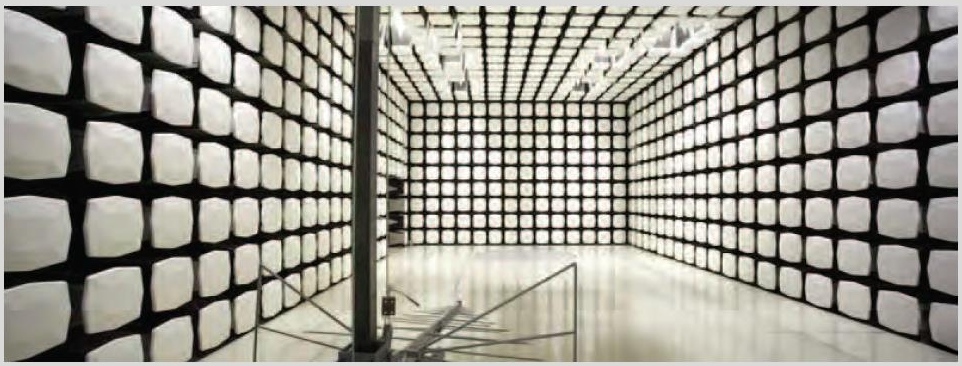
Starkey Laboratories, Inc.

Mini Remote Microphone

FCC 15.207 2018
FCC 15.247:2018

Bluetooth Low Energy (DTS) Radio

Report # STAK0144.1



NVLAP LAB CODE: 200881-0

CERTIFICATE OF TEST

Last Date of Test: January 8, 2019
Starkey Laboratories, Inc.
Model: Mini Remote Microphone

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2018	ANSI C63.10:2013
FCC 15.247:2018	

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	Pass	
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.9.1.1	Equivalent Isotropic Radiated Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	
11.12.1, 11.13.2, 6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Matt Nuernberg, 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). Certification chambers and Open Area Test Sites are filed with ISED.

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

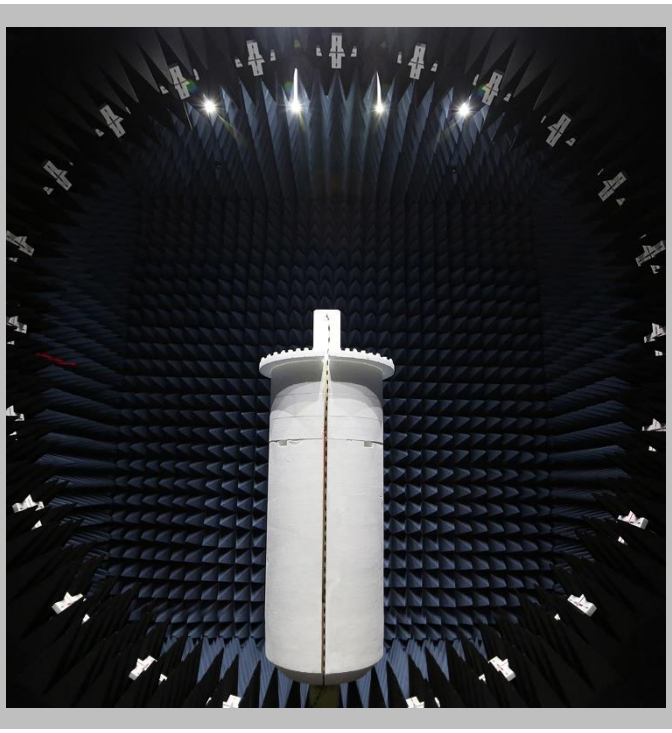
MIC – Recognized by MIC as a CAB for the acceptance of test data.

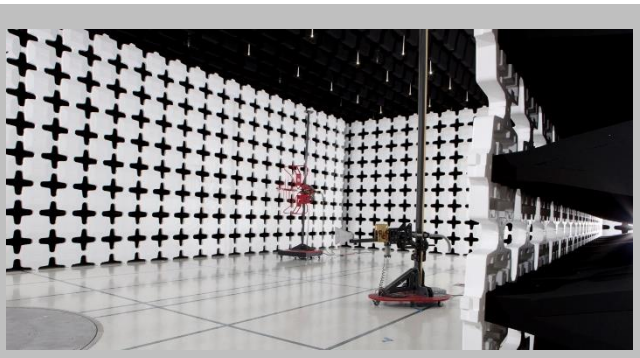
SCOPE

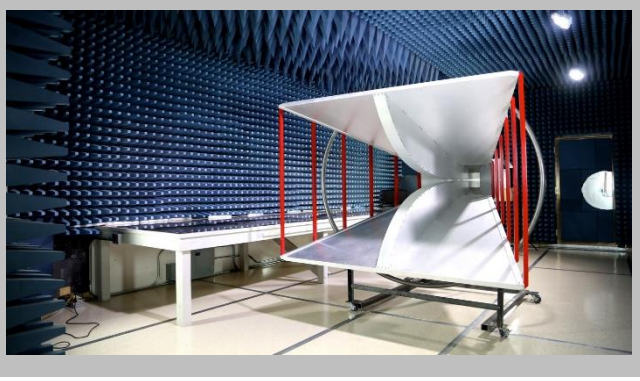
For details on the Scopes of our Accreditations, please visit:
https://www.nwemc.com/emc-testing-accreditations

FACILITIES

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	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	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

element
TMU.2015.07.10

Measurement Uncertainty

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

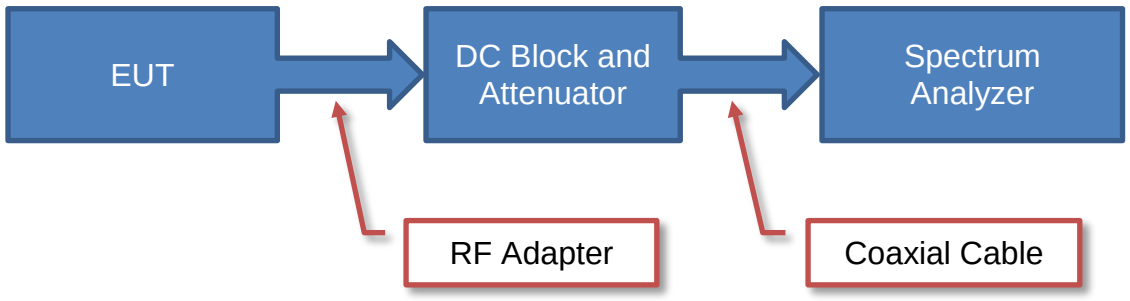
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable 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.

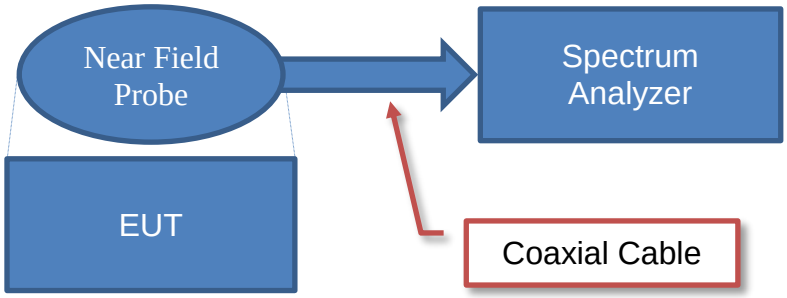
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams

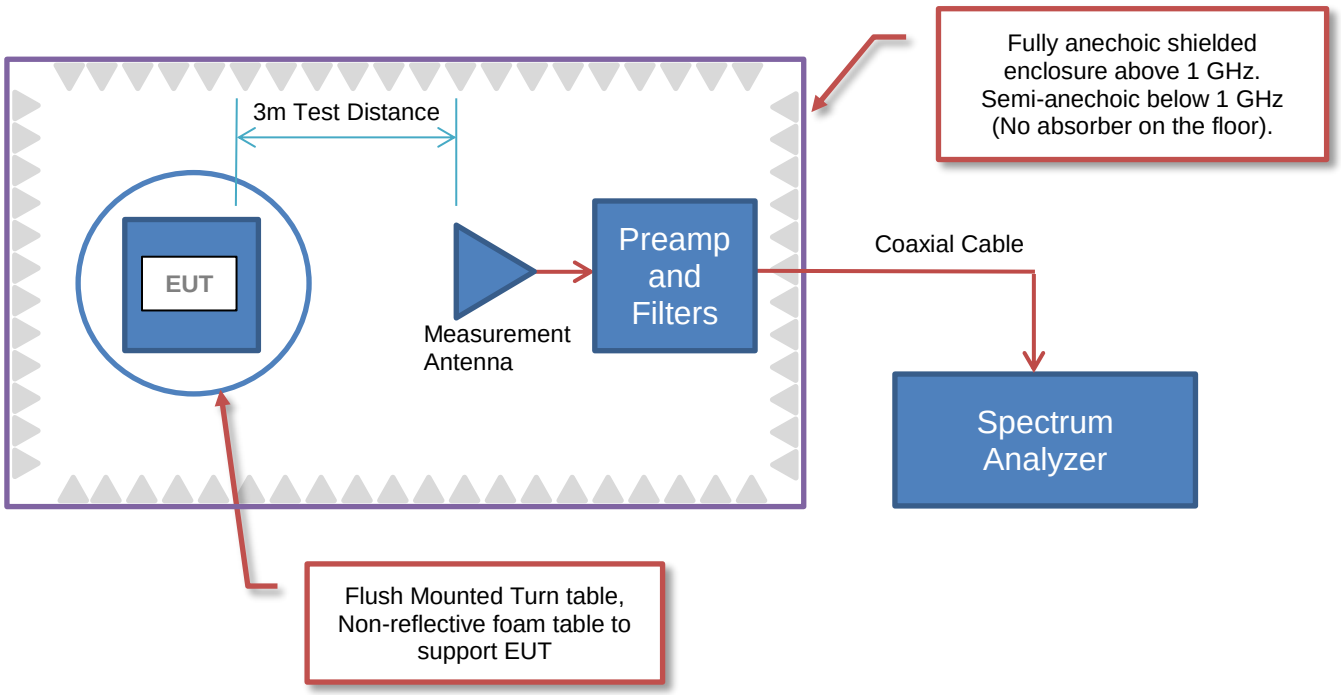
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Starkey Laboratories, Inc.
Address:	6600 Washington Ave. SO.
City, State, Zip:	Eden Prairie, MN 55344
Test Requested By:	Bill Mitchell
Model:	Mini Remote Microphone
First Date of Test:	October 18, 2018
Last Date of Test:	January 8, 2019
Receipt Date of Samples:	October 16, 2018
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
This is a remote microphone device for 2.4 GHz hearing aids using BLE.

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

CONFIGURATIONS

Configuration STAK0144- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Microphone	Starkey Laboratories, Inc.	N/A	182000364

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	DVE	DSA-5PPFU1-05	N/A

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Micro-USB Cable	No	2 m	No	Remote Microphone	AC Adapter

Configuration STAK0144- 5

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Microphone	Starkey Laboratories, Inc.	N/A	182000364

Configuration STAK0144- 7

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Microphone	Starkey Laboratories, Inc.	N/A	182000364

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Lenovo	ThinkPad T430	11306
AC Adapter (Laptop)	Lenovo	ADLX90NCT2A	11S45N0311Z1ZLZ633M0T4

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	Yes	1.8m	No	Laptop	Remote Microphone
DC Cable (Laptop)	No	1.8m	Yes	AC Adapter (Laptop)	Laptop
AC Cable (Laptop)	No	1.0m	No	AC Adapter (Laptop)	AC Mains

CONFIGURATIONS

Configuration STAK0144- 8

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Microphone	Starkey Laboratories, Inc.	N/A	182000364

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude E6420	F6WC5R1
AC Adapter (Laptop)	Dell	DA90PE1-00	CN-0WK890-73245-96F-0270-A01

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	Yes	1.8m	No	Laptop	Remote Microphone
DC Cable (Laptop)	No	1.8m	Yes	AC Adapter (Laptop)	Laptop
AC Cable (Laptop)	No	1.0m	No	AC Adapter (Laptop)	AC Mains

Configuration STAK0144- 11

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Mini Remote Microphone	Starkey Laboratories, Inc.	43023-000	182010339

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2018-10-18	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2018-10-18	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.
3	2018-10-18	Equivalent Isotropic Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2018-10-18	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.
5	2018-10-18	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.
6	2018-10-18	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.
7	2018-10-18	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2018-10-22	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT was taken home by the client before the next scheduled test.
9	2019-01-08	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

element
WTD.2017.11.22.1

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	Rohde & Schwarz	ESR7	ARI	6/26/2018	6/26/2019
Cable - Conducted Cable Assembly	Northwest EMC	MNC, HGN, TYK	MNCA	3/14/2018	3/14/2019
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	3/15/2018	3/15/2019

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

STAK0144-1
STAK0144-8

MODES INVESTIGATED

Transmitting mid channel (2440 MHz) at 2 Mbps

POWERLINE CONDUCTED EMISSIONS

element
WTD.2017.11.22.1

EUT:	Mini Remote Microphone	Work Order:	STAK0144
Serial Number:	182000364	Date:	10/22/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	22°C
Attendees:	Charlie Esch, John Quach	Relative Humidity:	30.2%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0144-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2018	ANSI C63.10:2013

TEST PARAMETERS

Run #:	18	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

None

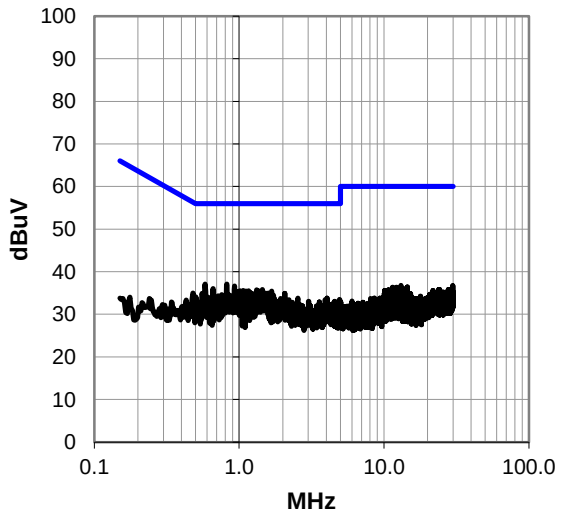
EUT OPERATING MODES

Transmitting mid channel (2440 MHz) at 2 Mbps

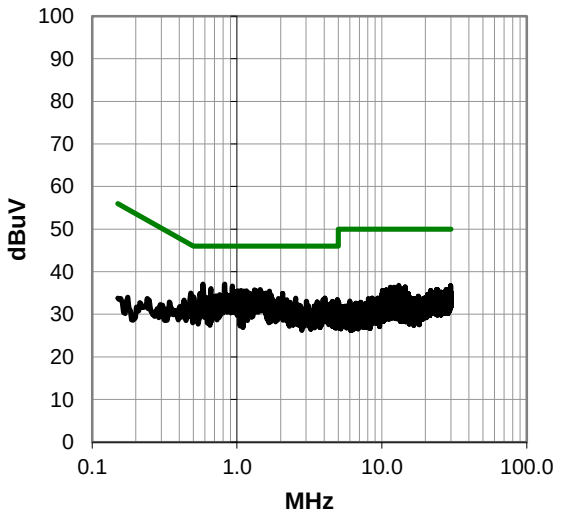
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2017.11.22.1

RESULTS - Run #18

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.583	16.7	20.4	37.1	56.0	-18.9
0.822	16.6	20.5	37.1	56.0	-18.9
0.930	16.1	20.5	36.6	56.0	-19.4
0.661	15.5	20.5	36.0	56.0	-20.0
1.445	15.3	20.5	35.8	56.0	-20.2
1.321	15.2	20.5	35.7	56.0	-20.3
1.068	15.1	20.5	35.6	56.0	-20.4
1.012	15.0	20.5	35.5	56.0	-20.5
1.165	15.0	20.5	35.5	56.0	-20.5
1.363	15.0	20.5	35.5	56.0	-20.5
1.113	14.9	20.5	35.4	56.0	-20.6
1.672	14.9	20.5	35.4	56.0	-20.6
0.986	14.8	20.5	35.3	56.0	-20.7
1.038	14.8	20.5	35.3	56.0	-20.7
1.195	14.6	20.5	35.1	56.0	-20.9
1.512	14.5	20.5	35.0	56.0	-21.0
1.594	14.5	20.5	35.0	56.0	-21.0
0.557	14.5	20.4	34.9	56.0	-21.1
2.064	14.4	20.5	34.9	56.0	-21.1
0.963	14.3	20.5	34.8	56.0	-21.2
1.239	14.3	20.5	34.8	56.0	-21.2
1.642	14.3	20.5	34.8	56.0	-21.2
1.564	14.2	20.5	34.7	56.0	-21.3
0.478	14.6	20.4	35.0	56.4	-21.4
0.758	14.1	20.5	34.6	56.0	-21.4
0.848	14.1	20.5	34.6	56.0	-21.4

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.583	16.7	20.4	37.1	46.0	-8.9
0.822	16.6	20.5	37.1	46.0	-8.9
0.930	16.1	20.5	36.6	46.0	-9.4
0.661	15.5	20.5	36.0	46.0	-10.0
1.445	15.3	20.5	35.8	46.0	-10.2
1.321	15.2	20.5	35.7	46.0	-10.3
1.068	15.1	20.5	35.6	46.0	-10.4
1.012	15.0	20.5	35.5	46.0	-10.5
1.165	15.0	20.5	35.5	46.0	-10.5
1.363	15.0	20.5	35.5	46.0	-10.5
1.113	14.9	20.5	35.4	46.0	-10.6
1.672	14.9	20.5	35.4	46.0	-10.6
0.986	14.8	20.5	35.3	46.0	-10.7
1.038	14.8	20.5	35.3	46.0	-10.7
1.195	14.6	20.5	35.1	46.0	-10.9
1.512	14.5	20.5	35.0	46.0	-11.0
1.594	14.5	20.5	35.0	46.0	-11.0
0.557	14.5	20.4	34.9	46.0	-11.1
2.064	14.4	20.5	34.9	46.0	-11.1
0.963	14.3	20.5	34.8	46.0	-11.2
1.239	14.3	20.5	34.8	46.0	-11.2
1.642	14.3	20.5	34.8	46.0	-11.2
1.564	14.2	20.5	34.7	46.0	-11.3
0.478	14.6	20.4	35.0	46.4	-11.4
0.758	14.1	20.5	34.6	46.0	-11.4
0.848	14.1	20.5	34.6	46.0	-11.4

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2017.11.22.1

EUT:	Mini Remote Microphone	Work Order:	STAK0144
Serial Number:	182000364	Date:	10/22/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	22°C
Attendees:	Charlie Esch, John Quach	Relative Humidity:	30.2%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0144-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2018	ANSI C63.10:2013

TEST PARAMETERS

Run #:	19	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

None

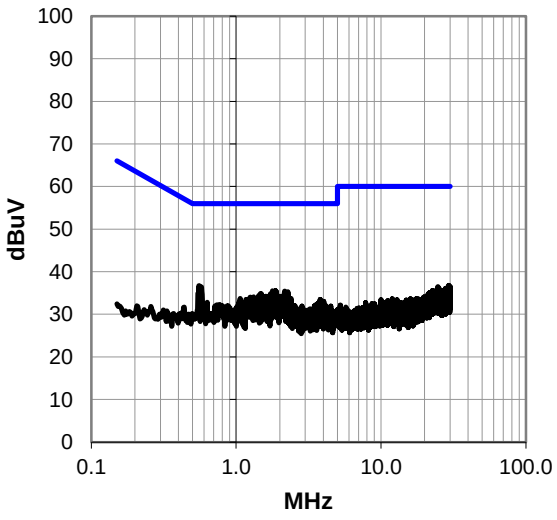
EUT OPERATING MODES

Transmitting mid channel (2440 MHz) at 2 Mbps

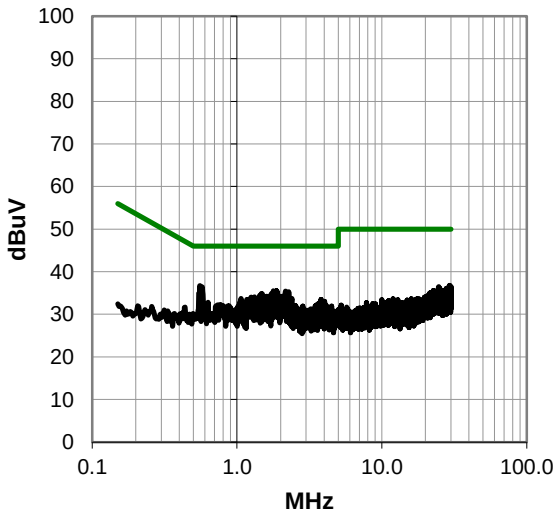
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2017.11.22.1

RESULTS - Run #19

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.553	16.3	20.4	36.7	56.0	-19.3
0.572	16.0	20.4	36.4	56.0	-19.6
1.784	15.0	20.5	35.5	56.0	-20.5
1.874	15.0	20.5	35.5	56.0	-20.5
1.855	14.9	20.5	35.4	56.0	-20.6
1.889	14.9	20.5	35.4	56.0	-20.6
2.157	14.9	20.5	35.4	56.0	-20.6
2.280	14.8	20.5	35.3	56.0	-20.7
2.183	14.4	20.5	34.9	56.0	-21.1
1.471	14.3	20.5	34.8	56.0	-21.2
1.493	14.3	20.5	34.8	56.0	-21.2
1.724	14.3	20.5	34.8	56.0	-21.2
1.430	13.9	20.5	34.4	56.0	-21.6
1.698	13.9	20.5	34.4	56.0	-21.6
1.598	13.7	20.5	34.2	56.0	-21.8
1.993	13.7	20.5	34.2	56.0	-21.8
2.086	13.7	20.5	34.2	56.0	-21.8
2.124	13.7	20.5	34.2	56.0	-21.8
1.318	13.6	20.5	34.1	56.0	-21.9
1.642	13.6	20.5	34.1	56.0	-21.9
1.251	13.5	20.5	34.0	56.0	-22.0
2.228	13.5	20.5	34.0	56.0	-22.0
2.306	13.3	20.5	33.8	56.0	-22.2
1.064	13.2	20.5	33.7	56.0	-22.3
1.668	13.2	20.5	33.7	56.0	-22.3
1.948	13.2	20.5	33.7	56.0	-22.3

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.553	16.3	20.4	36.7	46.0	-9.3
0.572	16.0	20.4	36.4	46.0	-9.6
1.784	15.0	20.5	35.5	46.0	-10.5
1.874	15.0	20.5	35.5	46.0	-10.5
1.855	14.9	20.5	35.4	46.0	-10.6
1.889	14.9	20.5	35.4	46.0	-10.6
2.157	14.9	20.5	35.4	46.0	-10.6
2.280	14.8	20.5	35.3	46.0	-10.7
2.183	14.4	20.5	34.9	46.0	-11.1
1.471	14.3	20.5	34.8	46.0	-11.2
1.493	14.3	20.5	34.8	46.0	-11.2
1.724	14.3	20.5	34.8	46.0	-11.2
1.430	13.9	20.5	34.4	46.0	-11.6
1.698	13.9	20.5	34.4	46.0	-11.6
1.598	13.7	20.5	34.2	46.0	-11.8
1.993	13.7	20.5	34.2	46.0	-11.8
2.086	13.7	20.5	34.2	46.0	-11.8
2.124	13.7	20.5	34.2	46.0	-11.8
1.318	13.6	20.5	34.1	46.0	-11.9
1.642	13.6	20.5	34.1	46.0	-11.9
1.251	13.5	20.5	34.0	46.0	-12.0
2.228	13.5	20.5	34.0	46.0	-12.0
2.306	13.3	20.5	33.8	46.0	-12.2
1.064	13.2	20.5	33.7	46.0	-12.3
1.668	13.2	20.5	33.7	46.0	-12.3
1.948	13.2	20.5	33.7	46.0	-12.3

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2017.11.22.1

EUT:	Mini Remote Microphone	Work Order:	STAK0144
Serial Number:	182000364	Date:	10/22/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	22°C
Attendees:	Charlie Esch, John Quach	Relative Humidity:	30.2%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0144-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2018	ANSI C63.10:2013

