NORTHWEST EMC

Starkey Laboratories, Inc.

SurfLink Media Streamer

FCC 15.207:2015
FCC 15.247:2015

Report # STAK0053

NVLAP Lab Code: 200881-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: June 19, 2015
Starkey Laboratories, Inc.
Model: SurfLink Media Streamer

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2015	ANSI C63.10:2009
FCC 15.247:2015	ANSI C63.10:2009

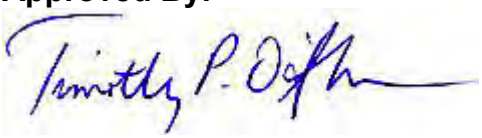
Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
6.7	Band Edge Compliance	Yes	Pass	
6.7	Spurious Conducted Emissions	Yes	Pass	
6.9.1	Occupied Bandwidth	Yes	Pass	
6.10.2	Output Power	Yes	Pass	
6.11.2	Power Spectral Density	Yes	Pass	
7.5	Duty Cycle	Yes	N/A	

Deviations From Test Standards

None

Approved By:



Tim O'Shea, 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

NORTHWEST EMC
REV 2014.10.14

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

NORTHWEST EMC
REV 2015.2.19

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 Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

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://www.nwemc.com/accreditations/
http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY

TMU.2014.12.03

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.

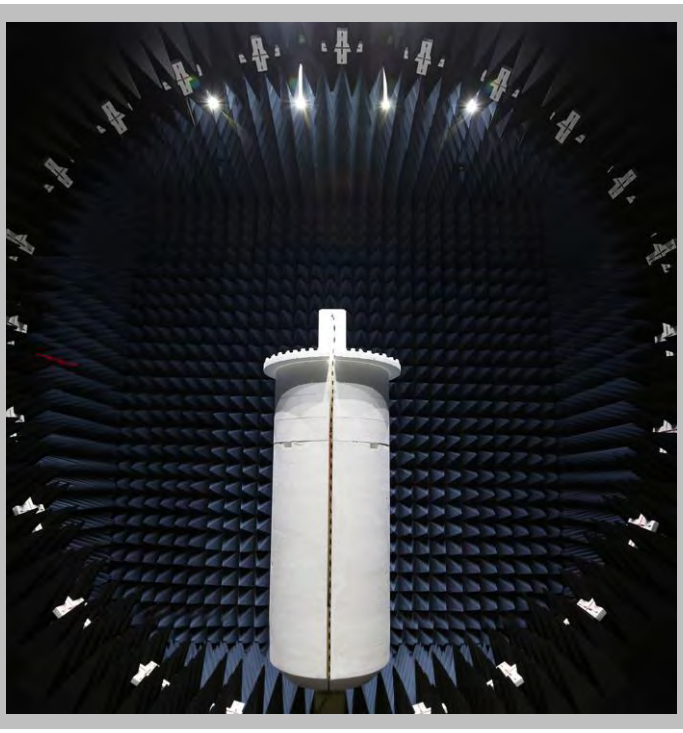
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

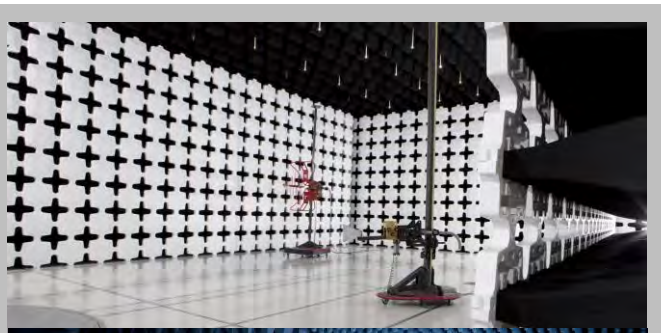
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	4.7 dB	-4.7 dB
AC Powerline Conducted Emissions (dB)	2.9 dB	-2.9 dB

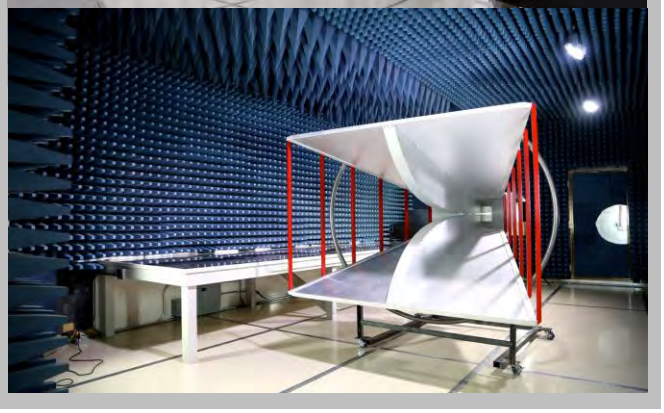
FACILITIES

NORTHWEST EMC
REV 2015.2.19

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-13 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 9801 (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
Industry Canada					
2834B-1, 2834B-3	2834E-1	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







PRODUCT DESCRIPTION

2014-12-10

Client and Equipment Under Test (EUT) Information

Company Name:	Starkey Laboratories, Inc.
Address:	6600 Washington Ave. South
City, State, Zip:	Eden Prairie, MN 55344
Test Requested By:	Bill Mitchell
Model:	SurfLink Media Streamer
First Date of Test:	June 18, 2015
Last Date of Test:	June 19, 2015
Receipt Date of Samples:	June 18, 2015
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Wireless media streamer that can accept various wired audio inputs from a TV or other audio sources for wireless transmission to hearing aids. The transmitter is a low power, short-range device operating in the 902 - 928 MHz range.

Testing Objective:
To demonstrate compliance of the 915 MHz radio to FCC 15.247 requirements for a new FCC ID.

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration STAK0053- 1

Software/Firmware Running during test	
Description	**Version**
WEST Test Software	3.3.4.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SurfLink Media Streamer	Starkey Laboratories, Inc.	210	M151000036

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Lenovo	T430	11306
AC Supply	Lenovo	ADLX90NCT2A	11S45N0311Z1ZLZ633MOT4
Mouse	Microsoft	1113	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB	Yes	1.0m	Yes	SurfLink Media Streamer	Laptop
USB	Yes	1.8m	Yes	Laptop	Mouse
AC Power	No	0.95m	No	AC Supply	AC Mains
DC Power	No	1.8m	Yes	Laptop	AC Supply

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration STAK0053- 2

Software/Firmware Running during test	
Description	**Version**
WEST Test Software	3.3.4.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SurfLink Media Streamer	Starkey Laboratories, Inc.	210	M151500057

