Multi-Tech Systems, Inc.

RBS304 Panic Button

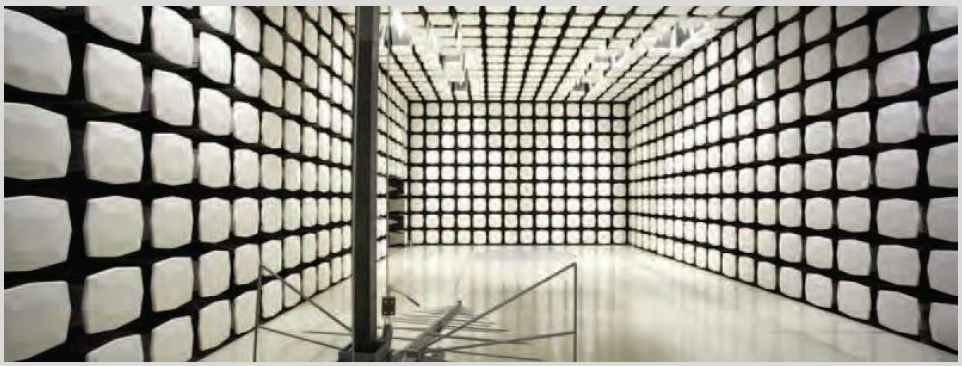
FCC 15.247:2024

RSS-Gen Issue 5:2018+A1:2019+A2:2021

RSS-247 Issue 3:2023

LoRa DTS transceiver

Report: MLTI0360.1 Rev. 1, Issue Date: July 18, 2024



CERT #3310.05

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CERTIFICATE OF TEST

Last Date of Test: May 15, 2024
Multi-Tech Systems, Inc.
EUT: RBS304 Panic Button

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2024	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013
RSS-247 Issue 3:2023	ANSI C63.10:2013

Note: RSS-247 Issue 3 has been updated superseding prior Issues and amendments noted within the body of this report. The FCC year has also been updated. The changes between the specifications do not affect the results of the prior testing. The manufacture attests that no changes have been made to the product. See gap analysis for RSS-247 below).

1. Modified section 6.2 to clarify that different measurement methods can apply depending on the operating frequency range of the device.
2. Added section 6.2.5 to introduce the requirements for devices operating from 5850 5895 MHz and channels that span across 5850 MHz.
3. Added section 6.2.5.1 to provide general information and definitions.
4. Added section 6.2.5.2 to identify the power limits associated with devices operating in the 5850-5895 MHz band.
5. Added section 6.2.5.3 to identify the unwanted emission limits associated with devices operating in the 5850-5895 MHz band.
6. Made editorial changes and clarifications, as appropriate.

Guidance

FCC KDB 558074 v05r02:2019

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Powerline Conducted Emissions (Transmitter)	N/A	15.207	RSS-Gen 8.8	6.2	Not required for a battery powered EUT.
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	
Duty Cycle	N/A	15.247, KDB 558074 -6.0	RSS-Gen 3.2	11.6	See Data
Output Power	Pass	15.247(b), KDB 558074 -8.3	RSS-247 5.4(d)	11.9.1.1	
Equivalent Isotropic Radiated Power (EIRP)	Pass	15.247(b), KDB 558074 -8.3	RSS-247 5.4(d)	11.9.1.1	
Band Edge Compliance	N/A	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	Not included for a C2PC related to adding a new antenna and addressing portable usage.
DTS Bandwidth (6 dB)	Pass	15.247(a), KDB 558074 -8.2	RSS-247 5.2(a)	11.8.2	
Occupied Bandwidth (99%)	N/A	KDB 558074 -2.1	RSS-Gen	6.9.3	Not included for a C2PC related

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

			6.7		to adding a new antenna and addressing portable usage.
Spurious Conducted Emissions	N/A	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	Not included for a C2PC related to adding a new antenna and addressing portable usage.
Power Spectral Density	N/A	15.247(e), KDB 558074 -8.4	RSS-247 5.2(b)	11.10.2	Not included for a C2PC related to adding a new antenna and addressing portable usage.
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.
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.

Deviations From Test Standards

None

Approved By:

Trevor Buls

Trevor Buls, Principal EMC Test Engineer
Signed for and on behalf of Element

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
00	None		
01	Removed additional data not needed to support a permissive change. Corrected frequency range for Spurious Radiated Emissions and equipment used.	2024-07-17	16-17
01	Included Appendix with Attestations	2024-07-18	41
01	Included Full set of data for SRE, updated modifications and configs to reflect the data.	2024-07-18	18-20, 15, 14,
01	Updates last testing date	2024-07-18	3, 12, 15

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 Minnesota Oregon Texas Washington

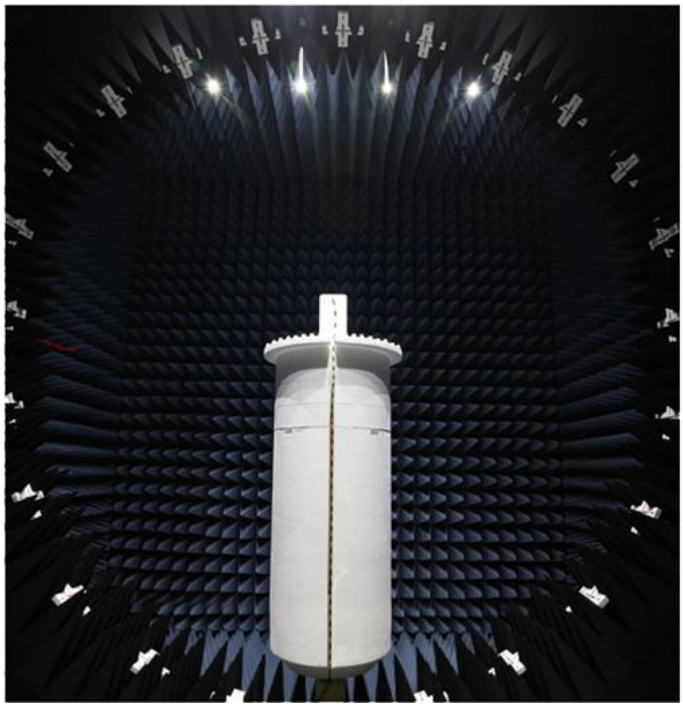
FACILITIES

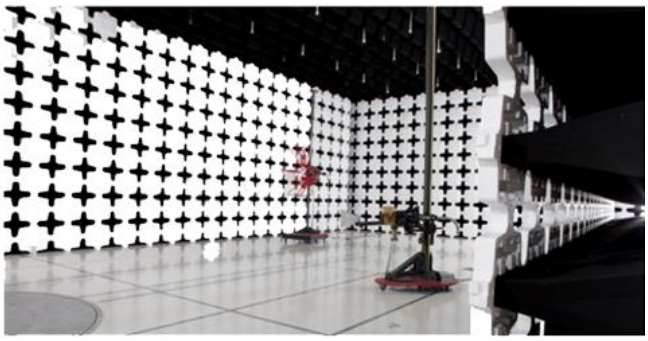
Testing was performed at the following location(s)

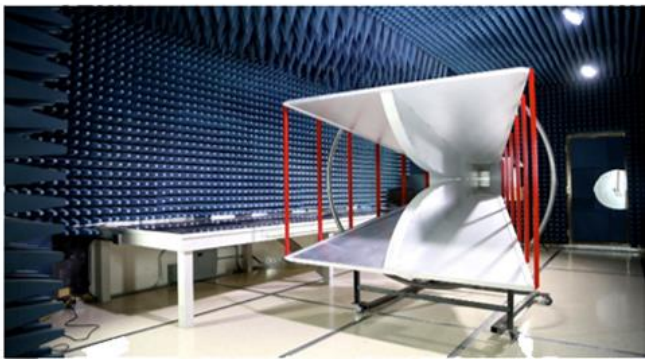
	Location	Labs (1)	Address	A2LA (2)	ISED (3)	BSMI (4)	VCCI (5)	CAB (6)	FDA (7)
☐	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
☒	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
☐	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
☐	Texas	TX01-09	3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	3310.03	2834G	SL2-IN-E-1158R	A-0201	US0191	TL-54
☐	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
☐	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

(1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
(2) A2LA Certificate No.
(3) ISED Company No.
(4) BSMI No.
(5) VCCI Site Filing No.
(6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA
(7) FDA ASCA No.







MEASUREMENT UNCERTAINTY

element
TMU.2015.07.10

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

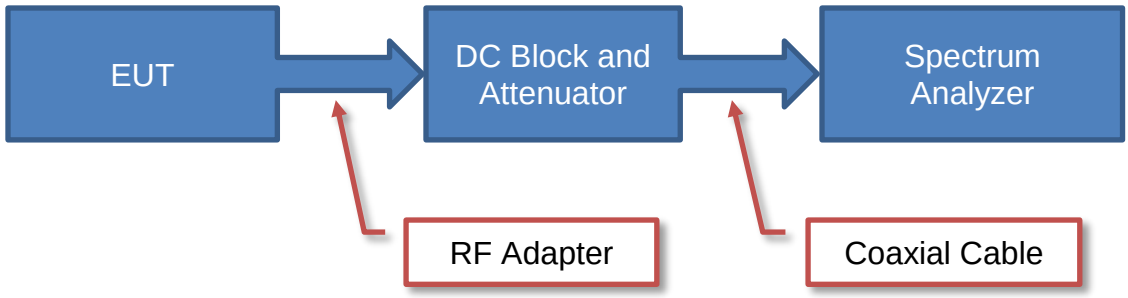
TEST SETUP BLOCK DIAGRAMS

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.

