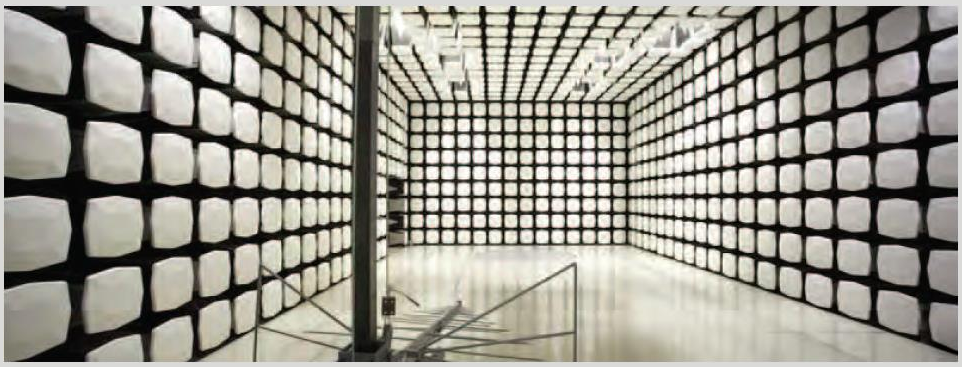
NAL Research Corporation

SHOUT sp Handheld Iridium Smartphone

FCC 15.247:2022

Bluetooth Low energy (DTS) Radio

Report: PCTE0003.4, Issue Date: May 15, 2022



NVLAP LAB CODE: 200630-0

ACCREDITED
CERT #3310.02

CERTIFICATE OF TEST

Last Date of Test: May 4, 2022
NAL Research Corporation
EUT: SHOUT sp Handheld Iridium Smartphone

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2022	ANSI C63.10:2013, FCC KDB 558074 v05r02:2019
FCC 15.247:2022	

Results

Test Description	Result	Specification Section(s)	Method Section(s)	Comments
Powerline Conducted Emissions	Pass	15.207	6.2	
Occupied Bandwidth (99%)	Pass	KDB 558074 -2.1	6.9.3	
Duty Cycle	Pass	KDB 558074 -6.0	11.6	
DTS Bandwidth (6 dB)	Pass	15.247(a)(2), KDB 558074 -8.2	11.8.2	
Equivalent Isotropic Radiated Power	Pass	15.247(b)(3), KDB 558074 -8.3.2	11.9.1.1	
Output Power	Pass	15.247(b)(3), KDB 558074 -8.3.2	11.9.1.1	
Power Spectral Density	Pass	15.247(e), KDB 558074 -8.4	11.10.2	
Band Edge Compliance	Pass	15.247(d), KDB 558074 -8.5	11.11	
Spurious Conducted Emissions	Pass	15.247(d), KDB 558074 -8.5	11.11	
Spurious Radiated Emissions	Pass	15.247(d), KDB 558074 - 8.6, 8.7	11.12.1, 11.13.2, 6.5, 6.6	

Deviations From Test Standards

None

Approved By:

Cole Ghizzone, Department Manager

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

REVISION HISTORY

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

ACCREDITATIONS AND AUTHORIZATIONS

element
2021.09.01

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

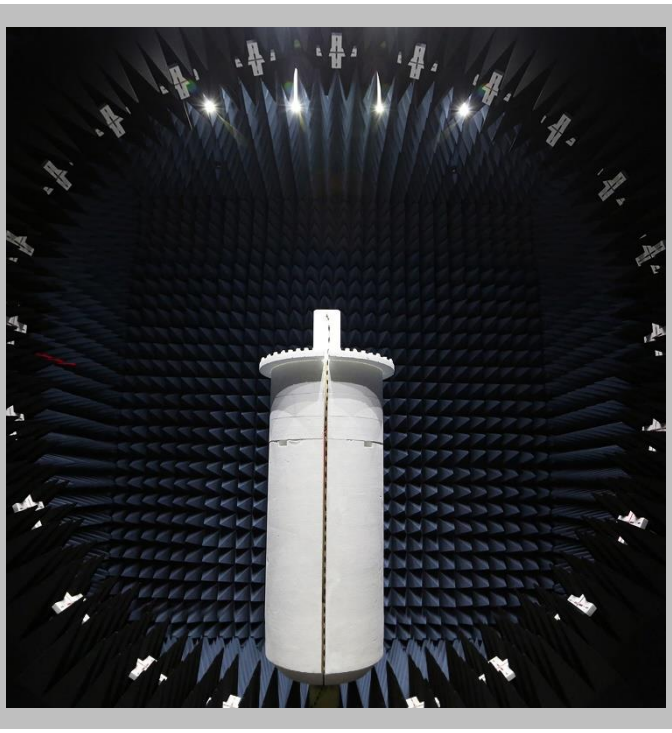
For details on the Scopes of our Accreditations, please visit:

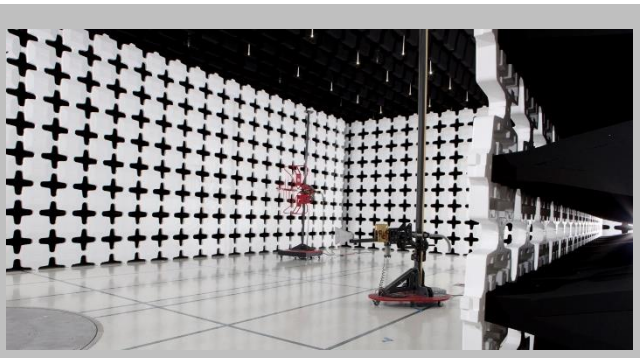
California Minnesota Oregon Texas Washington

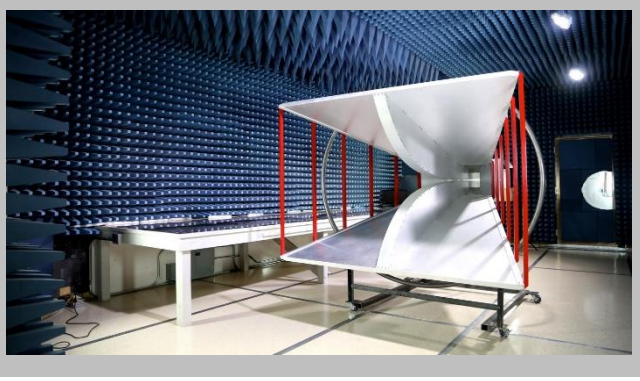
FACILITIES

element
2020.12.15

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th 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

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

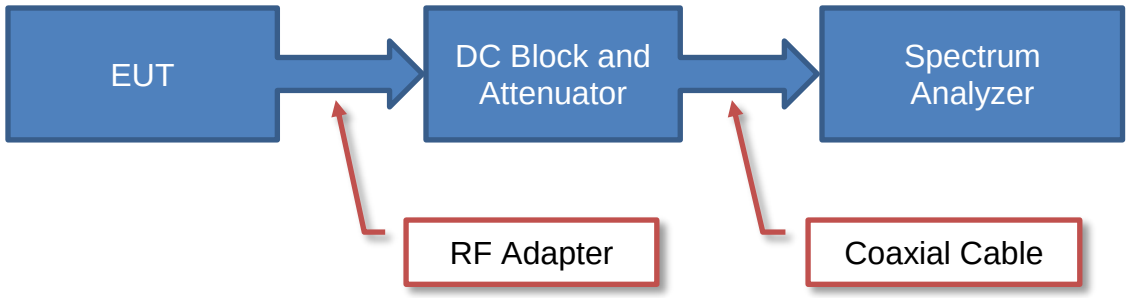
TEST SETUP BLOCK DIAGRAMS

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.

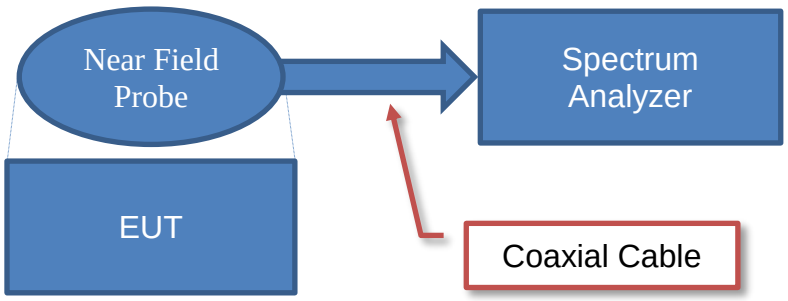
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

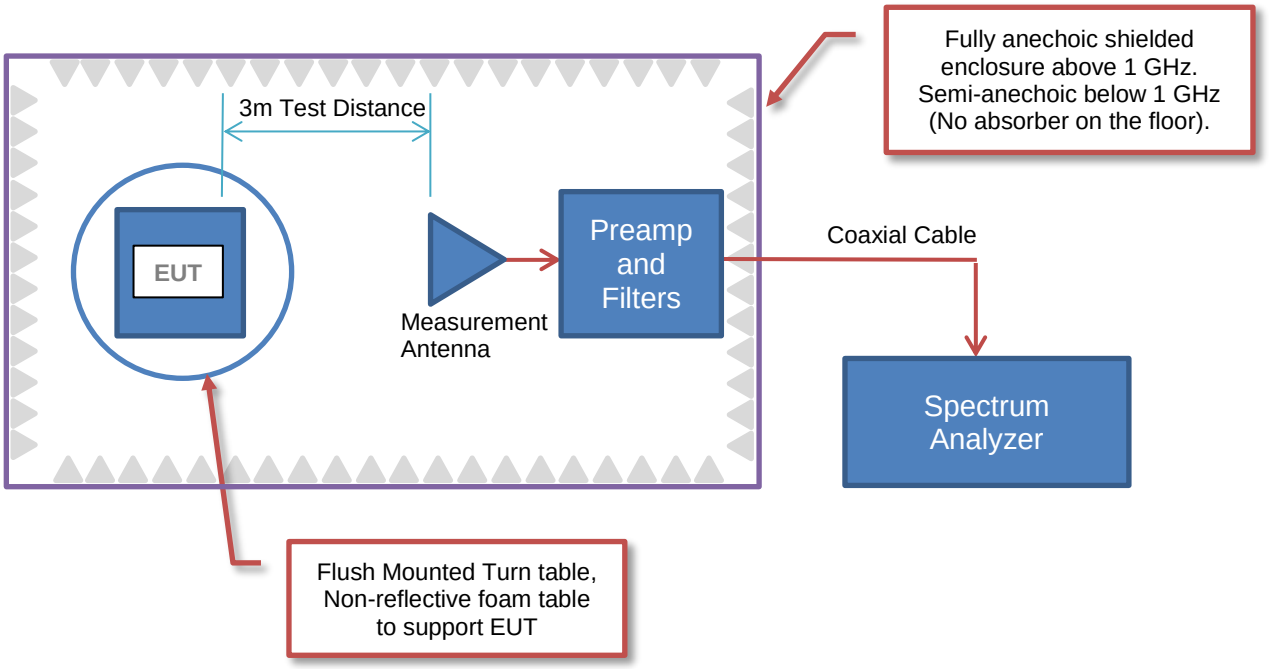


Sample Calculation (logarithmic units)

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**

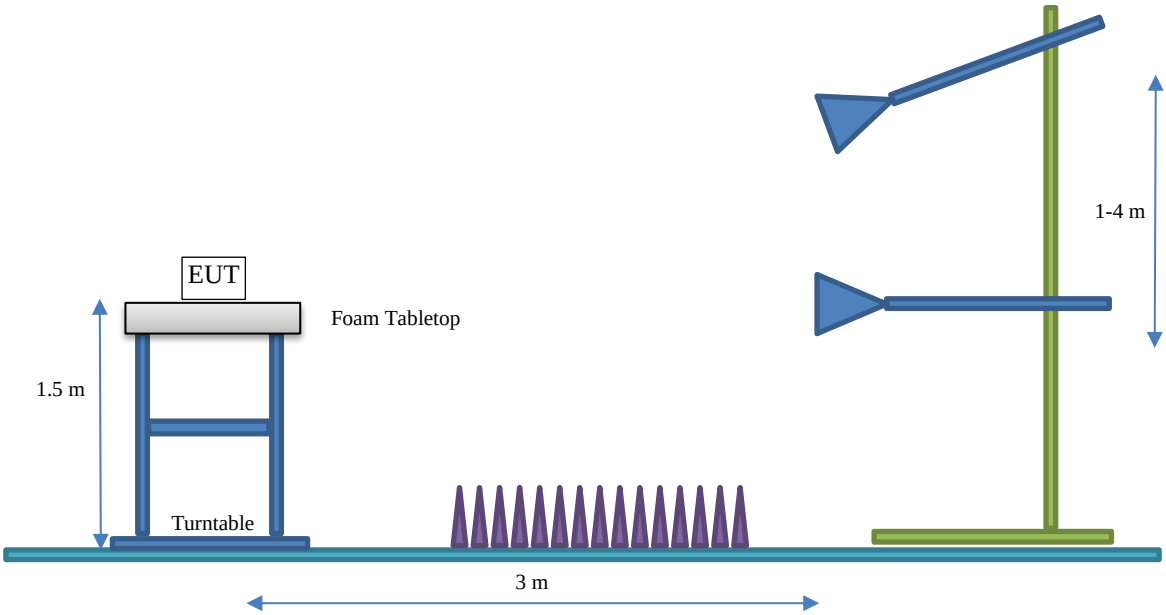
Conducted Emissions:

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

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

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



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	NAL Research Corporation
Address:	11100 Endeavor Ct. Suite 300
City, State, Zip:	Manassas, VA 20109
Test Requested By:	Andy Schiltz
EUT:	SHOUT sp Handheld Iridium Smartphone
First Date of Test:	April 19, 2022
Last Date of Test:	May 4, 2022
Receipt Date of Samples:	May 3, 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:
Handheld Iridium Smartphone with 1.6 GHz radio and 802.11/Bluetooth radio.

Testing Objective:
To demonstrate compliance of the Bluetooth radio to FCC 15.247 requirements.

