# Summit Semiconductor

## Model 444-2224 (Athena 4X)

**FCC 15.247:2013**

**FCC 15.207:2013**

**Report #: FOCU0141**

Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

# CERTIFICATE OF TEST

**Last Date of Test: May 16, 2013**
**Summit Semiconductor**
**Model 444-2224 (Athena 4X)**

## Emissions

| Test Description | Specification | Test Method | Pass/Fail |
|---|---|---|---|
| Duty Cycle | FCC 15.247:2013 | ANSI C63.10:2009 | Pass |
| Occupied Bandwidth | FCC 15.247:2013 | ANSI C63.10:2009 | Pass |
| Output Power | FCC 15.247:2013 | ANSI C63.10:2009 | Pass |
| Band Edge Compliance | FCC 15.247:2013 | ANSI C63.10:2009 | Pass |
| Spurious Conducted Emissions | FCC 15.247:2013 | ANSI C63.10:2009 | Pass |
| Power Spectral Density | FCC 15.247:2013 | ANSI C63.10:2009 | Pass |
| Spurious Radiated Emissions | FCC 15.247:2013 | ANSI C63.10:2009 | Pass |
| AC Powerline Conducted Emissions | FCC 15.207:2013 | ANSI C63.10:2009 | Pass |

## Deviations From Test Standards

None

## Approved By:

*Tim O'Shea, Operations Manager*

**NVLAP Lab Code: 200630-0**

### *Test Facility*

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834D-1).

***This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.***

***Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.***

# REVISION HISTORY

REV 2012.08.02

| Revision Number | Description | Date | Page Number |
|---|---|---|---|
| 00 | None | | |

## Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

NORTHWEST EMC

REV 2012.05.24

# ACCREDITATIONS AND AUTHORIZATIONS

## United States

**FCC** - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

**A2LA** - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

**NVLAP** - Each laboratory is accredited by NVLAP to ISO 17025

## Canada

**IC** - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

## European Union

**European Commission** – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

## Australia/New Zealand

**ACMA** - Recognized by ACMA as a CAB for the acceptance of test data.

## Korea

**KCC / RRA** - Recognized by KCC's RRA as a CAB for the acceptance of test data.

## Japan

**VCCI** - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

## Taiwan

**BSMI** – Recognized by BSMI as a CAB for the acceptance of test data.

**NCC** - Recognized by NCC as a CAB for the acceptance of test data.

## Singapore

**IDA** – Recognized by IDA as a CAB for the acceptance of test data.

## Hong Kong

**OFTA** – Recognized by OFTA as a CAB for the acceptance of test data.

## Vietnam

**MIC** – Recognized by MIC as a CAB for the acceptance of test data.

## Russia

**GOST** – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

## SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/

# MEASUREMENT UNCERTAINTY

## Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is listed below. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-1 as applicable), and are available upon request.

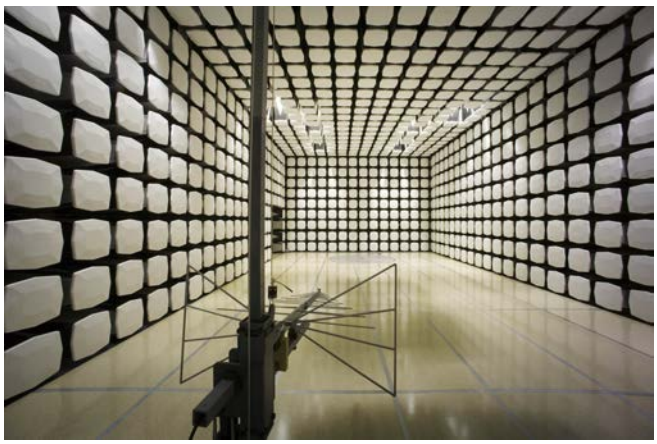
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

| Test | + MU | - MU |
|---|---|---|
| Frequency Accuracy (Hz) | 0.12 | -0.01 |
| Amplitude Accuracy (dB) | 0.49 | -0.49 |
| Conducted Power (dB) | 0.41 | -0.41 |
| Radiated Power via Substitution (dB) | 0.69 | -0.68 |
| Temperature (degrees C) | 0.81 | -0.81 |
| Humidity (% RH) | 2.89 | -2.89 |
| Field Strength (dB) | 3.80 | -3.80 |
| AC Powerline Conducted Emissions (dB) | 2.94 | -2.94 |

# LOCATIONS

REV 2013.02.26

| Oregon | California | New York | Minnesota | Washington |
|---|---|---|---|---|
| Labs EV01-12<br>22975 NW Evergreen Pkwy<br>Hillsboro, OR 97124<br>(503) 844-4066 | Labs OC01-13<br>41 Tesla<br>Irvine, CA 92618<br>(949) 861-8918 | Labs NY01-04<br>4939 Jordan Rd.<br>Elbridge, NY 13060<br>(315) 685-0796 | Labs MN01-08<br>9349 W Broadway Ave.<br>Brooklyn Park, MN 55445<br>(763) 425-2281 | Labs NC01-05,SU02,SU07<br>19201 120th Ave. NE<br>Bothell, WA 98011<br>(425) 984-6600 |
| **VCCI** | | | | |
| A-0108 | A-0029 | | A-0109 | A-0110 |
| **Industry Canada** | | | | |
| 2834D-1, 2834D-*2* | 2834B-1, 2834B-2, 2834B-3 | | 2834E-1 | 2834C-1 |
| **NVLAP** | | | | |
| NVLAP Lab Code: 200630-0 | NVLAP Lab Code: 200676-0 | NVLAP Lab Code: 200761-0 | NVLAP Lab Code: 200881-0 | NVLAP Lab Code: 200629-0 |



# PRODUCT DESCRIPTION

## Client and Equipment Under Test (EUT) Information

| | |
|---|---|
| **Company Name:** | Summit Semiconductor |
| **Address:** | 22867 NW Bennett St, Suite 200 |
| **City, State, Zip:** | Hillsboro, OR 97124 |
| **Test Requested By:** | Ponnappa Pasura |
| **Model:** | Model 444-2224 (Athena 4X) |
| **First Date of Test:** | May 3, 2013 |
| **Last Date of Test:** | May 16, 2013 |
| **Receipt Date of Samples:** | May 8, 2013 |
| **Equipment Design Stage:** | Production |
| **Equipment Condition:** | No Damage |

## Information Provided by the Party Requesting the Test

**Functional Description of the EUT (Equipment Under Test):**

Digital wireless Audio client device ( Athena 4X ).

The radios and RF path of the Model 444-2224 (Athena 4x) and Model 444-2225 (Athena UFL) are identical, including antenna matching components and test points, up to the integral antennas on the Model 444-2224 and the u.fl connectors on the Model 444-2225. All radio operations are identical.

**Testing Objective:**

Seeking modular approval of the client under FCC 15.247 for operation in the 5.8 GHz band.

# CONFIGURATIONS

## Configuration FOCU0140- 5

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Radio Board (Athena UFL) | Summit Semiconductor | 444-2225 | 02EA4D000027 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Laptop DC Power Supply | Dell | AC-PA-10 | Unknown |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Laptop | Dell | Latitude D820 | 26000021917 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| RS232 | Yes | 1.7m | No | I/O to Serial Adapter | Laptop |
| DC Power | No | 1.1m | Yes | Laptop DC Power Supply | Laptop |
| AC Power | No | 0.8 | No | AC Mains | Laptop DC Power Supply |
| I/O to Serial Adapter | No | .1m | No | RS232 | Athena |
| AC/DC Power Adapter Cable | PA | 1.5m | Yes | AC Mains | Athena |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

# CONFIGURATIONS

## Configuration FOCU0140- 7

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Radio Board (Athena UFL) | Summit Semiconductor | 444-2225 | 02EA4D000003 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Inverted F Antenna | Tyco | Unknown | Unknown |
| Topward DC Power Supply | Topward Electronic Instruments Co., LTD. | TPS-2000 | 946425 |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Laptop | Dell | Latitude D820 | 26000021917 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| Antenna Wires x 4 | No | 0.36m | No | Athena UFL | Inverted F Antenna |
| RS232 | Yes | 1.7m | No | I/O to Serial Adapter | Laptop |
| DC Power | No | 1.1m | Yes | Laptop DC Power Supply | Laptop |
| AC Power | No | 0.8 | No | AC Mains | Laptop DC Power Supply |
| AC Power | No | 1.4m | No | AC Mains | Topward DC Supply |
| I/O to Serial Adapter | No | .1m | No | RS232 | Athena |
| DC Power Cable x1 | No | 1.5m | No | Topward DC Power Supply | Athena |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

## Configuration FOCU0141- 1

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Radio Board (Athena 4X) | Summit Semiconductor | 444-2224 | 202EA4C0001C4 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| DC Power Supply | Topward Electronic Instruments Co., LTD. | TPS-2000 | 946425 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| DC Power | No | 2.8m | No | DC Power Supply | Radio Board (Athena 4X) |
| AC Power | No | 1.4m | No | AC Mains | DC Power Supply |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

# MODIFICATIONS

WTD 12.5.23

## Equipment Modifications

| Item | Date | Test | Modification | Note | Disposition of EUT |
|---|---|---|---|---|---|
| 1 | 5/3/2013 | Band Edge Compliance | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 2 | 5/3/2013 | Spurious Conducted Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 3 | 5/3/2013 | Power Spectral Density | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 4 | 5/3/2013 | Output Power | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 5 | 5/3/2013 | Occupied Bandwidth | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 6 | 5/3/2013 | Duty Cycle | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 7 | 5/6/2013 | Spurious Radiated Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 8 | 5/16/2013 | AC Powerline Conducted Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed. |

# Duty Cycle

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Attenuator, 6dB | S.M. Electronics | 18N-06 | AWN | 3/25/2013 | 12 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |
| Power Meter | Gigatronics | 8651A | SPM | 1/9/2012 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| EV06 Direct Connect Cable | ESM Cable Corp. | TT | ECA | NCR | 0 |
| Attenuator, 6 dB, 'SMA' | N/A | 93459 3330A-6 | AUF | 3/5/2013 | 12 |
| 40GHz DC Block | Miteq | DCB4000 | AMD | 6/25/2012 | 12 |
| Spectrum Analyzer | Agilent | E4446A | AAQ | 2/7/2012 | 24 |

**TEST DESCRIPTION**

The Duty Cycle (x) were measured for each of the EUT operating modes. The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating was used during some of the other tests in this report to only measure during the burst duration.

# Duty Cycle

| | | | |
|---|---|---|---|
| **EUT:** | Model 444-2225 (Athena UFL) | **Work Order:** | FOCU0140 |
| **Serial Number:** | 02EA4D000027 | **Date:** | 05/03/13 |
| **Customer:** | Summit Semiconductor | **Temperature:** | 24°C |
| **Attendees:** | None | **Humidity:** | 30% |
| **Project:** | None | **Barometric Pres.:** | 1023 |
| **Tested by:** | Brandon Hobbs | **Power:** 3.3V DC | **Job Site:** EV06 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2013 | ANSI C63.10:2009 |
| | |

**COMMENTS**

All testing was completed on the highest output power antenna port A2.

**DEVIATIONS FROM TEST STANDARD**

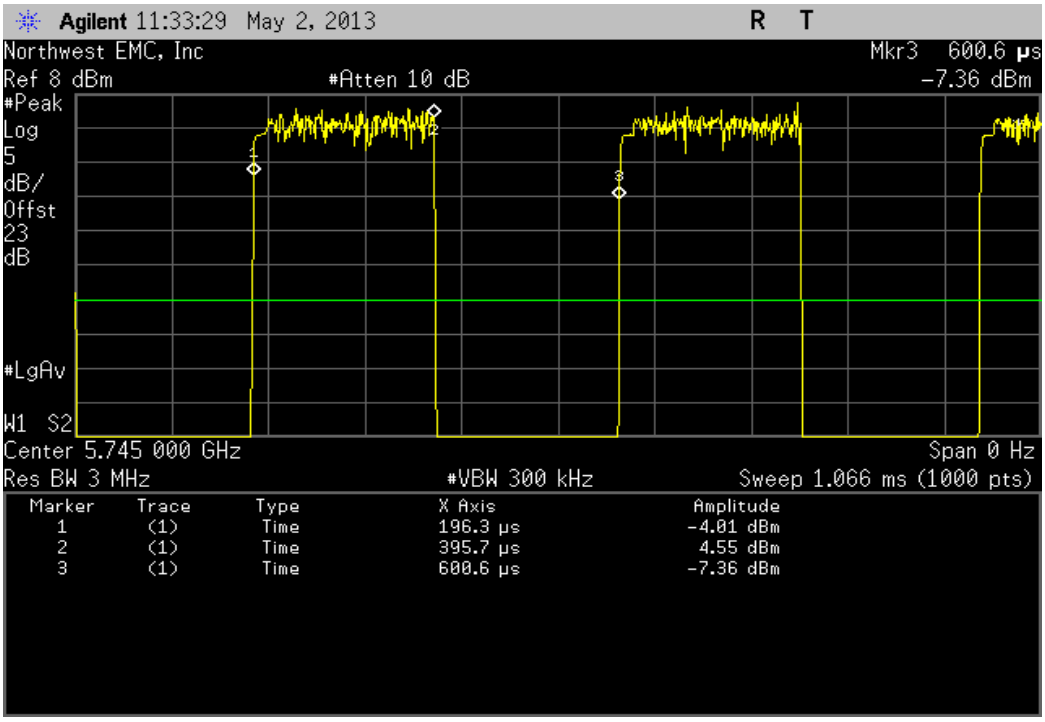
None

| Configuration # | 5 | Signature |
|---|---|---|

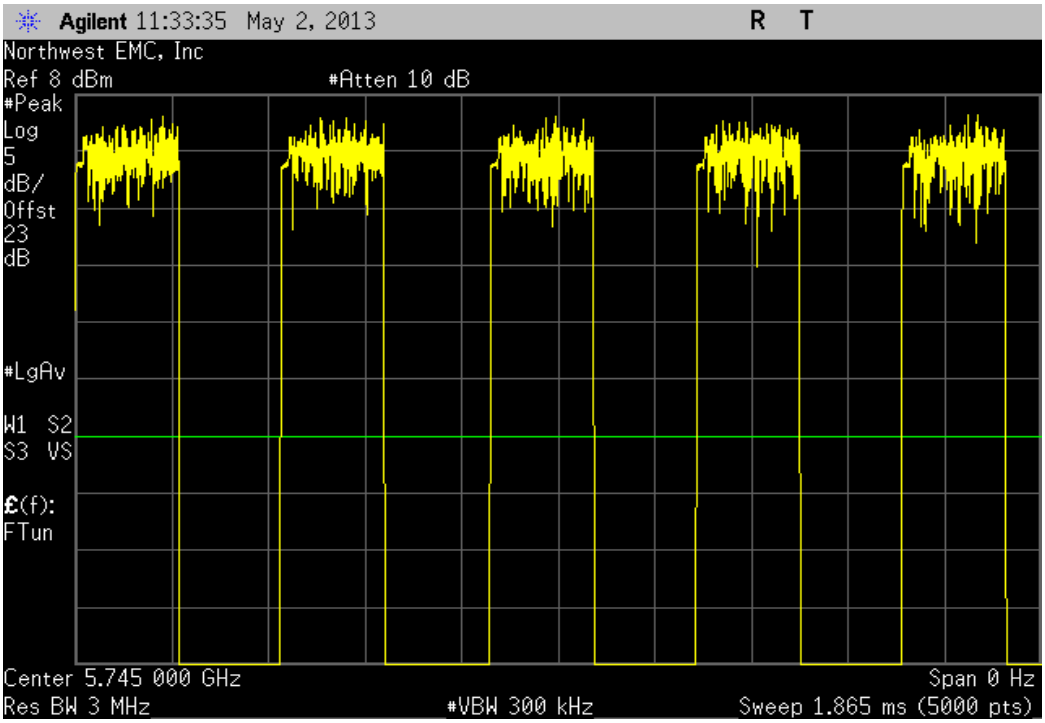
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| 5725 MHz - 5850 MHz Band | | | | | | |
| 802.11(a) 6 Mbps | | | | | | |
| Low Channel 149, 5745 MHz | 199.432 uS | 404.267 uS | 1 | 49.3 | N/A | N/A |
| Low Channel 149, 5745 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel 157, 5785 MHz | 199.484 uS | 397.901 uS | 1 | 50.1 | N/A | N/A |
| Mid Channel 157, 5785 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel 165, 5825 MHz | 199.449 uS | 396.8 uS | 1 | 50.3 | N/A | N/A |
| High Channel 165, 5825 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| 802.11(a) 18 Mbps | | | | | | |
| Low Channel 149, 5745 MHz | 87.484 uS | 294.4 uS | 1 | 29.7 | N/A | N/A |
| Low Channel 149, 5745 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel 157, 5785 MHz | 87.432 uS | 284.8 uS | 1 | 30.7 | N/A | N/A |
| Mid Channel 157, 5785 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel 165, 5825 MHz | 86.366 uS | 283.716 uS | 1 | 30.4 | N/A | N/A |
| High Channel 165, 5825 MHz | N/A | N/A | 5 | N/A | N/A | N/A |

# Duty Cycle

| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | 199.432 uS | 404.267 uS | 1 | 49.3 | N/A | N/A |

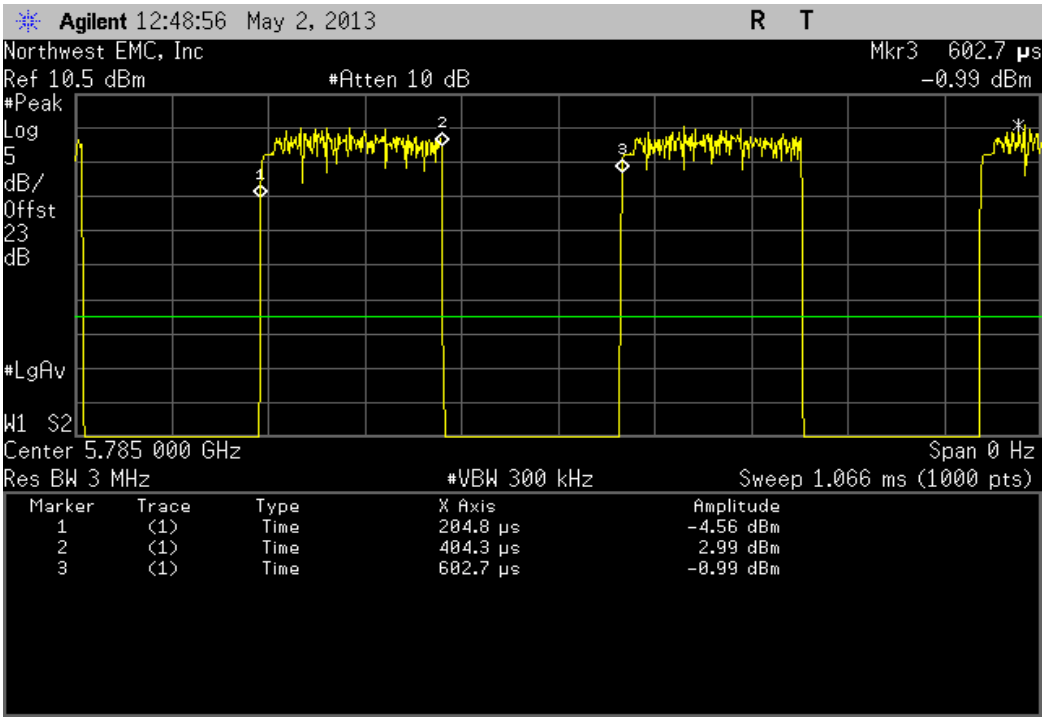



| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | N/A | N/A | 5 | N/A | N/A | N/A |



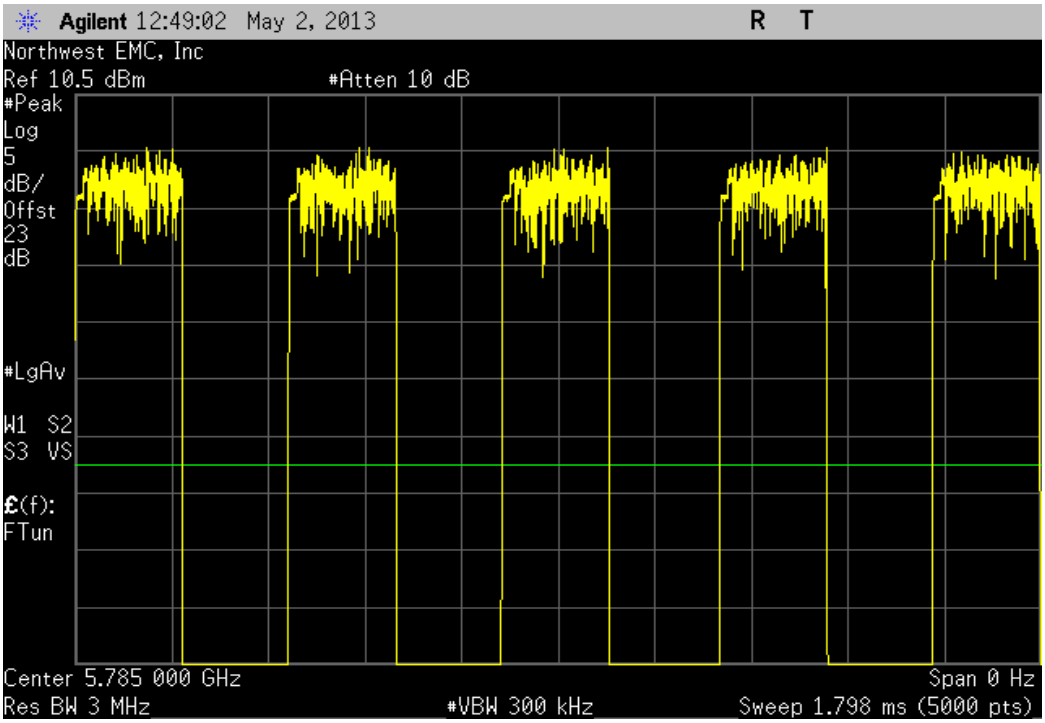
5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 199.484 uS | 397.901 uS | 1 | 50.1 | N/A | N/A |



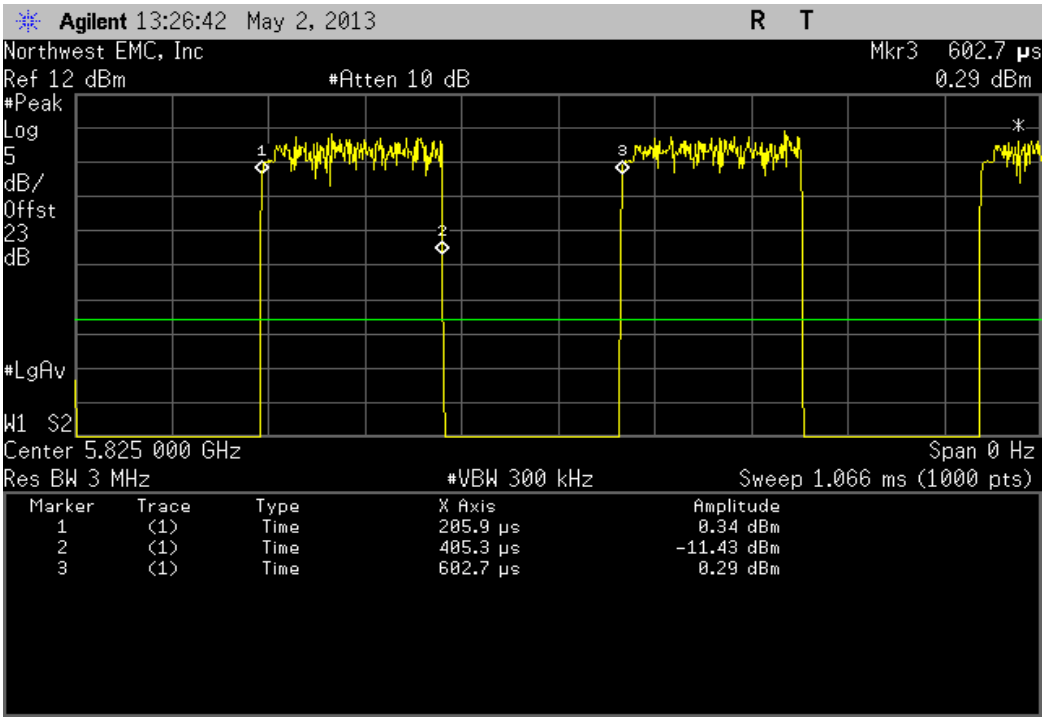

5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |



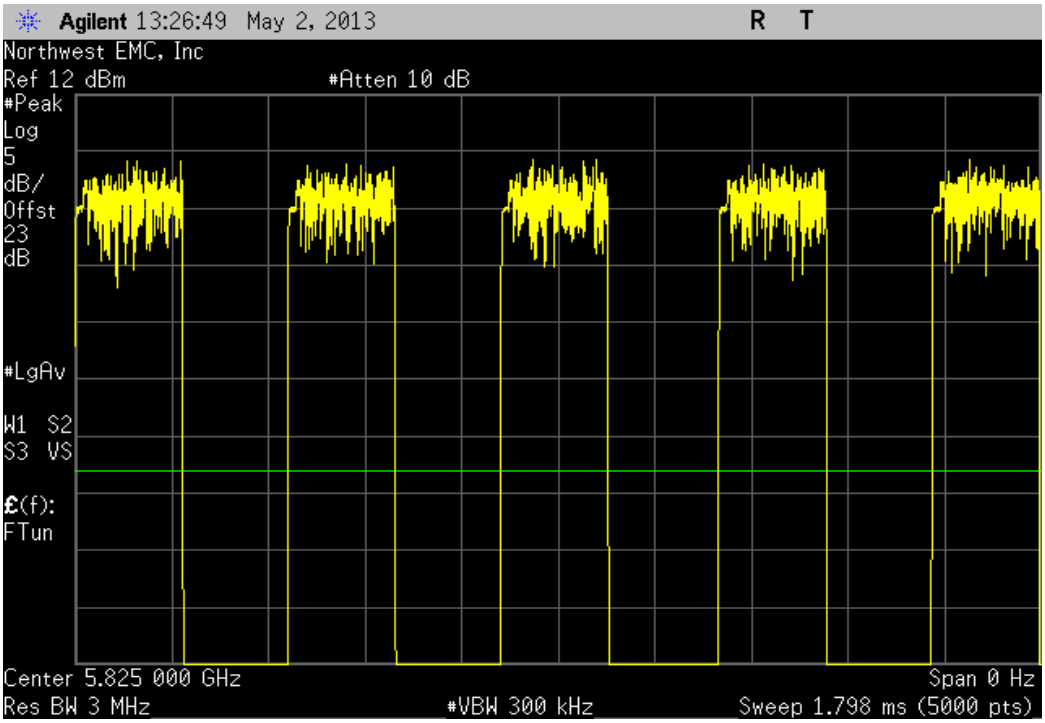
5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | 199.449 uS | 396.8 uS | 1 | 50.3 | N/A | N/A |



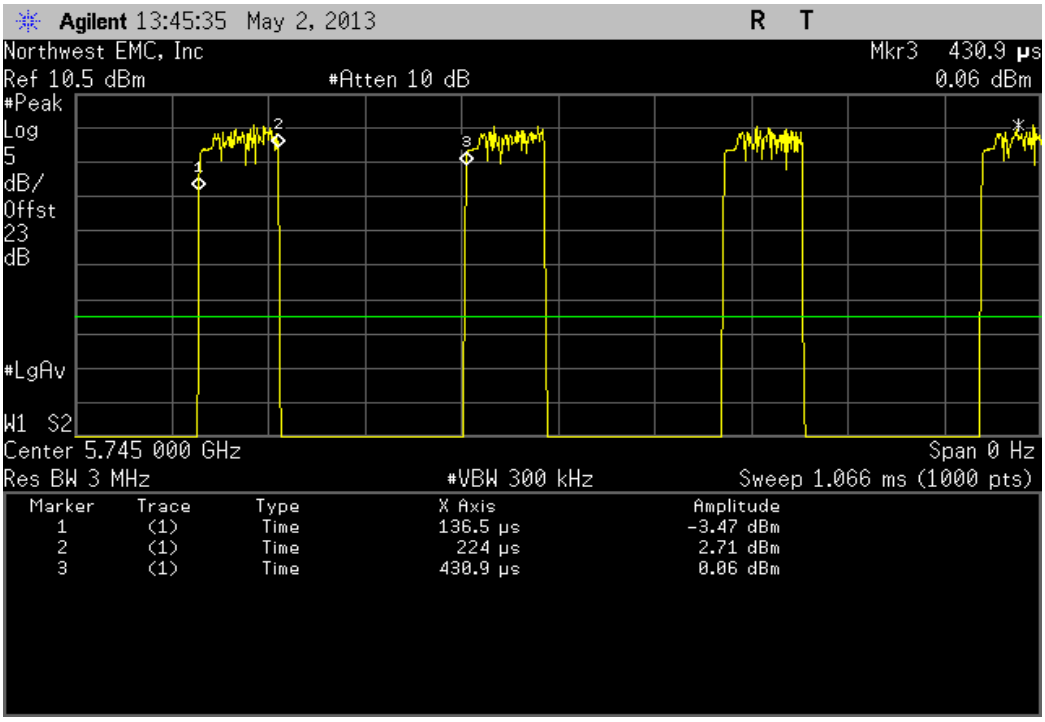

5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | N/A | N/A | 5 | N/A | N/A | N/A |



