



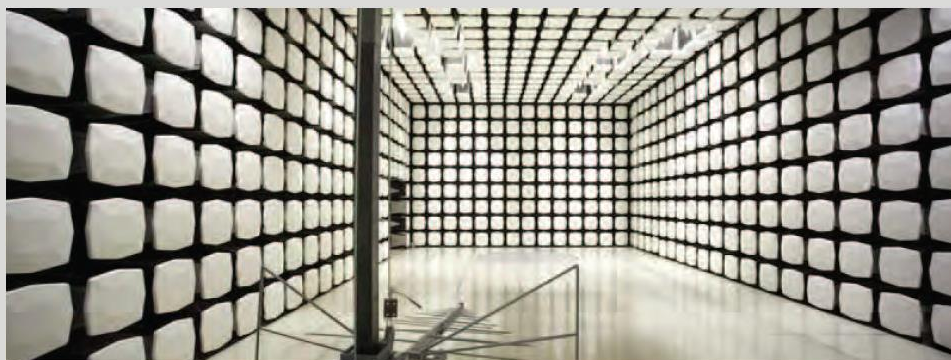
## **Apricity Code**

**JL Module**

**FCC 15.247:2020**

**2.4GHz Bluetooth (FHSS) Radio**

**Report: APRI0010, Issue Date: April 28, 2020**



NVLAP LAB CODE: 200881-0



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# CERTIFICATE OF TEST



Last Date of Test: March 25, 2020

Apricity Code

EUT: JL Module

## Radio Equipment Testing

### Standards

| Specification   | Method           |
|-----------------|------------------|
| FCC 15.247:2020 | ANSI C63.10:2013 |

### Results

| Method Clause | Test Description                    | Applied | Results | Comments |
|---------------|-------------------------------------|---------|---------|----------|
| 6.2           | Powerline Conducted Emissions       | Yes     | Pass    |          |
| 6.5, 6.6      | Spurious Radiated Emissions         | Yes     | Pass    |          |
| 7.5           | Duty Cycle                          | Yes     | N/A     |          |
| 7.8.2         | Carrier Frequency Separation        | Yes     | Pass    |          |
| 7.8.3         | Number of Hopping Frequencies       | Yes     | Pass    |          |
| 7.8.4         | Dwell Time                          | Yes     | Pass    |          |
| 7.8.5         | Output Power                        | Yes     | Pass    |          |
| 7.8.5         | Equivalent Isotropic Radiated Power | Yes     | Pass    |          |
| 7.8.6         | Band Edge Compliance                | Yes     | Pass    |          |
| 7.8.6         | Band Edge Compliance - Hopping Mode | Yes     | Pass    |          |
| 7.8.7         | Occupied Bandwidth                  | Yes     | Pass    |          |
| 7.8.8         | Spurious Conducted Emissions        | Yes     | Pass    |          |

### Deviations From Test Standards

None

### Approved By:

Eric Brandon, Department Manager

*Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.*

# REVISION HISTORY



| Revision Number | Description | Date<br>(yyyy-mm-dd) | 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 Element to certify transmitters to FCC and IC specifications.

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

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## Canada

**ISED** - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

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## European Union

**European Commission** – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

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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

**MSIT / 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

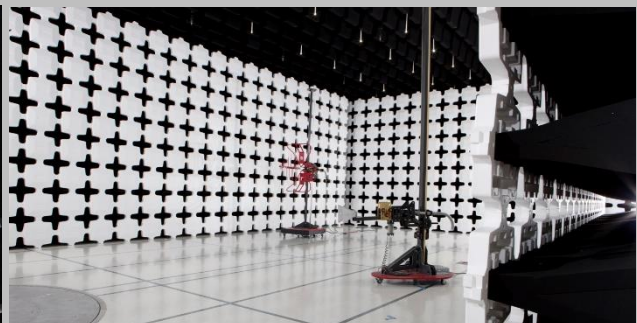
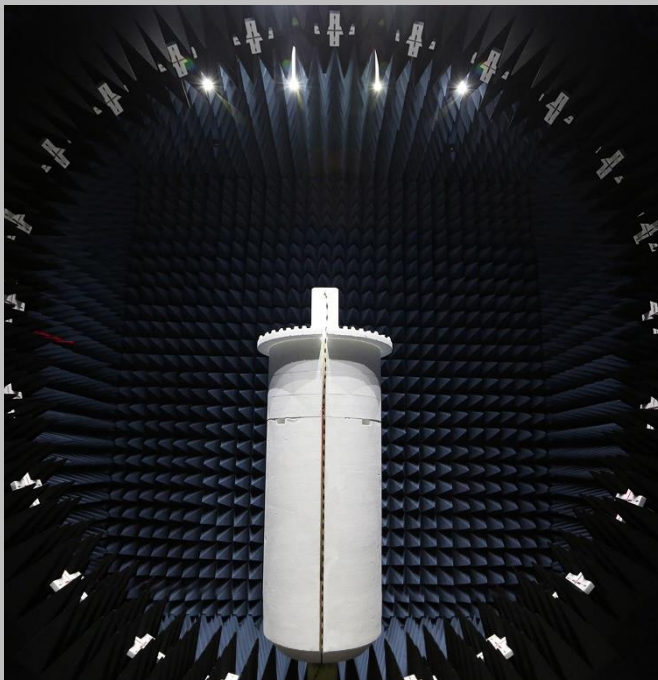
For details on the Scopes of our Accreditations, please visit:

<https://www.nwemc.com/emc-testing-accreditations>

# FACILITIES



|                                                                                       |                                                                                                       |                                                                                                       |                                                                                        |                                                                                                           |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>California</b><br>Labs OC01-17<br>41 Tesla<br>Irvine, CA 92618<br>(949) 861-8918   | <b>Minnesota</b><br>Labs MN01-10<br>9349 W Broadway Ave.<br>Brooklyn Park, MN 55445<br>(612)-638-5136 | <b>Oregon</b><br>Labs EV01-12<br>6775 NE Evergreen Pkwy #400<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 98011<br>(425)984-6600 |
| <b>NVLAP</b>                                                                          |                                                                                                       |                                                                                                       |                                                                                        |                                                                                                           |
| NVLAP Lab Code: 200676-0                                                              | NVLAP Lab Code: 200881-0                                                                              | NVLAP Lab Code: 200630-0                                                                              | NVLAP Lab Code:201049-0                                                                | NVLAP Lab Code: 200629-0                                                                                  |
| <b>Innovation, Science and Economic Development Canada</b>                            |                                                                                                       |                                                                                                       |                                                                                        |                                                                                                           |
| 2834B-1, 2834B-3                                                                      | 2834E-1, 2834E-3                                                                                      | 2834D-1                                                                                               | 2834G-1                                                                                | 2834F-1                                                                                                   |
| <b>BSMI</b>                                                                           |                                                                                                       |                                                                                                       |                                                                                        |                                                                                                           |
| SL2-IN-E-1154R                                                                        | SL2-IN-E-1152R                                                                                        | SL2-IN-E-1017                                                                                         | SL2-IN-E-1158R                                                                         | SL2-IN-E-1153R                                                                                            |
| <b>VCCI</b>                                                                           |                                                                                                       |                                                                                                       |                                                                                        |                                                                                                           |
| A-0029                                                                                | A-0109                                                                                                | A-0108                                                                                                | A-0201                                                                                 | A-0110                                                                                                    |
| <b>Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA</b> |                                                                                                       |                                                                                                       |                                                                                        |                                                                                                           |
| US0158                                                                                | US0175                                                                                                | US0017                                                                                                | US0191                                                                                 | US0157                                                                                                    |



# 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.

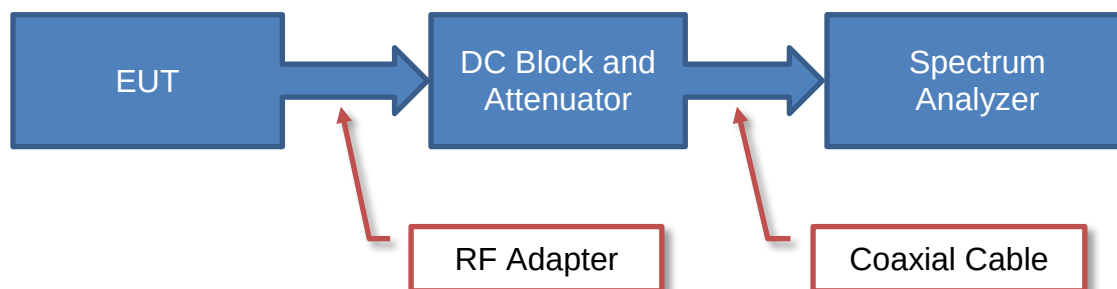
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

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

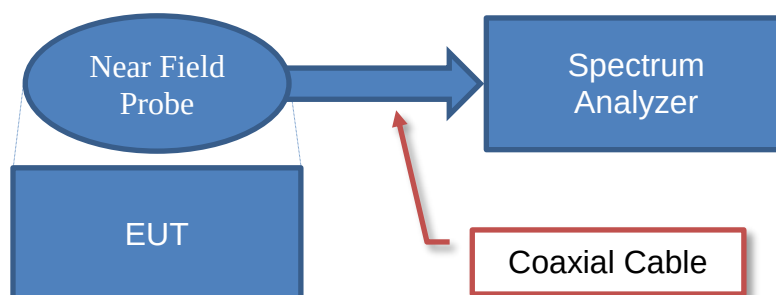
| Test                                  | + MU    | - MU     |
|---------------------------------------|---------|----------|
| Frequency Accuracy                    | 0.0007% | -0.0007% |
| Amplitude Accuracy (dB)               | 1.2 dB  | -1.2 dB  |
| Conducted Power (dB)                  | 1.2 dB  | -1.2 dB  |
| Radiated Power via Substitution (dB)  | 0.7 dB  | -0.7 dB  |
| Temperature (degrees C)               | 0.7°C   | -0.7°C   |
| Humidity (% RH)                       | 2.5% RH | -2.5% RH |
| Voltage (AC)                          | 1.0%    | -1.0%    |
| Voltage (DC)                          | 0.7%    | -0.7%    |
| Field Strength (dB)                   | 5.2 dB  | -5.2 dB  |
| AC Powerline Conducted Emissions (dB) | 2.6 dB  | -2.6 dB  |

# Test Setup Block Diagrams

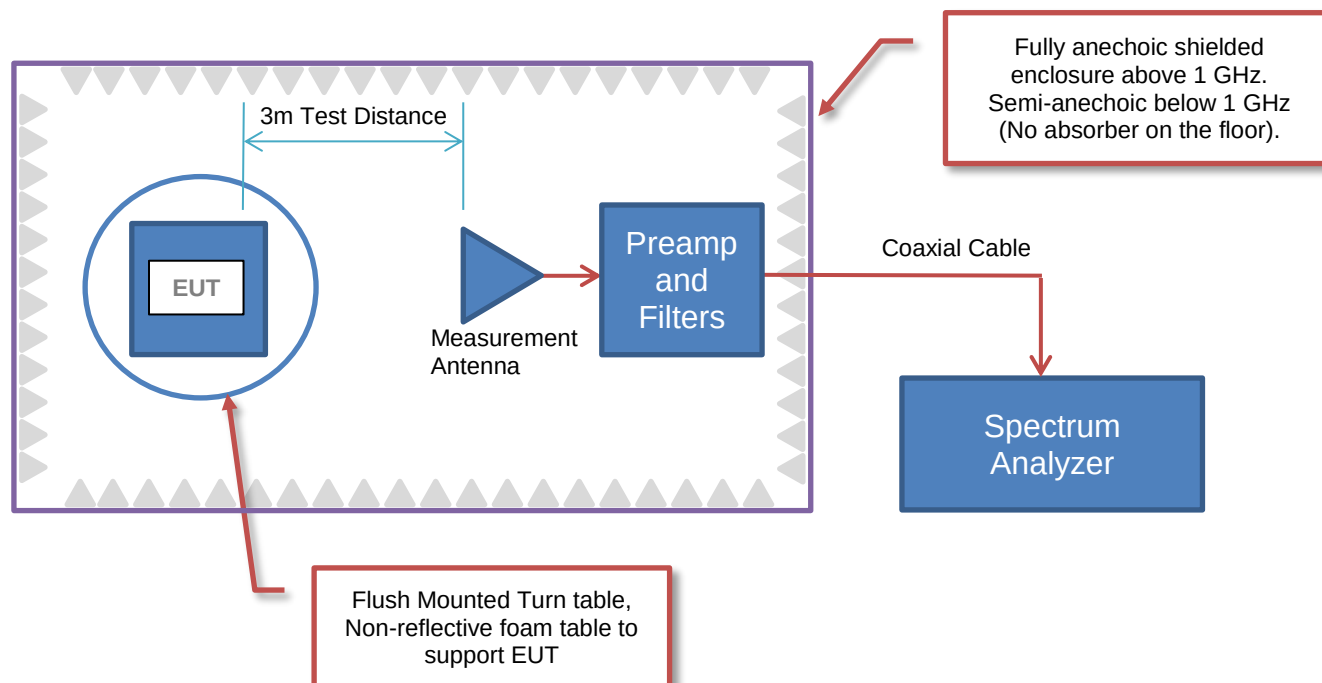
## Antenna Port Conducted Measurements



## Near Field Test Fixture Measurements



## Spurious Radiated Emissions





# PRODUCT DESCRIPTION



## Client and Equipment Under Test (EUT) Information

|                          |                    |
|--------------------------|--------------------|
| Company Name:            | Apricity Code      |
| Address:                 | 2789 NW Lolo Drive |
| City, State, Zip:        | Bend, OR 97703     |
| Test Requested By:       | Justin Olexy       |
| EUT:                     | JL Module          |
| First Date of Test:      | March 20, 2020     |
| Last Date of Test:       | March 25, 2020     |
| Receipt Date of Samples: | March 19, 2020     |
| Equipment Design Stage:  | Production         |
| Equipment Condition:     | No Damage          |
| Purchase Authorization:  | Verified           |

## Information Provided by the Party Requesting the Test

|                                                                                     |
|-------------------------------------------------------------------------------------|
| <b>Functional Description of the EUT:</b>                                           |
| Bluetooth Class 2 device, with a U.FL connector to connect an external antenna      |
| <b>Testing Objective:</b>                                                           |
| To demonstrate compliance of the Bluetooth (FHSS) radio to FCC 15.247 requirements. |



# CONFIGURATIONS

## Configuration APRI0010- 1

| Software/Firmware Running during test |         |
|---------------------------------------|---------|
| Description                           | Version |
| BlueTest3                             | 3.2.2   |

| EUT         |               |                   |               |
|-------------|---------------|-------------------|---------------|
| Description | Manufacturer  | Model/Part Number | Serial Number |
| JL Module   | Apricity Code | 6001-003          | 4             |

| Peripherals in test setup boundary |              |                   |               |
|------------------------------------|--------------|-------------------|---------------|
| Description                        | Manufacturer | Model/Part Number | Serial Number |
| BTM Demonstrator Board             | JL Audio     | 6003-001          | 2             |

| Remote Equipment Outside of Test Setup Boundary |              |                   |                              |
|-------------------------------------------------|--------------|-------------------|------------------------------|
| Description                                     | Manufacturer | Model/Part Number | Serial Number                |
| Laptop                                          | Dell         | Inspiron 3583     | 4W5ZZX2                      |
| Power Supply (Laptop)                           | Dell         | LA45NM140         | CN-0KXTTW-LOC00-97N-39D5-A09 |

| Cables     |        |            |         |                       |                        |
|------------|--------|------------|---------|-----------------------|------------------------|
| Cable Type | Shield | Length (m) | Ferrite | Connection 1          | Connection 2           |
| USB Cable  | Yes    | 1.3 m      | No      | Laptop                | BTM Demonstrator Board |
| AC Cable   | No     | 0.9 m      | No      | AC Mains              | Power Supply (Laptop)  |
| DC Cable   | No     | 1.8 m      | Yes     | Power Supply (Laptop) | Laptop                 |

# CONFIGURATIONS

## Configuration APRI0010- 2

| Software/Firmware Running during test |         |
|---------------------------------------|---------|
| Description                           | Version |
| BlueTest3                             | 3.2.2   |

| EUT           |               |                   |               |
|---------------|---------------|-------------------|---------------|
| Description   | Manufacturer  | Model/Part Number | Serial Number |
| JL Module     | Apricity Code | 6001-003          | 4             |
| Patch Antenna | Yageo         | ANTX100P112B24553 | None          |

| Peripherals in test setup boundary |              |                   |               |
|------------------------------------|--------------|-------------------|---------------|
| Description                        | Manufacturer | Model/Part Number | Serial Number |
| BTM Demonstrator Board             | JL Audio     | 6003-001          | 2             |

| Remote Equipment Outside of Test Setup Boundary |              |                   |                              |
|-------------------------------------------------|--------------|-------------------|------------------------------|
| Description                                     | Manufacturer | Model/Part Number | Serial Number                |
| Laptop                                          | Dell         | Inspiron 3583     | 4W5ZZX2                      |
| Power Supply (Laptop)                           | Dell         | LA45NM140         | CN-0KXTTW-LOC00-97N-39D5-A09 |

| Cables       |        |            |         |                       |                        |
|--------------|--------|------------|---------|-----------------------|------------------------|
| Cable Type   | Shield | Length (m) | Ferrite | Connection 1          | Connection 2           |
| USB Cable    | Yes    | 1.3 m      | No      | Laptop                | BTM Demonstrator Board |
| AC Cable     | No     | 0.9 m      | No      | AC Mains              | Power Supply (Laptop)  |
| DC Cable     | No     | 1.8 m      | Yes     | Power Supply (Laptop) | Laptop                 |
| Antenna Coax | Yes    | 0.1 m      | No      | Antenna               | JL Module              |

# CONFIGURATIONS

## Configuration APRI0010- 3

| Software/Firmware Running during test |         |
|---------------------------------------|---------|
| Description                           | Version |
| BlueTest3                             | 3.2.2   |

| EUT           |               |                   |               |
|---------------|---------------|-------------------|---------------|
| Description   | Manufacturer  | Model/Part Number | Serial Number |
| JL Module     | Apricity Code | 6001-003          | 4             |
| Trace Antenna | Yageo         | ANTX100P001B24003 | None          |

| Peripherals in test setup boundary |              |                   |               |
|------------------------------------|--------------|-------------------|---------------|
| Description                        | Manufacturer | Model/Part Number | Serial Number |
| BTM Demonstrator Board             | JL Audio     | 6003-001          | 2             |

| Remote Equipment Outside of Test Setup Boundary |              |                   |                              |
|-------------------------------------------------|--------------|-------------------|------------------------------|
| Description                                     | Manufacturer | Model/Part Number | Serial Number                |
| Laptop                                          | Dell         | Inspiron 3583     | 4W5ZZX2                      |
| Power Supply (Laptop)                           | Dell         | LA45NM140         | CN-0KXTTW-LOC00-97N-39D5-A09 |

| Cables       |        |            |         |                       |                        |
|--------------|--------|------------|---------|-----------------------|------------------------|
| Cable Type   | Shield | Length (m) | Ferrite | Connection 1          | Connection 2           |
| USB Cable    | Yes    | 1.3 m      | No      | Laptop                | BTM Demonstrator Board |
| AC Cable     | No     | 0.9 m      | No      | AC Mains              | Power Supply (Laptop)  |
| DC Cable     | No     | 1.8 m      | Yes     | Power Supply (Laptop) | Laptop                 |
| Antenna Coax | Yes    | 0.1 m      | No      | Antenna               | JL Module              |

# CONFIGURATIONS

## Configuration APRI0010- 4

| Software/Firmware Running during test |         |
|---------------------------------------|---------|
| Description                           | Version |
| BlueTest3                             | 3.2.2   |

| EUT         |               |                   |               |
|-------------|---------------|-------------------|---------------|
| Description | Manufacturer  | Model/Part Number | Serial Number |
| JL Module   | Apricity Code | 6001-003          | 4             |
| PCB Antenna | Yageo         | ANTX100P011B24003 | None          |

| Peripherals in test setup boundary |              |                   |               |
|------------------------------------|--------------|-------------------|---------------|
| Description                        | Manufacturer | Model/Part Number | Serial Number |
| BTM Demonstrator Board             | JL Audio     | 6003-001          | 2             |

| Remote Equipment Outside of Test Setup Boundary |              |                   |                              |
|-------------------------------------------------|--------------|-------------------|------------------------------|
| Description                                     | Manufacturer | Model/Part Number | Serial Number                |
| Laptop                                          | Dell         | Inspiron 3583     | 4W5ZZX2                      |
| Power Supply (Laptop)                           | Dell         | LA45NM140         | CN-0KXTTW-LOC00-97N-39D5-A09 |

| Cables       |        |            |         |                       |                        |
|--------------|--------|------------|---------|-----------------------|------------------------|
| Cable Type   | Shield | Length (m) | Ferrite | Connection 1          | Connection 2           |
| USB Cable    | Yes    | 1.3 m      | No      | Laptop                | BTM Demonstrator Board |
| AC Cable     | No     | 0.9 m      | No      | AC Mains              | Power Supply (Laptop)  |
| DC Cable     | No     | 1.8 m      | Yes     | Power Supply (Laptop) | Laptop                 |
| Antenna Coax | Yes    | 0.1 m      | No      | Antenna               | JL Module              |

# CONFIGURATIONS

## Configuration APRI0010- 5

| Software/Firmware Running during test |         |
|---------------------------------------|---------|
| Description                           | Version |
| BlueTest3                             | 3.2.2   |

| EUT           |               |                   |               |
|---------------|---------------|-------------------|---------------|
| Description   | Manufacturer  | Model/Part Number | Serial Number |
| JL Module     | Apricity Code | 6001-003          | 4             |
| Patch Antenna | Yageo         | ANTX100P112B24553 | None          |

| Peripherals in test setup boundary |              |                   |               |
|------------------------------------|--------------|-------------------|---------------|
| Description                        | Manufacturer | Model/Part Number | Serial Number |
| BTM Demonstrator Board             | JL Audio     | 6003-001          | 2             |
| DC Power Supply                    | Agilent      | U8002A            | TPZ           |
| Laptop                             | Dell         | Inspiron 3583     | 4W5ZZX2       |

| Remote Equipment Outside of Test Setup Boundary |              |                   |                              |
|-------------------------------------------------|--------------|-------------------|------------------------------|
| Description                                     | Manufacturer | Model/Part Number | Serial Number                |
| Power Supply (Laptop)                           | Dell         | LA45NM140         | CN-0KXTTW-LOC00-97N-39D5-A09 |

| Cables           |        |            |         |                       |                        |
|------------------|--------|------------|---------|-----------------------|------------------------|
| Cable Type       | Shield | Length (m) | Ferrite | Connection 1          | Connection 2           |
| USB Cable        | Yes    | 1.3 m      | No      | Laptop                | BTM Demonstrator Board |
| AC Cable         | No     | 0.9 m      | No      | AC Mains              | Power Supply (Laptop)  |
| DC Cable         | No     | 1.8 m      | Yes     | Power Supply (Laptop) | Laptop                 |
| Antenna Coax     | Yes    | 0.1 m      | No      | Antenna               | JL Module              |
| DC Leads         | No     | 1.0 m      | No      | DC Power Supply       | USB Splice Cable       |
| USB Splice Cable | Yes    | 1.0 m      | No      | Laptop                | USB Cable              |

# MODIFICATIONS

## Equipment Modifications

| Item | Date       | Test                                | Modification                         | Note                                                                | Disposition of EUT                          |
|------|------------|-------------------------------------|--------------------------------------|---------------------------------------------------------------------|---------------------------------------------|
| 1    | 2020-03-20 | Spurious Radiated Emissions         | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 2    | 2020-03-25 | Powerline Conducted Emissions       | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 3    | 2020-03-25 | Duty Cycle                          | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 4    | 2020-03-25 | Carrier Frequency Separation        | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 5    | 2020-03-25 | Number of Hopping Frequencies       | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 6    | 2020-03-25 | Dwell Time                          | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 7    | 2020-03-25 | Output Power                        | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 8    | 2020-03-25 | Equivalent Isotropic Radiated Power | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 9    | 2020-03-25 | Band Edge Compliance                | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 10   | 2020-03-25 | Band Edge Compliance - Hopping Mode | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 11   | 2020-03-25 | Occupied Bandwidth                  | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 12   | 2020-03-25 | Spurious Conducted Emissions        | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed.            |

# POWERLINE CONDUCTED EMISSIONS

## TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

## TEST EQUIPMENT

| Description                      | Manufacturer      | Model            | ID   | Last Cal.  | Cal. Due   |
|----------------------------------|-------------------|------------------|------|------------|------------|
| Receiver                         | Rohde & Schwarz   | ESR7             | ARI  | 2019-07-08 | 2020-07-08 |
| Cable - Conducted Cable Assembly | Northwest EMC     | MNC, HGN, TYK    | MNCA | 2020-03-11 | 2021-03-11 |
| LISN                             | Solar Electronics | 9252-50-R-24-BNC | LIY  | 2020-03-15 | 2021-03-15 |
| LISN                             | Solar Electronics | 9252-50-R-24-BNC | LIQ  | 2019-10-04 | 2020-10-04 |

## MEASUREMENT UNCERTAINTY

| Description  |        |         |
|--------------|--------|---------|
| Expanded k=2 | 2.6 dB | -2.6 dB |

## CONFIGURATIONS INVESTIGATED

APRI0010-5

## MODES INVESTIGATED

Continuous Transmit Bluetooth, Max power. Mid channel (2440 MHz), DH5



# POWERLINE CONDUCTED EMISSIONS



|                   |                 |                    |            |
|-------------------|-----------------|--------------------|------------|
| EUT:              | JL Module       | Work Order:        | APRI0010   |
| Serial Number:    | 4               | Date:              | 2020-03-25 |
| Customer:         | Apricity Code   | Temperature:       | 21.8°C     |
| Attendees:        | None            | Relative Humidity: | 34.2%      |
| Customer Project: | None            | Bar. Pressure:     | 1012 mb    |
| Tested By:        | Dan Haas        | Job Site:          | MN03       |
| Power:            | 5 VDC (via USB) | Configuration:     | APRI0010-5 |

## TEST SPECIFICATIONS

|                 |                  |
|-----------------|------------------|
| Specification:  | Method:          |
| FCC 15.207:2020 | ANSI C63.10:2013 |

## TEST PARAMETERS

|        |   |       |           |                             |   |
|--------|---|-------|-----------|-----------------------------|---|
| Run #: | 1 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|-----------|-----------------------------|---|

## COMMENTS

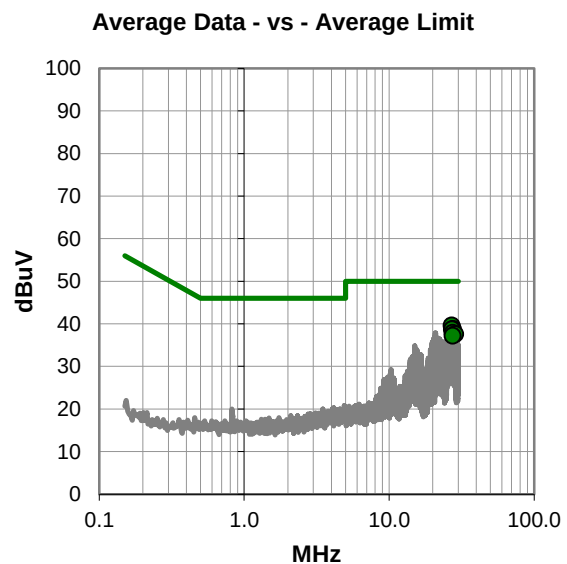
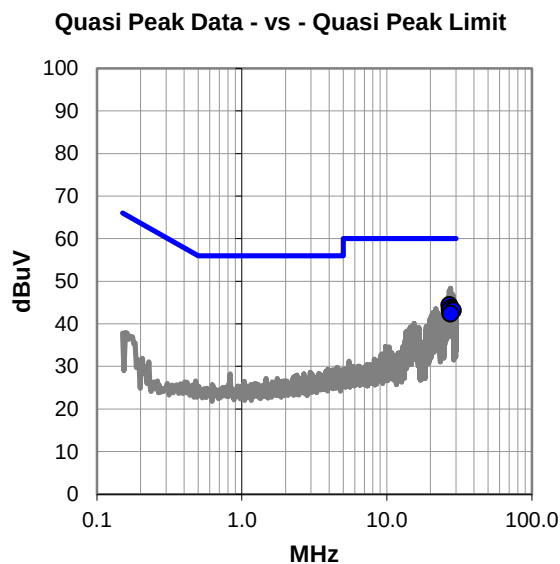
Tested AC power (120VAC/60Hz) to DC Supply. 5 VDC to the BTM Demonstrator Board (via USB)

## EUT OPERATING MODES

Continuous Transmit Bluetooth, Max power. Mid channel (2440 MHz), DH5

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS

## RESULTS - Run #1

Quasi Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 27.080     | 23.1        | 21.3        | 44.4            | 60.0               | -15.6       |
| 27.559     | 22.4        | 21.3        | 43.7            | 60.0               | -16.3       |
| 27.522     | 22.1        | 21.3        | 43.4            | 60.0               | -16.6       |
| 27.161     | 22.0        | 21.3        | 43.3            | 60.0               | -16.7       |
| 28.522     | 21.6        | 21.5        | 43.1            | 60.0               | -16.9       |
| 27.399     | 21.1        | 21.3        | 42.4            | 60.0               | -17.6       |

Average Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 27.080     | 18.3        | 21.3        | 39.6            | 50.0               | -10.4       |
| 27.559     | 17.5        | 21.3        | 38.8            | 50.0               | -11.2       |
| 27.161     | 17.4        | 21.3        | 38.7            | 50.0               | -11.3       |
| 27.522     | 16.6        | 21.3        | 37.9            | 50.0               | -12.1       |
| 28.522     | 16.1        | 21.5        | 37.6            | 50.0               | -12.4       |
| 27.399     | 15.9        | 21.3        | 37.2            | 50.0               | -12.8       |

## CONCLUSION

Pass



Tested By

# POWERLINE CONDUCTED EMISSIONS

|                   |                 |                    |            |
|-------------------|-----------------|--------------------|------------|
| EUT:              | JL Module       | Work Order:        | APRI0010   |
| Serial Number:    | 4               | Date:              | 2020-03-25 |
| Customer:         | Apricity Code   | Temperature:       | 21.8°C     |
| Attendees:        | None            | Relative Humidity: | 34.2%      |
| Customer Project: | None            | Bar. Pressure:     | 1012 mb    |
| Tested By:        | Dan Haas        | Job Site:          | MN03       |
| Power:            | 5 VDC (via USB) | Configuration:     | APRI0010-5 |

## TEST SPECIFICATIONS

|                 |                  |
|-----------------|------------------|
| Specification:  | Method:          |
| FCC 15.207:2020 | ANSI C63.10:2013 |

## TEST PARAMETERS

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

## COMMENTS

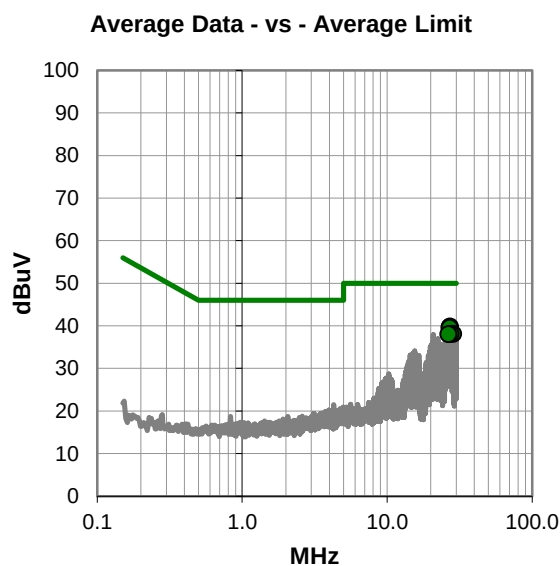
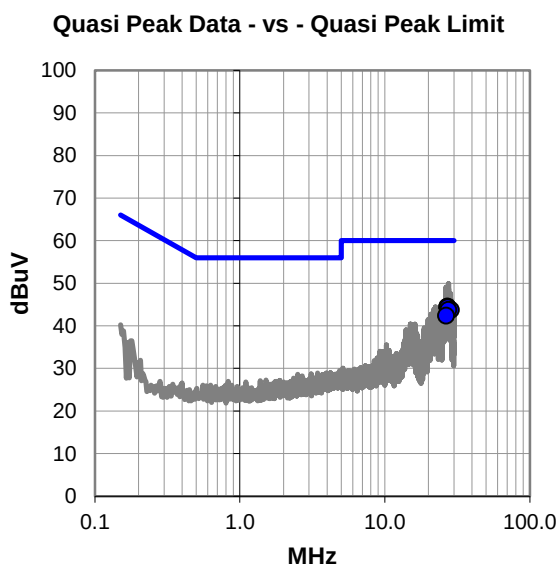
Tested AC power (120VAC/60Hz) to DC Supply. 5 VDC to the BTM Demonstrator Board (via USB)

## EUT OPERATING MODES

Continuous Transmit Bluetooth, Max power. Mid channel (2440 MHz), DH5

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS

## RESULTS - Run #2

Quasi Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 27.040     | 23.2        | 21.3        | 44.5            | 60.0               | -15.5       |
| 27.081     | 23.2        | 21.3        | 44.5            | 60.0               | -15.5       |
| 27.120     | 23.0        | 21.3        | 44.3            | 60.0               | -15.7       |
| 28.521     | 22.2        | 21.5        | 43.7            | 60.0               | -16.3       |
| 27.481     | 22.4        | 21.3        | 43.7            | 60.0               | -16.3       |
| 26.519     | 21.1        | 21.3        | 42.4            | 60.0               | -17.6       |

Average Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 27.120     | 18.5        | 21.3        | 39.8            | 50.0               | -10.2       |
| 27.081     | 18.4        | 21.3        | 39.7            | 50.0               | -10.3       |
| 27.040     | 18.2        | 21.3        | 39.5            | 50.0               | -10.5       |
| 28.521     | 16.6        | 21.5        | 38.1            | 50.0               | -11.9       |
| 27.481     | 16.8        | 21.3        | 38.1            | 50.0               | -11.9       |
| 26.519     | 16.7        | 21.3        | 38.0            | 50.0               | -12.0       |

## CONCLUSION

Pass



Tested By

# SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2019.11.08.1

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

## MODES OF OPERATION

Continuous Transmit Bluetooth, Max power. See comments for EUT orientation, transmit frequency, and data rate.

Continuous Transmit Bluetooth on Low channel (2402 MHz), Mid channel (2440 MHz), High channel (2480 MHz); Max power; DH5, 2DH5, and 3DH5. See comments for EUT orientation, transmit frequency, and data rate.

## POWER SETTINGS INVESTIGATED

5 VDC (via USB)

## CONFIGURATIONS INVESTIGATED

APRI0010 - 4

APRI0010 - 3

APRI0010 - 2

## FREQUENCY RANGE INVESTIGATED

|                 |        |                |           |
|-----------------|--------|----------------|-----------|
| Start Frequency | 30 MHz | Stop Frequency | 26000 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 |
|------------------------------|-----------------|--------------------------------|-----|------------|----------|
| Filter - Low Pass            | Micro-Tronics   | LPM50004                       | HGG | 2019-09-17 | 12 mo    |
| Filter - High Pass           | Micro-Tronics   | HPM50111                       | HFM | 2019-09-18 | 12 mo    |
| Attenuator                   | Coaxicom        | 3910-20                        | AXY | 2019-09-17 | 12 mo    |
| Amplifier - Pre-Amplifier    | Miteq           | AMF-3D-00100800-32-13P         | AVX | 2020-02-18 | 12 mo    |
| Amplifier - Pre-Amplifier    | Miteq           | AMF-6F-08001200-30-10P         | AVC | 2020-02-18 | 12 mo    |
| Amplifier - Pre-Amplifier    | L-3 Narda-MITEQ | AMF-6F-12001800-30-10P         | PAP | 2020-02-18 | 12 mo    |
| Amplifier - Pre-Amplifier    | Miteq           | AM-1064-9079 and SA18E-10      | AOO | 2020-02-18 | 12 mo    |
| Amplifier - Pre-Amplifier    | Miteq           | JSD4-18002600-26-8P            | APU | 2019-09-11 | 12 mo    |
| Cable                        | Element         | Biconilog Cable                | MNX | 2020-02-18 | 12 mo    |
| Cable                        | Element         | Standard Gain Cable            | MNW | 2020-02-18 | 12 mo    |
| Cable                        | Element         | Double Ridge Guide Horn Cables | MNV | 2020-02-18 | 12 mo    |
| Cable                        | ESM Cable Corp. | TTBJ141 KMKM-72                | MNP | 2019-09-11 | 12 mo    |
| Antenna - Biconilog          | Ametek          | CBL 6141B                      | AYS | 2019-03-19 | 24 mo    |
| Antenna - Standard Gain      | ETS Lindgren    | 3160-09                        | AHG | NCR        | 0 mo     |
| Antenna - Standard Gain      | ETS-Lindgren    | 3160-08                        | AJP | NCR        | 0 mo     |
| Antenna - Standard Gain      | ETS-Lindgren    | 3160-07                        | AJJ | NCR        | 0 mo     |
| Antenna - Double Ridge       | ETS Lindgren    | 3115                           | AIB | 2018-08-27 | 24 mo    |
| Analyzer - Spectrum Analyzer | Agilent         | E4440A                         | AFD | 2019-07-28 | 12 mo    |
| Amplifier - Pre-Amplifier    | Miteq           | AMF-6F-12001800-30-10P         | AVW | 2020-01-17 | 12 mo    |
| Antenna - Standard Gain      | ETS Lindgren    | 3160-08                        | AIQ | NCR        | 0 mo     |
| Amplifier - Pre-Amplifier    | Miteq           | AMF-6F-08001200-30-10P         | AVV | 2020-01-17 | 12 mo    |
| Cable                        | ESM Cable Corp. | Standard Gain Horn Cables      | MNJ | 2020-03-10 | 12 mo    |
| Antenna - Standard Gain      | ETS Lindgren    | 3160-07                        | AXP | NCR        | 0 mo     |
| Amplifier - Pre-Amplifier    | Miteq           | AMF-3D-00100800-32-13P         | AVT | 2020-01-17 | 12 mo    |
| Cable                        | ESM Cable Corp. | Double Ridge Guide Horn Cables | MNI | 2019-09-17 | 12 mo    |
| Antenna - Double Ridge       | ETS-Lindgren    | 3115                           | AJQ | 2019-01-16 | 24 mo    |
| Amplifier - Pre-Amplifier    | Miteq           | AM-1616-1000                   | AVO | 2019-10-18 | 12 mo    |
| Cable                        | ESM Cable Corp. | Bilog Cables                   | MNH | 2019-10-18 | 12 mo    |
| Antenna - Biconilog          | ETS Lindgren    | 3142D                          | AXO | 2019-09-03 | 24 mo    |

|                              |          |        |     |            |       |
|------------------------------|----------|--------|-----|------------|-------|
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFN | 2019-12-23 | 12 mo |
|------------------------------|----------|--------|-----|------------|-------|

#### MEASUREMENT BANDWIDTHS

| Frequency Range<br>(MHz) | Peak Data<br>(kHz) | Quasi-Peak Data<br>(kHz) | Average Data<br>(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 of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual 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 if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector  
PK = Peak Detector  
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

# SPURIOUS RADIATED EMISSIONS

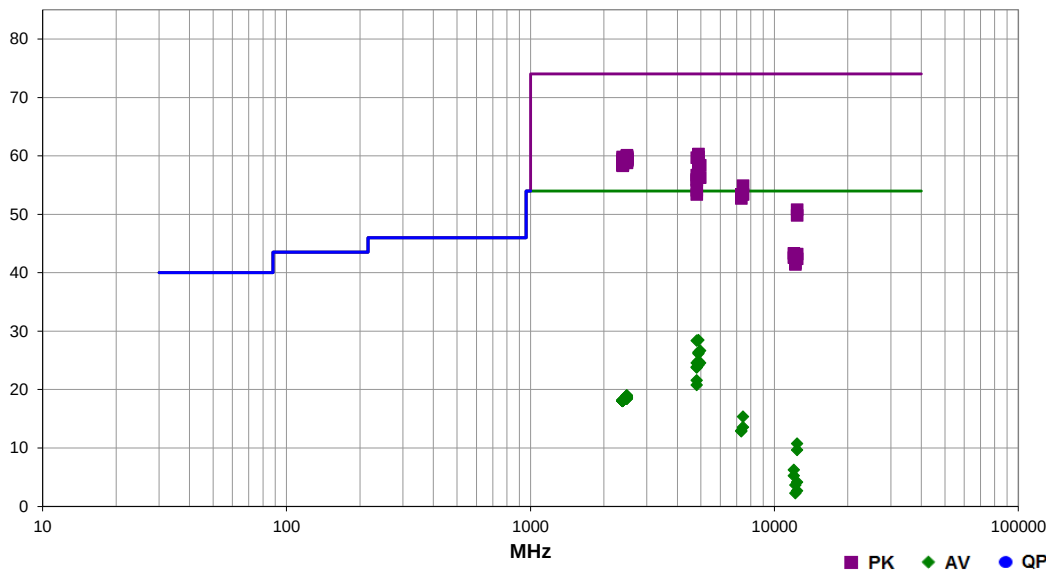


EmiRS 2019.08.15.1 PSA-ESCI 2019.11.08.1

|                 |                                                                                                                                                                                                                                                                                                                     |                   |            |  |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------|--|
| Work Order:     | APRI0010                                                                                                                                                                                                                                                                                                            | Date:             | 2020-03-20 |  |
| Project:        | None                                                                                                                                                                                                                                                                                                                | Temperature:      | 21.4 °C    |  |
| Job Site:       | MN09                                                                                                                                                                                                                                                                                                                | Humidity:         | 23.9% RH   |  |
| Serial Number:  | 4                                                                                                                                                                                                                                                                                                                   | Barometric Pres.: | 1033 mbar  |  |
| EUT:            | JL Module                                                                                                                                                                                                                                                                                                           | Tested by:        | Dan Haas   |  |
| Configuration:  | 2                                                                                                                                                                                                                                                                                                                   |                   |            |  |
| Customer:       | Apricity Code                                                                                                                                                                                                                                                                                                       |                   |            |  |
| Attendees:      | None                                                                                                                                                                                                                                                                                                                |                   |            |  |
| EUT Power:      | 5 VDC (via USB)                                                                                                                                                                                                                                                                                                     |                   |            |  |
| Operating Mode: | Continuous Transmit Bluetooth, Max power. See comments for EUT orientation, transmit frequency, and data rate.                                                                                                                                                                                                      |                   |            |  |
| Deviations:     | None                                                                                                                                                                                                                                                                                                                |                   |            |  |
| Comments:       | Test mode operates at 77% duty Cycle, Upward DCCF correction applied based on $10 \cdot \log(1/\text{Duty cycle}) = 1.135$ . Operational worst case Duty cycle in any 100ms is 2.892ms. Downward DCCF correction applied based on $20 \cdot \log(\text{Duty Cycle}) = -30.776$ . Total correction applied = -29.64. |                   |            |  |

| Test Specifications | Test Method      |
|---------------------|------------------|
| FCC 15.247:2020     | ANSI C63.10:2013 |

| Run # | 16 | Test Distance (m) | 3 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|-------|----|-------------------|---|-------------------|-----------|---------|------|
|-------|----|-------------------|---|-------------------|-----------|---------|------|



| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Duty Cycle Correction Factor (dB) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments                              |
|------------|------------------|-------------|-------------------------|-------------------|-----------------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|---------------------------------------|
| 4880.333   | 55.0             | 5.3         | 1.9                     | 124.0             | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 60.3              | 74.0                 | -13.7                  | EUT Vertical, Mid (2440 MHz), DH5     |
| 2484.227   | 43.0             | -2.9        | 1.5                     | 135.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 60.1              | 74.0                 | -13.9                  | EUT Horizontal, High (2480 MHz), DH5  |
| 2485.367   | 42.8             | -2.9        | 1.5                     | 116.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.9              | 74.0                 | -14.1                  | EUT on side, High (2480 MHz), 3DH5    |
| 2485.087   | 42.8             | -2.9        | 1.2                     | 32.0              | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.9              | 74.0                 | -14.1                  | EUT Horizontal, High (2480 MHz), 2DH5 |
| 4880.450   | 54.5             | 5.3         | 2.0                     | 149.0             | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 59.8              | 74.0                 | -14.2                  | EUT Vertical, Mid (2440 MHz), 2DH5    |
| 2486.000   | 42.7             | -2.9        | 1.1                     | 123.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.8              | 74.0                 | -14.2                  | EUT Vertical, High (2480 MHz), DH5    |
| 2386.787   | 43.0             | -3.2        | 2.5                     | 262.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.8              | 74.0                 | -14.2                  | EUT Vertical, Low (2402 MHz), 3DH5    |
| 4804.575   | 54.5             | 5.2         | 1.9                     | 123.0             | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 59.7              | 74.0                 | -14.3                  | EUT Vertical, Low (2402 MHz), DH5     |
| 2486.313   | 42.6             | -2.9        | 2.0                     | 222.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.7              | 74.0                 | -14.3                  | EUT on side, High (2480 MHz), 2DH5    |
| 2485.940   | 42.5             | -2.9        | 1.5                     | 212.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.6              | 74.0                 | -14.4                  | EUT on side, High (2480 MHz), DH5     |
| 2484.720   | 42.4             | -2.9        | 2.5                     | 227.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.5              | 74.0                 | -14.5                  | EUT on side, High (2480 MHz), DH5     |
| 2485.267   | 42.4             | -2.9        | 1.5                     | 227.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.5              | 74.0                 | -14.5                  | EUT Vertical, High (2480 MHz), 3DH5   |
| 2386.633   | 42.7             | -3.2        | 3.3                     | 97.0              | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.5              | 74.0                 | -14.5                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 2487.087   | 42.3             | -2.9        | 1.5                     | 54.0              | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.4              | 74.0                 | -14.6                  | EUT Vertical, High (2480 MHz), DH5    |
| 2486.720   | 42.3             | -2.9        | 1.5                     | 7.0               | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.4              | 74.0                 | -14.6                  | EUT Vertical, High (2480 MHz), 3DH5   |
| 2487.467   | 42.3             | -2.9        | 3.9                     | 0.0               | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.4              | 74.0                 | -14.6                  | EUT Horizontal, High (2480 MHz), 3DH5 |
| 2486.553   | 42.2             | -2.9        | 1.5                     | 153.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.3              | 74.0                 | -14.7                  | EUT Horizontal, High (2480 MHz), DH5  |
| 2485.973   | 42.2             | -2.9        | 1.5                     | 326.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.3              | 74.0                 | -14.7                  | EUT on side, High (2480 MHz), 2DH5    |
| 2483.747   | 42.1             | -2.9        | 1.5                     | 99.0              | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.2              | 74.0                 | -14.8                  | EUT Vertical, High (2480 MHz), 2DH5   |
| 2386.753   | 42.4             | -3.2        | 1.5                     | 282.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.2              | 74.0                 | -14.8                  | EUT on side, Low (2402 MHz), DH5      |
| 2483.547   | 42.0             | -2.9        | 1.5                     | 207.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.1              | 74.0                 | -14.9                  | EUT on side, High (2480 MHz), 3DH5    |
| 2485.813   | 42.0             | -2.9        | 2.4                     | 160.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.1              | 74.0                 | -14.9                  | EUT Horizontal, High (2480 MHz), 2DH5 |
| 2387.013   | 42.3             | -3.2        | 3.0                     | 201.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 59.1              | 74.0                 | -14.9                  | EUT Horizontal, Low (2402 MHz), 3DH5  |
| 2483.533   | 41.9             | -2.9        | 1.5                     | 139.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.0              | 74.0                 | -15.0                  | EUT Vertical, High (2480 MHz), 2DH5   |
| 2389.927   | 42.2             | -3.2        | 1.5                     | 276.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 59.0              | 74.0                 | -15.0                  | EUT on side, Low (2402 MHz), 2DH5     |
| 2387.300   | 42.1             | -3.2        | 3.2                     | 26.0              | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 58.9              | 74.0                 | -15.1                  | EUT Vertical, Low (2402 MHz), 2DH5    |
| 2387.227   | 42.1             | -3.2        | 1.5                     | 337.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 58.9              | 74.0                 | -15.1                  | EUT on side, Low (2402 MHz), 3DH5     |
| 2388.520   | 42.1             | -3.2        | 1.5                     | 290.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 58.9              | 74.0                 | -15.1                  | EUT Vertical, Low (2402 MHz), 3DH5    |
| 2484.993   | 41.7             | -2.9        | 1.5                     | 47.0              | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 58.8              | 74.0                 | -15.2                  | EUT Horizontal, High (2480 MHz), 3DH5 |

