Starkey Laboratories, Inc.

Muse iQ R Hearing Aid

FCC 15.249:2017

902 – 928 MHz Transceiver

Report # STAK0106.2

NVLAP Lab Code: 200881-0

CERTIFICATE OF TEST

2017-1-25

Last Date of Test: November 6, 2017
Starkey Laboratories, Inc.
Model: Muse iQ R Hearing Aid

Radio Equipment Testing

Standards

Specification	Method
FCC 15.249:2017	ANSI C63.10:2013

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required for a battery powered EUT.
6.5	Field Strength of Fundamental	Yes	Pass	
6.5, 6.6	Field Strength of Harmonics and 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.

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

2017.6.12

United States

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

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

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

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

Australia/New Zealand

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

Korea

MSIP / 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:
http://portlandcustomer.element.com/ts/scope/scope.htm
http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY

TMU.2015.07.10

Measurement Uncertainty

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

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

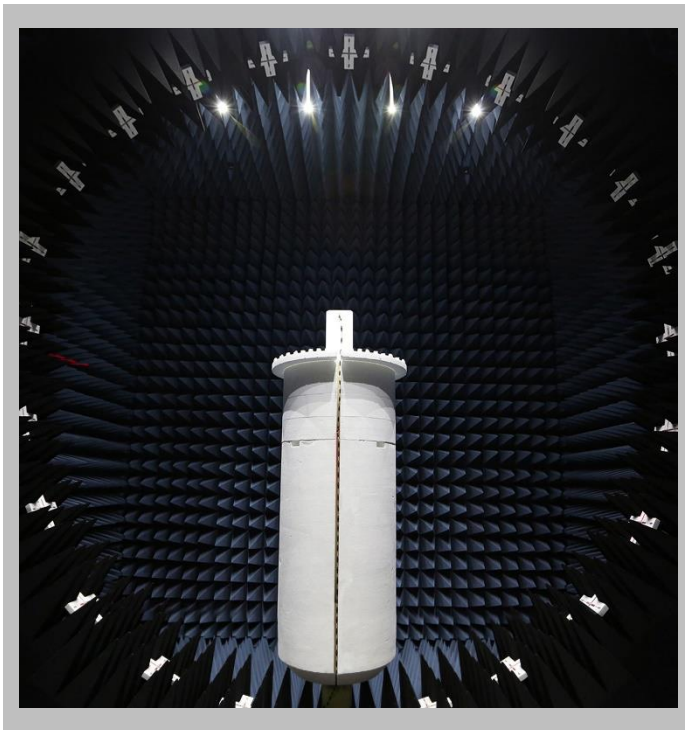
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

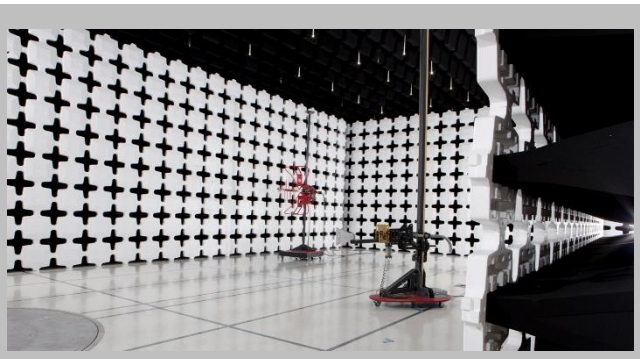
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%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

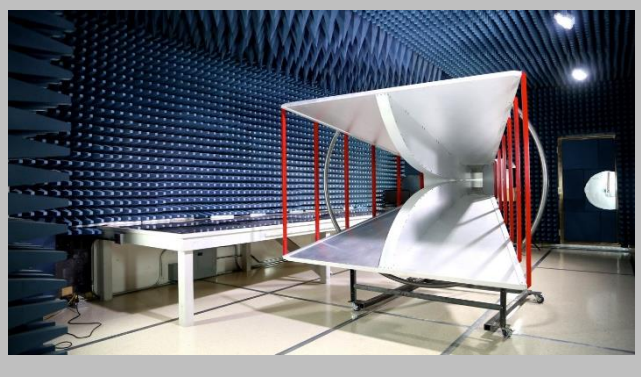
FACILITIES

2017.9.15

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada					
2834B-1, 2834B-3	2834E-1, 2834E-3	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157