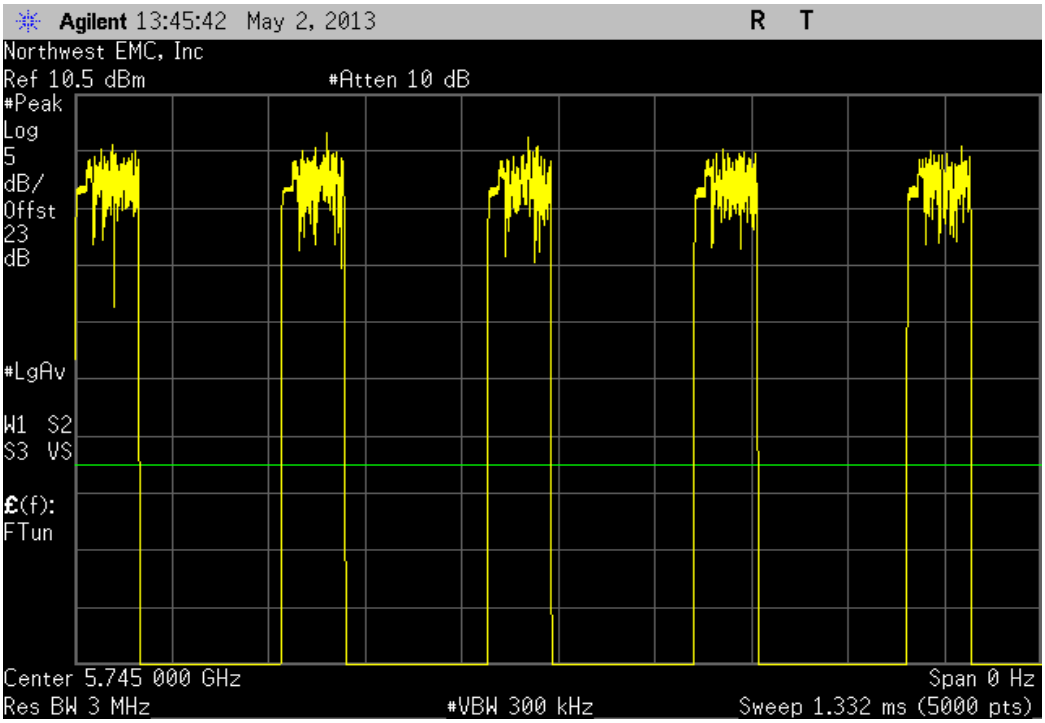
5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 87.484 uS | 294.4 uS | 1 | 29.7 | N/A | N/A |



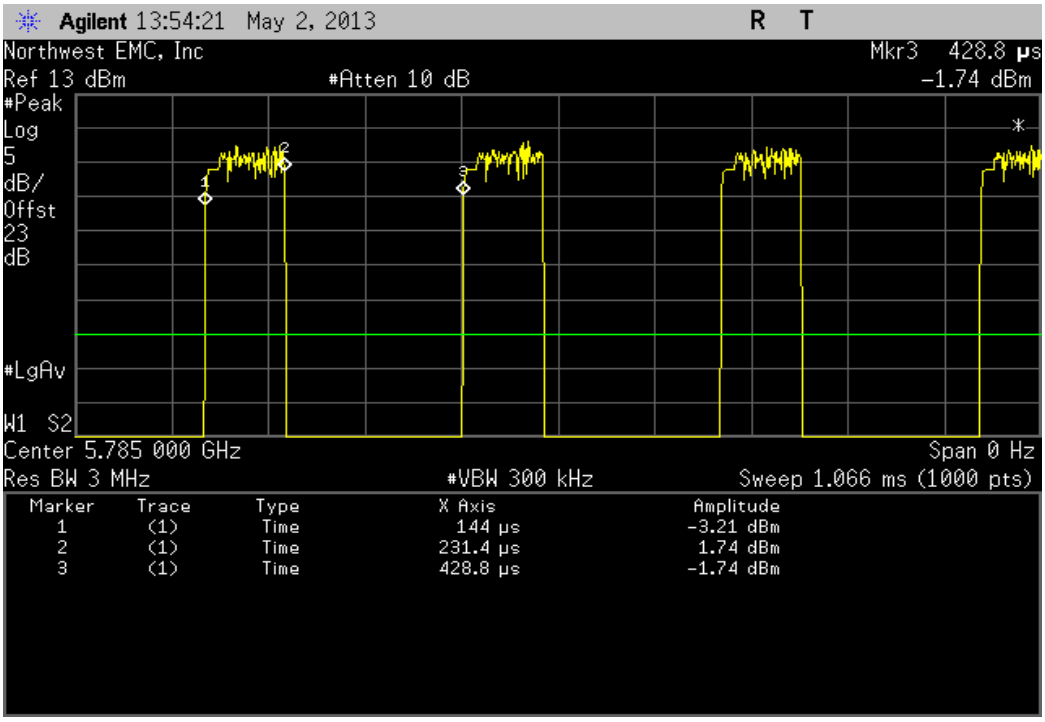

5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |



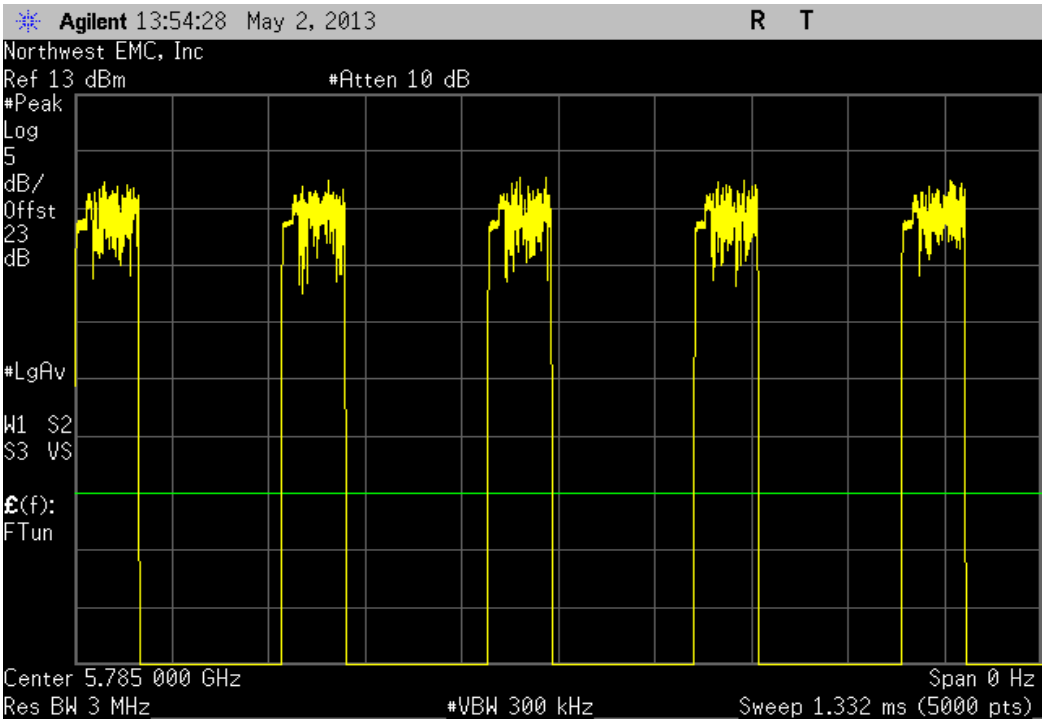
5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | 87.432 uS | 284.8 uS | 1 | 30.7 | N/A | N/A |



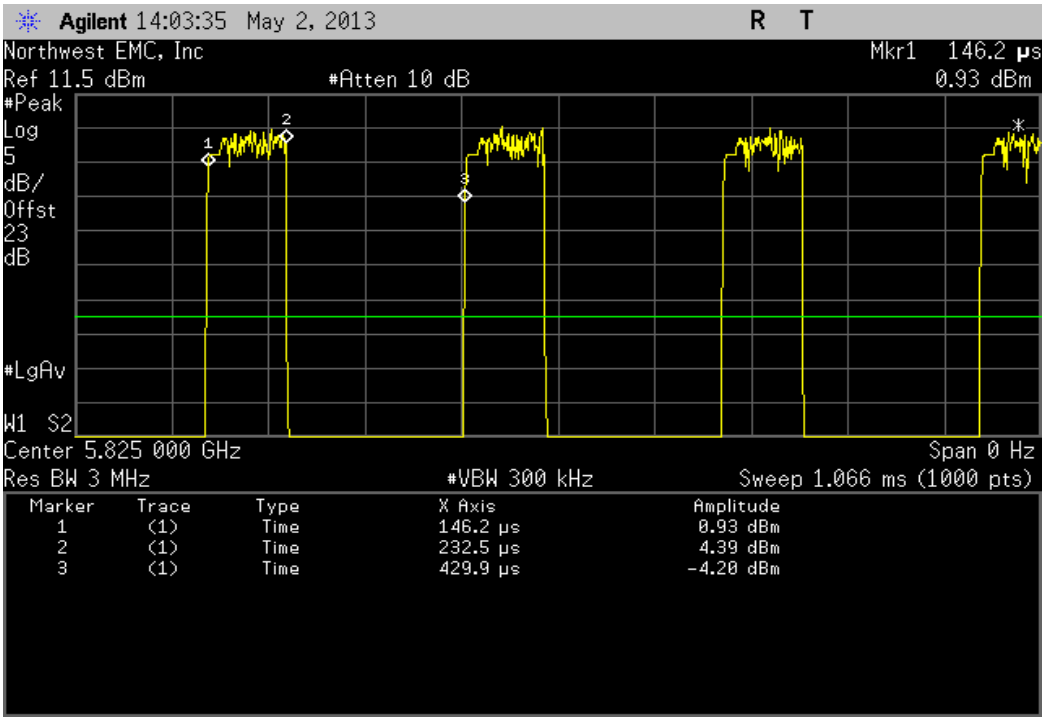

5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | N/A | N/A | 5 | N/A | N/A | N/A |



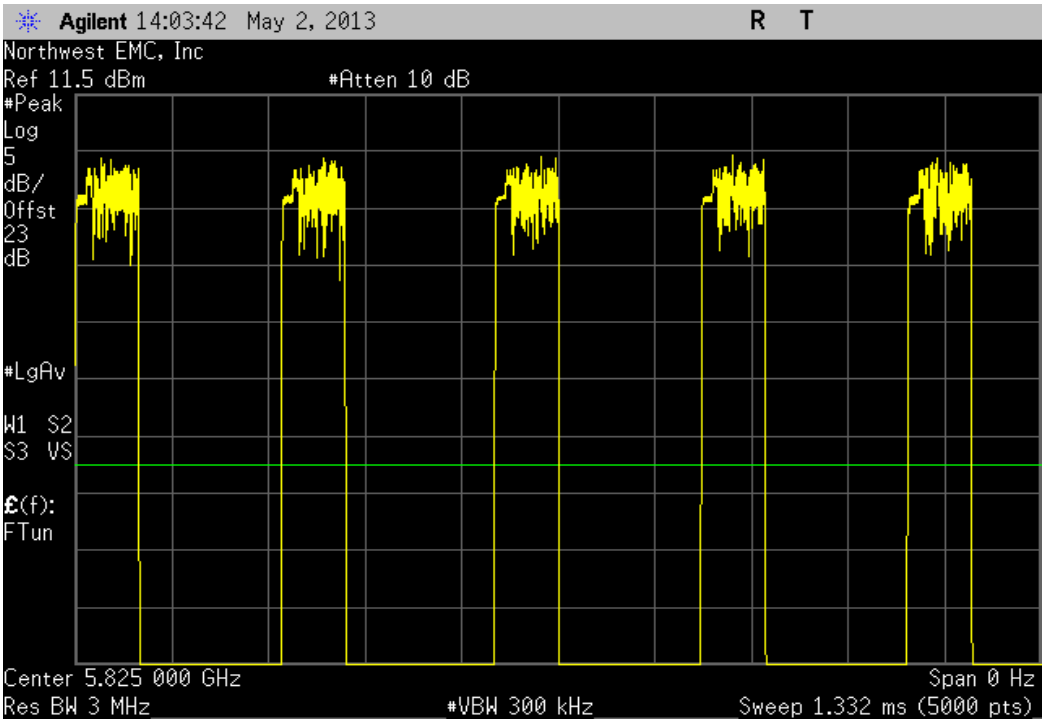
5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 86.366 uS | 283.716 uS | 1 | 30.4 | N/A | N/A |




5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |



# Occupied Bandwidth

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Attenuator, 6dB | S.M. Electronics | 18N-06 | AWN | 3/25/2013 | 12 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |
| Power Meter | Gigatronics | 8651A | SPM | 1/9/2012 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| EV06 Direct Connect Cable | ESM Cable Corp. | TT | ECA | NCR | 0 |
| Attenuator, 6 dB, 'SMA' | N/A | 93459 3330A-6 | AUF | 3/5/2013 | 12 |
| 40GHz DC Block | Miteq | DCB4000 | AMD | 6/25/2012 | 12 |
| Spectrum Analyzer | Agilent | E4446A | AAQ | 2/7/2012 | 24 |

**TEST DESCRIPTION**

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 26 dB (99.9%) emission bandwidth (EBW) was also measured at the same time.

The EUT was set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

# Occupied Bandwidth

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | Model 444-2225 (Athena UFL) | | | **Work Order:** | FOCU0140 |
| **Serial Number:** | 02EA4D000027 | | | **Date:** | 05/03/13 |
| **Customer:** | Summit Semiconductor | | | **Temperature:** | 24°C |
| **Attendees:** | None | | | **Humidity:** | 30% |
| **Project:** | None | | | **Barometric Pres.:** | 1023 |
| **Tested by:** | Brandon Hobbs | **Power:** | 3.3V DC | **Job Site:** | EV06 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2013 | ANSI C63.10:2009 |
| | |

**COMMENTS**

All testing was completed on the highest output power antenna port A2.

**DEVIATIONS FROM TEST STANDARD**

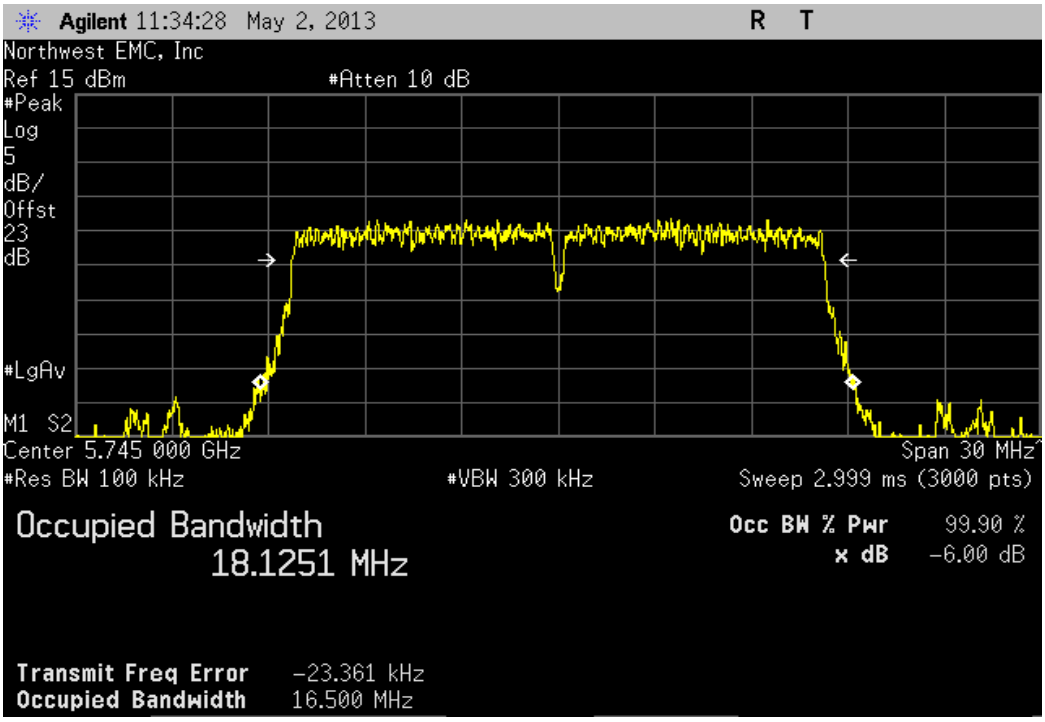
None

| Configuration # | 5 | Signature |
|---|---|---|

| | Value | Limit | Result |
|---|---|---|---|
| 5725 MHz - 5850 MHz Band | | | |
| 802.11(a) 6 Mbps | | | |
| Low Channel 149, 5745 MHz | 16.5 MHz | > 500 kHz | Pass |
| Mid Channel 157, 5785 MHz | 16.55 MHz | > 500 kHz | Pass |
| High Channel 165, 5825 MHz | 16.557 MHz | > 500 kHz | Pass |
| 802.11(a) 18 Mbps | | | |
| Low Channel 149, 5745 MHz | 16.32 MHz | > 500 kHz | Pass |
| Mid Channel 157, 5785 MHz | 16.272 MHz | > 500 kHz | Pass |
| High Channel 165, 5825 MHz | 16.011 MHz | > 500 kHz | Pass |

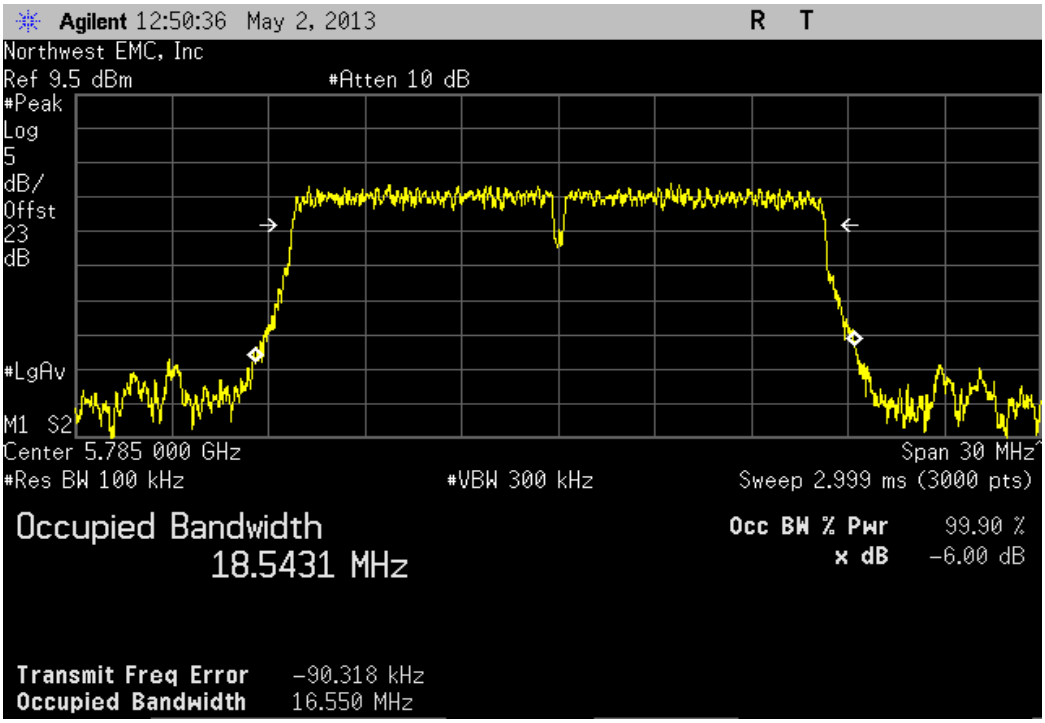
5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 16.5 MHz | > 500 kHz | Pass |



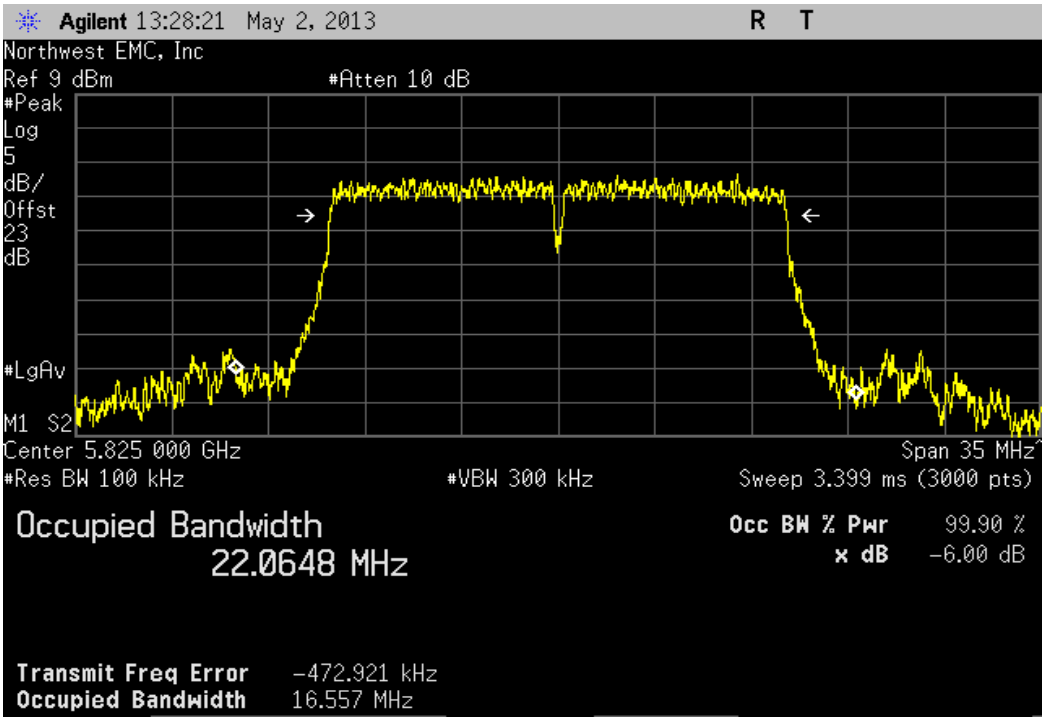

5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 16.55 MHz | > 500 kHz | Pass |



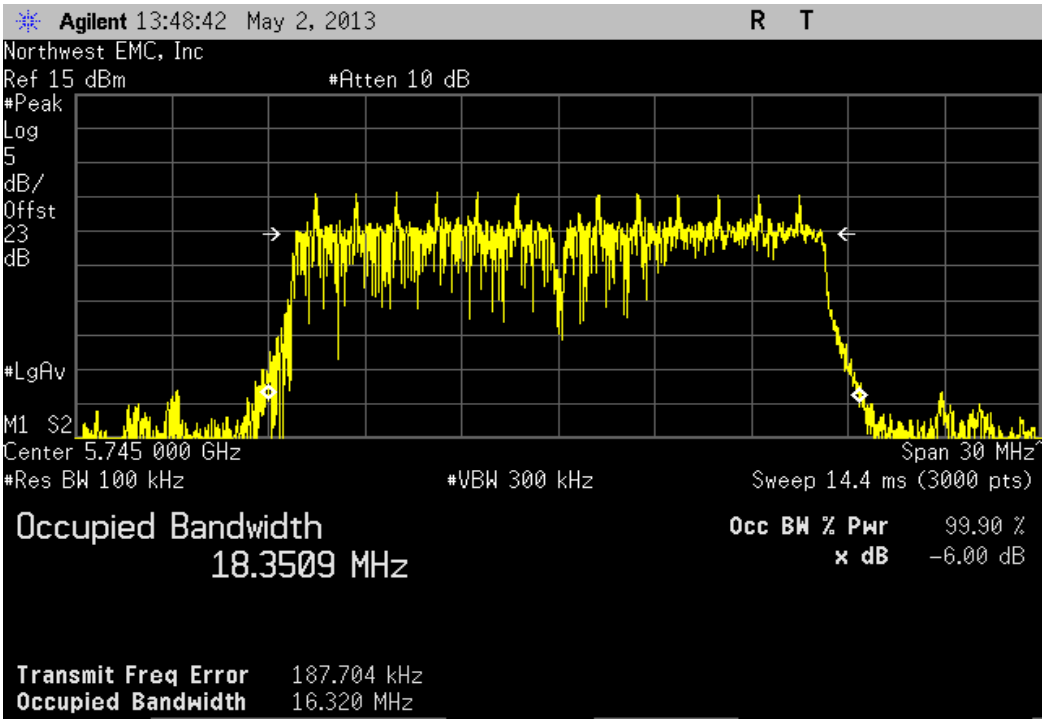
5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 16.557 MHz | > 500 kHz | Pass |



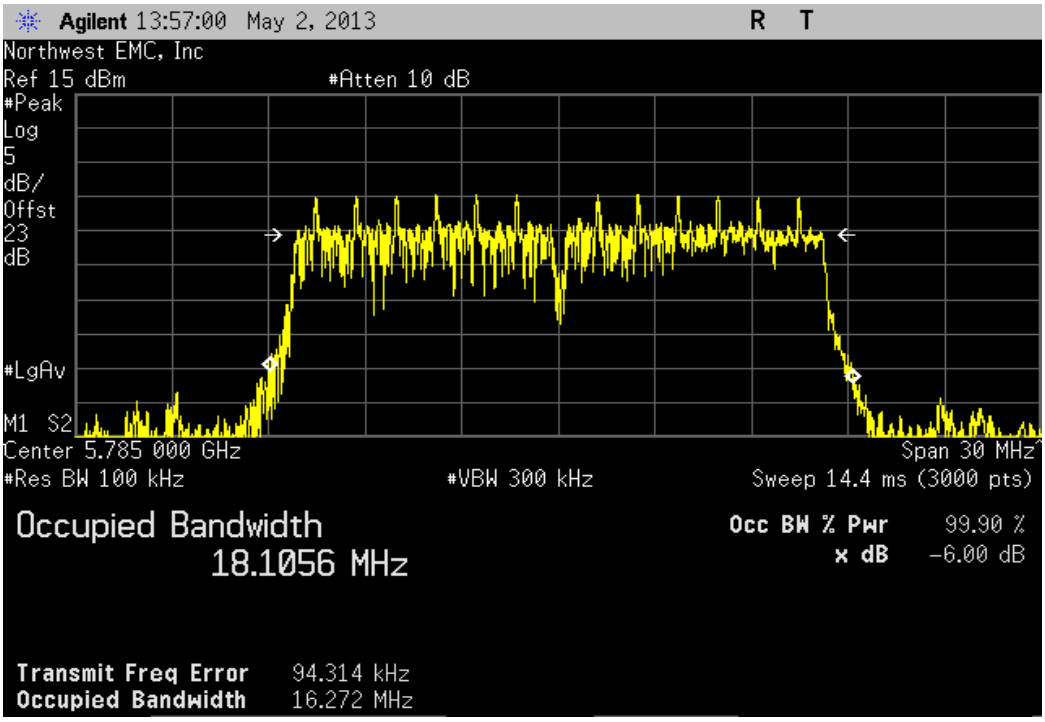

5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 16.32 MHz | > 500 kHz | Pass |



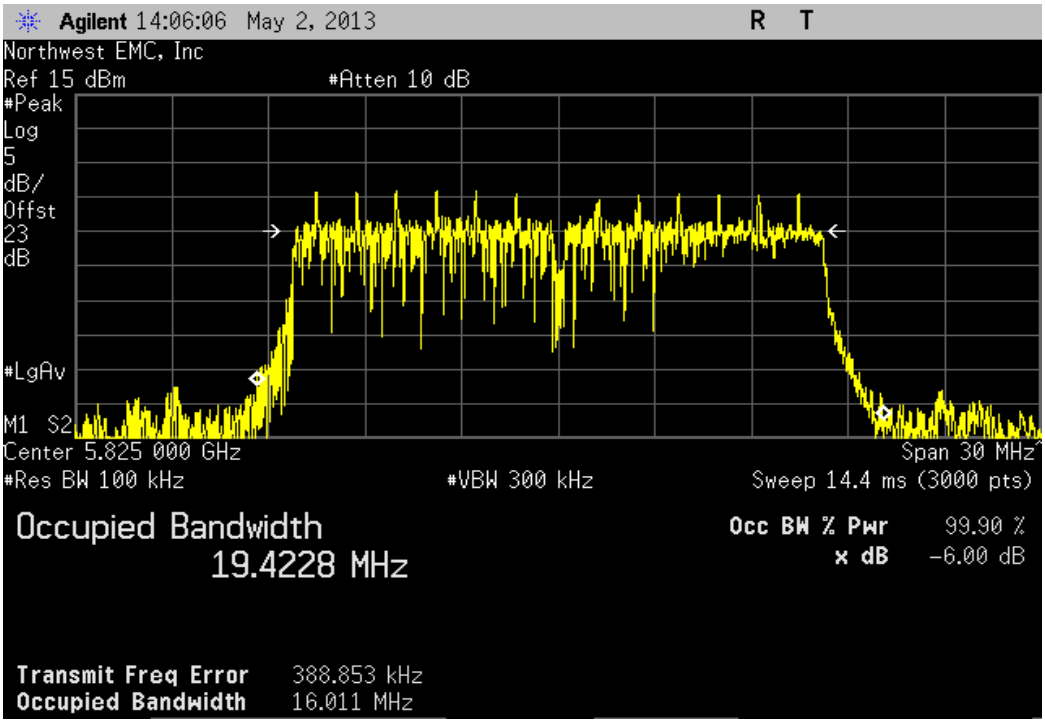
5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 16.272 MHz | > 500 kHz | Pass |




5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 16.011 MHz | > 500 kHz | Pass |



# Output Power

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Attenuator, 6dB | S.M. Electronics | 18N-06 | AWN | 3/25/2013 | 12 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |
| Power Meter | Gigatronics | 8651A | SPM | 1/9/2012 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| EV06 Direct Connect Cable | ESM Cable Corp. | TT | ECA | NCR | 0 |
| Attenuator, 6 dB, 'SMA' | N/A | 93459 3330A-6 | AUF | 3/5/2013 | 12 |
| 40GHz DC Block | Miteq | DCB4000 | AMD | 6/25/2012 | 12 |
| Spectrum Analyzer | Agilent | E4446A | AAQ | 2/7/2012 | 24 |

**TEST DESCRIPTION**

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Method Option 1 found in KDB 558074 DTS D01 Measurement Section 9.1.1 was used because the RBW on the analyzer was greater than the Emission Bandwidth of the radio.

