



Boss Snowplow A Division of the Toro Company
Remote (143-7589)

FCC 15.247:2022
RSS-247 Issue 2:2017, RSS-Gen Issue 5:2018+A1:2019+A2:2021

902 - 928 MHz LoRa (DTS) Radio

Report: BONY0002.4, Issue Date: May 31, 2023



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CERTIFICATE OF TEST

Last Date of Test: October 05, 2022
Boss Snowplow A Division of the Toro Company
EUT: Remote (143-7589)

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2022	ANSI C63.10:2013, FCC KDB 558074 v05r02:2019
RSS-247 Issue 2:2017, RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Band Edge Compliance	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
Band Edge Compliance - Hopping Mode	N/A	15.247(d)	RSS-247 5.5	7.8.6	Not required for DTS devices.
Carrier Frequency Separation	N/A	15.247(a)(1)	RSS-247 5.1(b)	7.8.2	Not required for DTS devices.
DTS Bandwidth (6 dB)	Pass	15.247(a), KDB 558074 -8.2	RSS-247 5.2(a)	11.8.2	
Duty Cycle	Pass	15.247, KDB 558074 -6.0	RSS-Gen 3.2	11.6	
Dwell Time	N/A	15.247(a)(1)	RSS-247 5.1(d)	7.8.4	Not required for DTS devices.
Equivalent Isotropic Radiated Power (EIRP)	Pass	15.247(b), KDB 558074 -8.3	RSS-247 5.4(d)	11.9.1.1	
Number of Hopping Frequencies	N/A	15.247(a)(1)	RSS-247 5.1(d)	7.8.3	Not required for DTS devices.
Occupied Bandwidth (99%)	Pass	KDB 558074 -2.1	RSS-Gen 6.7	6.9.3	
Output Power	Pass	15.247(b), KDB 558074 -8.3	RSS-247 5.4(d)	11.9.1.1	
Power Spectral Density	Pass	15.247(e), KDB 558074 -8.4	RSS-247 5.2(b)	11.10.2	
Powerline Conducted Emissions (Receiver)	N/A	15.101, 15.107	RSS-Gen 5.2	ANSI C63.4 - 12.2.4	Not included per FCC 15.101 as this will be covered under SDoC rules for the FCC. RSS-Gen section 7 stated receiver requirements only apply to standalone receivers operating in the 30-960 MHz band and this is not a standalone receiver.
Powerline Conducted Emissions (Transmitter)	N/A	15.207	RSS-Gen 8.8	6.2	Not required for a battery powered EUT.
Radiated Emissions for Receiver	N/A	15.101, 15.109	RSS-Gen 5.2	ANSI C63.4 - 12.2.5	Not included per FCC 15.101 as this will be covered under SDoC rules for the FCC. RSS-Gen section 7 stated receiver requirements only apply to standalone receivers operating in the 30-960 MHz band and this is not a standalone receiver.
Spurious Conducted Emissions	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
Spurious Radiated Emissions	Pass	15.247(d), KDB 558074 -8.6, 8.7	RSS-247 5.5	6.5, 6.6, 11.12.1, 11.13.2	

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.

CERTIFICATE OF TEST



Deviations From Test Standards

None

Approved By:

Eric Brandon, Department Manager

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REVISION HISTORY



Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS



United States

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

A2LA - 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:

[California](#)

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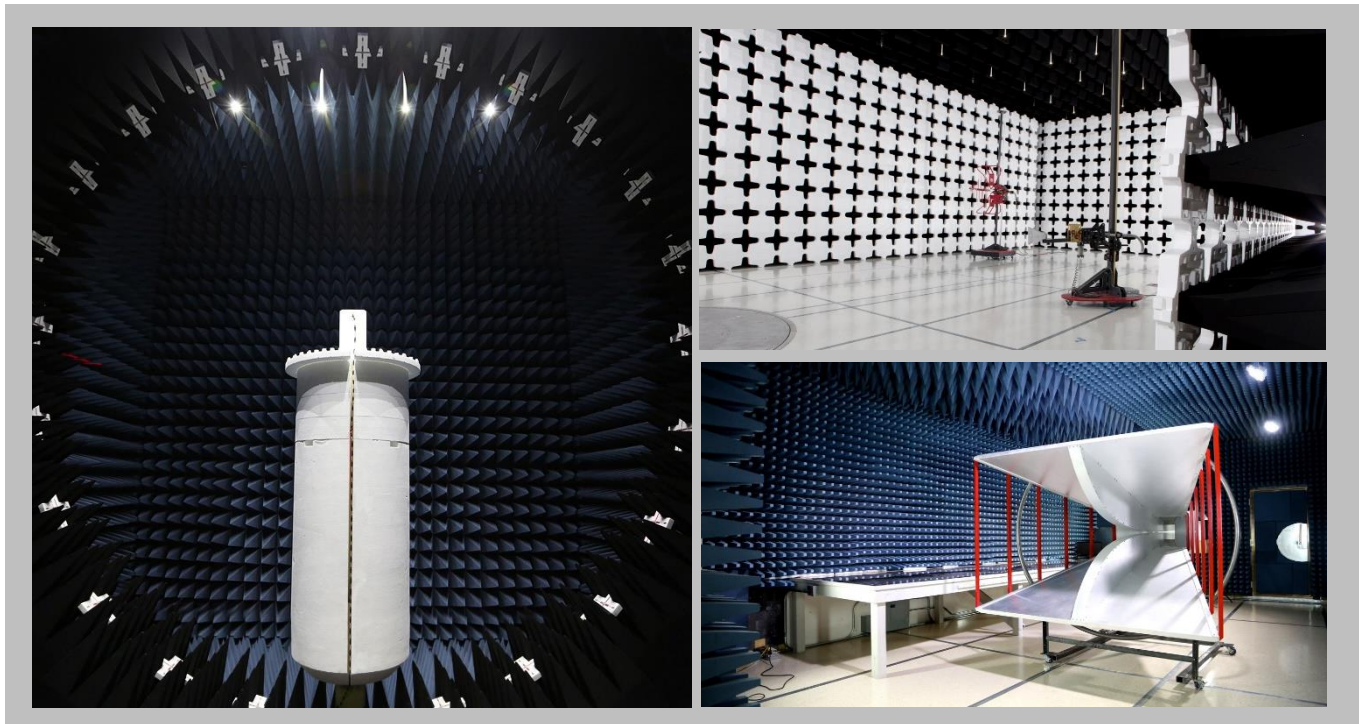
[Texas](#)

[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/RRA, 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

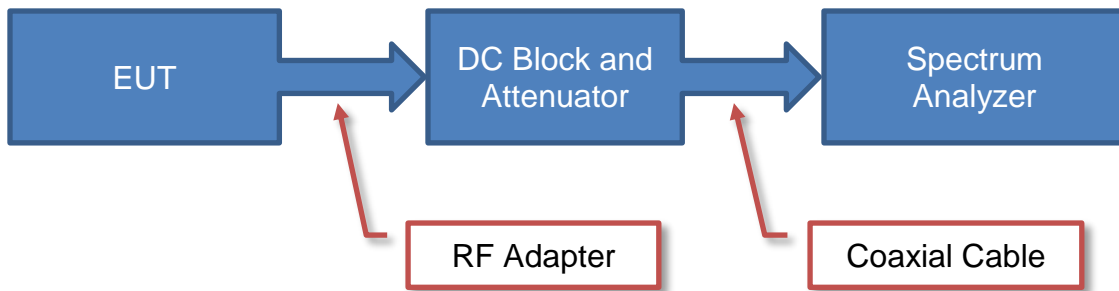
TEST SETUP BLOCK DIAGRAMS

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.