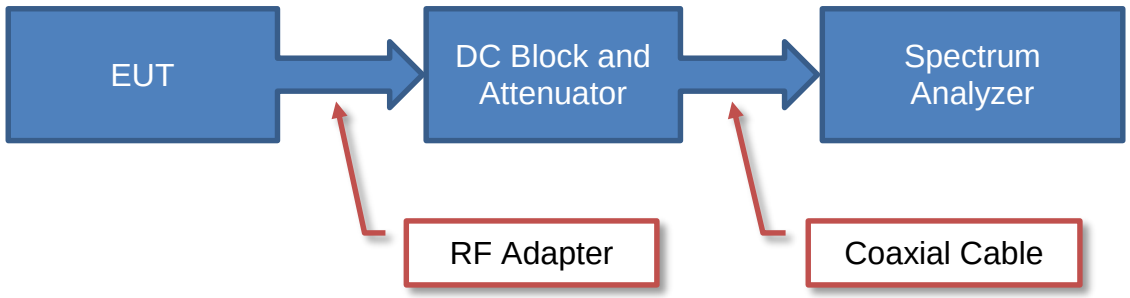




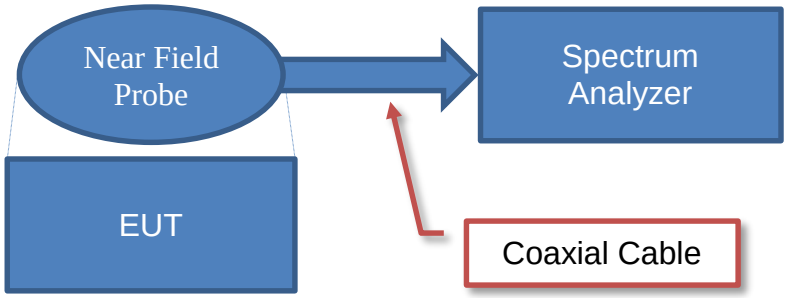


Test Setup Block Diagrams

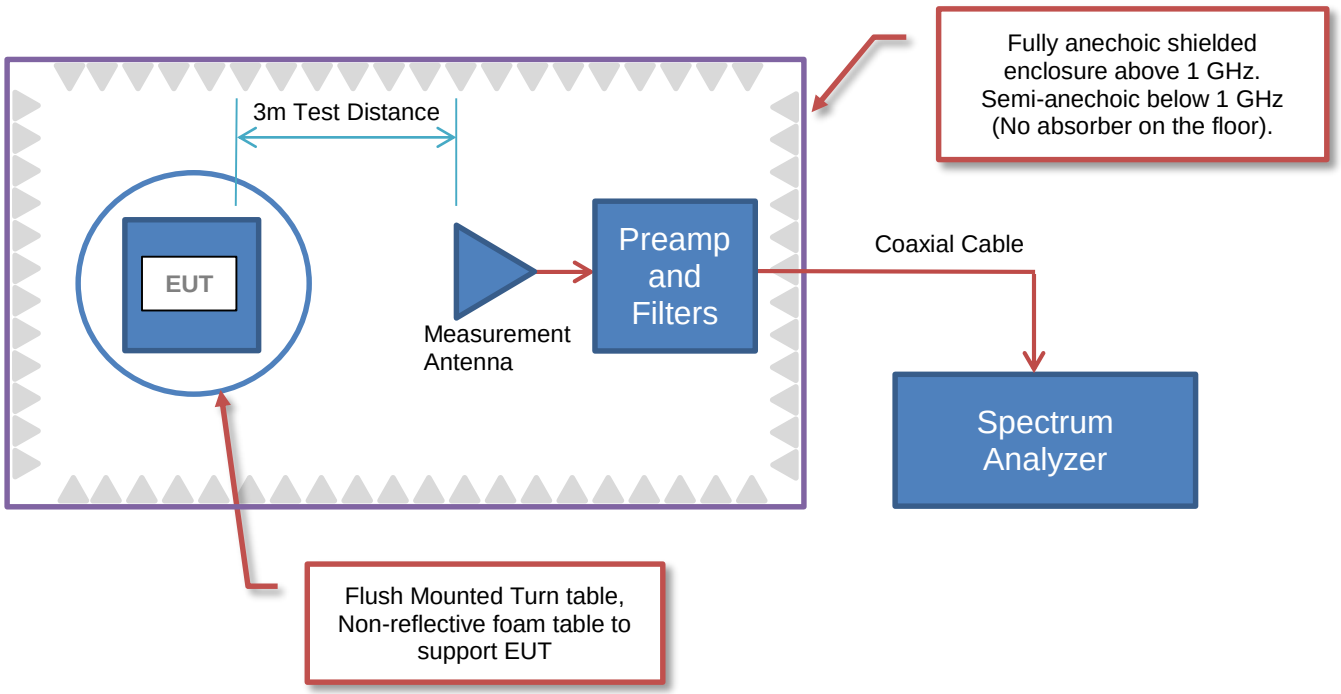
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

