

# NORTHWEST EMC

## TE Connectivity / ADC Telecommunications

InterReach Fusion TDD - 2.5 GHz -RAU

FCC 27:2015

Report # TECO0025



NVLAP Lab Code: 200881-0

*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: March 6, 2015**  
**TE Connectivity / ADC Telecommunications**  
**Model: InterReach Fusion TDD - 2.5 GHz -RAU**

## Radio Equipment Testing

### Standards

| Specification           | Method                  |
|-------------------------|-------------------------|
| FCC 27:2015, FCC 2.1046 | ANSI/TIA/EIA-603-C-2004 |
| FCC 27:2015, FCC 2.1049 |                         |
| FCC 27:2015, FCC 2.1051 |                         |
| FCC 27:2015, FCC 2.1053 |                         |
| FCC 27:2015, FCC 2.1055 |                         |

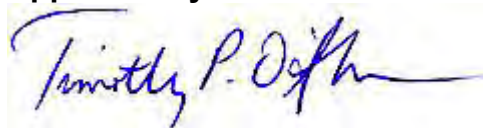
### Results

| Test Description                           | Applied | Results | Comments |
|--------------------------------------------|---------|---------|----------|
| Equivalent Isotropic Radiated Power (EIRP) | Yes     | Pass    |          |
| Emissions Bandwidth                        | Yes     | Pass    |          |
| Spurious Conducted Emissions               | Yes     | Pass    |          |
| Band Edge Compliance                       | Yes     | Pass    |          |
| Intermodulation                            | Yes     | Pass    |          |
| Frequency Stability                        | Yes     | Pass    |          |
| Field Strength of Spurious Emissions       | Yes     | Pass    |          |

### Deviations From Test Standards

None

### Approved By:



Tim O'Shea, 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.*

# REVISION HISTORY

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

# ACCREDITATIONS AND AUTHORIZATIONS

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## 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

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## Canada

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

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## 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.

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## Australia/New Zealand

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

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## Korea

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

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## Japan

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

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## 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.

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## Singapore

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

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## Israel

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

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## Hong Kong

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

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## Vietnam

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

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## 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.

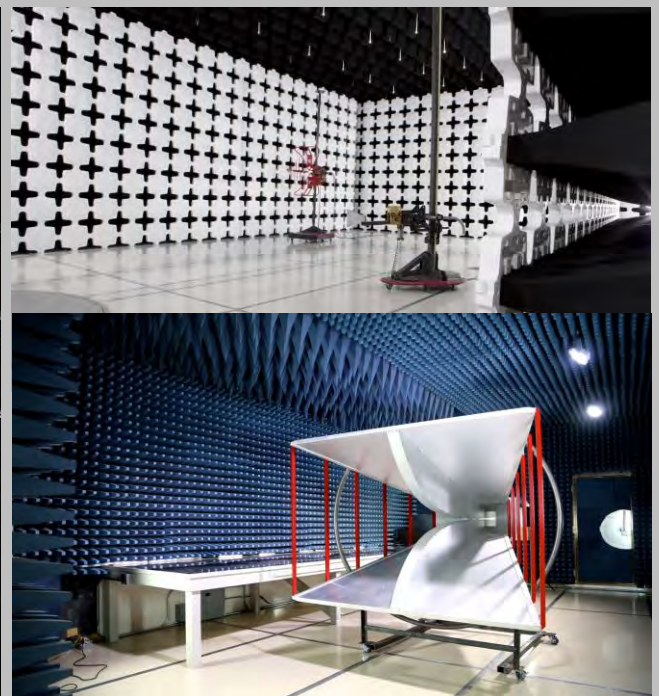
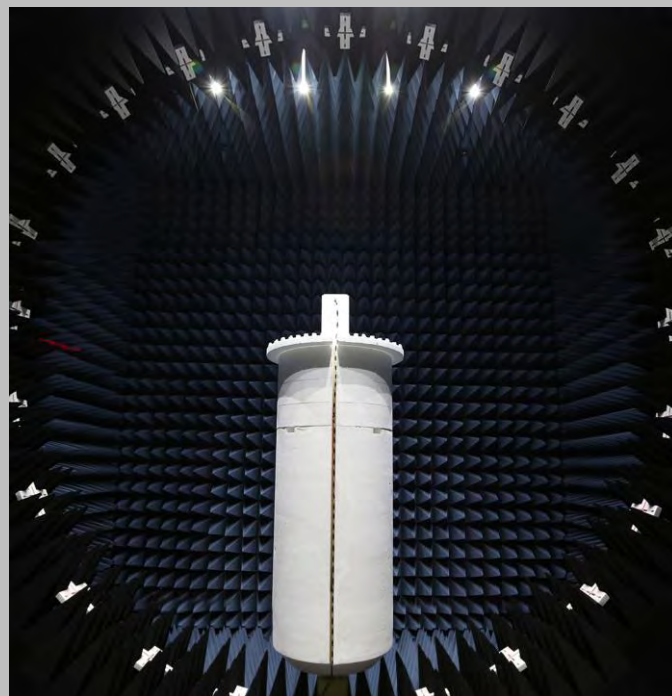
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

| <b>Test</b>                           | <b>+ MU</b> | <b>- MU</b> |
|---------------------------------------|-------------|-------------|
| 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)                   | 4.7 dB      | -4.7 dB     |
| AC Powerline Conducted Emissions (dB) | 2.9 dB      | -2.9 dB     |

# FACILITIES



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



# PRODUCT DESCRIPTION

## Client and Equipment Under Test (EUT) Information

|                                 |                                          |
|---------------------------------|------------------------------------------|
| <b>Company Name:</b>            | TE Connectivity / ADC Telecommunications |
| <b>Address:</b>                 | 1187 Park Place                          |
| <b>City, State, Zip:</b>        | Shakopee, MN 55379                       |
| <b>Test Requested By:</b>       | Joshua Wittman                           |
| <b>Model:</b>                   | InterReach Fusion TDD - 2.5 GHz -RAU     |
| <b>First Date of Test:</b>      | March 03, 2015                           |
| <b>Last Date of Test:</b>       | March 06, 2015                           |
| <b>Receipt Date of Samples:</b> | March 03, 2015                           |
| <b>Equipment Design Stage:</b>  | Production                               |
| <b>Equipment Condition:</b>     | No Damage                                |

## Information Provided by the Party Requesting the Test

|                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Functional Description of the EUT:</b>                                                                                      |
| In-Building Wireless Networking System utilizing LTE 20 MHz channel bandwidth 2x2 MIMO in Band 41, 2500 MHz (2496 – 2690 MHz). |
| <b>Testing Objective:</b>                                                                                                      |
| To demonstrate compliance to FCC Part 27.                                                                                      |

# CONFIGURATIONS

## Configuration TECO0025- 1

| Software/Firmware Running during test |         |
|---------------------------------------|---------|
| Description                           | Version |
| Remote Firmware                       | 01-06-3 |

| EUT                                  |                                          |                   |               |
|--------------------------------------|------------------------------------------|-------------------|---------------|
| Description                          | Manufacturer                             | Model/Part Number | Serial Number |
| InterReach Fusion TDD - 2.5 GHz -RAU | TE Connectivity / ADC Telecommunications | FSN-2525-1-TDD    | None          |

| Peripherals in test setup boundary |                                          |                   |                         |
|------------------------------------|------------------------------------------|-------------------|-------------------------|
| Description                        | Manufacturer                             | Model/Part Number | Serial Number           |
| RF Signal Generator                | Agilent                                  | E4438C            | MC60053                 |
| Laptop                             | Lenovo                                   | T400              | L3-A9994 08/09          |
| Laptop Supply                      | Lenovo                                   | 42T4418           | 11S42T4418Z1ZGWWG19659N |
| InterReach Fusion Main Hub         | TE Connectivity / ADC Telecommunications | FSN-1-MH-2        | MR2210U4                |
| InterReach Fusion Expansion Hub    | TE Connectivity / ADC Telecommunications | FSN-W1-EH-2       | GR221U7W                |
| Attenuator                         | Not Listed                               | None              | A1164                   |
| Attenuator                         | Not Listed                               | None              | A1153                   |

| Cables                       |        |            |         |                                 |                                      |
|------------------------------|--------|------------|---------|---------------------------------|--------------------------------------|
| Cable Type                   | Shield | Length (m) | Ferrite | Connection 1                    | Connection 2                         |
| AC Power                     | No     | 1.8m       | No      | RF Signal Generator             | AC Mains                             |
| AC Power                     | No     | 1.8m       | No      | InterReach Fusion Main Hub      | AC Mains                             |
| AC Power                     | No     | 1.8m       | No      | InterReach Fusion Expansion Hub | AC Mains                             |
| AC Power                     | No     | 1.8m       | No      | Laptop Supply                   | AC Mains                             |
| DC Power                     | No     | 1.8m       | Yes     | Laptop                          | Laptop Supply                        |
| Ethernet                     | No     | 1.8m       | No      | InterReach Fusion Main Hub      | Laptop                               |
| Coax                         | Yes    | 2.0m       | No      | InterReach Fusion Expansion Hub | InterReach Fusion TDD - 2.5 GHz -RAU |
| Coax x2 to Coax via combiner | Yes    | 2.7m       | No      | InterReach Fusion Main Hub      | RF Signal Generator                  |
| Fiber x2                     | No     | 1.8m       | No      | InterReach Fusion Main Hub      | IO Control Device                    |

# CONFIGURATIONS

## Configuration TECO0025- 2

| Software/Firmware Running during test |         |
|---------------------------------------|---------|
| Description                           | Version |
| Remote Firmware                       | 01-06-3 |

| EUT                                  |                                          |                   |               |
|--------------------------------------|------------------------------------------|-------------------|---------------|
| Description                          | Manufacturer                             | Model/Part Number | Serial Number |
| InterReach Fusion TDD - 2.5 GHz -RAU | TE Connectivity / ADC Telecommunications | FSN-2525-1-TDD    | None          |

| Peripherals in test setup boundary |              |                   |               |
|------------------------------------|--------------|-------------------|---------------|
| Description                        | Manufacturer | Model/Part Number | Serial Number |
| Attenuator                         | Not Listed   | None              | A1164         |
| Attenuator                         | Not Listed   | None              | A1153         |

| Remote Equipment Outside of Test Setup Boundary |                                          |                   |                        |
|-------------------------------------------------|------------------------------------------|-------------------|------------------------|
| Description                                     | Manufacturer                             | Model/Part Number | Serial Number          |
| RF Signal Generator                             | Agilent                                  | E4438C            | MC60053                |
| Laptop                                          | Lenovo                                   | T400              | L3-A9994 08/09         |
| Laptop Supply                                   | Lenovo                                   | 42T4418           | 11S42T4418Z1ZGWG19659N |
| InterReach Fusion Main Hub                      | TE Connectivity / ADC Telecommunications | FSN-1-MH-2        | MR2210U4               |
| InterReach Fusion Expansion Hub                 | TE Connectivity / ADC Telecommunications | FSN-W1-EH-2       | GR221U7W               |

| Cables                       |        |            |         |                                 |                                      |
|------------------------------|--------|------------|---------|---------------------------------|--------------------------------------|
| Cable Type                   | Shield | Length (m) | Ferrite | Connection 1                    | Connection 2                         |
| AC Power                     | No     | 1.8m       | No      | RF Signal Generator             | AC Mains                             |
| AC Power                     | No     | 1.8m       | No      | InterReach Fusion Main Hub      | AC Mains                             |
| AC Power                     | No     | 1.8m       | No      | InterReach Fusion Expansion Hub | AC Mains                             |
| AC Power                     | No     | 1.8m       | No      | Laptop Supply                   | AC Mains                             |
| DC Power                     | No     | 1.8m       | Yes     | Laptop                          | Laptop Supply                        |
| Ethernet                     | No     | 1.8m       | No      | InterReach Fusion Main Hub      | Laptop                               |
| Coax x2 to Coax via combiner | Yes    | 2.7m       | No      | InterReach Fusion Main Hub      | RF Signal Generator                  |
| Fiber x2                     | No     | 1.8m       | No      | InterReach Fusion Main Hub      | IO Control Device                    |
| Coax                         | No     | >3.0m      | No      | InterReach Fusion Expansion Hub | InterReach Fusion TDD - 2.5 GHz -RAU |

# MODIFICATIONS

## Equipment Modifications

| Item | Date     | Test                                       | Modification                         | Note                                                                | Disposition of EUT                                |
|------|----------|--------------------------------------------|--------------------------------------|---------------------------------------------------------------------|---------------------------------------------------|
| 1    | 3/3/2015 | Intermodulation                            | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 2    | 3/3/2015 | Band Edge Compliance                       | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 3    | 3/3/2015 | Equivalent Isotropic Radiated Power (EIRP) | 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    | 3/3/2015 | Spurious Conducted Emissions               | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 5    | 3/3/2015 | Emissions Bandwidth                        | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 6    | 3/4/2015 | Frequency Stability                        | 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    | 3/6/2015 | Field Strength of Spurious Emissions       | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed.                  |

# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMit 2015.01.14

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) |
|------------------------------|--------------------|-----------------|-----|------------|---------------|
| EMPower USB RF Power Sensor  | ETS                | 7002-006        | SRE | 8/8/2014   | 12            |
| EMPower USB RF Power Sensors | ETS                | 7002-006        | SRA | 4/17/2014  | 12            |
| Attenuator - 26dB SMA        | Fairview Microwave | 18B5W-26        | RFY | 7/22/2014  | 12            |
| MN08 Direct Connect Cable    | ESM Cable Corp.    | TTBJ141 KMKM-72 | MNU | 10/2/2014  | 12            |
| Attenuator - 20db, 'SMA'     | SM Electronics     | SA26B-20        | RFW | 4/3/2014   | 12            |
| 40 GHz DC Block              | Fairview Microwave | SD3379          | AMI | 10/2/2014  | 12            |
| Signal Generator MXG         | Agilent            | N5183A          | TIK | 10/17/2014 | 36            |
| Spectrum Analyzer            | Agilent            | E4440A          | AAX | 4/28/2014  | 12            |

## TEST DESCRIPTION

The RF output power was measured with the EUT set to the frequencies listed in the datasheet.

The power measurement was made using a direct connection between the RF output of the EUT and an RF Power Sensor which only measures across the high time of the burst of the carrier.

The observed duty cycle was noted but not needed to calculate the EirP.

$EiRP = \text{Max Measured Power} + \text{Antenna gain (dBi)}$

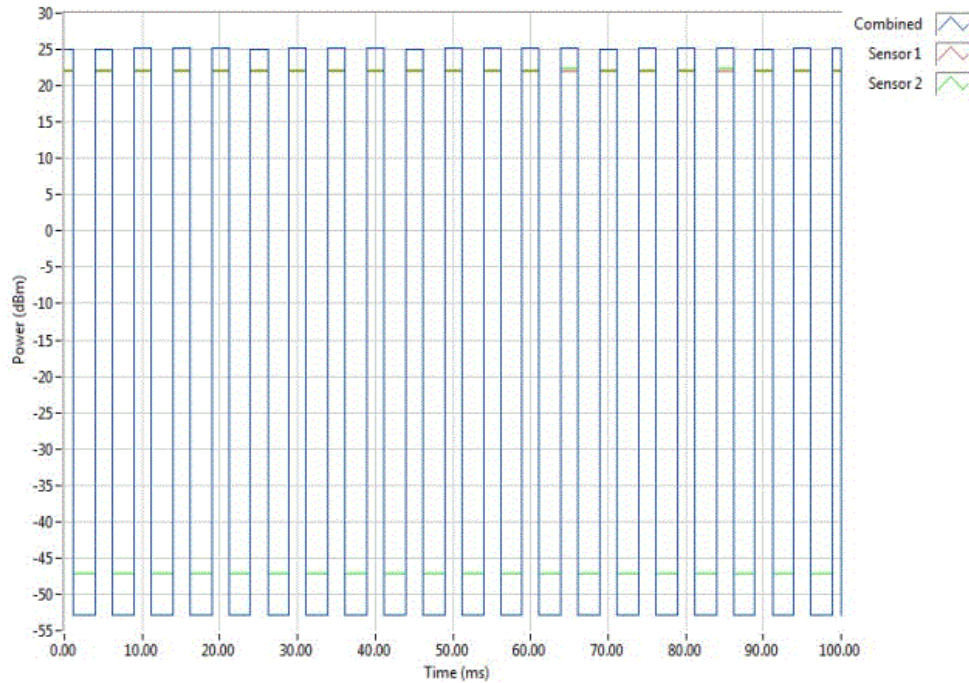
The measurements from port 1 and port 2 were summed in linear terms to determine the total average power in EIRP.

# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

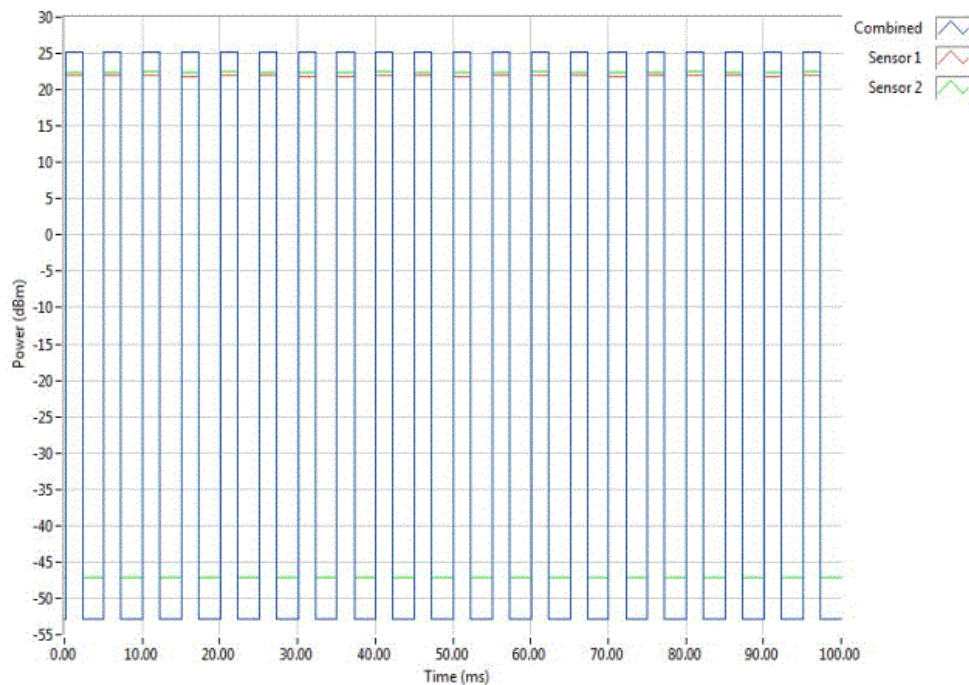
|                                                                                                                                                                                                                                                                                                               |                    |                              |                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|----------------------|
| EUT: InterReach Fusion TDD - 2.5 GHz -RAU                                                                                                                                                                                                                                                                     |                    | Work Order: TECO0025         |                      |
| Serial Number: None                                                                                                                                                                                                                                                                                           |                    | Date: 03/03/15               |                      |
| Customer: TE Connectivity / ADC Telecommunications                                                                                                                                                                                                                                                            |                    | Temperature: 22.5°C          |                      |
| Attendees: Josh Wittman                                                                                                                                                                                                                                                                                       |                    | Humidity: 16%                |                      |
| Project: None                                                                                                                                                                                                                                                                                                 |                    | Barometric Pres.: 1007.7     |                      |
| Tested by: Trevor Buls                                                                                                                                                                                                                                                                                        | Power: 110VAC/60Hz | Job Site: MN08               |                      |
| TEST SPECIFICATIONS                                                                                                                                                                                                                                                                                           |                    |                              |                      |
| FCC 27:2015                                                                                                                                                                                                                                                                                                   |                    | Test Method                  |                      |
|                                                                                                                                                                                                                                                                                                               |                    | ANSI/TIA/EIA-603-C-2004      |                      |
| COMMENTS                                                                                                                                                                                                                                                                                                      |                    |                              |                      |
| Antenna gain is assumed to be 0, per customer the antenna gain will be reevaluated during installation. System is rated at 158mW (+22 dBm) per port. Limit is 33 dBW + 10log(Maximum Bandwidth/6 MHz) dBW. Conversion from dBW to dBm is dBW + 30 dB = dBm. 33 dBW + 10log(20 MHz/6 MHz) dBW +30dB = 68.6 dBm |                    |                              |                      |
| DEVIATIONS FROM TEST STANDARD                                                                                                                                                                                                                                                                                 |                    |                              |                      |
| None                                                                                                                                                                                                                                                                                                          |                    |                              |                      |
| Configuration #                                                                                                                                                                                                                                                                                               | 1                  | Signature <i>Trevor Buls</i> |                      |
|                                                                                                                                                                                                                                                                                                               |                    | Avg Pwr Port 2 (dBm)         | Avg Pwr Port 1 (dBm) |
|                                                                                                                                                                                                                                                                                                               |                    | Duty Cycle (%)               | Avg Pwr Sum (dBm)    |
|                                                                                                                                                                                                                                                                                                               |                    | EIRP (dBm)                   | Limit (dBm)          |
|                                                                                                                                                                                                                                                                                                               |                    | Results                      |                      |
| LTE 20 MHz                                                                                                                                                                                                                                                                                                    |                    |                              |                      |
| Low Channel 2506 MHz                                                                                                                                                                                                                                                                                          | 22.05              | 22.25                        | 45.594               |
| Mid Channel 2593 MHz                                                                                                                                                                                                                                                                                          | 21.95              | 22.46                        | 45.59                |
| High Channel 2680 MHz                                                                                                                                                                                                                                                                                         | 21.17              | 22.98                        | 45.594               |
|                                                                                                                                                                                                                                                                                                               | 25.133             | 25.21                        | 25.176               |
|                                                                                                                                                                                                                                                                                                               | 25.1               | 25.2                         | 68.6                 |
|                                                                                                                                                                                                                                                                                                               | 68.6               | 68.6                         | 68.6                 |
|                                                                                                                                                                                                                                                                                                               | Pass               | Pass                         | Pass                 |

# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

| LTE 20 MHz, Low Channel 2506 MHz |                      |                |                   |            |             |         |
|----------------------------------|----------------------|----------------|-------------------|------------|-------------|---------|
| Avg Pwr Port 2 (dBm)             | Avg Pwr Port 1 (dBm) | Duty Cycle (%) | Avg Pwr Sum (dBm) | EIRP (dBm) | Limit (dBm) | Results |
| 22.05                            | 22.25                | 45.594         | 25.133            | 25.1       | 68.6        | Pass    |

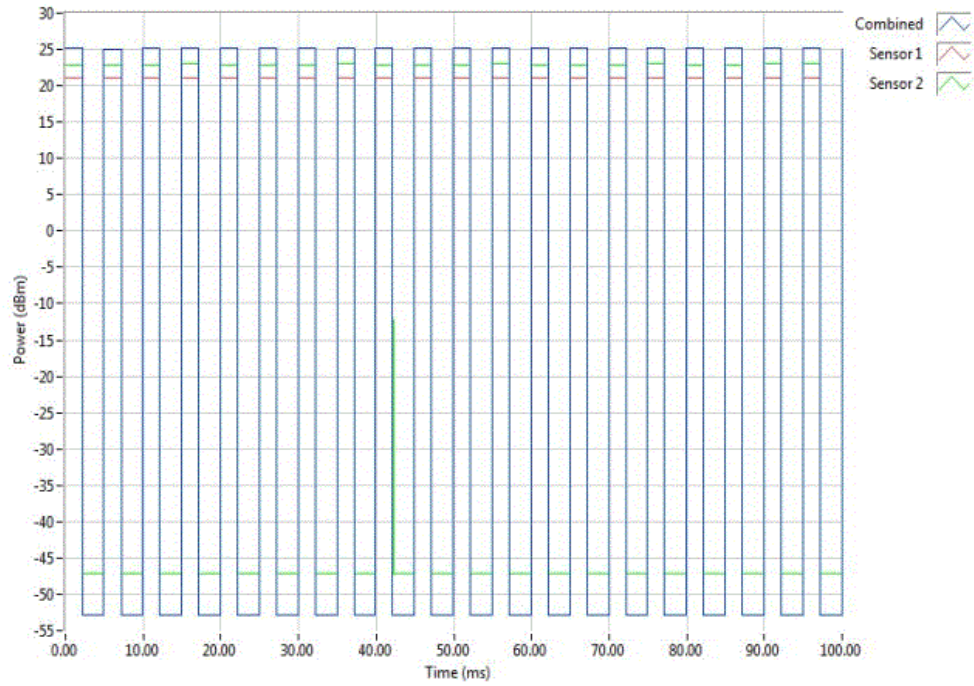


| LTE 20 MHz, Mid Channel 2593 MHz |                      |                |                   |            |             |         |
|----------------------------------|----------------------|----------------|-------------------|------------|-------------|---------|
| Avg Pwr Port 2 (dBm)             | Avg Pwr Port 1 (dBm) | Duty Cycle (%) | Avg Pwr Sum (dBm) | EIRP (dBm) | Limit (dBm) | Results |
| 21.95                            | 22.46                | 45.59          | 25.21             | 25.2       | 68.6        | Pass    |



# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

| LTE 20 MHz, High Channel 2680 MHz |                      |                |                   |            |             |         |
|-----------------------------------|----------------------|----------------|-------------------|------------|-------------|---------|
| Avg Pwr Port 2 (dBm)              | Avg Pwr Port 1 (dBm) | Duty Cycle (%) | Avg Pwr Sum (dBm) | EIRP (dBm) | Limit (dBm) | Results |
| 21.17                             | 22.98                | 45.594         | 25.176            | 25.2       | 68.6        | Pass    |



# EMISSIONS 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) |
|---------------------------|--------------------|-----------------|-----|------------|---------------|
| MN08 Direct Connect Cable | ESM Cable Corp.    | TTBJ141 KMKM-72 | MNU | 10/2/2014  | 12            |
| Attenuator - 20db, 'SMA'  | SM Electronics     | SA26B-20        | RFW | 4/3/2014   | 12            |
| 40 GHz DC Block           | Fairview Microwave | SD3379          | AMI | 10/2/2014  | 12            |
| Signal Generator MXG      | Agilent            | N5183A          | TIK | 10/17/2014 | 36            |
| Spectrum Analyzer         | Agilent            | E4440A          | AAX | 4/28/2014  | 12            |

## TEST DESCRIPTION

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). This was an iterative process to determine the RBW based on the emissions bandwidth (B).
- VBW= > RBW
- A peak detector was used
- Trace 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 and to utilize the emission bandwidth for setting the channel power integration bandwidth during conducted output power testing.

