

SonicSensory, Inc.

Jonah

FCC 15.247:2019 Bluetooth (FHSS) CSR 8670 Radio

Report # DROP0009.1



NVLAP LAB CODE: 200676-0

CERTIFICATE OF TEST



Last Date of Test: June 10, 2019 SonicSensory, Inc. Model: Jonah

Radio Equipment Testing

Standards

Specification	Mathad
Specification	Method
FCC 15.207:2019	ANGL C62 10:2012
FCC 15.247:2019	ANOI 003.10.2013

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
7.5	Duty Cycle	Yes	Pass	
7.8.2	Carrier Frequency Separation	Yes	Pass	
7.8.3	Number of Hopping Channels	Yes	Pass	
7.8.4	Dwell Time	Yes	Pass	
7.8.5	Output Power	Yes	Pass	
7.8.5	Equivalent Isotropic Radiated Power	Yes	Pass	
7.8.6	Band Edge Compliance	Yes	Pass	
7.8.6	Band Edge Compliance - Hopping Mode	Yes	Pass	
7.8.7	Occupied Bandwidth	Yes	Pass	
7.8.8	Spurious Conducted Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Victor Ratinoff, Operations Manager

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

REVISION HISTORY



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

ACCREDITATIONS AND AUTHORIZATIONS



United States

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

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

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 – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

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: https://www.nwemc.com/emc-testing-accreditations

FACILITIES





California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-10 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	
		NVLAP			
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0	
	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 included as part of the applicable test description page. 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 (Hz)	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)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams





PRODUCT DESCRIPTION



Client and Equipment Under Test (EUT) Information

Company Name:	SonicSensory, Inc.
Address:	1163 Logan St
City, State, Zip:	Los Angeles, CA 90026
Test Requested By:	Mimi Liu
Model:	Jonah
First Date of Test:	June 6, 2019
Last Date of Test:	June 10, 2019
Receipt Date of Samples:	June 5, 2019
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Jonah is a radio enabled footwear device with audio processing devices and low frequency transducers, which transmit vibrational energy received from multimedia and environmental sources. The transducers are located under the arch area. Jonah comes with built in rechargeable Lithium-ion batteries and custom programmable options via the SonicSensory app.

Testing Objective:

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





Configuration DROP0009-3

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
Jonah	SonicSensory, Inc.	PVT- Jonah	PL191910034		

Peripherals in test setup boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
Power supply	Asian Power Devices	WB-24J12FU	S9510999000058		

Remote Equipment Outside of Test Setup Boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
Laptop	HP	XPS159560	25058299006		
USB-SPI Converter	CSR	1324	398772		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC cable	Yes	1.8m	Yes	Power supply	Jonah
Ethernet	No	1.5m	No	Laptop	USB-SPI
Ethernet	Yes	1m	No	USB-SPI	Ribbon
Ribbon	No	0.05m	No	Ethernet	Jonah

Configuration DROP0010-1

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
Jonah	SonicSensory, Inc.	PVT- Jonah	PL1919P10041		

Peripherals in test setup boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
Power supply	Asian Power Devices	WB-24J12FU	S9510999000058		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC cable	Yes	1.8m	Yes	Power supply	Jonah

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2019-06-06	Carrier Frequency Separation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2019-06-06	Number of Hopping Channels	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	2019-06-06	Dwell Time	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2019-06-06	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	2019-06-06	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	2019-06-06	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	2019-06-06	Band Edge Compliance - Hopping Mode	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	2019-06-06	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2019-06-06	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.
10	2019-06-10	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.
11	2019-06-10	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.



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 500hm measuring port is terminated by a 500hm EMI meter or a 500hm resistive load. All 500hm measuring ports of the LISN are terminated by 500hm. 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	Rohde & Schwarz	ESCI	ARG	2018-07-05	2019-07-05
Cable - Conducted Cable Assembly	Northwest EMC	OCP, HFP, AWC	OCPA	2018-10-05	2019-10-05
LISN	Solar Electronics	9252-50-24-BNC	LIA	2019-01-08	2020-01-08

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

DROP0009-3

MODES INVESTIGATED

CSR Radio: Mid Channel 2440 MHz, 1MHz DH5



EUT:	Jonah				Work Order:	DROP0009		
Serial Number:	PL1919P100	34			Date:	2019-06-10		
Customer:	SonicSensor	y, Inc.			Temperature:	26.6°C		
Attendees:	Daniel Quiros	S			Relative Humidity:	43%		
Customer Project:	None				Bar. Pressure:	1015 mb		
Tested By:	Mark Baytan				Job Site:	OC06		
Power:	110VAC/60H	z			Configuration:	DROP0009-3		
TEST SPECIFIC	CATIONS							
Specification:				Method:				
FCC 15.207:2019 ANSI C63.10:2013):2013				
TEST PARAMETERS								
TEST PARAME	TERS							
TEST PARAMERun #:11	TERS	Line:	Neutral	A	dd. Ext. Attenuation (dB)): 0		
TEST PARAMERun #:11COMMENTS	TERS	Line:	Neutral	A	dd. Ext. Attenuation (dB): 0		
TEST PARAME Run #: 11 COMMENTS None	TERS	Line:	Neutral	A	dd. Ext. Attenuation (dB): 0		
COMMENTS None		Line:	Neutral	A	dd. Ext. Attenuation (dB): 0		
TEST PARAME Run #: 11 COMMENTS None EUT OPERATIN CSR Radio: Mid Ch	TERS	Line:	Neutral	A	dd. Ext. Attenuation (dB): 0		
TEST PARAME Run #: 11 COMMENTS None EUT OPERATIN CSR Radio: Mid Ch DEVIATIONS F	NG MODES hannel 2440 MH ROM TEST	Line: Hz, 1MHz [STAND/	Neutral	A	dd. Ext. Attenuation (dB): 0		





Peak Data - vs - Average Limit



RESULTS - Run #11

Peak Data - vs - Quasi Peak Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	Freq (MHz
0.150	31.4	20.3	51.7	66.0	-14.3	0.150
0.340	23.6	20.1	43.7	59.2	-15.5	0.340
0.191	27.6	20.2	47.8	64.0	-16.2	0.191
0.322	22.1	20.1	42.2	59.7	-17.5	0.322
0.240	21.6	20.1	41.7	62.1	-20.4	0.240
0.266	20.1	20.1	40.2	61.3	-21.1	0.266
0.296	18.1	20.1	38.2	60.4	-22.2	0.296
3.168	12.9	20.3	33.2	56.0	-22.8	3.168
0.553	12.3	20.0	32.3	56.0	-23.7	0.553
0.478	12.5	20.0	32.5	56.4	-23.9	0.478
1.251	11.9	20.0	31.9	56.0	-24.1	1.251
0.654	11.8	20.0	31.8	56.0	-24.2	0.654
0.587	11.7	20.0	31.7	56.0	-24.3	0.587
1.676	11.6	20.1	31.7	56.0	-24.3	1.676
1.784	11.5	20.1	31.6	56.0	-24.4	1.784
2.325	11.5	20.1	31.6	56.0	-24.4	2.325
4.612	11.3	20.3	31.6	56.0	-24.4	4.612
4.683	11.3	20.3	31.6	56.0	-24.4	4.683
1.072	11.5	20.0	31.5	56.0	-24.5	1.072
2.631	11.3	20.2	31.5	56.0	-24.5	2.631
0.531	11.4	20.0	31.4	56.0	-24.6	0.531
3.858	11.1	20.3	31.4	56.0	-24.6	3.858
4.746	11.1	20.3	31.4	56.0	-24.6	4.746
1.836	11.2	20.1	31.3	56.0	-24.7	1.836
2.042	11.2	20.1	31.3	56.0	-24.7	2.042
4.049	11.0	20.3	31.3	56.0	-24.7	4.049

Peak Data - vs - Average Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
0.150	31.4	20.3	51.7	56.0	-4.3	
0.340	23.6	20.1	43.7	49.2	-5.5	
0.191	27.6	20.2	47.8	54.0	-6.2	
0.322	22.1	20.1	42.2	49.7	-7.5	
0.240	21.6	20.1	41.7	52.1	-10.4	
0.266	20.1	20.1	40.2	51.3	-11.1	
0.296	18.1	20.1	38.2	50.4	-12.2	
3.168	12.9	20.3	33.2	46.0	-12.8	
0.553	12.3	20.0	32.3	46.0	-13.7	
0.478	12.5	20.0	32.5	46.4	-13.9	
1.251	11.9	20.0	31.9	46.0	-14.1	
0.654	11.8	20.0	31.8	46.0	-14.2	
0.587	11.7	20.0	31.7	46.0	-14.3	
1.676	11.6	20.1	31.7	46.0	-14.3	
1.784	11.5	20.1	31.6	46.0	-14.4	
2.325	11.5	20.1	31.6	46.0	-14.4	
4.612	11.3	20.3	31.6	46.0	-14.4	
4.683	11.3	20.3	31.6	46.0	-14.4	
1.072	11.5	20.0	31.5	46.0	-14.5	
2.631	11.3	20.2	31.5	46.0	-14.5	
0.531	11.4	20.0	31.4	46.0	-14.6	
3.858	11.1	20.3	31.4	46.0	-14.6	
4.746	11.1	20.3	31.4	46.0	-14.6	
1.836	11.2	20.1	31.3	46.0	-14.7	
2.042	11.2	20.1	31.3	46.0	-14.7	
4.049	11.0	20.3	31.3	46.0	-14.7	

CONCLUSION

Pass

MKE

Tested By



EUT:	Jonah				Work Order:	DROP0009
Serial Number:	PL1919P100	PL1919P10034			Date:	2019-06-10
Customer:	SonicSensor	y, Inc.			Temperature:	26.6°C
Attendees:	Daniel Quiro	S			Relative Humidity:	43%
Customer Project:	None				Bar. Pressure:	1015 mb
Tested By:	Mark Baytan				Job Site:	OC06
Power:	110VAC/60H	lz			Configuration:	DROP0009-3
TEST SPECIF	CATIONS					
Specification:				Method:		
FCC 15.207:2019				ANSI C63.1	0:2013	
TEST PARAM	ETERS					
Run #: 12		Line:	High Line	ŀ	Add. Ext. Attenuation (dB): 0
NULLE						
EUT OPERAT	NG MODES					
CSR Radio: Mid C	hannel 2440 M	Hz, 1MHz [DH5			
DEVIATIONS	ROM TEST	STAND	ARD			
None						