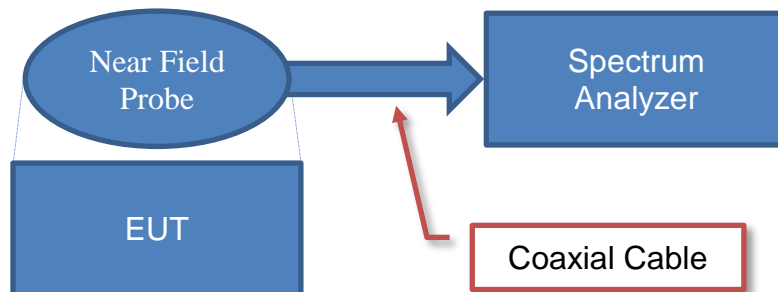
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

$$\begin{array}{r}
 \text{Measured Value} \\
 71.2
 \end{array}
 =
 \begin{array}{r}
 \text{Measured Level} \\
 42.6
 \end{array}
 +
 \begin{array}{r}
 \text{Reference Level Offset} \\
 28.6
 \end{array}$$

Near Field Test Fixture Measurements

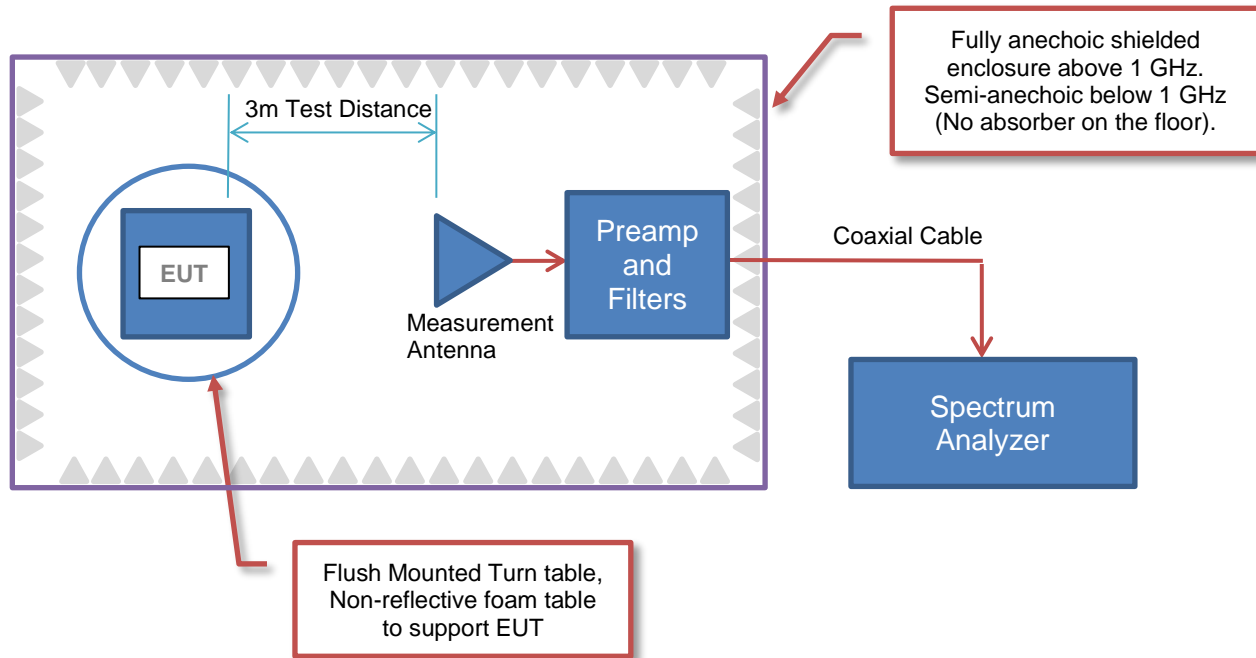


Sample Calculation (logarithmic units)

$$\begin{array}{r}
 \text{Measured Value} \\
 71.2
 \end{array}
 =
 \begin{array}{r}
 \text{Measured Level} \\
 42.6
 \end{array}
 +
 \begin{array}{r}
 \text{Reference Level Offset} \\
 28.6
 \end{array}$$

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

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

26.7 + 0.3 + 0.1 + 20.0 = 47.1

Radiated Power (ERP/EIRP) – Substitution Method:

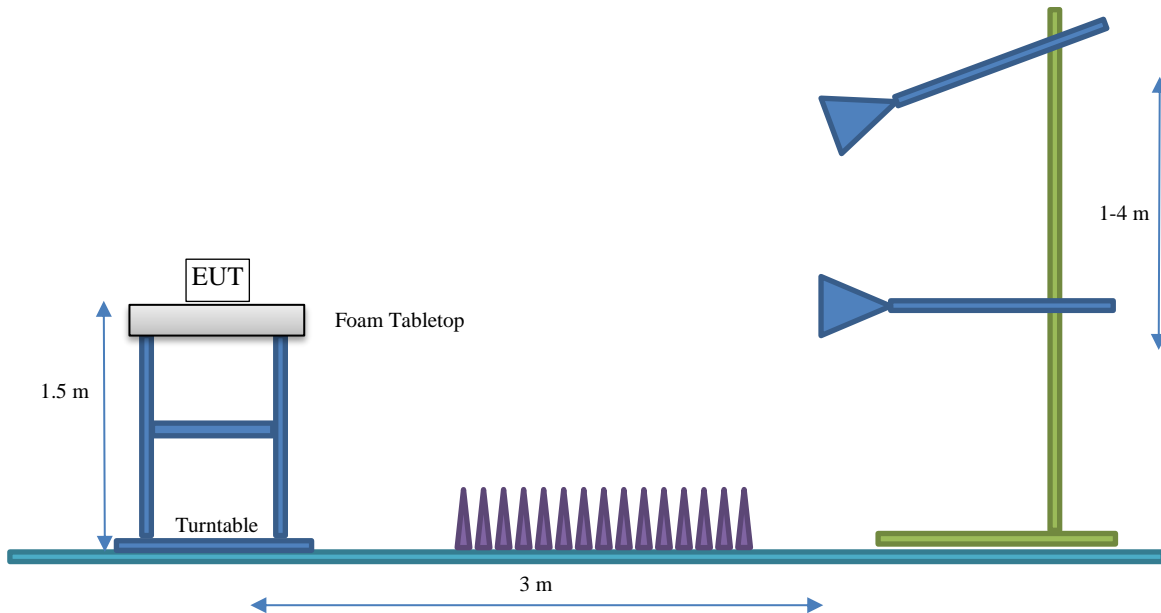
Measured Level into Substitution Antenna (Amplitude dBm)	Substitution Antenna Factor (dBi)	EIRP to ERP (if applicable)	Measured power (dBm ERP/EIRP)
10.0	6.0	2.15	13.9/16.0

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:	Boss Snowplow A Division of the Toro Company
Address:	2010 The Boss Way
City, State, Zip:	Iron Mountain, MI 49801
Test Requested By:	Derek Meyer
EUT:	Remote (143-7589)
First Date of Test:	October 4, 2022
Last Date of Test:	October 5, 2022
Receipt Date of Samples:	October 4, 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:

Battery powered remote device containing a LoRa radio module (915MHz). The EUT is used to control a sprayer de-icing system.