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Lenovo	T430	11306
AC Supply	Lenovo	ADLX90NCT2A	11S45N0311Z1ZLZ633MOT4
Mouse	Microsoft	1113	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB	Yes	1.8m	Yes	Laptop	Mouse
AC Power	No	0.95m	No	AC Supply	AC Mains
DC Power	No	1.8m	Yes	Laptop	AC Supply
USB	Yes	>3.0m	Yes	SurfLink Media Streamer	Laptop
RCA	No	1.8m	No	SurfLink Media Streamer	Unterminated
RCA	No	1.8m	No	SurfLink Media Streamer	Unterminated
Headphone	No	1.0m	No	SurfLink Media Streamer	Unterminated

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration STAK0053- 5

Software/Firmware Running during test	
Description	**Version**
WEST Test Software	3.3.4.0

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SurfLink Media Streamer	Starkey Laboratories, Inc.	210	M151000036

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Lenovo	T430	11306
AC Supply	Lenovo	ADLX90NCT2A	11S45N0311Z1ZLZ633MOT4

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB	Yes	1.0m	Yes	SurfLink Media Streamer	Laptop
AC Power	No	0.95m	No	AC Supply	AC Mains
DC Power	No	1.8m	Yes	Laptop	AC Supply
RCA	No	1.8m	No	SurfLink Media Streamer	Unterminated
RCA	No	1.8m	No	SurfLink Media Streamer	Unterminated
Headphone	No	1.0m	No	SurfLink Media Streamer	Unterminated

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration stak0053- 6

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SurfLink Media Streamer	Starkey Laboratories, Inc.	210	M151500057
AC power brick	ITE Power Supply	HK-U-050A100-CP	5

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
RCA	No	1.8m	No	SurfLink Media Streamer	Unterminated
RCA	No	1.8m	No	SurfLink Media Streamer	Unterminated
DC Power	No	1.6m	No	Power Brick	SurfLink Media Streamer
AC Power	No	1.8m	No	Power Brick	AC Mains

MODIFICATIONS

NORTHWEST EMC
2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	6/18/2015	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	6/18/2015	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	6/18/2015	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	6/18/2015	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	6/18/2015	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	6/18/2015	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	6/19/2015	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10-2009.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
High Pass Filter	TTE	H97-100K-50-720B	HGN	5/11/2015	05/11/2016
Attenuator 20dB, BNC	Fairview Microwave	SA01B-20	AQP	7/22/2014	07/22/2015
Cable	ESM Cable Corp.	Conducted Cables	MNC	5/13/2015	05/13/2016
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	3/23/2015	03/23/2016
Receiver	Rohde & Schwarz	ESR7	ARI	5/21/2015	05/21/2016

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

STAK0053-5

MODES INVESTIGATED

Transmitting modulated, high channel
Transmitting modulated, low channel
Transmitting modulated, mid channel

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	SurfLink Media Streamer	Work Order:	STAK0053
Serial Number:	M151000036	Date:	06/19/2015
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	Charlie Esch	Relative Humidity:	51.5%
Customer Project:	None	Bar. Pressure:	986.1 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0053-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	10	Line:	Neutral	Ext. Attenuation (dB):	0

COMMENTS

None

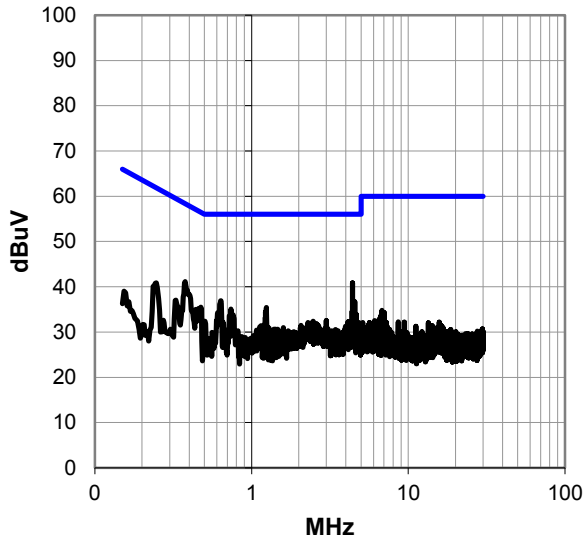
EUT OPERATING MODES

Transmitting modulated, low channel

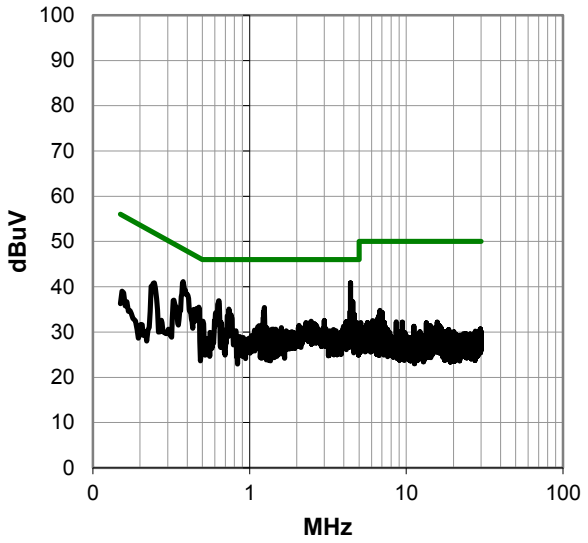
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

RESULTS - Run #10

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.407	20.4	20.5	40.9	56.0	-15.1
0.378	20.9	20.2	41.1	58.3	-17.2
0.635	16.7	20.2	36.9	56.0	-19.1
4.560	16.2	20.5	36.7	56.0	-19.3
1.243	15.2	20.2	35.4	56.0	-20.6
0.739	14.9	20.2	35.1	56.0	-20.9
0.475	15.3	20.2	35.5	56.4	-20.9
0.247	20.6	20.3	40.9	61.9	-21.0
4.388	14.1	20.5	34.6	56.0	-21.4
1.228	14.2	20.2	34.4	56.0	-21.6
4.668	13.4	20.5	33.9	56.0	-22.1
0.721	13.4	20.2	33.6	56.0	-22.4
0.329	16.8	20.2	37.0	59.5	-22.4
2.997	12.2	20.3	32.5	56.0	-23.5
2.478	12.1	20.3	32.4	56.0	-23.6
0.501	12.2	20.2	32.4	56.0	-23.6
4.131	11.8	20.5	32.3	56.0	-23.7
0.657	12.0	20.2	32.2	56.0	-23.8
2.288	11.8	20.3	32.1	56.0	-23.9
4.836	11.6	20.5	32.1	56.0	-23.9
2.430	11.7	20.3	32.0	56.0	-24.0
4.474	11.4	20.5	31.9	56.0	-24.1
2.586	11.5	20.3	31.8	56.0	-24.2
4.806	11.3	20.5	31.8	56.0	-24.2
2.620	11.4	20.3	31.7	56.0	-24.3
4.735	11.1	20.5	31.6	56.0	-24.4