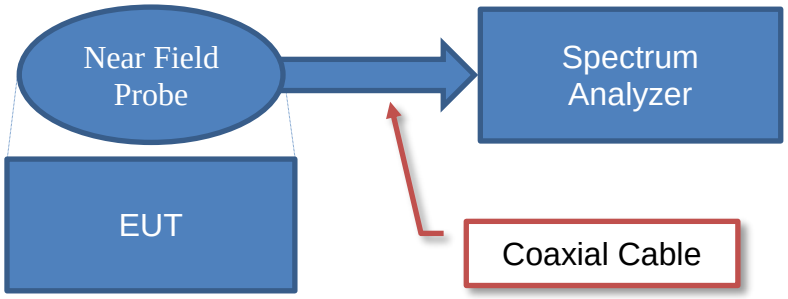
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

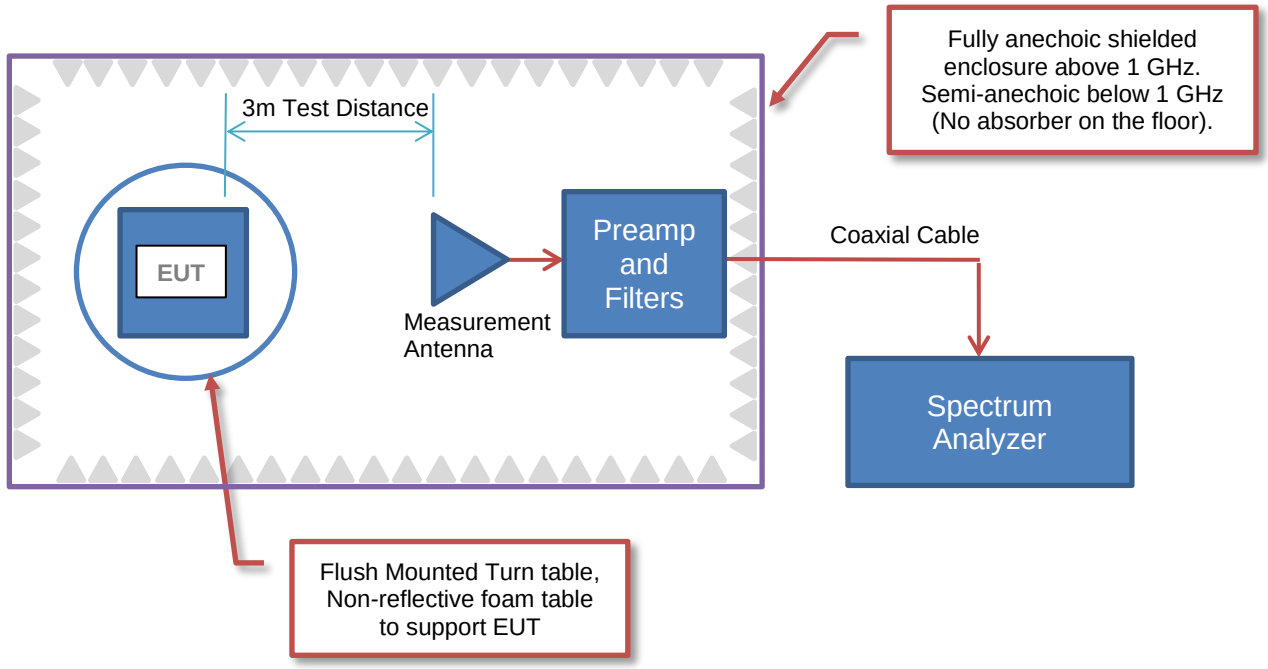


Sample Calculation (logarithmic units)

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: Antenna Factor		Factor: Cable Factor		Factor: Amplifier Gain		Distance Adjustment Factor		External Attenuation		Field Strength
42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0	=	**33.5**

Conducted Emissions:

Measured Level (Amplitude)		Factor: Transducer Factor		Factor: Cable Factor		External Attenuation		Adjusted Level
26.7	+	0.3	+	0.1	+	20.0	=	**47.1**

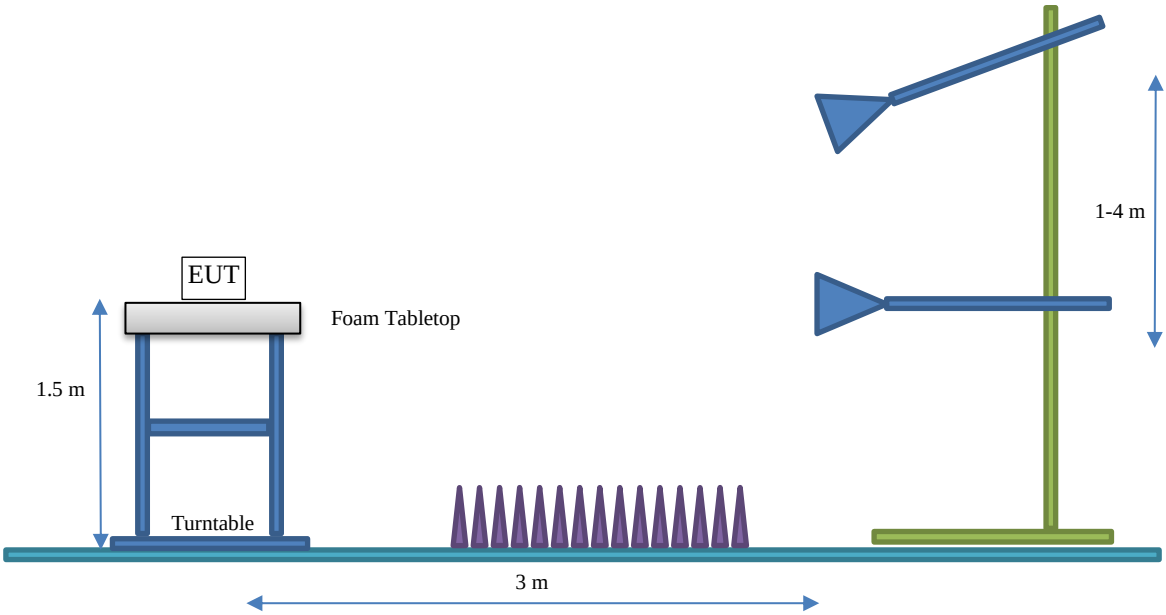
Radiated Power (ERP/EIRP) – Substitution Method:

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:	Multi-Tech Systems, Inc.
Address:	2205 Woodale Dr
City, State, Zip:	Mounds View, MN 55112
Test Requested By:	Tim Gunn
EUT:	RBS304 Panic Button
First Date of Test:	January 21, 2022
Last Date of Test:	May 15, 2024
Receipt Date of Samples:	January 21, 2022
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

The wireless sensors designed and manufactured by Radio Bridge provide full sensor to cloud solutions for Internet of Things (IoT) applications. The wireless single push button sensor can be used as a panic button, PERS, remote control, or other remote push button applications. When the button is pressed, a message is sent over the wireless network.

This radio has both DTS and Hybrid modes. This test report covers DTS operation.

Testing Objective:

Seeking to demonstrate compliance of the LoRa radio with operation under FCC 15.247:2024 and RSS-Gen Issue 5:2018+A1:2019+A2:2021, RSS-247 Issue 3:2023 specifications under technology category Other.

POWER SETTINGS AND ANTENNAS

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

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Ceramic Chip Antenna	Unictron Technologies Corp.	902-928	0.8

The EUT was tested using the power settings provided by the manufacturer:

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types	Position (if multiple channels)	Frequency (MHz)	Power Setting
CSS Modulation 500 kHz Channel Bandwidth	Low Channel	903.0	22 dBm
	Mid Channel	909.4	22 dBm
	High Channel	914.2	22 dBm

TEST FIRMWARE AND SOFTWARE

Main Processor – PIC18LF26K40 Firmware Version 2.2.14
Radio Processor – 1SJ Firmware Version 1.0.02

Test Software:
Tera Term Version 4.106

CONFIGURATIONS

Configuration MLTI0217-2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Panic Button	Multi-Tech Systems, Inc.	RBS304	1243133741-0015

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Lenovo	P15s	PF-2Z6MQL
Power Supply (Laptop)	Lenovo	14F006V	8SSA10R16898D1SG
USB to Serial Bridge	N/A	YPU-05	N/A

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Cable (Laptop)	No	1.0 m	No	AC Mains	Power Supply (Laptop)
DC Cable (Laptop)	No	1.8 m	No	Power Supply (Laptop)	Laptop
USB Cable	Yes	1.8 m	No	Laptop	USB to Serial Bridge
Serial Cable	No	0.2 m	No	USB to Serial Bridge	Panic Button

Configuration MLTI0360-1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RBS304 Panic Button	MultiTech	RBS304	1243133741-0023

Only the equipment shown directly in the test setup was included in this configuration.

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2022-02-14	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.
2	2022-02-14	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.
3	2022-02-14	DTS Bandwidth (6 dB)	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	2022-02-14	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	2022-02-14	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	2024-05-15	Spurious Radiated Emissions	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

SPURIOUS RADIATED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

18-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*log(1/dc).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Double Ridge	ETS Lindgren	3115	AIP	2022-07-20	2024-07-20
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	2024-01-08	2025-01-08
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	2024-01-08	2025-01-08
Filter - High Pass	Micro-Tronics	HPM50108	LFM	2023-10-11	2024-10-11
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2024-03-13	2025-03-13
Filter-Low Pass	Micro-Tronics	LPM50003	HGL	2023-09-10	2024-09-10
Pre-amplifier	Miteq	AM-1616-1000	AVO	2023-10-08	2024-10-08
Notch Filter, Tunable	K&L Microwave	3TNF-500/1000-N/N	HGS	2023-06-17	2024-06-17
Antenna, Biconilog	Teseq	CBL6141B	AYD	2024-03-18	2025-03-18
Cable	Element	Biconilog Cable	MNX	2024-01-30	2025-01-30

SPURIOUS RADIATED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

TEST EQUIPMENT - Prescans

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Filter - Low Pass	Micro-Tronics	LPM50003	HGL	2021-09-10	2022-09-10
Filter - High Pass	Micro-Tronics	HPM50108	HFW	2021-09-10	2022-09-10
Filter - High Pass	Micro-Tronics	HPM50111	HFM	2021-09-10	2022-09-10
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HGS	2021-06-28	2022-06-28
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2021-05-18	2022-05-18
Cable	Element	Biconilog Cable	MNX	2022-01-24	2023-01-24
Cable	Element	Double Ridge Guide Horn Cables	MNV	2022-01-24	2023-01-24
Cable	Element	Standard Gain Cable	MNW	2022-01-24	2023-01-24
Antenna - Biconilog	Teseq	CBL 6141B	AYD	2020-02-05	2022-02-05
Attenuator	Coaxicom	3910-20	AXY	2021-09-10	2022-09-10
Attenuator	Coaxicom	3910-10	AWZ	2021-09-10	2022-09-10
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2022-01-24	2023-01-24
Antenna - Standard Gain	ETS-Lindgren	3160-08	AJP	NCR	NCR
Antenna - Standard Gain	ETS-Lindgren	3160-07	AJJ	NCR	NCR
Antenna - Double Ridge	ETS Lindgren	3115	AIB	2020-09-03	2022-09-03
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2022-01-24	2023-01-24

