



Onity Inc.

Passport

FCC 15.247:2023

902 - 928 MHz FHSS Transceiver

Report: ONIT0101.3 Rev. 2, Issue Date: June 30, 2023



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CERTIFICATE OF TEST

Last Date of Test: February 16, 2023

Onity Inc.

EUT: Passport

Radio Equipment Testing

Standards

| Specification | Method |
|-----------------|------------------|
| FCC 15.247:2023 | ANSI C63.10:2013 |

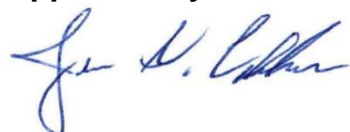
Results

| Method Clause | Test Description | Applied | Results | Comments |
|---------------|-------------------------------------|---------|---------|---|
| 6.2 | Powerline Conducted Emissions | No | N/A | Not required for a battery powered EUT. |
| 6.5, 6.6 | Spurious Radiated Emissions | Yes | Pass | |
| 7.5 | Duty Cycle | Yes | Pass | |
| 7.8.2 | Carrier Frequency Separation | Yes | Pass | |
| 7.8.3 | Number of Hopping Frequencies | Yes | Pass | |
| 7.8.4 | Dwell Time | Yes | Pass | |
| 7.8.5 | Output Power | Yes | Pass | |
| 7.8.5 | Equivalent Isotropic Radiated Power | Yes | Pass | |
| 7.8.6 | Band Edge Compliance | Yes | Pass | |
| 7.8.6 | Band Edge Compliance – Hopping Mode | Yes | Pass | |
| 7.8.7 | Emissions Bandwidth | Yes | Pass | |
| 7.8.7 | Occupied Bandwidth | Yes | Pass | |
| 7.8.8 | Spurious Conducted Emissions | Yes | Pass | |
| 11.10.3 | Power Spectral Density | Yes | Pass | |

Deviations From Test Standards

None

Approved By:



Johnny Candelas, 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 (yyyy-mm-dd) | Page Number |
|-----------------|--|----------------------|-----------------------------|
| 01 | Updated SN in the Spurious Radiated Emissions and removed 500KHz BW data | 2023-06-15 | 15, 62, 66, 67, 69, 79 – 83 |
| 02 | Added Power Spectral Density data. | 2023-06-30 | 75-79 |
| | Added Power Spectral Density to COT. | 2023-06-30 | 2 |
| | Removed 500kHz BW data from the OP data module. | 2023-06-30 | 36-40 |
| | Changed the limits in the band edge compliance - hopping mode to 30 dBc | 2023-06-30 | 50-53 |

ACCREDITATIONS AND AUTHORIZATIONS



United States

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

A2LA - 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.

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.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

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

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[Oregon](#)

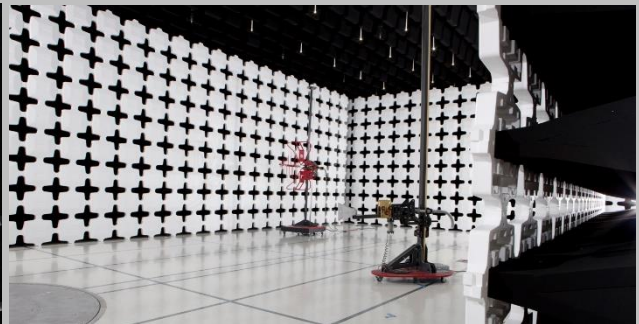
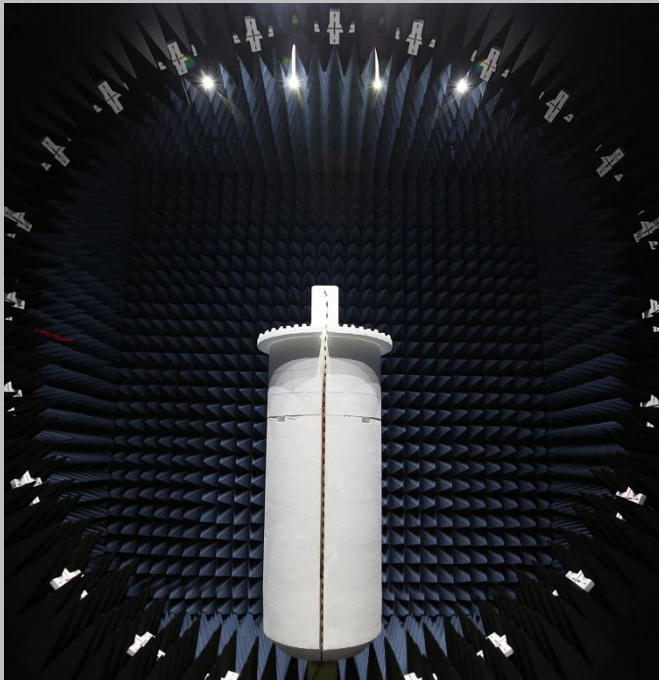
[Texas](#)

[Washington](#)

FACILITIES



| | | | | |
|---|---|---|--|---|
| California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918 | Minnesota Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136 | Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066 | Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255 | Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 98011 (425)984-6600 |
| A2LA | | | | |
| Lab Code: 3310.04 | Lab Code: 3310.05 | Lab Code: 3310.02 | Lab Code: 3310.03 | Lab Code: 3310.06 |
| Innovation, Science and Economic Development Canada | | | | |
| 2834B-1, 2834B-3 | 2834E-1, 2834E-3 | 2834D-1 | 2834G-1 | 2834F-1 |
| BSMI | | | | |
| SL2-IN-E-1154R | SL2-IN-E-1152R | SL2-IN-E-1017 | SL2-IN-E-1158R | SL2-IN-E-1153R |
| VCCI | | | | |
| A-0029 | A-0109 | A-0108 | A-0201 | A-0110 |
| Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA | | | | |
| 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 |

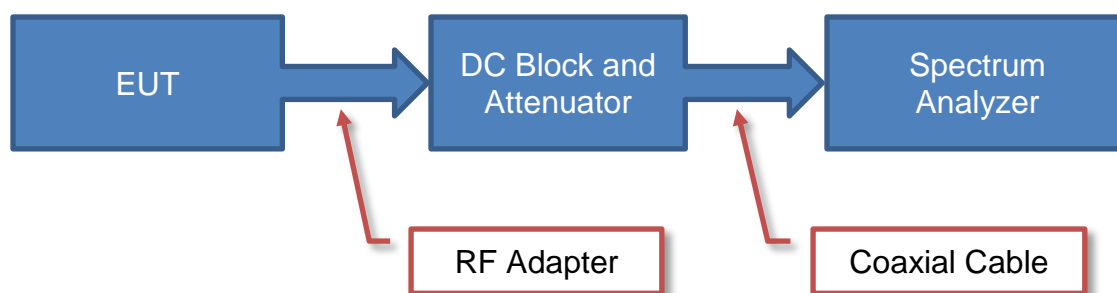
TEST SETUP BLOCK DIAGRAMS

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.

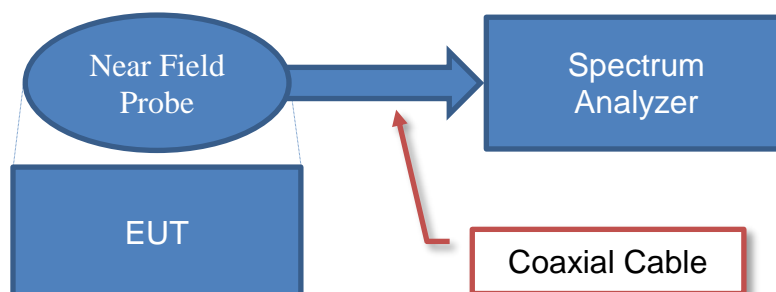
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

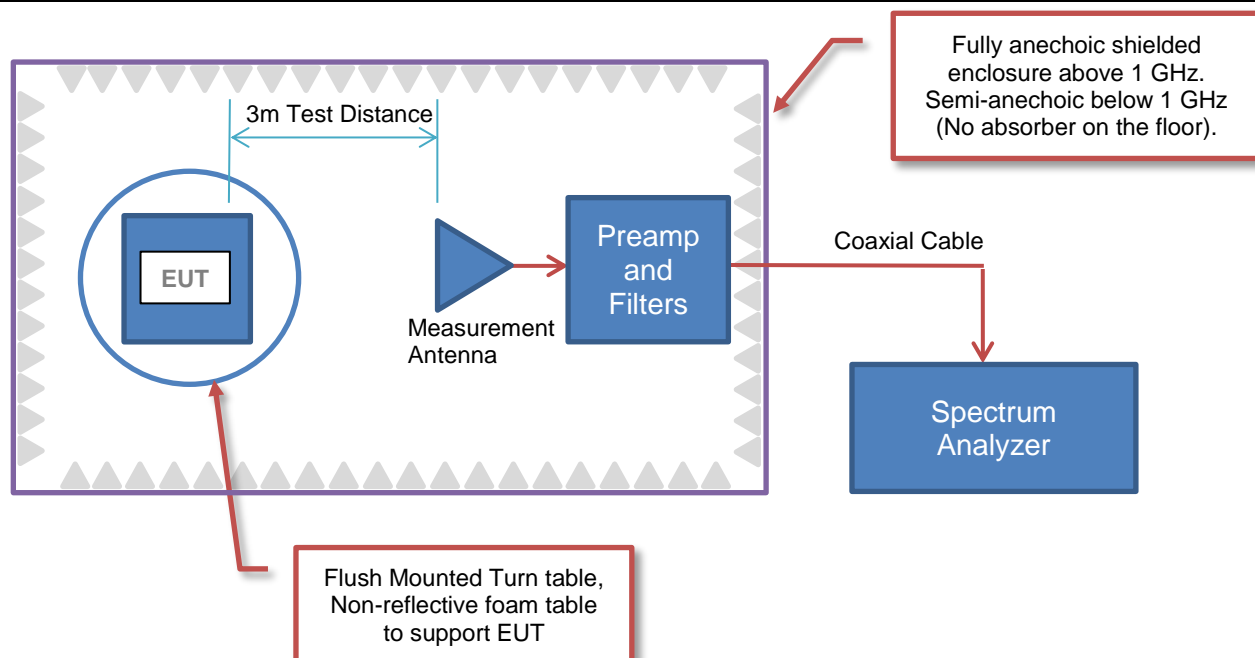


Sample Calculation (logarithmic units)

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

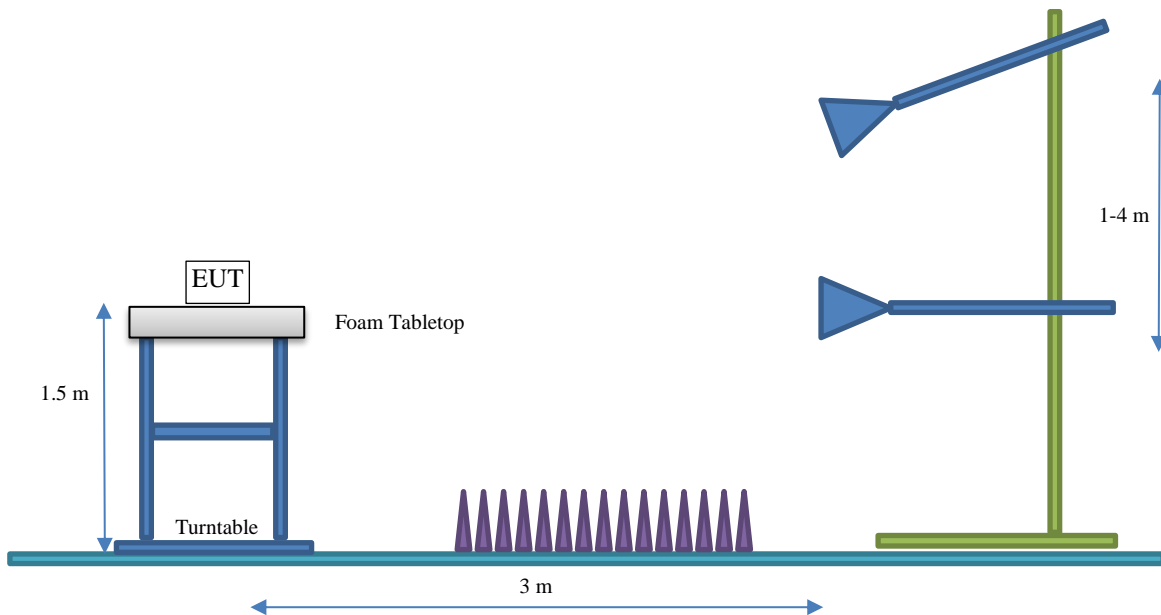
Radiated Power (ERP/EIRP) – Substitution Method:

| Measured Level into Substitution Antenna (Amplitude dBm) | Substitution Antenna Factor (dBi) | EIRP to ERP (if applicable) | Measured power (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: | Onity Inc. |
| Address: | 4001 Fairview Industrial Drive |
| City, State, Zip: | Salem, OR 97302 |
| Test Requested By: | Ali Elmi |
| EUT: | Passport |
| First Date of Test: | September 30, 2022 |
| Last Date of Test: | February 16, 2023 |
| Receipt Date of Samples: | September 30, 2022 |
| Equipment Design Stage: | Prototype |
| Equipment Condition: | No Damage |
| Purchase Authorization: | Verified |

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Electronic door lock - it can be operated by Bluetooth (2.4 GHz) or by LoRaWAN (868 MHz / 915 MHz), which is a Low Power Wide Area (LPWA), long ranging networking protocol designed to wirelessly connect battery operated devices to the internet in regional, national, or global networks.

SF8 500kHz mode/data rate will not be supported in final device per manufacturer.

Testing Objective:

Seeking to demonstrate compliance under FCC 15.247:2023 for operation in the 902 - 928 MHz Band.

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. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

| Type | Provided by: | Frequency Range (MHz) | Gain (dBi) |
|----------------------------------|--------------|-----------------------|------------|
| Ceramic Isolated Magnetic Dipole | ethertronics | 902 - 928 | 0.75 |

The EUT was tested using the power settings provided by the manufacturer which were based upon:

- ☒ Test software settings Test software/firmware installed on EUT: 99.025
☐ Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

| Channel Bandwidth (kHz) | Modulation Types / Data Rates | Type | Channel | Frequency (MHz) | Power Setting (dBm) |
|-------------------------|--|--------|---------|-----------------|---------------------|
| 125 | CSS / SF10, 0.98 kbps CSS / SF07, 5.47 kbps | Hybrid | 0 | 902.3 | 22 |
| | | | 32 | 908.7 | |
| | | | 63 | 914.9 | |

CONFIGURATIONS



Configuration ONIT0091- 2

| Software/Firmware Running During Test | |
|---------------------------------------|---------|
| Description | Version |
| BLE Firmware | 10.0.23 |
| TRFW Tester | None |

| EUT | | | |
|---|--------------|-------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Electronic door lock with BLE and LoRaWAN | Onity Inc. | Passport | 47155986 |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|--------------|-------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| iPad mini | Apple | MUQW2LL/A | DMPZKMCHLM93 |

Configuration ONIT0091- 3

| Software/Firmware Running During Test | |
|---------------------------------------|---------|
| Description | Version |
| TRFW Tester | None |
| LoRa Firmware | 99.0.25 |

| EUT | | | |
|---|--------------|-------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Electronic door lock with BLE and LoRaWAN | Onity Inc. | Passport | 44594524 |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|--------------|-------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| iPad mini | Apple | MUQW2LL/A | DMPZKMCHLM93 |

Configuration ONIT0091- 5

| Software/Firmware Running During Test | |
|---------------------------------------|---------|
| Description | Version |
| TRFW Tester | None |
| LoRa Firmware | 99.0.3 |

| EUT | | | |
|---|--------------|-------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| Electronic door lock with BLE and LoRaWAN | Onity Inc. | Passport | 44594549 |

| Remote Equipment Outside of Test Setup Boundary | | | |
|---|--------------|-------------------|---------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| iPad mini | Apple | MUQW2LL/A | DMPZKMCHLM93 |

MODIFICATIONS

Equipment Modifications

| Item | Date | Test | Modification | Note | Disposition of EUT |
|------|------------|-------------------------------------|--------------------------------------|---|---|
| 1 | 2022-09-30 | Duty Cycle | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 2 | 2022-09-30 | 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. |
| 3 | 2022-09-30 | 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. |
| 4 | 2022-09-30 | Equivalent Isotropic Radiated Power | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 5 | 2022-09-30 | Band Edge Compliance | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 6 | 2022-09-30 | Emissions 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. |
| 7 | 2022-09-30 | 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. |
| 8 | 2022-09-30 | Spurious Conducted Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 9 | 2022-10-03 | 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. |
| 10 | 2022-12-16 | Carrier Frequency Separation | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 11 | 2022-12-16 | Number of Hopping Frequencies | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 12 | 2023-02-16 | Dwell Time | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 13 | 2023-02-16 | Band Edge Compliance - Hopping Mode | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed. |

SPURIOUS RADIATED EMISSIONS

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies (in no-hop, single channel mode) and the modes as showed in the data sheets.

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

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

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

QP = Quasi-Peak Detector

PK = Peak Detector

AV = RMS Detector

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

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

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

RMS measurements taken for a FHSS radio also may have a duty cycle correction subtracted using the formula $10 \cdot \log(DC)$, where DC is the worst-case dwell time of the radio while in a hopping mode in a 100 ms period.

TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Cal. Due |
|------------------------------|-----------------|---------------------------|-----|------------|------------|
| Antenna - Biconilog | EMCO | 3142B | AXJ | 2021-03-03 | 2023-03-03 |
| Cable | N/A | Bilog Cables | EVA | 2022-11-03 | 2023-11-03 |
| Amplifier - Pre-Amplifier | Miteq | AM-1616-1000 | AOL | 2021-11-17 | 2022-11-17 |
| Analyzer - Spectrum Analyzer | Agilent | N9010A | AFI | 2021-12-09 | 2022-12-09 |
| Cable | N/A | Double Ridge Horn Cables | EVB | 2022-05-03 | 2023-05-03 |
| Amplifier - Pre-Amplifier | Miteq | AMF-3D-00100800-32-13P | PAG | 2022-05-03 | 2023-05-03 |
| Antenna - Standard Gain | ETS Lindgren | 3160-07 | AHU | NCR | NCR |
| Cable | None | Standard Gain Horn Cables | EVF | 2022-11-03 | 2023-11-03 |
| Amplifier - Pre-Amplifier | L-3 Narda-MITEQ | AMF-6F-08001200-30-10P | PAO | 2022-11-03 | 2023-11-03 |
| Antenna - Double Ridge | ETS Lindgren | 3115 | AIZ | 2022-03-02 | 2024-03-02 |

MEASUREMENT UNCERTAINTY

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

FREQUENCY RANGE INVESTIGATED

30 MHz TO 12400 MHz

POWER INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

ONIT0091-2

MODES INVESTIGATED

Continuous transmit LoRa, low ch. 0, 902.3MHz, mid ch. 32, 908.7 MHz & high ch. 63, 914.9 MHz. See data comments for bandwidth and spreading factor settings.

