



# element<sup>®</sup>

**Starkey Laboratories, Inc.**

**Multi-Function Accessory**

**FCC 15.247:2018**

**Bluetooth LE (DTS) Radio**

**Report # STAK0117.1**



NVLAP LAB CODE: 200881-0



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# CERTIFICATE OF TEST

Last Date of Test: June 25, 2018  
Starkey Laboratories, Inc.  
Model: Multi-Function Accessory

## Radio Equipment Testing

### Standards

Specification	Method
FCC 15.207:2018	ANSI C63.10:2013
FCC 15.247:2018	ANSI C63.10:2013, KDB 558074

### Results

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

# REVISION HISTORY



Revision Number	Description	Date	Page Number
00	None		

# ACCREDITATIONS AND AUTHORIZATIONS



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## 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

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## 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.

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## European Union

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

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## Australia/New Zealand

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

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## Korea

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

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## Japan

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

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## 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.

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## Singapore

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

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## Israel

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

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## Hong Kong

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

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## Vietnam

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

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## SCOPE

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

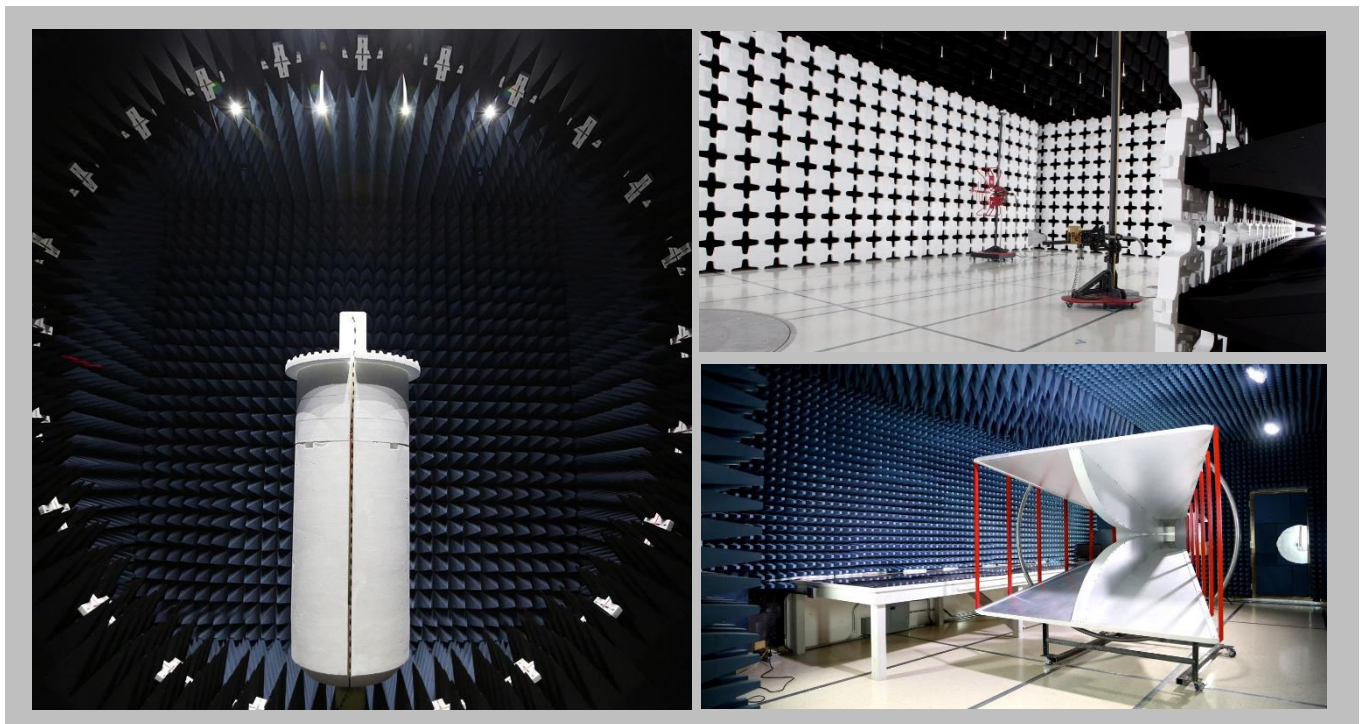
<http://portlandcustomer.element.com/ts/scope/scope.htm>

<http://gsi.nist.gov/global/docs/cabs/designations.html>

# FACILITIES



<b>California</b> Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	<b>Minnesota</b> Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	<b>New York</b> Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	<b>Oregon</b> Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	<b>Texas</b> Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	<b>Washington</b> Labs NC01-05 19201 120 <sup>th</sup> Ave NE Bothell, WA 98011 (425)984-6600
<b>NVLAP</b>					
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
<b>Innovation, Science and Economic Development Canada</b>					
2834B-1, 2834B-3	2834E-1, 2834E-3	N/A	2834D-1, 2834D-2	2834G-1	2834F-1
<b>BSMI</b>					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
<b>VCCI</b>					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
<b>Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA</b>					
US0158	US0175	N/A	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.

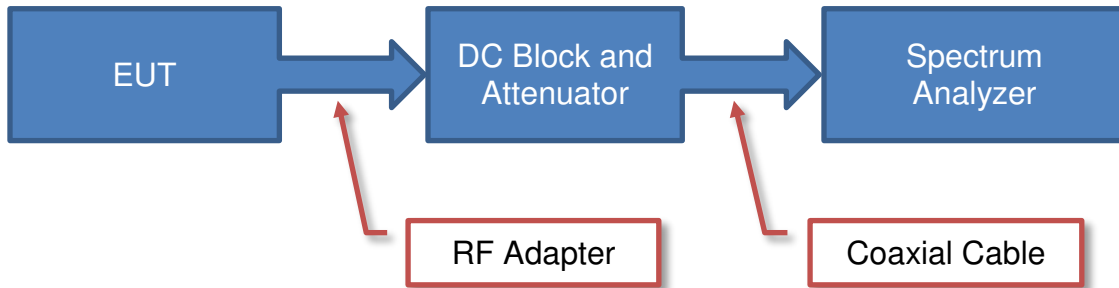
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable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

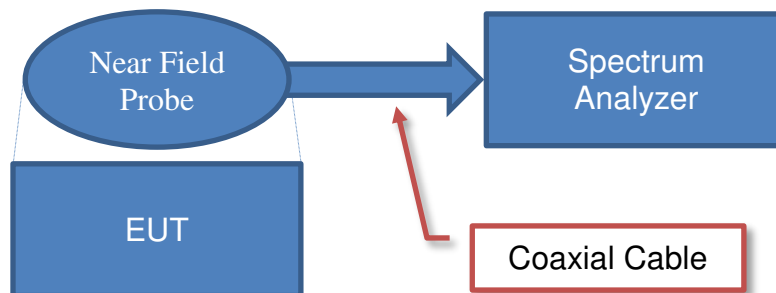
<b>Test</b>	<b>+ MU</b>	<b>- MU</b>
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (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

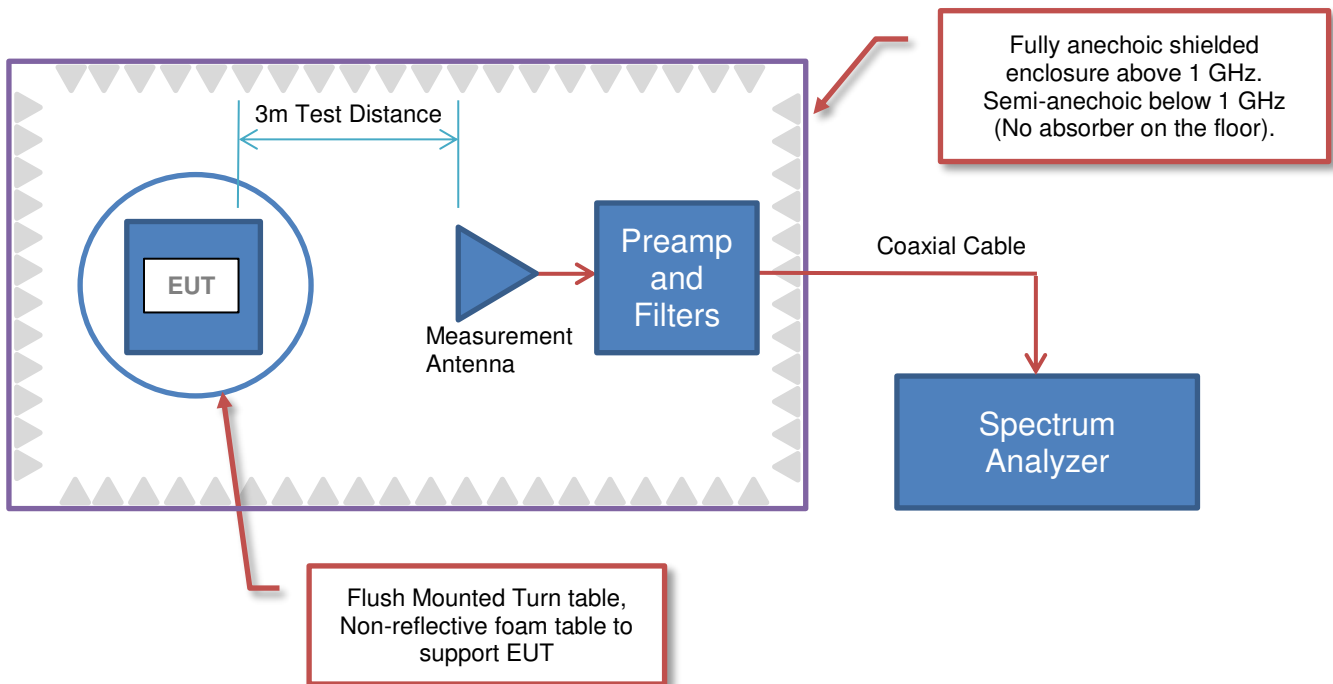
## Antenna Port Conducted Measurements



## Near Field Test Fixture Measurements



## Spurious Radiated Emissions







# PRODUCT DESCRIPTION

## Client and Equipment Under Test (EUT) Information

<b>Company Name:</b>	Starkey Laboratories, Inc.
<b>Address:</b>	6600 Washington Ave. SO.
<b>City, State, Zip:</b>	Eden Prairie, MN 55344
<b>Test Requested By:</b>	Bill Mitchell
<b>Model:</b>	Multi-Function Accessory
<b>First Date of Test:</b>	June 18, 2018
<b>Last Date of Test:</b>	June 25, 2018
<b>Receipt Date of Samples:</b>	June 18, 2018
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No Damage
<b>Purchase Authorization:</b>	Verified

## Information Provided by the Party Requesting the Test

<b>Functional Description of the EUT:</b>
Remote Microphone Device

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



# CONFIGURATIONS



## Configuration STAK0117- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Multi-function Accessory	Starkey Laboratories, Inc.	900	182010052A

## Configuration STAK0117- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Multi-function Accessory	Starkey Laboratories, Inc.	900	182010052A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter (Multi-function Accessory)	PHIHONG	PSA05F-050Q	PD22021832A2

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Power Cable	No	1.5 m	No	Multi-function Accessory	AC Adapter (Multi-function Accessory)

## Configuration STAK0117- 4

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Multi-function Accessory	Starkey Laboratories, Inc.	900	182010052A

# CONFIGURATIONS



## Configuration STAK0117- 5

<b>EUT</b>			
<b>Description</b>	<b>Manufacturer</b>	<b>Model/Part Number</b>	<b>Serial Number</b>
Multi-function Accessory	Starkey Laboratories, Inc.	900	182010052A

<b>Peripherals in test setup boundary</b>			
<b>Description</b>	<b>Manufacturer</b>	<b>Model/Part Number</b>	<b>Serial Number</b>
Laptop	Acer	Aspire one 53h-2997	LUSAL0B137014F42B1601
Laptop AC adapter	Safety Mark	N17908	AP0400100201108409P101

<b>Cables</b>					
<b>Cable Type</b>	<b>Shield</b>	<b>Length (m)</b>	<b>Ferrite</b>	<b>Connection 1</b>	<b>Connection 2</b>
USB Power Cable	No	1.5 m	No	Multi-function Accessory	AC Adapter (Multi-function Accessory)
AC Cable (Laptop)	No	1.5 m	No	Laptop	AC mains
Ethernet Cable	No	1 m	No	Laptop	Unterminated
VGA Cable	No	1 m	Yes	Laptop	Unterminated
USB x2	No	1 m	No	Laptop	Unterminated
Headphone Cable	No	1 m	No	Laptop	Unterminated

# MODIFICATIONS



## Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	6/18/2018	Spurious Radiated Emissions	Modified from delivered configuration.	Per client request, cut channel 39 at 2 Mb due to failing band edge. Modification authorized by Charlie Esch	EUT remained at Element following the test.
2	6/22/2018	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	6/22/2018	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.
4	6/22/2018	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.
5	6/22/2018	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.
6	6/22/2018	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.
7	6/22/2018	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.
8	6/25/2018	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

# POWERLINE CONDUCTED EMISSIONS



## 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
Analyzer - Spectrum Analyzer	Agilent	E4443A	AAS	2/27/2018	2/27/2019
Cable - Conducted Cable Assembly	Northwest EMC	MNC	MNCC	1/24/2018	1/24/2019
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	3/15/2018	3/15/2019
Filter - High Pass	TTE	H97-100K-50-720B	HGN	NCR	NCR

## MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

## CONFIGURATIONS INVESTIGATED

STAK0117-2  
STAK0117-5

## MODES INVESTIGATED

Tx mode, Ch. 20 2442 MHz, 1 MB  
Tx mode, Ch. 20 2442 MHz, 2 MB

# POWERLINE CONDUCTED EMISSIONS



EUT:	Multi-Function Accessory	Work Order:	STAK0117
Serial Number:	182010052A	Date:	06/25/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	21.6°C
Attendees:	Charlie Esch	Relative Humidity:	56.2%
Customer Project:	None	Bar. Pressure:	1022 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0117-2

## TEST SPECIFICATIONS

Specification:	FCC 15.207:2018	Method:	ANSI C63.10:2013
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## TEST PARAMETERS

Run #:	5	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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## COMMENTS

Pairing

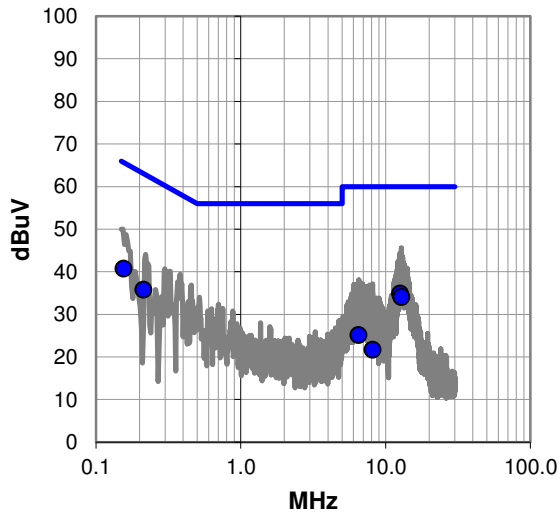
## EUT OPERATING MODES

Tx mode, Ch. 20 2442 MHz, 1 MB

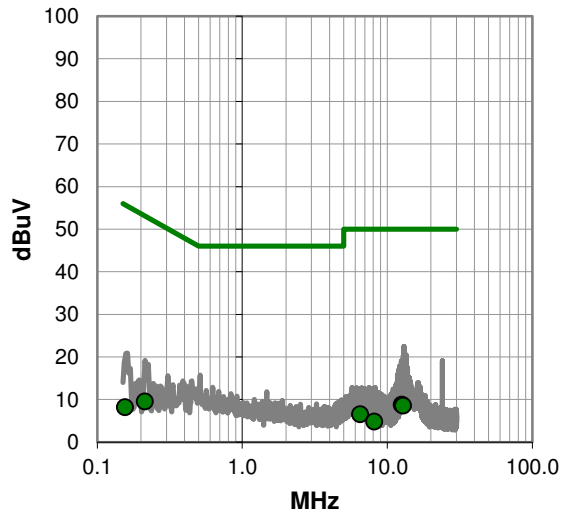
## DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #5

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.155	40.5	0.3	40.8	65.7	-24.9
12.556	33.7	1.2	34.9	60.0	-25.1
12.835	32.9	1.2	34.1	60.0	-25.9
0.212	35.5	0.3	35.8	63.1	-27.3
6.500	24.6	0.6	25.2	60.0	-34.8
8.110	20.9	0.8	21.7	60.0	-38.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
12.556	7.6	1.2	8.8	50.0	-41.2
12.835	7.4	1.2	8.6	50.0	-41.4
6.500	6.0	0.6	6.6	50.0	-43.4
0.212	9.3	0.3	9.6	53.1	-43.5
8.110	4.1	0.8	4.9	50.0	-45.1
0.155	7.9	0.3	8.2	55.7	-47.5

## CONCLUSION

Pass

Tested By

# POWERLINE CONDUCTED EMISSIONS



EUT:	Multi-Function Accessory	Work Order:	STAK0117
Serial Number:	182010052A	Date:	06/25/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	21.6°C
Attendees:	Charlie Esch	Relative Humidity:	56.2%
Customer Project:	None	Bar. Pressure:	1022 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0117-2

## TEST SPECIFICATIONS

Specification:	FCC 15.207:2018	Method:	ANSI C63.10:2013
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## TEST PARAMETERS

Run #:	6	Line:	High Line	Add. Ext. Attenuation (dB):	0
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## COMMENTS

Pairing

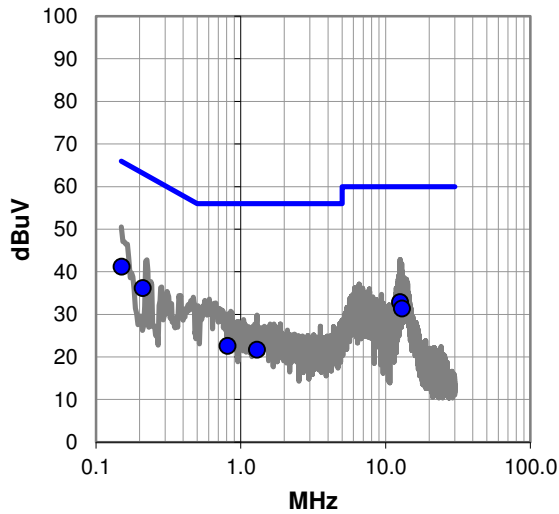
## EUT OPERATING MODES

Tx mode, Ch. 20 2442 MHz, 1 MB

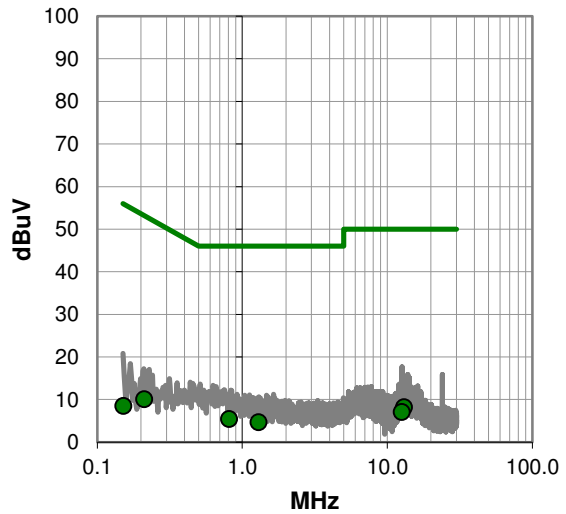
## DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit





# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #6

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.151	40.9	0.3	41.2	66.0	-24.8
0.210	35.9	0.3	36.2	63.2	-27.0
12.591	31.7	1.2	32.9	60.0	-27.1
13.005	30.2	1.2	31.4	60.0	-28.6
0.809	22.4	0.2	22.6	56.0	-33.4
1.293	21.4	0.3	21.7	56.0	-34.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.809	5.3	0.2	5.5	46.0	-40.5
1.293	4.4	0.3	4.7	46.0	-41.3
13.005	7.0	1.2	8.2	50.0	-41.8
12.591	5.9	1.2	7.1	50.0	-42.9
0.210	9.8	0.3	10.1	53.2	-43.1
0.151	8.2	0.3	8.5	56.0	-47.5

## CONCLUSION

Pass

Tested By

# POWERLINE CONDUCTED EMISSIONS



EUT:	Multi-Function Accessory	Work Order:	STAK0117
Serial Number:	182010052A	Date:	06/25/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	21.6°C
Attendees:	Charlie Esch	Relative Humidity:	56.2%
Customer Project:	None	Bar. Pressure:	1022 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0117-2

## TEST SPECIFICATIONS

Specification:	FCC 15.207:2018	Method:	ANSI C63.10:2013
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## TEST PARAMETERS

Run #:	7	Line:	High Line	Add. Ext. Attenuation (dB):	0
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## COMMENTS

Streaming

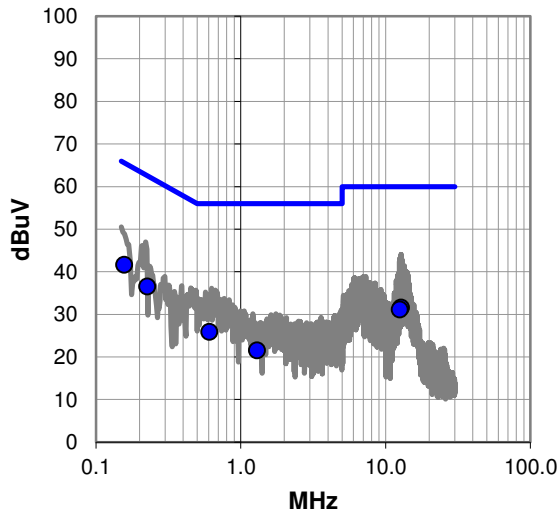
## EUT OPERATING MODES

Tx mode, Ch. 20 2442 MHz, 2 MB

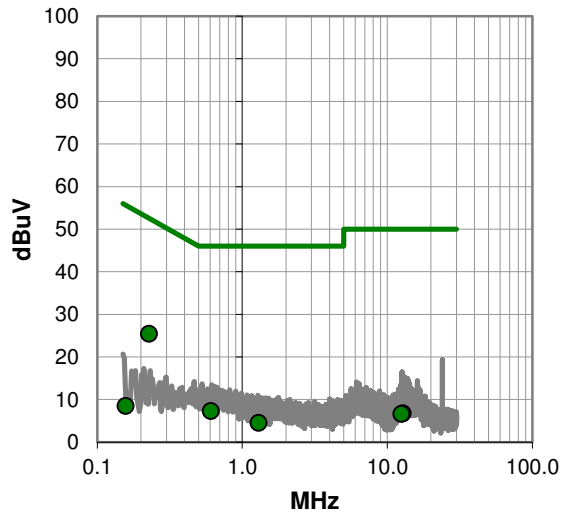
## DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #7

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.157	41.4	0.3	41.7	65.6	-23.9
0.226	36.3	0.3	36.6	62.6	-26.0
12.792	30.4	1.2	31.6	60.0	-28.4
12.510	30.0	1.2	31.2	60.0	-28.8
0.606	25.7	0.2	25.9	56.0	-30.1
1.292	21.3	0.3	21.6	56.0	-34.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.226	25.2	0.3	25.5	52.6	-27.1
0.606	7.1	0.2	7.3	46.0	-38.7
1.292	4.3	0.3	4.6	46.0	-41.4
12.792	5.6	1.2	6.8	50.0	-43.2
12.510	5.5	1.2	6.7	50.0	-43.3
0.157	8.2	0.3	8.5	55.6	-47.1

