

NORTHWEST EMC

Summit Semiconductor LLC

Athena4XD (Extended Distance)

FCC 15.207:2015

FCC 15.407:2015

802.11 Radio

Report # FOCU0214.1



NVLAP Lab Code: 200630-0

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. This Report may only be duplicated in its entirety

CERTIFICATE OF TEST

Last Date of Test: October 8, 2015
Summit Semiconductor LLC
Model: Athena4XD (Extended Distance)

Radio Equipment Testing

Standards

| Specification | Method |
|-----------------|------------------|
| FCC 15.207:2015 | ANSI C63.10:2009 |
| FCC 15.407:2015 | |

Results

| Method Clause | Test Description | Applied | Results | Comments |
|---------------|--------------------------------|---------|---------|----------|
| 6.2 | Powerline Conducted Emissions | Yes | Pass | |
| 6.5, 6.6 | Spurious Radiated Emissions | Yes | Pass | |
| 6.8 | Frequency Stability | Yes | Pass | |
| 6.9.1 | Emission Bandwidth | Yes | Pass | |
| 6.9.1 | Occupied Bandwidth | Yes | Pass | |
| 6.10.3 | Maximum Conducted Output Power | Yes | Pass | |
| 6.11.1 | Peak Power Spectral Density | Yes | Pass | |
| 7.5 | Duty Cycle | Yes | Pass | |

Deviations From Test Standards

None

Approved By:



Kyle Holgate, Operations Manager

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. 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. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY

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

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 17065 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

MSIP / 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.

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>
<http://gsi.nist.gov/global/docs/cabs/designations.html>

MEASUREMENT UNCERTAINTY

Measurement Uncertainty

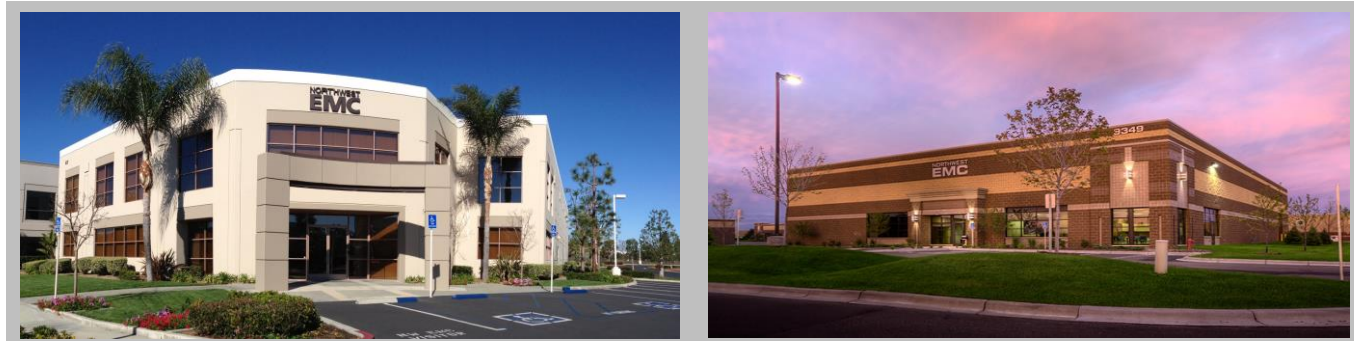
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement 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 on each data sheet. 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 16-4-2 as applicable), and are available upon request.

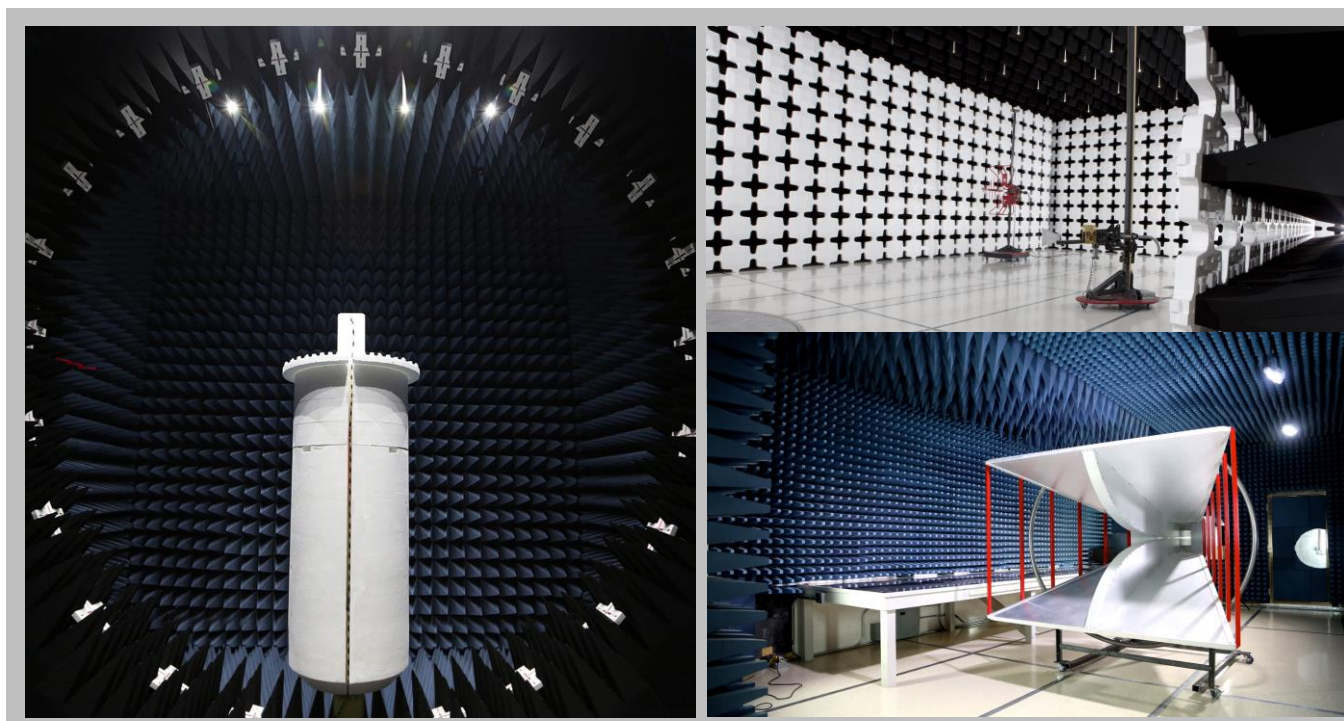
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

| Test | + MU | - MU |
|---------------------------------------|-------------|-------------|
| Frequency Accuracy (Hz) | 0.0007% | -0.0007% |
| Amplitude Accuracy (dB) | 1.2 dB | -1.2 dB |
| Conducted Power (dB) | 0.3 dB | -0.3 dB |
| Radiated Power via Substitution (dB) | 0.7 dB | -0.7 dB |
| Temperature (degrees C) | 0.7°C | -0.7°C |
| Humidity (% RH) | 2.5% RH | -2.5% RH |
| Voltage (AC) | 1.0% | -1.0% |
| Voltage (DC) | 0.7% | -0.7% |
| Field Strength (dB) | 5.2 dB | -5.2 dB |
| AC Powerline Conducted Emissions (dB) | 2.4 dB | -2.4 dB |

FACILITIES



| | | | | | |
|---|---|--|---|--|--|
| California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918 | Minnesota Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136 | New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214 | Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066 | Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255 | Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 9801 (425)984-6600 |
| NVLAP | | | | | |
| NVLAP Lab Code: 200676-0 | NVLAP Lab Code: 200881-0 | NVLAP Lab Code: 200761-0 | NVLAP Lab Code: 200630-0 | NVLAP Lab Code:201049-0 | NVLAP Lab Code: 200629-0 |
| Industry Canada | | | | | |
| 2834B-1, 2834B-3 | 2834E-1 | N/A | 2834D-1, 2834D-2 | 2834G-1 | 2834F-1 |
| BSMI | | | | | |
| SL2-IN-E-1154R | SL2-IN-E-1152R | N/A | SL2-IN-E-1017 | SL2-IN-E-1158R | SL2-IN-E-1153R |
| VCCI | | | | | |
| A-0029 | A-0109 | N/A | A-0108 | A-0201 | A-0110 |
| Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA | | | | | |
| US0158 | US0175 | N/A | US0017 | US0191 | US0157 |



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

| | |
|---------------------------------|-------------------------------------|
| Company Name: | Summit Semiconductor LLC |
| Address: | 20575 NW Von Neumann Dr., Suite 100 |
| City, State, Zip: | Beaverton, OR 97006 |
| Test Requested By: | Kenneth Boehlke |
| Model: | Athena4XD (Extended Distance) |
| First Date of Test: | August 21, 2015 |
| Last Date of Test: | October 8, 2015 |
| Receipt Date of Samples: | August 21, 2015 |
| Equipment Design Stage: | Production |
| Equipment Condition: | No Damage |

Information Provided by the Party Requesting the Test

| |
|--|
| Functional Description of the EUT: |
| UNII client radio module with 4 identical SISO ports. The Athena may be battery powered or it can be AC powered with an adapter, or battery charged via an AC adapter. |
| Testing Objective: |
| To demonstrate compliance of the 802.11 radio under FCC 15.407 for operation in the 5.2 GHz, 5.3 GHz, 5.6 GHz and 5.8 GHz band(s). |

CONFIGURATIONS

Configuration FOCU0214- 1

| EUT | | | |
|---|--------------------------|----------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Radio Module (Athena4XD) Extended Distance | Summit Semiconductor LLC | Athena4XD / 444-2253 | 02EA3CD00087 |

| Peripherals in test setup boundary | | | |
|------------------------------------|--------------------------|-------------------|-------------------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Development Board (Athena) | Summit Semiconductor LLC | None | None |
| Laptop (Dell) | Dell | Latitude D820 | CN-0GF470-48643-7391438 |
| AC/DC Adapter (DELL) | Dell | LA90PS-00 | CN-0DF26671615-81L |
| AC/DC Adapter (Athena) | CONDOR | STD-1836P | SA-183A6IV |

| Cables | | | | | |
|-------------------------|---------|------------|---------|----------------------------|----------------------------|
| Cable Type | Shield | Length (m) | Ferrite | Connection 1 | Connection 2 |
| Serial Cable | No | 1.6m | Yes | Development Board (Athena) | Laptop |
| AC Power Cable (Laptop) | No | 2m | No | AC mains | AC/DC Power Adapter (Dell) |
| DC Power Cable (Laptop) | Unknown | 2m | Yes | AC/DC Power Adapter (Dell) | Laptop |
| DC Power Cable (Athena) | Unknown | 1.5m | Yes | AC/DC Adapter (Athena) | Development Board (Athena) |
| AC Power Cable (Athena) | No | 1.5m | No | AC mains | AC/DC Adapter (Athena) |

CONFIGURATIONS

Configuration FOCU0214- 4

| EUT | | | |
|---|--------------------------|----------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Radio Module (Athena4XD) Extended Distance | Summit Semiconductor LLC | Athena4XD / 444-2253 | 02EA3CD00087 |

| Peripherals in test setup boundary | | | |
|------------------------------------|--------------------------|-------------------|-------------------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Development Board (Athena) | Summit Semiconductor LLC | None | None |
| Laptop (Dell) | Dell | Latitude D820 | CN-0GF470-48643-7391438 |
| AC/DC Adapter (DELL) | Dell | LA90PS-00 | CN-0DF26671615-81L |
| AC/DC Adapter (Athena) | CONDOR | STD-1836P | SA-183A6IV |

| Cables | | | | | |
|-------------------------|---------|------------|---------|----------------------------|----------------------------|
| Cable Type | Shield | Length (m) | Ferrite | Connection 1 | Connection 2 |
| Serial Cable | No | 1.6m | Yes | Development Board (Athena) | Laptop |
| AC Power Cable (Laptop) | No | 2m | No | AC mains | AC/DC Power Adapter (Dell) |
| DC Power Cable (Laptop) | Unknown | 2m | Yes | AC/DC Power Adapter (Dell) | Laptop |
| DC Power Cable (Athena) | Unknown | 1.5m | Yes | AC/DC Adapter (Athena) | Development Board (Athena) |
| AC Power Cable (Athena) | No | 1.5m | No | AC mains | AC/DC Adapter (Athena) |

CONFIGURATIONS

Configuration FOCU0214- 5

| EUT | | | |
|--|--------------------------|----------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Radio Board (Athena4XD) Extended Distance | Summit Semiconductor LLC | Athena4XD / 444-2253 | 02EA4CD00042 |

| Peripherals in test setup boundary | | | |
|------------------------------------|--------------------------|-------------------|-------------------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Development Board (Athena) | Summit Semiconductor LLC | None | None |
| Laptop (Dell) | Dell | Latitude D820 | CN-0GF470-48643-7391438 |
| AC/DC Adapter (DELL) | Dell | LA90PS-00 | CN-0DF26671615-81L |
| Power Supply Development Board | Summit Semiconductor LLC | None | None |

| Cables | | | | | |
|-------------------------|---------|------------|---------|----------------------------|----------------------------|
| Cable Type | Shield | Length (m) | Ferrite | Connection 1 | Connection 2 |
| AC Power Cable (Laptop) | No | 2m | No | AC mains | AC/DC Power Adapter (Dell) |
| DC Power Cable (Laptop) | Unknown | 2m | Yes | AC/DC Power Adapter (Dell) | Laptop |
| DC Leads x2 | No | 2m | No | DC Power Supply | Development Boards |
| USB Cable | Yes | 1.2m | No | Laptop | Development Board (Athena) |

CONFIGURATIONS

Configuration FOCU0214- 7

| EUT | | | |
|--|--------------------------|----------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Radio Board (Athena4XD) Extended Distance | Summit Semiconductor LLC | Athena4XD / 444-2253 | 02EA4CD00042 |

| Peripherals in test setup boundary | | | |
|------------------------------------|--------------------------|-------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Development Board (Athena) | Summit Semiconductor LLC | None | None |
| Power Supply Development Board | Summit Semiconductor LLC | None | None |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|--------------|-------------------|-------------------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Laptop (Dell) | Dell | Latitude D820 | CN-0GF470-48643-7391438 |
| AC/DC Adapter (DELL) | Dell | LA90PS-00 | CN-0DF26671615-81L |

| Cables | | | | | |
|-------------------------|---------|------------|---------|----------------------------|----------------------------|
| Cable Type | Shield | Length (m) | Ferrite | Connection 1 | Connection 2 |
| AC Power Cable (Laptop) | No | 2m | No | AC mains | AC/DC Power Adapter (Dell) |
| DC Power Cable (Laptop) | Unknown | 2m | Yes | AC/DC Power Adapter (Dell) | Laptop |
| DC Leads x4 | No | .5m | No | DC Power Supply | Development Board |

MODIFICATIONS

Equipment Modifications

| Item | Date | Test | Modification | Note | Disposition of EUT |
|------|-----------|--------------------------------|--------------------------------------|---|--|
| 1 | 8/21/2015 | Frequency Stability | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT was taken home by the client before the next scheduled test. |
| 2 | 8/21/2015 | Emission 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. |
| 3 | 8/21/2015 | 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. |
| 4 | 8/21/2015 | Maximum Conducted 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 | 8/21/2015 | Peak 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. |
| 6 | 8/21/2015 | 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 | 10/7/2015 | Powerline 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. |
| 8 | 10/8/2015 | Spurious Radiated Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed. |

POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50 Ω .

The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Cal. Due |
|----------------------------------|--------------------|------------------|------|-----------|-----------|
| LISN | Solar Electronics | 9252-50-R-24-BNC | LIN | 1/27/2015 | 1/27/2016 |
| Cable - Conducted Cable Assembly | Northwest EMC | EVG, HHD, TQQ | EVGA | 5/12/2015 | 5/12/2016 |
| Attenuator | Fairview Microwave | SA6B10W-20 | TQQ | NCR | NCR |
| Filter - High Pass | TTE | H97-100K-50-720B | HHD | NCR | NCR |
| Receiver | Rohde & Schwarz | ESCI | ARH | 3/11/2015 | 3/11/2016 |
| Power Supply - DC | Tektronix | PS280 | TPM | NCR | NCR |

MEASUREMENT UNCERTAINTY

| Description | | |
|--------------|--------|---------|
| Expanded k=2 | 2.4 dB | -2.4 dB |

CONFIGURATIONS INVESTIGATED

FOCU0214-7

MODES INVESTIGATED

Continuous Tx, 6Mbps 5180 MHz Ch.8
Continuous Tx, 6Mbps 5240 MHz Ch.14
Continuous Tx, 6Mbps 5260 MHz Ch.15
Continuous Tx, 6Mbps 5320 MHz Ch.18
Continuous Tx, 6Mbps 5500 MHz Ch.19
Continuous Tx, 6Mbps 5580 MHz Ch.23
Continuous Tx, 6Mbps 5700 MHz Ch.29
Continuous Tx, 6Mbps 5745 MHz Ch.30
Continuous Tx, 6Mbps 5785 MHz Ch.32
Continuous Tx, 6Mbps 5825 MHz Ch.34

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|-----------|-----------------------------|---|
| Run #: | 2 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|-----------|-----------------------------|---|

COMMENTS

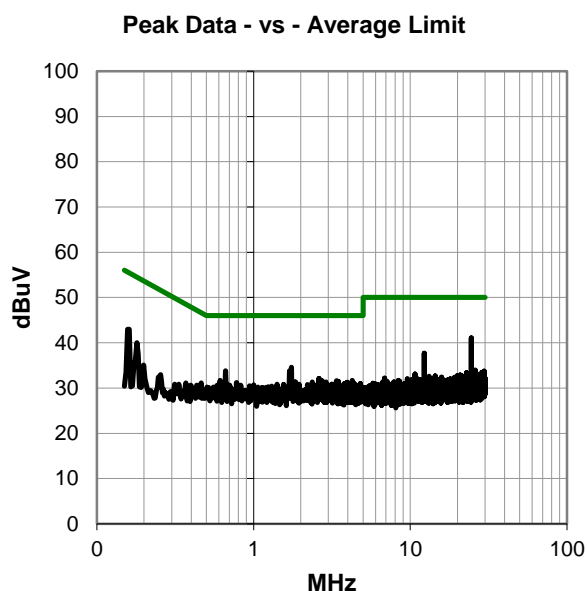
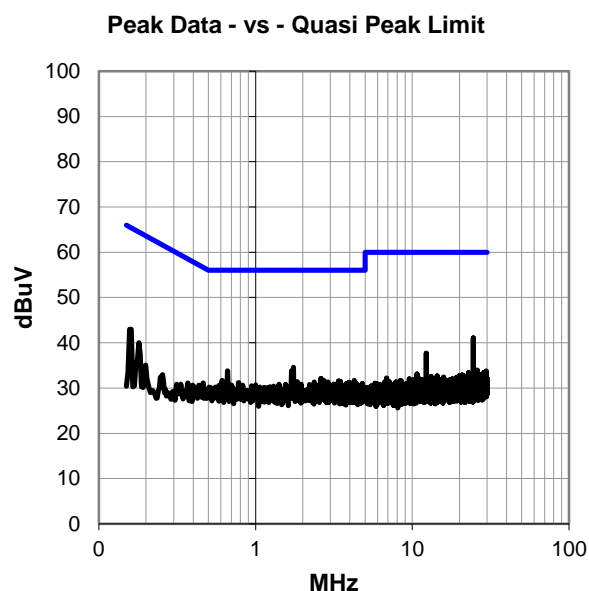
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5180 MHz Ch.8

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #2

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.5 | 21.6 | 41.1 | 60.0 | -18.9 |
| 1.743 | 14.4 | 20.2 | 34.6 | 56.0 | -21.4 |
| 0.661 | 13.8 | 20.0 | 33.8 | 56.0 | -22.2 |
| 1.695 | 13.6 | 20.2 | 33.8 | 56.0 | -22.2 |
| 12.286 | 16.8 | 20.9 | 37.7 | 60.0 | -22.3 |
| 0.157 | 22.7 | 20.3 | 43.0 | 65.6 | -22.6 |
| 2.616 | 11.8 | 20.3 | 32.1 | 56.0 | -23.9 |
| 0.613 | 11.7 | 20.0 | 31.7 | 56.0 | -24.3 |
| 4.273 | 11.3 | 20.4 | 31.7 | 56.0 | -24.3 |
| 2.698 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 2.735 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 3.381 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 0.180 | 19.9 | 20.1 | 40.0 | 64.5 | -24.5 |
| 3.470 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 1.848 | 11.1 | 20.2 | 31.3 | 56.0 | -24.7 |
| 2.907 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 2.374 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 3.952 | 10.9 | 20.4 | 31.3 | 56.0 | -24.7 |
| 0.777 | 11.2 | 20.0 | 31.2 | 56.0 | -24.8 |
| 4.392 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 4.802 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 3.776 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 3.444 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 4.108 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 3.832 | 10.5 | 20.3 | 30.8 | 56.0 | -25.2 |
| 1.411 | 10.7 | 20.1 | 30.8 | 56.0 | -25.2 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.5 | 21.6 | 41.1 | 50.0 | -8.9 |
| 1.743 | 14.4 | 20.2 | 34.6 | 46.0 | -11.4 |
| 0.661 | 13.8 | 20.0 | 33.8 | 46.0 | -12.2 |
| 1.695 | 13.6 | 20.2 | 33.8 | 46.0 | -12.2 |
| 12.286 | 16.8 | 20.9 | 37.7 | 50.0 | -12.3 |
| 0.157 | 22.7 | 20.3 | 43.0 | 55.6 | -12.6 |
| 2.616 | 11.8 | 20.3 | 32.1 | 46.0 | -13.9 |
| 0.613 | 11.7 | 20.0 | 31.7 | 46.0 | -14.3 |
| 4.273 | 11.3 | 20.4 | 31.7 | 46.0 | -14.3 |
| 2.698 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 2.735 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 3.381 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 0.180 | 19.9 | 20.1 | 40.0 | 54.5 | -14.5 |
| 3.470 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 1.848 | 11.1 | 20.2 | 31.3 | 46.0 | -14.7 |
| 2.907 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 2.374 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 3.952 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 0.777 | 11.2 | 20.0 | 31.2 | 46.0 | -14.8 |
| 4.392 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 4.802 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 3.776 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 3.444 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 4.108 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 3.832 | 10.5 | 20.3 | 30.8 | 46.0 | -15.2 |
| 1.411 | 10.7 | 20.1 | 30.8 | 46.0 | -15.2 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|---------|-----------------------------|---|
| Run #: | 3 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|---------|-----------------------------|---|

COMMENTS

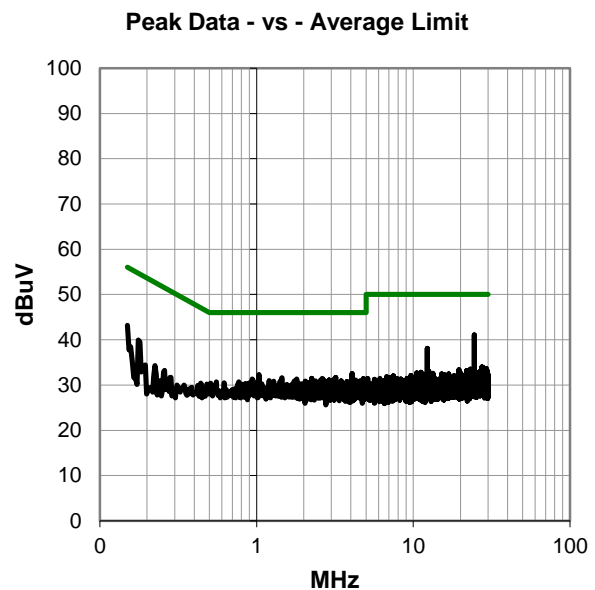
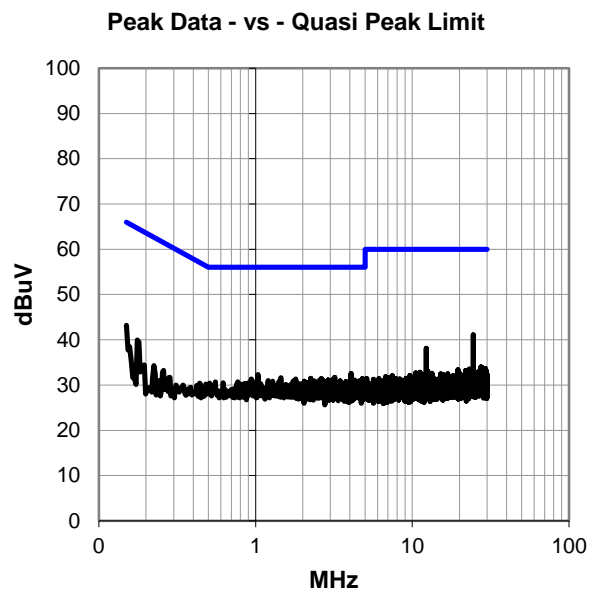
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5180 MHz Ch.8

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #3

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.5 | 21.6 | 41.1 | 60.0 | -18.9 |
| 12.286 | 17.2 | 20.9 | 38.1 | 60.0 | -21.9 |
| 0.150 | 22.9 | 20.3 | 43.2 | 66.0 | -22.8 |
| 4.071 | 12.1 | 20.4 | 32.5 | 56.0 | -23.5 |
| 1.038 | 12.2 | 20.1 | 32.3 | 56.0 | -23.7 |
| 3.202 | 11.4 | 20.3 | 31.7 | 56.0 | -24.3 |
| 1.452 | 11.5 | 20.1 | 31.6 | 56.0 | -24.4 |
| 2.624 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 2.250 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 4.802 | 11.0 | 20.4 | 31.4 | 56.0 | -24.6 |
| 1.803 | 11.1 | 20.2 | 31.3 | 56.0 | -24.7 |
| 0.937 | 11.2 | 20.1 | 31.3 | 56.0 | -24.7 |
| 0.176 | 19.8 | 20.1 | 39.9 | 64.7 | -24.7 |
| 2.564 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 2.903 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 3.082 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 4.295 | 10.7 | 20.4 | 31.1 | 56.0 | -24.9 |
| 4.978 | 10.7 | 20.4 | 31.1 | 56.0 | -24.9 |
| 3.127 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 4.590 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 1.202 | 10.9 | 20.1 | 31.0 | 56.0 | -25.0 |
| 2.381 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 2.702 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 3.467 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 1.743 | 10.7 | 20.2 | 30.9 | 56.0 | -25.1 |
| 1.415 | 10.7 | 20.1 | 30.8 | 56.0 | -25.2 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.5 | 21.6 | 41.1 | 50.0 | -8.9 |
| 12.286 | 17.2 | 20.9 | 38.1 | 50.0 | -11.9 |
| 0.150 | 22.9 | 20.3 | 43.2 | 56.0 | -12.8 |
| 4.071 | 12.1 | 20.4 | 32.5 | 46.0 | -13.5 |
| 1.038 | 12.2 | 20.1 | 32.3 | 46.0 | -13.7 |
| 3.202 | 11.4 | 20.3 | 31.7 | 46.0 | -14.3 |
| 1.452 | 11.5 | 20.1 | 31.6 | 46.0 | -14.4 |
| 2.624 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 2.250 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 4.802 | 11.0 | 20.4 | 31.4 | 46.0 | -14.6 |
| 1.803 | 11.1 | 20.2 | 31.3 | 46.0 | -14.7 |
| 0.937 | 11.2 | 20.1 | 31.3 | 46.0 | -14.7 |
| 0.176 | 19.8 | 20.1 | 39.9 | 54.7 | -14.7 |
| 2.564 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 2.903 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 3.082 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 4.295 | 10.7 | 20.4 | 31.1 | 46.0 | -14.9 |
| 4.978 | 10.7 | 20.4 | 31.1 | 46.0 | -14.9 |
| 3.127 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 4.590 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 1.202 | 10.9 | 20.1 | 31.0 | 46.0 | -15.0 |
| 2.381 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 2.702 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 3.467 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 1.743 | 10.7 | 20.2 | 30.9 | 46.0 | -15.1 |
| 1.415 | 10.7 | 20.1 | 30.8 | 46.0 | -15.2 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|---------|-----------------------------|---|
| Run #: | 4 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|---------|-----------------------------|---|

COMMENTS

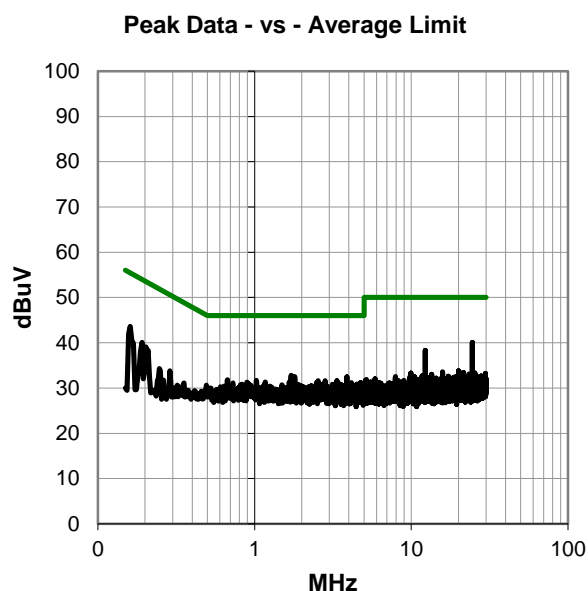
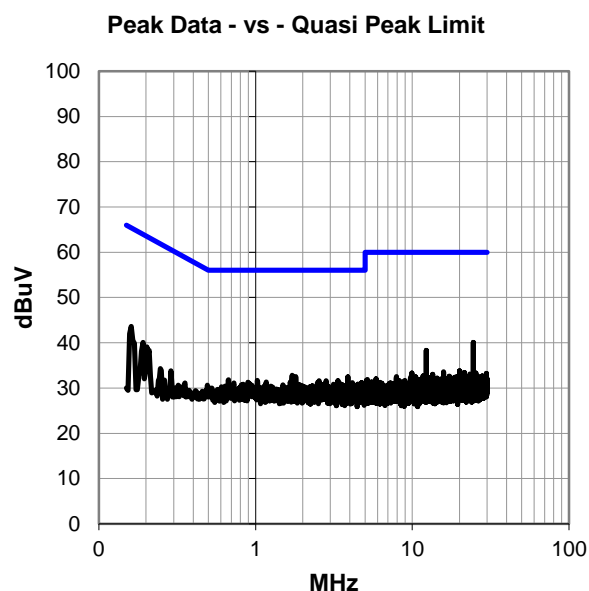
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5240 MHz Ch.14

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #4

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.5 | 21.6 | 40.1 | 60.0 | -19.9 |
| 12.286 | 17.4 | 20.9 | 38.3 | 60.0 | -21.7 |
| 0.161 | 23.4 | 20.2 | 43.6 | 65.4 | -21.8 |
| 1.709 | 12.6 | 20.2 | 32.8 | 56.0 | -23.2 |
| 1.806 | 12.3 | 20.2 | 32.5 | 56.0 | -23.5 |
| 3.881 | 12.1 | 20.4 | 32.5 | 56.0 | -23.5 |
| 0.191 | 20.0 | 20.1 | 40.1 | 64.0 | -23.9 |
| 1.762 | 11.7 | 20.2 | 31.9 | 56.0 | -24.1 |
| 0.672 | 11.8 | 20.0 | 31.8 | 56.0 | -24.2 |
| 1.027 | 11.6 | 20.1 | 31.7 | 56.0 | -24.3 |
| 2.538 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 2.821 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 3.355 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 0.202 | 19.0 | 20.1 | 39.1 | 63.5 | -24.4 |
| 1.668 | 11.1 | 20.2 | 31.3 | 56.0 | -24.7 |
| 1.169 | 11.2 | 20.1 | 31.3 | 56.0 | -24.7 |
| 0.896 | 11.2 | 20.1 | 31.3 | 56.0 | -24.7 |
| 2.482 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 4.138 | 10.8 | 20.4 | 31.2 | 56.0 | -24.8 |
| 4.754 | 10.8 | 20.4 | 31.2 | 56.0 | -24.8 |
| 0.728 | 11.1 | 20.0 | 31.1 | 56.0 | -24.9 |
| 3.314 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 3.452 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 4.884 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 4.664 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 0.833 | 10.8 | 20.0 | 30.8 | 56.0 | -25.2 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.5 | 21.6 | 40.1 | 50.0 | -9.9 |
| 12.286 | 17.4 | 20.9 | 38.3 | 50.0 | -11.7 |
| 0.161 | 23.4 | 20.2 | 43.6 | 55.4 | -11.8 |
| 1.709 | 12.6 | 20.2 | 32.8 | 46.0 | -13.2 |
| 1.806 | 12.3 | 20.2 | 32.5 | 46.0 | -13.5 |
| 3.881 | 12.1 | 20.4 | 32.5 | 46.0 | -13.5 |
| 0.191 | 20.0 | 20.1 | 40.1 | 54.0 | -13.9 |
| 1.762 | 11.7 | 20.2 | 31.9 | 46.0 | -14.1 |
| 0.672 | 11.8 | 20.0 | 31.8 | 46.0 | -14.2 |
| 1.027 | 11.6 | 20.1 | 31.7 | 46.0 | -14.3 |
| 2.538 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 2.821 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 3.355 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 0.202 | 19.0 | 20.1 | 39.1 | 53.5 | -14.4 |
| 1.668 | 11.1 | 20.2 | 31.3 | 46.0 | -14.7 |
| 1.169 | 11.2 | 20.1 | 31.3 | 46.0 | -14.7 |
| 0.896 | 11.2 | 20.1 | 31.3 | 46.0 | -14.7 |
| 2.482 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 4.138 | 10.8 | 20.4 | 31.2 | 46.0 | -14.8 |
| 4.754 | 10.8 | 20.4 | 31.2 | 46.0 | -14.8 |
| 0.728 | 11.1 | 20.0 | 31.1 | 46.0 | -14.9 |
| 3.314 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 3.452 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 4.884 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 4.664 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 0.833 | 10.8 | 20.0 | 30.8 | 46.0 | -15.2 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|-----------|-----------------------------|---|
| Run #: | 5 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|-----------|-----------------------------|---|

COMMENTS

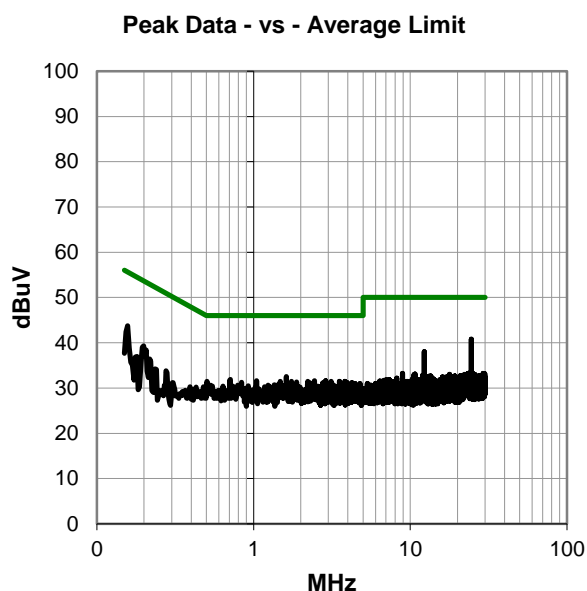
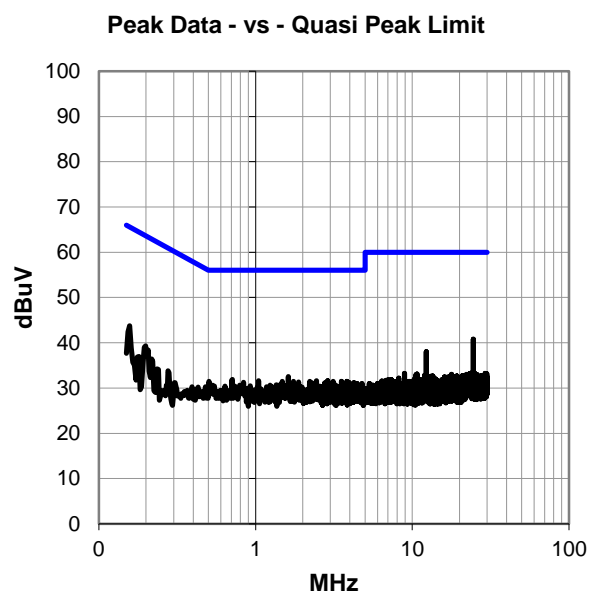
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5240 MHz Ch.14

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #5

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.2 | 21.6 | 40.8 | 60.0 | -19.2 |
| 0.157 | 23.5 | 20.3 | 43.8 | 65.6 | -21.8 |
| 12.286 | 17.1 | 20.9 | 38.0 | 60.0 | -22.0 |
| 1.616 | 12.3 | 20.2 | 32.5 | 56.0 | -23.5 |
| 0.710 | 11.9 | 20.0 | 31.9 | 56.0 | -24.1 |
| 0.199 | 19.2 | 20.1 | 39.3 | 63.7 | -24.4 |
| 2.444 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 2.885 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 1.045 | 11.5 | 20.1 | 31.6 | 56.0 | -24.4 |
| 0.504 | 11.5 | 20.0 | 31.5 | 56.0 | -24.5 |
| 1.747 | 11.3 | 20.2 | 31.5 | 56.0 | -24.5 |
| 3.135 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 3.534 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 1.482 | 11.3 | 20.2 | 31.5 | 56.0 | -24.5 |
| 3.825 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |
| 2.217 | 11.2 | 20.2 | 31.4 | 56.0 | -24.6 |
| 1.881 | 11.1 | 20.2 | 31.3 | 56.0 | -24.7 |
| 0.836 | 11.2 | 20.0 | 31.2 | 56.0 | -24.8 |
| 4.250 | 10.8 | 20.4 | 31.2 | 56.0 | -24.8 |
| 3.952 | 10.8 | 20.4 | 31.2 | 56.0 | -24.8 |
| 2.262 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 2.769 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 4.448 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 4.769 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 2.318 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 3.982 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.2 | 21.6 | 40.8 | 50.0 | -9.2 |
| 0.157 | 23.5 | 20.3 | 43.8 | 55.6 | -11.8 |
| 12.286 | 17.1 | 20.9 | 38.0 | 50.0 | -12.0 |
| 1.616 | 12.3 | 20.2 | 32.5 | 46.0 | -13.5 |
| 0.710 | 11.9 | 20.0 | 31.9 | 46.0 | -14.1 |
| 0.199 | 19.2 | 20.1 | 39.3 | 53.7 | -14.4 |
| 2.444 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 2.885 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 1.045 | 11.5 | 20.1 | 31.6 | 46.0 | -14.4 |
| 0.504 | 11.5 | 20.0 | 31.5 | 46.0 | -14.5 |
| 1.747 | 11.3 | 20.2 | 31.5 | 46.0 | -14.5 |
| 3.135 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 3.534 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 1.482 | 11.3 | 20.2 | 31.5 | 46.0 | -14.5 |
| 3.825 | 11.1 | 20.3 | 31.4 | 46.0 | -14.6 |
| 2.217 | 11.2 | 20.2 | 31.4 | 46.0 | -14.6 |
| 1.881 | 11.1 | 20.2 | 31.3 | 46.0 | -14.7 |
| 0.836 | 11.2 | 20.0 | 31.2 | 46.0 | -14.8 |
| 4.250 | 10.8 | 20.4 | 31.2 | 46.0 | -14.8 |
| 3.952 | 10.8 | 20.4 | 31.2 | 46.0 | -14.8 |
| 2.262 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 2.769 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 4.448 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 4.769 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 2.318 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 3.982 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|-----------|-----------------------------|---|
| Run #: | 6 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|-----------|-----------------------------|---|

COMMENTS

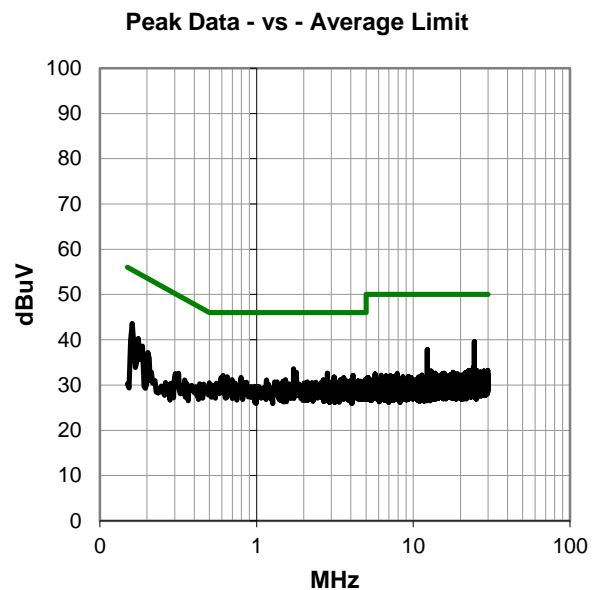
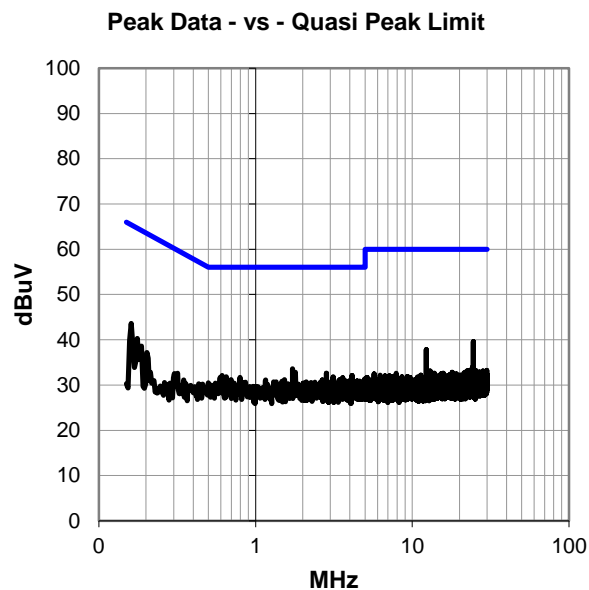
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5260 MHz Ch.15

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #6

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.0 | 21.6 | 39.6 | 60.0 | -20.4 |
| 0.161 | 23.4 | 20.2 | 43.6 | 65.4 | -21.8 |
| 12.286 | 16.9 | 20.9 | 37.8 | 60.0 | -22.2 |
| 1.724 | 13.4 | 20.2 | 33.6 | 56.0 | -22.4 |
| 1.795 | 12.6 | 20.2 | 32.8 | 56.0 | -23.2 |
| 2.836 | 12.3 | 20.3 | 32.6 | 56.0 | -23.4 |
| 0.613 | 12.1 | 20.0 | 32.1 | 56.0 | -23.9 |
| 4.123 | 11.7 | 20.4 | 32.1 | 56.0 | -23.9 |
| 0.650 | 11.8 | 20.0 | 31.8 | 56.0 | -24.2 |
| 3.123 | 11.5 | 20.3 | 31.8 | 56.0 | -24.2 |
| 0.594 | 11.7 | 20.0 | 31.7 | 56.0 | -24.3 |
| 0.795 | 11.7 | 20.0 | 31.7 | 56.0 | -24.3 |
| 0.176 | 20.2 | 20.1 | 40.3 | 64.7 | -24.3 |
| 3.601 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 4.989 | 10.9 | 20.4 | 31.3 | 56.0 | -24.7 |
| 0.698 | 11.2 | 20.0 | 31.2 | 56.0 | -24.8 |
| 3.448 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 1.530 | 11.0 | 20.2 | 31.2 | 56.0 | -24.8 |
| 2.665 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 1.157 | 11.0 | 20.1 | 31.1 | 56.0 | -24.9 |
| 3.982 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 3.735 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 3.396 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 4.452 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 1.474 | 10.7 | 20.1 | 30.8 | 56.0 | -25.2 |
| 4.619 | 10.4 | 20.4 | 30.8 | 56.0 | -25.2 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.0 | 21.6 | 39.6 | 50.0 | -10.4 |
| 0.161 | 23.4 | 20.2 | 43.6 | 55.4 | -11.8 |
| 12.286 | 16.9 | 20.9 | 37.8 | 50.0 | -12.2 |
| 1.724 | 13.4 | 20.2 | 33.6 | 46.0 | -12.4 |
| 1.795 | 12.6 | 20.2 | 32.8 | 46.0 | -13.2 |
| 2.836 | 12.3 | 20.3 | 32.6 | 46.0 | -13.4 |
| 0.613 | 12.1 | 20.0 | 32.1 | 46.0 | -13.9 |
| 4.123 | 11.7 | 20.4 | 32.1 | 46.0 | -13.9 |
| 0.650 | 11.8 | 20.0 | 31.8 | 46.0 | -14.2 |
| 3.123 | 11.5 | 20.3 | 31.8 | 46.0 | -14.2 |
| 0.594 | 11.7 | 20.0 | 31.7 | 46.0 | -14.3 |
| 0.795 | 11.7 | 20.0 | 31.7 | 46.0 | -14.3 |
| 0.176 | 20.2 | 20.1 | 40.3 | 54.7 | -14.3 |
| 3.601 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 4.989 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 0.698 | 11.2 | 20.0 | 31.2 | 46.0 | -14.8 |
| 3.448 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 1.530 | 11.0 | 20.2 | 31.2 | 46.0 | -14.8 |
| 2.665 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 1.157 | 11.0 | 20.1 | 31.1 | 46.0 | -14.9 |
| 3.982 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 3.735 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 3.396 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 4.452 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 1.474 | 10.7 | 20.1 | 30.8 | 46.0 | -15.2 |
| 4.619 | 10.4 | 20.4 | 30.8 | 46.0 | -15.2 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|---------|-----------------------------|---|
| Run #: | 7 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|---------|-----------------------------|---|

COMMENTS

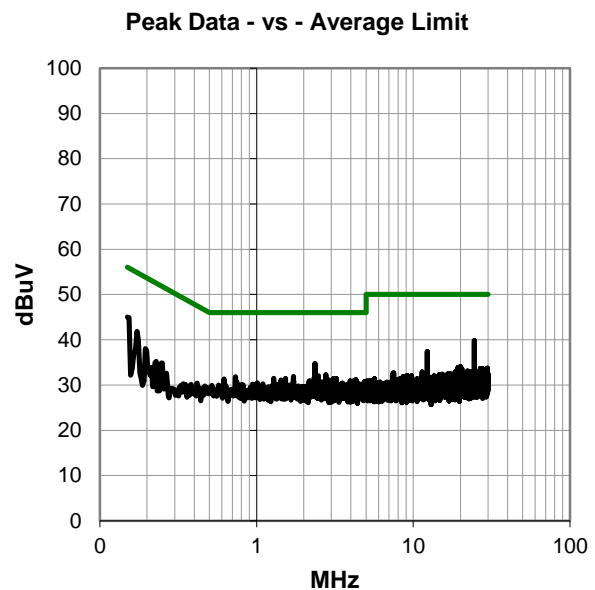
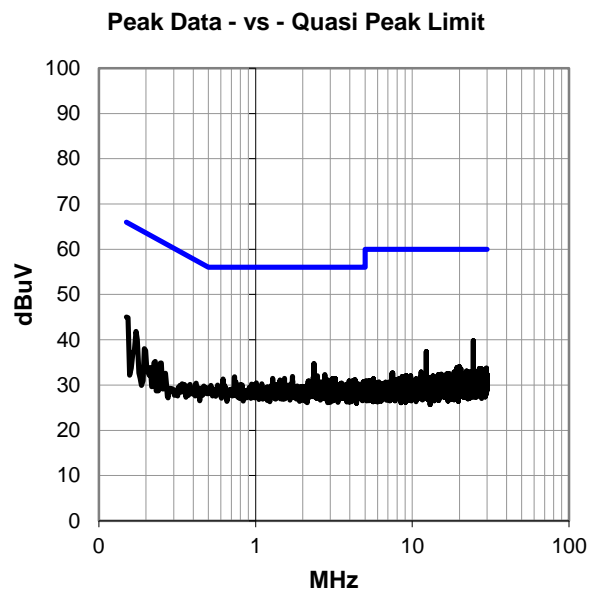
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5260 MHz Ch.15

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #7

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.2 | 21.6 | 39.8 | 60.0 | -20.2 |
| 0.150 | 24.7 | 20.3 | 45.0 | 66.0 | -21.0 |
| 2.359 | 14.4 | 20.3 | 34.7 | 56.0 | -21.3 |
| 12.286 | 16.5 | 20.9 | 37.4 | 60.0 | -22.6 |
| 0.172 | 21.7 | 20.1 | 41.8 | 64.8 | -23.0 |
| 2.769 | 12.0 | 20.3 | 32.3 | 56.0 | -23.7 |
| 2.478 | 11.7 | 20.3 | 32.0 | 56.0 | -24.0 |
| 1.721 | 11.7 | 20.2 | 31.9 | 56.0 | -24.1 |
| 0.736 | 11.8 | 20.0 | 31.8 | 56.0 | -24.2 |
| 2.336 | 11.5 | 20.3 | 31.8 | 56.0 | -24.2 |
| 1.288 | 11.4 | 20.1 | 31.5 | 56.0 | -24.5 |
| 1.527 | 11.3 | 20.2 | 31.5 | 56.0 | -24.5 |
| 3.101 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |
| 3.232 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |
| 0.620 | 11.3 | 20.0 | 31.3 | 56.0 | -24.7 |
| 2.385 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 4.302 | 10.8 | 20.4 | 31.2 | 56.0 | -24.8 |
| 1.430 | 11.0 | 20.1 | 31.1 | 56.0 | -24.9 |
| 2.907 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 4.187 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 2.165 | 10.7 | 20.2 | 30.9 | 56.0 | -25.1 |
| 2.732 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 3.959 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 2.209 | 10.6 | 20.2 | 30.8 | 56.0 | -25.2 |
| 4.355 | 10.4 | 20.4 | 30.8 | 56.0 | -25.2 |
| 2.582 | 10.4 | 20.3 | 30.7 | 56.0 | -25.3 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.2 | 21.6 | 39.8 | 50.0 | -10.2 |
| 0.150 | 24.7 | 20.3 | 45.0 | 56.0 | -11.0 |
| 2.359 | 14.4 | 20.3 | 34.7 | 46.0 | -11.3 |
| 12.286 | 16.5 | 20.9 | 37.4 | 50.0 | -12.6 |
| 0.172 | 21.7 | 20.1 | 41.8 | 54.8 | -13.0 |
| 2.769 | 12.0 | 20.3 | 32.3 | 46.0 | -13.7 |
| 2.478 | 11.7 | 20.3 | 32.0 | 46.0 | -14.0 |
| 1.721 | 11.7 | 20.2 | 31.9 | 46.0 | -14.1 |
| 0.736 | 11.8 | 20.0 | 31.8 | 46.0 | -14.2 |
| 2.336 | 11.5 | 20.3 | 31.8 | 46.0 | -14.2 |
| 1.288 | 11.4 | 20.1 | 31.5 | 46.0 | -14.5 |
| 1.527 | 11.3 | 20.2 | 31.5 | 46.0 | -14.5 |
| 3.101 | 11.1 | 20.3 | 31.4 | 46.0 | -14.6 |
| 3.232 | 11.1 | 20.3 | 31.4 | 46.0 | -14.6 |
| 0.620 | 11.3 | 20.0 | 31.3 | 46.0 | -14.7 |
| 2.385 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 4.302 | 10.8 | 20.4 | 31.2 | 46.0 | -14.8 |
| 1.430 | 11.0 | 20.1 | 31.1 | 46.0 | -14.9 |
| 2.907 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 4.187 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 2.165 | 10.7 | 20.2 | 30.9 | 46.0 | -15.1 |
| 2.732 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 3.959 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 2.209 | 10.6 | 20.2 | 30.8 | 46.0 | -15.2 |
| 4.355 | 10.4 | 20.4 | 30.8 | 46.0 | -15.2 |
| 2.582 | 10.4 | 20.3 | 30.7 | 46.0 | -15.3 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|---------|-----------------------------|---|
| Run #: | 8 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|---------|-----------------------------|---|

COMMENTS

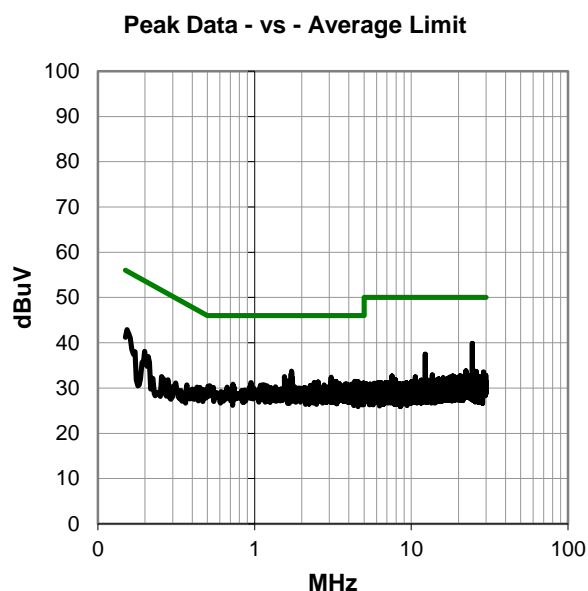
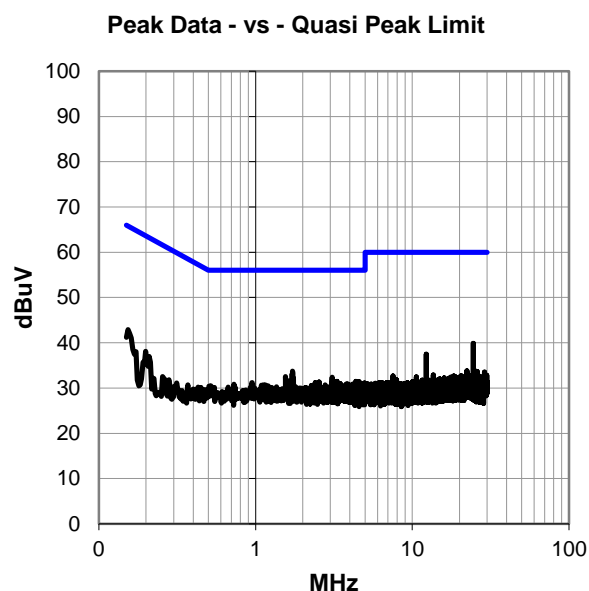
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5320 MHz Ch.18

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #8

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.3 | 21.6 | 39.9 | 60.0 | -20.1 |
| 1.724 | 13.5 | 20.2 | 33.7 | 56.0 | -22.3 |
| 12.286 | 16.6 | 20.9 | 37.5 | 60.0 | -22.5 |
| 1.713 | 12.9 | 20.2 | 33.1 | 56.0 | -22.9 |
| 0.154 | 22.6 | 20.3 | 42.9 | 65.8 | -22.9 |
| 1.553 | 12.3 | 20.2 | 32.5 | 56.0 | -23.5 |
| 3.079 | 12.1 | 20.3 | 32.4 | 56.0 | -23.6 |
| 1.739 | 12.1 | 20.2 | 32.3 | 56.0 | -23.7 |
| 1.642 | 11.4 | 20.2 | 31.6 | 56.0 | -24.4 |
| 3.310 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 4.373 | 11.1 | 20.4 | 31.5 | 56.0 | -24.5 |
| 4.575 | 11.0 | 20.4 | 31.4 | 56.0 | -24.6 |
| 2.545 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 4.552 | 10.9 | 20.4 | 31.3 | 56.0 | -24.7 |
| 0.948 | 11.1 | 20.1 | 31.2 | 56.0 | -24.8 |
| 2.403 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 4.955 | 10.7 | 20.4 | 31.1 | 56.0 | -24.9 |
| 3.467 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 4.485 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 3.836 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 2.459 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 4.194 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 4.720 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 4.866 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 3.926 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 0.728 | 10.8 | 20.0 | 30.8 | 56.0 | -25.2 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.3 | 21.6 | 39.9 | 50.0 | -10.1 |
| 1.724 | 13.5 | 20.2 | 33.7 | 46.0 | -12.3 |
| 12.286 | 16.6 | 20.9 | 37.5 | 50.0 | -12.5 |
| 1.713 | 12.9 | 20.2 | 33.1 | 46.0 | -12.9 |
| 0.154 | 22.6 | 20.3 | 42.9 | 55.8 | -12.9 |
| 1.553 | 12.3 | 20.2 | 32.5 | 46.0 | -13.5 |
| 3.079 | 12.1 | 20.3 | 32.4 | 46.0 | -13.6 |
| 1.739 | 12.1 | 20.2 | 32.3 | 46.0 | -13.7 |
| 1.642 | 11.4 | 20.2 | 31.6 | 46.0 | -14.4 |
| 3.310 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 4.373 | 11.1 | 20.4 | 31.5 | 46.0 | -14.5 |
| 4.575 | 11.0 | 20.4 | 31.4 | 46.0 | -14.6 |
| 2.545 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 4.552 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 0.948 | 11.1 | 20.1 | 31.2 | 46.0 | -14.8 |
| 2.403 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 4.955 | 10.7 | 20.4 | 31.1 | 46.0 | -14.9 |
| 3.467 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 4.485 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 3.836 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 2.459 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 4.194 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 4.720 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 4.866 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 3.926 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 0.728 | 10.8 | 20.0 | 30.8 | 46.0 | -15.2 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|-----------|-----------------------------|---|
| Run #: | 9 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|-----------|-----------------------------|---|

COMMENTS

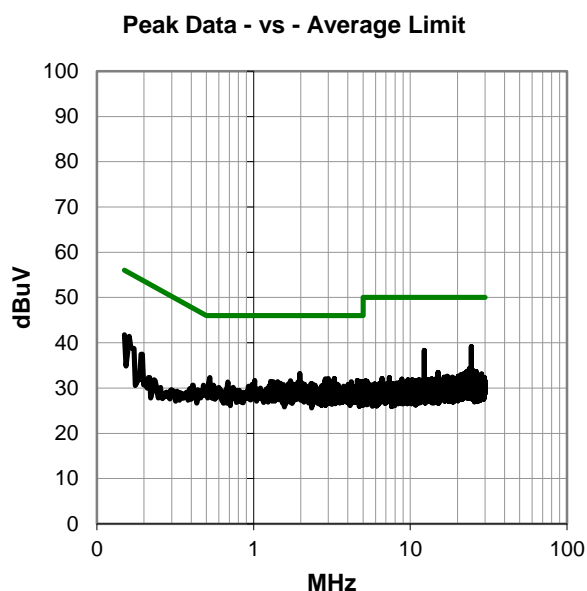
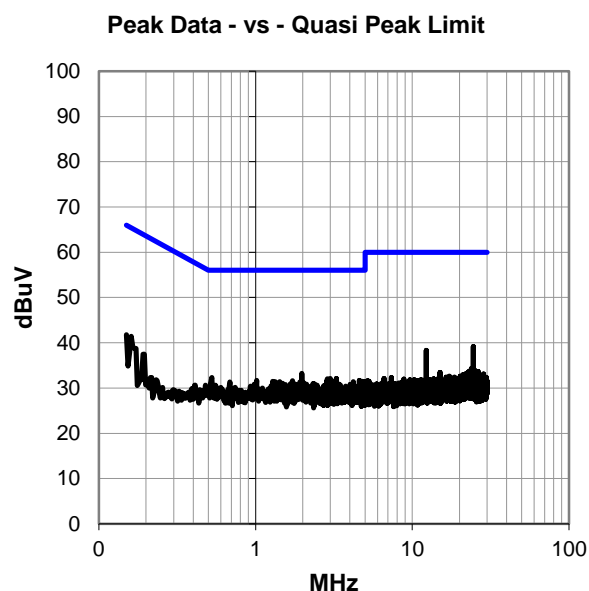
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5320 MHz Ch.18

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #9

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 17.6 | 21.6 | 39.2 | 60.0 | -20.8 |
| 12.286 | 17.4 | 20.9 | 38.3 | 60.0 | -21.7 |
| 1.971 | 13.0 | 20.2 | 33.2 | 56.0 | -22.8 |
| 0.527 | 12.3 | 20.0 | 32.3 | 56.0 | -23.7 |
| 2.993 | 11.8 | 20.3 | 32.1 | 56.0 | -23.9 |
| 3.276 | 11.8 | 20.3 | 32.1 | 56.0 | -23.9 |
| 0.161 | 21.2 | 20.2 | 41.4 | 65.4 | -24.0 |
| 2.870 | 11.7 | 20.3 | 32.0 | 56.0 | -24.0 |
| 0.150 | 21.5 | 20.3 | 41.8 | 66.0 | -24.2 |
| 1.016 | 11.6 | 20.1 | 31.7 | 56.0 | -24.3 |
| 4.601 | 11.3 | 20.4 | 31.7 | 56.0 | -24.3 |
| 1.721 | 11.4 | 20.2 | 31.6 | 56.0 | -24.4 |
| 4.802 | 11.1 | 20.4 | 31.5 | 56.0 | -24.5 |
| 1.284 | 11.4 | 20.1 | 31.5 | 56.0 | -24.5 |
| 1.426 | 11.3 | 20.1 | 31.4 | 56.0 | -24.6 |
| 2.851 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |
| 3.131 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |
| 1.336 | 11.3 | 20.1 | 31.4 | 56.0 | -24.6 |
| 4.213 | 11.0 | 20.4 | 31.4 | 56.0 | -24.6 |
| 0.684 | 11.3 | 20.0 | 31.3 | 56.0 | -24.7 |
| 1.915 | 11.1 | 20.2 | 31.3 | 56.0 | -24.7 |
| 4.937 | 10.9 | 20.4 | 31.3 | 56.0 | -24.7 |
| 2.034 | 10.9 | 20.2 | 31.1 | 56.0 | -24.9 |
| 1.486 | 10.9 | 20.2 | 31.1 | 56.0 | -24.9 |
| 1.739 | 10.8 | 20.2 | 31.0 | 56.0 | -25.0 |
| 2.362 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 17.6 | 21.6 | 39.2 | 50.0 | -10.8 |
| 12.286 | 17.4 | 20.9 | 38.3 | 50.0 | -11.7 |
| 1.971 | 13.0 | 20.2 | 33.2 | 46.0 | -12.8 |
| 0.527 | 12.3 | 20.0 | 32.3 | 46.0 | -13.7 |
| 2.993 | 11.8 | 20.3 | 32.1 | 46.0 | -13.9 |
| 3.276 | 11.8 | 20.3 | 32.1 | 46.0 | -13.9 |
| 0.161 | 21.2 | 20.2 | 41.4 | 55.4 | -14.0 |
| 2.870 | 11.7 | 20.3 | 32.0 | 46.0 | -14.0 |
| 0.150 | 21.5 | 20.3 | 41.8 | 56.0 | -14.2 |
| 1.016 | 11.6 | 20.1 | 31.7 | 46.0 | -14.3 |
| 4.601 | 11.3 | 20.4 | 31.7 | 46.0 | -14.3 |
| 1.721 | 11.4 | 20.2 | 31.6 | 46.0 | -14.4 |
| 4.802 | 11.1 | 20.4 | 31.5 | 46.0 | -14.5 |
| 1.284 | 11.4 | 20.1 | 31.5 | 46.0 | -14.5 |
| 1.426 | 11.3 | 20.1 | 31.4 | 46.0 | -14.6 |
| 2.851 | 11.1 | 20.3 | 31.4 | 46.0 | -14.6 |
| 3.131 | 11.1 | 20.3 | 31.4 | 46.0 | -14.6 |
| 1.336 | 11.3 | 20.1 | 31.4 | 46.0 | -14.6 |
| 4.213 | 11.0 | 20.4 | 31.4 | 46.0 | -14.6 |
| 0.684 | 11.3 | 20.0 | 31.3 | 46.0 | -14.7 |
| 1.915 | 11.1 | 20.2 | 31.3 | 46.0 | -14.7 |
| 4.937 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 2.034 | 10.9 | 20.2 | 31.1 | 46.0 | -14.9 |
| 1.486 | 10.9 | 20.2 | 31.1 | 46.0 | -14.9 |
| 1.739 | 10.8 | 20.2 | 31.0 | 46.0 | -15.0 |
| 2.362 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|-----------|-----------------------------|---|
| Run #: | 10 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|-----------|-----------------------------|---|

COMMENTS

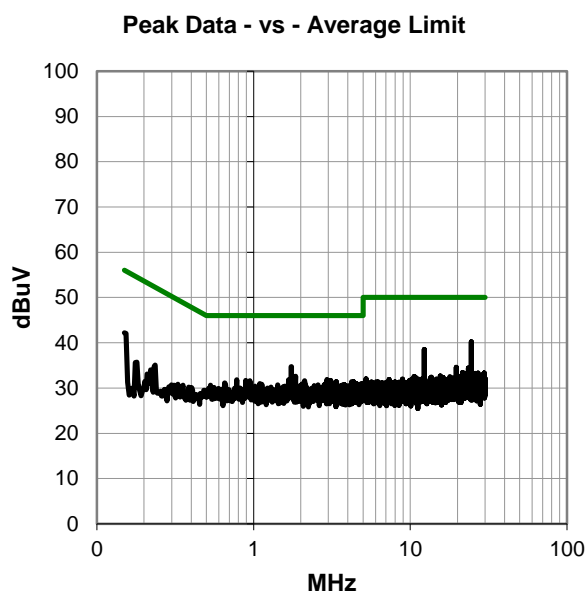
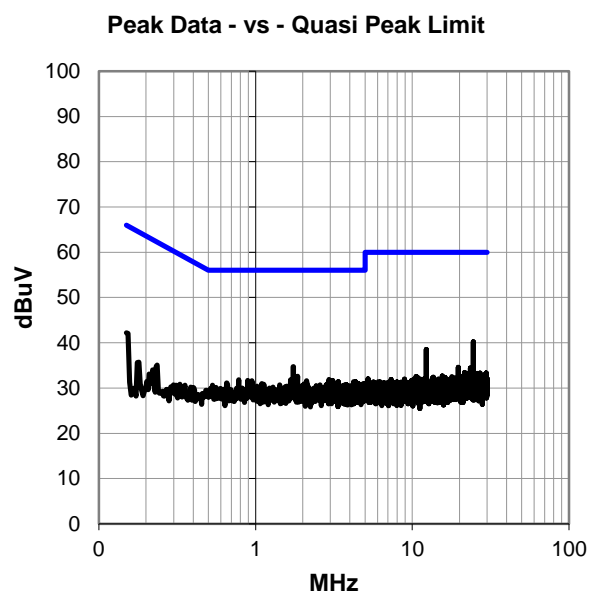
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5500 MHz Ch.19

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #10

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.6 | 21.6 | 40.2 | 60.0 | -19.8 |
| 1.739 | 14.5 | 20.2 | 34.7 | 56.0 | -21.3 |
| 12.286 | 17.6 | 20.9 | 38.5 | 60.0 | -21.5 |
| 1.855 | 12.4 | 20.2 | 32.6 | 56.0 | -23.4 |
| 1.806 | 12.3 | 20.2 | 32.5 | 56.0 | -23.5 |
| 0.150 | 21.9 | 20.3 | 42.2 | 66.0 | -23.8 |
| 2.948 | 11.6 | 20.3 | 31.9 | 56.0 | -24.1 |
| 0.781 | 11.8 | 20.0 | 31.8 | 56.0 | -24.2 |
| 1.672 | 11.6 | 20.2 | 31.8 | 56.0 | -24.2 |
| 3.097 | 11.4 | 20.3 | 31.7 | 56.0 | -24.3 |
| 0.892 | 11.6 | 20.1 | 31.7 | 56.0 | -24.3 |
| 2.112 | 11.4 | 20.2 | 31.6 | 56.0 | -24.4 |
| 0.948 | 11.5 | 20.1 | 31.6 | 56.0 | -24.4 |
| 3.370 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |
| 4.235 | 11.0 | 20.4 | 31.4 | 56.0 | -24.6 |
| 4.343 | 11.0 | 20.4 | 31.4 | 56.0 | -24.6 |
| 3.224 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 0.654 | 11.1 | 20.0 | 31.1 | 56.0 | -24.9 |
| 2.060 | 10.8 | 20.2 | 31.0 | 56.0 | -25.0 |
| 4.537 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 4.873 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 4.970 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 1.094 | 10.9 | 20.1 | 31.0 | 56.0 | -25.0 |
| 2.135 | 10.7 | 20.2 | 30.9 | 56.0 | -25.1 |
| 2.855 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 1.127 | 10.7 | 20.1 | 30.8 | 56.0 | -25.2 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.6 | 21.6 | 40.2 | 50.0 | -9.8 |
| 1.739 | 14.5 | 20.2 | 34.7 | 46.0 | -11.3 |
| 12.286 | 17.6 | 20.9 | 38.5 | 50.0 | -11.5 |
| 1.855 | 12.4 | 20.2 | 32.6 | 46.0 | -13.4 |
| 1.806 | 12.3 | 20.2 | 32.5 | 46.0 | -13.5 |
| 0.150 | 21.9 | 20.3 | 42.2 | 56.0 | -13.8 |
| 2.948 | 11.6 | 20.3 | 31.9 | 46.0 | -14.1 |
| 0.781 | 11.8 | 20.0 | 31.8 | 46.0 | -14.2 |
| 1.672 | 11.6 | 20.2 | 31.8 | 46.0 | -14.2 |
| 3.097 | 11.4 | 20.3 | 31.7 | 46.0 | -14.3 |
| 0.892 | 11.6 | 20.1 | 31.7 | 46.0 | -14.3 |
| 2.112 | 11.4 | 20.2 | 31.6 | 46.0 | -14.4 |
| 0.948 | 11.5 | 20.1 | 31.6 | 46.0 | -14.4 |
| 3.370 | 11.1 | 20.3 | 31.4 | 46.0 | -14.6 |
| 4.235 | 11.0 | 20.4 | 31.4 | 46.0 | -14.6 |
| 4.343 | 11.0 | 20.4 | 31.4 | 46.0 | -14.6 |
| 3.224 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 0.654 | 11.1 | 20.0 | 31.1 | 46.0 | -14.9 |
| 2.060 | 10.8 | 20.2 | 31.0 | 46.0 | -15.0 |
| 4.537 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 4.873 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 4.970 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 1.094 | 10.9 | 20.1 | 31.0 | 46.0 | -15.0 |
| 2.135 | 10.7 | 20.2 | 30.9 | 46.0 | -15.1 |
| 2.855 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 1.127 | 10.7 | 20.1 | 30.8 | 46.0 | -15.2 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|---------|-----------------------------|---|
| Run #: | 11 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|---------|-----------------------------|---|

COMMENTS

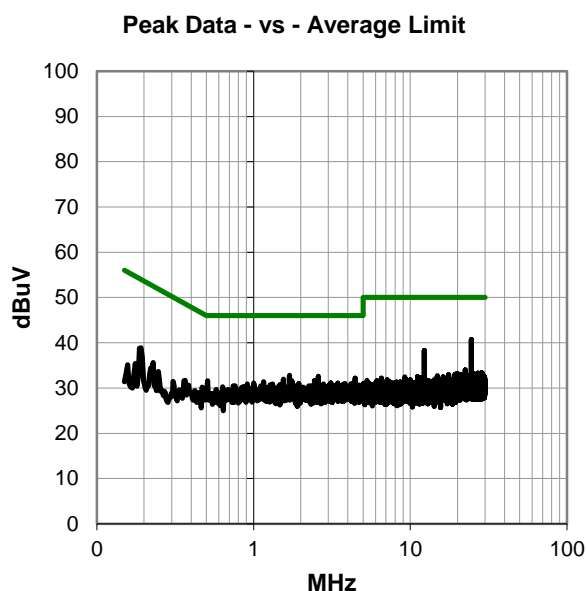
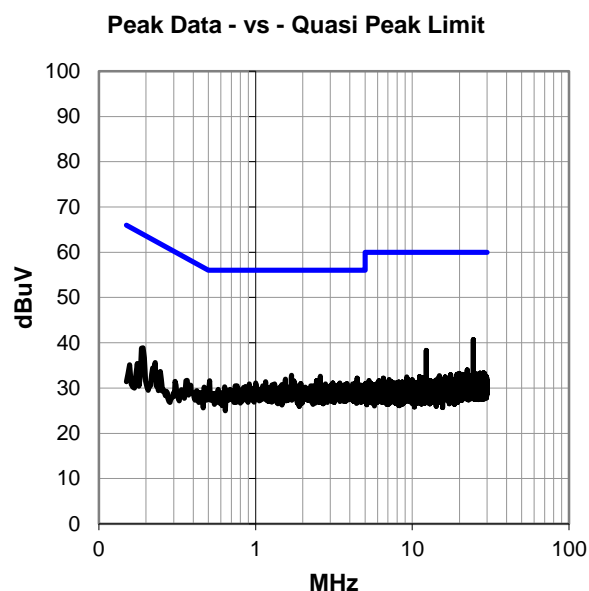
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5500 MHz Ch.19