TEST PARAMETERS

Run #:	21	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

None

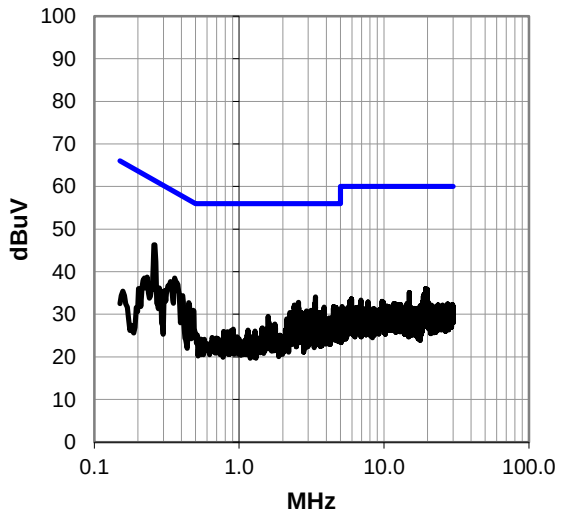
EUT OPERATING MODES

Transmitting mid channel (2440 MHz) at 2 Mbps

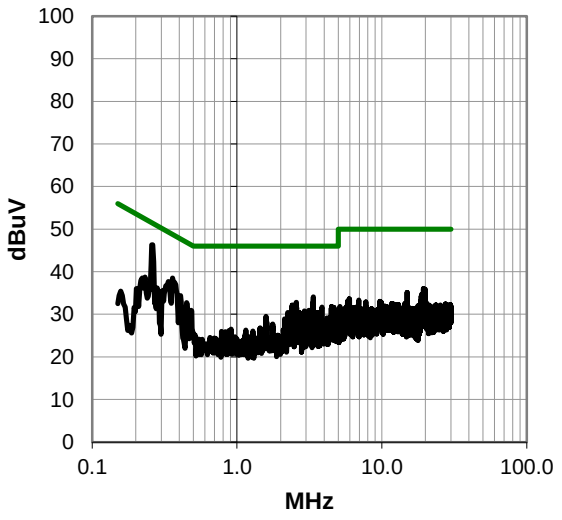
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2017.11.22.1

RESULTS - Run #21

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.258	25.8	20.5	46.3	61.5	-15.2
0.359	18.1	20.4	38.5	58.8	-20.3
0.337	17.3	20.4	37.7	59.3	-21.6
3.358	13.4	20.7	34.1	56.0	-21.9
2.564	12.3	20.5	32.8	56.0	-23.2
0.407	14.0	20.4	34.4	57.7	-23.3
0.232	18.1	20.6	38.7	62.4	-23.7
2.403	11.6	20.5	32.1	56.0	-23.9
3.332	11.3	20.7	32.0	56.0	-24.0
19.382	13.6	22.4	36.0	60.0	-24.0
2.430	11.4	20.5	31.9	56.0	-24.1
19.845	13.5	22.4	35.9	60.0	-24.1
0.448	12.3	20.4	32.7	56.9	-24.2
4.500	11.1	20.7	31.8	56.0	-24.2
3.855	11.0	20.7	31.7	56.0	-24.3
4.657	10.9	20.7	31.6	56.0	-24.4
0.281	15.7	20.5	36.2	60.8	-24.6
19.487	12.9	22.4	35.3	60.0	-24.7
14.954	13.4	21.7	35.1	60.0	-24.9
19.621	12.6	22.4	35.0	60.0	-25.0
3.135	10.3	20.6	30.9	56.0	-25.1
3.250	10.2	20.7	30.9	56.0	-25.1
4.840	10.2	20.7	30.9	56.0	-25.1
2.915	10.3	20.5	30.8	56.0	-25.2
18.901	12.4	22.3	34.7	60.0	-25.3
0.482	10.5	20.4	30.9	56.3	-25.4

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.258	25.8	20.5	46.3	51.5	-5.2
0.359	18.1	20.4	38.5	48.8	-10.3
0.337	17.3	20.4	37.7	49.3	-11.6
3.358	13.4	20.7	34.1	46.0	-11.9
2.564	12.3	20.5	32.8	46.0	-13.2
0.407	14.0	20.4	34.4	47.7	-13.3
0.232	18.1	20.6	38.7	52.4	-13.7
2.403	11.6	20.5	32.1	46.0	-13.9
3.332	11.3	20.7	32.0	46.0	-14.0
19.382	13.6	22.4	36.0	50.0	-14.0
2.430	11.4	20.5	31.9	46.0	-14.1
19.845	13.5	22.4	35.9	50.0	-14.1
0.448	12.3	20.4	32.7	46.9	-14.2
4.500	11.1	20.7	31.8	46.0	-14.2
3.855	11.0	20.7	31.7	46.0	-14.3
4.657	10.9	20.7	31.6	46.0	-14.4
0.281	15.7	20.5	36.2	50.8	-14.6
19.487	12.9	22.4	35.3	50.0	-14.7
14.954	13.4	21.7	35.1	50.0	-14.9
19.621	12.6	22.4	35.0	50.0	-15.0
3.135	10.3	20.6	30.9	46.0	-15.1
3.250	10.2	20.7	30.9	46.0	-15.1
4.840	10.2	20.7	30.9	46.0	-15.1
2.915	10.3	20.5	30.8	46.0	-15.2
18.901	12.4	22.3	34.7	50.0	-15.3
0.482	10.5	20.4	30.9	46.3	-15.4

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2017.11.22.1

EUT:	Mini Remote Microphone	Work Order:	STAK0144
Serial Number:	182000364	Date:	10/22/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	22°C
Attendees:	Charlie Esch, John Quach	Relative Humidity:	30.2%
Customer Project:	None	Bar. Pressure:	1020 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0144-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2018	ANSI C63.10:2013

TEST PARAMETERS

Run #:	22	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

None

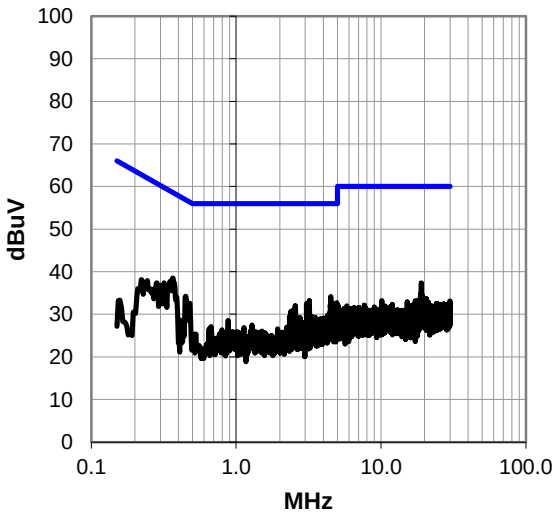
EUT OPERATING MODES

Transmitting mid channel (2440 MHz) at 2 Mbps

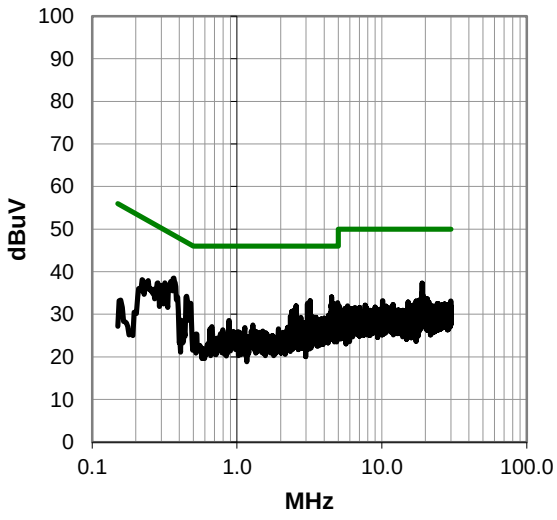
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2017.11.22.1

RESULTS - Run #22

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.366	18.1	20.4	38.5	58.6	-20.1
4.496	13.4	20.7	34.1	56.0	-21.9
0.318	17.0	20.4	37.4	59.8	-22.4
0.448	13.8	20.4	34.2	56.9	-22.7
18.998	15.0	22.3	37.3	60.0	-22.7
3.202	12.6	20.6	33.2	56.0	-22.8
4.944	12.0	20.7	32.7	56.0	-23.3
0.284	17.0	20.4	37.4	60.7	-23.3
3.064	12.0	20.6	32.6	56.0	-23.4
0.303	16.4	20.4	36.8	60.2	-23.4
4.653	11.8	20.7	32.5	56.0	-23.5
0.478	12.2	20.4	32.6	56.4	-23.8
2.556	11.5	20.5	32.0	56.0	-24.0
0.243	17.3	20.6	37.9	62.0	-24.1
4.597	10.7	20.7	31.4	56.0	-24.6
0.221	17.5	20.6	38.1	62.8	-24.7
18.935	12.7	22.3	35.0	60.0	-25.0
2.459	10.4	20.5	30.9	56.0	-25.1
2.385	10.1	20.5	30.6	56.0	-25.4
19.151	12.2	22.4	34.6	60.0	-25.4
4.918	9.5	20.7	30.2	56.0	-25.8
19.423	11.5	22.4	33.9	60.0	-26.1
4.295	9.1	20.7	29.8	56.0	-26.2
19.211	11.2	22.4	33.6	60.0	-26.4
19.766	11.2	22.4	33.6	60.0	-26.4
20.580	11.1	22.5	33.6	60.0	-26.4

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.366	18.1	20.4	38.5	48.6	-10.1
4.496	13.4	20.7	34.1	46.0	-11.9
0.318	17.0	20.4	37.4	49.8	-12.4
0.448	13.8	20.4	34.2	46.9	-12.7
18.998	15.0	22.3	37.3	50.0	-12.7
3.202	12.6	20.6	33.2	46.0	-12.8
4.944	12.0	20.7	32.7	46.0	-13.3
0.284	17.0	20.4	37.4	50.7	-13.3
3.064	12.0	20.6	32.6	46.0	-13.4
0.303	16.4	20.4	36.8	50.2	-13.4
4.653	11.8	20.7	32.5	46.0	-13.5
0.478	12.2	20.4	32.6	46.4	-13.8
2.556	11.5	20.5	32.0	46.0	-14.0
0.243	17.3	20.6	37.9	52.0	-14.1
4.597	10.7	20.7	31.4	46.0	-14.6
0.221	17.5	20.6	38.1	52.8	-14.7
18.935	12.7	22.3	35.0	50.0	-15.0
2.459	10.4	20.5	30.9	46.0	-15.1
2.385	10.1	20.5	30.6	46.0	-15.4
19.151	12.2	22.4	34.6	50.0	-15.4
4.918	9.5	20.7	30.2	46.0	-15.8
19.423	11.5	22.4	33.9	50.0	-16.1
4.295	9.1	20.7	29.8	46.0	-16.2
19.211	11.2	22.4	33.6	50.0	-16.4
19.766	11.2	22.4	33.6	50.0	-16.4
20.580	11.1	22.5	33.6	50.0	-16.4

CONCLUSION

Pass

Tested By

DUTY CYCLE

XMit 2017.12.13

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	E4422B	TGQ	15-Mar-18	15-Mar-21
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	15-Mar-18	15-Mar-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-18	13-Feb-19
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	19-Dec-17	19-Dec-18

TEST DESCRIPTION

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

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

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

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

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

DUTY CYCLE

TbtTx 2018.09.13 XMit 2017.12.13

EUT:	Mini Remote Microphone			**Work Order:**	STAK0144
Serial Number:	182000364			**Date:**	18-Oct-18
Customer:	Starkey Laboratories, Inc.			**Temperature:**	22 °C
Attendees:	Charlie Esch			**Humidity:**	33.1% RH
Project:	None			**Barometric Pres.:**	1028 mbar
Tested by:	Dustin Sparks	**Power:**	Battery	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

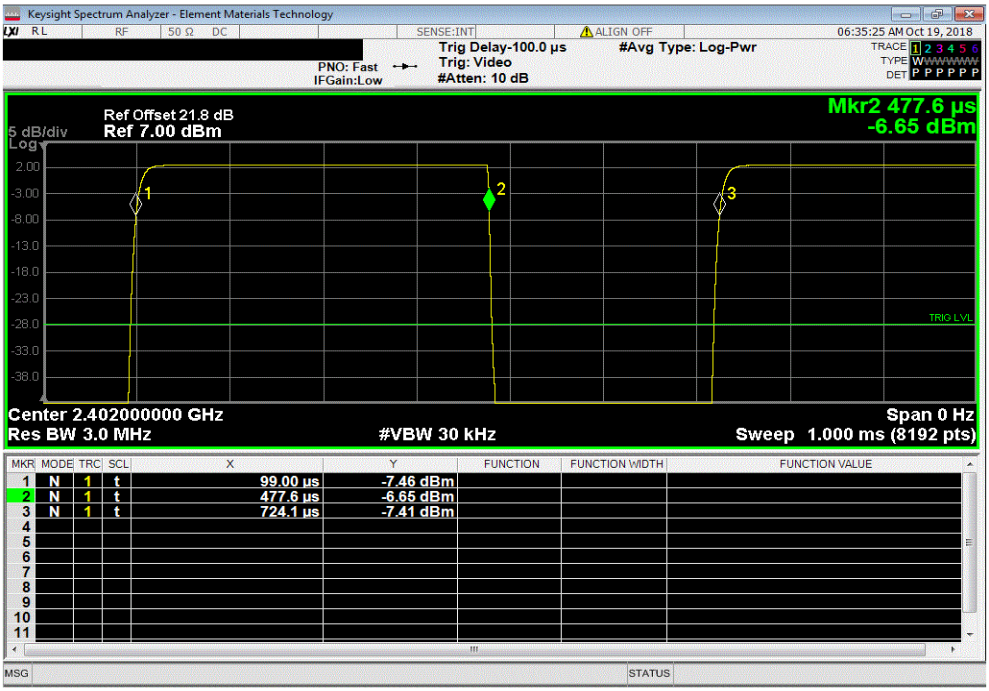
None

Configuration #	7	Signature

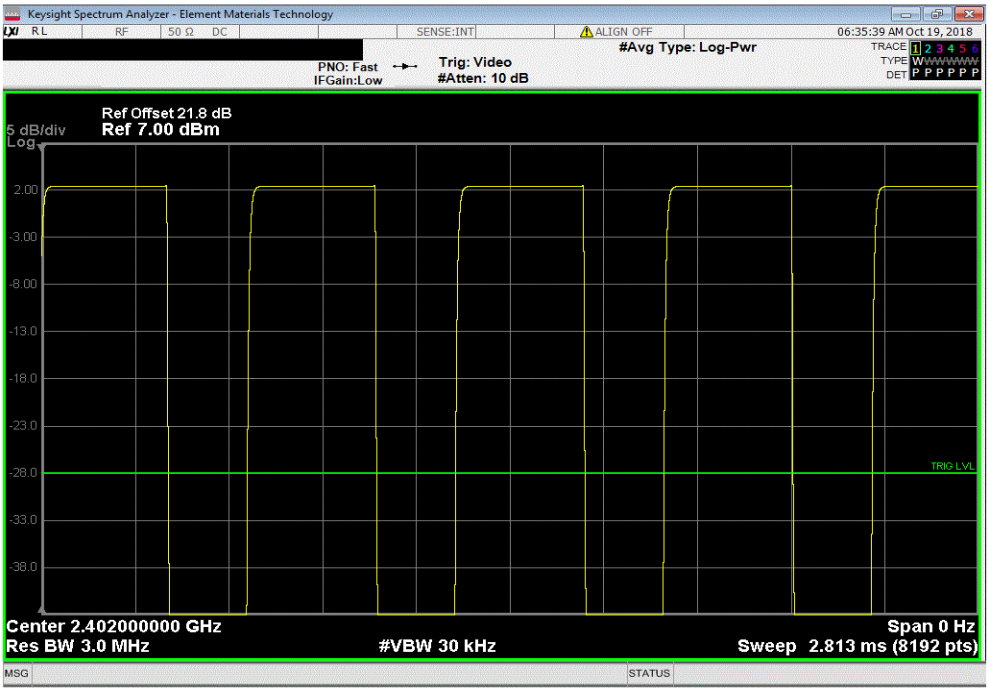
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
BLE, Low Channel (2402 MHz), 1 Mbps	378.633 us	625.1 us	1	60.6	N/A	N/A
BLE, Low Channel (2402 MHz), 1 Mbps	N/A	N/A	5	N/A	N/A	N/A
BLE, Mid Channel (2440 MHz), 1 Mbps	378.544 us	625.1 us	1	60.6	N/A	N/A
BLE, Mid Channel (2440 MHz), 1 Mbps	N/A	N/A	5	N/A	N/A	N/A
BLE, High Channel (2480 MHz), 1 Mbps	378.567 us	625.1 us	1	60.6	N/A	N/A
BLE, High Channel (2480 MHz), 1 Mbps	N/A	N/A	5	N/A	N/A	N/A
Low Channel (2402 MHz), 2 Mbps	306.922 us	625.1 us	1	49.1	N/A	N/A
Low Channel (2402 MHz), 2 Mbps	N/A	N/A	5	N/A	N/A	N/A
Mid Channel (2440 MHz), 2 Mbps	306.355 us	625.1 us	1	49	N/A	N/A
Mid Channel (2440 MHz), 2 Mbps	N/A	N/A	5	N/A	N/A	N/A
High Channel (2478 MHz), 2 Mbps	306.998 us	625 us	1	49.1	N/A	N/A
High Channel (2478 MHz), 2 Mbps	N/A	N/A	5	N/A	N/A	N/A

DUTY CYCLE

BLE, Low Channel (2402 MHz), 1 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	378.633 us	625.1 us	1	60.6	N/A	N/A

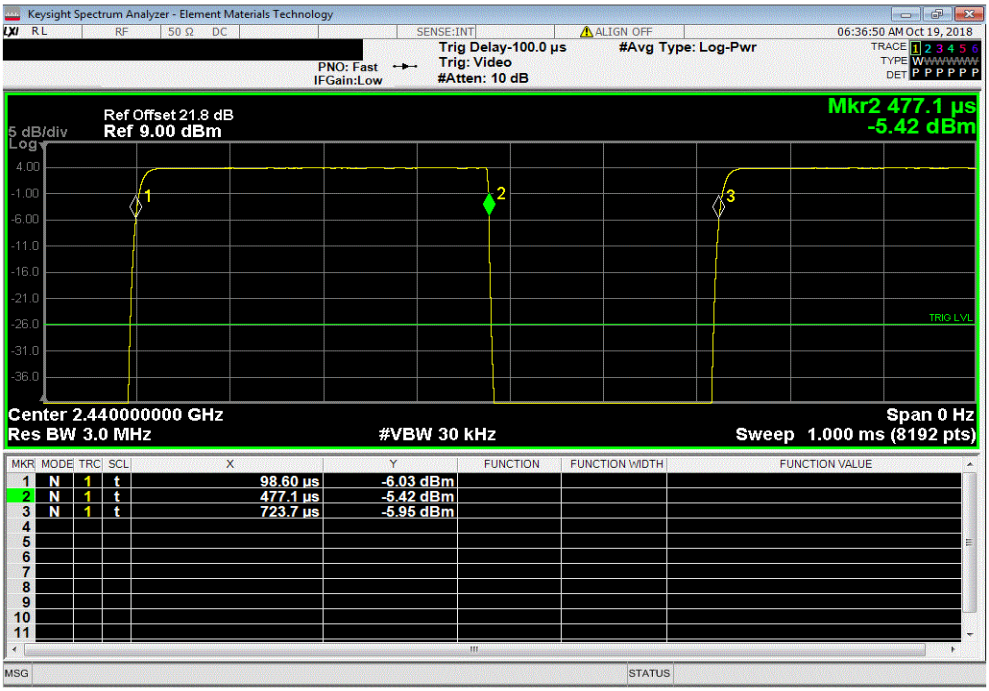


BLE, Low Channel (2402 MHz), 1 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

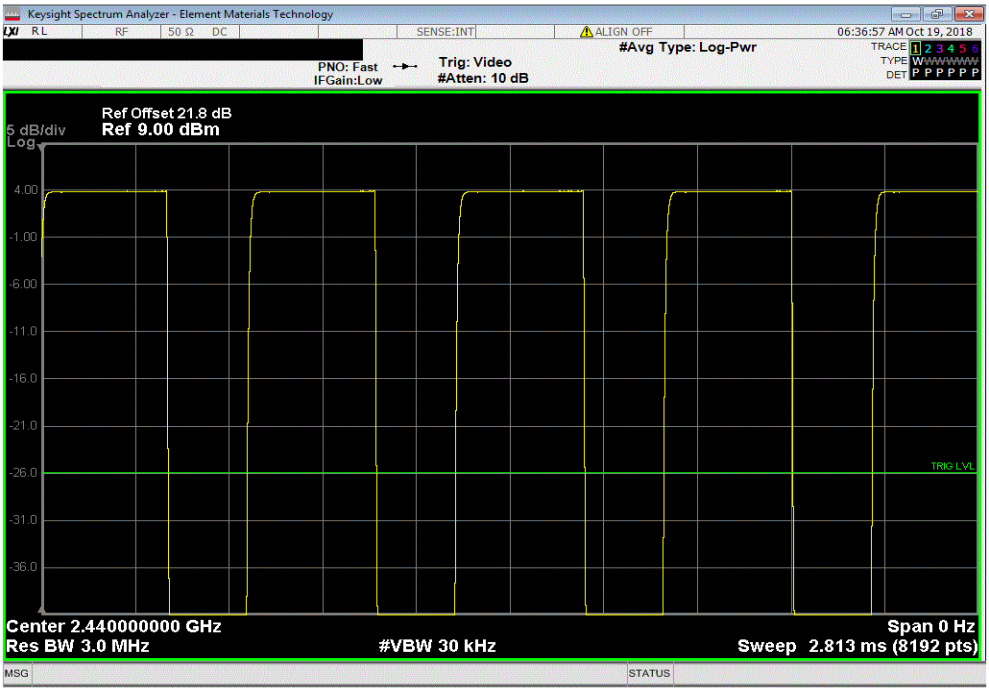


DUTY CYCLE

BLE, Mid Channel (2440 MHz), 1 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	378.544 us	625.1 us	1	60.6	N/A	N/A

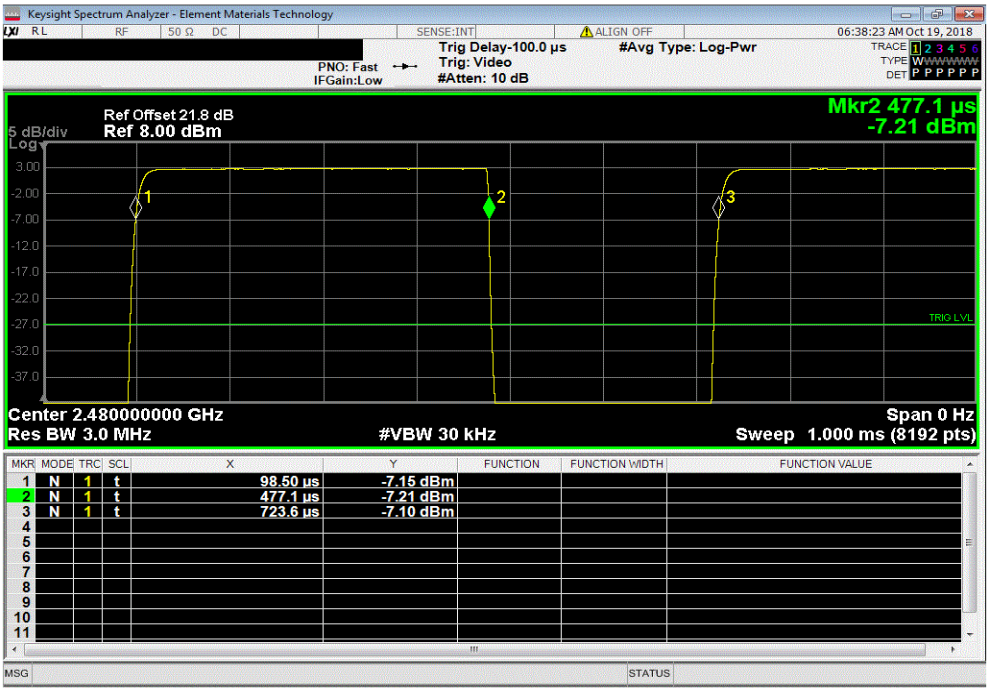


BLE, Mid Channel (2440 MHz), 1 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