Testing Objective:

To demonstrate compliance of the LoRa radio under FCC 15.247/RSS-247

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)
Dielectric Resonator	Abracon (Model ACAG1204-915-T)	915 MHz	3.42

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: USI 1.21

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Type	Software Power Setting
LoRa (CSS)	23

CONFIGURATIONS



Configuration BONY0002- 1

Software/Firmware Running During Test	
Description	Version
EUT Firmware	USI 1.21

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Remote	Boss Snowplow A Division of the Toro Company	143-7589	VSIR-2210007

Configuration BONY0002- 3

Software/Firmware Running During Test	
Description	Version
EUT Firmware	USI 1.21

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Remote	Boss Snowplow A Division of the Toro Company	143-7589	VSIR-2210009

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2022-10-04	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	2022-10-04	DTS 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.
3	2022-10-04	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.
4	2022-10-04	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.
5	2022-10-04	Equivalent Isotropic Radiated Power (EIRP)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2022-10-04	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT was taken home by the client before the next scheduled test.
7	2022-10-04	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT was taken home by the client before the next scheduled test.
8	2022-10-04	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT was taken home by the client before the next scheduled test.
9	2022-10-05	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

DUTY CYCLE



XMR 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
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2022-05-30	2023-05-30
Block - DC	Fairview Microwave	SD3379	AMI	2022-09-10	2023-09-10
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2022-09-10	2023-09-10
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2022-04-25	2023-04-25
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24

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



TelTx 2022.06.03.0 XMit 2022.02.07.0

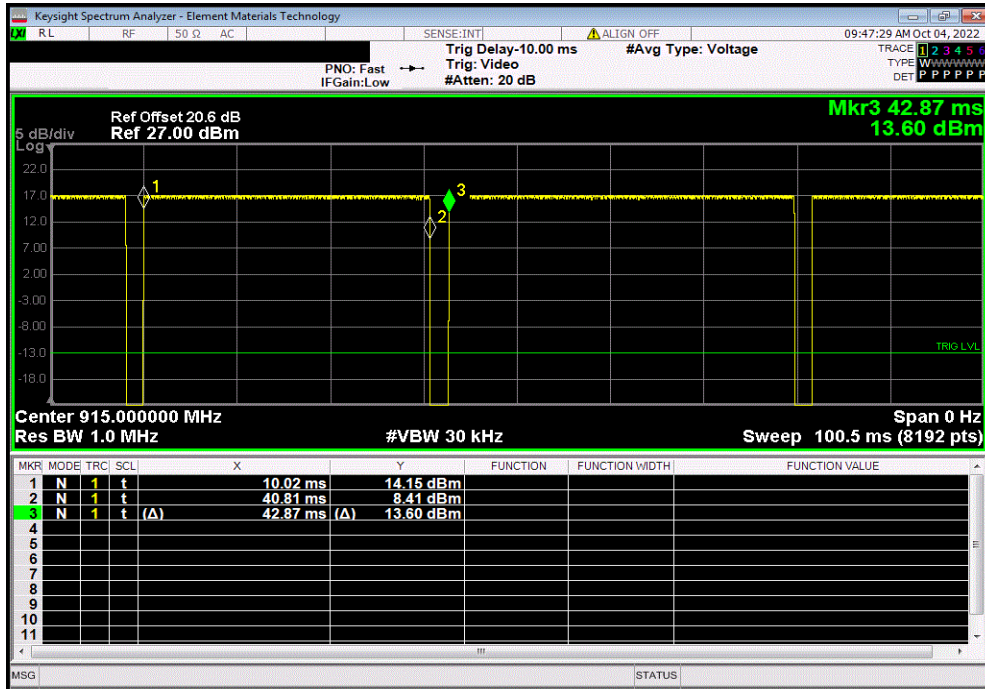
EUT: Remote		Work Order: BONY0002					
Serial Number: VSIR-22100007		Date: 4-Oct-22					
Customer: Boss Snowplow A Division of the Toro Company		Temperature: 22.1 °C					
Attendees: Derek Meyer		Humidity: 44.5% RH					
Project: None		Barometric Pres.: 1022 mbar					
Tested by: Christopher Heintzelman	Power: Internal Battery	Job Site: MN11					
TEST SPECIFICATIONS							
FCC 15.247:2022		ANSI C63.10:2013					
RSS-247 Issue 2:2017		ANSI C63.10:2013					
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013					
COMMENTS							
Reference level offset includes measurement cable, attenuator, and DC block, does not include customer's patch cable.							
DEVIATIONS FROM TEST STANDARD							
None							
Configuration #	1	Signature <i>Christopher Heintzelman</i>					
		Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
LoRa Single Channel, 915 MHz		30.796 ms	32.856 ms	1	93.7	N/A	N/A
LoRa Single Channel, 915 MHz		N/A	N/A	5	N/A	N/A	N/A

DUTY CYCLE

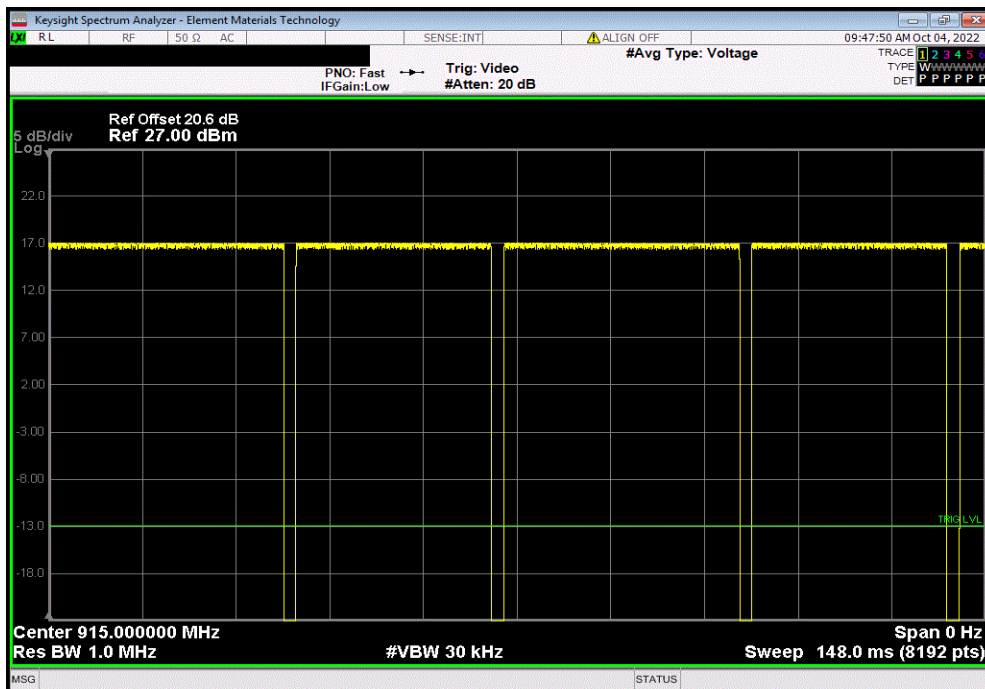


TbTx 2022.06.03.0 XMI 2022.02.07.0

LoRa Single Channel, 915 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
30.796 ms	32.856 ms	1	93.7	N/A	N/A	



LoRa Single Channel, 915 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	



DTS BANDWIDTH (6 dB)



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
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2022-05-30	2023-05-30
Block - DC	Fairview Microwave	SD3379	AMI	2022-09-10	2023-09-10
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2022-09-10	2023-09-10
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2022-04-25	2023-04-25

TEST DESCRIPTION

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

The EUT was set to the channels and modes listed in the datasheet.

The 6dB DTS bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

DTS BANDWIDTH (6 dB)



Ts/Ts 2022.06.03.0 XMt 2022.02.07.0

EUT:	Remote	Work Order:	BONY0002
Serial Number:	VSIR-22100007	Date:	4-Oct-22
Customer:	Boss Snowplow A Division of the Toro Company	Temperature:	22.1 °C
Attendees:	Derek Meyer	Humidity:	44.6% RH
Project:	None	Barometric Pres.:	1023 mbar
Tested by:	Christopher Heintzelman	Power:	Internal Battery
		Job Site:	MN11
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2022		ANSI C63.10:2013	
RSS-247 Issue 2:2017		ANSI C63.10:2013	
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013	
COMMENTS			
Reference level offset includes measurement cable, attenuator, and DC block, does not include customer's patch cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature	<i>Christopher Heintzelman</i>
		Value	Limit (>)
		686.6	500
			Result
			Pass