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #11

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.1 | 21.6 | 40.7 | 60.0 | -19.3 |
| 12.286 | 17.4 | 20.9 | 38.3 | 60.0 | -21.7 |
| 1.695 | 12.6 | 20.2 | 32.8 | 56.0 | -23.2 |
| 2.586 | 12.3 | 20.3 | 32.6 | 56.0 | -23.4 |
| 4.452 | 11.8 | 20.4 | 32.2 | 56.0 | -23.8 |
| 1.549 | 11.8 | 20.2 | 32.0 | 56.0 | -24.0 |
| 2.448 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 0.508 | 11.6 | 20.0 | 31.6 | 56.0 | -24.4 |
| 1.751 | 11.4 | 20.2 | 31.6 | 56.0 | -24.4 |
| 1.157 | 11.3 | 20.1 | 31.4 | 56.0 | -24.6 |
| 1.717 | 11.1 | 20.2 | 31.3 | 56.0 | -24.7 |
| 4.470 | 10.9 | 20.4 | 31.3 | 56.0 | -24.7 |
| 3.116 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 3.459 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 1.004 | 11.0 | 20.1 | 31.1 | 56.0 | -24.9 |
| 4.340 | 10.7 | 20.4 | 31.1 | 56.0 | -24.9 |
| 1.945 | 10.8 | 20.2 | 31.0 | 56.0 | -25.0 |
| 4.306 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 3.829 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 0.191 | 18.8 | 20.1 | 38.9 | 64.0 | -25.1 |
| 2.788 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 3.437 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 0.911 | 10.8 | 20.1 | 30.9 | 56.0 | -25.1 |
| 1.325 | 10.8 | 20.1 | 30.9 | 56.0 | -25.1 |
| 4.176 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 1.471 | 10.6 | 20.1 | 30.7 | 56.0 | -25.3 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.1 | 21.6 | 40.7 | 50.0 | -9.3 |
| 12.286 | 17.4 | 20.9 | 38.3 | 50.0 | -11.7 |
| 1.695 | 12.6 | 20.2 | 32.8 | 46.0 | -13.2 |
| 2.586 | 12.3 | 20.3 | 32.6 | 46.0 | -13.4 |
| 4.452 | 11.8 | 20.4 | 32.2 | 46.0 | -13.8 |
| 1.549 | 11.8 | 20.2 | 32.0 | 46.0 | -14.0 |
| 2.448 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 0.508 | 11.6 | 20.0 | 31.6 | 46.0 | -14.4 |
| 1.751 | 11.4 | 20.2 | 31.6 | 46.0 | -14.4 |
| 1.157 | 11.3 | 20.1 | 31.4 | 46.0 | -14.6 |
| 1.717 | 11.1 | 20.2 | 31.3 | 46.0 | -14.7 |
| 4.470 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 3.116 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 3.459 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 1.004 | 11.0 | 20.1 | 31.1 | 46.0 | -14.9 |
| 4.340 | 10.7 | 20.4 | 31.1 | 46.0 | -14.9 |
| 1.945 | 10.8 | 20.2 | 31.0 | 46.0 | -15.0 |
| 4.306 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 3.829 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 0.191 | 18.8 | 20.1 | 38.9 | 54.0 | -15.1 |
| 2.788 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 3.437 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 0.911 | 10.8 | 20.1 | 30.9 | 46.0 | -15.1 |
| 1.325 | 10.8 | 20.1 | 30.9 | 46.0 | -15.1 |
| 4.176 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 1.471 | 10.6 | 20.1 | 30.7 | 46.0 | -15.3 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|---------|-----------------------------|---|
| Run #: | 12 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|---------|-----------------------------|---|

COMMENTS

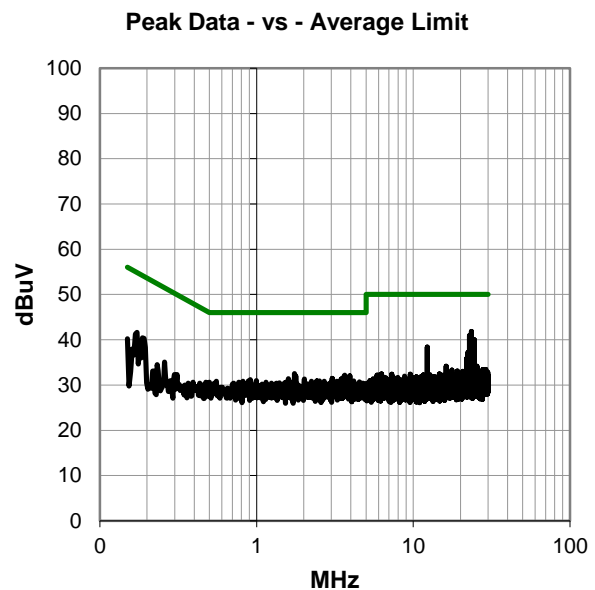
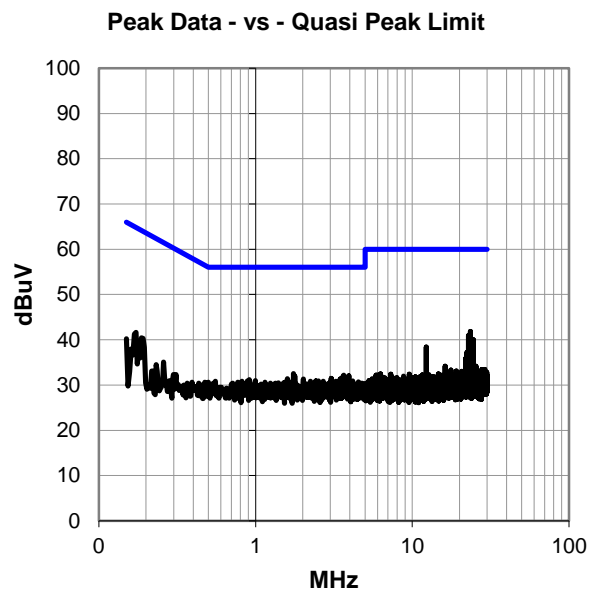
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5580 MHz Ch.23

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #12

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 23.516 | 20.3 | 21.5 | 41.8 | 60.0 | -18.2 |
| 22.826 | 19.5 | 21.5 | 41.0 | 60.0 | -19.0 |
| 24.575 | 18.4 | 21.6 | 40.0 | 60.0 | -20.0 |
| 23.747 | 18.3 | 21.5 | 39.8 | 60.0 | -20.2 |
| 23.050 | 17.1 | 21.5 | 38.6 | 60.0 | -21.4 |
| 12.286 | 17.5 | 20.9 | 38.4 | 60.0 | -21.6 |
| 23.986 | 16.5 | 21.5 | 38.0 | 60.0 | -22.0 |
| 22.371 | 15.8 | 21.4 | 37.2 | 60.0 | -22.8 |
| 0.172 | 21.5 | 20.1 | 41.6 | 64.8 | -23.2 |
| 1.747 | 12.3 | 20.2 | 32.5 | 56.0 | -23.5 |
| 0.187 | 20.3 | 20.1 | 40.4 | 64.2 | -23.8 |
| 3.661 | 11.9 | 20.3 | 32.2 | 56.0 | -23.8 |
| 3.937 | 11.7 | 20.4 | 32.1 | 56.0 | -23.9 |
| 1.777 | 11.8 | 20.2 | 32.0 | 56.0 | -24.0 |
| 21.930 | 14.5 | 21.4 | 35.9 | 60.0 | -24.1 |
| 3.594 | 11.5 | 20.3 | 31.8 | 56.0 | -24.2 |
| 3.038 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 1.598 | 11.2 | 20.2 | 31.4 | 56.0 | -24.6 |
| 2.015 | 11.1 | 20.2 | 31.3 | 56.0 | -24.7 |
| 3.467 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 3.530 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 0.911 | 11.1 | 20.1 | 31.2 | 56.0 | -24.8 |
| 0.997 | 10.9 | 20.1 | 31.0 | 56.0 | -25.0 |
| 2.426 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 2.515 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 4.176 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 23.516 | 20.3 | 21.5 | 41.8 | 50.0 | -8.2 |
| 22.826 | 19.5 | 21.5 | 41.0 | 50.0 | -9.0 |
| 24.575 | 18.4 | 21.6 | 40.0 | 50.0 | -10.0 |
| 23.747 | 18.3 | 21.5 | 39.8 | 50.0 | -10.2 |
| 23.050 | 17.1 | 21.5 | 38.6 | 50.0 | -11.4 |
| 12.286 | 17.5 | 20.9 | 38.4 | 50.0 | -11.6 |
| 23.986 | 16.5 | 21.5 | 38.0 | 50.0 | -12.0 |
| 22.371 | 15.8 | 21.4 | 37.2 | 50.0 | -12.8 |
| 0.172 | 21.5 | 20.1 | 41.6 | 54.8 | -13.2 |
| 1.747 | 12.3 | 20.2 | 32.5 | 46.0 | -13.5 |
| 0.187 | 20.3 | 20.1 | 40.4 | 54.2 | -13.8 |
| 3.661 | 11.9 | 20.3 | 32.2 | 46.0 | -13.8 |
| 3.937 | 11.7 | 20.4 | 32.1 | 46.0 | -13.9 |
| 1.777 | 11.8 | 20.2 | 32.0 | 46.0 | -14.0 |
| 21.930 | 14.5 | 21.4 | 35.9 | 50.0 | -14.1 |
| 3.594 | 11.5 | 20.3 | 31.8 | 46.0 | -14.2 |
| 3.038 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 1.598 | 11.2 | 20.2 | 31.4 | 46.0 | -14.6 |
| 2.015 | 11.1 | 20.2 | 31.3 | 46.0 | -14.7 |
| 3.467 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 3.530 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 0.911 | 11.1 | 20.1 | 31.2 | 46.0 | -14.8 |
| 0.997 | 10.9 | 20.1 | 31.0 | 46.0 | -15.0 |
| 2.426 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 2.515 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 4.176 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|-----------|-----------------------------|---|
| Run #: | 13 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|-----------|-----------------------------|---|

COMMENTS

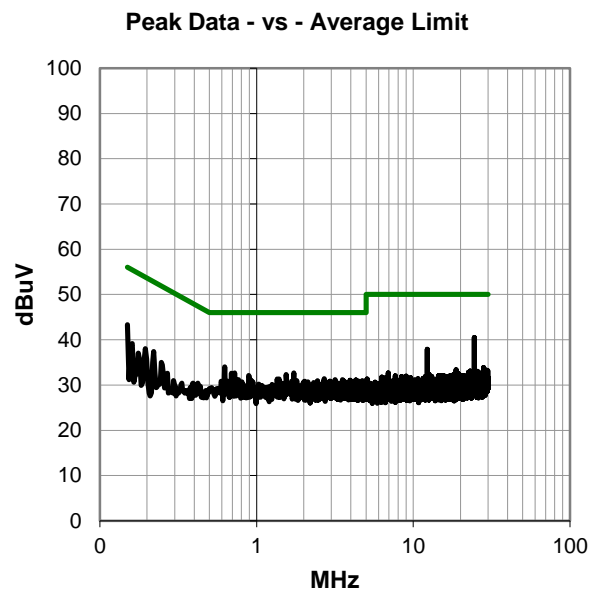
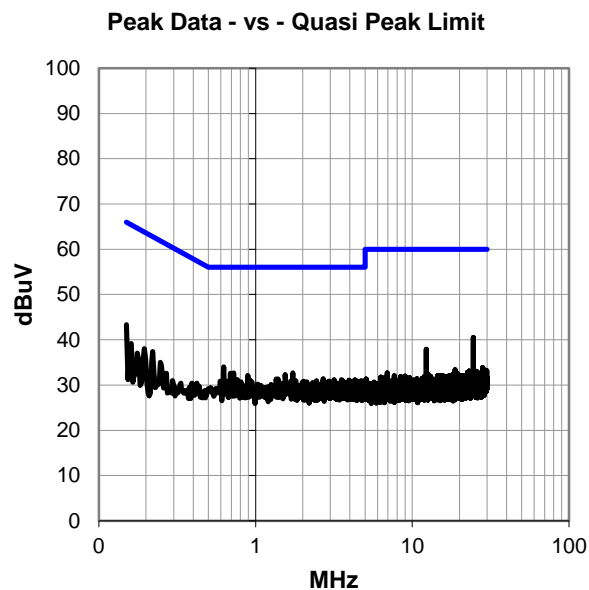
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5580 MHz Ch.23

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #13

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.9 | 21.6 | 40.5 | 60.0 | -19.5 |
| 0.628 | 14.0 | 20.0 | 34.0 | 56.0 | -22.0 |
| 12.286 | 17.0 | 20.9 | 37.9 | 60.0 | -22.1 |
| 0.150 | 23.0 | 20.3 | 43.3 | 66.0 | -22.7 |
| 0.725 | 12.7 | 20.0 | 32.7 | 56.0 | -23.3 |
| 1.728 | 12.5 | 20.2 | 32.7 | 56.0 | -23.3 |
| 0.691 | 12.6 | 20.0 | 32.6 | 56.0 | -23.4 |
| 1.545 | 12.1 | 20.2 | 32.3 | 56.0 | -23.7 |
| 0.892 | 12.0 | 20.1 | 32.1 | 56.0 | -23.9 |
| 2.698 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |
| 1.392 | 11.2 | 20.1 | 31.3 | 56.0 | -24.7 |
| 1.355 | 11.2 | 20.1 | 31.3 | 56.0 | -24.7 |
| 0.766 | 11.2 | 20.0 | 31.2 | 56.0 | -24.8 |
| 3.168 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 3.541 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 0.922 | 11.0 | 20.1 | 31.1 | 56.0 | -24.9 |
| 4.306 | 10.7 | 20.4 | 31.1 | 56.0 | -24.9 |
| 3.955 | 10.7 | 20.4 | 31.1 | 56.0 | -24.9 |
| 1.806 | 10.8 | 20.2 | 31.0 | 56.0 | -25.0 |
| 4.739 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 2.452 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 3.601 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 0.594 | 10.8 | 20.0 | 30.8 | 56.0 | -25.2 |
| 2.030 | 10.6 | 20.2 | 30.8 | 56.0 | -25.2 |
| 2.941 | 10.5 | 20.3 | 30.8 | 56.0 | -25.2 |
| 4.228 | 10.4 | 20.4 | 30.8 | 56.0 | -25.2 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.9 | 21.6 | 40.5 | 50.0 | -9.5 |
| 0.628 | 14.0 | 20.0 | 34.0 | 46.0 | -12.0 |
| 12.286 | 17.0 | 20.9 | 37.9 | 50.0 | -12.1 |
| 0.150 | 23.0 | 20.3 | 43.3 | 56.0 | -12.7 |
| 0.725 | 12.7 | 20.0 | 32.7 | 46.0 | -13.3 |
| 1.728 | 12.5 | 20.2 | 32.7 | 46.0 | -13.3 |
| 0.691 | 12.6 | 20.0 | 32.6 | 46.0 | -13.4 |
| 1.545 | 12.1 | 20.2 | 32.3 | 46.0 | -13.7 |
| 0.892 | 12.0 | 20.1 | 32.1 | 46.0 | -13.9 |
| 2.698 | 11.1 | 20.3 | 31.4 | 46.0 | -14.6 |
| 1.392 | 11.2 | 20.1 | 31.3 | 46.0 | -14.7 |
| 1.355 | 11.2 | 20.1 | 31.3 | 46.0 | -14.7 |
| 0.766 | 11.2 | 20.0 | 31.2 | 46.0 | -14.8 |
| 3.168 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 3.541 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 0.922 | 11.0 | 20.1 | 31.1 | 46.0 | -14.9 |
| 4.306 | 10.7 | 20.4 | 31.1 | 46.0 | -14.9 |
| 3.955 | 10.7 | 20.4 | 31.1 | 46.0 | -14.9 |
| 1.806 | 10.8 | 20.2 | 31.0 | 46.0 | -15.0 |
| 4.739 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 2.452 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 3.601 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 0.594 | 10.8 | 20.0 | 30.8 | 46.0 | -15.2 |
| 2.030 | 10.6 | 20.2 | 30.8 | 46.0 | -15.2 |
| 2.941 | 10.5 | 20.3 | 30.8 | 46.0 | -15.2 |
| 4.228 | 10.4 | 20.4 | 30.8 | 46.0 | -15.2 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|-----------|-----------------------------|---|
| Run #: | 14 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|-----------|-----------------------------|---|

COMMENTS

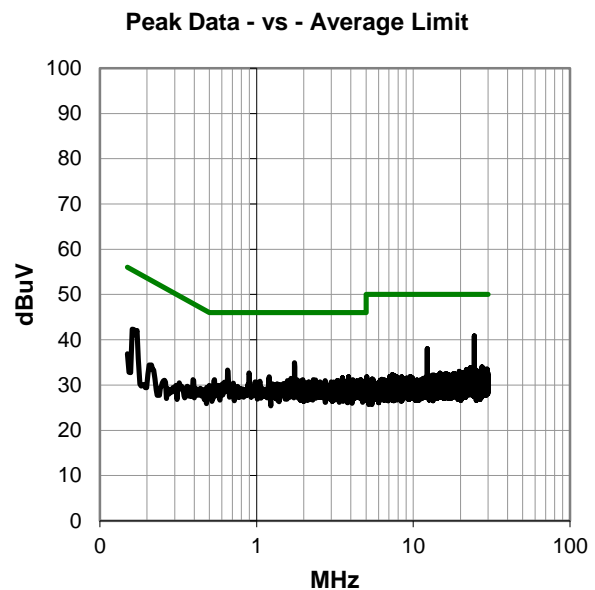
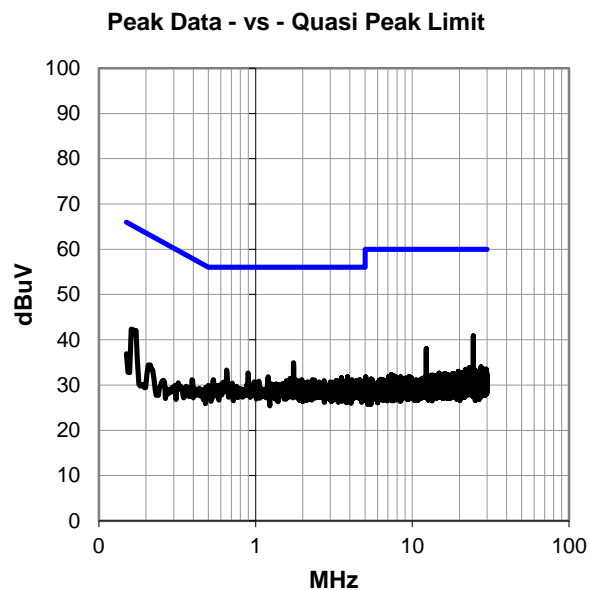
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5700 MHz Ch.29

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #14

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.3 | 21.6 | 40.9 | 60.0 | -19.1 |
| 1.747 | 14.7 | 20.2 | 34.9 | 56.0 | -21.1 |
| 12.286 | 17.1 | 20.9 | 38.0 | 60.0 | -22.0 |
| 0.654 | 13.3 | 20.0 | 33.3 | 56.0 | -22.7 |
| 0.161 | 22.1 | 20.2 | 42.3 | 65.4 | -23.1 |
| 0.896 | 12.6 | 20.1 | 32.7 | 56.0 | -23.3 |
| 3.866 | 11.5 | 20.4 | 31.9 | 56.0 | -24.1 |
| 1.202 | 11.7 | 20.1 | 31.8 | 56.0 | -24.2 |
| 3.530 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 1.661 | 11.3 | 20.2 | 31.5 | 56.0 | -24.5 |
| 0.538 | 11.2 | 20.0 | 31.2 | 56.0 | -24.8 |
| 1.971 | 11.0 | 20.2 | 31.2 | 56.0 | -24.8 |
| 4.116 | 10.8 | 20.4 | 31.2 | 56.0 | -24.8 |
| 4.608 | 10.8 | 20.4 | 31.2 | 56.0 | -24.8 |
| 2.306 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 1.821 | 10.9 | 20.2 | 31.1 | 56.0 | -24.9 |
| 4.646 | 10.7 | 20.4 | 31.1 | 56.0 | -24.9 |
| 2.377 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 1.571 | 10.8 | 20.2 | 31.0 | 56.0 | -25.0 |
| 2.735 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 3.276 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 3.582 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 4.138 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 4.981 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 3.773 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 3.414 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 19.3 | 21.6 | 40.9 | 50.0 | -9.1 |
| 1.747 | 14.7 | 20.2 | 34.9 | 46.0 | -11.1 |
| 12.286 | 17.1 | 20.9 | 38.0 | 50.0 | -12.0 |
| 0.654 | 13.3 | 20.0 | 33.3 | 46.0 | -12.7 |
| 0.161 | 22.1 | 20.2 | 42.3 | 55.4 | -13.1 |
| 0.896 | 12.6 | 20.1 | 32.7 | 46.0 | -13.3 |
| 3.866 | 11.5 | 20.4 | 31.9 | 46.0 | -14.1 |
| 1.202 | 11.7 | 20.1 | 31.8 | 46.0 | -14.2 |
| 3.530 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 1.661 | 11.3 | 20.2 | 31.5 | 46.0 | -14.5 |
| 0.538 | 11.2 | 20.0 | 31.2 | 46.0 | -14.8 |
| 1.971 | 11.0 | 20.2 | 31.2 | 46.0 | -14.8 |
| 4.116 | 10.8 | 20.4 | 31.2 | 46.0 | -14.8 |
| 4.608 | 10.8 | 20.4 | 31.2 | 46.0 | -14.8 |
| 2.306 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 1.821 | 10.9 | 20.2 | 31.1 | 46.0 | -14.9 |
| 4.646 | 10.7 | 20.4 | 31.1 | 46.0 | -14.9 |
| 2.377 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 1.571 | 10.8 | 20.2 | 31.0 | 46.0 | -15.0 |
| 2.735 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 3.276 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 3.582 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 4.138 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 4.981 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 3.773 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 3.414 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|---------|-----------------------------|---|
| Run #: | 15 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|---------|-----------------------------|---|

COMMENTS

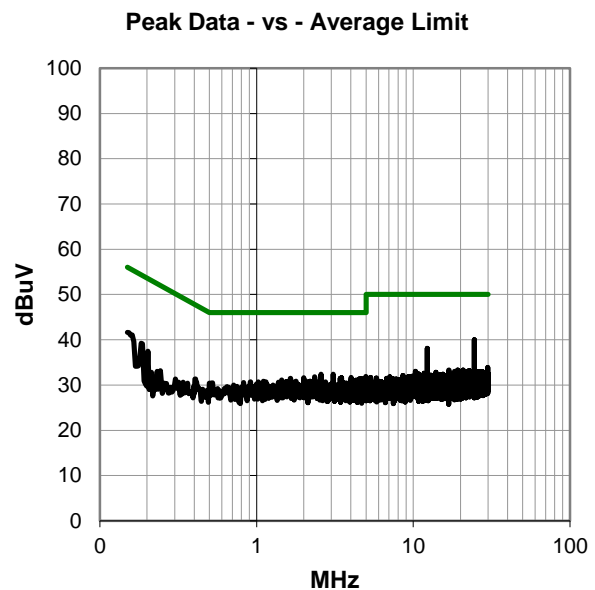
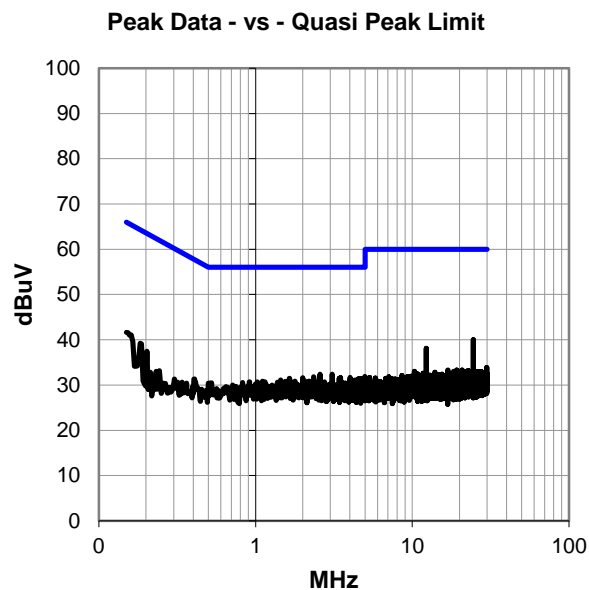
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5700 MHz Ch.29

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #15

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.4 | 21.6 | 40.0 | 60.0 | -20.0 |
| 12.286 | 17.2 | 20.9 | 38.1 | 60.0 | -21.9 |
| 2.582 | 12.1 | 20.3 | 32.4 | 56.0 | -23.6 |
| 3.090 | 12.1 | 20.3 | 32.4 | 56.0 | -23.6 |
| 4.974 | 11.5 | 20.4 | 31.9 | 56.0 | -24.1 |
| 2.351 | 11.5 | 20.3 | 31.8 | 56.0 | -24.2 |
| 4.023 | 11.3 | 20.4 | 31.7 | 56.0 | -24.3 |
| 3.482 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 1.997 | 11.4 | 20.2 | 31.6 | 56.0 | -24.4 |
| 0.150 | 21.3 | 20.3 | 41.6 | 66.0 | -24.4 |
| 1.642 | 11.3 | 20.2 | 31.5 | 56.0 | -24.5 |
| 3.422 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 4.672 | 11.0 | 20.4 | 31.4 | 56.0 | -24.6 |
| 4.511 | 10.9 | 20.4 | 31.3 | 56.0 | -24.7 |
| 1.445 | 11.0 | 20.1 | 31.1 | 56.0 | -24.9 |
| 4.317 | 10.7 | 20.4 | 31.1 | 56.0 | -24.9 |
| 2.541 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 4.828 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 4.948 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 3.993 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 0.184 | 19.1 | 20.1 | 39.2 | 64.3 | -25.1 |
| 2.198 | 10.6 | 20.2 | 30.8 | 56.0 | -25.2 |
| 1.672 | 10.6 | 20.2 | 30.8 | 56.0 | -25.2 |
| 1.780 | 10.6 | 20.2 | 30.8 | 56.0 | -25.2 |
| 2.075 | 10.6 | 20.2 | 30.8 | 56.0 | -25.2 |
| 1.105 | 10.7 | 20.1 | 30.8 | 56.0 | -25.2 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.4 | 21.6 | 40.0 | 50.0 | -10.0 |
| 12.286 | 17.2 | 20.9 | 38.1 | 50.0 | -11.9 |
| 2.582 | 12.1 | 20.3 | 32.4 | 46.0 | -13.6 |
| 3.090 | 12.1 | 20.3 | 32.4 | 46.0 | -13.6 |
| 4.974 | 11.5 | 20.4 | 31.9 | 46.0 | -14.1 |
| 2.351 | 11.5 | 20.3 | 31.8 | 46.0 | -14.2 |
| 4.023 | 11.3 | 20.4 | 31.7 | 46.0 | -14.3 |
| 3.482 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 1.997 | 11.4 | 20.2 | 31.6 | 46.0 | -14.4 |
| 0.150 | 21.3 | 20.3 | 41.6 | 56.0 | -14.4 |
| 1.642 | 11.3 | 20.2 | 31.5 | 46.0 | -14.5 |
| 3.422 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 4.672 | 11.0 | 20.4 | 31.4 | 46.0 | -14.6 |
| 4.511 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 1.445 | 11.0 | 20.1 | 31.1 | 46.0 | -14.9 |
| 4.317 | 10.7 | 20.4 | 31.1 | 46.0 | -14.9 |
| 2.541 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 4.828 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 4.948 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 3.993 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 0.184 | 19.1 | 20.1 | 39.2 | 54.3 | -15.1 |
| 2.198 | 10.6 | 20.2 | 30.8 | 46.0 | -15.2 |
| 1.672 | 10.6 | 20.2 | 30.8 | 46.0 | -15.2 |
| 1.780 | 10.6 | 20.2 | 30.8 | 46.0 | -15.2 |
| 2.075 | 10.6 | 20.2 | 30.8 | 46.0 | -15.2 |
| 1.105 | 10.7 | 20.1 | 30.8 | 46.0 | -15.2 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|---------|-----------------------------|---|
| Run #: | 16 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|---------|-----------------------------|---|

COMMENTS

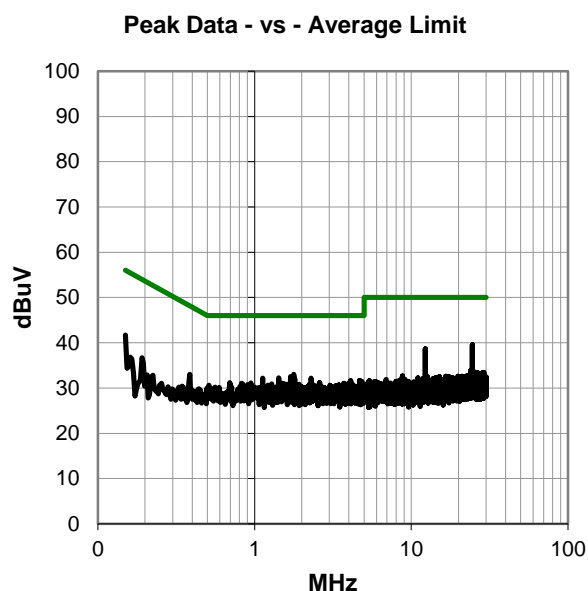
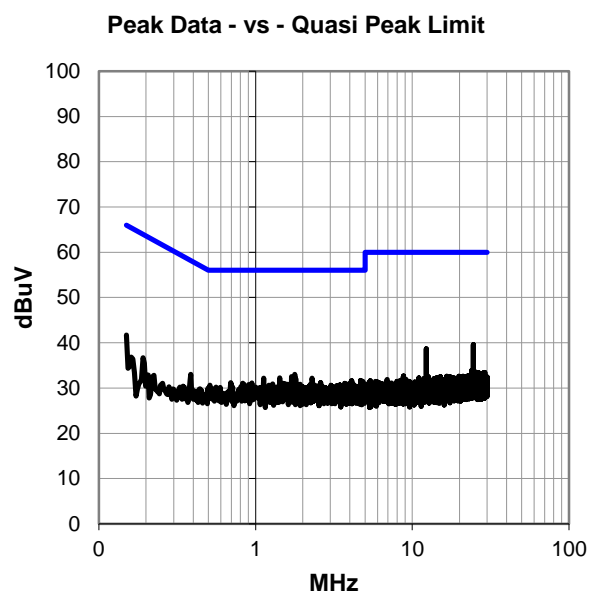
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5745 MHz Ch.30

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #16

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.0 | 21.6 | 39.6 | 60.0 | -20.4 |
| 12.290 | 17.8 | 20.9 | 38.7 | 60.0 | -21.3 |
| 1.780 | 12.8 | 20.2 | 33.0 | 56.0 | -23.0 |
| 1.695 | 12.3 | 20.2 | 32.5 | 56.0 | -23.5 |
| 1.426 | 12.1 | 20.1 | 32.2 | 56.0 | -23.8 |
| 1.127 | 12.1 | 20.1 | 32.2 | 56.0 | -23.8 |
| 2.295 | 11.9 | 20.3 | 32.2 | 56.0 | -23.8 |
| 1.806 | 11.9 | 20.2 | 32.1 | 56.0 | -23.9 |
| 4.690 | 11.3 | 20.4 | 31.7 | 56.0 | -24.3 |
| 0.150 | 21.4 | 20.3 | 41.7 | 66.0 | -24.3 |
| 4.108 | 11.2 | 20.4 | 31.6 | 56.0 | -24.4 |
| 4.855 | 11.1 | 20.4 | 31.5 | 56.0 | -24.5 |
| 4.067 | 11.0 | 20.4 | 31.4 | 56.0 | -24.6 |
| 0.695 | 11.2 | 20.0 | 31.2 | 56.0 | -24.8 |
| 2.605 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 0.948 | 11.0 | 20.1 | 31.1 | 56.0 | -24.9 |
| 1.497 | 10.9 | 20.2 | 31.1 | 56.0 | -24.9 |
| 0.829 | 11.0 | 20.0 | 31.0 | 56.0 | -25.0 |
| 3.698 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 1.534 | 10.8 | 20.2 | 31.0 | 56.0 | -25.0 |
| 3.724 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 1.288 | 10.8 | 20.1 | 30.9 | 56.0 | -25.1 |
| 4.190 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 3.974 | 10.5 | 20.4 | 30.9 | 56.0 | -25.1 |
| 3.832 | 10.5 | 20.3 | 30.8 | 56.0 | -25.2 |
| 0.385 | 13.0 | 20.0 | 33.0 | 58.2 | -25.2 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.0 | 21.6 | 39.6 | 50.0 | -10.4 |
| 12.290 | 17.8 | 20.9 | 38.7 | 50.0 | -11.3 |
| 1.780 | 12.8 | 20.2 | 33.0 | 46.0 | -13.0 |
| 1.695 | 12.3 | 20.2 | 32.5 | 46.0 | -13.5 |
| 1.426 | 12.1 | 20.1 | 32.2 | 46.0 | -13.8 |
| 1.127 | 12.1 | 20.1 | 32.2 | 46.0 | -13.8 |
| 2.295 | 11.9 | 20.3 | 32.2 | 46.0 | -13.8 |
| 1.806 | 11.9 | 20.2 | 32.1 | 46.0 | -13.9 |
| 4.690 | 11.3 | 20.4 | 31.7 | 46.0 | -14.3 |
| 0.150 | 21.4 | 20.3 | 41.7 | 56.0 | -14.3 |
| 4.108 | 11.2 | 20.4 | 31.6 | 46.0 | -14.4 |
| 4.855 | 11.1 | 20.4 | 31.5 | 46.0 | -14.5 |
| 4.067 | 11.0 | 20.4 | 31.4 | 46.0 | -14.6 |
| 0.695 | 11.2 | 20.0 | 31.2 | 46.0 | -14.8 |
| 2.605 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 0.948 | 11.0 | 20.1 | 31.1 | 46.0 | -14.9 |
| 1.497 | 10.9 | 20.2 | 31.1 | 46.0 | -14.9 |
| 0.829 | 11.0 | 20.0 | 31.0 | 46.0 | -15.0 |
| 3.698 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 1.534 | 10.8 | 20.2 | 31.0 | 46.0 | -15.0 |
| 3.724 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 1.288 | 10.8 | 20.1 | 30.9 | 46.0 | -15.1 |
| 4.190 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 3.974 | 10.5 | 20.4 | 30.9 | 46.0 | -15.1 |
| 3.832 | 10.5 | 20.3 | 30.8 | 46.0 | -15.2 |
| 0.385 | 13.0 | 20.0 | 33.0 | 48.2 | -15.2 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|-----------|-----------------------------|---|
| Run #: | 17 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|-----------|-----------------------------|---|

COMMENTS

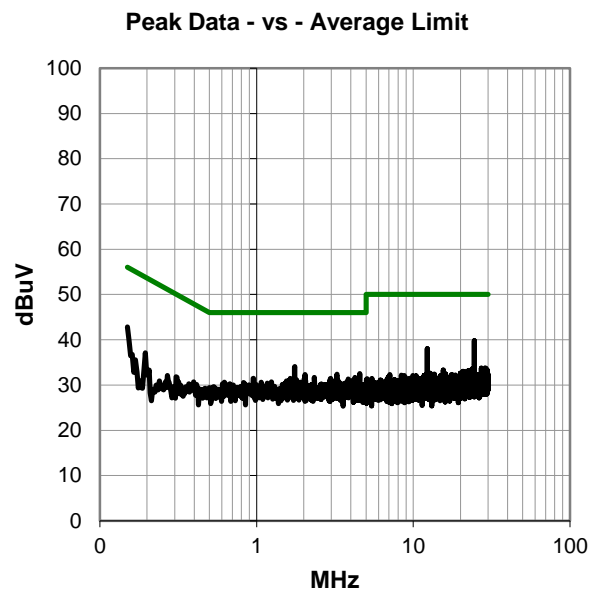
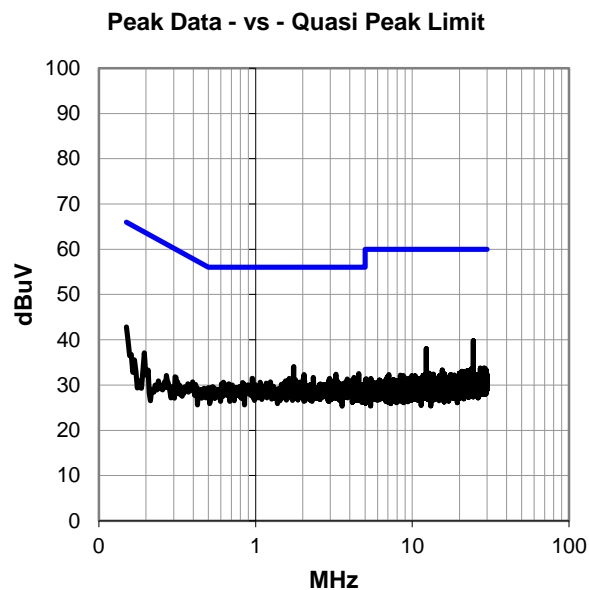
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5745 MHz Ch.30

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #17

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.2 | 21.6 | 39.8 | 60.0 | -20.2 |
| 1.751 | 13.9 | 20.2 | 34.1 | 56.0 | -21.9 |
| 12.286 | 17.1 | 20.9 | 38.0 | 60.0 | -22.0 |
| 0.150 | 22.5 | 20.3 | 42.8 | 66.0 | -23.2 |
| 4.549 | 12.1 | 20.4 | 32.5 | 56.0 | -23.5 |
| 3.258 | 12.1 | 20.3 | 32.4 | 56.0 | -23.6 |
| 2.042 | 12.1 | 20.2 | 32.3 | 56.0 | -23.7 |
| 4.250 | 11.3 | 20.4 | 31.7 | 56.0 | -24.3 |
| 2.340 | 11.4 | 20.3 | 31.7 | 56.0 | -24.3 |
| 1.642 | 11.3 | 20.2 | 31.5 | 56.0 | -24.5 |
| 2.015 | 11.3 | 20.2 | 31.5 | 56.0 | -24.5 |
| 2.967 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 0.952 | 11.4 | 20.1 | 31.5 | 56.0 | -24.5 |
| 3.840 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 2.948 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 1.806 | 10.9 | 20.2 | 31.1 | 56.0 | -24.9 |
| 4.470 | 10.7 | 20.4 | 31.1 | 56.0 | -24.9 |
| 4.041 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 3.317 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 1.549 | 10.7 | 20.2 | 30.9 | 56.0 | -25.1 |
| 3.105 | 10.5 | 20.3 | 30.8 | 56.0 | -25.2 |
| 3.877 | 10.4 | 20.4 | 30.8 | 56.0 | -25.2 |
| 1.247 | 10.6 | 20.1 | 30.7 | 56.0 | -25.3 |
| 3.926 | 10.3 | 20.4 | 30.7 | 56.0 | -25.3 |
| 0.624 | 10.6 | 20.0 | 30.6 | 56.0 | -25.4 |
| 1.072 | 10.5 | 20.1 | 30.6 | 56.0 | -25.4 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.2 | 21.6 | 39.8 | 50.0 | -10.2 |
| 1.751 | 13.9 | 20.2 | 34.1 | 46.0 | -11.9 |
| 12.286 | 17.1 | 20.9 | 38.0 | 50.0 | -12.0 |
| 0.150 | 22.5 | 20.3 | 42.8 | 56.0 | -13.2 |
| 4.549 | 12.1 | 20.4 | 32.5 | 46.0 | -13.5 |
| 3.258 | 12.1 | 20.3 | 32.4 | 46.0 | -13.6 |
| 2.042 | 12.1 | 20.2 | 32.3 | 46.0 | -13.7 |
| 4.250 | 11.3 | 20.4 | 31.7 | 46.0 | -14.3 |
| 2.340 | 11.4 | 20.3 | 31.7 | 46.0 | -14.3 |
| 1.642 | 11.3 | 20.2 | 31.5 | 46.0 | -14.5 |
| 2.015 | 11.3 | 20.2 | 31.5 | 46.0 | -14.5 |
| 2.967 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 0.952 | 11.4 | 20.1 | 31.5 | 46.0 | -14.5 |
| 3.840 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 2.948 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 1.806 | 10.9 | 20.2 | 31.1 | 46.0 | -14.9 |
| 4.470 | 10.7 | 20.4 | 31.1 | 46.0 | -14.9 |
| 4.041 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 3.317 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 1.549 | 10.7 | 20.2 | 30.9 | 46.0 | -15.1 |
| 3.105 | 10.5 | 20.3 | 30.8 | 46.0 | -15.2 |
| 3.877 | 10.4 | 20.4 | 30.8 | 46.0 | -15.2 |
| 1.247 | 10.6 | 20.1 | 30.7 | 46.0 | -15.3 |
| 3.926 | 10.3 | 20.4 | 30.7 | 46.0 | -15.3 |
| 0.624 | 10.6 | 20.0 | 30.6 | 46.0 | -15.4 |
| 1.072 | 10.5 | 20.1 | 30.6 | 46.0 | -15.4 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|-----------|-----------------------------|---|
| Run #: | 18 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|-----------|-----------------------------|---|

COMMENTS

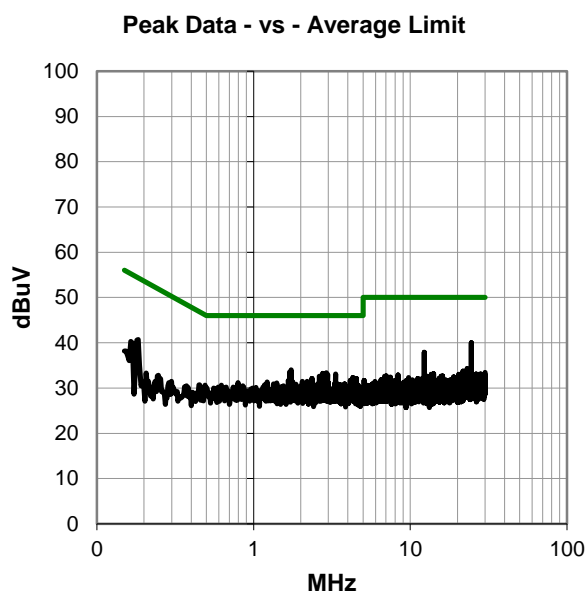
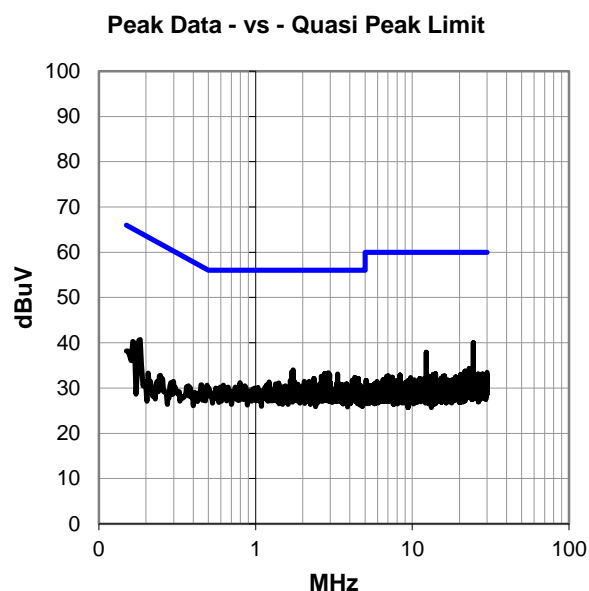
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5785 MHz Ch.32

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #18

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.4 | 21.6 | 40.0 | 60.0 | -20.0 |
| 1.736 | 13.8 | 20.2 | 34.0 | 56.0 | -22.0 |
| 12.286 | 17.0 | 20.9 | 37.9 | 60.0 | -22.1 |
| 1.698 | 13.3 | 20.2 | 33.5 | 56.0 | -22.5 |
| 2.911 | 13.1 | 20.3 | 33.4 | 56.0 | -22.6 |
| 2.765 | 12.9 | 20.3 | 33.2 | 56.0 | -22.8 |
| 3.336 | 12.8 | 20.3 | 33.1 | 56.0 | -22.9 |
| 2.967 | 12.7 | 20.3 | 33.0 | 56.0 | -23.0 |
| 2.631 | 12.3 | 20.3 | 32.6 | 56.0 | -23.4 |
| 0.184 | 20.6 | 20.1 | 40.7 | 64.3 | -23.6 |
| 4.310 | 11.9 | 20.4 | 32.3 | 56.0 | -23.7 |
| 4.534 | 11.7 | 20.4 | 32.1 | 56.0 | -23.9 |
| 2.359 | 11.8 | 20.3 | 32.1 | 56.0 | -23.9 |
| 1.758 | 11.5 | 20.2 | 31.7 | 56.0 | -24.3 |
| 2.821 | 11.4 | 20.3 | 31.7 | 56.0 | -24.3 |
| 4.149 | 11.3 | 20.4 | 31.7 | 56.0 | -24.3 |
| 1.668 | 11.4 | 20.2 | 31.6 | 56.0 | -24.4 |
| 2.049 | 11.3 | 20.2 | 31.5 | 56.0 | -24.5 |
| 2.202 | 11.2 | 20.2 | 31.4 | 56.0 | -24.6 |
| 1.773 | 11.1 | 20.2 | 31.3 | 56.0 | -24.7 |
| 1.221 | 11.2 | 20.1 | 31.3 | 56.0 | -24.7 |
| 0.795 | 11.2 | 20.0 | 31.2 | 56.0 | -24.8 |
| 1.404 | 11.0 | 20.1 | 31.1 | 56.0 | -24.9 |
| 0.165 | 20.1 | 20.2 | 40.3 | 65.2 | -24.9 |
| 2.224 | 10.8 | 20.2 | 31.0 | 56.0 | -25.0 |
| 4.246 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.4 | 21.6 | 40.0 | 50.0 | -10.0 |
| 1.736 | 13.8 | 20.2 | 34.0 | 46.0 | -12.0 |
| 12.286 | 17.0 | 20.9 | 37.9 | 50.0 | -12.1 |
| 1.698 | 13.3 | 20.2 | 33.5 | 46.0 | -12.5 |
| 2.911 | 13.1 | 20.3 | 33.4 | 46.0 | -12.6 |
| 2.765 | 12.9 | 20.3 | 33.2 | 46.0 | -12.8 |
| 3.336 | 12.8 | 20.3 | 33.1 | 46.0 | -12.9 |
| 2.967 | 12.7 | 20.3 | 33.0 | 46.0 | -13.0 |
| 2.631 | 12.3 | 20.3 | 32.6 | 46.0 | -13.4 |
| 0.184 | 20.6 | 20.1 | 40.7 | 54.3 | -13.6 |
| 4.310 | 11.9 | 20.4 | 32.3 | 46.0 | -13.7 |
| 4.534 | 11.7 | 20.4 | 32.1 | 46.0 | -13.9 |
| 2.359 | 11.8 | 20.3 | 32.1 | 46.0 | -13.9 |
| 1.758 | 11.5 | 20.2 | 31.7 | 46.0 | -14.3 |
| 2.821 | 11.4 | 20.3 | 31.7 | 46.0 | -14.3 |
| 4.149 | 11.3 | 20.4 | 31.7 | 46.0 | -14.3 |
| 1.668 | 11.4 | 20.2 | 31.6 | 46.0 | -14.4 |
| 2.049 | 11.3 | 20.2 | 31.5 | 46.0 | -14.5 |
| 2.202 | 11.2 | 20.2 | 31.4 | 46.0 | -14.6 |
| 1.773 | 11.1 | 20.2 | 31.3 | 46.0 | -14.7 |
| 1.221 | 11.2 | 20.1 | 31.3 | 46.0 | -14.7 |
| 0.795 | 11.2 | 20.0 | 31.2 | 46.0 | -14.8 |
| 1.404 | 11.0 | 20.1 | 31.1 | 46.0 | -14.9 |
| 0.165 | 20.1 | 20.2 | 40.3 | 55.2 | -14.9 |
| 2.224 | 10.8 | 20.2 | 31.0 | 46.0 | -15.0 |
| 4.246 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|---------|-----------------------------|---|
| Run #: | 19 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|---------|-----------------------------|---|

COMMENTS

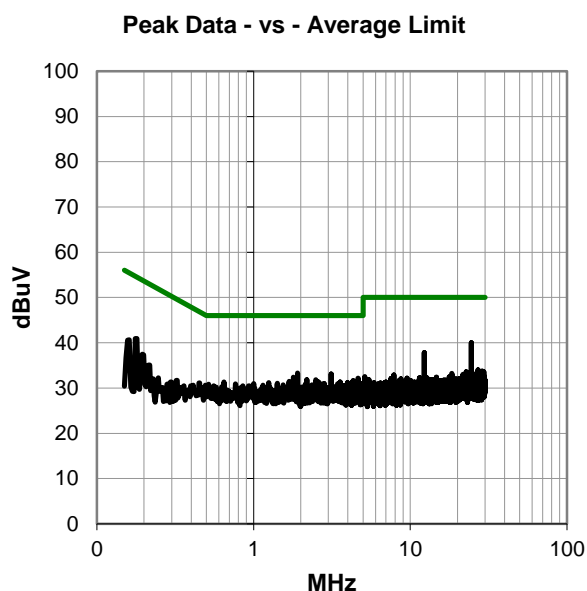
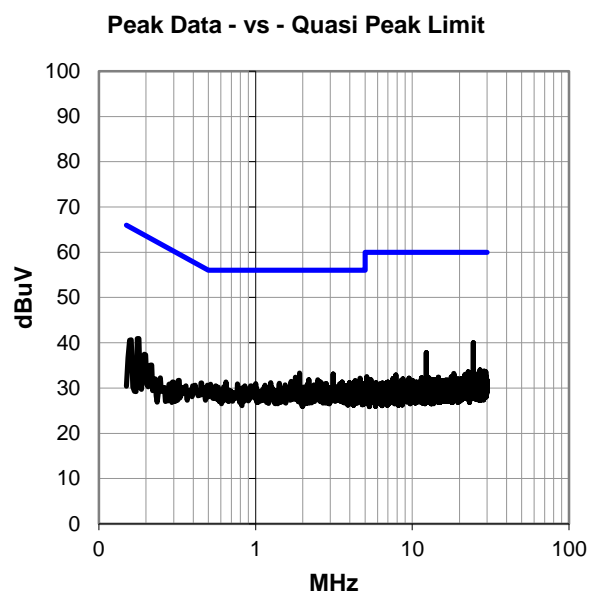
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5785 MHz Ch.32

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #19

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.4 | 21.6 | 40.0 | 60.0 | -20.0 |
| 12.290 | 16.9 | 20.9 | 37.8 | 60.0 | -22.2 |
| 1.911 | 13.1 | 20.2 | 33.3 | 56.0 | -22.7 |
| 3.127 | 12.8 | 20.3 | 33.1 | 56.0 | -22.9 |
| 1.799 | 12.2 | 20.2 | 32.4 | 56.0 | -23.6 |
| 0.176 | 20.8 | 20.1 | 40.9 | 64.7 | -23.7 |
| 4.653 | 11.8 | 20.4 | 32.2 | 56.0 | -23.8 |
| 2.187 | 11.6 | 20.2 | 31.8 | 56.0 | -24.2 |
| 2.500 | 11.5 | 20.3 | 31.8 | 56.0 | -24.2 |
| 4.317 | 11.3 | 20.4 | 31.7 | 56.0 | -24.3 |
| 1.687 | 11.3 | 20.2 | 31.5 | 56.0 | -24.5 |
| 0.646 | 11.3 | 20.0 | 31.3 | 56.0 | -24.7 |
| 2.590 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 3.564 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 4.254 | 10.9 | 20.4 | 31.3 | 56.0 | -24.7 |
| 0.161 | 20.4 | 20.2 | 40.6 | 65.4 | -24.8 |
| 1.251 | 11.1 | 20.1 | 31.2 | 56.0 | -24.8 |
| 3.978 | 10.8 | 20.4 | 31.2 | 56.0 | -24.8 |
| 1.418 | 10.9 | 20.1 | 31.0 | 56.0 | -25.0 |
| 2.818 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 3.575 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 4.370 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 1.001 | 10.9 | 20.1 | 31.0 | 56.0 | -25.0 |
| 0.766 | 10.9 | 20.0 | 30.9 | 56.0 | -25.1 |
| 2.698 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 3.437 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.4 | 21.6 | 40.0 | 50.0 | -10.0 |
| 12.290 | 16.9 | 20.9 | 37.8 | 50.0 | -12.2 |
| 1.911 | 13.1 | 20.2 | 33.3 | 46.0 | -12.7 |
| 3.127 | 12.8 | 20.3 | 33.1 | 46.0 | -12.9 |
| 1.799 | 12.2 | 20.2 | 32.4 | 46.0 | -13.6 |
| 0.176 | 20.8 | 20.1 | 40.9 | 54.7 | -13.7 |
| 4.653 | 11.8 | 20.4 | 32.2 | 46.0 | -13.8 |
| 2.187 | 11.6 | 20.2 | 31.8 | 46.0 | -14.2 |
| 2.500 | 11.5 | 20.3 | 31.8 | 46.0 | -14.2 |
| 4.317 | 11.3 | 20.4 | 31.7 | 46.0 | -14.3 |
| 1.687 | 11.3 | 20.2 | 31.5 | 46.0 | -14.5 |
| 0.646 | 11.3 | 20.0 | 31.3 | 46.0 | -14.7 |
| 2.590 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 3.564 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 4.254 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 0.161 | 20.4 | 20.2 | 40.6 | 55.4 | -14.8 |
| 1.251 | 11.1 | 20.1 | 31.2 | 46.0 | -14.8 |
| 3.978 | 10.8 | 20.4 | 31.2 | 46.0 | -14.8 |
| 1.418 | 10.9 | 20.1 | 31.0 | 46.0 | -15.0 |
| 2.818 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 3.575 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 4.370 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 1.001 | 10.9 | 20.1 | 31.0 | 46.0 | -15.0 |
| 0.766 | 10.9 | 20.0 | 30.9 | 46.0 | -15.1 |
| 2.698 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 3.437 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|---------|-----------------------------|---|
| Run #: | 20 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|---------|-----------------------------|---|

COMMENTS

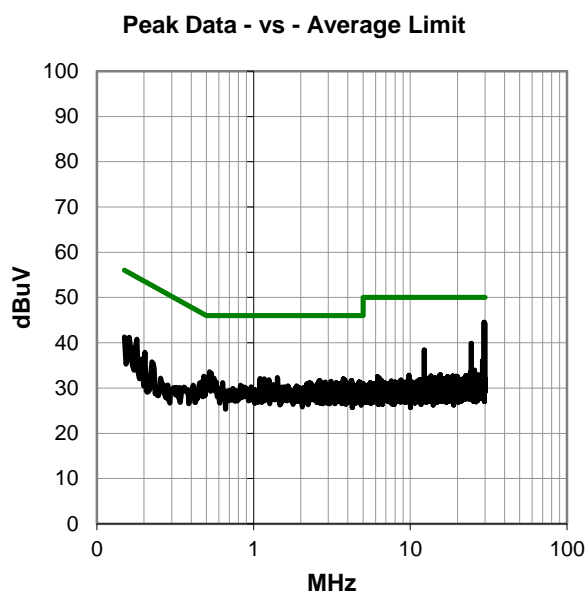
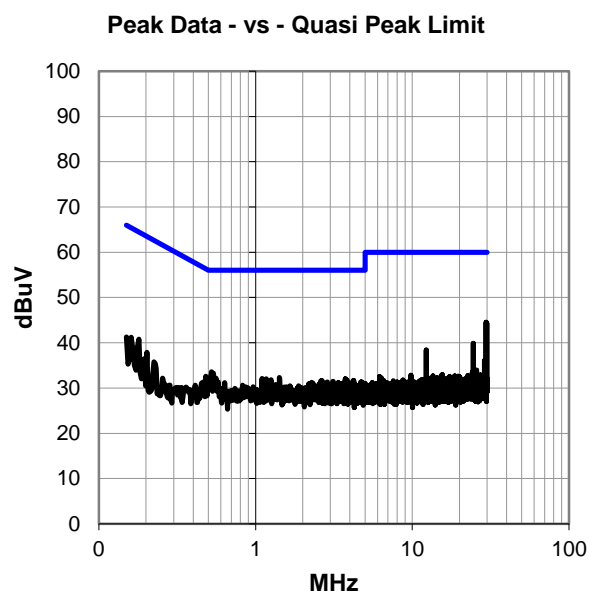
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5825 MHz Ch.34

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #20

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 29.560 | 22.6 | 21.9 | 44.5 | 60.0 | -15.5 |
| 29.858 | 22.4 | 21.9 | 44.3 | 60.0 | -15.7 |
| 24.575 | 18.3 | 21.6 | 39.9 | 60.0 | -20.1 |
| 12.286 | 17.5 | 20.9 | 38.4 | 60.0 | -21.6 |
| 0.523 | 13.6 | 20.0 | 33.6 | 56.0 | -22.4 |
| 0.538 | 13.2 | 20.0 | 33.2 | 56.0 | -22.8 |
| 1.422 | 12.2 | 20.1 | 32.3 | 56.0 | -23.7 |
| 0.180 | 20.7 | 20.1 | 40.8 | 64.5 | -23.7 |
| 0.482 | 12.6 | 20.0 | 32.6 | 56.3 | -23.7 |
| 1.101 | 12.0 | 20.1 | 32.1 | 56.0 | -23.9 |
| 28.982 | 14.2 | 21.8 | 36.0 | 60.0 | -24.0 |
| 3.735 | 11.7 | 20.3 | 32.0 | 56.0 | -24.0 |
| 1.172 | 11.9 | 20.1 | 32.0 | 56.0 | -24.0 |
| 0.161 | 21.0 | 20.2 | 41.2 | 65.4 | -24.2 |
| 1.254 | 11.7 | 20.1 | 31.8 | 56.0 | -24.2 |
| 3.829 | 11.4 | 20.3 | 31.7 | 56.0 | -24.3 |
| 4.228 | 11.3 | 20.4 | 31.7 | 56.0 | -24.3 |
| 2.612 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 2.653 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 3.120 | 11.2 | 20.3 | 31.5 | 56.0 | -24.5 |
| 2.870 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 0.150 | 21.0 | 20.3 | 41.3 | 66.0 | -24.7 |
| 4.705 | 10.9 | 20.4 | 31.3 | 56.0 | -24.7 |
| 4.765 | 10.9 | 20.4 | 31.3 | 56.0 | -24.7 |
| 2.284 | 11.0 | 20.3 | 31.3 | 56.0 | -24.7 |
| 0.635 | 11.2 | 20.0 | 31.2 | 56.0 | -24.8 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 29.560 | 22.6 | 21.9 | 44.5 | 50.0 | -5.5 |
| 29.858 | 22.4 | 21.9 | 44.3 | 50.0 | -5.7 |
| 24.575 | 18.3 | 21.6 | 39.9 | 50.0 | -10.1 |
| 12.286 | 17.5 | 20.9 | 38.4 | 50.0 | -11.6 |
| 0.523 | 13.6 | 20.0 | 33.6 | 46.0 | -12.4 |
| 0.538 | 13.2 | 20.0 | 33.2 | 46.0 | -12.8 |
| 1.422 | 12.2 | 20.1 | 32.3 | 46.0 | -13.7 |
| 0.180 | 20.7 | 20.1 | 40.8 | 54.5 | -13.7 |
| 0.482 | 12.6 | 20.0 | 32.6 | 46.3 | -13.7 |
| 1.101 | 12.0 | 20.1 | 32.1 | 46.0 | -13.9 |
| 28.982 | 14.2 | 21.8 | 36.0 | 50.0 | -14.0 |
| 3.735 | 11.7 | 20.3 | 32.0 | 46.0 | -14.0 |
| 1.172 | 11.9 | 20.1 | 32.0 | 46.0 | -14.0 |
| 0.161 | 21.0 | 20.2 | 41.2 | 55.4 | -14.2 |
| 1.254 | 11.7 | 20.1 | 31.8 | 46.0 | -14.2 |
| 3.829 | 11.4 | 20.3 | 31.7 | 46.0 | -14.3 |
| 4.228 | 11.3 | 20.4 | 31.7 | 46.0 | -14.3 |
| 2.612 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 2.653 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 3.120 | 11.2 | 20.3 | 31.5 | 46.0 | -14.5 |
| 2.870 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 0.150 | 21.0 | 20.3 | 41.3 | 56.0 | -14.7 |
| 4.705 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 4.765 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 2.284 | 11.0 | 20.3 | 31.3 | 46.0 | -14.7 |
| 0.635 | 11.2 | 20.0 | 31.2 | 46.0 | -14.8 |

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

| | | | |
|-------------------|-------------------------------|--------------------|------------|
| EUT: | Athena4XD (Extended Distance) | Work Order: | FOCU0214 |
| Serial Number: | 02EA4CD00042 | Date: | 10/07/2015 |
| Customer: | Summit Semiconductor LLC | Temperature: | 23.3°C |
| Attendees: | David Schilling | Relative Humidity: | 46.1% |
| Customer Project: | None | Bar. Pressure: | 1020 mb |
| Tested By: | Brandon Hobbs | Job Site: | EV07 |
| Power: | 3.3/1.2 VDC | Configuration: | FOCU0214-7 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2015 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|-------|-----------|-----------------------------|---|
| Run #: | 21 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|----|-------|-----------|-----------------------------|---|

COMMENTS

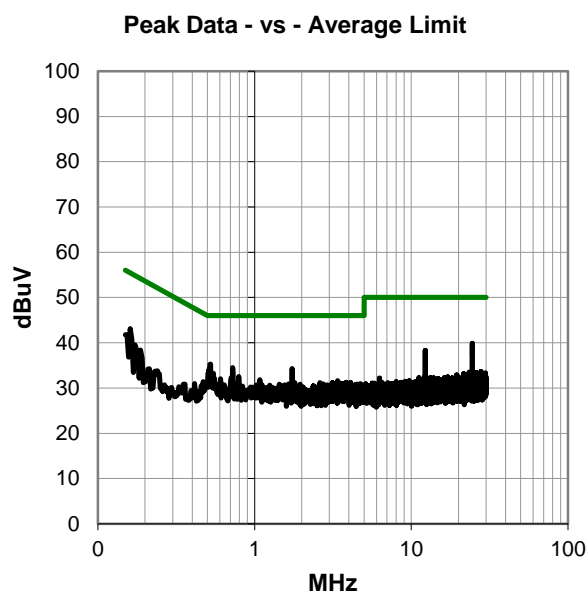
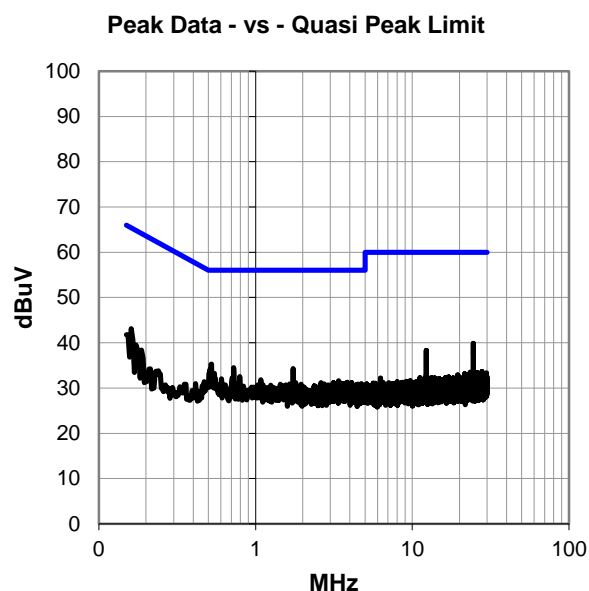
None using a dual channel linear power supply

EUT OPERATING MODES

Continuous Tx, 6Mbps 5825 MHz Ch.34

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #21

Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.3 | 21.6 | 39.9 | 60.0 | -20.1 |
| 0.523 | 15.3 | 20.0 | 35.3 | 56.0 | -20.7 |
| 0.725 | 14.5 | 20.0 | 34.5 | 56.0 | -21.5 |
| 1.739 | 14.1 | 20.2 | 34.3 | 56.0 | -21.7 |
| 12.290 | 17.4 | 20.9 | 38.3 | 60.0 | -21.7 |
| 0.512 | 14.1 | 20.0 | 34.1 | 56.0 | -21.9 |
| 0.161 | 22.9 | 20.2 | 43.1 | 65.4 | -22.3 |
| 0.545 | 13.2 | 20.0 | 33.2 | 56.0 | -22.8 |
| 0.792 | 12.5 | 20.0 | 32.5 | 56.0 | -23.5 |
| 0.710 | 12.3 | 20.0 | 32.3 | 56.0 | -23.7 |
| 0.605 | 12.0 | 20.0 | 32.0 | 56.0 | -24.0 |
| 0.150 | 21.5 | 20.3 | 41.8 | 66.0 | -24.2 |
| 1.079 | 11.7 | 20.1 | 31.8 | 56.0 | -24.2 |
| 3.381 | 11.3 | 20.3 | 31.6 | 56.0 | -24.4 |
| 3.847 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 1.806 | 11.0 | 20.2 | 31.2 | 56.0 | -24.8 |
| 2.612 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 3.142 | 10.9 | 20.3 | 31.2 | 56.0 | -24.8 |
| 4.105 | 10.8 | 20.4 | 31.2 | 56.0 | -24.8 |
| 3.470 | 10.8 | 20.3 | 31.1 | 56.0 | -24.9 |
| 3.437 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 3.564 | 10.7 | 20.3 | 31.0 | 56.0 | -25.0 |
| 4.735 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 4.067 | 10.6 | 20.4 | 31.0 | 56.0 | -25.0 |
| 3.691 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 2.735 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |

Peak Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 24.575 | 18.3 | 21.6 | 39.9 | 50.0 | -10.1 |
| 0.523 | 15.3 | 20.0 | 35.3 | 46.0 | -10.7 |
| 0.725 | 14.5 | 20.0 | 34.5 | 46.0 | -11.5 |
| 1.739 | 14.1 | 20.2 | 34.3 | 46.0 | -11.7 |
| 12.290 | 17.4 | 20.9 | 38.3 | 50.0 | -11.7 |
| 0.512 | 14.1 | 20.0 | 34.1 | 46.0 | -11.9 |
| 0.161 | 22.9 | 20.2 | 43.1 | 55.4 | -12.3 |
| 0.545 | 13.2 | 20.0 | 33.2 | 46.0 | -12.8 |
| 0.792 | 12.5 | 20.0 | 32.5 | 46.0 | -13.5 |
| 0.710 | 12.3 | 20.0 | 32.3 | 46.0 | -13.7 |
| 0.605 | 12.0 | 20.0 | 32.0 | 46.0 | -14.0 |
| 0.150 | 21.5 | 20.3 | 41.8 | 56.0 | -14.2 |
| 1.079 | 11.7 | 20.1 | 31.8 | 46.0 | -14.2 |
| 3.381 | 11.3 | 20.3 | 31.6 | 46.0 | -14.4 |
| 3.847 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 1.806 | 11.0 | 20.2 | 31.2 | 46.0 | -14.8 |
| 2.612 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 3.142 | 10.9 | 20.3 | 31.2 | 46.0 | -14.8 |
| 4.105 | 10.8 | 20.4 | 31.2 | 46.0 | -14.8 |
| 3.470 | 10.8 | 20.3 | 31.1 | 46.0 | -14.9 |
| 3.437 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 3.564 | 10.7 | 20.3 | 31.0 | 46.0 | -15.0 |
| 4.735 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 4.067 | 10.6 | 20.4 | 31.0 | 46.0 | -15.0 |
| 3.691 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |
| 2.735 | 10.6 | 20.3 | 30.9 | 46.0 | -15.1 |

CONCLUSION

Pass



Tested By

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

Continuous Tx, 6 Mbps

Continuous Tx, 18 Mbps

CHANNELS OF OPERATION

Ch.8, 5180 MHz

Ch.14, 5240 MHz

Ch.15, 5260 MHz

Ch.18, 5320 MHz

Ch.19, 5500 MHz

Ch.23, 5580 MHz

Ch.29, 5700 MHz

Ch.30, 5745 MHz

Ch.32, 5785 MHz

Ch.34, 5825 MHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

FOCU0214 - 4

FOCU0214 - 8

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 |
|-------------------------------|-----------------|---------------------------|-----|-----------|----------|
| Notch Filter, 5.15 - 5.35 GHz | Micro-Tronics | BRC50703 | HHJ | 3/11/2015 | 12 mo |
| Notch Filter, 5.47-5.725 GHz | Micro-Tronics | BRC50704 | HGI | 1/27/2015 | 12 mo |
| Notch Filter, 5.725-5.875 GHz | Micro-Tronics | BRC50705 | HGJ | 1/27/2015 | 12 mo |
| Spectrum Analyzer | Keysight | N9010A | AFN | 2/10/2015 | 12 mo |
| Cable | ESM Cable Corp. | KMKM-72 | EVE | 6/6/2015 | 12 mo |
| Pre-Amplifier | Miteq | JSW45-26004000-40-5P | PAE | 6/6/2015 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3160-10 | AIW | NCR | 0 mo |
| Cable | ESM Cable Corp. | KMKM-72 | EVY | 11/9/2014 | 12 mo |
| Pre-Amplifier | Miteq | AMF-6F-18002650-25-10P | AVU | 11/9/2014 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3160-09 | AIV | NCR | 0 mo |
| Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AVD | 4/16/2015 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3160-08 | AHV | NCR | 0 mo |
| Cable | None | Standard Gain Horns Cable | EVF | 4/20/2015 | 12 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AVC | 4/20/2015 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3160-07 | AHU | NCR | 0 mo |
| Cable | N/A | Double Ridge Horn Cables | EVB | 4/16/2015 | 12 mo |
| Pre-Amplifier | Miteq | AMF-3D-00100800-32-13P | PAG | 4/16/2015 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIZ | 1/27/2014 | 24 mo |
| Low Pass Filter, 0 - 1000 MHz | Micro-Tronics | LPM50004 | LFD | 5/24/2015 | 12 mo |
| Cable | N/A | Bilog Cables | EVA | 2/10/2015 | 12 mo |
| Pre-Amplifier | Miteq | AM-1616-1000 | AOL | 2/10/2015 | 12 mo |
| Antenna, Biconilog | EMCO | 3141 | AXE | 8/29/2014 | 24 mo |
| Cable | ESM Cable Corp. | TTBJ-141-KMKM-72 | EV3 | 6/24/2015 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHC | 6/13/2014 | 24 mo |

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT were tested. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. Measurements were made to satisfy the three requirements of 47 CFR 15.407: Field strength under 1GHz, Restricted Bands of 47 CFR 15.205, and EIRP of 47 CFR 15.407.

