



element

Soovu Labs

Soovu Pod

FCC 15.247:2022

RSS-247 Issue 2:2017

Bluetooth Low Energy (DTS) Radio

Report: SOOV0005.2 Rev. 1, Issue Date: June 28, 2022



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CERTIFICATE OF TEST



Last Date of Test: May 12, 2022
Soovu Labs
EUT: Soovu Pod

Radio Equipment Testing

Standards

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

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Band Edge Compliance	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
DTS Bandwidth (6 dB)	Pass	15.247(a)(2), KDB 558074 -8.2	RSS-247 5.2(a)	11.8.2	
Duty Cycle	N/A	KDB 558074 -6.0	RSS-Gen 3.2	11.6	Characterization of radio operation
Equivalent Isotropic Radiated Power	Pass	15.247(b)(3), KDB 558074 -8.3.1	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.1.1	
Occupied Bandwidth (99%)	Pass	KDB 558074 -2.1	RSS-Gen 6.7	6.9.3	
Output Power	Pass	15.247(b)(3), KDB 558074 -8.3.1	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.1.1	
Power Spectral Density	Pass	15.247(e), KDB 558074 -8.4	RSS-247 5.2(b)	11.10.2	
Powerline Conducted Emissions	Pass	15.207	RSS-Gen 8.8	6.2	
Spurious Conducted Emissions	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
Spurious Radiated Emissions	Pass	15.247(d), KDB 558074 -8.6, 8.7	RSS-247 5.5, RSS-Gen 6.13, 8.10	11.12.1, 11.13.2, 6.5, 6.6	

Deviations From Test Standards

None

Approved By:

Chuck Heller, 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
01	Updated the specification and test method KDB 558074 was removed from the method of RSS-Gen.	2022-06-28	2
	OB 99%, changed the RSS-Gen section to 6.7.		
	OP & EIRP, changed the KDB 558074 section to 8.3.1.	2022-06-28	35, 44
	revised the description		
added the missing cable and preamp	2022-06-28	51	

ACCREDITATIONS AND AUTHORIZATIONS



United States

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

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

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

United Kingdom

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

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

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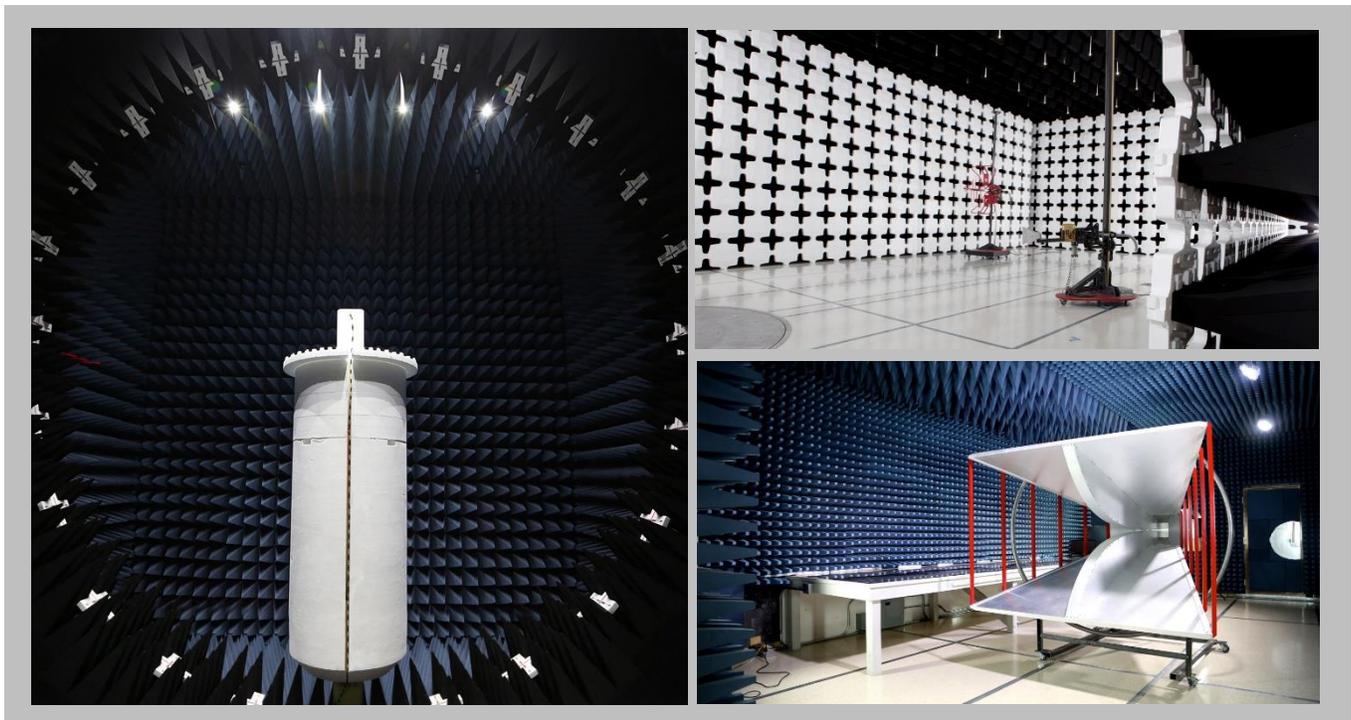
[Texas](#)

[Washington](#)

FACILITIES



California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 98011 (425)984-6600
A2LA				
Lab Code: 3310.04	Lab Code: 3310.05	Lab Code: 3310.02	Lab Code: 3310.03	Lab Code: 3310.06
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157



MEASUREMENT UNCERTAINTY



Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	3.1 dB	-3.1 dB

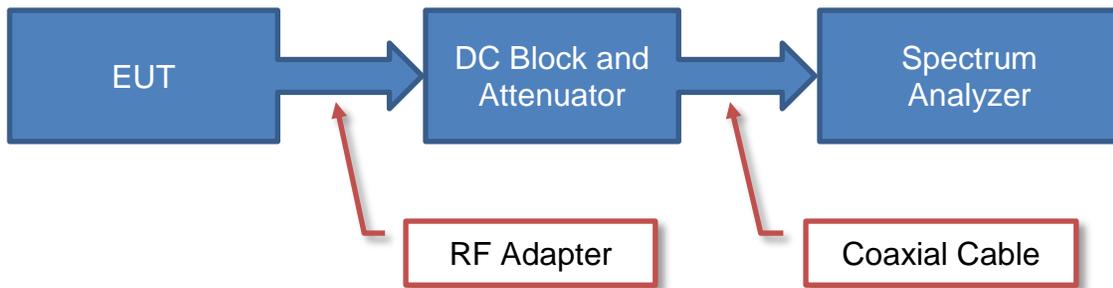
TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

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

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

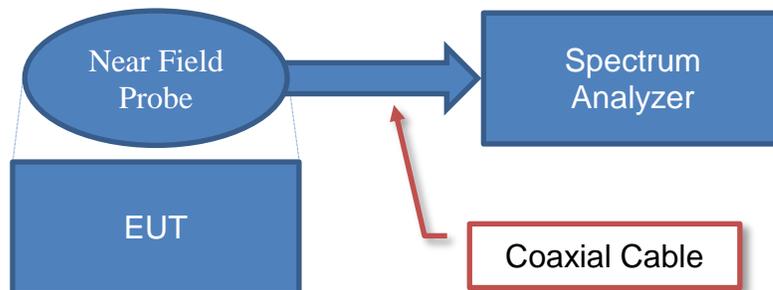
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

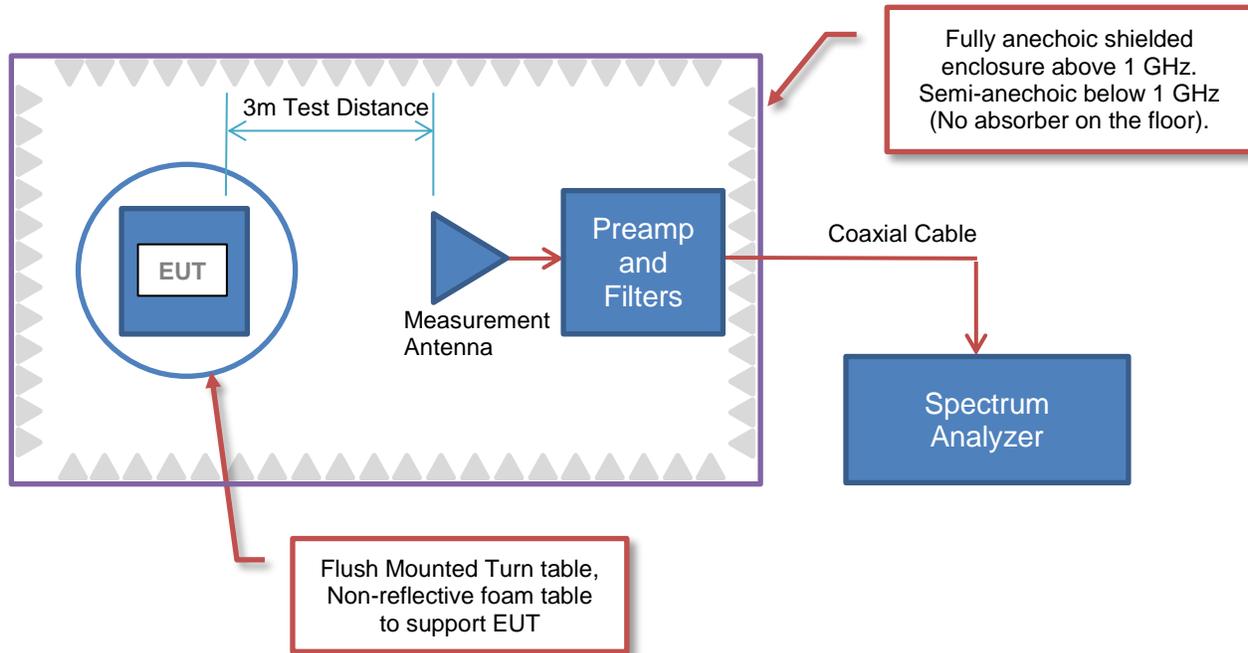


Sample Calculation (logarithmic units)

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

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

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

42.6 + 28.6 + 3.1 - 40.8 + 0.0 + 0.0 = 33.5

Conducted Emissions:

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

26.7 + 0.3 + 0.1 + 20.0 = 47.1

Radiated Power (ERP/EIRP):

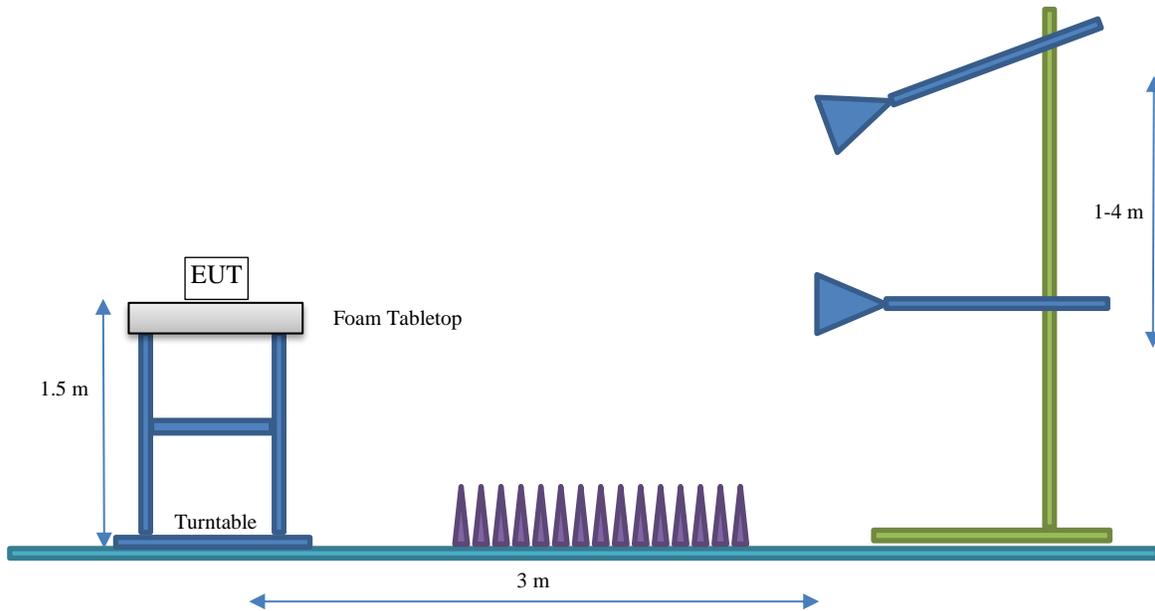
Measured Level into Substitution Antenna (Amplitude dBm)	Substitution Antenna Factor (dBi)	EIRP to ERP (if applicable)	Measured power (dBm ERP/EIRP)
10.0	6.0	2.15	13.9/16.0

10.0 + 6.0 - 2.15 = 13.9/16.0

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

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



PRODUCT DESCRIPTION



Client and Equipment Under Test (EUT) Information

Company Name:	Soovu Labs
Address:	2439 8TH AVE N
City, State, Zip:	Seattle, WA 98109-2212
Test Requested By:	Mark Freeman
EUT:	Soovu Pod
First Date of Test:	May 6, 2022
Last Date of Test:	May 12, 2022
Receipt Date of Samples:	May 6, 2022
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Transmits pulsed heat up to 45 degrees Celsius for pain relief. Rating it for IP65. Two units charged in a USB-powered cradle connected to 5v AC adaptor. Operates therapeutically when attached to user via mobile app, and device attaches magnetically to a disposable ring that uses adhesive to attach to skin. Item overview is available at www.soovu.com

Testing Objective:

To demonstrate compliance of the Bluetooth radio to FCC 15.247 and RSS-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)
PIFA	Soovu Labs	2400-2500	-4.22

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

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types / Data Rates	Type	Channel	Frequency (MHz)	Power Setting (dBm)
BLE GFSK/1 Mbps	DTS	0 or 37	2402	0
		20 or 18	2442	0
		39	2480	0

CONFIGURATIONS



Configuration SOOV0005- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Soovu Pod	Soovu Labs	SL-WPKIT	C0BD65FA2CD6
Soovu Pod	Soovu Labs	SL-WPKIT	B38FD8A910EA
Charger Base	Soovu Labs	SL-WPKIT	200

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	2m	No	USB	USB-C

Configuration SOOV0005- 3

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Soovu Pod	Soovu Labs	SL-WPKIT	BA5044E00CD0

Configuration SOOV0005- 4

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Soovu Pod	Soovu Labs	SL-WPKIT	606AE28B55E1

CONFIGURATIONS



Configuration SOOV0005- 5

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Charger Base	Soovu Labs	SL-WPKIT	200
Soovu Pod	Soovu Labs	SL-WPKIT	BA5044E00CD0

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC adapter	Apple	A1385	E1999967

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	2m	No	USB	USB-C

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2022-05-06	Powerline 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.
2	2022-05-12	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.
3	2022-05-12	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.
4	2022-05-12	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.
5	2022-05-12	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.
6	2022-05-12	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.
7	2022-05-12	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.
8	2022-05-12	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.
9	2022-05-12	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2022-01-27	2023-01-27
Attenuator	Weinschel	54A-20	TYR	2022-01-27	2023-01-27
Block - DC	Weinschel Corp.	7006	AMS	2022-01-27	2023-01-27
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAT	2021-10-20	2022-10-20
Generator - Signal	Agilent	N5183A	TIA	2020-06-19	2022-06-19