**De Facto EIRP Limit:** Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36 dBm.

# Output Power

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | Model 444-2225 (Athena UFL) | | | **Work Order:** | FOCU0140 |
| **Serial Number:** | 02EA4D000027 | | | **Date:** | 05/03/13 |
| **Customer:** | Summit Semiconductor | | | **Temperature:** | 24°C |
| **Attendees:** | None | | | **Humidity:** | 30% |
| **Project:** | None | | | **Barometric Pres.:** | 1023 |
| **Tested by:** | Brandon Hobbs | **Power:** | 3.3V DC | **Job Site:** | EV06 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2013 | ANSI C63.10:2009 |
| | |

**COMMENTS**

All testing was completed on the highest output power antenna port A2.

**DEVIATIONS FROM TEST STANDARD**

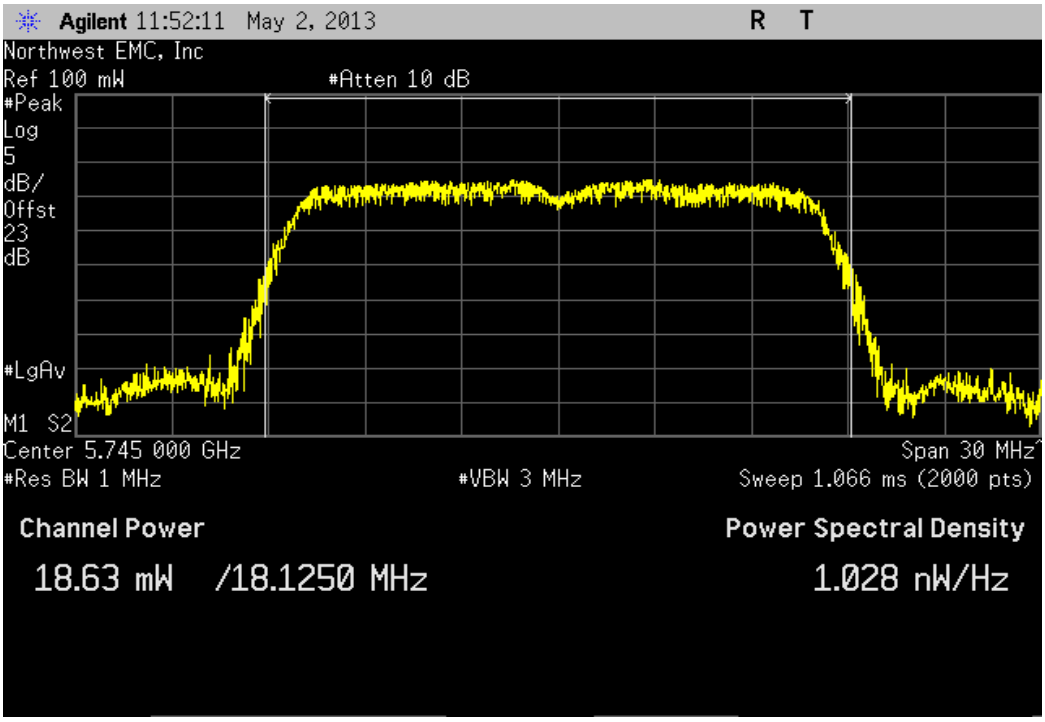
None

| Configuration # | 5 | Signature |
|---|---|---|

| | Value | Limit | Result |
|---|---|---|---|
| 5725 MHz - 5850 MHz Band | | | |
| 802.11(a) 6 Mbps | | | |
| Low Channel 149, 5745 MHz | 18.63 mW | < 1 W | Pass |
| Mid Channel 157, 5785 MHz | 17.202 mW | < 1 W | Pass |
| High Channel 165, 5825 MHz | 18.946 mW | < 1 W | Pass |
| 802.11(a) 18 Mbps | | | |
| Low Channel 149, 5745 MHz | 19.569 mW | < 1 W | Pass |
| Mid Channel 157, 5785 MHz | 18.223 mW | < 1 W | Pass |
| High Channel 165, 5825 MHz | 20.137 mW | < 1 W | Pass |

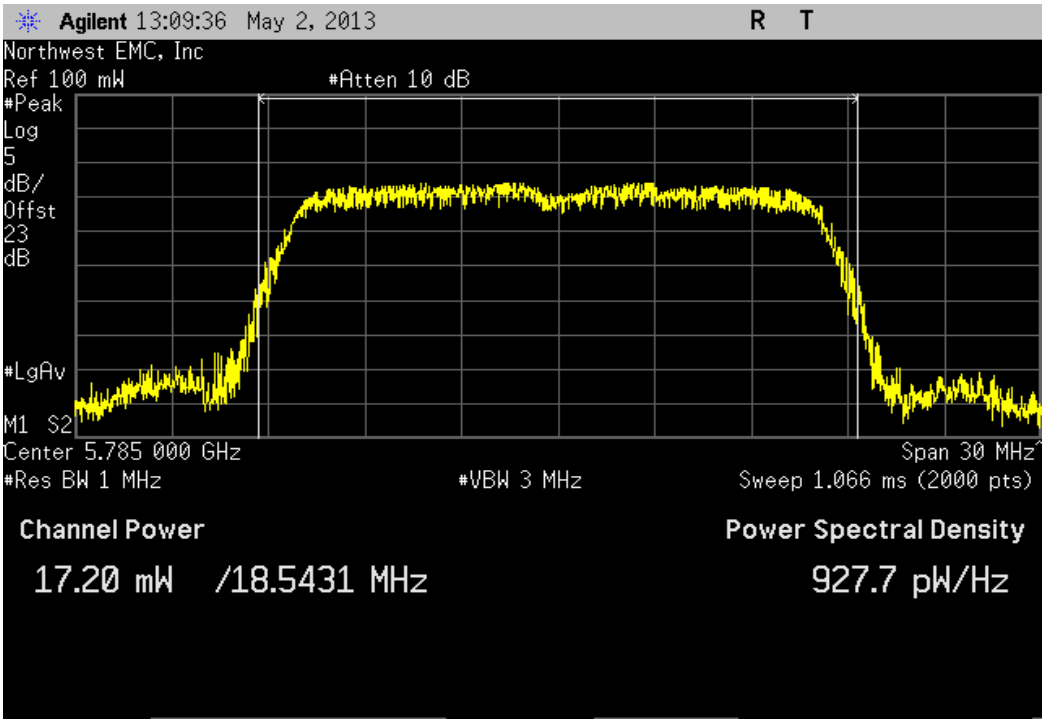
5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 18.63 mW | < 1 W | Pass |



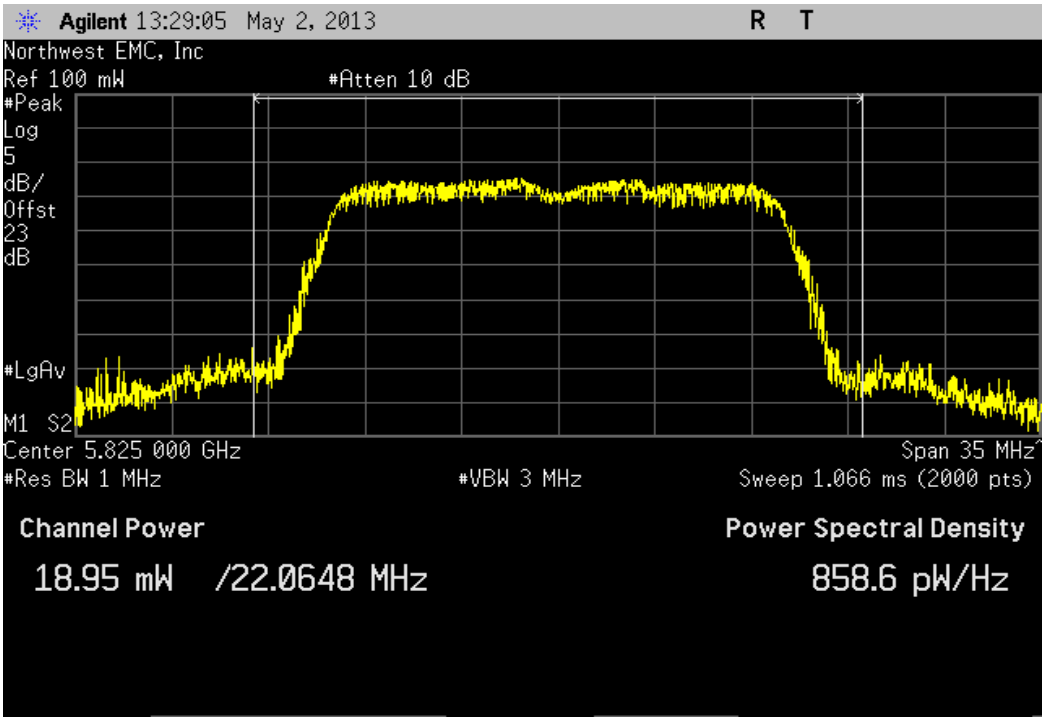

5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 17.202 mW | < 1 W | Pass |



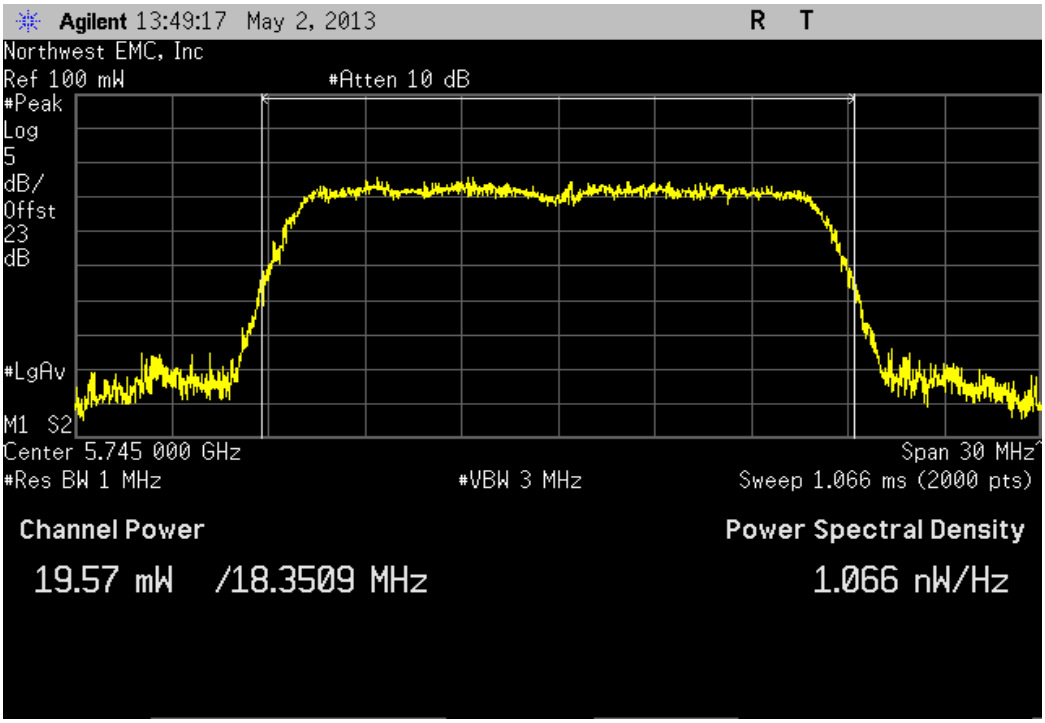
5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 18.946 mW | < 1 W | Pass |



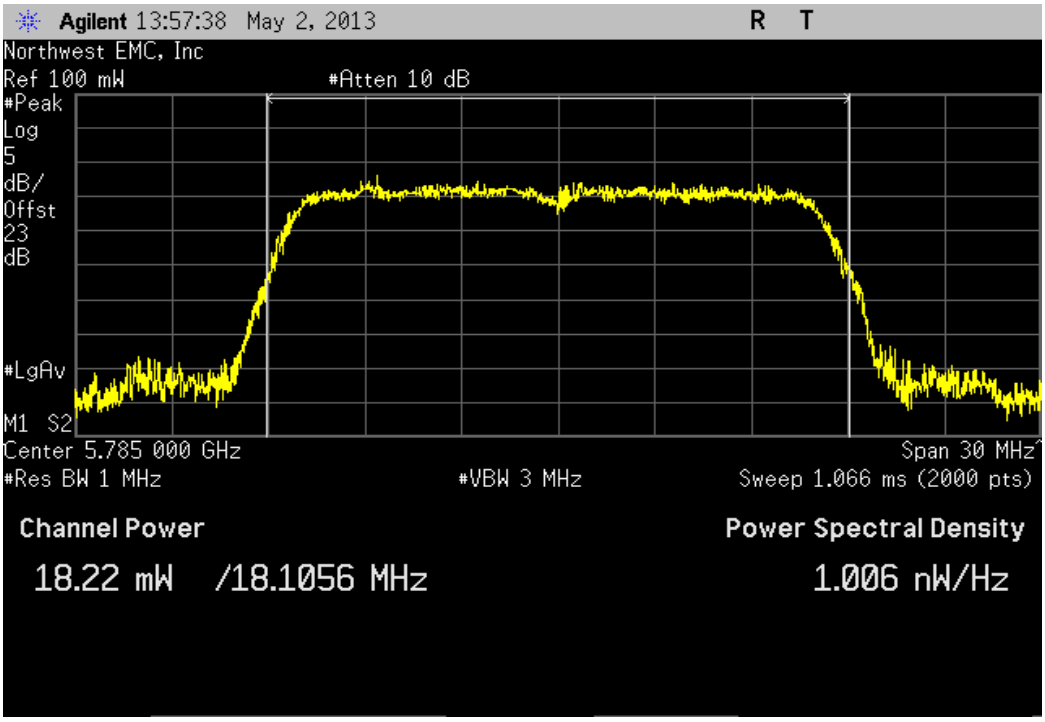

5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 19.569 mW | < 1 W | Pass |



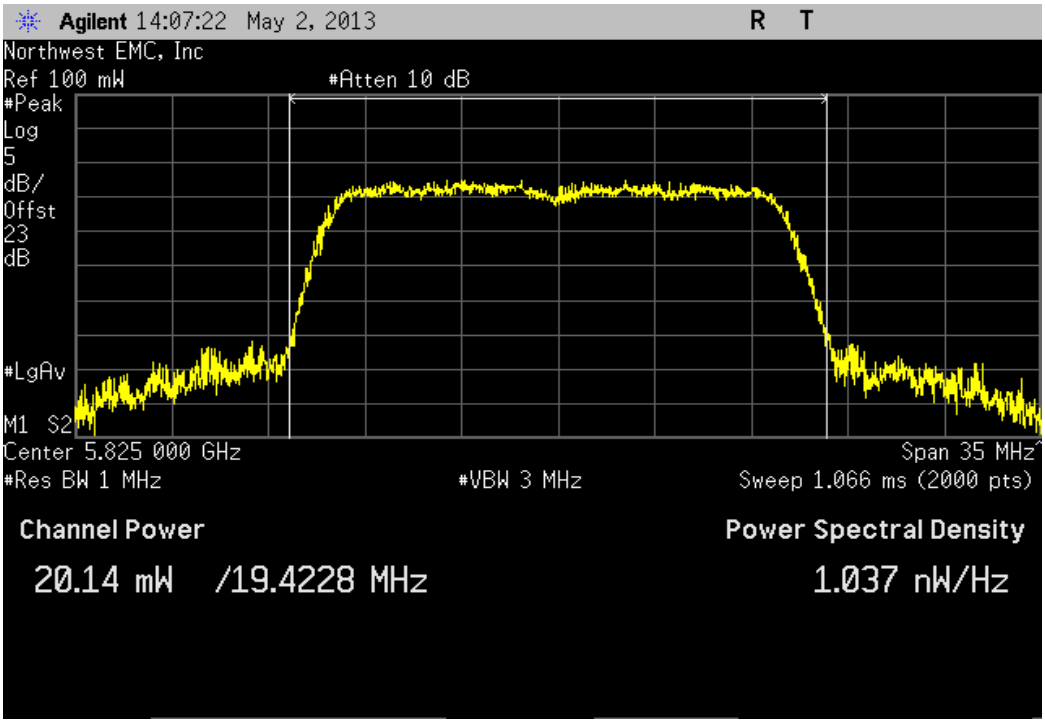
5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 18.223 mW | < 1 W | Pass |




5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 20.137 mW | < 1 W | Pass |



# Band Edge Compliance

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Attenuator, 6dB | S.M. Electronics | 18N-06 | AWN | 3/25/2013 | 12 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |
| Power Meter | Gigatronics | 8651A | SPM | 1/9/2012 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| EV06 Direct Connect Cable | ESM Cable Corp. | TT | ECA | NCR | 0 |
| Attenuator, 6 dB, 'SMA' | N/A | 93459 3330A-6 | AUF | 3/5/2013 | 12 |
| 40GHz DC Block | Miteq | DCB4000 | AMD | 6/25/2012 | 12 |
| Spectrum Analyzer | Agilent | E4446A | AAQ | 2/7/2012 | 24 |

**TEST DESCRIPTION**

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

# Band Edge Compliance

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | Model 444-2225 (Athena UFL) | | | **Work Order:** | FOCU0140 |
| **Serial Number:** | 02EA4D000027 | | | **Date:** | 05/03/13 |
| **Customer:** | Summit Semiconductor | | | **Temperature:** | 24°C |
| **Attendees:** | None | | | **Humidity:** | 30% |
| **Project:** | None | | | **Barometric Pres.:** | 1023 |
| **Tested by:** | Brandon Hobbs | **Power:** | 3.3V DC | **Job Site:** | EV06 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2013 | ANSI C63.10:2009 |
| | |

**COMMENTS**

All testing was completed on the highest output power antenna port A2.

**DEVIATIONS FROM TEST STANDARD**

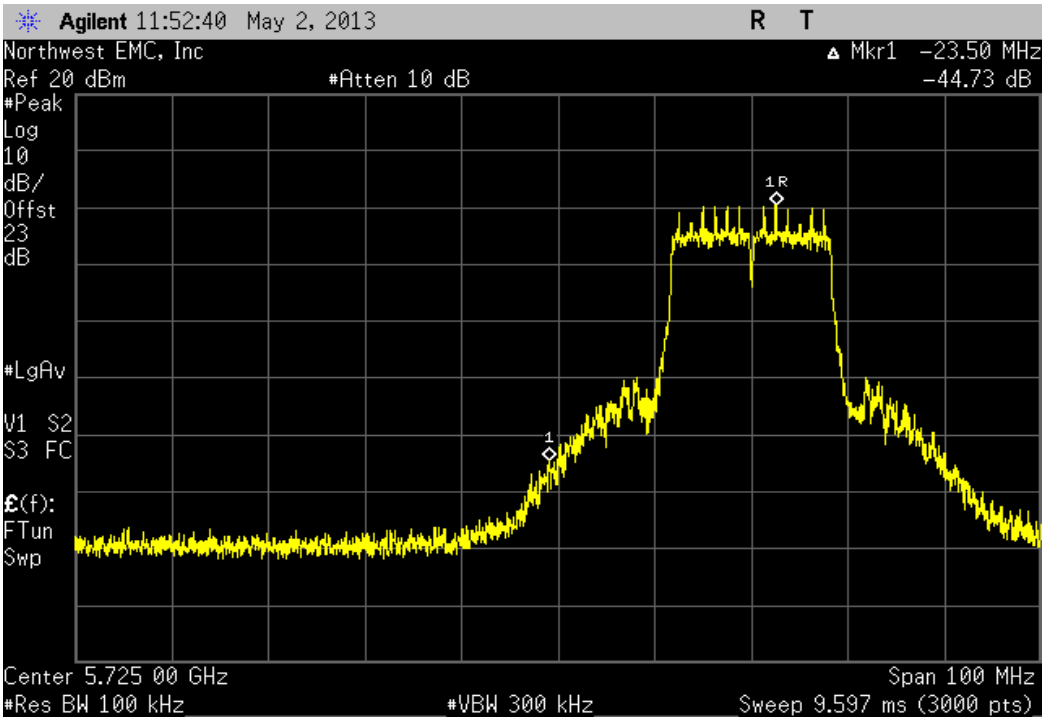
None

| Configuration # | 5 | Signature |
|---|---|---|

| | Value | Limit | Result |
|---|---|---|---|
| 5725 MHz - 5850 MHz Band | | | |
| 802.11(a) 6 Mbps | | | |
| Low Channel 149, 5745 MHz | -44.73 dBc | ≤ -20 dBc | Pass |
| High Channel 165, 5825 MHz | -50.56 dBc | ≤ -20 dBc | Pass |
| 802.11(a) 18 Mbps | | | |
| Low Channel 149, 5745 MHz | -44.14 dBc | ≤ -20 dBc | Pass |
| High Channel 165, 5825 MHz | -50.43 dBc | ≤ -20 dBc | Pass |

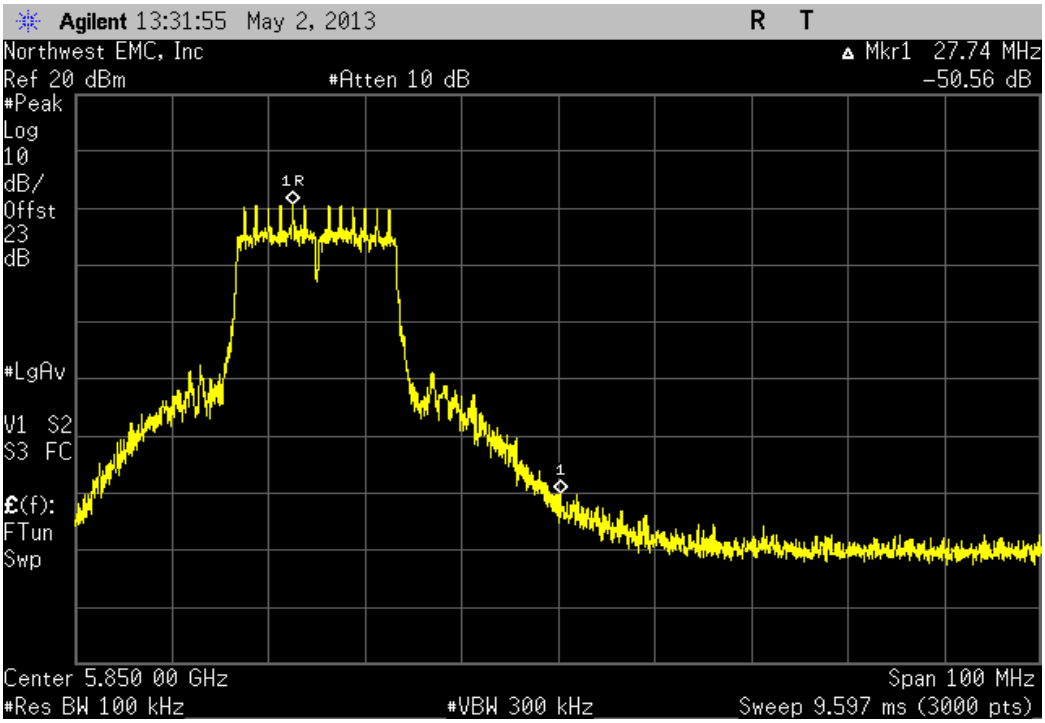
5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -44.73 dBc | ≤ -20 dBc | Pass |



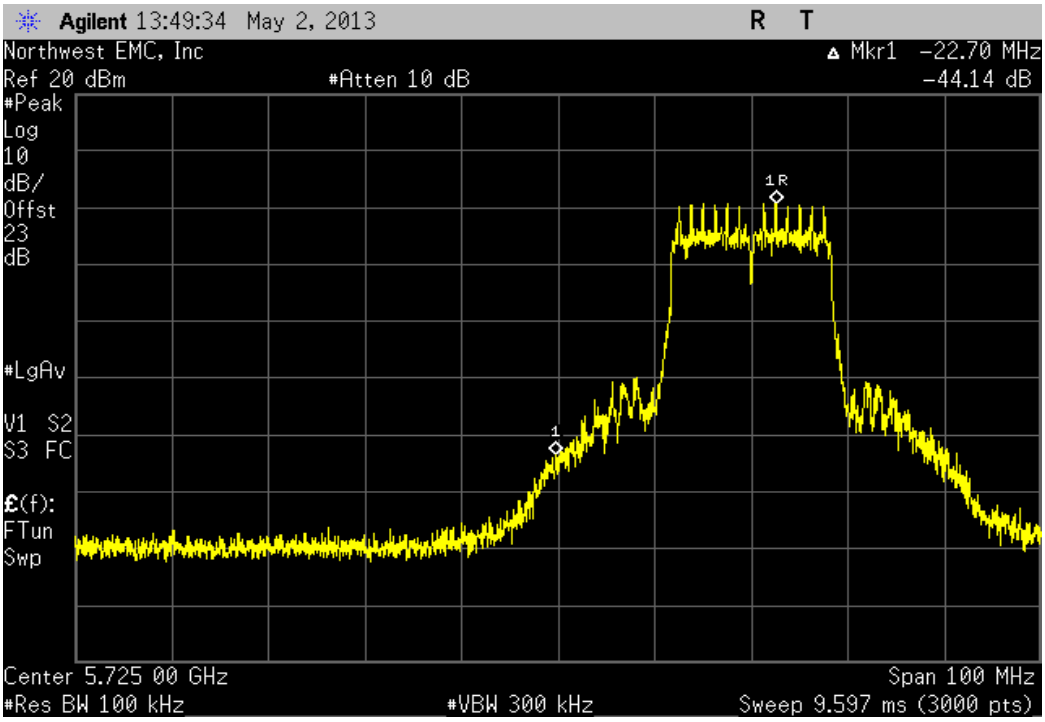

5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -50.56 dBc | ≤ -20 dBc | Pass |



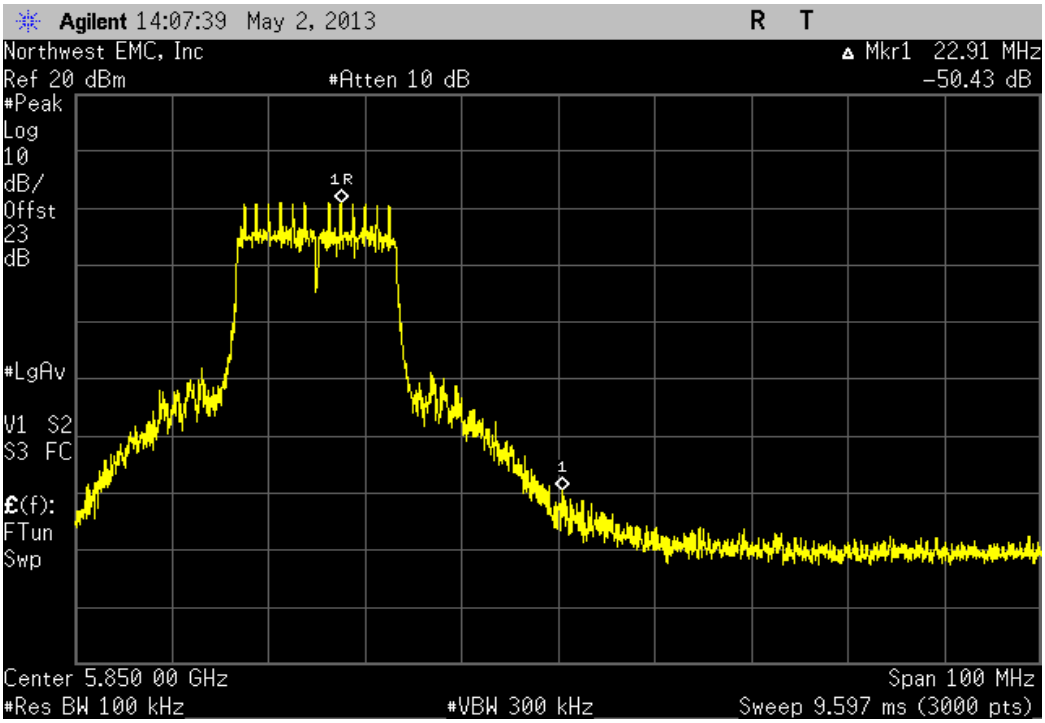
5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -44.14 dBc | ≤ -20 dBc | Pass |




5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -50.43 dBc | ≤ -20 dBc | Pass |



# Spurious Conducted Emissions

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Attenuator, 6dB | S.M. Electronics | 18N-06 | AWN | 3/25/2013 | 12 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |
| Power Meter | Gigatronics | 8651A | SPM | 1/9/2012 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| EV06 Direct Connect Cable | ESM Cable Corp. | TT | ECA | NCR | 0 |
| Attenuator, 6 dB, 'SMA' | N/A | 93459 3330A-6 | AUF | 3/5/2013 | 12 |
| 40GHz DC Block | Miteq | DCB4000 | AMD | 6/25/2012 | 12 |
| Spectrum Analyzer | Agilent | E4446A | AAQ | 2/7/2012 | 24 |

**TEST DESCRIPTION**

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

# Spurious Conducted Emissions

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | Model 444-2225 (Athena UFL) | | | **Work Order:** | FOCU0140 |
| **Serial Number:** | 02EA4D000027 | | | **Date:** | 05/03/13 |
| **Customer:** | Summit Semiconductor | | | **Temperature:** | 24°C |
| **Attendees:** | None | | | **Humidity:** | 30% |
| **Project:** | None | | | **Barometric Pres.:** | 1023 |
| **Tested by:** | Brandon Hobbs | **Power:** | 3.3V DC | **Job Site:** | EV06 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2013 | ANSI C63.10:2009 |
| | |

**COMMENTS**

All testing was completed on the highest output power antenna port A2.