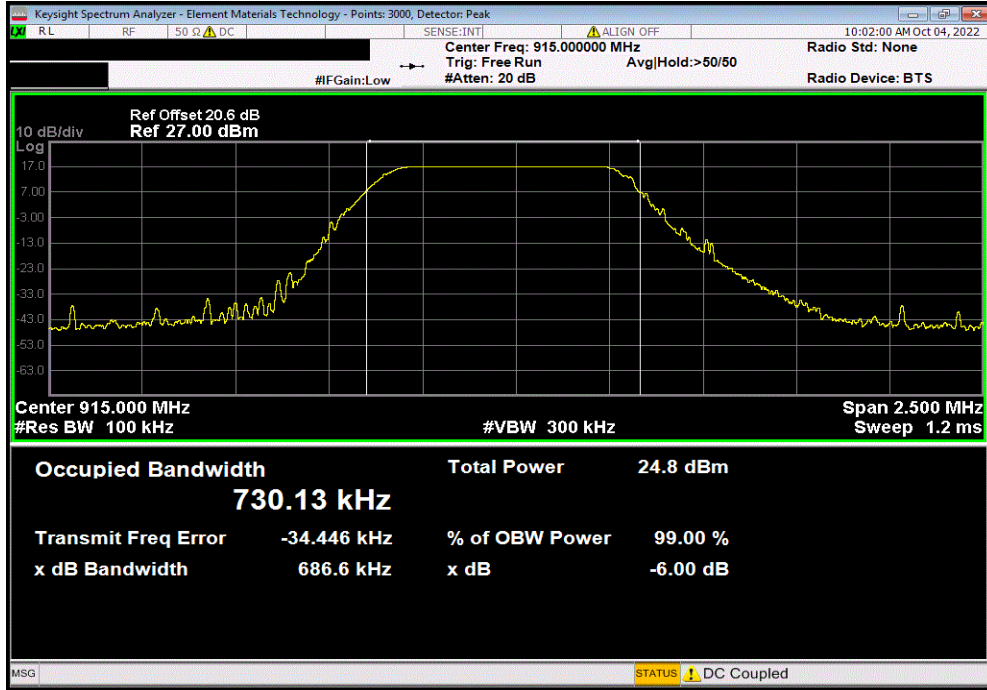
LoRa Single Channel, 915 MHz

DTS BANDWIDTH (6 dB)



TbTx 2022.06.03.0 XMI 2022.02.07.0

LoRa Single Channel, 915 MHz				Limit	Result
	Value	(>)			
	686.6	500			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
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2022-05-30	2023-05-30
Block - DC	Fairview Microwave	SD3379	AMI	2022-09-10	2023-09-10
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2022-09-10	2023-09-10
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2022-04-25	2023-04-25
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24

TEST DESCRIPTION

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

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.

Per ANSI C63.10:2013, 6.9.3, the spectrum analyzer was configured as follows:

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth.

OCCUPIED BANDWIDTH



TelTx 2022.06.03.0 XMI 2022.02.07.0

EUT: Remote		Work Order: BONY0002	
Serial Number: VSIR-22100007		Date: 4-Oct-22	
Customer: Boss Snowplow A Division of the Toro Company		Temperature: 22 °C	
Attendees: Derek Meyer		Humidity: 43.9% RH	
Project: None		Barometric Pres.: 1023 mbar	
Tested by: Christopher Heintzelman	Power: Internal Battery	Job Site: MN11	
TEST SPECIFICATIONS			
FCC 15.247:2022		ANSI C63.10:2013	
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013	
COMMENTS			
Reference level offset includes measurement cable, attenuator, and DC block, does not include customer's patch cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Christopher Heintzelman</i>	
		Value (kHz)	Limit
		562.3	N/A
			Result
			N/A

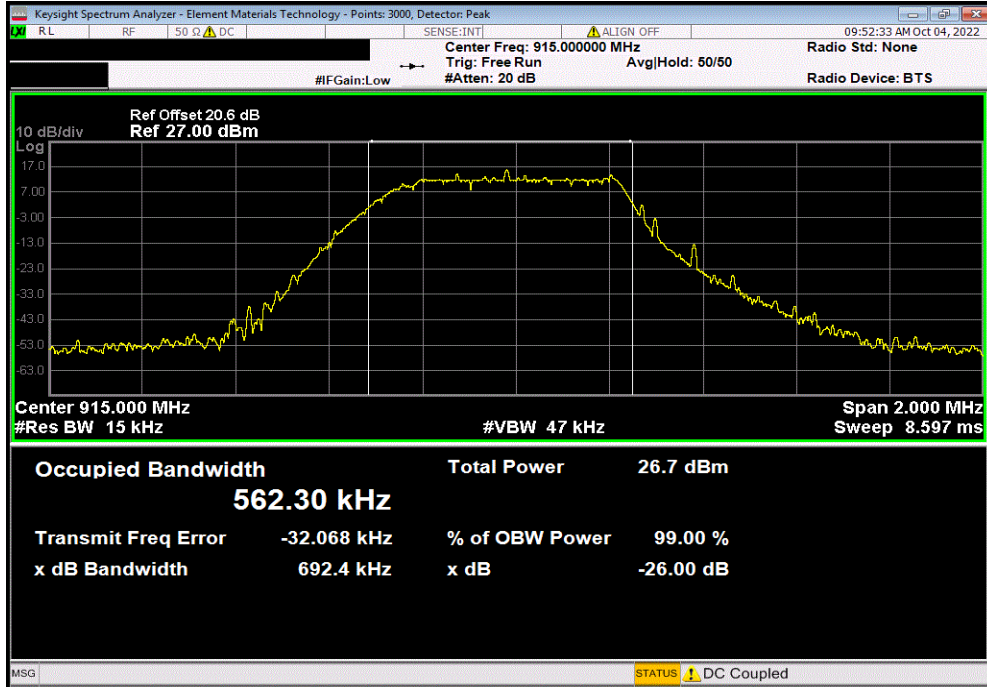
LoRa Single Channel, 915 MHz

OCCUPIED BANDWIDTH



TbTx 2022.06.03.0 XMI 2022.02.07.0

LoRa Single Channel, 915 MHz			
	Value	Limit	Result
	562.3	N/A	N/A



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
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2022-05-30	2023-05-30
Block - DC	Fairview Microwave	SD3379	AMI	2022-09-10	2023-09-10
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2022-09-10	2023-09-10
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2022-04-25	2023-04-25

TEST DESCRIPTION

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

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

OUTPUT POWER



Tb1Tx 2022.06.03.0 XMi 2022.02.07.0

EUT:	Remote	Work Order:	BONY0002	
Serial Number:	VSIR-22100007	Date:	4-Oct-22	
Customer:	Boss Snowplow A Division of the Toro Company	Temperature:	22.1 °C	
Attendees:	Derek Meyer	Humidity:	44.4% RH	
Project:	None	Barometric Pres.:	1023 mbar	
Tested by:	Christopher Heintzelman	Power:	Internal Battery	Job Site:
				MN11
TEST SPECIFICATIONS				
Test Method				
FCC 15.247:2022	ANSI C63.10:2013			
RSS-247 Issue 2:2017	ANSI C63.10:2013			
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013			
COMMENTS				
Reference level offset includes measurement cable, attenuator, and DC block, does not include customer's patch cable.				
DEVIATIONS FROM TEST STANDARD				
None				
Configuration #	1	Signature <i>Christopher Heintzelman</i>		
		Out Pwr (dBm)	Limit (dBm)	Result
		17.117	30	Pass

