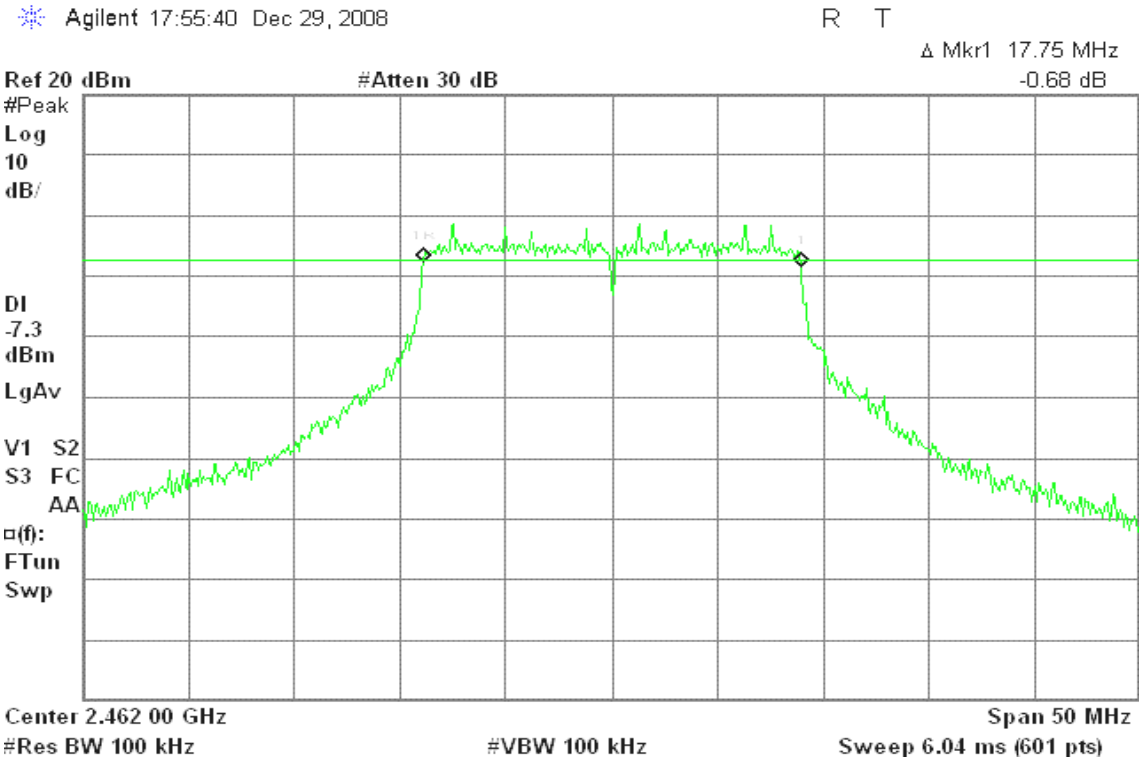
### 6dB Bandwidth (CH Low)




### 6dB Bandwidth (CH Mid)

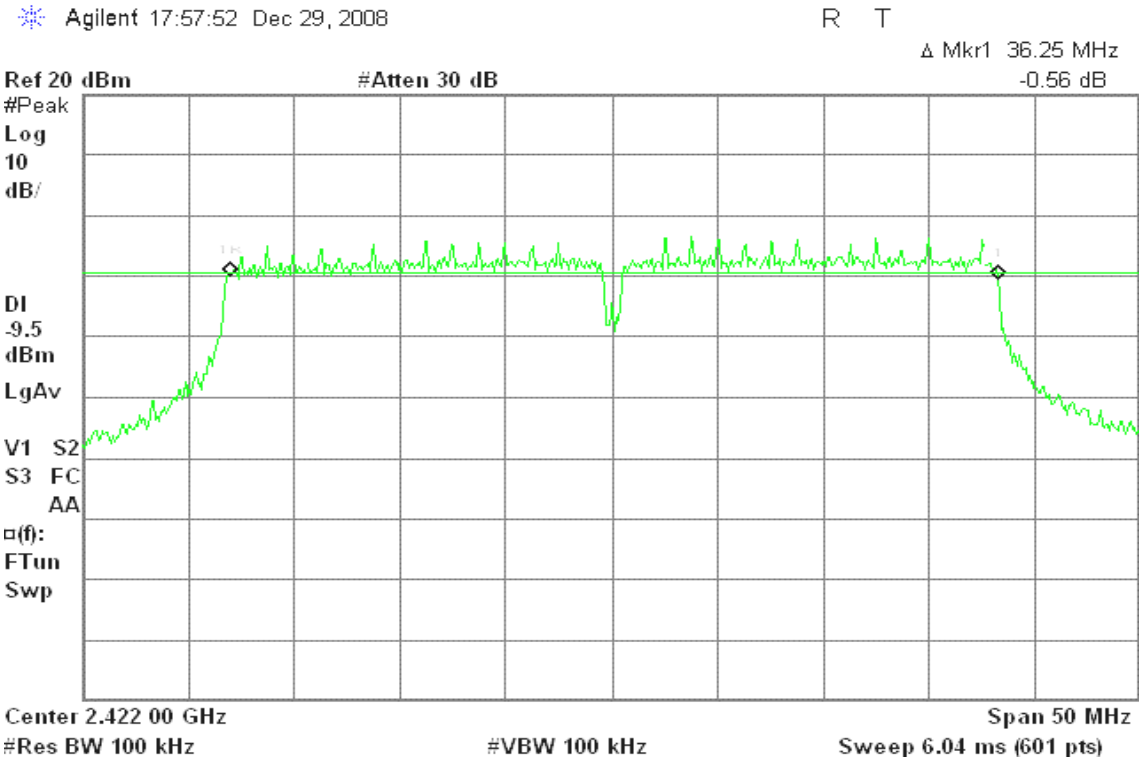


## 6dB Bandwidth (CH High)

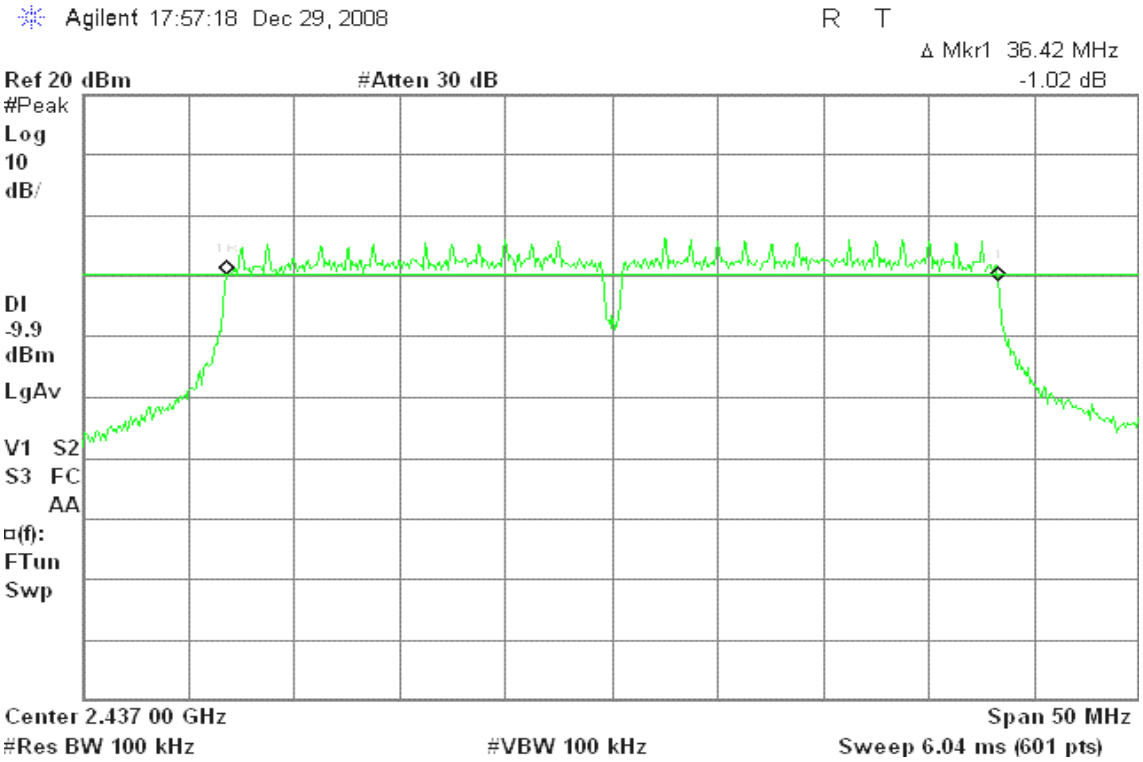



## IEEE 802.11n HT40 mode

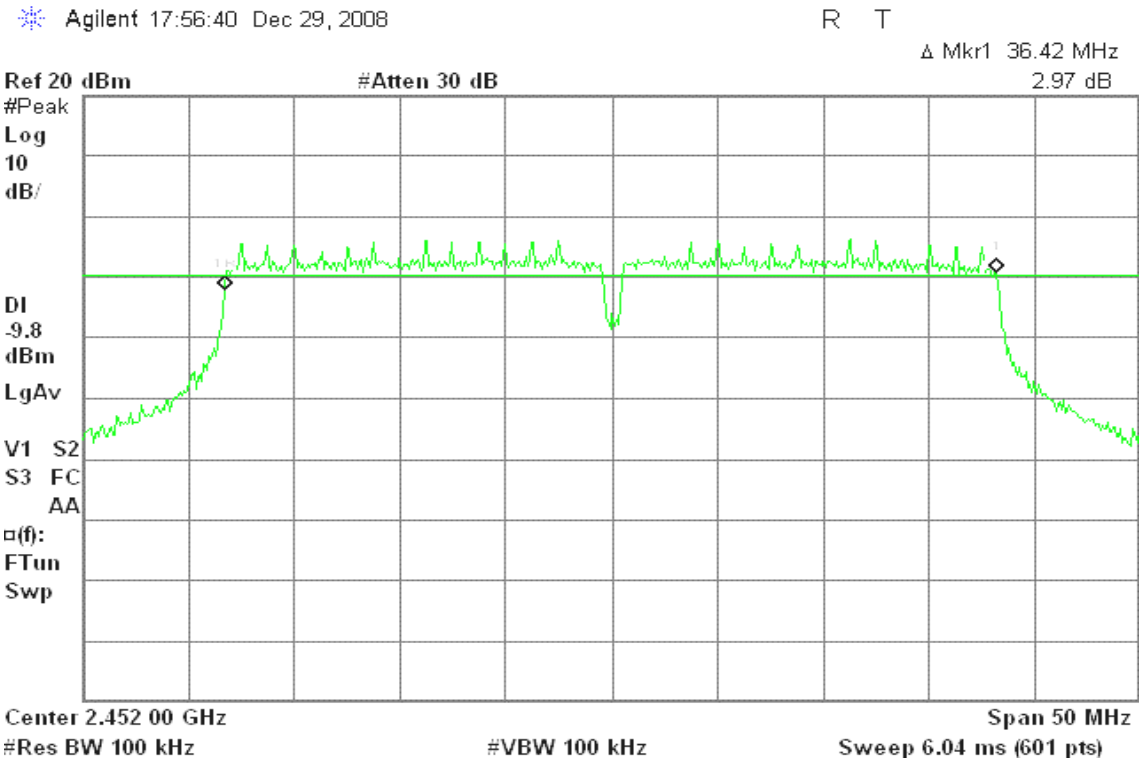
## 6dB Bandwidth (CH Low)



## 6dB Bandwidth (CH Mid)




## 6dB Bandwidth (CH High)



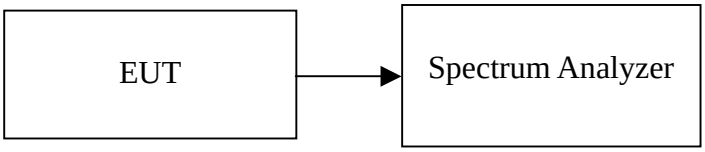
## 8.3 PEAK POWER

## LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. According to RSS-210 §A8.4(4), for systems employing digital modulation techniques operating in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands, the maximum peak conducted power shall not exceed 1 W.

**Test Configuration**




## TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 1 MHz, VBW >= 3 MHz. in “Channel Power ” measurement.
4. Record the max reading.
5. Repeat the above procedure until the measurements for all frequencies are completed.

## TEST RESULTS

*No non-compliance noted.*

## Test Data

### Test mode: IEEE 802.11b

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Limit (W) | Result |
|---|---|---|---|---|---|
| Low | 2412 | 19.80 | 0.0955 | 1.00 | PASS |
| Mid | 2437 | 22.64 | 0.1837 | | PASS |
| High | 2462 | 17.69 | 0.0587 | | PASS |

### Test mode: IEEE 802.11g

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Limit (W) | Result |
|---|---|---|---|---|---|
| Low | 2412 | 20.23 | 0.1054 | 1.00 | PASS |
| Mid | 2437 | 24.90 | 0.3090 | | PASS |
| High | 2462 | 19.45 | 0.0881 | | PASS |

### Test mode: IEEE 802.11n HT20 mode

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Limit (W) | Result |
|---|---|---|---|---|---|
| Low | 2412 | 18.90 | 0.0776 | 1.00 | PASS |
| Mid | 2437 | 25.65 | 0.3673 | | PASS |
| High | 2462 | 19.47 | 0.0885 | | PASS |

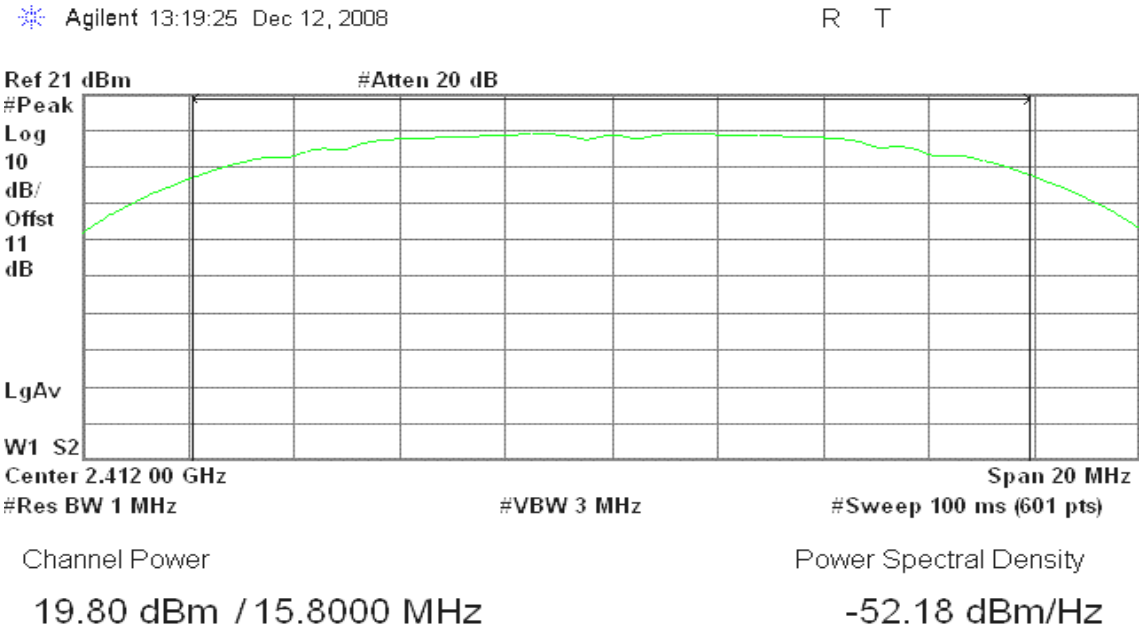
### Test mode: IEEE 802.11n HT40 mode

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Limit (W) | Result |
|---|---|---|---|---|---|
| Low | 2422 | 21.87 | 0.1538 | 1.00 | PASS |
| Mid | 2437 | 25.59 | 0.3622 | | PASS |
| High | 2452 | 19.38 | 0.0867 | | PASS |

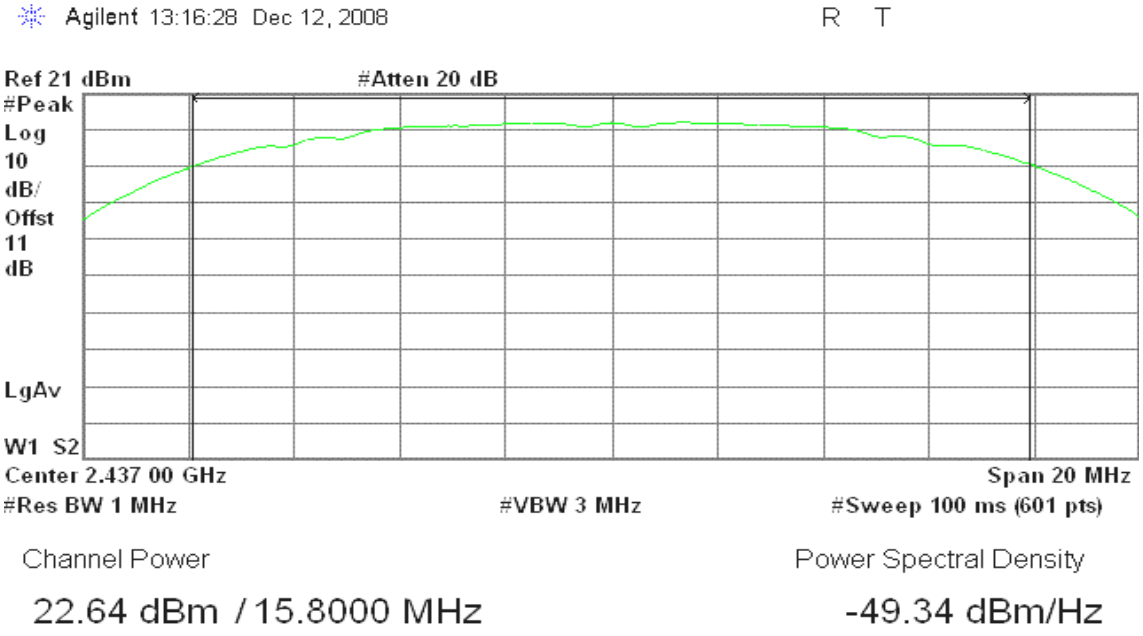
## Test Plot

### IEEE 802.11b

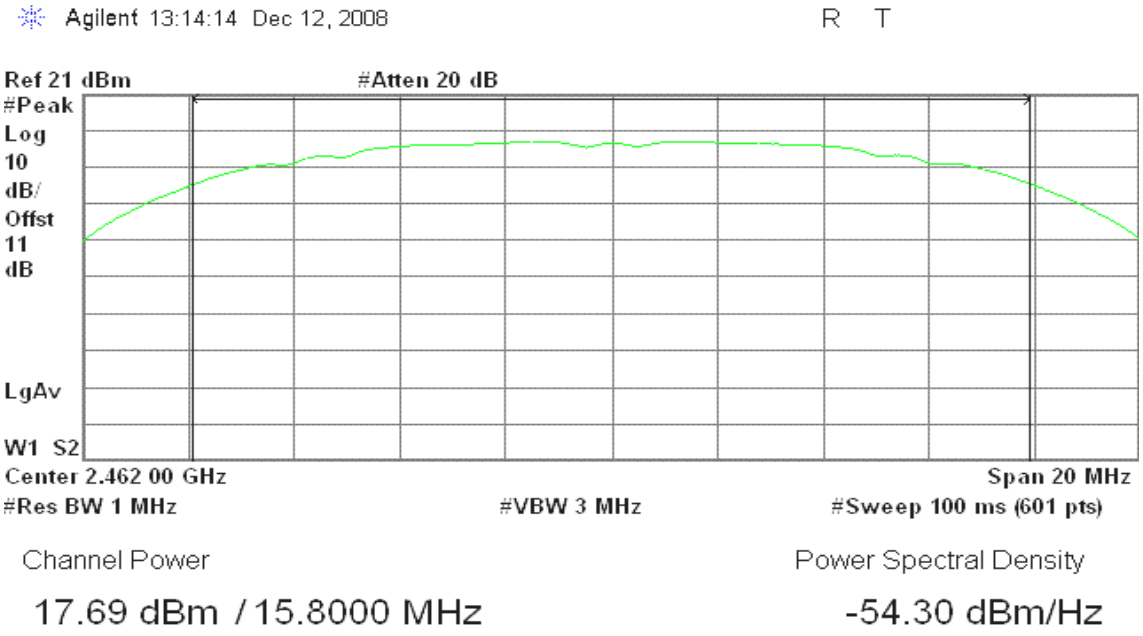
### Peak Power (CH Low)




### Peak Power (CH Mid)

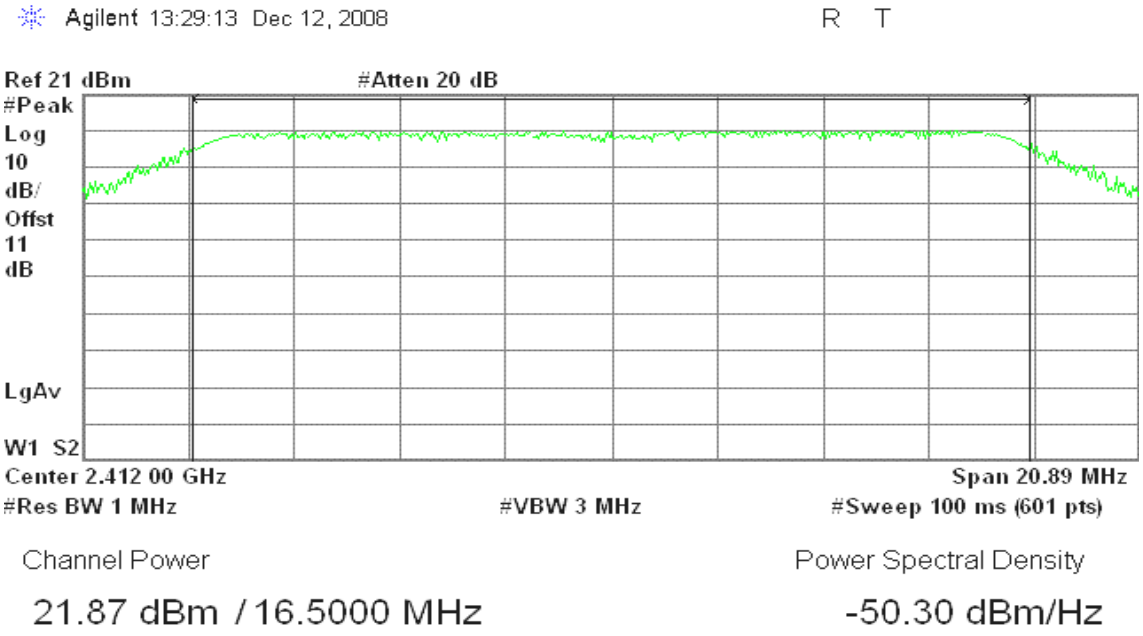


## Peak Power (CH High)

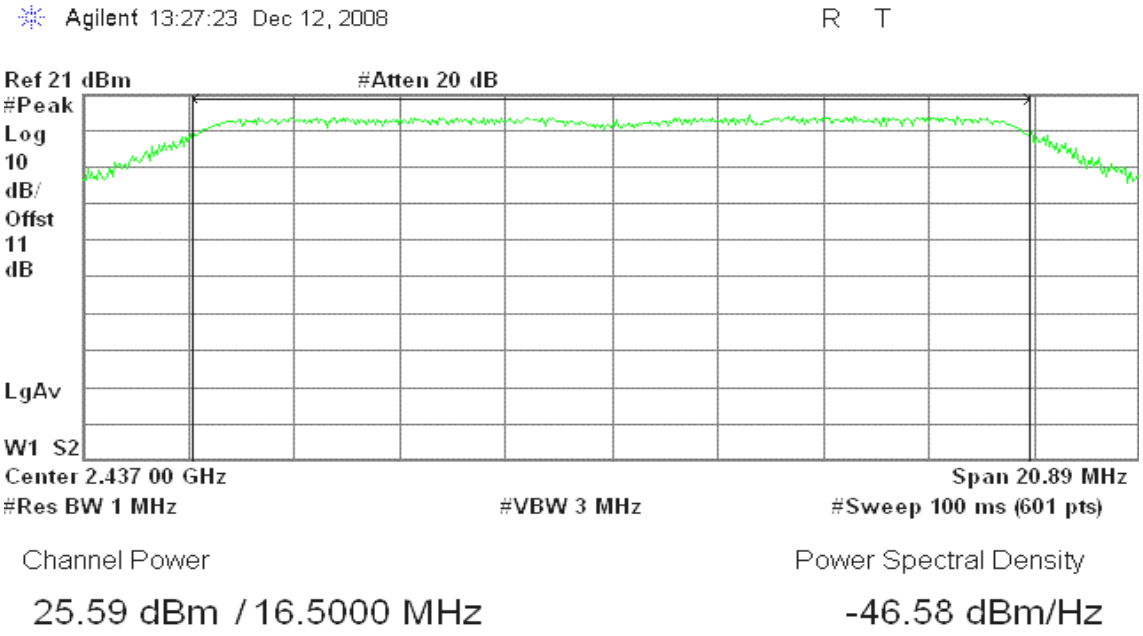



## IEEE 802.11g

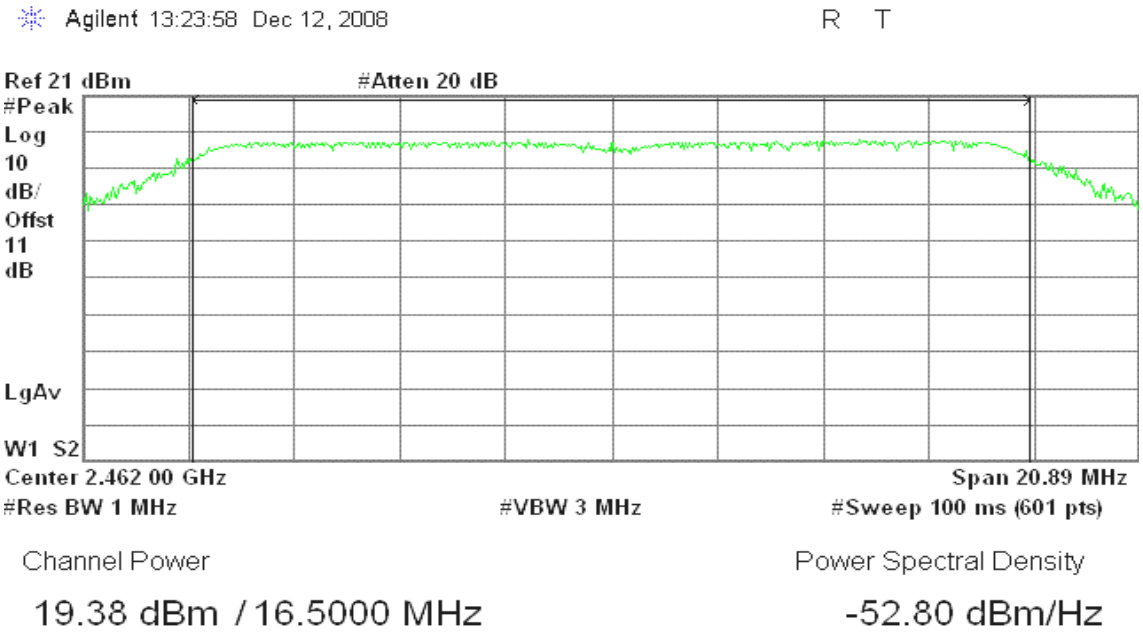
## Peak Power (CH Low)



## Peak Power (CH Mid)

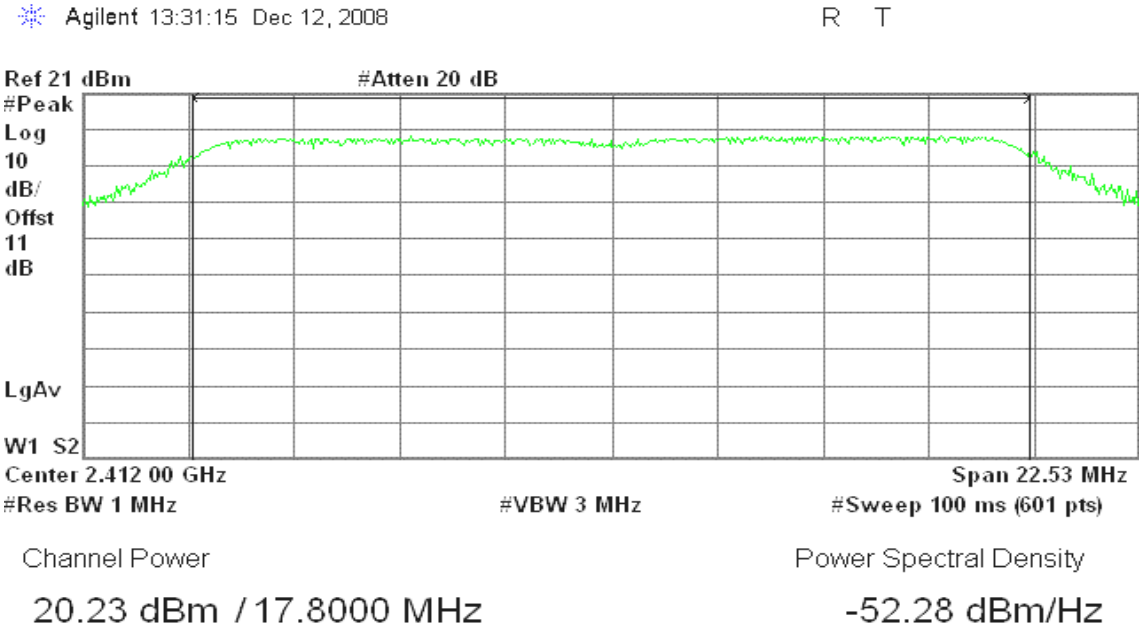



## Peak Power (CH High)

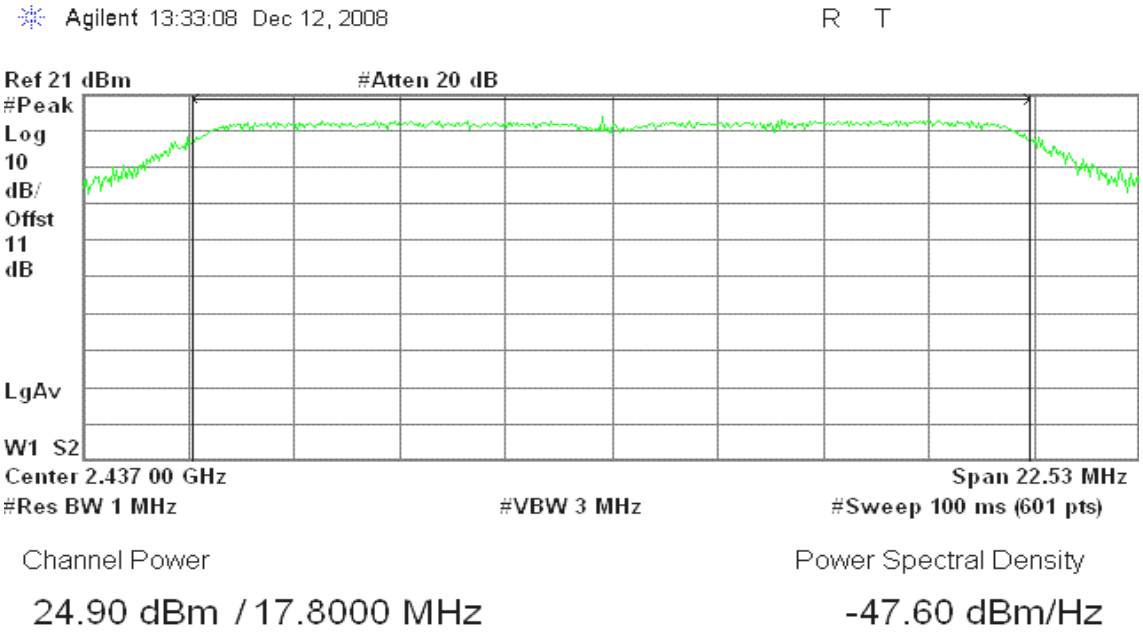


## IEEE 802.11n HT20

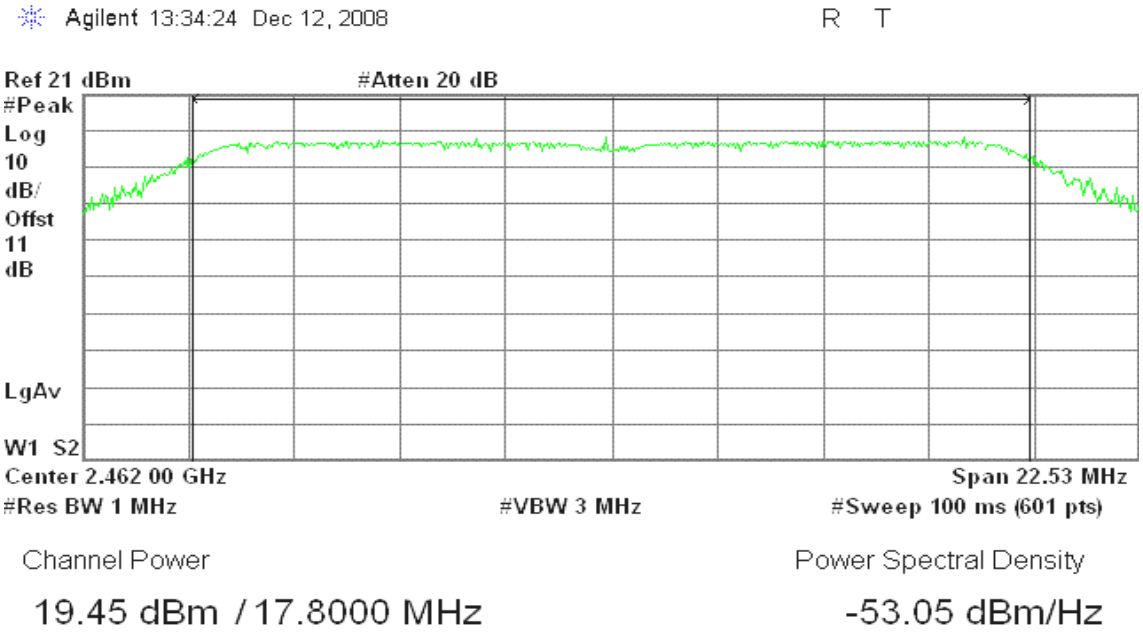
### Peak Power (CH Low)




### Peak Power (CH Mid)

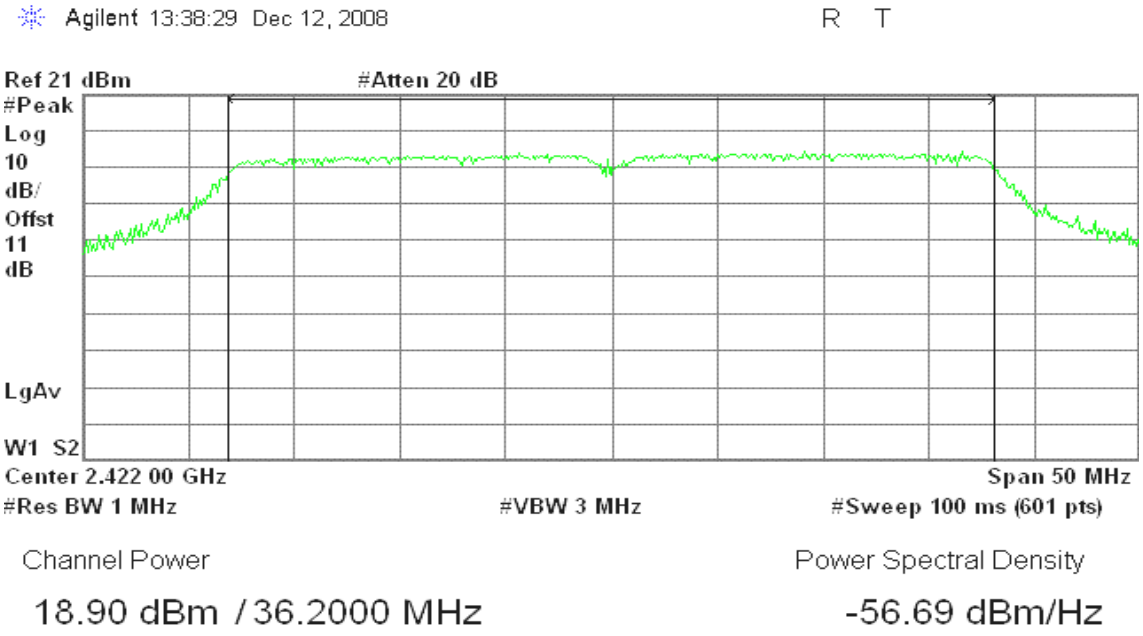


**Peak Power (CH High)**

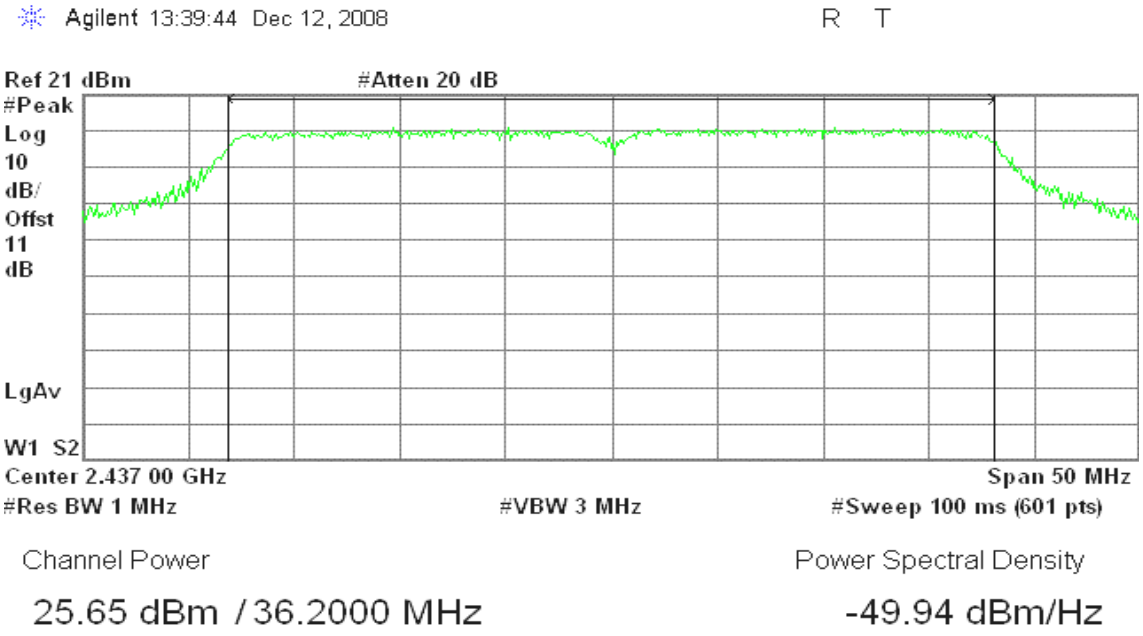



**IEEE 802.11n HT40**

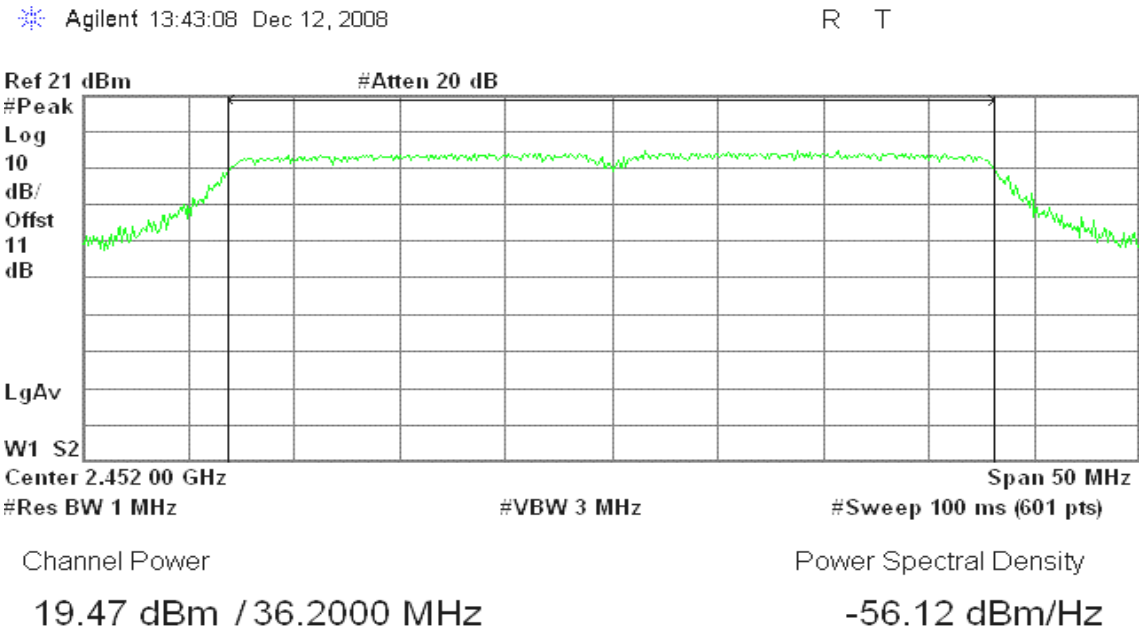
**Peak Power (CH Low)**



## Peak Power (CH Mid)




## Peak Power (CH High)



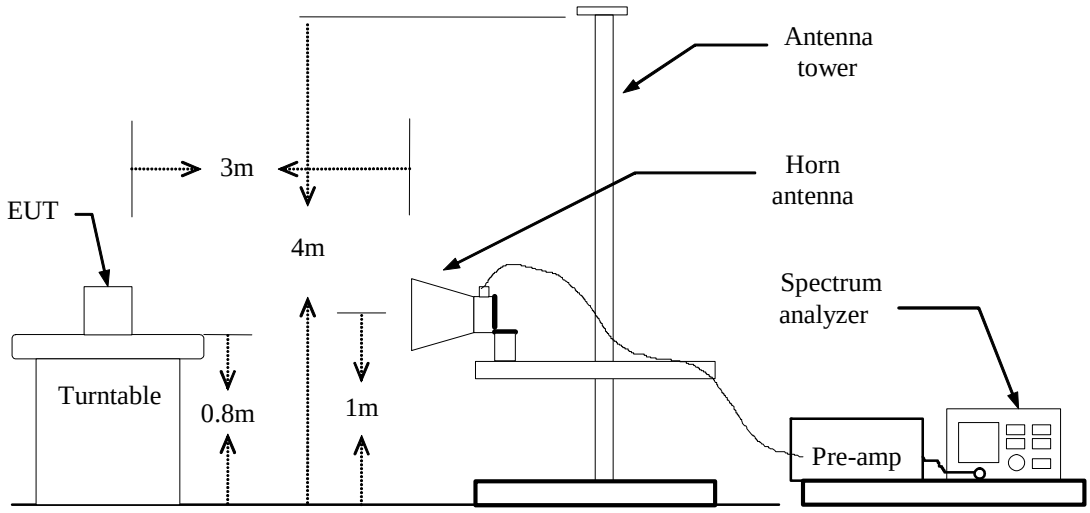
## 8.4 BAND EDGES MEASUREMENT

## LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

According to RSS-210 §A8.5, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

**Test Configuration**



## TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

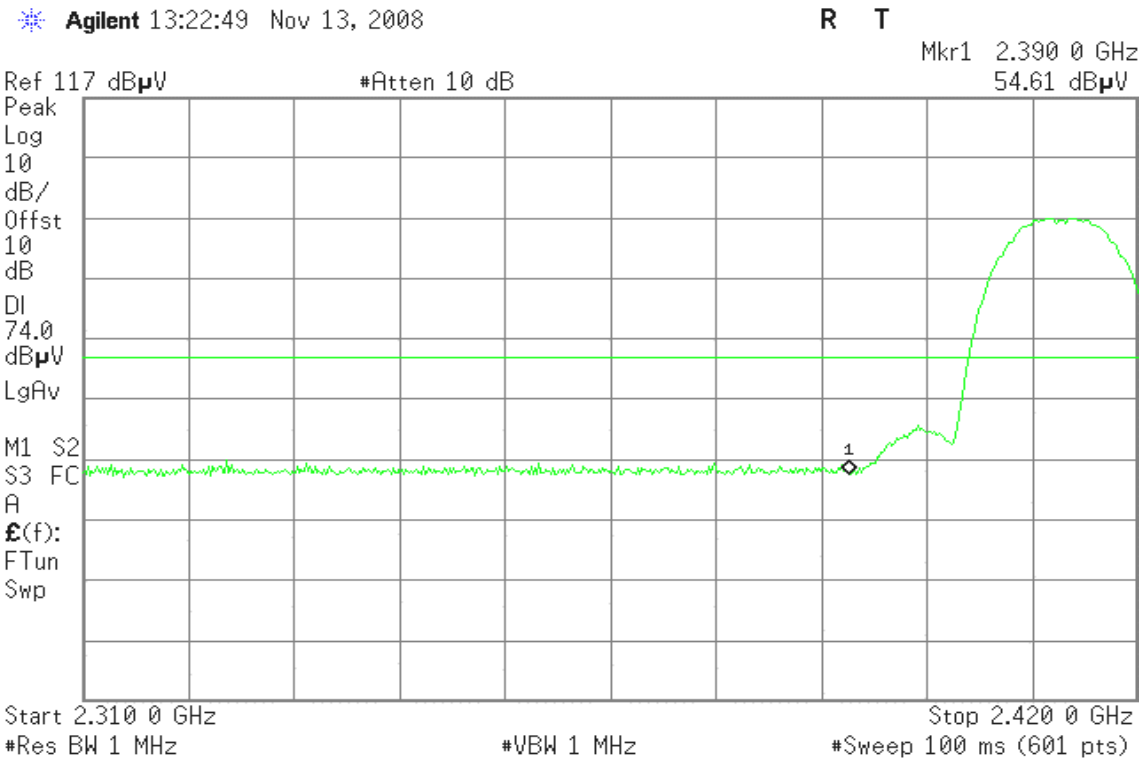
## TEST RESULTS

Refer to attach spectrum analyzer data chart.

**PIFA Antenna / Full Length Board:**

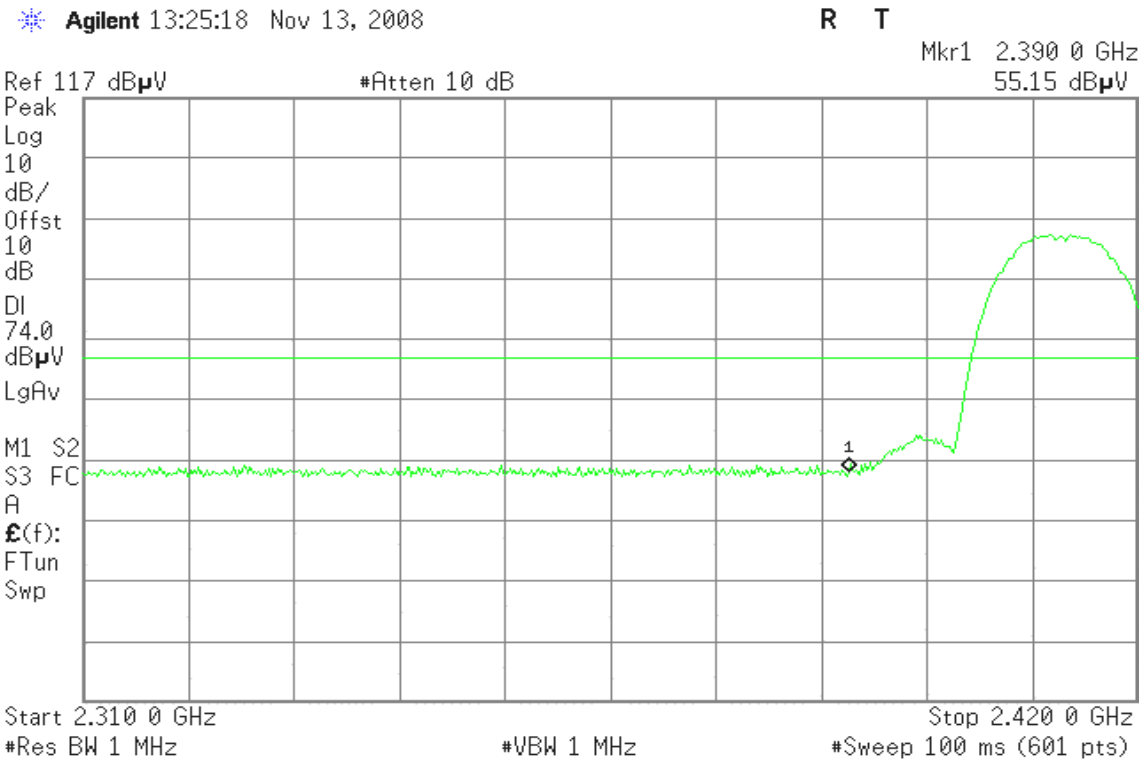
**Band Edges (IEEE 802.11b mode / CH Low)**

**Detector mode: Peak** **Polarity: Vertical**




**Detector mode: Average** **Polarity: Vertical**

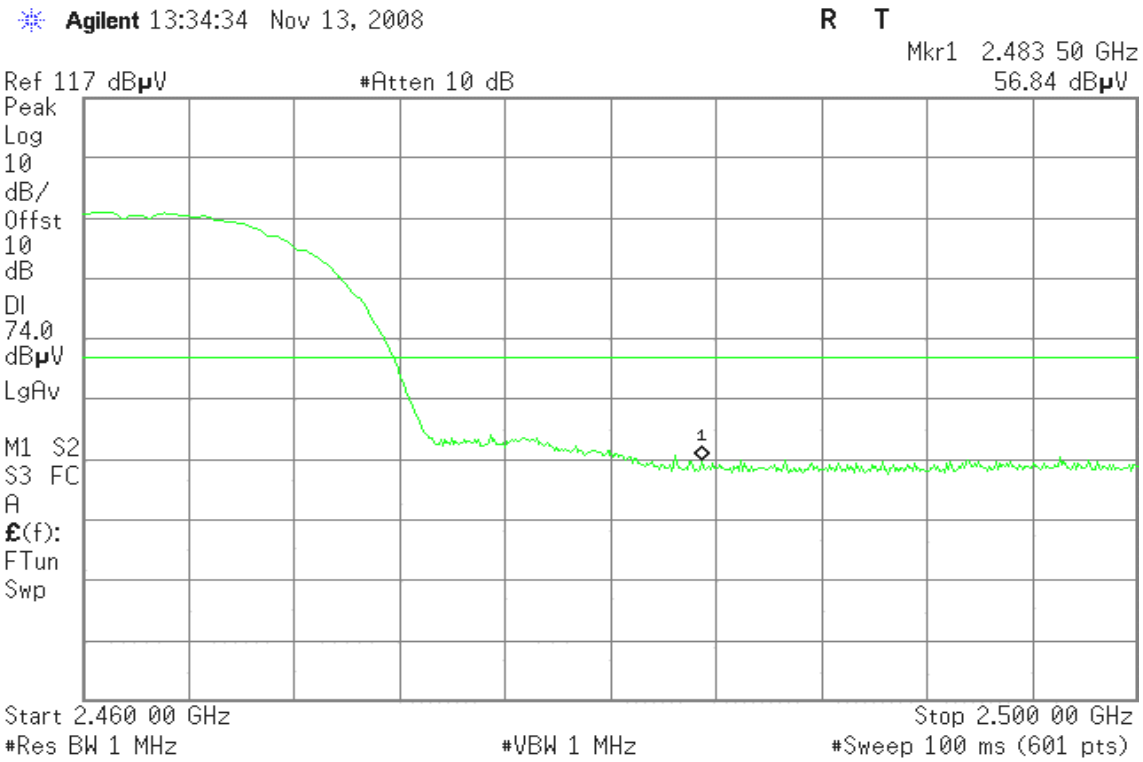
**Detector mode: Peak** **Polarity: Horizontal**



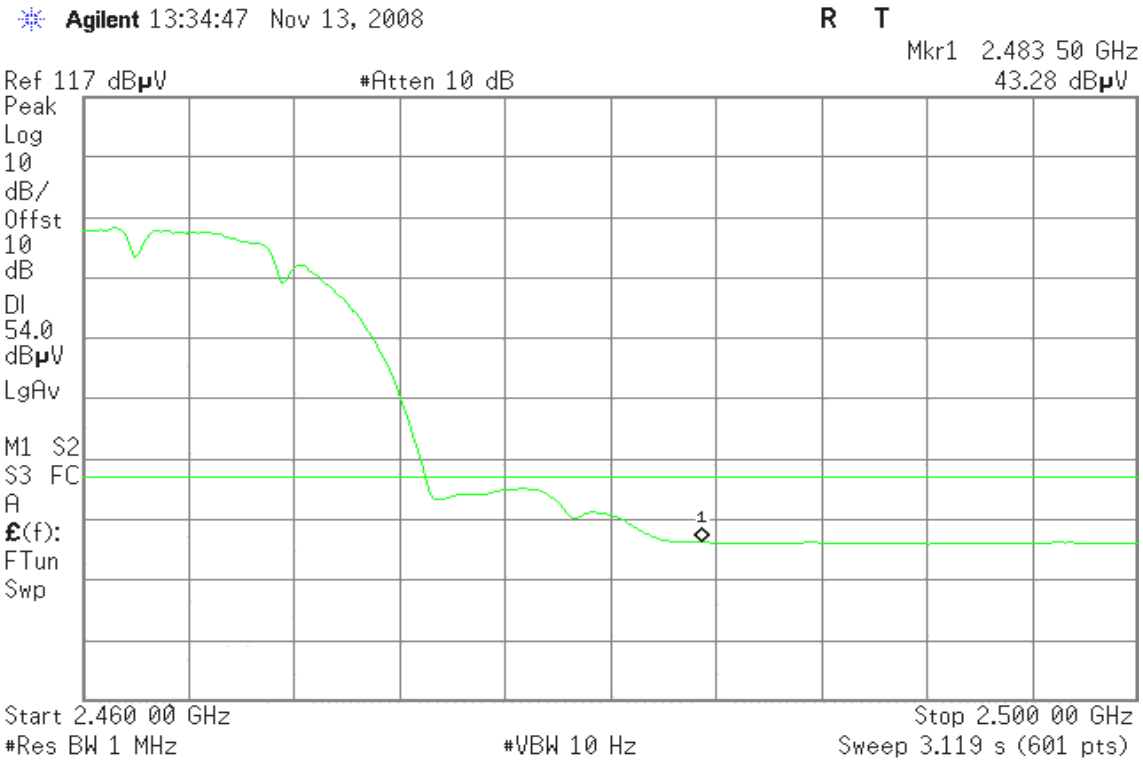

**Detector mode: Average** **Polarity: Horizontal**

## Band Edges (IEEE 802.11b mode / CH High)

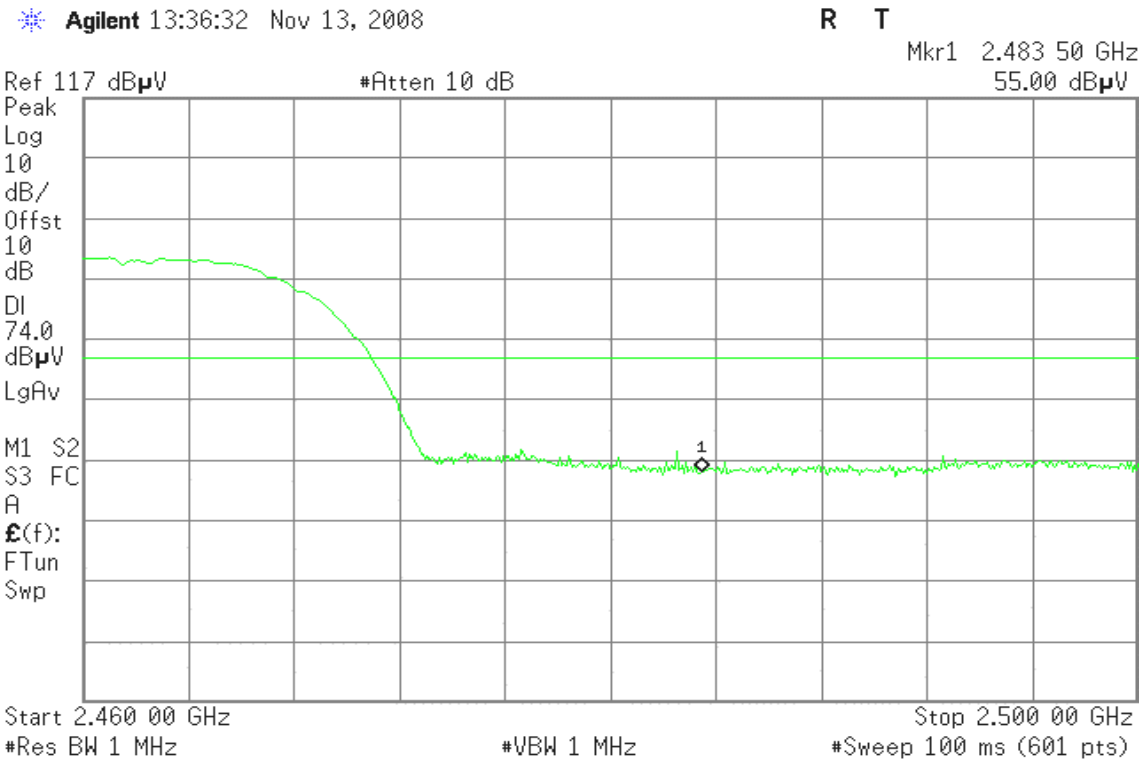
### Detector mode: Peak Polarity: Vertical



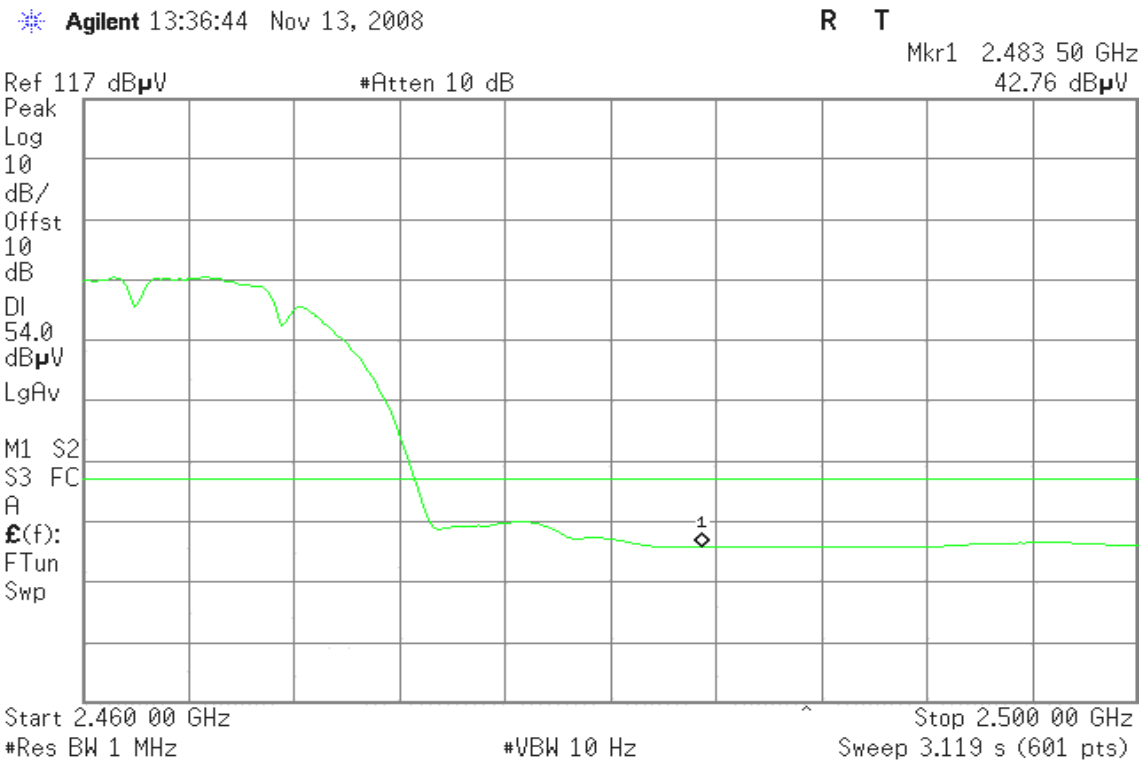

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

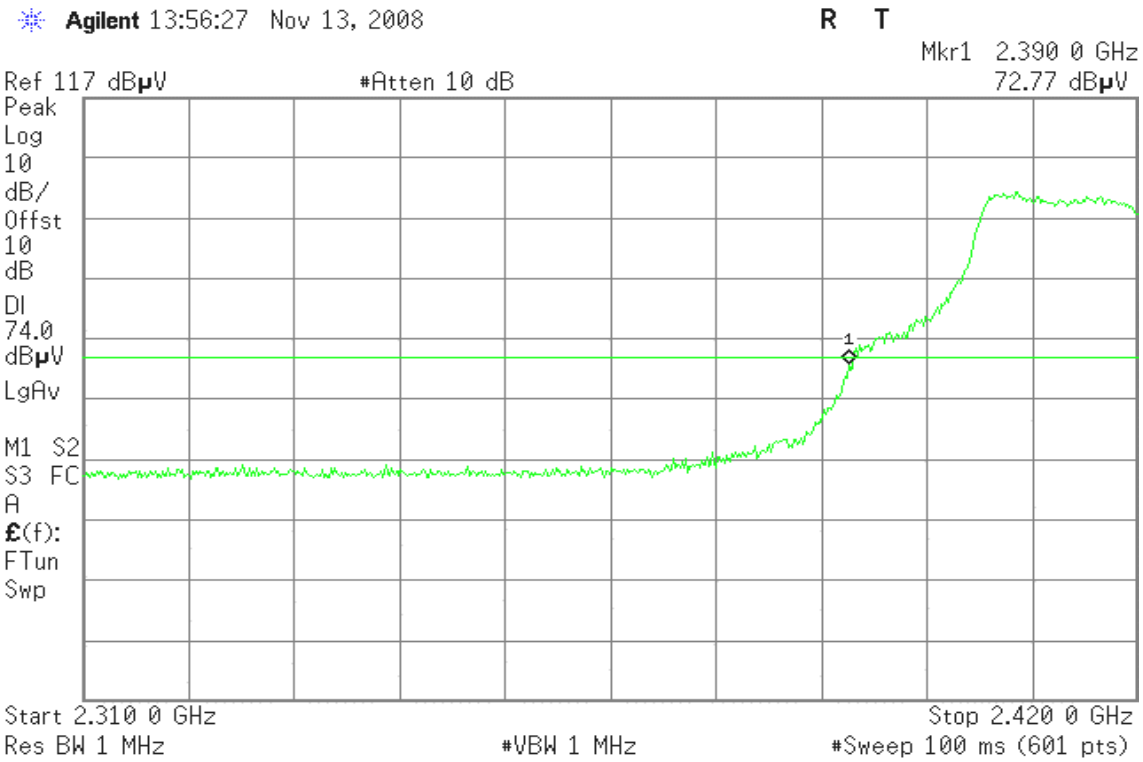



**Detector mode: Average** **Polarity: Horizontal**

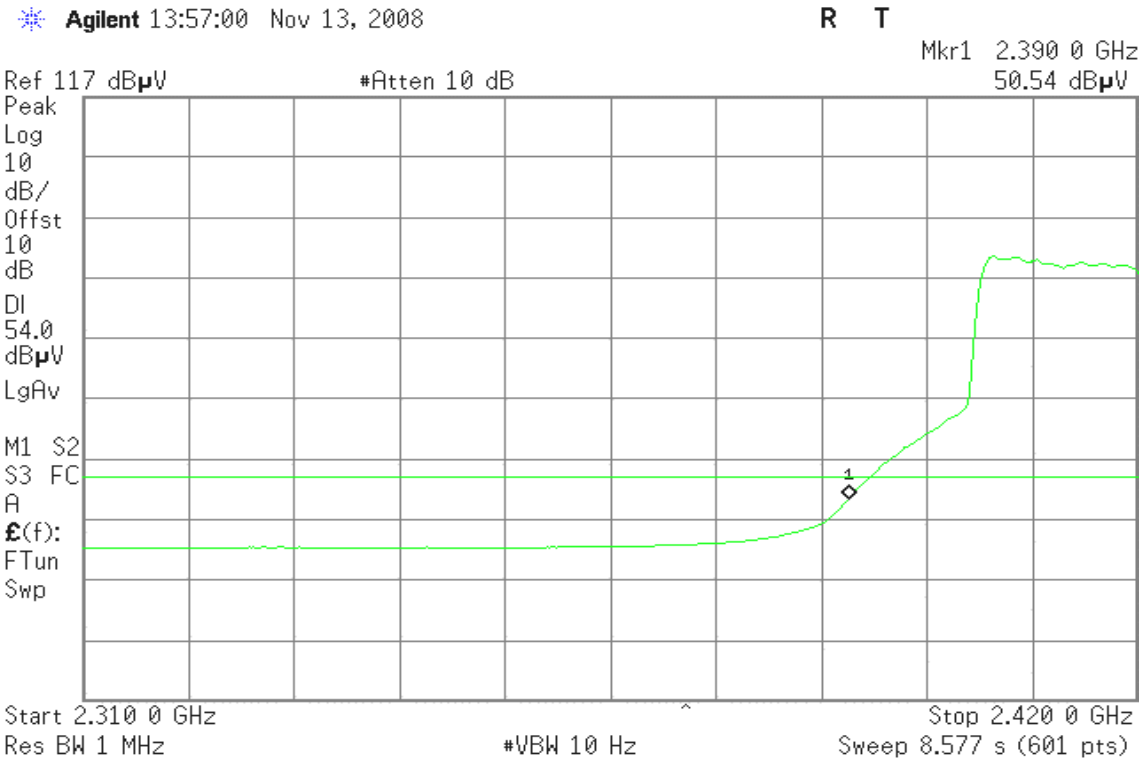


## Band Edges (IEEE 802.11g mode / CH Low)

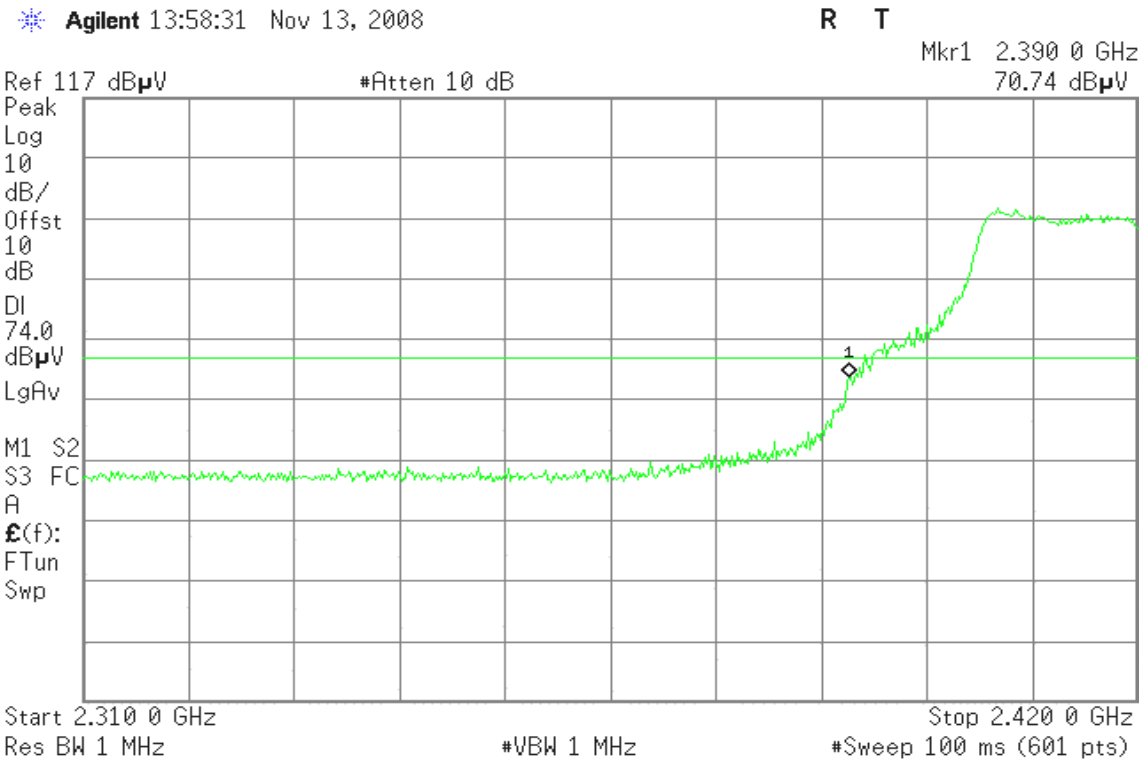
### Detector mode: Peak Polarity: Vertical



