



Nuance Hearing

Remote Microphone

**FCC 15.207:2019, FCC 15.247:2019
Bluetooth**

Report # NUAH0002



NVLAP LAB CODE: 200881-0



This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government. This Report shall not be reproduced, except in full without written approval of the laboratory.

CERTIFICATE OF TEST

Last Date of Test: November 19, 2019
Nuance Hearing
EUT: Remote Microphone

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2019	ANSI C63.10:2013
FCC 15.247:2019	

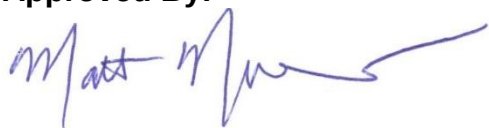
Results

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

Deviations From Test Standards

None

Approved By:



Matt Nuernberg, Operations Manager

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

REVISION HISTORY



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

ACCREDITATIONS AND AUTHORIZATIONS



United States

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

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

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

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

European Union

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

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

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

FACILITIES

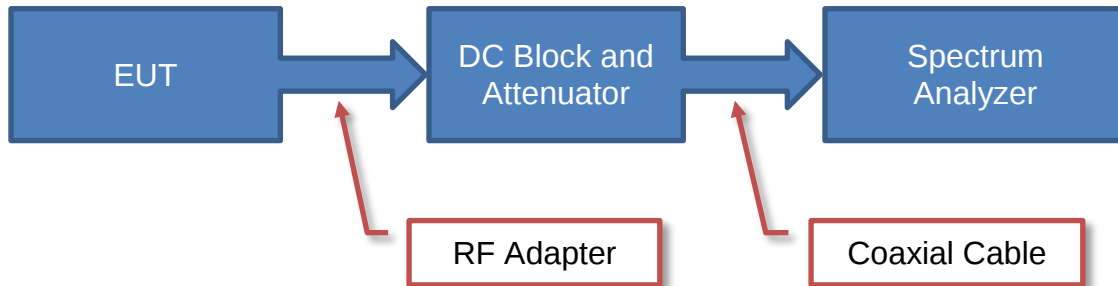


California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP				
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157

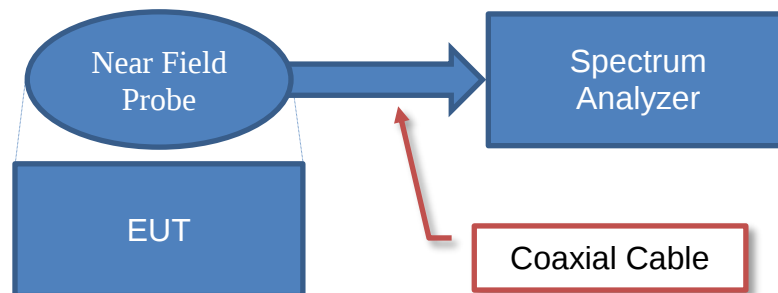


Test Setup Block Diagrams

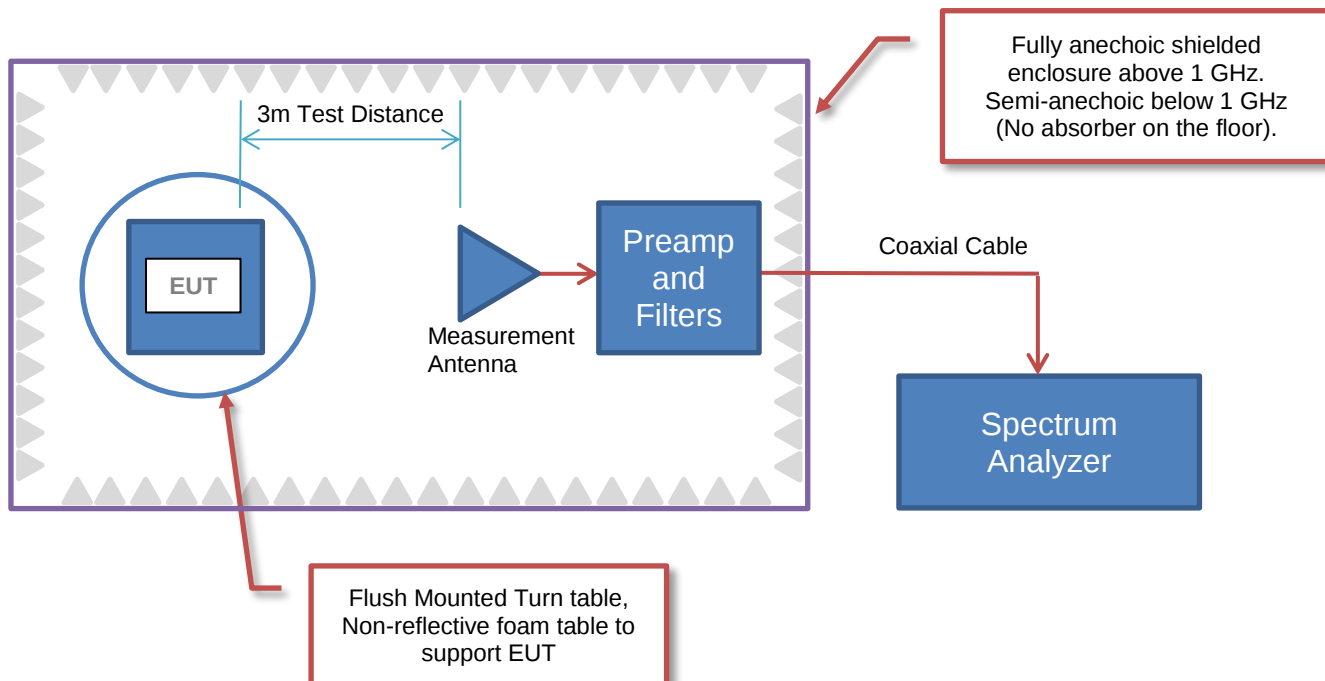
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



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 WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

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

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

PRODUCT DESCRIPTION



Client and Equipment Under Test (EUT) Information

Company Name:	Nuance Hearing
Address:	24 Raoul Wallenberg, Building A1, Floor 3
City, State, Zip:	Tel Aviv, Tel Aviv 6971920
Test Requested By:	Oran Bertelsen
EUT:	Remote Microphone
First Date of Test:	July 2, 2019
Last Date of Test:	November 19, 2019
Receipt Date of Samples:	July 1, 2019
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Remote microphone device that communicates with Bluetooth Low Energy devices, including Starkey 2.4 GHz hearing aids.

Testing Objective:

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

CONFIGURATIONS

Configuration NUAH0001- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Nuance Remote Microphone	Nuance Hearing	TM10	EP3.4

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
USB Hub	D-Link	DUB-H7	R2081B3004766

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply (USB Hub)	Ault Inc.	PW118RA0503F02	0621C

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1.5 m	No	Nuance Pod	USB Hub
AC Cable (USB Hub)	No	1.8 m	No	AC Mains	Power Supply (USB Hub)
DC Cable (USB Hub)	No	1.8 m	No	Power Supply (USB Hub)	USB Hub

Configuration NUAH0001- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Nuance Remote Microphone	Nuance Hearing	TM10	EP3.4

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply (Nuance Pod)	Phihong	PSA05F-050Q	DC10003803A2

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	0.9 m	Yes	Nuance Pod	Power Supply (Nuance Pod)

CONFIGURATIONS



Configuration NUAH0001- 6

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Nuance Remote Microphone	Nuance Hearing	TM10	EP3.7

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
DC Power Supply	Kikusui	PWR401ML	TQL
USB Interface Board	Starkey Laboratories, Inc.	N/A	N/A

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop	Lenovo	ThinkPad T430	11306
Power Supply (Laptop)	Lenovo	ADLX90NCT2A	11S45N0311Z1ZLZ633M0T4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1.0 m	No	Nuance Pod	USB Interface Board
USB Cable 2	Yes	1.9 m	No	USB Interface Board	Laptop
DC Leads	No	0.2 m	No	USB Interface Board	BNC Cable
AC Cable	No	1.0 m	No	AC Mains	Power Supply (Laptop)
DC Cable	No	1.8 m	Yes	Power Supply (Laptop)	Laptop
BNC Cable	Yes	0.8 m	No	DC Leads	DC Power Supply

CONFIGURATIONS

Configuration NUAH0004- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Nuance Remote Microphone	Nuance Hearing	TM10	1938AE20030

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
USB Interface Board	Starkey Laboratories, Inc.	N/A	N/A
DC Power Supply	Agilent	U8002A	TPZ
Laptop	Dell	Latitude 5490	DZ658Y2
AC Adapter (Laptop)	Dell	HA65NM130	CN-0FPC2Y-CH200-966-C2BF-A04

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
BNC to Banana Cable	Yes	0.8m	No	DC Power Supply	DC Leads (x2)
DC Leads (x2)	No	0.2m	No	BNC to Banana Cable	USB Interface Board
USB Cable 1	Yes	1.0m	No	Nuance Pod	USB Interface Board
USB Cable 2	Yes	2.0m	No	USB Interface Board	USB Cable 3
USB Cable 3	Yes	1.0m	No	USB Cable 2	Laptop
AC Cable (DC Power Supply)	No	1.8m	No	AC Mains	DC Power Supply
AC Cable (Laptop)	No	1.0m	No	AC Mains	AC Adapter (Laptop)
DC Cable (Laptop)	No	1.8m	No	AC Adapter (Laptop)	Laptop

Configuration NUAH0004- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Nuance Remote Microphone	Nuance Hearing	TM10	1938AE20010

MODIFICATIONS

Equipment Modifications (NUAH0001)

Item	Date	Test	Modification	Note	Disposition of EUT
1	2019-07-02	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2019-07-02	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2019-07-09	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.
4	2019-07-09	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.
5	2019-07-09	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2019-07-09	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.
7	2019-07-09	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	2019-07-09	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.
9	2019-07-09	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

MODIFICATIONS

Equipment Modifications (PAS, NUAH0004)

Item	Date	Test	Modification	Note	Disposition of EUT
1	2019-11-19	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2019-11-19	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2019-11-19	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.
4	2019-11-19	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.
5	2019-11-19	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2019-11-19	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.
7	2019-11-19	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	2019-11-19	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.
9	2019-11-19	Spurious 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
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	3/15/2019	3/15/2020
Analyzer - Spectrum Analyzer	Agilent	E4443A	AAS	3/8/2019	3/8/2020
Cable - Conducted Cable Assembly	Northwest EMC	MNC, HGN, TYK	MNCA	3/13/2019	3/13/2020

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

NUAH0001-2

MODES INVESTIGATED

Charging, Tx on mid channel (2442 MHz), BLE

POWERLINE CONDUCTED EMISSIONS



EUT:	Remote Microphone	Work Order:	NUAH0001
Serial Number:	EP3.4	Date:	07/02/2019
Customer:	Nuance Hearing	Temperature:	21.9°C
Attendees:	Charlie Esch	Relative Humidity:	62.3%
Customer Project:	None	Bar. Pressure:	1014 mb
Tested By:	Andrew Rogstad	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	NUAH0001-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	1	Line:	Neutral	Add. Ext. Attenuation (dB):	0
--------	---	-------	---------	-----------------------------	---

COMMENTS

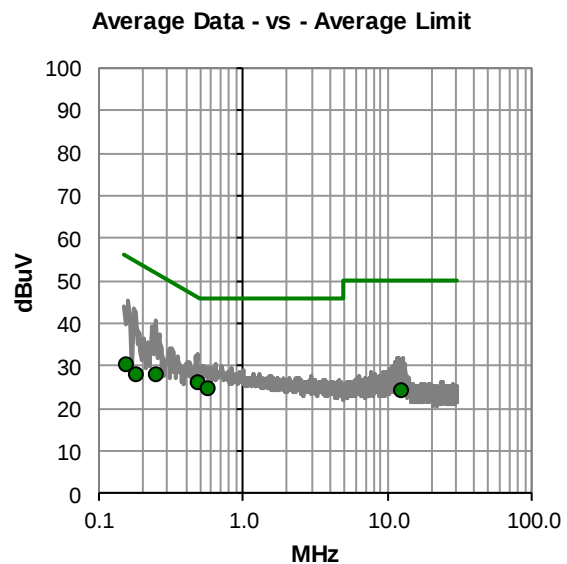
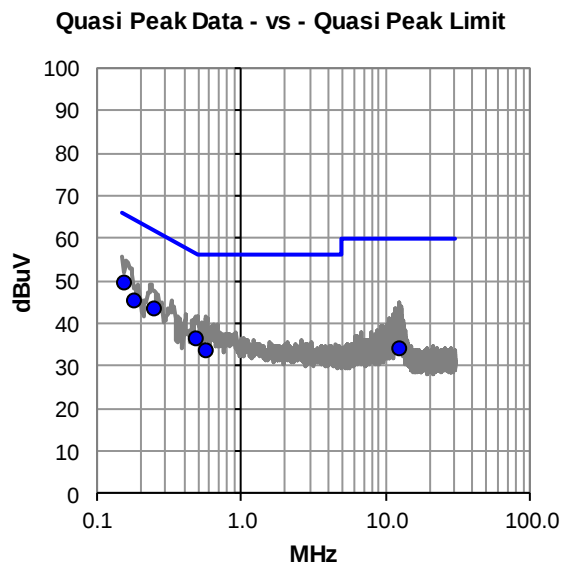
None

EUT OPERATING MODES

Charging, Tx on mid channel (2442 MHz), BLE

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #1

Quasi Peak Data - vs - Quasi Peak Limit

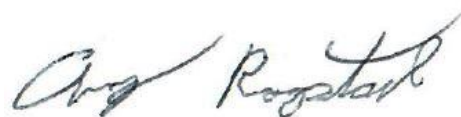
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.155	28.3	21.0	49.3	65.7	-16.4
0.251	22.5	20.7	43.2	61.7	-18.5
0.185	24.1	20.9	45.0	64.3	-19.3
0.490	15.7	20.6	36.3	56.2	-19.9
0.583	13.1	20.5	33.6	56.0	-22.4
12.415	12.9	20.9	33.8	60.0	-26.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.490	5.2	20.6	25.8	46.2	-20.4
0.583	4.2	20.5	24.7	46.0	-21.3
0.251	7.3	20.7	28.0	51.7	-23.7
0.155	9.2	21.0	30.2	55.7	-25.5
12.415	3.0	20.9	23.9	50.0	-26.1
0.185	7.1	20.9	28.0	54.3	-26.3

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS



EUT:	Remote Microphone	Work Order:	NUAH0001
Serial Number:	EP3.4	Date:	07/02/2019
Customer:	Nuance Hearing	Temperature:	21.9°C
Attendees:	Charlie Esch	Relative Humidity:	62.3%
Customer Project:	None	Bar. Pressure:	1014 mb
Tested By:	Andrew Rogstad	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	NUAH0001-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	2	Line:	High Line	Add. Ext. Attenuation (dB):	0
--------	---	-------	-----------	-----------------------------	---