## CONCLUSION

Pass

Tested By

# POWERLINE CONDUCTED EMISSIONS



EUT:	Multi-Function Accessory	Work Order:	STAK0117
Serial Number:	182010052A	Date:	06/25/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	21.6°C
Attendees:	Charlie Esch	Relative Humidity:	56.2%
Customer Project:	None	Bar. Pressure:	1022 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0117-2

## TEST SPECIFICATIONS

Specification:	FCC 15.207:2018	Method:	ANSI C63.10:2013
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## TEST PARAMETERS

Run #:	8	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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## COMMENTS

Streaming

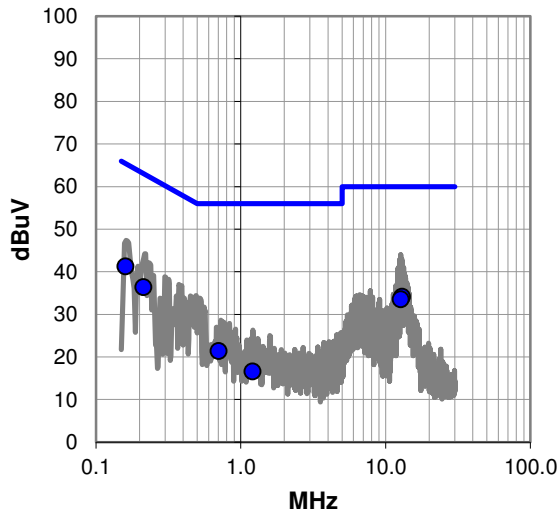
## EUT OPERATING MODES

Tx mode, Ch. 20 2442 MHz, 2 MB

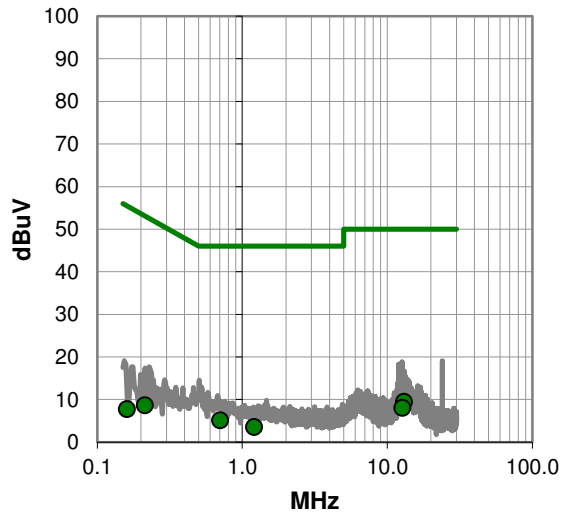
## DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #8

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.160	41.0	0.3	41.3	65.5	-24.2
13.000	33.0	1.2	34.2	60.0	-25.8
12.697	32.4	1.2	33.6	60.0	-26.4
0.213	36.1	0.3	36.4	63.1	-26.7
0.702	21.2	0.2	21.4	56.0	-34.6
1.205	16.3	0.3	16.6	56.0	-39.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.000	8.3	1.2	9.5	50.0	-40.5
0.702	5.0	0.2	5.2	46.0	-40.8
12.697	6.9	1.2	8.1	50.0	-41.9
1.205	3.3	0.3	3.6	46.0	-42.4
0.213	8.4	0.3	8.7	53.1	-44.4
0.160	7.5	0.3	7.8	55.5	-47.7

## CONCLUSION

Pass

Tested By

# POWERLINE CONDUCTED EMISSIONS



EUT:	Multi-Function Accessory	Work Order:	STAK0117
Serial Number:	182010052A	Date:	06/25/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	21.5°C
Attendees:	Charlie Esch	Relative Humidity:	56.7%
Customer Project:	None	Bar. Pressure:	1022 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0117-5

## TEST SPECIFICATIONS

Specification:	FCC 15.207:2018	Method:	ANSI C63.10:2013
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## TEST PARAMETERS

Run #:	13	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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## COMMENTS

Pairing

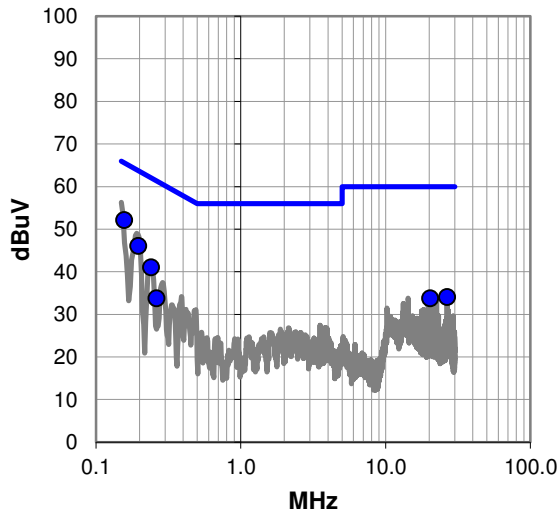
## EUT OPERATING MODES

Tx mode, Ch. 20 2442 MHz, 1 MB

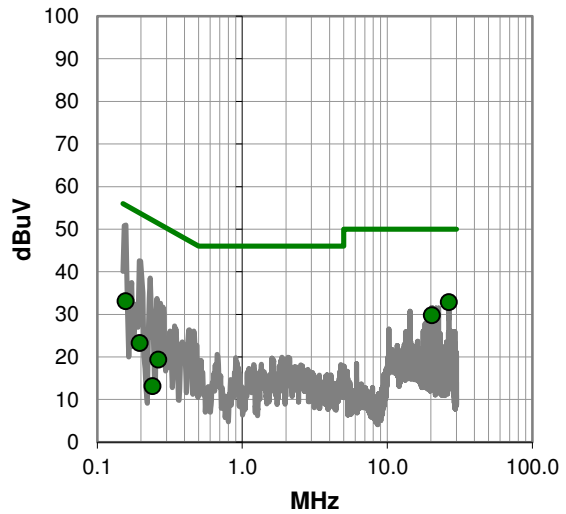
## DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #13

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.157	51.9	0.3	52.2	65.6	-13.4
0.196	45.8	0.3	46.1	63.8	-17.7
0.240	40.8	0.3	41.1	62.1	-21.0
26.623	31.1	3.0	34.1	60.0	-25.9
20.259	31.6	2.2	33.8	60.0	-26.2
0.262	33.6	0.2	33.8	61.4	-27.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
26.623	29.9	3.0	32.9	50.0	-17.1
20.259	27.6	2.2	29.8	50.0	-20.2
0.157	32.8	0.3	33.1	55.6	-22.5
0.196	23.0	0.3	23.3	53.8	-30.5
0.262	19.2	0.2	19.4	51.4	-32.0
0.240	12.9	0.3	13.2	52.1	-38.9

## CONCLUSION

Pass

Tested By



# POWERLINE CONDUCTED EMISSIONS



EUT:	Multi-Function Accessory	Work Order:	STAK0117
Serial Number:	182010052A	Date:	06/25/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	21.5°C
Attendees:	Charlie Esch	Relative Humidity:	56.7%
Customer Project:	None	Bar. Pressure:	1022 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0117-5

## TEST SPECIFICATIONS

Specification:	FCC 15.207:2018	Method:	ANSI C63.10:2013
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## TEST PARAMETERS

Run #:	14	Line:	High Line	Add. Ext. Attenuation (dB):	0
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## COMMENTS

Pairing

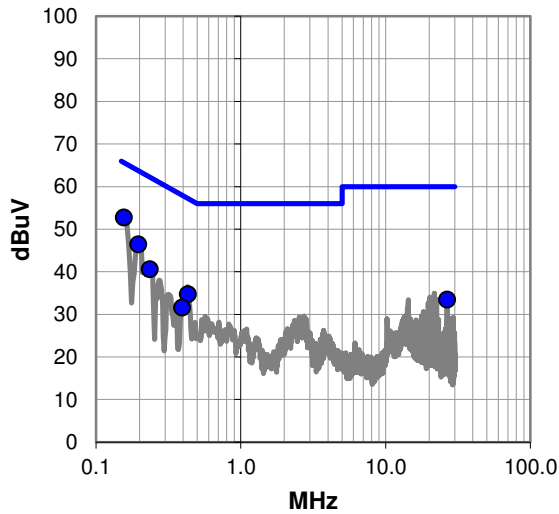
## EUT OPERATING MODES

Tx mode, Ch. 20 2442 MHz, 1 MB

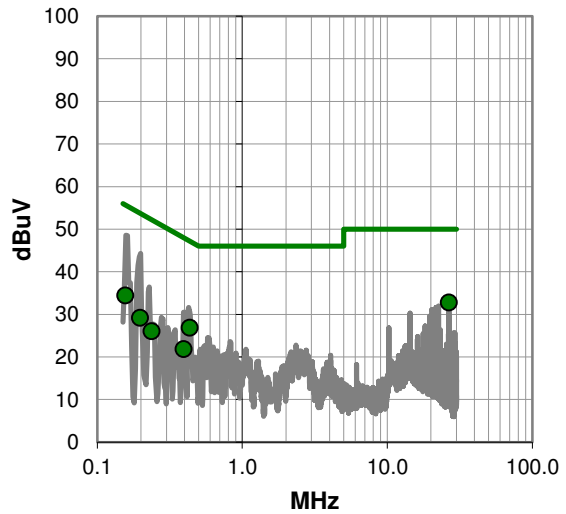
## DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #14

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.156	52.5	0.3	52.8	65.7	-12.9
0.196	46.2	0.3	46.5	63.8	-17.3
0.236	40.3	0.3	40.6	62.2	-21.6
0.432	34.6	0.2	34.8	57.2	-22.4
0.393	31.4	0.2	31.6	58.0	-26.4
26.623	30.5	3.0	33.5	60.0	-26.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
26.623	29.8	3.0	32.8	50.0	-17.2
0.432	26.7	0.2	26.9	47.2	-20.3
0.156	34.2	0.3	34.5	55.7	-21.2
0.196	28.9	0.3	29.2	53.8	-24.6
0.393	21.7	0.2	21.9	48.0	-26.1
0.236	25.8	0.3	26.1	52.2	-26.1

## CONCLUSION

Pass

Tested By

# POWERLINE CONDUCTED EMISSIONS



EUT:	Multi-Function Accessory	Work Order:	STAK0117
Serial Number:	182010052A	Date:	06/25/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	21.5°C
Attendees:	Charlie Esch	Relative Humidity:	56.7%
Customer Project:	None	Bar. Pressure:	1022 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0117-5

## TEST SPECIFICATIONS

Specification:	FCC 15.207:2018	Method:	ANSI C63.10:2013
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## TEST PARAMETERS

Run #:	15	Line:	High Line	Add. Ext. Attenuation (dB):	0
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## COMMENTS

Streaming

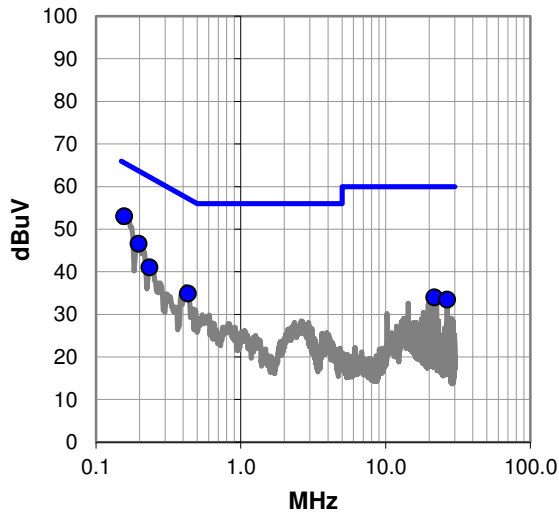
## EUT OPERATING MODES

Tx mode, Ch. 20 2442 MHz, 2 MB

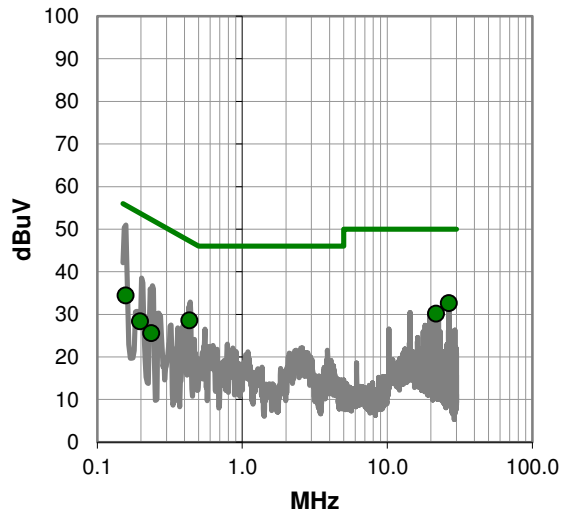
## DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #15

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.157	52.8	0.3	53.1	65.6	-12.5
0.197	46.3	0.3	46.6	63.7	-17.1
0.235	40.8	0.3	41.1	62.3	-21.2
0.430	34.7	0.2	34.9	57.2	-22.3
21.664	31.7	2.3	34.0	60.0	-26.0
26.623	30.5	3.0	33.5	60.0	-26.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
26.623	29.7	3.0	32.7	50.0	-17.3
0.430	28.4	0.2	28.6	47.2	-18.6
21.664	27.9	2.3	30.2	50.0	-19.8
0.157	34.2	0.3	34.5	55.6	-21.1
0.197	28.1	0.3	28.4	53.7	-25.3
0.235	25.3	0.3	25.6	52.3	-26.7

## CONCLUSION

Pass

Tested By

# POWERLINE CONDUCTED EMISSIONS



EUT:	Multi-Function Accessory	Work Order:	STAK0117
Serial Number:	182010052A	Date:	06/25/2018
Customer:	Starkey Laboratories, Inc.	Temperature:	21.5°C
Attendees:	Charlie Esch	Relative Humidity:	56.7%
Customer Project:	None	Bar. Pressure:	1022 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0117-5

## TEST SPECIFICATIONS

Specification:	FCC 15.207:2018	Method:	ANSI C63.10:2013
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## TEST PARAMETERS

Run #:	16	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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## COMMENTS

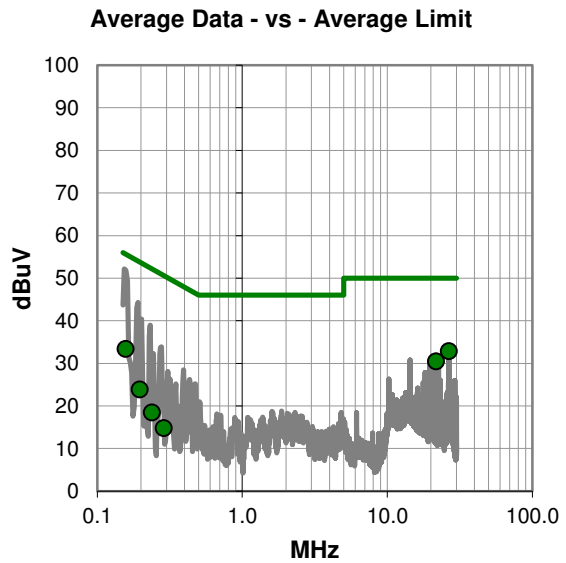
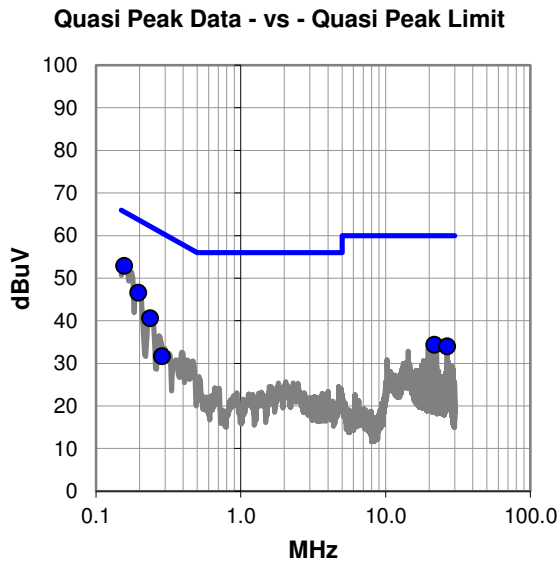
Streaming

## EUT OPERATING MODES

Tx mode, Ch. 20 2442 MHz, 2 MB

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS



## RESULTS - Run #16

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.156	52.6	0.3	52.9	65.7	-12.8
0.196	46.3	0.3	46.6	63.8	-17.2
0.237	40.3	0.3	40.6	62.2	-21.6
21.664	32.1	2.3	34.4	60.0	-25.6
26.623	31.0	3.0	34.0	60.0	-26.0
0.286	31.5	0.2	31.7	60.6	-28.9

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
26.623	29.9	3.0	32.9	50.0	-17.1
21.664	28.2	2.3	30.5	50.0	-19.5
0.156	33.1	0.3	33.4	55.7	-22.3
0.196	23.6	0.3	23.9	53.8	-29.9
0.237	18.2	0.3	18.5	52.2	-33.7
0.286	14.6	0.2	14.8	50.6	-35.8

## CONCLUSION

Pass

Tested By

# SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2018.05.04

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

Tx on Ch. 0, 2402 MHz; Ch. 20, 2442 MHz; Ch. 37, 2477 MHz (2 Mb only); Ch. 39, 2480 MHz (1 Mb only), and 1 Mb, and 2 Mb data rate. Channel 37 will be the highest channel available for 2 Mb data rate per client request.

Tx on Ch. 39 at 2480 MHz on the RSL Radio

## POWER SETTINGS INVESTIGATED

110VAC/60Hz

Battery

## CONFIGURATIONS INVESTIGATED

STAK0117 - 1

## FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26000 MHz
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## 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	SA18E-20	TWZ	20-Sep-2017	12 mo
Cable	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	12-Jul-2017	12 mo
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cab	MNI	21-Nov-2017	12 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	9-Nov-2017	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	LFN	20-Sep-2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFK	20-Sep-2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYD	25-Jan-2018	24 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AXP	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	9-Nov-2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	13-Feb-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AIQ	NCR	0 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIB	25-Aug-2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	2-Aug-2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	13-Feb-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	12-Sep-2017	12 mo
Cable	ESM Cable Corp	TTBJ141 KMKM-72	MNP	12-Sep-2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AHG	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	13-Feb-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



## 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

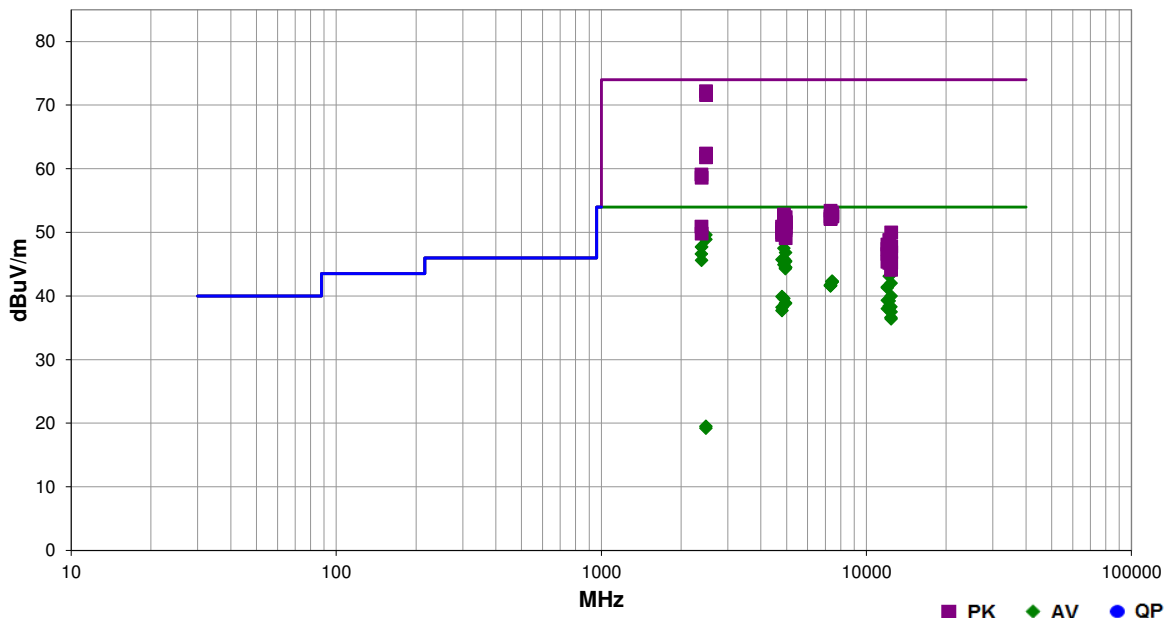


EmiRS 2018.05.07 PSA-ESCI 2018.05.04

<b>Work Order:</b>	STAK0117	<b>Date:</b>	18-Jun-2018	
<b>Project:</b>	None	<b>Temperature:</b>	21.6 °C	
<b>Job Site:</b>	MN05	<b>Humidity:</b>	63.7% RH	
<b>Serial Number:</b>	182010052A	<b>Barometric Pres.:</b>	1017 mbar	
<b>EUT:</b>	Multi-Function Accessory			
<b>Configuration:</b>	1			
<b>Customer:</b>	Starkey Laboratories, Inc.			
<b>Attendees:</b>	Charlie Esch			
<b>EUT Power:</b>	Battery			
<b>Operating Mode:</b>	Tx on Ch. 0, 2402 MHz; Ch. 20, 2442 MHz; Ch. 37, 2477 MHz (2 Mb only); Ch. 39, 2480 MHz (1 Mb only), and 1 Mb, and 2 Mb data rate. Channel 37 will be the highest channel available for 2 Mb data rate per client request.			
<b>Deviations:</b>	None			
<b>Comments:</b>	None			

<b>Test Specifications</b>	FCC 15.247:2018	<b>Test Method</b>	ANSI C63.10:2013
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<b>Run #</b>	18	<b>Test Distance (m)</b>	3	<b>Antenna Height(s)</b>	1 to 4(m)	<b>Results</b>	Pass
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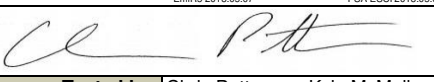
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.533	56.4	-4.2	1.0	189.0		20.0	Vert	PK	0.0	72.2	74.0	-1.8	EUT Vert, Ch. 39, 1 Mb
2483.540	55.8	-4.2	1.0	282.9		20.0	Horz	PK	0.0	71.6	74.0	-2.4	EUT Horz, Ch. 39, 1 Mb
2483.600	33.8	-4.2	1.0	77.1		20.0	Horz	AV	0.0	49.6	54.0	-4.4	EUT Horz, Ch. 37, 2 Mb
2483.707	33.1	-4.2	1.0	29.1		20.0	Vert	AV	0.0	48.9	54.0	-5.1	EUT Vert, Ch. 37, 2 Mb
2389.380	32.1	-4.4	1.0	106.1		20.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT Vert, Ch. 0, 2 Mb
2389.853	32.1	-4.4	1.0	91.1		20.0	Horz	AV	0.0	47.7	54.0	-6.3	EUT Horz, Ch. 0, 2 Mb
4883.800	42.1	5.4	2.3	300.0		0.0	Horz	AV	0.0	47.5	54.0	-6.5	EUT Horz, Ch. 20, 1 Mb
4959.875	41.1	5.7	2.1	133.0		0.0	Horz	AV	0.0	46.8	54.0	-7.2	EUT Horz, Ch. 39, 1 Mb
2388.050	30.6	-4.0	1.0	286.9		20.0	Horz	AV	0.0	46.6	54.0	-7.4	EUT Horz, Ch. 0, 1 Mb
4883.950	40.4	5.4	1.0	108.0		0.0	Vert	AV	0.0	45.8	54.0	-8.2	EUT Vert, Ch. 20, 1 Mb
4803.858	40.7	5.0	2.1	318.0		0.0	Horz	AV	0.0	45.7	54.0	-8.3	EUT Horz, Ch. 0, 1 Mb
2389.250	29.6	-4.0	1.0	169.0		20.0	Vert	AV	0.0	45.6	54.0	-8.4	EUT Vert, Ch. 0, 1 Mb
4959.833	39.8	5.7	1.0	60.0		0.0	Vert	AV	0.0	45.5	54.0	-8.5	EUT Vert, Ch. 39, 1 Mb
4959.925	39.7	5.7	1.3	0.0		0.0	Horz	AV	0.0	45.4	54.0	-8.6	EUT On Side, Ch. 39
4883.208	39.5	5.4	1.0	129.0		0.0	Vert	AV	0.0	44.9	54.0	-9.1	EUT Vert, Ch. 20, 2 Mb
4959.858	38.8	5.7	1.4	206.1		0.0	Horz	AV	0.0	44.5	54.0	-9.5	EUT Vert, Ch. 39, 1 Mb
4960.017	38.8	5.7	1.0	145.1		0.0	Vert	AV	0.0	44.5	54.0	-9.5	EUT On Side, Ch. 39, 1 Mb
4951.550	38.7	5.6	2.7	113.1		0.0	Horz	AV	0.0	44.3	54.0	-9.7	EUT Horz, Ch. 37, 2 Mb
12208.850	44.2	-1.1	1.8	121.0		0.0	Vert	AV	0.0	43.1	54.0	-10.9	EUT Horz, Ch. 20, 1 Mb
2483.907	46.6	-4.2	1.0	77.1		20.0	Horz	PK	0.0	62.4	74.0	-11.6	EUT Horz, Ch. 37, 2 Mb

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7438.475	31.4	10.9	1.0	339.0		0.0	Vert	AV	0.0	42.3	54.0	-11.7	EUT Vert, Ch. 39, 1 Mb
7429.400	31.4	10.9	2.9	81.0		0.0	Vert	AV	0.0	42.3	54.0	-11.7	EUT Vert, Ch. 37, 2 Mb
7438.233	31.3	10.9	1.0	208.0		0.0	Horz	AV	0.0	42.2	54.0	-11.8	EUT Horz, Ch. 39, 1 Mb
7432.475	31.3	10.9	1.0	205.0		0.0	Horz	AV	0.0	42.2	54.0	-11.8	EUT Horz, Ch. 37, 2 Mb
12400.950	37.1	4.9	1.8	120.1		0.0	Vert	AV	0.0	42.0	54.0	-12.0	EUT Vert, Ch. 39, 1 Mb
2483.540	46.0	-4.2	1.0	49.0		20.0	Vert	PK	0.0	61.8	74.0	-12.2	EUT Vert, Ch. 37, 2 Mb
7327.300	31.2	10.5	2.7	80.1		0.0	Vert	AV	0.0	41.7	54.0	-12.3	EUT Vert, Ch. 20, 2 Mb
7324.058	31.1	10.6	1.0	322.0		0.0	Horz	AV	0.0	41.7	54.0	-12.3	EUT Horz, Ch. 20, 2 Mb
7327.192	31.0	10.6	3.5	268.0		0.0	Horz	AV	0.0	41.6	54.0	-12.4	EUT Horz, Ch. 20, 1 Mb
7327.317	31.0	10.6	3.0	235.0		0.0	Vert	AV	0.0	41.6	54.0	-12.4	EUT Vert, Ch. 20, 1 Mb
12008.740	42.8	-1.4	1.8	140.0		0.0	Vert	AV	0.0	41.4	54.0	-12.6	EUT Vert, Ch. 0, 1 Mb
12008.690	42.7	-1.4	1.8	32.0		0.0	Horz	AV	0.0	41.3	54.0	-12.7	EUT Horz, Ch. 0, 1 Mb
12398.850	40.4	-0.4	2.0	312.9		0.0	Vert	AV	0.0	40.0	54.0	-14.0	EUT Vert, Ch. 39, 1 Mb
4803.883	34.9	5.0	1.0	21.0		0.0	Vert	AV	0.0	39.9	54.0	-14.1	EUT Vert, Ch. 0, 1 Mb
4883.075	34.2	5.4	2.4	300.0		0.0	Horz	AV	0.0	39.6	54.0	-14.4	EUT Horz, Ch. 20, 2 Mb
12007.560	40.7	-1.4	1.9	196.1		0.0	Horz	AV	0.0	39.3	54.0	-14.7	EUT Horz, Ch. 0, 2 Mb
12208.840	40.3	-1.1	1.8	24.0		0.0	Horz	AV	0.0	39.2	54.0	-14.8	EUT Vert, Ch. 20, 1 Mb
2386.780	43.5	-4.4	1.0	91.1		20.0	Horz	PK	0.0	59.1	74.0	-14.9	EUT Horz, Ch. 0, 2 Mb
4959.792	33.2	5.7	1.0	304.9		0.0	Vert	AV	0.0	38.9	54.0	-15.1	EUT Horz, Ch. 39, 1 Mb
4951.600	33.2	5.6	1.0	292.0		0.0	Vert	AV	0.0	38.8	54.0	-15.2	EUT Vert, Ch. 37, 2 Mb
2389.047	43.0	-4.4	1.0	106.1		20.0	Vert	PK	0.0	58.6	74.0	-15.4	EUT Vert, Ch. 0, 2 Mb
12207.520	39.5	-1.1	1.0	117.0		0.0	Vert	AV	0.0	38.4	54.0	-15.6	EUT Vert, Ch. 20, 2 Mb
12382.530	38.8	-0.5	2.5	310.0		0.0	Vert	AV	0.0	38.3	54.0	-15.7	EUT Vert, Ch. 37, 2 Mb
4803.075	33.2	5.0	1.0	263.0		0.0	Vert	AV	0.0	38.2	54.0	-15.8	EUT Vert, Ch. 0, 2 Mb
12207.530	39.1	-1.1	1.9	9.0		0.0	Horz	AV	0.0	38.0	54.0	-16.0	EUT Horz, Ch. 20, 2 Mb
12007.530	39.4	-1.4	1.0	115.0		0.0	Vert	AV	0.0	38.0	54.0	-16.0	EUT Vert, Ch. 0, 2 Mb
4803.100	32.7	5.0	2.1	121.0		0.0	Horz	AV	0.0	37.7	54.0	-16.3	EUT Horz, Ch. 0, 2 Mb
12398.800	37.9	-0.4	1.8	290.9		0.0	Horz	AV	0.0	37.5	54.0	-16.5	EUT Horz, Ch. 39, 1 Mb
12382.500	37.1	-0.5	1.8	194.0		0.0	Horz	AV	0.0	36.6	54.0	-17.4	EUT Horz, Ch. 37, 2 Mb
12401.080	31.5	4.9	1.7	290.9		0.0	Horz	AV	0.0	36.4	54.0	-17.6	EUT Horz, Ch. 39, 1 Mb
7323.758	42.8	10.6	3.0	235.0		0.0	Vert	PK	0.0	53.4	74.0	-20.6	EUT Vert, Ch. 20, 1 Mb
7429.183	42.2	10.9	2.9	81.0		0.0	Vert	PK	0.0	53.1	74.0	-20.9	EUT Vert, Ch. 37, 2 Mb
7429.583	42.1	10.9	1.0	205.0		0.0	Horz	PK	0.0	53.0	74.0	-21.0	EUT Horz, Ch. 37, 2 Mb
4883.400	47.4	5.4	2.3	300.0		0.0	Horz	PK	0.0	52.8	74.0	-21.2	EUT Horz, Ch. 20, 1 Mb
7441.025	41.7	10.9	1.0	208.0		0.0	Horz	PK	0.0	52.6	74.0	-21.4	EUT Horz, Ch. 39, 1 Mb
7437.750	41.6	10.9	1.0	339.0		0.0	Vert	PK	0.0	52.5	74.0	-21.5	EUT Vert, Ch. 39, 1 Mb
7326.675	41.9	10.6	1.0	322.0		0.0	Horz	PK	0.0	52.5	74.0	-21.5	EUT Horz, Ch. 20, 2 Mb
4960.417	46.7	5.7	2.1	133.0		0.0	Horz	PK	0.0	52.4	74.0	-21.6	EUT Horz, Ch. 39, 1 Mb
7325.708	41.7	10.5	2.7	80.1		0.0	Vert	PK	0.0	52.2	74.0	-21.8	EUT Vert, Ch. 20, 2 Mb
7326.642	41.5	10.6	3.5	268.0		0.0	Horz	PK	0.0	52.1	74.0	-21.9	EUT Horz, Ch. 20, 1 Mb
4882.858	46.4	5.4	2.4	300.0		0.0	Horz	PK	0.0	51.8	74.0	-22.2	EUT Horz, Ch. 20, 2 Mb
4884.233	46.3	5.4	1.0	108.0		0.0	Vert	PK	0.0	51.7	74.0	-22.3	EUT Vert, Ch. 20, 1 Mb
4953.025	46.1	5.6	2.7	113.1		0.0	Horz	PK	0.0	51.7	74.0	-22.3	EUT Horz, Ch. 37, 2 Mb
4885.325	46.3	5.4	1.0	129.0		0.0	Vert	PK	0.0	51.7	74.0	-22.3	EUT Vert, Ch. 20, 2 Mb
4959.500	45.9	5.7	1.0	60.0		0.0	Vert	PK	0.0	51.6	74.0	-22.4	EUT Vert, Ch. 39, 1 Mb
4959.508	45.8	5.7	1.3	0.0		0.0	Horz	PK	0.0	51.5	74.0	-22.5	EUT On Side, Ch. 39, 1 Mb
4960.267	45.2	5.7	1.0	145.1		0.0	Vert	PK	0.0	50.9	74.0	-23.1	EUT On Side, Ch. 39, 1 Mb
4804.833	45.9	5.0	2.1	318.0		0.0	Horz	PK	0.0	50.9	74.0	-23.1	EUT Horz, Ch. 0, 1 Mb
2388.050	34.9	-4.0	1.0	286.9		20.0	Horz	PK	0.0	50.9	74.0	-23.1	EUT Horz, Ch. 0, 1 Mb
4959.408	45.0	5.7	1.4	206.1		0.0	Horz	PK	0.0	50.7	74.0	-23.3	EUT Vert, Ch. 39, 1 Mb
4805.142	45.6	5.0	1.0	263.0		0.0	Vert	PK	0.0	50.6	74.0	-23.4	EUT Vert, Ch. 0, 2 Mb
4952.842	44.7	5.6	1.0	292.0		0.0	Vert	PK	0.0	50.3	74.0	-23.7	EUT Vert, Ch. 37, 2 Mb
4804.508	45.0	5.0	1.0	21.0		0.0	Vert	PK	0.0	50.0	74.0	-24.0	EUT Vert, Ch. 0, 1 Mb
12401.110	45.1	4.9	1.8	120.1		0.0	Vert	PK	0.0	50.0	74.0	-24.0	EUT Vert, Ch. 39, 1 Mb
2389.250	33.8	-4.0	1.0	169.0		20.0	Vert	PK	0.0	49.8	74.0	-24.2	EUT Vert, Ch. 0, 1 Mb
4804.975	44.6	5.0	2.1	121.0		0.0	Horz	PK	0.0	49.6	74.0	-24.4	EUT Horz, Ch. 0, 2 Mb
4959.975	43.4	5.7	1.0	304.9		0.0	Vert	PK	0.0	49.1	74.0	-24.9	EUT Horz, Ch. 39, 1 Mb
12211.300	49.9	-1.1	1.8	121.0		0.0	Vert	PK	0.0	48.8	74.0	-25.2	EUT Hoz, Ch. 20, 1 Mb
12008.780	49.5	-1.4	1.8	140.0		0.0	Vert	PK	0.0	48.1	74.0	-25.9	EUT Vert, Ch. 0, 1 Mb
12401.490	42.9	4.9	1.7	290.9		0.0	Horz	PK	0.0	47.8	74.0	-26.2	EUT Horz, Ch. 39, 1 Mb
12008.610	48.8	-1.4	1.8	32.0		0.0	Horz	PK	0.0	47.4	74.0	-26.6	EUT Horz, Ch. 0, 1 Mb
12398.780	47.3	-0.4	2.0	312.9		0.0	Vert	PK	0.0	46.9	74.0	-27.1	EUT Vert, Ch. 39, 1 Mb
12009.830	48.0	-1.4	1.9	196.1		0.0	Horz	PK	0.0	46.6	74.0	-27.4	EUT Horz, Ch. 0, 2 Mb
12208.470	47.0	-1.1	1.8	24.0		0.0	Horz	PK	0.0	45.9	74.0	-28.1	EUT Vert, Ch. 20, 1 Mb
12382.700	46.3	-0.4	2.5	310.0		0.0	Vert	PK	0.0	45.9	74.0	-28.1	EUT Vert, Ch. 37, 2 Mb
12207.580	46.6	-1.1	1.9	9.0		0.0	Horz	PK	0.0	45.5	74.0	-28.5	EUT Horz, Ch. 20, 2 Mb
12007.510	46.8	-1.4	1.0	115.0		0.0	Vert	PK	0.0	45.4	74.0	-28.6	EUT Vert, Ch. 0, 2 Mb
12398.890	45.6	-0.4	1.8	290.9		0.0	Horz	PK	0.0	45.2	74.0	-28.8	EUT Horz, Ch. 39, 1 Mb
12207.570	46.3	-1.1	1.0	117.0		0.0	Vert	PK	0.0	45.2	74.0	-28.8	EUT Vert, Ch. 20, 2 Mb
12382.540	44.6	-0.5	1.8	194.0		0.0	Horz	PK	0.0	44.1	74.0	-29.9	EUT Horz, Ch. 37, 2 Mb
2483.507	39.2	-4.2	1.0	282.9		-35.5	20.0	Horz	AV	19.5	54.0	-34.5	EUT Horz, Ch. 39, 1 Mb
2483.500	38.9	-4.2	1.0	189.0		-35.5	20.0	Vert	AV	19.2	54.0	-34.8	EUT Vert, Ch. 39, 1 Mb

# SPURIOUS RADIATED EMISSIONS

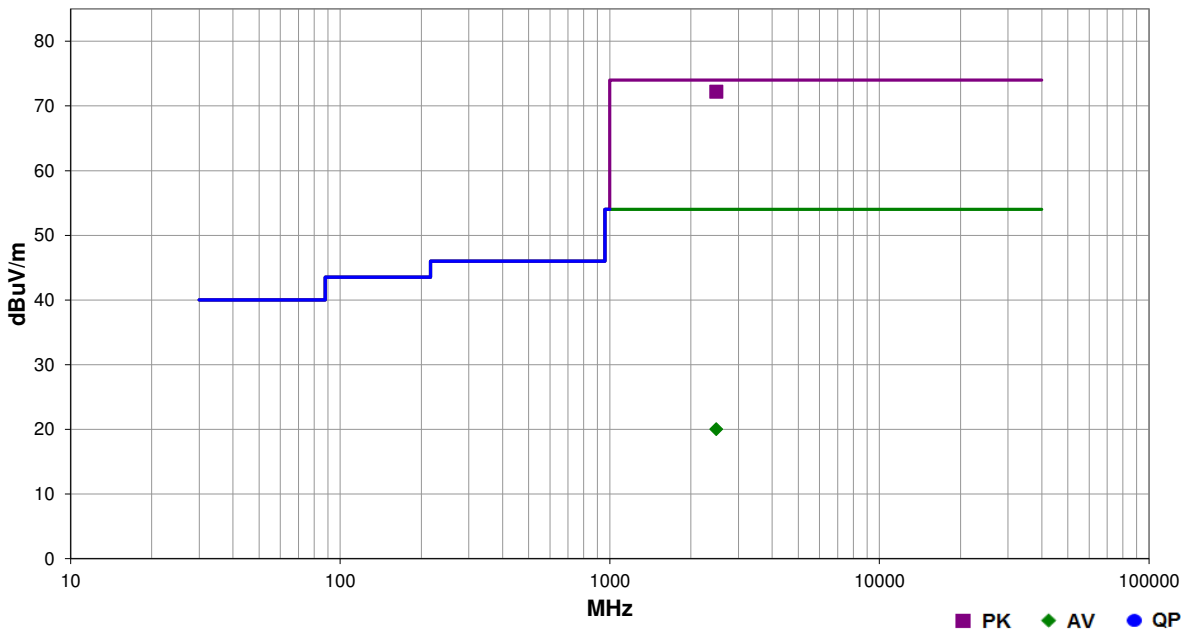


EmiRS 2018.05.07 PSA-ESCI 2018.05.04

<b>Work Order:</b>	STAK0117	<b>Date:</b>	20-Jun-2018	
<b>Project:</b>	None	<b>Temperature:</b>	21.8 °C	
<b>Job Site:</b>	MN05	<b>Humidity:</b>	55.1% RH	
<b>Serial Number:</b>	182010052A	<b>Barometric Pres.:</b>	1016 mbar	
<b>EUT:</b>	Multi-Function Accessory			
<b>Configuration:</b>	2			
<b>Customer:</b>	Starkey Laboratories, Inc.			
<b>Attendees:</b>	Charlie Esch			
<b>EUT Power:</b>	110VAC/60Hz			
<b>Operating Mode:</b>	Tx on Ch. 39 at 2480 MHz on the RSL Radio			
<b>Deviations:</b>	None			
<b>Comments:</b>	AC Powered spot check of highest emission. Output power of radio lowered from max power to 1 dB below max power.			

<b>Test Specifications</b>	<b>Test Method</b>
FCC 15.247:2018	ANSI C63.10:2013

<b>Run #</b>	74	<b>Test Distance (m)</b>	3	<b>Antenna Height(s)</b>	1 to 4(m)	<b>Results</b>	Pass
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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
2483.523	56.7	-4.5	1.0	344.9		20.0	Vert	PK	0.0	72.2	74.0	-1.8	EUT Vert, Ch. 39, 1 Mb
2483.520	40.0	-4.5	1.0	344.9	-35.5	20.0	Vert	AV	0.0	20.0	54.0	-34.0	EUT Vert, Ch. 39, 1 Mb

# 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	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	27-Apr-18	27-Apr-19

## 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



TstTx 2017.12.14 XMt 2017.12.13

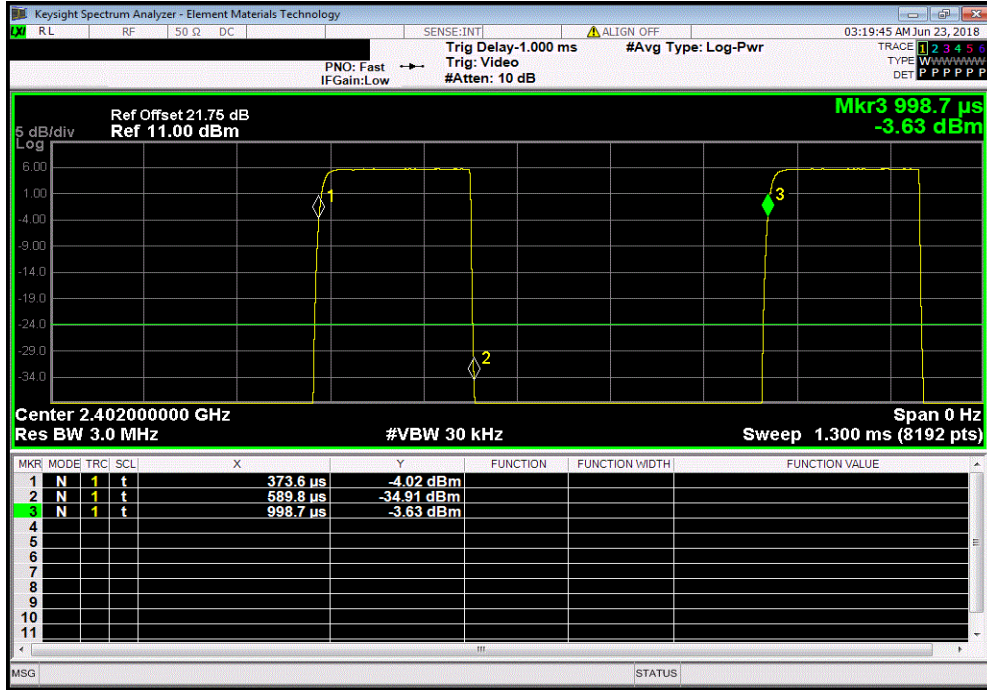
EUT: Multi-Function Accessory		Work Order: STAK0117	
Serial Number: 182010052A		Date: 22-Jun-18	
Customer: Starkey Laboratories, Inc.		Temperature: 22.1 °C	
Attendees: Charlie Esch		Humidity: 53.9% RH	
Project: None		Barometric Pres.: 1015 mbar	
Tested by: Dustin Sparks		Job Site: MN08	
Power: Battery		Test Method	
TEST SPECIFICATIONS		FCC 15.247:2018	
		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	4	Signature <i>Dustin Sparks</i>	
		Pulse Width	Period
		Number of Pulses	Value (%)
		Limit (%)	Results
BLE/GFSK, 1 Mbps			
	BLE/GFSK Low Channel, 2402 MHz	216.2 us	625.1 us
	BLE/GFSK Low Channel, 2402 MHz	N/A	N/A
	BLE/GFSK Mid Channel, 2442 MHz	215.9 us	624.9 us
	BLE/GFSK Mid Channel, 2442 MHz	N/A	N/A
	BLE/GFSK High Channel, 2480 MHz	216.8 us	624.9 us
	BLE/GFSK High Channel, 2480 MHz	N/A	N/A
BLE/GFSK, 2 Mbps			
	BLE/GFSK Low Channel, 2402 MHz	112 us	625.2 us
	BLE/GFSK Low Channel, 2402 MHz	N/A	N/A
	BLE/GFSK Mid Channel, 2442 MHz	112.2 us	625.2 us
	BLE/GFSK Mid Channel, 2442 MHz	N/A	N/A
	BLE/GFSK High Channel, 2480 MHz	112.5 us	625 us
	BLE/GFSK High Channel, 2480 MHz	N/A	N/A

# DUTY CYCLE

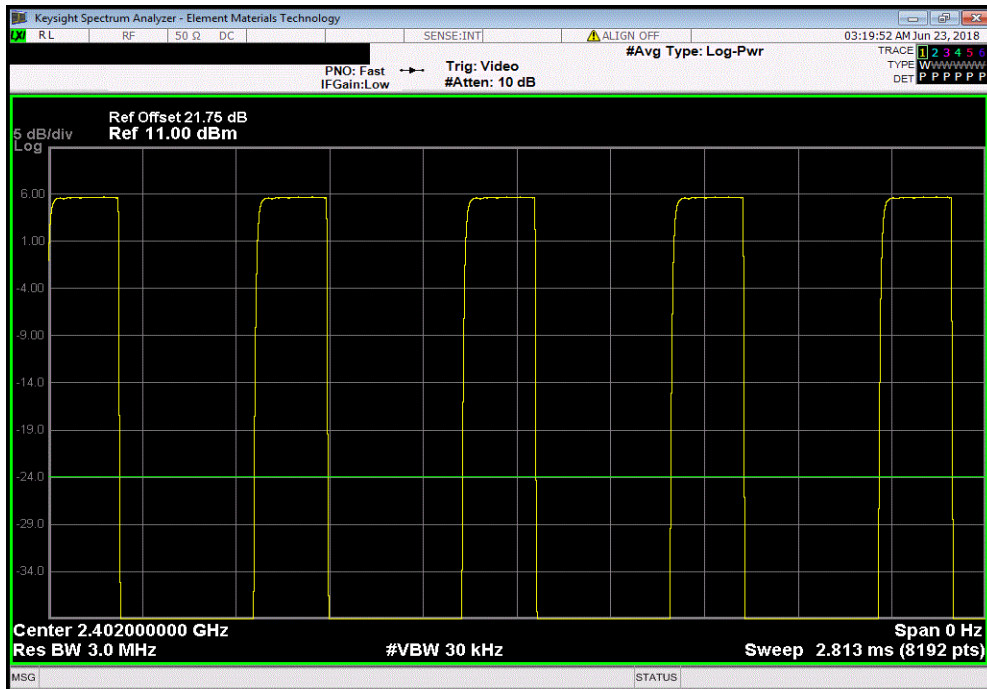


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK Low Channel, 2402 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
216.2 us	625.1 us	1	34.6	N/A	N/A	



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



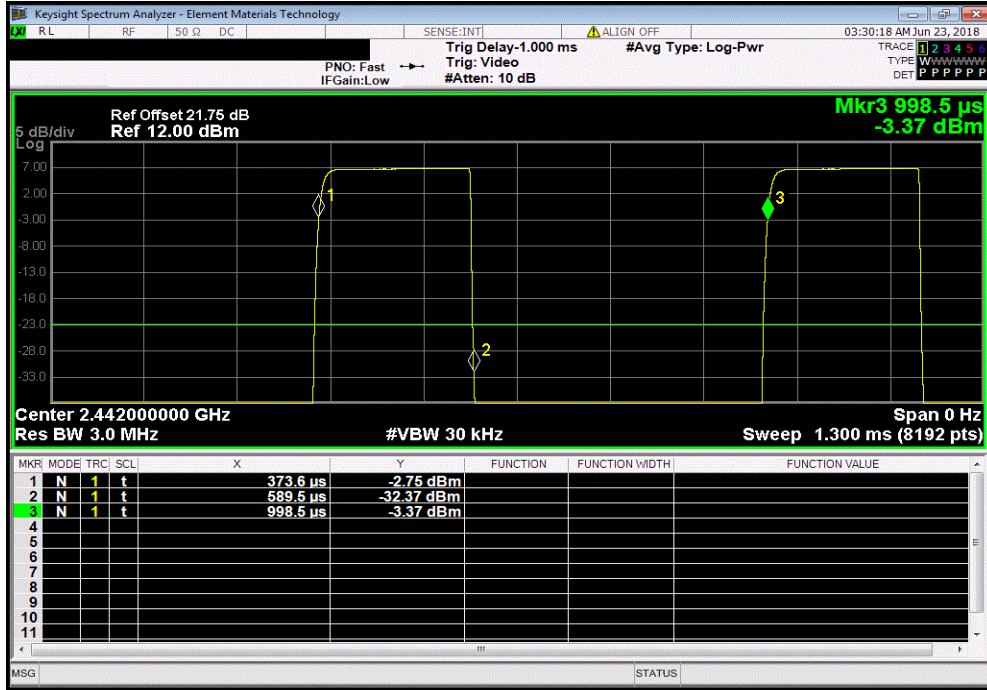


# DUTY CYCLE

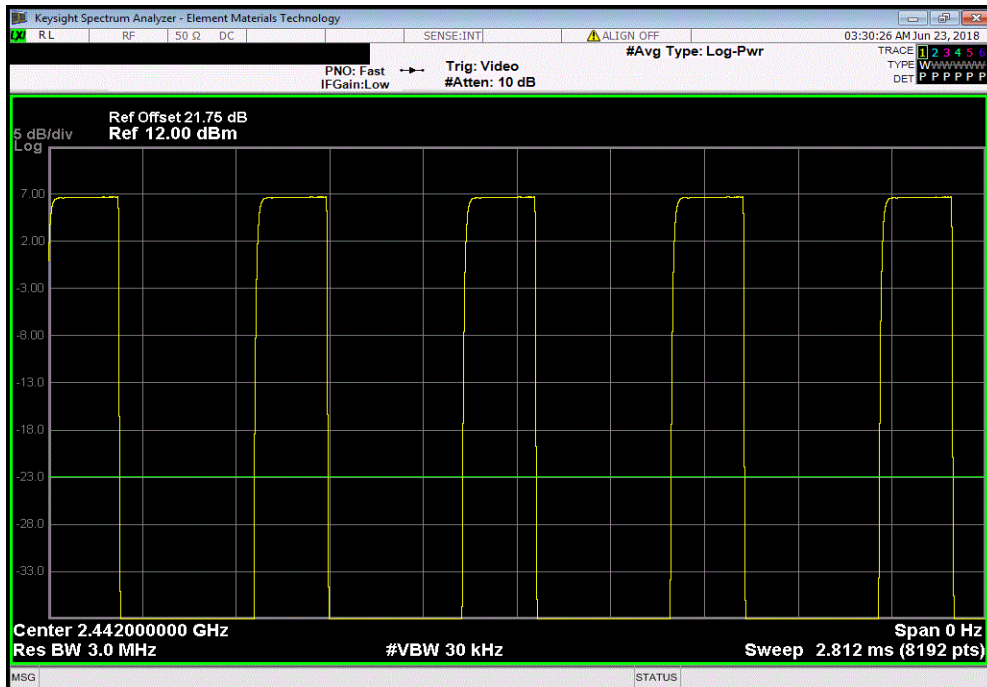


TbTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK Mid Channel, 2442 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
215.9 us	624.9 us	1	34.5	N/A	N/A	



BLE/GFSK, 1 Mbps, BLE/GFSK Mid Channel, 2442 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

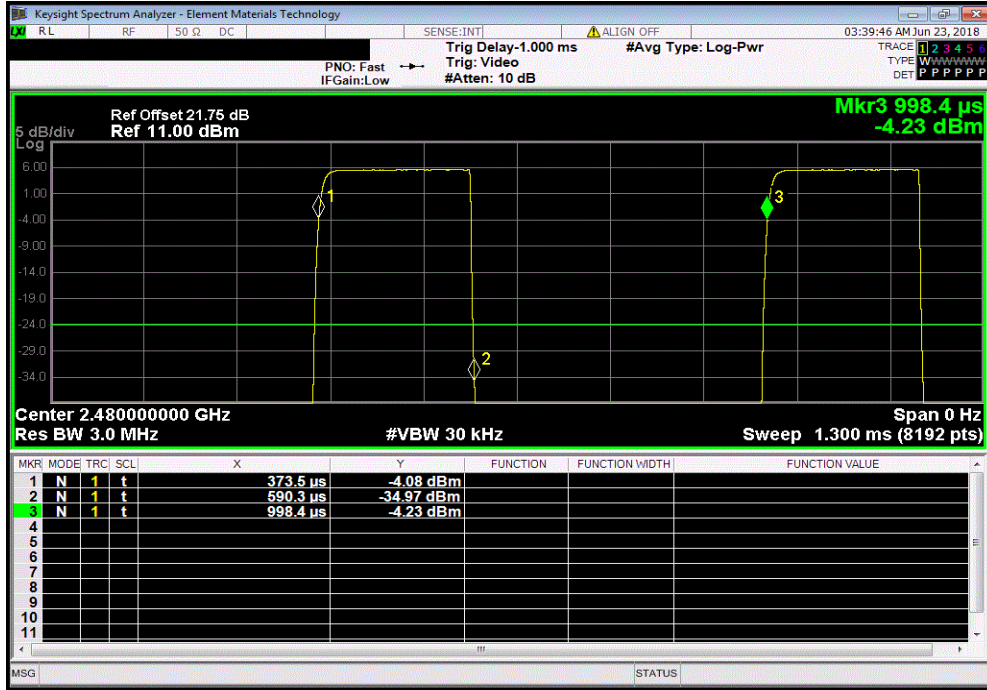


# DUTY CYCLE

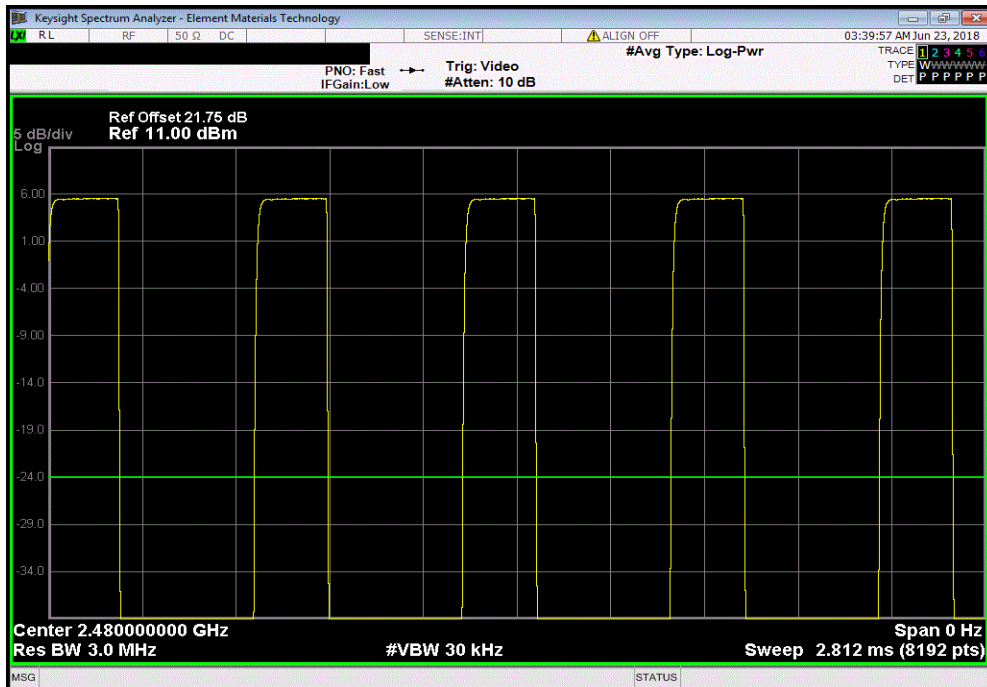


TbTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK High Channel, 2480 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
216.8 us	624.9 us	1	34.7	N/A	N/A	



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

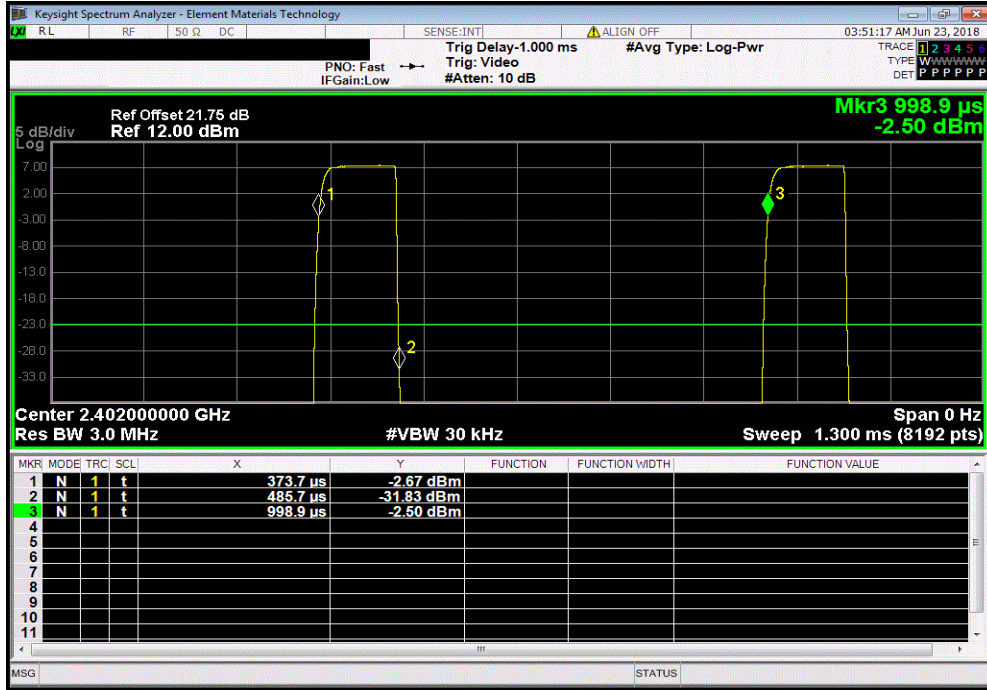


# DUTY CYCLE

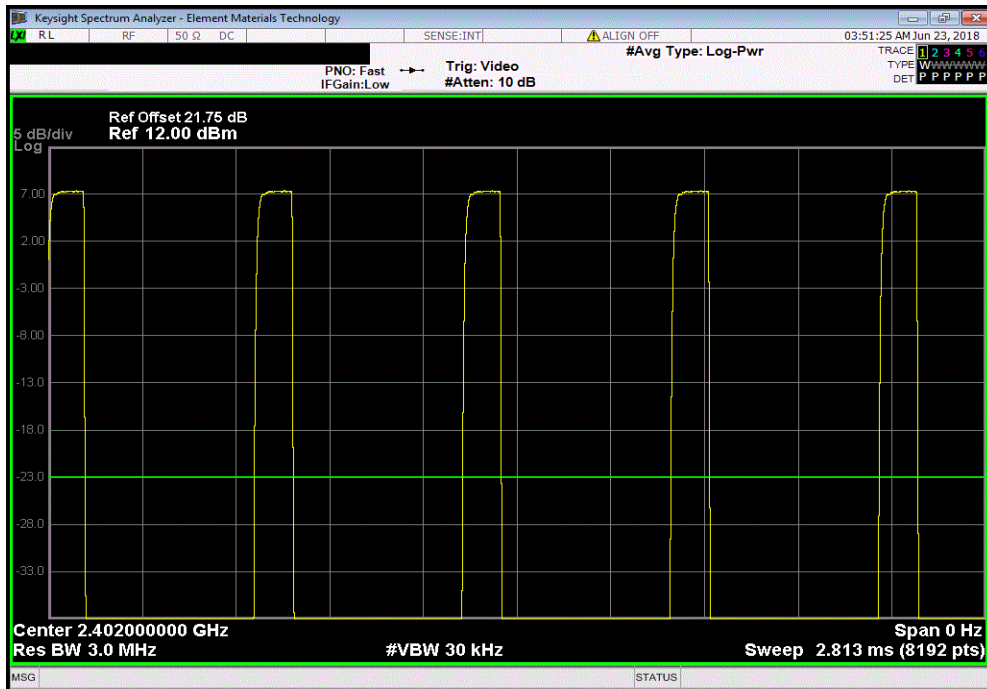


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK Low Channel, 2402 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
112 us	625.2 us	1	17.9	N/A	N/A	



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

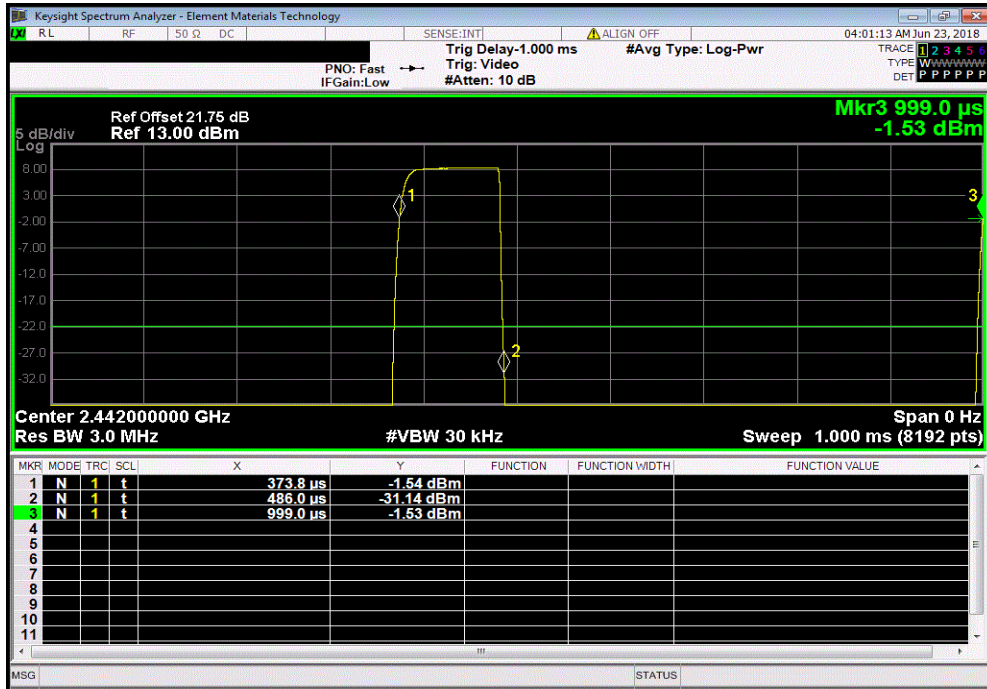


# DUTY CYCLE

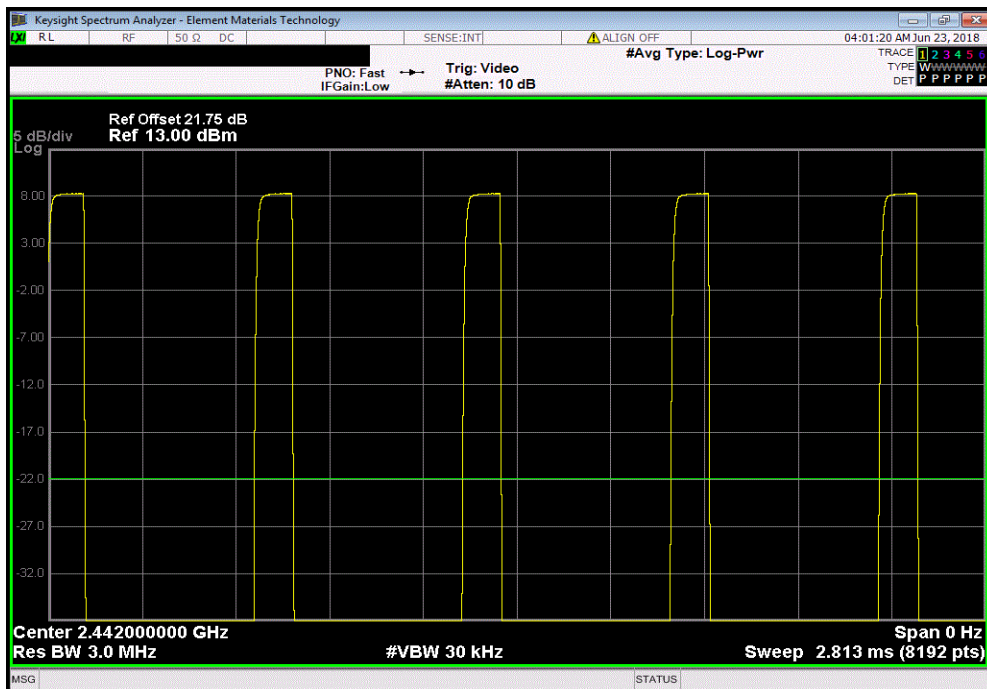


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK Mid Channel, 2442 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
112.2 us	625.2 us	1	17.9	N/A	N/A	



BLE/GFSK, 2 Mbps, BLE/GFSK Mid Channel, 2442 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

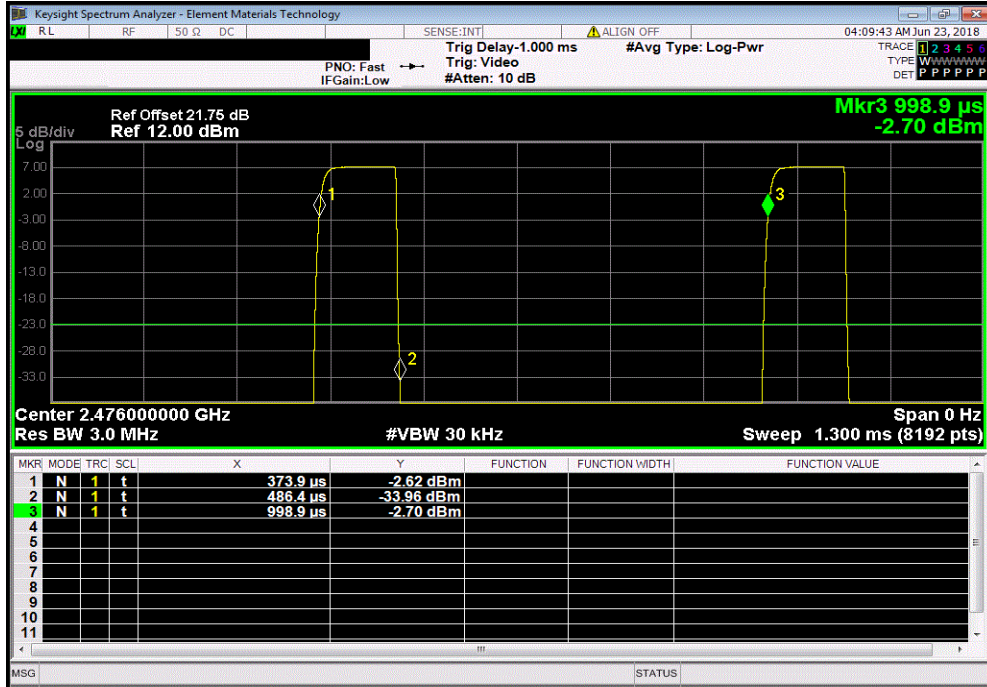


# DUTY CYCLE

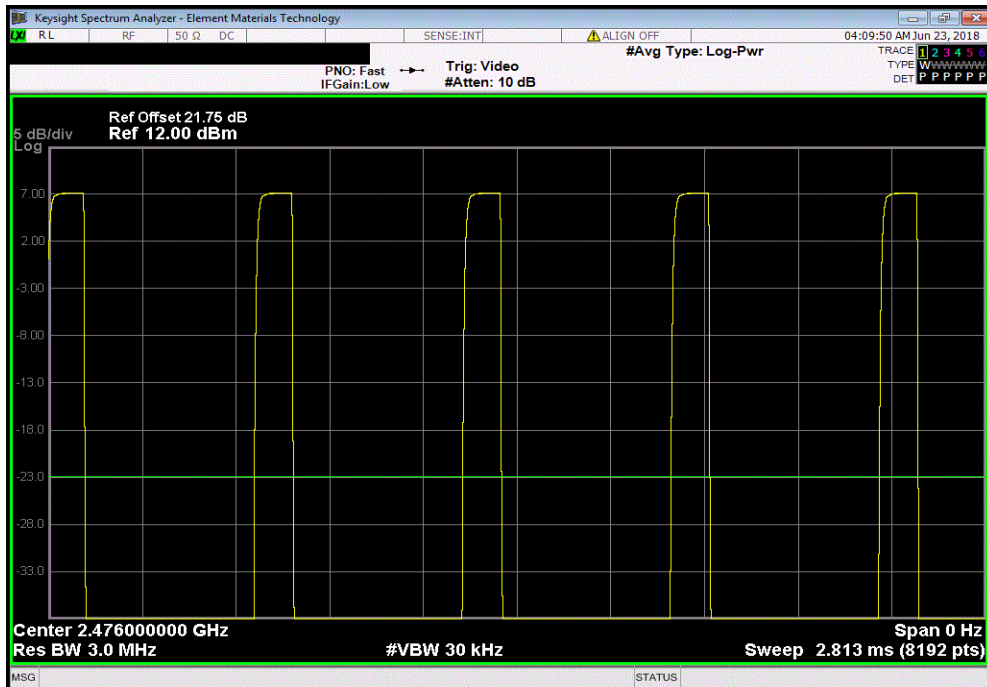


TbTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK High Channel, 2480 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
112.5 us	625 us	1	18	N/A	N/A	



BLE/GFSK, 2 Mbps, BLE/GFSK High Channel, 2480 MHz						
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	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	27-Apr-18	27-Apr-19

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was set to the channels and modes listed in the datasheet.

The 6dB 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



Tel# 2017.12.14 XM# 2017.12.13

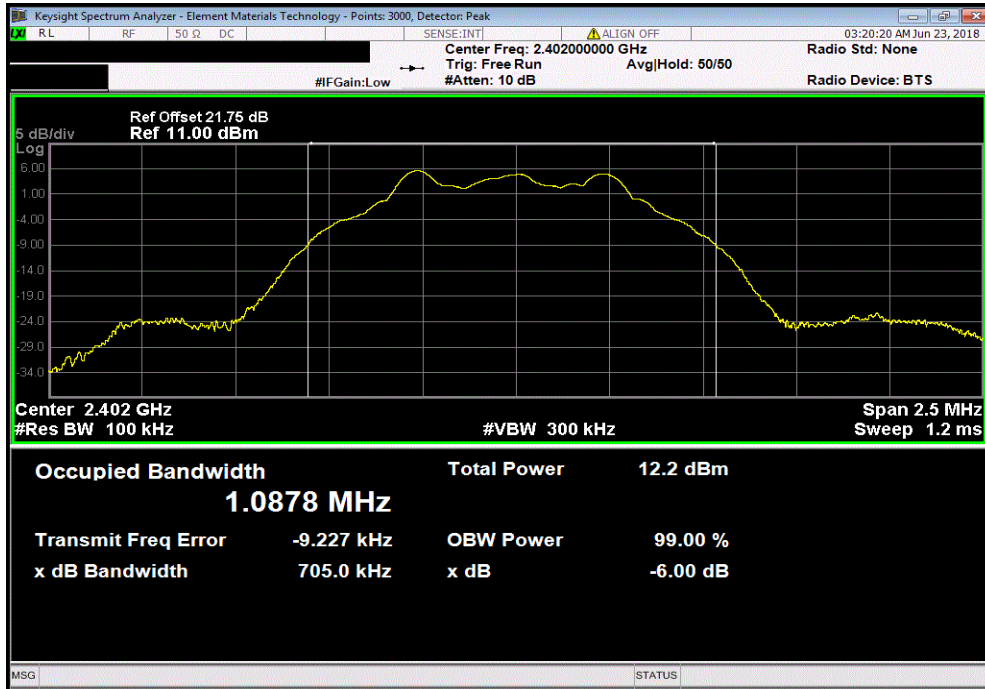
EUT: Multi-Function Accessory		Work Order: STAK0117	
Serial Number: 182010052A		Date: 22-Jun-18	
Customer: Starkey Laboratories, Inc.		Temperature: 22.1 °C	
Attendees: Charlie Esch		Humidity: 53.9% RH	
Project: None		Barometric Pres.: 1015 mbar	
Tested by: Dustin Sparks		Power: Battery	
		Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2018		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	4	Signature <i>Dustin Sparks</i>	
		Value	Limit (±) Result
BLE/GFSK, 1 Mbps			
	BLE/GFSK Low Channel, 2402 MHz	705.017 kHz	500 kHz Pass
	BLE/GFSK Mid Channel, 2442 MHz	669.049 kHz	500 kHz Pass
	BLE/GFSK High Channel, 2480 MHz	682.649 kHz	500 kHz Pass
BLE/GFSK, 2 Mbps			
	BLE/GFSK Low Channel, 2402 MHz	1.224 MHz	500 kHz Pass
	BLE/GFSK Mid Channel, 2442 MHz	1.218 MHz	500 kHz Pass
	BLE/GFSK High Channel, 2480 MHz	1.222 MHz	500 kHz Pass

# OCCUPIED BANDWIDTH

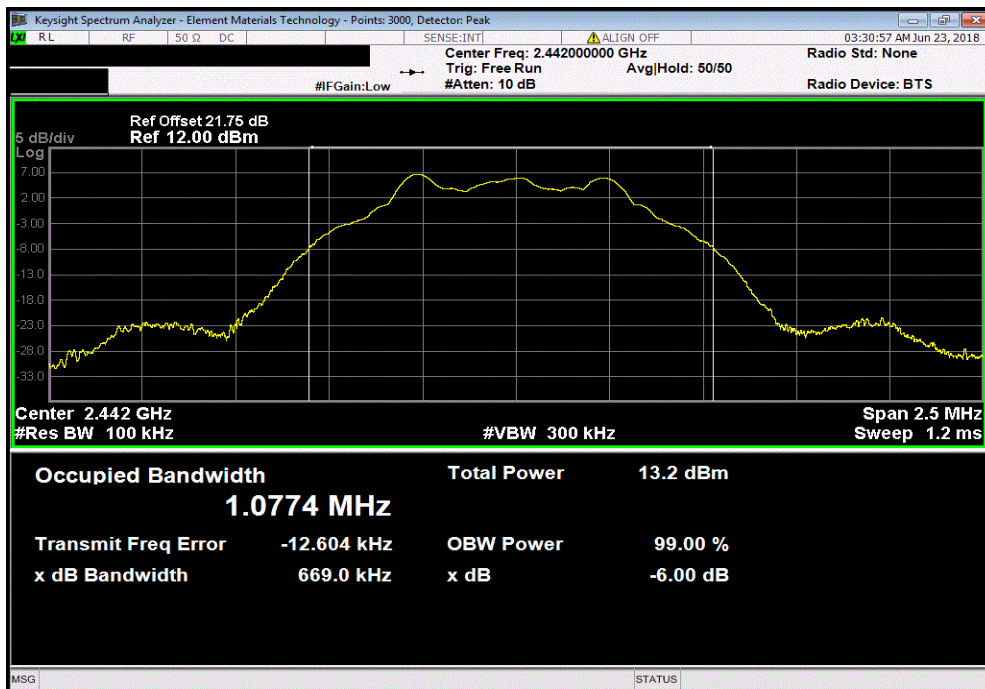


TbTx 2017.12.14 XMI 2017.12.13

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



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



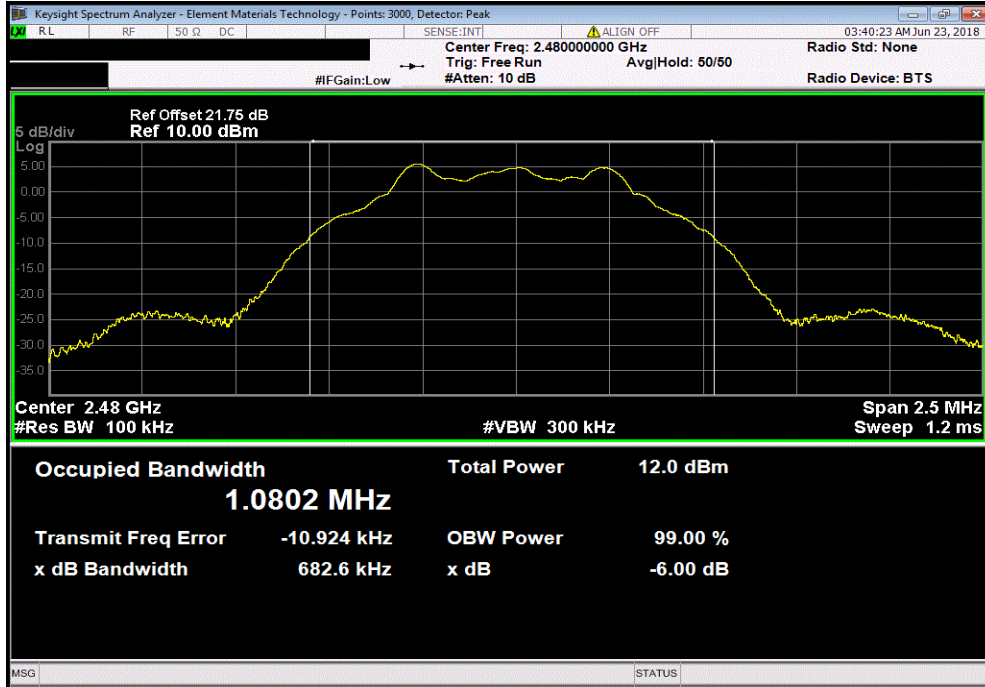


# OCCUPIED BANDWIDTH

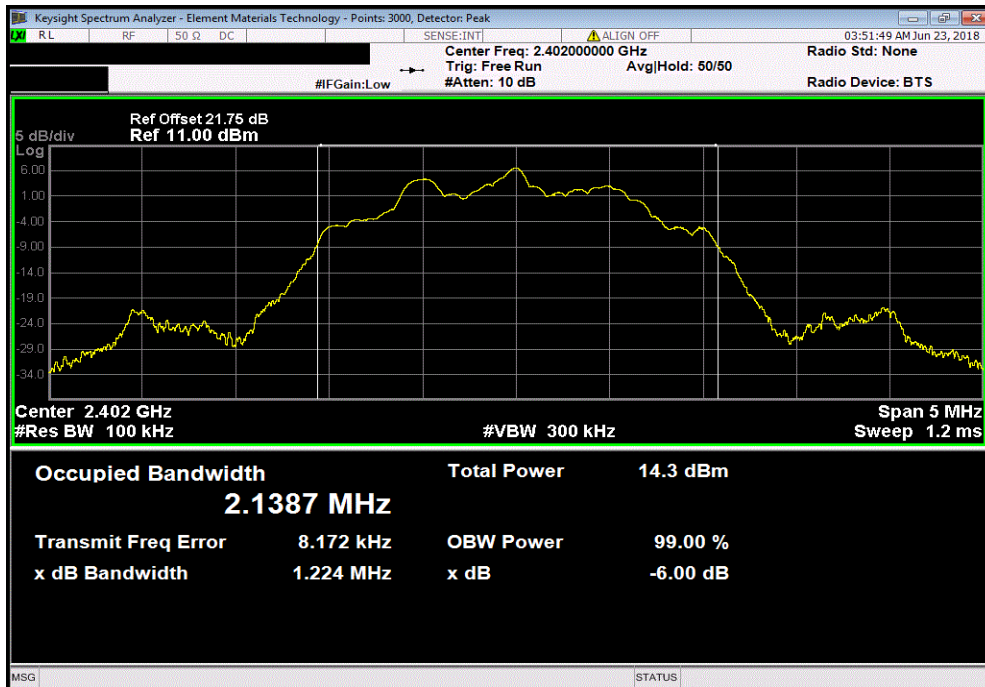


TMTx 2017.12.14 XMI 2017.12.13

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



BLE/GFSK, 2 Mbps, BLE/GFSK Low Channel, 2402 MHz						
	Value	Limit	Result			
	1.224 MHz	500 kHz	Pass			

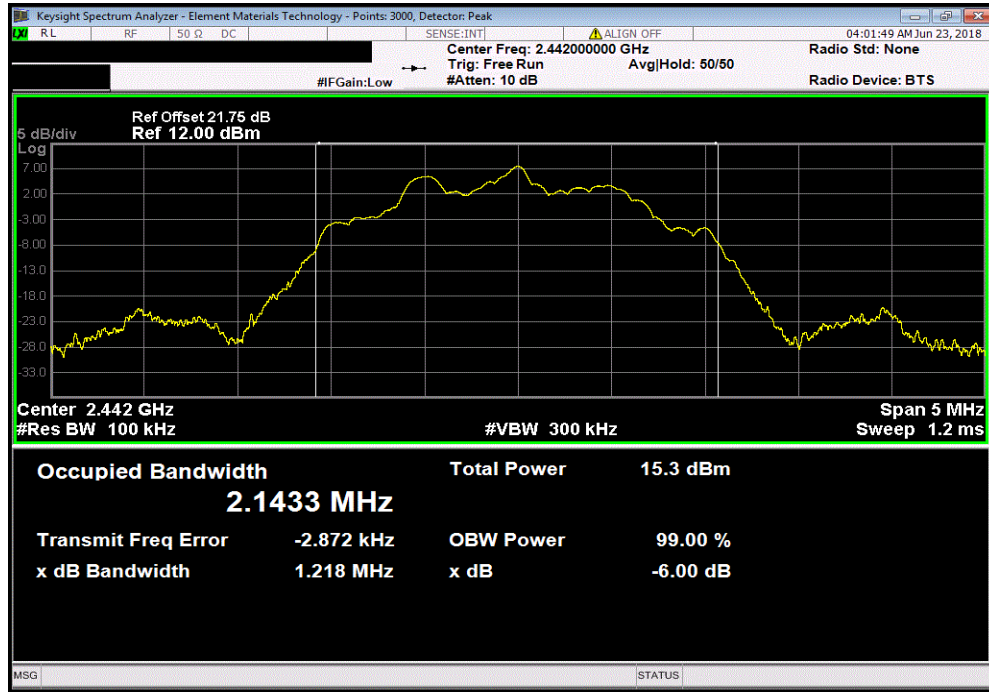


# OCCUPIED BANDWIDTH

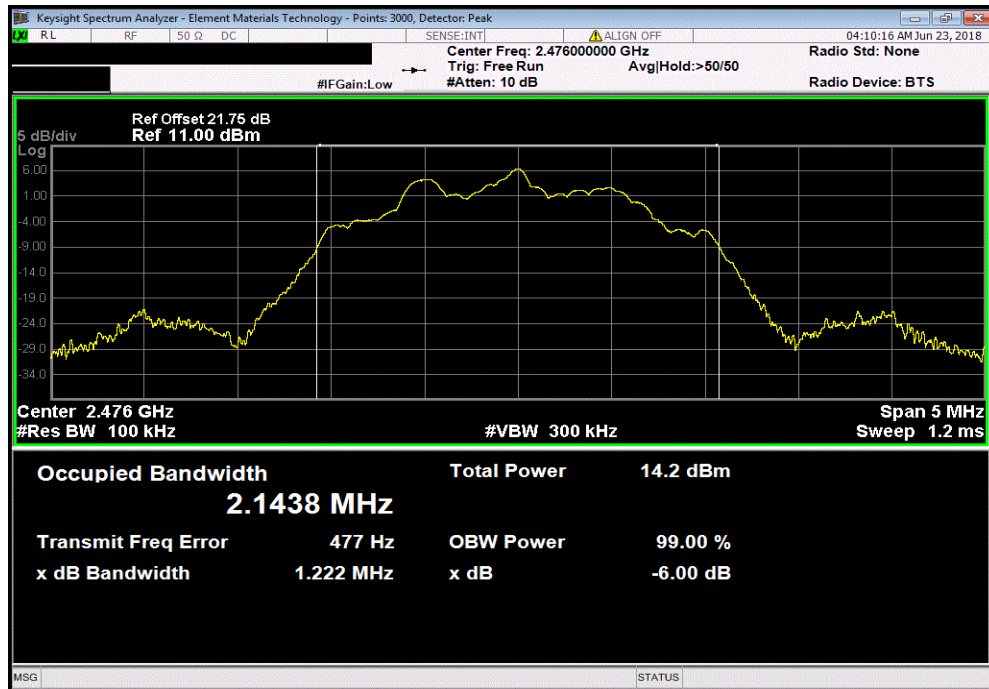


TbTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK Mid Channel, 2442 MHz						
				Value	Limit	Result
					(≥)	
				1.218 MHz	500 kHz	Pass



BLE/GFSK, 2 Mbps, BLE/GFSK High Channel, 2480 MHz						
				Value	Limit	Result
					(≥)	
				1.222 MHz	500 kHz	Pass



# OUTPUT POWER



XMI 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	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	27-Apr-18	27-Apr-19

## TEST DESCRIPTION

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

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

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

**De Facto EIRP Limit:** The EUT meets the de facto EIRP limit of +36 dBm.

# OUTPUT POWER



TbTx 2017.12.14 XMt 2017.12.13

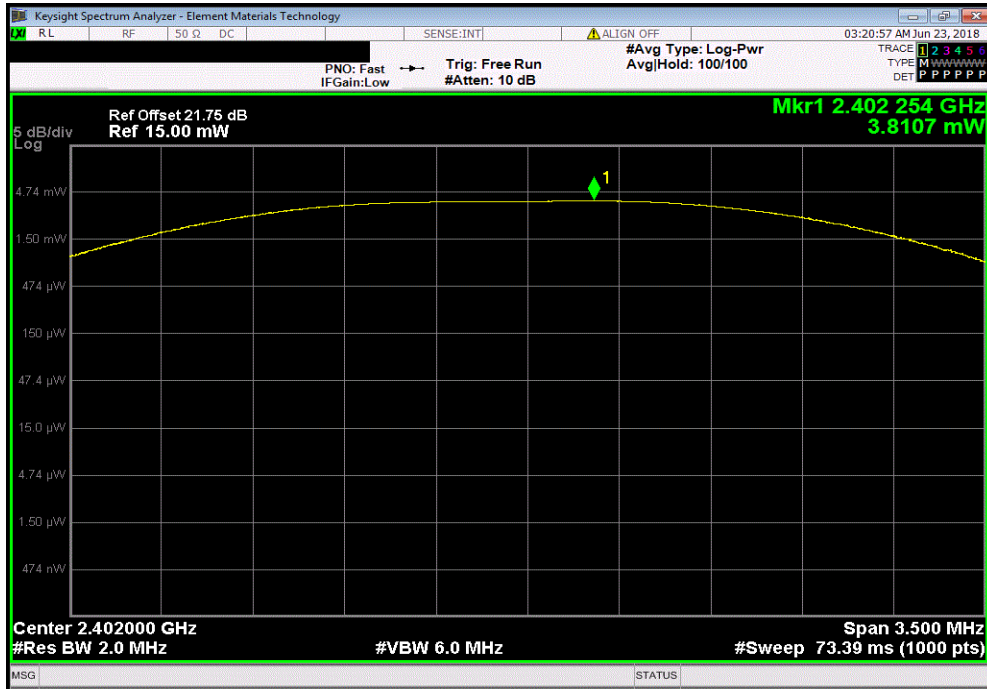
EUT: Multi-Function Accessory		Work Order: STAK0117	
Serial Number: 182010052A		Date: 22-Jun-18	
Customer: Starkey Laboratories, Inc.		Temperature: 22.1 °C	
Attendees: Charlie Esch		Humidity: 53.9% RH	
Project: None		Barometric Pres.: 1015 mbar	
Tested by: Dustin Sparks		Job Site: MN08	
Power: Battery			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2018		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	4	Signature	<i>Dustin Sparks</i>
		Value	Limit (-) Result
BLE/GFSK, 1 Mbps			
	BLE/GFSK Low Channel, 2402 MHz	3.811 mW	1 W Pass
	BLE/GFSK Mid Channel, 2442 MHz	4.797 mW	1 W Pass
	BLE/GFSK High Channel, 2480 MHz	3.651 mW	1 W Pass
BLE/GFSK, 2 Mbps			
	BLE/GFSK Low Channel, 2402 MHz	5.927 mW	1 W Pass
	BLE/GFSK Mid Channel, 2442 MHz	7.344 mW	1 W Pass
	BLE/GFSK High Channel, 2480 MHz	5.66 mW	1 W Pass

# OUTPUT POWER

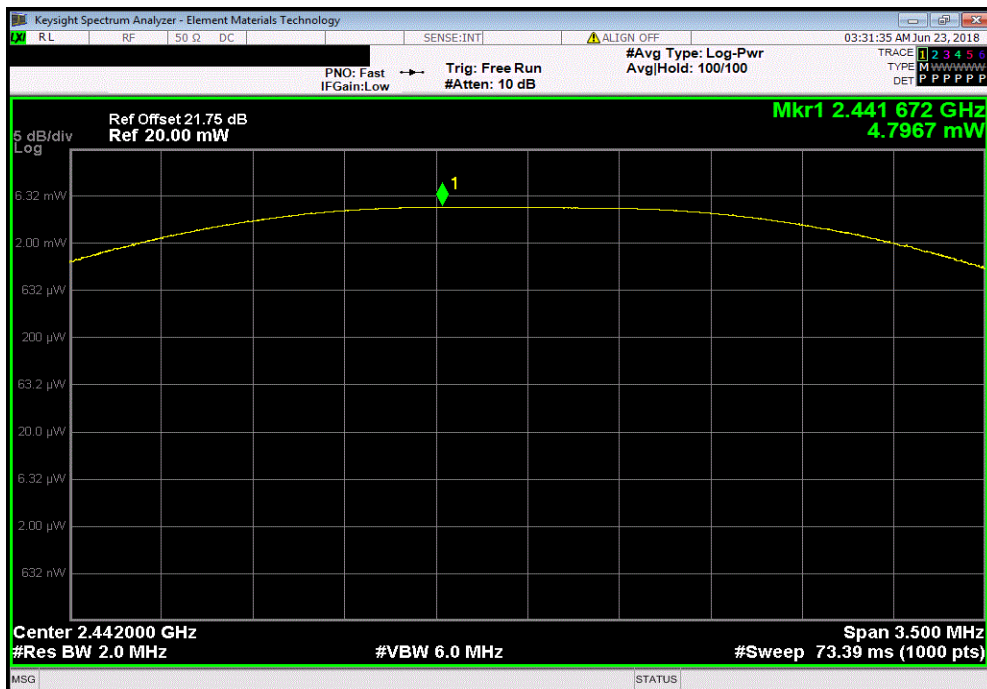


TbTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK Low Channel, 2402 MHz						
				Value	Limit	Result
				3.811 mW	1 W	Pass



BLE/GFSK, 1 Mbps, BLE/GFSK Mid Channel, 2442 MHz						
				Value	Limit	Result
				4.797 mW	1 W	Pass

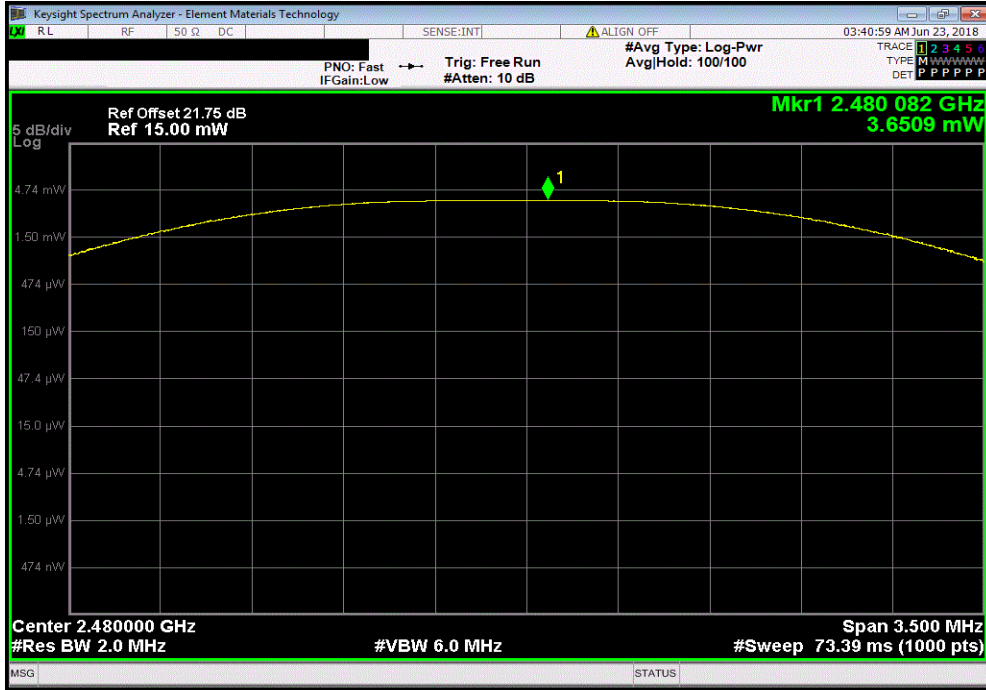


# OUTPUT POWER

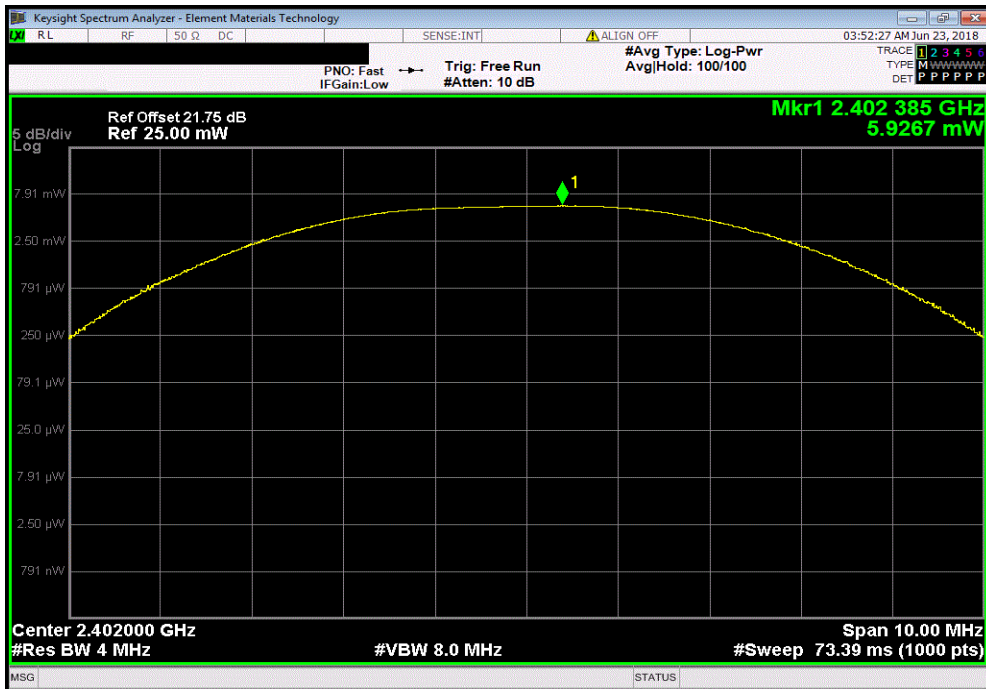


TMTx 2017.12.14 XMI 2017.12.13

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



BLE/GFSK, 2 Mbps, BLE/GFSK Low Channel, 2402 MHz						
				Value	Limit (<)	Result
				5.927 mW	1 W	Pass

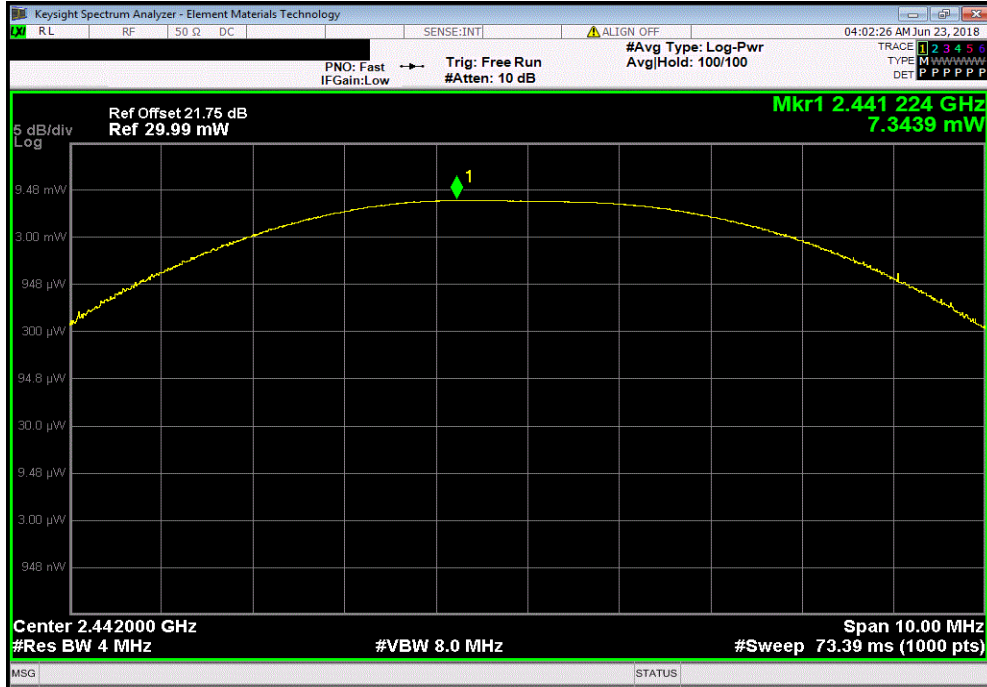


# OUTPUT POWER

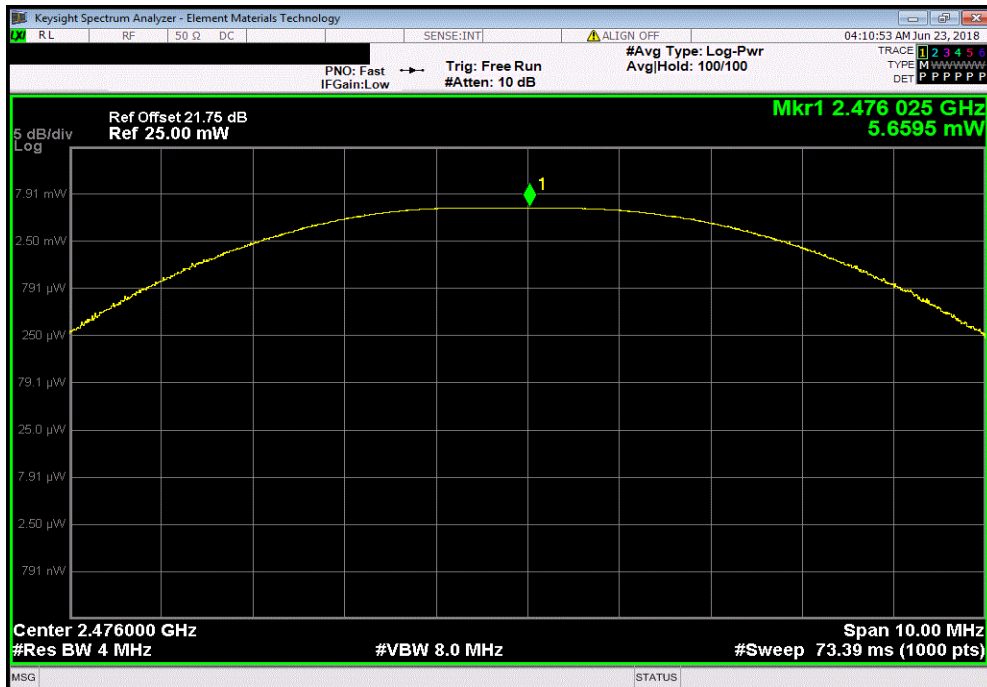


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK Mid Channel, 2442 MHz						
				Value	Limit (<)	Result
				7.344 mW	1 W	Pass



BLE/GFSK, 2 Mbps, BLE/GFSK High Channel, 2480 MHz						
				Value	Limit (<)	Result
				5.66 mW	1 W	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	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	27-Apr-18	27-Apr-19

## 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



TbTx 2017.12.14 XMt 2017.12.13

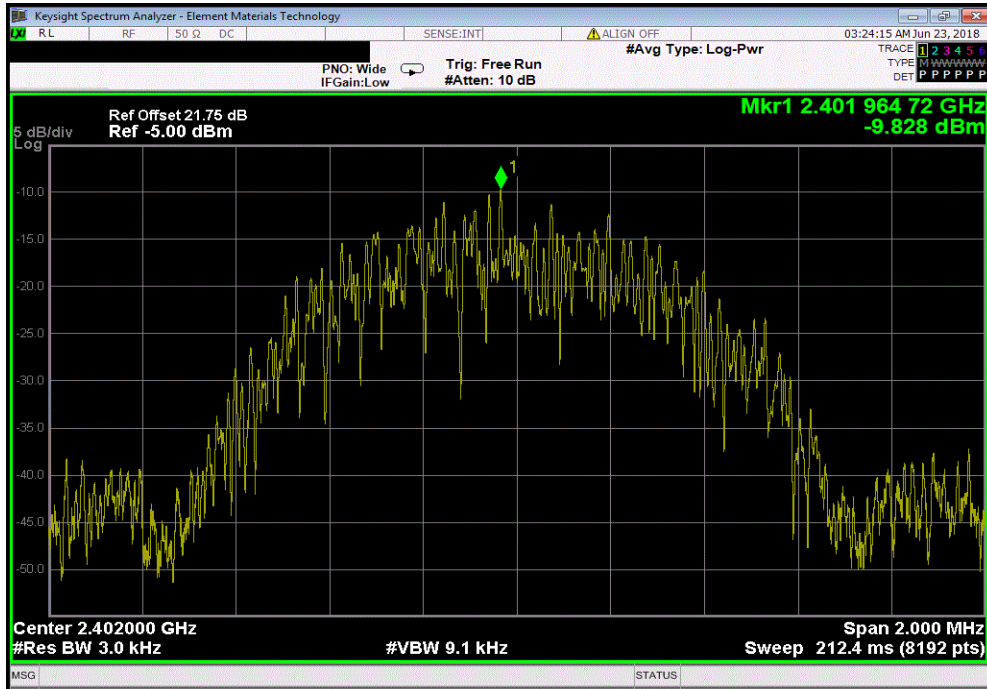
EUT: Multi-Function Accessory		Work Order: STAK0117		
Serial Number: 182010052A		Date: 22-Jun-18		
Customer: Starkey Laboratories, Inc.		Temperature: 22.2 °C		
Attendees: Charlie Esch		Humidity: 54% RH		
Project: None		Barometric Pres.: 1015 mbar		
Tested by: Dustin Sparks		Power: Battery		
		Job Site: MN08		
TEST SPECIFICATIONS		Test Method		
FCC 15.247:2018		ANSI C63.10:2013		
COMMENTS				
None				
DEVIATIONS FROM TEST STANDARD				
None				
Configuration #	4	Signature <i>Dustin Sparks</i>		
		Value	Limit	Results
		dBm/3kHz	< dBm/3kHz	
BLE/GFSK, 1 Mbps				
	BLE/GFSK Low Channel, 2402 MHz	-9.828	8	Pass
	BLE/GFSK Mid Channel, 2442 MHz	-8.684	8	Pass
	BLE/GFSK High Channel, 2480 MHz	-9.88	8	Pass
BLE/GFSK, 2 Mbps				
	BLE/GFSK Low Channel, 2402 MHz	-11.91	8	Pass
	BLE/GFSK Mid Channel, 2442 MHz	-10.994	8	Pass
	BLE/GFSK High Channel, 2480 MHz	-12.12	8	Pass

# POWER SPECTRAL DENSITY

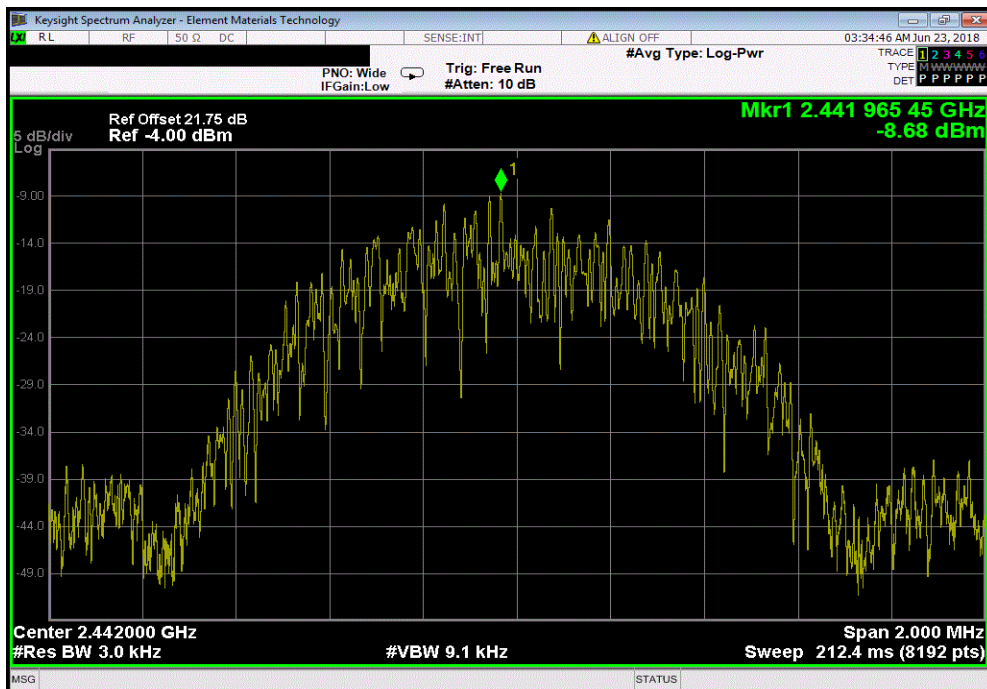


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK Low Channel, 2402 MHz						
	Value	Limit	Results			
	dBm/3kHz	< dBm/3kHz				
	-9.828	8	Pass			



BLE/GFSK, 1 Mbps, BLE/GFSK Mid Channel, 2442 MHz						
	Value	Limit	Results			
	dBm/3kHz	< dBm/3kHz				
	-8.684	8	Pass			

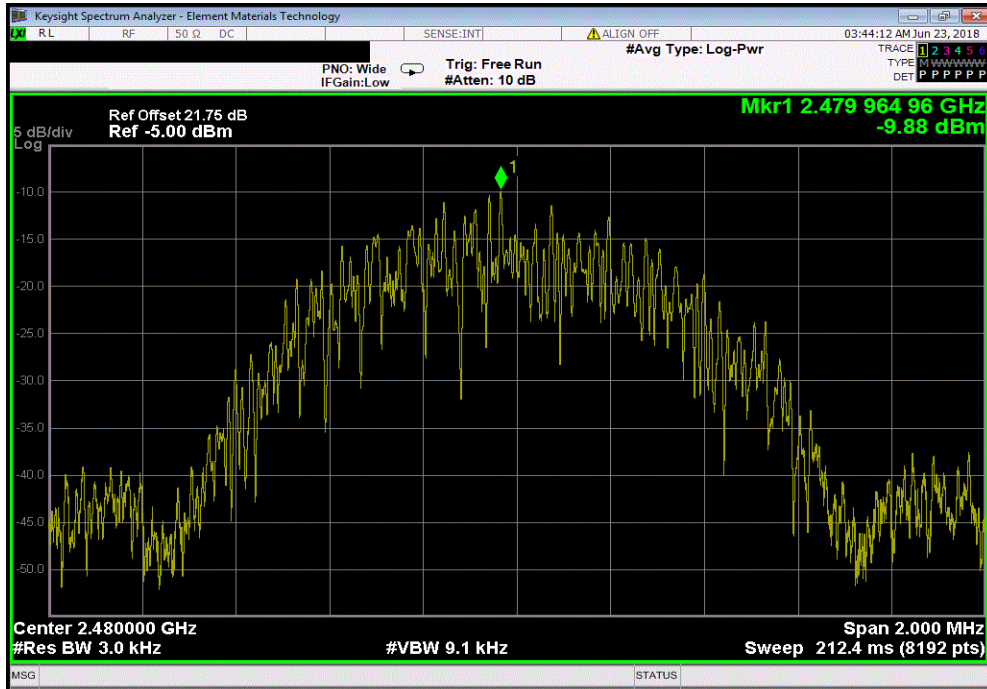


# POWER SPECTRAL DENSITY

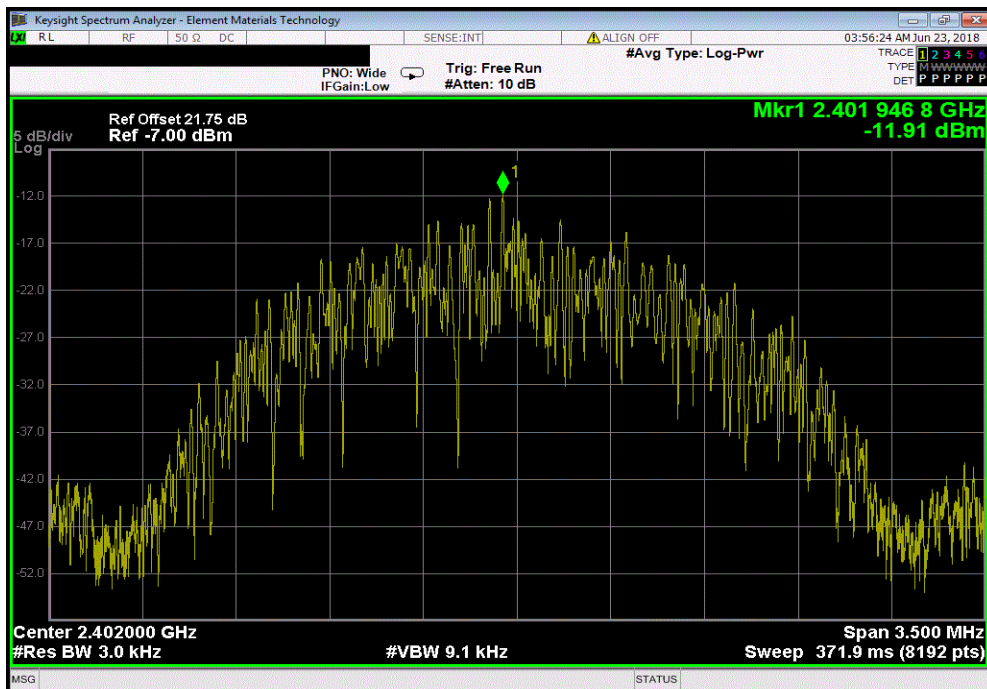


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK High Channel, 2480 MHz			
	Value	Limit	Results
	dBm/3kHz	< dBm/3kHz	
	-9.88	8	Pass



BLE/GFSK, 2 Mbps, BLE/GFSK Low Channel, 2402 MHz			
	Value	Limit	Results
	dBm/3kHz	< dBm/3kHz	
	-11.91	8	Pass

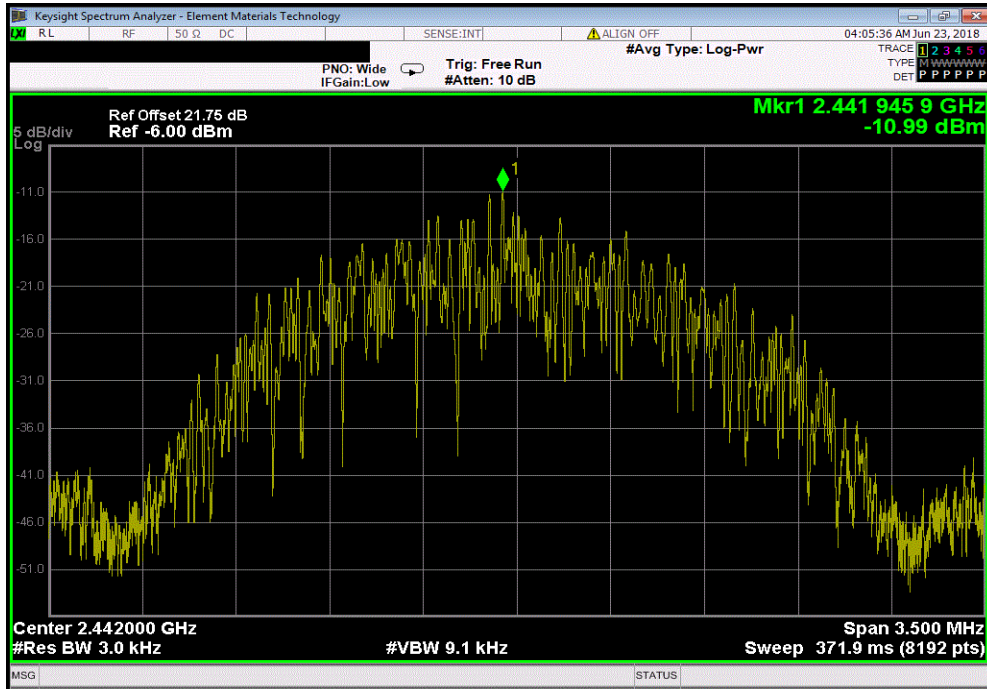


# POWER SPECTRAL DENSITY

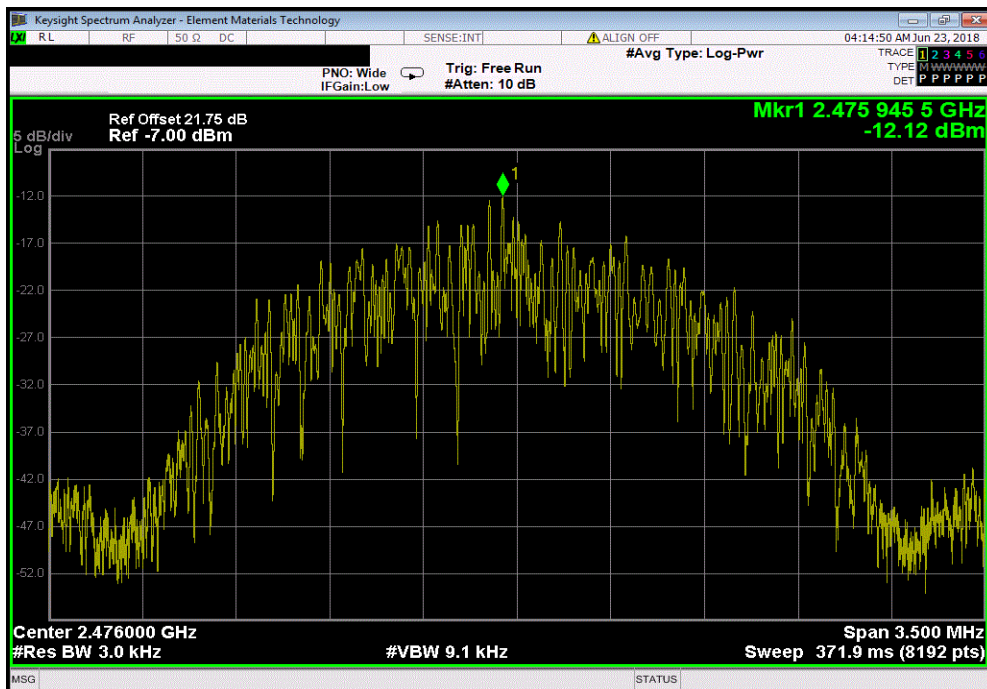


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK Mid Channel, 2442 MHz						
	Value	Limit	Results			
	dBm/3kHz	< dBm/3kHz				
	-10.994	8	Pass			



BLE/GFSK, 2 Mbps, BLE/GFSK High Channel, 2480 MHz						
	Value	Limit	Results			
	dBm/3kHz	< dBm/3kHz				
	-12.12	8	Pass			



# BAND EDGE COMPLIANCE



XMI 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	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	27-Apr-18	27-Apr-19

## TEST DESCRIPTION

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

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

# BAND EDGE COMPLIANCE



TbTfx 2017.12.14 XME 2017.12.13

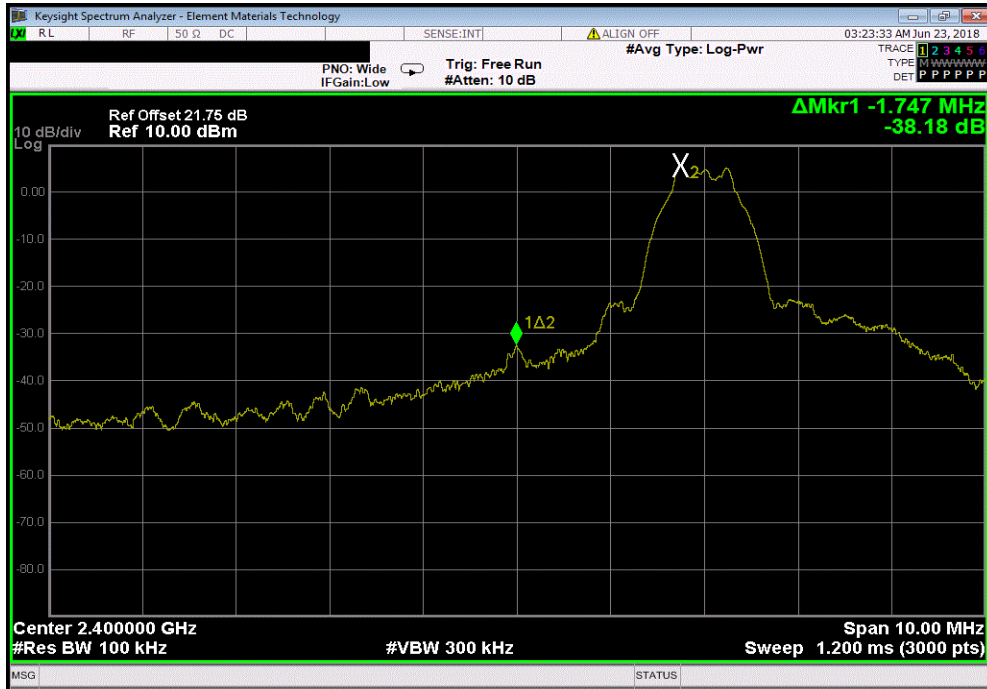
EUT: Multi-Function Accessory		Work Order: STAK0117
Serial Number: 182010052A		Date: 22-Jun-18
Customer: Starkey Laboratories, Inc.		Temperature: 22.1 °C
Attendees: Charlie Esch		Humidity: 54% RH
Project: None		Barometric Pres.: 1015 mbar
Tested by: Dustin Sparks		Power: Battery
		Job Site: MN08
TEST SPECIFICATIONS		Test Method
FCC 15.247:2018		ANSI C63.10:2013
COMMENTS		
None		
DEVIATIONS FROM TEST STANDARD		
None		
Configuration #	4	Signature <i>Dustin Sparks</i>
		Value (dBc)      Limit ≤ (dBc)      Result
BLE/GFSK, 1 Mbps	BLE/GFSK Low Channel, 2402 MHz	-38.18      -20      Pass
	BLE/GFSK High Channel, 2480 MHz	-45.05      -20      Pass
BLE/GFSK, 2 Mbps	BLE/GFSK Low Channel, 2402 MHz	-27.3      -20      Pass
	BLE/GFSK High Channel, 2480 MHz	-48.85      -20      Pass

# BAND EDGE COMPLIANCE



TbTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-38.18	-20	Pass



BLE/GFSK, 1 Mbps, BLE/GFSK High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-45.05	-20	Pass



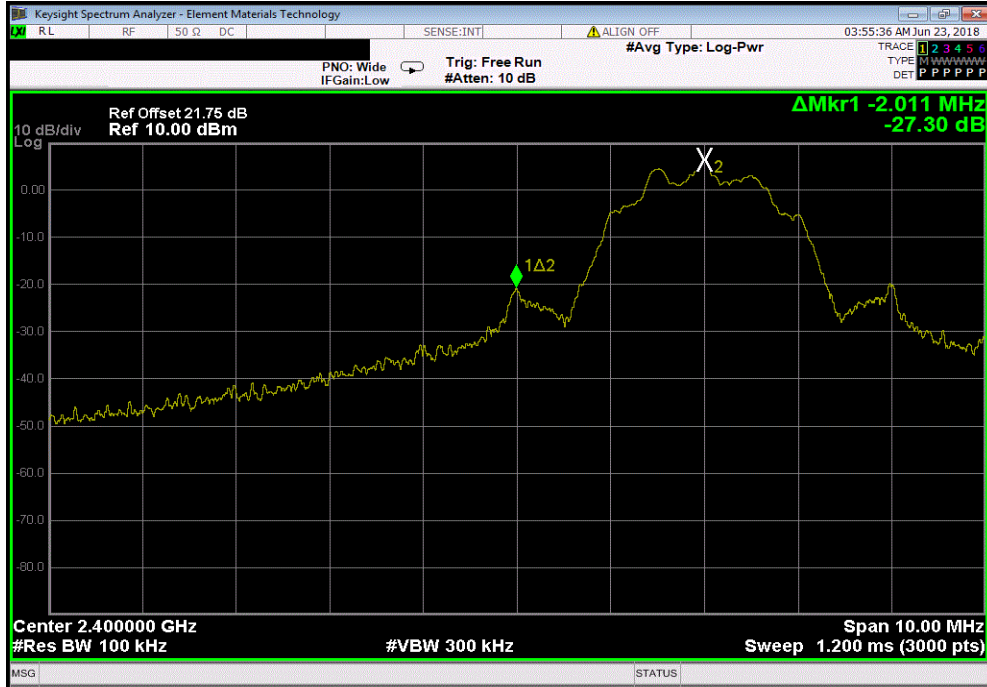


# BAND EDGE COMPLIANCE



TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-27.3	-20	Pass



BLE/GFSK, 2 Mbps, BLE/GFSK High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-48.85	-20	Pass





# SPURIOUS CONDUCTED EMISSIONS



XMI 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	12-Sep-17	12-Sep-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	27-Apr-18	27-Apr-19

## TEST DESCRIPTION

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



Tel: 2017.12.14 XM: 2017.12.13

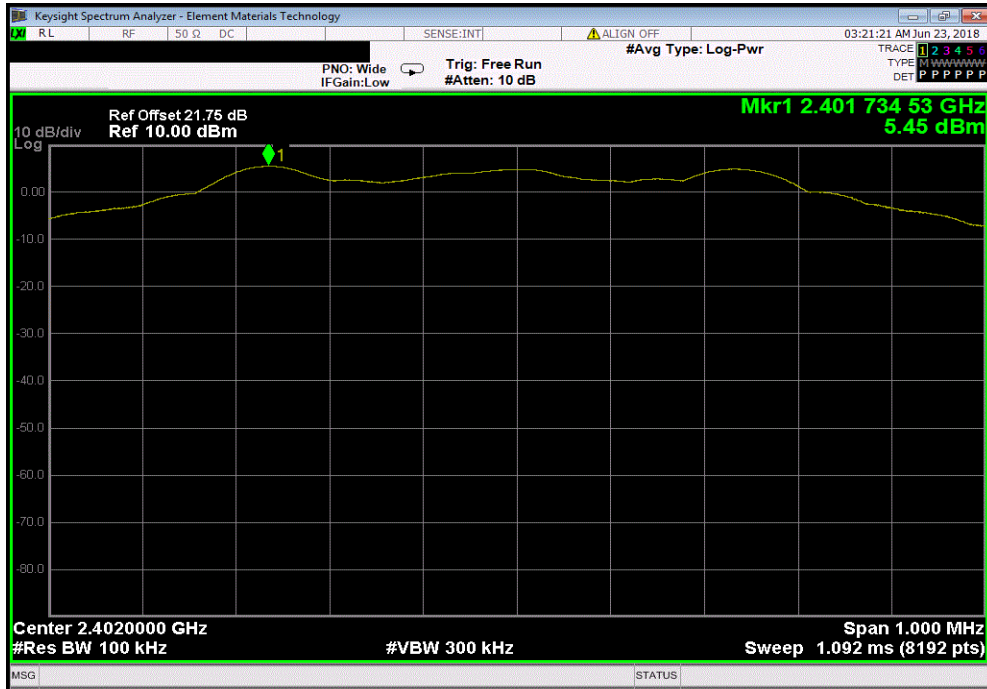
EUT: Multi-Function Accessory		Work Order: STAK0117				
Serial Number: 182010052A		Date: 22-Jun-18				
Customer: Starkey Laboratories, Inc.		Temperature: 22.2 °C				
Attendees: Charlie Esch		Humidity: 54% RH				
Project: None		Barometric Pres.: 1015 mbar				
Tested by: Dustin Sparks		Job Site: MN08				
Power: Battery		Test Method				
TEST SPECIFICATIONS		FCC 15.247:2018				
		ANSI C63.10:2013				
COMMENTS						
None						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	4	Signature <i>Dustin Sparks</i>				
		Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
BLE/GFSK, 1 Mbps						
		BLE/GFSK Low Channel, 2402 MHz	Fundamental	N/A	N/A	N/A
		BLE/GFSK Low Channel, 2402 MHz	30 MHz - 12.5 GHz	-50.48	-20	Pass
		BLE/GFSK Low Channel, 2402 MHz	12.5 GHz - 25 GHz	-56.76	-20	Pass
		BLE/GFSK Mid Channel, 2442 MHz	Fundamental	N/A	N/A	N/A
		BLE/GFSK Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	-59.12	-20	Pass
		BLE/GFSK Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	-57.78	-20	Pass
		BLE/GFSK High Channel, 2480 MHz	Fundamental	N/A	N/A	N/A
		BLE/GFSK High Channel, 2480 MHz	30 MHz - 12.5 GHz	-53.45	-20	Pass
		BLE/GFSK High Channel, 2480 MHz	12.5 GHz - 25 GHz	-56.44	-20	Pass
BLE/GFSK, 2 Mbps						
		BLE/GFSK Low Channel, 2402 MHz	Fundamental	N/A	N/A	N/A
		BLE/GFSK Low Channel, 2402 MHz	30 MHz - 12.5 GHz	-46.68	-20	Pass
		BLE/GFSK Low Channel, 2402 MHz	12.5 GHz - 25 GHz	-57.18	-20	Pass
		BLE/GFSK Mid Channel, 2442 MHz	Fundamental	N/A	N/A	N/A
		BLE/GFSK Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	-58.49	-20	Pass
		BLE/GFSK Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	-58.76	-20	Pass
		BLE/GFSK High Channel, 2480 MHz	Fundamental	N/A	N/A	N/A
		BLE/GFSK High Channel, 2480 MHz	30 MHz - 12.5 GHz	-58.97	-20	Pass
		BLE/GFSK High Channel, 2480 MHz	12.5 GHz - 25 GHz	-56.78	-20	Pass

# SPURIOUS CONDUCTED EMISSIONS

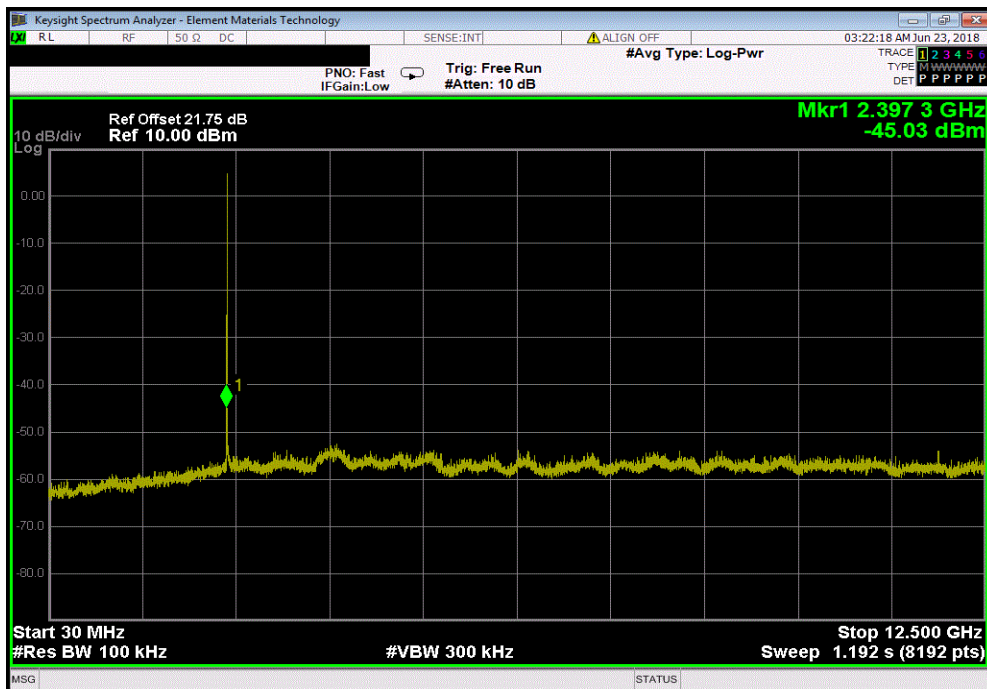


TMTx 2017.12.14 XMI 2017.12.13

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



BLE/GFSK, 1 Mbps, BLE/GFSK Low Channel, 2402 MHz					
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	-50.48	-20	Pass		

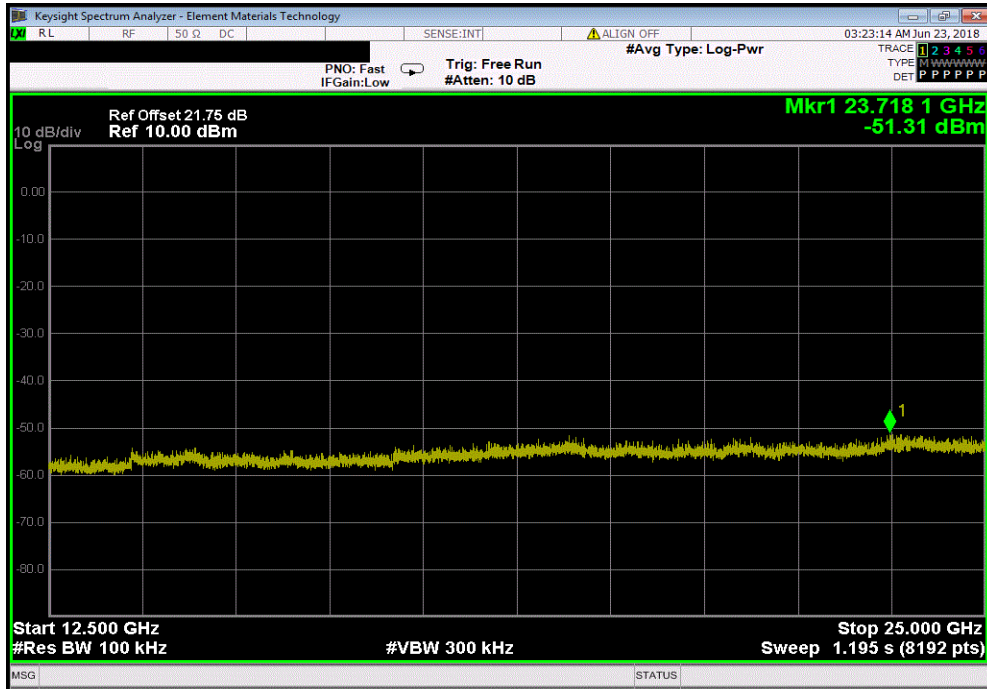


# SPURIOUS CONDUCTED EMISSIONS

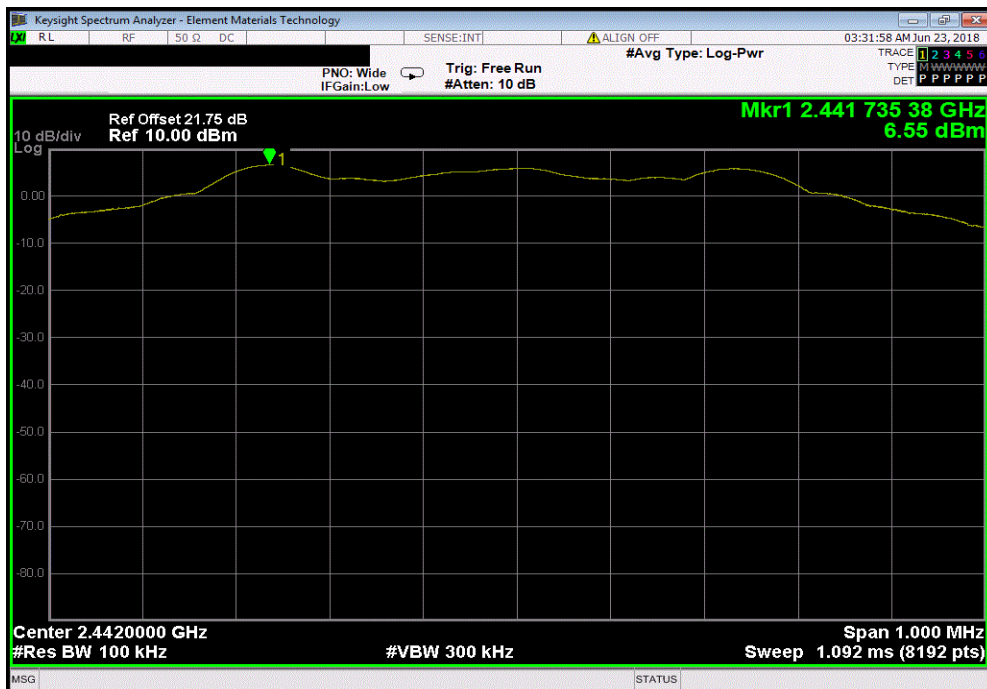


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK Low Channel, 2402 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-56.76	-20	Pass	



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

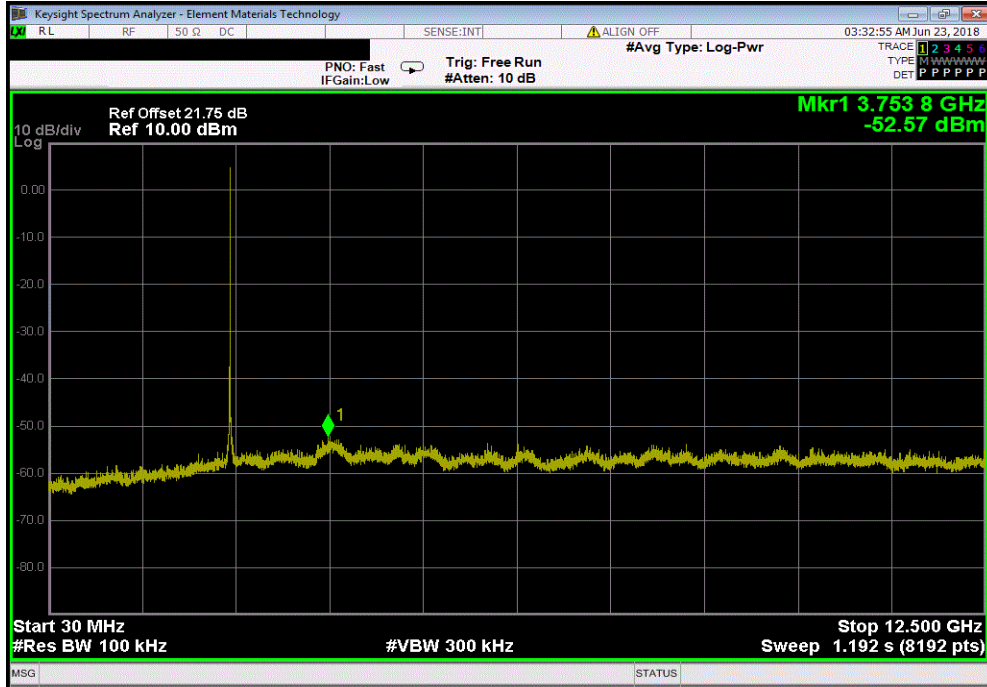


# SPURIOUS CONDUCTED EMISSIONS

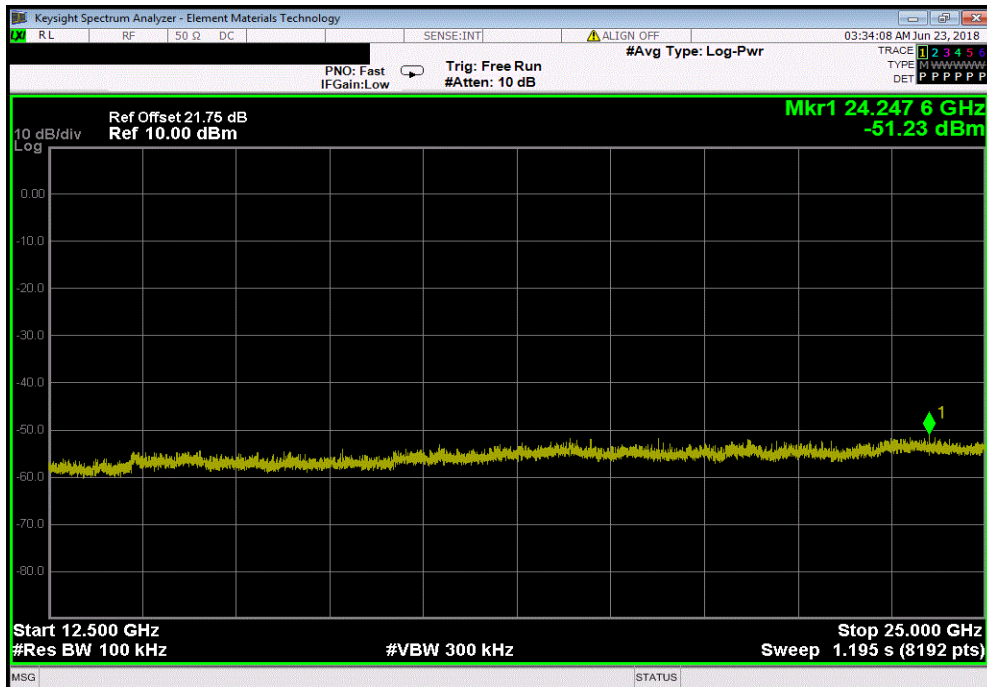


TbTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK Mid Channel, 2442 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-59.12	-20	Pass	



BLE/GFSK, 1 Mbps, BLE/GFSK Mid Channel, 2442 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-57.78	-20	Pass	