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



Tel: 2022.05.02.0 XMI: 2022.02.07.0

EUT: Soovu Pod		Work Order: SOOV0005	
Serial Number: 606AE28B55E1		Date: 12-May-22	
Customer: Soovu Labs		Temperature: 22.6 °C	
Attendees: Mark Freeman		Humidity: 36.4% RH	
Project: None		Barometric Pres.: 1018 mbar	
Tested by: Harry Zhao & Brian Fahey		Power: Battery	
Job Site: NC02			
TEST SPECIFICATIONS			
FCC 15.247:2022		ANSI C63.10:2013	
RSS-247 Issue 2:2017		ANSI C63.10:2013	
COMMENTS			
Single pod. Duty cycle at 100%. Reference level offset includes RF measurement cable, DC block, 20 dB attenuator = 21.5 dB.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	4	Signature 	
		Value (dBc)	Limit ≤ (dBc) Result
		-54.67	-20 Pass
		-55.78	-20 Pass

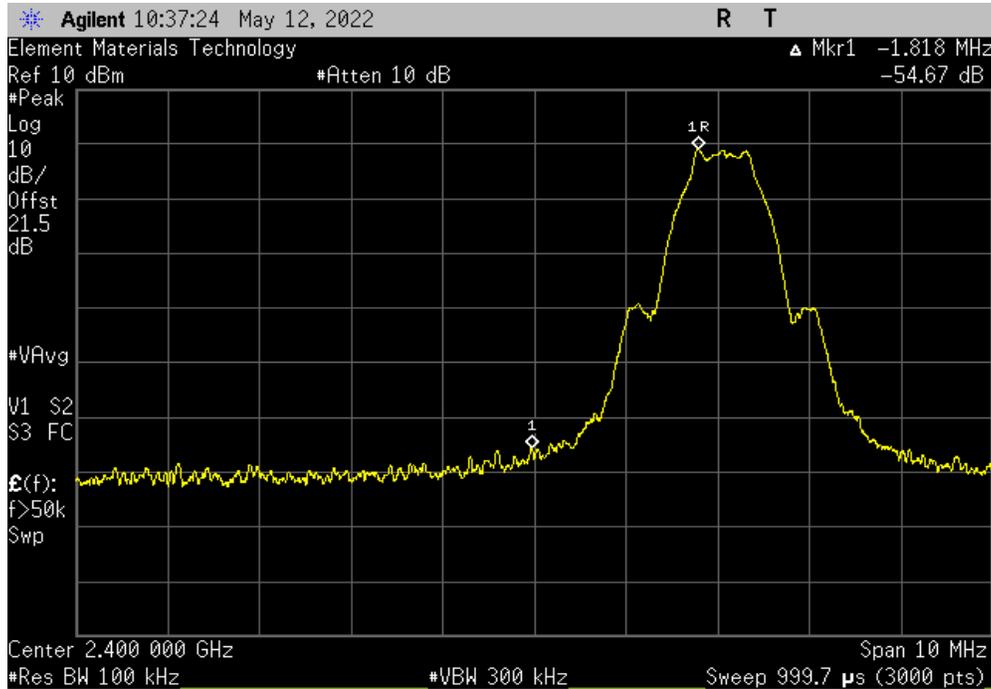
BLE/GFSK 1 Mbps Low Channel, 2402 MHz
 BLE/GFSK 1 Mbps High Channel, 2480 MHz

BAND EDGE COMPLIANCE

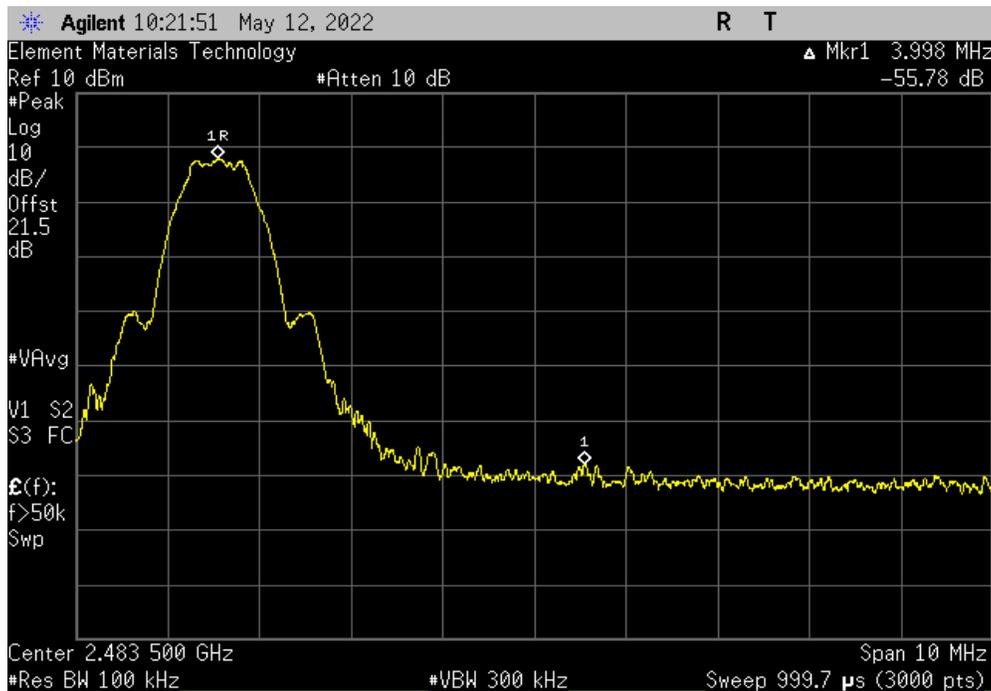


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz				Value	Limit	Result
				(dBc)	≤ (dBc)	
				-54.67	-20	Pass



BLE/GFSK 1 Mbps High Channel, 2480 MHz				Value	Limit	Result
				(dBc)	≤ (dBc)	
				-55.78	-20	Pass



DTS BANDWIDTH



XMH 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
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2022-01-27	2023-01-27
Attenuator	Weinschel	54A-20	TYR	2022-01-27	2023-01-27
Block - DC	Weinschel Corp.	7006	AMS	2022-01-27	2023-01-27
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAT	2021-10-20	2022-10-20
Generator - Signal	Agilent	N5183A	TIA	2020-06-19	2022-06-19

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



TelTx 2022.05.02.0 XMit 2022.02.07.0

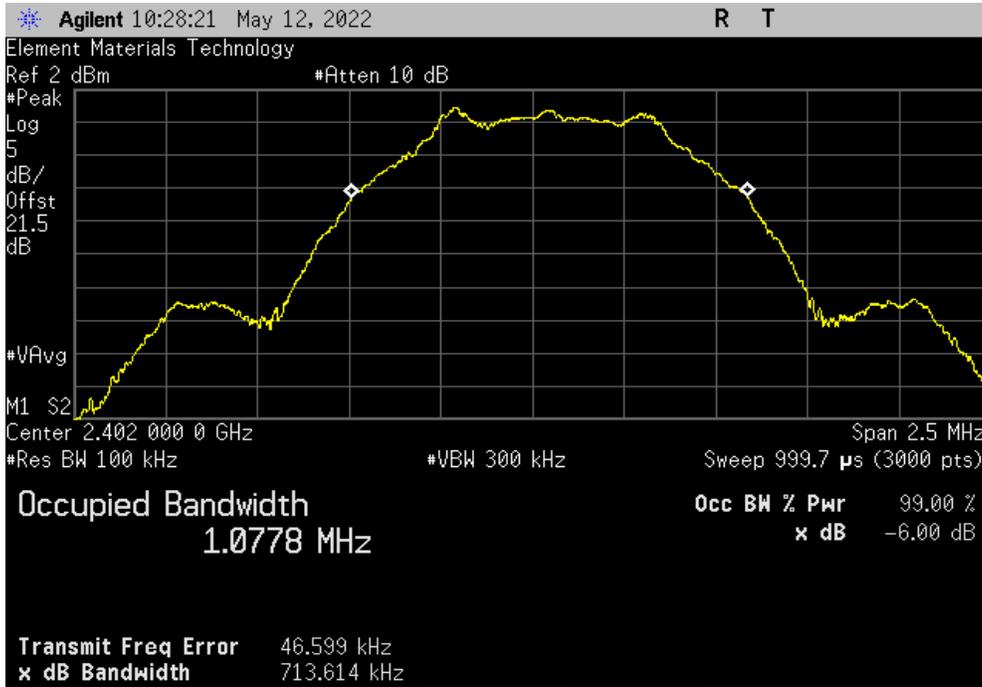
EUT: Soovu Pod		Work Order: SOOV0005	
Serial Number: 606AE28B55E1		Date: 12-May-22	
Customer: Soovu Labs		Temperature: 22.6 °C	
Attendees: Mark Freeman		Humidity: 37.1% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Harry Zhao & Brian Fahey		Power: Battery	
Job Site: NC02			
TEST SPECIFICATIONS			
FCC 15.247:2022		Test Method	
RSS-247 Issue 2:2017		ANSI C63.10:2013	
		ANSI C63.10:2013	
COMMENTS			
Single pod. Duty cycle at 100%. Reference level offset includes RF measurement cable, DC block, 20 dB attenuator = 21.5 dB.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	4	Signature 	
		Value	Limit (±)
BLE/GFSK 1 Mbps Low Channel, 2402 MHz		713.614 kHz	500 kHz
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		726.992 kHz	500 kHz
BLE/GFSK 1 Mbps High Channel, 2480 MHz		751.968 kHz	500 kHz
			Result
			Pass
			Pass
			Pass

DTS BANDWIDTH

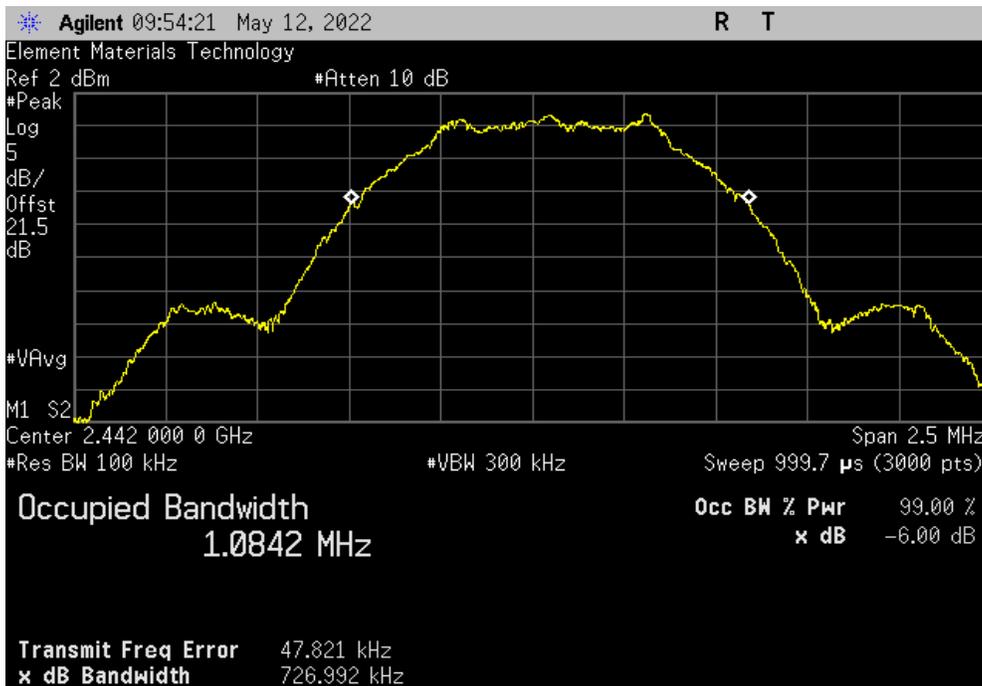


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Value	Limit	Result
				713.614 kHz	500 kHz	Pass



BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Value	Limit	Result
				726.992 kHz	500 kHz	Pass

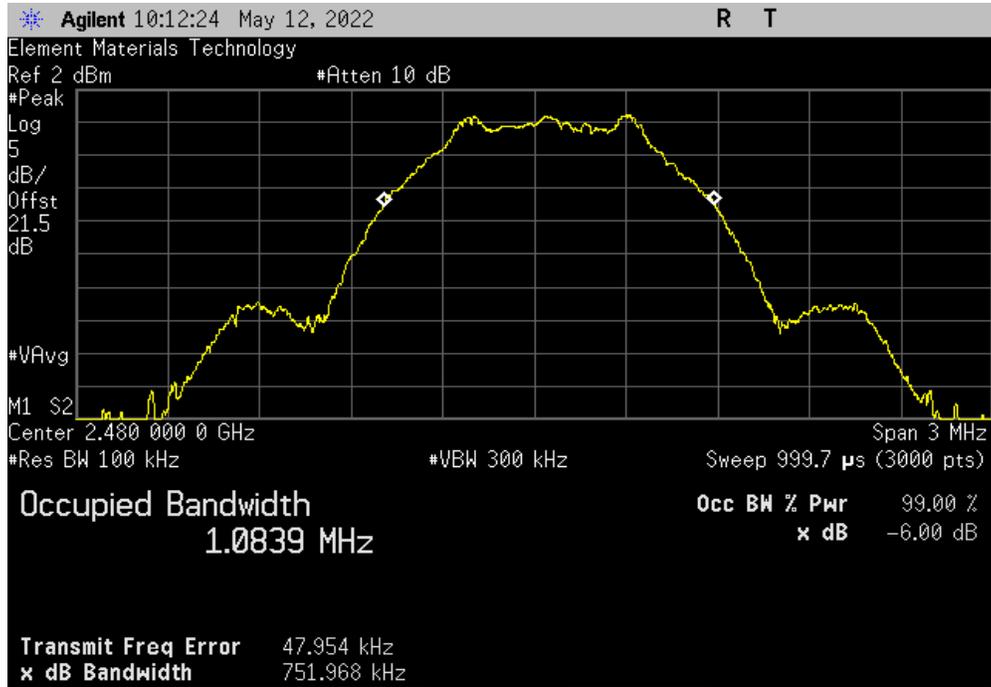


DTS BANDWIDTH



TbTx 2022.05.02.0 XMI 2022.02.07.0

BLE/GFSK 1 Mbps High Channel, 2480 MHz		
Value	Limit	Result
751.968 kHz	500 kHz	Pass



DUTY CYCLE

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 test software provided for operation in a fixed, single channel mode allows the EUT to operate continuously at 100% Duty Cycle.