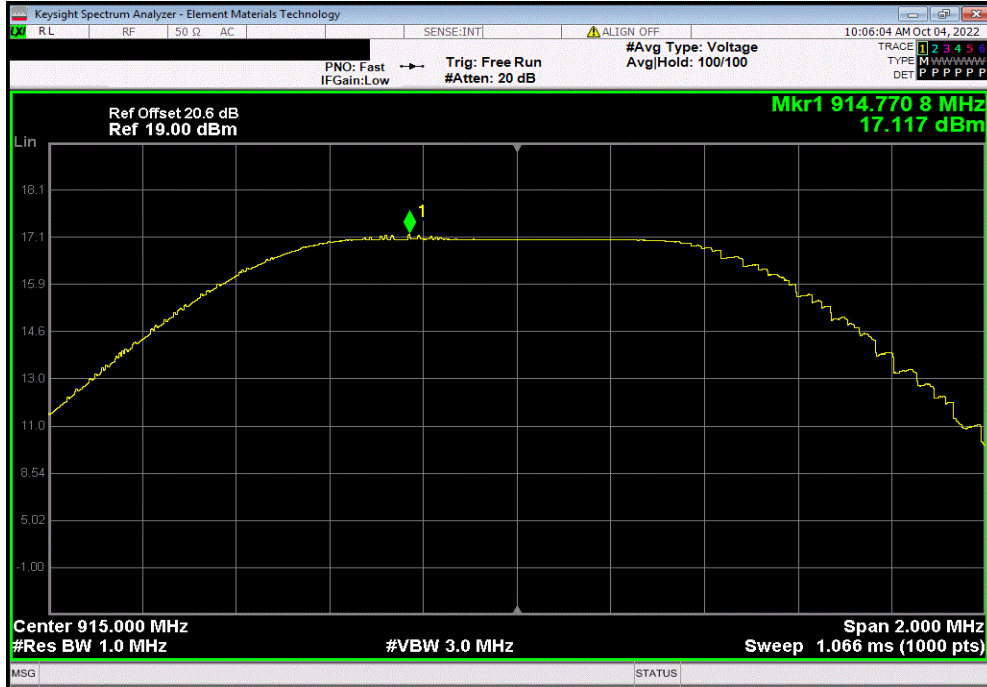
LoRa Single Channel, 915 MHz

OUTPUT POWER



TbTx 2022.06.03.0 XMI 2022.02.07.0

LoRa Single Channel, 915 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				17.117	30	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMI 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	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2022-05-30	2023-05-30
Block - DC	Fairview Microwave	SD3379	AMI	2022-09-10	2023-09-10
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2022-09-10	2023-09-10
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2022-04-25	2023-04-25

TEST DESCRIPTION

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

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

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

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TbTx 2022.06.03.0 XMI 2022.02.07.0

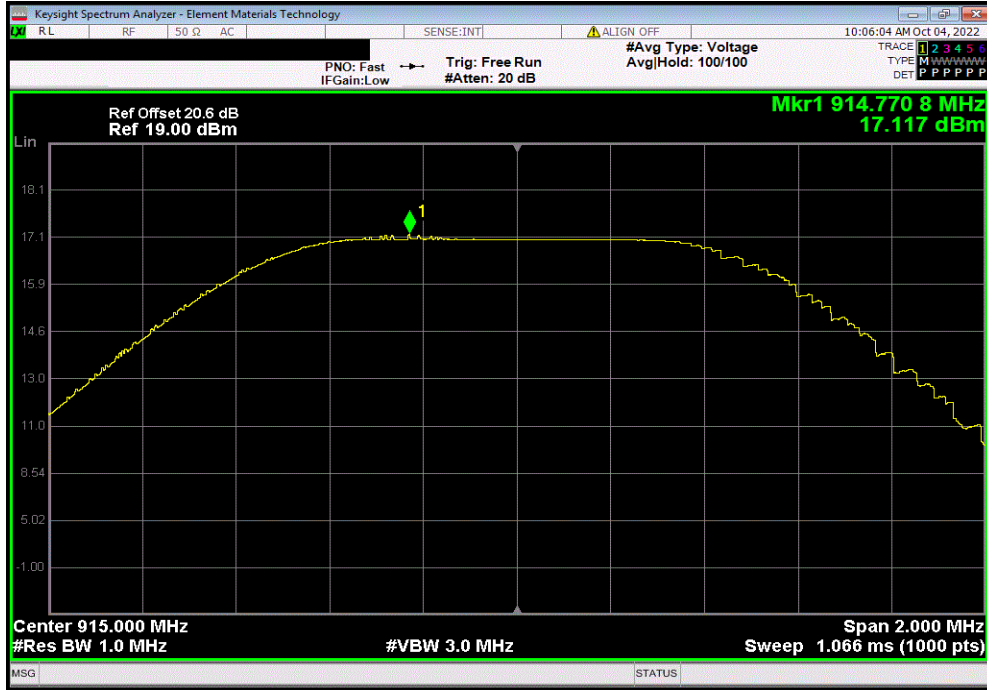
EUT: Remote		Work Order: BONY0002			
Serial Number: VSIR-22100007		Date: 4-Oct-22			
Customer: Boss Snowplow A Division of the Toro Company		Temperature: 22.1 °C			
Attendees: Derek Meyer		Humidity: 43.9% RH			
Project: None		Barometric Pres.: 1023 mbar			
Tested by: Christopher Heintzelman		Job Site: MN11			
Power: Internal Battery					
TEST SPECIFICATIONS		Test Method			
FCC 15.247:2022	ANSI C63.10:2013				
RSS-247 Issue 2:2017	ANSI C63.10:2013				
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013				
COMMENTS					
Reference level offset includes measurement cable, attenuator, and DC block, does not include customer's patch cable.					
DEVIATIONS FROM TEST STANDARD					
None					
Configuration #	1	Signature			
		<i>Christopher Heintzelman</i>			
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
LoRa Single Channel, 915 MHz	17.117	3.42	20.537	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TbTx 2022.06.03.0 XMI 2022.02.07.0

LoRa Single Channel, 915 MHz					
Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result	
17.117	3.42	20.537	36	Pass	



POWER SPECTRAL DENSITY



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
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2022-05-30	2023-05-30
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Block - DC	Fairview Microwave	SD3379	AMI	2022-09-10	2023-09-10
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2022-09-10	2023-09-10
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2022-04-25	2023-04-25

TEST DESCRIPTION

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

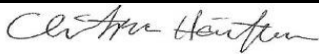
The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

POWER SPECTRAL DENSITY



TbTfx 2022.06.03.0 XMt 2022.02.07.0

EUT:	Remote	Work Order:	BONY0002	
Serial Number:	VSIR-22100007	Date:	4-Oct-22	
Customer:	Boss Snowplow A Division of the Toro Company	Temperature:	22.1 °C	
Attendees:	Derek Meyer	Humidity:	43.9% RH	
Project:	None	Barometric Pres.:	1023 mbar	
Tested by:	Christopher Heintzelman	Power:	Internal Battery	Job Site:
				MN11
TEST SPECIFICATIONS				
		Test Method		
FCC 15.247:2022		ANSI C63.10:2013		
RSS-247 Issue 2:2017		ANSI C63.10:2013		
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013		
COMMENTS				
Reference level offset includes measurement cable, attenuator, and DC block, does not include customer's patch cable.				
DEVIATIONS FROM TEST STANDARD				
None				
Configuration #	1	 <i>Signature</i>		
		Value	Limit	Results
		dBm/3kHz	< dBm/3kHz	
		5.417	8	Pass