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Duty Cycle Correction Factor (dB) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments                              |
|------------|------------------|-------------|-------------------------|-------------------|-----------------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|---------------------------------------|
| 2389.993   | 42.0             | -3.2        | 1.5                     | 134.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 58.8              | 74.0                 | -15.2                  | EUT on side, Low (2402 MHz), 2DH5     |
| 2388.973   | 42.0             | -3.2        | 2.6                     | 117.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 58.8              | 74.0                 | -15.2                  | EUT Horizontal, Low (2402 MHz), 3DH5  |
| 2389.700   | 41.9             | -3.2        | 1.9                     | 312.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 58.7              | 74.0                 | -15.3                  | EUT Horizontal, Low (2402 MHz), 2DH5  |
| 2387.507   | 41.9             | -3.2        | 1.5                     | 255.0             | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 58.7              | 74.0                 | -15.3                  | EUT Vertical, Low (2402 MHz), DH5     |
| 2387.760   | 41.7             | -3.2        | 1.5                     | 56.0              | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 58.5              | 74.0                 | -15.5                  | EUT Vertical, Low (2402 MHz), 2DH5    |
| 2388.507   | 41.7             | -3.2        | 1.5                     | 9.0               | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 58.5              | 74.0                 | -15.5                  | EUT on side, Low (2402 MHz), 3DH5     |
| 2389.453   | 41.7             | -3.2        | 1.9                     | 35.0              | 0.0                               | 20.0                      | Horz                      | PK       | 0.0                      | 58.5              | 74.0                 | -15.5                  | EUT on side, Low (2402 MHz), DH5      |
| 4959.675   | 52.9             | 5.5         | 2.0                     | 140.0             | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 58.4              | 74.0                 | -15.6                  | EUT Vertical, High (2480 MHz), DH5    |
| 2386.120   | 41.6             | -3.2        | 1.5                     | 201.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 58.4              | 74.0                 | -15.6                  | EUT Horizontal, Low (2402 MHz), 2DH5  |
| 2386.767   | 41.6             | -3.2        | 2.7                     | 38.0              | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 58.4              | 74.0                 | -15.6                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 4879.983   | 53.0             | 5.3         | 1.8                     | 129.0             | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 58.3              | 74.0                 | -15.7                  | EUT Vertical, Mid (2440 MHz), DH5     |
| 2388.300   | 41.5             | -3.2        | 1.5                     | 120.0             | 0.0                               | 20.0                      | Vert                      | PK       | 0.0                      | 58.3              | 74.0                 | -15.7                  | EUT Vertical, Low (2402 MHz), DH5     |
| 4880.708   | 52.5             | 5.3         | 2.0                     | 141.0             | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 57.8              | 74.0                 | -16.2                  | EUT Vertical, Mid (2440 MHz), 3DH5    |
| 4803.775   | 51.5             | 5.2         | 3.9                     | 117.0             | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 56.7              | 74.0                 | -17.3                  | EUT on side, Low (2402 MHz), DH5      |
| 4880.442   | 51.4             | 5.3         | 4.0                     | 131.0             | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 56.7              | 74.0                 | -17.3                  | EUT on side, Mid (2440 MHz), DH5      |
| 4960.433   | 50.8             | 5.5         | 3.8                     | 114.0             | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 56.3              | 74.0                 | -17.7                  | EUT on side, High (2480 MHz), DH5     |
| 4803.875   | 50.8             | 5.2         | 3.3                     | 205.0             | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 56.0              | 74.0                 | -18.0                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 4803.892   | 50.6             | 5.2         | 1.5                     | 43.0              | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 55.8              | 74.0                 | -18.2                  | EUT on side, Low (2402 MHz), DH5      |
| 7440.433   | 40.4             | 14.5        | 3.1                     | 62.0              | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 54.9              | 74.0                 | -19.1                  | EUT Vertical, High (2480 MHz), DH5    |
| 4803.883   | 48.9             | 5.2         | 1.6                     | 119.0             | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 54.1              | 74.0                 | -19.9                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 4803.783   | 48.2             | 5.2         | 1.5                     | 49.0              | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 53.4              | 74.0                 | -20.6                  | EUT Vertical, Low (2402 MHz), DH5     |
| 7318.633   | 39.4             | 14.0        | 1.5                     | 351.0             | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 53.4              | 74.0                 | -20.6                  | EUT on side, Mid (2440 MHz), DH5      |
| 7439.683   | 38.9             | 14.5        | 1.5                     | 134.0             | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 53.4              | 74.0                 | -20.6                  | EUT on side, High (2480 MHz), DH5     |
| 7321.308   | 38.7             | 14.0        | 1.5                     | 172.0             | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 52.7              | 74.0                 | -21.3                  | EUT Vertical, Mid (2440 MHz), DH5     |
| 12401.720  | 36.7             | 14.1        | 3.1                     | 76.0              | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 50.8              | 74.0                 | -23.2                  | EUT on side, High (2480 MHz), DH5     |
| 12402.060  | 35.7             | 14.1        | 1.5                     | 9.0               | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 49.8              | 74.0                 | -24.2                  | EUT Vertical, High (2480 MHz), DH5    |
| 4880.108   | 52.8             | 5.3         | 1.9                     | 124.0             | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 28.5              | 54.0                 | -25.5                  | EUT Vertical, Mid (2440 MHz), DH5     |
| 4804.092   | 52.8             | 5.2         | 1.9                     | 123.0             | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 28.4              | 54.0                 | -25.6                  | EUT Vertical, Low (2402 MHz), DH5     |
| 4960.133   | 50.8             | 5.5         | 2.0                     | 140.0             | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 26.7              | 54.0                 | -27.3                  | EUT Vertical, High (2480 MHz), DH5    |
| 4880.100   | 50.7             | 5.3         | 1.8                     | 129.0             | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 26.4              | 54.0                 | -27.6                  | EUT Vertical, Mid (2440 MHz), DH5     |
| 4880.067   | 50.5             | 5.3         | 2.0                     | 149.0             | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 26.2              | 54.0                 | -27.8                  | EUT Vertical, Mid (2440 MHz), 2DH5    |
| 4880.058   | 49.2             | 5.3         | 4.0                     | 131.0             | -29.6                             | 0.0                       | Vert                      | AV       | 0.0                      | 24.9              | 54.0                 | -29.1                  | EUT on side, Mid (2440 MHz), DH5      |
| 4804.067   | 49.0             | 5.2         | 3.9                     | 117.0             | -29.6                             | 0.0                       | Vert                      | AV       | 0.0                      | 24.6              | 54.0                 | -29.4                  | EUT on side, Low (2402 MHz), DH5      |
| 4960.100   | 48.7             | 5.5         | 3.8                     | 114.0             | -29.6                             | 0.0                       | Vert                      | AV       | 0.0                      | 24.6              | 54.0                 | -29.4                  | EUT on side, High (2480 MHz), DH5     |
| 4880.108   | 48.5             | 5.3         | 2.0                     | 141.0             | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 24.2              | 54.0                 | -29.8                  | EUT Vertical, Mid (2440 MHz), 3DH5    |
| 4804.092   | 48.3             | 5.2         | 3.3                     | 205.0             | -29.6                             | 0.0                       | Vert                      | AV       | 0.0                      | 23.9              | 54.0                 | -30.1                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 4804.083   | 48.2             | 5.2         | 1.5                     | 43.0              | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 23.8              | 54.0                 | -30.2                  | EUT on side, Low (2402 MHz), DH5      |
| 12009.280  | 45.0             | -1.7        | 3.1                     | 114.0             | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 43.3              | 74.0                 | -30.7                  | EUT Vertical, Low (2402 MHz), DH5     |
| 12399.700  | 43.5             | -0.3        | 1.6                     | 21.0              | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 43.2              | 74.0                 | -30.8                  | EUT Vertical, High (2480 MHz), DH5    |
| 12009.870  | 44.3             | -1.7        | 4.0                     | 78.0              | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 42.6              | 74.0                 | -31.4                  | EUT on side, Low (2402 MHz), DH5      |
| 12399.930  | 42.7             | -0.3        | 1.5                     | 110.0             | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 42.4              | 74.0                 | -31.6                  | EUT on side, High (2480 MHz), DH5     |
| 12198.930  | 42.0             | -0.3        | 1.6                     | 10.0              | 0.0                               | 0.0                       | Horz                      | PK       | 0.0                      | 41.7              | 74.0                 | -32.3                  | EUT Vertical, Mid (2440 MHz), DH5     |
| 4804.075   | 46.0             | 5.2         | 1.6                     | 119.0             | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 21.6              | 54.0                 | -32.4                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 12199.550  | 41.7             | -0.3        | 1.9                     | 114.0             | 0.0                               | 0.0                       | Vert                      | PK       | 0.0                      | 41.4              | 74.0                 | -32.6                  | EUT on side, Mid (2440 MHz), DH5      |
| 4804.083   | 45.2             | 5.2         | 1.5                     | 49.0              | -29.6                             | 0.0                       | Vert                      | AV       | 0.0                      | 20.8              | 54.0                 | -33.2                  | EUT Vertical, Low (2402 MHz), DH5     |
| 2483.500   | 31.5             | -2.9        | 1.5                     | 54.0              | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 19.0              | 54.0                 | -35.0                  | EUT Vertical, High (2480 MHz), DH5    |
| 2483.627   | 31.5             | -2.9        | 1.5                     | 326.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 19.0              | 54.0                 | -35.0                  | EUT on side, High (2480 MHz), 2DH5    |
| 2483.540   | 31.5             | -2.9        | 1.5                     | 99.0              | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 19.0              | 54.0                 | -35.0                  | EUT Vertical, High (2480 MHz), 2DH5   |
| 2484.273   | 31.3             | -2.9        | 1.1                     | 123.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.8              | 54.0                 | -35.2                  | EUT Vertical, High (2480 MHz), DH5    |
| 2483.613   | 31.3             | -2.9        | 2.5                     | 227.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.8              | 54.0                 | -35.2                  | EUT on side, High (2480 MHz), DH5     |
| 2483.520   | 31.2             | -2.9        | 1.5                     | 207.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.7              | 54.0                 | -35.3                  | EUT on side, High (2480 MHz), 3DH5    |
| 2483.727   | 31.2             | -2.9        | 2.4                     | 160.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.7              | 54.0                 | -35.3                  | EUT Horizontal, High (2480 MHz), 2DH5 |
| 2484.147   | 31.1             | -2.9        | 1.5                     | 212.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.6              | 54.0                 | -35.4                  | EUT on side, High (2480 MHz), DH5     |
| 2484.833   | 31.1             | -2.9        | 1.5                     | 153.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.6              | 54.0                 | -35.4                  | EUT Horizontal, High (2480 MHz), DH5  |
| 2484.140   | 31.1             | -2.9        | 1.5                     | 135.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.6              | 54.0                 | -35.4                  | EUT Horizontal, High (2480 MHz), DH5  |
| 2483.640   | 31.1             | -2.9        | 1.5                     | 116.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.6              | 54.0                 | -35.4                  | EUT on side, High (2480 MHz), 3DH5    |
| 2483.613   | 31.1             | -2.9        | 3.9                     | 0.0               | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.6              | 54.0                 | -35.4                  | EUT Horizontal, High (2480 MHz), 3DH5 |
| 2484.427   | 31.1             | -2.9        | 1.2                     | 32.0              | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.6              | 54.0                 | -35.4                  | EUT Horizontal, High (2480 MHz), 2DH5 |
| 2484.107   | 31.0             | -2.9        | 1.5                     | 7.0               | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.5              | 54.0                 | -35.5                  | EUT Vertical, High (2480 MHz), 3DH5   |
| 2483.547   | 31.0             | -2.9        | 1.5                     | 227.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.5              | 54.0                 | -35.5                  | EUT Vertical, High (2480 MHz), 3DH5   |
| 2485.293   | 31.0             | -2.9        | 1.5                     | 47.0              | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.5              | 54.0                 | -35.5                  | EUT Horizontal, High (2480 MHz), 3DH5 |
| 2485.153   | 31.0             | -2.9        | 2.0                     | 222.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.5              | 54.0                 | -35.5                  | EUT on side, High (2480 MHz), 2DH5    |
| 2483.513   | 31.0             | -2.9        | 1.5                     | 139.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.5              | 54.0                 | -35.5                  | EUT Vertical, High (2480 MHz), 2DH5   |
| 2388.940   | 31.0             | -3.2        | 1.5                     | 56.0              | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.2              | 54.0                 | -35.8                  | EUT Vertical, Low (2402 MHz), 2DH5    |
| 2387.547   | 31.0             | -3.2        | 1.5                     | 134.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.2              | 54.0                 | -35.8                  | EUT on side, Low (2402 MHz), 2DH5     |
| 2386.100   | 31.0             | -3.2        | 1.5                     | 201.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.2              | 54.0                 | -35.8                  | EUT Horizontal, Low (2402 MHz), 2DH5  |
| 2389.053   | 31.0             | -3.2        | 3.0                     | 201.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.2              | 54.0                 | -35.8                  | EUT Horizontal, Low (2402 MHz), 3DH5  |
| 2389.787   | 31.0             | -3.2        | 2.6                     | 117.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.2              | 54.0                 | -35.8                  | EUT Horizontal, Low (2402 MHz), 3DH5  |
| 2387.160   | 31.0             | -3.2        | 3.3                     | 97.0              | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.2              | 54.0                 | -35.8                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 2388.313   | 31.0             | -3.2        | 2.7                     | 38.0              | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.2              | 54.0                 | -35.8                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 2386.247   | 30.9             | -3.2        | 3.2                     | 26.0              | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT Vertical, Low (2402 MHz), 2DH5    |
| 2389.373   | 30.9             | -3.2        | 1.5                     | 276.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT on side, Low (2402 MHz), 2DH5     |
| 2386.453   | 30.9             | -3.2        | 1.9                     | 312.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT Horizontal, Low (2402 MHz), 2DH5  |
| 2387.407   | 30.9             | -3.2        | 1.5                     | 337.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT on side, Low (2402 MHz), 3DH5     |
| 2387.787   | 30.9             | -3.2        | 1.5                     | 9.0               | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT on side, Low (2402 MHz), 3DH5     |
| 2386.073   | 30.9             | -3.2        | 1.5                     | 290.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT Vertical, Low (2402 MHz), 3DH5    |
| 2388.187   | 30.9             | -3.2        | 2.5                     | 262.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT Vertical, Low (2402 MHz), 3DH5    |
| 2389.740   | 30.9             | -3.2        | 1.9                     | 35.0              | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT on side, Low (2402 MHz), DH5      |
| 2387.900   | 30.9             | -3.2        | 1.5                     | 282.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT on side, Low (2402 MHz), DH5      |
| 2387.160   | 30.9             | -3.2        | 1.5                     | 255.0             | -29.6                             | 20.0                      | Horz                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT Vertical, Low (2402 MHz), DH5     |
| 2387.653   | 30.9             | -3.2        | 1.5                     | 120.0             | -29.6                             | 20.0                      | Vert                      | AV       | 0.0                      | 18.1              | 54.0                 | -35.9                  | EUT Vertical, Low (2402 MHz), DH5     |
| 7440.300   | 30.5             | 14.5        | 3.1                     | 62.0              | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 15.4              | 54.0                 | -38.6                  | EUT Vertical, High (2480 MHz), DH5    |
| 7440.317   | 28.7             | 14.5        | 1.5                     | 134.0             | -29.6                             | 0.0                       | Vert                      | AV       | 0.0                      | 13.6              | 54.0                 | -40.4                  | EUT on side, High (2480 MHz), DH5     |
| 7320.658   | 28.6             | 14.0        | 1.5                     | 351.0             | -29.6                             | 0.0                       | Vert                      | AV       | 0.0                      | 13.0              | 54.0                 | -41.0                  | EUT on side, Mid (2440 MHz), DH5      |
| 7320.392   | 28.5             | 14.0        | 1.5                     | 172.0             | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 12.9              | 54.0                 | -41.1                  | EUT Vertical, Mid (2440 MHz), DH5     |
| 12400.830  | 26.3             | 14.1        | 3.1                     | 76.0              | -29.6                             | 0.0                       | Vert                      | AV       | 0.0                      | 10.8              | 54.0                 | -43.2                  | EUT on side, High (2480 MHz), DH5     |
| 12400.750  | 25.2             | 14.1        | 1.5                     | 9.0               | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 9.7               | 54.0                 | -44.3                  | EUT Vertical, High (2480 MHz), DH5    |
| 12010.870  | 37.6             | -1.7        | 3.1                     | 114.0             | -29.6                             | 0.0                       | Horz                      | AV       | 0.0                      | 6.3               | 54.0                 | -47.7                  | EUT Vertical, Low (2402 MHz), DH5     |
| 12010.800  | 36.6             | -1.7        | 4.0                     | 78.0              | -29.6                             | 0.0                       | Vert                      | AV       | 0.0                      | 5.3               | 54.0                 | -48.7                  | EUT on side, Low (2402 MHz), DH5      |
| 12399.660  | 34.1             | -0.3        | 1.6                     | 21.0              | -29.6                             |                           |                           |          |                          |                   |                      |                        |                                       |



# SPURIOUS RADIATED EMISSIONS

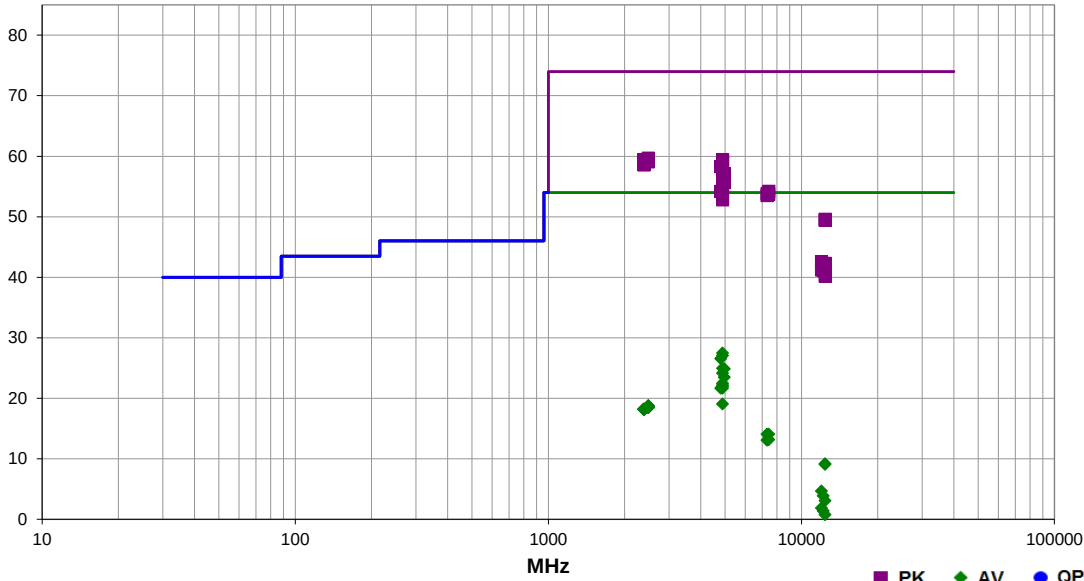


EmiRS 2019.08.15.1 PSA-ESCI 2019.11.08.1

|                 |                                                                                                                                                                                                                                                                                                                     |                     |            |                                                                                    |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|------------------------------------------------------------------------------------|
| Work Order:     | APRI0010                                                                                                                                                                                                                                                                                                            | Date:               | 2020-03-24 |  |
| Project:        | None                                                                                                                                                                                                                                                                                                                | Temperature:        | 21.6 °C    |                                                                                    |
| Job Site:       | MN09                                                                                                                                                                                                                                                                                                                | Humidity:           | 31% RH     |                                                                                    |
| Serial Number:  | 4                                                                                                                                                                                                                                                                                                                   | Barometric Pres.:   | 1018 mbar  |                                                                                    |
|                 |                                                                                                                                                                                                                                                                                                                     | Tested by: Dan Haas |            |                                                                                    |
| EUT:            | JL Module                                                                                                                                                                                                                                                                                                           |                     |            |                                                                                    |
| Configuration:  | 3                                                                                                                                                                                                                                                                                                                   |                     |            |                                                                                    |
| Customer:       | Apricity Code                                                                                                                                                                                                                                                                                                       |                     |            |                                                                                    |
| Attendees:      | None                                                                                                                                                                                                                                                                                                                |                     |            |                                                                                    |
| EUT Power:      | 5 VDC (via USB)                                                                                                                                                                                                                                                                                                     |                     |            |                                                                                    |
| Operating Mode: | Continuous Transmit Bluetooth, Max power. See comments for EUT orientation, transmit frequency, and data rate.                                                                                                                                                                                                      |                     |            |                                                                                    |
| Deviations:     | None                                                                                                                                                                                                                                                                                                                |                     |            |                                                                                    |
| Comments:       | Test mode operates at 77% duty Cycle, Upward DCCF correction applied based on $10 \cdot \log(1/\text{Duty cycle}) = 1.135$ . Operational worst case Duty cycle in any 100ms is 2.892ms. Downward DCCF correction applied based on $20 \cdot \log(\text{Duty Cycle}) = -30.776$ . Total correction applied = -29.64. |                     |            |                                                                                    |

| Test Specifications | Test Method      |
|---------------------|------------------|
| FCC 15.247:2020     | ANSI C63.10:2013 |

| Run # | 60 | Test Distance (m) | 3 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|-------|----|-------------------|---|-------------------|-----------|---------|------|
|-------|----|-------------------|---|-------------------|-----------|---------|------|



| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Duty Cycle Correction Factor (dB) | External Attenuation (dB) | Polarity/Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments                              |
|------------|------------------|-------------|-------------------------|-------------------|-----------------------------------|---------------------------|--------------------------|----------|--------------------------|-------------------|----------------------|------------------------|---------------------------------------|
| 2486.880   | 42.6             | -2.9        | 1.5                     | 79.0              | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.7              | 74.0                 | -14.3                  | EUT Vertical, High (2480 MHz), DH5    |
| 2484.620   | 42.5             | -2.9        | 1.5                     | 223.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.6              | 74.0                 | -14.4                  | EUT Horizontal, High (2480 MHz), DH5  |
| 2484.400   | 42.4             | -2.9        | 1.5                     | 188.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.5              | 74.0                 | -14.5                  | EUT on side, High (2480 MHz), DH5     |
| 2483.900   | 42.4             | -2.9        | 1.5                     | 190.0             | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 59.5              | 74.0                 | -14.5                  | EUT on side, High (2480 MHz), DH5     |
| 4880.493   | 54.1             | 5.3         | 1.9                     | 140.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 59.4              | 74.0                 | -14.6                  | EUT Vertical, Mid (2440 MHz), DH5     |
| 2388.293   | 42.6             | -3.2        | 1.5                     | 136.0             | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 59.4              | 74.0                 | -14.6                  | EUT on side, Low (2402 MHz), DH5      |
| 2486.853   | 42.2             | -2.9        | 1.5                     | 4.0               | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.3              | 74.0                 | -14.7                  | EUT Horizontal, High (2480 MHz), 2DH5 |
| 2484.280   | 42.2             | -2.9        | 3.6                     | 107.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.3              | 74.0                 | -14.7                  | EUT Vertical, High (2480 MHz), 3DH5   |
| 2486.833   | 42.1             | -2.9        | 1.5                     | 204.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.2              | 74.0                 | -14.8                  | EUT Vertical, High (2480 MHz), 2DH5   |
| 2387.413   | 42.4             | -3.2        | 1.5                     | 267.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.2              | 74.0                 | -14.8                  | EUT Vertical, Low (2402 MHz), DH5     |
| 4880.073   | 53.8             | 5.3         | 2.0                     | 140.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 59.1              | 74.0                 | -14.9                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 2486.287   | 42.0             | -2.9        | 1.5                     | 141.0             | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 59.1              | 74.0                 | -14.9                  | EUT Vertical, High (2480 MHz), DH5    |
| 2485.180   | 42.0             | -2.9        | 3.6                     | 89.0              | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 59.1              | 74.0                 | -14.9                  | EUT Horizontal, High (2480 MHz), DH5  |
| 2386.287   | 42.3             | -3.2        | 1.5                     | 231.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.1              | 74.0                 | -14.9                  | EUT on side, Low (2402 MHz), DH5      |
| 2387.867   | 42.3             | -3.2        | 1.5                     | 56.0              | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 59.1              | 74.0                 | -14.9                  | EUT on side, Low (2402 MHz), 2DH5     |
| 2386.360   | 42.1             | -3.2        | 1.5                     | 321.0             | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 58.9              | 74.0                 | -15.1                  | EUT Vertical, Low (2402 MHz), DH5     |
| 2387.067   | 42.1             | -3.2        | 1.5                     | 42.0              | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 58.9              | 74.0                 | -15.1                  | EUT Horizontal, Low (2402 MHz), DH5   |
| 2388.967   | 41.8             | -3.2        | 1.5                     | 24.0              | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 58.6              | 74.0                 | -15.4                  | EUT Horizontal, High (2480 MHz), DH5  |
| 2386.260   | 41.8             | -3.2        | 1.5                     | 10.0              | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 58.6              | 74.0                 | -15.4                  | EUT on side, Low (2402 MHz), 3DH5     |
| 4804.387   | 53.1             | 5.2         | 3.3                     | 136.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 58.3              | 74.0                 | -15.7                  | EUT Vertical, Low (2402 MHz), DH5     |
| 4880.113   | 52.0             | 5.3         | 1.8                     | 139.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 57.3              | 74.0                 | -16.7                  | EUT Vertical, Mid (2440 MHz), 3DH5    |
| 4880.420   | 51.9             | 5.3         | 2.1                     | 56.0              | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 57.2              | 74.0                 | -16.8                  | EUT on side, Mid (2440 MHz), DH5      |
| 4960.433   | 51.6             | 5.5         | 2.0                     | 141.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 57.1              | 74.0                 | -16.9                  | EUT Vertical, High (2480 MHz), DH5    |
| 4879.780   | 51.2             | 5.3         | 1.5                     | 140.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 56.5              | 74.0                 | -17.5                  | EUT Vertical, Mid (2440 MHz), 2DH5    |
| 4880.433   | 50.8             | 5.3         | 2.9                     | 233.0             | 0.0                               | 0.0                       | Vert                     | PK       | 0.0                      | 56.1              | 74.0                 | -17.9                  | EUT Horizontal, Mid (2440 MHz), DH5   |

| Freq<br>(MHz) | Amplitude<br>(dBuV) | Factor<br>(dB) | Antenna<br>Height<br>(meters) | Azimuth<br>(degrees) | Duty Cycle<br>Correction<br>Factor<br>(dB) | External<br>Attenuation<br>(dB) | Polarity/<br>Transducer<br>Type | Detector | Distance<br>Adjustment<br>(dB) | Adjusted<br>(dBuV/m) | Spec. Limit<br>(dBuV/m) | Compared to<br>Spec.<br>(dB) | Comments                              |
|---------------|---------------------|----------------|-------------------------------|----------------------|--------------------------------------------|---------------------------------|---------------------------------|----------|--------------------------------|----------------------|-------------------------|------------------------------|---------------------------------------|
| 4960.360      | 50.2                | 5.5            | 3.8                           | 245.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 55.7                 | 74.0                    | -18.3                        | EUT Horizontal, High (2480 MHz), DH5  |
| 4880.293      | 49.4                | 5.3            | 2.5                           | 71.0                 | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 54.7                 | 74.0                    | -19.3                        | EUT Vertical, Mid (2440 MHz), DH5     |
| 4879.747      | 49.4                | 5.3            | 3.2                           | 137.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 54.7                 | 74.0                    | -19.3                        | EUT on side, Mid (2440 MHz), DH5      |
| 4804.527      | 49.0                | 5.2            | 4.0                           | 280.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 54.2                 | 74.0                    | -19.8                        | EUT Horizontal, Low (2402 MHz), DH5   |
| 7440.200      | 39.7                | 14.5           | 1.6                           | 67.0                 | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 54.2                 | 74.0                    | -19.8                        | EUT Vertical, High (2480 MHz), DH5    |
| 7320.487      | 39.8                | 14.0           | 1.9                           | 56.0                 | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 53.8                 | 74.0                    | -20.2                        | EUT Vertical, Mid (2440 MHz), DH5     |
| 7440.500      | 39.2                | 14.5           | 1.5                           | 252.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 53.7                 | 74.0                    | -20.3                        | EUT Horizontal, High (2480 MHz), DH5  |
| 7319.700      | 39.5                | 14.0           | 3.2                           | 38.0                 | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 53.5                 | 74.0                    | -20.5                        | EUT Horizontal, Mid (2440 MHz), DH5   |
| 4880.547      | 47.5                | 5.3            | 1.5                           | 173.0                | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 52.8                 | 74.0                    | -21.2                        | EUT Horizontal, Mid (2440 MHz), DH5   |
| 12401.260     | 35.5                | 14.1           | 1.5                           | 228.0                | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 49.6                 | 74.0                    | -24.4                        | EUT Vertical, High (2480 MHz), DH5    |
| 12400.180     | 35.3                | 14.1           | 1.5                           | 194.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 49.4                 | 74.0                    | -24.6                        | EUT Horizontal, High (2480 MHz), DH5  |
| 4880.093      | 51.8                | 5.3            | 1.9                           | 140.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 27.5                 | 54.0                    | -26.5                        | EUT Vertical, Mid (2440 MHz), DH5     |
| 4880.100      | 51.4                | 5.3            | 2.0                           | 140.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 27.1                 | 54.0                    | -26.9                        | EUT Vertical, Mid (2440 MHz), DH5     |
| 4804.113      | 51.0                | 5.2            | 3.3                           | 136.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 26.6                 | 54.0                    | -27.4                        | EUT Vertical, Low (2402 MHz), DH5     |
| 4880.107      | 49.3                | 5.3            | 2.1                           | 56.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 25.0                 | 54.0                    | -29.0                        | EUT on side, Mid (2440 MHz), DH5      |
| 4960.107      | 49.0                | 5.5            | 2.0                           | 141.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 24.9                 | 54.0                    | -29.1                        | EUT Vertical, High (2480 MHz), DH5    |
| 4880.087      | 48.5                | 5.3            | 2.9                           | 233.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 24.2                 | 54.0                    | -29.8                        | EUT Horizontal, Mid (2440 MHz), DH5   |
| 4960.060      | 47.6                | 5.5            | 3.8                           | 245.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 23.5                 | 54.0                    | -30.5                        | EUT Horizontal, High (2480 MHz), DH5  |
| 12010.940     | 44.3                | -1.7           | 1.6                           | 31.0                 | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 42.6                 | 74.0                    | -31.4                        | EUT Vertical, Low (2402 MHz), DH5     |
| 4880.160      | 46.8                | 5.3            | 1.8                           | 139.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 22.5                 | 54.0                    | -31.5                        | EUT Vertical, Mid (2440 MHz), 3DH5    |
| 12399.860     | 42.6                | -0.3           | 1.6                           | 22.0                 | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 42.3                 | 74.0                    | -31.7                        | EUT Vertical, High (2480 MHz), DH5    |
| 12199.920     | 42.5                | -0.3           | 1.6                           | 22.0                 | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 42.2                 | 74.0                    | -31.8                        | EUT Vertical, Mid (2440 MHz), DH5     |
| 4880.067      | 46.5                | 5.3            | 3.2                           | 137.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 22.2                 | 54.0                    | -31.8                        | EUT on side, Mid (2440 MHz), DH5      |
| 4880.060      | 46.3                | 5.3            | 2.5                           | 71.0                 | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 22.0                 | 54.0                    | -32.0                        | EUT Vertical, Mid (2440 MHz), DH5     |
| 4804.087      | 46.1                | 5.2            | 4.0                           | 280.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 21.7                 | 54.0                    | -32.3                        | EUT Horizontal, Low (2402 MHz), DH5   |
| 4880.193      | 46.0                | 5.3            | 1.5                           | 140.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 21.7                 | 54.0                    | -32.3                        | EUT Vertical, Mid (2440 MHz), 2DH5    |
| 12009.970     | 42.9                | -1.7           | 1.8                           | 233.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 41.2                 | 74.0                    | -32.8                        | EUT Horizontal, Low (2402 MHz), DH5   |
| 12201.370     | 41.4                | -0.3           | 3.2                           | 96.0                 | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 41.1                 | 74.0                    | -32.9                        | EUT Horizontal, Mid (2440 MHz), DH5   |
| 12399.830     | 40.5                | -0.3           | 3.9                           | 210.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 40.2                 | 74.0                    | -33.8                        | EUT Horizontal, High (2480 MHz), DH5  |
| 4880.100      | 43.4                | 5.3            | 1.5                           | 173.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 19.1                 | 54.0                    | -34.9                        | EUT Horizontal, Mid (2440 MHz), DH5   |
| 2485.500      | 31.3                | -2.9           | 1.5                           | 79.0                 | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.8                 | 54.0                    | -35.2                        | EUT Vertical, High (2480 MHz), DH5    |
| 2485.227      | 31.3                | -2.9           | 1.5                           | 141.0                | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.8                 | 54.0                    | -35.2                        | EUT Vertical, High (2480 MHz), DH5    |
| 2484.060      | 31.2                | -2.9           | 1.5                           | 188.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.7                 | 54.0                    | -35.3                        | EUT on side, High (2480 MHz), DH5     |
| 2483.520      | 31.1                | -2.9           | 1.5                           | 190.0                | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.6                 | 54.0                    | -35.4                        | EUT on side, High (2480 MHz), DH5     |
| 2483.640      | 31.1                | -2.9           | 1.5                           | 223.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.6                 | 54.0                    | -35.4                        | EUT Horizontal, High (2480 MHz), DH5  |
| 2483.833      | 31.1                | -2.9           | 3.6                           | 89.0                 | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.6                 | 54.0                    | -35.4                        | EUT Horizontal, High (2480 MHz), DH5  |
| 2484.820      | 31.0                | -2.9           | 1.5                           | 4.0                  | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.5                 | 54.0                    | -35.5                        | EUT Horizontal, High (2480 MHz), 2DH5 |
| 2485.600      | 31.0                | -2.9           | 1.5                           | 204.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.5                 | 54.0                    | -35.5                        | EUT Vertical, High (2480 MHz), 2DH5   |
| 2483.887      | 31.0                | -2.9           | 3.6                           | 107.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.5                 | 54.0                    | -35.5                        | EUT Vertical, High (2480 MHz), 3DH5   |
| 2389.500      | 31.0                | -3.2           | 1.5                           | 267.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Vertical, Low (2402 MHz), DH5     |
| 2387.640      | 31.0                | -3.2           | 1.5                           | 321.0                | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Vertical, Low (2402 MHz), DH5     |
| 2387.493      | 31.0                | -3.2           | 1.5                           | 231.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT on side, Low (2402 MHz), DH5      |
| 2386.027      | 31.0                | -3.2           | 1.5                           | 136.0                | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT on side, Low (2402 MHz), DH5      |
| 2387.887      | 31.0                | -3.2           | 1.5                           | 24.0                 | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Horizontal, Low (2402 MHz), DH5   |
| 2387.913      | 31.0                | -3.2           | 1.5                           | 42.0                 | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Horizontal, Low (2402 MHz), DH5   |
| 2389.640      | 31.0                | -3.2           | 1.5                           | 56.0                 | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT on side, Low (2402 MHz), 2DH5     |
| 2389.927      | 31.0                | -3.2           | 1.5                           | 10.0                 | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT on side, Low (2402 MHz), 3DH5     |
| 7319.740      | 29.7                | 14.0           | 3.2                           | 38.0                 | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 14.1                 | 54.0                    | -39.9                        | EUT Horizontal, Mid (2440 MHz), DH5   |
| 7440.020      | 29.2                | 14.5           | 1.6                           | 67.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 14.1                 | 54.0                    | -39.9                        | EUT Vertical, High (2480 MHz), DH5    |
| 7440.493      | 28.3                | 14.5           | 1.5                           | 252.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 13.2                 | 54.0                    | -40.8                        | EUT Horizontal, High (2480 MHz), DH5  |
| 7320.160      | 28.7                | 14.0           | 1.9                           | 56.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 13.1                 | 54.0                    | -40.9                        | EUT Vertical, Mid (2440 MHz), DH5     |
| 12401.460     | 24.7                | 14.1           | 1.5                           | 194.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 9.2                  | 54.0                    | -44.8                        | EUT Horizontal, High (2480 MHz), DH5  |
| 12400.650     | 24.6                | 14.1           | 1.5                           | 228.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 9.1                  | 54.0                    | -44.9                        | EUT Vertical, High (2480 MHz), DH5    |
| 12010.910     | 36.0                | -1.7           | 1.6                           | 31.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 4.7                  | 54.0                    | -49.3                        | EUT Vertical, Low (2402 MHz), DH5     |
| 12200.930     | 33.8                | -0.3           | 1.6                           | 22.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 3.9                  | 54.0                    | -50.1                        | EUT Vertical, Mid (2440 MHz), DH5     |
| 12399.630     | 33.0                | -0.3           | 1.6                           | 22.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 3.1                  | 54.0                    | -50.9                        | EUT Vertical, High (2480 MHz), DH5    |
| 12010.980     | 33.2                | -1.7           | 1.8                           | 233.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 1.9                  | 54.0                    | -52.1                        | EUT Horizontal, Low (2402 MHz), DH5   |
| 12200.950     | 31.3                | -0.3           | 3.2                           | 96.0                 | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 1.4                  | 54.0                    | -52.6                        | EUT Horizontal, Mid (2440 MHz), DH5   |
| 12399.660     | 30.7                | -0.3           | 3.9                           | 210.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 0.8                  | 54.0                    | -53.2                        | EUT Horizontal, High (2480 MHz), DH5  |



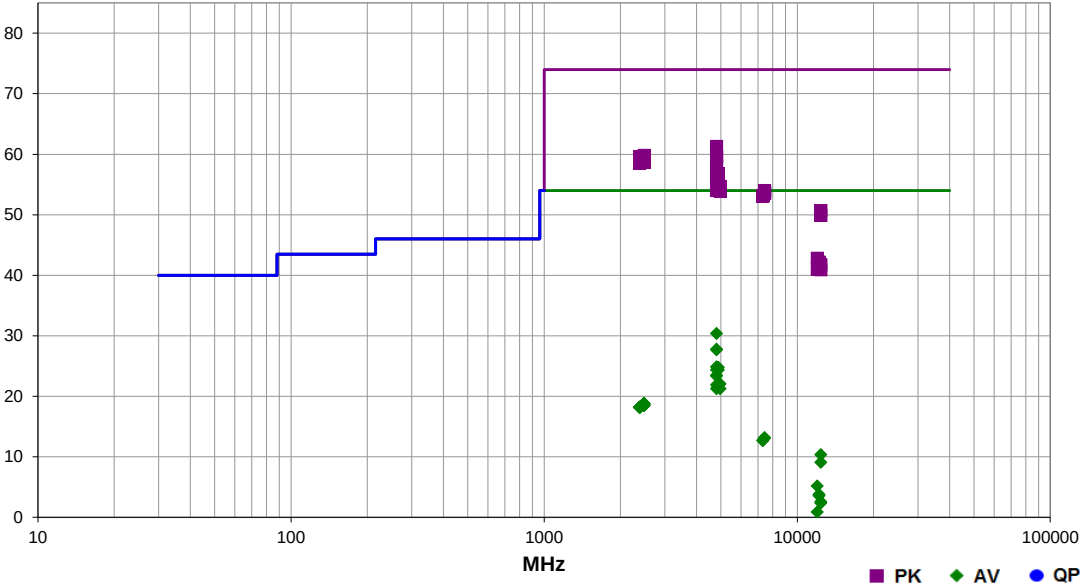
# SPURIOUS RADIATED EMISSIONS

EmR5 2019 08 15.1 PSA-ESCI 2019 11 08.1

|                 |                                                                                                                                                                                                                                                                                                                     |                   |            |                                                                                    |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------|------------------------------------------------------------------------------------|
| Work Order:     | APRI0010                                                                                                                                                                                                                                                                                                            | Date:             | 2020-03-23 |  |
| Project:        | None                                                                                                                                                                                                                                                                                                                | Temperature:      | 21.5 °C    |                                                                                    |
| Job Site:       | MN09                                                                                                                                                                                                                                                                                                                | Humidity:         | 29.8% RH   |                                                                                    |
| Serial Number:  | 4                                                                                                                                                                                                                                                                                                                   | Barometric Pres.: | 1021 mbar  |                                                                                    |
| EUT:            | JL Module                                                                                                                                                                                                                                                                                                           | Tested by:        | Dan Haas   |                                                                                    |
| Configuration:  | 4                                                                                                                                                                                                                                                                                                                   |                   |            |                                                                                    |
| Customer:       | Apricity Code                                                                                                                                                                                                                                                                                                       |                   |            |                                                                                    |
| Attendees:      | None                                                                                                                                                                                                                                                                                                                |                   |            |                                                                                    |
| EUT Power:      | 5 VDC (via USB)                                                                                                                                                                                                                                                                                                     |                   |            |                                                                                    |
| Operating Mode: | Continuous Transmit Bluetooth, Max power. See comments for EUT orientation, transmit frequency, and data rate.                                                                                                                                                                                                      |                   |            |                                                                                    |
| Deviations:     | None                                                                                                                                                                                                                                                                                                                |                   |            |                                                                                    |
| Comments:       | Test mode operates at 77% duty Cycle, Upward DCCF correction applied based on $10 \cdot \log(1/\text{Duty cycle}) = 1.135$ . Operational worst case Duty cycle in any 100ms is 2.892ms. Downward DCCF correction applied based on $20 \cdot \log(\text{Duty Cycle}) = -30.776$ . Total correction applied = -29.64. |                   |            |                                                                                    |

|                     |                  |
|---------------------|------------------|
| Test Specifications | Test Method      |
| FCC 15.247:2020     | ANSI C63.10:2013 |

|       |    |                   |   |                   |           |         |      |
|-------|----|-------------------|---|-------------------|-----------|---------|------|
| Run # | 44 | Test Distance (m) | 3 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|-------|----|-------------------|---|-------------------|-----------|---------|------|



| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Duty Cycle Correction Factor (dB) | External Attenuation (dB) | Polarity/Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments                             |
|------------|------------------|-------------|-------------------------|-------------------|-----------------------------------|---------------------------|--------------------------|----------|--------------------------|-------------------|----------------------|------------------------|--------------------------------------|
| 4804.087   | 56.1             | 5.2         | 3.3                     | 133.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 61.3              | 74.0                 | -12.7                  | EUT Vertical, Low (2402 MHz), 2DH5   |
| 2484.873   | 42.7             | -2.9        | 3.0                     | 43.0              | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 59.8              | 74.0                 | -14.2                  | EUT Vertical, High (2480 MHz), 3DH5  |
| 2484.007   | 42.6             | -2.9        | 1.3                     | 126.0             | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 59.7              | 74.0                 | -14.3                  | EUT Vertical, High (2480 MHz), DH5   |
| 4804.387   | 54.4             | 5.2         | 1.7                     | 132.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 59.6              | 74.0                 | -14.4                  | EUT Vertical, Low (2402 MHz), DH5    |
| 4803.700   | 54.4             | 5.2         | 3.3                     | 133.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 59.6              | 74.0                 | -14.4                  | EUT Vertical, Low (2402 MHz), DH5    |
| 2483.947   | 42.5             | -2.9        | 1.5                     | 121.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.6              | 74.0                 | -14.4                  | EUT Vertical, High (2480 MHz), DH5   |
| 2387.307   | 42.8             | -3.2        | 1.5                     | 334.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.6              | 74.0                 | -14.4                  | EUT Vertical, Low (2402 MHz), 3DH5   |
| 2484.427   | 42.4             | -2.9        | 1.5                     | 16.0              | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.5              | 74.0                 | -14.5                  | EUT on side, High (2480 MHz), DH5    |
| 2386.873   | 42.5             | -3.2        | 2.1                     | 238.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.3              | 74.0                 | -14.7                  | EUT Vertical, Low (2402 MHz), DH5    |
| 2486.380   | 42.1             | -2.9        | 1.5                     | 109.0             | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 59.2              | 74.0                 | -14.8                  | EUT on side, High (2480 MHz), DH5    |
| 2486.467   | 42.1             | -2.9        | 1.0                     | 79.0              | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 59.2              | 74.0                 | -14.8                  | EUT Vertical, High (2480 MHz), 2DH5  |
| 2484.447   | 42.1             | -2.9        | 4.0                     | 257.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.2              | 74.0                 | -14.8                  | EUT Vertical, High (2480 MHz), 3DH5  |
| 2487.120   | 41.9             | -2.9        | 1.5                     | 104.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.0              | 74.0                 | -15.0                  | EUT Horizontal, High (2480 MHz), DH5 |
| 2484.840   | 41.9             | -2.9        | 1.5                     | 151.0             | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 59.0              | 74.0                 | -15.0                  | EUT Vertical, High (2480 MHz), 2DH5  |
| 2487.120   | 41.6             | -2.9        | 1.5                     | 19.0              | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 58.7              | 74.0                 | -15.3                  | EUT Horizontal, High (2480 MHz), DH5 |
| 2387.267   | 41.9             | -3.2        | 1.5                     | 314.0             | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 58.7              | 74.0                 | -15.3                  | EUT Vertical, Low (2402 MHz), DH5    |
| 2389.807   | 41.9             | -3.2        | 1.5                     | 29.0              | 0.0                               | 20.0                      | Horz                     | PK       | 0.0                      | 58.7              | 74.0                 | -15.3                  | EUT Vertical, Low (2402 MHz), 2DH5   |
| 2389.340   | 41.8             | -3.2        | 1.5                     | 102.0             | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 58.6              | 74.0                 | -15.4                  | EUT Vertical, Low (2402 MHz), 2DH5   |
| 2388.367   | 41.7             | -3.2        | 1.5                     | 218.0             | 0.0                               | 20.0                      | Vert                     | PK       | 0.0                      | 58.5              | 74.0                 | -15.5                  | EUT Vertical, Low (2402 MHz), 3DH5   |
| 4804.080   | 52.9             | 5.2         | 3.3                     | 133.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 58.1              | 74.0                 | -15.9                  | EUT Vertical, Low (2402 MHz), 3DH5   |
| 4803.720   | 51.8             | 5.2         | 1.7                     | 64.0              | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 57.0              | 74.0                 | -17.0                  | EUT on side, Low (2402 MHz), DH5     |
| 4879.813   | 51.5             | 5.3         | 1.5                     | 129.0             | 0.0                               | 0.0                       | Horz                     | PK       | 0.0                      | 56.8              | 74.0                 | -17.2                  | EUT Vertical, Mid (2440 MHz), DH5    |
| 4879.887   | 51.5             | 5.3         | 4.0                     | 135.0             | 0.0                               | 0.0                       | Vert                     | PK       | 0.0                      | 56.8              | 74.0                 | -17.2                  | EUT on side, Mid (2440 MHz), DH5     |
| 4803.807   | 51.4             | 5.2         | 2.6                     | 107.0             | 0.0                               | 0.0                       | Vert                     | PK       | 0.0                      | 56.6              | 74.0                 | -17.4                  | EUT on side, Low (2402 MHz), DH5     |
| 4803.807   | 50.4             | 5.2         | 2.9                     | 99.0              | 0.0                               | 0.0                       | Vert                     | PK       | 0.0                      | 55.6              | 74.0                 | -18.4                  | EUT Vertical, Low (2402 MHz), DH5    |