FREQUENCY RANGE INVESTIGATED

30 MHz TO 18 GHz

POWER INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

MLTI0360-1

MODES INVESTIGATED

Transmitting packets, Low, Mid, and High Channels (903.0, 909.4, and 914.2 MHz

SPURIOUS RADIATED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	RBS304 Panic Button	Work Order:	MLTI0360
Serial Number:	1243133741-0023	Date:	2024-05-15
Customer:	Multi-Tech Systems, Inc.	Temperature:	22.5°C
Attendees:	Aaron Kramer	Relative Humidity:	37.8%
Customer Project:	None	Bar. Pressure (PMSL):	1013 mb
Tested By:	Christopher Heintzelman	Job Site:	MN05
Power:	Battery	Configuration:	MLTI0360-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013
RSS-247 Issue 3:2023	ANSI C63.10:2013
RSS-Gen Issue Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	2	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

Same EUT settings used as MLTI0217. The test mode duty cycle was 25%. A Duty Cycle Correction Factor was applied to average measurements using 10*log(1/duty cycle)=+6.0dB. The test mode duty cycle for this testing was configured differently than the direct connect tests which was confirmed via screen shot.
The average data was taken with a max hold detector as a worst case instead of clear write and trace averaging as stated ANSI C63.10 and then then DCCF was applied. Due to the longer pulse width of the transmit signal (26 ms), the average measurements using max hold appear above the peak measurements.

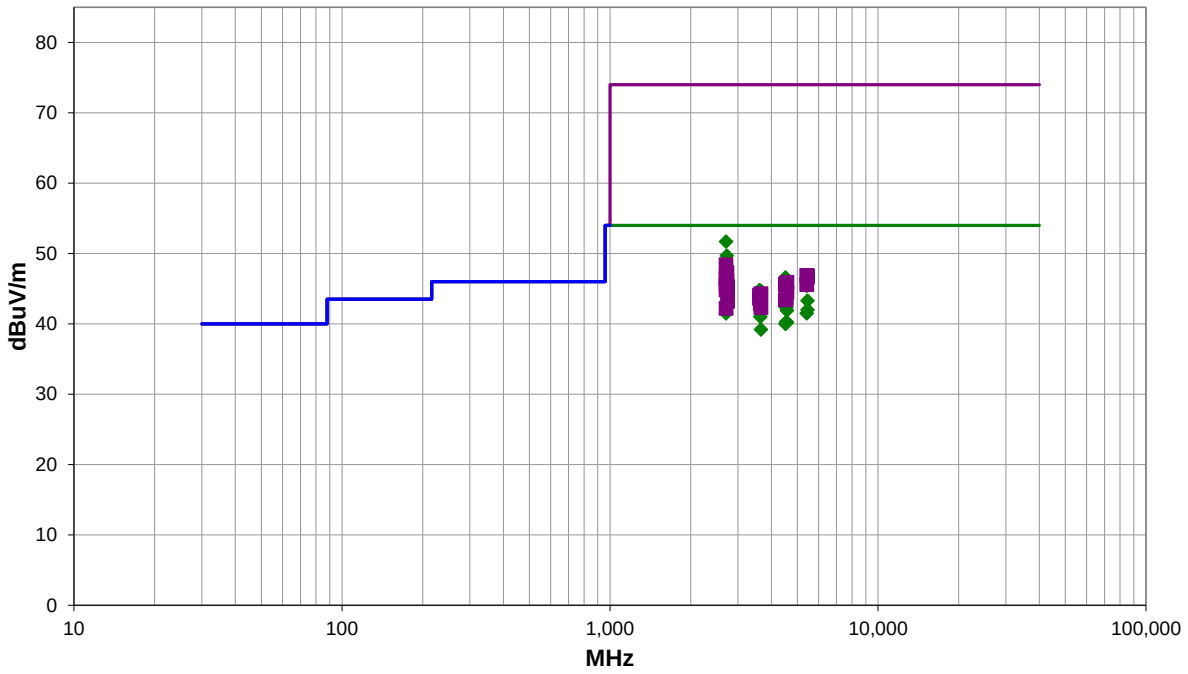
Prescans performed in MN09 on 2022-01-21

EUT OPERATING MODES

Transmitting SRD, Low, Mid, and High Channels (903.0, 909.4, and 914.2 MHz), 500 kHz Channel Bandwidth

DEVIATIONS FROM TEST STANDARD

None



Run #: 2 PK AV QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #2

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2708.958	48.2	-2.5	4.0	315.9	6.0	0.0	Horz	AV	0.0	51.7	54.0	-2.3	EUT Vert, Low Ch
2728.108	46.2	-2.5	1.4	235.0	6.0	0.0	Vert	AV	0.0	49.7	54.0	-4.3	EUT On Side, Mid Ch
2708.933	45.1	-2.5	1.3	20.9	6.0	0.0	Horz	AV	0.0	48.6	54.0	-5.4	EUT Horz, Low Ch
2728.250	44.7	-2.5	3.8	149.0	6.0	0.0	Horz	AV	0.0	48.2	54.0	-5.8	EUT Vert, Mid Ch
2708.975	44.3	-2.5	2.8	16.9	6.0	0.0	Horz	AV	0.0	47.8	54.0	-6.2	EUT On Side, Low Ch
2709.067	43.8	-2.5	1.5	210.0	6.0	0.0	Vert	AV	0.0	47.3	54.0	-6.7	EUT On Side, Low Ch
4515.075	36.7	3.9	3.8	85.9	6.0	0.0	Horz	AV	0.0	46.6	54.0	-7.4	EUT Vert, Low Ch
2742.517	42.8	-2.5	3.2	335.0	6.0	0.0	Horz	AV	0.0	46.3	54.0	-7.7	EUT Vert, High Ch
2709.025	41.9	-2.5	1.6	354.0	6.0	0.0	Vert	AV	0.0	45.4	54.0	-8.6	EUT Vert, Low Ch
5418.017	33.1	6.3	1.4	267.0	6.0	0.0	Horz	AV	0.0	45.4	54.0	-8.6	EUT Vert, Low Ch
3611.925	38.4	0.4	1.1	265.9	6.0	0.0	Vert	AV	0.0	44.8	54.0	-9.2	EUT On Side, Low Ch
3656.750	38.1	0.6	4.0	132.9	6.0	0.0	Horz	AV	0.0	44.7	54.0	-9.3	EUT Vert, High Ch
3611.983	37.1	0.4	3.5	80.0	6.0	0.0	Horz	AV	0.0	43.5	54.0	-10.5	EUT Vert, Low Ch
5456.308	30.8	6.5	1.5	0.0	6.0	0.0	Horz	AV	0.0	43.3	54.0	-10.7	EUT Vert, Mid Ch
2742.650	39.0	-2.5	1.5	27.9	6.0	0.0	Vert	AV	0.0	42.5	54.0	-11.5	EUT On Side, High Ch
4546.967	32.2	4.1	1.1	311.9	6.0	0.0	Horz	AV	0.0	42.3	54.0	-11.7	EUT Vert, Mid Ch
3637.583	35.7	0.6	1.2	84.0	6.0	0.0	Vert	AV	0.0	42.3	54.0	-11.7	EUT On Side, Mid Ch
5456.333	29.5	6.5	1.9	59.9	6.0	0.0	Vert	AV	0.0	42.0	54.0	-12.0	EUT On Side, Mid Ch
4571.083	31.8	4.1	3.7	102.9	6.0	0.0	Horz	AV	0.0	41.9	54.0	-12.1	EUT Vert, High Ch
2708.983	38.0	-2.5	1.5	27.9	6.0	0.0	Vert	AV	0.0	41.5	54.0	-12.5	EUT Horz, Low Ch
5418.950	29.2	6.3	2.6	153.9	6.0	0.0	Vert	AV	0.0	41.5	54.0	-12.5	EUT On Side, Low Ch
3637.658	34.4	0.6	2.5	157.9	6.0	0.0	Horz	AV	0.0	41.0	54.0	-13.0	EUT Vert, Mid Ch
4546.975	30.2	4.1	1.5	80.0	6.0	0.0	Vert	AV	0.0	40.3	54.0	-13.7	EUT On Side, Mid Ch
4570.308	30.1	4.1	1.5	199.0	6.0	0.0	Vert	AV	0.0	40.2	54.0	-13.8	EUT On Side, High Ch
4514.975	30.1	3.9	1.5	216.0	6.0	0.0	Vert	AV	0.0	40.0	54.0	-14.0	EUT On Side, Low Ch
3656.675	32.6	0.6	1.5	149.9	6.0	0.0	Vert	AV	0.0	39.2	54.0	-14.8	EUT On Side, High Ch
2708.775	50.9	-2.5	4.0	315.9	0.0	0.0	Horz	PK	0.0	48.4	74.0	-25.6	EUT Vert, Low Ch
2727.975	49.8	-2.5	1.4	235.0	0.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	EUT On Side, Mid Ch
5417.492	40.6	6.3	1.4	267.0	0.0	0.0	Horz	PK	0.0	46.9	74.0	-27.1	EUT Vert, Low Ch
5457.425	40.3	6.5	1.9	59.9	0.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	EUT On Side, Mid Ch
5455.292	40.1	6.5	1.5	0.0	0.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	EUT Vert, Mid Ch
2709.642	49.0	-2.5	1.3	20.9	0.0	0.0	Horz	PK	0.0	46.5	74.0	-27.5	EUT Horz, Low Ch
2708.533	49.0	-2.5	2.8	16.9	0.0	0.0	Horz	PK	0.0	46.5	74.0	-27.5	EUT On Side, Low Ch
2728.575	48.7	-2.5	3.8	149.0	0.0	0.0	Horz	PK	0.0	46.2	74.0	-27.8	EUT Vert, Mid Ch
4571.200	41.8	4.1	3.7	102.9	0.0	0.0	Horz	PK	0.0	45.9	74.0	-28.1	EUT Vert, High Ch
2709.383	48.1	-2.5	1.5	210.0	0.0	0.0	Vert	PK	0.0	45.6	74.0	-28.4	EUT On Side, Low Ch
5420.425	39.3	6.3	2.6	153.9	0.0	0.0	Vert	PK	0.0	45.6	74.0	-28.4	EUT On Side, Low Ch
4514.833	41.7	3.9	3.8	85.9	0.0	0.0	Horz	PK	0.0	45.6	74.0	-28.4	EUT Vert, Low Ch
2742.533	47.7	-2.5	3.2	335.0	0.0	0.0	Horz	PK	0.0	45.2	74.0	-28.8	EUT Vert, High Ch
2708.958	47.3	-2.5	1.6	354.0	0.0	0.0	Vert	PK	0.0	44.8	74.0	-29.2	EUT Vert, Low Ch
4569.542	40.4	4.1	1.5	199.0	0.0	0.0	Vert	PK	0.0	44.5	74.0	-29.5	EUT On Side, High Ch