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



element

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
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2022-01-27	2023-01-27
Attenuator	Weinschel	54A-20	TYR	2022-01-27	2023-01-27
Block - DC	Weinschel Corp.	7006	AMS	2022-01-27	2023-01-27
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAT	2021-10-20	2022-10-20
Generator - Signal	Agilent	N5183A	TIA	2020-06-19	2022-06-19

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)



Tel: 2022.05.02.0 XMI: 2022.02.07.0

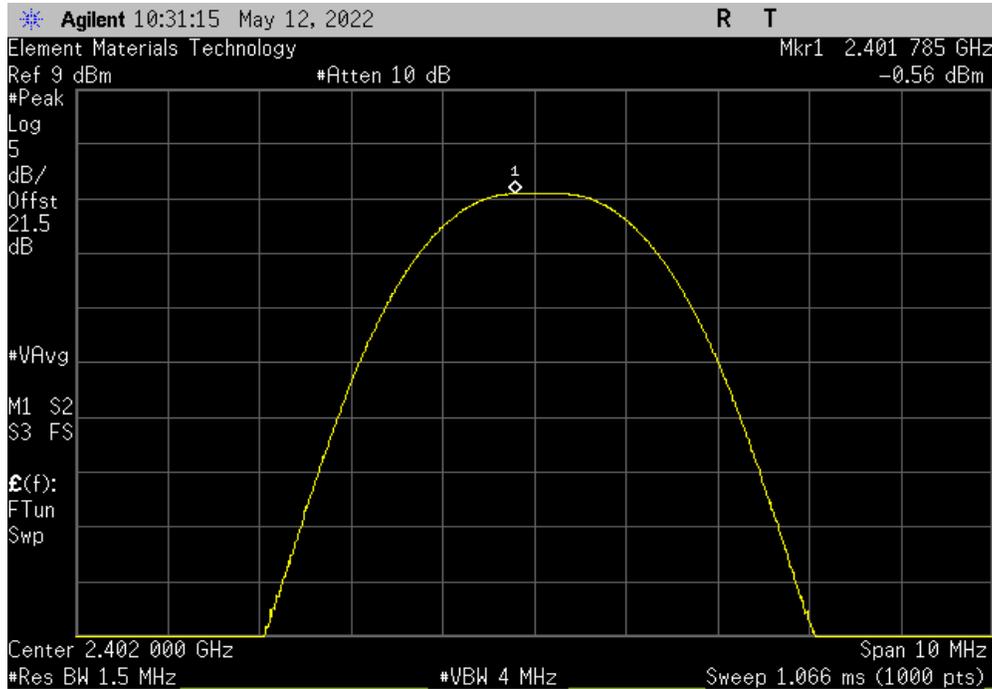
EUT: Soovu Pod		Work Order: SOOV0005				
Serial Number: 606AE28B55E1		Date: 12-May-22				
Customer: Soovu Labs		Temperature: 22.5 °C				
Attendees: Mark Freeman		Humidity: 37.4% RH				
Project: None		Barometric Pres.: 1017 mbar				
Tested by: Harry Zhao & Brian Fahey		Power: Battery				
TEST SPECIFICATIONS		Job Site: NC02				
FCC 15.247:2022		Test Method				
RSS-247 Issue 2:2017		ANSI C63.10:2013				
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013				
COMMENTS						
Single pod. Duty cycle at 100%. Reference level offset includes RF measurement cable, DC block, 20 dB attenuator = 21.5 dB.						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	4	Signature 				
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		-0.56	-4.22	-4.78	36	Pass
		-0.788	-4.22	-5.01	36	Pass
		-1.268	-4.22	-5.51	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

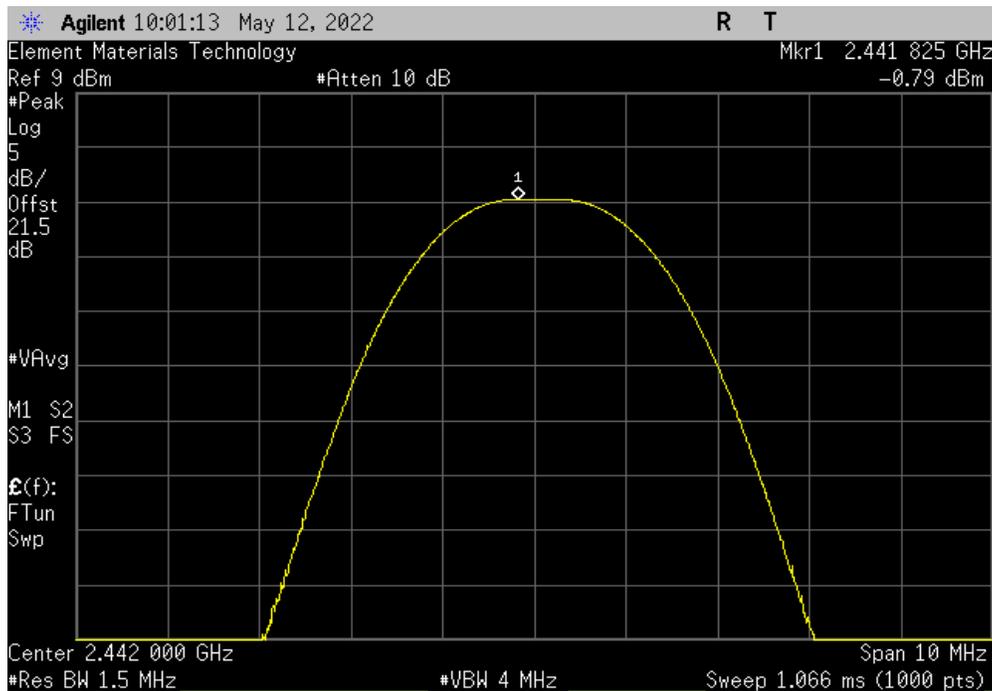


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result	
	-0.56	-4.22	-4.78	36	Pass	



BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result	
	-0.788	-4.22	-5.008	36	Pass	

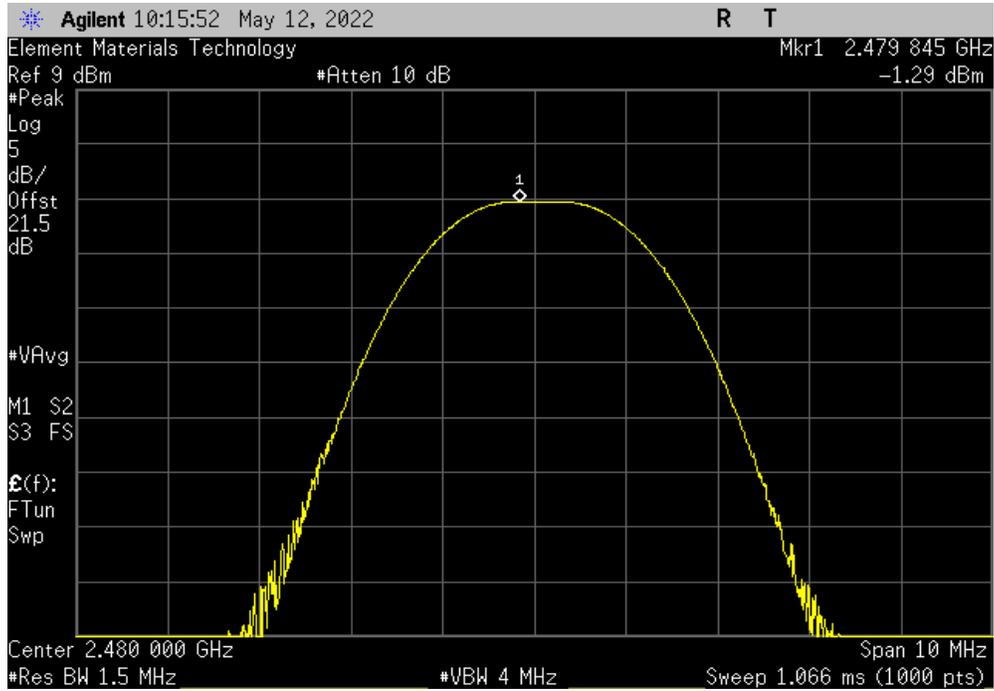


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps High Channel, 2480 MHz					
Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-1.288	-4.22	-5.508	36	Pass	





OCCUPIED BANDWIDTH

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2022-01-27	2023-01-27
Attenuator	Weinschel	54A-20	TYR	2022-01-27	2023-01-27
Block - DC	Weinschel Corp.	7006	AMS	2022-01-27	2023-01-27
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAT	2021-10-20	2022-10-20
Generator - Signal	Agilent	N5183A	TIA	2020-06-19	2022-06-19

TEST DESCRIPTION

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

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

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

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

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

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

OCCUPIED BANDWIDTH



TelTx 2022.05.02.0 XMit 2022.02.07.0

EUT: Soovu Pod		Work Order: SOOV0005
Serial Number: 606AE28B55E1		Date: 12-May-22
Customer: Soovu Labs		Temperature: 22.5 °C
Attendees: Mark Freeman		Humidity: 37.6% RH
Project: None		Barometric Pres.: 1017 mbar
Tested by: Harry Zhao & Brian Fahey	Power: Battery	Job Site: NC02
TEST SPECIFICATIONS		
FCC 15.247:2022		Test Method
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013
		ANSI C63.10:2013
COMMENTS		
Single pod. Duty cycle at 100%. Reference level offset includes RF measurement cable, DC block, 20 dB attenuator = 21.5 dB.		
DEVIATIONS FROM TEST STANDARD		
None		
Configuration #	4	Signature <i>Brian Fahey</i>

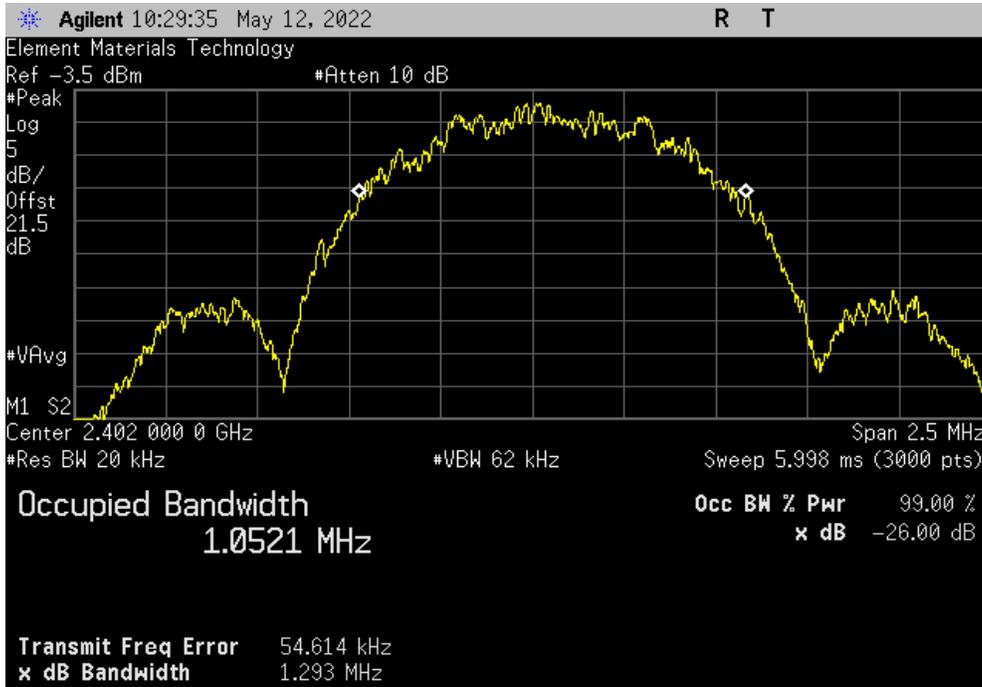
	Value	Limit	Result
BLE/GFSK 1 Mbps Low Channel, 2402 MHz	1.052 MHz	N/A	N/A
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	1.064 MHz	N/A	N/A
BLE/GFSK 1 Mbps High Channel, 2480 MHz	1.074 MHz	N/A	N/A

OCCUPIED BANDWIDTH

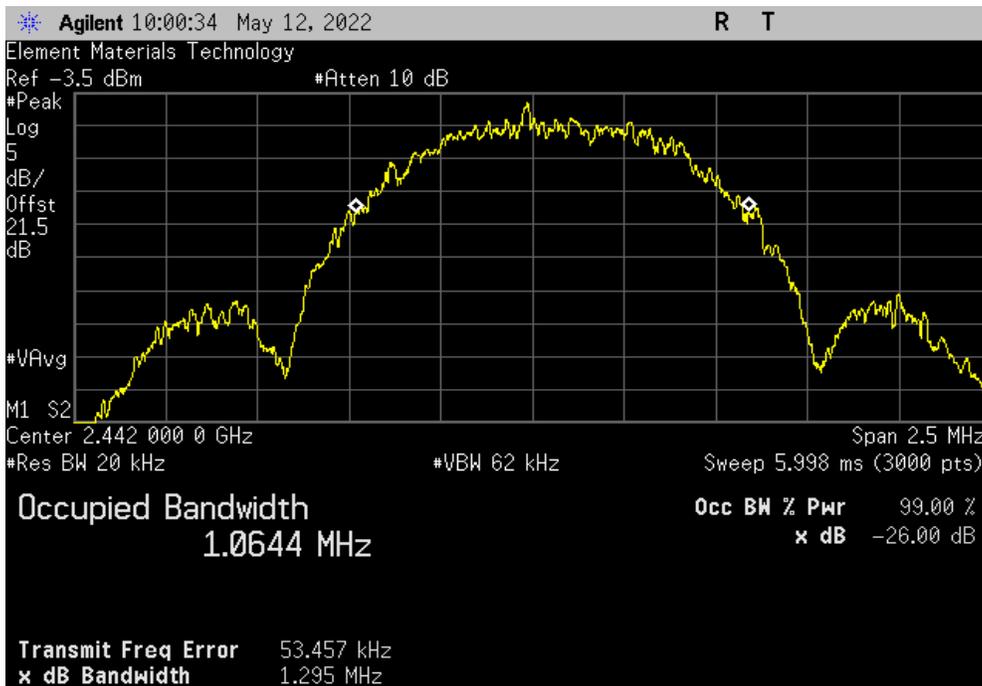


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Value	Limit	Result
				1.052 MHz	N/A	N/A



BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Value	Limit	Result
				1.064 MHz	N/A	N/A

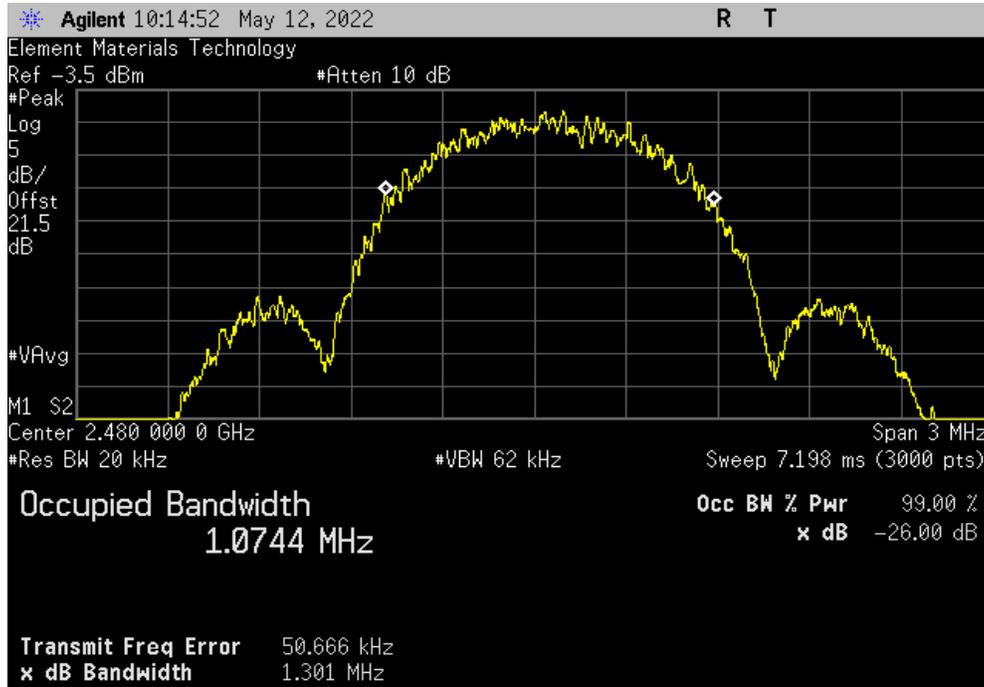


OCCUPIED BANDWIDTH



TbTx 2022.05.02.0 XMI 2022.02.07.0

BLE/GFSK 1 Mbps High Channel, 2480 MHz			
	Value	Limit	Result
	1.074 MHz	N/A	N/A



OUTPUT POWER



XMIT 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2022-01-27	2023-01-27
Attenuator	Weinschel	54A-20	TYR	2022-01-27	2023-01-27
Block - DC	Weinschel Corp.	7006	AMS	2022-01-27	2023-01-27
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAT	2021-10-20	2022-10-20
Generator - Signal	Agilent	N5183A	TIA	2020-06-19	2022-06-19