2017-1-25

Client and Equipment Under Test (EUT) Information

Company Name:	Starkey Laboratories, Inc.
Address:	6600 Washington Ave. SO.
City, State, Zip:	Eden Prairie, MN 55344
Test Requested By:	Bill Mitchell
Model:	Muse iQ R Hearing Aid
First Date of Test:	November 6, 2017
Last Date of Test:	November 6, 2017
Receipt Date of Samples:	November 6, 2017
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Hearing Aid with rechargeable battery

Testing Objective:
Seeking to demonstrate compliance under FCC 15.249:2017 for operation in the 902 - 928 MHz Band.

CONFIGURATIONS

2017-1-25

Configuration STAK0106- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Hearing Aid	Starkey Laboratories, Inc.	Muse iQ R	171140415

MODIFICATIONS

2017-1-25

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	11/6/2017	Field Strength of Fundamental	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	11/6/2017	Field Strength of Harmonics and Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

FIELD STRENGTH OF FUNDAMENTAL

PSA-ESCI 2017.06.01

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

MODES OF OPERATION

Transmitting low channel (902.637 MHz), mid channel (914.773 MHz) and high channel (926.91 MHz) modulated

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

STAK0106 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	902 MHz	Stop Frequency	928 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	12/1/2016	12 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	12/1/2016	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYD	1/6/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFI	1/6/2017	12 mo

MEASUREMENT BANDWIDTHS

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

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes.