| Freq<br>(MHz) | Amplitude<br>(dBuV) | Factor<br>(dB) | Antenna<br>Height<br>(meters) | Azimuth<br>(degrees) | Duty Cycle<br>Correction<br>Factor<br>(dB) | External<br>Attenuation<br>(dB) | Polarity/<br>Transducer<br>Type | Detector | Distance<br>Adjustment<br>(dB) | Adjusted<br>(dBuV/m) | Spec. Limit<br>(dBuV/m) | Compared to<br>Spec.<br>(dB) | Comments                             |
|---------------|---------------------|----------------|-------------------------------|----------------------|--------------------------------------------|---------------------------------|---------------------------------|----------|--------------------------------|----------------------|-------------------------|------------------------------|--------------------------------------|
| 4959.833      | 49.2                | 5.5            | 1.5                           | 129.0                | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 54.7                 | 74.0                    | -19.3                        | EUT Vertical, High (2480 MHz), DH5   |
| 4803.673      | 49.2                | 5.2            | 2.2                           | 308.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 54.4                 | 74.0                    | -19.6                        | EUT Horizontal, Low (2402 MHz), DH5  |
| 4804.573      | 48.8                | 5.2            | 1.6                           | 198.0                | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 54.0                 | 74.0                    | -20.0                        | EUT Horizontal, Low (2402 MHz), DH5  |
| 7439.913      | 39.5                | 14.5           | 1.5                           | 336.0                | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 54.0                 | 74.0                    | -20.0                        | EUT Vertical, High (2480 MHz), DH5   |
| 4959.800      | 48.4                | 5.5            | 2.5                           | 101.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 53.9                 | 74.0                    | -20.1                        | EUT on side, High (2480 MHz), DH5    |
| 7441.707      | 39.1                | 14.5           | 1.5                           | 245.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 53.6                 | 74.0                    | -20.4                        | EUT on side, High (2480 MHz), DH5    |
| 7321.933      | 39.2                | 14.0           | 2.5                           | 64.0                 | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 53.2                 | 74.0                    | -20.8                        | EUT on side, Mid (2440 MHz), DH5     |
| 7319.987      | 39.1                | 14.0           | 1.5                           | 228.0                | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 53.1                 | 74.0                    | -20.9                        | EUT Vertical, Mid (2440 MHz), DH5    |
| 12400.260     | 36.6                | 14.1           | 2.4                           | 102.0                | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 50.7                 | 74.0                    | -23.3                        | EUT on side, High (2480 MHz), DH5    |
| 4804.113      | 54.8                | 5.2            | 3.3                           | 133.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 30.4                 | 54.0                    | -23.6                        | EUT Vertical, Low (2402 MHz), 2DH5   |
| 12400.950     | 35.8                | 14.1           | 1.5                           | 309.0                | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 49.9                 | 74.0                    | -24.1                        | EUT Vertical, High (2480 MHz), DH5   |
| 4804.127      | 52.2                | 5.2            | 1.7                           | 132.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 27.8                 | 54.0                    | -26.2                        | EUT Vertical, Low (2402 MHz), DH5    |
| 4804.113      | 52.1                | 5.2            | 3.3                           | 133.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 27.7                 | 54.0                    | -26.3                        | EUT Vertical, Low (2402 MHz), DH5    |
| 4804.087      | 49.3                | 5.2            | 1.7                           | 64.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 24.9                 | 54.0                    | -29.1                        | EUT on side, Low (2402 MHz), DH5     |
| 4880.093      | 49.1                | 5.3            | 4.0                           | 135.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 24.8                 | 54.0                    | -29.2                        | EUT on side, Mid (2440 MHz), DH5     |
| 4804.100      | 48.8                | 5.2            | 2.6                           | 107.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 24.4                 | 54.0                    | -29.6                        | EUT on side, Low (2402 MHz), DH5     |
| 4880.120      | 48.7                | 5.3            | 1.5                           | 129.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 24.4                 | 54.0                    | -29.6                        | EUT Vertical, Mid (2440 MHz), DH5    |
| 4804.147      | 47.9                | 5.2            | 3.3                           | 133.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 23.5                 | 54.0                    | -30.5                        | EUT Vertical, Low (2402 MHz), 3DH5   |
| 4804.113      | 47.8                | 5.2            | 2.9                           | 99.0                 | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 23.4                 | 54.0                    | -30.6                        | EUT Vertical, Low (2402 MHz), DH5    |
| 12011.020     | 44.5                | -1.7           | 1.7                           | 28.0                 | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 42.8                 | 74.0                    | -31.2                        | EUT Vertical, Low (2402 MHz), DH5    |
| 12199.400     | 42.5                | -0.3           | 3.4                           | 82.0                 | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 42.2                 | 74.0                    | -31.8                        | EUT on side, Mid (2440 MHz), DH5     |
| 4960.113      | 46.2                | 5.5            | 1.5                           | 129.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 22.1                 | 54.0                    | -31.9                        | EUT Vertical, High (2480 MHz), DH5   |
| 12200.780     | 42.3                | -0.3           | 1.5                           | 25.0                 | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 42.0                 | 74.0                    | -32.0                        | EUT Vertical, Mid (2440 MHz), DH5    |
| 4804.107      | 46.3                | 5.2            | 2.2                           | 308.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 21.9                 | 54.0                    | -32.1                        | EUT Horizontal, Low (2402 MHz), DH5  |
| 12399.540     | 42.0                | -0.3           | 2.9                           | 91.0                 | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 41.7                 | 74.0                    | -32.3                        | EUT on side, High (2480 MHz), DH5    |
| 4804.087      | 45.7                | 5.2            | 1.6                           | 198.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 21.3                 | 54.0                    | -32.7                        | EUT Horizontal, Low (2402 MHz), DH5  |
| 4960.140      | 45.4                | 5.5            | 2.5                           | 101.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 21.3                 | 54.0                    | -32.7                        | EUT on side, High (2480 MHz), DH5    |
| 12009.310     | 42.7                | -1.7           | 1.5                           | 36.0                 | 0.0                                        | 0.0                             | Vert                            | PK       | 0.0                            | 41.0                 | 74.0                    | -33.0                        | EUT on side, Low (2402 MHz), DH5     |
| 12399.410     | 41.2                | -0.3           | 1.5                           | 31.0                 | 0.0                                        | 0.0                             | Horz                            | PK       | 0.0                            | 40.9                 | 74.0                    | -33.1                        | EUT Vertical, High (2480 MHz), DH5   |
| 2483.560      | 31.4                | -2.9           | 3.0                           | 43.0                 | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.9                 | 54.0                    | -35.1                        | EUT Vertical, High (2480 MHz), 3DH5  |
| 2483.527      | 31.3                | -2.9           | 1.5                           | 121.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.8                 | 54.0                    | -35.2                        | EUT Vertical, High (2480 MHz), DH5   |
| 2483.567      | 31.3                | -2.9           | 1.3                           | 126.0                | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.8                 | 54.0                    | -35.2                        | EUT Vertical, High (2480 MHz), DH5   |
| 2483.700      | 31.3                | -2.9           | 1.0                           | 79.0                 | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.8                 | 54.0                    | -35.2                        | EUT Vertical, High (2480 MHz), 2DH5  |
| 2483.633      | 31.1                | -2.9           | 1.5                           | 16.0                 | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.6                 | 54.0                    | -35.4                        | EUT on side, High (2480 MHz), DH5    |
| 2483.913      | 31.1                | -2.9           | 1.5                           | 109.0                | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.6                 | 54.0                    | -35.4                        | EUT on side, High (2480 MHz), DH5    |
| 2483.760      | 31.1                | -2.9           | 1.5                           | 104.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.6                 | 54.0                    | -35.4                        | EUT Horizontal, High (2480 MHz), DH5 |
| 2483.580      | 31.1                | -2.9           | 1.5                           | 151.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.6                 | 54.0                    | -35.4                        | EUT Vertical, High (2480 MHz), 2DH5  |
| 2483.733      | 31.0                | -2.9           | 1.5                           | 19.0                 | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.5                 | 54.0                    | -35.5                        | EUT Horizontal, High (2480 MHz), DH5 |
| 2485.500      | 31.0                | -2.9           | 4.0                           | 257.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.5                 | 54.0                    | -35.5                        | EUT Vertical, High (2480 MHz), 3DH5  |
| 2387.120      | 31.0                | -3.2           | 2.1                           | 238.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Vertical, Low (2402 MHz), DH5    |
| 2387.973      | 31.0                | -3.2           | 1.5                           | 314.0                | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Vertical, Low (2402 MHz), DH5    |
| 2389.647      | 31.0                | -3.2           | 1.5                           | 29.0                 | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Vertical, Low (2402 MHz), 2DH5   |
| 2387.620      | 31.0                | -3.2           | 1.5                           | 102.0                | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Vertical, Low (2402 MHz), 2DH5   |
| 2387.287      | 31.0                | -3.2           | 1.5                           | 334.0                | -29.6                                      | 20.0                            | Horz                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Vertical, Low (2402 MHz), 3DH5   |
| 2388.040      | 31.0                | -3.2           | 1.5                           | 218.0                | -29.6                                      | 20.0                            | Vert                            | AV       | 0.0                            | 18.2                 | 54.0                    | -35.8                        | EUT Vertical, Low (2402 MHz), 3DH5   |
| 7440.493      | 28.3                | 14.5           | 1.5                           | 336.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 13.2                 | 54.0                    | -40.8                        | EUT Vertical, High (2480 MHz), DH5   |
| 7440.487      | 28.2                | 14.5           | 1.5                           | 245.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 13.1                 | 54.0                    | -40.9                        | EUT on side, High (2480 MHz), DH5    |
| 7321.287      | 28.4                | 14.0           | 1.5                           | 228.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 12.8                 | 54.0                    | -41.2                        | EUT Vertical, Mid (2440 MHz), DH5    |
| 7319.240      | 28.3                | 14.0           | 2.5                           | 64.0                 | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 12.7                 | 54.0                    | -41.3                        | EUT on side, Mid (2440 MHz), DH5     |
| 12400.770     | 25.9                | 14.1           | 2.4                           | 102.0                | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 10.4                 | 54.0                    | -43.6                        | EUT on side, High (2480 MHz), DH5    |
| 12401.490     | 24.6                | 14.1           | 1.5                           | 309.0                | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 9.1                  | 54.0                    | -44.9                        | EUT Vertical, High (2480 MHz), DH5   |
| 12010.870     | 36.5                | -1.7           | 1.7                           | 28.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 5.2                  | 54.0                    | -48.8                        | EUT Vertical, Low (2402 MHz), DH5    |
| 12200.830     | 33.7                | -0.3           | 3.4                           | 82.0                 | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 3.8                  | 54.0                    | -50.2                        | EUT on side, Mid (2440 MHz), DH5     |
| 12199.650     | 33.5                | -0.3           | 1.5                           | 25.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 3.6                  | 54.0                    | -50.4                        | EUT Vertical, Mid (2440 MHz), DH5    |
| 12399.640     | 32.5                | -0.3           | 2.9                           | 91.0                 | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 2.6                  | 54.0                    | -51.4                        | EUT on side, High (2480 MHz), DH5    |
| 12399.540     | 32.3                | -0.3           | 1.5                           | 31.0                 | -29.6                                      | 0.0                             | Horz                            | AV       | 0.0                            | 2.4                  | 54.0                    | -51.6                        | EUT Vertical, High (2480 MHz), DH5   |
| 12010.970     | 32.2                | -1.7           | 1.5                           | 36.0                 | -29.6                                      | 0.0                             | Vert                            | AV       | 0.0                            | 0.9                  | 54.0                    | -53.1                        | EUT on side, Low (2402 MHz), DH5     |

# DUTY CYCLE



XMIT 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|-----------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A          | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72 | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20        | TZP | 9-Nov-19  | 9-Nov-20  |
| Block - DC                   | Fairview Microwave | SD3379          | AMZ | 9-Nov-19  | 9-Nov-20  |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A          | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

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

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only take the measurement during the burst duration.

# DUTY CYCLE



TMTx 2019.08.30.0 XMI 2019.09.05

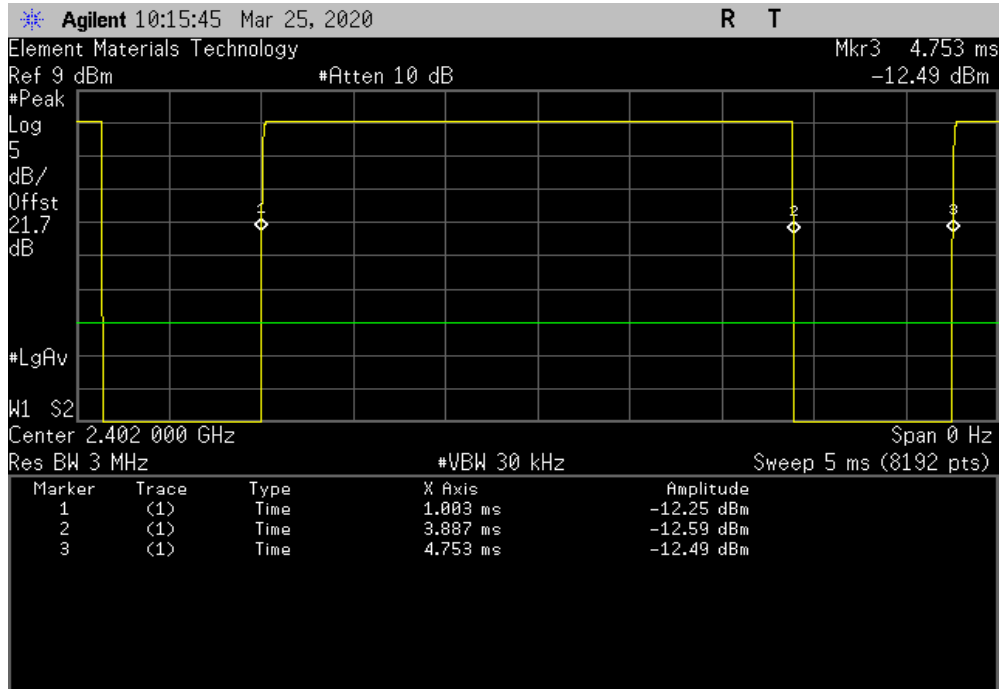
|                                                                                    |              |                                |           |
|------------------------------------------------------------------------------------|--------------|--------------------------------|-----------|
| EUT: JL Module                                                                     |              | Work Order: APRI0010           |           |
| Serial Number: 4                                                                   |              | Date: 25-Mar-20                |           |
| Customer: Apricity Code                                                            |              | Temperature: 22.3 °C           |           |
| Attendees: None                                                                    |              | Humidity: 32.8% RH             |           |
| Project: None                                                                      |              | Barometric Pres.: 1009.9 mbar  |           |
| Tested by: Kyle McMullan                                                           |              | Power: 5 VDC (via USB)         |           |
| Job Site: MN09                                                                     |              |                                |           |
| TEST SPECIFICATIONS                                                                |              |                                |           |
| FCC 15.247:2020                                                                    |              | Test Method                    |           |
|                                                                                    |              | ANSI C63.10:2013               |           |
| COMMENTS                                                                           |              |                                |           |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |              |                                |           |
| DEVIATIONS FROM TEST STANDARD                                                      |              |                                |           |
| None                                                                               |              |                                |           |
| Configuration #                                                                    | 1            | Signature <i>Kyle McMullan</i> |           |
|                                                                                    |              | Pulse Width                    | Period    |
|                                                                                    |              | Number of Pulses               | Value (%) |
|                                                                                    |              | Limit (%)                      | Results   |
| DH5, GFSK                                                                          |              |                                |           |
|                                                                                    | Low Channel  | 2.884 ms                       | 3.75 ms   |
|                                                                                    | Low Channel  | N/A                            | N/A       |
|                                                                                    | Mid Channel  | 2.884 ms                       | 3.75 ms   |
|                                                                                    | Mid Channel  | N/A                            | N/A       |
|                                                                                    | High Channel | 2.884 ms                       | 3.75 ms   |
|                                                                                    | High Channel | N/A                            | N/A       |
| 2DH5, pi/4-DQPSK                                                                   |              |                                |           |
|                                                                                    | Low Channel  | 2.893 ms                       | 3.75 ms   |
|                                                                                    | Low Channel  | N/A                            | N/A       |
|                                                                                    | Mid Channel  | 2.892 ms                       | 3.75 ms   |
|                                                                                    | Mid Channel  | N/A                            | N/A       |
|                                                                                    | High Channel | 2.892 ms                       | 3.75 ms   |
|                                                                                    | High Channel | N/A                            | N/A       |
| 3DH5, 8-DPSK                                                                       |              |                                |           |
|                                                                                    | Low Channel  | 2.893 ms                       | 3.75 ms   |
|                                                                                    | Low Channel  | N/A                            | N/A       |
|                                                                                    | Mid Channel  | 2.893 ms                       | 3.75 ms   |
|                                                                                    | Mid Channel  | N/A                            | N/A       |
|                                                                                    | High Channel | 2.893 ms                       | 3.75 ms   |
|                                                                                    | High Channel | N/A                            | N/A       |

# DUTY CYCLE

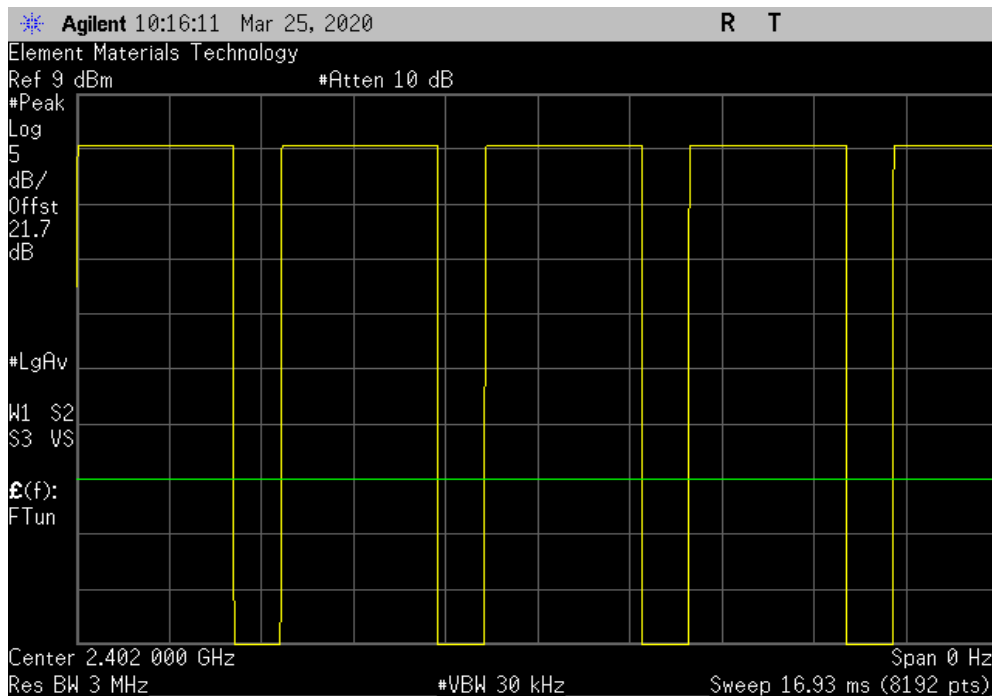


TbTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, Low Channel |             |         |                  |           |           |         |
|------------------------|-------------|---------|------------------|-----------|-----------|---------|
|                        | Pulse Width | Period  | Number of Pulses | Value (%) | Limit (%) | Results |
|                        | 2.884 ms    | 3.75 ms | 1                | 76.9      | N/A       | N/A     |



| DH5, GFSK, Low Channel |             |        |                  |           |           |         |
|------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                        | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                        | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |

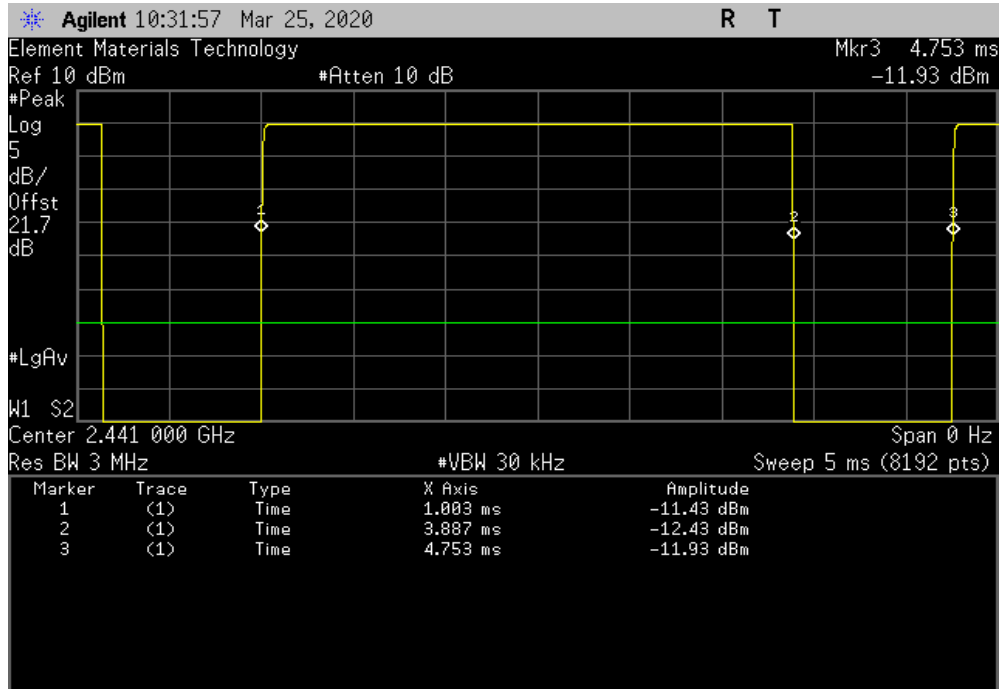


# DUTY CYCLE

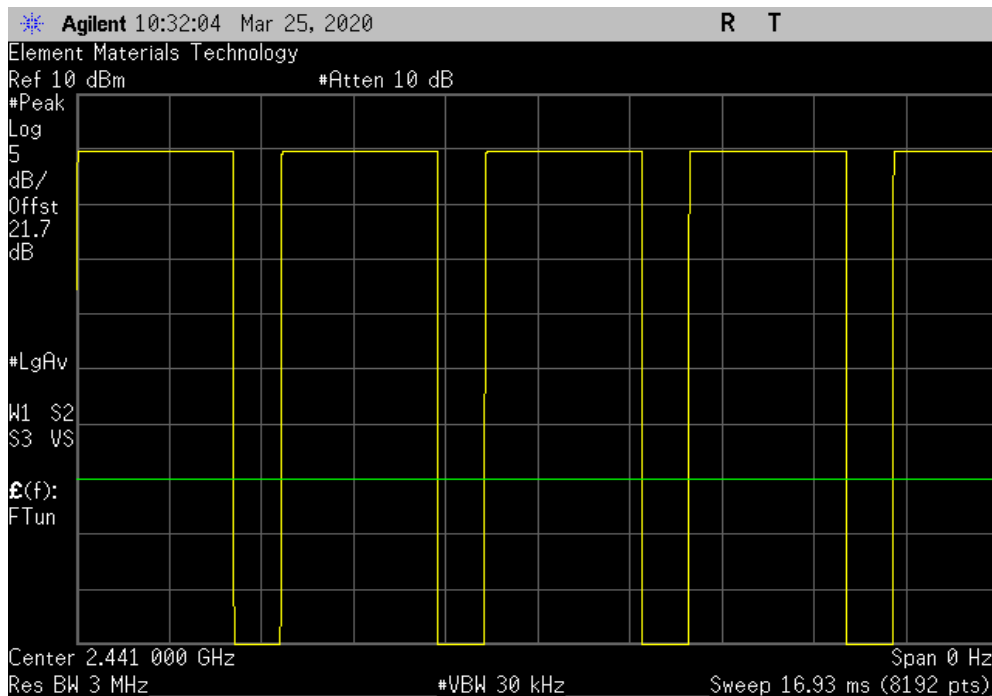


TIMx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, Mid Channel |             |         |                  |           |           |         |
|------------------------|-------------|---------|------------------|-----------|-----------|---------|
|                        | Pulse Width | Period  | Number of Pulses | Value (%) | Limit (%) | Results |
|                        | 2.884 ms    | 3.75 ms | 1                | 76.9      | N/A       | N/A     |



| DH5, GFSK, Mid Channel |             |        |                  |           |           |         |
|------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                        | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                        | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |



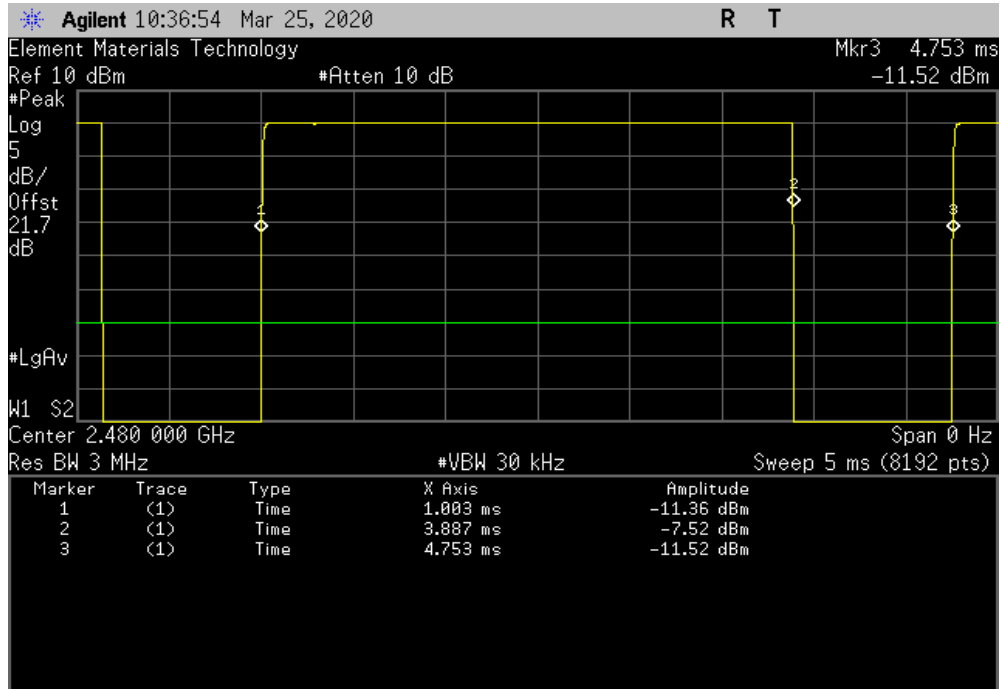


# DUTY CYCLE

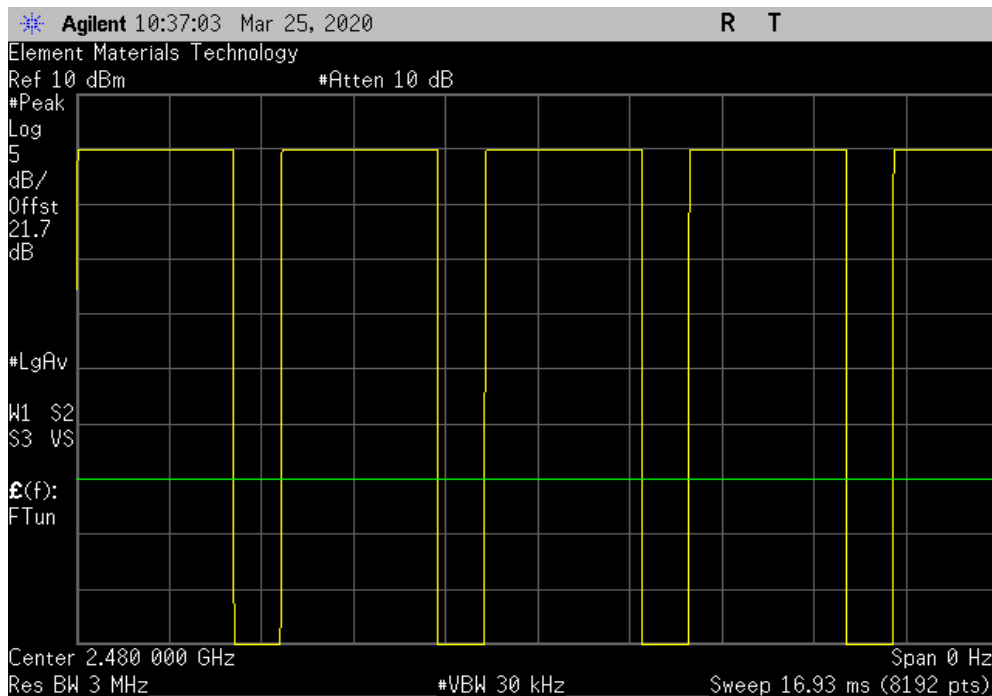


TbTtx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, High Channel |             |         |                  |           |           |         |
|-------------------------|-------------|---------|------------------|-----------|-----------|---------|
|                         | Pulse Width | Period  | Number of Pulses | Value (%) | Limit (%) | Results |
|                         | 2.884 ms    | 3.75 ms | 1                | 76.9      | N/A       | N/A     |



| DH5, GFSK, High Channel |             |        |                  |           |           |         |
|-------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                         | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                         | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |

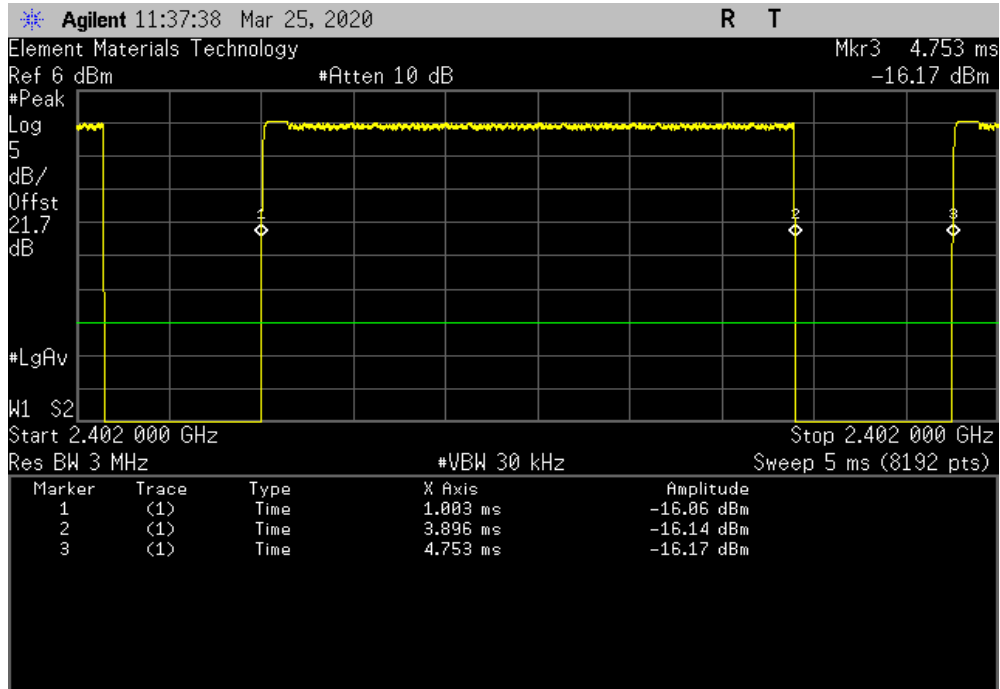


# DUTY CYCLE

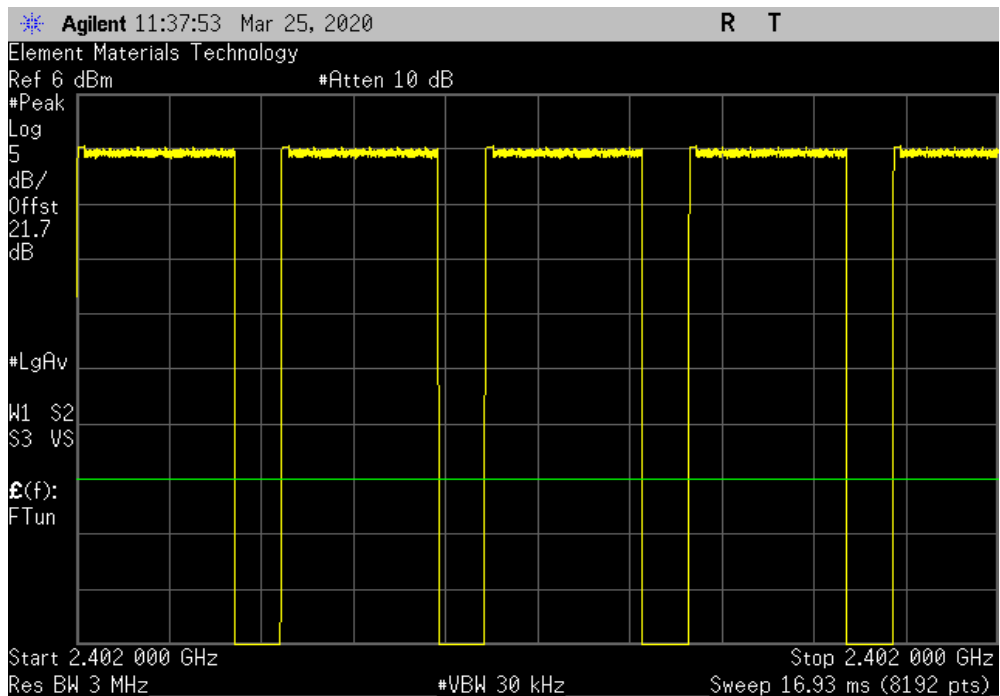


TIMTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, Low Channel |             |         |                  |           |           |         |
|-------------------------------|-------------|---------|------------------|-----------|-----------|---------|
|                               | Pulse Width | Period  | Number of Pulses | Value (%) | Limit (%) | Results |
|                               | 2.893 ms    | 3.75 ms | 1                | 77.1      | N/A       | N/A     |



| 2DH5, pi/4-DQPSK, Low Channel |             |        |                  |           |           |         |
|-------------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                               | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                               | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |

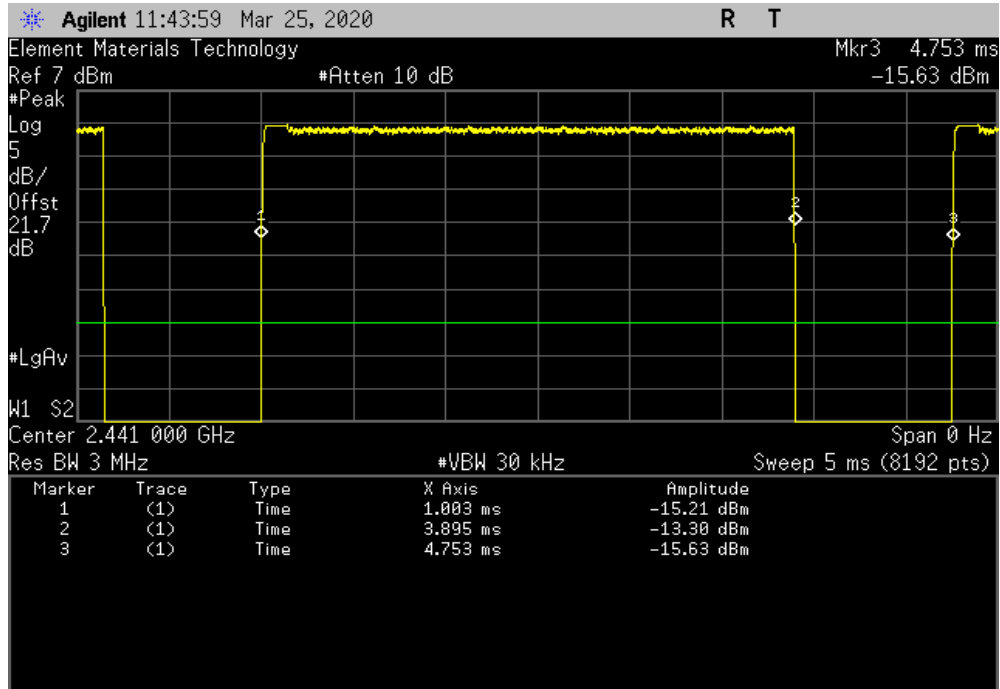


# DUTY CYCLE

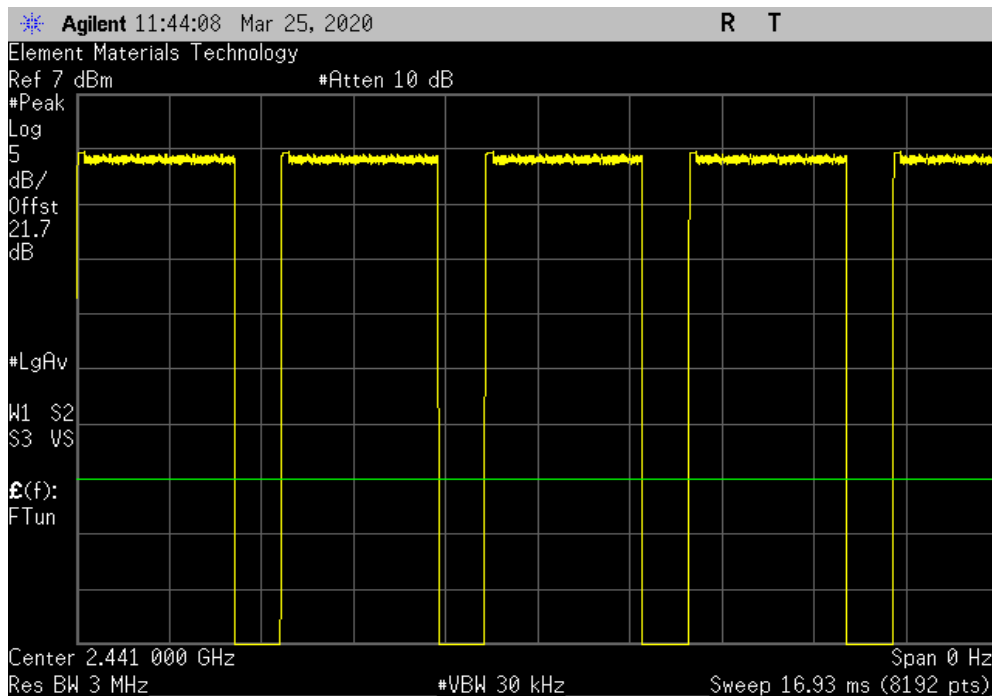


TMTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, Mid Channel |             |         |                  |           |           |         |
|-------------------------------|-------------|---------|------------------|-----------|-----------|---------|
|                               | Pulse Width | Period  | Number of Pulses | Value (%) | Limit (%) | Results |
|                               | 2.892 ms    | 3.75 ms | 1                | 77.1      | N/A       | N/A     |



| 2DH5, pi/4-DQPSK, Mid Channel |             |        |                  |           |           |         |
|-------------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                               | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                               | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |

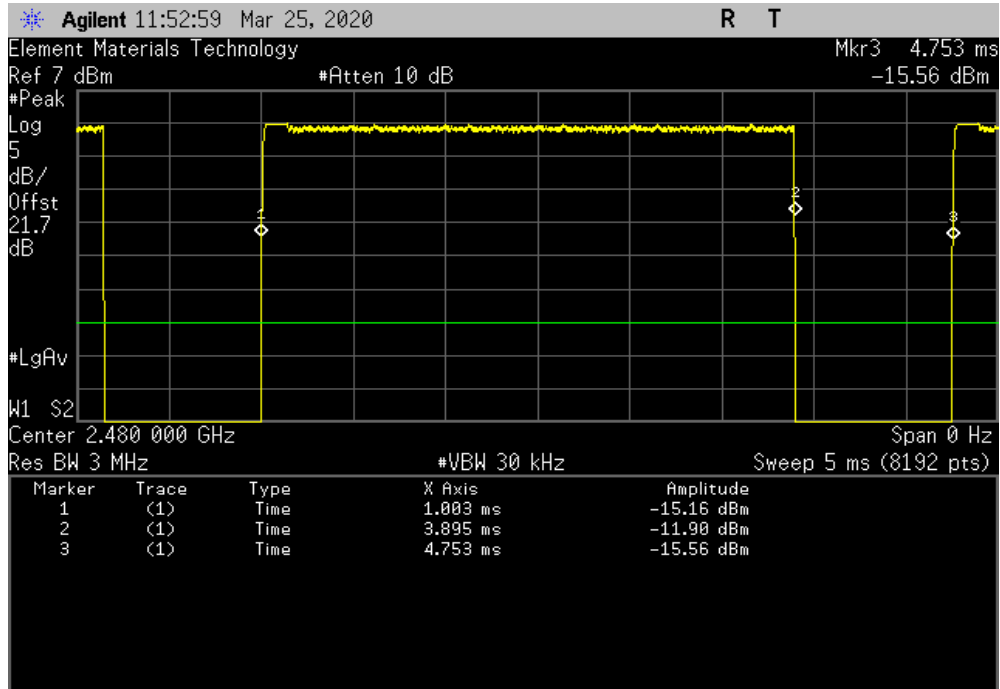


# DUTY CYCLE

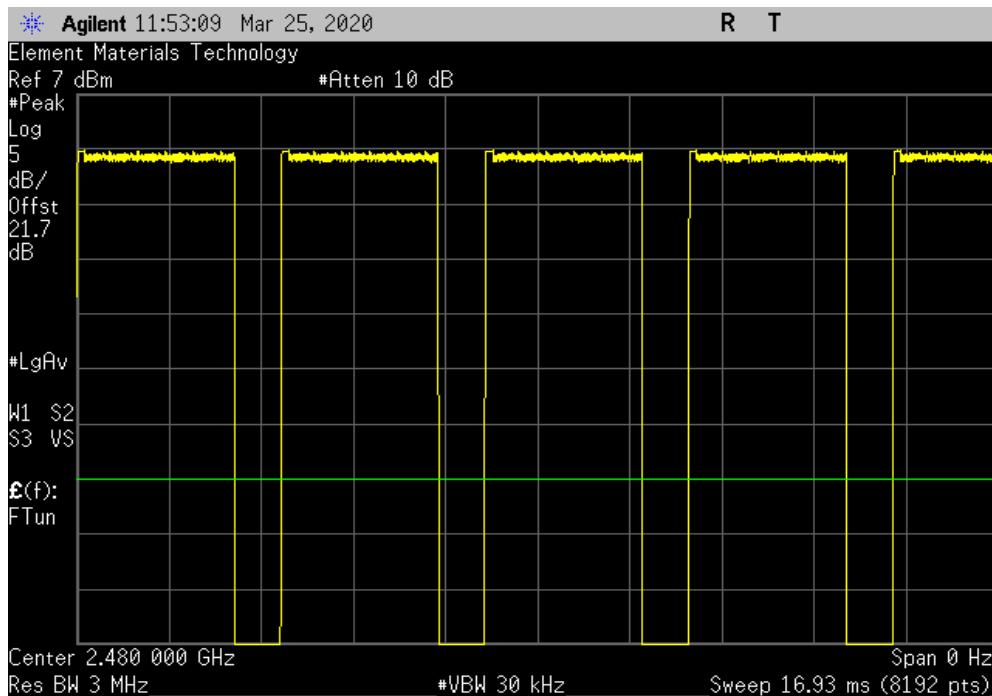


TIMTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, High Channel |             |         |                  |           |           |         |
|--------------------------------|-------------|---------|------------------|-----------|-----------|---------|
|                                | Pulse Width | Period  | Number of Pulses | Value (%) | Limit (%) | Results |
|                                | 2.892 ms    | 3.75 ms | 1                | 77.1      | N/A       | N/A     |



| 2DH5, pi/4-DQPSK, High Channel |             |        |                  |           |           |         |
|--------------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                                | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                                | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |

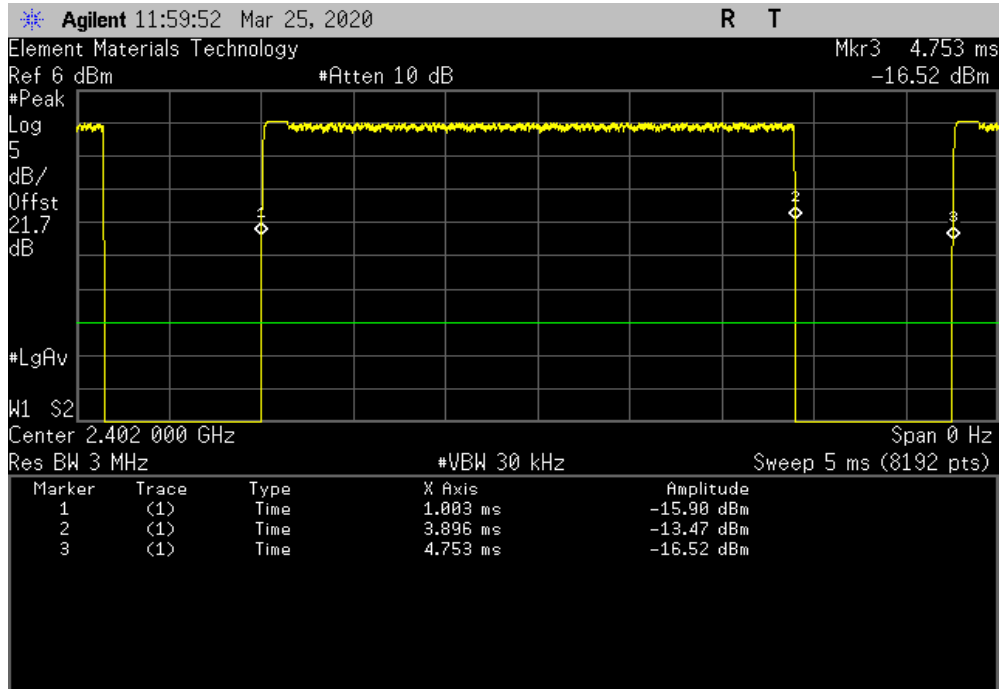


# DUTY CYCLE

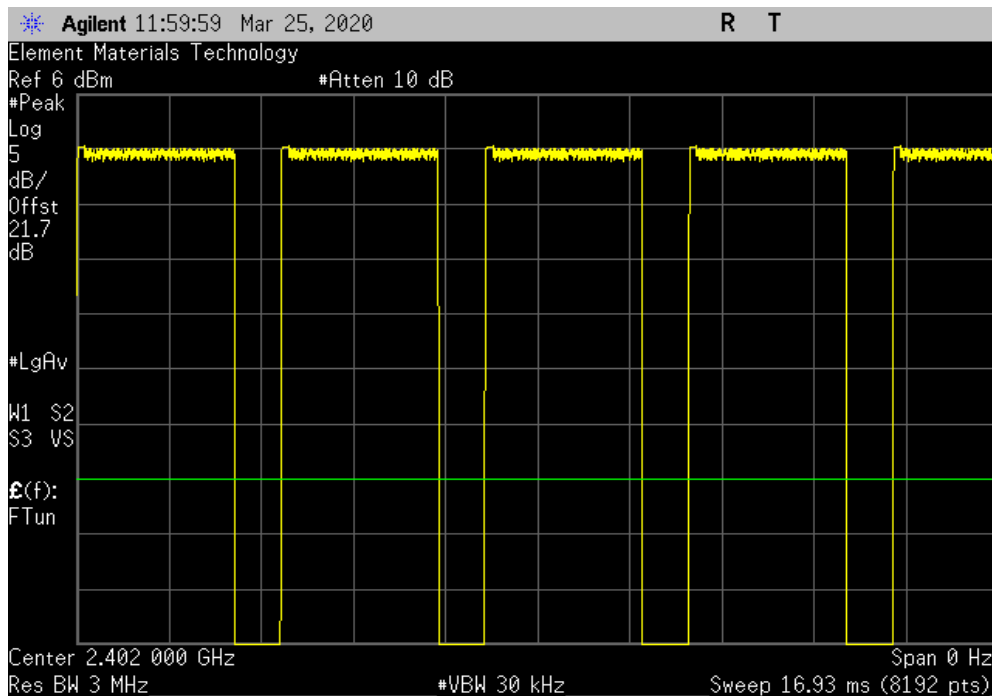


TIMTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, Low Channel |             |         |                  |           |           |         |
|---------------------------|-------------|---------|------------------|-----------|-----------|---------|
|                           | Pulse Width | Period  | Number of Pulses | Value (%) | Limit (%) | Results |
|                           | 2.893 ms    | 3.75 ms | 1                | 77.2      | N/A       | N/A     |



| 3DH5, 8-DPSK, Low Channel |             |        |                  |           |           |         |
|---------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                           | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                           | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |

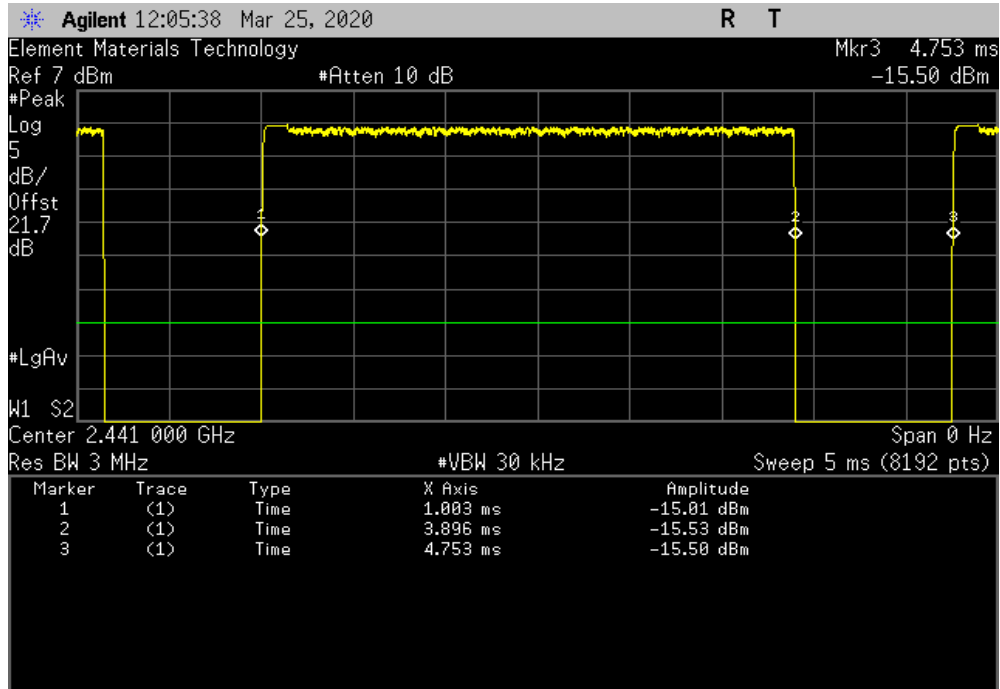


# DUTY CYCLE

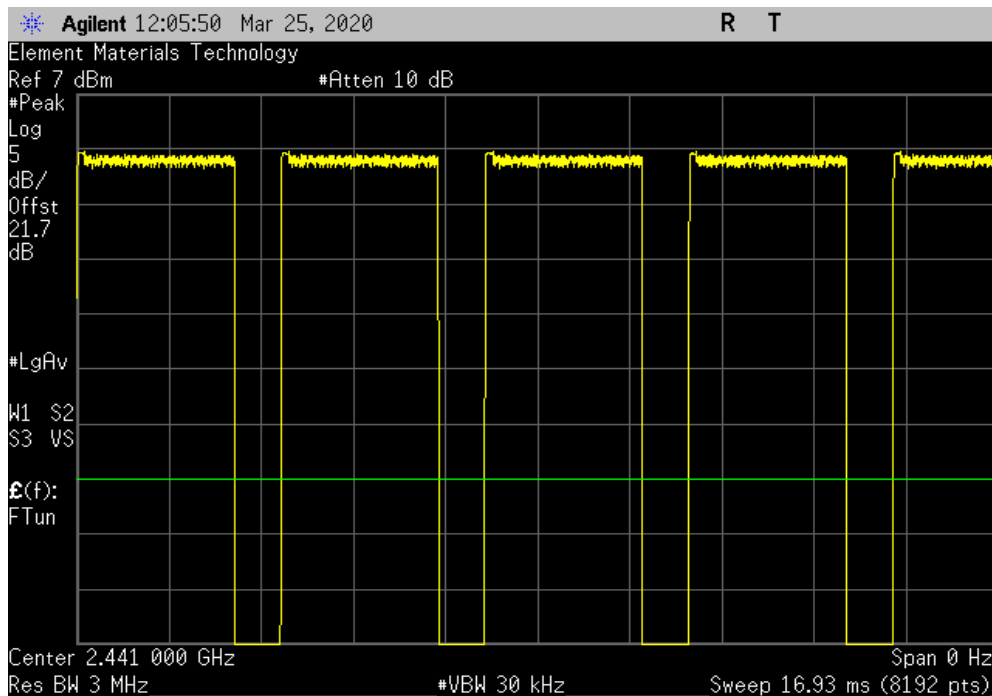


TIMx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, Mid Channel |             |         |                  |           |           |         |
|---------------------------|-------------|---------|------------------|-----------|-----------|---------|
|                           | Pulse Width | Period  | Number of Pulses | Value (%) | Limit (%) | Results |
|                           | 2.893 ms    | 3.75 ms | 1                | 77.2      | N/A       | N/A     |



| 3DH5, 8-DPSK, Mid Channel |             |        |                  |           |           |         |
|---------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                           | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                           | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |

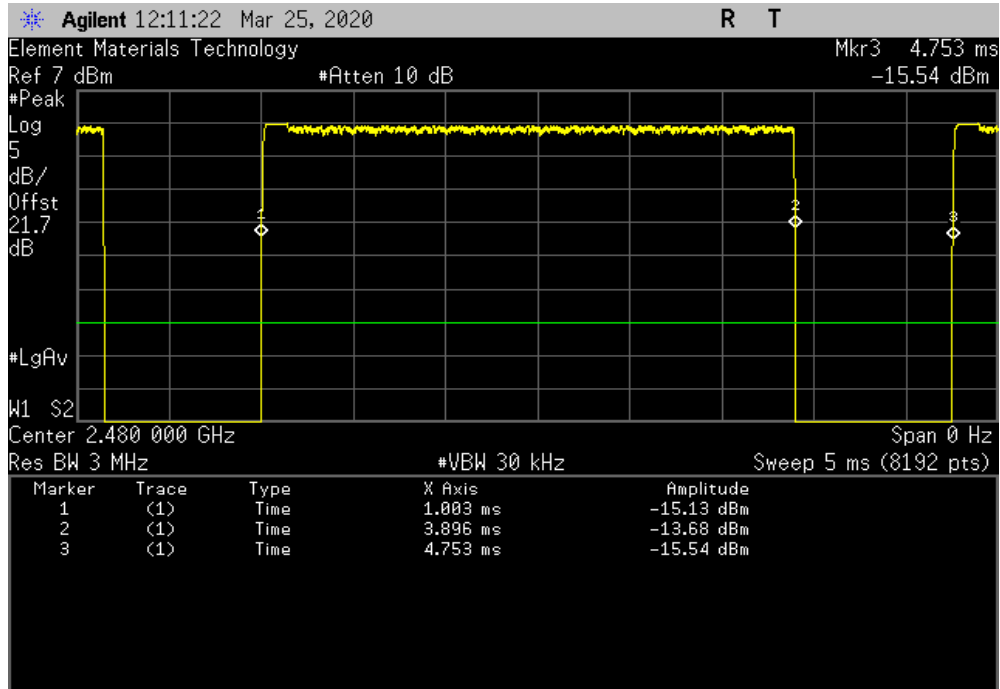


# DUTY CYCLE

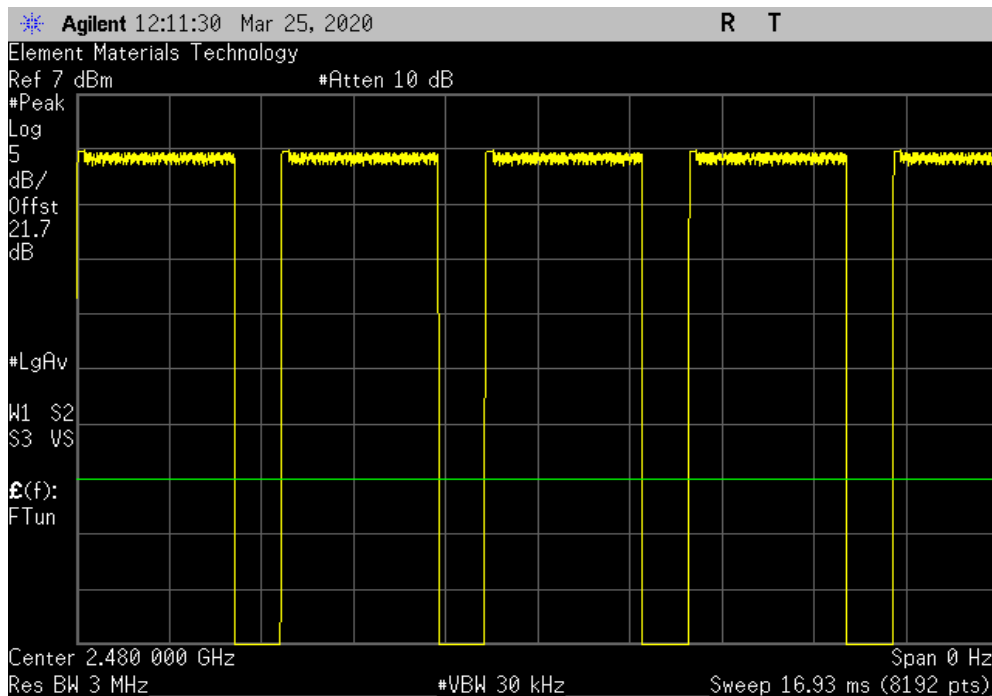


TIMx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, High Channel |             |         |                  |           |           |         |
|----------------------------|-------------|---------|------------------|-----------|-----------|---------|
|                            | Pulse Width | Period  | Number of Pulses | Value (%) | Limit (%) | Results |
|                            | 2.893 ms    | 3.75 ms | 1                | 77.2      | N/A       | N/A     |



| 3DH5, 8-DPSK, High Channel |             |        |                  |           |           |         |
|----------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                            | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                            | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |



# CARRIER FREQUENCY SEPARATION



XMIT 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|-----------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A          | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72 | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20        | TZP | 9-Nov-19  | 9-Nov-20  |
| Block - DC                   | Fairview Microwave | SD3379          | AMZ | 9-Nov-19  | 9-Nov-20  |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A          | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The channel carrier frequencies in the 2400-2483.5MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Or, if the output power is less than 125 mW, the channel separation can be 25 kHz or 2/3 of the 20dB bandwidth. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.



# CARRIER FREQUENCY SEPARATION



TMTx 2019.08.30.0 XMI 2019.09.05

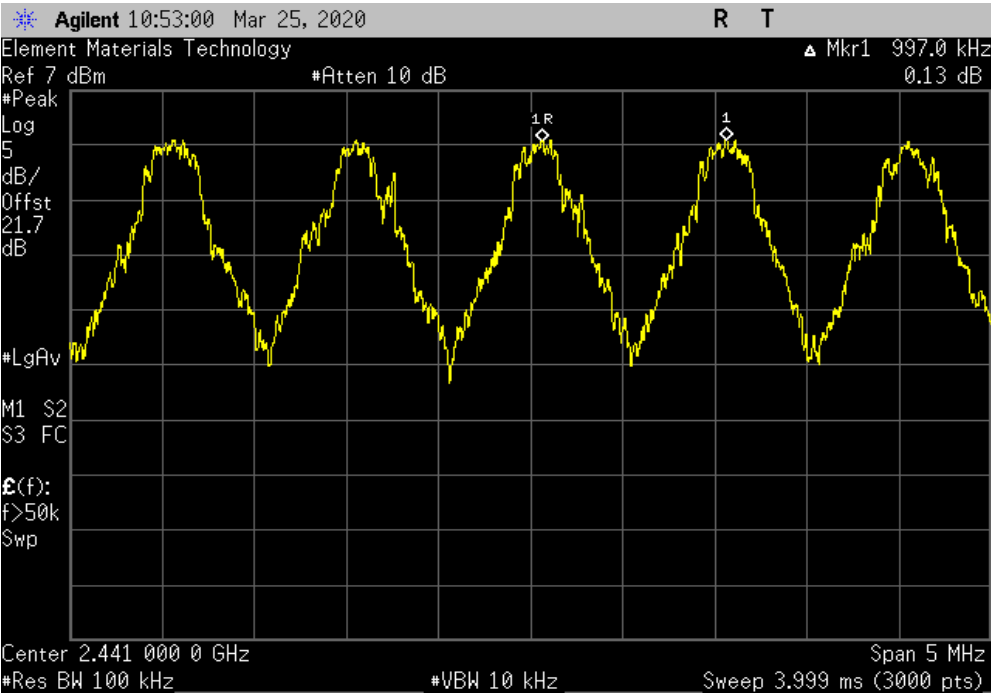
|                                                                                    |   |                                |                   |
|------------------------------------------------------------------------------------|---|--------------------------------|-------------------|
| EUT: JL Module                                                                     |   | Work Order: APRI0010           |                   |
| Serial Number: 4                                                                   |   | Date: 25-Mar-20                |                   |
| Customer: Apricity Code                                                            |   | Temperature: 22.8 °C           |                   |
| Attendees: None                                                                    |   | Humidity: 32.1% RH             |                   |
| Project: None                                                                      |   | Barometric Pres.: 1009.9 mbar  |                   |
| Tested by: Kyle McMullan                                                           |   | Power: 5 VDC (via USB)         |                   |
|                                                                                    |   | Job Site: MN09                 |                   |
| TEST SPECIFICATIONS                                                                |   | Test Method                    |                   |
| FCC 15.247:2020                                                                    |   | ANSI C63.10:2013               |                   |
| COMMENTS                                                                           |   |                                |                   |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |   |                                |                   |
| DEVIATIONS FROM TEST STANDARD                                                      |   |                                |                   |
| None                                                                               |   |                                |                   |
| Configuration #                                                                    | 1 | Signature <i>Kyle McMullan</i> |                   |
|                                                                                    |   | Value                          | Limit (±) Results |
| Hopping Mode (All Channels)                                                        |   |                                |                   |
| DH5, GFSK                                                                          |   |                                |                   |
| Mid Channel, 2441 MHz                                                              |   | 0.997 MHz                      | 0.9 MHz Pass      |

# CARRIER FREQUENCY SEPARATION



TMTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz |  |  |  |           |              |         |
|---------------------------------------------------------------|--|--|--|-----------|--------------|---------|
|                                                               |  |  |  | Value     | Limit<br>(≥) | Results |
|                                                               |  |  |  | 0.997 MHz | 0.9 MHz      | Pass    |



# NUMBER OF HOPPING FREQUENCIES



XMIT 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|-----------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A          | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72 | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20        | TZP | 9-Nov-19  | 9-Nov-20  |
| Block - DC                   | Fairview Microwave | SD3379          | AMZ | 9-Nov-19  | 9-Nov-20  |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A          | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The number of hopping frequencies was measured across the authorized band. The hopping function of the EUT was enabled.

# NUMBER OF HOPPING FREQUENCIES



TMTx 2019.08.30.0 XMt 2019.09.05

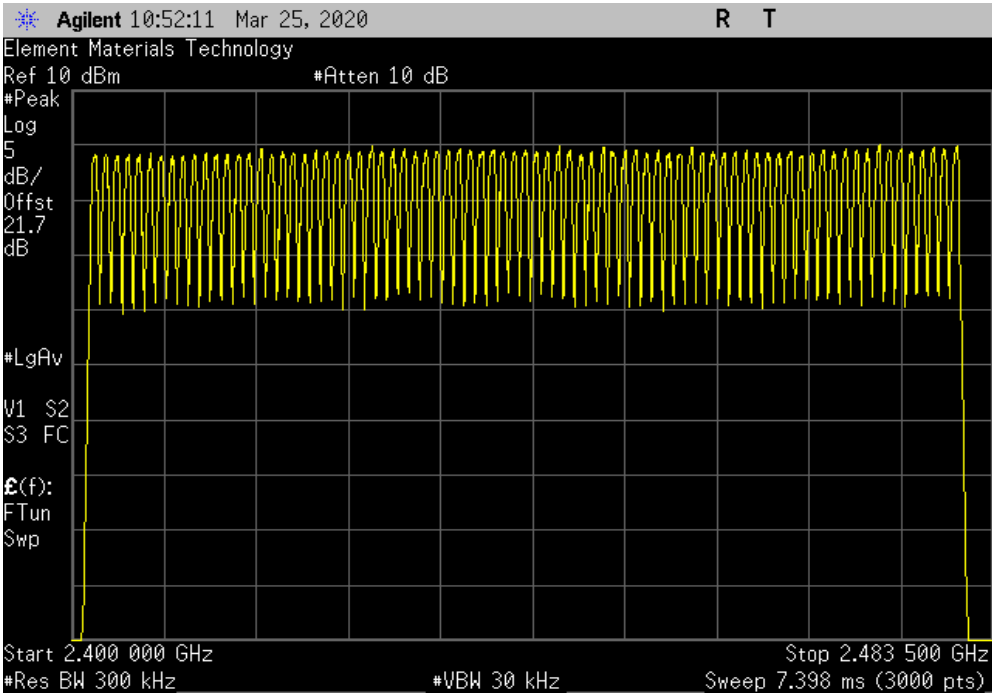
|                                                                                    |   |                                |                |
|------------------------------------------------------------------------------------|---|--------------------------------|----------------|
| EUT: JL Module                                                                     |   | Work Order: APRI0010           |                |
| Serial Number: 4                                                                   |   | Date: 25-Mar-20                |                |
| Customer: Apricity Code                                                            |   | Temperature: 22.3 °C           |                |
| Attendees: None                                                                    |   | Humidity: 32.2% RH             |                |
| Project: None                                                                      |   | Barometric Pres.: 1009.9 mbar  |                |
| Tested by: Kyle McMullan                                                           |   | Power: 5 VDC (via USB)         | Job Site: MN09 |
| TEST SPECIFICATIONS                                                                |   | Test Method                    |                |
| FCC 15.247:2020                                                                    |   | ANSI C63.10:2013               |                |
| COMMENTS                                                                           |   |                                |                |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |   |                                |                |
| DEVIATIONS FROM TEST STANDARD                                                      |   |                                |                |
| None                                                                               |   |                                |                |
| Configuration #                                                                    | 1 | Signature <i>Kyle McMullan</i> |                |
|                                                                                    |   | Number of Channels             | Limit (≥)      |
| Hopping Mode (All Channels)                                                        |   |                                | Results        |
| DH5, GFSK                                                                          |   |                                |                |
| Mid Channel, 2441 MHz                                                              |   | 79                             | 15             |
|                                                                                    |   |                                | Pass           |

# NUMBER OF HOPPING FREQUENCIES



TbTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz |  |  |  |                    |           |         |
|---------------------------------------------------------------|--|--|--|--------------------|-----------|---------|
|                                                               |  |  |  | Number of Channels | Limit (≥) | Results |
|                                                               |  |  |  | 79                 | 15        | Pass    |



# DWELL TIME



XMI 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|-----------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A          | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72 | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20        | TZP | 9-Nov-19  | 9-Nov-20  |
| Block - DC                   | Fairview Microwave | SD3379          | AMZ | 9-Nov-19  | 9-Nov-20  |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A          | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The hopping function of the EUT was enabled.

The dwell time limit is based on the Number of Hopping Channels \* 400 mS. For Bluetooth this would be 79 Channels \* 400mS = 31.6 Sec.

On Time During 31.6 Sec = Pulse Width \* Average Number of Pulses \* Scale Factor

➤ Average Number of Pulses is based on 4 samples.

➤ Scale Factor = 31.6 Sec / Screen Capture Sweep Time = 31.6 Sec / 6.32 Sec = 5

# DWELL TIME



TMTx 2019.08.30.0 XMI 2019.09.05

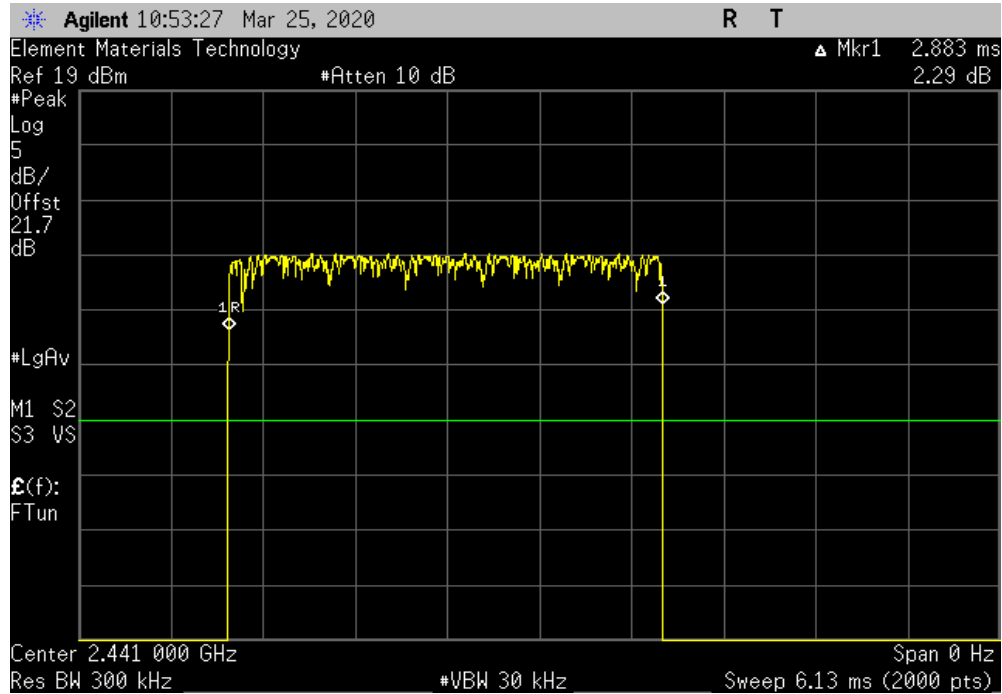
|                                                                                    |                       |                                |                  |
|------------------------------------------------------------------------------------|-----------------------|--------------------------------|------------------|
| EUT: JL Module                                                                     |                       | Work Order: APRI0010           |                  |
| Serial Number: 4                                                                   |                       | Date: 25-Mar-20                |                  |
| Customer: Apricity Code                                                            |                       | Temperature: 22 °C             |                  |
| Attendees: None                                                                    |                       | Humidity: 32.8% RH             |                  |
| Project: None                                                                      |                       | Barometric Pres.: 1009.9 mbar  |                  |
| Tested by: Kyle McMullan                                                           |                       | Power: 5 VDC (via USB)         |                  |
|                                                                                    |                       | Job Site: MN09                 |                  |
| TEST SPECIFICATIONS                                                                |                       |                                |                  |
| FCC 15.247:2020                                                                    |                       | Test Method                    |                  |
|                                                                                    |                       | ANSI C63.10:2013               |                  |
| COMMENTS                                                                           |                       |                                |                  |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |                       |                                |                  |
| DEVIATIONS FROM TEST STANDARD                                                      |                       |                                |                  |
| None                                                                               |                       |                                |                  |
| Configuration #                                                                    | 1                     | Signature <i>Kyle McMullan</i> |                  |
|                                                                                    |                       | Pulse Width (ms)               | Number of Pulses |
|                                                                                    |                       | Average No. of Pulses          | Scale Factor     |
|                                                                                    |                       | On Time (ms) During 31.6 s     | Limit (ms)       |
|                                                                                    |                       |                                | Results          |
| Hopping Mode (All Channels)                                                        |                       |                                |                  |
| DH5, GFSK                                                                          |                       |                                |                  |
|                                                                                    | Mid Channel, 2441 MHz | 2.883                          | N/A              |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | 2.883                          | N/A              |
|                                                                                    | Mid Channel, 2441 MHz |                                | 22               |
|                                                                                    | Mid Channel, 2441 MHz |                                | 5                |
|                                                                                    | Mid Channel, 2441 MHz | 317.13                         | 400              |
|                                                                                    | Mid Channel, 2441 MHz |                                | Pass             |
| 2DH5, pi/4-DQPSK                                                                   |                       |                                |                  |
|                                                                                    | Mid Channel, 2441 MHz | 2.892                          | N/A              |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | 2.892                          | N/A              |
|                                                                                    | Mid Channel, 2441 MHz |                                | 22               |
|                                                                                    | Mid Channel, 2441 MHz |                                | 5                |
|                                                                                    | Mid Channel, 2441 MHz | 318.12                         | 400              |
|                                                                                    | Mid Channel, 2441 MHz |                                | Pass             |
| 3DH5, 8-DPSK                                                                       |                       |                                |                  |
|                                                                                    | Mid Channel, 2441 MHz | 2.892                          | N/A              |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | N/A                            | 22               |
|                                                                                    | Mid Channel, 2441 MHz | 2.892                          | N/A              |
|                                                                                    | Mid Channel, 2441 MHz |                                | 22               |
|                                                                                    | Mid Channel, 2441 MHz |                                | 5                |
|                                                                                    | Mid Channel, 2441 MHz | 318.12                         | 400              |
|                                                                                    | Mid Channel, 2441 MHz |                                | Pass             |

# DWELL TIME

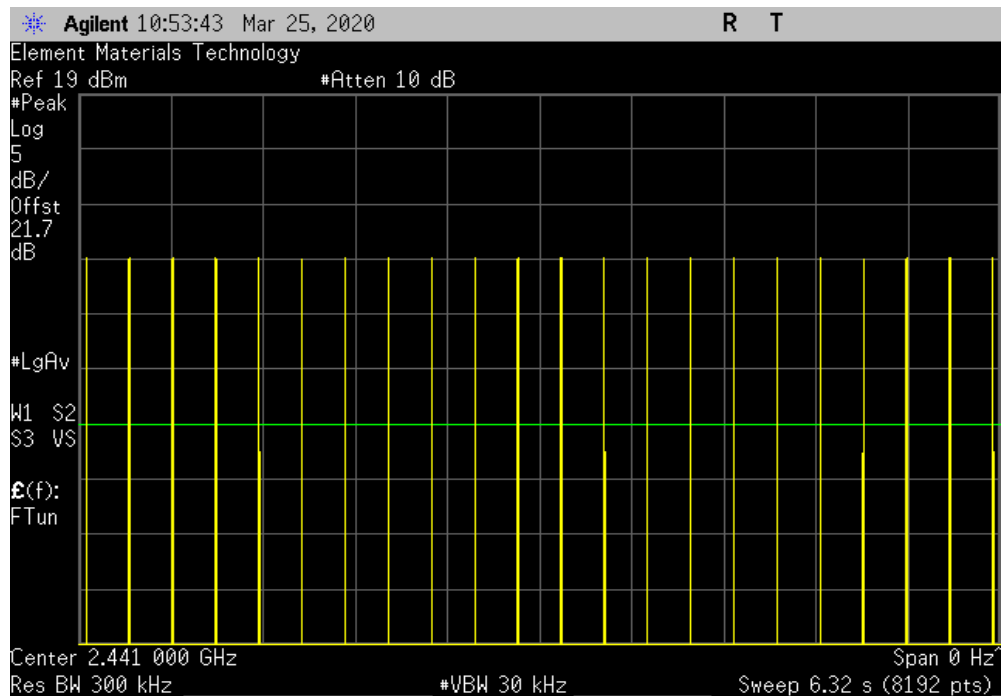


TMTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|---------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                              | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.883                                                         | N/A              | N/A                   | N/A          | N/A                        | N/A        | N/A     |



| Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|---------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                              | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                           | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |



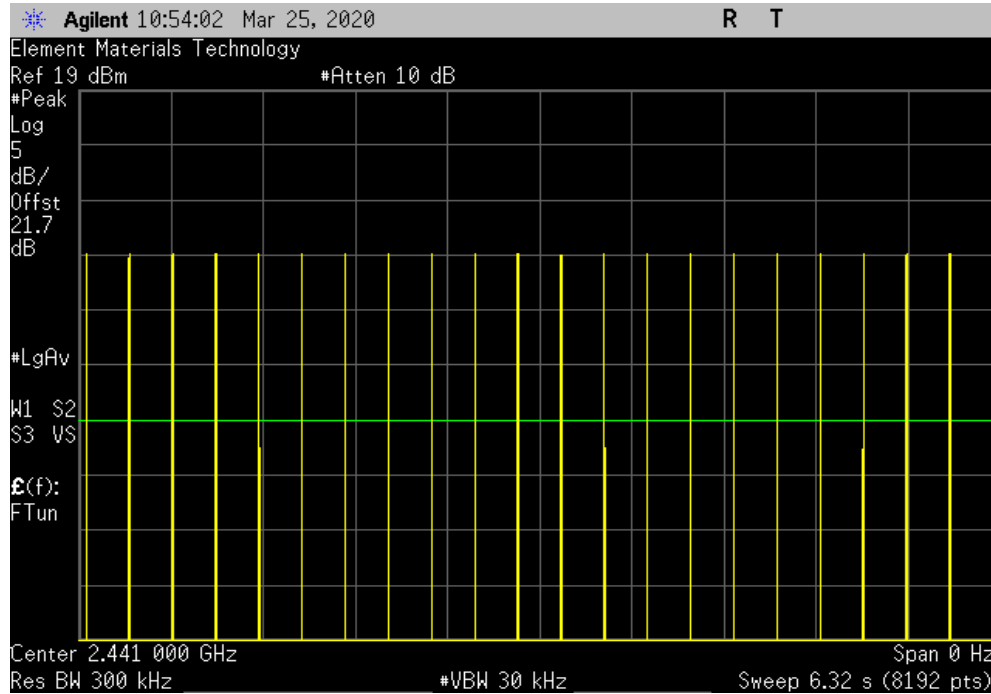


# DWELL TIME

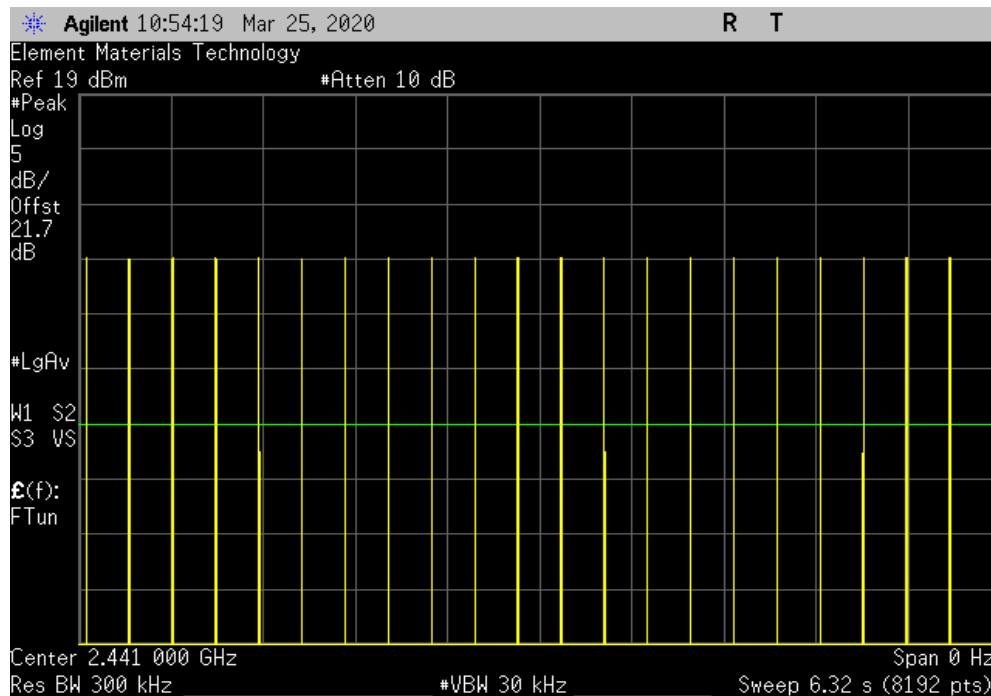


TbTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|---------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                              | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                           | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |



| Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|---------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                              | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                           | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |

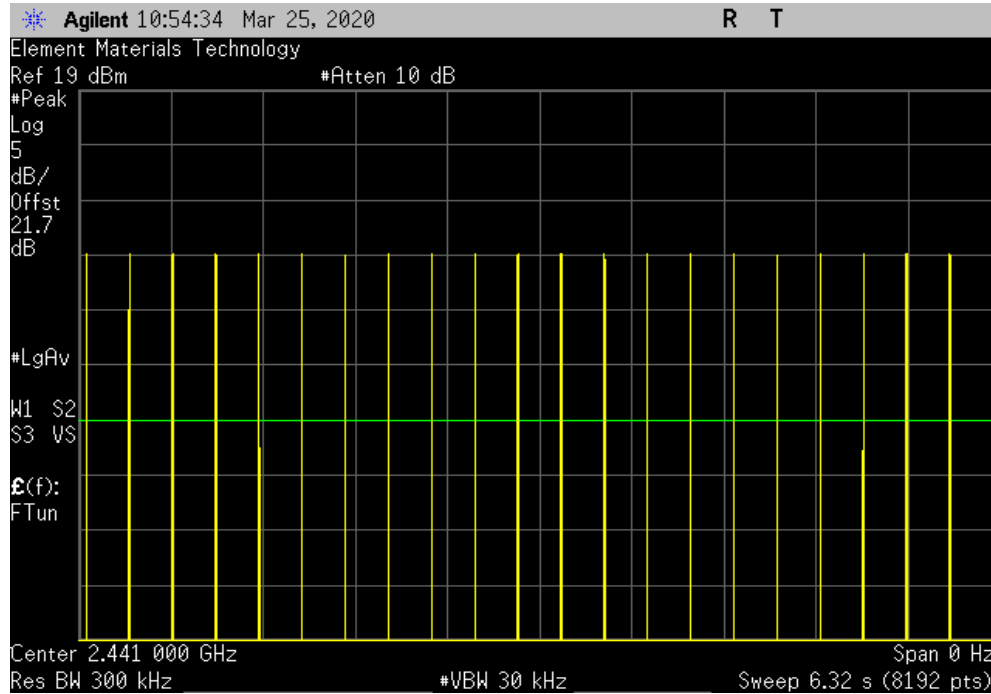


# DWELL TIME



TbTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|---------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                              | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                           | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |



| Hopping Mode (All Channels), DH5, GFSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|---------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                              | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.883                                                         | N/A              | 22                    | 5            | 317.13                     | 400        | Pass    |

Calculation Only

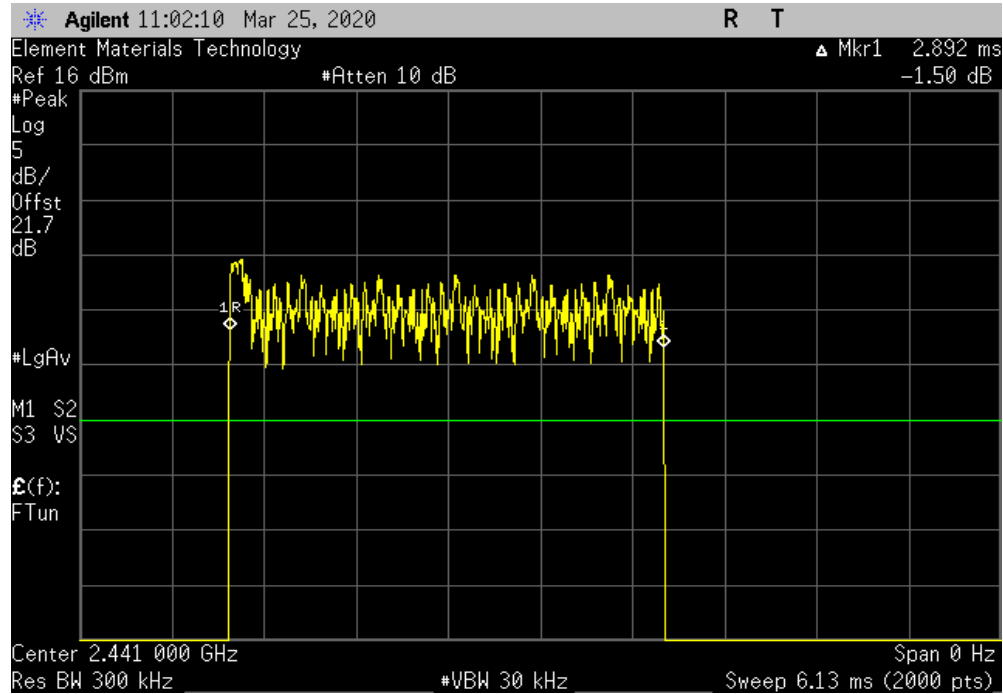
No Screen Capture Required

# DWELL TIME

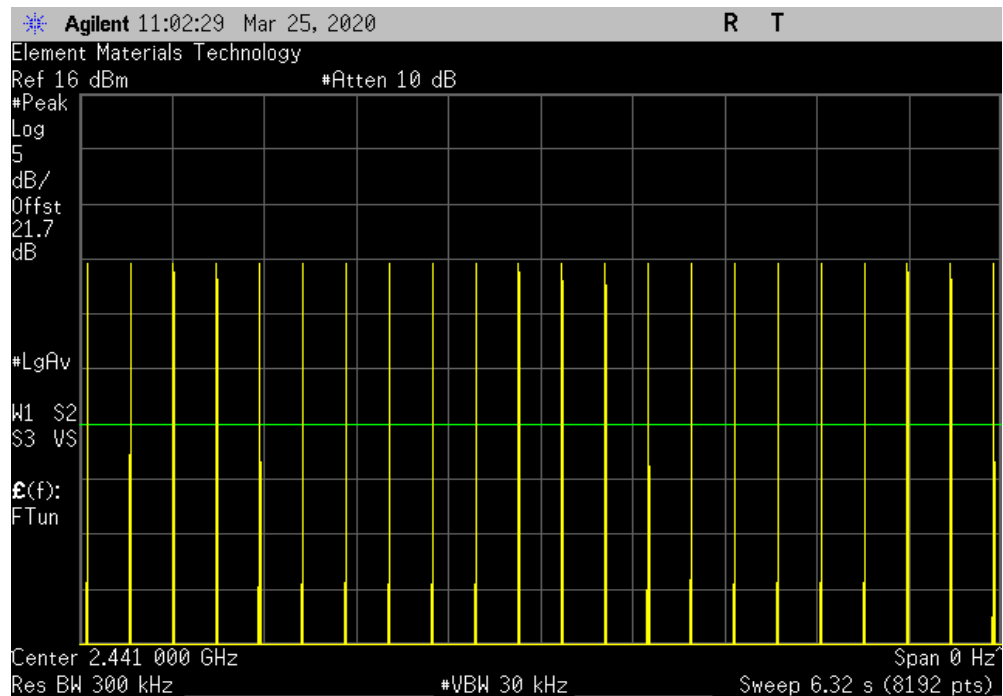


TMTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|----------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                     | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.892                                                                | N/A              | N/A                   | N/A          | N/A                        | N/A        | N/A     |



| Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|----------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                     | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                                  | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |

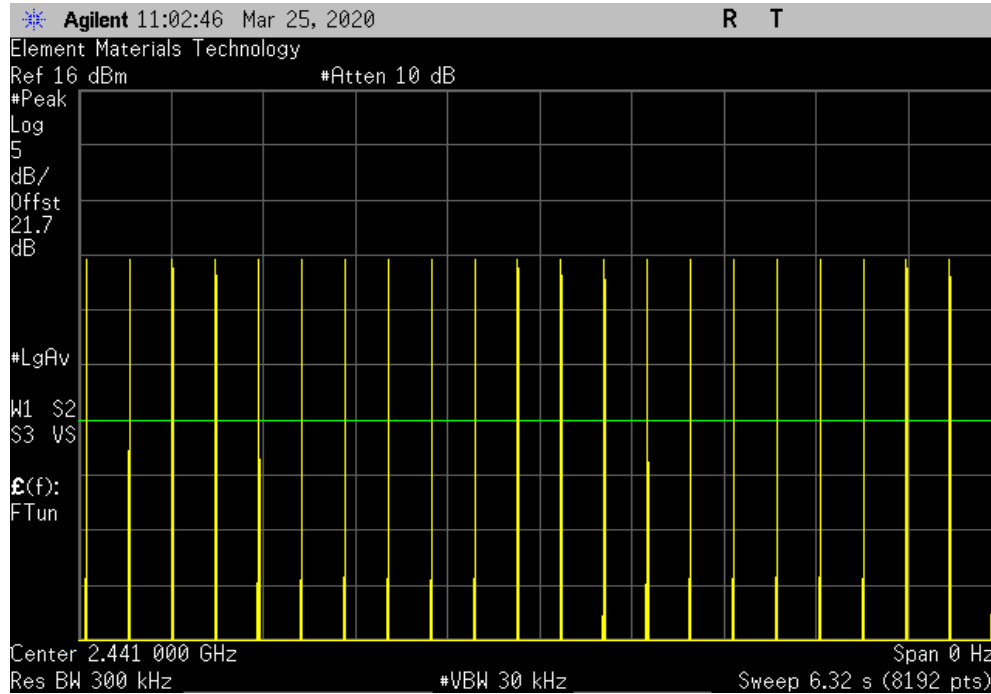


# DWELL TIME

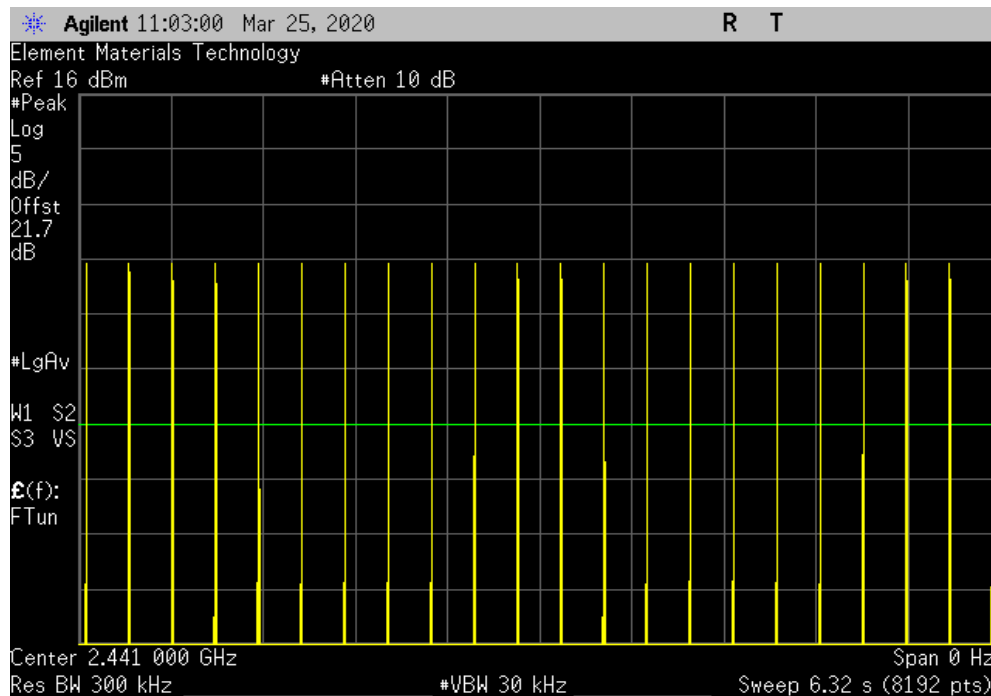


TMTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|----------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                     | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                                  | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |



| Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|----------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                     | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                                  | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |

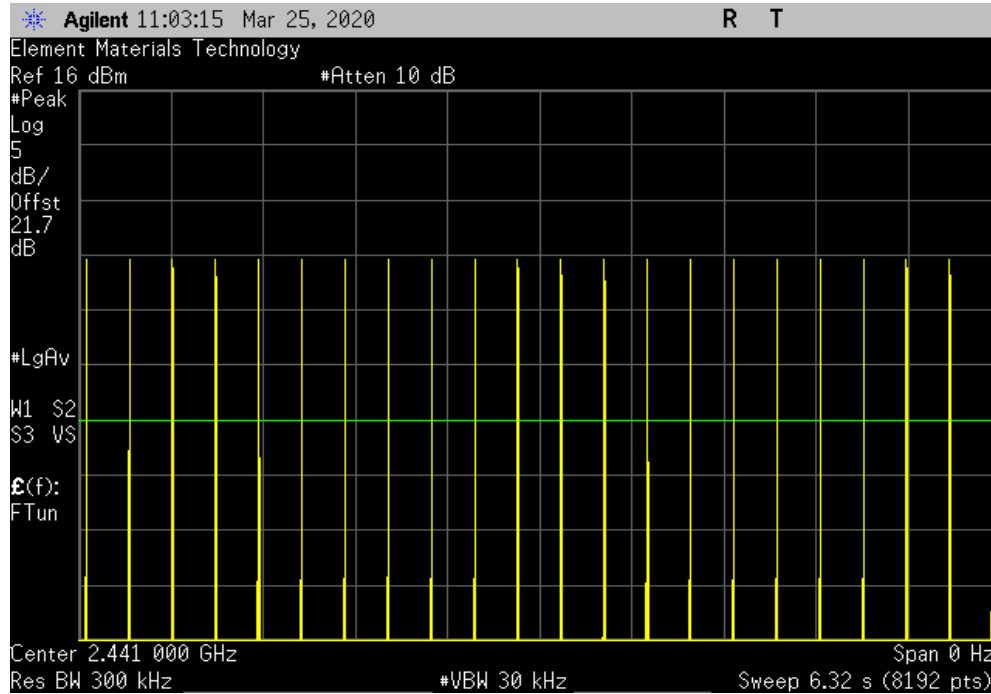


# DWELL TIME



TbTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|----------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                     | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                                  | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |



| Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|----------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                     | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.892                                                                | N/A              | 22                    | 5            | 318.12                     | 400        | Pass    |

