



**NAL Research Corporation**  
**SHOUT sp Handheld Iridium Smartphone**

**FCC 25 Subpart C:2021**  
**1.6 GHz Satellite Radio**

**Report: PCTE0003.1 Rev. 1, Issue Date: June 2, 2022**



NVLAP LAB CODE: 200630-0



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# CERTIFICATE OF TEST



Last Date of Test: October 1, 2021  
NAL Research Corporation  
EUT: SHOUT sp Handheld Iridium Smartphone

## Radio Equipment Testing

### Standards

| Specification          | Method           |
|------------------------|------------------|
| FCC 25 Subpart C: 2021 | ANSI C63.26:2015 |

### Results

| Specification clause | Method Clause | Test Description                                                                                                 | Applied | Results | Comments                                                                                        |
|----------------------|---------------|------------------------------------------------------------------------------------------------------------------|---------|---------|-------------------------------------------------------------------------------------------------|
| N/A                  | 5.2.4.3.4     | Duty Cycle                                                                                                       | Yes     | N/A     | Characterization of radio operation                                                             |
| 2.1046               | 5.2.4.3.2     | Conducted Output Power                                                                                           | Yes     | N/A     | Characterization of radio operation                                                             |
| 25.204               | 5.2.4.5       | Power Spectral Density                                                                                           | Yes     | Pass    |                                                                                                 |
| 2.1049               | 5.4           | Occupied Bandwidth                                                                                               | Yes     | Pass    |                                                                                                 |
| 25.202 (f)           | 5.5           | Spurious Radiated Emissions                                                                                      | Yes     | Pass    |                                                                                                 |
| 25.202 (d)           | 5.6           | Frequency Stability                                                                                              | Yes     | Pass    |                                                                                                 |
| 25.202 (f)           | 5.7           | Spurious Emissions at the Antenna Terminals                                                                      | Yes     | Pass    |                                                                                                 |
| 25.202               | 5.7           | Spurious Emissions at the Antenna Terminals - Emissions Mask                                                     | Yes     | Pass    |                                                                                                 |
| 25.216               | 5.7           | Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radio navigation-Satellite Service | Yes     | Pass    |                                                                                                 |
| 2.1047 (d)           | N/A           | Modulation characteristics                                                                                       | No      | N/A     | Not required to test. Assumes manufacturer will support this requirement through an attestation |

### Deviations From Test Standards

None

### Approved By:

Kyle Holgate, Operations Manager

*Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. 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 |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------|-------------|
| 01              | Added both accreditations bodies to the report to reflect Elements transitions to A2LA                                      | 2021-09-03           | 1, 3-6      |
|                 | The test description has been updated for carrier off state from -70dBW to -80 dBW                                          | 2022-05-17           | 57          |
|                 | Added screen captures for 25.216c, which covers the 1559 - 1605 MHz range                                                   | 2022-05-17           | 59, 61, 63  |
|                 | Changed Output Power test name to Power Spectral Density.                                                                   | 2022-05-17           | 27-30       |
|                 | Removed extraneous copy and paste values under the last screen capture.                                                     | 2022-05-17           | 45          |
|                 | Changed the rule from FCC PART 25:2021 to FCC Part 25 Subpart C:2022, and 1.6 GHz Cellular radio to 1.6 GHz Satellite radio | 2022-05-17           | 1           |
|                 | Added Duty Cycle as a line item and added the rule parts                                                                    | 2022-05-17           | 2           |
|                 | Removed cellular and added "satellite" to the functional description, and testing objective.                                | 2022-05-17           | 11          |
|                 | Updated EUT Model Number                                                                                                    | 2022-05-17           | 13-15       |
|                 | Antenna and power settings have been added to the report.                                                                   | 2022-05-17           | 12          |
|                 | Updated calibration info for equipment code TLE                                                                             | 2022-05-17           | 31          |
|                 | Added duty cycle data module                                                                                                | 2022-05-17           | 17-21       |
|                 | Corrected the spelling error.                                                                                               | 2022-05-17           | 28          |
|                 | Updated the CoT to include Power Spectral Density                                                                           | 2022-05-17           | 2           |
|                 | Added the authorized bandwidth and mask values from 25.202(f) to the test description.                                      | 2022-05-17           | 53          |
|                 | Values are now a %, the test description has been updated as well.                                                          | 2022-05-17           | 38 - 45     |
|                 | The resultant value is now based off the assigned frequency.                                                                | 2022-05-17           | 39 - 45     |
|                 | Updated the test description to better fit how the measurement was performed.                                               | 2022-05-17           | 30          |
|                 | The limit line color has been corrected to an AVG limit.                                                                    | 2022-05-17           | 36          |
|                 | Updated block diagram added to the report.                                                                                  | 2022-05-17           | 8-10        |

# 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** - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which 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** – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

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## United Kingdom

**BEIS** – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

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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:

[California](#)

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[Oregon](#)

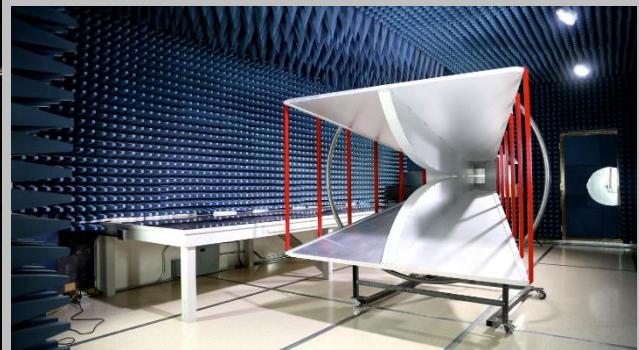
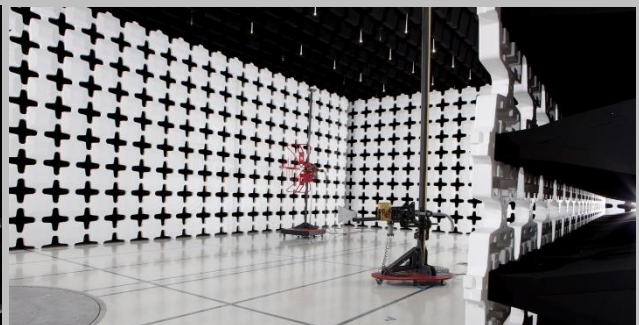
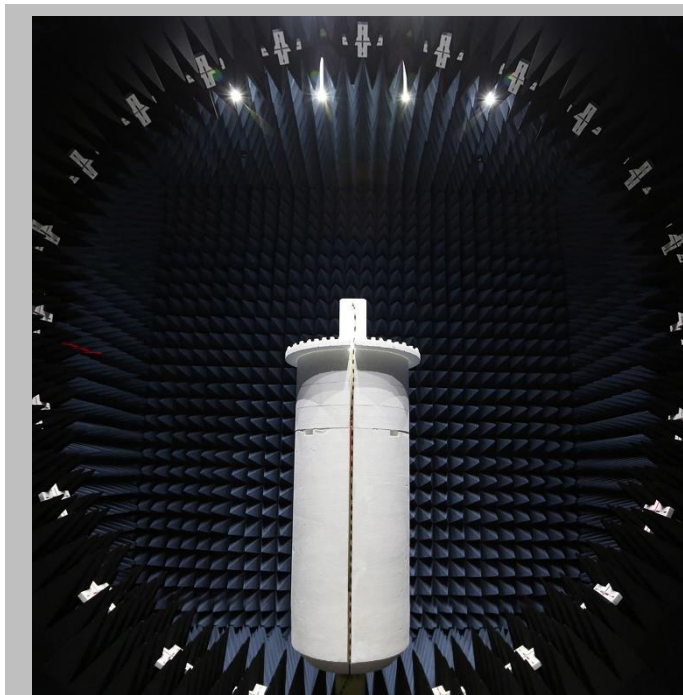
[Texas](#)

[Washington](#)

# FACILITIES



|                                                                                       |                                                                                                       |                                                                                                       |                                                                                        |                                                                                                           |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>California</b><br>Labs OC01-17<br>41 Tesla<br>Irvine, CA 92618<br>(949) 861-8918   | <b>Minnesota</b><br>Labs MN01-11<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>A2LA</b>                                                                           |                                                                                                       |                                                                                                       |                                                                                        |                                                                                                           |
| Lab Code: 3310.04                                                                     | Lab Code: 3310.05                                                                                     | Lab Code: 3310.02                                                                                     | Lab Code: 3310.03                                                                      | Lab Code: 3310.06                                                                                         |
| <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 in the table below. A lab specific value may also be found in the applicable test description section. 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) | 3.2 dB  | -3.2 dB  |

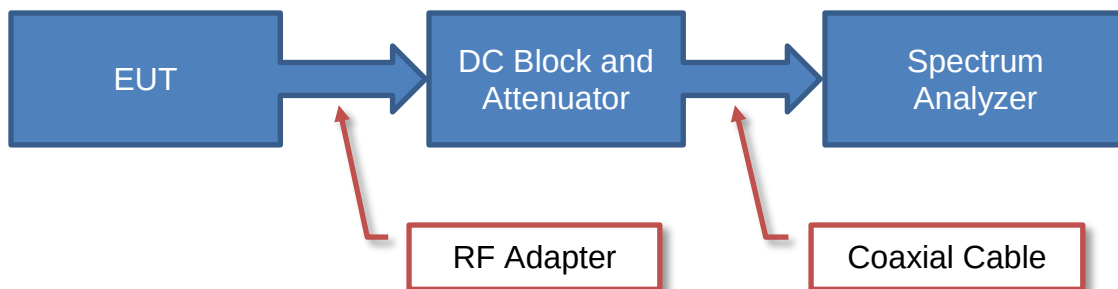
# TEST SETUP BLOCK DIAGRAMS

## Measurement Bandwidths

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

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

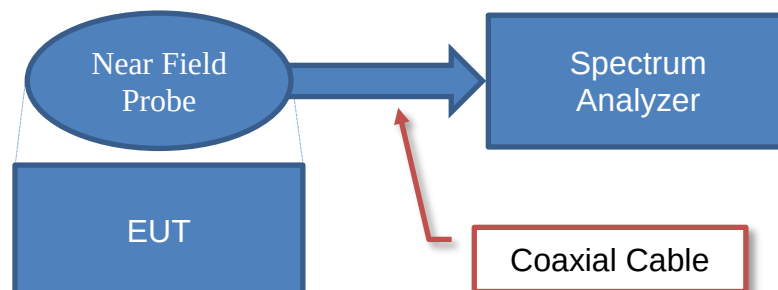
## Antenna Port Conducted Measurements



### Sample Calculation (logarithmic units)

|                |   |                |   |                        |
|----------------|---|----------------|---|------------------------|
| Measured Value |   | Measured Level |   | Reference Level Offset |
| 71.2           | = | 42.6           | + | 28.6                   |

## Near Field Test Fixture Measurements

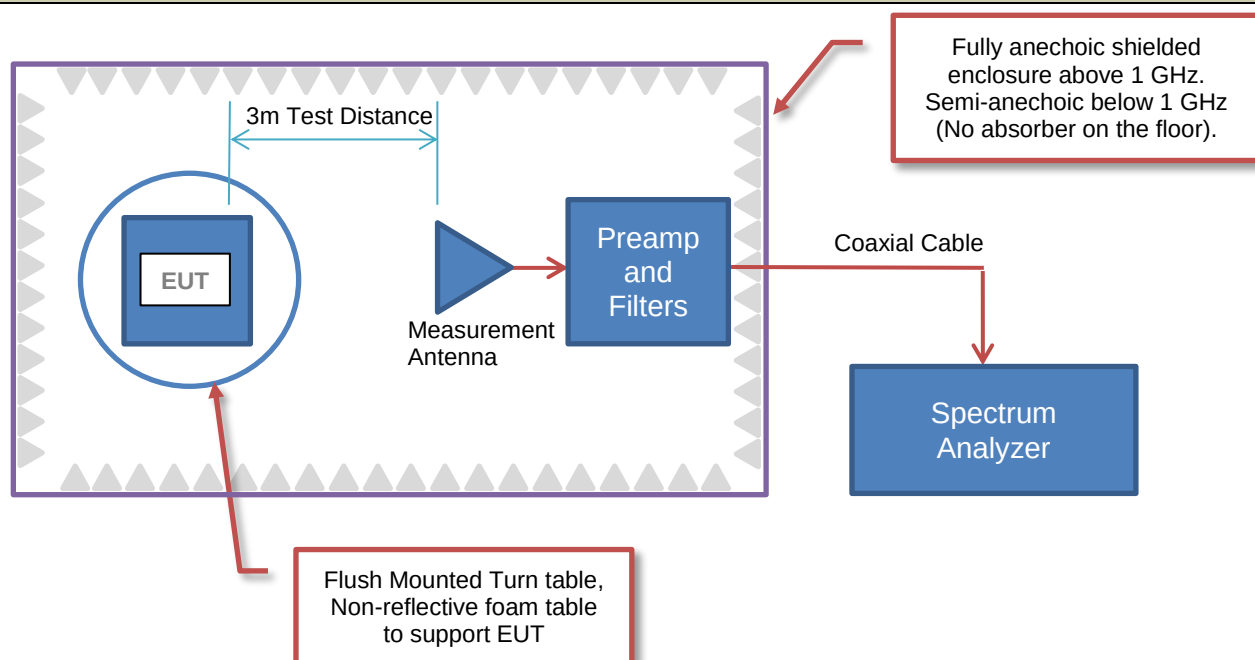


### Sample Calculation (logarithmic units)

|                |   |                |   |                        |
|----------------|---|----------------|---|------------------------|
| Measured Value |   | Measured Level |   | Reference Level Offset |
| 71.2           | = | 42.6           | + | 28.6                   |

# TEST SETUP BLOCK DIAGRAMS

## Emissions Measurements



## Sample Calculation (logarithmic units)

### Radiated Emissions:

| Measured Level<br>(Amplitude) | Factor         |              |                | Distance Adjustment Factor | External Attenuation | Field Strength |
|-------------------------------|----------------|--------------|----------------|----------------------------|----------------------|----------------|
|                               | Antenna Factor | Cable Factor | Amplifier Gain |                            |                      |                |
| 42.6                          | 28.6           | 3.1          | 40.8           | 0.0                        | 0.0                  | 33.5           |

### Conducted Emissions:

| Measured Level<br>(Amplitude) | Factor            |              | External Attenuation | Adjusted Level |
|-------------------------------|-------------------|--------------|----------------------|----------------|
|                               | Transducer Factor | Cable Factor |                      |                |
| 26.7                          | 0.3               | 0.1          | 20.0                 | 47.1           |

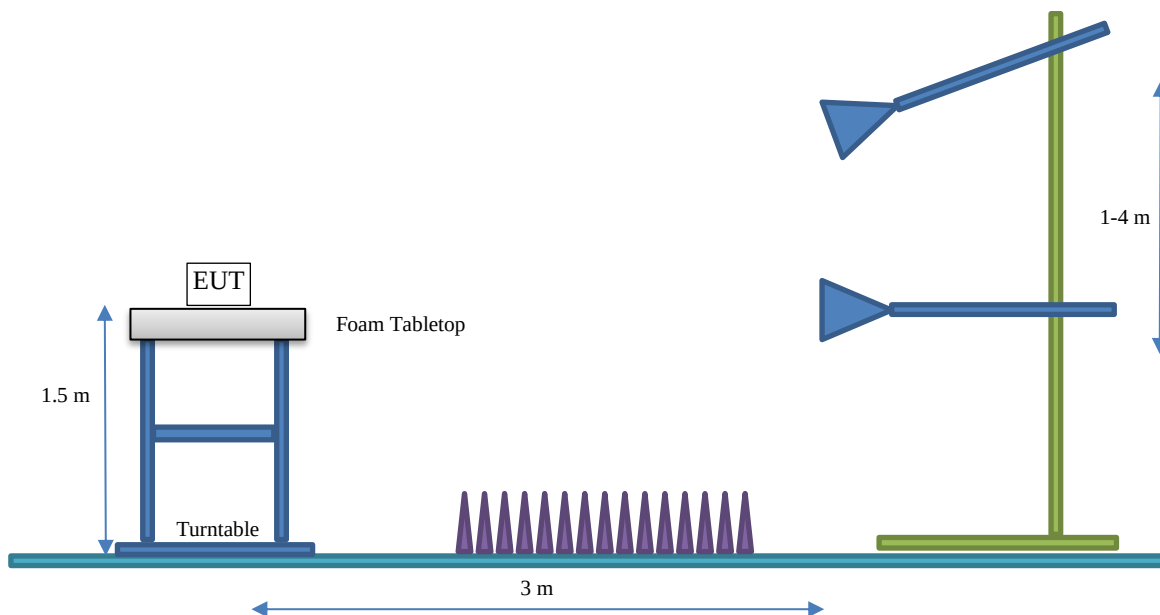
### Radiated Power (ERP/EIRP):

| Measured Level into Substitution Antenna<br>(Amplitude dBm) | Substitution Antenna Factor<br>(dBi) | EIRP to ERP (if applicable) | Measured power<br>(dBm ERP/EIRP) |
|-------------------------------------------------------------|--------------------------------------|-----------------------------|----------------------------------|
| 10.0                                                        | 6.0                                  | 2.15                        | 13.9/16.0                        |

# TEST SETUP BLOCK DIAGRAMS

## Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



# PRODUCT DESCRIPTION



## Client and Equipment Under Test (EUT) Information

|                          |                                      |
|--------------------------|--------------------------------------|
| Company Name:            | NAL Research Corporation             |
| Address:                 | 11100 Endeavor Ct Suite 300          |
| City, State, Zip:        | Manassas, VA 20109                   |
| Test Requested By:       | Andy Shiltz                          |
| EUT:                     | SHOUT sp Handheld Iridium Smartphone |
| First Date of Test:      | May 27, 2021                         |
| Last Date of Test:       | October 1, 2021                      |
| Receipt Date of Samples: | May 27, 2021                         |
| Equipment Design Stage:  | Production                           |
| Equipment Condition:     | No Damage                            |
| Purchase Authorization:  | Verified                             |

## Information Provided by the Party Requesting the Test

### Functional Description of the EUT:

Handheld Iridium Smartphone with 1.6 GHz satellite radio and 802.11bgn / Bluetooth FHSS and BLE radios.  
FCC ID: 2AXMS-SHOUTSPR1  
Equipment class: TNE

### Testing Objective:

To demonstrate compliance of the satellite radio to FCC part 25 requirements.

# POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information.

## ANTENNA GAIN (dBi)

| Type                   | Provided by: | Frequency Range (MHz) | Gain (dBi) |
|------------------------|--------------|-----------------------|------------|
| RHCP helical decafilar | Manufacturer | 1616-1626.5           | 2.74       |

The EUT was tested using the maximum power settings.

## SETTINGS FOR ALL TESTS IN THIS REPORT

| Modulation Types | Position     | Frequency (MHz) | Power Setting (dBm) |
|------------------|--------------|-----------------|---------------------|
| DE-QPSK          | Low Channel  | 1616.020833     | 37.7                |
|                  | Mid Channel  | 1621.020833     | 37.7                |
|                  | High Channel | 1625.979167     | 37.7                |

# CONFIGURATIONS

## Configuration PCTE0003- 2

| Software/Firmware Running during test |  |  |  |         |  |
|---------------------------------------|--|--|--|---------|--|
| Description                           |  |  |  | Version |  |
| Iridium TX Tester                     |  |  |  | 1.0.0   |  |

| EUT                                  |                          |                   |               |
|--------------------------------------|--------------------------|-------------------|---------------|
| Description                          | Manufacturer             | Model/Part Number | Serial Number |
| SHOUT sp Handheld Iridium Smartphone | NAL Research Corporation | 433-93281-001     | FCC 1         |

| Peripherals in test setup boundary |              |                   |               |
|------------------------------------|--------------|-------------------|---------------|
| Description                        | Manufacturer | Model/Part Number | Serial Number |
| Laptop                             | Dell         | Inspiron          | 20976051206   |
| AC/DC Adapter                      | Dell         | LA45NM140         | None          |

| Cables            |        |            |         |                                      |              |
|-------------------|--------|------------|---------|--------------------------------------|--------------|
| Cable Type        | Shield | Length (m) | Ferrite | Connection 1                         | Connection 2 |
| USB Cable (Power) | Yes    | 1.0 m      | No      | SHOUT sp Handheld Iridium Smartphone | Laptop       |
| USB Cable x2      | Yes    | 1.1 m      | No      | SHOUT sp Handheld Iridium Smartphone | Unterminated |
| AC Power          | No     | 1.0 m      | No      | AC/DC Adapter                        | AC Power     |
| DC Power          | No     | 1.8 m      | No      | AC/DC Adapter                        | Laptop       |
| USB Cable (com)   | Yes    | 1.1 m      | No      | SHOUT sp Handheld Iridium Smartphone | Laptop       |

# CONFIGURATIONS

## Configuration PCTE0003- 6

| Software/Firmware Running during test |                          |                   |               |                                      |                                      |
|---------------------------------------|--------------------------|-------------------|---------------|--------------------------------------|--------------------------------------|
| Description                           |                          | Version           |               |                                      |                                      |
| Iridium TX Tester                     |                          | 1.0.0             |               |                                      |                                      |
|                                       |                          |                   |               |                                      |                                      |
| EUT                                   |                          |                   |               |                                      |                                      |
| Description                           | Manufacturer             | Model/Part Number | Serial Number |                                      |                                      |
| SHOUT sp Handheld Iridium Smartphone  | NAL Research Corporation | 433-93281-001     | FCC 2         |                                      |                                      |
|                                       |                          |                   |               |                                      |                                      |
| Peripherals in test setup boundary    |                          |                   |               |                                      |                                      |
| Description                           | Manufacturer             | Model/Part Number | Serial Number |                                      |                                      |
| Laptop                                | Dell                     | Latitude E5450    | 5z9B063       |                                      |                                      |
| Earbuds                               | Betron                   | MK23              | None          |                                      |                                      |
| AC Adapter                            | Dell                     | LA65NM130         | None          |                                      |                                      |
|                                       |                          |                   |               |                                      |                                      |
| Cables                                |                          |                   |               |                                      |                                      |
| Cable Type                            | Shield                   | Length (m)        | Ferrite       | Connection 1                         | Connection 2                         |
| USB Extension Cable                   | Yes                      | 1.1 m             | No            | USB Cable                            | Laptop                               |
| USB Cable x2                          | Yes                      | 1.1 m             | No            | SHOUT sp Handheld Iridium Smartphone | Unterminated                         |
| USB Cable                             | Yes                      | 1.1 m             | No            | SHOUT sp Handheld Iridium Smartphone | USB Extension Cable                  |
| Headphones                            | No                       | 1.2 m             | No            | Earbuds                              | SHOUT sp Handheld Iridium Smartphone |
| USB Cable (Power)                     | Yes                      | 1.8 m             | No            | SHOUT sp Handheld Iridium Smartphone | Laptop                               |
| DC Power                              | No                       | 2.0 m             | No            | Laptop                               | AC Adapter                           |
| AC Power                              | No                       | 1.0 m             | No            | AC Adapter                           | AC Power                             |

# CONFIGURATIONS



## Configuration PCTE0003- 7

| Software/Firmware Running during test |              |                          |                   |                                      |                     |
|---------------------------------------|--------------|--------------------------|-------------------|--------------------------------------|---------------------|
| Description                           |              |                          | Version           |                                      |                     |
| Iridium TX Tester                     |              |                          | 1.0.0             |                                      |                     |
|                                       |              |                          |                   |                                      |                     |
| EUT                                   |              |                          |                   |                                      |                     |
| Description                           |              | Manufacturer             | Model/Part Number | Serial Number                        |                     |
| SHOUT sp Handheld Iridium Smartphone  |              | NAL Research Corporation | 433-93281-001     | FCC 1                                |                     |
|                                       |              |                          |                   |                                      |                     |
| Peripherals in test setup boundary    |              |                          |                   |                                      |                     |
| Description                           | Manufacturer | Model/Part Number        |                   | Serial Number                        |                     |
| Laptop                                | Dell         | Inspiron                 |                   | 20976051206                          |                     |
| AC/DC Adapter                         | Dell         | LA45NM140                |                   | None                                 |                     |
|                                       |              |                          |                   |                                      |                     |
| Cables                                |              |                          |                   |                                      |                     |
| Cable Type                            | Shield       | Length (m)               | Ferrite           | Connection 1                         | Connection 2        |
| USB Cable (com)                       | Yes          | 1.1 m                    | No                | Phone                                | USB extension       |
| USB Cable x2                          | Yes          | 1.1 m                    | No                | SHOUT sp Handheld Iridium Smartphone | Unterminated        |
| AC Power                              | No           | 1.0 m                    | No                | AC/DC Adapter                        | AC Power            |
| DC Power                              | No           | 1.8 m                    | No                | AC/DC Adapter                        | Laptop              |
| USB Extension Cable                   | Yes          | 1.1 m                    | No                | USB Cable                            | Laptop              |
| DC Power                              | No           | 2.0 m                    | No                | SHOUT sp Handheld Iridium Smartphone | Lab DC power supply |

# MODIFICATIONS

## Equipment Modifications

| Item | Date       | Test                                                                                                            | Modification                         | Note                                                                | Disposition of EUT                          |
|------|------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------|---------------------------------------------|
| 1    | 2021-05-27 | 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. |
| 2    | 2021-05-27 | Conducted 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. |
| 3    | 2021-05-27 | Spurious Emissions at the Antenna Terminals                                                                     | 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    | 2021-08-25 | 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. |
| 5    | 2021-08-27 | Frequency Stability                                                                                             | 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    | 2021-09-29 | Power Spectral Density                                                                                          | 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    | 2021-10-01 | Spurious Emissions at the Antenna Terminals – Emissions Masks                                                   | 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    | 2021-10-01 | Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed.            |

# DUTY CYCLE



XMH 2020.12.30.0

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   |
|------------------------------|--------------------|------------------|-----|------------|------------|
| Cable                        | Micro-Coax         | D150A-1-0720-200 | EVH | 2021-03-14 | 2022-03-14 |
| Attenuator                   | Fairview Microwave | SA18N5WA-30      | TLE | 2021-07-22 | 2022-07-22 |
| Attenuator                   | Fairview Microwave | SA18N5WA-20      | TWD | 2021-02-16 | 2022-02-16 |
| Block - DC                   | Fairview Microwave | SD3074           | AMF | NCR        | NCR        |
| Generator - Signal           | Agilent            | E8257D           | TGX | 2020-01-07 | 2022-01-07 |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A           | AFE | 2021-04-08 | 2022-04-08 |

## TEST DESCRIPTION

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.