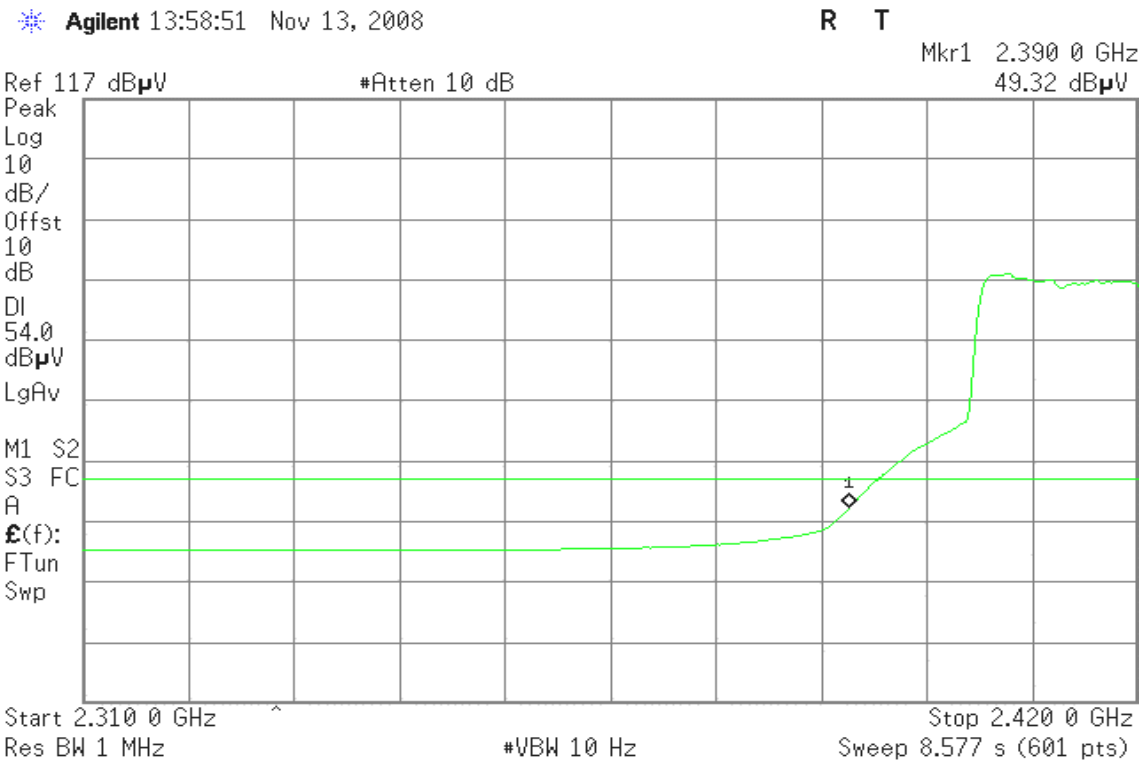

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

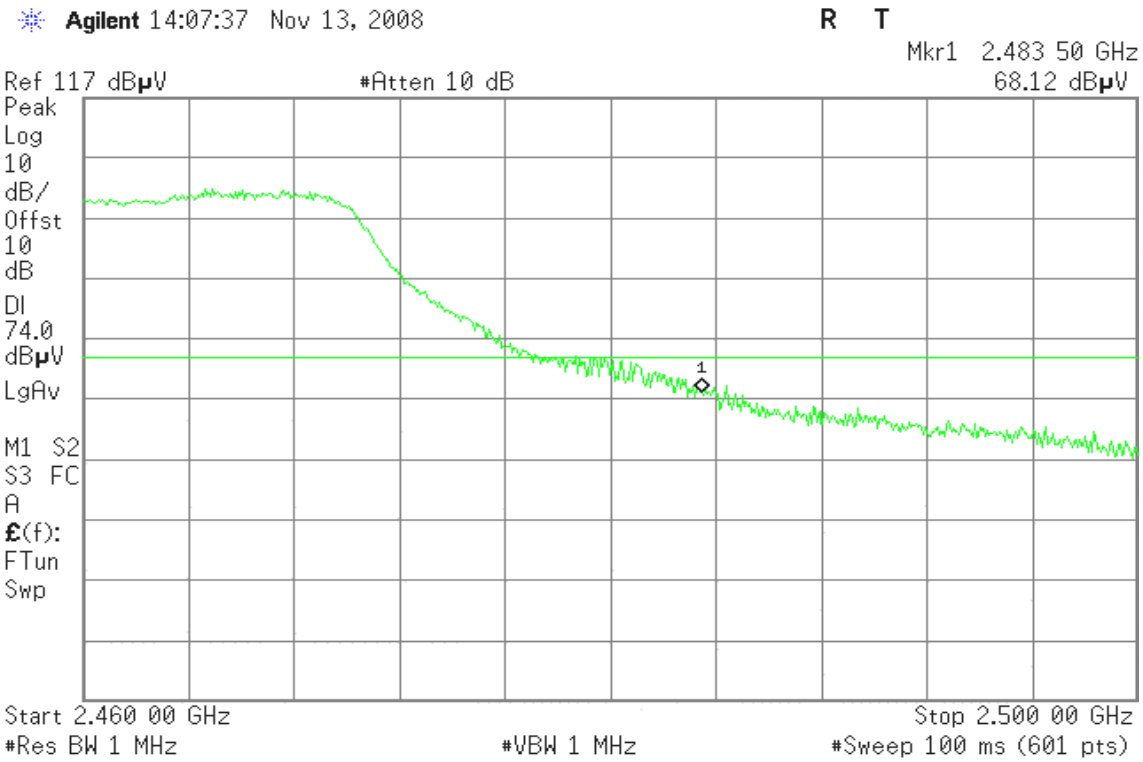



**Detector mode: Average** **Polarity: Horizontal**

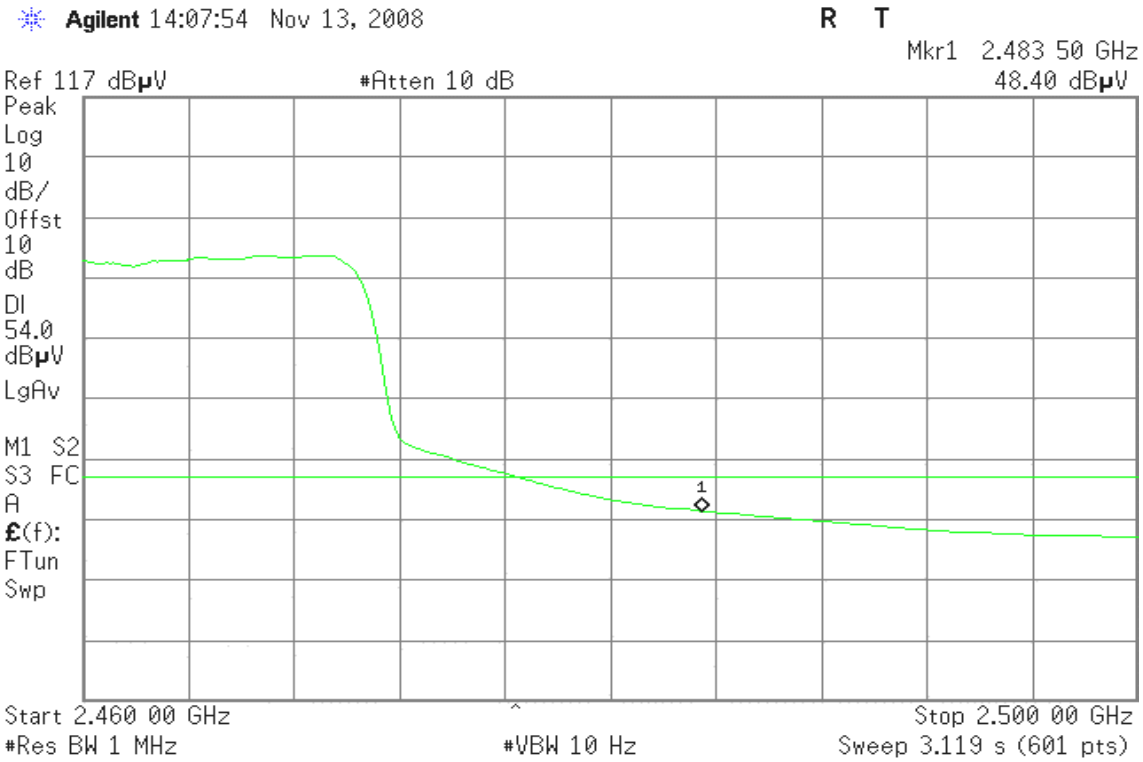


## Band Edges (IEEE 802.11g mode / CH High)

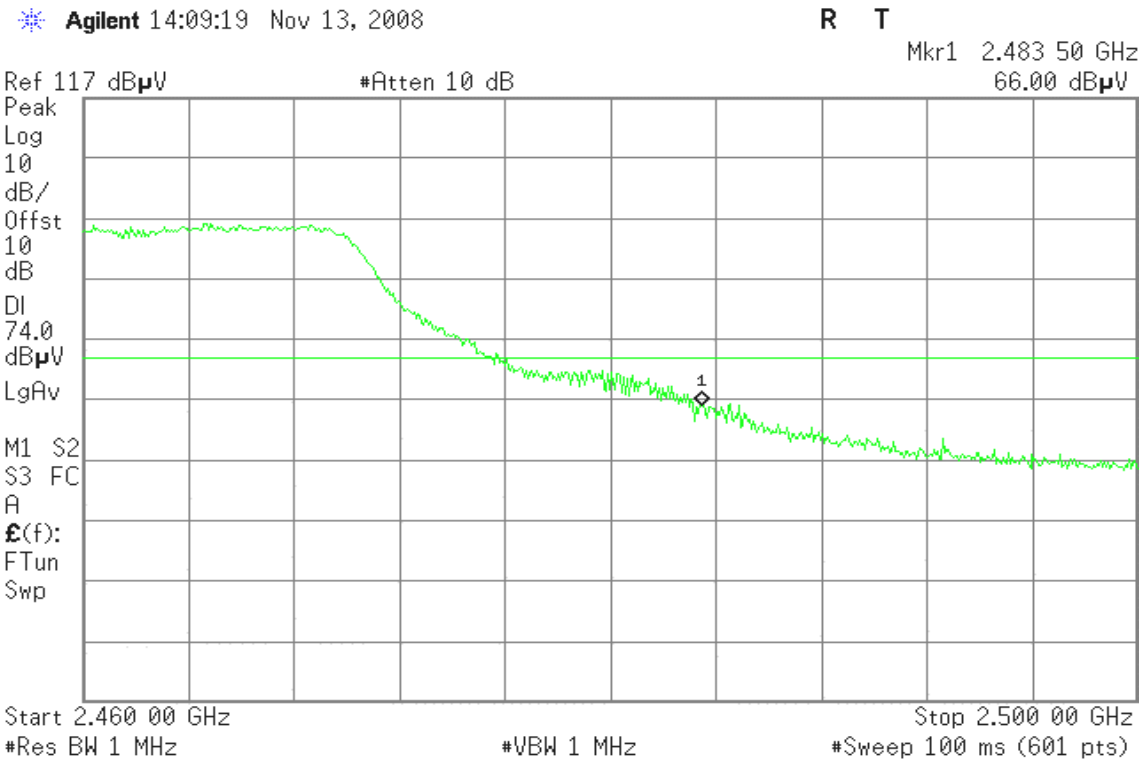
### Detector mode: Peak Polarity: Vertical



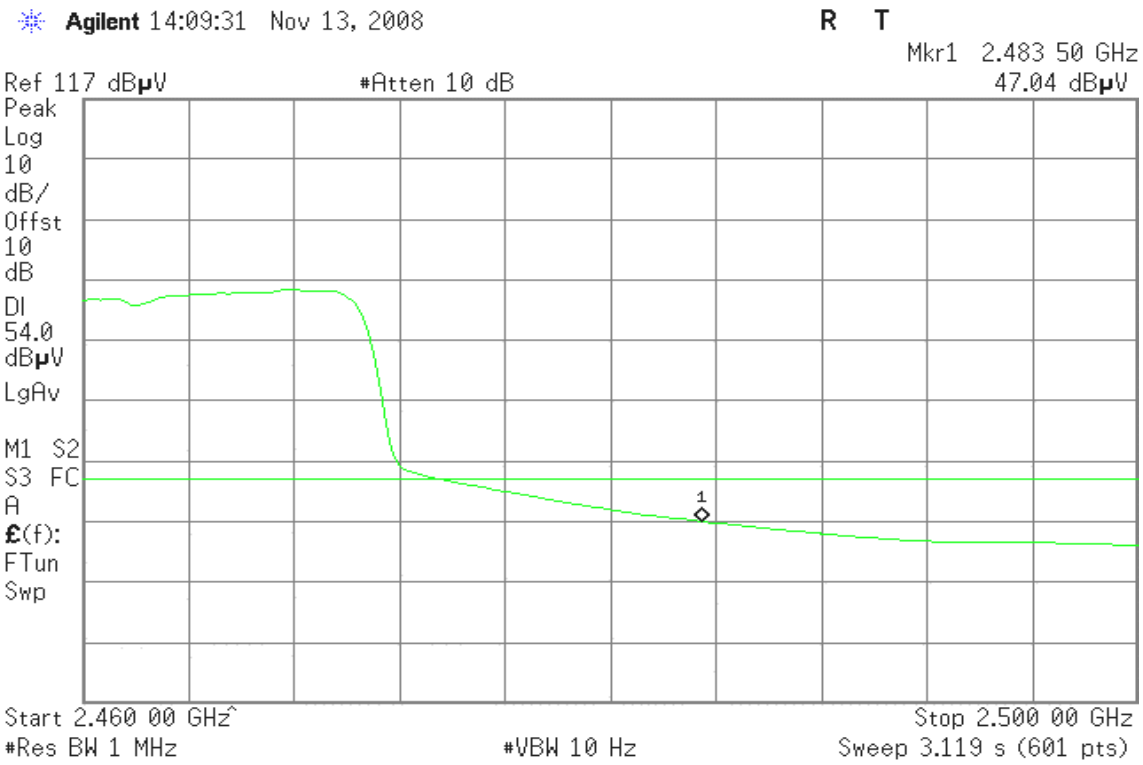

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

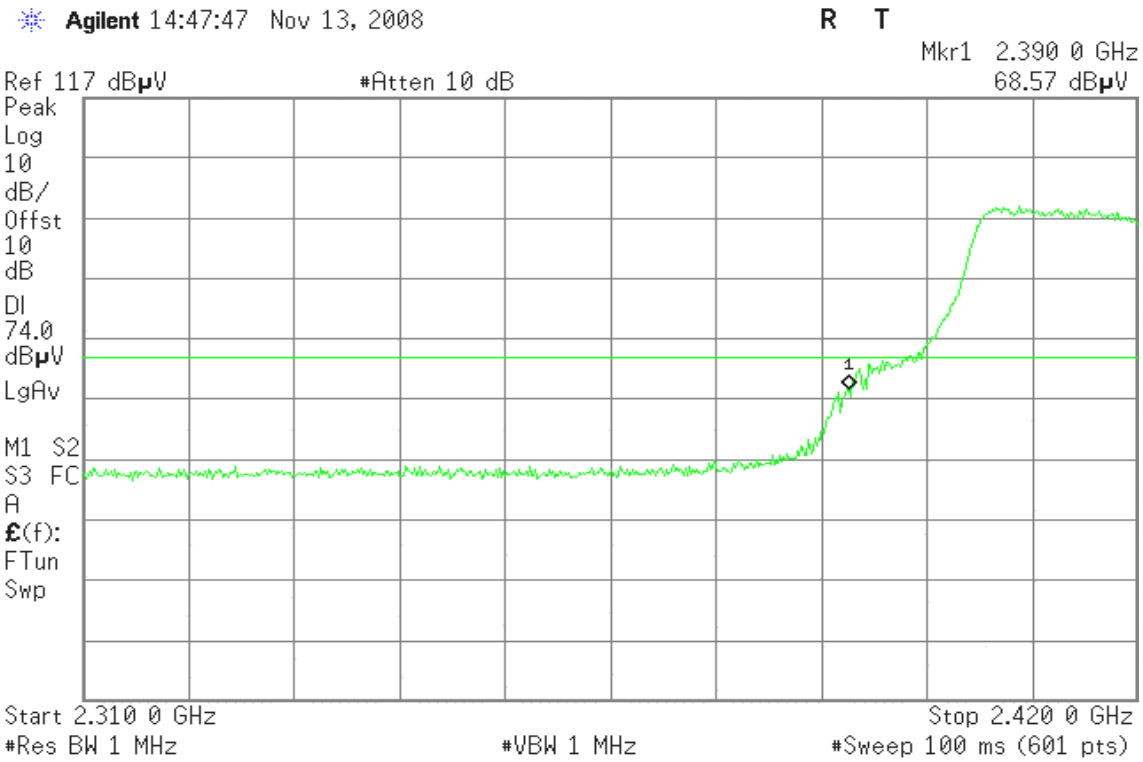



**Detector mode: Average** **Polarity: Horizontal**

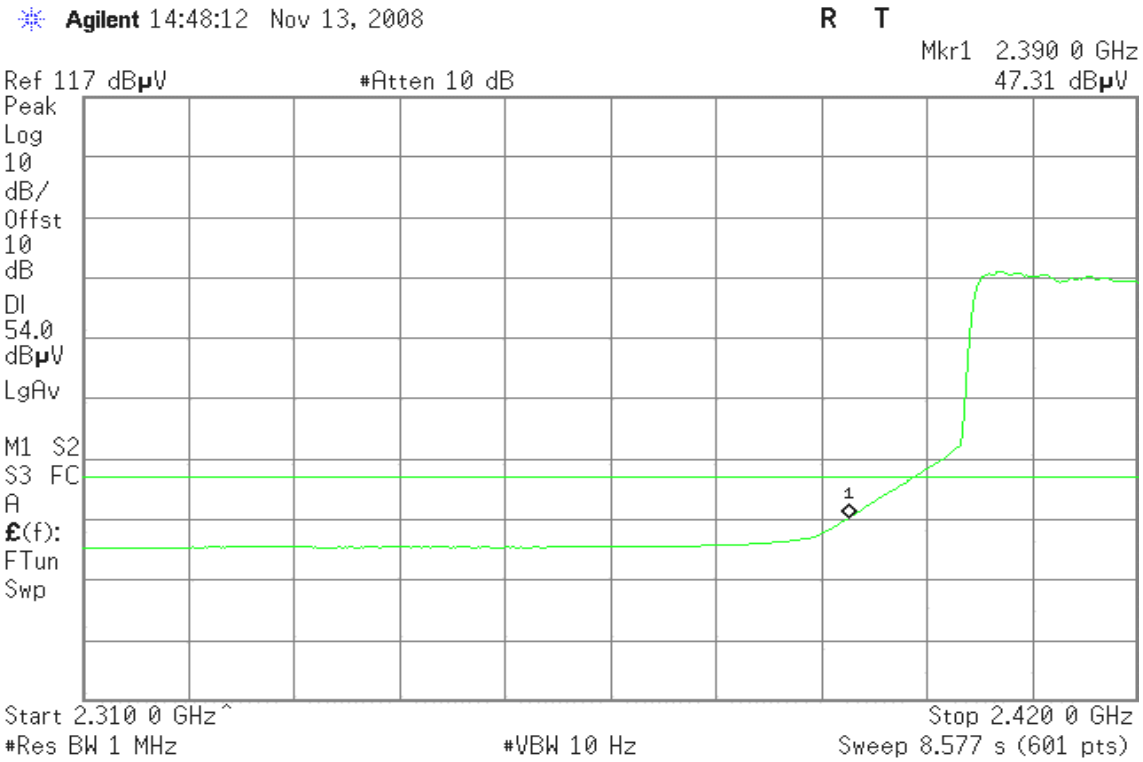


## Band Edges (IEEE 802.11n HT20 mode / CH Low)

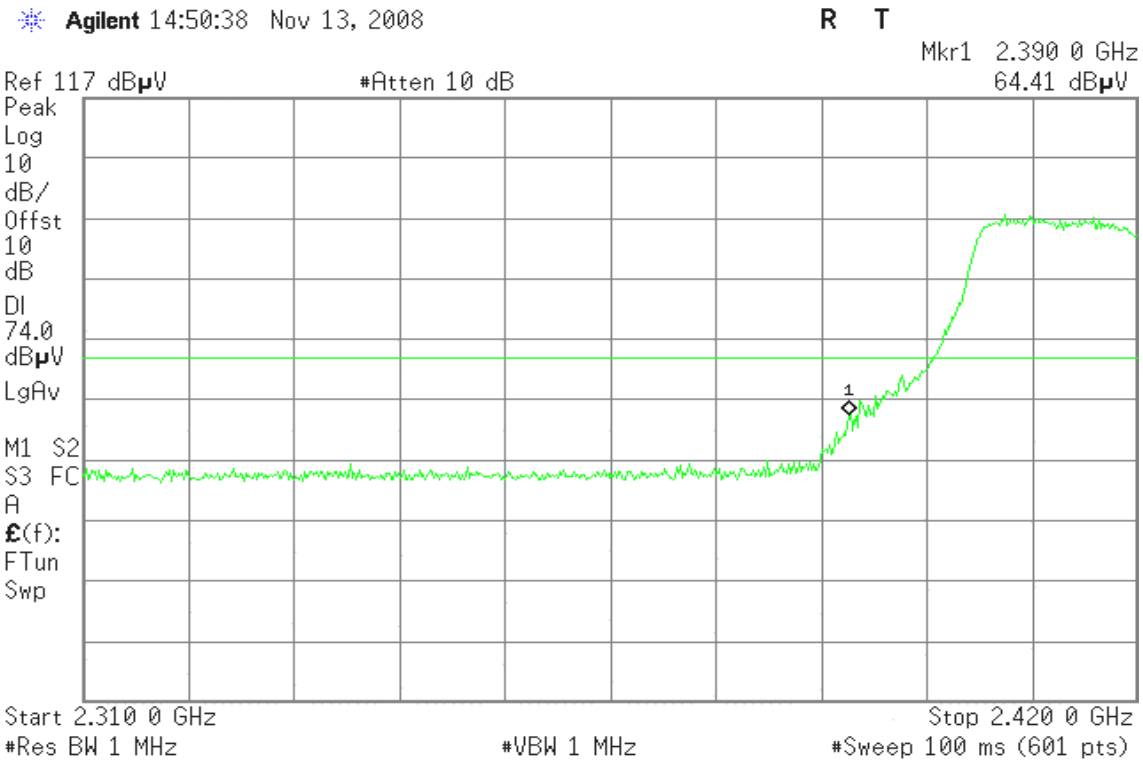
### Detector mode: Peak Polarity: Vertical



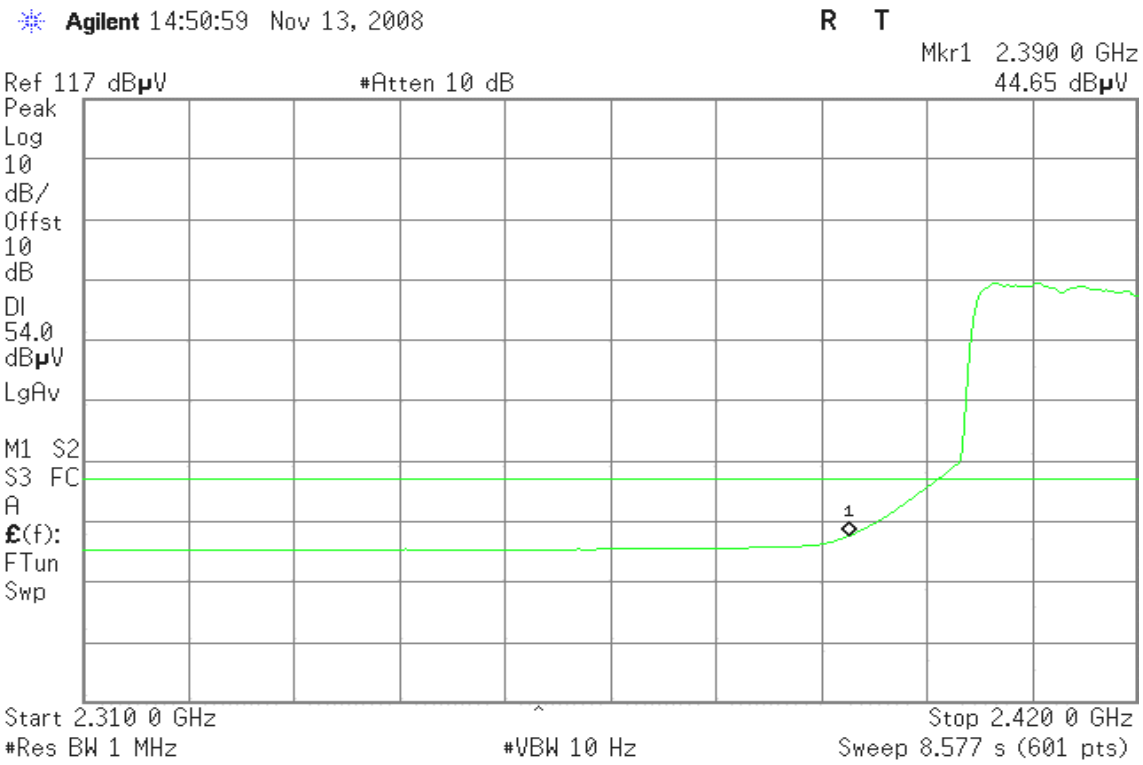

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

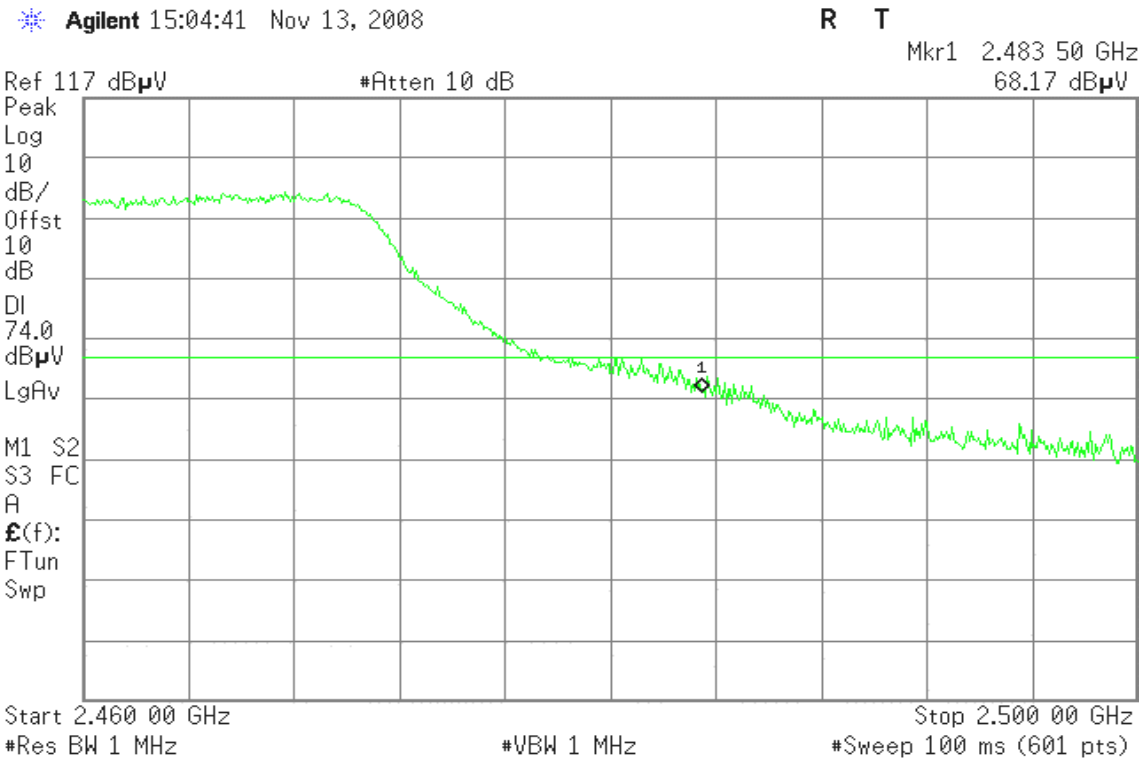



**Detector mode: Average** **Polarity: Horizontal**

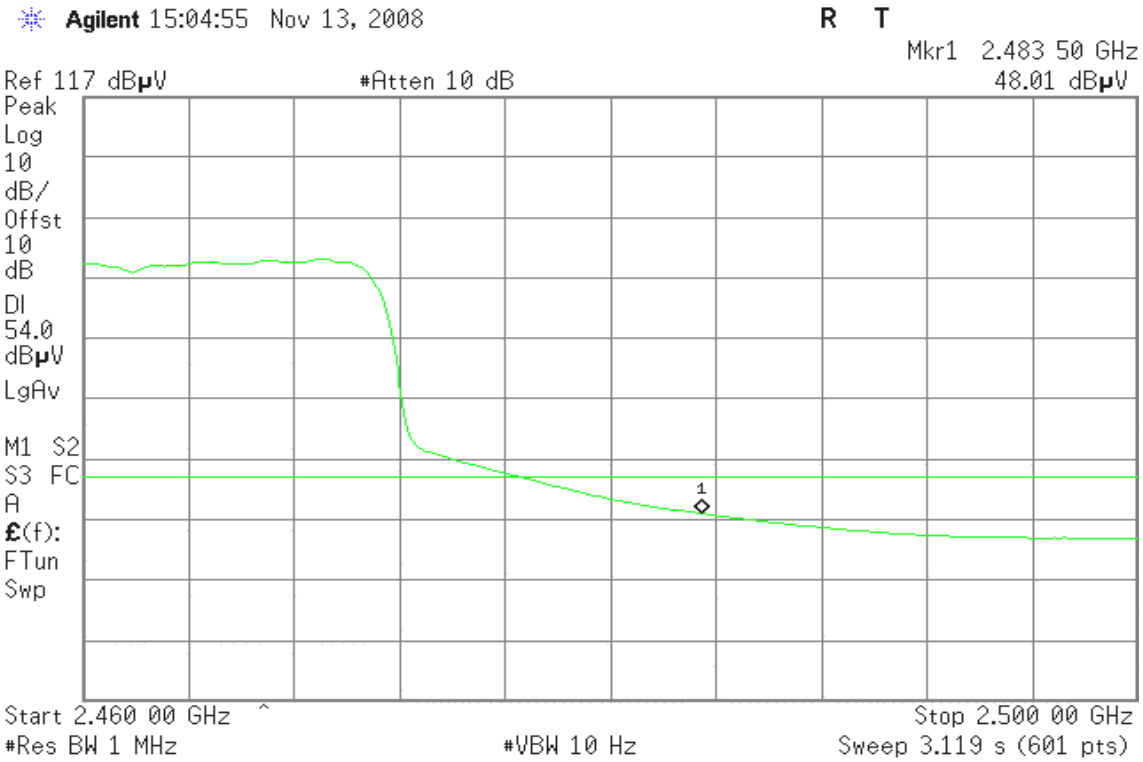


## Band Edges (IEEE 802.11n HT20 mode / CH High)

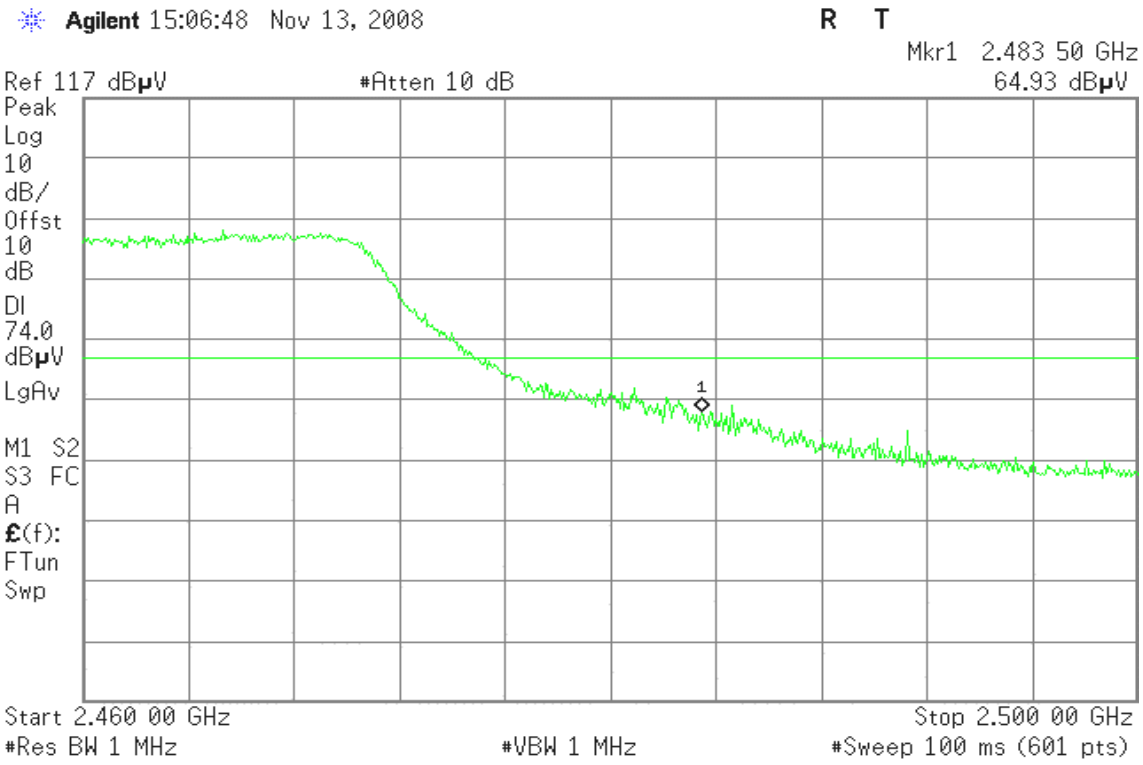
### Detector mode: Peak Polarity: Vertical



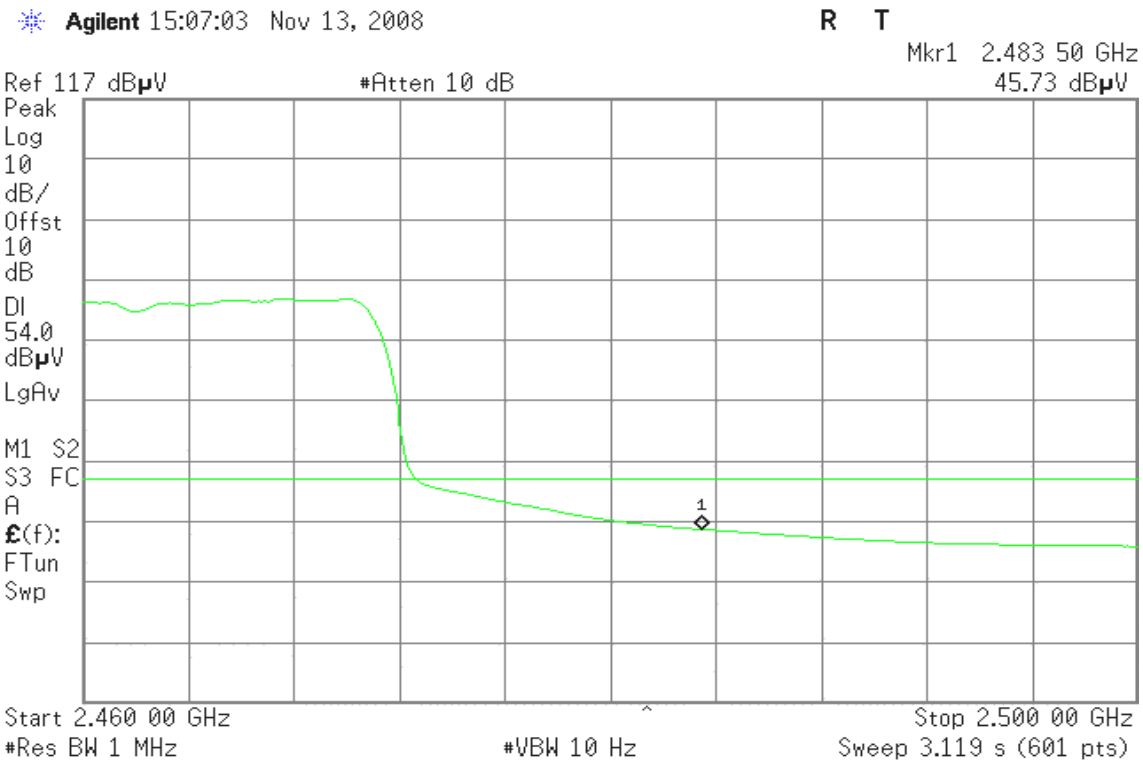

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

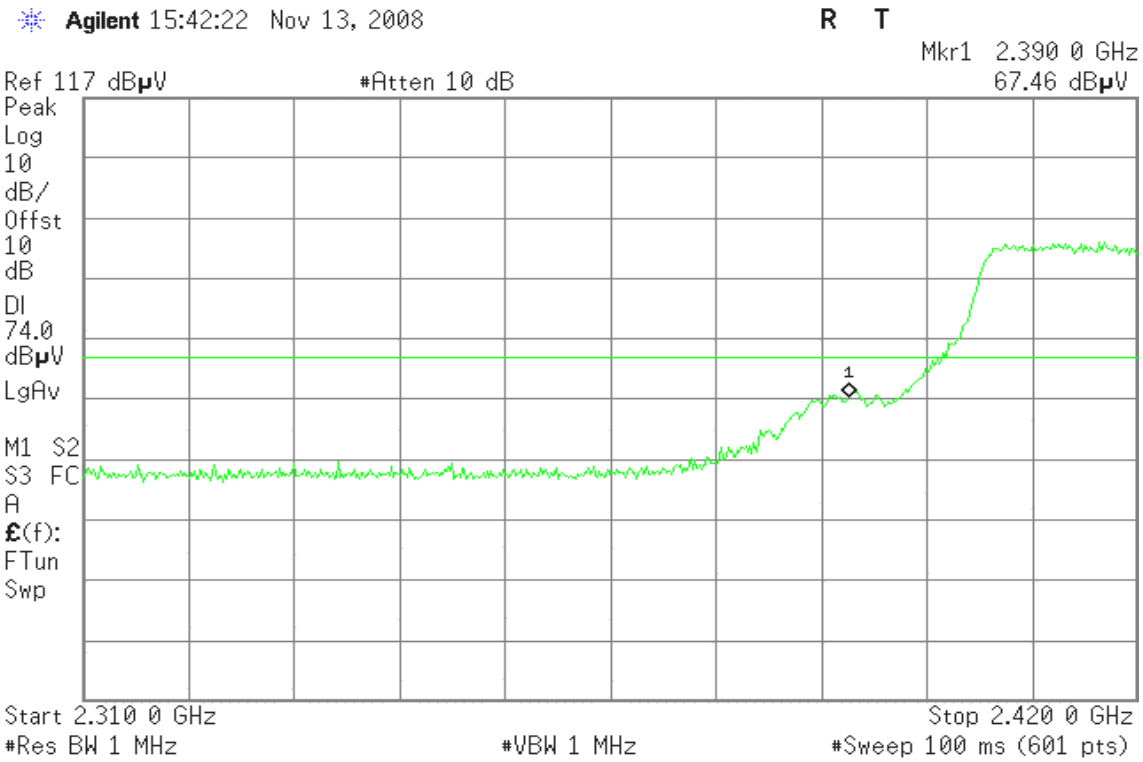



**Detector mode: Average** **Polarity: Horizontal**

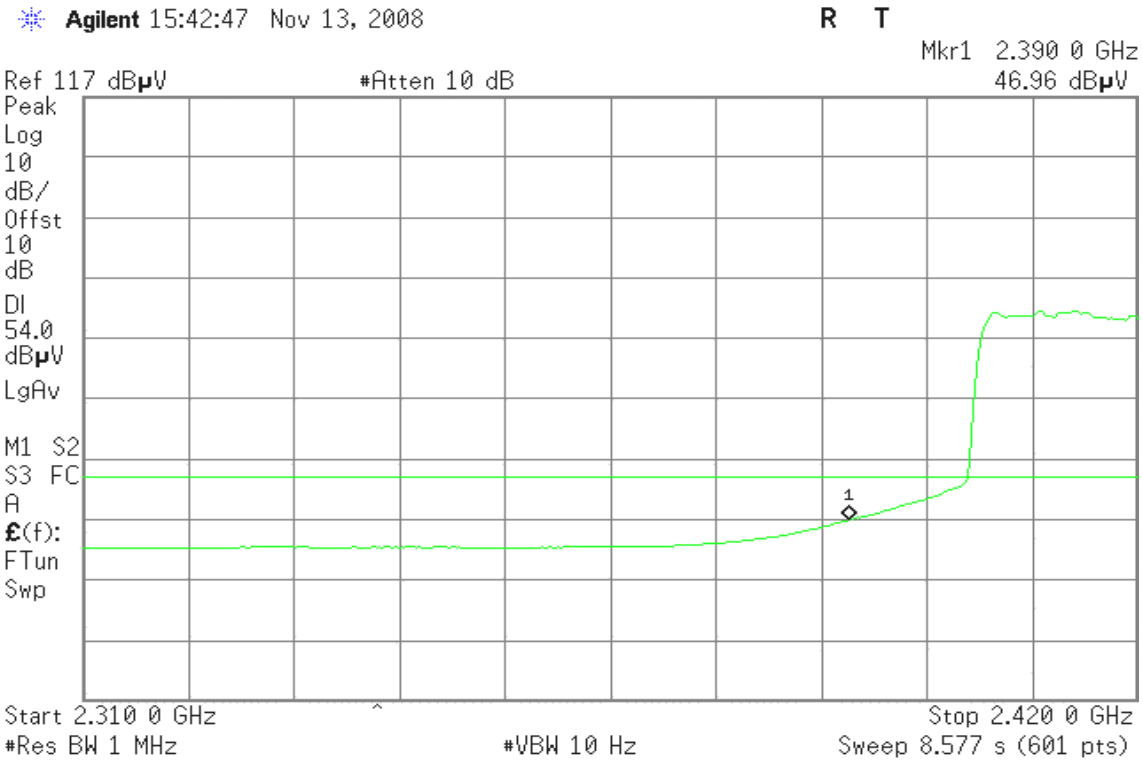


## Band Edges (IEEE 802.11n HT40 mode / CH Low)

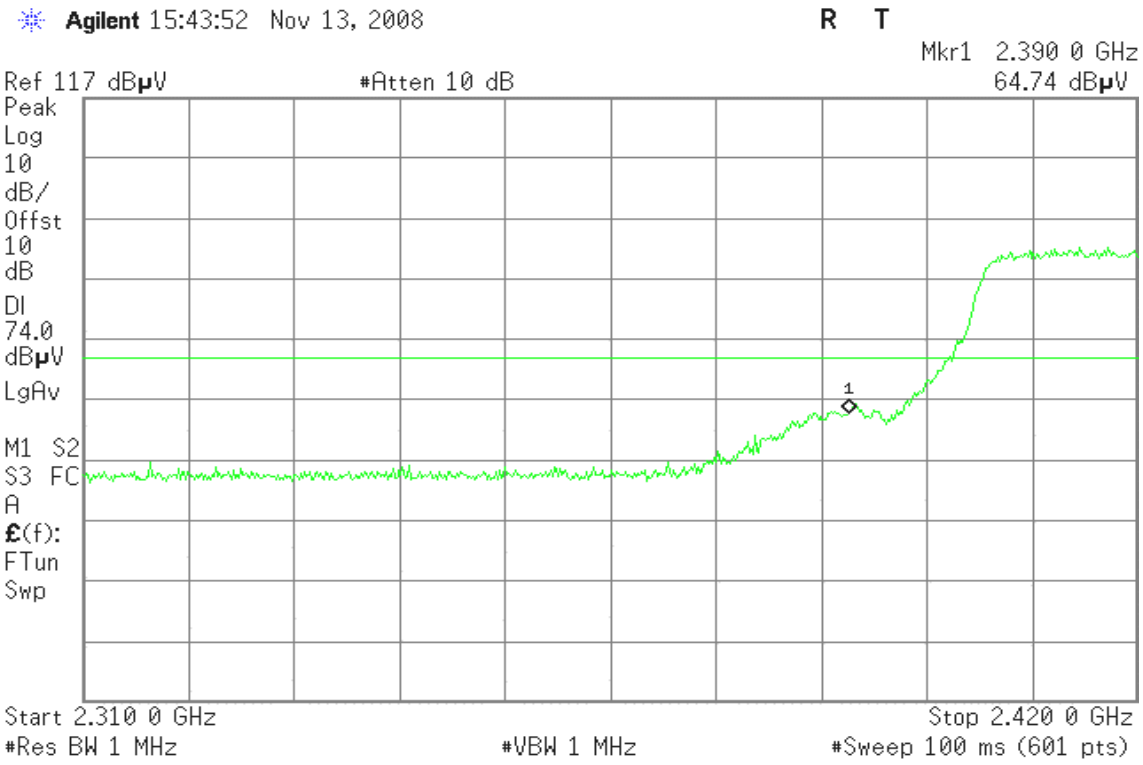
### Detector mode: Peak Polarity: Vertical



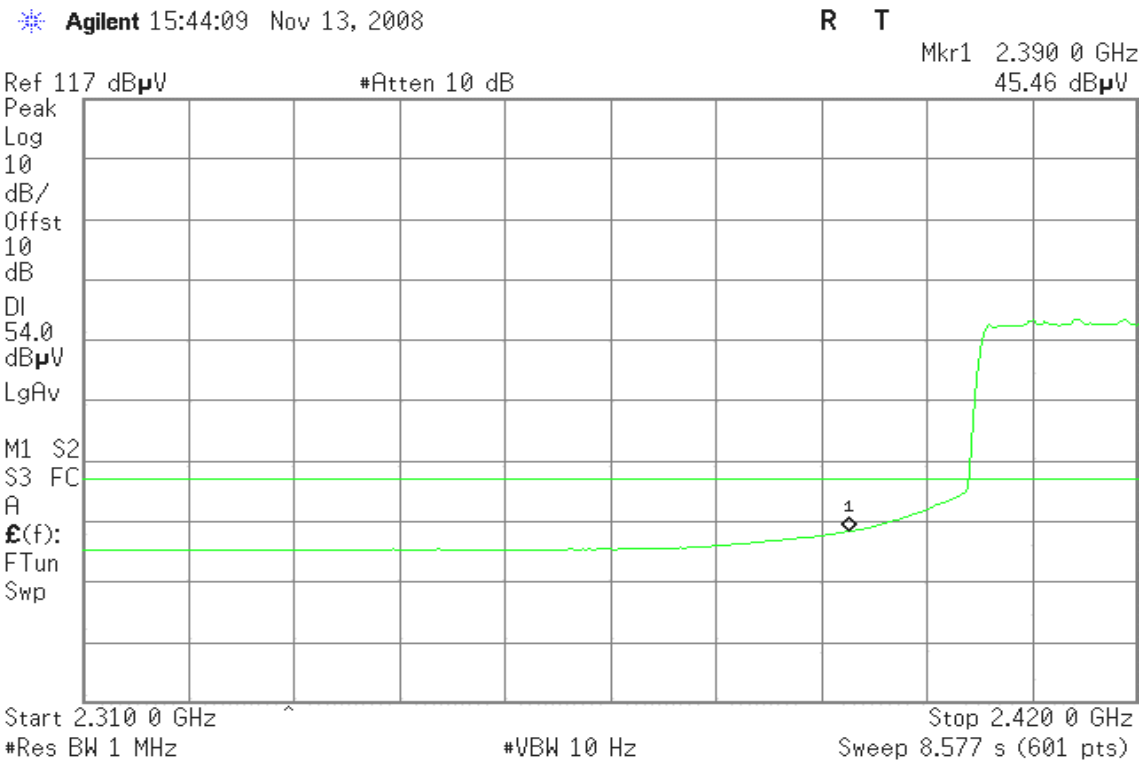

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

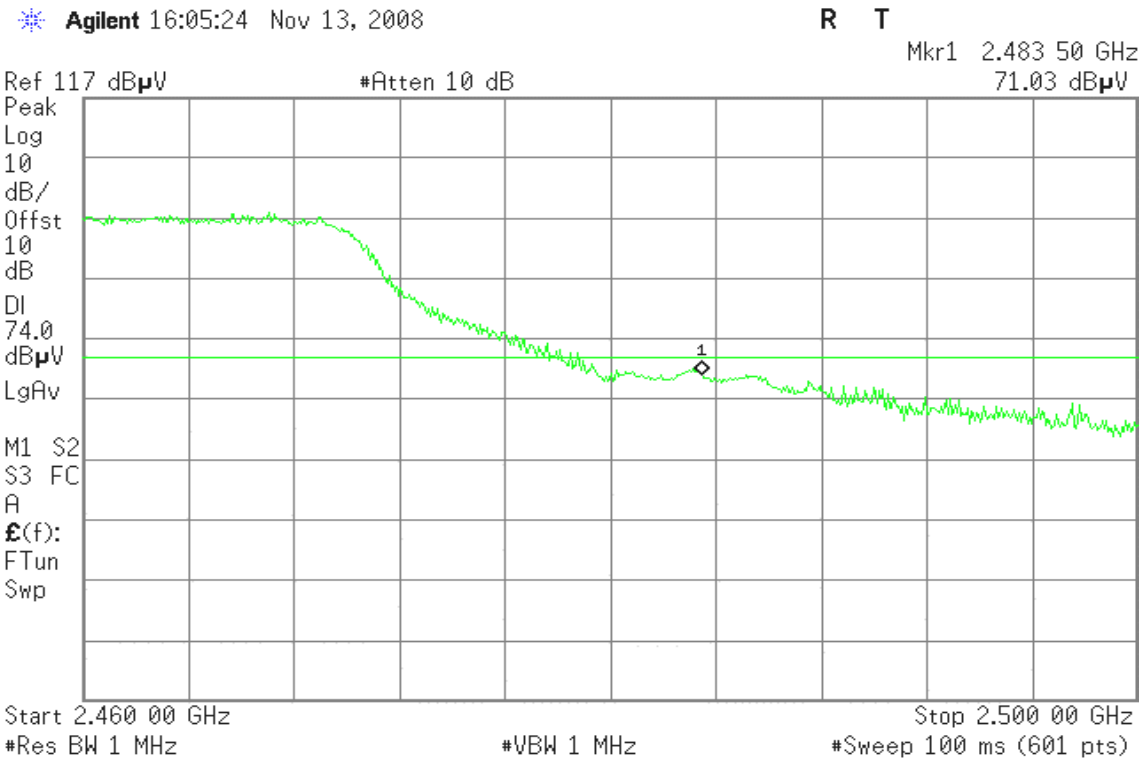



**Detector mode: Average** **Polarity: Horizontal**

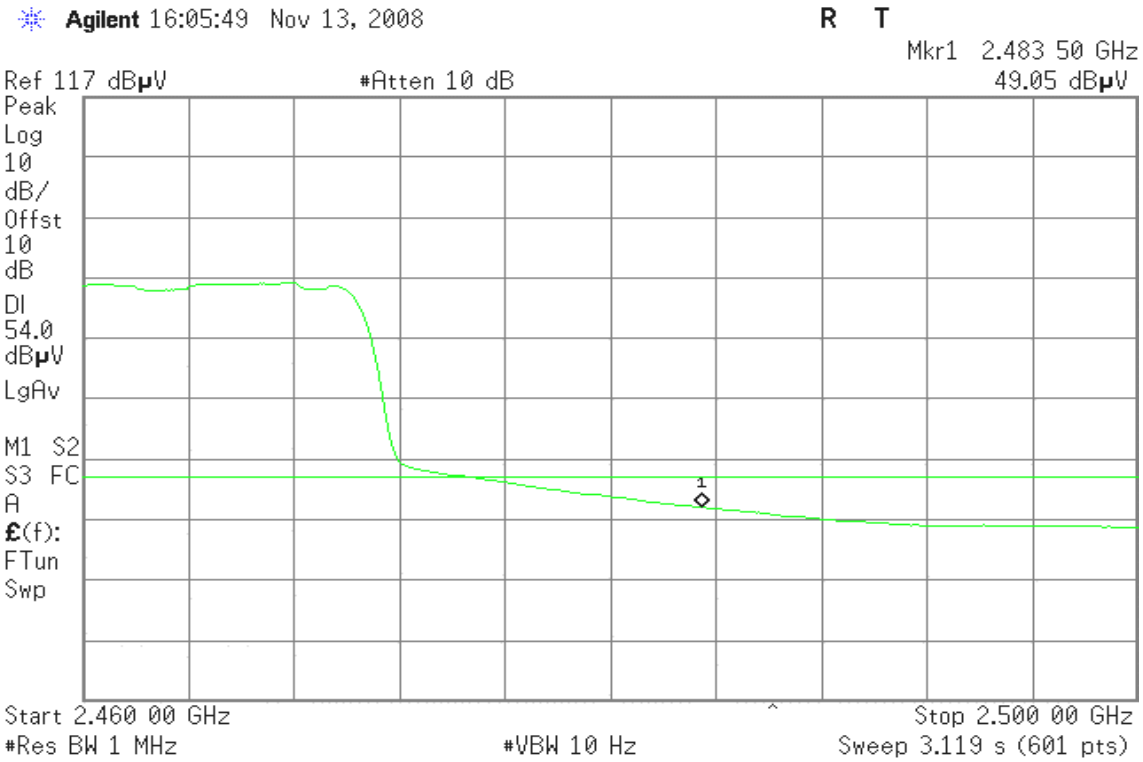


## Band Edges (IEEE 802.11n HT40 mode / CH High)

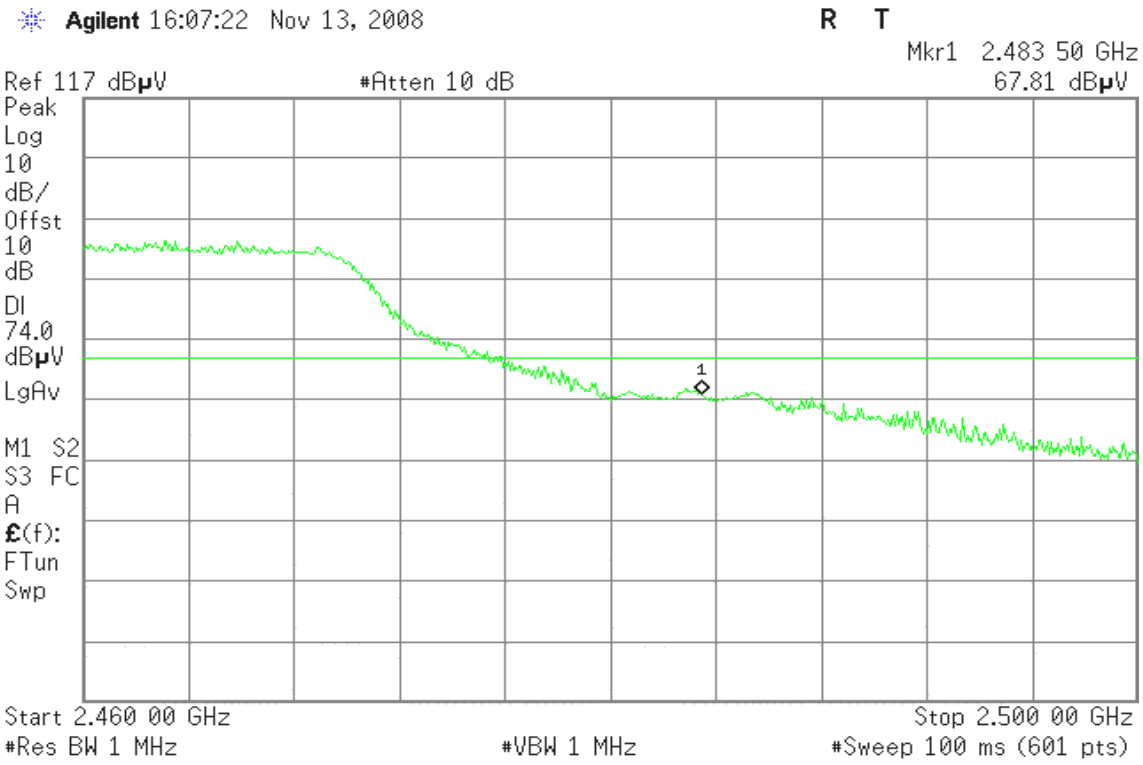
### Detector mode: Peak Polarity: Vertical



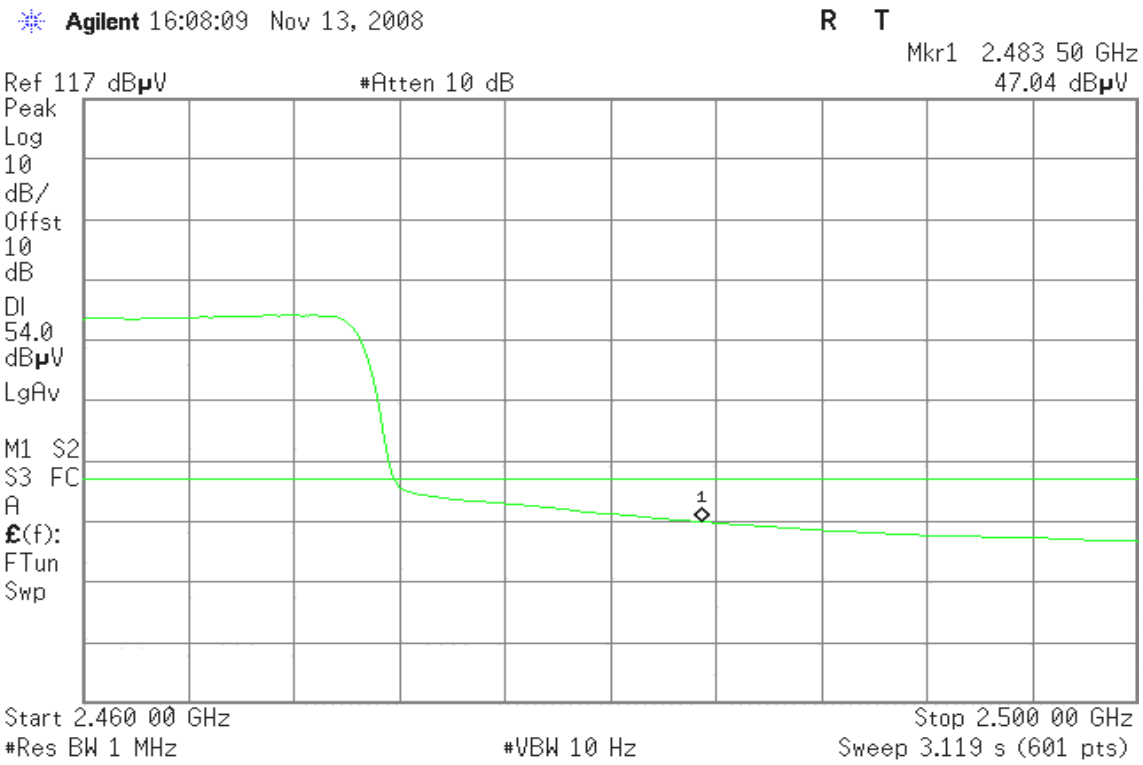

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**



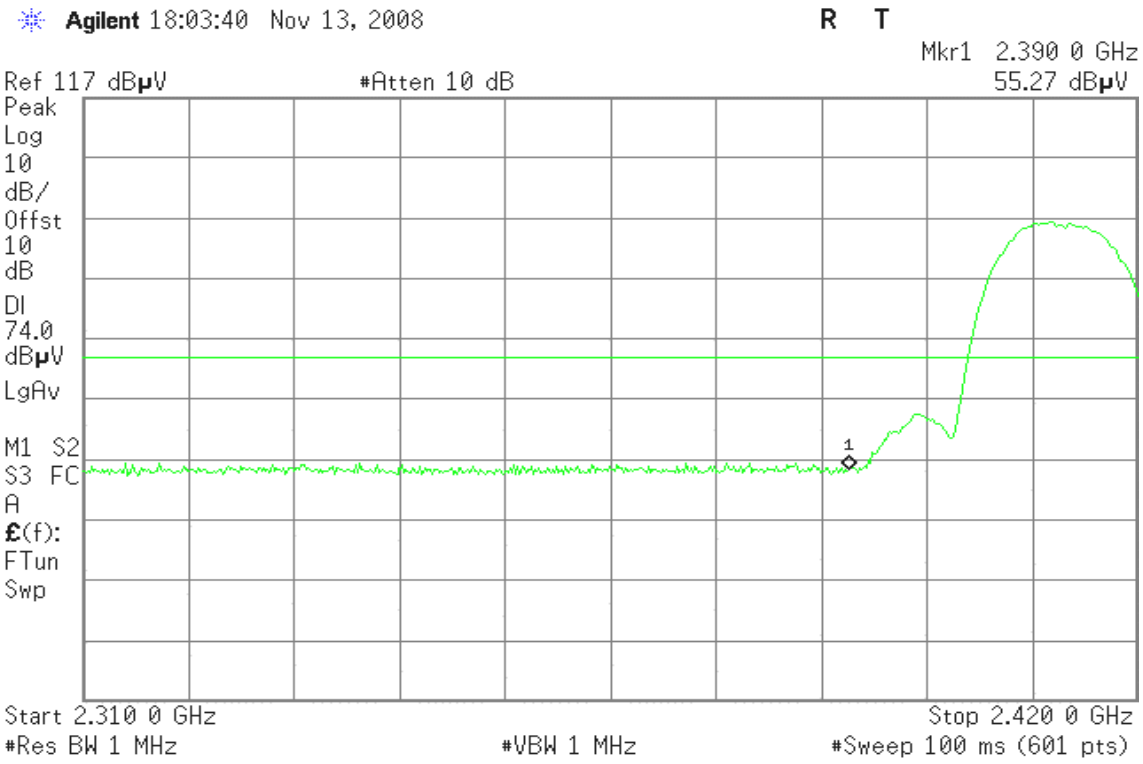

**Detector mode: Average** **Polarity: Horizontal**



**PIFA Antenna / Half Length Board:**

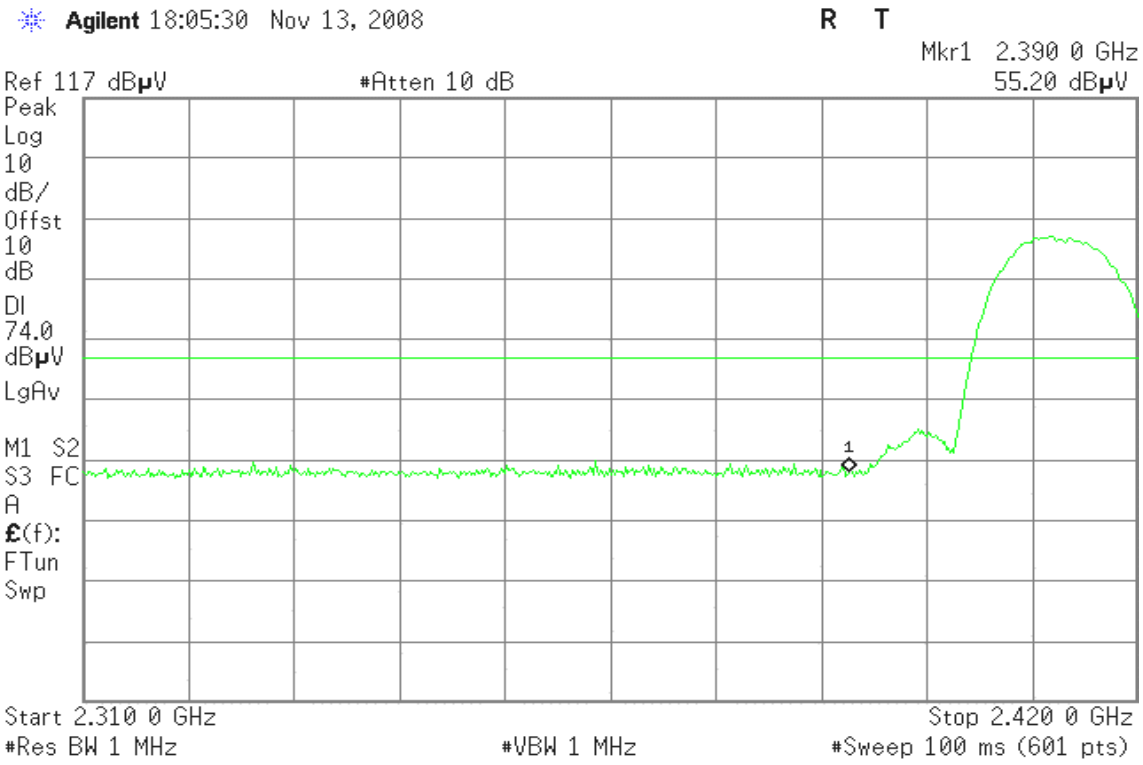
**Band Edges (IEEE 802.11b mode / CH Low)**

**Detector mode: Peak** **Polarity: Vertical**

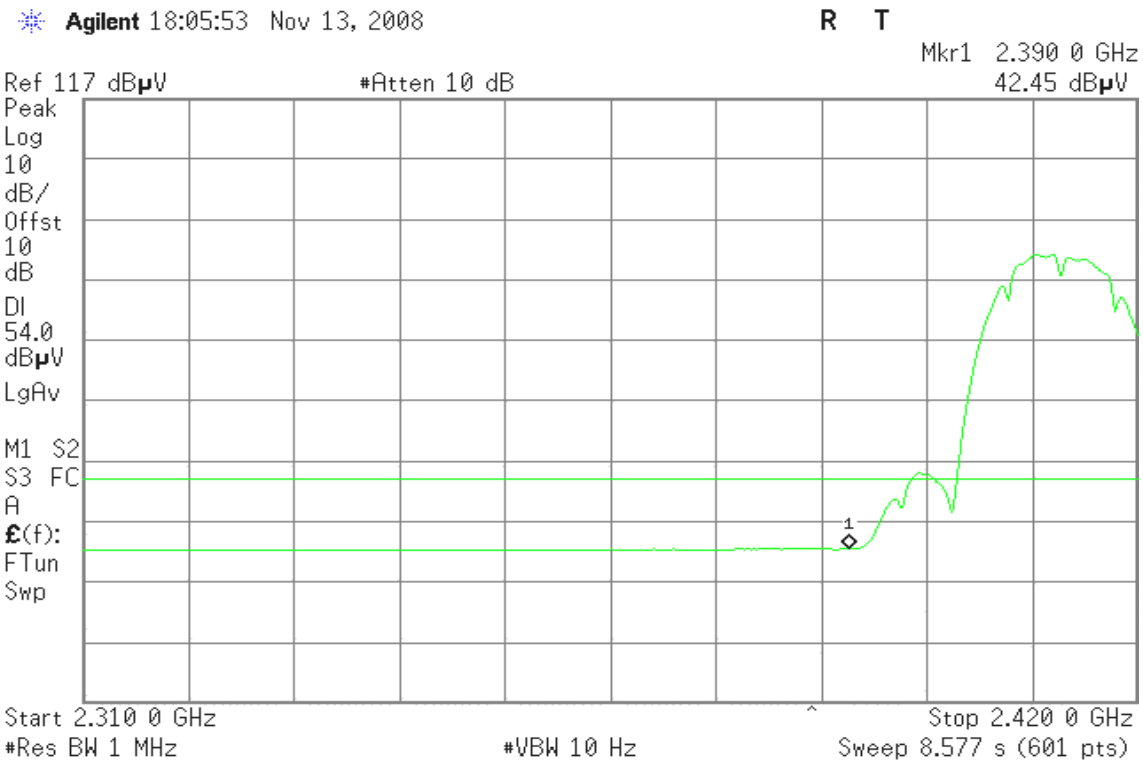



**Detector mode: Average** **Polarity: Vertical**

**Detector mode: Peak** **Polarity: Horizontal**

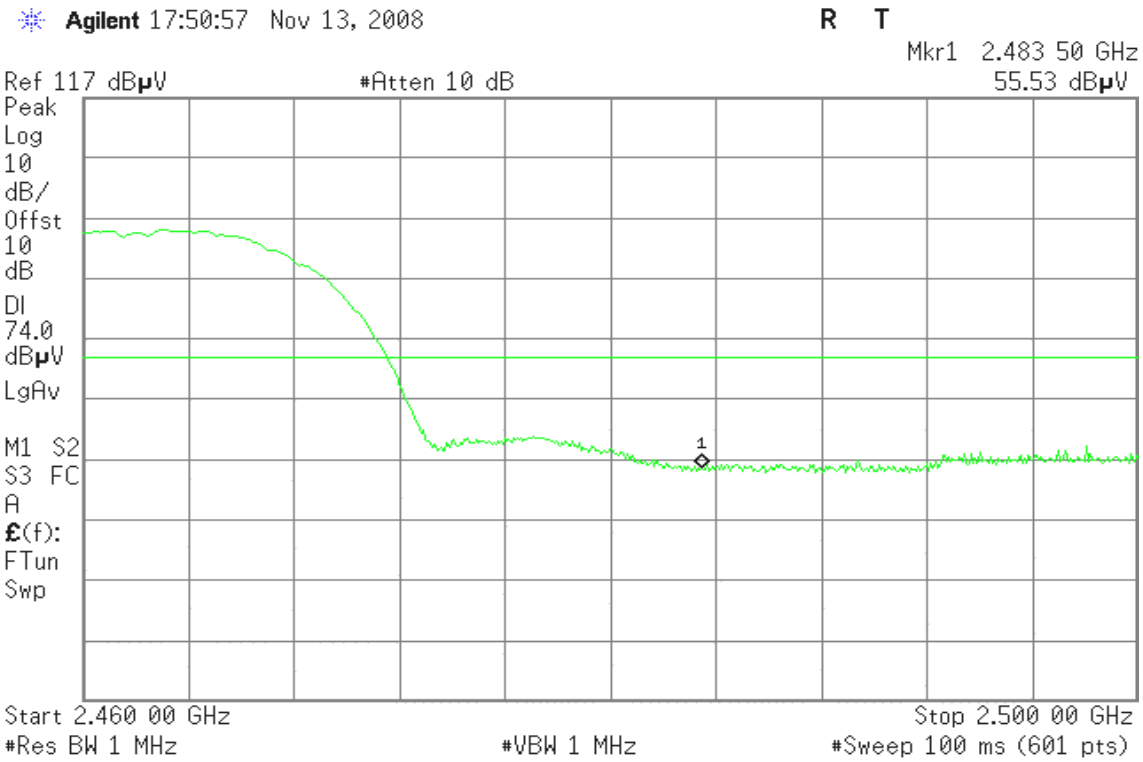



**Detector mode: Average** **Polarity: Horizontal**

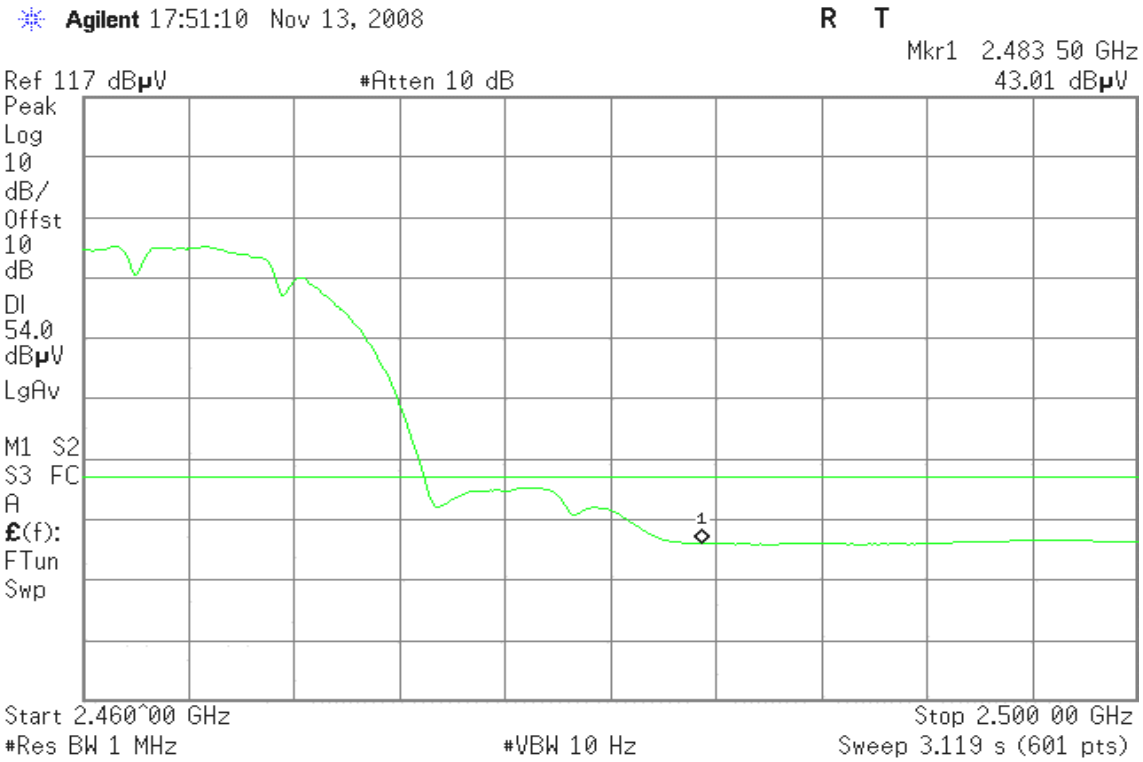


## Band Edges (IEEE 802.11b mode / CH High)

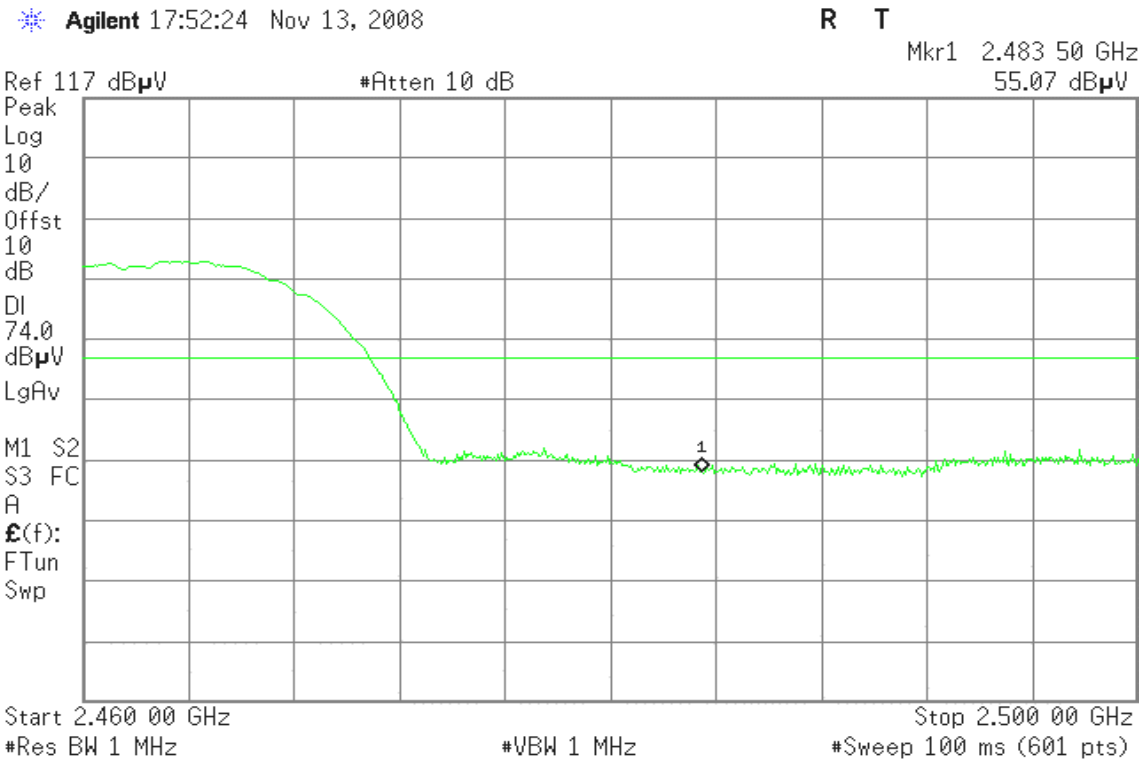
### Detector mode: Peak Polarity: Vertical