# EMISSIONS BANDWIDTH

|                                                    |                    |                              |        |
|----------------------------------------------------|--------------------|------------------------------|--------|
| EUT: InterReach Fusion TDD - 2.5 GHz -RAU          |                    | Work Order: TECO0025         |        |
| Serial Number: None                                |                    | Date: 03/03/15               |        |
| Customer: TE Connectivity / ADC Telecommunications |                    | Temperature: 22.5°C          |        |
| Attendees: None                                    |                    | Humidity: 16%                |        |
| Project: None                                      |                    | Barometric Pres.: 1007.7     |        |
| Tested by: Trevor Buls                             | Power: 110VAC/60Hz | Job Site: MN08               |        |
| TEST SPECIFICATIONS                                |                    |                              |        |
| FCC 27:2015                                        |                    | Test Method                  |        |
|                                                    |                    | ANSI/TIA/EIA-603-C-2004      |        |
| COMMENTS                                           |                    |                              |        |
| Port 1 was determined to be worst case.            |                    |                              |        |
| DEVIATIONS FROM TEST STANDARD                      |                    |                              |        |
| None                                               |                    |                              |        |
| Configuration #                                    | 1                  | Signature <i>Trevor Buls</i> |        |
|                                                    |                    | Value                        | Limit  |
| LTE 20 MHz                                         |                    |                              | Result |
| Low Channel 2506 MHz                               |                    | 19.57 MHz                    | N/A    |
| Mid Channel 2593 MHz                               |                    | 19.888 MHz                   | N/A    |
| High Channel 2680 MHz                              |                    | 19.639 MHz                   | N/A    |
| Sig Gen Input - Mid Channel 2593 MHz               |                    | 19.865 MHz                   | N/A    |

**NORTHWEST  
EMC**  
XMit 2015.01.14

Agilent 11:11:58 Mar 3, 2015 R T

Northwest EMC, Inc

Ref 22 dBm #Atten 10 dB

#Peak Log 5 dB/Offset 22.1 dB

#LgAv

M1 S2

Center 2.506 000 GHz Span 30 MHz

#Res BW 300 kHz #VBW 910 kHz Sweep 1.066 ms (4000 pts)

Occupied Bandwidth 17.8760 MHz

Occ BW % Pwr 99.00 %

x dB -26.00 dB

Transmit Freq Error 51.336 kHz

Occupied Bandwidth 19.570 MHz

Agilent 11:14:06 Mar 3, 2015 R T

Northwest EMC, Inc

Ref 22 dBm #Atten 10 dB

#Peak Log 5 dB/Offset 22.1 dB

#LgAv

M1 S2

Center 2.593 000 GHz Span 30 MHz

#Res BW 360 kHz #VBW 1 MHz Sweep 1.066 ms (4000 pts)

Occupied Bandwidth 17.9515 MHz

Occ BW % Pwr 99.00 %

x dB -26.00 dB

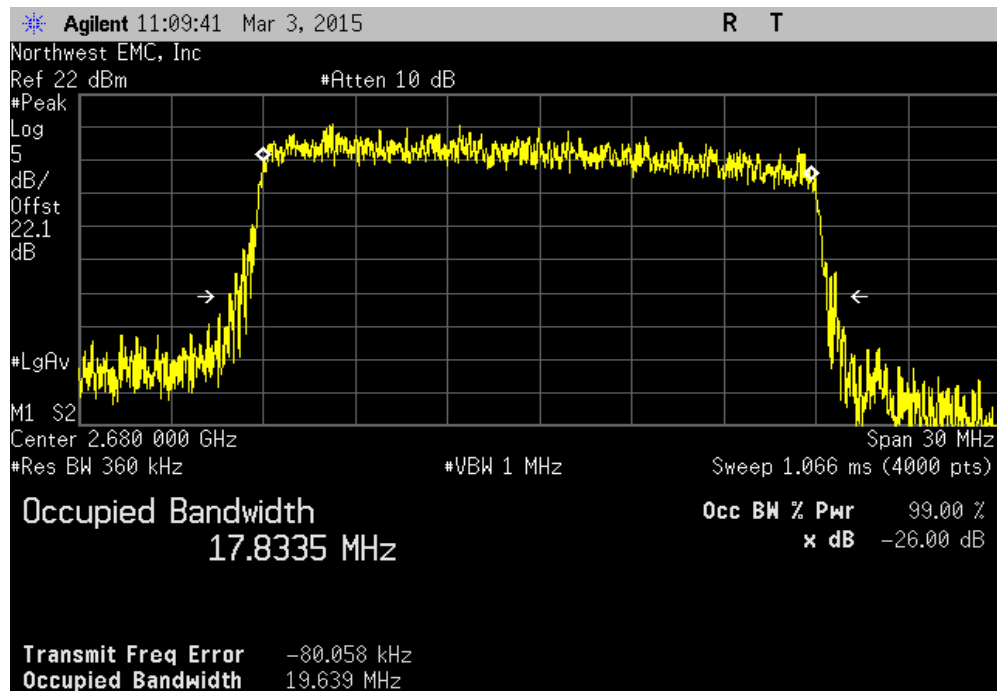
Transmit Freq Error 21.888 kHz

Occupied Bandwidth 19.888 MHz

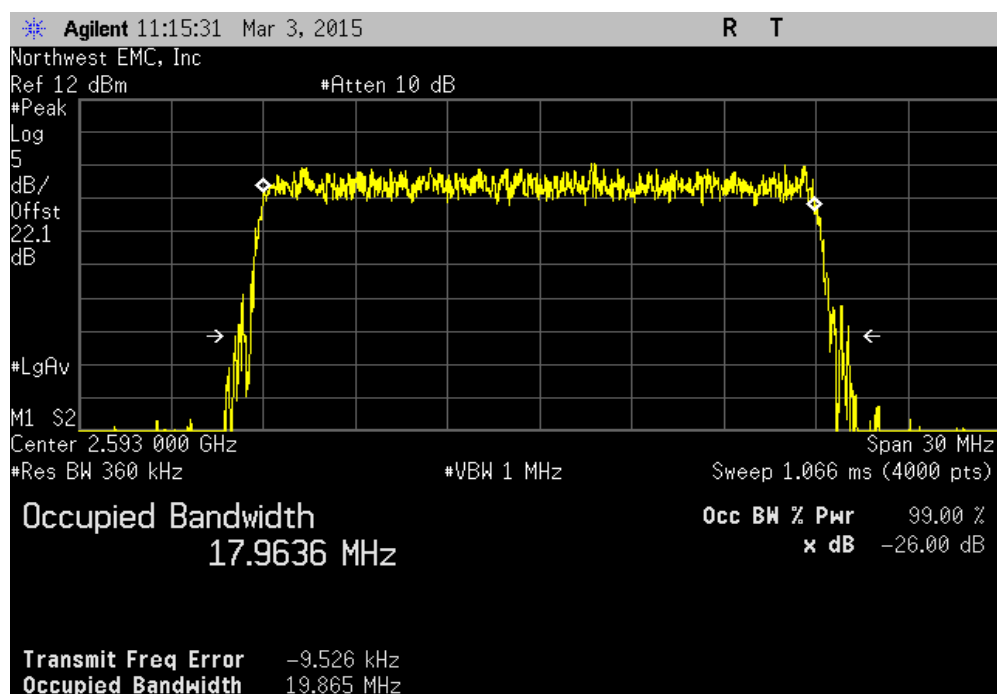
The graph shows a spectral plot with a yellow trace. Two white diamonds mark the -26 dB points on the trace. Arrows point from the text 'Occupied Bandwidth 17.9515 MHz' to these diamonds. The plot is on a grid with a center frequency of 2.593 GHz and a span of 30 MHz. The y-axis represents power in dB, with a reference of 22 dBm and an attenuation of 10 dB. The x-axis represents frequency. The trace shows a flat top between the two marked points, indicating the occupied bandwidth.

# EMISSIONS BANDWIDTH

| LTE 20 MHz, High Channel 2680 MHz |  |  |  |            |       |        |
|-----------------------------------|--|--|--|------------|-------|--------|
|                                   |  |  |  | Value      | Limit | Result |
|                                   |  |  |  | 19.639 MHz | N/A   | N/A    |



| LTE 20 MHz, Sig Gen Input - Mid Channel 2593 MHz |  |  |  |            |       |        |
|--------------------------------------------------|--|--|--|------------|-------|--------|
|                                                  |  |  |  | Value      | Limit | Result |
|                                                  |  |  |  | 19.865 MHz | N/A   | N/A    |



# SPURIOUS CONDUCTED EMISSIONS

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

## TEST EQUIPMENT

| Description               | Manufacturer       | Model           | ID  | Last Cal.  | Interval (mo) |
|---------------------------|--------------------|-----------------|-----|------------|---------------|
| Spectrum Analyzer         | Agilent            | N9010A          | AFI | 1/27/2015  | 12            |
| MN08 Direct Connect Cable | ESM Cable Corp.    | TTBJ141 KMKM-72 | MNU | 10/2/2014  | 12            |
| Attenuator - 20db, 'SMA'  | SM Electronics     | SA26B-20        | RFW | 4/3/2014   | 12            |
| 40 GHz DC Block           | Fairview Microwave | SD3379          | AMI | 10/2/2014  | 12            |
| Signal Generator MXG      | Agilent            | N5183A          | TIK | 10/17/2014 | 36            |
| Spectrum Analyzer         | Agilent            | E4440A          | AAX | 4/28/2014  | 12            |

## TEST DESCRIPTION

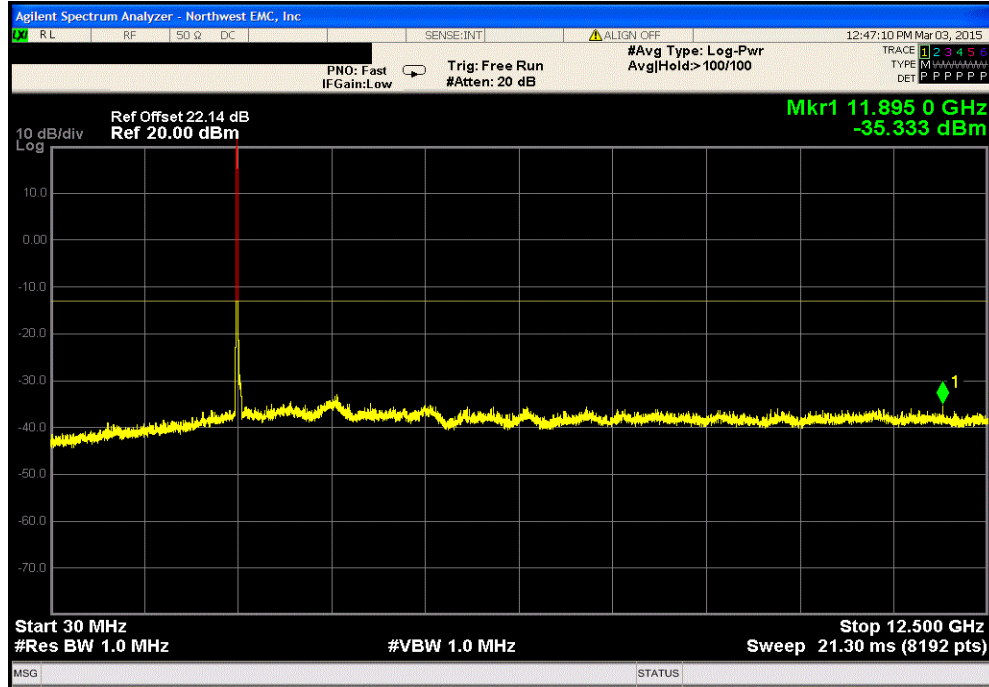
The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet. For each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

# SPURIOUS CONDUCTED EMISSIONS

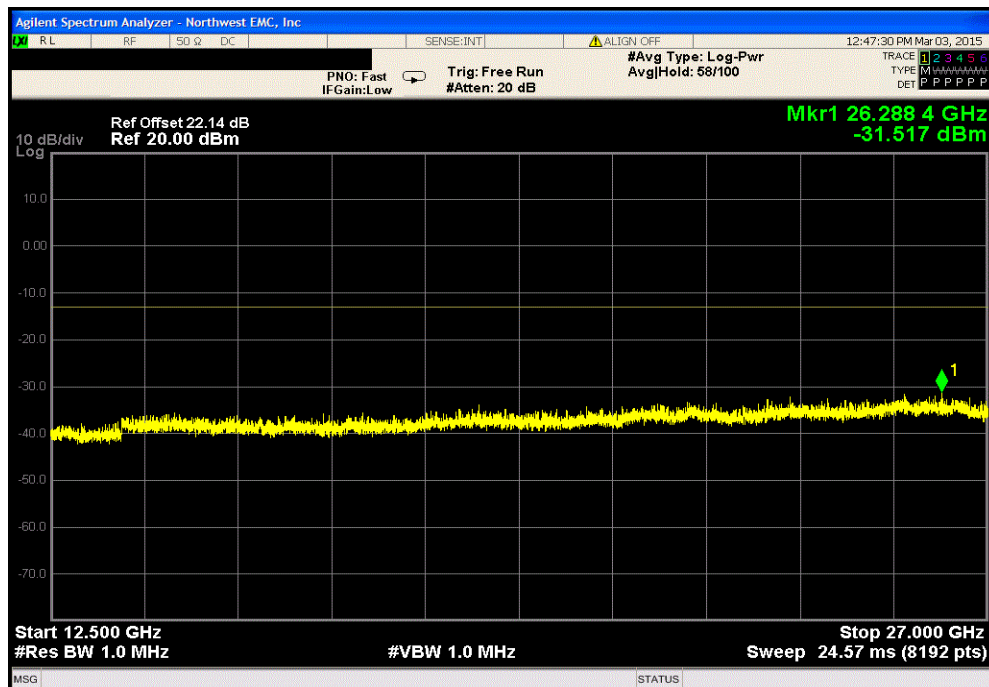
|                                                    |                       |                                      |               |
|----------------------------------------------------|-----------------------|--------------------------------------|---------------|
| EUT: InterReach Fusion TDD - 2.5 GHz -RAU          |                       | Work Order: TECO0025                 |               |
| Serial Number: None                                |                       | Date: 03/03/15                       |               |
| Customer: TE Connectivity / ADC Telecommunications |                       | Temperature: 22.5°C                  |               |
| Attendees: None                                    |                       | Humidity: 16%                        |               |
| Project: None                                      |                       | Barometric Pres.: 1007.7             |               |
| Tested by: Trevor Buls                             | Power: 110VAC/60Hz    | Job Site: MN08                       |               |
| TEST SPECIFICATIONS                                |                       |                                      |               |
| FCC 27:2015                                        |                       | Test Method: ANSI/TIA/EIA-603-C-2004 |               |
| COMMENTS                                           |                       |                                      |               |
| Port 1 was determined to be worst case.            |                       |                                      |               |
| DEVIATIONS FROM TEST STANDARD                      |                       |                                      |               |
| None                                               |                       |                                      |               |
| Configuration #                                    | 1                     | Signature: <i>Trevor Buls</i>        |               |
|                                                    |                       | Frequency Range                      | Value (dBm)   |
|                                                    |                       |                                      | Limit ≤ (dBm) |
|                                                    |                       |                                      | Result        |
| LTE 20 MHz                                         |                       |                                      |               |
|                                                    | Low Channel 2506 MHz  | 30 MHz - 12.5 GHz                    | -35.33        |
|                                                    | Low Channel 2506 MHz  | 12.5 GHz - 27 GHz                    | -31.52        |
|                                                    | Mid Channel 2593 MHz  | 30 MHz - 12.5 GHz                    | -34.4         |
|                                                    | Mid Channel 2593 MHz  | 12.5 GHz - 27 GHz                    | -32.05        |
|                                                    | High Channel 2680 MHz | 30 MHz - 12.5 GHz                    | -33.99        |
|                                                    | High Channel 2680 MHz | 12.5 GHz - 27 GHz                    | -30.07        |

# SPURIOUS CONDUCTED EMISSIONS

| LTE 20 MHz, Low Channel 2506 MHz |             |               |        |  |
|----------------------------------|-------------|---------------|--------|--|
| Frequency Range                  | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 30 MHz - 12.5 GHz                | -35.33      | -13           | Pass   |  |

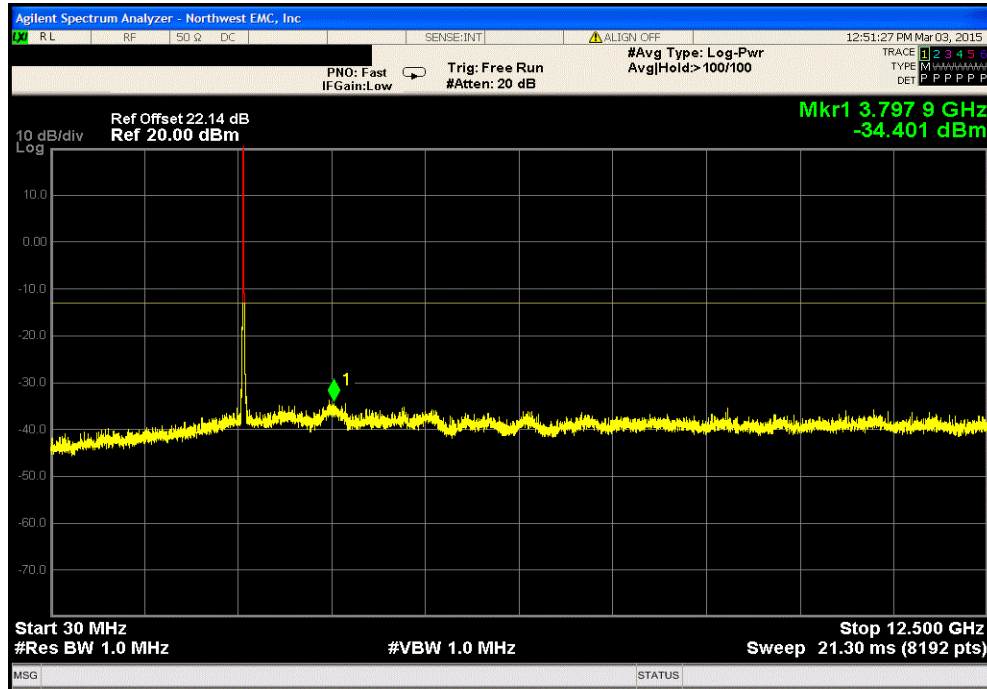


| LTE 20 MHz, Low Channel 2506 MHz |             |               |        |  |
|----------------------------------|-------------|---------------|--------|--|
| Frequency Range                  | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 12.5 GHz - 27 GHz                | -31.52      | -13           | Pass   |  |

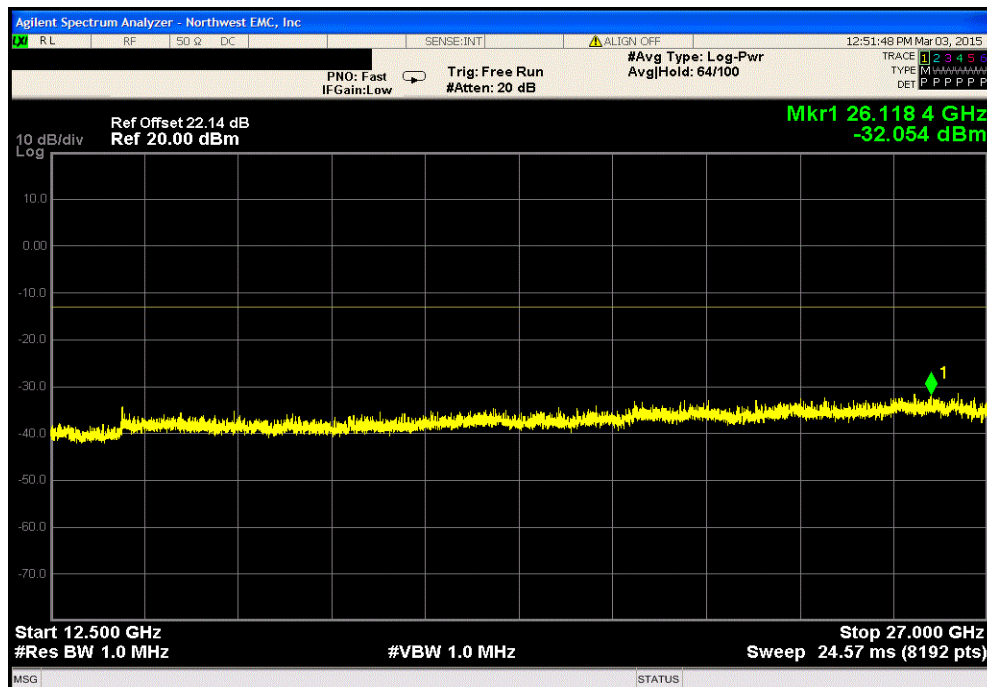


# SPURIOUS CONDUCTED EMISSIONS

| LTE 20 MHz, Mid Channel 2593 MHz |             |               |        |  |
|----------------------------------|-------------|---------------|--------|--|
| Frequency Range                  | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 30 MHz - 12.5 GHz                | -34.4       | -13           | Pass   |  |

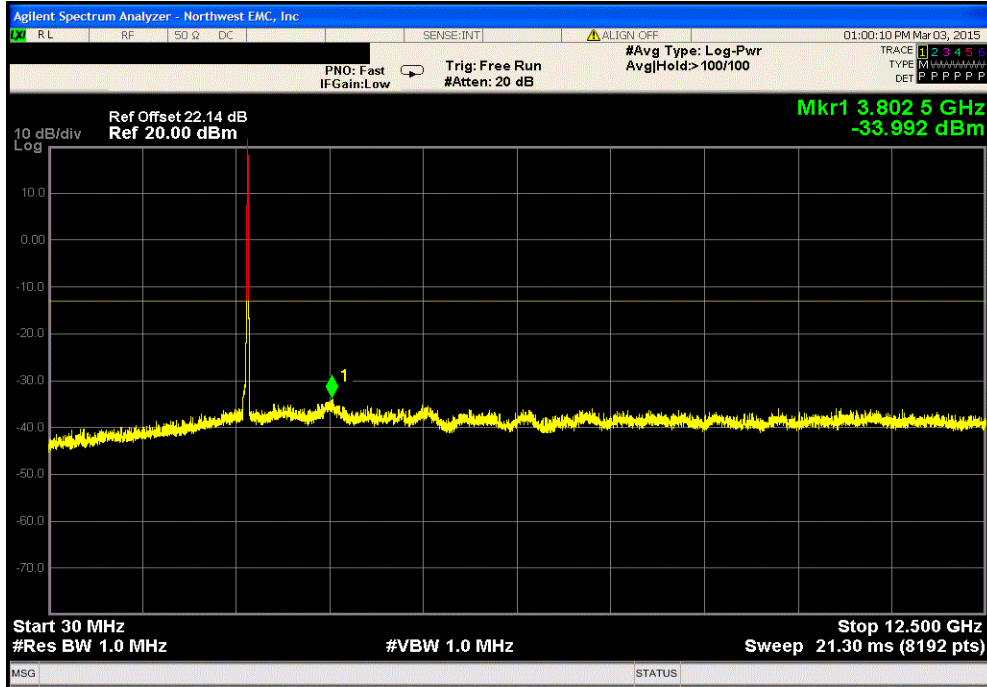


| LTE 20 MHz, Mid Channel 2593 MHz |             |               |        |  |
|----------------------------------|-------------|---------------|--------|--|
| Frequency Range                  | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 12.5 GHz - 27 GHz                | -32.05      | -13           | Pass   |  |