SPURIOUS RADIATED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4549.125	40.3	4.1	1.1	311.9	0.0	0.0	Horz	PK	0.0	44.4	74.0	-29.6	EUT Vert, Mid Ch
3657.292	43.7	0.6	4.0	132.9	0.0	0.0	Horz	PK	0.0	44.3	74.0	-29.7	EUT Vert, High Ch
3612.733	43.7	0.4	1.1	265.9	0.0	0.0	Vert	PK	0.0	44.1	74.0	-29.9	EUT On Side, Low Ch
3612.558	43.2	0.4	3.5	80.0	0.0	0.0	Horz	PK	0.0	43.6	74.0	-30.4	EUT Vert, Low Ch
3637.283	42.9	0.6	1.2	84.0	0.0	0.0	Vert	PK	0.0	43.5	74.0	-30.5	EUT On Side, Mid Ch
4547.392	39.4	4.1	1.5	80.0	0.0	0.0	Vert	PK	0.0	43.5	74.0	-30.5	EUT On Side, Mid Ch
4516.358	39.5	3.9	1.5	216.0	0.0	0.0	Vert	PK	0.0	43.4	74.0	-30.6	EUT On Side, Low Ch
2742.783	45.7	-2.5	1.5	27.9	0.0	0.0	Vert	PK	0.0	43.2	74.0	-30.8	EUT On Side, High Ch
3638.633	42.3	0.6	2.5	157.9	0.0	0.0	Horz	PK	0.0	42.9	74.0	-31.1	EUT Vert, Mid Ch
3656.592	41.7	0.6	1.5	149.9	0.0	0.0	Vert	PK	0.0	42.3	74.0	-31.7	EUT On Side, High Ch
2709.942	44.7	-2.5	1.5	27.9	0.0	0.0	Vert	PK	0.0	42.2	74.0	-31.8	EUT Horz, Low Ch

CONCLUSION
Pass

Tested By

SPURIOUS RADIATED EMISSIONS

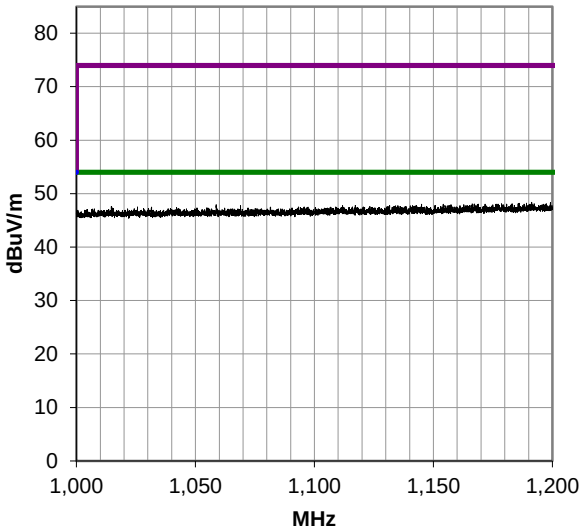
element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

PRESCAN DATA

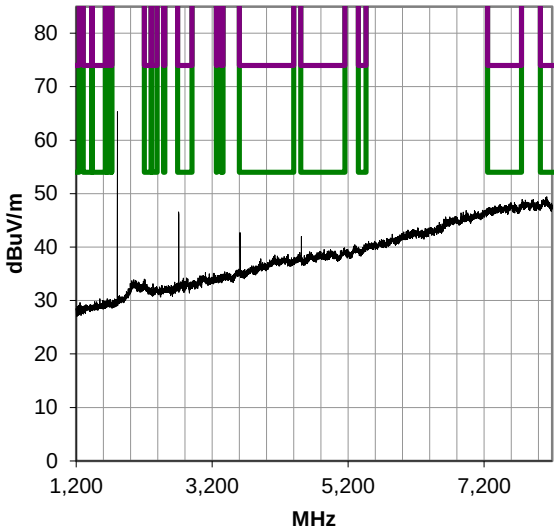
Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

These prescans were also referenced in MLTI0360.0

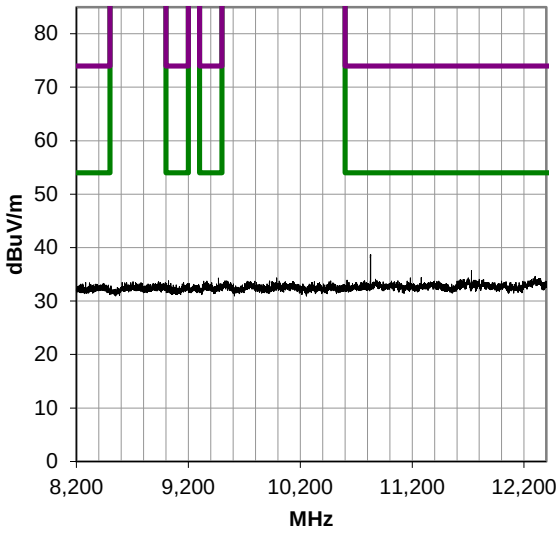
1000-1200 MHz, Run 4



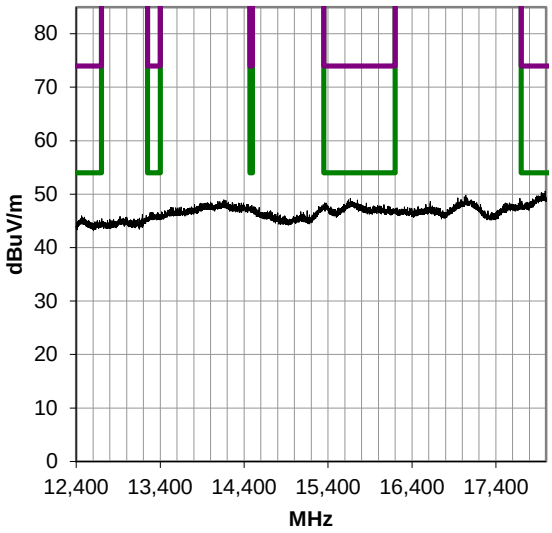
1200-8200 MHz, Run 5



8200-12400 MHz, Run 6



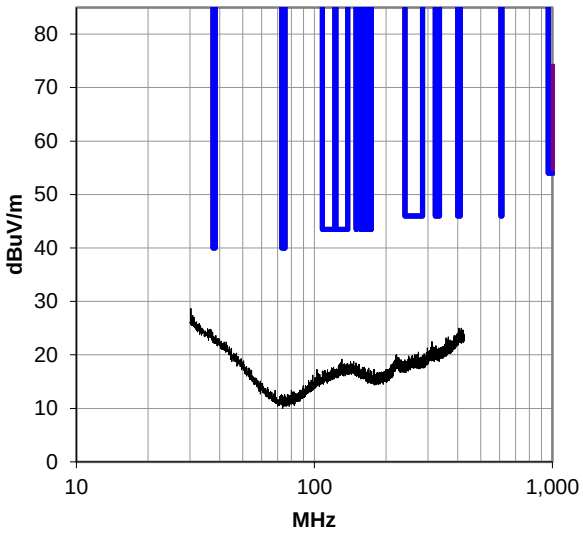
12400-18000 MHz, Run 7



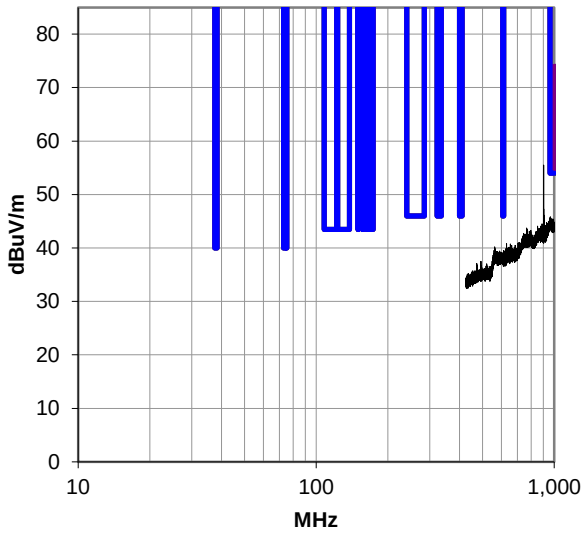
SPURIOUS RADIATED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

30-425 MHz, Run 19



425-1000 MHz, Run 21



DUTY CYCLE

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMI	2021-08-13	2022-08-13
Attenuator	Fairview Microwave	18B5W-26	RFY	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

TEST DESCRIPTION

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

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

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

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

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

DUTY CYCLE

TbtTx 2021.12.14.1 XMit 2020.12.30.0

EUT:	RBS304 Panic Button	Work Order:	MLTI0217
Serial Number:	1243133741-0015	Date:	14-Feb-22
Customer:	Multi-Tech Systems, Inc.	Temperature:	22.2 °C
Attendees:	Mike Dauk	Humidity:	16.4% RH
Project:	None	Barometric Pres.:	1028 mbar
Tested by:	Andrew Rogstad	Power: Battery	Job Site: MN08