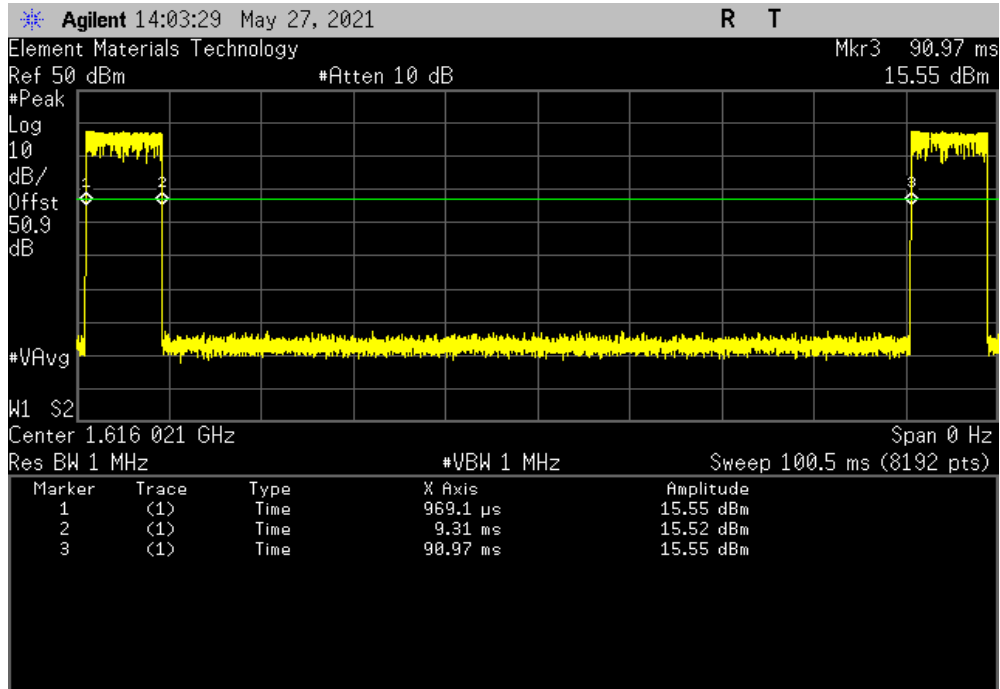
ThiTx 2021.03.19.1 XMIT 2020.12.30.0

# DUTY CYCLE

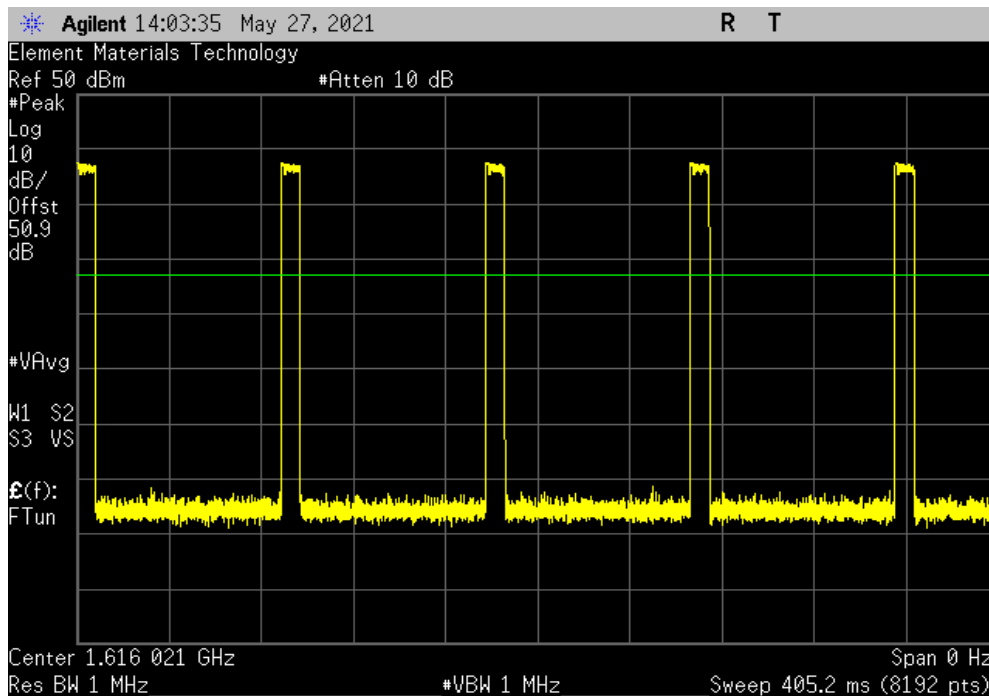


TbTx 2021.03.19.1 XMR 2020.12.30.0

| Transmit, DE-QPSK, Low Ch. 1, 1616.020833 MHz |             |           |                  |           |           |         |
|-----------------------------------------------|-------------|-----------|------------------|-----------|-----------|---------|
|                                               | Pulse Width | Period    | Number of Pulses | Value (%) | Limit (%) | Results |
|                                               | 8.341 ms    | 89.999 ms | 1                | 9.3       | N/A       | N/A     |



| Transmit, DE-QPSK, Low Ch. 1, 1616.020833 MHz |             |        |                  |           |           |         |
|-----------------------------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                                               | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                                               | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |

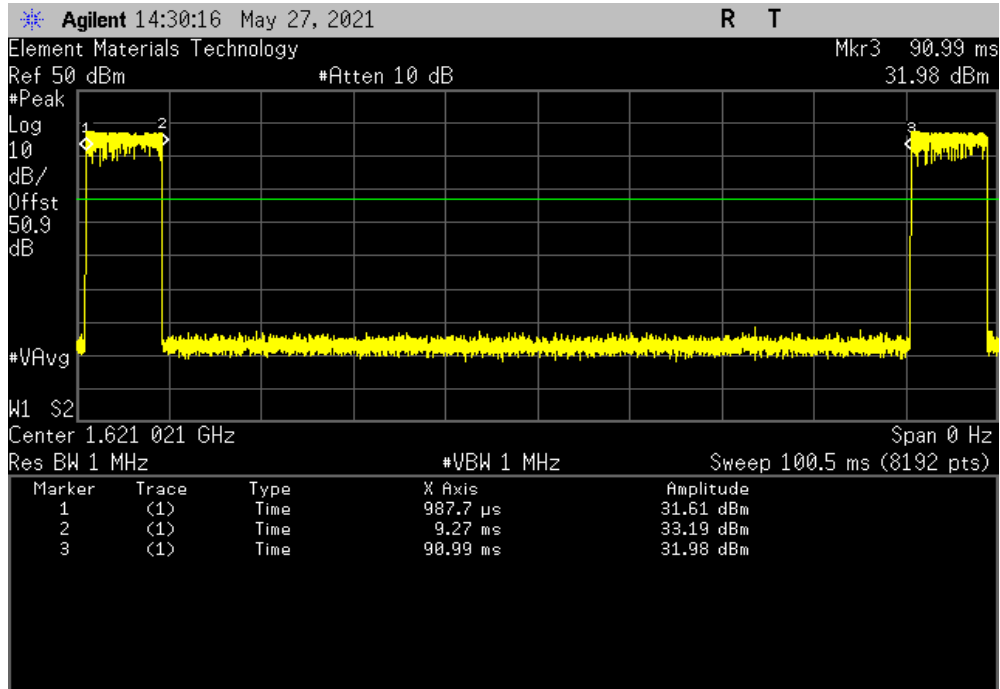


# DUTY CYCLE

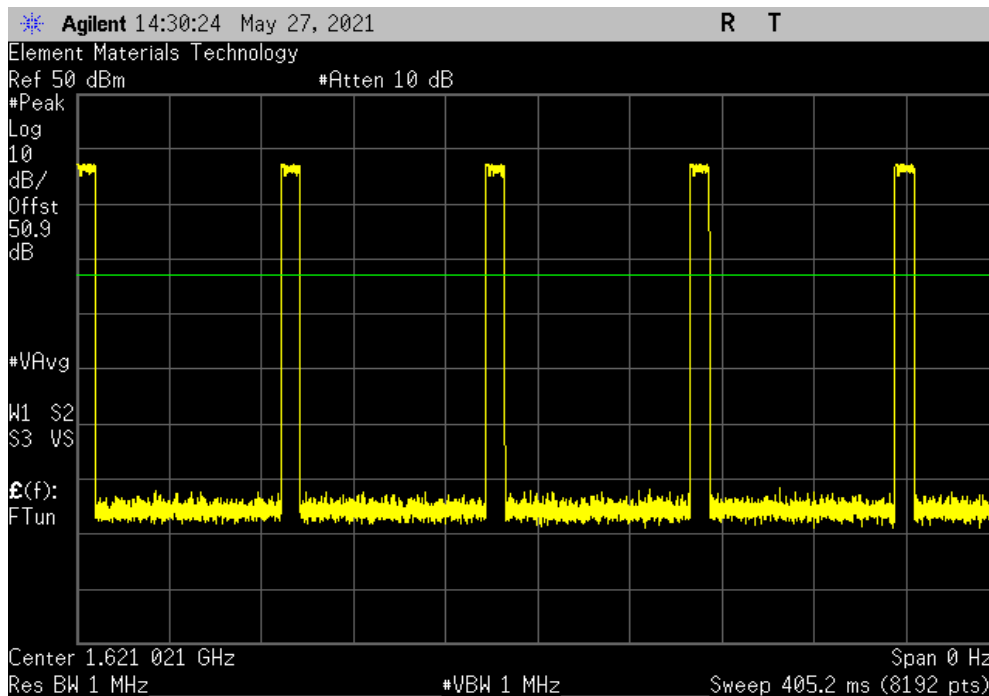


TbTx 2021.03.19.1 XMR 2020.12.30.0

| Transmit, DE-QPSK, Mid Ch. 121, 1621.020833 MHz |             |           |                  |           |           |         |
|-------------------------------------------------|-------------|-----------|------------------|-----------|-----------|---------|
|                                                 | Pulse Width | Period    | Number of Pulses | Value (%) | Limit (%) | Results |
|                                                 | 8.283 ms    | 90.006 ms | 1                | 9.2       | N/A       | N/A     |



| Transmit, DE-QPSK, Mid Ch. 121, 1621.020833 MHz |             |        |                  |           |           |         |
|-------------------------------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                                                 | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                                                 | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |

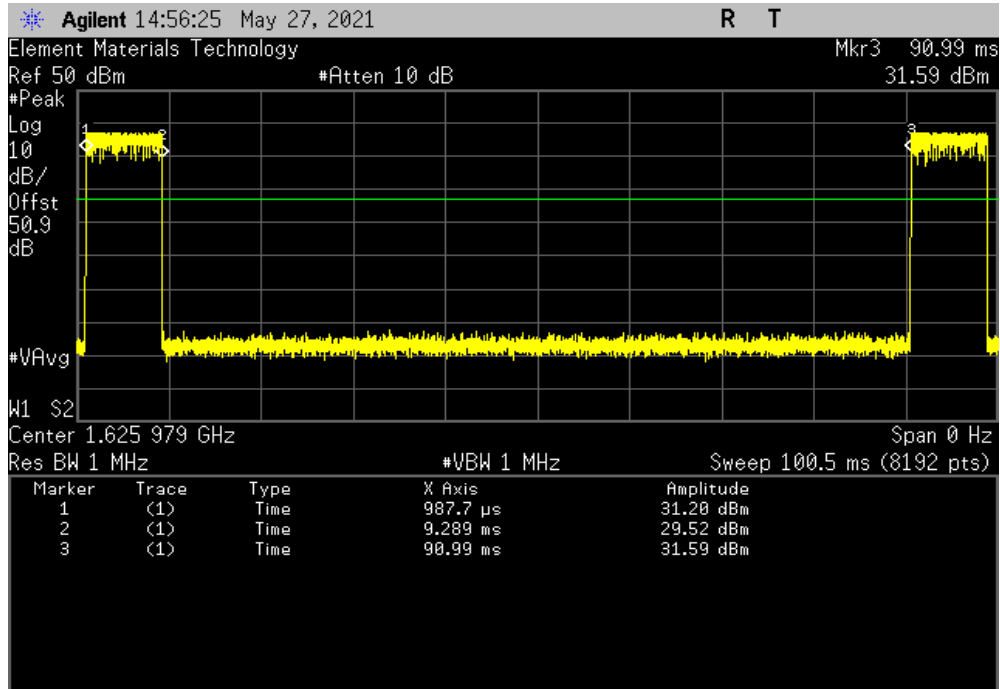


# DUTY CYCLE

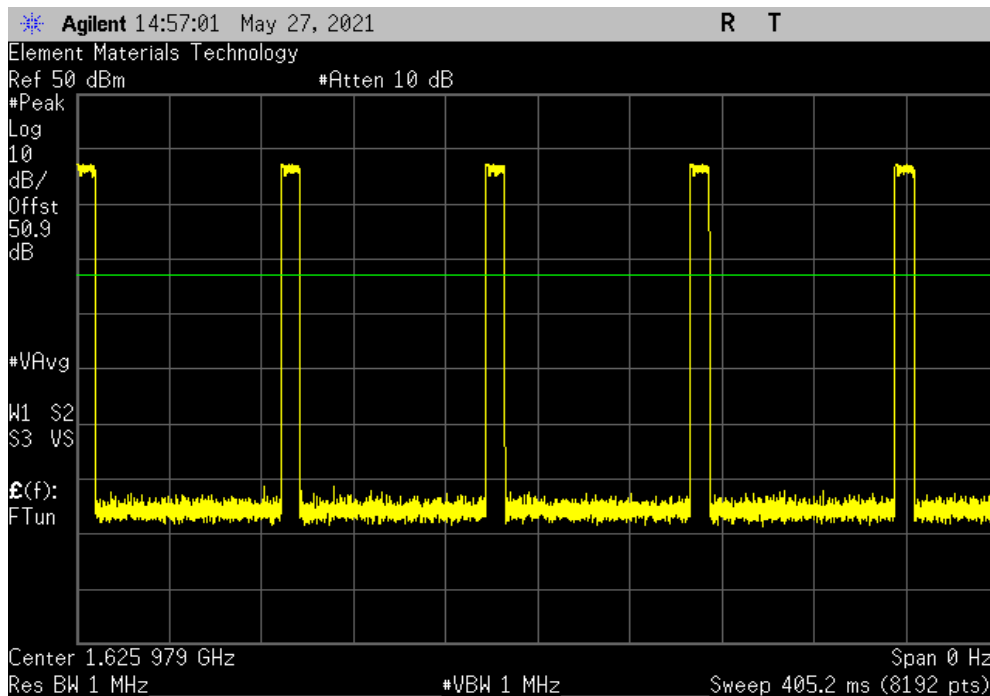


TbTx 2021.03.19.1 XMR 2020.12.30.0

| Transmit, DE-QPSK, High Ch. 240, 1625.979167 MHz |             |           |                  |           |           |         |
|--------------------------------------------------|-------------|-----------|------------------|-----------|-----------|---------|
|                                                  | Pulse Width | Period    | Number of Pulses | Value (%) | Limit (%) | Results |
|                                                  | 8.301 ms    | 90.006 ms | 1                | 9.2       | N/A       | N/A     |



| Transmit, DE-QPSK, High Ch. 240, 1625.979167 MHz |             |        |                  |           |           |         |
|--------------------------------------------------|-------------|--------|------------------|-----------|-----------|---------|
|                                                  | Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
|                                                  | N/A         | N/A    | 5                | N/A       | N/A       | N/A     |



# CONDUCTED OUTPUT POWER

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

## TEST EQUIPMENT

| Description                  | Manufacturer       | Model            | ID  | Last Cal.  | Cal. Due   |
|------------------------------|--------------------|------------------|-----|------------|------------|
| Analyzer - Spectrum Analyzer | Agilent            | E4440A           | AFE | 2021-04-08 | 2022-04-08 |
| Generator - Signal           | Agilent            | E8257D           | TGX | 2020-01-07 | 2022-01-07 |
| Block - DC                   | Fairview Microwave | SD3074           | AMF | NCR        | NCR        |
| Attenuator                   | Fairview Microwave | SA18N5WA-20      | TWD | 2021-02-16 | 2022-02-16 |
| Attenuator                   | Fairview Microwave | SA18N5WA-30      | TLE | 2021-07-22 | 2022-07-22 |
| Cable                        | Micro-Coax         | D150A-1-0720-200 | EVH | 2021-03-14 | 2022-03-14 |

## TEST DESCRIPTION

The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

Prior to measuring output power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method in section 5.2.4.3.2 of ANSI C63.26:2015 was used to make the measurement.

The spectrum analyzer was configured to the following settings:

Span = 2x to 3x OBW  
 RBW ≥ OWB  
 VBW ≥ 3x RBW  
 Detector = RMS  
 Sweep = single

The sweep time is:

$$\text{Sweep time} \geq 10 * [\text{number of points in sweep}] * [\text{transmission period}]$$

Where:

The transmission period is the (on + off) time

A peak marker was used to indicate the maximum level.

Following the measurement a duty cycle correction was applied by adding  $[10 \log (1 / D)]$ , where D is the duty cycle, to the measured value.

# CONDUCTED OUTPUT POWER



TSTx 2021.03.19.1 XMR 2020.12.30.0

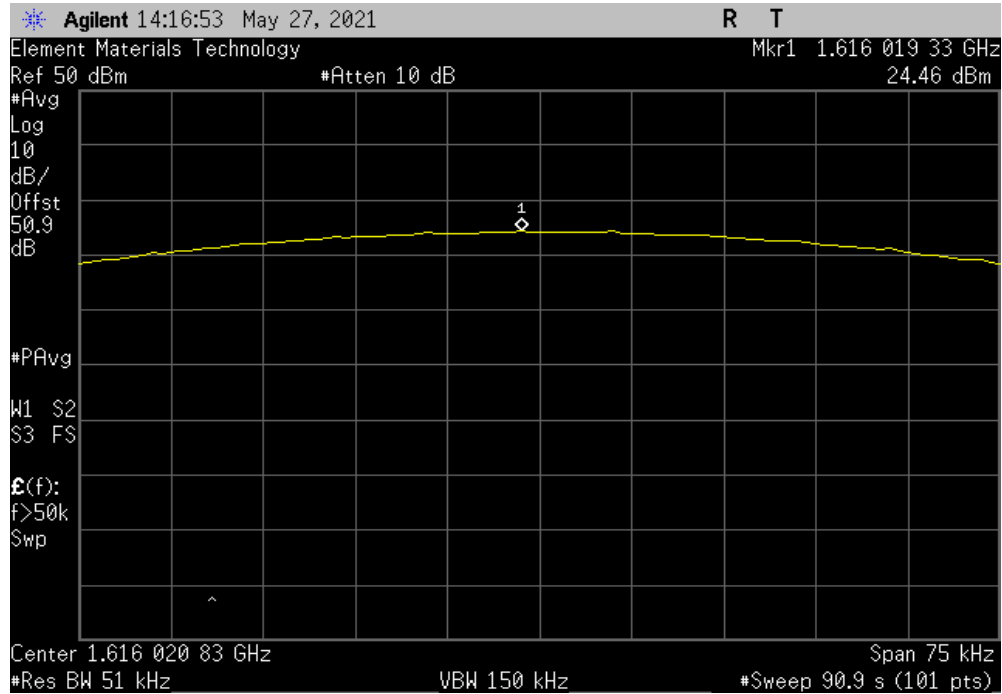
|                                                                                                                                                                                                                                           |                        |                                                                                             |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------|------------------------|
| EUT: SHOUT sp Handheld Iridium Smartphone                                                                                                                                                                                                 |                        | Work Order: PCTE0003                                                                        |                        |
| Serial Number: FCC 1                                                                                                                                                                                                                      |                        | Date: 27-May-21                                                                             |                        |
| Customer: NAL Research Corporation                                                                                                                                                                                                        |                        | Temperature: 23 °C                                                                          |                        |
| Attendees: None                                                                                                                                                                                                                           |                        | Humidity: 46.3% RH                                                                          |                        |
| Project: None                                                                                                                                                                                                                             |                        | Barometric Pres.: 1024 mbar                                                                 |                        |
| Tested by: Jeff Alcock                                                                                                                                                                                                                    | Power: 5.0 VDC via USB | Job Site: EV06                                                                              |                        |
| TEST SPECIFICATIONS                                                                                                                                                                                                                       |                        | Test Method                                                                                 |                        |
| FCC 2.1046:2021                                                                                                                                                                                                                           |                        | ANSI C63.26:2015                                                                            |                        |
| COMMENTS                                                                                                                                                                                                                                  |                        |                                                                                             |                        |
| From the duty cycle data included in this report, the transmission period of the radio is 90.012 mS. The sweep time calculated to be $10 * [101 \text{ points}] * [90.012 \text{ mS}] * 1 \text{ S} / 1000 \text{ mS} = 90.9 \text{ S}$ . |                        |                                                                                             |                        |
| DEVIATIONS FROM TEST STANDARD                                                                                                                                                                                                             |                        |                                                                                             |                        |
| None                                                                                                                                                                                                                                      |                        |                                                                                             |                        |
| Configuration #                                                                                                                                                                                                                           | 2                      | Signature  |                        |
|                                                                                                                                                                                                                                           |                        | Avg Cond Pwr (dBm)                                                                          | Duty Cycle Factor (dB) |
|                                                                                                                                                                                                                                           |                        | Antenna Gain (dBi)                                                                          | EIRP (dBm)             |
|                                                                                                                                                                                                                                           |                        | EIRP (dBW)                                                                                  | Limit (dBW)            |
|                                                                                                                                                                                                                                           |                        | Results                                                                                     |                        |
| Transmit, DE-QPSK                                                                                                                                                                                                                         |                        |                                                                                             |                        |
| Low Ch. 1, 1616.020833 MHz                                                                                                                                                                                                                |                        | 24.463                                                                                      | 10.3                   |
| Mid Ch. 121, 1621.020833 MHz                                                                                                                                                                                                              |                        | 24.406                                                                                      | 10.4                   |
| High Ch. 240, 1625.979167 MHz                                                                                                                                                                                                             |                        | 24.304                                                                                      | 10.4                   |