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.407	20.4	20.5	40.9	46.0	-5.1
0.378	20.9	20.2	41.1	48.3	-7.2
0.635	16.7	20.2	36.9	46.0	-9.1
4.560	16.2	20.5	36.7	46.0	-9.3
1.243	15.2	20.2	35.4	46.0	-10.6
0.739	14.9	20.2	35.1	46.0	-10.9
0.475	15.3	20.2	35.5	46.4	-10.9
0.247	20.6	20.3	40.9	51.9	-11.0
4.388	14.1	20.5	34.6	46.0	-11.4
1.228	14.2	20.2	34.4	46.0	-11.6
4.668	13.4	20.5	33.9	46.0	-12.1
0.721	13.4	20.2	33.6	46.0	-12.4
0.329	16.8	20.2	37.0	49.5	-12.4
2.997	12.2	20.3	32.5	46.0	-13.5
2.478	12.1	20.3	32.4	46.0	-13.6
0.501	12.2	20.2	32.4	46.0	-13.6
4.131	11.8	20.5	32.3	46.0	-13.7
0.657	12.0	20.2	32.2	46.0	-13.8
2.288	11.8	20.3	32.1	46.0	-13.9
4.836	11.6	20.5	32.1	46.0	-13.9
2.430	11.7	20.3	32.0	46.0	-14.0
4.474	11.4	20.5	31.9	46.0	-14.1
2.586	11.5	20.3	31.8	46.0	-14.2
4.806	11.3	20.5	31.8	46.0	-14.2
2.620	11.4	20.3	31.7	46.0	-14.3
4.735	11.1	20.5	31.6	46.0	-14.4

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	SurfLink Media Streamer	Work Order:	STAK0053
Serial Number:	M151000036	Date:	06/19/2015
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	Charlie Esch	Relative Humidity:	51.5%
Customer Project:	None	Bar. Pressure:	986.1 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0053-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	11	Line:	High Line	Ext. Attenuation (dB):	0

COMMENTS

None

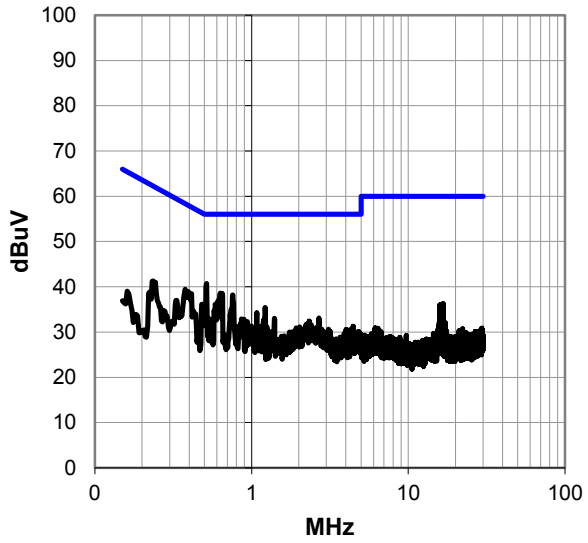
EUT OPERATING MODES

Transmitting modulated, low channel

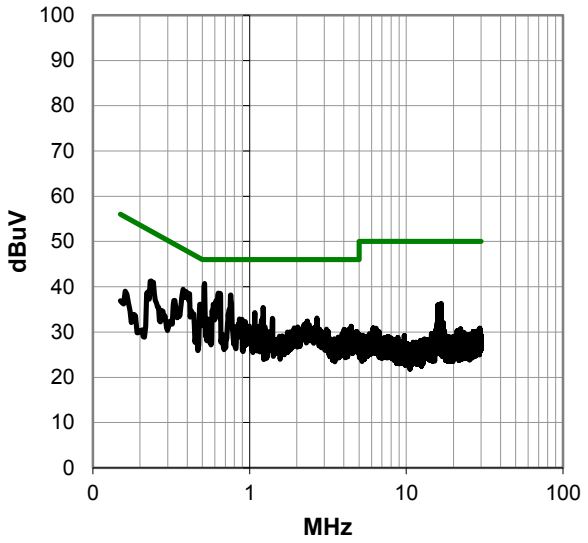
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

RESULTS - Run #11

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.516	20.5	20.2	40.7	56.0	-15.3
0.631	18.4	20.2	38.6	56.0	-17.4
0.650	18.3	20.2	38.5	56.0	-17.5
0.754	18.0	20.2	38.2	56.0	-17.8
0.378	19.2	20.2	39.4	58.3	-18.9
0.587	15.9	20.2	36.1	56.0	-19.9
0.482	15.9	20.2	36.1	56.3	-20.2
1.221	15.2	20.2	35.4	56.0	-20.6
0.236	21.0	20.3	41.3	62.2	-21.0
1.079	14.1	20.2	34.3	56.0	-21.7
0.329	16.7	20.2	36.9	59.5	-22.5
2.694	12.8	20.3	33.1	56.0	-22.9
1.400	12.8	20.2	33.0	56.0	-23.0
0.542	12.7	20.2	32.9	56.0	-23.1
0.863	12.7	20.2	32.9	56.0	-23.1
0.896	12.6	20.2	32.8	56.0	-23.2
1.191	12.4	20.2	32.6	56.0	-23.4
2.336	12.1	20.3	32.4	56.0	-23.6
0.937	12.1	20.2	32.3	56.0	-23.7
16.670	15.0	21.3	36.3	60.0	-23.7
15.950	14.8	21.2	36.0	60.0	-24.0
2.265	11.4	20.3	31.7	56.0	-24.3
2.224	11.4	20.3	31.7	56.0	-24.3
2.661	11.0	20.3	31.3	56.0	-24.7
0.997	11.1	20.2	31.3	56.0	-24.7
4.448	10.8	20.5	31.3	56.0	-24.7

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.516	20.5	20.2	40.7	46.0	-5.3
0.631	18.4	20.2	38.6	46.0	-7.4
0.650	18.3	20.2	38.5	46.0	-7.5
0.754	18.0	20.2	38.2	46.0	-7.8
0.378	19.2	20.2	39.4	48.3	-8.9
0.587	15.9	20.2	36.1	46.0	-9.9
0.482	15.9	20.2	36.1	46.3	-10.2
1.221	15.2	20.2	35.4	46.0	-10.6
0.236	21.0	20.3	41.3	52.2	-11.0
1.079	14.1	20.2	34.3	46.0	-11.7
0.329	16.7	20.2	36.9	49.5	-12.5
2.694	12.8	20.3	33.1	46.0	-12.9
1.400	12.8	20.2	33.0	46.0	-13.0
0.542	12.7	20.2	32.9	46.0	-13.1
0.863	12.7	20.2	32.9	46.0	-13.1
0.896	12.6	20.2	32.8	46.0	-13.2
1.191	12.4	20.2	32.6	46.0	-13.4
2.336	12.1	20.3	32.4	46.0	-13.6
0.937	12.1	20.2	32.3	46.0	-13.7
16.670	15.0	21.3	36.3	50.0	-13.7
15.950	14.8	21.2	36.0	50.0	-14.0
2.265	11.4	20.3	31.7	46.0	-14.3
2.224	11.4	20.3	31.7	46.0	-14.3
2.661	11.0	20.3	31.3	46.0	-14.7
0.997	11.1	20.2	31.3	46.0	-14.7
4.448	10.8	20.5	31.3	46.0	-14.7