POWER SETTINGS AND ANTENNAS

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

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
On-ground MID Chip	Manufacturer	2400 – 2485	3.0

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

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types	Type	Channel		Frequency (MHz)	Power Setting
GFSK / 1 Mbps	DTS	0	Low Channel	2402	7 dBm
		20	Mid Channel	2442	
		39	High channel	2480	

CONFIGURATIONS

Configuration PCTE0021- 1

Software/Firmware Running During Test	
Description	**Version**
HCI Tester	3.0.0.37

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	3000425060205200
Antenna	18942	HARRIS-NEXGEN	8960263-1

Peripherals in Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Earbuds	Betron	MK23	None
Laptop	Dell	Latitude E5450	5z9B063

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Headphones	No	1.2 m	No	SHOUT sp Handheld Iridium Smartphone	Earbuds
USB Cable (Power)	Yes	1.8 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
USB Cable Extension	Yes	3.0 m	No	USB Cable (Coms)	Laptop
USB Cable (Coms)	Yes	1.0 m	No	SHOUT sp Handheld Iridium Smartphone	USB Extension Cable
USB Cable x2	Yes	1.0 m	No	SHOUT sp Handheld Iridium Smartphone	unterminated

CONFIGURATIONS

Configuration PCTE0021- 2

Software/Firmware Running During Test	
Description	**Version**
HCI Tester	3.0.0.37

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	FCC 3

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable x2	Yes	1.0 m	No	SHOUT sp Handheld Iridium Smartphone	unterminated
USB Cable (Coms)	Yes	1.0 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
USB Cable (Power)	Yes	1.0 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop

CONFIGURATIONS

Configuration PCTE0021- 3

Software/Firmware Running During Test	
Description	**Version**
HCI Tester	3.0.0.37

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	3000425060205200
Antenna	18942	HARRIS-NEXGEN	8960263-1

Peripherals in Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Earbuds	Betron	MK23	None
AC Adaptor	Sony	AC-UUD12	1901AQ2032484

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Headphones	No	1.2 m	No	SHOUT sp Handheld Iridium Smartphone	Earbuds
USB Cable x3	Yes	1.0 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
USB (Power)	Yes	1.8 m	No	SHOUT sp Handheld Iridium Smartphone	AC Adaptor

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2022-04-19	Occupied Bandwidth (99%)	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	2022-04-19	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.
3	2022-04-19	Equivalent Isotropic Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2022-04-19	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	2022-04-19	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2022-04-19	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.
7	2022-04-19	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2022-05-03	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2022-05-04	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

TEST DESCRIPTION

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Gauss Instruments	TDEMI 30M	ARN	2022-04-20	2023-04-20
LISN	Solar Electronics	9252-50-R-24-BNC	LIP	2021-09-10	2022-09-10
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKT	EVGA	2022-01-04	2023-01-04

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.2 dB	-3.2 dB

CONFIGURATIONS INVESTIGATED

PCTE0021-3

MODES INVESTIGATED

BTLE Continuous Tx: Low Ch = 2402 MHz, Mid Ch = 2442 MHz, High Ch = 2480 MHz

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0021
Serial Number:	3000425060205200	Date:	2022-05-04
Customer:	NAL Research Corporation	Temperature:	23.3°C
Attendees:	None	Relative Humidity:	41%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	5.0 VDC via USB	Configuration:	PCTE0021-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2022	ANSI C63.10:2013

TEST PARAMETERS

Run #:	3	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

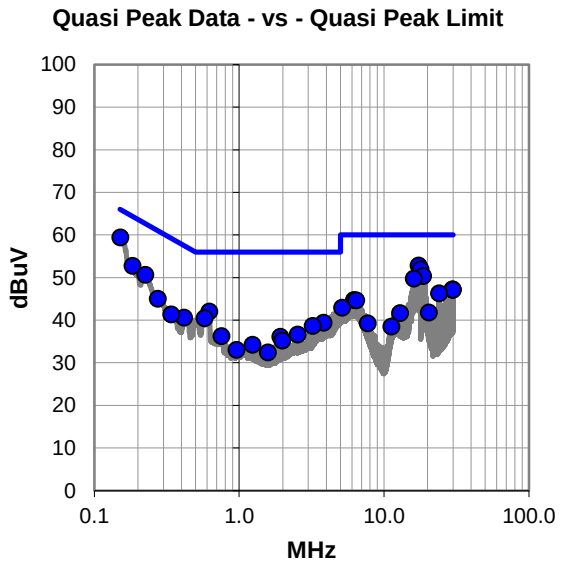
None

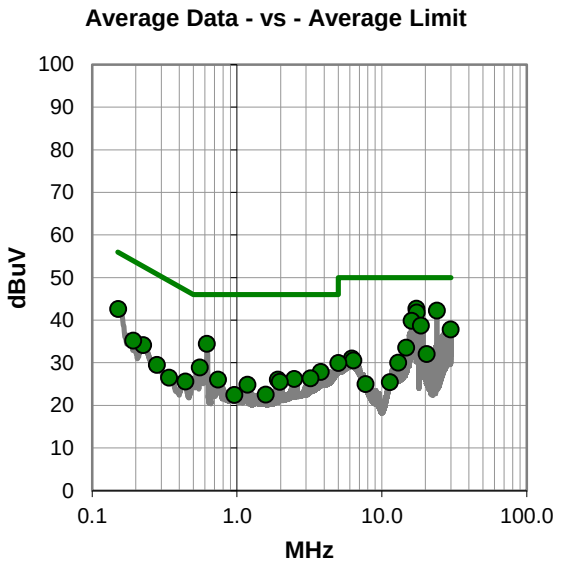
EUT OPERATING MODES

BTLE Continuous Tx: Mid Ch = 2442 MHz

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

RESULTS - Run #3

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.152	39.3	20.1	59.4	65.9	-6.5
17.376	32.2	20.6	52.8	60.0	-7.2
17.942	31.3	20.6	51.9	60.0	-8.1
18.685	29.7	20.6	50.3	60.0	-9.7
16.076	29.2	20.5	49.7	60.0	-10.3
0.184	32.7	20.0	52.7	64.3	-11.6
0.225	30.6	20.0	50.6	62.6	-12.0
29.716	26.1	21.1	47.2	60.0	-12.8
29.839	26.1	21.1	47.2	60.0	-12.8
29.954	26.0	21.1	47.1	60.0	-12.9
24.000	25.4	20.9	46.3	60.0	-13.7
0.623	22.2	19.8	42.0	56.0	-14.0
6.209	24.5	20.2	44.7	60.0	-15.3
6.433	24.4	20.2	44.6	60.0	-15.4
0.577	20.6	19.8	40.4	56.0	-15.6
0.275	25.1	19.9	45.0	61.0	-16.0
3.838	19.4	20.0	39.4	56.0	-16.6
0.417	20.8	19.8	40.6	57.5	-16.9
5.135	22.7	20.2	42.9	60.0	-17.1
3.228	18.6	20.0	38.6	56.0	-17.4
0.339	21.5	19.8	41.3	59.2	-17.9
20.483	21.1	20.7	41.8	60.0	-18.2
12.916	21.2	20.4	41.6	60.0	-18.4
2.542	16.6	20.0	36.6	56.0	-19.4
0.756	16.3	19.9	36.2	56.0	-19.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
17.382	22.1	20.6	42.7	50.0	-7.3
24.000	21.3	20.9	42.2	50.0	-7.8
17.445	21.2	20.6	41.8	50.0	-8.2
16.082	19.3	20.5	39.8	50.0	-10.2
18.685	18.1	20.6	38.7	50.0	-11.3
0.620	14.6	19.8	34.4	46.0	-11.6
29.954	16.7	21.1	37.8	50.0	-12.2
0.152	22.5	20.1	42.6	55.9	-13.3
14.793	13.1	20.4	33.5	50.0	-16.5
0.554	9.1	19.8	28.9	46.0	-17.1
20.484	11.3	20.7	32.0	50.0	-18.0
3.784	7.8	20.0	27.8	46.0	-18.2
0.225	14.1	20.0	34.1	52.6	-18.5
0.193	15.2	20.0	35.2	53.9	-18.7
6.209	10.8	20.2	31.0	50.0	-19.0
6.371	10.3	20.2	30.5	50.0	-19.5
3.228	6.3	20.0	26.3	46.0	-19.7
2.483	6.2	20.0	26.2	46.0	-19.8
0.739	6.1	19.9	26.0	46.0	-20.0
1.920	6.0	20.0	26.0	46.0	-20.0
12.979	9.6	20.4	30.0	50.0	-20.0
5.023	9.7	20.2	29.9	50.0	-20.1
1.979	5.5	20.0	25.5	46.0	-20.5
1.183	4.9	19.9	24.8	46.0	-21.2
0.280	9.6	19.9	29.5	50.8	-21.3

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0021
Serial Number:	3000425060205200	Date:	2022-05-04
Customer:	NAL Research Corporation	Temperature:	23.3°C
Attendees:	None	Relative Humidity:	41%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	5.0 VDC via USB	Configuration:	PCTE0021-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2022	ANSI C63.10:2013

TEST PARAMETERS

Run #:	4	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

None

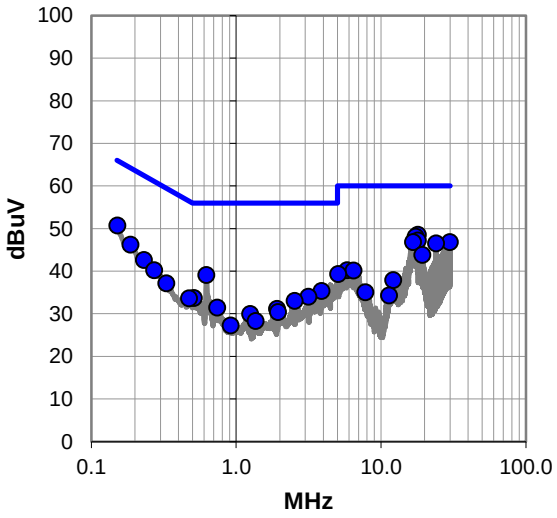
EUT OPERATING MODES

BTLE Continuous Tx: Mid Ch = 2442 MHz

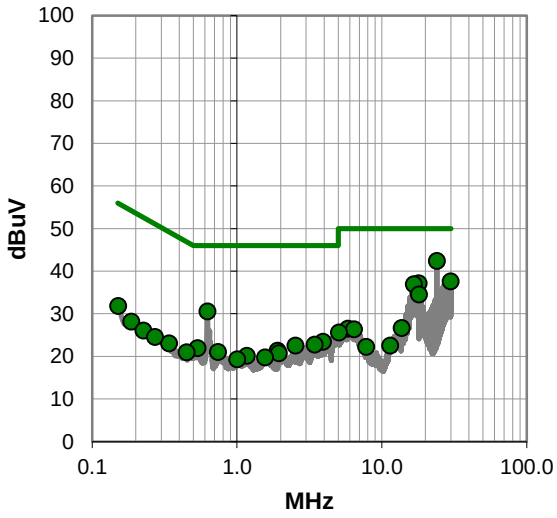
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
18.007	27.9	20.6	48.5	60.0	-11.5
17.384	27.5	20.6	48.1	60.0	-11.9
18.037	26.6	20.6	47.2	60.0	-12.8
16.638	26.2	20.6	46.8	60.0	-13.2
29.954	25.7	21.1	46.8	60.0	-13.2
24.000	25.6	20.9	46.5	60.0	-13.5
0.152	30.6	20.1	50.7	65.9	-15.2
19.297	23.2	20.6	43.8	60.0	-16.2
0.625	19.3	19.8	39.1	56.0	-16.9
0.187	26.2	20.0	46.2	64.2	-18.0
5.847	20.0	20.2	40.2	60.0	-19.8
0.231	22.6	20.0	42.6	62.4	-19.8
6.468	19.9	20.2	40.1	60.0	-19.9
3.897	15.3	20.0	35.3	56.0	-20.7
5.068	19.1	20.2	39.3	60.0	-20.7
0.272	20.3	19.9	40.2	61.1	-20.9
3.157	14.0	20.0	34.0	56.0	-22.0
12.158	17.5	20.4	37.9	60.0	-22.1
0.512	13.9	19.8	33.7	56.0	-22.3
0.330	17.3	19.8	37.1	59.5	-22.4
0.473	13.8	19.8	33.6	56.5	-22.9
2.533	13.0	20.0	33.0	56.0	-23.0
0.740	11.5	19.9	31.4	56.0	-24.6
1.914	11.1	20.0	31.1	56.0	-24.9
7.793	14.8	20.2	35.0	60.0	-25.0

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
24.000	21.5	20.9	42.4	50.0	-7.6
29.943	16.5	21.1	37.6	50.0	-12.4
18.007	16.5	20.6	37.1	50.0	-12.9
16.635	16.3	20.6	36.9	50.0	-13.1
0.626	10.7	19.8	30.5	46.0	-15.5
18.071	13.9	20.6	34.5	50.0	-15.5
3.923	3.4	20.0	23.4	46.0	-22.6
3.452	2.7	20.0	22.7	46.0	-23.3
13.742	6.2	20.4	26.6	50.0	-23.4
5.846	6.3	20.2	26.5	50.0	-23.5
2.536	2.5	20.0	22.5	46.0	-23.5
6.433	6.1	20.2	26.3	50.0	-23.7
0.152	11.7	20.1	31.8	55.9	-24.1
0.536	2.1	19.8	21.9	46.0	-24.1
5.069	5.4	20.2	25.6	50.0	-24.4
1.912	1.3	20.0	21.3	46.0	-24.7
0.739	1.1	19.9	21.0	46.0	-25.0
1.949	0.7	20.0	20.7	46.0	-25.3
1.174	0.2	19.9	20.1	46.0	-25.9
0.449	1.1	19.8	20.9	46.9	-26.0
0.187	8.1	20.0	28.1	54.2	-26.1
0.339	3.2	19.8	23.0	49.2	-26.2
1.566	-0.2	19.9	19.7	46.0	-26.3
0.226	6.0	20.0	26.0	52.6	-26.6
0.272	4.6	19.9	24.5	51.1	-26.6

CONCLUSION

Pass

Tested By

99% OCCUPIED BANDWIDTH

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2022-03-14	2023-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

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.