SPURIOUS RADIATED EMISSIONS

| | | | |
|-------------------|---------------|-----------------------|------------|
| EUT: | Passport | Work Order: | ONIT0091 |
| Serial Number: | 47155986 | Date: | 2022-10-03 |
| Customer: | Onity Inc. | Temperature: | 22.8°C |
| Attendees: | Ali Elmi | Relative Humidity: | 49.2% |
| Customer Project: | None | Bar. Pressure (PMSL): | 0 mb |
| Tested By: | Cole Ghizzone | Job Site: | EV01 |
| Power: | Battery | Configuration: | ONIT0091-2 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.247:2022 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|----|--------------------|---|---------------------|-----------|
| Run #: | 34 | Test Distance (m): | 3 | Ant. Height(s) (m): | 1 to 4(m) |
|--------|----|--------------------|---|---------------------|-----------|

COMMENTS

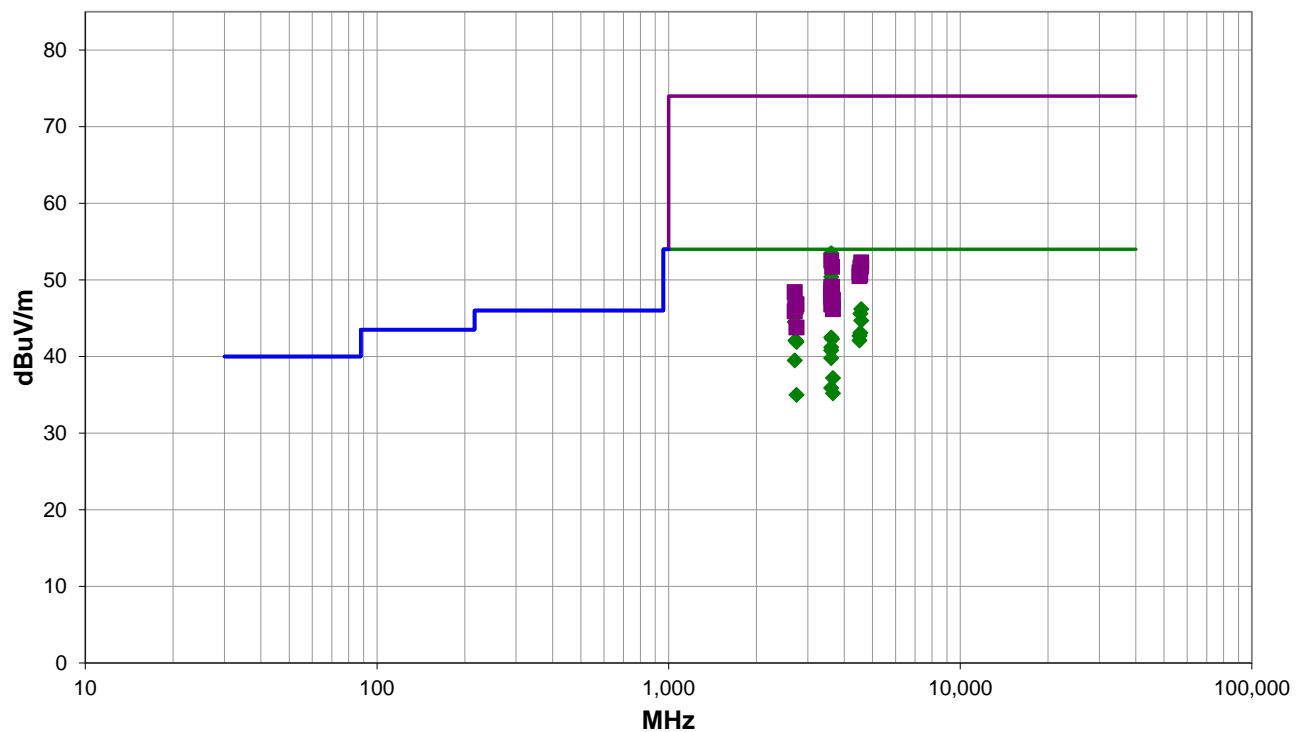
See data comments for EUT orientation. While operating with a spreading factor (SF) of 8, the measured duty cycle was 50.9%, all other data rates operated at > than 98% duty cycle. Any average measurements where the radio was operating with SF = 8 had a duty cycle correction factor (DCCF) added to them. $DCCF = 10 \cdot \log(1/0.509) = 2.9$

EUT OPERATING MODES

Continuous transmit LoRa, low ch. 0, 902.3MHz, mid ch. 32, 908.7 MHz & high ch. 63, 914.9 MHz. See data comments for spreading factor settings.

DEVIATIONS FROM TEST STANDARD

None



Run #: 34

PK AV QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #34

| Freq (MHz) | Amplitude (dBuV) | Factor (dB/m) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | DCCF (dB) | Polarity/Transducer | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|------------|------------------|---------------|-------------------------|-------------------|------------------------|-----------|---------------------|----------|--------------------------|-------------------|----------------------|------------------------|---|
| 3609.358 | 44.9 | 5.5 | 1.0 | 206.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 50.4 | 54.0 | -3.6 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 3609.400 | 42.0 | 5.5 | 1.0 | 208.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 47.5 | 54.0 | -6.5 | Low channel, Vertical,125KHz BW, SF 10 |
| 3634.642 | 41.7 | 5.5 | 1.5 | 9.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 47.2 | 54.0 | -6.8 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 4574.767 | 37.9 | 8.3 | 1.08 | 209.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 46.2 | 54.0 | -7.8 | High Channel, Horizontal,125KHz BW, SF 10 |
| 4543.717 | 37.4 | 8.2 | 2.44 | 191.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 45.6 | 54.0 | -8.4 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 4574.800 | 36.4 | 8.3 | 1.39 | 251.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 44.7 | 54.0 | -9.3 | High Channel, Horizontal,125KHz BW, SF 10 |
| 2706.967 | 44.4 | 0.1 | 1.5 | 155.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 44.5 | 54.0 | -9.5 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 4543.383 | 34.9 | 8.2 | 1.5 | 42.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 43.1 | 54.0 | -10.9 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 4511.692 | 34.5 | 8.2 | 1.0 | 211.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 42.7 | 54.0 | -11.3 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 3609.283 | 37.0 | 5.5 | 1.0 | 7.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 42.5 | 54.0 | -11.5 | Low Channel, Horizontal,125KHz BW, SF 7 |
| 3634.925 | 36.8 | 5.5 | 1.32 | 227.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 42.3 | 54.0 | -11.7 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 4511.808 | 33.9 | 8.2 | 1.5 | 259.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 42.1 | 54.0 | -11.9 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 2726.258 | 42.0 | 0.1 | 2.38 | 252.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 42.1 | 54.0 | -11.9 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 2726.158 | 42.0 | 0.1 | 1.5 | 150.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 42.1 | 54.0 | -11.9 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 2744.742 | 41.7 | 0.2 | 1.5 | 171.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 41.9 | 54.0 | -12.1 | High Channel, Horizontal,125KHz BW, SF 10 |
| 3609.292 | 35.7 | 5.5 | 1.0 | 303.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 41.2 | 54.0 | -12.8 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 3609.342 | 35.3 | 5.5 | 1.5 | 180.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 40.8 | 54.0 | -13.2 | Low Channel, On Side,125KHz BW, SF 10 |
| 3609.108 | 34.3 | 5.5 | 1.5 | 248.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 39.8 | 54.0 | -14.2 | Low channel, Vertical,125KHz BW, SF 10 |
| 2707.008 | 39.4 | 0.1 | 1.5 | 253.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 39.5 | 54.0 | -14.5 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 3659.275 | 31.7 | 5.5 | 1.0 | 1.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 37.2 | 54.0 | -16.8 | High Channel, Horizontal,125KHz BW, SF 10 |
| 3609.375 | 30.4 | 5.5 | 1.5 | 3.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 35.9 | 54.0 | -18.1 | Low Channel, On Side,125KHz BW, SF 10 |
| 3659.592 | 29.7 | 5.5 | 1.5 | 262.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 35.2 | 54.0 | -18.8 | High Channel, Horizontal,125KHz BW, SF 10 |
| 2744.675 | 34.8 | 0.2 | 1.5 | 254.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 35.0 | 54.0 | -19.0 | High Channel, Horizontal,125KHz BW, SF 10 |
| 3609.308 | 48.0 | 5.5 | 1.0 | 206.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 53.5 | 74.0 | -20.5 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 3609.625 | 47.0 | 5.5 | 1.0 | 208.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 52.5 | 74.0 | -21.5 | Low channel, Vertical,125KHz BW, SF 10 |
| 4574.325 | 44.0 | 8.3 | 1.08 | 209.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 52.3 | 74.0 | -21.7 | High Channel, Horizontal,125KHz BW, SF 10 |
| 4574.825 | 43.5 | 8.3 | 1.39 | 251.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 51.8 | 74.0 | -22.2 | High Channel, Horizontal,125KHz BW, SF 10 |
| 3634.517 | 46.2 | 5.5 | 1.5 | 9.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 51.7 | 74.0 | -22.3 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 4543.433 | 43.4 | 8.2 | 2.44 | 191.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 51.6 | 74.0 | -22.4 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 4511.700 | 42.8 | 8.2 | 1.0 | 211.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 51.0 | 74.0 | -23.0 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 4543.258 | 42.5 | 8.2 | 1.5 | 42.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 50.7 | 74.0 | -23.3 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 4511.817 | 42.3 | 8.2 | 1.5 | 259.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 50.5 | 74.0 | -23.5 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 3634.708 | 43.6 | 5.5 | 1.32 | 227.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 49.1 | 74.0 | -24.9 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 3609.583 | 43.6 | 5.5 | 1.0 | 7.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 49.1 | 74.0 | -24.9 | Low Channel, Horizontal,125KHz BW, SF 7 |
| 3609.167 | 43.2 | 5.5 | 1.0 | 303.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.7 | 74.0 | -25.3 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 2706.917 | 48.3 | 0.1 | 1.5 | 155.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 48.4 | 74.0 | -25.6 | Low Channel, Horizontal,125KHz BW, SF 10 |
| 3608.925 | 42.7 | 5.5 | 1.5 | 180.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.2 | 74.0 | -25.8 | Low Channel, On Side,125KHz BW, SF 10 |
| 3609.083 | 42.2 | 5.5 | 1.5 | 248.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 47.7 | 74.0 | -26.3 | Low channel, Vertical,125KHz BW, SF 10 |
| 3659.600 | 41.9 | 5.5 | 1.0 | 1.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 47.4 | 74.0 | -26.6 | High Channel, Horizontal,125KHz BW, SF 10 |
| 2725.942 | 46.8 | 0.1 | 2.38 | 252.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 46.9 | 74.0 | -27.1 | Mid Channel, Horizontal,125KHz BW, SF 10 |
| 3608.950 | 41.3 | 5.5 | 1.5 | 3.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 46.8 | 74.0 | -27.2 | Low Channel, On Side,125KHz BW, SF 10 |

SPURIOUS RADIATED EMISSIONS

| Freq (MHz) | Amplitude (dBuV) | Factor (dB/m) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | DCCF (dB) | Polarity/Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|------------|------------------|---------------|-------------------------|-------------------|------------------------|-----------|--------------------------|----------|--------------------------|-------------------|----------------------|------------------------|--|
| 2744.625 | 46.6 | 0.2 | 1.5 | 171.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 46.8 | 74.0 | -27.2 | High Channel, Horizontal, 125KHz BW, SF 10 |
| 2725.683 | 46.4 | 0.1 | 1.5 | 150.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 46.5 | 74.0 | -27.5 | Mid Channel, Horizontal, 125KHz BW, SF 10 |
| 3660.433 | 40.7 | 5.5 | 1.5 | 262.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 46.2 | 74.0 | -27.8 | High Channel, Horizontal, 125KHz BW, SF 10 |
| 2706.983 | 45.8 | 0.1 | 1.5 | 253.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 45.9 | 74.0 | -28.1 | Low Channel, Horizontal, 125KHz BW, SF 10 |
| 2744.617 | 43.6 | 0.2 | 1.5 | 254.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 43.8 | 74.0 | -30.2 | High Channel, Horizontal, 125KHz BW, SF 10 |

CONCLUSION

Pass



Tested By

DUTY CYCLE



XMIT 2022.02.07.0

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 |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Generator - Signal | Keysight | N5182B | TFU | 2020-11-20 | 2022-11-20 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVI | 2021-12-05 | 2022-12-05 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFO | 2022-09-08 | 2023-09-08 |

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

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

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


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

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

DUTY CYCLE



TbMTx 2022.06.03.0 XMI 2022.02.07.0

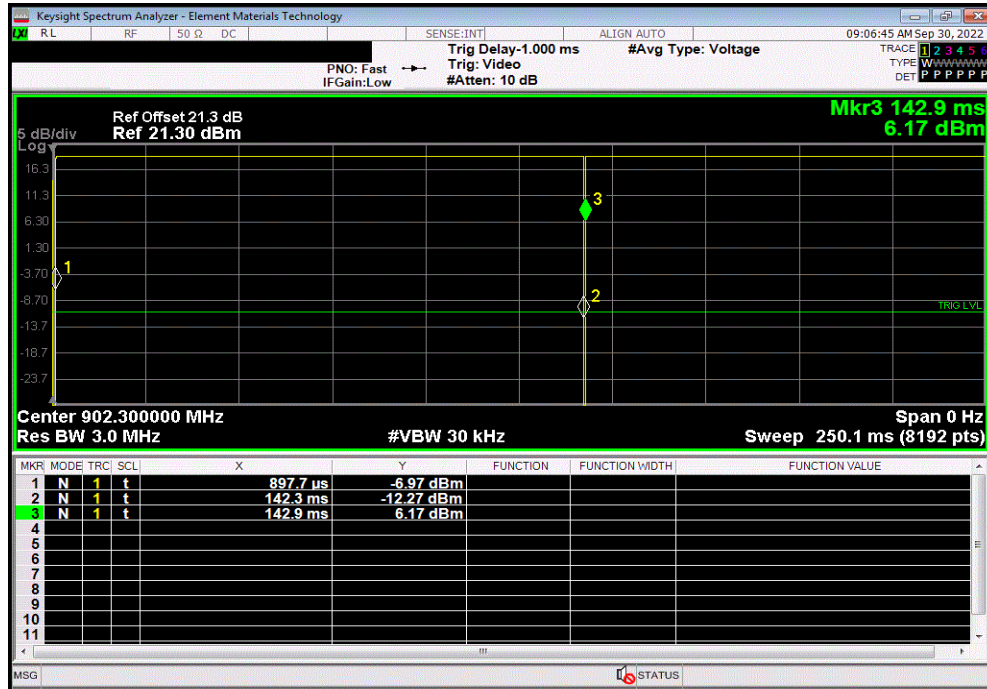
| | | | |
|--|-------------------|---|------------|
| EUT: Passport | | Work Order: ONIT0091 | |
| Serial Number: 44594524 | | Date: 30-Sep-22 | |
| Customer: Onity Inc. | | Temperature: 21.8 °C | |
| Attendees: Ali Elmi | | Humidity: 48.3% RH | |
| Project: None | | Barometric Pres.: 1021 mbar | |
| Tested by: Jeff Alcock | | Power: Battery | |
| Job Site: EV06 | | | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.247:2022 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable and manufacturers provided SMA patch cable. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 3 | Signature  | |
| | | Pulse Width | Period |
| | | Number of Pulses | Value (%) |
| | | Limit (%) | Results |
| Single Channel Mode | | | |
| LoRa, 125 kHz BW | | | |
| SF 10 | | | |
| | Ch. 0, 902.3 MHz | 141.407 ms | 142.017 ms |
| | Ch. 0, 902.3 MHz | N/A | N/A |
| | Ch. 32, 908.7 MHz | 141.376 ms | 142.414 ms |
| | Ch. 32, 908.7 MHz | N/A | N/A |
| | Ch. 63, 914.9 MHz | 141.402 ms | 142.349 ms |
| | Ch. 63, 914.9 MHz | N/A | N/A |
| SF 7 | | | |
| | Ch. 0, 902.3 MHz | 17.714 ms | 17.887 ms |
| | Ch. 0, 902.3 MHz | N/A | N/A |
| | Ch. 32, 908.7 MHz | 17.707 ms | 17.983 ms |
| | Ch. 32, 908.7 MHz | N/A | N/A |
| | Ch. 63, 914.9 MHz | 17.715 ms | 17.983 ms |
| | Ch. 63, 914.9 MHz | N/A | N/A |

DUTY CYCLE

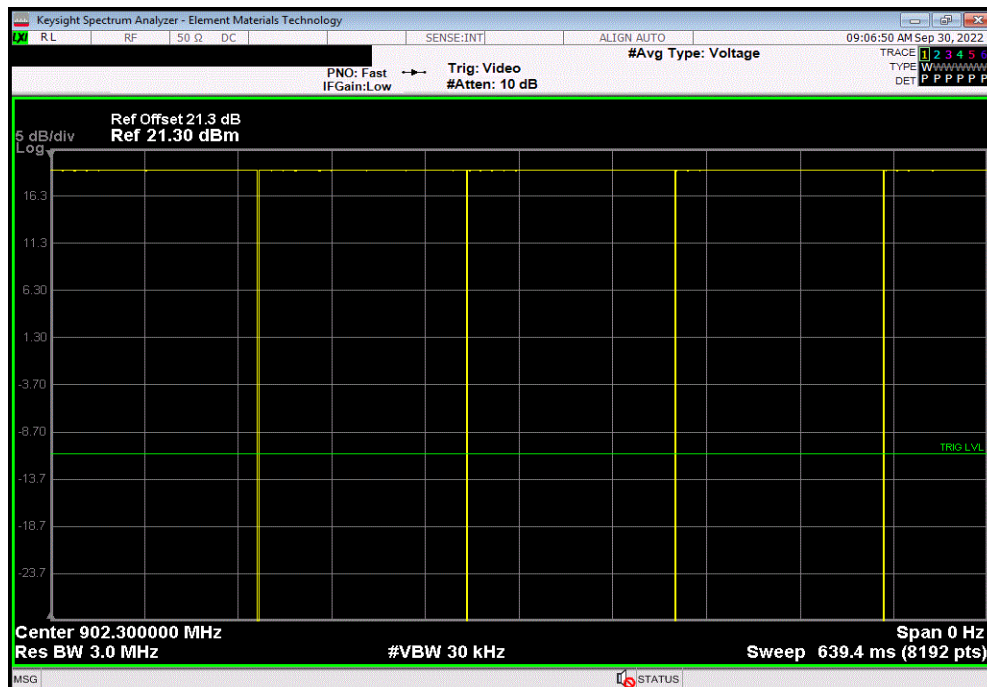


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz | | | | | | |
|--|------------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| 141.407 ms | 142.017 ms | 1 | 99.6 | N/A | N/A | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz | | | | | | |
|--|--------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| N/A | N/A | 5 | N/A | N/A | N/A | |

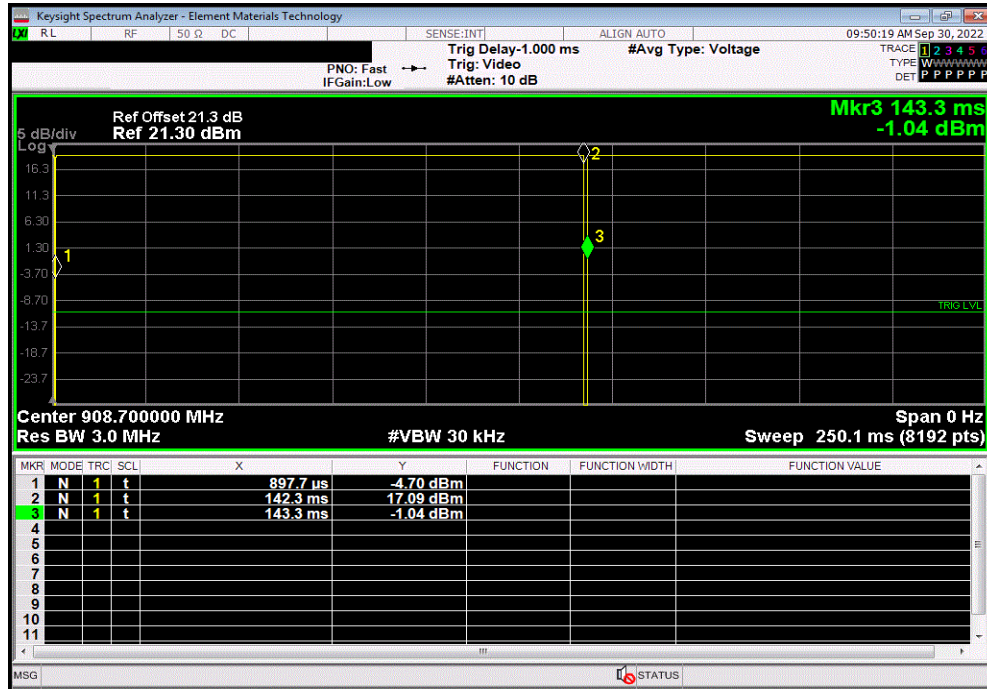


DUTY CYCLE

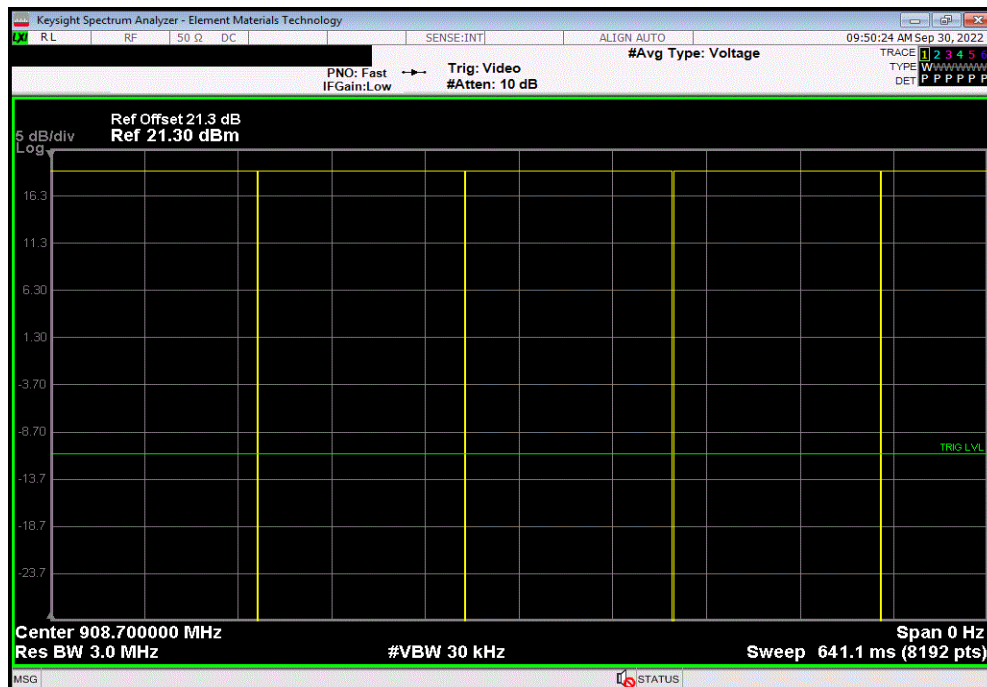


TbTtX 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz | | | | | | |
|---|------------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| 141.376 ms | 142.414 ms | 1 | 99.3 | N/A | N/A | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz | | | | | | |
|---|--------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| N/A | N/A | 5 | N/A | N/A | N/A | |