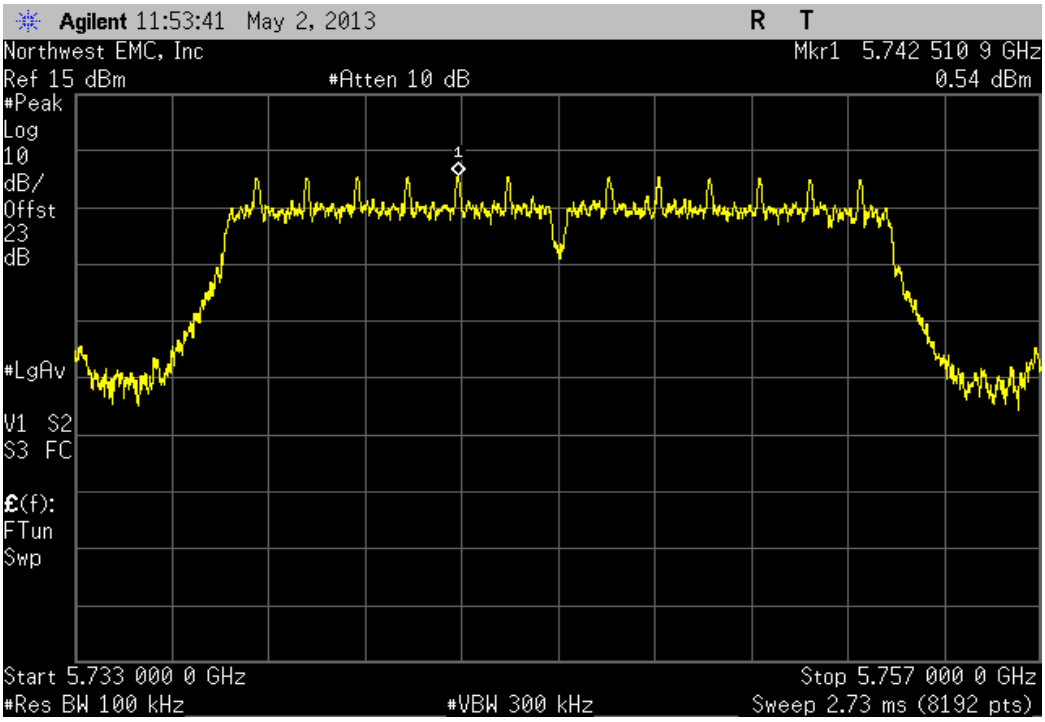
**DEVIATIONS FROM TEST STANDARD**

None

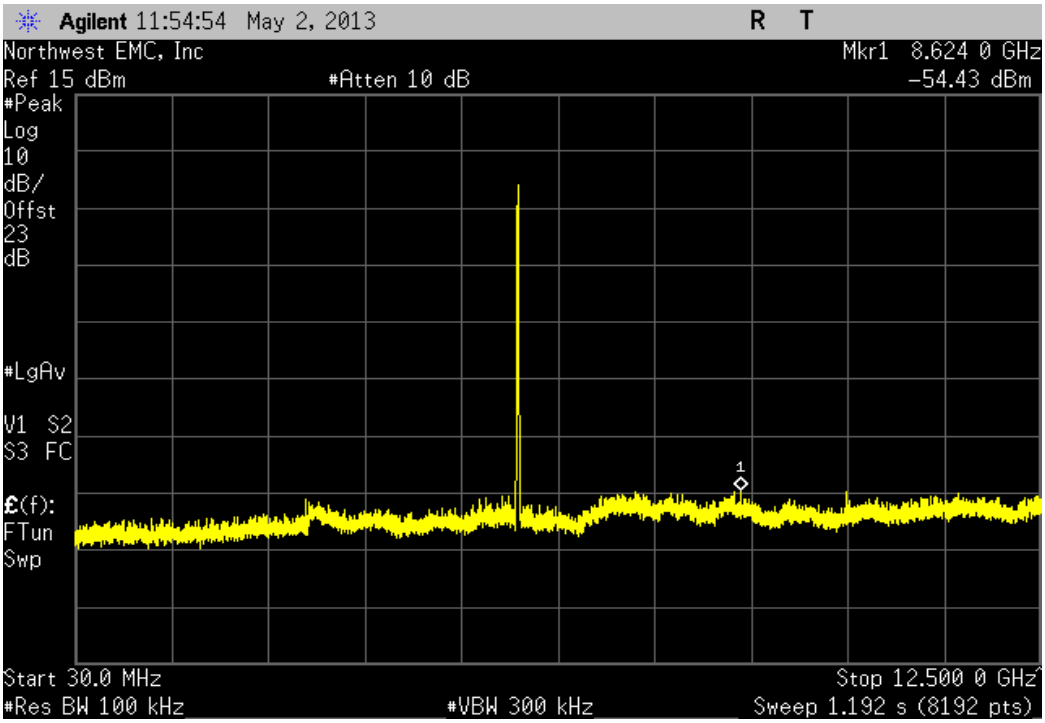
| Configuration # | 5 | Signature |
|---|---|---|

| | | Frequency Range | Value | Limit | Result |
|---|---|---|---|---|---|
| 5725 MHz - 5850 MHz Band | | | | | |
| | 802.11(a) 6 Mbps | | | | |
| | Low Channel 149, 5745 MHz | Fundamental | N/A | N/A | N/A |
| | Low Channel 149, 5745 MHz | 30 MHz - 12.5 GHz | -54.97 dBc | ≤ -20 dBc | Pass |
| | Low Channel 149, 5745 MHz | 12.5 GHz - 25 GHz | -48.14 dBc | ≤ -20 dBc | Pass |
| | Low Channel 149, 5745 MHz | 25 GHz - 32 GHz | -46.38 dBc | ≤ -20 dBc | Pass |
| | Low Channel 149, 5745 MHz | 32 GHz - 40 GHz | -36.95 dBc | ≤ -20 dBc | Pass |
| | Mid Channel 157, 5785 MHz | Fundamental | N/A | N/A | N/A |
| | Mid Channel 157, 5785 MHz | 30 MHz - 12.5 GHz | -53.97 dBc | ≤ -20 dBc | Pass |
| | Mid Channel 157, 5785 MHz | 12.5 GHz - 25 GHz | -46.69 dBc | ≤ -20 dBc | Pass |
| | Mid Channel 157, 5785 MHz | 25 GHz - 32 GHz | -45.81 dBc | ≤ -20 dBc | Pass |
| | Mid Channel 157, 5785 MHz | 32 GHz - 40 GHz | -36.53 dBc | ≤ -20 dBc | Pass |
| | High Channel 165, 5825 MHz | Fundamental | N/A | N/A | N/A |
| | High Channel 165, 5825 MHz | 30 MHz - 12.5 GHz | -55.21 dBc | ≤ -20 dBc | Pass |
| | High Channel 165, 5825 MHz | 12.5 GHz - 25 GHz | -48.01 dBc | ≤ -20 dBc | Pass |
| | High Channel 165, 5825 MHz | 25 GHz - 32 GHz | -46.02 dBc | ≤ -20 dBc | Pass |
| | High Channel 165, 5825 MHz | 32 GHz - 40 GHz | -37.54 dBc | ≤ -20 dBc | Pass |
| | 802.11(a) 18 Mbps | | | | |
| | Low Channel 149, 5745 MHz | Fundamental | N/A | N/A | N/A |
| | Low Channel 149, 5745 MHz | 30 MHz - 12.5 GHz | -54.8 dBc | ≤ -20 dBc | Pass |
| | Low Channel 149, 5745 MHz | 12.5 GHz - 25 GHz | -48.52 dBc | ≤ -20 dBc | Pass |
| | Low Channel 149, 5745 MHz | 25 GHz - 32 GHz | -46.5 dBc | ≤ -20 dBc | Pass |
| | Low Channel 149, 5745 MHz | 32 GHz - 40 GHz | -37.23 dBc | ≤ -20 dBc | Pass |
| | Mid Channel 157, 5785 MHz | Fundamental | N/A | N/A | N/A |
| | Mid Channel 157, 5785 MHz | 30 MHz - 12.5 GHz | -54.62 dBc | ≤ -20 dBc | Pass |
| | Mid Channel 157, 5785 MHz | 12.5 GHz - 25 GHz | -47.9 dBc | ≤ -20 dBc | Pass |
| | Mid Channel 157, 5785 MHz | 25 GHz - 32 GHz | -46.12 dBc | ≤ -20 dBc | Pass |
| | Mid Channel 157, 5785 MHz | 32 GHz - 40 GHz | -37.2 dBc | ≤ -20 dBc | Pass |
| | High Channel 165, 5825 MHz | Fundamental | N/A | N/A | N/A |
| | High Channel 165, 5825 MHz | 30 MHz - 12.5 GHz | -54.71 dBc | ≤ -20 dBc | Pass |
| | High Channel 165, 5825 MHz | 12.5 GHz - 25 GHz | -48.65 dBc | ≤ -20 dBc | Pass |
| | High Channel 165, 5825 MHz | 25 GHz - 32 GHz | -46.55 dBc | ≤ -20 dBc | Pass |
| | High Channel 165, 5825 MHz | 32 GHz - 40 GHz | -36.86 dBc | ≤ -20 dBc | Pass |

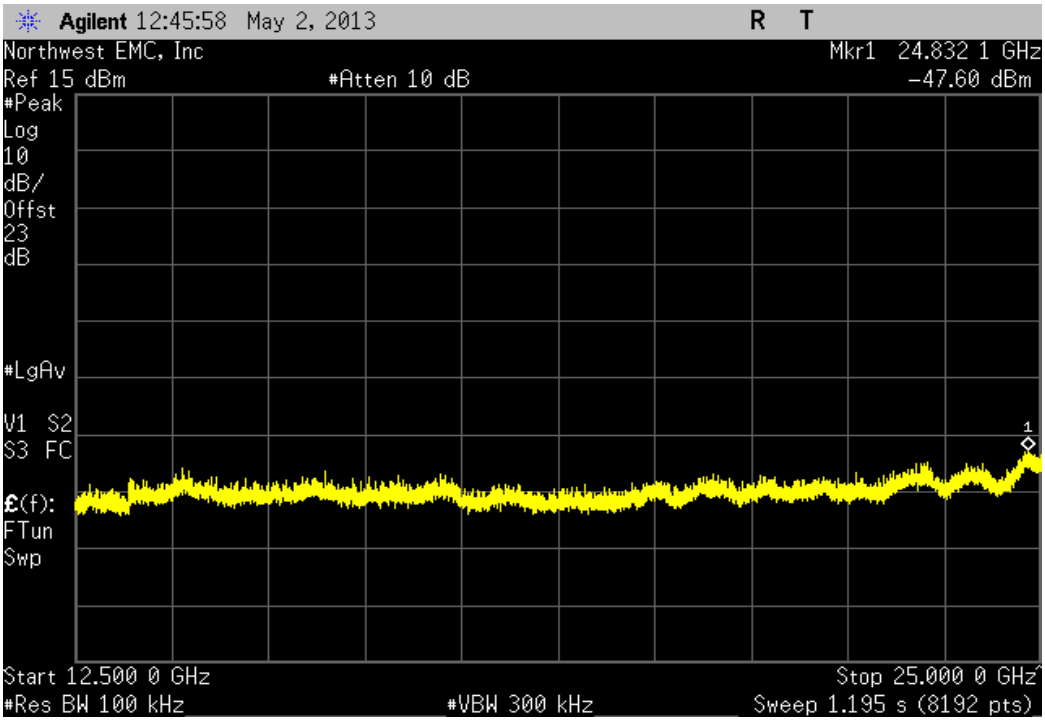
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Frequency Range | | | Value | Limit | Result |
| | Fundamental | | | N/A | N/A | N/A |



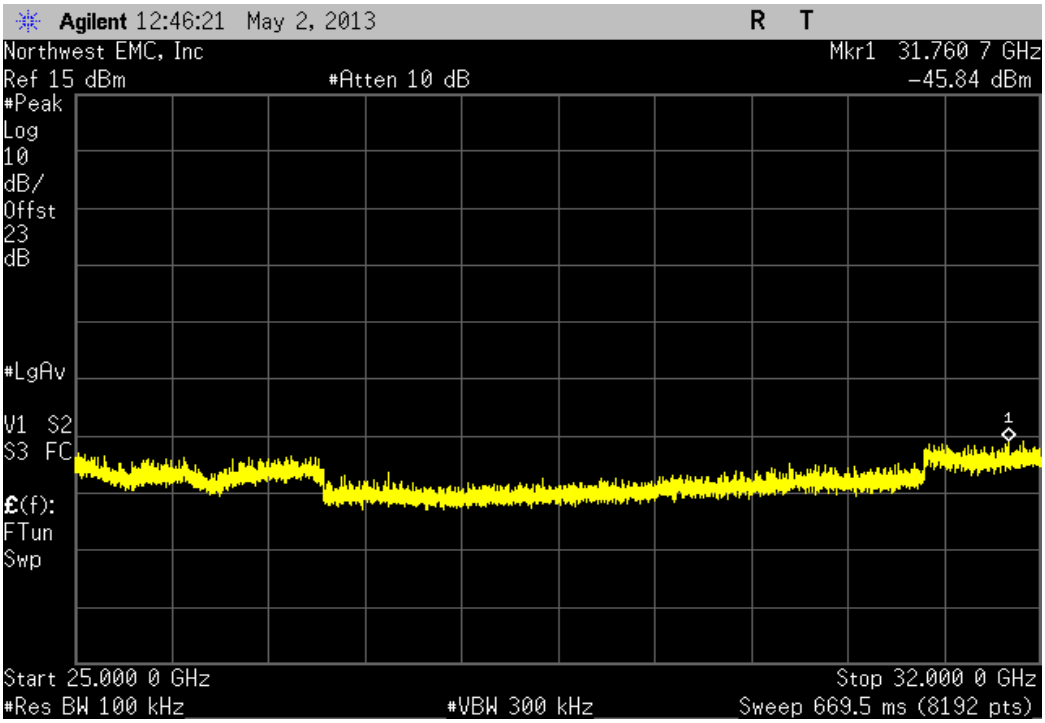

| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz | | | | | |
|---|---|---|---|---|---|
| Frequency Range | | | Value | Limit | Result |
| 30 MHz - 12.5 GHz | | | -54.97 dBc | ≤ -20 dBc | Pass |



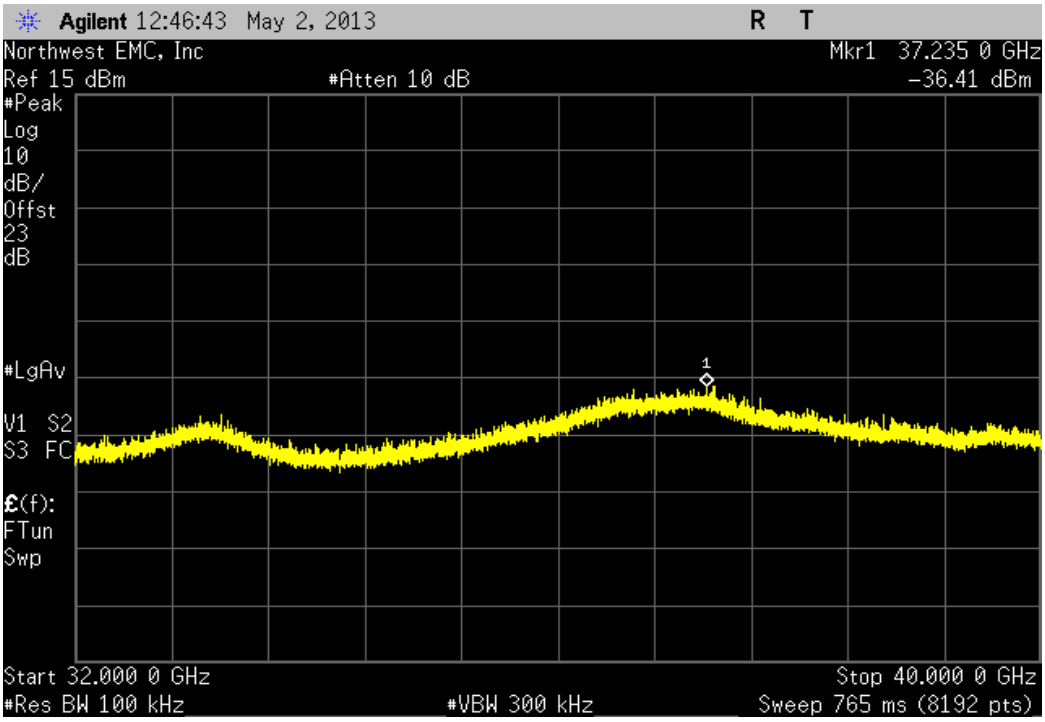
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz | | | | |
|---|---|---|---|---|
| Frequency Range | | Value | Limit | Result |
| 12.5 GHz - 25 GHz | | -48.14 dBc | ≤ -20 dBc | Pass |



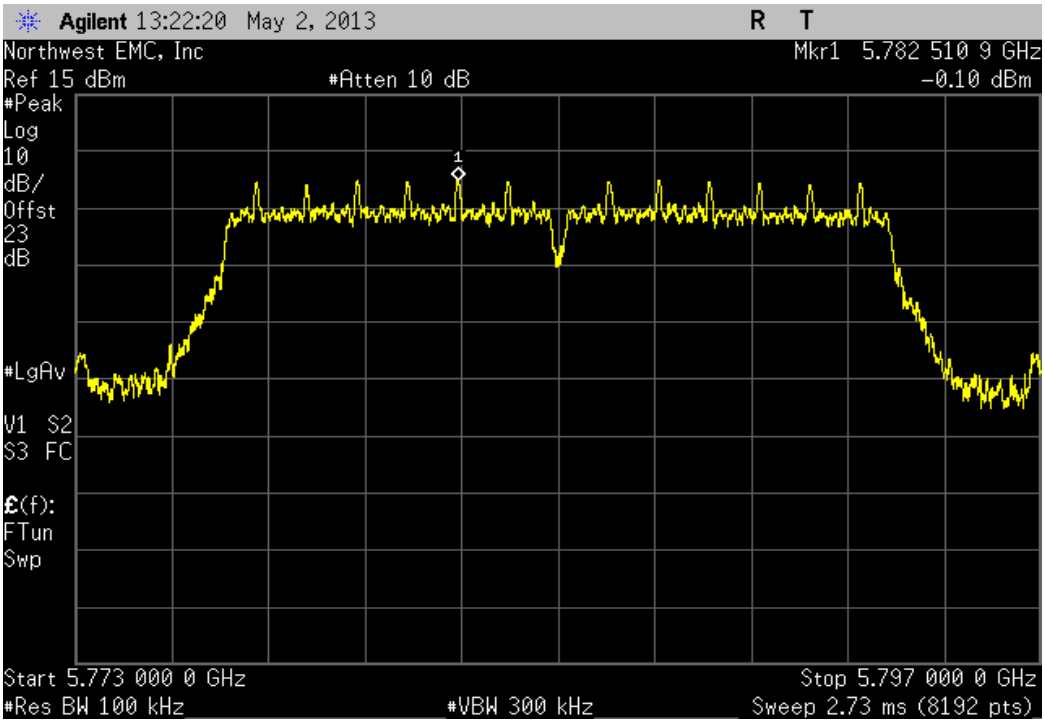

| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz | | | | |
|---|---|---|---|---|
| Frequency Range | | Value | Limit | Result |
| 25 GHz - 32 GHz | | -46.38 dBc | ≤ -20 dBc | Pass |



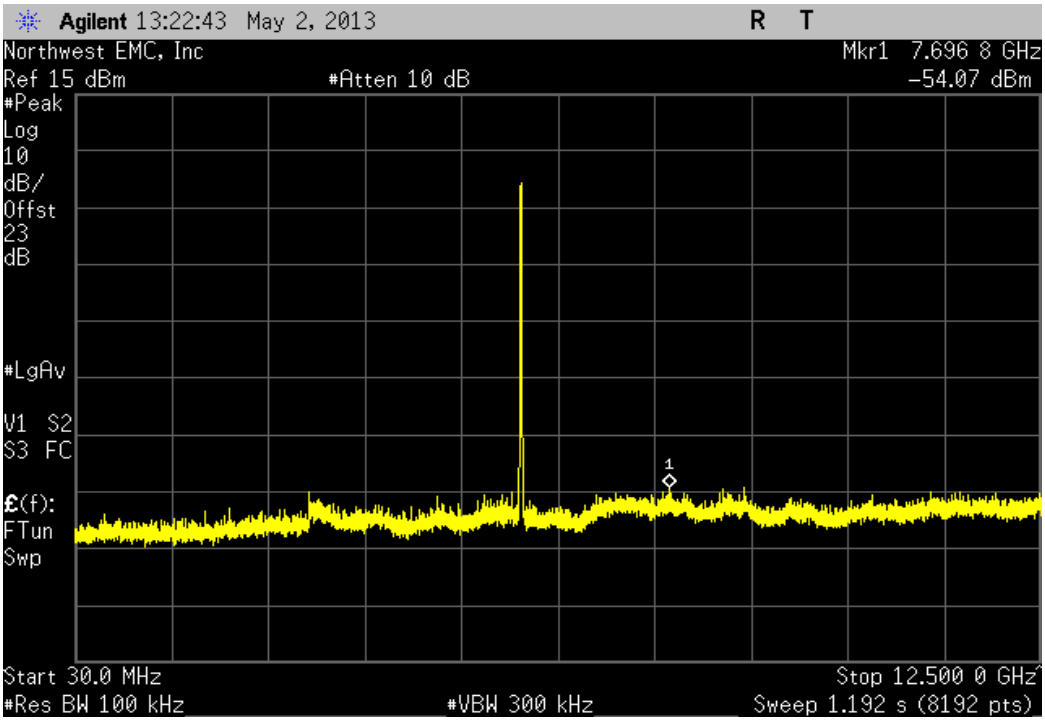
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz | | | | |
|---|---|---|---|---|
| Frequency Range | | Value | Limit | Result |
| 32 GHz - 40 GHz | | -36.95 dBc | ≤ -20 dBc | Pass |



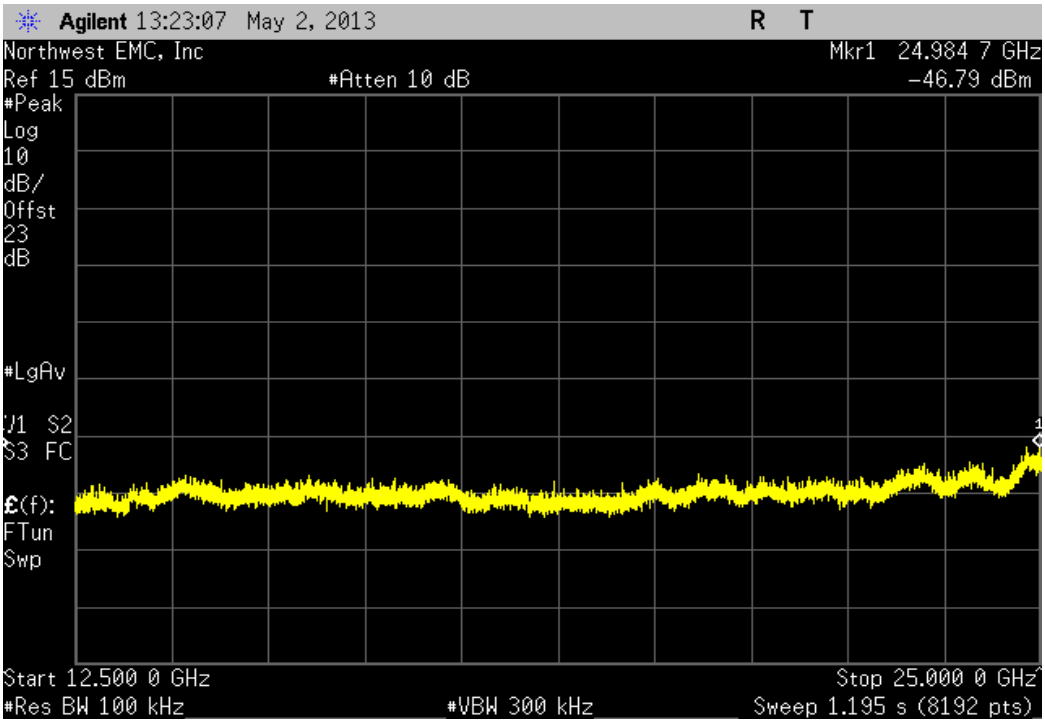

| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Frequency Range | | | Value | Limit | Result |
| | Fundamental | | | N/A | N/A | N/A |



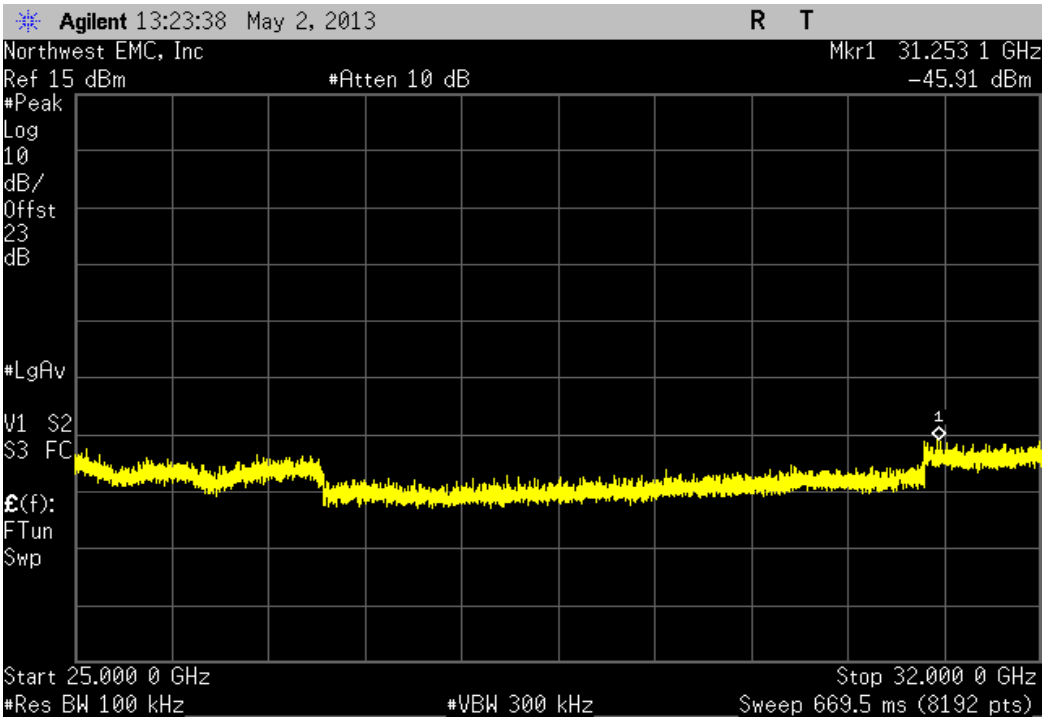
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz | | | | |
|---|---|---|---|---|
| Frequency Range | | Value | Limit | Result |
| 30 MHz - 12.5 GHz | | -53.97 dBc | ≤ -20 dBc | Pass |