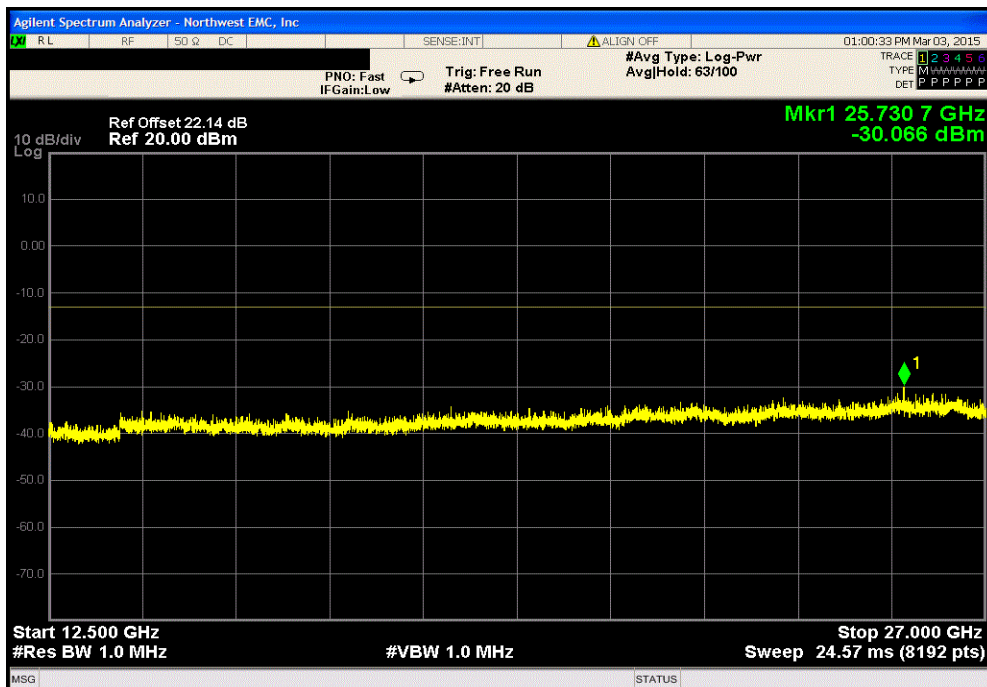


# SPURIOUS CONDUCTED EMISSIONS

| LTE 20 MHz, High Channel 2680 MHz |             |               |        |  |
|-----------------------------------|-------------|---------------|--------|--|
| Frequency Range                   | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 30 MHz - 12.5 GHz                 | -33.99      | -13           | Pass   |  |



| LTE 20 MHz, High Channel 2680 MHz |             |               |        |  |
|-----------------------------------|-------------|---------------|--------|--|
| Frequency Range                   | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 12.5 GHz - 27 GHz                 | -30.07      | -13           | Pass   |  |



# BAND EDGE COMPLIANCE

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

## TEST EQUIPMENT

| Description               | Manufacturer       | Model           | ID  | Last Cal.  | Interval (mo) |
|---------------------------|--------------------|-----------------|-----|------------|---------------|
| MN08 Direct Connect Cable | ESM Cable Corp.    | TTBJ141 KMKM-72 | MNU | 10/2/2014  | 12            |
| Attenuator - 20db, 'SMA'  | SM Electronics     | SA26B-20        | RFW | 4/3/2014   | 12            |
| 40 GHz DC Block           | Fairview Microwave | SD3379          | AMI | 10/2/2014  | 12            |
| Signal Generator MXG      | Agilent            | N5183A          | TIK | 10/17/2014 | 36            |
| Spectrum Analyzer         | Agilent            | E4440A          | AAX | 4/28/2014  | 12            |

## TEST DESCRIPTION

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

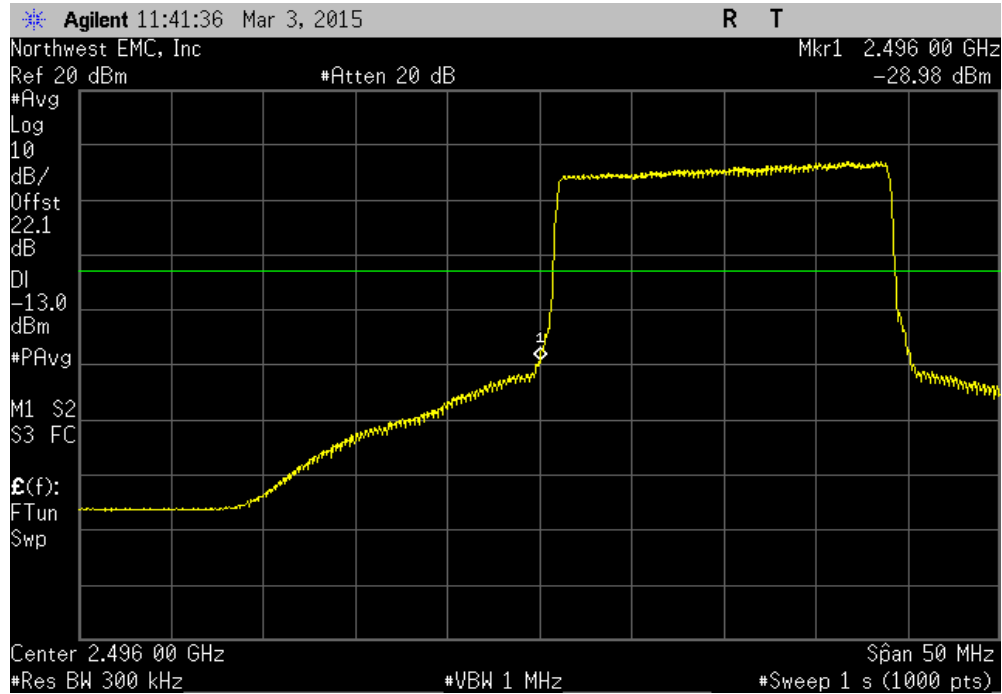
The spectrum was scanned below the lower band edge and above the higher band edge. The resolution bandwidth was set to approximately 1% of the measured emissions bandwidth within the first 1 MHz block adjacent to the transmit band. An average RMS detector was used to match the method used during Output Power. The screen capture shows the margin between the measured value and the limit at the band edge.

# BAND EDGE COMPLIANCE

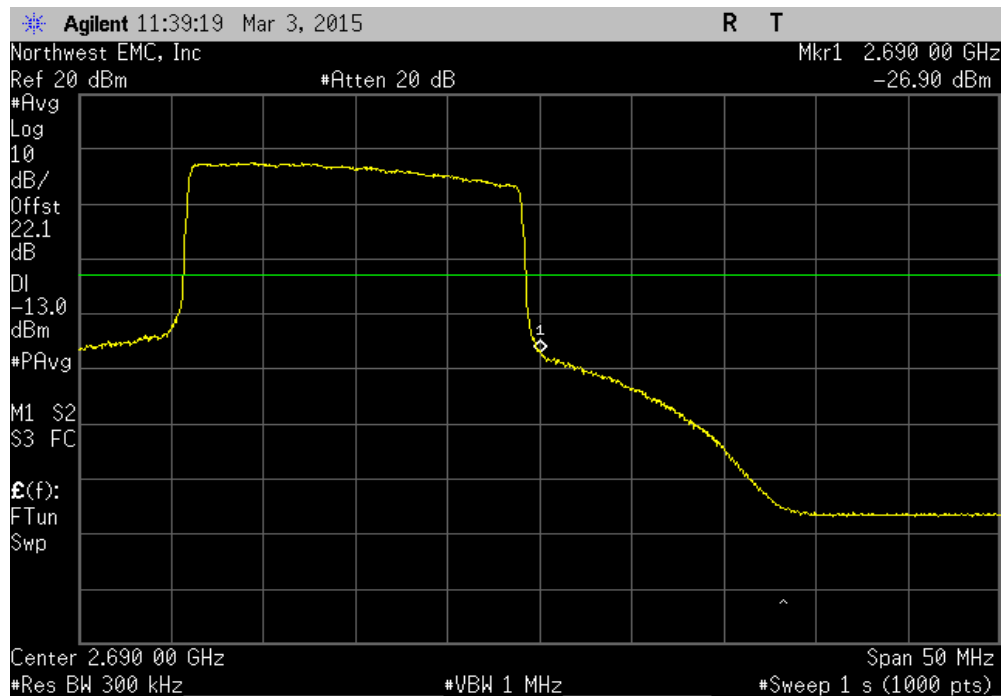
|                                                    |                    |                              |             |
|----------------------------------------------------|--------------------|------------------------------|-------------|
| EUT: InterReach Fusion TDD - 2.5 GHz -RAU          |                    | Work Order: TECO0025         |             |
| Serial Number: None                                |                    | Date: 03/03/15               |             |
| Customer: TE Connectivity / ADC Telecommunications |                    | Temperature: 22.5°C          |             |
| Attendees: None                                    |                    | Humidity: 16%                |             |
| Project: None                                      |                    | Barometric Pres.: 1007.7     |             |
| Tested by: Trevor Buls                             | Power: 110VAC/60Hz | Job Site: MN08               |             |
| TEST SPECIFICATIONS                                |                    |                              |             |
| FCC 27:2015                                        |                    | Test Method                  |             |
|                                                    |                    | ANSI/TIA/EIA-603-C-2004      |             |
| COMMENTS                                           |                    |                              |             |
| Port 1 was determined to be worst case.            |                    |                              |             |
| DEVIATIONS FROM TEST STANDARD                      |                    |                              |             |
| None                                               |                    |                              |             |
| Configuration #                                    | 1                  | Signature <i>Trevor Buls</i> |             |
|                                                    |                    | Value (dBm)                  | Limit (dBm) |
| LTE 20 MHz                                         |                    |                              | Result      |
| Low Channel 2506 MHz                               |                    | -28.98                       | Pass        |
| High Channel 2680 MHz                              |                    | -26.9                        | Pass        |

# BAND EDGE COMPLIANCE

| LTE 20 MHz, Low Channel 2506 MHz |  |  |  |                |                |        |
|----------------------------------|--|--|--|----------------|----------------|--------|
|                                  |  |  |  | Value<br>(dBm) | Limit<br>(dBm) | Result |
|                                  |  |  |  | -28.98         | -13            | Pass   |



| LTE 20 MHz, High Channel 2680 MHz |  |  |  |                |                |        |
|-----------------------------------|--|--|--|----------------|----------------|--------|
|                                   |  |  |  | Value<br>(dBm) | Limit<br>(dBm) | Result |
|                                   |  |  |  | -26.9          | -13            | Pass   |



# INTERMODULATION

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) |
|---------------------------|--------------------|-----------------|-----|------------|---------------|
| Signal Generator          | Rohde & Schwarz    | SML03           | TII | 3/28/2012  | 36            |
| Power Divider/Combiner    | Fairview Microwave | MP0208-2        | IAF | NCR        | 0             |
| Power Divider/Combiner    | Fairview Microwave | MP0208-2        | IAE | NCR        | 0             |
| Spectrum Analyzer         | Agilent            | N9010A          | AFI | 1/27/2015  | 12            |
| MN08 Direct Connect Cable | ESM Cable Corp.    | TTBJ141 KMKM-72 | MNU | 10/2/2014  | 12            |
| Attenuator - 20db, 'SMA'  | SM Electronics     | SA26B-20        | RFW | 4/3/2014   | 12            |
| 40 GHz DC Block           | Fairview Microwave | SD3379          | AMI | 10/2/2014  | 12            |
| Signal Generator MXG      | Agilent            | N5183A          | TIK | 10/17/2014 | 36            |
| Spectrum Analyzer         | Agilent            | E4440A          | AAX | 4/28/2014  | 12            |

## TEST DESCRIPTION

The EUT was configured with an input of a CW pulse at the top of the band, a CW pulse at the bottom of the band ,and a modulated pulse near the edge of the band.

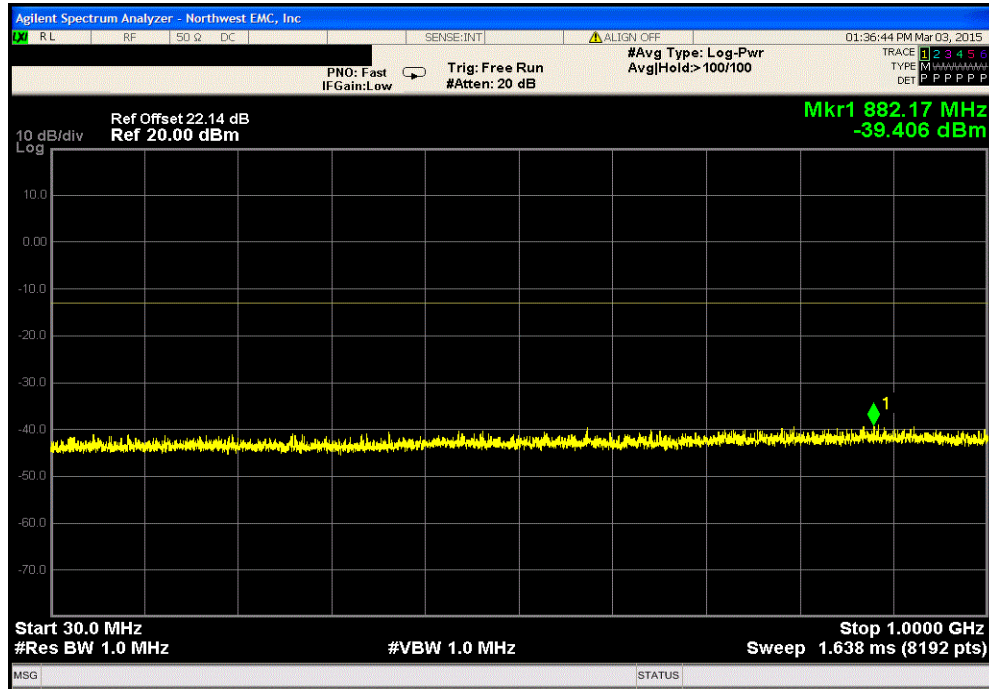
The antenna port spurious emissions were measured at the RF output terminal of the EUT with external attenuation on the RF input of the spectrum analyzer. Analyzer plots utilizing a 1MHz resolution bandwidth and no video filtering were made for each modulation type from 30 MHz to 27 GHz. The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated to ensure they were less than or equal to -13 dBm.

# INTERMODULATION

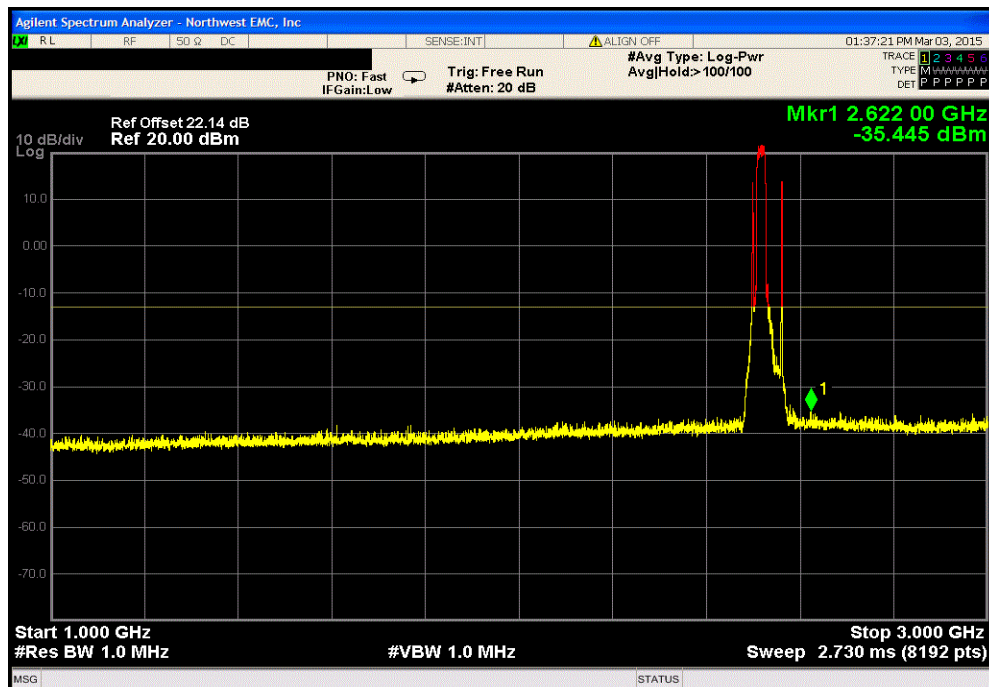
|                                                    |                    |                                      |               |
|----------------------------------------------------|--------------------|--------------------------------------|---------------|
| EUT: InterReach Fusion TDD - 2.5 GHz -RAU          |                    | Work Order: TECO0025                 |               |
| Serial Number: None                                |                    | Date: 03/03/15                       |               |
| Customer: TE Connectivity / ADC Telecommunications |                    | Temperature: 22.5°C                  |               |
| Attendees: None                                    |                    | Humidity: 16%                        |               |
| Project: None                                      |                    | Barometric Pres.: 1007.7             |               |
| Tested by: Trevor Buls                             | Power: 110VAC/60Hz | Job Site: MN08                       |               |
| TEST SPECIFICATIONS                                |                    |                                      |               |
| FCC 27:2015                                        |                    | Test Method: ANSI/TIA/EIA-603-C-2004 |               |
| COMMENTS                                           |                    |                                      |               |
| Port 1 was determined to be worst case.            |                    |                                      |               |
| DEVIATIONS FROM TEST STANDARD                      |                    |                                      |               |
| None                                               |                    |                                      |               |
| Configuration #                                    | 1                  | Signature: <i>Trevor Buls</i>        |               |
|                                                    |                    | Frequency Range                      | Value (dBm)   |
|                                                    |                    |                                      | Limit ≤ (dBm) |
|                                                    |                    |                                      | Result        |
| LTE 20 MHz                                         |                    |                                      |               |
| Low Band                                           |                    | 30 MHz - 1 GHz                       | -39.41        |
| Low Band                                           |                    | 1 GHz - 3 GHz                        | -35.45        |
| Low Band                                           |                    | 3 GHz - 12.5 GHz                     | -34.05        |
| Low Band                                           |                    | 12.5 GHz - 27 GHz                    | -31.31        |
| Mid Band                                           |                    | 30 MHz - 1 GHz                       | -39.04        |
| Mid Band                                           |                    | 1 GHz - 3 GHz                        | -35.5         |
| Mid Band                                           |                    | 3 GHz - 12.5 GHz                     | -34.33        |
| Mid Band                                           |                    | 12.5 GHz - 27 GHz                    | -31.16        |
| High Band                                          |                    | 30 MHz - 1 GHz                       | -38.62        |
| High Band                                          |                    | 1 GHz - 3 GHz                        | -32.07        |
| High Band                                          |                    | 3 GHz - 12.5 GHz                     | -33.84        |
| High Band                                          |                    | 12.5 GHz - 27 GHz                    | -31.35        |

# INTERMODULATION

| LTE 20 MHz, Low Band |             |               |        |  |  |
|----------------------|-------------|---------------|--------|--|--|
| Frequency Range      | Value (dBm) | Limit ≤ (dBm) | Result |  |  |
| 30 MHz - 1 GHz       | -39.41      | -13           | Pass   |  |  |

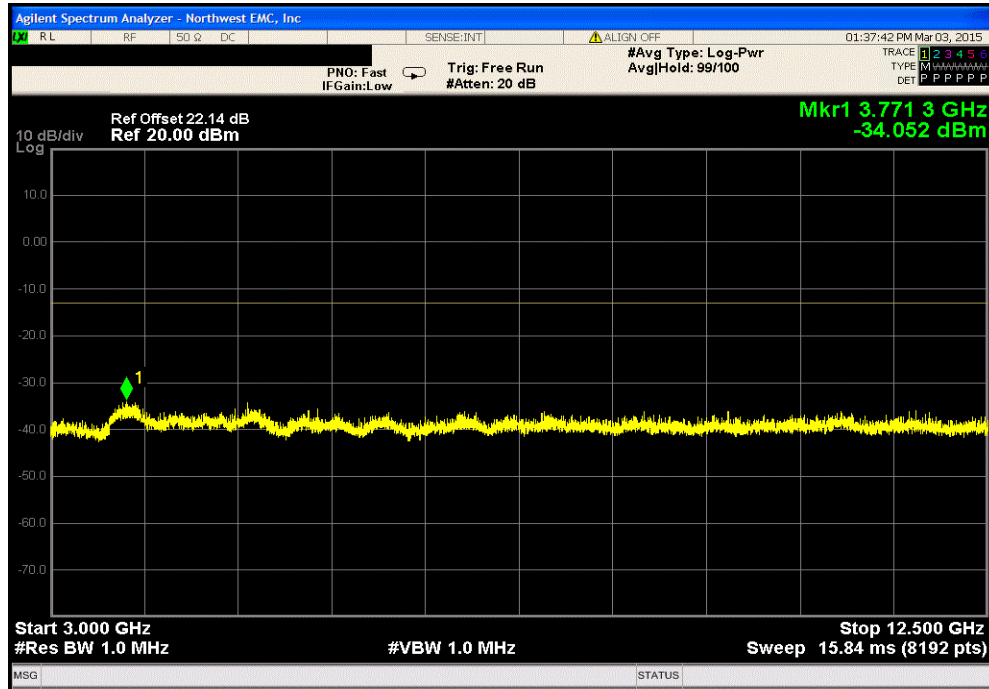


| LTE 20 MHz, Low Band |             |               |        |  |  |
|----------------------|-------------|---------------|--------|--|--|
| Frequency Range      | Value (dBm) | Limit ≤ (dBm) | Result |  |  |
| 1 GHz - 3 GHz        | -35.45      | -13           | Pass   |  |  |

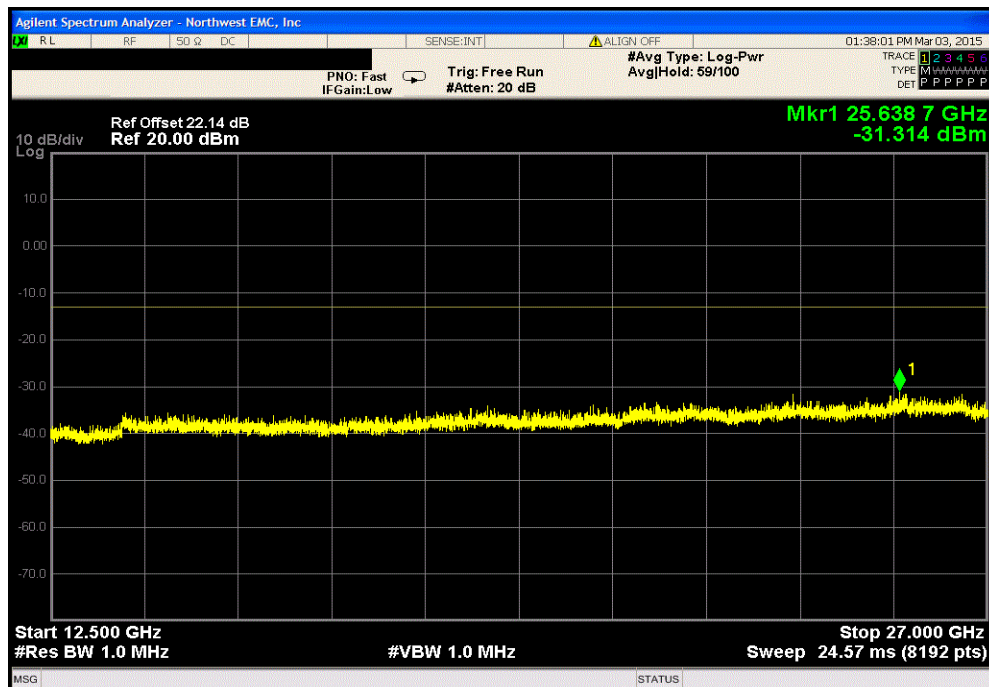


# INTERMODULATION

| LTE 20 MHz, Low Band |             |               |        |  |
|----------------------|-------------|---------------|--------|--|
| Frequency Range      | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 3 GHz - 12.5 GHz     | -34.05      | -13           | Pass   |  |

