

Nuance Hearing

Remote Microphone

FCC 15.207:2019, FCC 15.247:2019 Bluetooth

Report # NUAH0002



TESTING





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 C62 10:2013
FCC 15.247:2019	ANSI 663.10.2013

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/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	US0017	US0191	US0157	



Test Setup Block Diagrams





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.





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	Cables							
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2			
LISB Cable	Ves	10 m	No	Nuance Pod	USB Interface			
COD Cable	163	1.0 11	NO	Nuance i ou	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	10 m	No		Power Supply			
AC Cable	INU	1.0 11	NO	AC Mains	(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	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
		Powerline	Tested as	No EMI suppression	EUT remained at
1	2019-07-02	Conducted	delivered to	devices were added or	Element following the
		Emissions	Test Station.	modified during this test.	test.
		Spurious	Tested as	No EMI suppression	EUT remained at
2	2019-07-02	Radiated	delivered to	devices were added or	Element following the
		Emissions	Test Station.	modified during this test.	test.
			Tested as	No EMI suppression	EUT remained at
3	2019-07-09	Duty Cycle	delivered to	devices were added or	Element following the
			Test Station.	modified during this test.	test.
		Occupied	Tested as	No EMI suppression	EUT remained at
4	2019-07-09	Decupied	delivered to	devices were added or	Element following the
		Danuwiuun	Test Station.	modified during this test.	test.
		Quitout	Tested as	No EMI suppression	EUT remained at
5	2019-07-09	Duipui	delivered to	devices were added or	Element following the
		FOWEI	Test Station.	modified during this test.	test.
		Equivalent	Tostod as		ELIT remained at
6	2010-07-00	Isotropic	delivered to	devices were added or	Element following the
0	2019-07-09	Radiated	Test Station	modified during this test	tost
		Power		mouned during this test.	
		Power	Tested as	No EMI suppression	EUT remained at
7	2019-07-09	Spectral	delivered to	devices were added or	Element following the
		Density	Test Station.	modified during this test.	test.
		Band Edge	Tested as	No EMI suppression	EUT remained at
8	2019-07-09	Compliance	delivered to	devices were added or	Element following the
		Compliance	Test Station.	modified during this test.	test.
		Spurious	Tested as	No EMI suppression	Scheduled testing
9	2019-07-09	Conducted	delivered to	devices were added or	was completed
		Emissions	Test Station.	modified during this test.	

MODIFICATIONS



Equipment Modifications (PAS, NUAH0004)

Item	Date	Test	Modification	Note	Disposition of EUT
		Powerline	Tested as	No EMI suppression	EUT remained at
1	2019-11-19	Conducted	delivered to	devices were added or	Element following the
		Emissions	Test Station.	modified during this test.	test.
		Spurious	Tested as	No EMI suppression	EUT remained at
2	2019-11-19	Radiated	delivered to	devices were added or	Element following the
		Emissions	Test Station.	modified during this test.	test.
			Tested as	No EMI suppression	EUT remained at
3	2019-11-19	Duty Cycle	delivered to	devices were added or	Element following the
			Test Station.	modified during this test.	test.
		Occupied	Tested as	No EMI suppression	EUT remained at
4	2019-11-19	Bondwidth	delivered to	devices were added or	Element following the
		Danuwiutn	Test Station.	modified during this test.	test.
		Output	Tested as	No EMI suppression	EUT remained at
5	2019-11-19	Duipui	delivered to	devices were added or	Element following the
		FOWEI	Test Station.	modified during this test.	test.
		Equivalent	Tested as	No EMI suppression	ELIT remained at
6	2010-11-10	Isotropic	delivered to	devices were added or	Element following the
0	2019-11-19	Radiated	Test Station	modified during this test	tost
		Power		mouned during this test.	
		Power	Tested as	No EMI suppression	EUT remained at
7	2019-11-19	Spectral	delivered to	devices were added or	Element following the
		Density	Test Station.	modified during this test.	test.
		Band Edge	Tested as	No EMI suppression	EUT remained at
8	2019-11-19	Compliance	delivered to	devices were added or	Element following the
		Compliance	Test Station.	modified during this test.	test.
		Spurious	Tested as	No EMI suppression	Schodulad testing
9	2019-11-19	Conducted	delivered to	devices were added or	was completed
		Emissions	Test Station.	modified during this test.	



TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 500hm measuring port is terminated by a 500hm EMI meter or a 500hm resistive load. All 500hm measuring ports of the LISN are terminated by 500hm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
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

Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

NUAH0001-2

MODES INVESTIGATED

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



EUT:	Remote Micr	ophone			Work Order:	NUAH0001		
Serial Number:	EP3.4				Date:	07/02/2019		
Customer:	Nuance Hea	ring			Temperature:	21.9°C		
Attendees:	Charlie Esch				Relative Humidity:	62.3%		
Customer Project:	None				Bar. Pressure:	1014 mb		
Tested By:	Andrew Rog	stad			Job Site:	MN03		
Power:	110VAC/60H	lz			Configuration:	NUAH0001-2		
TEST SPECIFI	CATIONS							
Specification:				Method:				
FCC 15.207:2019				ANSI C63.10:20	13			
TEST PARAME	ETERS							
Run #: 1		Line:	Neutral		Add. Ext. Attenuation (dB	3): 0		
COMMENTS								
None								
EUT OPERATING MODES								
EUT OPERATI	NG MODES							
EUT OPERATI Charging, Tx on mi	NG MODES d channel (244	2 MHz), Bl	_E					
EUT OPERATI Charging, Tx on mi DEVIATIONS F	NG MODES d channel (244 ROM TEST	2 MHz), BL STAND	_E ARD					
EUT OPERATIOn Charging, Tx on minimized DEVIATIONS F None	NG MODES d channel (244 ROM TEST	2 MHz), BL STAND	_E ARD					