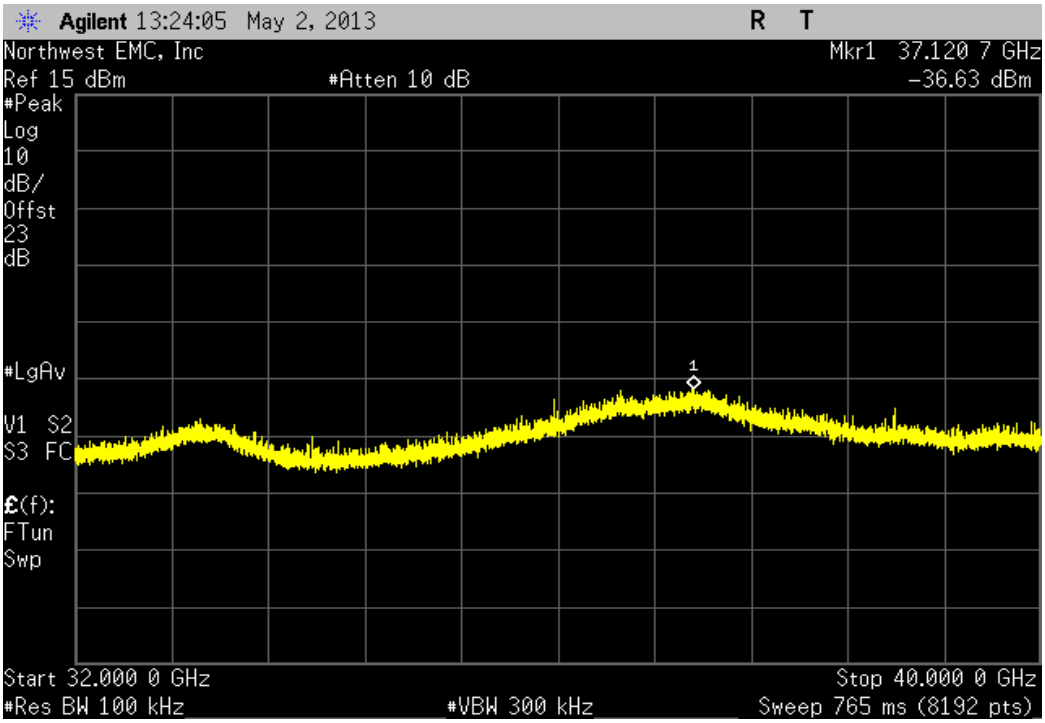

| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz | | | | |
|---|---|---|---|---|
| Frequency Range | | Value | Limit | Result |
| 12.5 GHz - 25 GHz | | -46.69 dBc | ≤ -20 dBc | Pass |



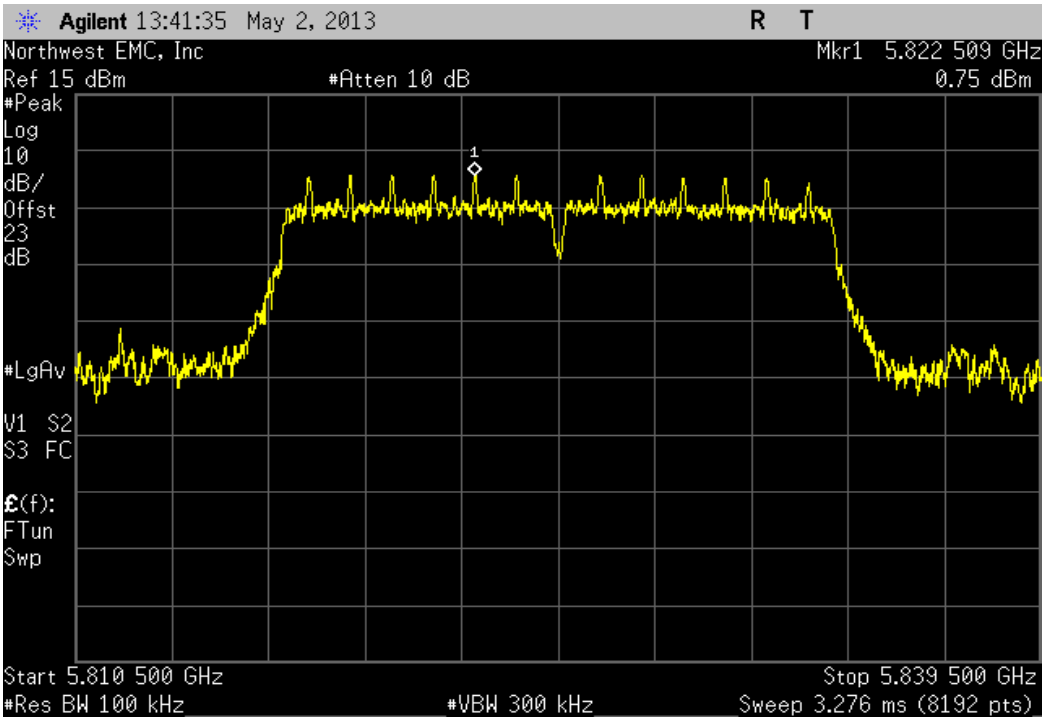
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 25 GHz - 32 GHz | | -45.81 dBc | ≤ -20 dBc | Pass |



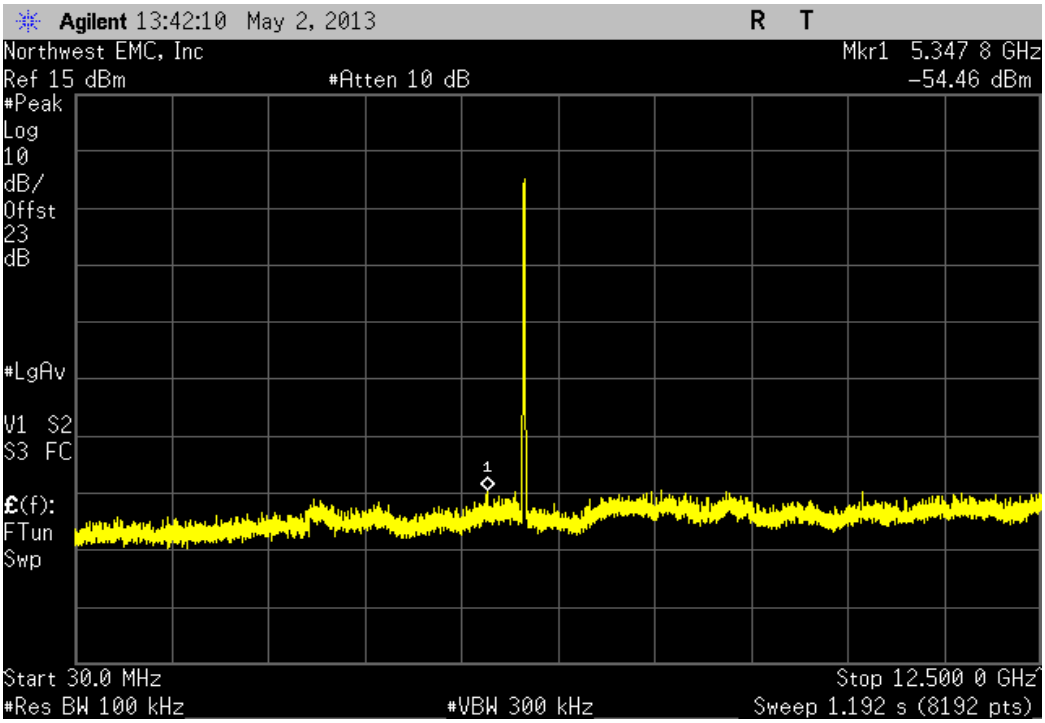

| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 32 GHz - 40 GHz | | -36.53 dBc | ≤ -20 dBc | Pass |



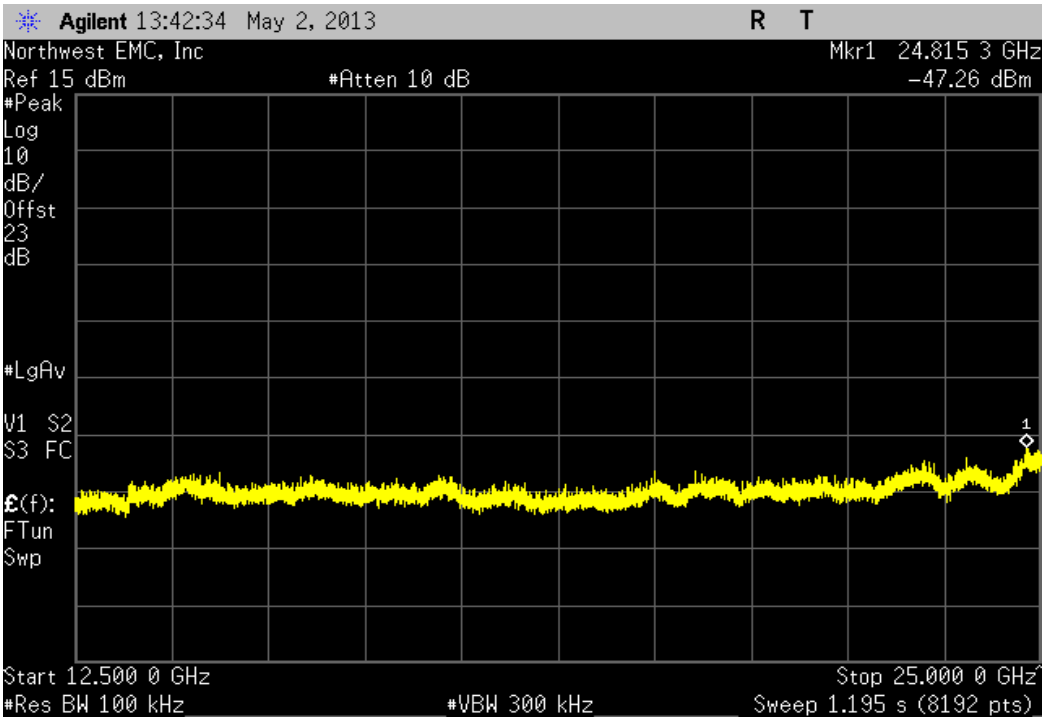
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Frequency Range | | | | Value | Limit | Result |
| | Fundamental | | | N/A | N/A | N/A |



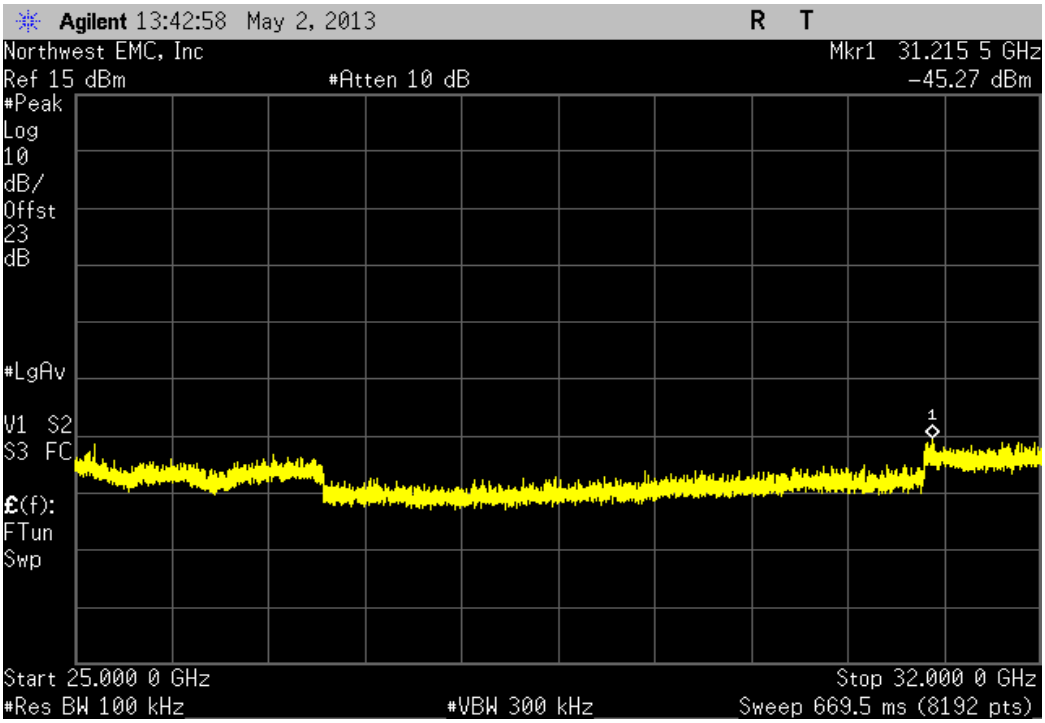

| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz | | | | | |
|---|---|---|---|---|---|
| Frequency Range | | | Value | Limit | Result |
| 30 MHz - 12.5 GHz | | | -55.21 dBc | ≤ -20 dBc | Pass |



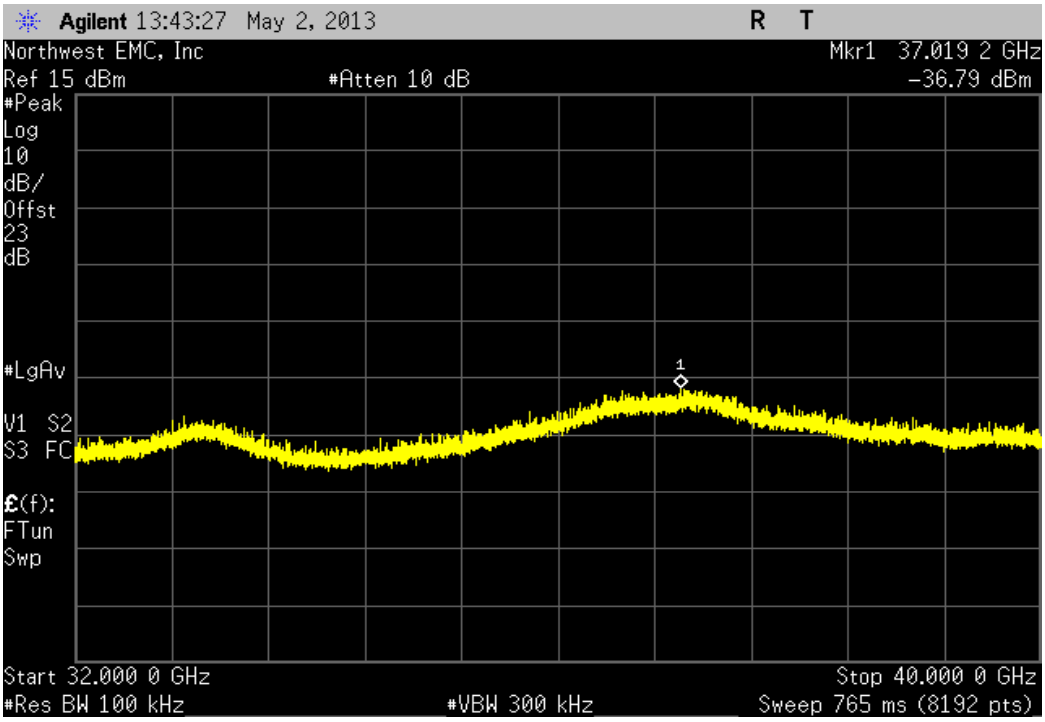
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -48.01 dBc | ≤ -20 dBc | Pass |



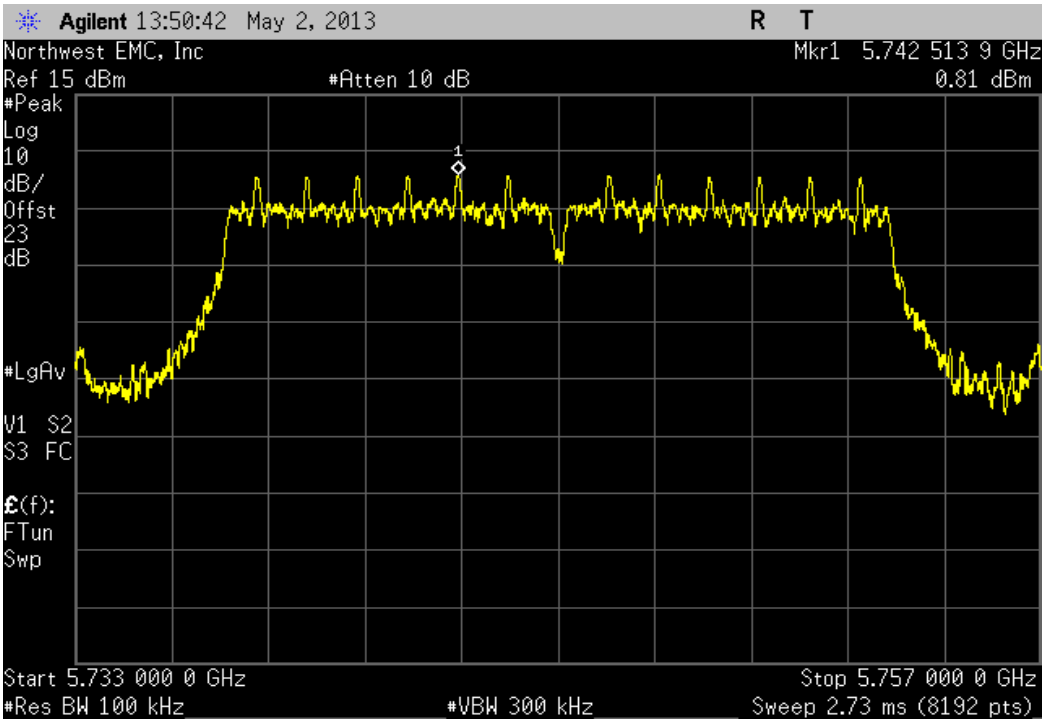

| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 25 GHz - 32 GHz | | -46.02 dBc | ≤ -20 dBc | Pass |



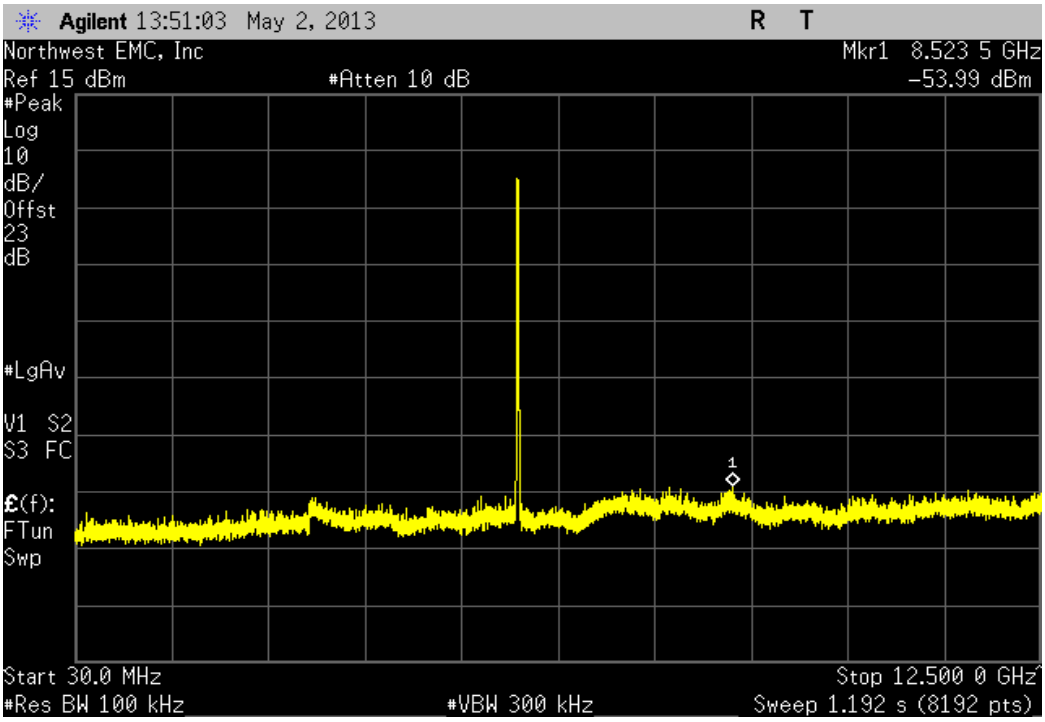
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz | | | | |
|---|---|---|---|---|
| Frequency Range | | Value | Limit | Result |
| 32 GHz - 40 GHz | | -37.54 dBc | ≤ -20 dBc | Pass |



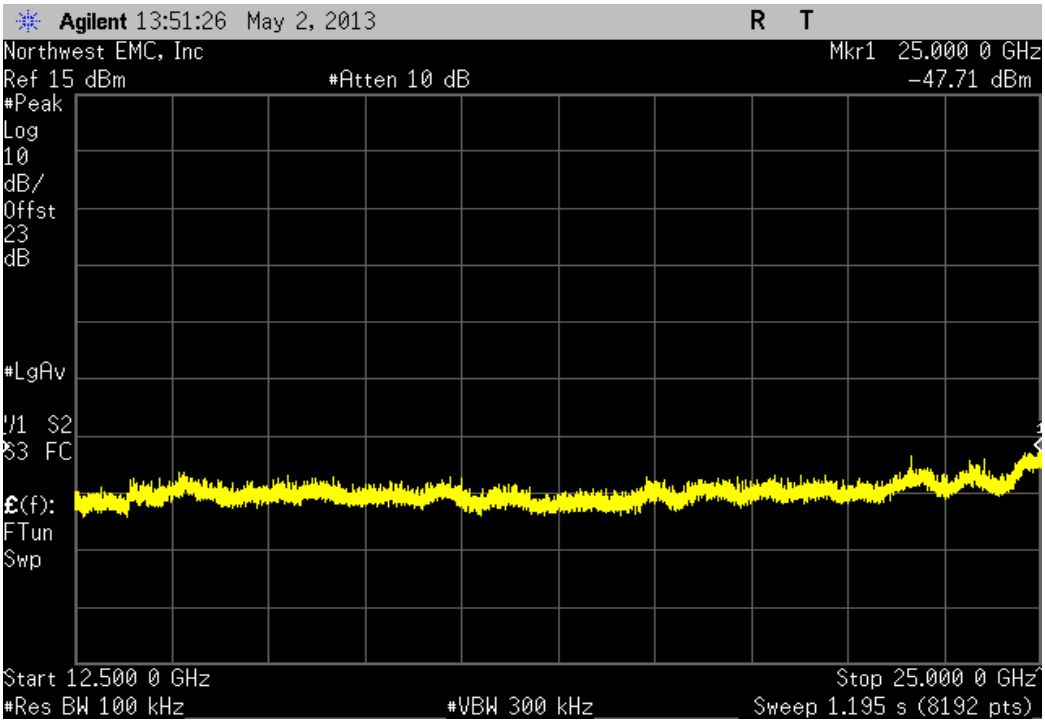

| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Frequency Range | | | Value | Limit | Result |
| | Fundamental | | | N/A | N/A | N/A |



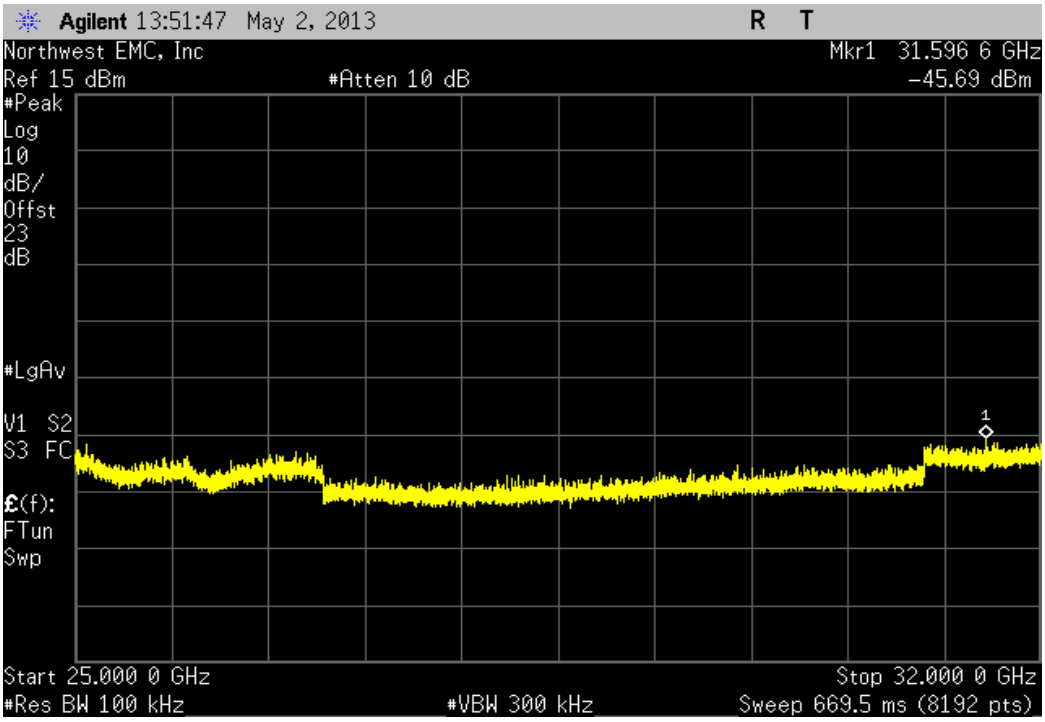
| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -54.8 dBc | ≤ -20 dBc | Pass |



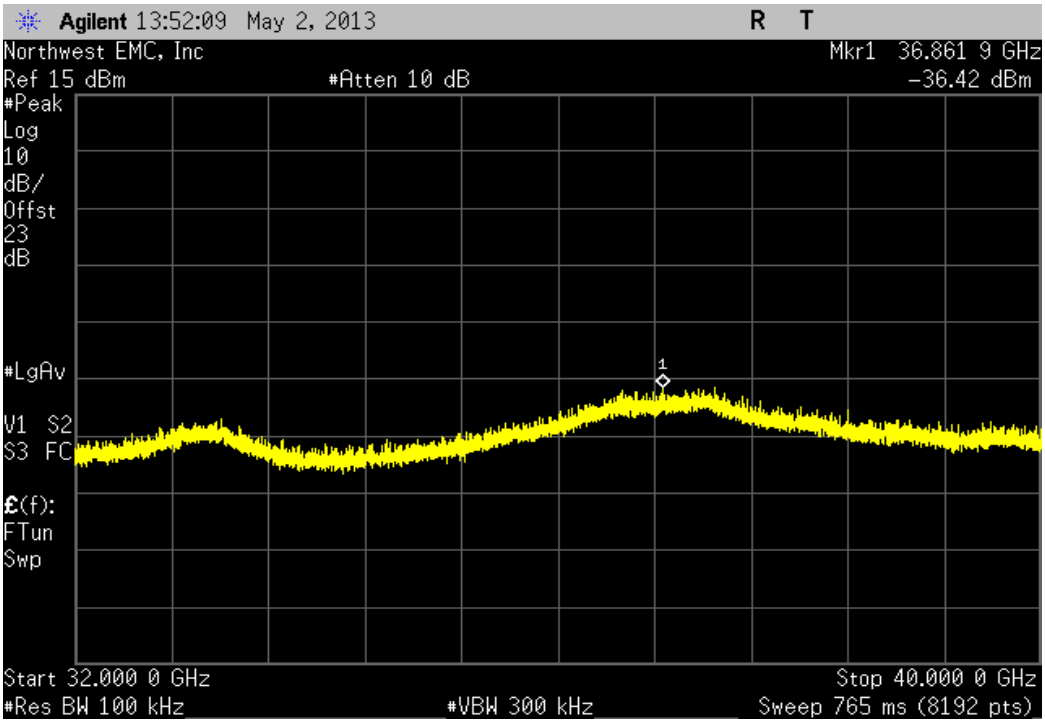

| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -48.52 dBc | ≤ -20 dBc | Pass |



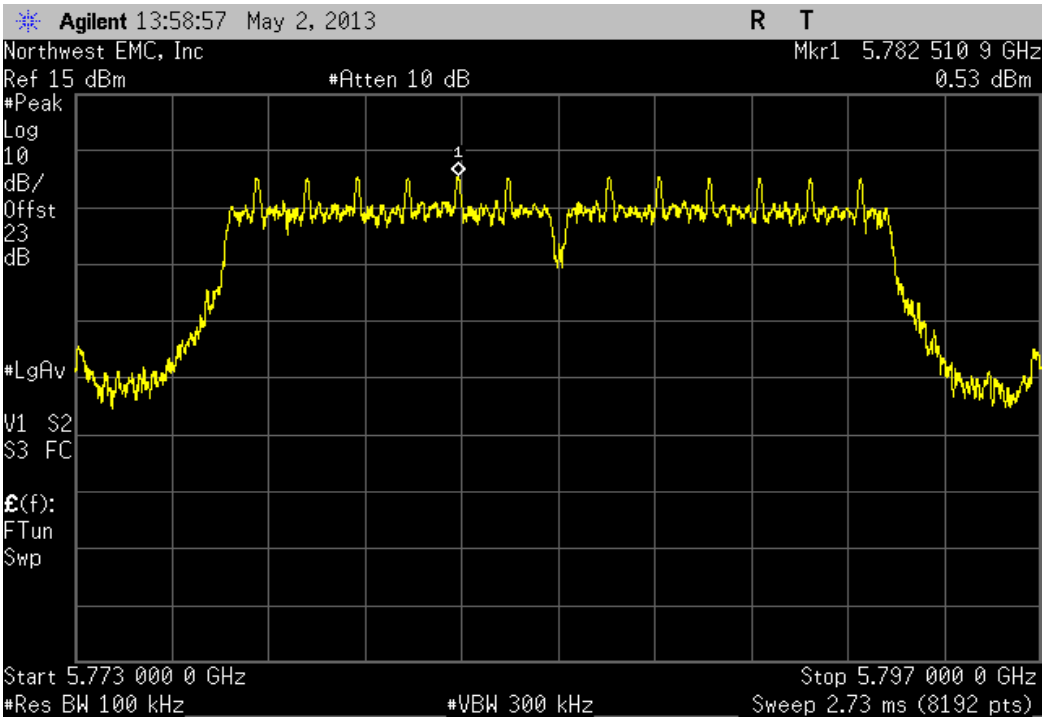
| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 25 GHz - 32 GHz | | -46.5 dBc | ≤ -20 dBc | Pass |