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



TelTx 2022.05.02.0 XMI: 2022.02.07.0

EUT: Soovu Pod		Work Order: SOOV0005	
Serial Number: 606AE28B55E1		Date: 12-May-22	
Customer: Soovu Labs		Temperature: 22.5 °C	
Attendees: Mark Freeman		Humidity: 37.7% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Harry Zhao & Brian Fahey		Power: Battery	
Job Site: NC02			
TEST SPECIFICATIONS			
		Test Method	
FCC 15.247:2022		ANSI C63.10:2013	
RSS-247 Issue 2:2017		ANSI C63.10:2013	
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013	
COMMENTS			
Single pod. Duty cycle at 100%. Reference level offset includes RF measurement cable, DC block, 20 dB attenuator = 21.5 dB.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	4	Signature 	
		Out Pwr (dBm)	Limit (dBm) Result
		-0.56	30 Pass
		-0.788	30 Pass
		-1.288	30 Pass

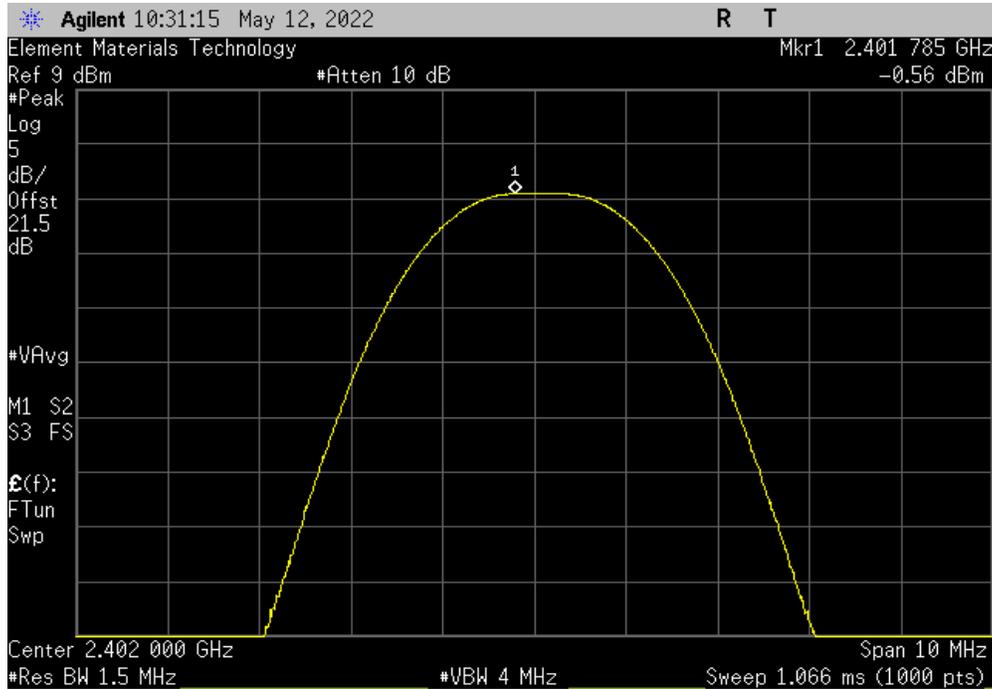
BLE/GFSK 1 Mbps Low Channel, 2402 MHz
 BLE/GFSK 1 Mbps Mid Channel, 2442 MHz
 BLE/GFSK 1 Mbps High Channel, 2480 MHz

OUTPUT POWER

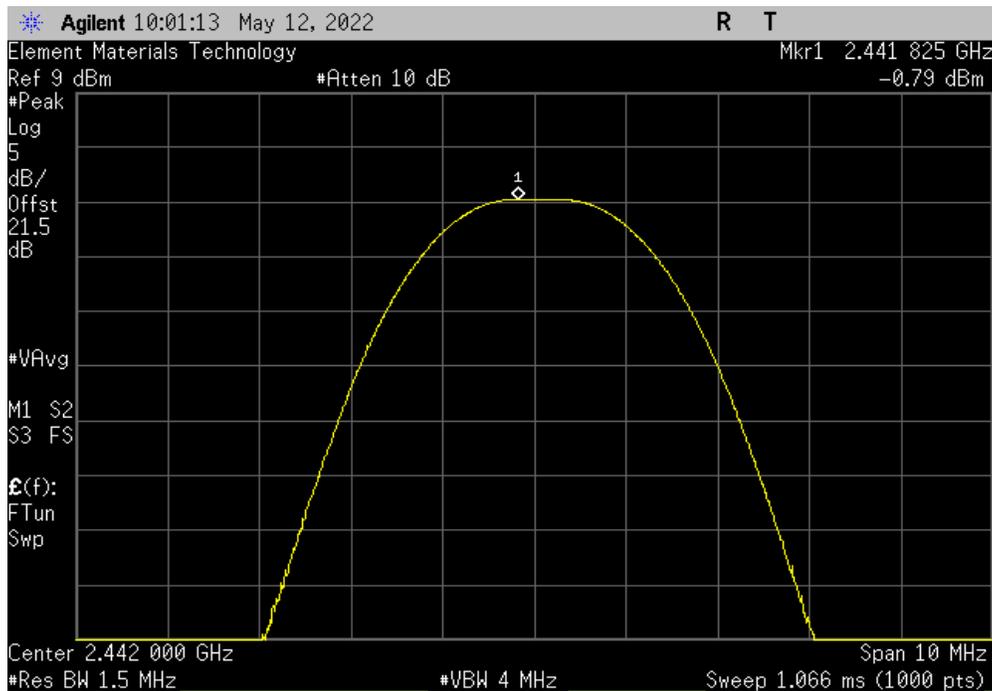


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-0.56	30	Pass



BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-0.788	30	Pass

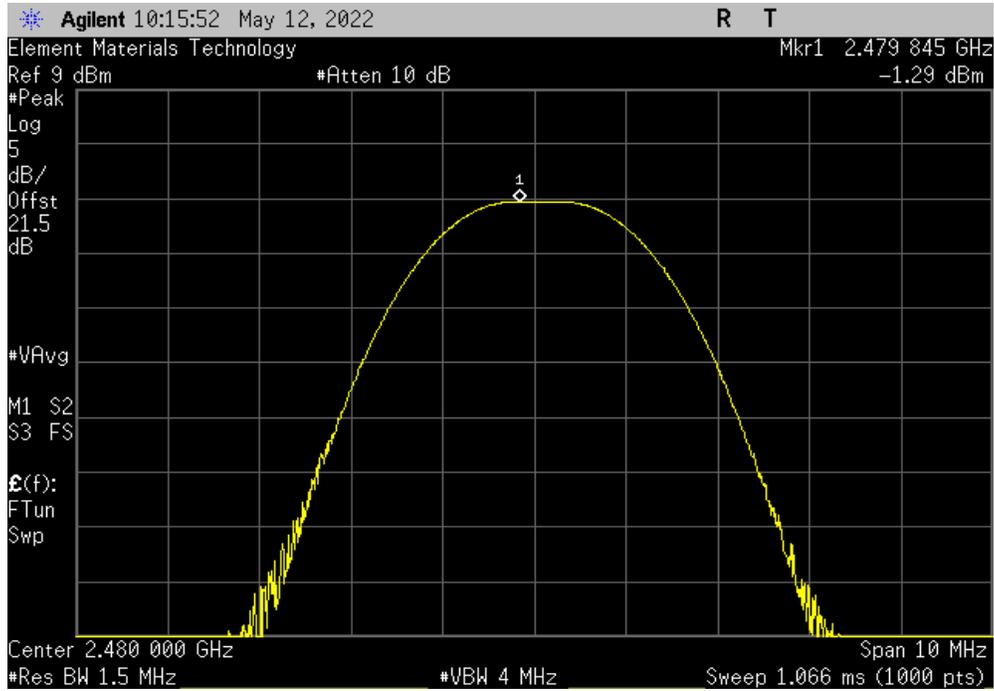


OUTPUT POWER



TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-1.288	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
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2022-01-27	2023-01-27
Attenuator	Weinschel	54A-20	TYR	2022-01-27	2023-01-27
Block - DC	Weinschel Corp.	7006	AMS	2022-01-27	2023-01-27
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAT	2021-10-20	2022-10-20
Generator - Signal	Agilent	N5183A	TIA	2020-06-19	2022-06-19

TEST DESCRIPTION

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



TelTx 2022.05.02.0 XMit 2022.02.07.0

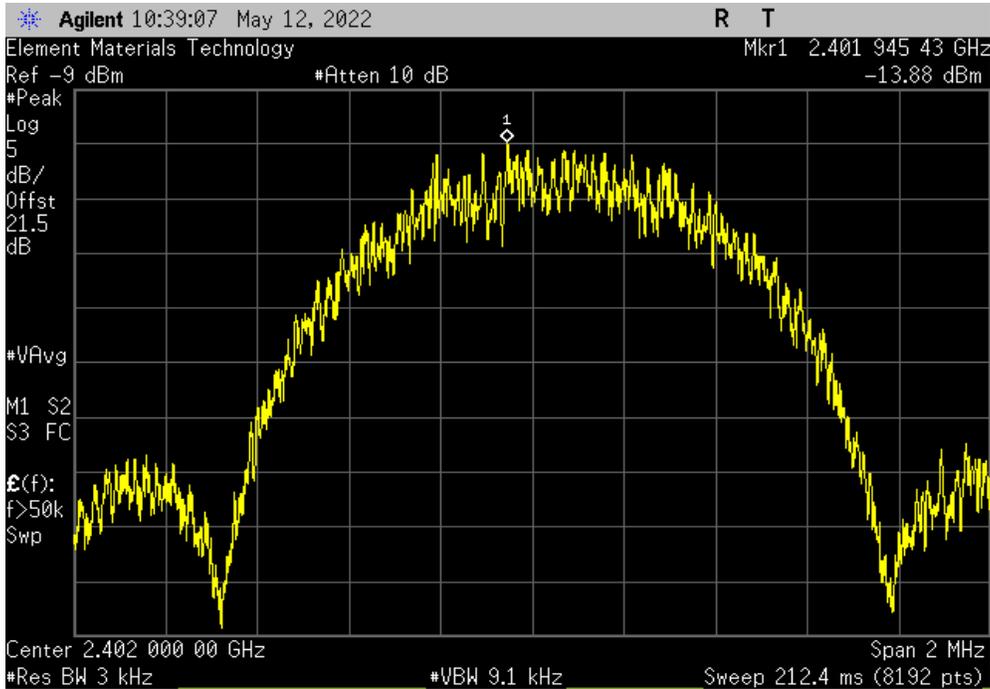
EUT: Soovu Pod		Work Order: SOOV0005	
Serial Number: 606AE28B55E1		Date: 12-May-22	
Customer: Soovu Labs		Temperature: 22.5 °C	
Attendees: Mark Freeman		Humidity: 37.9% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Harry Zhao & Brian Fahey		Power: Battery	
		Job Site: NC02	
TEST SPECIFICATIONS			
		Test Method	
FCC 15.247:2022		ANSI C63.10:2013	
RSS-247 Issue 2:2017		ANSI C63.10:2013	
COMMENTS			
Single pod. Duty cycle at 100%. Reference level offset includes RF measurement cable, DC block, 20 dB attenuator = 21.5 dB.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	4	Signature 	
		Value dBm/3kHz	Limit < dBm/3kHz
BLE/GFSK 1 Mbps Low Channel, 2402 MHz		-13.883	8
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		-13.124	8
BLE/GFSK 1 Mbps High Channel, 2480 MHz		-14.45	8
			Results
			Pass
			Pass
			Pass

POWER SPECTRAL DENSITY

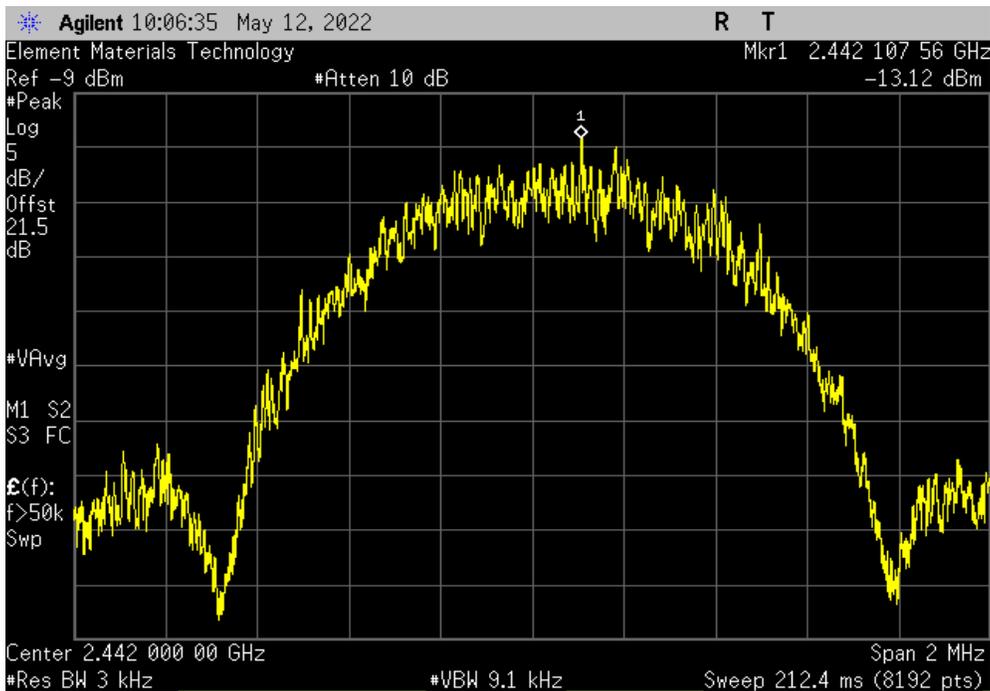


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz			
	Value	Limit	Results
	dBm/3kHz	< dBm/3kHz	
	-13.883	8	Pass



BLE/GFSK 1 Mbps Mid Channel, 2442 MHz			
	Value	Limit	Results
	dBm/3kHz	< dBm/3kHz	
	-13.124	8	Pass

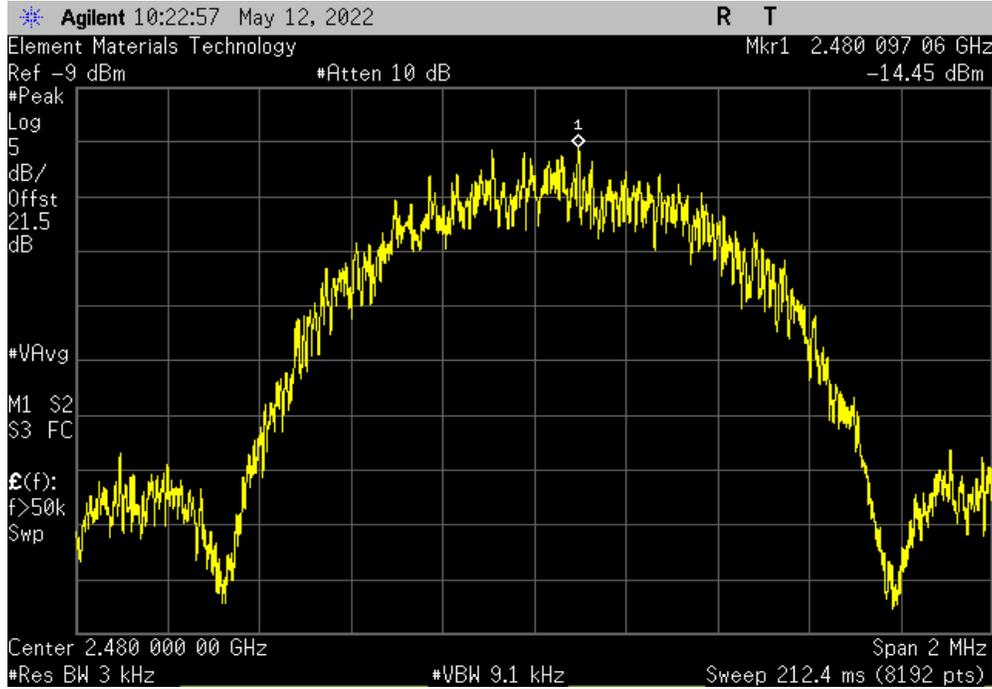


POWER SPECTRAL DENSITY



TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps High Channel, 2480 MHz			
	Value	Limit	Results
	dBm/3kHz	< dBm/3kHz	
	-14.45	8	Pass



POWERLINE CONDUCTED EMISSIONS



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	TDEMI30M	ARR	2022-04-22	2023-04-22
Cable - Conducted Cable Assembly	Northwest EMC	NC4, HHF, TYL	NC4A	2022-02-16	2023-02-16
LISN	Solar Electronics	9252-50-R-24-BNC	LIM	2021-07-01	2022-07-01

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.1 dB	-3.1 dB

CONFIGURATIONS INVESTIGATED

SOOV0005-2

MODES INVESTIGATED

Bluetooth LE communicating with phone while charging on docking station and not heating.