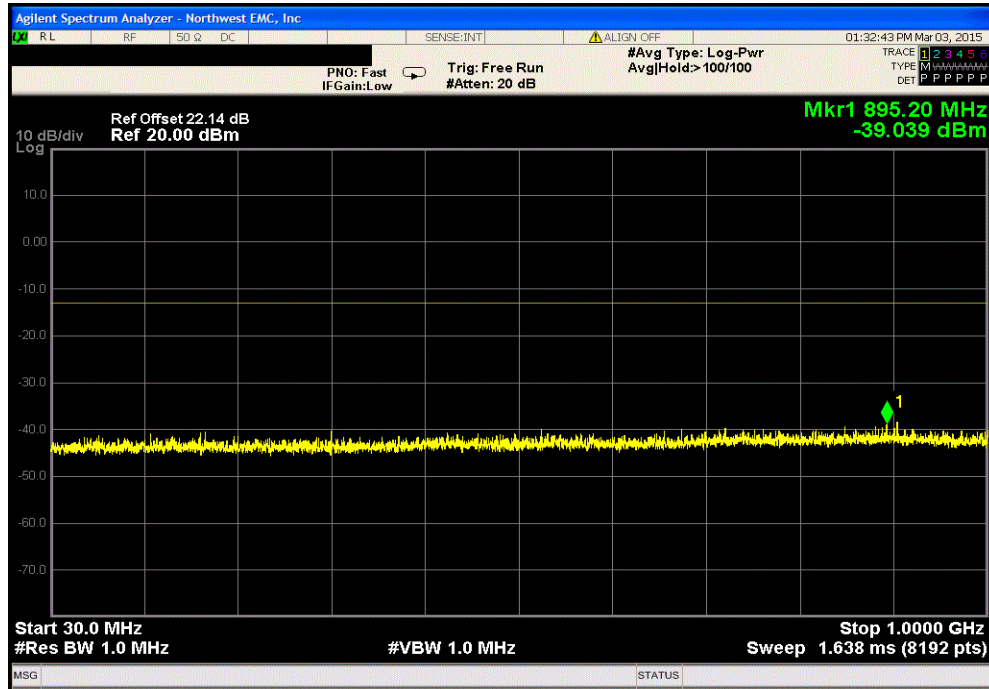


| LTE 20 MHz, Low Band |             |               |        |  |
|----------------------|-------------|---------------|--------|--|
| Frequency Range      | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 12.5 GHz - 27 GHz    | -31.31      | -13           | Pass   |  |

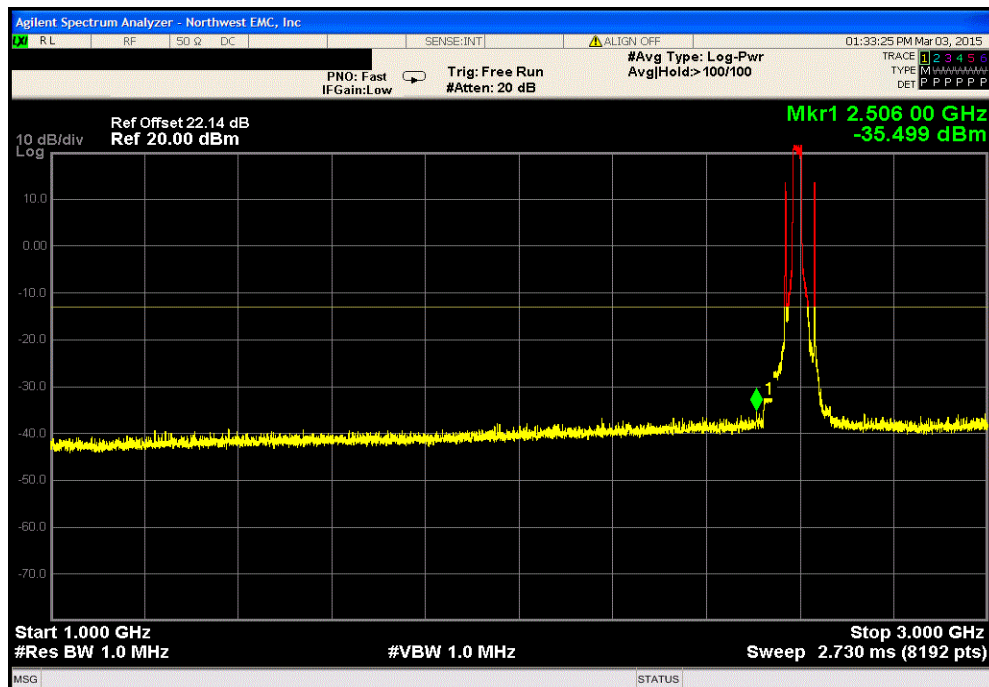


# INTERMODULATION

| LTE 20 MHz, Mid Band |             |               |        |  |  |
|----------------------|-------------|---------------|--------|--|--|
| Frequency Range      | Value (dBm) | Limit ≤ (dBm) | Result |  |  |
| 30 MHz - 1 GHz       | -39.04      | -13           | Pass   |  |  |

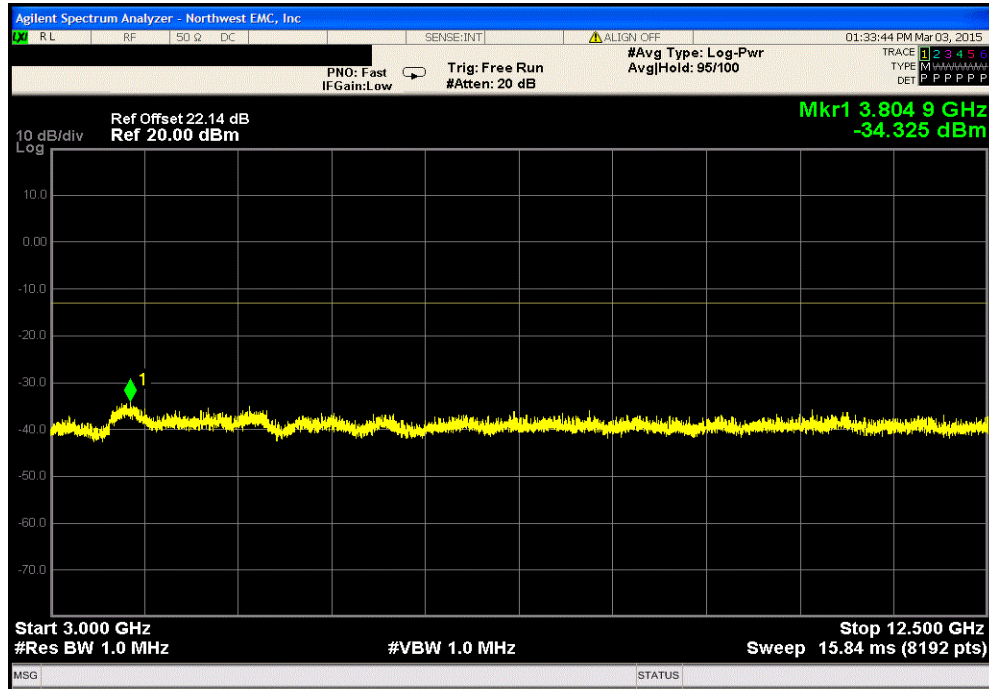


| LTE 20 MHz, Mid Band |             |               |        |  |  |
|----------------------|-------------|---------------|--------|--|--|
| Frequency Range      | Value (dBm) | Limit ≤ (dBm) | Result |  |  |
| 1 GHz - 3 GHz        | -35.5       | -13           | Pass   |  |  |

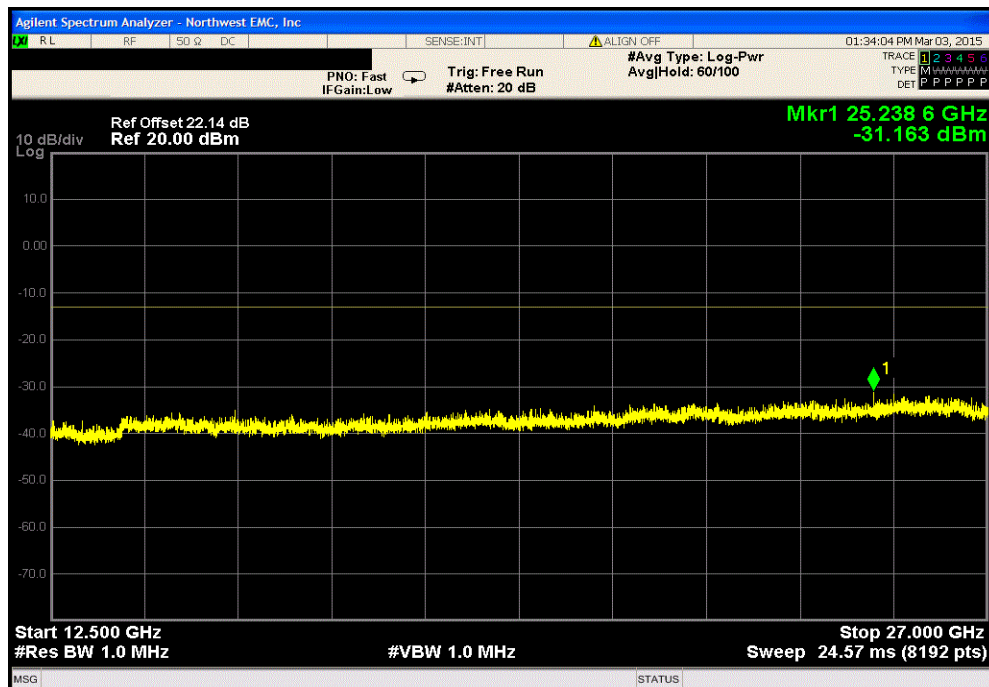


# INTERMODULATION

| LTE 20 MHz, Mid Band |             |               |        |  |
|----------------------|-------------|---------------|--------|--|
| Frequency Range      | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 3 GHz - 12.5 GHz     | -34.33      | -13           | Pass   |  |

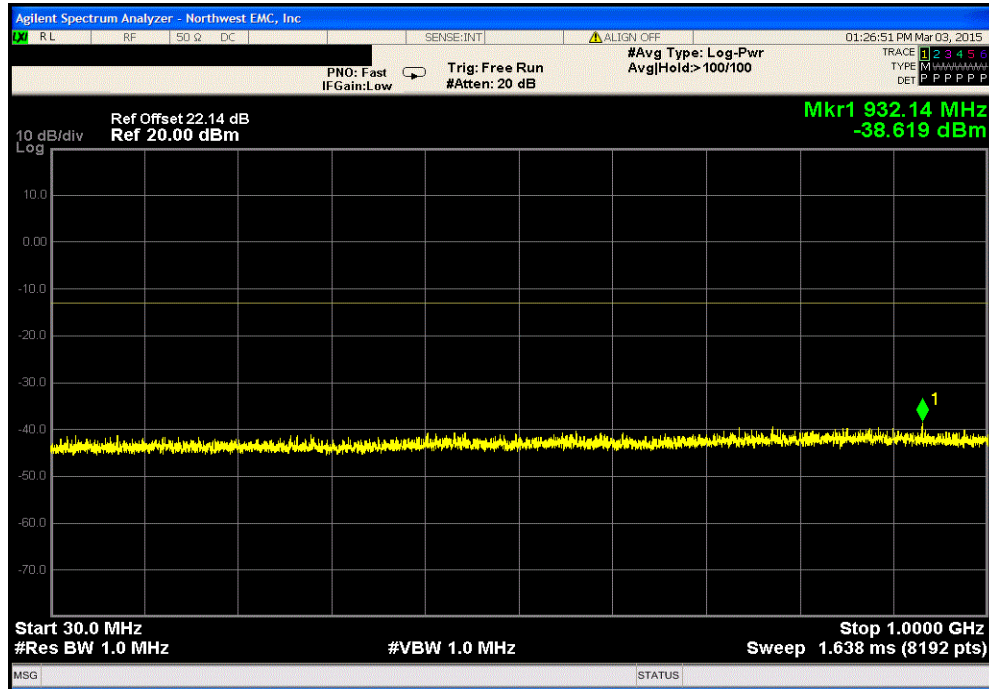


| LTE 20 MHz, Mid Band |             |               |        |  |
|----------------------|-------------|---------------|--------|--|
| Frequency Range      | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 12.5 GHz - 27 GHz    | -31.16      | -13           | Pass   |  |

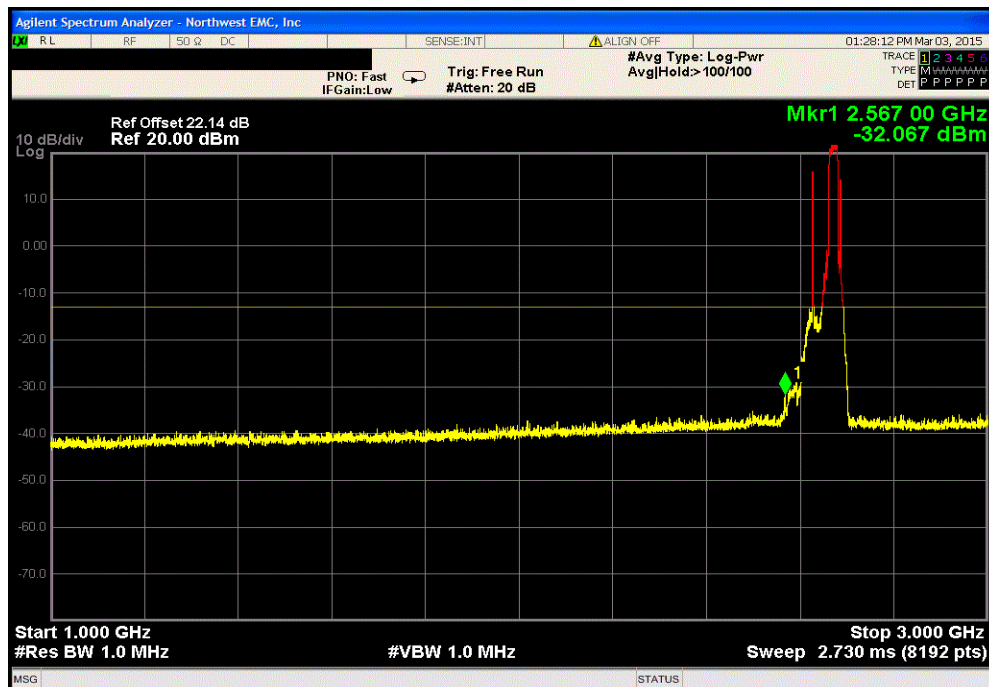


# INTERMODULATION

| LTE 20 MHz, High Band |             |               |        |  |  |
|-----------------------|-------------|---------------|--------|--|--|
| Frequency Range       | Value (dBm) | Limit ≤ (dBm) | Result |  |  |
| 30 MHz - 1 GHz        | -38.62      | -13           | Pass   |  |  |

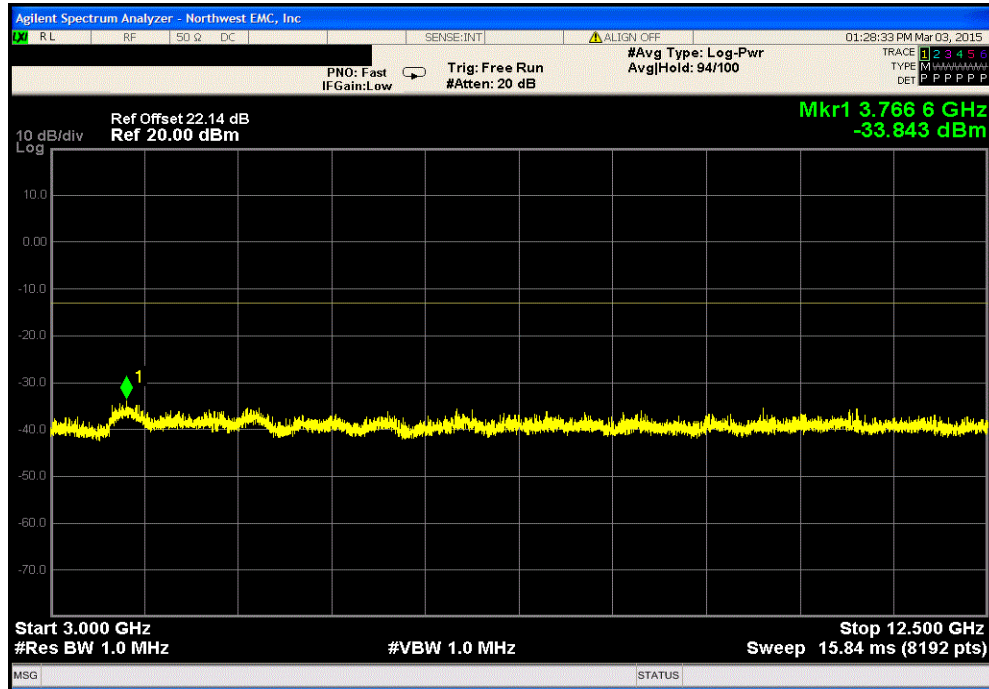


| LTE 20 MHz, High Band |             |               |        |  |  |
|-----------------------|-------------|---------------|--------|--|--|
| Frequency Range       | Value (dBm) | Limit ≤ (dBm) | Result |  |  |
| 1 GHz - 3 GHz         | -32.07      | -13           | Pass   |  |  |

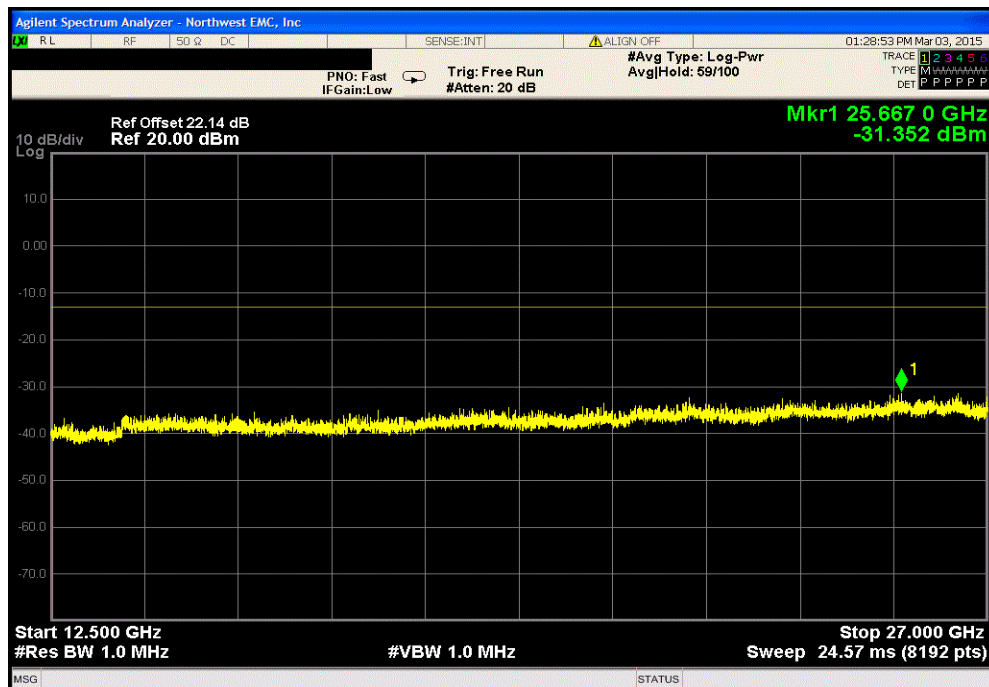


# INTERMODULATION

| LTE 20 MHz, High Band |             |               |        |  |
|-----------------------|-------------|---------------|--------|--|
| Frequency Range       | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 3 GHz - 12.5 GHz      | -33.84      | -13           | Pass   |  |



| LTE 20 MHz, High Band |             |               |        |  |
|-----------------------|-------------|---------------|--------|--|
| Frequency Range       | Value (dBm) | Limit ≤ (dBm) | Result |  |
| 12.5 GHz - 27 GHz     | -31.35      | -13           | Pass   |  |



# 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) |
|------------------------------|---------------------------|-------------------|-----|------------|---------------|
| Thermometer                  | Omega Engineering, Inc.   | HH311             | DUB | 11/3/2014  | 36            |
| Humidity Temperature Chamber | Cincinnati Sub Zero (CSZ) | ZPH-32-3.5-SCT/AC | TBF | NCR        | 0             |
| Multimeter                   | Fluke                     | 117               | MLS | 1/20/2014  | 36            |
| Variable Transformer         | Powerstat                 | 246               | XFR | NCR        | 0             |
| MN08 Direct Connect Cable    | ESM Cable Corp.           | TTBJ141 KMKM-72   | MNU | 10/2/2014  | 12            |
| Attenuator - 20db, 'SMA'     | SM Electronics            | SA26B-20          | RFW | 4/3/2014   | 12            |
| 40 GHz DC Block              | Fairview Microwave        | SD3379            | AMI | 10/2/2014  | 12            |
| Signal Generator MXG         | Agilent                   | N5183A            | TIK | 10/17/2014 | 36            |
| Spectrum Analyzer            | Agilent                   | E4440A            | AAX | 4/28/2014  | 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 was done with an absence of modulation in a CW mode of operation.

The primary supply voltage was varied from 85 % to 115% 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 Part 27.54:

"The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation."

No specific limits are provided in either FCC 27.54, 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 1ppm will still allow the radio to be operating within the band.