Calculation Only

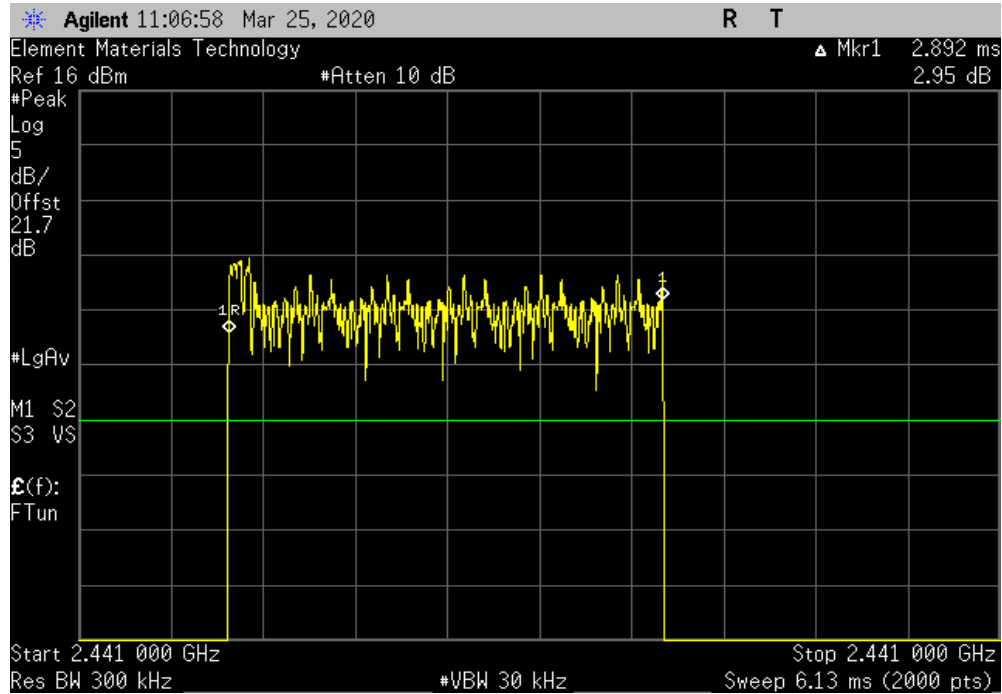
No Screen Capture Required

# DWELL TIME

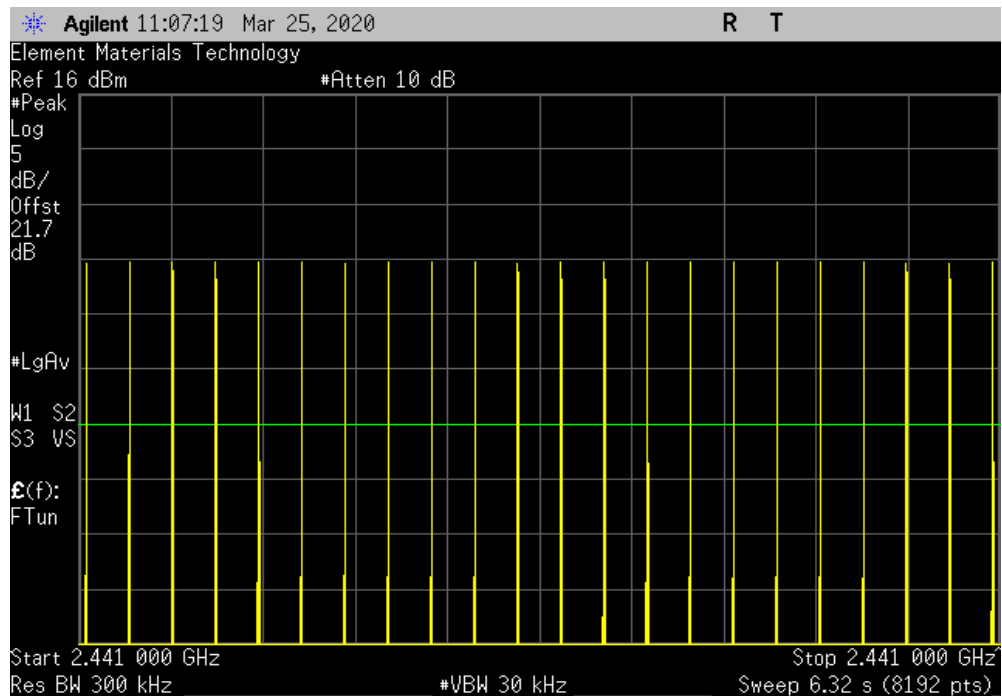


TMTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                 | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.892                                                            | N/A              | N/A                   | N/A          | N/A                        | N/A        | N/A     |



| Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                 | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                              | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |

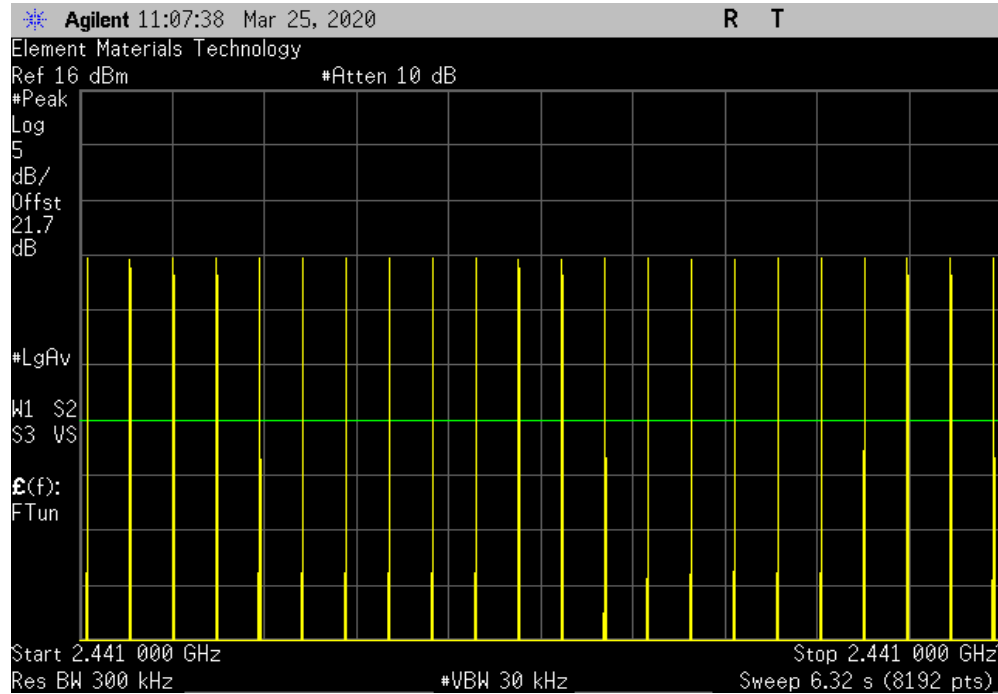


# DWELL TIME

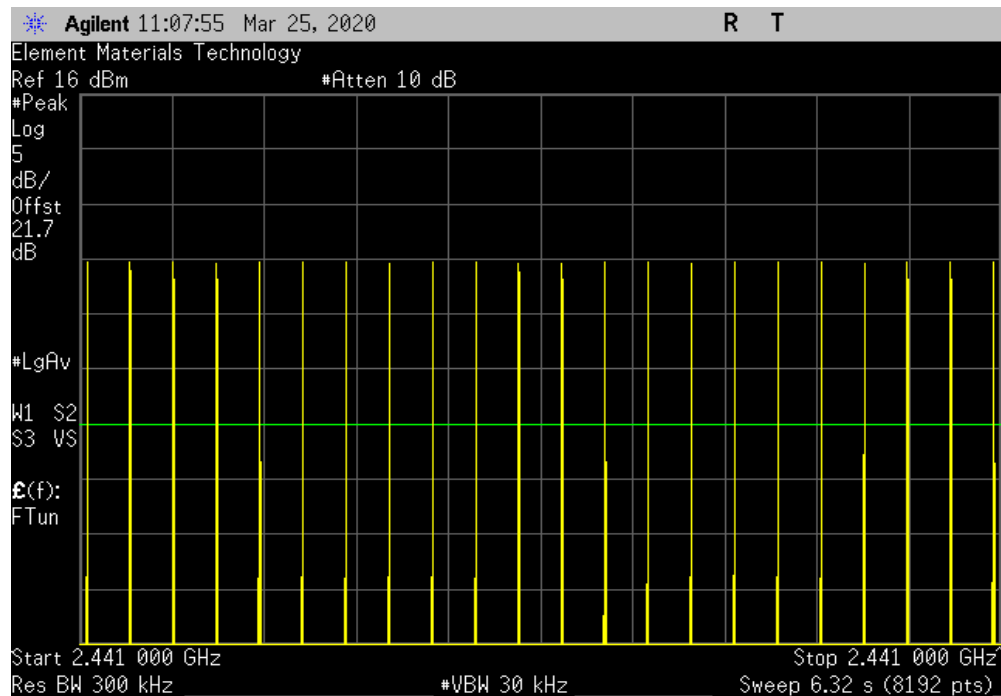


TbTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                 | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                              | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |



| Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                 | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                              | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |

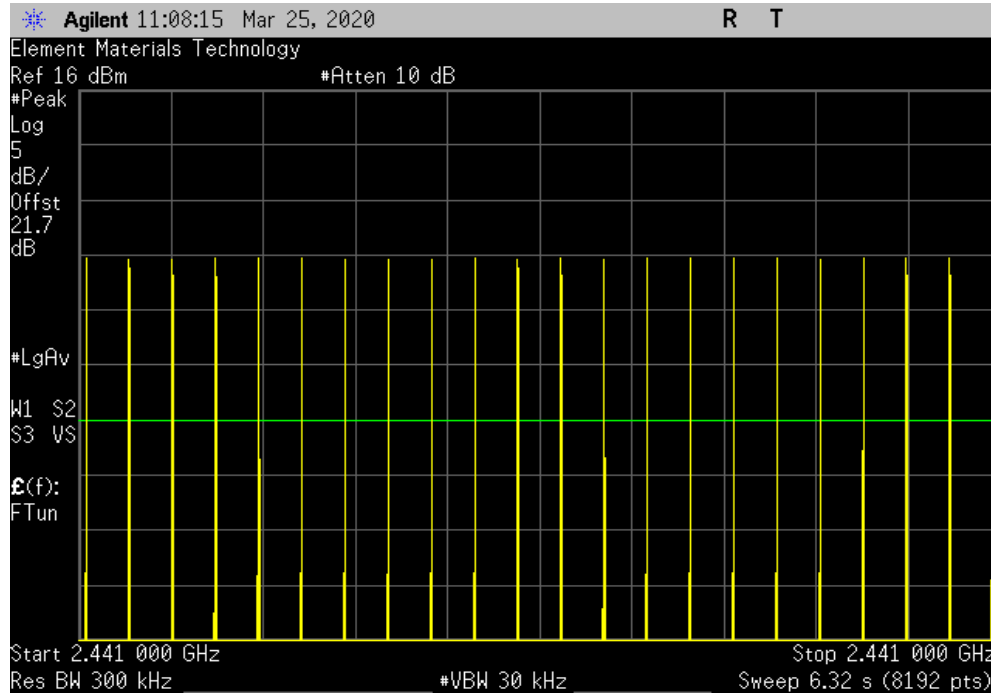


# DWELL TIME



TbTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                 | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| N/A                                                              | 22               | N/A                   | N/A          | N/A                        | N/A        | N/A     |



| Hopping Mode (All Channels), 3DH5, 8-DPSK, Mid Channel, 2441 MHz |                  |                       |              |                            |            |         |
|------------------------------------------------------------------|------------------|-----------------------|--------------|----------------------------|------------|---------|
| Pulse Width (ms)                                                 | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (ms) During 31.6 s | Limit (ms) | Results |
| 2.892                                                            | N/A              | 22                    | 5            | 318.12                     | 400        | Pass    |

Calculation Only

No Screen Capture Required



# OUTPUT POWER



XMIT 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|-----------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A          | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72 | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20        | TZP | 9-Nov-19  | 9-Nov-20  |
| Block - DC                   | Fairview Microwave | SD3379          | AMZ | 9-Nov-19  | 9-Nov-20  |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A          | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

The method found in ANSI C63.10:2013 Section 7.8.5 was used for a FHSS radio.

# OUTPUT POWER



TMTx 2019.08.30.0 XMM 2019.09.05

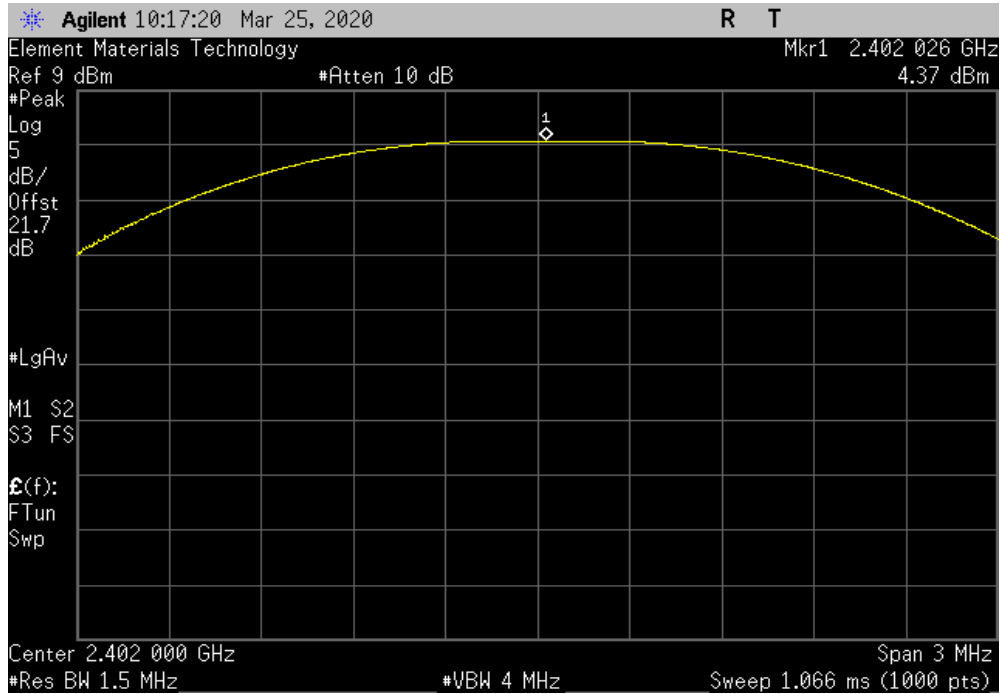
|                                                                                    |              |                                |             |
|------------------------------------------------------------------------------------|--------------|--------------------------------|-------------|
| EUT: JL Module                                                                     |              | Work Order: APRI0010           |             |
| Serial Number: 4                                                                   |              | Date: 25-Mar-20                |             |
| Customer: Apricity Code                                                            |              | Temperature: 22.2 °C           |             |
| Attendees: None                                                                    |              | Humidity: 32.8% RH             |             |
| Project: None                                                                      |              | Barometric Pres.: 1009.9 mbar  |             |
| Tested by: Kyle McMullan                                                           |              | Power: 5 VDC (via USB)         |             |
|                                                                                    |              | Job Site: MN09                 |             |
| TEST SPECIFICATIONS                                                                |              | Test Method                    |             |
| FCC 15.247:2020                                                                    |              | ANSI C63.10:2013               |             |
| COMMENTS                                                                           |              |                                |             |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |              |                                |             |
| DEVIATIONS FROM TEST STANDARD                                                      |              |                                |             |
| None                                                                               |              |                                |             |
| Configuration #                                                                    | 1            | Signature <i>Kyle McMullan</i> |             |
|                                                                                    |              | Out Pwr (dBm)                  | Limit (dBm) |
|                                                                                    |              |                                | Result      |
| DH5, GFSK                                                                          |              |                                |             |
|                                                                                    | Low Channel  | 4.368                          | 21          |
|                                                                                    | Mid Channel  | 4.81                           | 21          |
|                                                                                    | High Channel | 4.996                          | 21          |
| 2DH5, pi/4-DQPSK                                                                   |              |                                |             |
|                                                                                    | Low Channel  | 3.434                          | 21          |
|                                                                                    | Mid Channel  | 3.828                          | 21          |
|                                                                                    | High Channel | 4.036                          | 21          |
| 3DH5, 8-DPSK                                                                       |              |                                |             |
|                                                                                    | Low Channel  | 4.039                          | 21          |
|                                                                                    | Mid Channel  | 4.426                          | 21          |
|                                                                                    | High Channel | 4.6                            | 21          |

# OUTPUT POWER

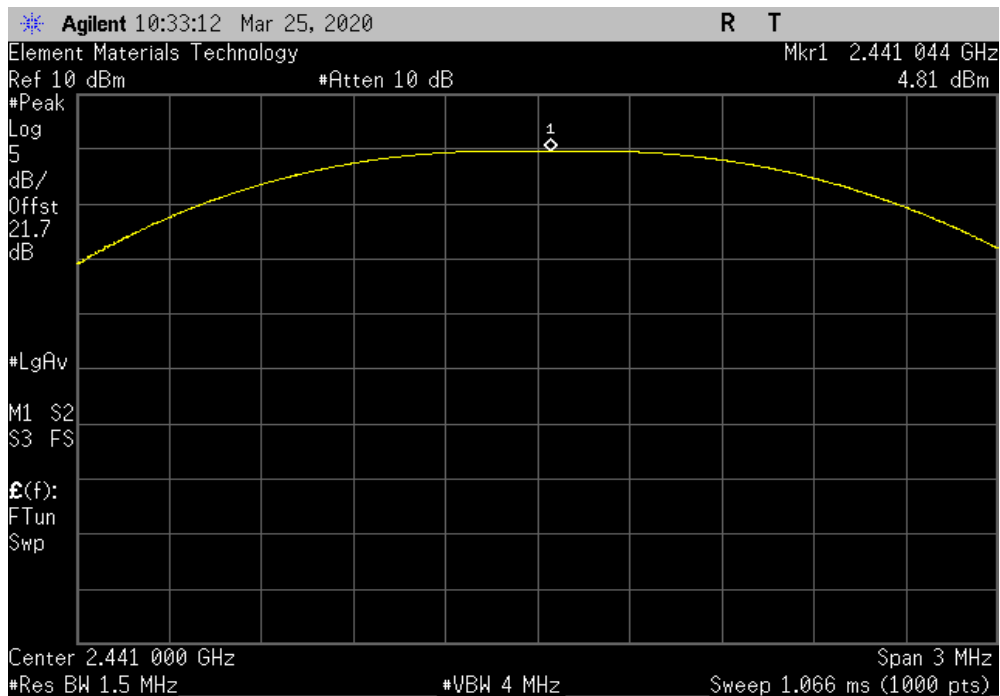


TMTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, Low Channel |  |  |  |                  |                |        |
|------------------------|--|--|--|------------------|----------------|--------|
|                        |  |  |  | Out Pwr<br>(dBm) | Limit<br>(dBm) | Result |
|                        |  |  |  | 4.368            | 21             | Pass   |



| DH5, GFSK, Mid Channel |  |  |  |                  |                |        |
|------------------------|--|--|--|------------------|----------------|--------|
|                        |  |  |  | Out Pwr<br>(dBm) | Limit<br>(dBm) | Result |
|                        |  |  |  | 4.81             | 21             | Pass   |

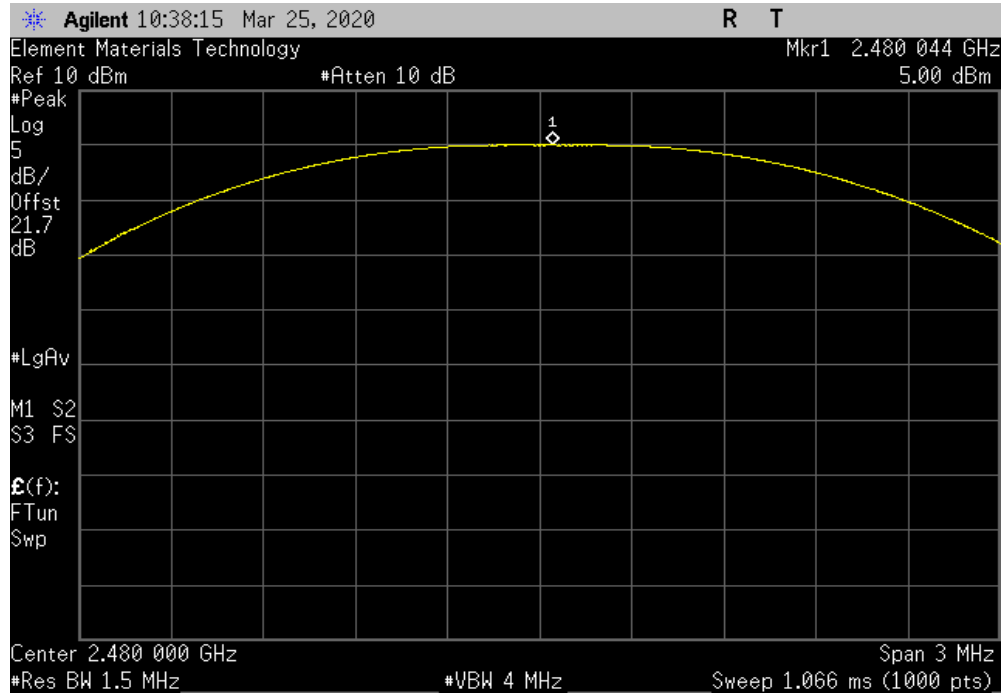


# OUTPUT POWER

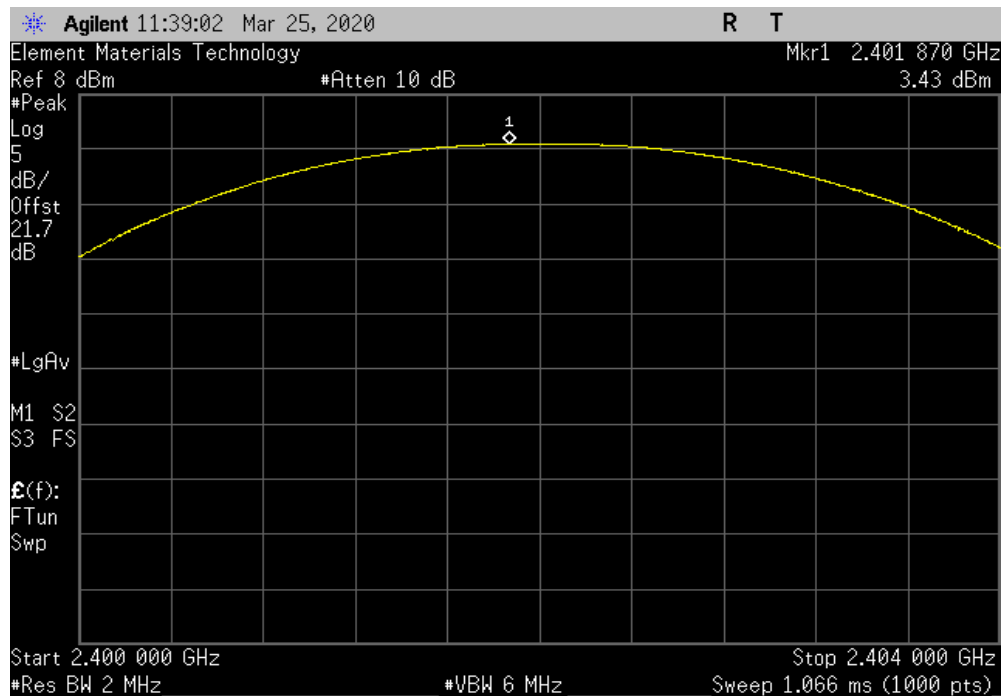


TMTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, High Channel |  |  |  |                  |                |        |
|-------------------------|--|--|--|------------------|----------------|--------|
|                         |  |  |  | Out Pwr<br>(dBm) | Limit<br>(dBm) | Result |
|                         |  |  |  | 4.996            | 21             | Pass   |



| 2DH5, pi/4-DQPSK, Low Channel |  |  |  |                  |                |        |
|-------------------------------|--|--|--|------------------|----------------|--------|
|                               |  |  |  | Out Pwr<br>(dBm) | Limit<br>(dBm) | Result |
|                               |  |  |  | 3.434            | 21             | Pass   |

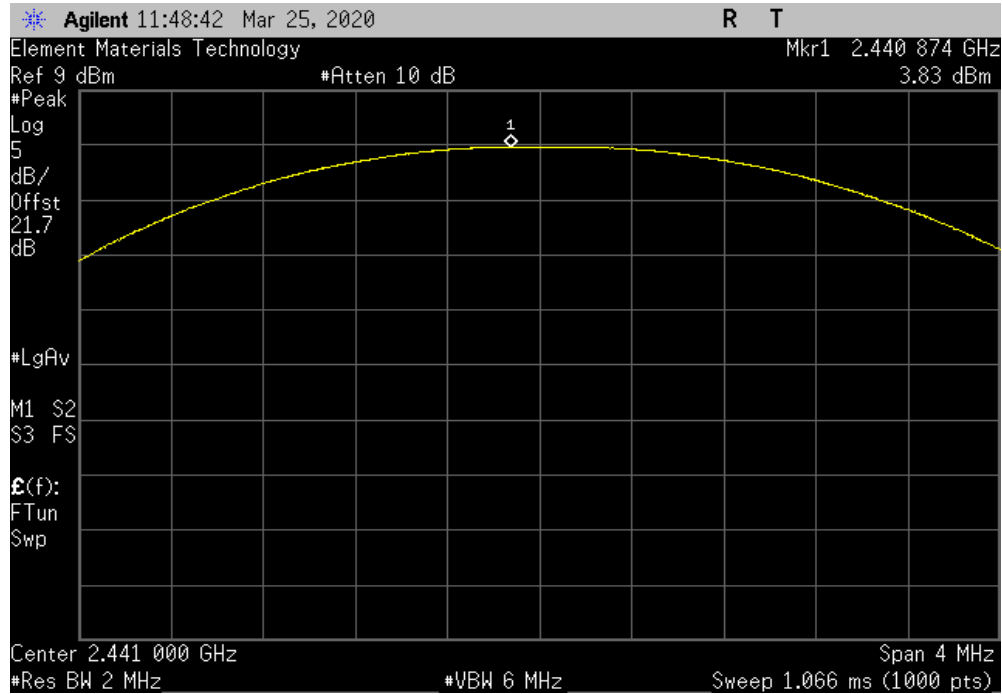


# OUTPUT POWER

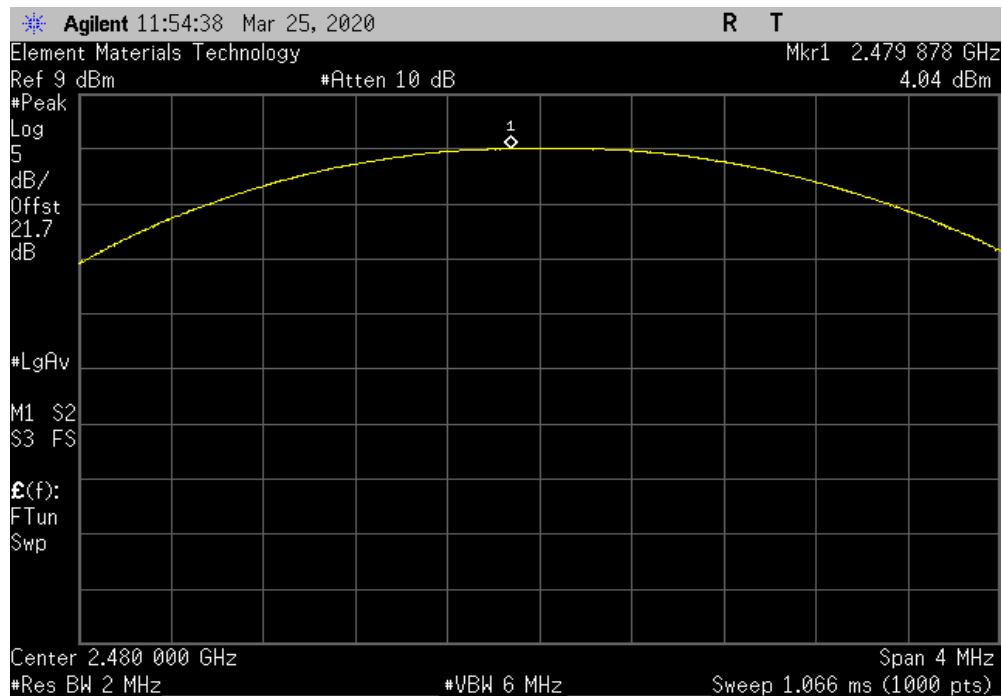


TMTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, Mid Channel |  |  |  |                  |                |        |
|-------------------------------|--|--|--|------------------|----------------|--------|
|                               |  |  |  | Out Pwr<br>(dBm) | Limit<br>(dBm) | Result |
|                               |  |  |  | 3.828            | 21             | Pass   |



| 2DH5, pi/4-DQPSK, High Channel |  |  |  |                  |                |        |
|--------------------------------|--|--|--|------------------|----------------|--------|
|                                |  |  |  | Out Pwr<br>(dBm) | Limit<br>(dBm) | Result |
|                                |  |  |  | 4.036            | 21             | Pass   |

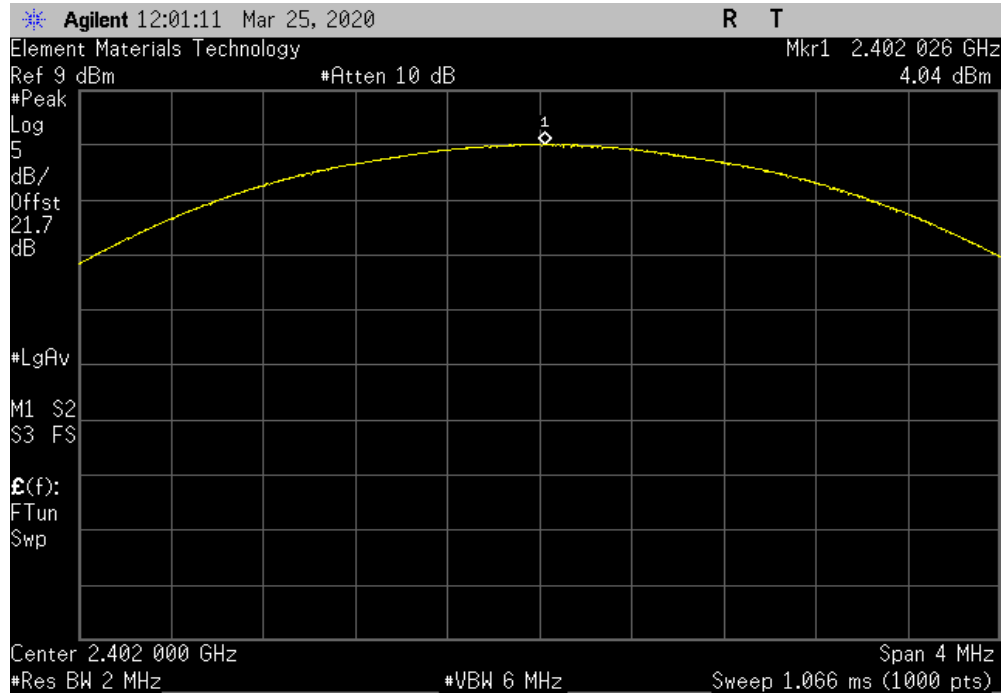


# OUTPUT POWER

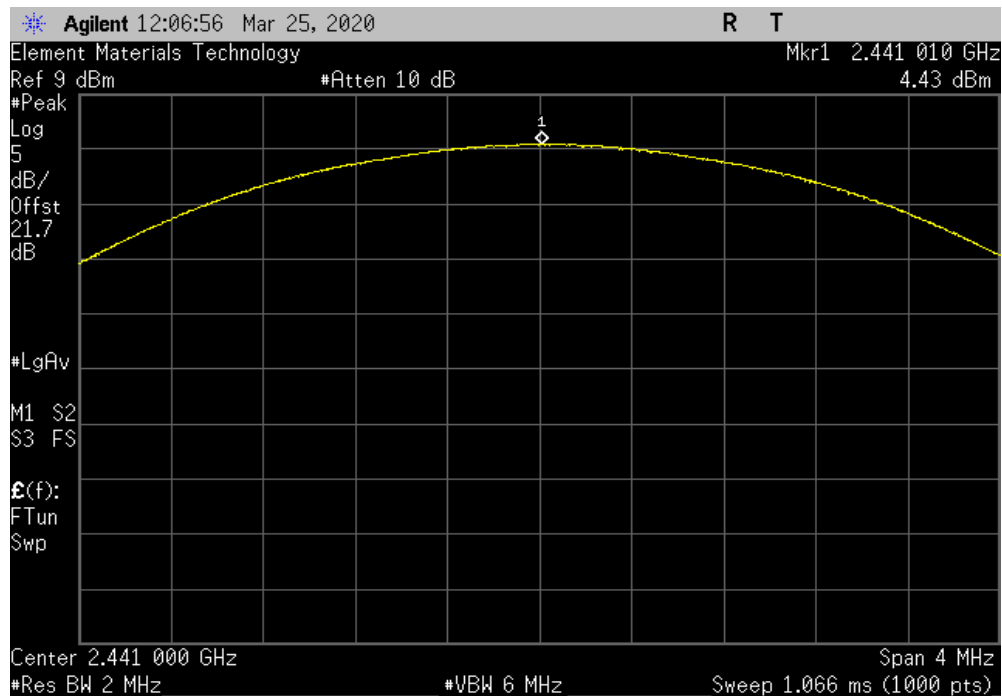


TMTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, Low Channel |  |  |  |                  |                |        |
|---------------------------|--|--|--|------------------|----------------|--------|
|                           |  |  |  | Out Pwr<br>(dBm) | Limit<br>(dBm) | Result |
|                           |  |  |  | 4.039            | 21             | Pass   |



| 3DH5, 8-DPSK, Mid Channel |  |  |  |                  |                |        |
|---------------------------|--|--|--|------------------|----------------|--------|
|                           |  |  |  | Out Pwr<br>(dBm) | Limit<br>(dBm) | Result |
|                           |  |  |  | 4.426            | 21             | Pass   |

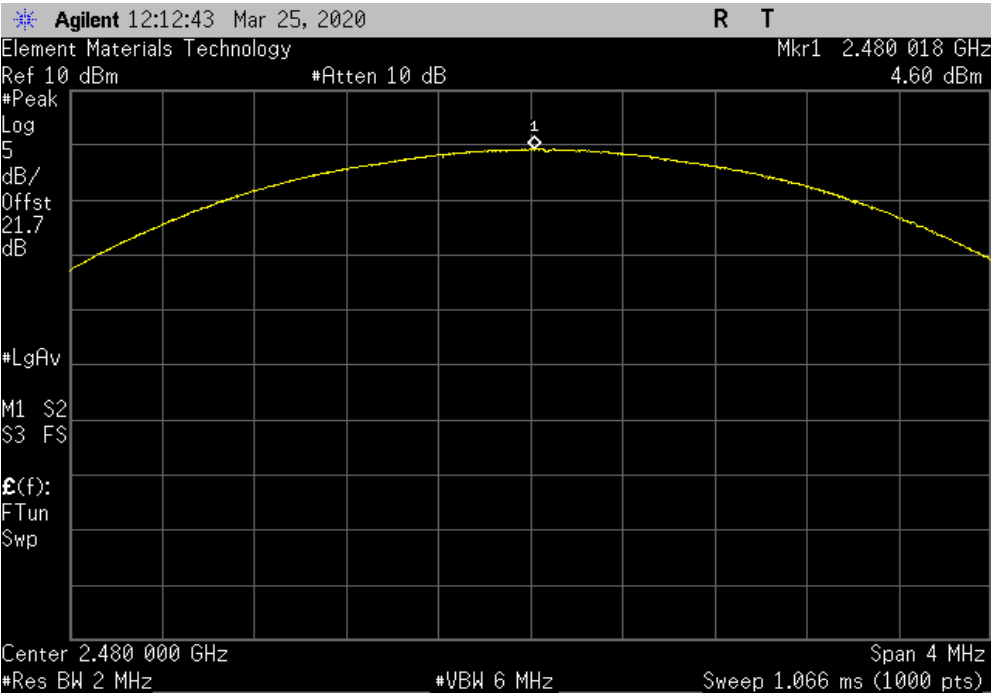


OUTPUT POWER



TbTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, High Channel |  |  |  |                  |                |        |
|----------------------------|--|--|--|------------------|----------------|--------|
|                            |  |  |  | Out Pwr<br>(dBm) | Limit<br>(dBm) | Result |
|                            |  |  |  | 4.6              | 21             | Pass   |



# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMIT 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|-----------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A          | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72 | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20        | TZP | 9-Nov-19  | 9-Nov-20  |
| Block - DC                   | Fairview Microwave | SD3379          | AMZ | 9-Nov-19  | 9-Nov-20  |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A          | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

The method found in ANSI C63.10:2013 Section 7.8.5 was used for a FHSS radio.

The highest antenna gain was added to the output power to calculate the EIRP using the following equation:  
$$\text{Output Power (dBm)} + \text{Antenna Gain (dBi)} = \text{EIRP}$$



# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TMTx 2019.08.30.0 XMM 2019.09.05

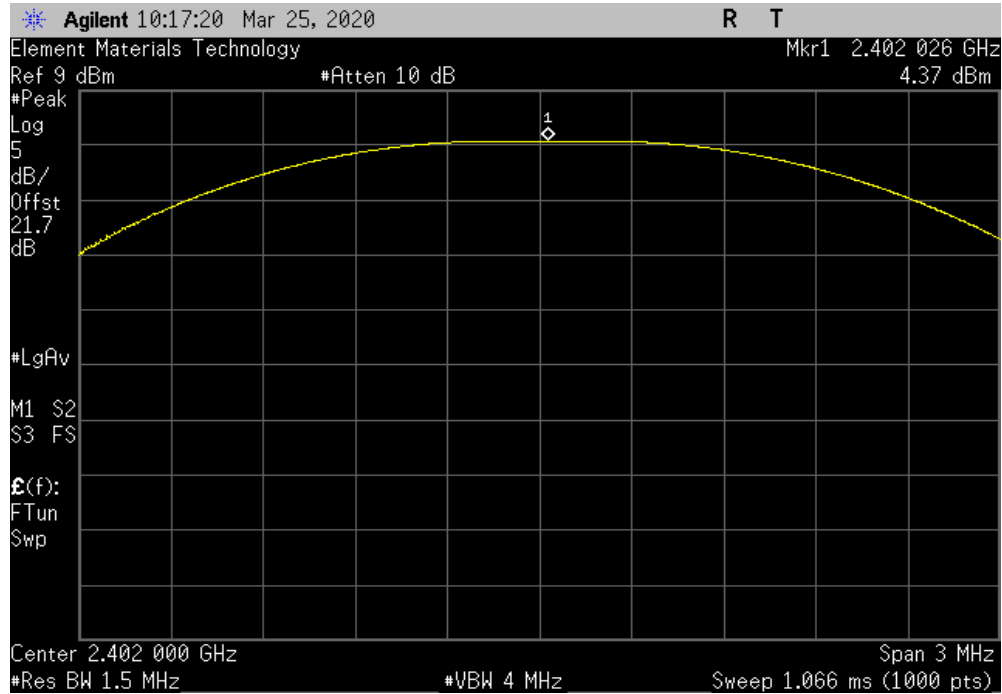
|                                                                                    |              |                                |                    |
|------------------------------------------------------------------------------------|--------------|--------------------------------|--------------------|
| EUT: JL Module                                                                     |              | Work Order: APRI0010           |                    |
| Serial Number: 4                                                                   |              | Date: 25-Mar-20                |                    |
| Customer: Apricity Code                                                            |              | Temperature: 22.4 °C           |                    |
| Attendees: None                                                                    |              | Humidity: 32.3% RH             |                    |
| Project: None                                                                      |              | Barometric Pres.: 1009.9 mbar  |                    |
| Tested by: Kyle McMullan                                                           |              | Power: 5 VDC (via USB)         |                    |
|                                                                                    |              | Job Site: MN09                 |                    |
| TEST SPECIFICATIONS                                                                |              | Test Method                    |                    |
| FCC 15.247:2020                                                                    |              | ANSI C63.10:2013               |                    |
| COMMENTS                                                                           |              |                                |                    |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |              |                                |                    |
| DEVIATIONS FROM TEST STANDARD                                                      |              |                                |                    |
| None                                                                               |              |                                |                    |
| Configuration #                                                                    | 1            | Signature <i>Kyle McMullan</i> |                    |
|                                                                                    |              | Out Pwr (dBm)                  | Antenna Gain (dBi) |
|                                                                                    |              | EIRP (dBm)                     | EIRP Limit (dBm)   |
|                                                                                    |              |                                | Result             |
| DH5, GFSK                                                                          |              |                                |                    |
|                                                                                    | Low Channel  | 4.368                          | 4.4                |
|                                                                                    | Mid Channel  | 4.81                           | 4.4                |
|                                                                                    | High Channel | 4.996                          | 4.4                |
| 2DH5, pi/4-DQPSK                                                                   |              |                                |                    |
|                                                                                    | Low Channel  | 3.434                          | 4.4                |
|                                                                                    | Mid Channel  | 3.828                          | 4.4                |
|                                                                                    | High Channel | 4.036                          | 4.4                |
| 3DH5, 8-DPSK                                                                       |              |                                |                    |
|                                                                                    | Low Channel  | 4.039                          | 4.4                |
|                                                                                    | Mid Channel  | 4.426                          | 4.4                |
|                                                                                    | High Channel | 4.6                            | 4.4                |

# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

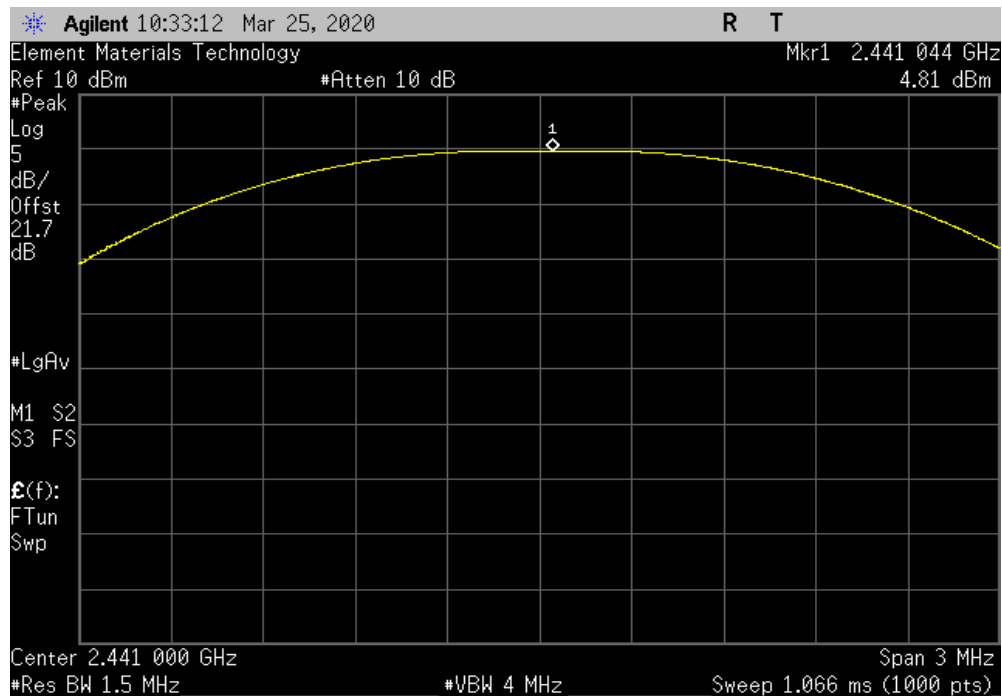


TbTb 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, Low Channel |                  |                       |               |                     |        |  |
|------------------------|------------------|-----------------------|---------------|---------------------|--------|--|
|                        | Out Pwr<br>(dBm) | Antenna<br>Gain (dBi) | EIRP<br>(dBm) | EIRP Limit<br>(dBm) | Result |  |
|                        | 4.368            | 4.4                   | 8.768         | 27                  | Pass   |  |



| DH5, GFSK, Mid Channel |                  |                       |               |                     |        |  |
|------------------------|------------------|-----------------------|---------------|---------------------|--------|--|
|                        | Out Pwr<br>(dBm) | Antenna<br>Gain (dBi) | EIRP<br>(dBm) | EIRP Limit<br>(dBm) | Result |  |
|                        | 4.81             | 4.4                   | 9.21          | 27                  | Pass   |  |

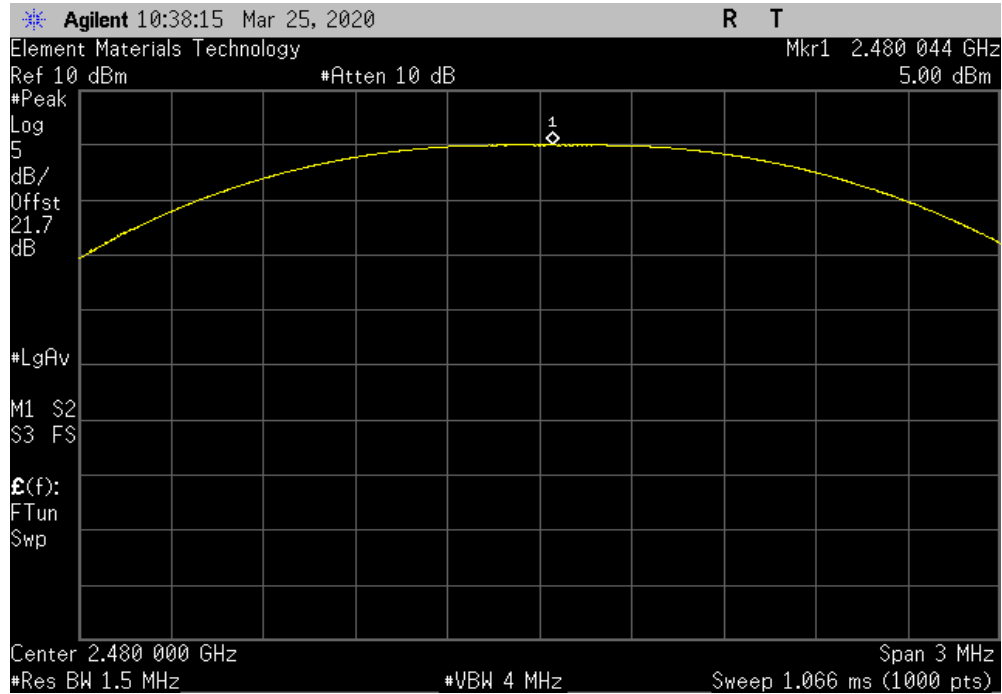


# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

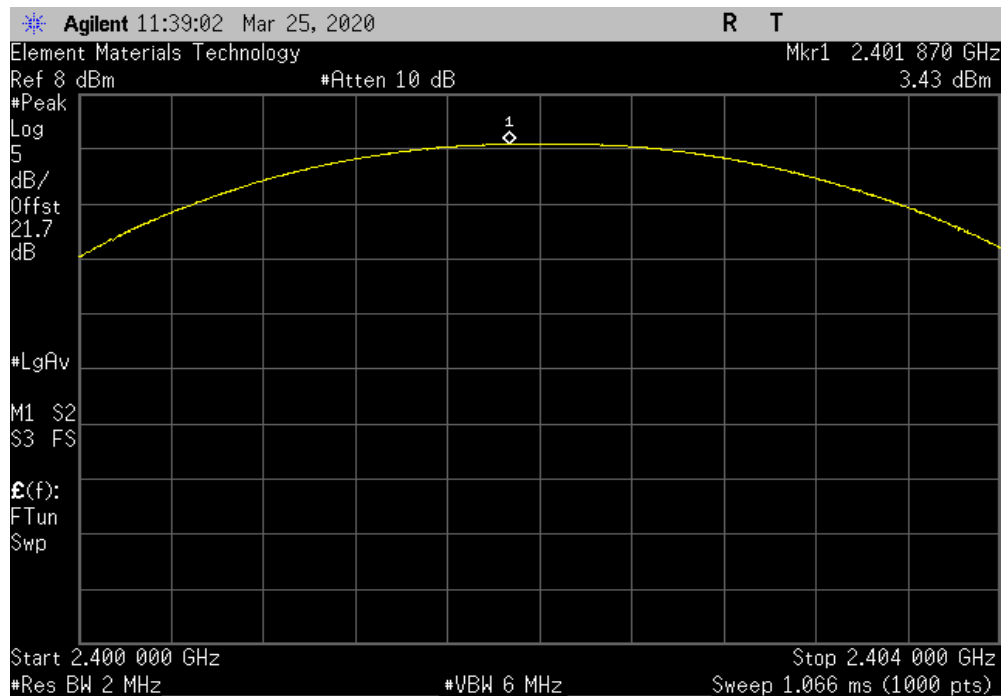


TbTb 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, High Channel |                  |                       |               |                     |        |  |
|-------------------------|------------------|-----------------------|---------------|---------------------|--------|--|
|                         | Out Pwr<br>(dBm) | Antenna<br>Gain (dBi) | EIRP<br>(dBm) | EIRP Limit<br>(dBm) | Result |  |
|                         | 4.996            | 4.4                   | 9.396         | 27                  | Pass   |  |



| 2DH5, pi/4-DQPSK, Low Channel |                  |                       |               |                     |        |  |
|-------------------------------|------------------|-----------------------|---------------|---------------------|--------|--|
|                               | Out Pwr<br>(dBm) | Antenna<br>Gain (dBi) | EIRP<br>(dBm) | EIRP Limit<br>(dBm) | Result |  |
|                               | 3.434            | 4.4                   | 7.834         | 27                  | Pass   |  |