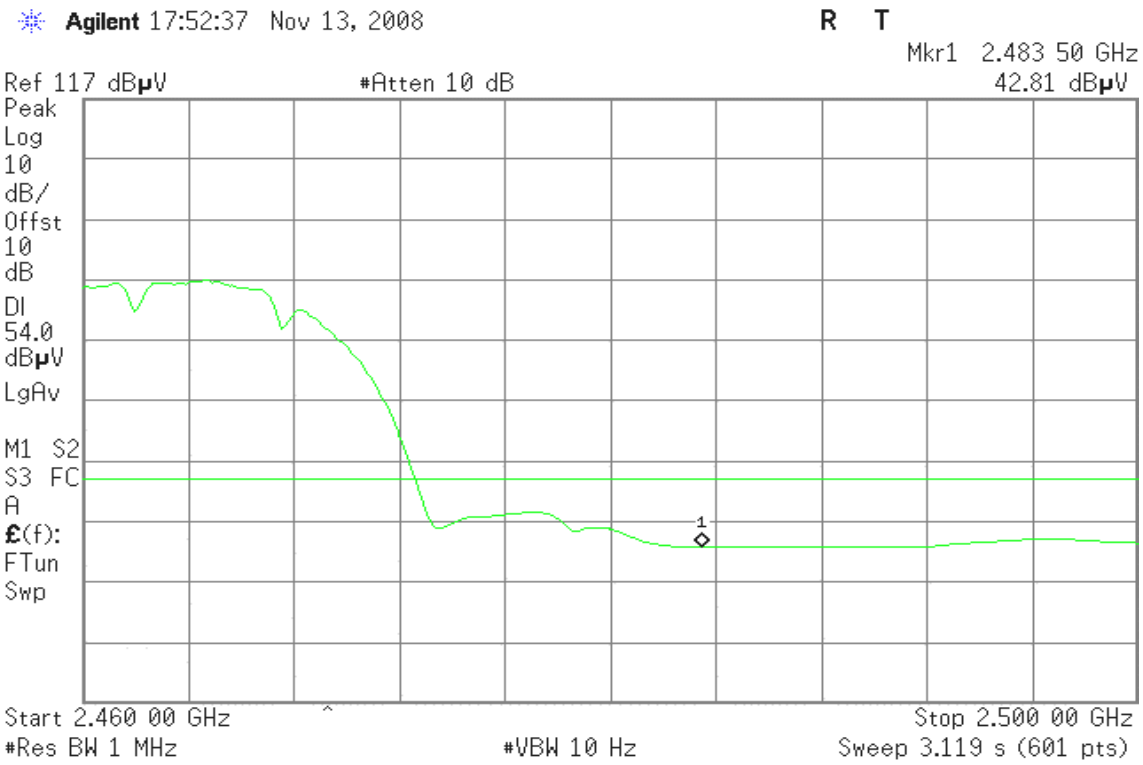

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

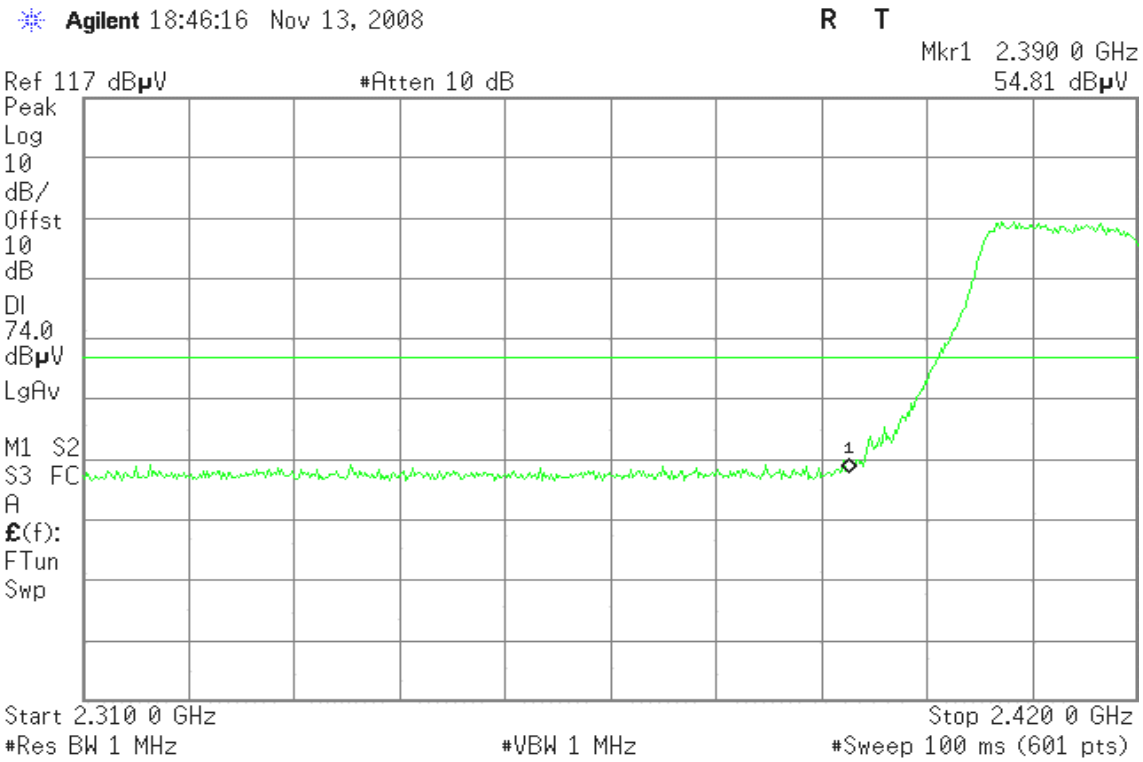



**Detector mode: Average** **Polarity: Horizontal**

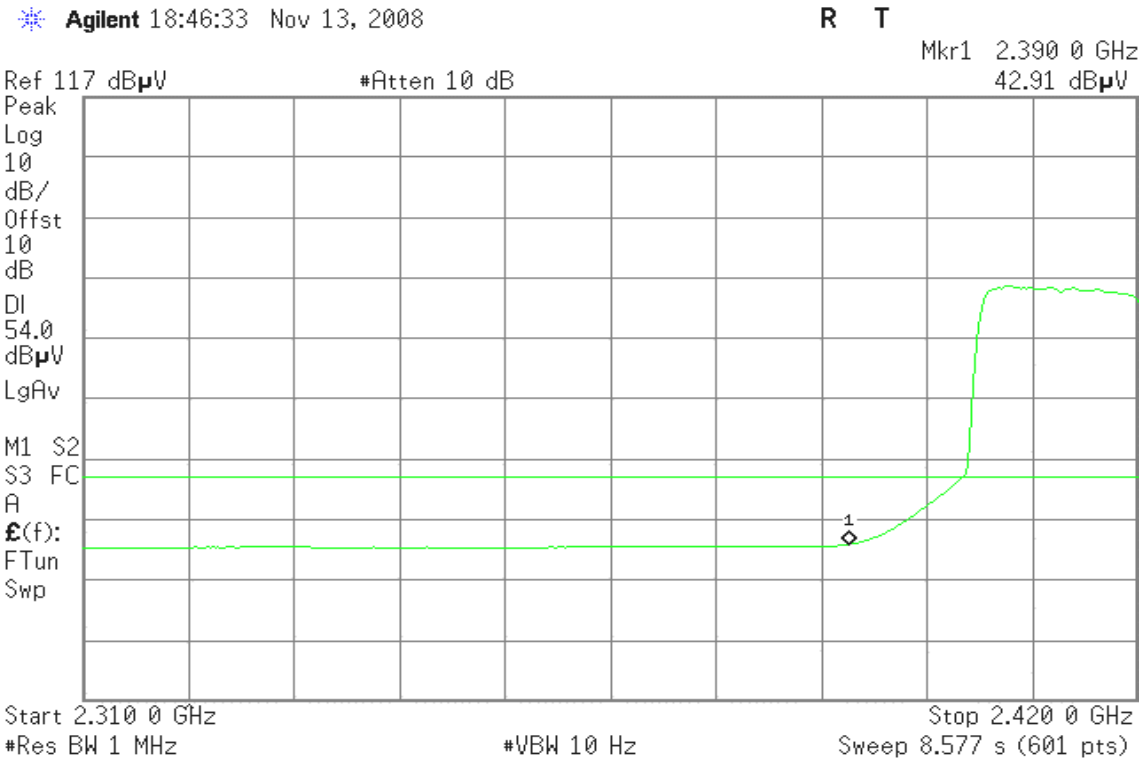


## Band Edges (IEEE 802.11g mode / CH Low)

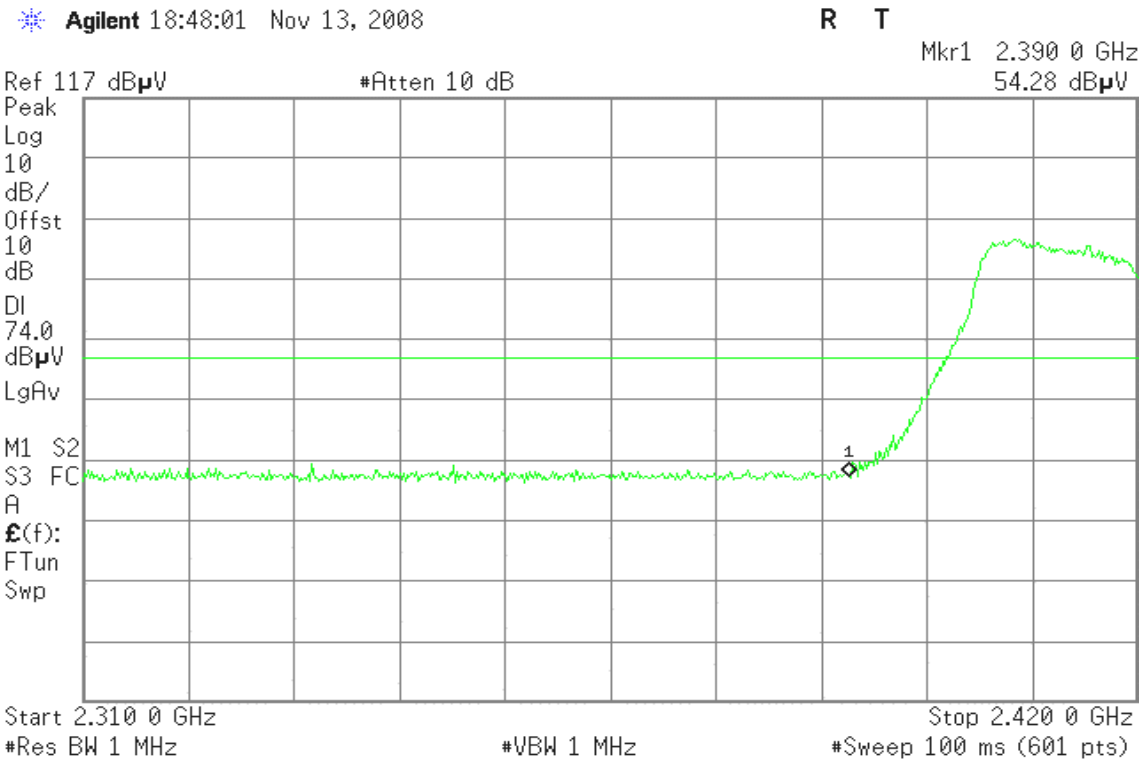
### Detector mode: Peak Polarity: Vertical



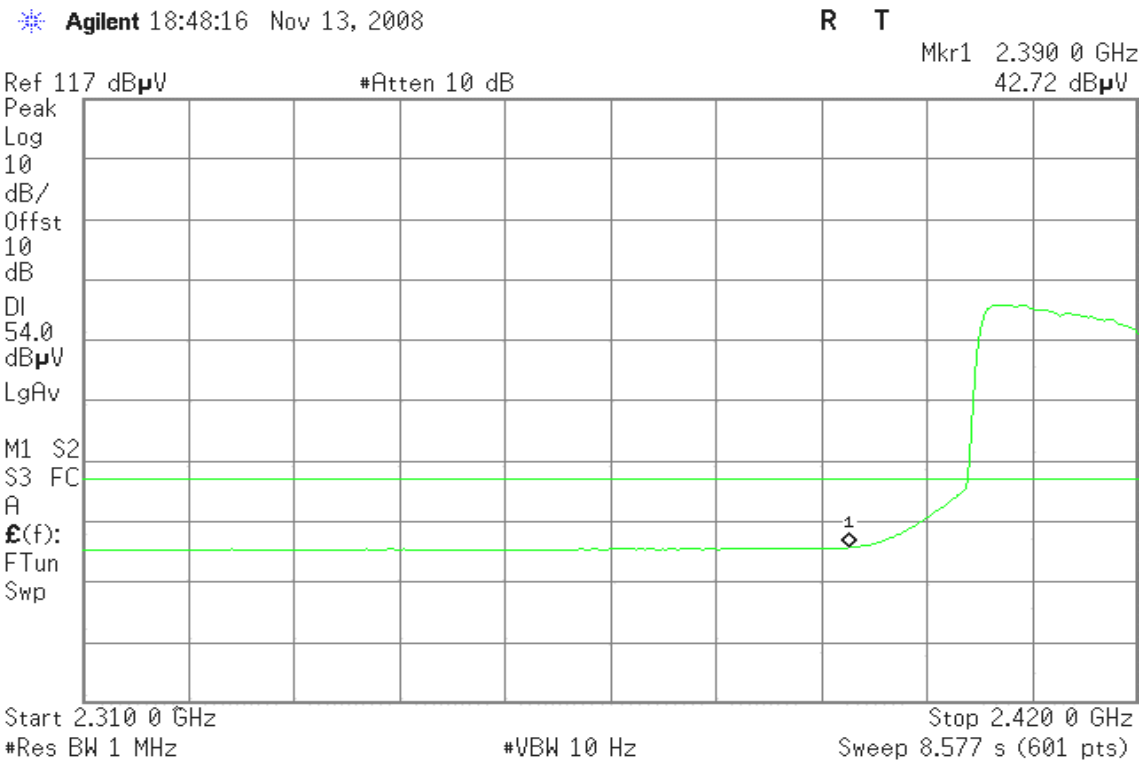

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

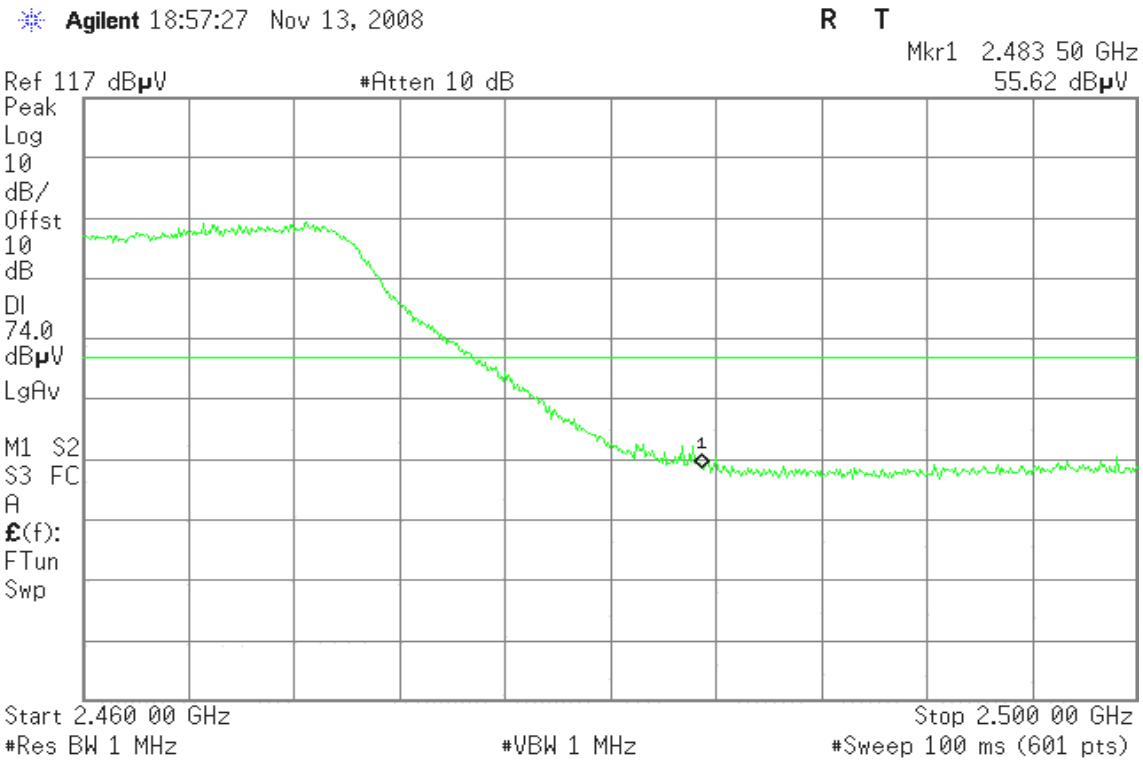



**Detector mode: Average** **Polarity: Horizontal**

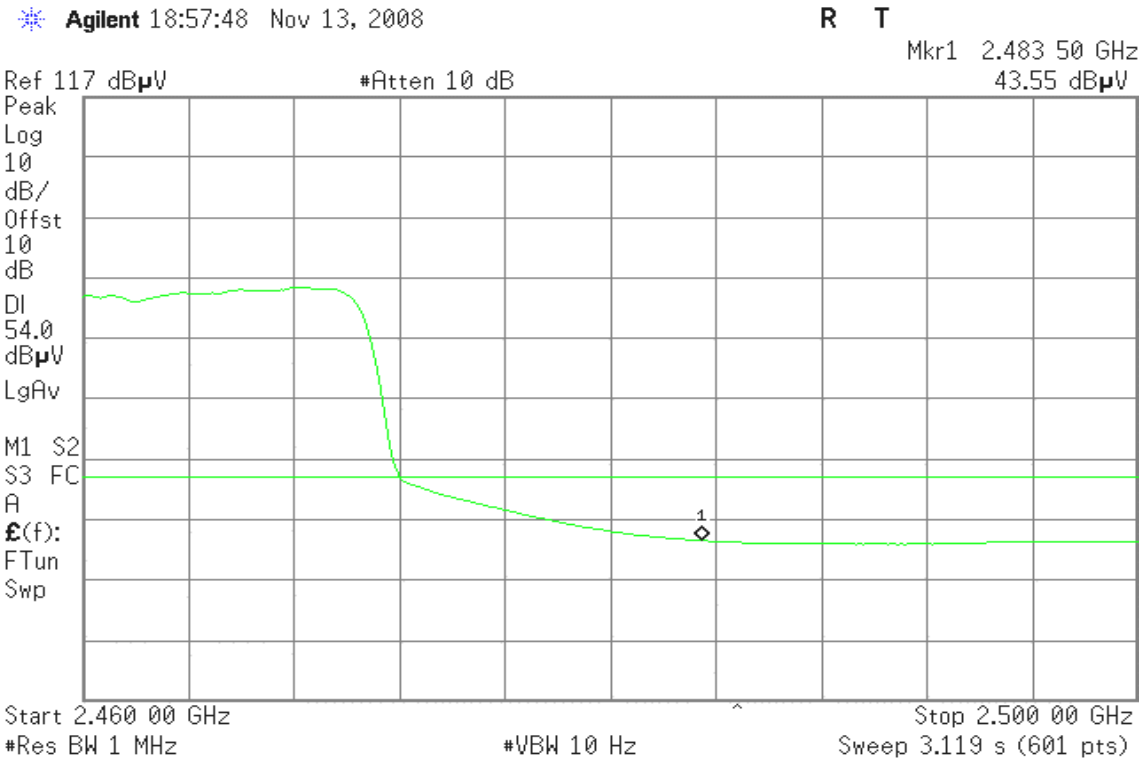


## Band Edges (IEEE 802.11g mode / CH High)

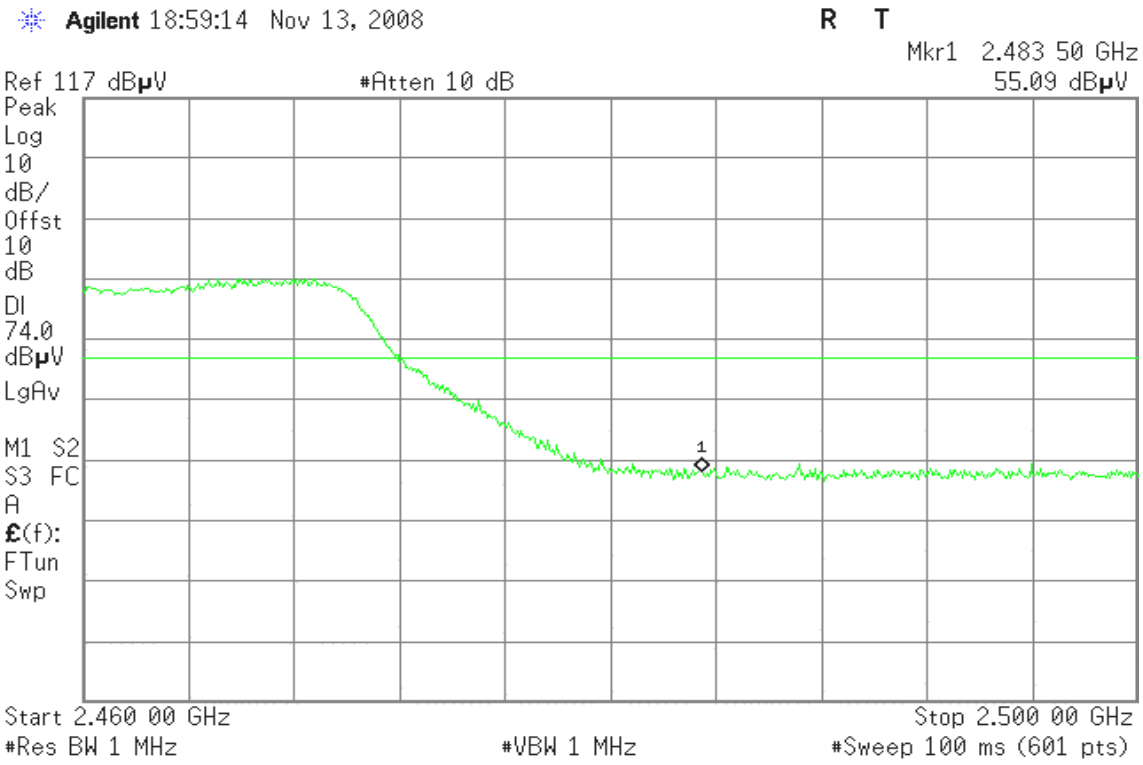
### Detector mode: Peak Polarity: Vertical



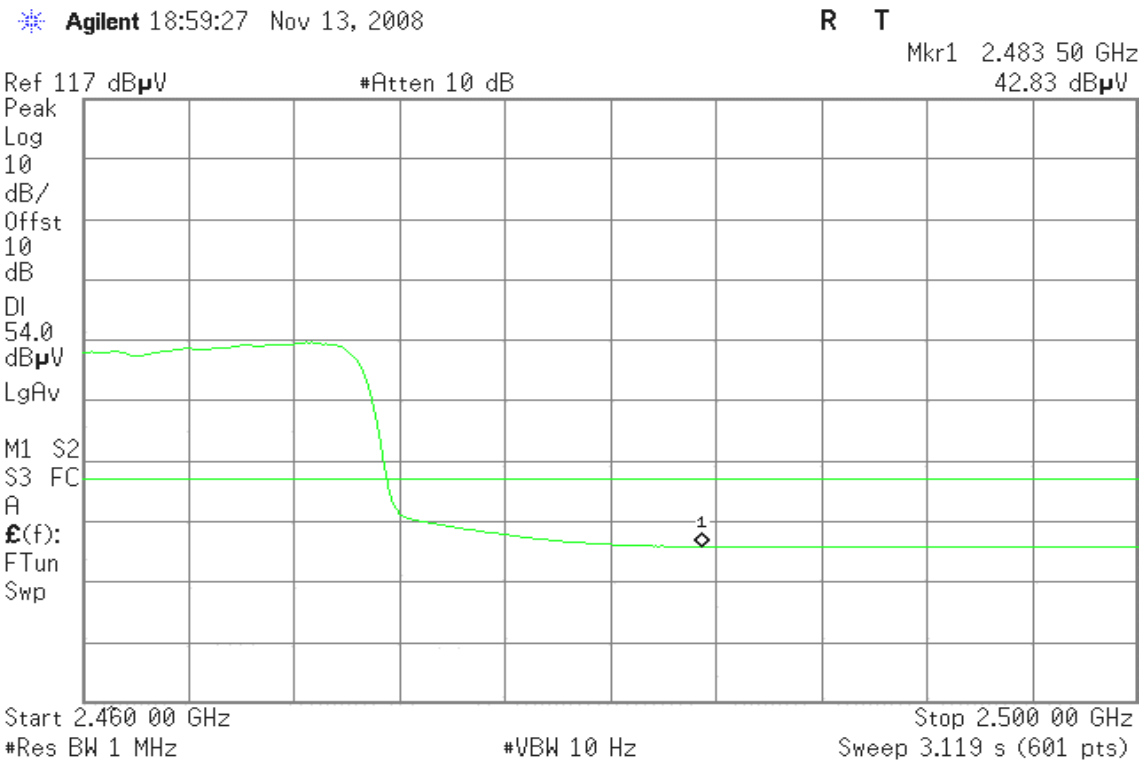

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

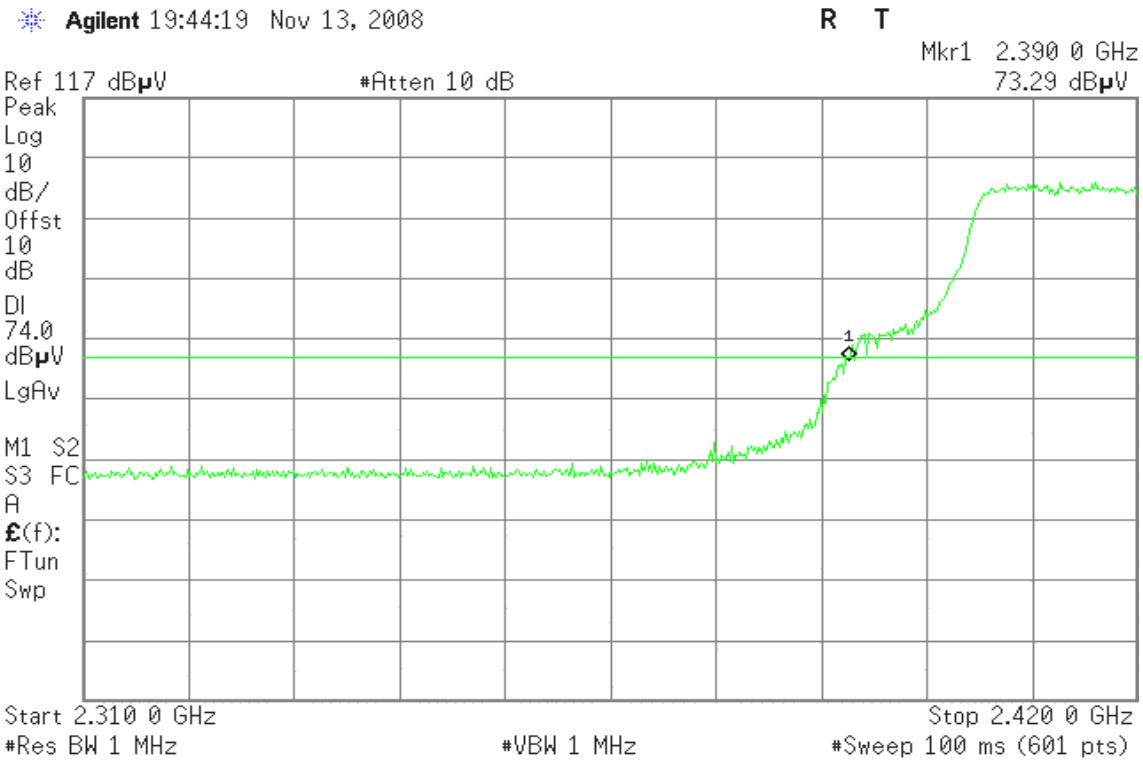



**Detector mode: Average** **Polarity: Horizontal**



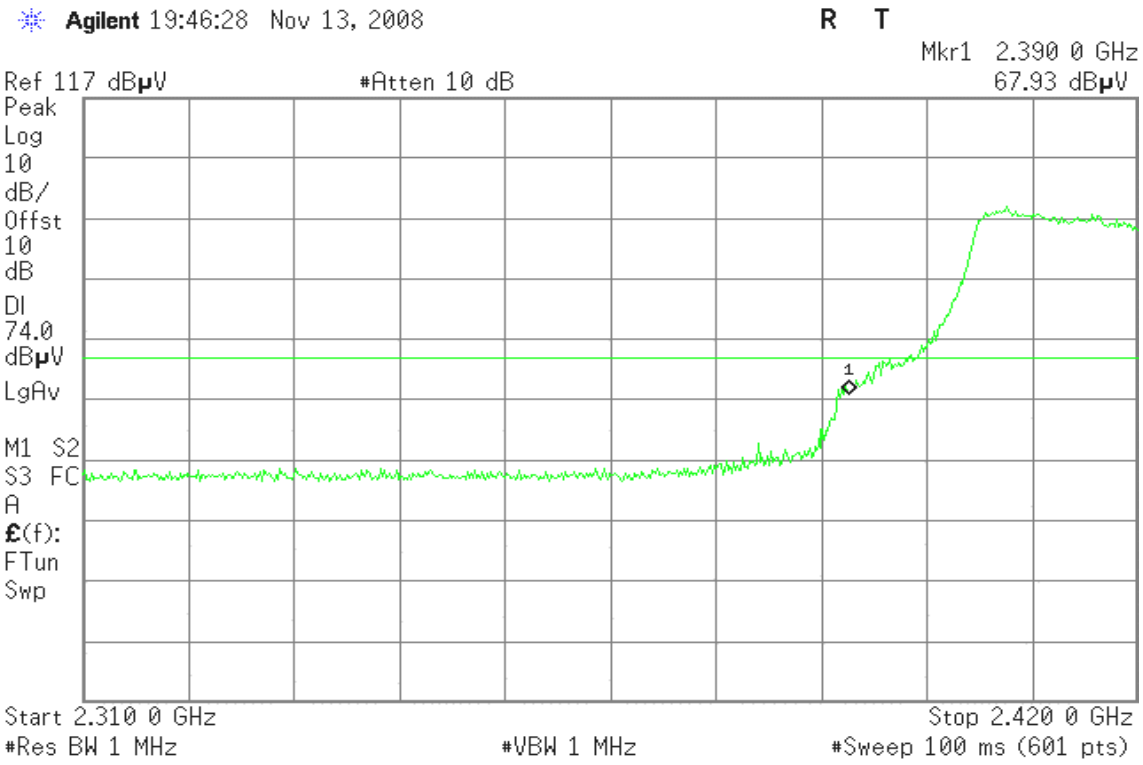
## Band Edges (IEEE 802.11n HT20 mode / CH Low)

### Detector mode: Peak Polarity: Vertical

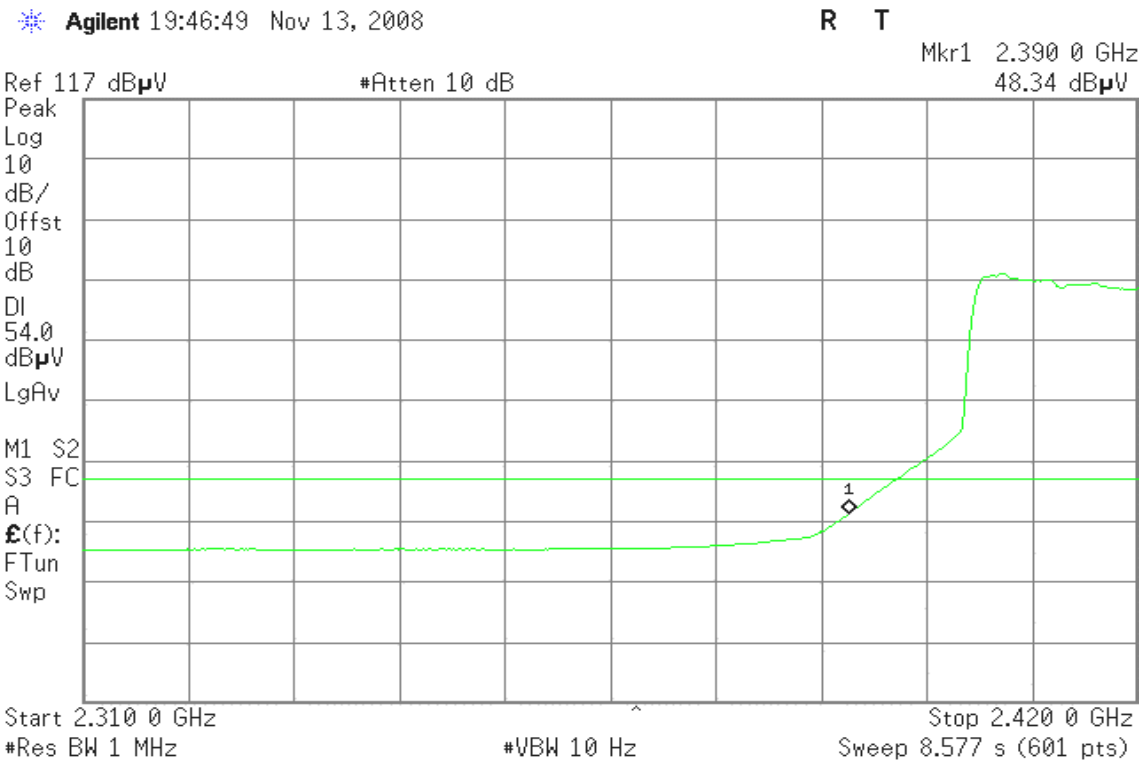



### Detector mode: Average Polarity: Vertical

**Detector mode: Peak** **Polarity: Horizontal**

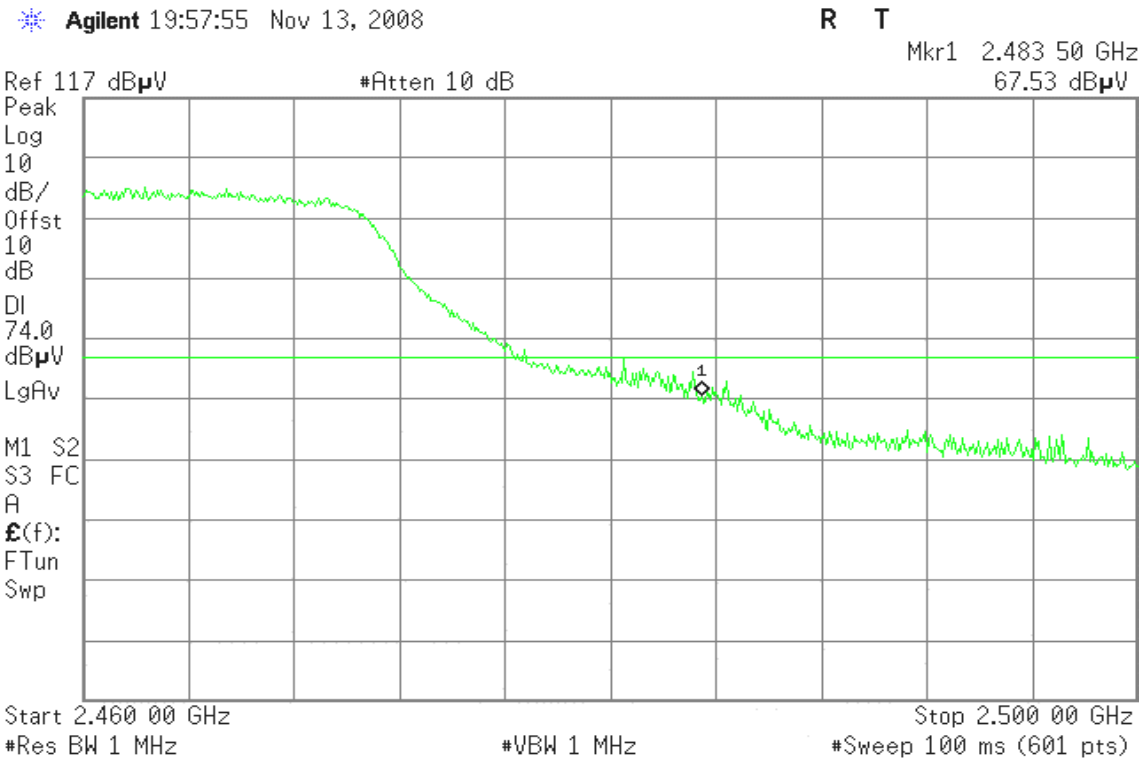



**Detector mode: Average** **Polarity: Horizontal**

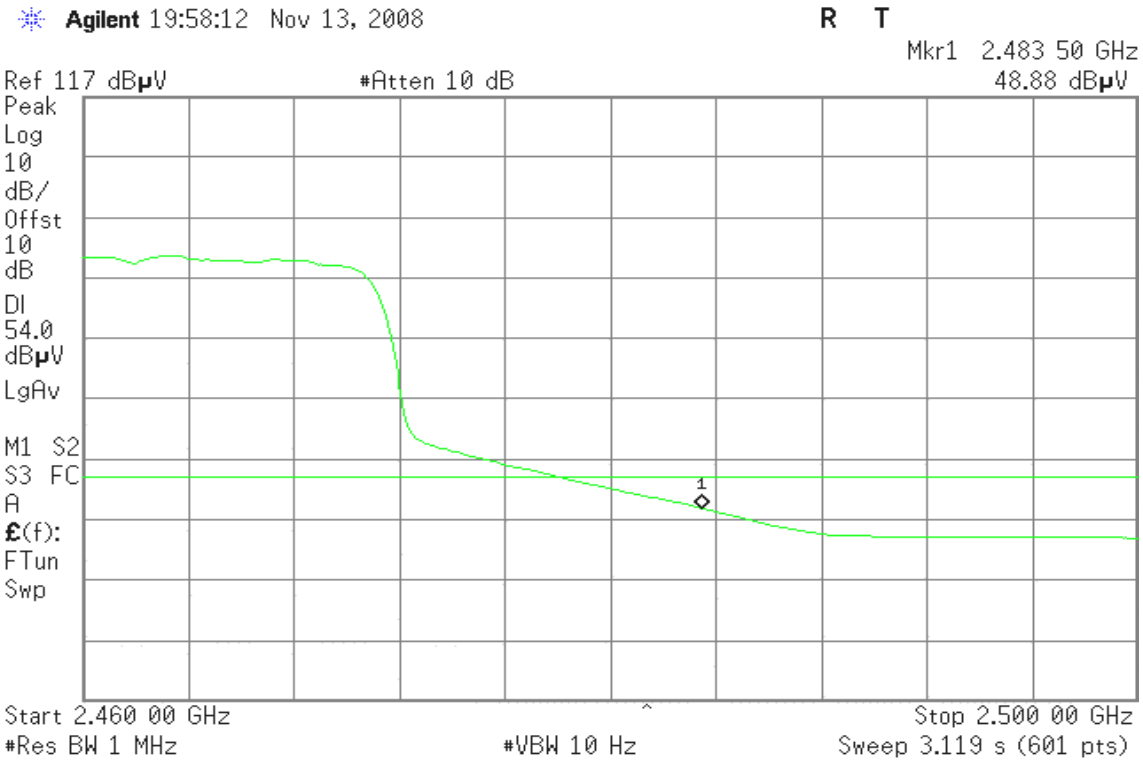


## Band Edges (IEEE 802.11n HT20 mode / CH High)

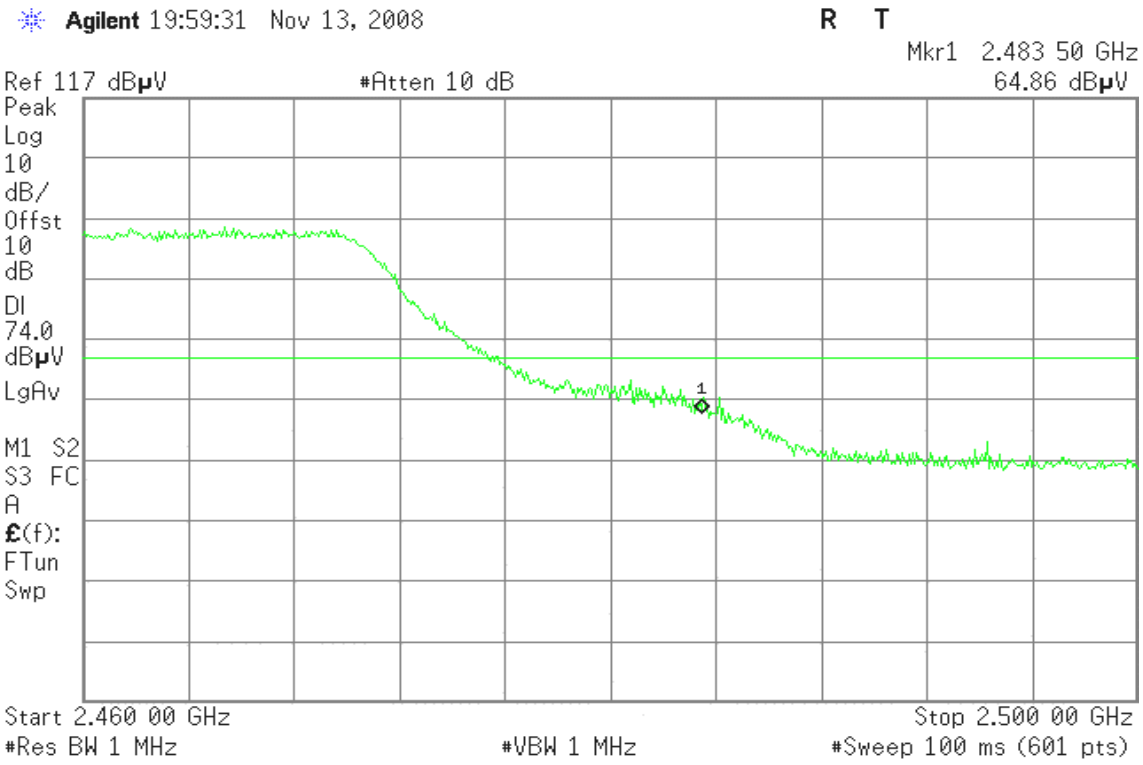
### Detector mode: Peak Polarity: Vertical



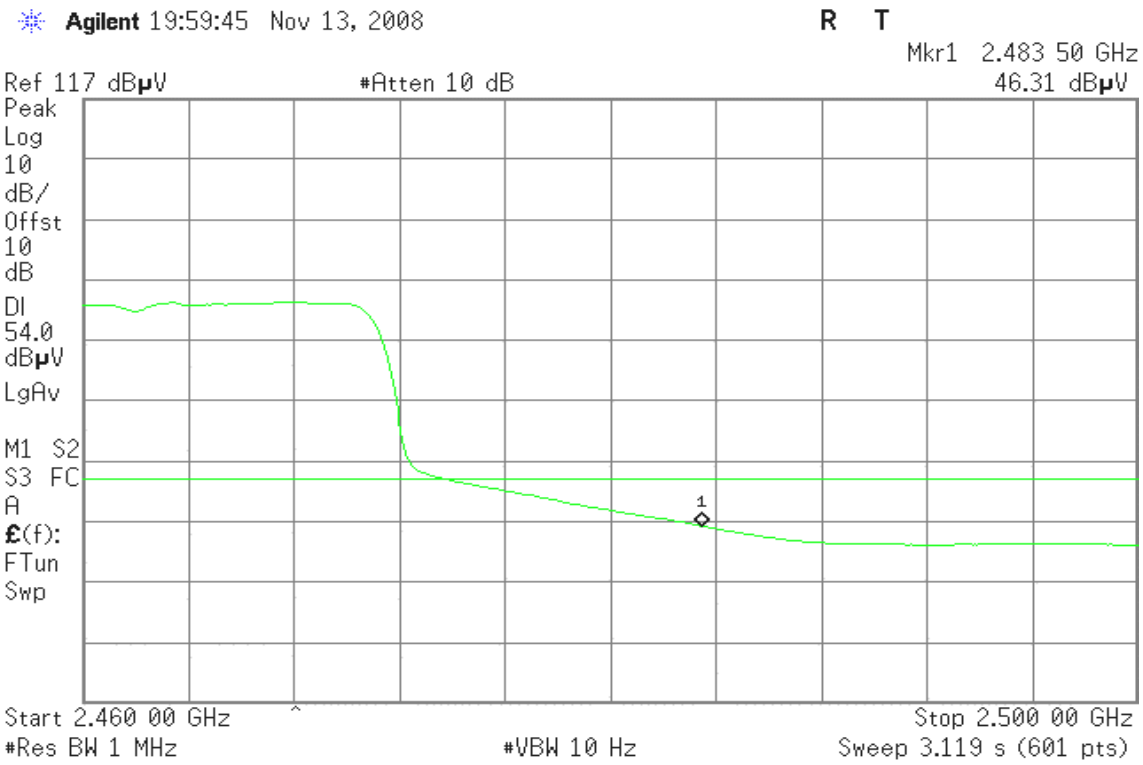

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

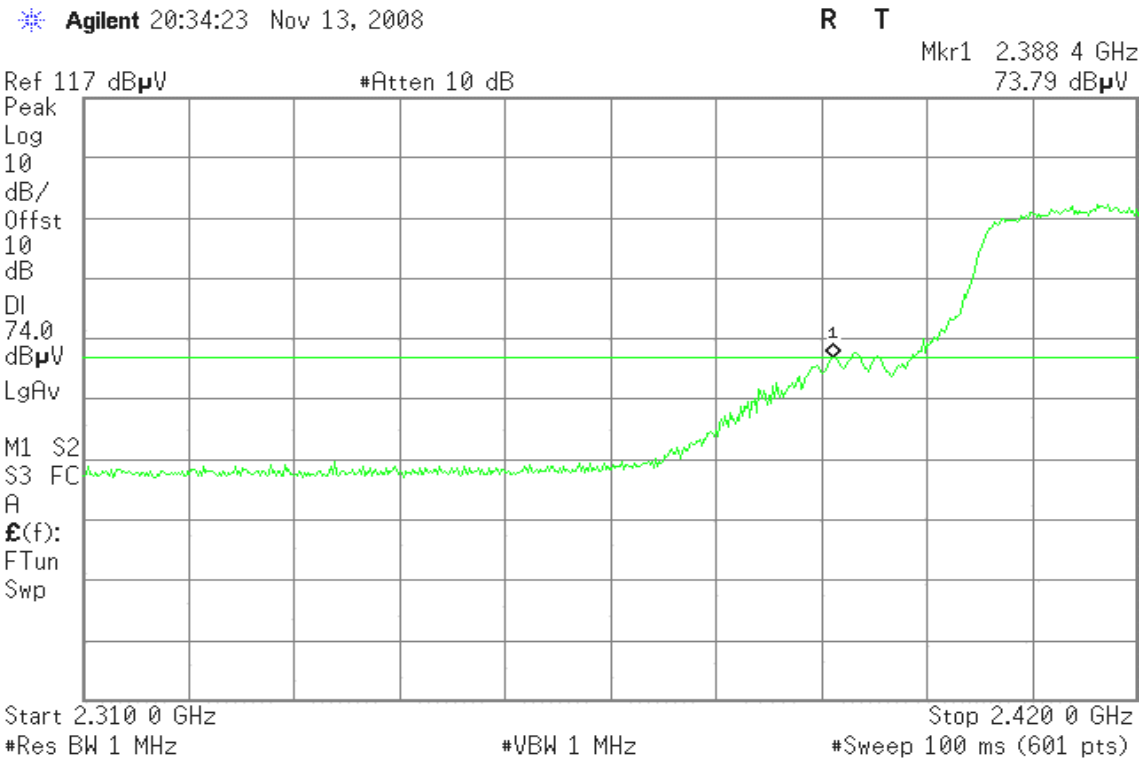



**Detector mode: Average** **Polarity: Horizontal**

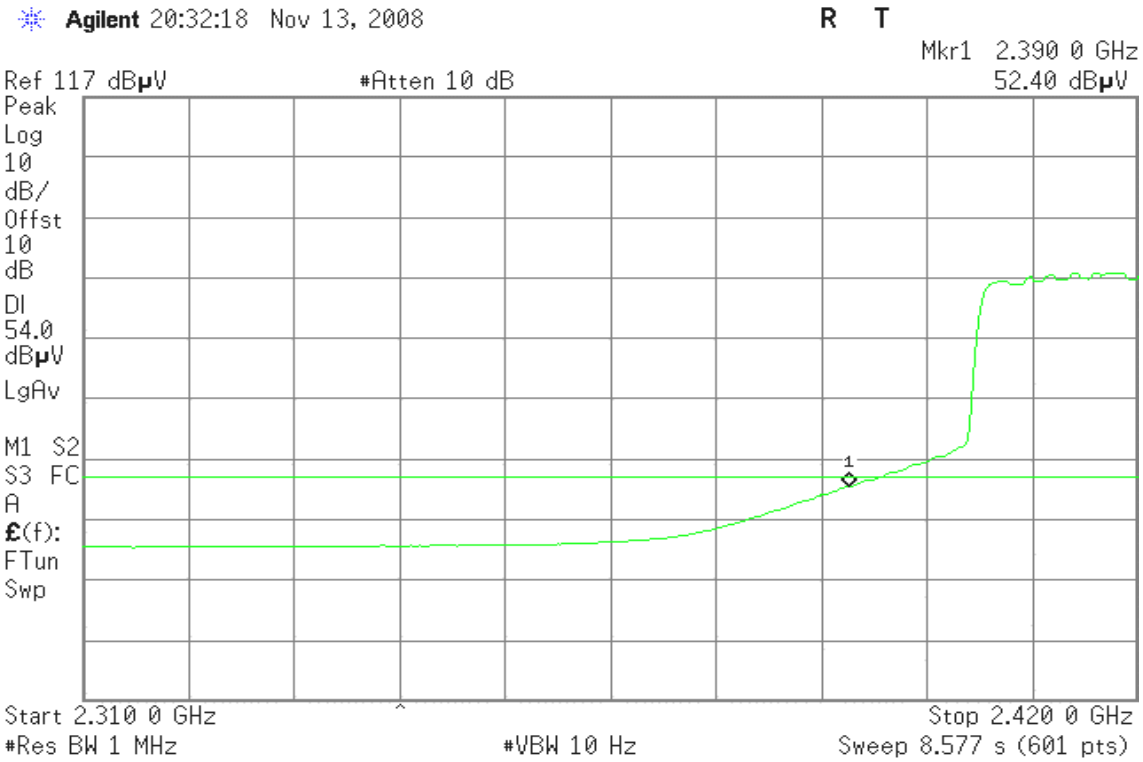


## Band Edges (IEEE 802.11n HT40 mode / CH Low)

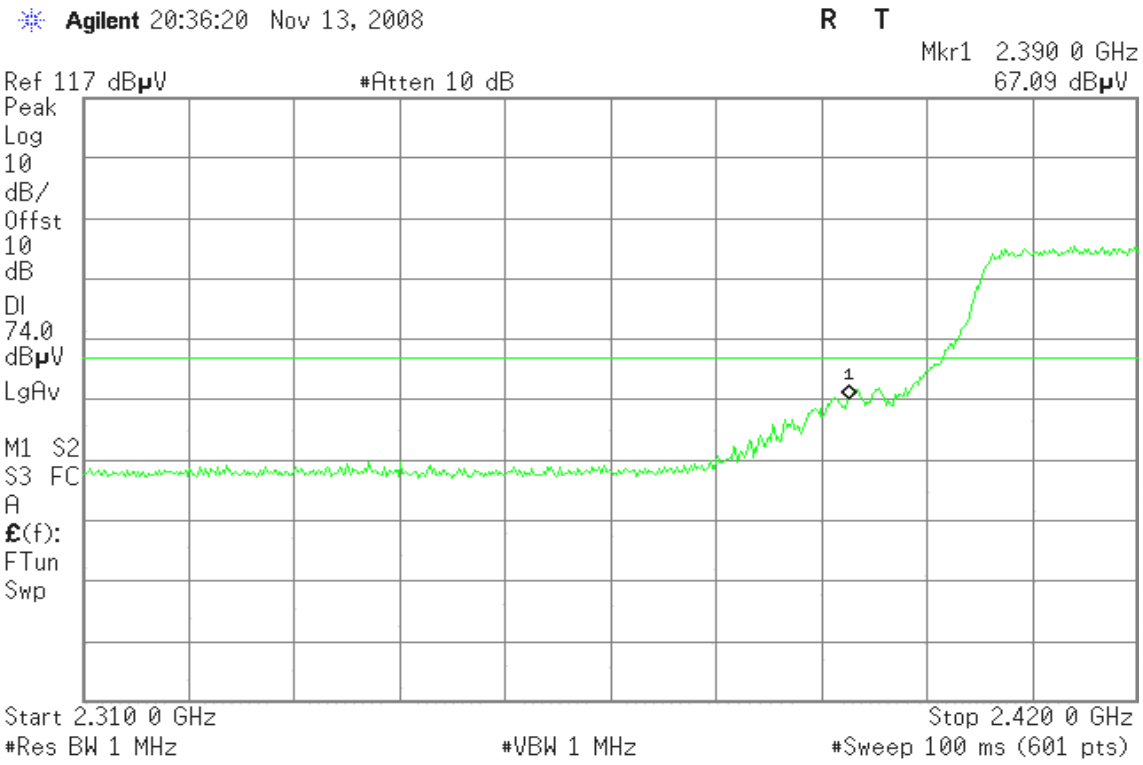
**Detector mode: Peak** **Polarity: Vertical**



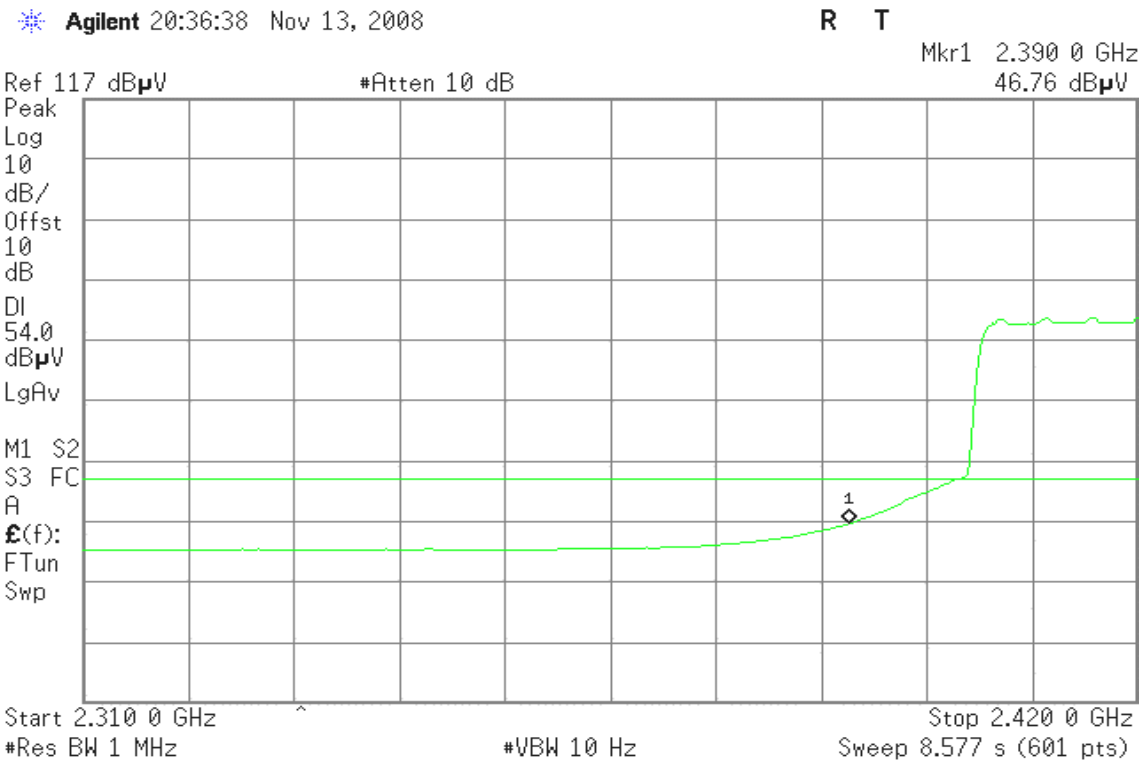

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**

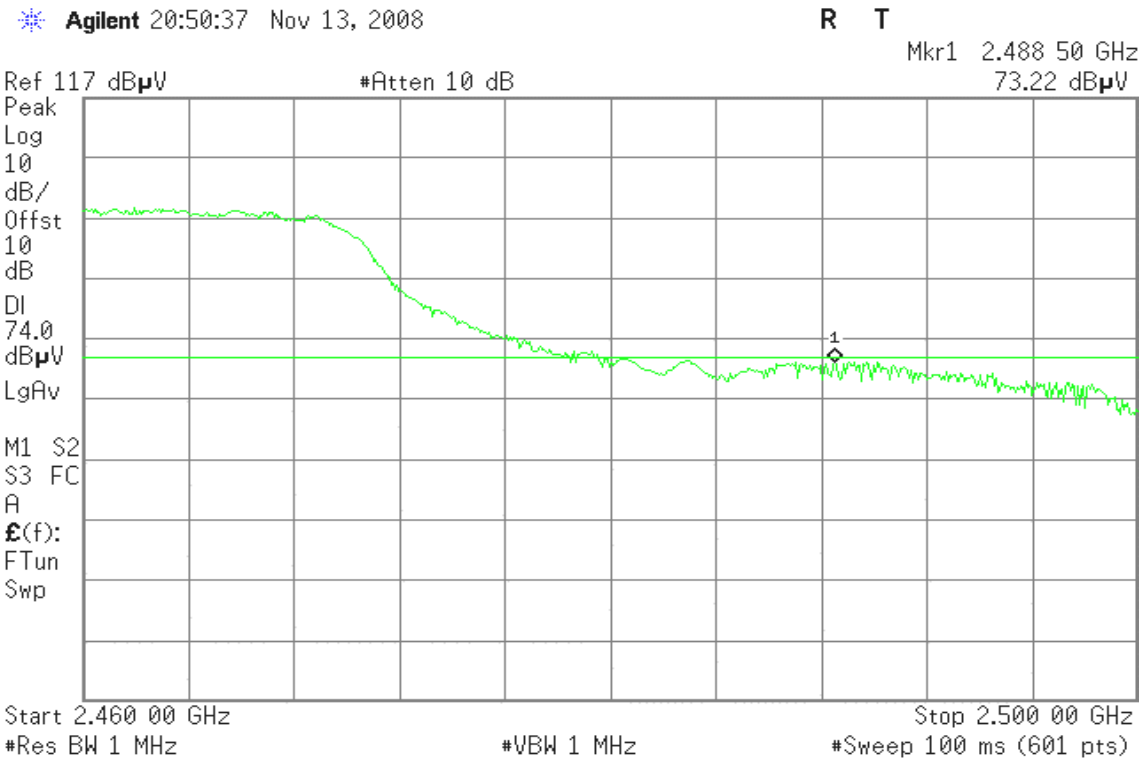



**Detector mode: Average** **Polarity: Horizontal**

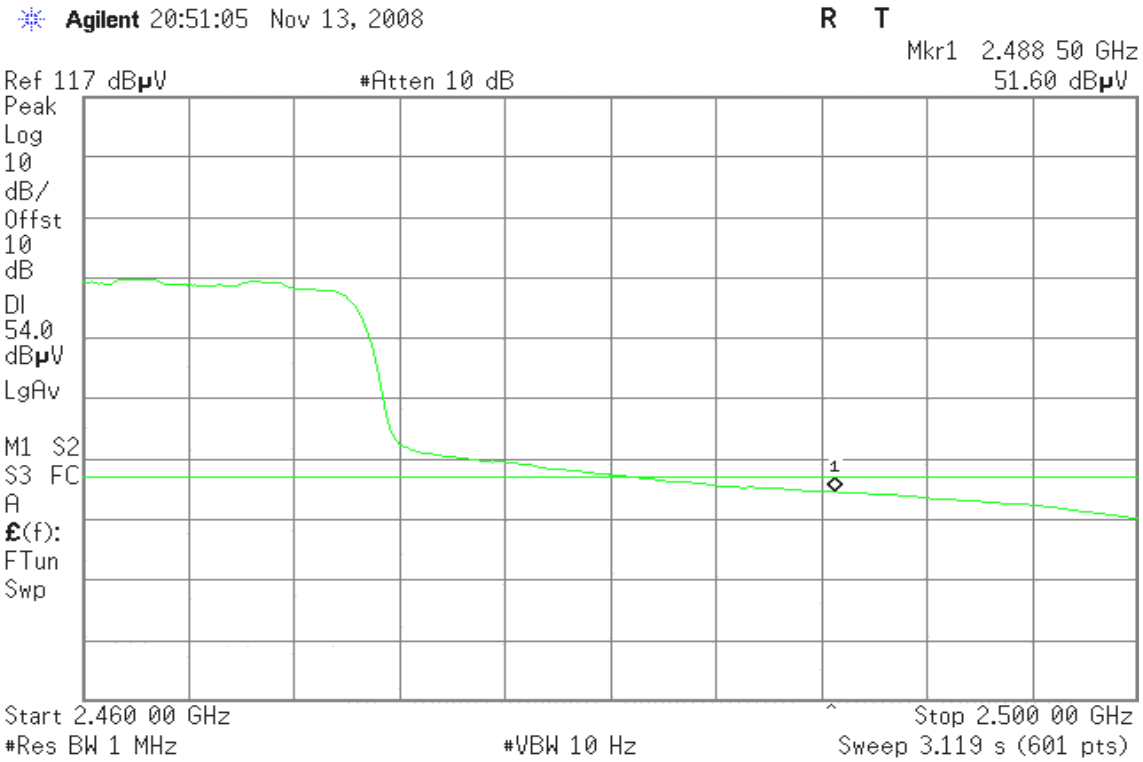


## Band Edges (IEEE 802.11n HT40 mode / CH High)

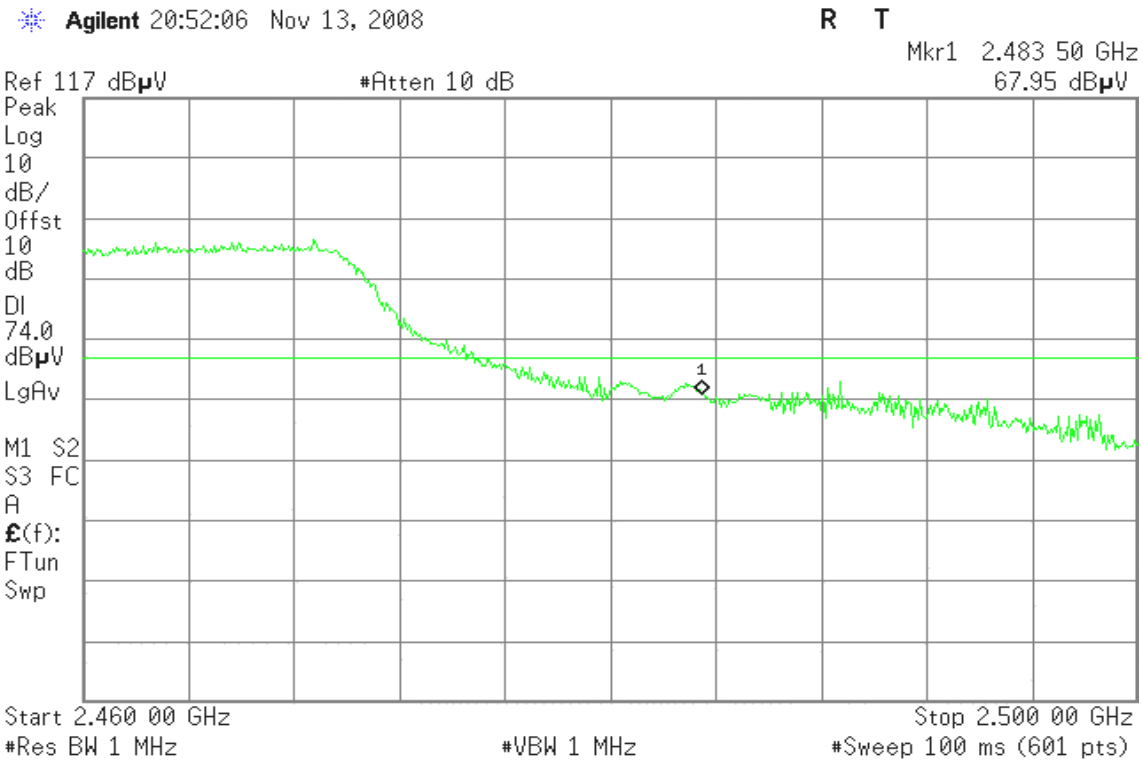
### Detector mode: Peak Polarity: Vertical



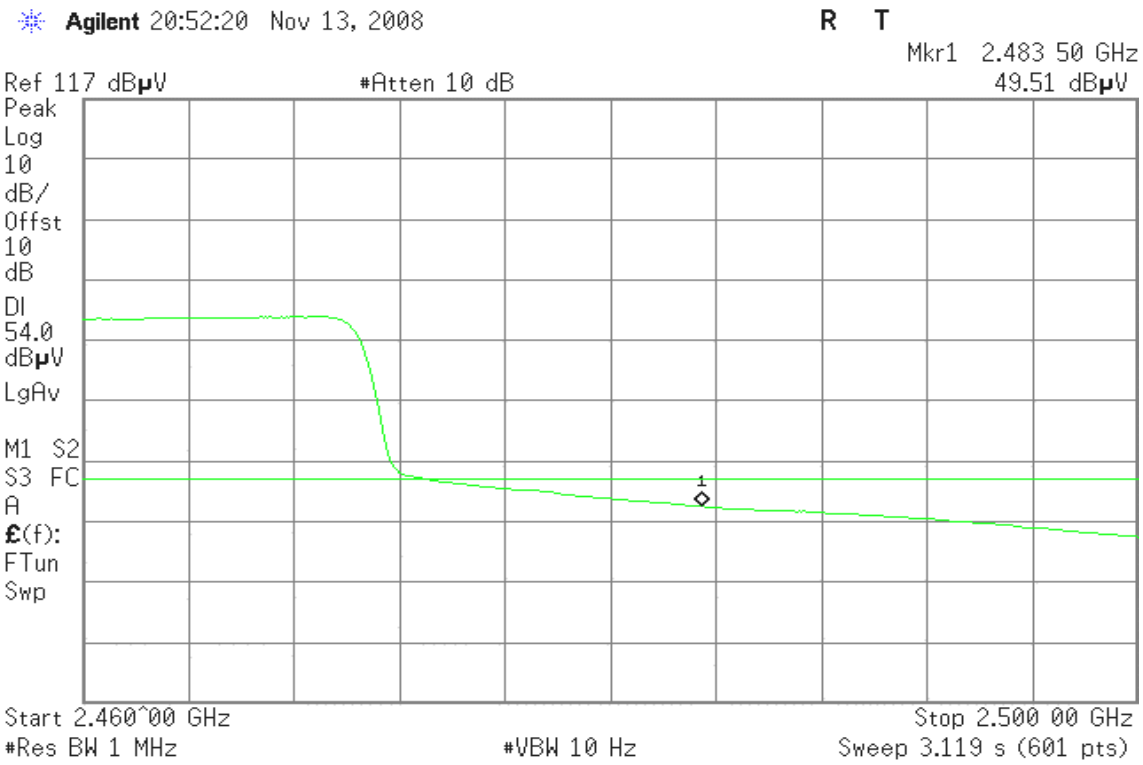

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**



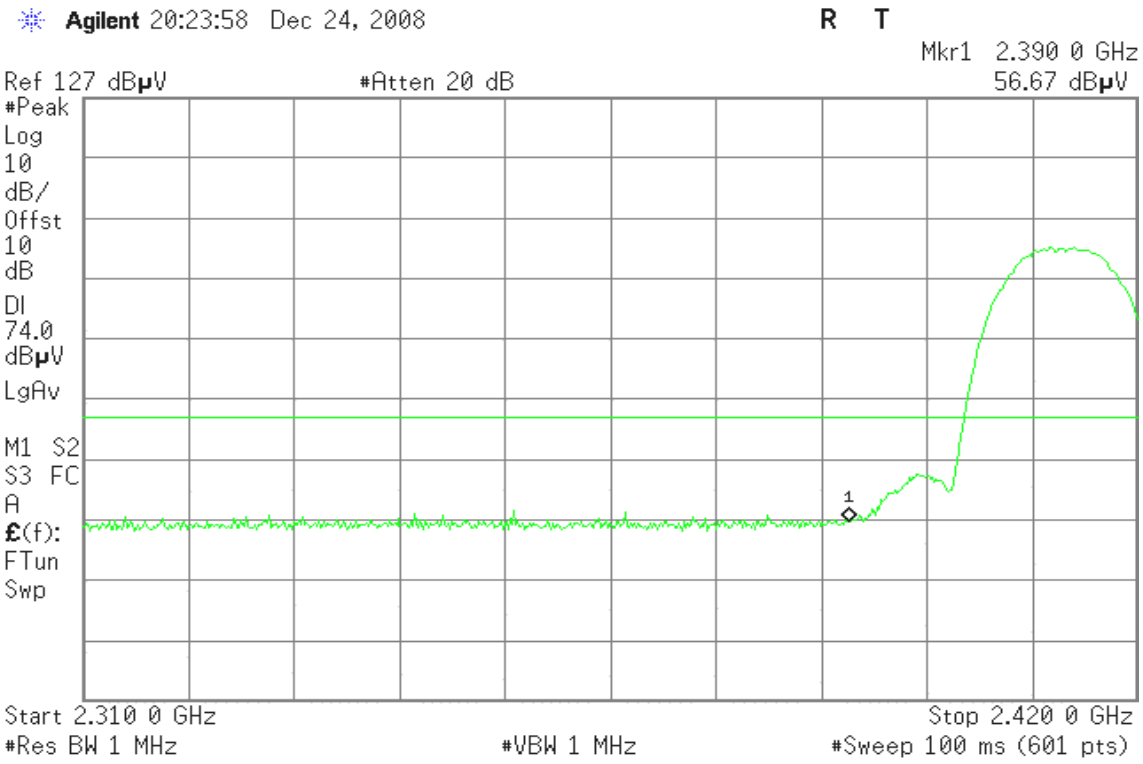

**Detector mode: Average** **Polarity: Horizontal**



**Dipole Antenna / Full Length Board:**

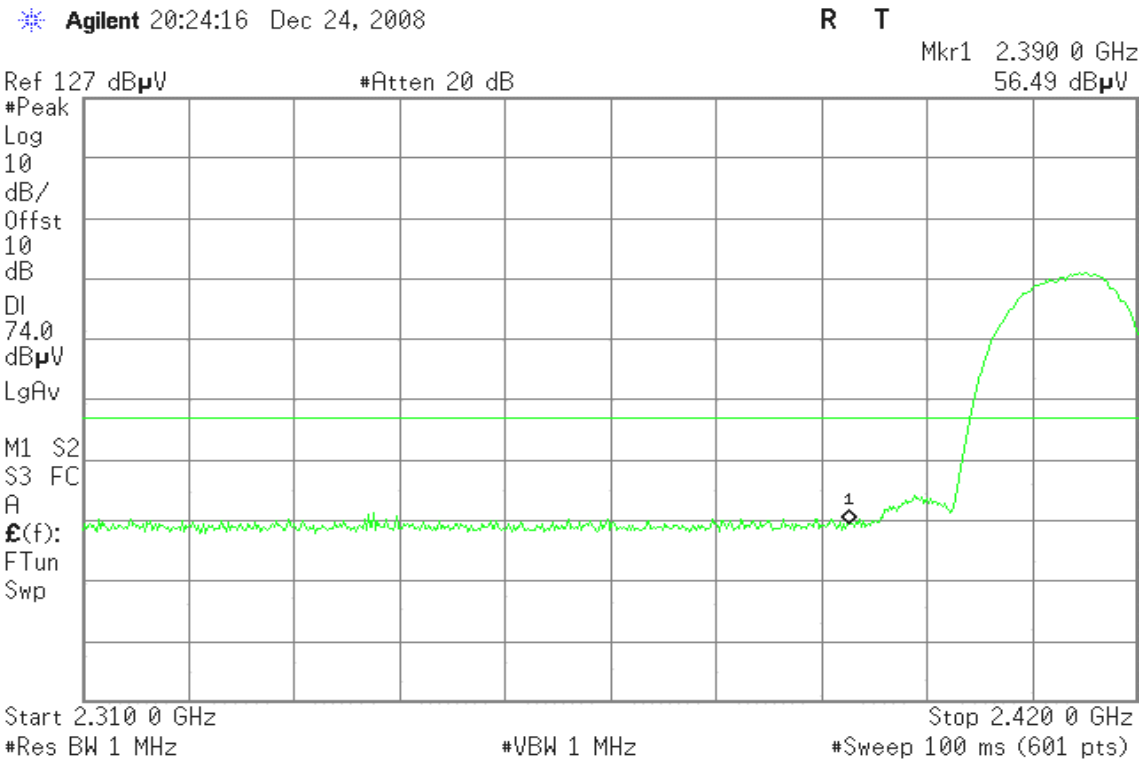
**Band Edges (IEEE 802.11b mode / CH Low)**

**Detector mode: Peak** **Polarity: Vertical**




**Detector mode: Average** **Polarity: Vertical**

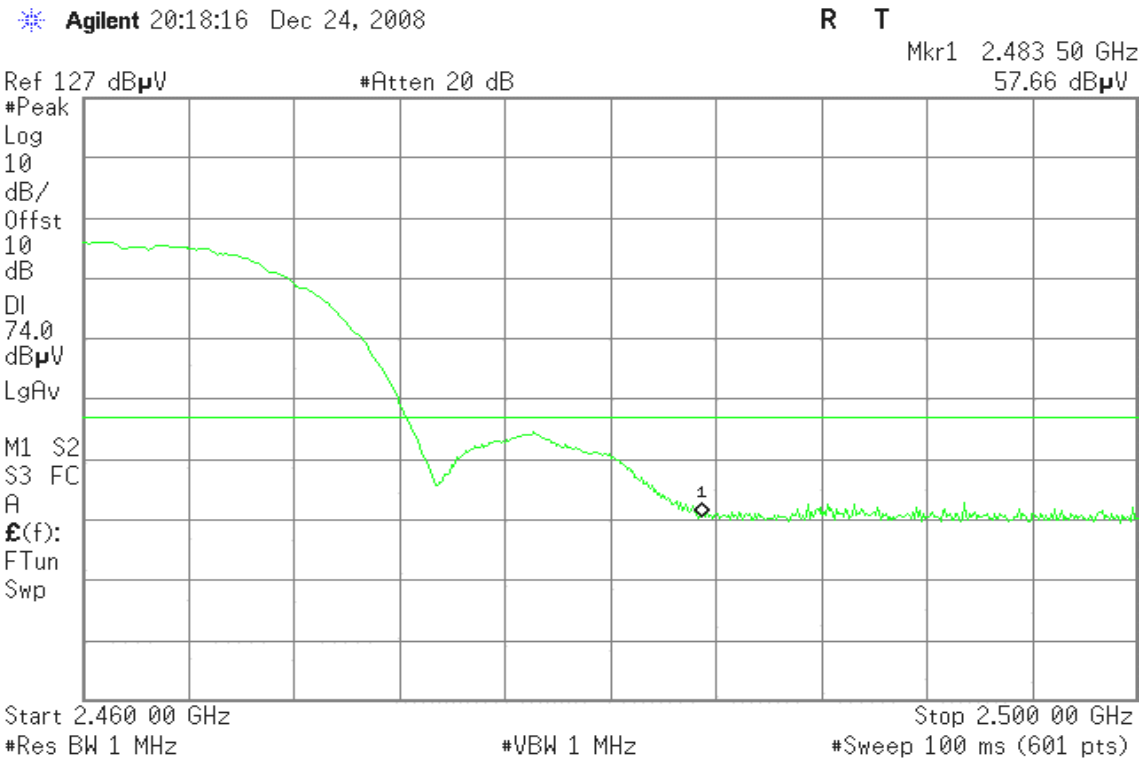
**Detector mode: Peak** **Polarity: Horizontal**



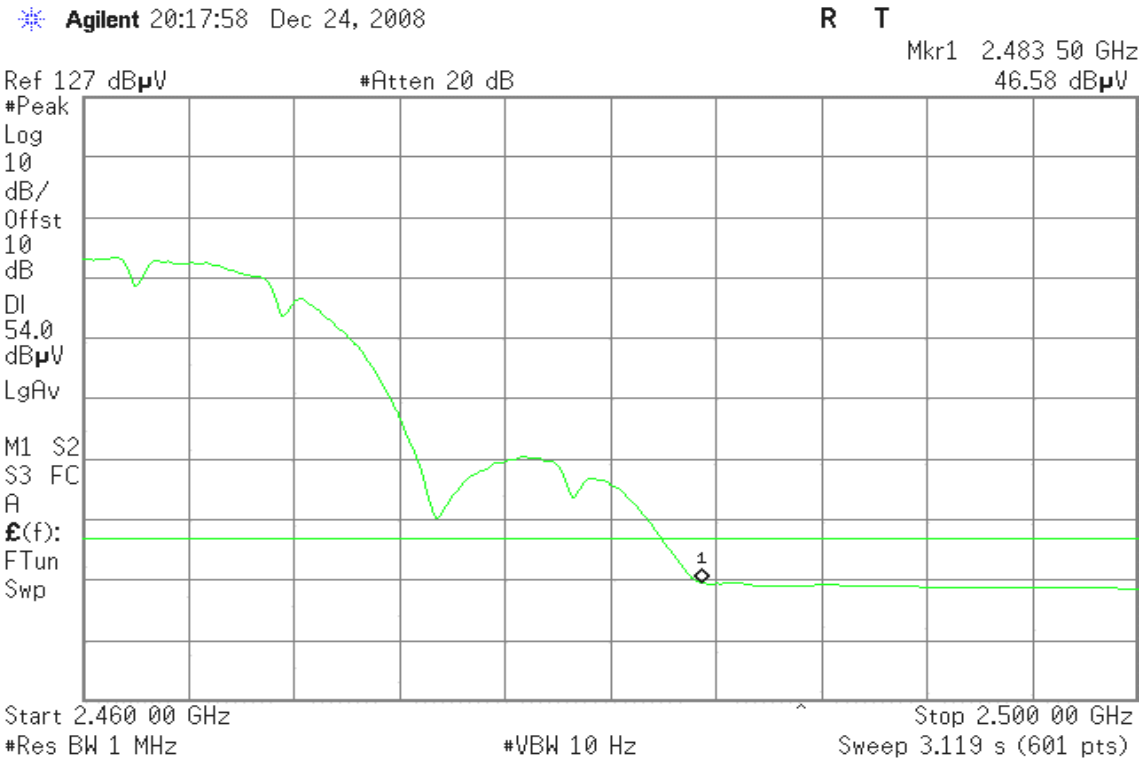

**Detector mode: Average** **Polarity: Horizontal**

## Band Edges (IEEE 802.11b mode / CH High)

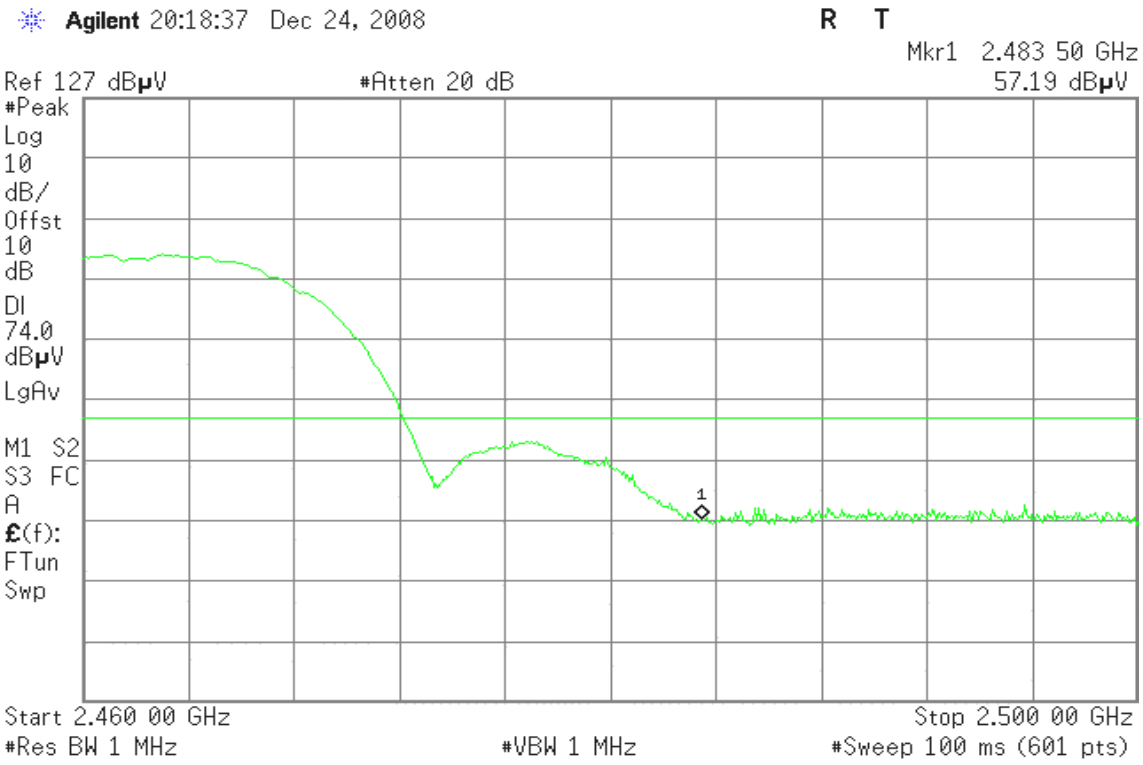
### Detector mode: Peak Polarity: Vertical



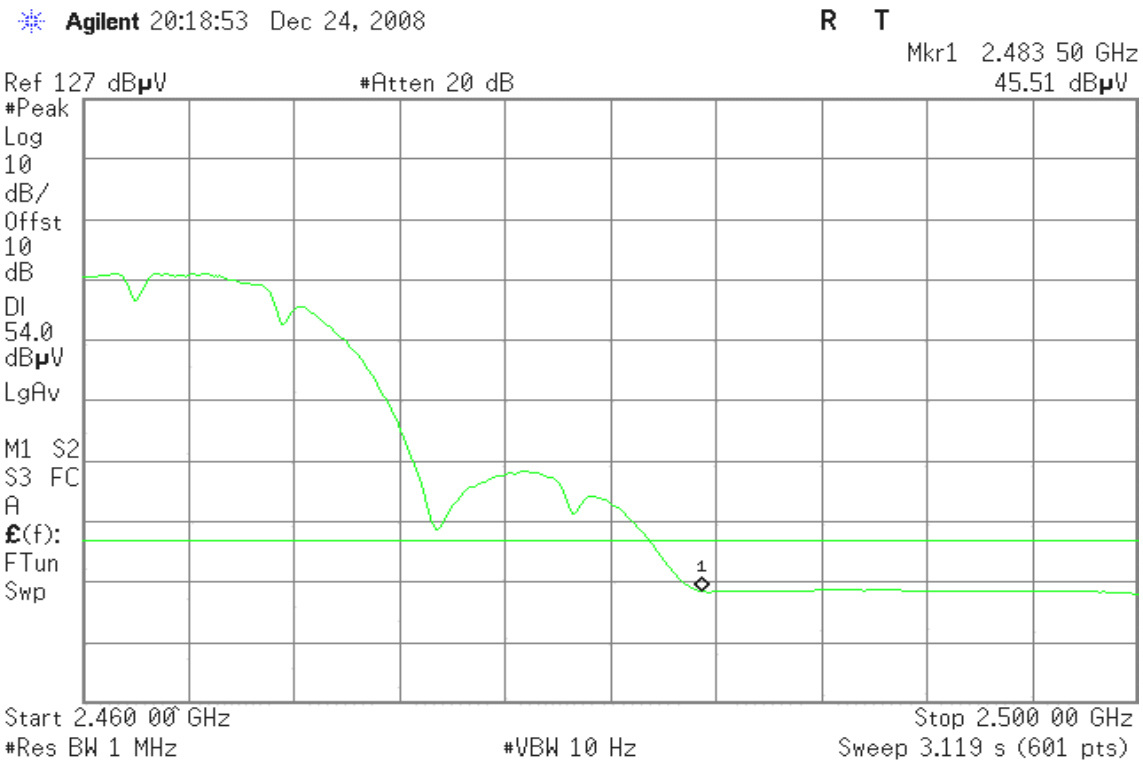

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

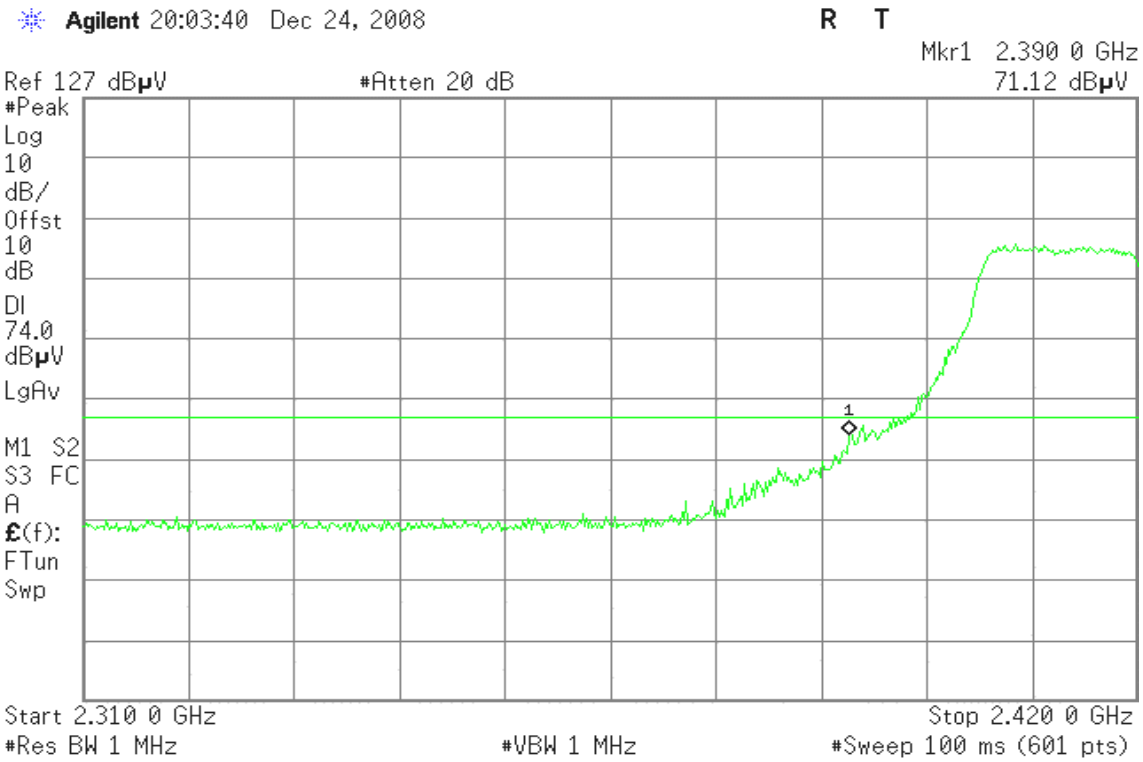



**Detector mode: Average** **Polarity: Horizontal**

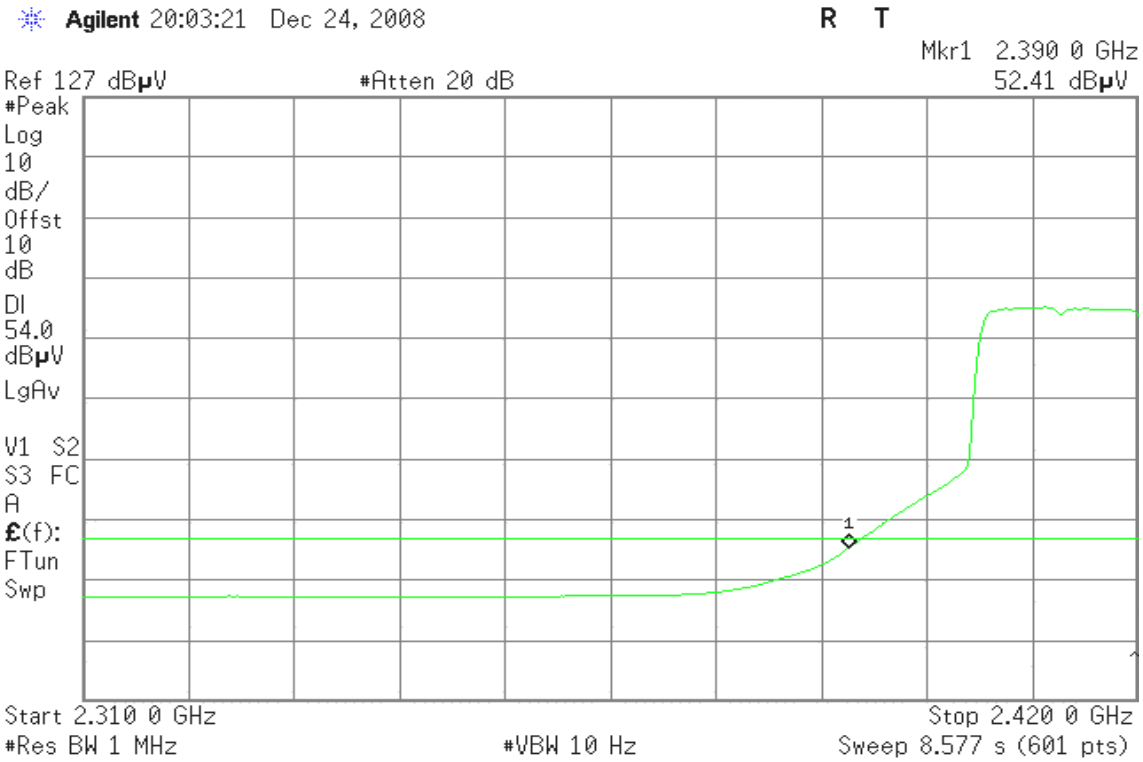


## Band Edges (IEEE 802.11g mode / CH Low)

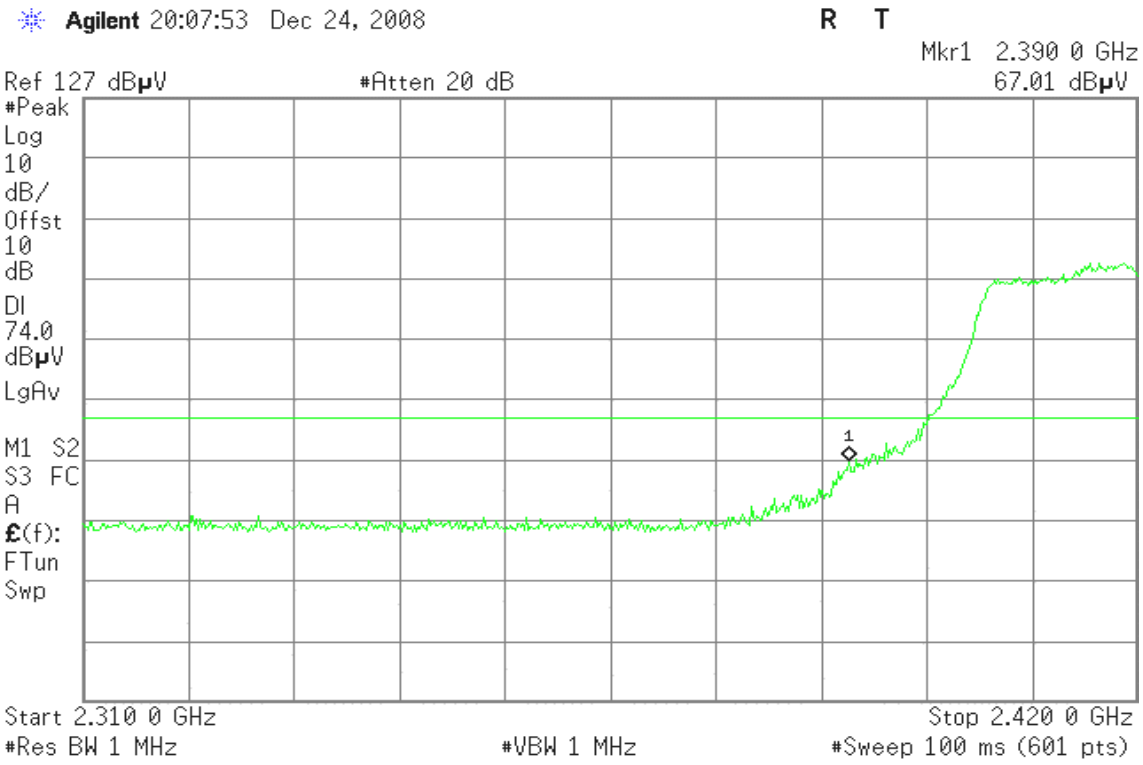
**Detector mode: Peak** **Polarity: Vertical**



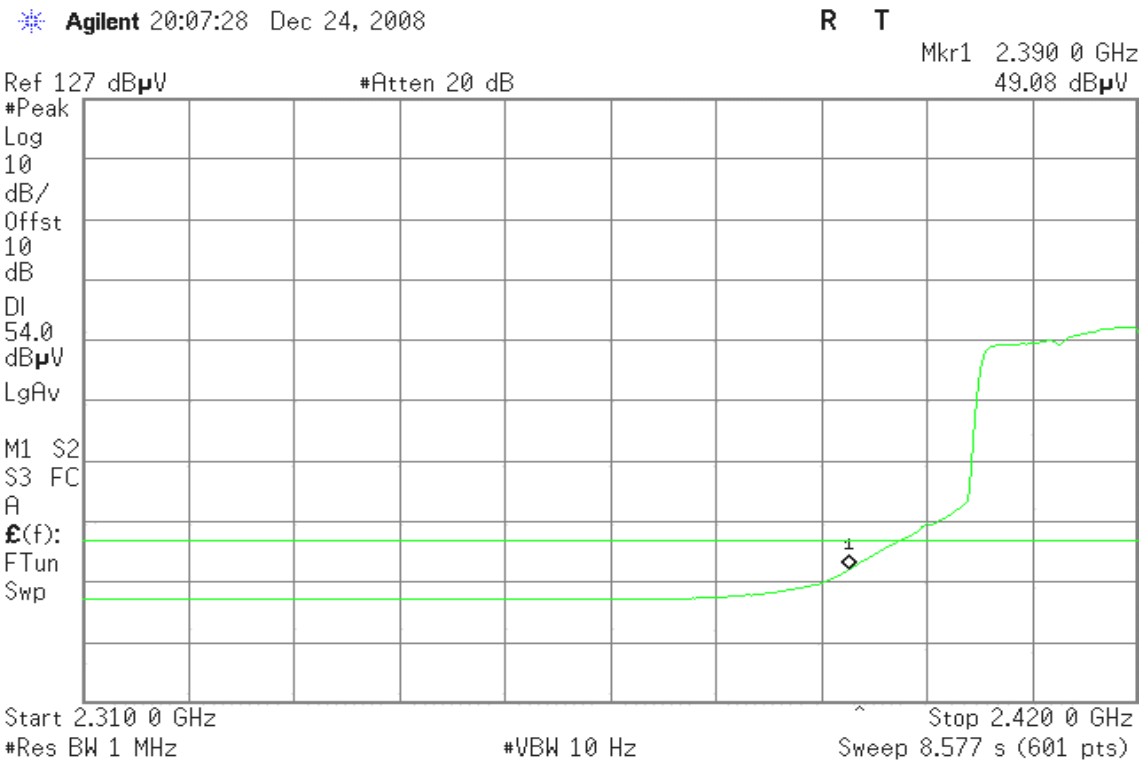

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**

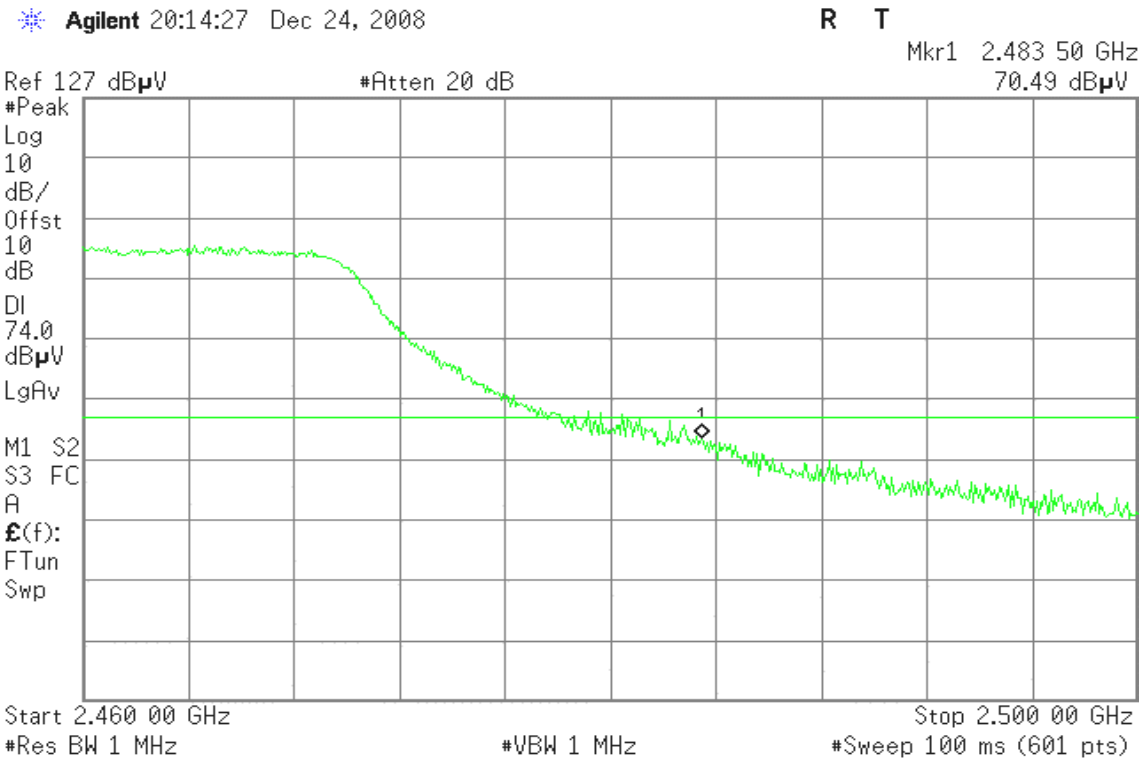



**Detector mode: Average** **Polarity: Horizontal**

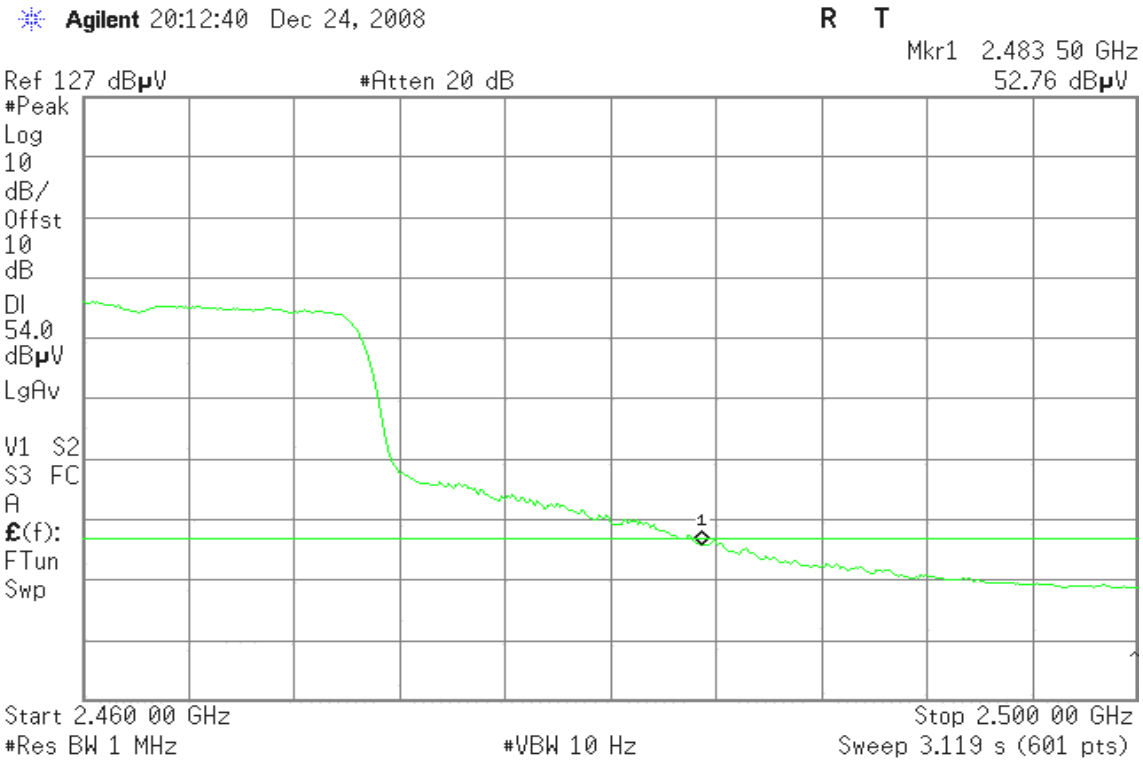


## Band Edges (IEEE 802.11g mode / CH High)

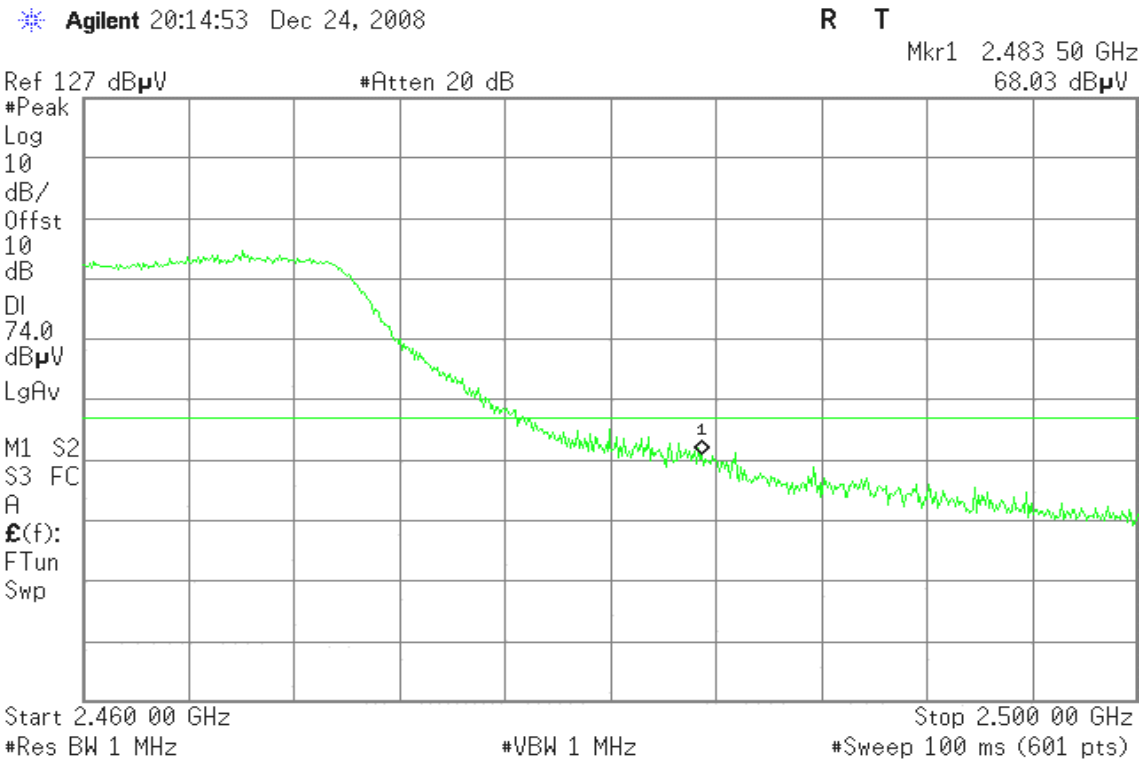
### Detector mode: Peak Polarity: Vertical



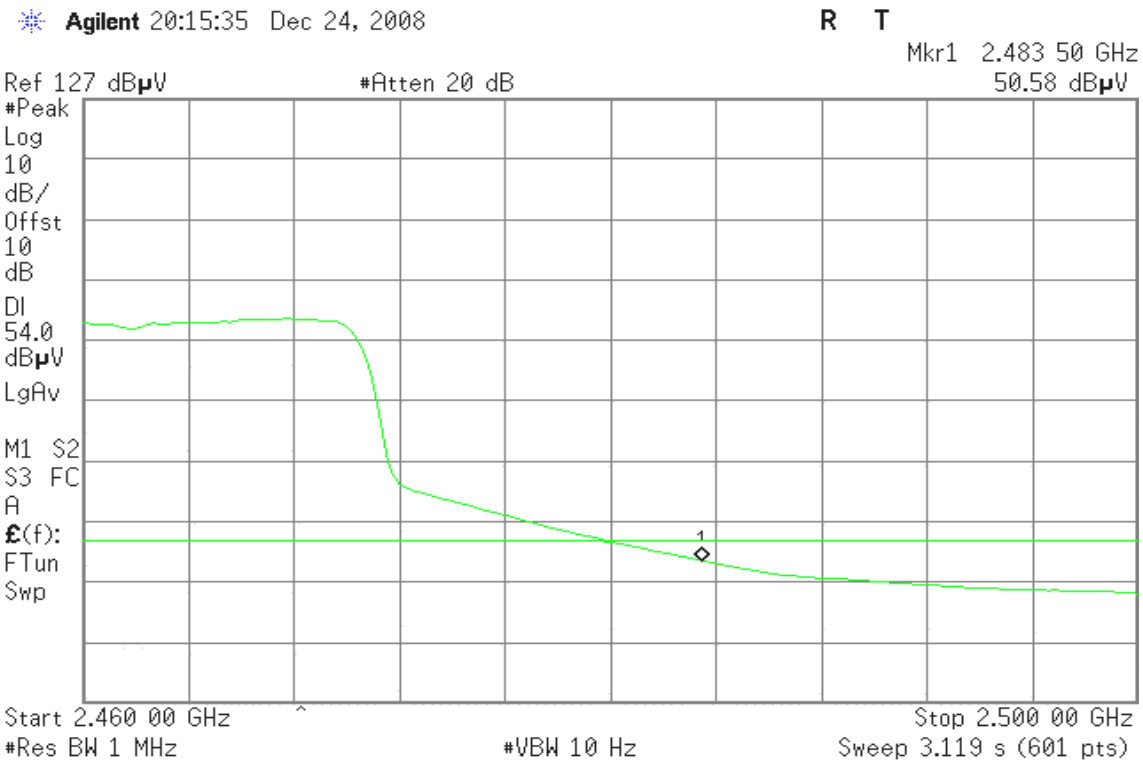

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

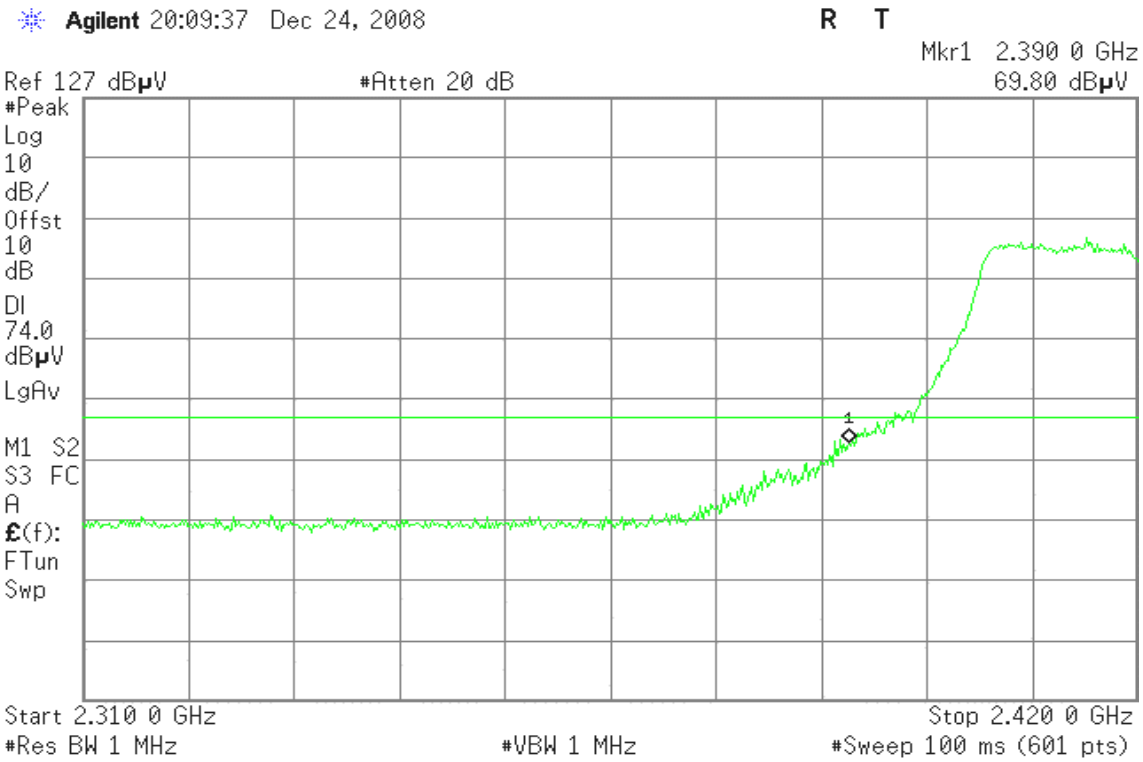



**Detector mode: Average** **Polarity: Horizontal**

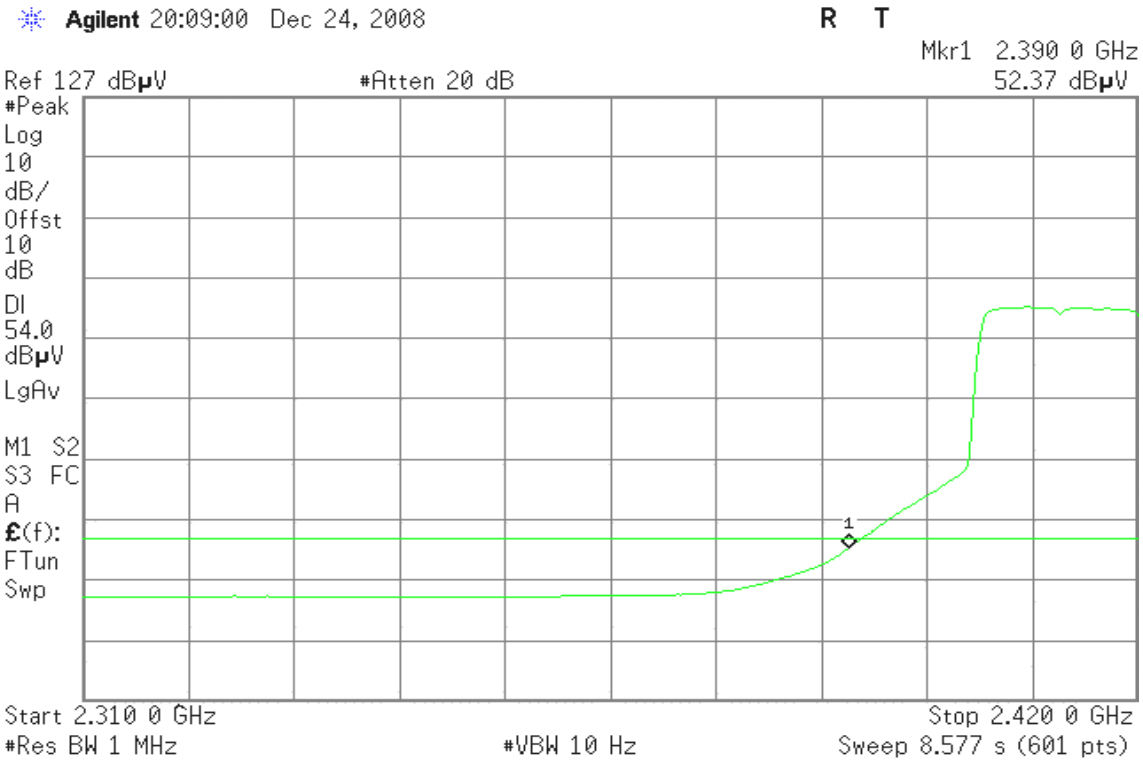


## Band Edges (IEEE 802.11n HT20 mode / CH Low)

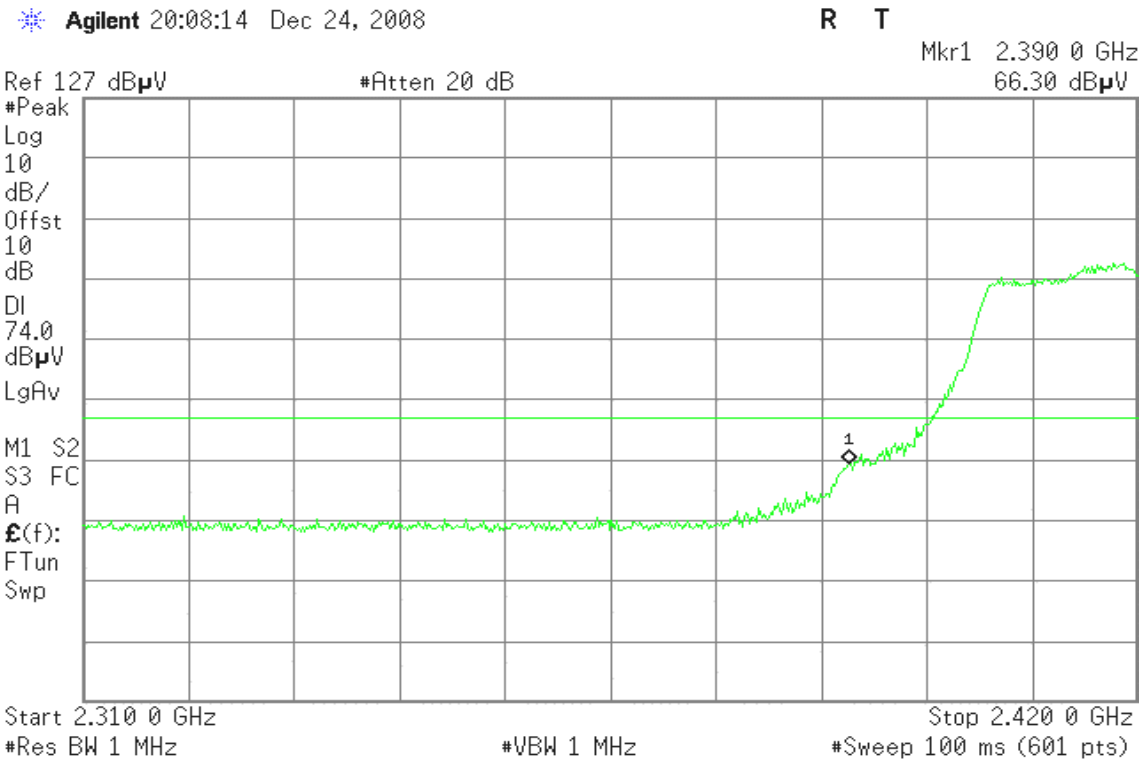
**Detector mode: Peak** **Polarity: Vertical**



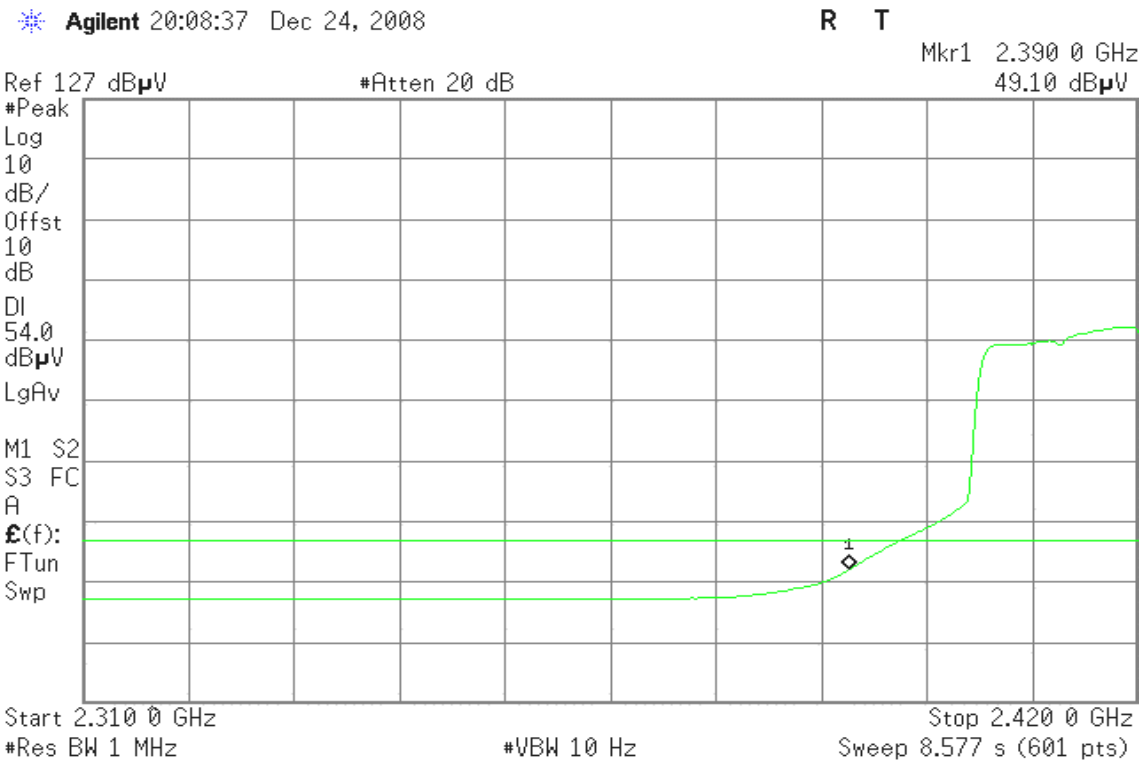

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**

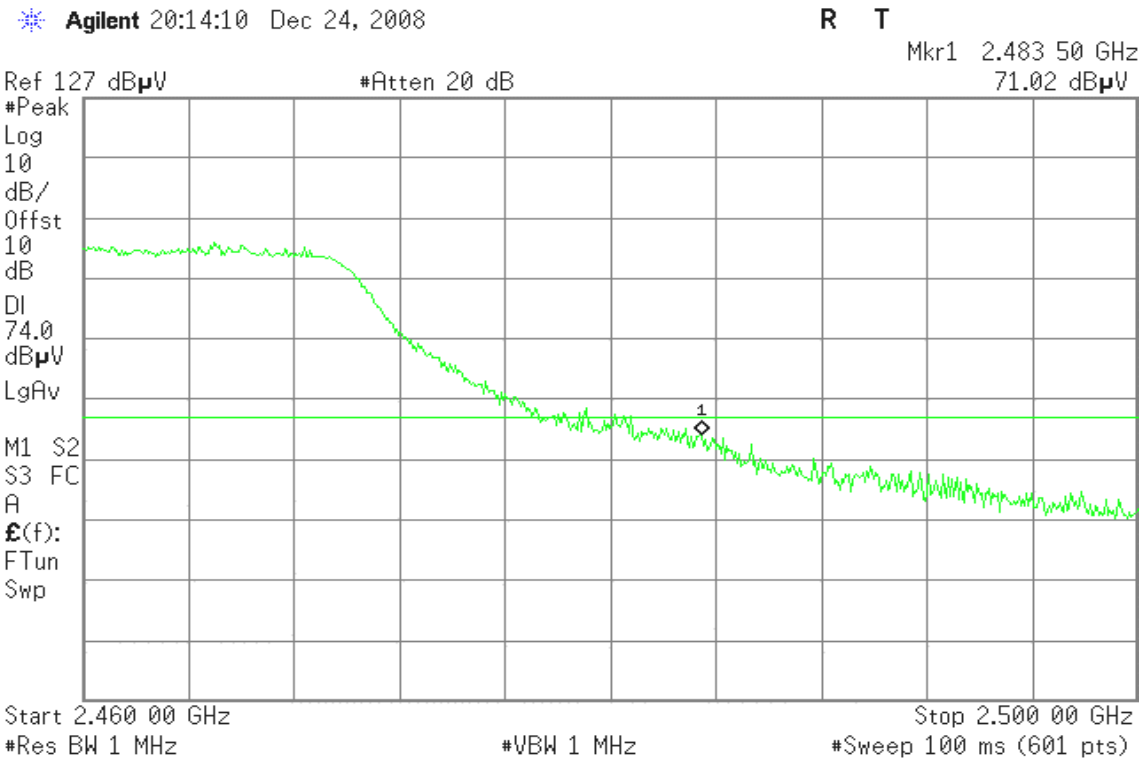



**Detector mode: Average** **Polarity: Horizontal**

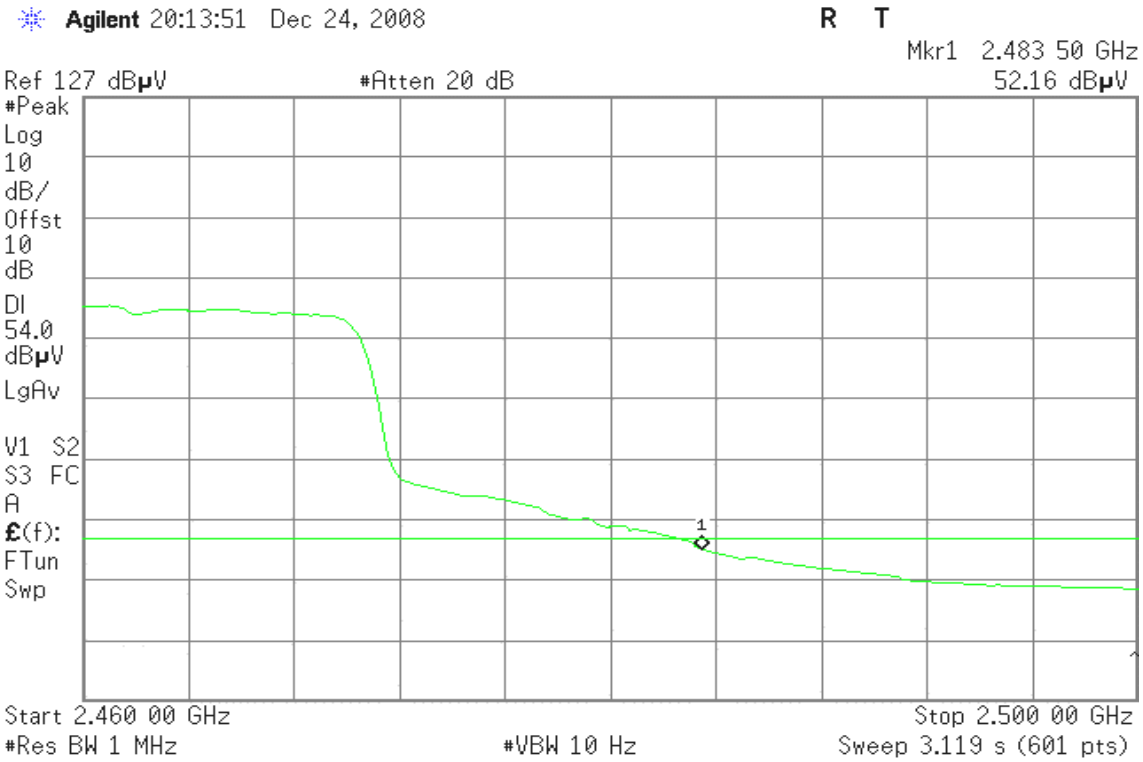


## Band Edges (IEEE 802.11n HT20 mode / CH High)

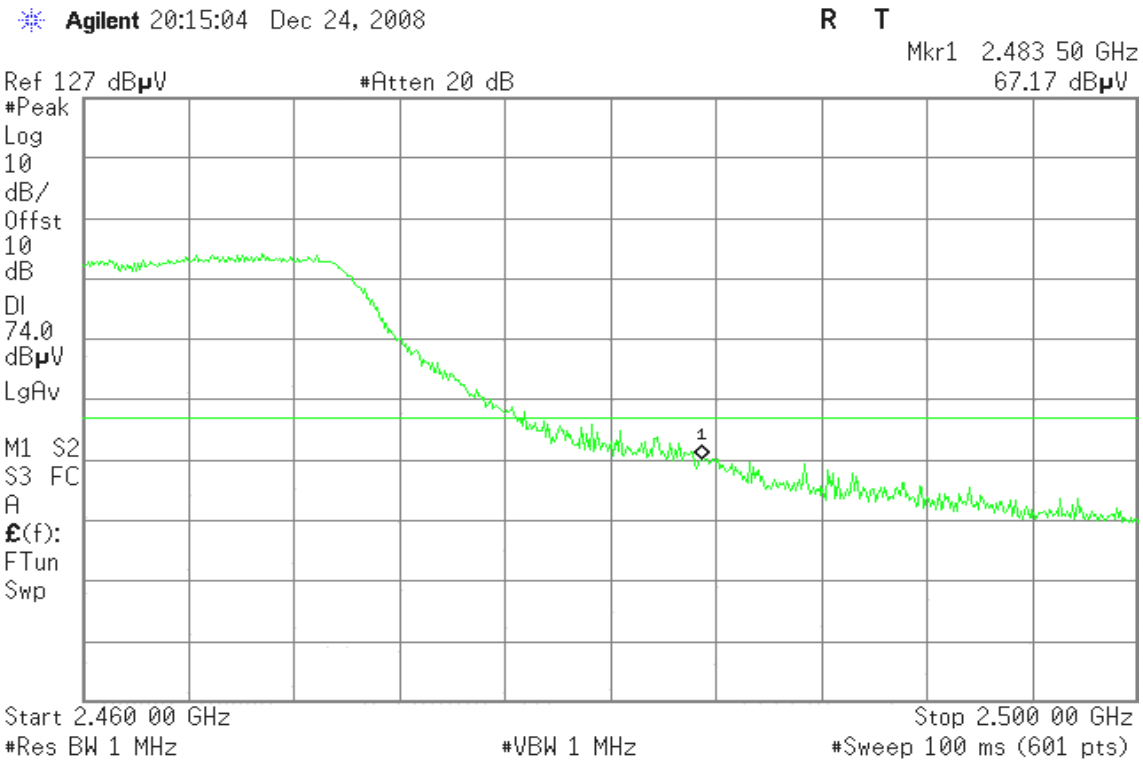
### Detector mode: Peak Polarity: Vertical



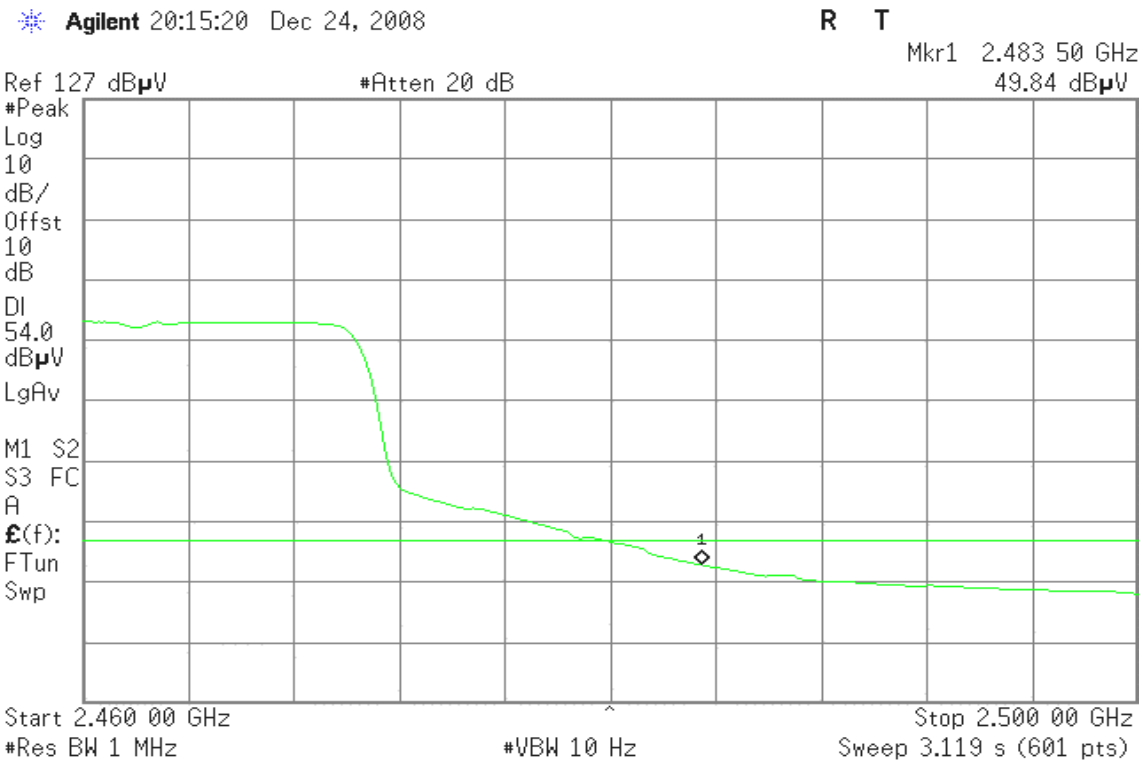

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

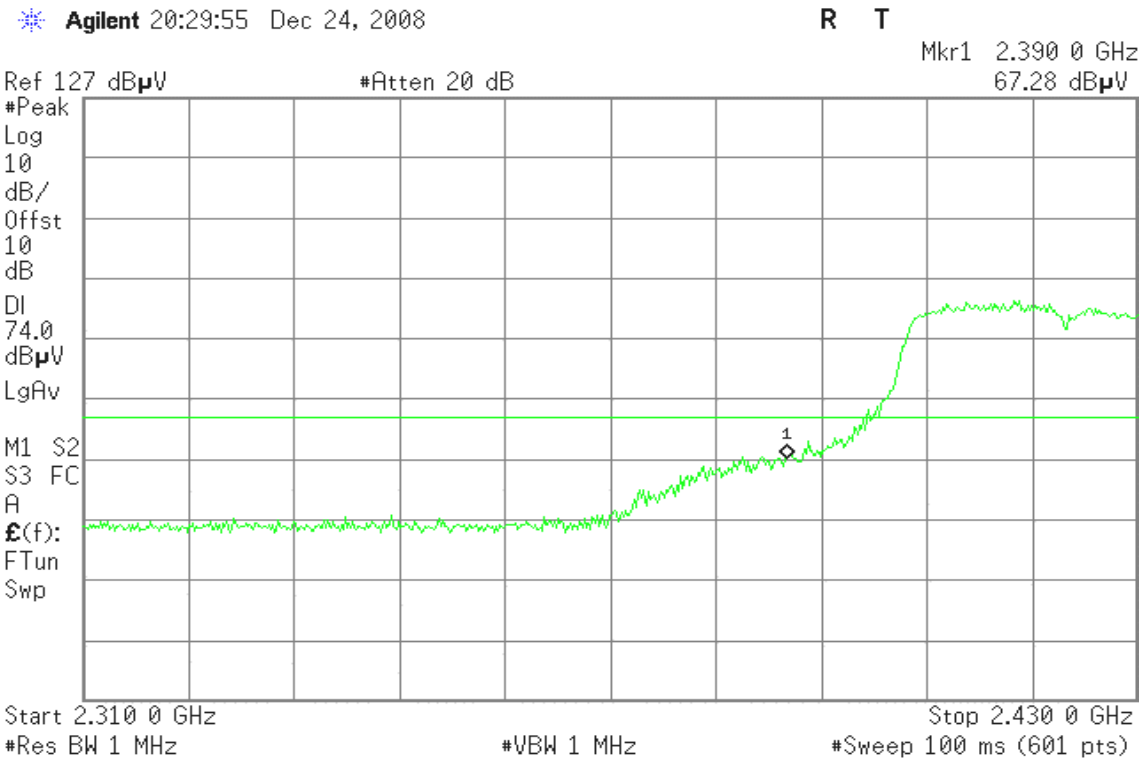



**Detector mode: Average** **Polarity: Horizontal**

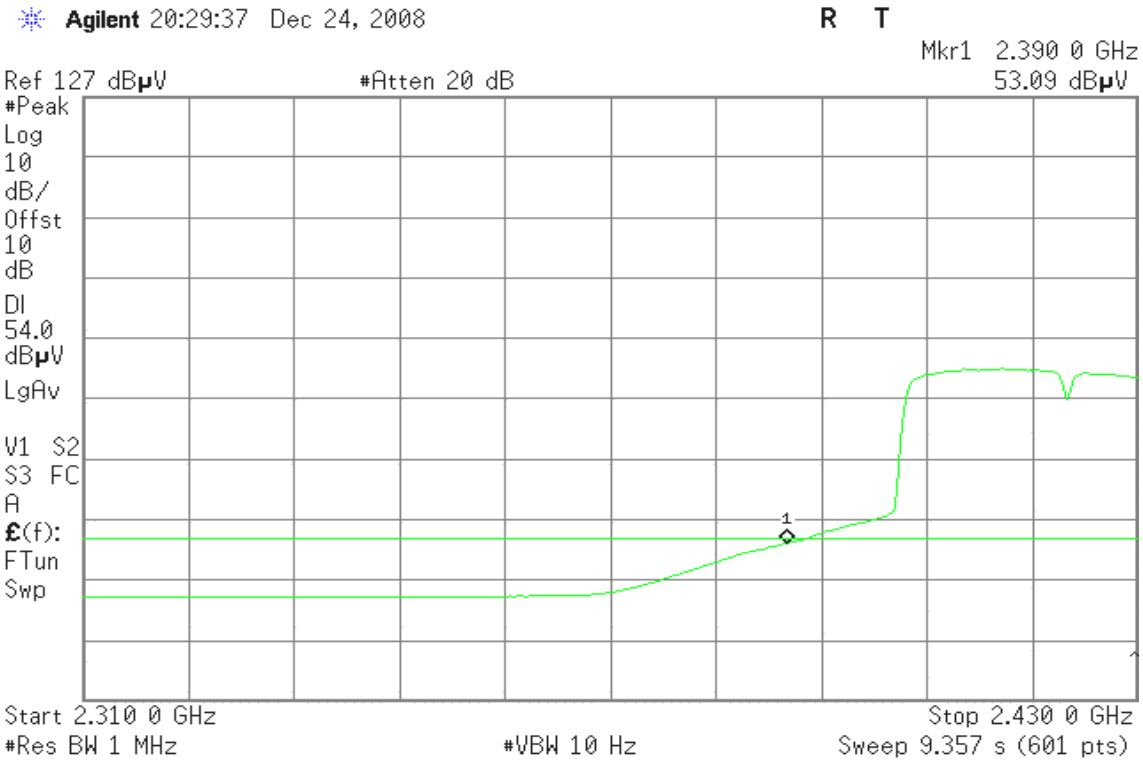


## Band Edges (IEEE 802.11n HT40 mode / CH Low)

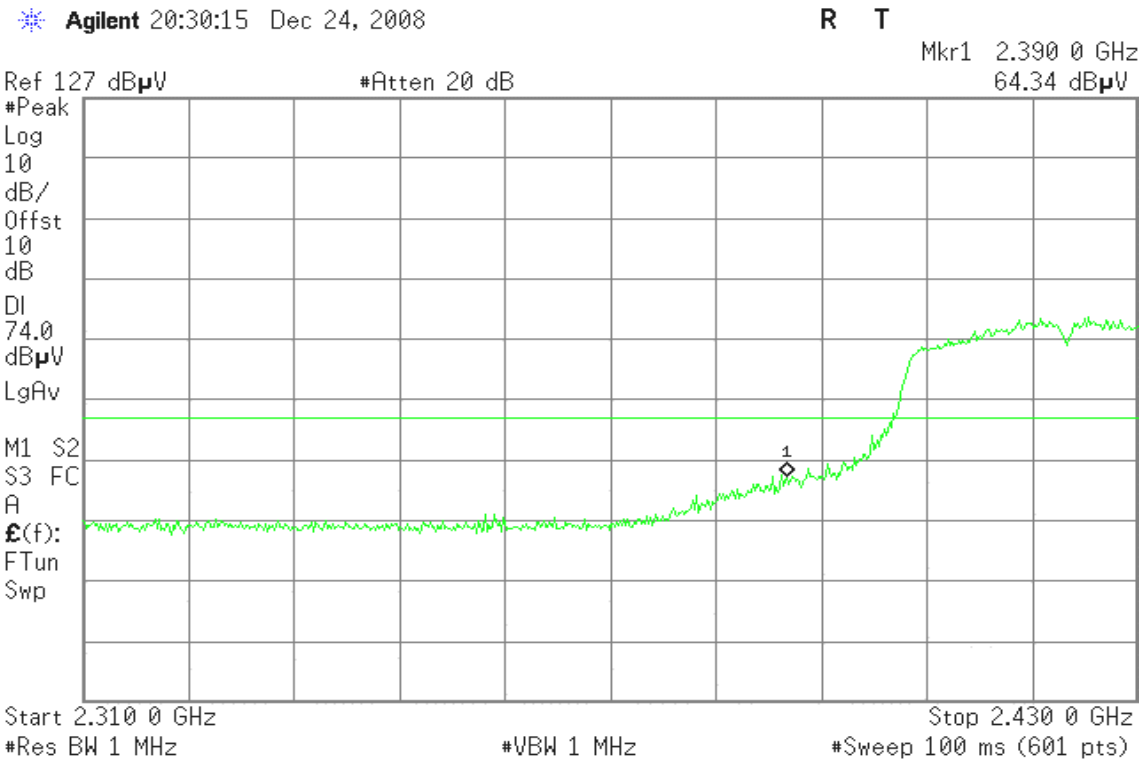
**Detector mode: Peak** **Polarity: Vertical**