COMMENTS

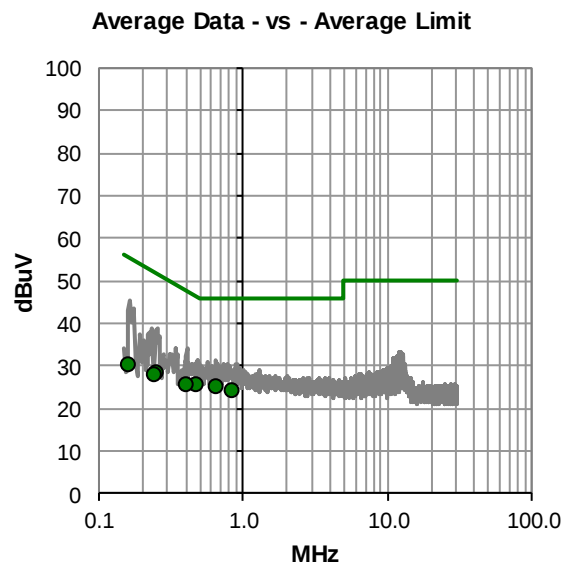
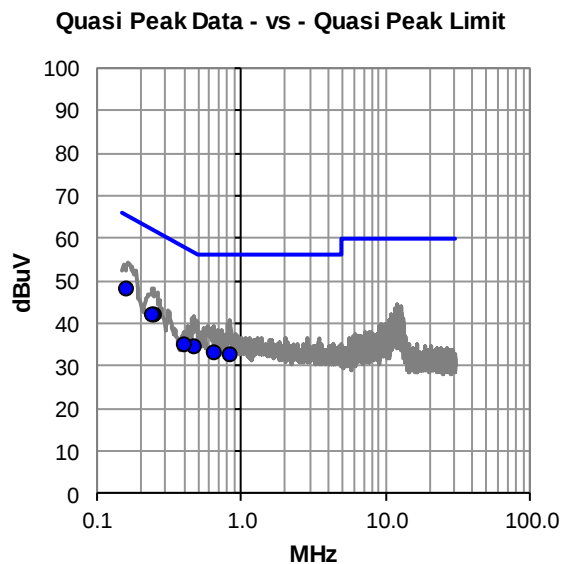
None

EUT OPERATING MODES

Charging, Tx on mid channel (2442 MHz), BLE

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #2

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.161	27.0	21.0	48.0	65.4	-17.4
0.248	21.4	20.7	42.1	61.8	-19.7
0.241	21.1	20.7	41.8	62.0	-20.2
0.484	13.8	20.6	34.4	56.3	-21.9
0.649	12.5	20.6	33.1	56.0	-22.9
0.407	14.1	20.6	34.7	57.7	-23.0
0.836	11.8	20.6	32.4	56.0	-23.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.484	5.1	20.6	25.7	46.3	-20.6
0.649	4.2	20.6	24.8	46.0	-21.2
0.836	3.6	20.6	24.2	46.0	-21.8
0.407	4.9	20.6	25.5	47.7	-22.2
0.248	7.5	20.7	28.2	51.8	-23.6
0.241	7.3	20.7	28.0	52.0	-24.0
0.161	9.3	21.0	30.3	55.4	-25.1

CONCLUSION

Pass



Tested By

DUTY CYCLE



XMIT 2019.05.15

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	E4422B	TGQ	15-Mar-18	15-Mar-21
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	7-Jun-19	7-Jun-20
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	13-Dec-18	13-Dec-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.

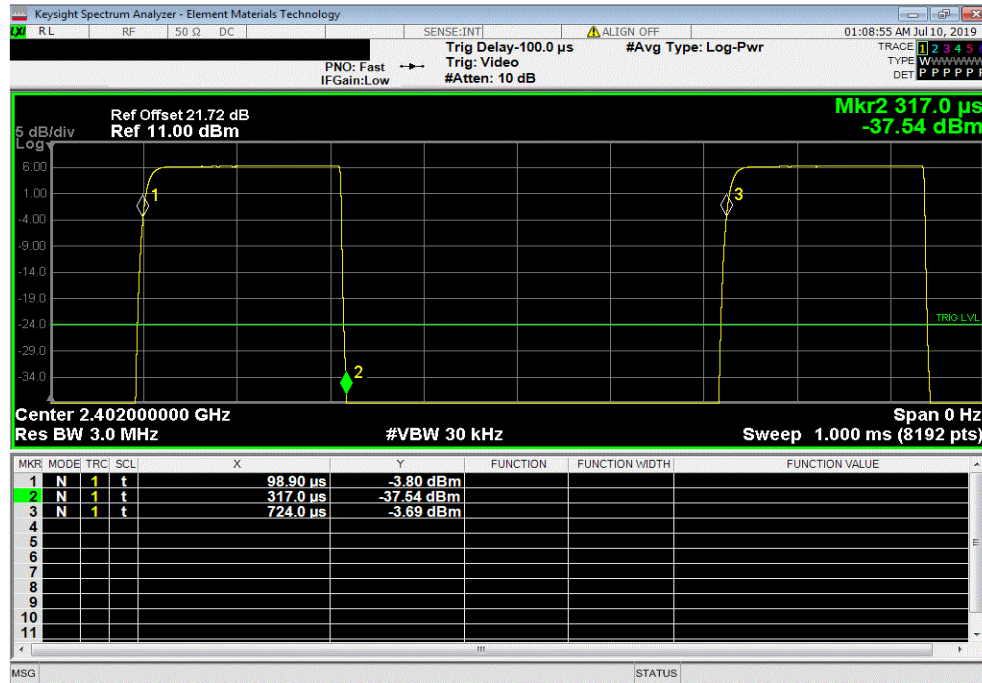
ThiTx 2018.09.13 XMIT 2019.05.15

DUTY CYCLE

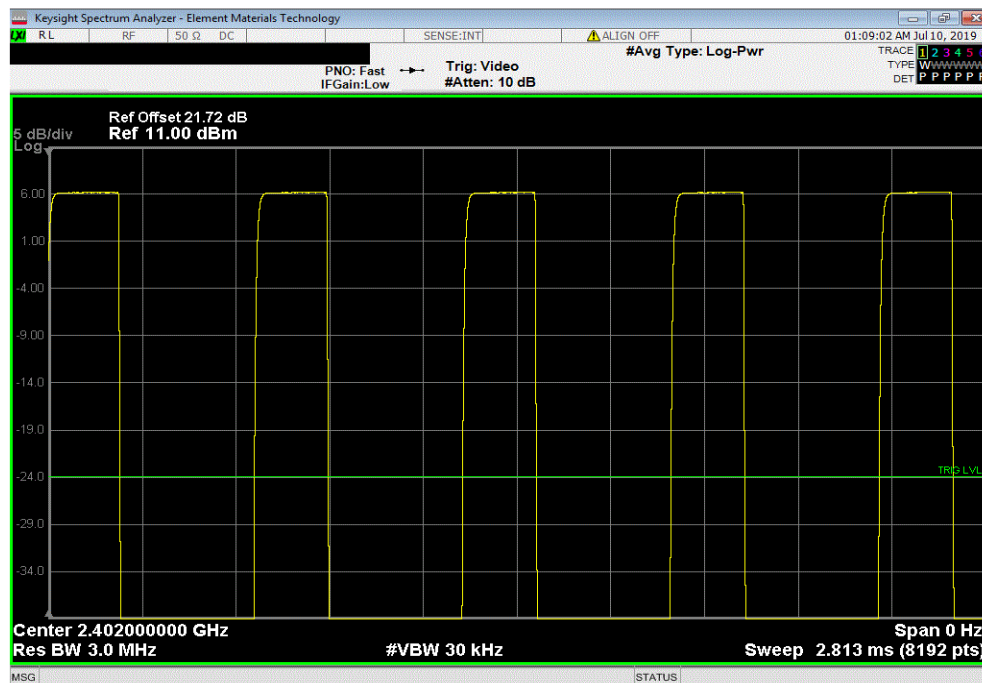


TMTx 2018.09.13 XMt 2019.05.15

BLE/GFSK Low Channel, 2402 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
218.071 us	625.1 us	1	34.9	N/A	N/A	



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	

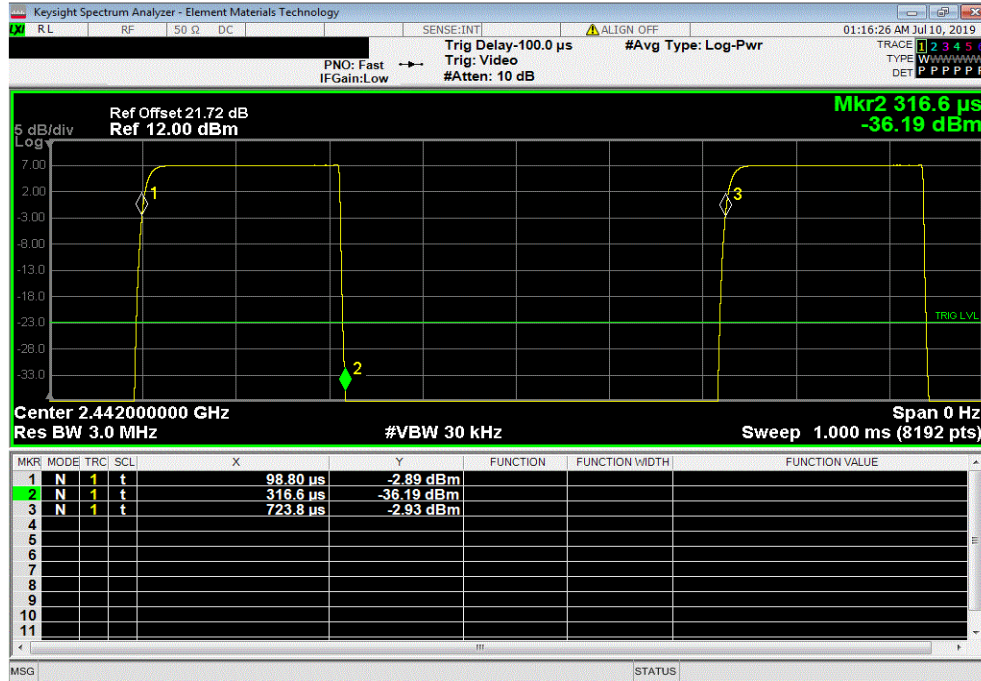


DUTY CYCLE

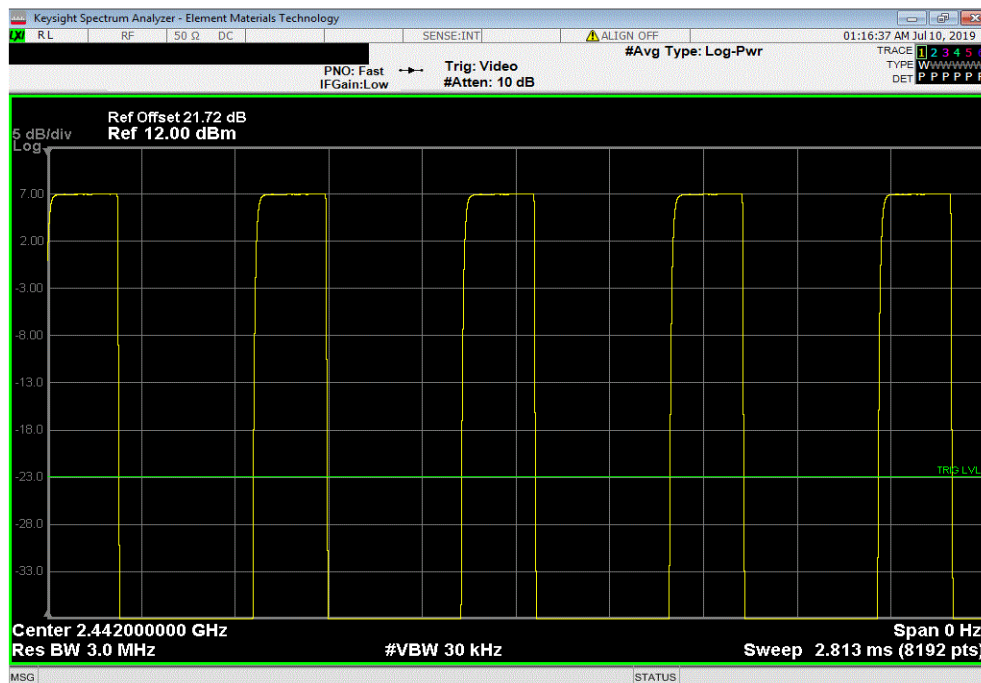


TMTx 2018.09.13 XMI 2019.05.15

BLE/GFSK Mid Channel, 2442 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
217.75 μ s	625 μ s	1	34.8	N/A	N/A	



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	

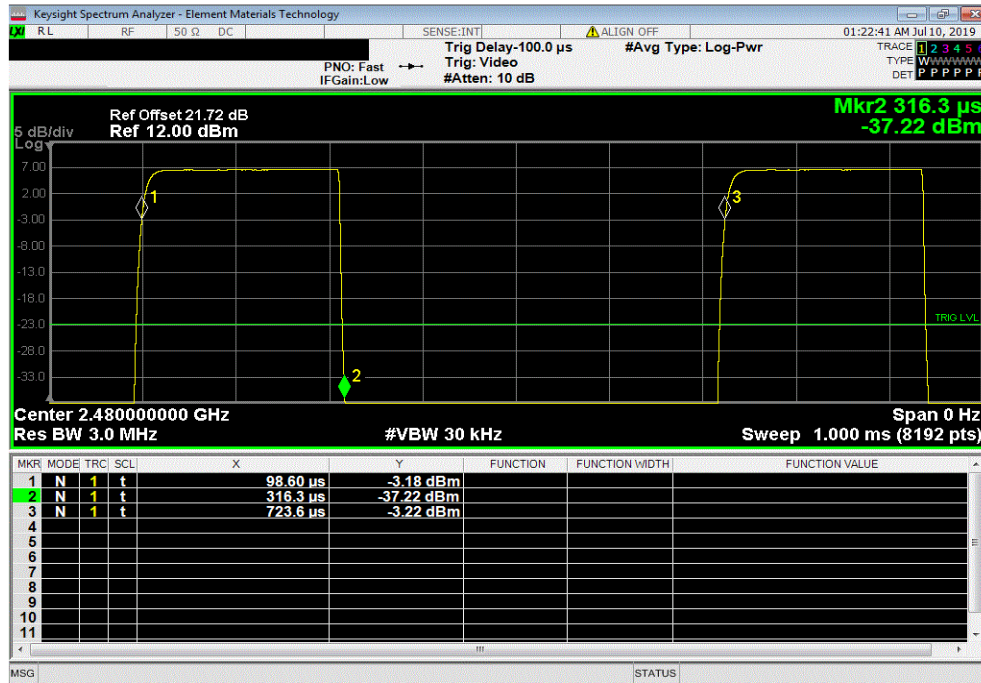


DUTY CYCLE

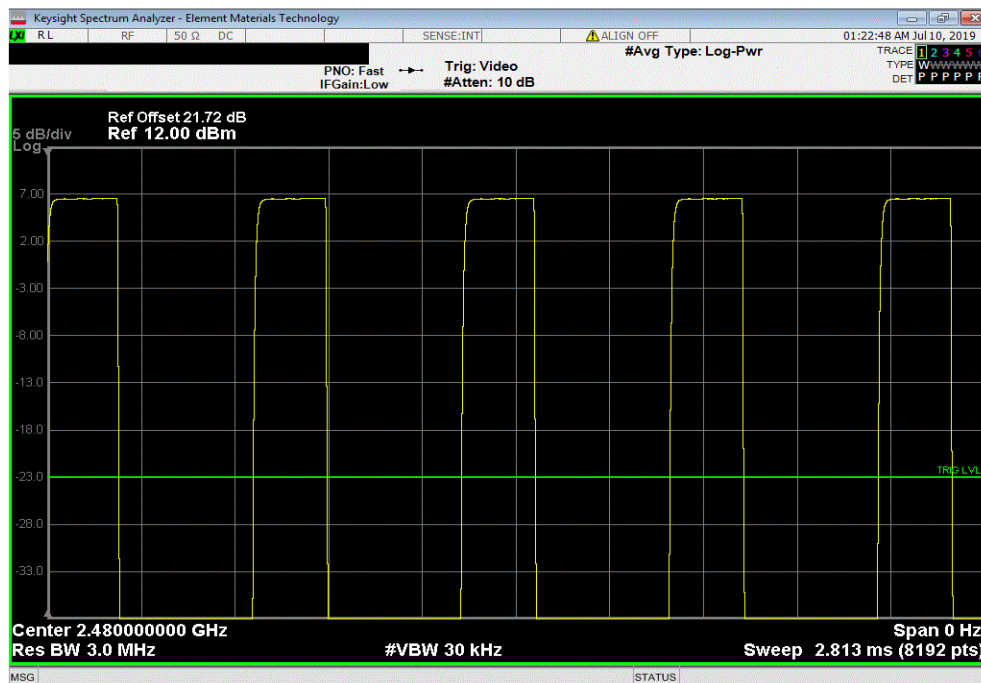


TMTx 2018.09.13 XMI 2019.05.15

BLE/GFSK High Channel, 2480 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
217.705 us	625 us	1	34.8	N/A	N/A	