99% OCCUPIED BANDWIDTH

TbtTx 2021.12.14.1 XMit 2022.02.07.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**			**Work Order:**	**PCTE0021**
Serial Number:	**FCC 3**			**Date:**	**19-Apr-22**
Customer:	**NAL Research Corporation**			**Temperature:**	**22.2 °C**
Attendees:	**None**			**Humidity:**	**40.7% RH**
Project:	**None**			**Barometric Pres.:**	**1020 mbar**
Tested by:	**Jeff Alcoke**	**Power:**	**5.0 VDC via USB**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

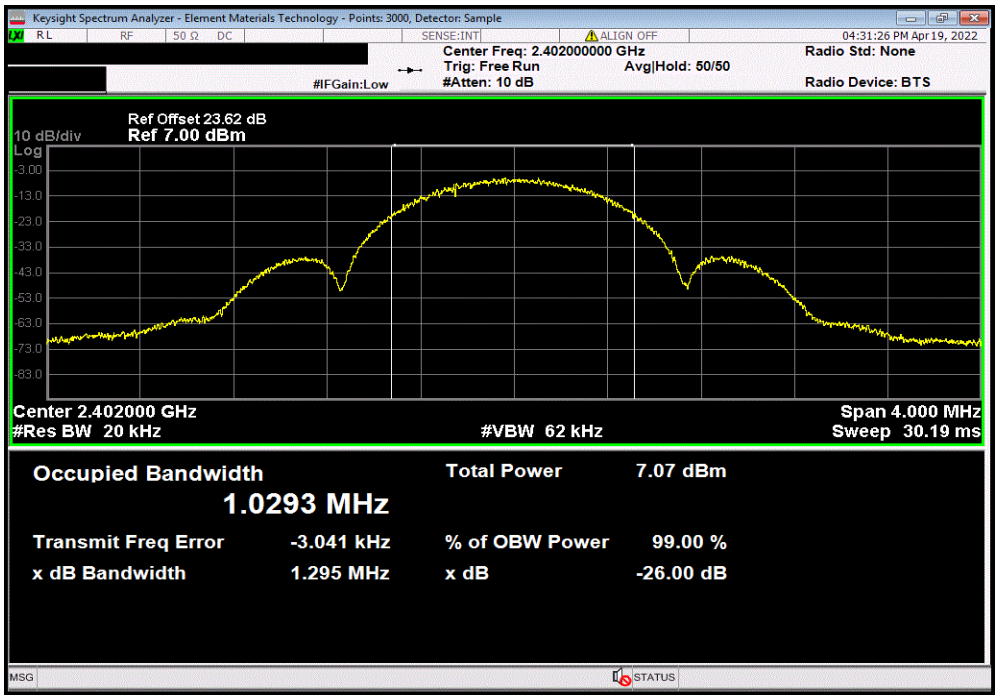
Configuration #	**2**	*Signature*

	Value	**Limit**	**Result**
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	1.029 MHz	N/A	N/A
Mid Channel, 2442 MHz	1.028 MHz	N/A	N/A
High Channel, 2480 MHz	1.031 MHz	N/A	N/A

99% OCCUPIED BANDWIDTH

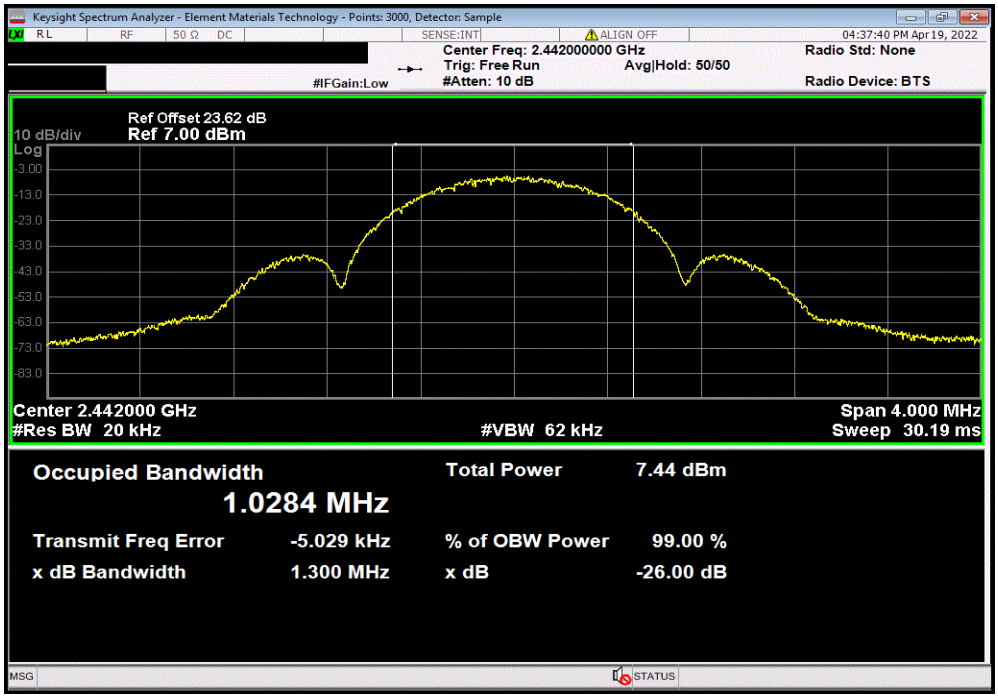
BLE/GFSK 1 Mbps, Low Channel, 2402 MHz

				Value	Limit	Result
				1.029 MHz	N/A	N/A



BLE/GFSK 1 Mbps, Mid Channel, 2442 MHz

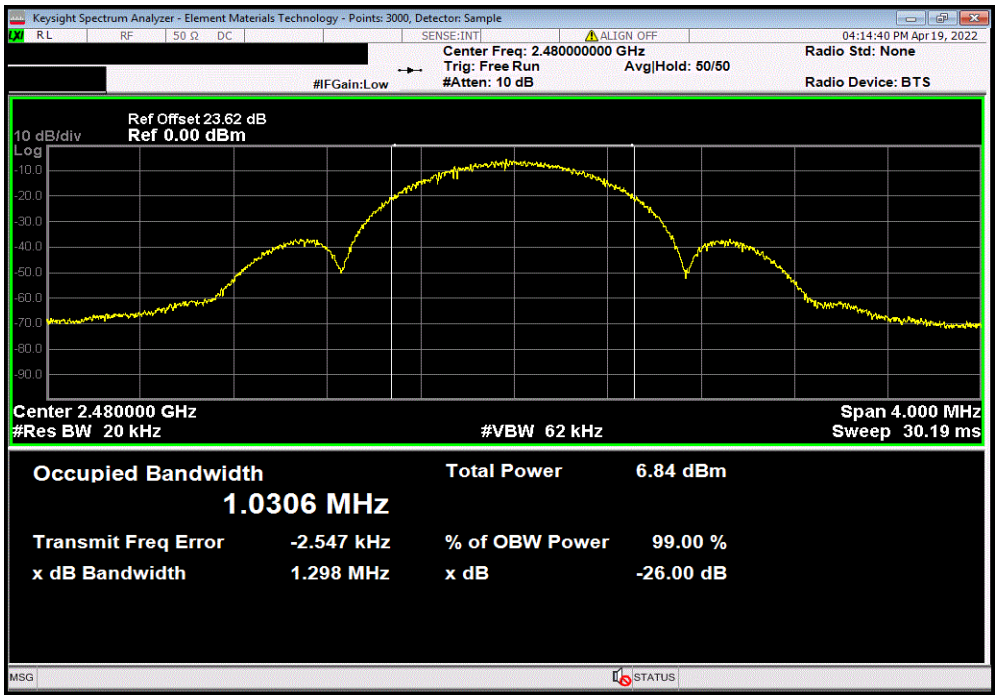
				Value	Limit	Result
				1.028 MHz	N/A	N/A



99% OCCUPIED BANDWIDTH

BLE/GFSK 1 Mbps, High Channel, 2480 MHz

				Value	Limit	Result
				1.031 MHz	N/A	N/A



DUTY CYCLE

TEST DESCRIPTION

The Duty Cycle (x) were measured for each of the EUT operating modes. 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.

The EUT operates at 100% Duty Cycle.

DTS BANDWIDTH

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2022-03-14	2023-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

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

TbtTx 2021.12.14.1 XMit 2022.02.07.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**			**Work Order:**	**PCTE0021**
Serial Number:	**FCC 3**			**Date:**	**19-Apr-22**
Customer:	**NAL Research Corporation**			**Temperature:**	**22.1 °C**
Attendees:	**None**			**Humidity:**	**40.9% RH**
Project:	**None**			**Barometric Pres.:**	**1020 mbar**
Tested by:	**Jeff Alcoke**	**Power:**	**5.0 VDC via USB**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013

COMMENTS

None

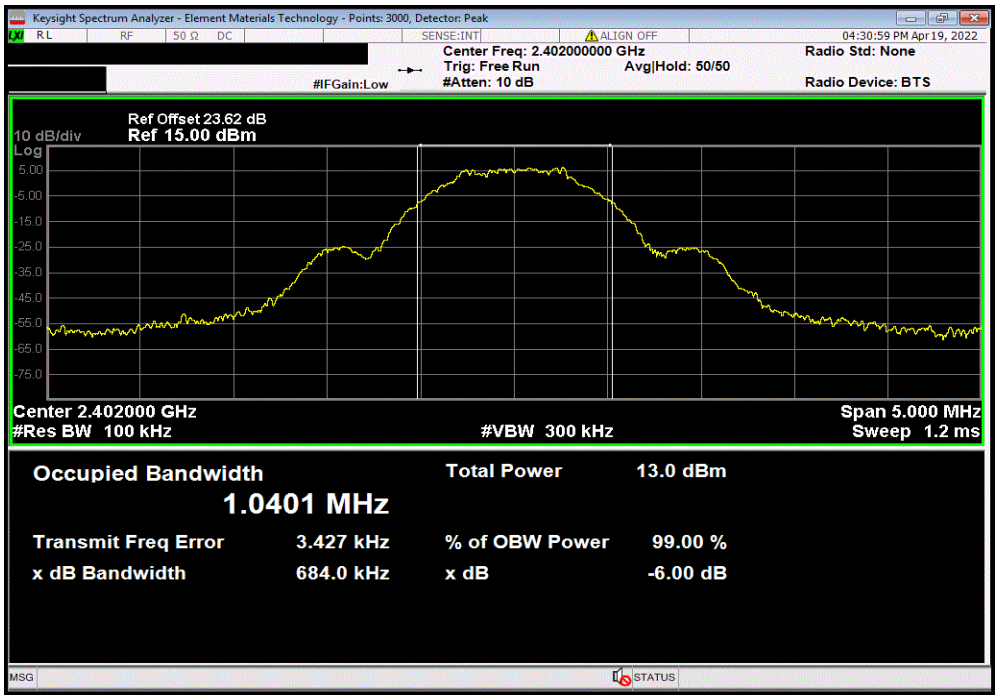
DEVIATIONS FROM TEST STANDARD

None

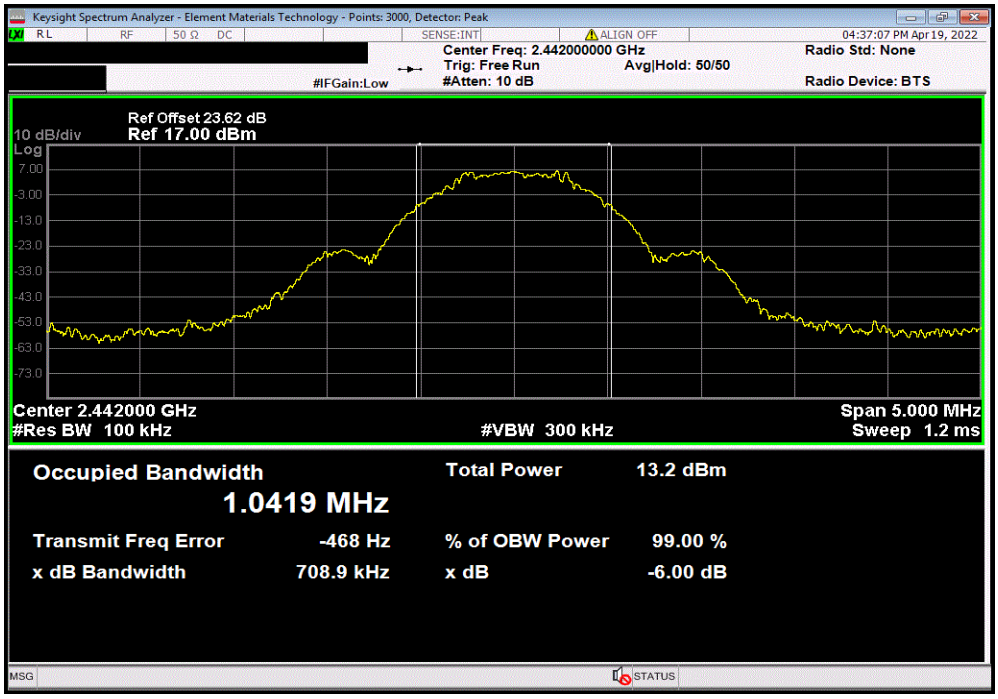
Configuration #	**2**	*Signature*

	Value	**Limit (≥)**	**Result**
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	683.994 kHz	500 kHz	Pass
Mid Channel, 2442 MHz	708.899 kHz	500 kHz	Pass
High Channel, 2480 MHz	681.526 kHz	500 kHz	Pass

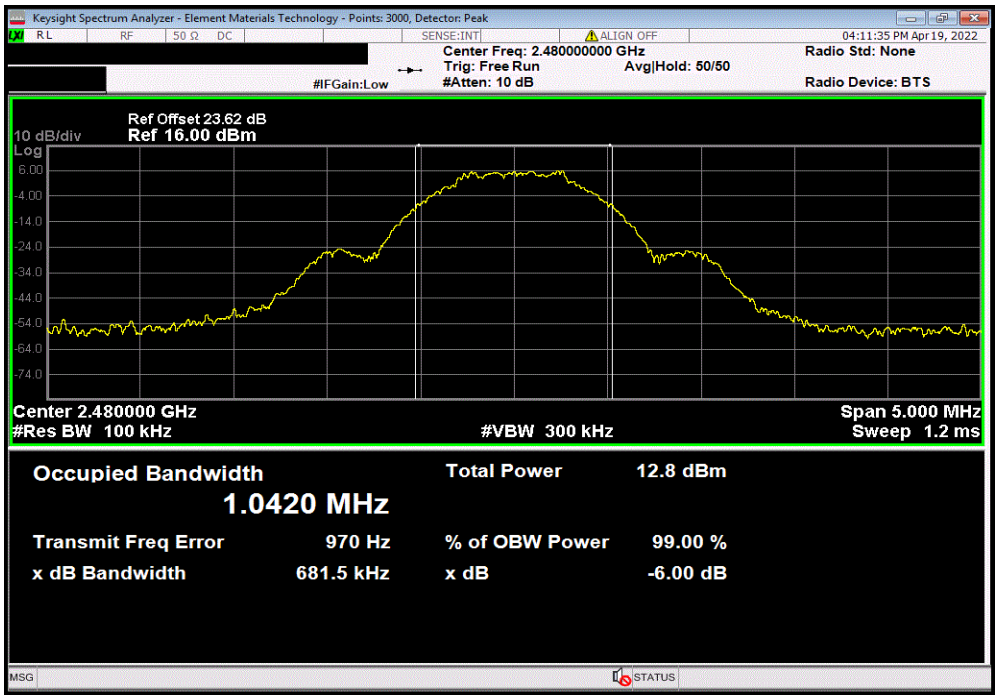
BLE/GFSK 1 Mbps, Low Channel, 2402 MHz						
				Value	Limit (≥)	Result
				683.994 kHz	500 kHz	Pass



BLE/GFSK 1 Mbps, Mid Channel, 2442 MHz						
				Value	Limit (≥)	Result
				708.899 kHz	500 kHz	Pass



BLE/GFSK 1 Mbps, High Channel, 2480 MHz							
					Value	Limit (≥)	Result
					681.526 kHz	500 kHz	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2022-03-14	2023-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

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)

element

TbtTx 2021.12.14.1 XMit 2022.02.07.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**			**Work Order:**	**PCTE0021**
Serial Number:	**FCC 3**			**Date:**	**19-Apr-22**
Customer:	**NAL Research Corporation**			**Temperature:**	**22.2 °C**
Attendees:	**None**			**Humidity:**	**40.8% RH**
Project:	**None**			**Barometric Pres.:**	**1020 mbar**
Tested by:	**Jeff Alcoke**	**Power:**	**5.0 VDC via USB**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

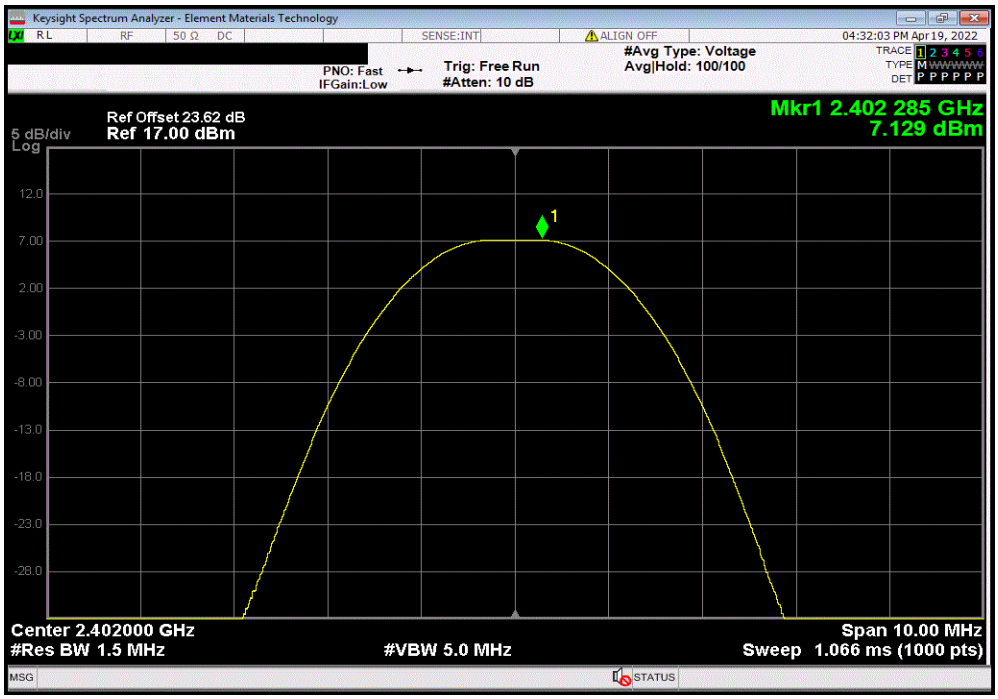
None

Configuration #	**2**	*Signature*

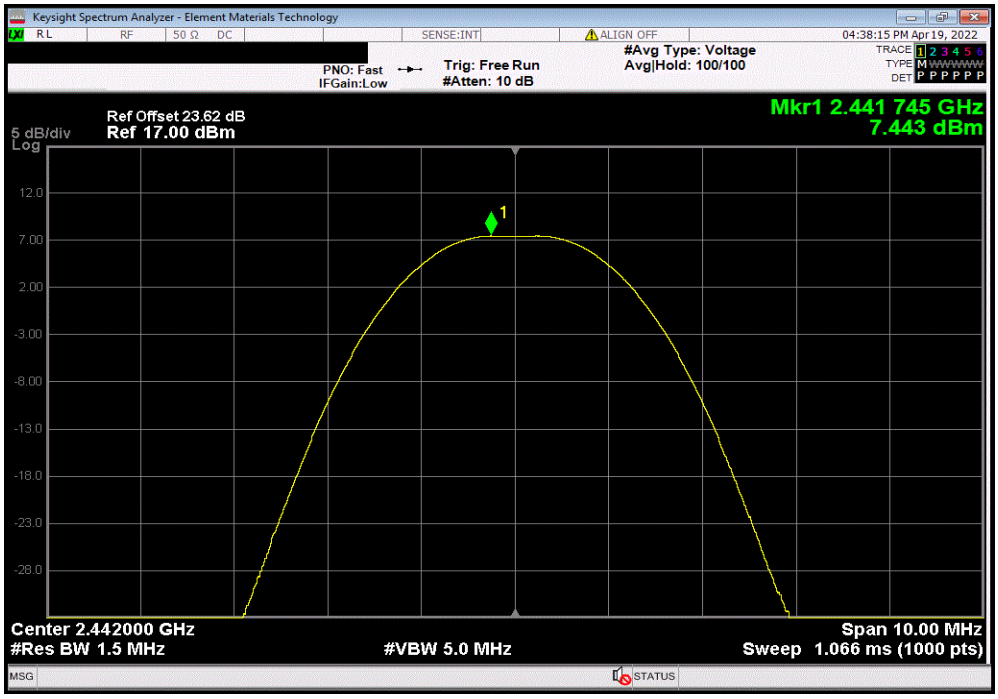
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
BLE/GFSK 1 Mbps					
Low Channel, 2402 MHz	7.129	3	10.129	36	Pass
Mid Channel, 2442 MHz	7.443	3	10.443	36	Pass
High Channel, 2480 MHz	6.925	3	9.925	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

BLE/GFSK 1 Mbps, Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		7.129	3	10.129	36	Pass

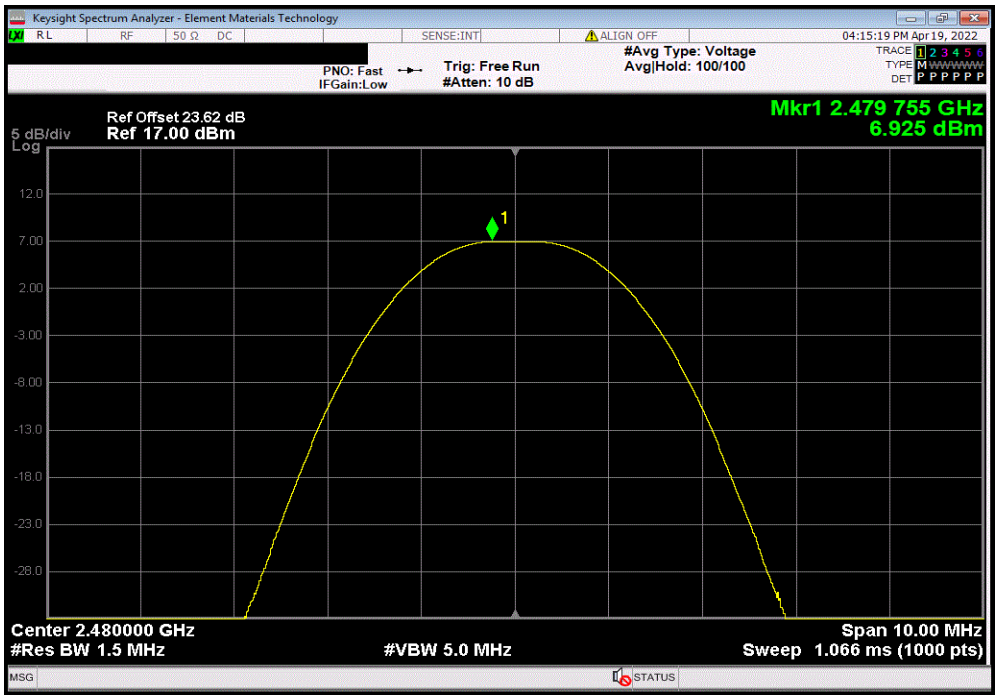


BLE/GFSK 1 Mbps, Mid Channel, 2442 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		7.443	3	10.443	36	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

BLE/GFSK 1 Mbps, High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		6.925	3	9.925	36	Pass



OUTPUT POWER

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2022-03-14	2023-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

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

element

TbtTx 2021.12.14.1 XMit 2022.02.07.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**			**Work Order:**	**PCTE0021**
Serial Number:	**FCC 3**			**Date:**	**19-Apr-22**
Customer:	**NAL Research Corporation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**41% RH**
Project:	**None**			**Barometric Pres.:**	**1018 mbar**
Tested by:	**Jeff Alcoke**	**Power:**	**5.0 VDC via USB**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013

COMMENTS

None

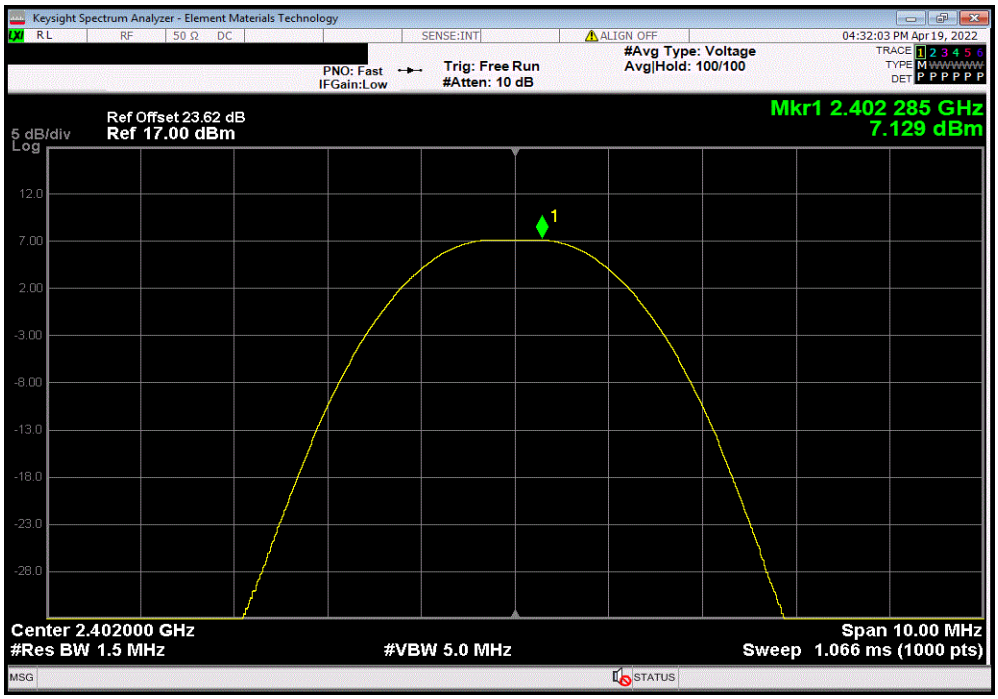
DEVIATIONS FROM TEST STANDARD

None

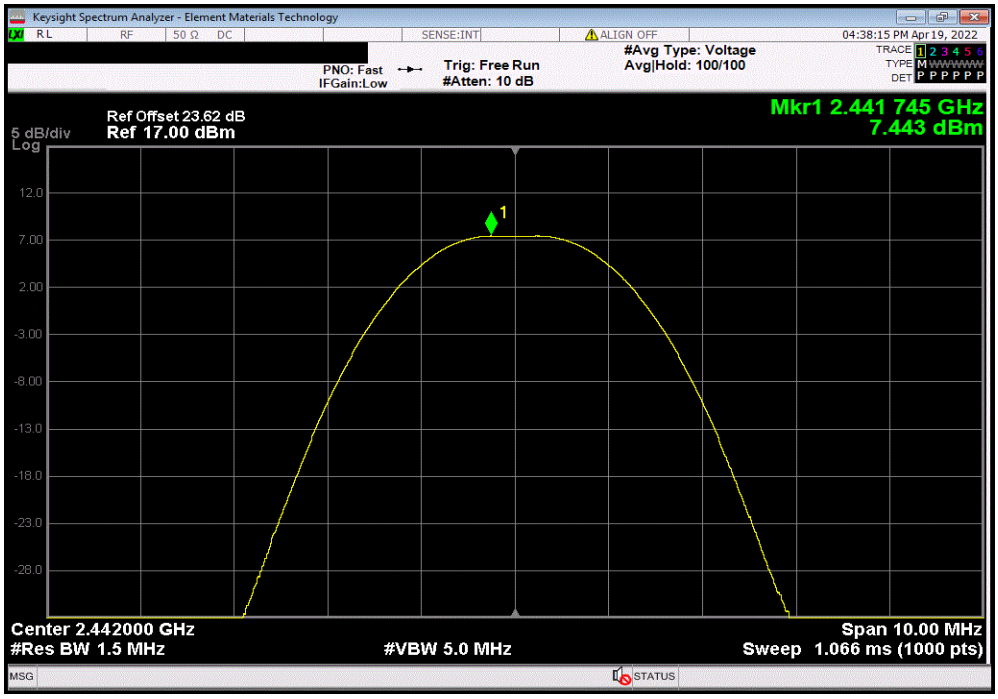
Configuration #	**2**	*Signature*

	Out Pwr (dBm)	**Limit (dBm)**	**Result**
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	7.129	30	Pass
Mid Channel, 2442 MHz	7.443	30	Pass
High Channel, 2480 MHz	6.925	30	Pass

BLE/GFSK 1 Mbps, Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				7.129	30	Pass

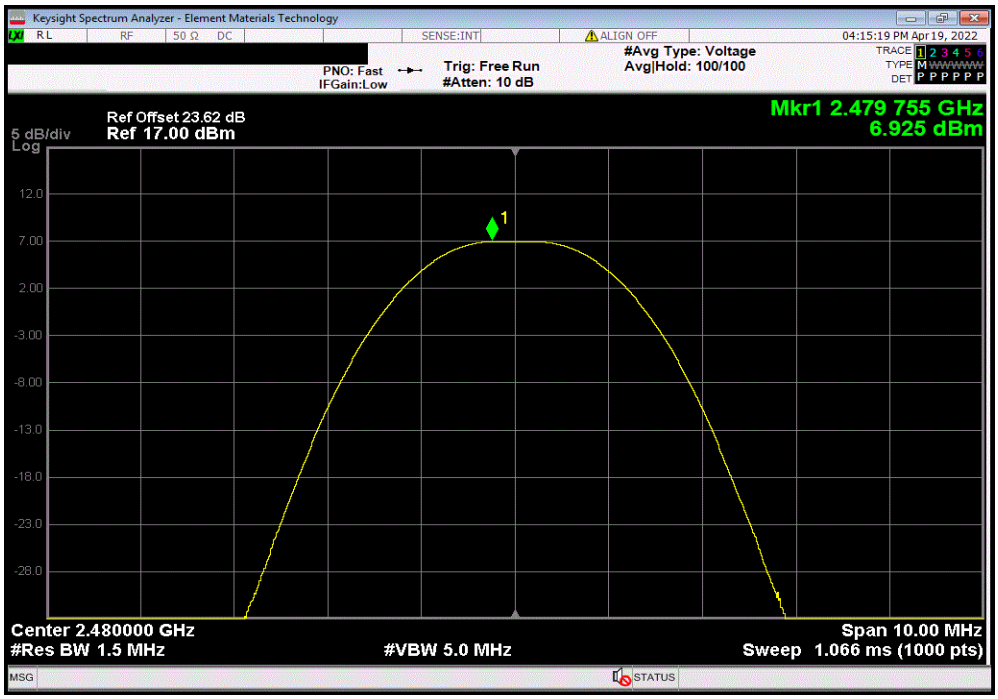


BLE/GFSK 1 Mbps, Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				7.443	30	Pass



OUTPUT POWER

BLE/GFSK 1 Mbps, High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				6.925	30	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
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2022-03-14	2023-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

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

element

TbtTx 2021.12.14.1 XMit 2022.02.07.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**			**Work Order:**	**PCTE0021**
Serial Number:	**FCC 3**			**Date:**	**19-Apr-22**
Customer:	**NAL Research Corporation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**41% RH**
Project:	**None**			**Barometric Pres.:**	**1017 mbar**
Tested by:	**Jeff Alcoke**	**Power:**	**5.0 VDC via USB**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013

COMMENTS

None

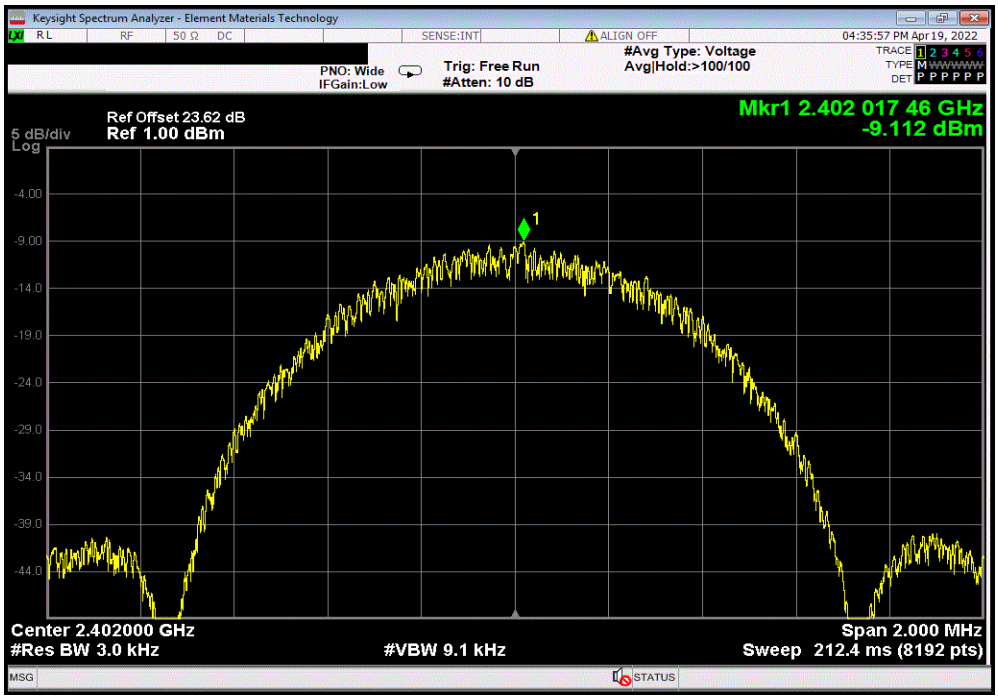
DEVIATIONS FROM TEST STANDARD

None

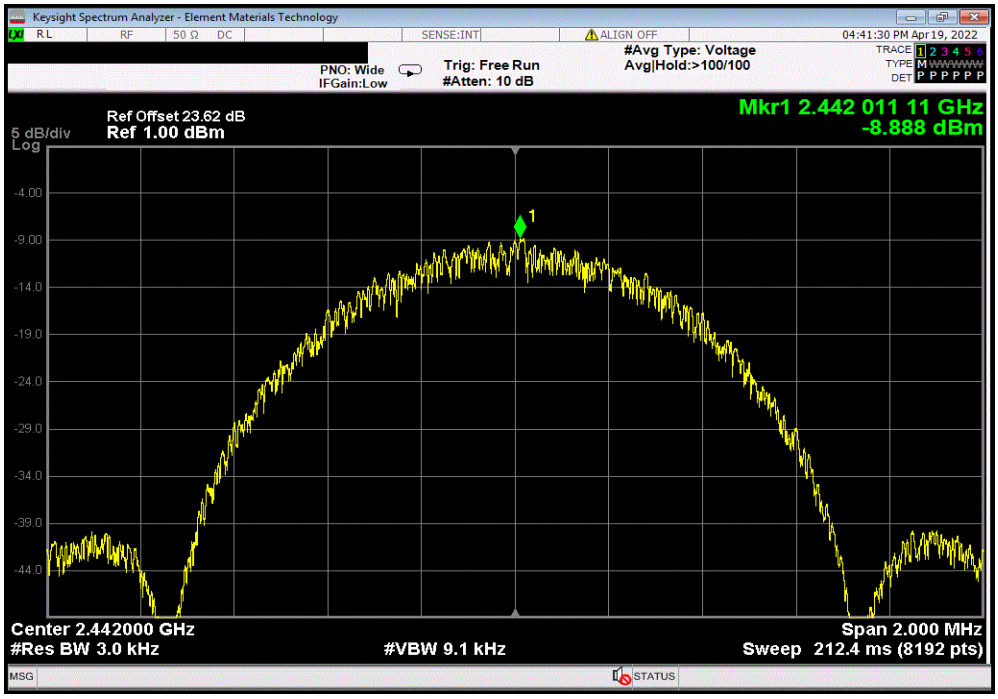
Configuration #	**2**	*Signature*

	Value dBm/3kHz	**Limit < dBm/3kHz**	**Results**
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-9.112	8	Pass
Mid Channel, 2442 MHz	-8.888	8	Pass
High Channel, 2480 MHz	-9.303	8	Pass

BLE/GFSK 1 Mbps, Low Channel, 2402 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-9.112	8	Pass



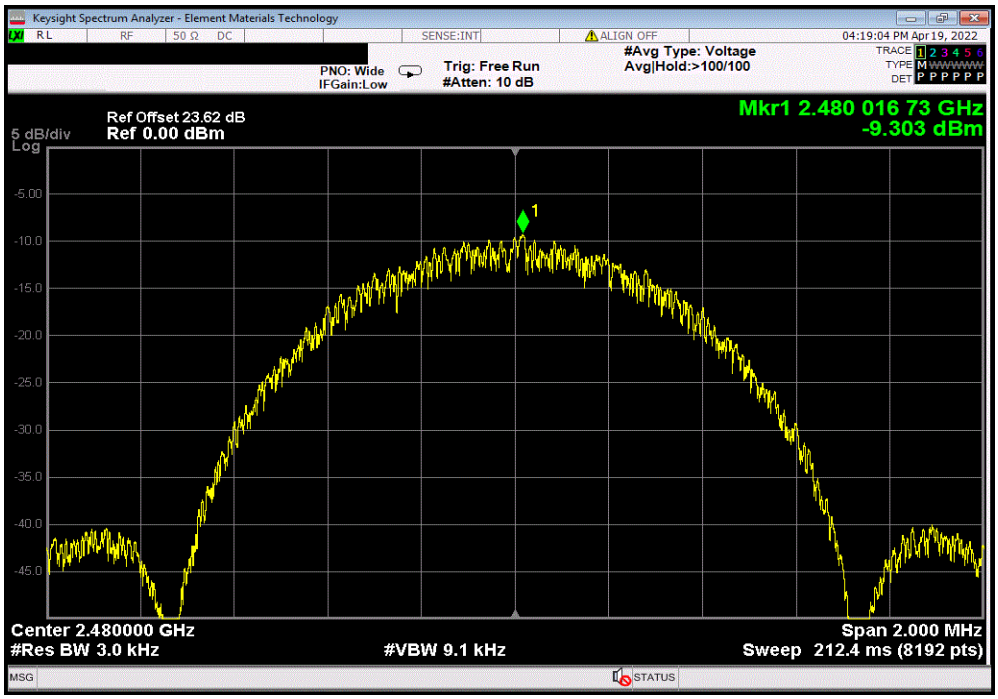
BLE/GFSK 1 Mbps, Mid Channel, 2442 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-8.888	8	Pass



POWER SPECTRAL DENSITY

TbtTx 2021.12.14.1 XMit 2022.07.0

BLE/GFSK 1 Mbps, High Channel, 2480 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-9.303	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	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2022-03-14	2023-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

TEST DESCRIPTION

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

The spurious RF conducted emissions at the edges of the authorized 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

TbtTx 2021.12.14.1 XMit 2022.02.07.0

EUT:	SHOUT sp Handheld Iridium Smartphone			Work Order:	PCTE0021
Serial Number:	FCC 3			Date:	19-Apr-22
Customer:	NAL Research Corporation			Temperature:	22 °C
Attendees:	None			Humidity:	40.8% RH
Project:	None			Barometric Pres.:	1020 mbar
Tested by:	Jeff Alcoke	Power:	5.0 VDC via USB	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2022	ANSI C63.10:2013