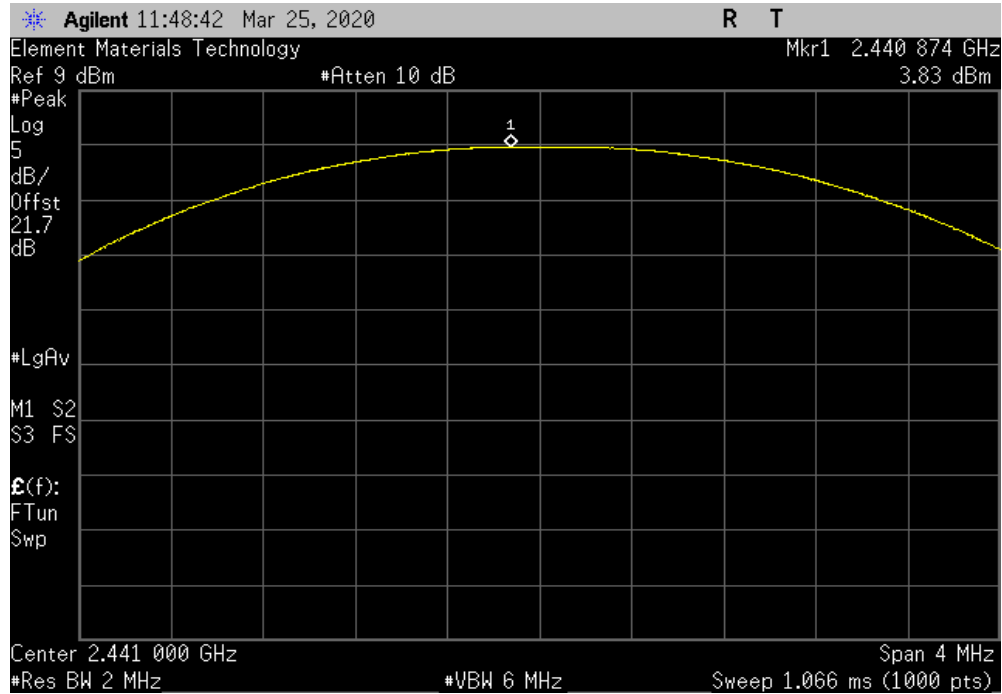


# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

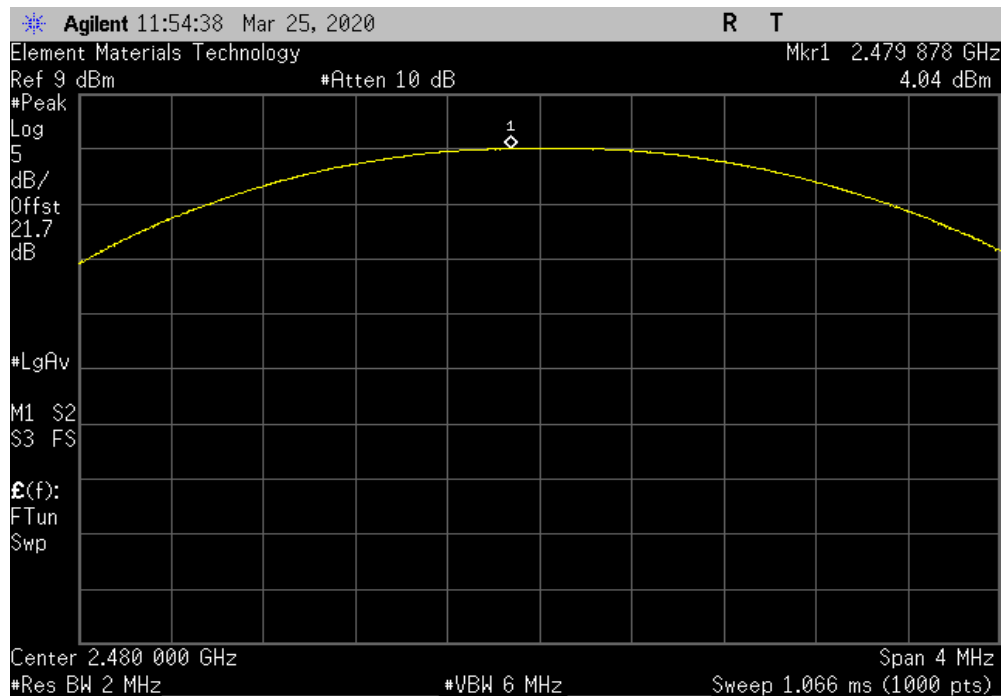


TbTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, Mid Channel |                  |                       |               |                     |        |  |
|-------------------------------|------------------|-----------------------|---------------|---------------------|--------|--|
|                               | Out Pwr<br>(dBm) | Antenna<br>Gain (dBi) | EIRP<br>(dBm) | EIRP Limit<br>(dBm) | Result |  |
|                               | 3.828            | 4.4                   | 8.228         | 27                  | Pass   |  |



| 2DH5, pi/4-DQPSK, High Channel |                  |                       |               |                     |        |  |
|--------------------------------|------------------|-----------------------|---------------|---------------------|--------|--|
|                                | Out Pwr<br>(dBm) | Antenna<br>Gain (dBi) | EIRP<br>(dBm) | EIRP Limit<br>(dBm) | Result |  |
|                                | 4.036            | 4.4                   | 8.436         | 27                  | Pass   |  |

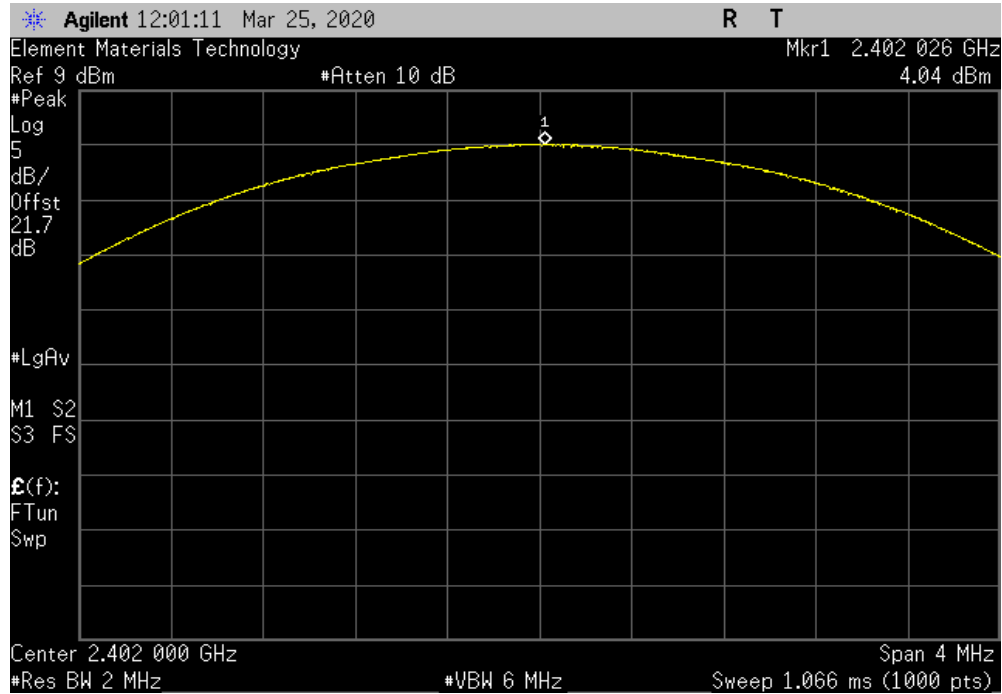


# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

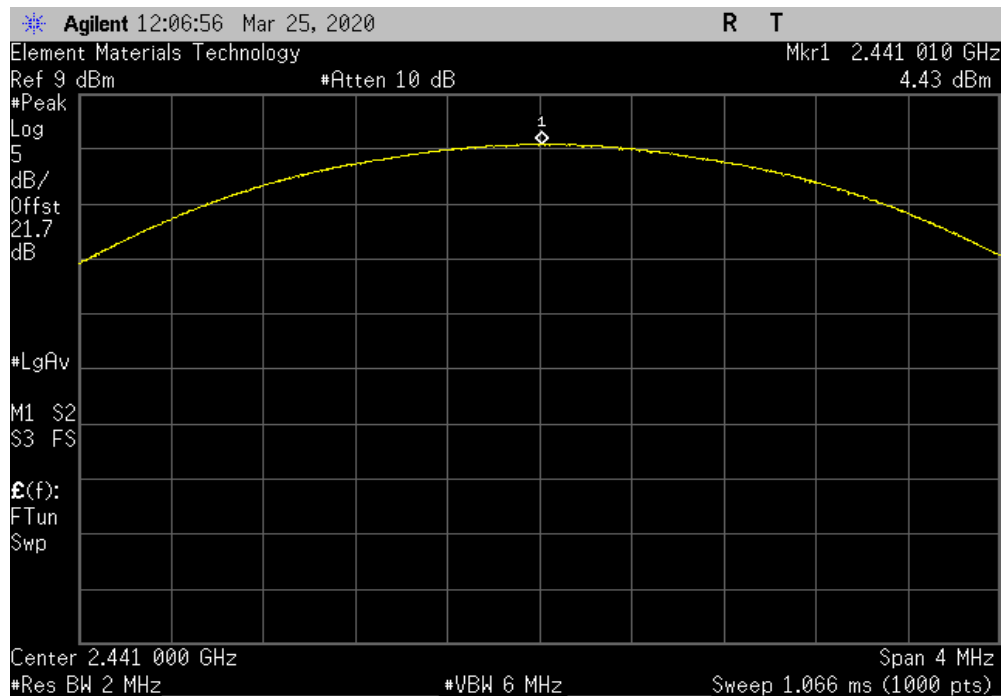


TbTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, Low Channel |                  |                       |               |                     |        |  |
|---------------------------|------------------|-----------------------|---------------|---------------------|--------|--|
|                           | Out Pwr<br>(dBm) | Antenna<br>Gain (dBi) | EIRP<br>(dBm) | EIRP Limit<br>(dBm) | Result |  |
|                           | 4.039            | 4.4                   | 8.439         | 27                  | Pass   |  |



| 3DH5, 8-DPSK, Mid Channel |                  |                       |               |                     |        |  |
|---------------------------|------------------|-----------------------|---------------|---------------------|--------|--|
|                           | Out Pwr<br>(dBm) | Antenna<br>Gain (dBi) | EIRP<br>(dBm) | EIRP Limit<br>(dBm) | Result |  |
|                           | 4.426            | 4.4                   | 8.826         | 27                  | Pass   |  |

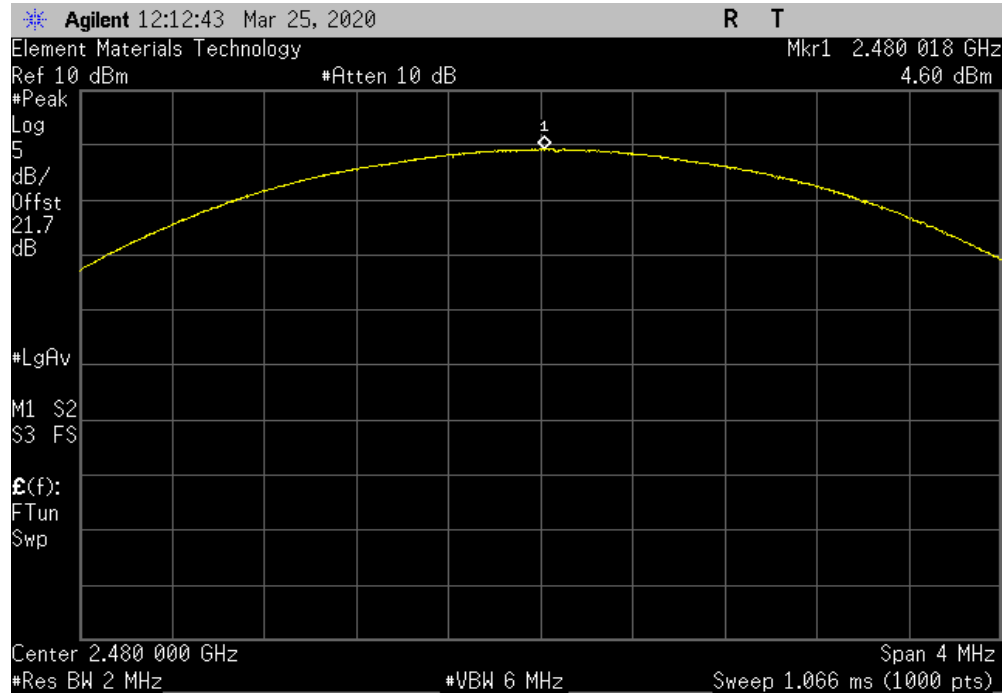


# EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TbTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, High Channel |                  |                       |               |                     |        |
|----------------------------|------------------|-----------------------|---------------|---------------------|--------|
|                            | Out Pwr<br>(dBm) | Antenna<br>Gain (dBi) | EIRP<br>(dBm) | EIRP Limit<br>(dBm) | Result |
|                            | 4.6              | 4.4                   | 9             | 27                  | Pass   |



# BAND EDGE COMPLIANCE



XMI 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|--------------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A             | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72    | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20           | TZP | 9-Nov-19  | 9-Nov-20  |
| Cable                        | Fairview Microwave | LMR240 NM-BNCM, 9m | MNZ | 17-Oct-19 | 17-Oct-20 |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A             | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet in a no hop mode. The channels closest to the band edges were selected.

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

# BAND EDGE COMPLIANCE



TMTx 2019.08.30.0 XMM 2019.09.05

|                                                                                    |                        |                                |                      |
|------------------------------------------------------------------------------------|------------------------|--------------------------------|----------------------|
| EUT: JL Module                                                                     |                        | Work Order: APRI0010           |                      |
| Serial Number: 4                                                                   |                        | Date: 25-Mar-20                |                      |
| Customer: Apricity Code                                                            |                        | Temperature: 22.6 °C           |                      |
| Attendees: None                                                                    |                        | Humidity: 32.1% RH             |                      |
| Project: None                                                                      |                        | Barometric Pres.: 1009.9 mbar  |                      |
| Tested by: Kyle McMullan                                                           | Power: 5 VDC (via USB) | Job Site: MN09                 |                      |
| TEST SPECIFICATIONS                                                                |                        | Test Method                    |                      |
| FCC 15.247:2020                                                                    |                        | ANSI C63.10:2013               |                      |
| COMMENTS                                                                           |                        |                                |                      |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |                        |                                |                      |
| DEVIATIONS FROM TEST STANDARD                                                      |                        |                                |                      |
| None                                                                               |                        |                                |                      |
| Configuration #                                                                    | 1                      | Signature <i>Kyle McMullan</i> |                      |
|                                                                                    |                        | Value (dBc)                    | Limit ≤ (dBc) Result |
| DH5, GFSK                                                                          |                        |                                |                      |
|                                                                                    | Low Channel            | -59.3                          | -20 Pass             |
|                                                                                    | High Channel           | -58.21                         | -20 Pass             |
| 2DH5, pi/4-DQPSK                                                                   |                        |                                |                      |
|                                                                                    | Low Channel            | -56.68                         | -20 Pass             |
|                                                                                    | High Channel           | -55.19                         | -20 Pass             |
| 3DH5, 8-DPSK                                                                       |                        |                                |                      |
|                                                                                    | Low Channel            | -51.23                         | -20 Pass             |
|                                                                                    | High Channel           | -56.86                         | -20 Pass             |

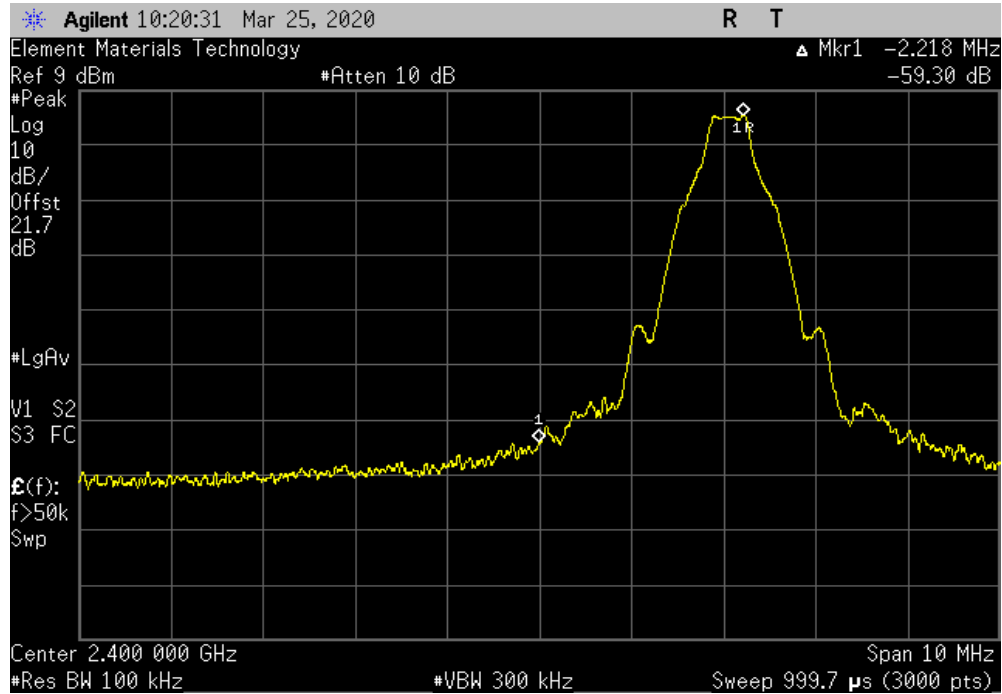


# BAND EDGE COMPLIANCE

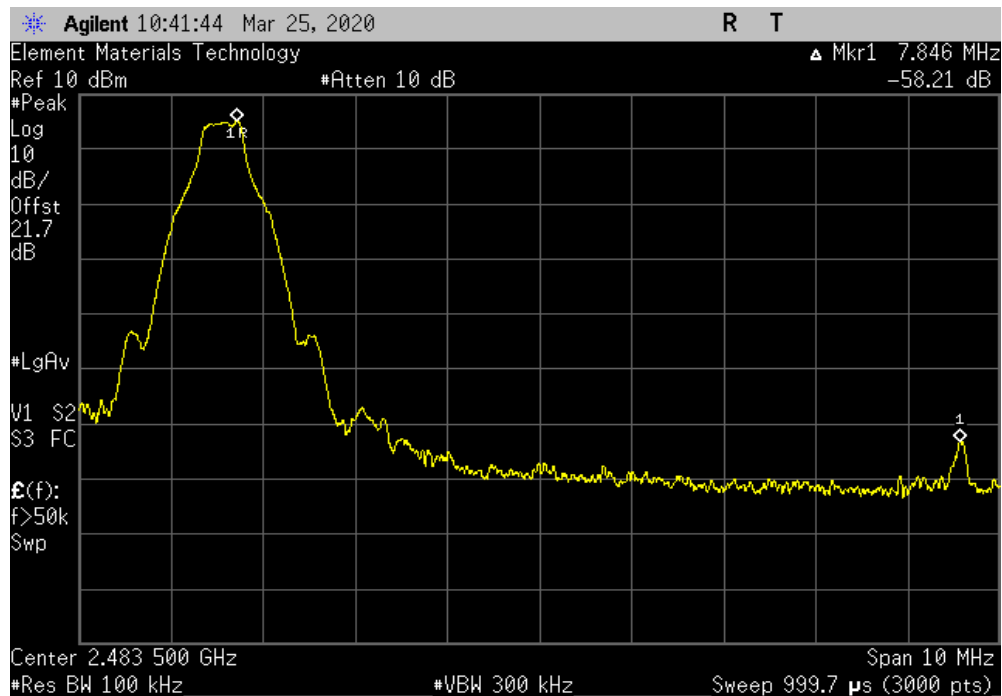


TMTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, Low Channel |  |  |  |                |                  |        |
|------------------------|--|--|--|----------------|------------------|--------|
|                        |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                        |  |  |  | -59.3          | -20              | Pass   |



| DH5, GFSK, High Channel |  |  |  |                |                  |        |
|-------------------------|--|--|--|----------------|------------------|--------|
|                         |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                         |  |  |  | -58.21         | -20              | Pass   |

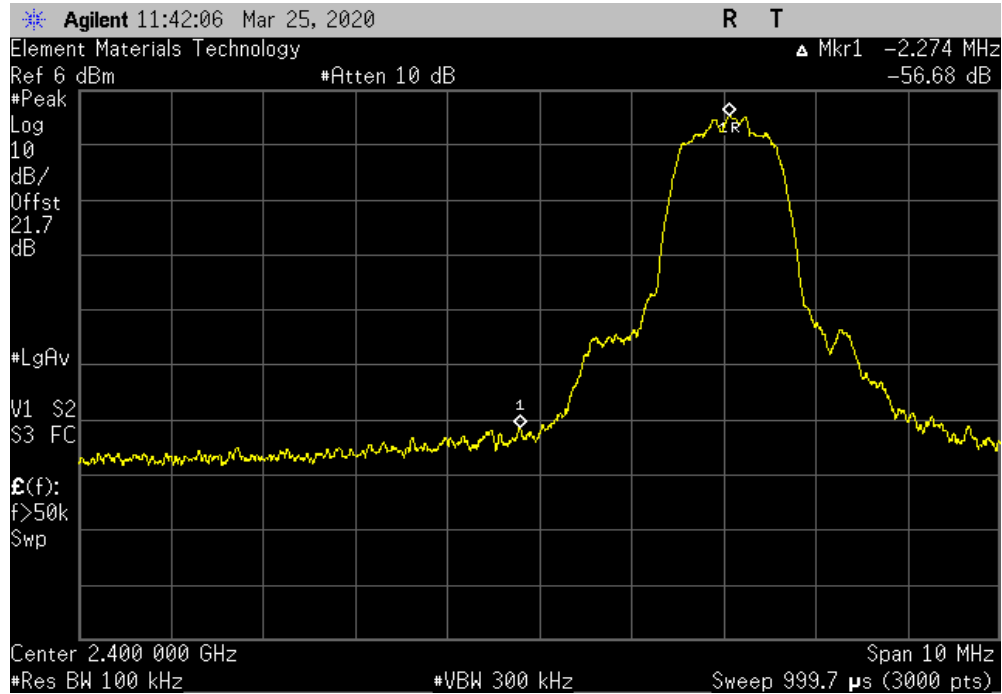


# BAND EDGE COMPLIANCE

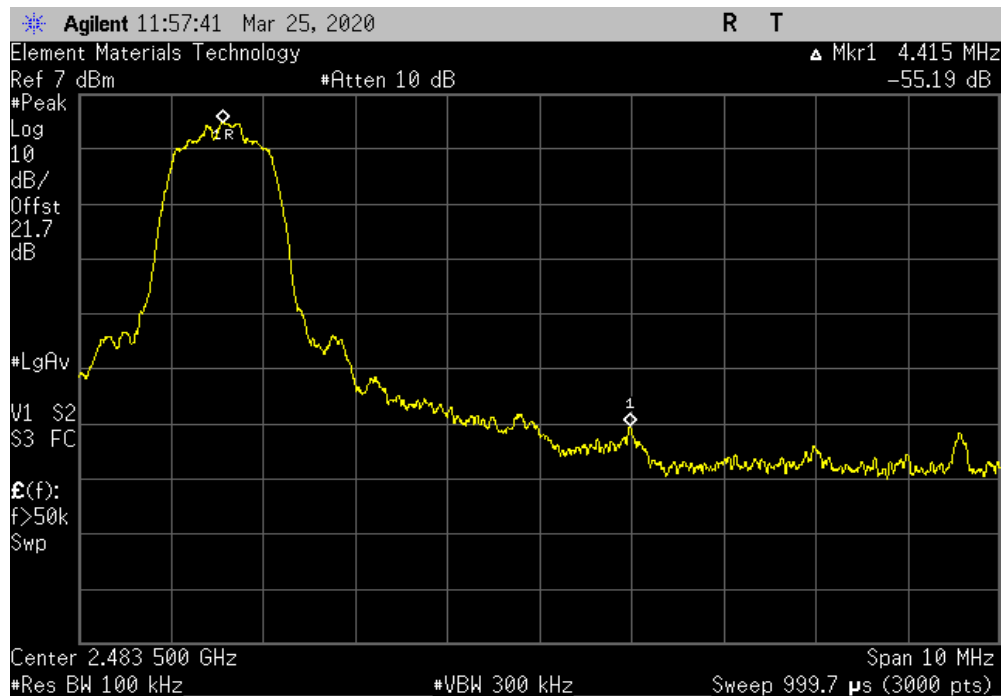


TMTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, Low Channel |  |  |  |                |                  |        |
|-------------------------------|--|--|--|----------------|------------------|--------|
|                               |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                               |  |  |  | -56.68         | -20              | Pass   |



| 2DH5, pi/4-DQPSK, High Channel |  |  |  |                |                  |        |
|--------------------------------|--|--|--|----------------|------------------|--------|
|                                |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                                |  |  |  | -55.19         | -20              | Pass   |

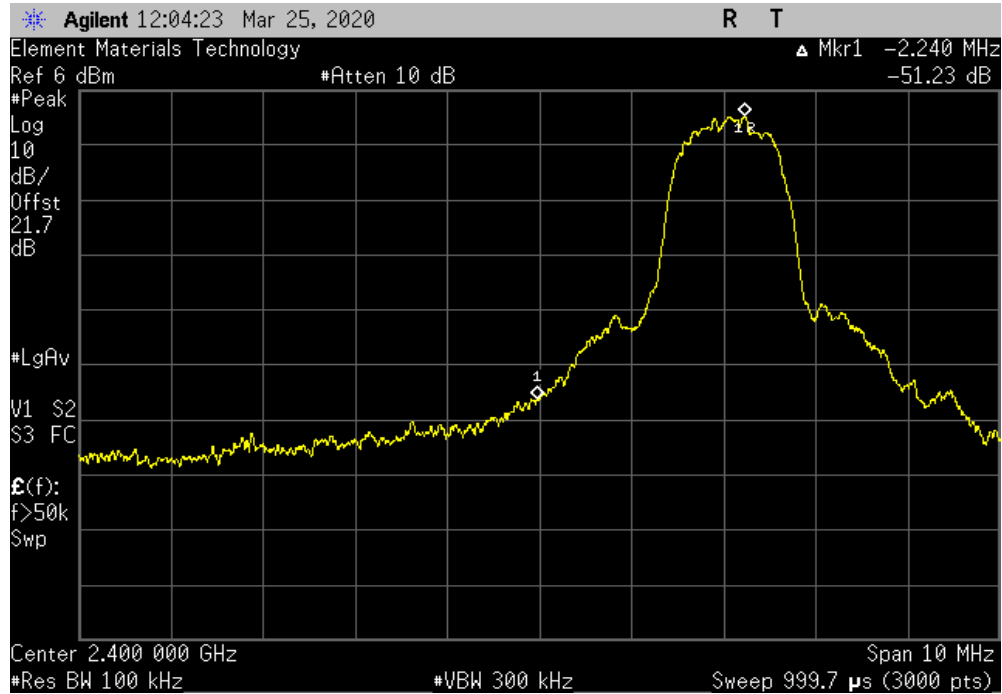


# BAND EDGE COMPLIANCE

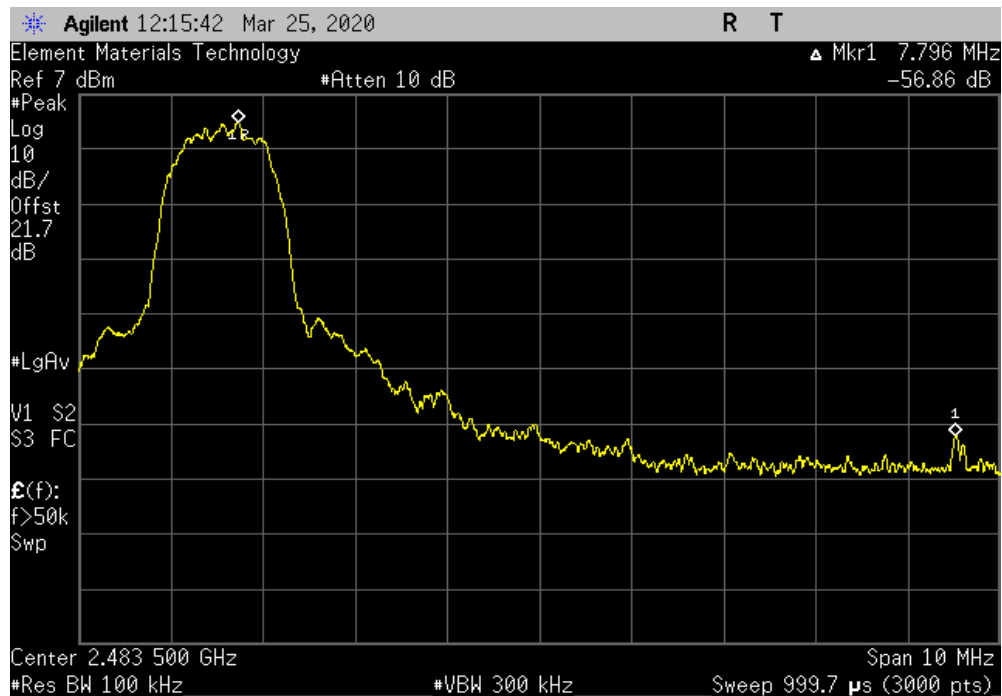


TMTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, Low Channel |  |  |  |                |                  |        |
|---------------------------|--|--|--|----------------|------------------|--------|
|                           |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                           |  |  |  | -51.23         | -20              | Pass   |



| 3DH5, 8-DPSK, High Channel |  |  |  |                |                  |        |
|----------------------------|--|--|--|----------------|------------------|--------|
|                            |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                            |  |  |  | -56.86         | -20              | Pass   |



# BAND EDGE COMPLIANCE -HOPPING MODE



XMIT 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|-----------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A          | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72 | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20        | TZP | 9-Nov-19  | 9-Nov-20  |
| Block - DC                   | Fairview Microwave | SD3379          | AMZ | 9-Nov-19  | 9-Nov-20  |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A          | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to its normal pseudo-random hopping sequence. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

# BAND EDGE COMPLIANCE -HOPPING MODE



TMTx 2019.08.30.0 XMI 2019.09.05

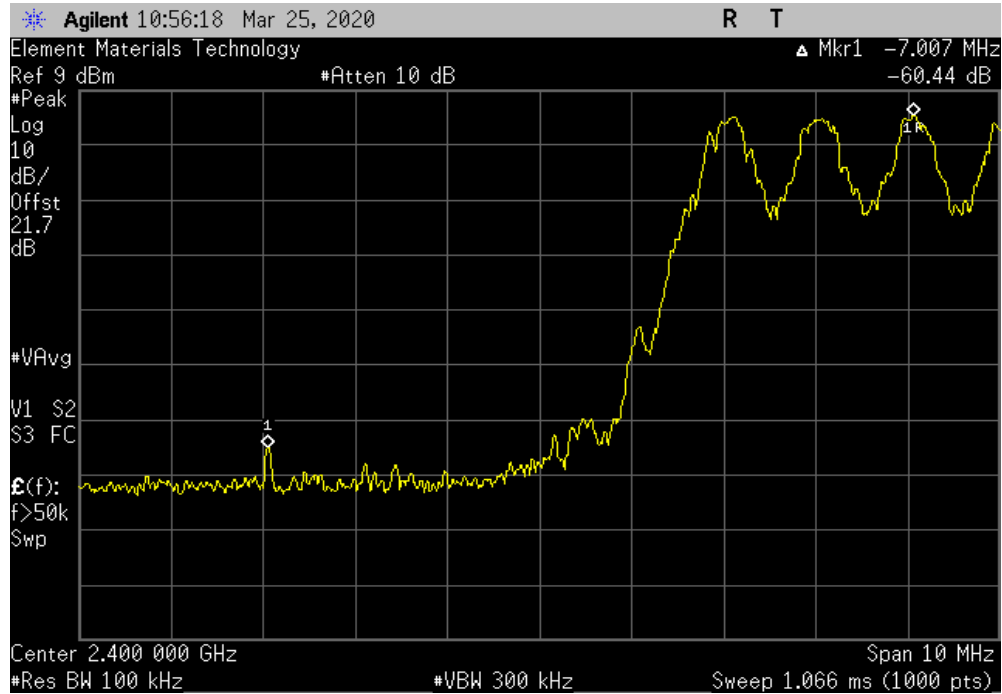
|                                                                                    |   |                                |                      |
|------------------------------------------------------------------------------------|---|--------------------------------|----------------------|
| EUT: JL Module                                                                     |   | Work Order: APRI0010           |                      |
| Serial Number: 4                                                                   |   | Date: 25-Mar-20                |                      |
| Customer: Apricity Code                                                            |   | Temperature: 22.2 °C           |                      |
| Attendees: None                                                                    |   | Humidity: 32.6% RH             |                      |
| Project: None                                                                      |   | Barometric Pres.: 1009.9 mbar  |                      |
| Tested by: Kyle McMullan                                                           |   | Power: 5 VDC (via USB)         |                      |
|                                                                                    |   | Job Site: MN09                 |                      |
| TEST SPECIFICATIONS                                                                |   | Test Method                    |                      |
| FCC 15.247:2020                                                                    |   | ANSI C63.10:2013               |                      |
| COMMENTS                                                                           |   |                                |                      |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |   |                                |                      |
| DEVIATIONS FROM TEST STANDARD                                                      |   |                                |                      |
| None                                                                               |   |                                |                      |
| Configuration #                                                                    | 1 | Signature <i>Kyle McMullan</i> |                      |
|                                                                                    |   | Value (dBc)                    | Limit ≤ (dBc) Result |
| Hopping Mode (All Channels)                                                        |   |                                |                      |
| DH5, GFSK                                                                          |   |                                |                      |
| Low Channel, 2402 MHz                                                              |   | -60.44                         | -20 Pass             |
| High Channel, 2480 MHz                                                             |   | -64.15                         | -20 Pass             |
| 2DH5, pi/4-DQPSK                                                                   |   |                                |                      |
| Low Channel, 2402 MHz                                                              |   | -56.42                         | -20 Pass             |
| High Channel, 2480 MHz                                                             |   | -56.93                         | -20 Pass             |
| 3DH5, 8-DPSK                                                                       |   |                                |                      |
| Low Channel, 2402 MHz                                                              |   | -57.01                         | -20 Pass             |
| High Channel, 2480 MHz                                                             |   | -59.74                         | -20 Pass             |

# BAND EDGE COMPLIANCE -HOPPING MODE

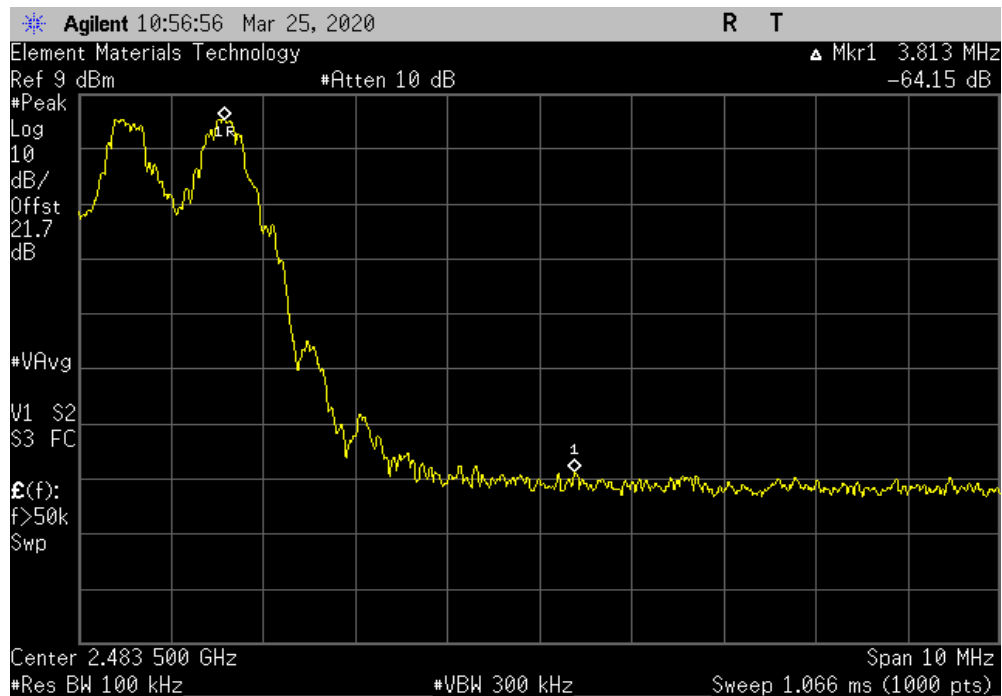


TMTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), DH5, GFSK, Low Channel, 2402 MHz |  |  |  |                |                  |        |
|---------------------------------------------------------------|--|--|--|----------------|------------------|--------|
|                                                               |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                                                               |  |  |  | -60.44         | -20              | Pass   |



| Hopping Mode (All Channels), DH5, GFSK, High Channel, 2480 MHz |  |  |  |                |                  |        |
|----------------------------------------------------------------|--|--|--|----------------|------------------|--------|
|                                                                |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                                                                |  |  |  | -64.15         | -20              | Pass   |

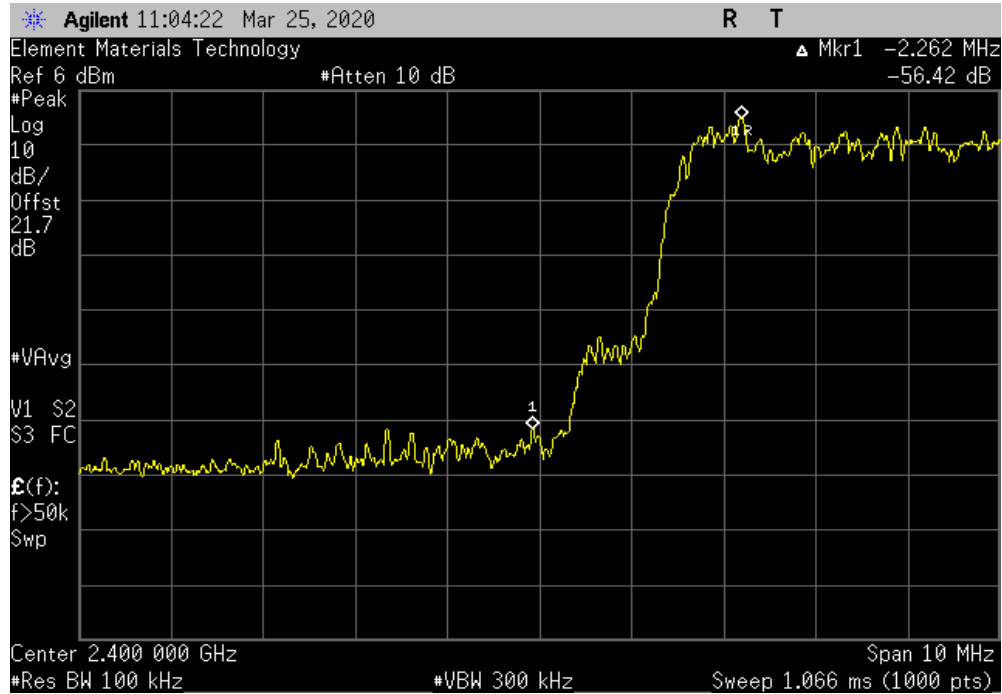


# BAND EDGE COMPLIANCE -HOPPING MODE

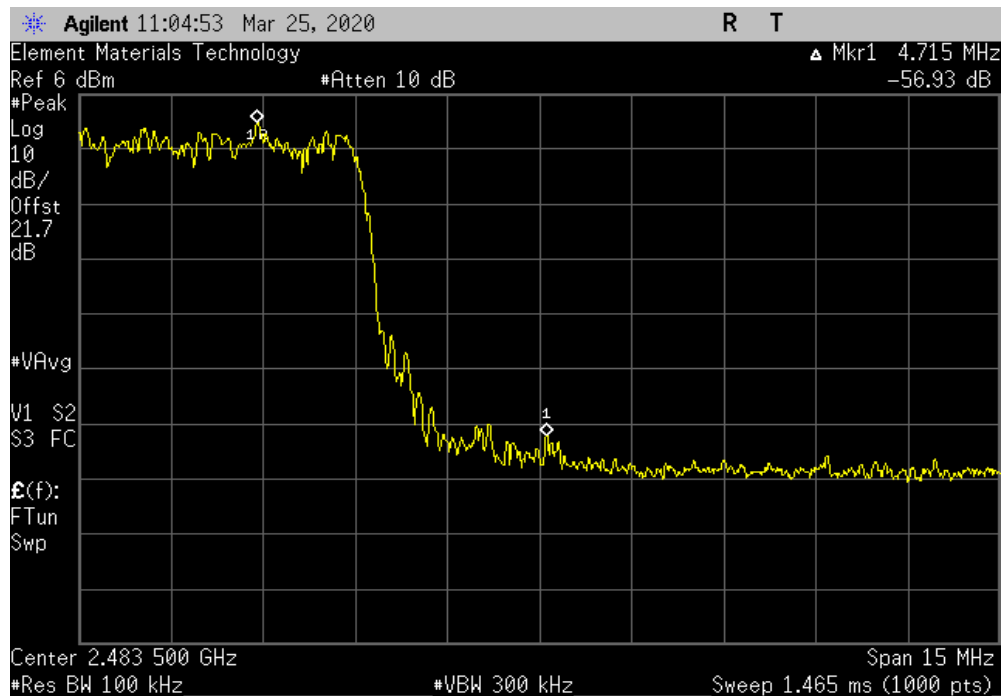


TMTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Low Channel, 2402 MHz |  |  |  |                |                  |        |
|----------------------------------------------------------------------|--|--|--|----------------|------------------|--------|
|                                                                      |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                                                                      |  |  |  | -56.42         | -20              | Pass   |



| Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, High Channel, 2480 MHz |  |  |  |                |                  |        |
|-----------------------------------------------------------------------|--|--|--|----------------|------------------|--------|
|                                                                       |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                                                                       |  |  |  | -56.93         | -20              | Pass   |

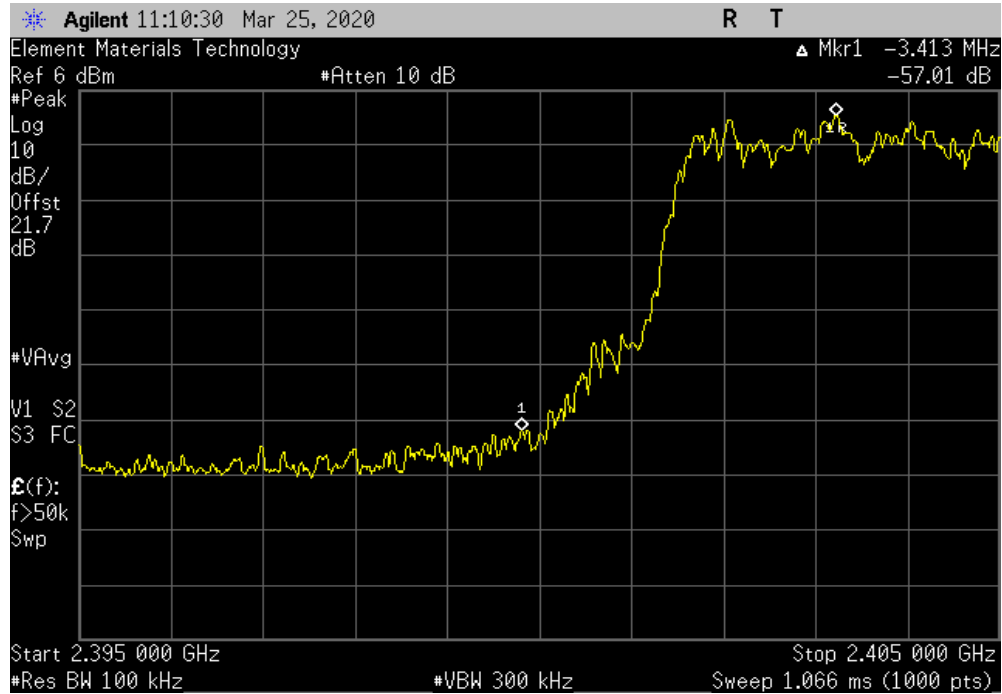


# BAND EDGE COMPLIANCE -HOPPING MODE

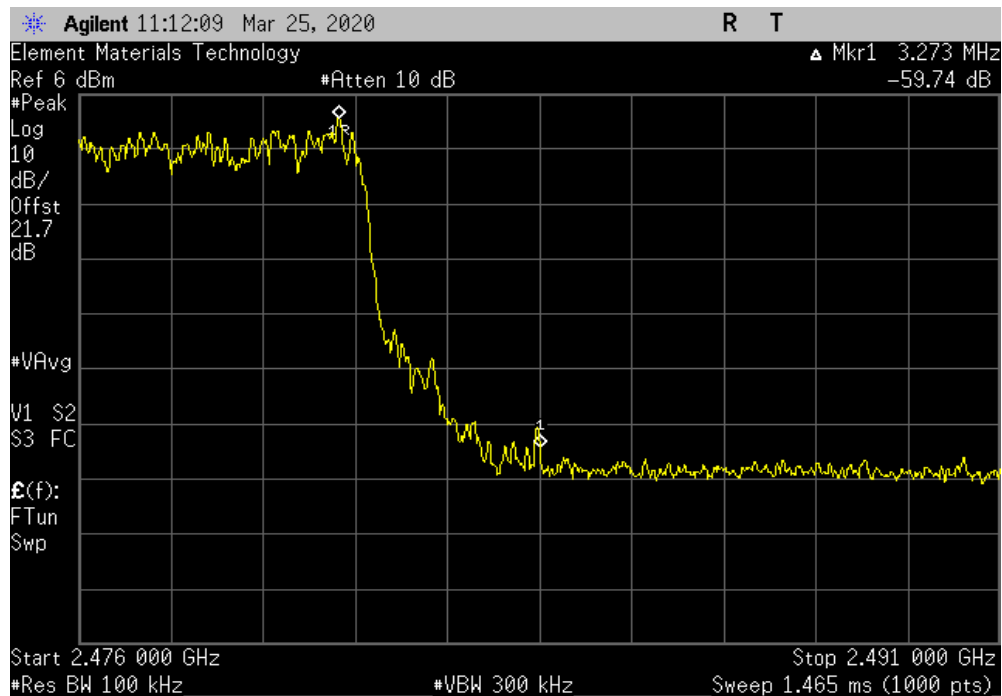


TMTx 2019.08.30.0 XMI 2019.09.05

| Hopping Mode (All Channels), 3DH5, 8-DPSK, Low Channel, 2402 MHz |  |  |  |                |                  |        |
|------------------------------------------------------------------|--|--|--|----------------|------------------|--------|
|                                                                  |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                                                                  |  |  |  | -57.01         | -20              | Pass   |



| Hopping Mode (All Channels), 3DH5, 8-DPSK, High Channel, 2480 MHz |  |  |  |                |                  |        |
|-------------------------------------------------------------------|--|--|--|----------------|------------------|--------|
|                                                                   |  |  |  | Value<br>(dBc) | Limit<br>≤ (dBc) | Result |
|                                                                   |  |  |  | -59.74         | -20              | Pass   |





# OCCUPIED BANDWIDTH



XMit 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|-----------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A          | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72 | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20        | TZP | 9-Nov-19  | 9-Nov-20  |
| Block - DC                   | Fairview Microwave | SD3379          | AMZ | 9-Nov-19  | 9-Nov-20  |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A          | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The 20 dB occupied bandwidth was measured with the EUT set to low, medium and high transmit frequencies in the band. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode.