Peak Data - vs - Average Limit



RESULTS - Run #12

Peak Data - vs - Quasi Peak Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	Freq (MHz)
0.150	32.5	20.3	52.8	66.0	-13.2	0.150
0.191	27.2	20.2	47.4	64.0	-16.6	0.191
0.213	24.6	20.1	44.7	63.1	-18.4	0.213
0.344	19.5	20.1	39.6	59.1	-19.5	0.344
0.247	20.4	20.1	40.5	61.9	-21.4	0.247
4.079	12.5	20.3	32.8	56.0	-23.2	4.079
4.799	12.5	20.3	32.8	56.0	-23.2	4.799
1.411	12.5	20.1	32.6	56.0	-23.4	1.411
3.885	12.1	20.3	32.4	56.0	-23.6	3.885
4.552	12.1	20.3	32.4	56.0	-23.6	4.552
0.728	12.3	20.0	32.3	56.0	-23.7	0.728
1.172	12.3	20.0	32.3	56.0	-23.7	1.172
1.310	12.3	20.0	32.3	56.0	-23.7	1.310
0.497	12.3	20.0	32.3	56.1	-23.8	0.497
0.381	14.3	20.0	34.3	58.3	-24.0	0.381
2.597	11.7	20.2	31.9	56.0	-24.1	2.597
1.075	11.8	20.0	31.8	56.0	-24.2	1.075
0.773	11.7	20.0	31.7	56.0	-24.3	0.773
1.430	11.5	20.1	31.6	56.0	-24.4	1.430
4.183	11.3	20.3	31.6	56.0	-24.4	4.183
0.665	11.5	20.0	31.5	56.0	-24.5	0.665
2.668	11.3	20.2	31.5	56.0	-24.5	2.668
1.239	11.4	20.0	31.4	56.0	-24.6	1.239
2.265	11.3	20.1	31.4	56.0	-24.6	2.265
3.116	11.1	20.3	31.4	56.0	-24.6	3.116
1.818	11.1	20.1	31.2	56.0	-24.8	1.818

Peak Data - vs - Average Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
0.150	32.5	20.3	52.8	56.0	-3.2	
0.191	27.2	20.2	47.4	54.0	-6.6	
0.213	24.6	20.1	44.7	53.1	-8.4	
0.344	19.5	20.1	39.6	49.1	-9.5	
0.247	20.4	20.1	40.5	51.9	-11.4	
4.079	12.5	20.3	32.8	46.0	-13.2	
4.799	12.5	20.3	32.8	46.0	-13.2	
1.411	12.5	20.1	32.6	46.0	-13.4	
3.885	12.1	20.3	32.4	46.0	-13.6	
4.552	12.1	20.3	32.4	46.0	-13.6	
0.728	12.3	20.0	32.3	46.0	-13.7	
1.172	12.3	20.0	32.3	46.0	-13.7	
1.310	12.3	20.0	32.3	46.0	-13.7	
0.497	12.3	20.0	32.3	46.1	-13.8	
0.381	14.3	20.0	34.3	48.3	-14.0	
2.597	11.7	20.2	31.9	46.0	-14.1	
1.075	11.8	20.0	31.8	46.0	-14.2	
0.773	11.7	20.0	31.7	46.0	-14.3	
1.430	11.5	20.1	31.6	46.0	-14.4	
4.183	11.3	20.3	31.6	46.0	-14.4	
0.665	11.5	20.0	31.5	46.0	-14.5	
2.668	11.3	20.2	31.5	46.0	-14.5	
1.239	11.4	20.0	31.4	46.0	-14.6	
2.265	11.3	20.1	31.4	46.0	-14.6	
3.116	11.1	20.3	31.4	46.0	-14.6	
1.818	11.1	20.1	31.2	46.0	-14.8	

CONCLUSION

Pass

M+K G

Tested By

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2019.05.10

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Low Ch 2402 MHz, Mid Ch 2440 MHz, High Ch 2480 MHz, 2MHz DH5, 2DH5, 3DH5

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

DROP0010 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 26000 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	Fairview Microwave	SA18H-20	TKQ	NCR	0 mo
Cable	Northwest EMC	8-18GHz RE Cables	000	10-Jan-2019	12 mo
Cable	Northwest EMC	18-26GHz RE Cables	OCK	19-Dec-2018	12 mo
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	10-Jan-2019	12 mo
Cable	Northwest EMC	10kHz-1GHz RE Cables	OCH	20-Sep-2018	12 mo
Cable	ESM Cable Corp.	KMKM-72	OC1	19-Dec-2018	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHX	16-Jul-2018	12 mo
Antenna - Biconilog	Teseq	CBL 6141A	AYE	7-Nov-2017	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1402	AOZ	10-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	10-Jan-2019	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOI	19-Dec-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOF	10-Jan-2019	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOE	10-Jan-2019	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHT	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHR	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AHN	NCR	0 mo
Antenna - Double Ridge	EMCO	3115	AHB	28-Mar-2018	24 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFJ	18-Dec-2018	12 mo

MEASUREMENT BANDWIDTHS

Frequency Range	Peak Data	Quasi-Peak Data	Average Data
(MHz)	(kHz)	(kHz)	(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

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 at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

SPURIOUS RADIATED EMISSIONS



							EmiR5 2018.09.26	PSA-ESCI 2019.05.10
Wor	rk Order:	DROP0010	Date	: 10-Ju	า-2019			
	Project:	None	Temperature	: 22.	5 °C	AC		
	Job Site:	OC10	Humidity	: 41.99	% RH	/	/	
Serial	Number:	PL1919P10041	Barometric Pres.	: 1018	mbar	Tested by:	Nolan De Ram	105
	EUT:	Jonah						
Config	guration:	1						
Ci	ustomer:	SonicSensory, Inc.						
At	tendees:	Daniel Quiros						
EU	T Power:	110VAC/60Hz						
Operatir	ng Mode:	Low Ch 2402 MHz, M	id Ch 2440 MHz, High	n Ch 2480 N	IHz, 2MHz DI	45		
De	viations:	None						
Co	mments:	Worst Case Duty Cyc DCCF = pi/4-DQPSK From Dwell Time: DC	le: pi/4-DQPSK = 8.7(Tx relaxation of -21.2 CF= 20*LOG (Pulse V	0% dB Vidth 2.9ms	*3(pulses) / 1	00ms) = -21.2dB		
Test Specif	ications				Test Metho	4		
FCC 15 247	10110115				ANSI C63 10	.2013		
Run #	17	Test Distance (m)	3 Antenn	a Height(s)		l to 4(m)	Results	Pass
ittair #	.,			u Holgin(0)			Robulto	1 400
80 —								
70 -								
60								
00								
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50 -								
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o 🕂								
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							📕 PK 🛛 🔶	AV 🗢 QP

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7320.550	37.6	18.4	3.9	75.0	0.0	0.0	Horz	PK	0.0	56.0	74.0	-18.0	Mid Ch, DH5, EUT On Side
7319.020	37.5	18.4	1.0	343.0	0.0	0.0	Vert	PK	0.0	55.9	74.0	-18.1	Mid Ch, DH5, EUT Horz
7441.080	36.9	18.5	2.9	123.0	0.0	0.0	Vert	PK	0.0	55.4	74.0	-18.6	High Ch, DH5, EUT Horz
7441.005	36.6	18.5	1.0	327.0	0.0	0.0	Horz	PK	0.0	55.1	74.0	-18.9	High Ch, DH5, EUT On Side
4880.070	41.7	13.3	1.0	320.0	0.0	0.0	Vert	PK	0.0	55.0	74.0	-19.0	Mid Ch, DH5, EUT Horz
4880.040	41.3	13.3	1.0	20.0	0.0	0.0	Horz	PK	0.0	54.6	74.0	-19.4	Mid Ch, DH5, EUT On Side
4804.000	41.6	12.7	1.0	349.0	0.0	0.0	Vert	PK	0.0	54.3	74.0	-19.7	Low Ch, DH5, EUT Horz
4959.610	40.2	13.5	1.0	7.0	0.0	0.0	Horz	PK	0.0	53.7	74.0	-20.3	High Ch, DH5, EUT On Side
4960.220	40.0	13.5	1.0	298.0	0.0	0.0	Vert	PK	0.0	53.5	74.0	-20.5	High Ch, DH5, EUT Horz
4879.535	39.6	13.3	3.8	360.0	0.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	Mid Ch, DH5, EUT Horz
4879.930	39.5	13.3	1.0	226.0	0.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	Mid Ch, DH5, EUT On Side
4879.750	39.5	13.3	1.0	332.0	0.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	Mid Ch, 2DH5, EUT Horz
4879.750	39.3	13.3	1.0	322.0	0.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	Mid Ch, DH5, EUT Vert
4879.820	39.2	13.3	1.0	332.0	0.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	Mid Ch, 3DH5, EUT Horz
4803.950	39.4	12.7	1.0	12.0	0.0	0.0	Horz	PK	0.0	52.1	74.0	-21.9	Low Ch, DH5, EUT On Side
4878.650	38.3	13.3	1.0	141.0	0.0	0.0	Horz	PK	0.0	51.6	74.0	-22.4	Mid Ch, DH5, EUT Vert
4879.950	35.5	13.3	1.0	320.0	-21.2	0.0	Vert	AV	0.0	27.6	54.0	-26.4	Mid Ch, DH5, EUT Horz
4879.975	32.8	13.3	1.0	20.0	-21.2	0.0	Horz	AV	0.0	24.9	54.0	-29.1	Mid Ch, DH5, EUT On Side
4803.985	33.4	12.7	1.0	349.0	-21.2	0.0	Vert	AV	0.0	24.9	54.0	-29.1	Low Ch, DH5, EUT Horz
12399.200	46.7	-2.7	1.0	75.0	0.0	0.0	Vert	PK	0.0	44.0	74.0	-30.0	High Ch, DH5, EUT Horz