# FREQUENCY STABILITY

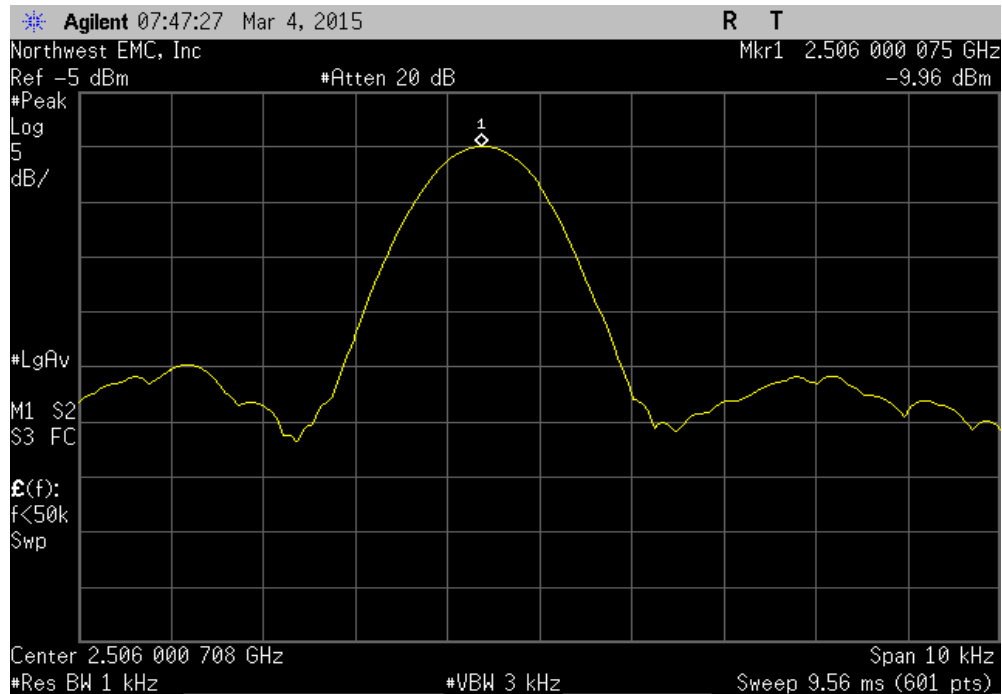


XMR 2015.01.14

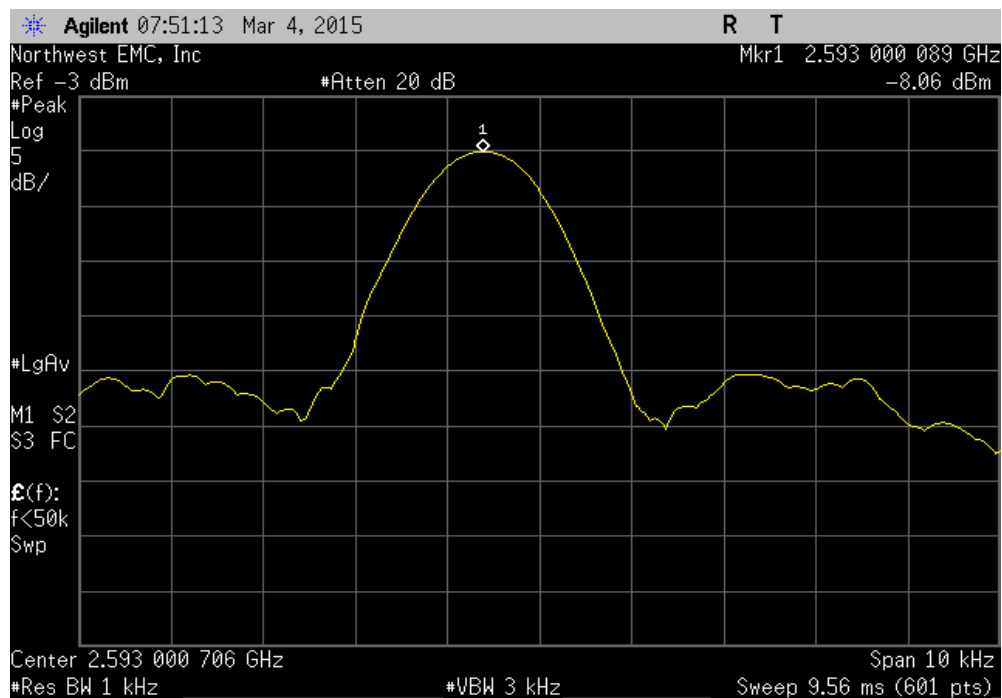
|                                                                                  |                        |                              |                      |
|----------------------------------------------------------------------------------|------------------------|------------------------------|----------------------|
| EUT: InterReach Fusion TDD - 2.5 GHz -RAU                                        |                        | Work Order: TECO0025         |                      |
| Serial Number: None                                                              |                        | Date: 03/04/15               |                      |
| Customer: TE Connectivity / ADC Telecommunications                               |                        | Temperature: 22.4°C          |                      |
| Attendees: None                                                                  |                        | Humidity: 13%                |                      |
| Project: None                                                                    |                        | Barometric Pres.: 1026.7     |                      |
| Tested by: Trevor Buls                                                           | Power: 110VAC/60Hz     | Job Site: MN08               |                      |
| TEST SPECIFICATIONS                                                              |                        | Test Method                  |                      |
| FCC 27:2015                                                                      |                        | ANSI/TIA/EIA-603-C-2004      |                      |
| COMMENTS                                                                         |                        |                              |                      |
| Port 1 was determined to be worst case. Voltage varied from 126.5VAC to 93.5VAC. |                        |                              |                      |
| DEVIATIONS FROM TEST STANDARD                                                    |                        |                              |                      |
| None                                                                             |                        |                              |                      |
| Configuration #                                                                  | 2                      | Signature <i>Trevor Buls</i> |                      |
|                                                                                  |                        | Measured Value (MHz)         | Assigned Value (MHz) |
|                                                                                  |                        | Error (ppm)                  | Limit (ppm)          |
|                                                                                  |                        |                              | Results              |
| Voltage: 115%                                                                    |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000075                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000089                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000086                  | 2680                 |
| Voltage: 100%                                                                    |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000075                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000009                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000086                  | 2680                 |
| Voltage: 85%                                                                     |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000078                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000073                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000086                  | 2680                 |
| Temperature: +50°                                                                |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000091                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000089                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000102                  | 2680                 |
| Temperature: +40°                                                                |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000075                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000009                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000004                  | 2680                 |
| Temperature: +30°                                                                |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000133                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000126                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000036                  | 2680                 |
| Temperature: +20°                                                                |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000075                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000073                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000085                  | 2680                 |
| Temperature: +10°                                                                |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000092                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000009                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000136                  | 2680                 |
| Temperature: 0°                                                                  |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000062                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000127                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000087                  | 2680                 |
| Temperature: -10°                                                                |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000068                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000024                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000137                  | 2680                 |
| Temperature: -20°                                                                |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000129                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000079                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000104                  | 2680                 |
| Temperature: -30°                                                                |                        |                              |                      |
|                                                                                  | Low Channel, 2506 MHz  | 2506.000113                  | 2506                 |
|                                                                                  | Mid Channel, 2593 MHz  | 2593.000059                  | 2593                 |
|                                                                                  | High Channel, 2680 MHz | 2680.000069                  | 2680                 |

# FREQUENCY STABILITY

| Voltage: 115%, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|--------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                      | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                      | 2506.000075          | 2506                 | 0           | 1           | Pass    |  |

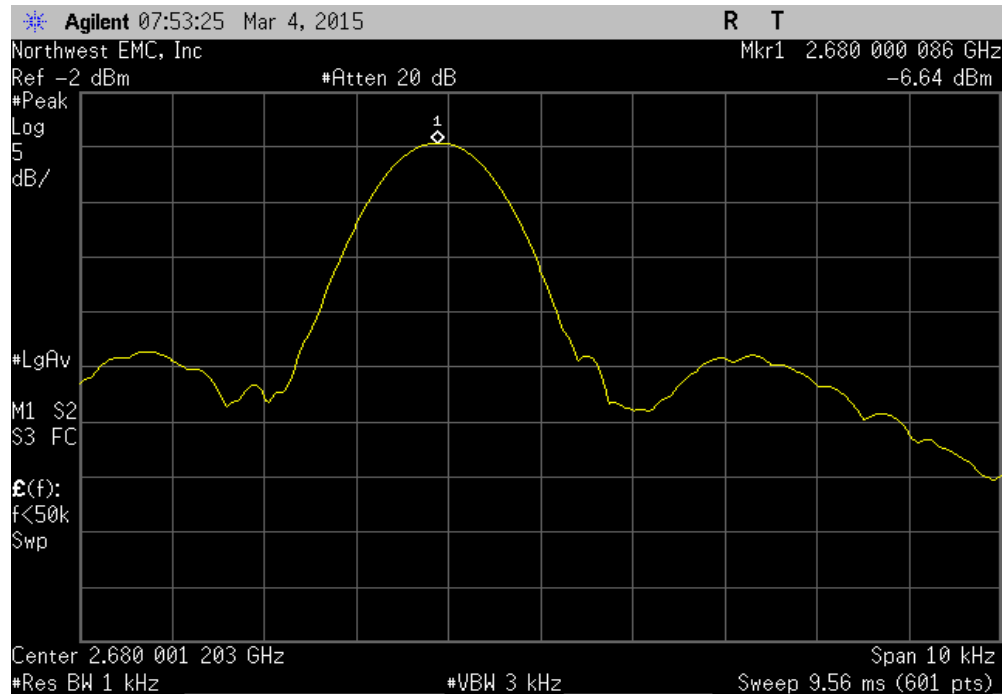


| Voltage: 115%, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|--------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                      | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                      | 2593.000089          | 2593                 | 0           | 1           | Pass    |  |

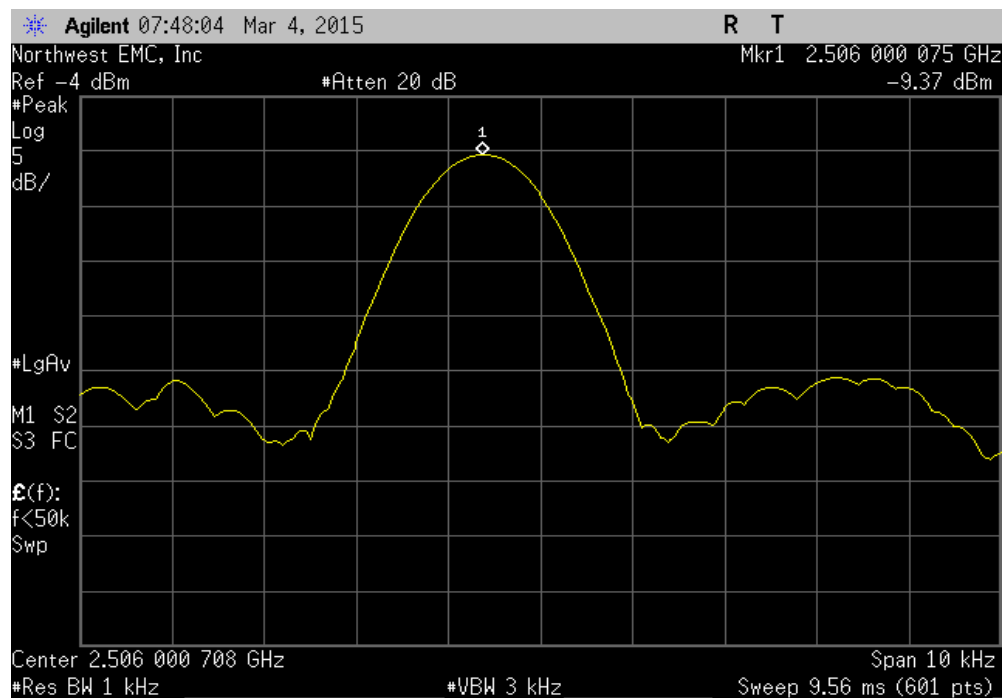


# FREQUENCY STABILITY

| Voltage: 115%, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|---------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                       | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                       | 2680.000086          | 2680                 | 0           | 1           | Pass    |  |

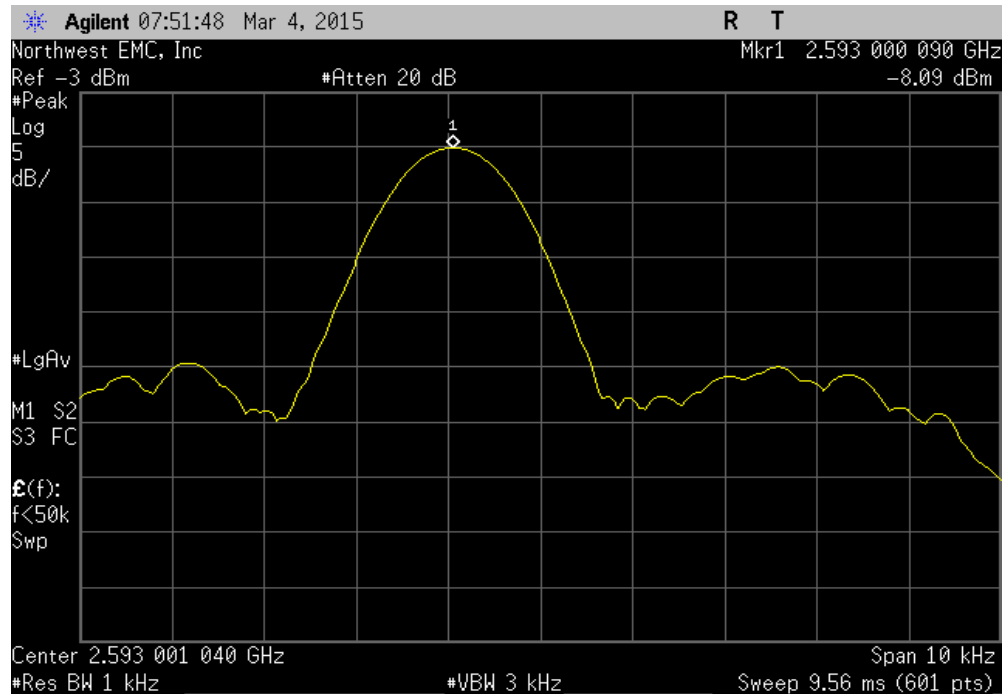


| Voltage: 100%, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|--------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                      | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                      | 2506.000075          | 2506                 | 0           | 1           | Pass    |  |

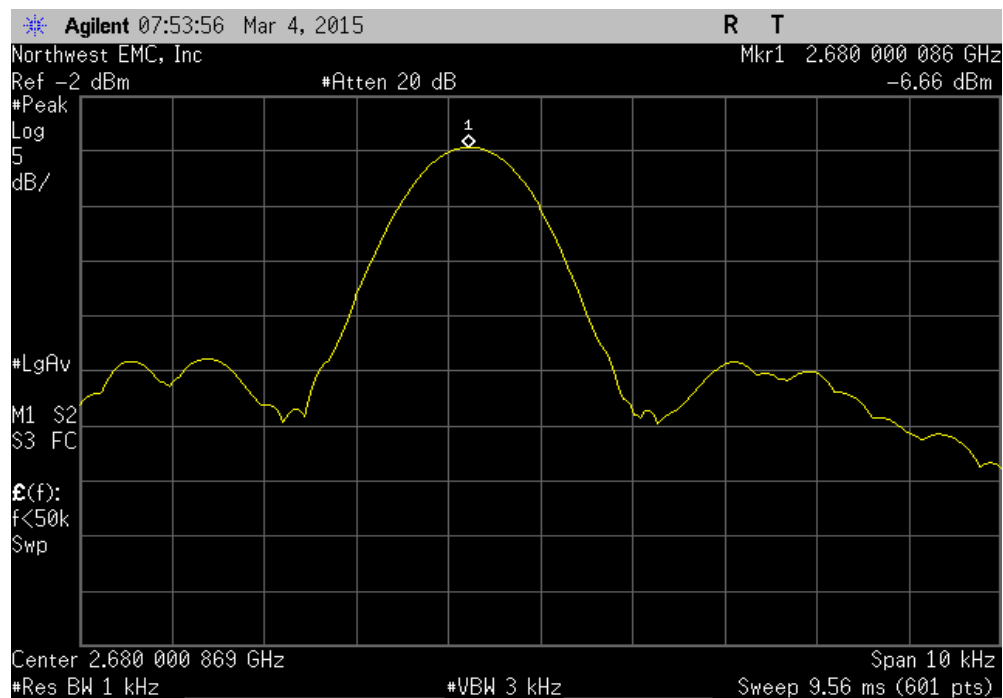


# FREQUENCY STABILITY

| Voltage: 100%, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|--------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                      | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                      | 2593.00009           | 2593                 | 0           | 1           | Pass    |  |

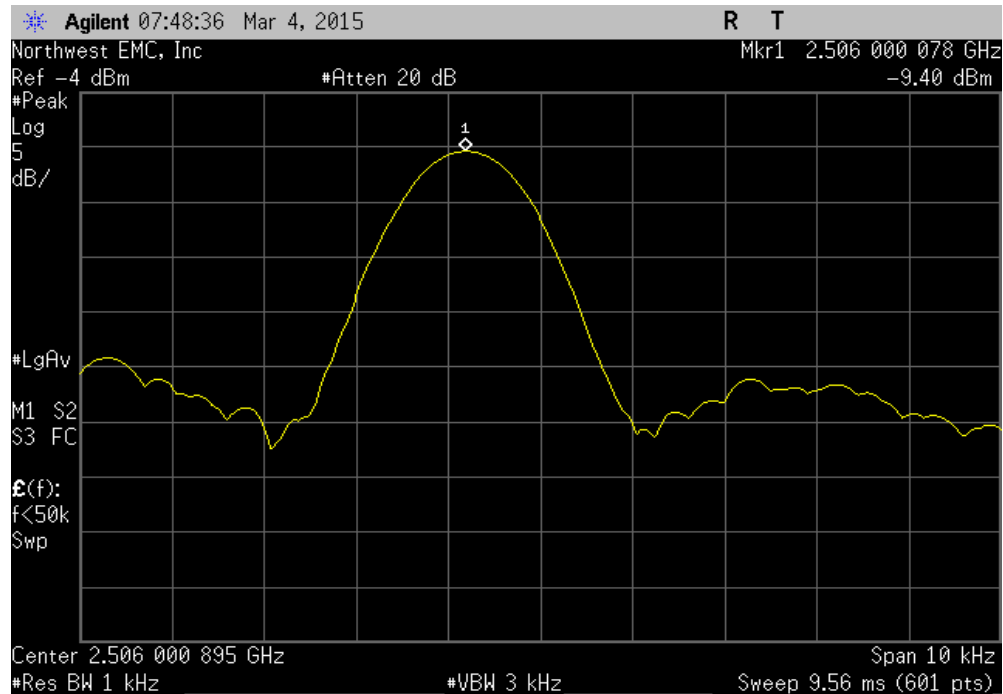


| Voltage: 100%, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|---------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                       | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                       | 2680.000086          | 2680                 | 0           | 1           | Pass    |  |

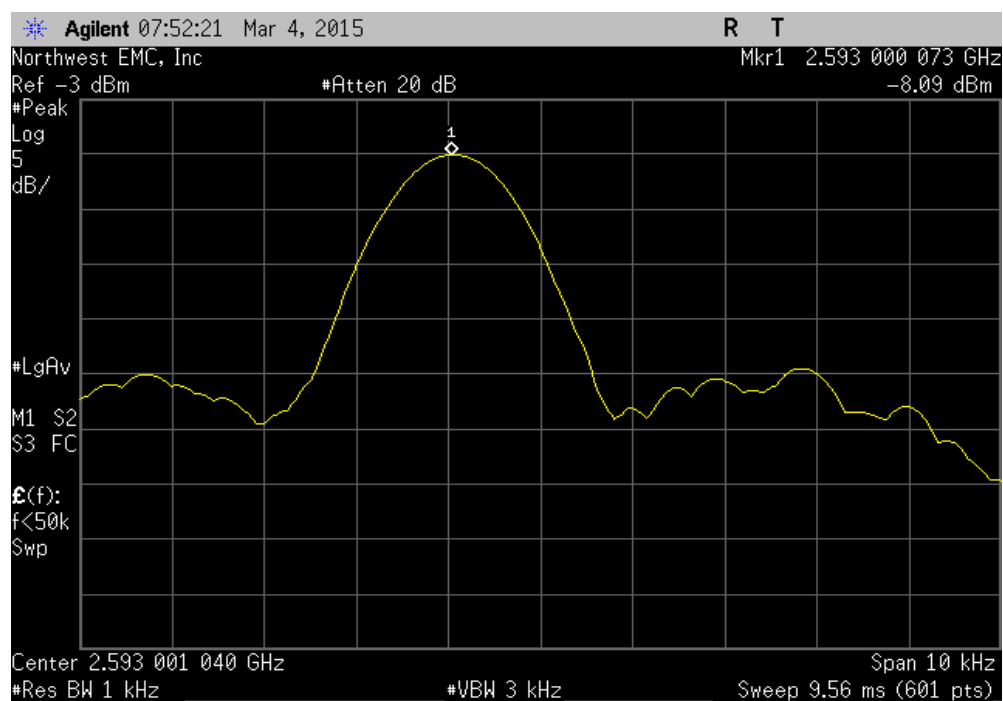


# FREQUENCY STABILITY

| Voltage: 85%, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|-------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                     | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                     | 2506.000078          | 2506                 | 0           | 1           | Pass    |  |

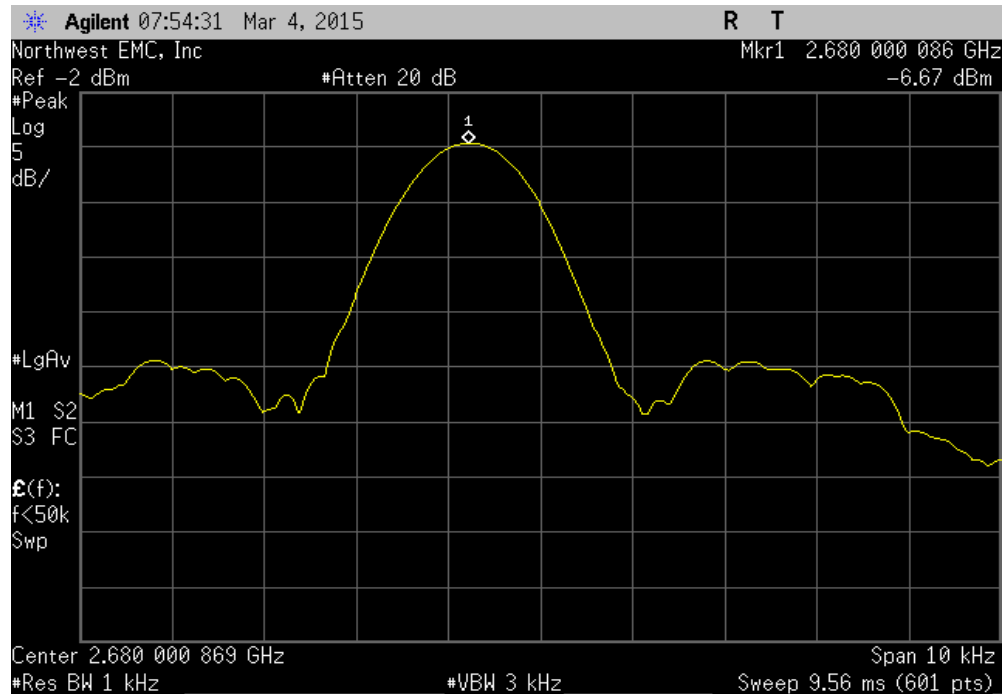


| Voltage: 85%, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|-------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                     | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                     | 2593.000073          | 2593                 | 0           | 1           | Pass    |  |

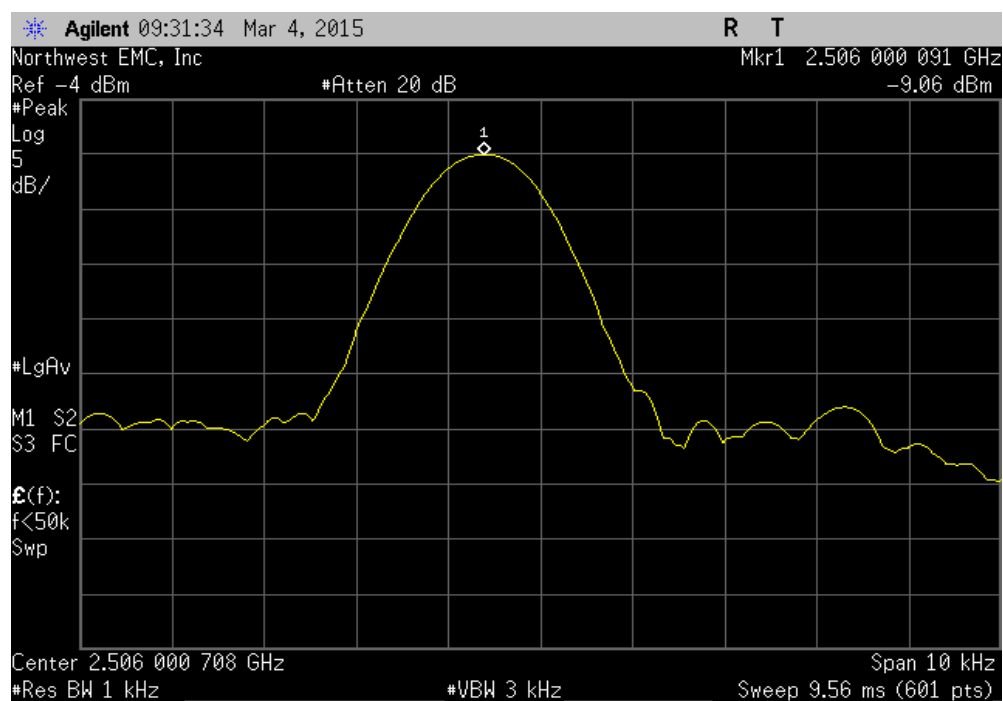


# FREQUENCY STABILITY

| Voltage: 85%, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|--------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                      | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                      | 2680.000086          | 2680                 | 0           | 1           | Pass    |  |