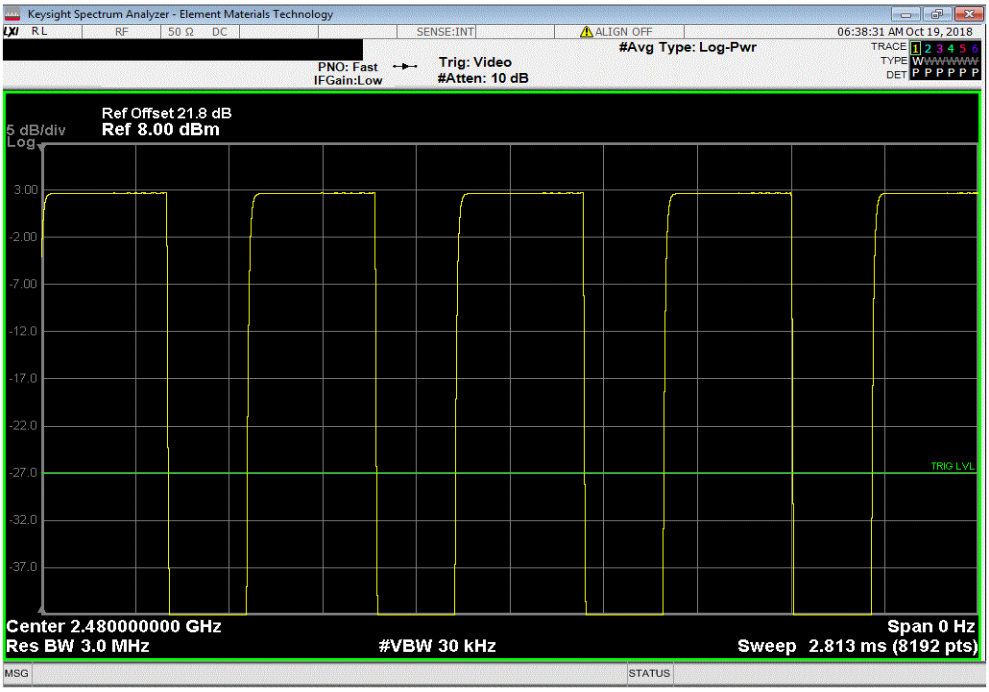


DUTY CYCLE

BLE, High Channel (2480 MHz), 1 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	378.567 us	625.1 us	1	60.6	N/A	N/A

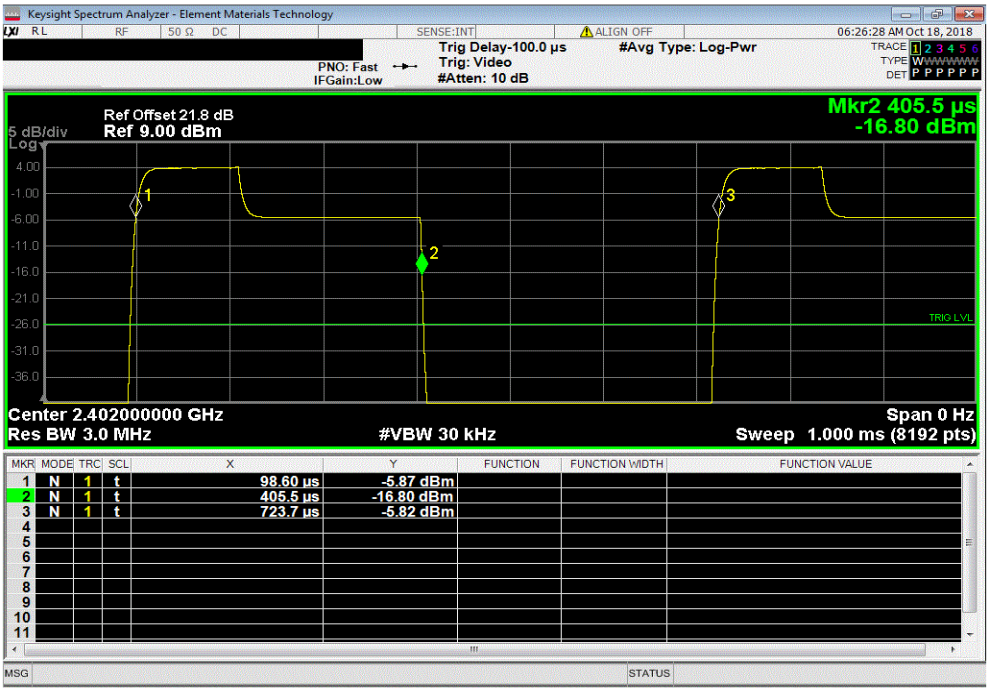


BLE, High Channel (2480 MHz), 1 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

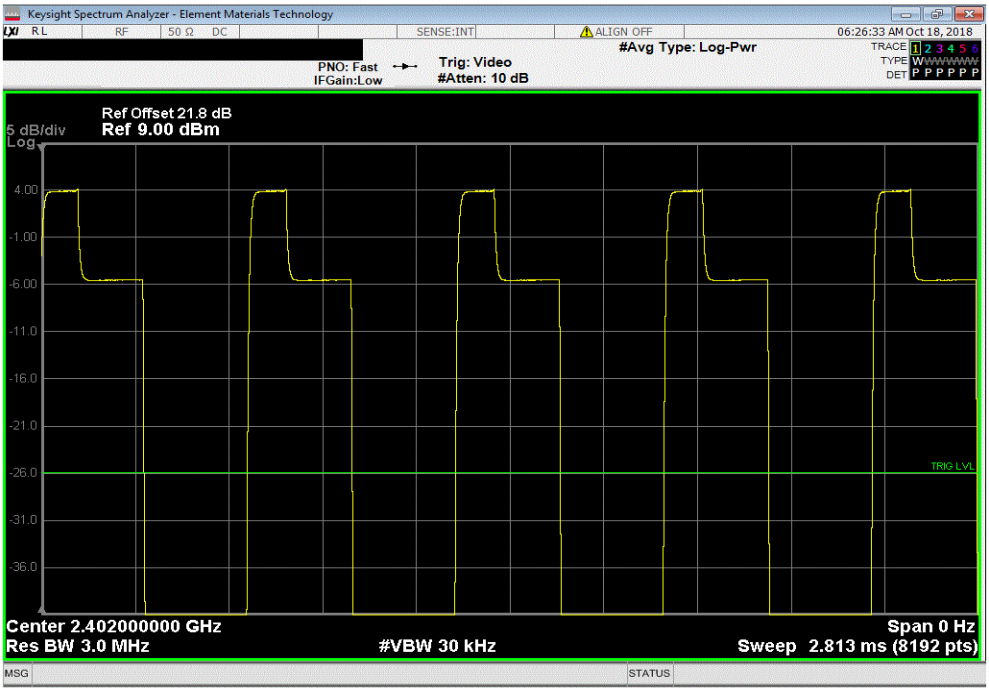


DUTY CYCLE

Low Channel (2402 MHz), 2 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	306.922 us	625.1 us	1	49.1	N/A	N/A

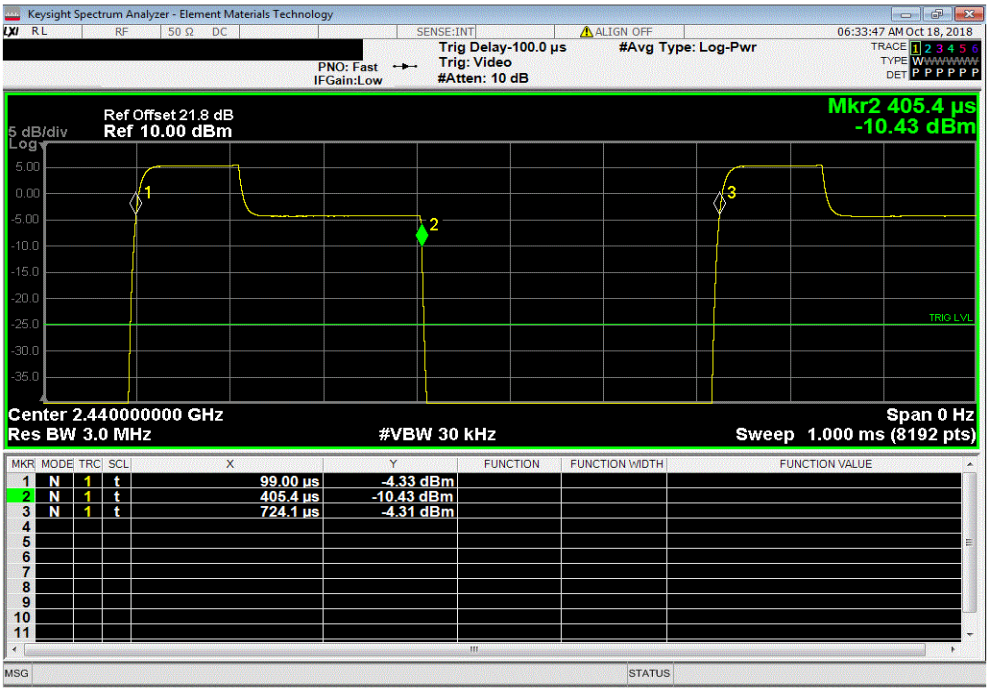


Low Channel (2402 MHz), 2 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

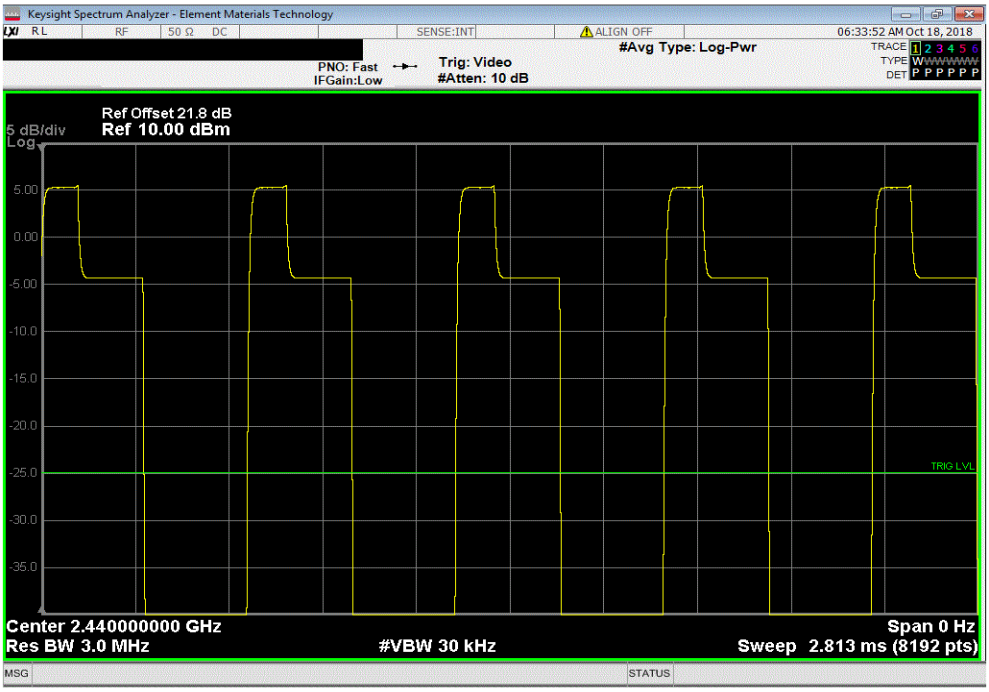


DUTY CYCLE

Mid Channel (2440 MHz), 2 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	306.355 us	625.1 us	1	49	N/A	N/A

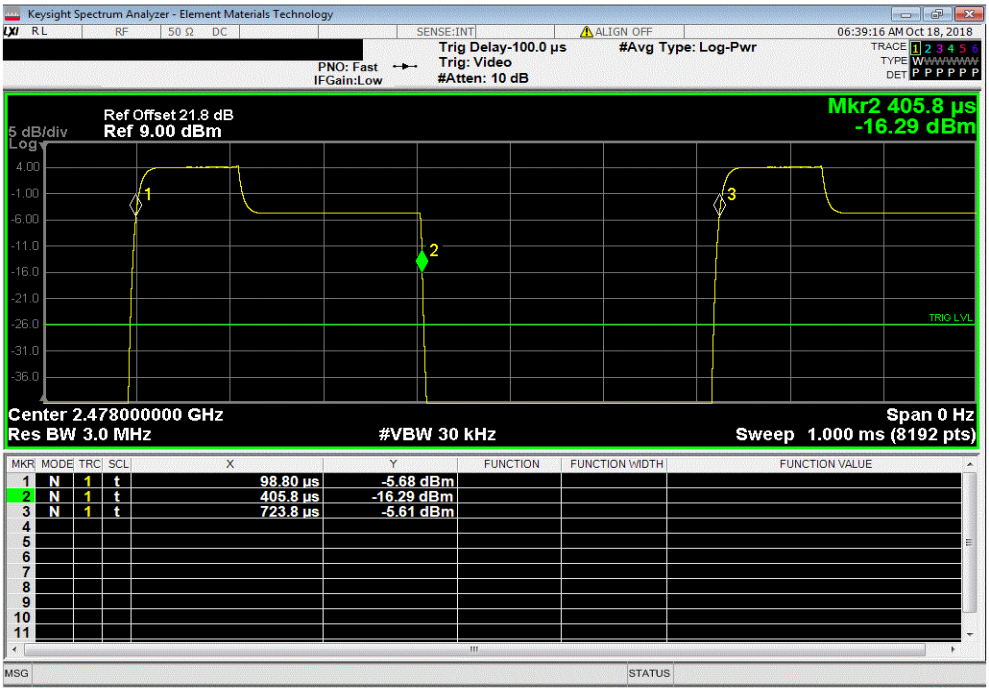


Mid Channel (2440 MHz), 2 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

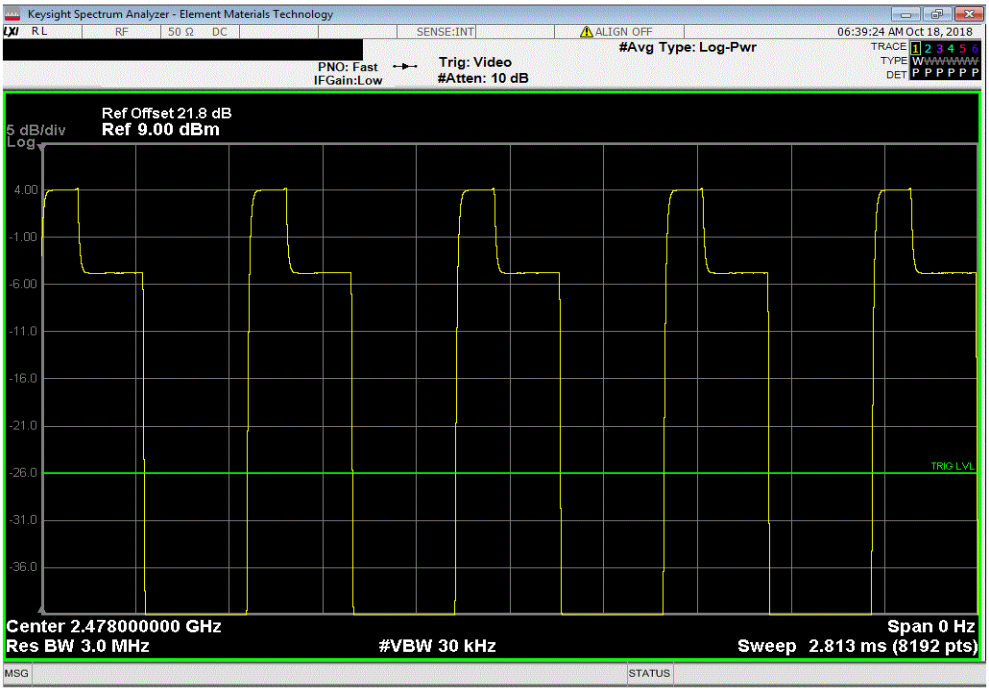


DUTY CYCLE

High Channel (2478 MHz), 2 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	306.998 us	625 us	1	49.1	N/A	N/A



High Channel (2478 MHz), 2 Mbps						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



OCCUPIED BANDWIDTH

XMit 2017.12.13

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	E4422B	TGQ	15-Mar-18	15-Mar-21
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	15-Mar-18	15-Mar-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-18	13-Feb-19
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	19-Dec-17	19-Dec-18

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 occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

OCCUPIED BANDWIDTH

TbtTx 2018.09.13 XMit 2017.12.13

EUT:	Mini Remote Microphone			**Work Order:**	STAK0144
Serial Number:	182000364			**Date:**	18-Oct-18
Customer:	Starkey Laboratories, Inc.			**Temperature:**	22 °C
Attendees:	Charlie Esch			**Humidity:**	32.8% RH
Project:	None			**Barometric Pres.:**	1024 mbar
Tested by:	Dustin Sparks	**Power:**	Battery	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

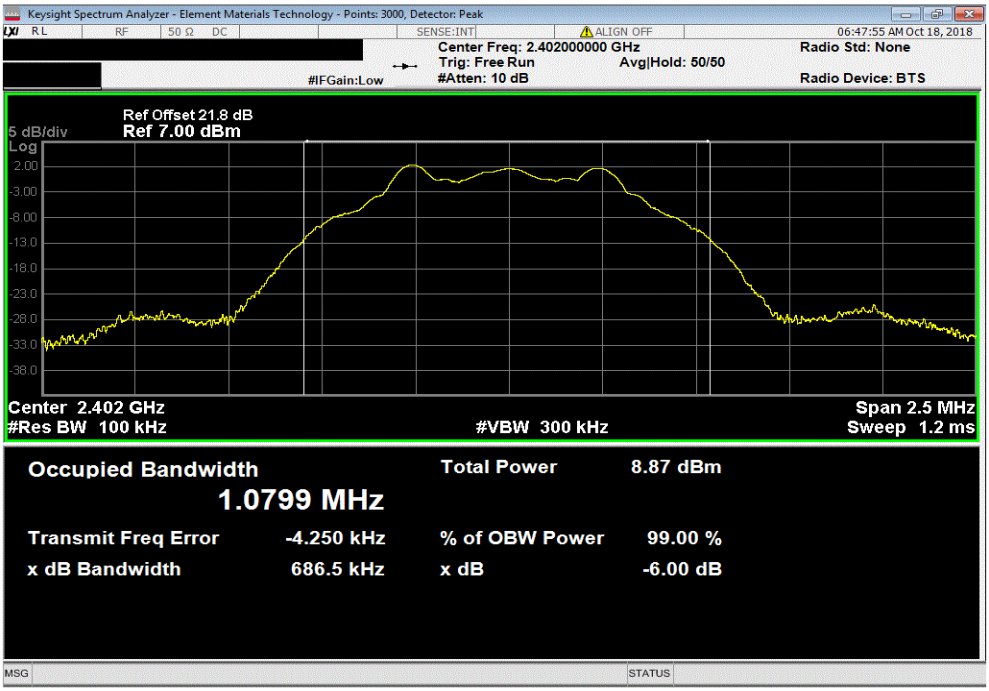
DEVIATIONS FROM TEST STANDARD

None

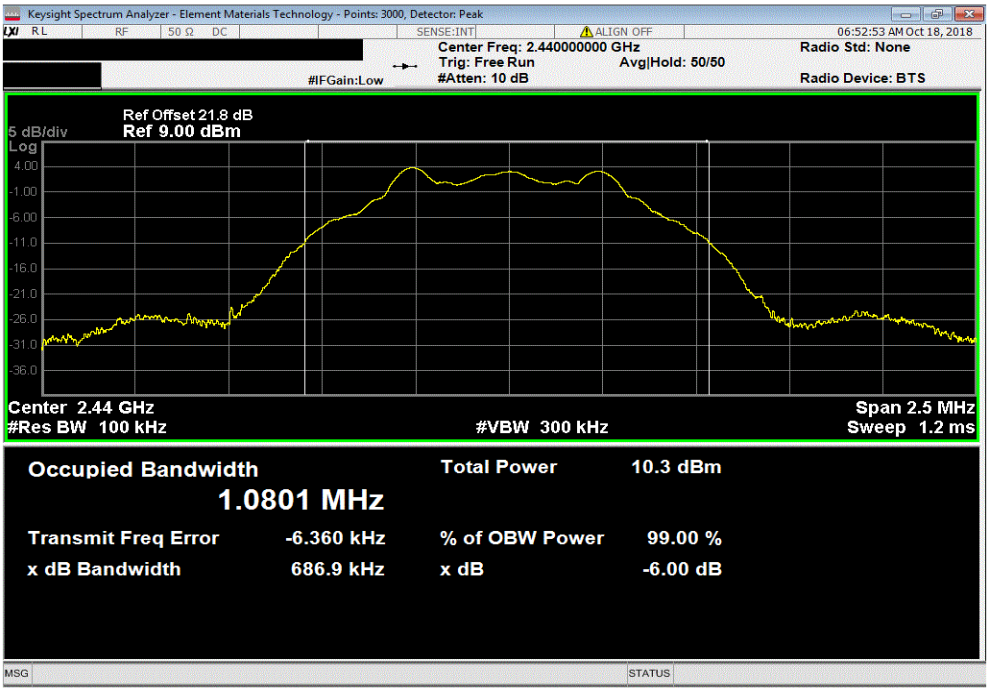
Configuration #	7	Signature

	Value	Limit (≥)	Result
BLE, Low Channel (2402 MHz), 1 Mbps	686.497 kHz	500 kHz	Pass
BLE, Mid Channel (2440 MHz), 1 Mbps	686.922 kHz	500 kHz	Pass
BLE, High Channel (2480 MHz), 1 Mbps	697.823 kHz	500 kHz	Pass
Low Channel (2402 MHz), 2 Mbps	968.619 kHz	500 kHz	Pass
Mid Channel (2440 MHz), 2 Mbps	979.96 kHz	500 kHz	Pass
High Channel (2478 MHz), 2 Mbps	978.442 kHz	500 kHz	Pass

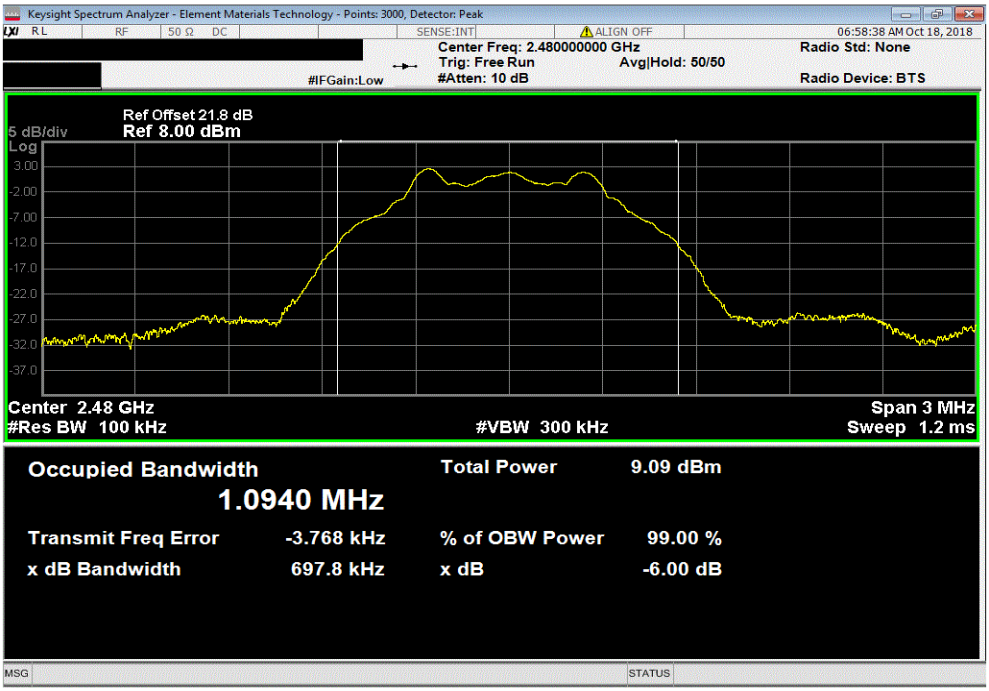
BLE, Low Channel (2402 MHz), 1 Mbps						
				Value	Limit (≥)	Result
				686.497 kHz	500 kHz	Pass