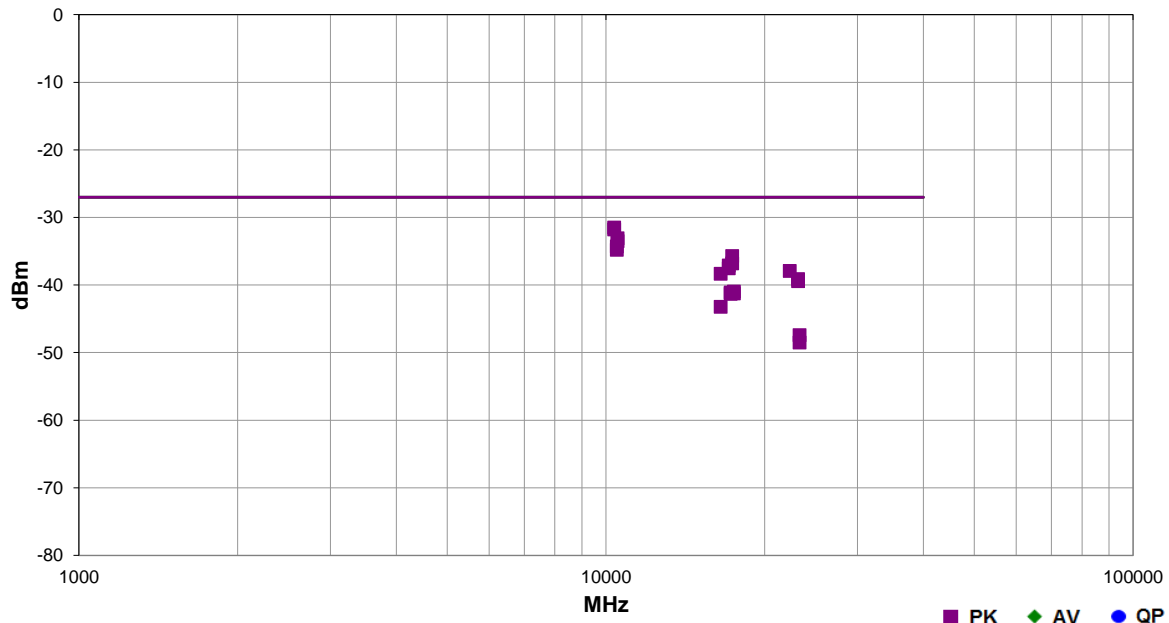
While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2013). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

SPURIOUS RADIATED EMISSIONS


| | | | | |
|-----------------|--|-------------------|-------------|--|
| Work Order: | FOCU0214 | Date: | 10/08/15 |  |
| Project: | None | Temperature: | 22.2 °C | |
| Job Site: | EV01 | Humidity: | 47.3% RH | |
| Serial Number: | 02EA4CD00042 | Barometric Pres.: | 1020.1 mbar | |
| EUT: | Athena4XD (Extended Distance) | | | |
| Configuration: | 4 | | | |
| Customer: | Summit Semiconductor LLC | | | |
| Attendees: | David Schilling | | | |
| EUT Power: | 3.3/1.2 VDC | | | |
| Operating Mode: | Continuous Tx, see data comments for channel, frequency and data rate. | | | |
| Deviations: | None | | | |
| Comments: | See comments for EUT orientation | | | |

| | |
|---------------------|------------------|
| Test Specifications | Test Method |
| FCC 15.407:2015 | ANSI C63.10:2013 |

| | | | | | | | |
|-------|-----|-------------------|---|-------------------|-----------|---------|------|
| Run # | 165 | Test Distance (m) | 3 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|-------|-----|-------------------|---|-------------------|-----------|---------|------|

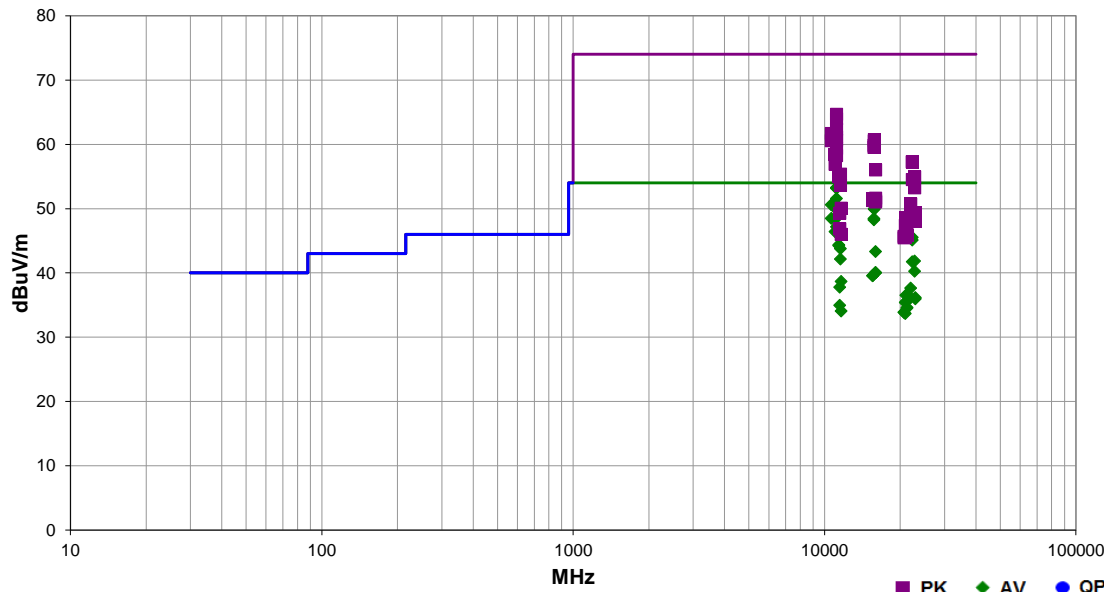


| Freq (MHz) | Antenna Height (meters) | Azimuth (degrees) | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|------------|-------------------------|-------------------|---------------------------|----------|--------------|------------|-------------------|------------------------|-----------------------------------|
| 10359.660 | 1.8 | 63.0 | Horz | PK | 7.10E-07 | -31.5 | -27.0 | -4.5 | Ch. 8, 5180MHz, 6Mbps, EUT Vert |
| 10359.470 | 2.1 | 309.0 | Vert | PK | 6.62E-07 | -31.8 | -27.0 | -4.8 | Ch. 8, 5180MHz, 6Mbps, EUT Horz |
| 10519.770 | 2.1 | 307.0 | Vert | PK | 4.90E-07 | -33.1 | -27.0 | -6.1 | Ch. 15, 5260MHz, 6Mbps, EUT Horz |
| 23140.070 | 1.8 | 41.0 | Horz | PK | 1.22E-07 | -39.1 | -27.0 | -12.1 | Ch. 32, 5785MHz, 6Mbps, EUT Vert |
| 10519.800 | 1.9 | 299.0 | Horz | PK | 4.47E-07 | -33.5 | -27.0 | -6.5 | Ch. 15, 5260MHz, 6Mbps, EUT Vert |
| 23140.960 | 1.8 | 344.0 | Vert | PK | 1.14E-07 | -39.4 | -27.0 | -12.4 | Ch. 32, 5785MHz, 6Mbps, EUT Horz |
| 10481.100 | 2.1 | 308.0 | Vert | PK | 3.72E-07 | -34.3 | -27.0 | -7.3 | Ch. 14, 5240MHz, 6Mbps, EUT Horz |
| 10481.170 | 1.9 | 297.0 | Horz | PK | 3.31E-07 | -34.8 | -27.0 | -7.8 | Ch. 14, 5240MHz, 6Mbps, EUT Vert |
| 17354.100 | 1.0 | 37.0 | Horz | PK | 2.68E-07 | -35.7 | -27.0 | -8.7 | Ch. 32, 5785MHz, 6Mbps, EUT Vert |
| 17355.910 | 3.2 | 342.0 | Vert | PK | 2.08E-07 | -36.8 | -27.0 | -9.8 | Ch. 32, 5785MHz, 6Mbps, EUT Horz |
| 17098.620 | 2.2 | 0.0 | Vert | PK | 1.94E-07 | -37.1 | -27.0 | -10.1 | Ch. 29, 5700MHz, 6Mbps, EUT Horz |
| 17099.090 | 1.0 | 67.0 | Horz | PK | 1.77E-07 | -37.5 | -27.0 | -10.5 | Ch. 29, 5700MHz, 6Mbps, EUT Vert |
| 22320.010 | 1.8 | 26.0 | Horz | PK | 1.62E-07 | -37.9 | -27.0 | -10.9 | Ch. 23, 5580MHz, 18Mbps, EUT Vert |
| 16498.700 | 1.0 | 69.0 | Horz | PK | 1.47E-07 | -38.3 | -27.0 | -11.3 | Ch. 19, 5500MHz, 6Mbps, EUT Vert |
| 17476.290 | 1.0 | 217.0 | Vert | PK | 8.02E-08 | -41.0 | -27.0 | -14.0 | Ch. 34, 5825MHz, 6Mbps, EUT Horz |
| 17234.510 | 1.0 | 146.0 | Horz | PK | 7.76E-08 | -41.1 | -27.0 | -14.1 | Ch. 30, 5745MHz, 6Mbps, EUT Vert |
| 17476.450 | 1.0 | 247.0 | Horz | PK | 7.49E-08 | -41.3 | -27.0 | -14.3 | Ch. 34, 5825MHz, 6Mbps, EUT Vert |
| 17234.040 | 1.1 | 289.0 | Vert | PK | 7.41E-08 | -41.3 | -27.0 | -14.3 | Ch. 30, 5745MHz, 6Mbps, EUT Horz |
| 23298.760 | 1.7 | 24.0 | Horz | PK | 1.82E-08 | -47.4 | -27.0 | -20.4 | Ch. 34, 5825MHz, 6Mbps, EUT Vert |
| 23299.200 | 1.6 | 359.0 | Vert | PK | 1.41E-08 | -48.5 | -27.0 | -21.5 | Ch. 34, 5825MHz, 6Mbps, EUT Horz |
| 16499.860 | 1.0 | 245.0 | Vert | PK | 4.75E-08 | -43.2 | -27.0 | -16.2 | Ch. 19, 5500MHz, 6Mbps, EUT Horz |

| | | | | |
|-----------------|--|---|-------------|--|
| Work Order: | FOCU0214 | Date: | 10/08/15 |  |
| Project: | None | Temperature: | 22.2 °C | |
| Job Site: | EV01 | Humidity: | 47.3% RH | |
| Serial Number: | 02EA4CD00042 | Barometric Pres.: | 1020.1 mbar | |
| | | Tested by: Cole Ghizzone, Brandon Hobbs | | |
| EUT: | Athena4XD (Extended Distance) | | | |
| Configuration: | 4 | | | |
| Customer: | Summit Semiconductor LLC | | | |
| Attendees: | David Schilling | | | |
| EUT Power: | 3.3/1.2 VDC | | | |
| Operating Mode: | Continuous Tx, see data comments for channel, frequency and data rate. | | | |
| Deviations: | None | | | |
| Comments: | See comments for EUT orientation | | | |


| | |
|---------------------|------------------|
| Test Specifications | Test Method |
| FCC 15.407:2015 | ANSI C63.10:2013 |

| | | | | | | | |
|-------|-----|-------------------|---|-------------------|-----------|---------|------|
| Run # | 165 | Test Distance (m) | 3 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|-------|-----|-------------------|---|-------------------|-----------|---------|------|



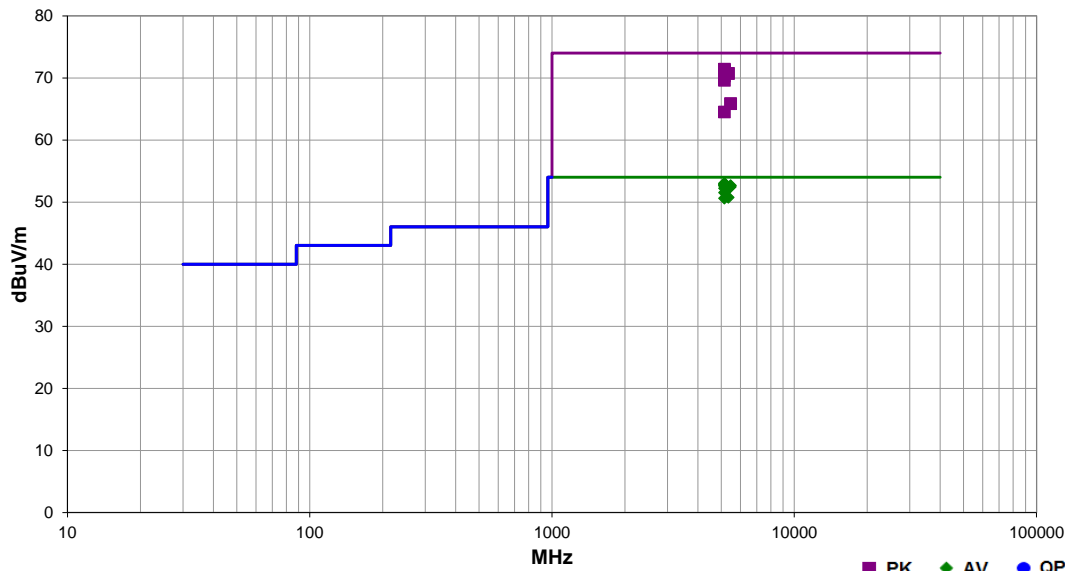
| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|--------------------------|----------|--------------------------|-------------------|----------------------|------------------------|-------------------------------------|
| 11158.960 | 58.4 | -5.1 | 1.8 | 308.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 53.3 | 54.0 | -0.7 | Ch. 23, 5580MHz, 6Mbps, EUT Vert |
| 11158.680 | 58.3 | -5.1 | 1.9 | 307.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 53.2 | 54.0 | -0.8 | Ch. 23, 5580MHz, 18Mbps, EUT Vert |
| 11159.190 | 56.7 | -5.1 | 2.2 | 26.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 51.6 | 54.0 | -2.4 | Ch. 23, 5580MHz, 6Mbps, EUT Horz |
| 10641.150 | 58.6 | -8.0 | 1.8 | 62.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 50.6 | 54.0 | -3.4 | Ch. 18, 5320MHz, 6Mbps, EUT Vert |
| 11158.900 | 55.7 | -5.1 | 2.5 | 312.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 50.6 | 54.0 | -3.4 | Ch. 23, 5580MHz, 6Mbps, EUT On Side |
| 15779.760 | 35.5 | 14.5 | 2.2 | 52.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 50.0 | 54.0 | -4.0 | Ch. 15, 5260MHz, 6Mbps, EUT Horz |
| 15779.880 | 35.4 | 14.5 | 1.1 | 71.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 49.9 | 54.0 | -4.1 | Ch. 15, 5260MHz, 6Mbps, EUT Vert |
| 11158.680 | 55.0 | -5.1 | 1.8 | 319.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 49.9 | 54.0 | -4.1 | Ch. 23, 5580MHz, 6Mbps, EUT Vert |
| 11158.640 | 53.7 | -5.1 | 2.8 | 136.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 48.6 | 54.0 | -5.4 | Ch. 23, 5580MHz, 6Mbps, EUT Horz |
| 10641.130 | 56.5 | -8.0 | 2.7 | 308.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 48.5 | 54.0 | -5.5 | Ch. 18, 5320MHz, 6Mbps, EUT Horz |
| 15719.860 | 34.0 | 14.5 | 1.6 | 75.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 48.5 | 54.0 | -5.5 | Ch. 14, 5240MHz, 6Mbps, EUT Vert |
| 11001.110 | 54.1 | -5.8 | 1.8 | 60.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 48.3 | 54.0 | -5.7 | Ch. 19, 5500MHz, 6Mbps, EUT Vert |
| 15719.970 | 33.8 | 14.5 | 2.1 | 51.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 48.3 | 54.0 | -5.7 | Ch. 14, 5240MHz, 6Mbps, EUT Horz |
| 11158.670 | 52.3 | -5.1 | 1.5 | 306.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 47.2 | 54.0 | -6.8 | Ch. 23, 5580MHz, 6Mbps, EUT On Side |
| 11001.060 | 52.2 | -5.8 | 2.5 | 50.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 46.4 | 54.0 | -7.6 | Ch. 19, 5500MHz, 6Mbps, EUT Horz |
| 22319.910 | 45.4 | 0.1 | 1.8 | 23.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 45.5 | 54.0 | -8.5 | Ch. 23, 5580MHz, 6Mbps, EUT Vert |
| 22319.840 | 45.0 | 0.1 | 1.8 | 26.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 45.1 | 54.0 | -8.9 | Ch. 23, 5580MHz, 18Mbps, EUT Vert |
| 11160.420 | 69.8 | -5.1 | 1.9 | 307.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 64.7 | 74.0 | -9.3 | Ch. 23, 5580MHz, 6Mbps, EUT Vert |
| 11398.620 | 48.1 | -3.7 | 2.7 | 315.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 44.4 | 54.0 | -9.6 | Ch. 29, 5700MHz, 6Mbps, EUT Horz |
| 11398.620 | 48.0 | -3.7 | 1.8 | 305.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 44.3 | 54.0 | -9.7 | Ch. 29, 5700MHz, 6Mbps, EUT Vert |
| 11160.190 | 69.1 | -5.1 | 1.8 | 308.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 64.0 | 74.0 | -10.0 | Ch. 23, 5580MHz, 6Mbps, EUT Vert |
| 11568.940 | 46.2 | -2.4 | 2.5 | 54.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 43.8 | 54.0 | -10.2 | Ch. 32, 5785MHz, 6Mbps, EUT Horz |
| 15959.880 | 28.6 | 14.7 | 1.1 | 71.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 43.3 | 54.0 | -10.7 | Ch. 18, 5320MHz, 6Mbps, EUT Vert |
| 11159.490 | 67.5 | -5.1 | 2.2 | 26.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 62.4 | 74.0 | -11.6 | Ch. 23, 5580MHz, 6Mbps, EUT Horz |
| 11568.970 | 44.6 | -2.4 | 1.6 | 50.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 42.2 | 54.0 | -11.8 | Ch. 32, 5785MHz, 6Mbps, EUT Vert |
| 22801.210 | 41.6 | 0.2 | 1.8 | 24.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 41.8 | 54.0 | -12.2 | Ch. 29, 5700MHz, 6Mbps, EUT Vert |
| 22319.830 | 41.6 | 0.1 | 1.8 | 311.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 41.7 | 54.0 | -12.3 | Ch. 23, 5580MHz, 6Mbps, EUT Horz |
| 10639.370 | 69.7 | -8.0 | 1.8 | 62.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 61.7 | 74.0 | -12.3 | Ch. 18, 5320MHz, 6Mbps, EUT Vert |

| 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 |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|-------------------------------------|
| 11160.080 | 66.3 | -5.1 | 2.5 | 312.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 61.2 | 74.0 | -12.8 | Ch. 23, 5580MHz, 6Mbps, EUT On Side |
| 15780.070 | 46.2 | 14.5 | 1.1 | 71.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 60.7 | 74.0 | -13.3 | Ch. 15, 5260MHz, 6Mbps, EUT Vert |
| 11160.220 | 65.8 | -5.1 | 1.8 | 319.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 60.7 | 74.0 | -13.3 | Ch. 23, 5580MHz, 6Mbps, EUT Vert |
| 10639.380 | 68.6 | -8.0 | 2.7 | 308.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 60.6 | 74.0 | -13.4 | Ch. 18, 5320MHz, 6Mbps, EUT Horz |
| 15780.060 | 46.0 | 14.5 | 2.2 | 52.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 60.5 | 74.0 | -13.5 | Ch. 15, 5260MHz, 6Mbps, EUT Horz |
| 22801.370 | 40.0 | 0.2 | 1.8 | 357.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 40.2 | 54.0 | -13.8 | Ch. 29, 5700MHz, 6Mbps, EUT Horz |
| 15960.700 | 25.3 | 14.7 | 1.0 | 225.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 40.0 | 54.0 | -14.0 | Ch. 23, 5580MHz, 6Mbps, EUT Horz |
| 15959.710 | 25.3 | 14.7 | 1.0 | 316.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 40.0 | 54.0 | -14.0 | Ch. 23, 5580MHz, 6Mbps, EUT Vert |
| 15958.780 | 25.3 | 14.7 | 1.0 | 149.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 40.0 | 54.0 | -14.0 | Ch. 18, 5320MHz, 6Mbps, EUT Horz |
| 15720.780 | 45.4 | 14.5 | 1.6 | 75.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 59.9 | 74.0 | -14.1 | Ch. 14, 5240MHz, 6Mbps, EUT Vert |
| 15539.870 | 25.2 | 14.4 | 1.0 | 122.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 39.6 | 54.0 | -14.4 | Ch. 8, 5180MHz, 6Mbps, EUT Vert |
| 15538.770 | 25.2 | 14.4 | 2.6 | 355.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 39.6 | 54.0 | -14.4 | Ch. 8, 5180MHz, 6Mbps, EUT Horz |
| 15720.690 | 45.1 | 14.5 | 2.1 | 51.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 59.6 | 74.0 | -14.4 | Ch. 14, 5240MHz, 6Mbps, EUT Horz |
| 11160.250 | 64.5 | -5.1 | 2.8 | 136.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 59.4 | 74.0 | -14.6 | Ch. 23, 5580MHz, 6Mbps, EUT Horz |
| 11648.760 | 40.4 | -1.7 | 1.0 | 33.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 38.7 | 54.0 | -15.3 | Ch. 34, 5825MHz, 6Mbps, EUT Vert |
| 11000.430 | 64.2 | -5.8 | 1.8 | 60.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 58.4 | 74.0 | -15.6 | Ch. 19, 5500MHz, 6Mbps, EUT Vert |
| 11160.170 | 63.4 | -5.1 | 1.5 | 306.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 58.3 | 74.0 | -15.7 | Ch. 23, 5580MHz, 6Mbps, EUT On Side |
| 11488.640 | 40.9 | -3.1 | 1.8 | 302.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 37.8 | 54.0 | -16.2 | Ch. 30, 5745MHz, 6Mbps, EUT Vert |
| 22001.450 | 37.4 | 0.2 | 1.8 | 39.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 37.6 | 54.0 | -16.4 | Ch. 19, 5500MHz, 6Mbps, EUT Vert |
| 22320.010 | 57.2 | 0.1 | 1.8 | 26.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 57.3 | 74.0 | -16.7 | Ch. 23, 5580MHz, 18Mbps, EUT Vert |
| 22320.330 | 57.1 | 0.1 | 1.8 | 23.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 57.2 | 74.0 | -16.8 | Ch. 23, 5580MHz, 6Mbps, EUT Vert |
| 11000.770 | 62.7 | -5.8 | 2.5 | 50.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 56.9 | 74.0 | -17.1 | Ch. 19, 5500MHz, 6Mbps, EUT Horz |
| 21039.740 | 36.8 | -0.3 | 1.8 | 353.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 36.5 | 54.0 | -17.5 | Ch. 15, 5260MHz, 6Mbps, EUT Vert |
| 22979.960 | 35.8 | 0.4 | 1.8 | 66.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 36.2 | 54.0 | -17.8 | Ch. 30, 5745MHz, 6Mbps, EUT Vert |
| 22001.430 | 35.9 | 0.2 | 1.8 | 0.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 36.1 | 54.0 | -17.9 | Ch. 19, 5500MHz, 6Mbps, EUT Horz |
| 15959.040 | 41.3 | 14.7 | 1.1 | 71.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 56.0 | 74.0 | -18.0 | Ch. 18, 5320MHz, 6Mbps, EUT Vert |
| 22979.540 | 35.6 | 0.4 | 1.5 | 4.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 36.0 | 54.0 | -18.0 | Ch. 30, 5745MHz, 6Mbps, EUT Horz |
| 21039.920 | 35.8 | -0.3 | 1.8 | 51.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 35.5 | 54.0 | -18.5 | Ch. 15, 5260MHz, 6Mbps, EUT Horz |
| 20959.890 | 35.7 | -0.3 | 1.6 | 53.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 35.4 | 54.0 | -18.6 | Ch. 14, 5240MHz, 6Mbps, EUT Horz |
| 11569.660 | 57.8 | -2.4 | 2.5 | 54.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 55.4 | 74.0 | -18.6 | Ch. 32, 5785MHz, 6Mbps, EUT Horz |
| 11400.310 | 59.0 | -3.7 | 2.7 | 315.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 55.3 | 74.0 | -18.7 | Ch. 29, 5700MHz, 6Mbps, EUT Horz |
| 11488.790 | 38.1 | -3.1 | 2.1 | 322.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 35.0 | 54.0 | -19.0 | Ch. 30, 5745MHz, 6Mbps, EUT Horz |
| 11400.180 | 58.7 | -3.7 | 1.8 | 305.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 55.0 | 74.0 | -19.0 | Ch. 29, 5700MHz, 6Mbps, EUT Vert |
| 22799.950 | 54.7 | 0.2 | 1.8 | 24.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 54.9 | 74.0 | -19.1 | Ch. 29, 5700MHz, 6Mbps, EUT Vert |
| 21281.470 | 34.8 | -0.2 | 1.8 | 17.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 34.6 | 54.0 | -19.4 | Ch. 18, 5320MHz, 6Mbps, EUT Vert |
| 21279.660 | 34.7 | -0.2 | 1.6 | 12.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 34.5 | 54.0 | -19.5 | Ch. 18, 5320MHz, 6Mbps, EUT Horz |
| 22320.130 | 54.4 | 0.1 | 1.8 | 311.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 54.5 | 74.0 | -19.5 | Ch. 23, 5580MHz, 6Mbps, EUT Horz |
| 11648.620 | 35.8 | -1.7 | 3.2 | 76.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 34.1 | 54.0 | -19.9 | Ch. 34, 5825MHz, 6Mbps, EUT Horz |
| 20718.530 | 34.3 | -0.4 | 1.6 | 243.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 33.9 | 54.0 | -20.1 | Ch. 8, 5180MHz, 6Mbps, EUT Horz |
| 20718.030 | 34.3 | -0.4 | 1.6 | 158.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 33.9 | 54.0 | -20.1 | Ch. 8, 5180MHz, 6Mbps, EUT Vert |
| 20959.030 | 34.0 | -0.3 | 1.6 | 219.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 33.7 | 54.0 | -20.3 | Ch. 14, 5240MHz, 6Mbps, EUT Vert |
| 11569.520 | 56.1 | -2.4 | 1.6 | 50.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 53.7 | 74.0 | -20.3 | Ch. 32, 5785MHz, 6Mbps, EUT Vert |
| 22800.080 | 53.0 | 0.2 | 1.8 | 357.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 53.2 | 74.0 | -20.8 | Ch. 29, 5700MHz, 6Mbps, EUT Horz |
| 15960.830 | 36.9 | 14.7 | 1.0 | 316.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 51.6 | 74.0 | -22.4 | Ch. 23, 5580MHz, 6Mbps, EUT Vert |
| 15540.670 | 37.2 | 14.4 | 1.0 | 122.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 51.6 | 74.0 | -22.4 | Ch. 8, 5180MHz, 6Mbps, EUT Vert |
| 15539.440 | 36.9 | 14.4 | 2.6 | 355.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 51.3 | 74.0 | -22.7 | Ch. 8, 5180MHz, 6Mbps, EUT Horz |
| 15960.990 | 36.5 | 14.7 | 1.0 | 225.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 51.2 | 74.0 | -22.8 | Ch. 23, 5580MHz, 6Mbps, EUT Horz |
| 15959.780 | 36.3 | 14.7 | 1.0 | 149.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 51.0 | 74.0 | -23.0 | Ch. 18, 5320MHz, 6Mbps, EUT Horz |
| 22001.170 | 50.5 | 0.2 | 1.8 | 39.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 50.7 | 74.0 | -23.3 | Ch. 19, 5500MHz, 6Mbps, EUT Vert |
| 11650.010 | 51.8 | -1.7 | 1.0 | 33.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 50.1 | 74.0 | -23.9 | Ch. 34, 5825MHz, 6Mbps, EUT Vert |
| 22979.320 | 49.0 | 0.4 | 1.5 | 4.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 49.4 | 74.0 | -24.6 | Ch. 30, 5745MHz, 6Mbps, EUT Horz |
| 11490.110 | 52.4 | -3.1 | 1.8 | 302.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 49.3 | 74.0 | -24.7 | Ch. 30, 5745MHz, 6Mbps, EUT Vert |
| 22000.420 | 48.7 | 0.2 | 1.8 | 0.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 48.9 | 74.0 | -25.1 | Ch. 19, 5500MHz, 6Mbps, EUT Horz |
| 21039.560 | 48.9 | -0.3 | 1.8 | 353.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.6 | 74.0 | -25.4 | Ch. 15, 5260MHz, 6Mbps, EUT Vert |
| 22979.670 | 47.7 | 0.4 | 1.8 | 66.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.1 | 74.0 | -25.9 | Ch. 30, 5745MHz, 6Mbps, EUT Vert |
| 20959.530 | 47.7 | -0.3 | 1.6 | 53.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 47.4 | 74.0 | -26.6 | Ch. 14, 5240MHz, 6Mbps, EUT Horz |
| 21040.470 | 47.5 | -0.3 | 1.8 | 51.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 47.2 | 74.0 | -26.8 | Ch. 15, 5260MHz, 6Mbps, EUT Horz |
| 11490.110 | 50.0 | -3.1 | 2.1 | 322.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 46.9 | 74.0 | -27.1 | Ch. 30, 5745MHz, 6Mbps, EUT Horz |
| 21278.900 | 46.9 | -0.2 | 1.8 | 17.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 46.7 | 74.0 | -27.3 | Ch. 18, 5320MHz, 6Mbps, EUT Vert |
| 11650.350 | 47.7 | -1.7 | 3.2 | 76.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 46.0 | 74.0 | -28.0 | Ch. 34, 5825MHz, 6Mbps, EUT Horz |
| 21281.230 | 46.0 | -0.2 | 1.6 | 12.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 45.8 | 74.0 | -28.2 | Ch. 18, 5320MHz, 6Mbps, EUT Horz |
| 20719.010 | 46.1 | -0.4 | 1.6 | 243.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 45.7 | 74.0 | -28.3 | Ch. 8, 5180MHz, 6Mbps, EUT Horz |
| 20961.120 | 45.9 | -0.3 | 1.6 | 219.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 45.6 | 74.0 | -28.4 | Ch. 14, 5240MHz, 6Mbps, EUT Vert |
| 20720.840 | 45.9 | -0.4 | 1.6 | 158.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 45.5 | 74.0 | -28.5 | Ch. 8, 5180MHz, 6Mbps, EUT Vert |

| | | | | |
|-----------------|--|-------------------|-----------|--|
| Work Order: | FOCU0214 | Date: | 10/08/15 |  |
| Project: | None | Temperature: | 23 °C | |
| Job Site: | EV01 | Humidity: | 48.9% RH | |
| Serial Number: | 02EA4CD00042 | Barometric Pres.: | 1016 mbar | |
| EUT: | Athena4XD (Extended Distance) | | | Tested by: Cole Ghizzone, Brandon Hobbs |
| Configuration: | 4 | | | |
| Customer: | Summit Semiconductor LLC | | | |
| Attendees: | Gerald | | | |
| EUT Power: | 3.3/1.2 VDC | | | |
| Operating Mode: | Continuous Tx, see data comments for channel, frequency and data rate. | | | |
| Deviations: | None | | | |
| Comments: | See comments for EUT orientation | | | |

| | |
|---------------------|------------------|
| Test Specifications | Test Method |
| FCC 15.407:2015 | ANSI C63.10:2013 |

| | | | | | | | |
|-------|-----|-------------------|---|-------------------|-----------|---------|------|
| Run # | 166 | Test Distance (m) | 1 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|-------|-----|-------------------|---|-------------------|-----------|---------|------|

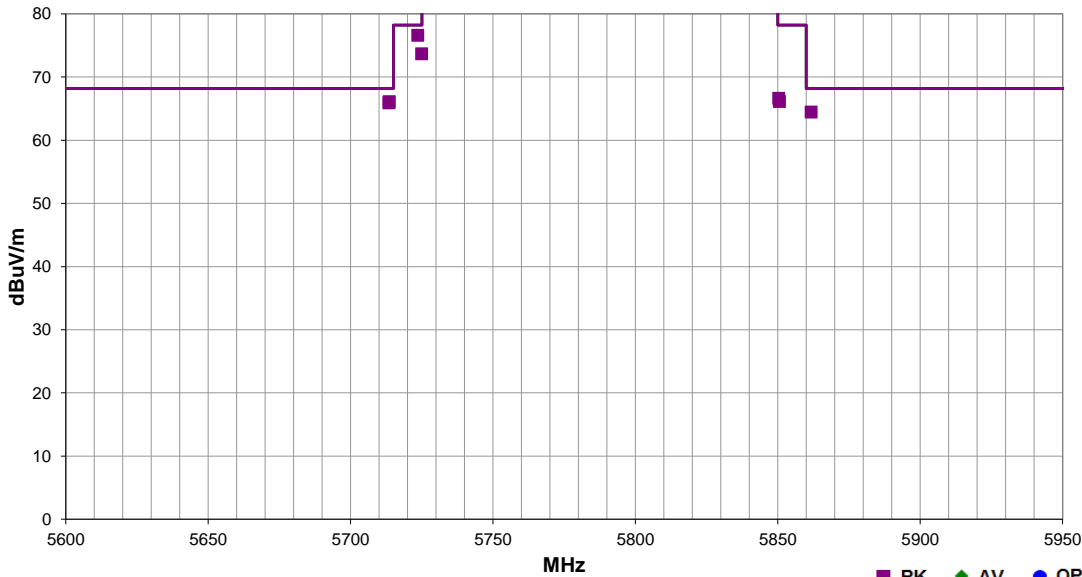


| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|--------------------------|----------|--------------------------|-------------------|----------------------|------------------------|--|
| 5149.695 | 25.4 | 37.1 | 1.6 | 48.0 | 1.0 | 0.0 | Horz | AV | -9.5 | 53.0 | 54.0 | -1.0 | Ch. 8, 5180MHz, 6Mbps, EUT Horz |
| 5150.000 | 25.3 | 37.1 | 2.0 | 23.0 | 1.0 | 0.0 | Horz | AV | -9.5 | 52.9 | 54.0 | -1.1 | Ch. 8, 5180MHz, 6Mbps, EUT On Side, 10Hz |
| 5149.990 | 25.2 | 37.1 | 1.4 | 16.0 | 1.0 | 0.0 | Vert | AV | -9.5 | 52.8 | 54.0 | -1.2 | Ch. 8, 5180MHz, 6Mbps, EUT Vert, 10Hz |
| 5150.000 | 25.1 | 37.1 | 1.7 | 342.0 | 1.0 | 0.0 | Horz | AV | -9.5 | 52.7 | 54.0 | -1.3 | Ch. 8, 5180MHz, 6Mbps, EUT Vert, 10Hz |
| 5459.885 | 24.4 | 37.8 | 1.9 | 40.0 | 1.0 | 0.0 | Horz | AV | -9.5 | 52.6 | 54.0 | -1.4 | Ch. 19, 5500MHz, 6Mbps, EUT On Side |
| 5150.000 | 25.0 | 37.1 | 1.9 | 24.0 | 1.0 | 0.0 | Vert | AV | -9.5 | 52.6 | 54.0 | -1.4 | Ch. 8, 5180MHz, 6Mbps, EUT Horz, 10Hz |
| 5459.485 | 24.2 | 37.8 | 1.9 | 40.0 | 1.0 | 0.0 | Horz | AV | -9.5 | 52.4 | 54.0 | -1.6 | Ch. 19, 5500MHz, 18Mbps, EUT On Side |
| 5350.005 | 24.4 | 37.5 | 1.9 | 16.0 | 1.0 | 0.0 | Horz | AV | -9.5 | 52.3 | 54.0 | -1.7 | Ch. 18, 5320MHz, 6Mbps, EUT On Side, 10Hz |
| 5150.000 | 24.6 | 37.1 | 1.2 | 353.0 | 1.0 | 0.0 | Vert | AV | -9.5 | 52.2 | 54.0 | -1.8 | Ch. 8, 5180MHz, 6Mbps, EUT On Side, 10Hz |
| 5150.000 | 23.9 | 37.1 | 2.0 | 23.0 | 1.0 | 0.0 | Horz | AV | -9.5 | 51.5 | 54.0 | -2.5 | Ch. 8, 5180MHz, 18Mbps, EUT On Side, 10Hz |
| 5149.630 | 43.8 | 37.1 | 2.0 | 23.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 71.4 | 74.0 | -2.6 | Ch. 8, 5180MHz, 6Mbps, EUT On Side |
| 5148.825 | 43.7 | 37.1 | 1.4 | 16.0 | 1.0 | 0.0 | Vert | PK | -9.5 | 71.3 | 74.0 | -2.7 | Ch. 8, 5180MHz, 6Mbps, EUT Vert |
| 5149.830 | 43.5 | 37.1 | 1.9 | 24.0 | 1.0 | 0.0 | Vert | PK | -9.5 | 71.1 | 74.0 | -2.9 | Ch. 8, 5180MHz, 6Mbps, EUT Horz |
| 5149.905 | 43.3 | 37.1 | 2.0 | 23.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 70.9 | 74.0 | -3.1 | Ch. 8, 5180MHz, 18Mbps, EUT On Side |
| 5351.640 | 42.8 | 37.5 | 1.9 | 16.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 70.7 | 74.0 | -3.3 | Ch. 18, 5320MHz, 18Mbps, EUT On Side |
| 5350.480 | 42.8 | 37.5 | 1.9 | 16.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 70.7 | 74.0 | -3.3 | Ch. 18, 5320MHz, 6Mbps, EUT On Side |
| 5350.000 | 22.8 | 37.5 | 1.9 | 16.0 | 1.0 | 0.0 | Horz | AV | -9.5 | 50.7 | 54.0 | -3.3 | Ch. 18, 5320MHz, 18Mbps, EUT On Side, 10Hz |
| 5149.960 | 23.0 | 37.1 | 1.6 | 48.0 | 1.0 | 0.0 | Horz | AV | -9.5 | 50.6 | 54.0 | -3.4 | Ch. 8, 5180MHz, 6Mbps, EUT Horz, 10Hz |
| 5149.900 | 42.7 | 37.1 | 1.7 | 342.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 70.3 | 74.0 | -3.7 | Ch. 8, 5180MHz, 6Mbps, EUT Vert |
| 5148.980 | 42.0 | 37.1 | 1.2 | 353.0 | 1.0 | 0.0 | Vert | PK | -9.5 | 69.6 | 74.0 | -4.4 | Ch. 8, 5180MHz, 6Mbps, EUT On Side |
| 5459.805 | 37.6 | 37.8 | 1.9 | 40.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 65.8 | 74.0 | -8.2 | Ch. 19, 5500MHz, 18Mbps, EUT On Side |
| 5457.510 | 37.6 | 37.8 | 1.9 | 40.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 65.8 | 74.0 | -8.2 | Ch. 19, 5500MHz, 6Mbps, EUT On Side |
| 5149.790 | 36.9 | 37.1 | 1.6 | 48.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 64.5 | 74.0 | -9.5 | Ch. 8, 5180MHz, 6Mbps, EUT Horz |

| | | | | |
|-----------------|--|-------------------|-----------|--|
| Work Order: | FOCU0214 | Date: | 10/08/15 | |
| Project: | None | Temperature: | 23 °C | |
| Job Site: | EV01 | Humidity: | 48.9% RH | |
| Serial Number: | 02EA4CD00042 | Barometric Pres.: | 1016 mbar | |
| EUT: | Athena4XD (Extended Distance) | | | |
| Configuration: | 4 | | | |
| Customer: | Summit Semiconductor LLC | | | |
| Attendees: | Gerald | | | |
| EUT Power: | 3.3/1.2 VDC | | | |
| Operating Mode: | Continuous Tx, see data comments for channel, frequency and data rate. | | | |
| Deviations: | None | | | |
| Comments: | See comments for EUT orientation | | | |

| Test Specifications | Test Method |
|---------------------|------------------|
| FCC 15.407:2015 | ANSI C63.10:2013 |

| Run # | 167 | Test Distance (m) | 1 | Antenna Height(s) | 1 to 4(m) | 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 |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|--------------------------------------|
| 5723.525 | 48.5 | 37.6 | 1.8 | 356.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 76.6 | 78.2 | -1.6 | Ch. 30, 5745MHz, 6Mbps, EUT On Side |
| 5713.570 | 38.0 | 37.6 | 1.7 | 0.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 66.1 | 68.2 | -2.1 | Ch. 30, 5745MHz, 6Mbps, EUT On Side |
| 5713.445 | 37.8 | 37.6 | 1.7 | 0.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 65.9 | 68.2 | -2.3 | Ch. 30, 5745MHz, 18Mbps, EUT On Side |
| 5861.680 | 36.2 | 37.8 | 1.6 | 360.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 64.5 | 68.2 | -3.7 | Ch. 34, 5825MHz, 6Mbps, EUT On Side |
| 5724.915 | 45.6 | 37.6 | 1.8 | 356.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 73.7 | 78.2 | -4.5 | Ch. 30, 5745MHz, 18Mbps, EUT On Side |
| 5850.330 | 38.4 | 37.8 | 1.6 | 349.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 66.6 | 78.2 | -11.6 | Ch. 34, 5825MHz, 18Mbps, EUT On Side |
| 5850.585 | 37.9 | 37.8 | 1.6 | 349.0 | 1.0 | 0.0 | Horz | PK | -9.5 | 66.1 | 78.2 | -12.1 | Ch. 34, 5825MHz, 6Mbps, EUT On Side |

FREQUENCY STABILITY

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 (mo) |
|--------------------------------|---------------------------|----------------|-----|-----------|---------------|
| Meter - Multimeter | Tektronix | DMM912 | MMH | 2/5/2013 | 36 |
| Thermometer | Omegaette | HH311 | DTY | 1/21/2015 | 36 |
| Power Supply - DC | Instek | PC-3030D | TPR | NCR | 0 |
| Chamber - Temperature/Humidity | Cincinnati Sub Zero (CSZ) | ZPH-8-2-SCT/AC | TBI | NCR | 0 |
| Power Supply - DC | Topward | TPS-2000 | TPD | NCR | 0 |
| Generator - Signal | Keysight | N5182B | TFX | 4/16/2015 | 36 |
| Cable | ESM Cable Corp. | TT | EV1 | NCR | 0 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 7/14/2015 | 12 |
| Block - DC | Fairview Microwave | SD3379 | AMP | 6/18/2015 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4446A | AAQ | 3/10/2015 | 12 |

TEST DESCRIPTION

A direct connect measurement was made between the EUT's antenna cable and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made at the edges of the main transmit bands as called out on the data sheets. Testing could not be done with the absence of modulation or CW mode so testing was completed modulated using the lowest data rate available.


The primary supply voltage was varied from 90 % to 110% of the nominal voltage Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

Per the requirements of FCC 15.407:

"Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual."

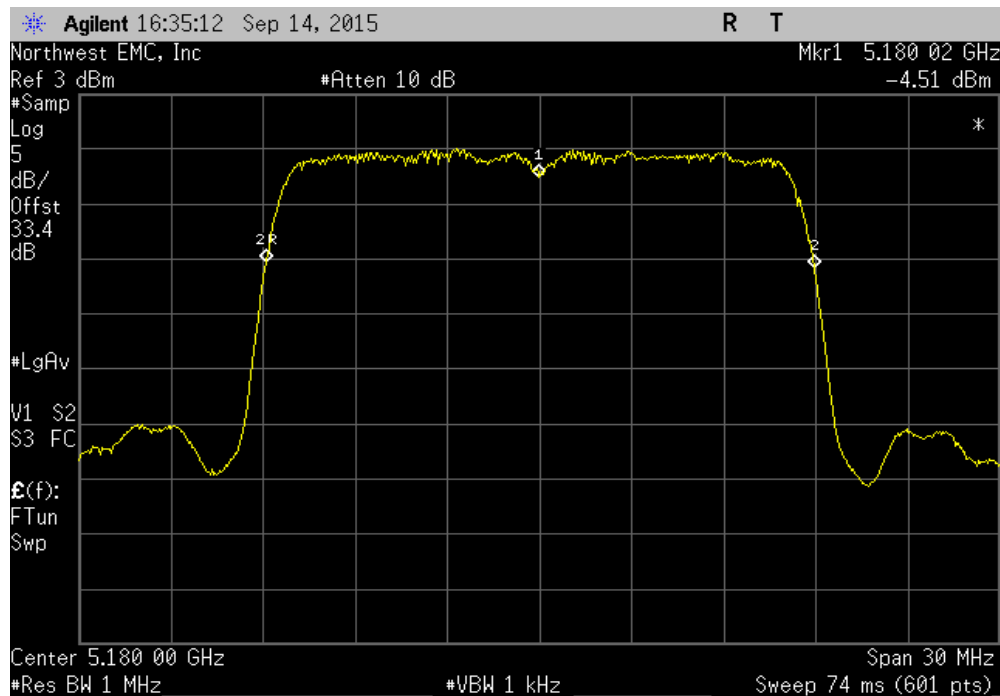
No specific limits are provided in either FCC 15.407, the product specific rule part, or FCC 2.1055, the equipment authorization procedure for testing frequency stability. While there are no limits called out, any results less than 100ppm will still allow the radio to be operating within the band.

FREQUENCY STABILITY

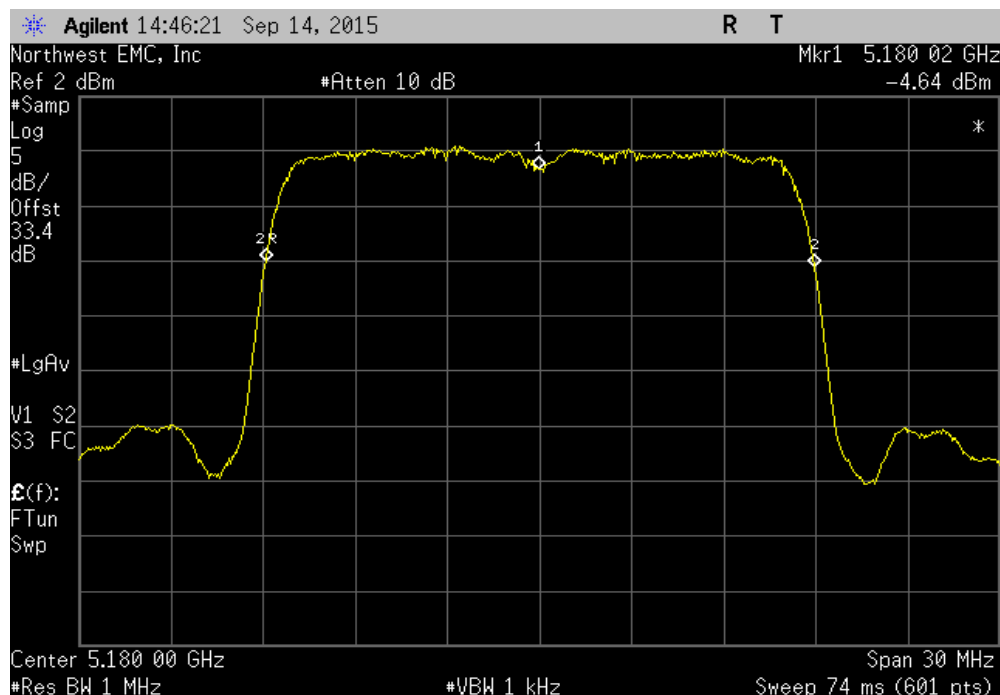
| | | | | | | |
|---|---|---|----------------------|-------------|-------------|---------|
| EUT: Athena4XD (extended distance) | | Work Order: FOCU0214 | | | | |
| Serial Number: 02EA4CD00042 | | Date: 09/15/15 | | | | |
| Customer: Summit Semiconductor LLC | | Temperature: 23.4°C | | | | |
| Attendees: David Schilling | | Humidity: 38% | | | | |
| Project: None | | Barometric Pres.: 1009.2 | | | | |
| Tested by: Brandon Hobbs | | Power: 3.3/1.2 VDC Nominal | | | | |
| | | Job Site: EV06 | | | | |
| TEST SPECIFICATIONS | | Test Method | | | | |
| FCC 15.407:2015 | | ANSI C63.10:2013 | | | | |
| COMMENTS | | | | | | |
| The EUT was not tested in ISOC mode. Testing was completed using a 10% variation in DC voltage. Based on transmission line length to all four identical antennas, a direct connect port was located on the worst case/shortest antenna path which was provided by the client. This test location was determined to be worst case by the client. | | | | | | |
| DEVIATIONS FROM TEST STANDARD | | | | | | |
| None | | | | | | |
| Configuration # | 5 | Signature  | | | | |
| | | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |
| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz | | | | | | |
| Voltage: 110% (3.63/1.32 VDC) | | 5180.02 | 5180 | 3.9 | 100 | Pass |
| Voltage: 100% (3.3/1.2 VDC) | | 5180.02 | 5180 | 3.9 | 100 | Pass |
| Voltage: 90% (2.97/1.08 VDC) | | 5180.02 | 5180 | 3.9 | 100 | Pass |
| Temperature: +50° | | 5180 | 5180 | 0 | 100 | Pass |
| Temperature: +40° | | 5180 | 5180 | 0 | 100 | Pass |
| Temperature: +30° | | 5180.02 | 5180 | 3.9 | 100 | Pass |
| Temperature: +20° | | 5180.02 | 5180 | 3.9 | 100 | Pass |
| Temperature: +10° | | 5180.02 | 5180 | 3.9 | 100 | Pass |
| Temperature: 0° | | 5180.05 | 5180 | 9.7 | 100 | Pass |
| Temperature: -10° | | 5180.05 | 5180 | 9.7 | 100 | Pass |
| Temperature: -20° | | 5180.05 | 5180 | 9.7 | 100 | Pass |
| Temperature: -30° | | 5180.02 | 5180 | 3.9 | 100 | Pass |
| 5250 MHz - 5350 MHz - High Channel, 5320 MHz | | | | | | |
| Voltage: 110% (3.63/1.32 VDC) | | 5320 | 5320 | 0 | 100 | Pass |
| Voltage: 100% (3.3/1.2 VDC) | | 5320.02 | 5320 | 3.8 | 100 | Pass |
| Voltage: 90% (2.97/1.08 VDC) | | 5320.05 | 5320 | 9.4 | 100 | Pass |
| Temperature: +50° | | 5320.02 | 5320 | 3.8 | 100 | Pass |
| Temperature: +40° | | 5320.02 | 5320 | 3.8 | 100 | Pass |
| Temperature: +30° | | 5320 | 5320 | 0 | 100 | Pass |
| Temperature: +20° | | 5320.02 | 5320 | 3.8 | 100 | Pass |
| Temperature: +10° | | 5320.02 | 5320 | 3.8 | 100 | Pass |
| Temperature: 0° | | 5320.05 | 5320 | 9.4 | 100 | Pass |
| Temperature: -10° | | 5320.08 | 5320 | 15 | 100 | Pass |
| Temperature: -20° | | 5320.05 | 5320 | 9.4 | 100 | Pass |
| Temperature: -30° | | 5320.05 | 5320 | 9.4 | 100 | Pass |
| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz | | | | | | |
| Voltage: 110% (3.63/1.32 VDC) | | 5500.02 | 5500 | 3.6 | 100 | Pass |
| Voltage: 100% (3.3/1.2 VDC) | | 5500.02 | 5500 | 3.6 | 100 | Pass |
| Voltage: 90% (2.97/1.08 VDC) | | 5500.02 | 5500 | 3.6 | 100 | Pass |
| Temperature: +50° | | 5500 | 5500 | 0 | 100 | Pass |
| Temperature: +40° | | 5500.02 | 5500 | 3.6 | 100 | Pass |
| Temperature: +30° | | 5500.02 | 5500 | 3.6 | 100 | Pass |
| Temperature: +20° | | 5500.02 | 5500 | 3.6 | 100 | Pass |
| Temperature: +10° | | 5500.05 | 5500 | 9.1 | 100 | Pass |
| Temperature: 0° | | 5500.08 | 5500 | 14.6 | 100 | Pass |
| Temperature: -10° | | 5500.1 | 5500 | 18.2 | 100 | Pass |
| Temperature: -20° | | 5500.08 | 5500 | 14.6 | 100 | Pass |
| Temperature: -30° | | 5500.05 | 5500 | 9.1 | 100 | Pass |
| 5470 MHz - 5725 MHz - High Channel, 5700 MHz | | | | | | |
| Voltage: 110% (3.63/1.32 VDC) | | 5700.02 | 5700 | 3.5 | 100 | Pass |
| Voltage: 100% (3.3/1.2 VDC) | | 5700 | 5700 | 0 | 100 | Pass |
| Voltage: 90% (2.97/1.08 VDC) | | 5700 | 5700 | 0 | 100 | Pass |
| Temperature: +50° | | 5700 | 5700 | 0 | 100 | Pass |
| Temperature: +40° | | 5699.98 | 5700 | 3.5 | 100 | Pass |
| Temperature: +30° | | 5700 | 5700 | 0 | 100 | Pass |
| Temperature: +20° | | 5700 | 5700 | 0 | 100 | Pass |
| Temperature: +10° | | 5700.02 | 5700 | 3.5 | 100 | Pass |
| Temperature: 0° | | 5700.05 | 5700 | 8.8 | 100 | Pass |
| Temperature: -10° | | 5700.05 | 5700 | 8.8 | 100 | Pass |
| Temperature: -20° | | 5700.05 | 5700 | 8.8 | 100 | Pass |
| Temperature: -30° | | 5700.02 | 5700 | 3.5 | 100 | Pass |
| 5725 MHz - 5850 MHz - High Channel, 5825 MHz | | | | | | |
| Voltage: 110% (3.63/1.32 VDC) | | 5825 | 5825 | 0 | 100 | Pass |
| Voltage: 100% (3.3/1.2 VDC) | | 5825 | 5825 | 0 | 100 | Pass |
| Voltage: 90% (2.97/1.08 VDC) | | 5825.02 | 5825 | 3.4 | 100 | Pass |
| Temperature: +50° | | 5825.02 | 5825 | 3.4 | 100 | Pass |
| Temperature: +40° | | 5824.98 | 5825 | 3.4 | 100 | Pass |
| Temperature: +30° | | 5825 | 5825 | 0 | 100 | Pass |
| Temperature: +20° | | 5825 | 5825 | 0 | 100 | Pass |
| Temperature: +10° | | 5825.02 | 5825 | 3.4 | 100 | Pass |
| Temperature: 0° | | 5825.05 | 5825 | 8.6 | 100 | Pass |
| Temperature: -10° | | 5825.05 | 5825 | 8.6 | 100 | Pass |
| Temperature: -20° | | 5825.05 | 5825 | 8.6 | 100 | Pass |
| Temperature: -30° | | 5825.02 | 5825 | 3.4 | 100 | Pass |

FREQUENCY STABILITY

| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Voltage: 110% (3.63/1.32 VDC) | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.02 | 5180 | 3.9 | 100 | Pass | |

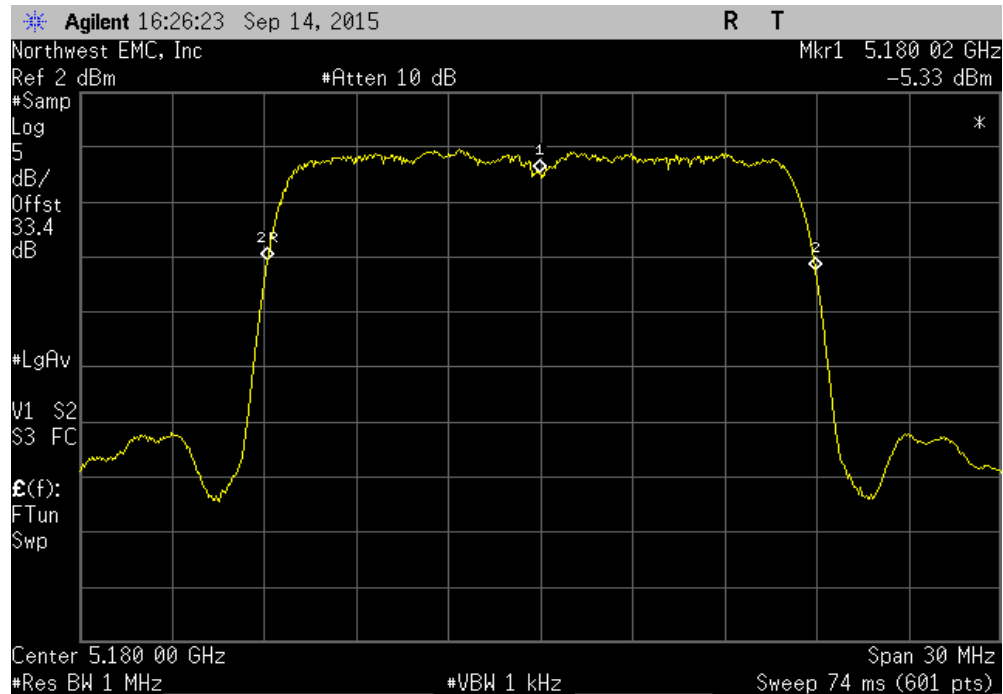


| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Voltage: 100% (3.3/1.2 VDC) | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.02 | 5180 | 3.9 | 100 | Pass | |

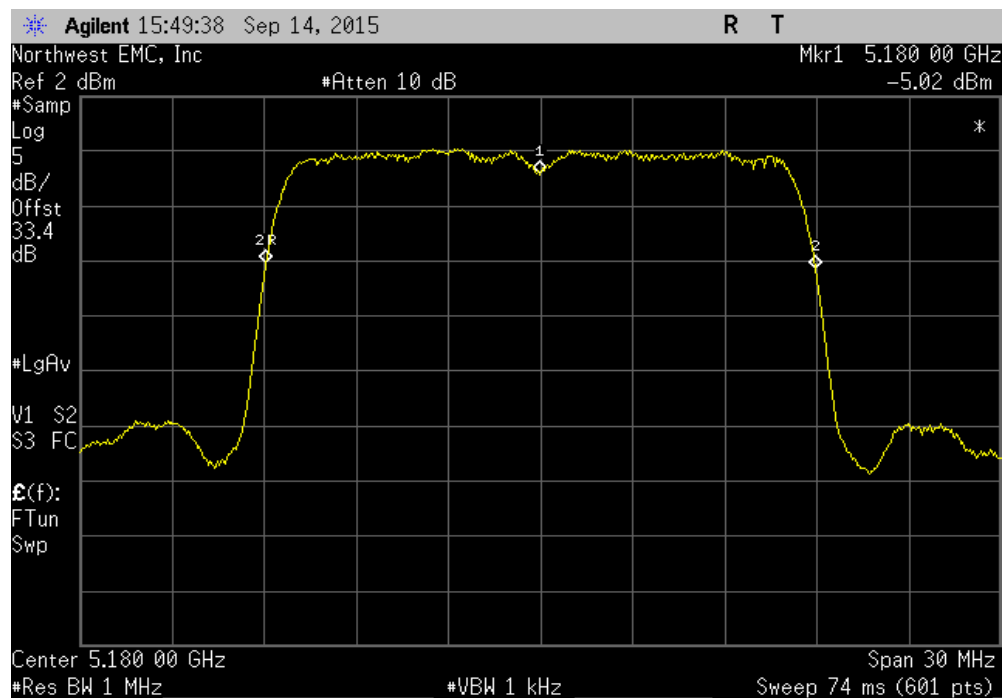


FREQUENCY STABILITY

| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Voltage: 90% (2.97/1.08 VDC) | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.02 | 5180 | 3.9 | 100 | Pass | |

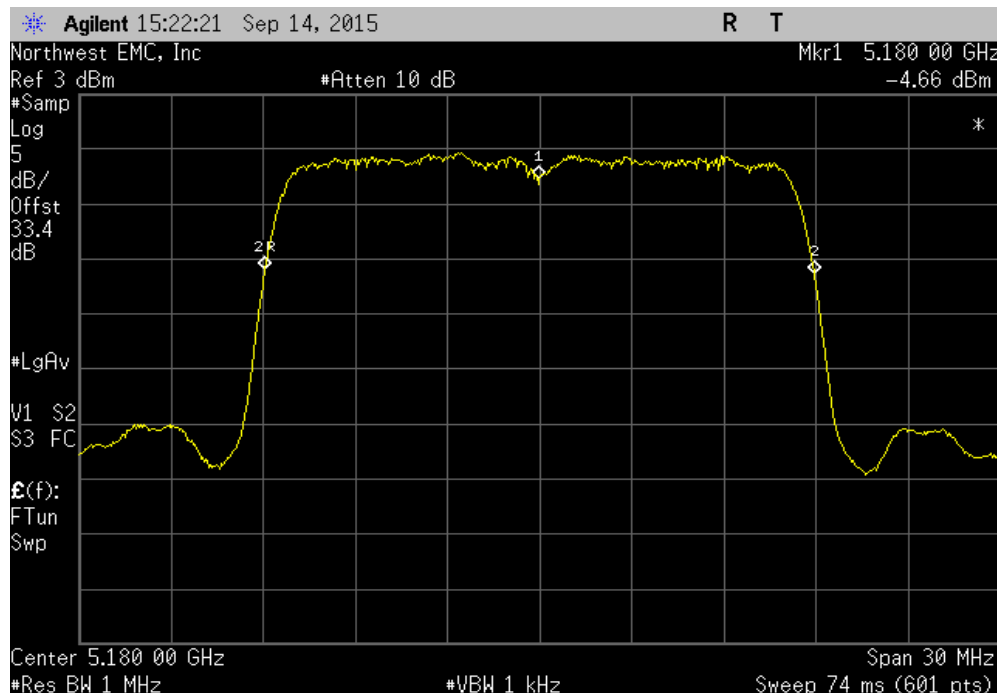


| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +50° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180 | 5180 | 0 | 100 | Pass | |

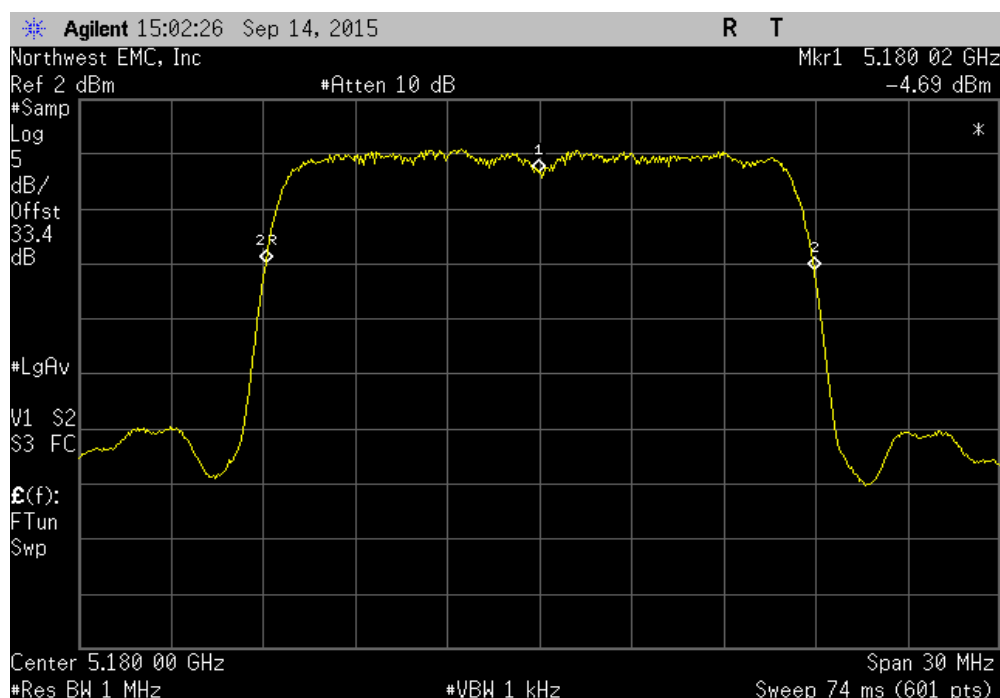


FREQUENCY STABILITY

| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +40° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180 | 5180 | 0 | 100 | Pass | |

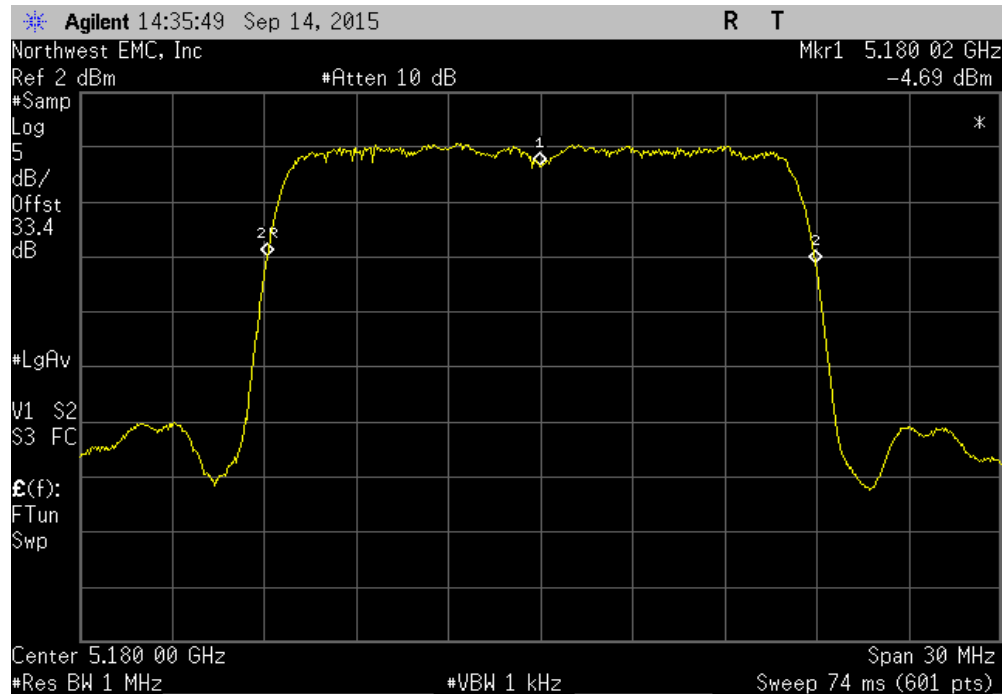


| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +30° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.02 | 5180 | 3.9 | 100 | Pass | |

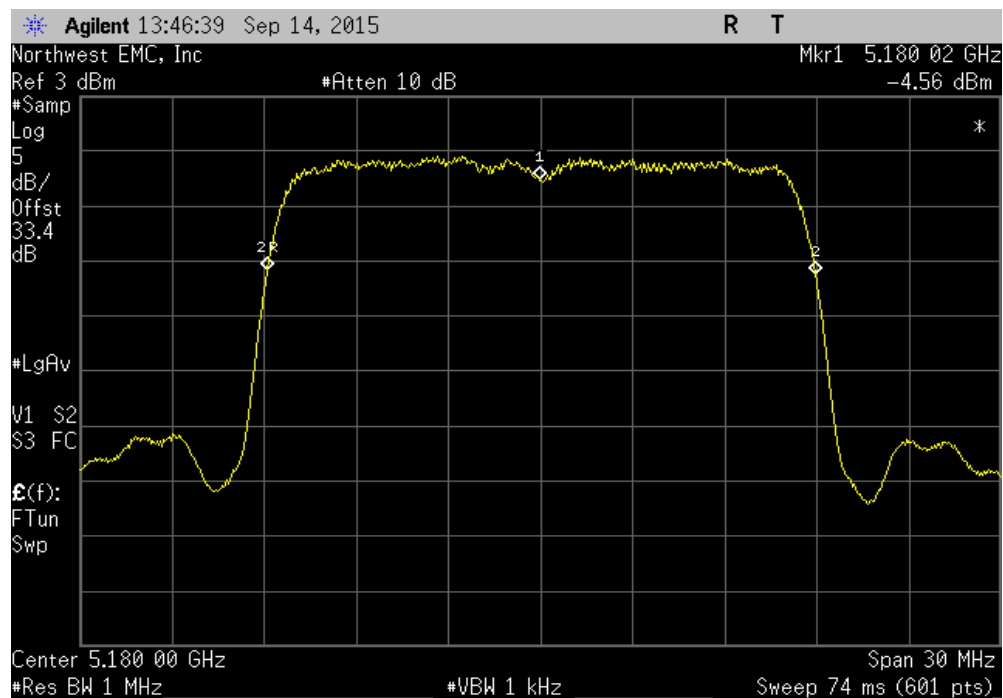


FREQUENCY STABILITY

| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +20° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.02 | 5180 | 3.9 | 100 | Pass | |

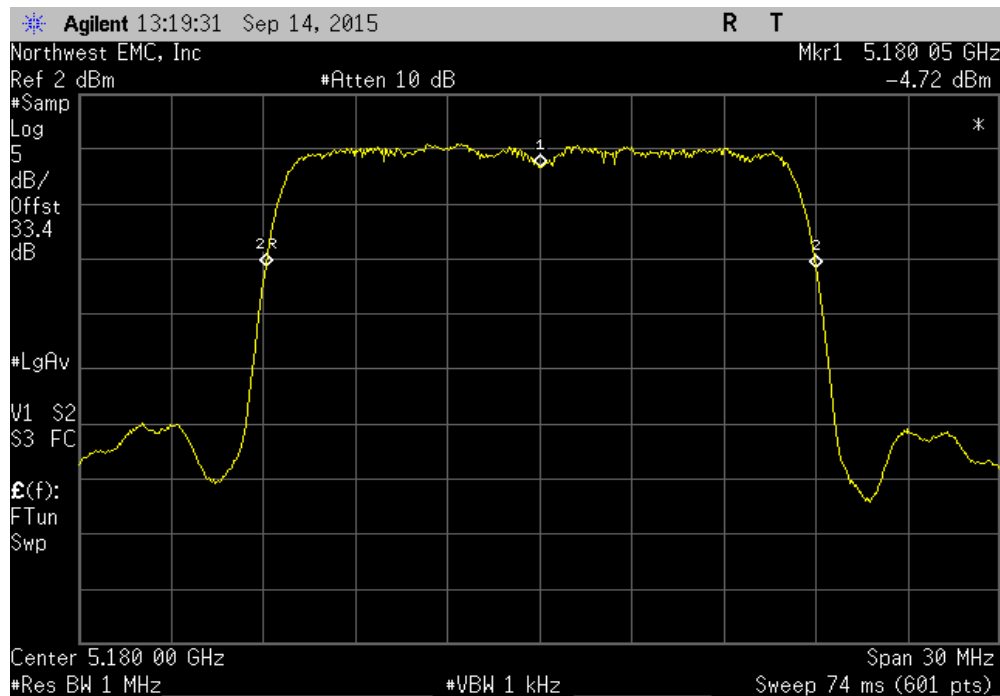


| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +10° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.02 | 5180 | 3.9 | 100 | Pass | |

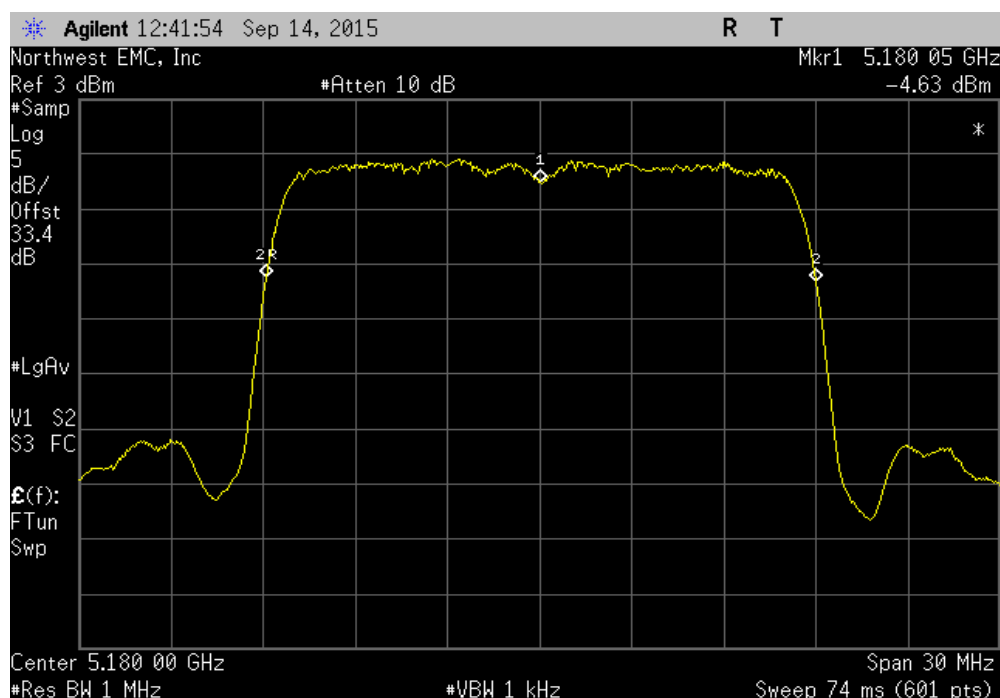


FREQUENCY STABILITY

| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: 0° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.05 | 5180 | 9.7 | 100 | Pass | |

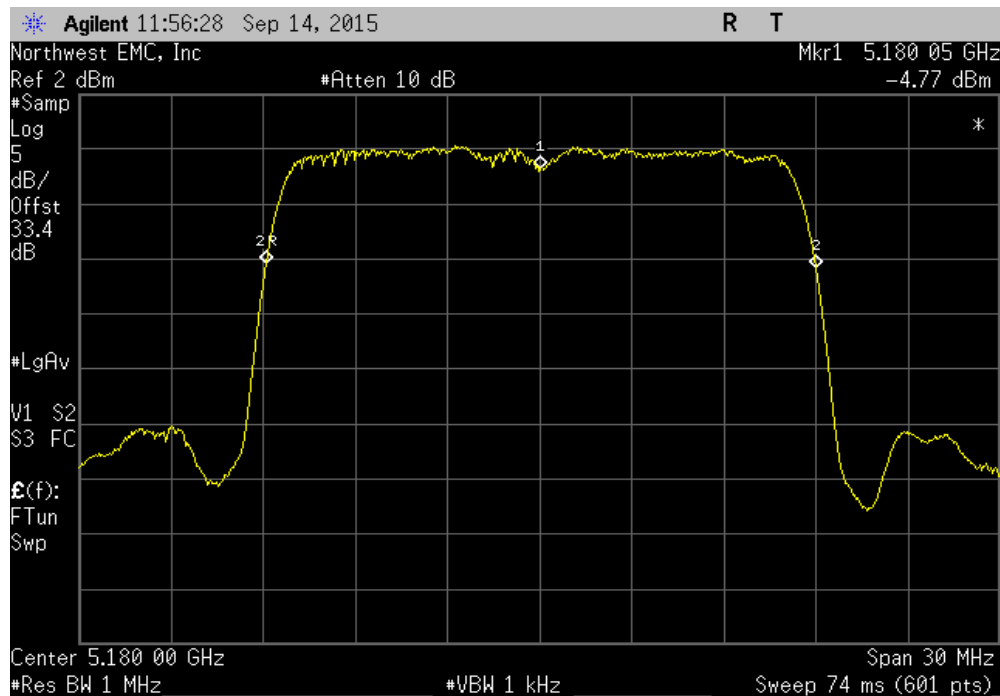


| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: -10° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.05 | 5180 | 9.7 | 100 | Pass | |