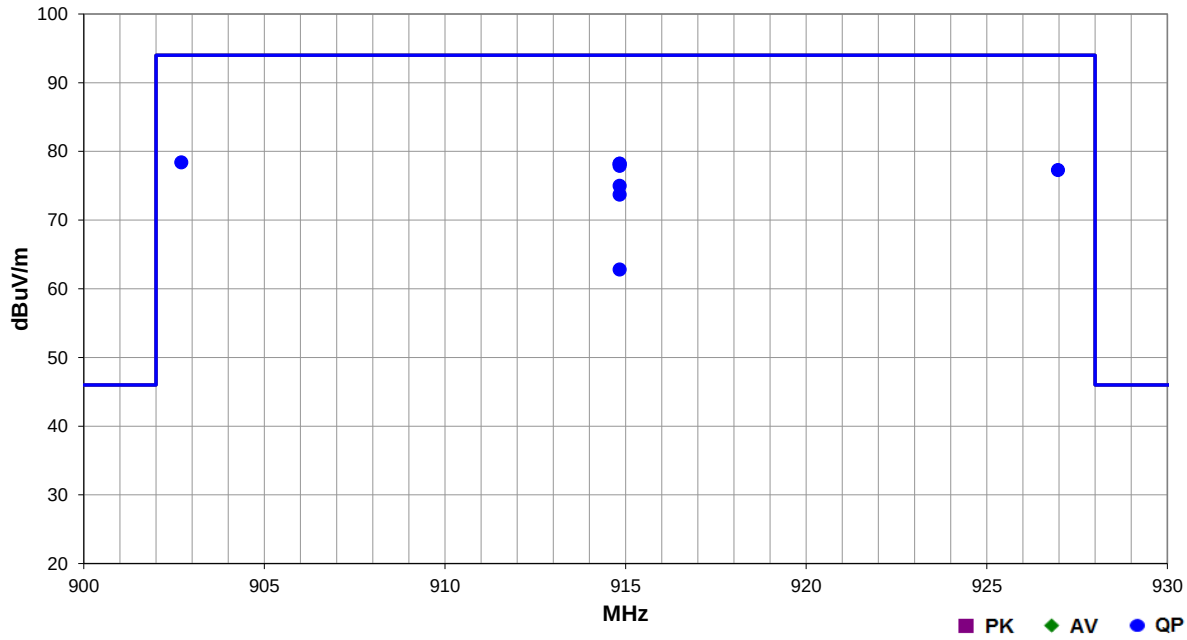
FIELD STRENGTH OF FUNDAMENTAL

EmiR5 2017.07.11 PSA-ESCI 2017.06.01

Work Order:	STAK0106	**Date:**	11/06/17		
Project:	None	**Temperature:**	22.7 °C		
Job Site:	MN05	**Humidity:**	22.6% RH		
Serial Number:	171140415	**Barometric Pres.:**	1029 mbar	**Tested by:**	Dustin Sparks
EUT:	Muse iQ R Hearing Aid				
Configuration:	1				
Customer:	Starkey Laboratories, Inc.				
Attendees:	Charlie Esch				
EUT Power:	Battery				
Operating Mode:	Transmitting low channel (902.637 MHz), mid channel (914.773 MHz) and high channel (926.91 MHz) modulated				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.249:2017	ANSI C63.10:2013

Run #	2	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
902.700	67.0	11.4	1.3	198.0	3.0	0.0	Vert	QP	0.0	78.4	94.0	-15.6	Low ch, EUT horizontal
914.836	66.8	11.4	1.2	197.0	3.0	0.0	Vert	QP	0.0	78.2	94.0	-15.8	Mid ch, EUT horizontal
914.836	66.8	11.4	1.0	206.1	3.0	0.0	Horz	QP	0.0	78.2	94.0	-15.8	Mid ch, EUT on side
914.836	66.5	11.4	1.4	13.0	3.0	0.0	Vert	QP	0.0	77.9	94.0	-16.1	Mid ch, EUT vertical
926.968	65.4	11.9	1.2	154.0	3.0	0.0	Vert	QP	0.0	77.3	94.0	-16.7	High ch, EUT horizontal
914.836	63.6	11.4	1.0	246.9	3.0	0.0	Horz	QP	0.0	75.0	94.0	-19.0	Mid ch, EUT vertical
914.836	62.3	11.4	3.7	253.0	3.0	0.0	Horz	QP	0.0	73.7	94.0	-20.3	Mid ch, EUT horizontal
914.836	51.4	11.4	1.0	112.1	3.0	0.0	Vert	QP	0.0	62.8	94.0	-31.2	Mid ch, EUT on side

FIELD STRENGTH OF HARMONICS AND SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2017.06.01

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

MODES OF OPERATION

Transmitting low channel (902.637 MHz), mid channel (914.773 MHz) and high channel (926.91 MHz) modulated