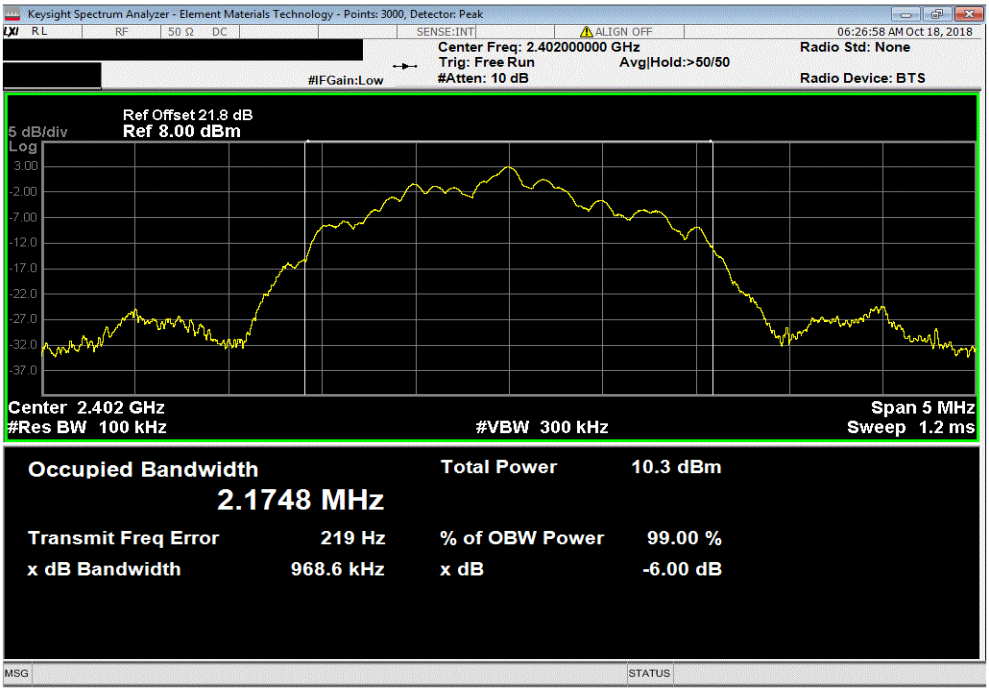
BLE, Mid Channel (2440 MHz), 1 Mbps						
				Value	Limit (≥)	Result
				686.922 kHz	500 kHz	Pass



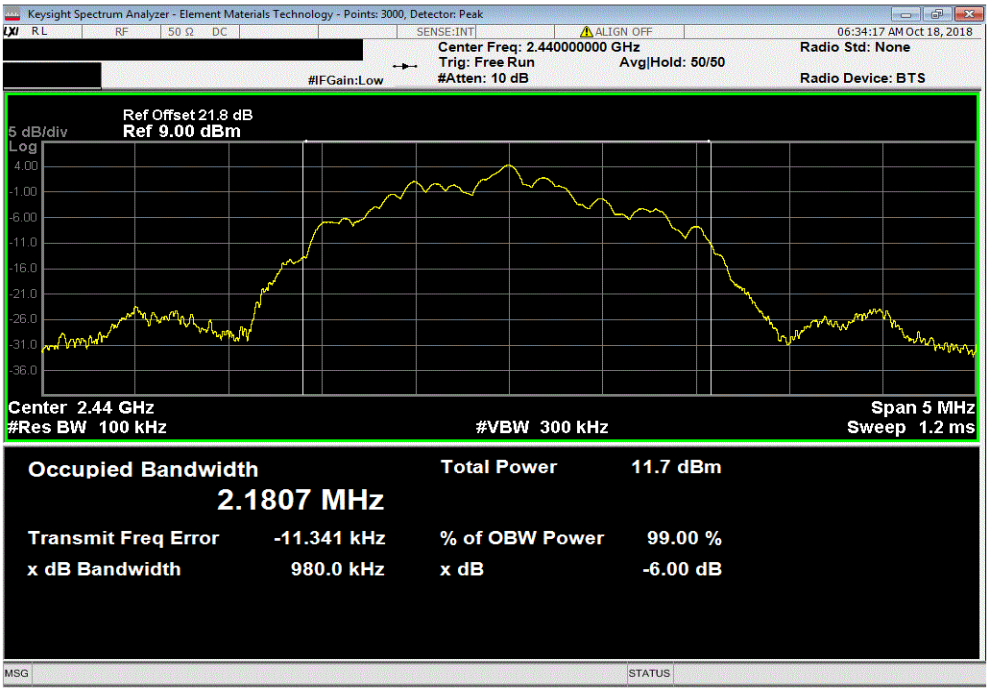
BLE, High Channel (2480 MHz), 1 Mbps							
				Value	Limit (≥)	Result
				697.823 kHz	500 kHz	Pass



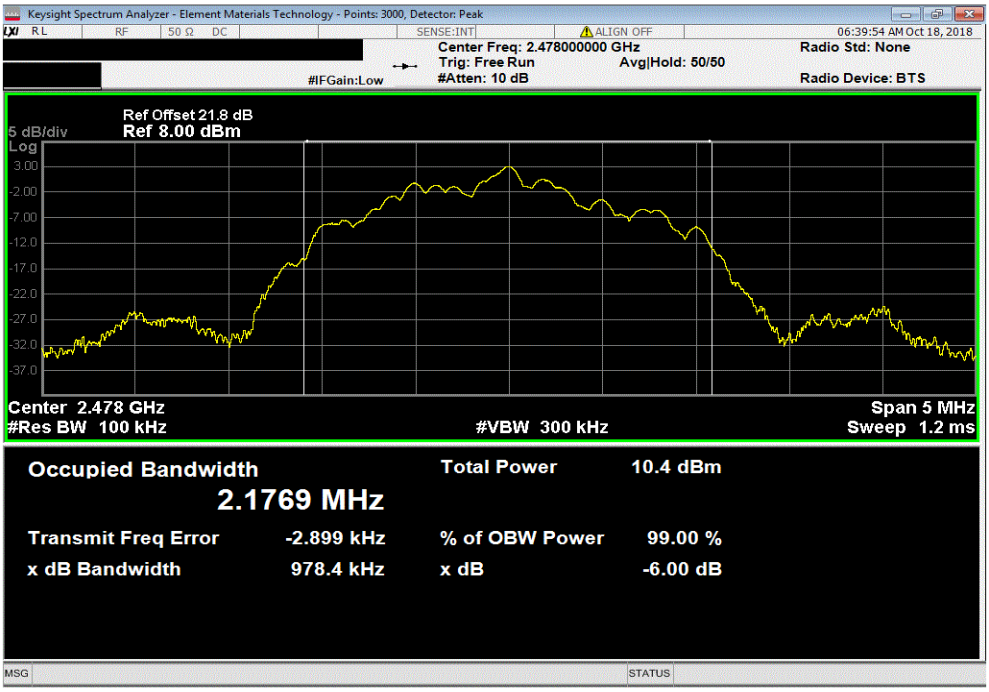
Low Channel (2402 MHz), 2 Mbps							
				Value	Limit (≥)	Result
				968.619 kHz	500 kHz	Pass



Mid Channel (2440 MHz), 2 Mbps						
				Value	Limit (≥)	Result
				979.96 kHz	500 kHz	Pass



High Channel (2478 MHz), 2 Mbps						
				Value	Limit (≥)	Result
				978.442 kHz	500 kHz	Pass



OUTPUT POWER

XMit 2017.12.13

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	E4422B	TGQ	15-Mar-18	15-Mar-21
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	15-Mar-18	15-Mar-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-18	13-Feb-19
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	19-Dec-17	19-Dec-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

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

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

OUTPUT POWER

element

TbtTx 2018.09.13 XMit 2017.12.13

EUT:	**Mini Remote Microphone**			**Work Order:**	**STAK0144**
Serial Number:	**182000364**			**Date:**	**18-Oct-18**
Customer:	**Starkey Laboratories, Inc.**			**Temperature:**	**22 °C**
Attendees:	**Charlie Esch**			**Humidity:**	**32.9% RH**
Project:	**None**			**Barometric Pres.:**	**1024 mbar**
Tested by:	**Dustin Sparks**	**Power:**	**Battery**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

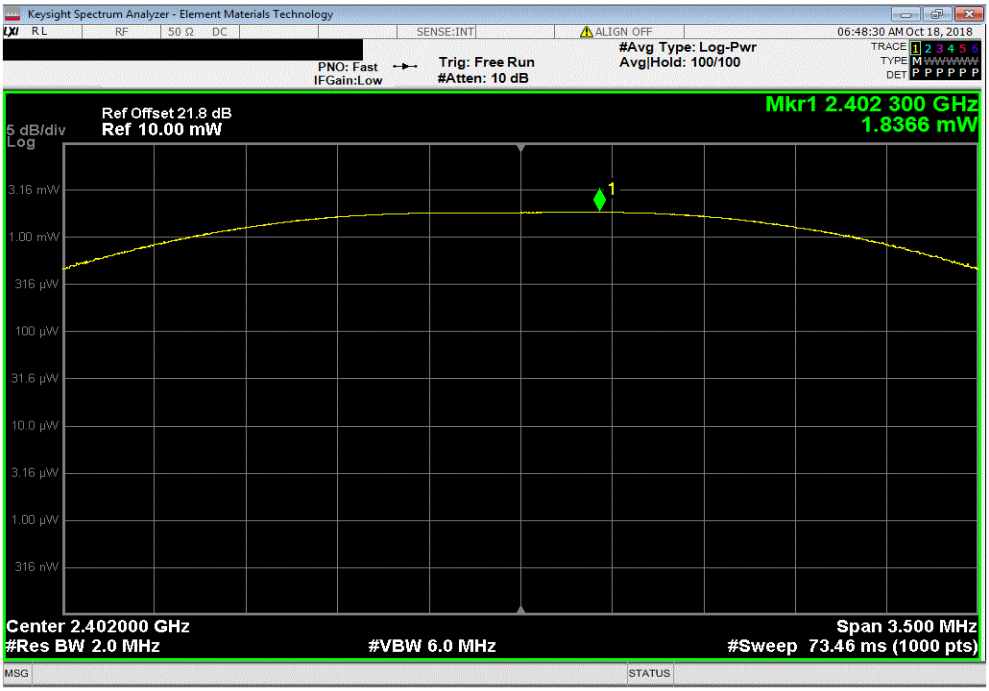
DEVIATIONS FROM TEST STANDARD

None

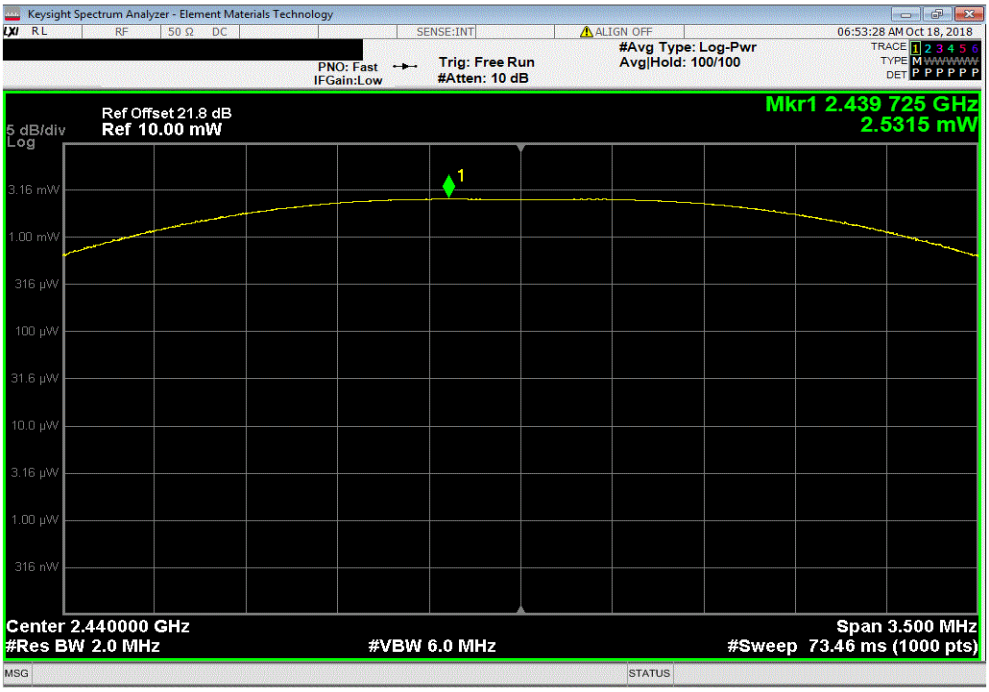
Configuration #	**7**	*Signature* Dustin Sparks

	Value	**Limit (<)**	**Result**
BLE, Low Channel (2402 MHz), 1 Mbps	1.837 mW	1 W	Pass
BLE, Mid Channel (2440 MHz), 1 Mbps	2.532 mW	1 W	Pass
BLE, High Channel (2480 MHz), 1 Mbps	1.917 mW	1 W	Pass
Low Channel (2402 MHz), 2 Mbps	2.668 mW	1 W	Pass
Mid Channel (2440 MHz), 2 Mbps	3.641 mW	1 W	Pass
High Channel (2478 MHz), 2 Mbps	2.73 mW	1 W	Pass

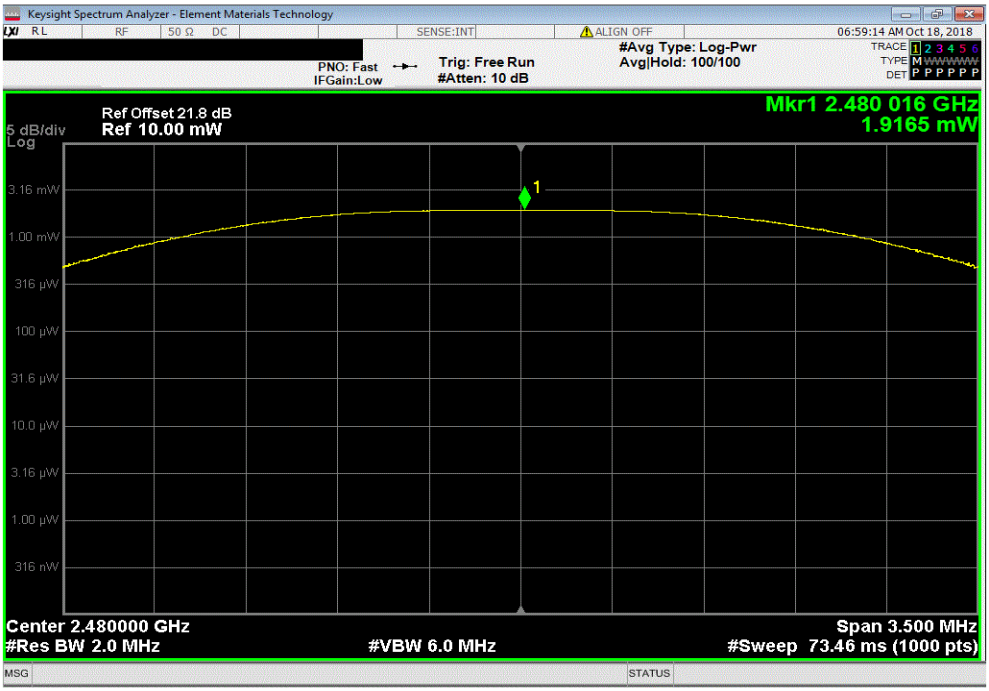
BLE, Low Channel (2402 MHz), 1 Mbps						
				Value	Limit (<)	Result
				1.837 mW	1 W	Pass



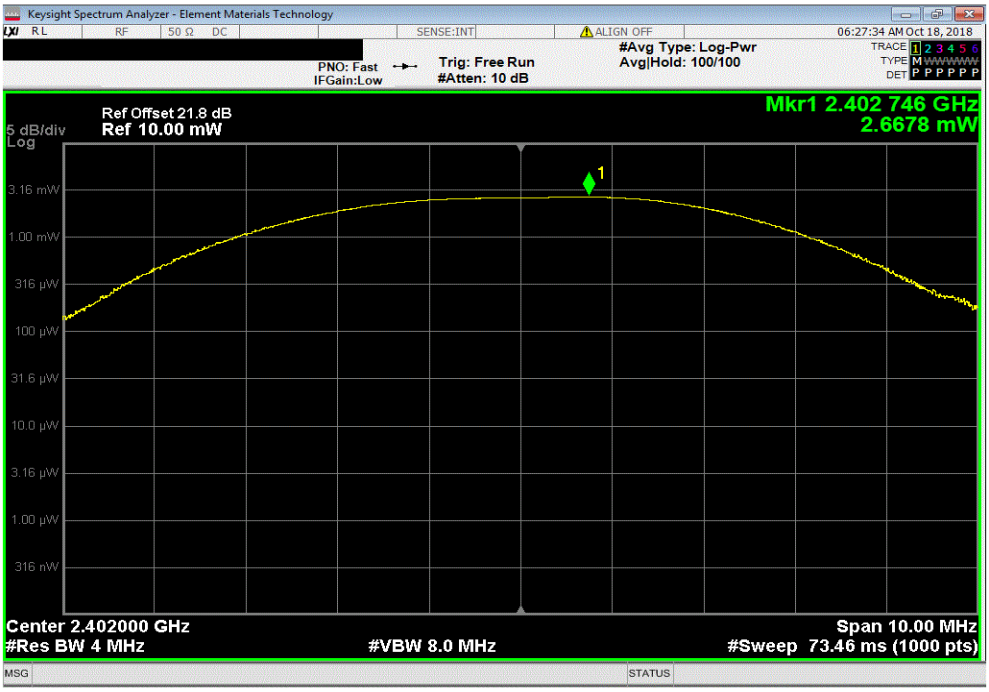
BLE, Mid Channel (2440 MHz), 1 Mbps						
				Value	Limit (<)	Result
				2.532 mW	1 W	Pass



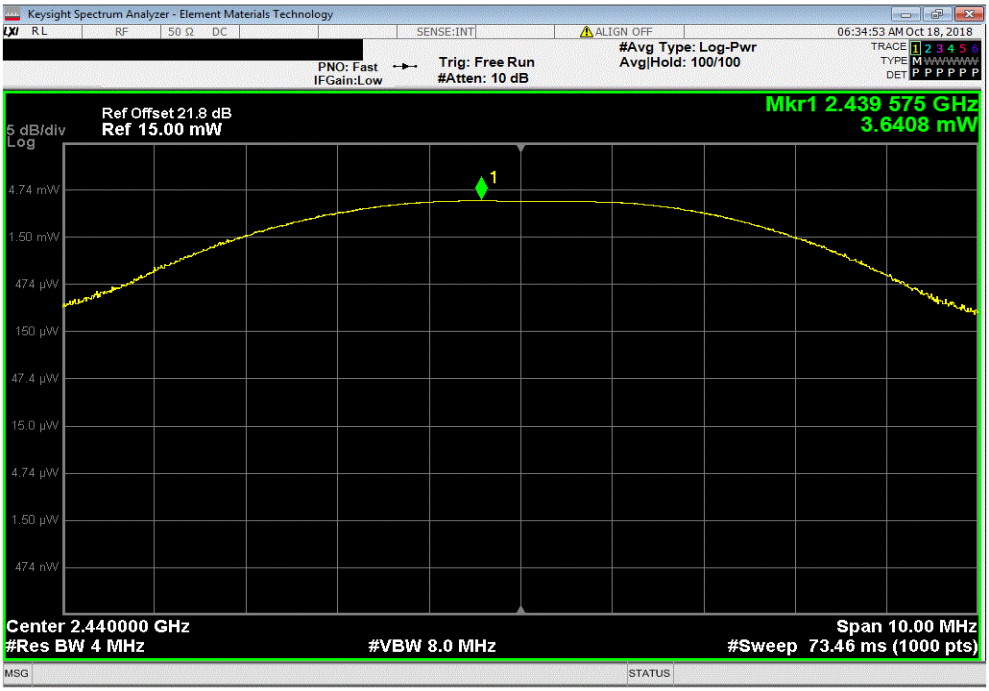
BLE, High Channel (2480 MHz), 1 Mbps						
				Value	Limit (<)	Result
				1.917 mW	1 W	Pass



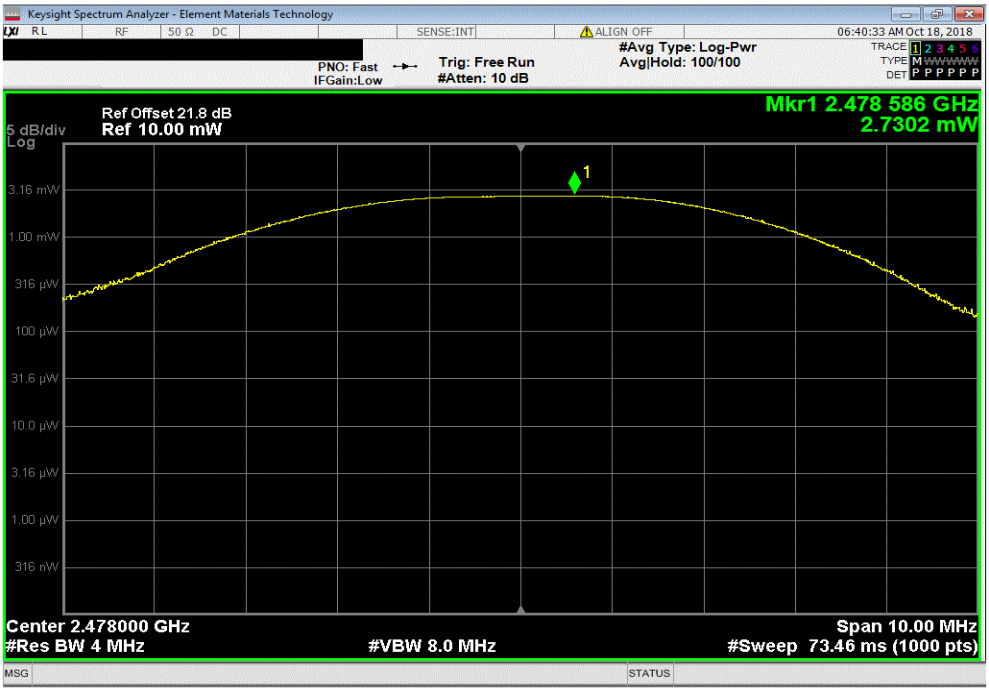
Low Channel (2402 MHz), 2 Mbps						
				Value	Limit (<)	Result
				2.668 mW	1 W	Pass



Mid Channel (2440 MHz), 2 Mbps						
				Value	Limit (<)	Result
				3.641 mW	1 W	Pass



High Channel (2478 MHz), 2 Mbps						
				Value	Limit (<)	Result
				2.73 mW	1 W	Pass



EQUIVALENT ISOTROPIC RADIATED POWER

XMit 2017.12.13

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	E4422B	TGQ	15-Mar-18	15-Mar-21
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	15-Mar-18	15-Mar-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-18	13-Feb-19
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	19-Dec-17	19-Dec-18

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. The actual antenna gain of the EUT was added to the conducted output power to derive the EIRP values.