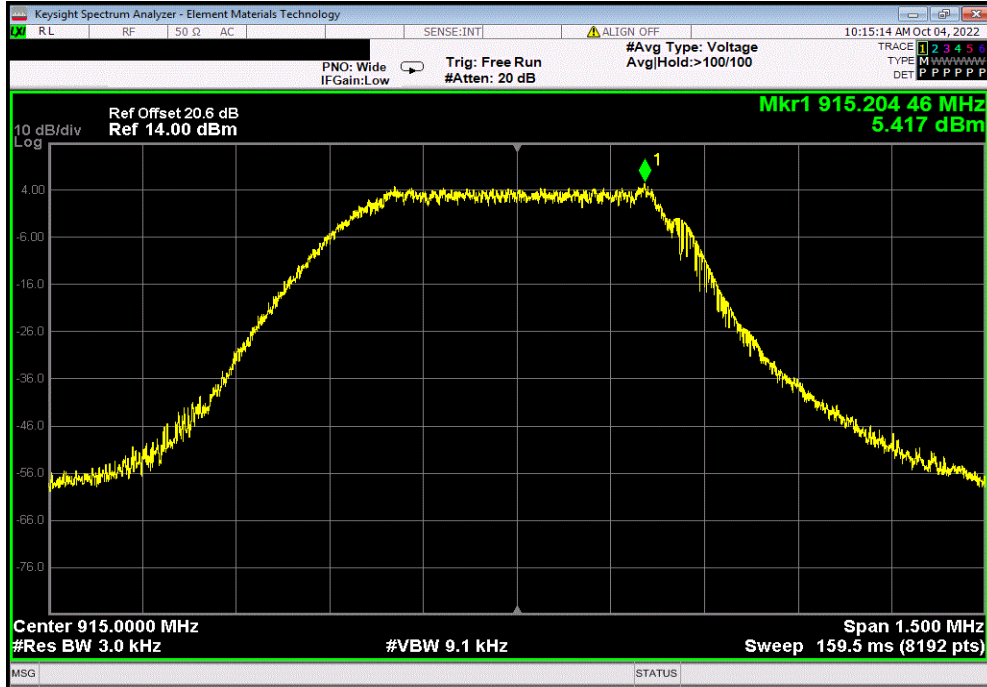
LoRa Single Channel, 915 MHz

POWER SPECTRAL DENSITY



TbTx 2022.06.03.0 XMI 2022.02.07.0

LoRa Single Channel, 915 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	5.417	8	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	Agilent	N5183A	TIK	2022-01-24	2025-01-24
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2022-05-30	2023-05-30
Block - DC	Fairview Microwave	SD3379	AMI	2022-09-10	2023-09-10
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2022-09-10	2023-09-10
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2022-04-25	2023-04-25

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 bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. 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



TelTx 2022.06.03.0 XMit 2022.02.07.0

EUT: Remote		Work Order: BONY0002	
Serial Number: VSIR-22100007		Date: 4-Oct-22	
Customer: Boss Snowplow A Division of the Toro Company		Temperature: 22 °C	
Attendees: Derek Meyer		Humidity: 44% RH	
Project: None		Barometric Pres.: 1022 mbar	
Tested by: Christopher Heintzelman		Power: Internal Battery	
		Job Site: MN11	
TEST SPECIFICATIONS			
FCC 15.247:2022		ANSI C63.10:2013	
RSS-247 Issue 2:2017		ANSI C63.10:2013	
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013	
COMMENTS			
Reference level offset includes measurement cable, attenuator, and DC block, does not include customer's patch cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Christopher Heintzelman</i>	
		Value (dBc)	Limit ≤ (dBc) Result
		-62.72	-20 Pass
		-63.04	-20 Pass

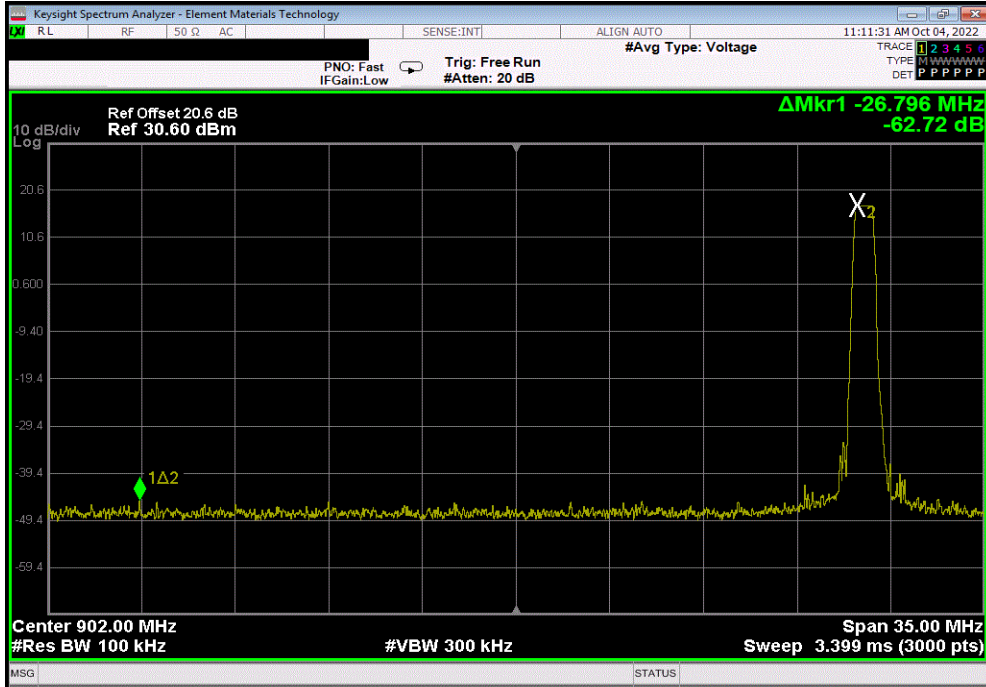
LoRa Single Channel, 915 MHz
LoRa Single Channel, 915 MHz

BAND EDGE COMPLIANCE

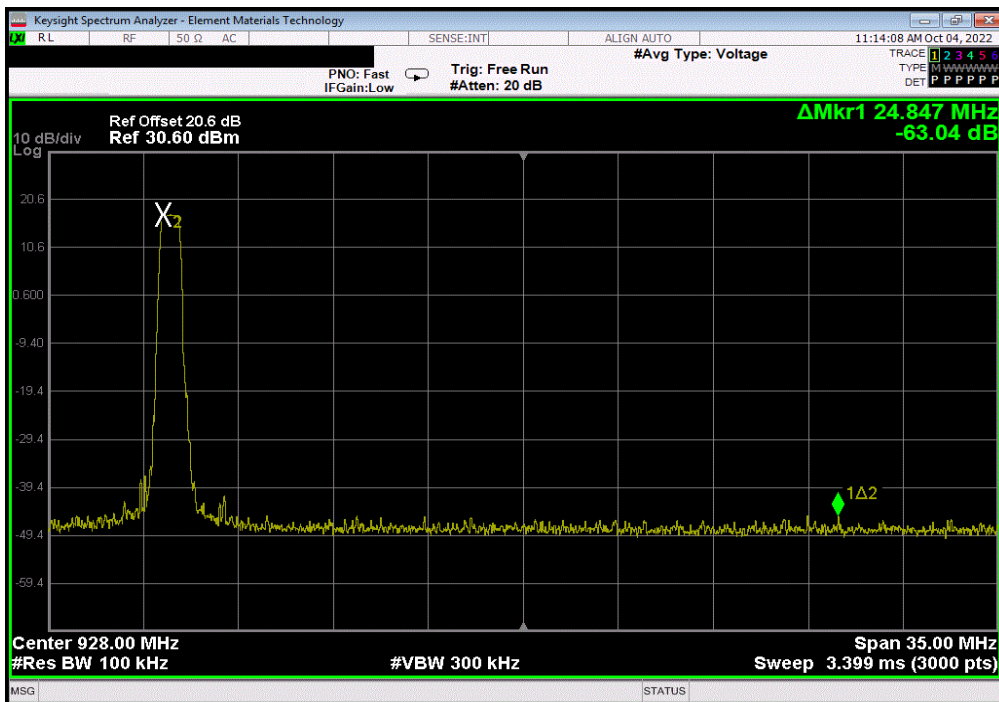


TbTx 2022.06.03.0 XMI 2022.02.07.0

LoRa Single Channel, 915 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-62.72	-20	Pass



LoRa Single Channel, 915 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-63.04	-20	Pass





XMit 2022.02.07.0

SPURIOUS CONDUCTED EMISSIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2022-05-30	2023-05-30
Block - DC	Fairview Microwave	SD3379	AMI	2022-09-10	2023-09-10
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2022-09-10	2023-09-10
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2022-04-25	2023-04-25
Generator - Signal	Agilent	N5183A	TIK	2022-01-24	2025-01-24

TEST DESCRIPTION

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

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the fundamental was measured with a 100 kHz resolution bandwidth and the highest value was recorded. The rest of the spectrum was then measured with a 100 kHz resolution bandwidth and the highest value was found. The difference between the value found on the fundamental and the rest of the spectrum was compared against the limit to determine compliance.

The reference level offset for the fundamental screen capture was based on a measured value of the loss between the spectrum analyzer and the EUT which was verified at the time of test. The remaining screen capture(s) use an internal transducer factor on the analyzer to correct the displayed trace based on the cable loss over frequency. The reference level offset for the additional screen capture(s) is then based on the expected attenuator value and any other losses.