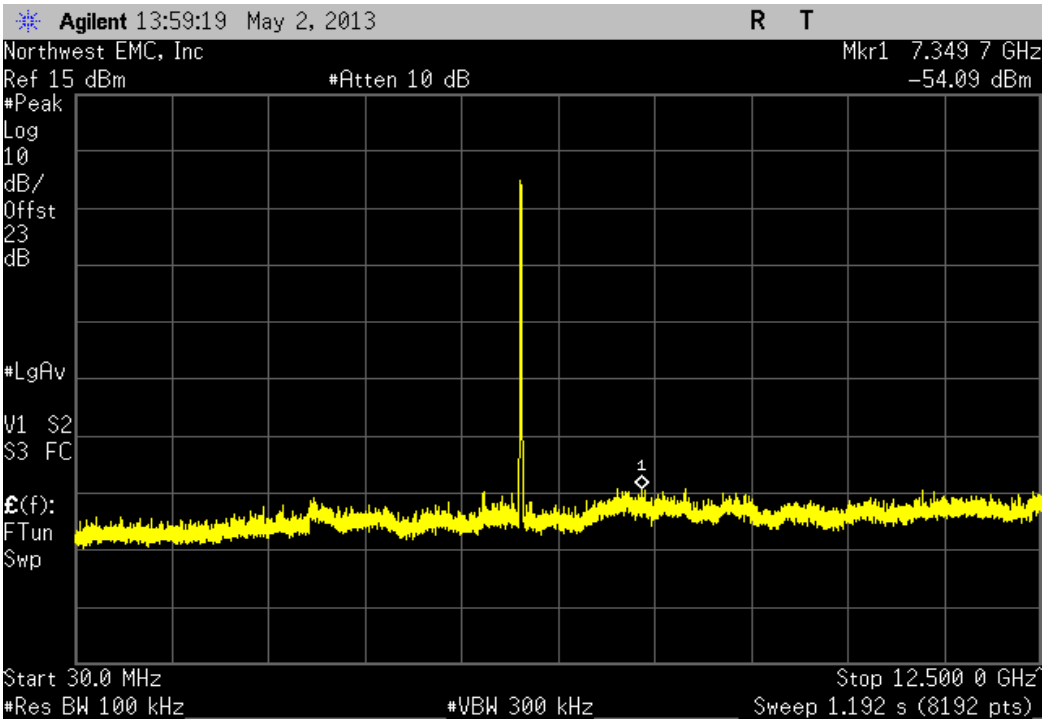

| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 32 GHz - 40 GHz | | -37.23 dBc | ≤ -20 dBc | Pass |



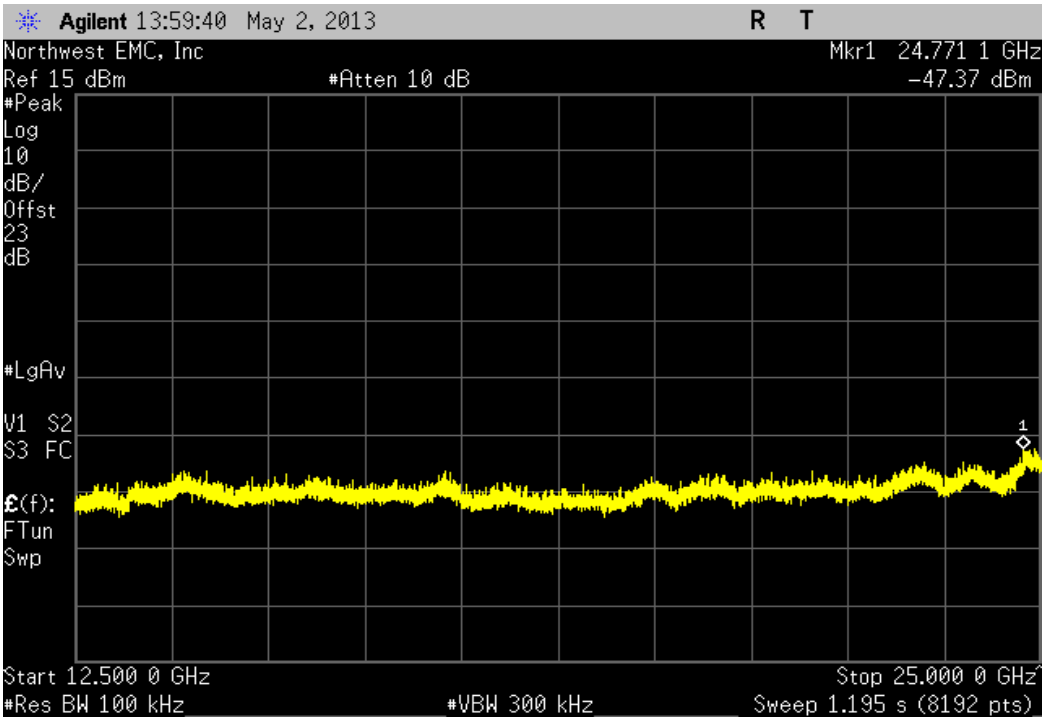
| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Frequency Range | | | Value | Limit | Result |
| | Fundamental | | | N/A | N/A | N/A |



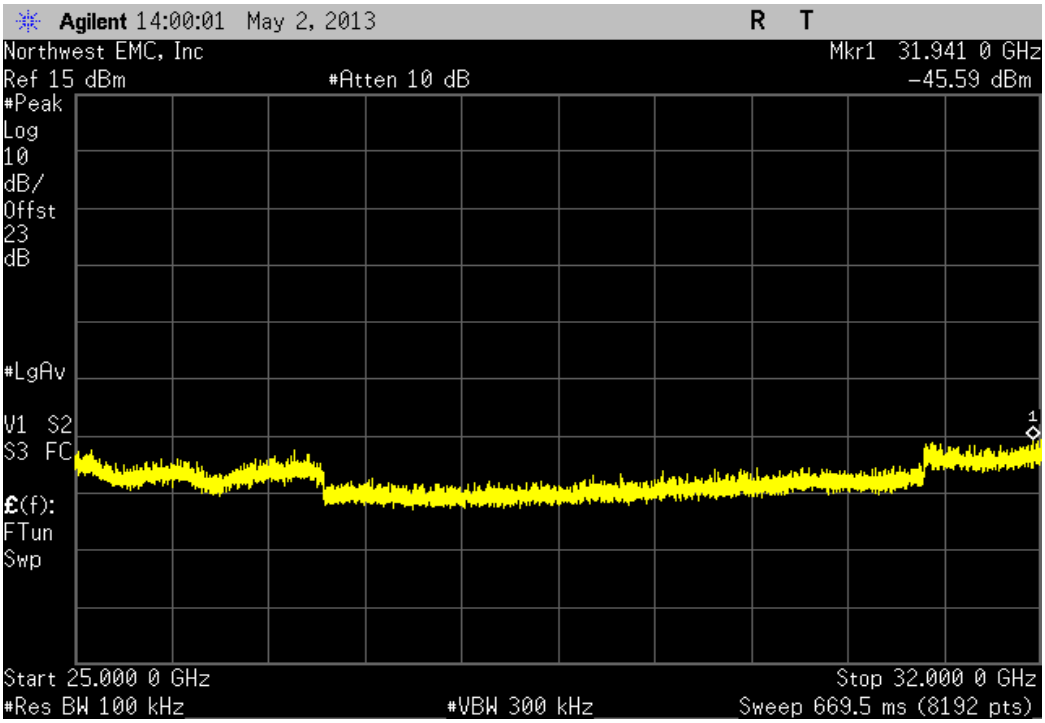

| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz | | | | |
|---|---|---|---|---|
| Frequency Range | | Value | Limit | Result |
| 30 MHz - 12.5 GHz | | -54.62 dBc | ≤ -20 dBc | Pass |



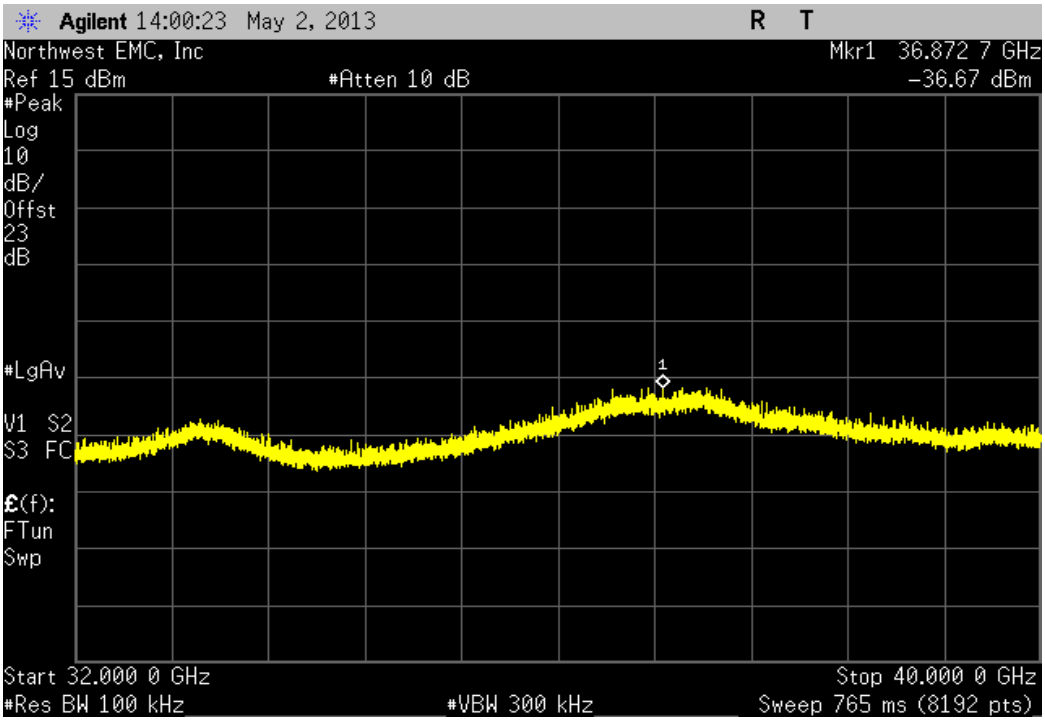
| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -47.9 dBc | ≤ -20 dBc | Pass |



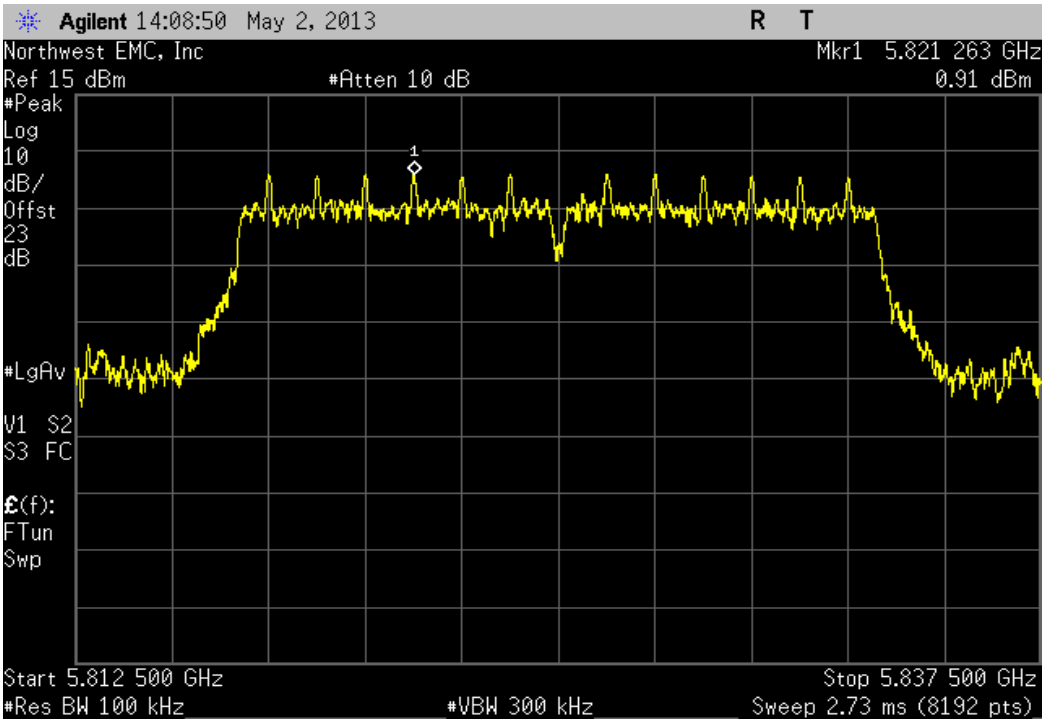

| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 25 GHz - 32 GHz | | -46.12 dBc | ≤ -20 dBc | Pass |



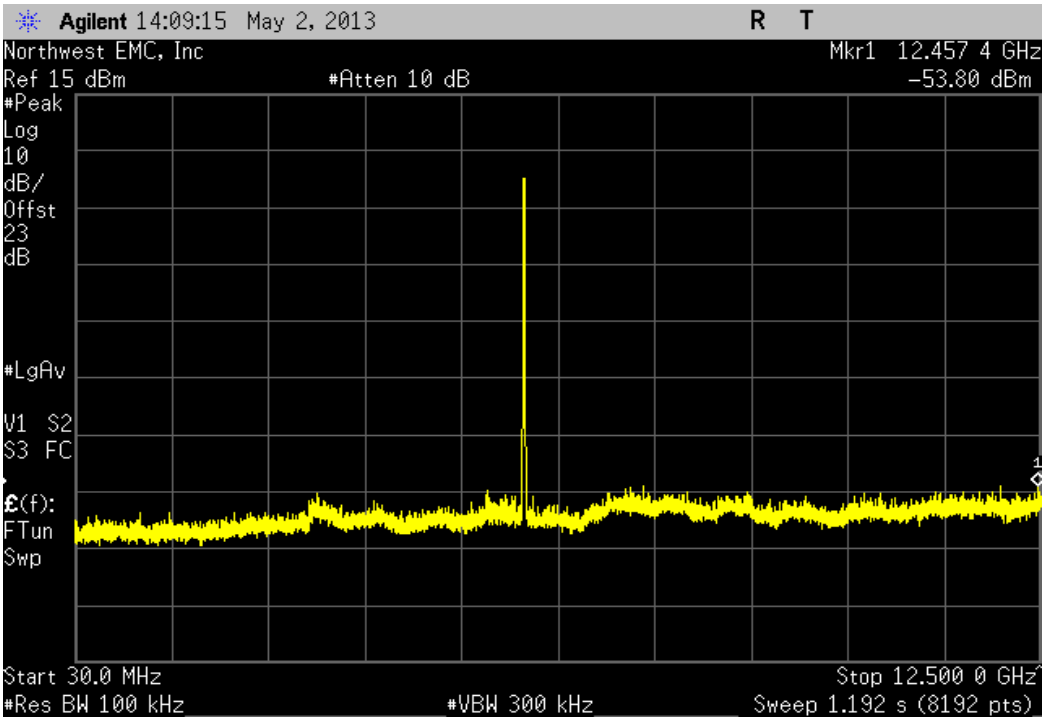
| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz | | | | |
|---|---|---|---|---|
| Frequency Range | | Value | Limit | Result |
| 32 GHz - 40 GHz | | -37.2 dBc | ≤ -20 dBc | Pass |



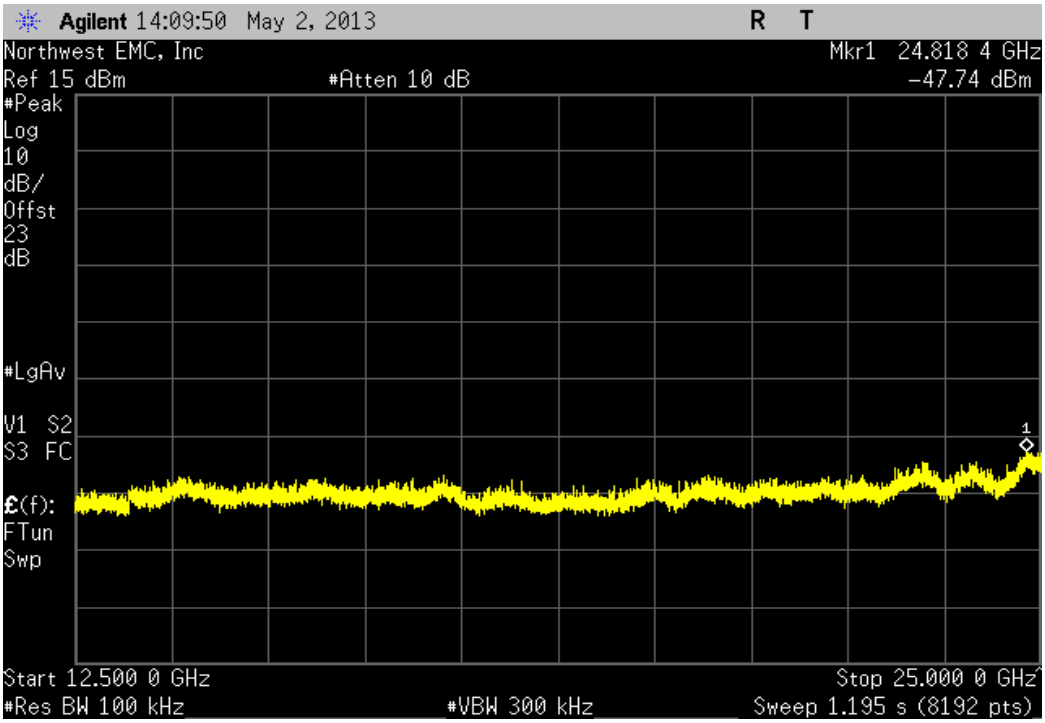

| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Frequency Range | | | Value | Limit | Result |
| | Fundamental | | | N/A | N/A | N/A |



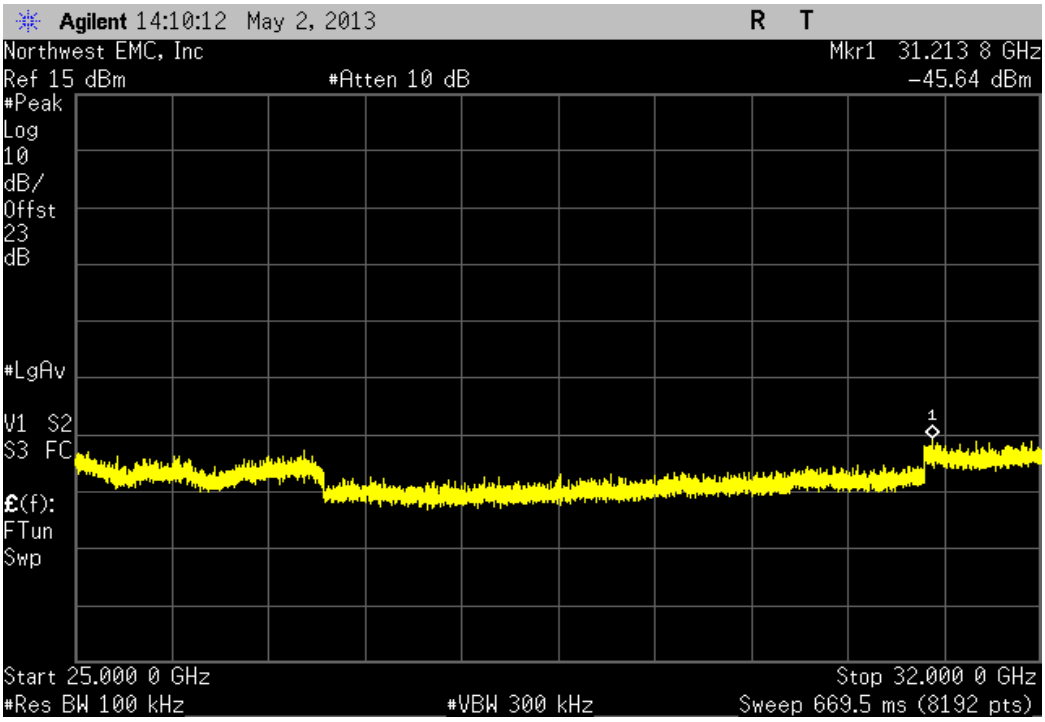
| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -54.71 dBc | ≤ -20 dBc | Pass |



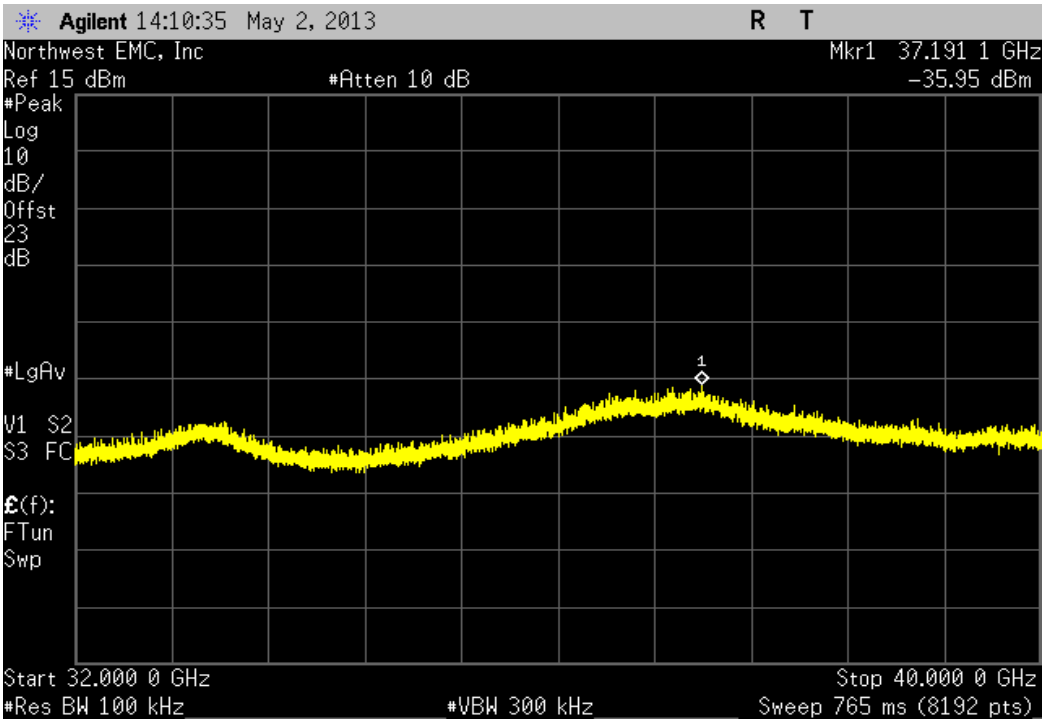

| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -48.65 dBc | ≤ -20 dBc | Pass |



| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 25 GHz - 32 GHz | | -46.55 dBc | ≤ -20 dBc | Pass |




| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 32 GHz - 40 GHz | | -36.86 dBc | ≤ -20 dBc | Pass |



# Power Spectral Density

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Attenuator, 6dB | S.M. Electronics | 18N-06 | AWN | 3/25/2013 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/9/2012 | 24 |
| EV06 Direct Connect Cable | ESM Cable Corp. | TT | ECA | NCR | 0 |
| 40GHz DC Block | Miteq | DCB4000 | AMD | 6/25/2012 | 12 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| Attenuator, 6 dB, 'SMA' | N/A | 93459 3330A-6 | AUF | 3/5/2013 | 12 |
| Spectrum Analyzer | Agilent | E4446A | AAQ | 2/7/2012 | 24 |

**TEST DESCRIPTION**

The maximum power spectral density measurements were measured with the EUT set to the required transmit frequencies in each band. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the lowest, middle, and maximum data rate for each modulation type available.

Per the procedure outlined in FCC KDB 558074 D01 DTS Measurement Section 5.3.1, the spectrum analyzer was used as follows:

- RBW = 100 kHz
- VBW = 300 kHz
- Detector = Peak (to match method used for power measurement)
- Trace = Max hold

The observed power level is then scaled to an equivalent value in 3 kHz by adding a Bandwidth Correction Factor (BWCF) where:

BWCF = 10*LOG (3 kHz / 100 kHz) = -15.2 dB

# Power Spectral Density

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | Model 444-2225 (Athena UFL) | | | **Work Order:** | FOCU0140 |
| **Serial Number:** | 02EA4D000027 | | | **Date:** | 05/03/13 |
| **Customer:** | Summit Semiconductor | | | **Temperature:** | 24°C |
| **Attendees:** | None | | | **Humidity:** | 30% |
| **Project:** | None | | | **Barometric Pres.:** | 1023 |
| **Tested by:** | Brandon Hobbs | **Power:** | 3.3V DC | **Job Site:** | EV06 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 15.247:2013 | ANSI C63.10:2009 |
| | |

**COMMENTS**

All testing was completed on the highest output power antenna port A2.

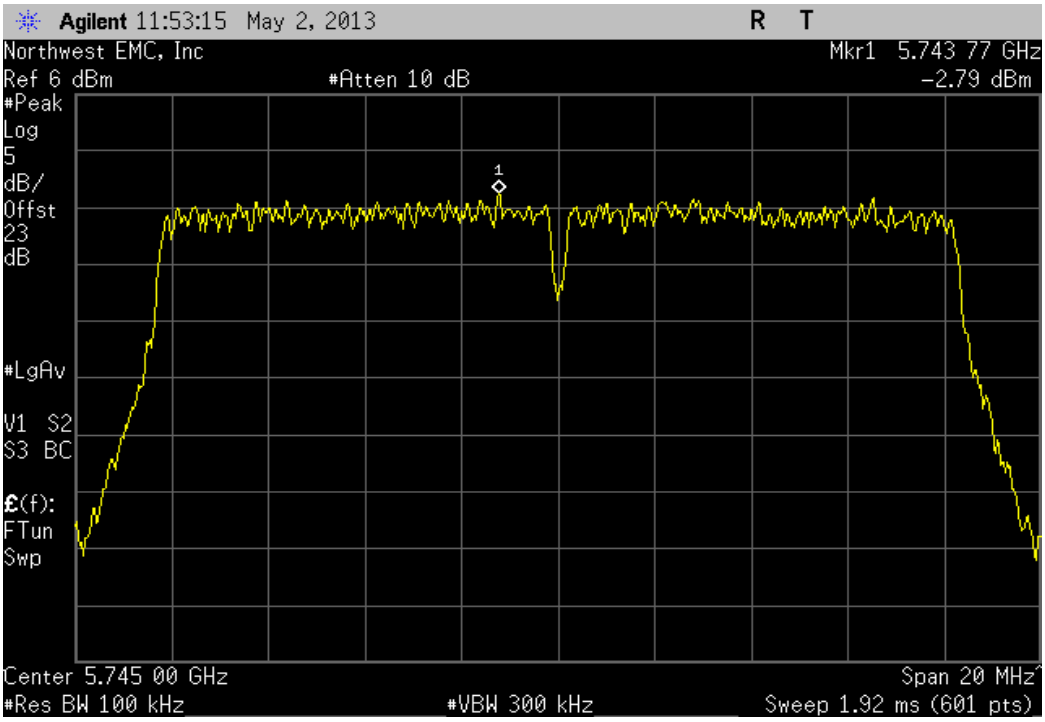
**DEVIATIONS FROM TEST STANDARD**

None

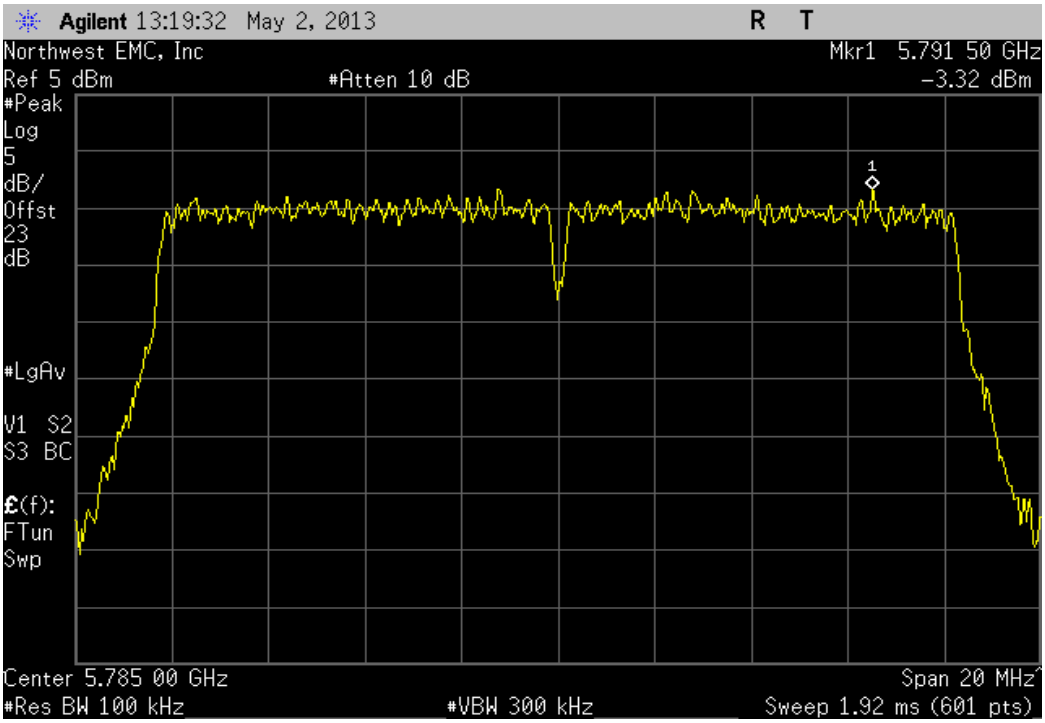
| Configuration # | 5 | Signature |
|---|---|---|

| | Value dBm/100kHz | dBm/100kHz To dBm/3kHz | Value dBm/3kHz | Limit dBm/3kHz | Result |
|---|---|---|---|---|---|
| 5725 MHz - 5850 MHz Band | | | | | |
| 802.11(a) 6 Mbps | | | | | |
| Low Channel 149, 5745 MHz | -2.792 | -15.2 | -17.992 | 8 | Pass |
| Mid Channel 157, 5785 MHz | -3.323 | -15.2 | -18.523 | 8 | Pass |
| High Channel 165, 5825 MHz | -2.468 | -15.2 | -17.668 | 8 | Pass |
| 802.11(a) 18 Mbps | | | | | |
| Low Channel 149, 5745 MHz | 0.767 | -15.2 | -14.433 | 8 | Pass |
| Mid Channel 157, 5785 MHz | 0.439 | -15.2 | -14.761 | 8 | Pass |
| High Channel 165, 5825 MHz | 0.639 | -15.2 | -14.561 | 8 | Pass |