EQUIVALENT ISOTROPIC RADIATED POWER

element

TbtTx 2018.09.13 XMit 2017.12.13

EUT:	Mini Remote Microphone			**Work Order:**	STAK0144
Serial Number:	182000364			**Date:**	18-Oct-18
Customer:	Starkey Laboratories, Inc.			**Temperature:**	22 °C
Attendees:	Charlie Esch			**Humidity:**	32.9% RH
Project:	None			**Barometric Pres.:**	1024 mbar
Tested by:	Dustin Sparks	**Power:**	Battery	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

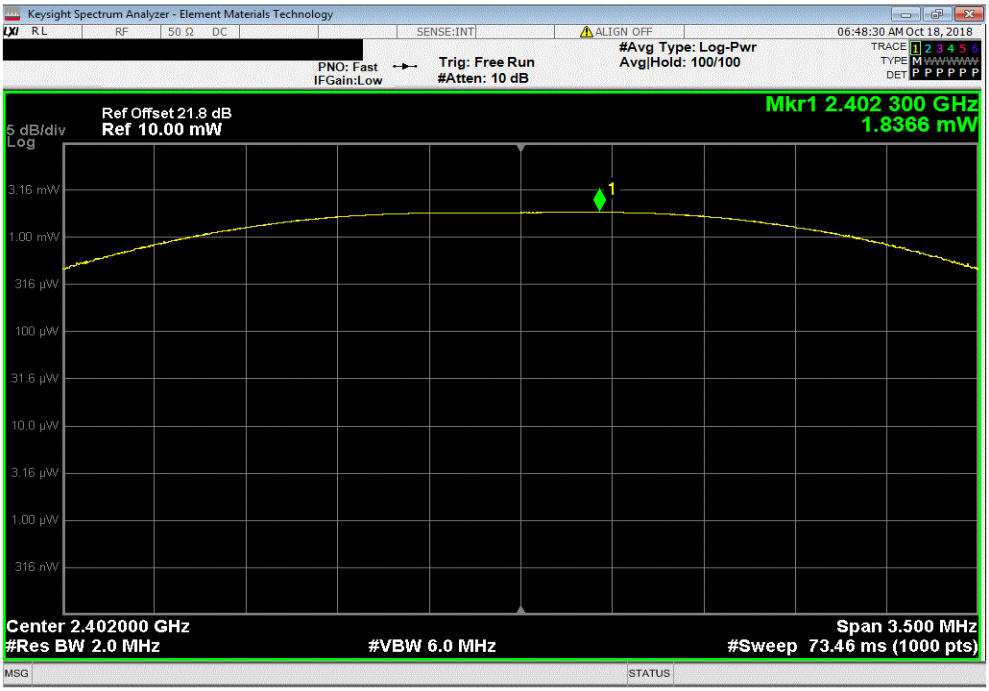
DEVIATIONS FROM TEST STANDARD

None

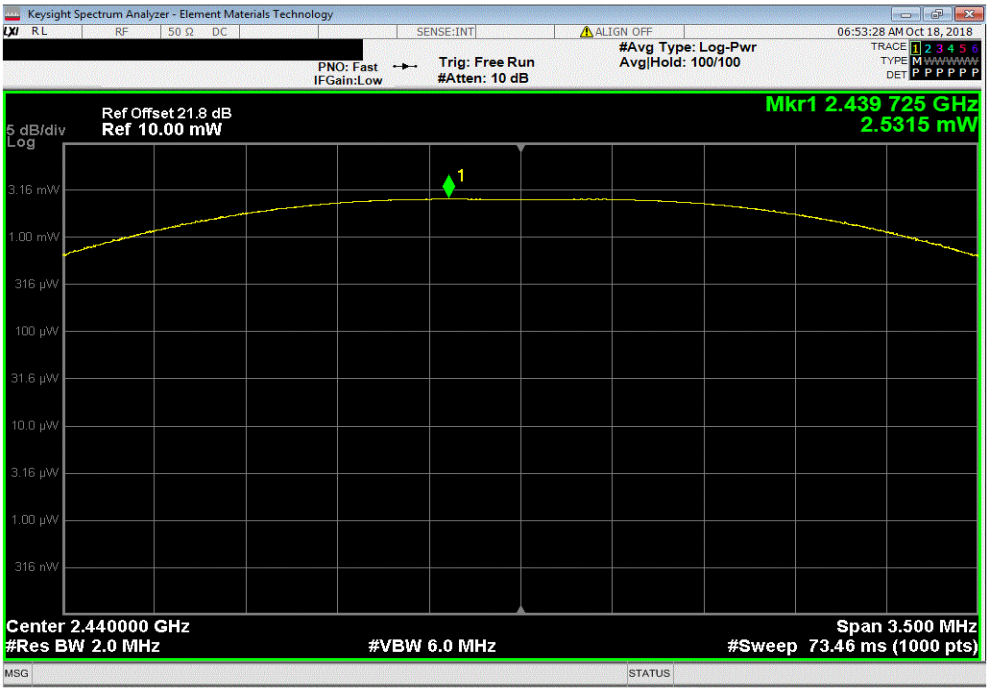
Configuration #	7	Signature

	Value	Value (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (< dBm)	Result
BLE, Low Channel (2402 MHz), 1 Mbps	1.837 mW	2.72	2.5	5.22	36	Pass
BLE, Mid Channel (2440 MHz), 1 Mbps	2.532 mW	4.03	2.5	6.53	36	Pass
BLE, High Channel (2480 MHz), 1 Mbps	1.917 mW	2.83	2.5	5.33	36	Pass
Low Channel (2402 MHz), 2 Mbps	2.668 mW	4.26	2.5	6.76	36	Pass
Mid Channel (2440 MHz), 2 Mbps	3.641 mW	5.61	2.5	8.11	36	Pass
High Channel (2478 MHz), 2 Mbps	2.73 mW	4.36	2.5	6.86	36	Pass

BLE, Low Channel (2402 MHz), 1 Mbps						
	Value	Value (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (< dBm)	Result
	1.837 mW	2.72	2.5	5.22	36	Pass

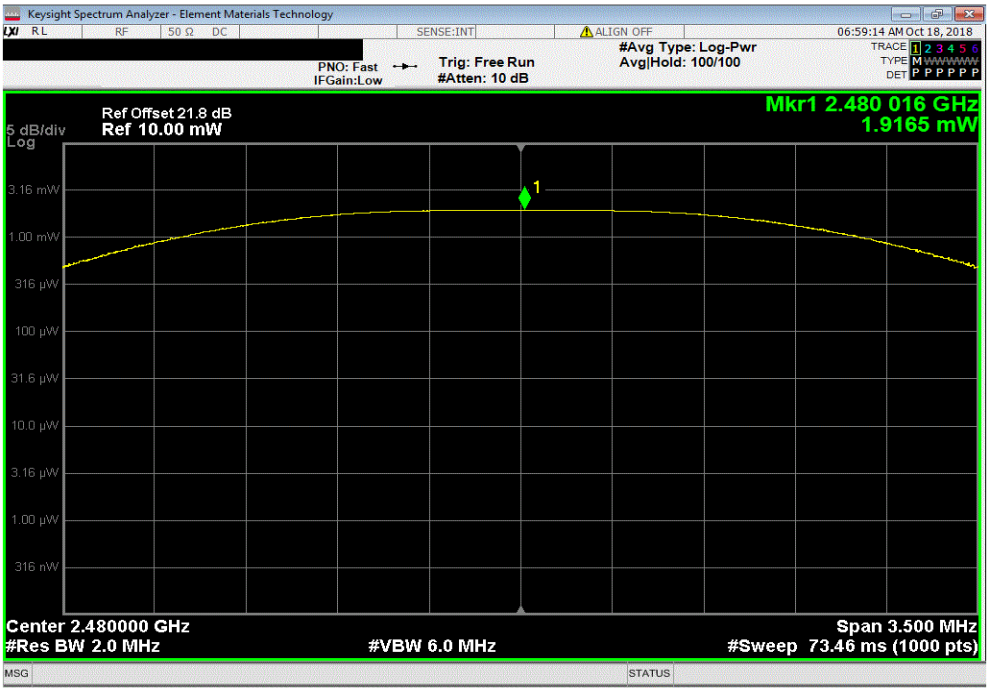


BLE, Mid Channel (2440 MHz), 1 Mbps						
	Value	Value (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (< dBm)	Result
	2.532 mW	4.03	2.5	6.53	36	Pass

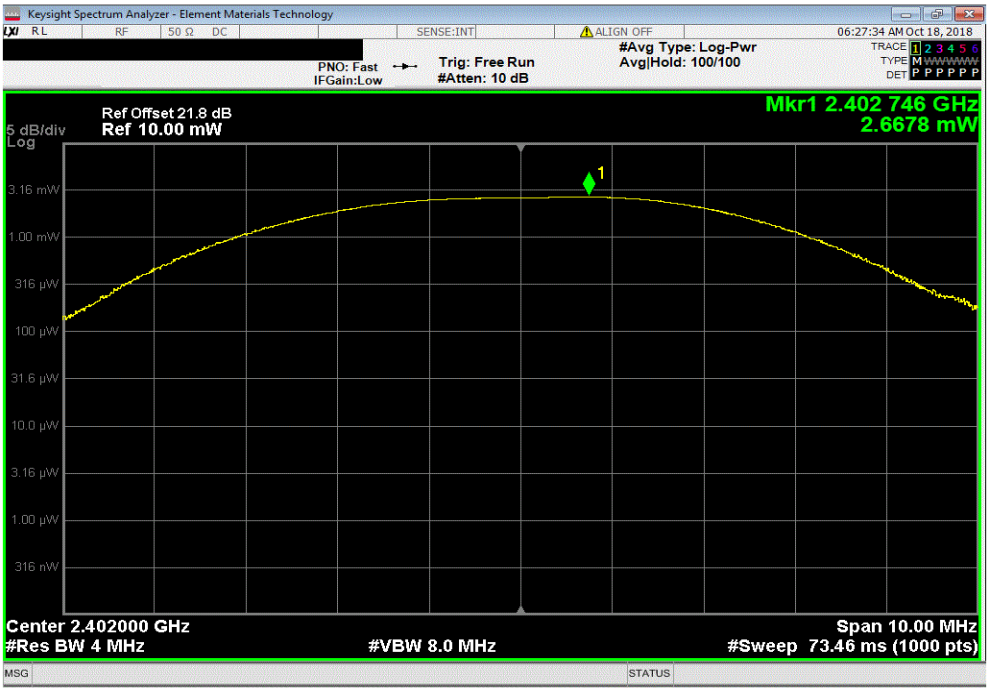


EQUIVALENT ISOTROPIC RADIATED POWER

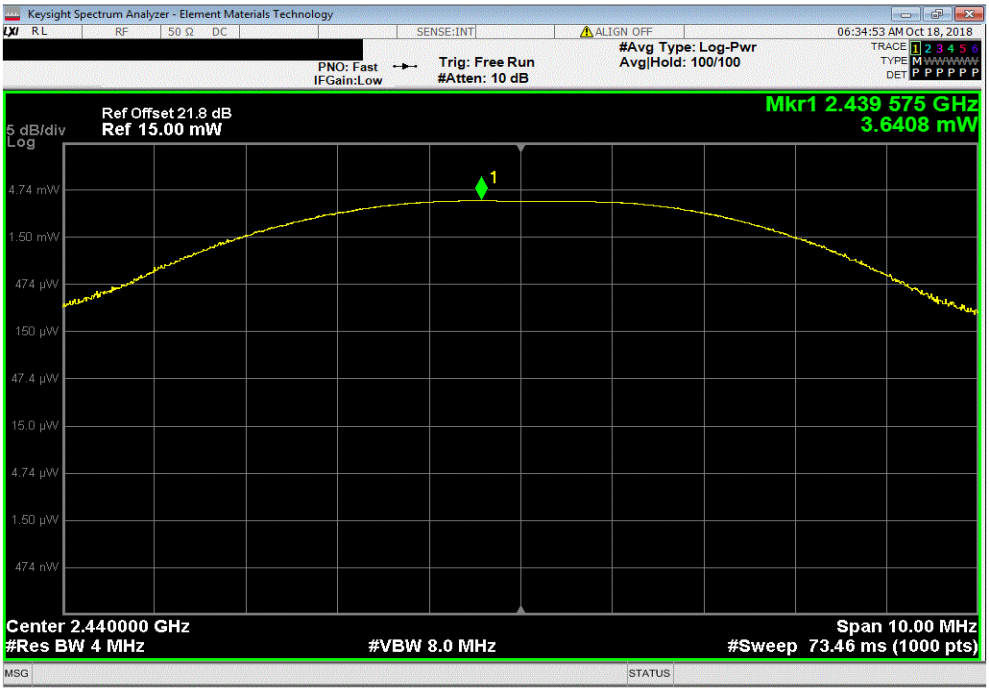
BLE, High Channel (2480 MHz), 1 Mbps						
	Value	Value (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (< dBm)	Result
	1.917 mW	2.83	2.5	5.33	36	Pass



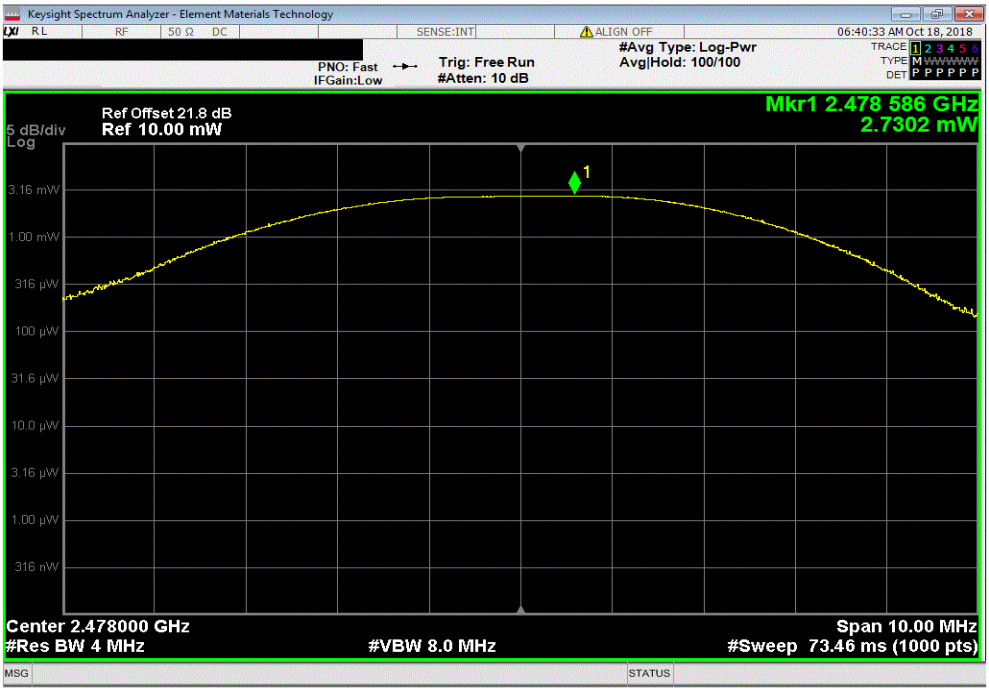
Low Channel (2402 MHz), 2 Mbps						
	Value	Value (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (< dBm)	Result
	2.668 mW	4.26	2.5	6.76	36	Pass



Mid Channel (2440 MHz), 2 Mbps						
	Value	Value (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (< dBm)	Result
	3.641 mW	5.61	2.5	8.11	36	Pass



High Channel (2478 MHz), 2 Mbps						
	Value	Value (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (< dBm)	Result
	2.73 mW	4.36	2.5	6.86	36	Pass



POWER SPECTRAL DENSITY

XMit 2017.12.13

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	E4422B	TGQ	15-Mar-18	15-Mar-21
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	15-Mar-18	15-Mar-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-18	13-Feb-19
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	19-Dec-17	19-Dec-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

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

POWER SPECTRAL DENSITY

element

TbtTx 2018.09.13 XMit 2017.12.13

EUT:	**Mini Remote Microphone**			**Work Order:**	**STAK0144**
Serial Number:	**182000364**			**Date:**	**18-Oct-18**
Customer:	**Starkey Laboratories, Inc.**			**Temperature:**	**22 °C**
Attendees:	**Charlie Esch**			**Humidity:**	**32.9% RH**
Project:	**None**			**Barometric Pres.:**	**1024 mbar**
Tested by:	**Dustin Sparks**	**Power:**	**Battery**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

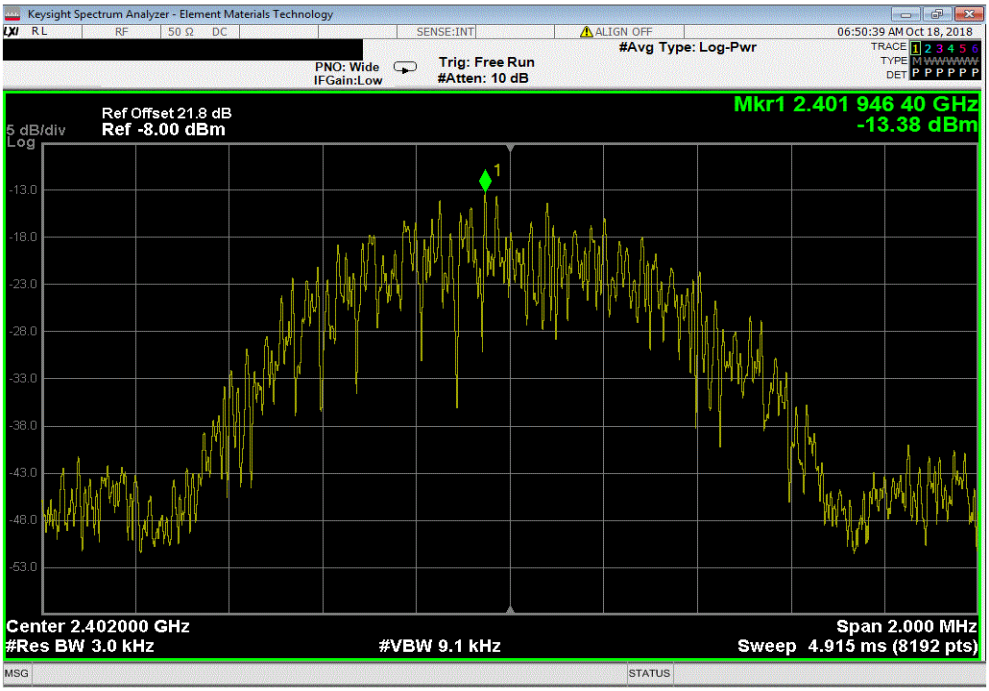
DEVIATIONS FROM TEST STANDARD

None

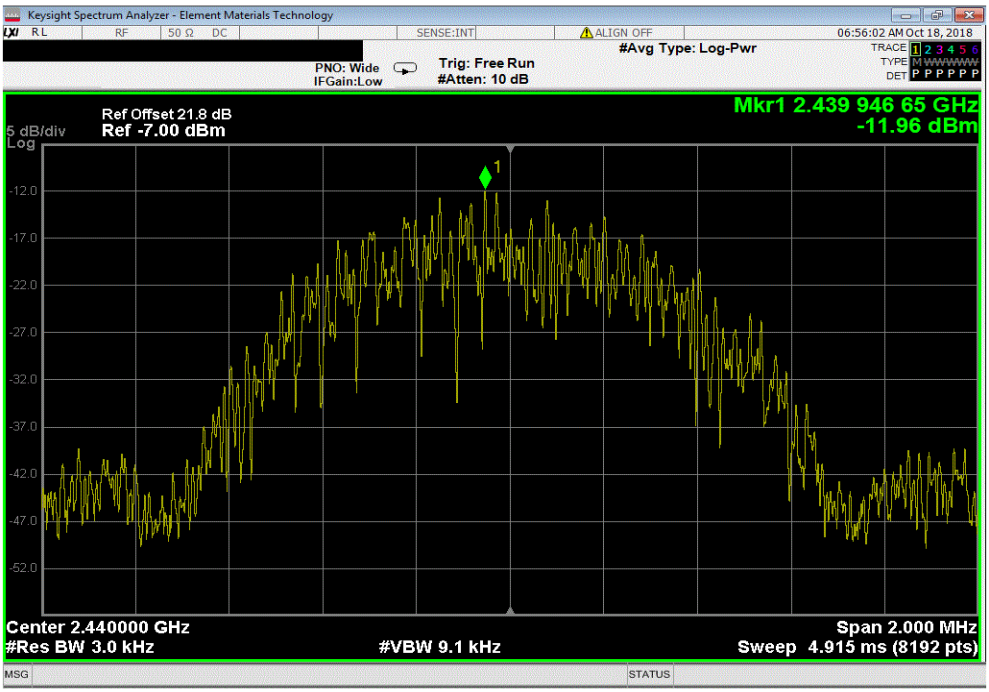
Configuration #	**7**	*Signature* Dustin Sparks

	Value dBm/3kHz	**Limit < dBm/3kHz**	**Results**
BLE, Low Channel (2402 MHz), 1 Mbps	-13.375	8	Pass
BLE, Mid Channel (2440 MHz), 1 Mbps	-11.958	8	Pass
BLE, High Channel (2480 MHz), 1 Mbps	-13.25	8	Pass
Low Channel (2402 MHz), 2 Mbps	-7.486	8	Pass
Mid Channel (2440 MHz), 2 Mbps	-6.328	8	Pass
High Channel (2478 MHz), 2 Mbps	-6.887	8	Pass

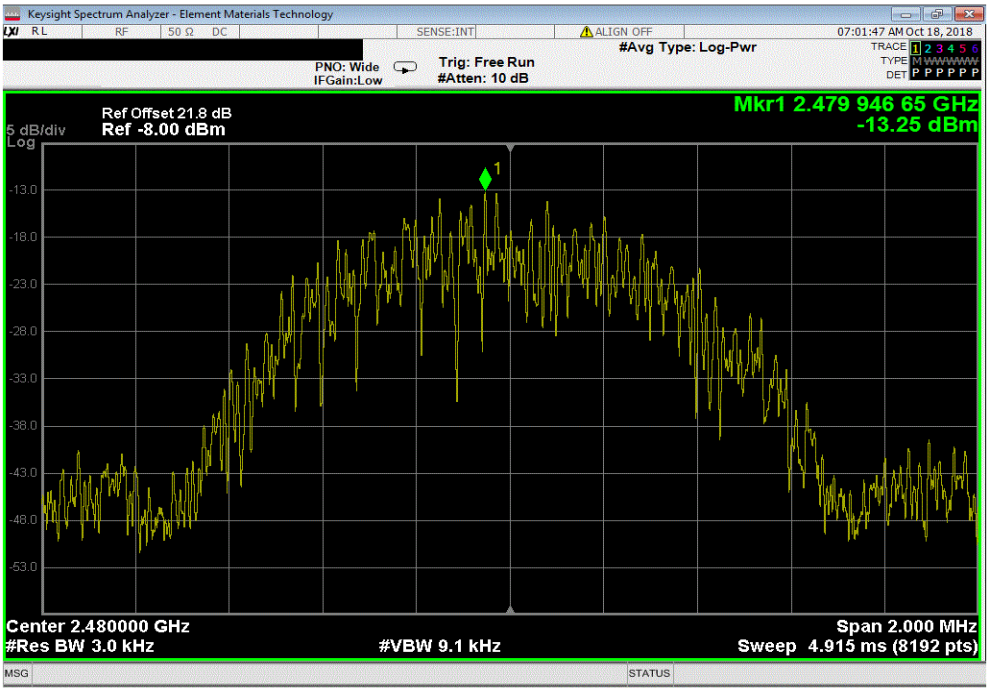
BLE, Low Channel (2402 MHz), 1 Mbps						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-13.375	8	Pass



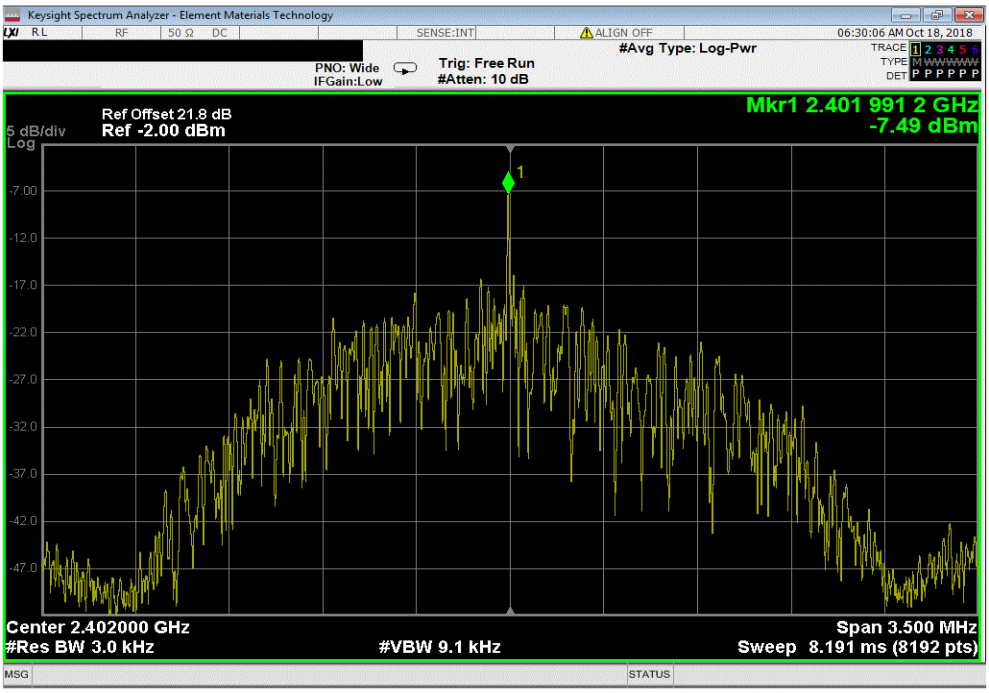
BLE, Mid Channel (2440 MHz), 1 Mbps						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-11.958	8	Pass