# CONDUCTED OUTPUT POWER

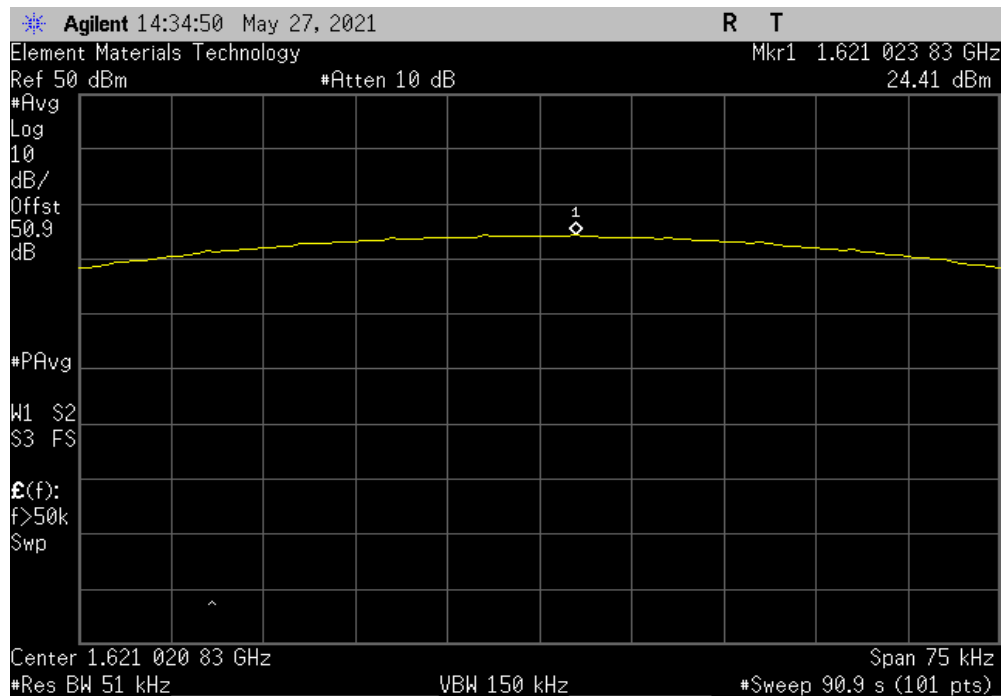


TbTx 2021.03.19.1 XM8 2020.12.30.0

| Transmit, DE-QPSK, Low Ch. 1, 1616.020833 MHz |                        |                    |            |            |             |         |
|-----------------------------------------------|------------------------|--------------------|------------|------------|-------------|---------|
| Avg Cond Pwr (dBm)                            | Duty Cycle Factor (dB) | Antenna Gain (dBi) | EIRP (dBm) | EIRP (dBW) | Limit (dBW) | Results |
| 24.463                                        | 10.3                   | 2.74               | 37.5       | 7.5        | N/A         | N/A     |



| Transmit, DE-QPSK, Mid Ch. 121, 1621.020833 MHz |                        |                    |            |            |             |         |
|-------------------------------------------------|------------------------|--------------------|------------|------------|-------------|---------|
| Avg Cond Pwr (dBm)                              | Duty Cycle Factor (dB) | Antenna Gain (dBi) | EIRP (dBm) | EIRP (dBW) | Limit (dBW) | Results |
| 24.406                                          | 10.4                   | 2.74               | 37.5       | 7.5        | N/A         | N/A     |

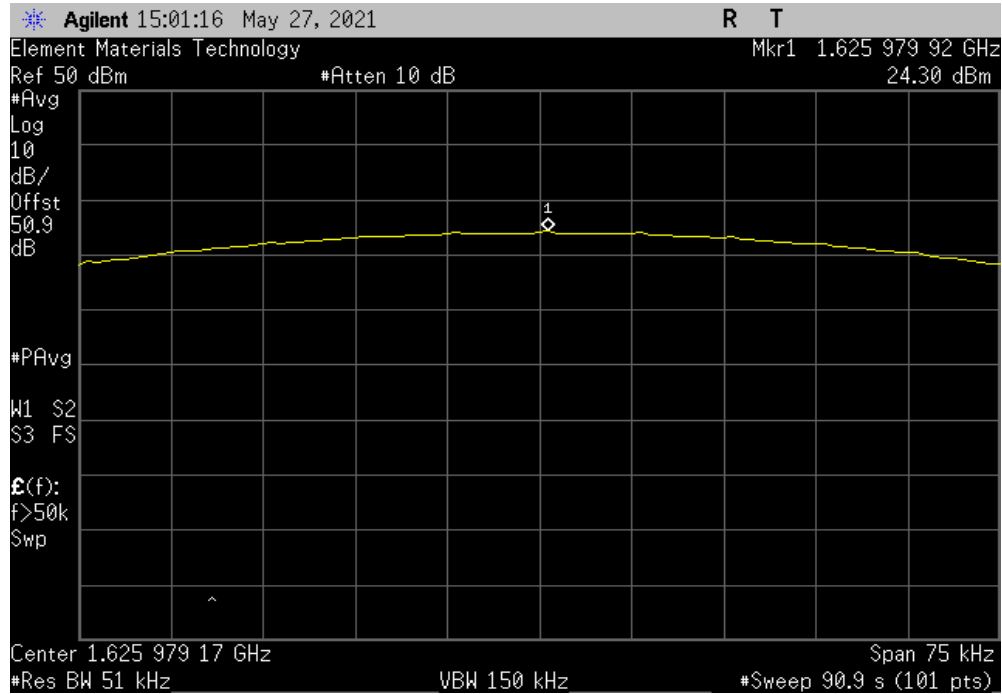


# CONDUCTED OUTPUT POWER



TbTx 2021.03.19.1 XMt 2020.12.30.0

| Transmit, DE-QPSK, High Ch. 240, 1625.979167 MHz |                        |                    |            |            |             |         |
|--------------------------------------------------|------------------------|--------------------|------------|------------|-------------|---------|
| Avg Cond Pwr (dBm)                               | Duty Cycle Factor (dB) | Antenna Gain (dBi) | EIRP (dBm) | EIRP (dBW) | Limit (dBW) | Results |
| 24.304                                           | 10.4                   | 2.74               | 37.4       | 7.4        | N/A         | N/A     |



# POWER SPECTRAL DENSITY



XMIT 2020.12.30.0

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   |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Analyzer - Spectrum Analyzer | Agilent            | N9010A                | AFO | 2021-07-06 | 2022-07-06 |
| Generator - Signal           | Agilent            | N5181A                | TIG | 2020-04-16 | 2023-04-16 |
| Block - DC                   | Fairview Microwave | SD3379                | AMW | 2021-07-06 | 2022-07-06 |
| Attenuator                   | S.M Electronics    | SA26B-20              | AUY | 2021-03-14 | 2022-03-14 |
| Attenuator                   | Fairview Microwave | 18B5W-26              | RFZ | 2021-07-16 | 2022-07-16 |
| Cable                        | Micro-Coax         | UFD150A-1-0720-200200 | EVK | 2021-03-14 | 2022-03-14 |

## TEST DESCRIPTION

The Power Spectral Density (PSD) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

Prior to measuring PSD; the transmission pulse duration (T) was measured. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method in section 5.2.4.5 of ANSI C63.26:2015 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer using an RMS detector. Following the measurement, a duty cycle correction was applied by adding  $[10 \log (1 / D)]$ , where D is the duty cycle, to the measured value.

Where trace averaging was not employed, the method allows for a single sweep measurement where the sweep time is:

$$\text{Sweep time} \geq 10 * [\text{number of points in sweep}] * [\text{transmission period}]$$

Where:

The transmission period is the (on + off) time.

The spectrum analyzer was configured with an RBW of 4.3 kHz and VBW of 13 kHz. A marker was then placed to identify the maximum PSD instead of summing the power across the OBW. The antenna gain and a correction factor which consists of an upward correction for Duty Cycle, and a downward correction factor to make the result relative to any 4 kHz band as per the requirement in 25.204(a) was added to the marker value. The corrected value is noted and compared to the limit.

$$\text{EIRP} = \text{AVG Cond Pwr} + \text{Correction Factor} + \text{Antenna Gain}$$

# POWER SPECTRAL DENSITY



TSTx 2021.03.19.1 XMR 2020.12.30.0

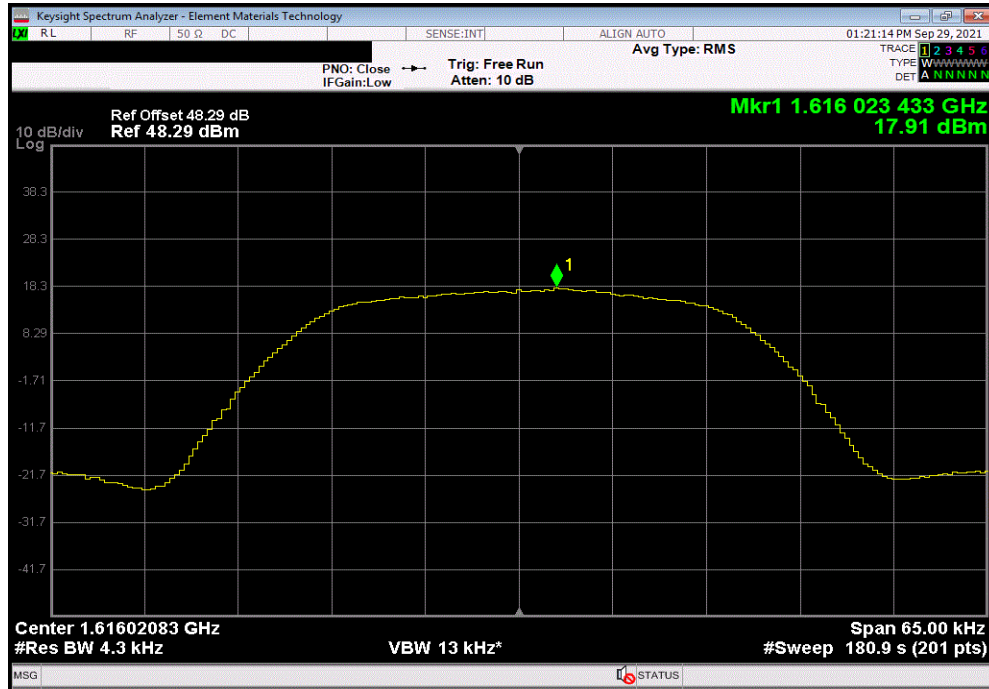
|                                                                                                                                                                                                                                                                                                                                                                                                       |                        |                               |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------|------------------------|
| EUT: SHOUT sp Handheld Iridium Smartphone                                                                                                                                                                                                                                                                                                                                                             |                        | Work Order: PCTE0003          |                        |
| Serial Number: FCC 1                                                                                                                                                                                                                                                                                                                                                                                  |                        | Date: 29-Sep-21               |                        |
| Customer: NAL Research Corporation                                                                                                                                                                                                                                                                                                                                                                    |                        | Temperature: 23 °C            |                        |
| Attendees: None                                                                                                                                                                                                                                                                                                                                                                                       |                        | Humidity: 46.3% RH            |                        |
| Project: None                                                                                                                                                                                                                                                                                                                                                                                         |                        | Barometric Pres.: 1024 mbar   |                        |
| Tested by: Jeff Alcock                                                                                                                                                                                                                                                                                                                                                                                | Power: 5.0 VDC via USB | Job Site: EV06                |                        |
| TEST SPECIFICATIONS                                                                                                                                                                                                                                                                                                                                                                                   |                        |                               |                        |
| FCC 25:2021                                                                                                                                                                                                                                                                                                                                                                                           |                        | Test Method: ANSI C63.26:2015 |                        |
| COMMENTS                                                                                                                                                                                                                                                                                                                                                                                              |                        |                               |                        |
| The transmission period of the radio is 90.012 mS. The sweep time calculated to be $10 * [201 \text{ points}] * [90.012 \text{ mS}] * 1 \text{ S} / 1000 \text{ mS} = 180.9 \text{ S}$ .<br>Correction Factor = Duty Cycle Correction Factor + $10 * \log(\text{RBW used} / \text{reference RBW}) = 10.4 \text{ dB} + 10 * \log(4.3 \text{ kHz} / 4 \text{ kHz}) = 10.4 + (-0.3) = 10.1 \text{ dB}$ . |                        |                               |                        |
| DEVIATIONS FROM TEST STANDARD                                                                                                                                                                                                                                                                                                                                                                         |                        |                               |                        |
| None                                                                                                                                                                                                                                                                                                                                                                                                  |                        |                               |                        |
| Configuration #                                                                                                                                                                                                                                                                                                                                                                                       | 2                      | Signature                     |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                       |                        | Avg Cond Pwr (dBm)            | Correction Factor (dB) |
|                                                                                                                                                                                                                                                                                                                                                                                                       |                        | Antenna Gain (dBi)            | EIRP (dBm/4kHz)        |
|                                                                                                                                                                                                                                                                                                                                                                                                       |                        | EIRP (dBW/4kHz)               | Limit (dBW/4kHz)       |
|                                                                                                                                                                                                                                                                                                                                                                                                       |                        |                               | Results                |
| Transmit, DE-QPSK                                                                                                                                                                                                                                                                                                                                                                                     |                        |                               |                        |
| Low Ch. 1, 1616.020833 MHz                                                                                                                                                                                                                                                                                                                                                                            |                        | 17.91                         | 10.1                   |
| Mid Ch. 121, 1621.020833 MHz                                                                                                                                                                                                                                                                                                                                                                          |                        | 17.51                         | 10.1                   |
| High Ch. 240, 1625.979167 MHz                                                                                                                                                                                                                                                                                                                                                                         |                        | 17.72                         | 10.1                   |

# POWER SPECTRAL DENSITY

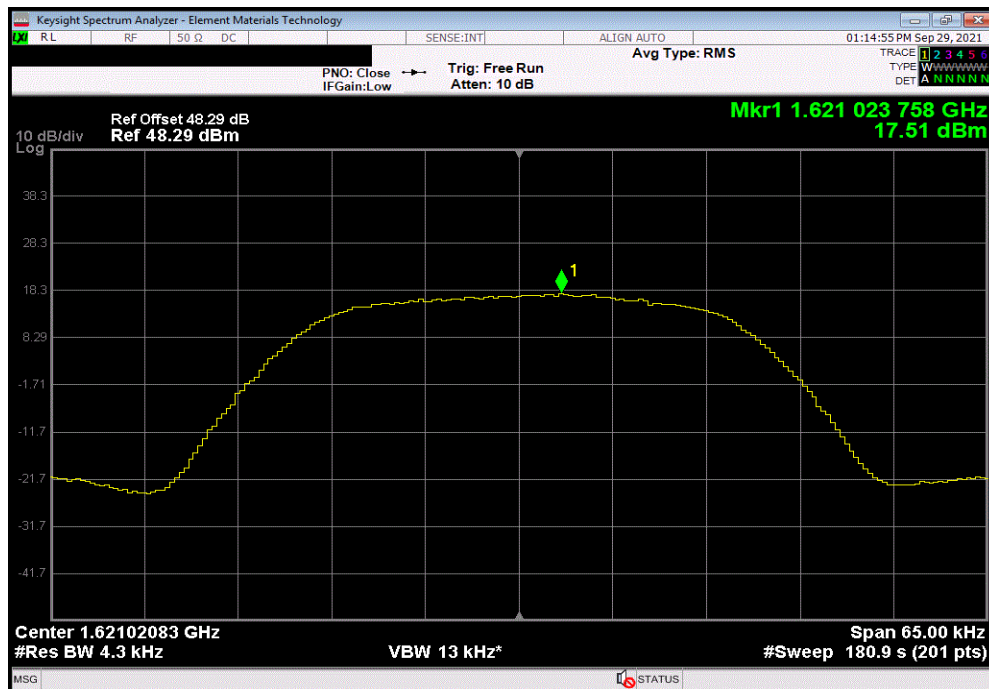


TbTx 2021.03.19.1 XMt 2020.12.30.0

| Transmit, DE-QPSK, Low Ch. 1, 1616.020833 MHz |                        |                    |                 |                 |                  |         |
|-----------------------------------------------|------------------------|--------------------|-----------------|-----------------|------------------|---------|
| Avg Cond Pwr (dBm)                            | Correction Factor (dB) | Antenna Gain (dBi) | EIRP (dBm/4kHz) | EIRP (dBW/4kHz) | Limit (dBW/4kHz) | Results |
| 17.91                                         | 10.1                   | 2.74               | 30.75           | 0.75            | ≤ 40             | Pass    |



| Transmit, DE-QPSK, Mid Ch. 121, 1621.020833 MHz |                        |                    |                 |                 |                  |         |
|-------------------------------------------------|------------------------|--------------------|-----------------|-----------------|------------------|---------|
| Avg Cond Pwr (dBm)                              | Correction Factor (dB) | Antenna Gain (dBi) | EIRP (dBm/4kHz) | EIRP (dBW/4kHz) | Limit (dBW/4kHz) | Results |
| 17.51                                           | 10.1                   | 2.74               | 30.35           | 0.35            | ≤ 40             | Pass    |

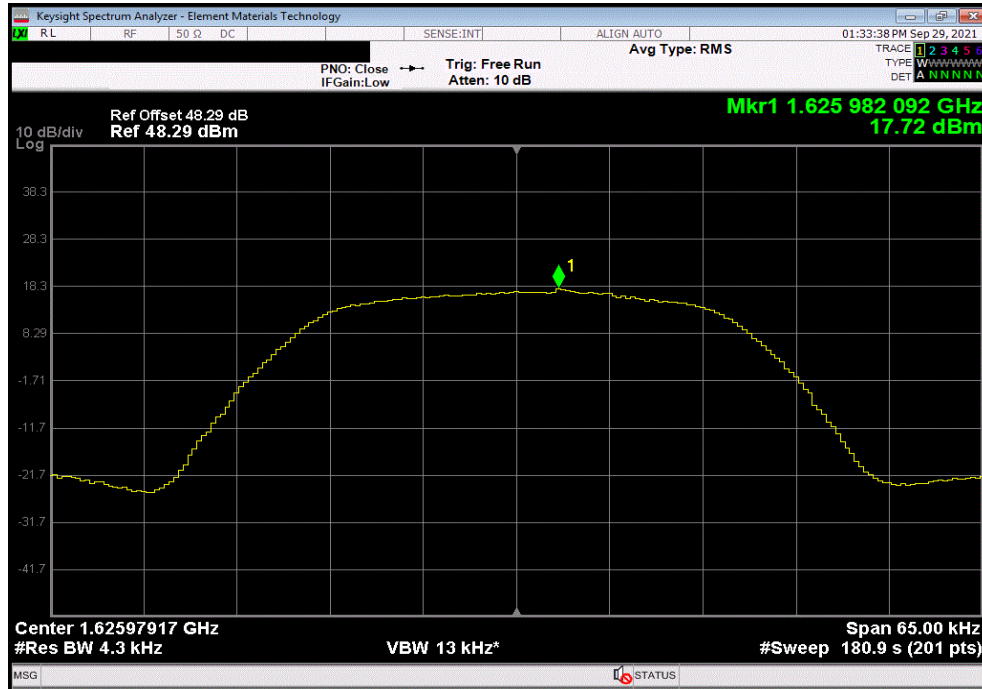


# POWER SPECTRAL DENSITY



TbTx 2021.03.19.1 XMt 2020.12.30.0

| Transmit, DE-QPSK, High Ch. 240, 1625.979167 MHz |                           |                       |                    |                    |                     |         |
|--------------------------------------------------|---------------------------|-----------------------|--------------------|--------------------|---------------------|---------|
| Avg Cond<br>Pwr (dBm)                            | Correction<br>Factor (dB) | Antenna<br>Gain (dBi) | EIRP<br>(dBm/4kHz) | EIRP<br>(dBW/4kHz) | Limit<br>(dBW/4kHz) | Results |
| 17.72                                            | 10.1                      | 2.74                  | 30.56              | 0.56               | ≤ 40                | Pass    |



# OCCUPIED BANDWIDTH



XMIT 2020.12.30.0

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   |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Analyzer - Spectrum Analyzer | Agilent            | E4440A                | AFE | 2021-04-08 | 2022-04-08 |
| Generator - Signal           | Agilent            | E8257D                | TGX | 2020-01-07 | 2022-01-07 |
| Block - DC                   | Fairview Microwave | SD3074                | AMF | NCR        | NCR        |
| Attenuator                   | Fairview Microwave | SA18N5WA-20           | TWD | 2021-02-16 | 2022-02-16 |
| Attenuator                   | Fairview Microwave | SA18N5WA-30           | TLE | 2020-07-24 | 2021-07-24 |
| Cable                        | Micro-Coax         | UFD150A-1-0720-200200 | EVH | 2021-03-14 | 2022-03-14 |

## TEST DESCRIPTION

An RF signal generator was used to create the modulated signal(s) listed in the datasheets. These signals were input into the EUT.

The spectrum analyzer settings were as follows:

- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process to determine the RBW based on the emissions bandwidth (B).
- VBW = > RBW
- A peak detector was used
- Trace max hold.

The spectrum analyzer occupied bandwidth measurement function was then used to measure the 26 dB and 99% emission bandwidth.