# OCCUPIED BANDWIDTH



TMTx 2019.08.30.0 XMt 2019.09.05

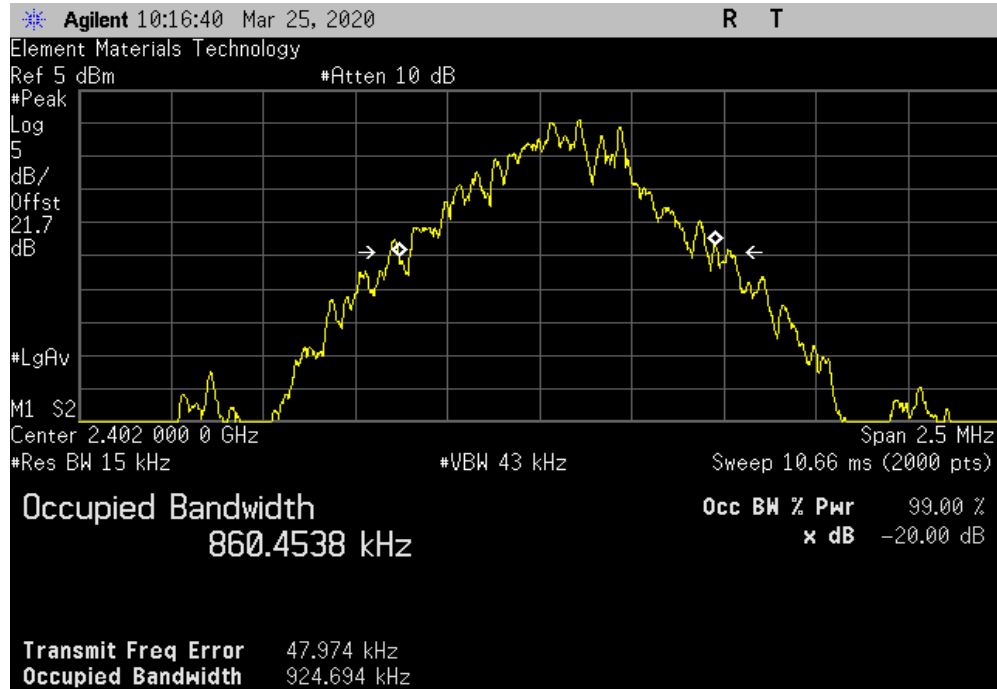
|                                                                                    |              |                                |                  |
|------------------------------------------------------------------------------------|--------------|--------------------------------|------------------|
| EUT: JL Module                                                                     |              | Work Order: APRI0010           |                  |
| Serial Number: 4                                                                   |              | Date: 25-Mar-20                |                  |
| Customer: Apricity Code                                                            |              | Temperature: 22.3 °C           |                  |
| Attendees: None                                                                    |              | Humidity: 32.6% RH             |                  |
| Project: None                                                                      |              | Barometric Pres.: 1009.9 mbar  |                  |
| Tested by: Kyle McMullan                                                           |              | Power: 5 VDC (via USB)         |                  |
|                                                                                    |              | Job Site: MN09                 |                  |
| TEST SPECIFICATIONS                                                                |              | Test Method                    |                  |
| FCC 15.247:2020                                                                    |              | ANSI C63.10:2013               |                  |
| COMMENTS                                                                           |              |                                |                  |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |              |                                |                  |
| DEVIATIONS FROM TEST STANDARD                                                      |              |                                |                  |
| None                                                                               |              |                                |                  |
| Configuration #                                                                    | 1            | Signature <i>Kyle McMullan</i> |                  |
|                                                                                    |              | Value                          | Limit (<) Result |
| DH5, GFSK                                                                          |              |                                |                  |
|                                                                                    | Low Channel  | 924.694 kHz                    | 1.5 MHz Pass     |
|                                                                                    | Mid Channel  | 927.608 kHz                    | 1.5 MHz Pass     |
|                                                                                    | High Channel | 924.245 kHz                    | 1.5 MHz Pass     |
| 2DH5, pi/4-DQPSK                                                                   |              |                                |                  |
|                                                                                    | Low Channel  | 1.34 MHz                       | 1.5 MHz Pass     |
|                                                                                    | Mid Channel  | 1.341 MHz                      | 1.5 MHz Pass     |
|                                                                                    | High Channel | 1.339 MHz                      | 1.5 MHz Pass     |
| 3DH5, 8-DPSK                                                                       |              |                                |                  |
|                                                                                    | Low Channel  | 1.316 MHz                      | 1.5 MHz Pass     |
|                                                                                    | Mid Channel  | 1.311 MHz                      | 1.5 MHz Pass     |
|                                                                                    | High Channel | 1.329 MHz                      | 1.5 MHz Pass     |

# OCCUPIED BANDWIDTH

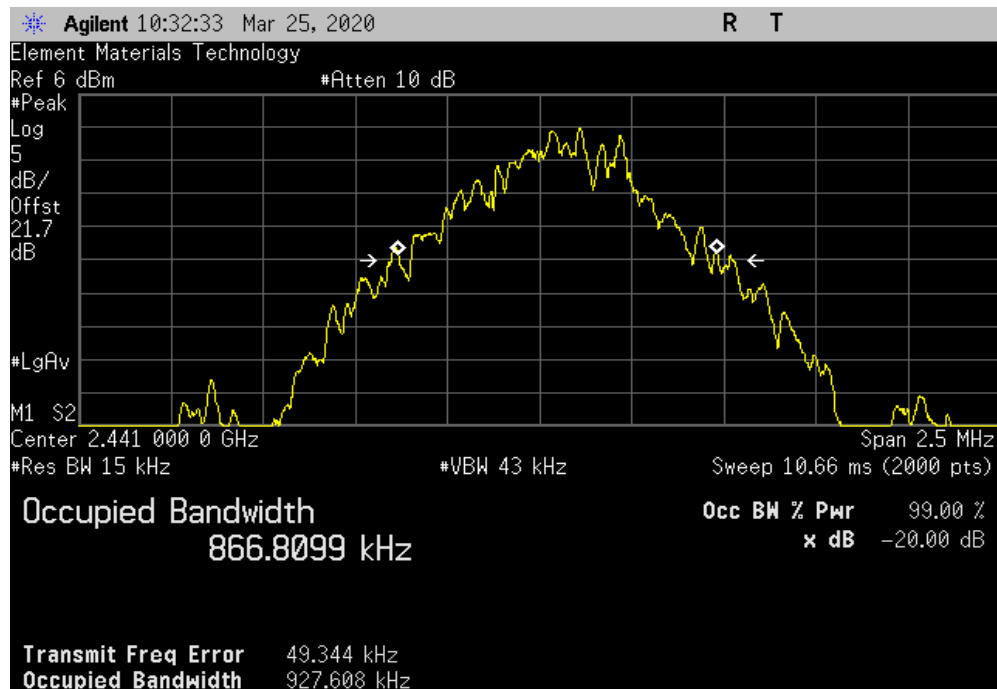


TMTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, Low Channel |  |  |  |             |           |        |
|------------------------|--|--|--|-------------|-----------|--------|
|                        |  |  |  | Value       | Limit (<) | Result |
|                        |  |  |  | 924.694 kHz | 1.5 MHz   | Pass   |



| DH5, GFSK, Mid Channel |  |  |  |             |           |        |
|------------------------|--|--|--|-------------|-----------|--------|
|                        |  |  |  | Value       | Limit (<) | Result |
|                        |  |  |  | 927.608 kHz | 1.5 MHz   | Pass   |

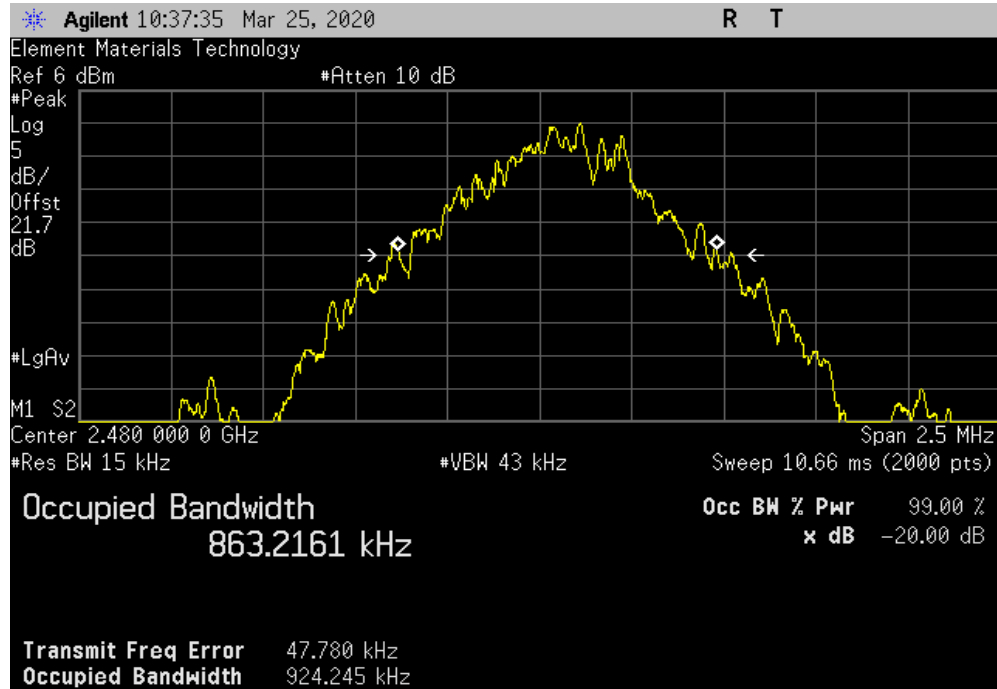


# OCCUPIED BANDWIDTH

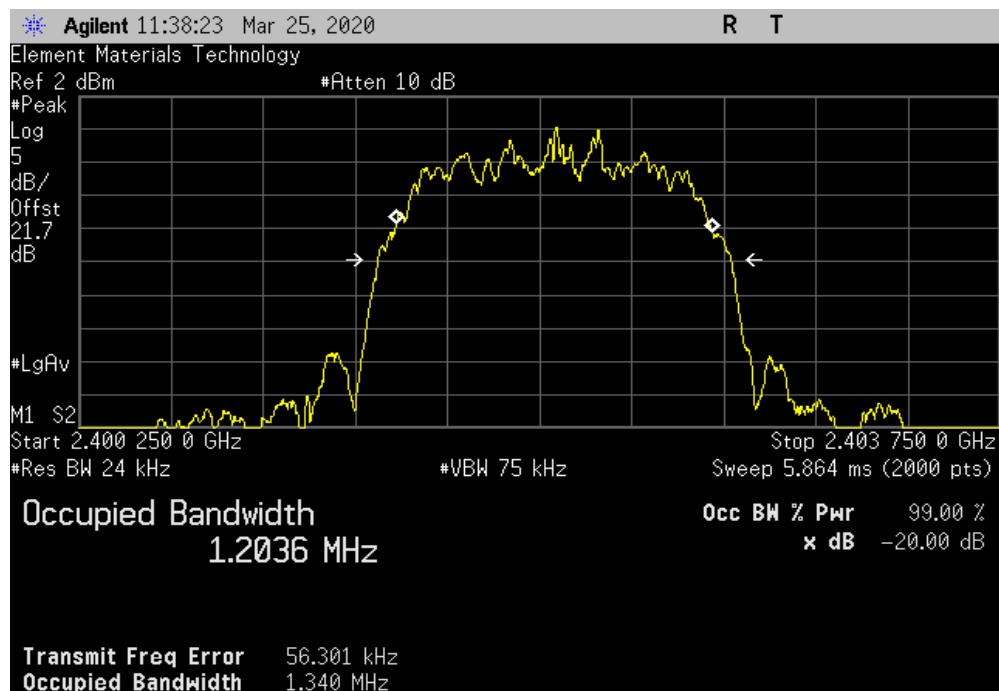


TMTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, High Channel |  |  |  |             |           |        |
|-------------------------|--|--|--|-------------|-----------|--------|
|                         |  |  |  | Value       | Limit (<) | Result |
|                         |  |  |  | 924.245 kHz | 1.5 MHz   | Pass   |



| 2DH5, pi/4-DQPSK, Low Channel |  |  |  |          |           |        |
|-------------------------------|--|--|--|----------|-----------|--------|
|                               |  |  |  | Value    | Limit (<) | Result |
|                               |  |  |  | 1.34 MHz | 1.5 MHz   | Pass   |

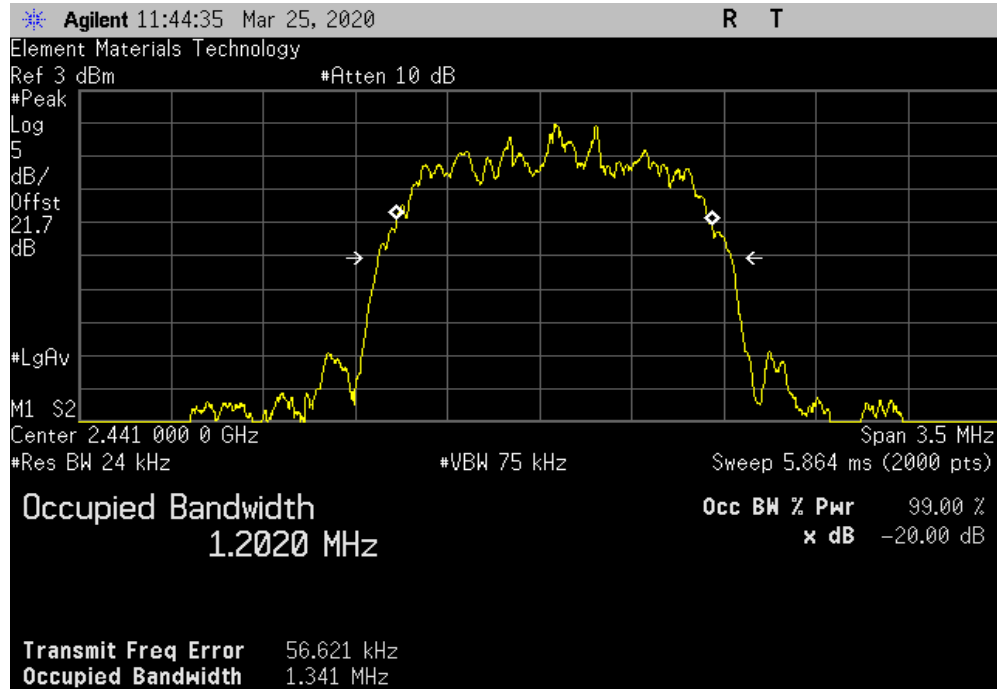


# OCCUPIED BANDWIDTH

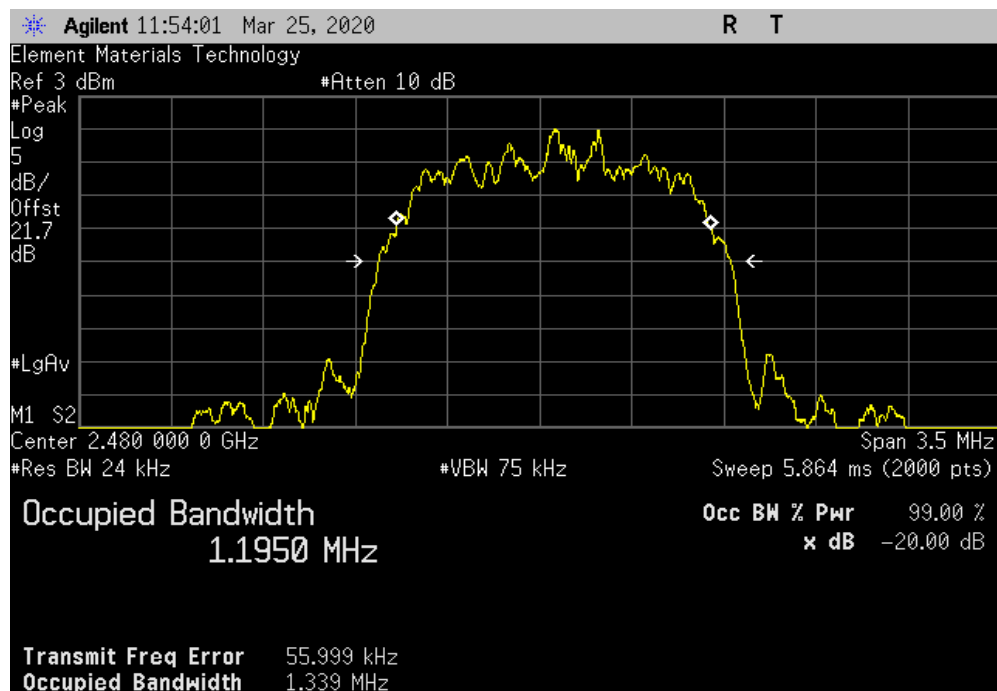


TMTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, Mid Channel |  |  |  |           |           |        |
|-------------------------------|--|--|--|-----------|-----------|--------|
|                               |  |  |  | Value     | Limit (<) | Result |
|                               |  |  |  | 1.341 MHz | 1.5 MHz   | Pass   |



| 2DH5, pi/4-DQPSK, High Channel |  |  |  |           |           |        |
|--------------------------------|--|--|--|-----------|-----------|--------|
|                                |  |  |  | Value     | Limit (<) | Result |
|                                |  |  |  | 1.339 MHz | 1.5 MHz   | Pass   |

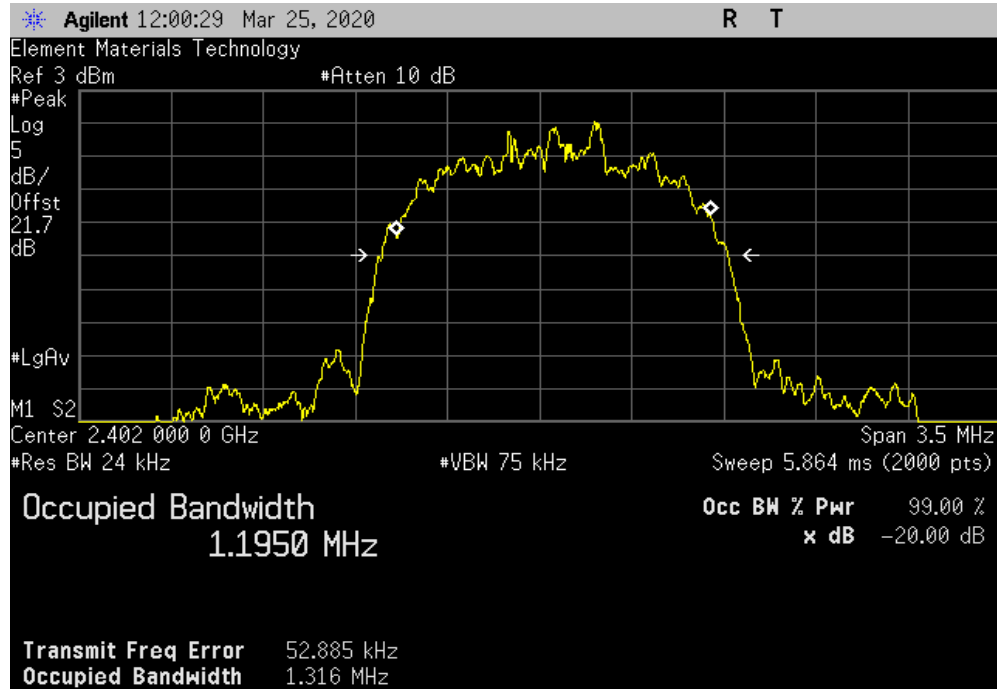


# OCCUPIED BANDWIDTH

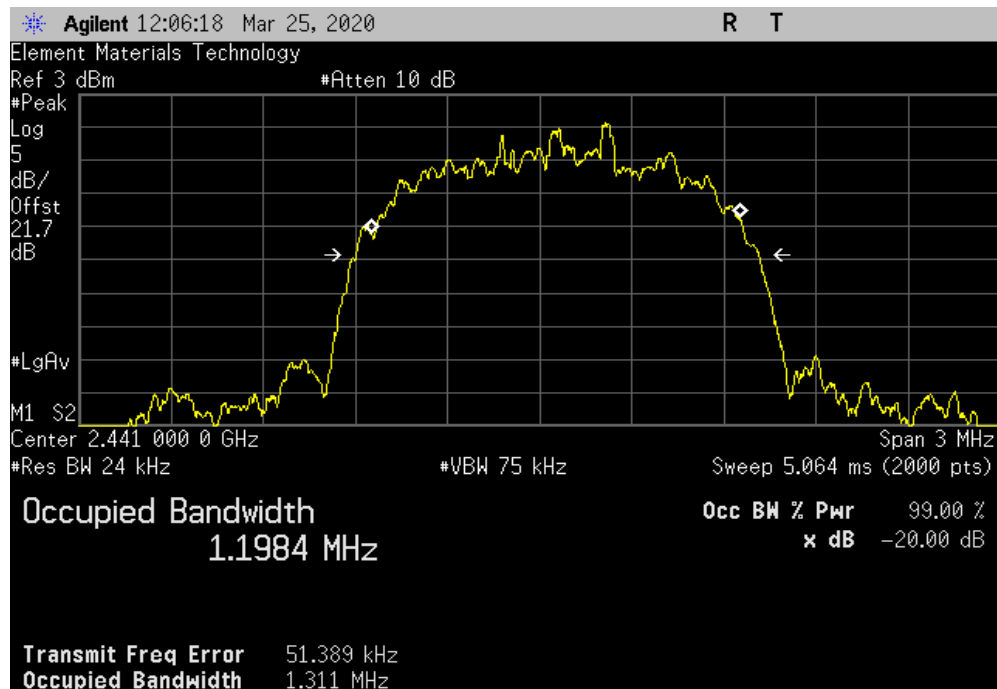


TMTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, Low Channel |  |  |  |           |           |        |
|---------------------------|--|--|--|-----------|-----------|--------|
|                           |  |  |  | Value     | Limit (<) | Result |
|                           |  |  |  | 1.316 MHz | 1.5 MHz   | Pass   |



| 3DH5, 8-DPSK, Mid Channel |  |  |  |           |           |        |
|---------------------------|--|--|--|-----------|-----------|--------|
|                           |  |  |  | Value     | Limit (<) | Result |
|                           |  |  |  | 1.311 MHz | 1.5 MHz   | Pass   |

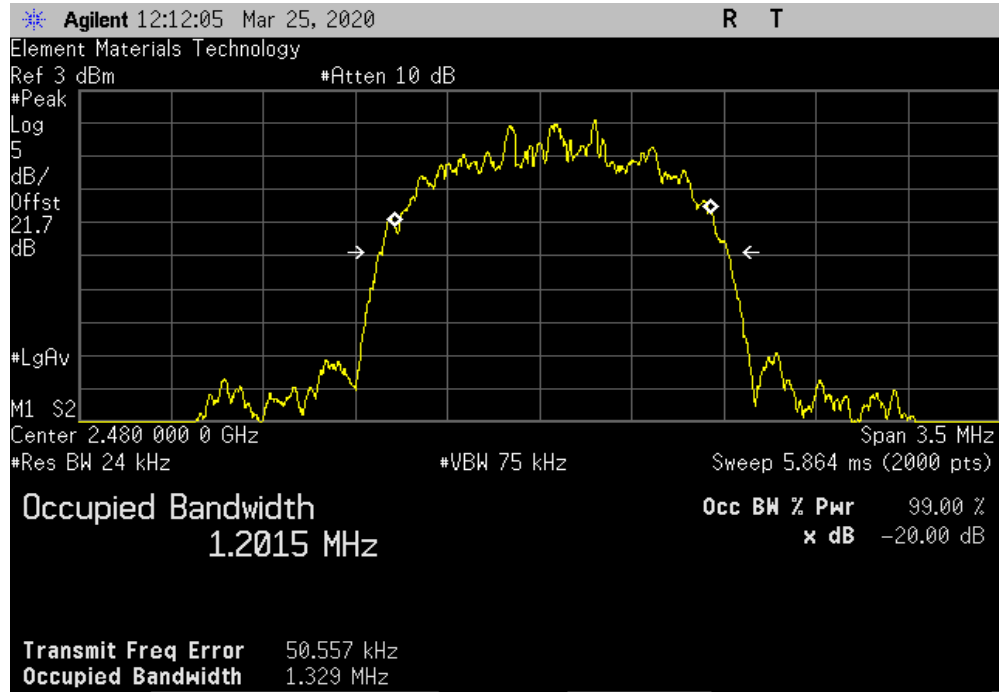


# OCCUPIED BANDWIDTH



TBTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, High Channel |  |  |  |           |              |        |
|----------------------------|--|--|--|-----------|--------------|--------|
|                            |  |  |  | Value     | Limit<br>(<) | Result |
|                            |  |  |  | 1.329 MHz | 1.5 MHz      | Pass   |



# SPURIOUS CONDUCTED EMISSIONS



XMIT 2019.09.05

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. | Cal. Due  |
|------------------------------|--------------------|-----------------|-----|-----------|-----------|
| Generator - Signal           | Agilent            | N5183A          | TIK | 30-Apr-19 | 30-Apr-22 |
| Cable                        | ESM Cable Corp.    | TTBJ141-KMKM-72 | MNU | 11-Apr-19 | 11-Apr-20 |
| Attenuator                   | S.M. Electronics   | SA26B-20        | TZP | 9-Nov-19  | 9-Nov-20  |
| Block - DC                   | Fairview Microwave | SD3379          | AMZ | 9-Nov-19  | 9-Nov-20  |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A          | AFD | 28-Jul-19 | 28-Jul-20 |

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.



# SPURIOUS CONDUCTED EMISSIONS



TMTx 2019.08.30.0 XMM 2019.09.05

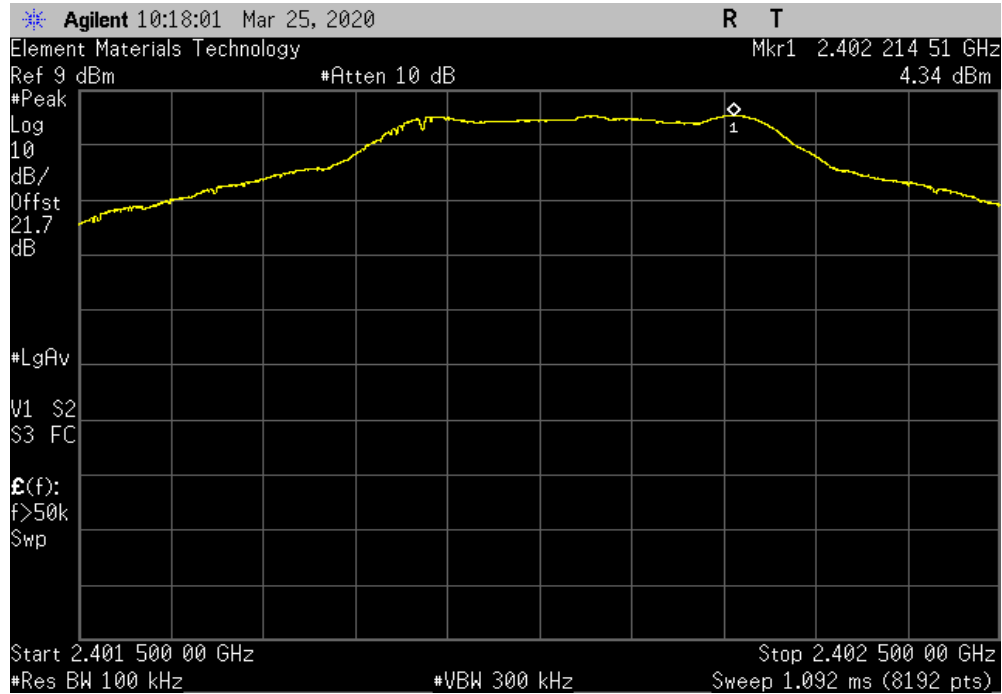
|                                                                                    |              |                                |                     |
|------------------------------------------------------------------------------------|--------------|--------------------------------|---------------------|
| EUT: JL Module                                                                     |              | Work Order: APRI0010           |                     |
| Serial Number: 4                                                                   |              | Date: 25-Mar-20                |                     |
| Customer: Apricity Code                                                            |              | Temperature: 22.2 °C           |                     |
| Attendees: None                                                                    |              | Humidity: 32.9% RH             |                     |
| Project: None                                                                      |              | Barometric Pres.: 1009.9 mbar  |                     |
| Tested by: Kyle McMullan                                                           |              | Power: 5 VDC (via USB)         |                     |
|                                                                                    |              | Job Site: MN09                 |                     |
| TEST SPECIFICATIONS                                                                |              | Test Method                    |                     |
| FCC 15.247:2020                                                                    |              | ANSI C63.10:2013               |                     |
| COMMENTS                                                                           |              |                                |                     |
| Reference level offset includes 20 dB attenuator, DC block, and measurement cable. |              |                                |                     |
| DEVIATIONS FROM TEST STANDARD                                                      |              |                                |                     |
| None                                                                               |              |                                |                     |
| Configuration #                                                                    | 1            | Signature <i>Kyle McMullan</i> |                     |
|                                                                                    |              | Frequency Range                | Measured Freq (MHz) |
|                                                                                    |              |                                | Max Value (dBc)     |
|                                                                                    |              |                                | Limit ≤ (dBc)       |
|                                                                                    |              |                                | Result              |
| DH5, GFSK                                                                          |              |                                |                     |
|                                                                                    | Low Channel  | Fundamental                    | 2402.21             |
|                                                                                    | Low Channel  | 30 MHz - 12.5 GHz              | 3603.1              |
|                                                                                    | Low Channel  | 12.5 GHz - 25 GHz              | 13612.5             |
|                                                                                    | Mid Channel  | Fundamental                    | 2441.22             |
|                                                                                    | Mid Channel  | 30 MHz - 12.5 GHz              | 7110.7              |
|                                                                                    | Mid Channel  | 12.5 GHz - 25 GHz              | 13580.5             |
|                                                                                    | High Channel | Fundamental                    | 2480.21             |
|                                                                                    | High Channel | 30 MHz - 12.5 GHz              | 7022.4              |
|                                                                                    | High Channel | 12.5 GHz - 25 GHz              | 13656.8             |
| 2DH5, pi/4-DQPSK                                                                   |              |                                |                     |
|                                                                                    | Low Channel  | Fundamental                    | 2402.06             |
|                                                                                    | Low Channel  | 30 MHz - 12.5 GHz              | 7037.6              |
|                                                                                    | Low Channel  | 12.5 GHz - 25 GHz              | 14216.8             |
|                                                                                    | Mid Channel  | Fundamental                    | 2441.06             |
|                                                                                    | Mid Channel  | 30 MHz - 12.5 GHz              | 6669.2              |
|                                                                                    | Mid Channel  | 12.5 GHz - 25 GHz              | 14296.2             |
|                                                                                    | High Channel | Fundamental                    | 2480.05             |
|                                                                                    | High Channel | 30 MHz - 12.5 GHz              | 2488.7              |
|                                                                                    | High Channel | 12.5 GHz - 25 GHz              | 13649.1             |
| 3DH5, 8-DPSK                                                                       |              |                                |                     |
|                                                                                    | Low Channel  | Fundamental                    | 2401.89             |
|                                                                                    | Low Channel  | 30 MHz - 12.5 GHz              | 7278.2              |
|                                                                                    | Low Channel  | 12.5 GHz - 25 GHz              | 13209.6             |
|                                                                                    | Mid Channel  | Fundamental                    | 2440.89             |
|                                                                                    | Mid Channel  | 30 MHz - 12.5 GHz              | 7326.9              |
|                                                                                    | Mid Channel  | 12.5 GHz - 25 GHz              | 22625.4             |
|                                                                                    | High Channel | Fundamental                    | 2480.22             |
|                                                                                    | High Channel | 30 MHz - 12.5 GHz              | 7290.3              |
|                                                                                    | High Channel | 12.5 GHz - 25 GHz              | 13636.9             |

# SPURIOUS CONDUCTED EMISSIONS

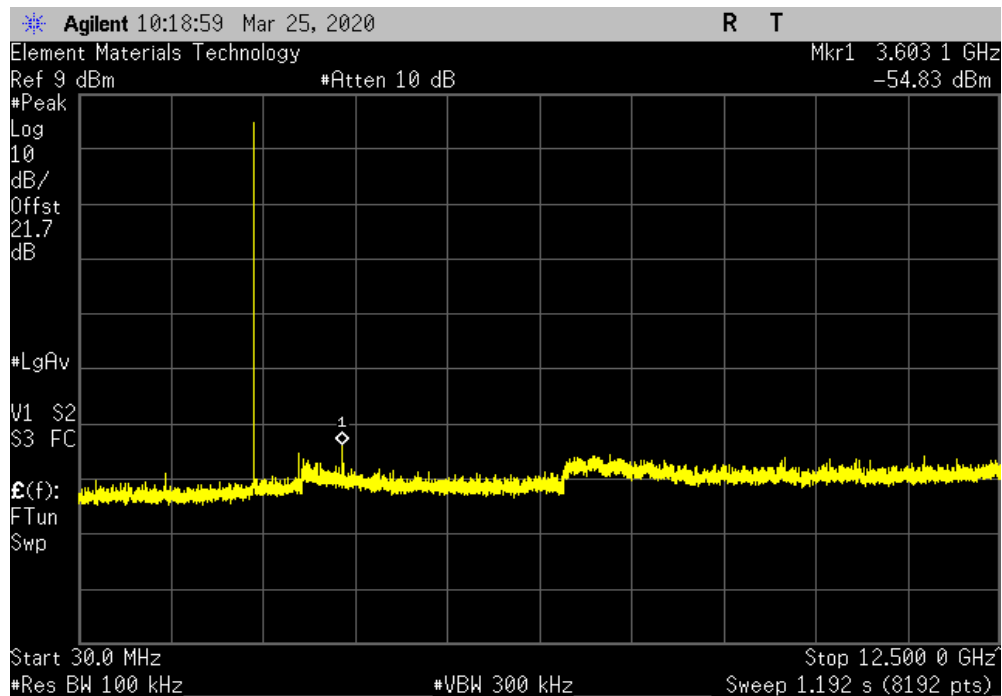


TBTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, Low Channel |                     |                 |               |        |  |  |
|------------------------|---------------------|-----------------|---------------|--------|--|--|
| Frequency Range        | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |  |
| Fundamental            | 2402.21             | N/A             | N/A           | N/A    |  |  |



| DH5, GFSK, Low Channel |                     |                 |               |        |  |  |
|------------------------|---------------------|-----------------|---------------|--------|--|--|
| Frequency Range        | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |  |
| 30 MHz - 12.5 GHz      | 3603.1              | -59.17          | -20           | Pass   |  |  |

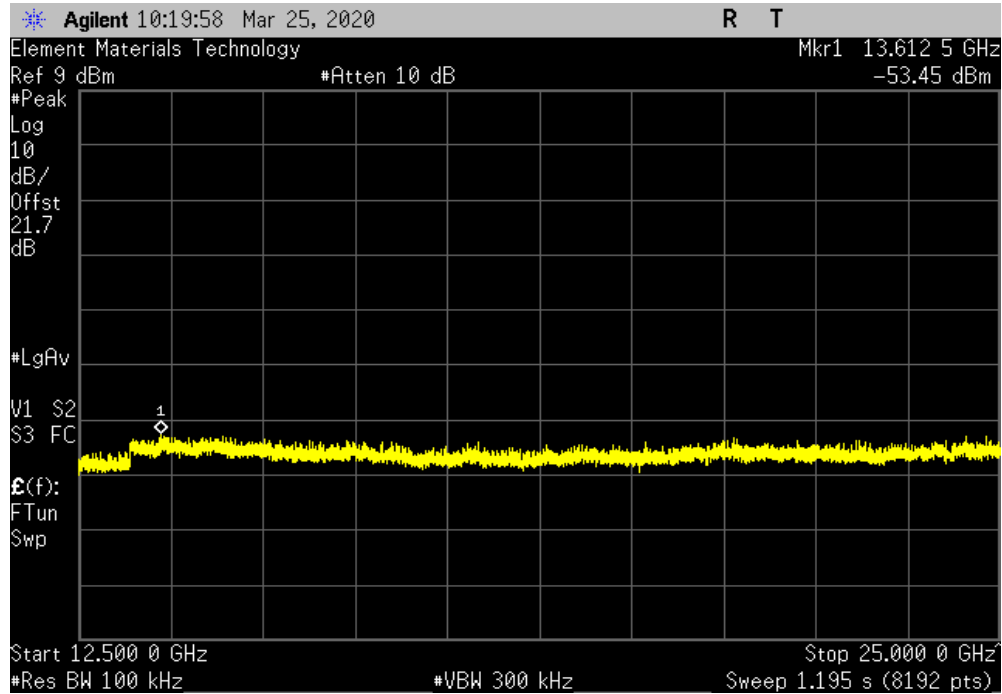


# SPURIOUS CONDUCTED EMISSIONS

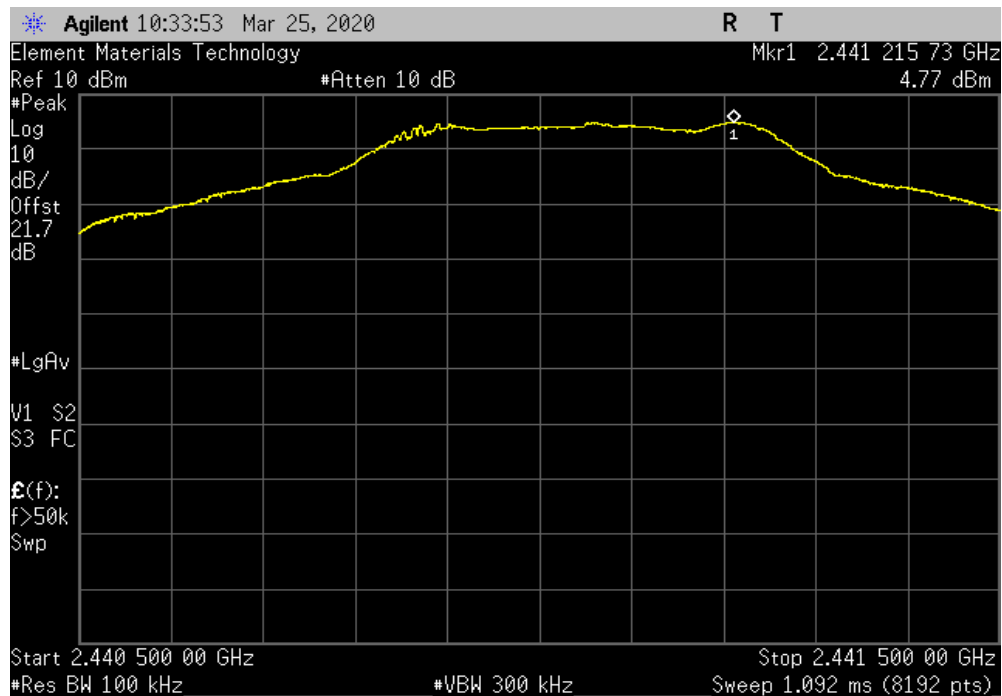


TIMTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, Low Channel |                     |                 |               |        |  |
|------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range        | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 12.5 GHz - 25 GHz      | 13612.5             | -57.79          | -20           | Pass   |  |



| DH5, GFSK, Mid Channel |                     |                 |               |        |  |
|------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range        | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| Fundamental            | 2441.22             | N/A             | N/A           | N/A    |  |

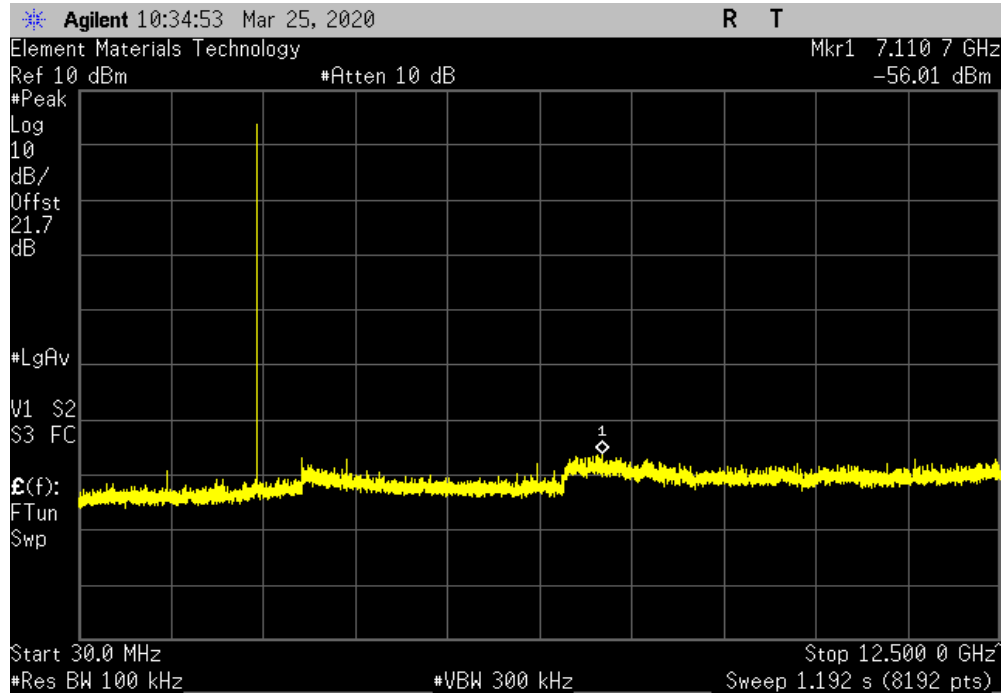


# SPURIOUS CONDUCTED EMISSIONS

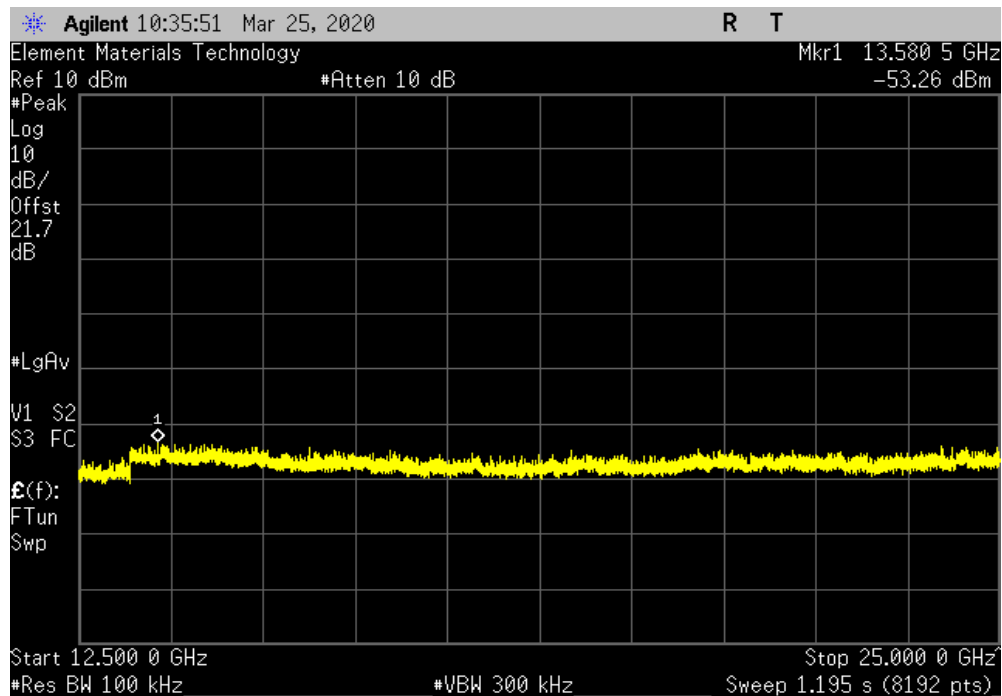


TMTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, Mid Channel |                     |                 |               |        |  |
|------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range        | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 30 MHz - 12.5 GHz      | 7110.7              | -60.78          | -20           | Pass   |  |



| DH5, GFSK, Mid Channel |                     |                 |               |        |  |
|------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range        | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 12.5 GHz - 25 GHz      | 13580.5             | -58.04          | -20           | Pass   |  |