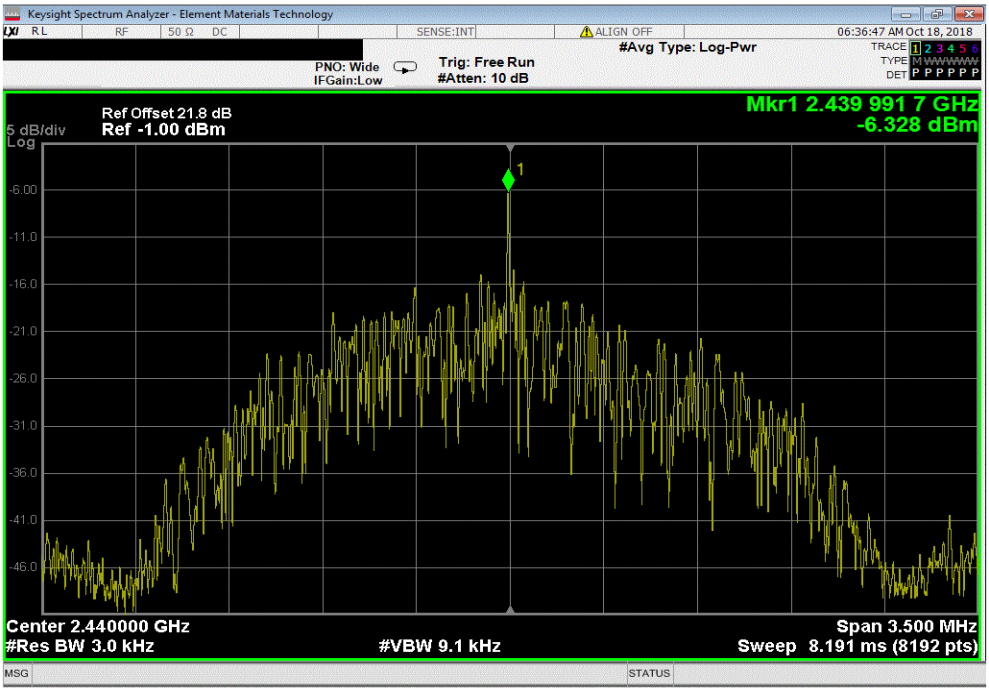
BLE, High Channel (2480 MHz), 1 Mbps						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-13.25	8	Pass



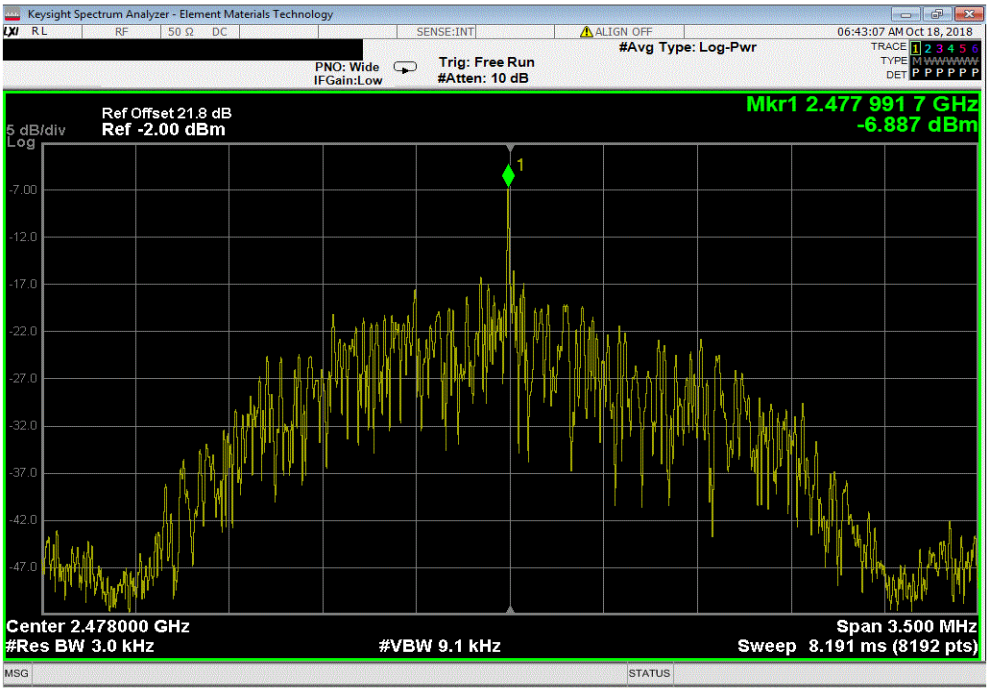
Low Channel (2402 MHz), 2 Mbps						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-7.486	8	Pass



Mid Channel (2440 MHz), 2 Mbps						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-6.328	8	Pass



High Channel (2478 MHz), 2 Mbps						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-6.887	8	Pass



BAND EDGE COMPLIANCE

XMit 2017.12.13

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	E4422B	TGQ	15-Mar-18	15-Mar-21
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	15-Mar-18	15-Mar-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-18	13-Feb-19
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	19-Dec-17	19-Dec-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

BAND EDGE COMPLIANCE

TbtTx 2018.09.13 XMit 2017.12.13

EUT:	Mini Remote Microphone			**Work Order:**	STAK0144
Serial Number:	182000364			**Date:**	18-Oct-18
Customer:	Starkey Laboratories, Inc.			**Temperature:**	22 °C
Attendees:	Charlie Esch			**Humidity:**	32.9% RH
Project:	None			**Barometric Pres.:**	1024 mbar
Tested by:	Dustin Sparks	**Power:**	Battery	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

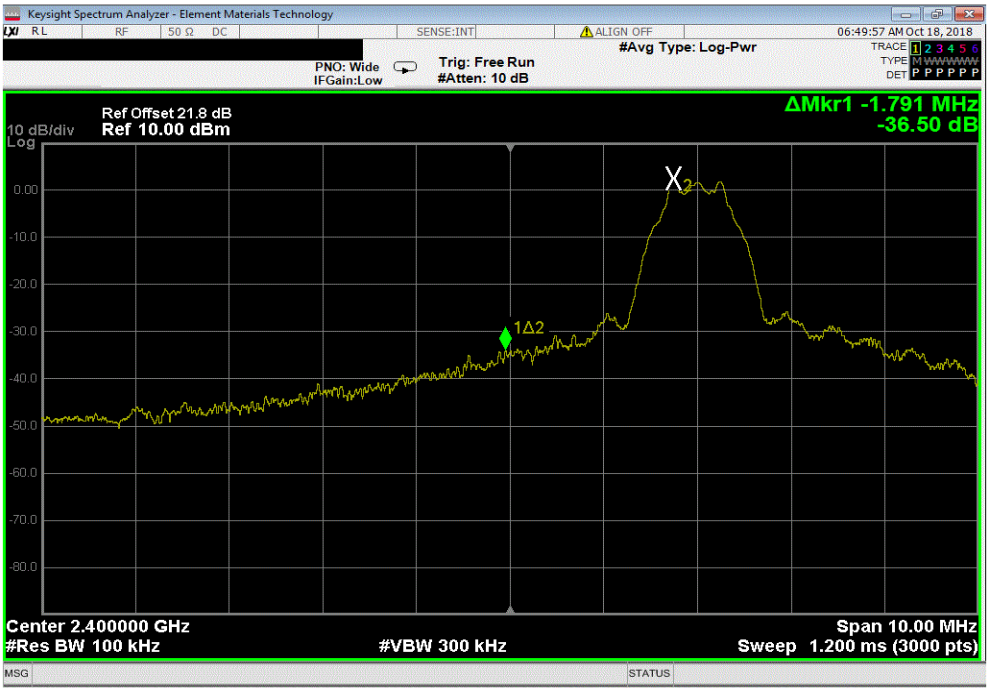
DEVIATIONS FROM TEST STANDARD

None

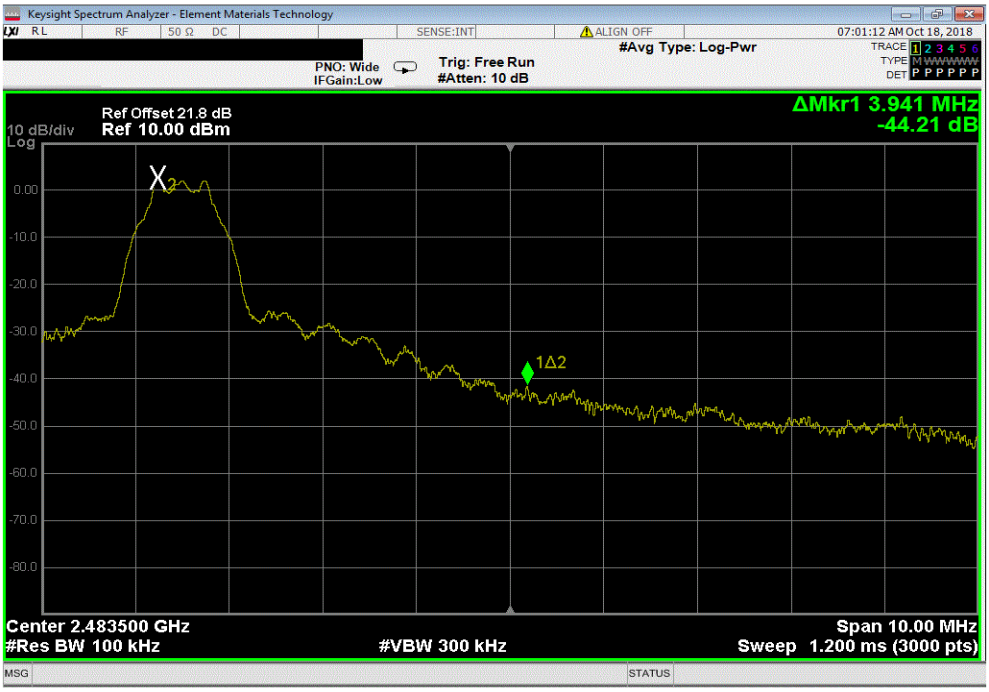
Configuration #	7	Signature

	Value (dBc)	Limit ≤ (dBc)	Result
BLE, Low Channel (2402 MHz), 1 Mbps	-36.5	-20	Pass
BLE, High Channel (2480 MHz), 1 Mbps	-44.21	-20	Pass
Low Channel (2402 MHz), 2 Mbps	-28.63	-20	Pass
High Channel (2478 MHz), 2 Mbps	-46.56	-20	Pass

BLE, Low Channel (2402 MHz), 1 Mbps						
				Value (dBc)	Limit ≤ (dBc)	Result
				-36.5	-20	Pass

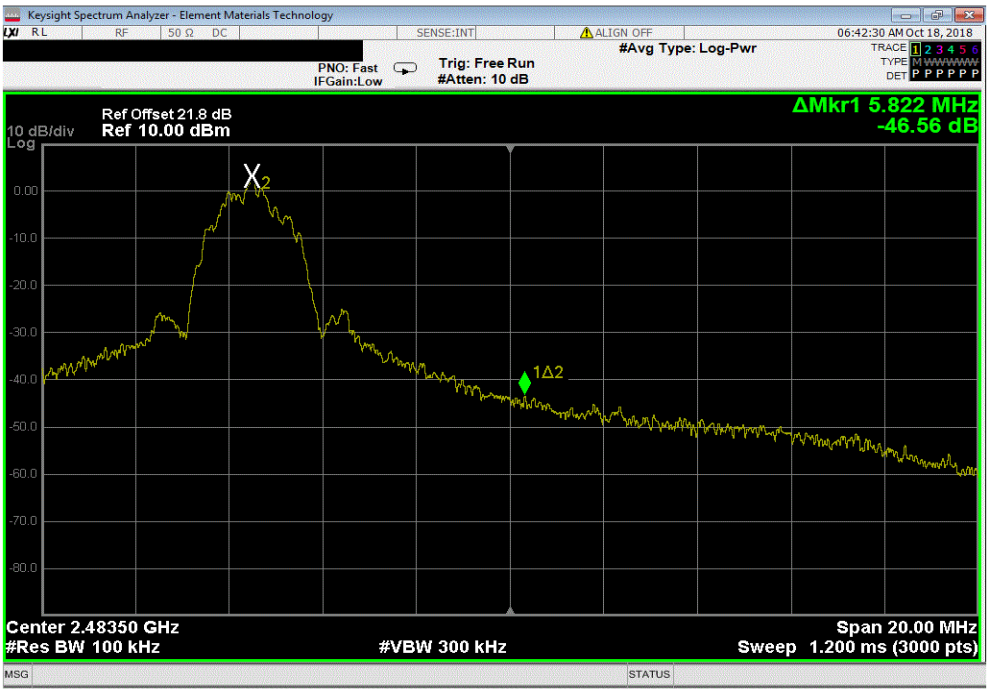


BLE, High Channel (2480 MHz), 1 Mbps						
				Value (dBc)	Limit ≤ (dBc)	Result
				-44.21	-20	Pass



Low Channel (2402 MHz), 2 Mbps						
				Value (dBc)	Limit ≤ (dBc)	Result
				-28.63	-20	Pass

High Channel (2478 MHz), 2 Mbps						
				Value (dBc)	Limit ≤ (dBc)	Result
				-46.56	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2017.12.13

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	E4422B	TGQ	15-Mar-18	15-Mar-21
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	15-Mar-18	15-Mar-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-18	13-Feb-19
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	19-Dec-17	19-Dec-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

element

TbtTx 2018.09.13 XMit 2017.12.13

EUT:	**Mini Remote Microphone**			**Work Order:**	**STAK0144**
Serial Number:	**182000364**			**Date:**	**18-Oct-18**
Customer:	**Starkey Laboratories, Inc.**			**Temperature:**	**22 °C**
Attendees:	**Charlie Esch**			**Humidity:**	**32.9% RH**
Project:	**None**			**Barometric Pres.:**	**1024 mbar**
Tested by:	**Dustin Sparks**	**Power:**	**Battery**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

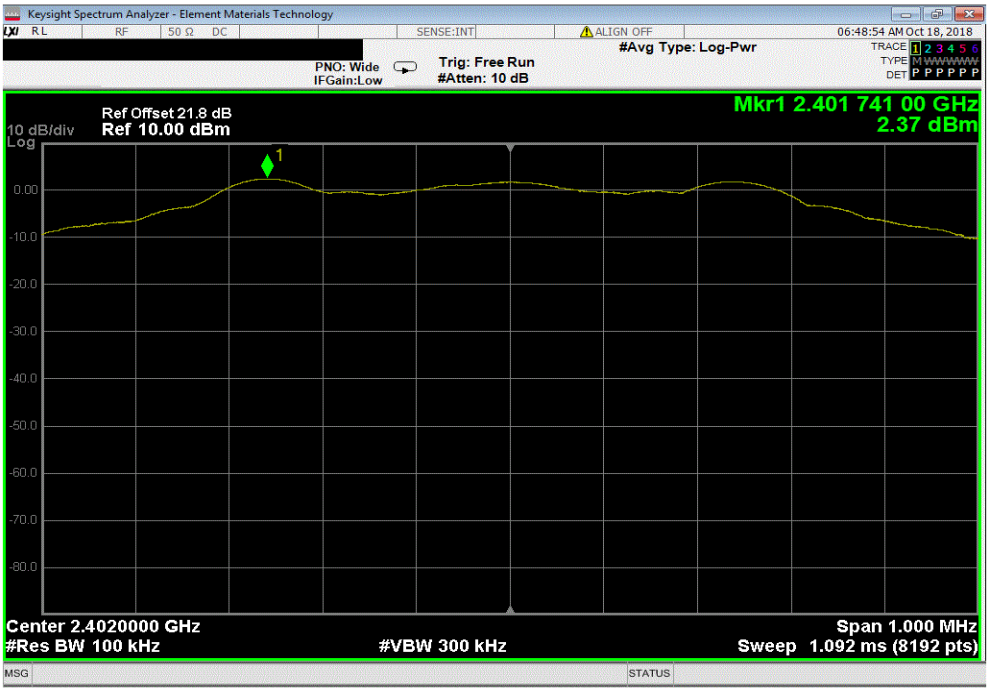
DEVIATIONS FROM TEST STANDARD

None

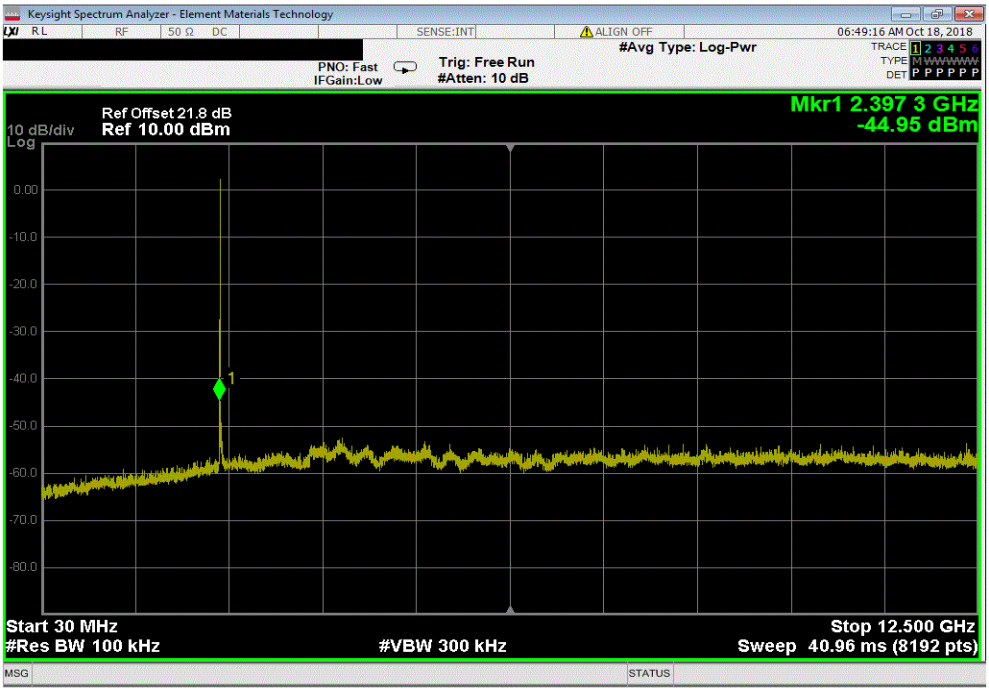
Configuration #	**7**	*Signature* Dustin Sparks

	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
BLE, Low Channel (2402 MHz), 1 Mbps	Fundamental	2401.74	N/A	N/A	N/A
BLE, Low Channel (2402 MHz), 1 Mbps	30 MHz - 12.5 GHz	2397.34	-47.32	-20	Pass
BLE, Low Channel (2402 MHz), 1 Mbps	12.5 GHz - 25 GHz	23769.99	-52.85	-20	Pass
BLE, Mid Channel (2440 MHz), 1 Mbps	Fundamental	2439.74	N/A	N/A	N/A
BLE, Mid Channel (2440 MHz), 1 Mbps	30 MHz - 12.5 GHz	4035.44	-55.92	-20	Pass
BLE, Mid Channel (2440 MHz), 1 Mbps	12.5 GHz - 25 GHz	23863.08	-54.24	-20	Pass
BLE, High Channel (2480 MHz), 1 Mbps	Fundamental	2479.74	N/A	N/A	N/A
BLE, High Channel (2480 MHz), 1 Mbps	30 MHz - 12.5 GHz	2487.16	-52.97	-20	Pass
BLE, High Channel (2480 MHz), 1 Mbps	12.5 GHz - 25 GHz	24087.41	-53.11	-20	Pass
Low Channel (2402 MHz), 2 Mbps	Fundamental	2402	N/A	N/A	N/A
Low Channel (2402 MHz), 2 Mbps	30 MHz - 12.5 GHz	2397.34	-41.37	-20	Pass
Low Channel (2402 MHz), 2 Mbps	12.5 GHz - 25 GHz	23936.33	-53.02	-20	Pass
Mid Channel (2440 MHz), 2 Mbps	Fundamental	2440	N/A	N/A	N/A
Mid Channel (2440 MHz), 2 Mbps	30 MHz - 12.5 GHz	3764.45	-57.37	-20	Pass
Mid Channel (2440 MHz), 2 Mbps	12.5 GHz - 25 GHz	24755.83	-54.45	-20	Pass
High Channel (2478 MHz), 2 Mbps	Fundamental	2478	N/A	N/A	N/A
High Channel (2478 MHz), 2 Mbps	30 MHz - 12.5 GHz	2490.2	-54.29	-20	Pass
High Channel (2478 MHz), 2 Mbps	12.5 GHz - 25 GHz	23708.95	-52.95	-20	Pass

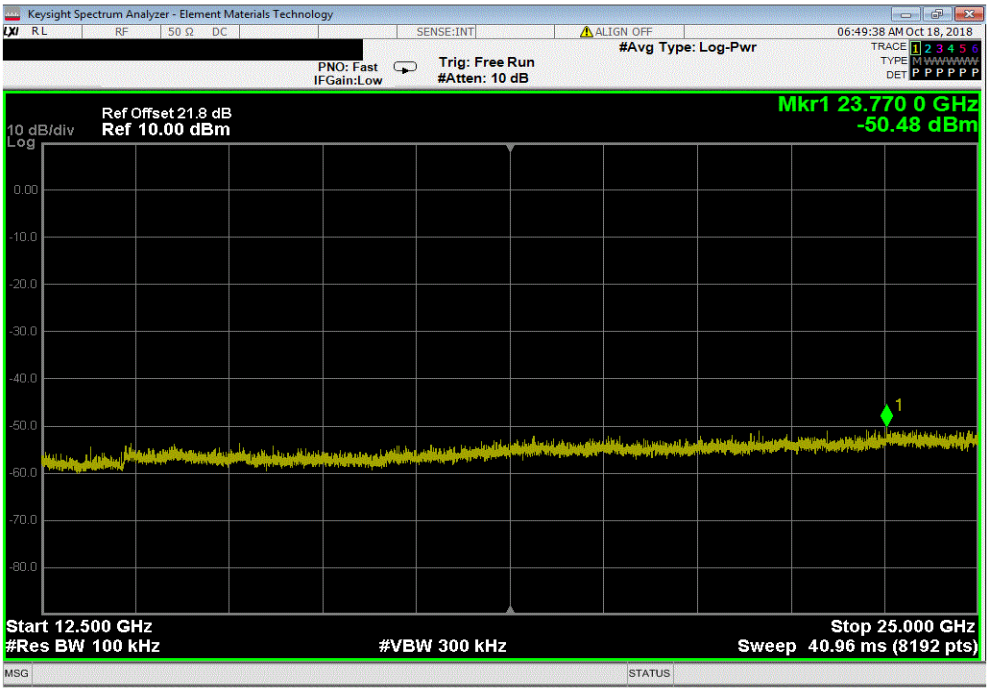
BLE, Low Channel (2402 MHz), 1 Mbps					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2401.74	N/A	N/A	N/A