Average Data - vs - Average Limit





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

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Tested By



FUT	Remote Micr	onhone			Work Order				
Sorial Number:		opriorie			Date:	07/02/2010			
Senai Number.	EF 3.4					01/02/2019			
Customer:	Nuance Hear	ing			Temperature:	21.9°C			
Attendees:	Charlie Esch				Relative Humidity:	62.3%			
Customer Project:	None				Bar. Pressure:	1014 mb			
Tested By:	Andrew Rogs	stad			Job Site:	MN03			
Power:	110VAC/60H	Z			Configuration:	NUAH0001-2			
TEST SPECIFIC	CATIONS								
Specification:				Method:					
FCC 15.207:2019				ANSI C63.10:201	3				
TEST PARAME	TERS								
Run #: 2		Line:	High Line	/	Add. Ext. Attenuation (dB): 0			
COMMENTS									
COMMENTS									
COMMENTS None									
COMMENTS None EUT OPERATII	NG MODES								
COMMENTS None EUT OPERATII Charging, Tx on mi	NG MODES d channel (244	2 MHz), BL	.E						
COMMENTS None EUT OPERATII Charging, Tx on mi DEVIATIONS F	NG MODES d channel (244 ROM TEST	2 MHz), BL	.E ARD						



Average Data - vs - Average Limit





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

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Tested By



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.



								TbtTx 2018.09.13	XMit 2019.05.15
EUI	Remote Microphone						Work Order:	NUAH0001	
Serial Number:							Date:	9-Jul-19	
Customer	Nuance Hearing						Temperature:	21.5 °C	
Attendees	Charlie Esch						Humidity:	57.6% RH	
Project	None						Barometric Pres.:	1014 mbar	
Tested by:	Andrew Rogstad		Power	: 4.8 VDC			Job Site:	MN08	
TEST SPECIFICAT	IONS			Test Method					
FCC 15.247:2019				ANSI C63.10:2013					
COMMENTS									
None DEVIATIONS FROM	M TEST STANDARD								
None									
Configuration #	6	Signature	and to	antal					
						Number of	Value	Limit	
				Pulse Width	Period	Pulses	(%)	(%)	Results
BLE/GFSK Low Cha	annel, 2402 MHz			218.071 us	625.1 us	1	34.9	N/A	N/A
BLE/GFSK Low Cha	annel, 2402 MHz			N/A	N/A	5	N/A	N/A	N/A
BLE/GFSK Mid Cha	annel, 2442 MHz			217.75 us	625 us	1	34.8	N/A	N/A
BLE/GFSK Mid Cha	annel, 2442 MHz	5	N/A	N/A	N/A				
BLE/GFSK High Ch	annel, 2480 MHz			217.705 us	625 us	1	34.8	N/A	N/A
BLE/GFSK High Ch	annel, 2480 MHz			N/A	N/A	5	N/A	N/A	N/A



			DLE/GF	Number of	Value	Limit		
		Dulas Width	Deried	Bulaco	value		Beaulto	
			Perioa	Puises	(%)	(%)	Results	
		218.071 us	625.1 us	1	34.9	N/A	N/A	
Keysight S	pectrum Analyz	zer - Element Materials Technol	ogy					x
L <mark>XI</mark> RL	RF	50 Ω DC	SI	ENSE:INT	ALIGN OFF		01:08:55 AM Jul 10, 20	19
				Trig Delay-100.0 µs	s #Avg Type	e: Log-Pwr	TRACE 1 2 3 4	5 6
			PNO: Fast ++-	#Atten: 10 dB			DET P P P P	ΡP
			- Guin. Eou				Mk-0 247.0	
	Ref Offs	set 21.72 dB					27 54 dD	
5 dB/div	Ref 11	.00 dBm					-37.54 GB	
0.00	\int							
1.00	(1					3		
-4.00	Y_							
-9.00								
14.0	Í							
-14.0								
-19.0								
-24.0			+				TRIG	
-29.0			+					
-34 በ			2					
Center 2	.4020000	000 GHz					Span 0	ΞZ
Res BW	3.0 MHz		#VBV	/ 30 kHz		Sweep '	1.000 ms (8192 p	is)
MKR MODE	TRC SCL	X	Y	FUNCTION	EUNCTION WIDTH	FUNC	TION VALUE	-
1 N	1 t	98.90 µs	-3.80 d	Bm				
2 N	1 t	317.0 µs	-37.54 d	Bm				
4	<u>+</u> ++	/ 24.0 µs	-3.69 0	Bm				
5								
6								
8								1
9								
10								
•				m			•	

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

🔤 Keysight Sp	pectrum Analyzer - Element Materia	als Technology			
LXI RL	RF 50 Ω DC		SENSE:INT	ALIGN OFF	01:09:02 AM Jul 10, 2019
		PNO: Fast + IFGain:Low	►. Trig: Video #Atten: 10 dB	#Avg Type: Log-Pwr	TRACE 2 3 4 5 6 TYPE WWWWW DET P P P P P P
5 dB/div	Ref Offset 21.72 dB Ref 11.00 dBm				
6.00					
1.00					
-4.00					
-9.00					
-14.0					
-19.0					
-24.0					TRIPLVL
24.0					
-29.0					
-34.0					
Center 2.	.402000000 GHz				Span 0 Hz
Res BW 3	3.0 MHz	#V	BW 30 kHz	Sw	eep 2.813 ms (8192 pts)
MSG				STATUS	