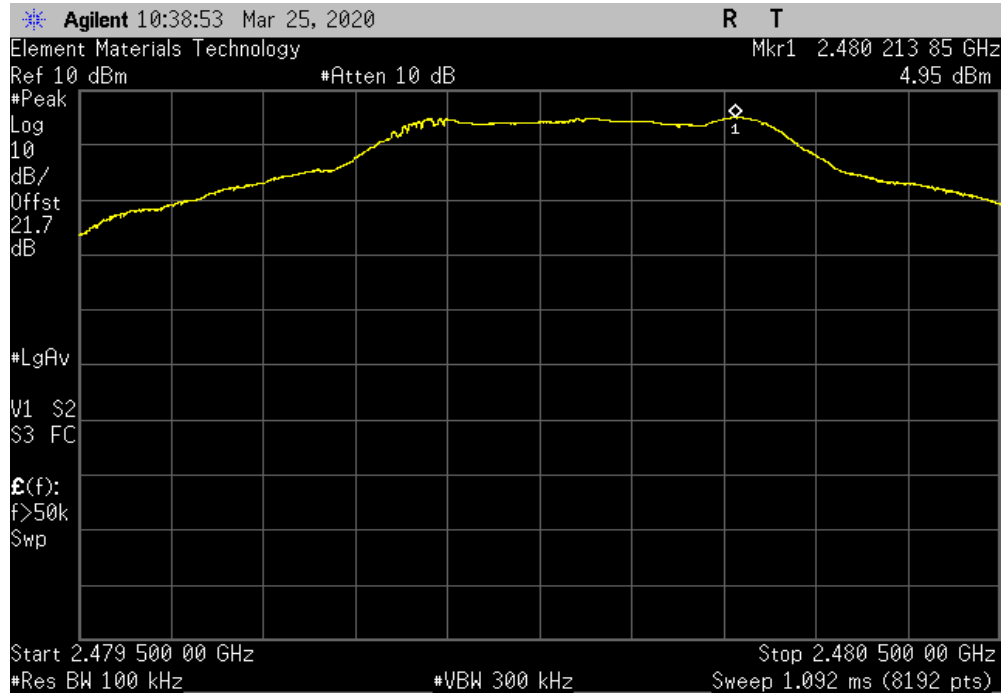


# SPURIOUS CONDUCTED EMISSIONS

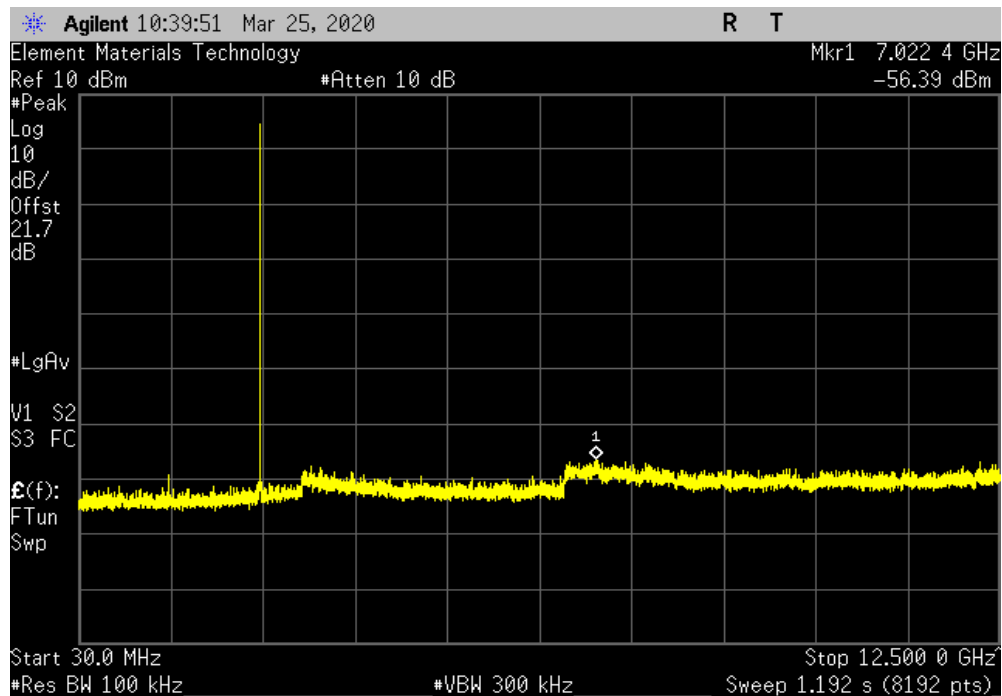


TBXTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, High Channel |                     |                 |               |        |  |
|-------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range         | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| Fundamental             | 2480.21             | N/A             | N/A           | N/A    |  |



| DH5, GFSK, High Channel |                     |                 |               |        |  |
|-------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range         | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 30 MHz - 12.5 GHz       | 7022.4              | -61.34          | -20           | Pass   |  |

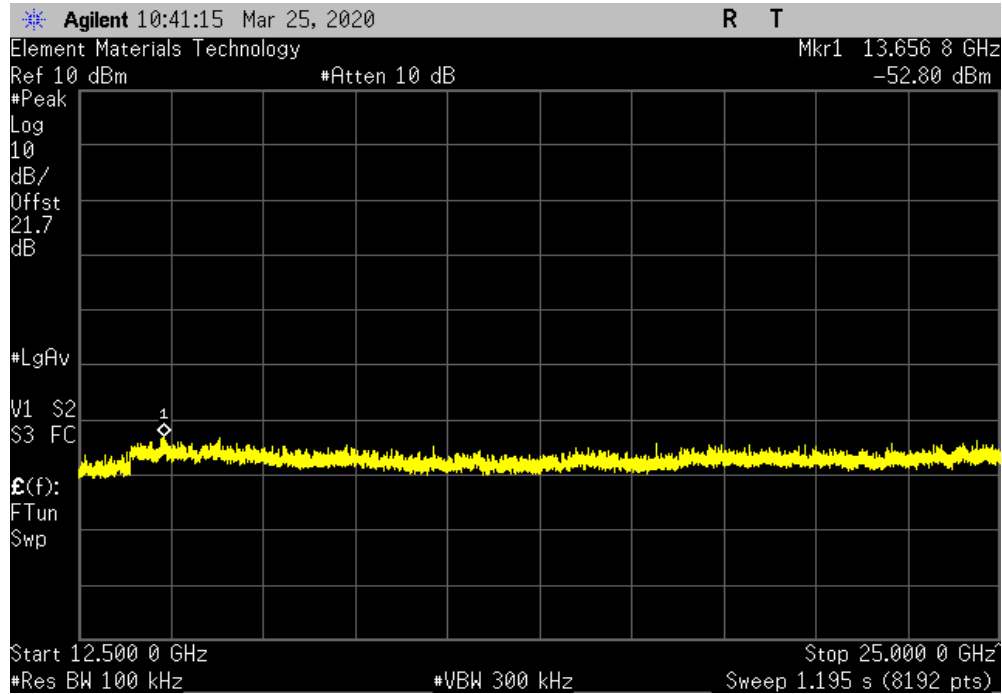


# SPURIOUS CONDUCTED EMISSIONS

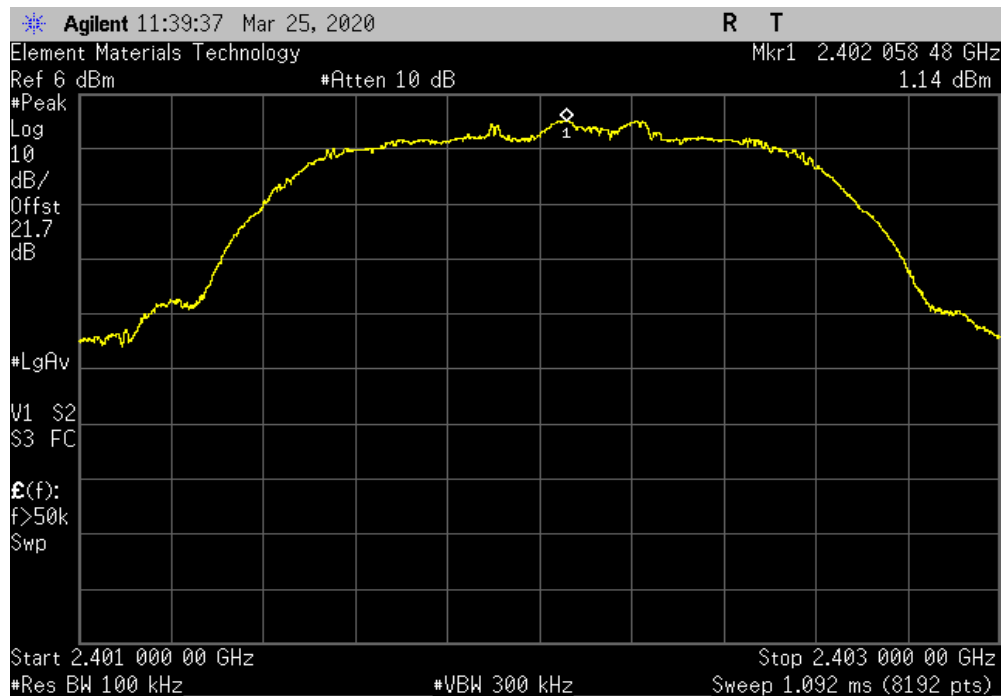


TBTx 2019.08.30.0 XMI 2019.09.05

| DH5, GFSK, High Channel |                     |                 |               |        |  |
|-------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range         | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 12.5 GHz - 25 GHz       | 13656.8             | -57.75          | -20           | Pass   |  |



| 2DH5, pi/4-DQPSK, Low Channel |                     |                 |               |        |  |
|-------------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range               | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| Fundamental                   | 2402.06             | N/A             | N/A           | N/A    |  |

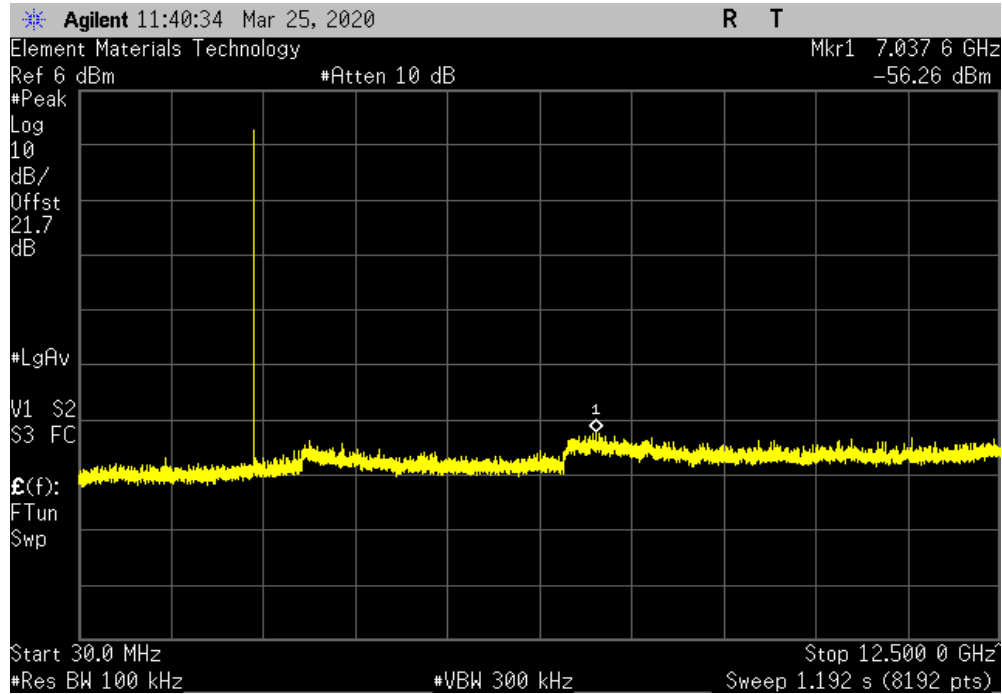


# SPURIOUS CONDUCTED EMISSIONS

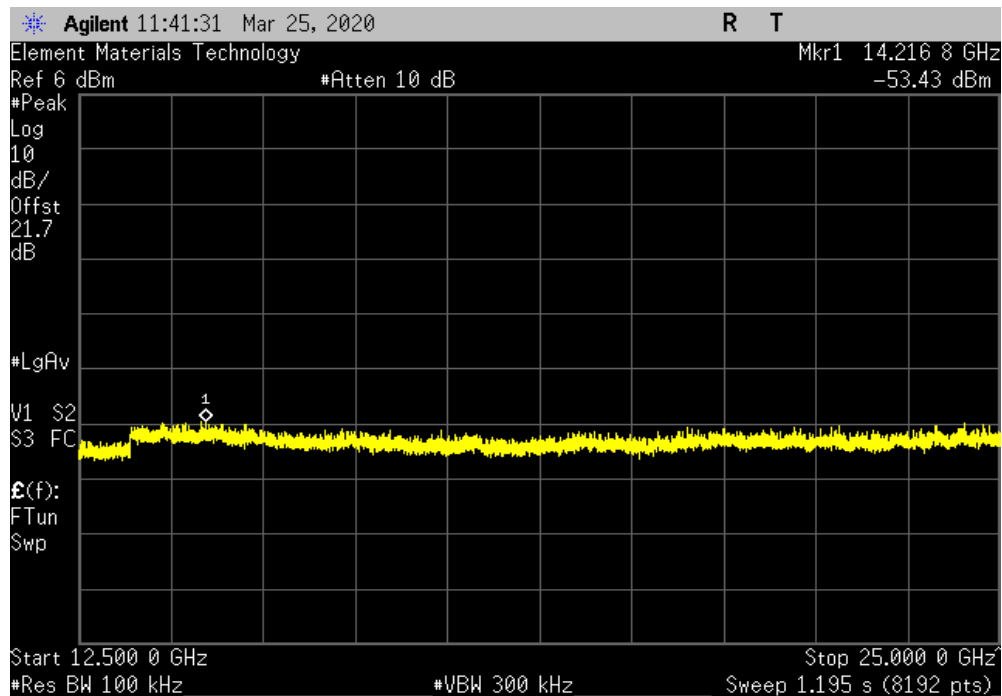


TbTtx 2019.08.30.0 XMt 2019.09.05

| 2DH5, pi/4-DQPSK, Low Channel |                     |                 |               |        |  |
|-------------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range               | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 30 MHz - 12.5 GHz             | 7037.6              | -57.4           | -20           | Pass   |  |



| 2DH5, pi/4-DQPSK, Low Channel |                     |                 |               |        |  |
|-------------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range               | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 12.5 GHz - 25 GHz             | 14216.8             | -54.57          | -20           | Pass   |  |

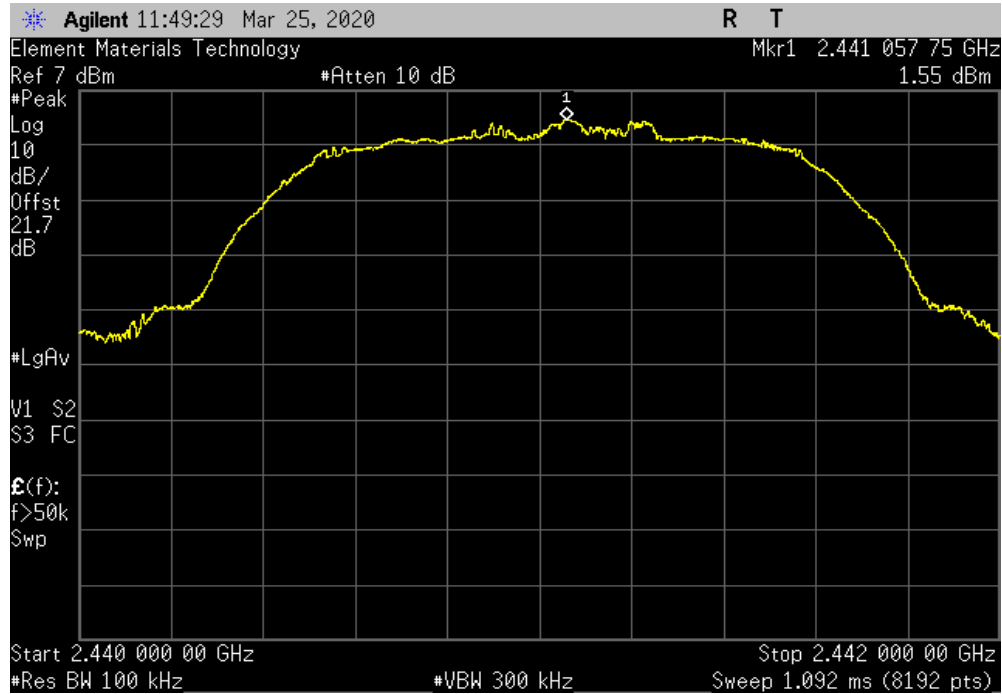


# SPURIOUS CONDUCTED EMISSIONS

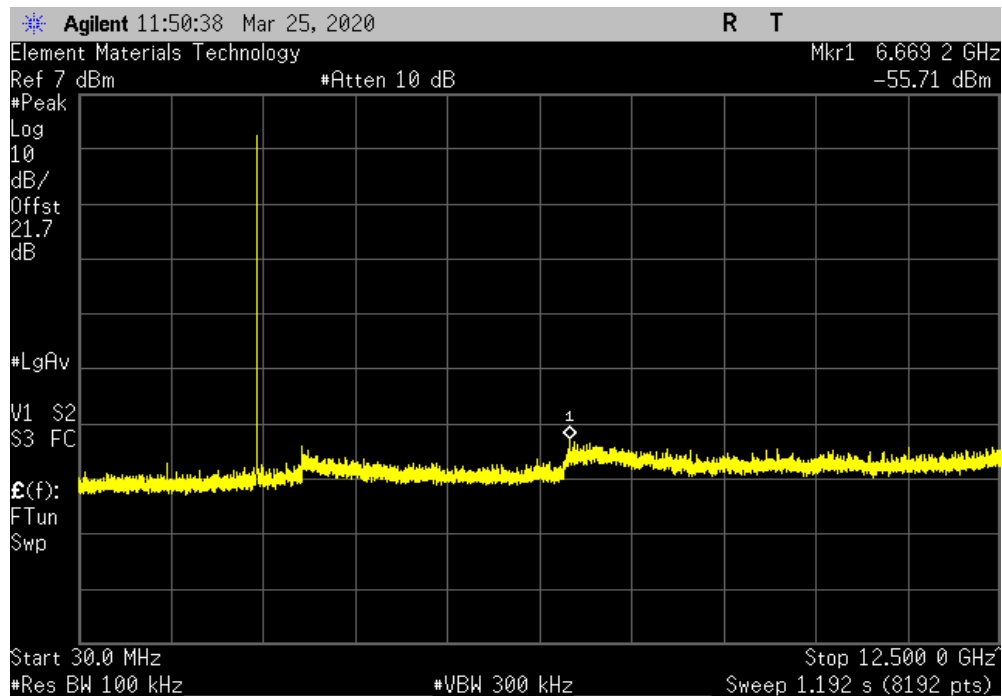


TBTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, Mid Channel |                     |                 |               |        |  |
|-------------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range               | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| Fundamental                   | 2441.06             | N/A             | N/A           | N/A    |  |



| 2DH5, pi/4-DQPSK, Mid Channel |                     |                 |               |        |  |
|-------------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range               | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 30 MHz - 12.5 GHz             | 6669.2              | -57.26          | -20           | Pass   |  |



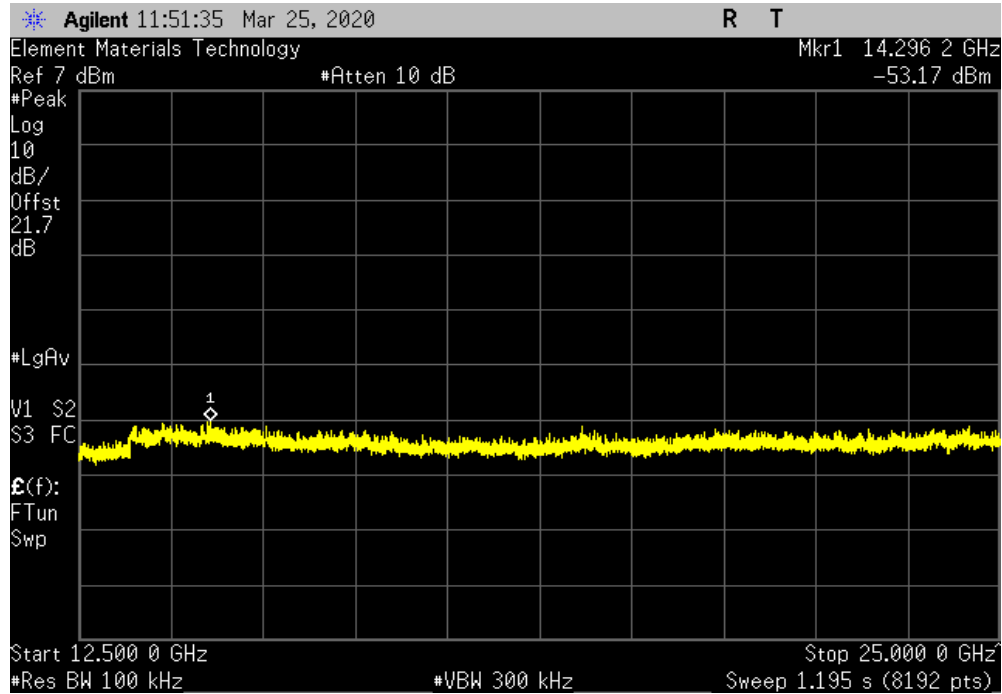


# SPURIOUS CONDUCTED EMISSIONS

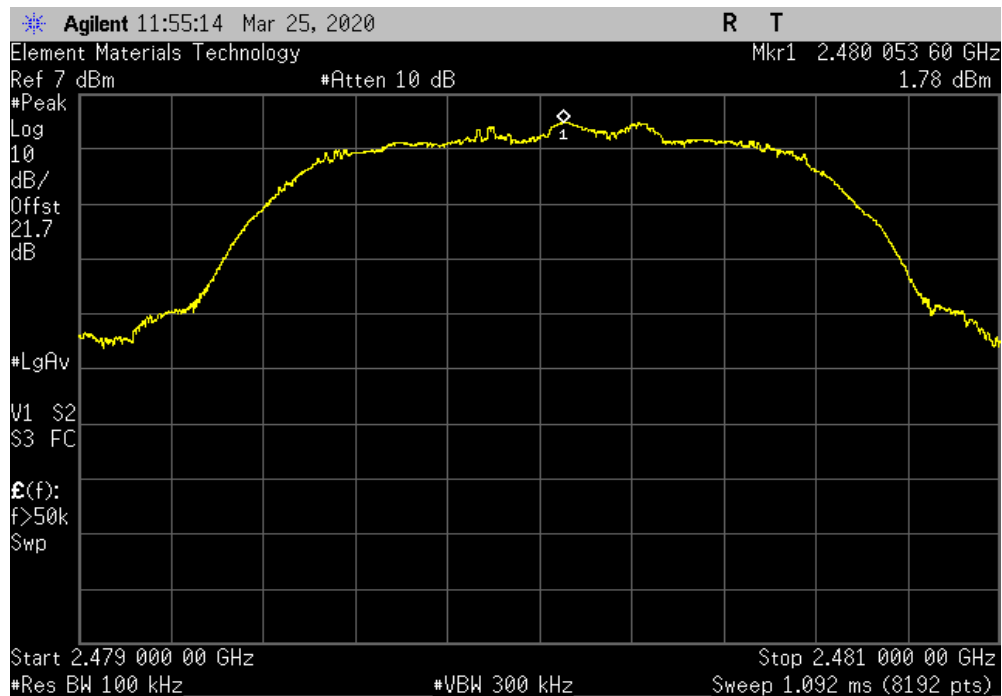


TbTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, Mid Channel |                     |                 |               |        |  |
|-------------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range               | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 12.5 GHz - 25 GHz             | 14296.2             | -54.72          | -20           | Pass   |  |



| 2DH5, pi/4-DQPSK, High Channel |                     |                 |               |        |  |
|--------------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range                | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| Fundamental                    | 2480.05             | N/A             | N/A           | N/A    |  |

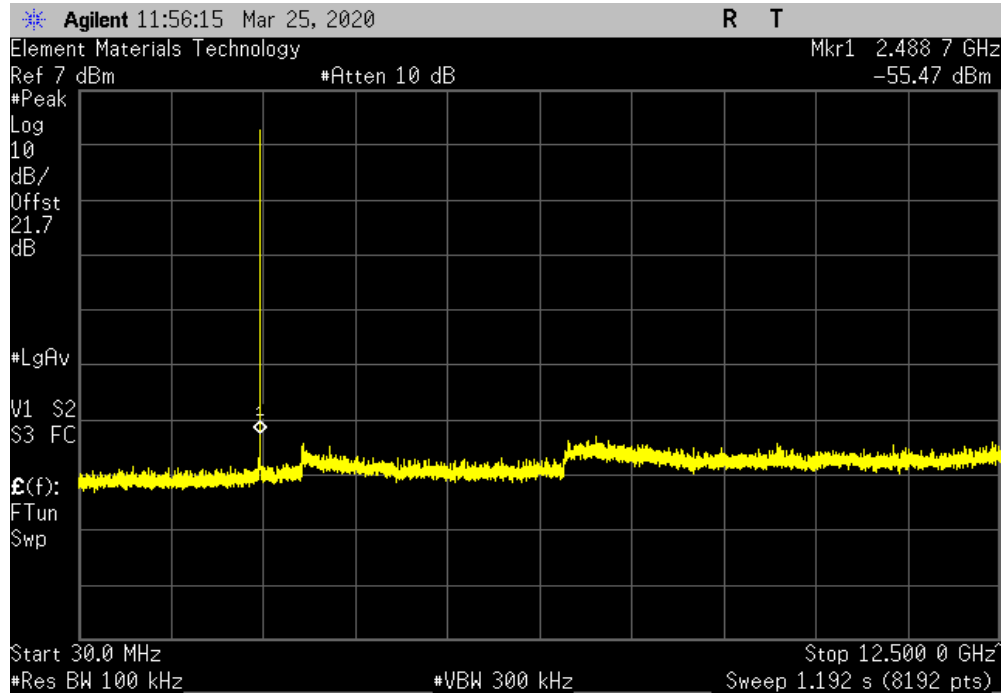


# SPURIOUS CONDUCTED EMISSIONS

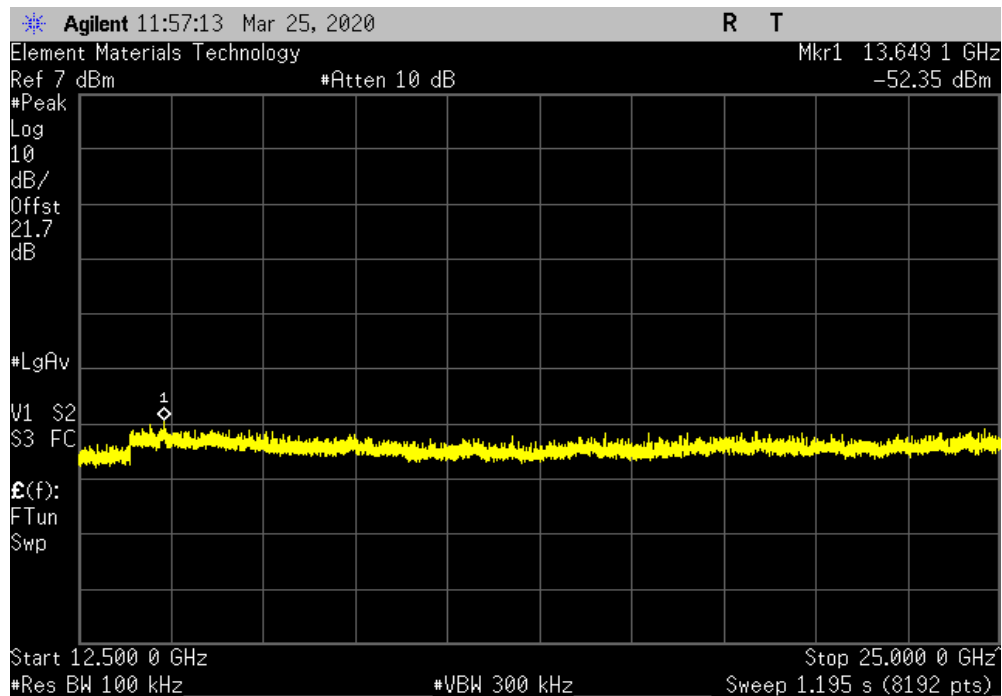


TIMTx 2019.08.30.0 XMI 2019.09.05

| 2DH5, pi/4-DQPSK, High Channel |                     |                 |               |        |  |
|--------------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range                | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 30 MHz - 12.5 GHz              | 2488.7              | -57.25          | -20           | Pass   |  |



| 2DH5, pi/4-DQPSK, High Channel |                     |                 |               |        |  |
|--------------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range                | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 12.5 GHz - 25 GHz              | 13649.1             | -54.13          | -20           | Pass   |  |

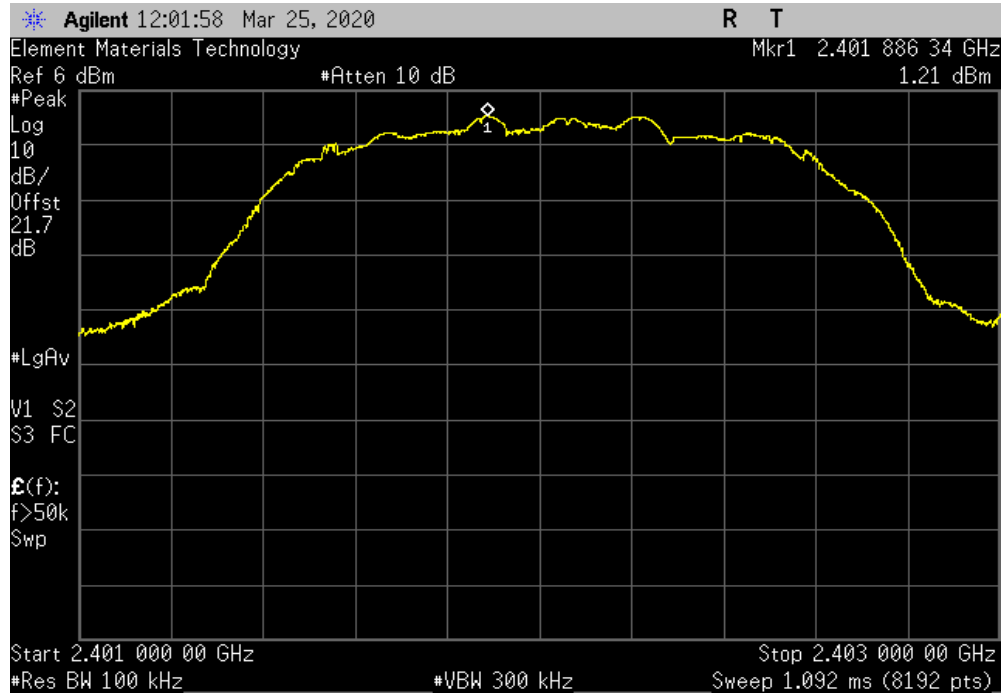


# SPURIOUS CONDUCTED EMISSIONS

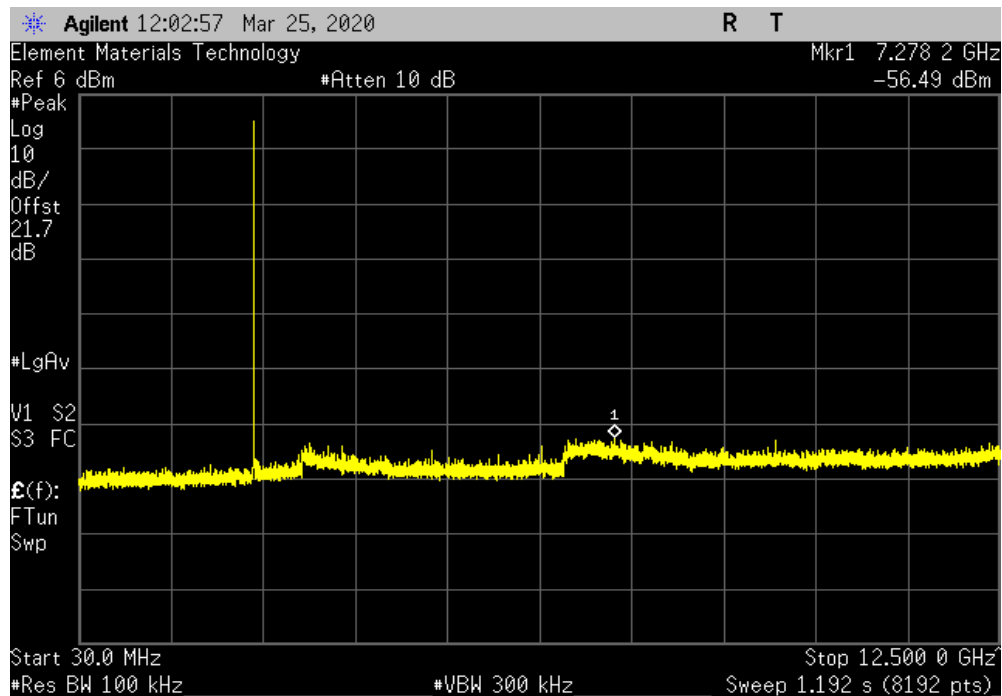


TBXTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, Low Channel |  |                     |                 |               |        |  |
|---------------------------|--|---------------------|-----------------|---------------|--------|--|
| Frequency Range           |  | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| Fundamental               |  | 2401.89             | N/A             | N/A           | N/A    |  |



| 3DH5, 8-DPSK, Low Channel |  |                     |                 |               |        |  |
|---------------------------|--|---------------------|-----------------|---------------|--------|--|
| Frequency Range           |  | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 30 MHz - 12.5 GHz         |  | 7278.2              | -57.7           | -20           | Pass   |  |

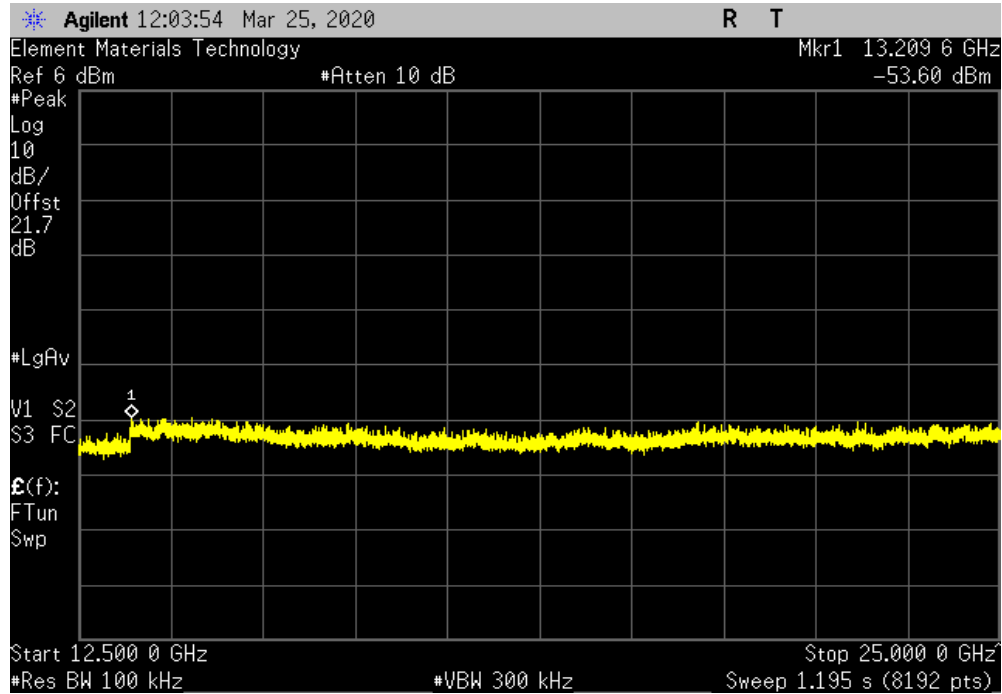


# SPURIOUS CONDUCTED EMISSIONS

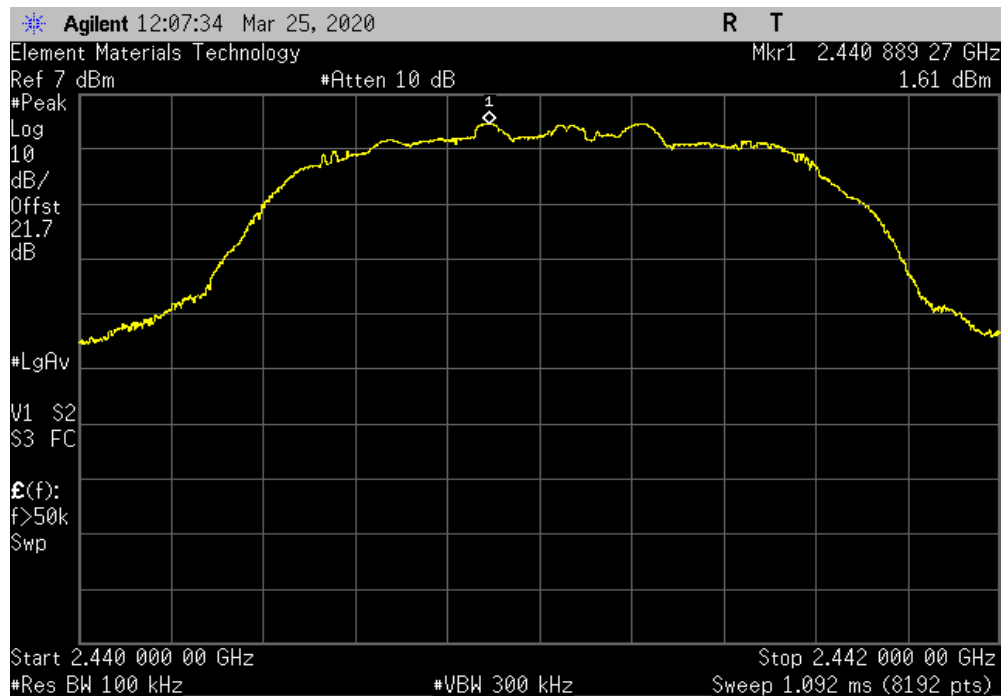


TMTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, Low Channel |                     |                 |               |        |  |
|---------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range           | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 12.5 GHz - 25 GHz         | 13209.6             | -54.82          | -20           | Pass   |  |



| 3DH5, 8-DPSK, Mid Channel |                     |                 |               |        |  |
|---------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range           | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| Fundamental               | 2440.89             | N/A             | N/A           | N/A    |  |

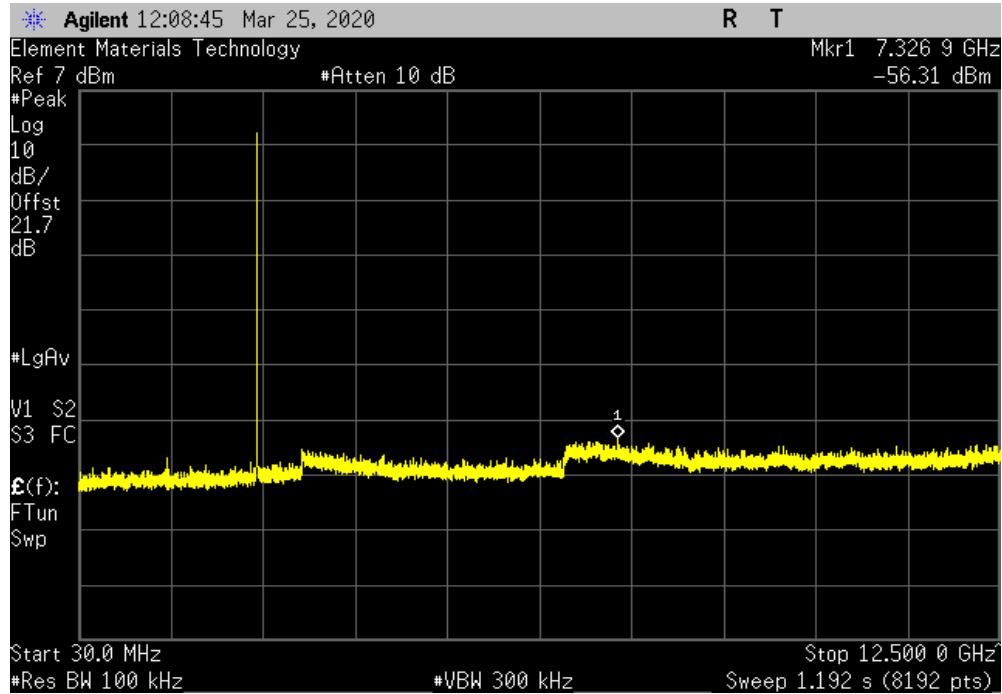


# SPURIOUS CONDUCTED EMISSIONS

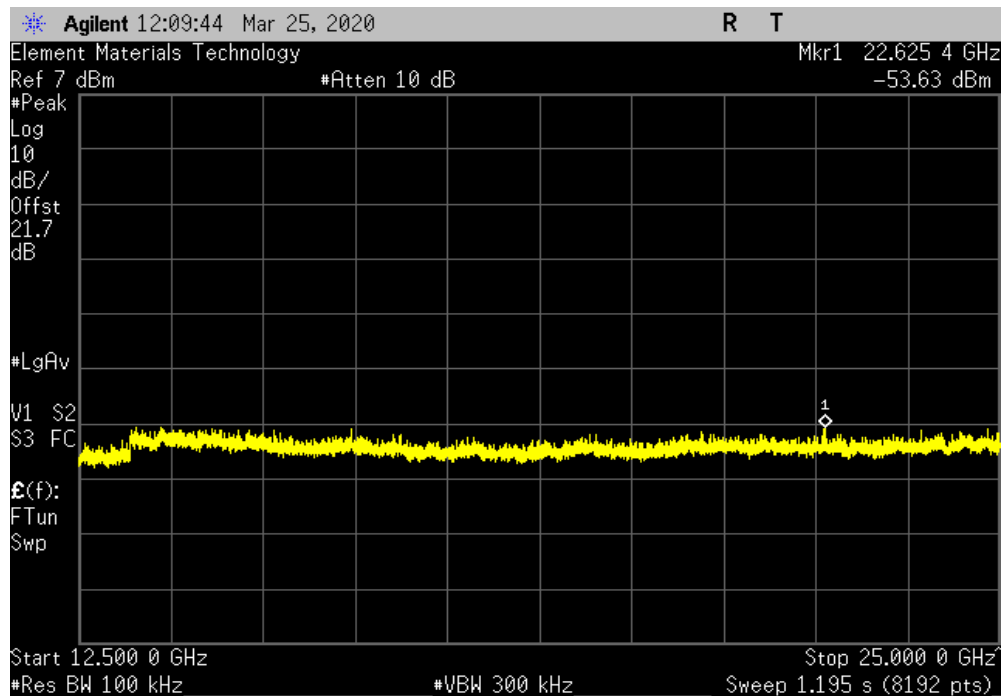


TIMTx 2019.08.30.0 XMI 2019.09.05

| 3DH5, 8-DPSK, Mid Channel |                     |                 |               |        |  |
|---------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range           | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 30 MHz - 12.5 GHz         | 7326.9              | -57.92          | -20           | Pass   |  |



| 3DH5, 8-DPSK, Mid Channel |                     |                 |               |        |  |
|---------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range           | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 12.5 GHz - 25 GHz         | 22625.4             | -55.24          | -20           | Pass   |  |

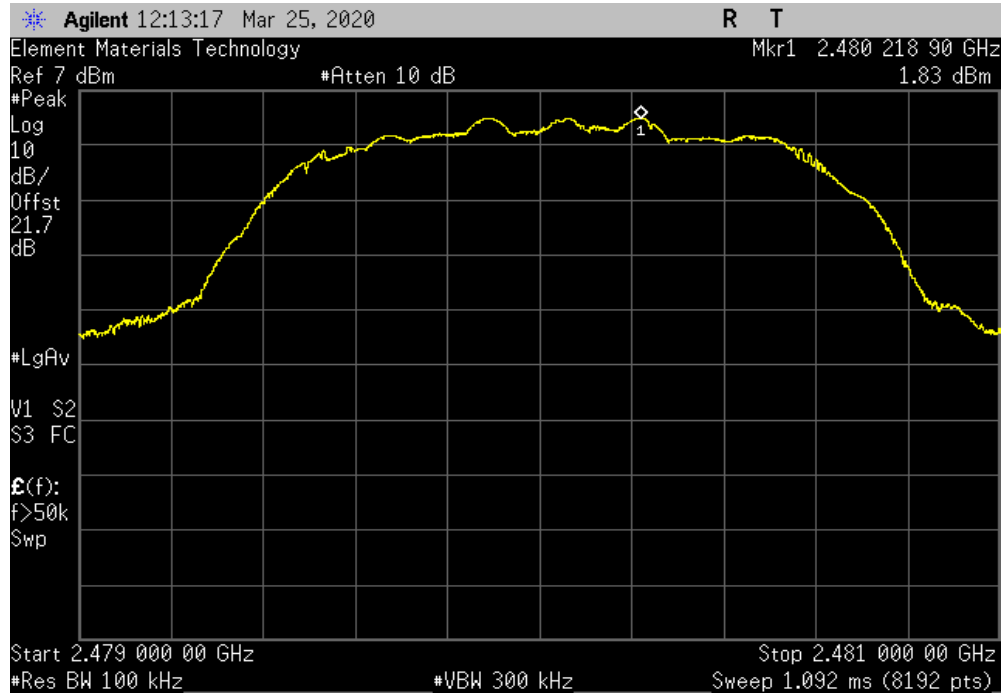


# SPURIOUS CONDUCTED EMISSIONS

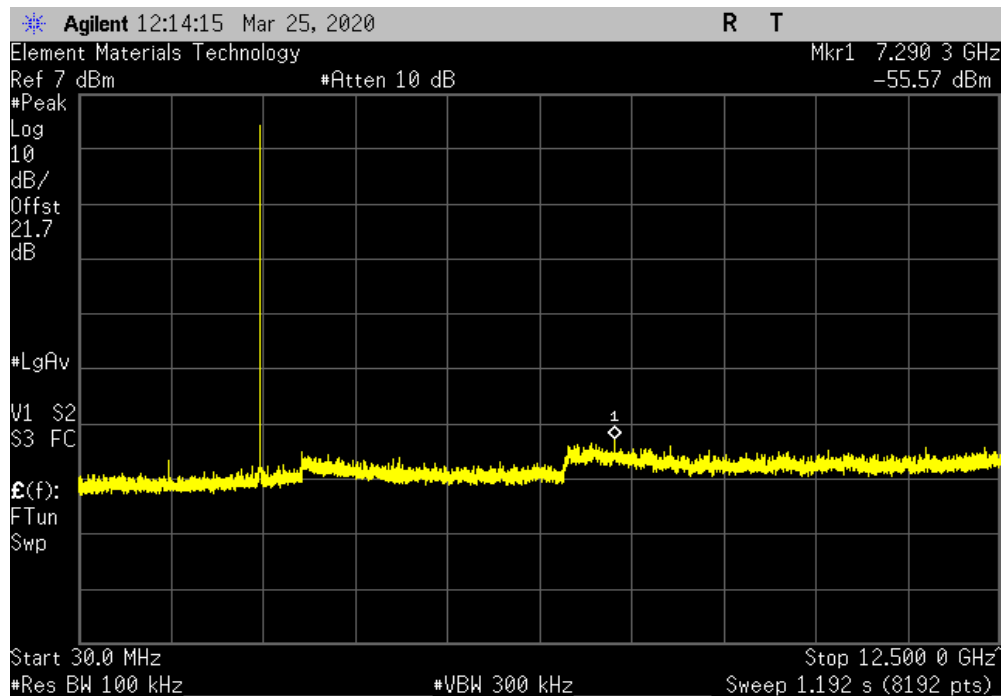


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| 3DH5, 8-DPSK, High Channel |  |                     |                 |               |        |  |
|----------------------------|--|---------------------|-----------------|---------------|--------|--|
| Frequency Range            |  | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| Fundamental                |  | 2480.22             | N/A             | N/A           | N/A    |  |



| 3DH5, 8-DPSK, High Channel |  |                     |                 |               |        |  |
|----------------------------|--|---------------------|-----------------|---------------|--------|--|
| Frequency Range            |  | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 30 MHz - 12.5 GHz          |  | 7290.3              | -57.4           | -20           | Pass   |  |



# SPURIOUS CONDUCTED EMISSIONS



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| 3DH5, 8-DPSK, High Channel |                     |                 |               |        |  |
|----------------------------|---------------------|-----------------|---------------|--------|--|
| Frequency Range            | Measured Freq (MHz) | Max Value (dBc) | Limit ≤ (dBc) | Result |  |
| 12.5 GHz - 25 GHz          | 13636.9             | -54.71          | -20           | Pass   |  |