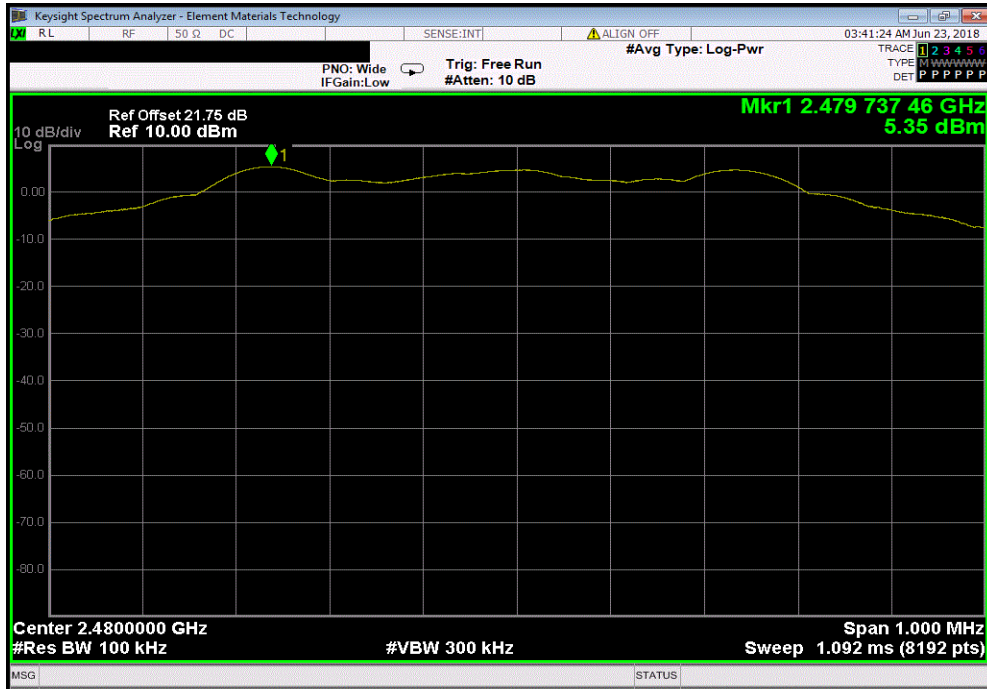


# SPURIOUS CONDUCTED EMISSIONS

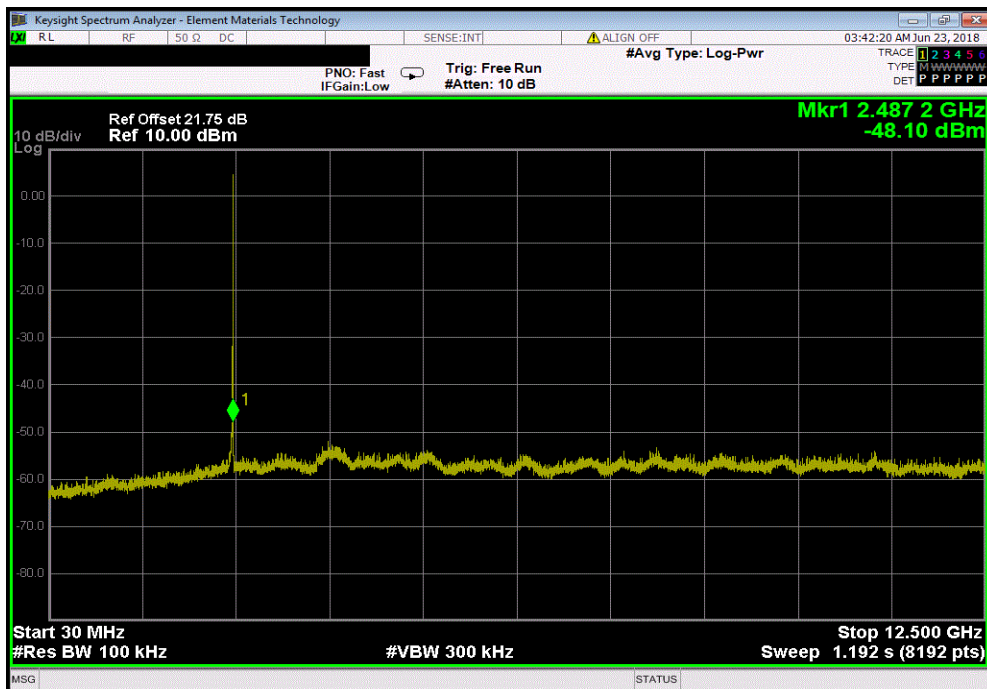


TbTx 2017.12.14 XMI 2017.12.13

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



BLE/GFSK, 1 Mbps, BLE/GFSK High Channel, 2480 MHz					
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	-53.45	-20	Pass		

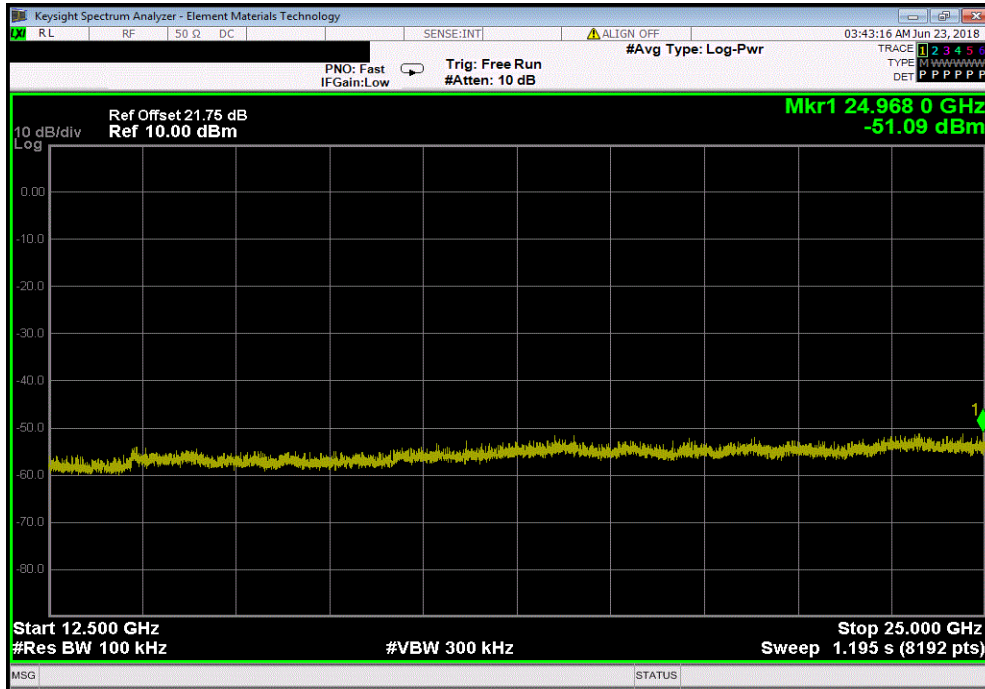


# SPURIOUS CONDUCTED EMISSIONS

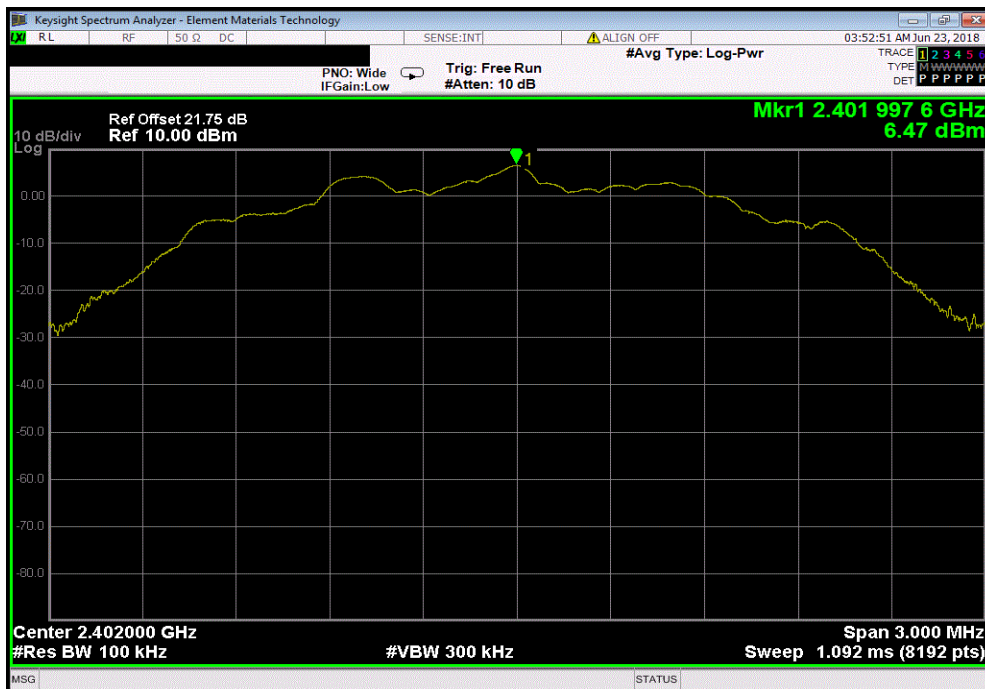


TMTX 2017.12.14 XMI 2017.12.13

BLE/GFSK, 1 Mbps, BLE/GFSK High Channel, 2480 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-56.44	-20	Pass	



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



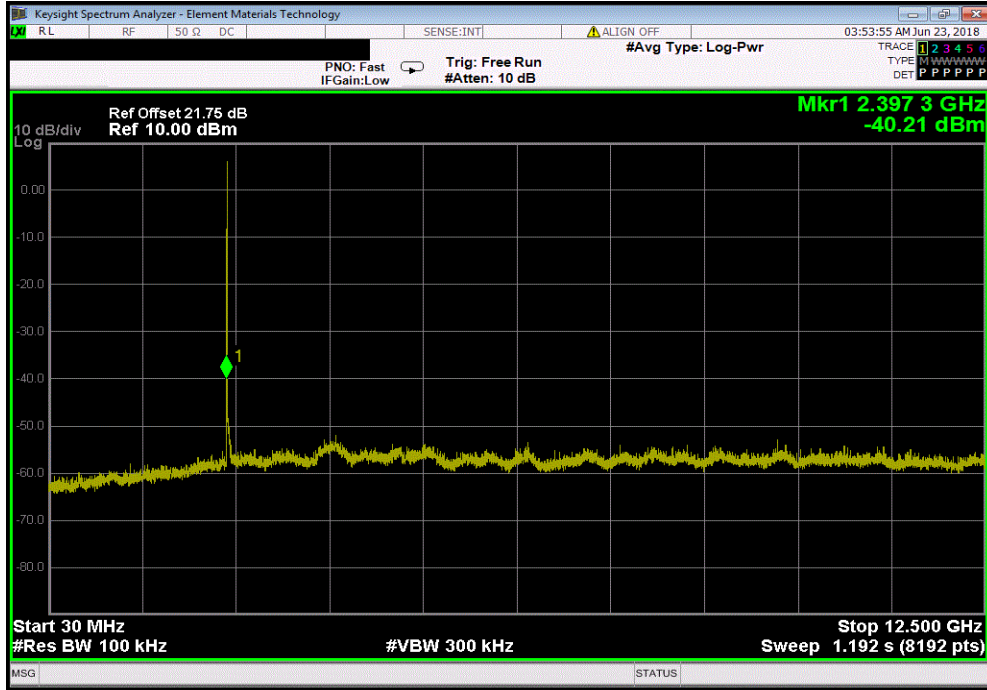


# SPURIOUS CONDUCTED EMISSIONS

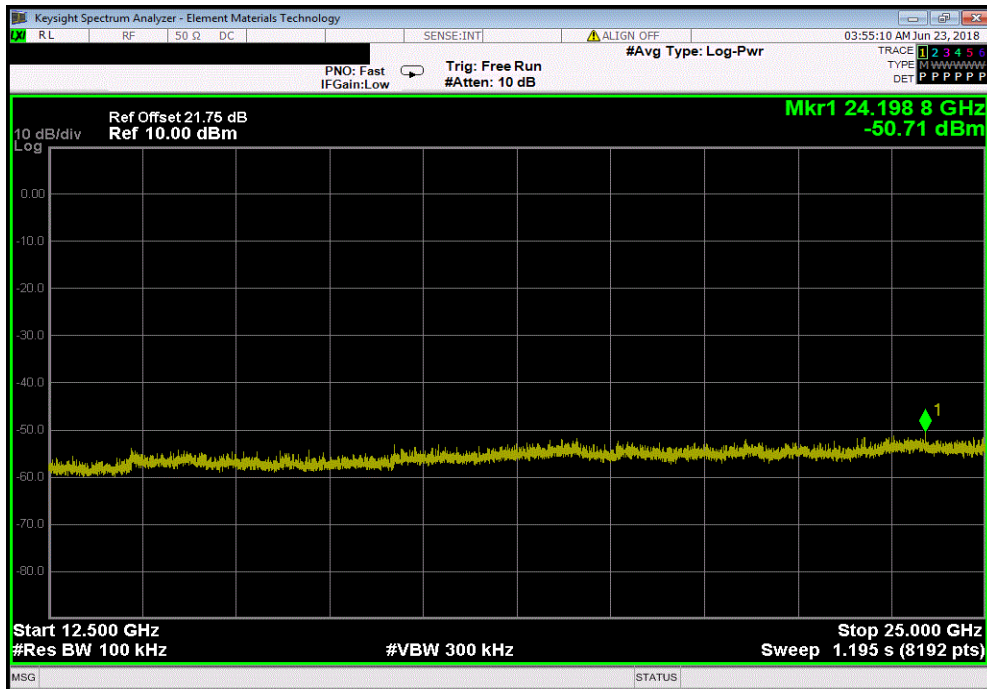


TbTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK Low Channel, 2402 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-46.68	-20	Pass	



BLE/GFSK, 2 Mbps, BLE/GFSK Low Channel, 2402 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-57.18	-20	Pass	



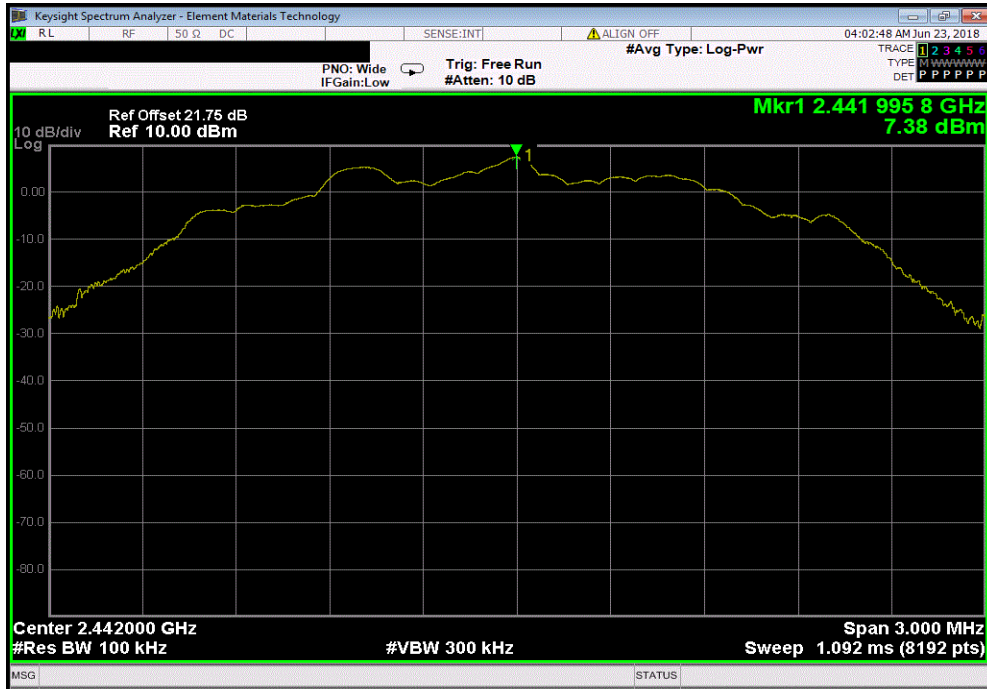


# SPURIOUS CONDUCTED EMISSIONS

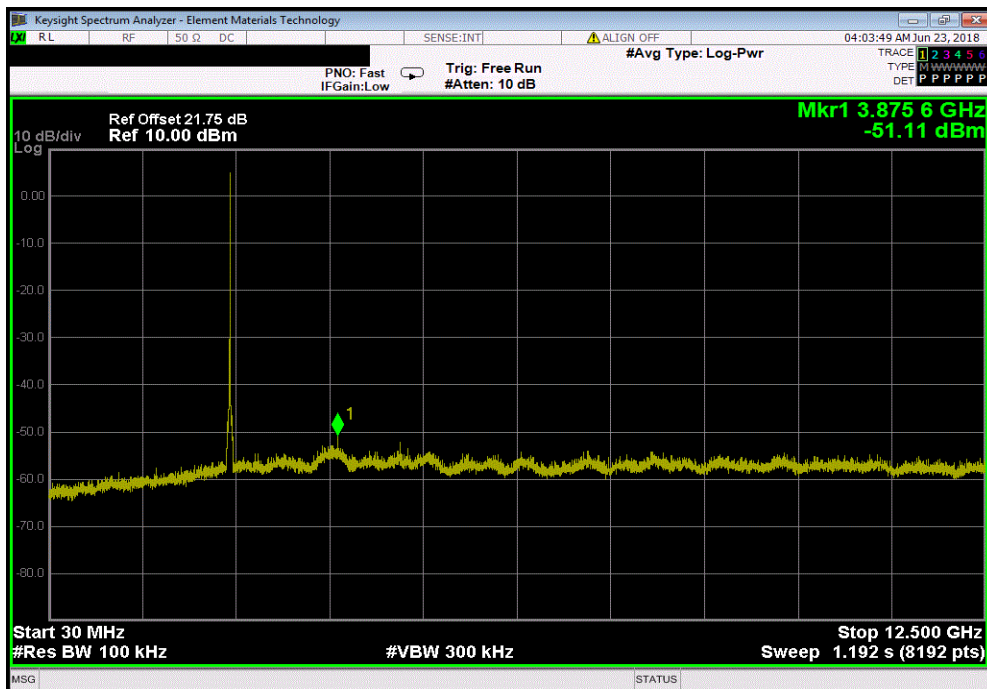


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK Mid Channel, 2442 MHz					
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	N/A	N/A	N/A		



BLE/GFSK, 2 Mbps, BLE/GFSK Mid Channel, 2442 MHz					
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	-58.49	-20	Pass		

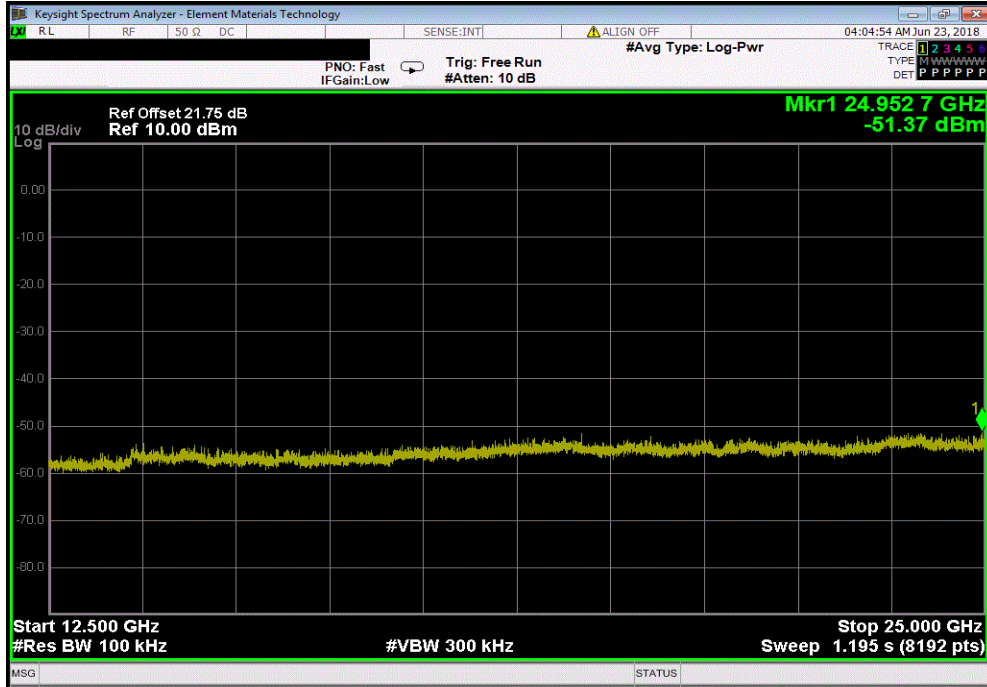


# SPURIOUS CONDUCTED EMISSIONS

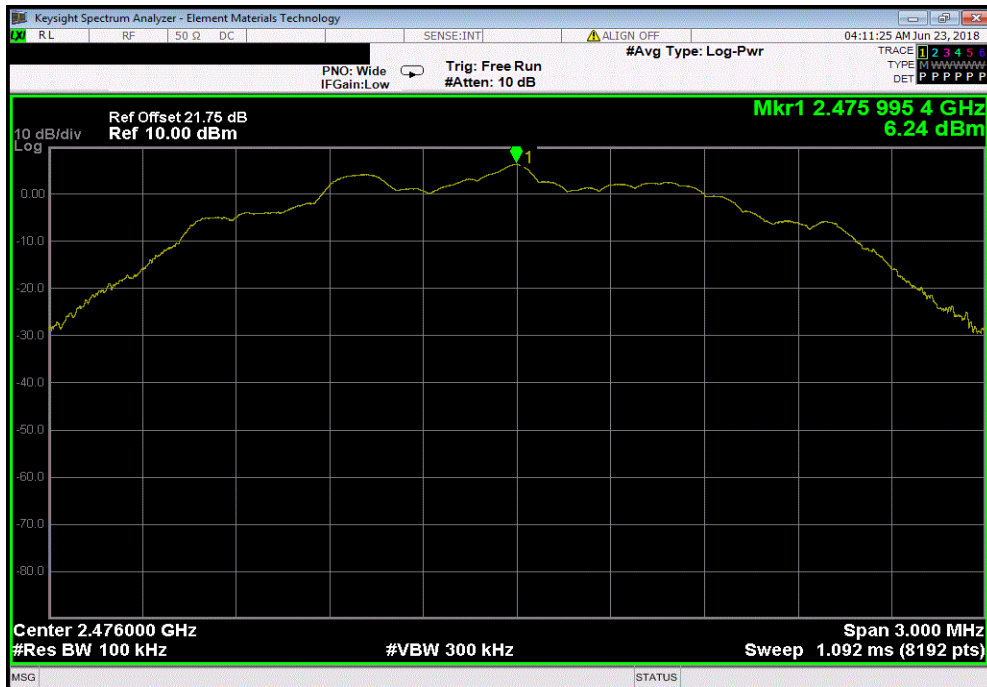


TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK Mid Channel, 2442 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-58.76	-20	Pass	



BLE/GFSK, 2 Mbps, BLE/GFSK High Channel, 2480 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	N/A	N/A	N/A	

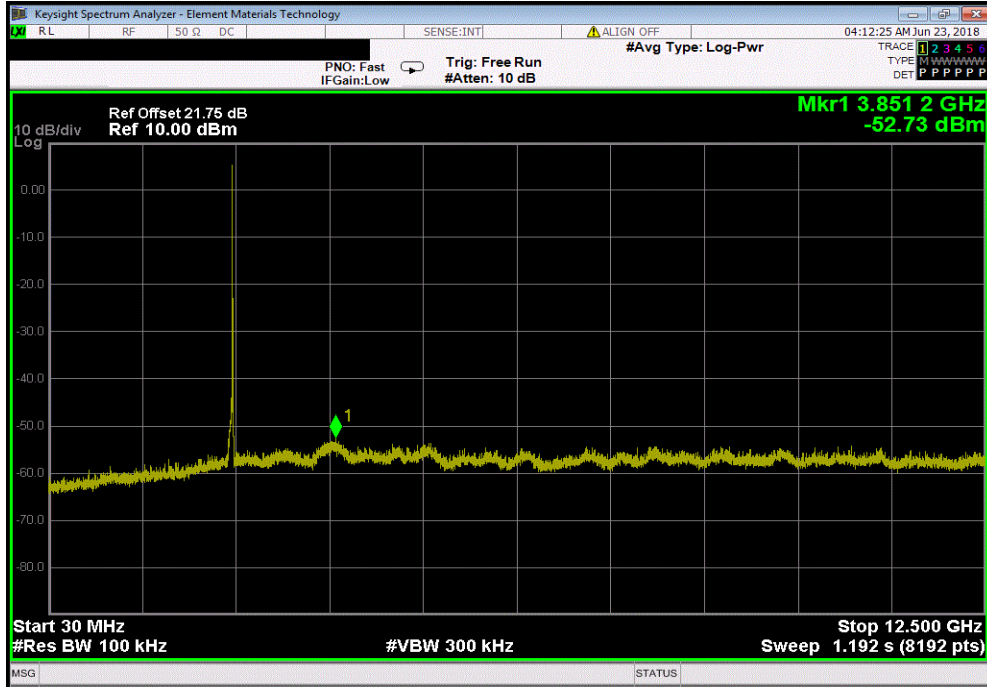


# SPURIOUS CONDUCTED EMISSIONS



TMTx 2017.12.14 XMI 2017.12.13

BLE/GFSK, 2 Mbps, BLE/GFSK High Channel, 2480 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-58.97	-20	Pass	



BLE/GFSK, 2 Mbps, BLE/GFSK High Channel, 2480 MHz				
Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-56.78	-20	Pass	