		BLE/GFS	K Mid Channel, 2	442 MHz			
			Number of	Value	Limit		
	Pulse Width	Period	Pulses	(%)	(%)	Results	
	217.75 us	625 us	1	34.8	N/A	N/A	
🔤 Keysight Spectrum A	Analyzer - Element Materials Technol	logy					
LXI RL RF	50 Ω DC	SEN	NSE:INT	ALIGN OFF		01:16:26 AM Jul 10, 2019	
		PNO: Fast ↔→ IFGain:Low	Trig Delay-100.0 µs Trig: Video #Atten: 10 dB	#Avg Type:	:: Log-Pwr	TYPE WWWWWWWW DET P P P P P	
S dB/div Ref	Offset 21.72 dB f 12.00 dBm					Mkr2 316.6 µs -36.19 dBm	
7.00		ر عرک ا					
2.00		ر کے کا ا					
2:00		/ The second se			3		
-3.00		ر و و ا					
-8.00		A LEN ET			و وحد کا		
-13.0		ر ویکی ا			<u>و محمد کا ا</u>		
		ر ور و ال					
-16.0		A DECEMBER OF				TRICLY	
-23.0							
-28.0		<u>Al Canada</u>					
-33.0		2					
Center 2.4420	000000 GHz					Span 0 Hz	
Res BW 3.0 M	Hz	#VBW	30 kHz		Sweep 1	.000 ms (8192 pts)	
MKR MODE TRC SCL	x	Y	FUNCTION	FUNCTION WIDTH	FUNCT	ION VALUE	
1 N 1 t	98.80 µr	s -2.89 dl	Bm				
2 N 1 t 3 N 1 t	316.6 µs	s -36.19 de	3m				
4		2.30 0	3111				
5		<u>المح</u>	ر و و و و	ي ومعالم		E	
0 7			Allen of				
8							
9			Allen in the second sec	<u>Anney y</u>			
11							
			III			•	
MSG				STATUS			
		BLE/GFS	K Mid Channel, 2	442 MHz			
			Number of	Value	Limit		
	Pulse Width	Period	Pulsos	(%)	(%)	Results	

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

🛄 Keysight Sp	ectrum Analyzer - Element Ma	terials Technolo	gy									X
LXI RL	RF 50 Ω DC		9	SENSE:INT		ALIO	GN OFF			01:16:3	87 AM Jul 10, 20	019
		1	PNO: Fast ↔↔ FGain:Low	Trig: Vid #Atten: *	eo I0 dB		#Avg Ty	pe: Log-	Pwr	Т	TYPE WWWW DET P P P F	456 ////// PPP
5 dB/div Log	Ref Offset 21.72 dB Ref 12.00 dBm										_	
7.00												
7.00												
2.00							ſ					
-3.00												_
-8.00												
-13.0												
-18.0												
-23.0											TRIG) LVL
-28.0												
22.0												
Center 2. Res BW 3	442000000 GHz 3.0 MHz		#VBI	A/ 30 kHz				1	Sweep	2.813 m	Span 0 s (8192 p	Hz ots)
MSG							STATUS					



			Number of	Value	l imit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	217.705 us	625 us	1	34.8	N/A	N/A
			· · · · · · · · · · · · · · · · · · ·			
RL RL RE	50.0 DC	ogy	NSEIINT	ALIGN OFF		01:22:41 AM Jul 10, 201
			Trig Delay-100.0 µ	#Avg Typ	e: Log-Pwr	TRACE 1 2 3 4
		PNO: Fast +++	Trig: Video			DET P P P P
		IFGain:Low	#Atten: 10 dB			
Ref Offse	t 21.72 dB					MKr2 316.3 µ
5 dB/div Ref 12.0	00 dBm					-37.22 aBi
7 00						
2.00					3	
-3.00					+ ¥	
-8.00						
-13.0						
-18.0						
-23.0						TRIG L
20.0						
-20.0						
-33.0						
Center 2.48000000	0 GHz		I			Span 0 H
Res BW 3.0 MHz		#VBW	30 kHz		Sweep 7	1.000 ms (8192 pt
MKR MODE TRC SCL	x	Y	FUNCTION	FUNCTION WIDTH	FUNC	TION VALUE
1 N 1 t	98.60 µ	-3.18 d	Bm			
	<u>316.3 µ</u> 723.6 µ	s <u>-37.22 d</u>	Bm Bm			
4	120.0 μ.					
5						
7						
8						
10						
			III	1999 - 1999 -		ta a construction of the second s

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

Keysight Sp	ectrum Analyzer - Element M	aterials Technolo	gy	ENCLINE		ALICA			01/22/4	
	K- 20.77 DC	1	PNO: Fast +++ FGain:Low	Trig: Video #Atten: 10	o dB	ALIGN #	Avg Type:	Log-Pwr	01:22:4 T	RACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P P
5 dB/div Log _w	Ref Offset 21.72 dE Ref 12.00 dBm	3								
7.00										
2.00										
-3.00										
-8.00										
-13.0										
-18.0										
-23.0										
-28.0										
-33.0										
Center 2	480000000 GHz									Span 0 Hz
Res BW 3	3.0 MHz		#VBV	V 30 kHz				Swe	ep 2.813 m	s (8192 pts)
MSG							STATUS			