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



XMIT 2019.09.05

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
Meter - Multimeter	Fluke	117	MLS	23-Jan-17	23-Jan-20
Power Supply - DC	Agilent	U8002A	TPZ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Cable	Micro-Coax	D150A-1-0720-200	MNL	15-Sep-19	15-Sep-20
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Block - DC	Fairview Microwave	SD3379	AMI	6-Aug-19	6-Aug-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	1-May-19	1-May-20

TEST DESCRIPTION

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

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

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

The 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.

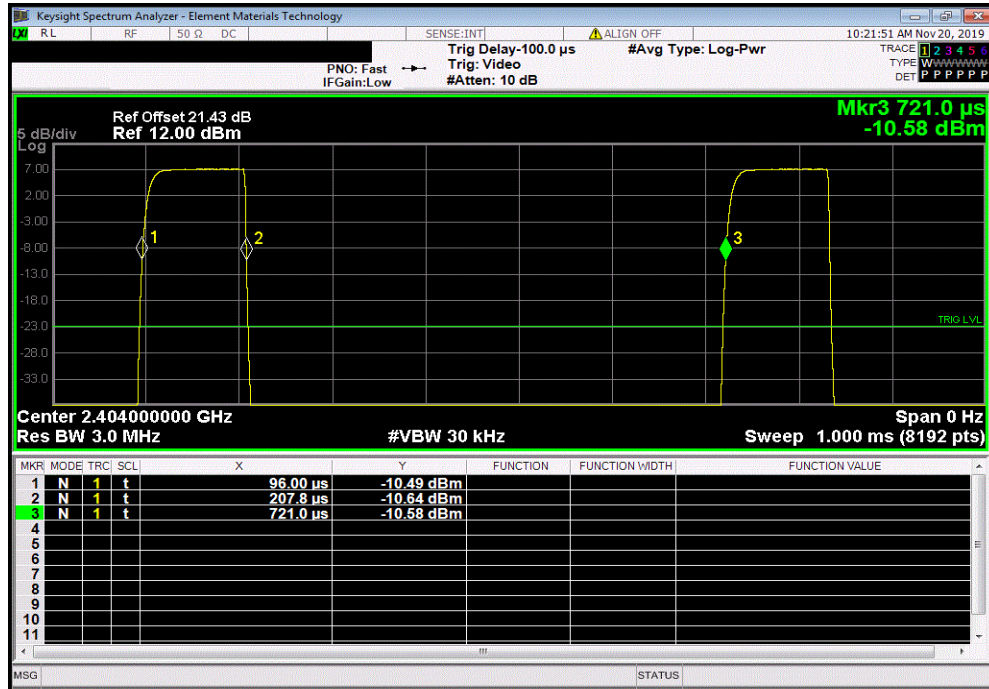
TbtTx 2019.08.30.0 XMit 2019.09.05

DUTY CYCLE

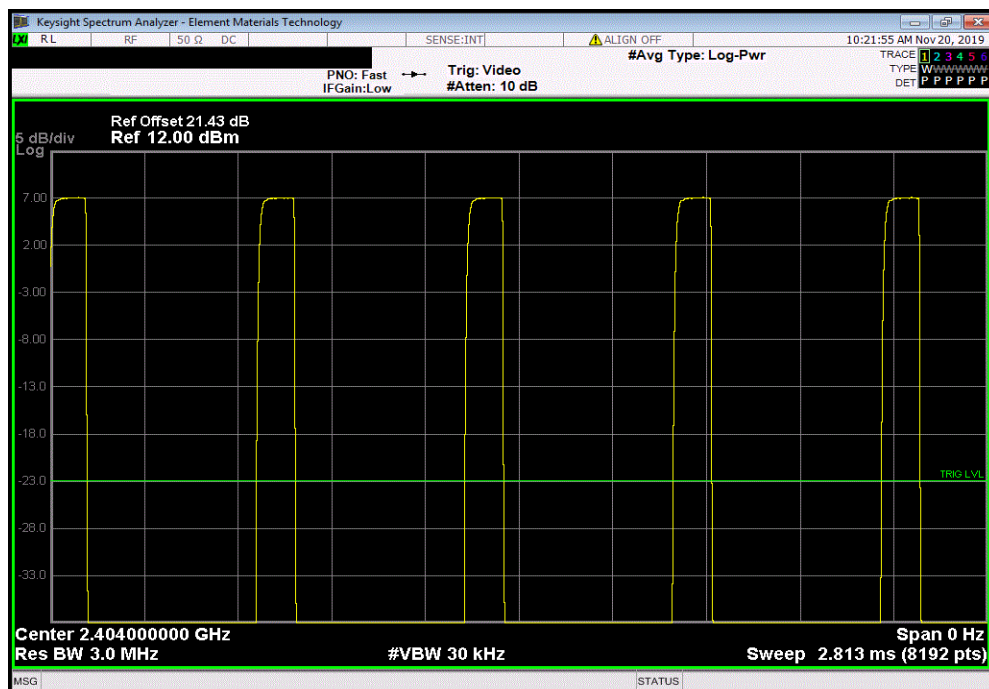


TbTx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), Low Channel, 2404 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
111.8 μ s	625 μ s	1	17.9	N/A	N/A	



PAS (2 Mbps), Low Channel, 2404 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

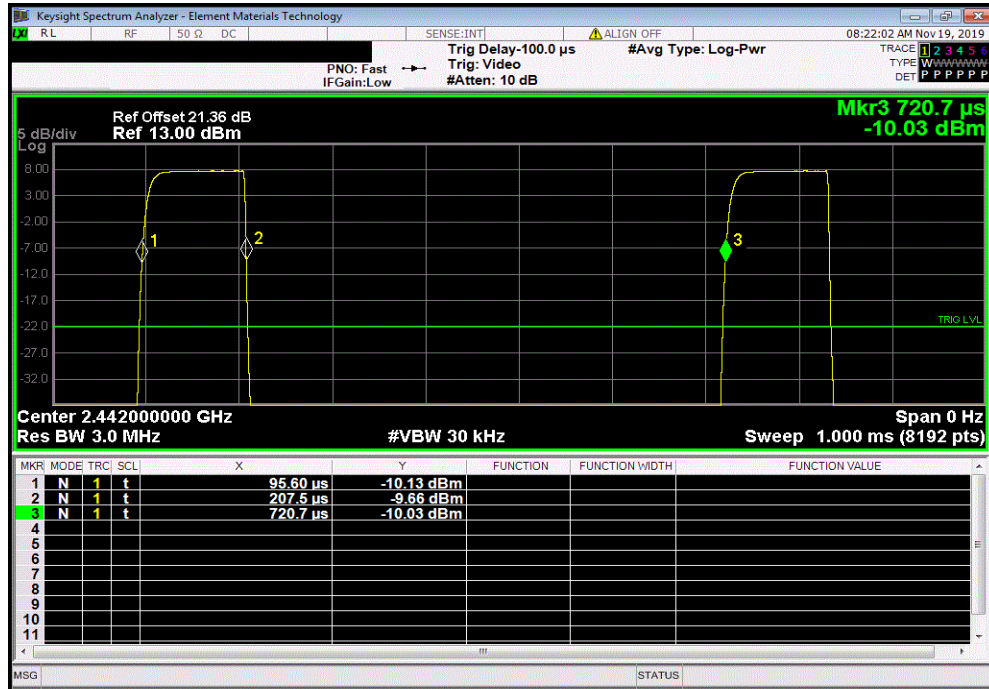


DUTY CYCLE

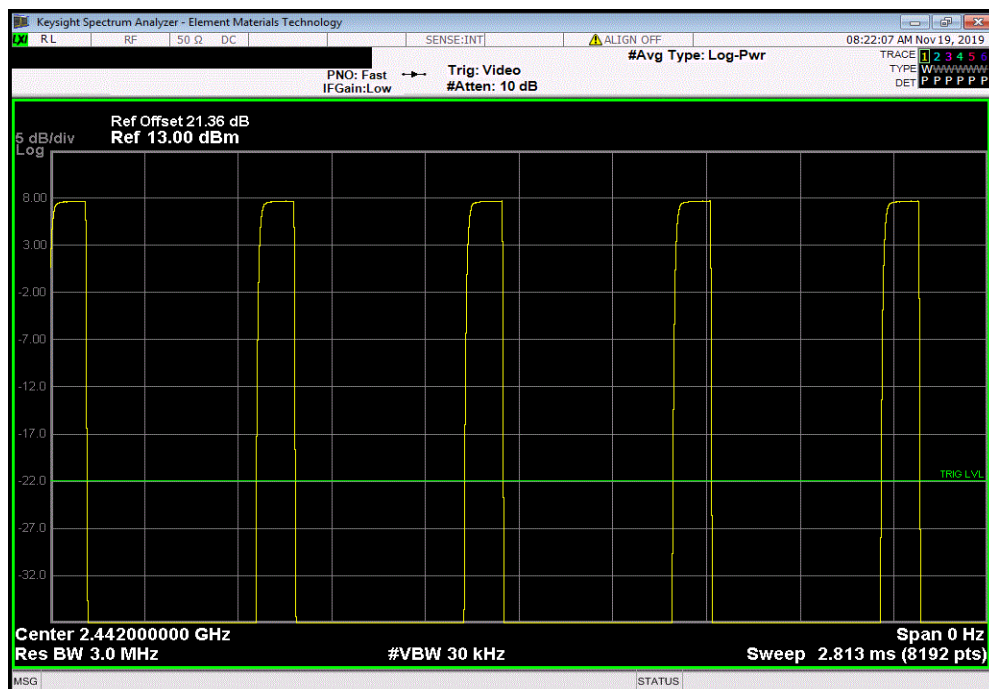


TbTtX 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), Mid Channel, 2442 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
111.9 μ s	625.1 μ s	1	17.9	N/A	N/A	



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

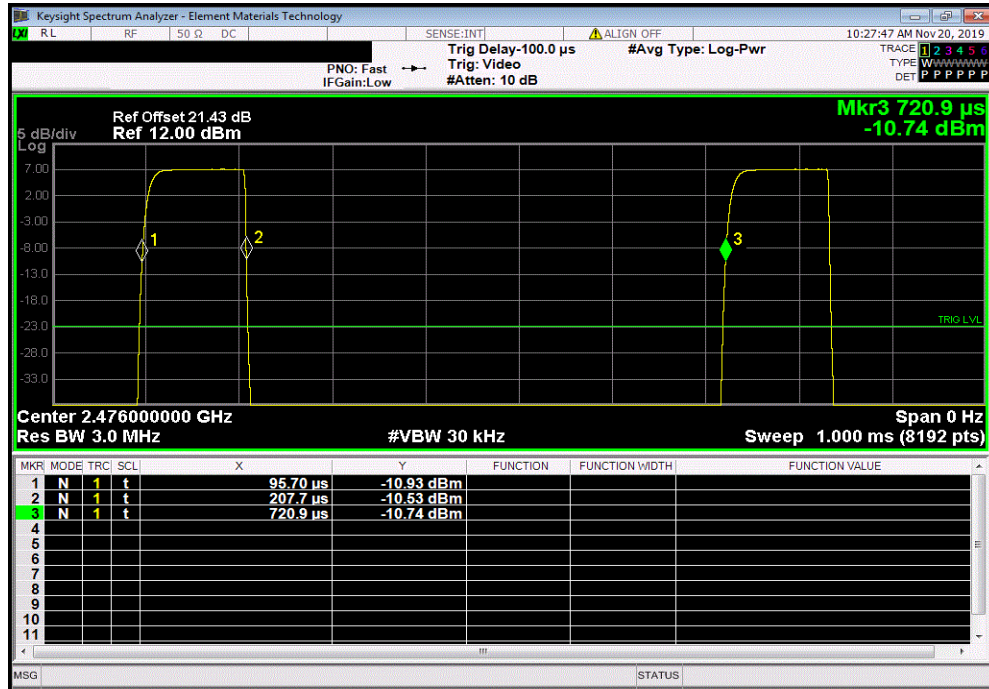


DUTY CYCLE

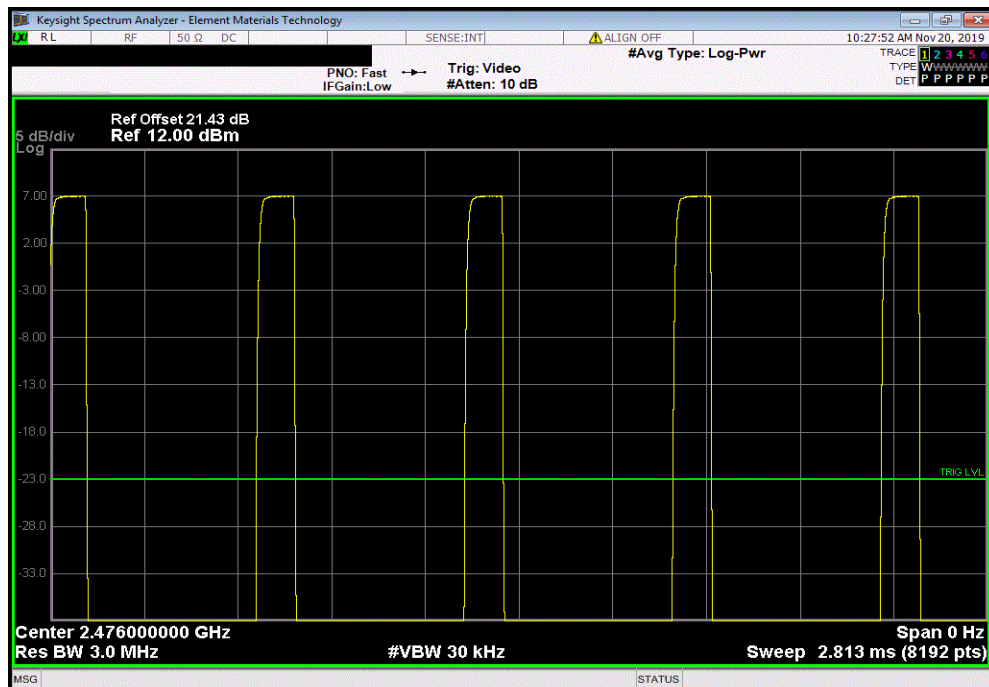


TbTx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), High Channel, 2476 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	112 us	625.2 us	1	17.9	N/A	N/A