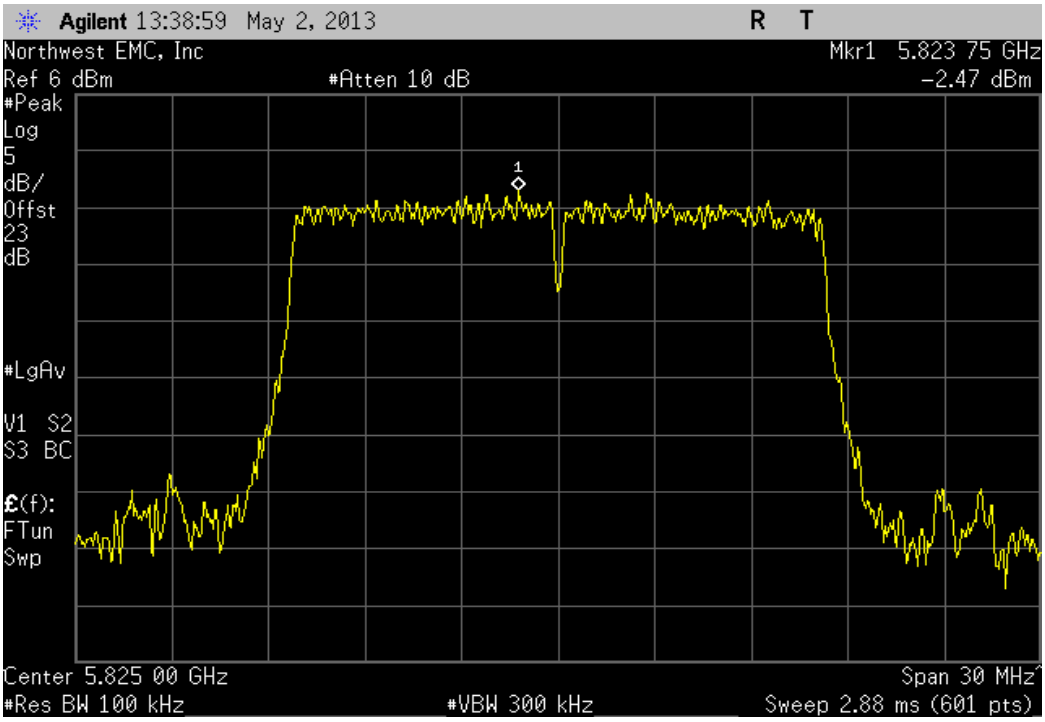
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Low Channel 149, 5745 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | Value dBm/100kHz | dBm/100kHz To dBm/3kHz | Value dBm/3kHz | Limit dBm/3kHz | Result |
| | | -2.792 | -15.2 | -17.992 | 8 | Pass |



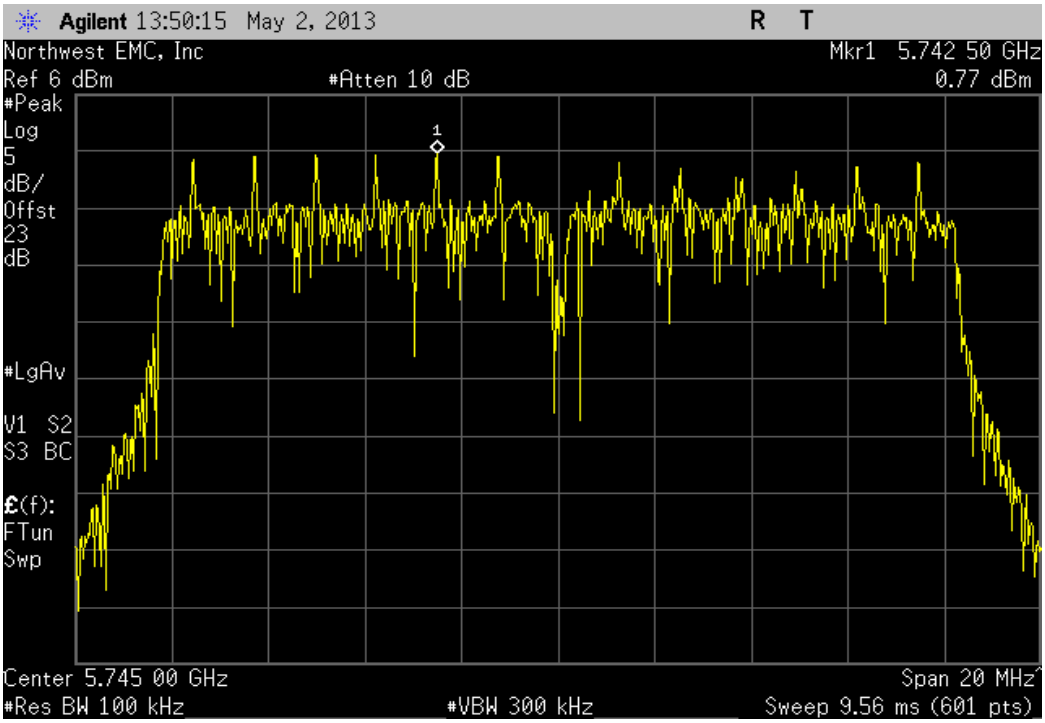

| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, Mid Channel 157, 5785 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | Value dBm/100kHz | dBm/100kHz To dBm/3kHz | Value dBm/3kHz | Limit dBm/3kHz | Result |
| | | -3.323 | -15.2 | -18.523 | 8 | Pass |



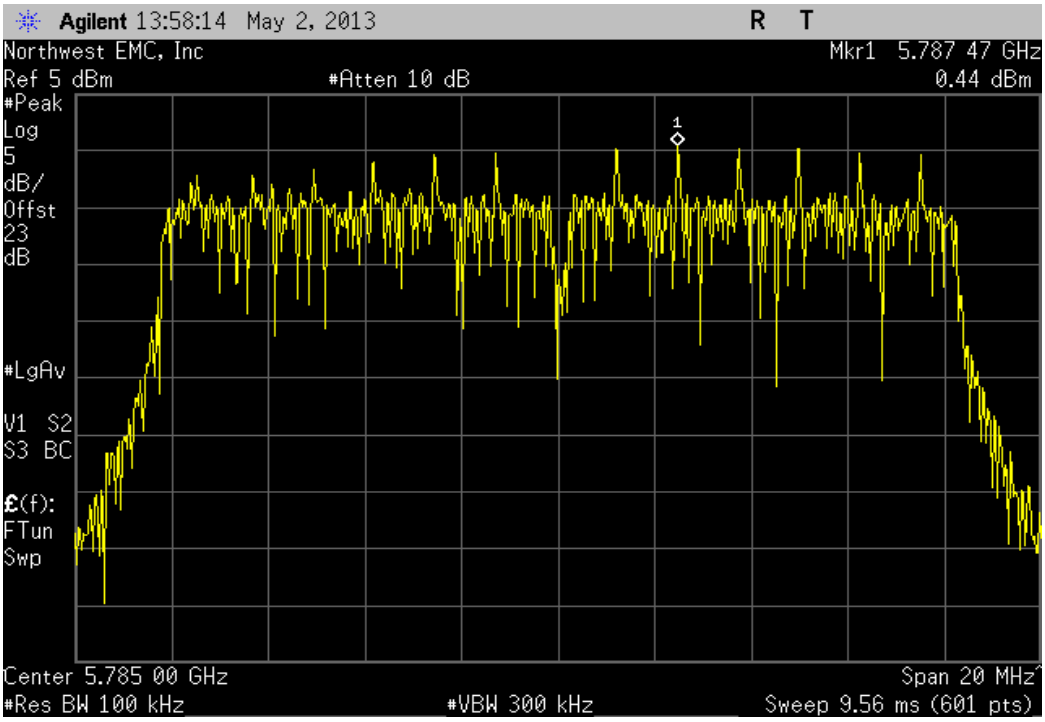
| 5725 MHz - 5850 MHz Band, 802.11(a) 6 Mbps, High Channel 165, 5825 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | Value dBm/100kHz | dBm/100kHz To dBm/3kHz | Value dBm/3kHz | Limit dBm/3kHz | Result |
| | | -2.468 | -15.2 | -17.668 | 8 | Pass |



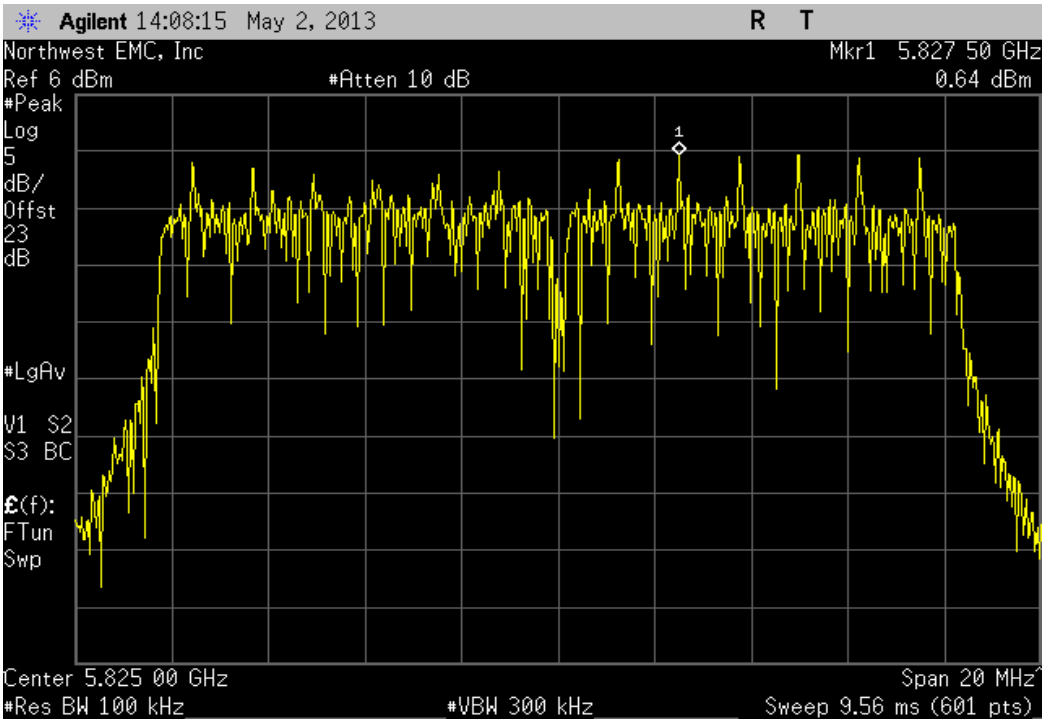

| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Low Channel 149, 5745 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | Value dBm/100kHz | dBm/100kHz To dBm/3kHz | Value dBm/3kHz | Limit dBm/3kHz | Result |
| | | 0.767 | -15.2 | -14.433 | 8 | Pass |



| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, Mid Channel 157, 5785 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | Value dBm/100kHz | dBm/100kHz To dBm/3kHz | Value dBm/3kHz | Limit dBm/3kHz | Result |
| | | 0.439 | -15.2 | -14.761 | 8 | Pass |




| 5725 MHz - 5850 MHz Band, 802.11(a) 18 Mbps, High Channel 165, 5825 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | Value dBm/100kHz | dBm/100kHz To dBm/3kHz | Value dBm/3kHz | Limit dBm/3kHz | Result |
| | | 0.639 | -15.2 | -14.561 | 8 | Pass |



# Spurious Radiated Emissions

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

**MODES OF OPERATION**

Transmitting 802.11a, 50% Duty Cycle

**POWER SETTINGS INVESTIGATED**

3.3V DC

**CONFIGURATIONS INVESTIGATED**

FOCU0141 - 1

**FREQUENCY RANGE INVESTIGATED**

| | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 40000 MHz |

**SAMPLE CALCULATIONS**

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| High Pass Filter | Micro-Tronics | HPM50112 | HGA | 10/4/2012 | 24 mo |
| 5.725-5.875 Notch Filter | Micro-Tronics | BRC50705 | HGJ | 3/21/2012 | 24 mo |
| 5.47-5.725 Notch Filter | Micro-Tronics | BRC50704 | HGI | 10/4/2012 | 24 mo |
| 5.25 GHz Notch Filter | K&L Microwave | 8N50-5250/X200-0/0 | HFK | 3/21/2012 | 24 mo |
| Cable | ESM Cable Corp. | KMKM-72 | EVY | 9/11/2012 | 12 mo |
| Pre-Amplifier | Miteq | AMF-6F-18002650-25-10P | AVU | 9/11/2012 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3160-09 | AIV | NCR | 0 mo |
| Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AVD | 2/27/2013 | 12 mo |
| Antenna, Horn | ETS | 3160-08 | AHV | NCR | 0 mo |
| EV01 Cables | N/A | Standard Gain Horns Cables | EVF | 2/27/2013 | 12 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AVC | 2/27/2013 | 12 mo |
| Antenna, Horn | ETS | 3160-07 | AHU | NCR | 0 mo |
| EV01 Cables | N/A | Double Ridge Horn Cables | EVB | 6/27/2012 | 12 mo |
| Pre-Amplifier | Miteq | AMF-4D-010100-24-10P | APW | 6/27/2012 | 12 mo |
| Antenna, Horn | ETS | 3115 | AIZ | 1/24/2011 | 36 mo |
| EV01 Cables | N/A | Bilog Cables | EVA | 6/26/2012 | 12 mo |
| Pre-Amplifier | Miteq | AM-1616-1000 | AOL | 6/26/2012 | 12 mo |
| Antenna, Biconilog | EMCO | 3141 | AXG | 4/10/2012 | 36 mo |
| Spectrum Analyzer | Agilent | E4440A | AFD | 7/5/2012 | 24 mo |

**MEASUREMENT BANDWIDTHS**

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

**TEST DESCRIPTION**

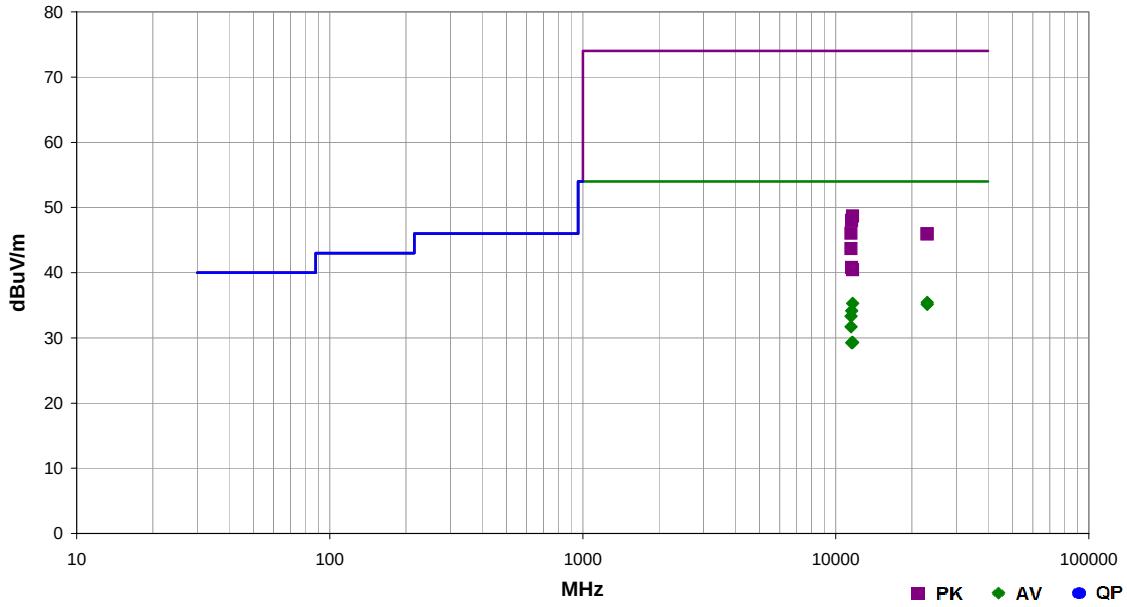
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

# Spurious Radiated Emissions

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | FOCU0141 | **Date:** | 05/06/13 | | |
| **Project:** | None | **Temperature:** | 24 °C | | |
| **Job Site:** | EV01 | **Humidity:** | 32.3% RH | | |
| **Serial Number:** | 202EA4C0001C4 | **Barometric Pres.:** | 1011.2 mbar | **Tested by:** | Cole Ghizzone, Brandon Hobbs |
| **EUT:** | Model 444-2224 (Athena 4X) | | | | |
| **Configuration:** | 1 | | | | |
| **Customer:** | Summit Semiconductor | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 3.3V DC | | | | |
| **Operating Mode:** | Transmitting 802.11a, 50% Duty Cycle | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | See comments below for frequency, data rate, and EUT orientation. | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 15.247:2013 | ANSI C63.10:2009 |

| **Run #** | 83 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22978.330 | 38.1 | -2.7 | 1.0 | 356.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 35.4 | 54.0 | -18.6 | 5745 MHz, 6 Mbps, EUT On Side |
| 11647.870 | 41.9 | -6.6 | 1.0 | 357.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 35.3 | 54.0 | -18.7 | 5825 MHz, 6 Mbps, EUT On Side |
| 22978.570 | 37.8 | -2.7 | 1.0 | 222.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 35.1 | 54.0 | -18.9 | 5745 MHz, 6 Mbps, EUT Horizontal |
| 11569.200 | 41.3 | -7.1 | 1.0 | 339.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 34.2 | 54.0 | -19.8 | 5785 MHz, 6 Mbps, EUT On Side |
| 11491.130 | 40.9 | -7.6 | 1.1 | 142.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 33.3 | 54.0 | -20.7 | 5745 MHz, 6 Mbps, EUT On Side |
| 11490.930 | 39.3 | -7.6 | 1.2 | 119.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 31.7 | 54.0 | -22.3 | 5745 MHz, 6 Mbps, EUT Horizontal |
| 11654.270 | 35.9 | -6.6 | 1.0 | 213.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 29.3 | 54.0 | -24.7 | 5825 MHz, 6 Mbps, EUT Horizontal |
| 11567.730 | 36.4 | -7.1 | 1.0 | 349.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 29.3 | 54.0 | -24.7 | 5785 MHz, 6 Mbps, EUT Horizontal |
| 11653.600 | 55.3 | -6.6 | 1.0 | 357.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.7 | 74.0 | -25.3 | 5825 MHz, 6 Mbps, EUT On Side |
| 11574.070 | 55.1 | -7.1 | 1.0 | 339.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.0 | 74.0 | -26.0 | 5785 MHz, 6 Mbps, EUT On Side |
| 11495.200 | 53.6 | -7.6 | 1.1 | 142.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 46.0 | 74.0 | -28.0 | 5745 MHz, 6 Mbps, EUTOn Side |
| 22980.600 | 48.6 | -2.7 | 1.0 | 356.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 45.9 | 74.0 | -28.1 | 5745 MHz, 6 Mbps, EUT On Side |
| 22979.550 | 48.6 | -2.7 | 1.0 | 222.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 45.9 | 74.0 | -28.1 | 5745 MHz, 6 Mbps, EUT Horizontal |
| 11490.400 | 51.3 | -7.6 | 1.2 | 119.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 43.7 | 74.0 | -30.3 | 5745 MHz, 6 Mbps, EUT Horizontal |
| 11568.470 | 47.9 | -7.1 | 1.0 | 349.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 40.8 | 74.0 | -33.2 | 5785 MHz, 6 Mbps, EUT Horizontal |
| 11659.670 | 47.0 | -6.6 | 1.0 | 213.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 40.4 | 74.0 | -33.6 | 5825 MHz, 6 Mbps, EUT Horizontal |

# AC Powerline Conducted Emissions

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**MODES OF OPERATION**

Transmitting 802.11a, 50% Duty Cycle, Ch. 34, 5825 MHz
Transmitting 802.11a, 50% Duty Cycle, Ch. 32, 5785 MHz
Transmitting 802.11a, 50% Duty Cycle, Ch. 30, 5745 MHz

**POWER SETTINGS INVESTIGATED**

3.3 VDC Nominal

**CONFIGURATIONS INVESTIGATED**

FOCU0140 - 7

**SAMPLE CALCULATIONS**

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| DC Power Supply | Topward | TPS-2000 | TPD | NCR | 0 mo |
| LISN | Solar | 9252-50-R-24-BNC | LIN | 3/11/2013 | 12 mo |
| Receiver | Rohde & Schwarz | ESCI | ARH | 1/24/2013 | 12 mo |
| High Pass Filter | TTE | H97-100K-50-720B | HHD | 2/1/2012 | 24 mo |
| Attenuator | Coaxicom | 66702 2910-20 | RBR | 4/25/2013 | 12 mo |
| EV07 Cables | N/A | Conducted Cables | EVG | 4/25/2013 | 12 mo |

**MEASUREMENT BANDWIDTHS**

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

Measurements were made using the bandwidths and detectors specified. No video filter was used.

**TEST DESCRIPTION**

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10-2009.

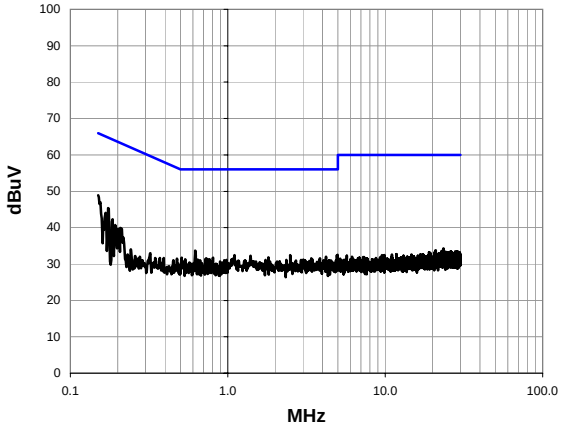
# AC Powerline Conducted Emissions

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | FOCU0140 | **Date:** | 05/16/13 | | |
| **Project:** | None | **Temperature:** | 23.7 °C | | |
| **Job Site:** | EV07 | **Humidity:** | 40.3% RH | | |
| **Serial Number:** | 02EA4D000003 | **Barometric Pres.:** | 1014 mbar | **Tested by:** | Brandon Hobbs |
| **EUT:** | Model 444-2225 (Athena UFL) | | | | |
| **Configuration:** | 7 | | | | |
| **Customer:** | Summit Semiconductor | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 3.3 VDC Nominal | | | | |
| **Operating Mode:** | Transmitting 802.11a, 50% Duty Cycle, Ch. 30, 5745 MHz | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | Power supply was plugged into 110VAC/60Hz | | | | |

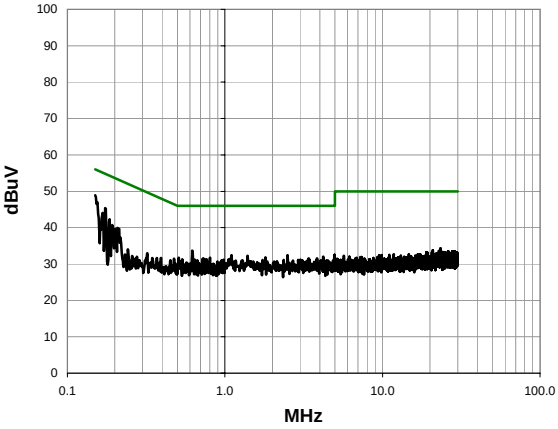
| **Test Specifications** | **Test Method** |
|---|---|
| FCC 15.207:2013 | ANSI C63.10:2009 |

| **Run #** | 23 | **Line:** | Neutral | **Ext. Attenuation:** | 20 | **Results** | Pass |
|---|---|---|---|---|---|---|---|

**Peak Data - vs - Quasi Peak Limit**




**Peak Data - vs - Average Limit**




Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.150 | 28.5 | 20.4 | 48.9 | 66.0 | -17.1 |
| 0.174 | 25.1 | 20.3 | 45.4 | 64.8 | -19.4 |
| 0.167 | 23.7 | 20.3 | 44.0 | 65.1 | -21.1 |
| 0.186 | 22.0 | 20.3 | 42.3 | 64.2 | -21.9 |
| 0.621 | 13.4 | 20.3 | 33.7 | 56.0 | -22.3 |
| 0.193 | 20.4 | 20.3 | 40.7 | 63.9 | -23.2 |
| 0.208 | 19.6 | 20.3 | 39.9 | 63.3 | -23.4 |
| 4.968 | 11.9 | 20.7 | 32.6 | 56.0 | -23.4 |
| 2.496 | 12.0 | 20.5 | 32.5 | 56.0 | -23.5 |
| 1.104 | 12.1 | 20.3 | 32.4 | 56.0 | -23.6 |
| 1.392 | 11.9 | 20.4 | 32.3 | 56.0 | -23.7 |
| 0.201 | 19.3 | 20.3 | 39.6 | 63.6 | -23.9 |
| 4.208 | 11.4 | 20.7 | 32.1 | 56.0 | -23.9 |
| 1.808 | 11.4 | 20.4 | 31.8 | 56.0 | -24.2 |
| 0.509 | 11.5 | 20.3 | 31.8 | 56.0 | -24.2 |
| 0.804 | 11.4 | 20.3 | 31.7 | 56.0 | -24.3 |
| 0.730 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 3.400 | 11.0 | 20.6 | 31.6 | 56.0 | -24.4 |
| 3.848 | 10.9 | 20.6 | 31.5 | 56.0 | -24.5 |
| 0.721 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.150 | 28.5 | 20.4 | 48.9 | 56.0 | -7.1 |
| 0.174 | 25.1 | 20.3 | 45.4 | 54.8 | -9.4 |
| 0.167 | 23.7 | 20.3 | 44.0 | 55.1 | -11.1 |
| 0.186 | 22.0 | 20.3 | 42.3 | 54.2 | -11.9 |
| 0.621 | 13.4 | 20.3 | 33.7 | 46.0 | -12.3 |
| 0.193 | 20.4 | 20.3 | 40.7 | 53.9 | -13.2 |
| 0.208 | 19.6 | 20.3 | 39.9 | 53.3 | -13.4 |
| 4.968 | 11.9 | 20.7 | 32.6 | 46.0 | -13.4 |
| 2.496 | 12.0 | 20.5 | 32.5 | 46.0 | -13.5 |
| 1.104 | 12.1 | 20.3 | 32.4 | 46.0 | -13.6 |
| 1.392 | 11.9 | 20.4 | 32.3 | 46.0 | -13.7 |
| 0.201 | 19.3 | 20.3 | 39.6 | 53.6 | -13.9 |
| 4.208 | 11.4 | 20.7 | 32.1 | 46.0 | -13.9 |
| 1.808 | 11.4 | 20.4 | 31.8 | 46.0 | -14.2 |
| 0.509 | 11.5 | 20.3 | 31.8 | 46.0 | -14.2 |
| 0.804 | 11.4 | 20.3 | 31.7 | 46.0 | -14.3 |
| 0.730 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 3.400 | 11.0 | 20.6 | 31.6 | 46.0 | -14.4 |
| 3.848 | 10.9 | 20.6 | 31.5 | 46.0 | -14.5 |
| 0.721 | 11.1 | 20.3 | 31.4 | 46.0 | -14.6 |

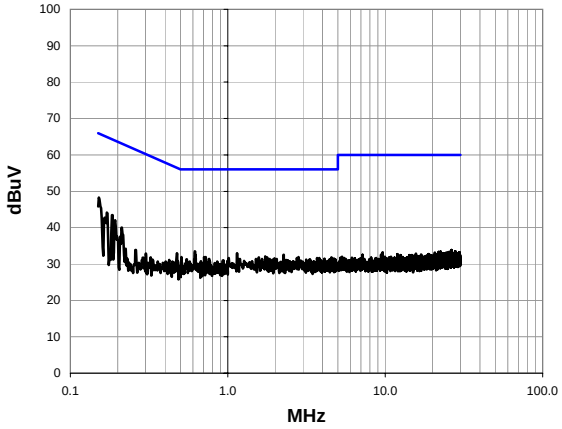
# AC Powerline Conducted Emissions

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | FOCU0140 | **Date:** | 05/16/13 | | |
| **Project:** | None | **Temperature:** | 23.7 °C | | |
| **Job Site:** | EV07 | **Humidity:** | 40.3% RH | | |
| **Serial Number:** | 02EA4D000003 | **Barometric Pres.:** | 1014 mbar | **Tested by:** | Brandon Hobbs |
| **EUT:** | Model 444-2225 (Athena UFL) | | | | |
| **Configuration:** | 7 | | | | |
| **Customer:** | Summit Semiconductor | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 3.3 VDC Nominal | | | | |
| **Operating Mode:** | Transmitting 802.11a, 50% Duty Cycle, Ch. 30, 5745 MHz | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | Power supply was plugged into 110VAC/60Hz | | | | |