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

TEST EQUIPMENT					
Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
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
EUT: Remote Microphone			Work Order:	NUAH0004	
Serial Number: 1938AE20030			Date:	19-Nov-19	
Customer: Nuance Hearing			Temperature:	22.2 °C	
Attendees: John Quach			Humidity:	33.7% RH	
Project: None			Barometric Pres.:	1014 mbar	
Tested by: Dustin Sparks Power: Battery			Job Site:	MN08	
TEST SPECIFICATIONS Test Metho	d				
FCC 15.247:2019 ANSI C63.1	0:2013				
COMMENTS					
DEVIATIONS FROM TEST STANDARD None Configuration # 1 Dustin	20				
Signature (Number of	Value	Limit	
Pulse W	lidth Period	Pulses	(%)	(%)	Results
PAS (2 Mbps), Low Channel, 2404 MHz 111.8	us 625 us	1	17.9	N/A	N/A
PAS (2 Mbps), Low Channel, 2404 MHz N/A	N/A	5	N/A	N/A	N/A
PAS (2 Mbps), Mid Channel, 2442 MHz 111.9	us 625.1 us	1	17.9	N/A	N/A
PAS (2 Mbps), Mid Channel, 2442 MHz N/A	N/A	5	N/A	N/A	N/A
PAS (2 Mbps), High Channel, 2476 MHz 112 u	is 625.2 us	1	17.9	N/A	N/A
PAS (2 Mbps), High Channel, 2476 MHz N/A	N/A	5	N/A	N/A	N/A



			PAS (2 Mbr	os). Low Channel	. 2404 MHz		
				Number of	Value	Limit	
	F	^o ulse Width	Period	Pulses	(%)	(%)	Results
		111.8 us	625 us	1	17.9	N/A	N/A
						•	
🚺 Keysight Spectru	ım Analyzer - Ele	ment Materials Technolo	gy				
LXI RL	RF 50 Ω	DC	SEN	NSE:INT	ALIGN OFF	-Log-Dwr	10:21:51 AM Nov 20, 2019
		I	PNO: Fast ↔↔ FGain:Low	Trig: Video #Atten: 10 dB	s #Avg type	:: Log-Pwi	TYPE WWWWWW DET PPPPP
R 5 dB(div	Ref Offset 21	I.43 dB					Mkr3 721.0 µs -10.58 dBm
Log							
7.00							
2.00							
-3.00							
8.00	1	2				3	
-8.00	Y	Y					
-13.0							
-18.0							
-23.0							TRIG LVL
-99 D							
-28.0							
-33.0							
Center 2.40/	1000000	207					Span () Hz
Res BW 3.0	MHz	902	#VBW	30 kHz		Sweep 1	.000 ms (8192 pts)
MKR MODE TRC S	SCL	x	Y	FUNCTION	FUNCTION WIDTH	FUNCT	ION VALUE
	t t	96.00 µs	-10.49 dL	3m Bm			
3 N 1	t	721.0 µs	-10.58 dl	Bm			
4							
6							
				<u> </u>			
7							
7							
7 8 9 10							
7 8 9 10 11							ا <u>ان</u> ب
7 8 9 10 11 				III			-
7 8 9 10 11 ×				ш	STATUS		
8 9 10 11 ×					STATUS		
0 8 9 10 11 ≪			PAS (2 Mbp	" »s), Low Channel	STATUS		· · · · · · · · · · · · · · · · · · ·
7 8 9 10 11 ×			PAS (2 Mbp), Low Channel Number of	, 2404 MHz Value	Limit	
7 8 9 10 11 1 4 MSG	F	2ulse Width	PAS (2 Mbp Period	"' os), Low Channel Number of Pulses	, 2404 MHz Value (%)	Limit (%)	Results

🍺 Keysight Spe	ctrum Analyzer - Elemen	t Materials Techn	ology						
LXI RL	RF 50 Ω C	DC 0		SENSE:INT	<u> </u>	ALIGN OFF		10:21:55	AM Nov 20, 2019
	-		PNO: Fast ↔→ IFGain:Low	Trig: Video #Atten: 10	o dB	#Avg Type	: Log-Pwr	TRA T` [CE 1 2 3 4 5 6 (PE WWWWWW DET P P P P P P
5 dB/div	Ref Offset 21.43 Ref 12.00 dB	dB m							
7.00									
7.00								ſ	
2.00									
-3.00									
-8.00						,			
-13.0									_
-18.0									_
-23.0									TRIG LVL
-28.0									
.33.0									
Center 2.4 Res BW 3	04000000 GHz	Z	#VB	W 30 kHz			Swee	o 2.813 ms	Span 0 Hz (8192 pts)
MSG						STATUS			



		PAS (2 Mbps)	, Mid Channel	, 2442 MHz		
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	111.9 us	625.1 us	1	17.9	N/A	N/A
Keysight Spectrum Analyzer	- Element Materials Technolog 50 Ω DC	SENSE	INT	ALIGN OFF		08:22:02 AM Nov 19, 2019
	P	NO:Fast →→ Tr Gain:Low #A	ig Delay-100.0 µ ig: Video itten: 10 dB	s #Avg Type	e: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P P P P P
Ref Offse 5 dB/div Ref 13.0	t 21.36 dB 00 dBm					Mkr3 720.7 µs -10.03 dBm
Log						
2.00						
2.00						
-7.00	2				3	
-12.0	Y					
-17.0						
-22.0						TRIG LVL
-27.0						
-32.0						
Cepter 2 4420000	0 CH7					Snan () Hz
Res BW 3.0 MHz	lu GHz	#VBW 30) kHz		Sweep 1	.000 ms (8192 pts)
MKR MODE TRC SCL	x	Y	FUNCTION	FUNCTION WIDTH	FUNCT	ION VALUE
1 N 1 t 2 N 1 t	95.60 µs 207.5 µs	<u>-10.13 dBm</u> -9.66 dBm				
3 N 1 t	720.7 µs	-10.03 dBm				
5						E
7						
9						
10						-
			m			
MSG				STATUS		
		PAS (2 Mbps)	, Mid Channel	, 2442 MHz		
			Number of	Value	Limit	_
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A