COMMENTS

None

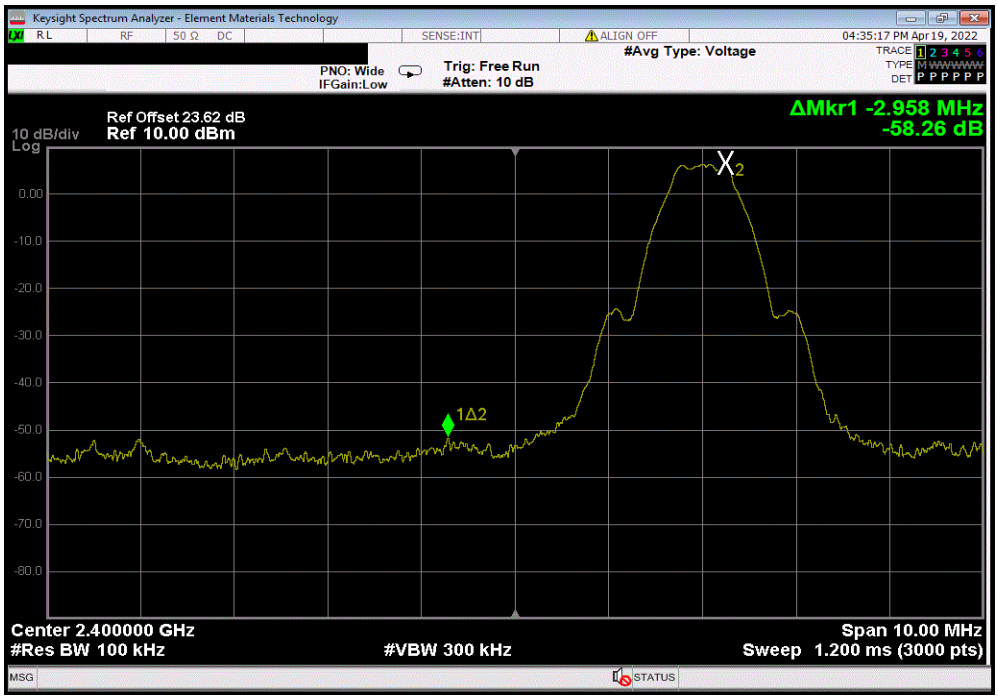
DEVIATIONS FROM TEST STANDARD

None

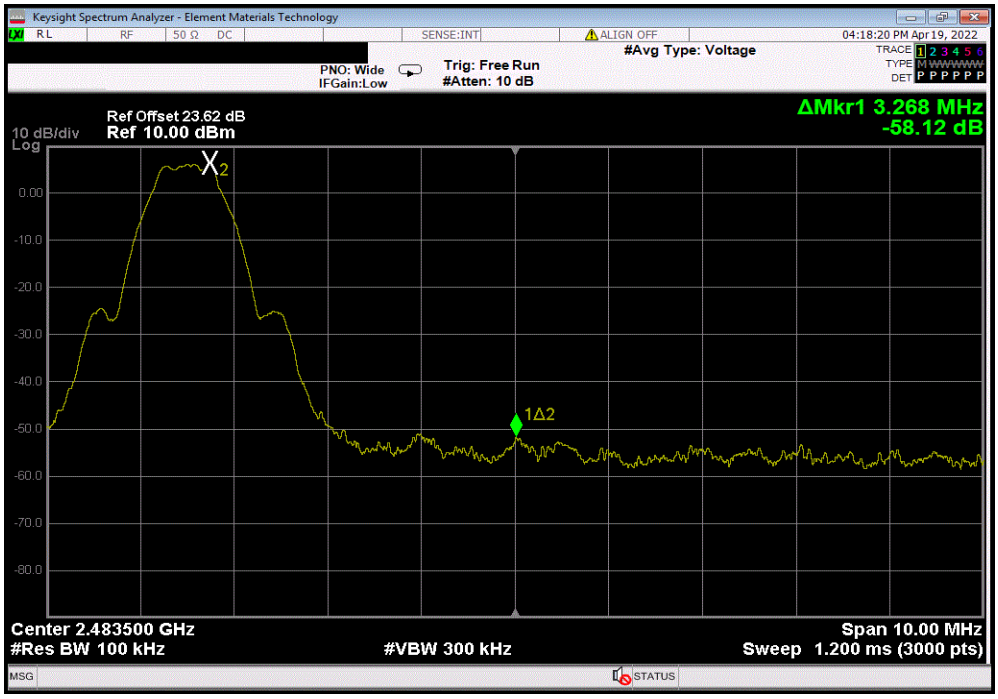
Configuration #	2	Signature

	Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-58.26	-20	Pass
High Channel, 2480 MHz	-58.12	-20	Pass

BLE/GFSK 1 Mbps, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-58.26	-20	Pass



BLE/GFSK 1 Mbps, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-58.12	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2022-03-14	2023-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

TEST DESCRIPTION

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

The spurious RF conducted emissions 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.

SPURIOUS CONDUCTED EMISSIONS

TbtTx 2021.12.14.1 XMit 2022.02.07.0

EUT:	**SHOUT sp Handheld Iridium Smartphone**			**Work Order:**	**PCTE0021**
Serial Number:	**FCC 3**			**Date:**	**4-May-22**
Customer:	**NAL Research Corporation**			**Temperature:**	**23.2 °C**
Attendees:	**None**			**Humidity:**	**41% RH**
Project:	**None**			**Barometric Pres.:**	**1017 mbar**
Tested by:	**Jeff Alcoke**	**Power:**	**5.0 VDC via USB**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2022	ANSI C63.10:2013

COMMENTS

None

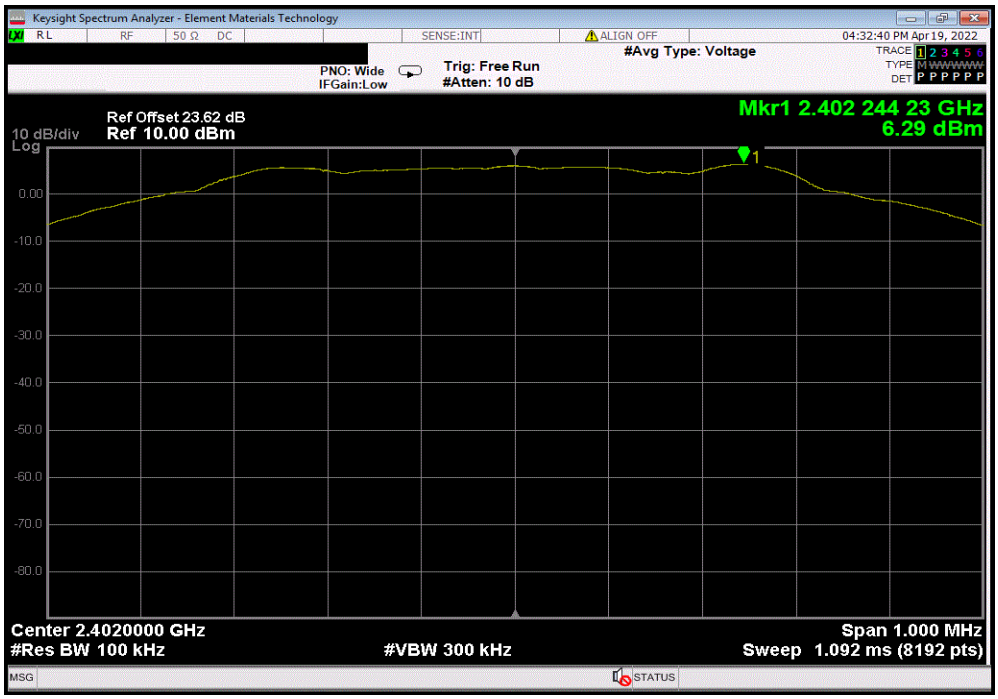
DEVIATIONS FROM TEST STANDARD

None

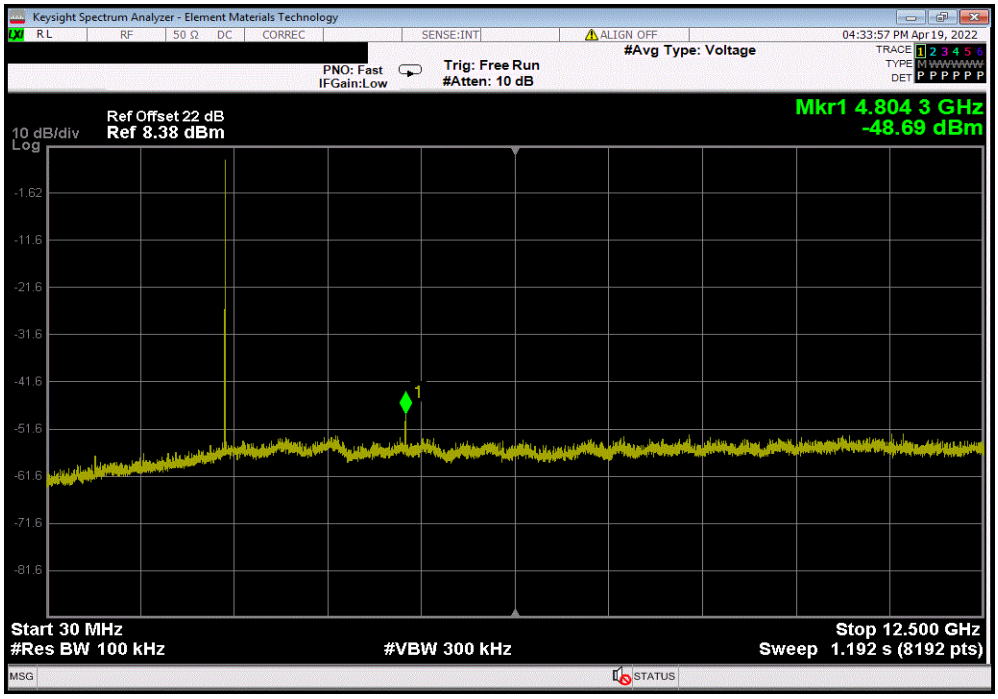
Configuration #	**2**	*Signature*

		Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
BLE/GFSK 1 Mbps						
	Low Channel, 2402 MHz	Fundamental	2402.24	N/A	N/A	N/A
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	4804.25	-54.98	-20	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	24983.21	-54.67	-20	Pass
	Mid Channel, 2442 MHz	Fundamental	2442.24	N/A	N/A	N/A
	Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	4883.42	-55.11	-20	Pass
	Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	24061.47	-54.44	-20	Pass
	High Channel, 2480 MHz	Fundamental	2480.24	N/A	N/A	N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	4959.54	-54.65	-20	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	24960.32	-53.94	-20	Pass

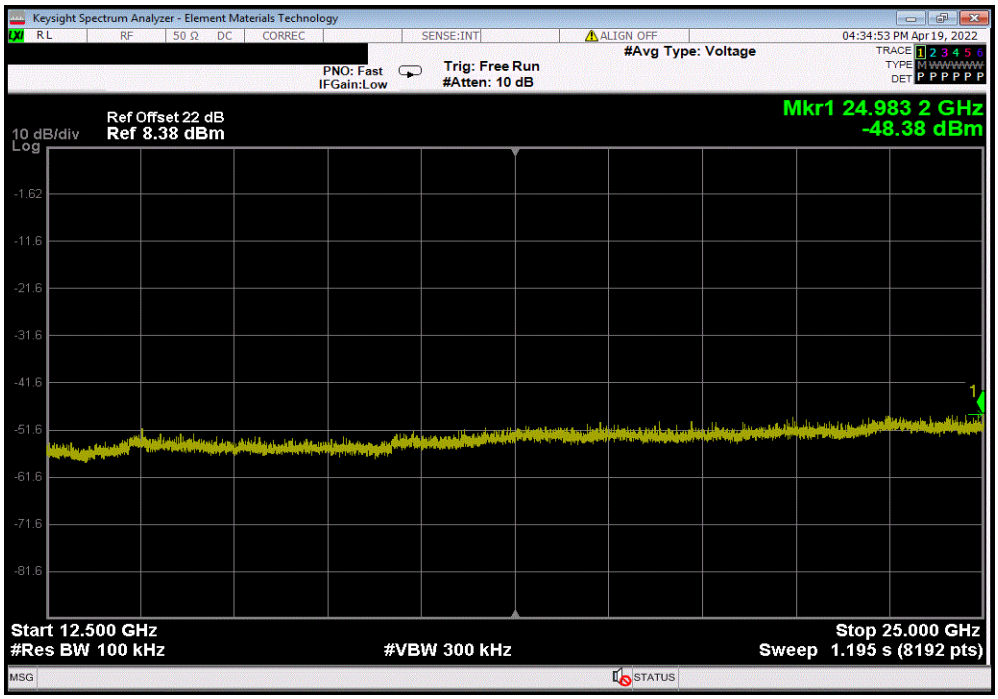
BLE/GFSK 1 Mbps, Low Channel, 2402 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2402.24	N/A	N/A	N/A



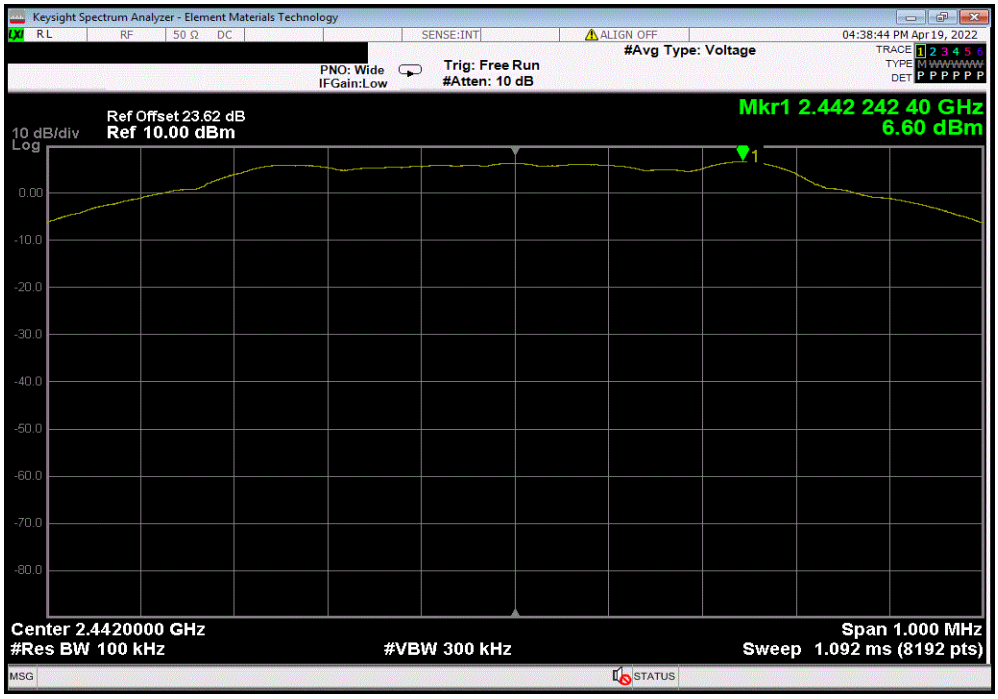
BLE/GFSK 1 Mbps, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4804.25	-54.98	-20	Pass