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

STAK0106 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	12400 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	Fairview Microwave	SA18E-20	TWZ	9/20/2017	12 mo
Filter - High Pass	Micro-Tronics	HPM50108	LFM	9/20/2017	12 mo
Cable	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	7/12/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	2/14/2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AXP	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	2/14/2017	12 mo
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	12/1/2016	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJA	6/23/2016	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	12/1/2016	12 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	12/1/2016	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYD	1/6/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFI	1/6/2017	12 mo

MEASUREMENT BANDWIDTHS

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

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

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

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

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

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

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

Measurements at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

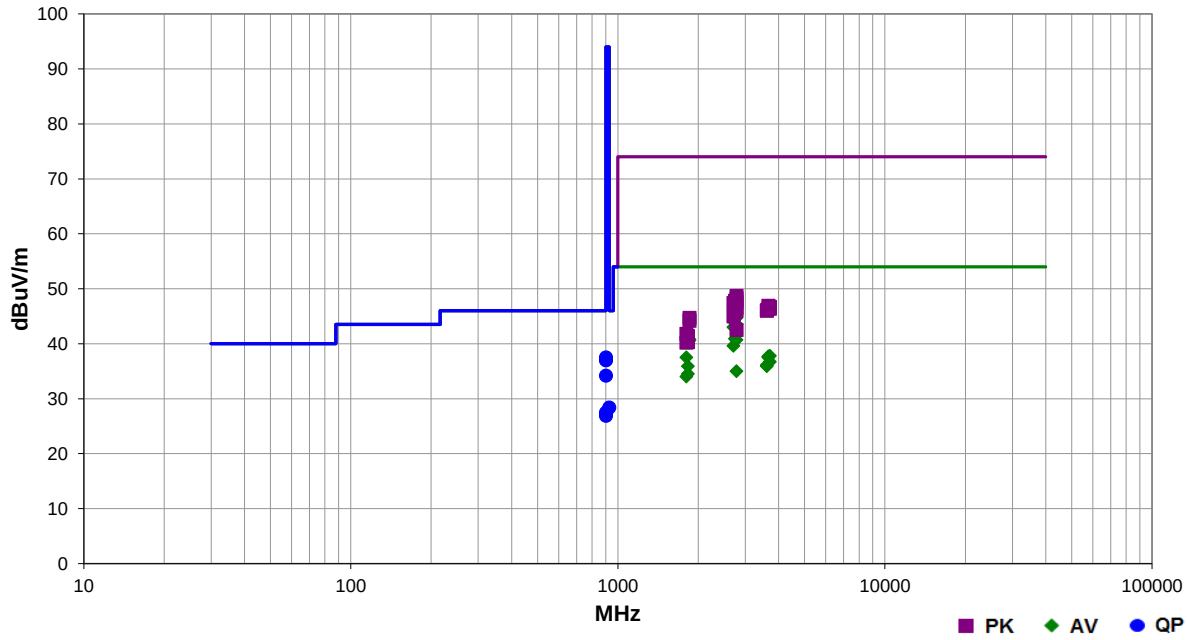
FIELD STRENGTH OF HARMONICS AND SPURIOUS RADIATED EMISSIONS

EmiR5 2017.07.11 PSA-ESCI 2017.06.01

Work Order:	STAK0106	**Date:**	11/06/17		
Project:	None	**Temperature:**	22.7 °C		
Job Site:	MN05	**Humidity:**	22.6% RH		
Serial Number:	171140415	**Barometric Pres.:**	1029 mbar	**Tested by:**	Dustin Sparks, William Hoffa
EUT:	Muse iQ R Hearing Aid				
Configuration:	1				
Customer:	Starkey Laboratories, Inc.				
Attendees:	Charlie Esch				
EUT Power:	Battery				
Operating Mode:	Transmitting low channel (902.637 MHz), mid channel (914.773 MHz) and high channel (926.91 MHz) modulated				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.249:2017	ANSI C63.10:2013