🇾 Keysight Spe	ectrum Analyzer - Element M	Materials Techno	logy				
LXI RL	RF 50 Ω DC			SENSE:INT	ALIGN OFF		08:22:07 AM Nov 19, 2019
			PNO: Fast +++ IFGain:Low	. Trig: Video #Atten: 10 dB	#Avg Type: L	.og-Pwr	TRACE 2 3 4 5 6 TYPE DET PPPPP
5 dB/div	Ref Offset 21.36 d Ref 13.00 dBm	IB I					
9.00							
		\square					
3.00							
-2.00							
-7.00							
-12.0							
-17.0							
-22.0							
-27.0							
-32.0					r		
Center 2.4 Res BW 3	442000000 GHz 3.0 MHz		#VB	W 30 kHz		Sweep	Span 0 Hz 2.813 ms (8192 pts)
MSG					STATUS		



		PAS (2 Mb	ps). High Channe	. 2476 MHz		
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	112 us	625.2 us	1	17.9	N/A	N/A
Keysight Spectrum An	alyzer - Element Materials Techn	ology				
KL RF	50 Ω DC	51	Trig Delay-100.0 µ	ALIGN OFF	e: Log-Pwr	TRACE 1 2 3 4 5 6
		PNO: Fast +++	Trig: Video #Atten: 10 dB			DET PPPPP
		II Gam.Low	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Mkr3 720 9 us
RefC 5 dB/div Ref)ffset 21.43 dB 12.00 dBm					-10.74 dBm
Log						
7.00						
2.00						
-3.00	1 2				2	
-8.00	·				+••	
-13.0						
-18.0						
-23.0						TRIG LVL
-28.0						
-33.0						
Center 2.47600	0000 GHz	L	J	L		Span 0 Hz
Res BW 3.0 MH	z	#VBV	/ 30 kHz		Sweep 1	.000 ms (8192 pts)
MKR MODE TRC SCL	х	Y	FUNCTION	FUNCTION WIDTH	FUNCT	ON VALUE
1 N 1 t 2 N 1 t	<u>95.70</u> 207.7	us -10.93 d us -10.53 d	Bm IBm			
3 N 1 t	720.9	µs -10.74 d	Bm			
5						E
7						
9						
10						
			m			•
MSG				STATUS		
		PAS (2 Mb	ps), High Channe	l, 2476 MHz	Limit	
	Pulse Width	Period	Pulses	value (%)	Limit (%)	Results
		N1/A		N1/A	N1/A	NI/A

🎉 Keysight Sp	ectrum Analyzer - Element I	Materials Tech	nology						
LXI RL	RF 50 Ω DC			SENSE:INT	ALIG		og Bur	10:27:52	AM Nov 20, 2019
	_		PNO: Fast ↔ IFGain:Low	. Trig: Video #Atten: 10	dB	+Avg Type. I	-0g-F WI	ייייייייייייייייייייייייייייייייייייי	PE WWWWWW PET PPPPP
5 dB/div	Ref Offset 21.43 c Ref 12.00 dBm	iB 1							
7.00									
7.00								ſ	
2.00									
-3.00									
-8.00									
-13.0									
-18.0									
-23.0									TRIG LVL
-28.0									
22.0									
-55.0									
Center 2.4 Res BW 3	476000000 GHz 1.0 MHz		#VB	W 30 kHz			Sween	2.813 ms	Span 0 Hz (8192 pts)
MSG						STATUS	- Anos I		(or or prov



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 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.



							THT: 2018 00 12	VMR 2010 05 15
FUT: Re	mote Microphone					Work Order: N		Amit 2019.00.15
Serial Number: EP	23.7					Date: 9	-Jul-19	
Customer: Nu	ance Hearing					Temperature: 2	1.6 °C	
Attendees: Ch	arlie Esch					Humidity: 5	8.1% RH	-
Project: No	one				Barc	metric Pres.: 1	014 mbar	
Tested by: An	drew Rogstad		Power	4.8 VDC		Job Site: N	/N08	
TEST SPECIFICATION	S			Test Method				
FCC 15.247:2019				ANSI C63.10:2013				
COMMENTS								
None								
DEVIATIONS FROM TE	EST STANDARD							
None								
Configuration #	6	Signature	to to	and				
		<u> </u>					Limit	
						Value	(≥)	Result
BLE/GFSK Low Channe	el, 2402 MHz				6	85.515 kHz	500 kHz	Pass
BLE/GFSK Mid Channe	l, 2442 MHz				6	83.164 kHz	500 kHz	Pass
BLE/GFSK High Channe	el, 2480 MHz				6	89.366 kHz	500 kHz	Pass

Report No. NUAH0002













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 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.



					TbITx 2019.08.30.0	XMit 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 SPECIFICAT	IONS		Test Method			
FCC 15.247:2019			ANSI C63.10:2013			
COMMENTS			-			
Reference level of	Set on spectrum analyzer includes 20 dB attenuator, DC block	and measurement	Cadie.			
DEVIATIONS FROM	I IESI SIANDARD					
None	I					
Configuration #	1 Signature	Justin	Spards			
					Limit	
				Value	(≥)	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













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.