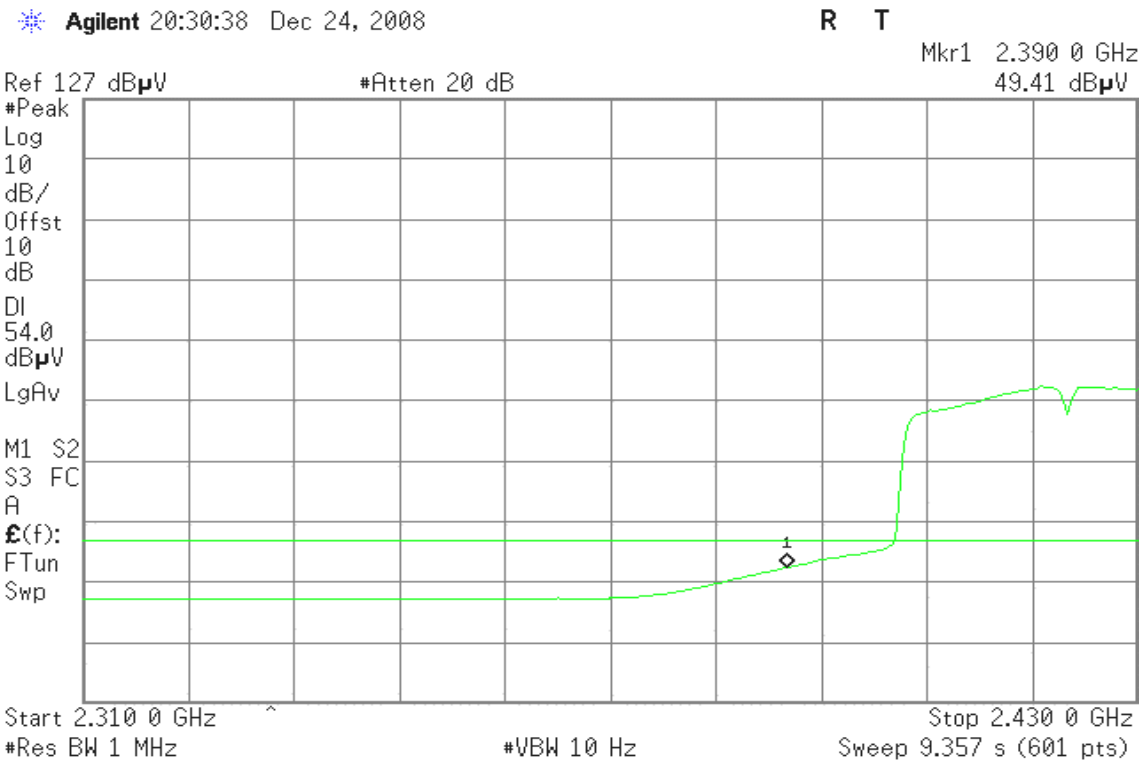

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**

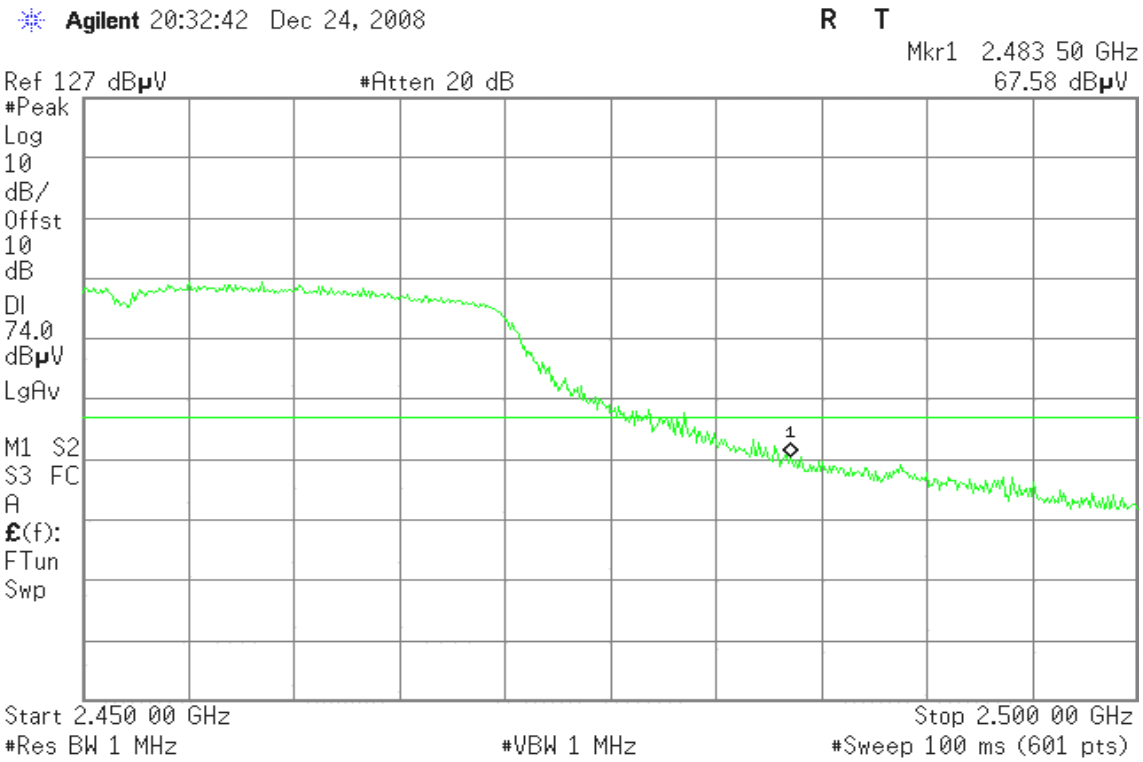



**Detector mode: Average** **Polarity: Horizontal**

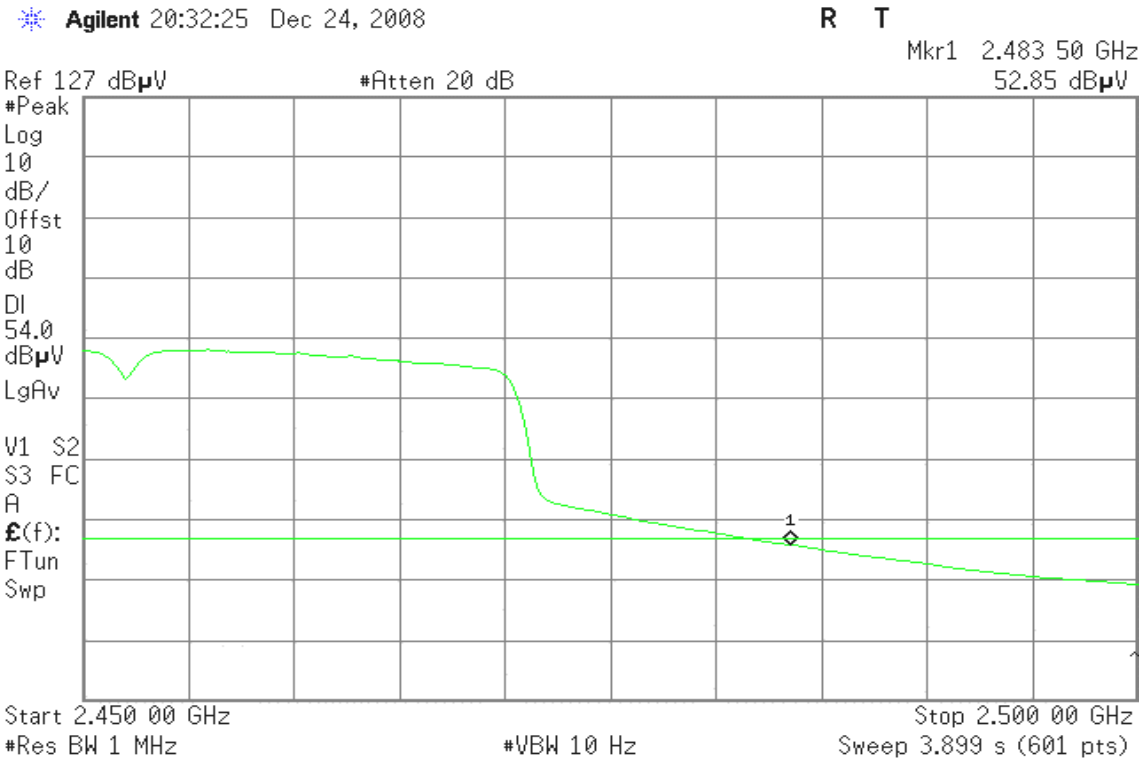


## Band Edges (IEEE 802.11n HT40 mode / CH High)

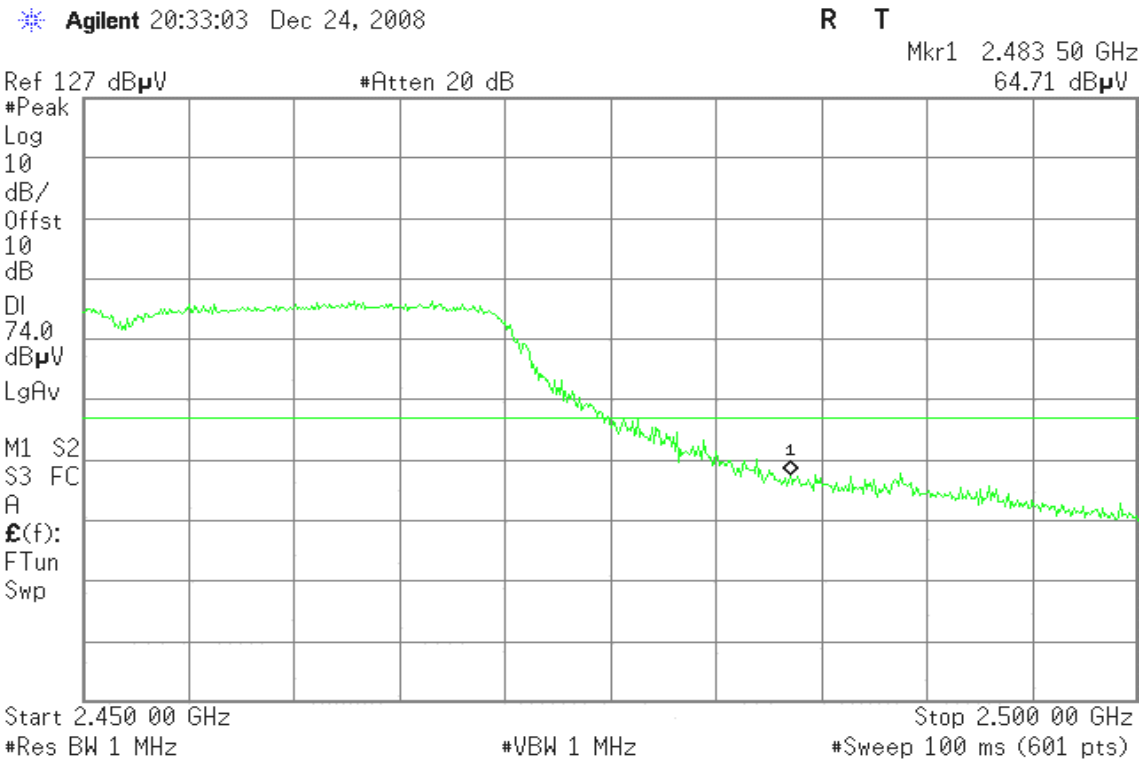
### Detector mode: Peak Polarity: Vertical



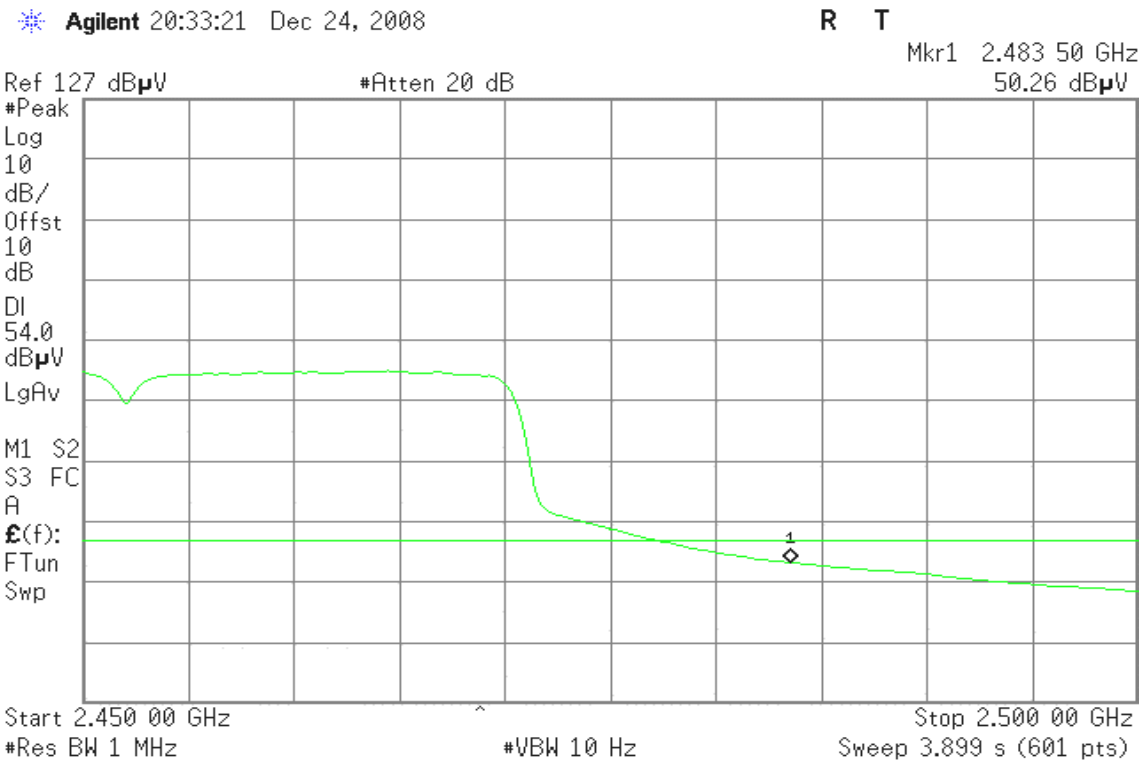

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**



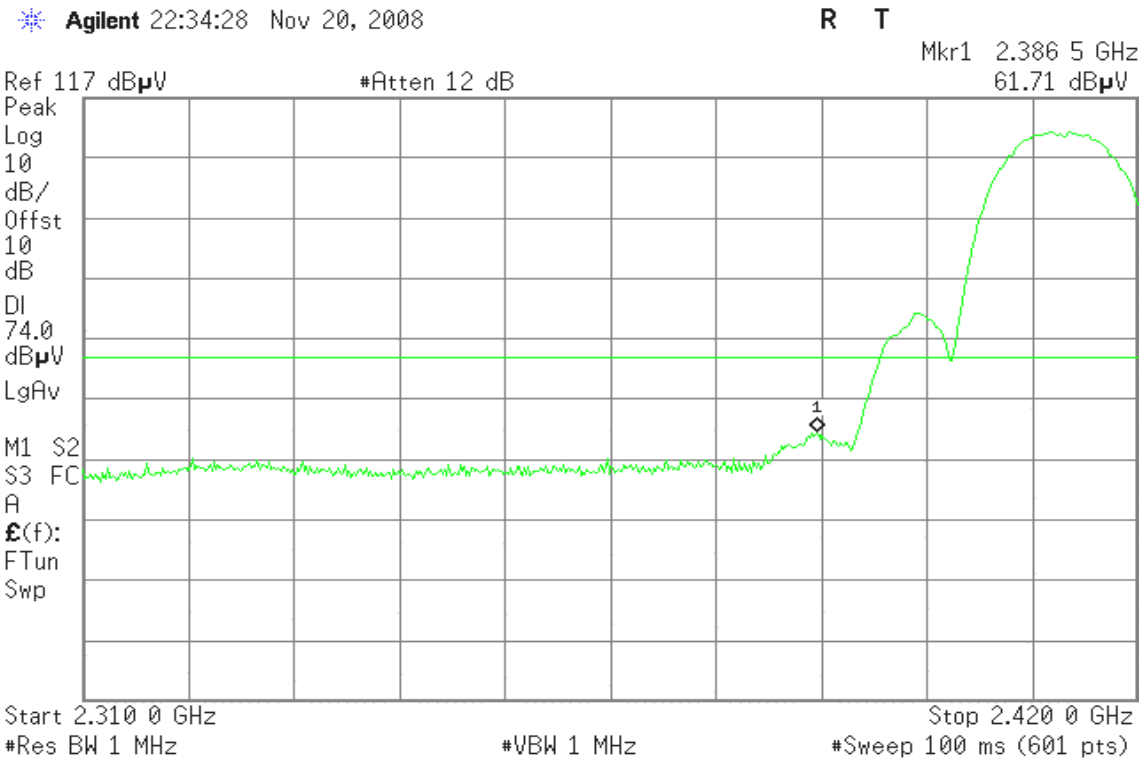

**Detector mode: Average** **Polarity: Horizontal**



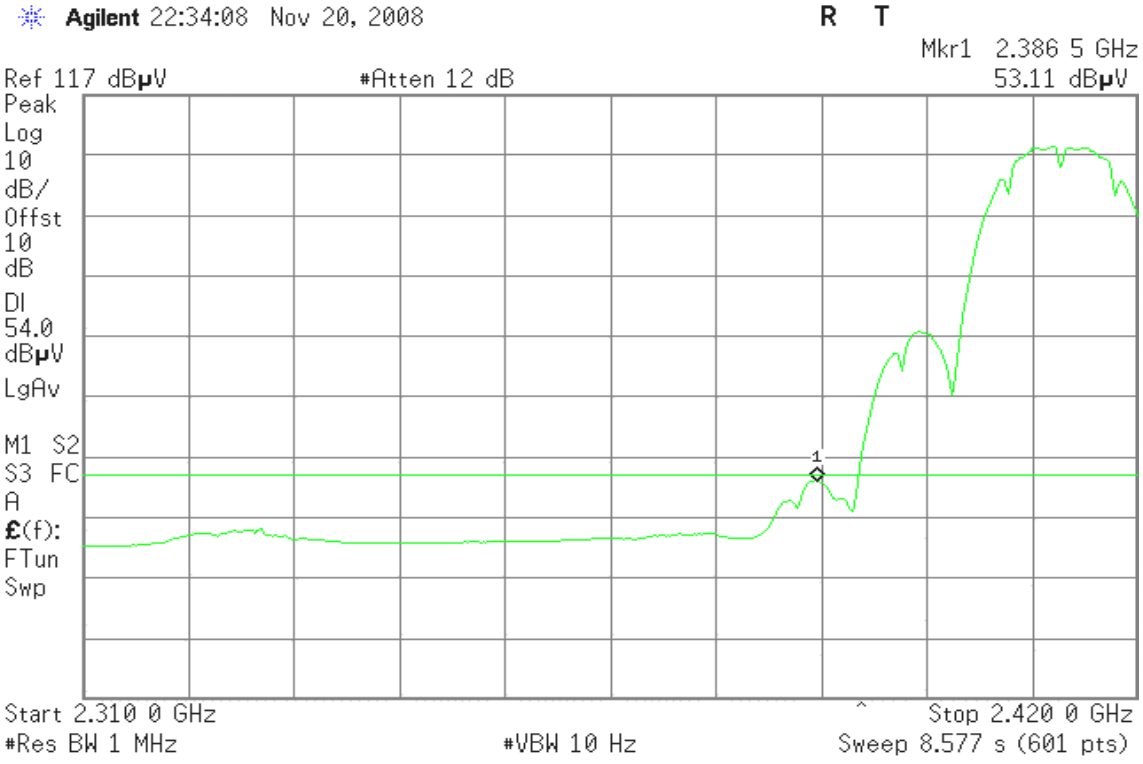
**Dipole Antenna / Half Length Board:**

**Band Edges (IEEE 802.11b mode / CH Low)**

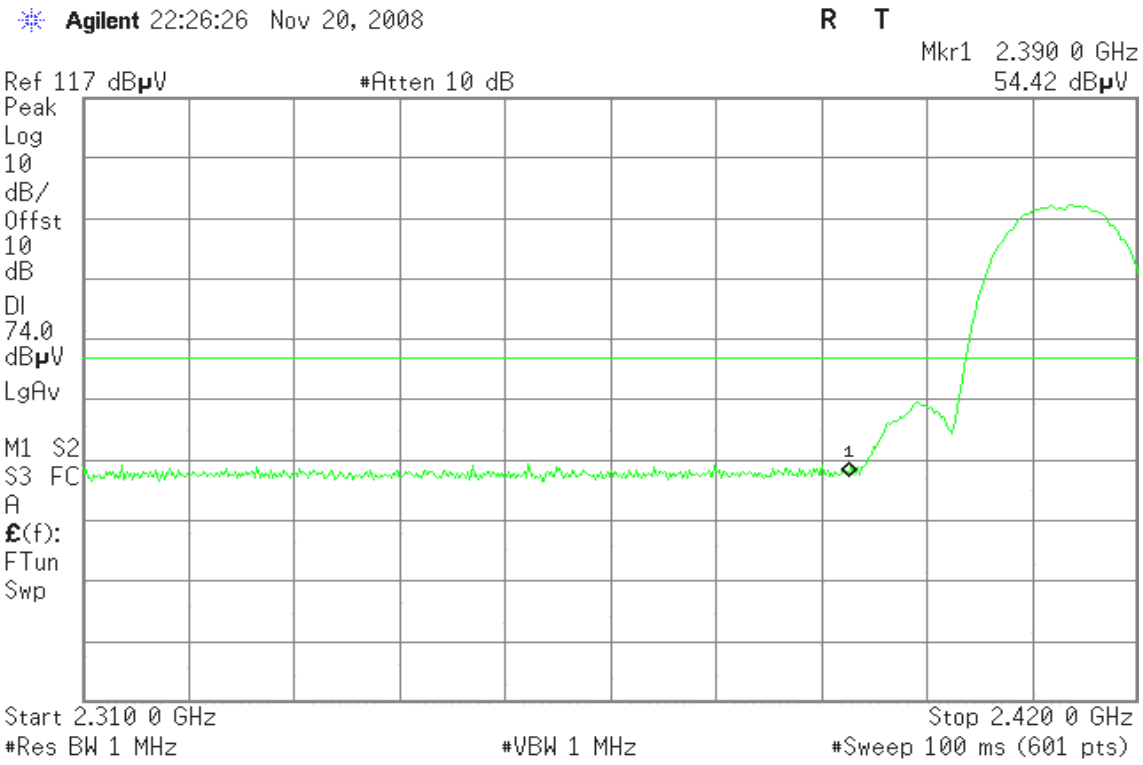
**Detector mode: Peak** **Polarity: Vertical**



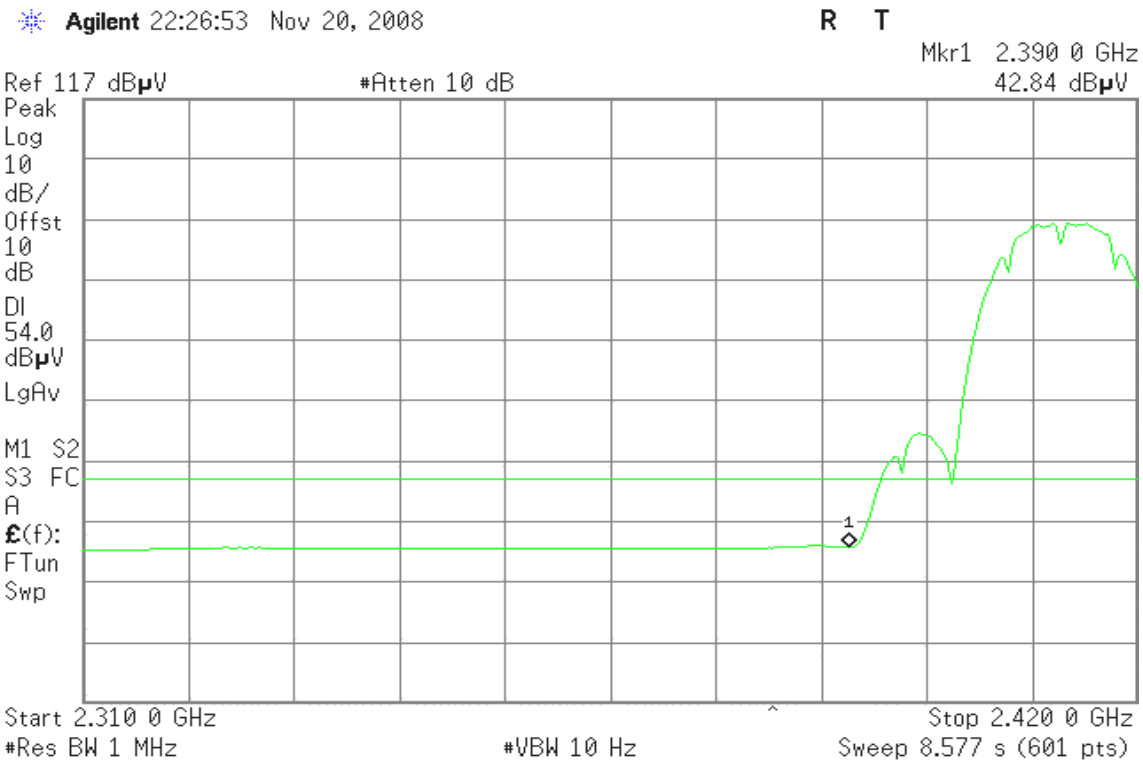

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**

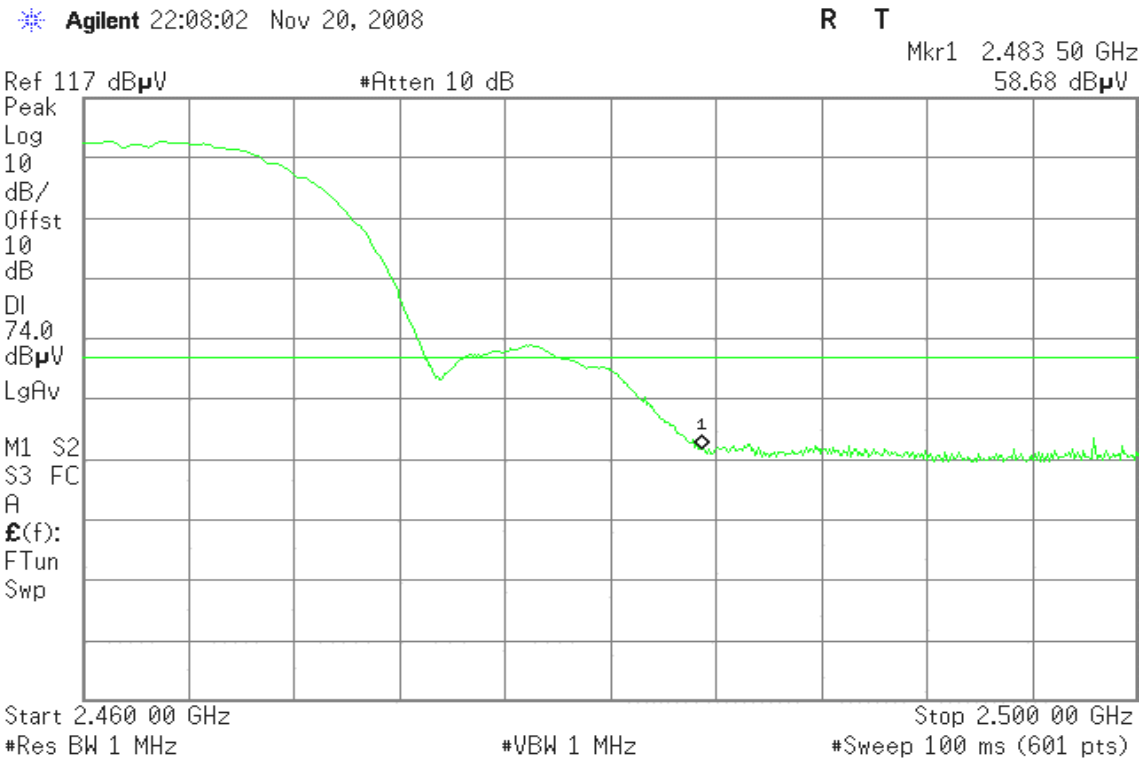



**Detector mode: Average** **Polarity: Horizontal**

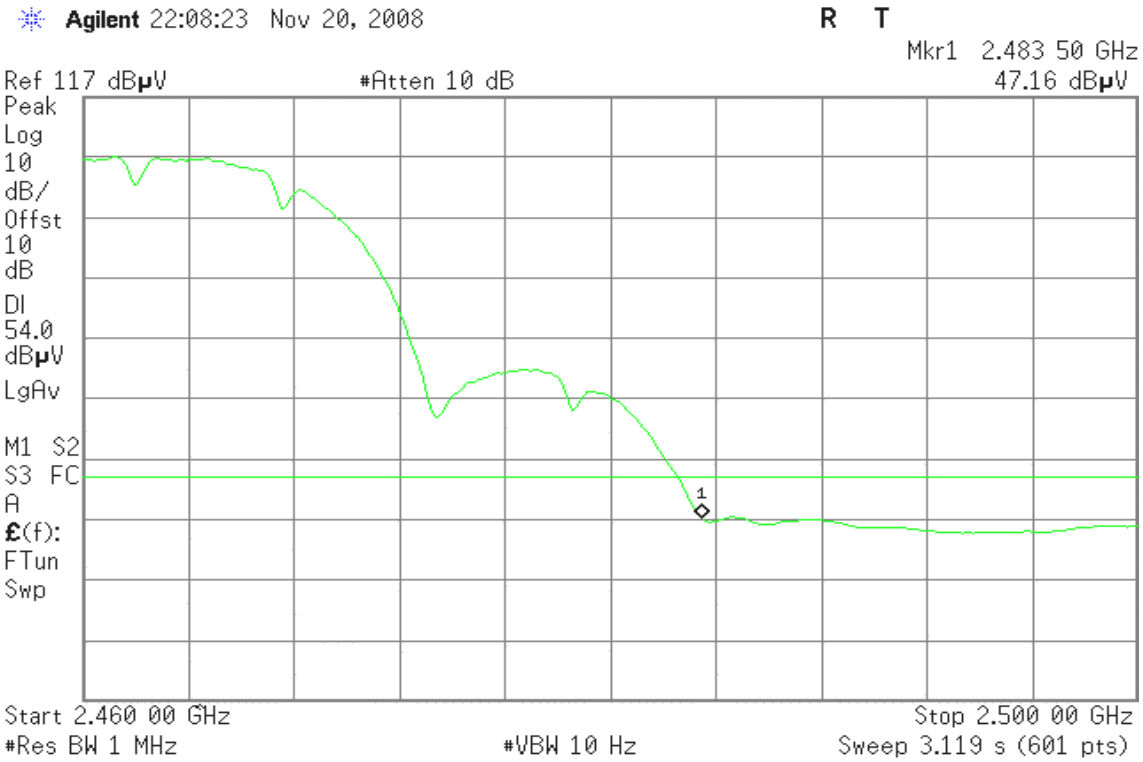


## Band Edges (IEEE 802.11b mode / CH High)

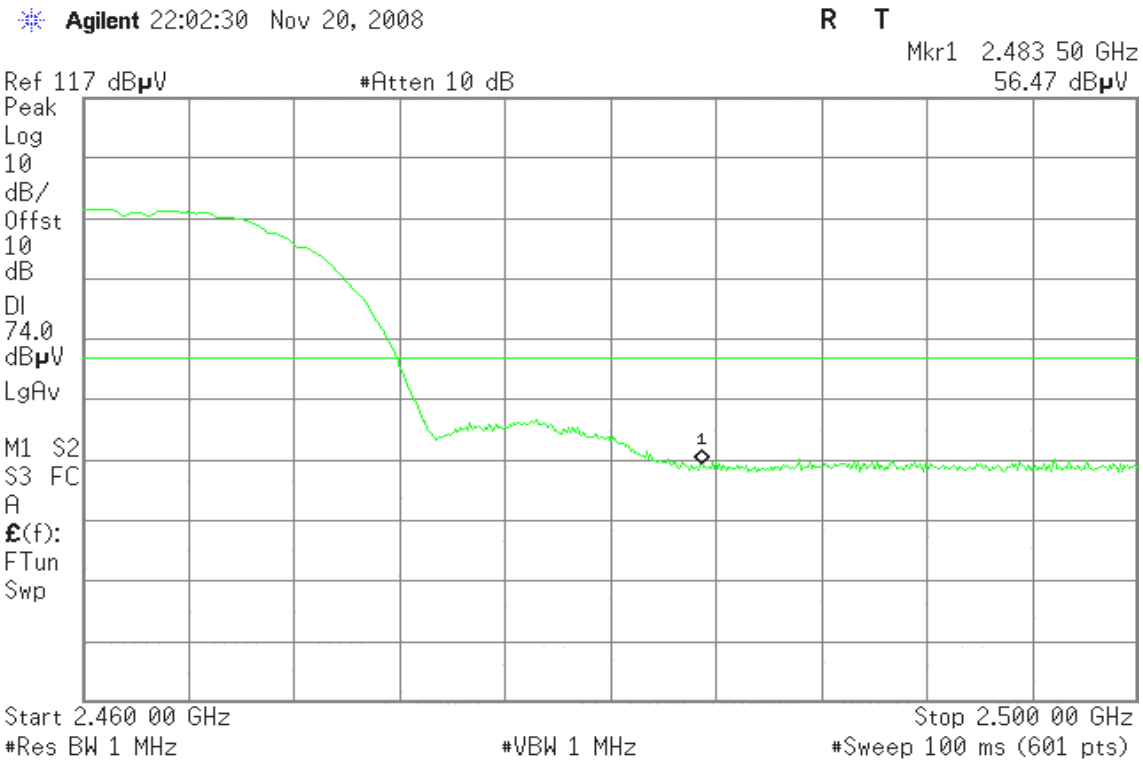
### Detector mode: Peak Polarity: Vertical



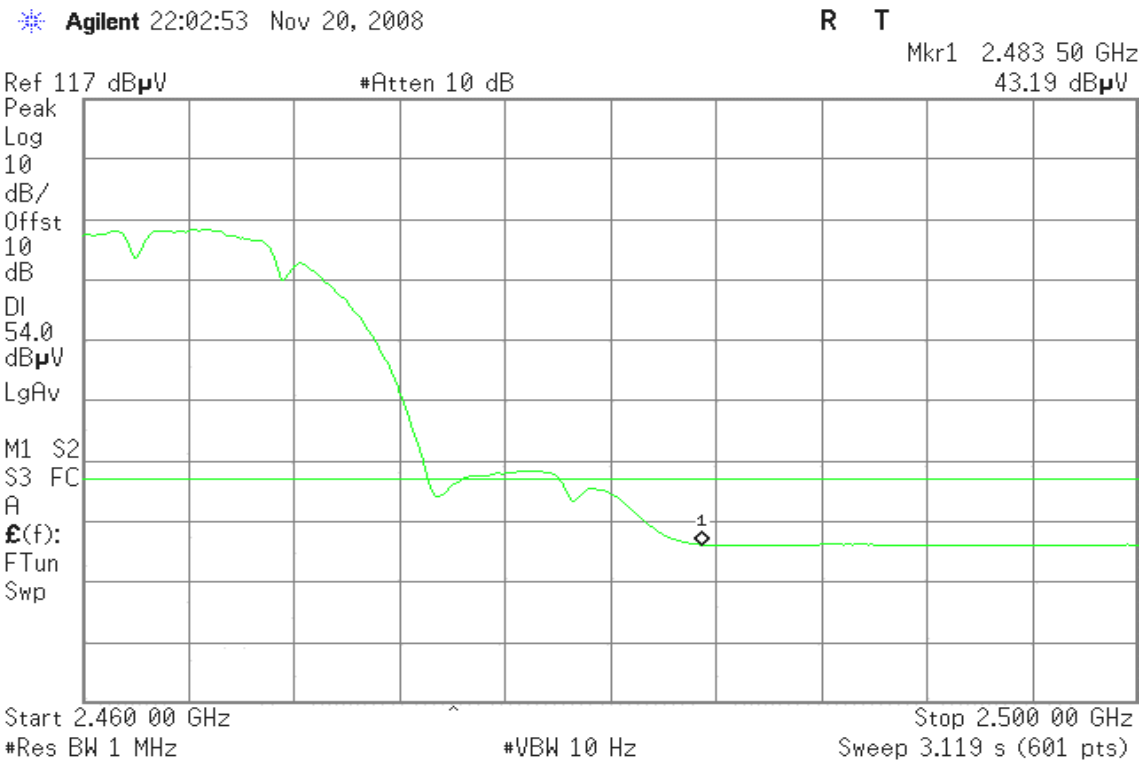

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

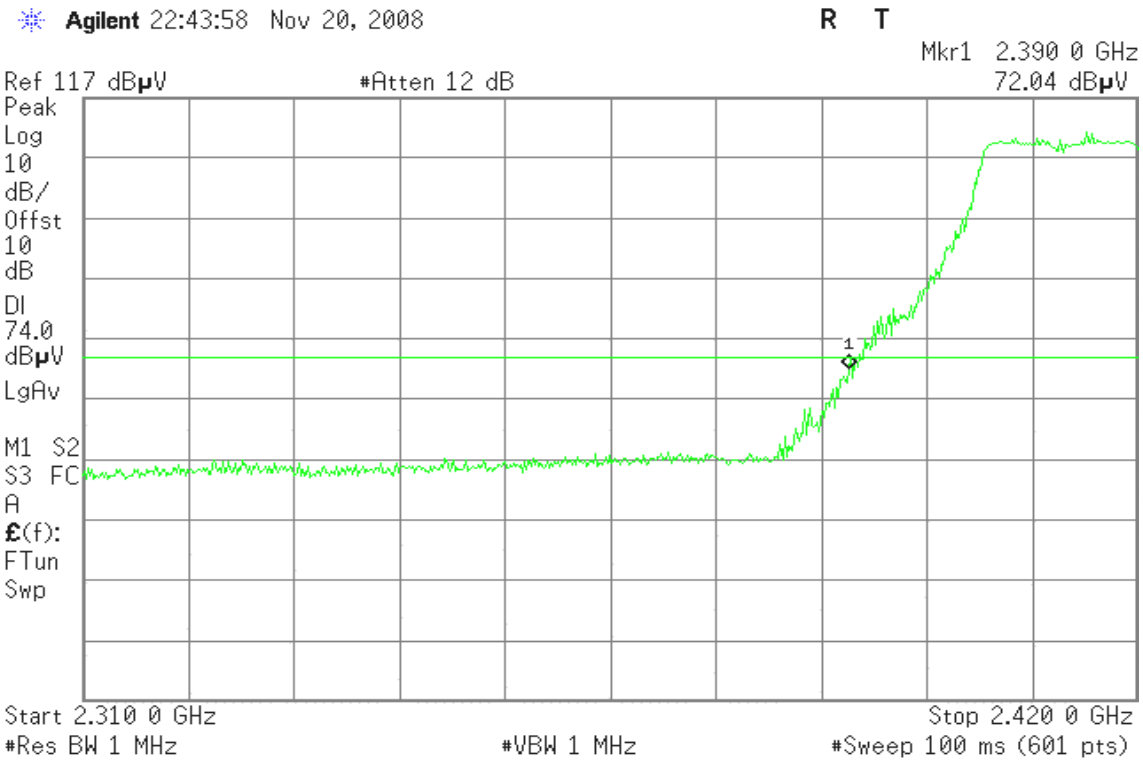



**Detector mode: Average** **Polarity: Horizontal**

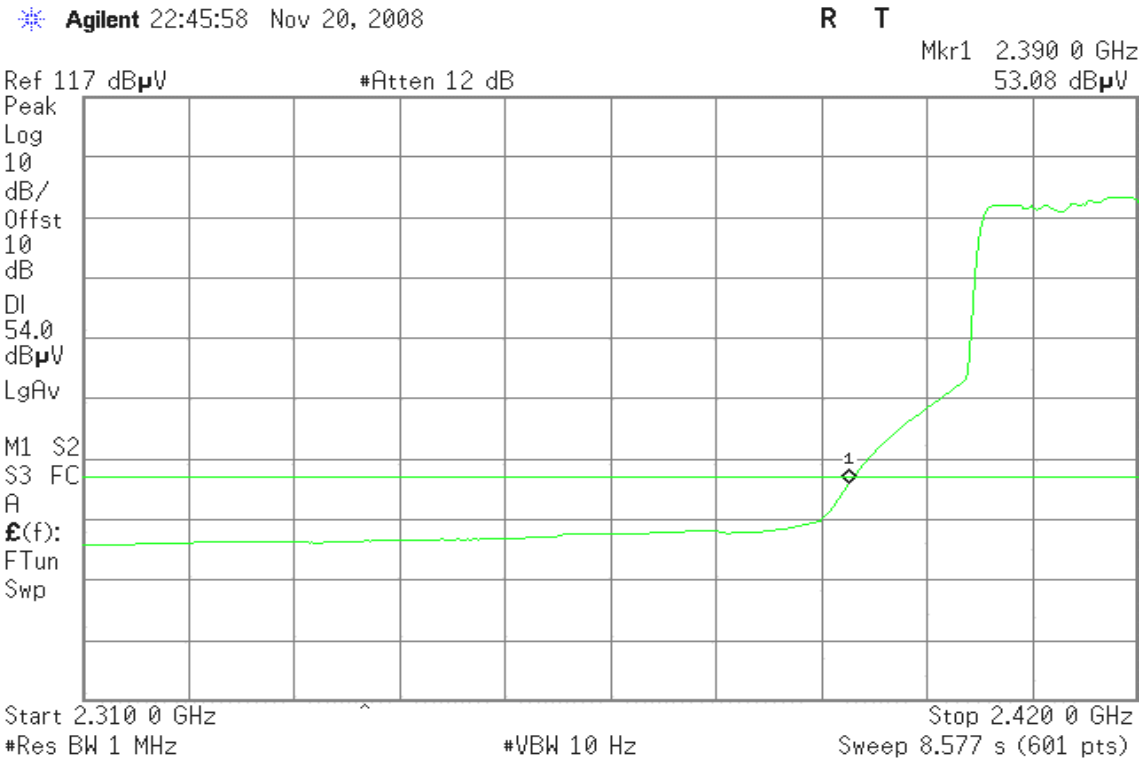


## Band Edges (IEEE 802.11g mode / CH Low)

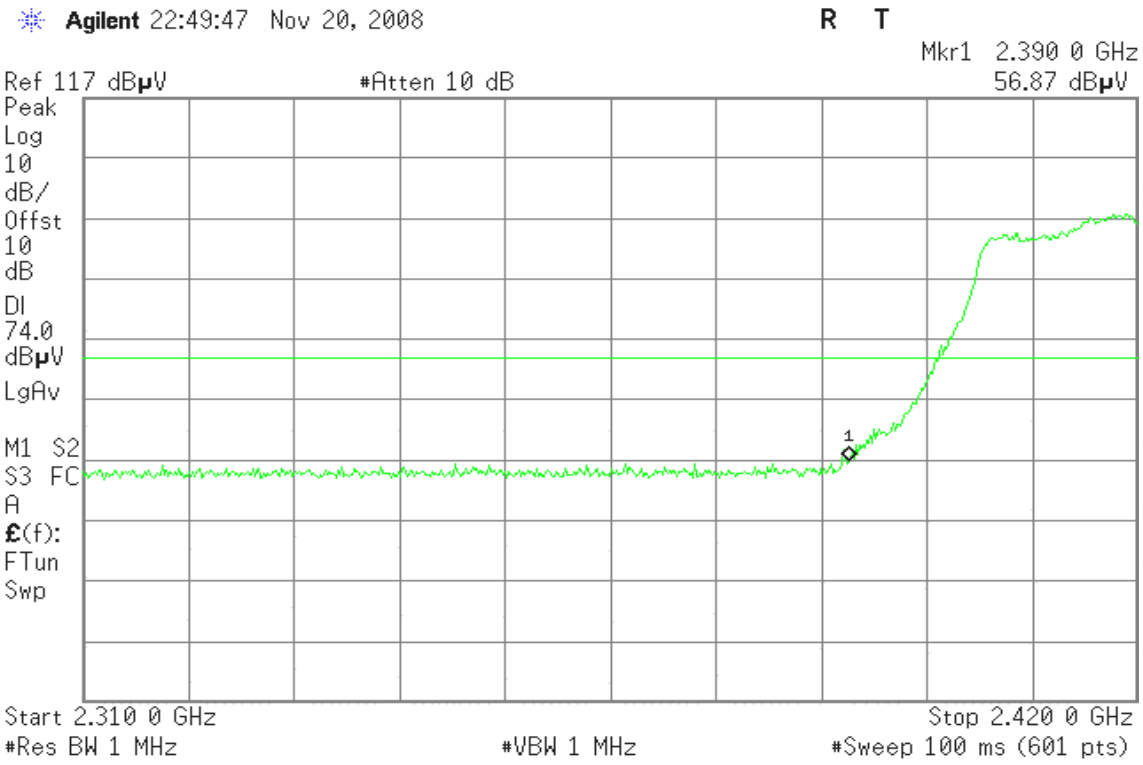
### Detector mode: Peak Polarity: Vertical



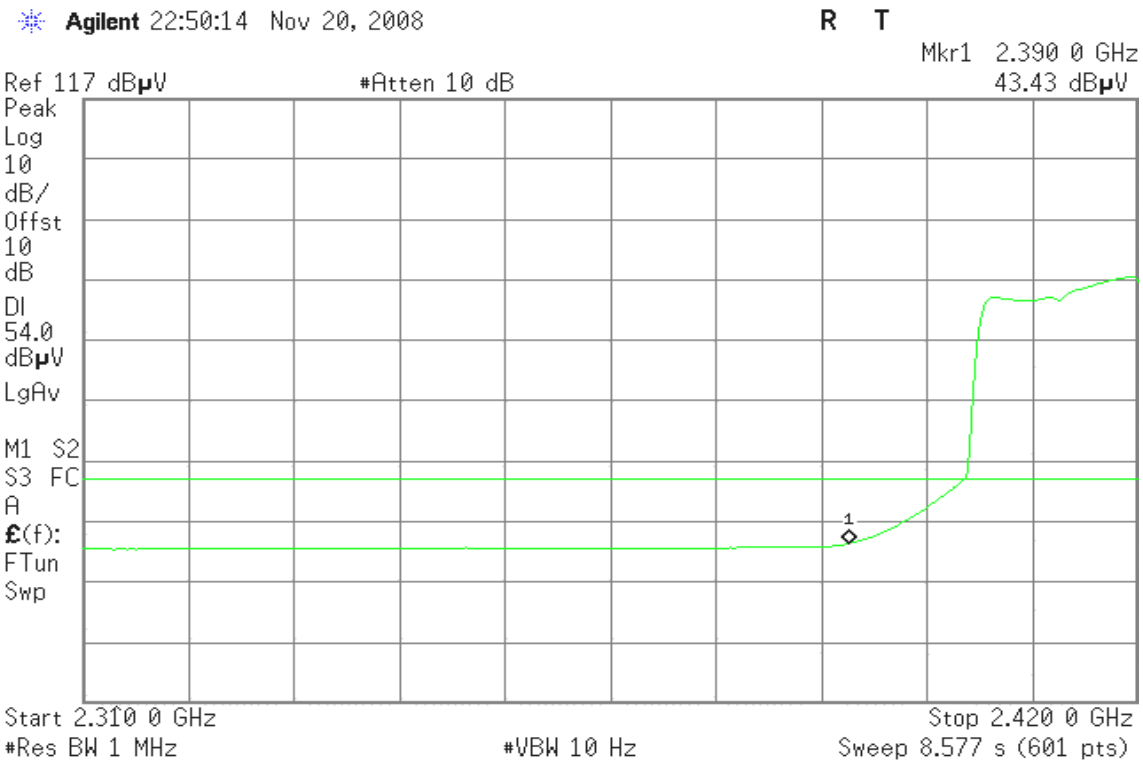

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

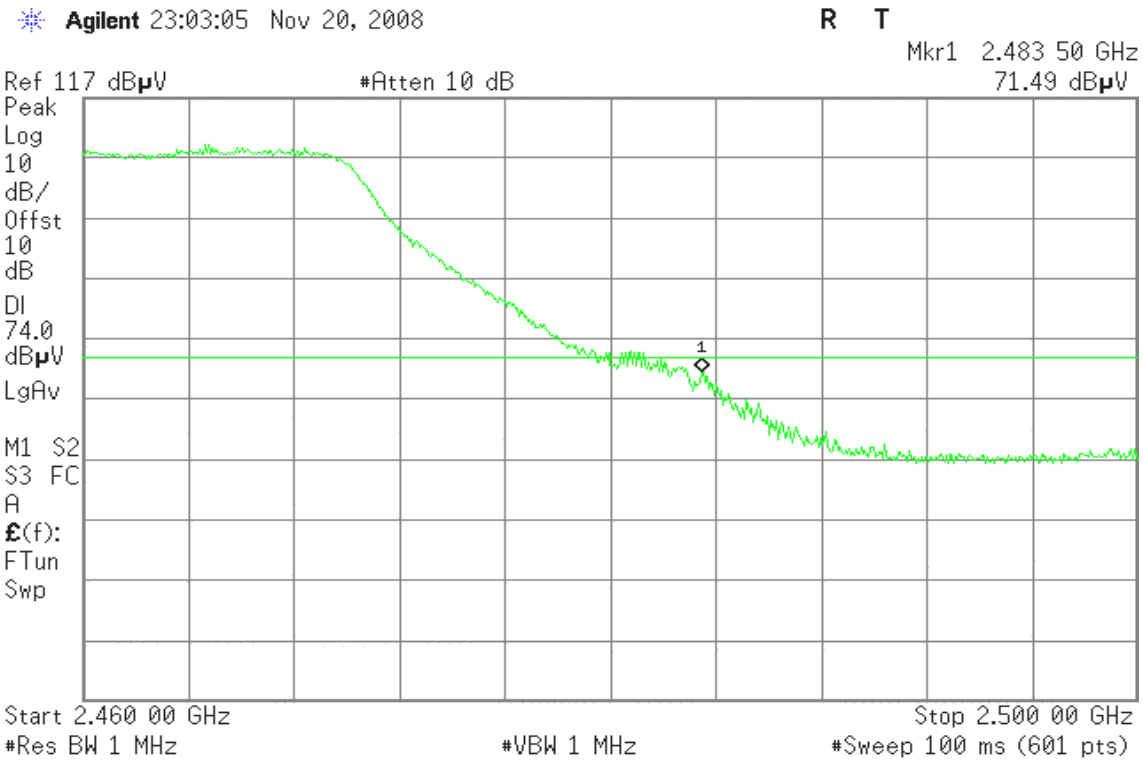



**Detector mode: Average** **Polarity: Horizontal**

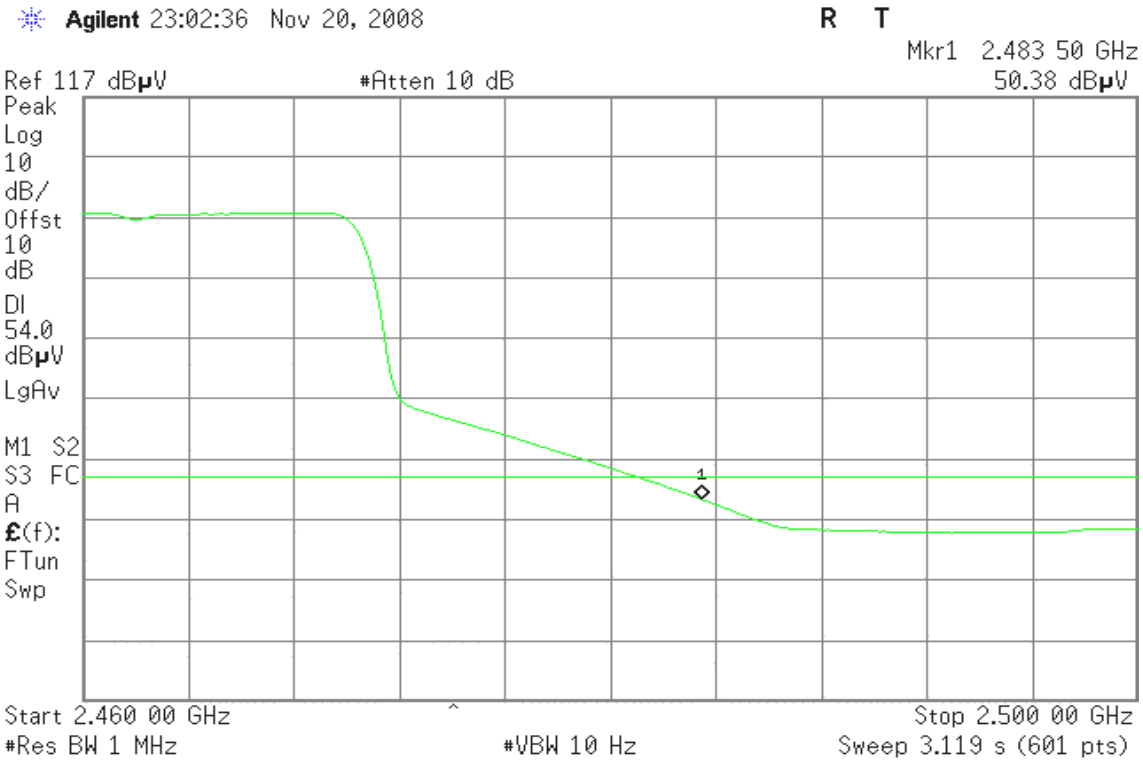


## Band Edges (IEEE 802.11g mode / CH High)

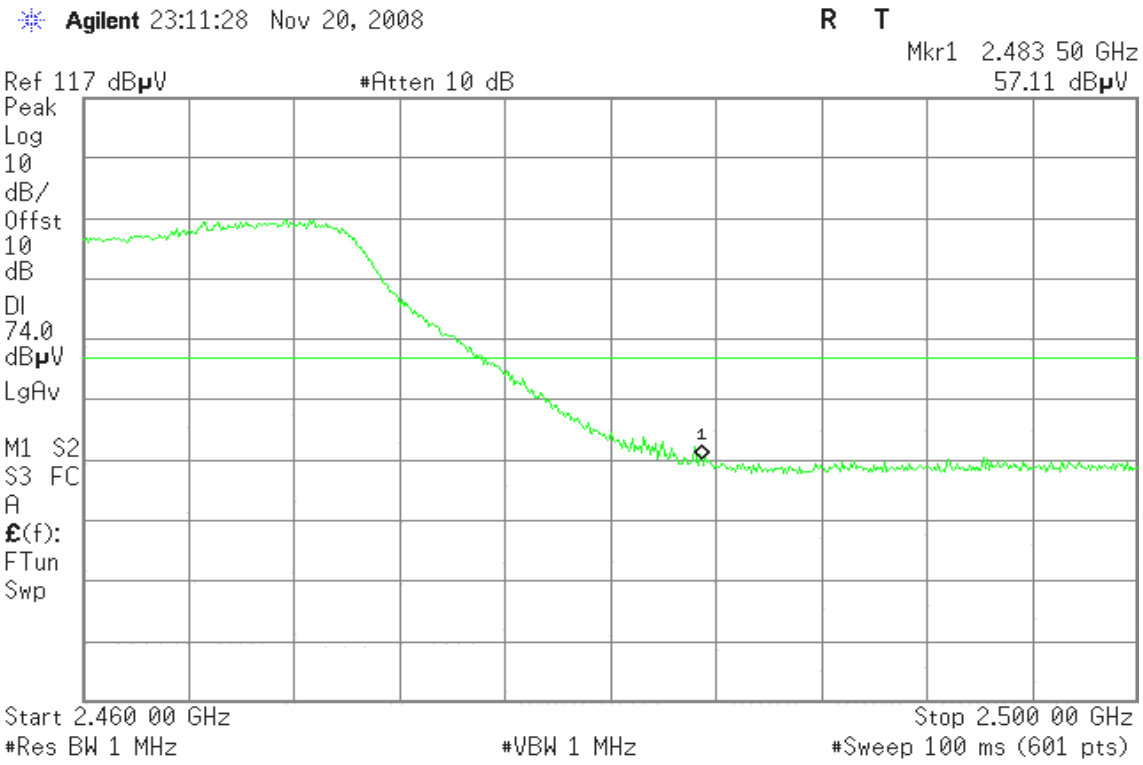
### Detector mode: Peak Polarity: Vertical



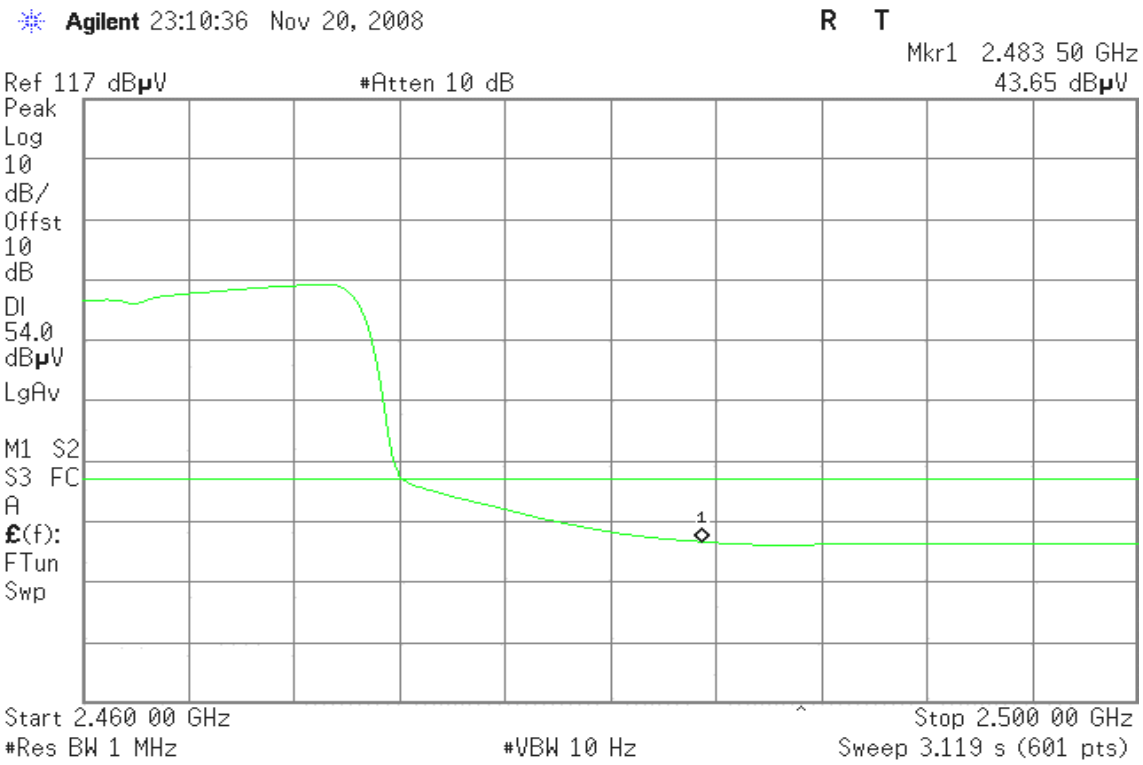

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

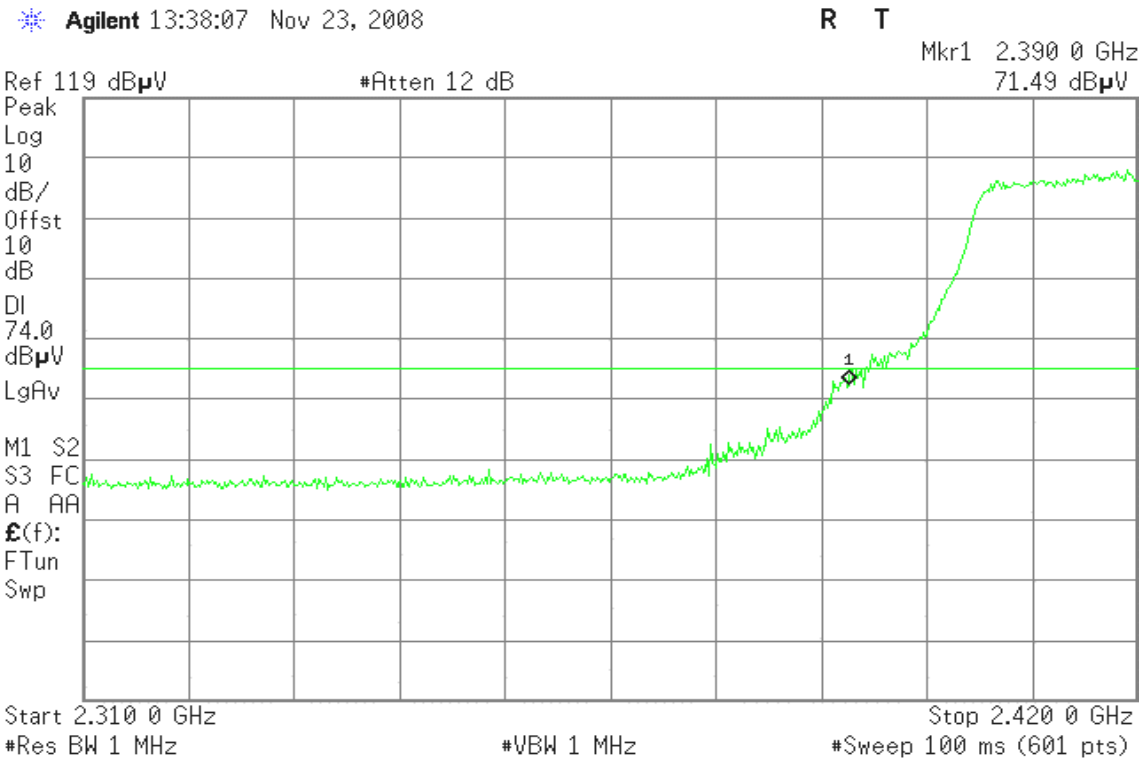



**Detector mode: Average** **Polarity: Horizontal**

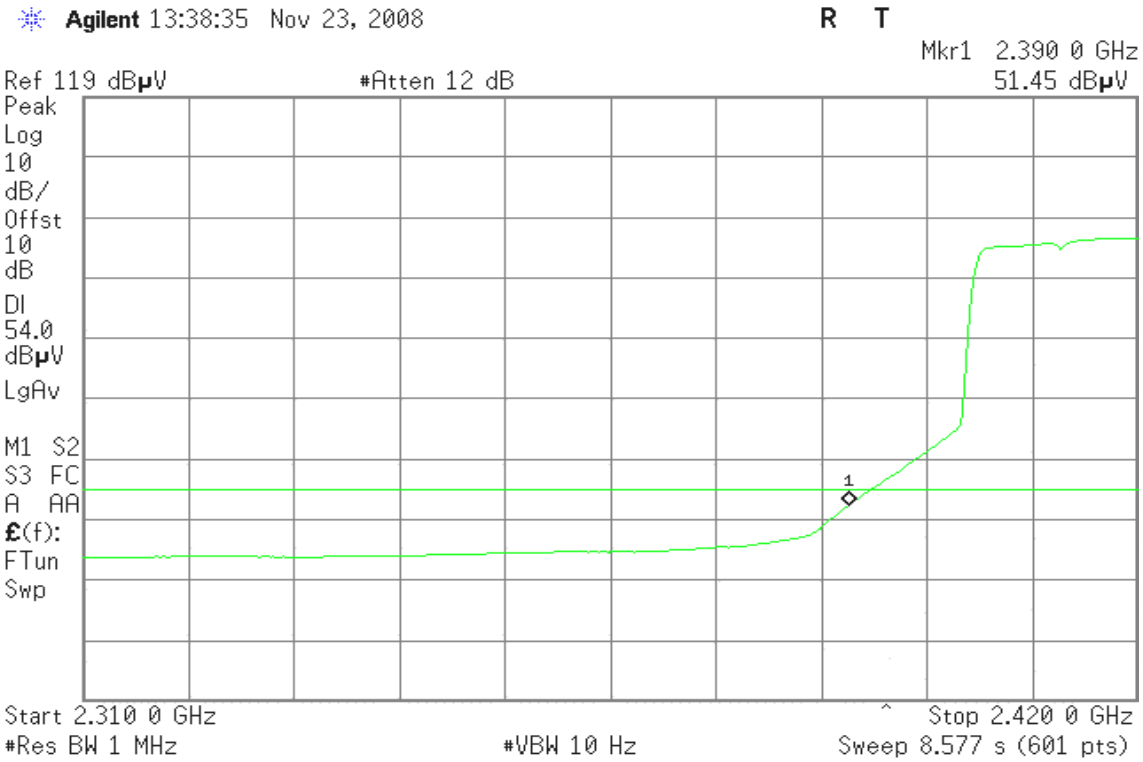


## Band Edges (IEEE 802.11n HT20 mode / CH Low)

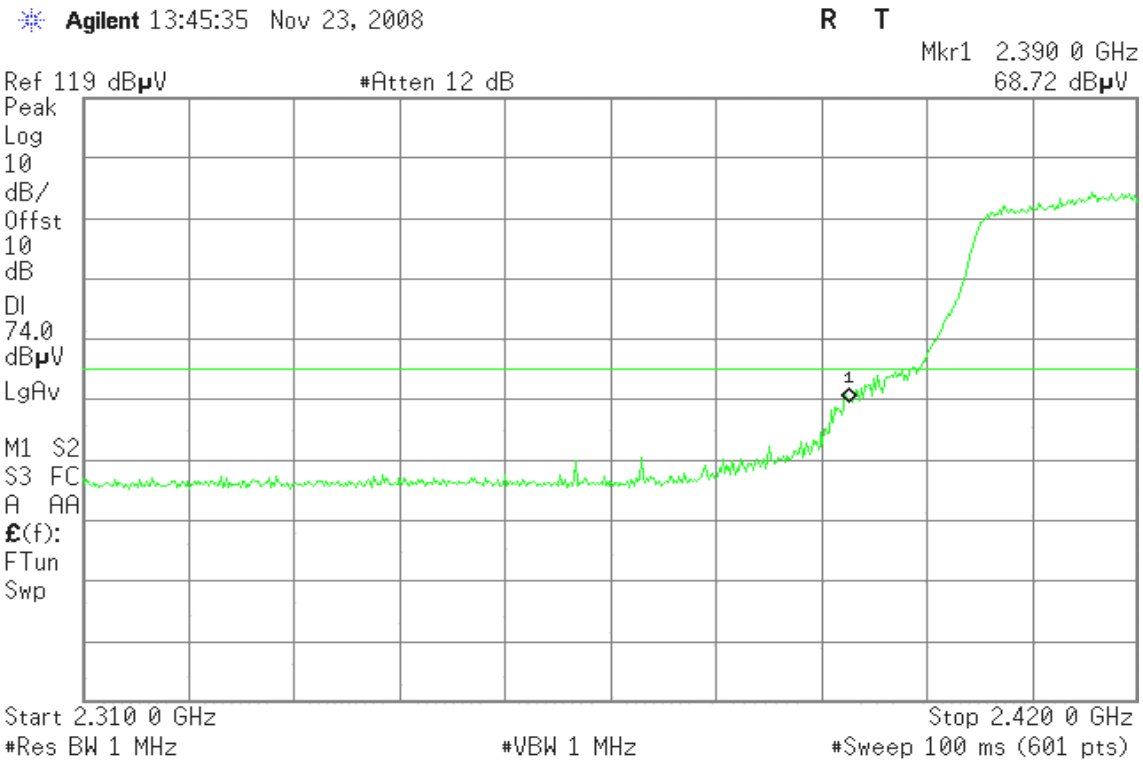
**Detector mode: Peak** **Polarity: Vertical**