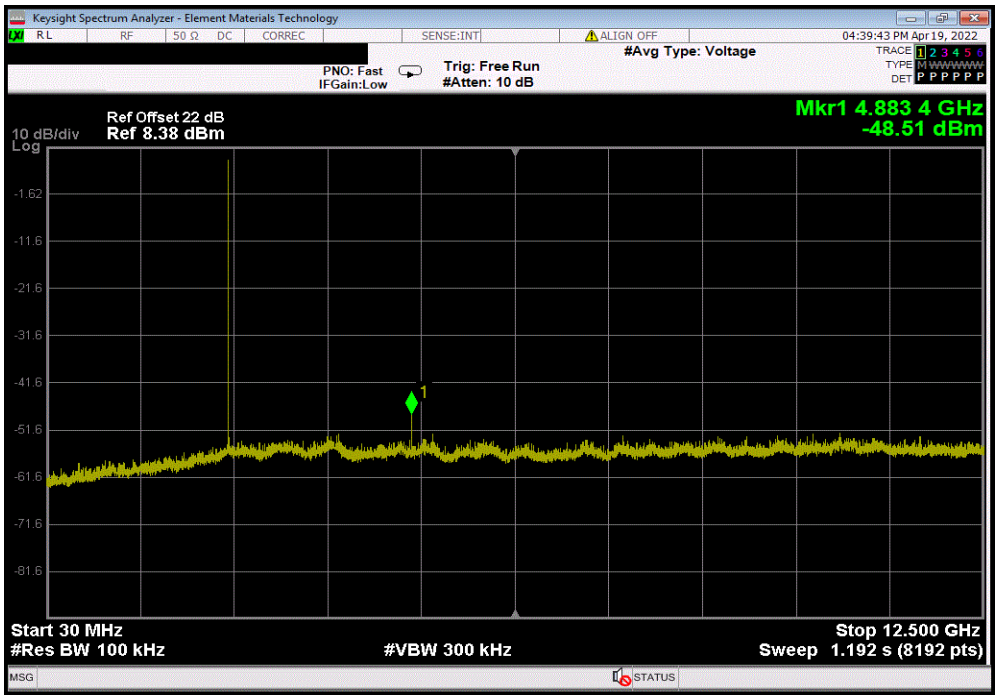
BLE/GFSK 1 Mbps, Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24983.21	-54.67	-20	Pass



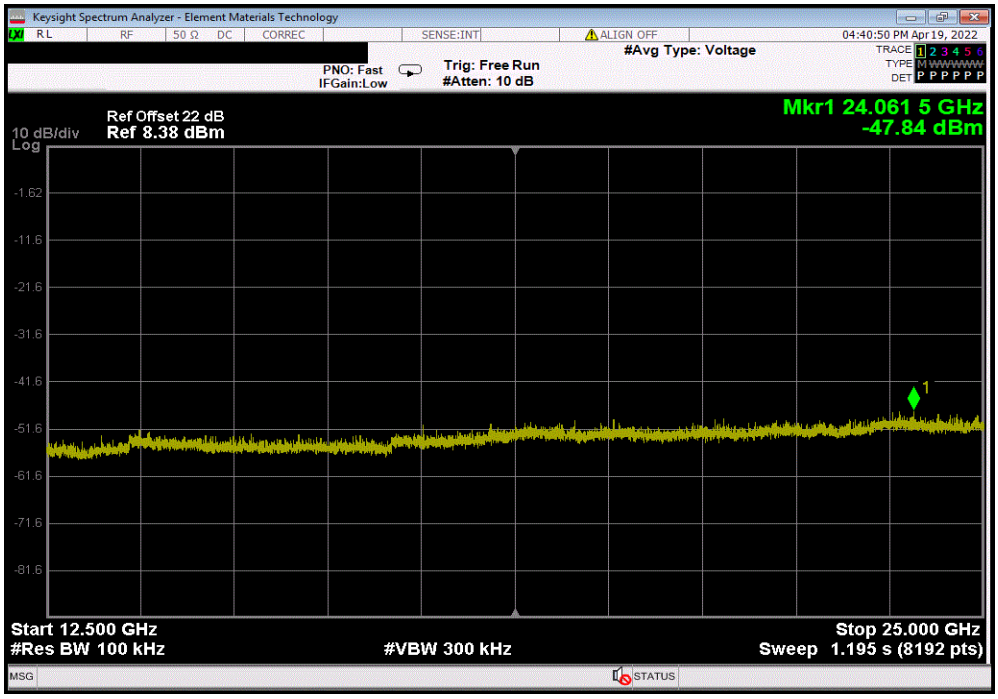
BLE/GFSK 1 Mbps, Mid Channel, 2442 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2442.24	N/A	N/A	N/A



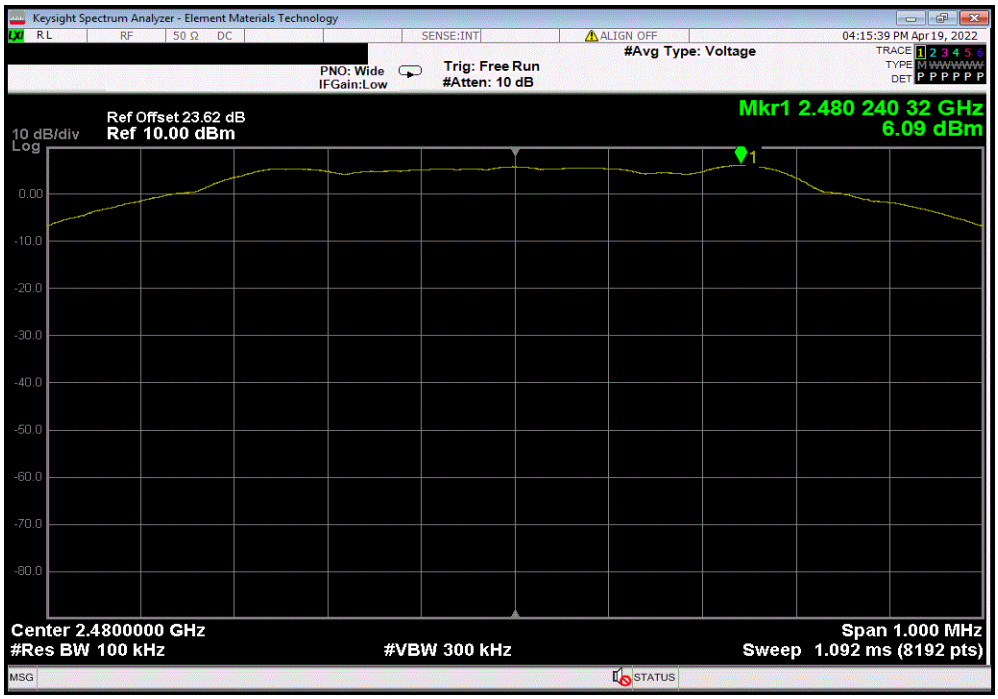
BLE/GFSK 1 Mbps, Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4883.42	-55.11	-20	Pass



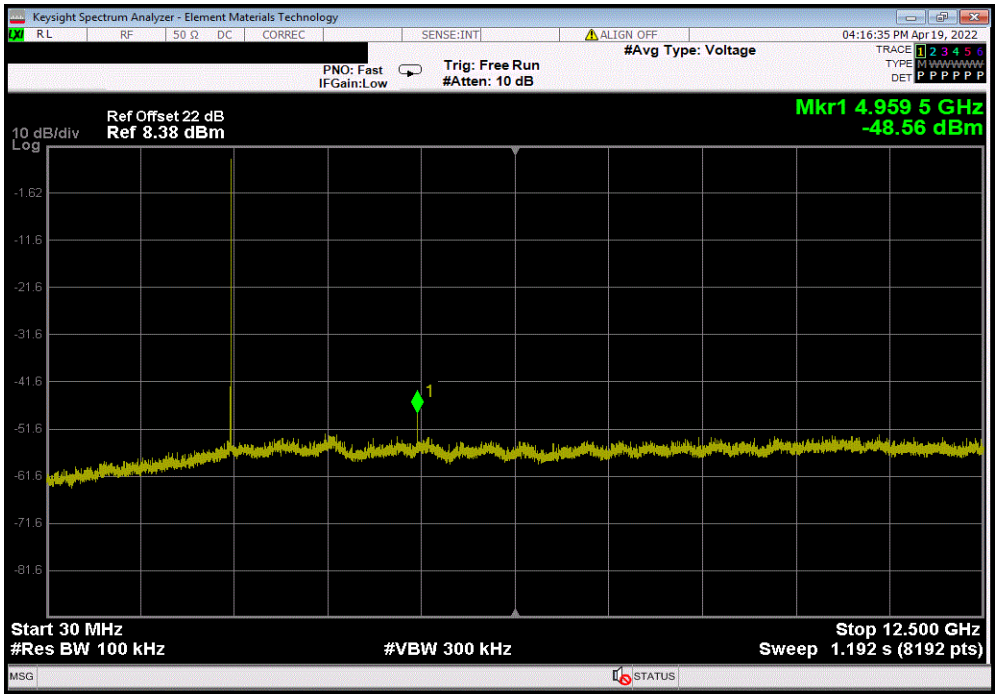
BLE/GFSK 1 Mbps, Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24061.47	-54.44	-20	Pass



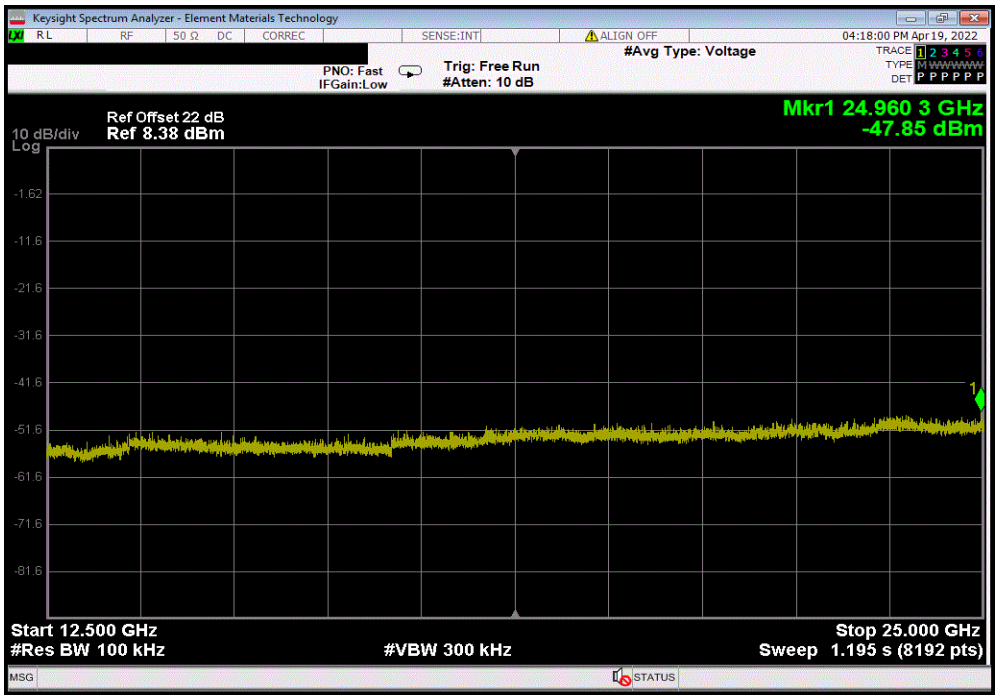
BLE/GFSK 1 Mbps, High Channel, 2480 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2480.24	N/A	N/A	N/A



BLE/GFSK 1 Mbps, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4959.54	-54.65	-20	Pass



BLE/GFSK 1 Mbps, High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24960.32	-53.94	-20	Pass



SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

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

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

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

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

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

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFI	2021-12-09	2022-12-09
Antenna - Biconilog	EMCO	3142B	AXJ	2021-03-03	2023-03-03
Antenna - Double Ridge	EMCO	3115	AHC	2020-07-01	2022-07-01
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2021-11-17	2022-11-17
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2021-11-17	2022-11-17
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2021-11-17	2022-11-17
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2021-11-17	2022-11-17
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	2021-07-16	2022-07-16
Cable	N/A	Bilog Cables	EVA	2021-11-17	2022-11-17
Cable	N/A	Double Ridge Horn Cables	EVB	2022-02-15	2023-02-15
Cable	None	Standard Gain Horn Cables	EVF	2021-11-17	2022-11-17
Cable	ESM Cable Corp.	TTBJ141-KMKM-72	EVY	2021-07-16	2022-07-16
Attenuator	Coaxicom	3910-20	AXZ	2022-02-10	2023-02-10
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2021-11-17	2022-11-17

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 26400 MHz

POWER INVESTIGATED

5.0 VDC via USB

CONFIGURATIONS INVESTIGATED

PCTE0021-1

MODES INVESTIGATED

BTLE Continuous Tx: Low Ch = 2402 MHz, Mid Ch = 2442 MHz, High Ch = 2480 MHz

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0021
Serial Number:	3000425060205200	Date:	2022-05-03
Customer:	NAL Research Corporation	Temperature:	21.8°C
Attendees:	None	Relative Humidity:	42.7%
Customer Project:	None	Bar. Pressure (PMSL):	1029 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	5.0 VDC via USB	Configuration:	PCTE0021-1