PAS (2 Mbps), High Channel, 2476 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



OCCUPIED BANDWIDTH



XMR 2019.05.15

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	E4422B	TGQ	15-Mar-18	15-Mar-21
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	7-Jun-19	7-Jun-20
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	13-Dec-18	13-Dec-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



THxTx 2018.09.13 XM 2019.05.15

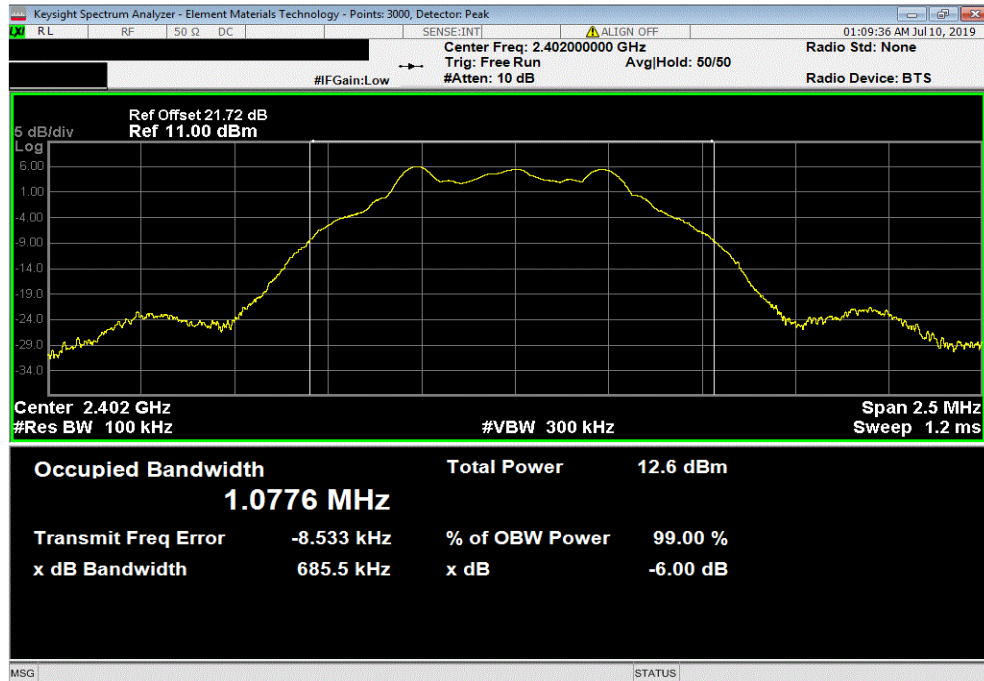
EUT: Remote Microphone		Work Order: NUAH0001	
Serial Number: EP3.7		Date: 9-Jul-19	
Customer: Nuance Hearing		Temperature: 21.6 °C	
Attendees: Charlie Esch		Humidity: 58.1% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Andrew Rogstad	Power: 4.8 VDC	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	6	Signature <i>Andrew Rogstad</i>	
		Value	Limit (±) Result
BLE/GFSK Low Channel, 2402 MHz		685.515 kHz	500 kHz Pass
BLE/GFSK Mid Channel, 2442 MHz		683.164 kHz	500 kHz Pass
BLE/GFSK High Channel, 2480 MHz		689.366 kHz	500 kHz Pass

OCCUPIED BANDWIDTH

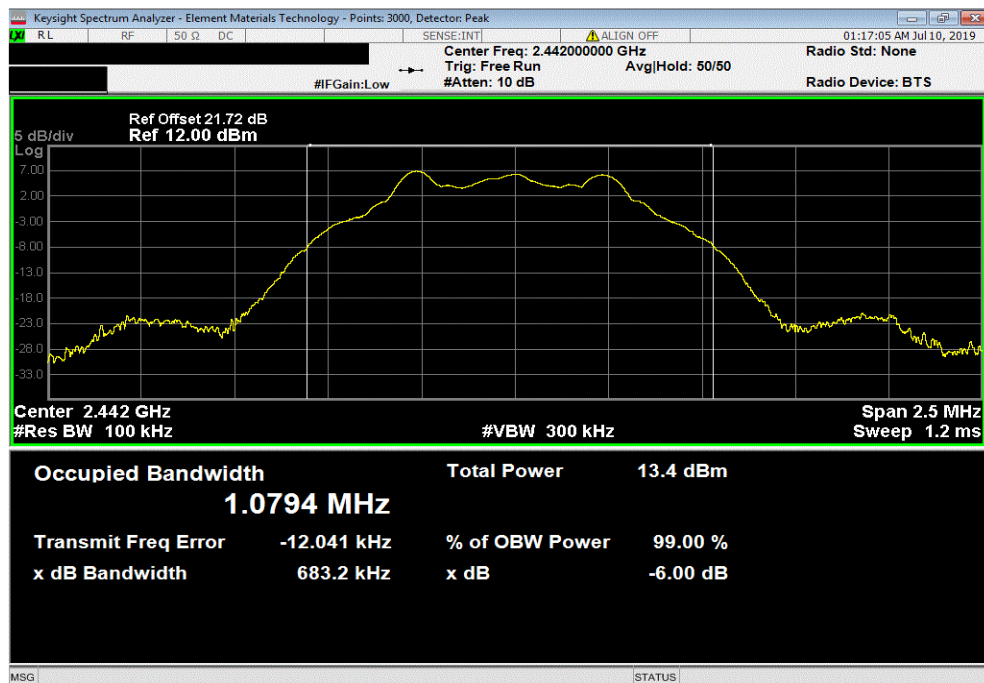


TMTx 2018.09.13 XMt 2019.05.15

BLE/GFSK Low Channel, 2402 MHz						
				Value	Limit (≥)	Result
				685.515 kHz	500 kHz	Pass



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

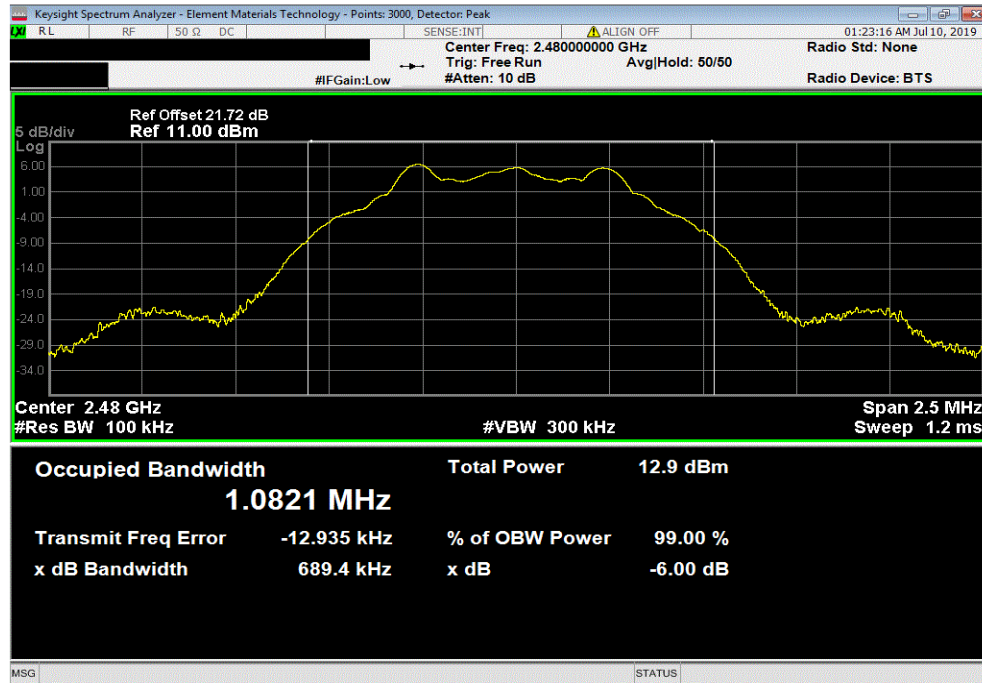


OCCUPIED BANDWIDTH



TMTx 2018.09.13 XMt 2019.05.15

BLE/GFSK High Channel, 2480 MHz						
Value				Limit	Result	
689.366 kHz				500 kHz	Pass	



OCCUPIED BANDWIDTH



XMI 2019.09.05

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
Meter - Multimeter	Fluke	117	MLS	23-Jan-17	23-Jan-20
Power Supply - DC	Agilent	U8002A	TPZ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	15-Sep-19	15-Sep-20
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Block - DC	Fairview Microwave	SD3379	AMI	6-Aug-19	6-Aug-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	1-May-19	1-May-20

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



TMTx 2019.08.30.0 XMI 2019.09.05

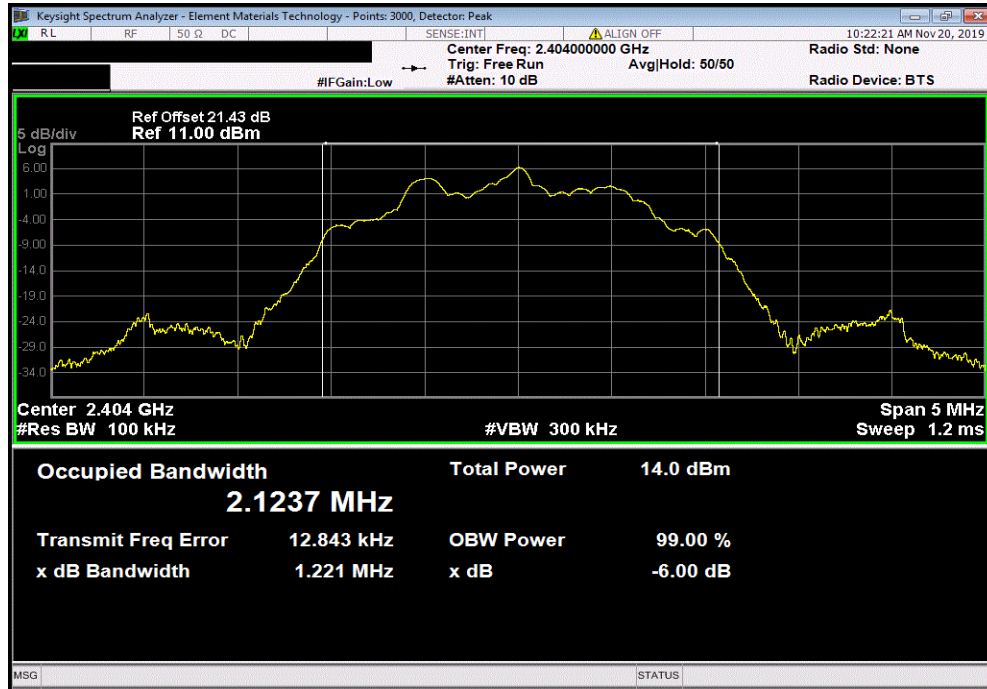
EUT: Remote Microphone		Work Order: NUAH0004	
Serial Number: 1938AE20030		Date: 19-Nov-19	
Customer: Nuance Hearing		Temperature: 22.3 °C	
Attendees: John Quach		Humidity: 33.5% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Dustin Sparks	Power: Battery	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
Reference level offset on spectrum analyzer includes 20 dB attenuator, DC block, and measurement cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Dustin Sparks</i>	
		Value	Limit (±) Result
PAS (2 Mbps), Low Channel, 2404 MHz		1.221 MHz	500 kHz Pass
PAS (2 Mbps), Mid Channel, 2442 MHz		1.218 MHz	500 kHz Pass
PAS (2 Mbps), High Channel, 2476 MHz		1.218 MHz	500 kHz Pass

OCCUPIED BANDWIDTH

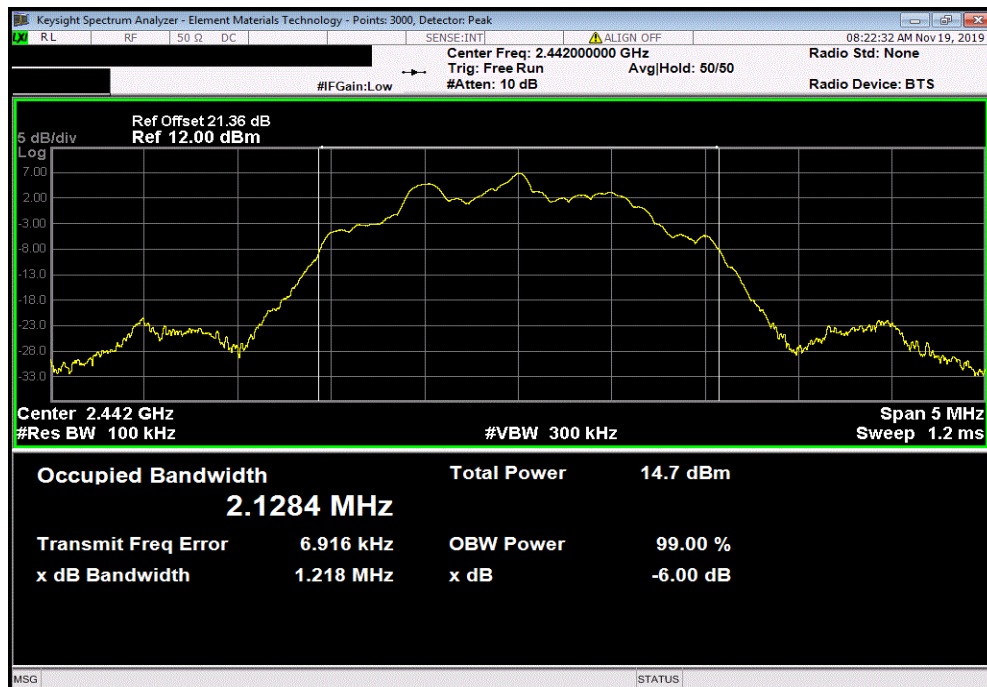


TbTx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), Low Channel, 2404 MHz						
				Value	Limit (≥)	Result
				1.221 MHz	500 kHz	Pass