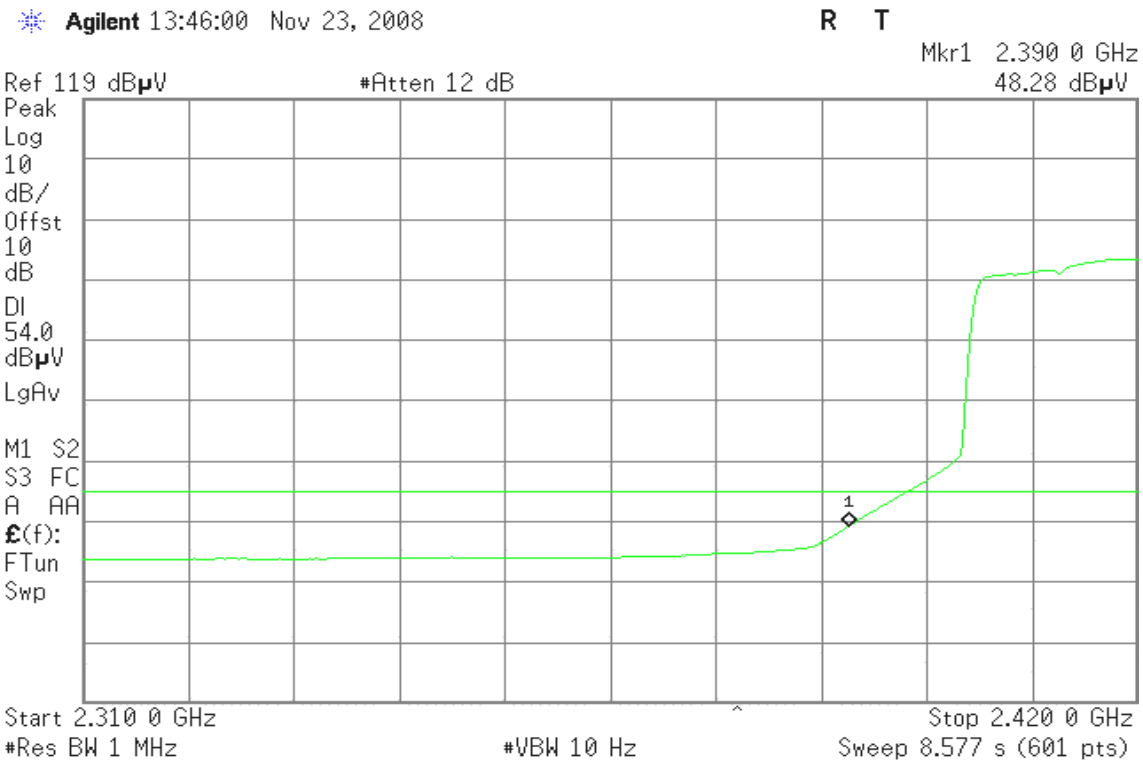

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**

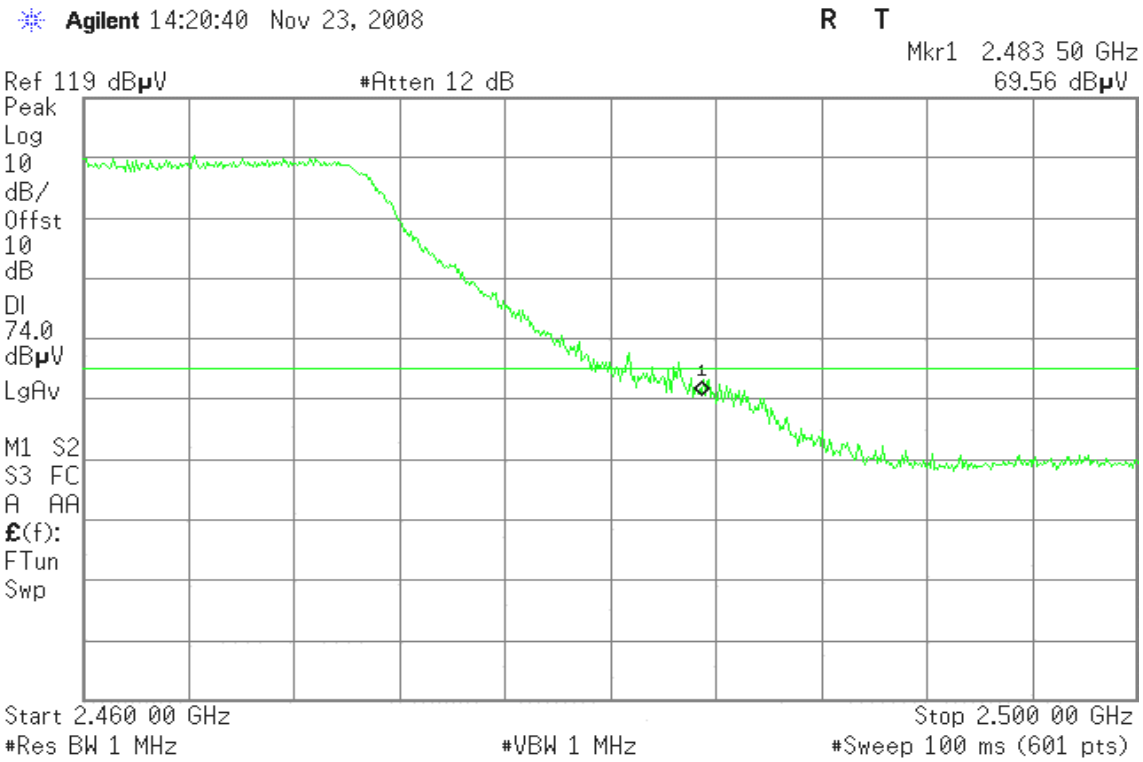



**Detector mode: Average** **Polarity: Horizontal**

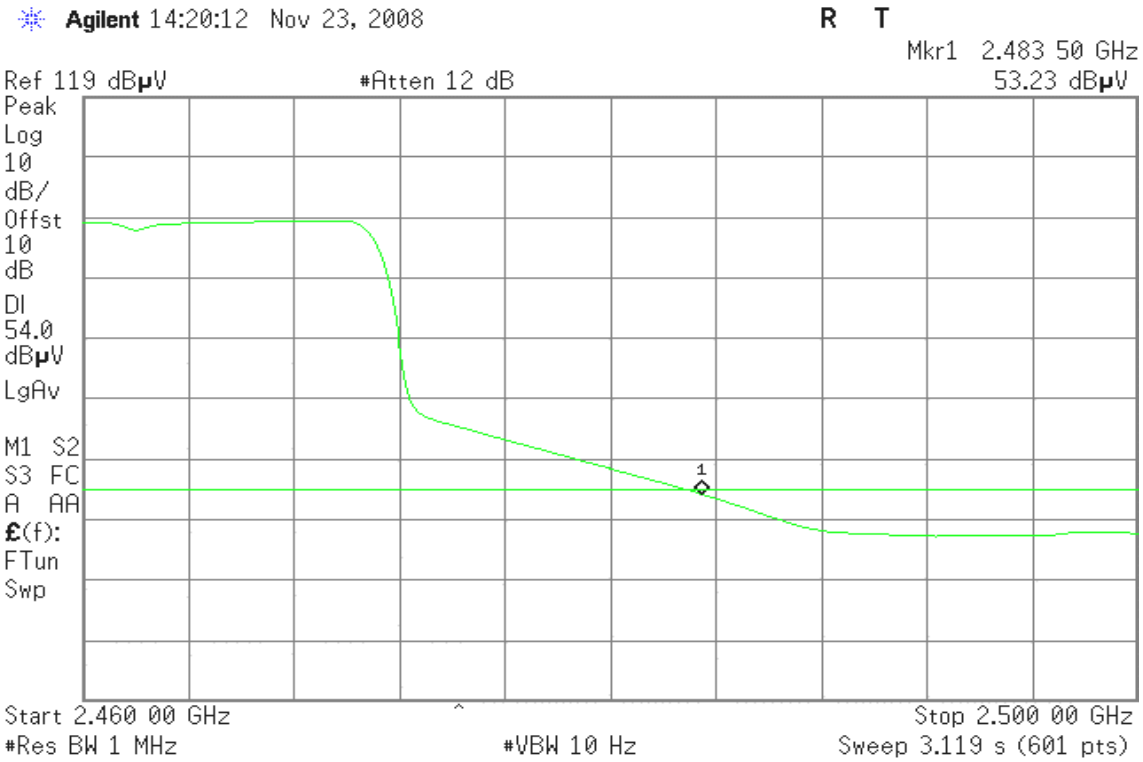


## Band Edges (IEEE 802.11n HT20 mode / CH High)

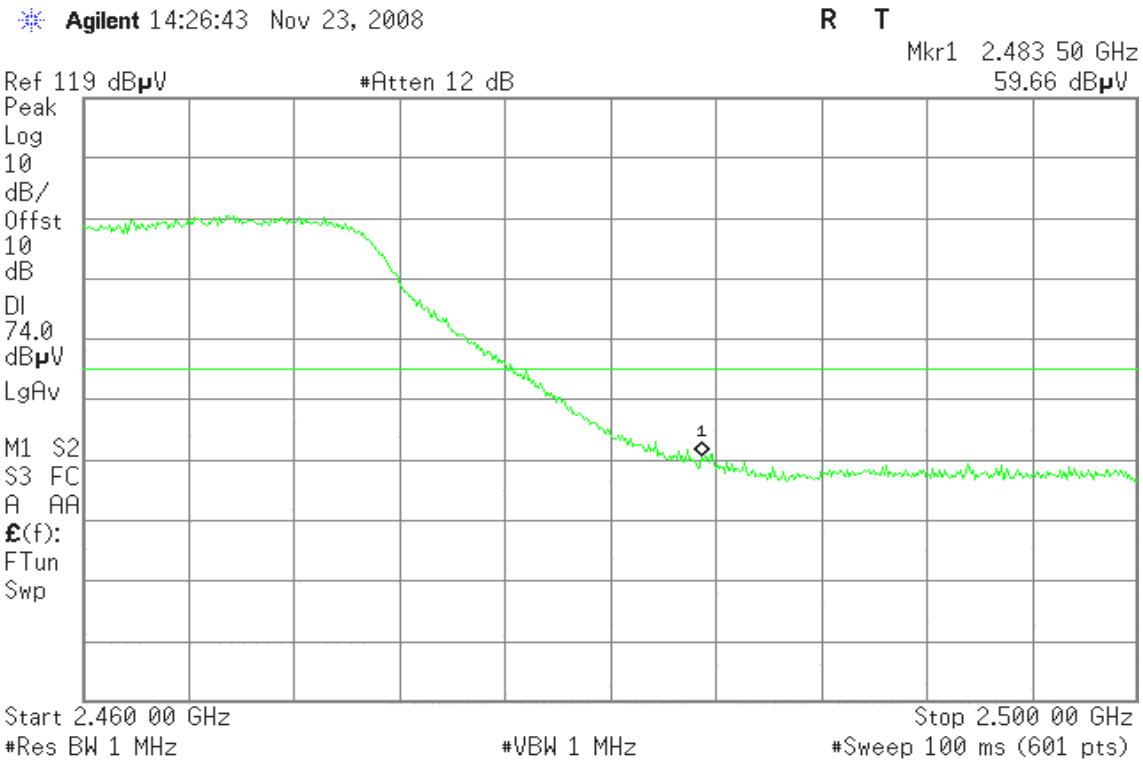
### Detector mode: Peak Polarity: Vertical



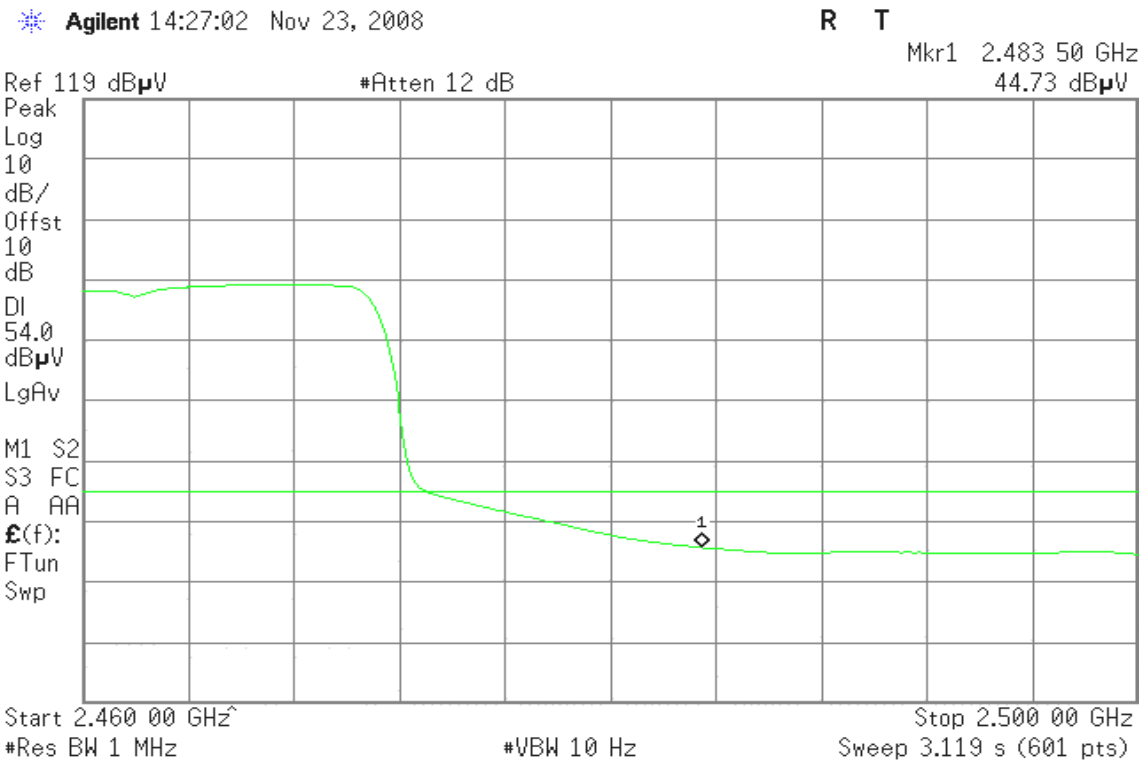

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

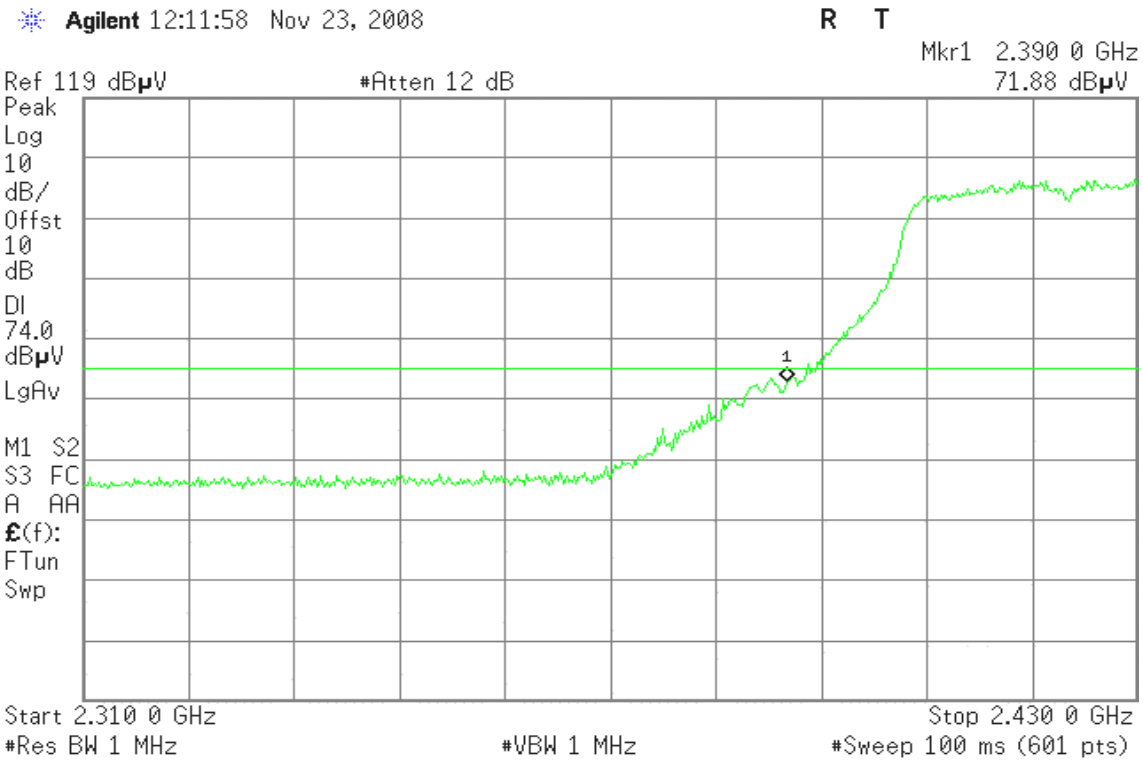



**Detector mode: Average** **Polarity: Horizontal**

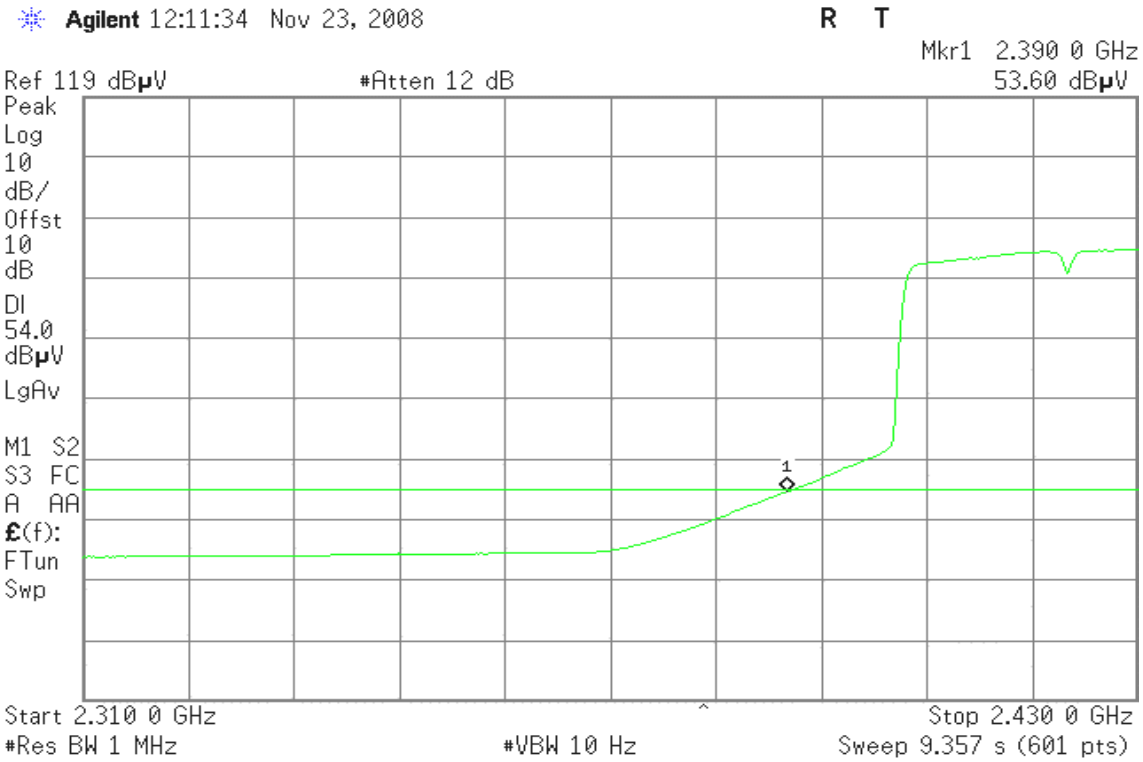


## Band Edges (IEEE 802.11n HT40 mode / CH Low)

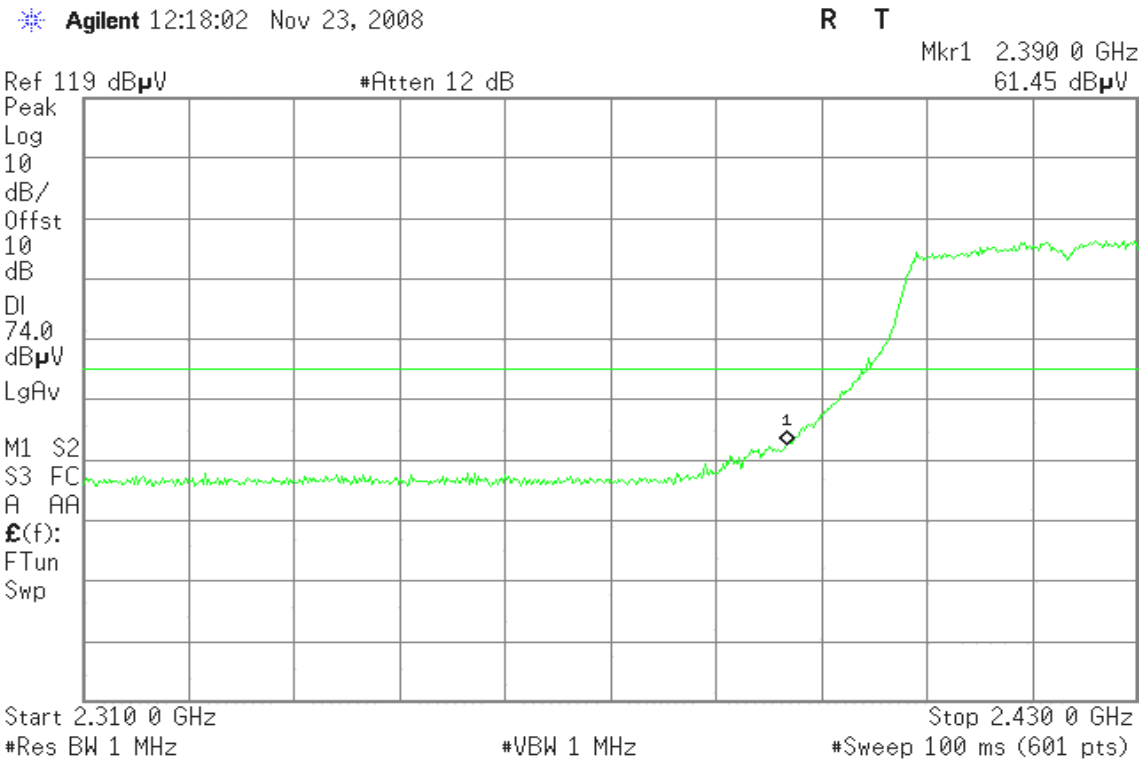
### Detector mode: Peak Polarity: Vertical



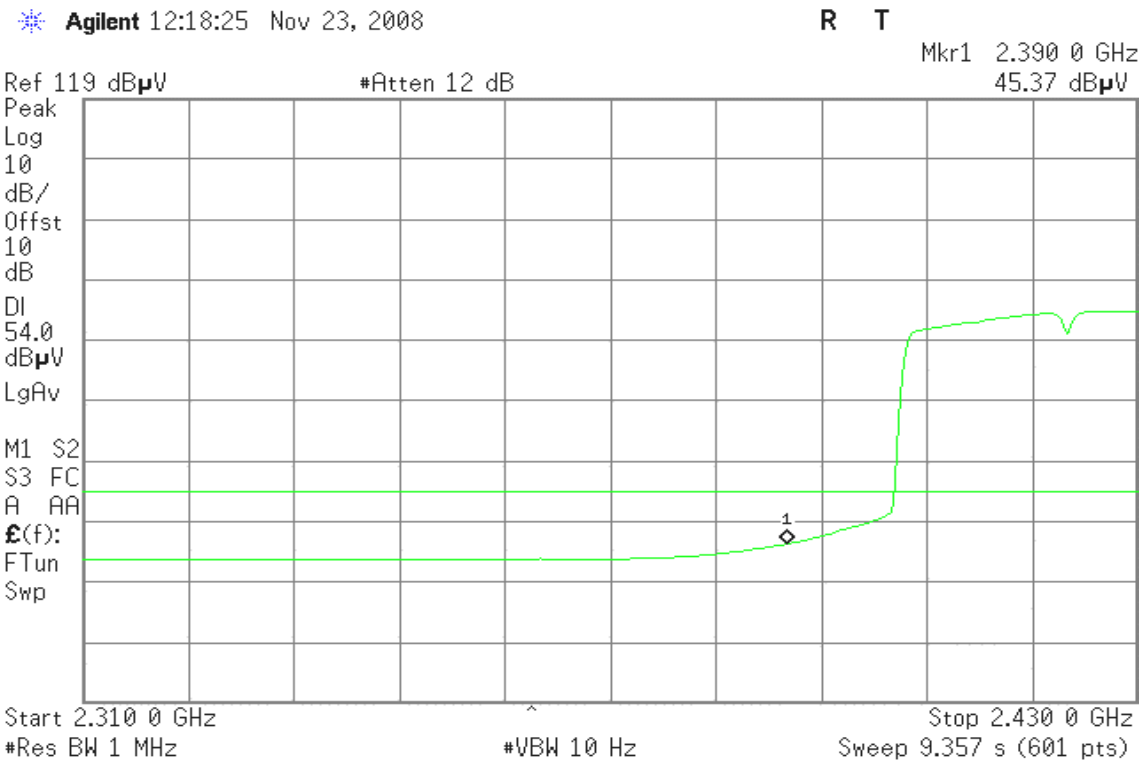

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**

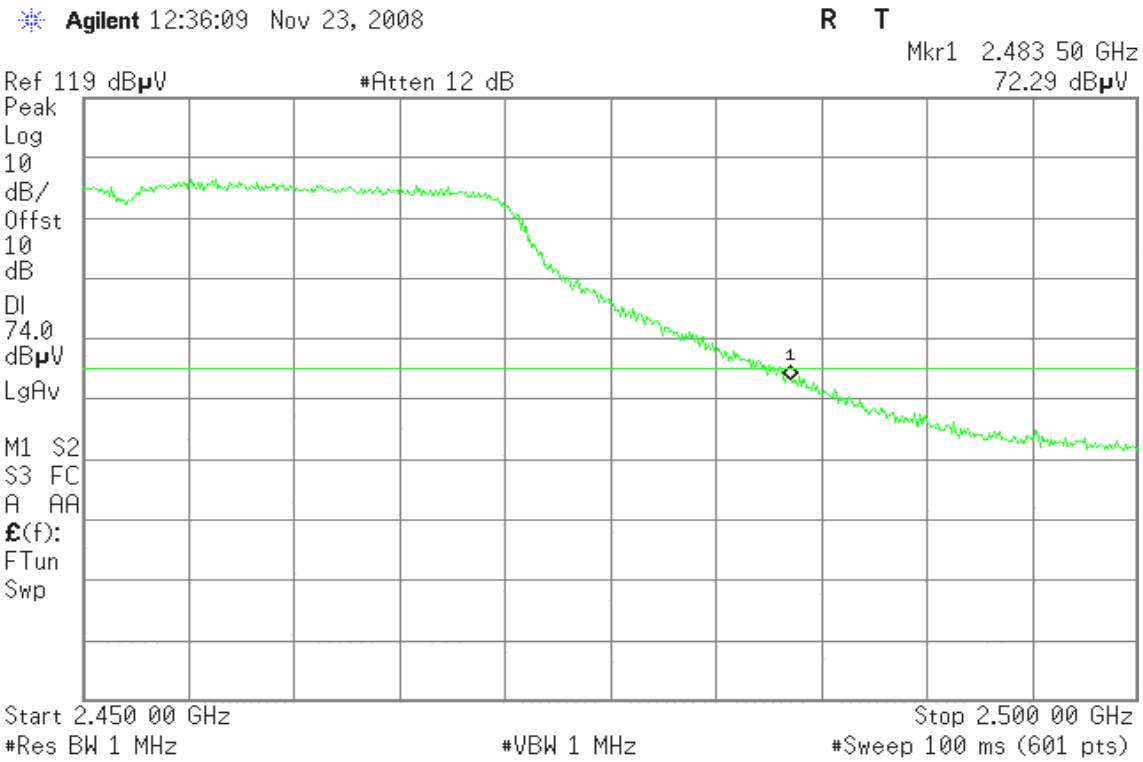



**Detector mode: Average** **Polarity: Horizontal**

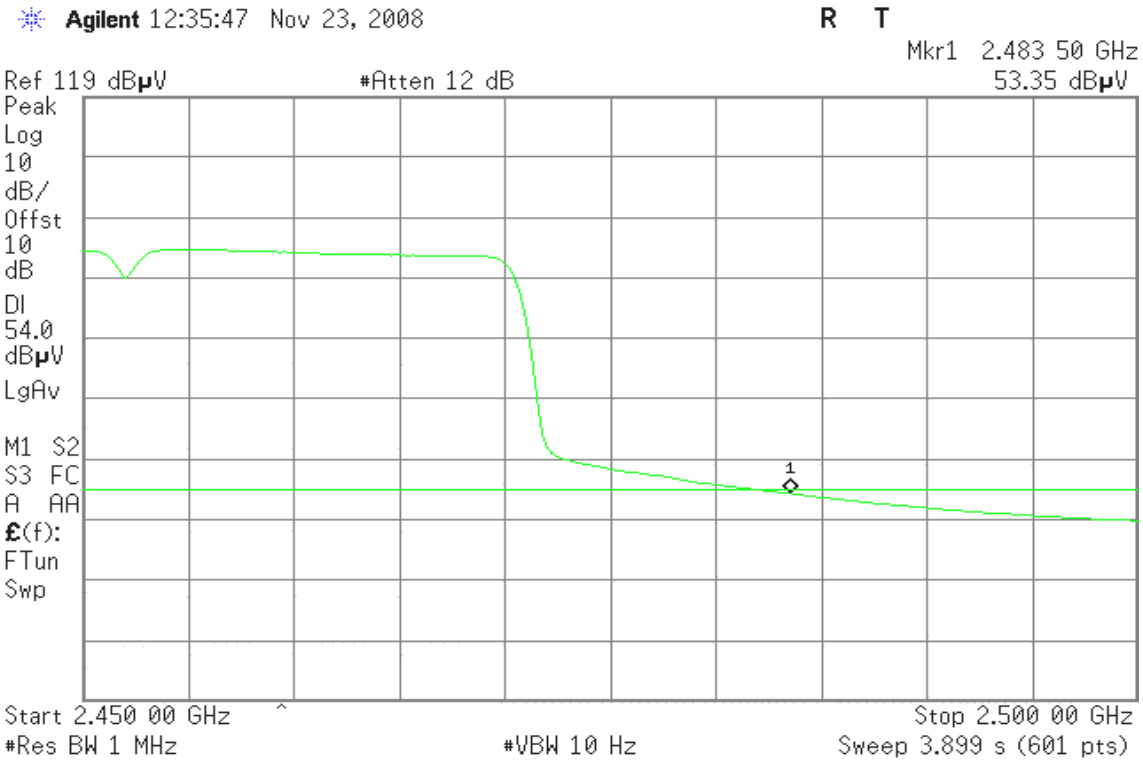


## Band Edges (IEEE 802.11n HT40 mode / CH High)

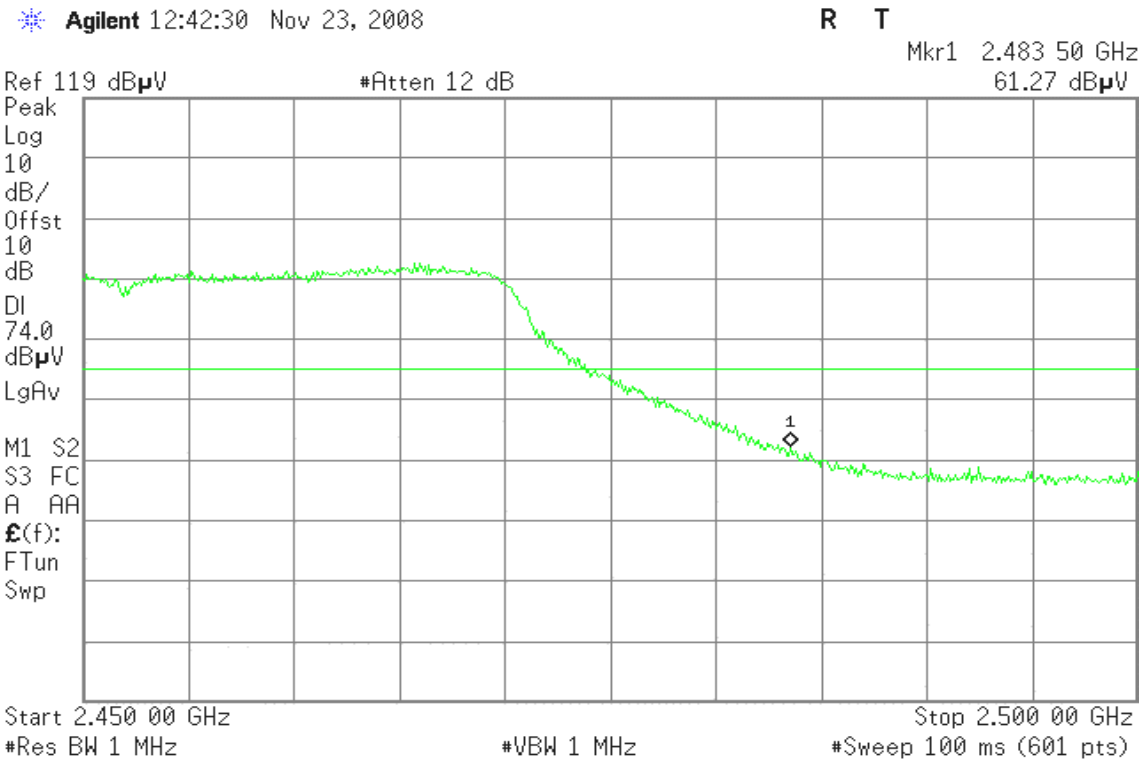
### Detector mode: Peak Polarity: Vertical



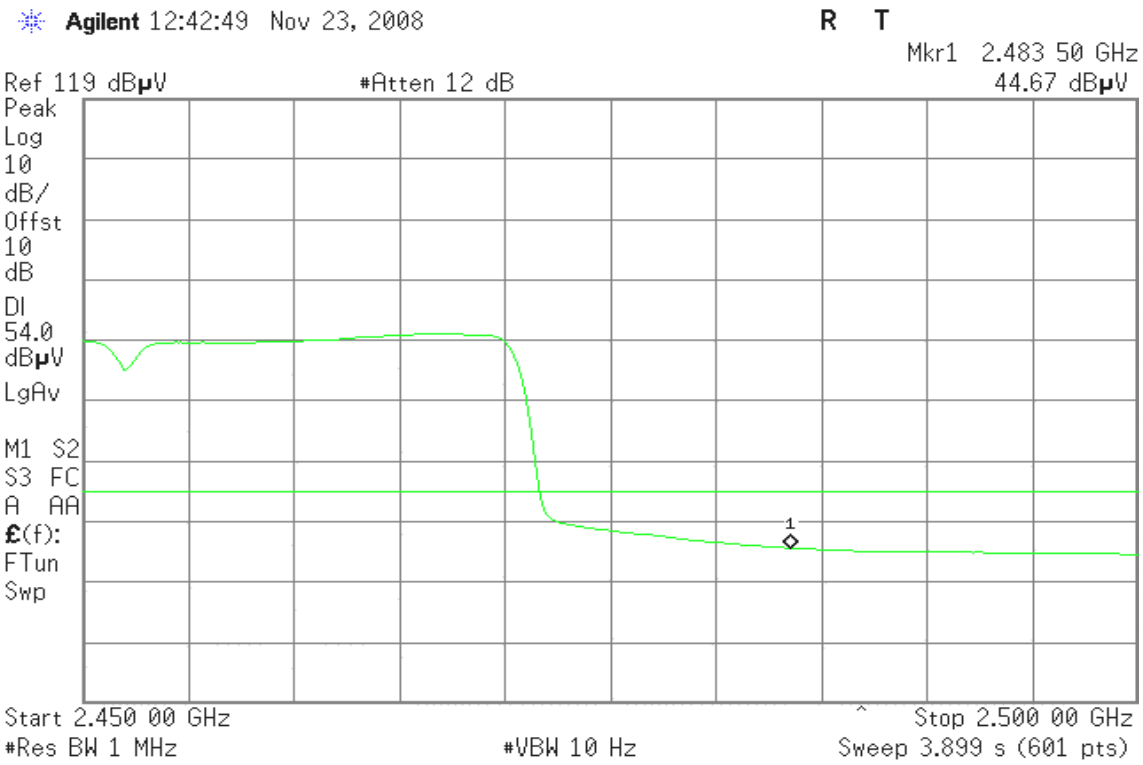

### Detector mode: Average Polarity: Vertical



**Detector mode: Peak** **Polarity: Horizontal**




**Detector mode: Average** **Polarity: Horizontal**

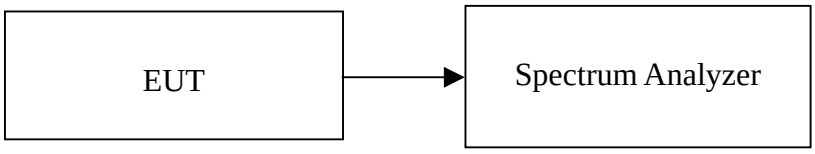


## 8.5 PEAK POWER SPECTRAL DENSITY

## LIMIT

1. According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
2. According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

**Test Configuration**




## TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
   Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep time = 100 s
3. Record the max reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

## TEST RESULTS

*No non-compliance noted.*

## Test Data

### Full Length Board:

### Test mode: IEEE 802.11b mode

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| Low | 2412 | -11.77 | 8.00 | PASS |
| Mid | 2437 | -8.42 | | PASS |
| High | 2462 | -13.12 | | PASS |

### Test mode: IEEE 802.11g mode

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| Low | 2412 | -11.10 | 8.00 | PASS |
| Mid | 2437 | -7.17 | | PASS |
| High | 2462 | -14.60 | | PASS |

### Test mode: IEEE 802.11n HT20 mode

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| Low | 2412 | -12.95 | 8.00 | PASS |
| Mid | 2437 | -8.97 | | PASS |
| High | 2462 | -14.05 | | PASS |

### Test mode: IEEE 802.11n HT40 mode

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| Low | 2422 | -15.12 | 8.00 | PASS |
| Mid | 2437 | -7.33 | | PASS |
| High | 2452 | -12.38 | | PASS |

**Half Length Board:**

**Test mode: IEEE 802.11b mode**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| Low | 2412 | -15.67 | 8.00 | PASS |
| Mid | 2437 | -13.07 | | PASS |
| High | 2462 | -18.08 | | PASS |

**Test mode: IEEE 802.11g mode**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| Low | 2412 | -18.05 | 8.00 | PASS |
| Mid | 2437 | -12.96 | | PASS |
| High | 2462 | -17.37 | | PASS |

**Test mode: IEEE 802.11n HT20 mode**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| Low | 2412 | -16.41 | 8.00 | PASS |
| Mid | 2437 | -9.81 | | PASS |
| High | 2462 | -14.93 | | PASS |

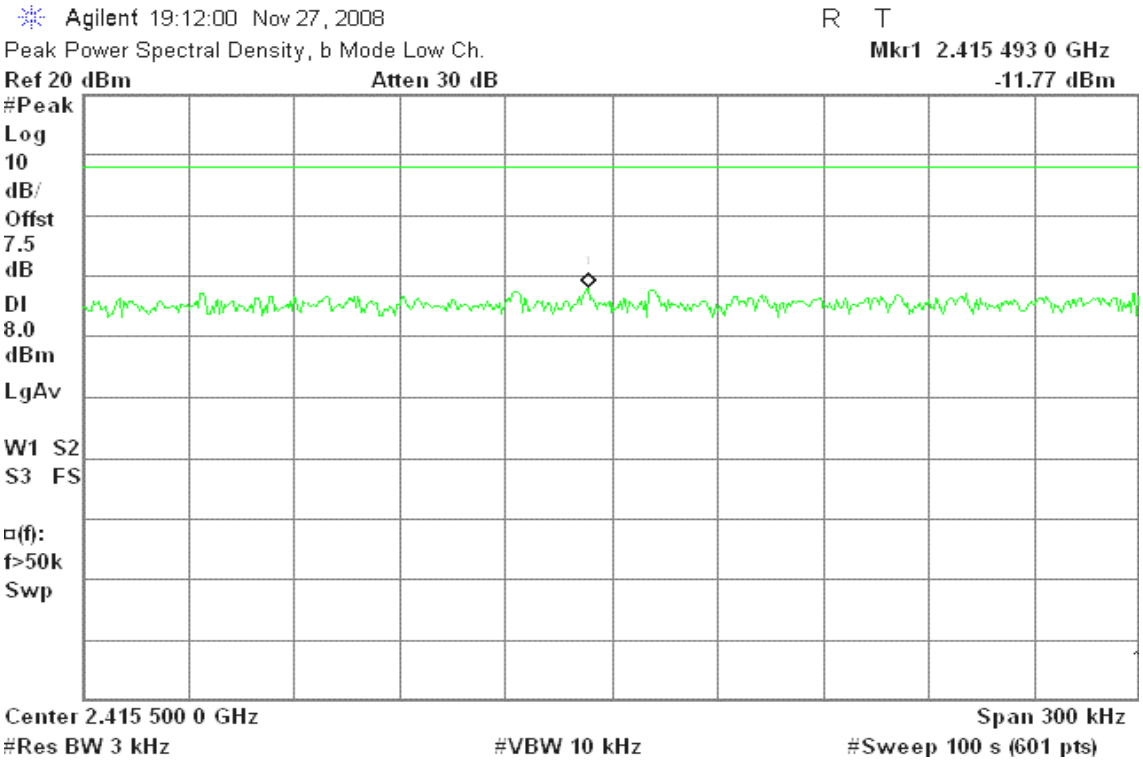
**Test mode: IEEE 802.11n HT40 mode**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| Low | 2422 | -14.56 | 8.00 | PASS |
| Mid | 2437 | -8.41 | | PASS |
| High | 2452 | -14.43 | | PASS |

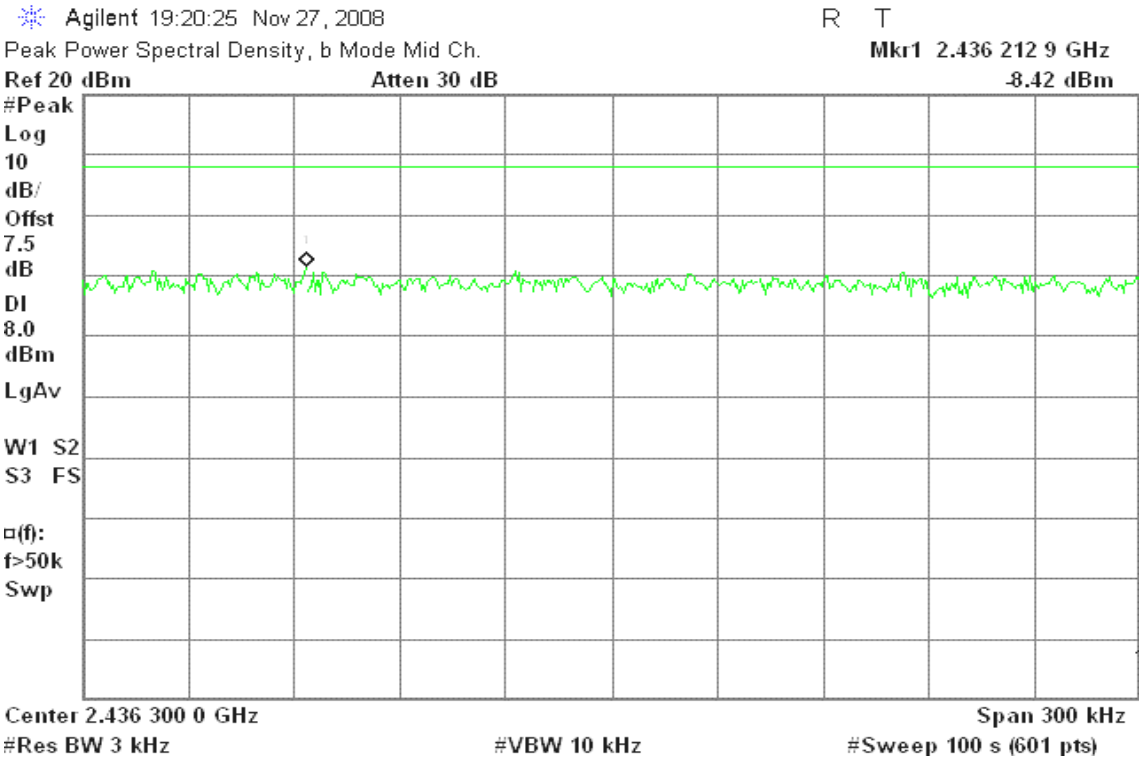
## Test Plot

### Full Length Board / IEEE 802.11b

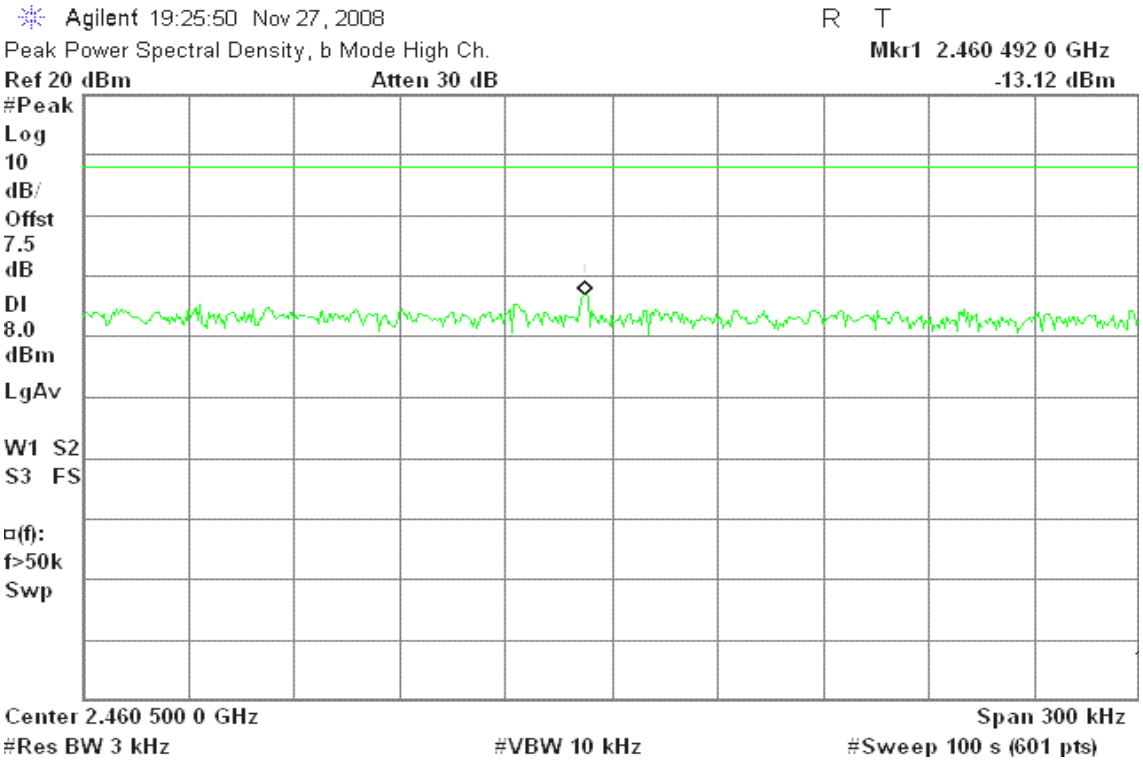
### PPSD (CH Low)




### PPSD (CH Mid)

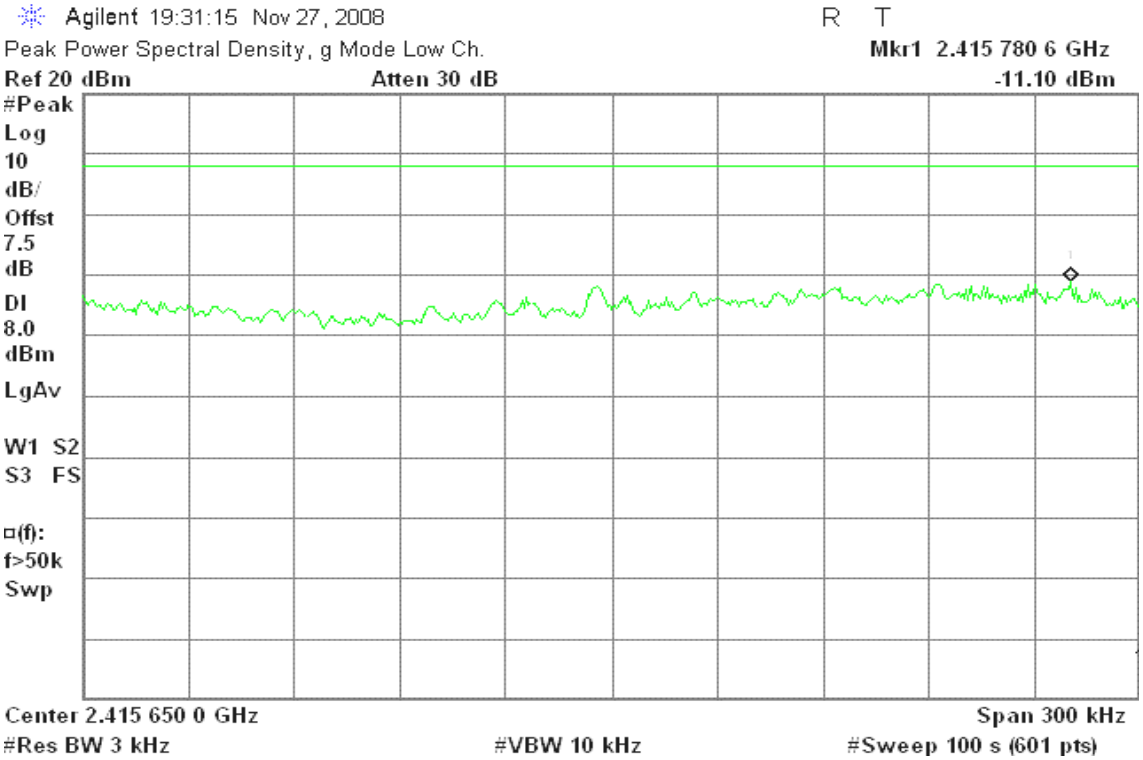


## PPSD (CH High)

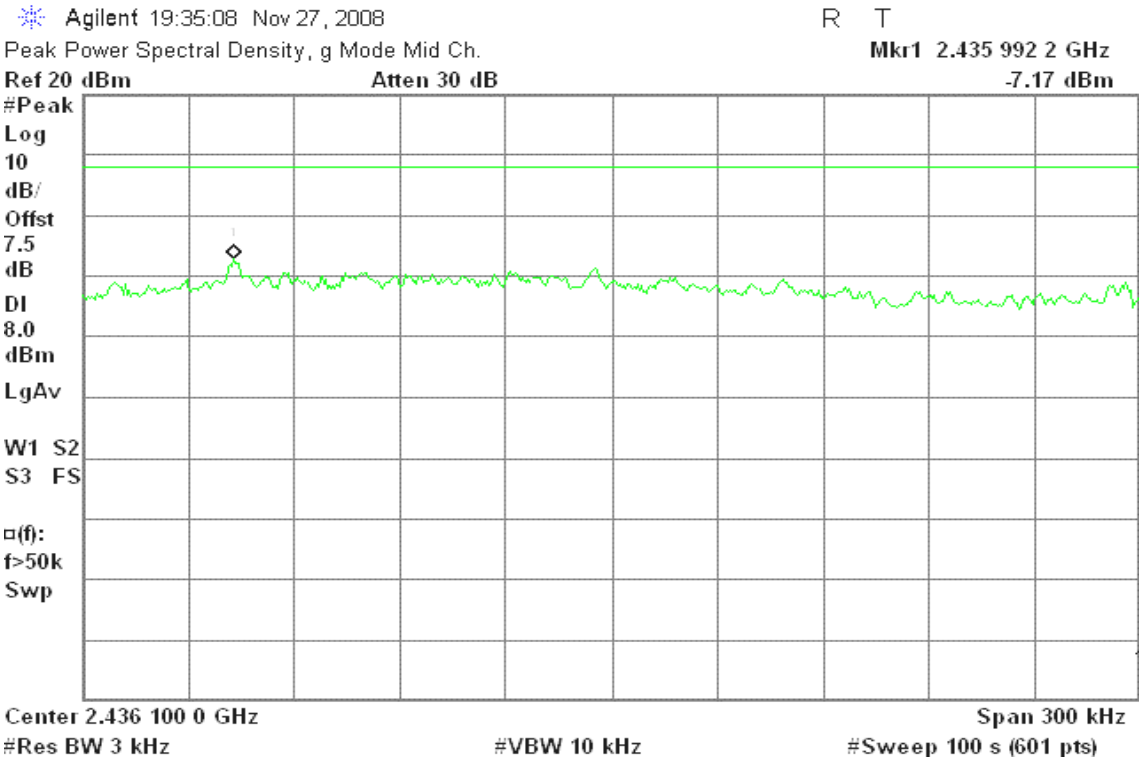



## IEEE 802.11g

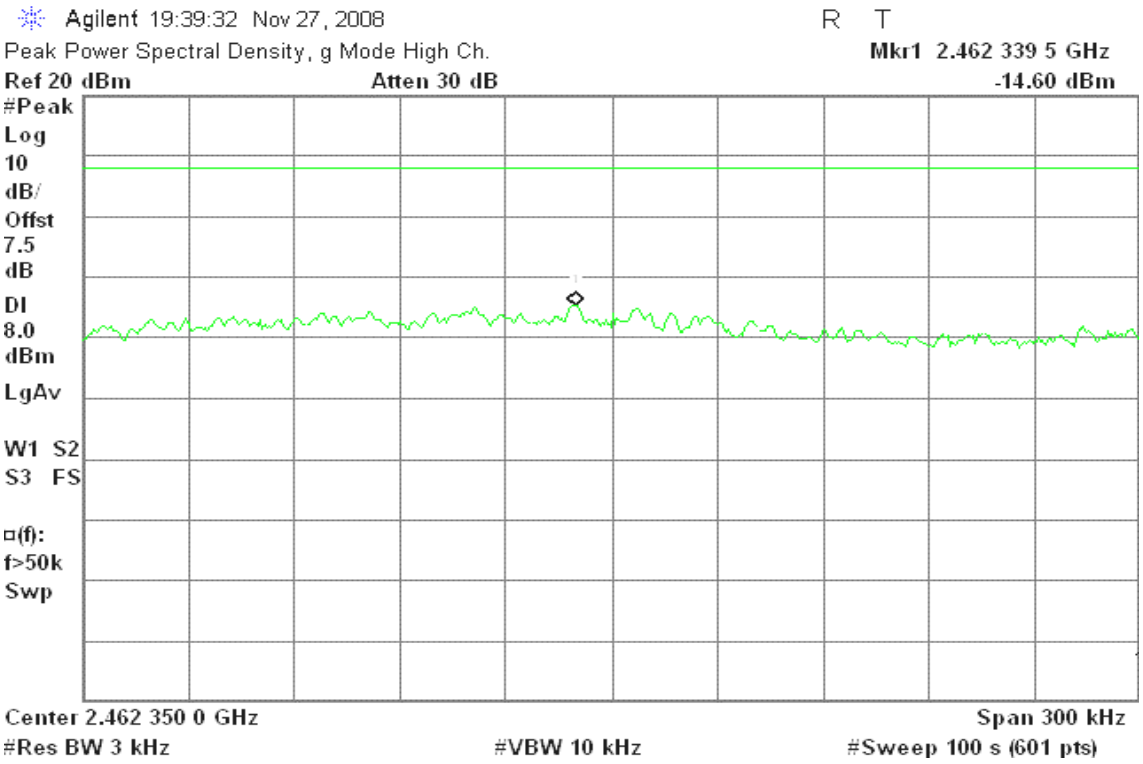
## PPSD (CH Low)



## PPSD (CH Mid)

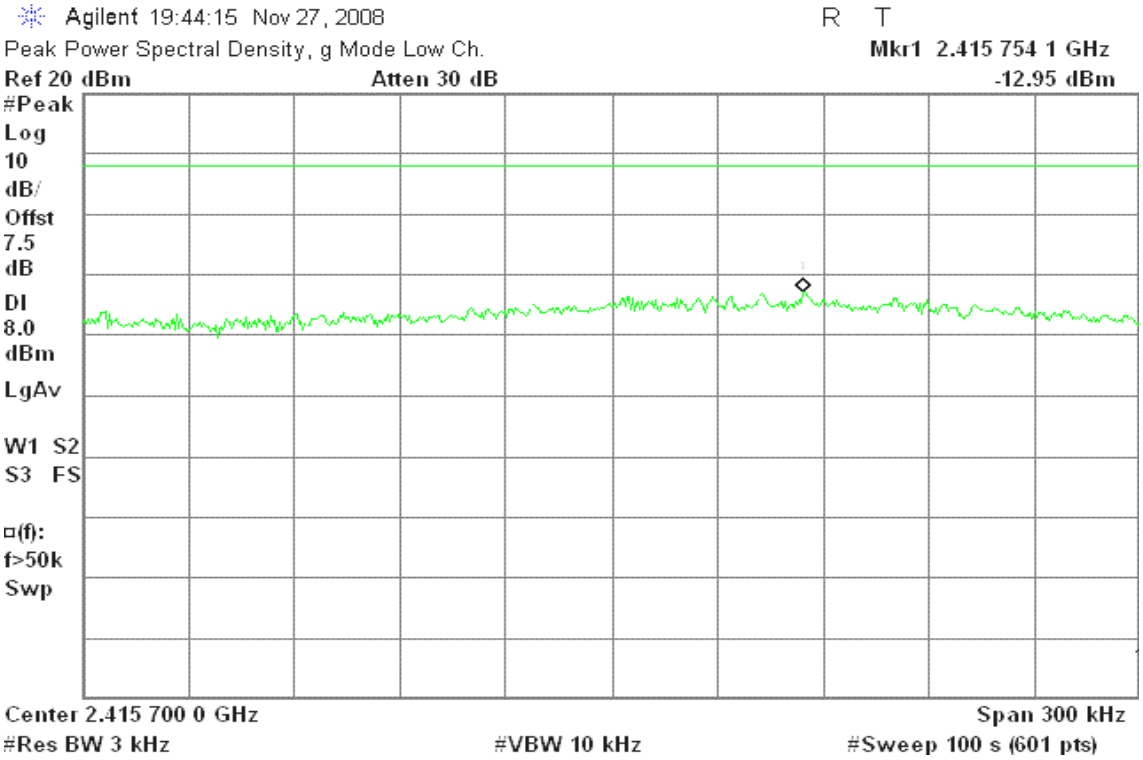



## PPSD (CH High)

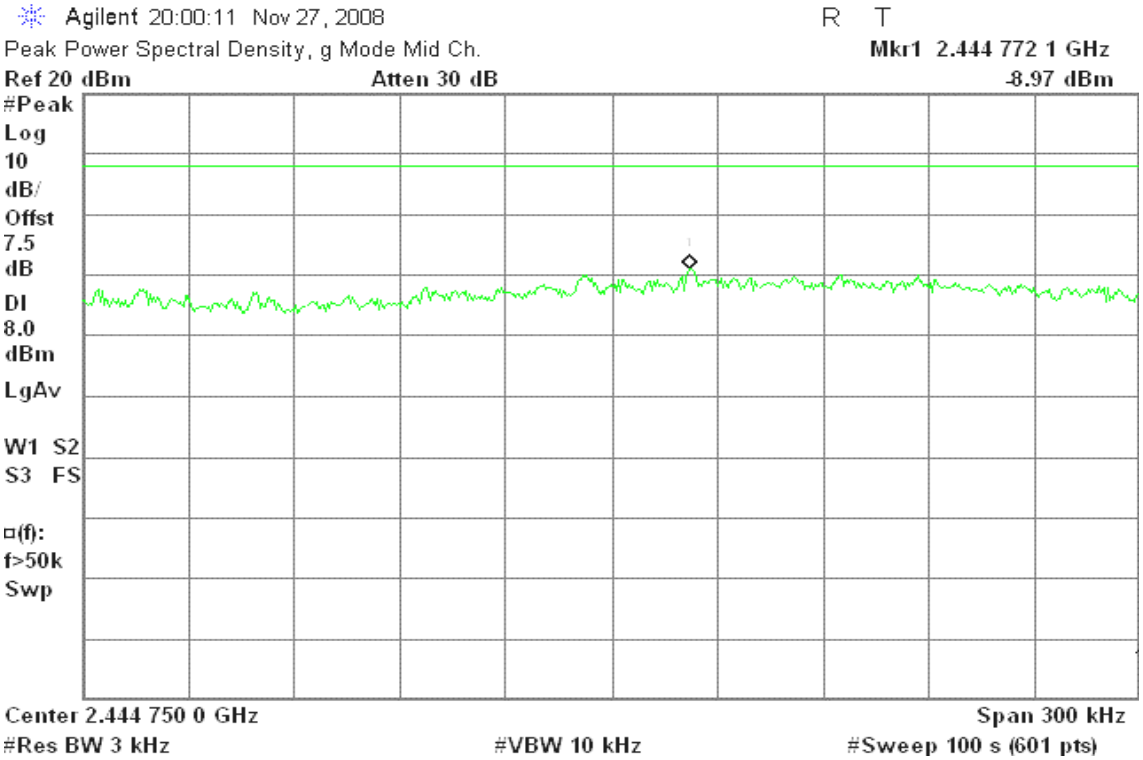


## IEEE 802.11n HT20

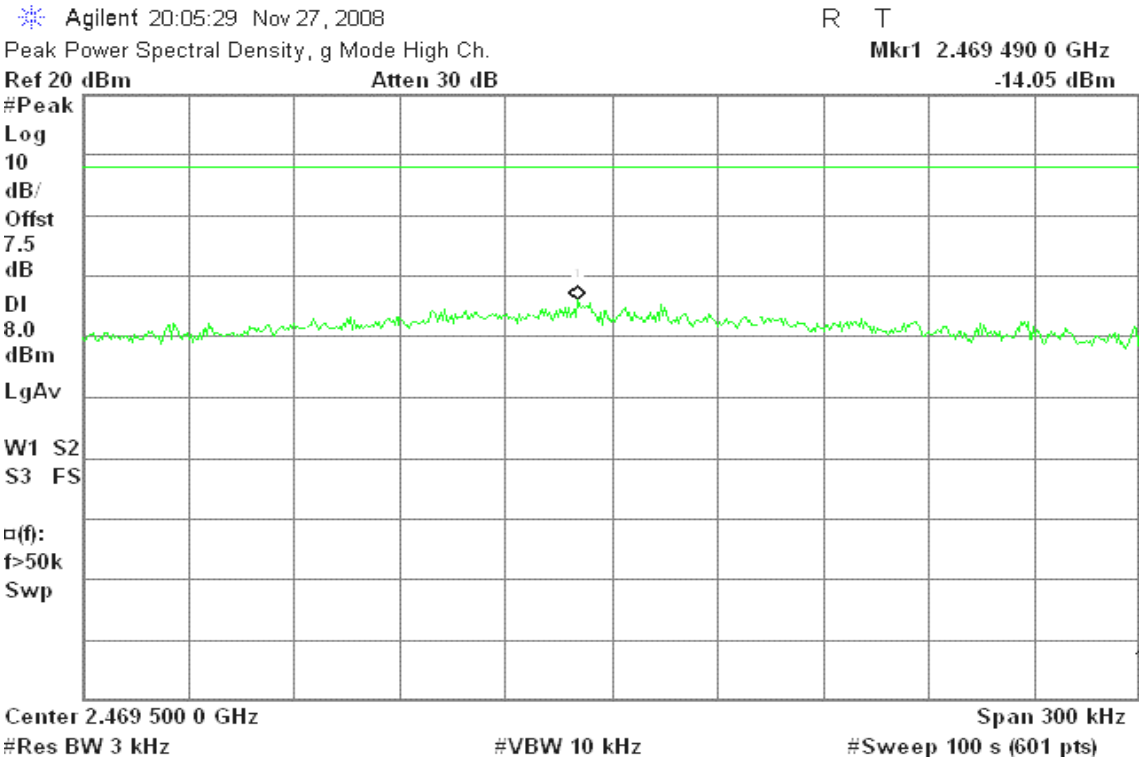
### PPSD (CH Low)