POWERLINE CONDUCTED EMISSIONS



EUT:	Soovu Pod	Work Order:	SOOV0005
Serial Number:	See Comments	Date:	2022-05-06
Customer:	Soovu Labs	Temperature:	22.6°C
Attendees:	Mark Freeman	Relative Humidity:	40.7%
Customer Project:	None	Bar. Pressure (PMSL):	1011 mb
Tested By:	Joshua Murphy & Brian Fahey	Job Site:	NC05
Power:	120VAC/60Hz	Configuration:	SOOV0005-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2022	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

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

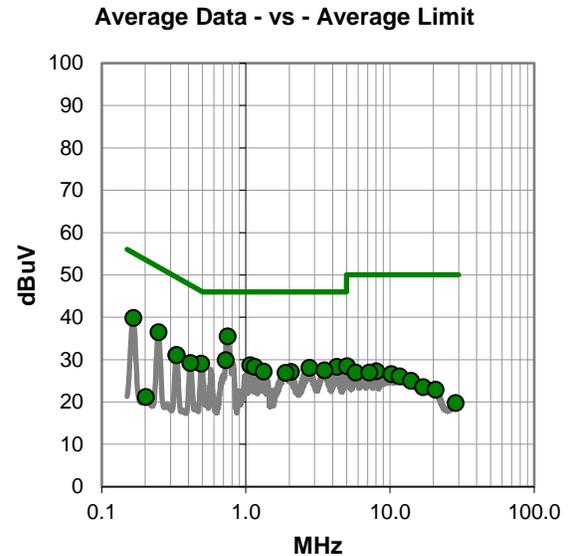
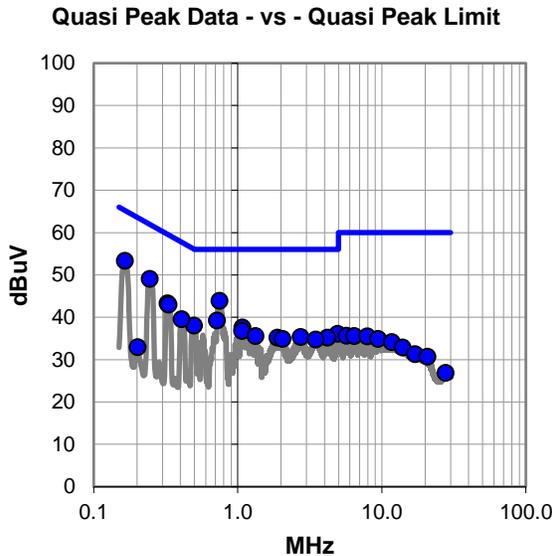
Charge Base Serial Number: 200, Pod 1 Serial Number: C0BD65FA2CD6, Pod 2 Serial Number: B38FD8A910EA

EUT OPERATING MODES

Bluetooth LE communicating with phone while charging on docking station and not heating.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #3

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.165	32.9	20.5	53.4	65.2	-11.8
0.748	23.7	20.2	43.9	56.0	-12.1
0.245	28.8	20.3	49.1	61.9	-12.8
0.325	23.1	20.2	43.3	59.6	-16.3
0.332	22.8	20.2	43.0	59.4	-16.4
0.718	19.1	20.2	39.3	56.0	-16.7
0.498	17.9	20.2	38.1	56.0	-17.9
0.408	19.4	20.2	39.6	57.7	-18.1
1.079	17.3	20.3	37.6	56.0	-18.4
1.070	16.5	20.3	36.8	56.0	-19.2
4.941	15.4	20.7	36.1	56.0	-19.9
1.328	15.2	20.4	35.6	56.0	-20.4
2.730	14.9	20.5	35.4	56.0	-20.6
1.889	14.8	20.4	35.2	56.0	-20.8
4.189	14.6	20.6	35.2	56.0	-20.8
2.050	14.5	20.4	34.9	56.0	-21.1
3.466	14.3	20.5	34.8	56.0	-21.2
5.687	15.0	20.7	35.7	60.0	-24.3
6.433	14.9	20.7	35.6	60.0	-24.4
7.930	14.6	20.9	35.5	60.0	-24.5
9.421	14.0	20.9	34.9	60.0	-25.1
11.722	13.1	21.1	34.2	60.0	-25.8
13.952	11.7	21.2	32.9	60.0	-27.1
16.972	9.8	21.5	31.3	60.0	-28.7
20.697	8.8	21.9	30.7	60.0	-29.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.747	15.3	20.2	35.5	46.0	-10.5
0.248	16.2	20.3	36.5	51.8	-15.3
0.165	19.4	20.5	39.9	55.2	-15.3
0.722	9.7	20.2	29.9	46.0	-16.1
0.490	8.9	20.2	29.1	46.2	-17.1
1.070	8.4	20.3	28.7	46.0	-17.3
1.152	7.9	20.4	28.3	46.0	-17.7
4.267	7.7	20.6	28.3	46.0	-17.7
2.759	7.6	20.5	28.1	46.0	-17.9
0.329	10.9	20.2	31.1	49.5	-18.4
0.330	10.9	20.2	31.1	49.5	-18.4
0.412	9.0	20.2	29.2	47.6	-18.4
3.507	7.0	20.5	27.5	46.0	-18.5
1.329	6.8	20.4	27.2	46.0	-18.8
2.050	6.7	20.4	27.1	46.0	-18.9
1.885	6.5	20.4	26.9	46.0	-19.1
5.026	7.8	20.7	28.5	50.0	-21.5
8.020	6.4	20.9	27.3	50.0	-22.7
5.765	6.3	20.7	27.0	50.0	-23.0
7.199	6.2	20.8	27.0	50.0	-23.0
10.219	5.6	21.0	26.6	50.0	-23.4
11.638	5.0	21.1	26.1	50.0	-23.9
13.981	3.8	21.2	25.0	50.0	-25.0
16.995	2.0	21.5	23.5	50.0	-26.5
20.683	1.0	21.9	22.9	50.0	-27.1

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS



EUT:	Soovu Pod	Work Order:	SOOV0005
Serial Number:	See Comments	Date:	2022-05-06
Customer:	Soovu Labs	Temperature:	22.6°C
Attendees:	Mark Freeman	Relative Humidity:	40.7%
Customer Project:	None	Bar. Pressure (PMSL):	1011 mb
Tested By:	Joshua Murphy & Brian Fahey	Job Site:	NC05
Power:	120VAC/60Hz	Configuration:	SOOV0005-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2022	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

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

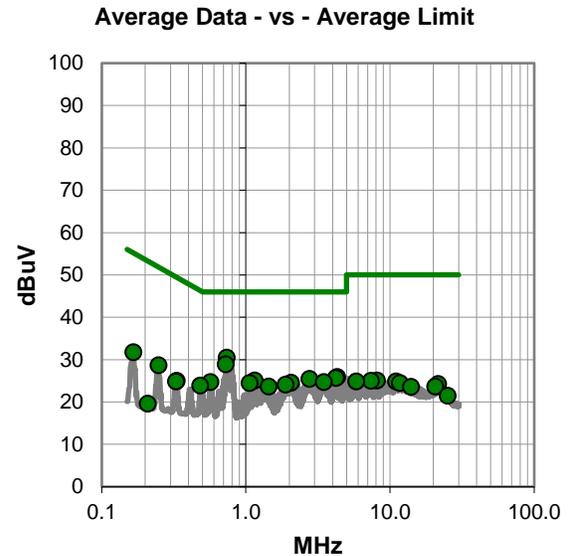
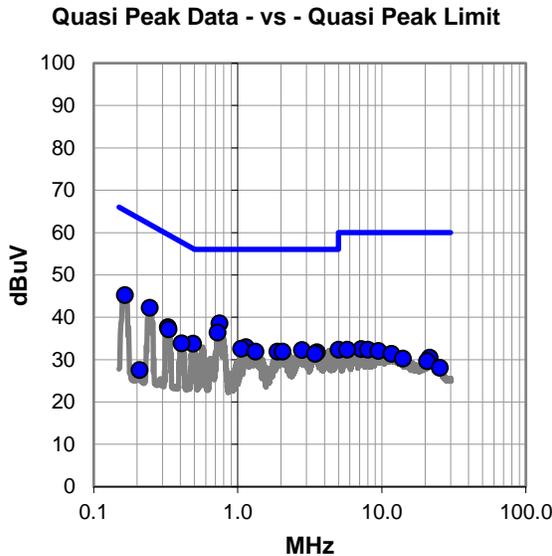
Charge Base Serial Number: 200, Pod 1 Serial Number: C0BD65FA2CD6, Pod 2 Serial Number: B38FD8A910EA

EUT OPERATING MODES

Bluetooth LE communicating with phone while charging on docking station and not heating.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.748	18.4	20.2	38.6	56.0	-17.4
0.245	22.0	20.3	42.3	61.9	-19.6
0.725	16.2	20.2	36.4	56.0	-19.6
0.165	24.8	20.5	45.3	65.2	-19.9
0.327	17.5	20.2	37.7	59.5	-21.8
0.332	17.0	20.2	37.2	59.4	-22.2
0.490	13.6	20.2	33.8	56.2	-22.4
1.140	12.6	20.4	33.0	56.0	-23.0
1.058	12.3	20.3	32.6	56.0	-23.4
2.793	11.8	20.5	32.3	56.0	-23.7
0.408	13.7	20.2	33.9	57.7	-23.8
1.329	11.5	20.4	31.9	56.0	-24.1
1.888	11.5	20.4	31.9	56.0	-24.1
2.051	11.5	20.4	31.9	56.0	-24.1
3.549	11.3	20.5	31.8	56.0	-24.2
3.447	10.9	20.5	31.4	56.0	-24.6
7.201	11.7	20.8	32.5	60.0	-27.5
5.010	11.7	20.7	32.4	60.0	-27.6
5.742	11.7	20.7	32.4	60.0	-27.6
8.012	11.5	20.9	32.4	60.0	-27.6
9.482	11.2	20.9	32.1	60.0	-27.9
11.642	10.3	21.1	31.4	60.0	-28.6
21.507	8.4	22.1	30.5	60.0	-29.5
13.995	9.1	21.2	30.3	60.0	-29.7
20.596	7.8	21.9	29.7	60.0	-30.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.734	10.3	20.2	30.5	46.0	-15.5
0.725	8.7	20.2	28.9	46.0	-17.1
4.294	5.3	20.6	25.9	46.0	-20.1
4.212	5.1	20.6	25.7	46.0	-20.3
2.756	5.0	20.5	25.5	46.0	-20.5
1.151	4.7	20.4	25.1	46.0	-20.9
0.567	4.5	20.2	24.7	46.0	-21.3
3.475	4.2	20.5	24.7	46.0	-21.3
2.051	4.2	20.4	24.6	46.0	-21.4
1.059	4.2	20.3	24.5	46.0	-21.5
1.883	3.7	20.4	24.1	46.0	-21.9
1.441	3.3	20.4	23.7	46.0	-22.3
0.483	3.7	20.2	23.9	46.3	-22.4
0.248	8.4	20.3	28.7	51.8	-23.1
0.165	11.3	20.5	31.8	55.2	-23.4
0.330	4.8	20.2	25.0	49.5	-24.5
0.327	4.7	20.2	24.9	49.5	-24.6
8.102	4.2	20.9	25.1	50.0	-24.9
7.356	4.2	20.8	25.0	50.0	-25.0
5.824	4.2	20.7	24.9	50.0	-25.1
11.041	3.8	21.1	24.9	50.0	-25.1
11.719	3.4	21.1	24.5	50.0	-25.5
21.510	2.2	22.1	24.3	50.0	-25.7
20.605	1.8	21.9	23.7	50.0	-26.3
13.994	2.4	21.2	23.6	50.0	-26.4

CONCLUSION

Pass

Tested By



SPURIOUS CONDUCTED EMISSIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2022-01-27	2023-01-27
Attenuator	Weinschel	54A-20	TYR	2022-01-27	2023-01-27
Block - DC	Weinschel Corp.	7006	AMS	2022-01-27	2023-01-27
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAT	2021-10-20	2022-10-20
Generator - Signal	Agilent	N5183A	TIA	2020-06-19	2022-06-19

TEST DESCRIPTION

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

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

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

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

SPURIOUS CONDUCTED EMISSIONS



TelTx 2022.05.02.0 XMit 2022.02.07.0

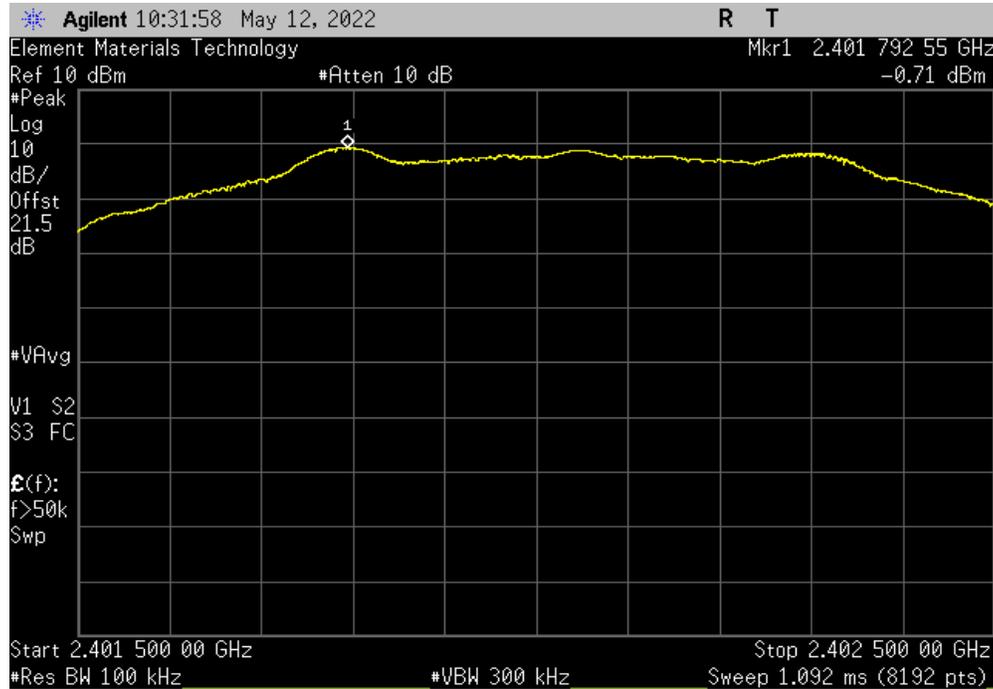
EUT: Soovu Pod		Work Order: SOOV0005				
Serial Number: 606AE28B55E1		Date: 12-May-22				
Customer: Soovu Labs		Temperature: 22.5 °C				
Attendees: Mark Freeman		Humidity: 38% RH				
Project: None		Barometric Pres.: 1017 mbar				
Tested by: Harry Zhao & Brian Fahey		Power: Battery				
Job Site: NC02						
TEST SPECIFICATIONS						
FCC 15.247:2022		Test Method				
RSS-247 Issue 2:2017		ANSI C63.10:2013				
		ANSI C63.10:2013				
COMMENTS						
Single pod. Duty cycle at 100%. Reference level offset includes RF measurement cable, DC block, 20 dB attenuator.						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	4	Signature				
		Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 1 Mbps Low Channel, 2402 MHz		Fundamental	2401.79	N/A	N/A	N/A
BLE/GFSK 1 Mbps Low Channel, 2402 MHz		30 MHz - 12.5 GHz	4804.3	-49.62	-20	Pass
BLE/GFSK 1 Mbps Low Channel, 2402 MHz		12.5 GHz - 25 GHz	13929.9	-48.14	-20	Pass
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		Fundamental	2442.31	N/A	N/A	N/A
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		30 MHz - 12.5 GHz	11508.9	-51.97	-20	Pass
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		12.5 GHz - 25 GHz	24969.5	-48.07	-20	Pass
BLE/GFSK 1 Mbps High Channel, 2480 MHz		Fundamental	2480.31	N/A	N/A	N/A
BLE/GFSK 1 Mbps High Channel, 2480 MHz		30 MHz - 12.5 GHz	4960	-53.97	-20	Pass
BLE/GFSK 1 Mbps High Channel, 2480 MHz		12.5 GHz - 25 GHz	24806.2	-47.8	-20	Pass