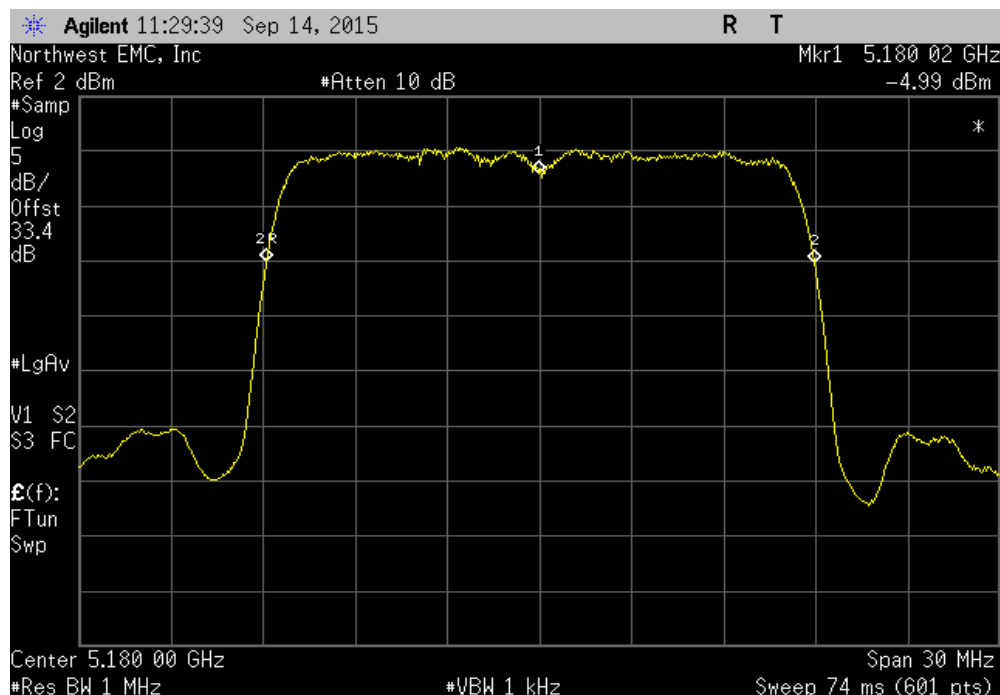


FREQUENCY STABILITY

| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: -20° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.05 | 5180 | 9.7 | 100 | Pass | |

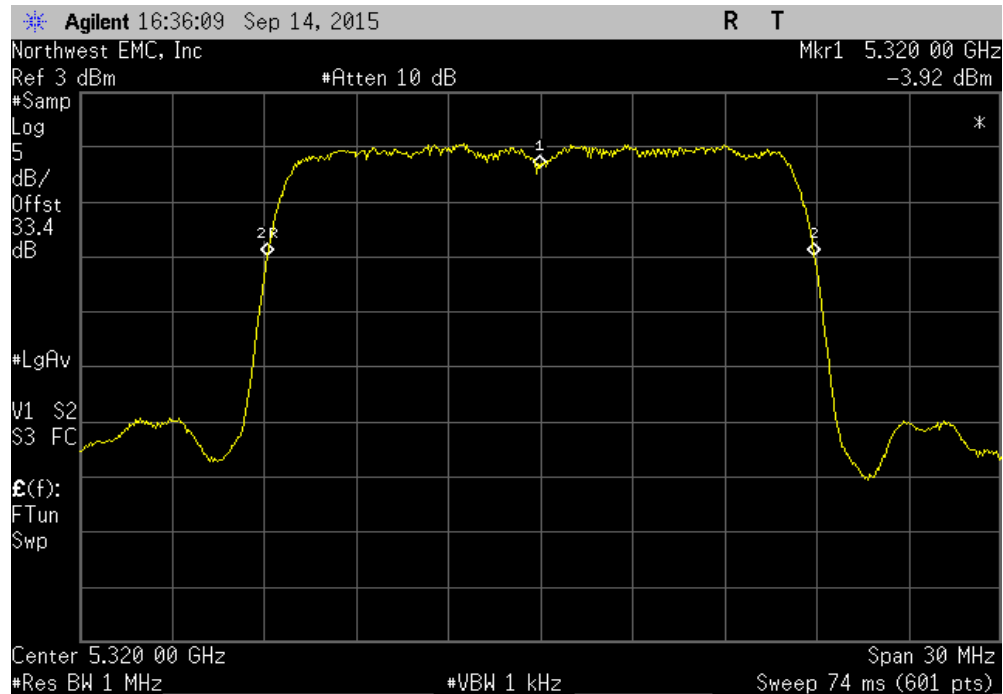


| 5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: -30° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5180.02 | 5180 | 3.9 | 100 | Pass | |

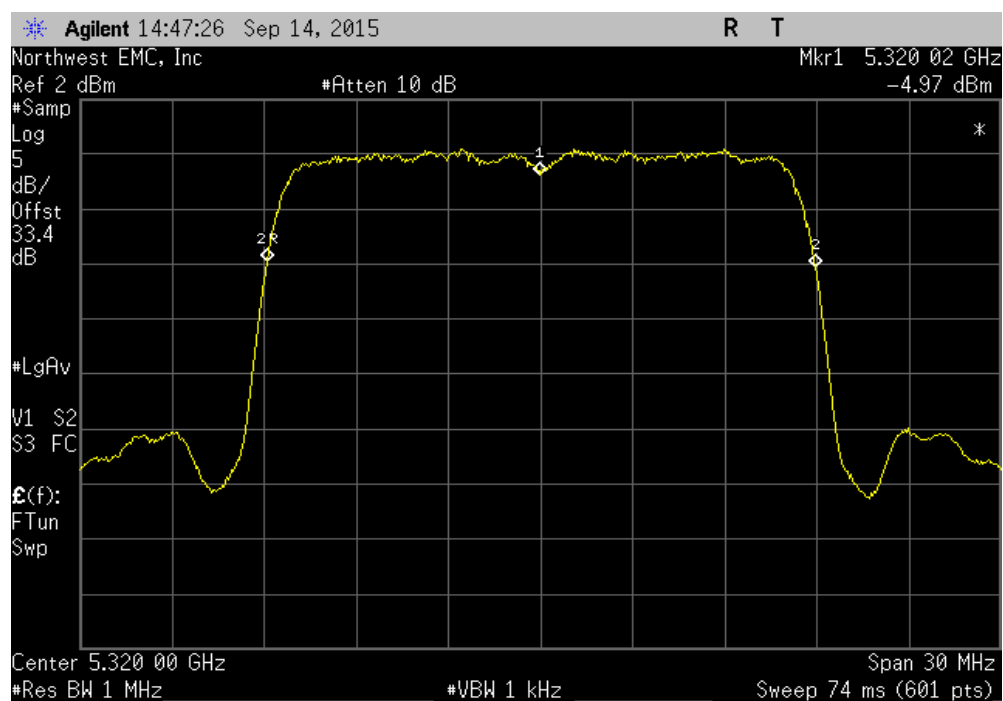


FREQUENCY STABILITY

| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Voltage: 110% (3.63/1.32 VDC) | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320 | 5320 | 0 | 100 | Pass | |

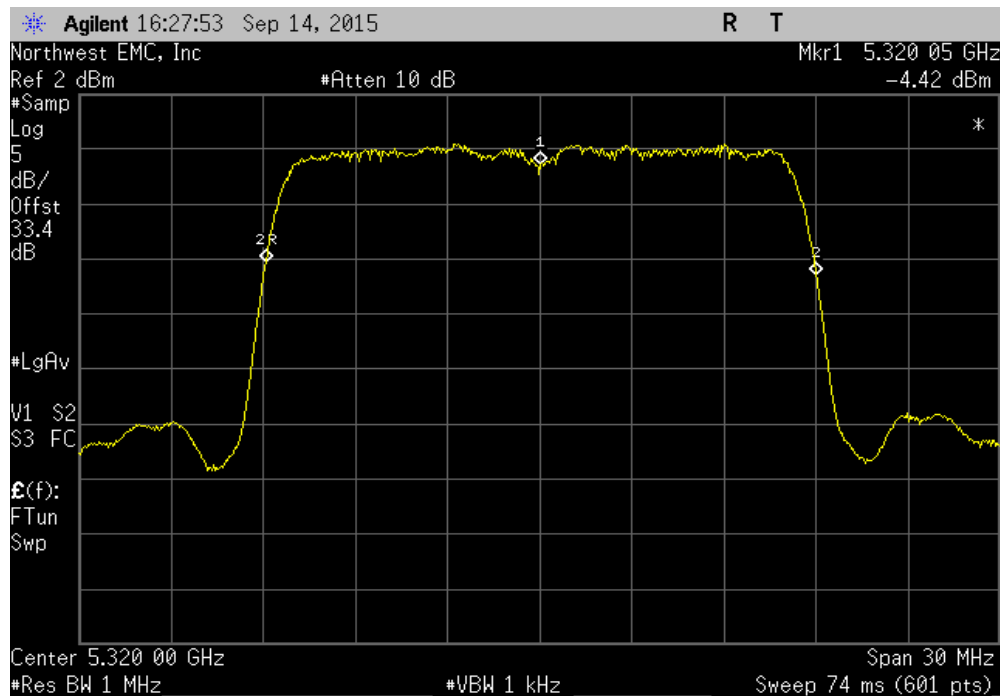


| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Voltage: 100% (3.3/1.2 VDC) | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.02 | 5320 | 3.8 | 100 | Pass | |

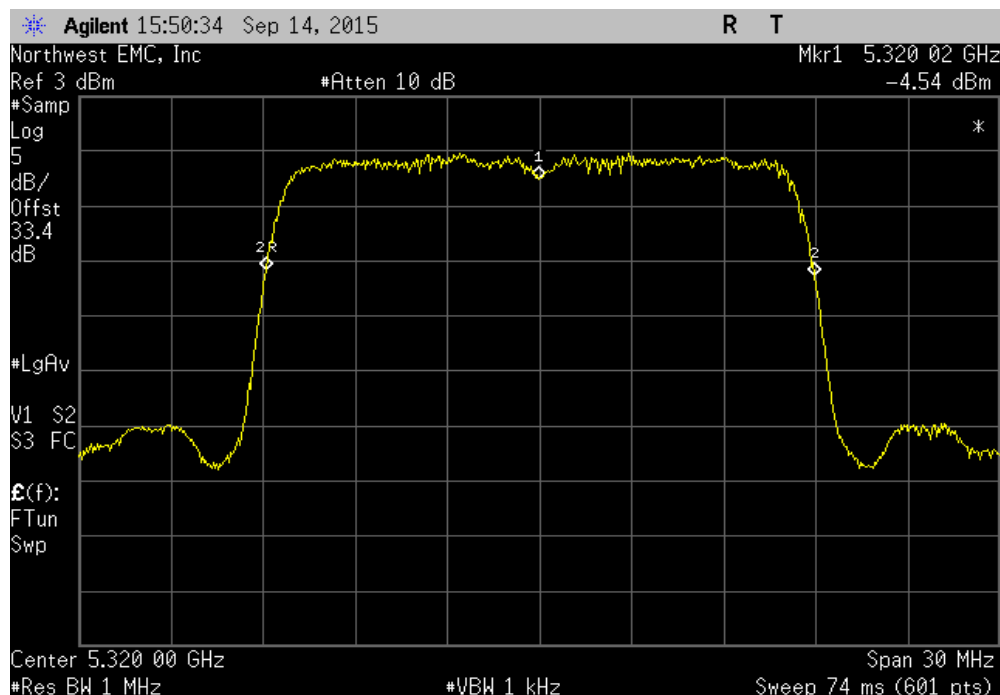


FREQUENCY STABILITY

| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Voltage: 90% (2.97/1.08 VDC) | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.05 | 5320 | 9.4 | 100 | Pass | |

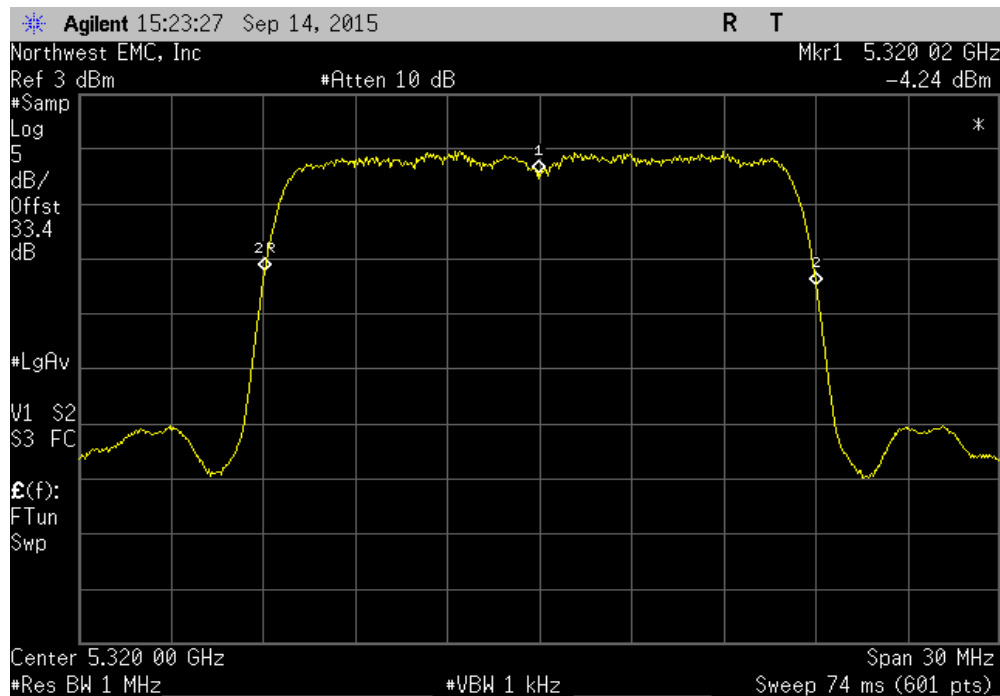


| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +50° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.02 | 5320 | 3.8 | 100 | Pass | |

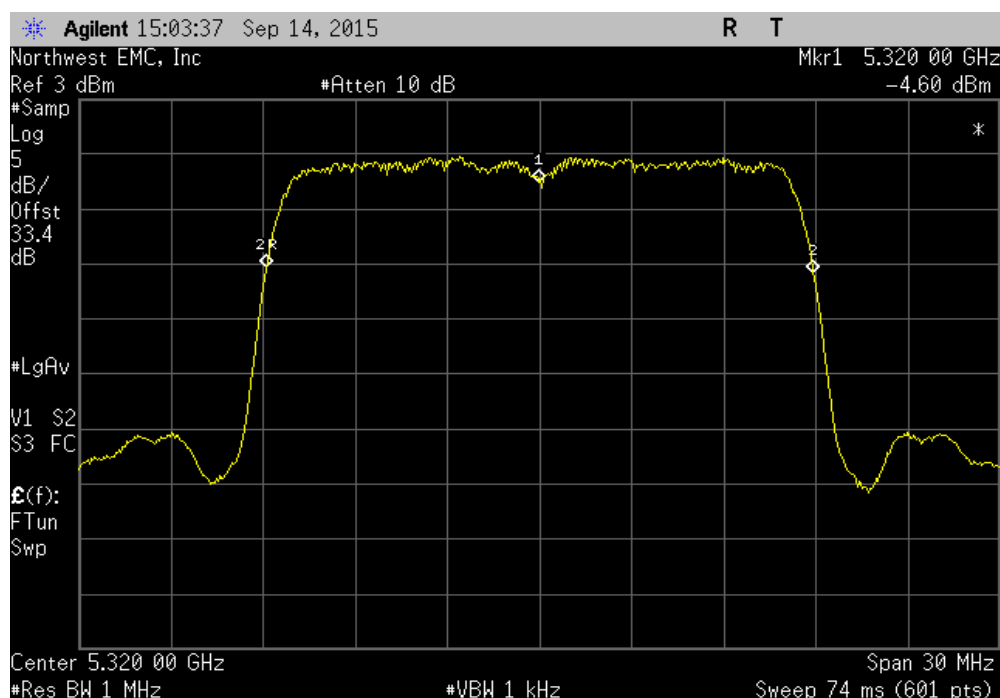


FREQUENCY STABILITY

| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +40° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.02 | 5320 | 3.8 | 100 | Pass | |

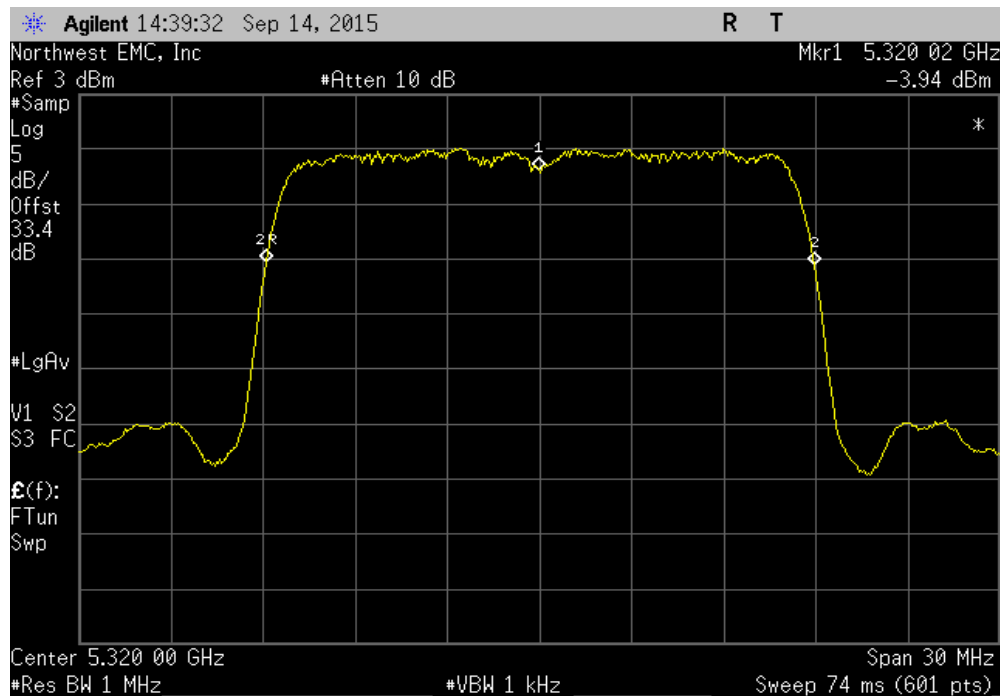


| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +30° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320 | 5320 | 0 | 100 | Pass | |

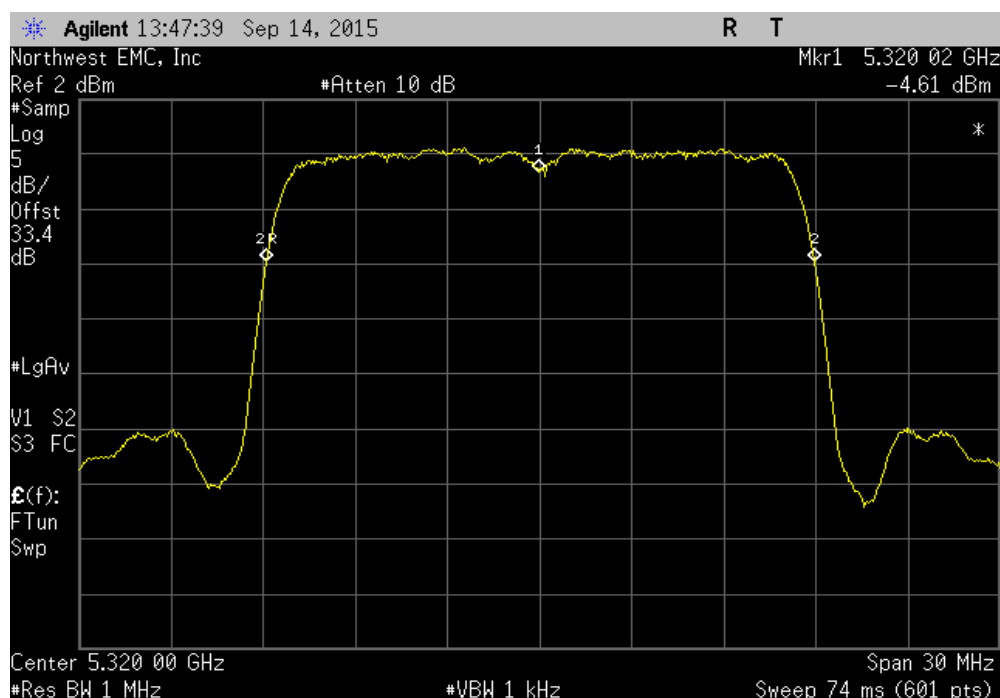


FREQUENCY STABILITY

| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +20° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.02 | 5320 | 3.8 | 100 | Pass | |

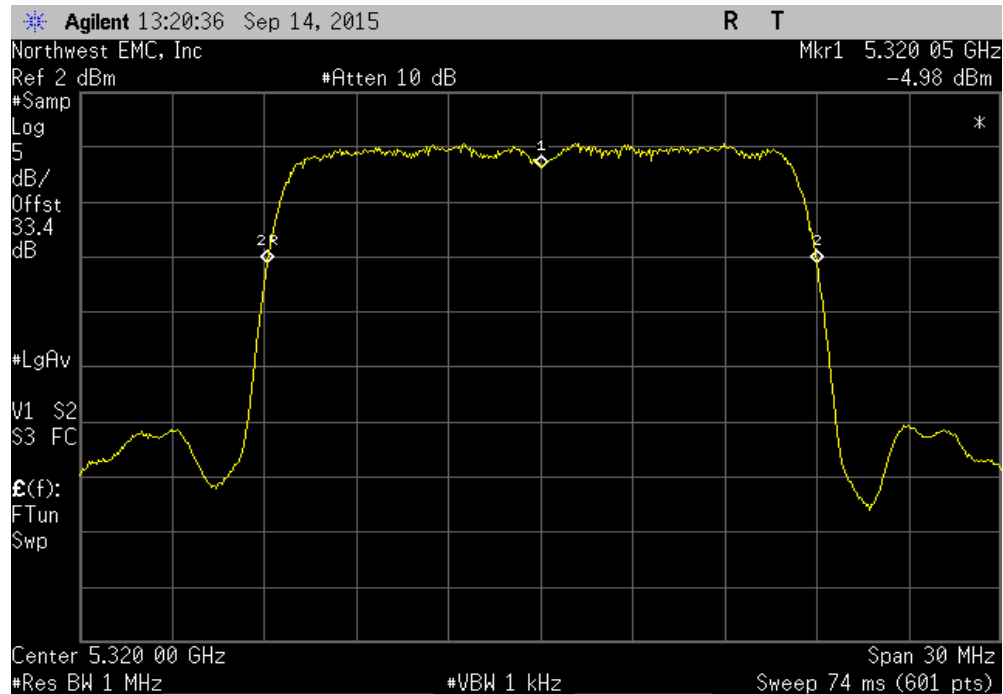


| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +10° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.02 | 5320 | 3.8 | 100 | Pass | |

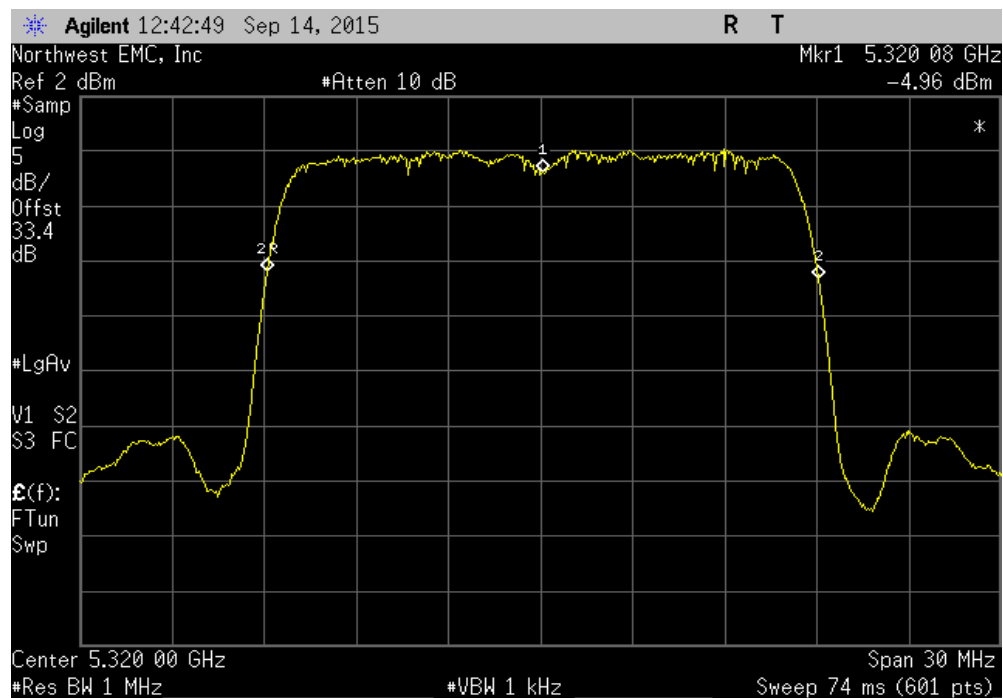


FREQUENCY STABILITY

| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: 0° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.05 | 5320 | 9.4 | 100 | Pass | |

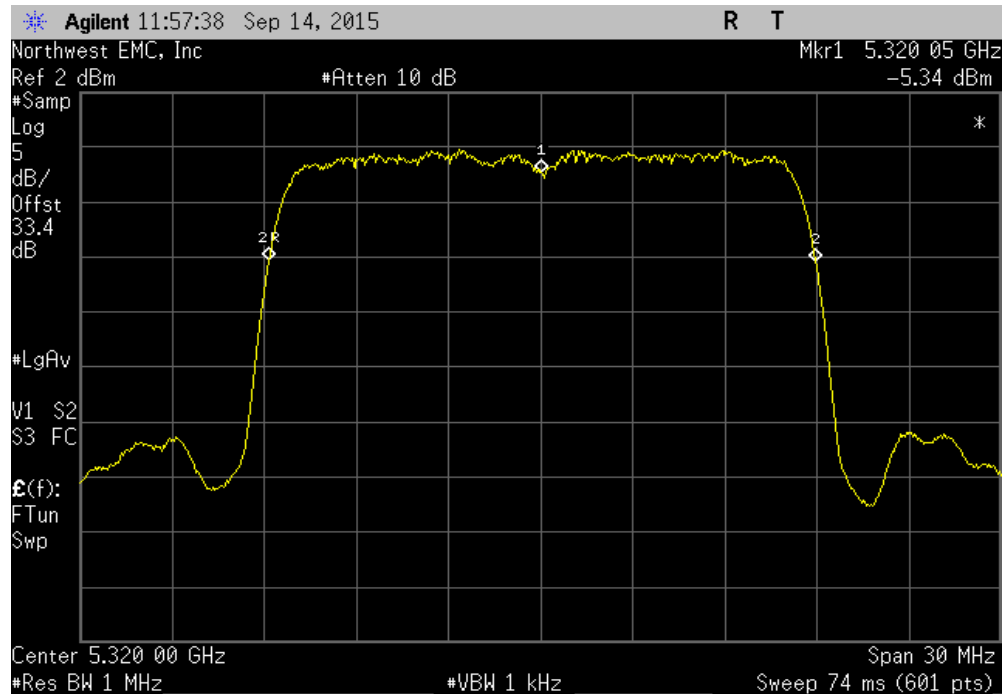


| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: -10° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.08 | 5320 | 15 | 100 | Pass | |

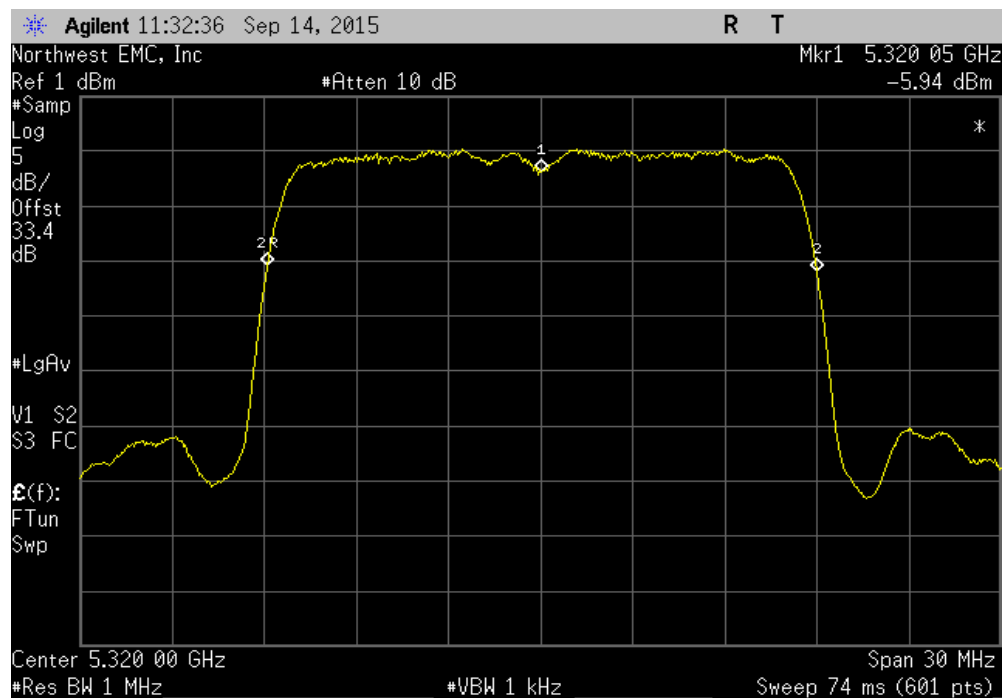


FREQUENCY STABILITY

| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: -20° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.05 | 5320 | 9.4 | 100 | Pass | |

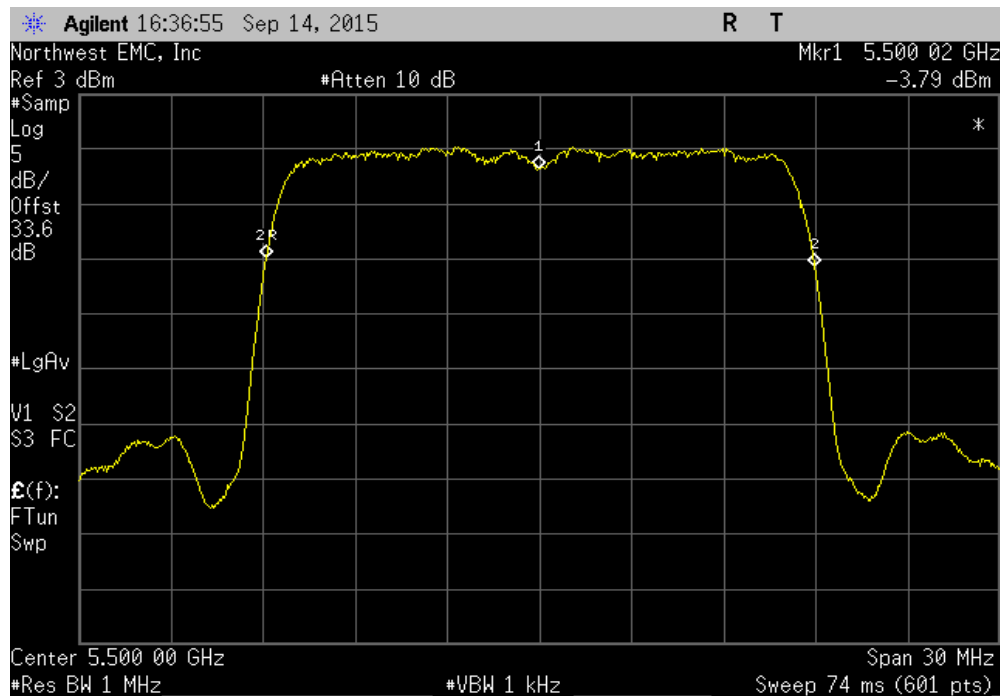


| 5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: -30° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5320.05 | 5320 | 9.4 | 100 | Pass | |

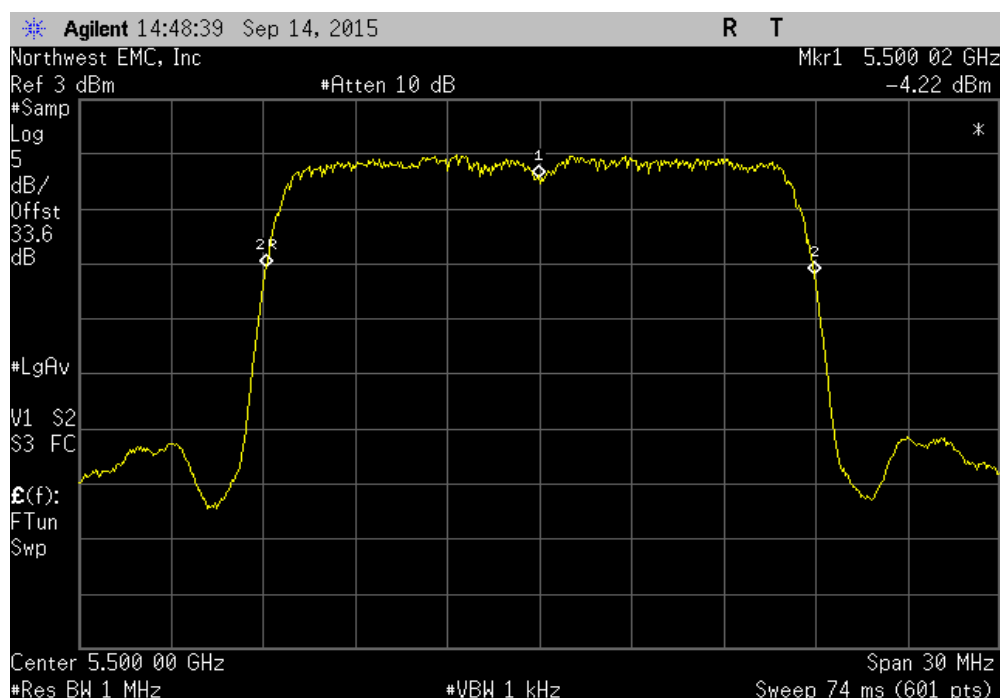


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Voltage: 110% (3.63/1.32 VDC) | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.02 | 5500 | 3.6 | 100 | Pass | |

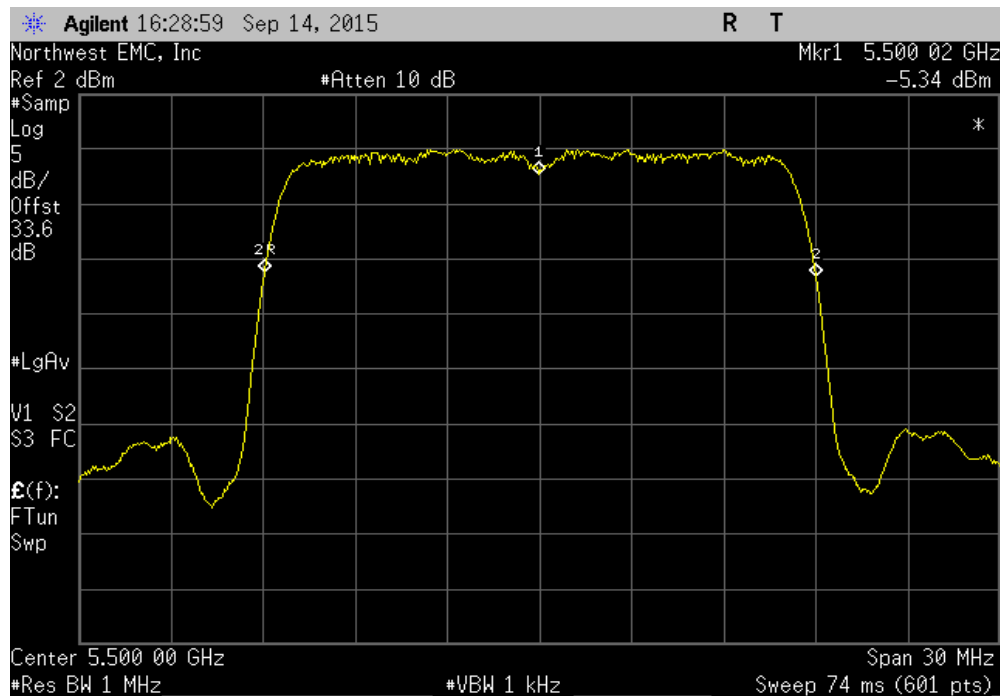


| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Voltage: 100% (3.3/1.2 VDC) | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.02 | 5500 | 3.6 | 100 | Pass | |

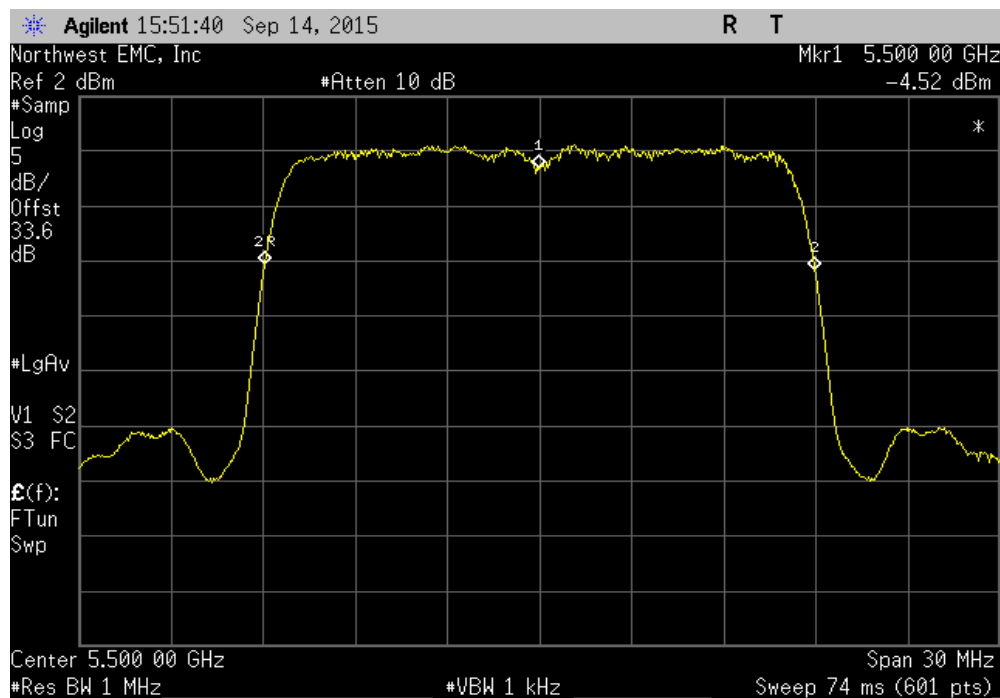


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Voltage: 90% (2.97/1.08 VDC) | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.02 | 5500 | 3.6 | 100 | Pass | |

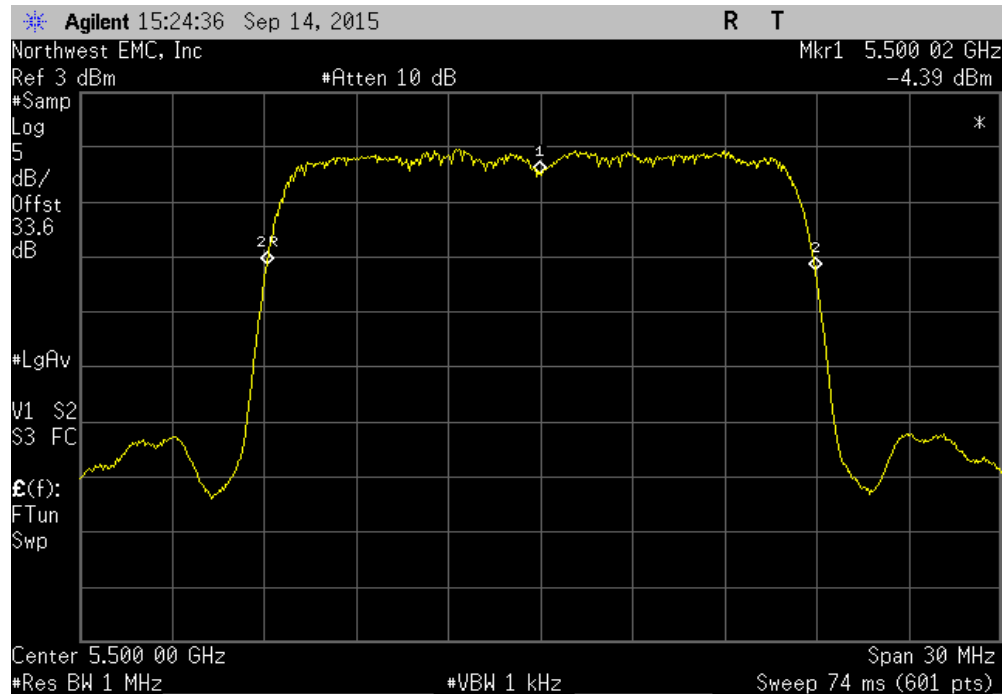


| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +50° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500 | 5500 | 0 | 100 | Pass | |

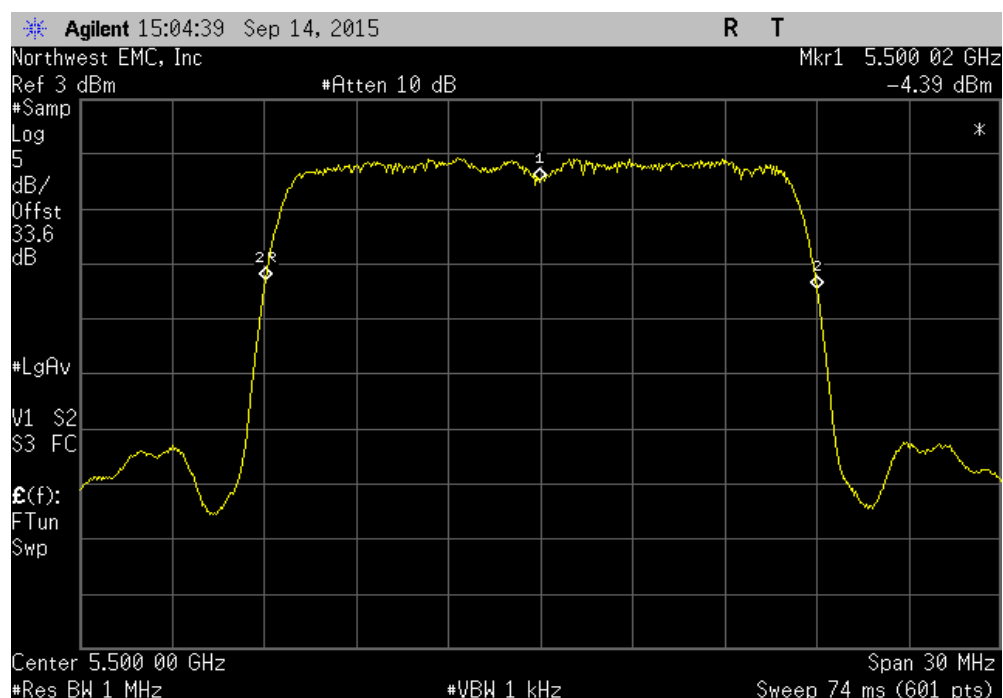


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +40° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.02 | 5500 | 3.6 | 100 | Pass | |

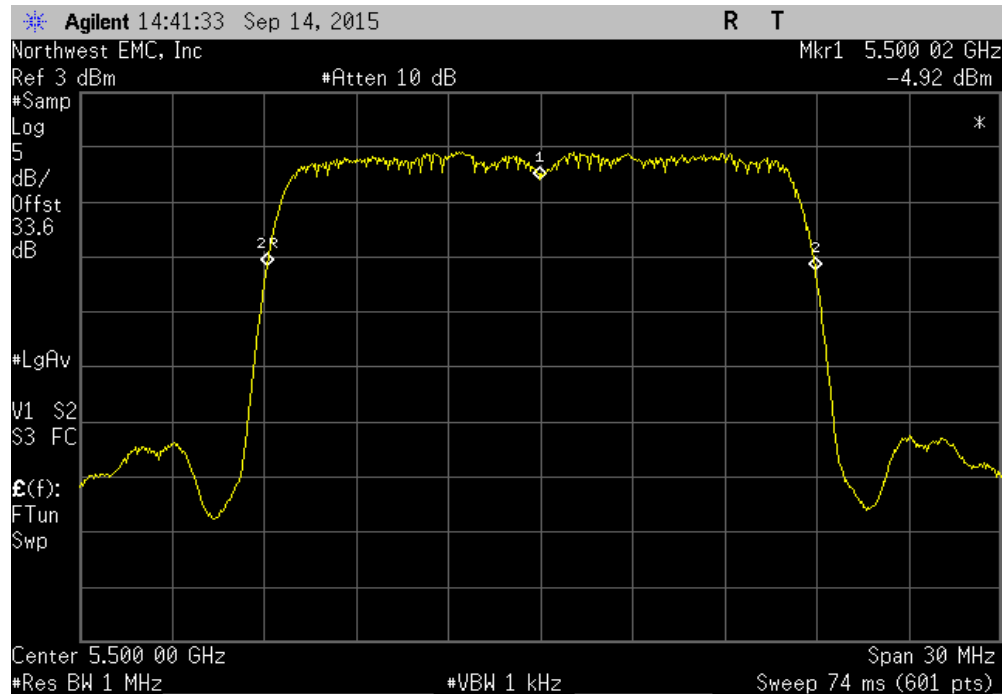


| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +30° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.02 | 5500 | 3.6 | 100 | Pass | |

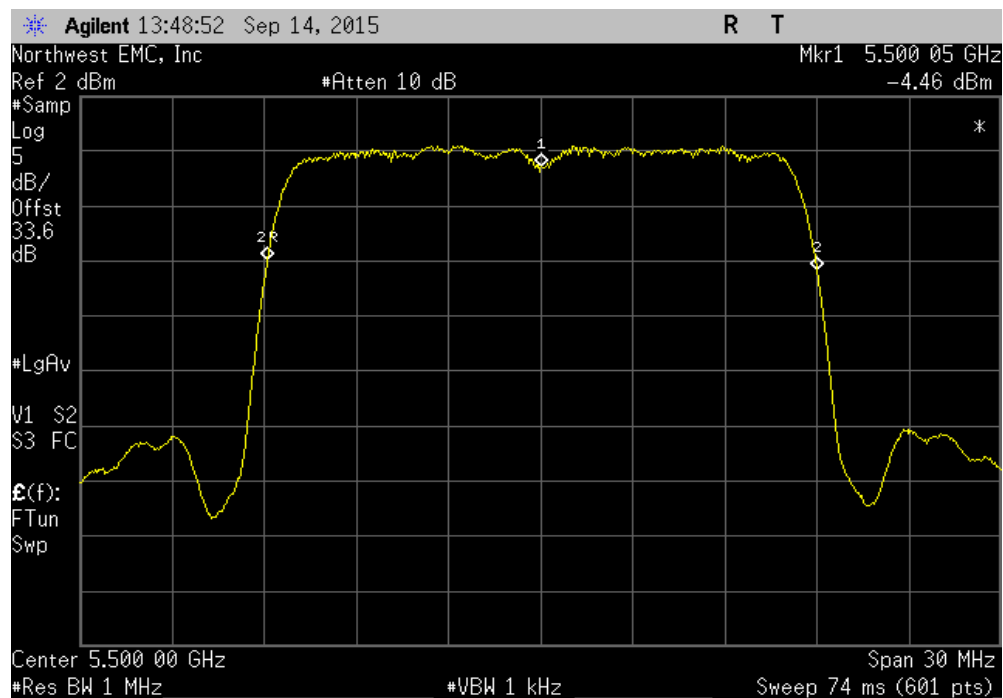


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +20° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.02 | 5500 | 3.6 | 100 | Pass | |

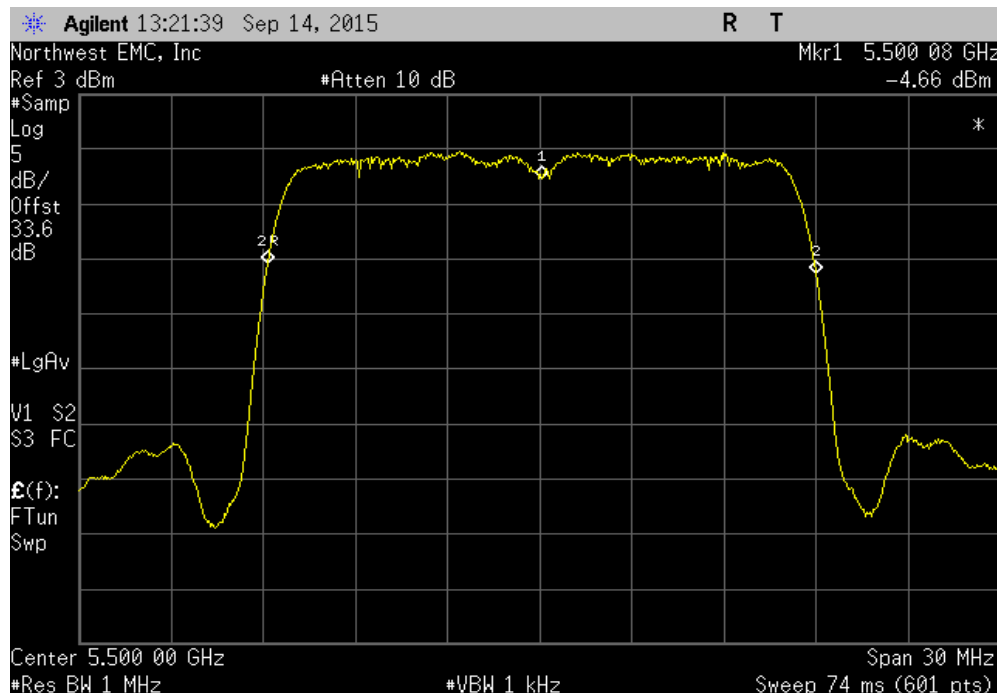


| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +10° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.05 | 5500 | 9.1 | 100 | Pass | |

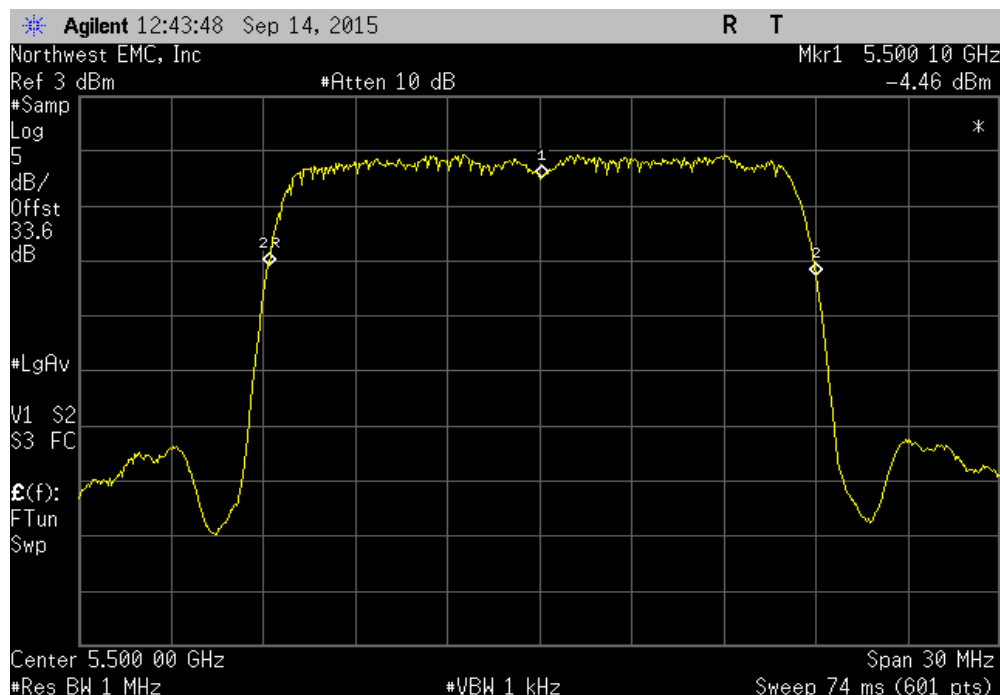


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: 0° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.08 | 5500 | 14.6 | 100 | Pass | |

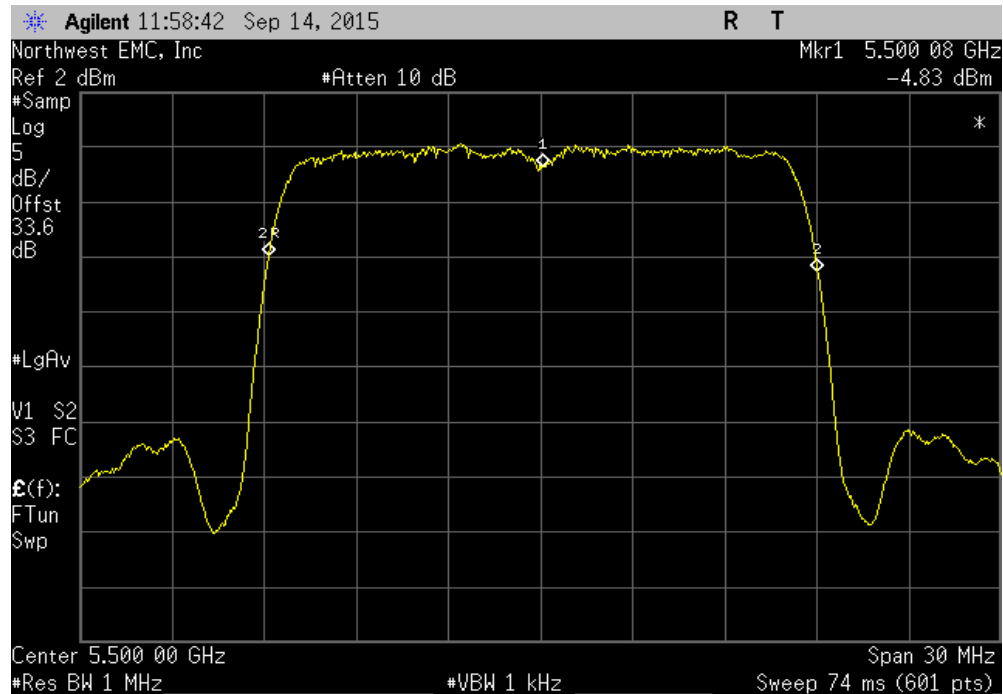


| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: -10° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.1 | 5500 | 18.2 | 100 | Pass | |

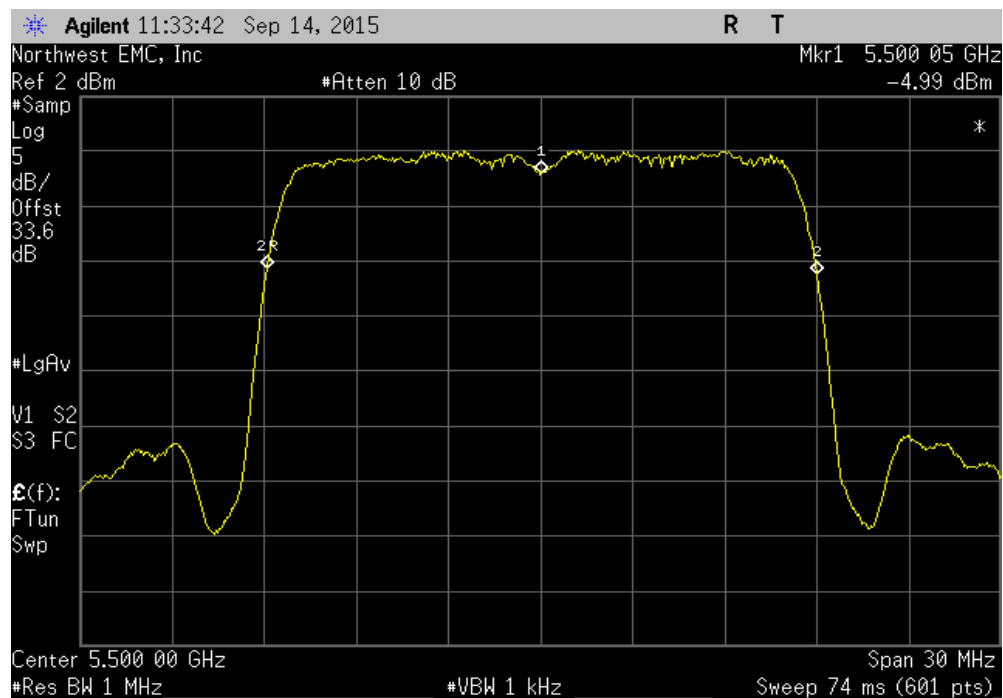


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: -20° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.08 | 5500 | 14.6 | 100 | Pass | |

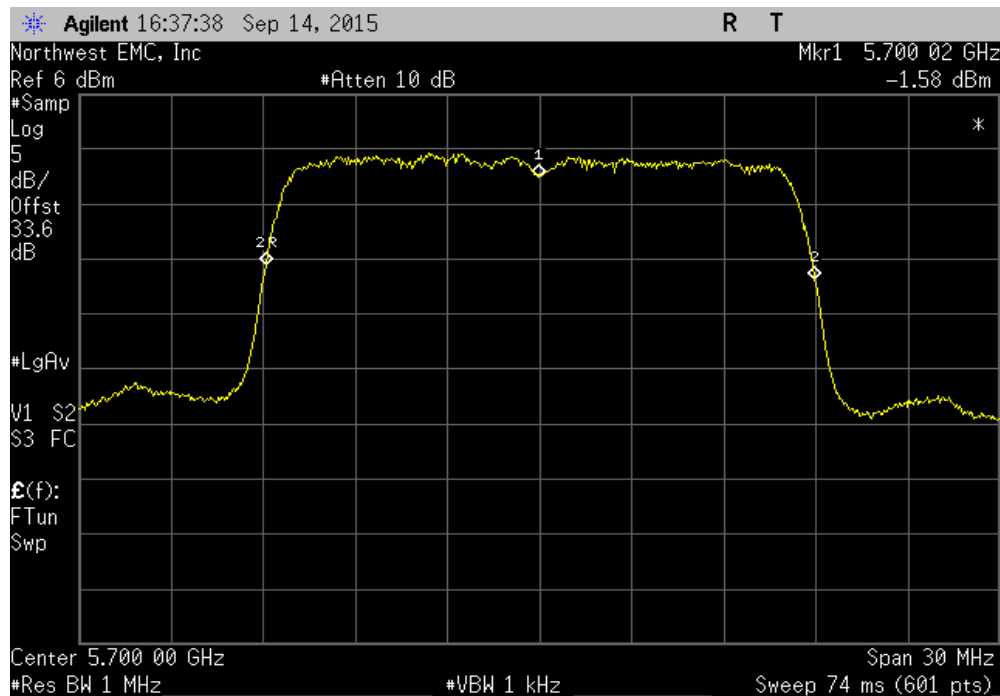


| 5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: -30° | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5500.05 | 5500 | 9.1 | 100 | Pass | |

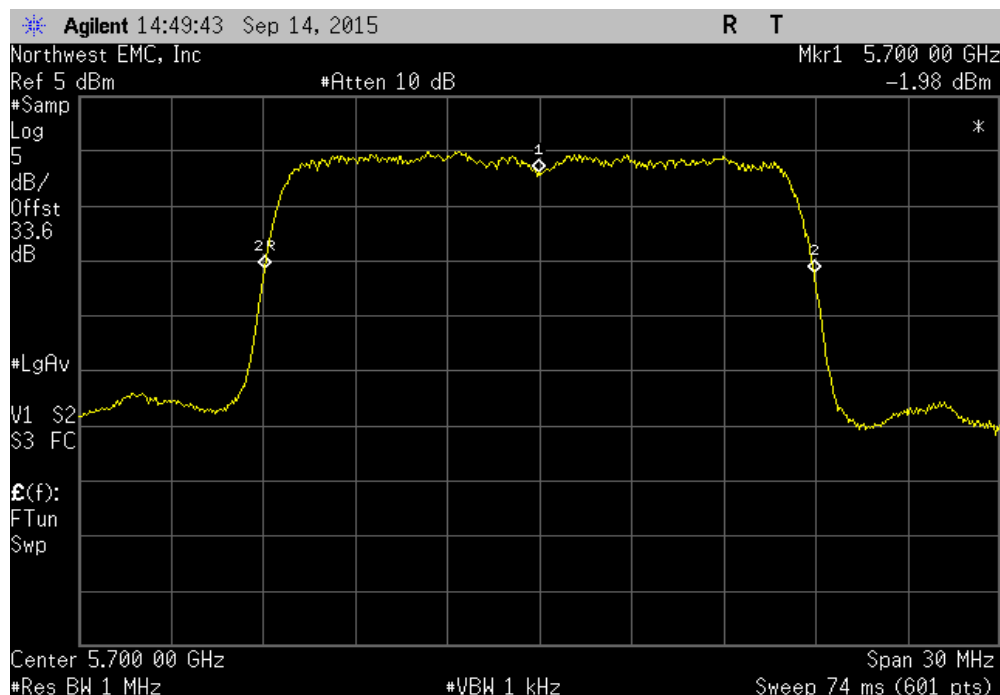


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Voltage: 110% (3.63/1.32 VDC) | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700.02 | 5700 | 3.5 | 100 | Pass | |

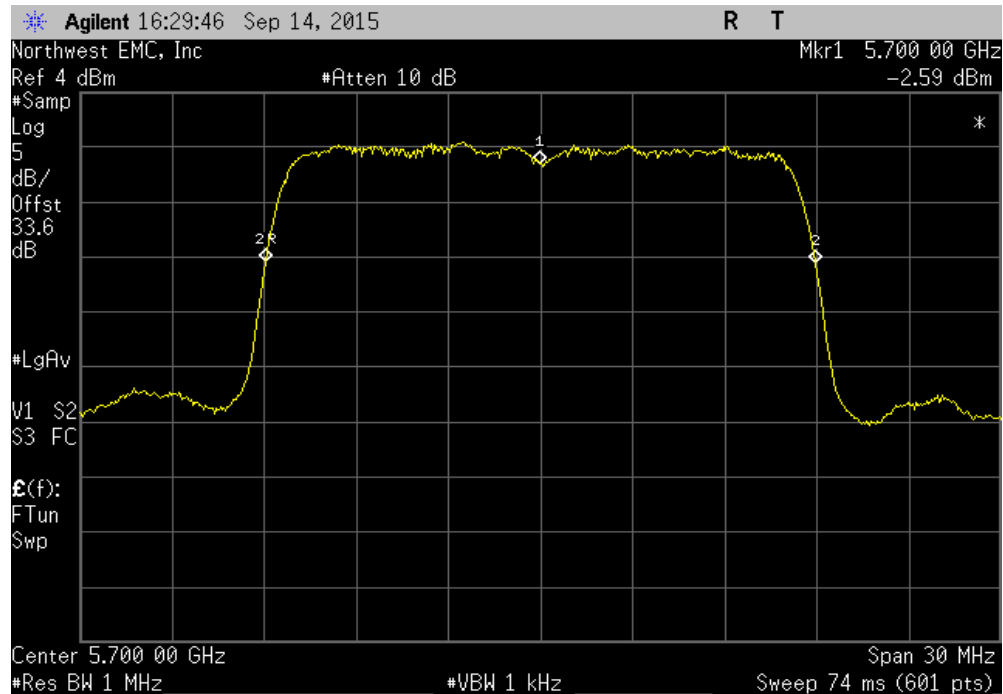


| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Voltage: 100% (3.3/1.2 VDC) | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700 | 5700 | 0 | 100 | Pass | |

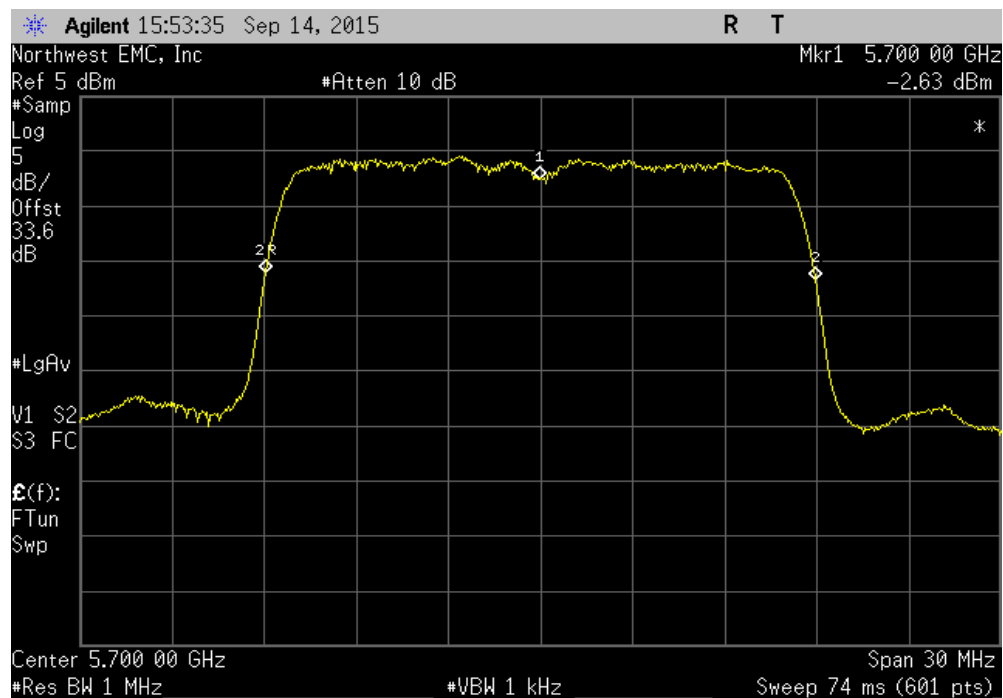


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Voltage: 90% (2.97/1.08 VDC) | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700 | 5700 | 0 | 100 | Pass | |

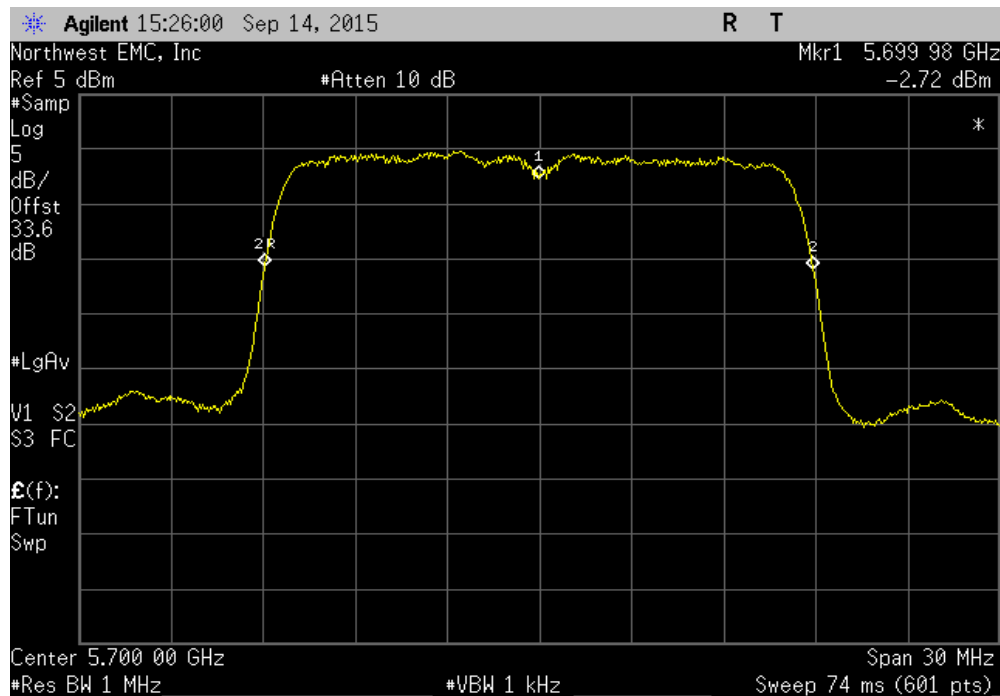


| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +50° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700 | 5700 | 0 | 100 | Pass | |

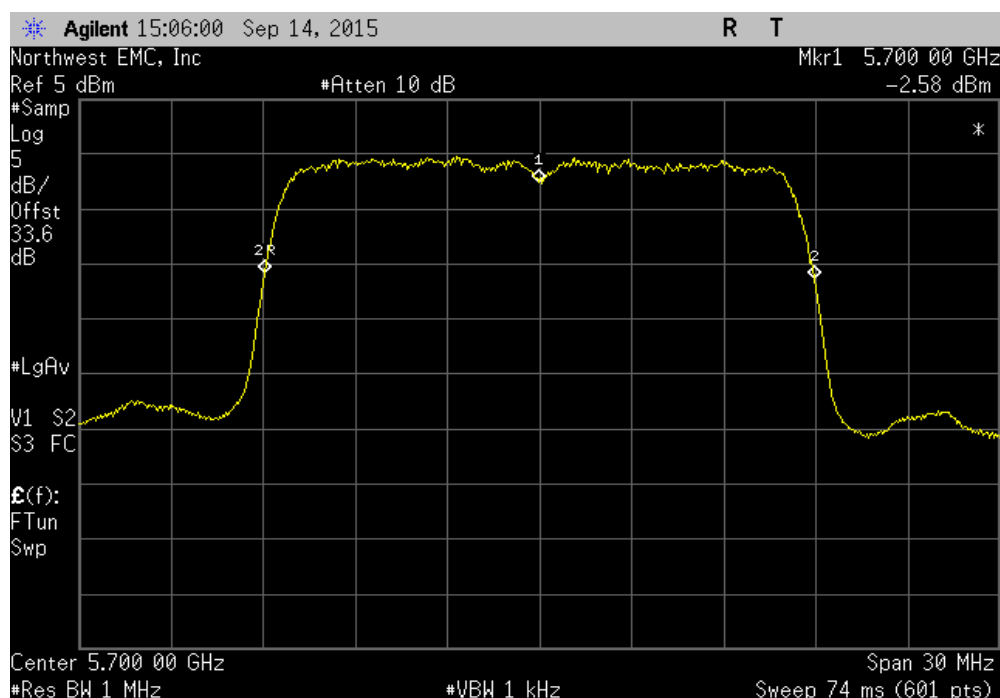


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +40° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5699.98 | 5700 | 3.5 | 100 | Pass | |

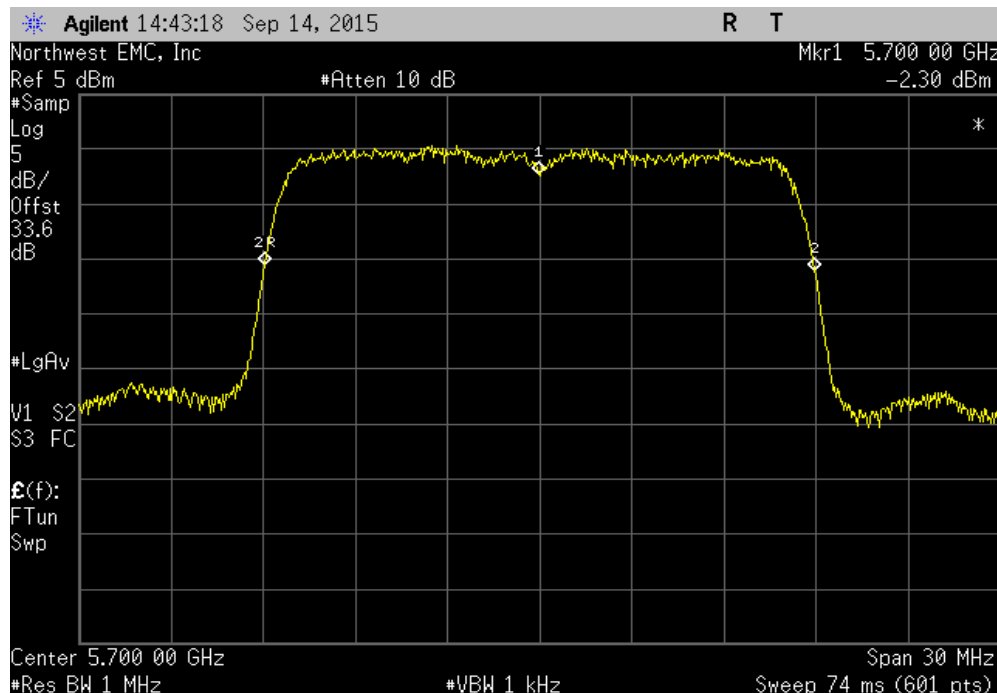


| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +30° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700 | 5700 | 0 | 100 | Pass | |