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

# OCCUPIED BANDWIDTH



TSTx 2021.03.19.1 XMR 2020.12.30.0

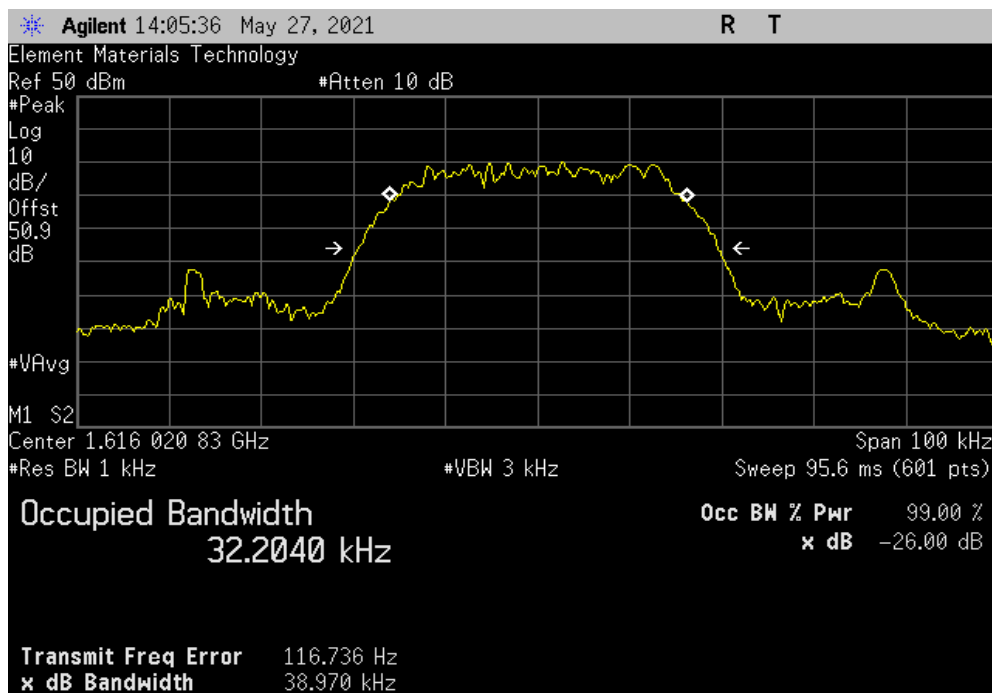
|                                                                       |   |                                                                                             |                       |
|-----------------------------------------------------------------------|---|---------------------------------------------------------------------------------------------|-----------------------|
| EUT: SHOUT sp Handheld Iridium Smartphone                             |   | Work Order: PCTE0003                                                                        |                       |
| Serial Number: FCC 1                                                  |   | Date: 27-May-21                                                                             |                       |
| Customer: NAL Research Corporation                                    |   | Temperature: 23 °C                                                                          |                       |
| Attendees: None                                                       |   | Humidity: 46.5% RH                                                                          |                       |
| Project: None                                                         |   | Barometric Pres.: 1024 mbar                                                                 |                       |
| Tested by: Jeff Alcock                                                |   | Power: 5.0 VDC via USB                                                                      |                       |
|                                                                       |   | Job Site: EV06                                                                              |                       |
| TEST SPECIFICATIONS                                                   |   |                                                                                             |                       |
| FCC 2.1049:2021                                                       |   | Test Method                                                                                 |                       |
|                                                                       |   | ANSI C63.26:2015                                                                            |                       |
| COMMENTS                                                              |   |                                                                                             |                       |
| Please reference data comments below for channel and EUT orientation. |   |                                                                                             |                       |
| DEVIATIONS FROM TEST STANDARD                                         |   |                                                                                             |                       |
| None                                                                  |   |                                                                                             |                       |
| Configuration #                                                       | 2 | Signature  |                       |
|                                                                       |   | 26 dB Occupied BW (kHz)                                                                     | 99% Occupied BW (kHz) |
|                                                                       |   | Limit                                                                                       | Result                |
| Transmit, DE-QPSK                                                     |   |                                                                                             |                       |
| Low Ch. 1, 1616.020833 MHz                                            |   | 38.97                                                                                       | 32.204                |
| Mid Ch. 121, 1621.020833 MHz                                          |   | 37.873                                                                                      | 31.649                |
| High Ch. 240, 1625.979167 MHz                                         |   | 38.208                                                                                      | 31.632                |
|                                                                       |   | N/A                                                                                         | Pass                  |
|                                                                       |   | N/A                                                                                         | Pass                  |
|                                                                       |   | N/A                                                                                         | Pass                  |

# OCCUPIED BANDWIDTH

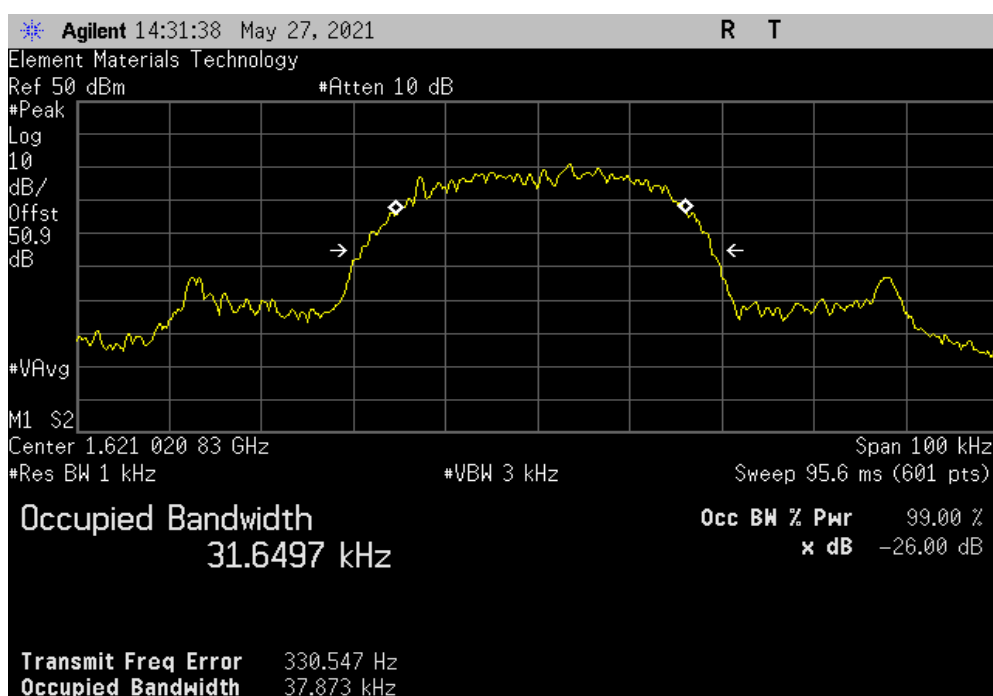


TMTX 2021.03.19.1 XMI 2020.12.30.0

| Transmit, DE-QPSK, Low Ch. 1, 1616.020833 MHz |       |              |        |       |        |  |
|-----------------------------------------------|-------|--------------|--------|-------|--------|--|
| 26 dB Occupied                                |       | 99% Occupied |        | Limit | Result |  |
| BW (kHz)                                      |       | BW (kHz)     |        |       |        |  |
|                                               | 38.97 |              | 32.204 | N/A   | Pass   |  |



| Transmit, DE-QPSK, Mid Ch. 121, 1621.020833 MHz |        |              |        |       |        |  |
|-------------------------------------------------|--------|--------------|--------|-------|--------|--|
| 26 dB Occupied                                  |        | 99% Occupied |        | Limit | Result |  |
| BW (kHz)                                        |        | BW (kHz)     |        |       |        |  |
|                                                 | 37 873 |              | 31 649 | N/A   | Pass   |  |

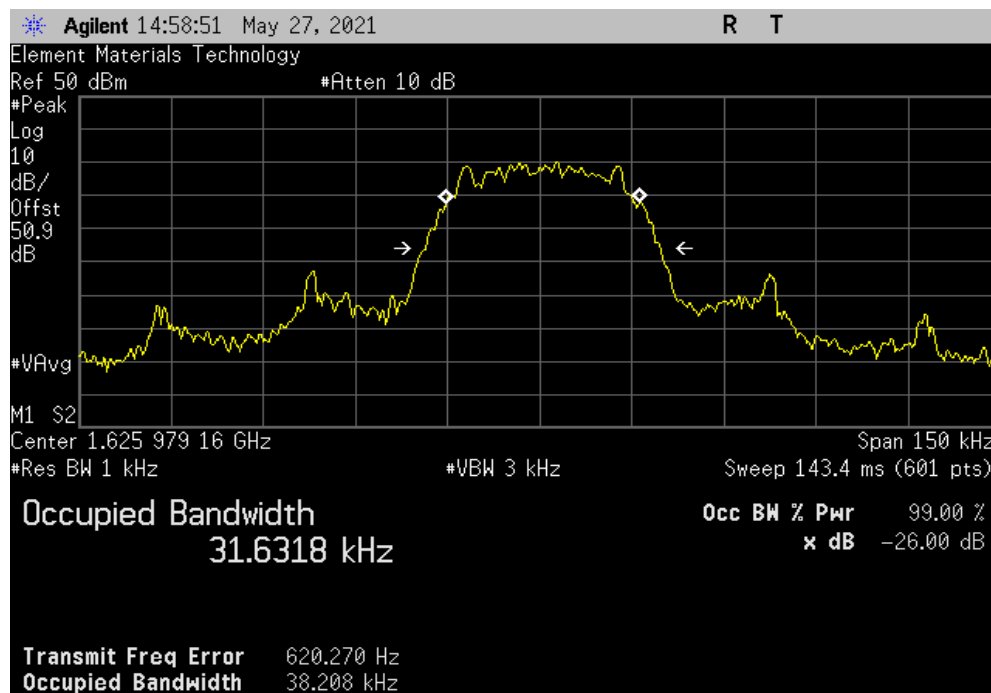


# OCCUPIED BANDWIDTH



TXM 2021.03.19.1 XM 2020.12.30.0

| Transmit, DE-QPSK, High Ch. 240, 1625.979167 MHz |  |  |              |        |       |        |
|--------------------------------------------------|--|--|--------------|--------|-------|--------|
| 26 dB Occupied                                   |  |  | 99% Occupied |        | Limit | Result |
| BW (kHz)                                         |  |  | BW (kHz)     |        |       |        |
|                                                  |  |  | 38.208       | 31.632 | N/A   | Pass   |



# SPURIOUS RADIATED EMISSIONS

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes. The antenna port of the EUT was terminated with a 50Ω load. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted.

For emissions with more than 20dB of margin, the EIRP was calculated using equations found in ANSI C63.26:2015, Clause 5.2.7. For emissions with less than 20 dB of margin, The EUT was replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

## TEST EQUIPMENT

| Description                  | Manufacturer    | Model                     | ID  | Last Cal.  | Cal. Due   |
|------------------------------|-----------------|---------------------------|-----|------------|------------|
| Analyzer - Spectrum Analyzer | Agilent         | N9010A                    | AFI | 2020-12-08 | 2021-12-08 |
| Antenna - Biconilog          | Teseq           | CBL 6141B                 | AXR | 2020-10-13 | 2022-10-13 |
| Antenna - Double Ridge       | EMCO            | 3115                      | AHC | 2020-07-01 | 2022-07-01 |
| Antenna - Standard Gain      | ETS Lindgren    | 3160-07                   | AHU | NCR        | NCR        |
| Antenna - Standard Gain      | ETS Lindgren    | 3160-08                   | AHV | NCR        | NCR        |
| Amplifier - Pre-Amplifier    | Miteq           | AM-1616-1000              | AOL | 2020-11-17 | 2021-11-17 |
| Amplifier - Pre-Amplifier    | Miteq           | AMF-3D-00100800-32-13P    | PAG | 2020-11-17 | 2021-11-17 |
| Amplifier - Pre-Amplifier    | L-3 Narda-MITEQ | AMF-6F-08001200-30-10P    | PAO | 2020-11-18 | 2021-11-18 |
| Amplifier - Pre-Amplifier    | Miteq           | AMF-6F-12001800-30-10P    | AVD | 2020-11-18 | 2021-11-18 |
| Cable                        | N/A             | Bilog Cables              | EVA | 2020-11-17 | 2021-11-17 |
| Cable                        | N/A             | Double Ridge Horn Cables  | EVB | 2020-11-17 | 2021-11-17 |
| Cable                        | None            | Standard Gain Horns Cable | EVF | 2020-11-18 | 2021-11-18 |
| Attenuator                   | Coaxicom        | 3910-20                   | AXZ | 2021-02-15 | 2022-02-15 |
| Filter - Low Pass            | Micro-Tronics   | LPM50004                  | LFD | 2021-02-15 | 2022-02-15 |
| Filter - High Pass           | Micro-Tronics   | HPM50111                  | HFO | 2020-11-17 | 2021-11-17 |

## MEASUREMENT UNCERTAINTY

| Description  |        |         |
|--------------|--------|---------|
| Expanded k=2 | 5.2 dB | -5.2 dB |

## FREQUENCY RANGE INVESTIGATED

30 MHz TO 18 GHz

## POWER INVESTIGATED

5.0 VDC via USB

## CONFIGURATIONS INVESTIGATED

PCTE0003-6

## MODES INVESTIGATED

Tx, DE-QPSK, 10% duty cycle, Ch 1 = 1616.020883 MHz, Ch 121 = 1621.020833 MHz, and Ch 240 = 1625.979167 MHz

# SPURIOUS RADIATED EMISSIONS

|                   |                                      |                    |            |
|-------------------|--------------------------------------|--------------------|------------|
| EUT:              | SHOUT sp Handheld Iridium Smartphone | Work Order:        | PCTE0003   |
| Serial Number:    | FCC 2                                | Date:              | 2021-08-25 |
| Customer:         | NAL Research Corporation             | Temperature:       | 23.7°C     |
| Attendees:        | None                                 | Relative Humidity: | 42.8%      |
| Customer Project: | None                                 | Bar. Pressure:     | 1019 mb    |
| Tested By:        | Jeff Alcock                          | Job Site:          | EV01       |
| Power:            | 5.0 VDC via USB                      | Configuration:     | PCTE0003-6 |

## TEST SPECIFICATIONS

|                |                  |
|----------------|------------------|
| Specification: | Method:          |
| FCC 25:2021    | ANSI C63.26:2015 |

## TEST PARAMETERS

|        |    |                    |   |                     |           |
|--------|----|--------------------|---|---------------------|-----------|
| Run #: | 71 | Test Distance (m): | 3 | Ant. Height(s) (m): | 1 to 4(m) |
|--------|----|--------------------|---|---------------------|-----------|

## COMMENTS

Due to the duty cycle of the EUT, a peak detector was used to ensure the peak emissions were captured. A peak detector is considered worst case as compared to an average detector.

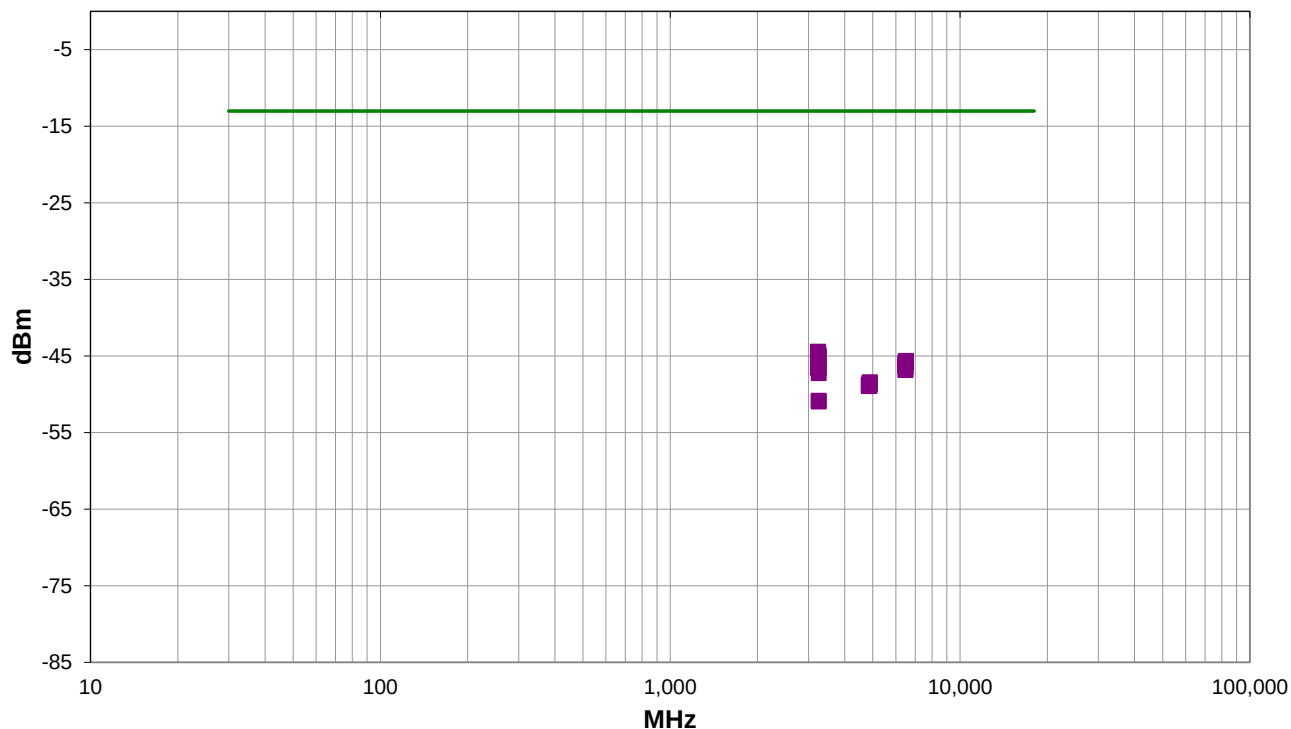
Please reference data comments below for channel and EUT orientation.

## EUT OPERATING MODES

Tx, DE-QPSK, 10% duty cycle, Ch 1 = 1616.020883 MHz, Ch 121 = 1621.020833 MHz, and Ch 240 = 1625.979167 MHz

## DEVIATIONS FROM TEST STANDARD

None



Run #: 71

■ PK    ◆ AV    ● QP

# SPURIOUS RADIATED EMISSIONS

## RESULTS - Run #71

| Freq (MHz) | Antenna Height (meters) | Azimuth (degrees) | Polarity/Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments            |
|------------|-------------------------|-------------------|--------------------------|----------|--------------|------------|-------------------|------------------------|---------------------|
| 3232.190   | 1.91                    | 179.0             | Vert                     | PK       | 36.1E-9      | -44.4      | -13.0             | -31.4                  | Ch 1, EUT on Side   |
| 3252.052   | 1.58                    | 180.0             | Vert                     | PK       | 32.9E-9      | -44.8      | -13.0             | -31.8                  | Ch 240, EUT on Side |
| 3252.010   | 1.16                    | 144.0             | Vert                     | PK       | 30.7E-9      | -45.1      | -13.0             | -32.1                  | Ch 240, EUT Horz    |
| 3242.157   | 1.7                     | 180.0             | Vert                     | PK       | 30.0E-9      | -45.2      | -13.0             | -32.2                  | Ch 121, EUT on Side |
| 6502.753   | 1.5                     | 208.0             | Vert                     | PK       | 27.4E-9      | -45.6      | -13.0             | -32.6                  | Ch 240, EUT on Side |
| 6504.512   | 1.5                     | 225.0             | Horz                     | PK       | 26.7E-9      | -45.7      | -13.0             | -32.7                  | Ch 240, EUT Horz    |
| 6462.880   | 1.0                     | 343.0             | Vert                     | PK       | 25.5E-9      | -45.9      | -13.0             | -32.9                  | Ch 1, EUT on Side   |
| 6466.063   | 1.5                     | 83.0              | Horz                     | PK       | 23.3E-9      | -46.3      | -13.0             | -33.3                  | Ch 1, EUT Horz      |
| 6484.722   | 1.5                     | 260.0             | Vert                     | PK       | 22.8E-9      | -46.4      | -13.0             | -33.4                  | Ch 121, EUT on Side |
| 3241.965   | 1.13                    | 274.0             | Horz                     | PK       | 22.8E-9      | -46.4      | -13.0             | -33.4                  | Ch 121, EUT Horz    |
| 3231.857   | 3.5                     | 135.0             | Horz                     | PK       | 22.2E-9      | -46.5      | -13.0             | -33.5                  | Ch 1, EUT Horz      |
| 3251.943   | 1.0                     | 134.0             | Horz                     | PK       | 21.7E-9      | -46.6      | -13.0             | -33.6                  | Ch 240, EUT Horz    |
| 6482.497   | 2.0                     | 22.0              | Horz                     | PK       | 20.8E-9      | -46.8      | -13.0             | -33.8                  | Ch 121, EUT Horz    |
| 3252.018   | 1.49                    | 162.0             | Horz                     | PK       | 18.9E-9      | -47.2      | -13.0             | -34.2                  | Ch 240, EUT on Side |
| 4878.407   | 1.5                     | 356.0             | Vert                     | PK       | 14.4E-9      | -48.4      | -13.0             | -35.4                  | Ch 240, EUT on Side |
| 4878.773   | 4.0                     | 225.0             | Horz                     | PK       | 13.7E-9      | -48.6      | -13.0             | -35.6                  | Ch 240, EUT Horz    |
| 4845.735   | 1.5                     | 360.0             | Vert                     | PK       | 13.4E-9      | -48.7      | -13.0             | -35.7                  | Ch 1, EUT on Side   |
| 4864.977   | 2.97                    | 79.0              | Vert                     | PK       | 13.1E-9      | -48.8      | -13.0             | -35.8                  | Ch 121, EUT on Side |
| 4863.793   | 1.5                     | 150.0             | Horz                     | PK       | 13.1E-9      | -48.8      | -13.0             | -35.8                  | Ch 121, EUT Horz    |
| 4846.193   | 1.73                    | 0.0               | Horz                     | PK       | 12.8E-9      | -48.9      | -13.0             | -35.9                  | Ch 1, EUT Horz      |
| 3251.893   | 1.5                     | 37.0              | Vert                     | PK       | 8.3E-9       | -50.8      | -13.0             | -37.8                  | Ch 240, EUT Vert    |
| 3251.885   | 3.0                     | 315.0             | Horz                     | PK       | 8.1E-9       | -50.9      | -13.0             | -37.9                  | Ch 240, EUT Vert    |

## CONCLUSION

Pass



Tested By

# FREQUENCY STABILITY



XMIT 2020.12.30.0

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   |
|--------------------------------|---------------------------|-----------------------|-----|------------|------------|
| Chamber - Temperature/Humidity | Cincinnati Sub Zero (CSZ) | ZPH-8-2-SCT/AC        | TBI | NCR        | NCR        |
| Meter - Multimeter             | Tektronix                 | DMM912                | MMH | 2019-02-15 | 2022-02-15 |
| Thermometer                    | Omegatette                | HH311                 | DTY | 2021-02-04 | 2024-02-04 |
| Power Supply - DC              | Topward                   | TPS-2000              | TPD | NCR        | NCR        |
| Cable                          | Micro-Coax                | UFD150A-1-0720-200200 | EVK | 2021-03-14 | 2022-03-14 |
| Attenuator                     | Fairview Microwave        | SA18N5WA-20           | TWD | 2021-02-16 | 2022-02-16 |
| Attenuator                     | Fairview Microwave        | SA18N5WA-30           | TLE | 2021-07-22 | 2022-07-22 |
| Analyzer - Spectrum Analyzer   | Keysight                  | N9010A                | AFO | 2021-07-06 | 2022-07-06 |

## TEST DESCRIPTION

The trace was max held to capture the entire envelope of the carrier. A marker was placed at the peak of the envelope. The marker delta function was used moving the delta marker until the -20 dBc point is reached (f\_high). The marker delta function was reset while maintaining its location at f\_high, the delta marker was moved again to the lowest frequency (f\_low) that has the same amplitude as f\_high.