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	SurfLink Media Streamer	Work Order:	STAK0053
Serial Number:	M151000036	Date:	06/19/2015
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	Charlie Esch	Relative Humidity:	51.5%
Customer Project:	None	Bar. Pressure:	986.1 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0053-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	12	Line:	High Line	Ext. Attenuation (dB):	0

COMMENTS

None

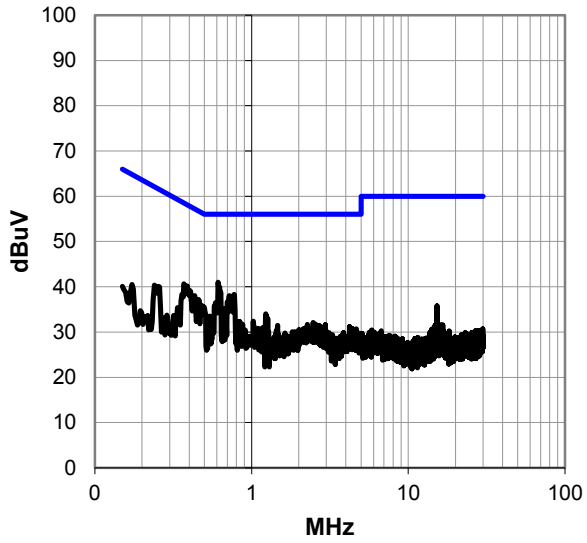
EUT OPERATING MODES

Transmitting modulated, mid channel

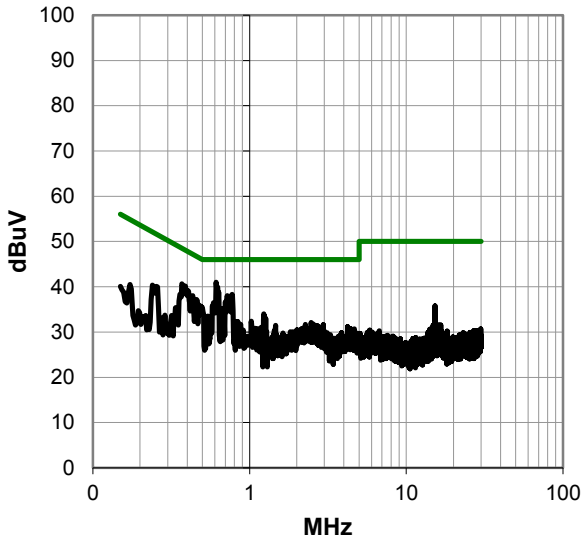
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

RESULTS - Run #12

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.613	20.8	20.2	41.0	56.0	-15.0
0.773	18.1	20.2	38.3	56.0	-17.7
0.370	20.4	20.2	40.6	58.5	-17.9
0.721	17.8	20.2	38.0	56.0	-18.0
0.434	17.8	20.2	38.0	57.2	-19.2
0.460	17.0	20.2	37.2	56.7	-19.5
0.475	15.8	20.2	36.0	56.4	-20.4
0.661	15.0	20.2	35.2	56.0	-20.8
0.240	20.1	20.3	40.4	62.1	-21.7
1.232	13.8	20.2	34.0	56.0	-22.0
0.542	13.3	20.2	33.5	56.0	-22.5
1.269	12.8	20.2	33.0	56.0	-23.0
1.027	12.2	20.2	32.4	56.0	-23.6
0.684	12.1	20.2	32.3	56.0	-23.7
0.825	12.1	20.2	32.3	56.0	-23.7
0.844	12.1	20.2	32.3	56.0	-23.7
0.340	15.2	20.2	35.4	59.2	-23.8
2.478	11.8	20.3	32.1	56.0	-23.9
15.230	14.7	21.1	35.8	60.0	-24.2
2.553	11.4	20.3	31.7	56.0	-24.3
2.277	11.4	20.3	31.7	56.0	-24.3
0.878	11.5	20.2	31.7	56.0	-24.3
0.172	20.1	20.4	40.5	64.8	-24.4
2.959	11.3	20.3	31.6	56.0	-24.4
1.467	11.2	20.2	31.4	56.0	-24.6
2.706	11.1	20.3	31.4	56.0	-24.6

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.613	20.8	20.2	41.0	46.0	-5.0
0.773	18.1	20.2	38.3	46.0	-7.7
0.370	20.4	20.2	40.6	48.5	-7.9
0.721	17.8	20.2	38.0	46.0	-8.0
0.434	17.8	20.2	38.0	47.2	-9.2
0.460	17.0	20.2	37.2	46.7	-9.5
0.475	15.8	20.2	36.0	46.4	-10.4
0.661	15.0	20.2	35.2	46.0	-10.8
0.240	20.1	20.3	40.4	52.1	-11.7
1.232	13.8	20.2	34.0	46.0	-12.0
0.542	13.3	20.2	33.5	46.0	-12.5
1.269	12.8	20.2	33.0	46.0	-13.0
1.027	12.2	20.2	32.4	46.0	-13.6
0.684	12.1	20.2	32.3	46.0	-13.7
0.825	12.1	20.2	32.3	46.0	-13.7
0.844	12.1	20.2	32.3	46.0	-13.7
0.340	15.2	20.2	35.4	49.2	-13.8
2.478	11.8	20.3	32.1	46.0	-13.9
15.230	14.7	21.1	35.8	50.0	-14.2
2.553	11.4	20.3	31.7	46.0	-14.3
2.277	11.4	20.3	31.7	46.0	-14.3
0.878	11.5	20.2	31.7	46.0	-14.3
0.172	20.1	20.4	40.5	54.8	-14.4
2.959	11.3	20.3	31.6	46.0	-14.4
1.467	11.2	20.2	31.4	46.0	-14.6
2.706	11.1	20.3	31.4	46.0	-14.6

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	SurfLink Media Streamer	Work Order:	STAK0053
Serial Number:	M151000036	Date:	06/19/2015
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	Charlie Esch	Relative Humidity:	51.5%
Customer Project:	None	Bar. Pressure:	986.1 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0053-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