SPURIOUS CONDUCTED EMISSIONS

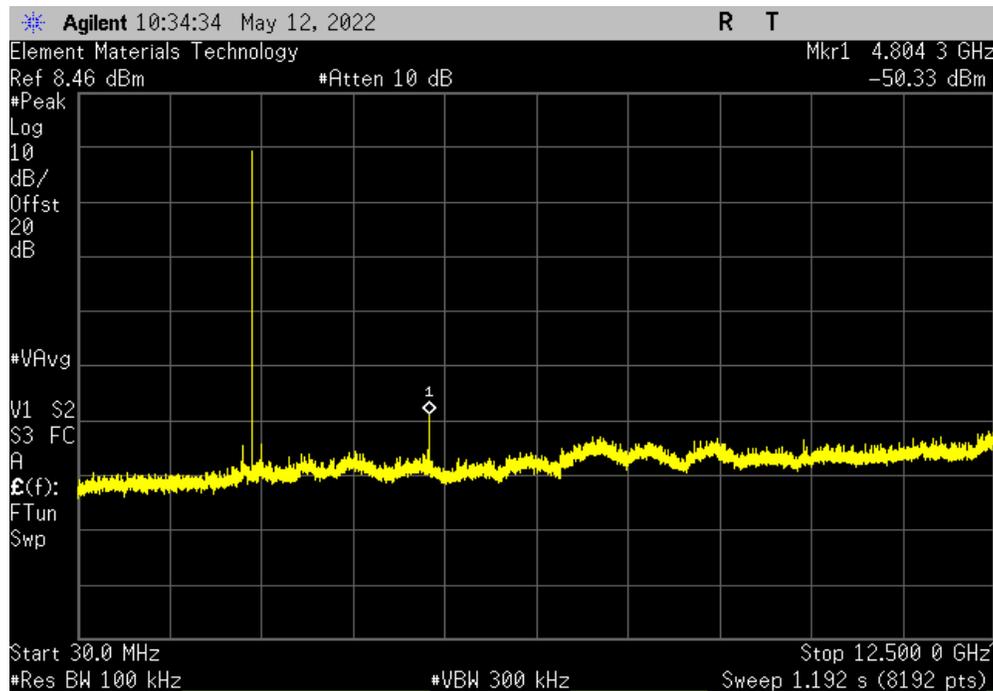


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2401.79	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	4804.3	-49.62	-20	Pass	

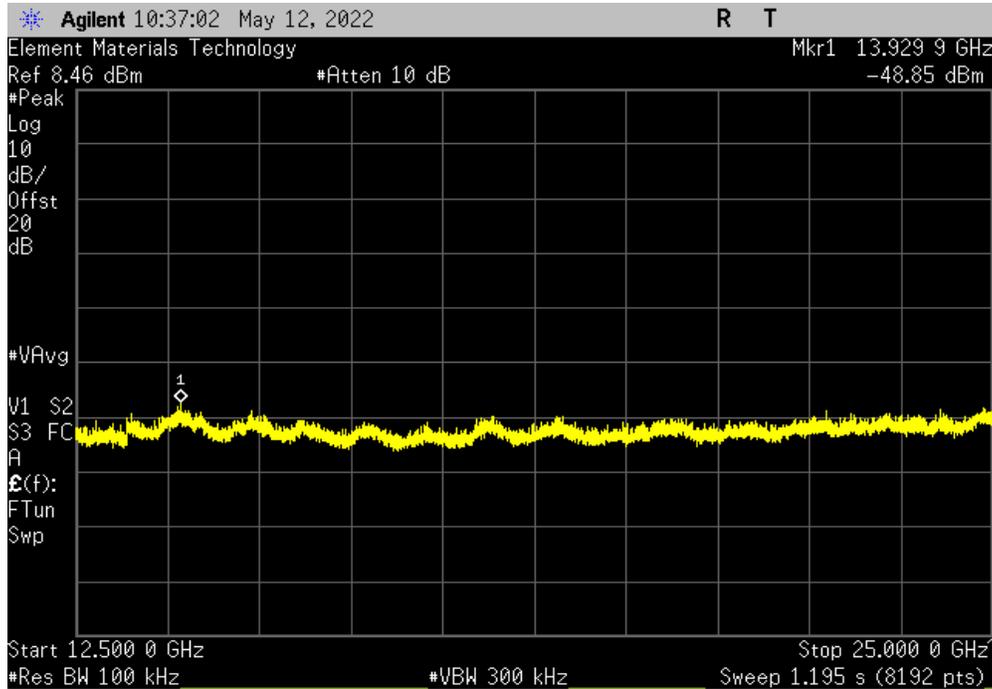


SPURIOUS CONDUCTED EMISSIONS

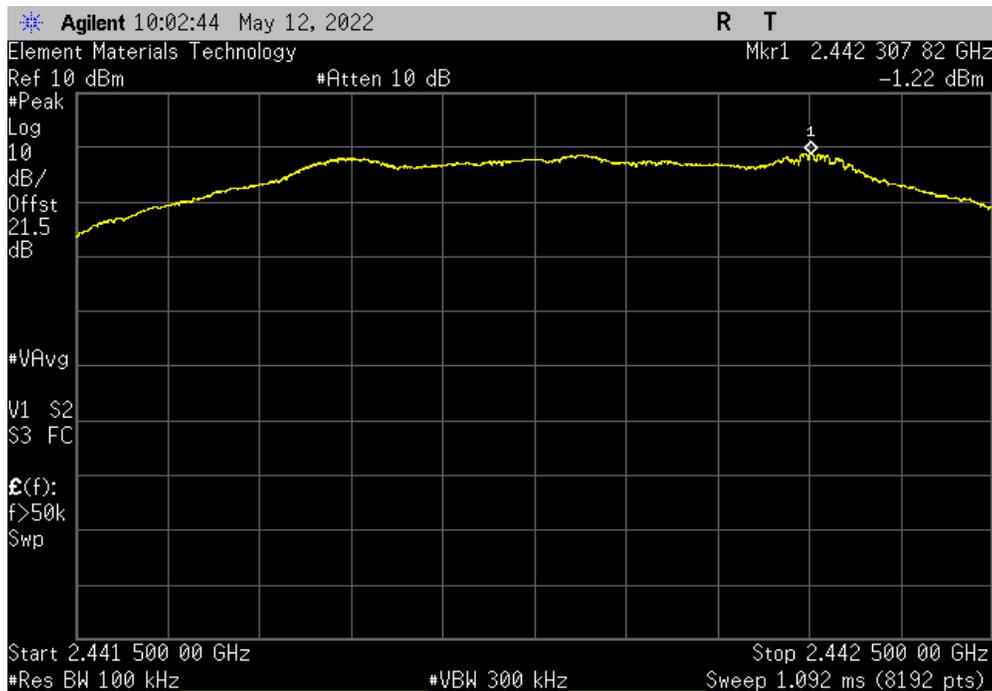


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	13929.9	-48.14	-20	Pass	



BLE/GFSK 1 Mbps Mid Channel, 2442 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2442.31	N/A	N/A	N/A	

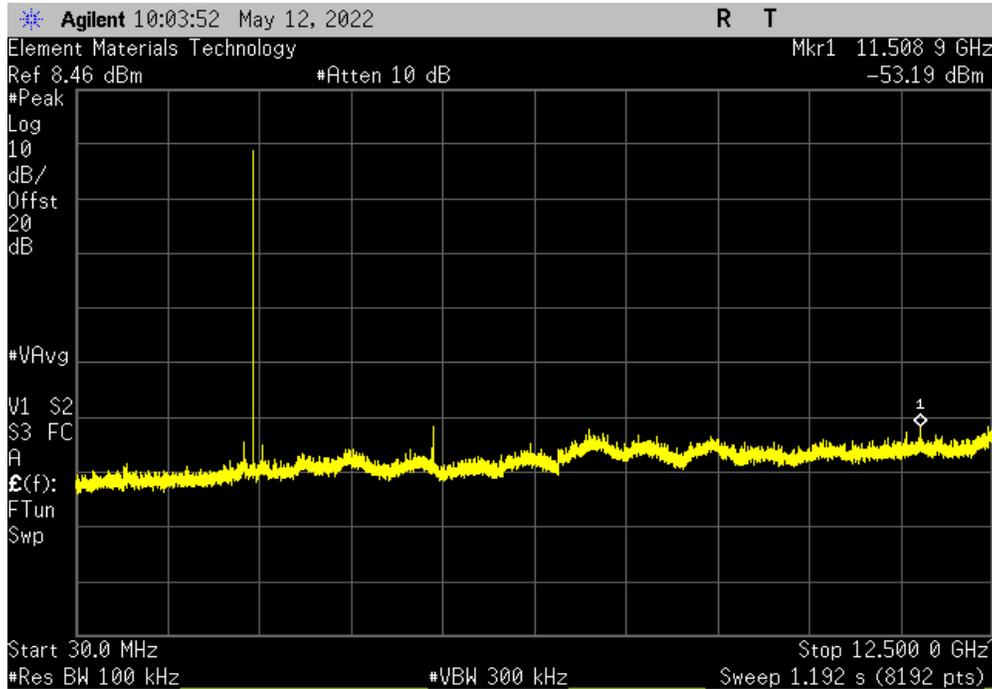


SPURIOUS CONDUCTED EMISSIONS

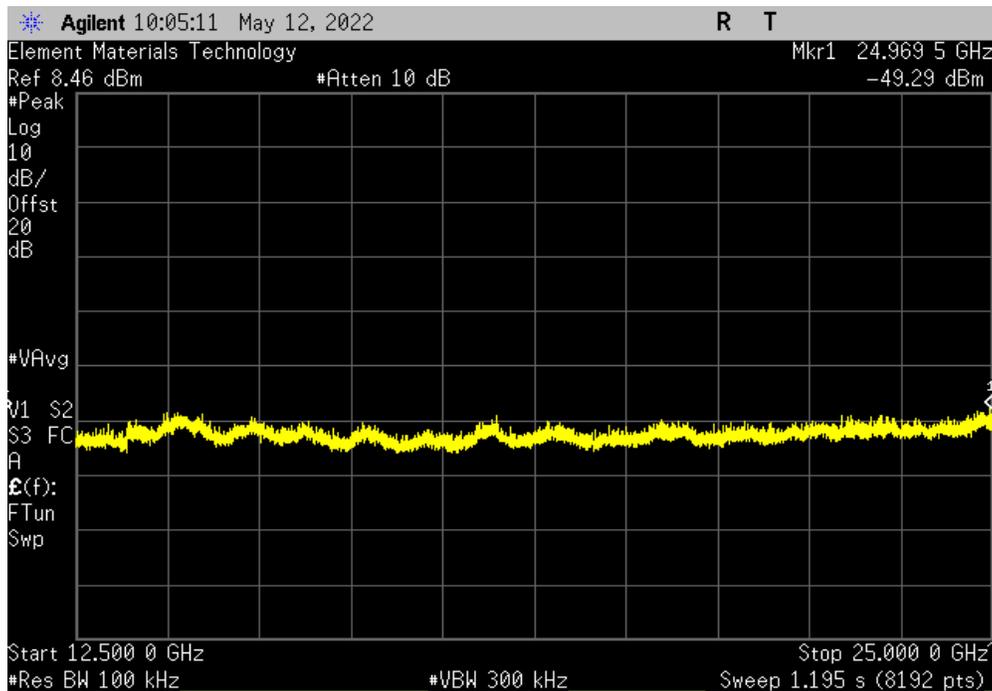


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	11508.9	-51.97	-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	24969.5	-48.07	-20	Pass

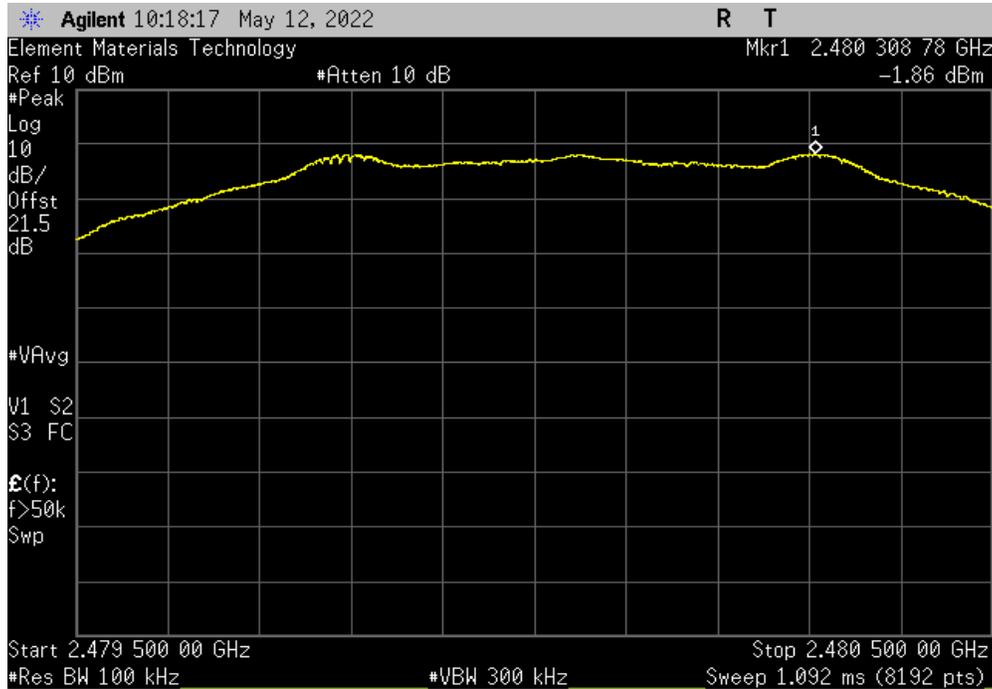


SPURIOUS CONDUCTED EMISSIONS

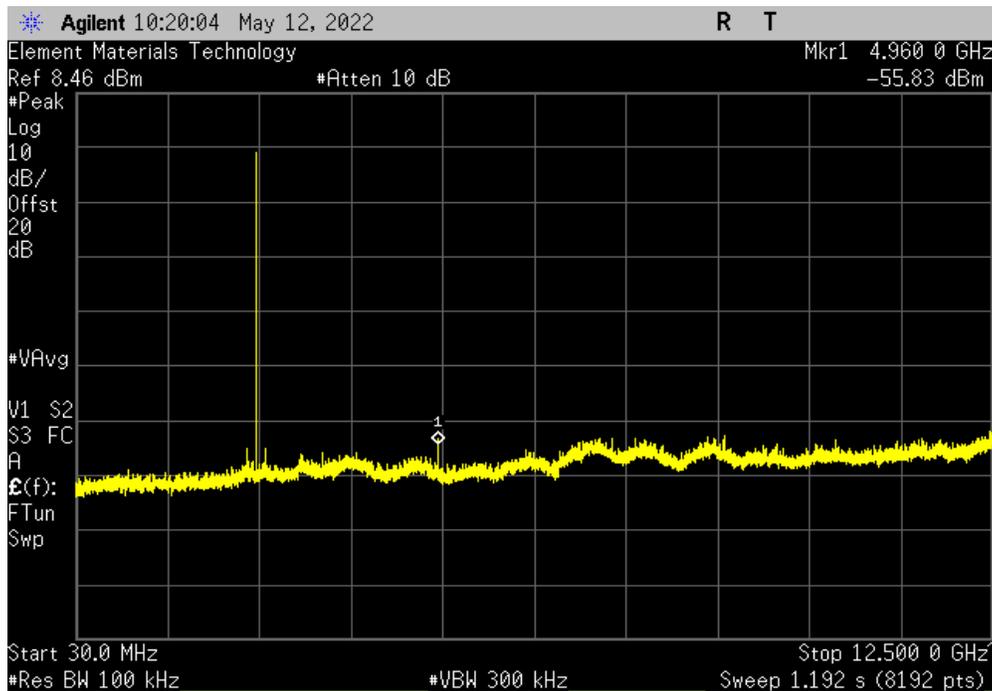


TuTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps High Channel, 2480 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2480.31	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	4960	-53.97	-20	Pass	