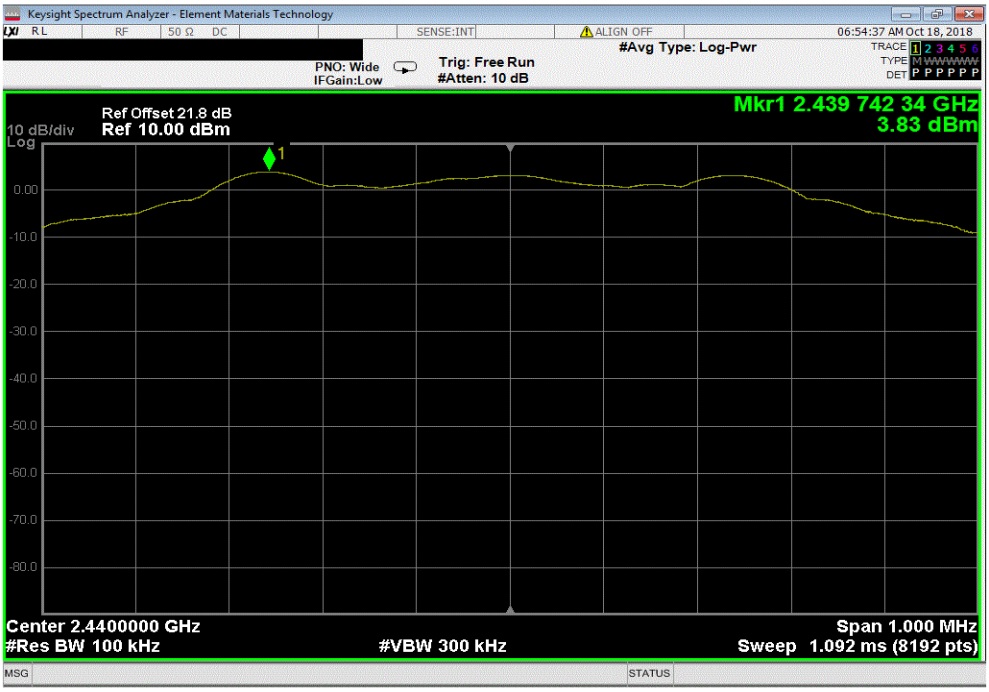
BLE, Low Channel (2402 MHz), 1 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2397.34	-47.32	-20	Pass



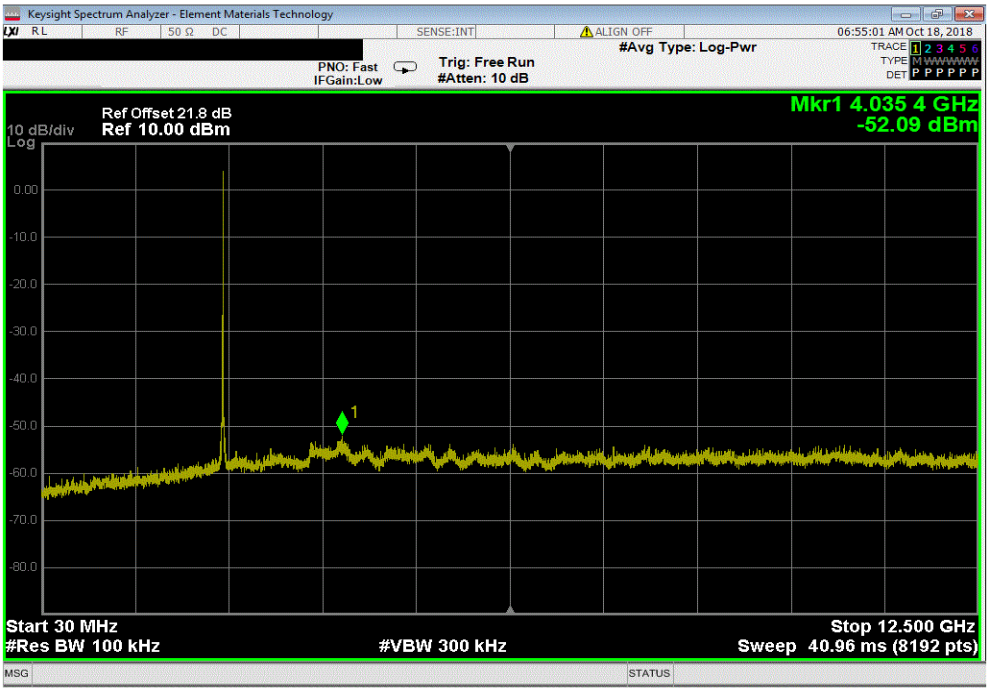
BLE, Low Channel (2402 MHz), 1 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	23769.99	-52.85	-20	Pass



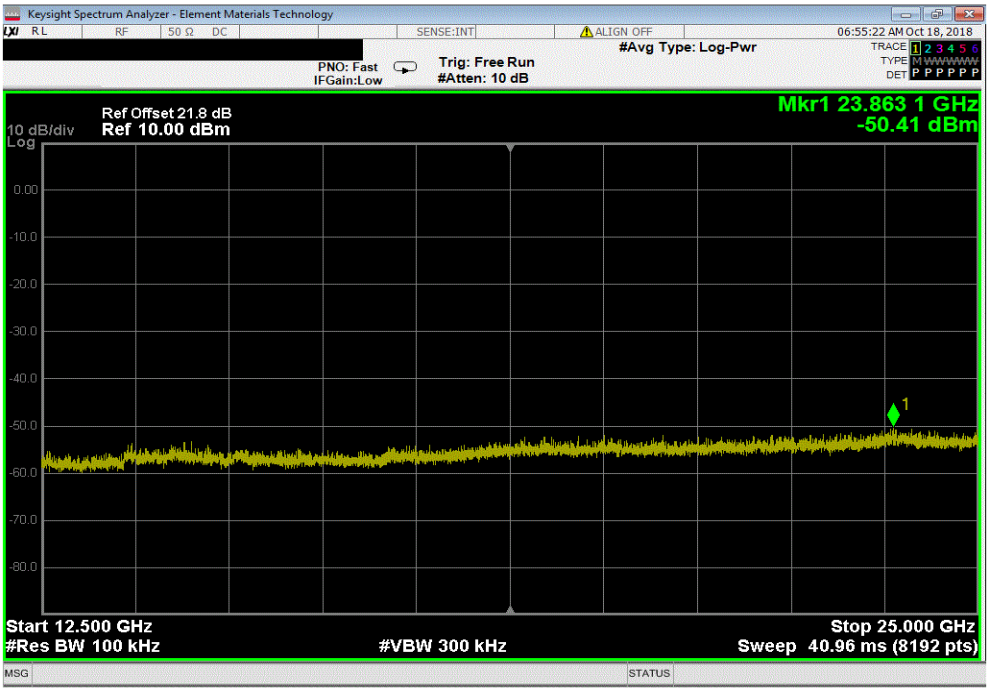
BLE, Mid Channel (2440 MHz), 1 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2439.74	N/A	N/A	N/A



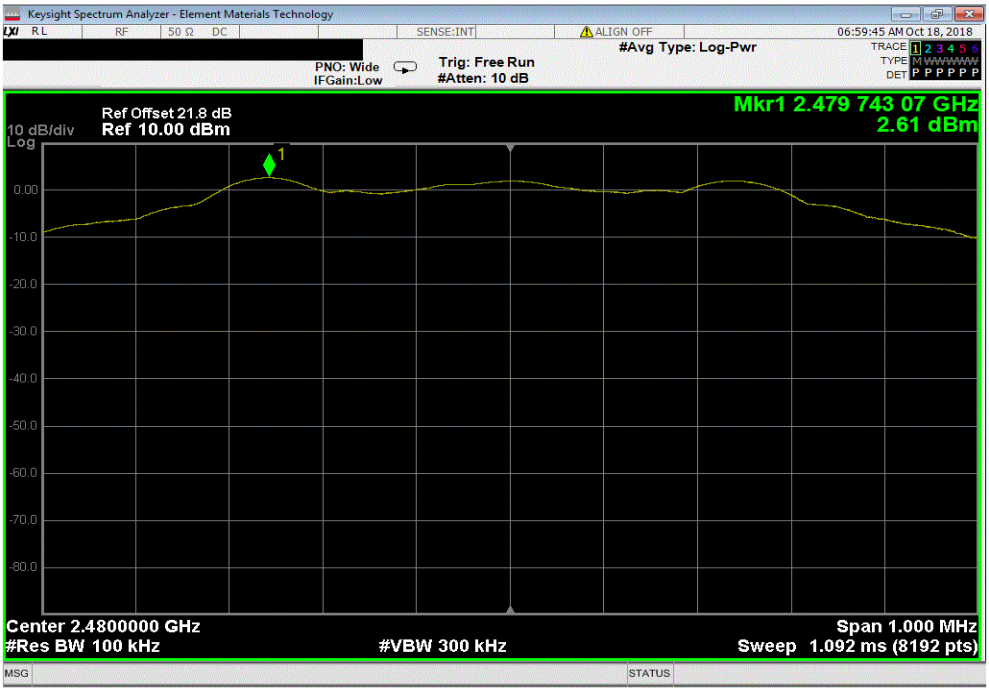
BLE, Mid Channel (2440 MHz), 1 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4035.44	-55.92	-20	Pass



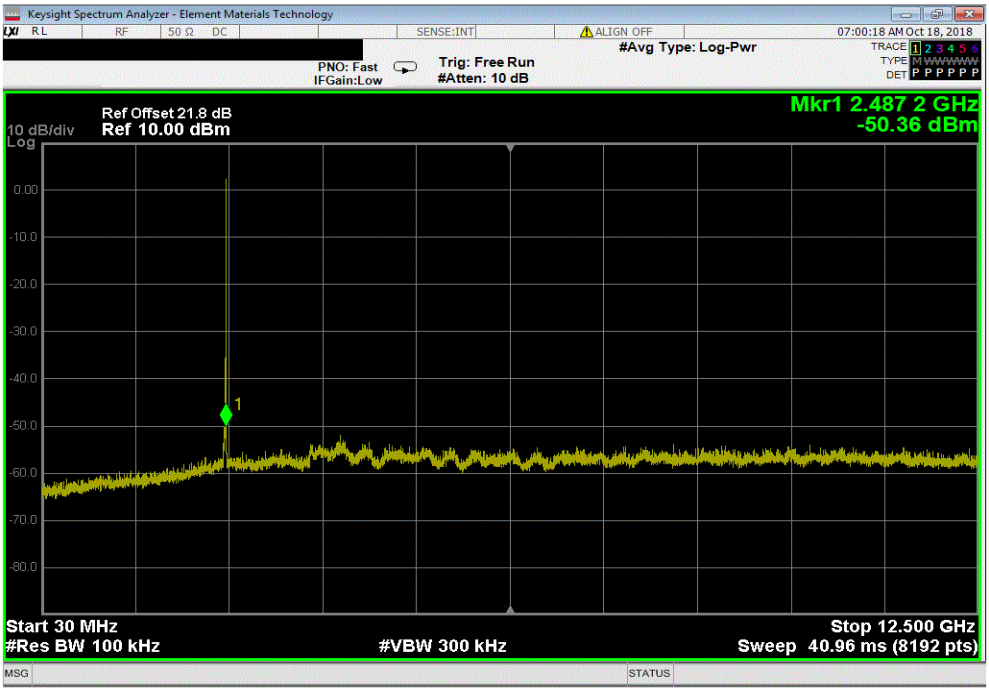
BLE, Mid Channel (2440 MHz), 1 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	23863.08	-54.24	-20	Pass



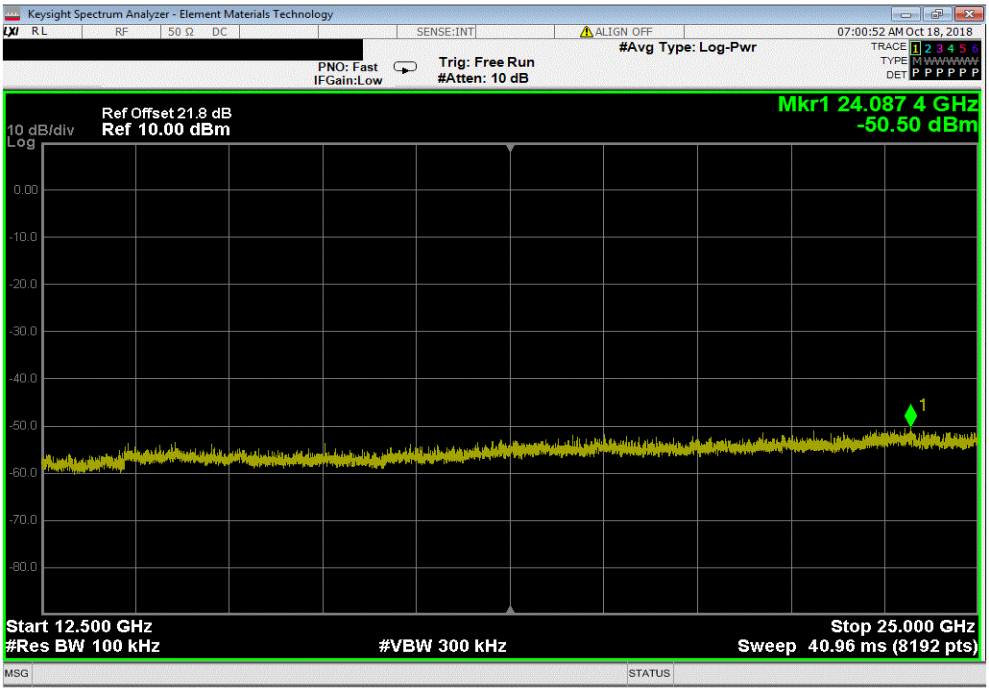
BLE, High Channel (2480 MHz), 1 Mbps					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2479.74	N/A	N/A	N/A



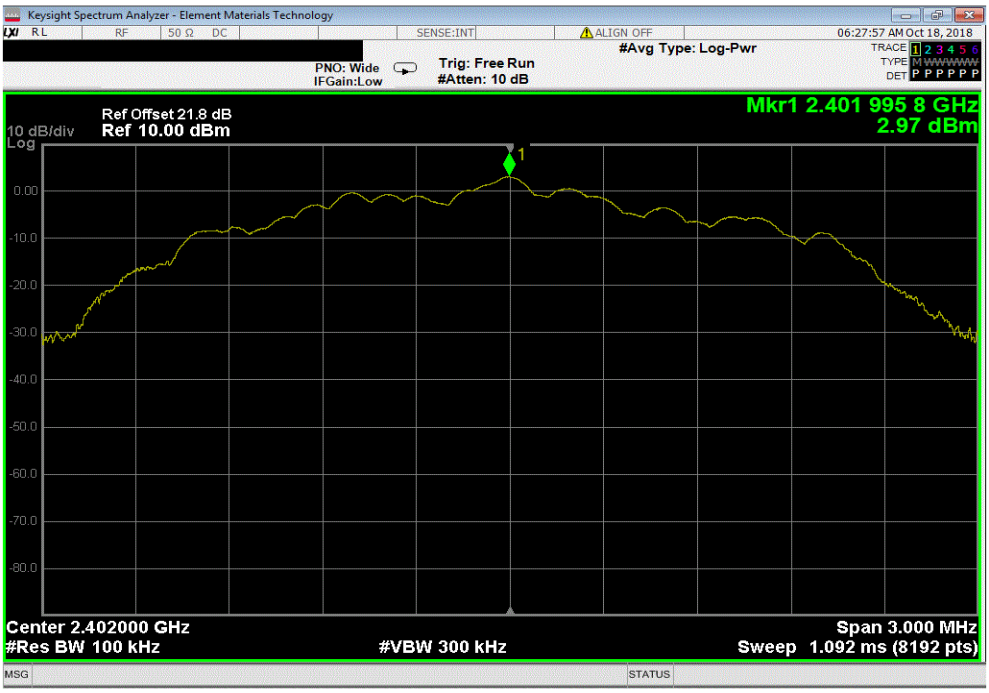
BLE, High Channel (2480 MHz), 1 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2487.16	-52.97	-20	Pass



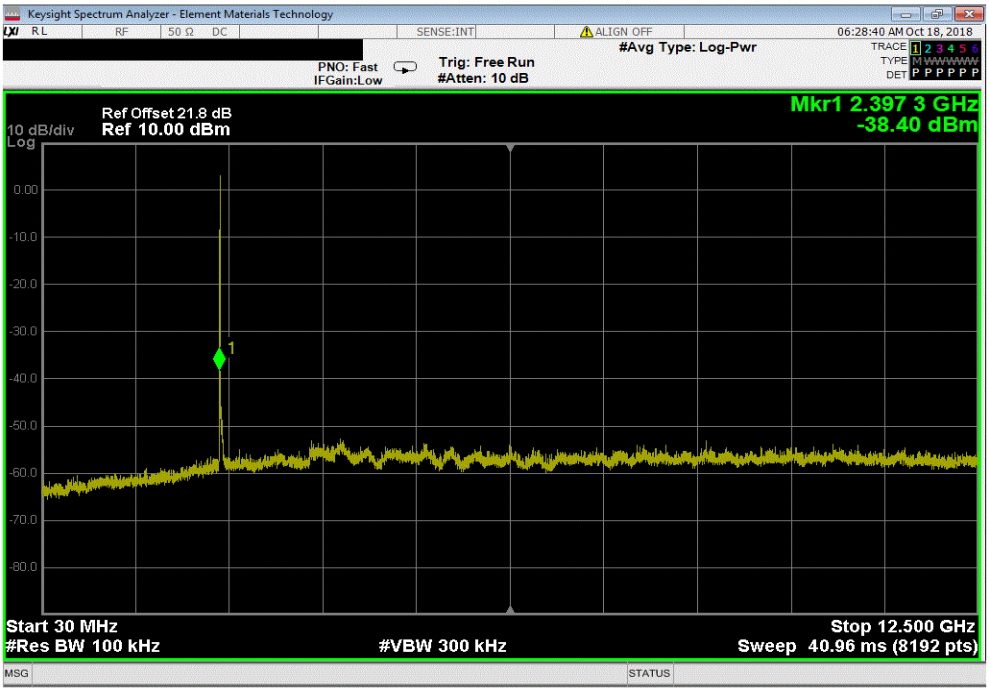
BLE, High Channel (2480 MHz), 1 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24087.41	-53.11	-20	Pass



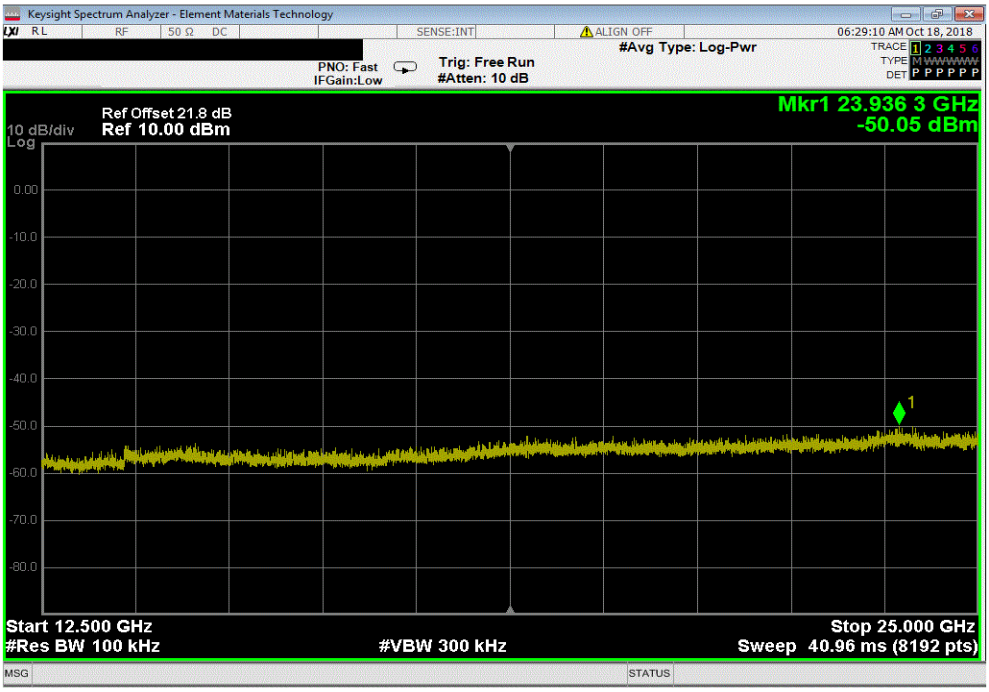
Low Channel (2402 MHz), 2 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2402	N/A	N/A	N/A



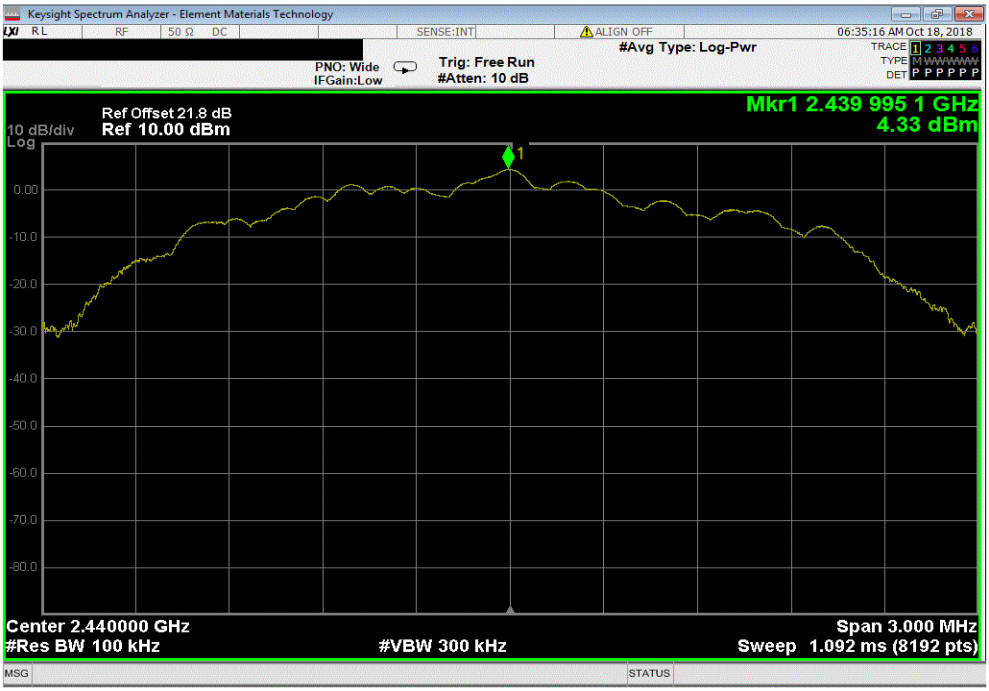
Low Channel (2402 MHz), 2 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2397.34	-41.37	-20	Pass



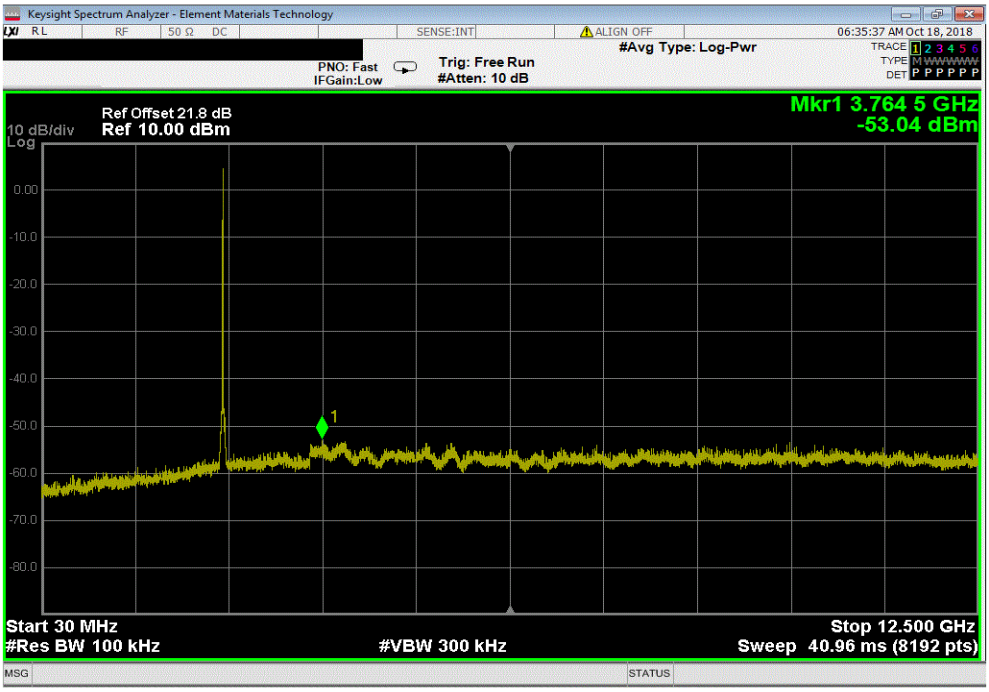
Low Channel (2402 MHz), 2 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	23936.33	-53.02	-20	Pass