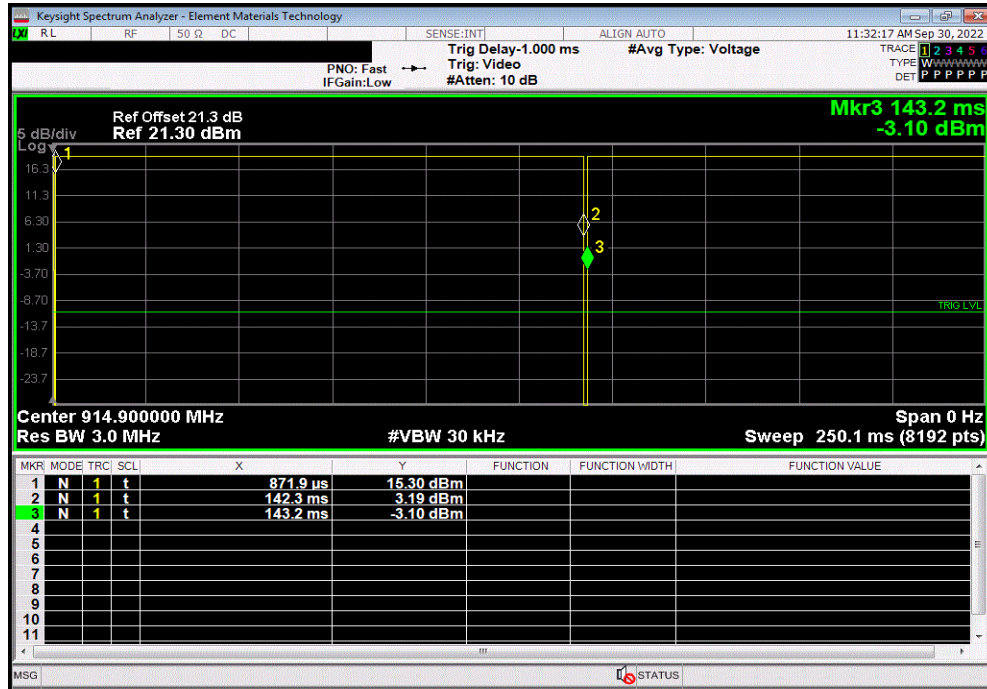


DUTY CYCLE

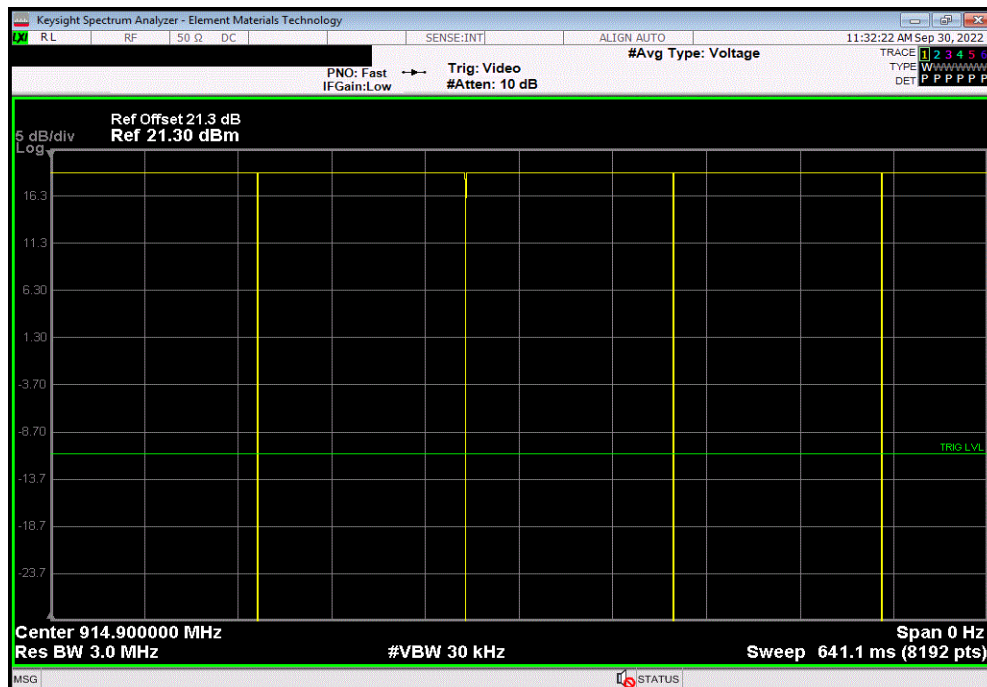


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz | | | | | | |
|---|------------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| 141.402 ms | 142.349 ms | 1 | 99.3 | N/A | N/A | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz | | | | | | |
|---|--------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| N/A | N/A | 5 | N/A | N/A | N/A | |

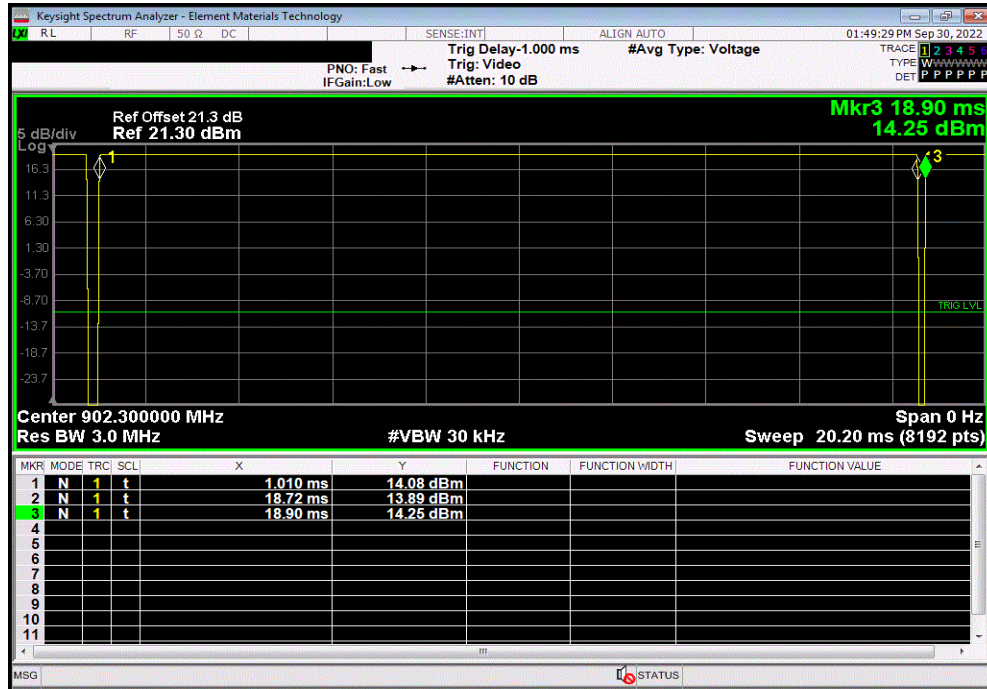


DUTY CYCLE

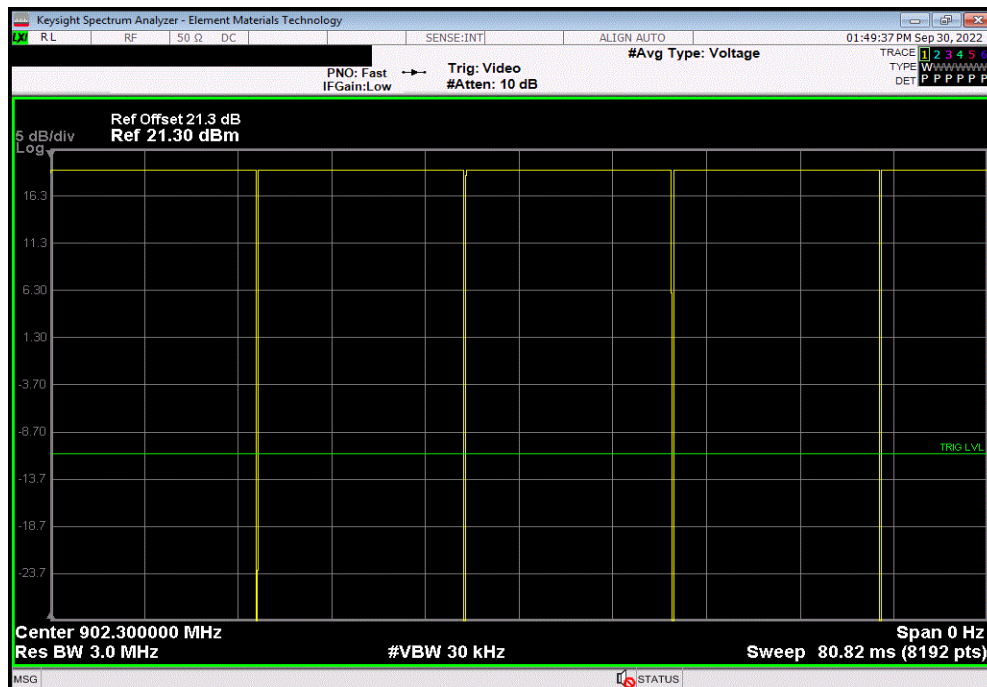


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz | | | | | | |
|---|-----------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| 17.714 ms | 17.887 ms | 1 | 99 | N/A | N/A | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz | | | | | | |
|---|--------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| N/A | N/A | 5 | N/A | N/A | N/A | |

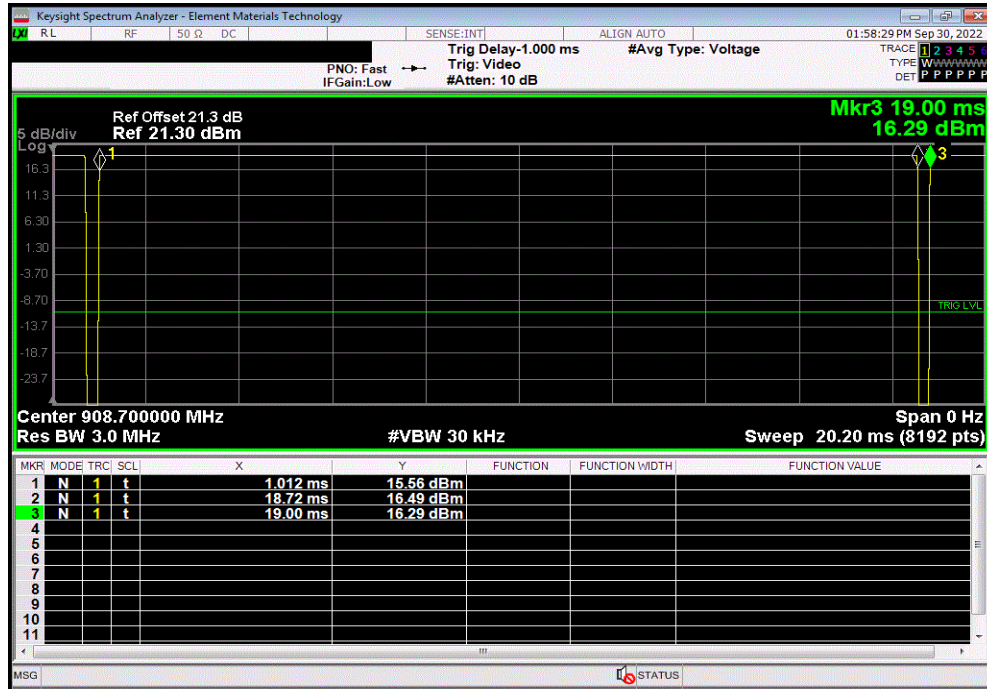


DUTY CYCLE

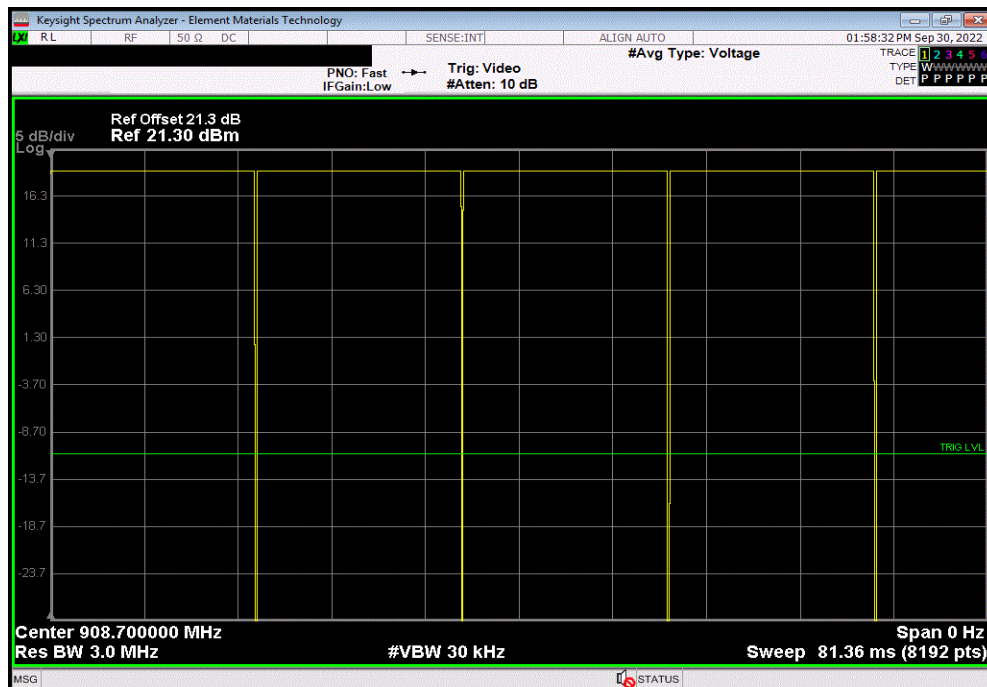


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz | | | | | | |
|--|-----------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| 17.707 ms | 17.983 ms | 1 | 98.5 | N/A | N/A | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz | | | | | | |
|--|--------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| N/A | N/A | 5 | N/A | N/A | N/A | |

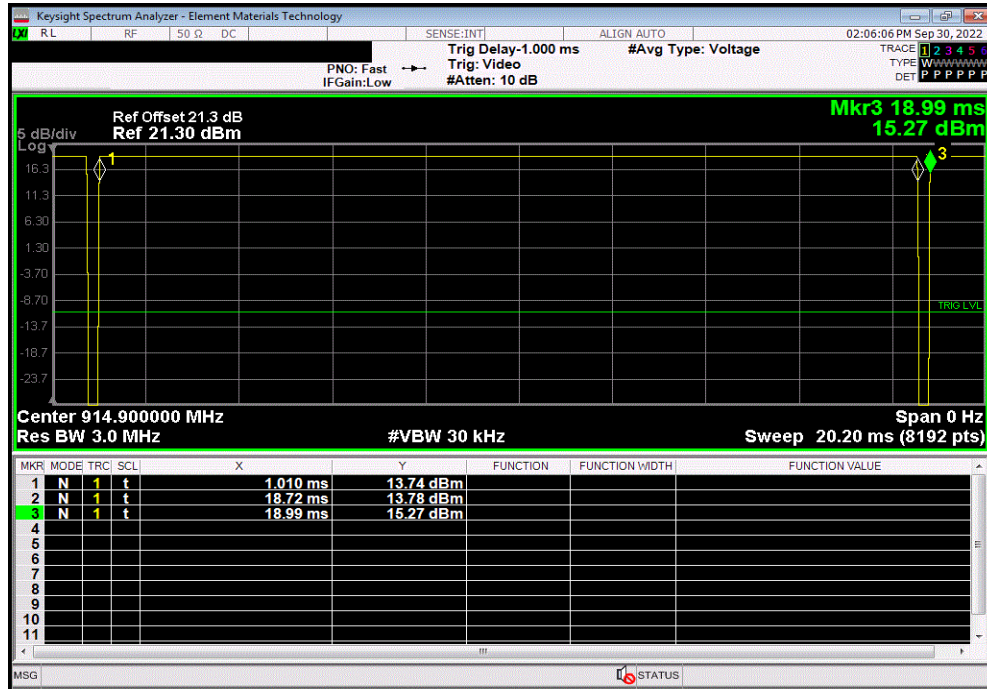


DUTY CYCLE

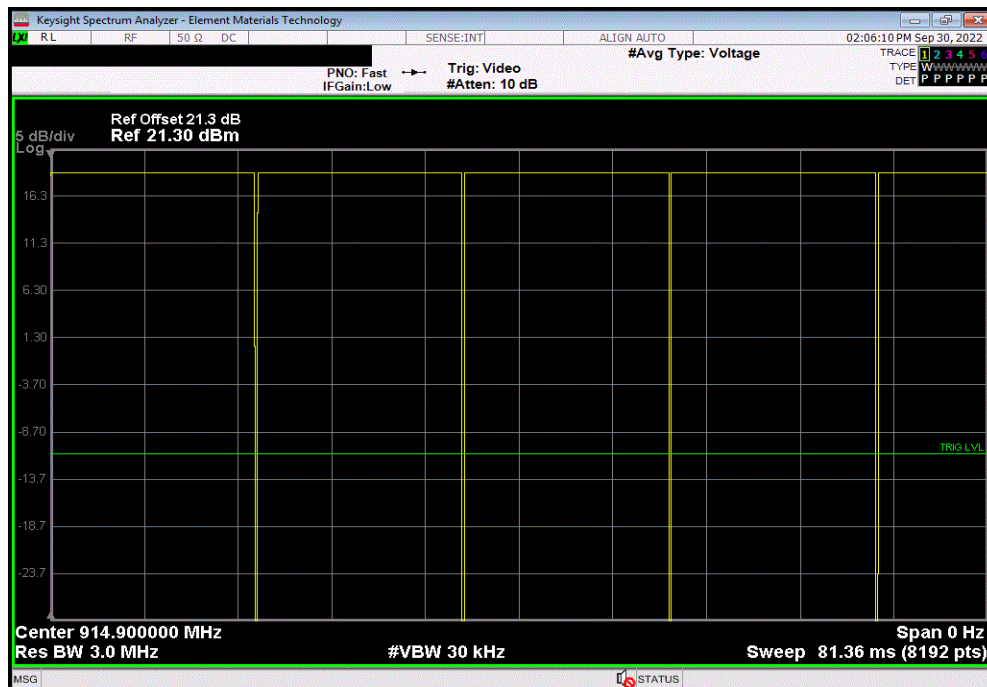


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz | | | | | | |
|--|-----------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| 17.715 ms | 17.983 ms | 1 | 98.5 | N/A | N/A | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz | | | | | | |
|--|--------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| N/A | N/A | 5 | N/A | N/A | N/A | |



CARRIER FREQUENCY SEPERATION



XMIT 2022.12.28.0

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 | Keysight | N9010A | AFO | 2022-09-08 | 2023-09-08 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVI | 2022-12-02 | 2023-12-02 |
| Generator - Signal | Keysight | N5182B | TFU | 2022-12-02 | 2024-12-02 |

TEST DESCRIPTION


The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The channel carrier frequencies in the 902-928 MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.

CARRIER FREQUENCY SEPERATION



XMit 2022.12.28.0

| | | | |
|--|----------------|---|-------------|
| EUT: Passport | | Work Order: ONIT0091 | |
| Serial Number: 44594549 | | Date: 12/16/22 | |
| Customer: Onity Inc. | | Temperature: 19.7°C | |
| Attendees: Ali Elmi | | Humidity: 33.6% | |
| Project: None | | Barometric Pres.: 1022 mbar | |
| Tested by: Jeff Alcocke | Power: Battery | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.247:2020 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable, and manufacturers SMA patch cable. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 5 | Signature  | |
| | | Value | Limit |
| Hopping Mode | | | Result |
| LoRa, 125 kHz BW | | | |
| Ch. 32, 908.7 MHz | | 200 kHz | ≥ 124.7 kHz |
| | | | Pass |

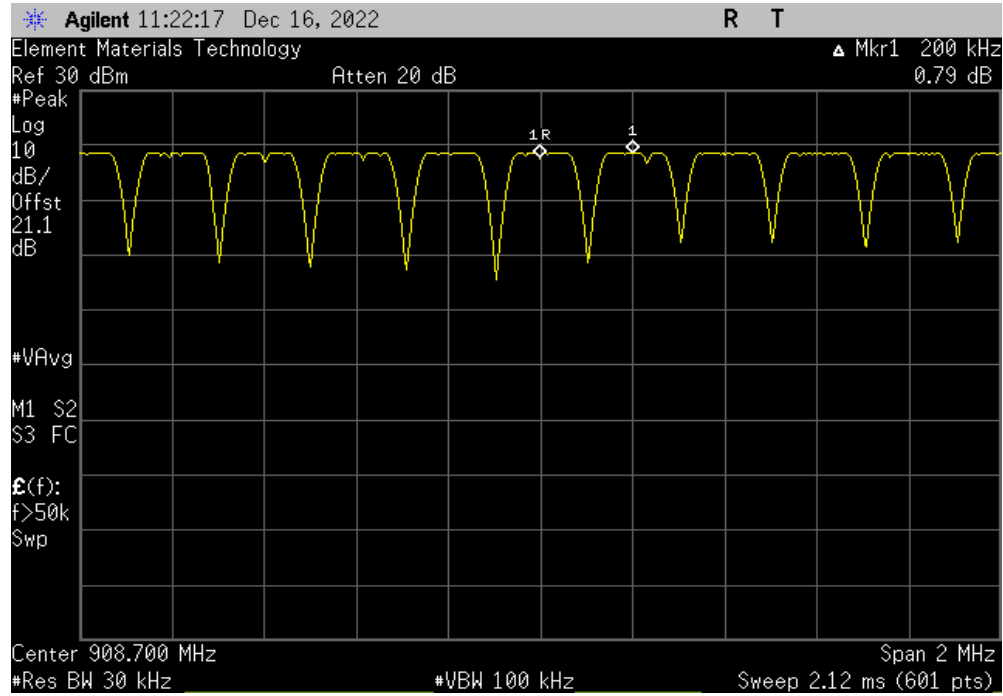
CARRIER FREQUENCY SEPERATION



XM8 2022.12.28.0

Hopping Mode, LoRa, 125 kHz BW, Ch. 32, 908.7 MHz

| | Value | Limit | Result |
|--|---------|------------------|--------|
| | 200 kHz | ≥ 124.7 kHz | Pass |



NUMBER OF HOPPING FREQUENCIES

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

TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Cal. Due |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Generator - Signal | Keysight | N5182B | TFU | 2022-12-02 | 2024-12-02 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVH | 2022-03-14 | 2023-03-14 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AAW | 2022-01-26 | 2023-01-26 |

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.