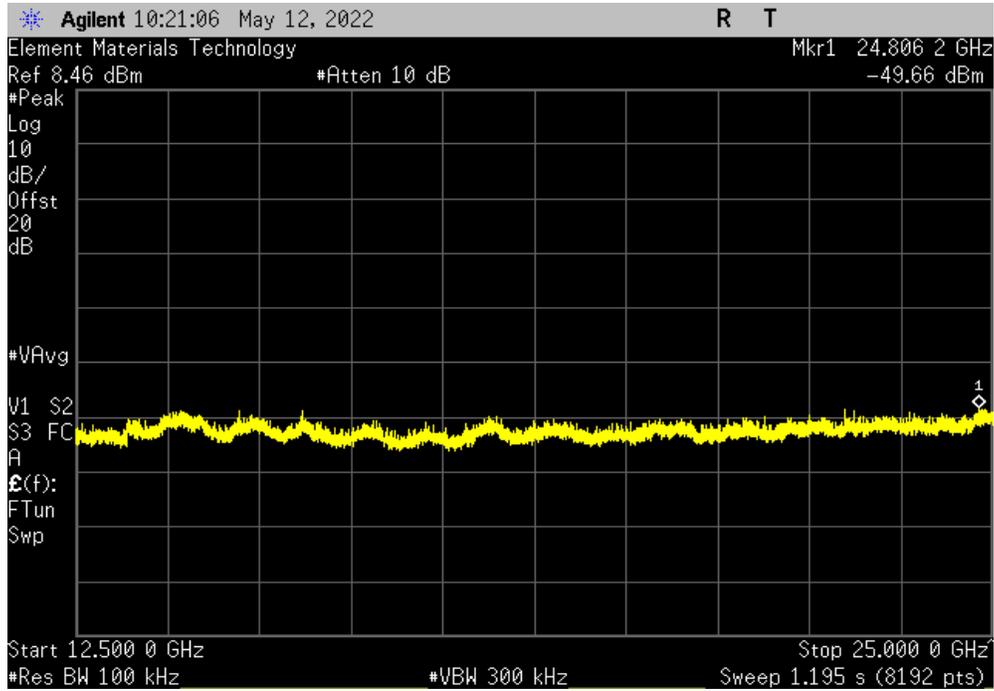


SPURIOUS CONDUCTED EMISSIONS



TbTx 2022.05.02.0 XMt 2022.02.07.0

BLE/GFSK 1 Mbps High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24806.2	-47.8	-20	Pass



SPURIOUS RADIATED EMISSIONS



TEST DESCRIPTION

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

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

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

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

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

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

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

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

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAT	2021-10-20	2022-10-20
Cable	Northwest EMC	Bilog Cables	NC1	2022-01-30	2023-01-30
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2021-11-01	2022-11-01
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2022-01-30	2023-01-30
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2021-10-05	2023-10-05
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	2022-07-01
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2022-04-14	2023-04-14
Cable	Northwest EMC	3115 Horn Cable	NC2	2022-04-14	2023-04-14
Attenuator	Fairview Microwave	SA18E-20	AQV	2021-07-28	2022-07-28
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2021-09-29	2022-09-29
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2021-08-13	2022-08-13
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2021-08-30	2022-08-30
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2021-08-13	2022-08-13
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	NCR
Cable	Northwest EMC	3160 Cable	NC8	2022-03-21	2023-03-21
Amplifier - Pre-Amplifier	Miteq	AMFAMF-6F-18002650-25-10P	AOD	2022-03-21	2023-03-21

SPURIOUS RADIATED EMISSIONS

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.1 dB	-5.1 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 26.5 GHz

POWER INVESTIGATED

120VAC/60Hz
Battery

CONFIGURATIONS INVESTIGATED

SOOV0005-3
SOOV0005-5

MODES INVESTIGATED

BTLE Tx, GFSK, 1 Mbps, High Channel 39 = 2480 MHz
BTLE Tx, GFSK, 1 Mbps, Low Channel 0 = 2402 MHz, High Channel 39 = 2480 MHz
BTLE Tx, GFSK, 1 Mbps, Low Channel 0 = 2402 MHz, Middle Channel 20 = 2442 MHz, High Channel 39 = 2480 MHz
BTLE Tx, GFSK, 1 Mbps, Middle Channel 20 = 2442 MHz

SPURIOUS RADIATED EMISSIONS



EUT:	Soovu Pod	Work Order:	SOOV0005
Serial Number:	BA5044E00CD0	Date:	2022-05-11
Customer:	Soovu Labs	Temperature:	23.1°C
Attendees:	Mark Freeman	Relative Humidity:	32.7%
Customer Project:	None	Bar. Pressure (PMSL):	1026 mb
Tested By:	Harry Zhao and Brian Fahey	Job Site:	NC01
Power:	Battery	Configuration:	SOOV0005-3

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	31	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

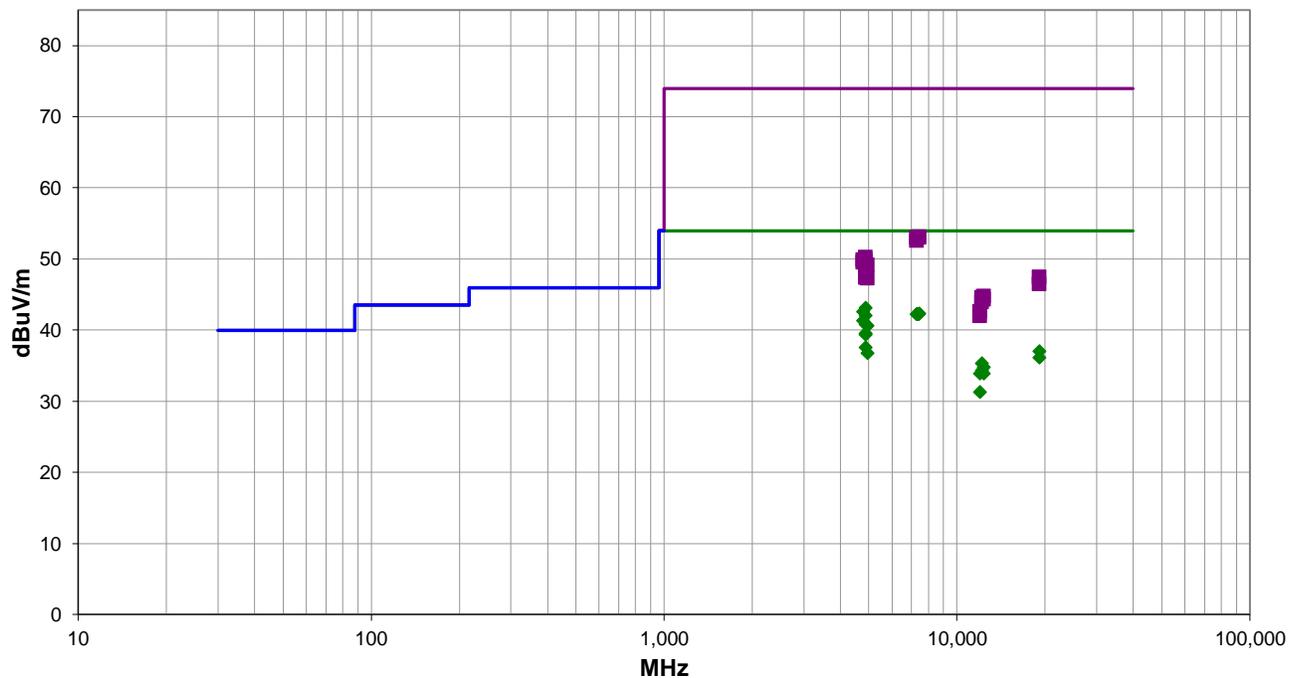
Single pod. Duty cycle at 100%. See comments below for Channel, EUT orientations.

EUT OPERATING MODES

BTLE Tx, GFSK, 1 Mbps, Low Channel 0 = 2402 MHz, Middle Channel 20 = 2442 MHz, High Channel 39 = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 31

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #31

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4884.150	33.1	10.0	2.56	295.0	3.0	0.0	Horz	AV	0.0	43.1	54.0	-10.9	EUT Vert, Mid Ch.
4804.108	33.0	9.6	2.73	278.0	3.0	0.0	Horz	AV	0.0	42.6	54.0	-11.4	EUT Vert, Low Ch.
7440.792	27.3	15.0	1.5	99.0	3.0	0.0	Vert	AV	0.0	42.3	54.0	-11.7	EUT Horz, High Ch.
7325.183	27.8	14.4	1.5	247.0	3.0	0.0	Horz	AV	0.0	42.2	54.0	-11.8	EUT Vert, Mid Ch.
7327.908	27.8	14.4	1.5	111.0	3.0	0.0	Vert	AV	0.0	42.2	54.0	-11.8	EUT Horz, Mid Ch.
7439.142	27.2	15.0	1.5	49.0	3.0	0.0	Horz	AV	0.0	42.2	54.0	-11.8	EUT Vert, High Ch.
4884.200	32.0	10.0	3.86	305.0	3.0	0.0	Horz	AV	0.0	42.0	54.0	-12.0	EUT Horz, Mid Ch.
4804.108	31.7	9.6	1.03	249.0	3.0	0.0	Vert	AV	0.0	41.3	54.0	-12.7	EUT Horz, Low Ch.
4884.075	30.8	10.0	1.19	255.0	3.0	0.0	Vert	AV	0.0	40.8	54.0	-13.2	EUT Horz, Mid Ch.
4960.025	30.6	10.0	2.64	41.0	3.0	0.0	Horz	AV	0.0	40.6	54.0	-13.4	EUT Vert, High Ch.
4883.942	29.5	10.0	3.54	359.0	3.0	0.0	Horz	AV	0.0	39.5	54.0	-14.5	EUT on Side, Mid. Ch.
4884.325	29.3	10.0	3.28	52.0	3.0	0.0	Vert	AV	0.0	39.3	54.0	-14.7	EUT Vert, Mid Ch.
4884.108	27.5	10.0	1.5	3.0	3.0	0.0	Vert	AV	0.0	37.5	54.0	-16.5	EUT on Side, Mid. Ch.
19215.000	36.7	0.3	1.6	285.0	3.0	0.0	Horz	AV	0.0	37.0	54.0	-17.0	EUT Vert. Low Ch.
4960.517	26.7	10.0	1.5	290.0	3.0	0.0	Vert	AV	0.0	36.7	54.0	-17.3	EUT Horz, High Ch.
19215.050	35.8	0.3	1.6	43.0	3.0	0.0	Vert	AV	0.0	36.1	54.0	-17.9	EUT Horz, Low Ch.
12209.240	34.6	0.7	1.94	69.0	3.0	0.0	Horz	AV	0.0	35.3	54.0	-18.7	EUT Vert, Mid Ch.
12399.090	34.9	-0.1	2.3	9.0	3.0	0.0	Horz	AV	0.0	34.8	54.0	-19.2	EUT Vert, High Ch.
12211.430	33.5	0.8	3.89	81.0	3.0	0.0	Vert	AV	0.0	34.3	54.0	-19.7	EUT Horz, Mid Ch.
12009.280	35.8	-1.9	1.89	66.0	3.0	0.0	Horz	AV	0.0	33.9	54.0	-20.1	EUT Vert, Low Ch.
12399.160	34.0	-0.1	3.57	92.0	3.0	0.0	Vert	AV	0.0	33.9	54.0	-20.1	EUT Horz, High Ch.
7440.708	38.1	15.0	1.5	49.0	3.0	0.0	Horz	PK	0.0	53.1	74.0	-20.9	EUT Vert, High Ch.
7328.283	38.6	14.4	1.5	247.0	3.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	EUT Vert, Mid Ch.
7441.883	38.0	15.0	1.5	99.0	3.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	EUT Horz, High Ch.
7326.875	38.1	14.4	1.5	111.0	3.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	EUT Horz, Mid Ch.
12011.520	33.2	-1.9	1.01	171.0	3.0	0.0	Vert	AV	0.0	31.3	54.0	-22.7	EUT Horz, Low Ch.
4884.542	40.2	10.0	2.56	295.0	3.0	0.0	Horz	PK	0.0	50.2	74.0	-23.8	EUT Vert, Mid Ch.
4804.575	40.2	9.6	2.73	278.0	3.0	0.0	Horz	PK	0.0	49.8	74.0	-24.2	EUT Vert, Low Ch.
4883.567	39.7	10.0	3.86	305.0	3.0	0.0	Horz	PK	0.0	49.7	74.0	-24.3	EUT Horz, Mid Ch.
4804.592	39.9	9.6	1.03	249.0	3.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	EUT Horz, Low Ch.
4960.150	39.1	10.0	2.64	41.0	3.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	EUT Vert, High Ch.
4884.750	39.0	10.0	3.54	359.0	3.0	0.0	Horz	PK	0.0	49.0	74.0	-25.0	EUT on Side, Mid. Ch.
4883.950	38.9	10.0	1.19	255.0	3.0	0.0	Vert	PK	0.0	48.9	74.0	-25.1	EUT Horz, Mid Ch.
4884.142	38.2	10.0	3.28	52.0	3.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	EUT Vert, Mid Ch.
19215.520	47.1	0.3	1.6	285.0	3.0	0.0	Horz	PK	0.0	47.4	74.0	-26.6	EUT Vert. Low Ch.
4884.208	37.3	10.0	1.5	3.0	3.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	EUT on Side, Mid. Ch.
4962.417	37.2	10.0	1.5	290.0	3.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	EUT Horz, High Ch.
19215.530	46.1	0.3	1.6	43.0	3.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	EUT Horz, Low Ch.
12399.230	44.8	-0.1	2.3	9.0	3.0	0.0	Horz	PK	0.0	44.7	74.0	-29.3	EUT Vert, High Ch.
12211.620	43.7	0.8	1.94	69.0	3.0	0.0	Horz	PK	0.0	44.5	74.0	-29.5	EUT Vert, Mid Ch.