### PPSD (CH Mid)

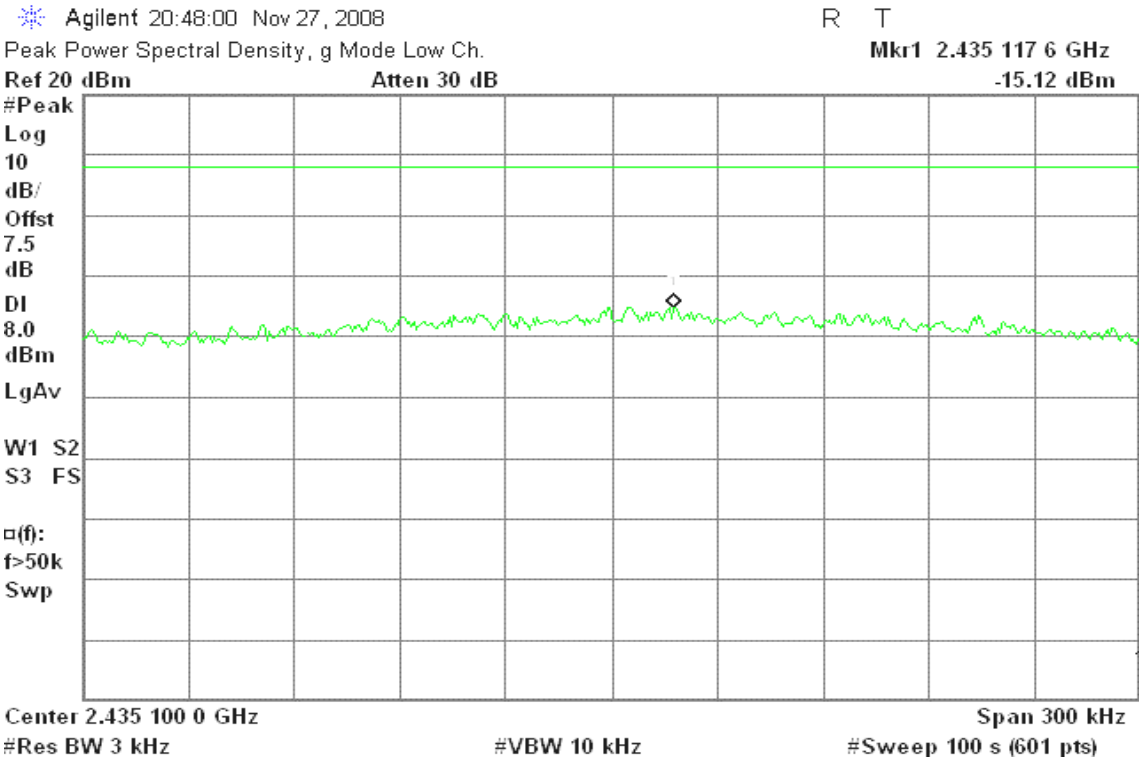


## PPSD (CH High)

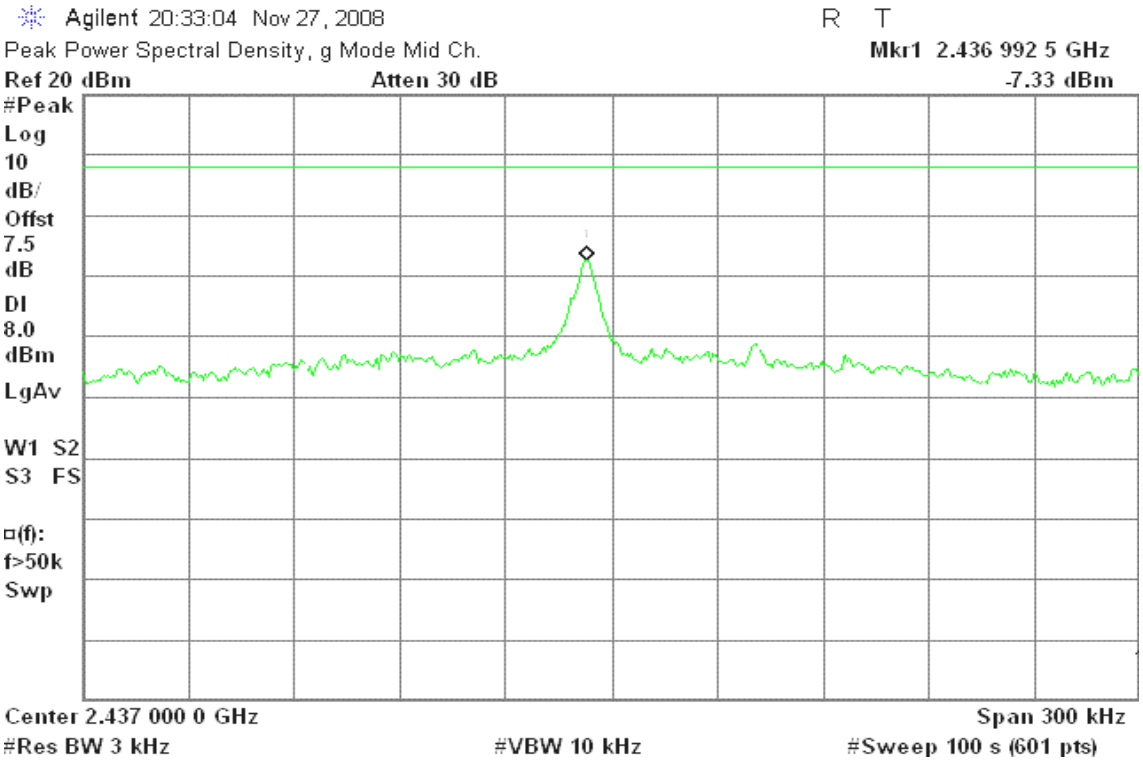



## IEEE 802.11n HT40

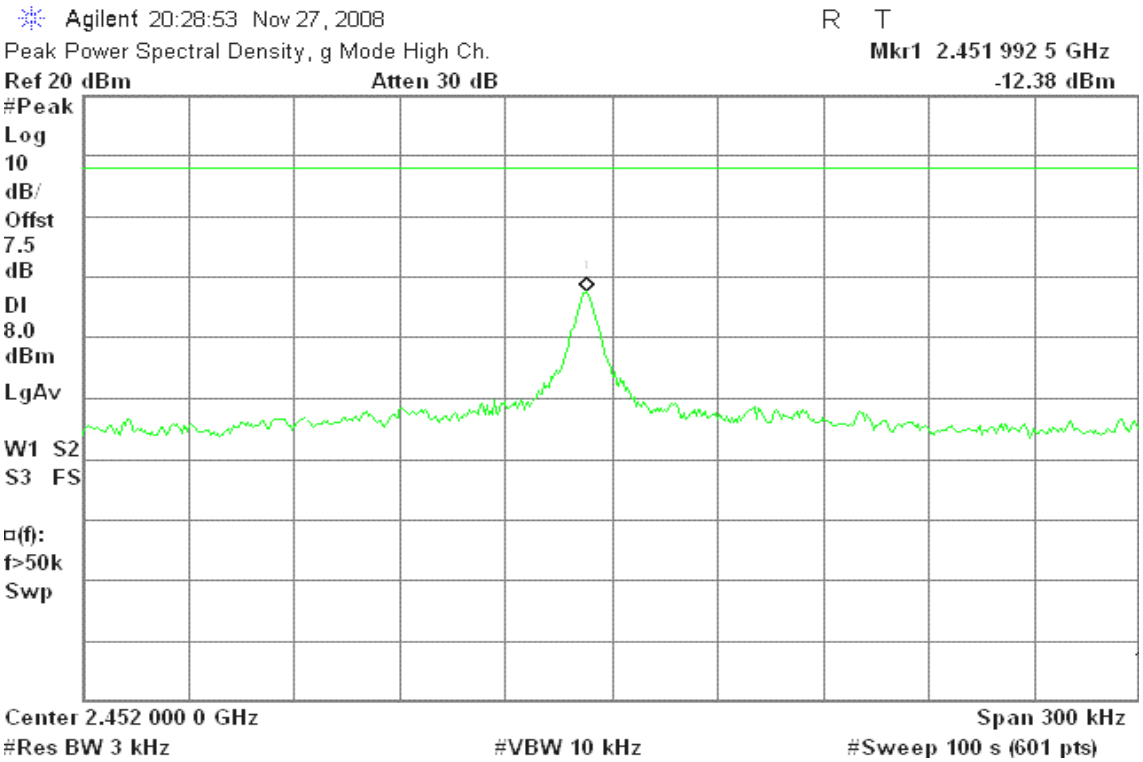
## PPSD (CH Low)



## PPSD (CH Mid)

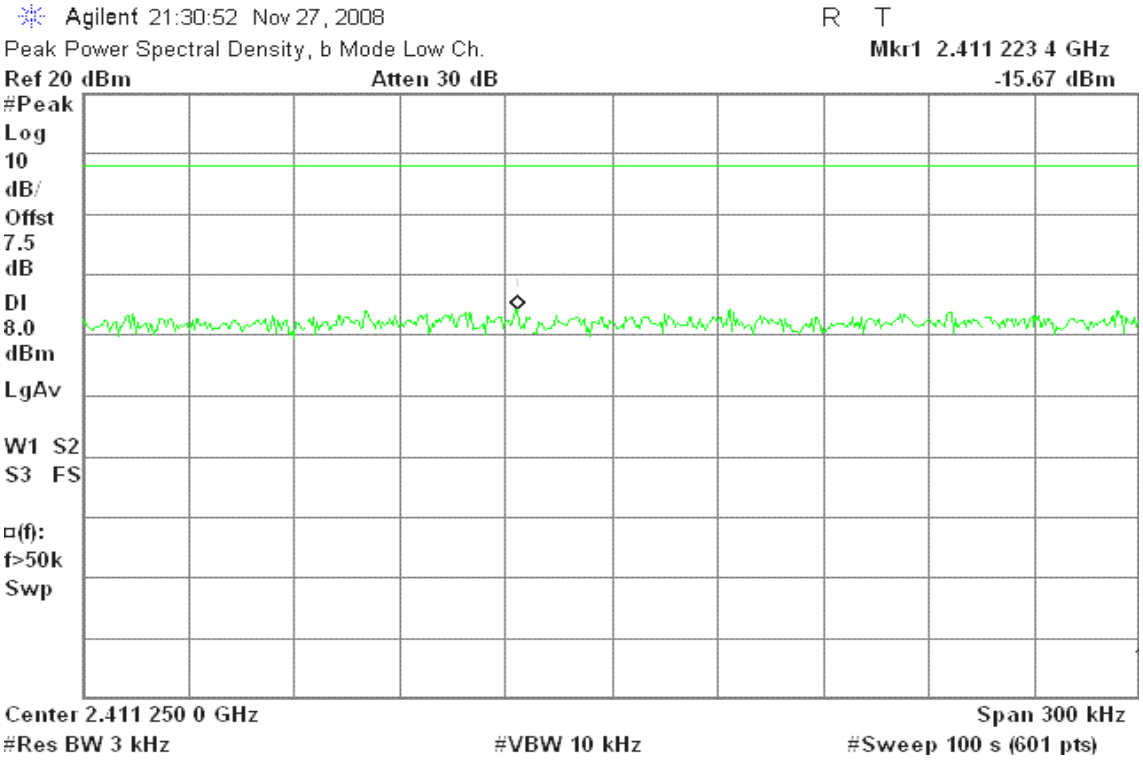



## PPSD (CH High)

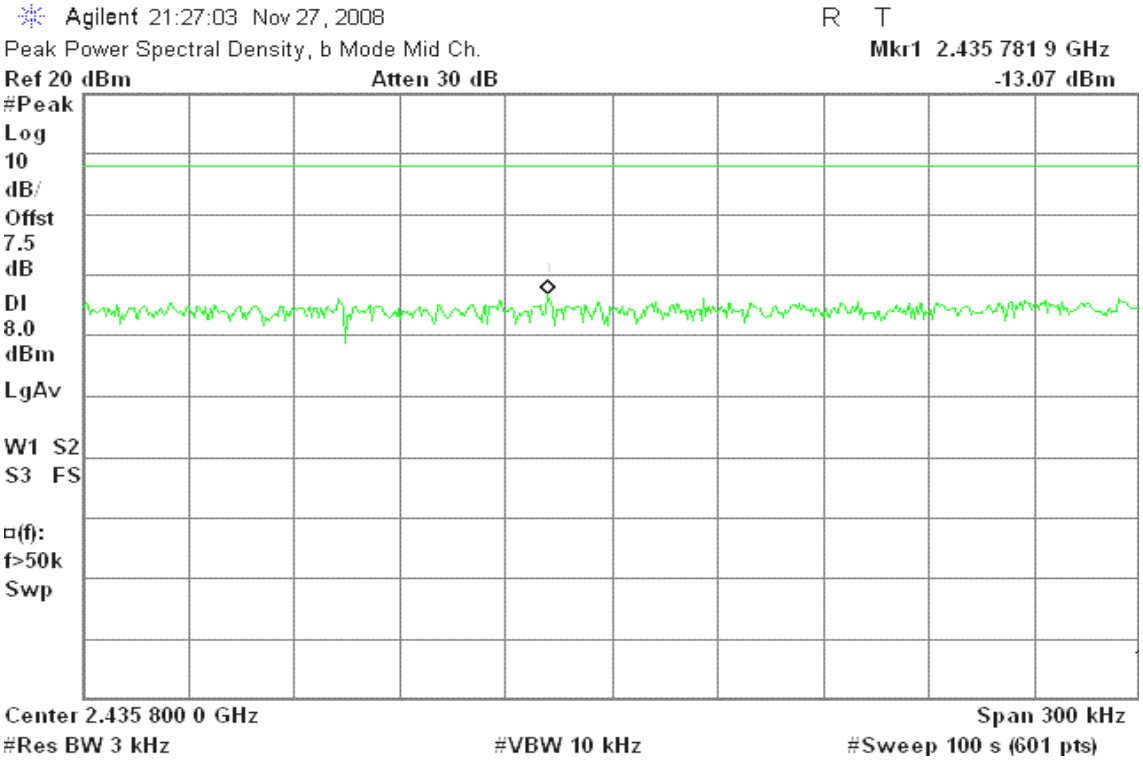


## Half Length Board / IEEE 802.11b

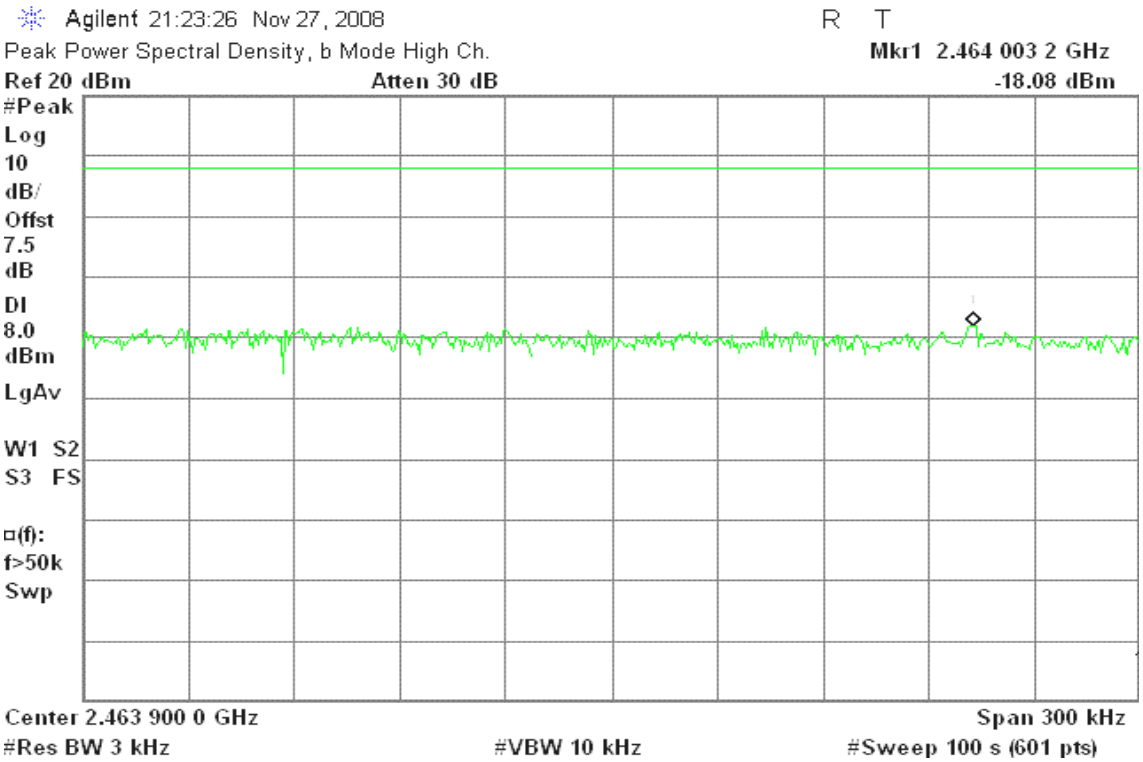
### PPSD (CH Low)




### PPSD (CH Mid)

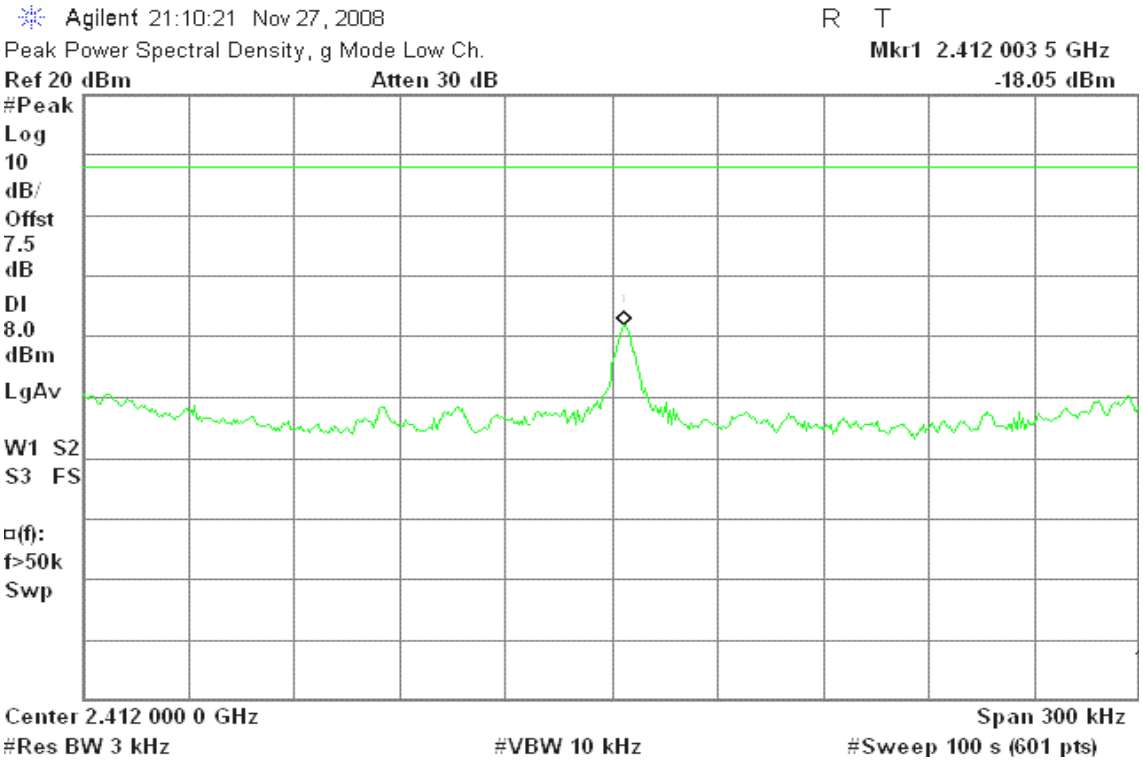


## PPSD (CH High)

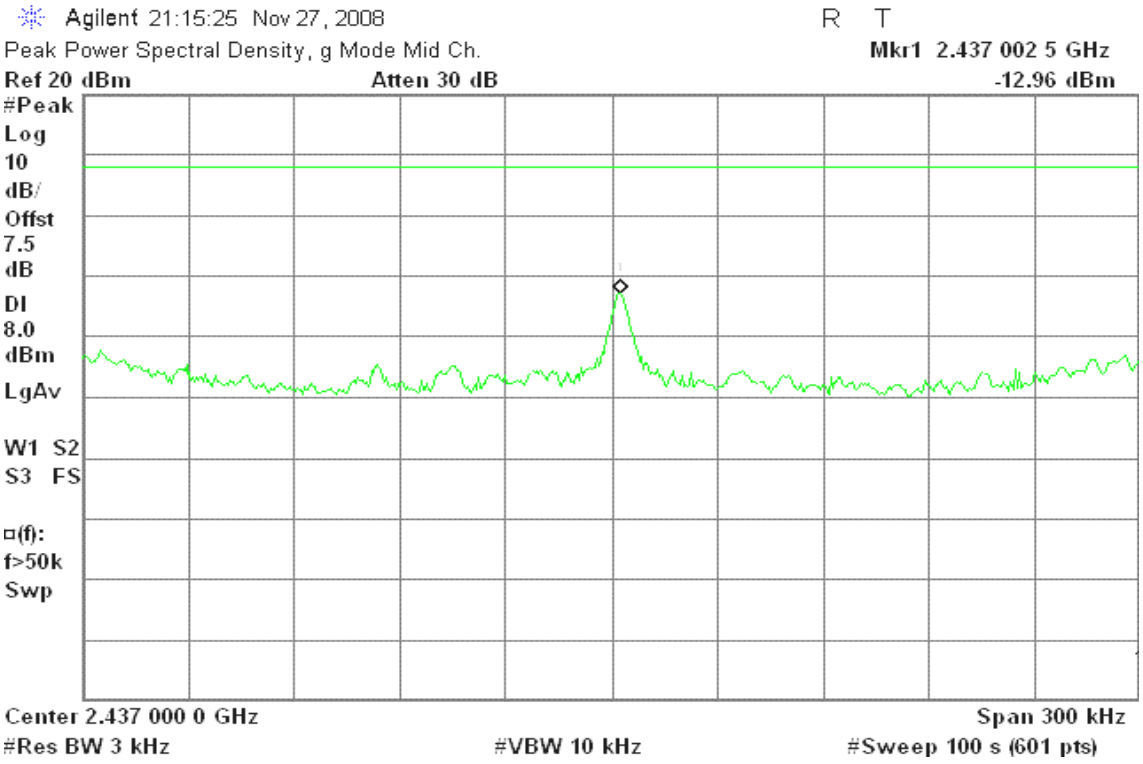



## IEEE 802.11g

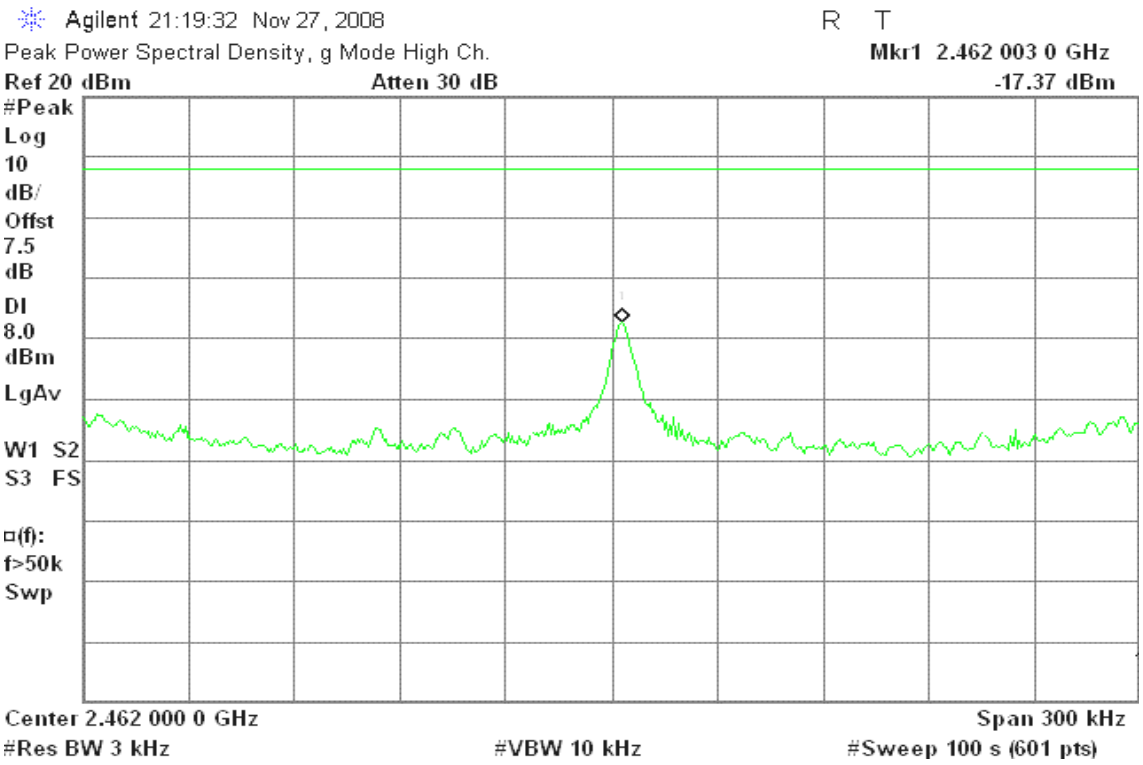
## PPSD (CH Low)



## PPSD (CH Mid)

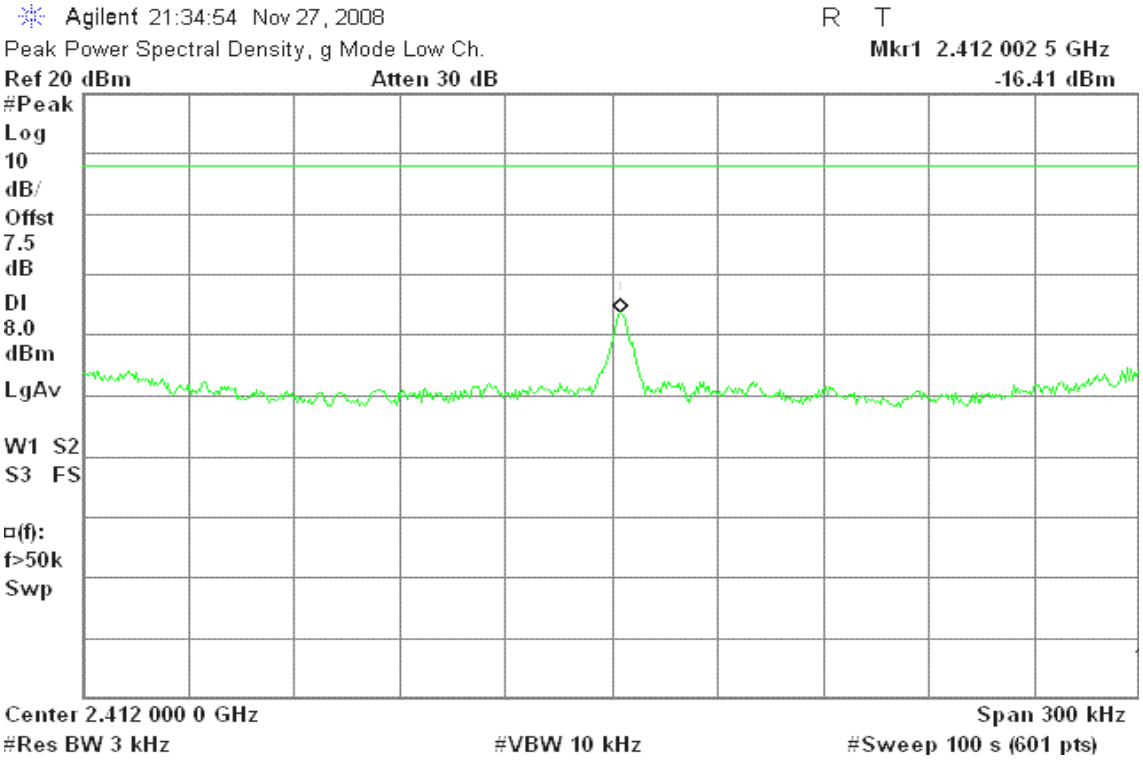



## PPSD (CH High)

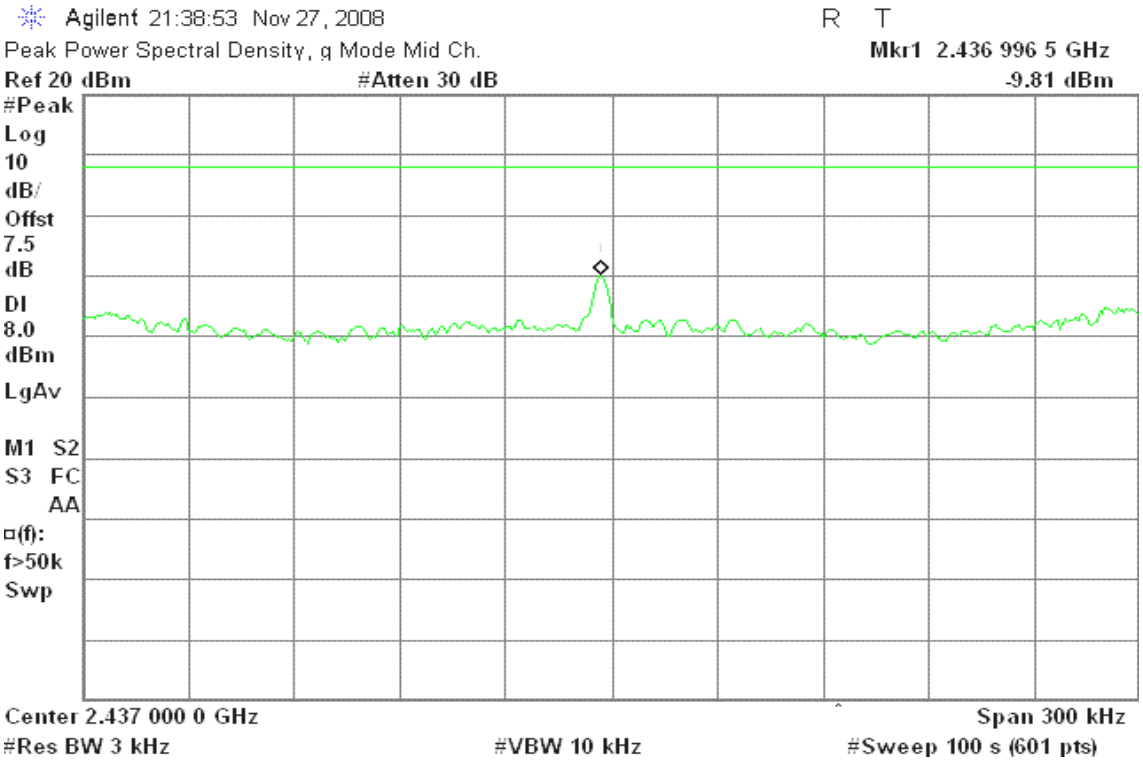


## IEEE 802.11n HT20

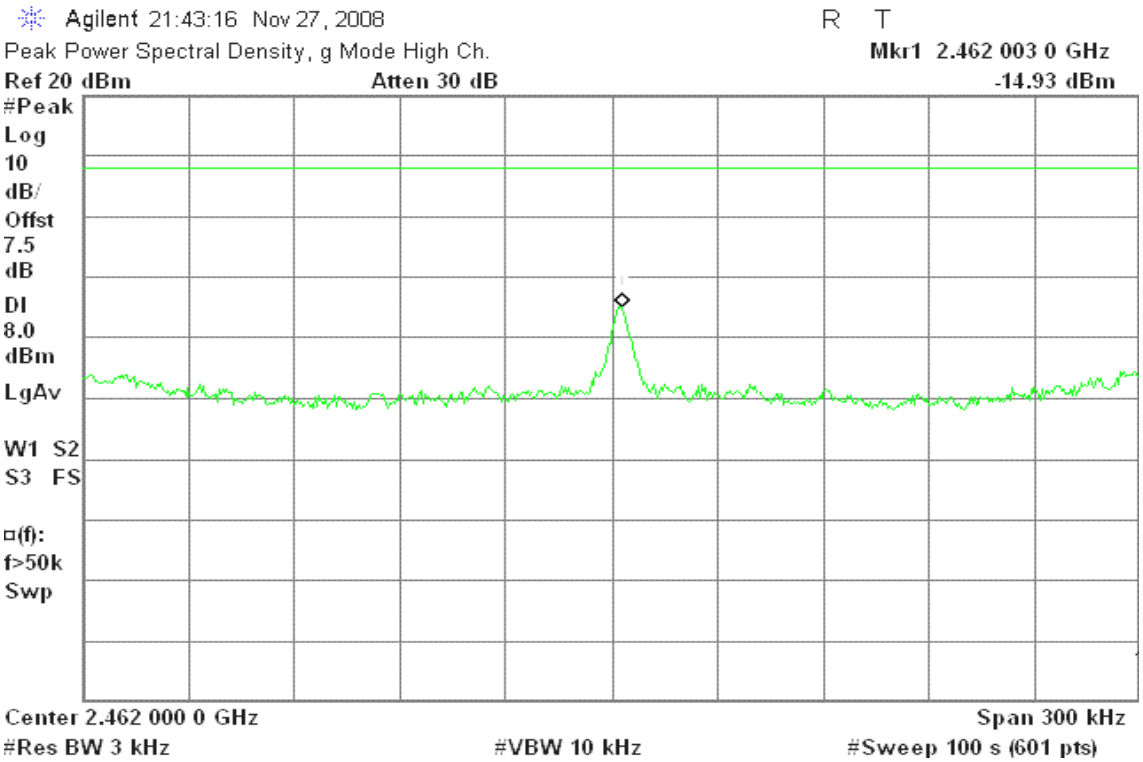
### PPSD (CH Low)




### PPSD (CH Mid)

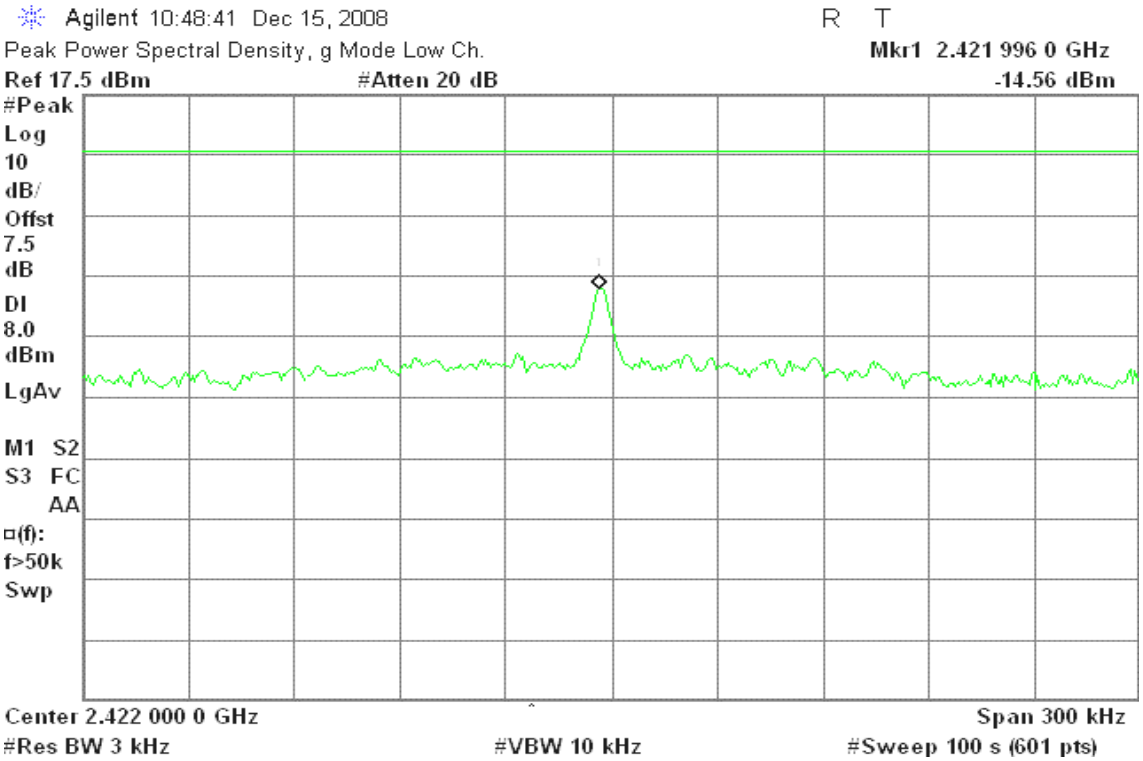


## PPSD (CH High)

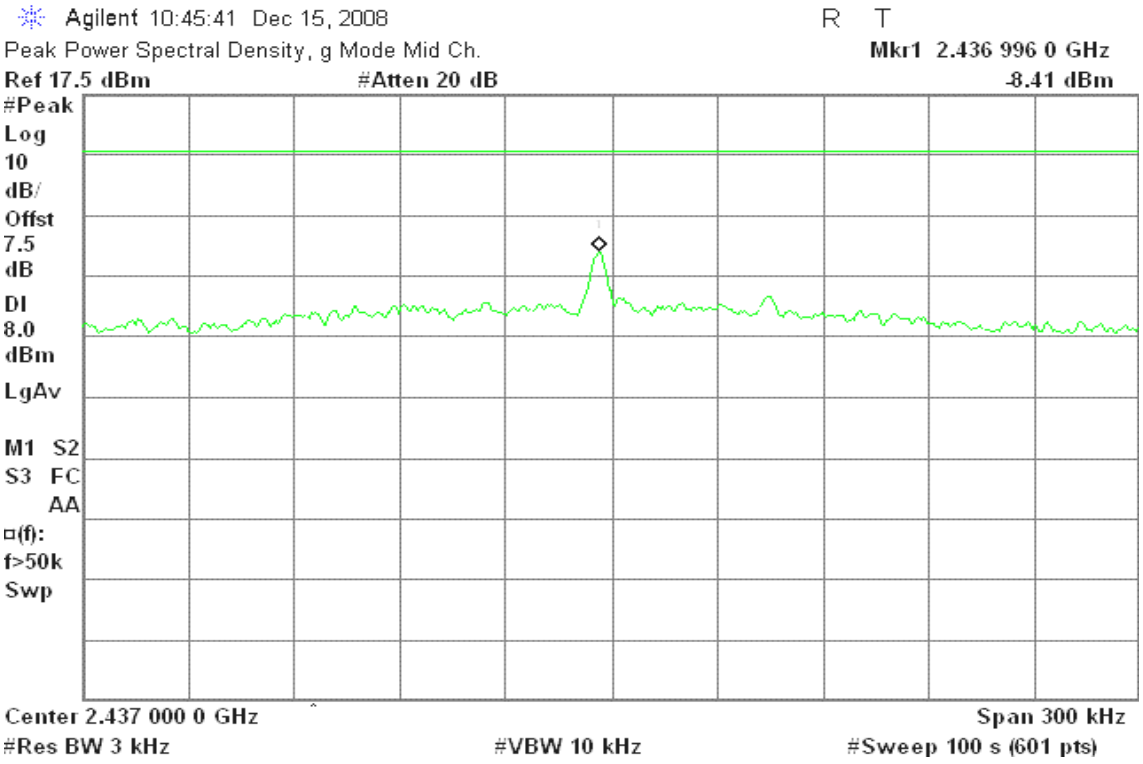



## IEEE 802.11n HT40

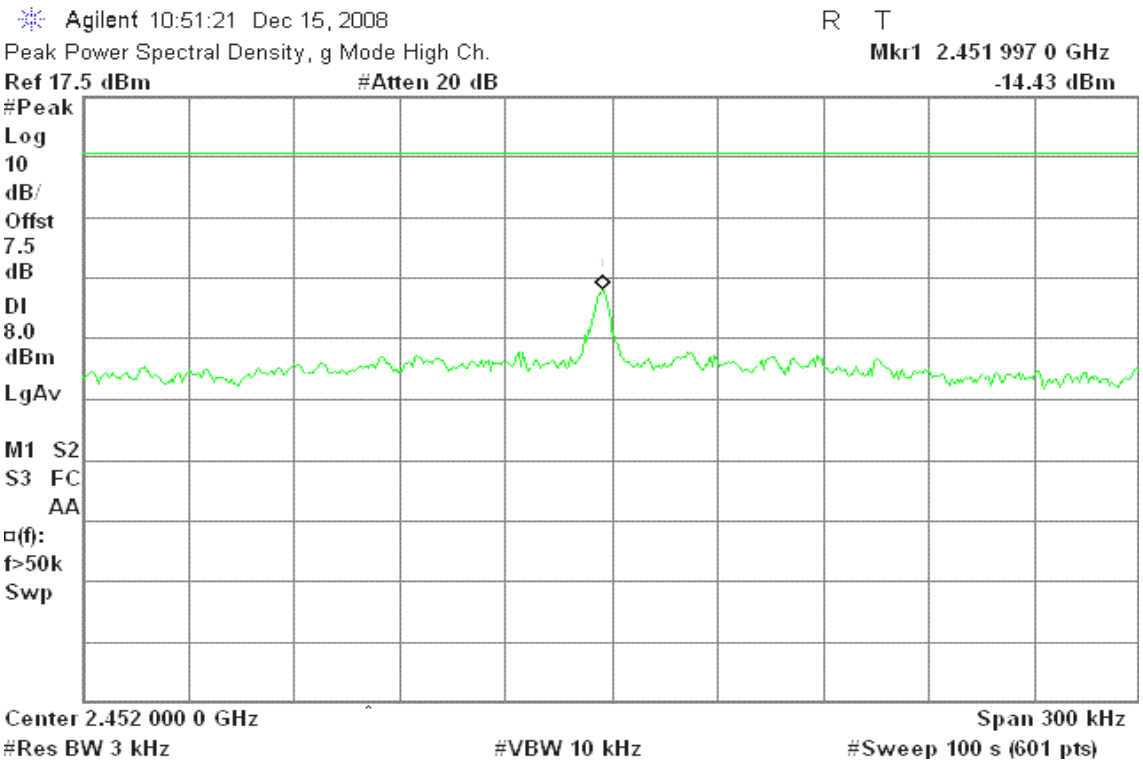
## PPSD (CH Low)



## PPSD (CH Mid)




## PPSD (CH High)



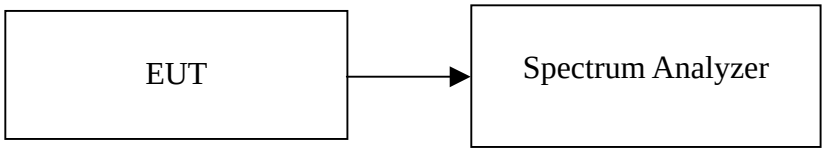
# 8.6 SPURIOUS EMISSIONS

## 8.6.1 CONDUCTED MEASUREMENT

## LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

**Test Configuration**




## TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

Measurements are made over the 13GHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