The mean frequency is calculated using the following:

$$(f_{\text{high}} + f_{\text{low}}) / 2$$

Where,  $f_{\text{low}} = f_{\text{high}} + \text{marker delta}$

The primary supply voltage was varied from 85 % to 115% of the nominal voltage Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

$$\text{Error \%} = |( \text{Mean Frequency} / \text{Assigned Frequency} - 1 )| * 100$$



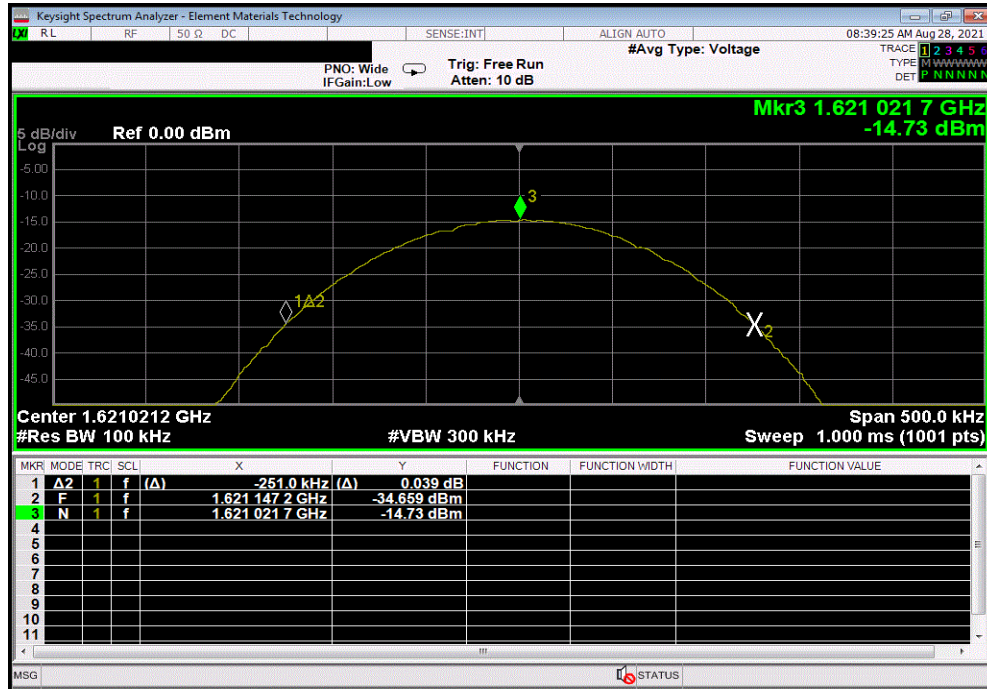
XMit 2020.12.30.0

# FREQUENCY STABILITY

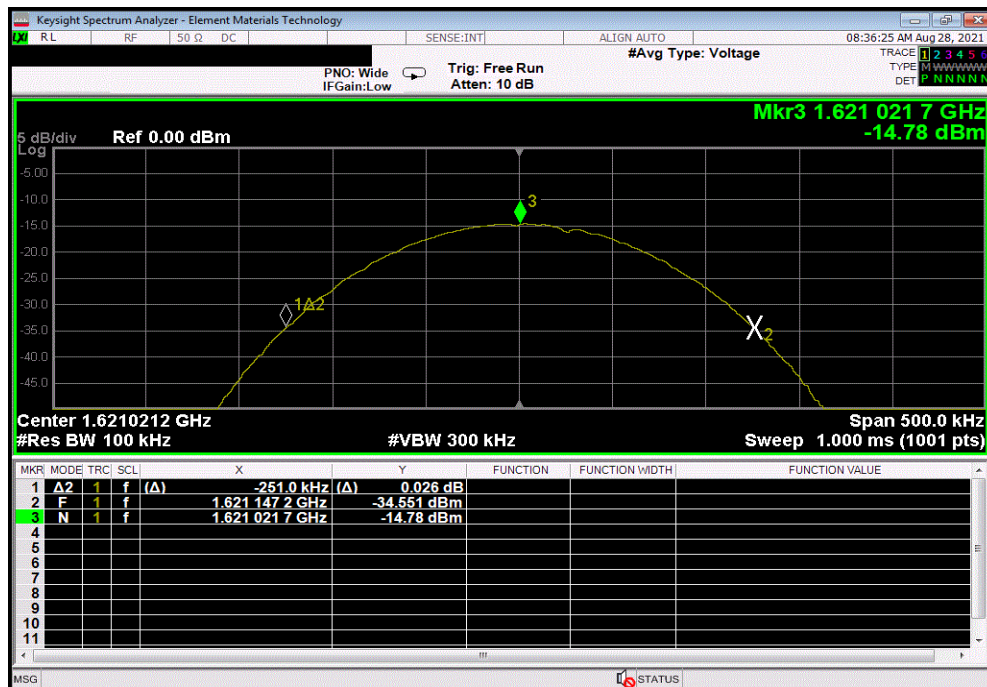


XMR 2020.12.30.0

| Ch 121, 1621.020833 MHz, Nominal voltage, 4.2 VDC |               |              |                  |              |              |        |
|---------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                    | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621147200                                        | 1620896200    | 1621021700   | 1621020833       | 0.00005      | ≤ 0.001      | Pass   |



| Ch 121, 1621.020833 MHz, Minimum operational voltage, 3.4 VDC |               |              |                  |              |              |        |
|---------------------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                                | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621147200                                                    | 1620896200    | 1621021700   | 1621020833       | 0.00005      | ≤ 0.001      | Pass   |

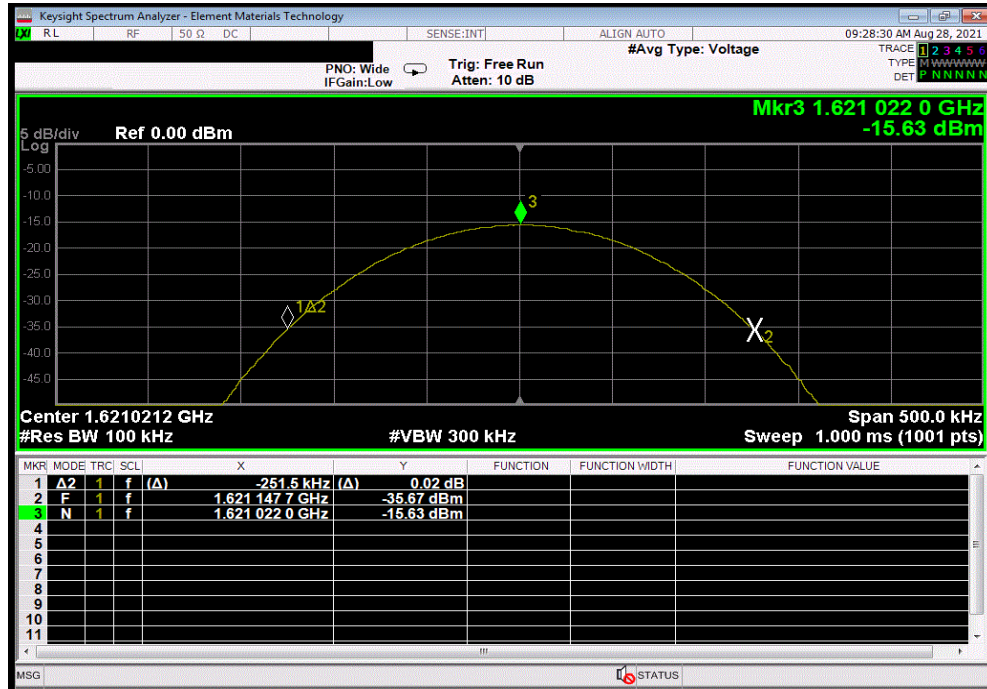


# FREQUENCY STABILITY

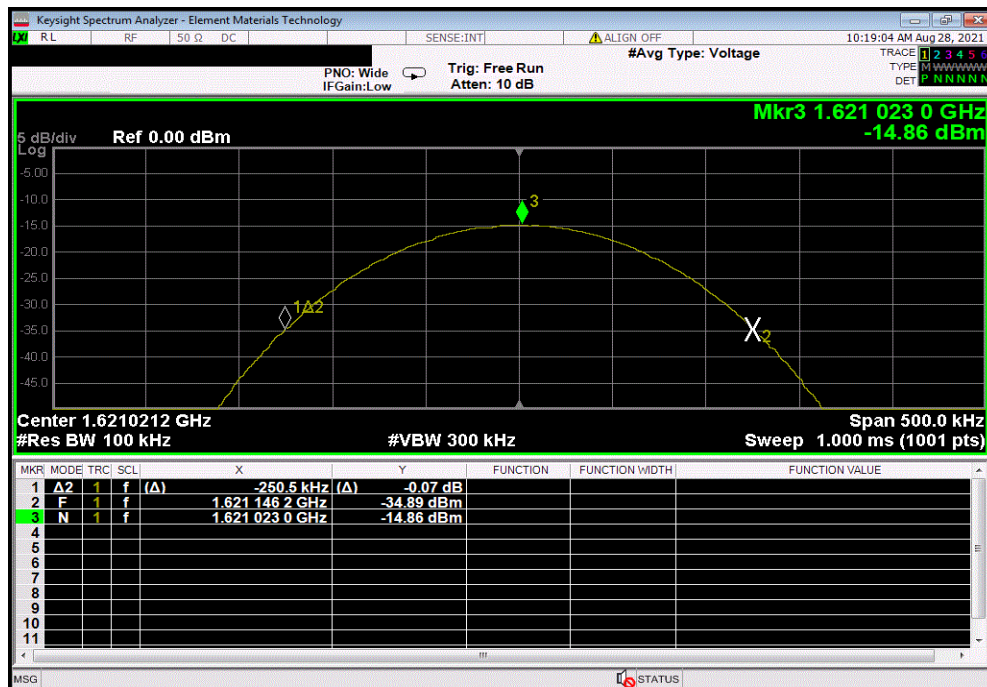


XMR 2020.12.30.0

| Ch 121, 1621.020833 MHz, Nominal voltage, 50°C |               |              |                  |              |              |        |
|------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                 | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621147700                                     | 1620896200    | 1621021950   | 1621020833       | 0.00007      | ≤ 0.001      | Pass   |



| Ch 121, 1621.020833 MHz, Nominal voltage, 40°C |               |              |                  |              |              |        |
|------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                 | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621146200                                     | 1620895700    | 1621020950   | 1621020833       | 0.00001      | ≤ 0.001      | Pass   |

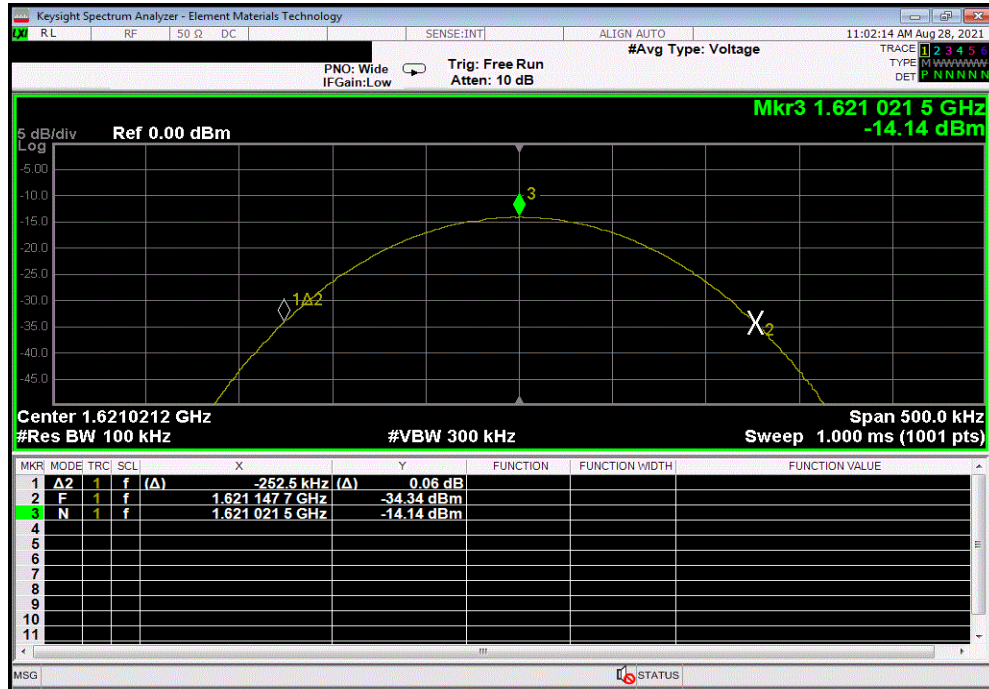


# FREQUENCY STABILITY

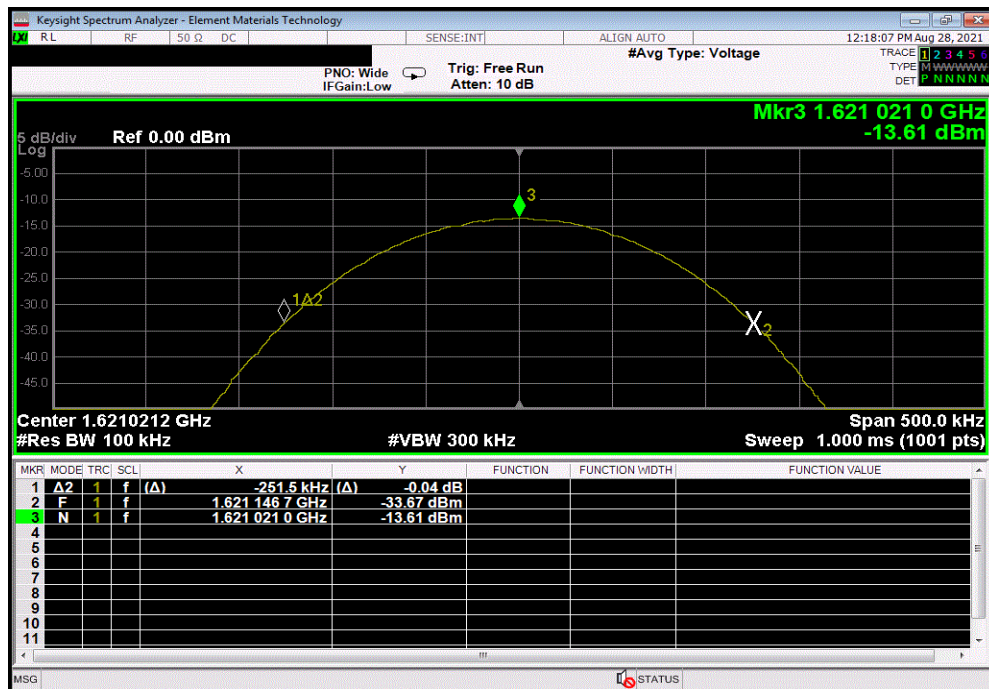


XMR 2020.12.30.0

| Ch 121, 1621.020833 MHz, Nominal voltage, 30°C |               |              |                  |              |              |        |
|------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                 | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621147700                                     | 1620895200    | 1621021450   | 1621020833       | 0.00004      | ≤ 0.001      | Pass   |



| Ch 121, 1621.020833 MHz, Nominal voltage, 20°C |               |              |                  |              |              |        |
|------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                 | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621147700                                     | 1620896200    | 1621021950   | 1621020833       | 0.00007      | ≤ 0.001      | Pass   |

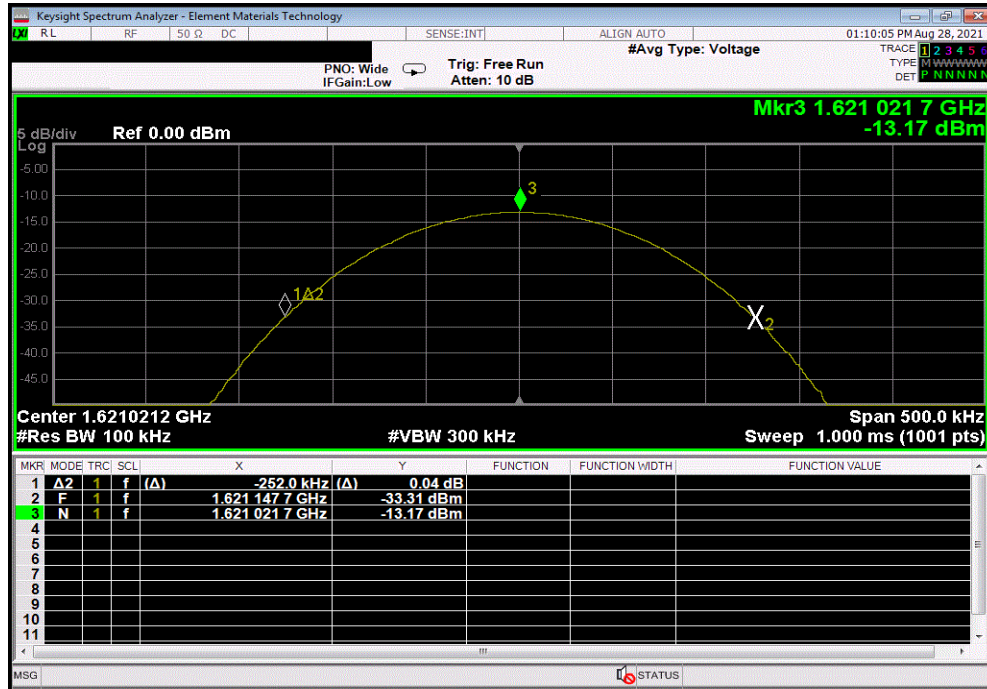


# FREQUENCY STABILITY

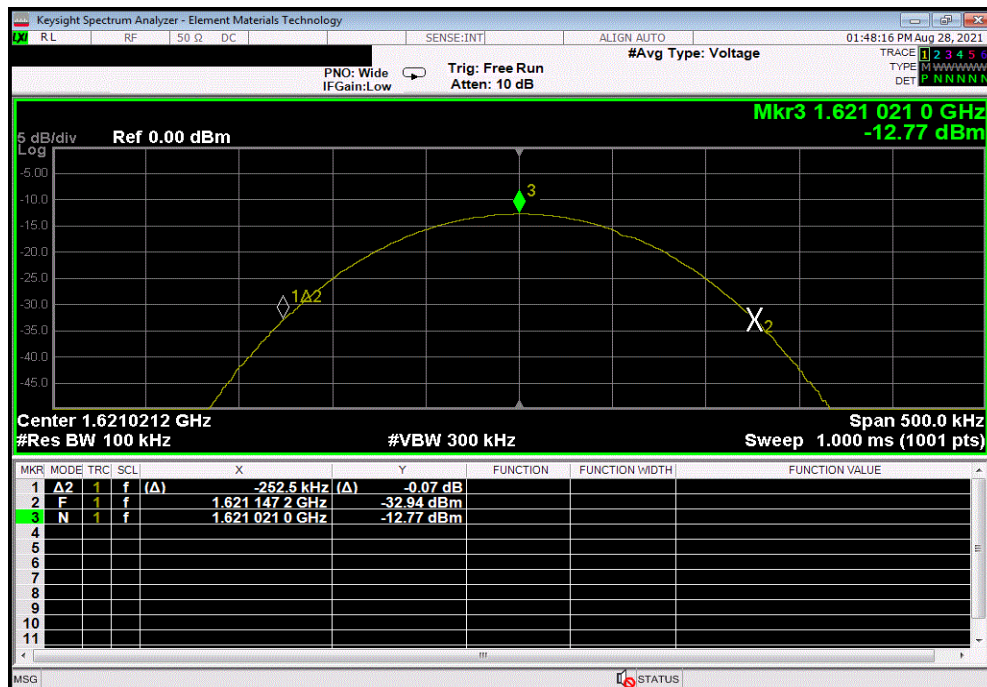


XMR 2020.12.30.0

| Ch 121, 1621.020833 MHz, Nominal voltage, 10°C |               |              |                  |              |              |        |
|------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                 | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621147700                                     | 1620895700    | 1621021700   | 1621020833       | 0.00005      | ≤ 0.001      | Pass   |



| Ch 121, 1621.020833 MHz, Nominal voltage, 0°C |               |              |                  |              |              |        |
|-----------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621147200                                    | 1620894700    | 1621020950   | 1621020833       | 0.00001      | ≤ 0.001      | Pass   |

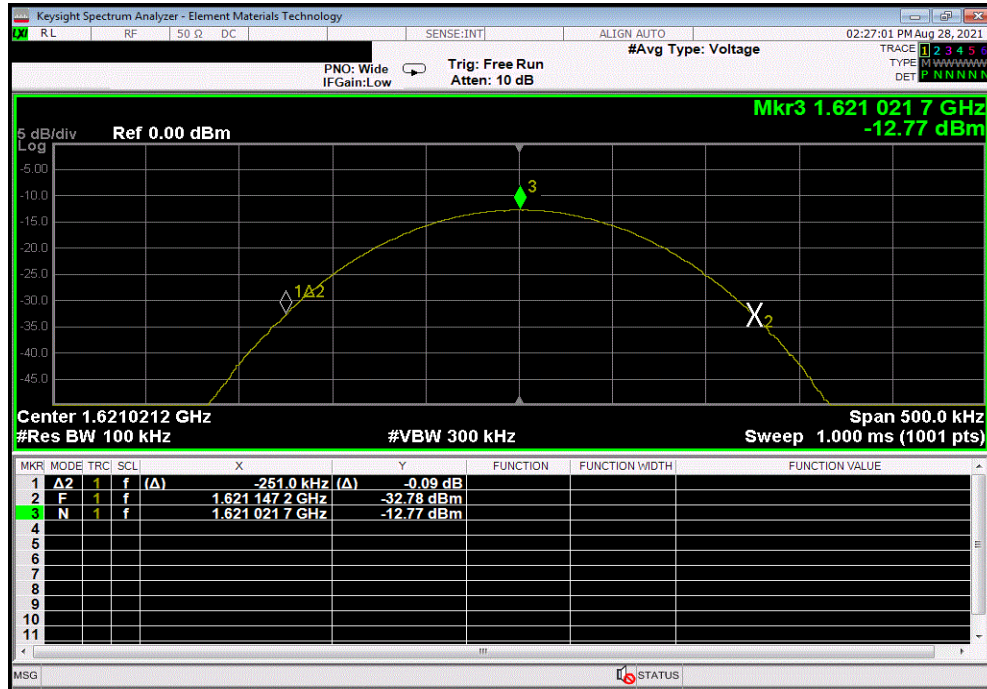


# FREQUENCY STABILITY

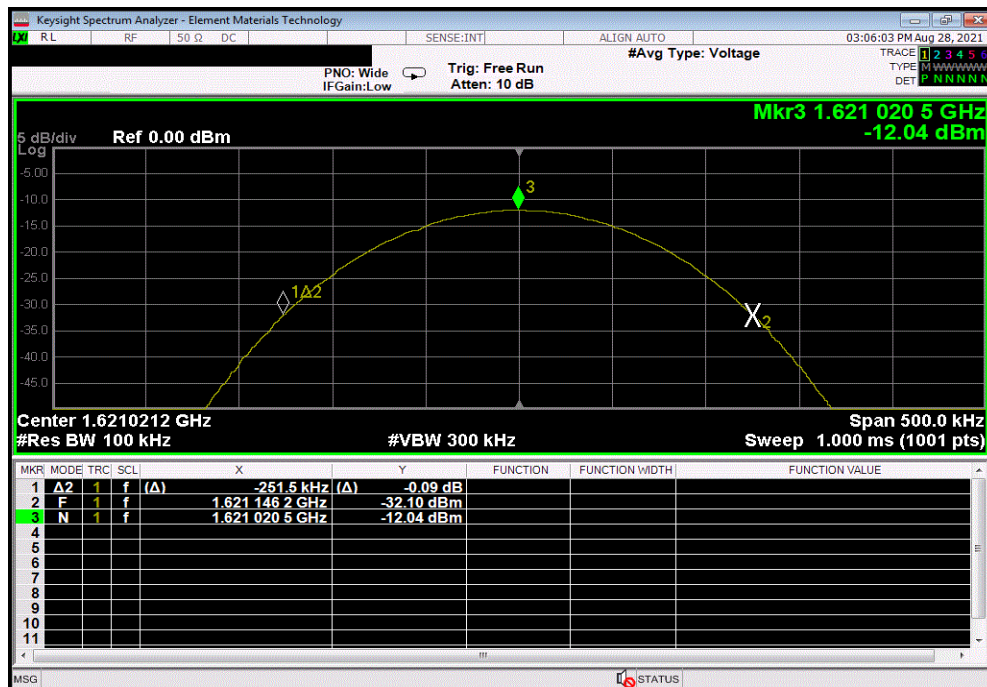


XMR 2020.12.30.0

| Ch 121, 1621.020833 MHz, Nominal voltage, -10°C |               |              |                  |              |              |        |
|-------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                  | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621147200                                      | 1620896200    | 1621021700   | 1621020833       | 0.00005      | ≤ 0.001      | Pass   |



| Ch 121, 1621.020833 MHz, Nominal voltage, -20°C |               |              |                  |              |              |        |
|-------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                  | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621146200                                      | 1620894700    | 1621020450   | 1621020833       | 0.00002      | ≤ 0.001      | Pass   |

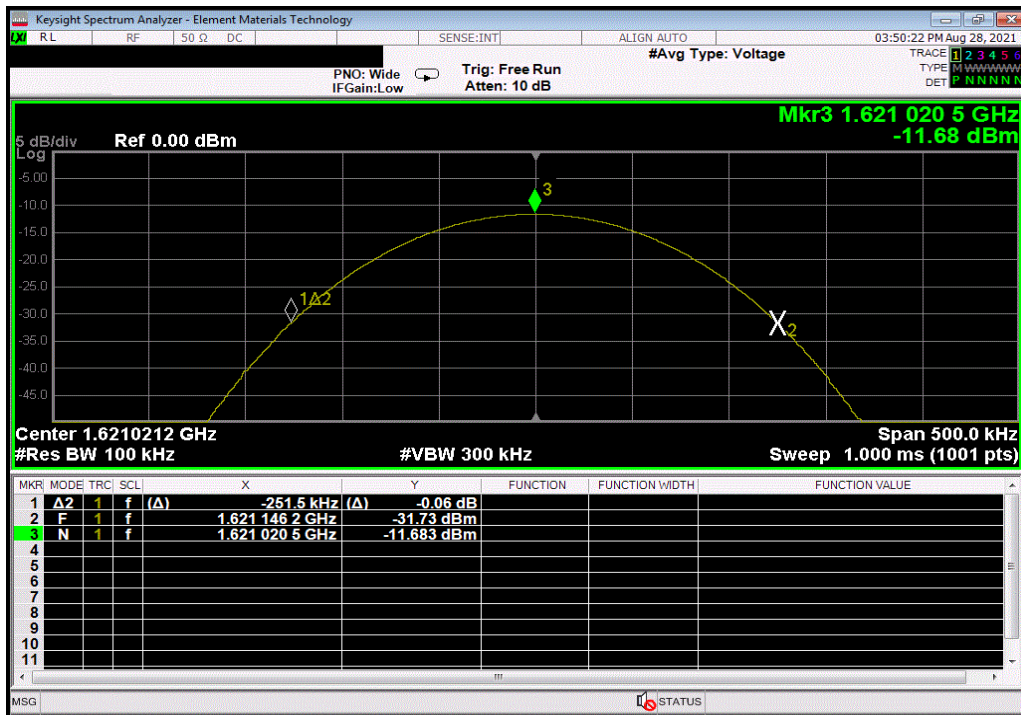


# FREQUENCY STABILITY



XMI 2020.12.30.0

| Ch 121, 1621.020833 MHz, Nominal voltage, -30°C |               |              |                  |              |              |        |
|-------------------------------------------------|---------------|--------------|------------------|--------------|--------------|--------|
| f_high<br>(Hz)                                  | f_low<br>(Hz) | Mean<br>(Hz) | Assigned<br>(Hz) | Error<br>(%) | Limit<br>(%) | Result |
| 1621146200                                      | 1620894700    | 1621020450   | 1621020833       | 0.00002      | ≤ 0.001      | Pass   |



# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS



XMit 2020.12.30.0

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   |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Cable                        | Micro-Coax         | UFD150A-1-0720-200200 | EVH | 2021-03-14 | 2022-03-14 |
| Attenuator                   | Fairview Microwave | SA18N5WA-30           | TLE | 2020-07-24 | 2021-07-24 |
| Attenuator                   | Fairview Microwave | SA18N5WA-20           | TWD | 2021-02-16 | 2022-02-16 |
| Block - DC                   | Fairview Microwave | SD3074                | AMF | NCR        | NCR        |
| Generator - Signal           | Agilent            | E8257D                | TGX | 2020-01-07 | 2022-01-07 |
| Analyzer - Spectrum Analyzer | Agilent            | E4440A                | AFE | 2021-04-08 | 2022-04-08 |

## TEST DESCRIPTION

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. For each transmit frequency, the spectrum investigated up to the 10<sup>th</sup> harmonic. The spectrum analyzer was configured with an RBW and VBW of 1 MHz and 3 MHz respectfully with the trace set to max hold using an RMS detector. The highest emission in each band was noted and compared to the limit.

# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS



TSTx 2021.03.19.1 XMR 2020.12.30.0

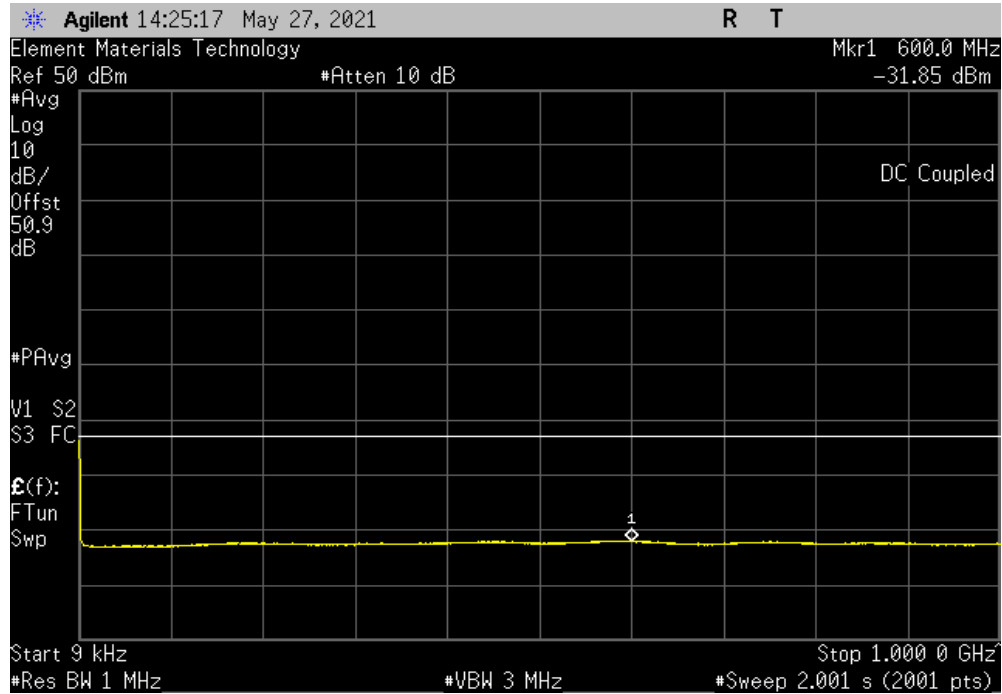
|                                           |                        |                                                                                             |                 |
|-------------------------------------------|------------------------|---------------------------------------------------------------------------------------------|-----------------|
| EUT: SHOUT sp Handheld Iridium Smartphone |                        | Work Order: PCTE0003                                                                        |                 |
| Serial Number: FCC 1                      |                        | Date: 27-May-21                                                                             |                 |
| Customer: NAL Research Corporation        |                        | Temperature: 23 °C                                                                          |                 |
| Attendees: None                           |                        | Humidity: 46.2% RH                                                                          |                 |
| Project: None                             |                        | Barometric Pres.: 1024 mbar                                                                 |                 |
| Tested by: Jeff Alcock                    | Power: 5.0 VDC via USB | Job Site: EV06                                                                              |                 |
| TEST SPECIFICATIONS                       |                        |                                                                                             |                 |
| FCC 25:2021                               |                        | Test Method: ANSI C63.26:2015                                                               |                 |
| COMMENTS                                  |                        |                                                                                             |                 |
| None                                      |                        |                                                                                             |                 |
| DEVIATIONS FROM TEST STANDARD             |                        |                                                                                             |                 |
| None                                      |                        |                                                                                             |                 |
| Configuration #                           | 2                      | Signature  |                 |
|                                           | Frequency Range        | Measured Freq (MHz)                                                                         | Max Value (dBm) |
|                                           |                        |                                                                                             | Limit (dBm)     |
|                                           |                        |                                                                                             | Result          |
| Transmit, DE-QPSK                         |                        |                                                                                             |                 |
| Low Ch. 1, 1616.020833 MHz                | 9 kHz - 1 GHz          | 600                                                                                         | -31.85          |
| Low Ch. 1, 1616.020833 MHz                | 1 GHz - 12.5 GHz       | 7509                                                                                        | -28.44          |
| Low Ch. 1, 1616.020833 MHz                | 12.5 GHz - 17 GHz      | 15004.25                                                                                    | -27.04          |
| Mid Ch. 121, 1621.020833 MHz              | 9 kHz - 1 GHz          | 592.5                                                                                       | -31.81          |
| Mid Ch. 121, 1621.020833 MHz              | 1 GHz - 12.5 GHz       | 7497.5                                                                                      | -28.54          |
| Mid Ch. 121, 1621.020833 MHz              | 12.5 GHz - 17 GHz      | 15886.25                                                                                    | -26.96          |
| High Ch. 240, 1625.979167 MHz             | 9 kHz - 1 GHz          | 589                                                                                         | -31.84          |
| High Ch. 240, 1625.979167 MHz             | 1 GHz - 12.5 GHz       | 7520.5                                                                                      | -28.59          |
| High Ch. 240, 1625.979167 MHz             | 12.5 GHz - 17 GHz      | 15897.5                                                                                     | -27.06          |

# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

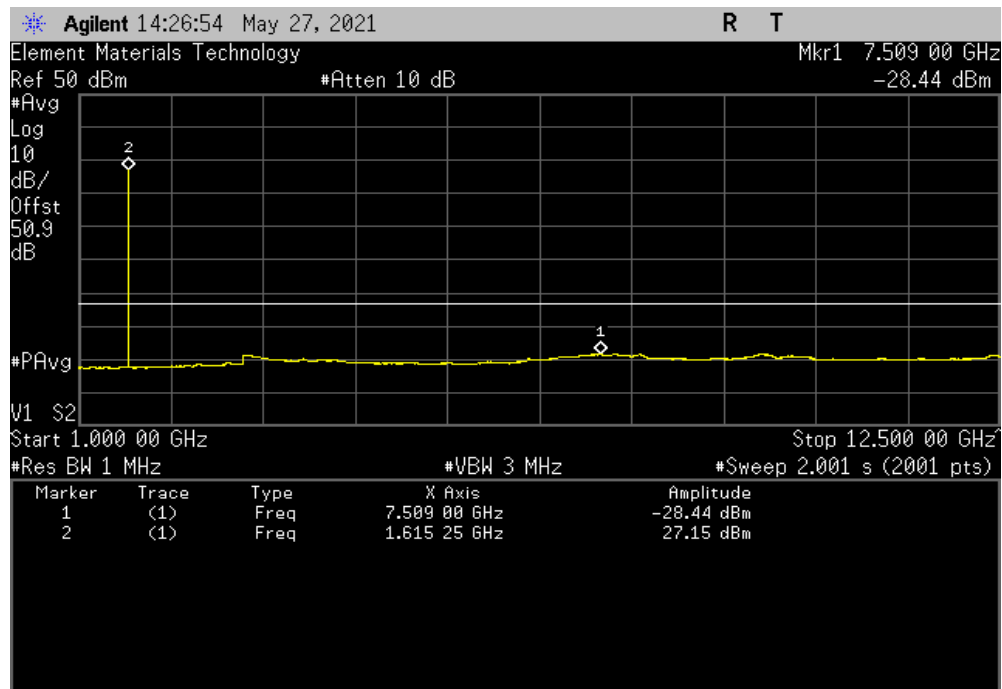


TbTx 2021.03.19.1 XM8 2020.12.30.0

| Transmit, DE-QPSK, Low Ch. 1, 1616.020833 MHz |                     |                 |             |        |  |
|-----------------------------------------------|---------------------|-----------------|-------------|--------|--|
| Frequency Range                               | Measured Freq (MHz) | Max Value (dBm) | Limit (dBm) | Result |  |
| 9 kHz - 1 GHz                                 | 600                 | -31.85          | -13         | Pass   |  |



| Transmit, DE-QPSK, Low Ch. 1, 1616.020833 MHz |                     |                 |             |        |  |
|-----------------------------------------------|---------------------|-----------------|-------------|--------|--|
| Frequency Range                               | Measured Freq (MHz) | Max Value (dBm) | Limit (dBm) | Result |  |
| 1 GHz - 12.5 GHz                              | 7509                | -28.44          | -13         | Pass   |  |

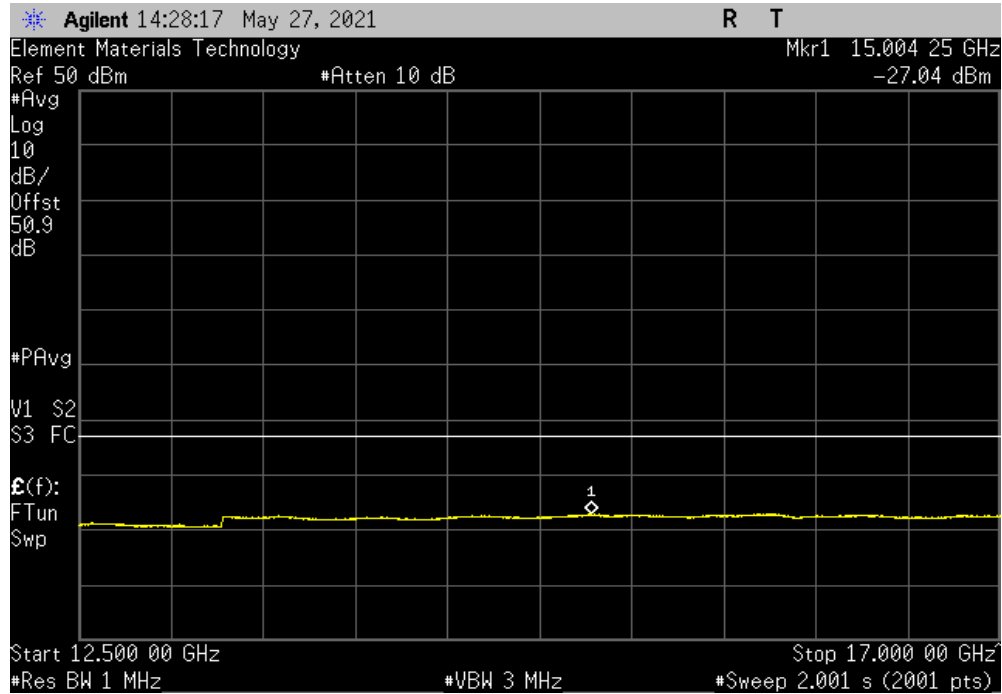


# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

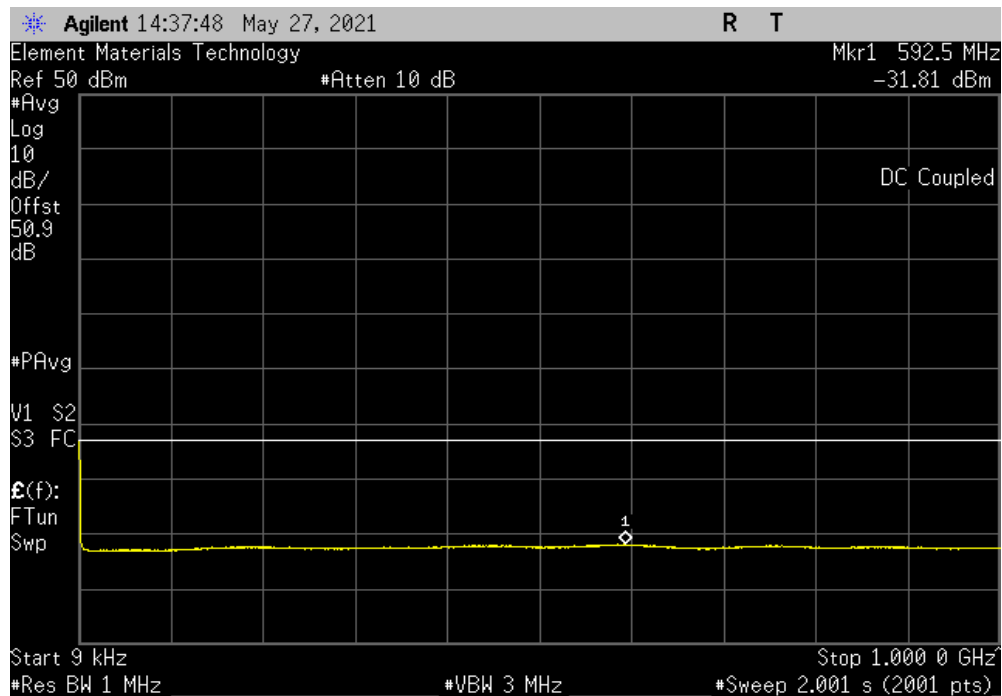


TbTx 2021.03.19.1 XM8 2020.12.30.0

| Transmit, DE-QPSK, Low Ch. 1, 1616.020833 MHz |                     |                 |             |        |  |
|-----------------------------------------------|---------------------|-----------------|-------------|--------|--|
| Frequency Range                               | Measured Freq (MHz) | Max Value (dBm) | Limit (dBm) | Result |  |
| 12.5 GHz - 17 GHz                             | 15004.25            | -27.04          | -13         | Pass   |  |



| Transmit, DE-QPSK, Mid Ch. 121, 1621.020833 MHz |                     |                 |             |        |  |
|-------------------------------------------------|---------------------|-----------------|-------------|--------|--|
| Frequency Range                                 | Measured Freq (MHz) | Max Value (dBm) | Limit (dBm) | Result |  |
| 9 kHz - 1 GHz                                   | 592.5               | -31.81          | -13         | Pass   |  |

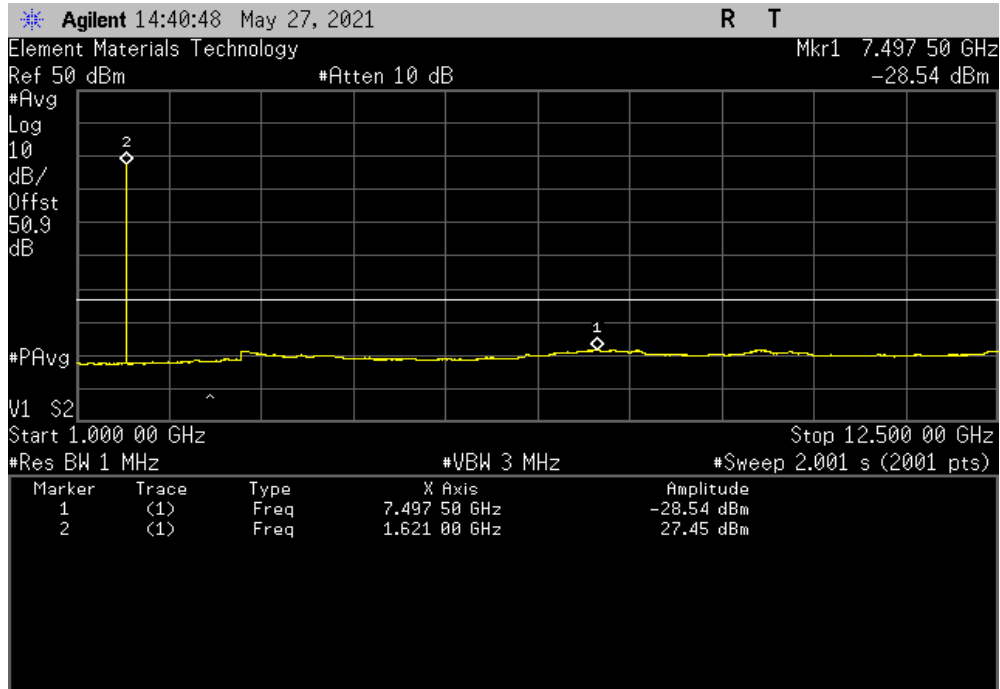


# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

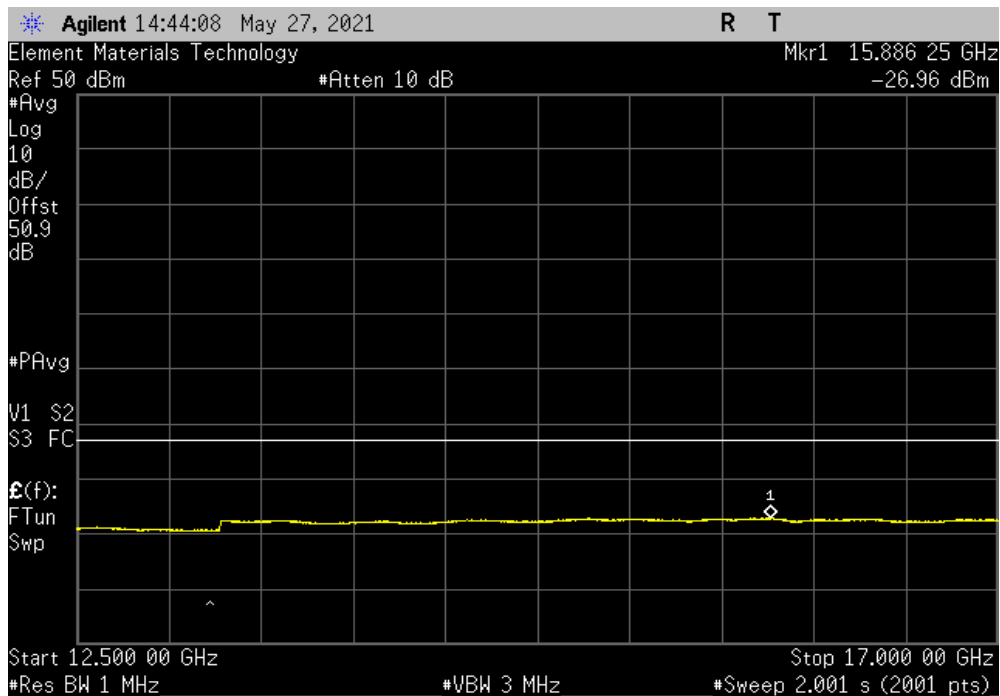


TUTx 2021.03.10.1 XMR 2020.12.30.0

| Transmit, DE-QPSK, Mid Ch. 121, 1621.020833 MHz |                     |                 |             |        |  |
|-------------------------------------------------|---------------------|-----------------|-------------|--------|--|
| Frequency Range                                 | Measured Freq (MHz) | Max Value (dBm) | Limit (dBm) | Result |  |
| 1 GHz - 12.5 GHz                                | 7497.5              | -28.54          | -13         | Pass   |  |



| Transmit, DE-QPSK, Mid Ch. 121, 1621.020833 MHz |                     |                 |             |        |  |
|-------------------------------------------------|---------------------|-----------------|-------------|--------|--|
| Frequency Range                                 | Measured Freq (MHz) | Max Value (dBm) | Limit (dBm) | Result |  |
| 12.5 GHz - 17 GHz                               | 15886.25            | -26.96          | -13         | Pass   |  |

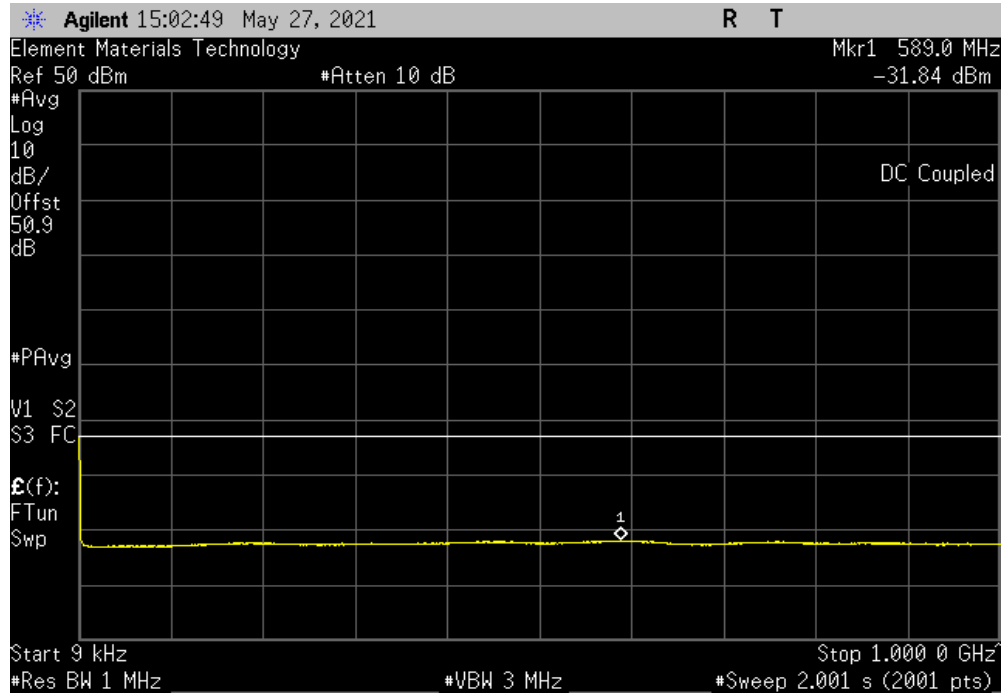


# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

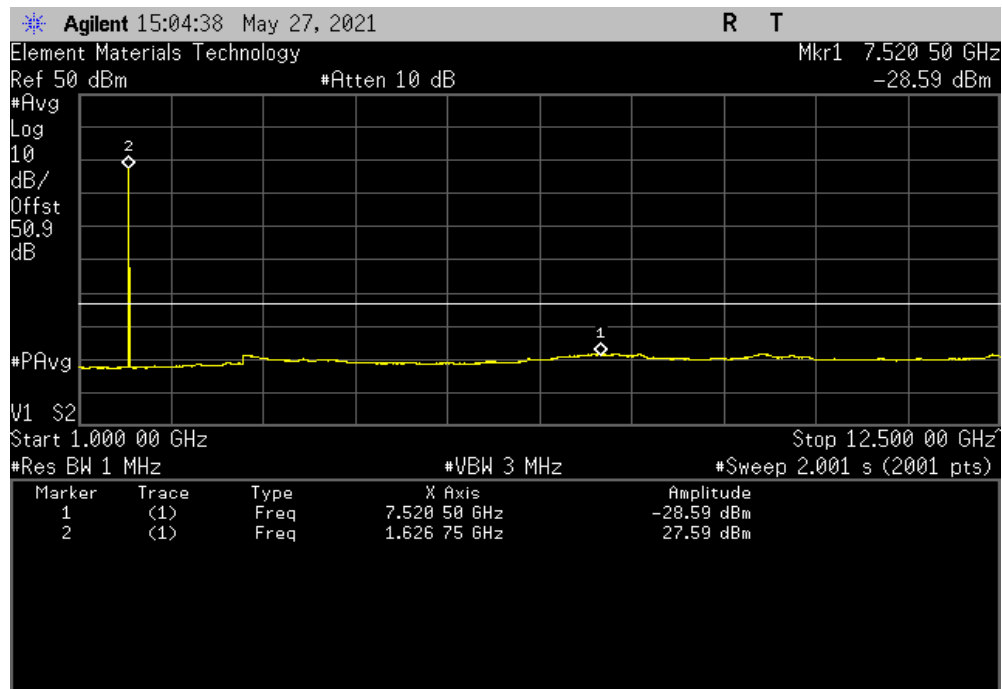


TbTx 2021.03.10.1 XMt 2020.12.30.0

| Transmit, DE-QPSK, High Ch. 240, 1625.979167 MHz |                     |                 |             |        |  |
|--------------------------------------------------|---------------------|-----------------|-------------|--------|--|
| Frequency Range                                  | Measured Freq (MHz) | Max Value (dBm) | Limit (dBm) | Result |  |
| 9 kHz - 1 GHz                                    | 589                 | -31.84          | -13         | Pass   |  |



| Transmit, DE-QPSK, High Ch. 240, 1625.979167 MHz |                     |                 |             |        |  |
|--------------------------------------------------|---------------------|-----------------|-------------|--------|--|
| Frequency Range                                  | Measured Freq (MHz) | Max Value (dBm) | Limit (dBm) | Result |  |
| 1 GHz - 12.5 GHz                                 | 7520.5              | -28.59          | -13         | Pass   |  |