-													
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12199.240	46.4	-2.5	1.0	316.0	0.0	0.0	Vert	PK	0.0	43.9	74.0	-30.1	Mid Ch, DH5, EUT Horz
7319.945	26.5	18.4	3.9	75.0	-21.2	0.0	Horz	AV	0.0	23.7	54.0	-30.3	Mid Ch, DH5, EUT On Side
7320.185	26.5	18.4	1.0	343.0	-21.2	0.0	Vert	AV	0.0	23.7	54.0	-30.3	Mid Ch, DH5, EUT Horz
7439.785	25.9	18.5	1.0	327.0	-21.2	0.0	Horz	AV	0.0	23.2	54.0	-30.8	High Ch, DH5, EUT On Side
4960.010	30.9	13.5	1.0	298.0	-21.2	0.0	Vert	AV	0.0	23.2	54.0	-30.8	High Ch, DH5, EUT Horz
7439.540	25.8	18.5	2.9	123.0	-21.2	0.0	Vert	AV	0.0	23.1	54.0	-30.9	High Ch, DH5, EUT Horz
4959.970	30.6	13.5	1.0	7.0	-21.2	0.0	Horz	AV	0.0	22.9	54.0	-31.1	High Ch, DH5, EUT On Side
12399.220	45.5	-2.7	1.0	116.0	0.0	0.0	Horz	PK	0.0	42.8	74.0	-31.2	High Ch, DH5, EUT On Side
12199.420	45.0	-2.5	1.0	82.0	0.0	0.0	Horz	PK	0.0	42.5	74.0	-31.5	Mid Ch, DH5, EUT On Side
12009.180	46.2	-3.7	1.0	21.0	0.0	0.0	Vert	PK	0.0	42.5	74.0	-31.5	Low Ch, DH5, EUT Horz
4879.920	30.1	13.3	3.8	360.0	-21.2	0.0	Horz	AV	0.0	22.2	54.0	-31.8	Mid Ch, DH5, EUT Horz
4804.020	30.6	12.7	1.0	12.0	-21.2	0.0	Horz	AV	0.0	22.1	54.0	-31.9	Low Ch, DH5, EUT On Side
4880.060	29.8	13.3	1.0	322.0	-21.2	0.0	Vert	AV	0.0	21.9	54.0	-32.1	Mid Ch, DH5, EUT Vert
12010.730	45.6	-3.7	1.0	328.0	0.0	0.0	Horz	PK	0.0	41.9	74.0	-32.1	Low Ch, DH5, EUT On Side
4879.870	29.4	13.3	1.0	226.0	-21.2	0.0	Vert	AV	0.0	21.5	54.0	-32.5	Mid Ch, DH5, EUT On Side
4880.035	28.9	13.3	1.0	141.0	-21.2	0.0	Horz	AV	0.0	21.0	54.0	-33.0	Mid Ch, DH5, EUT Vert
4880.045	29.0	13.3	1.0	332.0	-21.2	0.0	Vert	AV	0.0	20.7	54.0	-33.3	Mid Ch, 2DH5, EUT Horz
4879.955	28.9	13.3	1.0	332.0	-21.2	0.0	Vert	AV	0.0	20.4	54.0	-33.6	Mid Ch, 3DH5, EUT Horz
12399.250	38.7	-2.7	1.0	75.0	-21.2	0.0	Vert	AV	0.0	14.8	54.0	-39.2	High Ch, DH5, EUT Horz
12199.270	38.2	-2.5	1.0	316.0	-21.2	0.0	Vert	AV	0.0	14.5	54.0	-39.5	Mid Ch, DH5, EUT Horz
12010.670	38.1	-3.7	1.0	21.0	-21.2	0.0	Vert	AV	0.0	13.2	54.0	-40.8	Low Ch, DH5, EUT Horz
12399.310	36.6	-2.7	1.0	116.0	-21.2	0.0	Horz	AV	0.0	12.4	54.0	-41.6	High Ch, DH5, EUT On Side
12199.290	37.1	-2.5	1.0	82.0	-21.2	0.0	Horz	AV	0.0	11.3	54.0	-42.7	Mid Ch, DH5, EUT On Side
12010.630	36.2	-3.7	1.0	328.0	-21.2	0.0	Horz	AV	0.0	11.3	54.0	-42.7	Low Ch, DH5, EUT On Side

SPURIOUS RADIATED EMISSIONS





Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	
()										<u> </u>			Comments
2483.510	38.0	3.4	3.2	12.0	0.0	20.0	Horz	PK	0.0	61.4	74.0	-12.6	High Ch, DH5, EUT Vert
2484.793	37.6	3.4	1.0	246.0	0.0	20.0	Vert	PK	0.0	61.0	74.0	-13.0	High Ch, DH5, EUT Horz
2483.650	37.6	3.4	1.0	246.0	0.0	20.0	Vert	PK	0.0	61.0	74.0	-13.0	High Ch, 2DH5, EUT Horz
2484.100	37.5	3.4	1.0	177.0	0.0	20.0	Horz	PK	0.0	60.9	74.0	-13.1	High Ch, 3DH5, EUT On Side
2485.063	37.5	3.4	1.0	111.0	0.0	20.0	Vert	PK	0.0	60.9	74.0	-13.1	High Ch, DH5, EUT Vert
2388.083	37.6	3.2	1.0	246.0	0.0	20.0	Vert	PK	0.0	60.8	74.0	-13.2	Low Ch, DH5, EUT Horz
2389.280	37.6	3.2	1.0	246.0	0.0	20.0	Vert	PK	0.0	60.8	74.0	-13.2	Low Ch, 2DH5, EUT Horz
2483.897	37.4	3.4	1.0	177.0	0.0	20.0	Horz	PK	0.0	60.8	74.0	-13.2	High Ch, DH5, EUT On Side
2388.267	37.5	3.2	1.0	177.0	0.0	20.0	Horz	PK	0.0	60.7	74.0	-13.3	Low Ch, DH5, EUT On Side
2388.943	37.5	3.2	1.0	246.0	0.0	20.0	Vert	PK	0.0	60.7	74.0	-13.3	Low Ch, 3DH5, EUT Horz
2483.970	37.2	3.4	1.0	246.0	0.0	20.0	Vert	PK	0.0	60.6	74.0	-13.4	High Ch, 3DH5, EUT Horz
2484.793	37.1	3.4	1.0	177.0	0.0	20.0	Horz	PK	0.0	60.5	74.0	-13.5	High Ch, 2DH5, EUT On Side
2388.200	37.3	3.2	1.0	177.0	0.0	20.0	Horz	PK	0.0	60.5	74.0	-13.5	Low Ch, 2DH5, EUT On Side
2483.553	37.0	3.4	1.0	6.0	0.0	20.0	Vert	PK	0.0	60.4	74.0	-13.6	High Ch, DH5, EUT On Side
2484.047	36.9	3.4	1.0	27.0	0.0	20.0	Horz	PK	0.0	60.3	74.0	-13.7	High Ch, DH5, EUT Horz
2483.793	26.4	3.4	1.0	246.0	-21.2	20.0	Vert	AV	0.0	28.6	54.0	-25.4	High Ch, DH5, EUT Horz
2483.753	26.4	3.4	1.0	177.0	-21.2	20.0	Horz	AV	0.0	28.6	54.0	-25.4	High Ch, DH5, EUT On Side
2483.687	26.4	3.4	1.0	6.0	-21.2	20.0	Vert	AV	0.0	28.6	54.0	-25.4	High Ch, DH5, EUT On Side
2483.907	26.4	3.4	3.2	12.0	-21.2	20.0	Horz	AV	0.0	28.6	54.0	-25.4	High Ch, DH5, EUT Vert
2484.243	26.3	3.4	1.0	27.0	-21.2	20.0	Horz	AV	0.0	28.5	54.0	-25.5	High Ch, DH5, EUT Horz
2484.887	26.3	3.4	1.0	111.0	-21.2	20.0	Vert	AV	0.0	28.5	54.0	-25.5	High Ch, DH5, EUT Vert
2388.363	26.3	3.2	1.0	246.0	-21.2	20.0	Vert	AV	0.0	28.3	54.0	-25.7	Low Ch, DH5, EUT Horz

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2389.737	26.3	3.2	1.0	177.0	-21.2	20.0	Horz	AV	0.0	28.3	54.0	-25.7	Low Ch, DH5, EUT On Side
2484.177	26.4	3.4	1.0	246.0	-21.2	20.0	Vert	AV	0.0	28.6	54.0	-25.8	High Ch, 2DH5, EUT Horz
2483.947	26.3	3.4	1.0	177.0	-21.2	20.0	Horz	AV	0.0	28.5	54.0	-25.9	High Ch, 2DH5, EUT On Side
2388.450	26.5	3.2	1.0	246.0	-21.2	20.0	Vert	AV	0.0	28.5	54.0	-25.9	Low Ch, 2DH5, EUT Horz
2483.880	26.4	3.4	1.0	246.0	-21.2	20.0	Vert	AV	0.0	28.6	54.0	-26.0	High Ch, 3DH5, EUT Horz
2484.483	26.3	3.4	1.0	177.0	-21.2	20.0	Horz	AV	0.0	28.5	54.0	-26.1	High Ch, 3DH5, EUT On Side
2388.363	26.3	3.2	1.0	177.0	-21.2	20.0	Horz	AV	0.0	28.3	54.0	-26.1	Low Ch, 2DH5, EUT On Side
2388.647	26.4	3.2	1.0	246.0	-21.2	20.0	Vert	AV	0.0	28.4	54.0	-26.2	Low Ch, 3DH5, EUT Horz

DUTY CYCLE



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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-18	13-Jun-19
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

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

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

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

CARRIER FREQUENCY SEPARATION



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
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-18	13-Jun-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The channel carrier frequencies in the 2400-2483.5MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Or, if the output power is less than 125 mW, the channel separation can be 25 kHz or 2/3 of the 20dB bandwidth. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.

CARRIER FREQUENCY SEPARATION



					TbtTx 2018.09.13	XMit 2019.05.15
EUT:	Jonah			Work Order:	DROP0009	
Serial Number:	PL1919P10034			Date:	6-Jun-19	
Customer:	SonicSensory, Inc.			Temperature:	24.5 °C	
Attendees:	Daniel Quiros			Humidity	47.2% RH	
Project:	None			Barometric Pres.:	1016 mbar	
Tested by:	Salvador Solorzano	Power:	110VAC/60Hz	Job Site:	OC13	
TEST SPECIFICAT	ONS		Test Method			
FCC 15.247:2019			ANSI C63.10:2013			
COMMENTS			-			
DC Block + 20dB a	tenuator + Coax Cable + patch cable = 24.07 dB Tot	al Offset				
DEVIATIONS FROM	I TEST STANDARD					
None						
Configuration #	3 Signature	Malto	Sa			
					Limit	
				Value	(≥)	Results
Hopping Mode (All C	hannels)					

DH5, GFSK Mid Channel, 2440 MHz

1.0 MHz 1 MHz Pass

CARRIER FREQUENCY SEPARATION





NUMBER OF HOPPING FREQUENCIES



XMit 2019.05.15

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
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-18	13-Jun-19
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The number of hopping frequencies was measured across the authorized band. The hopping function of the EUT was enabled.

NUMBER OF HOPPING FREQUENCIES



TbtTx 2018.09.1 XMit 2019 05 1 Work Order: DROP0009 Date: 6-Jun-19 Temperature: 24.5 °C EUT: Jonah Serial Number: PL1919P10034 Customer: SonicSensory, Inc Attendees: Daniel Quiros Project: None Tested by: Salvador Solorzano TEST SPECIFICATIONS Humidity: 47.2% RH Barometric Pres.: 1016 mbar Job Site: OC13 Power: 110VAC/60Hz Test Method ANSI C63.10:2013 FCC 15.247:2019 COMMENTS DC Block + 20dB attenuator + Coax Cable + patch cable = 24.07 dB Total Offset DEVIATIONS FROM TEST STANDARD None En Mill Configuration # 3 Signature Limit Number of Results Channels (≥) Hopping Mode (All Channels) DH5, GFSK

Mid Channel, 2440 MHz

15 Pass

79

NUMBER OF HOPPING FREQUENCIES







XMit 2019.05.15

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	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-18	13-Jun-19
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The hopping function of the EUT was enabled.

The dwell time limit is based on the Number of Hopping Channels * 400 mS. For Bluetooth this would be 79 Channels * 400mS = 31.6 Sec.

On Time During 31.6 Sec = Pulse Width * Average Number of Pulses * Scale Factor

>Average Number of Pulses is based on 4 samples.

Scale Factor = 31.6 Sec / Screen Capture Sweep Time = 31.6 Sec / 6.32 Sec = 5



								TbtTx 2018.09.13	XMit 2019.05.15
EUT	Jonah						Work Order:	DROP0009	
Serial Number	: PL1919P10034						Date: 6	S-Jun-19	
Customer	SonicSensory, Inc.						Temperature: 2	24.5 °C	
Attendees	Daniel Quiros						Humidity: 4	17.2% RH	
Project	None						Barometric Pres.: 1	1016 mbar	
Tested by	: Salvador Solorzano		Power:	110VAC/60Hz			Job Site: 0	OC13	
TEST SPECIFICAT	TIONS			Test Method					
FCC 15.247:2019				ANSI C63.10:2013					
COMMENTS									
DC Block + 20dB a	attenuator + Coax Cable +	patch cable = 24.07 dB ⁻	Fotal Offset						
DEVIATIONS FRO	M TEST STANDARD								
None									
Configuration #	3	Sianature	142	Sa					
		<u> </u>	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
			(ms)	Pulses	of Pulses	Factor	During 31.6 s	(ms)	Results
Hopping Mode (All	Channels)								
	DH5, GFSK								
	Mid Channel,	2441 MHz	2.87	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	N/A	22	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	N/A	22	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	N/A	22	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	N/A	22	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	2.87	N/A	22	5	315.7	400	Pass
	2DH5, pi/4-DQPSK								
	Mid Channel,	2441 MHz	2.889	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	N/A	22	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	N/A	22	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	N/A	22	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	N/A	22	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHz	2.889	N/A	22	5	317.79	400	Pass
	3DH5, 8-DPSK	0444 MUL	0.005	N1/A	N1/A	N1/A	N1/A	N1/A	N1/A
	Mid Channel,	2441 MHZ	2.895	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel,	2441 MHZ	N/A	22	N/A	N/A	N/A	N/A	N/A
	Mid Channel,		N/A	22	IN/A	IN/A	IN/A	IN/A	IN/A
	Mid Channel,	2441 MHZ	N/A	22	N/A	N/A	N/A	N/A	N/A
	Wid Channel,		IN/A	22	IN/A	IN/A	IN/A	IN/A	IN/A
	ivila Channel,		2.095	IN/A	22	Э	310.40	400	Pass



		н	opping	Mode (All Chann	nels) DH5	GESK	Mid Cha	nnel 24	141 MHz		
	Pulse Width	Numbe	er of	Average No.	Scale	e. e	On Time	e (ms)	Limit		
	(ms)	Pulse	es	of Pulses	Facto	r	During	31.6 s	(ms)		Results
	2.87	N/A		N/A	N/A		N/A	Ą	N/A		N/A
Ki	eysight Spectrum Analy	zer - Element Mate	rials Techn	nology	NSE:INT	1)FF		09:2	2:54 AM Jun 07, 2019
				PNO: Fast 🖵 IFGain:Low	Trig Delay- Trig: Video #Atten: 10 c	1.000 m IB	s #A Av	vg Type: g Hold: 8	: Log-Pwr 30/100		TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P P
5 dE Log	Ref Off Ref 24	set 24.07 dB I.00 dBm								ΔMki	1 2.870 ms -0.824 dB
19.0											
14.0								140			
9.00		Xout	A.4.06.1.0.1	al destroyed a set hars and	b I a set I at soch	to and he		1Δ2			
4.00		T KATA	ale autor la	an haad ahaad a	ואריקיייקיייקיייקיייקיי	rvaviyiii	"Y**TY V/*"Y				
-1.00											
-6.00											
-11.0											
-16.0											
-21.0											
Cer Res	ter 2.4400000 BW 300 kHz	000 GHz		#VBW	30 kHz				Sweep	6.130	Span 0 Hz ms (2000 pts)
MSG							S	TATUS			
		Н	opping	Mode (All Chann	nels), DH5,	GFSK	, Mid Cha	nnel, 24	141 MHz		
	Pulse Width	Numbe	er of	Average No.	Scale	9	On Time	e (ms)	Limit		
	(ms)	Pulse	es	of Pulses	Facto	r	During	31.6 s	(ms)	-	Results
	N/A	22		N/A	N/A		N/#	4	N/A		N/A





				Hopping	g Mode	(All Char	nnels), l	DH5, GFS	K, Mid	Channel, 2	441 MHz			
	Pul	se Width	Nun	nber of	Ave	age No.	_	Scale	On 1	ime (ms)	Lir	nit	_	
		(ms)	Pu	lises	of	Pulses	1	actor	Duri	ng 31.6 s	(m	is)	Re	sults
		N/A		22		N/A		N/A		N/A	N	/A		N/A
E K	eysight Sp	ectrum Analy RF	zer - Element I	Materials Tech	inology		SENSE INT		۵ ۵۱	IGN OFF			09:24:2	0 AM lun 07, 2019
		14	10030 110				Trig C	elay-50.00	ms	#Avg Type	: Log-Pwr		TI	RACE 1 2 3 4 5 (
					PNO: IFGain	Fast 🖵	#Atter	/ideo 1: 10 dB						DET PPPPP
5 dE	3/div	Ref Off	set 24.07 d 1.00 dBn	1B 1										
Log				-										
19.1	J													
1.4.0														
14.0	,													
9.00	1													
0.00														
4.00)													
-1.00		_			_									
-6.00		-			_									
-11.0					-		-							
														TRIG L VI
-16.0														
24.0														
-21.0														
								1						
Cer	nter 2.	440000	000 GHz					-					c 000	Span 0 Hz
Res	SBW 3	300 KHZ				#VB	AV JU K	HZ				sweep	6.320	s (8192 pts,
MSG										STATUS				
_		_	_	Honning	n Modo		nole) I		K Mid	hannel 2				
	Pul	se Width	Nun	nber of	Ave	age No.	ineis), I	Scale	On 1	ime (ms)	∠⊓ıvı ı ⊷⊷. Lir	nit		
		(ms)	Pu	ulses	of	Pulses	F	actor	Duri	ng 31.6 s	(m	ns)	Re	sults
		NI/A		22		N/A		N/A		N/A	Ň	/A		N/A

鱦 Keysight Sp	ectrum Analyzer - Element N	Aaterials Techno	ology												J X
LXI RL	RF 50 Ω AC			SE	NSE:INT		AL1	IGN OFF		_		C	9:24:44	AM Jun 0	7,2019
	_		PNO: Fast IFGain:Low	P	Trig Dela Trig: Vide #Atten: 1	y-50.00 ms eo 0 dB		#Avg I	ype: L	.og-Pwr			T	ACE 1 2 YPE WV DET P P	3456 WWWW PPPP
5 dB/div	Ref Offset 24.07 d Ref 24.00 dBm	В													
19.0															
14.0															
9.00															
4.00															
-1.00															
-6.00															
-11.0															
-16.0 =															IRIG LVI.
-21.0						<u>_</u> 1									
Center 2. Res BW 3	440000000 GHz 300 kHz		#\	вw	30 kHz					_	Swee	ep 6.	320 s	Span (819	0 Hz 2 pts)
MSG								STATUS	6						



Puise Width	Number of	Average No.	Scale	On Time (ms)	Limit	Beaulto
(IIIS) N/A	22	N/A		During 31.6 S	(ms) N/A	N/A
11/73	22	11/73	N/A	11/73	19/7	19/75
We wight Construct And and	Flow and Materials Tax	hand have				
Keysight Spectrum Analyzer	50 Ω AC	S	ENSE:INT	ALIGN OFF		09:24:59 AM Jun 07, 20
			Trig Delay-50.00 m	s #Avg Type	: Log-Pwr	TRACE 1 2 3 4
		PNO: Fast	#Atten: 10 dB			DET PPPP
5 dB/div Ref Offse	t24.07 dB)0 dBm					
Log						
19.0						
14.0						
9.00						
4.00						
1.00						
-1.00						
-6.00						
0.00						
-11.0						
-16.0						TRIG I
-21.0						
			1			
Center 2 4400000	0 GHZ					Span 0 l
Res BW 300 kHz		#VBV	V 30 kHz		Sweep	6.320 s (81 <u>92 p</u>
MSG				STATUS		

	Hopping	wode (All Chann	ieis), Dho, Gror	, iviid Channel, 24	441 MHZ	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 31.6 s	(ms)	Results
0.07	N1/A	22	F	215 7	400	Deee

Calculation Only

No Screen Capture Required



		Lissoine Ma			DOK Mid Channel			
	Pulse Width	Number of	Average No), ZDH5, pi/4-DG Scale	On Time (ms)	, 2441 IVIHZ		
	(me)	Pulses	of Pulses	Factor	During 31.6 s	(ms)	Results	
	2 889	N/A	N/A	N/A	N/A	N/A	N/A	
	2.000	14/7	14/7	14/7	14/1	14/7	14/7	
	in the Country And Inc.	Flow and Materials Tasks						
	RL RF	50 Ω AC	SE	NSE:INT	ALIGN OFF		09:38:04 AM Jun 07, 2019	
				Trig Delay-1.000 r	ns #Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6	1
			PNO: Fast	#Atten: 10 dB	Avg Hold: 9	9/100	DET PPPPF	
			in Guineon				AMkr1 2 889 ms	
5 df	Ref Offse	t 24.07 dB					-3.313 dB	
Log	Sidiv Rei 22.0					1		
17.								
12.	□							
7.0) ———————	-X						
		1	n 4					
2.0			Mth. whter where w	I would a way & south I	with a million			
		IN WAY IN SHARE	NAMA AMANAA I	(million) yearing	AN VERMIN			
-3.00		_	. AL PULLAY					
-8.00								
-13.0								
-18.0							TRIG LVL	
-23.0								
Cer	nter 2.44000000	0 GHz					Span 0 Hz	
Res	S BW 300 KHz		#VBN	30 KHZ		Sweep	6.130 ms (2000 pts)	L
MSG					STATUS			
		Hopping Mo	de (All Channels), 2DH5, pi/4-DC	PSK, Mid Channel	, 2441 MHz		
	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit		
	(ms)	Pulses	of Pulses	Factor	During 31.6 s	(ms)	Results	
1	N/A	22	N/A	N/A	N/A	N/A	N/A	

	Hopping Mo	de (All Channels)	, 2DH5, pi/4-DQ	PSK, Mid Channe	l, 2441 MHz	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 31.6 s	(ms)	Results
N/A	22	N/A	N/A	N/A	N/A	N/A

🎉 Keysight S	pectrum Ar	alyzer - Elemer	nt Material	s Technolo	ogy				a da anti-										ð X
LXI RL	RF	<u>50 Ω</u>	AC				SENS	INT	av-5(0 00 ms	<u>∧</u> AL	IGN OFF	Type:	l og-Pv	<i>IT</i>		09:38:58	AM Jun	07,2019
					PNO: Far FGain:Lo	st 🖵	т #	rig: Vid Atten:	leo 10 di	3		#Avg	rype.	Log-r				TYPE W DET P F	PPPPP
5 dB/div	Ref C Ref)ffset 24.07 2 2.00 dB	′dB m																
209																			
17.0																			
12.0																			
12.0																			
7.00						i													
2.00																			
2.00																			
-3.00																			
-8.00																			
-13.0																			
-18.0 =																			TRIG LVI.
-23.0																			
									\downarrow										
Center 2 Res BW	.44000 300 kH	0000 GH z	Z			#VB	W 3	0 kHz	,						Swe	ep 6	.320 s	spar s (819	2 pts)
MSG												STATU	IS						



				Норр	oing Mo	ode (All	Channe	s), 2D	0H5, pi	/4-DG	PSK, I	Mid Cha	nnel,	2441 I	MHz			
	Puls	e Widt	h	Numb	er of	Aver	age No.		Scal	e	On T	Fime (m	is)	Li	mit ne)		Pocult	e
Г		N/A		22	63		N/A		N/A	<u>,</u>	Dun	N/A		N	1/A		N/A	.5
																		•
📜 Key	sight Spe	ectrum Ana	ilyzer - E	lement Mat	erials Tech	nology												d C
LXI RL		RF	50	Ω AC				SENSE:II	v⊺∣ j Delay-	-50.00 r	AL NS	IGN OFF #Avg T	ype: L	og-Pwi	r	09	:39:18 AM J TRACE	lun 07, 2019
						PNO:	Fast 🖵	Trig #At	: Video	dB							TYPE DET	WWWWWW PPPPP
		5.60		4.07 .10		II Guili	and the second											
5 dB/	div	Ref 0	2.00	dBm				00004044000004044										
17.0																		
12.0																		
7.00																		
2.00 -					_													
-3.00																		
-3.00																		
-8.00											_	_						
-13.0 -																		
-18.0					_				_									TRIG LVI.
-23.0																		
										1								
Cent	er 2.4	40000	0000	GHz			#\/B	A/ 30	kH7						Swaa	n 63	Sp	an 0 Hz
MSG		00 MHZ					D		wi 1/2			STATUS	5		emele	p 0.0	20 3 (0	192 pts)
				Норр	oing Mo	ode (All	Channe	s), 2D	H5, pi	/4-DQ	PSK, I	Mid Cha	nnel,	2441 I	MHz			
	Puls	e Widt	h	Numb	er of	Aver	age No.		Scal	e	On T	Fime (m	is)	Li	mit ne)		Pocult	e
Г		N/A		22	63		N/A		N/A		Duri	N/A	3	(I 	1/A		N/A	

RL RF 50 Ω AC	PNO: Fast IFGain:Low	Trig Delay-50.00 ms Trig: Video #Atten: 10 dB	ALIGN OFF #Avg Type: Log-Pwr	09:39:40 AM Jun 07, 2019 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P
Ref Offset 24.07 dB				
pg				
7.0				
20				
2.0				
00				
00				
.0				
.0				
		1		Chan O Ha



Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	Posulto
(IIIS) N/A	22	N/A	N/A	N/A	N/A	N/A
11/7	22	N/A	11/74	IN/A	11/74	19/73
Keysight Spectrum Analyze	r - Element Materials Tech	pology			ante dance dance dance dance d	
XI RL RF	50 Ω AC	SEN	ISE:INT	ALIGN OFF		09:40:15 AM Jun 07, 201
		BNO: Fast	Trig Delay-50.00 m Trig: Video	s #Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 TYPE WWWWM
		IFGain:Low	#Atten: 10 dB			DET PPPP
Ref Offse 5 dB/div Ref 22.	et 24.07 dB 00 dBm					
Log						
17.0						
12.0						
7.00						
2.00						
-3.00						
-8.00						
-13.0						
-18.0						TRIG L
1010						
-23.0						
Center 2,4400000	0 GHz					Span 0 H
Res BW 300 kHz		#VBW	30 kHz		Sweep	6.320 s (8192 pt
MSG				STATUS		

	Hopping Mc	de (All Channels)), 2DH5, pi/4-DQ	PSK, Mid Channe	I, 2441 MHZ	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 31.6 s	(ms)	Results
	1					_

Calculation Only

No Screen Capture Required



P	ulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	Baculta
	2 895	N/A	N/A	N/A	N/A	N/A	N/A
Keysight K	Spectrum Analyzer	- Element Materials Techr 50 Ω AC 24.07 dB	PNO: Fast F IFGain:Low	NSE:INT Trig Delay-1.000 n Trig: Video #Atten: 10 dB	ALIGN OFF as #Avg Type: Avg Hold: 7(_og-Pwr //100	09:42:34 AM Jun 07, 2019 TRACE 2 3 4 5 с ТУРЕ МУЖУРИ DET P P P P P P AMkr1 2.895 ms
5 dB/div Log	Ref 22.0	0 dBm					-1.188 aB
17.0							
12.0							
7.00		X12					
-3.00				MAN MAN	The Area		
-8.00				·			
-13.0							
-18.0							
-23.0							
Center Res BW	2.44000000 / 300 kHz	0 GHz	#VBW	30 kHz		Sweep	Span 0 Hz 6.130 ms (2000 pts)
MSG					STATUS		

Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 31.6 s	(ms)	Results
N/A	22	N/A	N/A	N/A	N/A	N/A

🊺 Key	/sight Spe	ctrum Ar	alyzer - Ele	ement Ma	terials T	echnology														J. X
L <mark>XI</mark> RI	L	RF	50 S	2 AC				5	ENSE:IN	T Delav.	50.00	ALI (SN OFF	Type:	Log-Pv	wr		09:43:24	AM Jun	07,2019
						PN IFGa	D: Fast ain:Low	Ģ	Trig: #Atte	Video en: 10	dB		mug	, ype.	Logiii					PPPPP
5 dB/	div	Ref (Ref	offset 24 22.00	1.07 dB dBm	;															
LUg																				
17.0																				
12.0																				
7.00																	1			
2.00								_	_											
-3.00																				
-8.00									_											
-13.0																				
-18.0																				TRIG LVI.
-23.0																				
											1									
Cent	ter 2.4	4000	0000	GHz	4											A		000	Spar	n 0 Hz
Res	BW 3	UU KH	Z				#	VEV	7 30 H	κHZ			STATU	S		Swe	ep 6	.320 9	s (819	2 pts)
mod													UNAID			121212				



P	ulse Wid (ms)	lth N	umber of Pulses	Avera of F	age No. Pulses	S Fa	cale actor	(On Tir During	ne (ms) g 31.6 s	L (_imit (ms)		Res	sults	
	N/A		22	1	N/A	I	N/A		Ν	I/A		N/A		N	I/A	
Keysight	t Spectrum An	halyzer - Eleme	ent Materials Tech	nology	5	NSEINT			A ALIG	N OFF				00-43-30	AM Jup 0	7 2010
N.L.	N	50 32			50	Trig De	lay-50.0	0 ms	;	#Avg Type	: Log-Pv	vr		TR	ACE 2	3456
				PNO: F IFGain:	ast 🖵 Low	Trig: Vi #Atten:	deo 10 dB								DET P P	PPPP
	Pof	offect 24.0	7 48													
5 dB/div	Ref	22.00 dE	3m													
17.0																
12.0																
7.00			1								1					
2.00																
3.00																
0.00																
-8.00						_										
-13.0																
-16.0																
-23.0																
Contor	2 4 4 0 0 0						_ ↓1,			l l	.				Enon	0 117
Res BW	/ 300 kH	iz	12		#VBW	/ 30 kH	z					Swee	ep 6.	.320 s	3pan ; (819)	2 pts)
ISG										STATUS						
_			Hopping	Mode (A	II Channe	els), 3DI	15, <mark>8-</mark> D	PSK	, Mid (Channel,	2441 N	1Hz				
P	ulse Wid	ith N	umber of	Avera	age No.	S	cale		On Tir	ne (ms)	L	_imit		Dec		
	(ms)		22	A TO		Fa			uring	g 31.6 S		I ΠS) N/Δ	Т	Kes	SUITS	

🚺 Keysight Sp	E Keysight Spectrum Analyzer - Element Materials Technology													
LXI RL	RF 50 Ω AC			SEI	VSE:INT	/-50 00 n		HAVE T	vpe [•]	og-Pwr	09:44:0 T	2 AM Jun 07, 2019		
	_	I	PNO: Fast ⊂ FGain:Low	P	Trig: Vide #Atten: 10	o) dB			, p.c. 1	-og i m		TYPE WWWWWW DET PPPPPP		
5 dB/div	Ref Offset 24.07 dE Ref 22.00 dBm	В									1			
17.0														
12.0														
7.00														
2.00														
-3.00														
-8.00							_							
-13.0							_							
-18.0							-					TRIG LVI.		
-23.0														
Center 2.4	440000000 GHz		#1	DIA	30 647	1				Sw/	an 6.320	Span 0 Hz		
MSG			#V	-144	30 KH2			STATUS		SWE	-ep 0 .320	s (8192 pts)		



Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	Beculto
(IIIS) N/A	22	N/A	N/A	N/A	N/A	N/A
14/7	LL	10/1	10/7	10/1	14/7	10/1
Keysight Spectrum Analyzer	- Element Materials Tech	nology				
X RL RF 5	0Ω AC	SEN	SE:INT	ALIGN OFF	Log-Pwr	09:44:16 AM Jun 07, 2019
		PNO: Fast 🖵 IFGain:Low	Trig: Video #Atten: 10 dB	is #Avg type.	Log-r wi	TYPE WWWWWW DET PPPPP
Ref Offset 5 dB/div Ref 22.0	24.07 dB 0 dBm					
_0g						
17.0						
12.0						
7.00						
7.00						
2.00						
-3.00						
-8.00						
-13.0						
-18.0						TRIG LVI
22.0						
-23.0						
			1			
Center 2.44000000 Res BW 300 kHz	U GHZ	#VBW	30 kHz		Sweep	Span 0 Hz 6.320 s (8192 pts
MSG				STATUS		

		nopping i	noue (All Channe	IS), SUND, O-DP3	SK, Mild Channel,		
l	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
	(ms)	Pulses	of Pulses	Factor	During 31.6 s	(ms)	Results
	2 905	N1/A	22	F	210 AE	400	Page

Calculation Only

No Screen Capture Required



Cal. Due 20-Dec-19

3-Jan-20

NCR

15-Feb-21 2-Jul-20

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.	
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	2-Jul-19	

TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

The method found in ANSI C63.10:2013 Section 7.8.5 was used for a FHSS radio.



					TbtTx 2018.09.13	XMit 2019.06.11
EUT:	Jonah			Work Order:	DROP0009	
Serial Number:	PL1919P10034			Date:	21-Aug-19	
Customer:	SonicSensory, Inc.			Temperature:	23.8 °C	
Attendees:	Daniel Quiros			Humidity:	46.7% RH	
Project:	None			Barometric Pres.:	1014 mbar	
Tested by:	Johnny Candelas		Power: 110VAC/60Hz	Job Site:	OC13	
TEST SPECIFICATI	IONS		Test Method			
FCC 15.247:2019			ANSI C63.10:2013			
COMMENTS						
DC Block + 20 dB a	attenuator + Coax Cable + pa	atch cable = 24.07 dB Total Offset				
DEVIATIONS FROM	M TEST STANDARD					
None						
			1			
Configuration #	3		a dela			
Configuration #	3	Signature	as N. Coller			
Configuration #	3	Signature	as D. Coller	Out Pwr	Limit	
Configuration #	3	Signature	e d. later	Out Pwr (dBm)	Limit (dBm)	Result
Configuration # DH5, GFSK	3	Signature	es d. latter	Out Pwr (dBm)	Limit (dBm)	Result
Configuration # DH5, GFSK	3 Low Channel	Signature	es d. lather	Out Pwr (dBm) -0.047	Limit (dBm) 21	Result Pass
Configuration # DH5, GFSK	3 Low Channel Mid Channel	Signature	e d. later	Out Pwr (dBm) -0.047 0.89	Limit (dBm) 21 21	Result Pass Pass
Configuration #	3 Low Channel Mid Channel High Channel	Signature	er d. latter	Out Pwr (dBm) -0.047 0.89 1.715	Limit (dBm) 21 21 21 21	Result Pass Pass Pass Pass
Configuration # DH5, GFSK 2DH5, pi/4-DQPSK	3 Low Channel Mid Channel High Channel	Signature	es d. latter	Out Pwr (dBm) -0.047 0.89 1.715	Limit (dBm) 21 21 21 21	Result Pass Pass Pass Pass
Configuration # DH5, GFSK 2DH5, pi/4-DQPSK	3 Low Channel Mid Channel High Channel Low Channel	Signature	e d. later	Out Pwr (dBm) -0.047 0.89 1.715 -1.043	Limit (dBm) 21 21 21 21 21	Result Pass Pass Pass Pass
Configuration # DH5, GFSK 2DH5, pi/4-DQPSK	3 Low Channel Mid Channel High Channel Low Channel Mid Channel	Signature	e d. later	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299	Limit (dBm) 21 21 21 21 21 21	Result Pass Pass Pass Pass Pass
Configuration # DH5, GFSK 2DH5, pi/4-DQPSK	3 Low Channel High Channel Low Channel Mid Channel High Channel	Signature	e d. later	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635	Limit (dBm) 21 21 21 21 21 21 21	Result Pass Pass Pass Pass Pass Pass
Configuration # DH5, GFSK 2DH5, pi/4-DQPSK 3DH5, 8-DPSK	3 Low Channel Mid Channel High Channel Low Channel Mid Channel High Channel	Signature	e d. later	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635	Limit (dBm) 21 21 21 21 21 21 21 21 21	Result Pass Pass Pass Pass Pass Pass
Configuration # DH5, GFSK 2DH5, pi/4-DQPSK 3DH5, 8-DPSK	3 Low Channel Mid Channel High Channel Low Channel High Channel Low Channel	Signature	e d. later	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635 -0.638	Limit (dBm) 21 21 21 21 21 21 21 21 21	Result Pass Pass Pass Pass Pass Pass Pass
Configuration # DH5, GFSK 2DH5, pi/4-DQPSK 3DH5, 8-DPSK	3 Low Channel Mid Channel High Channel Low Channel High Channel Low Channel Mid Channel	Signature	Le d. later	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635 -0.638 -1.132	Limit (dBm) 21 21 21 21 21 21 21 21 21	Result Pass Pass Pass Pass Pass Pass Pass
Configuration # DH5, GFSK 2DH5, pi/4-DQPSK 3DH5, 8-DPSK	3 Low Channel Mid Channel High Channel Mid Channel High Channel Low Channel Mid Channel Mid Channel High Channel	Signature	e d. later	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635 -0.638 -1.132 0.074	Limit (dBm) 21 21 21 21 21 21 21 21 21 21	Result Pass Pass Pass Pass Pass Pass Pass Pas



		C	0H5, GFSK, Low	Channe	el		
					Out Pwr	Limit	Deset
					(dBm)	(dBm)	Result
					-0.047	21	F 855
📜 Keysight Spectrum	n Analyzer - Element Materials Te	chnology					
LXI RL I	RF 50 Ω AC		SENSE:INT	4	ALIGN OFF	-Log-Pwr	07:05:03 AM Aug 22, 2019
		PNO: Fast ↔ IFGain:Low	⊶ Trig: Free Ru #Atten: 10 dB	n	Avg Hold:	100/100	TYPE M WWWWW DET P P P P P
5 dB/div R	ef Offset 24.07 dB ef 5.00 dBm					Mkr1	2.402 152 GHz -0.047 dBm
				▲1			
0.00				•			
-5.00							
-10.0							
-15.0							
-20.0							
25.0							
-23.0							
-30.0							
-35.0							
-40.0							
Center 2 402	000 GH7						Span 3 000 MHz
#Res BW 1.5	MHz	#VI	BW 5.0 MHz			Sweep 1	.066 ms (1000 pts)
MSG					STATUS		Territoria de la compañía de la comp
		[DH5, GFSK, Mid	Channe	el		
					Out Pwr	Limit	Decult
					(dBm) 0.89	(dBm) 21	Pass
I	L	I	1	1	0.03	21	1 000
🎉 Keysight Spectrur	m Analyzer - Element Materials Te	chnology					
LXI RL I	RF 50 Ω AC		SENSE:INT	4	ALIGN OFF #Avg Type	: Log-Pwr	07:08:01 AM Aug 22, 2019 TRACE 1 2 3 4 5 6
		PNO: Fast 🕂	🛏 🛛 Trig: Free Ru	n	Avg Hold:	100/100	
		IEGaind out	#Atten: 10 dB				