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

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

DEVIATIONS FROM TEST STANDARD

None

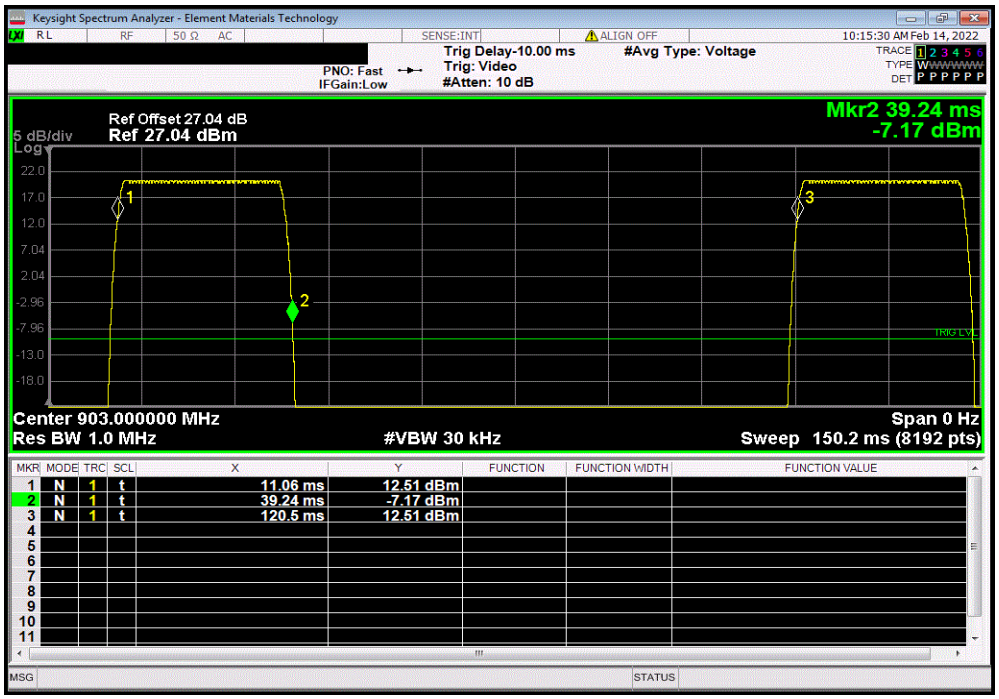
Configuration #	2	Signature

	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
500k Channel						
Low Channel, 903.0 MHz	28.176 ms	109.402 ms	1	25.8	N/A	N/A
Low Channel, 903.0 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel, 909.4 MHz	28.281 ms	109.509 ms	1	25.8	N/A	N/A
Mid Channel, 909.4 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel, 914.2 MHz	28.212 ms	109.382 ms	1	25.8	N/A	N/A
High Channel, 914.2 MHz	N/A	N/A	5	N/A	N/A	N/A

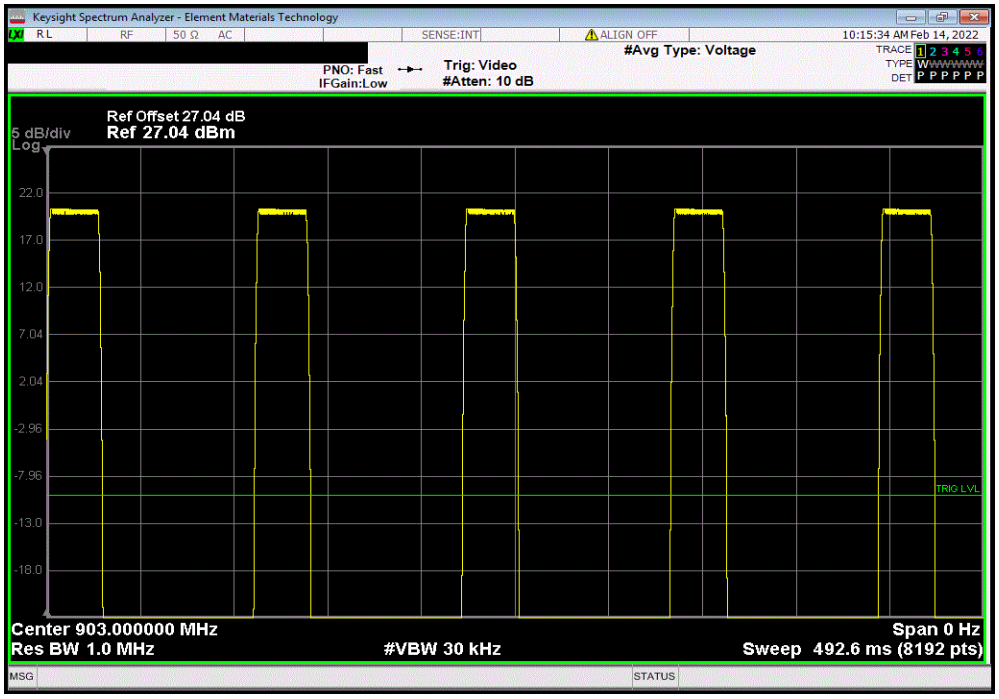
DUTY CYCLE

TbtTx 2021.12.14.1 XMit 2020.12.30.0

500k Channel, Low Channel, 903.0 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	28.176 ms	109.402 ms	1	25.8	N/A	N/A



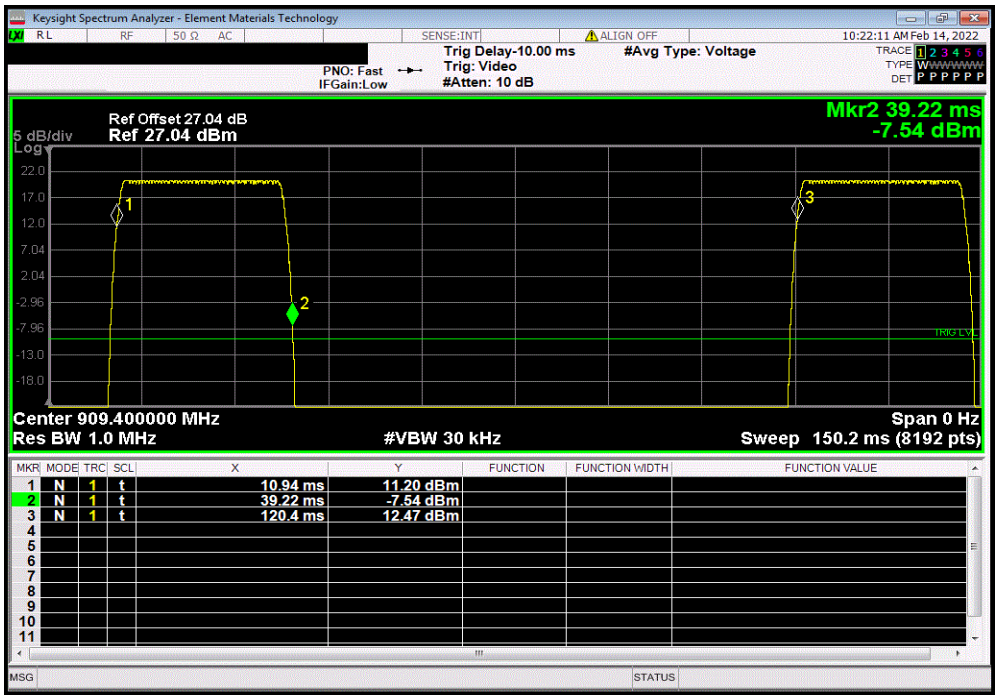
500k Channel, Low Channel, 903.0 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



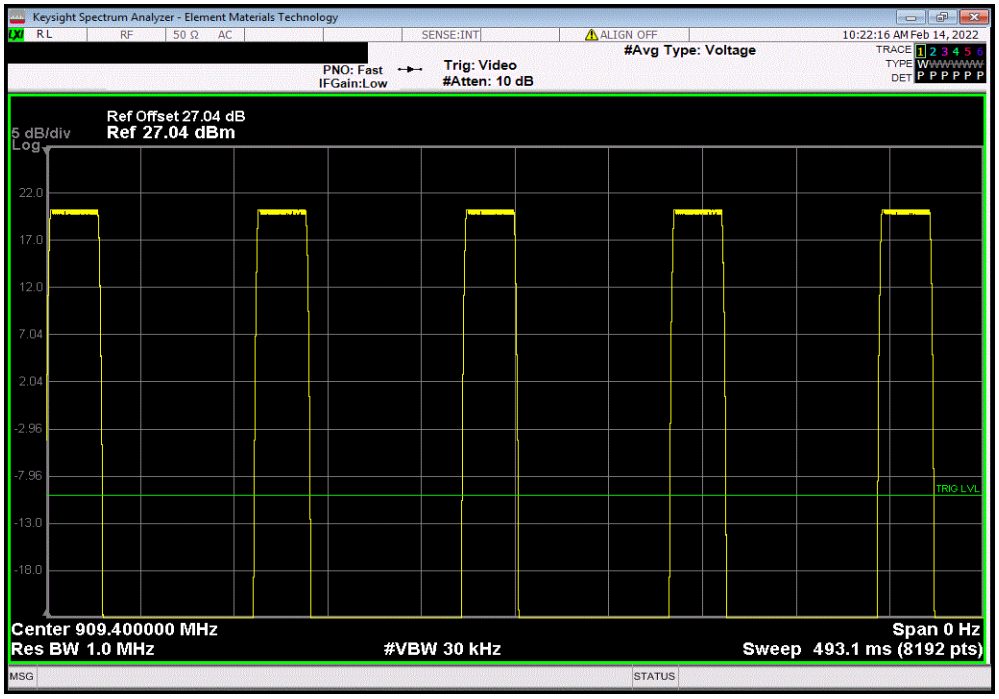
DUTY CYCLE

TbtTx 2021.12.14.1 XMit 2020.12.30.0

500k Channel, Mid Channel, 909.4 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	28.281 ms	109.509 ms	1	25.8	N/A	N/A