Run #	5	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
902.000	26.2	11.3	1.0	228.1	3.0	0.0	Horz	QP	0.0	37.5	46.0	-8.5	Low ch, EUT horizontal
2780.713	46.9	-1.5	1.0	135.0	3.0	0.0	Horz	AV	0.0	45.4	54.0	-8.6	High ch, EUT on side
902.000	25.8	11.3	1.3	163.1	3.0	0.0	Vert	QP	0.0	37.1	46.0	-8.9	Low ch, EUT on side
902.000	25.7	11.3	1.2	186.0	3.0	0.0	Vert	QP	0.0	37.0	46.0	-9.0	Low ch, EUT vertical
2780.738	46.2	-1.5	1.0	145.1	3.0	0.0	Vert	AV	0.0	44.7	54.0	-9.3	High ch, EUT vertical
2744.303	45.5	-1.7	1.0	139.0	3.0	0.0	Horz	AV	0.0	43.8	54.0	-10.2	Mid ch, EUT on side
2780.713	45.0	-1.5	1.0	188.1	3.0	0.0	Vert	AV	0.0	43.5	54.0	-10.5	High ch, EUT horizontal
2707.893	45.1	-2.1	1.0	141.1	3.0	0.0	Horz	AV	0.0	43.0	54.0	-11.0	Low ch, EUT on side
902.000	22.9	11.3	1.0	254.9	3.0	0.0	Horz	QP	0.0	34.2	46.0	-11.8	Low ch, EUT vertical
2780.697	43.4	-1.5	1.0	110.0	3.0	0.0	Horz	AV	0.0	41.9	54.0	-12.1	High ch, EUT horizontal
2744.370	42.6	-1.7	1.1	31.0	3.0	0.0	Vert	AV	0.0	40.9	54.0	-13.1	Mid ch, EUT vertical
1853.803	44.7	-3.9	1.0	254.9	3.0	0.0	Vert	AV	0.0	40.8	54.0	-13.2	High ch, EUT vertical
2780.747	42.2	-1.5	1.0	87.1	3.0	0.0	Horz	AV	0.0	40.7	54.0	-13.3	High ch, EUT vertical
1853.820	44.5	-3.9	1.0	66.1	3.0	0.0	Horz	AV	0.0	40.6	54.0	-13.4	High ch, EUT on side
2707.877	41.7	-2.1	1.0	2.0	3.0	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Low ch, EUT vertical
3707.582	35.1	2.7	1.0	73.1	3.0	0.0	Horz	AV	0.0	37.8	54.0	-16.2	High ch, EUT on side
3659.107	35.4	2.3	1.0	258.9	3.0	0.0	Horz	AV	0.0	37.7	54.0	-16.3	Mid ch, EUT on side
3659.007	35.2	2.3	1.0	122.0	3.0	0.0	Vert	AV	0.0	37.5	54.0	-16.5	Mid ch, EUT vertical