Fundamental Offset = Ref Lvl Offset showing measured composite factor of all losses

Remaining Screen capture(s) Offset = "Internal" cable loss factor not shown on screen capture + Ref Lvl Offset showing expected attenuator value and any other losses

SPURIOUS CONDUCTED EMISSIONS



ThyTr 2022.06.03.0 XMI 2022.02.07.0

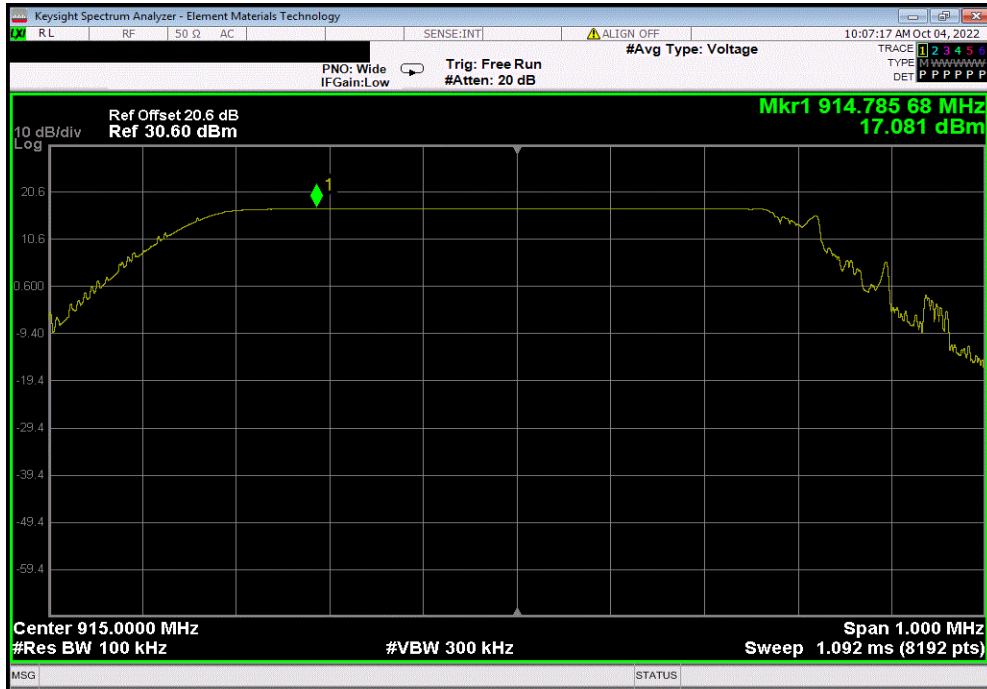
EUT: Remote		Work Order: BONY0002				
Serial Number: VSIR-22100007		Date: 4-Oct-22				
Customer: Boss Snowplow A Division of the Toro Company		Temperature: 22 °C				
Attendees: Derek Meyer		Humidity: 44% RH				
Project: None		Barometric Pres.: 1023 mbar				
Tested by: Christopher Heintzelman		Job Site: MN11				
Power: Internal Battery						
TEST SPECIFICATIONS						
		Test Method				
FCC 15.247:2022		ANSI C63.10:2013				
RSS-247 Issue 2:2017		ANSI C63.10:2013				
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013				
COMMENTS						
Reference level offset includes measurement cable, attenuator, and DC block, does not include customer's patch cable.						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	1	Signature <i>Christopher Heintzelman</i>				
		Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
LoRa Single Channel, 915 MHz		Fundamental	914.79	N/A	N/A	N/A
LoRa Single Channel, 915 MHz		30 MHz - 12 GHz	5672.31	-56.81	-20	Pass

SPURIOUS CONDUCTED EMISSIONS

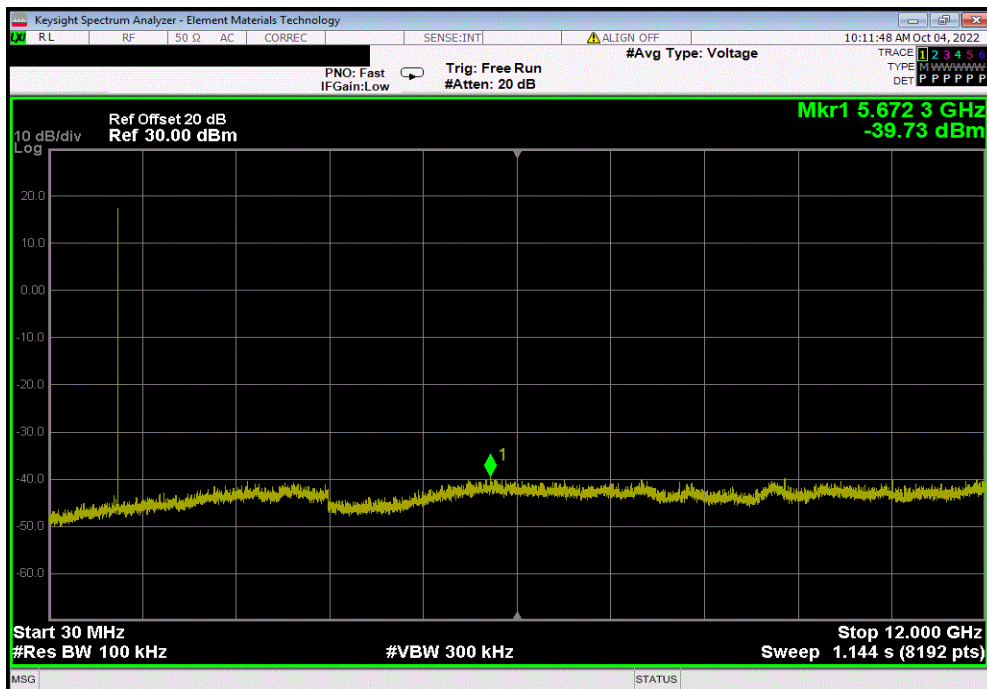


TbTx 2022.06.03.0 XMi 2022.02.07.0

LoRa Single Channel, 915 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	914.79	N/A	N/A	N/A	



LoRa Single Channel, 915 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12 GHz	5672.31	-56.81	-20	Pass	



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 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 $10 \cdot \log(1/dc)$.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2022-03-22	2023-03-22
Antenna - Double Ridge	ETS Lindgren	3115	AIB	2022-09-01	2024-09-01
Cable	Element	Double Ridge Guide Horn Cables	MNV	2022-01-24	2023-01-24
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2022-01-24	2023-01-24
Antenna - Standard Gain	ETS-Lindgren	3160-07	AJJ	NCR	NCR
Cable	Element	Standard Gain Cable	MNW	2022-01-24	2023-01-24
Filter - High Pass	Micro-Tronics	HPM50111	HFM	2022-09-10	2023-09-10
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2022-01-24	2023-01-24
Antenna - Standard Gain	ETS-Lindgren	3160-08	AJP	NCR	NCR
Amplifier - Pre-Amplifier	L-3 Narda-Miteq	AMF-6F-12001800-30-10P	PAP	2022-01-24	2023-01-24
Antenna - Biconilog	Ametek	CBL 6141B	AYS	2021-03-09	2023-03-09
Cable	Element	Biconilog Cable	MNX	2022-01-24	2023-01-24
Amplifier - Pre-Amplifier	Miteq	AM-1064-9079 and SA18E-10	AOO	2022-01-24	2023-01-24
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HGS	2022-06-22	2023-06-22

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 12400 MHz

POWER INVESTIGATED

Internal Battery

CONFIGURATIONS INVESTIGATED

BONY0002-3

SPURIOUS RADIATED EMISSIONS



MODES INVESTIGATED

Transmitting LoRa 915 MHz, Modulated, 500 kHz Bandwidth

SPURIOUS RADIATED EMISSIONS



EUT:	Remote	Work Order:	BONY0002
Serial Number:	VSIR-2210009	Date:	2022-10-05
Customer:	Boss Snowplow A Division of the Toro Company	Temperature:	22.6°C
Attendees:	Derek Meyer	Relative Humidity:	47.8%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Marcelo Aguayo, Chris Heintzelman	Job Site:	MN09
Power:	Internal Battery	Configuration:	BONY0002-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2022	ANSI C63.10:2013
RSS-247 Issue 2:2017, RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	5	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