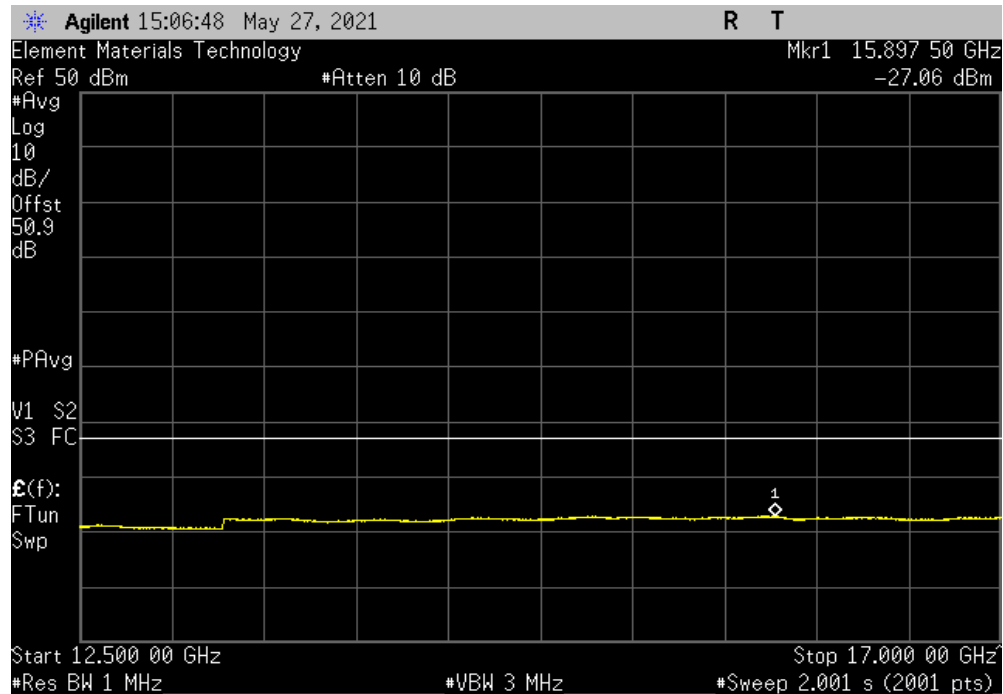


# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS



TbTx 2021.03.19.1 XMt 2020.12.30.0

| Transmit, DE-QPSK, High Ch. 240, 1625.979167 MHz |                     |                 |             |        |  |
|--------------------------------------------------|---------------------|-----------------|-------------|--------|--|
| Frequency Range                                  | Measured Freq (MHz) | Max Value (dBm) | Limit (dBm) | Result |  |
| 12.5 GHz - 17 GHz                                | 15897.5             | -27.06          | -13         | Pass   |  |



# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS - EMISSIONS MASK



XMit 2020.12.30.0

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   |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Analyzer - Spectrum Analyzer | Agilent            | N9010A                | AFO | 2021-07-06 | 2022-07-06 |
| Generator - Signal           | Agilent            | N5181A                | TIG | 2020-04-16 | 2023-04-16 |
| Block - DC                   | Fairview Microwave | SD3379                | AMW | 2021-07-06 | 2022-07-06 |
| Attenuator                   | S.M Electronics    | SA26B-20              | AUY | 2021-03-14 | 2022-03-14 |
| Attenuator                   | Fairview Microwave | 18B5W-26              | RFZ | 2021-07-16 | 2022-07-16 |
| Cable                        | Micro-Coax         | UFD150A-1-0720-200200 | EVK | 2021-03-14 | 2022-03-14 |

## TEST DESCRIPTION

The EUT was transmitting at its default max power using the channels and modes called out in the following data sheets. The spectrum analyzer was configured to a RBW and VBW of 3 kHz and 9.1 kHz respectfully with the trace set to max hold using and RMS detector. An additional reference level offset was added to make the resultant measurement relative to any 4kHz band as per the requirement as called out in 25.202(f).

The mask specified in clause 25.202(f) was applied using an authorized bandwidth of 41.667 kHz.

1. In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: 25 dB;
2. In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: 35 dB;
3. In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: An amount equal to 43 dB plus 10 times the logarithm (to the base 10) of the transmitter power in watts;

# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS - EMISSIONS MASK



XMIT 2020.12.30.0

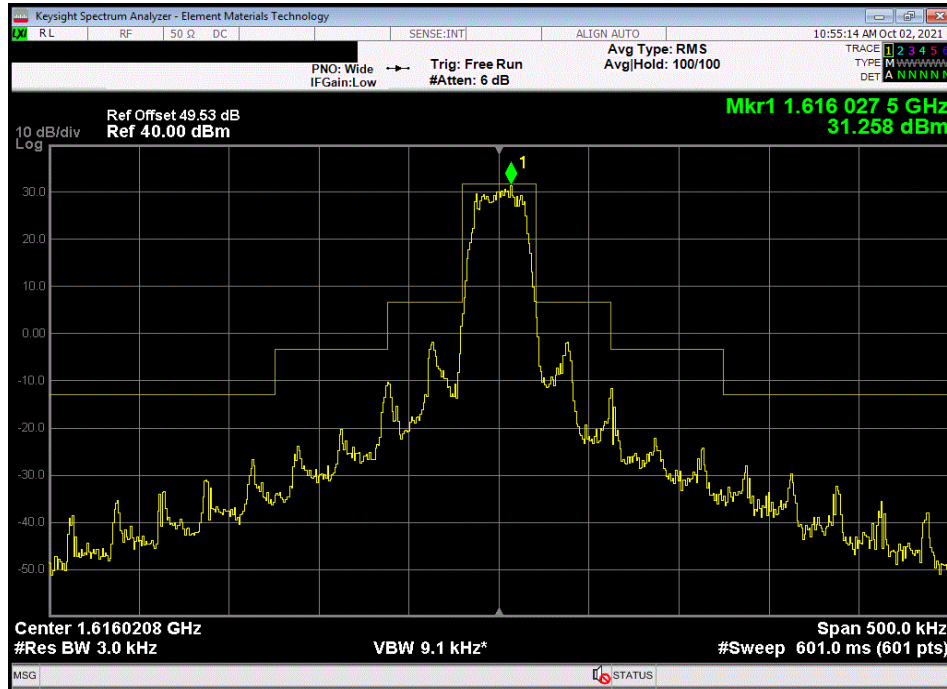
|                                                                                                                                                                                                                                                                                                           |                        |                                                                                             |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------|--------|
| EUT: SHOUT sp Handheld Iridium Smartphone                                                                                                                                                                                                                                                                 |                        | Work Order: PCTE0003                                                                        |        |
| Serial Number: FCC 1                                                                                                                                                                                                                                                                                      |                        | Date: 1-Oct-21                                                                              |        |
| Customer: NAL Research Corporation                                                                                                                                                                                                                                                                        |                        | Temperature: 22.5                                                                           |        |
| Attendees: None                                                                                                                                                                                                                                                                                           |                        | Humidity: 44%                                                                               |        |
| Project: None                                                                                                                                                                                                                                                                                             |                        | Barometric Pres.: 1018.6 mbar                                                               |        |
| Tested by: Jeff Alcock                                                                                                                                                                                                                                                                                    | Power: 5.0 VDC via USB | Job Site: EV06                                                                              |        |
| TEST SPECIFICATIONS                                                                                                                                                                                                                                                                                       |                        |                                                                                             |        |
| FCC 25:2021                                                                                                                                                                                                                                                                                               |                        | Test Method                                                                                 |        |
|                                                                                                                                                                                                                                                                                                           |                        | ANSI C63.26:2015                                                                            |        |
| COMMENTS                                                                                                                                                                                                                                                                                                  |                        |                                                                                             |        |
| Reference level offset includes: DC block, attenuation, measurement cable, and an additional correction for reduced RBW. The additional correction was calculated using $10 \cdot \log(\text{specified RBW} / \text{measurement RBW}) = 10 \cdot \log(4 \text{ kHz} / 3 \text{ kHz}) = 1.25 \text{ dB}$ . |                        |                                                                                             |        |
| DEVIATIONS FROM TEST STANDARD                                                                                                                                                                                                                                                                             |                        |                                                                                             |        |
| None                                                                                                                                                                                                                                                                                                      |                        |                                                                                             |        |
| Configuration #                                                                                                                                                                                                                                                                                           | 2                      | Signature  |        |
|                                                                                                                                                                                                                                                                                                           |                        | Value                                                                                       | Limit  |
| Tx, DE-QPSK                                                                                                                                                                                                                                                                                               |                        |                                                                                             | Result |
| Low Ch. 1, 1616.020833 MHz                                                                                                                                                                                                                                                                                |                        | See Graph                                                                                   | Pass   |
| Mid Ch. 121, 1621.020833 MHz                                                                                                                                                                                                                                                                              |                        | See Graph                                                                                   | Pass   |
| High Ch. 240, 1625.979167 MHz                                                                                                                                                                                                                                                                             |                        | See Graph                                                                                   | Pass   |

# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS - EMISSIONS MASK

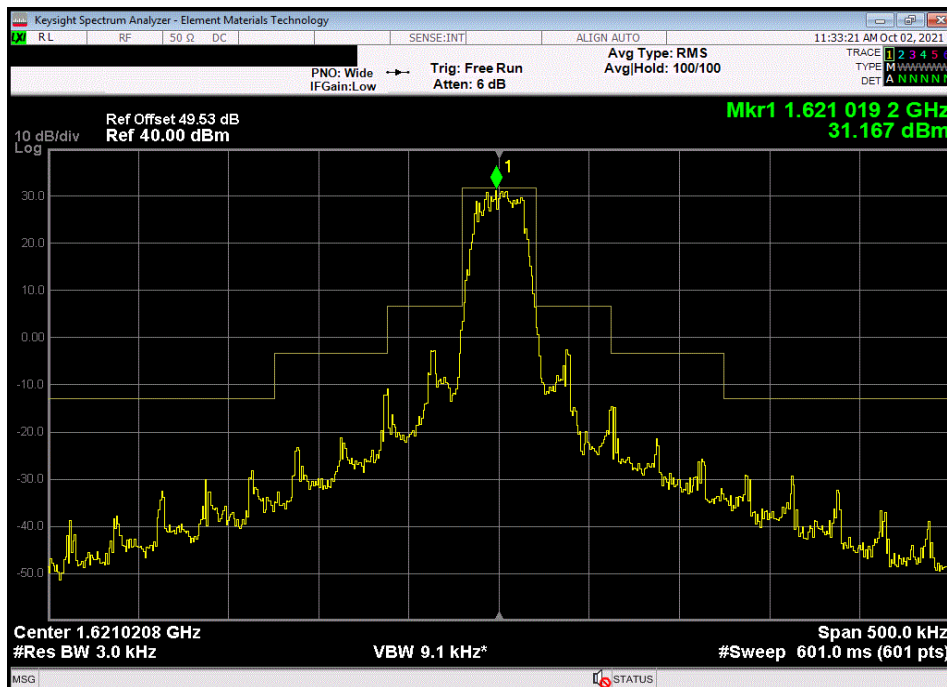


XMR 2020.12.30.0

| Tx, DE-QPSK, Low Ch. 1, 1616.020833 MHz |  |  |  |           |           |        |
|-----------------------------------------|--|--|--|-----------|-----------|--------|
|                                         |  |  |  | Value     | Limit     | Result |
|                                         |  |  |  | See Graph | See Graph | Pass   |



| Tx, DE-QPSK, Mid Ch. 121, 1621.020833 MHz |  |  |  |           |           |        |
|-------------------------------------------|--|--|--|-----------|-----------|--------|
|                                           |  |  |  | Value     | Limit     | Result |
|                                           |  |  |  | See Graph | See Graph | Pass   |



# SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS - EMISSIONS MASK



XMR 2020.12.30.0

| Tx, DE-QPSK, High Ch. 240, 1625.979167 MHz |  |  |  |           |           |        |
|--------------------------------------------|--|--|--|-----------|-----------|--------|
|                                            |  |  |  | Value     | Limit     | Result |
|                                            |  |  |  | See Graph | See Graph | Pass   |



# LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS FOR PROTECTION OF AERONAUTICAL RADIONAVIGATION-SATELLITE SERVICE



XMIT 2020.12.30.0

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   |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Cable                        | Micro-Coax         | UFD150A-1-0720-200200 | EVK | 2021-03-14 | 2022-03-14 |
| Block - DC                   | Fairview Microwave | SD3379                | AMW | 2021-03-14 | 2022-03-14 |
| Attenuator                   | Fairview Microwave | SA18N5WA-6            | TYT | 2021-07-22 | 2022-07-22 |
| Analyzer - Spectrum Analyzer | Keysight           | N9010A                | AFO | 2021-07-06 | 2022-07-06 |
| Generator - Signal           | Agilent            | N5181A                | TIG | 2020-04-16 | 2023-04-16 |

## TEST DESCRIPTION

The EUT was set to transmit at its maximum power using the modulation as described by the manufacturer. Antenna port emissions were measured at the RF output terminal of the EUT via a cable, attenuation and DC block on the RF input of the spectrum analyzer.

Analyzer plots collected in the 1559 – 1605 MHz band-segments with the EUT transmitting using the following parameters:

- 70 dBW / MHz EIRP
- 80 dBW / kHz EIRP

Analyzer plots collected in the 1605 – 1610 MHz band-segments with the EUT transmitting using the following parameters:

- 70 dBW / MHz EIRP at 1605 MHz to -10 dBW / MHz EIRP at 1610 MHz
- 80 dBW / kHz EIRP at 1605 MHz to -20 dBW / kHz EIRP at 1610 MHz

Analyzer plot was collected in the following band with the EUT configured to standby / carrier off state:

- 80 dBW / MHz EIRP at 1559 MHz to 1610 MHz

# LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS FOR PROTECTION OF AERONAUTICAL RADIONAVIGATION- SATELLITE SERVICE



XMIT 2020.12.30.0

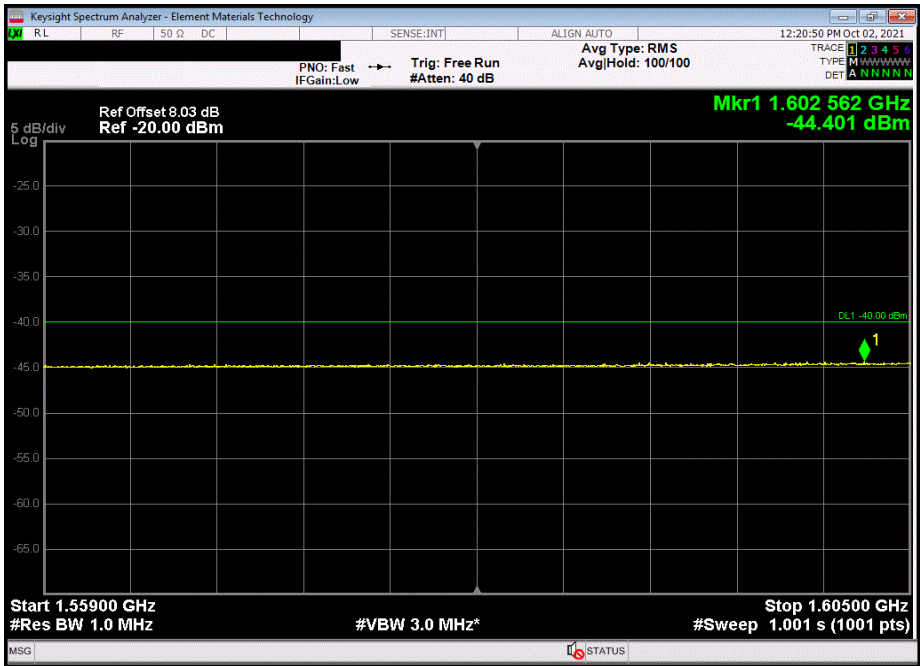
|                                                                                                            |   |                                                                                             |        |
|------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------------------------------|--------|
| EUT: SHOUT sp Handheld Iridium Smartphone                                                                  |   | Work Order: PCTE0003                                                                        |        |
| Serial Number: FCC 1                                                                                       |   | Date: 1-Oct-21                                                                              |        |
| Customer: NAL Research Corporation                                                                         |   | Temperature: 23.2 °C                                                                        |        |
| Attendees: None                                                                                            |   | Humidity: 46.1% RH                                                                          |        |
| Project: None                                                                                              |   | Barometric Pres.: 1024 mbar                                                                 |        |
| Tested by: Jeff Alcock                                                                                     |   | Power: 5.0 VDC via USB                                                                      |        |
| Job Site: EV06                                                                                             |   |                                                                                             |        |
| TEST SPECIFICATIONS                                                                                        |   | Test Method                                                                                 |        |
| FCC 25:2021                                                                                                |   | ANSI C63.26:2015                                                                            |        |
| COMMENTS                                                                                                   |   |                                                                                             |        |
| Reference level offset includes: DC block, 6 dB attenuation, measurement cable, and the EUTs antenna gain. |   |                                                                                             |        |
| DEVIATIONS FROM TEST STANDARD                                                                              |   |                                                                                             |        |
| Configuration #                                                                                            | 2 | Signature  |        |
|                                                                                                            |   | Value                                                                                       | Limit  |
| Transmit, DE-QPSK                                                                                          |   |                                                                                             | Result |
| Low Ch. 1616.020833 MHz                                                                                    |   |                                                                                             |        |
| 1559 - 1605 MHz, 1 MHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| 1559 - 1605 MHz, 1 kHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| 1605 - 1610 MHz, 1 MHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| 1605 - 1610 MHz, 1 kHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| Mid Ch. 1621.020833 MHz                                                                                    |   |                                                                                             |        |
| 1559 - 1605 MHz, 1 MHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| 1559 - 1605 MHz, 1 kHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| 1605 - 1610 MHz, 1 MHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| 1605 - 1610 MHz, 1 kHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| High Ch. 1625.979167 MHz                                                                                   |   |                                                                                             |        |
| 1559 - 1605 MHz, 1 MHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| 1559 - 1605 MHz, 1 kHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| 1605 - 1610 MHz, 1 MHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| 1605 - 1610 MHz, 1 kHz RBW                                                                                 |   | See Graph                                                                                   | Pass   |
| Carrier off state                                                                                          |   |                                                                                             |        |
| 1559 MHz - 1610 MHz                                                                                        |   | See Graph                                                                                   | Pass   |

LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS  
FOR PROTECTION OF AERONAUTICAL  
RADIONAVIGATION-SATELLITE SERVICE

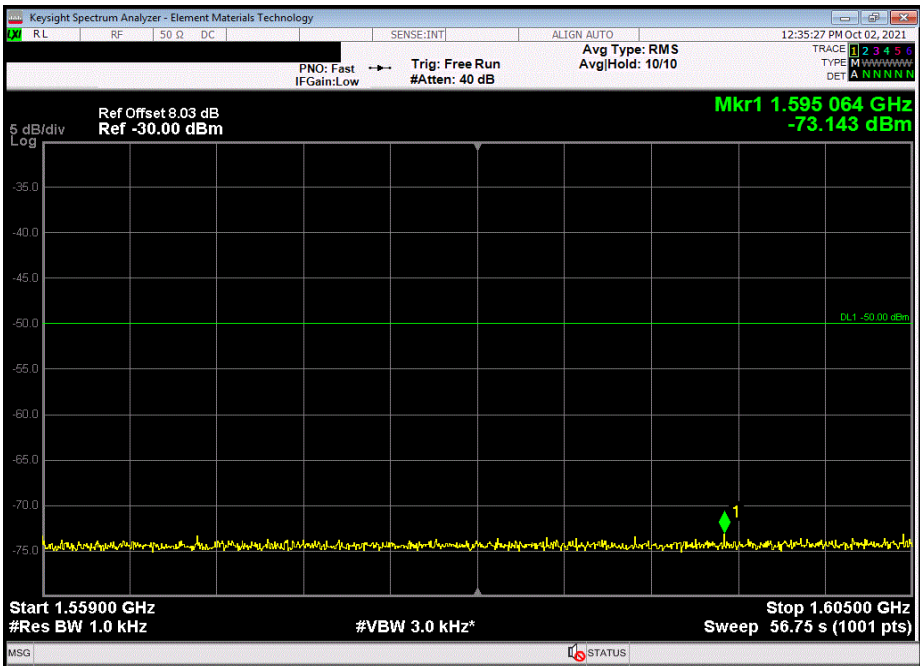


XMII 2020.12.30.0

| Transmit, DE-QPSK, Low Ch. 1616.020833 MHz, 1559 - 1605 MHz, 1 MHz RBW |  |  |  |           |           |        |
|------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                        |  |  |  | Value     | Limit     | Result |
|                                                                        |  |  |  | See Graph | See Graph | Pass   |



| Transmit, DE-QPSK, Low Ch. 1616.020833 MHz, 1559 - 1605 MHz, 1 kHz RBW |  |  |  |           |           |        |
|------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                        |  |  |  | Value     | Limit     | Result |
|                                                                        |  |  |  | See Graph | See Graph | Pass   |

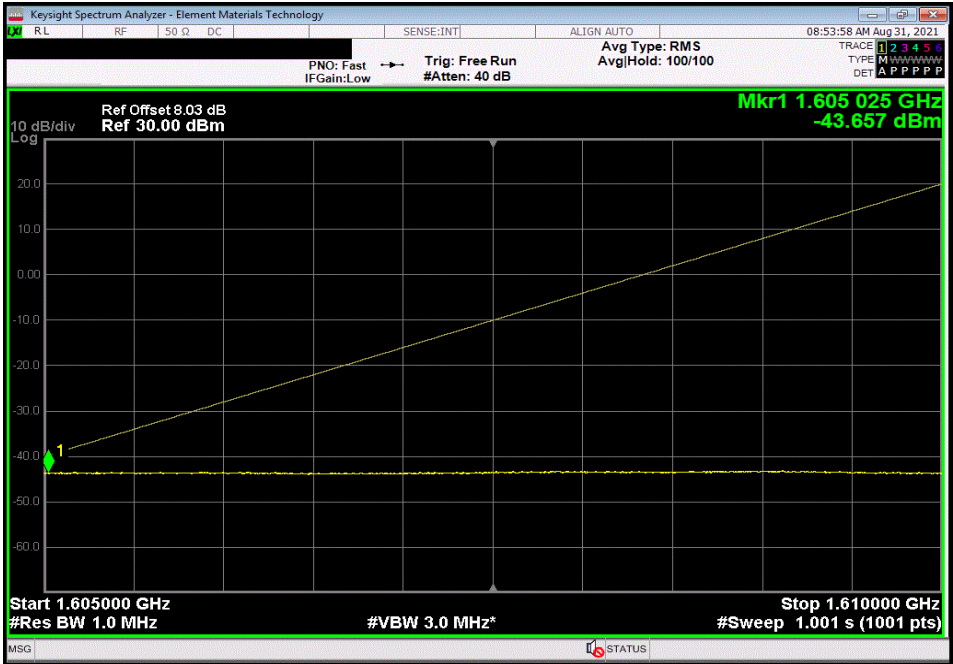


# LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS FOR PROTECTION OF AERONAUTICAL RADIONAVIGATION-SATELLITE SERVICE