TEST SPECIFICATIONS

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

TEST PARAMETERS

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

COMMENTS

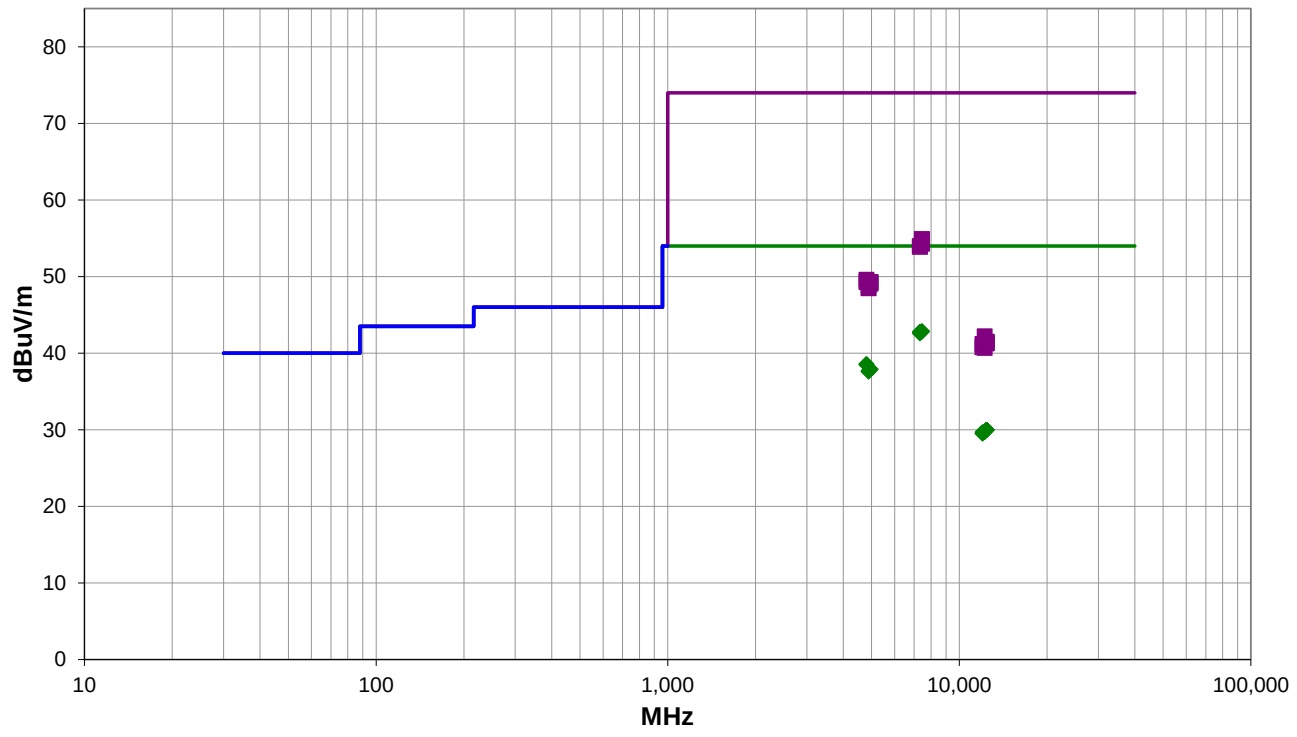
See comments below for channel and EUT orientation

EUT OPERATING MODES

BTLE Continuous Tx: Low Ch = 2402 MHz, Mid Ch = 2442 MHz, High Ch = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 3 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

RESULTS - Run #3

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7437.958	27.8	15.1	1.5	73.0	3.0	0.0	Horz	AV	0.0	42.9	54.0	-11.1	High Ch, EUT Vert
7325.600	28.2	14.6	1.5	131.0	3.0	0.0	Horz	AV	0.0	42.8	54.0	-11.2	Mid Ch, EUT Vert
7438.258	27.7	15.1	1.5	106.0	3.0	0.0	Vert	AV	0.0	42.8	54.0	-11.2	High Ch, EUT Vert
7323.917	28.1	14.5	1.5	22.0	3.0	0.0	Vert	AV	0.0	42.6	54.0	-11.4	Mid Ch, EUT Vert
4801.842	30.4	8.2	1.5	121.0	3.0	0.0	Horz	AV	0.0	38.6	54.0	-15.4	Low Ch, EUT Vert
4801.792	30.3	8.2	2.56	195.0	3.0	0.0	Vert	AV	0.0	38.5	54.0	-15.5	Low Ch, EUT Vert
4959.350	29.5	8.4	1.5	234.0	3.0	0.0	Horz	AV	0.0	37.9	54.0	-16.1	High Ch, EUT Vert
4959.567	29.5	8.4	1.5	172.0	3.0	0.0	Vert	AV	0.0	37.9	54.0	-16.1	High Ch, EUT Vert
4883.683	29.5	8.2	1.5	179.0	3.0	0.0	Horz	AV	0.0	37.7	54.0	-16.3	Mid Ch, EUT Vert
4883.808	29.4	8.2	2.13	197.0	3.0	0.0	Vert	AV	0.0	37.6	54.0	-16.4	Mid Ch, EUT Vert
7439.433	39.8	15.1	1.5	73.0	3.0	0.0	Horz	PK	0.0	54.9	74.0	-19.1	High Ch, EUT Vert
7440.833	39.2	15.1	1.5	106.0	3.0	0.0	Vert	PK	0.0	54.3	74.0	-19.7	High Ch, EUT Vert
7324.825	39.5	14.5	1.5	131.0	3.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	Mid Ch, EUT Vert
7324.600	39.4	14.5	1.5	22.0	3.0	0.0	Vert	PK	0.0	53.9	74.0	-20.1	Mid Ch, EUT Vert
12399.650	29.5	0.5	1.5	0.0	3.0	0.0	Horz	AV	0.0	30.0	54.0	-24.0	High Ch, EUT Vert
12399.970	29.5	0.5	2.03	232.0	3.0	0.0	Vert	AV	0.0	30.0	54.0	-24.0	High Ch, EUT Vert
12399.650	29.5	0.5	1.5	0.0	3.0	0.0	Horz	AV	0.0	30.0	54.0	-24.0	High Ch, EUT Vert
12399.970	29.5	0.5	2.03	232.0	3.0	0.0	Vert	AV	0.0	30.0	54.0	-24.0	High Ch, EUT Vert
12210.610	29.8	0.0	1.3	264.0	3.0	0.0	Horz	AV	0.0	29.8	54.0	-24.2	Mid Ch, EUT Vert
12008.920	29.9	-0.2	1.5	154.0	3.0	0.0	Horz	AV	0.0	29.7	54.0	-24.3	Low Ch, EUT Vert
12212.390	29.7	0.0	1.5	208.0	3.0	0.0	Vert	AV	0.0	29.7	54.0	-24.3	Mid Ch, EUT Vert
4802.025	41.4	8.2	1.5	121.0	3.0	0.0	Horz	PK	0.0	49.6	74.0	-24.4	Low Ch, EUT Vert
12008.120	29.7	-0.2	1.51	62.0	3.0	0.0	Vert	AV	0.0	29.5	54.0	-24.5	Low Ch, EUT Vert
4803.108	41.1	8.2	2.56	195.0	3.0	0.0	Vert	PK	0.0	49.3	74.0	-24.7	Low Ch, EUT Vert
4961.317	40.9	8.4	1.5	234.0	3.0	0.0	Horz	PK	0.0	49.3	74.0	-24.7	High Ch, EUT Vert
4961.458	40.7	8.4	1.5	172.0	3.0	0.0	Vert	PK	0.0	49.1	74.0	-24.9	High Ch, EUT Vert
4886.475	40.7	8.2	1.5	179.0	3.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	Mid Ch, EUT Vert
4885.292	40.3	8.2	2.13	197.0	3.0	0.0	Vert	PK	0.0	48.5	74.0	-25.5	Mid Ch, EUT Vert
12211.880	42.2	0.0	1.3	264.0	3.0	0.0	Horz	PK	0.0	42.2	74.0	-31.8	Mid Ch, EUT Vert
12398.810	41.0	0.5	2.03	232.0	3.0	0.0	Vert	PK	0.0	41.5	74.0	-32.5	High Ch, EUT Vert
12398.810	41.0	0.5	2.03	232.0	3.0	0.0	Vert	PK	0.0	41.5	74.0	-32.5	High Ch, EUT Vert
12399.040	40.8	0.5	1.5	0.0	3.0	0.0	Horz	PK	0.0	41.3	74.0	-32.7	High Ch, EUT Vert
12399.040	40.8	0.5	1.5	0.0	3.0	0.0	Horz	PK	0.0	41.3	74.0	-32.7	High Ch, EUT Vert
12009.780	41.4	-0.2	1.51	62.0	3.0	0.0	Vert	PK	0.0	41.2	74.0	-32.8	Low Ch, EUT Vert
12008.630	41.0	-0.2	1.5	154.0	3.0	0.0	Horz	PK	0.0	40.8	74.0	-33.2	Low Ch, EUT Vert
12210.860	40.7	0.0	1.5	208.0	3.0	0.0	Vert	PK	0.0	40.7	74.0	-33.3	Mid Ch, EUT Vert

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

CONCLUSION
Pass

Tested By

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0021
Serial Number:	3000425060205200	Date:	2022-05-03
Customer:	NAL Research Corporation	Temperature:	21.8°C
Attendees:	None	Relative Humidity:	42.7%
Customer Project:	None	Bar. Pressure (PMSL):	1029 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	5.0 VDC via USB	Configuration:	PCTE0021-1

TEST SPECIFICATIONS

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

TEST PARAMETERS

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

COMMENTS

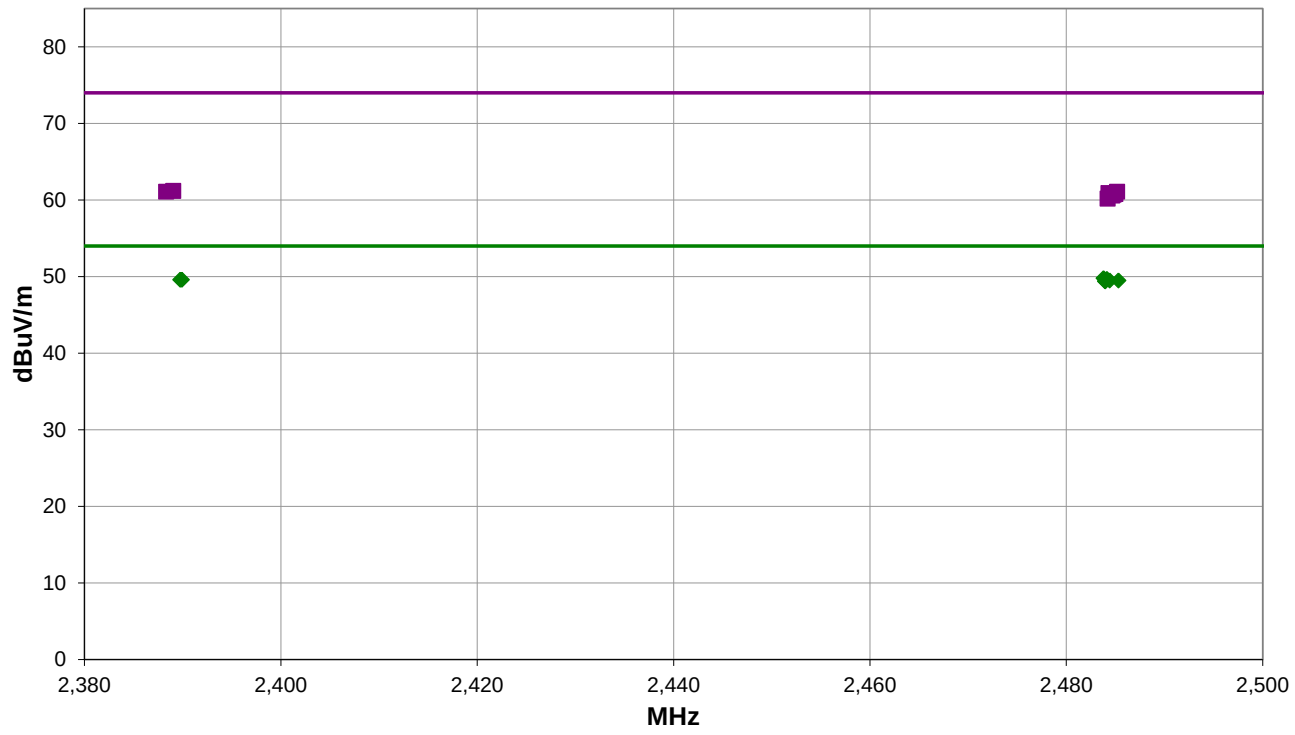
See comments below for channel and EUT orientation

EUT OPERATING MODES

BTLE Continuous Tx: Low Ch = 2402 MHz, Mid Ch = 2442 MHz, High Ch = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 4 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2022.03.10.0
PSA-ESCI 2022.1.12.0

RESULTS - Run #4

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.787	31.4	-1.6	1.5	118.0	3.0	20.0	Horz	AV	0.0	49.8	54.0	-4.2	High Ch, EUT Vert
2484.130	31.3	-1.6	1.5	113.0	3.0	20.0	Vert	AV	0.0	49.7	54.0	-4.3	High Ch, EUT Vert
2389.747	31.2	-1.6	1.5	190.0	3.0	20.0	Horz	AV	0.0	49.6	54.0	-4.4	Low Ch, EUT Vert
2389.920	31.2	-1.6	1.5	41.0	3.0	20.0	Vert	AV	0.0	49.6	54.0	-4.4	Low Ch, EUT Vert
2485.310	31.0	-1.5	1.5	28.0	3.0	20.0	Horz	AV	0.0	49.5	54.0	-4.5	High Ch, EUT on Side
2484.413	31.1	-1.6	1.5	106.0	3.0	20.0	Horz	AV	0.0	49.5	54.0	-4.5	High Ch, EUT Horz
2483.967	31.0	-1.6	2.22	360.0	3.0	20.0	Vert	AV	0.0	49.4	54.0	-4.6	High Ch, EUT on Side
2483.940	31.0	-1.6	1.5	191.0	3.0	20.0	Vert	AV	0.0	49.4	54.0	-4.6	High Ch, EUT Horz
2389.033	42.8	-1.6	1.5	41.0	3.0	20.0	Vert	PK	0.0	61.2	74.0	-12.8	Low Ch, EUT Vert
2485.177	42.6	-1.5	1.5	113.0	3.0	20.0	Vert	PK	0.0	61.1	74.0	-12.9	High Ch, EUT Vert
2388.317	42.7	-1.6	1.5	190.0	3.0	20.0	Horz	PK	0.0	61.1	74.0	-12.9	Low Ch, EUT Vert
2484.300	42.5	-1.6	1.5	118.0	3.0	20.0	Horz	PK	0.0	60.9	74.0	-13.1	High Ch, EUT Vert
2484.993	42.4	-1.6	1.5	106.0	3.0	20.0	Horz	PK	0.0	60.8	74.0	-13.2	High Ch, EUT Horz
2484.820	42.3	-1.6	2.22	360.0	3.0	20.0	Vert	PK	0.0	60.7	74.0	-13.3	High Ch, EUT on Side
2484.673	42.2	-1.6	1.5	28.0	3.0	20.0	Horz	PK	0.0	60.6	74.0	-13.4	High Ch, EUT on Side
2484.203	41.8	-1.6	1.5	191.0	3.0	20.0	Vert	PK	0.0	60.2	74.0	-13.8	High Ch, EUT Horz

CONCLUSION

Pass

Tested By

End of Test Report