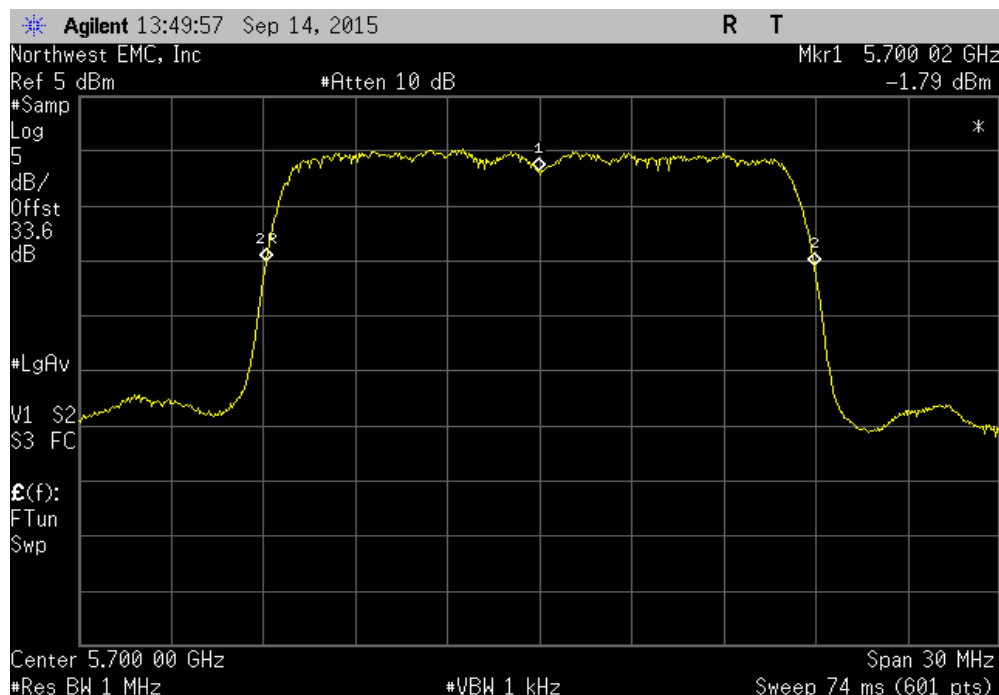


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +20° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700 | 5700 | 0 | 100 | Pass | |

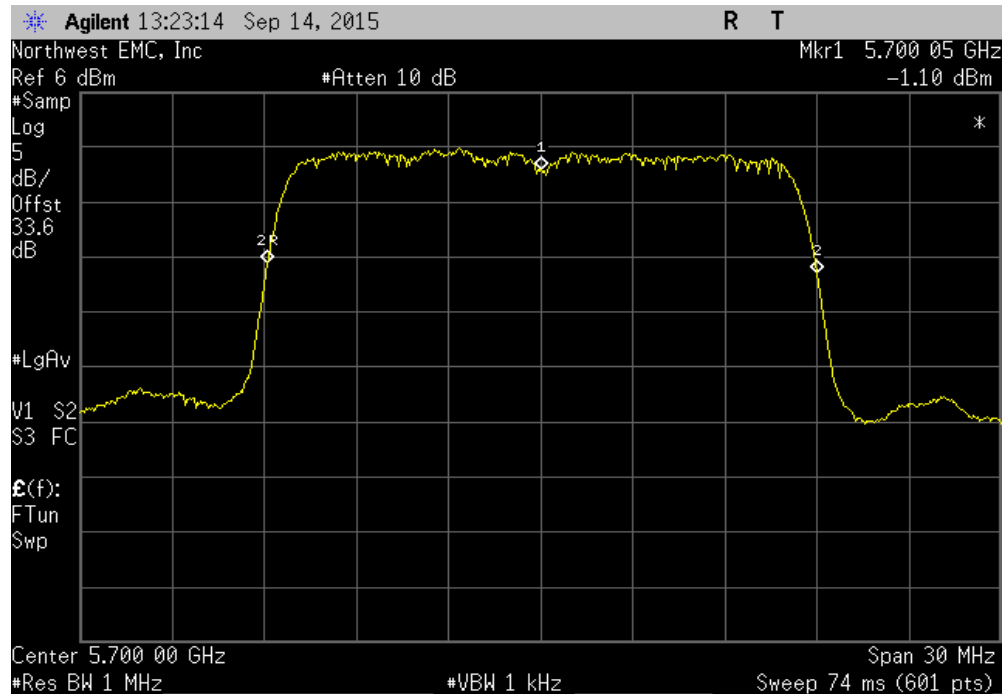


| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +10° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700.02 | 5700 | 3.5 | 100 | Pass | |

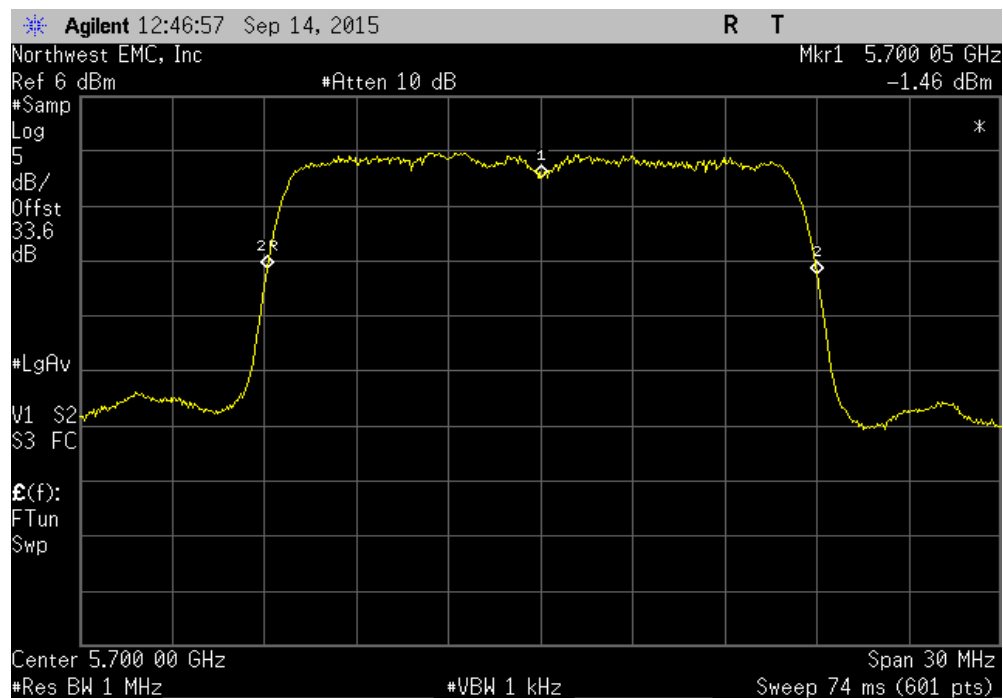


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: 0° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700.05 | 5700 | 8.8 | 100 | Pass | |

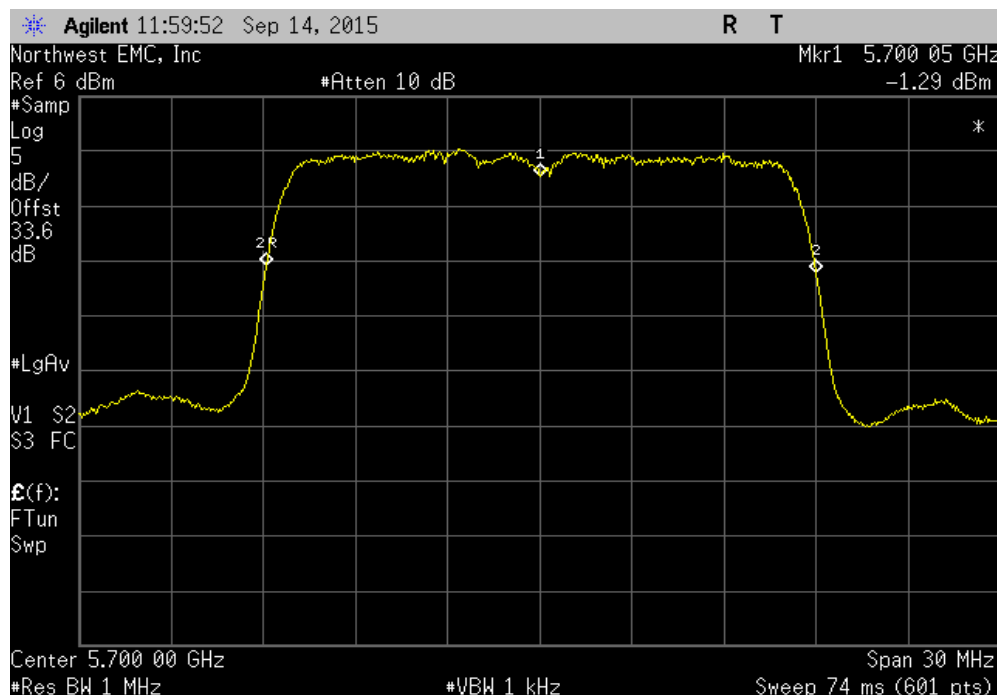


| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: -10° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700.05 | 5700 | 8.8 | 100 | Pass | |

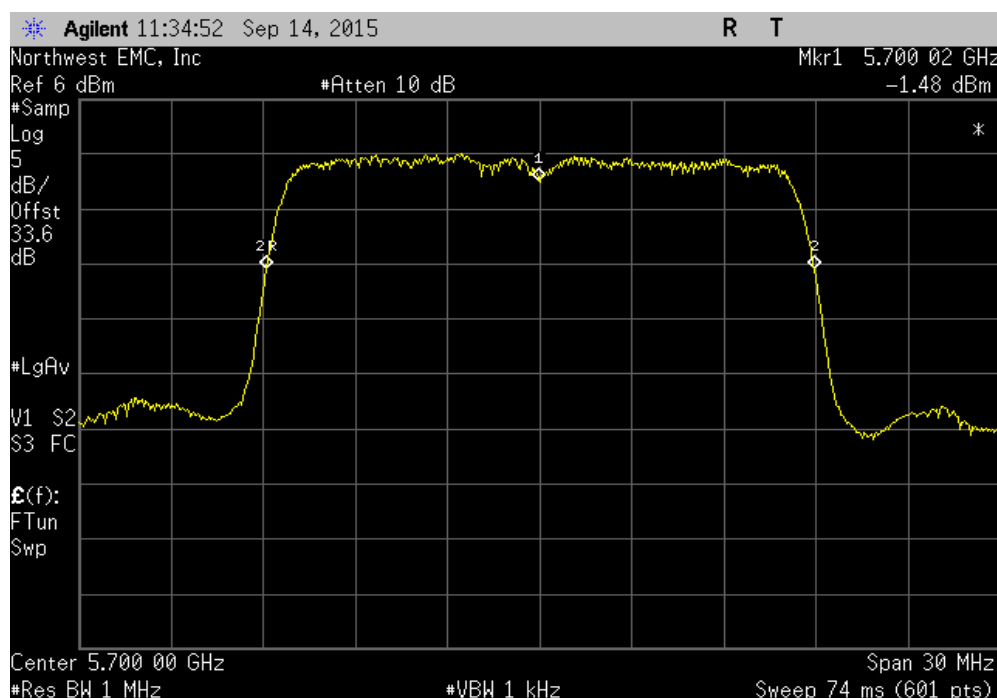


FREQUENCY STABILITY

| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: -20° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700.05 | 5700 | 8.8 | 100 | Pass | |

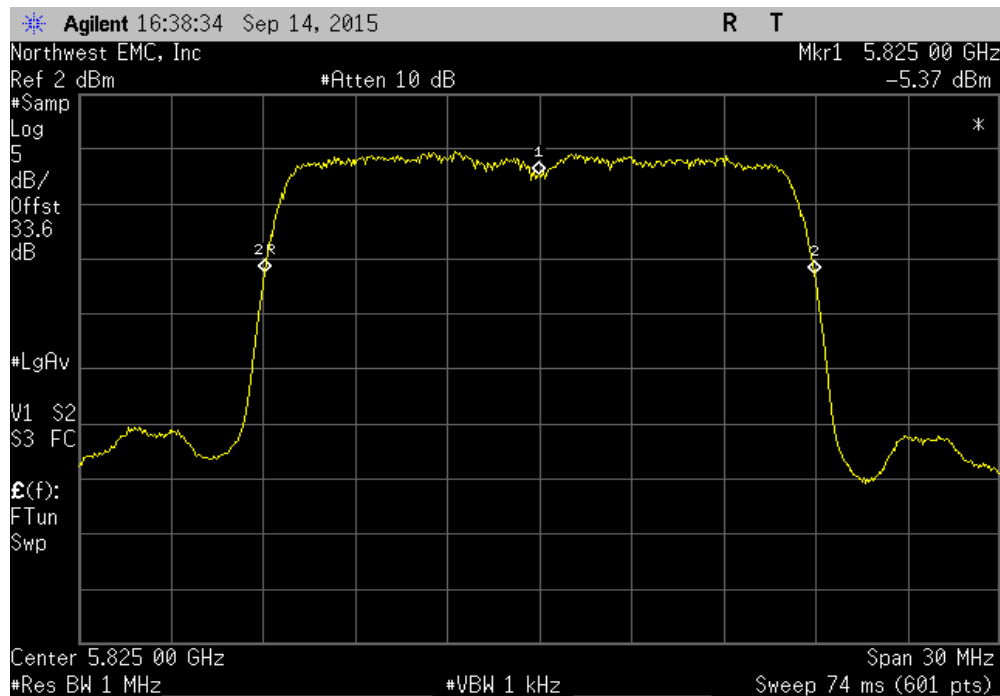


| 5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: -30° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5700.02 | 5700 | 3.5 | 100 | Pass | |

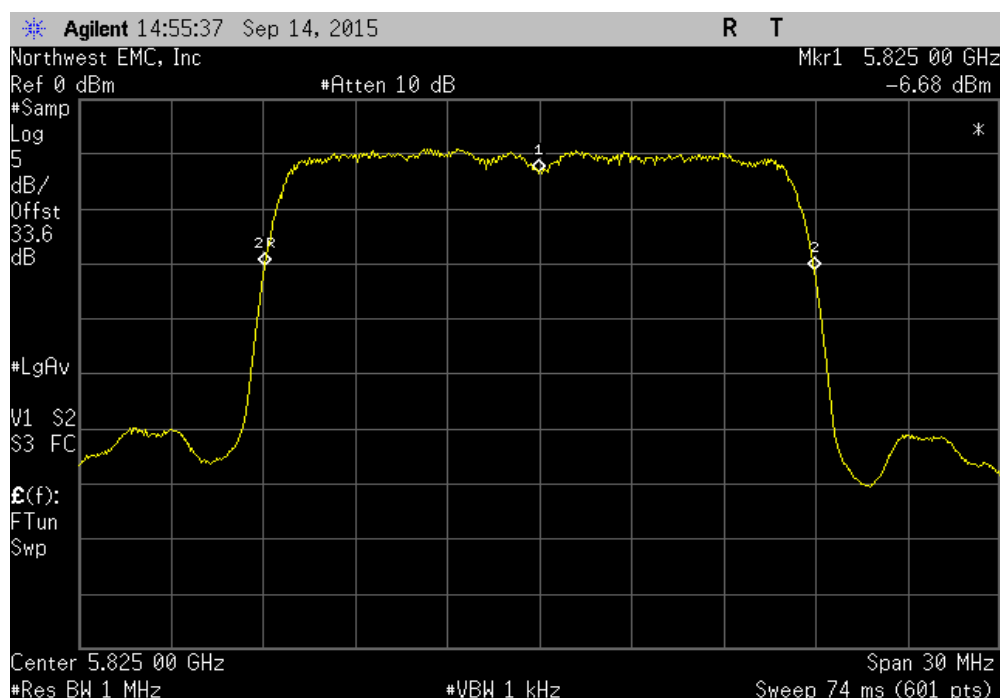


FREQUENCY STABILITY

| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Voltage: 110% (3.63/1.32 VDC) | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825 | 5825 | 0 | 100 | Pass | |

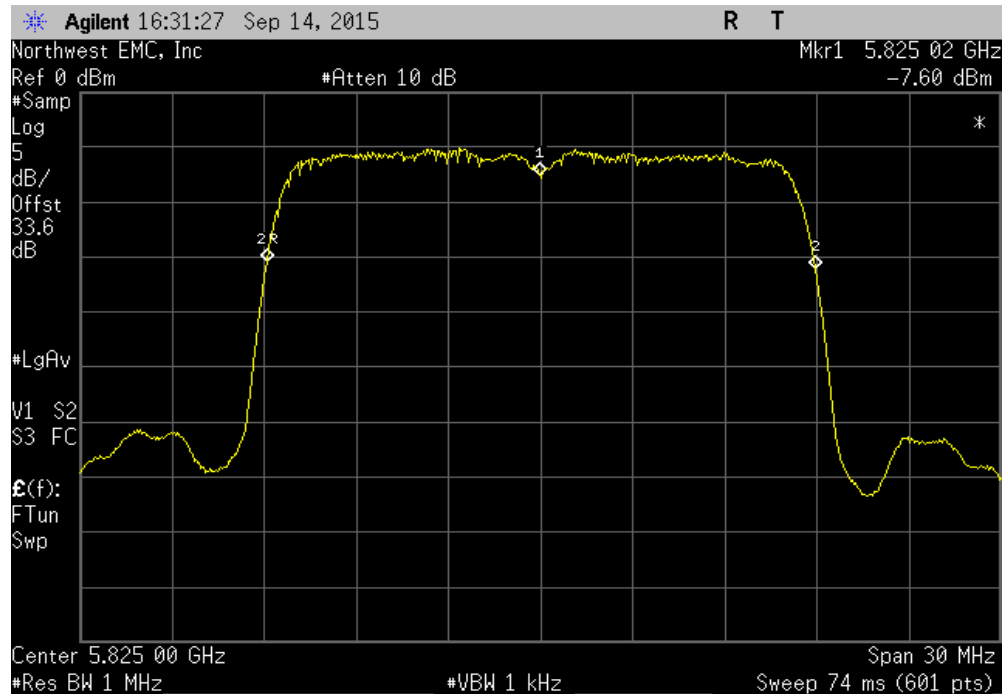


| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Voltage: 100% (3.3/1.2 VDC) | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825 | 5825 | 0 | 100 | Pass | |

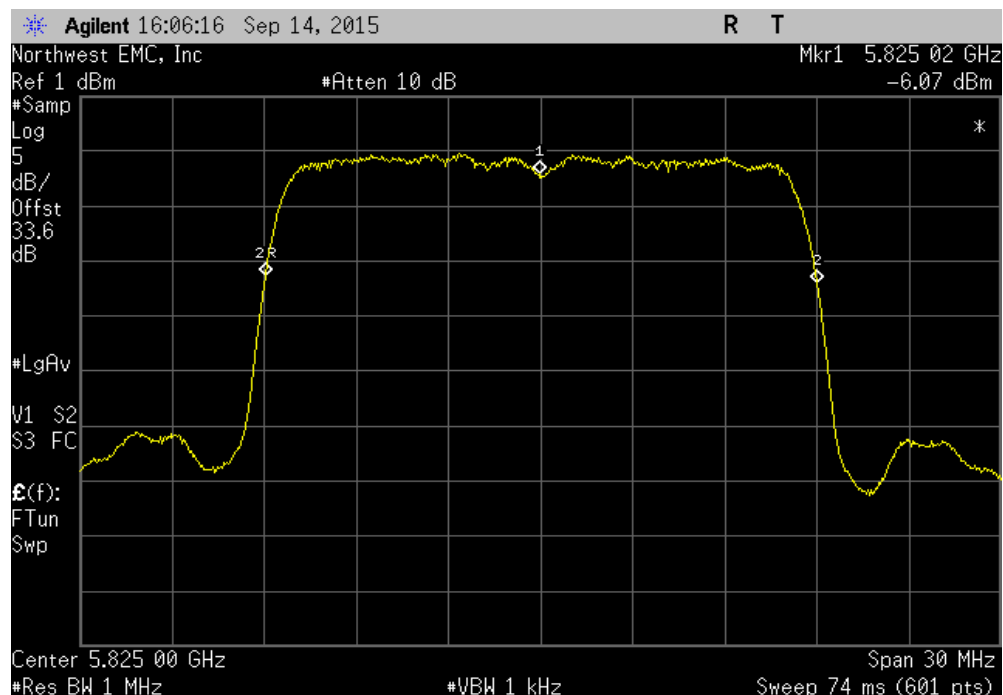


FREQUENCY STABILITY

| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Voltage: 90% (2.97/1.08 VDC) | | | | | | |
|--|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825.02 | 5825 | 3.4 | 100 | Pass | |

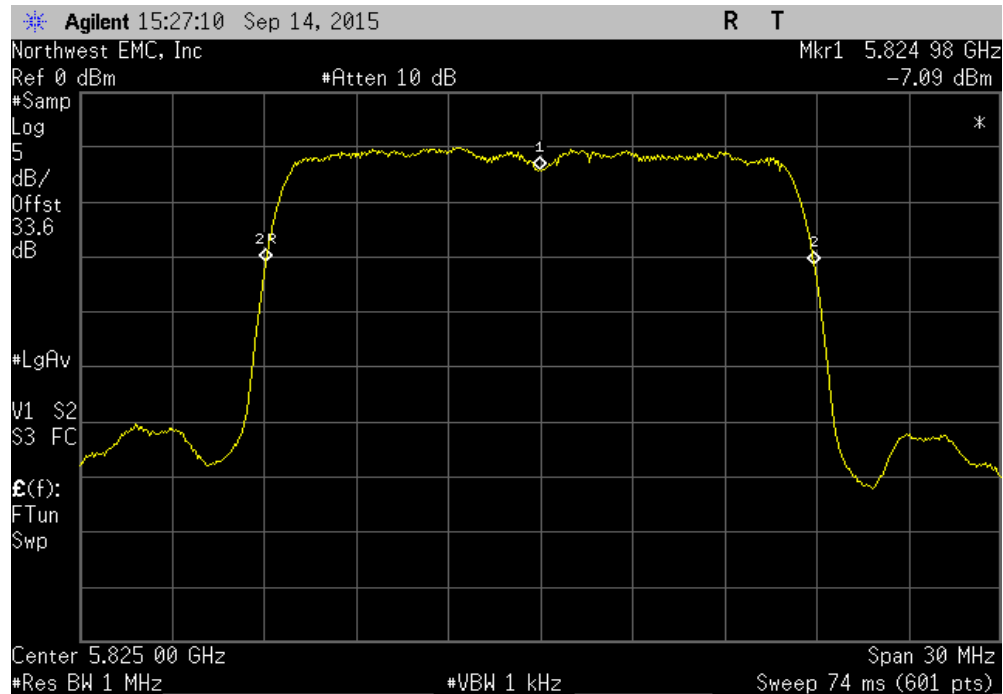


| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Temperature: +50° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825.02 | 5825 | 3.4 | 100 | Pass | |

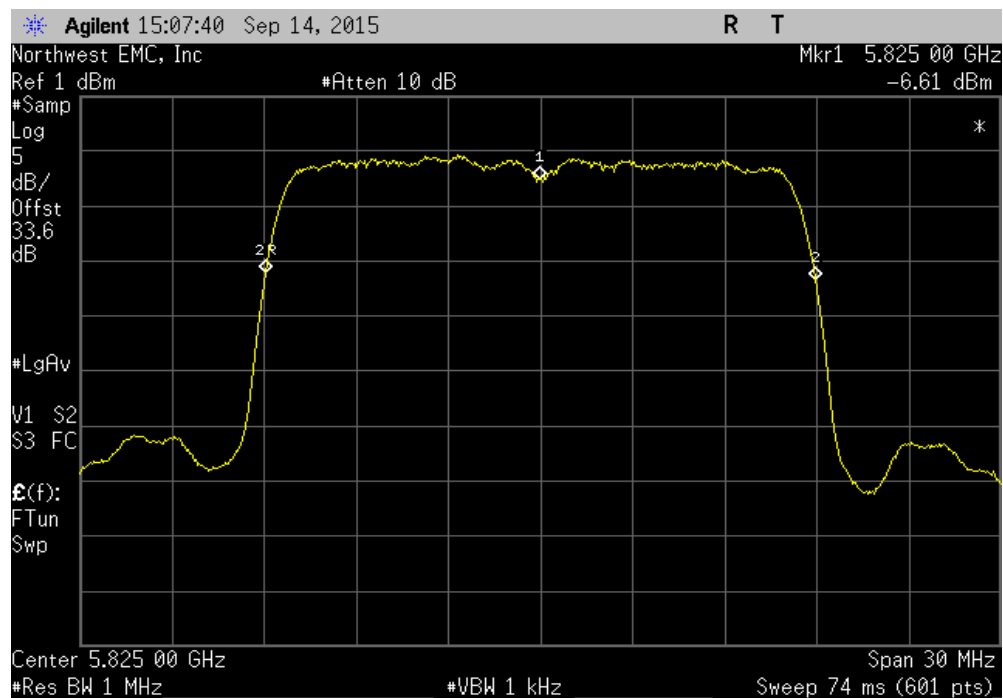


FREQUENCY STABILITY

| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Temperature: +40° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5824.98 | 5825 | 3.4 | 100 | Pass | |

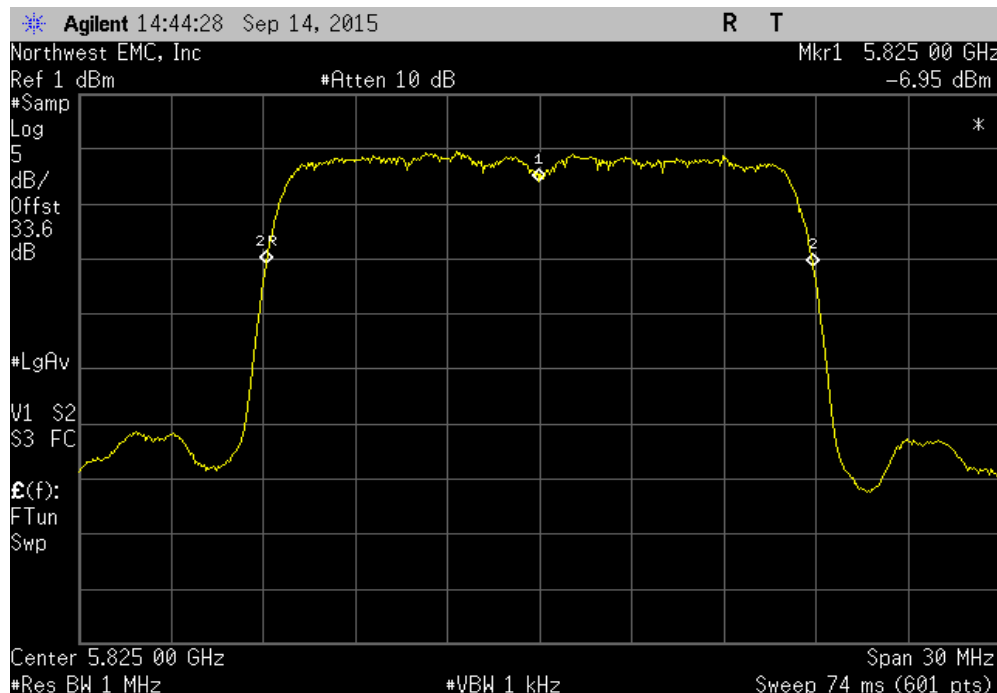


| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Temperature: +30° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825 | 5825 | 0 | 100 | Pass | |

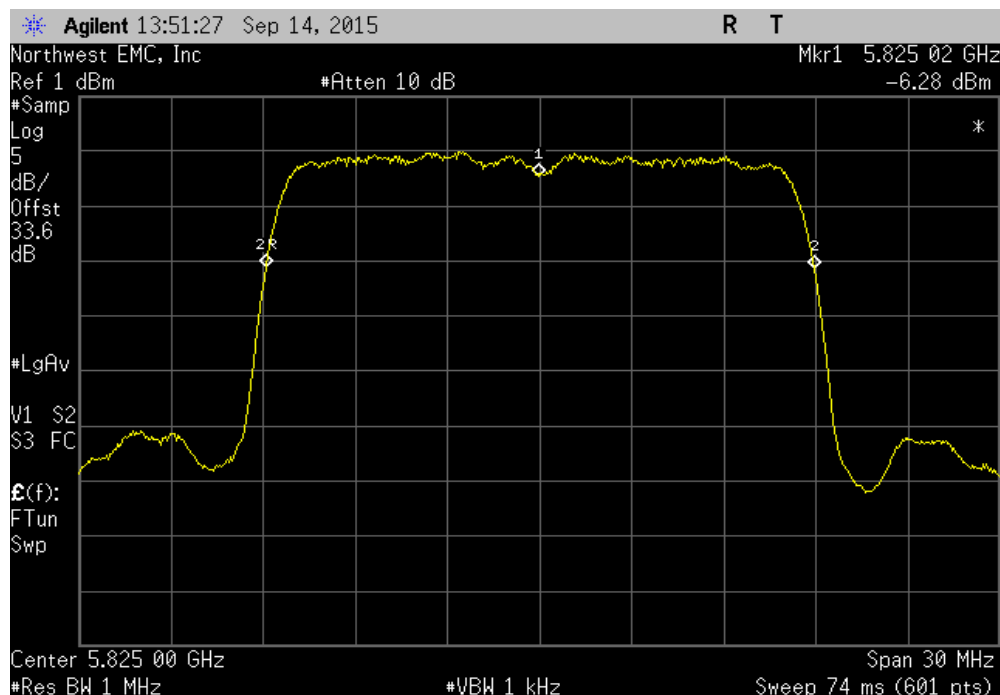


FREQUENCY STABILITY

| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Temperature: +20° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825 | 5825 | 0 | 100 | Pass | |

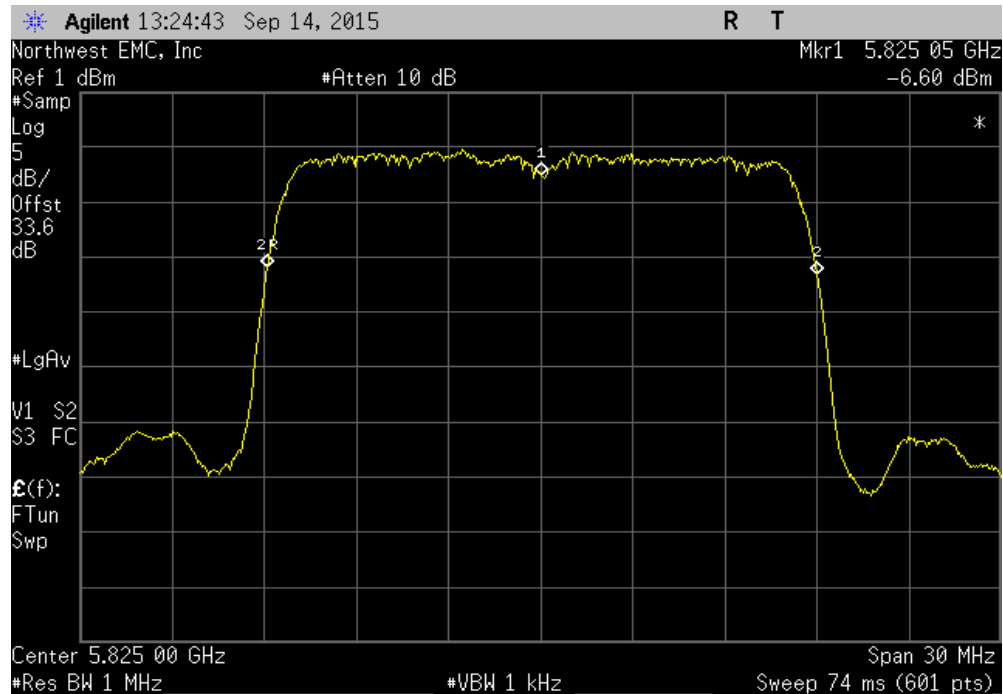


| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Temperature: +10° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825.02 | 5825 | 3.4 | 100 | Pass | |

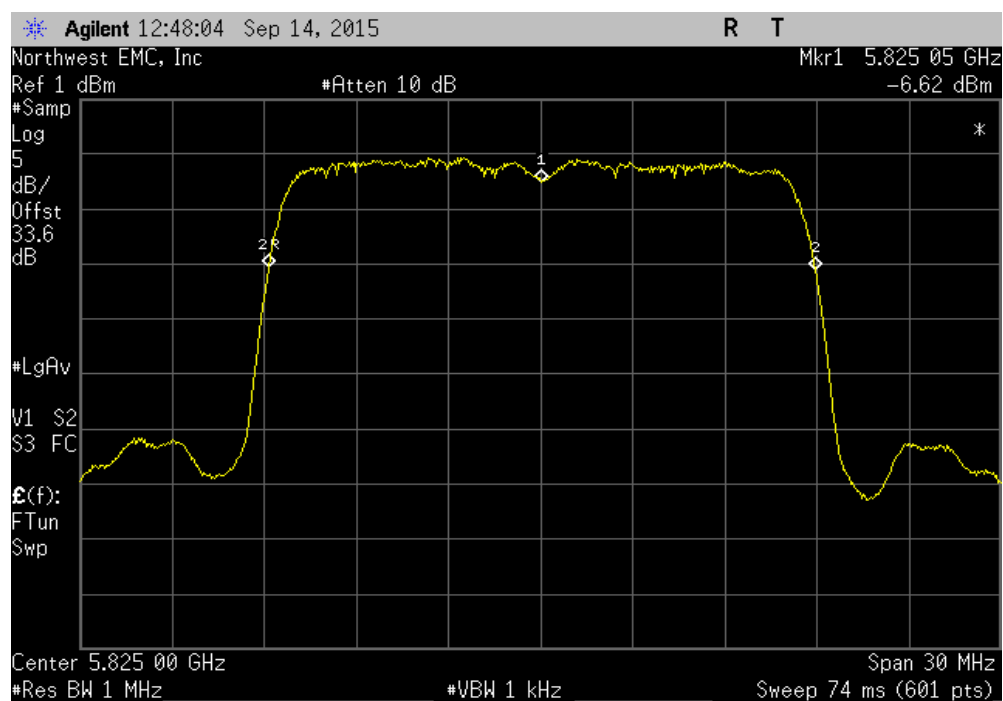


FREQUENCY STABILITY

| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Temperature: 0° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825.05 | 5825 | 8.6 | 100 | Pass | |

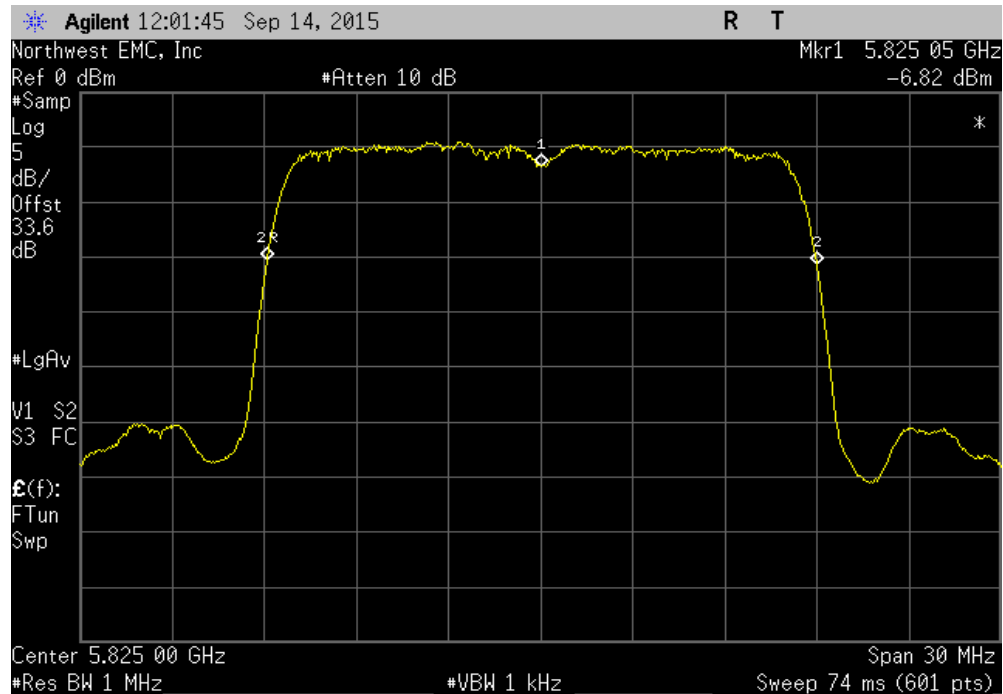


| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Temperature: -10° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825.05 | 5825 | 8.6 | 100 | Pass | |

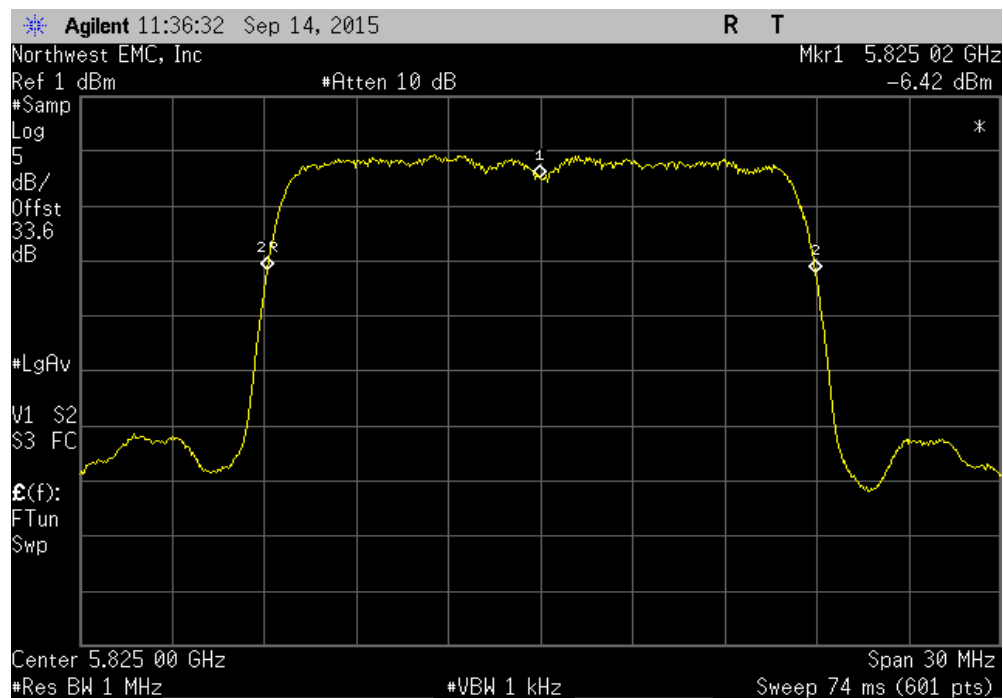


FREQUENCY STABILITY

| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Temperature: -20° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825.05 | 5825 | 8.6 | 100 | Pass | |



| 5725 MHz - 5850 MHz - High Channel, 5825 MHz, Temperature: -30° | | | | | | |
|---|----------------------|----------------------|-------------|-------------|---------|--|
| | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results | |
| | 5825.02 | 5825 | 3.4 | 100 | Pass | |



EMISSION 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 (mo) |
|------------------------------|------------------|----------|-----|-----------|---------------|
| Generator - Signal | Keysight | N5182B | TFX | 4/16/2015 | 36 |
| Cable | ESM Cable Corp. | TT | EV1 | NCR | 0 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 7/14/2015 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4446A | AAQ | 3/10/2015 | 12 |

TEST DESCRIPTION

FCC KDB 789033 General UNII Test Procedures were followed.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. 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.


The spectrum analyzer settings were as follows:

- RBW = Approx. 1% of the emission bandwidth (B).
- VBW = > RBW
- Detector = Peak
- Trace mode = max hold

The spectrum analyzer occupied bandwidth measurement function was then used to measure 26 dB emission bandwidth.

There is no required limit to be met in the rule part for this test. The purpose of the test is to both report the results as required by the KDB, and to utilize the emission bandwidth for setting the channel power integration bandwidth during conducted output power testing.

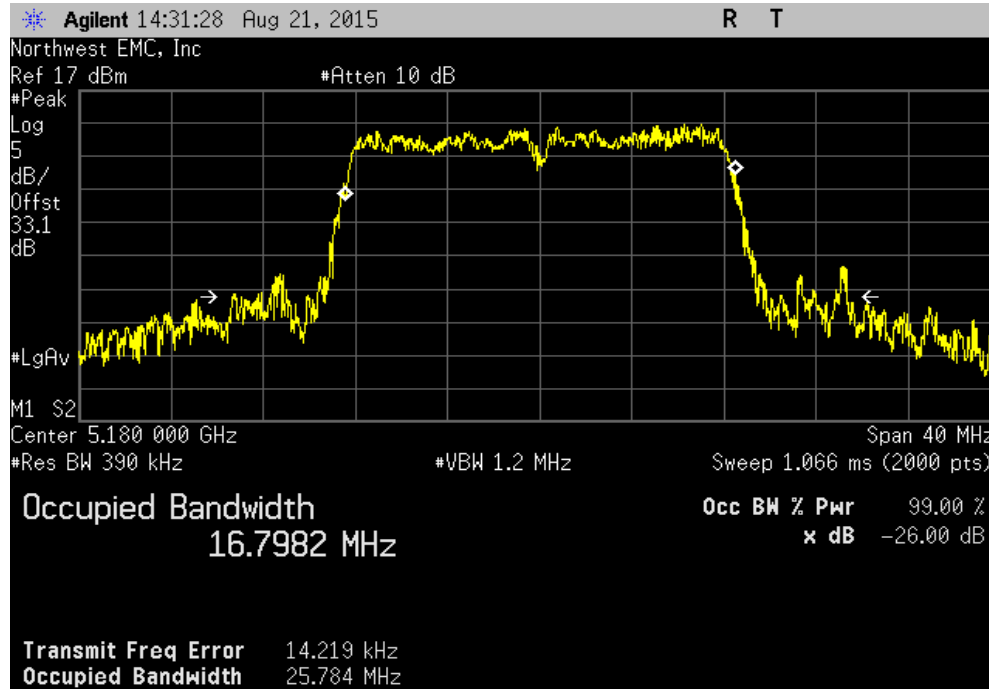
EMISSION BANDWIDTH

| | | | |
|--|------------------------------|---|-------------|
| EUT: Athena4XD (extended distance) | | Work Order: FOCU0214 | |
| Serial Number: 02EA3CD00087 | | Date: 08/21/15 | |
| Customer: Summit Semiconductor LLC | | Temperature: 24.6°C | |
| Attendees: David Schilling | | Humidity: 41% | |
| Project: None | | Barometric Pres.: 1009.2 | |
| Tested by: Brandon Hobbs | Power: 3.3 VDC Nominal | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.407:2015 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| The EUT was not tested in ISOC mode. Based on transmission line length to all four identical antennas, a direct connect port was located on the worst case/shortest antenna path which was provided by the client. This test location was determined to be worst case by the client. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 1 | Signature  | |
| | | Value | Limit (N/A) |
| Normal Conditions | | | |
| 802.11(a) 6 Mbps | | | |
| | Low Channel, Ch.8 5180 MHz | 25.784 MHz | N/A |
| | High Channel, Ch.14 5240 MHz | 33.922 MHz | N/A |
| | Low Channel, Ch.15 5260 MHz | 34.665 MHz | N/A |
| | High Channel, Ch.18 5320 MHz | 26.299 MHz | N/A |
| | Low Channel, Ch.19 5500 MHz | 21.614 MHz | N/A |
| | Mid Channel, Ch.23 5580 MHz | 24.269 MHz | N/A |
| | High Channel, Ch.29 5700 MHz | 27.969 MHz | N/A |
| 802.11(a) 18 Mbps | | | |
| | Low Channel, Ch.8 5180 MHz | 18.703 MHz | N/A |
| | High Channel, Ch.14 5240 MHz | 31.897 MHz | N/A |
| | Low Channel, Ch.15 5260 MHz | 26.601 MHz | N/A |
| | High Channel, Ch.18 5320 MHz | 18.695 MHz | N/A |
| | Low Channel, Ch.19 5500 MHz | 18.727 MHz | N/A |
| | Mid Channel, Ch.23 5580 MHz | 19.066 MHz | N/A |
| | High Channel, Ch.29 5700 MHz | 19.078 MHz | N/A |

EMISSION BANDWIDTH

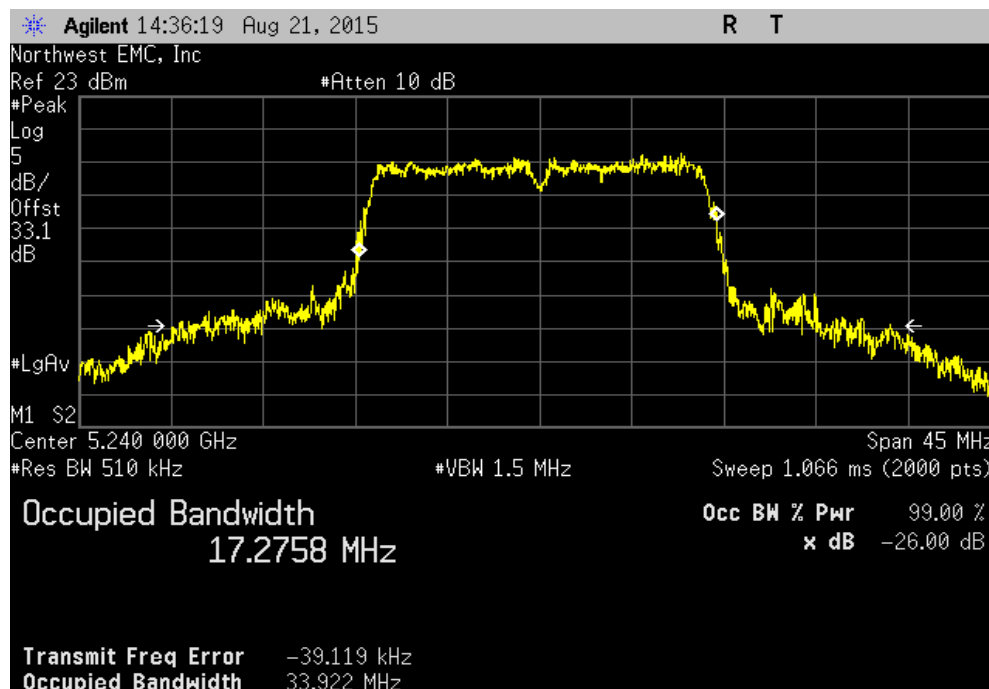
Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.8 5180 MHz

| | Value | Limit (N/A) | Result |
|--|------------|----------------|--------|
| | 25.784 MHz | N/A | N/A |



Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.14 5240 MHz

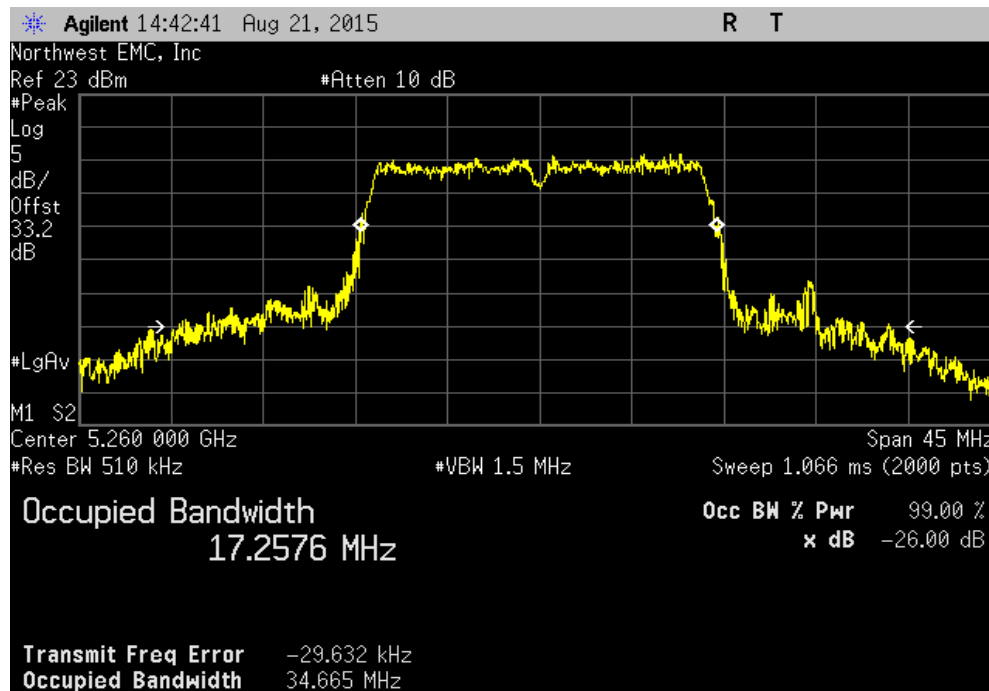
| | Value | Limit (N/A) | Result |
|--|------------|----------------|--------|
| | 33.922 MHz | N/A | N/A |



EMISSION BANDWIDTH

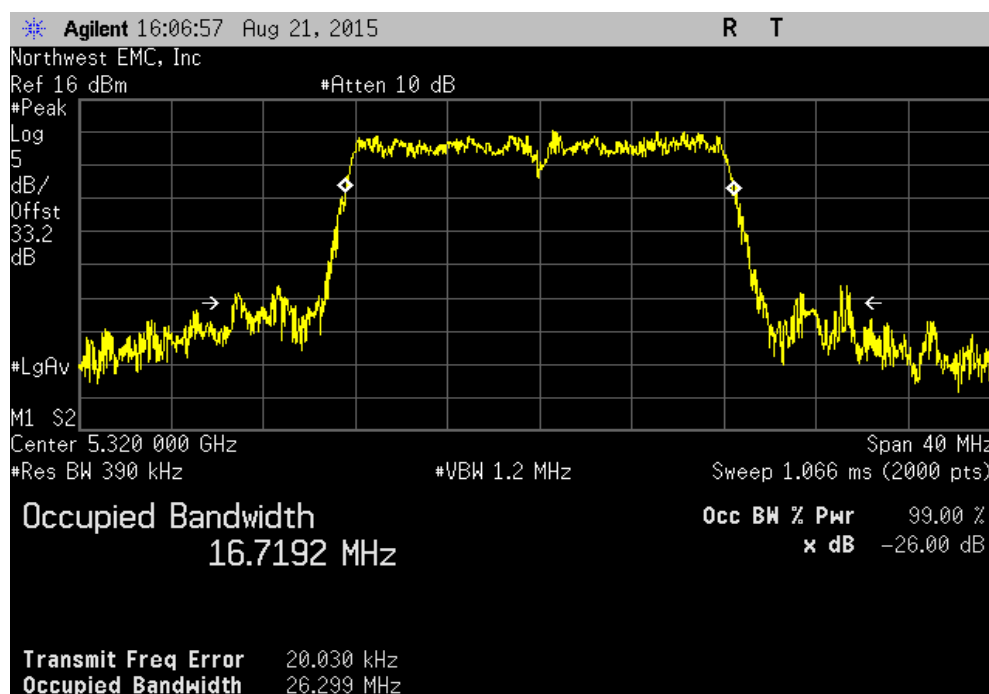
Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.15 5260 MHz

| | Value | Limit (N/A) | Result |
|--|------------|----------------|--------|
| | 34.665 MHz | N/A | N/A |



Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.18 5320 MHz

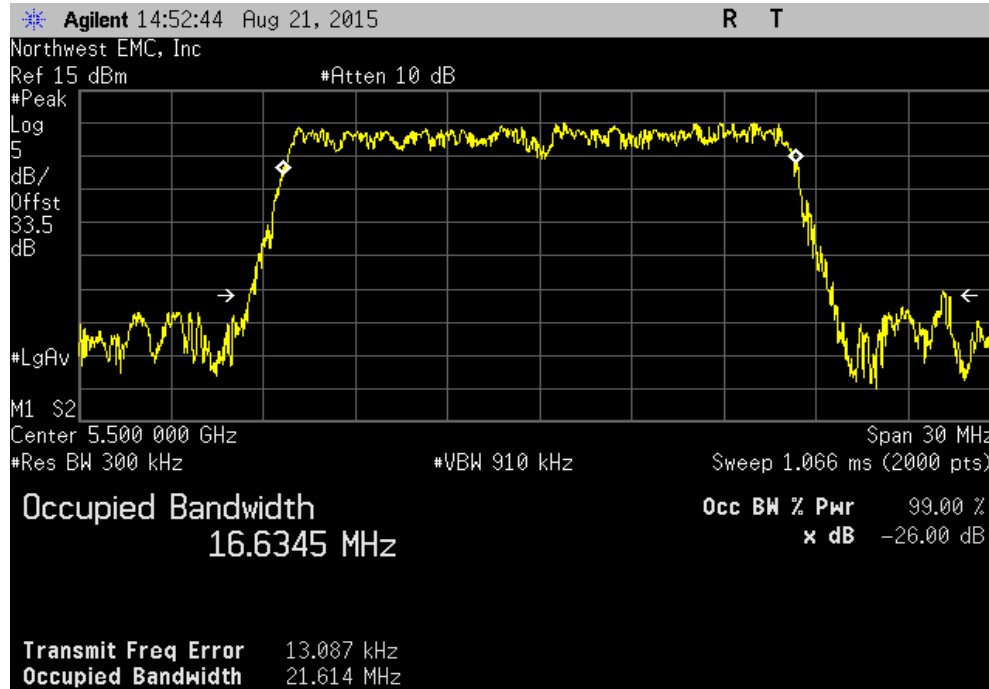
| | Value | Limit (N/A) | Result |
|--|------------|----------------|--------|
| | 26.299 MHz | N/A | N/A |



EMISSION BANDWIDTH

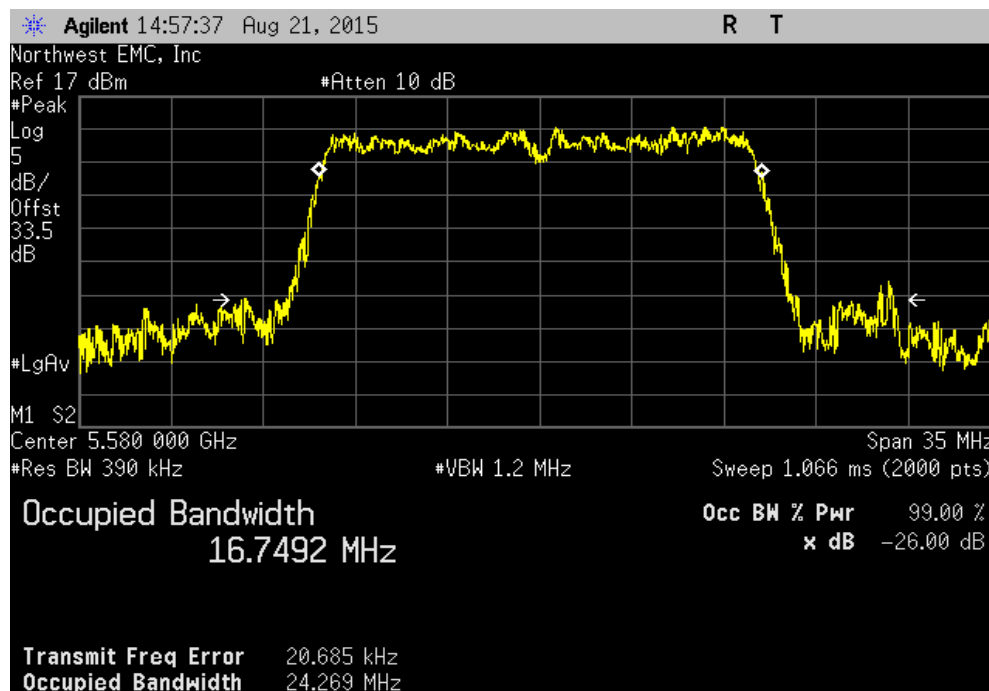
Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.19 5500 MHz

| | | | | Value | Limit (N/A) | Result |
|--|--|--|--|------------|----------------|--------|
| | | | | 21.614 MHz | N/A | N/A |



Normal Conditions, 802.11(a) 6 Mbps, Mid Channel, Ch.23 5580 MHz

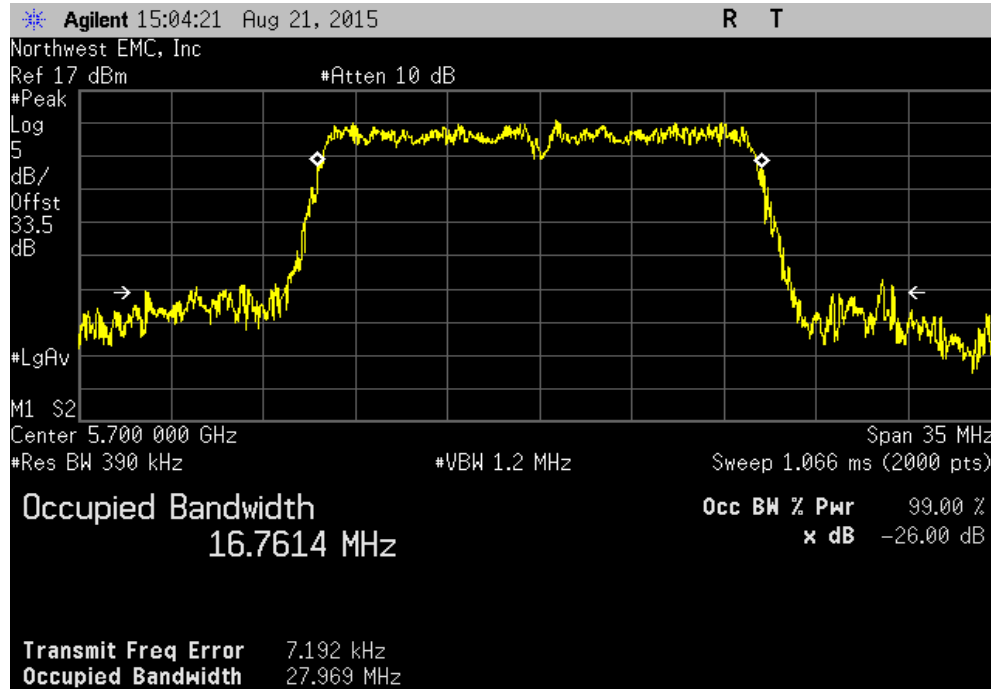
| | | | | Value | Limit (N/A) | Result |
|--|--|--|--|------------|----------------|--------|
| | | | | 24.269 MHz | N/A | N/A |



EMISSION BANDWIDTH

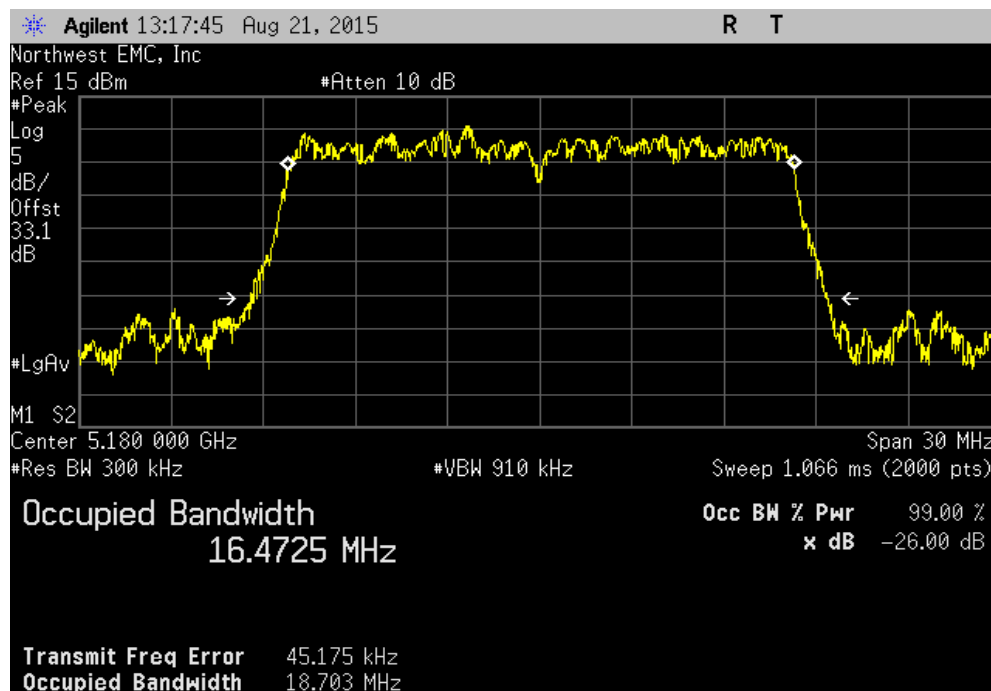
Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.29 5700 MHz

| | | | | Value | Limit (N/A) | Result |
|--|--|--|--|------------|----------------|--------|
| | | | | 27.969 MHz | N/A | N/A |



Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.8 5180 MHz

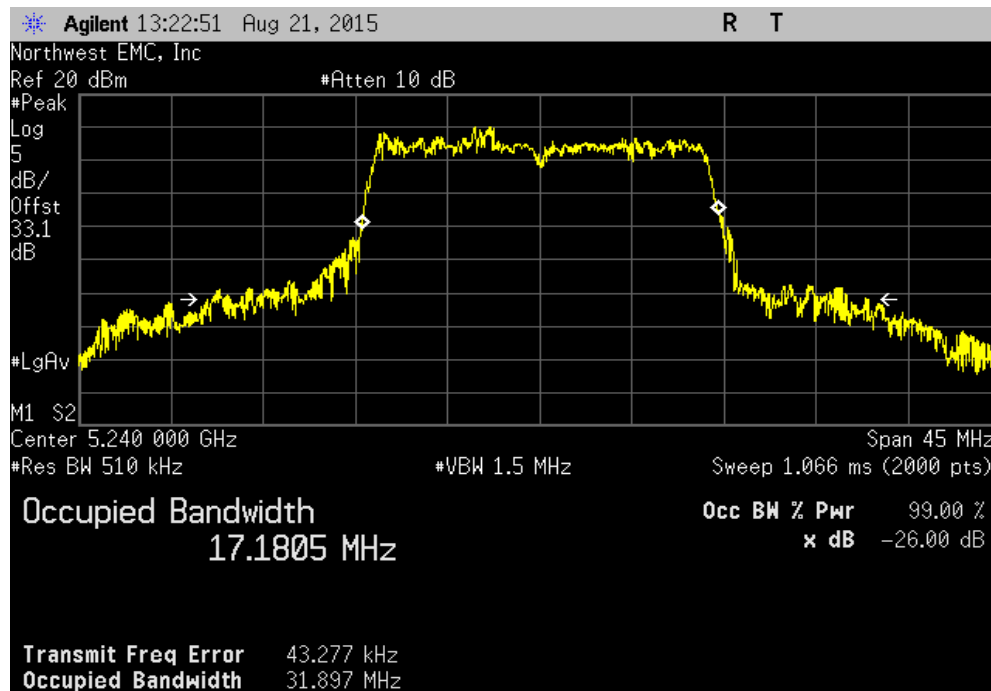
| | | | | Value | Limit (N/A) | Result |
|--|--|--|--|------------|----------------|--------|
| | | | | 18.703 MHz | N/A | N/A |



EMISSION BANDWIDTH

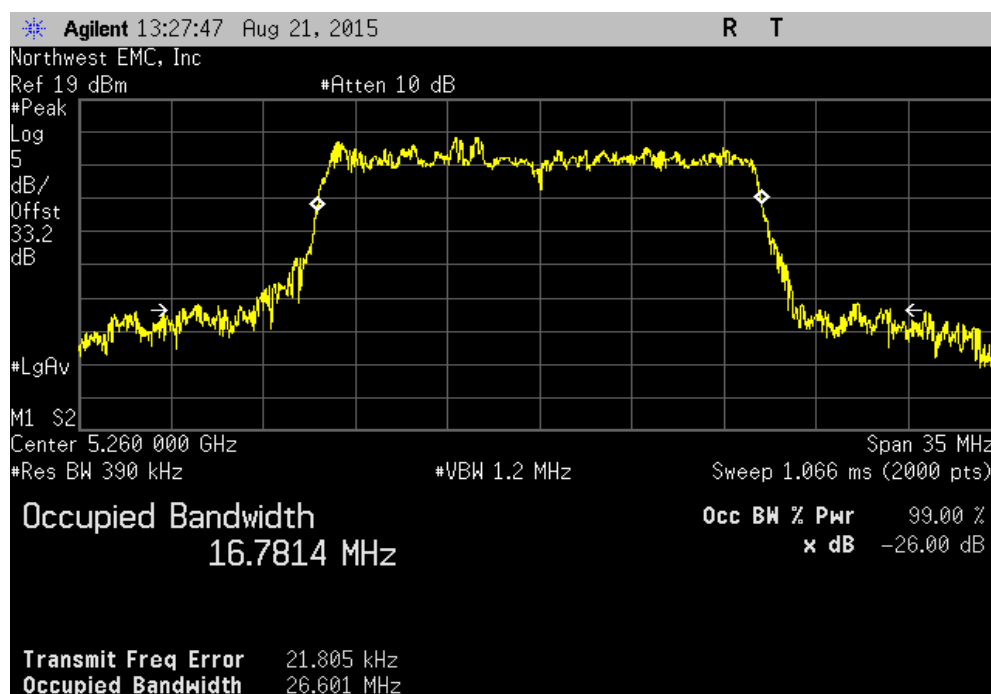
Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.14 5240 MHz

| | | | | Value | Limit (N/A) | Result |
|--|--|--|--|------------|----------------|--------|
| | | | | 31.897 MHz | N/A | N/A |



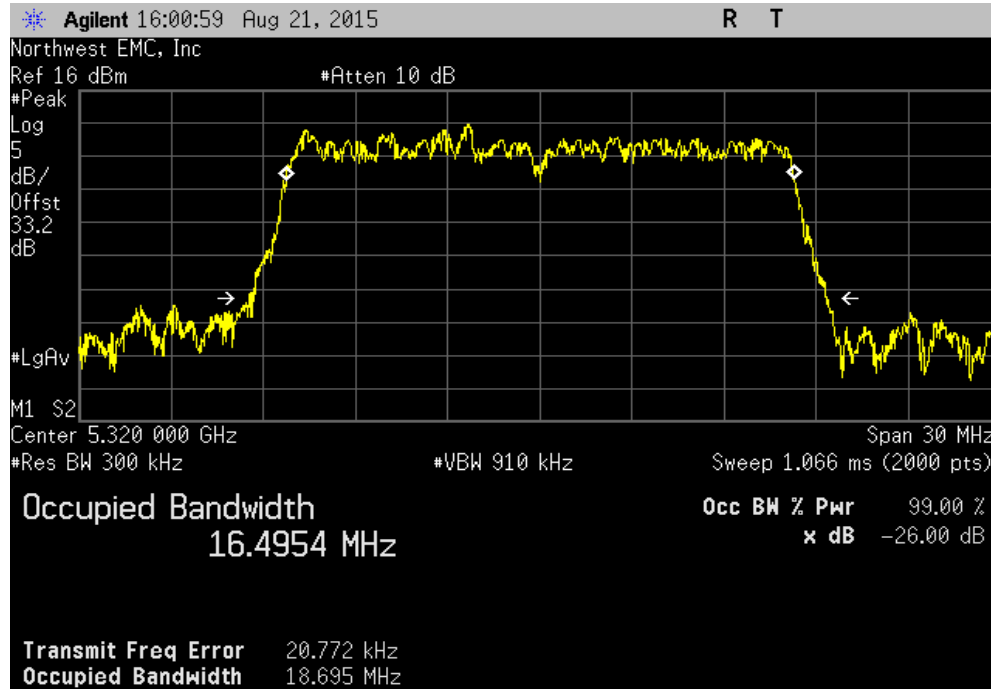
Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.15 5260 MHz

| | | | | Value | Limit (N/A) | Result |
|--|--|--|--|------------|----------------|--------|
| | | | | 26.601 MHz | N/A | N/A |

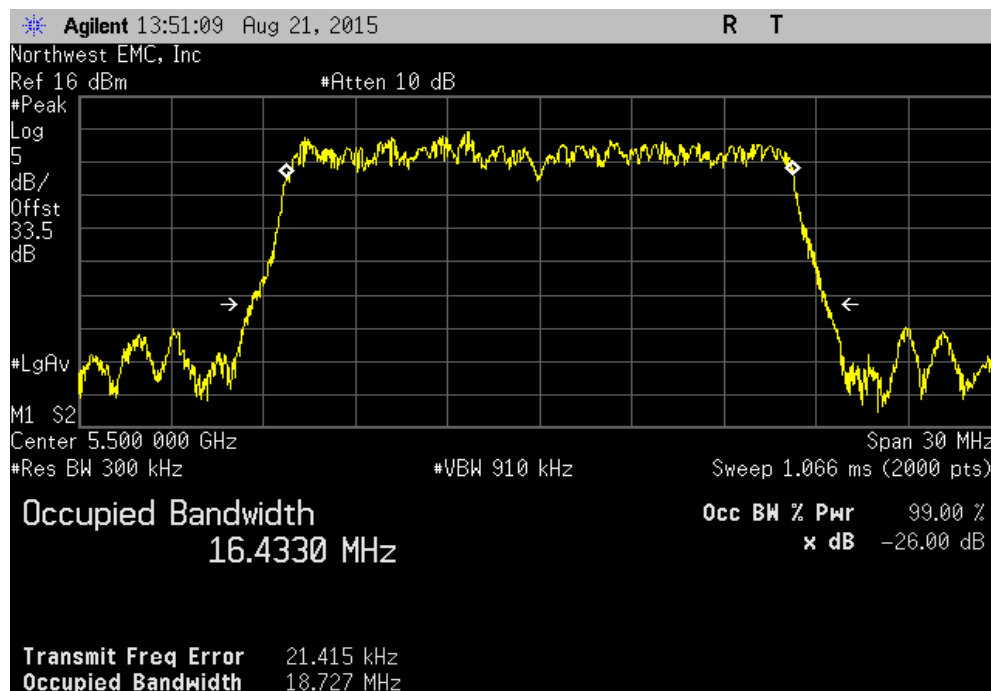


EMISSION BANDWIDTH

| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.18 5320 MHz | | | | | | |
|--|--|--|--|------------|----------------|--------|
| | | | | Value | Limit (N/A) | Result |
| | | | | 18.695 MHz | N/A | N/A |

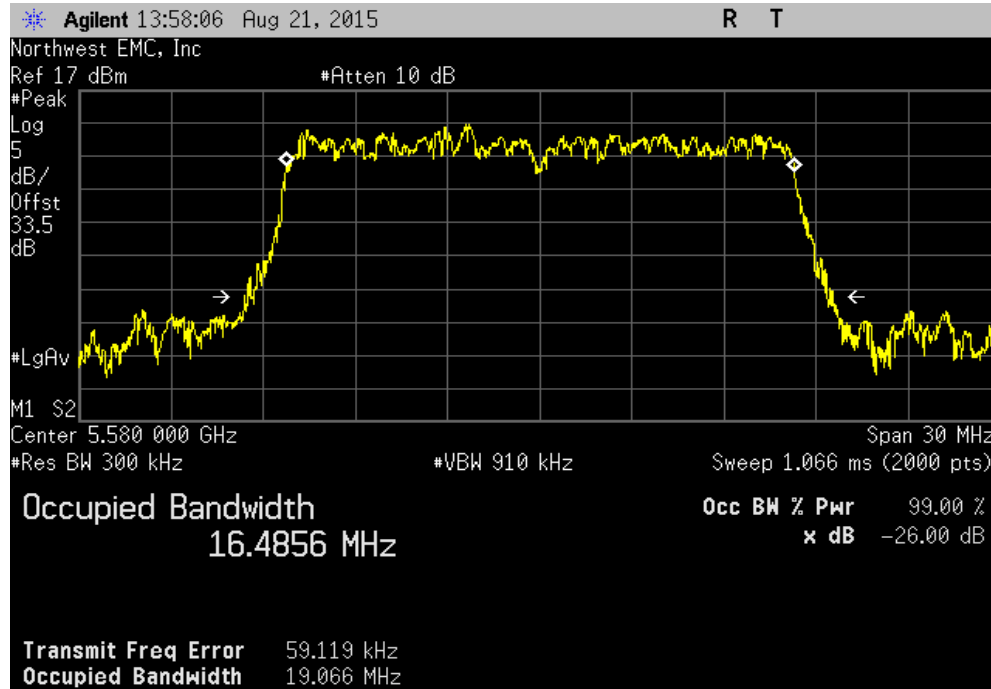


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.19 5500 MHz | | | | | | |
|---|--|--|--|------------|----------------|--------|
| | | | | Value | Limit (N/A) | Result |
| | | | | 18.727 MHz | N/A | N/A |

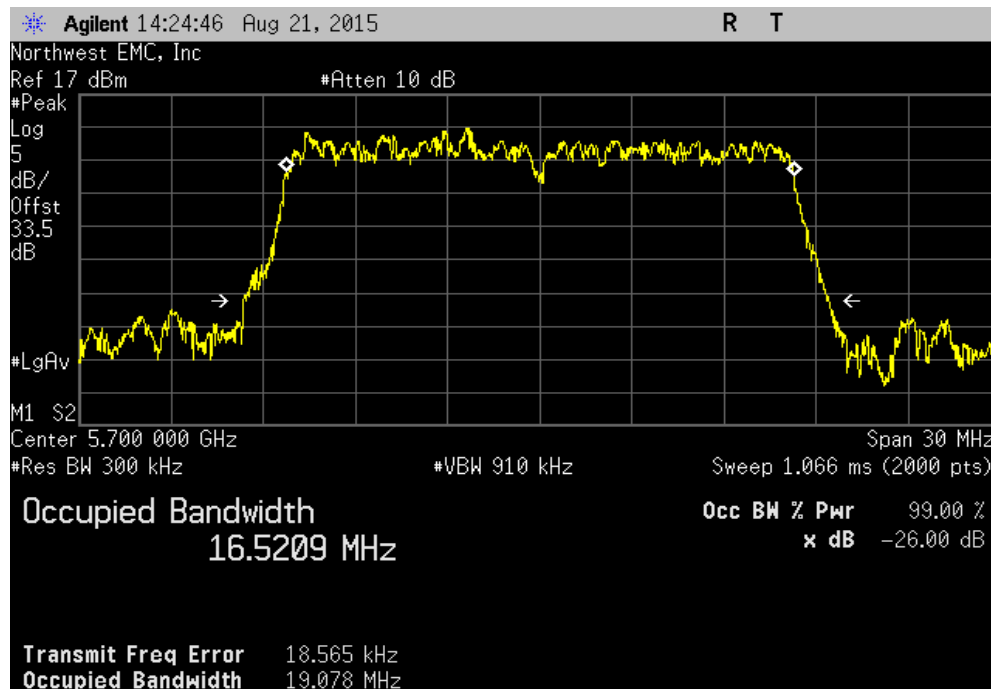


EMISSION BANDWIDTH

| Normal Conditions, 802.11(a) 18 Mbps, Mid Channel, Ch.23 5580 MHz | | | | | | |
|---|--|--|--|------------|----------------|--------|
| | | | | Value | Limit (N/A) | Result |
| | | | | 19.066 MHz | N/A | N/A |



| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.29 5700 MHz | | | | | | |
|--|--|--|--|------------|----------------|--------|
| | | | | Value | Limit (N/A) | Result |
| | | | | 19.078 MHz | 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 (mo) |
|------------------------------|------------------|----------|-----|-----------|---------------|
| Generator - Signal | Keysight | N5182B | TFX | 4/16/2015 | 36 |
| Cable | ESM Cable Corp. | TT | EV1 | NCR | 0 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 7/14/2015 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4446A | AAQ | 3/10/2015 | 12 |

TEST DESCRIPTION

FCC KDB 789033 General UNII Test Procedures were followed to measure the minimum emission bandwidth for the 5.725-5.85 GHz band.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. 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.