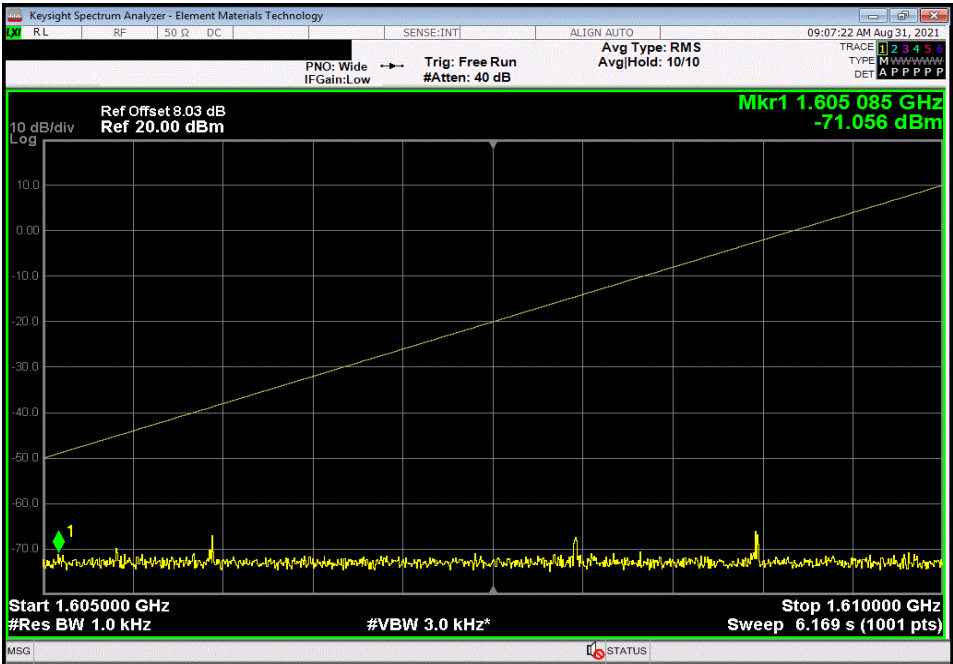


XMII 2020.12.30.0

| Transmit, DE-QPSK, Low Ch. 1616.020833 MHz, 1605 - 1610 MHz, 1 MHz RBW |  |  |  |           |           |        |
|------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                        |  |  |  | Value     | Limit     | Result |
|                                                                        |  |  |  | See Graph | See Graph | Pass   |



| Transmit, DE-QPSK, Low Ch. 1616.020833 MHz, 1605 - 1610 MHz, 1 kHz RBW |  |  |  |           |           |        |
|------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                        |  |  |  | Value     | Limit     | Result |
|                                                                        |  |  |  | See Graph | See Graph | Pass   |

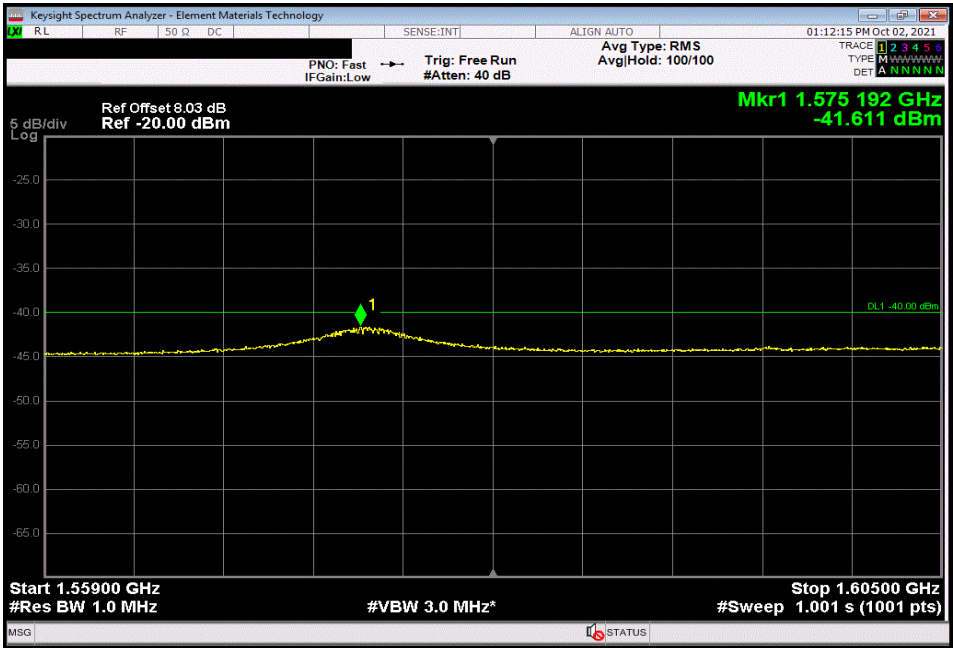


# LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS FOR PROTECTION OF AERONAUTICAL RADIONAVIGATION-SATELLITE SERVICE

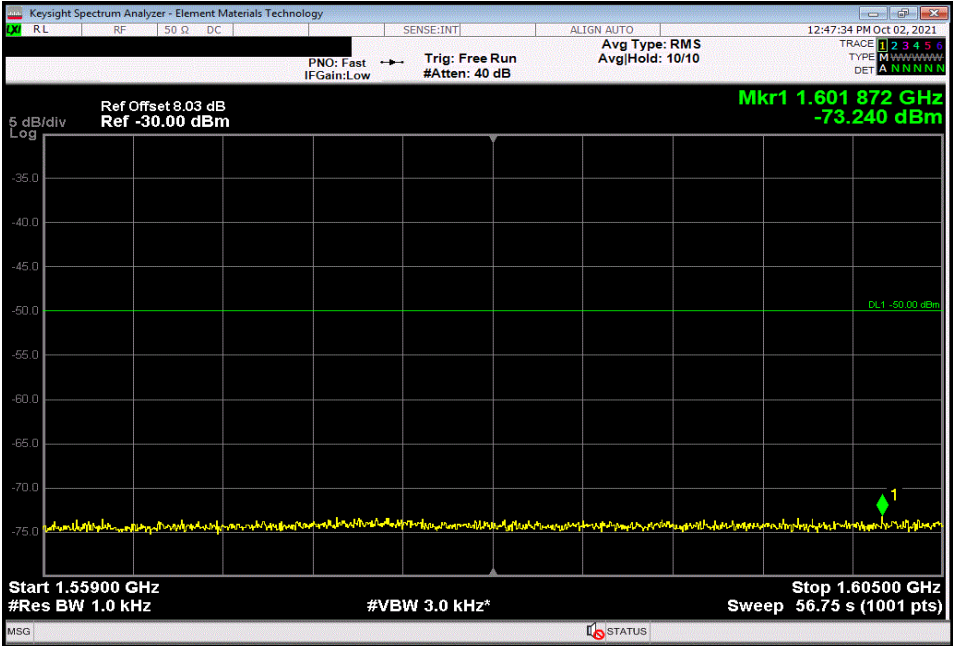


XMII 2020.12.30.0

| Transmit, DE-QPSK, Mid Ch. 1621.020833 MHz, 1559 - 1605 MHz, 1 MHz RBW |  |  |  |           |           |        |
|------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                        |  |  |  | Value     | Limit     | Result |
|                                                                        |  |  |  | See Graph | See Graph | Pass   |



| Transmit, DE-QPSK, Mid Ch. 1621.020833 MHz, 1559 - 1605 MHz, 1 kHz RBW |  |  |  |           |           |        |
|------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                        |  |  |  | Value     | Limit     | Result |
|                                                                        |  |  |  | See Graph | See Graph | Pass   |

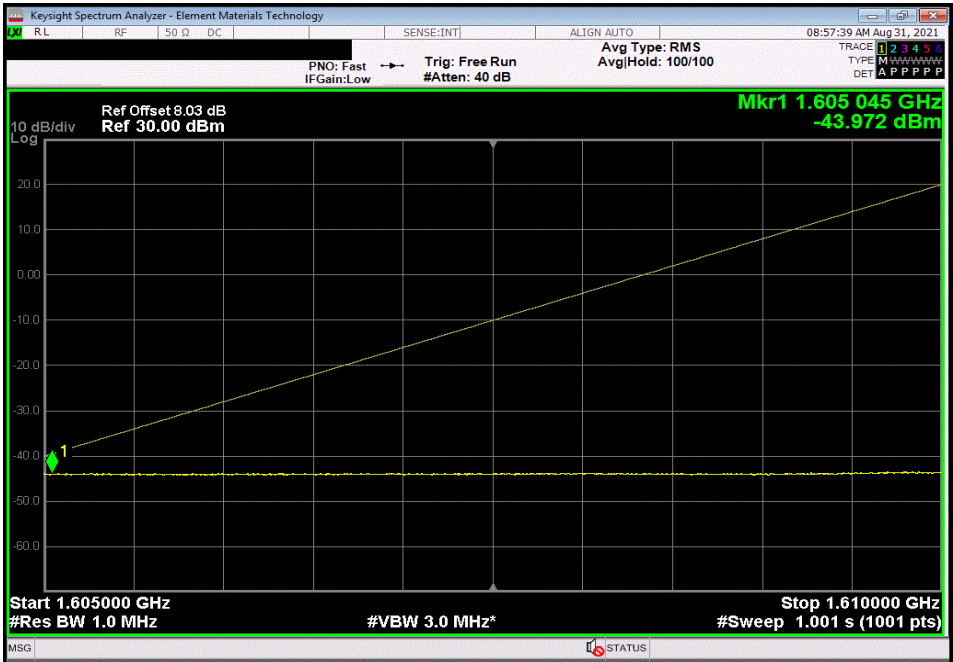


LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS  
FOR PROTECTION OF AERONAUTICAL  
RADIONAVIGATION-SATELLITE SERVICE

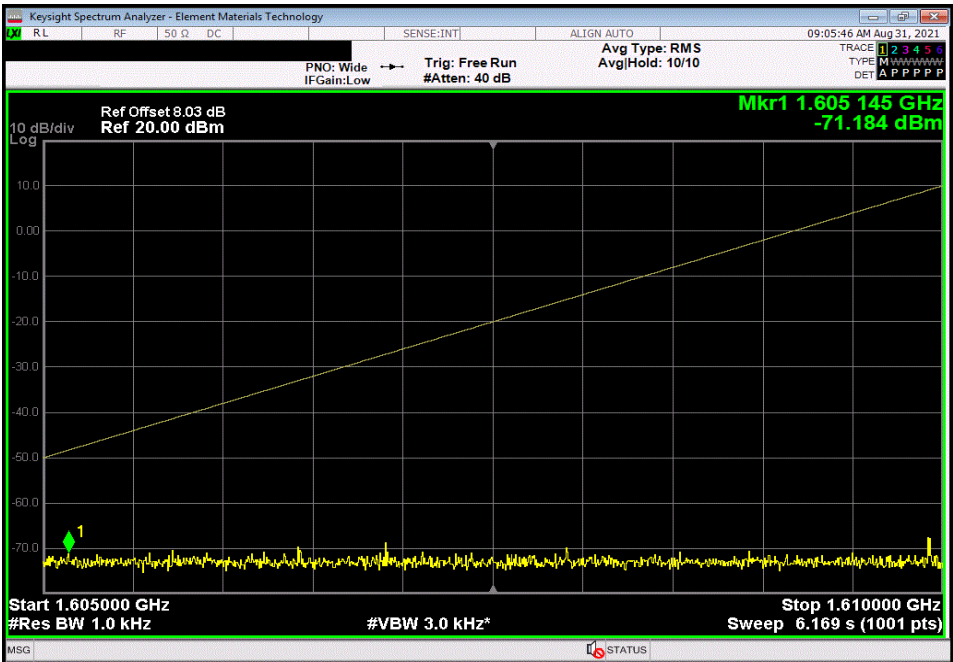


XMII 2020.12.30.0

| Transmit, DE-QPSK, Mid Ch. 1621.020833 MHz, 1605 - 1610 MHz, 1 MHz RBW |  |  |  |           |           |        |
|------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                        |  |  |  | Value     | Limit     | Result |
|                                                                        |  |  |  | See Graph | See Graph | Pass   |



| Transmit, DE-QPSK, Mid Ch. 1621.020833 MHz, 1605 - 1610 MHz, 1 kHz RBW |  |  |  |           |           |        |
|------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                        |  |  |  | Value     | Limit     | Result |
|                                                                        |  |  |  | See Graph | See Graph | Pass   |

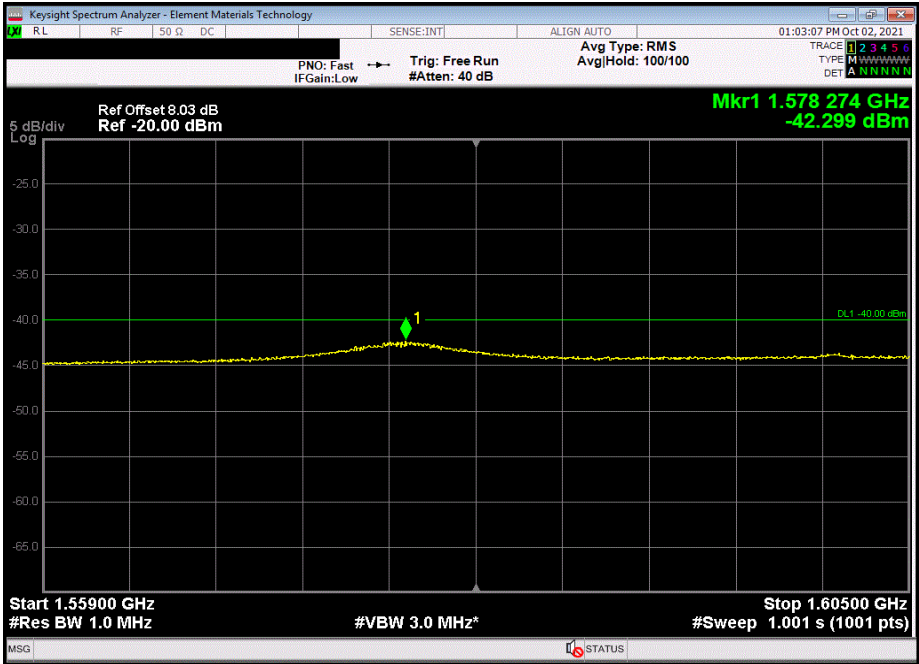


# LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS FOR PROTECTION OF AERONAUTICAL RADIONAVIGATION-SATELLITE SERVICE

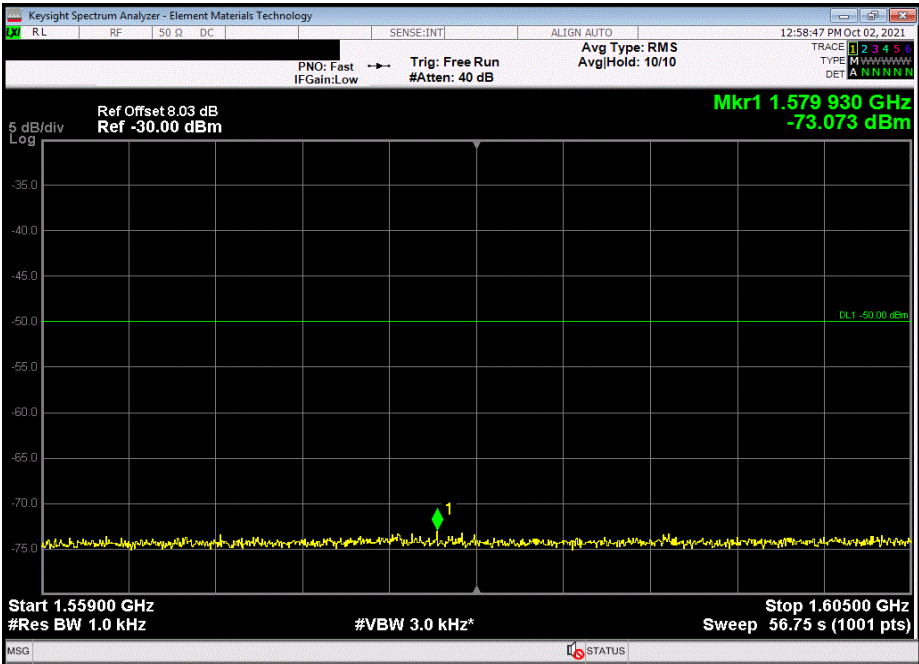


XMII 2020.12.30.0

| Transmit, DE-QPSK, High Ch. 1625.979167 MHz, 1559 - 1605 MHz, 1 MHz RBW |  |  |  |           |           |        |
|-------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                         |  |  |  | Value     | Limit     | Result |
|                                                                         |  |  |  | See Graph | See Graph | Pass   |



| Transmit, DE-QPSK, High Ch. 1625.979167 MHz, 1559 - 1605 MHz, 1 kHz RBW |  |  |  |           |           |        |
|-------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                         |  |  |  | Value     | Limit     | Result |
|                                                                         |  |  |  | See Graph | See Graph | Pass   |

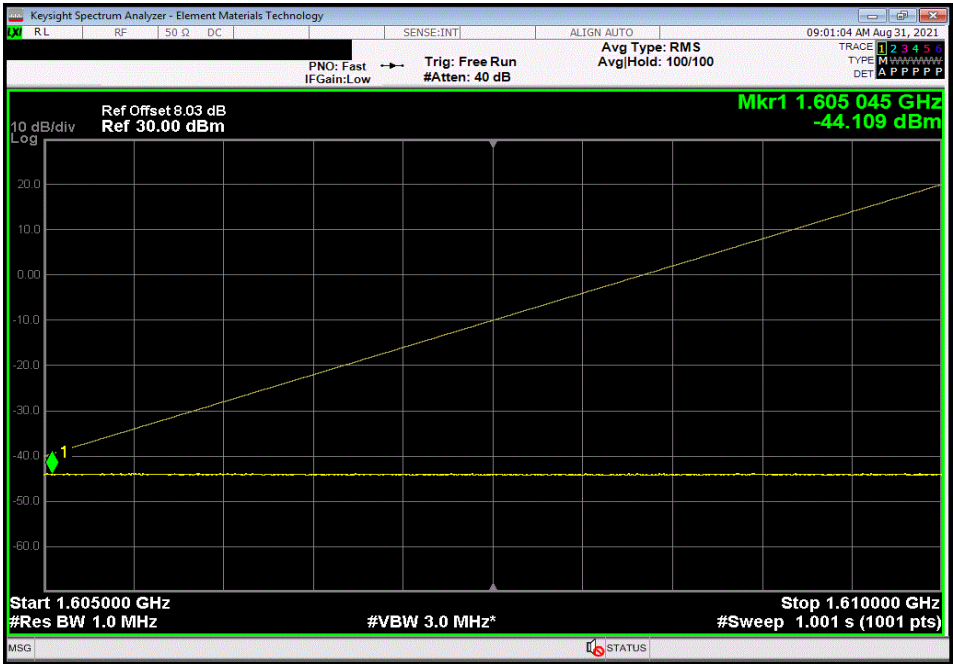


LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS  
FOR PROTECTION OF AERONAUTICAL  
RADIONAVIGATION-SATELLITE SERVICE

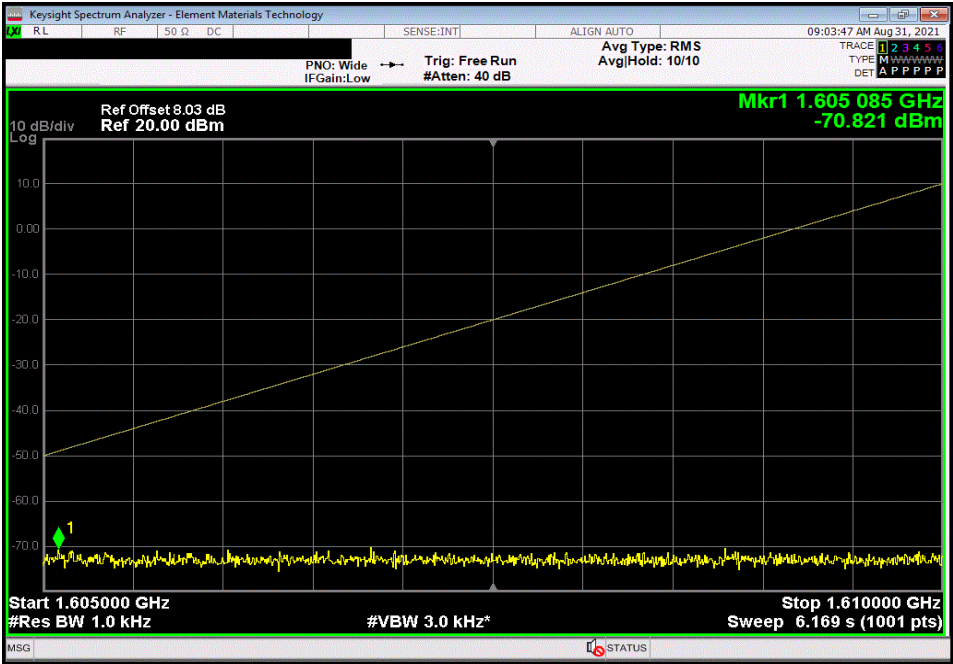


XMII 2020.12.30.0

| Transmit, DE-QPSK, High Ch. 1625.979167 MHz, 1605 - 1610 MHz, 1 MHz RBW |  |  |  |           |           |        |
|-------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                         |  |  |  | Value     | Limit     | Result |
|                                                                         |  |  |  | See Graph | See Graph | Pass   |



| Transmit, DE-QPSK, High Ch. 1625.979167 MHz, 1605 - 1610 MHz, 1 kHz RBW |  |  |  |           |           |        |
|-------------------------------------------------------------------------|--|--|--|-----------|-----------|--------|
|                                                                         |  |  |  | Value     | Limit     | Result |
|                                                                         |  |  |  | See Graph | See Graph | Pass   |

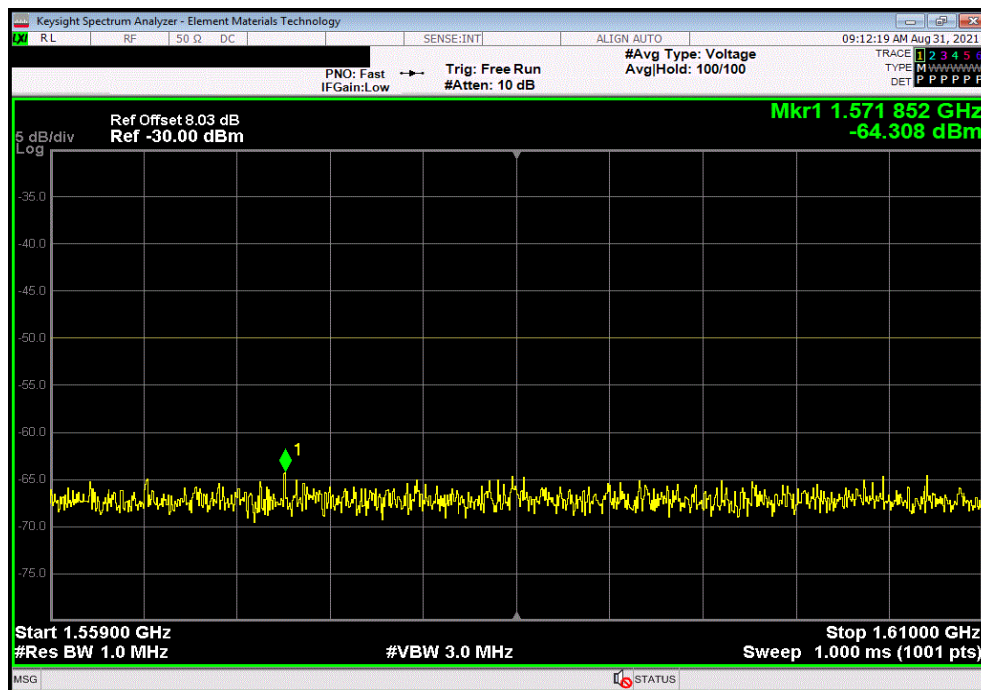


# LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS FOR PROTECTION OF AERONAUTICAL RADIONAVIGATION-SATELLITE SERVICE



XMIT 2020.12.30.0

| Carrier off state, 1559 MHz - 1610 MHz |  |  |  |           |           |        |
|----------------------------------------|--|--|--|-----------|-----------|--------|
|                                        |  |  |  | Value     | Limit     | Result |
|                                        |  |  |  | See Graph | See Graph | Pass   |



End of Test Report