Hybrid radios do not have a minimum number of hopping channels. Measurements collected for radio characterization.

The number of hopping frequencies was measured across the authorized band. The hopping function of the EUT was enabled.

NUMBER OF HOPPING FREQUENCIES



XMIT 2022.02.07.0

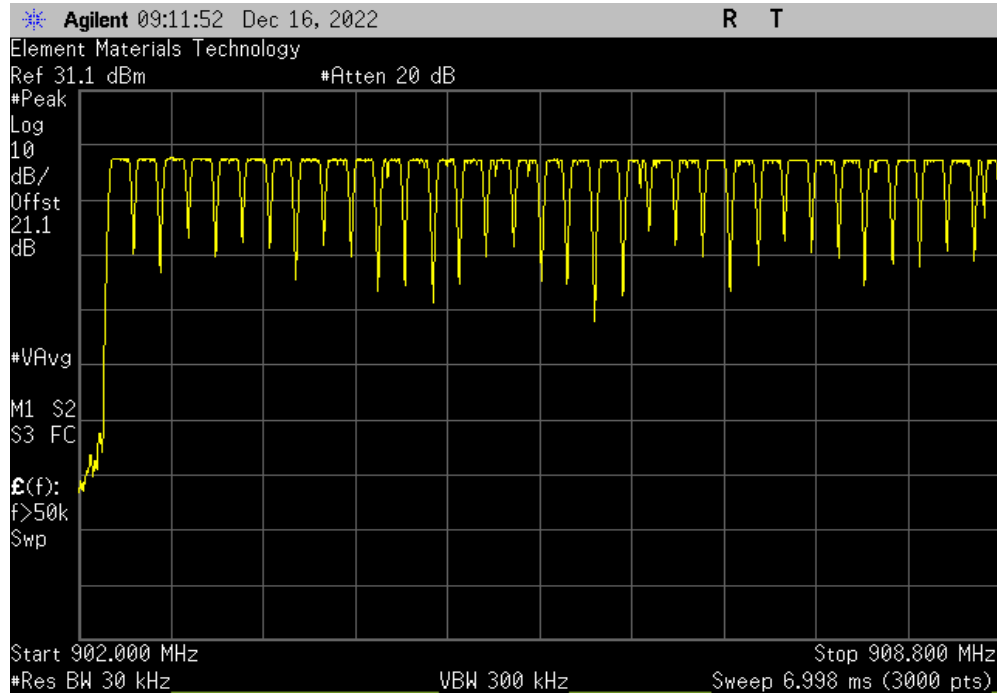
| | | | |
|--|----------------|---|--------|
| EUT: Passport | | Work Order: ONIT0091 | |
| Serial Number: 44594549 | | Date: 16-Dec-22 | |
| Customer: Onity Inc. | | Temperature: 19.6 °C | |
| Attendees: Ali Elmi | | Humidity: 31.7% RH | |
| Project: None | | Barometric Pres.: 1031 mbar | |
| Tested by: Jeff Alcock | Power: Battery | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.247:2022 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable, and manufacturers SMA patch cable. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 5 | Signature  | |
| | | Number of Channels | Limit |
| Hopping Mode | | | Result |
| LoRa, 125 kHz BW | | | |
| 902 - 908.8 MHz | | 33 | N/A |
| 908.8 - 915 MHz | | 31 | N/A |
| Total number of hopping frequencies | | 64 | N/A |

NUMBER OF HOPPING FREQUENCIES

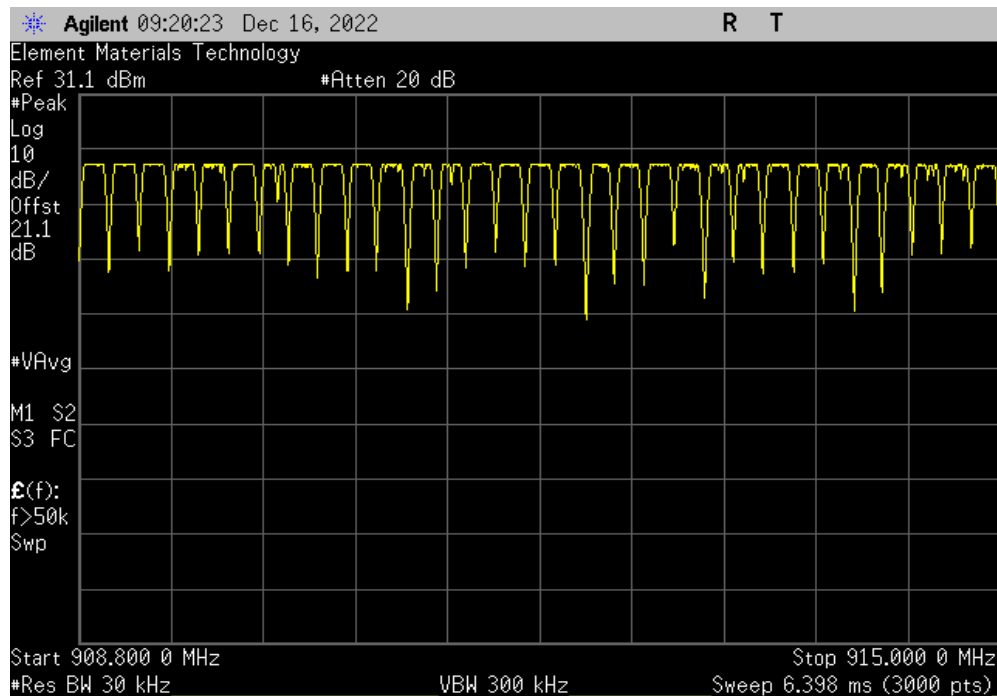


XMH 2022.02.07.0

| Hopping Mode, LoRa, 125 kHz BW, 902 - 908.8 MHz | | | | | | |
|---|--|--|--|--------------------|-------|--------|
| | | | | Number of Channels | Limit | Result |
| | | | | 33 | N/A | N/A |



| Hopping Mode, LoRa, 125 kHz BW, 908.8 - 915 MHz | | | | | | |
|---|--|--|--|--------------------|-------|--------|
| | | | | Number of Channels | Limit | Result |
| | | | | 31 | N/A | N/A |



DWELL TIME



XMIT 2023.02.14.0

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 |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Generator - Signal | Keysight | N5182B | TFU | 2022-12-02 | 2024-12-02 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVH | 2022-03-14 | 2023-03-14 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AAW | 2022-01-26 | 2023-01-26 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AAW | 2023-02-06 | 2024-02-06 |

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.


The average dwell time per hopping channel was measured at one hopping channel in the authorized band. The hopping function of the EUT was enabled.

The dwell time limit is based on the Number of Hopping Channels * 400 mS. For the EUT, the hopping sequence is limited to an 8 channel set. The limit would be 8 Channels * 400mS = 3.2 Seconds.

DWELL TIME



XMtr 2023.02.14.0

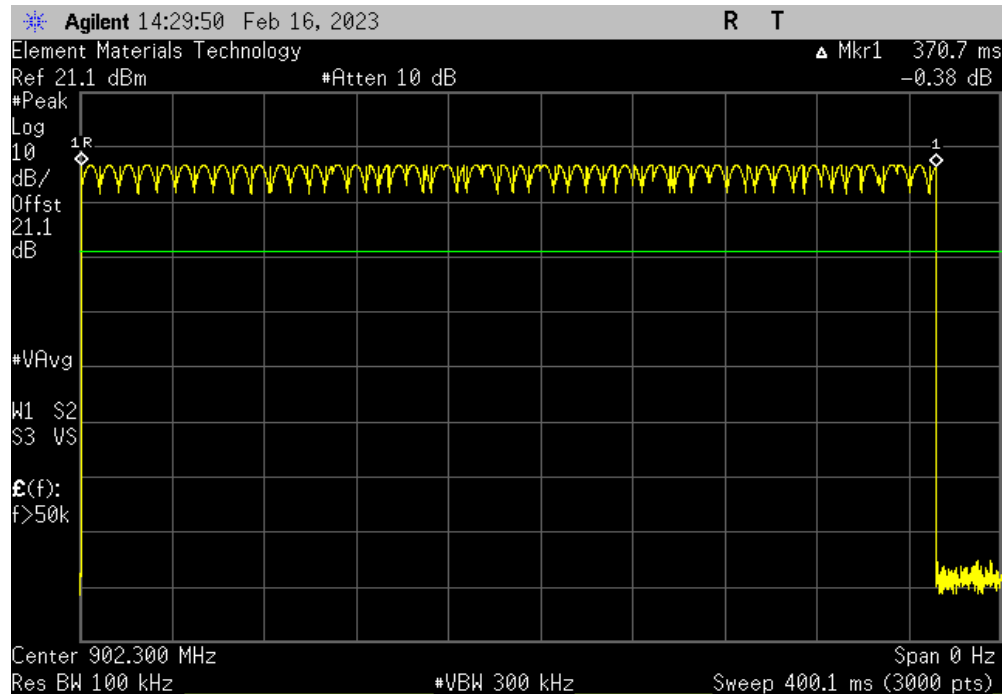
| | | | | | | | | |
|--|-------------|---|-------------------|----------------------|-----------------|------------|--------|------|
| EUT: | Passport | | Work Order: | ONIT0091 | | | | |
| Serial Number: | 44594549 | | Date: | 02/16/23 | | | | |
| Customer: | Onity Inc. | | Temperature: | 17.7°C | | | | |
| Attendees: | Ali Elmi | | Humidity: | 43.4% | | | | |
| Project: | None | | Barometric Pres.: | 1009 mbar | | | | |
| Tested by: | Jeff Alcock | Power: | Battery | Job Site: | EV06 | | | |
| TEST SPECIFICATIONS | | | Test Method | | | | | |
| FCC 15.247:2022 | | | ANSI C63.10:2013 | | | | | |
| COMMENTS | | | | | | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable, and manufacturers SMA patch cable. | | | | | | | | |
| DEVIATIONS FROM TEST STANDARD | | | | | | | | |
| None | | | | | | | | |
| Configuration # | ONIT0091-5 | Signature  | | | | | | |
| | | | Pulse Width (mS) | Number of Pulses (#) | Dwell Time (mS) | Limit (mS) | Result | |
| Hopping Mode | | | | | | | | |
| LoRa, 125 kHz BW | | | | | | | | |
| SF 10 | | | | | | | | |
| Ch. 0, 902.3 MHz | | | | | | | | |
| | | | Pulse Width | 370.7 | N/A | N/A | N/A | |
| | | | Dwell Time | 370.7 | 1 | 370.7 | ≤ 400 | Pass |
| SF 7 | | | | | | | | |
| Ch. 0, 902.3 MHz | | | | | | | | |
| | | | Pulse Width | 61.84 | N/A | N/A | N/A | |
| | | | Dwell Time | 61.84 | 1 | 61.84 | ≤ 400 | Pass |

DWELL TIME

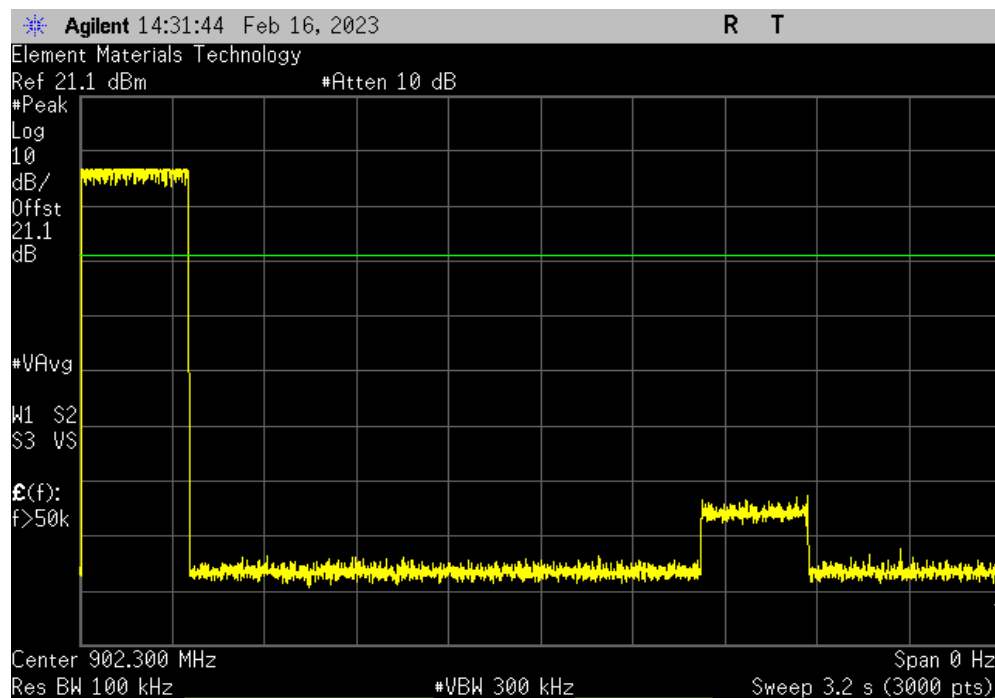


XMR 2023.02.14.0

| Hopping Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz, Pulse Width | | | | | | |
|--|------------------|----------------------|-----------------|------------|--------|--|
| | Pulse Width (mS) | Number of Pulses (#) | Dwell Time (mS) | Limit (mS) | Result | |
| | 370.7 | N/A | N/A | N/A | N/A | |



| Hopping Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz, Dwell Time | | | | | | |
|---|------------------|----------------------|-----------------|------------|--------|--|
| | Pulse Width (mS) | Number of Pulses (#) | Dwell Time (mS) | Limit (mS) | Result | |
| | 370.7 | 1 | 370.7 | ≤ 400 | Pass | |

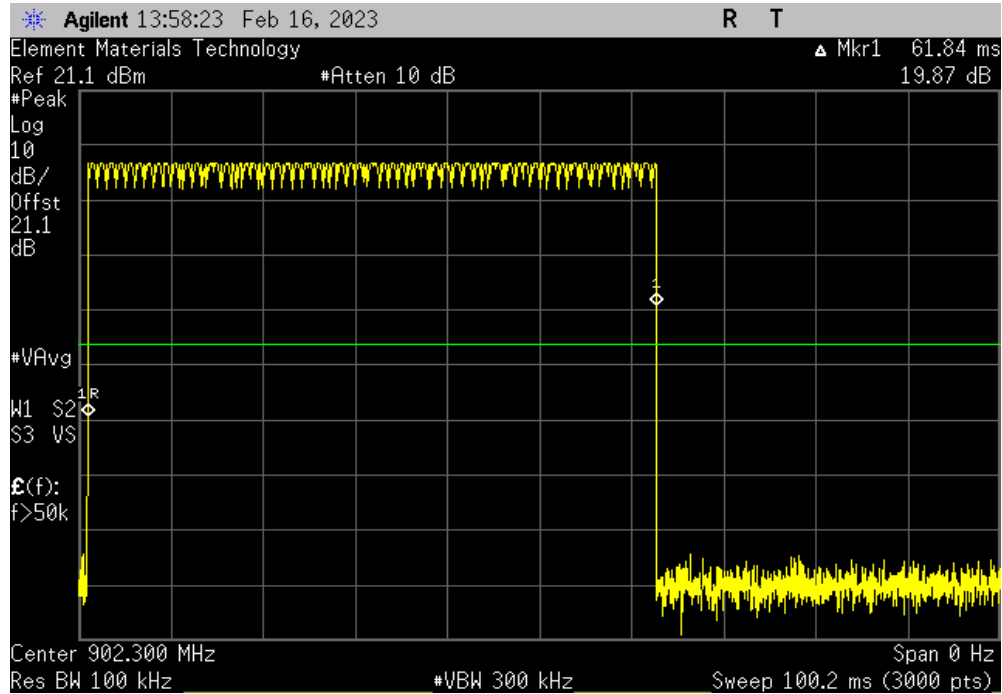


DWELL TIME

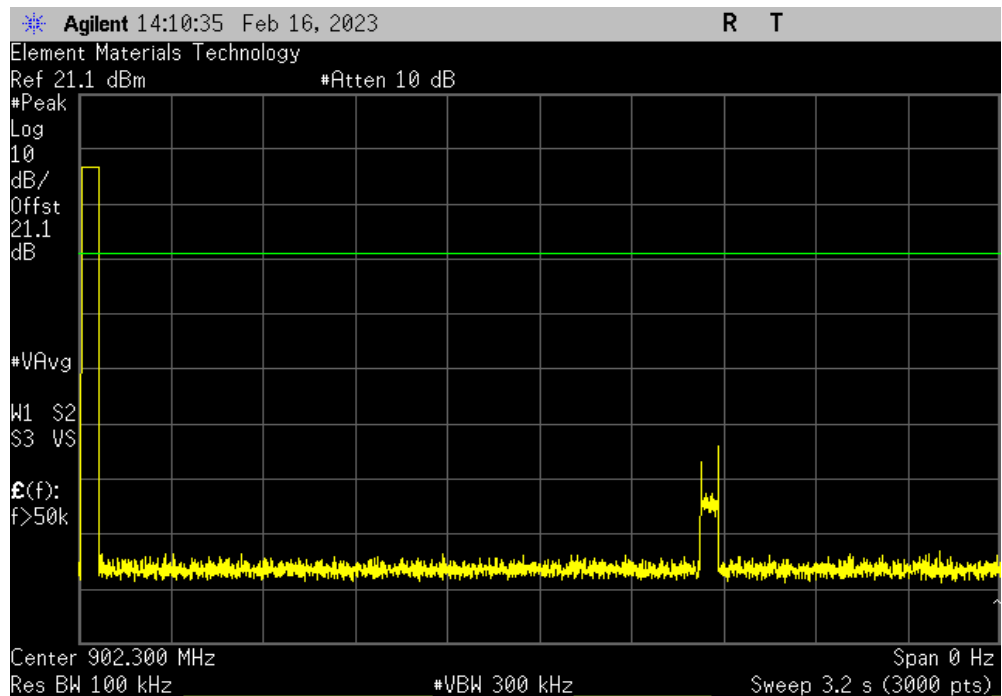


XMR 2023.02.14.0

| Hopping Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz, Pulse Width | | | | | | |
|---|------------------|----------------------|-----------------|------------|--------|--|
| | Pulse Width (mS) | Number of Pulses (#) | Dwell Time (mS) | Limit (mS) | Result | |
| | 61.84 | N/A | N/A | N/A | N/A | |



| Hopping Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz, Dwell Time | | | | | | |
|--|------------------|----------------------|-----------------|------------|--------|--|
| | Pulse Width (mS) | Number of Pulses (#) | Dwell Time (mS) | Limit (mS) | Result | |
| | 61.84 | 1 | 61.84 | ≤ 400 | Pass | |



OUTPUT POWER



XMit 2022.02.07.0

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 |
|------------------------------|--------------------|-------------------------|-----|------------|------------|
| Generator - Signal | Keysight | N5182B | TFU | 2020-11-20 | 2022-11-20 |
| Cable | None | 10m Test Distance Cable | EVL | 2021-11-30 | 2022-11-30 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFO | 2022-09-08 | 2023-09-08 |

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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 AVGSA-2 in section 11.9.2.2.4 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function 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 power to compute the average power during the actual transmission times.