The spectrum analyzer settings were as follows:

- RBW = 100 kHz
- VBW = $\geq 3 \times$ RBW
- Detector = Peak
- Trace mode = max hold

The spectrum analyzer occupied bandwidth measurement function was then used to measure 6 dB emission bandwidth.

The 99.9% (approximate 26 dB) emission bandwidth (EBW) was also measured at the same time to be used for setting the channel power integration bandwidth during conducted output power testing.

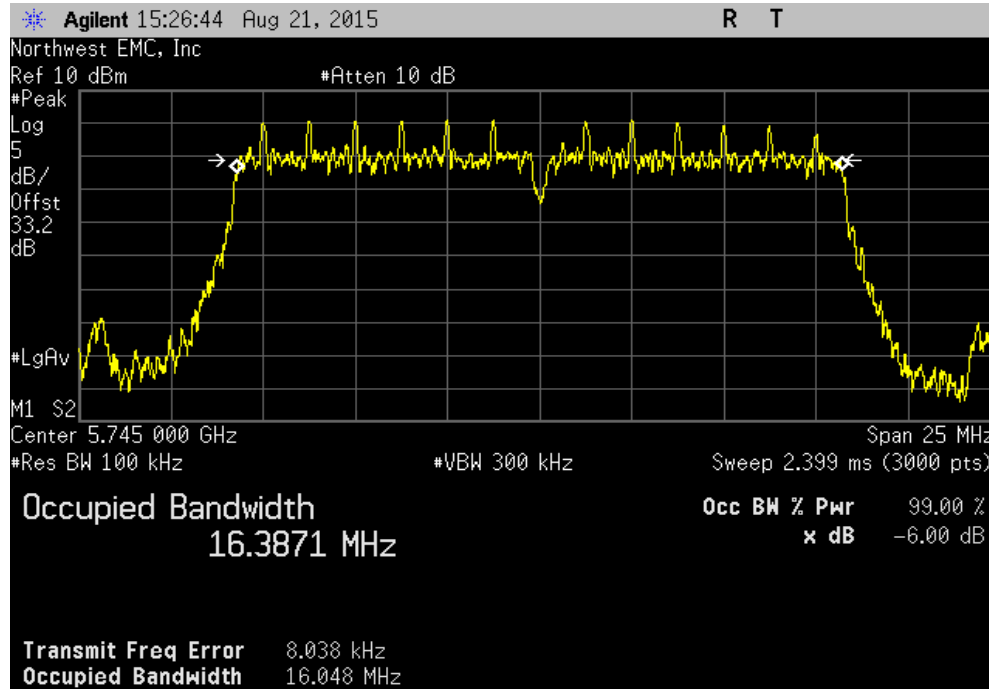
OCCUPIED BANDWIDTH

| | | | |
|--|-------------------------------|---|------------------|
| EUT: Athena4XD (extended distance) | | Work Order: FOCU0214 | |
| Serial Number: 02EA3CD00087 | | Date: 08/21/15 | |
| Customer: Summit Semiconductor LLC | | Temperature: 24.6°C | |
| Attendees: David Schilling | | Humidity: 41% | |
| Project: None | | Barometric Pres.: 1009.2 | |
| Tested by: Brandon Hobbs | | Power: 3.3 VDC Nominal | |
| | | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.407:2015 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| The EUT was not tested in ISOC mode. Based on transmission line length to all four identical antennas, a direct connect port was located on the worst case/shortest antenna path which was provided by the client. This test location was determined to be worst case by the client. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 1 | Signature  | |
| | | Value | Limit (>) Result |
| Normal Conditions | | | |
| 802.11(a) 6 Mbps | | | |
| | Low channel, Ch.30, 5745 MHz | 16.048 MHz | 500 kHz Pass |
| | Mid channel, Ch.32, 5785 MHz | 16.141 MHz | 500 kHz Pass |
| | High channel, Ch.34, 5825 MHz | 16.006 MHz | 500 kHz Pass |
| 802.11(a) 18 Mbps | | | |
| | Low channel, Ch.30, 5745 MHz | 15.427 MHz | 500 kHz Pass |
| | Mid channel, Ch.32, 5785 MHz | 15.096 MHz | 500 kHz Pass |
| | High channel, Ch.34, 5825 MHz | 15.759 MHz | 500 kHz Pass |

OCCUPIED BANDWIDTH

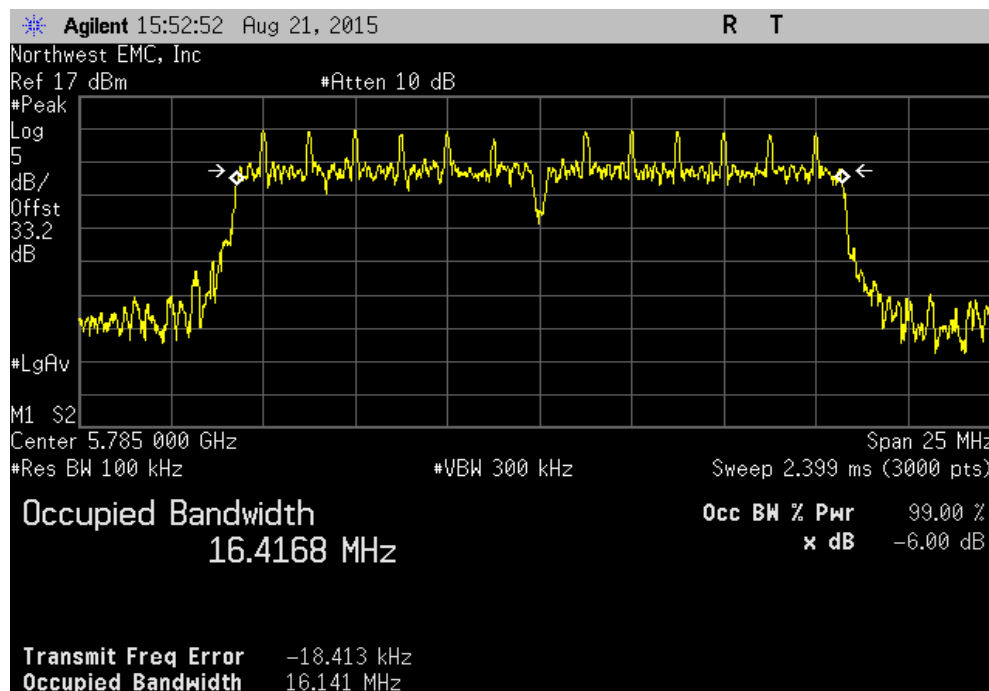
Normal Conditions, 802.11(a) 6 Mbps, Low channel, Ch.30, 5745 MHz

| | | | | Value | Limit (>) | Result |
|--|--|--|--|------------|--------------|--------|
| | | | | 16.048 MHz | 500 kHz | Pass |



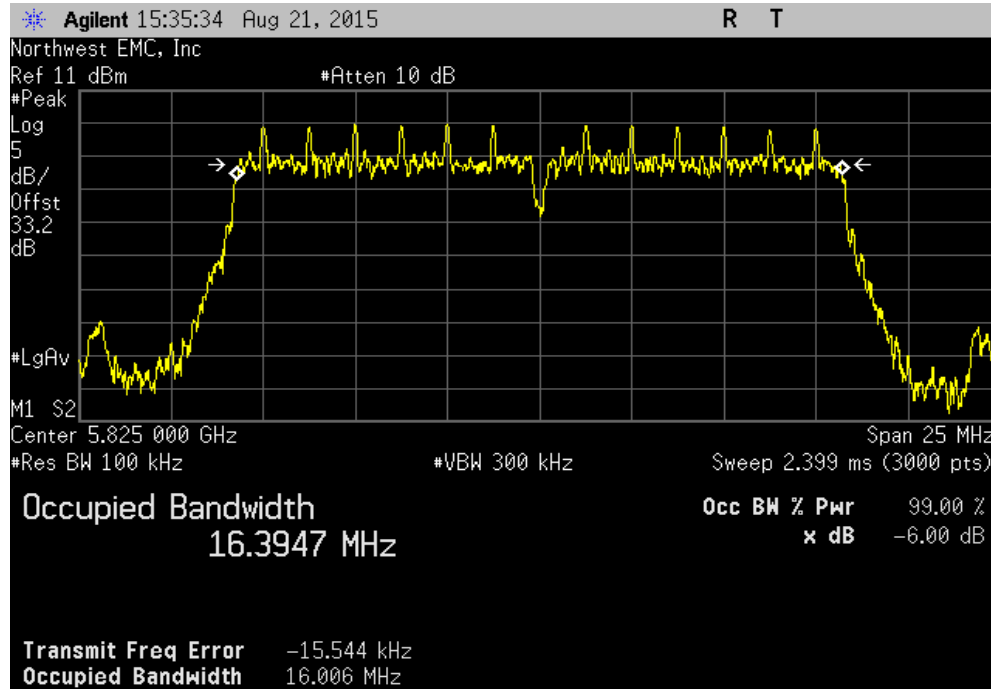
Normal Conditions, 802.11(a) 6 Mbps, Mid channel, Ch.32, 5785 MHz

| | | | | Value | Limit (>) | Result |
|--|--|--|--|------------|--------------|--------|
| | | | | 16.141 MHz | 500 kHz | Pass |

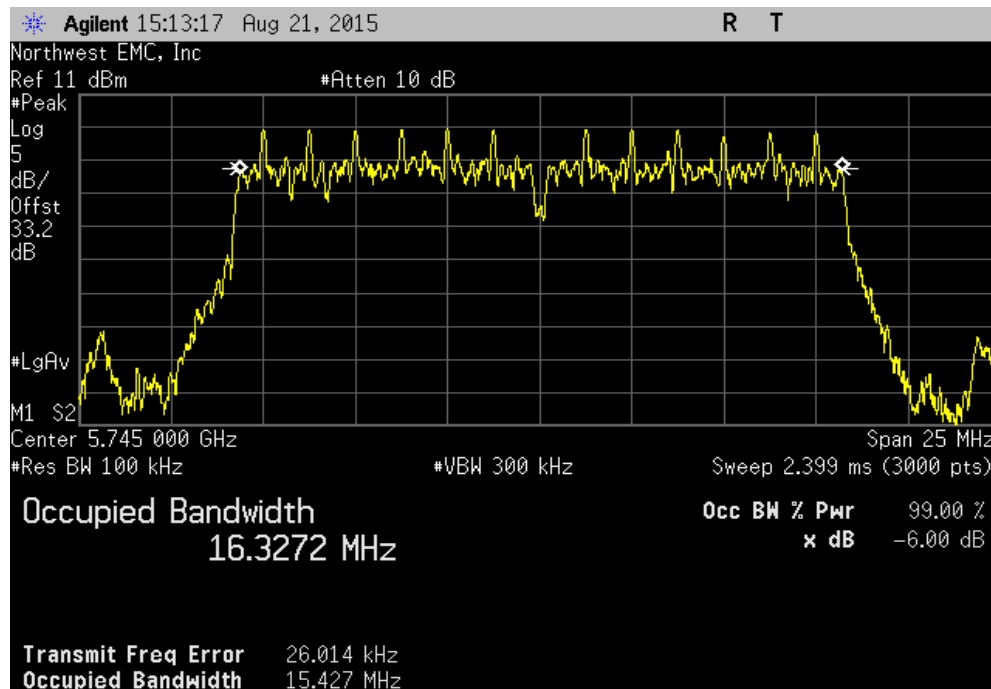


OCCUPIED BANDWIDTH

| Normal Conditions, 802.11(a) 6 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|--|--|--|--|------------|---------|--------|
| | | | | Value | Limit | Result |
| | | | | 16.006 MHz | 500 kHz | Pass |

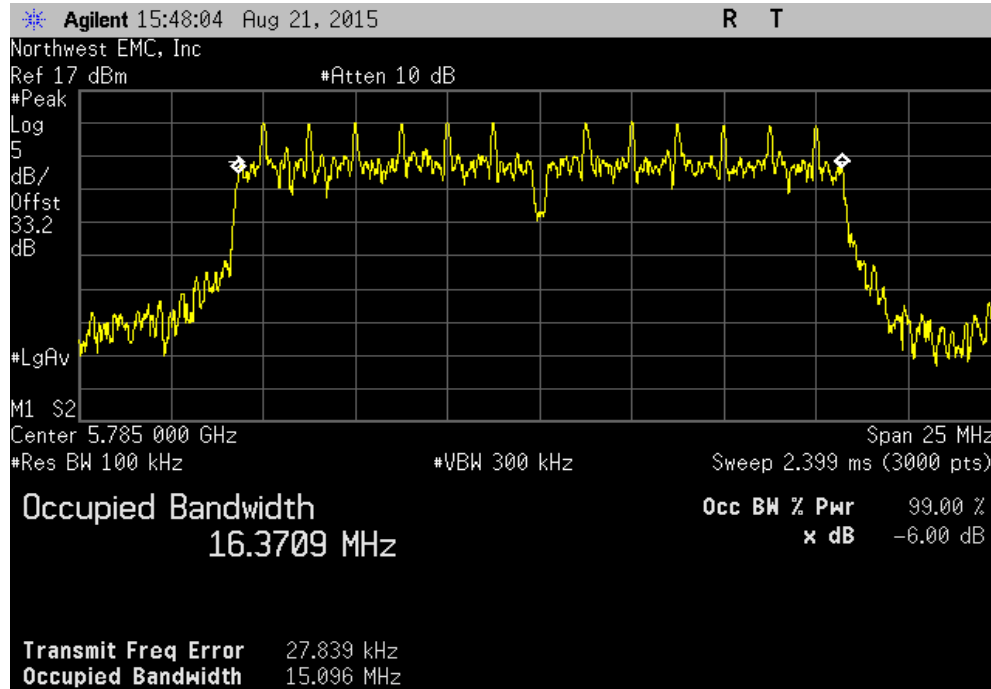


| Normal Conditions, 802.11(a) 18 Mbps, Low channel, Ch.30, 5745 MHz | | | | | | |
|--|--|--|--|------------|---------|--------|
| | | | | Value | Limit | Result |
| | | | | 15.427 MHz | 500 kHz | Pass |

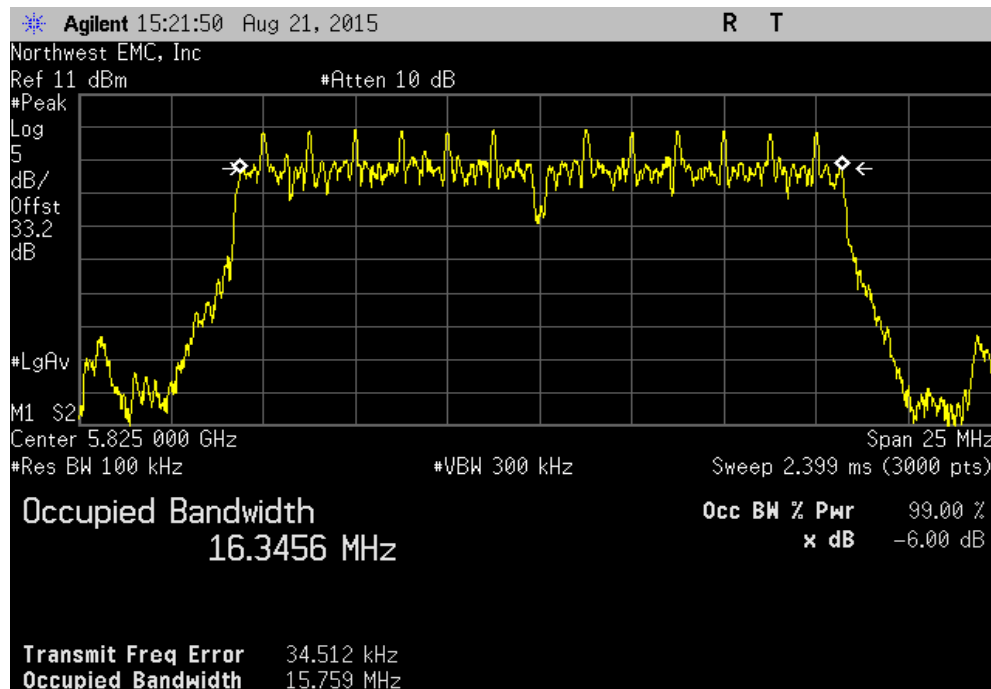


OCCUPIED BANDWIDTH

| Normal Conditions, 802.11(a) 18 Mbps, Mid channel, Ch.32, 5785 MHz | | | | | | |
|--|--|--|--|------------|---------|--------|
| | | | | Value | Limit | Result |
| | | | | 15.096 MHz | 500 kHz | Pass |



| Normal Conditions, 802.11(a) 18 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|---|--|--|--|------------|---------|--------|
| | | | | Value | Limit | Result |
| | | | | 15.759 MHz | 500 kHz | Pass |



MAXIMUM CONDUCTED 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 (mo) |
|------------------------------|------------------|----------|-----|-----------|---------------|
| Generator - Signal | Keysight | N5182B | TFX | 4/16/2015 | 36 |
| Cable | ESM Cable Corp. | TT | EV1 | NCR | 0 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 7/14/2015 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4446A | AAQ | 3/10/2015 | 12 |

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test.

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. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.


Prior to measuring peak transmit power; the emission bandwidth (B) was measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report

Method SA-2 Alternate (RMS detection with slow sweep across on and off times of the EUT transmission and use of a duty cycle correction factor) was used for this test.

MAXIMUM CONDUCTED OUTPUT POWER

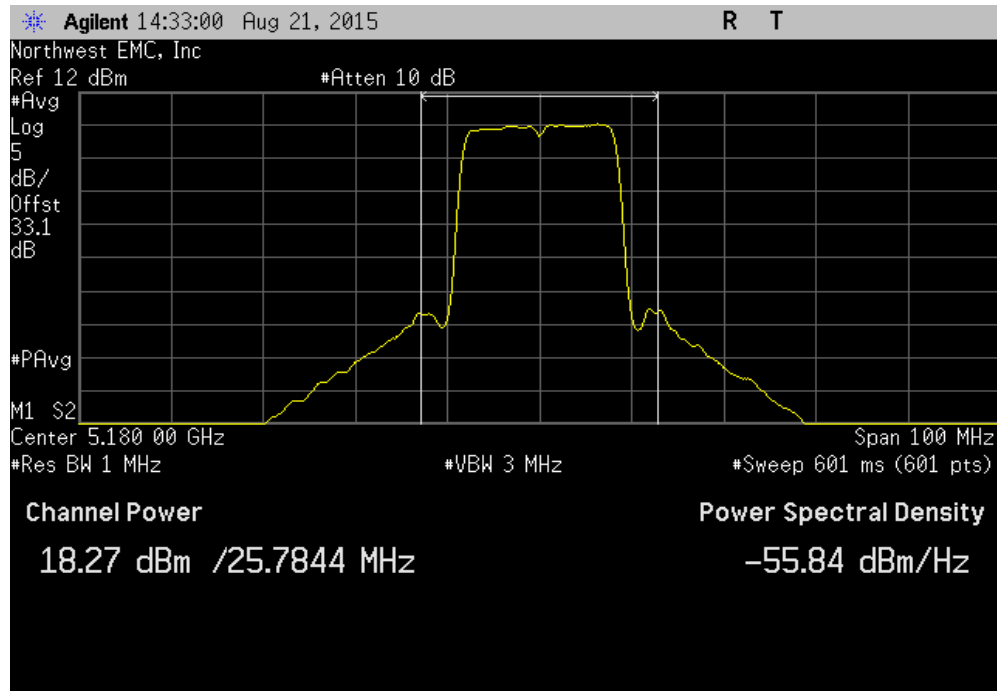


XMR 2015.01.14

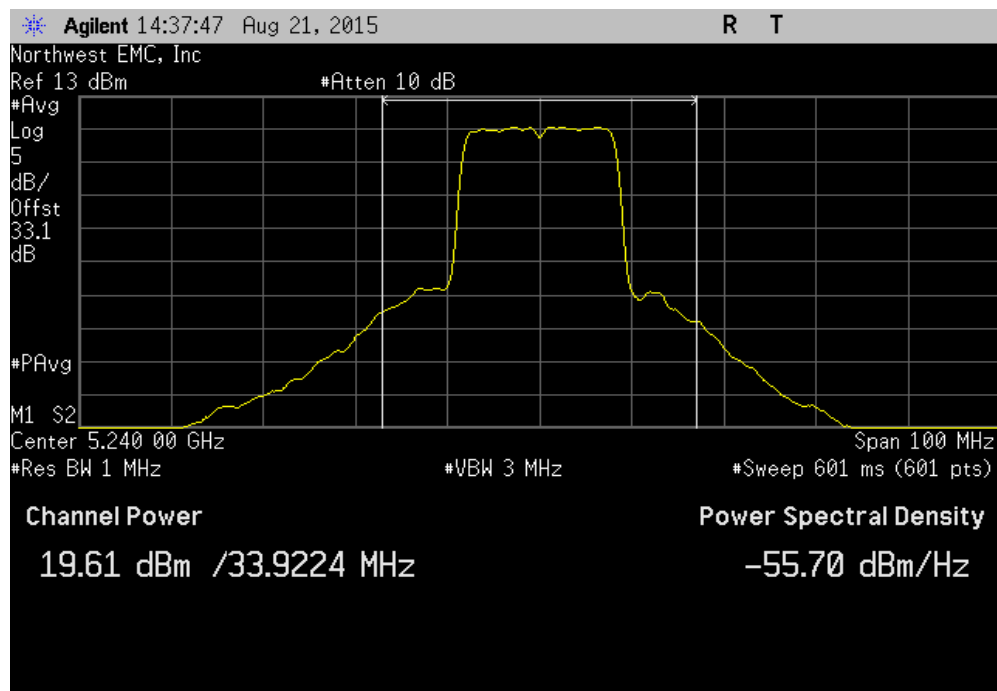
| | | | |
|--|------------------------------|---|------------------------|
| EUT: Athena4XD (extended distance) | | Work Order: FOCU0214 | |
| Serial Number: 02EA3CD00087 | | Date: 08/21/15 | |
| Customer: Summit Semiconductor LLC | | Temperature: 24.6°C | |
| Attendees: David Schilling | | Humidity: 41% | |
| Project: None | | Barometric Pres.: 1009.2 | |
| Tested by: Brandon Hobbs | Power: 3.3 VDC Nominal | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.407:2015 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| The EUT was not tested in ISOC mode. Based on transmission line length to all four identical antennas, a direct connect port was located on the worst case/shortest antenna path which was provided by the client. This test location was determined to be worst case by the client. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 1 | Signature  | |
| | | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) |
| | | Output Power (dBm) | Limit (dBm) |
| | | | Results |
| Normal Conditions | | | |
| 802.11(a) 6 Mbps | | | |
| | Low Channel, Ch.8 5180 MHz | 18.271 | 1.9 |
| | High Channel, Ch.14 5240 MHz | 19.607 | 1.9 |
| | Low Channel, Ch.15 5260 MHz | 19.453 | 2 |
| | High Channel, Ch.18 5320 MHz | 17.729 | 1.9 |
| | Low Channel, Ch.19 5500 MHz | 18.22 | 1.9 |
| | Mid Channel, Ch.23 5580 MHz | 18.929 | 1.9 |
| | High Channel, Ch.29 5700 MHz | 19.191 | 1.9 |
| 802.11(a) 18 Mbps | | | |
| | Low Channel, Ch.8 5180 MHz | 16.552 | 3.8 |
| | High Channel, Ch.14 5240 MHz | 18.595 | 3.7 |
| | Low Channel, Ch.15 5260 MHz | 17.942 | 3.7 |
| | High Channel, Ch.18 5320 MHz | 16.41 | 3.7 |
| | Low Channel, Ch.19 5500 MHz | 16.41 | 3.9 |
| | Mid Channel, Ch.23 5580 MHz | 17.736 | 3.7 |
| | High Channel, Ch.29 5700 MHz | 17.486 | 3.7 |

MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.8 5180 MHz | | | | | | |
|---|-----------------------|---------------------------|--|-----------------------|----------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 18.271 | 1.9 | | 20.1 | 24 | Pass |

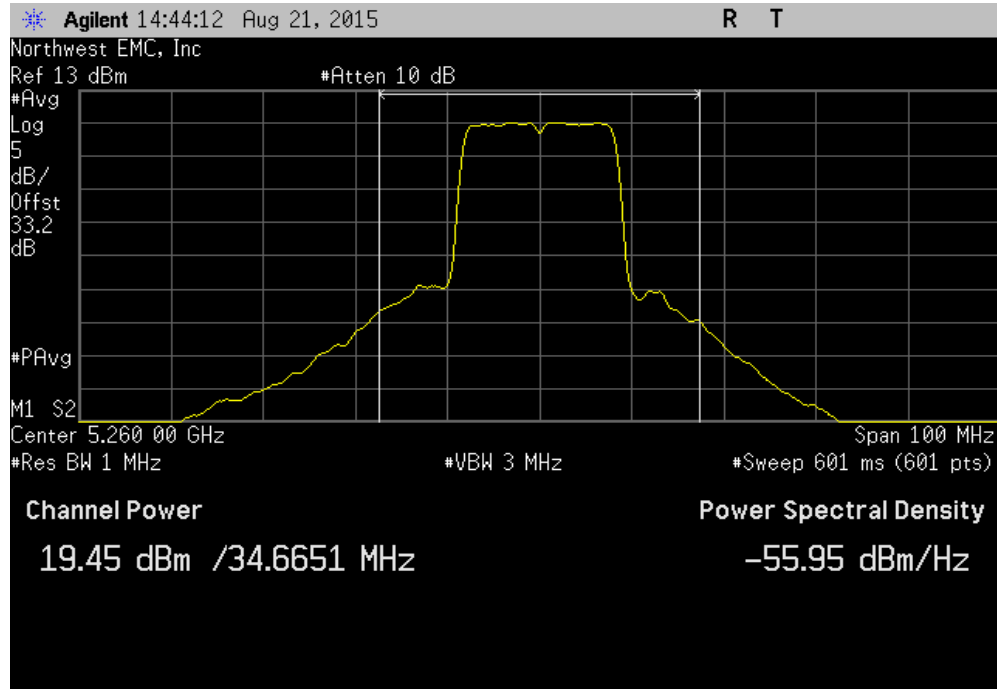


| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.14 5240 MHz | | | | | | |
|---|-----------------------|---------------------------|--|-----------------------|----------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 19.607 | 1.9 | | 21.5 | 24 | Pass |

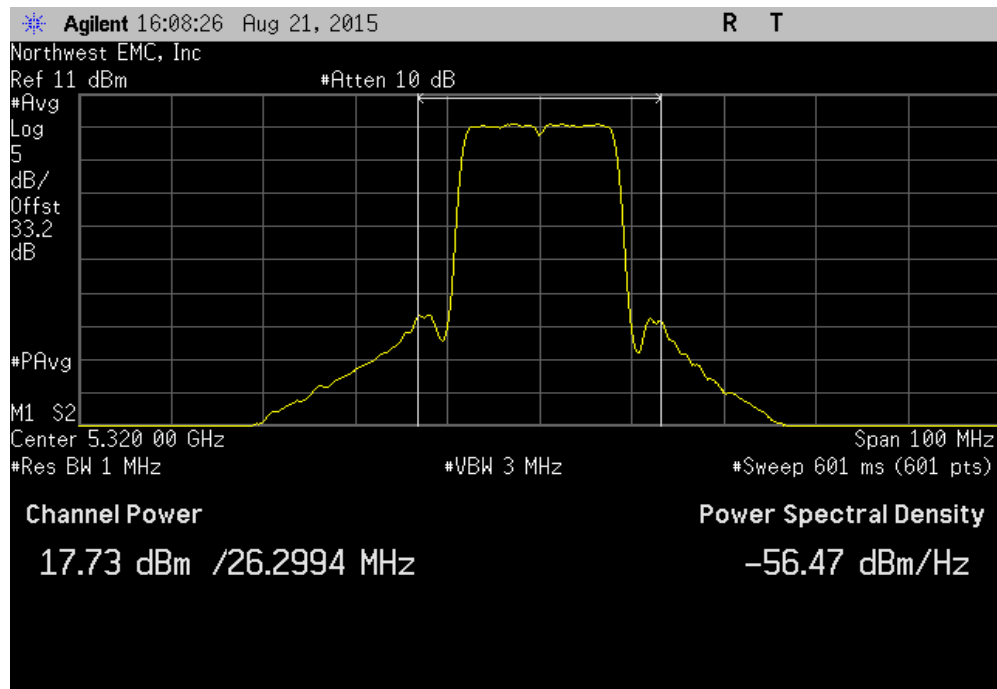


MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.15 5260 MHz | | | | | | |
|--|-----------------------|---------------------------|--|-----------------------|----------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 19.453 | 2 | | 21.5 | 24 | Pass |

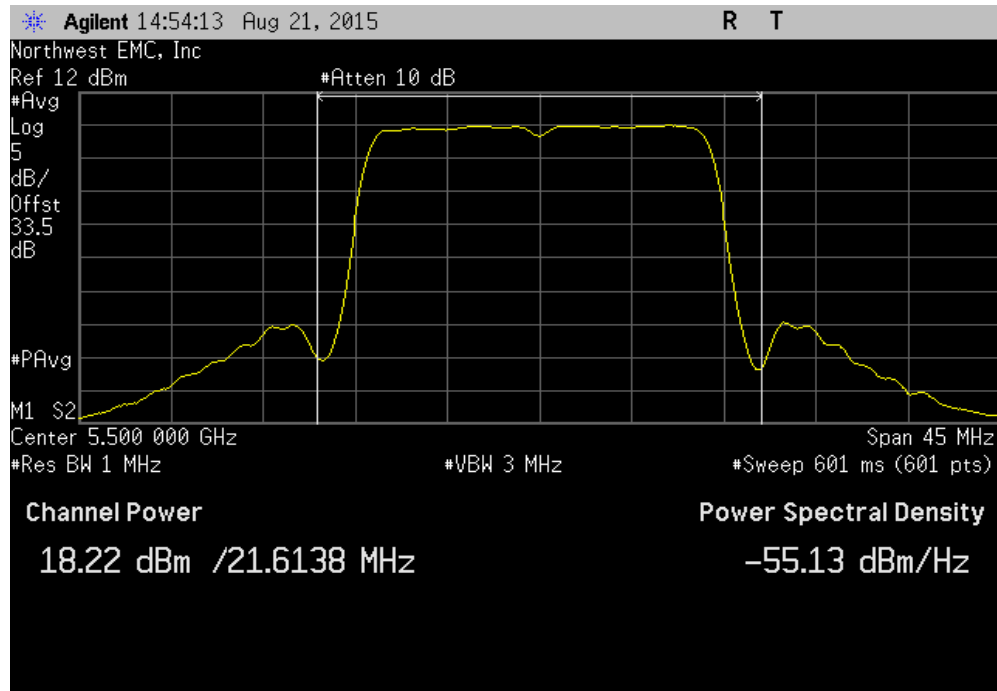


| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.18 5320 MHz | | | | | | |
|---|-----------------------|---------------------------|--|-----------------------|----------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 17.729 | 1.9 | | 19.6 | 24 | Pass |

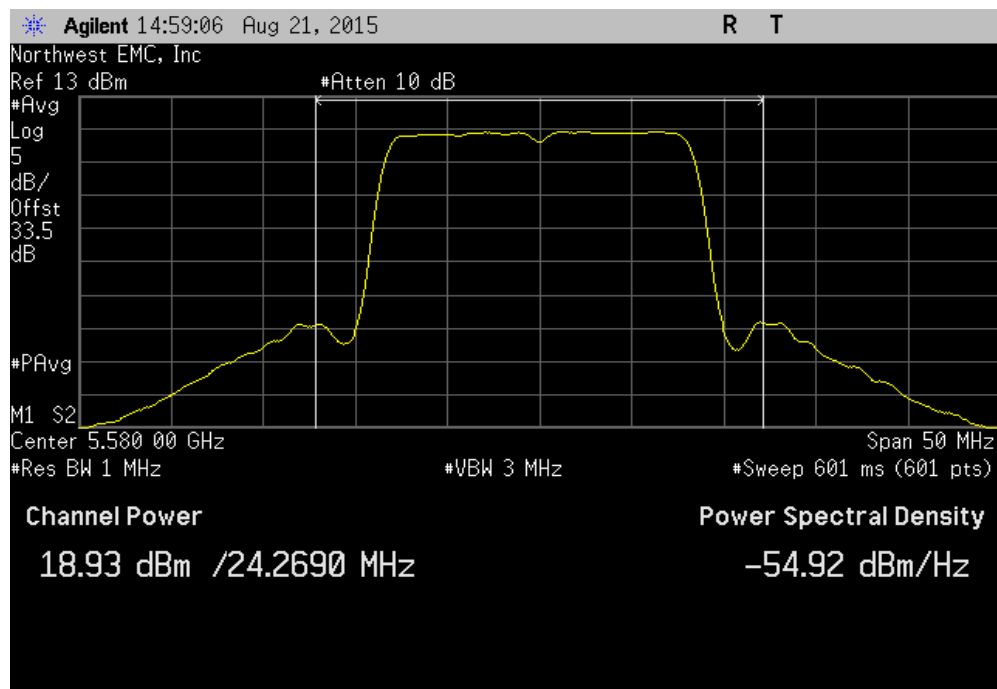


MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.19 5500 MHz | | | | | |
|--|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 18.22 | 1.9 | 20.1 | 24 | Pass | |

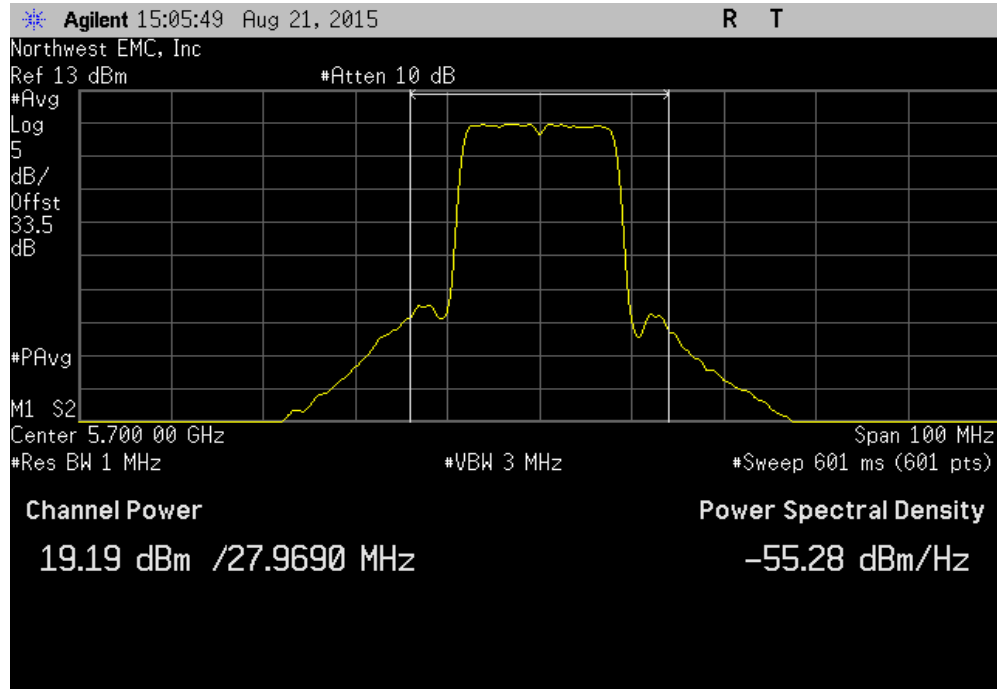


| Normal Conditions, 802.11(a) 6 Mbps, Mid Channel, Ch.23 5580 MHz | | | | | |
|--|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 18.929 | 1.9 | 20.8 | 24 | Pass | |

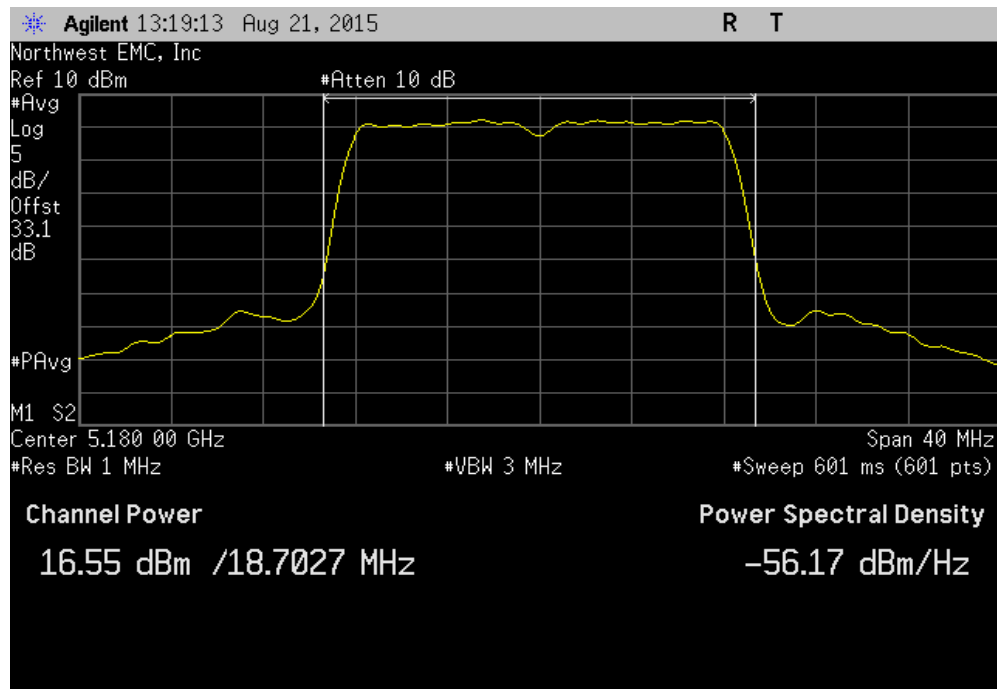


MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.29 5700 MHz | | | | | |
|---|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 19.191 | 1.9 | 21.1 | 24 | Pass | |

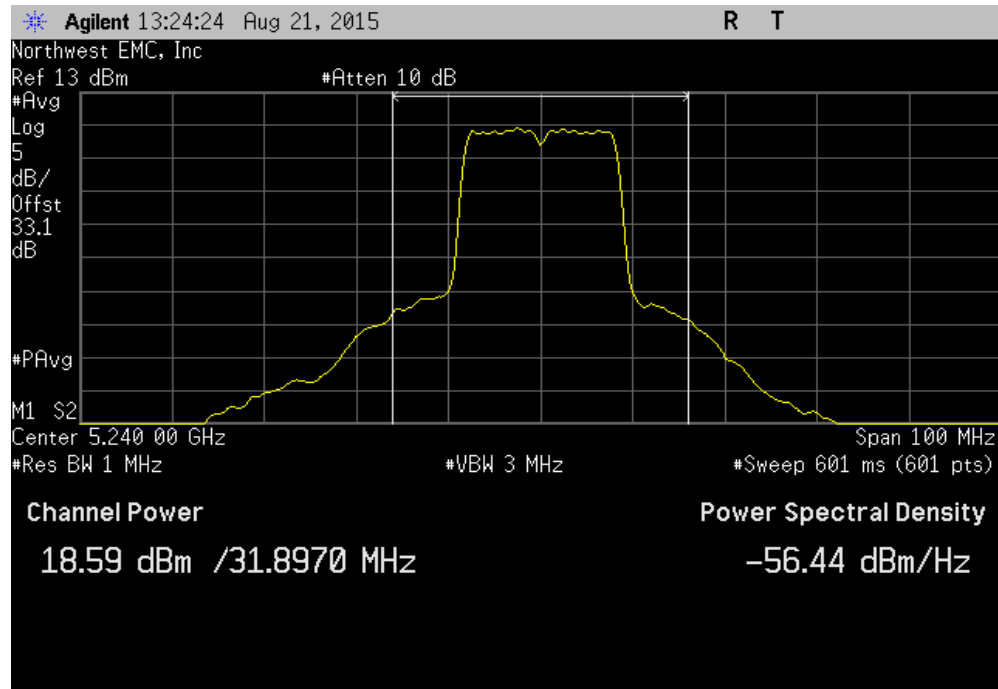


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.8 5180 MHz | | | | | |
|--|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 16.552 | 3.8 | 20.3 | 24 | Pass | |

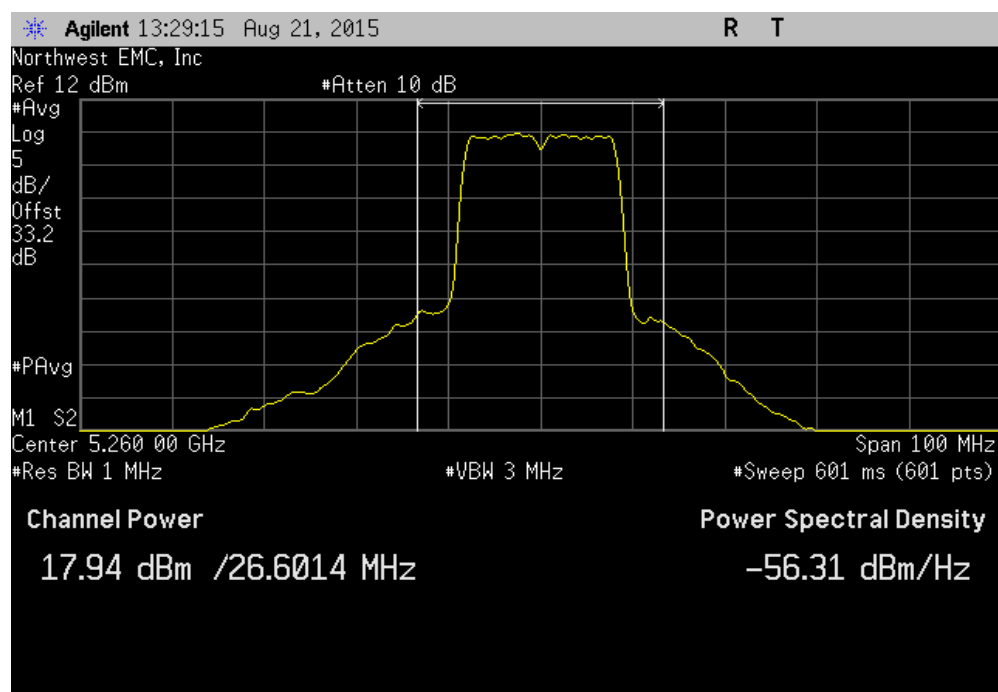


MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.14 5240 MHz | | | | | |
|--|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 18.595 | 3.7 | 22.3 | 24 | Pass | |

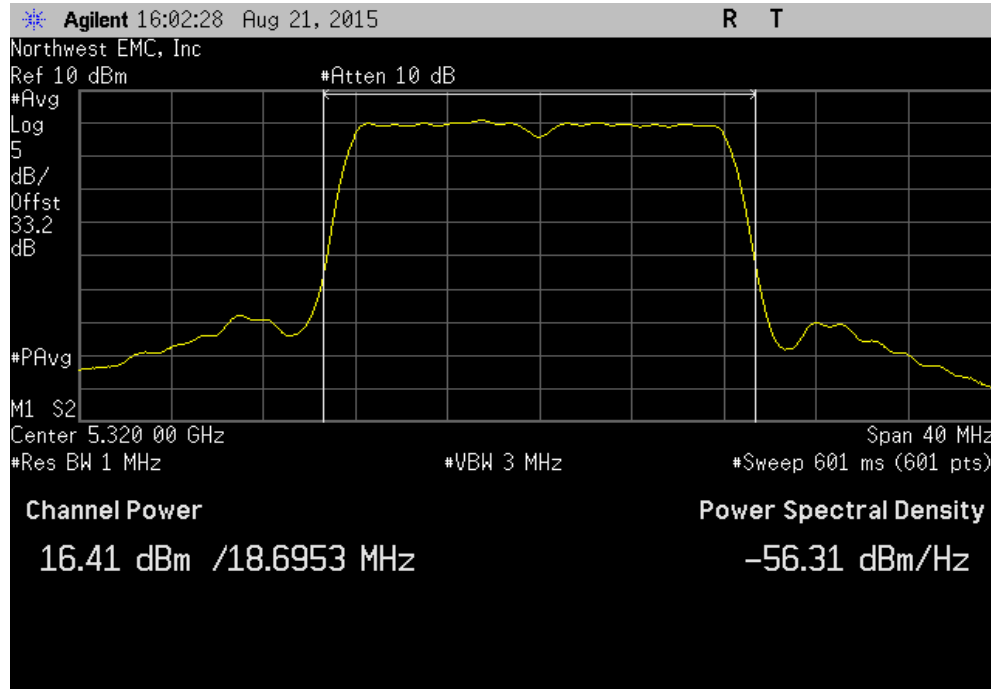


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.15 5260 MHz | | | | | |
|---|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 17.942 | 3.7 | 21.7 | 24 | Pass | |

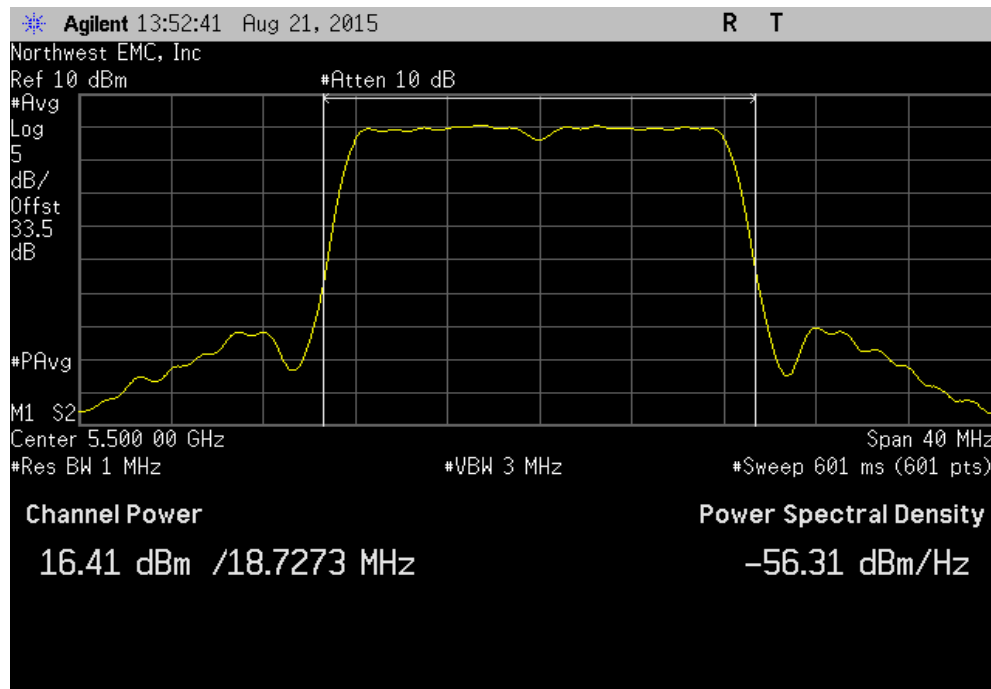


MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.18 5320 MHz | | | | | |
|--|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 16.41 | 3.7 | 20.1 | 24 | Pass | |

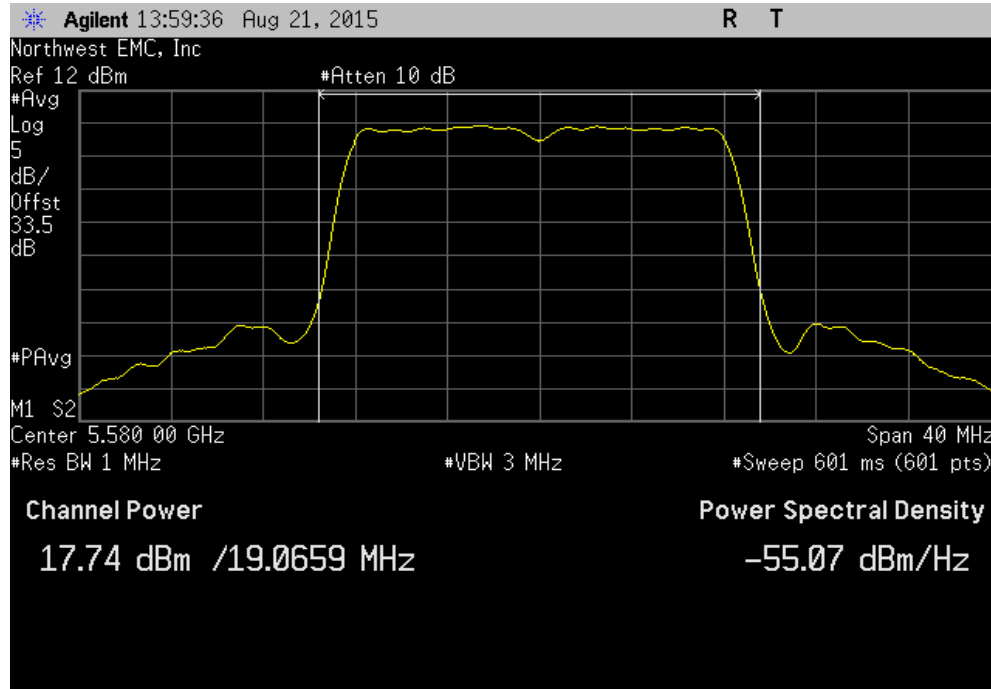


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.19 5500 MHz | | | | | |
|---|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 16.41 | 3.9 | 20.3 | 24 | Pass | |

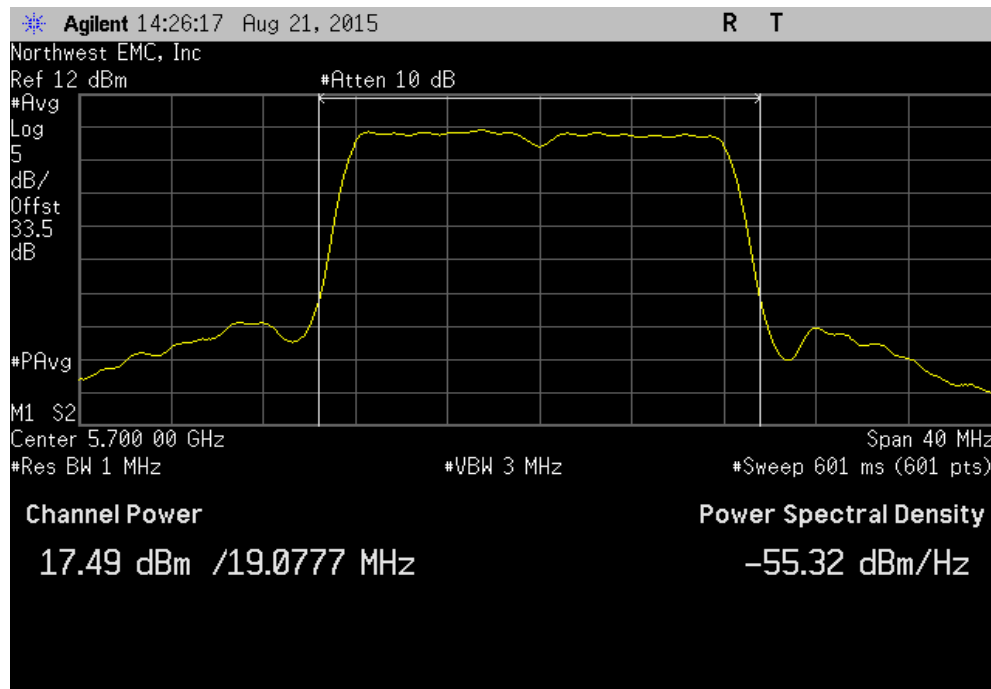


MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 18 Mbps, Mid Channel, Ch.23 5580 MHz | | | | | |
|---|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 17.736 | 3.7 | 21.5 | 24 | Pass | |



| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.29 5700 MHz | | | | | |
|--|------------------------|--------------------|-------------|---------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Output Power (dBm) | Limit (dBm) | Results | |
| 17.486 | 3.7 | 21.2 | 24 | Pass | |



MAXIMUM CONDUCTED 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 (mo) |
|------------------------------|------------------|----------|-----|-----------|---------------|
| Generator - Signal | Keysight | N5182B | TFX | 4/16/2015 | 36 |
| Cable | ESM Cable Corp. | TT | EV1 | NCR | 0 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 7/14/2015 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4446A | AAQ | 3/10/2015 | 12 |

TEST DESCRIPTION


FCC KDB 789033 D01 General UNII Test.

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. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.

Prior to measuring peak transmit power; the emission bandwidth (B) was measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report

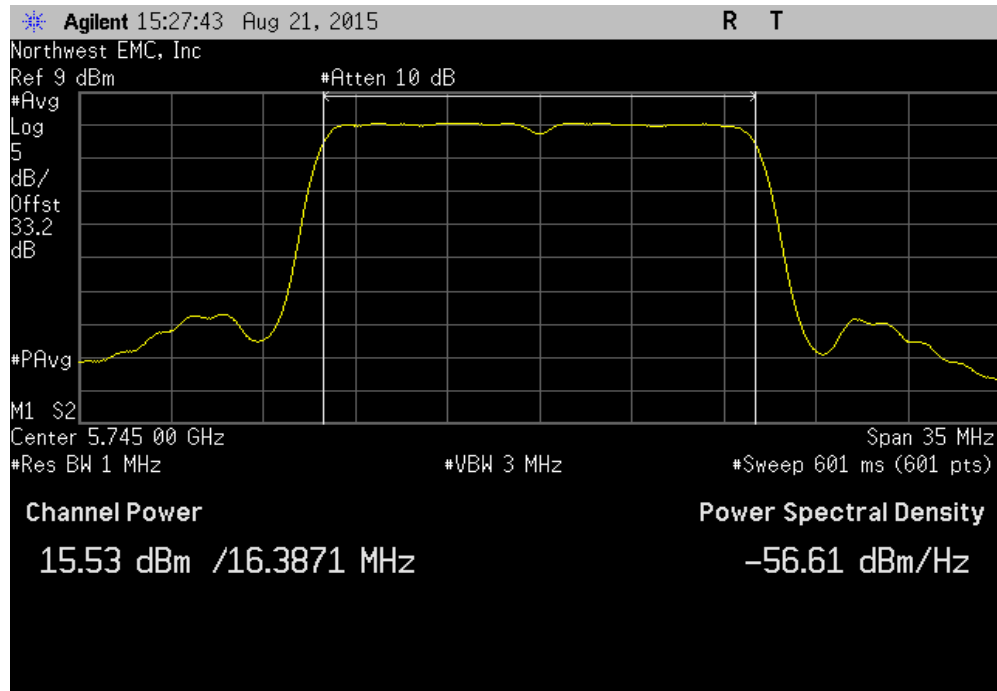
Method SA-2 Alternate (RMS detection with slow sweep across on and off times of the EUT transmission and use of a duty cycle correction factor) was used for this test.

MAXIMUM CONDUCTED OUTPUT POWER

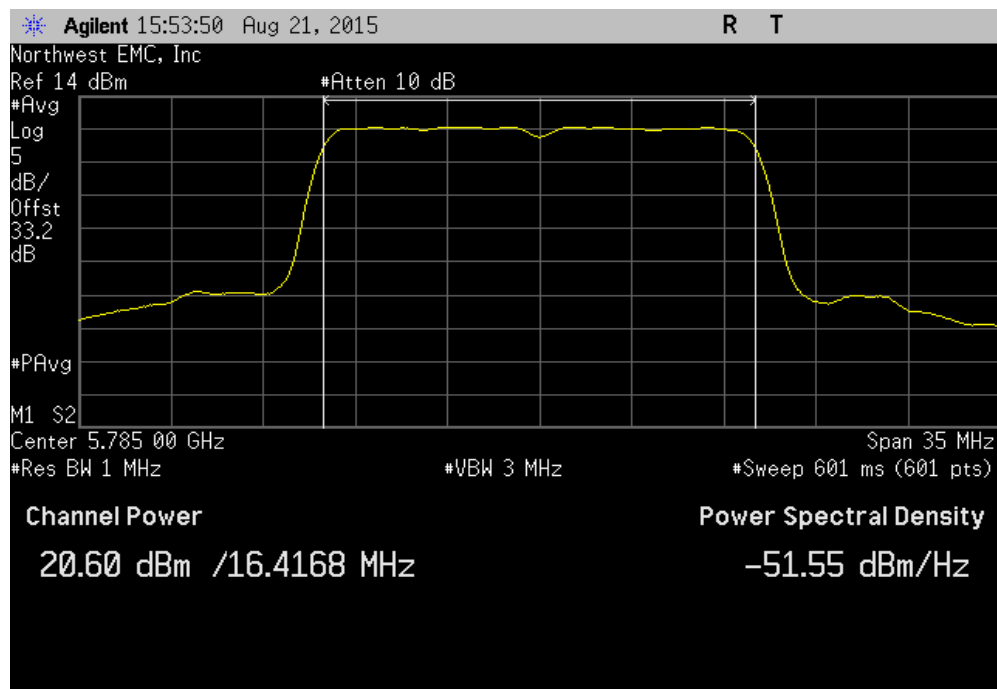
| | | | |
|--------------------------------------|-------------------------------|---|------------------------|
| EUT: Athena4XD (extended distance) | | Work Order: FOCU0214 | |
| Serial Number: 02EA3CD00087 | | Date: 08/21/15 | |
| Customer: Summit Semiconductor LLC | | Temperature: 24.6°C | |
| Attendees: David Schilling | | Humidity: 41% | |
| Project: None | | Barometric Pres.: 1009.2 | |
| Tested by: Brandon Hobbs | | Power: 3.3 VDC Nominal | |
| | | Job Site: EV06 | |
| TEST SPECIFICATIONS | | | |
| FCC 15.407:2015 | | Test Method | |
| | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| The EUT was not tested in ISOC mode. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 1 | Signature  | |
| | | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) |
| | | Output Power (dBm) | Limit (dBm) |
| | | | Results |
| Normal Conditions | | | |
| 802.11(a) 6 Mbps | | | |
| | Low channel, Ch.30, 5745 MHz | 15.53 | 1.9 |
| | Mid channel, Ch.32, 5785 MHz | 20.6 | 1.9 |
| | High channel, Ch.34, 5825 MHz | 15.015 | 1.9 |
| 802.11(a) 18 Mbps | | | |
| | Low channel, Ch.30, 5745 MHz | 13.435 | 3.7 |
| | Mid channel, Ch.32, 5785 MHz | 19.349 | 3.8 |
| | High channel, Ch.34, 5825 MHz | 13.353 | 3.7 |

MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 6 Mbps, Low channel, Ch.30, 5745 MHz | | | | | | |
|---|-----------------------|---------------------------|--|-----------------------|----------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 15.53 | 1.9 | | 17.4 | 30 | Pass |

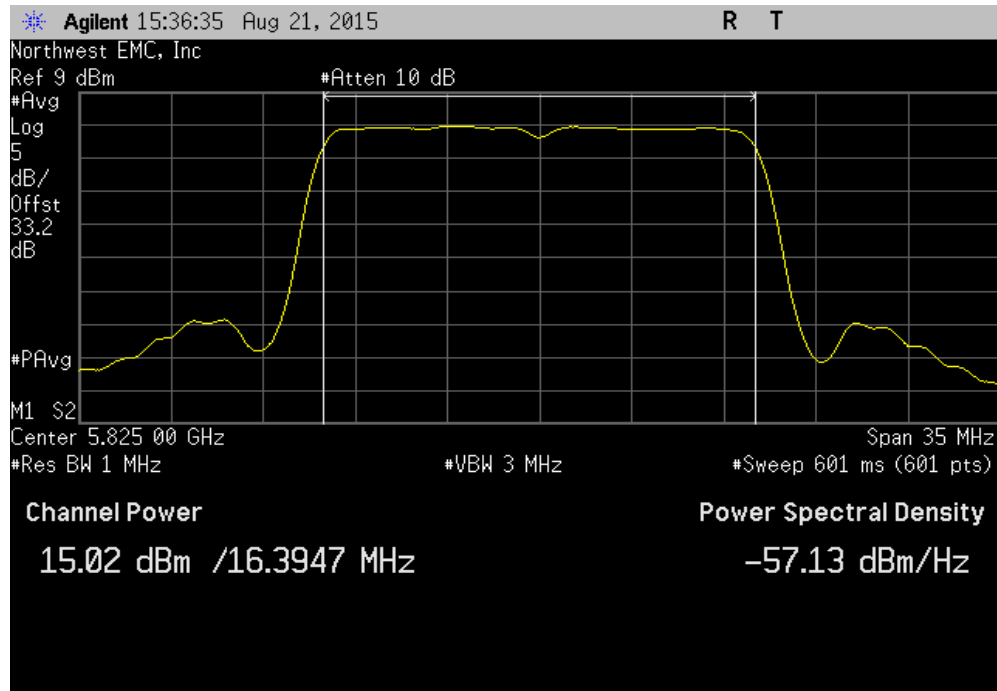


| Normal Conditions, 802.11(a) 6 Mbps, Mid channel, Ch.32, 5785 MHz | | | | | | |
|---|-----------------------|---------------------------|--|-----------------------|----------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 20.6 | 1.9 | | 22.5 | 30 | Pass |

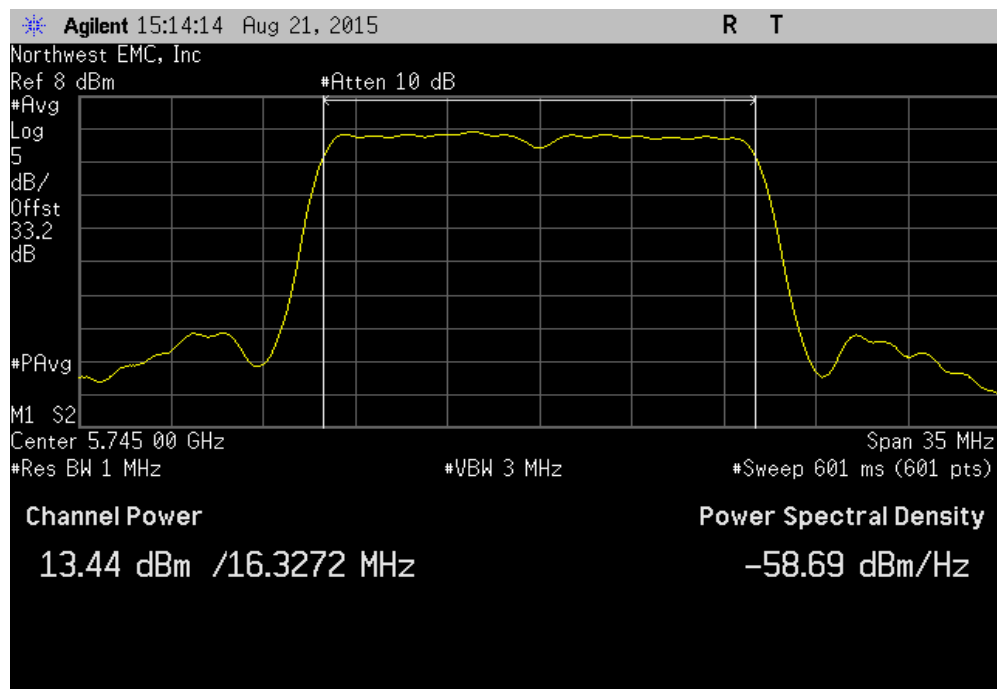


MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 6 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|--|--------------------|------------------------|--|--------------------|-------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 15.015 | 1.9 | | 16.9 | 30 | Pass |

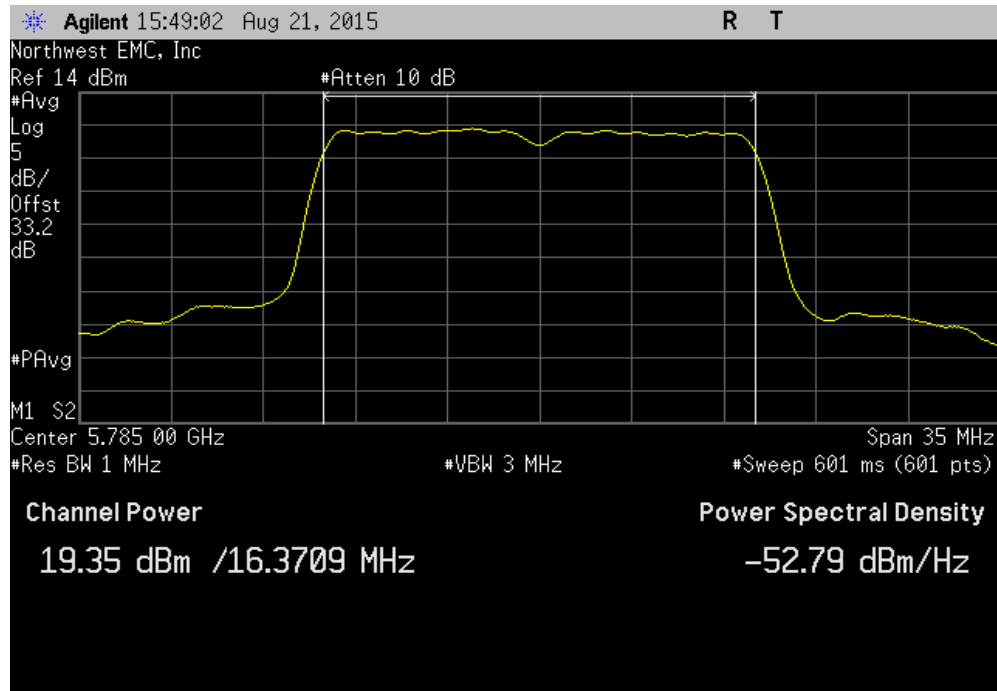


| Normal Conditions, 802.11(a) 18 Mbps, Low channel, Ch.30, 5745 MHz | | | | | | |
|--|--------------------|------------------------|--|--------------------|-------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 13.435 | 3.7 | | 17.2 | 30 | Pass |

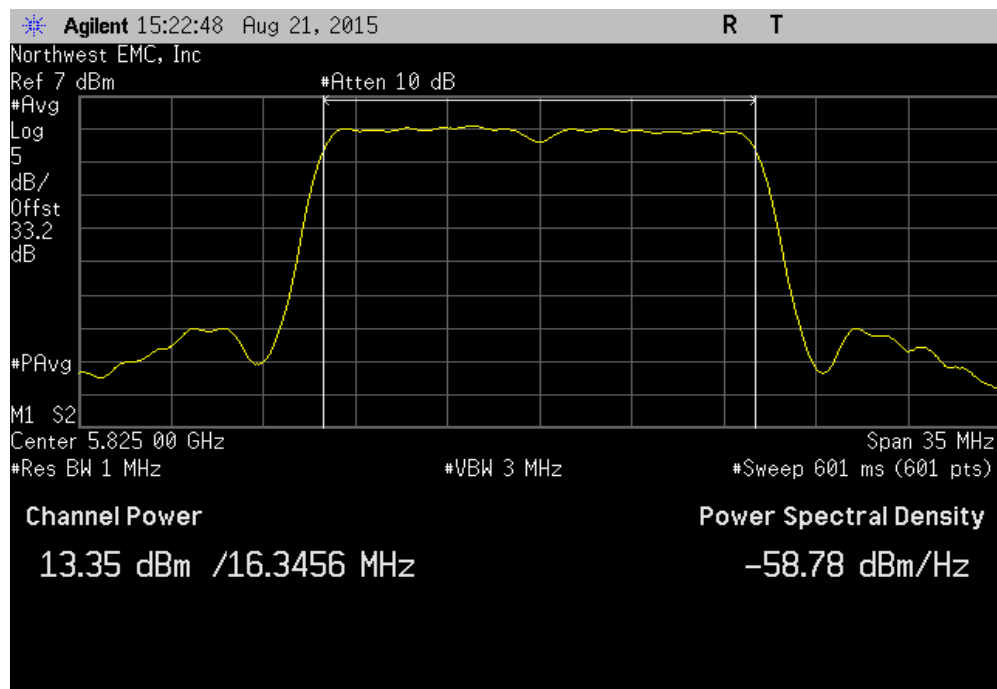


MAXIMUM CONDUCTED OUTPUT POWER

| Normal Conditions, 802.11(a) 18 Mbps, Mid channel, Ch.32, 5785 MHz | | | | | | |
|--|--------------------|------------------------|--|--------------------|-------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 19.349 | 3.8 | | 23.1 | 30 | Pass |



| Normal Conditions, 802.11(a) 18 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|---|--------------------|------------------------|--|--------------------|-------------|---------|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | | Output Power (dBm) | Limit (dBm) | Results |
| | 13.353 | 3.7 | | 17.1 | 30 | Pass |



MAXIMUM 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 (mo) |
|------------------------------|------------------|----------|-----|-----------|---------------|
| Generator - Signal | Keysight | N5182B | TFX | 4/16/2015 | 36 |
| Cable | ESM Cable Corp. | TT | EV1 | NCR | 0 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 7/14/2015 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4446A | AAQ | 3/10/2015 | 12 |

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test.


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. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.

Method SA-2 Alternate (RMS detection with slow sweep across on and off times of the EUT transmission and use of a duty cycle correction factor) was used for this test.