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

COMMENTS

None

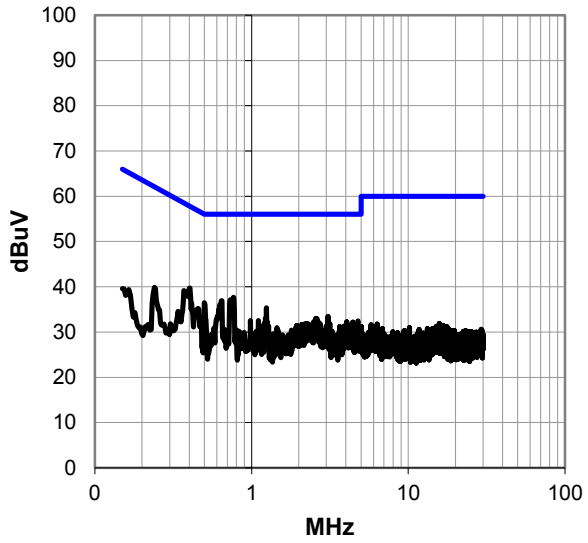
EUT OPERATING MODES

Transmitting modulated, mid channel

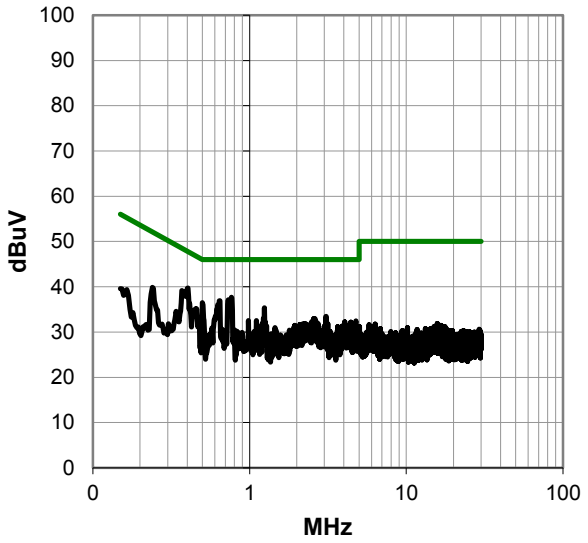
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

RESULTS - Run #13

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.404	19.5	20.2	39.7	57.8	-18.0
0.766	17.5	20.2	37.7	56.0	-18.3
0.642	16.7	20.2	36.9	56.0	-19.1
0.501	16.3	20.2	36.5	56.0	-19.5
1.243	15.1	20.2	35.3	56.0	-20.7
0.452	14.9	20.2	35.1	56.8	-21.7
0.240	19.6	20.3	39.9	62.1	-22.2
3.079	13.1	20.3	33.4	56.0	-22.6
1.224	12.8	20.2	33.0	56.0	-23.0
2.612	12.6	20.3	32.9	56.0	-23.1
2.568	12.6	20.3	32.9	56.0	-23.1
1.105	12.3	20.2	32.5	56.0	-23.5
0.986	12.3	20.2	32.5	56.0	-23.5
4.765	12.0	20.5	32.5	56.0	-23.5
2.497	12.0	20.3	32.3	56.0	-23.7
4.056	11.8	20.5	32.3	56.0	-23.7
2.627	11.9	20.3	32.2	56.0	-23.8
4.429	11.7	20.5	32.2	56.0	-23.8
2.694	11.8	20.3	32.1	56.0	-23.9
1.213	11.9	20.2	32.1	56.0	-23.9
2.277	11.6	20.3	31.9	56.0	-24.1
3.157	11.5	20.3	31.8	56.0	-24.2
2.735	11.5	20.3	31.8	56.0	-24.2
2.236	11.5	20.3	31.8	56.0	-24.2
2.183	11.5	20.3	31.8	56.0	-24.2
2.504	11.4	20.3	31.7	56.0	-24.3

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.404	19.5	20.2	39.7	47.8	-8.0
0.766	17.5	20.2	37.7	46.0	-8.3
0.642	16.7	20.2	36.9	46.0	-9.1
0.501	16.3	20.2	36.5	46.0	-9.5
1.243	15.1	20.2	35.3	46.0	-10.7
0.452	14.9	20.2	35.1	46.8	-11.7
0.240	19.6	20.3	39.9	52.1	-12.2
3.079	13.1	20.3	33.4	46.0	-12.6
1.224	12.8	20.2	33.0	46.0	-13.0
2.612	12.6	20.3	32.9	46.0	-13.1
2.568	12.6	20.3	32.9	46.0	-13.1
1.105	12.3	20.2	32.5	46.0	-13.5
0.986	12.3	20.2	32.5	46.0	-13.5
4.765	12.0	20.5	32.5	46.0	-13.5
2.497	12.0	20.3	32.3	46.0	-13.7
4.056	11.8	20.5	32.3	46.0	-13.7
2.627	11.9	20.3	32.2	46.0	-13.8
4.429	11.7	20.5	32.2	46.0	-13.8
2.694	11.8	20.3	32.1	46.0	-13.9
1.213	11.9	20.2	32.1	46.0	-13.9
2.277	11.6	20.3	31.9	46.0	-14.1
3.157	11.5	20.3	31.8	46.0	-14.2
2.735	11.5	20.3	31.8	46.0	-14.2
2.236	11.5	20.3	31.8	46.0	-14.2
2.183	11.5	20.3	31.8	46.0	-14.2
2.504	11.4	20.3	31.7	46.0	-14.3

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	SurfLink Media Streamer	Work Order:	STAK0053
Serial Number:	M151000036	Date:	06/19/2015
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	Charlie Esch	Relative Humidity:	51.5%
Customer Project:	None	Bar. Pressure:	986.1 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0053-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	14	Line:	Neutral	Ext. Attenuation (dB):	0

COMMENTS

None

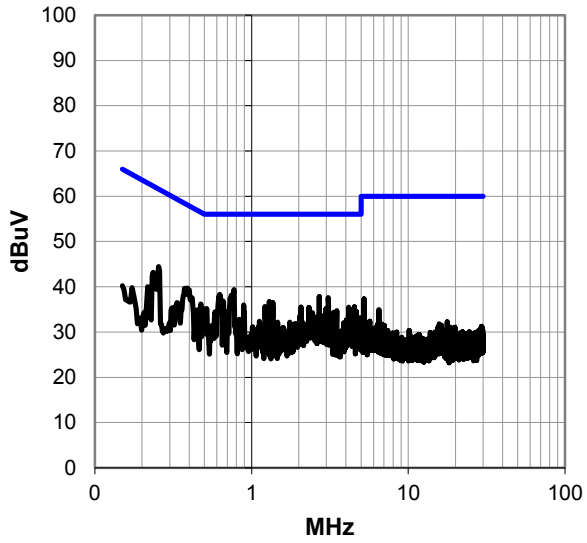
EUT OPERATING MODES

Transmitting modulated, high channel

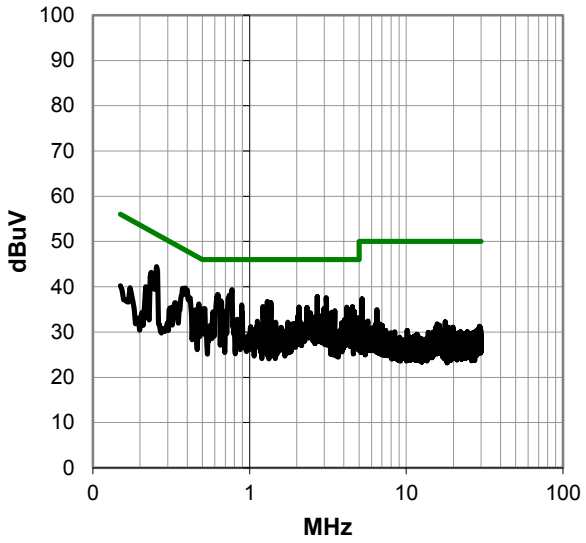
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