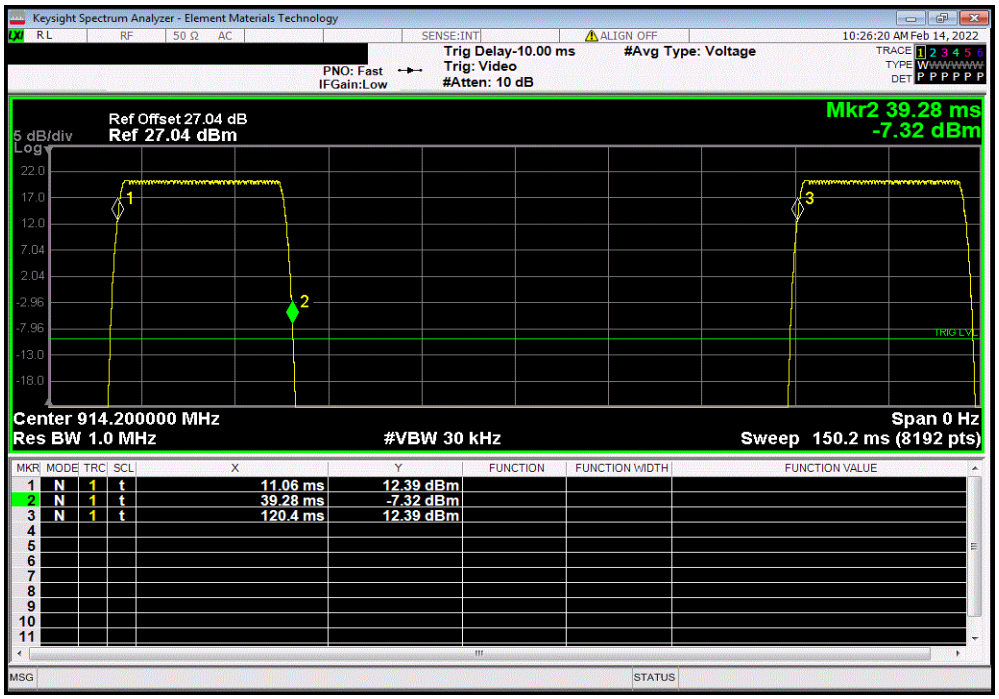
500k Channel, Mid Channel, 909.4 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



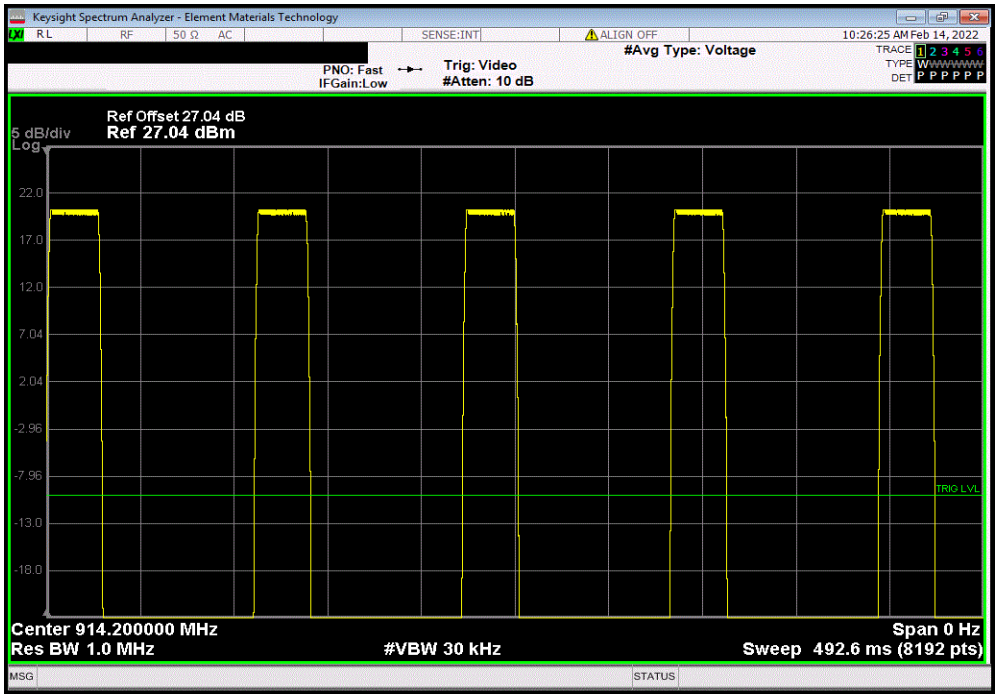
DUTY CYCLE

TbtTx 2021.12.14.1 XMit 2020.12.30.0

500k Channel, High Channel, 914.2 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	28.212 ms	109.382 ms	1	25.8	N/A	N/A



500k Channel, High Channel, 914.2 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



OUTPUT POWER

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMI	2021-08-13	2022-08-13
Attenuator	Fairview Microwave	18B5W-26	RFY	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

TEST DESCRIPTION

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

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

The method 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.

The AVGSA-2 method was modified as the emissions bandwidth (B) was less than the available resolution bandwidth (RBw) of the spectrum analyzer. RBw was set wider than B. This follows the guidance of section 11.9.1.1 and is equivalent to a measurement with a power meter AVGPM per section 11.9.2.3.

OUTPUT POWER

TbtTx 2021.12.14.1 XMit 2020.12.30.0

EUT:	RBS304 Panic Button	Work Order:	MLTI0217
Serial Number:	1243133741-0015	Date:	14-Feb-22
Customer:	Multi-Tech Systems, Inc.	Temperature:	22.2 °C
Attendees:	Mike Dauk	Humidity:	16.7% RH
Project:	None	Barometric Pres.:	1028 mbar
Tested by:	Andrew Rogstad	Power: Battery	Job Site: MN08

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

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

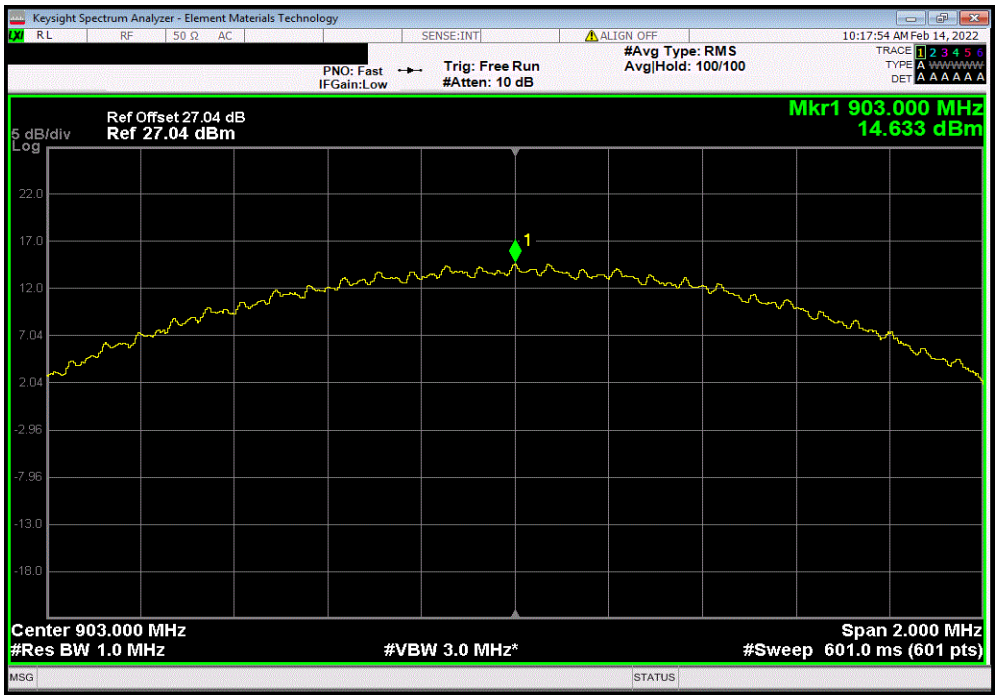
DEVIATIONS FROM TEST STANDARD

None

Configuration #	2	Signature

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Value (dBm)	Limit (dBm)	Results
500k Channel					
Low Channel, 903.0 MHz	14.633	5.9	20.5	30	Pass
Mid Channel, 909.4 MHz	14.554	5.9	20.5	30	Pass
High Channel, 914.2 MHz	15.001	5.9	20.9	30	Pass

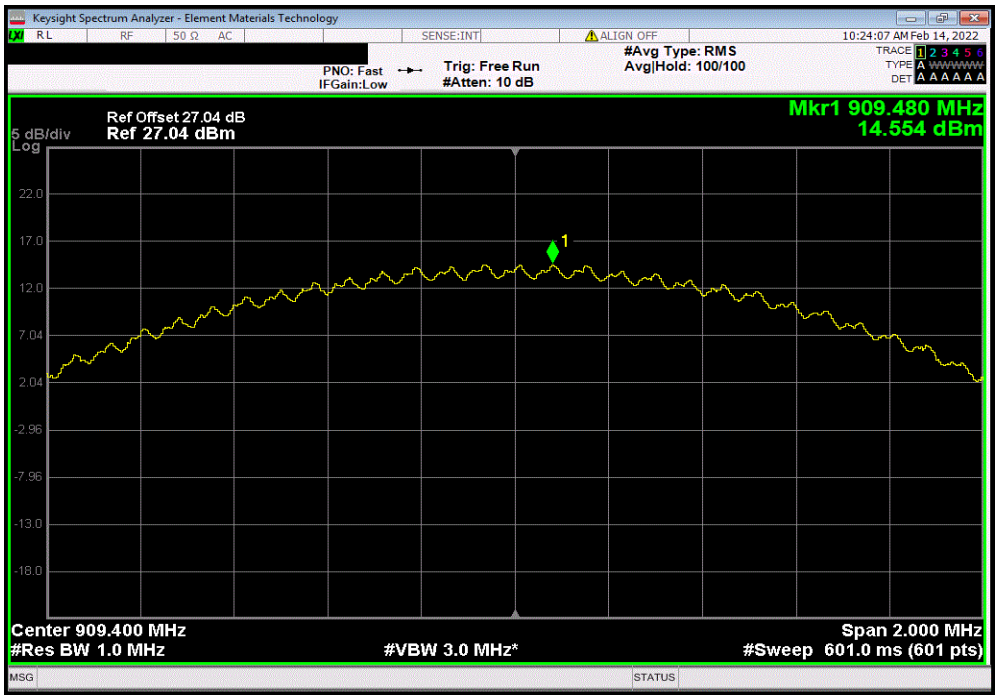
500k Channel, Low Channel, 903.0 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	14.633	5.9		20.5	30	Pass