					TbtTx 2018.09.13	XMit 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 SPECIFICAT	IONS		Test Method			
FCC 15.247:2019			ANSI C63.10:2013			
COMMENTS						
None						
DEVIATIONS FROM	M TEST STANDARD					
None						
Configuration #	6	Signature	to Rogatal			
				Out Pwr (dBm)	Limit (dBm)	Result
BLE/GFSK Low Cha	annel, 2402 MHz			6.364	30	Pass
BLE/GFSK Mid Cha	nnel, 2442 MHz			7.136	30	Pass
BLE/GFSK High Ch	annel, 2480 MHz			6.691	30	Pass



	BLE/G	FSK Low Channel.	2402 MHz		
			Out Pwr	Limit	
		-	(dBm)	(dBm)	Result
			6.364	30	Pass
Keysight Spectrum Analyzer - Element Materia	als Technology	SENSEIINT	ALIGN OFF		01:10:21 AM Jul 10, 2019
		Trive Free Days	#Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6
	PNO: Fast ++ IFGain:Low	#Atten: 10 dB	Avginoid: 1	100/100	DET PPPPP
Ref Offset 21.72 dB				Mkr1	2.402 289 GHz
5 dB/div Ref 11.00 dBm		V			0.304 UBIII
			≜ 1		
6.00					
1.00					
-4.00					
-9.00					
-14.0					
-19.0					
-24.0					
-29.0					
-34.0					
Center 2.402000 GHz #Res BW 2.0 MHz	#VE	W 6.0 MHz		Sweep 1	Span 3.500 MHz .066 ms (1000 pts)
MSG			STATUS		
	BLE/G	FSK Mid Channel,	2442 MHz	Limit	
			(dBm)	(dBm)	Result
			7.136	30	Pass
	•				•
Keysight Spectrum Analyzer - Element Materi	als Technology				
KL RF 50Ω DC		SENSE:INT	ALIGN OFF #Avg Type:	Log-Pwr	01:17:43 AM Jul 10, 2019 TRACE 1 2 3 4 5 6

		PNO: Fast ↔→ Trig: Fr IFGain:Low #Atten:	#A ee Run Av 10 dB	vg Type: Log-Pwr g Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE M WWWWW DET PPPPP
5 dB/div	Ref Offset 21.72 dB Ref 12.00 dBm			Mk	r1 2.441 781 GHz 7.136 dBm
7.00		∮ 1			
7.00					
2.00					
-3.00					
-8.00					
-13.0					
-18.0					
-23.0					
-28.0					
-33.0					
Center 2 #Res BV	2.442000 GHz V 2.0 MHz	#VBW 6.0 MI	lz	Sween	Span 3.500 MHz 1.066 ms (1000 pts)
MSG			S	TATUS	



		Out Pwr (dBm)	Limit (dBm)	Result
		6.691	30	Pass
M Kawiakt Casetnum Analuser Element Materials 3	Federalezzi			
XI RL RF 50.9 DC	SENSE:INT	ALIGN OFF		01:25:05 AM Jul 10, 2019
	PNO: Fast Trig: Free Run IFGain:Low #Atten: 10 dB	#Avg Type: Avg Hold: 1	Log-Pwr 00/100	TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P P P P P
Ref Offset 21.72 dB 5 dB/div Ref 12.00 dBm			Mkr1	2.479 820 GHz 6.691 dBm
	1			
2.00				
2.00				
• 00				
13.0				
-18.0				
-23.0				
-28.0				
-33.0				



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.



				TbtTx 2019.08.30.0	XMit 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 SPECIFICAT	ONS	Test Method			
FCC 15.247:2019		ANSI C63.10:2013			
COMMENTS					
Reference level off	set on spectrum analyzer includes 20 dB attenuator, DC block,	and measurement cable.			
None					
Configuration #	1 Signature	Justin Sparts			
			Out Pwr (dBm)	Limit (dBm)	Result
PAS (2 Mbps), Low	Channel, 2404 MHz		7.41	30	Pass
PAS (2 Mbps), Mid (Channel, 2442 MHz		8.068	30	Pass
PAS (2 Mbps), High	Channel, 2476 MHz		7.407	30	Pass



	- (Out Pwr	Limit	
			(dBm)	(dBm)	Result
			7.41	30	Pass
📁 Keysight Spectrum Analyzer - Element Materi	als Technology				
LX RL RF 50Ω DC		SENSE:INT	ALIGN OFF		10:23:01 AM Nov 20, 2019
	PNO: Fast ↔ IFGain:Low	. Trig: Free Run #Atten: 10 dB	#Avg Type: Avg Hold:>	Log-Pwr 100/100	TYPE M WWWWW DET P P P P P
Ref Offset 21.43 dB 5 dB/div Ref 12.00 dBm				Mkr1	2.404 405 GHz 7.410 dBm
Log		1			
7.00					
2.00					
-3.00					
-8.00					
-13.0					
-18.0					
-23.0					
-28.0					
-33.0					
Center 2.404000 GHz #Res BW 4 MHz	#VB	W 8.0 MHz		Sweep 1	Span 10.00 MHz .066 ms (1000 pts)
MSG			STATUS		
	PAS (2 N	Ibps), Mid Channel	, 2442 MHz	Limit	
			(dBm)	(dBm)	Result
			8.068	30	Pass

RL RF 50 Ω DC SENSE:INT ALIGN OFF 08:23: #Avg Type: Log-Pwr Avg]Hold: 100/100 PNO: Fast IFGain:Low	D8 AM Nov 19, 2019 RACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P 525 GHz .068 dBm
PNC: Fast Trig: Free Run IFGain:Low #Atten: 10 dB Ref Offset 21.36 dB S dB/div Ref 13.00 dBm 8 00	TYPE MWWWW DET P P P P P P 1 525 GHz .068 dBm
Ref Offset 21.36 dB 5 dB/div 8:00 Ref 13.00 dBm 8:00 Ref 13.00 dBm	1 525 GHz .068 dBm
E.00	
8.00	
3.00	
-2.00	in and a
7.00	
-12.0	
-17.0	
-22.0	
-27.0	
22.0	
Center 2.442000 GHz Spar #Res BW 4 MHz #VBW 8.0 MHz Sweep 1.066 m	n 10.00 MHz is (1000 pts)
MSG	