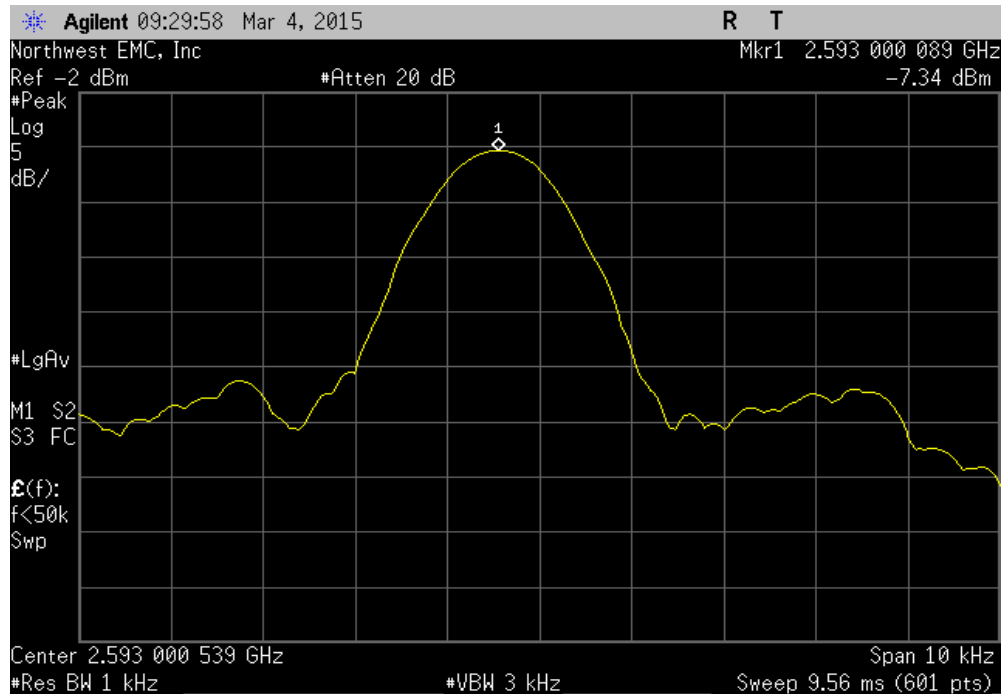


| Temperature: +50°, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2506.000091          | 2506                 | 0           | 1           | Pass    |  |

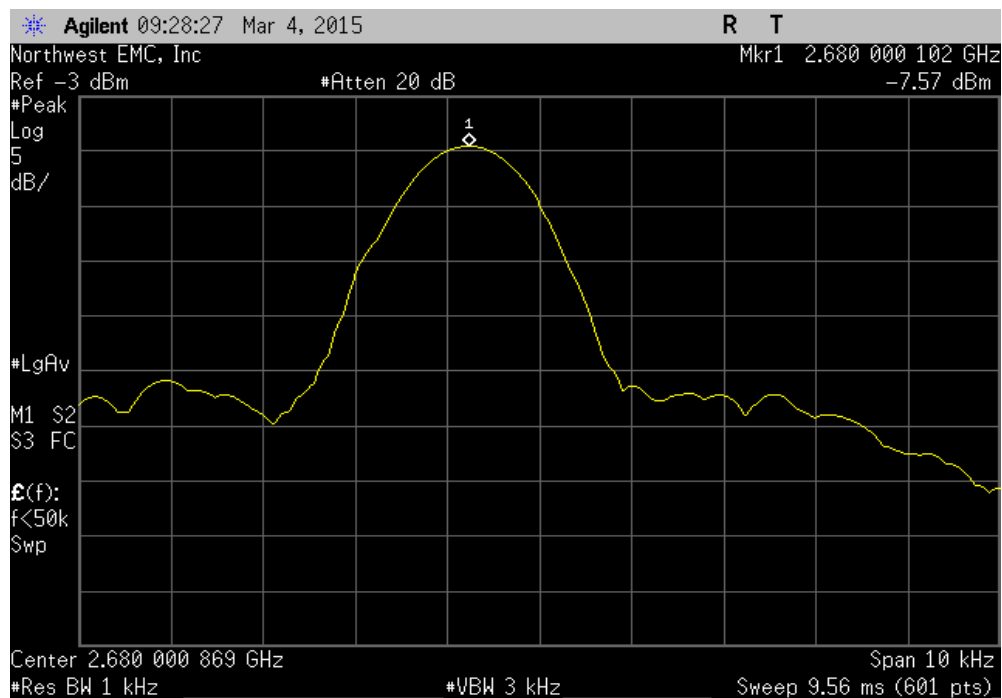


# FREQUENCY STABILITY

| Temperature: +50°, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2593.000089          | 2593                 | 0           | 1           | Pass    |  |

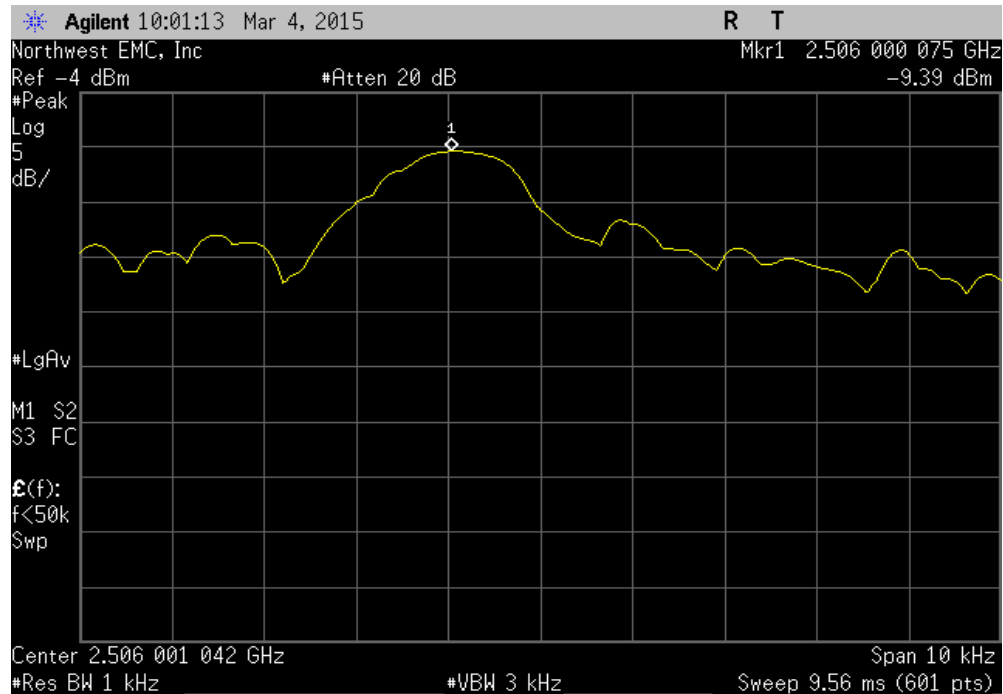


| Temperature: +50°, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|-------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                           | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                           | 2680.000102          | 2680                 | 0           | 1           | Pass    |  |

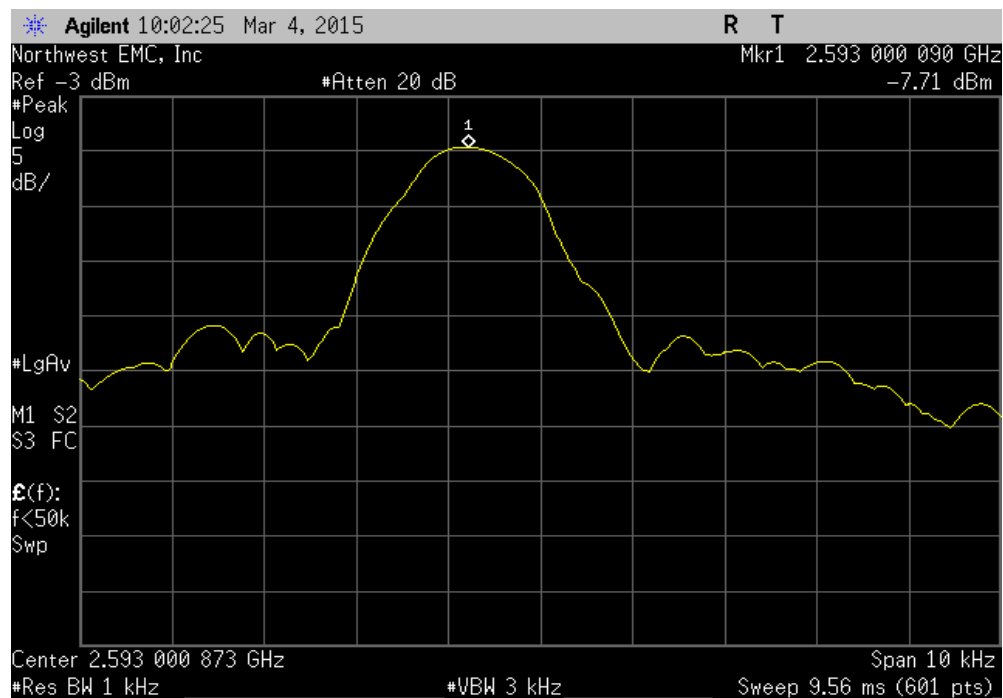


# FREQUENCY STABILITY

| Temperature: +40°, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2506.000075          | 2506                 | 0           | 1           | Pass    |  |

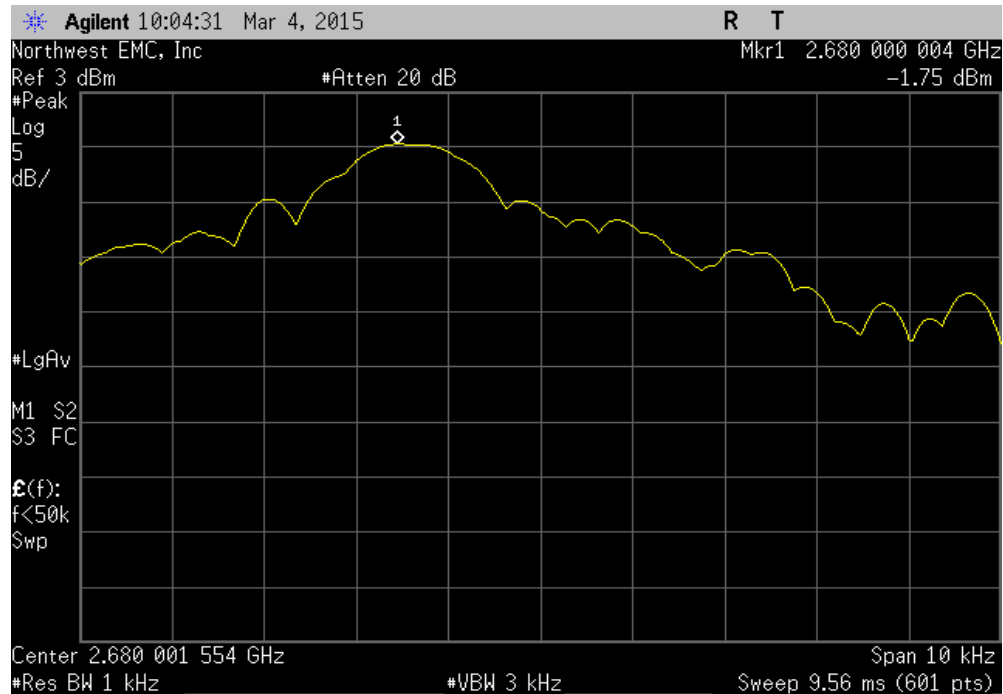


| Temperature: +40°, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2593.00009           | 2593                 | 0           | 1           | Pass    |  |

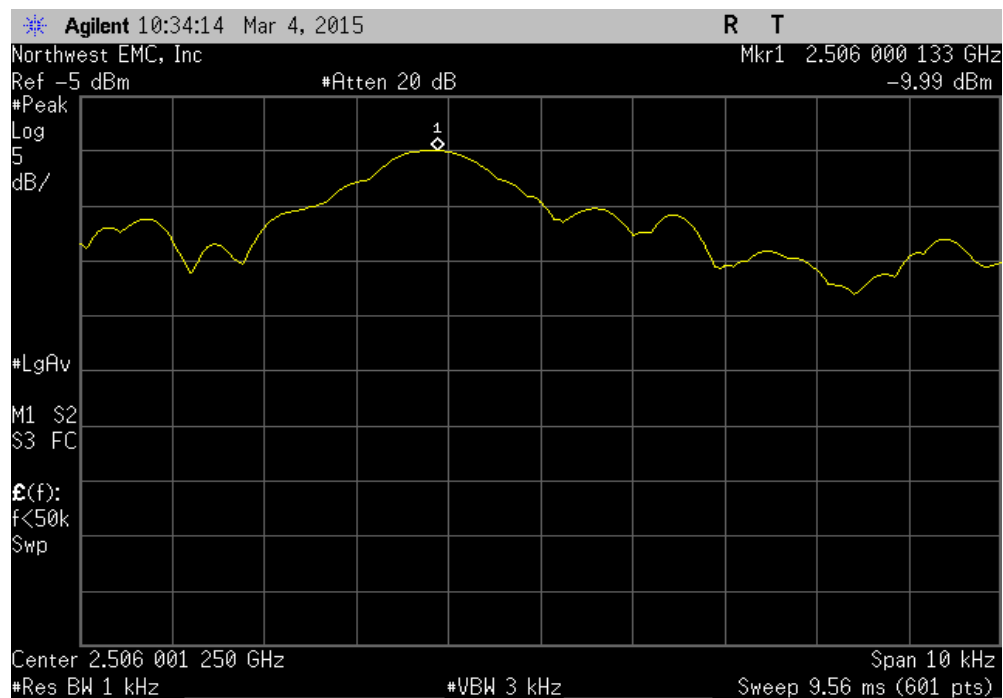


# FREQUENCY STABILITY

| Temperature: +40°, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|-------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                           | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                           | 2680.000004          | 2680                 | 0           | 1           | Pass    |  |

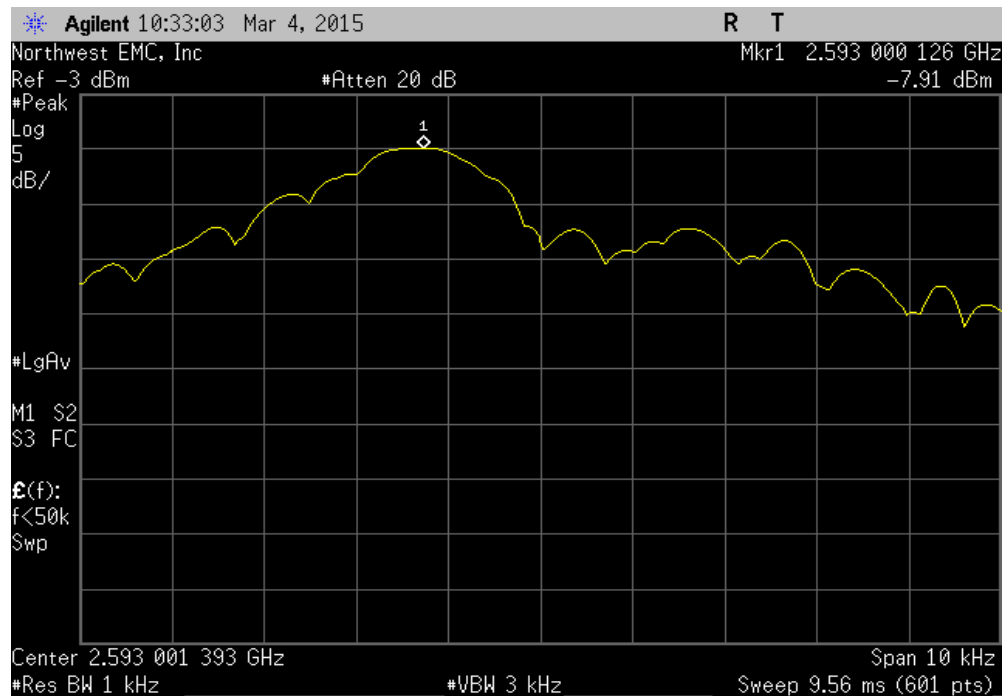


| Temperature: +30°, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2506.000133          | 2506                 | 0.1         | 1           | Pass    |  |

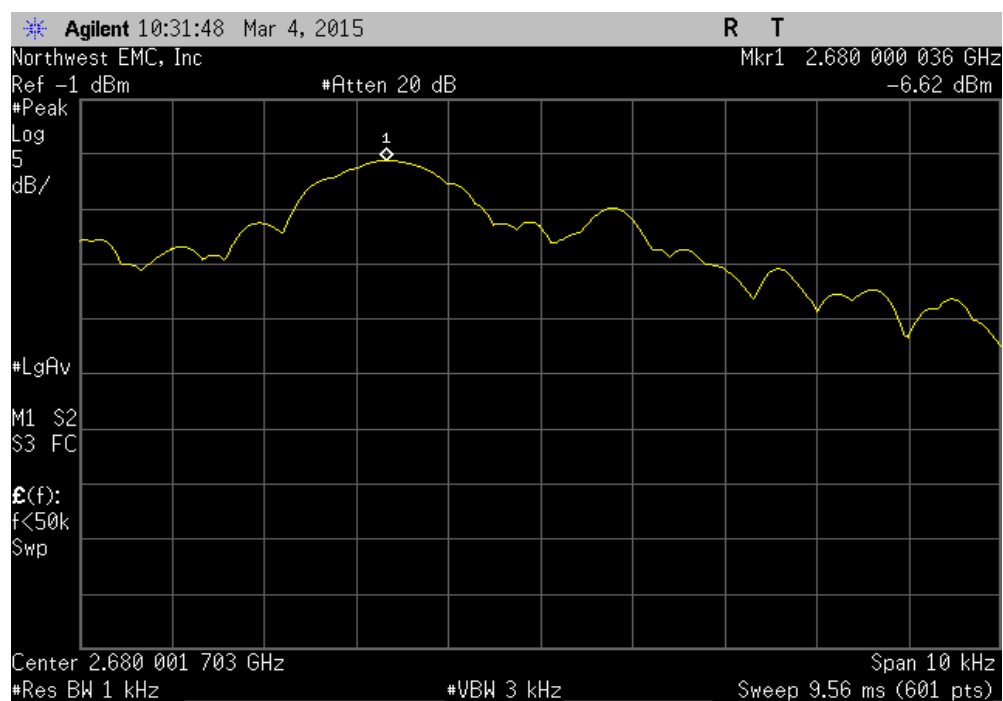


# FREQUENCY STABILITY

| Temperature: +30°, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2593.000126          | 2593                 | 0.1         | 1           | Pass    |  |

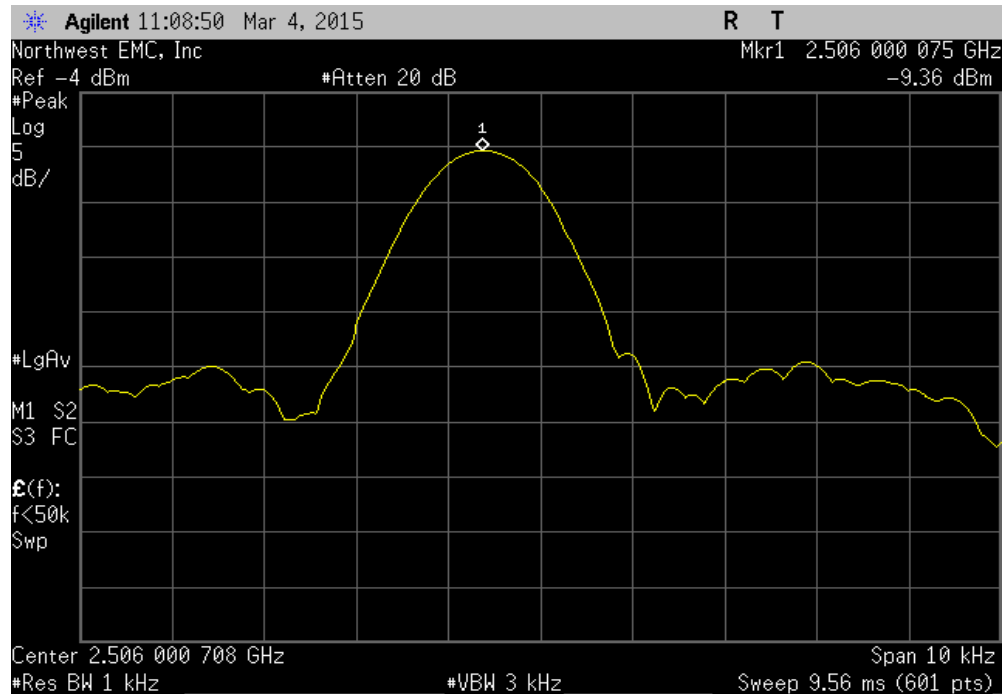


| Temperature: +30°, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|-------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                           | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                           | 2680.000036          | 2680                 | 0           | 1           | Pass    |  |

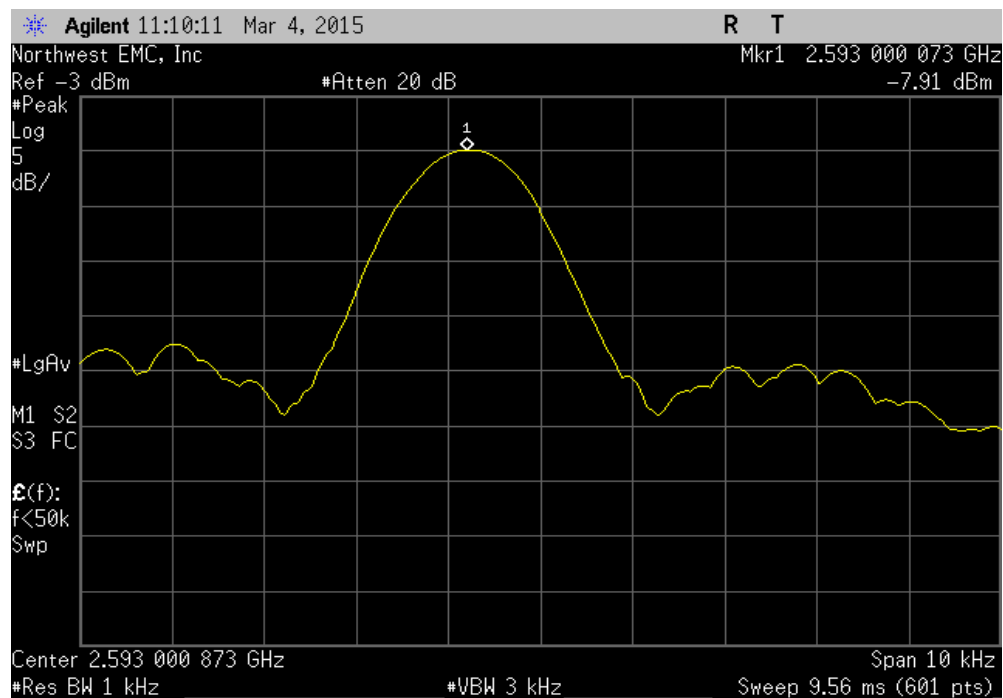


# FREQUENCY STABILITY

| Temperature: +20°, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2506.000075          | 2506                 | 0           | 1           | Pass    |  |

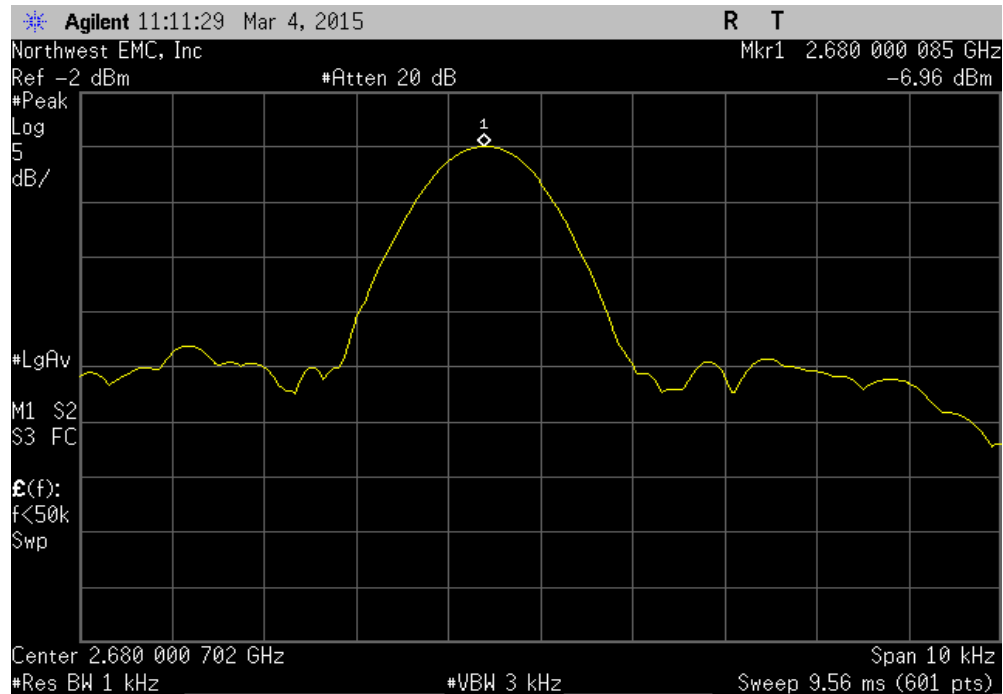


| Temperature: +20°, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2593.000073          | 2593                 | 0           | 1           | Pass    |  |