SPURIOUS RADIATED EMISSIONS

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12399.110	44.4	-0.1	3.57	92.0	3.0	0.0	Vert	PK	0.0	44.3	74.0	-29.7	EUT Horz, High Ch.
12211.560	43.1	0.8	3.89	81.0	3.0	0.0	Vert	PK	0.0	43.9	74.0	-30.1	EUT Horz, Mid Ch.
12008.950	44.5	-1.9	1.89	66.0	3.0	0.0	Horz	PK	0.0	42.6	74.0	-31.4	EUT Vert, Low Ch.
12009.270	43.8	-1.9	1.01	171.0	3.0	0.0	Vert	PK	0.0	41.9	74.0	-32.1	EUT Horz, Low Ch.

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS



EUT:	Soovu Pod	Work Order:	SOOV0005
Serial Number:	BA5044E00CDO	Date:	2022-05-11
Customer:	Soovu Labs	Temperature:	23.1°C
Attendees:	Mark Freeman	Relative Humidity:	32.7%
Customer Project:	None	Bar. Pressure (PMSL):	1026 mb
Tested By:	Harry Zhao and Brian Fahey	Job Site:	NC01
Power:	Battery	Configuration:	SOOV0005-3

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	35	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

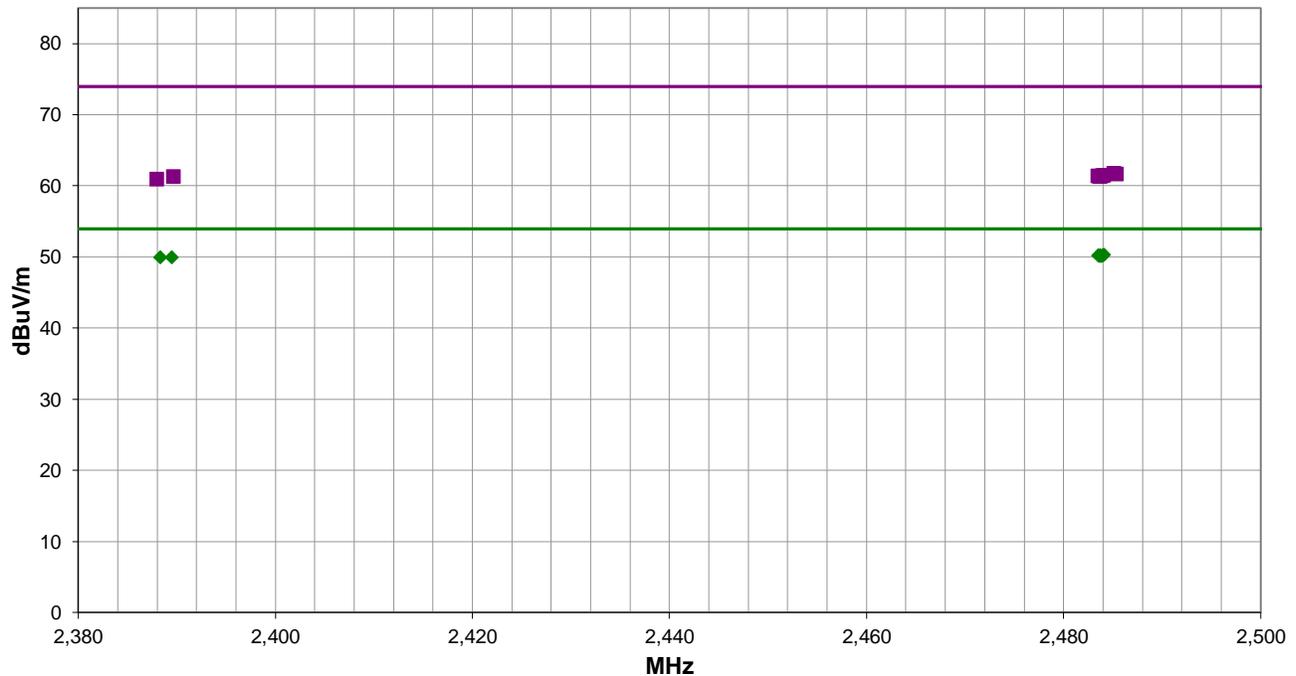
Single pod. Duty cycle at 100%. See comments below for Channel, EUT orientations.

EUT OPERATING MODES

BTLE Tx, GFSK, 1 Mbps, Low Channel 0 = 2402 MHz, High Channel 39 = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 35

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #35

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.133	29.3	1.0	2.24	0.0	3.0	20.0	Horz	AV	0.0	50.3	54.0	-3.7	EUT on Side, High Ch.
2484.023	29.2	1.0	1.5	355.0	3.0	20.0	Vert	AV	0.0	50.2	54.0	-3.8	EUT Vert, High Ch.
2483.707	29.2	1.0	1.5	347.0	3.0	20.0	Horz	AV	0.0	50.2	54.0	-3.8	EUT Horz, High Ch.
2483.520	29.2	1.0	1.5	167.0	3.0	20.0	Vert	AV	0.0	50.2	54.0	-3.8	EUT Horz, High Ch.
2483.890	29.1	1.0	1.5	4.0	3.0	20.0	Horz	AV	0.0	50.1	54.0	-3.9	EUT Vert, High Ch.
2483.700	29.1	1.0	1.5	331.0	3.0	20.0	Vert	AV	0.0	50.1	54.0	-3.9	EUT on Side, High Ch.
2389.517	29.0	0.9	1.5	311.0	3.0	20.0	Vert	AV	0.0	49.9	54.0	-4.1	EUT Vert, Low Ch.
2388.353	29.0	0.9	1.5	162.0	3.0	20.0	Horz	AV	0.0	49.9	54.0	-4.1	EUT on Side, Low Ch.
2485.177	40.7	1.0	1.5	4.0	3.0	20.0	Horz	PK	0.0	61.7	74.0	-12.3	EUT Vert, High Ch.
2485.440	40.6	1.0	1.5	167.0	3.0	20.0	Vert	PK	0.0	61.6	74.0	-12.4	EUT Horz, High Ch.
2484.143	40.4	1.0	2.24	0.0	3.0	20.0	Horz	PK	0.0	61.4	74.0	-12.6	EUT on Side, High Ch.
2483.513	40.3	1.0	1.5	331.0	3.0	20.0	Vert	PK	0.0	61.3	74.0	-12.7	EUT on Side, High Ch.
2483.947	40.3	1.0	1.5	347.0	3.0	20.0	Horz	PK	0.0	61.3	74.0	-12.7	EUT Horz, High Ch.
2483.717	40.2	1.0	1.5	355.0	3.0	20.0	Vert	PK	0.0	61.2	74.0	-12.8	EUT Vert, High Ch.
2389.683	40.3	0.9	1.5	311.0	3.0	20.0	Vert	PK	0.0	61.2	74.0	-12.8	EUT Vert, Low Ch.
2388.047	40.0	0.9	1.5	162.0	3.0	20.0	Horz	PK	0.0	60.9	74.0	-13.1	EUT on Side, Low Ch.

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS



EUT:	Soovu Pod	Work Order:	SOOV0005
Serial Number:	BA5044E00CDO	Date:	2022-05-12
Customer:	Soovu Labs	Temperature:	22.6°C
Attendees:	Mark Freeman	Relative Humidity:	38.8%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mb
Tested By:	Harry Zhao and Brian Fahey	Job Site:	NC01
Power:	120VAC/60Hz	Configuration:	SOOV0005-5

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	41	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

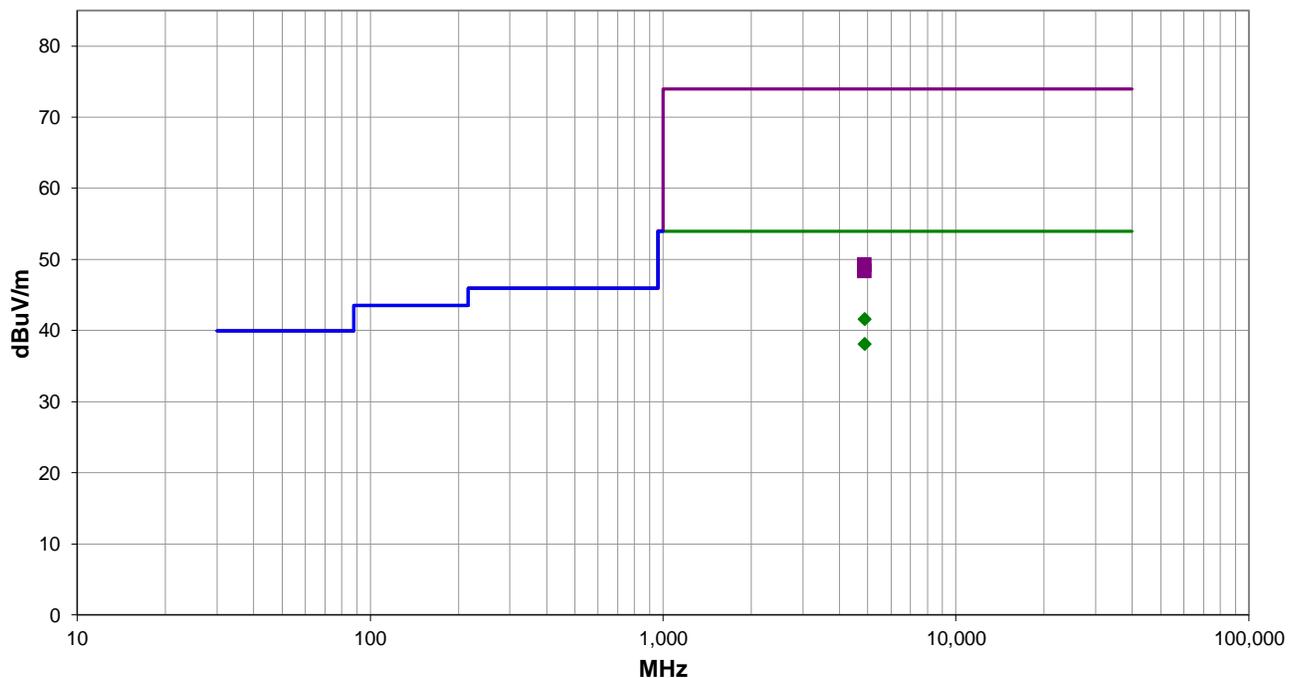
Single pod. Duty cycle at 100%. EUT is docked onto a charging cradle. EUT transmit while in charging mode. See comments below for Channel, EUT orientations.

EUT OPERATING MODES

BTLE Tx, GFSK, 1 Mbps, Middle Channel 20 = 2442 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 41

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #41

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4884.158	31.6	10.0	2.96	337.0	3.0	0.0	Horz	AV	0.0	41.6	54.0	-12.4	EUT Vert, Mid Ch., Charging Dock mode
4884.000	28.1	10.0	1.18	70.0	3.0	0.0	Vert	AV	0.0	38.1	54.0	-15.9	EUT Horz, Mid. Ch., Charging Dock mode
4884.442	39.2	10.0	2.96	337.0	3.0	0.0	Horz	PK	0.0	49.2	74.0	-24.8	EUT Vert, Mid Ch., Charging Dock mode
4884.817	38.3	10.0	1.18	70.0	3.0	0.0	Vert	PK	0.0	48.3	74.0	-25.7	EUT Horz, Mid. Ch., Charging Dock mode

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS



EUT:	Soovu Pod	Work Order:	SOOV0005
Serial Number:	BA5044E00CDO	Date:	2022-05-12
Customer:	Soovu Labs	Temperature:	22.6°C
Attendees:	Mark Freeman	Relative Humidity:	38.8%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mb
Tested By:	Harry Zhao and Brian Fahey	Job Site:	NC01
Power:	120VAC/60Hz	Configuration:	SOOV0005-5

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	42	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

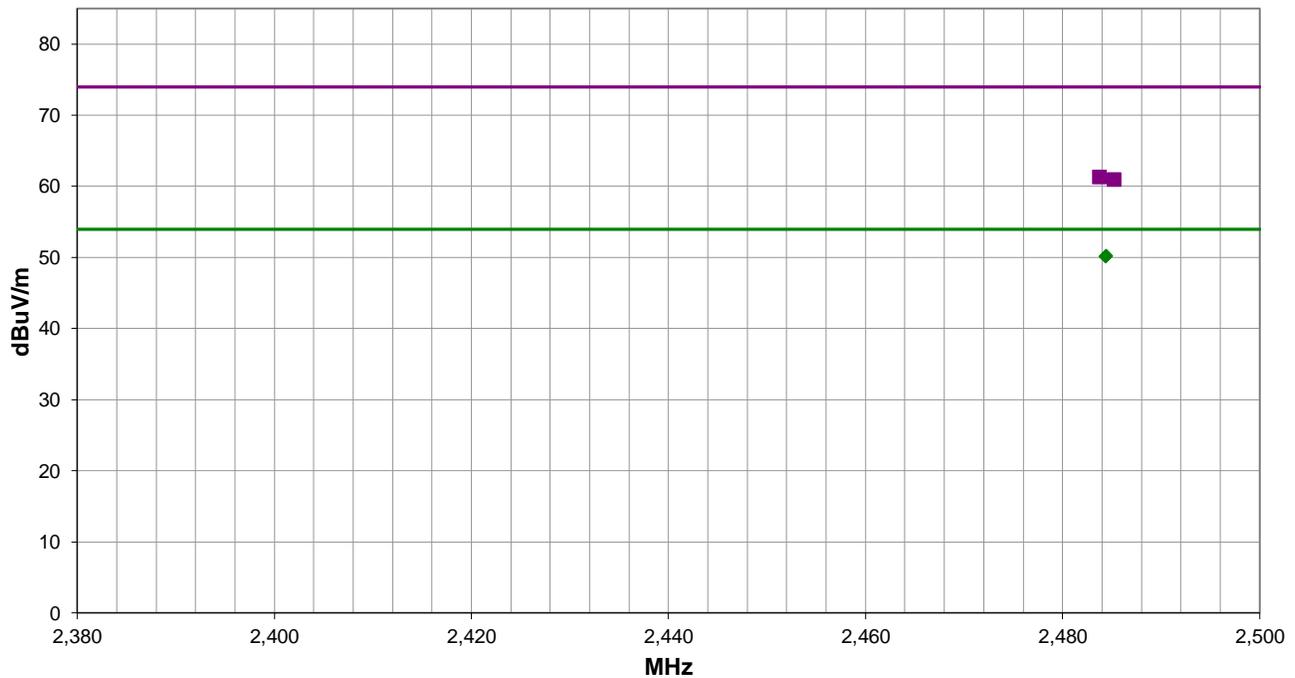
Single pod. Duty cycle at 100%. EUT is docked onto a charging cradle. EUT transmit while in charging mode. See comments below for Channel, EUT orientations.

EUT OPERATING MODES

BTLE Tx, GFSK, 1 Mbps, High Channel 39 = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 42

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #42

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.440	29.2	1.0	1.5	294.0	3.0	20.0	Vert	AV	0.0	50.2	54.0	-3.8	EUT Vert, High Ch., Charging Dock mode
2484.367	29.1	1.0	1.5	226.0	3.0	20.0	Horz	AV	0.0	50.1	54.0	-3.9	EUT on Side, High Ch., Charging Dock mode
2483.797	40.2	1.0	1.5	226.0	3.0	20.0	Horz	PK	0.0	61.2	74.0	-12.8	EUT on Side, High Ch., Charging Dock mode
2485.320	39.9	1.0	1.5	294.0	3.0	20.0	Vert	PK	0.0	60.9	74.0	-13.1	EUT Vert, High Ch., Charging Dock mode

CONCLUSION

Pass



Tested By

End of Test Report