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

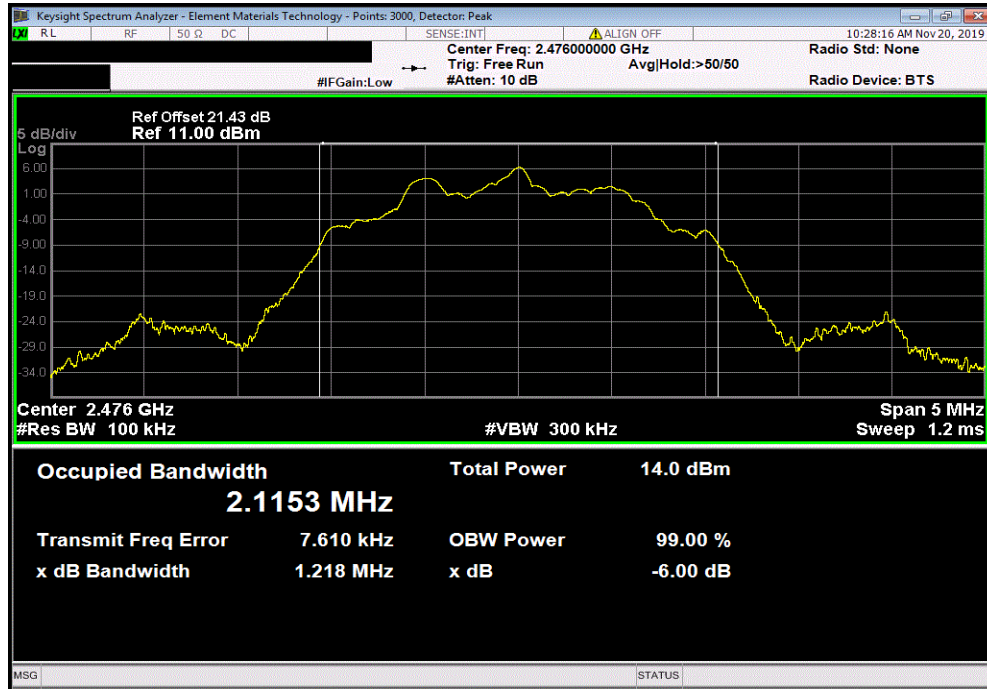


OCCUPIED BANDWIDTH



TbTx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), High Channel, 2476 MHz						
Value				Limit	Result	
1.218 MHz				500 kHz	Pass	



OUTPUT POWER



XMI 2019.05.15

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	E4422B	TGQ	15-Mar-18	15-Mar-21
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	7-Jun-19	7-Jun-20
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	13-Dec-18	13-Dec-19

TEST DESCRIPTION

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

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

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

OUTPUT POWER



TMTx 2018.09.13 XMM 2019.05.15

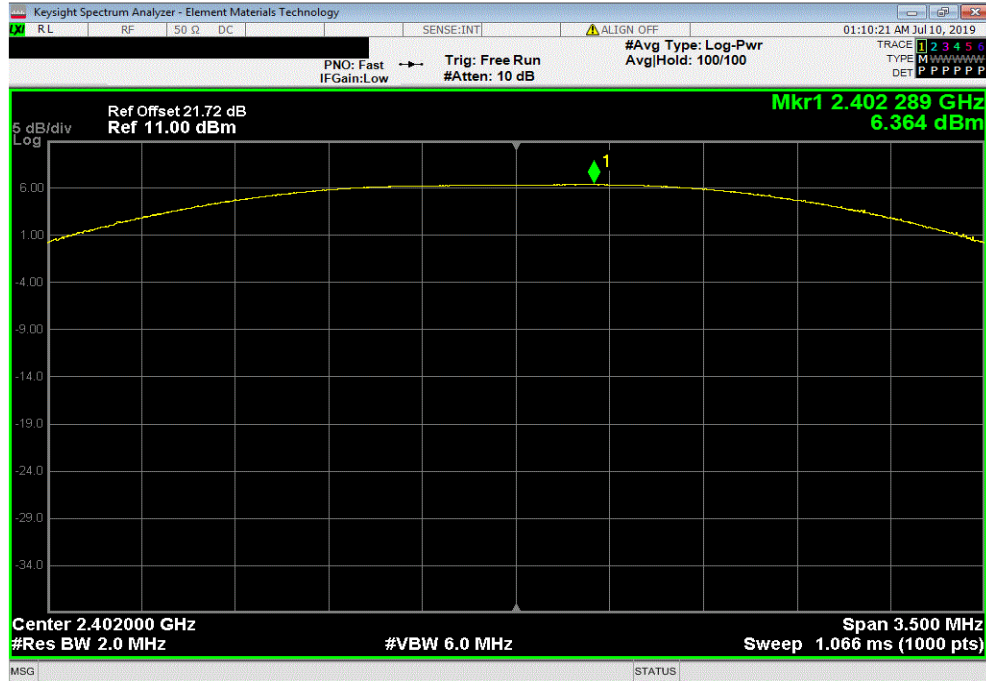
EUT: Remote Microphone		Work Order: NUAH0001	
Serial Number: EP3.7		Date: 9-Jul-19	
Customer: Nuance Hearing		Temperature: 21.5 °C	
Attendees: Charlie Esch		Humidity: 58.1% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Andrew Rogstad	Power: 4.8 VDC	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	6	Signature <i>Andrew Rogstad</i>	
		Out Pwr (dBm)	Limit (dBm) Result
BLE/GFSK Low Channel, 2402 MHz		6.364	30 Pass
BLE/GFSK Mid Channel, 2442 MHz		7.136	30 Pass
BLE/GFSK High Channel, 2480 MHz		6.691	30 Pass

OUTPUT POWER

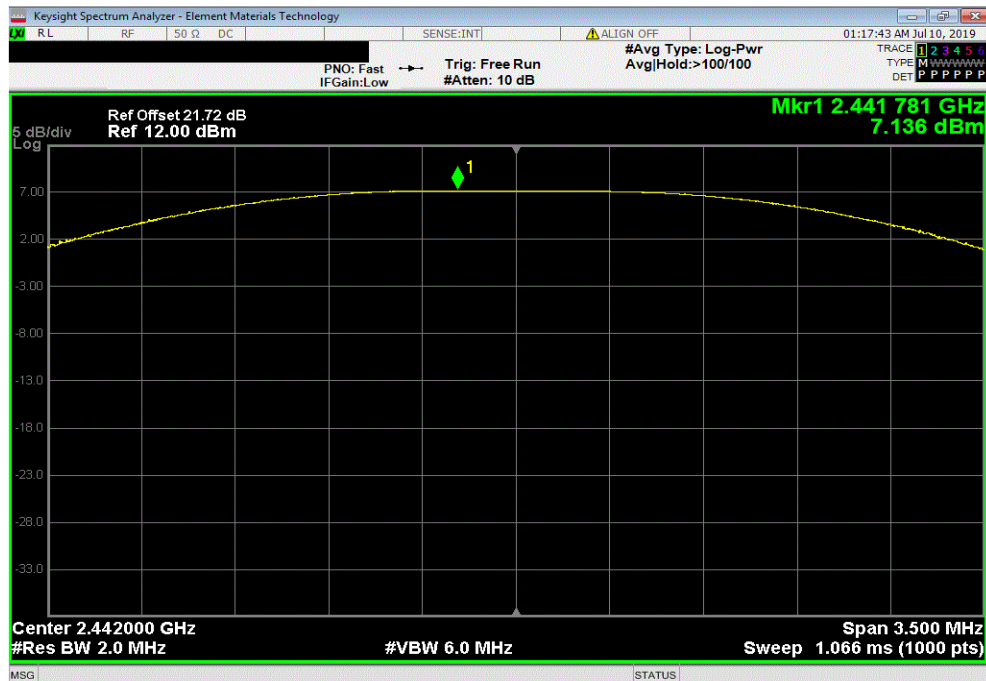


TMTx 2018.09.13 XMt 2019.05.15

BLE/GFSK Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				6.364	30	Pass



BLE/GFSK Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				7.136	30	Pass

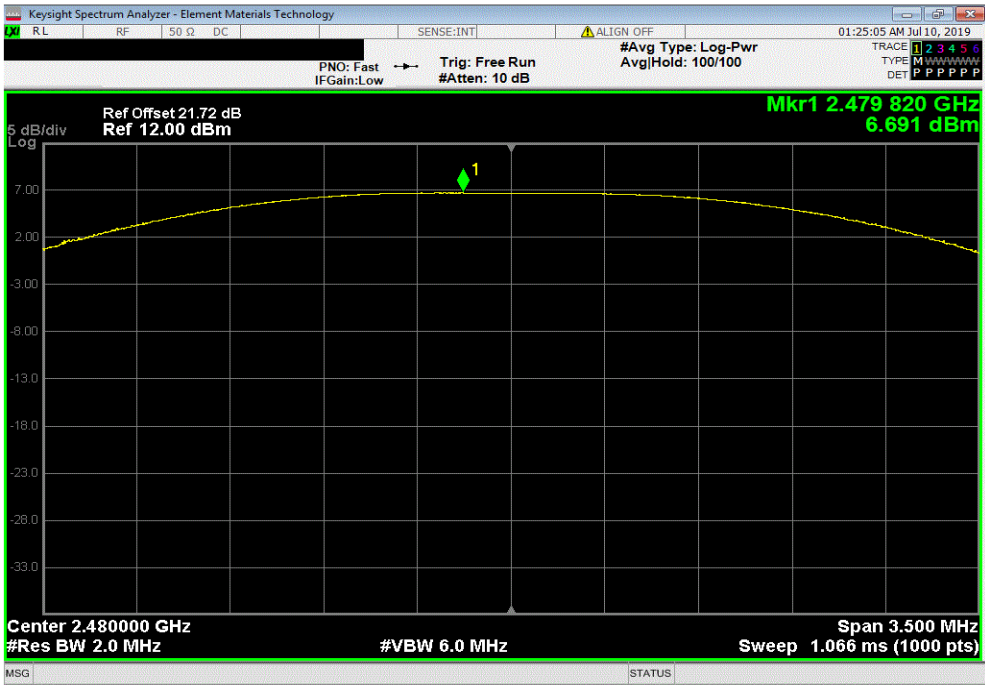


OUTPUT POWER



TMTx 2018.09.13 XMt 2019.05.15

BLE/GFSK High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				6.691	30	Pass



OUTPUT POWER



XMHt 2019.09.05

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
Meter - Multimeter	Fluke	117	MLS	23-Jan-17	23-Jan-20
Power Supply - DC	Agilent	U8002A	TPZ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	15-Sep-19	15-Sep-20
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Block - DC	Fairview Microwave	SD3379	AMI	6-Aug-19	6-Aug-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	1-May-19	1-May-20

TEST DESCRIPTION

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

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

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

OUTPUT POWER



TMTx 2019.08.30.0 XMM 2019.09.05

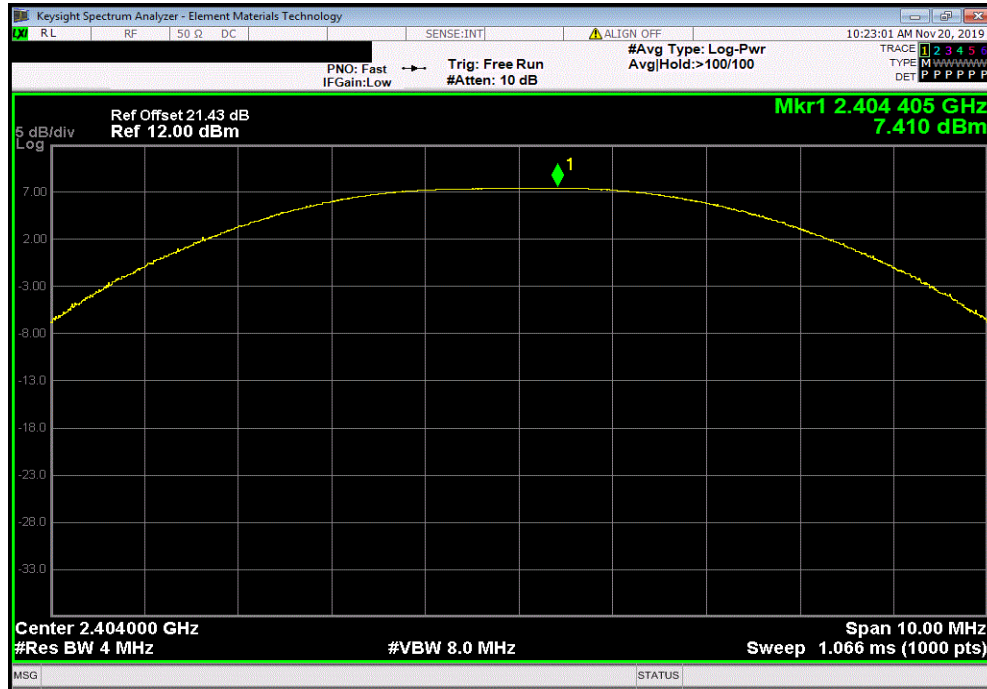
EUT: Remote Microphone		Work Order: NUAH0004	
Serial Number: 1938AE20030		Date: 19-Nov-19	
Customer: Nuance Hearing		Temperature: 22.3 °C	
Attendees: John Quach		Humidity: 33.5% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Dustin Sparks	Power: Battery	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
Reference level offset on spectrum analyzer includes 20 dB attenuator, DC block, and measurement cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Dustin Sparks</i>	
		Out Pwr (dBm)	Limit (dBm)
PAS (2 Mbps), Low Channel, 2404 MHz		7.41	30
PAS (2 Mbps), Mid Channel, 2442 MHz		8.068	30
PAS (2 Mbps), High Channel, 2476 MHz		7.407	30
			Result
			Pass
			Pass
			Pass

OUTPUT POWER

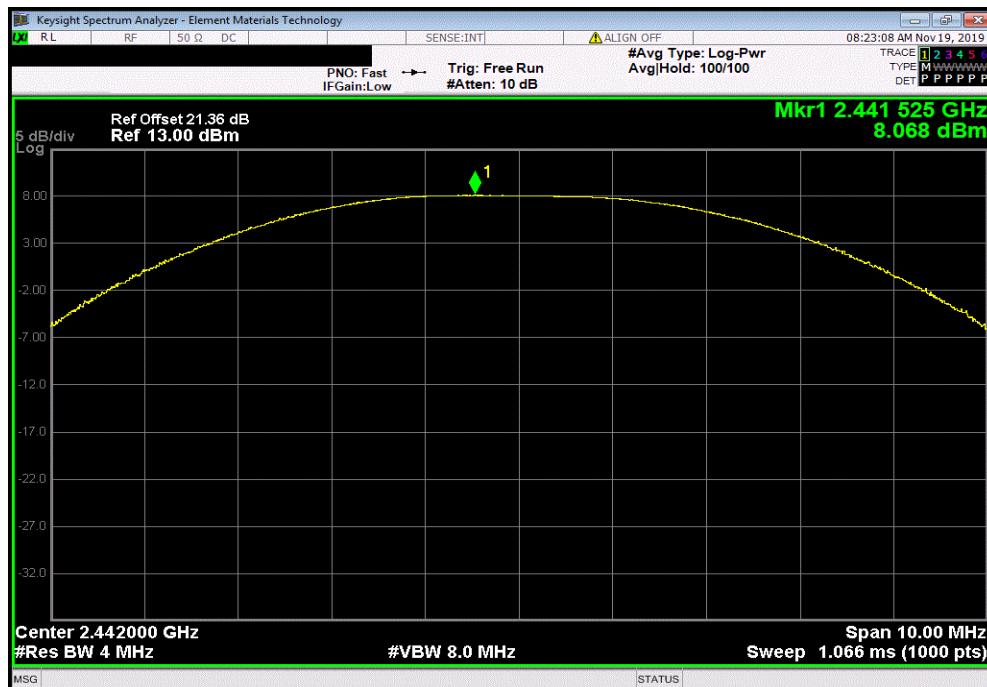


TbTx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), Low Channel, 2404 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				7.41	30	Pass