			PNO: IFGai	Fast ↔ n:Low	Trig: Free #Atten: 10	Run dB	Avg Hold: 1	00/100	ï	
5 dB. Log	Re /div Re	f Offset 24.07 di f 6.00 dBm	В					Mk	r1 2.439 0.	797 GHz 890 dBm
1.00					♦ ¹					
-4.00										
-9.00										
-14.0										
-19.0										
-24.0										
-29.0										
-34.0										
-39.0										
Cen	ter 2.440	000 GHz							Span	3.000 MHz
#Re	s BW 1.5	MHz		#VB	W 5.0 MHz			Sweep	1.066 ms	(1000 pts)
MSG							STATUS			



			DH5. GFSK. Hid	ah Cha	nnel		
			-, , ,	5	Out Pwr	Limit	
					(dBm)	(dBm)	Result
					1.715	21	Pass
	•					•	
🚺 Keysight Sp	pectrum Analyzer - Element Materials T	echnology					
CXI RL	RF 50 Ω AC		SENSE:INT			-Log-Pwr	07:10:19 AM Aug 22, 2019
		PNO: Fast IFGain:Low	→ Trig: Free R #Atten: 10 d	lun 1B	Avg Hold:	100/100	TYPE M WWWW DET P P P P P P
	Ref Offset 24.07 dB					Mkr1	2.479 809 GHz
5 dB/div Log	Ref 7.00 dBm	1					1.715 0.611
			1				
2.00							
-3.00							
-8.00							
-13.0							
-18.0							
-23.0							
-28.0							
-33.0							
-38.0							
Center 2	.480000 GHz		I		1		Span 3.000 MHz
#Res BW	1.5 MHz	#	VBW 5.0 MHz			Sweep 1	.066 ms (1000 pts)
MSG							
		20	H5 pi/4-DQPSK	Low	hannel		
		20		., _0 (Out Pwr	Limit	
					(dBm)	(dBm)	Result
					-1 043	21	Pass

🊺 Keysigi	ht Spectrum Analyzer - I	Element Materials	Technology					
LXI RL	RF 50	Ω AC		SENSE:INT	ALIGN OFF	og Dur	07:20:42	AM Aug 22, 2019
			PNO: Fast ↔ IFGain:Low	, Trig: Free Run #Atten: 10 dB	Avg Hold: 10	00/100	ī	TYPE MWWWWW DET PPPPP
5 dB/div	Ref Offset 2 Ref 4.00 (24.07 dB d Bm				Mk	r1 2.401 -1.	798 GHz 043 dBm
				<u> </u>				
-1.00								
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-21.0								
-26.0								
-31.0								
00.0								
-36.U								
-41.0								
Center	2.402000 GH	Z	#VE			Sween	Span	4.000 MHz
MSG	999-2.0 IVIT12		#VE	DT SRUMMA	STATUS	oweep	- NOUVIIIS	(Tobo pis)
		and the second			<u> </u>			



			2DH	5, pi/4-DQPS	K, Mid C	hannel				
						Out Pwr	L	imit		
						(dBm)	(d	Bm)	Result	
						0.299		21	Pass	
🚺 Keysight S	pectrum Analyzer - Ele	ment Materials Technol	ogy							x
l <mark>xi</mark> RL	RF 50 Ω	AC		SENSE:INT		ALIGN OFF #Ava Ty	vpe: Log-Pw	r	07:18:35 AM Aug 22, 2 TRACE	2019
			PNO: Fast ↔ IFGain:Low	Trig: Free #Atten: 10	Run dB	Avg Hol	id: 100/100		TYPE MWWW DET PPPP	PPP
5 dB/div	Ref Offset 24 Ref 5 00 d	.07 dB Bm						Mkr1	2.439 770 G 0.299 dE	Hz 3m
Log				. 1						
0.00				•						
-5.00										
									and the second	
-10.0										~
-15.0										
-20.0										
-25.0										
-30.0										
25.0										
-35.0										
-40.0										
Center 2 #Res BW	.440000 GHz / 2.0 MHz		#VI	BW 6.0 MHz			s	weep 1	Span 4.000 M 066 ms (10 <u>00 p</u>	Hz ots)
MSG										
						()				
			2DH	5, pi/4-DQPS	K, High (Channel				
						Out Pwr	L	imit		
	1	г		-		(dBm)	(d	Bm)	Result	1
						1.635		21	Pass	

📕 Keysight Spectrum Analyzer - El	ement Materials Technology			
(XI RL RF 50 S	2 AC	SENSE:INT	ALIGN OFF	07:15:48 AM Aug 22, 2019
	PNO: Fast ↔ IFGain:Low	. Trig: Free Run #Atten: 10 dB	Avg Hold: 100/100	TYPE MWWWW DET PPPPP
Ref Offset 24 5 dB/div Ref 7.00 d	4.07 dB Bm		MI	kr1 2.479 794 GHz 1.635 dBm
200		↓ ¹		
2.00				
-3.00				
-8.00				
-13.0				
-18.0				
-23.0				
-28.0				
-33.0				
-38.0				
Center 2.480000 GHz #Res BW 2.0 MHz	#VE	W 6.0 MHz	Sweet	Span 4.000 MHz
MSG			STATUS	[10]





LX/ RL RF 50Ω AC	SI	ENSE:INT	ALIGN OFF	07:27:52 AM Aug 22, 2019
	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P P
Ref Offset 24.07 dB 5 dB/div Ref 4.00 dBm			N	/kr1 2.439 982 GHz -1.132 dBm
-1.00		1		
-6.00				
-11.0				
-16.0				
-21.0				
-26.0				
-36.0				
-41.0				
Center 2.440000 GHz	#\/P\		Swo	Span 4.000 MHz
	#VBV		SWe	ep note ms (1000 pts)



	3DF	l5, 8-DPSK, High (Channel		
			Out Pwr	Limit	
			(dBm)	(dBm)	Result
			0.074	21	Pass
Keysight Spectrum Analyzer - Element Materia	als Technology				
XX RL RF 50Ω AC		SENSE:INT	ALIGN OFF		07:30:03 AM Aug 22, 2019
		Trig: Eree Bun	#Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6
	PNO: Fast ++ IFGain:Low	#Atten: 10 dB	Avginoid.	00/100	DETPPPPP
				Mkr	1 2 479 938 GHz
Ref Offset 24.07 dB					0.074 dBm
		<u></u> 1			
0.00					
-5.00					
-10.0					
15.0					
10.0					
-20 D					
20.0					
-25.0					
20.0					
-30.0					
35.0					
49.0					
-40.0					
Center 2.480000 GHz					Span 4.000 MHz
#Res BW 2.0 MHz	#VB	W 6.0 MHz		Sweep	1.066 ms (1000 pts)
MSG			T-STATUS		



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	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	2-Jul-19	2-Jul-20
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21

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. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% emission bandwidth (B) and the transmission pulse duration (T) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The maximum conducted output power was measured using ANSI C63.10, Method SA-1 (RMS detection with the EUT Transmitting at full power throughout each sweep). Note per ANSI C63.10 continuous transmit is defined as operation > 98% duty Cycle.

The spectrum analyzer settings were set per the guidance as well as the following specifics:

RMS Detector

Trace average 100 traces in power averaging mode.

Power was integrated across "B", by using the channel power function of the analyzer.

EIRP = Max Measured Power + Antenna gain (dBi)



							TbtTx 2019.08.02	XMit 2019.06.11			
EUT:	Jonah					Work Order:	DROP0009				
Serial Number:	: PL1919P10034					Date:	21-Aug-19				
Customer:	SonicSensory, Inc.					Temperature:	23.1 °C				
Attendees:	Daniel Quiros					Humidity:	45.2% RH				
Project:	None					Barometric Pres.:	1015 mbar				
Tested by:	Johnny Candelas		Power: 110VAC/60Hz			Job Site:	OC13				
TEST SPECIFICAT	rest specifications Test Method										
FCC 15.247:2019			ANSI C63.10:2013								
COMMENTS											
DC Block + 20 dB a	attenuator + Coax Cable + p	batch cable = 24.07 dB Total Offset									
DEVIATIONS FROM	M TEST STANDARD										
None											
			0 11 001								
	<u>^</u>										
Configuration #	3		er a. Coller								
Configuration #	3	Signature	a d. Coller	Out Dur	Antonno	FIRD	EIDD Limit				
Configuration #	3	Signature	fer a later	Out Pwr	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit	Pocult			
Configuration #	3	Signature	e a. Com	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result			
DH5, GFSK		Signature	er d. Com	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result			
DH5, GFSK	3 Low Channel Mid Channel	Signature	en d'. Cather	Out Pwr (dBm)	Antenna Gain (dBi) 2.9 2.78	EIRP (dBm) 2.853 3.67	EIRP Limit (dBm) 27	Result Pass			
DH5, GFSK	3 Low Channel Mid Channel Hinb Channel	Signature	fer d. Com	Out Pwr (dBm) -0.047 0.89 1.715	Antenna Gain (dBi) 2.9 2.78 3.86	EIRP (dBm) 2.853 3.67 5.575	EIRP Limit (dBm) 27 27 27	Result Pass Pass			
DH5, GFSK	3 Low Channel Mid Channel High Channel	Signature	er d. Com	Out Pwr (dBm) -0.047 0.89 1.715	Antenna Gain (dBi) 2.9 2.78 3.86	EIRP (dBm) 2.853 3.67 5.575	EIRP Limit (dBm) 27 27 27 27	Result Pass Pass Pass			
DH5, GFSK 2DH5, pi/4-DQPSK	3 Low Channel Mid Channel High Channel	Signature	e d. Char	Out Pwr (dBm) -0.047 0.89 1.715 -1.043	Antenna Gain (dBi) 2.9 2.78 3.86 2.9	EIRP (dBm) 2.853 3.67 5.575 1.857	EIRP Limit (dBm) 27 27 27 27	Result Pass Pass Pass Pass			
DH5, GFSK 2DH5, pi/4-DQPSK	3 Low Channel Mid Channel Low Channel Mid Channel	Signature	er d. Com	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299	Antenna Gain (dBi) 2.9 2.78 3.86 2.9 2.78	EIRP (dBm) 2.853 3.67 5.575 1.857 3.079	EIRP Limit (dBm) 27 27 27 27 27 27	Result Pass Pass Pass Pass			
DH5, GFSK 2DH5, pi/4-DQPSK	3 Low Channel Mid Channel High Channel Low Channel Mid Channel High Channel	Signature	per d. Com	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635	Antenna Gain (dBi) 2.9 2.78 3.86 2.9 2.78 3.86	EIRP (dBm) 2.853 3.67 5.575 1.857 3.079 5.495	EIRP Limit (dBm) 27 27 27 27 27 27 27 27	Result Pass Pass Pass Pass Pass Pass			
DH5, GFSK 2DH5, pi/4-DQPSK 3DH5, 8-DPSK	3 Low Channel Mid Channel High Channel Mid Channel High Channel	Signature	per d. Cotton	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635	Antenna Gain (dBi) 2.9 2.78 3.86 2.9 2.78 3.86	EIRP (dBm) 2.853 3.67 5.575 1.857 3.079 5.495	EIRP Limit (dBm) 27 27 27 27 27 27 27 27 27 27	Result Pass Pass Pass Pass Pass Pass			
DH5, GFSK 2DH5, pi/4-DQPSK 3DH5, 8-DPSK	3 Low Channel Mid Channel Low Channel Mid Channel High Channel Low Channel	Signature	ge d. Com	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635 -0.638	Antenna Gain (dBi) 2.9 2.78 3.86 2.9 2.78 3.86 2.9	EIRP (dBm) 2.853 3.67 5.575 1.857 3.079 5.495 2.262	EIRP Limit (dBm) 27 27 27 27 27 27 27 27 27 27 27	Result Pass Pass Pass Pass Pass Pass Pass			
DH5, GFSK 2DH5, pi/4-DQPSK 3DH5, 8-DPSK	3 Low Channel Mid Channel High Channel Mid Channel High Channel Low Channel Low Channel	Signature	ge d. Com	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635 -0.638 -1.132	Antenna Gain (dBi) 2.9 2.78 3.86 2.9 2.78 3.86 2.9 2.78 2.9 2.78	EIRP (dBm) 2.853 3.67 5.575 1.857 3.079 5.495 2.262 1.648	EIRP Limit (dBm) 27 27 27 27 27 27 27 27 27 27 27	Result Pass Pass Pass Pass Pass Pass Pass			
DH5, GFSK 2DH5, pi/4-DQPSK 3DH5, 8-DPSK	3 Low Channel Mid Channel High Channel High Channel High Channel Low Channel Mid Channel High Channel	Signature	per d. Com	Out Pwr (dBm) -0.047 0.89 1.715 -1.043 0.299 1.635 -0.638 -1.132 0.074	Antenna Gain (dBi) 2.9 2.78 3.86 2.9 2.78 3.86 2.9 2.78 3.86	EIRP (dBm) 2.853 3.67 5.575 1.857 3.079 5.495 2.262 1.648 3.934	EIRP Limit (dBm) 27 27 27 27 27 27 27 27 27 27 27 27 27	Result Pass Pass Pass Pass Pass Pass Pass Pas			