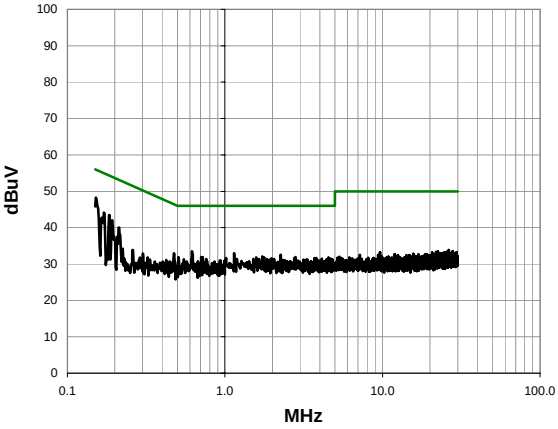
| **Test Specifications** | **Test Method** |
|---|---|
| FCC 15.207:2013 | ANSI C63.10:2009 |

| **Run #** | 24 | **Line:** | High Line | **Ext. Attenuation:** | 20 | **Results** | Pass |
|---|---|---|---|---|---|---|---|

**Peak Data - vs - Quasi Peak Limit**




**Peak Data - vs - Average Limit**




Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.152 | 27.9 | 20.4 | 48.3 | 65.9 | -17.6 |
| 0.186 | 23.1 | 20.3 | 43.4 | 64.2 | -20.8 |
| 0.170 | 23.8 | 20.3 | 44.1 | 64.9 | -20.8 |
| 0.193 | 21.7 | 20.3 | 42.0 | 63.9 | -21.9 |
| 0.618 | 13.2 | 20.3 | 33.5 | 56.0 | -22.5 |
| 1.144 | 12.6 | 20.4 | 33.0 | 56.0 | -23.0 |
| 0.211 | 19.7 | 20.3 | 40.0 | 63.2 | -23.1 |
| 2.264 | 12.1 | 20.5 | 32.6 | 56.0 | -23.4 |
| 0.475 | 12.7 | 20.3 | 33.0 | 56.4 | -23.5 |
| 1.728 | 11.7 | 20.4 | 32.1 | 56.0 | -23.9 |
| 0.507 | 11.7 | 20.3 | 32.0 | 56.0 | -24.0 |
| 0.725 | 11.6 | 20.3 | 31.9 | 56.0 | -24.1 |
| 0.708 | 11.6 | 20.3 | 31.9 | 56.0 | -24.1 |
| 2.808 | 11.4 | 20.5 | 31.9 | 56.0 | -24.1 |
| 4.552 | 11.2 | 20.7 | 31.9 | 56.0 | -24.1 |
| 1.576 | 11.4 | 20.4 | 31.8 | 56.0 | -24.2 |
| 2.752 | 11.2 | 20.5 | 31.7 | 56.0 | -24.3 |
| 1.016 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 3.808 | 11.0 | 20.6 | 31.6 | 56.0 | -24.4 |
| 3.696 | 11.0 | 20.6 | 31.6 | 56.0 | -24.4 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.152 | 27.9 | 20.4 | 48.3 | 55.9 | -7.6 |
| 0.186 | 23.1 | 20.3 | 43.4 | 54.2 | -10.8 |
| 0.170 | 23.8 | 20.3 | 44.1 | 54.9 | -10.8 |
| 0.193 | 21.7 | 20.3 | 42.0 | 53.9 | -11.9 |
| 0.618 | 13.2 | 20.3 | 33.5 | 46.0 | -12.5 |
| 1.144 | 12.6 | 20.4 | 33.0 | 46.0 | -13.0 |
| 0.211 | 19.7 | 20.3 | 40.0 | 53.2 | -13.1 |
| 2.264 | 12.1 | 20.5 | 32.6 | 46.0 | -13.4 |
| 0.475 | 12.7 | 20.3 | 33.0 | 46.4 | -13.5 |
| 1.728 | 11.7 | 20.4 | 32.1 | 46.0 | -13.9 |
| 0.507 | 11.7 | 20.3 | 32.0 | 46.0 | -14.0 |
| 0.725 | 11.6 | 20.3 | 31.9 | 46.0 | -14.1 |
| 0.708 | 11.6 | 20.3 | 31.9 | 46.0 | -14.1 |
| 2.808 | 11.4 | 20.5 | 31.9 | 46.0 | -14.1 |
| 4.552 | 11.2 | 20.7 | 31.9 | 46.0 | -14.1 |
| 1.576 | 11.4 | 20.4 | 31.8 | 46.0 | -14.2 |
| 2.752 | 11.2 | 20.5 | 31.7 | 46.0 | -14.3 |
| 1.016 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 3.808 | 11.0 | 20.6 | 31.6 | 46.0 | -14.4 |
| 3.696 | 11.0 | 20.6 | 31.6 | 46.0 | -14.4 |

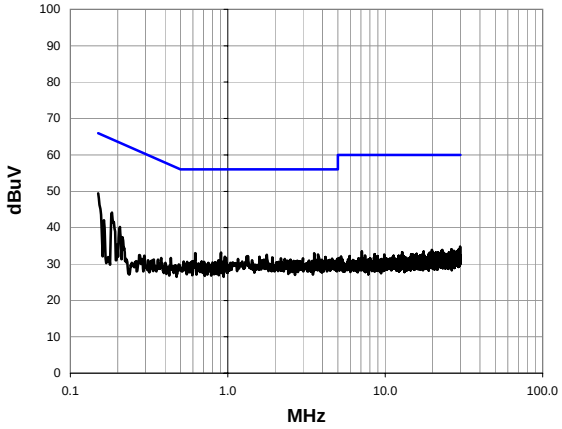
# AC Powerline Conducted Emissions

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | FOCU0140 | **Date:** | 05/16/13 | | |
| **Project:** | None | **Temperature:** | 23.7 °C | | |
| **Job Site:** | EV07 | **Humidity:** | 40.3% RH | | |
| **Serial Number:** | 02EA4D000003 | **Barometric Pres.:** | 1014 mbar | **Tested by:** | Brandon Hobbs |
| **EUT:** | Model 444-2225 (Athena UFL) | | | | |
| **Configuration:** | 7 | | | | |
| **Customer:** | Summit Semiconductor | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 3.3 VDC Nominal | | | | |
| **Operating Mode:** | Transmitting 802.11a, 50% Duty Cycle, Ch. 32, 5785 MHz | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | Power supply was plugged into 110VAC/60Hz | | | | |

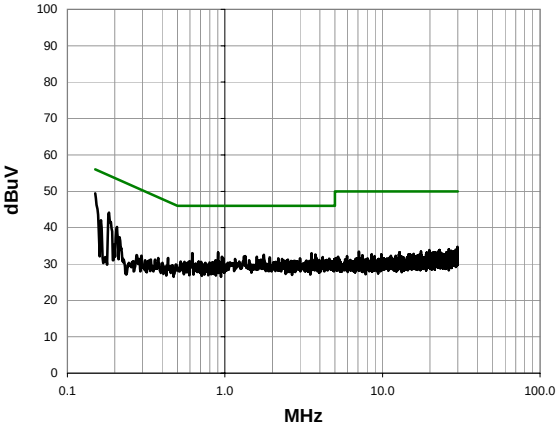
| **Test Specifications** | **Test Method** |
|---|---|
| FCC 15.207:2013 | ANSI C63.10:2009 |

| **Run #** | 25 | **Line:** | High Line | **Ext. Attenuation:** | 20 | **Results** | Pass |
|---|---|---|---|---|---|---|---|

**Peak Data - vs - Quasi Peak Limit**




**Peak Data - vs - Average Limit**




Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.150 | 29.0 | 20.4 | 49.4 | 66.0 | -16.6 |
| 0.184 | 23.8 | 20.3 | 44.1 | 64.3 | -20.2 |
| 0.905 | 12.8 | 20.3 | 33.1 | 56.0 | -22.9 |
| 3.544 | 12.4 | 20.6 | 33.0 | 56.0 | -23.0 |
| 0.623 | 12.7 | 20.3 | 33.0 | 56.0 | -23.0 |
| 0.206 | 19.9 | 20.3 | 40.2 | 63.4 | -23.1 |
| 0.164 | 21.7 | 20.3 | 42.0 | 65.3 | -23.2 |
| 3.744 | 12.0 | 20.6 | 32.6 | 56.0 | -23.4 |
| 1.768 | 12.1 | 20.4 | 32.5 | 56.0 | -23.5 |
| 1.344 | 11.8 | 20.4 | 32.2 | 56.0 | -23.8 |
| 0.959 | 11.7 | 20.3 | 32.0 | 56.0 | -24.0 |
| 1.592 | 11.6 | 20.4 | 32.0 | 56.0 | -24.0 |
| 4.168 | 11.3 | 20.7 | 32.0 | 56.0 | -24.0 |
| 1.920 | 11.4 | 20.4 | 31.8 | 56.0 | -24.2 |
| 3.800 | 11.1 | 20.6 | 31.7 | 56.0 | -24.3 |
| 3.000 | 11.1 | 20.5 | 31.6 | 56.0 | -24.4 |
| 2.176 | 11.1 | 20.4 | 31.5 | 56.0 | -24.5 |
| 4.592 | 10.8 | 20.7 | 31.5 | 56.0 | -24.5 |
| 2.304 | 10.9 | 20.5 | 31.4 | 56.0 | -24.6 |
| 2.504 | 10.8 | 20.5 | 31.3 | 56.0 | -24.7 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.150 | 29.0 | 20.4 | 49.4 | 56.0 | -6.6 |
| 0.184 | 23.8 | 20.3 | 44.1 | 54.3 | -10.2 |
| 0.905 | 12.8 | 20.3 | 33.1 | 46.0 | -12.9 |
| 3.544 | 12.4 | 20.6 | 33.0 | 46.0 | -13.0 |
| 0.623 | 12.7 | 20.3 | 33.0 | 46.0 | -13.0 |
| 0.206 | 19.9 | 20.3 | 40.2 | 53.4 | -13.1 |
| 0.164 | 21.7 | 20.3 | 42.0 | 55.3 | -13.2 |
| 3.744 | 12.0 | 20.6 | 32.6 | 46.0 | -13.4 |
| 1.768 | 12.1 | 20.4 | 32.5 | 46.0 | -13.5 |
| 1.344 | 11.8 | 20.4 | 32.2 | 46.0 | -13.8 |
| 0.959 | 11.7 | 20.3 | 32.0 | 46.0 | -14.0 |
| 1.592 | 11.6 | 20.4 | 32.0 | 46.0 | -14.0 |
| 4.168 | 11.3 | 20.7 | 32.0 | 46.0 | -14.0 |
| 1.920 | 11.4 | 20.4 | 31.8 | 46.0 | -14.2 |
| 3.800 | 11.1 | 20.6 | 31.7 | 46.0 | -14.3 |
| 3.000 | 11.1 | 20.5 | 31.6 | 46.0 | -14.4 |
| 2.176 | 11.1 | 20.4 | 31.5 | 46.0 | -14.5 |
| 4.592 | 10.8 | 20.7 | 31.5 | 46.0 | -14.5 |
| 2.304 | 10.9 | 20.5 | 31.4 | 46.0 | -14.6 |
| 2.504 | 10.8 | 20.5 | 31.3 | 46.0 | -14.7 |

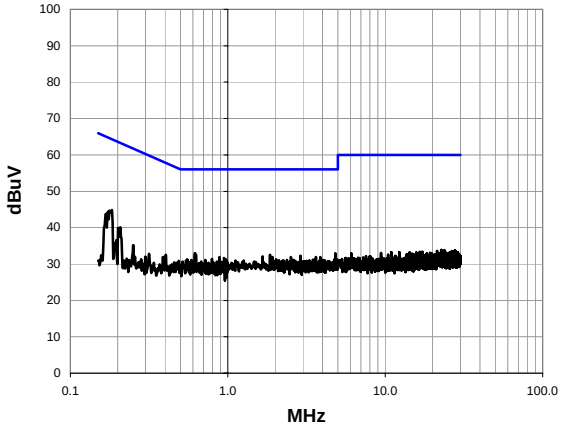
# AC Powerline Conducted Emissions

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | FOCU0140 | **Date:** | 05/16/13 | | |
| **Project:** | None | **Temperature:** | 23.7 °C | | |
| **Job Site:** | EV07 | **Humidity:** | 40.3% RH | | |
| **Serial Number:** | 02EA4D000003 | **Barometric Pres.:** | 1014 mbar | **Tested by:** | Brandon Hobbs |
| **EUT:** | Model 444-2225 (Athena UFL) | | | | |
| **Configuration:** | 7 | | | | |
| **Customer:** | Summit Semiconductor | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 3.3 VDC Nominal | | | | |
| **Operating Mode:** | Transmitting 802.11a, 50% Duty Cycle, Ch. 32, 5785 MHz | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | Power supply was plugged into 110VAC/60Hz | | | | |

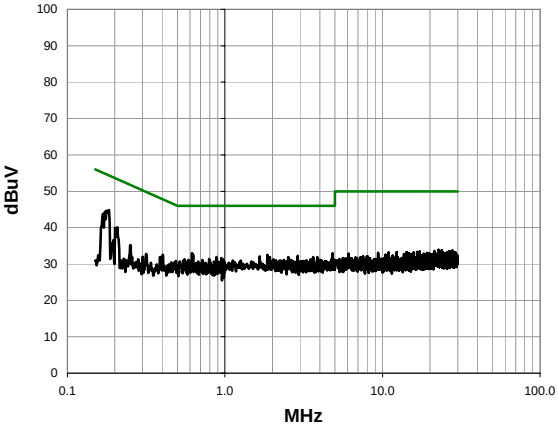
| **Test Specifications** | **Test Method** |
|---|---|
| FCC 15.207:2013 | ANSI C63.10:2009 |

| **Run #** | 26 | **Line:** | Neutral | **Ext. Attenuation:** | 20 | **Results** | Pass |
|---|---|---|---|---|---|---|---|

**Peak Data - vs - Quasi Peak Limit**




**Peak Data - vs - Average Limit**




Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.184 | 24.5 | 20.3 | 44.8 | 64.3 | -19.5 |
| 0.169 | 23.5 | 20.3 | 43.8 | 65.0 | -21.2 |
| 0.619 | 12.7 | 20.3 | 33.0 | 56.0 | -23.0 |
| 4.824 | 12.3 | 20.7 | 33.0 | 56.0 | -23.0 |
| 0.208 | 19.8 | 20.3 | 40.1 | 63.3 | -23.2 |
| 1.856 | 12.1 | 20.4 | 32.5 | 56.0 | -23.5 |
| 2.896 | 11.8 | 20.5 | 32.3 | 56.0 | -23.7 |
| 1.664 | 11.7 | 20.4 | 32.1 | 56.0 | -23.9 |
| 2.520 | 11.5 | 20.5 | 32.0 | 56.0 | -24.0 |
| 3.864 | 11.3 | 20.6 | 31.9 | 56.0 | -24.1 |
| 0.886 | 11.6 | 20.3 | 31.9 | 56.0 | -24.1 |
| 3.624 | 11.3 | 20.6 | 31.9 | 56.0 | -24.1 |
| 1.928 | 11.5 | 20.4 | 31.9 | 56.0 | -24.1 |
| 0.947 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 0.794 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |
| 0.974 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 0.553 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 3.480 | 10.6 | 20.6 | 31.2 | 56.0 | -24.8 |
| 0.587 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 2.376 | 10.7 | 20.5 | 31.2 | 56.0 | -24.8 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.184 | 24.5 | 20.3 | 44.8 | 54.3 | -9.5 |
| 0.169 | 23.5 | 20.3 | 43.8 | 55.0 | -11.2 |
| 0.619 | 12.7 | 20.3 | 33.0 | 46.0 | -13.0 |
| 4.824 | 12.3 | 20.7 | 33.0 | 46.0 | -13.0 |
| 0.208 | 19.8 | 20.3 | 40.1 | 53.3 | -13.2 |
| 1.856 | 12.1 | 20.4 | 32.5 | 46.0 | -13.5 |
| 2.896 | 11.8 | 20.5 | 32.3 | 46.0 | -13.7 |
| 1.664 | 11.7 | 20.4 | 32.1 | 46.0 | -13.9 |
| 2.520 | 11.5 | 20.5 | 32.0 | 46.0 | -14.0 |
| 3.864 | 11.3 | 20.6 | 31.9 | 46.0 | -14.1 |
| 0.886 | 11.6 | 20.3 | 31.9 | 46.0 | -14.1 |
| 3.624 | 11.3 | 20.6 | 31.9 | 46.0 | -14.1 |
| 1.928 | 11.5 | 20.4 | 31.9 | 46.0 | -14.1 |
| 0.947 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 0.794 | 11.1 | 20.3 | 31.4 | 46.0 | -14.6 |
| 0.974 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 0.553 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 3.480 | 10.6 | 20.6 | 31.2 | 46.0 | -14.8 |
| 0.587 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 2.376 | 10.7 | 20.5 | 31.2 | 46.0 | -14.8 |

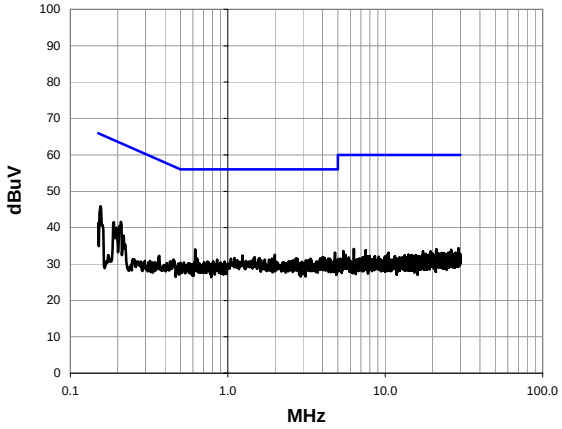
# AC Powerline Conducted Emissions

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | FOCU0140 | **Date:** | 05/16/13 | | |
| **Project:** | None | **Temperature:** | 23.7 °C | | |
| **Job Site:** | EV07 | **Humidity:** | 40.3% RH | | |
| **Serial Number:** | 02EA4D000003 | **Barometric Pres.:** | 1014 mbar | **Tested by:** | Brandon Hobbs |
| **EUT:** | Model 444-2225 (Athena UFL) | | | | |
| **Configuration:** | 7 | | | | |
| **Customer:** | Summit Semiconductor | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 3.3 VDC Nominal | | | | |
| **Operating Mode:** | Transmitting 802.11a, 50% Duty Cycle, Ch. 34, 5825 MHz | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | Power supply was plugged into 110VAC/60Hz | | | | |

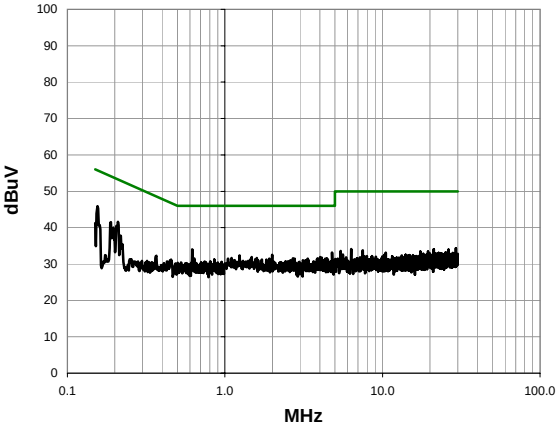
| **Test Specifications** | **Test Method** |
|---|---|
| FCC 15.207:2013 | ANSI C63.10:2009 |

| **Run #** | 27 | **Line:** | Neutral | **Ext. Attenuation:** | 20 | **Results** | Pass |
|---|---|---|---|---|---|---|---|

**Peak Data - vs - Quasi Peak Limit**




**Peak Data - vs - Average Limit**




Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.155 | 25.5 | 20.4 | 45.9 | 65.7 | -19.8 |
| 0.210 | 21.3 | 20.3 | 41.6 | 63.2 | -21.6 |
| 0.621 | 13.8 | 20.3 | 34.1 | 56.0 | -21.9 |
| 0.189 | 21.2 | 20.3 | 41.5 | 64.1 | -22.6 |
| 4.792 | 12.5 | 20.7 | 33.2 | 56.0 | -22.8 |
| 1.992 | 12.1 | 20.4 | 32.5 | 56.0 | -23.5 |
| 1.240 | 12.0 | 20.4 | 32.4 | 56.0 | -23.6 |
| 4.016 | 11.3 | 20.6 | 31.9 | 56.0 | -24.1 |
| 1.480 | 11.5 | 20.4 | 31.9 | 56.0 | -24.1 |
| 4.112 | 11.1 | 20.7 | 31.8 | 56.0 | -24.2 |
| 1.592 | 11.3 | 20.4 | 31.7 | 56.0 | -24.3 |
| 1.104 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 2.704 | 11.1 | 20.5 | 31.6 | 56.0 | -24.4 |
| 3.872 | 10.9 | 20.6 | 31.5 | 56.0 | -24.5 |
| 1.912 | 11.1 | 20.4 | 31.5 | 56.0 | -24.5 |
| 0.640 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 2.768 | 11.0 | 20.5 | 31.5 | 56.0 | -24.5 |
| 4.440 | 10.8 | 20.7 | 31.5 | 56.0 | -24.5 |
| 4.344 | 10.8 | 20.7 | 31.5 | 56.0 | -24.5 |
| 3.360 | 10.9 | 20.6 | 31.5 | 56.0 | -24.5 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.155 | 25.5 | 20.4 | 45.9 | 55.7 | -9.8 |
| 0.210 | 21.3 | 20.3 | 41.6 | 53.2 | -11.6 |
| 0.621 | 13.8 | 20.3 | 34.1 | 46.0 | -11.9 |
| 0.189 | 21.2 | 20.3 | 41.5 | 54.1 | -12.6 |
| 4.792 | 12.5 | 20.7 | 33.2 | 46.0 | -12.8 |
| 1.992 | 12.1 | 20.4 | 32.5 | 46.0 | -13.5 |
| 1.240 | 12.0 | 20.4 | 32.4 | 46.0 | -13.6 |
| 4.016 | 11.3 | 20.6 | 31.9 | 46.0 | -14.1 |
| 1.480 | 11.5 | 20.4 | 31.9 | 46.0 | -14.1 |
| 4.112 | 11.1 | 20.7 | 31.8 | 46.0 | -14.2 |
| 1.592 | 11.3 | 20.4 | 31.7 | 46.0 | -14.3 |
| 1.104 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 2.704 | 11.1 | 20.5 | 31.6 | 46.0 | -14.4 |
| 3.872 | 10.9 | 20.6 | 31.5 | 46.0 | -14.5 |
| 1.912 | 11.1 | 20.4 | 31.5 | 46.0 | -14.5 |
| 0.640 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 2.768 | 11.0 | 20.5 | 31.5 | 46.0 | -14.5 |
| 4.440 | 10.8 | 20.7 | 31.5 | 46.0 | -14.5 |
| 4.344 | 10.8 | 20.7 | 31.5 | 46.0 | -14.5 |
| 3.360 | 10.9 | 20.6 | 31.5 | 46.0 | -14.5 |

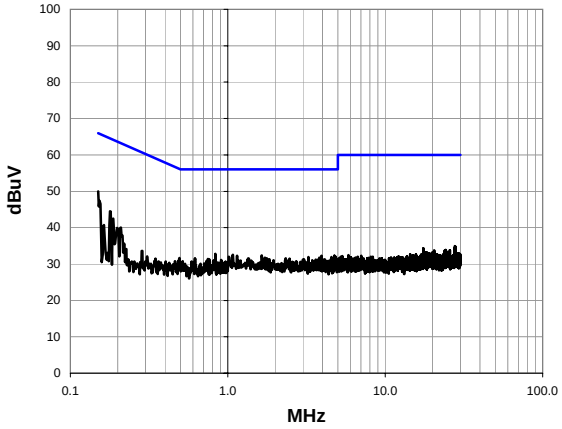
# AC Powerline Conducted Emissions

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | FOCU0140 | **Date:** | 05/16/13 | | |
| **Project:** | None | **Temperature:** | 23.7 °C | | |
| **Job Site:** | EV07 | **Humidity:** | 40.3% RH | | |
| **Serial Number:** | 02EA4D000003 | **Barometric Pres.:** | 1014 mbar | **Tested by:** | Brandon Hobbs |
| **EUT:** | Model 444-2225 (Athena UFL) | | | | |
| **Configuration:** | 7 | | | | |
| **Customer:** | Summit Semiconductor | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 3.3 VDC Nominal | | | | |
| **Operating Mode:** | Transmitting 802.11a, 50% Duty Cycle, Ch. 34, 5825 MHz | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | Power supply was plugged into 110VAC/60Hz | | | | |

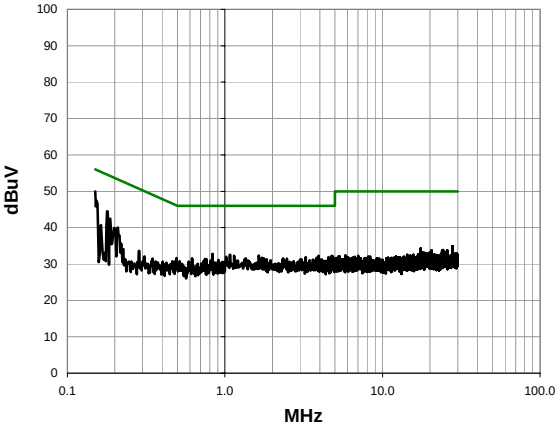
| **Test Specifications** | **Test Method** |
|---|---|
| FCC 15.207:2013 | ANSI C63.10:2009 |

| **Run #** | 28 | **Line:** | High Line | **Ext. Attenuation:** | 20 | **Results** | Pass |
|---|---|---|---|---|---|---|---|

**Peak Data - vs - Quasi Peak Limit**




**Peak Data - vs - Average Limit**




Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.150 | 29.5 | 20.4 | 49.9 | 66.0 | -16.1 |
| 0.179 | 24.2 | 20.3 | 44.5 | 64.5 | -20.0 |
| 0.187 | 22.2 | 20.3 | 42.5 | 64.2 | -21.6 |
| 0.835 | 12.5 | 20.3 | 32.8 | 56.0 | -23.2 |
| 0.210 | 19.7 | 20.3 | 40.0 | 63.2 | -23.2 |
| 1.080 | 12.2 | 20.3 | 32.5 | 56.0 | -23.5 |
| 1.640 | 12.0 | 20.4 | 32.4 | 56.0 | -23.6 |
| 4.752 | 11.6 | 20.7 | 32.3 | 56.0 | -23.7 |
| 1.144 | 11.9 | 20.4 | 32.3 | 56.0 | -23.7 |
| 3.936 | 11.6 | 20.6 | 32.2 | 56.0 | -23.8 |
| 0.198 | 19.6 | 20.3 | 39.9 | 63.7 | -23.8 |
| 1.016 | 11.7 | 20.3 | 32.0 | 56.0 | -24.0 |
| 4.848 | 11.3 | 20.7 | 32.0 | 56.0 | -24.0 |
| 4.552 | 11.3 | 20.7 | 32.0 | 56.0 | -24.0 |
| 3.256 | 11.4 | 20.5 | 31.9 | 56.0 | -24.1 |
| 3.816 | 11.1 | 20.6 | 31.7 | 56.0 | -24.3 |
| 1.768 | 11.2 | 20.4 | 31.6 | 56.0 | -24.4 |
| 2.336 | 11.1 | 20.5 | 31.6 | 56.0 | -24.4 |
| 0.493 | 11.4 | 20.3 | 31.7 | 56.1 | -24.4 |
| 0.621 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|---|---|---|---|---|---|
| 0.150 | 29.5 | 20.4 | 49.9 | 56.0 | -6.1 |
| 0.179 | 24.2 | 20.3 | 44.5 | 54.5 | -10.0 |
| 0.187 | 22.2 | 20.3 | 42.5 | 54.2 | -11.6 |
| 0.835 | 12.5 | 20.3 | 32.8 | 46.0 | -13.2 |
| 0.210 | 19.7 | 20.3 | 40.0 | 53.2 | -13.2 |
| 1.080 | 12.2 | 20.3 | 32.5 | 46.0 | -13.5 |
| 1.640 | 12.0 | 20.4 | 32.4 | 46.0 | -13.6 |
| 4.752 | 11.6 | 20.7 | 32.3 | 46.0 | -13.7 |
| 1.144 | 11.9 | 20.4 | 32.3 | 46.0 | -13.7 |
| 3.936 | 11.6 | 20.6 | 32.2 | 46.0 | -13.8 |
| 0.198 | 19.6 | 20.3 | 39.9 | 53.7 | -13.8 |
| 1.016 | 11.7 | 20.3 | 32.0 | 46.0 | -14.0 |
| 4.848 | 11.3 | 20.7 | 32.0 | 46.0 | -14.0 |
| 4.552 | 11.3 | 20.7 | 32.0 | 46.0 | -14.0 |
| 3.256 | 11.4 | 20.5 | 31.9 | 46.0 | -14.1 |
| 3.816 | 11.1 | 20.6 | 31.7 | 46.0 | -14.3 |
| 1.768 | 11.2 | 20.4 | 31.6 | 46.0 | -14.4 |
| 2.336 | 11.1 | 20.5 | 31.6 | 46.0 | -14.4 |
| 0.493 | 11.4 | 20.3 | 31.7 | 46.1 | -14.4 |
| 0.621 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |