



element

Starkey Laboratories, Inc.

Edge Remote Microphone

FCC 15.247:2025

RSS-247 Issue 3:2023

RSS-Gen Issue 5:2018+A1:2019+A2:2021

Bluetooth Radio

Report: STAK0353.0 Rev. 1, Issue Date: February 5, 2025

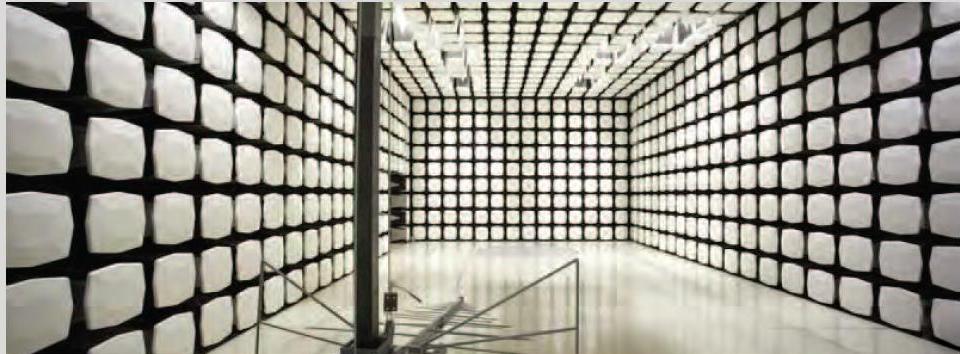


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CERTIFICATE OF TEST



Last Date of Test: December 11, 2024
Starkey Laboratories, Inc.
EUT: Edge Remote Microphone

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2025	
RSS-247 Issue 3:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	

Note: FCC 15.247 has been updated superseding prior issues. The changes between the specifications do not affect the results of the prior testing. The manufacturer attests that no changes have been made to the product.

Guidance

FCC KDB 558074 v05r02:2019
Notice 2021 - CEB0001

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Powerline Conducted Emissions	N/A	15.207	RSS-Gen 8.8	6.2	Not required for a battery powered EUT.
Duty Cycle	Pass	KDB 558074 -6.0	RSS-Gen 3.2	11.6	
DTS Bandwidth (6 dB)	Pass	15.247(a)(2), KDB 558074 -8.2	RSS-247 5.2(a)	11.8.2	
Occupied Bandwidth (99%)	Pass	KDB 558074 -2.1	RSS-Gen 6.7	6.9.3	
Output Power	Pass	15.247(b)(3), KDB 558074 -8.3.1	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.1.1	
Equivalent Isotropic Radiated Power	Pass	15.247(b)(3), KDB 558074 -8.3.1	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.1.1	
Power Spectral Density	Pass	15.247(e), KDB 558074 -8.4	RSS-247 5.2(b)	11.10.2	
Band Edge Compliance	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
Spurious Conducted Emissions	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
Spurious Radiated Emissions	Pass	15.247(d), KDB 558074 - 8.6, 8.7	RSS-247 5.5, RSS-Gen 6.13, 8.10	11.12.1, 11.13.2, 6.5, 6.6	

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.

CERTIFICATE OF TEST



Deviations From Test Standards

None

Approved By:

A handwritten signature in blue ink, appearing to read "J. C. Candelas".

Johnny Candelas, Operations Manager
Signed for and on behalf of Element

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

REVISION HISTORY



Revision Number	Description	Date (yyyy-mm-dd)	Page Number
01	Added note under standards table.	2025-02-05	3
	Removed extra photos from photos only report.	2025-02-05	N/A
	Added "960" as the model/part number for the EUT in both configuration.	2025-02-05	14
	Added pre-scans to Spurious Radiated Emissions.	2025-02-05	40-49
	Fixed the correction factor on the pre-scans. Added the updated pre-scans and removed the OATS points in Spurious Radiated Emissions.	2025-02-05	40-49
	Added EUT orientation in Spurious Radiated Emissions.	2025-02-05	40-49

ACCREDITATIONS AND AUTHORIZATIONS

United States

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

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

Canada

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

European Union

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

United Kingdom

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

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

[California](#)

[Minnesota](#)

[Oregon](#)

[Texas](#)

[Washington](#)

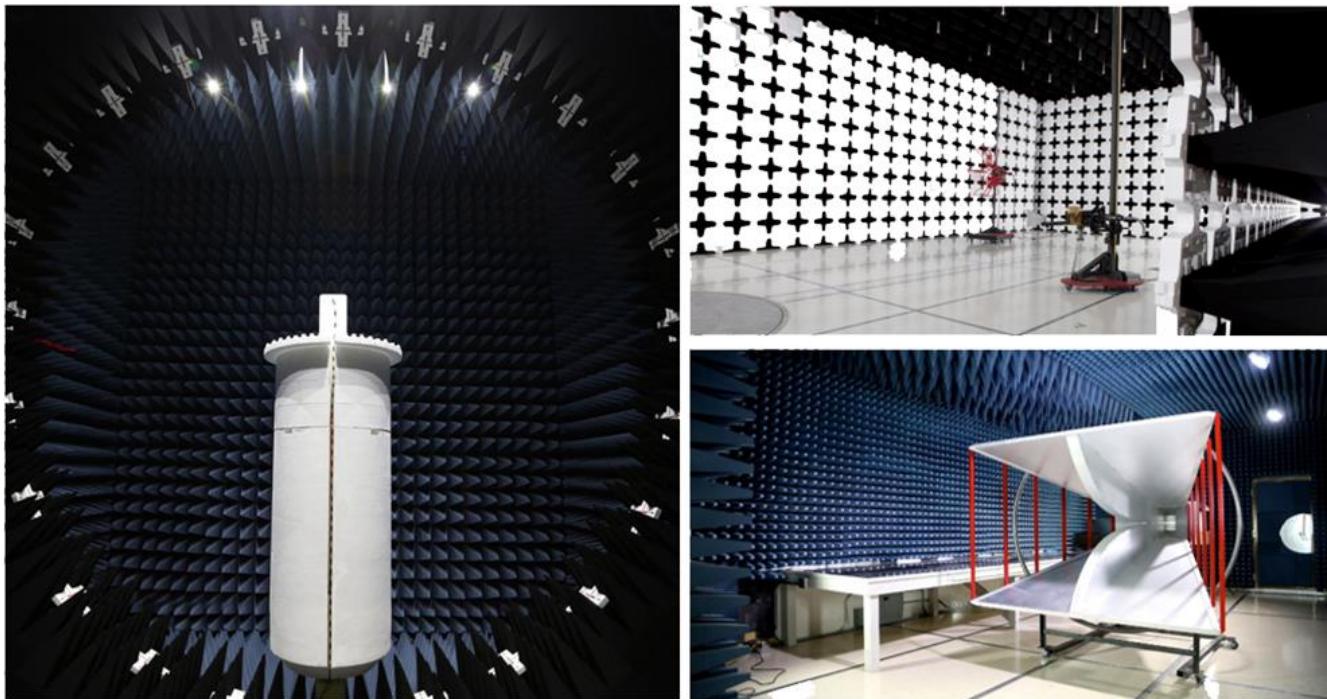
FACILITIES

Testing was performed at the following location(s)

Location	Labs ⁽¹⁾	Address	A2LA ⁽²⁾	ISED ⁽³⁾	BSMI ⁽⁴⁾	VCCI ⁽⁵⁾	CAB ⁽⁶⁾	FDA ⁽⁷⁾
<input type="checkbox"/> California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
<input checked="" type="checkbox"/> Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
<input type="checkbox"/> Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
<input type="checkbox"/> Plano Texas	PT01-15	1701 E Plano Pkwy, Ste 150 Plano, TX 75074 (972) 509-2566	214.19	32637	SL2-IN-E-057R	A-0426	US0054	TL-137
<input type="checkbox"/> Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
<input type="checkbox"/> Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

- (1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
- (2) A2LA Certificate No.
- (3) ISED Company No.
- (4) BSMI No.
- (5) VCCI Site Filing No.
- (6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MOC, NCC, OFCA
- (7) FDA ASCA No.



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 reported is based on statistical analysis that was performed by the laboratory. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty ($k=2$) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable) and are available upon request.

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

Various Measurements

Test	All Labs (+/-)
Frequency Accuracy (%)	0.0007
Amplitude Accuracy (dB)	1.2
Conducted Power (dB)	1.2
Radiated Power via Substitution (dB)	0.7
Temperature (degrees C)	0.7
Humidity (% RH)	2.5
Voltage (AC) (%)	1
Voltage (DC) (%)	0.7

Field Strength Measurements (dB)

Range	MN04 (+/-)	MN05 (+/-)
10kHz-30MHz	1.8	1.8
30MHz-1GHz 3m	4.6	4.6
30MHz-1GHz 10m	3.6	N/A
1GHz-6GHz	5.1	5.1
6GHz-40GHz	5.2	5.2

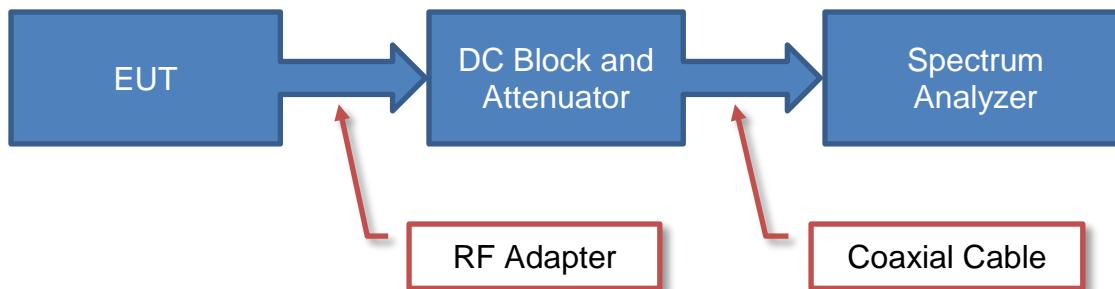
TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

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

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

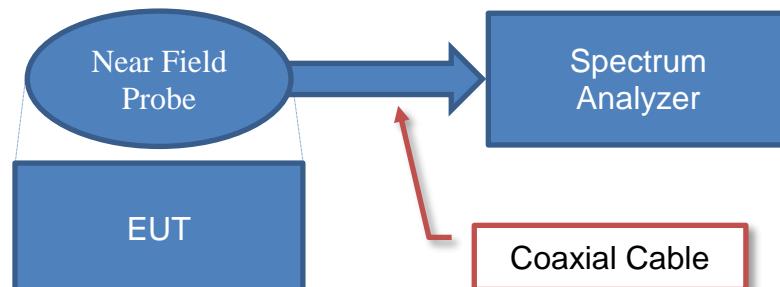
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

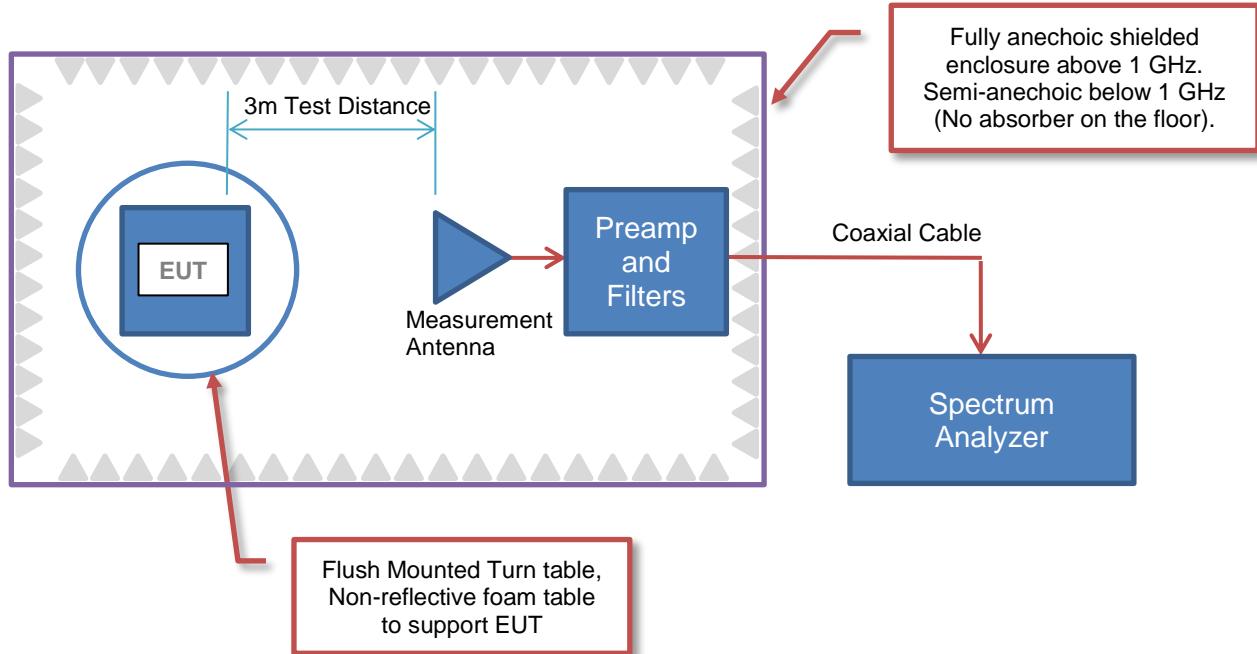


Sample Calculation (logarithmic units)

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

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

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

Conducted Emissions:

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

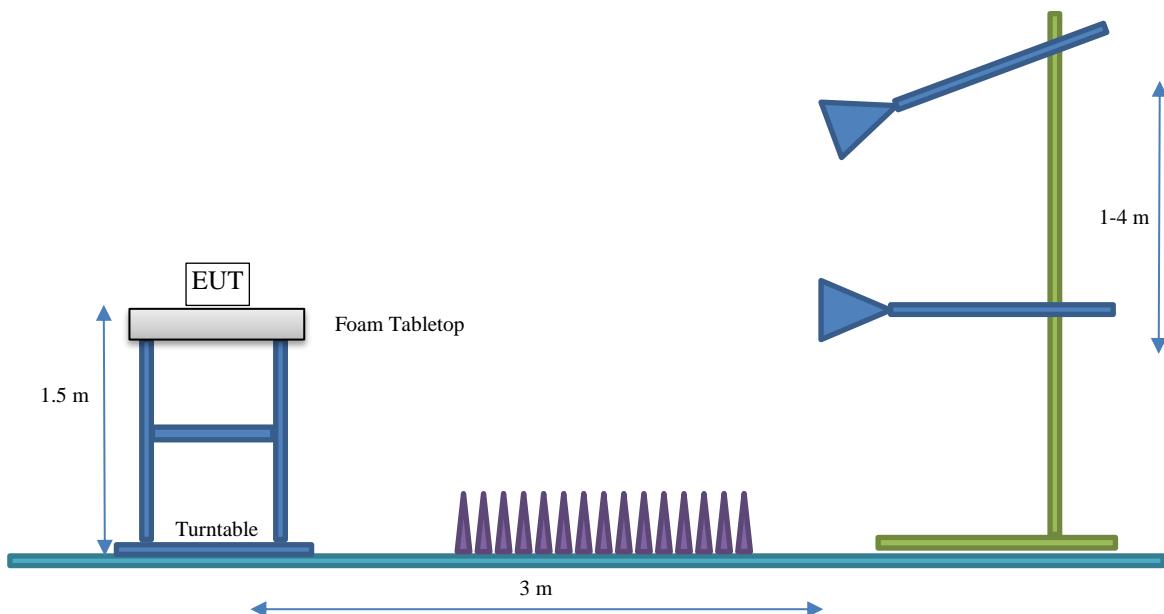
Radiated Power (ERP/EIRP) – Substitution Method:

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

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

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



PRODUCT DESCRIPTION



Client and Equipment under Test (EUT) Information

Company Name:	Starkey Laboratories, Inc.
Address:	6600 Washington Ave S
City, State, Zip:	Eden Prairie, MN 55344-3404
Test Requested By:	Bill Mitchell
EUT:	Edge Remote Microphone
First Date of Test:	December 6, 2024
Last Date of Test:	December 11, 2024
Receipt Date of Samples:	November 26, 2024
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

| **Functional Description of the EUT:** |
| Hearing Aid Remote Microphone |
| **Testing Objective:** |
| To demonstrate compliance of the Bluetooth radio to FCC 15.247/RSS-247 requirements. |

POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Ceramic Chip Antenna	Starkey Laboratories, Inc	2400-2483.8	1.07

The EUT was tested using the power settings provided by the manufacturer which were based upon:

- Test software settings Software / firmware used for testing: see configuration
- Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types / Data Rates	Type	Channel	Frequency (MHz)	Power Setting
BLE GFSK 1 Mbps, 2 Mbps	DTS	0 or 37	2402	0x45
		20 or 18	2442	0x45
		39	2480	0x45

CONFIGURATIONS



Configuration STAK0353-5

Software/Firmware Running During Test	
Description	Version
Realtek Bluetooth RF Test Tool	RtlBluetoothMP.dll Version :5.5.0.2, RTLBTAPP Version :5.2.4.12
Firmware	1.0.9

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Edge Remote Microphone	Starkey Laboratories, Inc.	960	6074B146274A

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop	Dell	Precision 5550	4C2C03CB-F4D0-40B0-89D9-7180B9D756B0
USB/UART Converter	N/A	SH-U09C5	N/A

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
USB Hub	Anker	A8305	ACDPLG0B25401321
AC/DC Adapter (Laptop)	Dell	SK90B200650	SM-SK90B200650

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable 1	Yes	1.5 m	No	Edge Remote Microphone	USB Cable 2
USB Cable 2	Yes	1 m	No	USB Cable 1	Charger
DC Cable	No	1.5 m	No	Laptop	AC/DC Adapter (Laptop)
AC Cable	No	1.3 m	No	AC/DC Adapter (Laptop)	AC Mains

Configuration STAK0353-9

Software/Firmware Running During Test	
Description	Version
Realtek Bluetooth RF Test Tool	RtlBluetoothMP.dll Version :5.5.0.2, RTLBTAPP Version :5.2.4.12
Firmware	1.0.9
Ellisys Bluetooth Analyzer	5.0.8912

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Edge Remote Microphone	Starkey Laboratories, Inc.	960	6074B1462764

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2024-12-06	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.
2	2024-12-06	DTS 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.
3	2024-12-06	Occupied Bandwidth (99%)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2024-12-06	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2024-12-06	Equivalent Isotropic Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2024-12-06	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.
7	2024-12-06	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2024-12-06	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2024-12-11	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

DUTY CYCLE



TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a RF Power Sensor capable of 1 million samples per second, which only measures across the high time of the burst of the carrier. The measured level was offset by the cable loss, attenuator, and DC block that was used between the power sensor and EUT. This offset was determined prior to testing using a signal generator and spectrum analyzer.

The observed duty cycle was noted. The measurements were made under normal test conditions.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5182A	TIF	2023-07-27	2026-07-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2024-01-31	2025-01-31
Meter - Power	ETS Lindgren	7002-008	SRA	2024-02-19	2025-02-19

DUTY CYCLE

EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B146274A	Date:	2024-12-06
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	John Quach	Relative Humidity:	20.5%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN04
Power:	3.7VDC Internal Battery	Configuration:	STAK0353-5

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

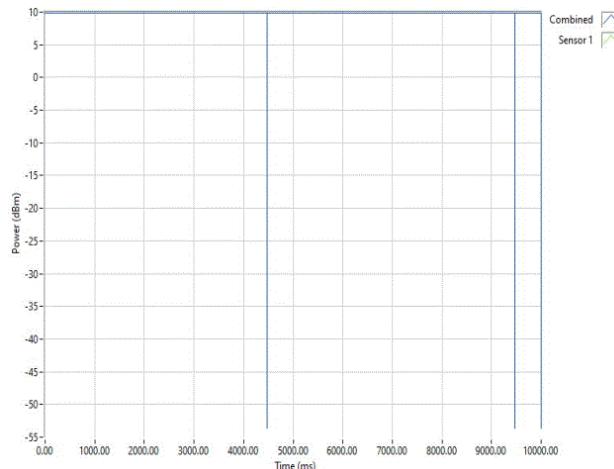


Tested By

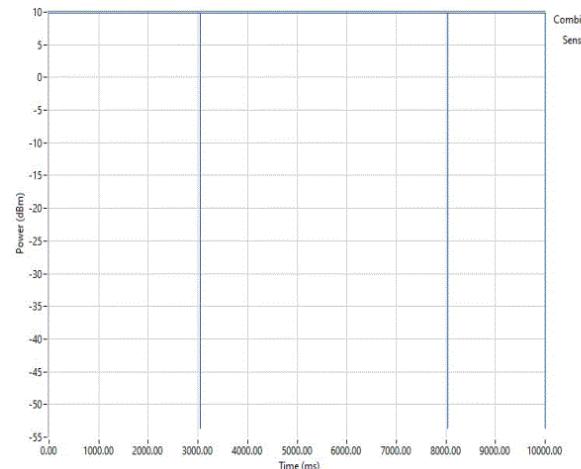
TEST RESULTS

		Duty Cycle (%)		Limit (dBm)	Results
Normal Test Conditions					
BLE/GFSK 1 Mbps Low Channel, 2402 MHz		99.98		N/A	N/A
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		99.98		N/A	N/A
BLE/GFSK 1 Mbps High Channel, 2480 MHz		99.98		N/A	N/A
BLE/GFSK 2 Mbps Low Channel, 2402 MHz		99.98		N/A	N/A
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz		99.98		N/A	N/A
BLE/GFSK 2 Mbps High Channel, 2480 MHz		99.98		N/A	N/A

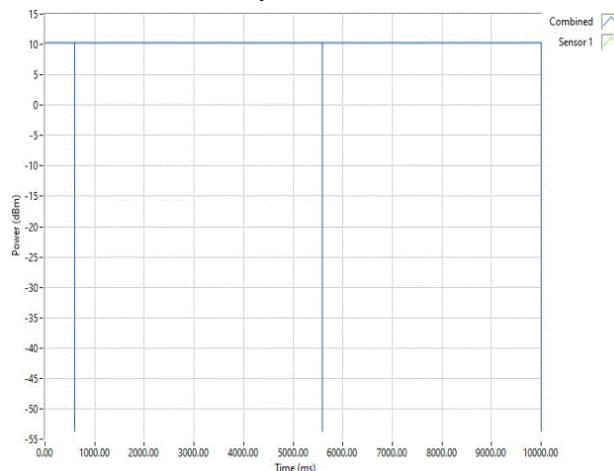
DUTY CYCLE



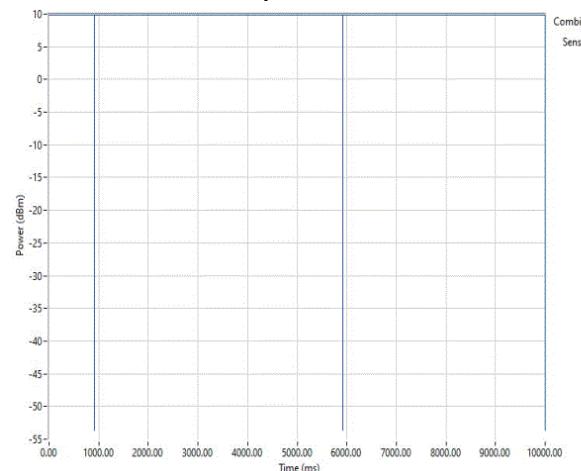
Normal Test Conditions
BLE/GFSK 1 Mbps Low Channel, 2402 MHz



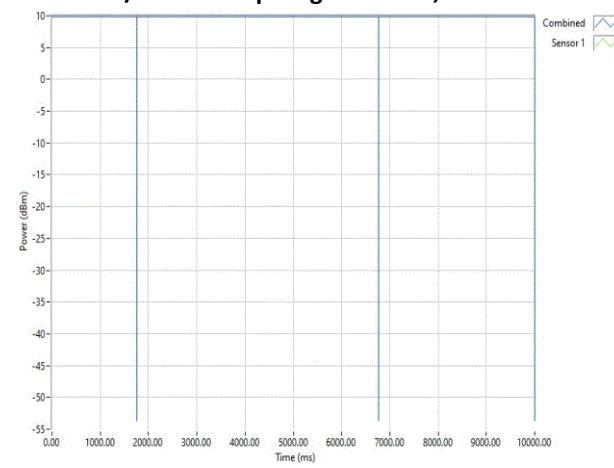
Normal Test Conditions
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz



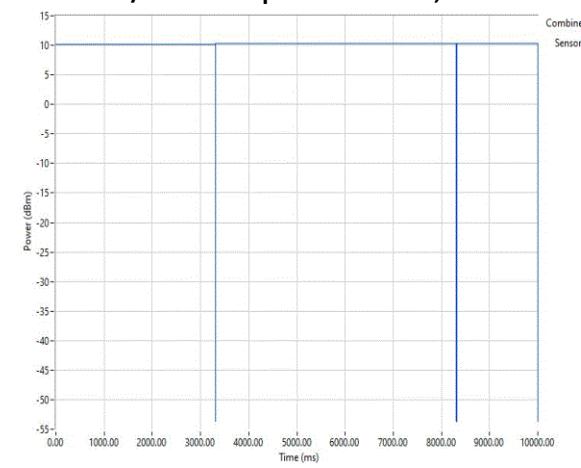
Normal Test Conditions
BLE/GFSK 1 Mbps High Channel, 2480 MHz



Normal Test Conditions
BLE/GFSK 2 Mbps Low Channel, 2402 MHz



Normal Test Conditions
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz



Normal Test Conditions
BLE/GFSK 2 Mbps High Channel, 2480 MHz

DTS BANDWIDTH (6 dB)

TEST DESCRIPTION

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

The EUT was set to the channels and modes listed in the datasheet.

The 6dB DTS bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5182A	TIF	2023-07-27	2026-07-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2024-01-31	2025-01-31

DTS BANDWIDTH (6 dB)

EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B146274A	Date:	2024-12-06
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	John Quach	Relative Humidity:	20.8%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN04
Power:	3.7VDC Internal Battery	Configuration:	STAK0353-5

COMMENTS

Reference level offset includes measurement cable, 20dB attenuator, and DC block.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass



Tested By

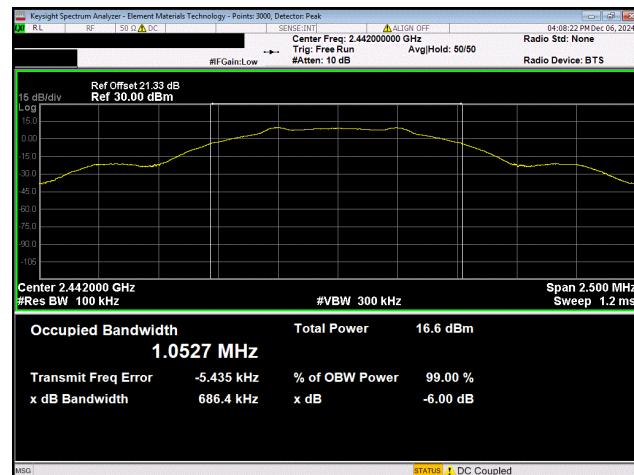
TEST RESULTS

		Value	Limit (\geq)	Result
BLE/GFSK 1 Mbps	Low Channel, 2402 MHz	678.058 kHz	500 kHz	Pass
	Mid Channel, 2442 MHz	686.382 kHz	500 kHz	Pass
	High Channel, 2480 MHz	677.001 kHz	500 kHz	Pass
BLE/GFSK 2 Mbps	Low Channel, 2402 MHz	1.407 MHz	500 kHz	Pass
	Mid Channel, 2442 MHz	1.368 MHz	500 kHz	Pass
	High Channel, 2480 MHz	1.388 MHz	500 kHz	Pass

DTS BANDWIDTH (6 dB)



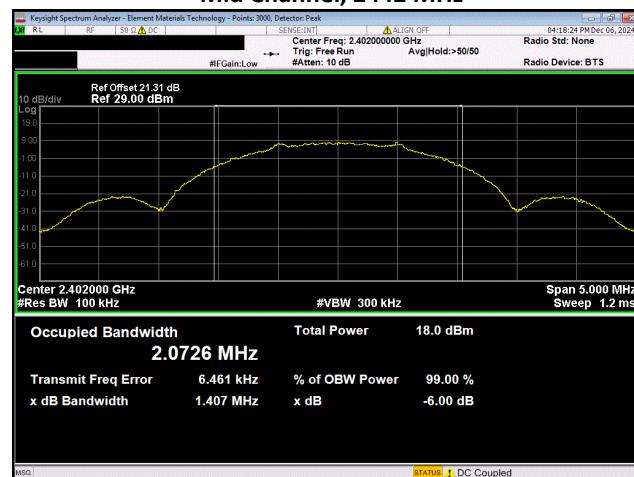
**BLE/GFSK 1 Mbps
Low Channel, 2402 MHz**



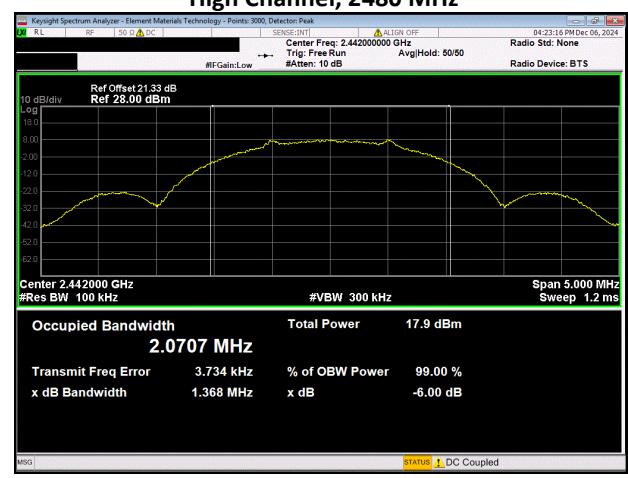
**BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz**



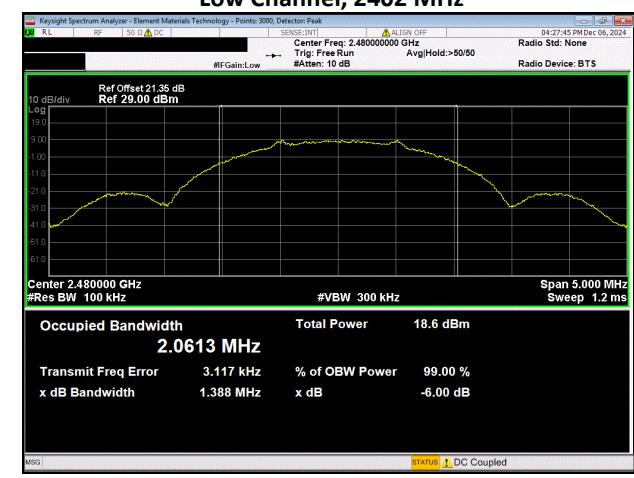
**BLE/GFSK 1 Mbps
High Channel, 2480 MHz**



**BLE/GFSK 2 Mbps
Low Channel, 2402 MHz**



**BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz**



**BLE/GFSK 2 Mbps
High Channel, 2480 MHz**

OCCUPIED BANDWIDTH (99%)

TEST DESCRIPTION

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

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

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

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

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

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5182A	TIF	2023-07-27	2026-07-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2024-01-31	2025-01-31

OCCUPIED BANDWIDTH (99%)



EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B146274A	Date:	2024-12-06
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	John Quach	Relative Humidity:	20.9%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN04
Power:	3.7VDC Internal Battery	Configuration:	STAK0353-5

COMMENTS

Reference level offset includes measurement cable, 20dB attenuator, and DC block.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

N/A

Tested By

TEST RESULTS

		Value	Limit	Result
BLE/GFSK 1 Mbps	Low Channel, 2402 MHz	1.041 MHz	N/A	N/A
	Mid Channel, 2442 MHz	1.035 MHz	N/A	N/A
	High Channel, 2480 MHz	1.036 MHz	N/A	N/A
BLE/GFSK 2 Mbps	Low Channel, 2402 MHz	2.067 MHz	N/A	N/A
	Mid Channel, 2442 MHz	2.07 MHz	N/A	N/A
	High Channel, 2480 MHz	2.077 MHz	N/A	N/A

OCCUPIED BANDWIDTH (99%)



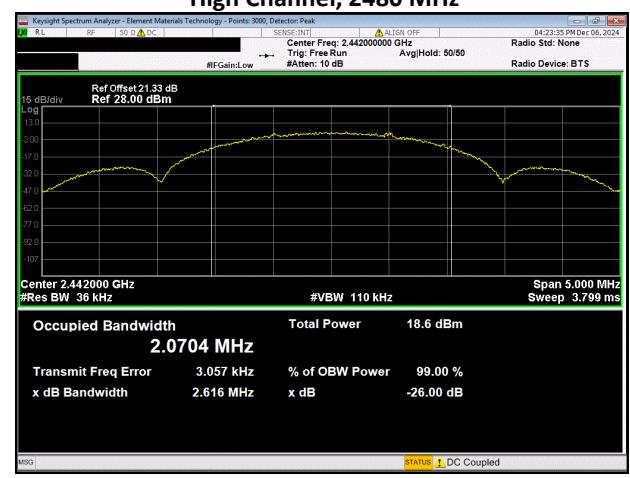
**BLE/GFSK 1 Mbps
Low Channel, 2402 MHz**



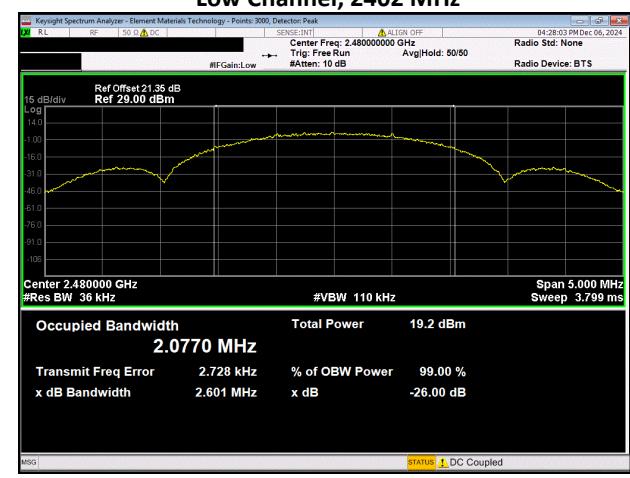
**BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz**



**BLE/GFSK 1 Mbps
High Channel, 2480 MHz**



**BLE/GFSK 2 Mbps
Low Channel, 2402 MHz**



**BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz**

**BLE/GFSK 2 Mbps
High Channel, 2480 MHz**

OUTPUT POWER

TEST DESCRIPTION

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 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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5182A	TIF	2023-07-27	2026-07-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2024-01-31	2025-01-31

OUTPUT POWER

EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B146274A	Date:	2024-12-06
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	John Quach	Relative Humidity:	20.8%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN04
Power:	3.7VDC Internal Battery	Configuration:	STAK0353-5

COMMENTS

Reference level offset includes measurement cable, 20dB attenuator, and DC block.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

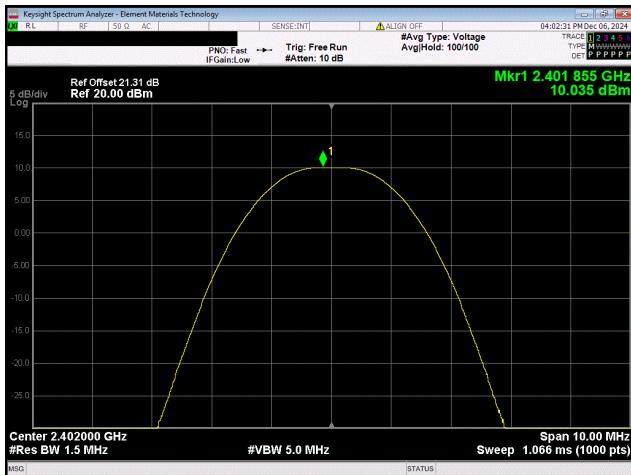


Tested By

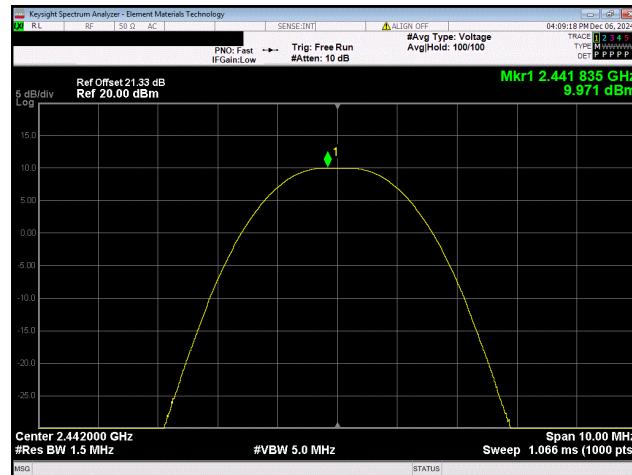
TEST RESULTS

		Out Pwr (dBm)	Limit (dBm)	Result
BLE/GFSK 1 Mbps	Low Channel, 2402 MHz	10.035	30	Pass
	Mid Channel, 2442 MHz	9.971	30	Pass
	High Channel, 2480 MHz	10.595	30	Pass
BLE/GFSK 2 Mbps	Low Channel, 2402 MHz	9.939	30	Pass
	Mid Channel, 2442 MHz	9.91	30	Pass
	High Channel, 2480 MHz	10.556	30	Pass

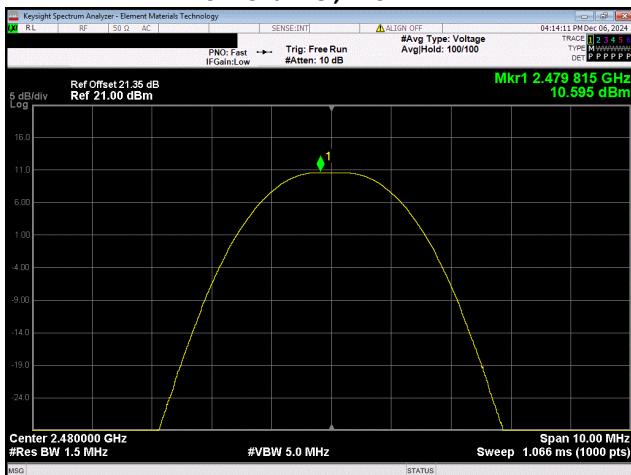
OUTPUT POWER



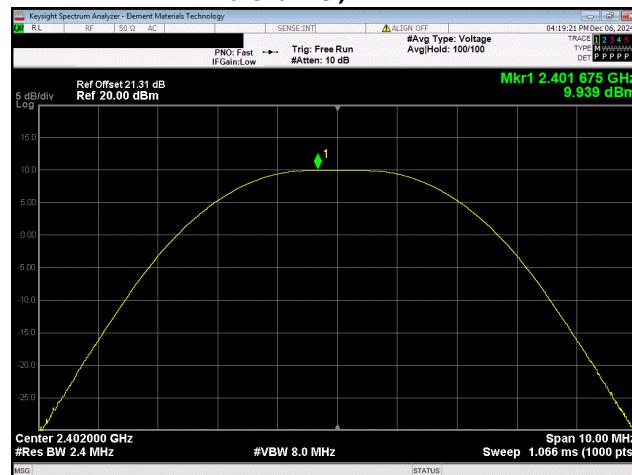
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



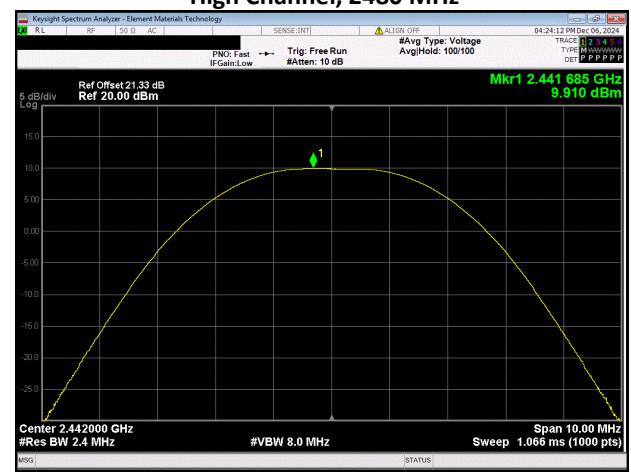
BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz



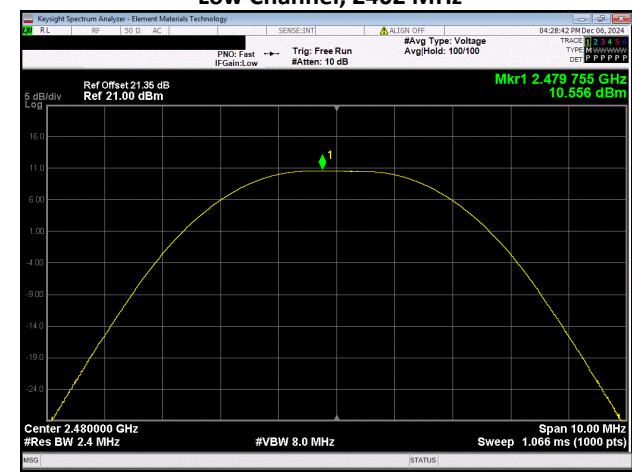
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TEST DESCRIPTION

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

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

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

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

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi)

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5182A	TIF	2023-07-27	2026-07-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2024-01-31	2025-01-31

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B146274A	Date:	2024-12-06
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	John Quach	Relative Humidity:	20.8%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN04
Power:	3.7VDC Internal Battery	Configuration:	STAK0353-5

COMMENTS

Reference level offset includes measurement cable, 20dB attenuator, and DC block.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
BLE/GFSK 1 Mbps					
Low Channel, 2402 MHz	10.035	1.07	11.105	36	Pass
Mid Channel, 2442 MHz	9.971	1.07	11.041	36	Pass
High Channel, 2480 MHz	10.595	1.07	11.665	36	Pass
BLE/GFSK 2 Mbps					
Low Channel, 2402 MHz	9.939	1.07	11.009	36	Pass
Mid Channel, 2442 MHz	9.91	1.07	10.98	36	Pass
High Channel, 2480 MHz	10.556	1.07	11.626	36	Pass

POWER SPECTRAL DENSITY



TEST DESCRIPTION

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 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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5182A	TIF	2023-07-27	2026-07-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2024-01-31	2025-01-31

POWER SPECTRAL DENSITY



EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B146274A	Date:	2024-12-06
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	John Quach	Relative Humidity:	20.7%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN04
Power:	3.7VDC Internal Battery	Configuration:	STAK0353-5

COMMENTS

Reference level offset includes measurement cable, 20dB attenuator, and DC block.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

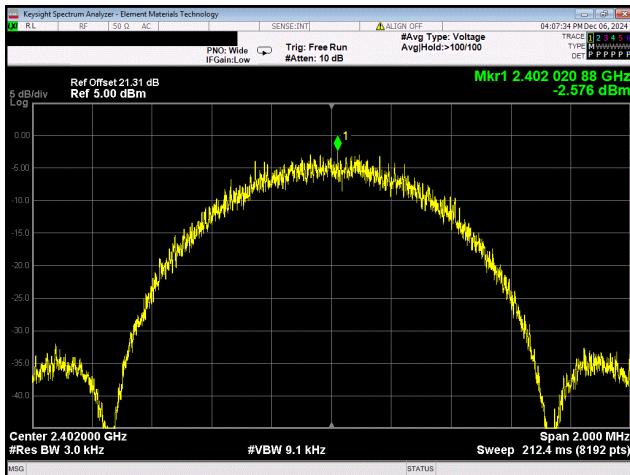
Pass

Tested By

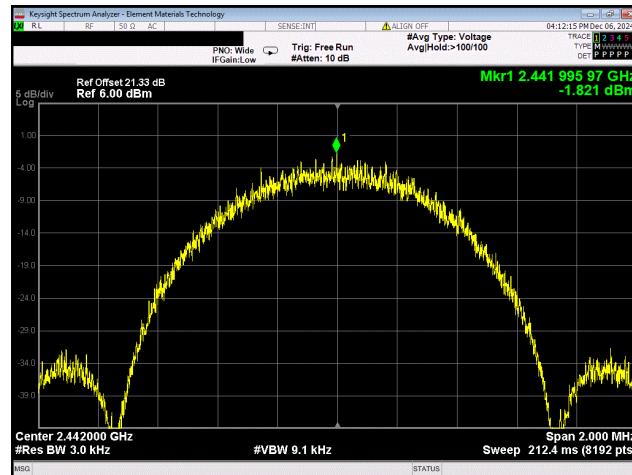
TEST RESULTS

	Value dBm/3kHz	Limit ≤ (dBm/3kHz)	Results
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-2.576	8	Pass
Mid Channel, 2442 MHz	-1.821	8	Pass
High Channel, 2480 MHz	-0.704	8	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	-4.664	8	Pass
Mid Channel, 2442 MHz	-4.832	8	Pass
High Channel, 2480 MHz	-4.18	8	Pass

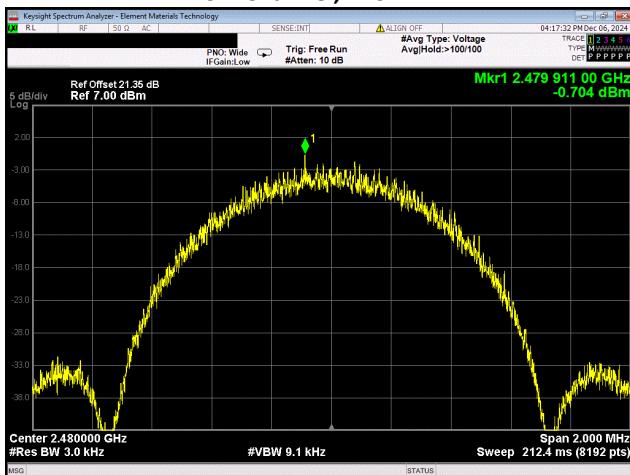
POWER SPECTRAL DENSITY



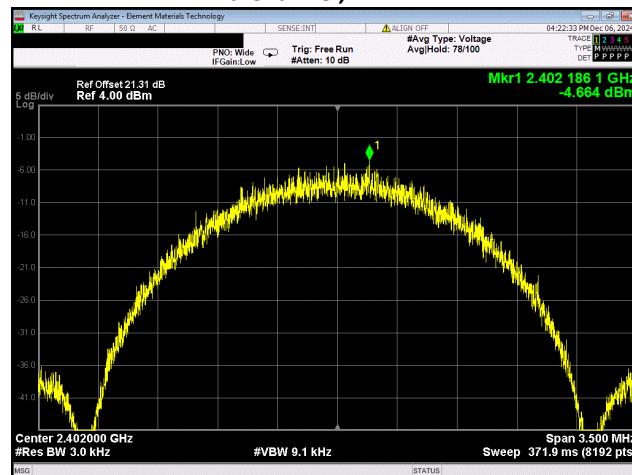
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



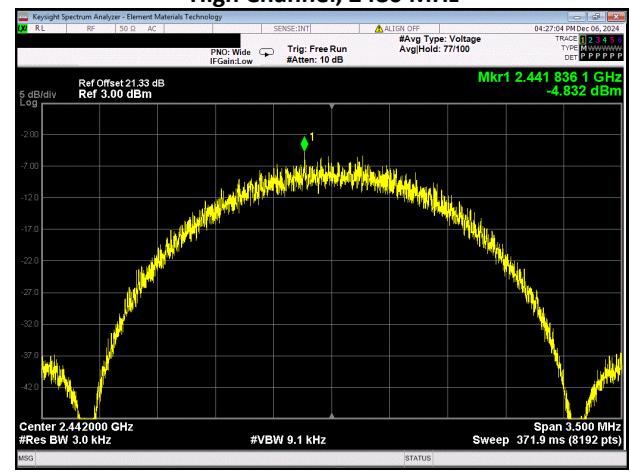
BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz



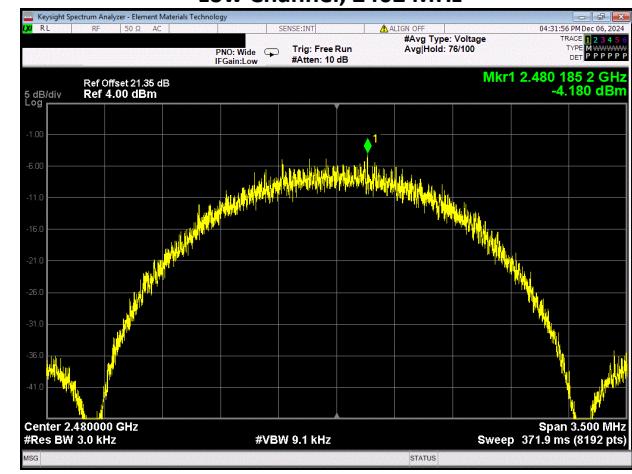
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

BAND EDGE COMPLIANCE



TEST DESCRIPTION

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 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. The analyzer screen captures for this test show an example of the emission mask for the test mode also used during the radiated spurious emissions at the restricted band edges test.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5182A	TIF	2023-07-27	2026-07-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2024-01-31	2025-01-31

BAND EDGE COMPLIANCE



EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B146274A	Date:	2024-12-06
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	John Quach	Relative Humidity:	20.8%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN04
Power:	3.7VDC Internal Battery	Configuration:	STAK0353-5

COMMENTS

Reference level offset includes measurement cable, 20dB attenuator, and DC block.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

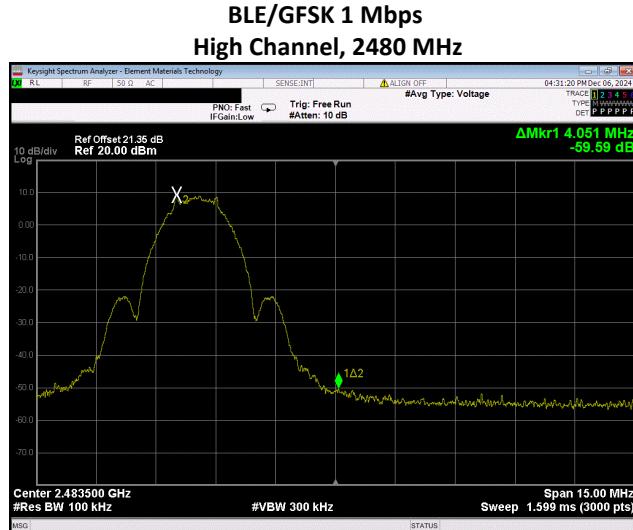
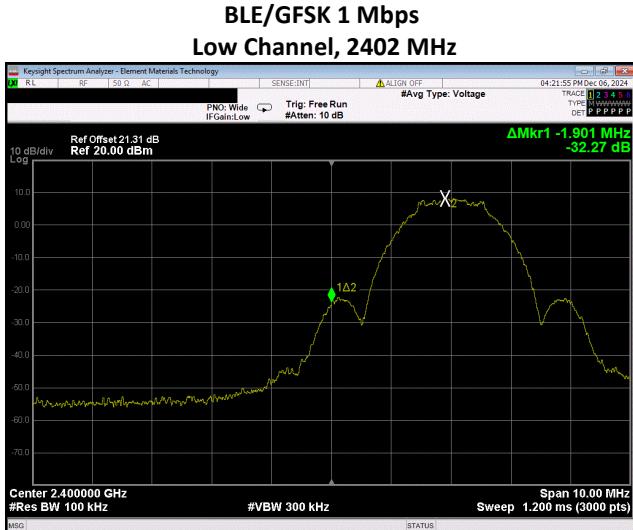
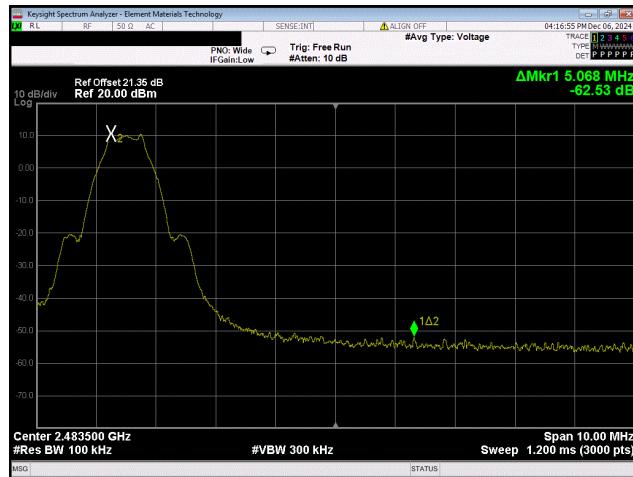
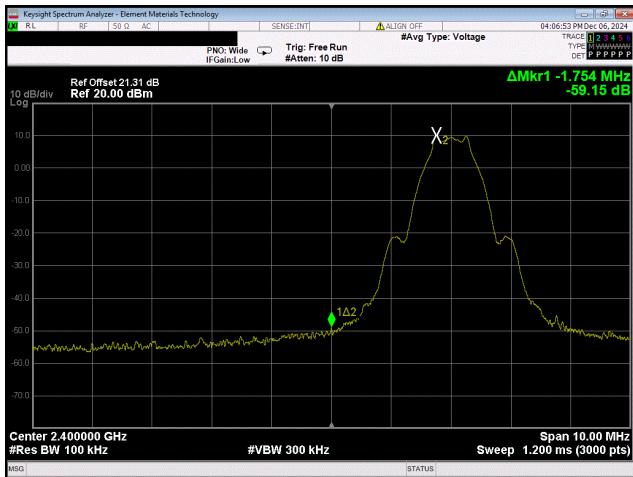
Pass

Tested By

TEST RESULTS

	Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-59.15	-20	Pass
High Channel, 2480 MHz	-62.53	-20	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	-32.27	-20	Pass
High Channel, 2480 MHz	-59.59	-20	Pass

BAND EDGE COMPLIANCE



SPURIOUS CONDUCTED EMISSIONS



TEST DESCRIPTION

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

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

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

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

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5182A	TIF	2023-07-27	2026-07-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2024-05-22	2025-05-22
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2024-08-28	2025-08-28
Block - DC	Fairview Microwave	SD3379	ANH	2024-08-28	2025-08-28
Attenuator	S.M. Electronics	SA26B-20	RFW	2024-01-31	2025-01-31

SPURIOUS CONDUCTED EMISSIONS



EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B146274A	Date:	2024-12-06
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	John Quach	Relative Humidity:	20.8%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mbar
Tested By:	Christopher Heintzelman	Job Site:	MN11
Power:	3.7VDC Battery	Configuration:	STAK0353-5

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

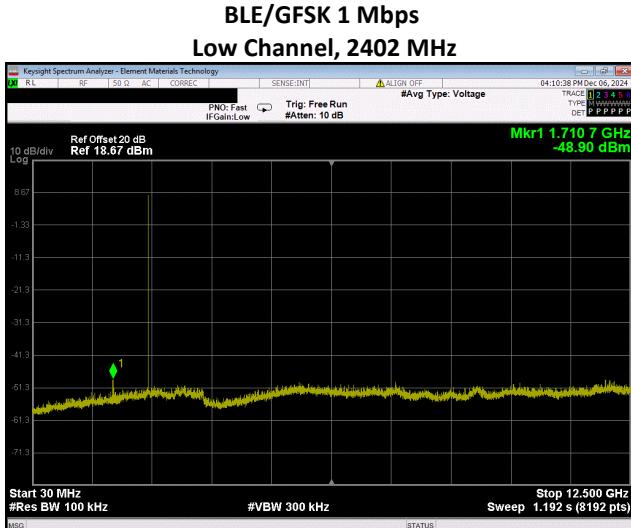
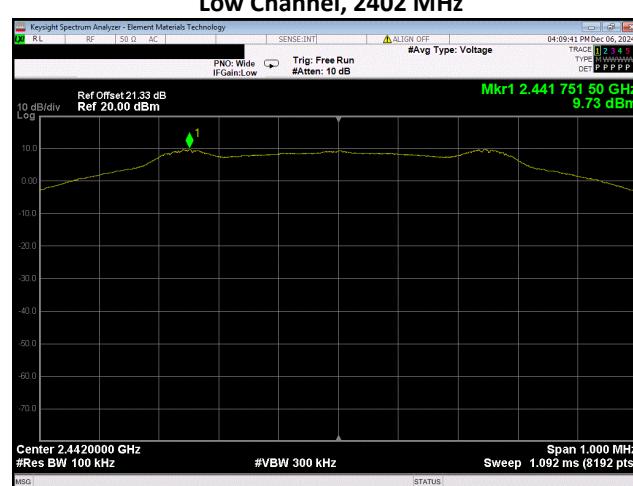
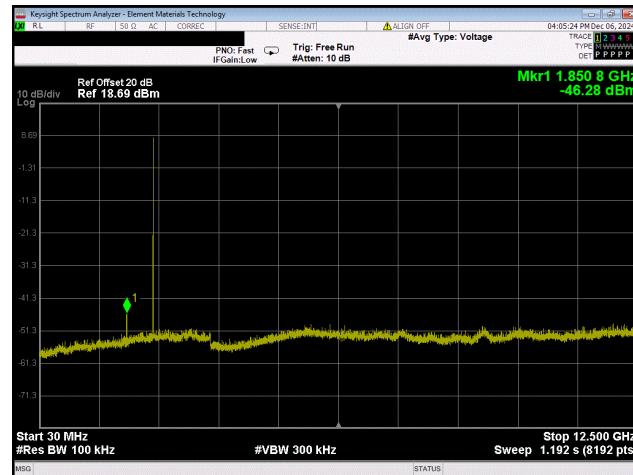
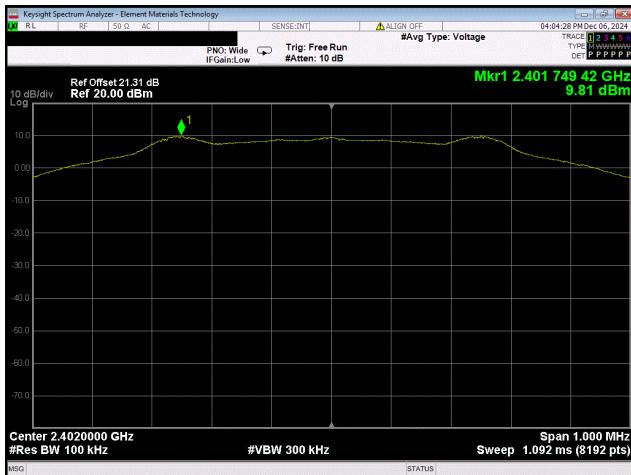
Pass

Tested By

TEST RESULTS

	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit \leq (dBc)	Result
BLE/GFSK 1 Mbps					
Low Channel, 2402 MHz	Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz	2401.75 1850.79 24926.75	N/A -56.09 -46.54	N/A -20 -20	N/A Pass Pass
Mid Channel, 2442 MHz	Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz	2441.75 1710.73 24935.91	N/A -58.63 -46.61	N/A -20 -20	N/A Pass Pass
High Channel, 2480 MHz	Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz	2479.75 12232.06 24832.13	N/A -60.04 -47.53	N/A -20 -20	N/A Pass Pass
BLE/GFSK 2 Mbps					
Low Channel, 2402 MHz	Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz	2402.51 1858.41 24942.01	N/A -56.39 -44.82	N/A -20 -20	N/A Pass Pass
Mid Channel, 2442 MHz	Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz	2442.5 9289.25 24845.87	N/A -57.64 -45.45	N/A -20 -20	N/A Pass Pass
High Channel, 2480 MHz	Fundamental 30 MHz - 12.5 GHz 12.5 GHz - 25 GHz	2479.51 1753.36 24971	N/A -53.94 -46.14	N/A -20 -20	N/A Pass Pass

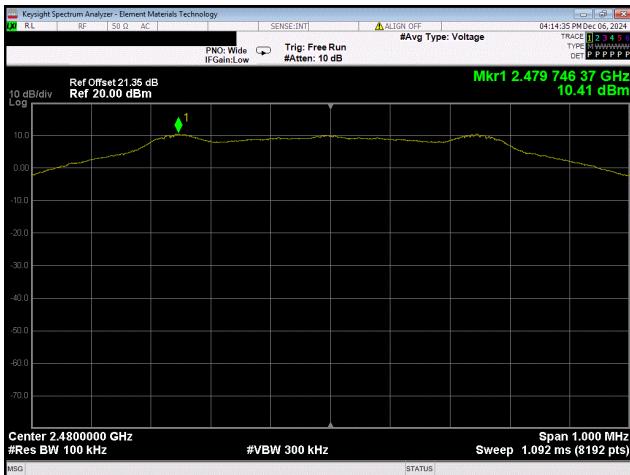
SPURIOUS CONDUCTED EMISSIONS



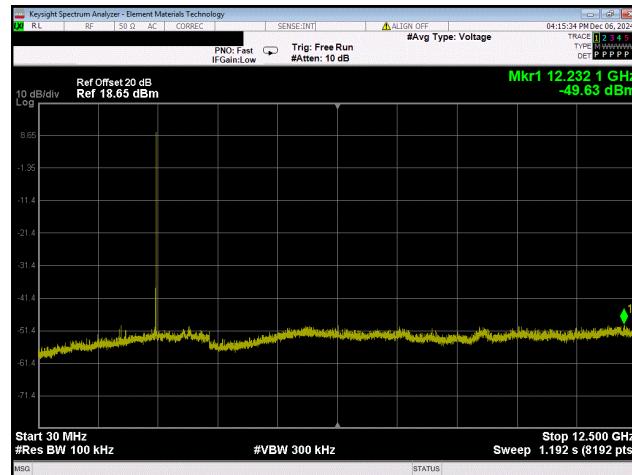
**BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz**

**BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz**

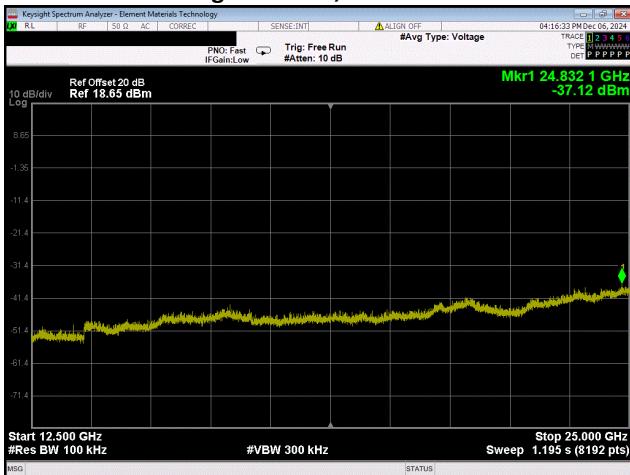
SPURIOUS CONDUCTED EMISSIONS



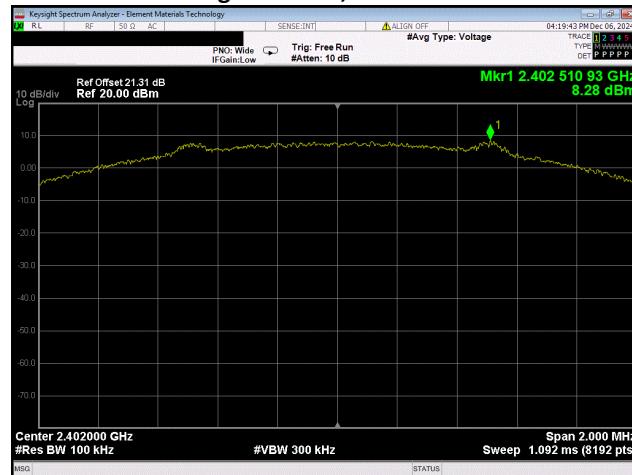
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

SPURIOUS RADIATED EMISSIONS

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies (in no-hop, single channel mode) 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. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

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

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

QP = Quasi-Peak Detector

PK = Peak Detector

AV = RMS Detector

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

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

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

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

RMS measurements taken for a FHSS radio also may have a duty cycle correction subtracted using the formula $10 \times \log(DC)$, where DC is the worst-case dwell time of the radio while in a hopping mode in a 100 ms period.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Standard Gain	ETS Lindgren	3160-07	AXP	NCR	NCR
Cable	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	2024-11-26	2025-11-26
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	2024-01-08	2025-01-08
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2024-03-13	2025-03-13
Antenna - Standard Gain	ETS Lindgren	3160-08	AIQ	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	2024-01-08	2025-01-08
Antenna - Double Ridge	ETS Lindgren	3115	AIP	2024-08-02	2026-08-02
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	2024-11-26	2025-11-26
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	2024-01-08	2025-01-08
Filter - High Pass	Micro-Tronics	HPM50111	LFN	2024-08-25	2025-08-25
Attenuator	Fairview Microwave	SA18H-20	VAF	2024-08-25	2025-08-25
Antenna - Biconilog	ETS Lindgren	3142D	AXO	2023-10-02	2025-10-02
Cable	ESM Cable Corp.	Bilog Cables	MNH	2024-11-26	2025-11-26
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	2024-10-09	2025-10-09
Filter - Low Pass	Micro-Tronics	LPM50004	LFK	2024-08-25	2025-08-25
Antenna - Loop	ETS Lindgren	6502	AOB	2023-06-12	2025-06-12

SPURIOUS RADIATED EMISSIONS

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Standard Gain	ETS Lindgren	3160-09	AHG	NCR	NCR
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNP	2024-09-05	2025-09-05
Amplifier - Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	2024-09-05	2025-09-05

FREQUENCY RANGE INVESTIGATED

10 kHz TO 26.5 GHz

POWER INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

STAK0353-9

MODES INVESTIGATED

Radio Transmitting BLE High Ch 2480 MHz, 1 Mbps
 Radio Transmitting BLE Low Ch 2402 MHz, 1 Mbps
 Radio Transmitting BLE Mid Ch 2442 MHz, 1 Mbps

SPURIOUS RADIATED EMISSIONS



EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B1462764	Date:	2024-12-11
Customer:	Starkey Laboratories, Inc.	Temperature:	22.5°C
Attendees:	John Quach	Relative Humidity:	0.221%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mb
Tested By:	Arnauld Dedry	Job Site:	MN05
Power:	Battery	Configuration:	STAK0353-9

TEST PARAMETERS

Run #:	48	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

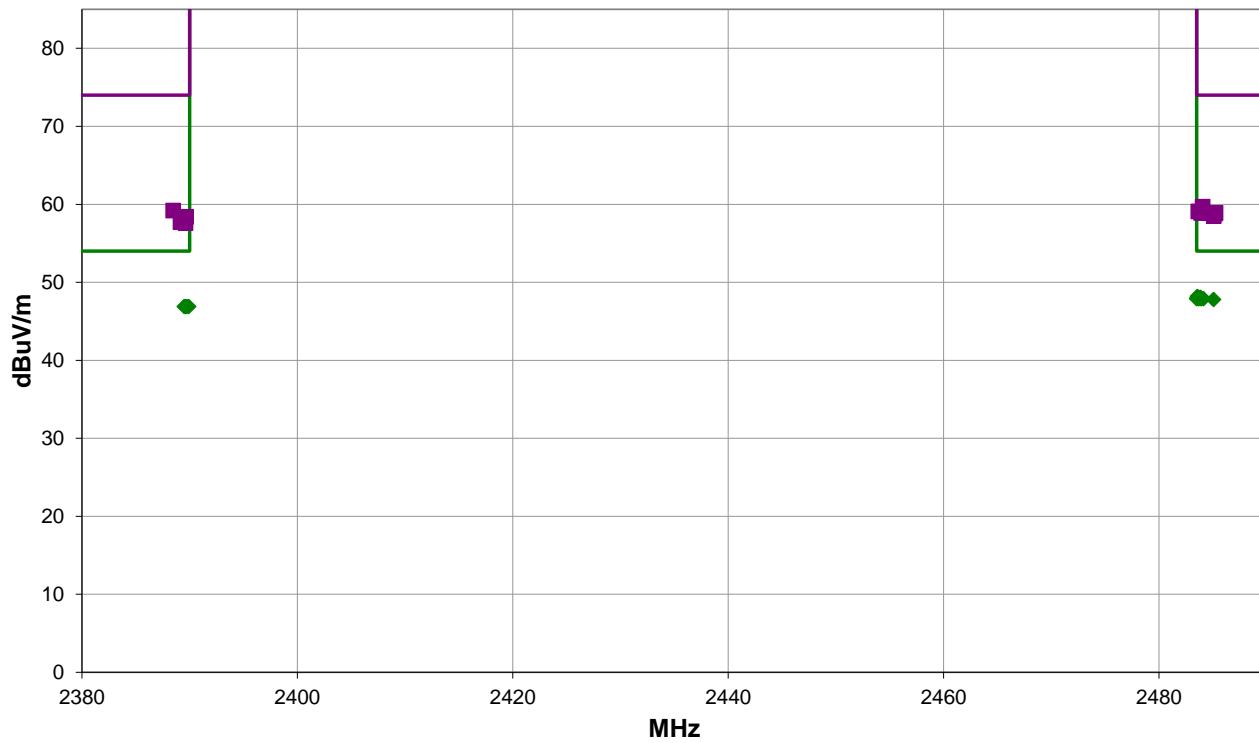
None

EUT OPERATING MODES

Radio Transmitting BLE Low and High Chs (2402 and 2480 MHz), 1 Mbps

DEVIATIONS FROM TEST STANDARD

None



Run #: 48

PK AV QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #48

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.567	31.7	-3.5	3.5	120.9	3.0	20.0	Horz	AV	0.0	48.2	54.0	-5.8	Eut Horz, High Ch,1 Mbps
2483.853	31.6	-3.5	1.5	274.0	3.0	20.0	Vert	AV	0.0	48.1	54.0	-5.9	Eut Vert, High Ch, 1 Mbps
2483.560	31.5	-3.5	1.5	41.0	3.0	20.0	Vert	AV	0.0	48.0	54.0	-6.0	Eut Vert, High Ch, 2 Mbps
2483.697	31.4	-3.5	1.5	141.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	Eut Horz, High Ch,1 Mbps
2484.133	31.4	-3.5	1.4	198.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	Eut On Side, High Ch,1 Mbps
2483.917	31.4	-3.5	2.1	306.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	Eut Vert, High Ch, 1 Mbps
2483.500	31.4	-3.5	3.4	163.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	Eut Horz, High Ch, 2 Mbps
2485.070	31.3	-3.5	1.5	347.9	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	Eut On Side, High Ch,1 Mbps
2389.903	31.1	-4.2	2.8	34.9	3.0	20.0	Horz	AV	0.0	46.9	54.0	-7.1	Eut Horz, Low Ch,1 Mbps
2389.640	31.1	-4.2	1.5	253.0	3.0	20.0	Vert	AV	0.0	46.9	54.0	-7.1	Eut Horz, Low Ch,1 Mbps
2389.493	31.1	-4.2	1.5	243.0	3.0	20.0	Horz	AV	0.0	46.9	54.0	-7.1	Eut Horz, Low Ch, 2 Mbps
2389.713	31.1	-4.2	1.6	185.9	3.0	20.0	Vert	AV	0.0	46.9	54.0	-7.1	Eut Horz, Low Ch, 2 Mbps
2484.053	43.2	-3.5	3.5	120.9	3.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	Eut Horz, High Ch,1 Mbps
2388.457	43.4	-4.2	1.5	253.0	3.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	Eut Horz, Low Ch,1 Mbps
2483.657	42.6	-3.5	1.5	141.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	Eut Horz, High Ch,1 Mbps
2484.233	42.4	-3.5	1.4	198.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	Eut On Side, High Ch,1 Mbps
2485.267	42.4	-3.5	2.1	306.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	Eut Vert, High Ch, 1 Mbps
2484.173	42.4	-3.5	1.5	274.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	Eut Vert, High Ch, 1 Mbps
2483.920	42.4	-3.5	1.5	41.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	Eut Vert, High Ch, 2 Mbps
2485.207	42.3	-3.5	1.5	347.9	3.0	20.0	Vert	PK	0.0	58.8	74.0	-15.2	Eut On Side, High Ch,1 Mbps
2485.097	42.0	-3.5	3.4	163.0	3.0	20.0	Horz	PK	0.0	58.5	74.0	-15.5	Eut Horz, High Ch, 2 Mbps
2389.677	42.6	-4.2	2.8	34.9	3.0	20.0	Horz	PK	0.0	58.4	74.0	-15.6	Eut Horz, Low Ch,1 Mbps
2389.137	41.9	-4.2	1.6	185.9	3.0	20.0	Vert	PK	0.0	57.7	74.0	-16.3	Eut Horz, Low Ch, 2 Mbps
2389.617	41.8	-4.2	1.5	243.0	3.0	20.0	Horz	PK	0.0	57.6	74.0	-16.4	Eut Horz, Low Ch, 2 Mbps

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS



EUT:	Edge Remote Microphone	Work Order:	STAK0353
Serial Number:	6074B1462764	Date:	2024-12-11
Customer:	Starkey Laboratories, Inc.	Temperature:	22.5°C
Attendees:	John Quach	Relative Humidity:	0.221%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mb
Tested By:	Arnauld Dedry	Job Site:	MN05
Power:	Battery	Configuration:	STAK0353-9

TEST PARAMETERS

Run #:	46	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

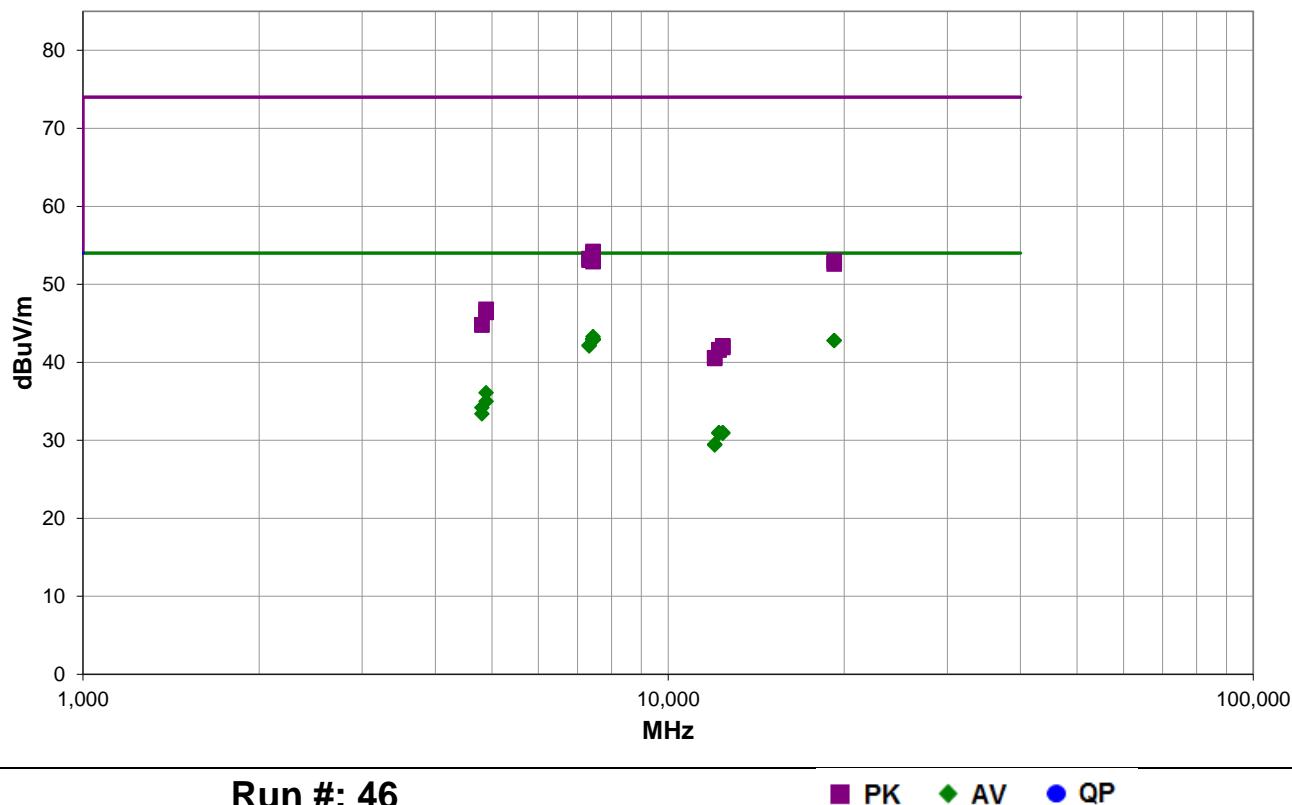
100% Duty Cycle

EUT OPERATING MODES

Radio Transmitting BLE Low, Mid & High Chs (2402, 2442, and 2480 MHz)

DEVIATIONS FROM TEST STANDARD

None



SPURIOUS RADIATED EMISSIONS

RESULTS - Run #46

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.383	29.7	13.6	1.5	77.0	3.0	0.0	Vert	AV	0.0	43.3	54.0	-10.7	Eut Horz, High Ch, 1 Mbps
7439.450	29.4	13.6	2.9	153.0	3.0	0.0	Horz	AV	0.0	43.0	54.0	-11.0	Eut Horz, High Ch, 1 Mbps
7440.500	29.4	13.6	1.5	246.9	3.0	0.0	Horz	AV	0.0	43.0	54.0	-11.0	Eut On Side, High Ch, 1 Mbps
7440.042	29.4	13.6	3.1	322.9	3.0	0.0	Vert	AV	0.0	43.0	54.0	-11.0	Eut On Side, High Ch, 1 Mbps
7441.483	29.4	13.6	1.5	299.0	3.0	0.0	Horz	AV	0.0	43.0	54.0	-11.0	Eut Vert, High Ch, 1 Mbps
7441.525	29.3	13.6	1.5	238.0	3.0	0.0	Vert	AV	0.0	42.9	54.0	-11.1	Eut Vert, High Ch, 1 Mbps
7441.000	29.3	13.6	1.5	41.9	3.0	0.0	Horz	AV	0.0	42.9	54.0	-11.1	EUT Horz, High Ch, 2 Mbps
7439.757	29.3	13.6	1.6	19.0	3.0	0.0	Vert	AV	0.0	42.9	54.0	-11.1	EUT Horz, High Ch, 2 Mbps
19216.440	26.3	16.5	1.5	195.0	3.0	0.0	Horz	AV	0.0	42.8	54.0	-11.2	Eut Horz, Low Ch, 1 Mbps
19217.840	26.3	16.5	0.15	9.9	3.0	0.0	Vert	AV	0.0	42.8	54.0	-11.2	Eut Horz, Low Ch, 1 Mbps
7326.657	29.1	13.1	1.7	217.9	3.0	0.0	Horz	AV	0.0	42.2	54.0	-11.8	Eut Horz, Mid Ch, 1 Mbps
7326.927	29.0	13.1	1.9	207.9	3.0	0.0	Vert	AV	0.0	42.1	54.0	-11.9	Eut Horz, Mid Ch, 1 Mbps
4884.193	31.2	4.9	3.5	132.9	3.0	0.0	Vert	AV	0.0	36.1	54.0	-17.9	Eut Horz, Mid Ch, 1 Mbps
4884.997	30.1	4.9	1.5	189.9	3.0	0.0	Horz	AV	0.0	35.0	54.0	-19.0	Eut Horz, Mid Ch, 1 Mbps
4803.747	29.9	4.3	2.6	131.0	3.0	0.0	Vert	AV	0.0	34.2	54.0	-19.8	Eut Horz, Mid Ch, 1 Mbps
7440.133	40.6	13.6	1.5	246.9	3.0	0.0	Horz	PK	0.0	54.2	74.0	-19.8	Eut On Side, High Ch, 1 Mbps
7440.540	40.5	13.6	1.6	19.0	3.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	EUT Horz, High Ch, 2 Mbps
7441.650	40.3	13.6	2.9	153.0	3.0	0.0	Horz	PK	0.0	53.9	74.0	-20.1	Eut Horz, High Ch, 1 Mbps
7439.503	40.1	13.6	1.5	41.9	3.0	0.0	Horz	PK	0.0	53.7	74.0	-20.3	EUT Horz, High Ch, 2 Mbps
7440.842	39.9	13.6	1.5	238.0	3.0	0.0	Vert	PK	0.0	53.5	74.0	-20.5	Eut Vert, High Ch, 1 Mbps
4804.720	29.1	4.3	1.5	58.0	3.0	0.0	Horz	AV	0.0	33.4	54.0	-20.6	Eut Horz, Mid Ch, 1 Mbps
7440.750	39.8	13.6	3.1	322.9	3.0	0.0	Vert	PK	0.0	53.4	74.0	-20.6	Eut On Side, High Ch, 1 Mbps
7325.437	40.2	13.1	1.9	207.9	3.0	0.0	Vert	PK	0.0	53.3	74.0	-20.7	Eut Horz, Mid Ch, 1 Mbps
7326.640	40.0	13.1	1.7	217.9	3.0	0.0	Horz	PK	0.0	53.1	74.0	-20.9	Eut Horz, Mid Ch, 1 Mbps
19218.160	36.5	16.5	1.5	195.0	3.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	Eut Horz, Low Ch, 1 Mbps
7442.050	39.4	13.6	1.5	77.0	3.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	Eut Horz, High Ch, 1 Mbps
7439.925	39.3	13.6	1.5	299.0	3.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	Eut Vert, High Ch, 1 Mbps
19216.590	36.1	16.5	0.15	9.9	3.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	Eut Horz, Low Ch, 1 Mbps
12209.290	31.8	-0.8	1.8	195.0	3.0	0.0	Vert	AV	0.0	31.0	54.0	-23.0	Eut Horz, Mid Ch, 1 Mbps
12397.630	31.2	-0.2	1.4	203.0	3.0	0.0	Vert	AV	0.0	31.0	54.0	-23.0	Eut Horz, High Ch, 1 Mbps
12209.070	31.7	-0.8	1.5	135.9	3.0	0.0	Horz	AV	0.0	30.9	54.0	-23.1	Eut Horz, Mid Ch, 1 Mbps
12397.540	31.1	-0.2	1.5	114.9	3.0	0.0	Horz	AV	0.0	30.9	54.0	-23.1	Eut Horz, High Ch, 1 Mbps
12010.990	31.9	-2.4	1.5	26.0	3.0	0.0	Horz	AV	0.0	29.5	54.0	-24.5	Eut Horz, Low Ch, 1 Mbps
12010.480	31.8	-2.4	3.7	198.0	3.0	0.0	Vert	AV	0.0	29.4	54.0	-24.6	Eut Horz, Low Ch, 1 Mbps
4884.893	41.9	4.9	1.5	189.9	3.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	Eut Horz, Mid Ch, 1 Mbps
4884.830	41.5	4.9	3.5	132.9	3.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	Eut Horz, Mid Ch, 1 Mbps
4804.547	40.5	4.3	1.5	58.0	3.0	0.0	Horz	PK	0.0	44.8	74.0	-29.2	Eut Horz, Mid Ch, 1 Mbps
4804.340	40.5	4.3	2.6	131.0	3.0	0.0	Vert	PK	0.0	44.8	74.0	-29.2	Eut Horz, Mid Ch, 1 Mbps
12398.420	42.3	-0.2	1.5	114.9	3.0	0.0	Horz	PK	0.0	42.1	74.0	-31.9	Eut Horz, High Ch, 1 Mbps
12399.980	42.1	-0.2	1.4	203.0	3.0	0.0	Vert	PK	0.0	41.9	74.0	-32.1	Eut Horz, High Ch, 1 Mbps

SPURIOUS RADIATED EMISSIONS



Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12209.420	42.4	-0.8	1.5	135.9	3.0	0.0	Horz	PK	0.0	41.6	74.0	-32.4	Eut Horz, Mid Ch, 1 Mbps
12210.800	42.4	-0.8	1.8	195.0	3.0	0.0	Vert	PK	0.0	41.6	74.0	-32.4	Eut Horz, Mid Ch, 1 Mbps
12009.570	43.0	-2.4	1.5	26.0	3.0	0.0	Horz	PK	0.0	40.6	74.0	-33.4	Eut Horz, Low Ch, 1 Mbps
12010.350	42.9	-2.4	3.7	198.0	3.0	0.0	Vert	PK	0.0	40.5	74.0	-33.5	Eut Horz, Low Ch, 1 Mbps

CONCLUSION

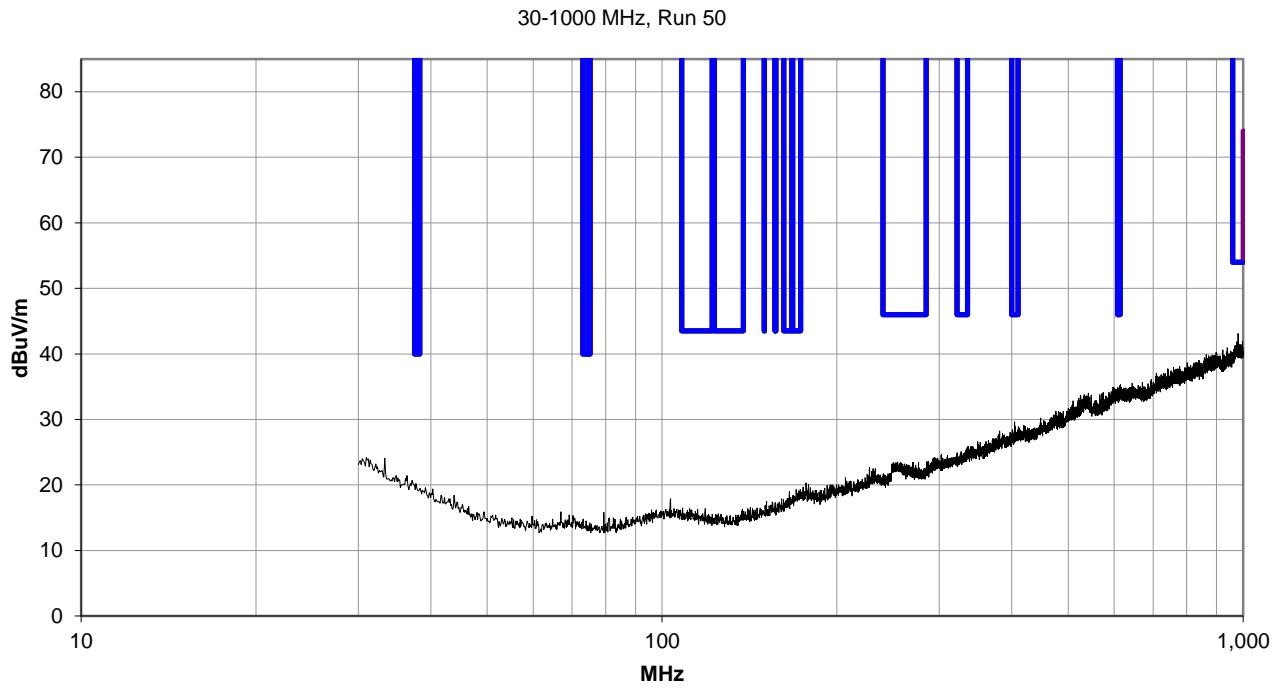
Pass

Tested By

SPURIOUS RADIATED EMISSIONS

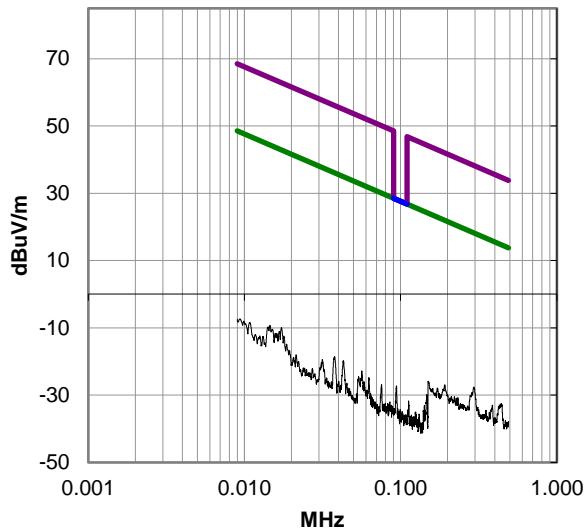
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

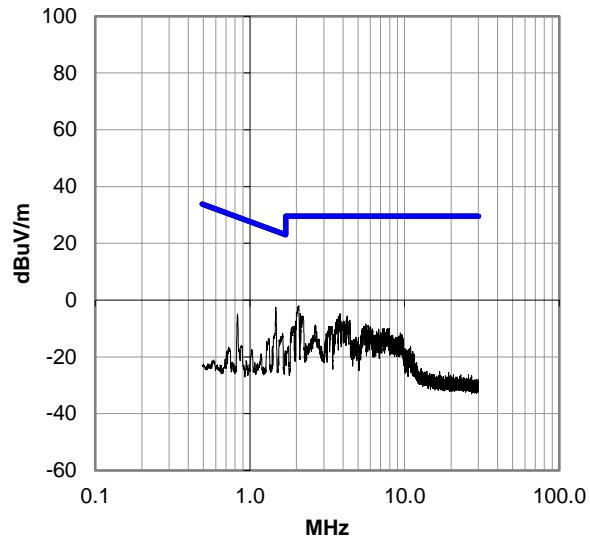


SPURIOUS RADIATED EMISSIONS

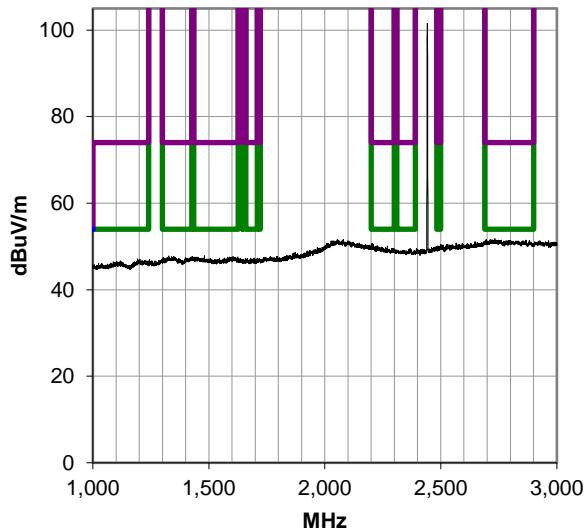
0.009-0.49 MHz, Run 51



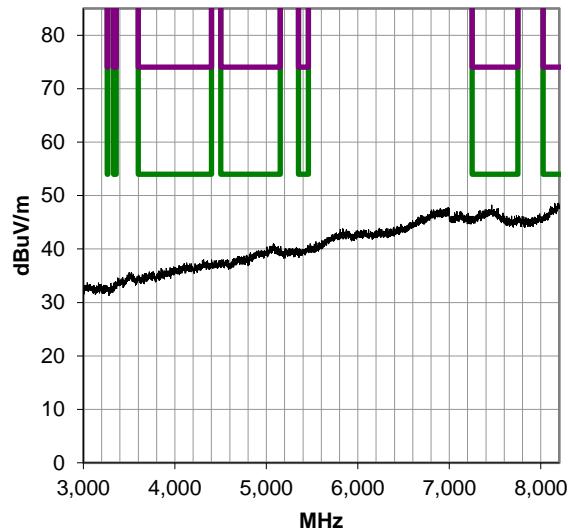
0.49-30 MHz, Run 55



1000-3000 MHz, Run 60

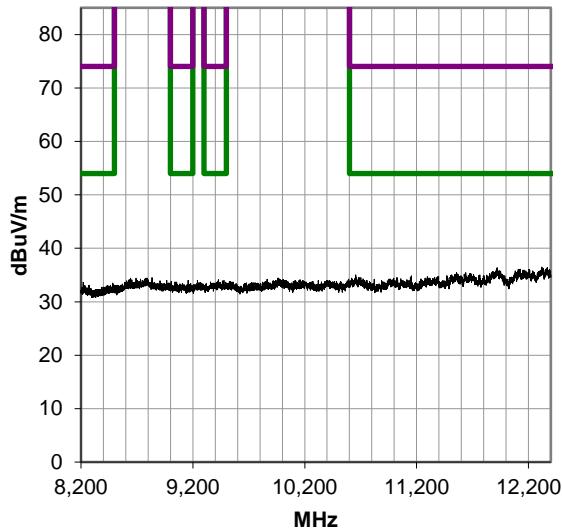


3000-8200 MHz, Run 61

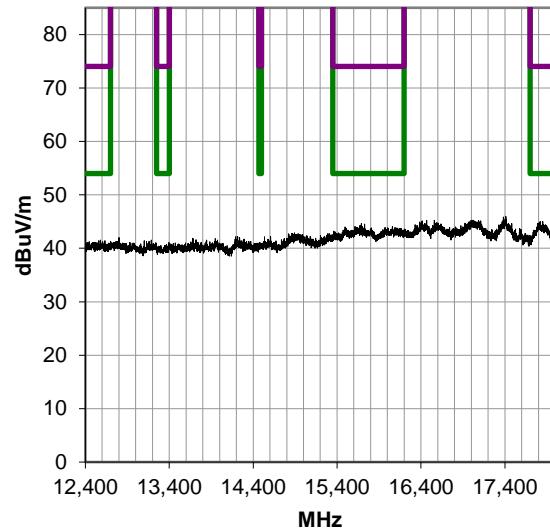


SPURIOUS RADIATED EMISSIONS

8200-12400 MHz, Run 62



12400-18000 MHz, Run 63



End of Test Report