RESULTS - Run #14

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.773	19.2	20.2	39.4	56.0	-16.6
0.254	24.2	20.3	44.5	61.6	-17.1
0.628	18.1	20.2	38.3	56.0	-17.7
2.702	17.5	20.3	37.8	56.0	-18.2
0.389	19.5	20.2	39.7	58.1	-18.4
3.090	17.3	20.3	37.6	56.0	-18.4
0.236	22.9	20.3	43.2	62.2	-19.1
0.657	16.7	20.2	36.9	56.0	-19.1
1.299	16.5	20.2	36.7	56.0	-19.3
1.370	16.3	20.2	36.5	56.0	-19.5
0.892	15.8	20.2	36.0	56.0	-20.0
0.475	16.0	20.2	36.2	56.4	-20.2
1.217	15.4	20.2	35.6	56.0	-20.4
4.530	15.1	20.5	35.6	56.0	-20.4
2.068	15.2	20.3	35.5	56.0	-20.5
4.176	15.0	20.5	35.5	56.0	-20.5
1.247	15.2	20.2	35.4	56.0	-20.6
2.325	15.1	20.3	35.4	56.0	-20.6
3.000	14.9	20.3	35.2	56.0	-20.8
0.516	15.0	20.2	35.2	56.0	-20.8
4.213	14.6	20.5	35.1	56.0	-20.9
2.974	14.7	20.3	35.0	56.0	-21.0
3.497	14.4	20.3	34.7	56.0	-21.3
0.684	14.4	20.2	34.6	56.0	-21.4
4.284	14.1	20.5	34.6	56.0	-21.4
4.672	14.0	20.5	34.5	56.0	-21.5

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.773	19.2	20.2	39.4	46.0	-6.6
0.254	24.2	20.3	44.5	51.6	-7.1
0.628	18.1	20.2	38.3	46.0	-7.7
2.702	17.5	20.3	37.8	46.0	-8.2
0.389	19.5	20.2	39.7	48.1	-8.4
3.090	17.3	20.3	37.6	46.0	-8.4
0.236	22.9	20.3	43.2	52.2	-9.1
0.657	16.7	20.2	36.9	46.0	-9.1
1.299	16.5	20.2	36.7	46.0	-9.3
1.370	16.3	20.2	36.5	46.0	-9.5
0.892	15.8	20.2	36.0	46.0	-10.0
0.475	16.0	20.2	36.2	46.4	-10.2
1.217	15.4	20.2	35.6	46.0	-10.4
4.530	15.1	20.5	35.6	46.0	-10.4
2.068	15.2	20.3	35.5	46.0	-10.5
4.176	15.0	20.5	35.5	46.0	-10.5
1.247	15.2	20.2	35.4	46.0	-10.6
2.325	15.1	20.3	35.4	46.0	-10.6
3.000	14.9	20.3	35.2	46.0	-10.8
0.516	15.0	20.2	35.2	46.0	-10.8
4.213	14.6	20.5	35.1	46.0	-10.9
2.974	14.7	20.3	35.0	46.0	-11.0
3.497	14.4	20.3	34.7	46.0	-11.3
0.684	14.4	20.2	34.6	46.0	-11.4
4.284	14.1	20.5	34.6	46.0	-11.4
4.672	14.0	20.5	34.5	46.0	-11.5

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

EUT:	SurfLink Media Streamer	Work Order:	STAK0053
Serial Number:	M151000036	Date:	06/19/2015
Customer:	Starkey Laboratories, Inc.	Temperature:	22.9°C
Attendees:	Charlie Esch	Relative Humidity:	51.5%
Customer Project:	None	Bar. Pressure:	986.1 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	STAK0053-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

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

COMMENTS

None

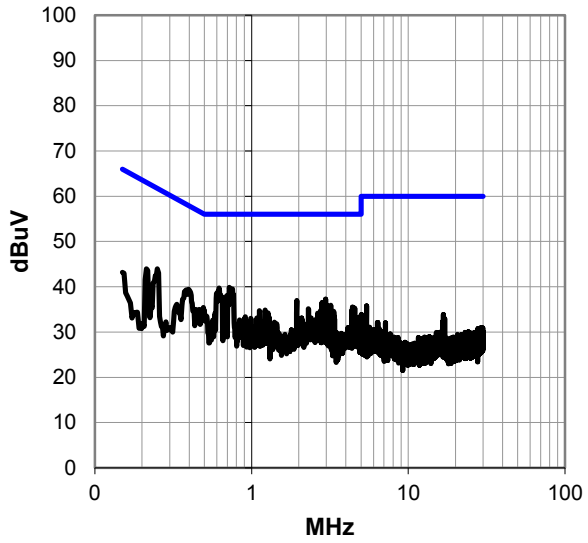
EUT OPERATING MODES

Transmitting modulated, high channel

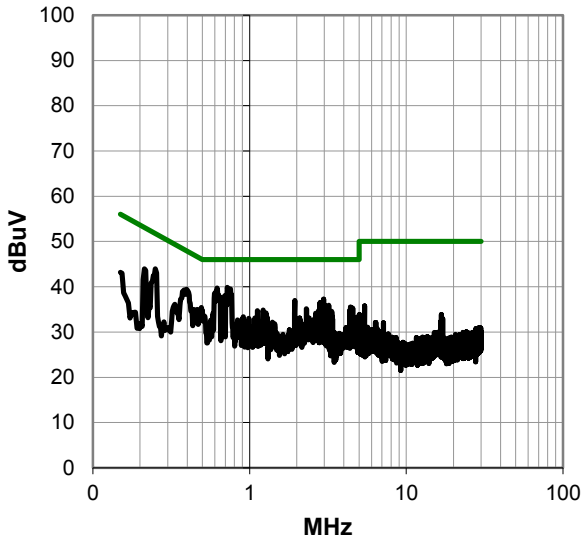
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC

WTD.2015.05.26
PSA-ESCI 2015.03.03, EmiR5 2015.05.29

RESULTS - Run #15

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.721	19.7	20.2	39.9	56.0	-16.1
0.620	19.5	20.2	39.7	56.0	-16.3
0.251	23.7	20.3	44.0	61.7	-17.8
0.695	17.8	20.2	38.0	56.0	-18.0
0.396	19.2	20.2	39.4	57.9	-18.5
2.970	16.9	20.3	37.2	56.0	-18.8
1.941	16.7	20.3	37.0	56.0	-19.0
0.213	23.7	20.3	44.0	63.1	-19.1
0.672	16.6	20.2	36.8	56.0	-19.2
2.825	16.2	20.3	36.5	56.0	-19.5
2.818	16.0	20.3	36.3	56.0	-19.7
3.198	15.6	20.3	35.9	56.0	-20.1
3.023	15.6	20.3	35.9	56.0	-20.1
4.407	15.0	20.5	35.5	56.0	-20.5
0.493	15.2	20.2	35.4	56.1	-20.7
4.552	14.8	20.5	35.3	56.0	-20.7
2.840	14.8	20.3	35.1	56.0	-20.9
2.306	14.8	20.3	35.1	56.0	-20.9
4.500	14.4	20.5	34.9	56.0	-21.1
1.221	14.6	20.2	34.8	56.0	-21.2
4.373	14.3	20.5	34.8	56.0	-21.2
2.750	14.4	20.3	34.7	56.0	-21.3
1.124	14.5	20.2	34.7	56.0	-21.3
3.347	14.2	20.3	34.5	56.0	-21.5
1.277	14.0	20.2	34.2	56.0	-21.8
2.635	13.8	20.3	34.1	56.0	-21.9

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.721	19.7	20.2	39.9	46.0	-6.1
0.620	19.5	20.2	39.7	46.0	-6.3
0.251	23.7	20.3	44.0	51.7	-7.8
0.695	17.8	20.2	38.0	46.0	-8.0
0.396	19.2	20.2	39.4	47.9	-8.5
2.970	16.9	20.3	37.2	46.0	-8.8
1.941	16.7	20.3	37.0	46.0	-9.0
0.213	23.7	20.3	44.0	53.1	-9.1
0.672	16.6	20.2	36.8	46.0	-9.2
2.825	16.2	20.3	36.5	46.0	-9.5
2.818	16.0	20.3	36.3	46.0	-9.7
3.198	15.6	20.3	35.9	46.0	-10.1
3.023	15.6	20.3	35.9	46.0	-10.1
4.407	15.0	20.5	35.5	46.0	-10.5
0.493	15.2	20.2	35.4	46.1	-10.7
4.552	14.8	20.5	35.3	46.0	-10.7
2.840	14.8	20.3	35.1	46.0	-10.9
2.306	14.8	20.3	35.1	46.0	-10.9
4.500	14.4	20.5	34.9	46.0	-11.1
1.221	14.6	20.2	34.8	46.0	-11.2
4.373	14.3	20.5	34.8	46.0	-11.2
2.750	14.4	20.3	34.7	46.0	-11.3
1.124	14.5	20.2	34.7	46.0	-11.3
3.347	14.2	20.3	34.5	46.0	-11.5
1.277	14.0	20.2	34.2	46.0	-11.8
2.635	13.8	20.3	34.1	46.0	-11.9

CONCLUSION

Pass

Trevor Buls

Tested By

SPURIOUS RADIATED EMISSIONS

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, modulated. Low channel operation centered at 902.8 MHz. High channel operation centered at 926.75 MHz. Mid channel is 915.184 MHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

STAK0053 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	10 GHz

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
.5-1 GHz Notch Filter	K&L Microwave	3TNF-500/1000-N/N	HGS	9/4/2014	12 mo
High Pass Filter, 1.2 - 18 GHz	Micro-Tronics	HPM50108	HGP	3/2/2015	12 mo
Low Pass Filter, 0 - 425 MHz	Micro-Tronics	LPM50003	HGO	3/2/2015	12 mo
Attenuator, 20 dB, 'SMA'	S.M. Electronics	SA6-20	REO	3/2/2015	12 mo
Attenuator, 10db, 'SMA'	S.M. Electronics	SA18H-10	REN	3/2/2015	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	3/2/2015	12 mo
Antenna, Horn	ETS Lindgren	3160-07	AXP	NCR	0 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	5/5/2015	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	5/5/2015	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/2/2015	12 mo
Antenna, Horn	ETS Lindgren	3115	AJA	6/3/2014	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/30/2015	12 mo
Antenna, Biconilog	Teseq	CBL 6141B	AYD	12/17/2013	24 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	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

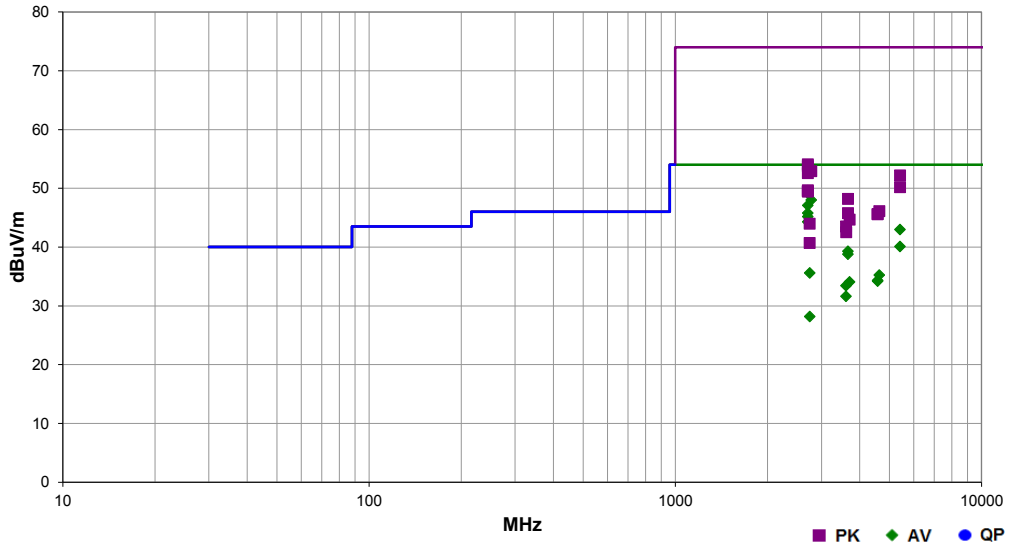
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

SPURIOUS RADIATED EMISSIONS

Work Order:	STAK0053	**Date:**	06/18/15		
Project:	None	**Temperature:**	23 °C		
Job Site:	MN05	**Humidity:**	52.6% RH		
Serial Number:	M151500057	**Barometric Pres.:**	985.8 mbar	**Tested by:**	Trevor Buls
EUT:	SurfLink Media Streamer				
Configuration:	2				
Customer:	Starkey Laboratories, Inc.				
Attendees:	Charlie Esch				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting, modulated. Low channel operation centered at 902.8 MHz. High channel operation centered at 926.75 MHz. Mid channel is 915.184 MHz				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.247:2015	ANSI C63.10:2009