PAS (2 Mbps), Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				8.068	30	Pass

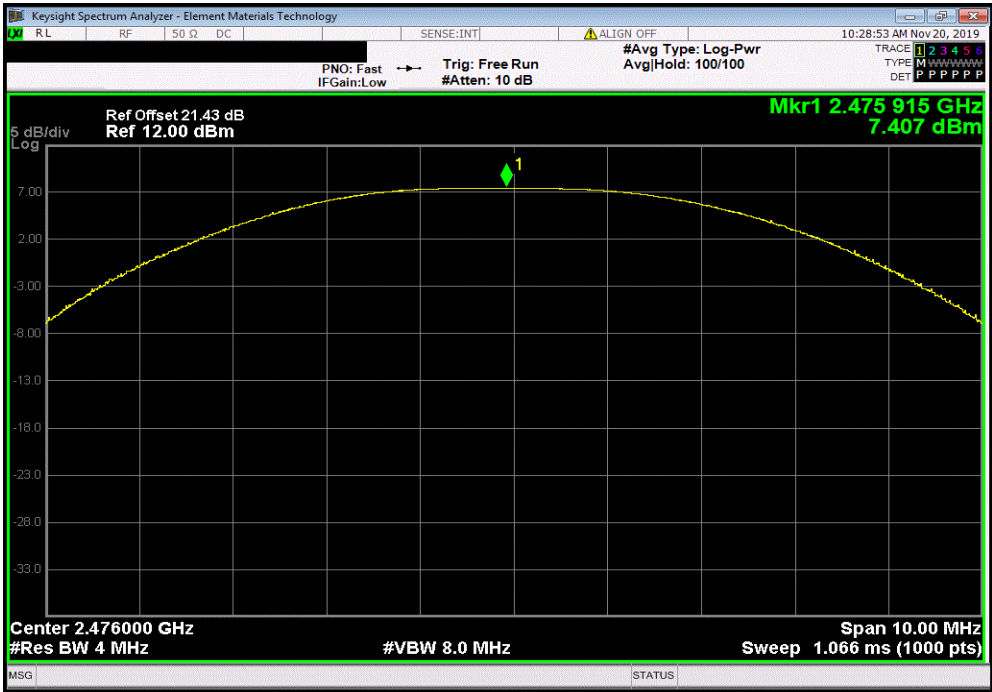


OUTPUT POWER



TbTx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), High Channel, 2476 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				7.407	30	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMIT 2019.05.15

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	E4422B	TGQ	15-Mar-18	15-Mar-21
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	7-Jun-19	7-Jun-20
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	13-Dec-18	13-Dec-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. The actual antenna gain of the EUT was added to the conducted output to derive the EIRP values.

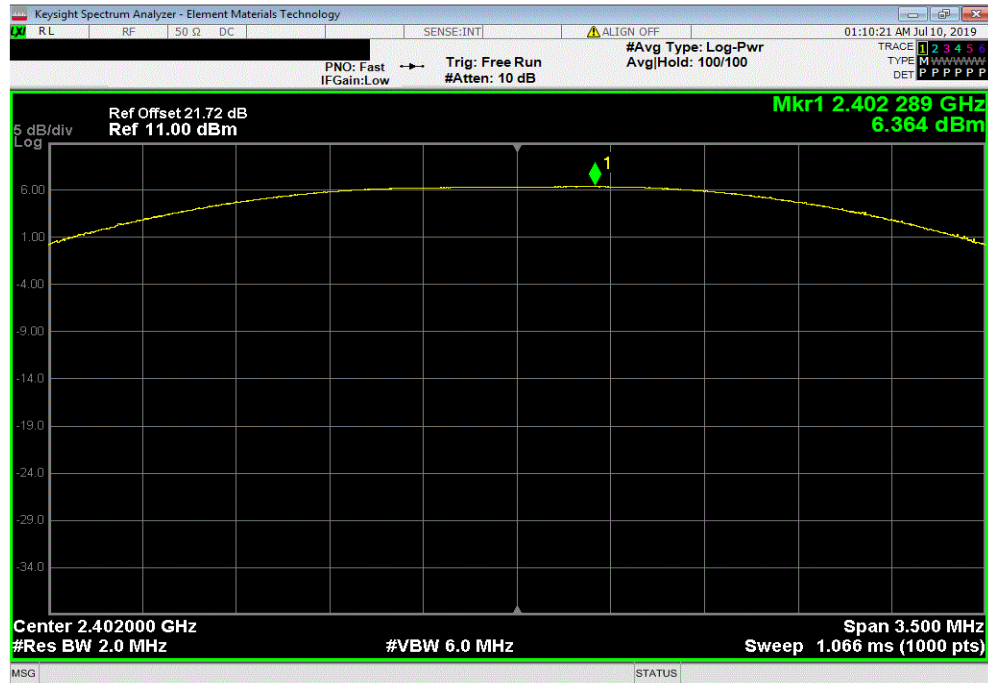
EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



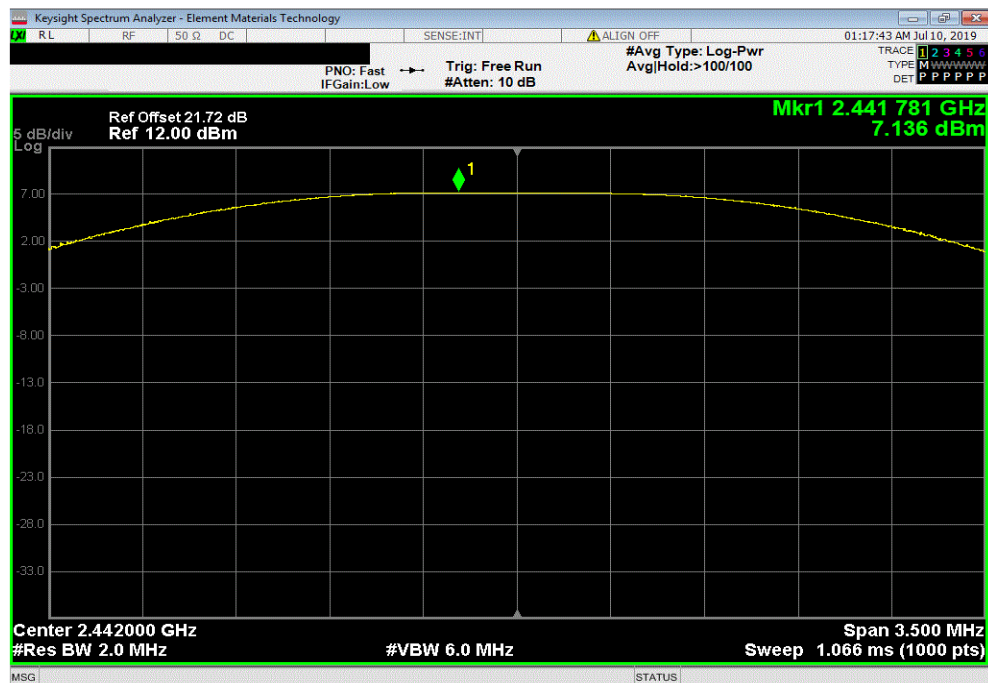
TMTx 2018.09.13 XMt 2019.05.15

EUT: Remote Microphone		Work Order: NUAH0001	
Serial Number: EP3.7		Date: 9-Jul-19	
Customer: Nuance Hearing		Temperature: 21.7 °C	
Attendees: Charlie Esch		Humidity: 58.7% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Andrew Rogstad	Power: 4.8 VDC	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	6	Signature <i>Andrew Rogstad</i>	
		Pk Cond Pwr (dBm)	Antenna Gain (dBi)
BLE/GFSK Low Channel, 2402 MHz		6.364	0
BLE/GFSK Mid Channel, 2442 MHz		7.136	0
BLE/GFSK High Channel, 2480 MHz		6.691	0
		EIRP (dBm)	EIRP Limit (dBm)
		6.364	36
		7.136	36
		6.691	36
			Result
			Pass
			Pass
			Pass

BLE/GFSK Low Channel, 2402 MHz							
			Pk Cond Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
			6.364	0	6.364	36	Pass



BLE/GFSK Mid Channel, 2442 MHz						
	Pk Cond Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result	
	7.136	0	7.136	36	Pass	

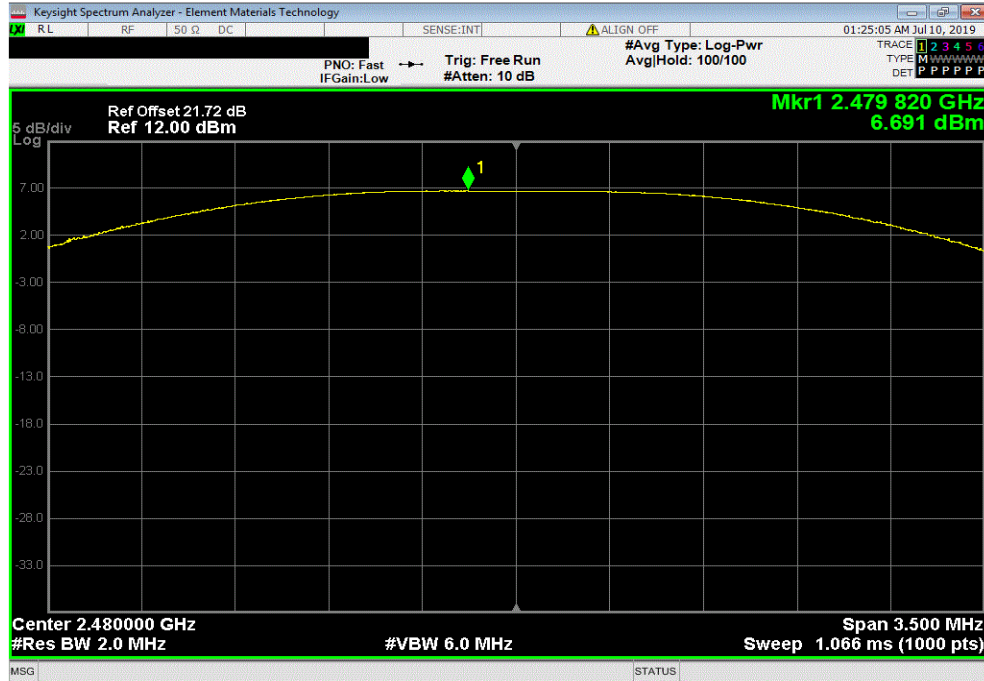


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TMTx 2018.09.13 XMt 2019.05.15

BLE/GFSK High Channel, 2480 MHz						
Pk Cond Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result		
6.691	0	6.691	36	Pass		



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMIT 2019.09.05

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
Meter - Multimeter	Fluke	117	MLS	23-Jan-17	23-Jan-20
Power Supply - DC	Agilent	U8002A	TPZ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	15-Sep-19	15-Sep-20
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Block - DC	Fairview Microwave	SD3379	AMI	6-Aug-19	6-Aug-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	1-May-19	1-May-20

TEST DESCRIPTION

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

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

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

The antenna gain of the EUT was added to the output power value to obtain the EIRP.

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TMTx 2019.08.30.0 XMI 2019.09.05

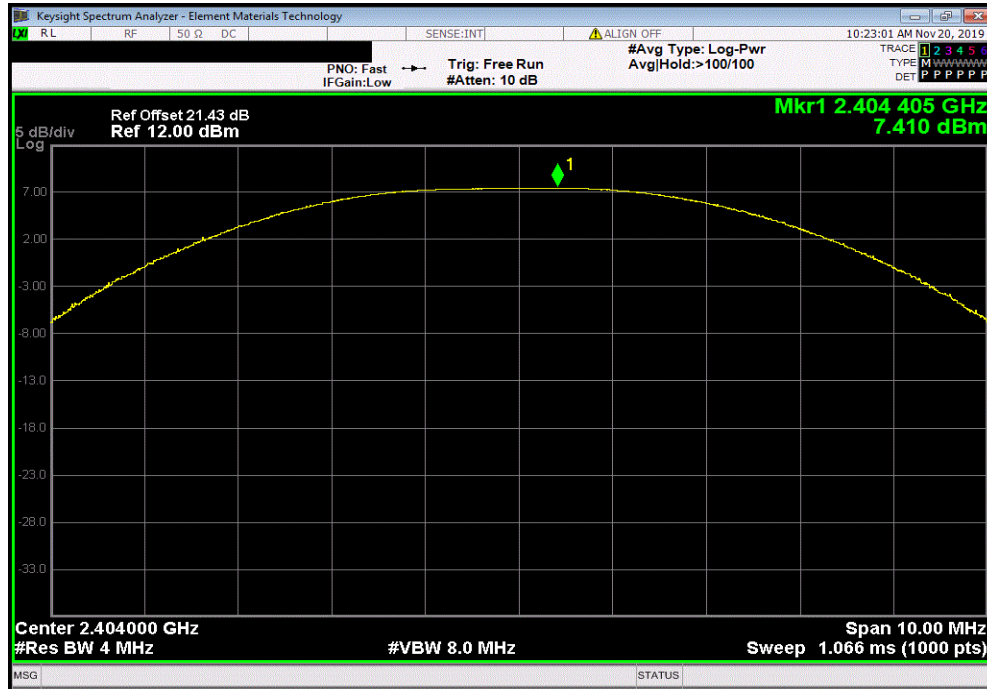
EUT: Remote Microphone		Work Order: NUAH0004	
Serial Number: 1938AE20030		Date: 19-Nov-19	
Customer: Nuance Hearing		Temperature: 22.4 °C	
Attendees: John Quach		Humidity: 33.4% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Dustin Sparks	Power: Battery	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
Reference level offset on spectrum analyzer includes 20 dB attenuator, DC block, and measurement cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Dustin Sparks</i>	
		Out Pwr (dBm)	Antenna Gain (dBi)
PAS (2 Mbps), Low Channel, 2404 MHz		7.41	0
PAS (2 Mbps), Mid Channel, 2442 MHz		8.068	0
PAS (2 Mbps), High Channel, 2476 MHz		7.407	0
		EIRP (dBm)	EIRP Limit (dBm)
		7.41	36
		8.068	36
		7.407	36
			Result
			Pass
			Pass
			Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