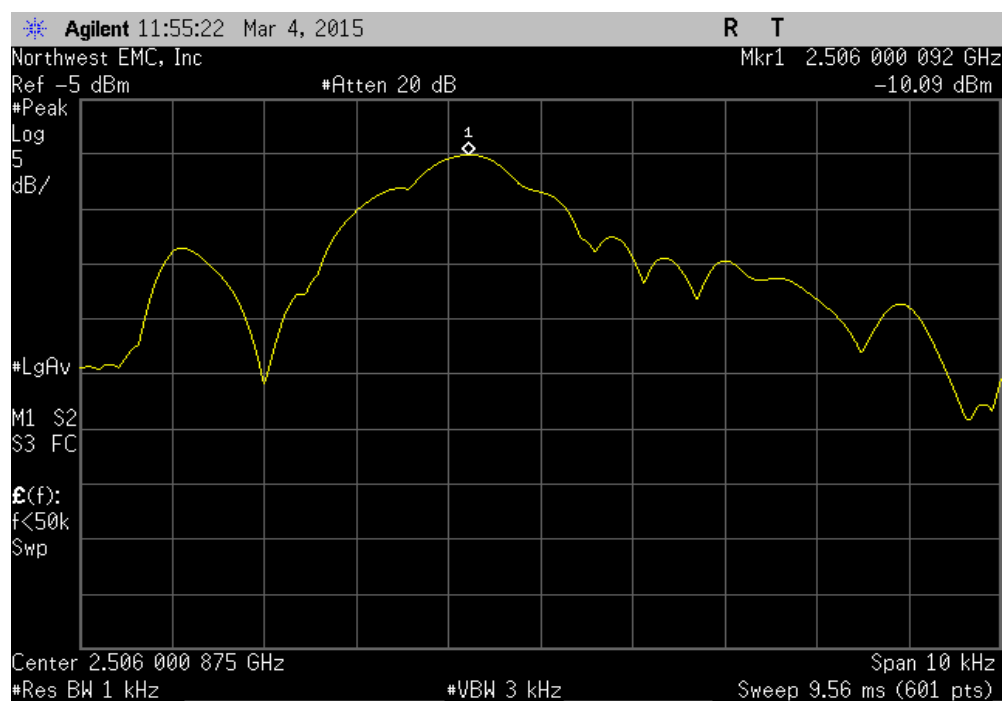


# FREQUENCY STABILITY

| Temperature: +20°, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|-------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                           | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                           | 2680.000085          | 2680                 | 0           | 1           | Pass    |  |

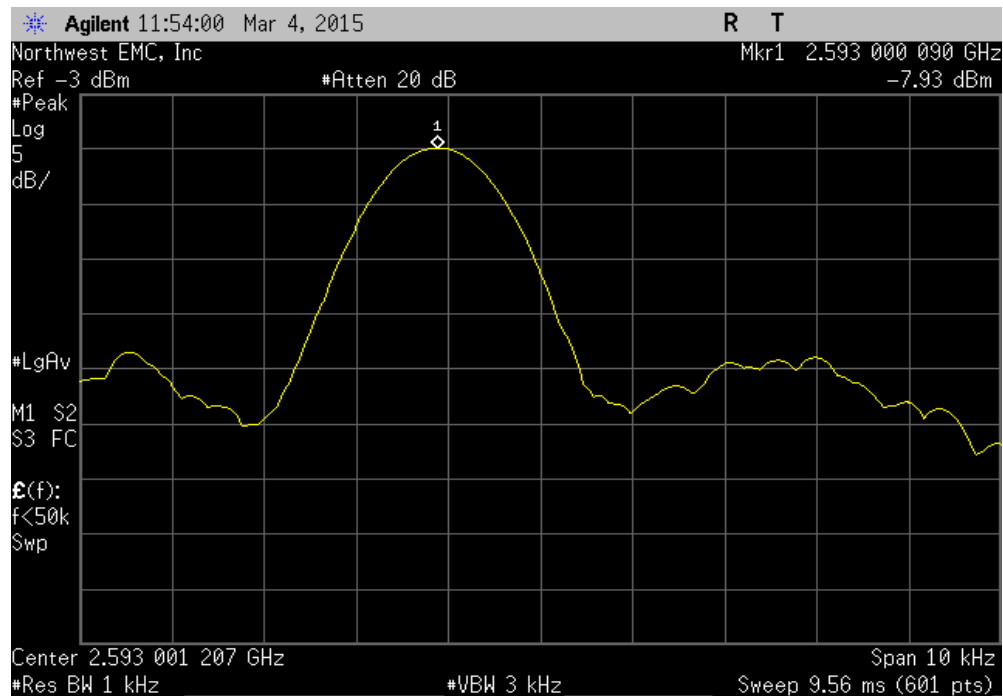


| Temperature: +10°, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2506.000092          | 2506                 | 0           | 1           | Pass    |  |

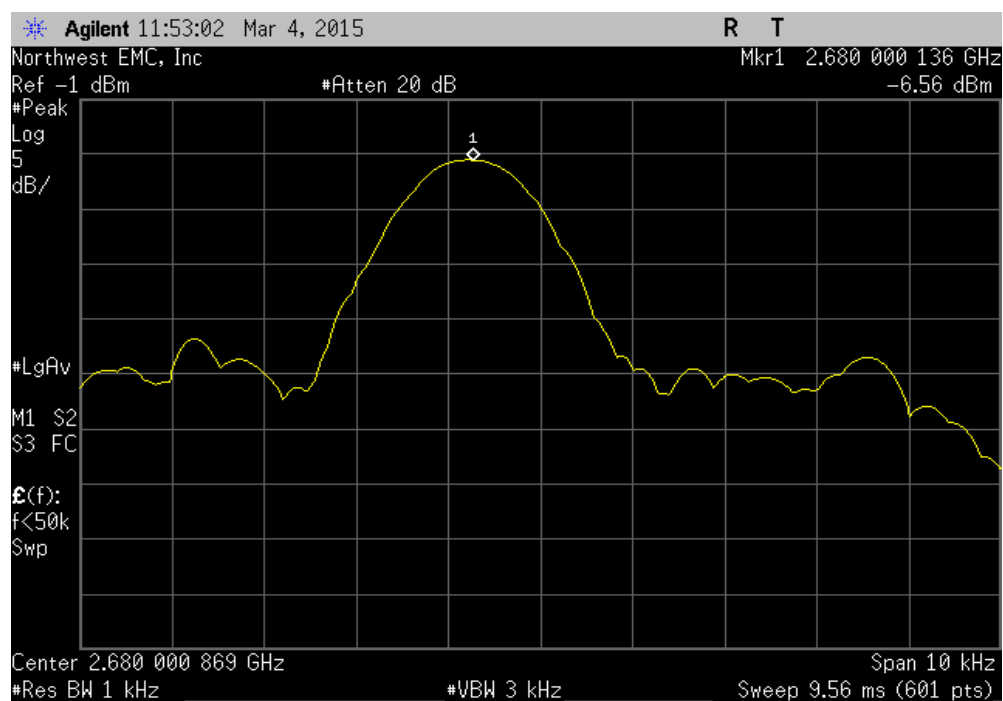


# FREQUENCY STABILITY

| Temperature: +10°, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2593.00009           | 2593                 | 0           | 1           | Pass    |  |

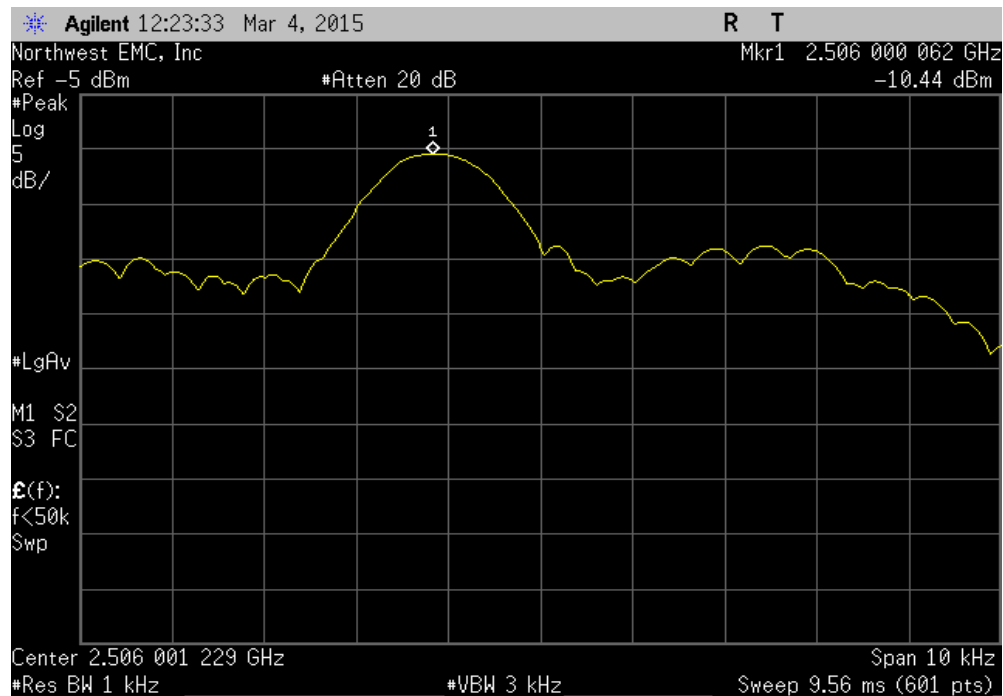


| Temperature: +10°, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|-------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                           | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                           | 2680.000136          | 2680                 | 0.1         | 1           | Pass    |  |

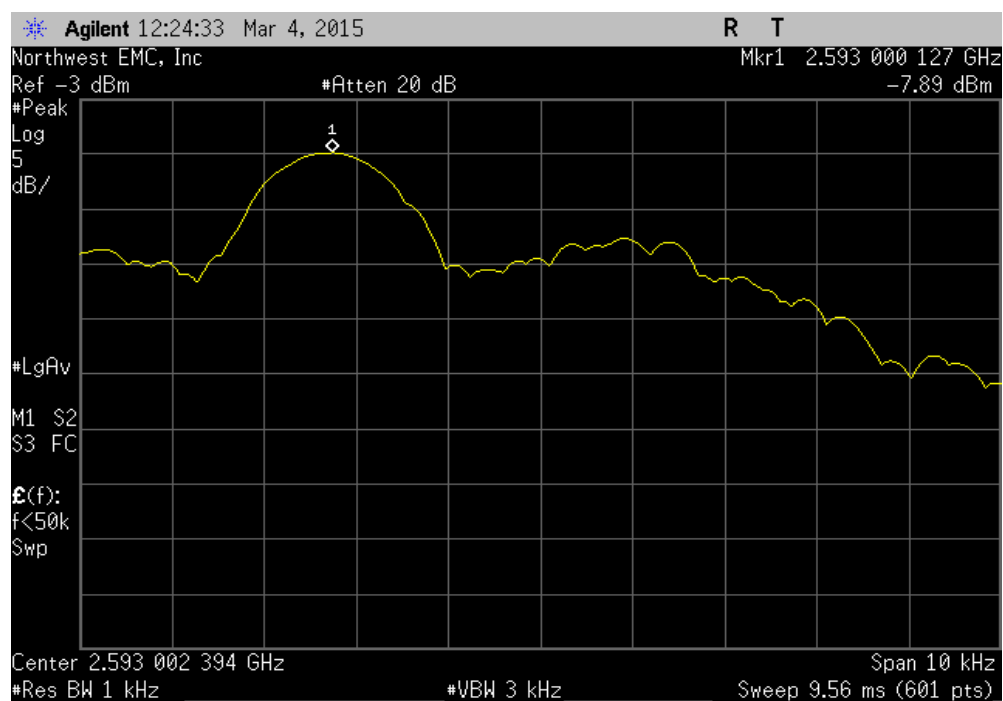


# FREQUENCY STABILITY

| Temperature: 0°, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|----------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                        | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                        | 2506.000062          | 2506                 | 0           | 1           | Pass    |  |

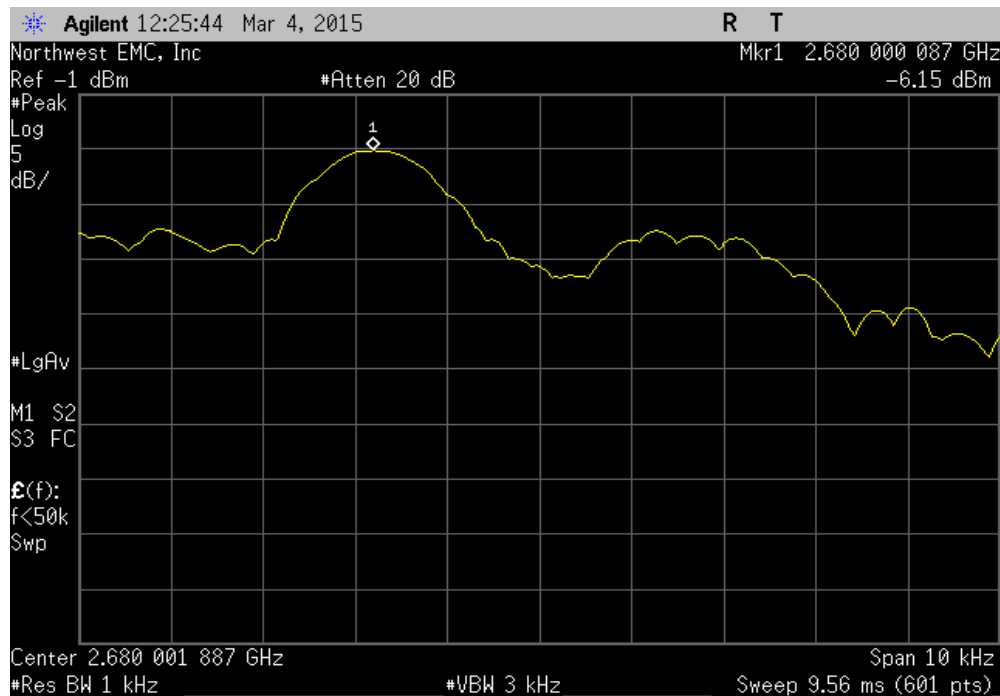


| Temperature: 0°, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|----------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                        | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                        | 2593.000127          | 2593                 | 0.1         | 1           | Pass    |  |

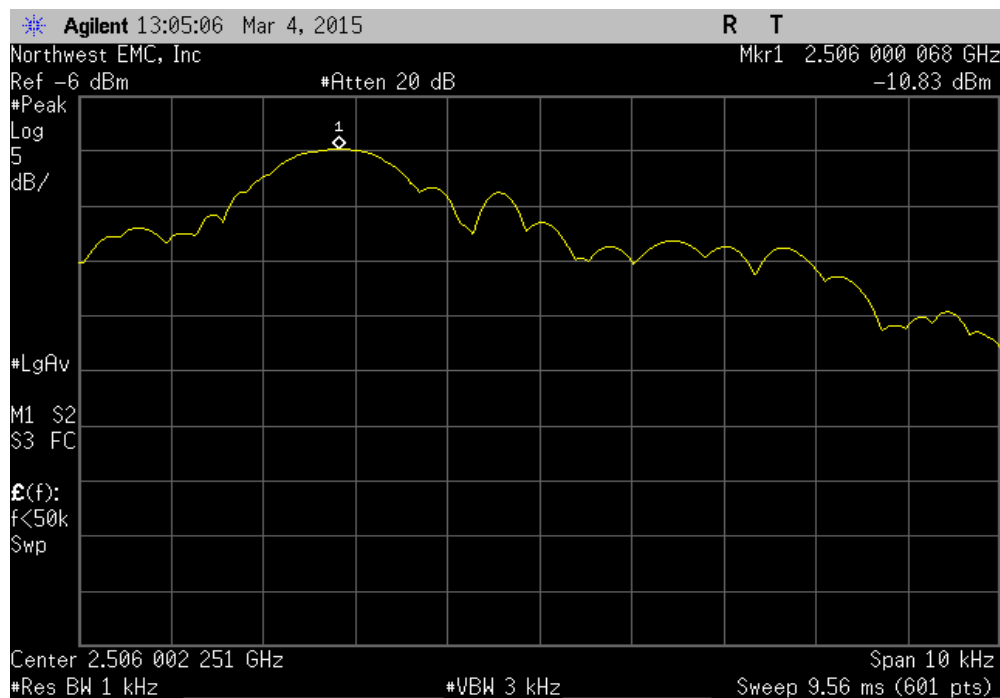


# FREQUENCY STABILITY

| Temperature: 0°, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|-----------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                         | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                         | 2680.000087          | 2680                 | 0           | 1           | Pass    |  |

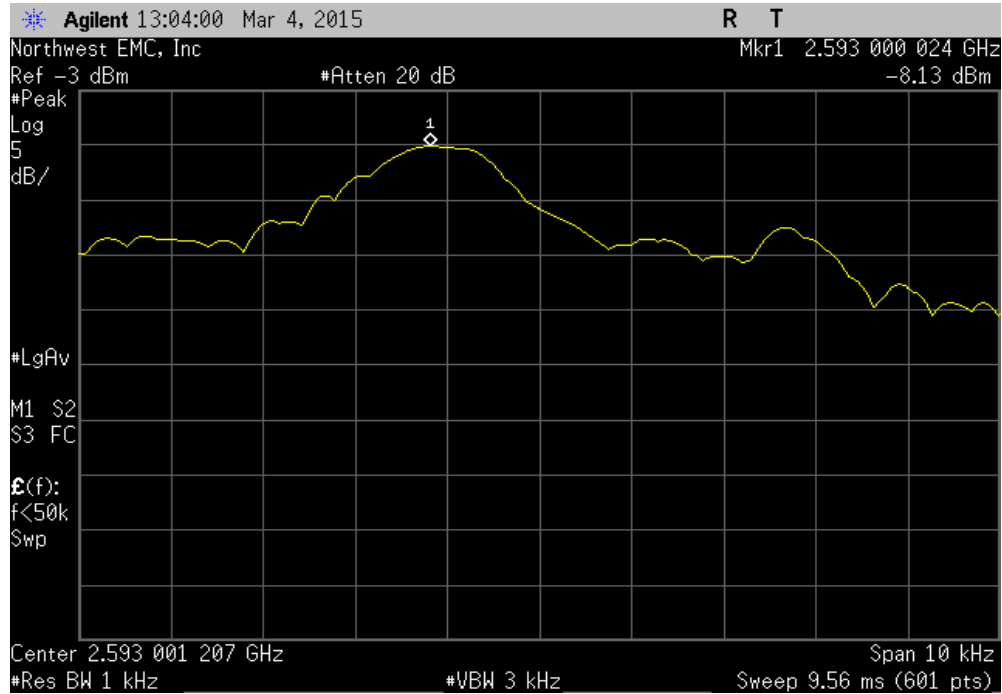


| Temperature: -10°, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2506.000068          | 2506                 | 0           | 1           | Pass    |  |

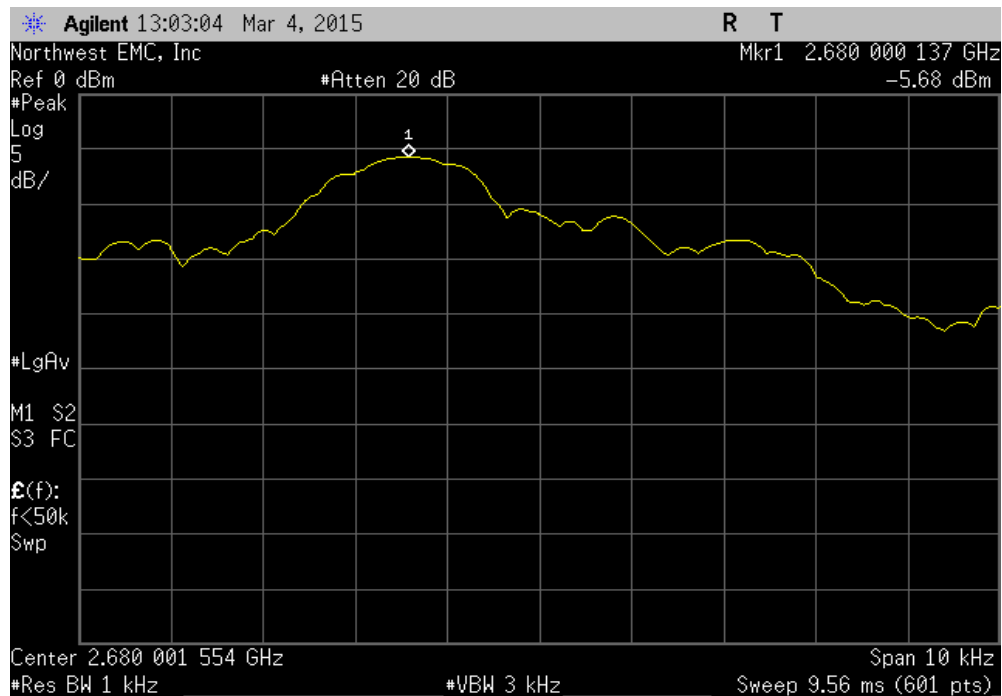


# FREQUENCY STABILITY

| Temperature: -10°, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2593.000024          | 2593                 | 0           | 1           | Pass    |  |

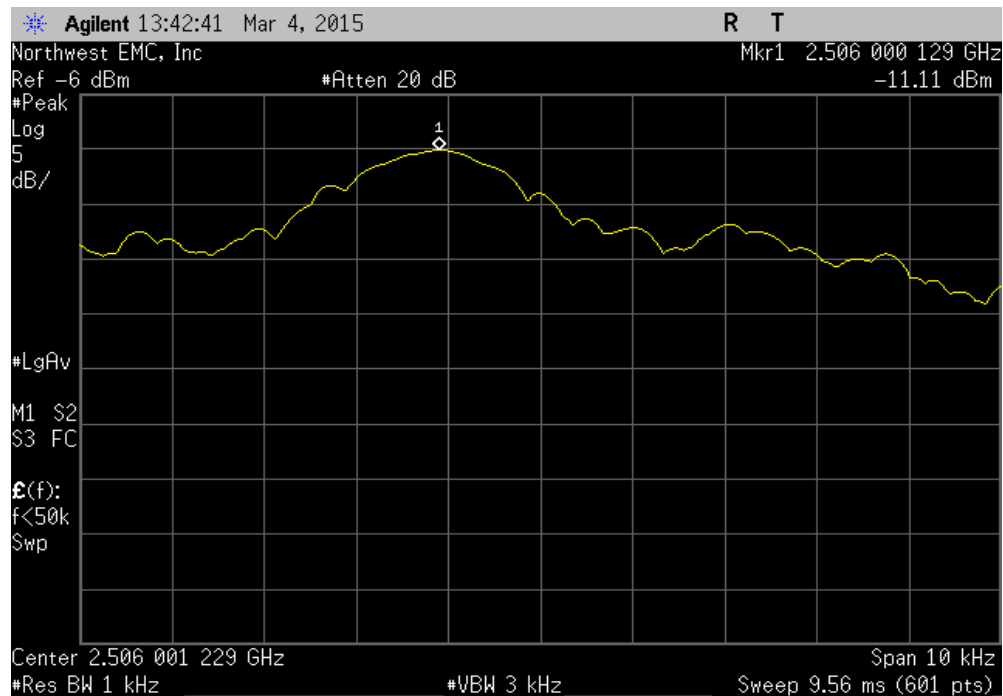


| Temperature: -10°, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|-------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                           | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                           | 2680.000137          | 2680                 | 0.1         | 1           | Pass    |  |