MAXIMUM POWER SPECTRAL DENSITY

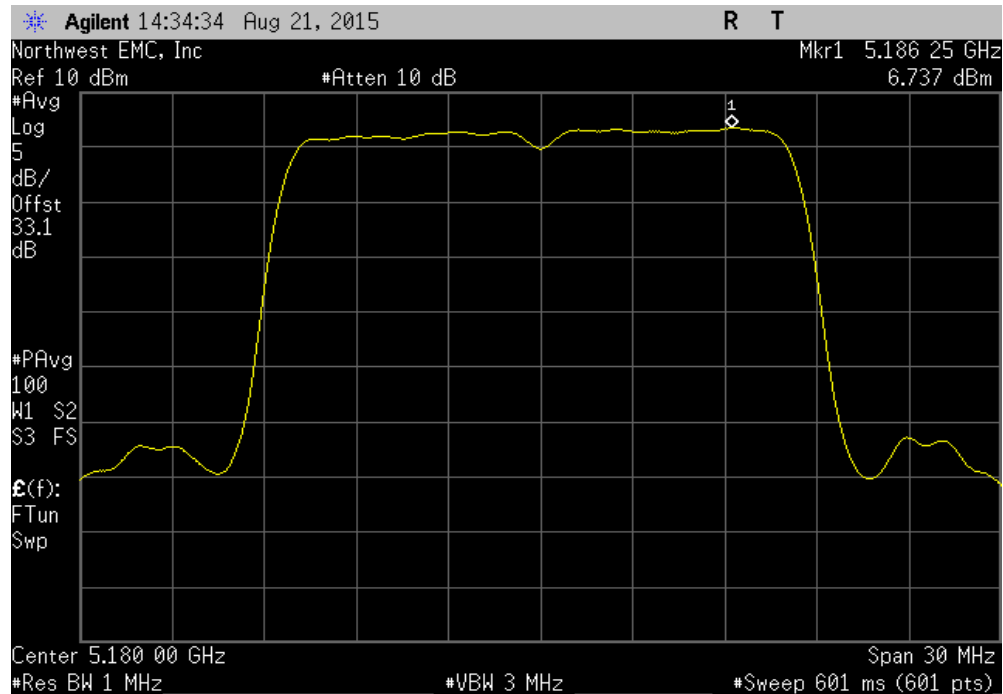


XMR 2015.01.14

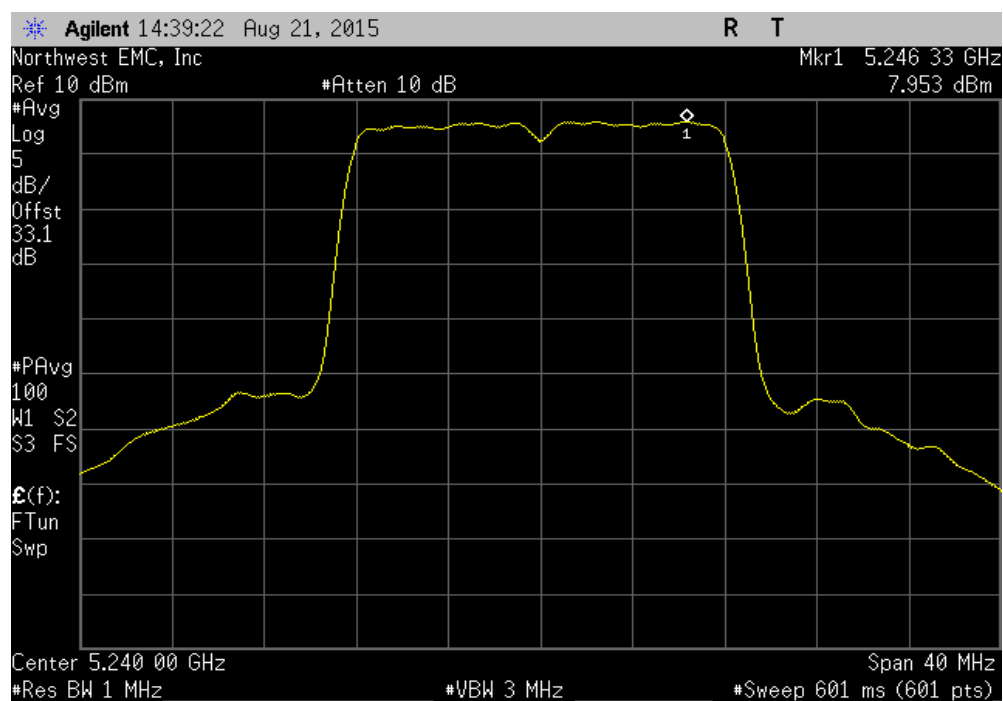
| | | | |
|--|------------------------------|---|------------------------|
| EUT: Athena4XD (extended distance) | | Work Order: FOCU0214 | |
| Serial Number: 02EA3CD00087 | | Date: 08/21/15 | |
| Customer: Summit Semiconductor LLC | | Temperature: 24.6°C | |
| Attendees: David Schilling | | Humidity: 41% | |
| Project: None | | Barometric Pres.: 1009.2 | |
| Tested by: Brandon Hobbs | | Power: 3.3 VDC Nominal | |
| | | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.407:2015 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| The EUT was not tested in ISOC mode. Based on transmission line length to all four identical antennas, a direct connect port was located on the worst case/shortest antenna path which was provided by the client. This test location was determined to be worst case by the client. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 1 | Signature  | |
| | | Power (dBm/MHz) | Duty Cycle Factor (dB) |
| | | Density (dBm/MHz) | Limit (dBm / Ref BW) |
| | | | Results |
| Normal Conditions | | | |
| 802.11(a) 6 Mbps | | | |
| | Low Channel, Ch.8 5180 MHz | 6.737 | 1.9 |
| | High Channel, Ch.14 5240 MHz | 7.953 | 1.9 |
| | Low Channel, Ch.15 5260 MHz | 7.86 | 2 |
| | High Channel, Ch.18 5320 MHz | 5.969 | 1.9 |
| | Low Channel, Ch.19 5500 MHz | 6.691 | 1.9 |
| | Mid Channel, Ch.23 5580 MHz | 7.37 | 1.9 |
| | High Channel, Ch.29 5700 MHz | 7.522 | 1.9 |
| 802.11(a) 18 Mbps | | | |
| | Low Channel, Ch.8 5180 MHz | 5.824 | 3.8 |
| | High Channel, Ch.14 5240 MHz | 7.192 | 3.7 |
| | Low Channel, Ch.15 5260 MHz | 6.661 | 3.7 |
| | High Channel, Ch.18 5320 MHz | 5.18 | 3.7 |
| | Low Channel, Ch.19 5500 MHz | 5.063 | 3.9 |
| | Mid Channel, Ch.23 5580 MHz | 6.4 | 3.7 |
| | High Channel, Ch.29 5700 MHz | 6.561 | 3.7 |

MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.8 5180 MHz | | | | | | |
|---|---------------------------|----------------------|-------------------------|---------|--|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | | |
| 6.737 | 1.9 | 8.6 | 11 | Pass | | |

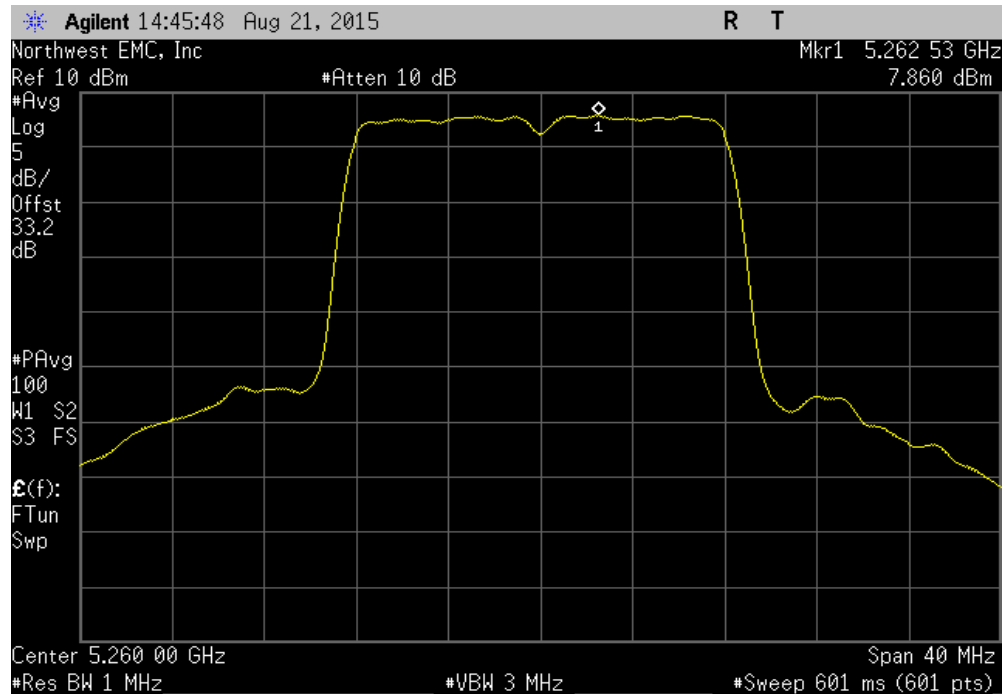


| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.14 5240 MHz | | | | | | |
|---|---------------------------|----------------------|-------------------------|---------|--|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | | |
| 7.953 | 1.9 | 9.8 | 11 | Pass | | |

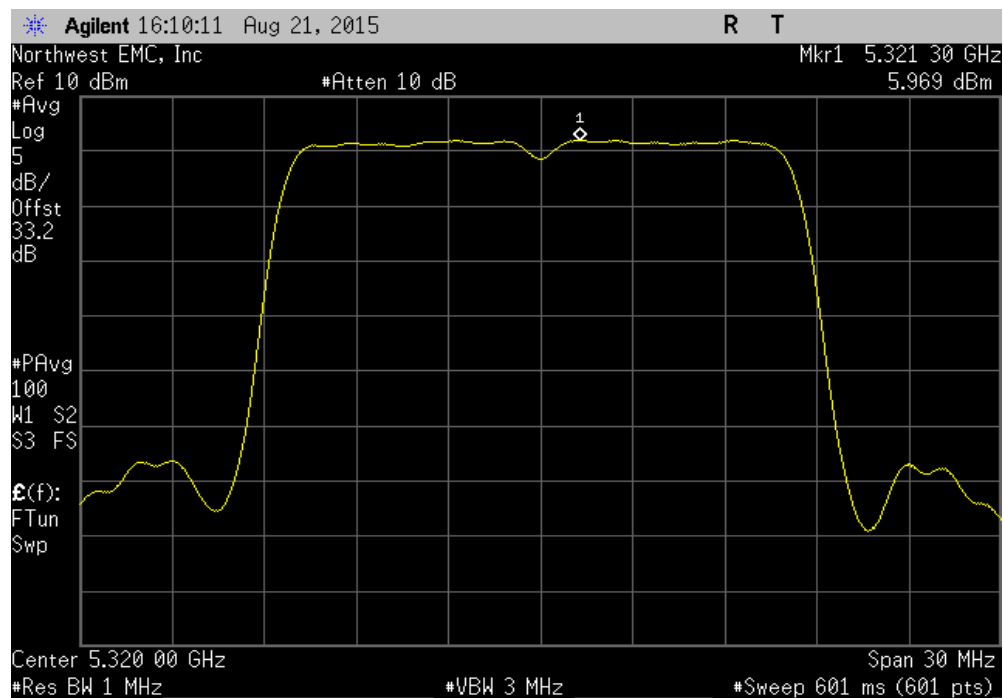


MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.15 5260 MHz | | | | | |
|--|---------------------------|----------------------|-------------------------|---------|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | |
| 7.86 | 2 | 9.9 | 11 | Pass | |

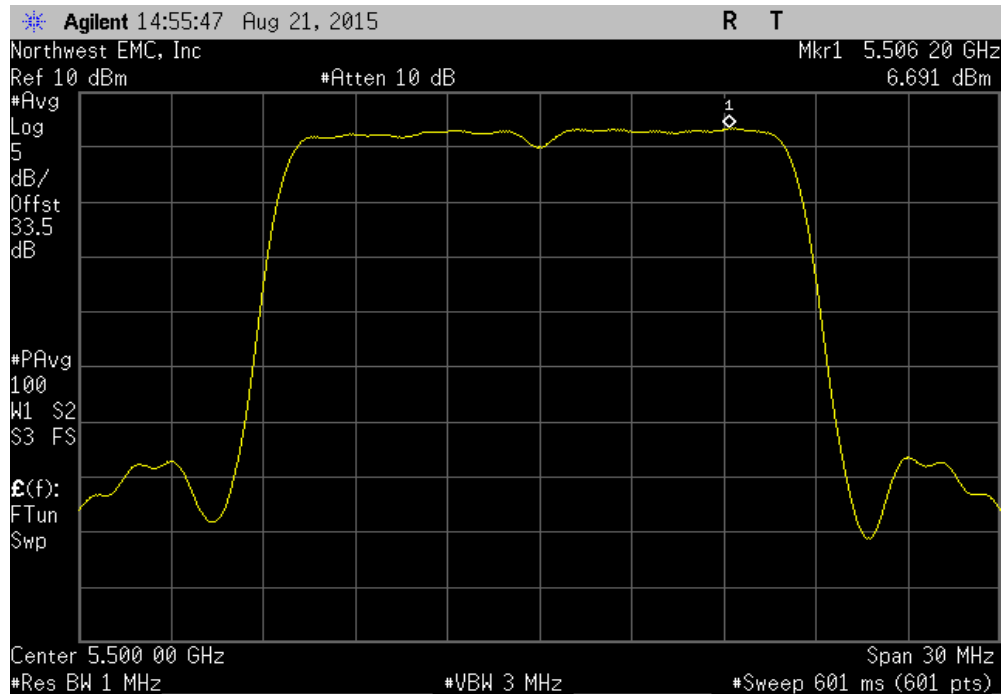


| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.18 5320 MHz | | | | | |
|---|---------------------------|----------------------|-------------------------|---------|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | |
| 5.969 | 1.9 | 7.8 | 11 | Pass | |

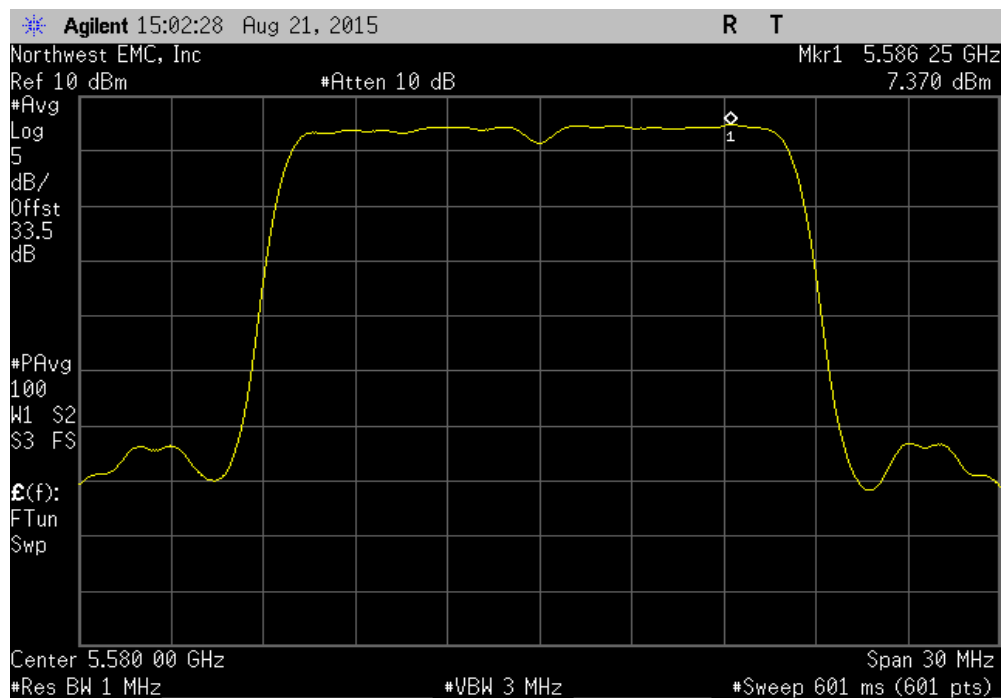


MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.19 5500 MHz | | | | | | |
|--|---------------------------|----------------------|-------------------------|---------|--|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | | |
| 6.691 | 1.9 | 8.6 | 11 | Pass | | |

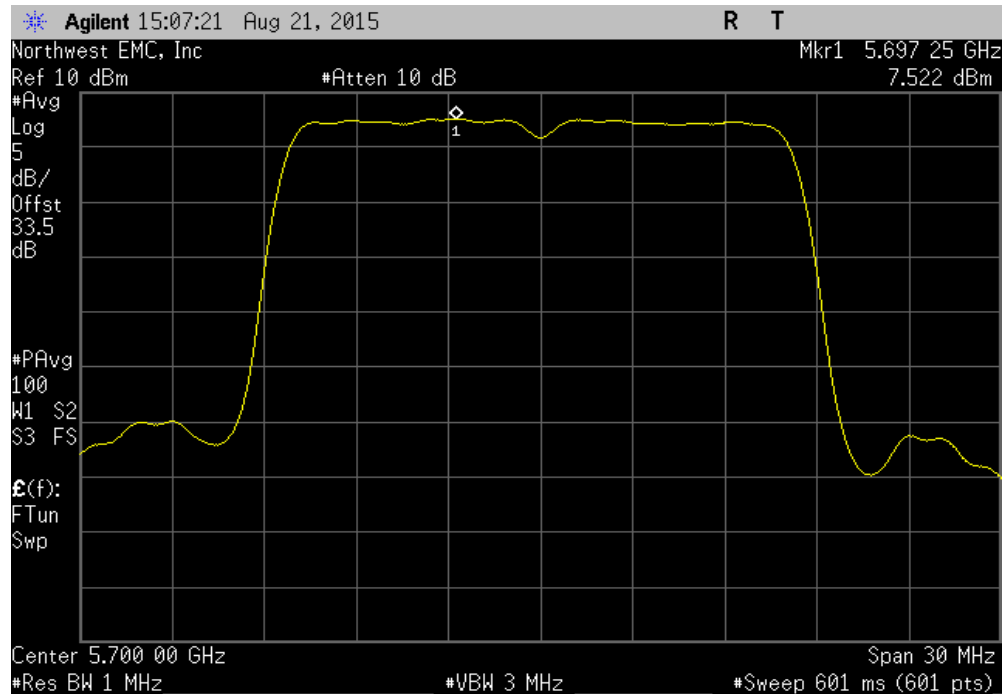


| Normal Conditions, 802.11(a) 6 Mbps, Mid Channel, Ch.23 5580 MHz | | | | | | |
|--|---------------------------|----------------------|-------------------------|---------|--|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | | |
| 7.37 | 1.9 | 9.3 | 11 | Pass | | |

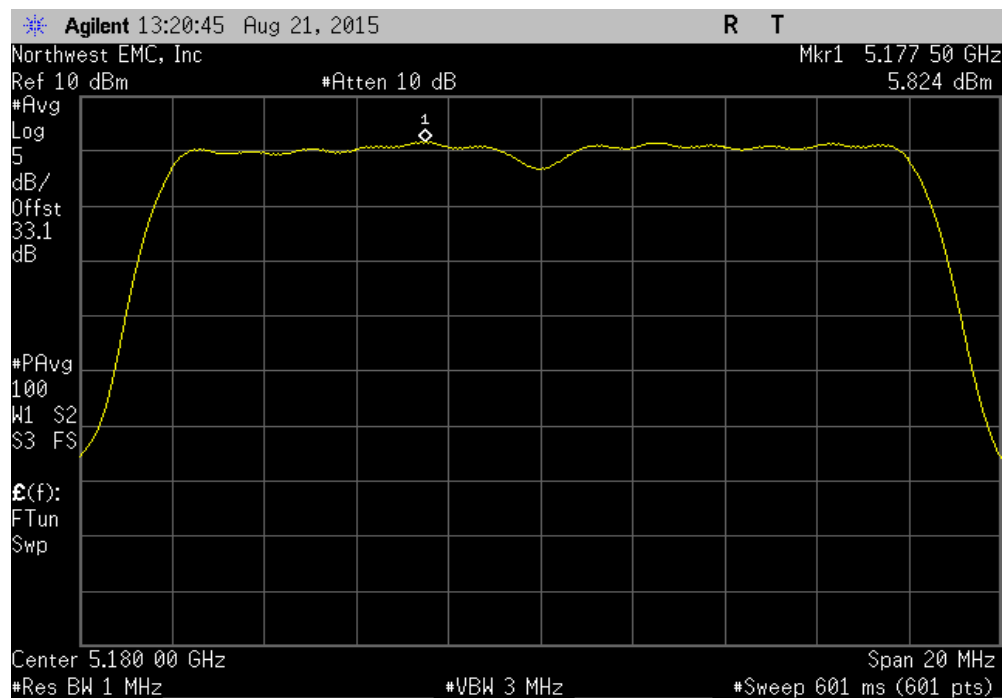


MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.29 5700 MHz | | | | | | |
|---|---------------------------|----------------------|-------------------------|---------|--|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | | |
| 7.522 | 1.9 | 9.4 | 11 | Pass | | |

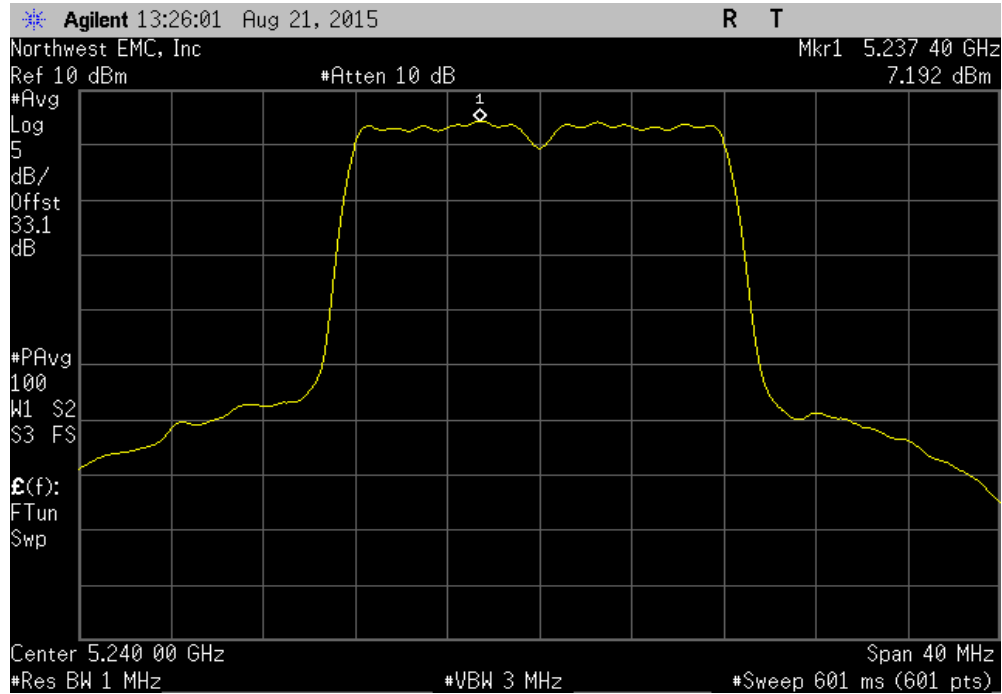


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.8 5180 MHz | | | | | | |
|--|---------------------------|----------------------|-------------------------|---------|--|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | | |
| 5.824 | 3.8 | 9.6 | 11 | Pass | | |

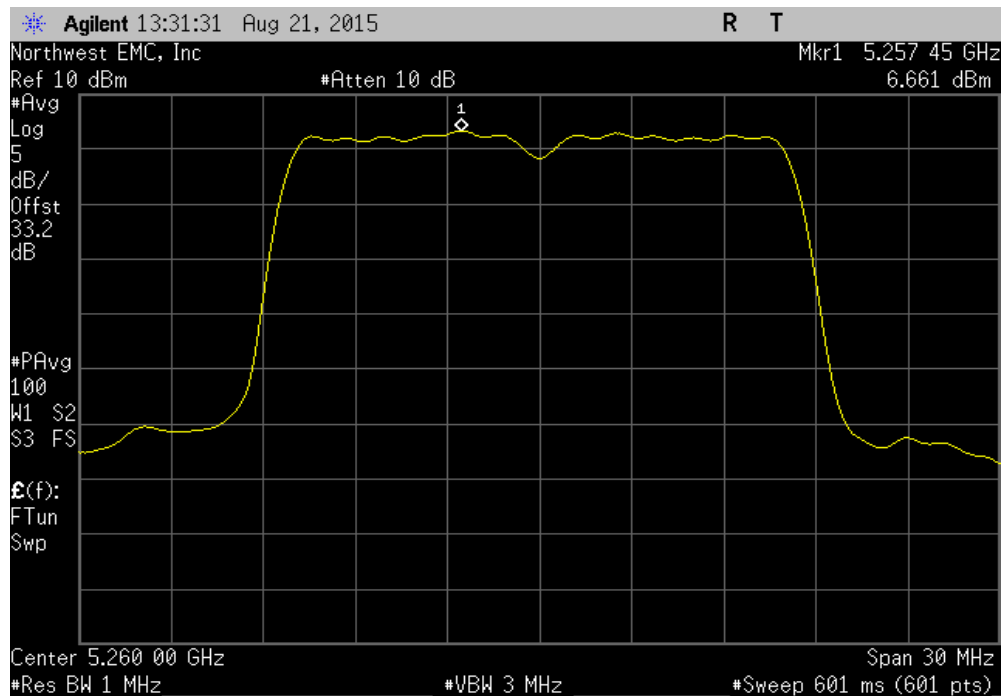


MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.14 5240 MHz | | | | | |
|--|---------------------------|----------------------|-------------------------|---------|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | |
| 7.192 | 3.7 | 10.9 | 11 | Pass | |

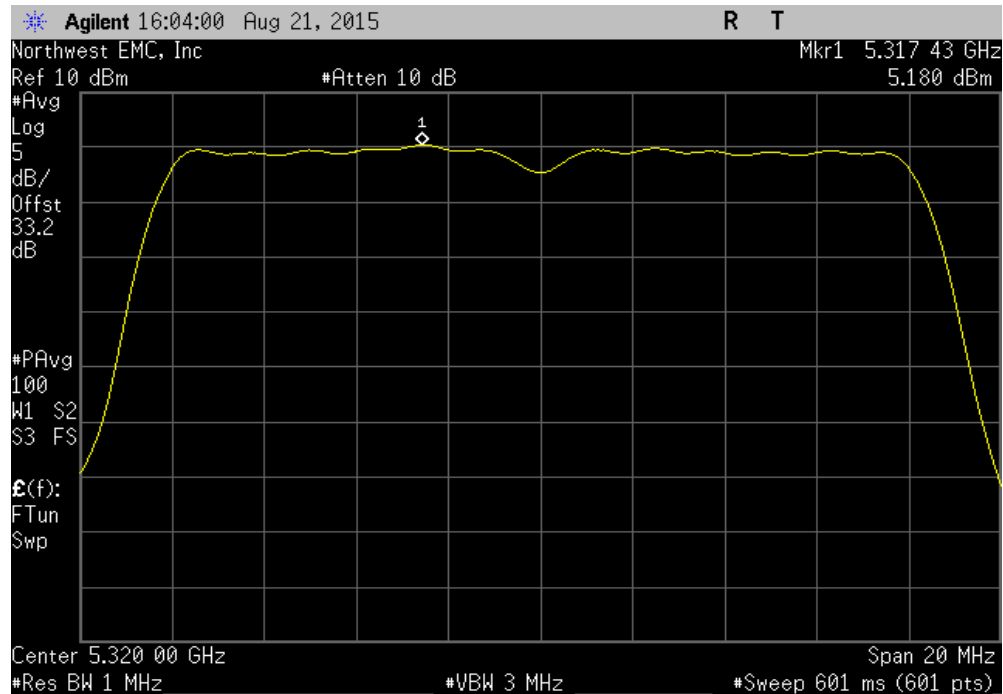


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.15 5260 MHz | | | | | |
|---|---------------------------|----------------------|-------------------------|---------|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | |
| 6.661 | 3.7 | 10.4 | 11 | Pass | |

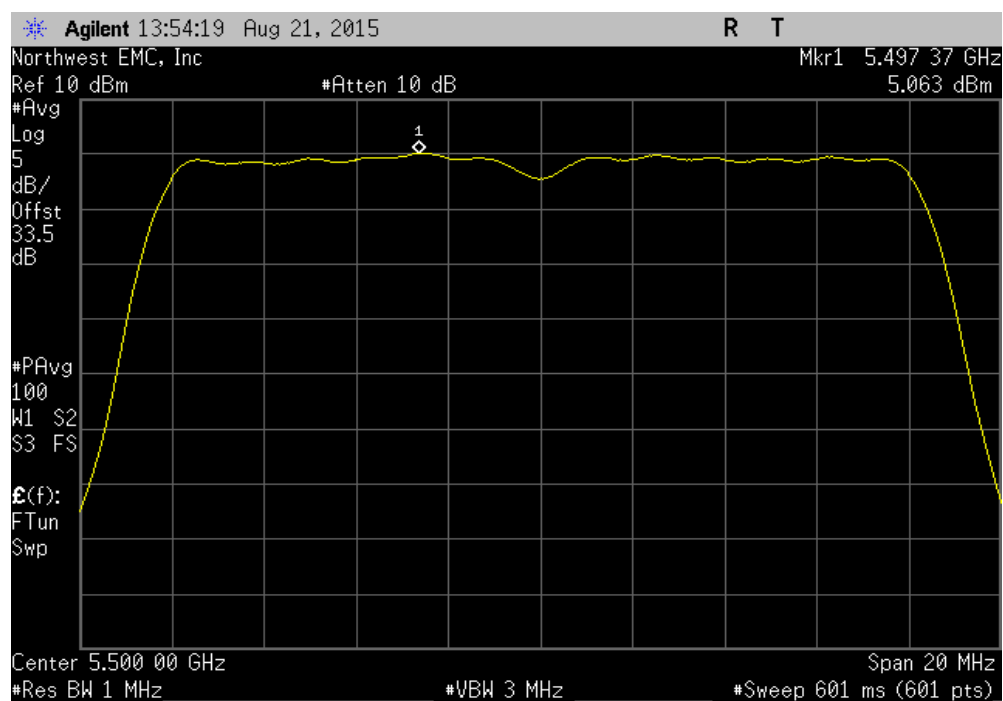


MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.18 5320 MHz | | | | | |
|--|---------------------------|----------------------|-------------------------|---------|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | |
| 5.18 | 3.7 | 8.9 | 11 | Pass | |

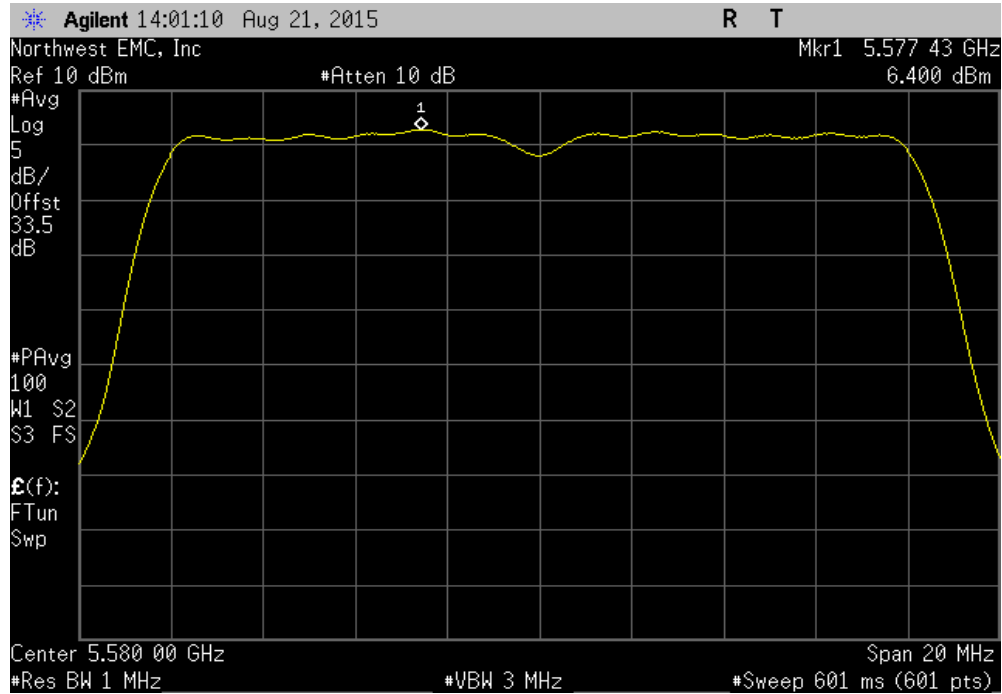


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.19 5500 MHz | | | | | |
|---|---------------------------|----------------------|-------------------------|---------|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | |
| 5.063 | 3.9 | 9 | 11 | Pass | |

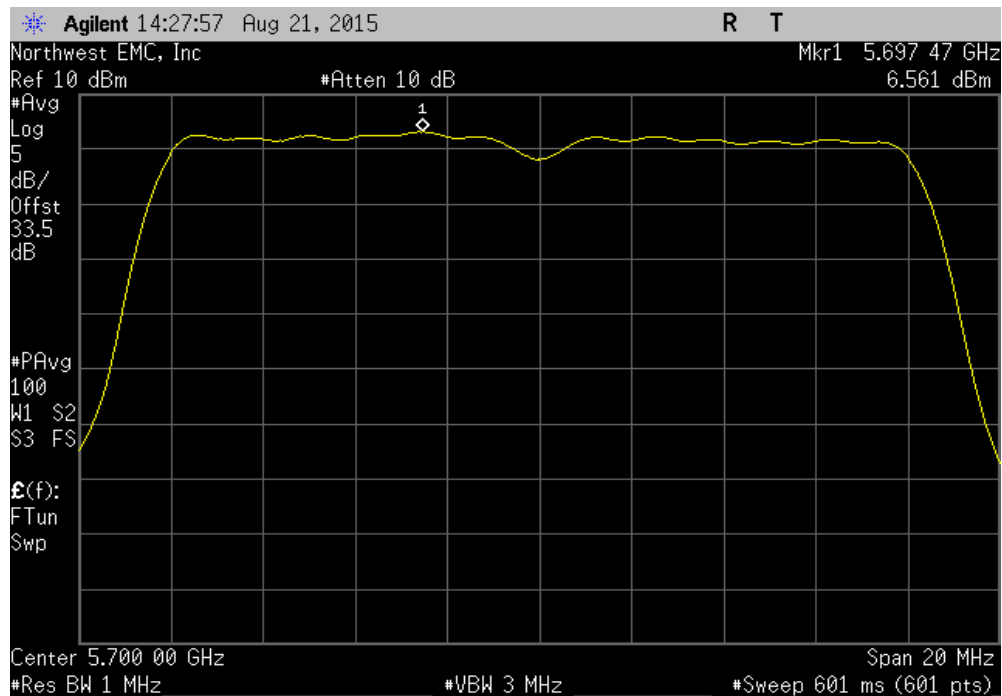


MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 18 Mbps, Mid Channel, Ch.23 5580 MHz | | | | | | |
|---|---------------------------|----------------------|-------------------------|---------|--|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | | |
| 6.4 | 3.7 | 10.1 | 11 | Pass | | |



| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.29 5700 MHz | | | | | | |
|--|---------------------------|----------------------|-------------------------|---------|--|--|
| Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | | |
| 6.561 | 3.7 | 10.3 | 11 | Pass | | |



MAXIMUM 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 (mo) |
|------------------------------|------------------|----------|-----|-----------|---------------|
| Generator - Signal | Keysight | N5182B | TFX | 4/16/2015 | 36 |
| Cable | ESM Cable Corp. | TT | EV1 | NCR | 0 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 7/14/2015 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4446A | AAQ | 3/10/2015 | 12 |


TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test.

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. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.

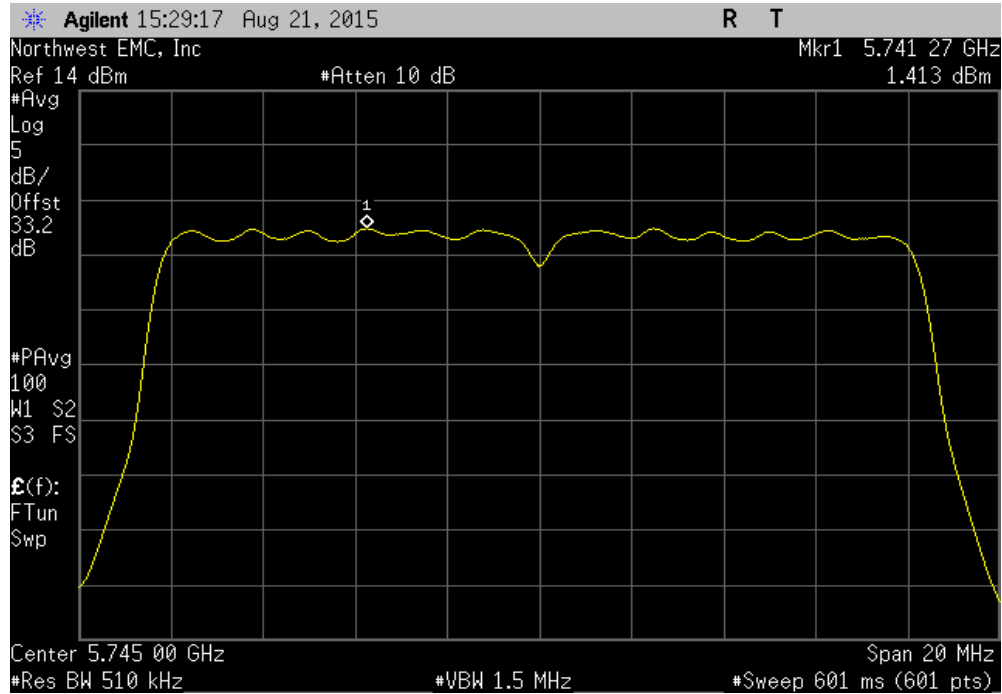
Method SA-2 Alternate (RMS detection with slow sweep across on and off times of the EUT transmission and use of a duty cycle correction factor) was used for this test.

MAXIMUM POWER SPECTRAL DENSITY

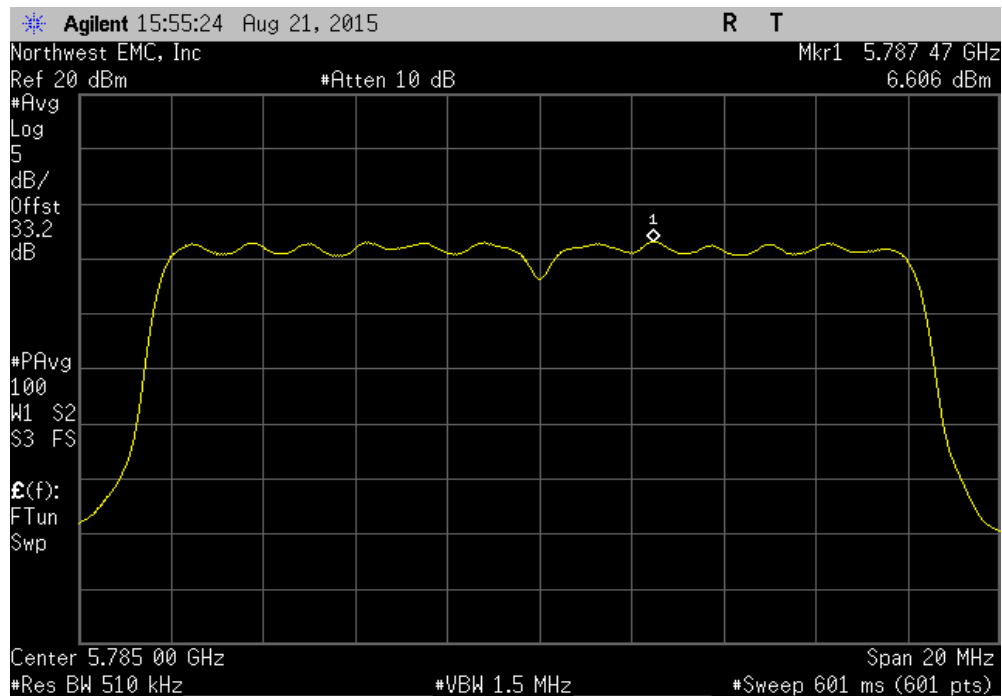
| | | | |
|--|-------------------------------|---|---------------------------|
| EUT: Athena4XD (extended distance) | | Work Order: FOCU0214 | |
| Serial Number: 02EA3CD00087 | | Date: 08/21/15 | |
| Customer: Summit Semiconductor LLC | | Temperature: 24.6°C | |
| Attendees: David Schilling | | Humidity: 41% | |
| Project: None | | Barometric Pres.: 1009.2 | |
| Tested by: Brandon Hobbs | | Power: 3.3 VDC Nominal | |
| | | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.407:2015 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| The EUT was not tested in ISOC mode. Based on transmission line length to all four identical antennas, a direct connect port was located on the worst case/shortest antenna path which was provided by the client. This test location was determined to be worst case by the client. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 1 | Signature  | |
| | | Power (dBm/MHz) | Duty Cycle Factor (dB) |
| | | Density (dBm/MHz) | Limit (dBm / Ref BW) |
| | | | Results |
| Normal Conditions | | | |
| 802.11(a) 6 Mbps | | | |
| | Low channel, Ch.30, 5745 MHz | 1.413 | 1.9 |
| | Mid channel, Ch.32, 5785 MHz | 6.606 | 1.9 |
| | High channel, Ch.34, 5825 MHz | 1.054 | 1.9 |
| 802.11(a) 18 Mbps | | | |
| | Low channel, Ch.30, 5745 MHz | 0.255 | 3.7 |
| | Mid channel, Ch.32, 5785 MHz | 6.443 | 3.8 |
| | High channel, Ch.34, 5825 MHz | 0.134 | 3.7 |

MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 6 Mbps, Low channel, Ch.30, 5745 MHz | | | | | | |
|---|--------------------|---------------------------|----------------------|-------------------------|---------|--|
| | Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | |
| | 1.413 | 1.9 | 3.3 | 30 | Pass | |

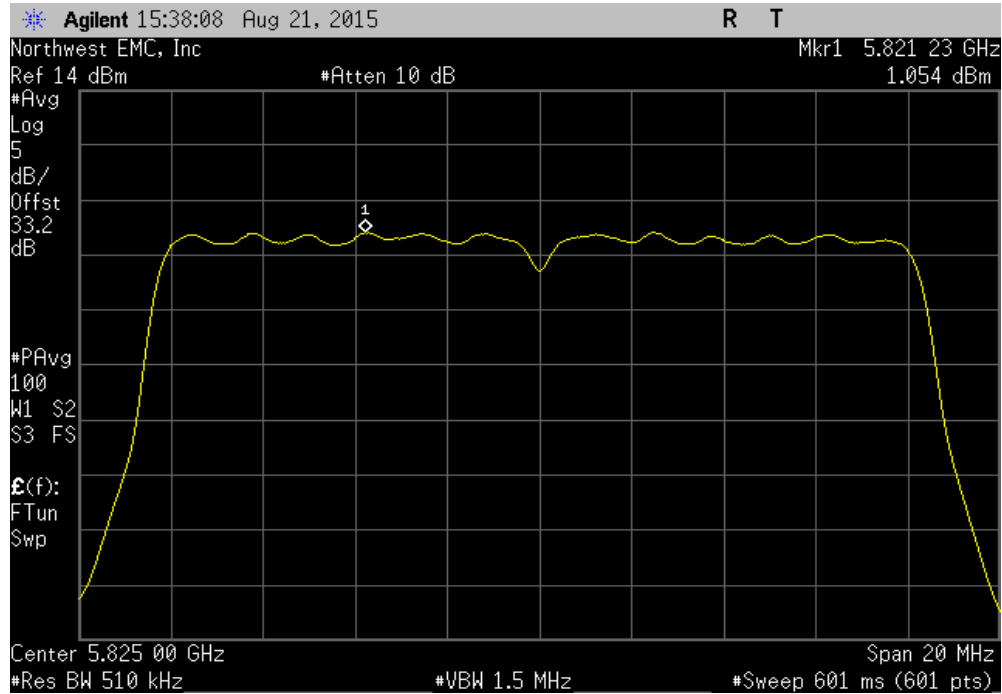


| Normal Conditions, 802.11(a) 6 Mbps, Mid channel, Ch.32, 5785 MHz | | | | | | |
|---|--------------------|---------------------------|----------------------|-------------------------|---------|--|
| | Power (dBm/MHz) | Duty Cycle Factor (dB) | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results | |
| | 6.606 | 1.9 | 8.5 | 30 | Pass | |

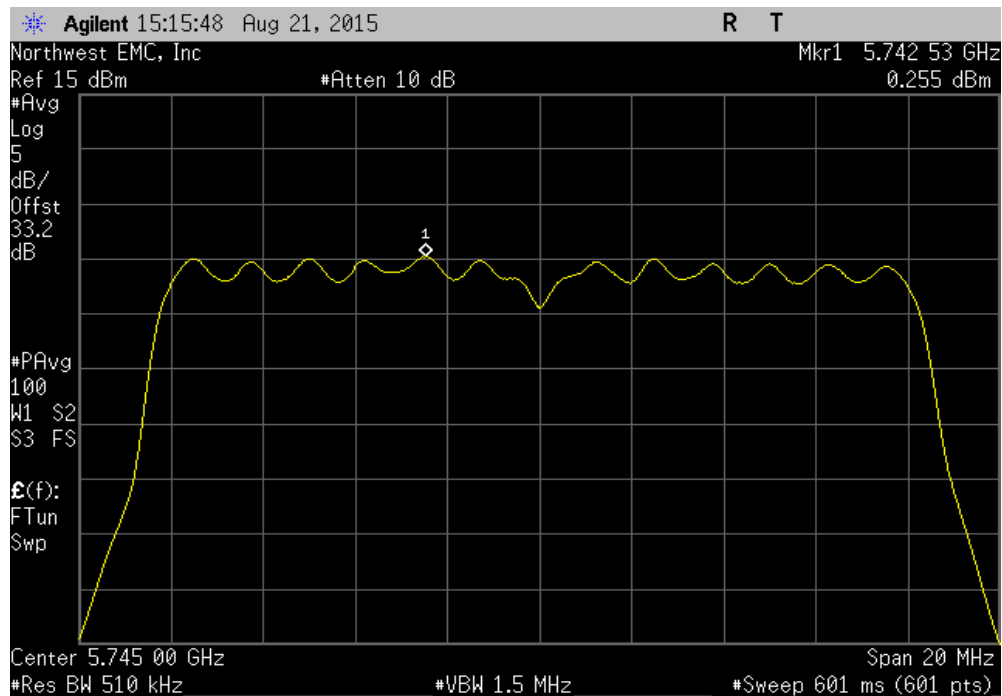


MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 6 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|--|--------------------|---------------------------|--|----------------------|-------------------------|---------|
| | Power (dBm/MHz) | Duty Cycle Factor (dB) | | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results |
| | 1.054 | 1.9 | | 2.9 | 30 | Pass |

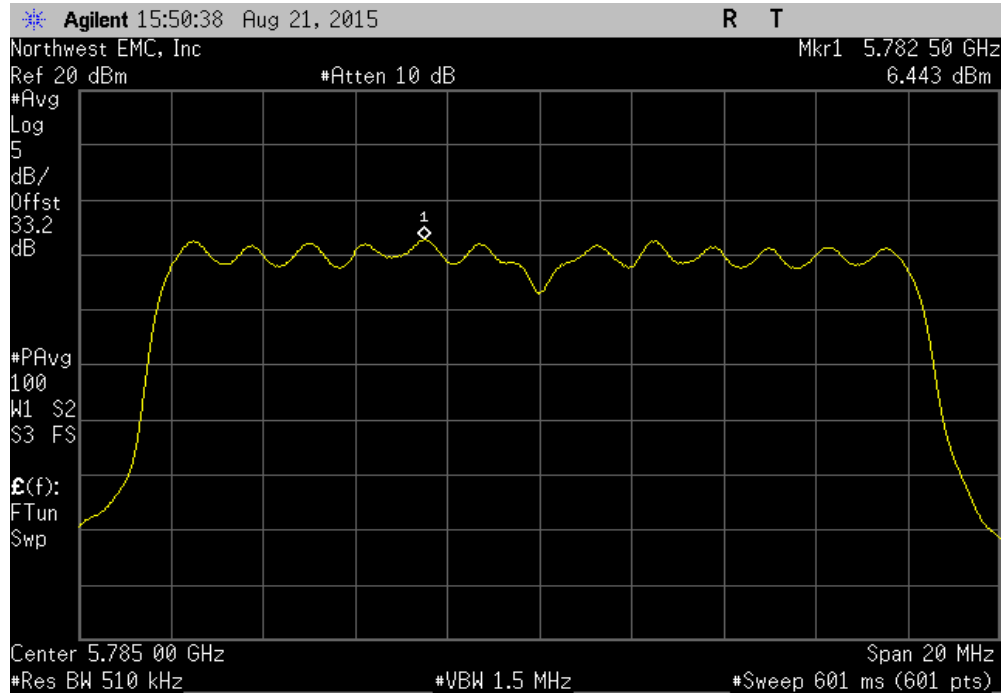


| Normal Conditions, 802.11(a) 18 Mbps, Low channel, Ch.30, 5745 MHz | | | | | | |
|--|--------------------|---------------------------|--|----------------------|-------------------------|---------|
| | Power (dBm/MHz) | Duty Cycle Factor (dB) | | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results |
| | 0.255 | 3.7 | | 4 | 30 | Pass |

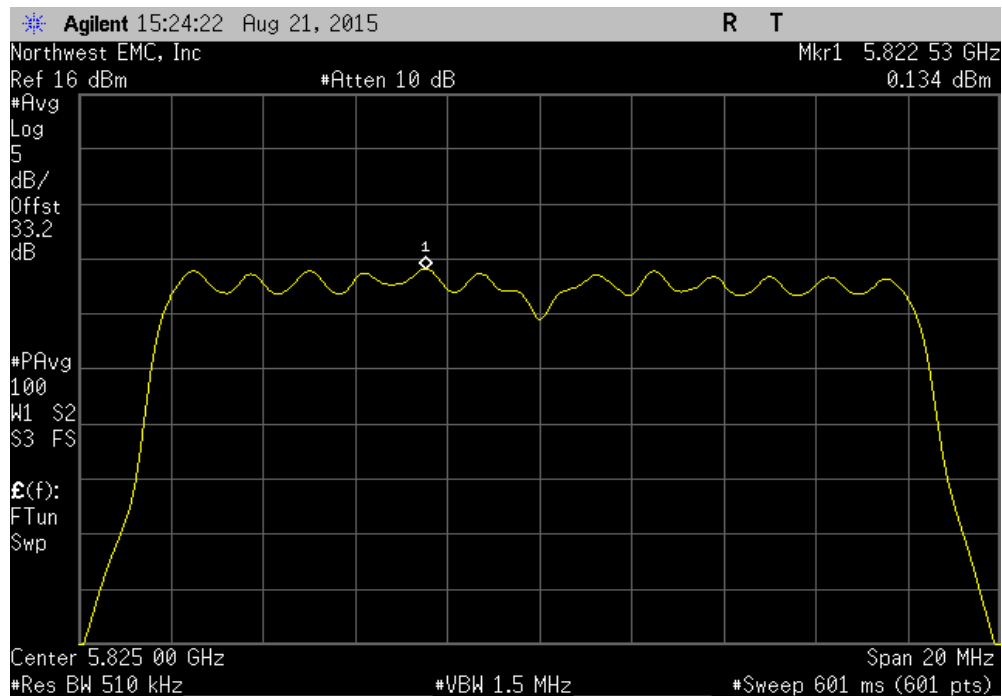


MAXIMUM POWER SPECTRAL DENSITY

| Normal Conditions, 802.11(a) 18 Mbps, Mid channel, Ch.32, 5785 MHz | | | | | | |
|--|--------------------|---------------------------|--|----------------------|-------------------------|---------|
| | Power (dBm/MHz) | Duty Cycle Factor (dB) | | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results |
| | 6.443 | 3.8 | | 10.2 | 30 | Pass |



| Normal Conditions, 802.11(a) 18 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|---|--------------------|---------------------------|--|----------------------|-------------------------|---------|
| | Power (dBm/MHz) | Duty Cycle Factor (dB) | | Density (dBm/MHz) | Limit (dBm / Ref BW) | Results |
| | 0.134 | 3.7 | | 3.9 | 30 | Pass |



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 (mo) |
|------------------------------|------------------|----------|-----|------------|---------------|
| Generator - Signal | Keysight | N5182B | TFX | 4/16/2015 | 36 |
| Cable | ESM Cable Corp. | TT | EV1 | NCR | 0 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 7/14/2015 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4446A | AAY | 10/27/2014 | 12 |

TEST DESCRIPTION


The transmission pulse duration (T) and Duty Cycle (x) were measured for each of the EUT operating modes per the FCC KDB 789033 D01 General UNII Test Procedures.

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.

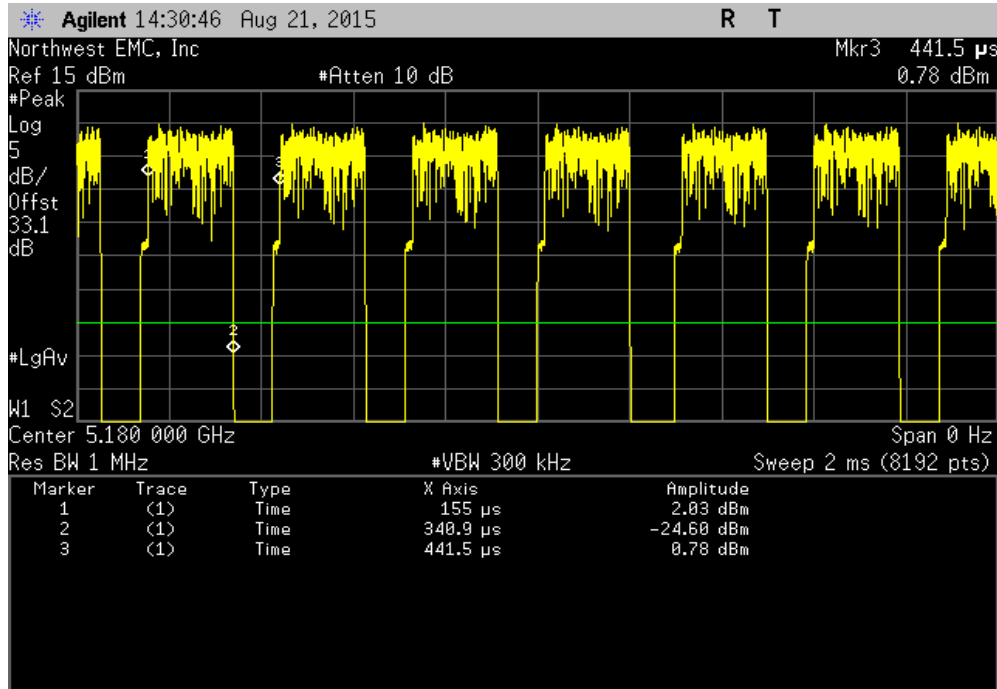
If the transmit duty cycle < 98 percent, burst gating was used during some of the other tests in this report only measure during the burst duration.

DUTY CYCLE

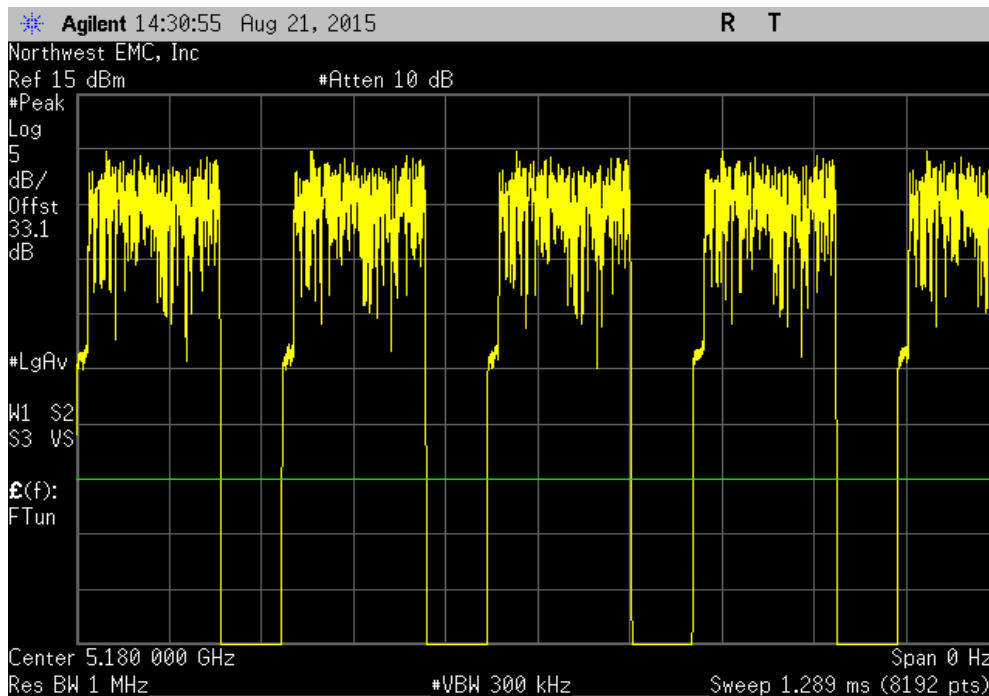
| | | | |
|--|------------------------------|---|-----------|
| EUT: Athena4XD (extended distance) | | Work Order: FOCU0214 | |
| Serial Number: 02EA3CD00087 | | Date: 08/21/15 | |
| Customer: Summit Semiconductor LLC | | Temperature: 24.6°C | |
| Attendees: David Schilling | | Humidity: 41% | |
| Project: None | | Barometric Pres.: 1009.2 | |
| Tested by: Brandon Hobbs | | Power: 3.3 VDC Nominal | |
| | | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.407:2015 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| The EUT was not tested in ISOC mode. Based on transmission line length to all four identical antennas, a direct connect port was located on the worst case/shortest antenna path which was provided by the client. This test location was determined to be worst case by the client. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 1 | Signature  | |
| | | Pulse Width | Period |
| | | Number of Pulses | Value (%) |
| | | Limit N/A (N/A) | Results |
| Normal Conditions | | | |
| 802.11(a) 6 Mbps | | | |
| | Low Channel, Ch.8 5180 MHz | 185.9 us | 286.5 us |
| | Low Channel, Ch.8 5180 MHz | N/A | N/A |
| | High Channel, Ch.14 5240 MHz | 186 us | 286.9 us |
| | High Channel, Ch.14 5240 MHz | N/A | N/A |
| | Low Channel, Ch.15 5260 MHz | 186.1 us | 296.7 us |
| | Low Channel, Ch.15 5260 MHz | N/A | N/A |
| | High Channel, Ch.18 5320 MHz | 186.4 us | 287.4 us |
| | High Channel, Ch.18 5320 MHz | N/A | N/A |
| | Low Channel, Ch.19 5500 MHz | 185.8 us | 287.2 us |
| | Low Channel, Ch.19 5500 MHz | N/A | N/A |
| | Mid Channel, Ch.23 5580 MHz | 186.1 us | 287.4 us |
| | Mid Channel, Ch.23 5580 MHz | N/A | N/A |
| | High Channel, Ch.29 5700 MHz | 185.8 us | 287.2 us |
| | High Channel, Ch.29 5700 MHz | N/A | N/A |
| 802.11(a) 18 Mbps | | | |
| | Low Channel, Ch.8 5180 MHz | 73.7 us | 175.3 us |
| | Low Channel, Ch.8 5180 MHz | N/A | N/A |
| | High Channel, Ch.14 5240 MHz | 74 us | 175.3 us |
| | High Channel, Ch.14 5240 MHz | N/A | N/A |
| | Low Channel, Ch.15 5260 MHz | 74 us | 175.1 us |
| | Low Channel, Ch.15 5260 MHz | N/A | N/A |
| | High Channel, Ch.18 5320 MHz | 74.2 us | 175.3 us |
| | High Channel, Ch.18 5320 MHz | N/A | N/A |
| | Low Channel, Ch.19 5500 MHz | 73.7 us | 181.9 us |
| | Low Channel, Ch.19 5500 MHz | N/A | N/A |
| | Mid Channel, Ch.23 5580 MHz | 74 us | 174.9 us |
| | Mid Channel, Ch.23 5580 MHz | N/A | N/A |
| | High Channel, Ch.29 5700 MHz | 74 us | 175.3 us |
| | High Channel, Ch.29 5700 MHz | N/A | N/A |

DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.8 5180 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 185.9 us | 286.5 us | 1 | 64.9 | N/A | N/A |

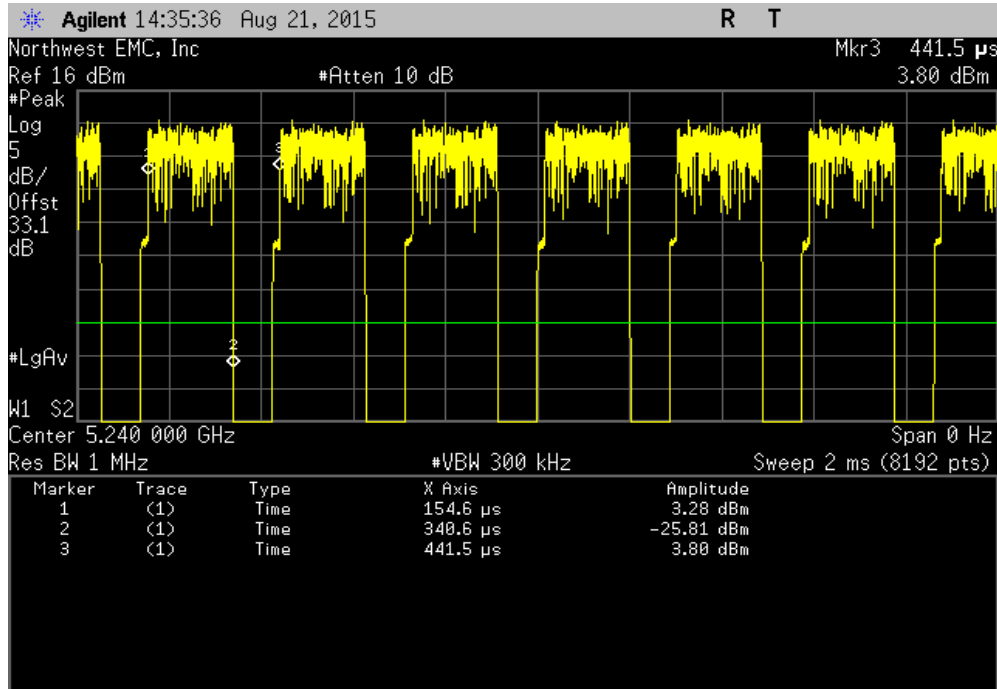


| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.8 5180 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

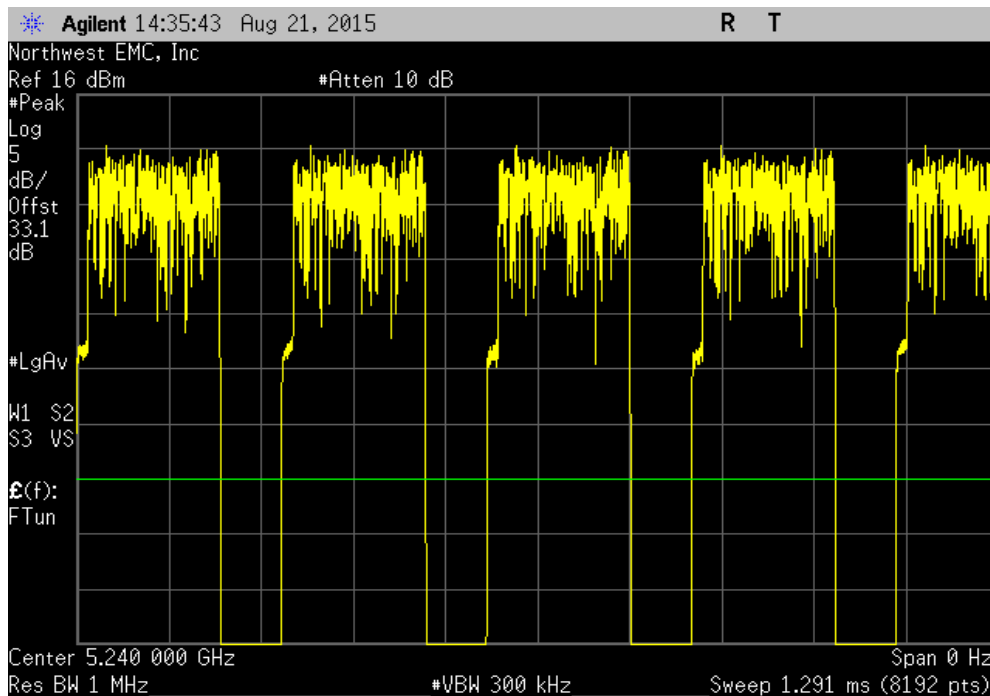


DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.14 5240 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 186 us | 286.9 us | 1 | 64.8 | N/A | N/A |

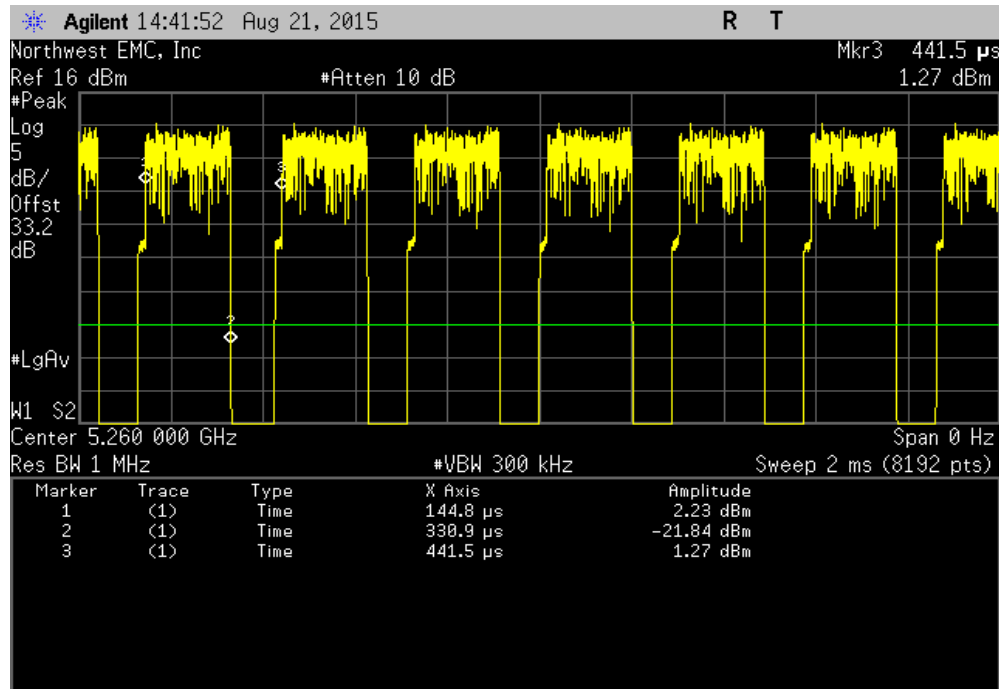


| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.14 5240 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

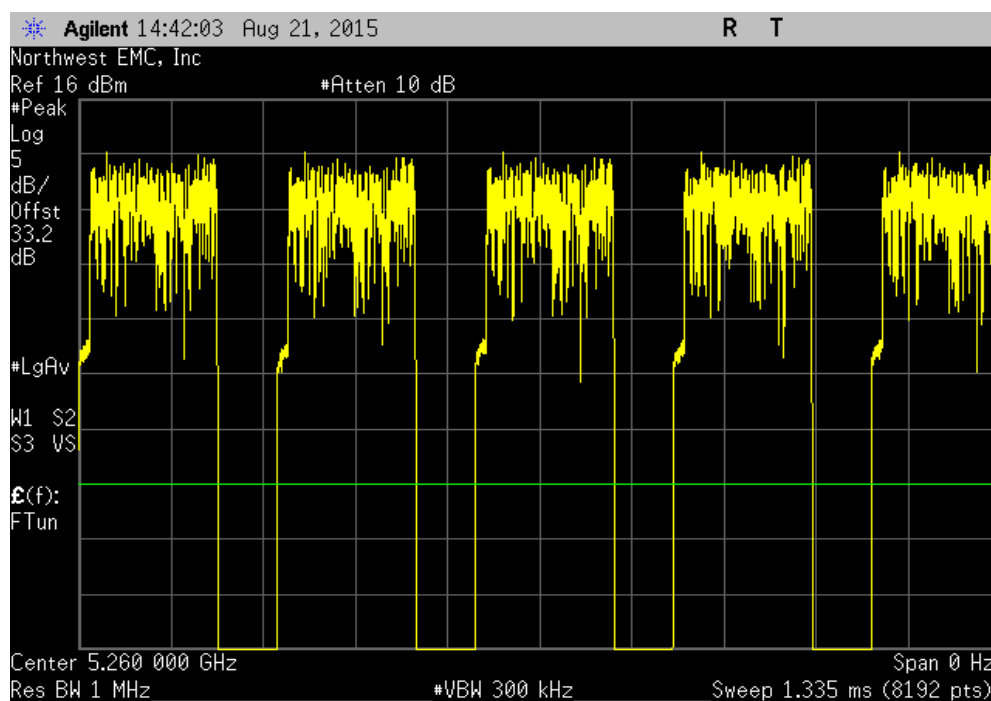


DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.15 5260 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 186.1 us | 296.7 us | 1 | 62.7 | N/A | N/A |

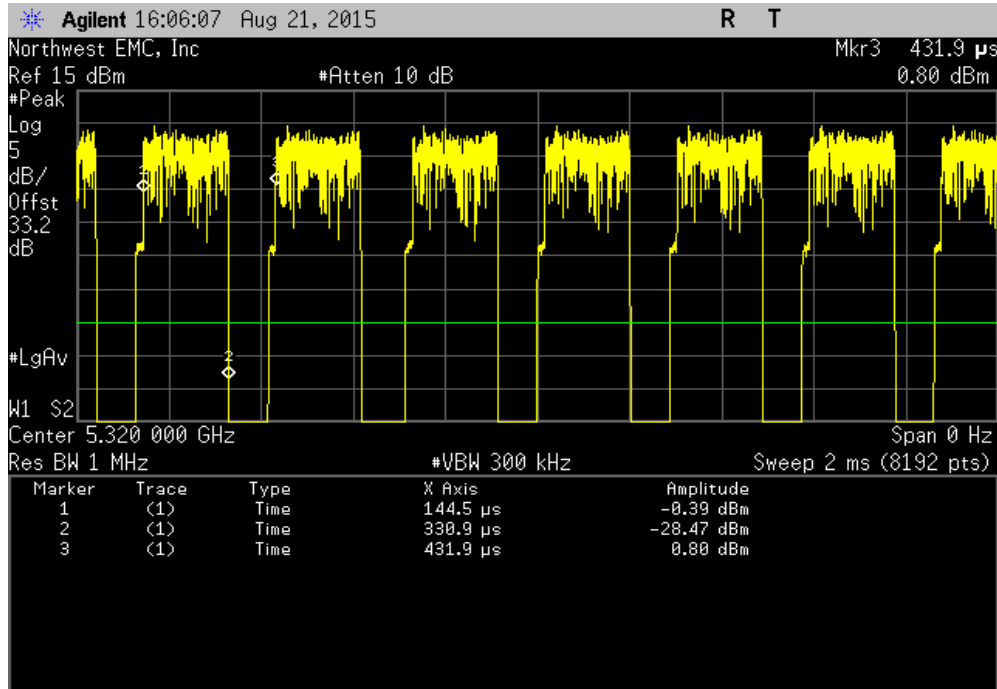


| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.15 5260 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

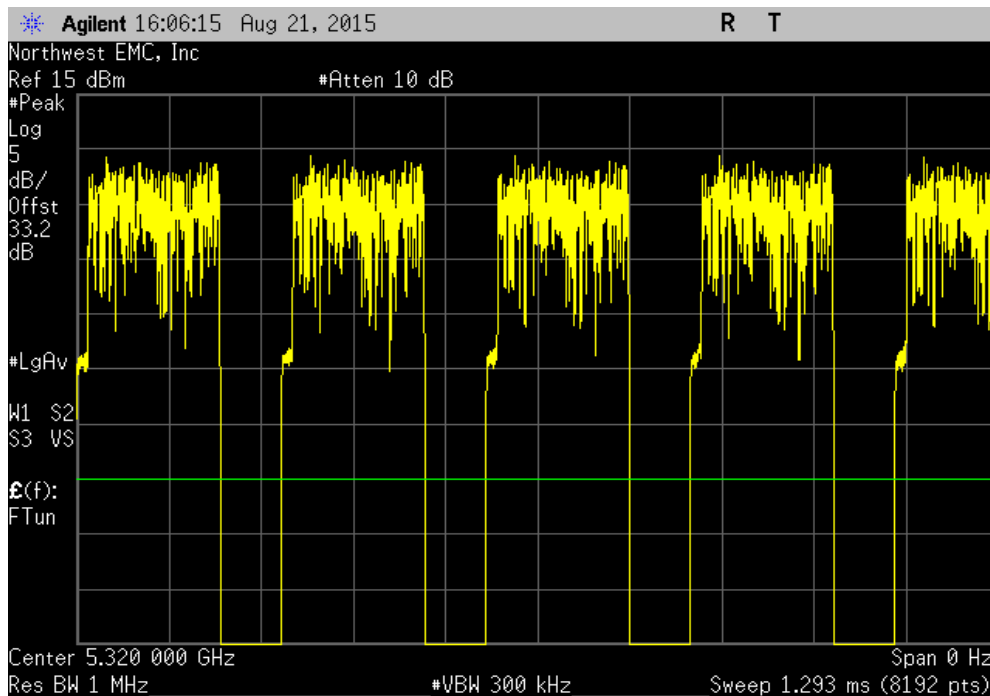


DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.18 5320 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 186.4 us | 287.4 us | 1 | 64.9 | N/A | N/A |