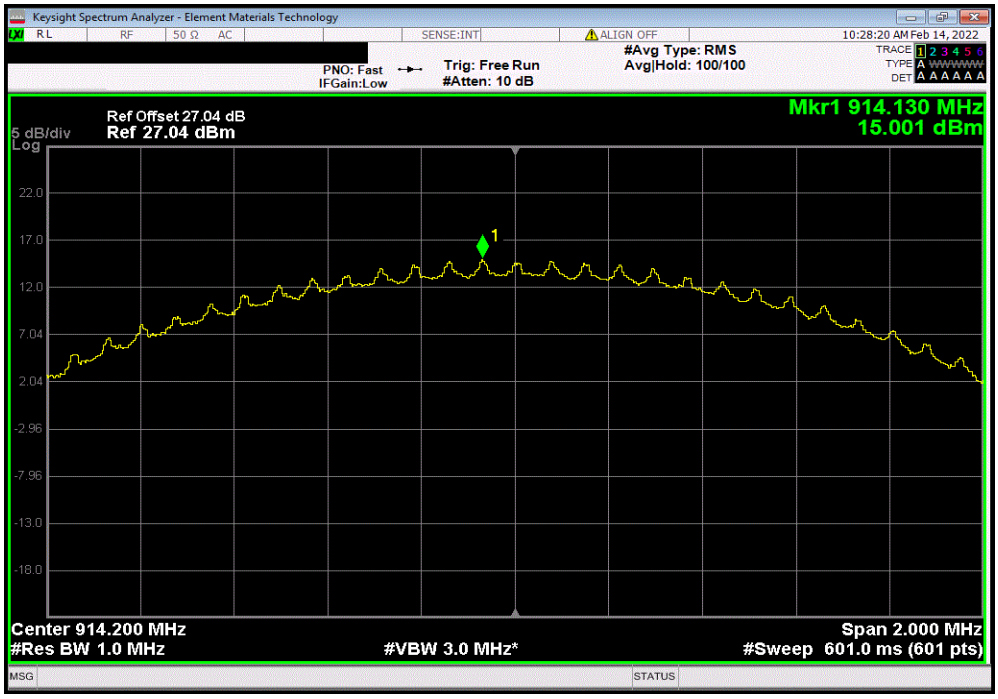
OUTPUT POWER

TbtTx 2021.12.14.1 XMit 2020.12.30.0

500k Channel, Mid Channel, 909.4 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	14.554	5.9		20.5	30	Pass



500k Channel, High Channel, 914.2 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	15.001	5.9		20.9	30	Pass



EQUIVALENT ISOTROPIC RADIATED POWER

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMI	2021-08-13	2022-08-13
Attenuator	Fairview Microwave	18B5W-26	RFY	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

TEST DESCRIPTION

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

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

The method 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.

The AVGSA-2 method was modified as the emissions bandwidth (B) was less than the available resolution bandwidth (RBw) of the spectrum analyzer. RBw was set wider than B. This follows the guidance of section 11.9.1.1 and is equivalent to a measurement with a power meter AVGPM per section 11.9.2.3.

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

EQUIVALENT ISOTROPIC RADIATED POWER

element

TbtTx 2021.12.14.1 XMit 2020.12.30.0

EUT:	RBS304 Panic Button			Work Order:	MLTI0217
Serial Number:	1243133741-0015			Date:	14-Feb-22
Customer:	Multi-Tech Systems, Inc.			Temperature:	22.2 °C
Attendees:	Mike Dauk			Humidity:	16.7% RH
Project:	None			Barometric Pres.:	1028 mbar
Tested by:	Andrew Rogstad	Power:	Battery	Job Site:	MN08

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

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

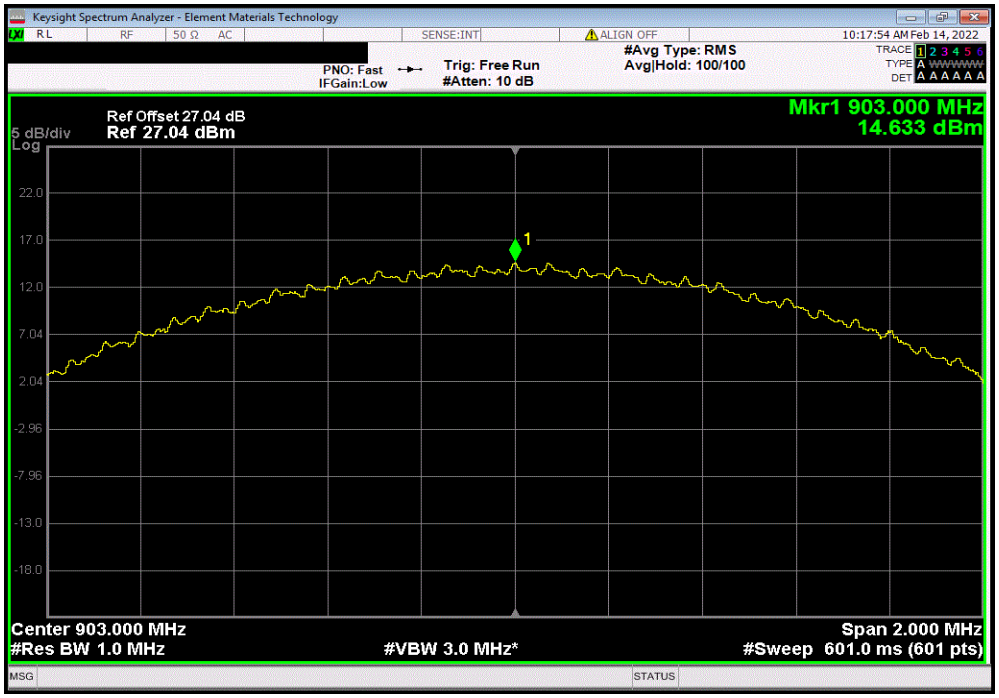
DEVIATIONS FROM TEST STANDARD

None

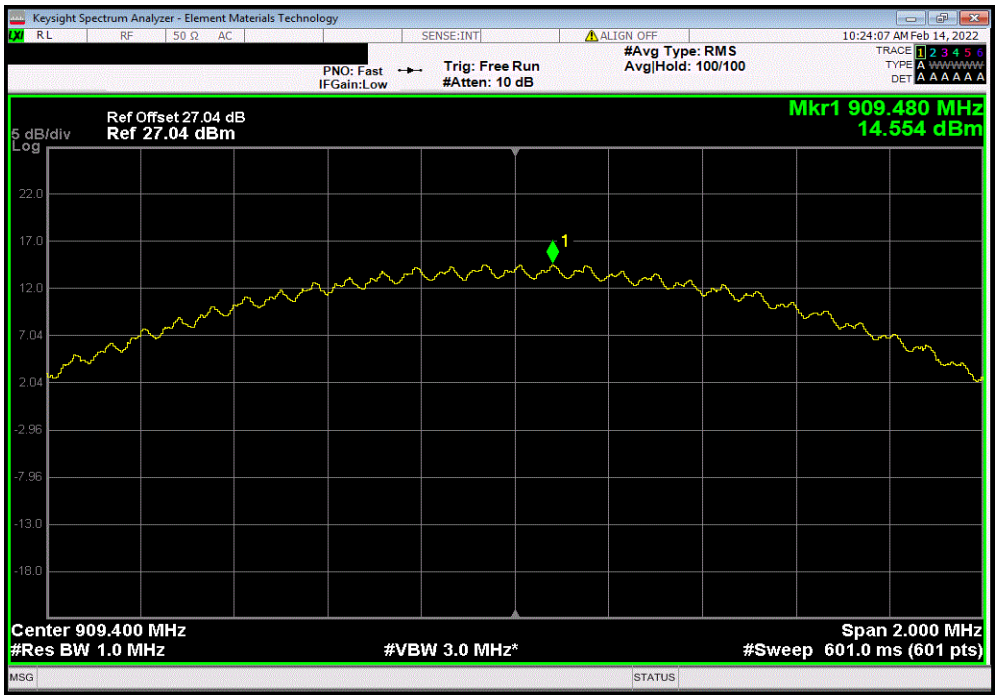
Configuration #	2	Signature

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Antenna Gain (dBi)	Value (dBm EIRP)	Limit (dBm EIRP)	Results
500k Channel						
Low Channel, 903.0 MHz	14.633	5.9	0.8	21.33	36	Pass
Mid Channel, 909.4 MHz	14.554	5.9	0.8	21.25	36	Pass
High Channel, 914.2 MHz	15.001	5.9	0.8	21.70	36	Pass

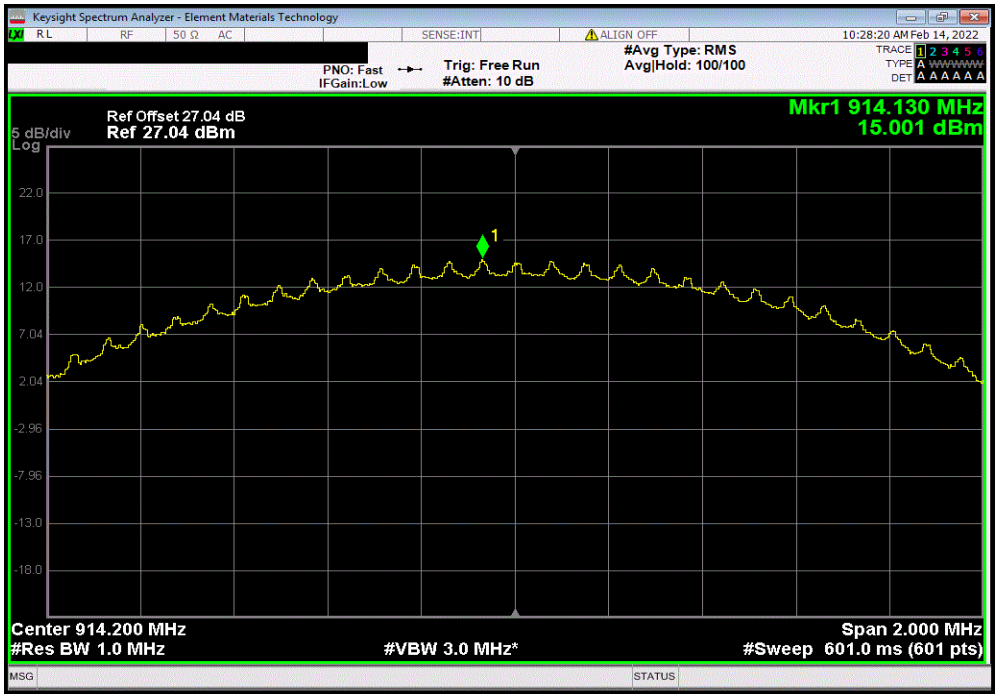
500k Channel, Low Channel, 903.0 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Antenna Gain (dBi)	Value (dBm EIRP)	Limit (dBm EIRP)	Results
	14.633	5.9	0.8	21.33	36	Pass