Keysight Spectrum Analyzer - Element Materials Technology (dBm) (dBm) <th< th=""><th>esult Pass 3 AM Nov 20, 2019 Det PPPPPP 915 GHz 407 dBm</th></th<>	esult Pass 3 AM Nov 20, 2019 Det PPPPPP 915 GHz 407 dBm
Keysight Spectrum Analyzer - Element Materials Technology 7.407 30 Keysight Spectrum Analyzer - Element Materials Technology ALIGN OFF 10:28: PNO: Fast Trig: Free Run IFGain:Low #Aug Type: Log-Pwr AvglHold: 100/100 Ref Offset 21.43 dB Mkr1 2.47 Cog 1 7.00 1 7.00 1 7.00 1	3 AM Nov 20, 2019 3 AM Nov 20, 2019 12 3 4 5 6 12 3 4 5 6 DET PPPPPP 9 915 GHz 407 dBm
Keysight Spectrum Analyzer - Element Materials Technology ALIGN OFF 10:28: W RL RF 50 Ω DC SENSE:INT ALIGN OFF 10:28: PNO: Fast → Trig: Free Run IFGain:Low #Aug Type: Log-Pwr Avg Hold: 100/100 Mkr1 2.47: S dB/div Ref Offset 21.43 dB Mkr1 2.47: Cog 1 1 1 7.00 1 1 1 1 8.00 1 1 1 1 1 13.0 1 1 1 1 1 1	ал Nov 20, 2019 RACE I 2 3 4 5 6 DET P P P P P P P 915 GHz 407 dBm
Keysight Spectrum Analyzer - Element Materials Technology ΔALIGN OFF 10:28: PNO: Fast Trig: Free Run IFGain:Low Trig: Free Run #Atten: 10 dB Mkr1 2.47: Composition Co	3 AM Nov 20, 2019 RACE 1 2 3 4 5 6 TYPE M WWWW DET P P P P P P 9 915 GHz 407 dBm
Ref Offset 21.43 dB Mkr1 2.47 C 1 C 1	3 AM Nov 20, 2019 RACE [] 2 3 4 5 6 TYPE MWWWW DET P P P P P P 915 GHz 407 dBm
PNO: Fast → Trig: Free Run IFGaln:Low Trig: Free Run #Avg]Hold: 100/100 Mkr1 2.47 Avg]Hold: 100/100 Mkr1 2.47 0 0 0 0 0 0 0 0 0 0 0 0 0	RACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P 915 GHz 407 dBm
PNO: Fast	915 GHz 407 dBm
Ref Offset 21.43 dB 6 dB/div Ref 12.00 dBm 7.00 2.00 3.00 -	915 GHz 407 dBm
Ref 0ffset21.43 dB 5 dB/div Ref 12.00 dBm 7.00 2.00 3.00 8.00 13.0	.407 dBm
2.00 3.00 4.00 -13.0	
-3.00 -6.00 -1.13.0	
3.00	
-13.0	and and a second s
-8.00	- and a
-13.0	
-13.0	
190	
22.0	
Center 2.476000 GHz Spa	
#Res BW 4 MHz #VBW 8.0 MHz Sweep 1.066 m	10.00 MHz



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.



								TbtTx 2018.09.13	XMit 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 SPECIFICAT	IONS			Test Method					
FCC 15.247:2019				ANSI C63.10:2013					
COMMENTS				•					
None									
DEVIATIONS FROM	I TEST STANDARD								
None									
Configuration #	6		17	P JR					
		Signature	Ch.	a had south					
	•				Pk Cond Pwr	Antenna	EIRP	EIRP Limit	
					(dBm)	Gain (dBi)	(dBm)	(dBm)	Result
BLE/GFSK Low Cha	nnel, 2402 MHz				6.364	0	6.364	36	Pass
BLE/GFSK Mid Cha	nnel, 2442 MHz				7.136	0	7.136	36	Pass
BLE/GFSK High Cha	annel. 2480 MHz				6.691	0	6.691	36	Pass



		BLE/GES	SK Low Channel	2402 MH 7			
		Pk Cond Pwr	Antenna	FIRP	FIRP L imit		
		(dBm)	Gain (dBi)	(dBm)	(dBm)	Posult	
		6 364		6 364	36	Pass	
		0.304	0	0.304	30	1 000	
Keysight Spectrum	Analyzer - Element Materials T	echnology	ENCE-INT			01:10:21 AM Jul 10, 2010	
	F 30.32 DC	3		#Avg Typ	e: Log-Pwr	TRACE 1 2 3 4 5 6	
		PNO: Fast	Trig: Free Run #Atten: 10 dB	Avg Hold	: 100/100	DET P P P P P P	
		IFGall.Low	withen. To up		Mkr4	2 402 200 CH-	
5 dB/div Re	f Offset 21.72 dB f 11.00 dBm					6.364 dBm	
Log			Ť	1			
6.00				<u> </u>			
1.00							
1.00							
-4.00							
-9 00							
-14.0							
-19.0							
-24.0							
-29.0							
-34.0							
Center 2 4020			A			Span 3 500 MHz	
#Res BW 2.0	MHz	#VBV	V 6.0 MHz		Sweep 1.0	066 ms (1000 pts)	
MSG				STATUS			
		BLE/GF	SK Mid Channel,	2442 MHz			
		Pk Cond Pwr	Antenna	EIRP	EIRP Limit		
		(dBm)	Gain (dBi)	(dBm)	(dBm)	Result	
		7.136	0	7.136	36	Pass	