			F IF	PNO: Fast ++- Gain:Low	. Trig: Free I #Atten: 10	Run dB	#Avg Type: Log-Pwr Avg Hold: 100/100		TF	ACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P
5 dB/	div	Ref Offset 24.07 d Ref 6.00 dBm	B					N	lkr1 2.439 0.	797 GHz 890 dBm
1.00					♦ ¹					
-4.00										
-9.00										
-14.0										
-19.0										
-24.0										
-29.0										
-34.0										
-39.0										
Cent #Res	ter 2.44 s BW <u>1</u>	40000 GHz .5 MHz		#VB	W 5.0 MHz			Swe	Span 2011-005	3.000 MHz s (1000 pt <u>s)</u>
MSG							STATUS			





	,. ,	PNO: Fast ↔ IFGain:Low	. Trig: Free Run #Atten: 10 dB	#Avg Type: Log-Pwr Avg Hold: 100/100	TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P P P P P
5 dB/div	Ref Offset 24.07 dE Ref 4.00 dBm	3		N	lkr1 2.401 798 GHz -1.043 dBm
-1.00			↓ ¹		
-6.00					
-11.0					
-16.0					
-21.0					
-26.0					
-31.0					
-36.0					
-41.0					
Center 2.4 #Res BW 2	02000 GHz 2.0 MHz	#VB	W 6.0 MHz	Swe	Span 4.000 MHz ep 1.066 ms (1000 pts)
MSG				STATUS	





		PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Hold: 100/100	TYPE MWWWW DET PPPPP
5 dB/div	Ref Offset 24.07 dB Ref 7.00 dBm				Mkr1 2.479 794 GHz 1.635 dBm
2.00			↓ ¹		
-3.00					
-8.00					
-13.0					
-18.0					
-23.0					
-28.0					
-33.0					
-38.0					
Center 2. #Res BW	480000 GHz 2.0 MHz	#VBV	V 6.0 MHz	s	Span 4.000 MHz weep 1.066 ms (1000 pts)
MSG				STATUS	7





		IFGain:Low	#Atten: 10	dB			
5 dB/div	Ref Offset 24.07 dB Ref 4.00 dBm				Mk	r1 2.439 -1.	982 GHz 132 dBm
-100				1			
e 00					 		
-0.00							
-11.0							
-16.0							
-21.0							
-26.0							
-31.0							
-36.0							
-41.0							
Center 2.44 #Res BW 2	40000 GHz 2.0 MHz	#VB	W 6.0 M <u>Hz</u>		 Sweep	Span 1.066 ms	4.000 MHz (1000 pt <u>s)</u>
MSG							



	Out Pwr	Antenna	EIRP	EIRP Limit	
	(dBm)	Gain (dBi)	(dBm)	(dBm)	Result
	0.074	3.86	3.934	27	Pass
Kawiakt Saatum Analyzer Flowent Materials T	ashpalamı				
Keysight spectrum Analyzer - Element Materials I	S	ENSE:INT	ALIGN OFF		07:30:03 AM Aug 22, 201
			#Avg Typ	e: Log-Pwr	TRACE 1 2 3 4 5
	PNO: Fast +++	Trig: Free Run #Atten: 10 dB	Avg Hold	: 100/100	DET P P P P P
	IFGain.Low	written. To db		Mire4	2 470 020 CH
Ref Offset 24.07 dB				WIKT	0 074 dBn
Log					0.074 001
		<u>1</u>			
0.00					
5.00					
.10.0					
10.0					
-15.0					
-13.8					
20.0					
-20.0					
25.0					
-20,0					
20.0					
-30.0					
25.0					
-35.0					
-40.0					
Center 2.480000 GHz			1		Span 4.000 MH
#Res BW 2.0 MHz	#VBV	6.0 MHz		Sweep 1	.066 ms (1000 pts
			d		



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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	2-Jul-19	2-Jul-20
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20

TEST DESCRIPTION

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

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



EUT: Jonah	Work Order:	DROP0009	
Serial Number: PL1919P10034	Date:	21-Aug-19	
Customer: SonicSensory, Inc.	Temperature:	22.9 °C	
Attendees: Daniel Quiros	Humidity:	45.6% RH	
Project: None	Barometric Pres.:	1015 mbar	
Tested by: Johnny Candelas Power: 110VAC/60Hz	Job Site:	OC13	
TEST SPECIFICATIONS Test Method			
FCC 15.247:2019 ANSI C63.10:2013			
COMMENTS			
DC Block + 20 dB attenuator + Coax Cable + patch cable = 24.07 dB Total Offset			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration # 3 Signature			
	Value (dBc)	Limit ≤ (dBc)	Result
DH5, GFSK			
Low Channel	-47.77	-20	Pass
High Channel	-55.27	-20	Pass
2DH5, pi/4-DQPSK			
Low Channel	-37.44	-20	Pass
High Channel	-52.64	-20	Pass
3DH5, 8-DPSK			
Low Channel	-38.11	-20	Pass
High Channel	-53.43	-20	Pass











Keysight S	opectrum Analyzer	- Element Mater	als lechnology	-	CALCE ANT				07.05	
KL RL	RF	50 Ω AC		5	ENSE:INT	<u>A</u> A	LIGN OFF		07:33:11	AM Aug 22, 2019
			PNO: IFGai	Wide 🖵 n:Low	Trig: Free I #Atten: 10	Run dB	#Avg Type:	Log-Pwr	1	TYPE MWWWW DET PPPP
10 dB/div	Ref Offse Ref 10.0	t 24.07 dB 1 0 dBm							ΔMkr1 7	.746 MHz 52.64 dE
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20.0										
30.0	~~		m							
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50.0			4	pales may	where and a second	man and the		a - Amore - A.M.	A s. wash-orbit.	1∆2
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70.0										
80.0										
Center 2 #Res BV	2.483500 G V 100 kHz	Hz		#VBV	V 300 kHz			Swee	Span 0 1.200 ms	10.00 MH s (3000 pts
180							T STATUS			





					1	(ubc)		Result	
						-53.43	-20	Pass	
-									
Keysight St	pectrum Ana	lvzer - Element Ma	aterials Technolog	IV					x
XI RL	RF	50 Ω AC		S	ENSE:INT	ALIGN OFF		07:31:40 AM Aug 22, 2	019
						#Avg Typ	e: Log-Pwr	TRACE 1 2 3 4	5 6
			PI IF	NO: Wide 😱 Gain:Low	Trig: Free Run #Atten: 10 dB			DET PPP	P P
	Ref Of	fset 24.07 dB	1				Δ	Mkr1 3.778 M	Hz
10 dB/div	Ref 1	0.00 dBm	,					-53.43 (łВ
	1								

			IF	Gain:Low	#Atten: 10	dB				DETPPPPP
10 di	Ref B/div Ref	Offset 24.07 d 10.00 dBm	B						ΔMkr1 3	778 MHz 53.43 dB
209										
0.00		Xen								
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				1						
				L M A		▲1∆2				
				Y YAW Y	mproven	and the second	hand	www.www.www	wwwwww	warm Annar m
-60.0										
-70.0										
-80.0										
Cen #Re	ter 2.4835 s BW 100	00 GHz kHz	1	#VB	W 300 kHz	l		Sweep	Span 1.200 ms	10.00 MHz (3000 pts)
MSG							STATUS			