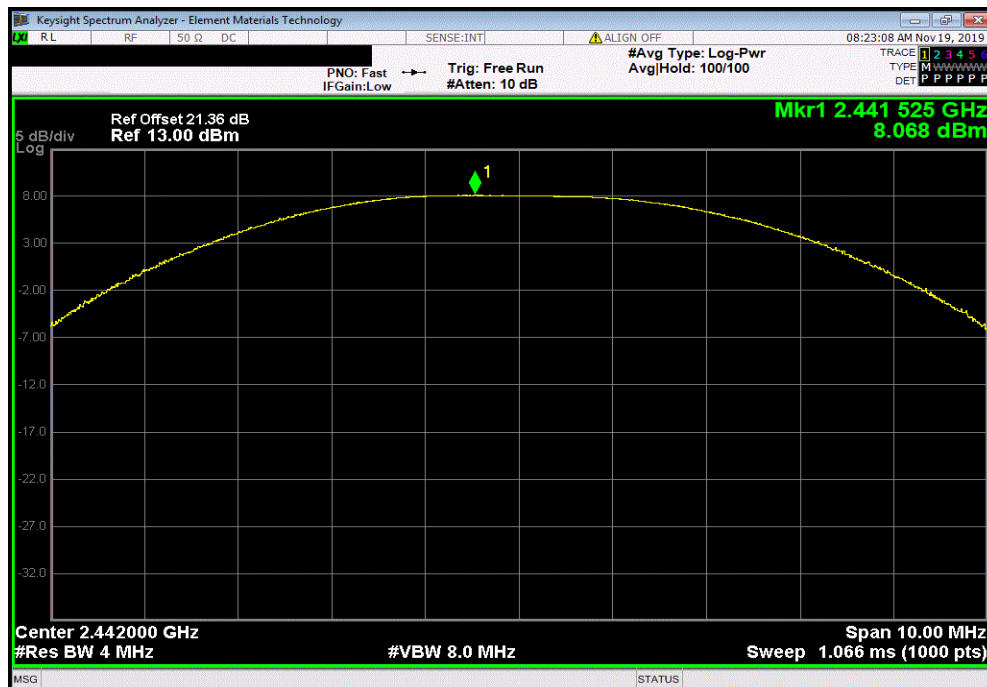


TbTx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), Low Channel, 2404 MHz						
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result	
	7.41	0	7.41	36	Pass	



PAS (2 Mbps), Mid Channel, 2442 MHz						
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result	
	8.068	0	8.068	36	Pass	

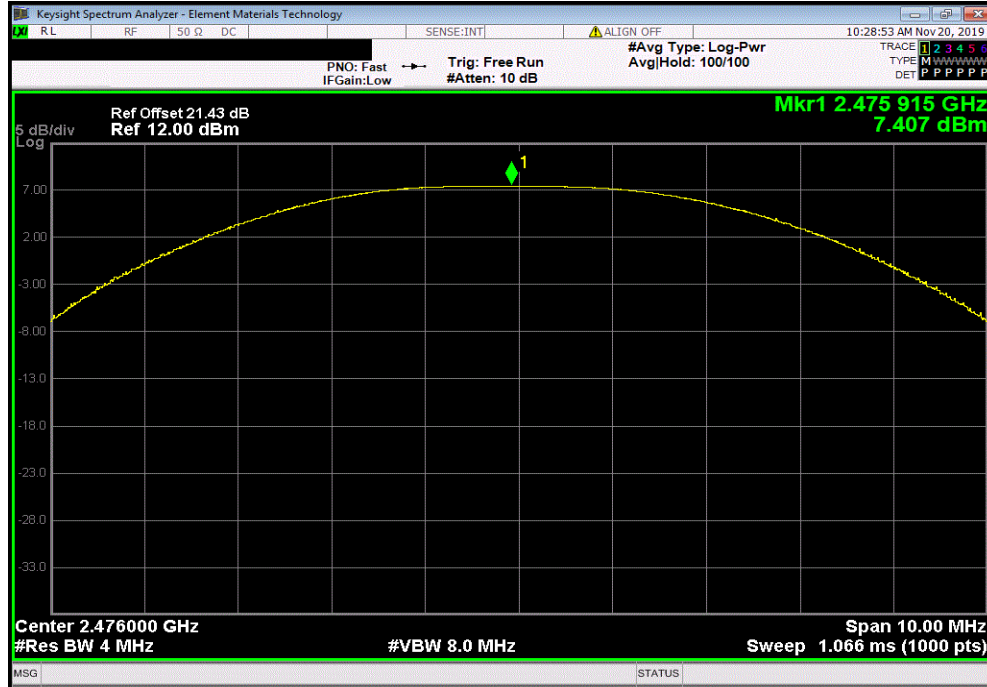


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TbTx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), High Channel, 2476 MHz					
Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result	
7.407	0	7.407	36	Pass	



POWER SPECTRAL DENSITY



XMI 2019.05.15

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	E4422B	TGQ	15-Mar-18	15-Mar-21
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	7-Jun-19	7-Jun-20
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	13-Dec-18	13-Dec-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



TMTx 2018.09.13 XMt 2019.05.15

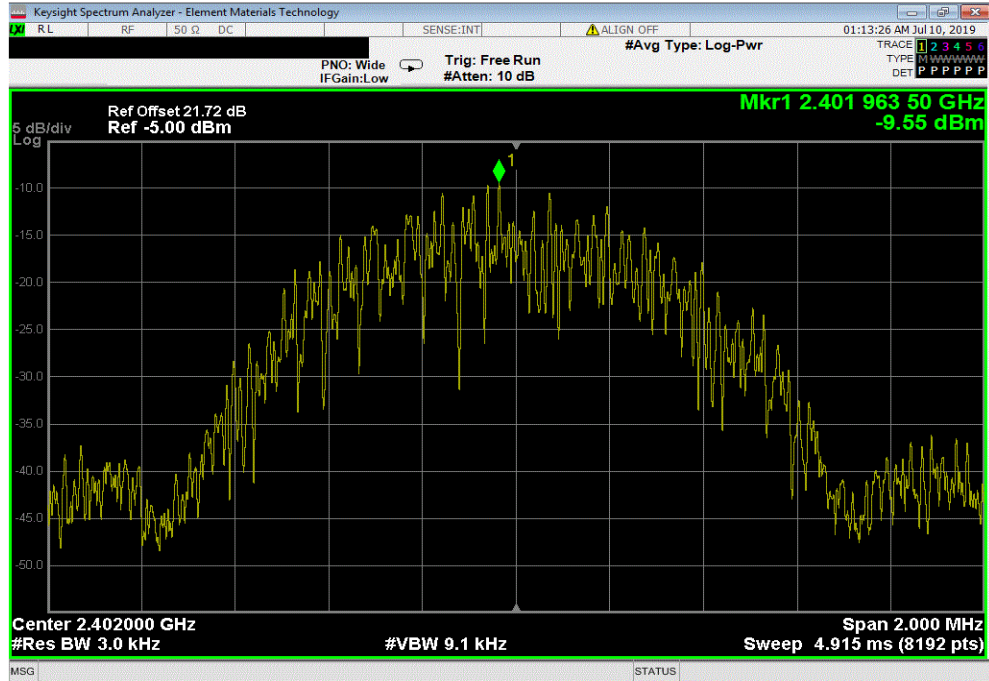
EUT: Remote Microphone		Work Order: NUAH0001	
Serial Number: EP3.7		Date: 9-Jul-19	
Customer: Nuance Hearing		Temperature: 21.5 °C	
Attendees: Charlie Esch		Humidity: 57.8% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Andrew Rogstad	Power: 4.8 VDC	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	6	Signature <i>Andrew Rogstad</i>	
		Value dBm/3kHz	Limit < dBm/3kHz
BLE/GFSK Low Channel, 2402 MHz		-9.548	8
BLE/GFSK Mid Channel, 2442 MHz		-8.654	8
BLE/GFSK High Channel, 2480 MHz		-9.015	8
			Results
			Pass
			Pass
			Pass

POWER SPECTRAL DENSITY

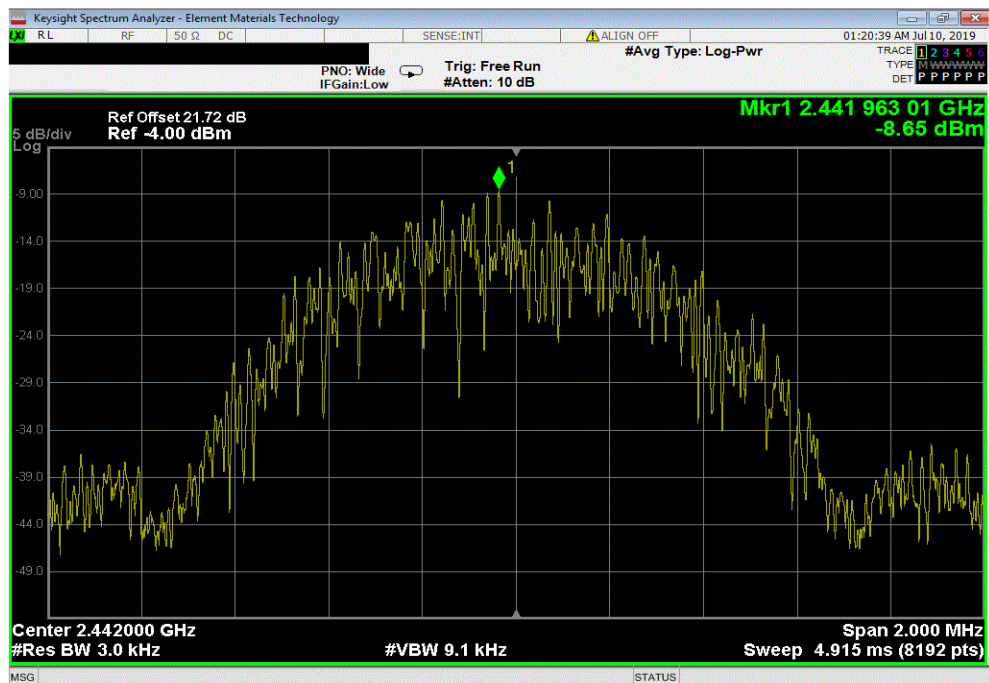


TMTx 2018.09.13 XMt 2019.05.15

BLE/GFSK Low Channel, 2402 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-9.548	8	Pass



BLE/GFSK Mid Channel, 2442 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-8.654	8	Pass

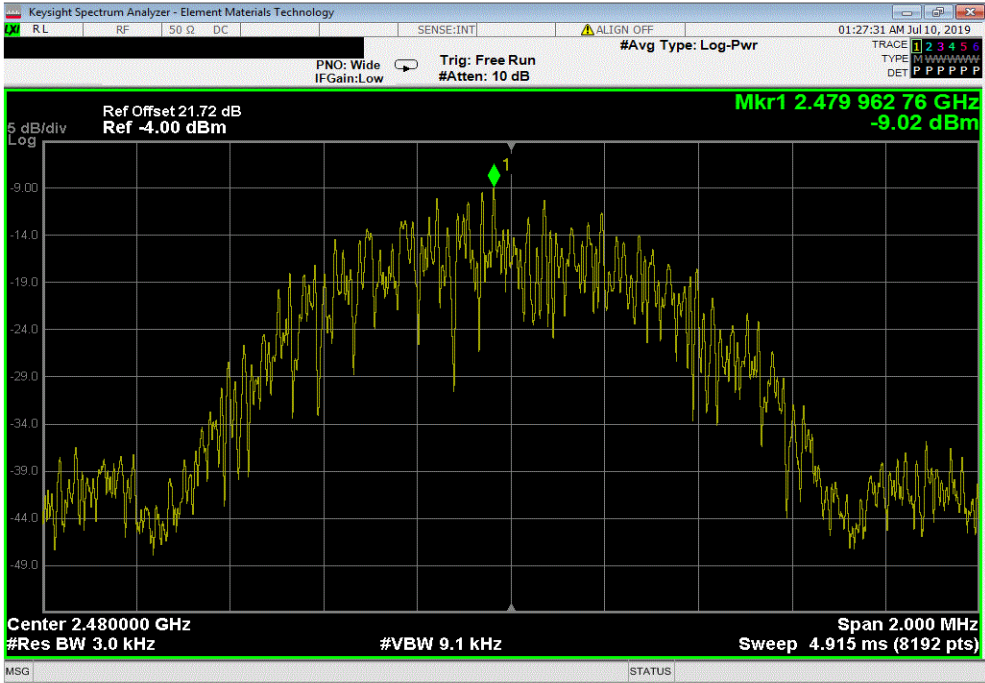


POWER SPECTRAL DENSITY



TMTx 2018.09.13 XMI 2019.05.15

BLE/GFSK High Channel, 2480 MHz						
				Value	Limit	Results
				dBm/3kHz	< dBm/3kHz	
				-9.015	8	Pass



POWER SPECTRAL DENSITY



XMIT 2019.09.05

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
Meter - Multimeter	Fluke	117	MLS	23-Jan-17	23-Jan-20
Power Supply - DC	Agilent	U8002A	TPZ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	15-Sep-19	15-Sep-20
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Block - DC	Fairview Microwave	SD3379	AMI	6-Aug-19	6-Aug-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	1-May-19	1-May-20

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



TMTx 2019.08.30.0 XMI 2019.09.05

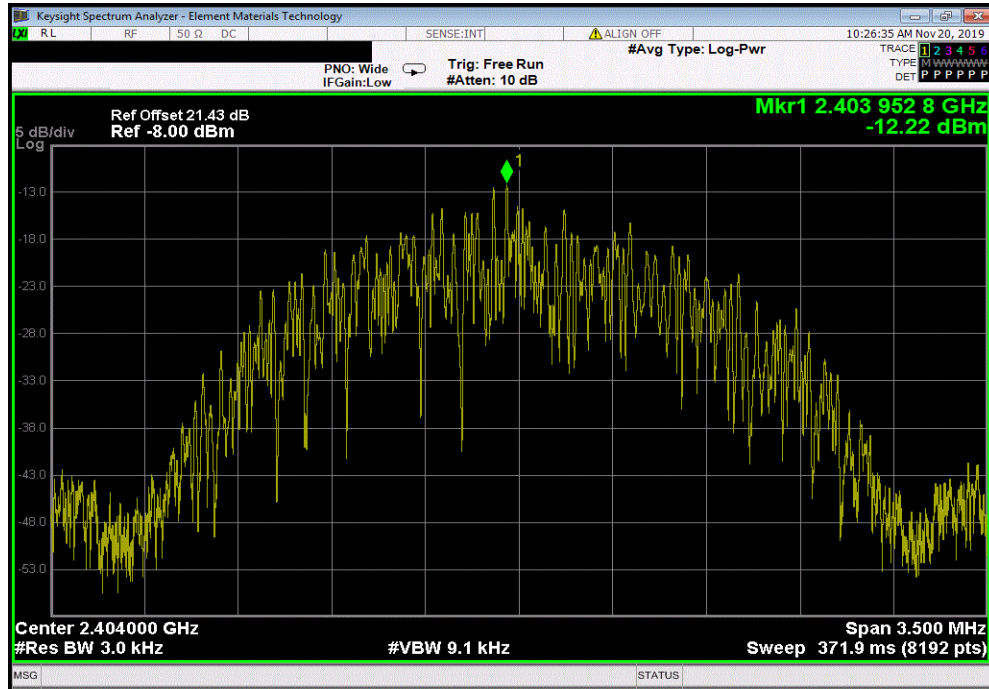
EUT: Remote Microphone		Work Order: NUAH0004	
Serial Number: 1938AE20030		Date: 19-Nov-19	
Customer: Nuance Hearing		Temperature: 22.3 °C	
Attendees: John Quach		Humidity: 33.5% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Dustin Sparks	Power: Battery	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
Reference level offset on spectrum analyzer includes 20 dB attenuator, DC block, and measurement cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Dustin Sparks</i>	
		Value dBm/3kHz	Limit < dBm/3kHz
PAS (2 Mbps), Low Channel, 2404 MHz		-12.223	8
PAS (2 Mbps), Mid Channel, 2442 MHz		-11.478	8
PAS (2 Mbps), High Channel, 2476 MHz		-11.979	8
			Results
			Pass
			Pass
			Pass