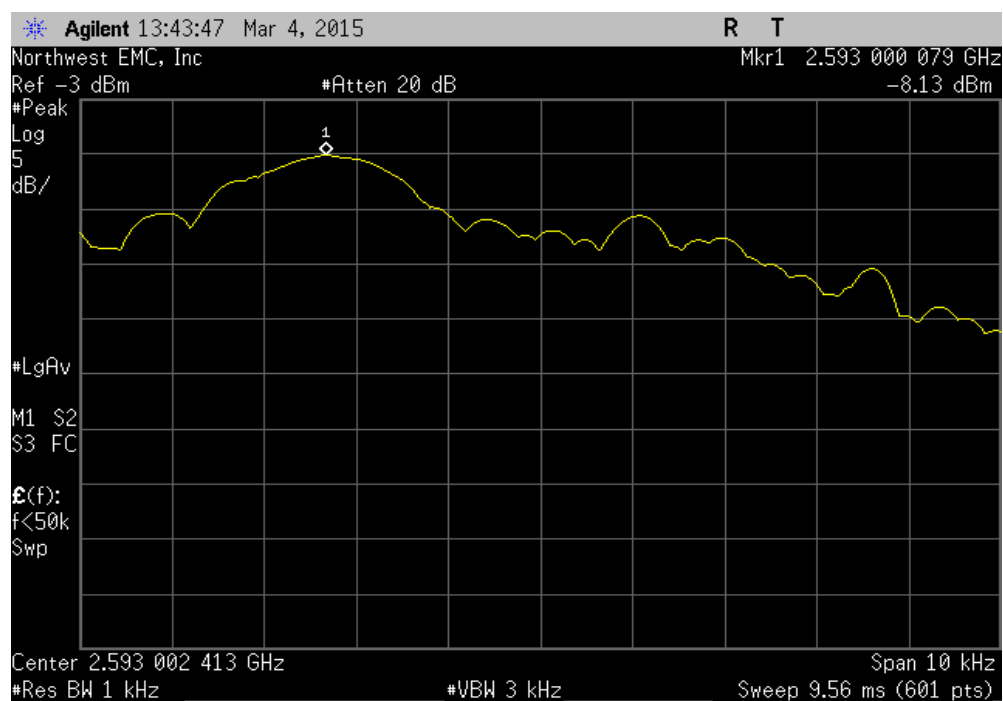


# FREQUENCY STABILITY

| Temperature: -20°, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2506.000129          | 2506                 | 0.1         | 1           | Pass    |  |

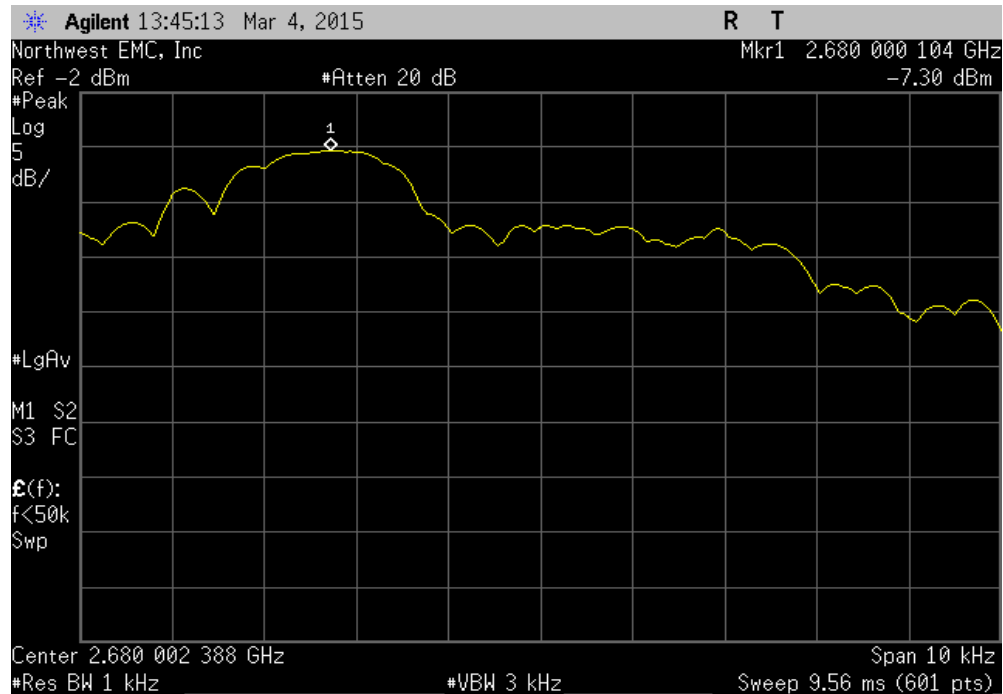


| Temperature: -20°, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2593.000079          | 2593                 | 0           | 1           | Pass    |  |

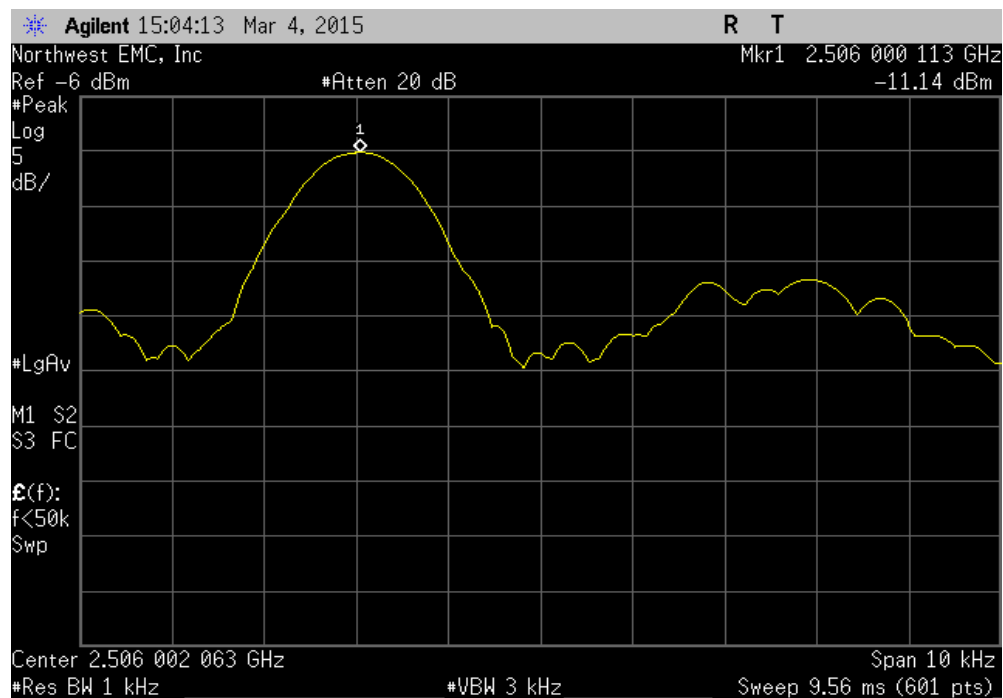


# FREQUENCY STABILITY

| Temperature: -20°, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|-------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                           | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                           | 2680.000104          | 2680                 | 0           | 1           | Pass    |  |

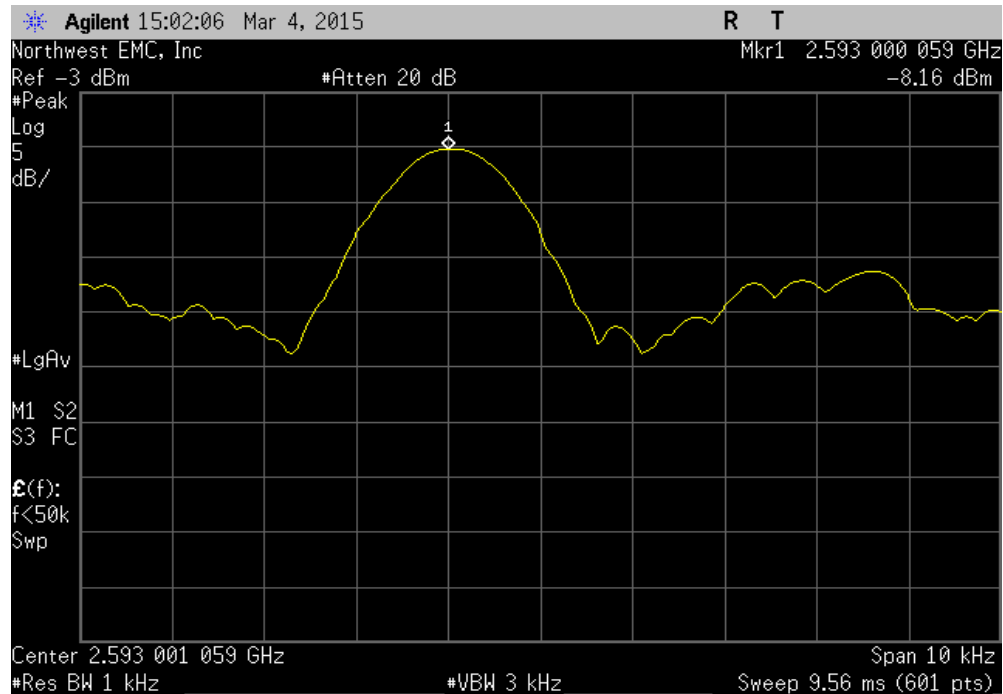


| Temperature: -30°, Low Channel, 2506 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2506.000113          | 2506                 | 0.1         | 1           | Pass    |  |

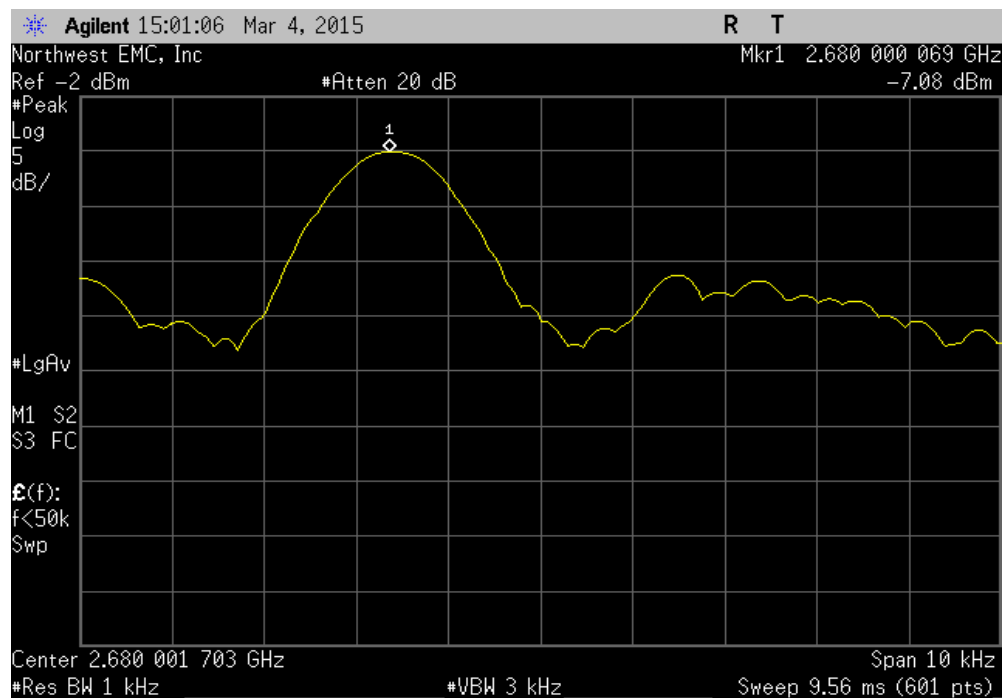


# FREQUENCY STABILITY

| Temperature: -30°, Mid Channel, 2593 MHz |                      |                      |             |             |         |  |
|------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                          | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                          | 2593.000059          | 2593                 | 0           | 1           | Pass    |  |



| Temperature: -30°, High Channel, 2680 MHz |                      |                      |             |             |         |  |
|-------------------------------------------|----------------------|----------------------|-------------|-------------|---------|--|
|                                           | Measured Value (MHz) | Assigned Value (MHz) | Error (ppm) | Limit (ppm) | Results |  |
|                                           | 2680.000069          | 2680                 | 0           | 1           | Pass    |  |



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

## MODES OF OPERATION

Transmitting LTE 20MHz low channel (2506 MHz), mid channel (2593 MHz), and high channel (2680 MHz).

## POWER SETTINGS INVESTIGATED

110VAC/60Hz

## CONFIGURATIONS INVESTIGATED

TECO0025 - 2

## 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 |
|--------------------------------|-----------------|-----------------------------------|-----|------------|----------|
| Low Pass Filter, 0 - 1000 MHz  | Micro-Tronics   | LPM50004                          | HGK | 3/2/2015   | 12 mo    |
| High Pass Filter, 2.8 - 18 GHz | Micro-Tronics   | HPM50111                          | HGQ | 3/2/2015   | 12 mo    |
| Attenuator, 20 dB, 'SMA'       | SM Electronics  | SA6-20                            | REO | 3/2/2015   | 12 mo    |
| Pre-Amplifier                  | Miteq           | JSW45-26004000-40-5P              | AVN | 10/3/2014  | 12 mo    |
| 26-40GHz Cable                 | N/A             | TTBJ141-KMKM-72                   | MNQ | 10/3/2014  | 12 mo    |
| Antenna, Horn                  | ETS             | 3160-10                           | AIC | NCR        | 0 mo     |
| Pre-Amplifier                  | Miteq           | JSD4-18002600-26-8P               | APU | 10/3/2014  | 12 mo    |
| MN05 Cable                     | N/A             | 18-26GHz Standard Gain Horn Cable | MNP | 10/3/2014  | 12 mo    |
| Antenna, Horn                  | ETS             | 3160-09                           | AHG | NCR        | 0 mo     |
| Pre-Amplifier                  | Miteq           | AMF-6F-12001800-30-10P            | AVW | 3/2/2015   | 12 mo    |
| Antenna, Horn                  | ETS Lindgren    | 3160-08                           | AIQ | NCR        | 0 mo     |
| MN05 Cables                    | ESM Cable Corp. | Standard Gain Horn Cables         | MNJ | 3/2/2015   | 12 mo    |
| Pre-Amplifier                  | Miteq           | AMF-6F-08001200-30-10P            | AVV | 3/2/2015   | 12 mo    |
| Antenna, Horn                  | ETS             | 3160-07                           | AXP | NCR        | 0 mo     |
| Pre-Amplifier                  | Miteq           | AMF-3D-00100800-32-13P            | AVX | 3/2/2015   | 12 mo    |
| MN05 Cables                    | ESM Cable Corp. | Double Ridge Guide Horn Cables    | MNI | 3/2/2015   | 12 mo    |
| Antenna, Horn                  | ETS             | 3115                              | AJA | 6/3/2014   | 24 mo    |
| Pre-Amplifier                  | Miteq           | AM-1616-1000                      | PAD | 3/2/2015   | 12 mo    |
| MN05 Cables                    | ESM Cable Corp. | Bilog Cables                      | MNH | 3/2/2015   | 12 mo    |
| Antenna, Biconilog             | Teseq           | CBL 6141B                         | AYD | 12/17/2013 | 24 mo    |
| Spectrum Analyzer              | Agilent         | N9010A                            | AFI | 1/27/2015  | 12 mo    |

## MEASUREMENT BANDWIDTHS

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

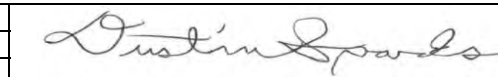
## TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. 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. 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 C63.10:2009). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

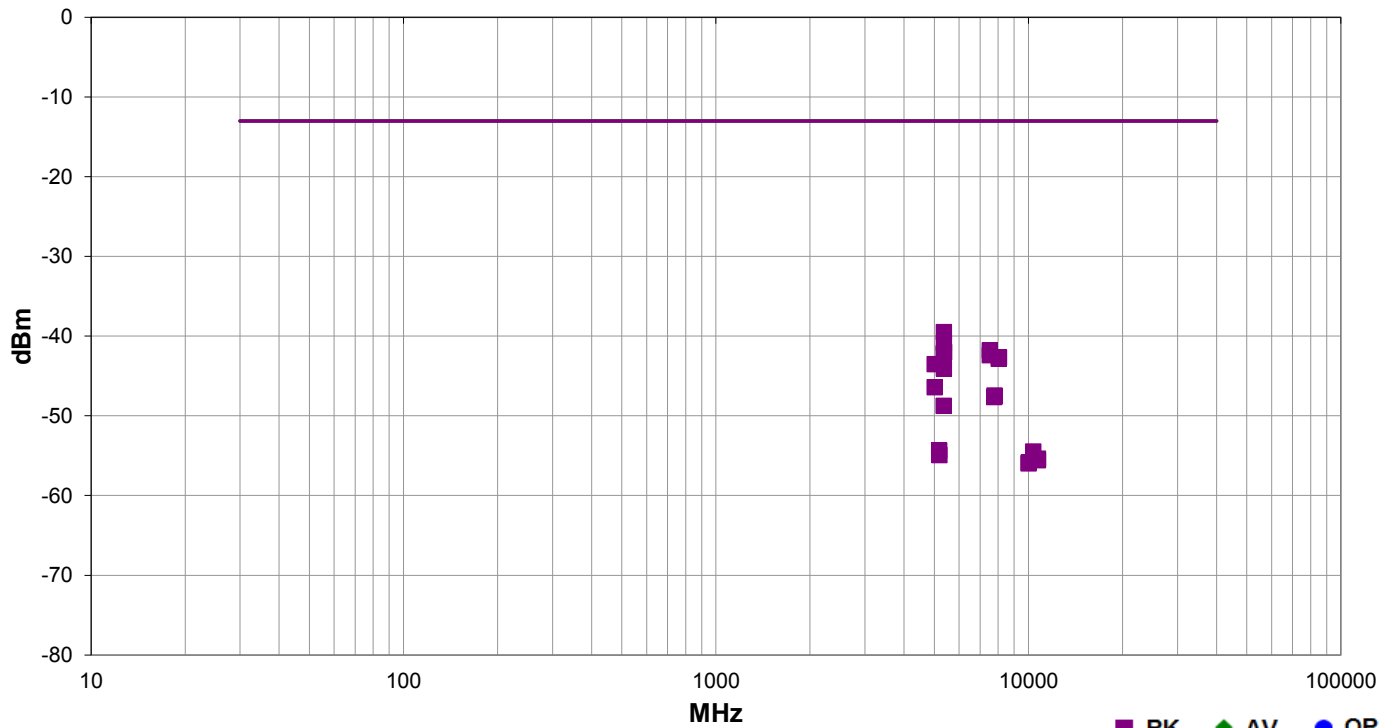
At an approved test site, the transmitter is placed on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a horn antenna for emissions above 1 GHz. A signal generator is connected to the horn antenna, and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal horn antenna is determined for each radiated spurious emission.

## FIELD STRENGTH OF SPURIOUS EMISSIONS

|                 |                                                                                                     |                   |             |                                                                                    |
|-----------------|-----------------------------------------------------------------------------------------------------|-------------------|-------------|------------------------------------------------------------------------------------|
| Work Order:     | TECO0025                                                                                            | Date:             | 03/06/15    |  |
| Project:        | None                                                                                                | Temperature:      | 21.3 °C     |                                                                                    |
| Job Site:       | MN05                                                                                                | Humidity:         | 12.8% RH    |                                                                                    |
| Serial Number:  | None                                                                                                | Barometric Pres.: | 1020.1 mbar | Tested by: Dustin Sparks                                                           |
| EUT:            | InterReach Fusion TDD - 2.5 GHz -RAU                                                                |                   |             |                                                                                    |
| Configuration:  | 2                                                                                                   |                   |             |                                                                                    |
| Customer:       | TE Connectivity / ADC Telecommunications                                                            |                   |             |                                                                                    |
| Attendees:      | None                                                                                                |                   |             |                                                                                    |
| EUT Power:      | 110VAC/60Hz                                                                                         |                   |             |                                                                                    |
| Operating Mode: | Transmitting LTE 20MHz low channel (2506 MHz), mid channel (2593 MHz), and high channel (2680 MHz). |                   |             |                                                                                    |
| Deviations:     | None                                                                                                |                   |             |                                                                                    |
| Comments:       | Antenna ports terminated                                                                            |                   |             |                                                                                    |

|                     |                         |
|---------------------|-------------------------|
| Test Specifications | Test Method             |
| FCC 27:2015         | ANSI/TIA/EIA-603-C:2004 |

|       |    |                   |   |                   |           |         |      |
|-------|----|-------------------|---|-------------------|-----------|---------|------|
| Run # | 14 | 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                        |
|--|------------|-------------------------|-------------------|---------------------------|----------|--------------|------------|-------------------|------------------------|---------------------------------|
|  | 5360.633   | 1.0                     | 289.9             | Horz                      | PK       | 1.12E-07     | -39.5      | -13.0             | -26.5                  | LTE 20MHz, high ch, EUT on side |
|  | 5364.867   | 1.0                     | 283.9             | Vert                      | PK       | 8.23E-08     | -40.8      | -13.0             | -27.8                  | LTE 20MHz, high ch, EUT on side |
|  | 7526.333   | 1.0                     | 358.9             | Horz                      | PK       | 6.59E-08     | -41.8      | -13.0             | -28.8                  | LTE 20MHz, low ch, EUT on side  |
|  | 5369.867   | 1.0                     | 19.1              | Vert                      | PK       | 6.32E-08     | -42.0      | -13.0             | -29.0                  | LTE 20MHz, high ch, EUT horz    |
|  | 5358.600   | 1.0                     | 13.0              | Horz                      | PK       | 6.01E-08     | -42.2      | -13.0             | -29.2                  | LTE 20MHz, high ch, EUT horz    |
|  | 7521.200   | 1.0                     | 275.0             | Vert                      | PK       | 5.78E-08     | -42.4      | -13.0             | -29.4                  | LTE 20MHz, low ch, EUT on side  |
|  | 8049.433   | 1.4                     | 271.0             | Vert                      | PK       | 5.42E-08     | -42.7      | -13.0             | -29.7                  | LTE 20MHz, high ch, EUT on side |
|  | 8041.533   | 1.0                     | 311.9             | Horz                      | PK       | 5.19E-08     | -42.8      | -13.0             | -29.8                  | LTE 20MHz, high ch, EUT on side |

|  | Freq<br>(MHz) | Antenna Height<br>(meters) | Azimuth<br>(degrees) | Polarity/<br>Transducer<br>Type | Detector | EIRP<br>(Watts) | EIRP<br>(dBm) | Spec. Limit<br>(dBm) | Compared to<br>Spec.<br>(dB) | Comments                        |
|--|---------------|----------------------------|----------------------|---------------------------------|----------|-----------------|---------------|----------------------|------------------------------|---------------------------------|
|  | 5011.800      | 1.2                        | 297.9                | Vert                            | PK       | 4.45E-08        | -43.5         | -13.0                | -30.5                        | LTE 20MHz, low ch, EUT on side  |
|  | 5362.400      | 1.0                        | 45.0                 | Vert                            | PK       | 3.92E-08        | -44.1         | -13.0                | -31.1                        | LTE 20MHz, high ch, EUT vert    |
|  | 5011.067      | 1.5                        | 283.9                | Horz                            | PK       | 2.28E-08        | -46.4         | -13.0                | -33.4                        | LTE 20MHz, low ch, EUT on side  |
|  | 7788.867      | 3.0                        | 117.0                | Vert                            | PK       | 1.80E-08        | -47.4         | -13.0                | -34.4                        | LTE 20MHz, mid ch, EUT on side  |
|  | 7772.733      | 2.3                        | 219.0                | Horz                            | PK       | 1.72E-08        | -47.7         | -13.0                | -34.7                        | LTE 20MHz, mid ch, EUT on side  |
|  | 5356.000      | 1.0                        | 297.9                | Horz                            | PK       | 1.34E-08        | -48.7         | -13.0                | -35.7                        | LTE 20MHz, high ch, EUT vert    |
|  | 5179.367      | 1.0                        | 222.0                | Horz                            | PK       | 3.68E-09        | -54.3         | -13.0                | -41.3                        | LTE 20MHz, mid ch, EUT on side  |
|  | 10364.270     | 1.7                        | 162.0                | Vert                            | PK       | 3.56E-09        | -54.5         | -13.0                | -41.5                        | LTE 20MHz, mid ch, EUT on side  |
|  | 5190.500      | 3.7                        | 123.1                | Vert                            | PK       | 3.23E-09        | -54.9         | -13.0                | -41.9                        | LTE 20MHz, mid ch, EUT on side  |
|  | 10727.200     | 1.0                        | 106.1                | Horz                            | PK       | 2.90E-09        | -55.4         | -13.0                | -42.4                        | LTE 20MHz, high ch, EUT on side |
|  | 10363.130     | 1.0                        | 52.1                 | Horz                            | PK       | 2.83E-09        | -55.5         | -13.0                | -42.5                        | LTE 20MHz, mid ch, EUT on side  |
|  | 10721.600     | 1.0                        | 249.0                | Vert                            | PK       | 2.77E-09        | -55.6         | -13.0                | -42.6                        | LTE 20MHz, high ch, EUT on side |
|  | 10023.400     | 1.4                        | 12.1                 | Vert                            | PK       | 2.59E-09        | -55.9         | -13.0                | -42.9                        | LTE 20MHz, low ch, EUT on side  |
|  | 10015.100     | 1.0                        | 288.0                | Horz                            | PK       | 2.54E-09        | -56.0         | -13.0                | -43.0                        | LTE 20MHz, low ch, EUT on side  |