	SENSEIINTI	ALIGN OFF		01:17:43 AM Jul 10 201
PNO: Fast ↔ IFGain:Low	→ Trig: Free Run #Atten: 10 dB	#Avg Type: L Avg Hold:>1	.og-Pwr 00/100	TRACE I 2 3 45 TYPE MWWW DET P P P P
			Mkı	1 2.441 781 GH 7.136 dBi
	♦ ¹			
#V6	BW 6.0 MHz		Sweep	Span 3.500 MH 1.066 ms (1000 pt
	PNO: Fast IFGain:Low →	PNO: Fast +>- Trig: Free Run #Atten: 10 dB	PNO: Fast Trig: Free Run #Avg Type: L FGain:Low Trig: Free Run #Atten: 10 dB	PNO: Fast → #Atten: 10 dB Avg Hold:>100/100 IFGain:Low I I



	Pk Cond Pwr	Antenna	EIRP	EIRP Limit	
	(dBm)	Gain (dBi)	(dBm)	(dBm)	Result
	6.691	0	6.691	36	Pass
Keysight Spectrum Analyzer - Element Materials Tr	echnology				
X RL RF 50 Ω DC	SE	NSE:INT	ALIGN OFF		01:25:05 AM Jul 10, 2019
			#Avg Type	: Log-Pwr	TRACE 1 2 3 4 5
	PNO: Fast	#Atten: 10 dB	Avg Hold:	100/100	DET P P P P P
	II Gain.Low			Miler	2 470 820 CH
Ref Offset 21.72 dB				WIKET	6 601 dBn
Log Ref 12.00 dBm					0.031 0.01
7.00		• '			
2.00					
2.00					
-3.00					
-8.00					
-13.0					
-18.0					
-23.0					
-28.0					
.33.0					
Center 2.480000 GHz					Span 3.500 MH
#Res BW 2.0 MHz	#VBM	6.0 MHz		Sweep 1	066 ms (1000 pts



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.



							TbtTx 2019.08.30.0	XMit 2019.09.05
EUT: F	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 SPECIFICATIO	NS		Test Method					
FCC 15.247:2019			ANSI C63.10:2013					
COMMENTS								
Reference level offse	et on spectrum analyzer	includes 20 dB attenuator, DC block, a	and measurement cable.					
DEVIATIONS FROM	TEST STANDARD							
None								
Configuration #	1	Signature	Fusting parks					
				Out Pwr	Antenna	EIRP	EIRP Limit	
				(dBm)	Gain (dBi)	(dBm)	(dBm)	Result
PAS (2 Mbps), Low C	hannel, 2404 MHz			7.41	0	7.41	36	Pass
PAS (2 Mbps), Mid Cl	hannel, 2442 MHz			8.068	0	8.068	36	Pass
PAS (2 Mbps), High C	Channel, 2476 MHz			7.407	0	7.407	36	Pass





Keysight Sp	ectrum Analyzer - Element Materials T	echnology				
RL	RF 50 Ω DC	S	ENSE:INT	ALIGN OFF	08:23:08	AM Nov 19, 201
		PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Log-Pw Avg Hold: 100/100	r TR T	ACE 1 2 3 4 5 YPE M WWW DET P P P P P
dB/div	Ref Offset 21.36 dB Ref 13.00 dBm				Mkr1 2.441 8.0	525 GH: 068 dBn
			↓ ¹			
					and the second second	
						the second secon
2.0						
enter 2. tes BW	442000 GHz 4 MHz	#VBV	V 8.0 MHz	s	Span weep 1.066 ms	10.00 MH (1000 pt
				STATUS		







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 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.



			TbtTx 2018.09.13	XMit 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 SPECIFICAT	DNS Test Method			
FCC 15.247:2019	ANSI C63.10:2013			
COMMENTS				
None				
DEVIATIONS FROM	TEST STANDARD			
None				
Configuration #	$6 \qquad \qquad$			
J	Signature Charles Magazan			
		Value	l imit	
		dBm/3kHz	< dBm/3kHz	Results
BLE/GESK Low Cha	nel 2402 MHz	-9 548	8	Pass
BLE/GESK Mid Cha		-8 654	8	Pass
BLE/GESK High Ch		-0.034	8	Page
DEL/OF OK HIGH ON		-9.015	0	1 035

Report No. NUAH0002













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.



							TbtTx 2019.08.30.0	XMit 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				В	Barometric Pres.: 1014 mbar			
Tested by:	Dustin Sparks		Power:	Battery		Job Site:	MN08		
TEST SPECIFICATION	ONS			Test Method					
FCC 15.247:2019				ANSI C63.10:2013					
COMMENTS									
Reference level offs	set on spectrum analyzer	Includes 20 dB attenuator, DC block,	and measurement	cable.					
DEVIATIONS FROM	I IESI SIANDARD								
None									
Configuration #	1	Signature	Justin	Spardo					
						Value	Limit		
						dBm/3kHz	< dBm/3kHz	Results	
PAS (2 Mbps), Low 0	Channel, 2404 MHz					-12.223	8	Pass	
PAS (2 Mbps), Mid C	Channel, 2442 MHz					-11.478	8	Pass	
PAS (2 Mbps), High	Channel, 2476 MHz					-11.979	8	Pass	













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.



				TbtTx 2018.09.13	XMit 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	Job Site:	MN08		
TEST SPECIFICAT	ONS	Test Method			
FCC 15.247:2019		ANSI C63.10:2013			
COMMENTS					
None					
DEVIATIONS FROM	I TEST STANDARD				
None					
Configuration #	6 Signature	to Ropatal			
			Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK Low Cha	nnel, 2402 MHz		-36.02	-20	Pass
BLE/GFSK High Ch	annel, 2480 MHz		-46.41	-20	Pass









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.



		TbtTx 2019.08.30.0	XMit 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			
	Value	Limit	
	(dBc)	≤ (dBc)	Result
PAS (2 Mbps), Low Channel, 2404 MHz	-42.02	-20	Pass
PAS (2 Mbps), High Channel, 2476 MHz	-52.81	-20	Pass