POWER SPECTRAL DENSITY

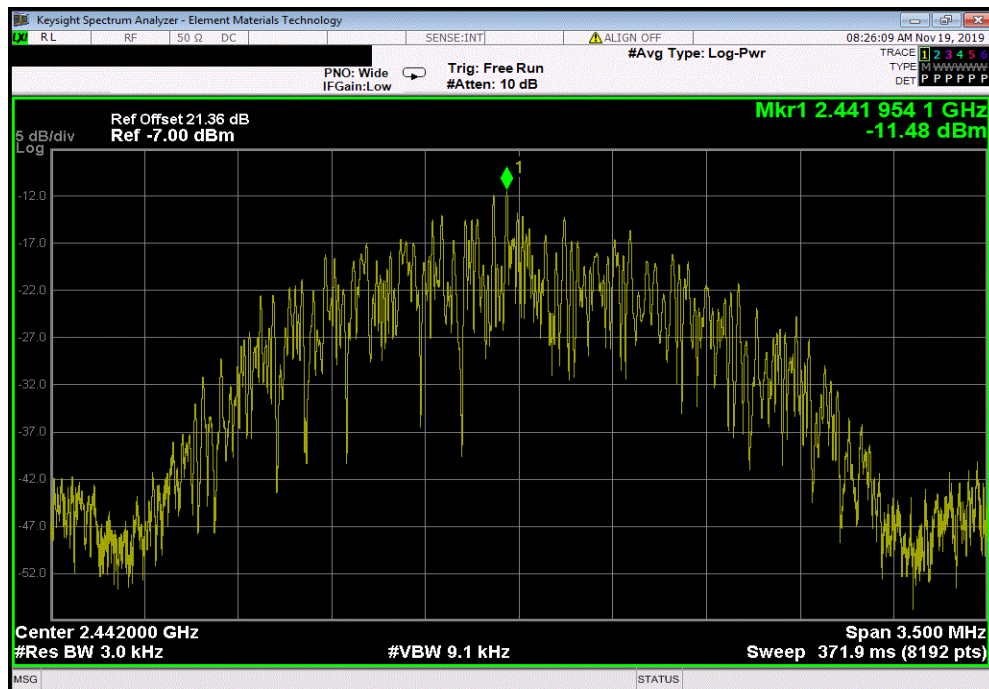


TbTtx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), Low Channel, 2404 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-12.223	8	Pass			



PAS (2 Mbps), Mid Channel, 2442 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-11.478	8	Pass			

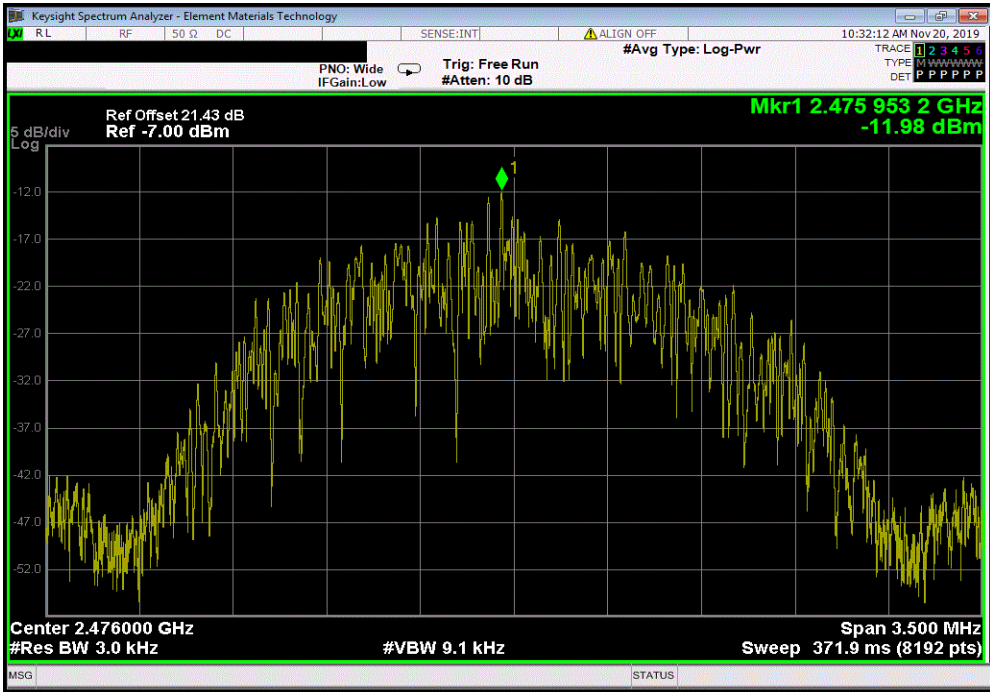


POWER SPECTRAL DENSITY



TbTtx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), High Channel, 2476 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
-11.979				8	Pass	



BAND EDGE COMPLIANCE



XMIT 2019.05.15

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	E4422B	TGQ	15-Mar-18	15-Mar-21
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	7-Jun-19	7-Jun-20
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	13-Dec-18	13-Dec-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



TMTx 2018.09.13 XMI 2019.05.15

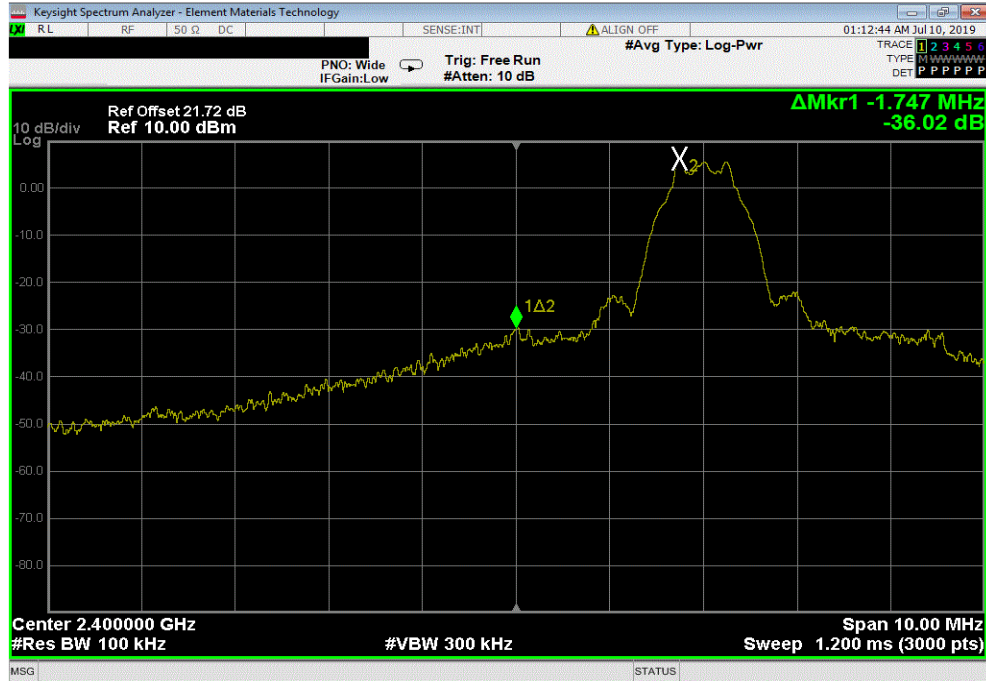
EUT: Remote Microphone		Work Order: NUAH0001	
Serial Number: EP3.7		Date: 9-Jul-19	
Customer: Nuance Hearing		Temperature: 21.7 °C	
Attendees: Charlie Esch		Humidity: 60.2% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Andrew Rogstad	Power: 4.8 VDC	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	6	Signature <i>Andrew Rogstad</i>	
		Value (dBc)	Limit ≤ (dBc) Result
BLE/GFSK Low Channel, 2402 MHz		-36.02	-20 Pass
BLE/GFSK High Channel, 2480 MHz		-46.41	-20 Pass

BAND EDGE COMPLIANCE

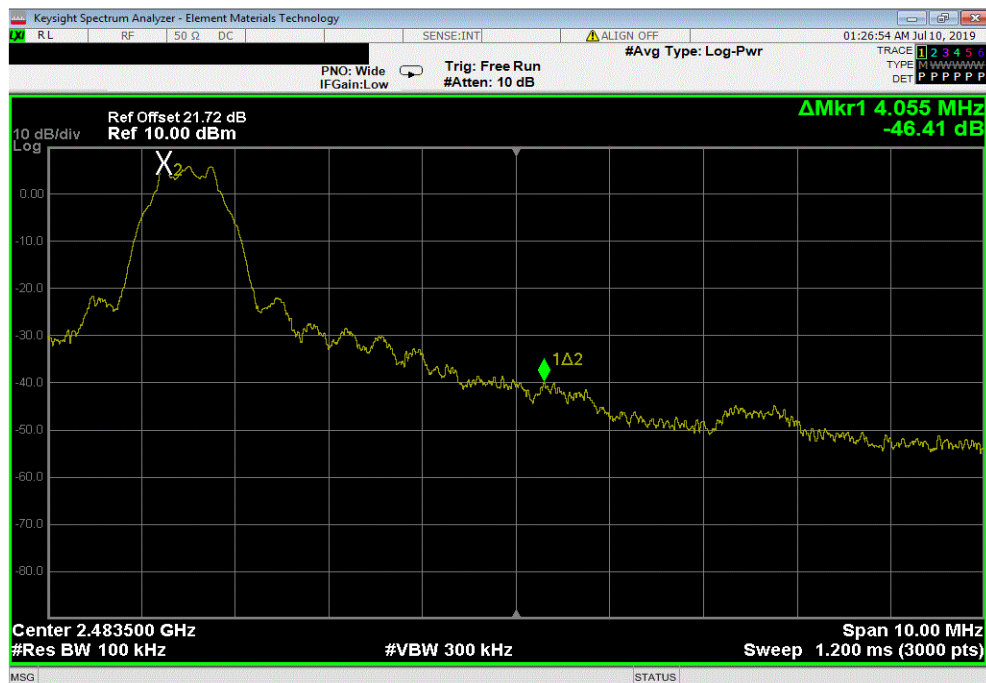


TMTx 2018.09.13 XMt 2019.05.15

BLE/GFSK Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-36.02	-20	Pass



BLE/GFSK High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-46.41	-20	Pass



BAND EDGE COMPLIANCE



XMIT 2019.09.05

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
Meter - Multimeter	Fluke	117	MLS	23-Jan-17	23-Jan-20
Power Supply - DC	Agilent	U8002A	TPZ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	15-Sep-19	15-Sep-20
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Block - DC	Fairview Microwave	SD3379	AMI	6-Aug-19	6-Aug-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	1-May-19	1-May-20

TEST DESCRIPTION

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

BAND EDGE COMPLIANCE



TMTx 2019.08.30.0 XMM 2019.09.05

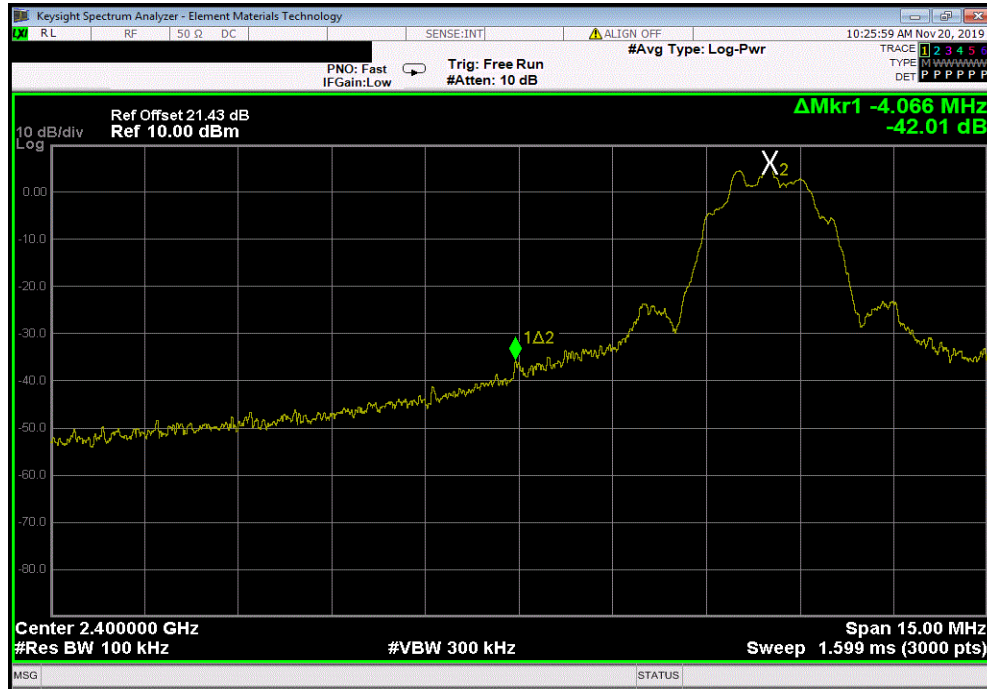
EUT: Remote Microphone		Work Order: NUAH0004	
Serial Number: 1938AE20030		Date: 19-Nov-19	
Customer: Nuance Hearing		Temperature: 22.4 °C	
Attendees: John Quach		Humidity: 33.4% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Dustin Sparks	Power: Battery	Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
Reference level offset on spectrum analyzer includes 20 dB attenuator, DC block, and measurement cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Dustin Sparks</i>	
		Value (dBc)	Limit ≤ (dBc) Result
PAS (2 Mbps), Low Channel, 2404 MHz		-42.02	-20 Pass
PAS (2 Mbps), High Channel, 2476 MHz		-52.81	-20 Pass

BAND EDGE COMPLIANCE



TbTtx 2019.08.30.0 XMI 2019.09.05

PAS (2 Mbps), Low Channel, 2404 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-42.02	-20	Pass



PAS (2 Mbps), High Channel, 2476 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-52.81	-20	Pass