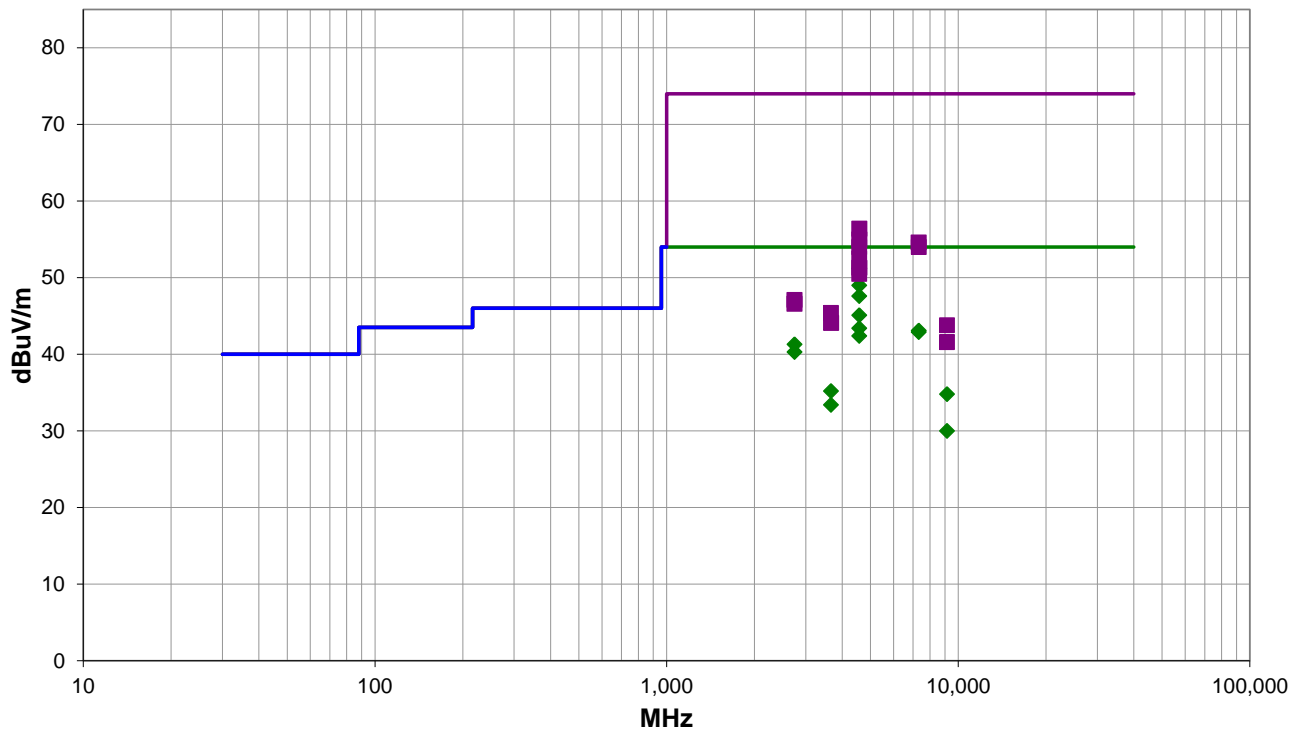
DCCF calculated as $10 \cdot \log(93.7\%) = 0.28 \text{ dB}$

EUT OPERATING MODES

Transmitting LoRa 915 MHz, Modulated, 500 kHz Bandwidth

DEVIATIONS FROM TEST STANDARD

None



Run #: 5

PK AV QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #5

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	Duty Cycle Correction Factor (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4575.283	46.1	5.1	4.0	133.0	3.0	0.3	Vert	AV	0.0	51.5	54.0	-2.5	EUT On Side
4575.200	43.9	5.1	1.0	14.0	3.0	0.3	Horz	AV	0.0	49.3	54.0	-4.7	EUT Vert
4575.167	42.5	5.1	1.1	255.0	3.0	0.3	Vert	AV	0.0	47.9	54.0	-6.1	EUT Horz
4575.517	40.0	5.1	1.1	139.0	3.0	0.3	Horz	AV	0.0	45.4	54.0	-8.6	EUT Vert
4574.875	38.3	5.1	1.1	254.0	3.0	0.3	Horz	AV	0.0	43.7	54.0	-10.3	EUT Horz
7319.542	28.6	14.5	1.8	10.0	3.0	0.3	Horz	AV	0.0	43.4	54.0	-10.6	EUT Vert
7318.575	28.4	14.5	1.5	90.0	3.0	0.3	Vert	AV	0.0	43.2	54.0	-10.8	EUT On Side
4575.300	37.3	5.1	1.1	360.0	3.0	0.3	Vert	AV	0.0	42.7	54.0	-11.3	EUT Vert
2745.058	43.2	-1.9	1.5	0.0	3.0	0.3	Horz	AV	0.0	41.6	54.0	-12.4	EUT Vert
2744.942	42.2	-1.9	1.5	335.0	3.0	0.3	Vert	AV	0.0	40.6	54.0	-13.4	EUT On Side
4576.142	51.3	5.1	4.0	133.0	3.0	0.0	Vert	PK	0.0	56.4	74.0	-17.6	EUT Vert
3660.258	33.6	1.6	1.5	354.0	3.0	0.3	Horz	AV	0.0	35.5	54.0	-18.5	EUT On Side
9150.375	45.4	-10.6	2.2	312.0	3.0	0.3	Horz	AV	0.0	35.1	54.0	-18.9	EUT On Side
4576.158	49.9	5.1	1.0	14.0	3.0	0.0	Horz	PK	0.0	55.0	74.0	-19.0	EUT Vert
7317.817	40.1	14.5	1.8	10.0	3.0	0.0	Horz	PK	0.0	54.6	74.0	-19.4	EUT On Side
4575.358	48.9	5.1	1.1	255.0	3.0	0.0	Vert	PK	0.0	54.0	74.0	-20.0	EUT Horz
7318.875	39.5	14.5	1.5	90.0	3.0	0.0	Vert	PK	0.0	54.0	74.0	-20.0	EUT On Side
3659.925	31.8	1.6	1.5	332.0	3.0	0.3	Vert	AV	0.0	33.7	54.0	-20.3	EUT On Side
4574.942	47.4	5.1	1.1	139.0	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	EUT On Side
4576.392	46.2	5.1	1.1	254.0	3.0	0.0	Horz	PK	0.0	51.3	74.0	-22.7	EUT Horz
4575.400	45.4	5.1	1.1	360.0	3.0	0.0	Vert	PK	0.0	50.5	74.0	-23.5	EUT Vert
9149.175	40.6	-10.6	3.7	61.0	3.0	0.3	Vert	AV	0.0	30.3	54.0	-23.7	EUT Vert
2744.450	49.0	-1.9	1.5	0.0	3.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	EUT Vert
2744.808	48.5	-1.9	1.5	335.0	3.0	0.0	Vert	PK	0.0	46.6	74.0	-27.4	EUT On Side
3659.658	43.8	1.6	1.5	354.0	3.0	0.0	Horz	PK	0.0	45.4	74.0	-28.6	EUT Vert
3662.258	42.5	1.6	1.5	332.0	3.0	0.0	Vert	PK	0.0	44.1	74.0	-29.9	EUT On Side
9148.208	54.4	-10.6	2.2	312.0	3.0	0.0	Horz	PK	0.0	43.8	74.0	-30.2	EUT On Side
9150.450	52.2	-10.6	3.7	61.0	3.0	0.0	Vert	PK	0.0	41.6	74.0	-32.4	EUT Vert

CONCLUSION

Pass



Tested By

End of Test Report