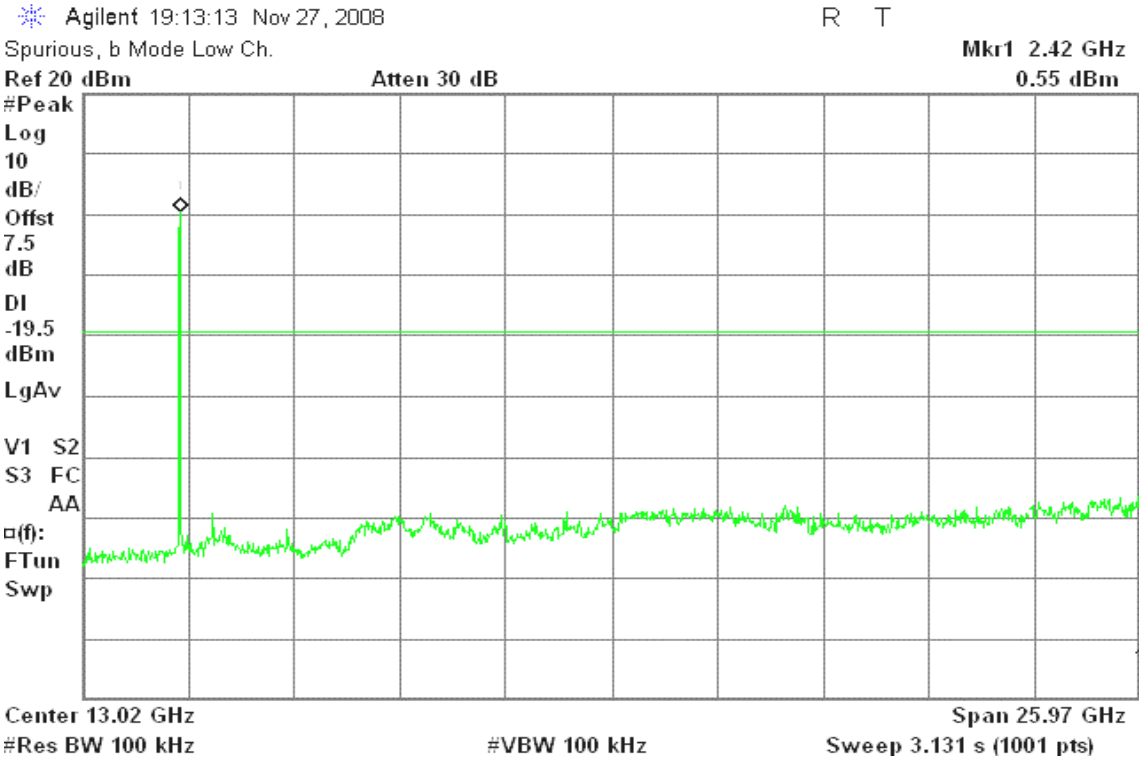
## TEST RESULTS

*No non-compliance noted.*

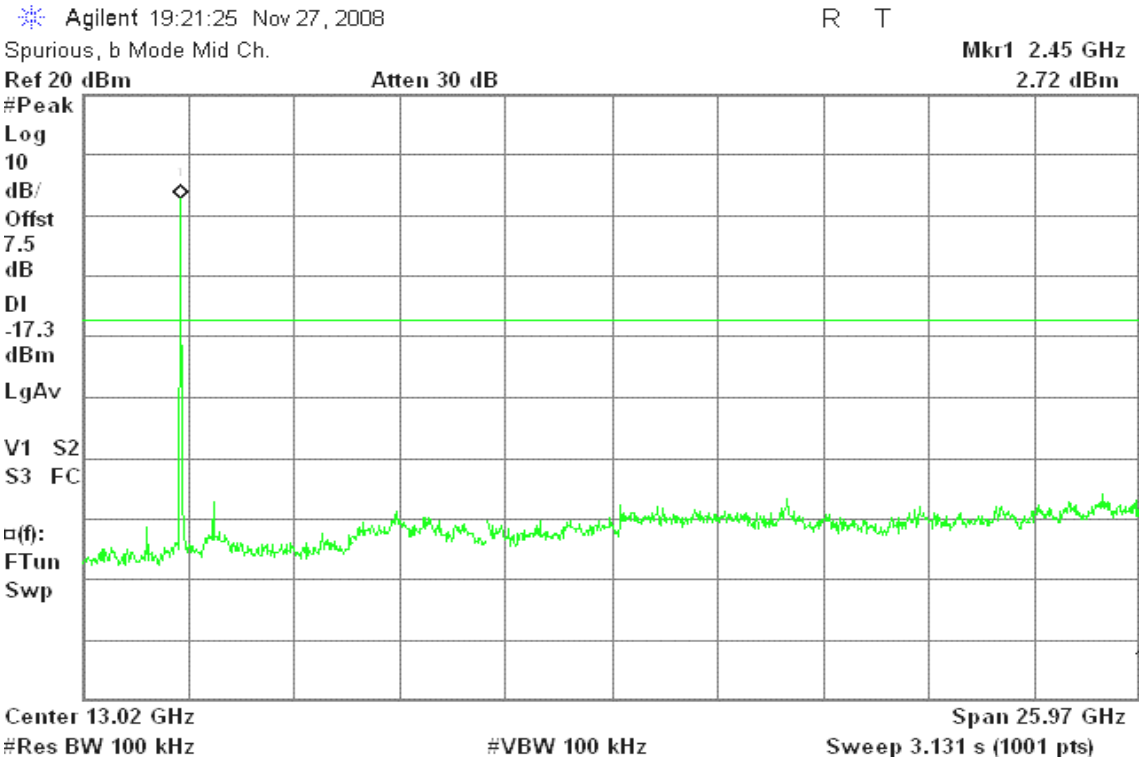
## Test Plot

### Full Length Board / IEEE 802.11b

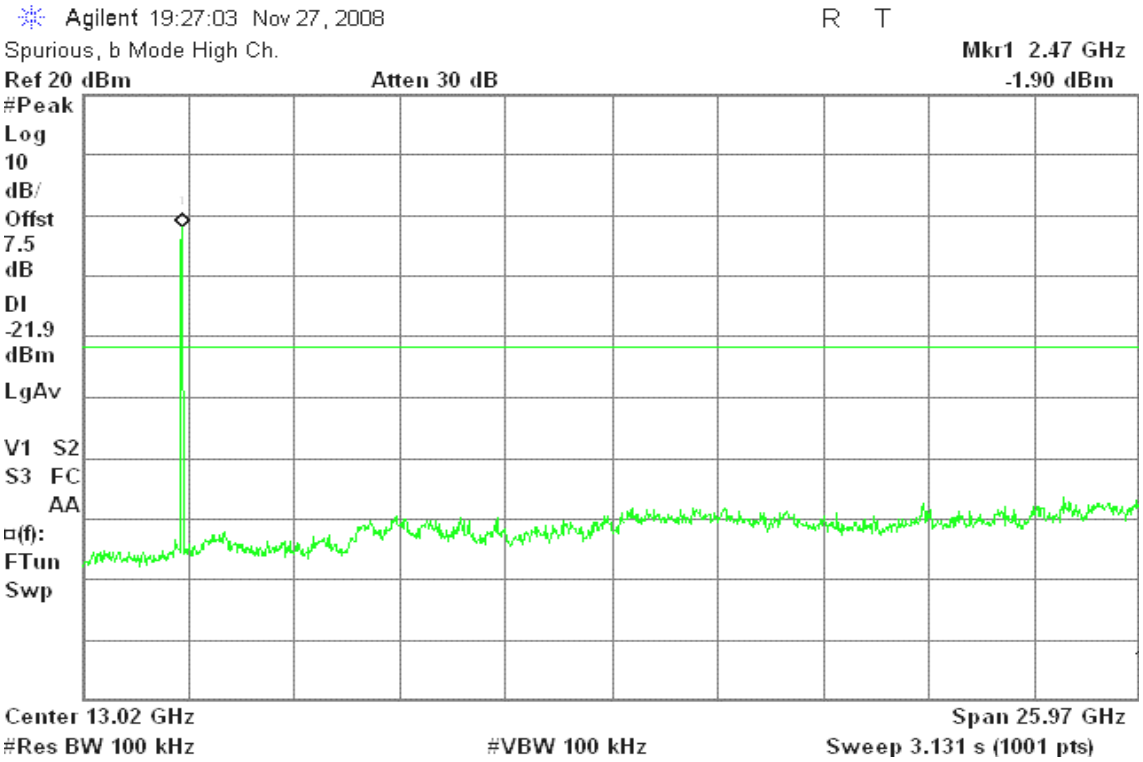
### CH Low




### CH Mid

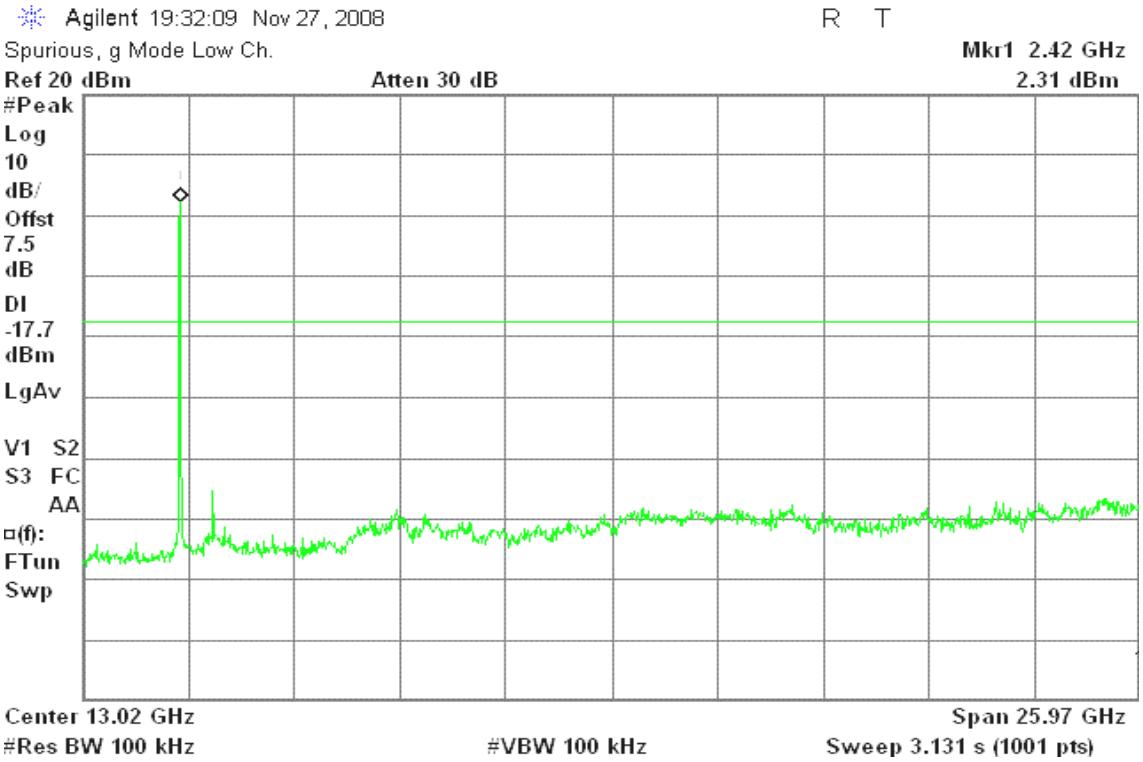


## CH High

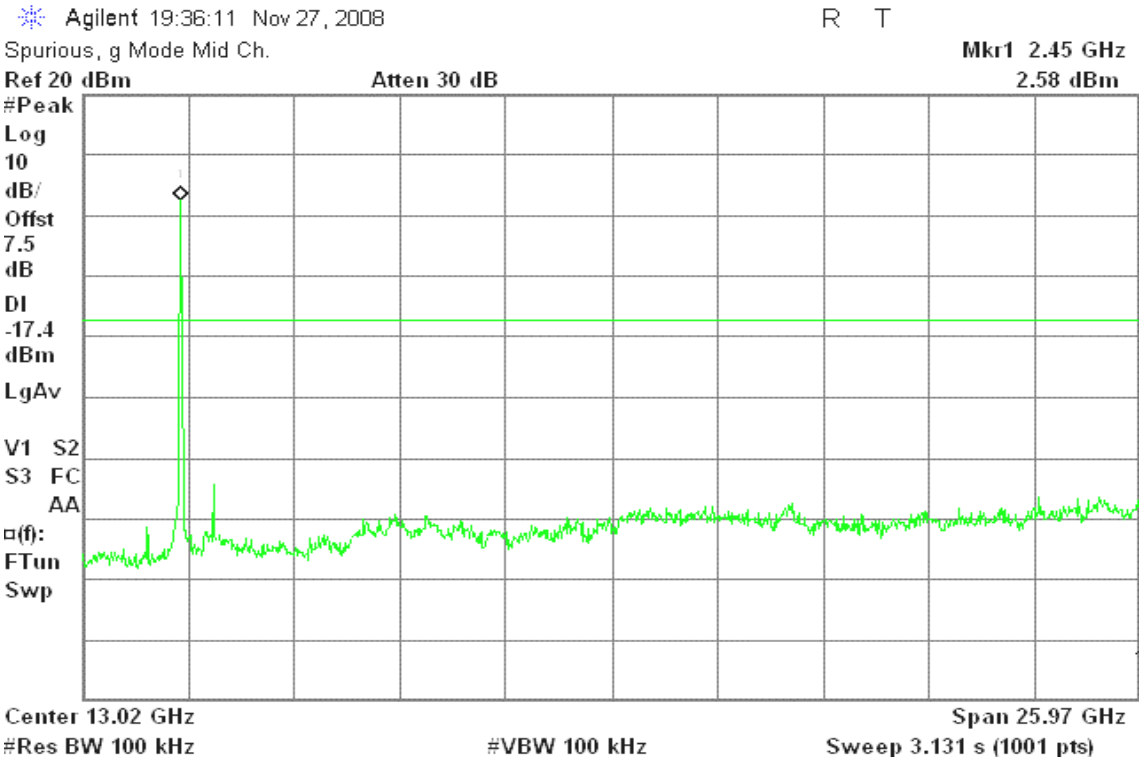



## IEEE 802.11g

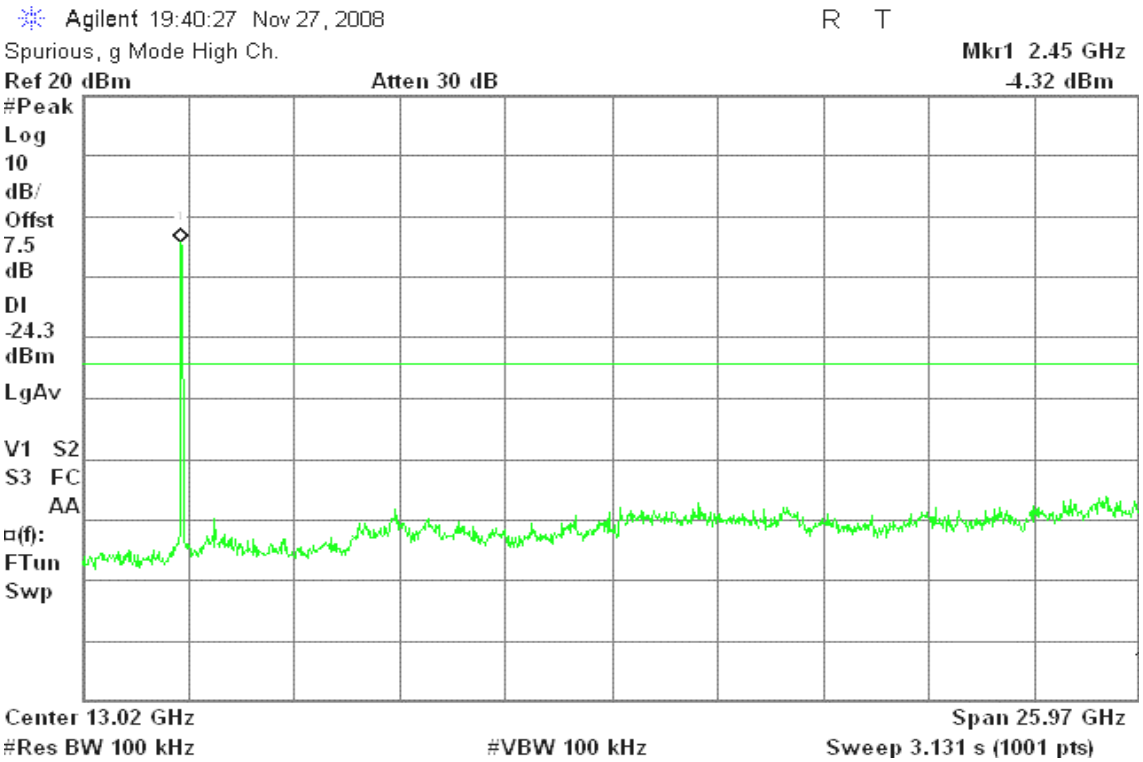
## CH Low



## CH Mid

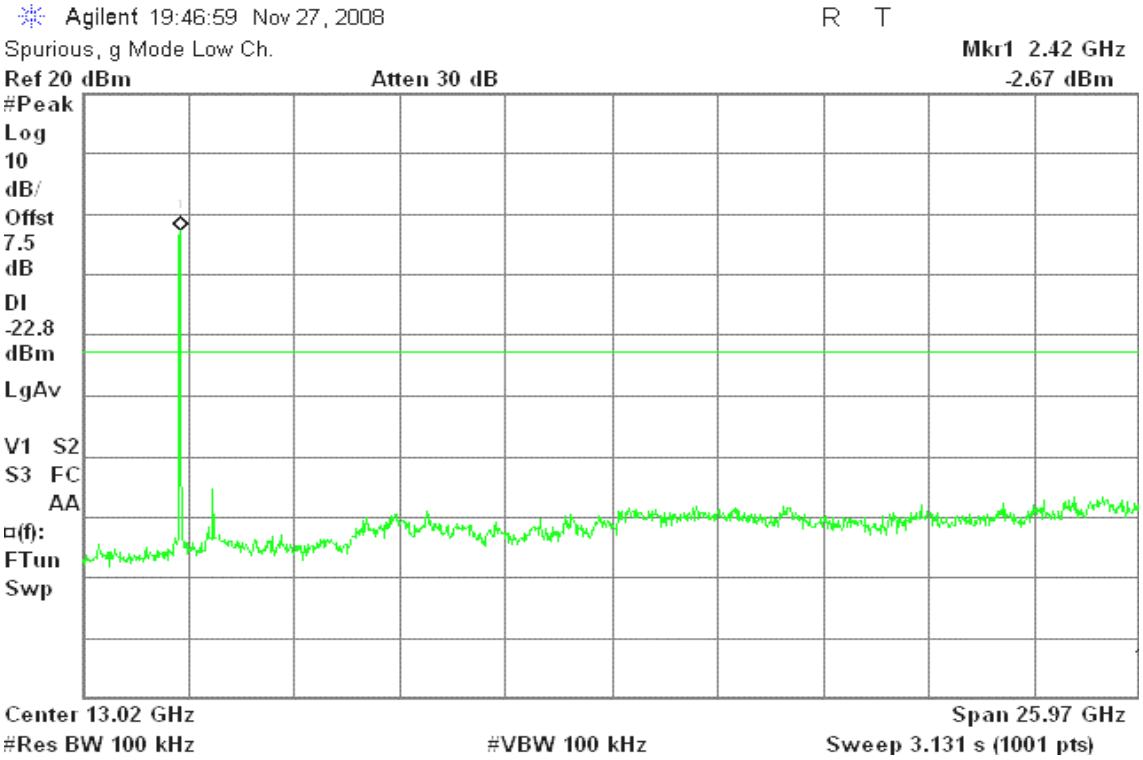



## CH High

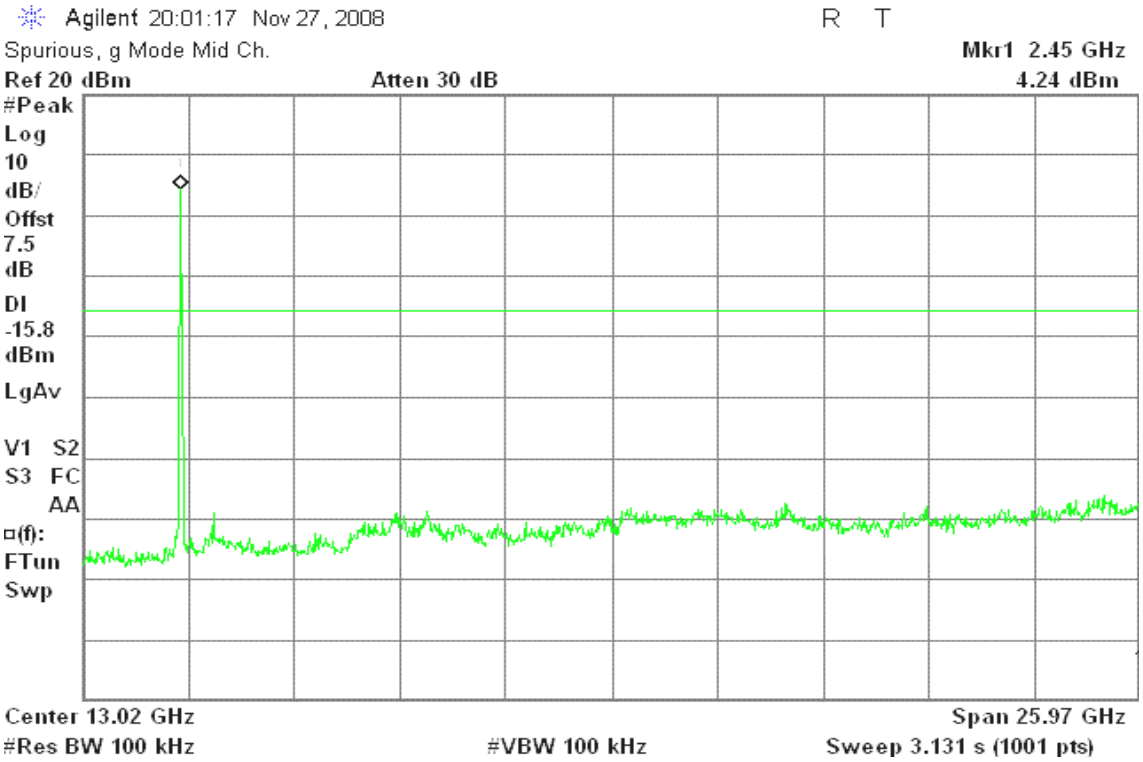


## IEEE 802.11n HT20

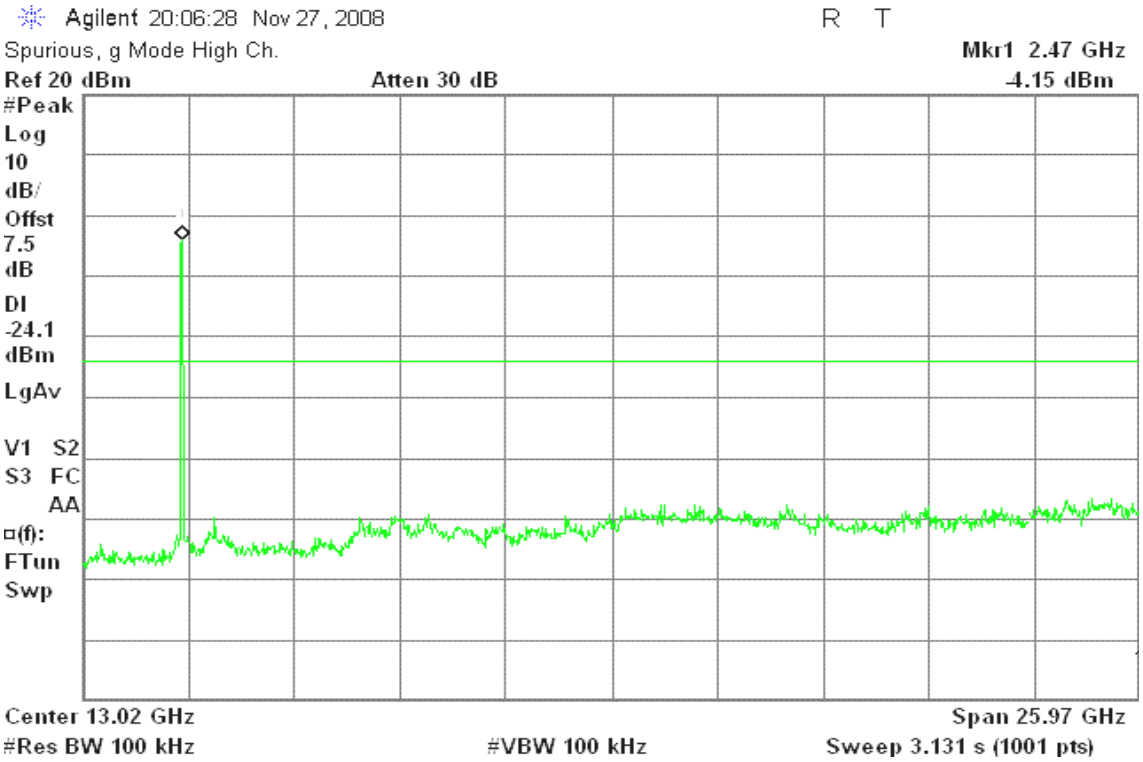
### CH Low




### CH Mid

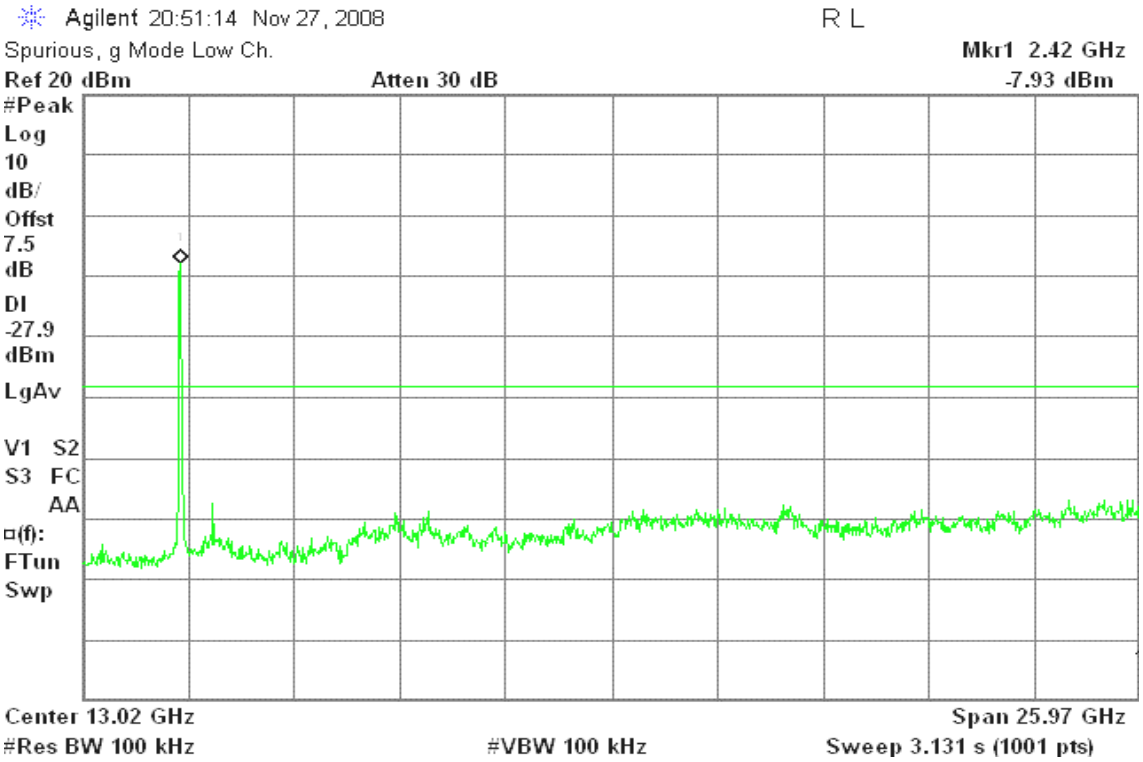


## CH High

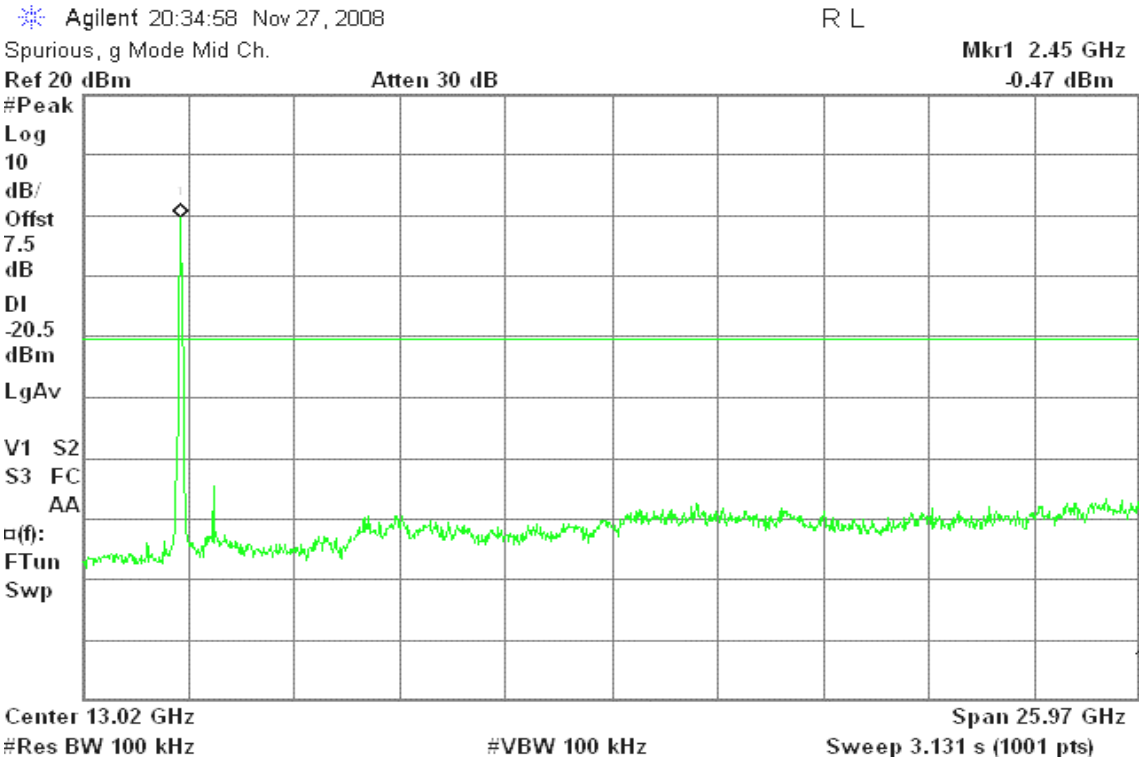



## IEEE 802.11n HT40

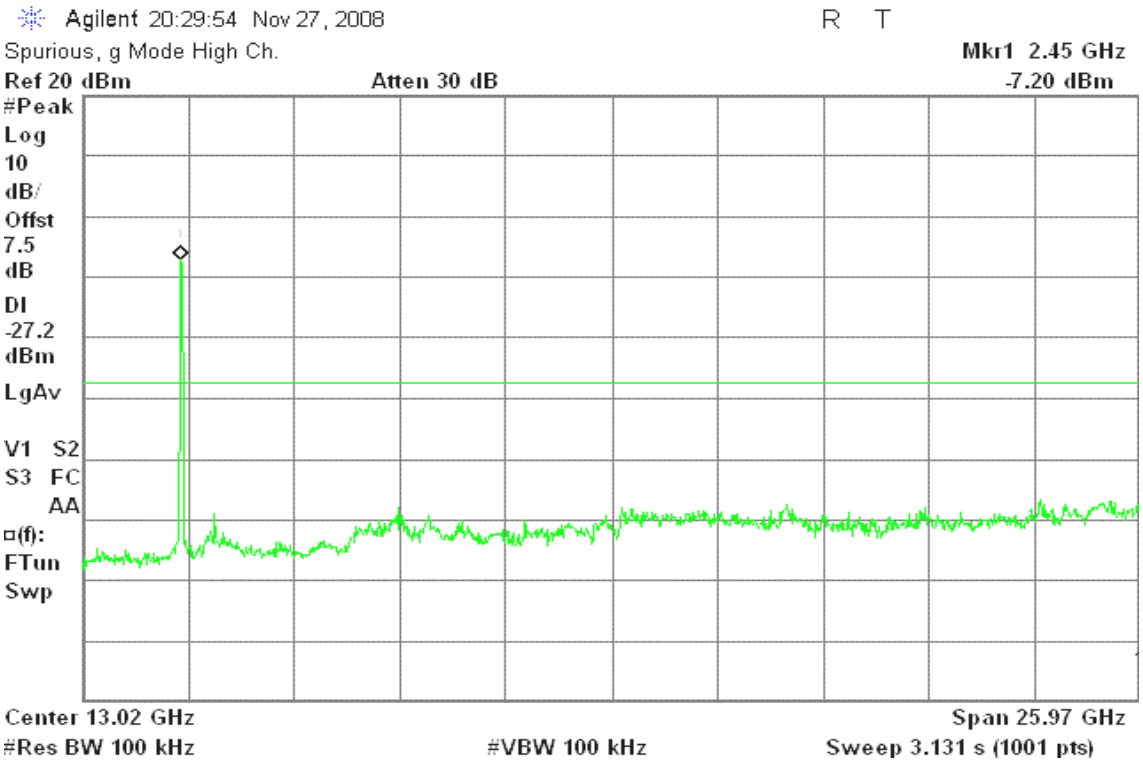
## CH Low



## CH Mid

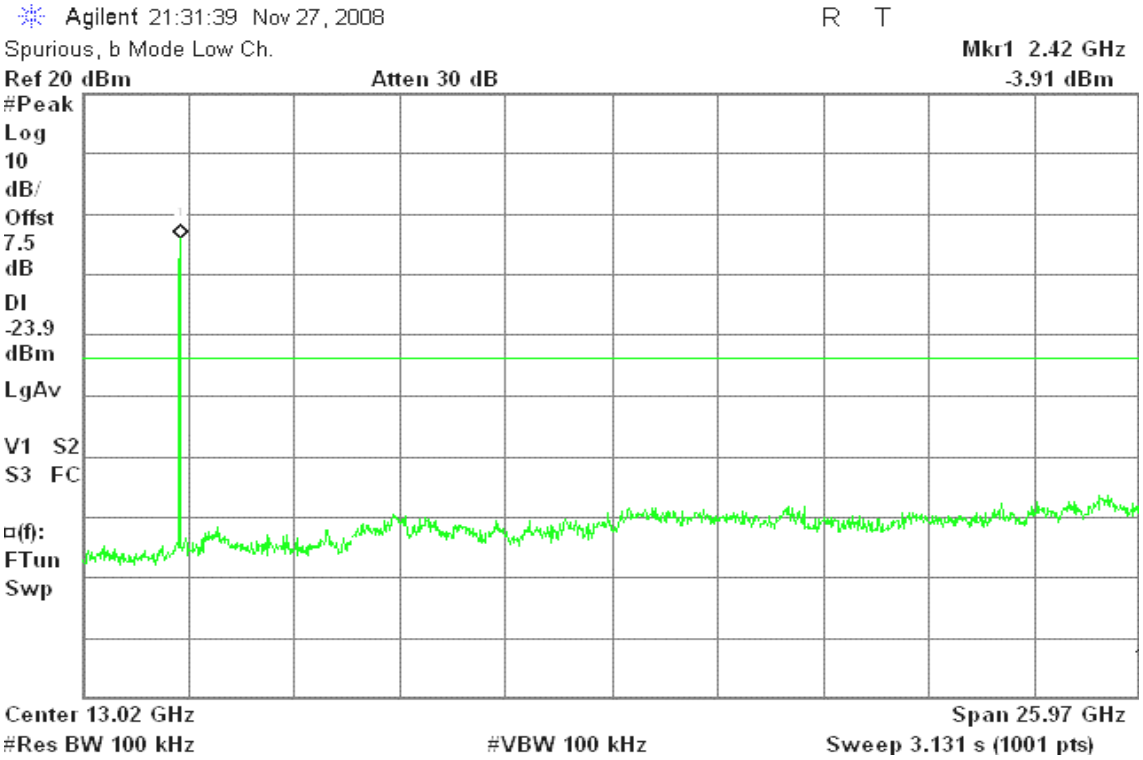



## CH High

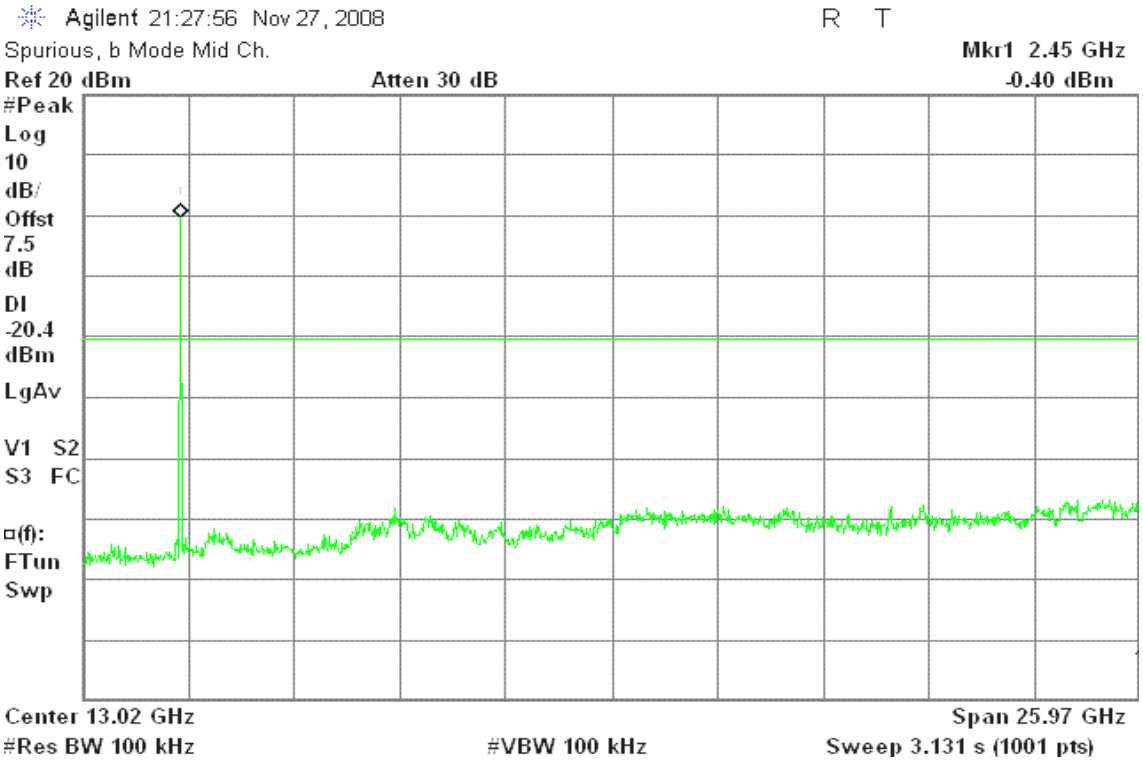


## Half Length Board / IEEE 802.11b

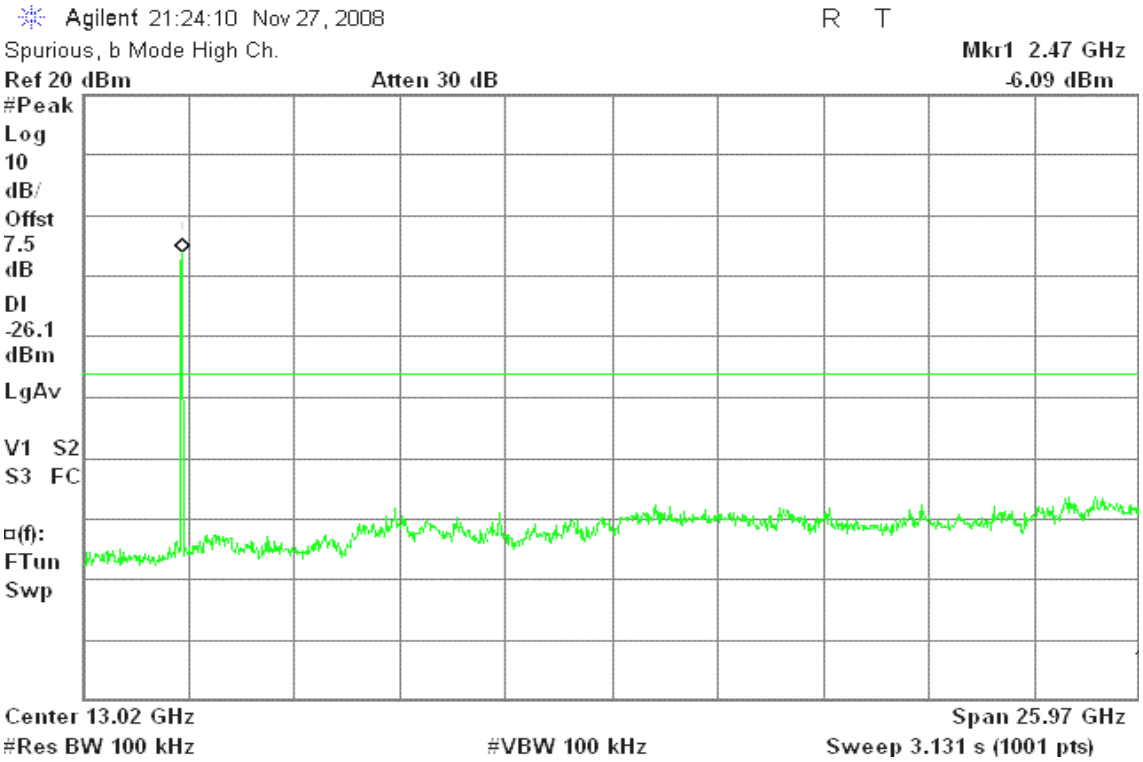
### CH Low




### CH Mid

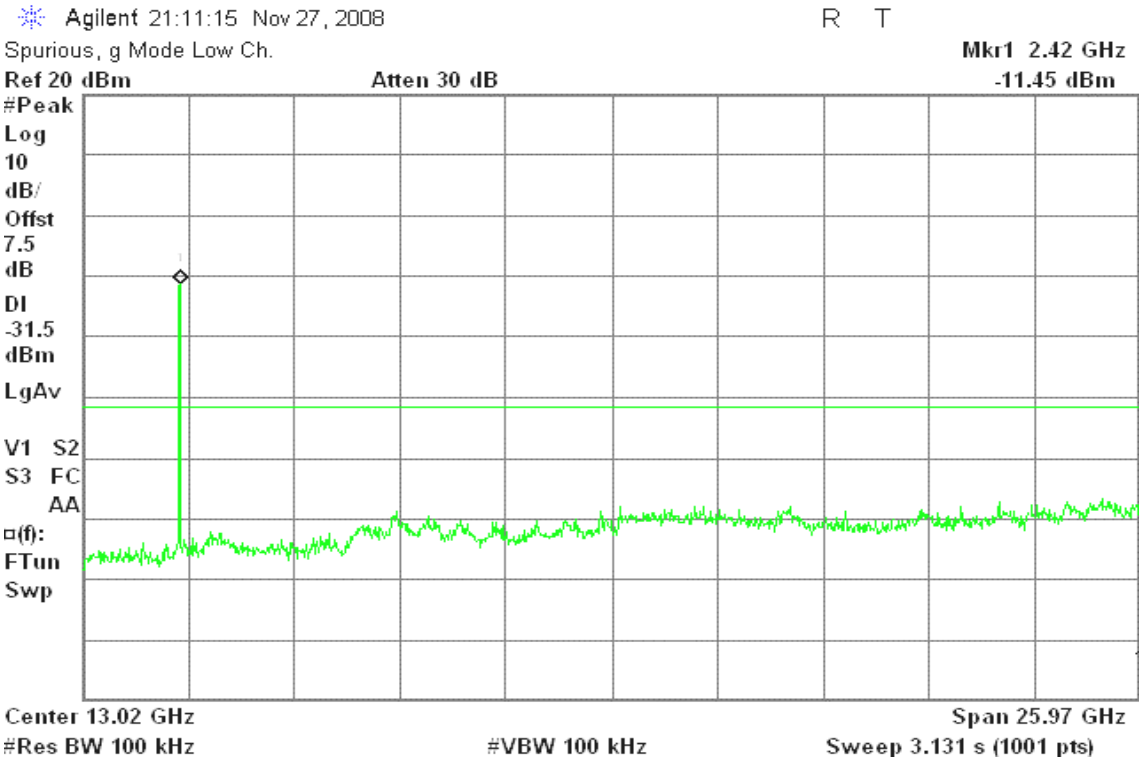


## CH High

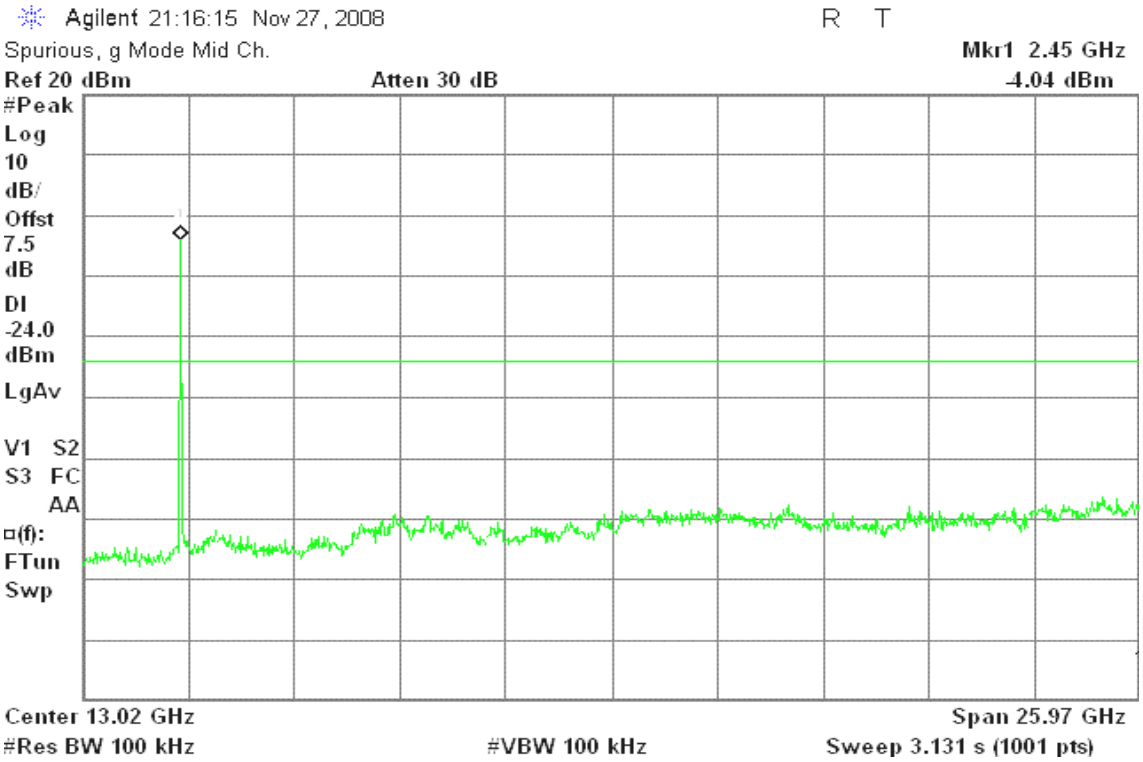



## IEEE 802.11g

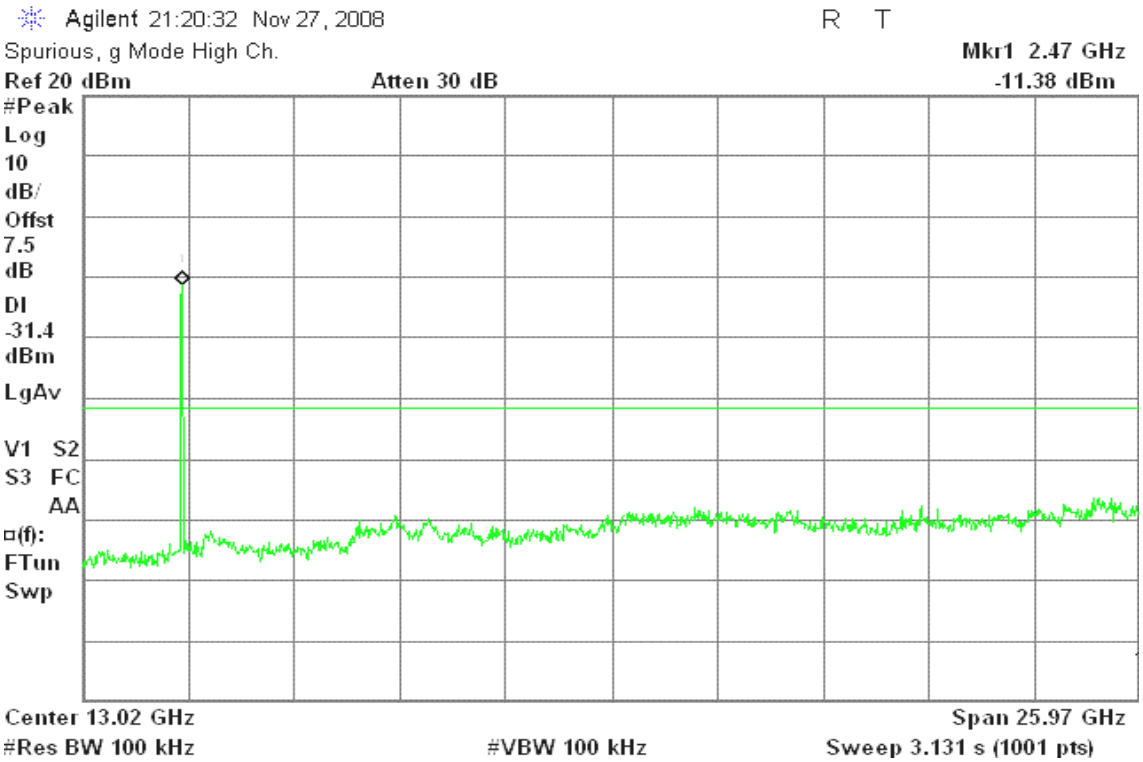
## CH Low



## CH Mid

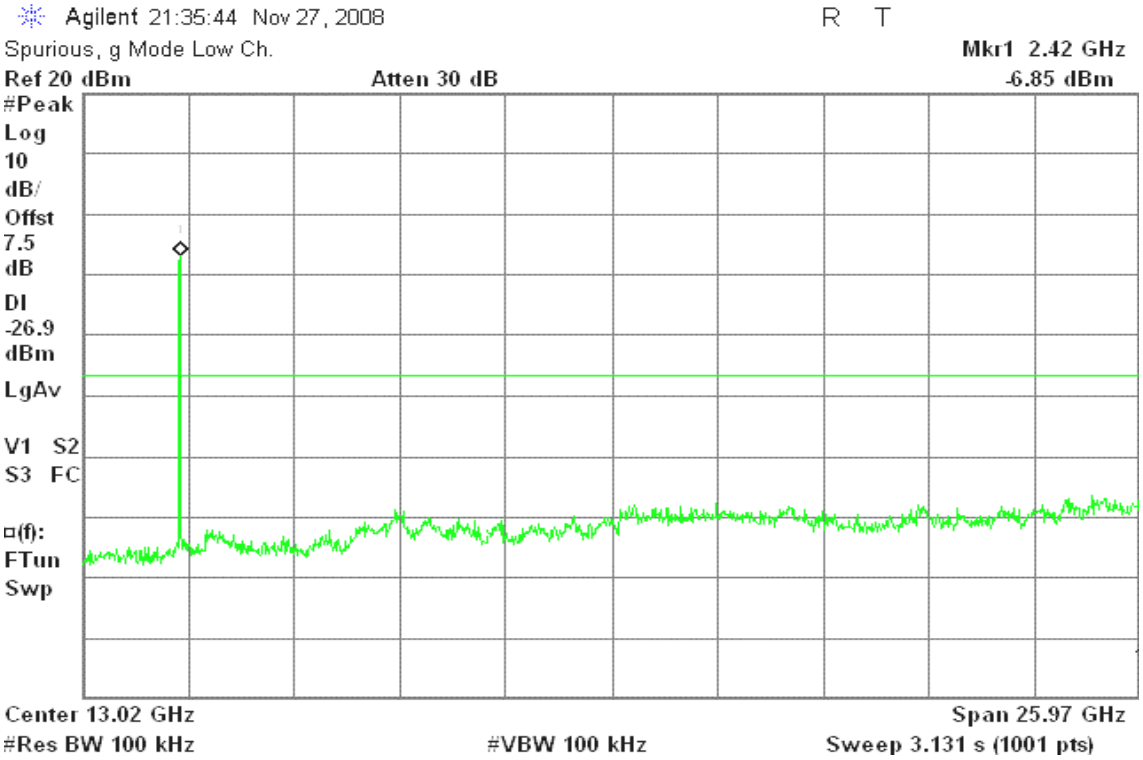



## CH High

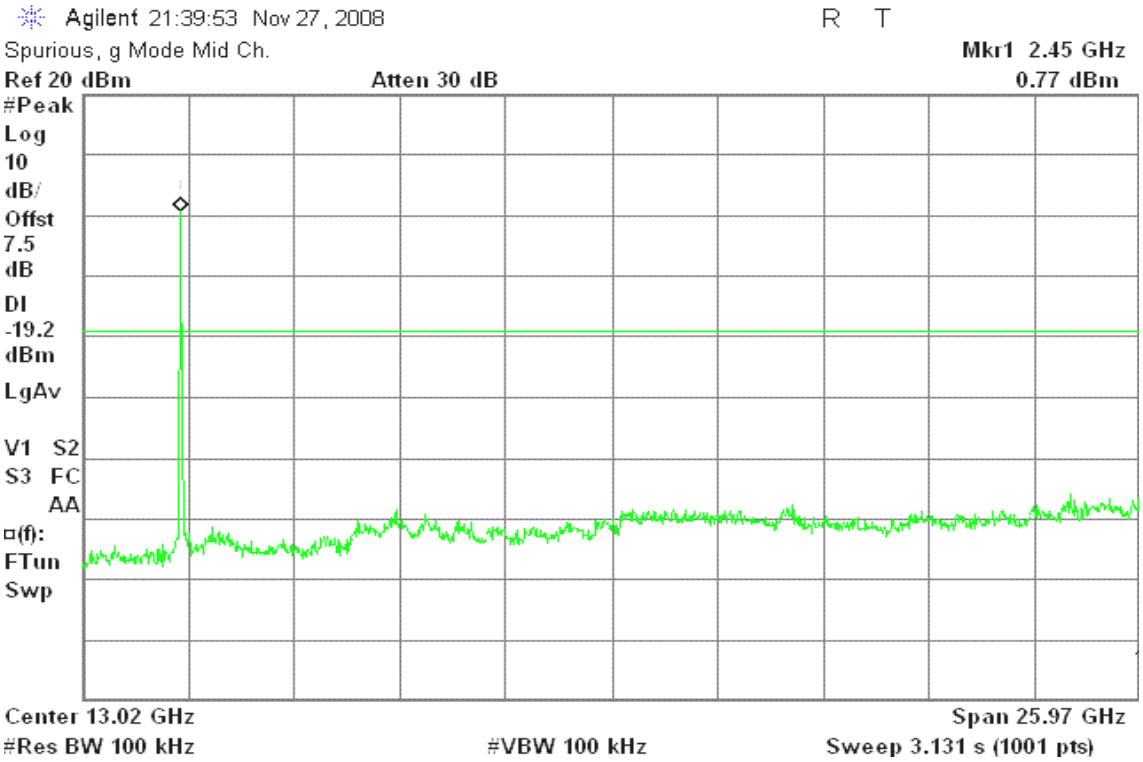


## IEEE 802.11n HT20

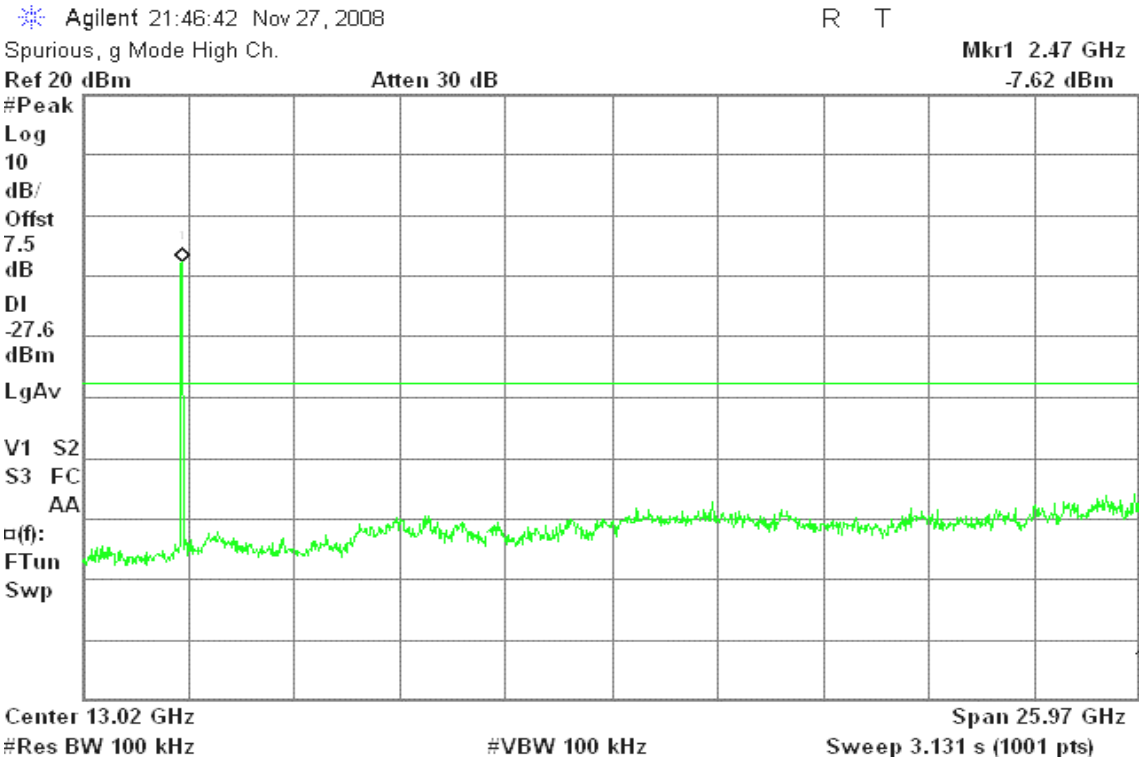
### CH Low




### CH Mid

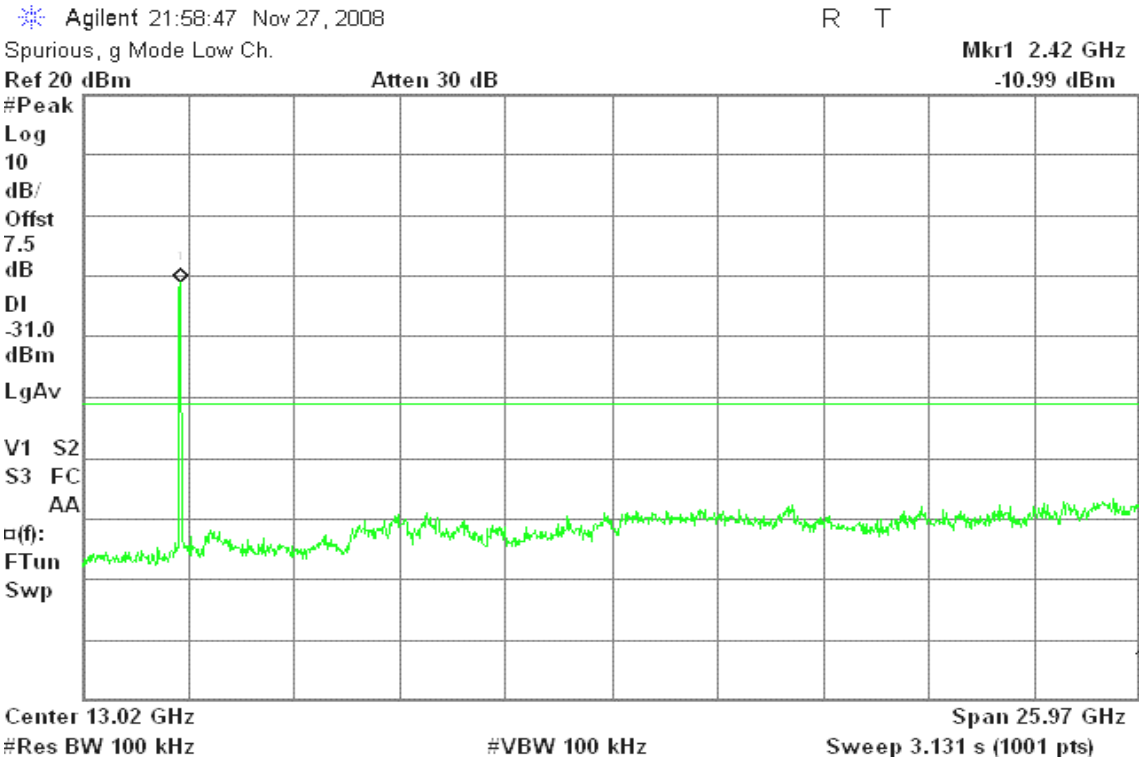


## CH High

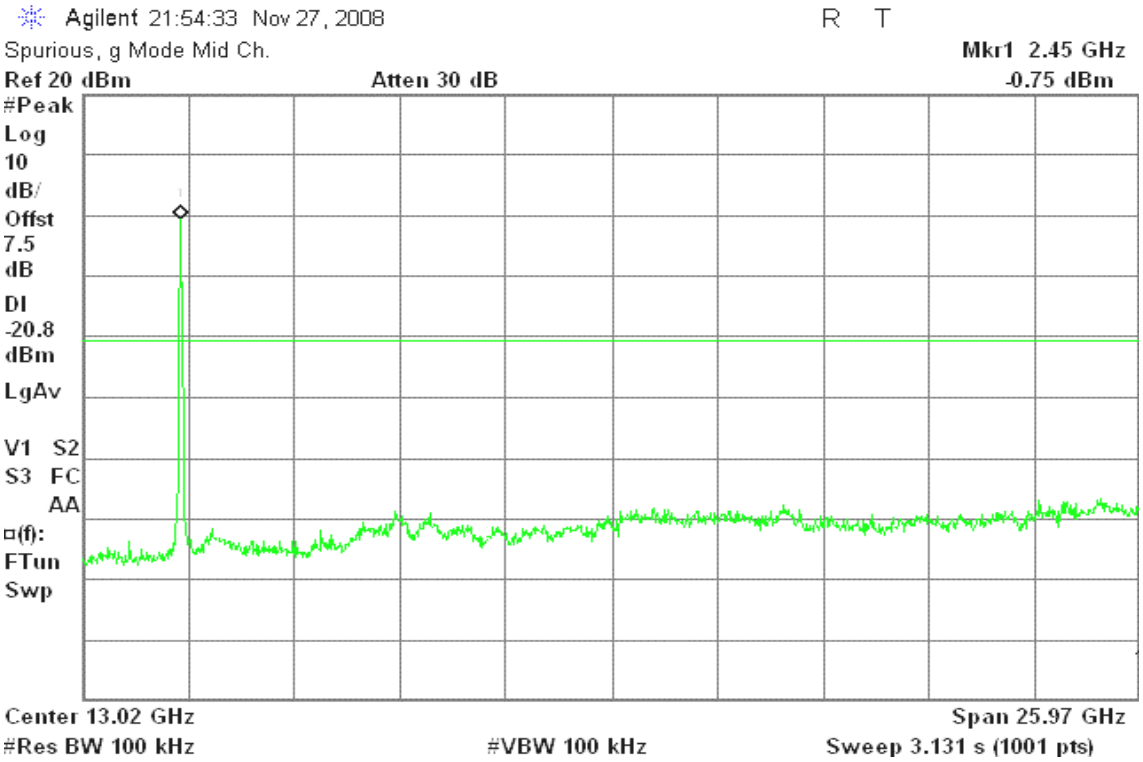



## IEEE 802.11n HT40

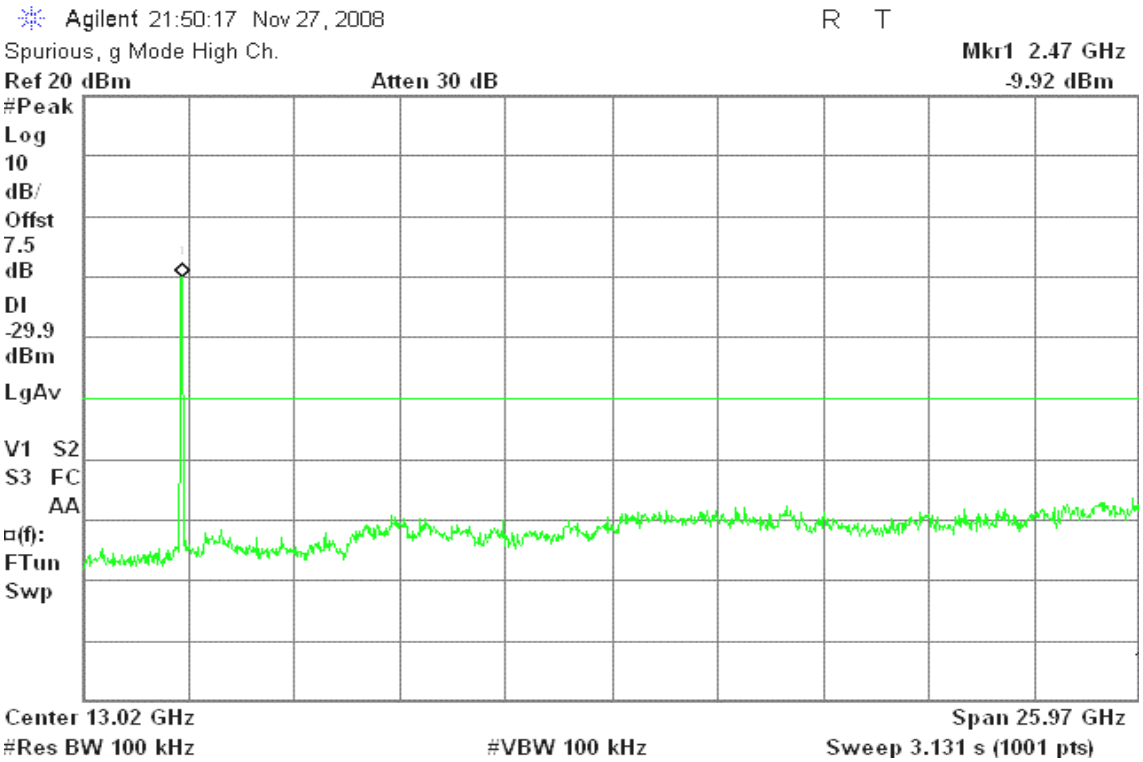
## CH Low



## CH Mid




## CH High



## 8.6.2 RADIATED EMISSIONS

## LIMIT

1. According to §15.209(a) and RSS-210 Table 2, except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (µV/m) | Measurement Distance (m) |
|---|---|---|
| 30-88 | 100* | 3 |
| 88-216 | 150* | 3 |
| 216-960 | 200* | 3 |
| Above 960 | 500 | 3 |

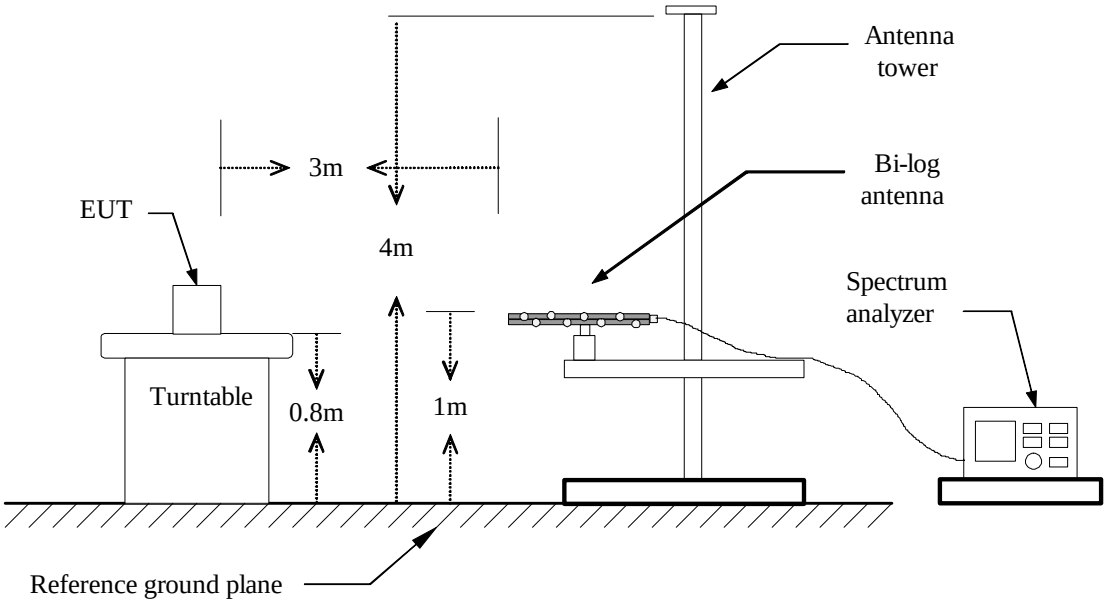
***Remark:*** *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2. In the emission table above, the tighter limit applies at the band edges.

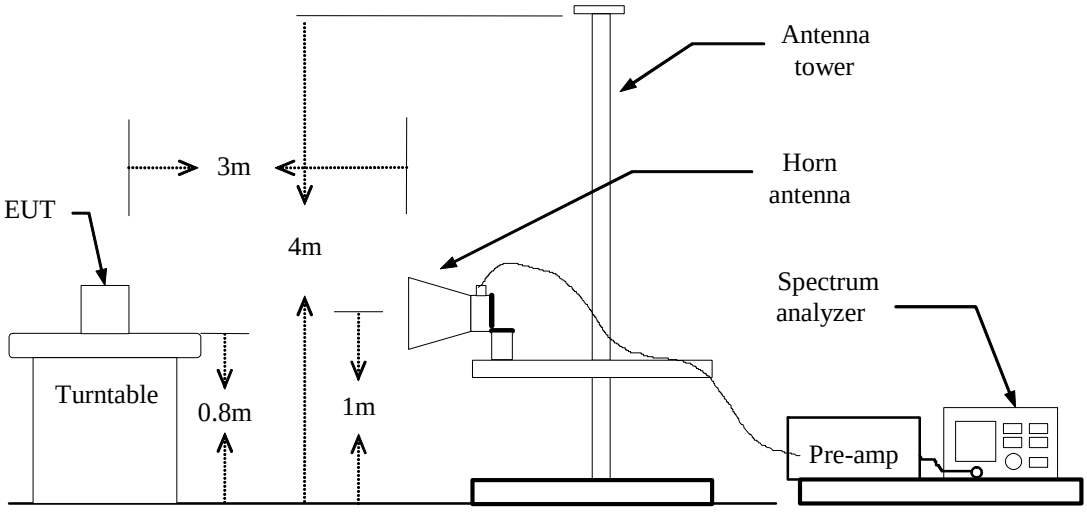
| Frequency (MHz) | Field Strength (µV/m at 3-meter) | Field Strength (dBµV/m at 3-meter) |
|---|---|---|
| 30-88 | 100 | 40 |
| 88-216 | 150 | 43.5 |
| 216-960 | 200 | 46 |
| Above 960 | 500 | 54 |

## Test Configuration

### Below 1 GHz




### Above 1 GHz



## TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

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

   Above 1GHz:

   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

**Below 1GHz**

**PIFA Antenna / Full Length Board:**

**Operation Mode:** Continue Transmit **Test Date:** November 26, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 181.97 | V | 46.82 | -10.67 | 36.15 | 43.50 | -7.35 | Peak |
| 299.98 | V | 45.33 | -8.61 | 36.71 | 46.00 | -9.29 | Peak |
| 335.55 | V | 45.72 | -8.04 | 37.68 | 46.00 | -8.32 | Peak |
| 400.22 | V | 42.58 | -6.05 | 36.53 | 46.00 | -9.47 | Peak |
| 663.73 | V | 42.32 | -2.21 | 40.11 | 46.00 | -5.89 | Peak |
| 995.15 | V | 40.50 | 2.29 | 42.79 | 54.00 | -11.21 | Peak |
| | | | | | | | |
| 199.75 | H | 44.19 | -8.13 | 36.06 | 43.50 | -7.44 | Peak |
| 298.37 | H | 53.30 | -8.63 | 44.67 | 46.00 | -1.33 | QP |
| 335.55 | H | 53.27 | -8.04 | 45.23 | 46.00 | -0.77 | QP |
| 400.22 | H | 51.08 | -6.05 | 45.03 | 46.00 | -0.97 | QP |
| 497.22 | H | 44.44 | -4.22 | 40.22 | 46.00 | -5.78 | Peak |
| 995.15 | H | 47.71 | 2.29 | 50.00 | 54.00 | -4.00 | Peak |

***Remark:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

**PIFA Antenna / Half Length Board:**

**Operation Mode:** Continue Transmit **Test Date:** November 26, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 177.12 | V | 47.49 | -10.85 | 36.65 | 43.50 | -6.85 | Peak |
| 298.37 | V | 44.15 | -8.63 | 35.52 | 46.00 | -10.48 | Peak |
| 335.55 | V | 44.66 | -8.04 | 36.62 | 46.00 | -9.38 | Peak |
| 663.73 | V | 40.61 | -2.21 | 38.40 | 46.00 | -7.60 | Peak |
| 784.98 | V | 39.49 | 0.27 | 39.76 | 46.00 | -6.24 | Peak |
| 948.27 | V | 37.05 | 1.83 | 38.87 | 46.00 | -7.13 | Peak |
| | | | | | | | |
| 99.52 | H | 56.42 | -13.36 | 43.06 | 43.50 | -0.44 | QP |
| 298.37 | H | 52.16 | -8.63 | 43.53 | 46.00 | -2.47 | QP |
| 335.55 | H | 53.19 | -8.04 | 45.15 | 46.00 | -0.85 | QP |
| 500.45 | H | 46.53 | -4.13 | 42.39 | 46.00 | -3.61 | Peak |
| 663.73 | H | 42.86 | -2.21 | 40.66 | 46.00 | -5.34 | Peak |
| 995.15 | H | 46.64 | 2.29 | 48.93 | 54.00 | -5.07 | Peak |

***Remark:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

**Above 1 GHz**

**PIFA Antenna / Full Length Board:**

**Operation Mode:** TX / IEEE 802.11b / CH Low **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1236.67 | V | 59.70 | --- | -8.98 | 50.72 | --- | 74.00 | 54.00 | -3.28 | Peak |
| N/A | | | | | | | | | | |
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| 1300.00 | H | 58.63 | --- | -8.83 | 49.80 | --- | 74.00 | 54.00 | -4.20 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11b / CH Mid **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1293.33 | V | 58.09 | --- | -8.85 | 49.24 | --- | 74.00 | 54.00 | -4.76 | Peak |
| N/A | | | | | | | | | | |
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| 1213.33 | H | 58.55 | --- | -9.04 | 49.51 | --- | 74.00 | 54.00 | -4.49 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11b / CH High **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1223.33 | V | 58.78 | --- | -9.01 | 49.77 | --- | 74.00 | 54.00 | -4.23 | Peak |
| N/A | | | | | | | | | | |
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| 1236.67 | H | 59.05 | --- | -8.98 | 50.07 | --- | 74.00 | 54.00 | -3.93 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH Low **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1356.67 | V | 58.83 | --- | -8.70 | 50.13 | --- | 74.00 | 54.00 | -3.87 | Peak |
| 7233.33 | V | 52.86 | 38.27 | 2.96 | 55.82 | 41.23 | 74.00 | 54.00 | -12.77 | AVG |
| N/A | | | | | | | | | | |
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| 1296.67 | H | 59.84 | --- | -8.84 | 51.00 | --- | 74.00 | 54.00 | -3.00 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH Mid **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1230.00 | V | 58.87 | --- | -9.00 | 49.87 | --- | 74.00 | 54.00 | -4.13 | Peak |
| 3250.00 | V | 51.03 | --- | -0.85 | 50.19 | --- | 74.00 | 54.00 | -3.81 | Peak |
| 4875.00 | V | 50.51 | --- | 0.24 | 50.75 | --- | 74.00 | 54.00 | -3.25 | Peak |
| 7308.33 | V | 63.98 | 50.35 | 2.95 | 66.93 | 53.30 | 74.00 | 54.00 | -0.70 | AVG |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1233.33 | H | 57.86 | --- | -8.99 | 48.87 | --- | 74.00 | 54.00 | -5.13 | Peak |
| 3250.00 | H | 49.54 | --- | -0.85 | 48.69 | --- | 74.00 | 54.00 | -5.31 | Peak |
| 7308.33 | H | 58.22 | 44.01 | 2.95 | 61.17 | 46.96 | 74.00 | 54.00 | -7.04 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH High **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1193.33 | V | 58.80 | --- | -9.08 | 49.72 | --- | 74.00 | 54.00 | -4.28 | Peak |
| 3333.33 | V | 50.34 | --- | -0.69 | 49.65 | --- | 74.00 | 54.00 | -4.35 | Peak |
| 7391.67 | V | 57.45 | 41.71 | 2.93 | 60.38 | 44.64 | 74.00 | 54.00 | -9.36 | AVG |
| N/A | | | | | | | | | | |
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| 1236.67 | H | 59.05 | --- | -8.98 | 50.07 | --- | 74.00 | 54.00 | -3.93 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Low **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1290.00 | V | 60.23 | --- | -8.86 | 51.38 | --- | 74.00 | 54.00 | -2.62 | Peak |
| 7250.00 | V | 51.98 | 36.92 | 2.96 | 54.94 | 39.88 | 74.00 | 54.00 | -14.12 | AVG |
| N/A | | | | | | | | | | |
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| 1256.67 | H | 59.40 | --- | -8.93 | 50.46 | --- | 74.00 | 54.00 | -3.54 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Mid **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1283.33 | V | 59.45 | --- | -8.87 | 50.58 | --- | 74.00 | 54.00 | -3.42 | Peak |
| 7308.33 | V | 62.30 | 47.83 | 2.95 | 65.25 | 50.78 | 74.00 | 54.00 | -3.22 | AVG |
| N/A | | | | | | | | | | |
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| 1280.00 | H | 58.81 | --- | -8.88 | 49.93 | --- | 74.00 | 54.00 | -4.07 | Peak |
| 7308.33 | H | 55.79 | 41.35 | 2.95 | 58.74 | 44.30 | 74.00 | 54.00 | -9.70 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH High **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1283.33 | V | 58.84 | --- | -8.87 | 49.97 | --- | 74.00 | 54.00 | -4.03 | Peak |
| 7375.00 | V | 55.79 | 40.32 | 2.93 | 58.72 | 43.25 | 74.00 | 54.00 | -10.75 | AVG |
| N/A | | | | | | | | | | |
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| 1213.33 | H | 58.59 | --- | -9.04 | 49.55 | --- | 74.00 | 54.00 | -4.45 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH Low **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1280.00 | V | 59.24 | --- | -8.88 | 50.36 | --- | 74.00 | 54.00 | -3.64 | Peak |
| N/A | | | | | | | | | | |
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| 1286.67 | H | 58.95 | --- | -8.86 | 50.08 | --- | 74.00 | 54.00 | -3.92 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH Mid **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1233.33 | V | 60.01 | --- | -8.99 | 51.02 | --- | 74.00 | 54.00 | -2.98 | Peak |
| 7316.67 | V | 60.04 | 46.62 | 2.95 | 62.99 | 49.57 | 74.00 | 54.00 | -4.43 | AVG |
| N/A | | | | | | | | | | |
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| 1270.00 | H | 59.68 | --- | -8.90 | 50.78 | --- | 74.00 | 54.00 | -3.22 | Peak |
| 7325.00 | H | 54.76 | 41.00 | 2.94 | 57.70 | 43.94 | 74.00 | 54.00 | -10.06 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH High **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1280.00 | V | 59.43 | --- | -8.88 | 50.55 | --- | 74.00 | 54.00 | -3.45 | Peak |
| N/A | | | | | | | | | | |
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| 1276.67 | H | 59.24 | --- | -8.89 | 50.36 | --- | 74.00 | 54.00 | -3.64 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**PIFA Antenna / Half Length Board:**

**Operation Mode:** TX / IEEE 802.11b / CH Low **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1290.00 | V | 59.16 | --- | -8.86 | 50.30 | --- | 74.00 | 54.00 | -3.70 | Peak |
| N/A | | | | | | | | | | |
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| 1233.33 | H | 59.19 | --- | -8.99 | 50.20 | --- | 74.00 | 54.00 | -3.80 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11b / CH Mid **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1273.33 | V | 59.23 | --- | -8.90 | 50.33 | --- | 74.00 | 54.00 | -3.67 | Peak |
| 4875.00 | V | 55.52 | 50.63 | 0.24 | 55.76 | 50.87 | 74.00 | 54.00 | -3.13 | AVG |
| N/A | | | | | | | | | | |
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| 1253.33 | H | 58.98 | --- | -8.94 | 50.04 | --- | 74.00 | 54.00 | -3.96 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11b / CH High **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1263.33 | V | 59.76 | --- | -8.92 | 50.84 | --- | 74.00 | 54.00 | -3.16 | Peak |
| N/A | | | | | | | | | | |
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| 1326.67 | H | 58.27 | --- | -8.77 | 49.50 | --- | 74.00 | 54.00 | -4.50 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH Low **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1250.00 | V | 58.49 | --- | -8.95 | 49.54 | --- | 74.00 | 54.00 | -4.46 | Peak |
| N/A | | | | | | | | | | |
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| 1213.33 | H | 59.50 | --- | -9.04 | 50.46 | --- | 74.00 | 54.00 | -3.54 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH Mid **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1280.00 | V | 59.74 | --- | -8.88 | 50.86 | --- | 74.00 | 54.00 | -3.14 | Peak |
| 4991.67 | V | 51.44 | --- | -0.02 | 51.42 | --- | 74.00 | 54.00 | -2.58 | Peak |
| 7308.33 | V | 48.88 | --- | 2.95 | 51.83 | --- | 74.00 | 54.00 | -2.17 | Peak |
| N/A | | | | | | | | | | |
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| 1240.00 | H | 59.12 | --- | -8.97 | 50.15 | --- | 74.00 | 54.00 | -3.85 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH High **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1270.00 | V | 59.24 | --- | -8.90 | 50.34 | --- | 74.00 | 54.00 | -3.66 | Peak |
| N/A | | | | | | | | | | |
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| 1290.00 | H | 58.58 | --- | -8.86 | 49.72 | --- | 74.00 | 54.00 | -4.28 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Low **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1246.67 | V | 59.38 | --- | -8.96 | 50.42 | --- | 74.00 | 54.00 | -3.58 | Peak |
| 7241.67 | V | 54.01 | 38.90 | 2.96 | 56.97 | 41.86 | 74.00 | 54.00 | -12.14 | AVG |
| N/A | | | | | | | | | | |
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| 1300.00 | H | 58.87 | --- | -8.83 | 50.04 | --- | 74.00 | 54.00 | -3.96 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Mid **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1286.67 | V | 58.92 | --- | -8.86 | 50.05 | --- | 74.00 | 54.00 | -3.95 | Peak |
| 4875.00 | V | 55.56 | 41.38 | 0.24 | 55.80 | 41.62 | 74.00 | 54.00 | -12.38 | AVG |
| 7308.33 | V | 58.22 | 42.59 | 2.95 | 61.17 | 45.54 | 74.00 | 54.00 | -8.46 | AVG |
| N/A | | | | | | | | | | |
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| 1263.33 | H | 59.27 | --- | -8.92 | 50.35 | --- | 74.00 | 54.00 | -3.65 | Peak |
| 4875.00 | H | 51.34 | --- | 0.24 | 51.58 | --- | 74.00 | 54.00 | -2.42 | Peak |
| 7308.33 | H | 56.04 | 40.71 | 2.95 | 58.99 | 43.66 | 74.00 | 54.00 | -10.34 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH High **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1216.67 | V | 58.95 | --- | -9.03 | 49.93 | --- | 74.00 | 54.00 | -4.07 | Peak |
| N/A | | | | | | | | | | |
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| 1160.00 | H | 58.96 | --- | -9.16 | 49.79 | --- | 74.00 | 54.00 | -4.21 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH Low **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1213.33 | V | 59.18 | --- | -9.04 | 50.14 | --- | 74.00 | 54.00 | -3.86 | Peak |
| N/A | | | | | | | | | | |
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| 1180.00 | H | 59.24 | --- | -9.12 | 50.13 | --- | 74.00 | 54.00 | -3.87 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH Mid **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1216.67 | V | 59.05 | --- | -9.03 | 50.02 | --- | 74.00 | 54.00 | -3.98 | Peak |
| 4875.00 | V | 54.85 | 40.65 | 0.24 | 55.09 | 40.89 | 74.00 | 54.00 | -13.11 | AVG |
| 7325.00 | V | 58.31 | 41.42 | 2.94 | 61.25 | 44.36 | 74.00 | 54.00 | -9.64 | AVG |
| 9750.00 | V | 48.31 | 34.38 | 9.65 | 57.96 | 44.03 | 74.00 | 54.00 | -9.97 | AVG |
| N/A | | | | | | | | | | |
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| 1223.33 | H | 59.31 | --- | -9.01 | 50.30 | --- | 74.00 | 54.00 | -3.70 | Peak |
| 7308.33 | H | 53.12 | 38.95 | 2.95 | 56.07 | 41.90 | 74.00 | 54.00 | -12.10 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH High **Test Date:** November 13, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1220.00 | V | 59.46 | --- | -9.02 | 50.44 | --- | 74.00 | 54.00 | -3.56 | Peak |
| N/A | | | | | | | | | | |
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| 1276.67 | H | 59.09 | --- | -8.89 | 50.20 | --- | 74.00 | 54.00 | -3.80 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Below 1GHz**

**Dipole Antenna / Full Length Board:**

**Operation Mode:** Continue Transmit **Test Date:** December 24, 2008

**Temperature:** 23°C **Tested by:** Nan Tsai

**Humidity:** 50% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 36.47 | V | 37.90 | -6.33 | 31.57 | 40.00 | -8.43 | QP |
| 165.80 | V | 48.79 | -10.44 | 38.35 | 43.50 | -5.15 | Peak |
| 233.70 | V | 44.62 | -9.92 | 34.70 | 46.00 | -11.30 | Peak |
| 299.98 | V | 46.31 | -8.61 | 37.70 | 46.00 | -8.30 | Peak |
| 699.30 | V | 40.90 | -2.06 | 38.84 | 46.00 | -7.16 | Peak |
| 799.53 | V | 36.10 | 0.42 | 36.52 | 46.00 | -9.48 | Peak |
| | | | | | | | |
| 99.52 | H | 47.97 | -13.36 | 34.61 | 43.50 | -8.89 | Peak |
| 144.78 | H | 46.23 | -9.19 | 37.03 | 43.50 | -6.47 | Peak |
| 165.80 | H | 41.25 | -10.44 | 30.81 | 43.50 | -12.69 | QP |
| 233.70 | H | 45.21 | -9.92 | 35.29 | 46.00 | -10.71 | QP |
| 298.37 | H | 40.10 | -8.63 | 31.47 | 46.00 | -14.53 | QP |
| 400.22 | H | 42.96 | -6.05 | 36.92 | 46.00 | -9.08 | Peak |

***Remark:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

**Dipole Antenna / Half Length Board:**

**Operation Mode:** Continue Transmit **Test Date:** November 26, 2008

**Temperature:** 24°C **Tested by:** Wolf Huang

**Humidity:** 50% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 36.47 | V | 37.90 | -6.33 | 31.57 | 40.00 | -8.43 | QP |
| 165.80 | V | 48.79 | -10.44 | 38.35 | 43.50 | -5.15 | Peak |
| 233.70 | V | 44.62 | -9.92 | 34.70 | 46.00 | -11.30 | Peak |
| 299.98 | V | 46.31 | -8.61 | 37.70 | 46.00 | -8.30 | Peak |
| 699.30 | V | 40.90 | -2.06 | 38.84 | 46.00 | -7.16 | Peak |
| 799.53 | V | 36.10 | 0.42 | 36.52 | 46.00 | -9.48 | Peak |
| | | | | | | | |
| 99.52 | H | 47.97 | -13.36 | 34.61 | 43.50 | -8.89 | Peak |
| 144.78 | H | 46.23 | -9.19 | 37.03 | 43.50 | -6.47 | Peak |
| 165.80 | H | 41.25 | -10.44 | 30.81 | 43.50 | -12.69 | QP |
| 233.70 | H | 45.21 | -9.92 | 35.29 | 46.00 | -10.71 | QP |
| 298.37 | H | 40.10 | -8.63 | 31.47 | 46.00 | -14.53 | QP |
| 400.22 | H | 42.96 | -6.05 | 36.92 | 46.00 | -9.08 | Peak |

***Remark:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

**Above 1 GHz**

**Dipole Antenna / Full Length Board:**

**Operation Mode:** TX / IEEE 802.11b / CH Low **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4825.00 | V | 51.33 | --- | 0.35 | 51.68 | --- | 74.00 | 54.00 | -2.32 | Peak |
| 4991.67 | V | 52.07 | 35.75 | -0.02 | 52.05 | 35.73 | 74.00 | 54.00 | -18.27 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11b / CH Mid **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4875.00 | V | 55.33 | 51.44 | 0.24 | 55.57 | 51.68 | 74.00 | 54.00 | -2.32 | AVG |
| 7308.33 | V | 52.18 | 44.20 | 2.95 | 55.13 | 47.15 | 74.00 | 54.00 | -6.85 | AVG |
| N/A | | | | | | | | | | |
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| 4875.00 | H | 49.64 | --- | 0.24 | 49.88 | --- | 74.00 | 54.00 | -4.12 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11b / CH High **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 5000.00 | V | 50.53 | --- | -0.04 | 50.49 | --- | 74.00 | 54.00 | -3.51 | Peak |
| N/A | | | | | | | | | | |
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| 4900.00 | H | 49.56 | --- | 0.18 | 49.75 | --- | 74.00 | 54.00 | -4.25 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH Low **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH Mid **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4875.00 | V | 51.23 | --- | 0.24 | 51.47 | --- | 74.00 | 54.00 | -2.53 | Peak |
| 5000.00 | V | 49.32 | 36.10 | -0.04 | 49.28 | 36.06 | 74.00 | 54.00 | -17.94 | AVG |
| 7316.67 | V | 55.69 | 42.41 | 2.95 | 58.64 | 45.36 | 74.00 | 54.00 | -8.64 | AVG |
| N/A | | | | | | | | | | |
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| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH High **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4983.33 | V | 51.68 | 36.60 | -0.00 | 51.68 | 36.60 | 74.00 | 54.00 | -2.32 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Low **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4991.67 | V | 50.29 | --- | -0.02 | 50.27 | --- | 74.00 | 54.00 | -3.73 | Peak |
| 7233.33 | V | 48.96 | --- | 2.96 | 51.92 | --- | 74.00 | 54.00 | -2.08 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Mid **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4875.00 | V | 57.02 | 43.14 | 0.24 | 57.26 | 43.38 | 74.00 | 54.00 | -10.62 | AVG |
| 7308.33 | V | 62.52 | 47.02 | 2.95 | 65.47 | 49.97 | 74.00 | 54.00 | -4.03 | AVG |
| N/A | | | | | | | | | | |
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| 4875.00 | H | 51.06 | --- | 0.24 | 51.29 | --- | 74.00 | 54.00 | -2.71 | Peak |
| 7316.67 | H | 55.32 | 41.48 | 2.95 | 58.27 | 44.43 | 74.00 | 54.00 | -9.57 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH High **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4991.67 | V | 51.37 | --- | -0.02 | 51.35 | --- | 74.00 | 54.00 | -2.65 | Peak |
| N/A | | | | | | | | | | |
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| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH Low **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4991.67 | V | 52.75 | 36.18 | -0.02 | 52.73 | 36.16 | 74.00 | 54.00 | -17.84 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH Mid **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4875.00 | V | 55.54 | 42.73 | 0.24 | 55.77 | 42.97 | 74.00 | 54.00 | -11.03 | AVG |
| 7316.67 | V | 60.93 | 47.88 | 2.95 | 63.88 | 50.83 | 74.00 | 54.00 | -3.17 | AVG |
| N/A | | | | | | | | | | |
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| 4866.67 | H | 51.03 | --- | 0.26 | 51.29 | --- | 74.00 | 54.00 | -2.71 | Peak |
| 7325.00 | H | 53.28 | 41.23 | 2.94 | 56.22 | 44.17 | 74.00 | 54.00 | -9.83 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH High **Test Date:** December 24, 2008

**Temperature:** 21°C **Tested by:** Nan Tasi

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4991.67 | V | 51.44 | --- | -0.02 | 51.42 | --- | 74.00 | 54.00 | -2.58 | Peak |
| N/A | | | | | | | | | | |
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| 4975.00 | H | 49.88 | --- | 0.02 | 49.89 | --- | 74.00 | 54.00 | -4.11 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Dipole Antenna / Half Length Board:**

**Operation Mode:** TX / IEEE 802.11b / CH Low **Test Date:** November 20, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4825.00 | V | 51.33 | --- | 0.35 | 51.68 | --- | 74.00 | 54.00 | -2.32 | Peak |
| 4991.67 | V | 52.07 | 35.75 | -0.02 | 52.05 | 35.73 | 74.00 | 54.00 | -18.27 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11b / CH Mid **Test Date:** November 20, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 53 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4875.00 | V | 55.33 | 51.44 | 0.24 | 55.57 | 51.68 | 74.00 | 54.00 | -2.32 | AVG |
| 7308.33 | V | 52.18 | 44.20 | 2.95 | 55.13 | 47.15 | 74.00 | 54.00 | -6.85 | AVG |
| N/A | | | | | | | | | | |
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| 4875.00 | H | 49.64 | --- | 0.24 | 49.88 | --- | 74.00 | 54.00 | -4.12 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11b / CH High **Test Date:** November 21, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 5000.00 | V | 50.53 | --- | -0.04 | 50.49 | --- | 74.00 | 54.00 | -3.51 | Peak |
| N/A | | | | | | | | | | |
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| 4900.00 | H | 49.56 | --- | 0.18 | 49.75 | --- | 74.00 | 54.00 | -4.25 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH Low **Test Date:** November 20, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH Mid **Test Date:** November 21, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4875.00 | V | 51.23 | --- | 0.24 | 51.47 | --- | 74.00 | 54.00 | -2.53 | Peak |
| 5000.00 | V | 49.32 | 36.10 | -0.04 | 49.28 | 36.06 | 74.00 | 54.00 | -17.94 | AVG |
| 7316.67 | V | 55.69 | 42.41 | 2.95 | 58.64 | 45.36 | 74.00 | 54.00 | -8.64 | AVG |
| N/A | | | | | | | | | | |
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| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11g / CH High **Test Date:** November 20, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4983.33 | V | 51.68 | 36.60 | -0.00 | 51.68 | 36.60 | 74.00 | 54.00 | -2.32 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Low **Test Date:** November 21, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4991.67 | V | 50.29 | --- | -0.02 | 50.27 | --- | 74.00 | 54.00 | -3.73 | Peak |
| 7233.33 | V | 48.96 | --- | 2.96 | 51.92 | --- | 74.00 | 54.00 | -2.08 | Peak |
| N/A | | | | | | | | | | |
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| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Mid **Test Date:** November 21, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4875.00 | V | 57.02 | 43.14 | 0.24 | 57.26 | 43.38 | 74.00 | 54.00 | -10.62 | AVG |
| 7308.33 | V | 62.52 | 47.02 | 2.95 | 65.47 | 49.97 | 74.00 | 54.00 | -4.03 | AVG |
| N/A | | | | | | | | | | |
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| 4875.00 | H | 51.06 | --- | 0.24 | 51.29 | --- | 74.00 | 54.00 | -2.71 | Peak |
| 7316.67 | H | 55.32 | 41.48 | 2.95 | 58.27 | 44.43 | 74.00 | 54.00 | -9.57 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH High **Test Date:** November 21, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4991.67 | V | 51.37 | --- | -0.02 | 51.35 | --- | 74.00 | 54.00 | -2.65 | Peak |
| N/A | | | | | | | | | | |
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| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH Low **Test Date:** November 21, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4991.67 | V | 52.75 | 36.18 | -0.02 | 52.73 | 36.16 | 74.00 | 54.00 | -1.27 | Peak |
| N/A | | | | | | | | | | |
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| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH Mid **Test Date:** November 21, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50 % RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4875.00 | V | 55.54 | 42.73 | 0.24 | 55.77 | 42.97 | 74.00 | 54.00 | -11.03 | AVG |
| 7316.67 | V | 60.93 | 47.88 | 2.95 | 63.88 | 50.83 | 74.00 | 54.00 | -3.17 | AVG |
| N/A | | | | | | | | | | |
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| 4866.67 | H | 51.03 | --- | 0.26 | 51.29 | --- | 74.00 | 54.00 | -2.71 | Peak |
| 7325.00 | H | 53.28 | 41.23 | 2.94 | 56.22 | 44.17 | 74.00 | 54.00 | -9.83 | AVG |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 mode / CH High **Test Date:** November 21, 2008

**Temperature:** 21°C **Tested by:** Wolf Huang

**Humidity:** 50% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4991.67 | V | 51.44 | --- | -0.02 | 51.42 | --- | 74.00 | 54.00 | -2.58 | Peak |
| N/A | | | | | | | | | | |
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| 4975.00 | H | 49.88 | --- | 0.02 | 49.89 | --- | 74.00 | 54.00 | -4.11 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**PIFA Antenna / Full Length Board:**

**Operation Mode:** RX / IEEE 802.11g **Test Date:** November 23, 2008

**Temperature:** 23°C **Tested by:** Wolf Huang

**Humidity:** 48% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4208.33 | V | 47.16 | --- | 0.90 | 48.06 | --- | 74.00 | 54.00 | -5.94 | Peak |
| N/A | | | | | | | | | | |
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| 3695.00 | H | 47.77 | --- | 0.07 | 47.85 | --- | 74.00 | 54.00 | -6.15 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**PIFA Antenna / Half Length Board:**

**Operation Mode:** RX / IEEE 802.11g **Test Date:** November 23, 2008

**Temperature:** 23°C **Tested by:** Wolf Huang

**Humidity:** 48% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4978.33 | V | 50.60 | --- | 0.01 | 50.61 | --- | 74.00 | 54.00 | -3.39 | Peak |
| N/A | | | | | | | | | | |
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| 5853.33 | H | 50.00 | --- | 0.94 | 50.94 | --- | 74.00 | 54.00 | -3.06 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Dipole Antenna / Half Length Board:**

**Operation Mode:** RX / IEEE 802.11g **Test Date:** December 12, 2008

**Temperature:** 23°C **Tested by:** Mimic Yang

**Humidity:** 53% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2000.00 | V | 52.16 | --- | -4.18 | 47.98 | --- | 74.00 | 54.00 | -6.02 | Peak |
| 2793.33 | V | 53.80 | --- | -1.86 | 51.95 | --- | 74.00 | 54.00 | -2.05 | Peak |
| N/A | | | | | | | | | | |
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| 2796.67 | H | 50.39 | --- | -1.85 | 48.55 | --- | 74.00 | 54.00 | -5.45 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Dipole Antenna / Half Length Board:**

**Operation Mode:** RX / IEEE 802.11g **Test Date:** November 23, 2008

**Temperature:** 23°C **Tested by:** Wolf Huang

**Humidity:** 48% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant. Pol. (H/V) | Reading (Peak) (dBuV) | Reading (Average) (dBuV) | Correction Factor (dB/m) | Result (Peak) (dBuV/m) | Result (Average) (dBuV/m) | Limit (Peak) (dBuV/m) | Limit (Average) (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 4208.33 | V | 47.16 | --- | 0.90 | 48.06 | --- | 74.00 | 54.00 | -5.94 | Peak |
| N/A | | | | | | | | | | |
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| 3695.00 | H | 47.77 | --- | 0.07 | 47.85 | --- | 74.00 | 54.00 | -6.15 | Peak |
| N/A | | | | | | | | | | |
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***Remark:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*