500k Channel, Mid Channel, 909.4 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Antenna Gain (dBi)	Value (dBm EIRP)	Limit (dBm EIRP)	Results
	14.554	5.9	0.8	21.25	36	Pass



500k Channel, High Channel, 914.2 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Antenna Gain (dBi)	Value (dBm EIRP)	Limit (dBm EIRP)	Results
	15.001	5.9	0.8	21.70	36	Pass



DTS BANDWIDTH (6 dB)

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMI	2021-08-13	2022-08-13
Attenuator	Fairview Microwave	18B5W-26	RFY	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

TEST DESCRIPTION

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)

TbtTx 2021.12.14.1 XMit 2020.12.30.0

EUT:	**RBS304 Panic Button**	**Work Order:**	**MLTI0217**
Serial Number:	**1243133741-0015**	**Date:**	**14-Feb-22**
Customer:	**Multi-Tech Systems, Inc.**	**Temperature:**	**22.2 °C**
Attendees:	**Mike Dauk**	**Humidity:**	**16.3% RH**
Project:	**None**	**Barometric Pres.:**	**1028 mbar**
Tested by:	**Andrew Rogstad**	**Power:** **Battery**	**Job Site:** **MN08**

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

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

DEVIATIONS FROM TEST STANDARD

None

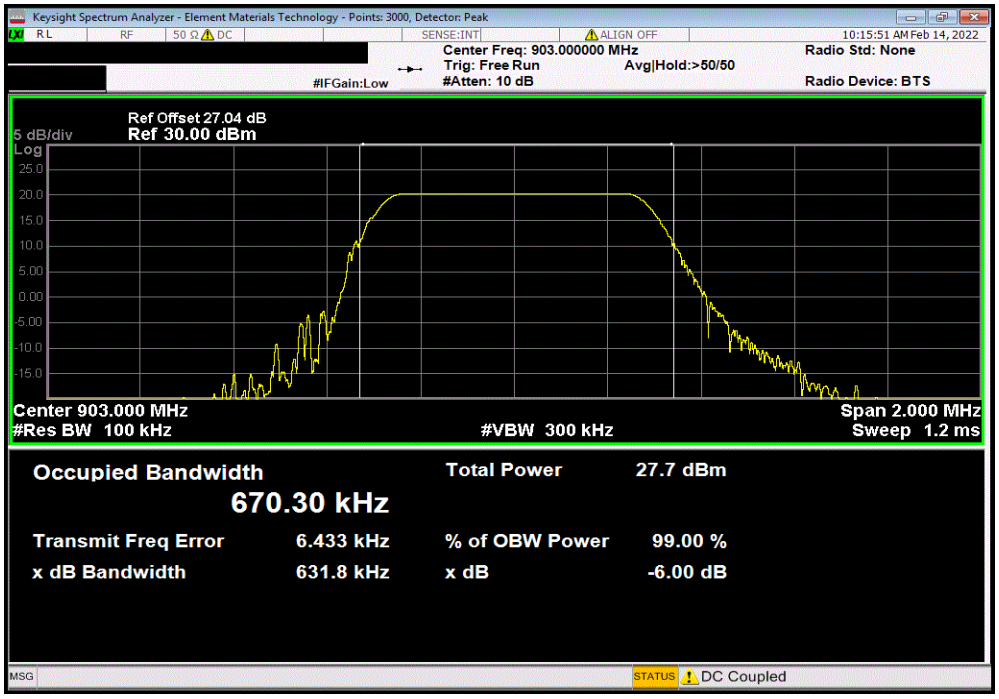
Configuration #	**2**	*Signature*

	Value	**Limit (>)**	**Result**
500k Channel			
Low Channel, 903.0 MHz	631.835 kHz	500 kHz	Pass
Mid Channel, 909.4 MHz	629.697 kHz	500 kHz	Pass
High Channel, 914.2 MHz	625.555 kHz	500 kHz	Pass

DTS BANDWIDTH (6 dB)

TbtTx 2021.12.14.1 XMit 2020.12.30.0

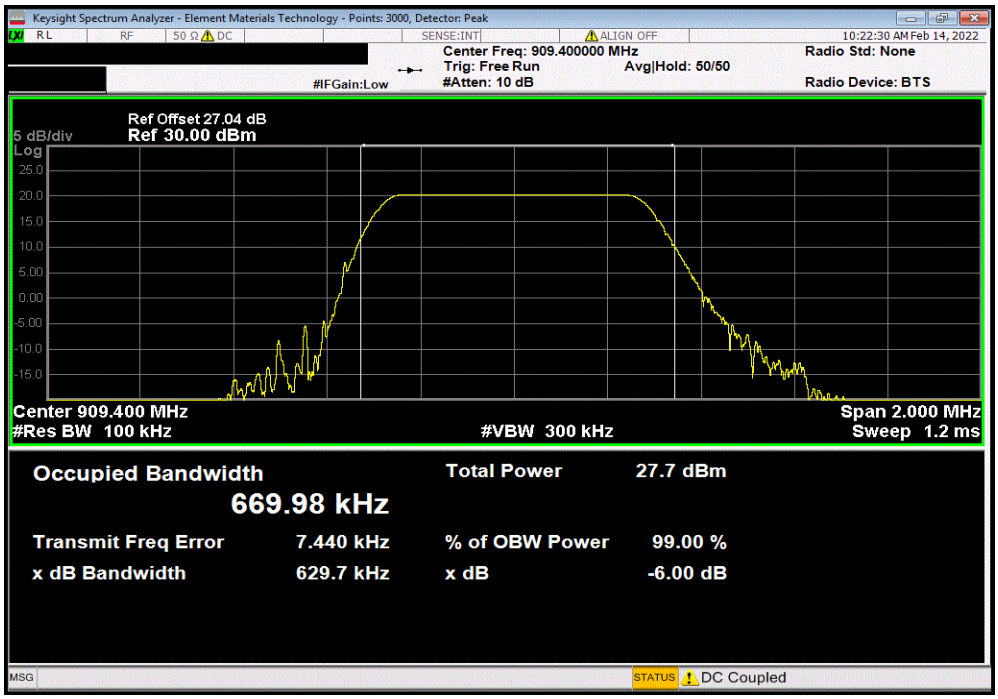
500k Channel, Low Channel, 903.0 MHz						
				Value	Limit (>)	Result
				631.835 kHz	500 kHz	Pass



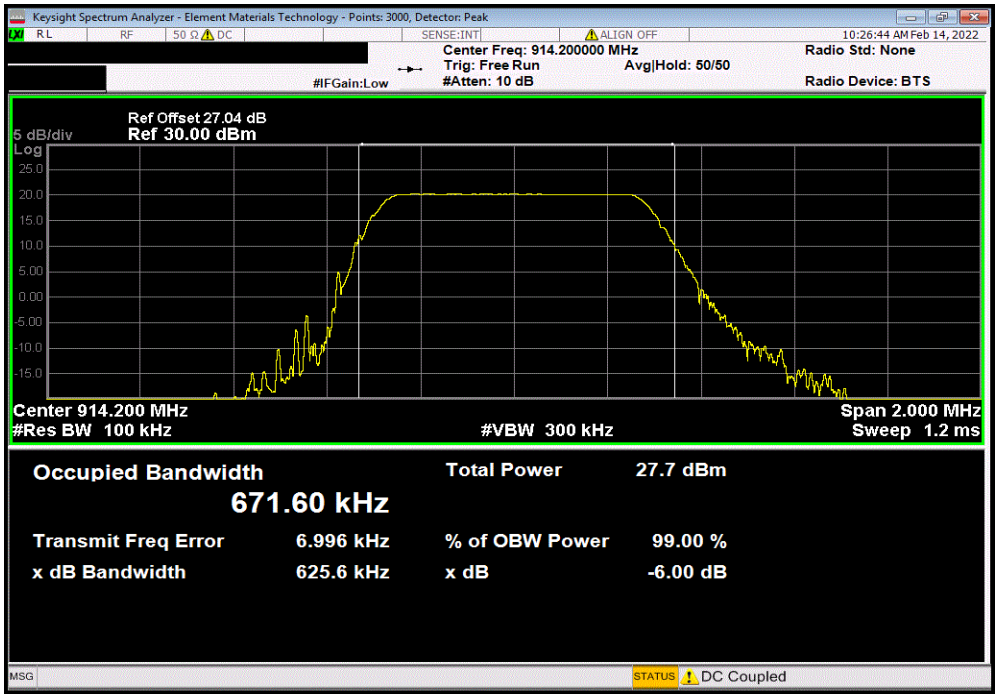
DTS BANDWIDTH (6 dB)

TbtTx 2021.12.14.1 XMit 2020.12.30.0

500k Channel, Mid Channel, 909.4 MHz						
				Value	Limit (>)	Result
				629.697 kHz	500 kHz	Pass



500k Channel, High Channel, 914.2 MHz						
				Value	Limit (>)	Result
				625.555 kHz	500 kHz	Pass



APPENDIX

DATE: June 5, 2024

Attestation for RBS304 reports
Project MLTI0360

The project got delayed by other priorities but has been re-activated.
The EUT for MLTI0360 reports has not changed since it was tested.

Sincerely,

_____

Name : Tim Gunn
Position: Directory of Technical Engineering Services
Company: Multi-Tech Systems, Inc

End of Test Report