OUTPUT POWER



ThTx 2022.06.03.0 XMir 2022.02.07.0

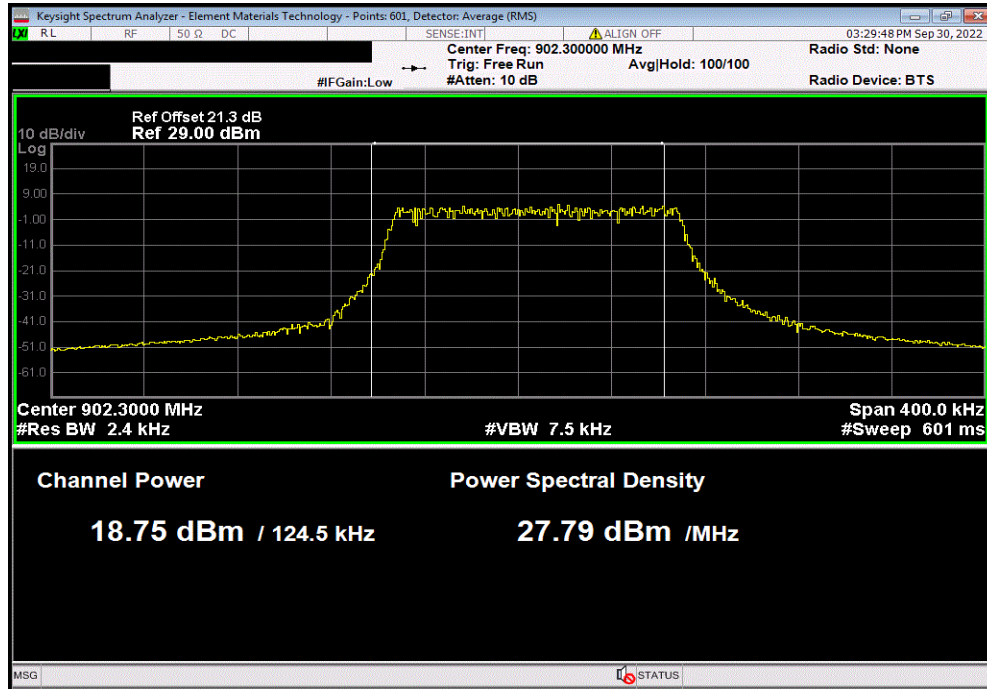
| | | | |
|--|-------------------|-----------------------------|------------------------|
| EUT: Passport | | Work Order: ONIT0091 | |
| Serial Number: 44594524 | | Date: 30-Sep-22 | |
| Customer: Onity Inc. | | Temperature: 21.9 °C | |
| Attendees: Ali Elmi | | Humidity: 48.3% RH | |
| Project: None | | Barometric Pres.: 1020 mbar | |
| Tested by: Jeff Alcock | | Job Site: EV06 | |
| Power: Battery | | | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.247:2022 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable and manufacturers provided SMA patch cable. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 3 | Signature | |
| | | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) |
| | | Out Pwr (dBm) | Limit (dBm) |
| | | | Result |
| Single Channel Mode | | | |
| LoRa, 125 kHz BW | | | |
| SF 10 | | | |
| | Ch. 0, 902.3 MHz | 18.75 | 0 |
| | Ch. 32, 908.7 MHz | 18.64 | 0 |
| | Ch. 63, 914.9 MHz | 18.43 | 0 |
| SF 7 | | | |
| | Ch. 0, 902.3 MHz | 18.47 | 0 |
| | Ch. 32, 908.7 MHz | 18.36 | 0 |
| | Ch. 63, 914.9 MHz | 18.24 | 0 |

OUTPUT POWER

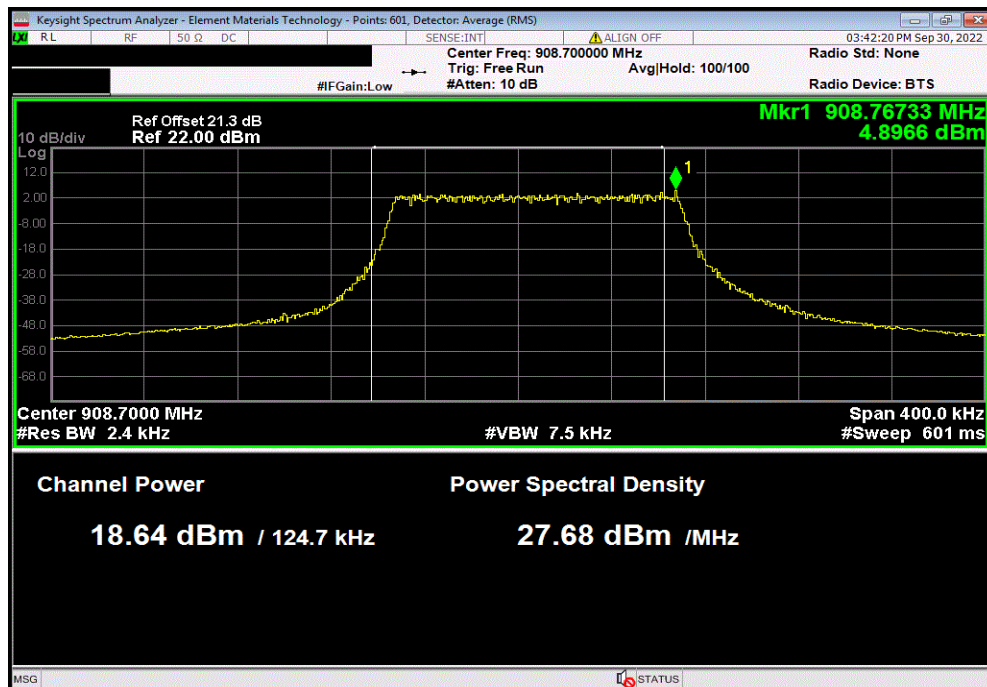


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz | | | | | | |
|--|--------------------|------------------------|---------------|-------------|--------|--|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Out Pwr (dBm) | Limit (dBm) | Result | |
| | 18.75 | 0 | 18.75 | 30 | Pass | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz | | | | | | |
|---|--------------------|------------------------|---------------|-------------|--------|--|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Out Pwr (dBm) | Limit (dBm) | Result | |
| | 18.64 | 0 | 18.64 | 30 | Pass | |

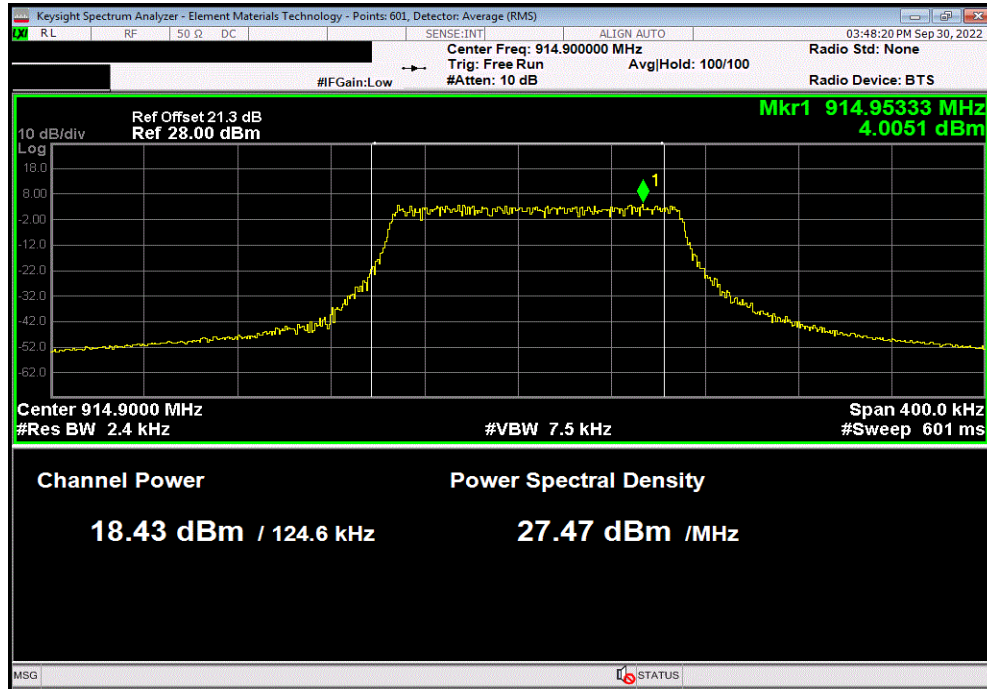


OUTPUT POWER

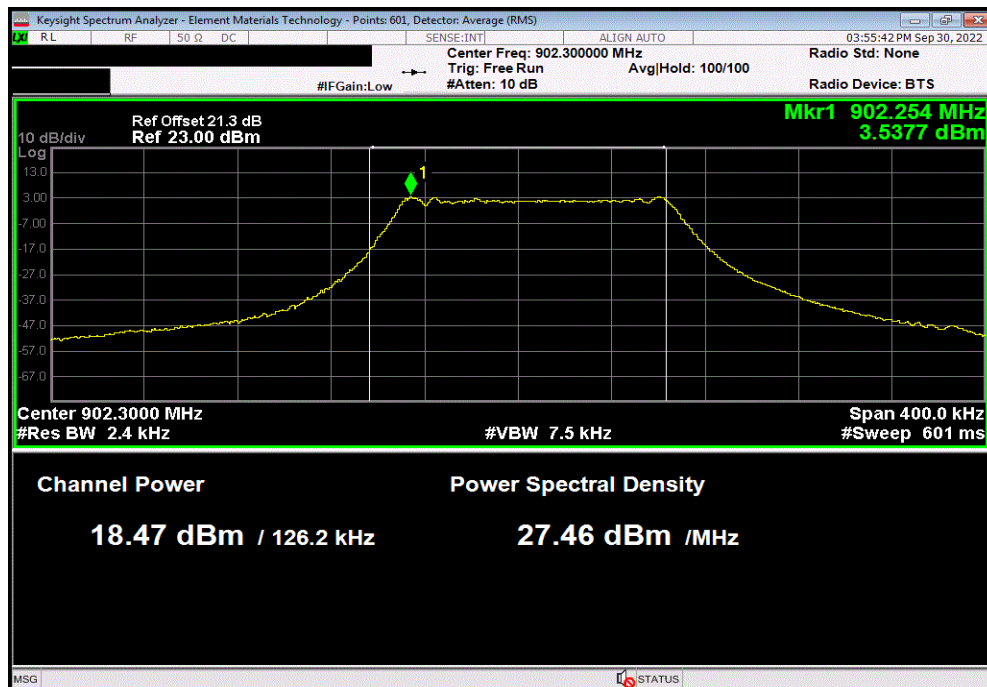


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz | | | | | | |
|---|--------------------|------------------------|---------------|-------------|--------|--|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Out Pwr (dBm) | Limit (dBm) | Result | |
| | 18.43 | 0 | 18.43 | 30 | Pass | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz | | | | | | |
|---|--------------------|------------------------|---------------|-------------|--------|--|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Out Pwr (dBm) | Limit (dBm) | Result | |
| | 18.47 | 0 | 18.47 | 30 | Pass | |

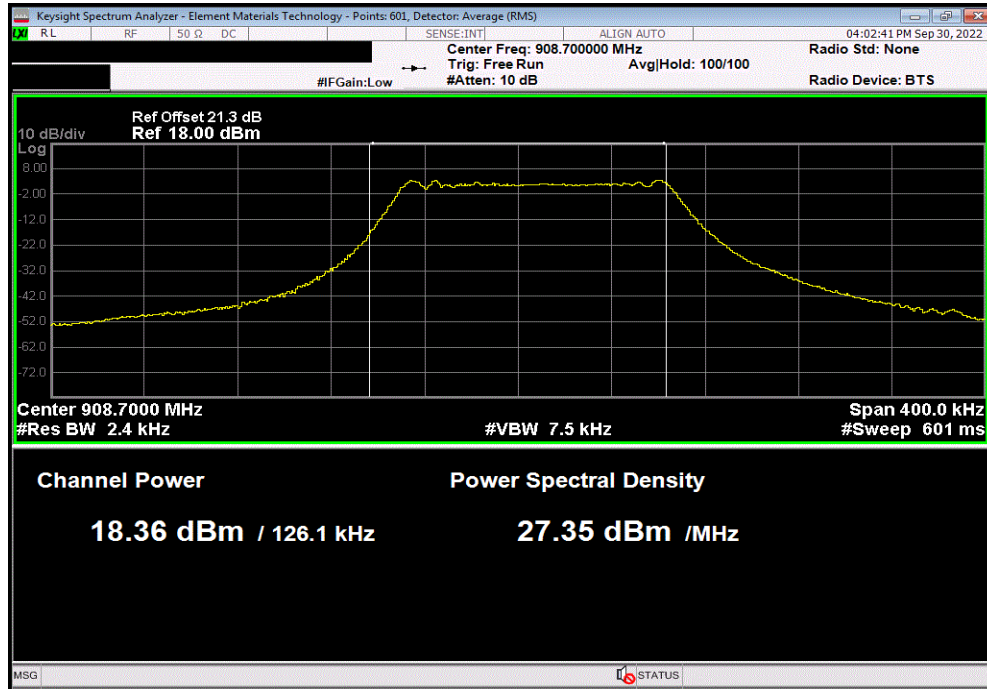


OUTPUT POWER

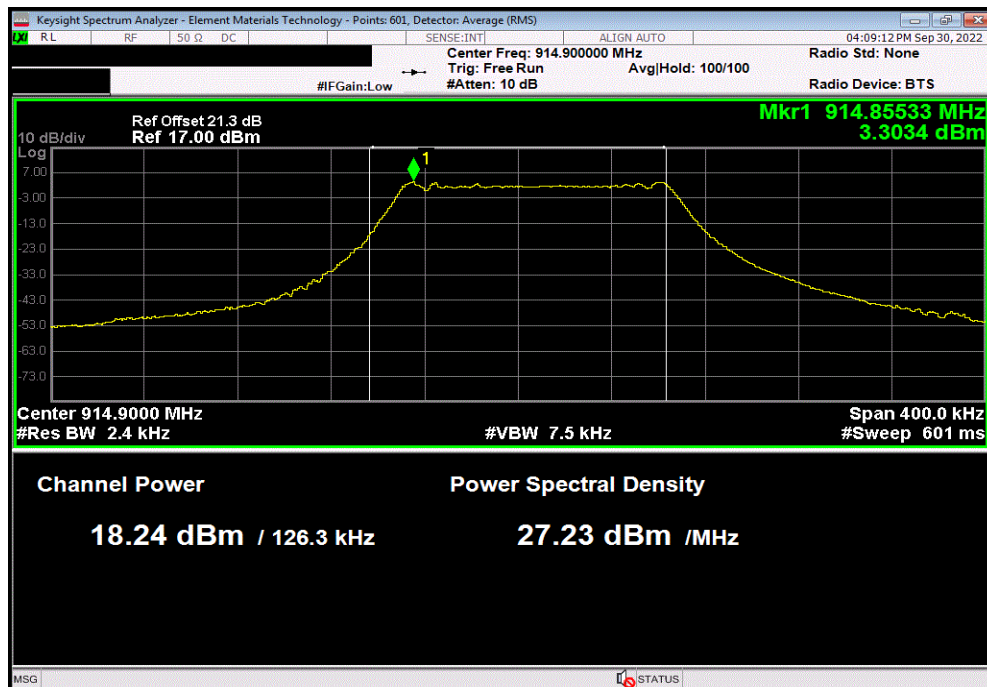


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz | | | | | | |
|--|--------------------|------------------------|---------------|-------------|--------|--|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Out Pwr (dBm) | Limit (dBm) | Result | |
| | 18.36 | 0 | 18.36 | 30 | Pass | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz | | | | | | |
|--|--------------------|------------------------|---------------|-------------|--------|--|
| | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Out Pwr (dBm) | Limit (dBm) | Result | |
| | 18.24 | 0 | 18.24 | 30 | Pass | |



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMit 2022.02.07.0

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 |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Generator - Signal | Keysight | N5182B | TFU | 2020-11-20 | 2022-11-20 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVI | 2021-12-05 | 2022-12-05 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFO | 2022-09-08 | 2023-09-08 |

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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 AVGSA-2 in section 11.9.2.2.4 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function 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 power to compute the average power during the actual transmission times.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi)

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TotTx 2022.06.03.0 XMin 2022.02.07.0

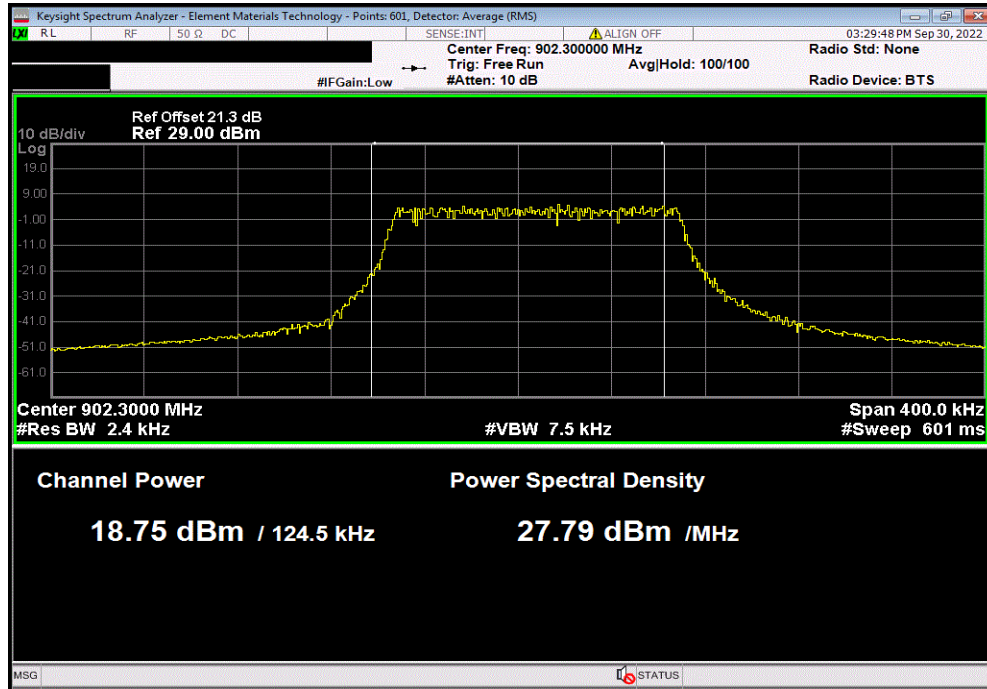
| | | | |
|--|-------------------|-----------------------------|------------------------|
| EUT: Passport | | Work Order: ONIT0091 | |
| Serial Number: 44594524 | | Date: 30-Sep-22 | |
| Customer: Onity Inc. | | Temperature: 21.9 °C | |
| Attendees: Ali Elmi | | Humidity: 48.6% RH | |
| Project: None | | Barometric Pres.: 1020 mbar | |
| Tested by: Jeff Alcock | | Job Site: EV06 | |
| Power: Battery | | | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.247:2022 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable and manufacturers provided SMA patch cable. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 3 | Signature | |
| | | Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) |
| | | Antenna Gain (dBi) | EIRP (dBm) |
| | | EIRP Limit (dBm) | Result |
| Single Channel Mode | | | |
| LoRa, 125 kHz BW | | | |
| SF 10 | | | |
| | Ch. 0, 902.3 MHz | 18.75 | 0 |
| | Ch. 32, 908.7 MHz | 18.64 | 0 |
| | Ch. 63, 914.9 MHz | 18.43 | 0 |
| SF 7 | | | |
| | Ch. 0, 902.3 MHz | 18.47 | 0 |
| | Ch. 32, 908.7 MHz | 18.36 | 0 |
| | Ch. 63, 914.9 MHz | 18.24 | 0 |

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

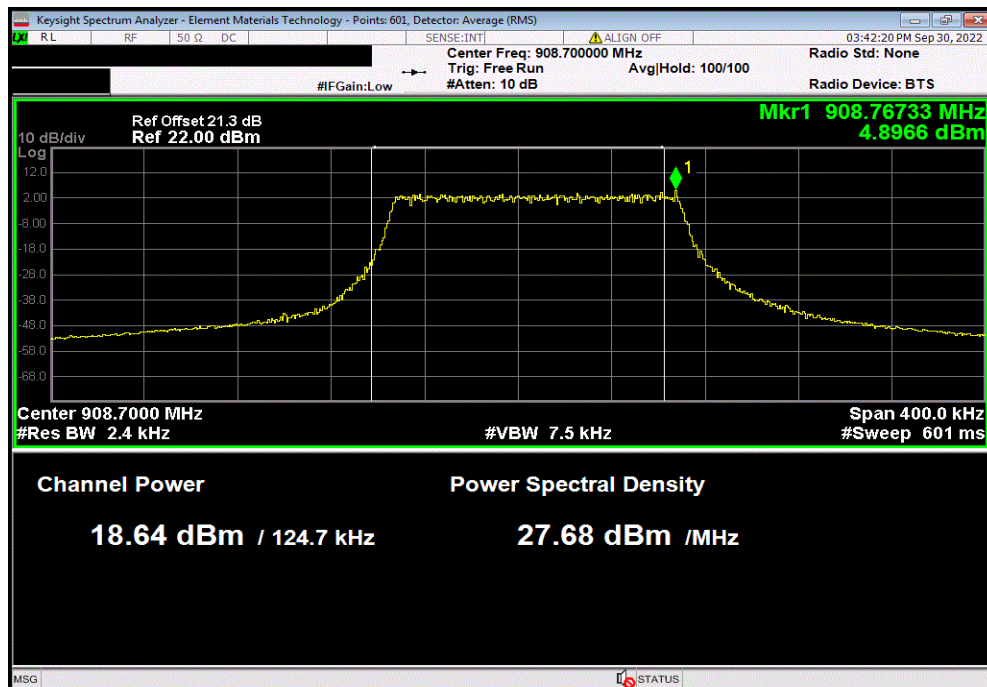


TbTtx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz | | | | | | |
|--|---------------------------|-----------------------|---------------|---------------------|--------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Result | |
| 18.75 | 0 | 0.75 | 19.5 | 36 | Pass | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz | | | | | | |
|---|---------------------------|-----------------------|---------------|---------------------|--------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Result | |
| 18.64 | 0 | 0.75 | 19.39 | 36 | Pass | |