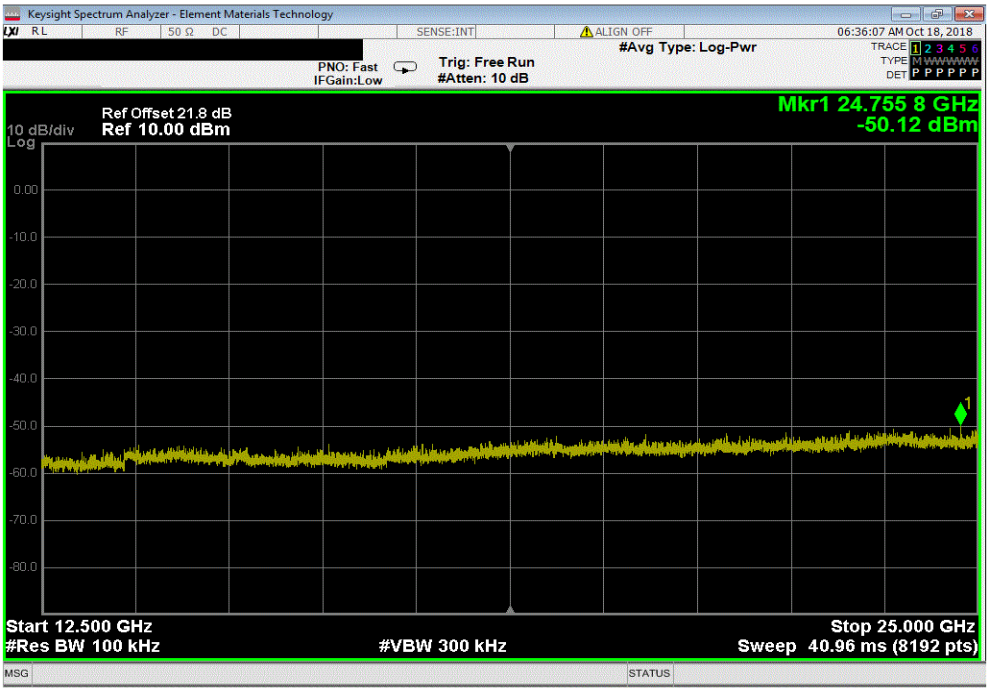
Mid Channel (2440 MHz), 2 Mbps					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2440	N/A	N/A	N/A



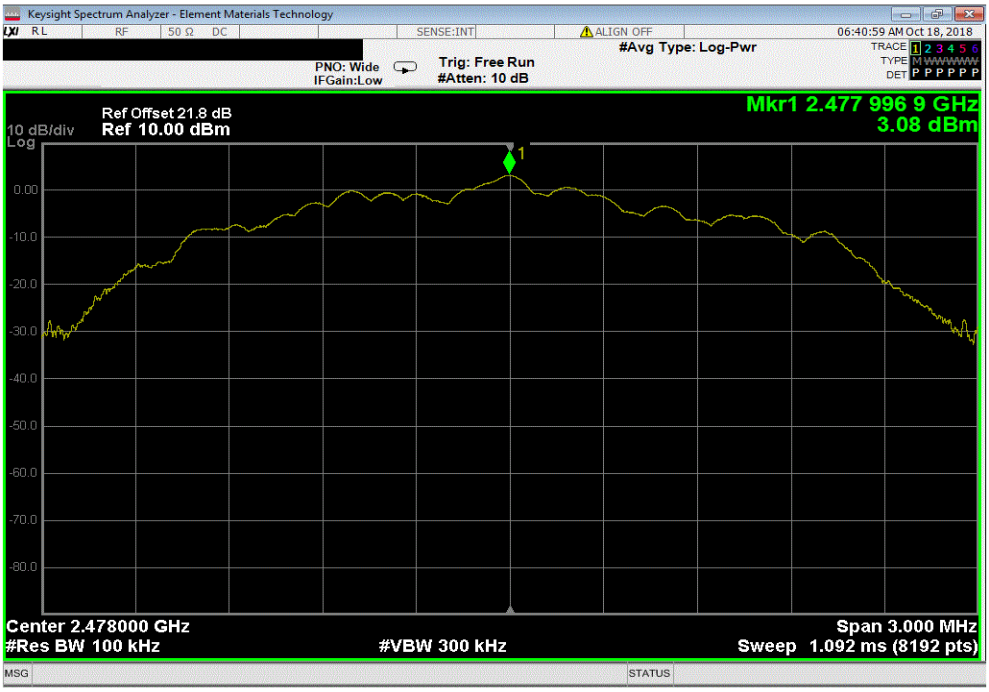
Mid Channel (2440 MHz), 2 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	3764.45	-57.37	-20	Pass



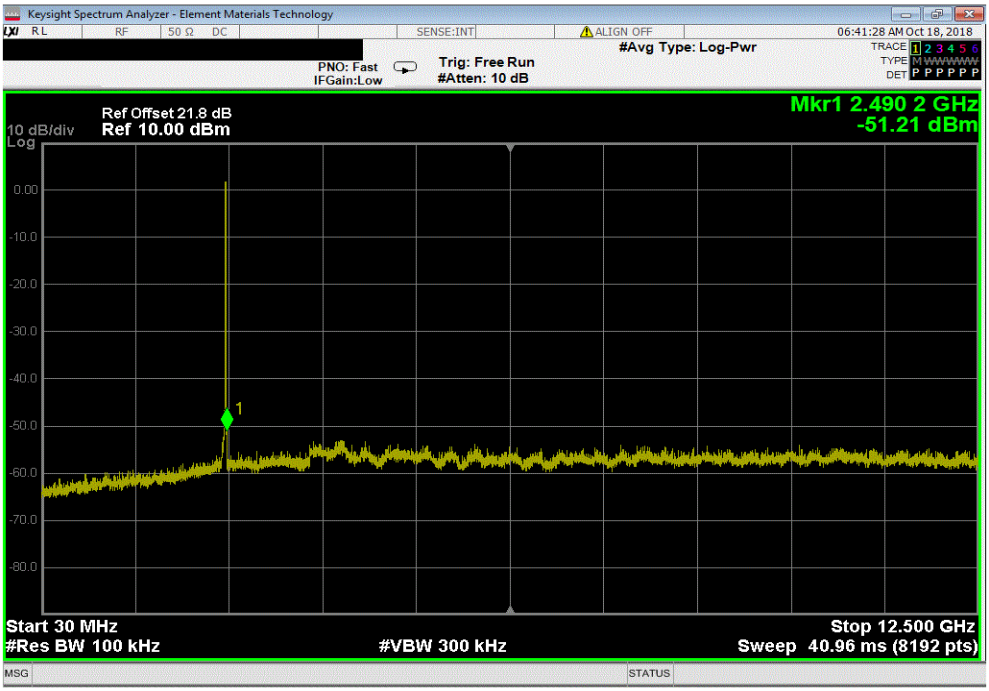
Mid Channel (2440 MHz), 2 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24755.83	-54.45	-20	Pass



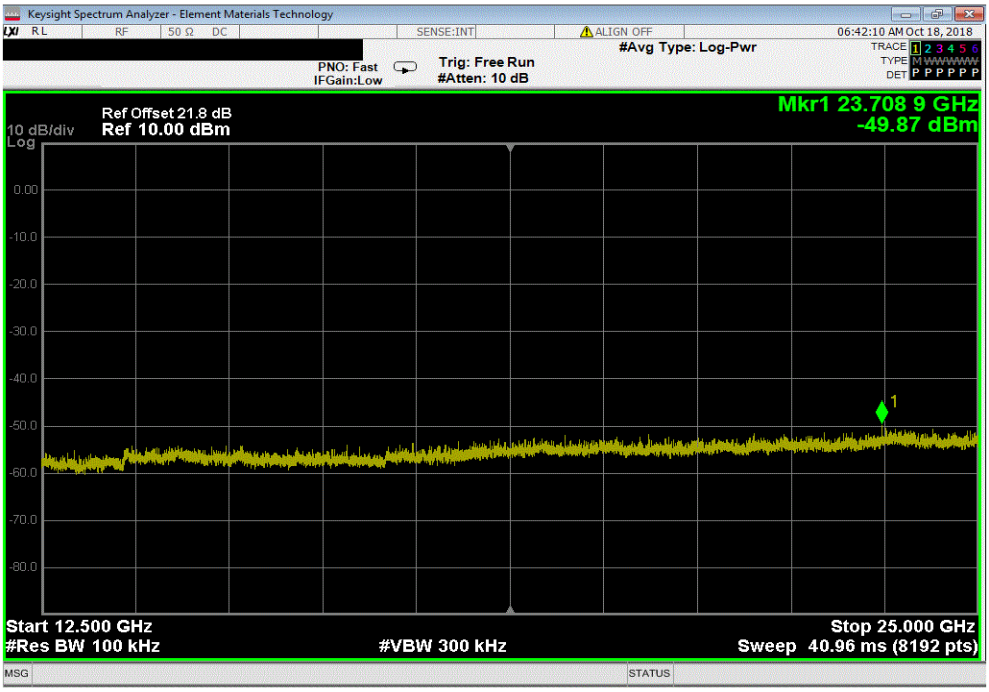
High Channel (2478 MHz), 2 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2478	N/A	N/A	N/A



High Channel (2478 MHz), 2 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2490.2	-54.29	-20	Pass



High Channel (2478 MHz), 2 Mbps				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	23708.95	-52.95	-20	Pass



SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2018.07.27

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

Transmitting BLE - low channel (2402 MHz), mid channel (2440 MHz) and high channel (2480 MHz) at 1 Mbps; low channel (2402 MHz), mid channel (2440 MHz), and high channel (2476 MHz) at 2 Mbps. High Channel for 2 Mbps taken at 2478 MHz for harmonics.

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

STAK0144 - 5, STAK0144 -11

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 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	Coaxicom	3910-20	AXY	26-Sep-2018	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HGG	26-Sep-2018	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HFM	26-Sep-2018	12 mo
Cable	ESM Cable Corp	TTBJ141 KMKM-72	MNP	12-Sep-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	13-Sep-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AHG	NCR	0 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-12001800-30-10P	PAP	24-Feb-2018	12 mo
Cable	Element	Biconilog Cable	MNX	24-Feb-2018	12 mo
Cable	Element	Standard Gain Cable	MNW	24-Feb-2018	12 mo
Cable	Element	Double Ridge Guide Horn Cables	MNV	24-Feb-2018	12 mo
Antenna - Biconilog	ETS Lindgren	3142D	AXO	15-Dec-2017	24 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	24-Feb-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	24-Feb-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1064-9079 and SA18E-10	AOO	24-Feb-2018	12 mo
Antenna - Double Ridge	ETS-Lindgren	3115	AJQ	14-Nov-2016	24 mo
Antenna	ETS-Lindgren	3160-08	AJP	NCR	0 mo
Antenna	ETS-Lindgren	3160-07	AJJ	NCR	0 mo
Attenuator	Fairview Microwave	SA18E-20	TWZ	24-Sep-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	13-Feb-2018	12 mo
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	24-Sep-2018	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJA	27-Jun-2018	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	27-Apr-2018	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	26-Mar-2018	12 mo

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

SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2018.07.27

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.

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

SPURIOUS RADIATED EMISSIONS

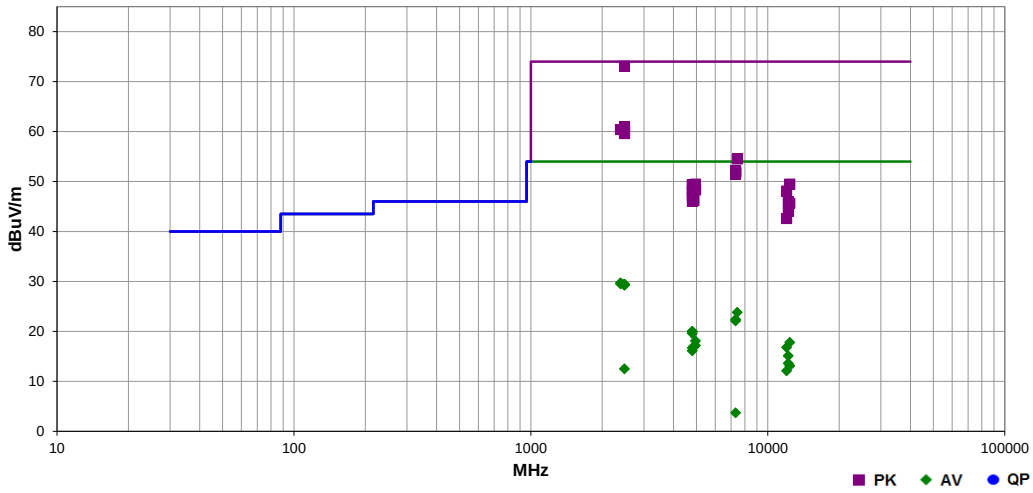
element

EmiR5 2018.09.26 PSA-ESCI 2018.07.27

Work Order:	STAK0144	**Date:**	8-Jan-2019		
Project:	None	**Temperature:**	22 °C		
Job Site:	MN09 and MN05	**Humidity:**	29.4% RH		
Serial Number:	182000364 and 182010339	**Barometric Pres.:**	1017 mbar	**Tested by:**	Dustin Sparks
EUT:	Mini Remote Microphone				
Configuration:	5 and 11 (see comments)				
Customer:	Starkey Laboratories, Inc.				
Attendees:	Charlie Esch				
EUT Power:	Battery				
Operating Mode:	Transmitting BLE - low channel (2402 MHz), mid channel (2440 MHz) and high channel (2480 MHz) at 1 Mbps; low channel (2402 MHz), mid channel (2440 MHz), and high channel (2476 MHz) at 2 Mbps. High Channel for 2 Mbps taken at 2478 MHz for harmonics.				
Deviations:	None				
Comments:	DCCF of 3.0 dB added to all 2 Mbps average points (based on 50% duty cycle.) DCCF of 2.2 added to all 1 Mbps average points (based on 60.6% duty cycle.) Worst case operating duty cycle is < 1% for 1 Mbps and 8% for 2 Mbps, so DCCF of -40 and -21.9 were added to the 1 and 2 Mbps points (respectively.) 1 Mbps mode set to tx power = -3. Configuration 11 only used for testing at the 2483.5 MHz band edge for 2 Mbps, configuration 5 used for all other testing. The AJQ double ridge horn was used only for the harmonics measurements performed on 10/15/2018 and 10/16/2018 before the calibration expiration date.				

Test Specifications	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

Run #	44	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



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
2483.533	57.3	-4.2	1.0	238.0		20.0	Vert	PK	0.0	73.1	74.0	-0.9	High ch, EUT vert, 1 Mbps
2484.237	45.1	-4.1	1.0	116.0		20.0	Horz	PK	0.0	61.0	74.0	-13.0	High Ch, EUT Horz
2484.140	44.6	-4.1	1.0	329.0		20.0	Vert	PK	0.0	60.5	74.0	-13.5	High Ch, EUT Vert
2389.308	44.3	-3.9	1.6	104.0		20.0	Vert	PK	0.0	60.4	74.0	-13.6	Low ch, EUT vert, 1 Mbps
2485.360	44.2	-4.1	1.7	307.0		20.0	Horz	PK	0.0	60.1	74.0	-13.9	High Ch, EUT Vert
2483.590	44.1	-4.1	1.0	95.0		20.0	Vert	PK	0.0	60.0	74.0	-14.0	High Ch, EUT Horz
2483.703	43.8	-4.1	1.0	275.0		20.0	Horz	PK	0.0	59.7	74.0	-14.3	High Ch, EUT On Side
2483.673	43.7	-4.1	1.0	268.9		20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch, EUT On Side
7434.167	42.9	11.6	1.1	317.0		0.0	Horz	PK	0.0	54.5	74.0	-19.5	High ch, EUT on side, 2 Mbps
7318.842	40.1	12.1	2.4	153.0		0.0	Vert	PK	0.0	52.2	74.0	-21.8	Mid ch, EUT on side, 1 Mbps
7321.225	39.8	12.1	1.0	201.0		0.0	Horz	PK	0.0	51.9	74.0	-22.1	Mid ch, EUT on side, 2 Mbps
7320.408	39.4	12.1	3.8	96.0		0.0	Vert	PK	0.0	51.5	74.0	-22.5	Mid ch, EUT on side, 2 Mbps
2389.758	32.5	-3.9	1.1	304.0	-18.9	20.0	Vert	AV	0.0	29.7	54.0	-24.3	Low ch, EUT vert, 2 Mbps
4954.817	45.2	4.3	2.6	357.0		0.0	Vert	PK	0.0	49.5	74.0	-24.5	High ch, EUT on side, 2 Mbps
12387.500	48.6	0.9	2.6	307.0		0.0	Horz	PK	0.0	49.5	74.0	-24.5	High ch, EUT on side, 2 Mbps
2389.750	32.3	-3.9	1.6	104.0	-18.9	20.0	Vert	AV	0.0	29.5	54.0	-24.5	Low ch, EUT vert, 1 Mbps

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
4802.983	45.1	4.3	3.7	157.0		0.0	Vert	PK	0.0	49.4	74.0	-24.6	Low ch, EUT on side, 2 Mbps
2483.610	32.4	-4.1	1.0	275.0	-18.9	20.0	Horz	AV	0.0	29.4	54.0	-24.6	High ch, EUT on side, 2 Mbps
2485.143	32.4	-4.1	1.0	329.0	-18.9	20.0	Vert	AV	0.0	29.4	54.0	-24.6	High ch, EUT vert, 2 Mbps
2483.543	32.4	-4.1	1.0	116.0	-18.9	20.0	Horz	AV	0.0	29.4	54.0	-24.6	High ch, EUT horz, 2 Mbps
2483.813	32.3	-4.1	1.0	95.0	-18.9	20.0	Vert	AV	0.0	29.3	54.0	-24.7	High ch, EUT horz, 2 Mbps
2484.810	32.3	-4.1	1.0	268.9	-18.9	20.0	Vert	AV	0.0	29.3	54.0	-24.7	High ch, EUT on side, 2 Mbps
2485.147	32.3	-4.1	1.7	307.0	-18.9	20.0	Horz	AV	0.0	29.3	54.0	-24.7	High ch, EUT vert, 2 Mbps
4803.967	44.9	4.3	2.8	268.0		0.0	Horz	PK	0.0	49.2	74.0	-24.8	Low ch, EUT horz, 2 Mbps
4879.042	44.8	4.0	1.0	178.0		0.0	Vert	PK	0.0	48.8	74.0	-25.2	Mid ch, EUT on side, 2 Mbps
4957.600	44.0	4.3	1.9	308.9		0.0	Horz	PK	0.0	48.3	74.0	-25.7	High ch, EUT on side, 2 Mbps
4803.192	43.9	4.3	3.2	210.0		0.0	Horz	PK	0.0	48.2	74.0	-25.8	Low ch, EUT on side, 2 Mbps
12007.510	49.9	-1.8	2.3	164.0		0.0	Horz	PK	0.0	48.1	74.0	-25.9	Low ch, EUT on side, 2 Mbps
4802.808	43.6	4.3	2.0	194.0		0.0	Horz	PK	0.0	47.9	74.0	-26.1	Low ch, EUT vert, 2 Mbps
4802.783	42.7	4.3	1.0	132.0		0.0	Vert	PK	0.0	47.0	74.0	-27.0	Low ch, EUT vert, 2 Mbps
4880.042	42.2	4.0	1.1	353.0		0.0	Horz	PK	0.0	46.2	74.0	-27.8	Mid ch, EUT on side, 2 Mbps
4803.150	41.8	4.3	1.0	282.0		0.0	Vert	PK	0.0	46.1	74.0	-27.9	Low ch, EUT horz, 2 Mbps
12200.030	46.2	-0.2	1.3	285.0		0.0	Horz	PK	0.0	46.0	74.0	-28.0	Mid ch, EUT on side
12387.630	44.7	0.9	1.0	139.0		0.0	Vert	PK	0.0	45.6	74.0	-28.4	High ch, EUT on side, 2 Mbps
12202.480	44.2	-0.2	1.0	150.0		0.0	Vert	PK	0.0	44.0	74.0	-30.0	Mid ch, EUT on side
7434.058	31.1	11.6	1.1	317.0	-18.9	0.0	Horz	AV	0.0	23.8	54.0	-30.2	High ch, EUT on side, 2 Mbps
12009.870	44.4	-1.8	1.0	77.0		0.0	Vert	PK	0.0	42.6	74.0	-31.4	Low ch, EUT on side, 2 Mbps
7319.858	29.2	12.1	3.8	96.0	-18.9	0.0	Vert	AV	0.0	22.4	54.0	-31.6	Mid ch, EUT on side, 2 Mbps
7318.883	28.9	12.1	1.0	201.0	-18.9	0.0	Horz	AV	0.0	22.1	54.0	-31.9	Mid ch, EUT on side, 2 Mbps
4803.900	34.6	4.3	3.7	157.0	-18.9	0.0	Vert	AV	0.0	20.0	54.0	-34.0	Low ch, EUT on side, 2 Mbps
4804.000	34.6	4.3	1.0	132.0	-18.9	0.0	Vert	AV	0.0	20.0	54.0	-34.0	Low ch, EUT vert, 2 Mbps
4803.967	34.5	4.3	3.2	210.0	-18.9	0.0	Horz	AV	0.0	19.9	54.0	-34.1	Low ch, EUT on side, 2 Mbps
4803.958	34.2	4.3	2.8	268.0	-18.9	0.0	Horz	AV	0.0	19.6	54.0	-34.4	Low ch, EUT horz, 2 Mbps
4955.167	32.7	4.3	2.6	357.0	-18.9	0.0	Vert	AV	0.0	18.1	54.0	-35.9	High ch, EUT on side, 2 Mbps
12387.510	35.8	0.9	2.6	307.0	-18.9	0.0	Horz	AV	0.0	17.8	54.0	-36.2	High ch, EUT on side, 2 Mbps
4953.708	31.8	4.3	1.9	308.9	-18.9	0.0	Horz	AV	0.0	17.2	54.0	-36.8	High ch, EUT on side, 2 Mbps
4880.017	31.8	4.0	1.1	353.0	-18.9	0.0	Horz	AV	0.0	16.9	54.0	-37.1	Mid ch, EUT on side, 2 Mbps
4879.867	31.8	4.0	1.0	178.0	-18.9	0.0	Vert	AV	0.0	16.9	54.0	-37.1	Mid ch, EUT on side, 2 Mbps
12010.070	37.4	-1.7	2.3	164.0	-18.9	0.0	Horz	AV	0.0	16.8	54.0	-37.2	Low ch, EUT on side, 2 Mbps
4803.817	31.3	4.3	2.0	194.0	-18.9	0.0	Horz	AV	0.0	16.7	54.0	-37.3	Low ch, EUT vert, 2 Mbps
4804.017	30.7	4.3	1.0	282.0	-18.9	0.0	Vert	AV	0.0	16.1	54.0	-37.9	Low ch, EUT horz, 2 Mbps
12197.610	34.2	-0.2	1.3	285.0	-18.9	0.0	Horz	AV	0.0	15.1	54.0	-38.9	Mid ch, EUT on side
12197.540	32.7	-0.2	1.0	150.0	-18.9	0.0	Vert	AV	0.0	13.6	54.0	-40.4	Mid ch, EUT on side
12387.620	31.1	0.9	1.0	139.0	-18.9	0.0	Vert	AV	0.0	13.1	54.0	-40.9	High ch, EUT on side, 2 Mbps
2484.000	34.5	-4.2	1.0	238.0	-37.8	20.0	Vert	AV	0.0	12.5	54.0	-41.5	High ch, EUT vert, 1 Mbps
12007.510	32.8	-1.8	1.0	77.0	-18.9	0.0	Vert	AV	0.0	12.1	54.0	-41.9	Low ch, EUT on side, 2 Mbps
7319.067	29.4	12.1	2.4	153.0	-37.8	0.0	Vert	AV	0.0	3.7	54.0	-50.3	High ch, EUT on side, 1 Mbps