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
1805.245	41.8	-4.3	1.0	258.9	3.0	0.0	Horz	AV	0.0	37.5	54.0	-16.5	Low ch, EUT on side
3707.490	34.0	2.7	1.0	296.0	3.0	0.0	Vert	AV	0.0	36.7	54.0	-17.3	High ch, EUT vertical
928.025	16.4	12.0	3.2	252.0	3.0	0.0	Horz	QP	0.0	28.4	46.0	-17.6	High ch, EUT horizontal
3610.442	33.9	2.2	1.0	235.0	3.0	0.0	Horz	AV	0.0	36.1	54.0	-17.9	Low ch, EUT on side
1829.550	40.1	-4.2	1.0	256.0	3.0	0.0	Vert	AV	0.0	35.9	54.0	-18.1	Mid ch, EUT vertical
3610.450	33.7	2.2	1.0	169.0	3.0	0.0	Vert	AV	0.0	35.9	54.0	-18.1	Low ch, EUT vertical
901.990	16.2	11.3	1.0	348.9	3.0	0.0	Horz	QP	0.0	27.5	46.0	-18.5	Low ch, EUT horizontal
2780.722	36.5	-1.5	1.0	176.0	3.0	0.0	Vert	AV	0.0	35.0	54.0	-19.0	High ch, EUT on side
902.000	15.6	11.3	4.0	351.0	3.0	0.0	Vert	QP	0.0	26.9	46.0	-19.1	Low ch, EUT on side
1829.542	38.7	-4.2	1.0	250.9	3.0	0.0	Horz	AV	0.0	34.5	54.0	-19.5	Mid ch, EUT on side
1805.245	38.3	-4.3	1.0	314.0	3.0	0.0	Vert	AV	0.0	34.0	54.0	-20.0	Low ch, EUT vertical
2780.897	50.2	-1.5	1.0	135.0	3.0	0.0	Horz	PK	0.0	48.7	74.0	-25.3	High ch, EUT on side
2780.597	49.7	-1.5	1.0	145.1	3.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	High ch, EUT vertical
2744.512	49.5	-1.7	1.0	139.0	3.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	Mid ch, EUT on side
2780.455	49.2	-1.5	1.0	188.1	3.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	High ch, EUT horizontal
2708.060	49.5	-2.1	1.0	141.1	3.0	0.0	Horz	PK	0.0	47.4	74.0	-26.6	Low ch, EUT on side
3658.840	44.6	2.3	1.0	258.9	3.0	0.0	Horz	PK	0.0	46.9	74.0	-27.1	Mid ch, EUT on side
3708.040	44.0	2.7	1.0	73.1	3.0	0.0	Horz	PK	0.0	46.7	74.0	-27.3	High ch, EUT on side
2780.888	48.1	-1.5	1.0	110.0	3.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	High ch, EUT horizontal
3708.048	43.7	2.7	1.0	296.0	3.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	High ch, EUT vertical
3658.823	44.1	2.3	1.0	122.0	3.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	Mid ch, EUT vertical
3610.833	43.9	2.2	1.0	235.0	3.0	0.0	Horz	PK	0.0	46.1	74.0	-27.9	Low ch, EUT on side
2780.813	47.5	-1.5	1.0	87.1	3.0	0.0	Horz	PK	0.0	46.0	74.0	-28.0	High ch, EUT vertical
3610.317	43.8	2.2	1.0	169.0	3.0	0.0	Vert	PK	0.0	46.0	74.0	-28.0	Low ch, EUT vertical
2744.187	47.5	-1.7	1.1	31.0	3.0	0.0	Vert	PK	0.0	45.8	74.0	-28.2	Mid ch, EUT vertical
2707.960	47.1	-2.1	1.0	2.0	3.0	0.0	Vert	PK	0.0	45.0	74.0	-29.0	Low ch, EUT vertical
1853.637	48.6	-3.9	1.0	254.9	3.0	0.0	Vert	PK	0.0	44.7	74.0	-29.3	High ch, EUT vertical
1853.928	48.1	-3.9	1.0	66.1	3.0	0.0	Horz	PK	0.0	44.2	74.0	-29.8	High ch, EUT on side
2780.522	44.0	-1.5	1.0	176.0	3.0	0.0	Vert	PK	0.0	42.5	74.0	-31.5	High ch, EUT on side
1805.095	46.1	-4.3	1.0	258.9	3.0	0.0	Horz	PK	0.0	41.8	74.0	-32.2	Low ch, EUT on side
1829.442	45.6	-4.2	1.0	256.0	3.0	0.0	Vert	PK	0.0	41.4	74.0	-32.6	Mid ch, EUT vertical
1829.533	44.5	-4.2	1.0	250.9	3.0	0.0	Horz	PK	0.0	40.3	74.0	-33.7	Mid ch, EUT on side
1805.262	44.5	-4.3	1.0	314.0	3.0	0.0	Vert	PK	0.0	40.2	74.0	-33.8	Low ch, EUT vertical