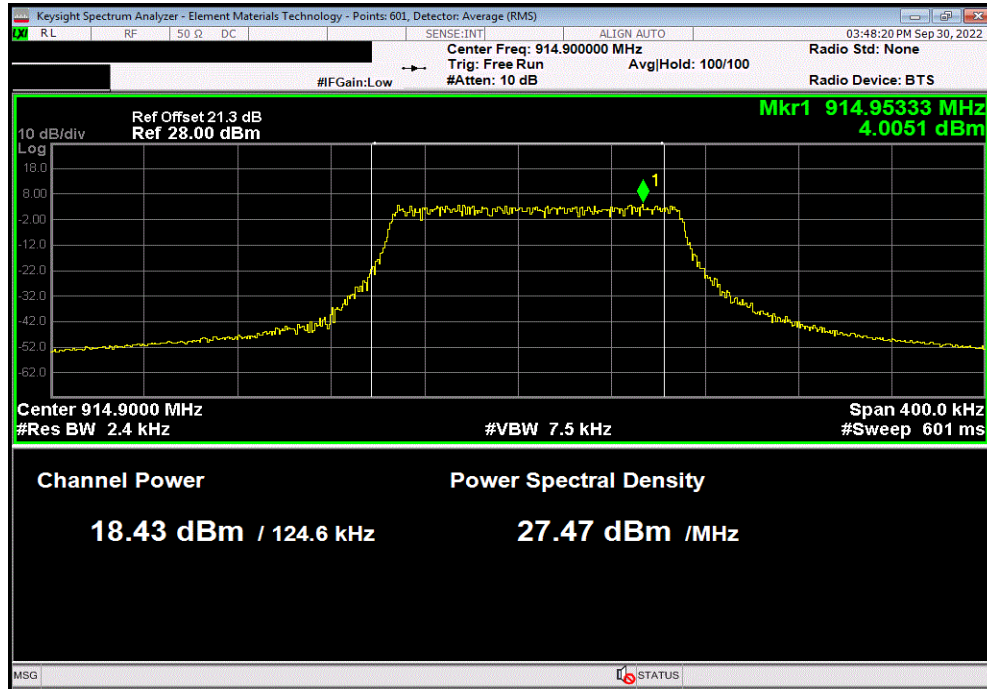


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

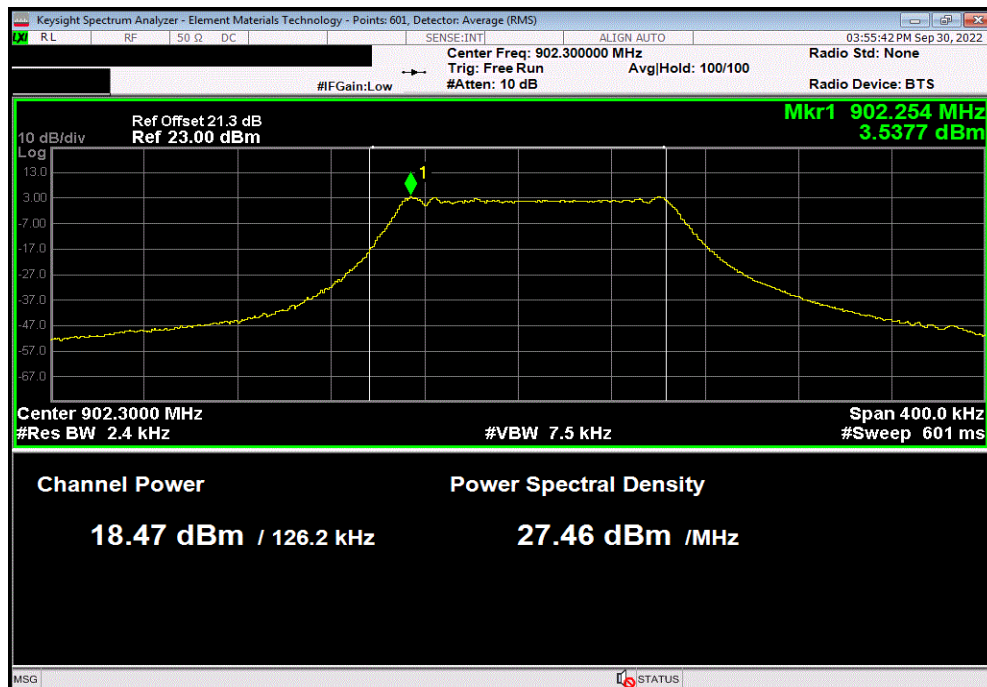


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz | | | | | | |
|---|---------------------------|-----------------------|---------------|---------------------|--------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Result | |
| 18.43 | 0 | 0.75 | 19.18 | 36 | Pass | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz | | | | | | |
|---|---------------------------|-----------------------|---------------|---------------------|--------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Result | |
| 18.47 | 0 | 0.75 | 19.22 | 36 | Pass | |

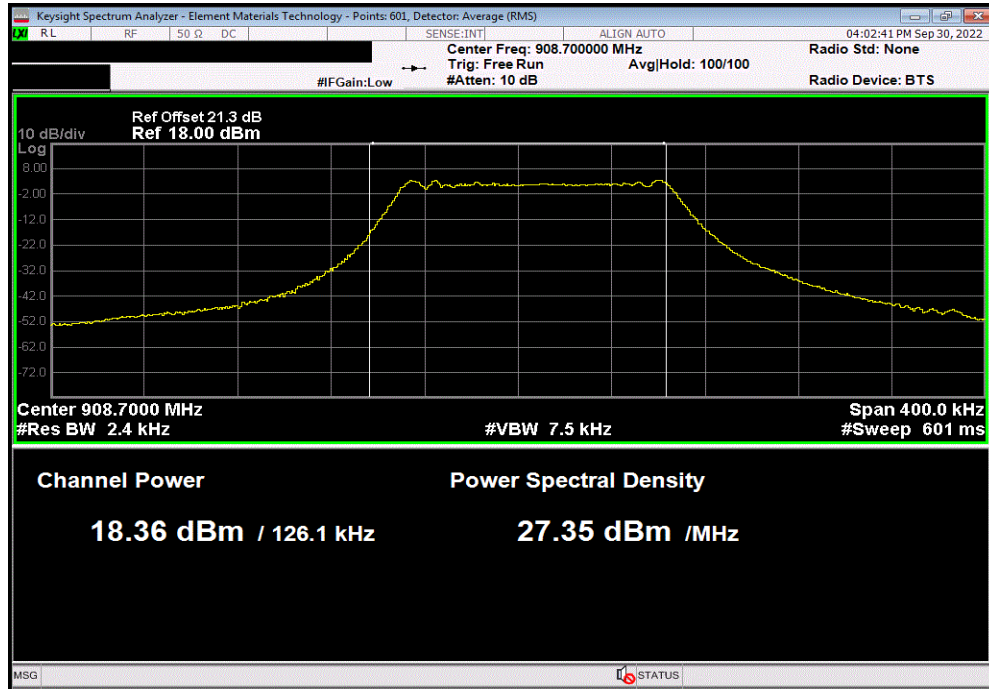


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

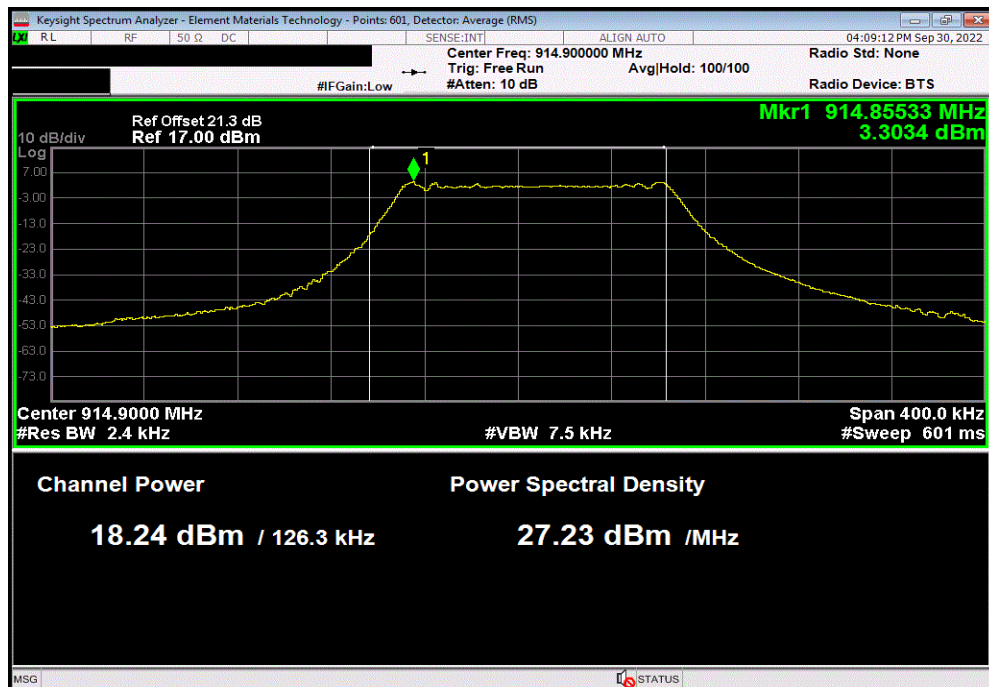


TbTtx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz | | | | | | |
|--|---------------------------|-----------------------|---------------|---------------------|--------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Result | |
| 18.36 | 0 | 0.75 | 19.11 | 36 | Pass | |



| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz | | | | | | |
|--|---------------------------|-----------------------|---------------|---------------------|--------|--|
| Avg Cond Pwr (dBm) | Duty Cycle Factor (dB) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Result | |
| 18.24 | 0 | 0.75 | 18.99 | 36 | Pass | |



BAND EDGE COMPLIANCE



XMIT 2022.02.07.0

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 |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Generator - Signal | Keysight | N5182B | TFU | 2020-11-20 | 2022-11-20 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVI | 2021-12-05 | 2022-12-05 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFO | 2022-09-08 | 2023-09-08 |

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.


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

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

BAND EDGE COMPLIANCE



TbTx 2022.06.03.0 XMt 2022.02.07.0

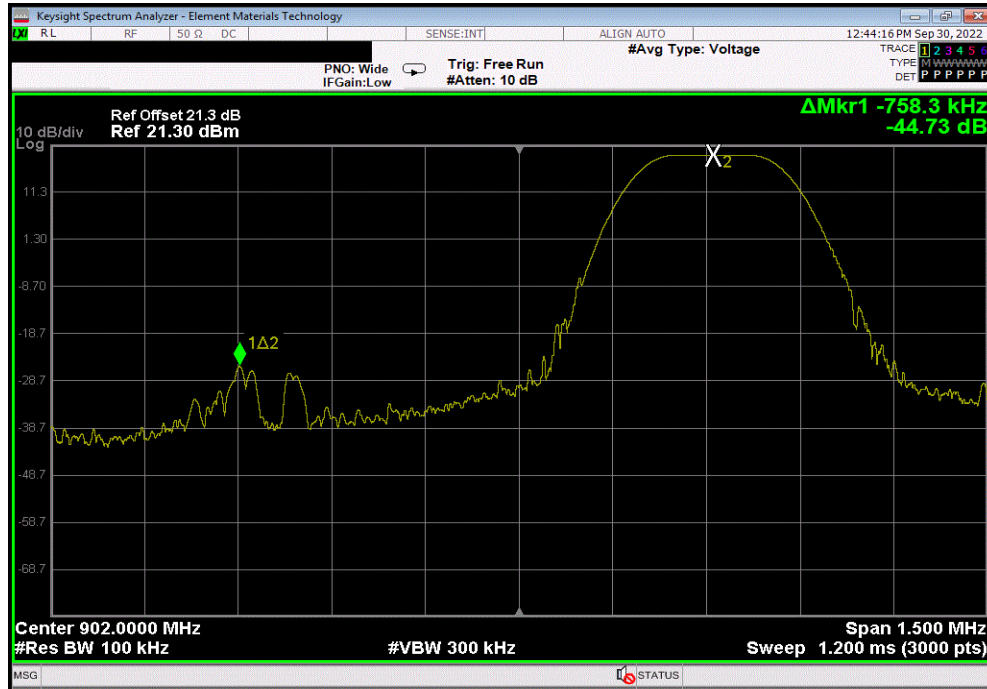
| | | | |
|--|-------------------|---|----------------------|
| EUT: Passport | | Work Order: ONIT0091 | |
| Serial Number: 44594524 | | Date: 30-Sep-22 | |
| Customer: Onity Inc. | | Temperature: 21.8 °C | |
| Attendees: Ali Elmi | | Humidity: 48.6% RH | |
| Project: None | | Barometric Pres.: 1021 mbar | |
| Tested by: Jeff Alcock | | Power: Battery | |
| Job Site: EV06 | | | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.247:2022 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable and manufacturers provided SMA patch cable. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 3 | Signature  | |
| | | Value (dBc) | Limit ≤ (dBc) Result |
| Single Channel Mode | | | |
| LoRa, 125 kHz BW | | | |
| SF 10 | | | |
| | Ch. 0, 902.3 MHz | -44.73 | -30 Pass |
| | Ch. 63, 914.9 MHz | -74.72 | -30 Pass |
| SF 7 | | | |
| | Ch. 0, 902.3 MHz | -44.3 | -30 Pass |
| | Ch. 63, 914.9 MHz | -75.18 | -30 Pass |

BAND EDGE COMPLIANCE

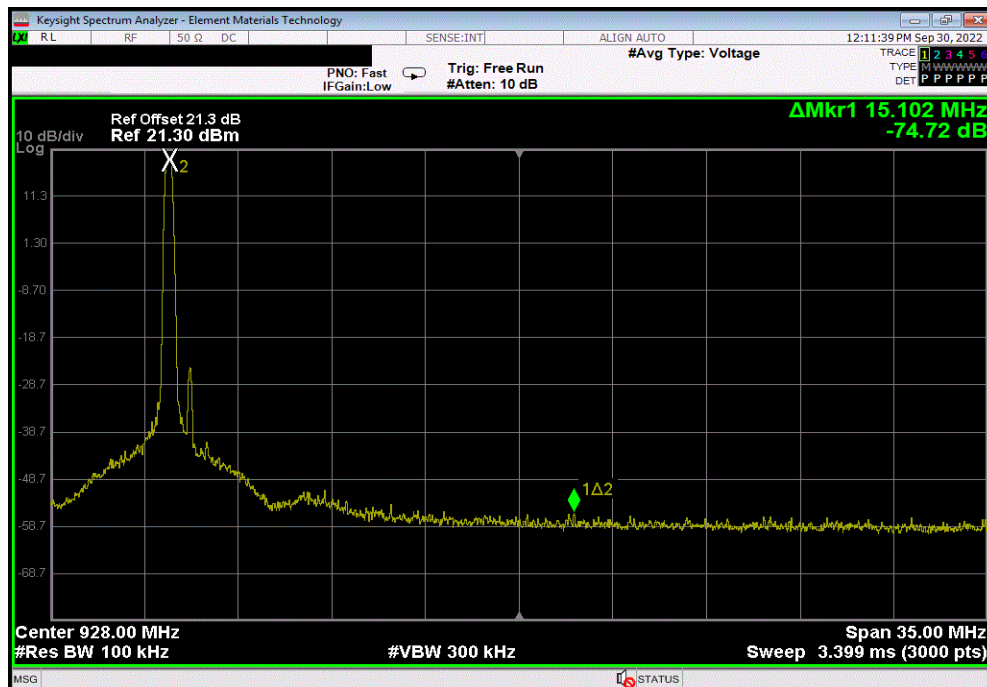


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz | | | | | | |
|--|--|--|--|----------------|------------------|--------|
| | | | | Value (dBc) | Limit ≤ (dBc) | Result |
| | | | | -44.73 | -30 | Pass |



| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz | | | | | | |
|---|--|--|--|----------------|------------------|--------|
| | | | | Value (dBc) | Limit ≤ (dBc) | Result |
| | | | | -74.72 | -30 | Pass |

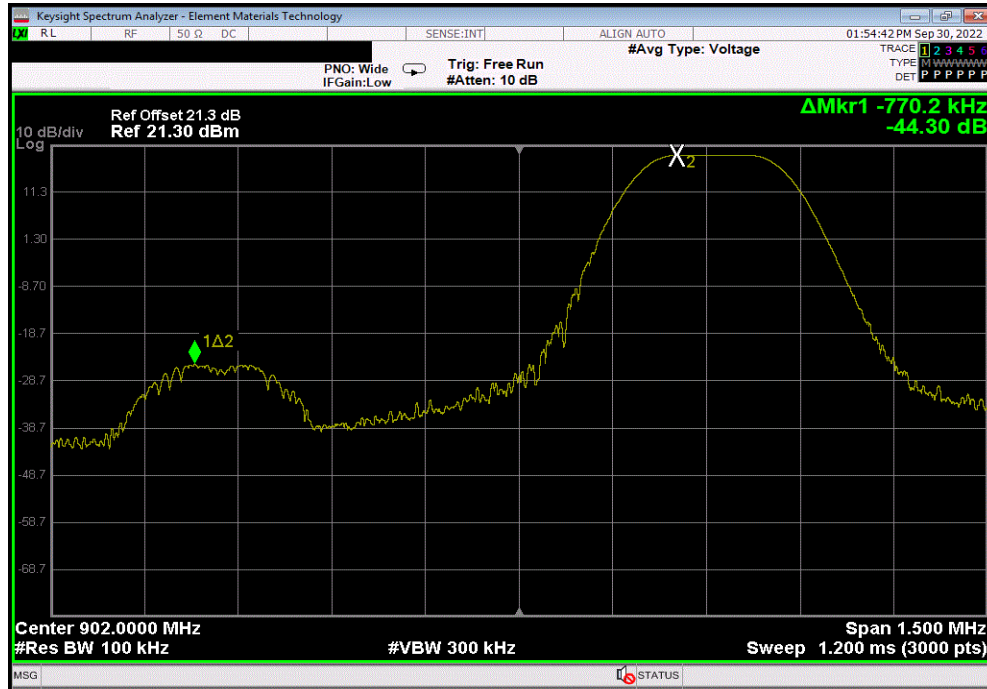


BAND EDGE COMPLIANCE

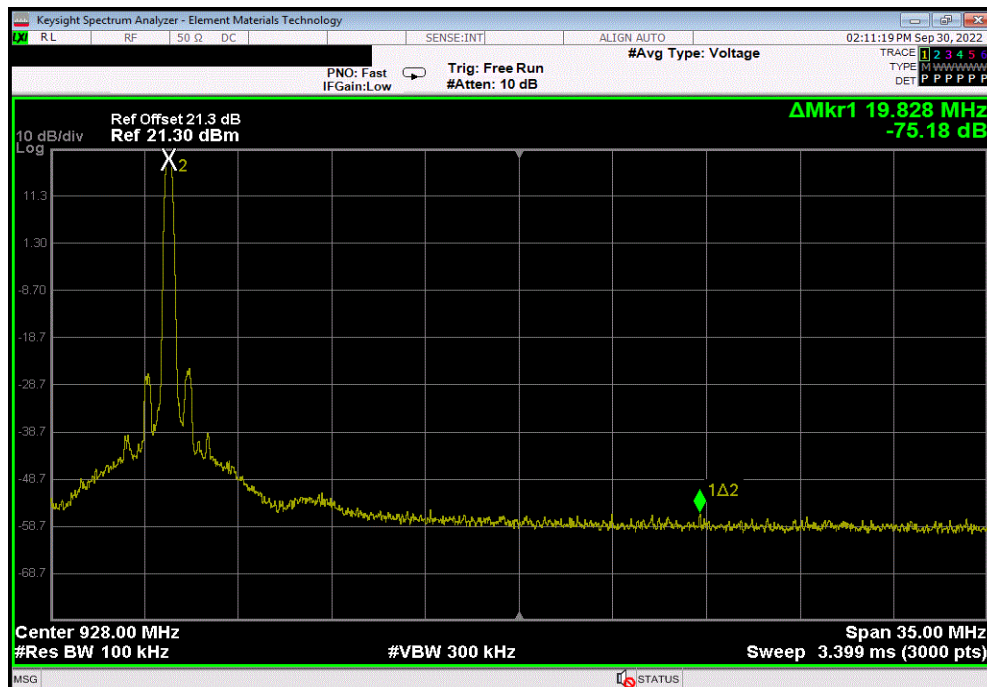


TbTtX 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz | | | | | | |
|---|--|--|--|----------------|------------------|--------|
| | | | | Value (dBc) | Limit ≤ (dBc) | Result |
| | | | | -44.3 | -30 | Pass |



| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz | | | | | | |
|--|--|--|--|----------------|------------------|--------|
| | | | | Value (dBc) | Limit ≤ (dBc) | Result |
| | | | | -75.18 | -30 | Pass |



BAND EDGE COMPLIANCE - HOPPING MODE



XMit 2023.02.14.0

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 |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Generator - Signal | Keysight | N5182B | TFU | 2022-12-02 | 2024-12-02 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVH | 2022-03-14 | 2023-03-14 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AAW | 2022-01-26 | 2023-01-26 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AAW | 2023-02-06 | 2024-02-06 |

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.