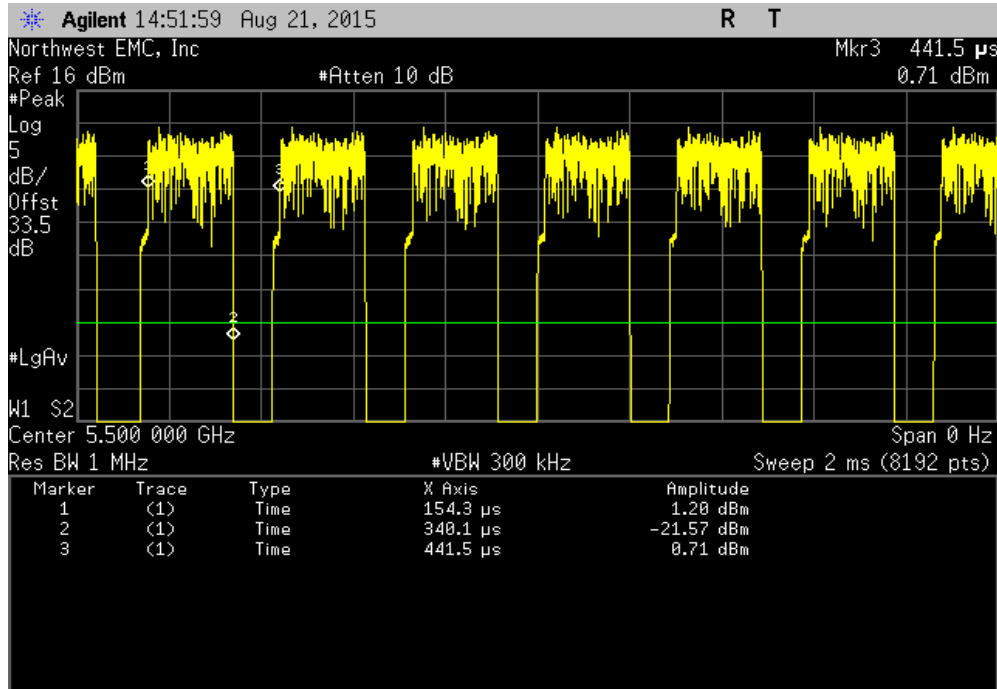


| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.18 5320 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

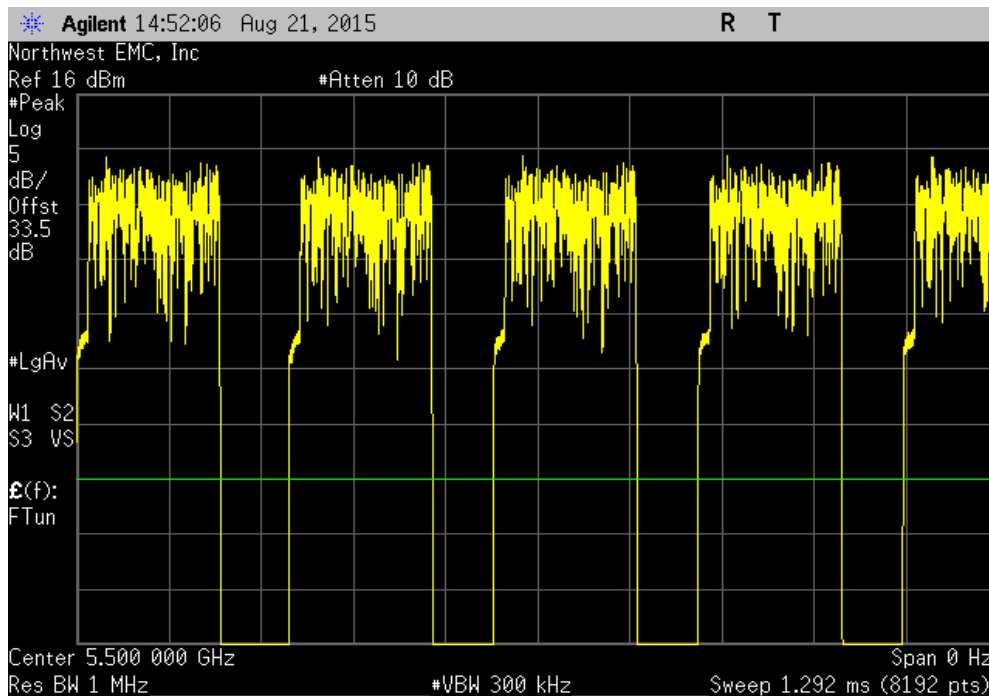


DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.19 5500 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 185.8 us | 287.2 us | 1 | 64.7 | N/A | N/A |

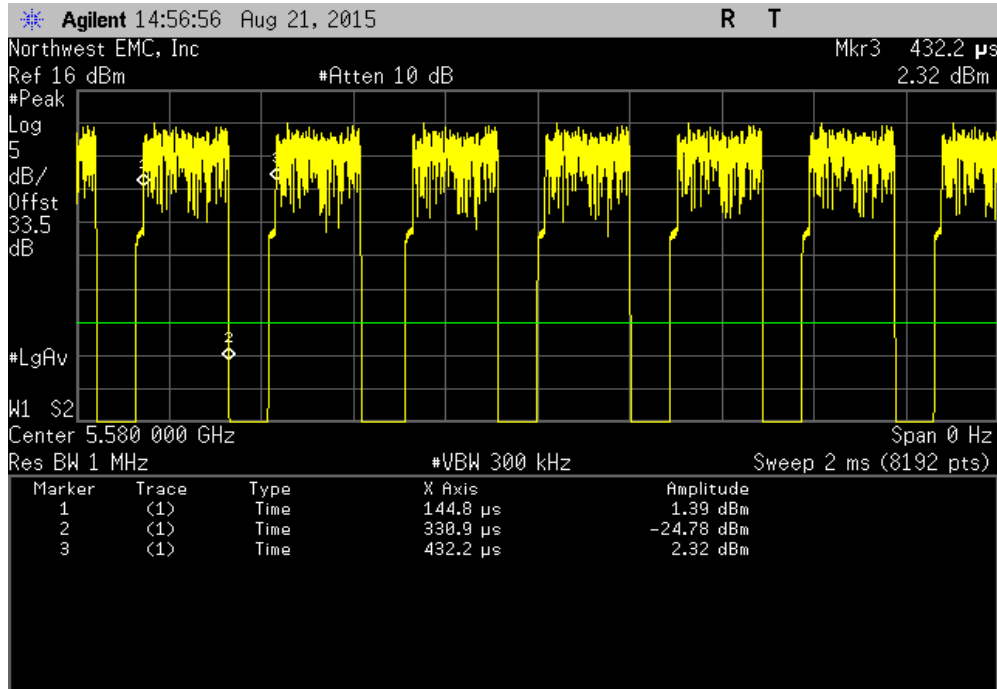


| Normal Conditions, 802.11(a) 6 Mbps, Low Channel, Ch.19 5500 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

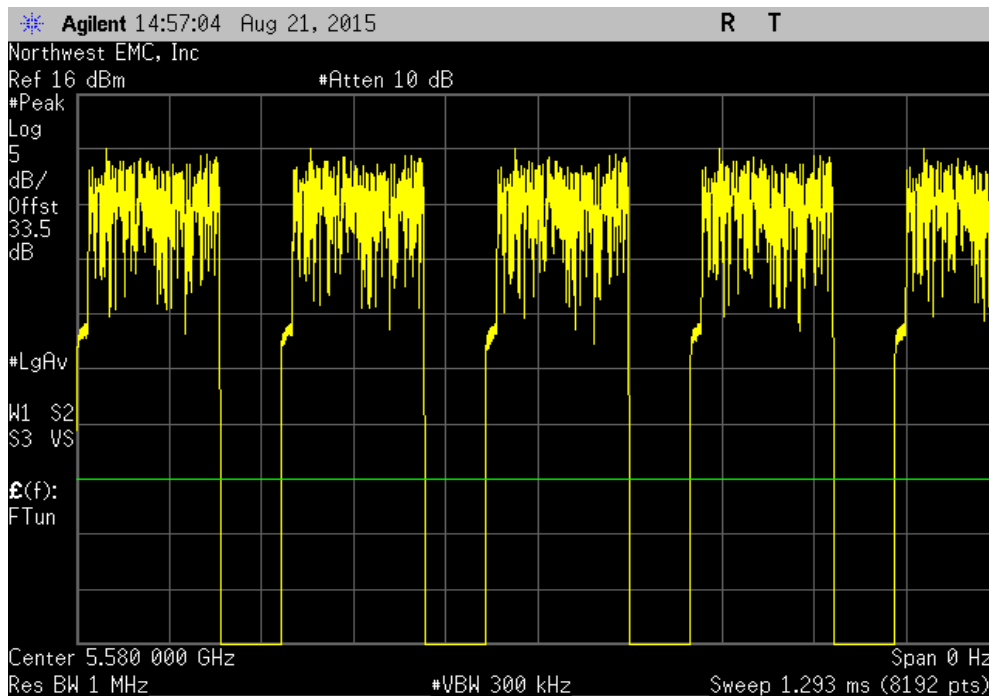


DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, Mid Channel, Ch.23 5580 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 186.1 us | 287.4 us | 1 | 64.8 | N/A | N/A |

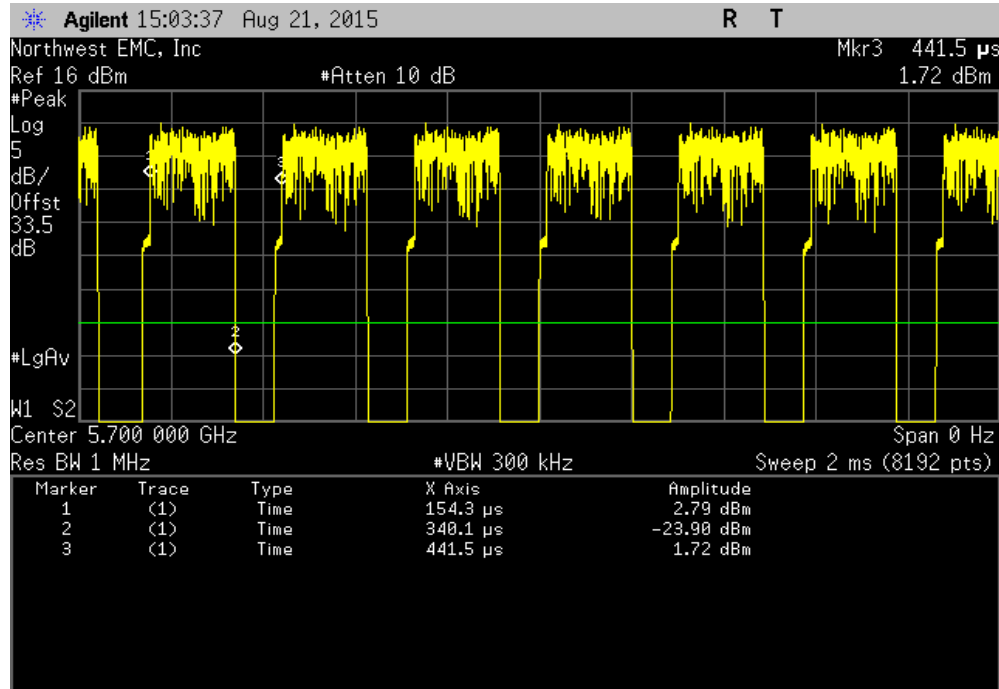


| Normal Conditions, 802.11(a) 6 Mbps, Mid Channel, Ch.23 5580 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

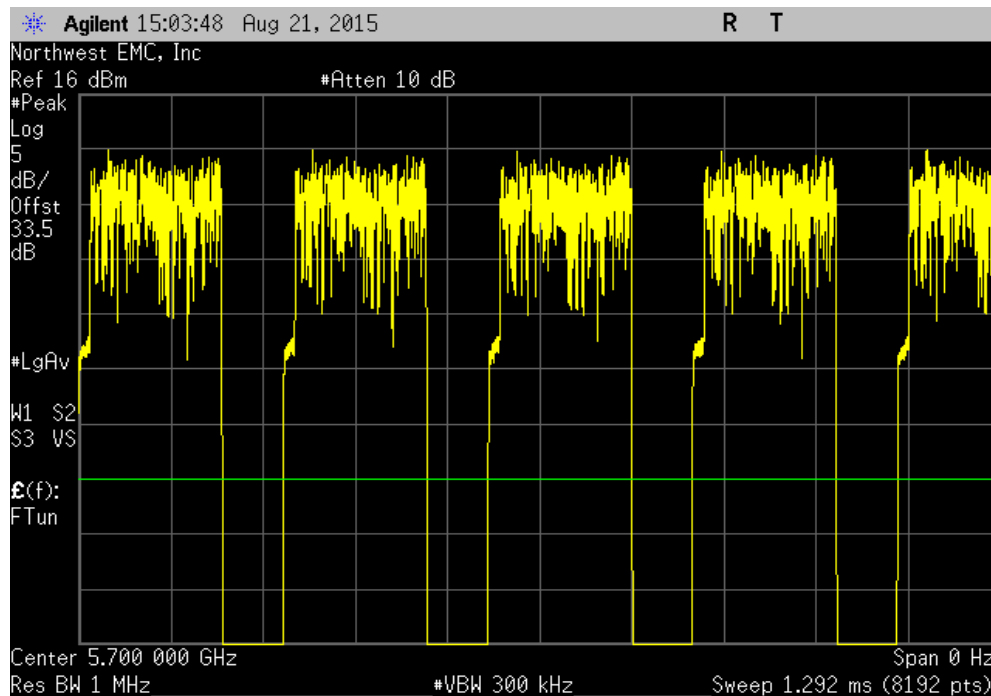


DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.29 5700 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 185.8 us | 287.2 us | 1 | 64.7 | N/A | N/A |

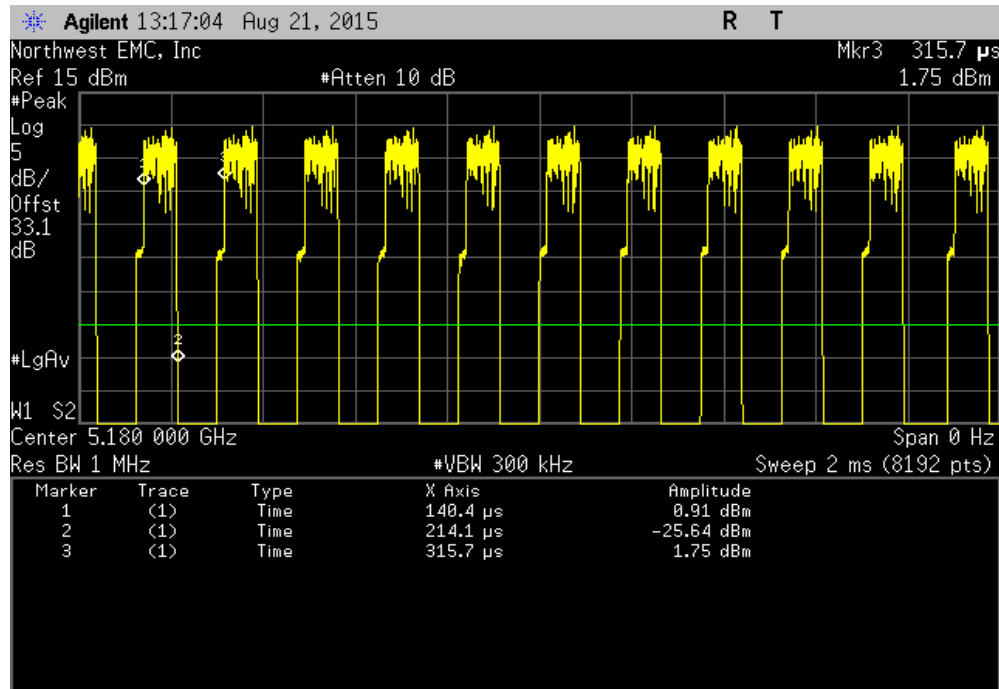


| Normal Conditions, 802.11(a) 6 Mbps, High Channel, Ch.29 5700 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

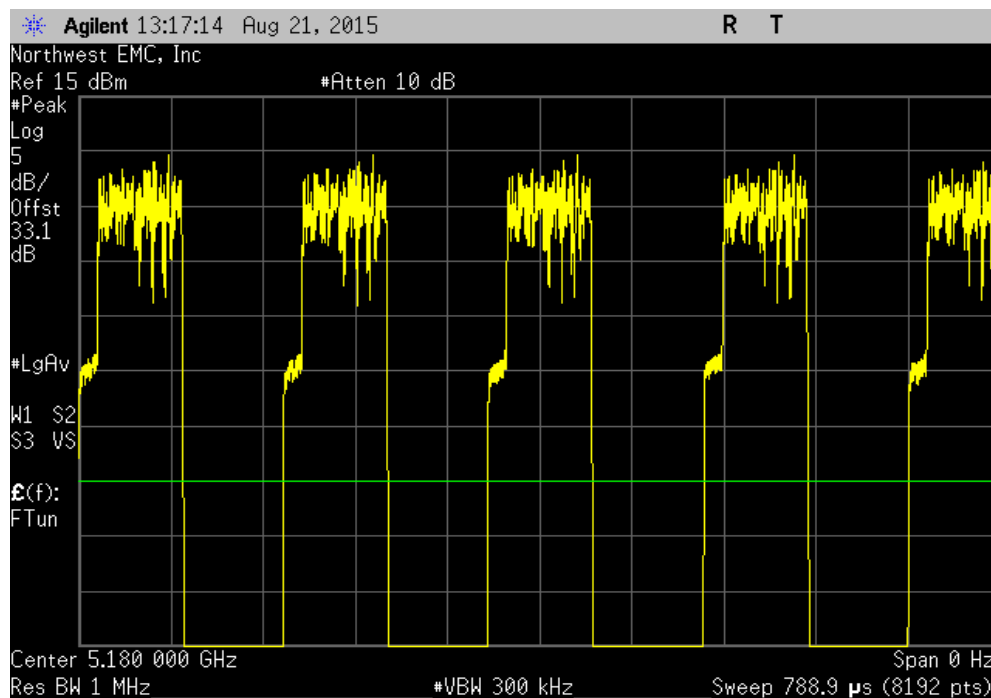


DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.8 5180 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 73.7 us | 175.3 us | 1 | 42 | N/A | N/A |

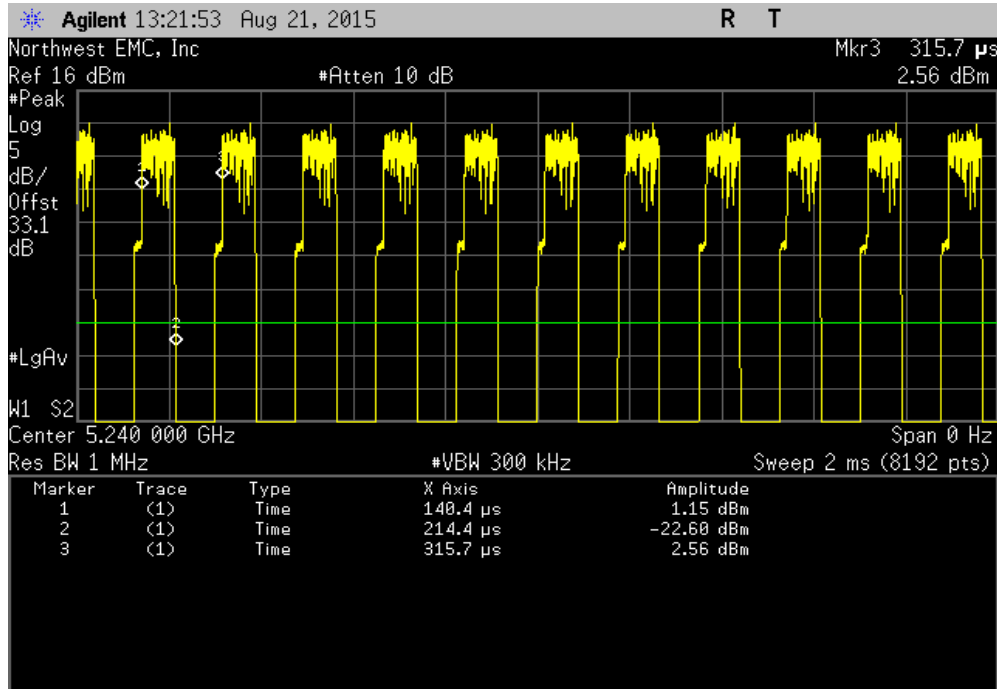


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.8 5180 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

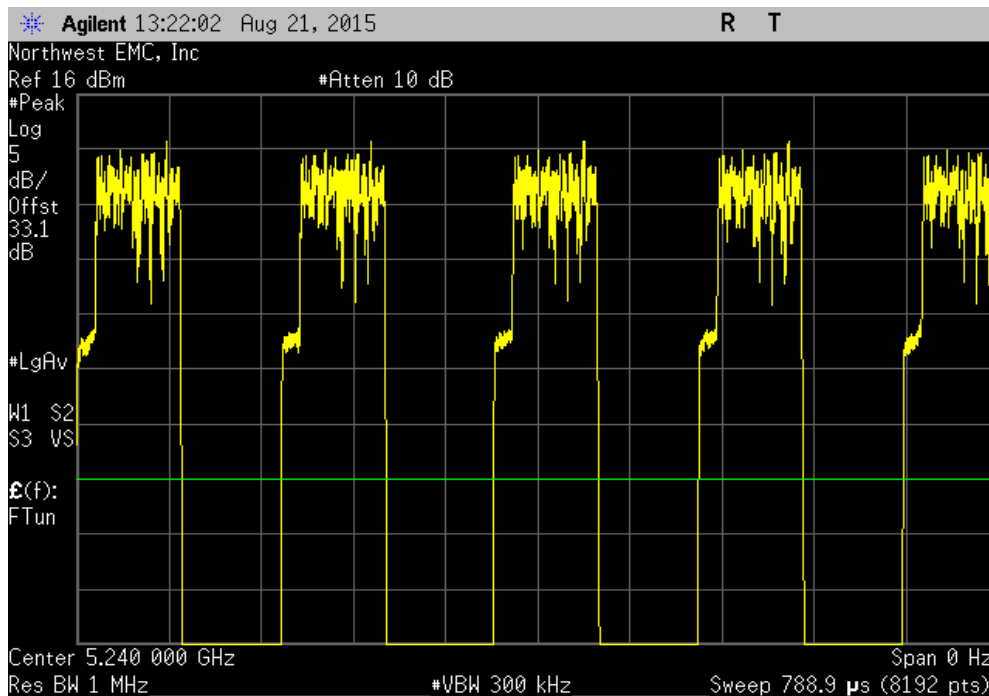


DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.14 5240 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 74 us | 175.3 us | 1 | 42.2 | N/A | N/A |

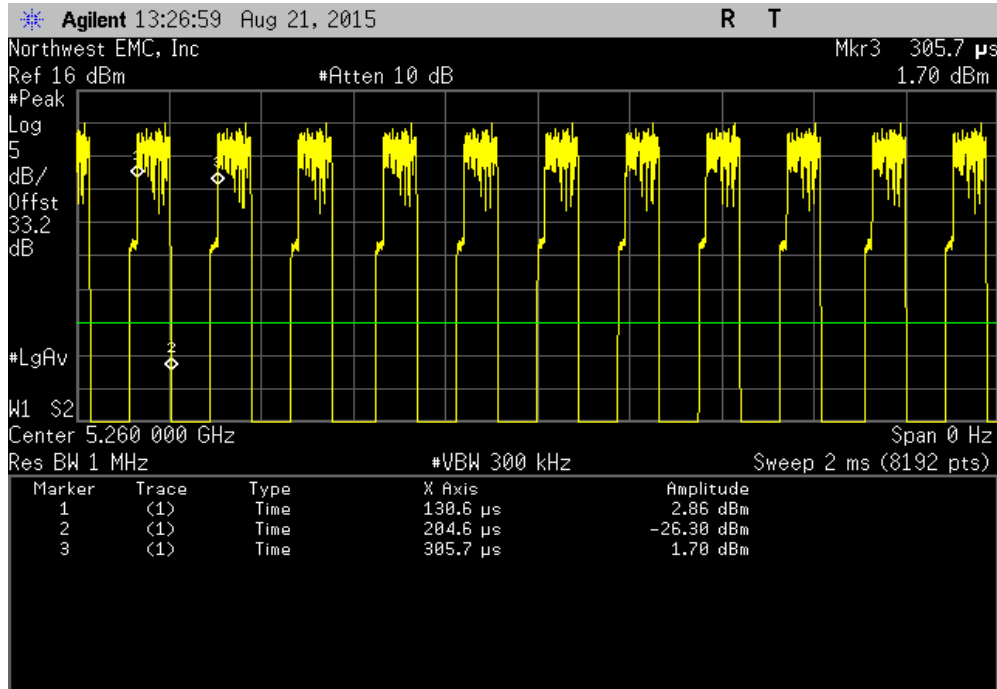


| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.14 5240 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

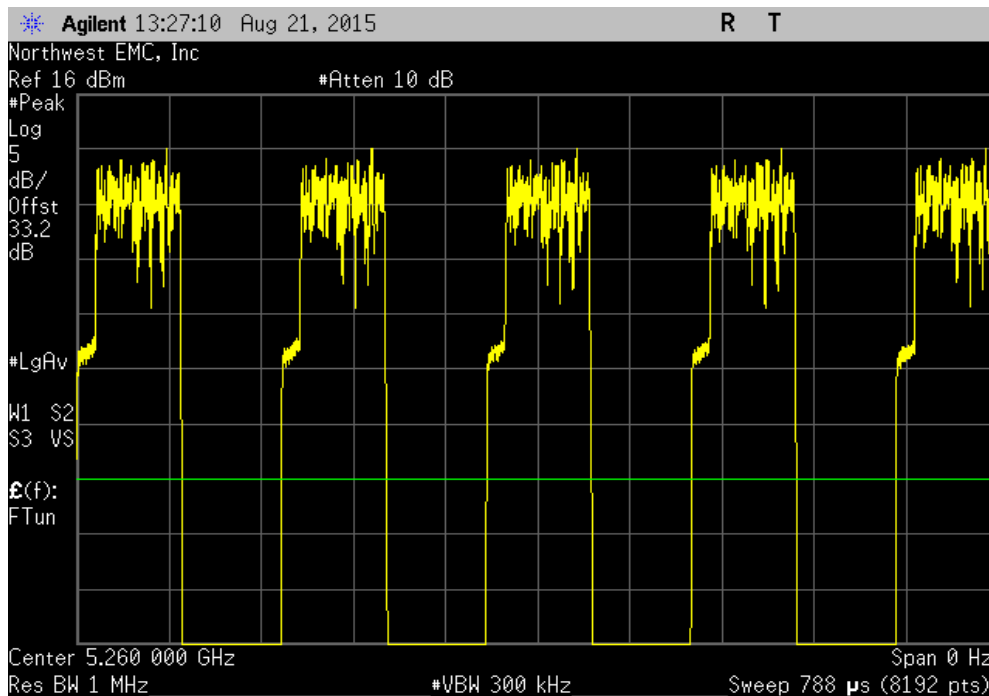


DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.15 5260 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 74 us | 175.1 us | 1 | 42.3 | N/A | N/A |

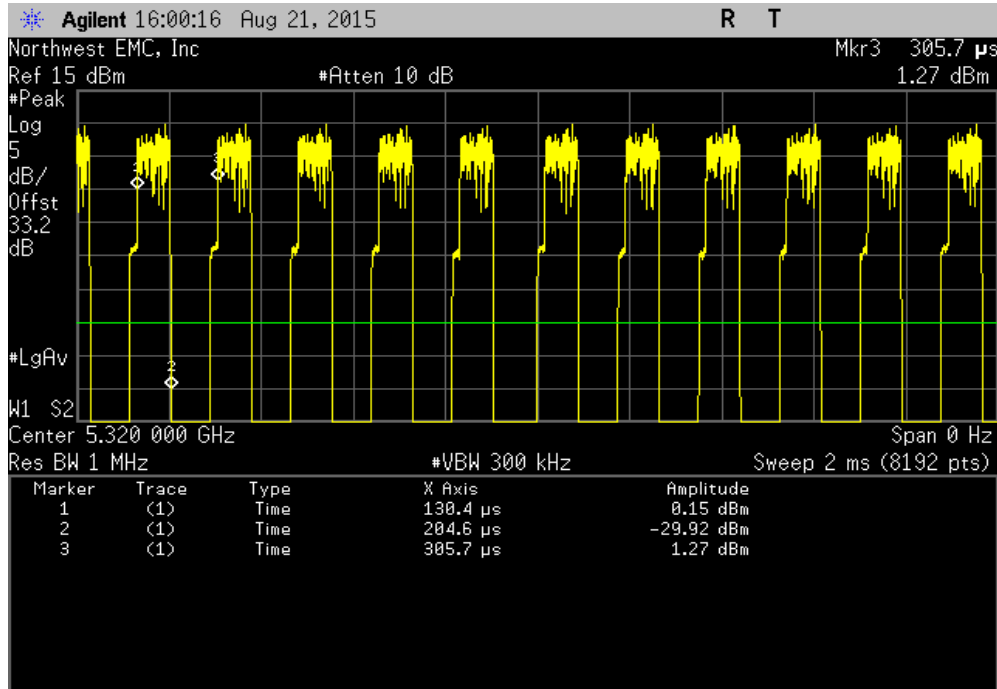


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.15 5260 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

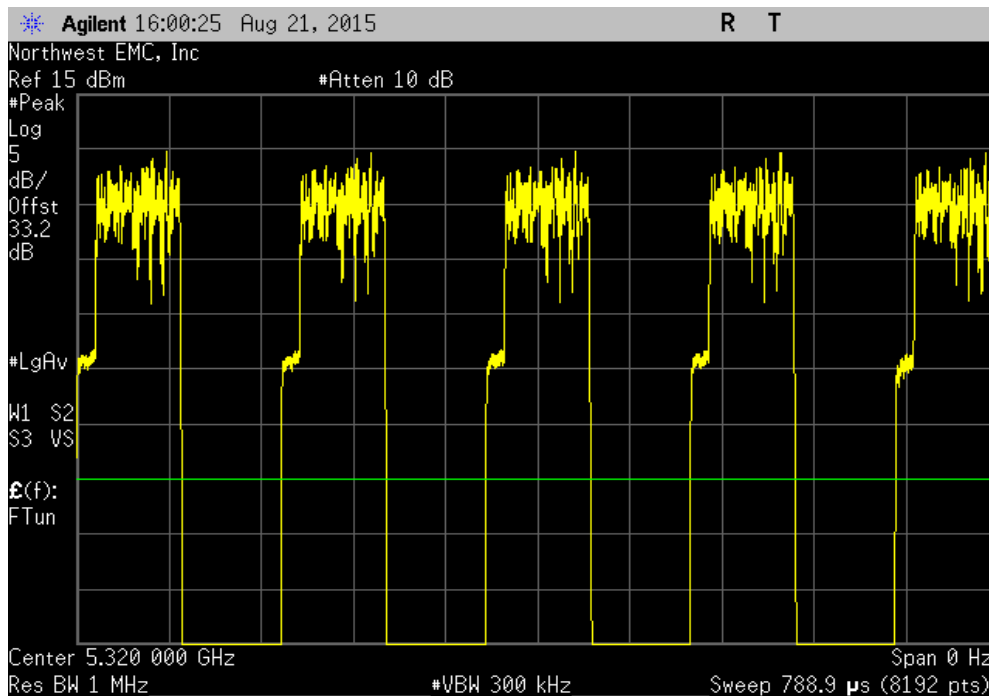


DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.18 5320 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 74.2 us | 175.3 us | 1 | 42.3 | N/A | N/A |

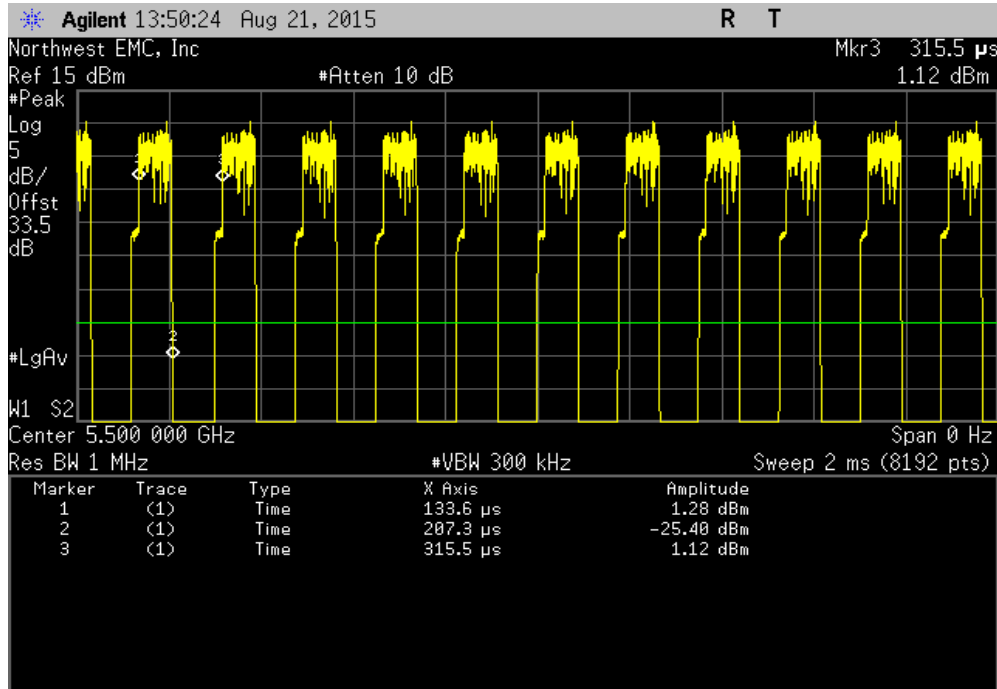


| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.18 5320 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

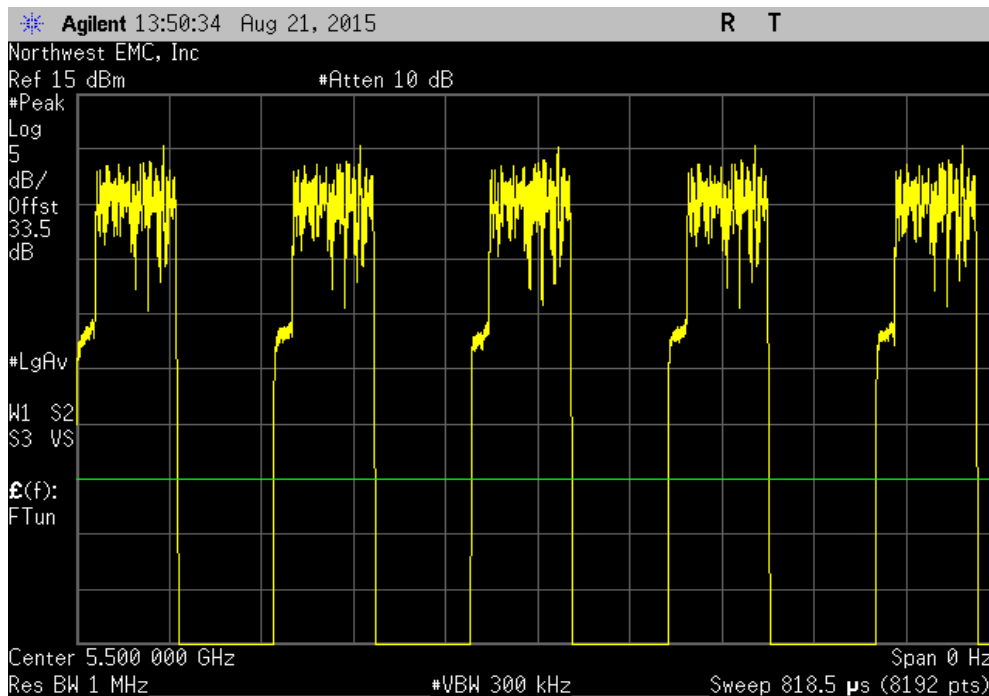


DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.19 5500 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 73.7 us | 181.9 us | 1 | 40.5 | N/A | N/A |

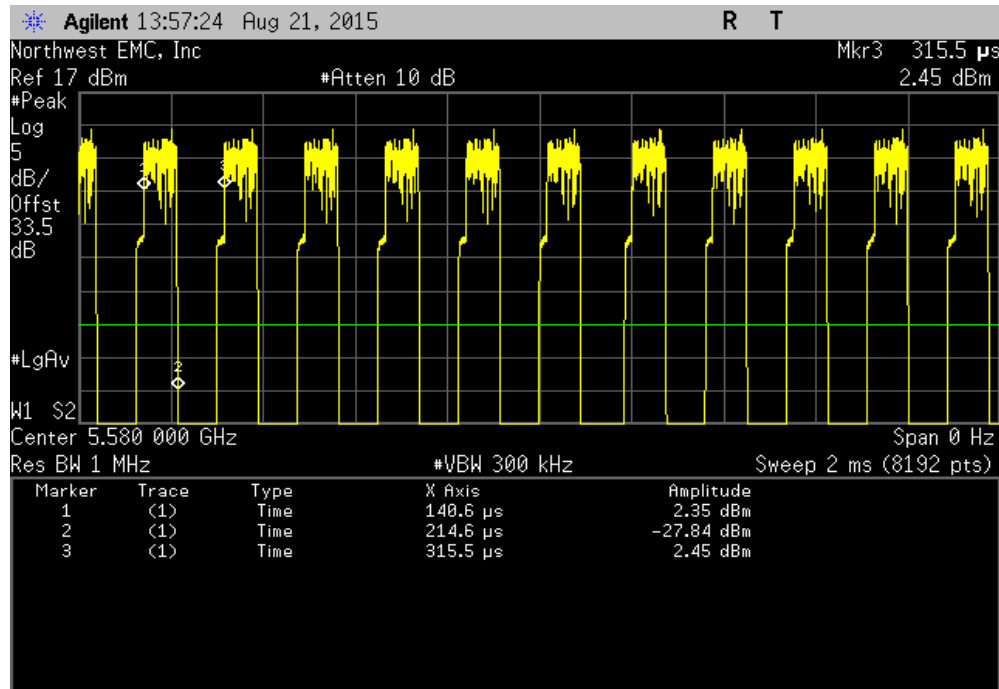


| Normal Conditions, 802.11(a) 18 Mbps, Low Channel, Ch.19 5500 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

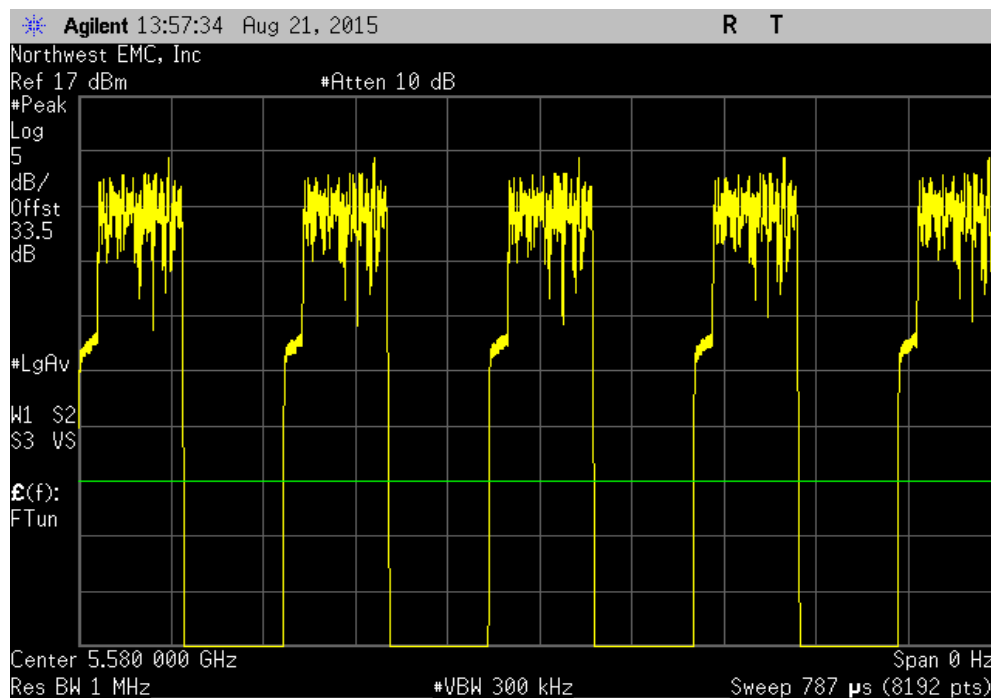


DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, Mid Channel, Ch.23 5580 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 74 us | 174.9 us | 1 | 42.3 | N/A | N/A |

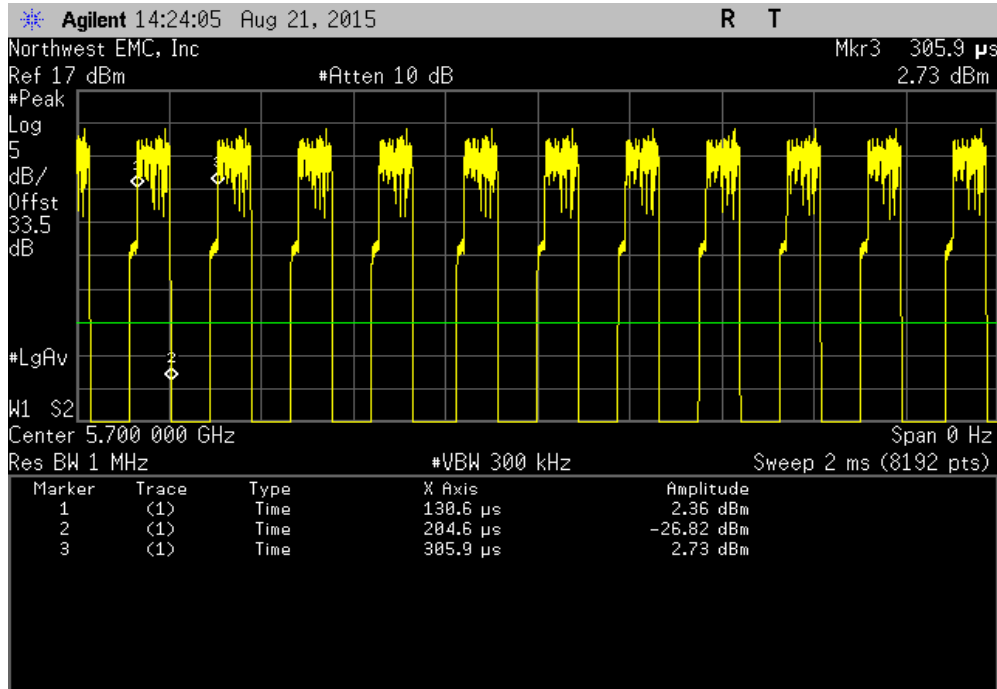


| Normal Conditions, 802.11(a) 18 Mbps, Mid Channel, Ch.23 5580 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

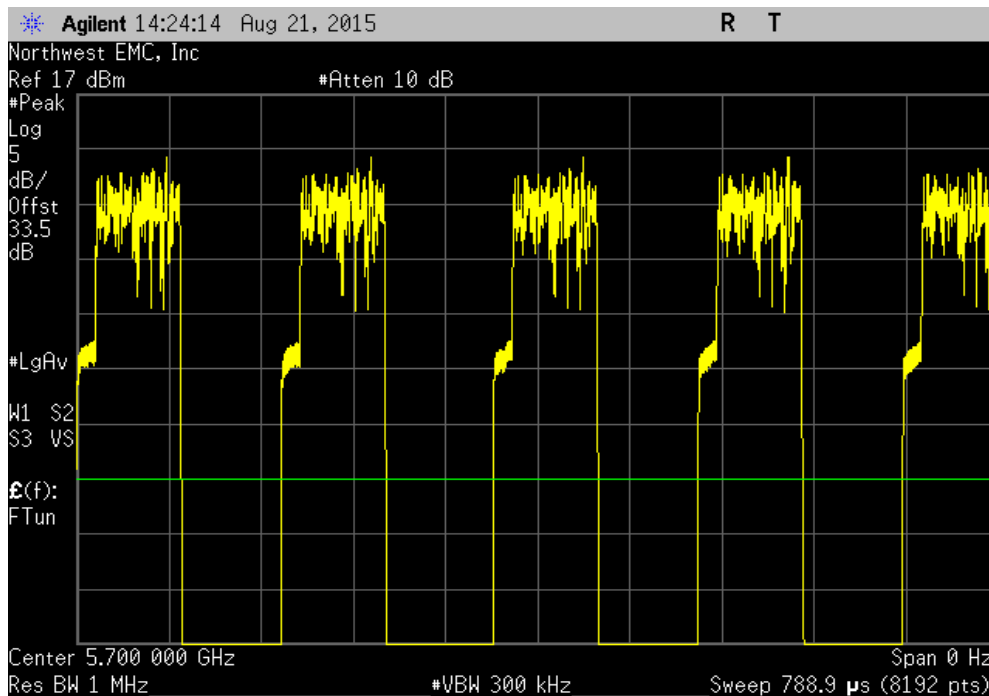


DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.29 5700 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | 74 us | 175.3 us | 1 | 42.2 | N/A | N/A |



| Normal Conditions, 802.11(a) 18 Mbps, High Channel, Ch.29 5700 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit N/A (N/A) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



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 (mo) |
|------------------------------|------------------|----------|-----|-----------|---------------|
| Generator - Signal | Keysight | N5182B | TFX | 4/16/2015 | 36 |
| Cable | ESM Cable Corp. | TT | EV1 | NCR | 0 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 7/14/2015 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4446A | AAQ | 3/10/2015 | 12 |

TEST DESCRIPTION


The transmission pulse duration (T) and Duty Cycle (x) were measured for each of the EUT operating modes per the FCC KDB 789033 D01 General UNII Test Procedures.

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.

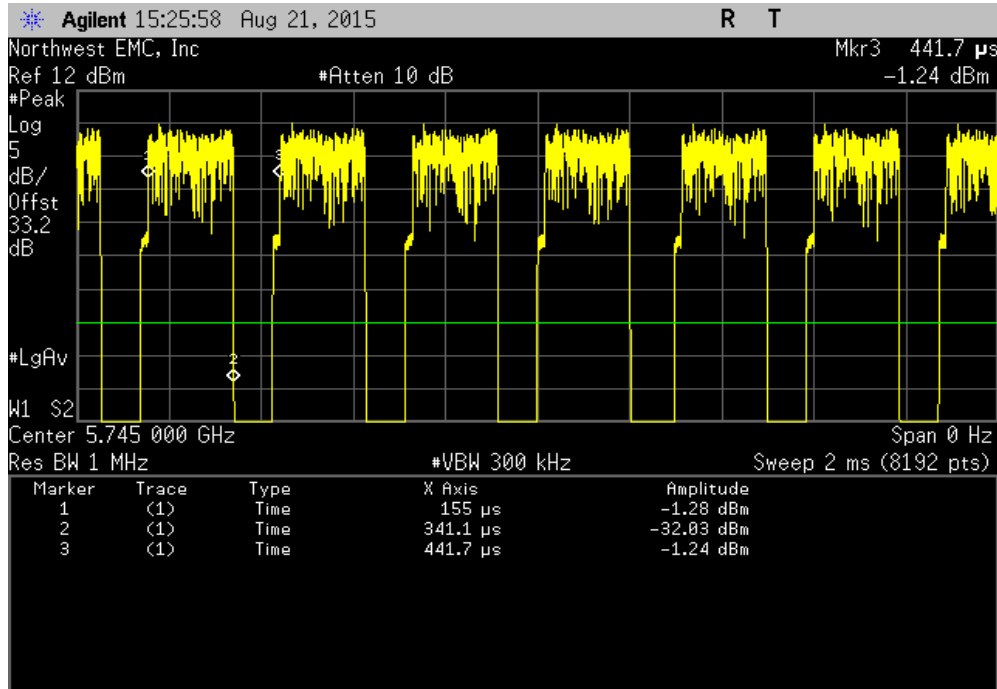
If the transmit duty cycle < 98 percent, burst gating was used during some of the other tests in this report only measure during the burst duration.

DUTY CYCLE

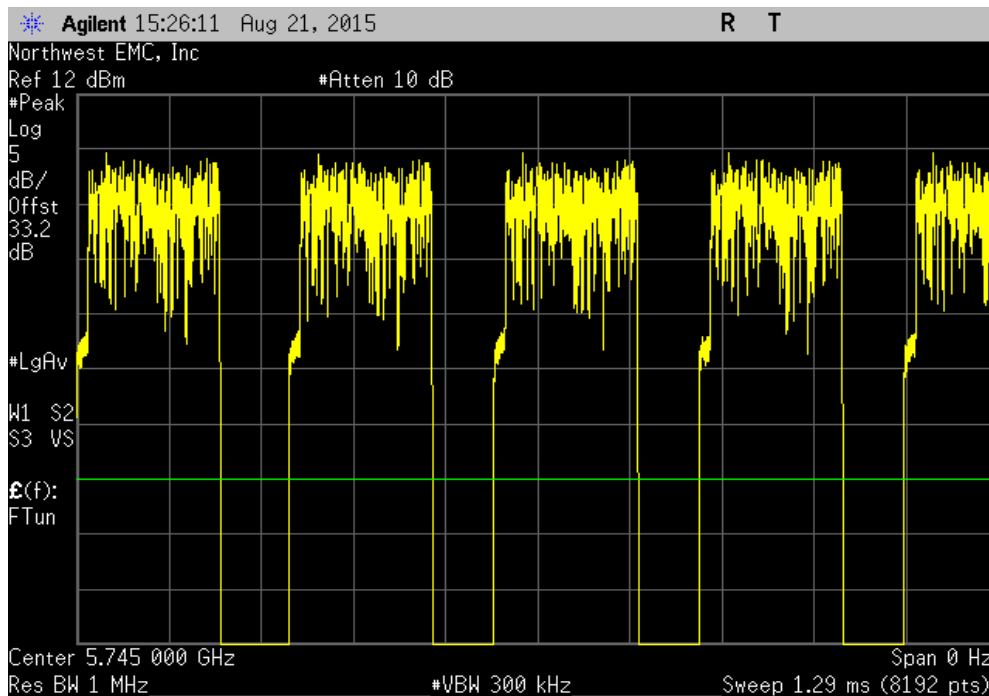
| | | | |
|--|-------------------------------|---|-----------|
| EUT: Athena4XD (extended distance) | | Work Order: FOCU0214 | |
| Serial Number: 02EA3CD00087 | | Date: 08/21/15 | |
| Customer: Summit Semiconductor LLC | | Temperature: 24.6°C | |
| Attendees: David Schilling | | Humidity: 41% | |
| Project: None | | Barometric Pres.: 1009.2 | |
| Tested by: Brandon Hobbs | | Power: 3.3 VDC Nominal | |
| | | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.407:2015 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| The EUT was not tested in ISOC mode. Based on transmission line length to all four identical antennas, a direct connect port was located on the worst case/shortest antenna path which was provided by the client. This test location was determined to be worst case by the client. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 1 | Signature  | |
| | | Pulse Width | Period |
| | | Number of Pulses | Value (%) |
| | | Limit (%) | Results |
| Normal Conditions | | | |
| 802.11(a) 6 Mbps | | | |
| | Low channel, Ch.30, 5745 MHz | 186.1 us | 286.7 us |
| | Low channel, Ch.30, 5745 MHz | N/A | N/A |
| | Mid channel, Ch.32, 5785 MHz | 186 us | 287.3 us |
| | Mid channel, Ch.32, 5785 MHz | N/A | N/A |
| | High channel, Ch.34, 5825 MHz | 185.8 us | 287.2 us |
| | High channel, Ch.34, 5825 MHz | N/A | N/A |
| 802.11(a) 18 Mbps | | | |
| | Low channel, Ch.30, 5745 MHz | 74 us | 174.6 us |
| | Low channel, Ch.30, 5745 MHz | N/A | N/A |
| | Mid channel, Ch.32, 5785 MHz | 73.8 us | 175.1 us |
| | Mid channel, Ch.32, 5785 MHz | N/A | N/A |
| | High channel, Ch.34, 5825 MHz | 74 us | 175.3 us |
| | High channel, Ch.34, 5825 MHz | N/A | N/A |

DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, Low channel, Ch.30, 5745 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 186.1 us | 286.7 us | 1 | 64.9 | N/A | N/A |

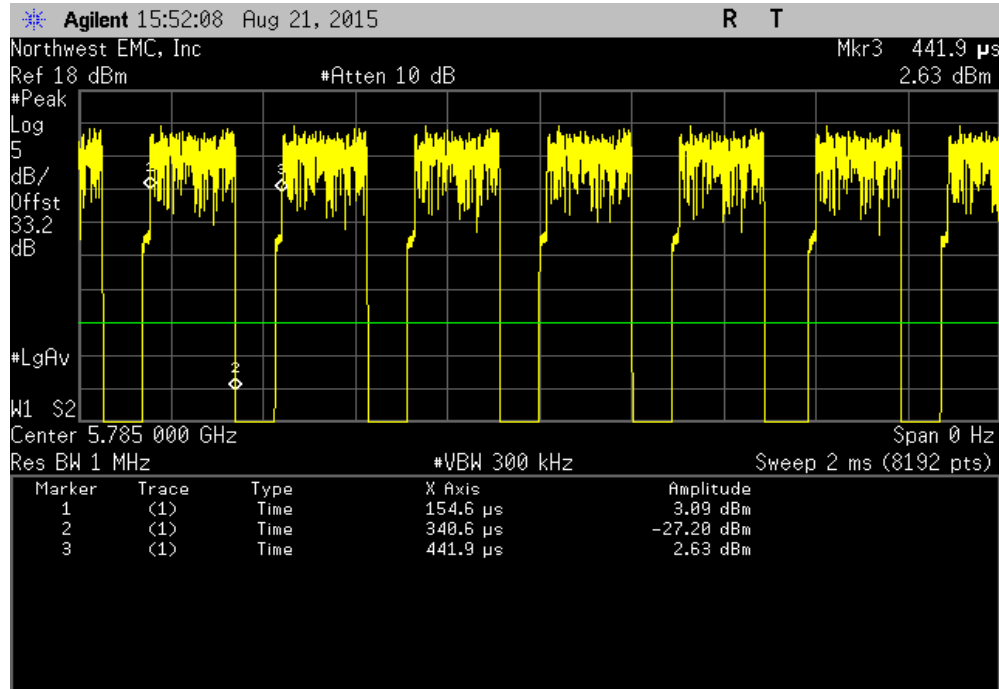


| Normal Conditions, 802.11(a) 6 Mbps, Low channel, Ch.30, 5745 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

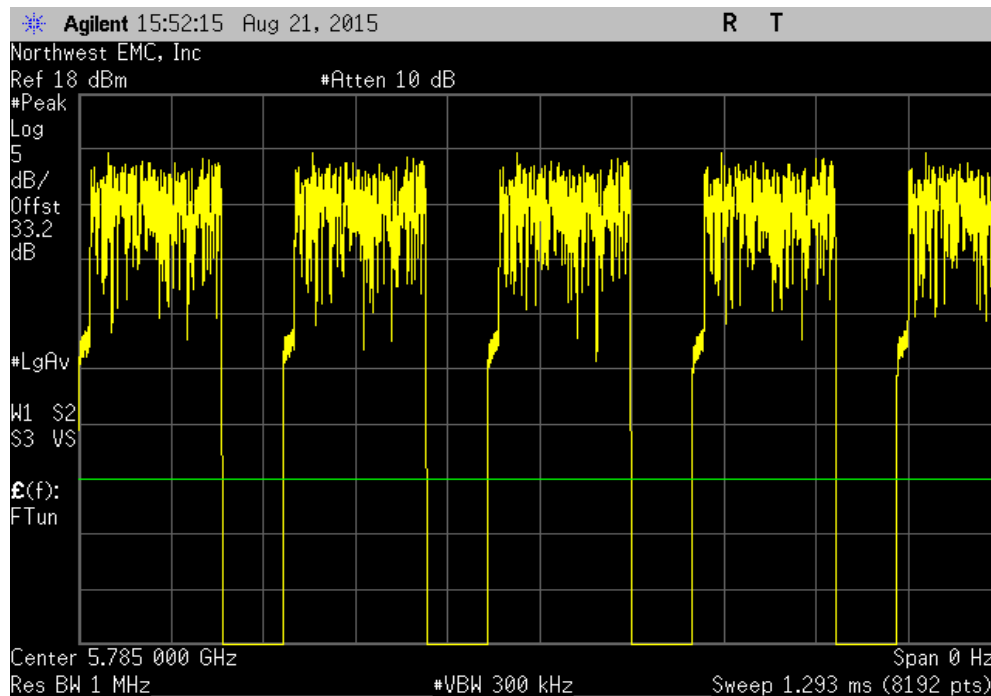


DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, Mid channel, Ch.32, 5785 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 186 us | 287.3 us | 1 | 64.7 | N/A | N/A |

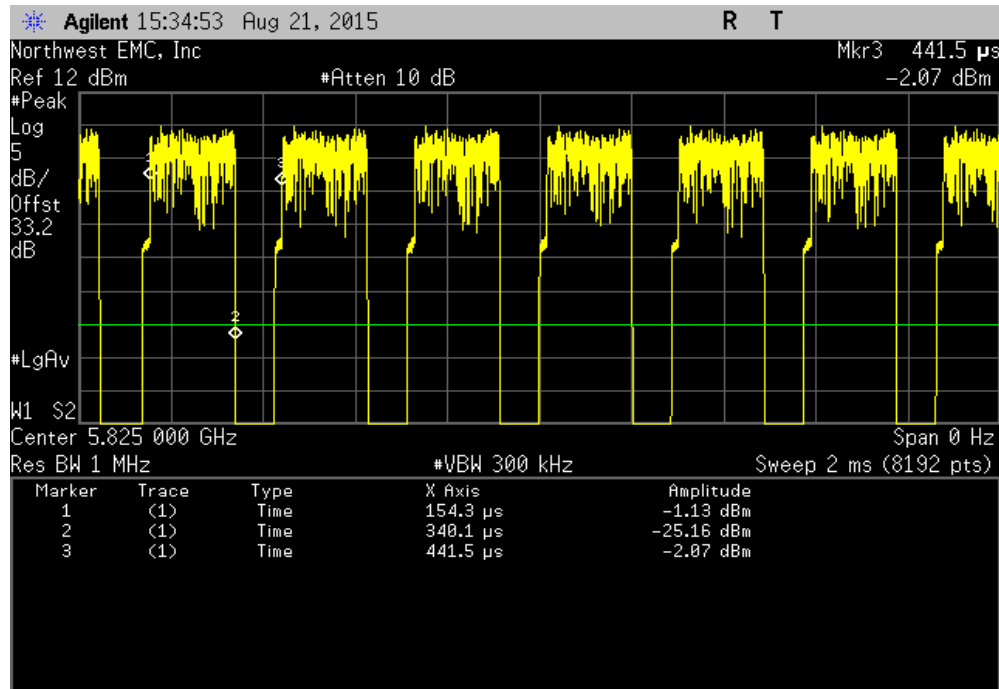


| Normal Conditions, 802.11(a) 6 Mbps, Mid channel, Ch.32, 5785 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

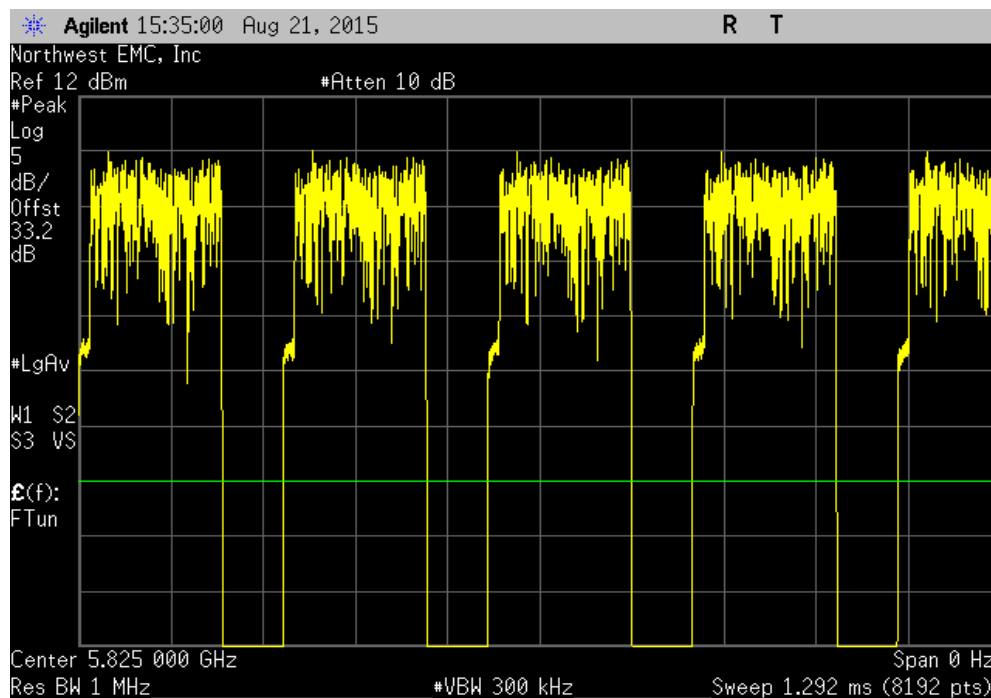


DUTY CYCLE

| Normal Conditions, 802.11(a) 6 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 185.8 us | 287.2 us | 1 | 64.7 | N/A | N/A |

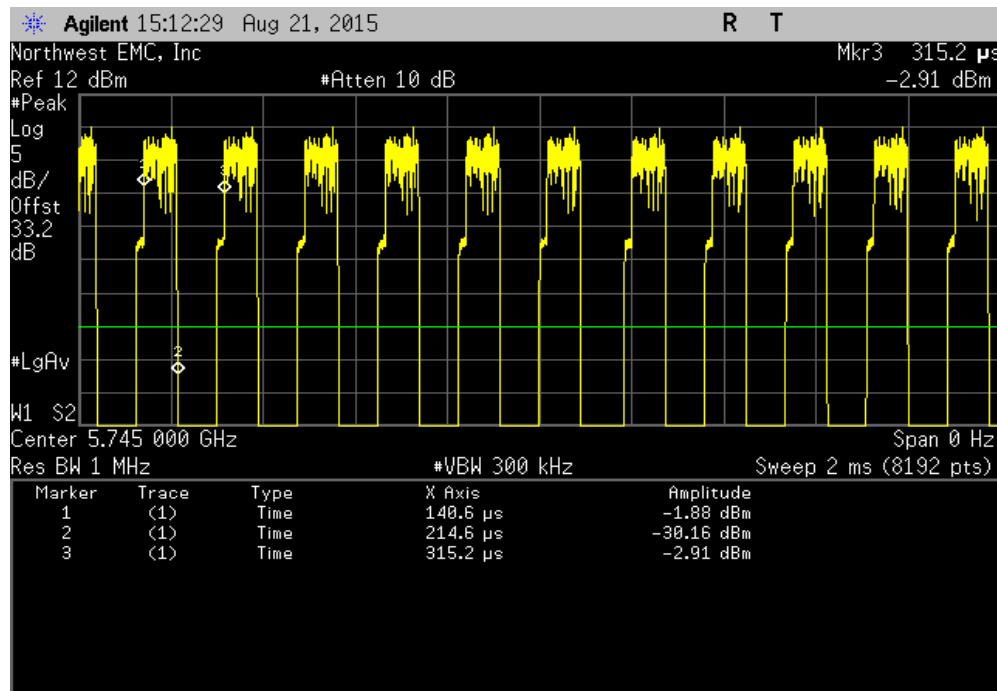


| Normal Conditions, 802.11(a) 6 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

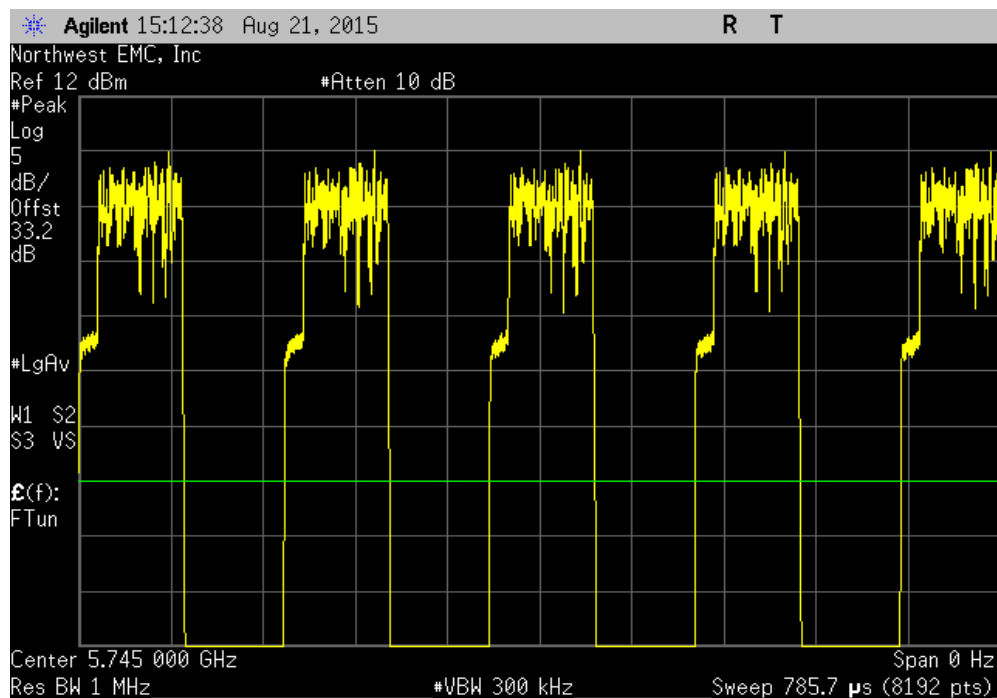


DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, Low channel, Ch.30, 5745 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 74 us | 174.6 us | 1 | 42.4 | N/A | N/A |

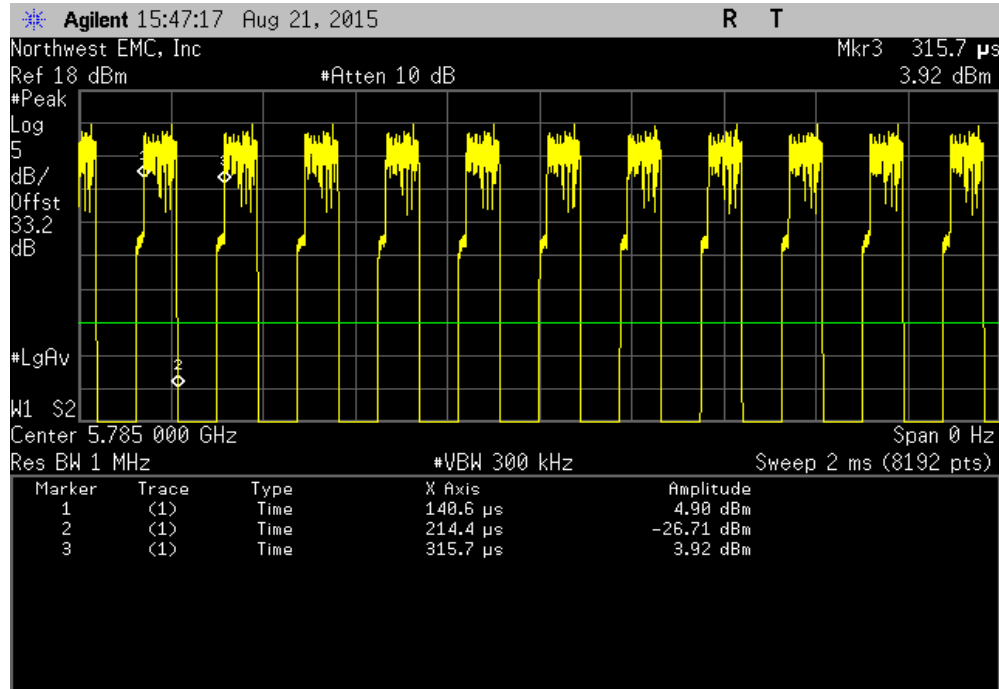


| Normal Conditions, 802.11(a) 18 Mbps, Low channel, Ch.30, 5745 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

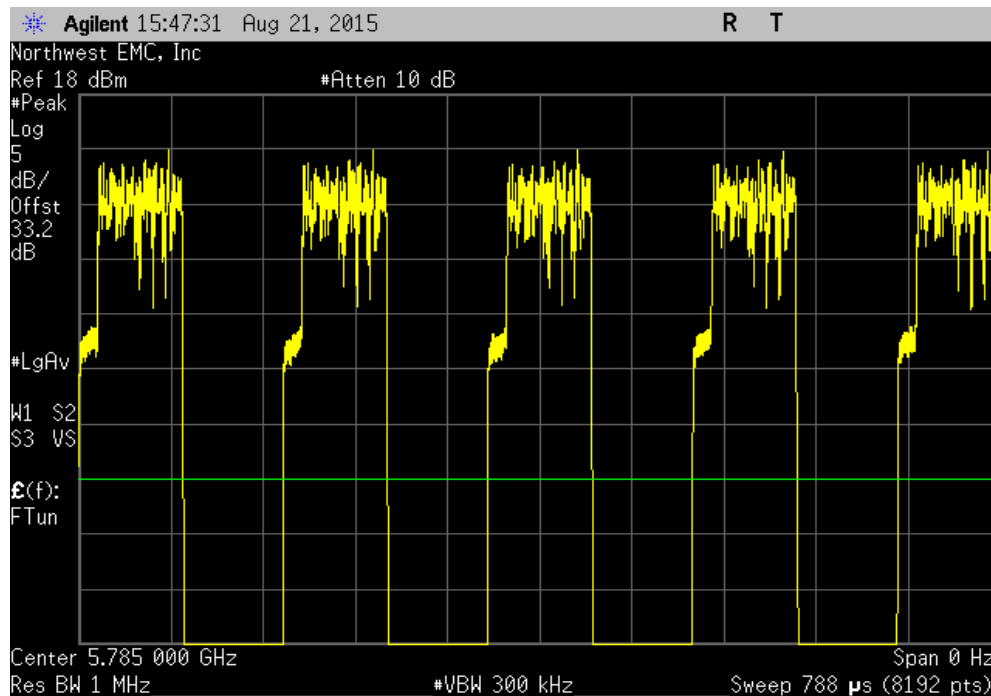


DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, Mid channel, Ch.32, 5785 MHz | | | | | | |
|--|-------------|----------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 73.8 us | 175.1 us | 1 | 42.1 | N/A | N/A |

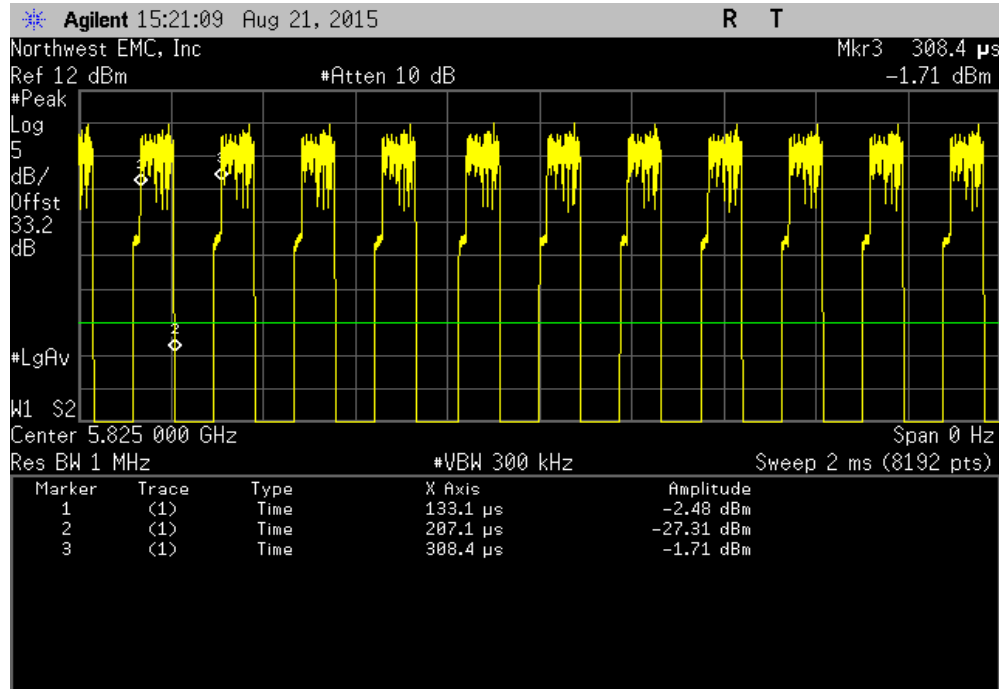


| Normal Conditions, 802.11(a) 18 Mbps, Mid channel, Ch.32, 5785 MHz | | | | | | |
|--|-------------|--------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |



DUTY CYCLE

| Normal Conditions, 802.11(a) 18 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|---|-------------|----------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | 74 us | 175.3 us | 1 | 42.2 | N/A | N/A |



| Normal Conditions, 802.11(a) 18 Mbps, High channel, Ch.34, 5825 MHz | | | | | | |
|---|-------------|--------|------------------|-----------|-----------|---------|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| | N/A | N/A | 5 | N/A | N/A | N/A |