The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to its normal pseudo-random hopping sequence. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

BAND EDGE COMPLIANCE - HOPPING MODE



XMIT 2023.02.14.0

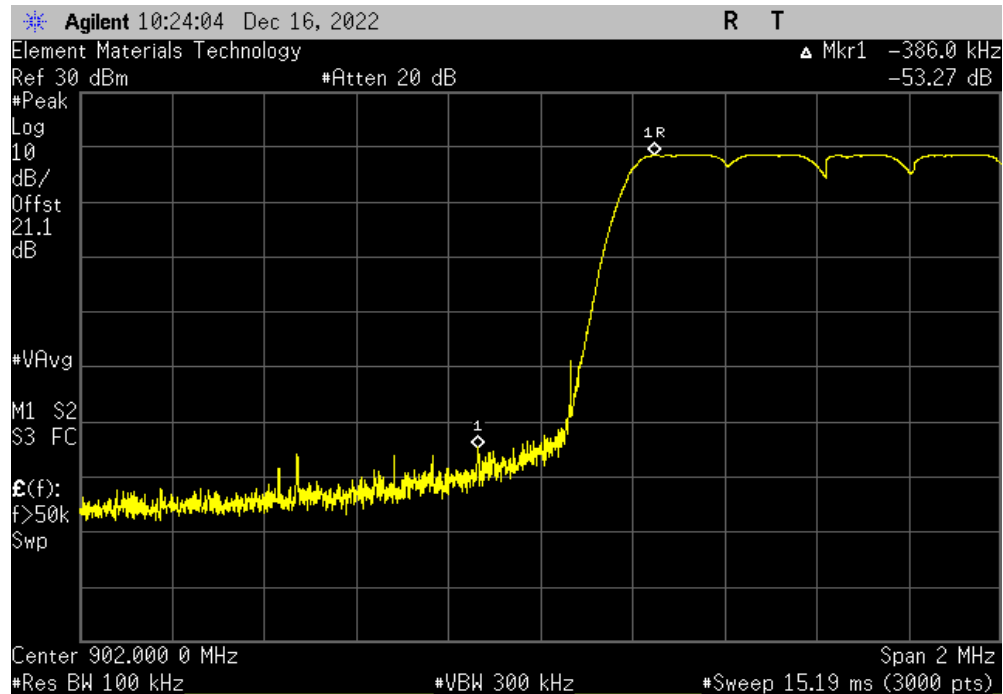
| | | | |
|--|---------------|--|-------------|
| EUT: Passport | | Work Order: ONIT0091 | |
| Serial Number: None | | Date: 02/16/23 | |
| Customer: Onity Inc. | | Temperature: 18.8°C | |
| Attendees: Ali Elmi | | Humidity: 41.6% | |
| Project: None | | Barometric Pres.: 1008 mbar | |
| Tested by: Jeff Alcock | | Power: Battery | |
| | | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.247:2022 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable, and manufacturers SMA patch cable. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | ONIT0091-5 | Signature  | |
| | | Value (dBc) | Limit (dBc) |
| Hopping Mode | | | |
| LoRa, 125 kHz BW | | | |
| SF 10 | | | |
| | Ch. 0, 902.3 | -53.3 | ≤ -30 |
| | Ch. 63, 914.9 | -68.3 | ≤ -30 |
| SF 7 | | | |
| | Ch. 0, 902.3 | -53.6 | ≤ -30 |
| | Ch. 63, 914.9 | -68.2 | ≤ -30 |
| | | | Result |
| | | | Pass |
| | | | Pass |

BAND EDGE COMPLIANCE - HOPPING MODE

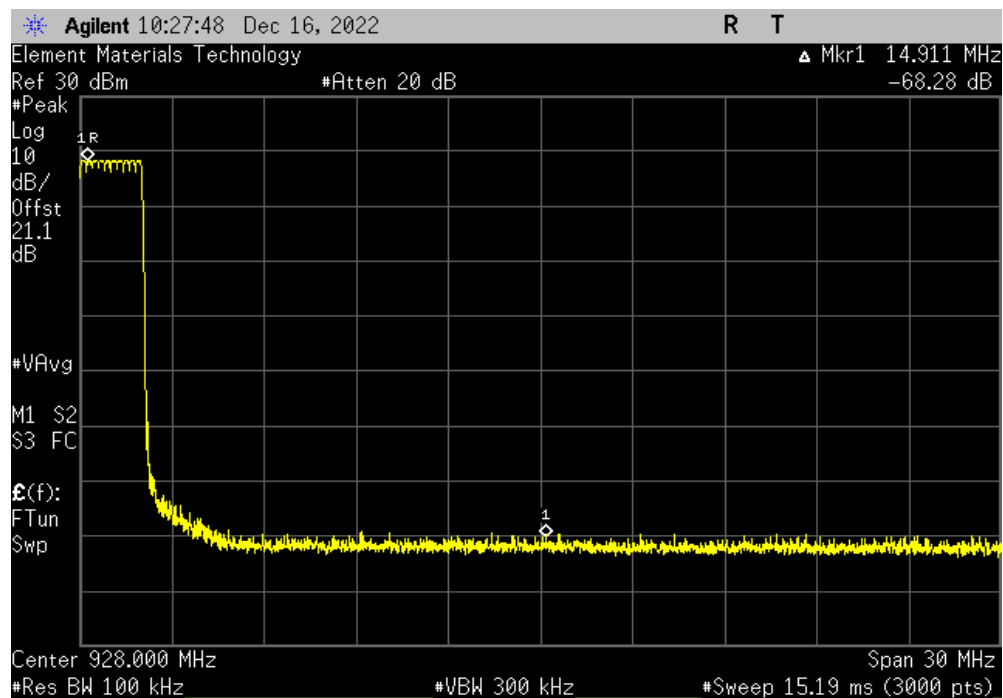


XMH 2023.02.14.0

| Hopping Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 | | | | | | |
|---|--|--|--|----------------|----------------|--------|
| | | | | Value (dBc) | Limit (dBc) | Result |
| | | | | -53.3 | ≤ -30 | Pass |



| Hopping Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 | | | | | | |
|--|--|--|--|----------------|----------------|--------|
| | | | | Value (dBc) | Limit (dBc) | Result |
| | | | | -68.3 | ≤ -30 | Pass |

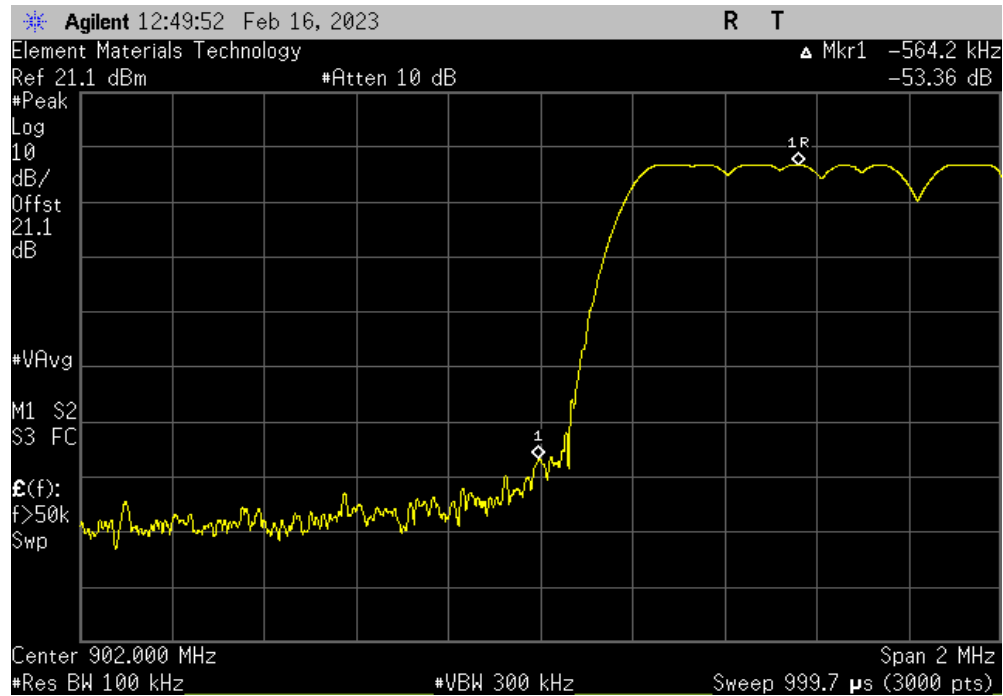


BAND EDGE COMPLIANCE - HOPPING MODE

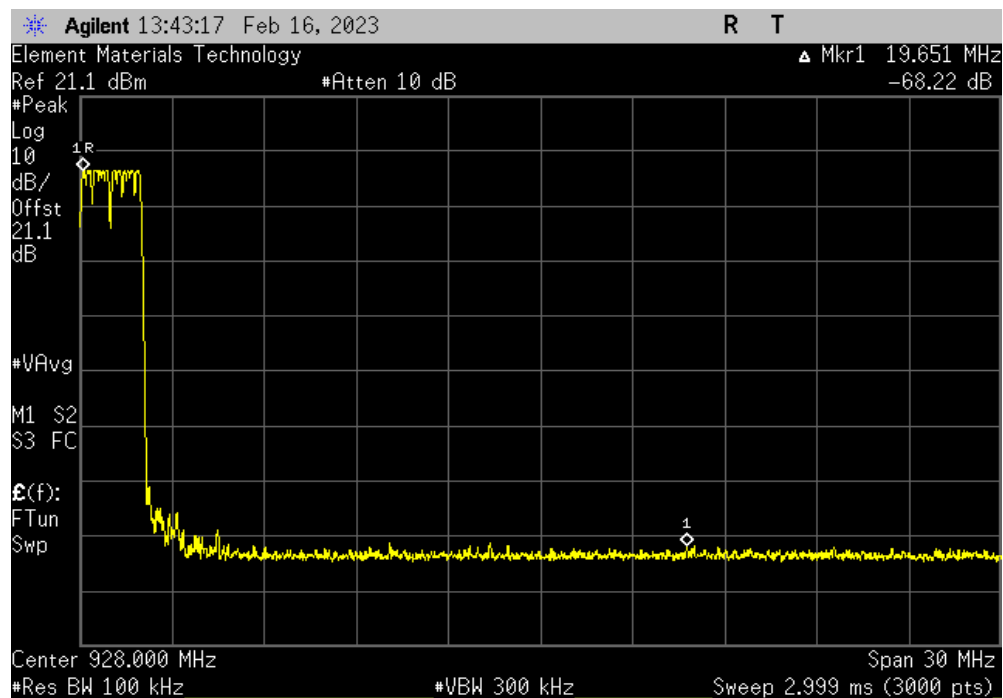


XM8 2023.02.14.0

| Hopping Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 | | | | | | |
|--|--|--|--|----------------|----------------|--------|
| | | | | Value (dBc) | Limit (dBc) | Result |
| | | | | -53.6 | ≤ -30 | Pass |



| Hopping Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 | | | | | | |
|---|--|--|--|----------------|----------------|--------|
| | | | | Value (dBc) | Limit (dBc) | Result |
| | | | | -68.2 | ≤ -30 | Pass |



EMISSIONS BANDWIDTH



XMit 2022.12.28.0

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 |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Generator - Signal | Keysight | N5182B | TFU | 2020-11-20 | 2022-11-20 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVI | 2021-12-05 | 2022-12-05 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFO | 2022-09-08 | 2023-09-08 |

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The 20 dB occupied bandwidth was measured with the EUT set to low, medium and high transmit frequencies in the band. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.


Per FCC KDB 558074 Section 10(b)(3), there is no requirement for hybrid systems to comply with the 500 kHz minimum 6dB bandwidth for DTS devices.

EMISSIONS BANDWIDTH



TbTx 2022.06.03.0

XMit 2022.12.28.0

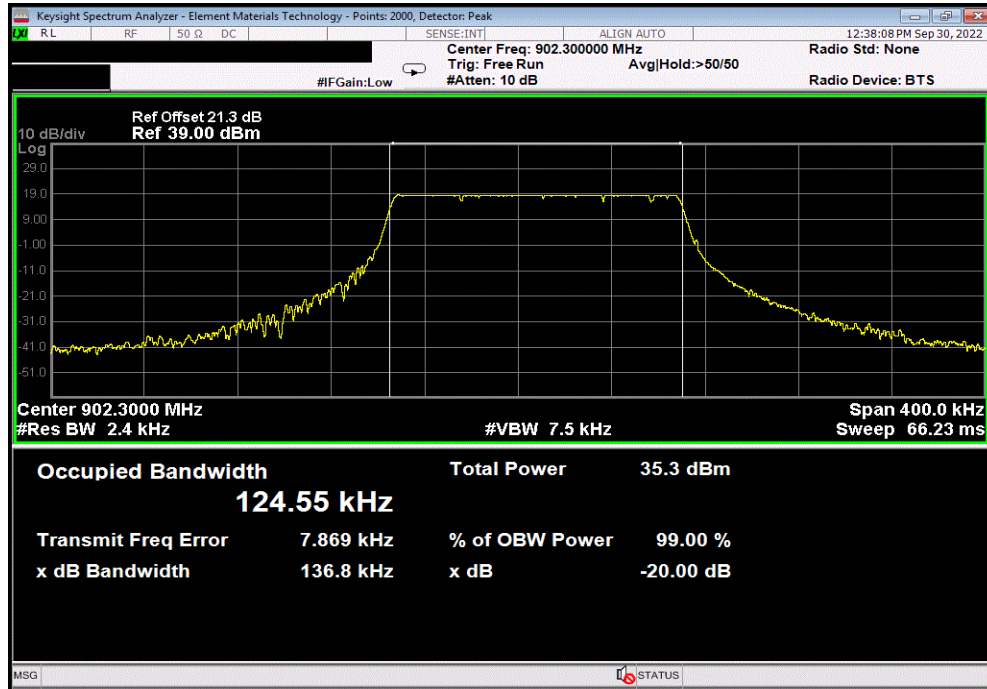
| | | | |
|--|----------------|---|--------|
| EUT: Passport | | Work Order: ONIT0091 | |
| Serial Number: 44594524 | | Date: 30-Sep-22 | |
| Customer: Onity Inc. | | Temperature: 21.8°C | |
| Attendees: Ali Elmi | | Humidity: 48.6% | |
| Project: None | | Barometric Pres.: 1021 mbar | |
| Tested by: Jeff Alcock | Power: Battery | Job Site: EV06 | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.247:2022 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable, and manufacturers SMA patch cable. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 3 | Signature  | |
| | | Value | Limit |
| Single Channel Mode | | | Result |
| LoRa, 125 kHz BW | | | |
| SF 10 | | | |
| Ch. 0, 902.3 MHz | | 136.76 kHz | N/A |
| Ch. 32, 908.7 MHz | | 137.71 kHz | N/A |
| Ch. 63, 914.9 MHz | | 136.844 kHz | N/A |
| SF 7 | | | |
| Ch. 0, 902.3 MHz | | 138.307 kHz | N/A |
| Ch. 32, 908.7 MHz | | 139.461 kHz | N/A |
| Ch. 63, 914.9 MHz | | 138.452 kHz | N/A |

EMISSIONS BANDWIDTH

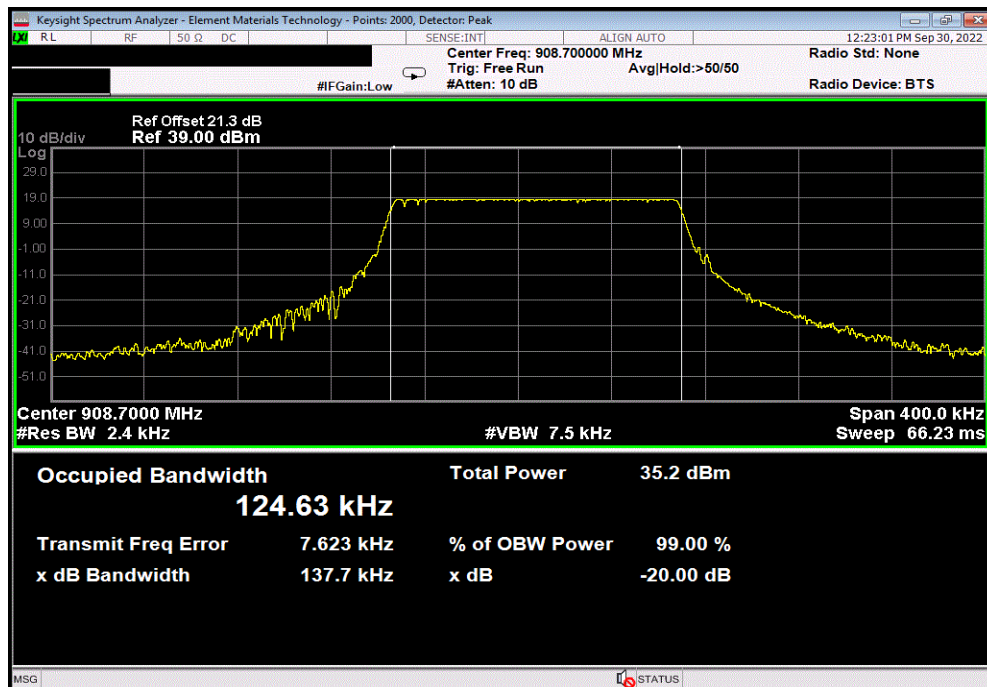


TbTx 2022.06.03.0 XMt 2022.12.28.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz | | | | | | |
|--|--|--|--|------------|-------|--------|
| | | | | Value | Limit | Result |
| | | | | 136.76 kHz | N/A | Pass |



| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz | | | | | | |
|---|--|--|--|------------|-------|--------|
| | | | | Value | Limit | Result |
| | | | | 137.71 kHz | N/A | Pass |



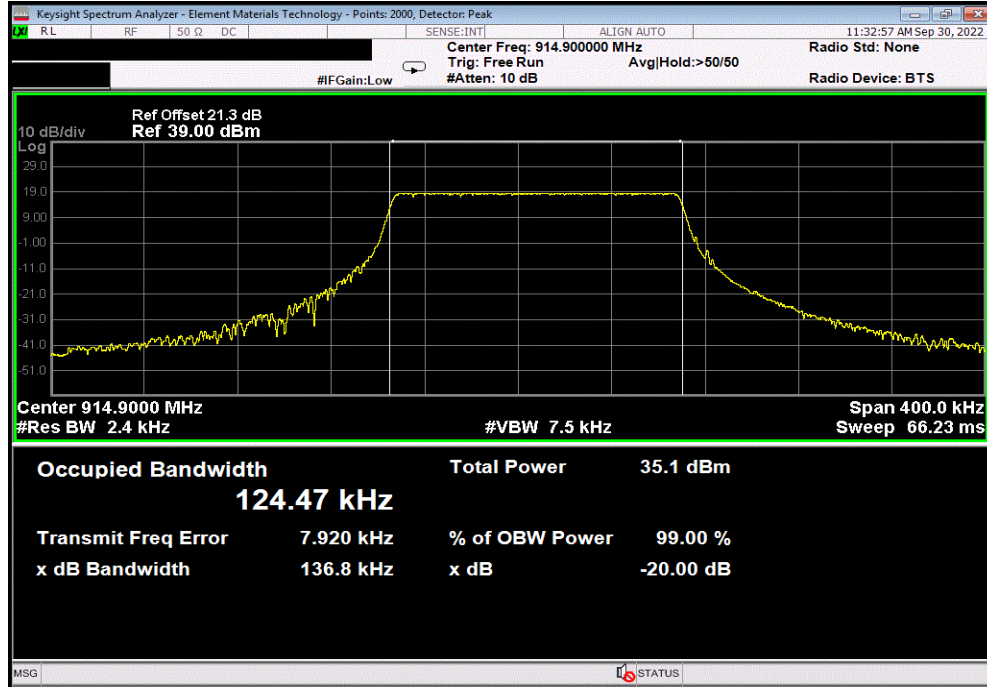
EMISSIONS BANDWIDTH



TbTx 2022.06.03.0 XMt 2022.12.28.0

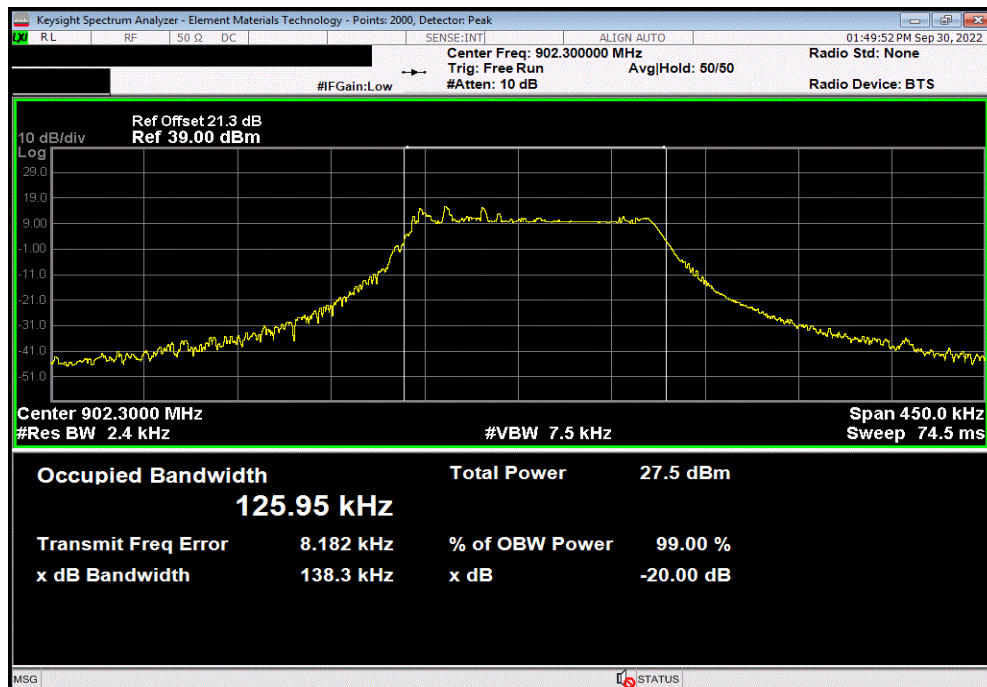
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz

| | Value | Limit | Result |
|--|-------------|-------|--------|
| | 136.844 kHz | N/A | Pass |



Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz

| | Value | Limit | Result |
|--|-------------|-------|--------|
| | 138.307 kHz | N/A | Pass |



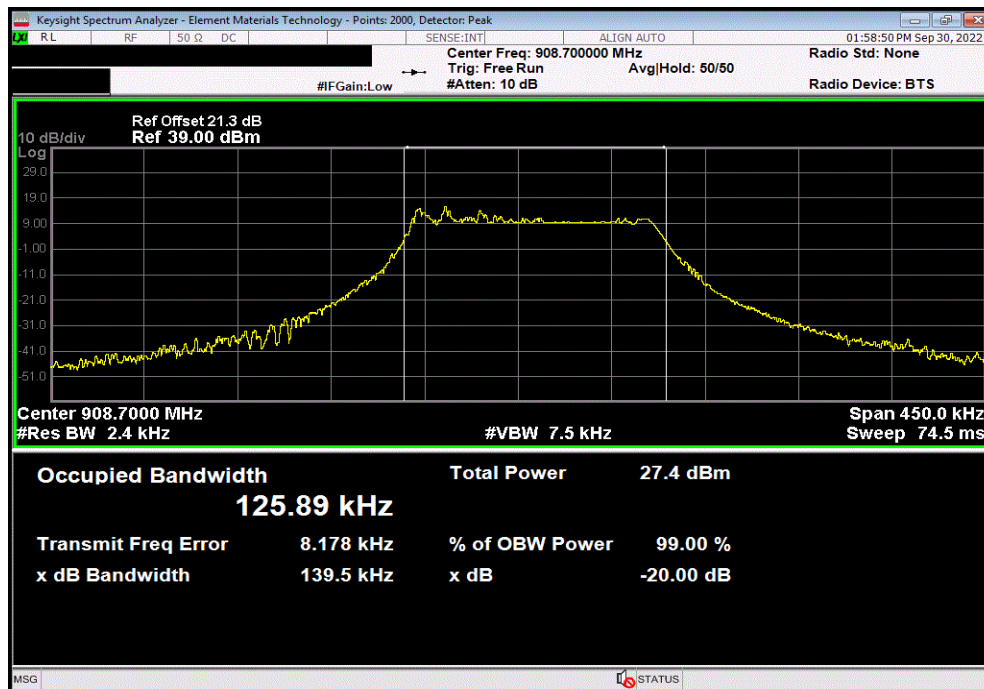
EMISSIONS BANDWIDTH



TbTx 2022.06.03.0 XMt 2022.12.28.0

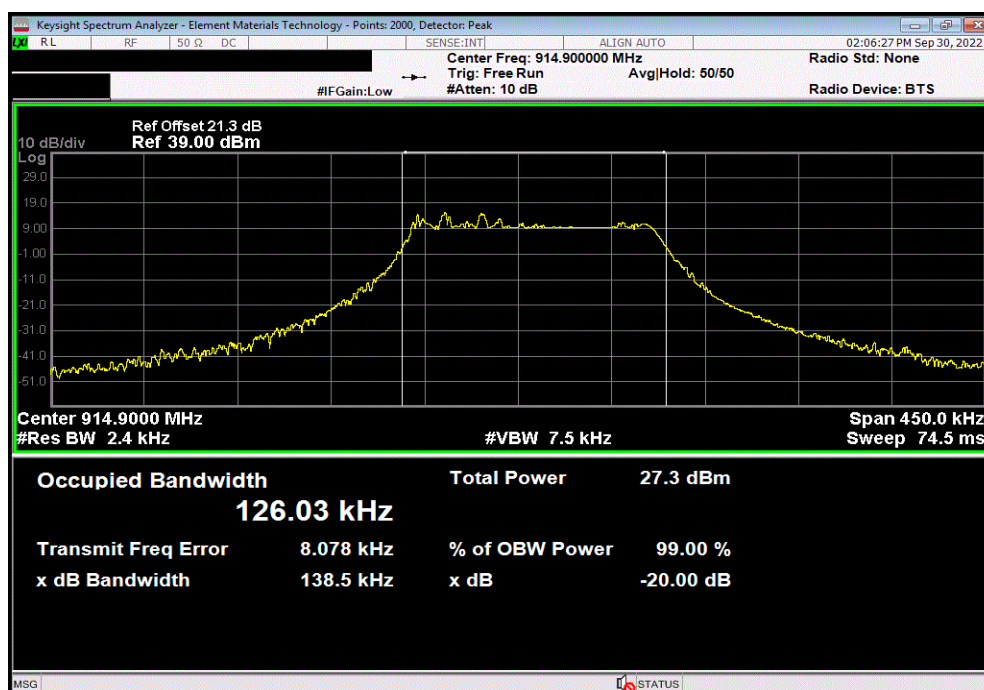
Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz

| Value | Limit | Result |
|-------------|-------|--------|
| 139.461 kHz | N/A | Pass |



Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz

| Value | Limit | Result |
|-------------|-------|--------|
| 138.452 kHz | N/A | Pass |



OCCUPIED BANDWIDTH

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

TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Cal. Due |
|------------------------------|--------------------|-----------------------|-----|------------|------------|
| Generator - Signal | Keysight | N5182B | TFU | 2020-11-20 | 2022-11-20 |
| Cable | Micro-Coax | UFD150A-1-0720-200200 | EVI | 2021-12-05 | 2022-12-05 |
| Attenuator | S.M. Electronics | SA26B-20 | AUY | 2022-03-15 | 2023-03-15 |
| Block - DC | Fairview Microwave | SD3379 | AMW | 2022-03-14 | 2023-03-14 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFO | 2022-09-08 | 2023-09-08 |

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.


Per FCC KDB 558074 Section 10(b)(3), there is no requirement for hybrid systems to comply with the 500 kHz minimum 6dB bandwidth for DTS devices.

The 99.0% occupied bandwidth was measured and used to determine the Resolution Bandwidth needed during Output Power measurement.

OCCUPIED BANDWIDTH



TbTx 2022.06.03.0 XMi 2022.02.07.0

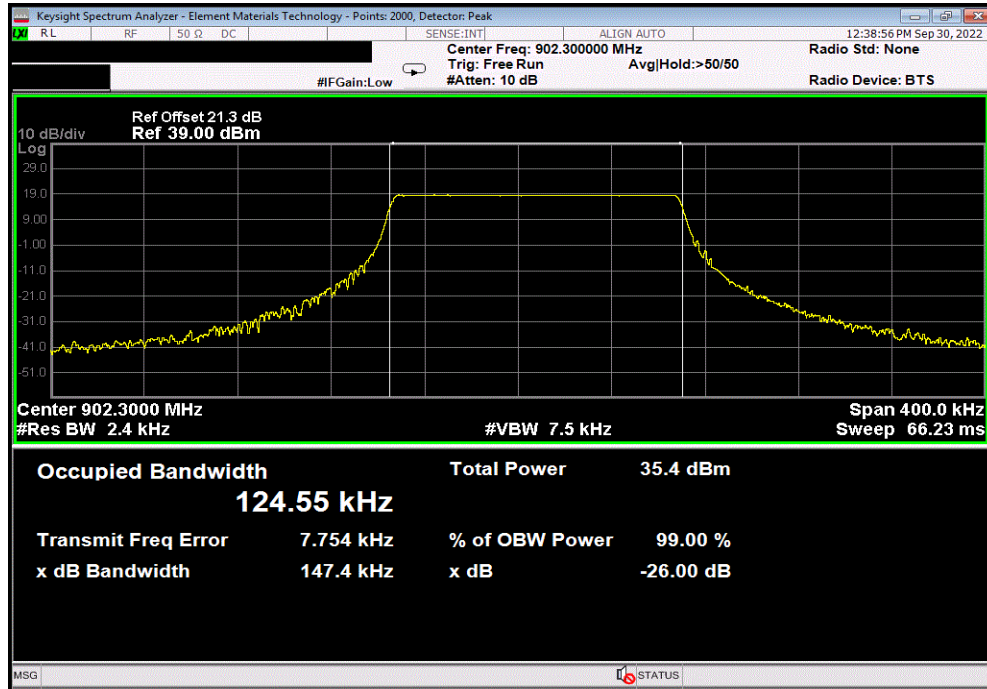
| | | | |
|--|-------------------|---|-------|
| EUT: Passport | | Work Order: ONIT0091 | |
| Serial Number: 44594524 | | Date: 30-Sep-22 | |
| Customer: Onity Inc. | | Temperature: 21.8 °C | |
| Attendees: Ali Elmi | | Humidity: 48.6% RH | |
| Project: None | | Barometric Pres.: 1021 mbar | |
| Tested by: Jeff Alcock | | Power: Battery | |
| Job Site: EV06 | | | |
| TEST SPECIFICATIONS | | Test Method | |
| FCC 15.247:2022 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Reference level offset includes: DC Block, 20 dB attenuator, measurement cable and manufacturers provided SMA patch cable. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 3 | Signature  | |
| | | Value | Limit |
| Single Channel Mode | | | |
| LoRa, 125 kHz BW | | | |
| SF 10 | | | |
| | Ch. 0, 902.3 MHz | 124.545 kHz | N/A |
| | Ch. 32, 908.7 MHz | 124.673 kHz | N/A |
| | Ch. 63, 914.9 MHz | 124.578 kHz | N/A |
| SF 7 | | | |
| | Ch. 0, 902.3 MHz | 126.188 kHz | N/A |
| | Ch. 32, 908.7 MHz | 126.091 kHz | N/A |
| | Ch. 63, 914.9 MHz | 126.289 kHz | N/A |

OCCUPIED BANDWIDTH

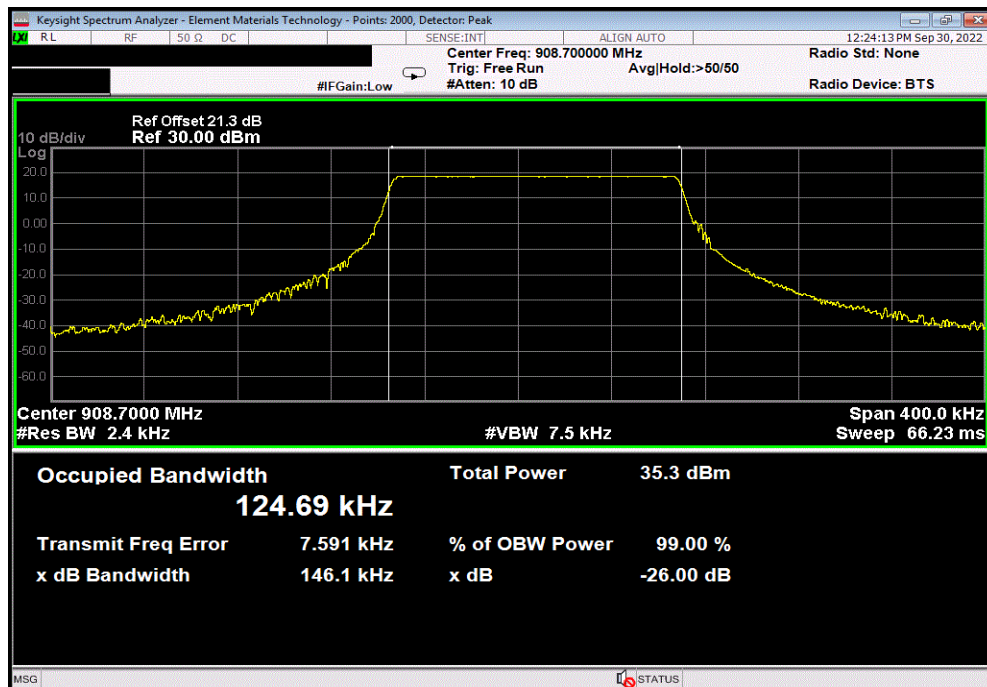


TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 0, 902.3 MHz | | | | | | |
|--|--|--|--|-------------|-------|--------|
| | | | | Value | Limit | Result |
| | | | | 124.545 kHz | N/A | N/A |



| Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 32, 908.7 MHz | | | | | | |
|---|--|--|--|-------------|-------|--------|
| | | | | Value | Limit | Result |
| | | | | 124.673 kHz | N/A | N/A |



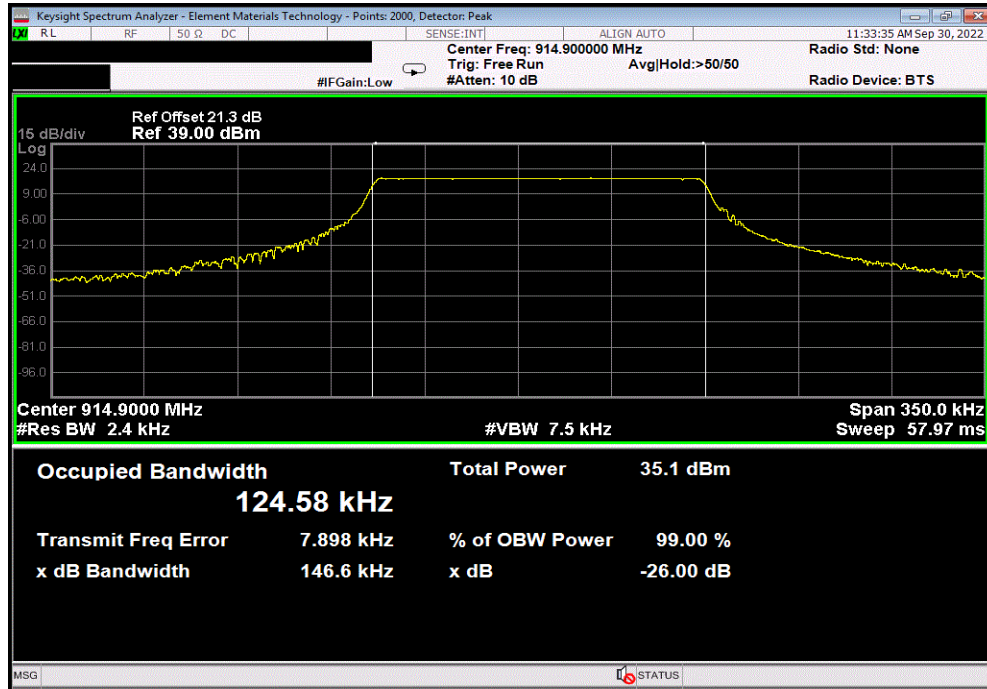
OCCUPIED BANDWIDTH



TbTx 2022.06.03.0 XMt 2022.02.07.0

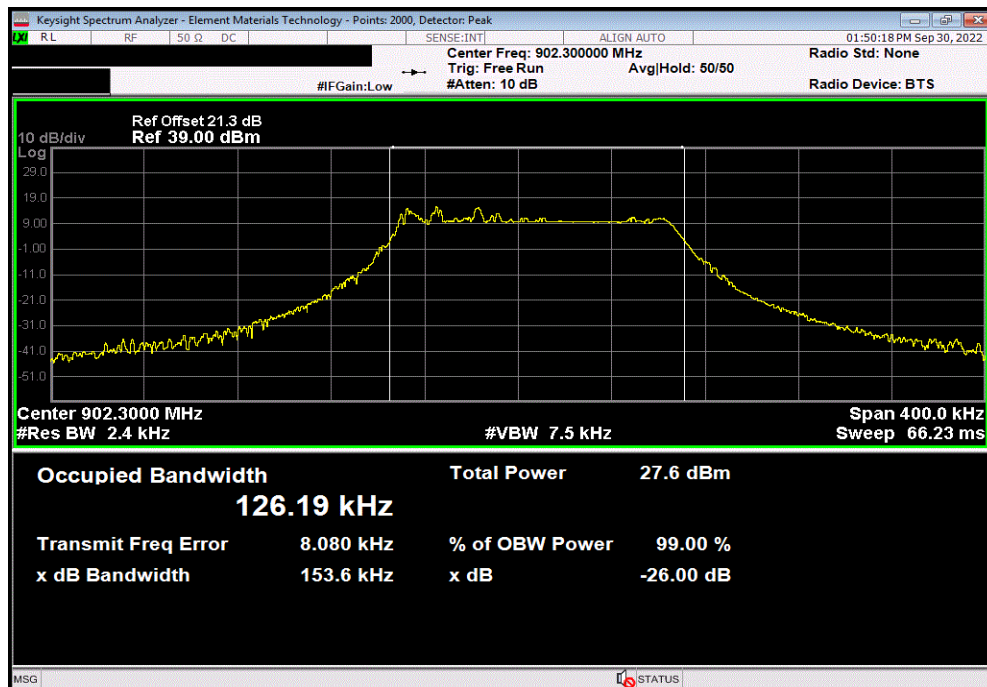
Single Channel Mode, LoRa, 125 kHz BW, SF 10, Ch. 63, 914.9 MHz

| | Value | Limit | Result |
|--|-------------|-------|--------|
| | 124.578 kHz | N/A | N/A |



Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 0, 902.3 MHz

| | Value | Limit | Result |
|--|-------------|-------|--------|
| | 126.188 kHz | N/A | N/A |

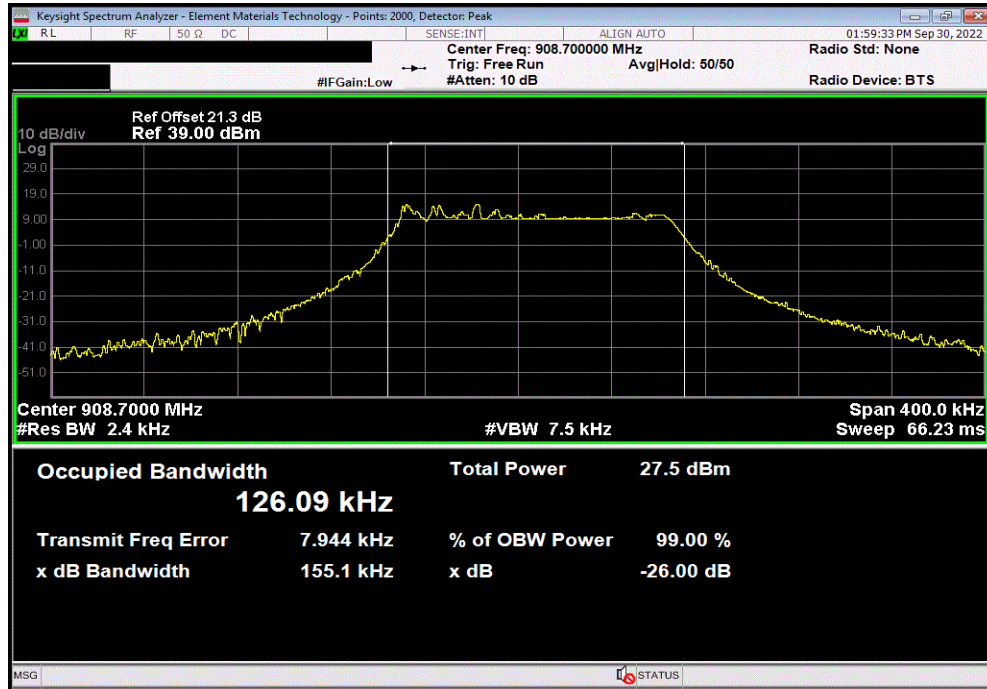


OCCUPIED BANDWIDTH



TbTx 2022.06.03.0 XMt 2022.02.07.0

| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 32, 908.7 MHz | | | | | | |
|--|--|--|--|-------------|-------|--------|
| | | | | Value | Limit | Result |
| | | | | 126.091 kHz | N/A | N/A |



| Single Channel Mode, LoRa, 125 kHz BW, SF 7, Ch. 63, 914.9 MHz | | | | | | |
|--|--|--|--|-------------|-------|--------|
| | | | | Value | Limit | Result |
| | | | | 126.289 kHz | N/A | N/A |