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
2707.742	50.9	-1.3	2.1	201.0	3.0	0.0	Vert	AV	0.0	49.6	54.0	-4.4	EUT Horizontal, Low Channel
2707.942	50.5	-1.3	1.0	261.0	3.0	0.0	Horz	AV	0.0	49.2	54.0	-4.8	EUT on Side, Low Ch
2779.825	49.5	-1.5	1.1	207.0	3.0	0.0	Vert	AV	0.0	48.0	54.0	-6.0	EUT Horizontal, High Ch
2707.733	48.4	-1.3	1.8	292.0	3.0	0.0	Horz	AV	0.0	47.1	54.0	-6.9	EUT Vertical, Low Channel
2707.817	47.1	-1.3	2.2	178.1	3.0	0.0	Horz	AV	0.0	45.8	54.0	-8.2	EUT Horizontal, Low Channel
2707.792	46.5	-1.3	3.4	243.0	3.0	0.0	Vert	AV	0.0	45.2	54.0	-8.8	EUT on Side, Low Ch
2707.875	45.6	-1.3	1.0	231.0	3.0	0.0	Vert	AV	0.0	44.3	54.0	-9.7	EUT Vertical, Low Channel
5417.083	34.9	8.1	2.4	358.9	3.0	0.0	Horz	AV	0.0	43.0	54.0	-11.0	EUT on Side, Low Ch
5415.242	32.0	8.1	1.9	150.0	3.0	0.0	Vert	AV	0.0	40.1	54.0	-13.9	EUT Horizontal, Low Channel
3661.790	37.3	2.0	1.1	118.0	3.0	0.0	Vert	AV	0.0	39.3	54.0	-14.7	EUT Horizontal, Mid Channel
3662.640	36.8	2.0	1.0	37.1	3.0	0.0	Horz	AV	0.0	38.8	54.0	-15.2	EUT on Side, Mid Channel
2747.800	37.0	-1.4	1.4	268.0	3.0	0.0	Vert	AV	0.0	35.6	54.0	-18.4	EUT Horizontal, Mid Channel
4633.800	29.7	5.5	1.0	192.1	3.0	0.0	Vert	AV	0.0	35.2	54.0	-18.8	EUT Horizontal, High Ch
4577.428	29.1	5.2	1.0	197.0	3.0	0.0	Vert	AV	0.0	34.3	54.0	-19.7	EUT Horizontal, Mid Channel
4577.945	29.0	5.2	1.0	131.1	3.0	0.0	Horz	AV	0.0	34.2	54.0	-19.8	EUT on Side, Mid Channel
2708.250	55.4	-1.3	1.8	292.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	EUT Vertical, Low Channel
3707.467	31.8	2.3	1.0	63.0	3.0	0.0	Vert	AV	0.0	34.1	54.0	-19.9	EUT Horizontal, High Ch
2708.283	55.1	-1.3	1.0	261.0	3.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	EUT on Side, Low Ch
3611.525	31.7	1.7	1.0	332.0	3.0	0.0	Horz	AV	0.0	33.4	54.0	-20.6	EUT on Side, Low Ch
2780.117	54.4	-1.5	1.1	207.0	3.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	EUT Horizontal, High Ch
2708.000	53.9	-1.3	2.1	201.0	3.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	EUT Horizontal, Low Channel
5416.525	44.1	8.1	2.4	358.9	3.0	0.0	Horz	PK	0.0	52.2	74.0	-21.8	EUT on Side, Low Ch
3610.975	29.9	1.7	1.0	176.0	3.0	0.0	Vert	AV	0.0	31.6	54.0	-22.4	EUT Horizontal, Low Channel
5416.650	42.1	8.1	1.9	150.0	3.0	0.0	Vert	PK	0.0	50.2	74.0	-23.8	EUT Horizontal, Low Channel
2708.233	51.0	-1.3	1.0	231.0	3.0	0.0	Vert	PK	0.0	49.7	74.0	-24.3	EUT Vertical, Low Channel
2708.158	50.8	-1.3	3.4	243.0	3.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	EUT on Side, Low Ch
2708.417	50.8	-1.3	2.2	178.1	3.0	0.0	Horz	PK	0.0	49.5	74.0	-24.5	EUT Horizontal, Low Channel
3661.707	46.2	2.0	1.1	118.0	3.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	EUT Horizontal, Mid Channel
2747.750	29.6	-1.4	1.0	234.0	3.0	0.0	Horz	AV	0.0	28.2	54.0	-25.8	EUT on Side, Mid Channel
4633.742	40.6	5.5	1.0	192.1	3.0	0.0	Vert	PK	0.0	46.1	74.0	-27.9	EUT Horizontal, High Ch
3662.057	43.8	2.0	1.0	37.1	3.0	0.0	Horz	PK	0.0	45.8	74.0	-28.2	EUT on Side, Mid Channel
4576.837	40.4	5.2	1.0	131.1	3.0	0.0	Horz	PK	0.0	45.6	74.0	-28.4	EUT on Side, Mid Channel
4575.362	40.4	5.2	1.0	197.0	3.0	0.0	Vert	PK	0.0	45.6	74.0	-28.4	EUT Horizontal, Mid Channel
3707.108	42.4	2.3	1.0	63.0	3.0	0.0	Vert	PK	0.0	44.7	74.0	-29.3	EUT Horizontal, High Ch
2746.258	45.4	-1.4	1.4	268.0	3.0	0.0	Vert	PK	0.0	44.0	74.0	-30.0	EUT Horizontal, Mid Channel
3611.633	41.8	1.7	1.0	332.0	3.0	0.0	Horz	PK	0.0	43.5	74.0	-30.5	EUT on Side, Low Ch
3612.567	40.8	1.7	1.0	176.0	3.0	0.0	Vert	PK	0.0	42.5	74.0	-31.5	EUT Horizontal, Low Channel
2746.292	42.1	-1.4	1.0	234.0	3.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	EUT on Side, Mid Channel

BAND EDGE COMPLIANCE

NORTHWEST EMC

XMit 2015.01.14

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.	Interval (mos)
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Attenuator, 20db, 'SMA'	S.M. Electronics	SA26B-20	RFW	3/10/2015	12
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

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

NORTHWEST EMC

XMit 2015.01.14

EUT:	SurfLink Media Streamer			Work Order:	STAK0053
Serial Number:	M151000036			Date:	06/18/15
Customer:	Starkey Laboratories, Inc.			Temperature:	23.1°C
Attendees:	Charlie Esch			Humidity:	50%
Project:	None			Barometric Pres.:	986.8
Tested by:	Trevor Buls	Power:	110VAC/60Hz	Job Site:	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

None

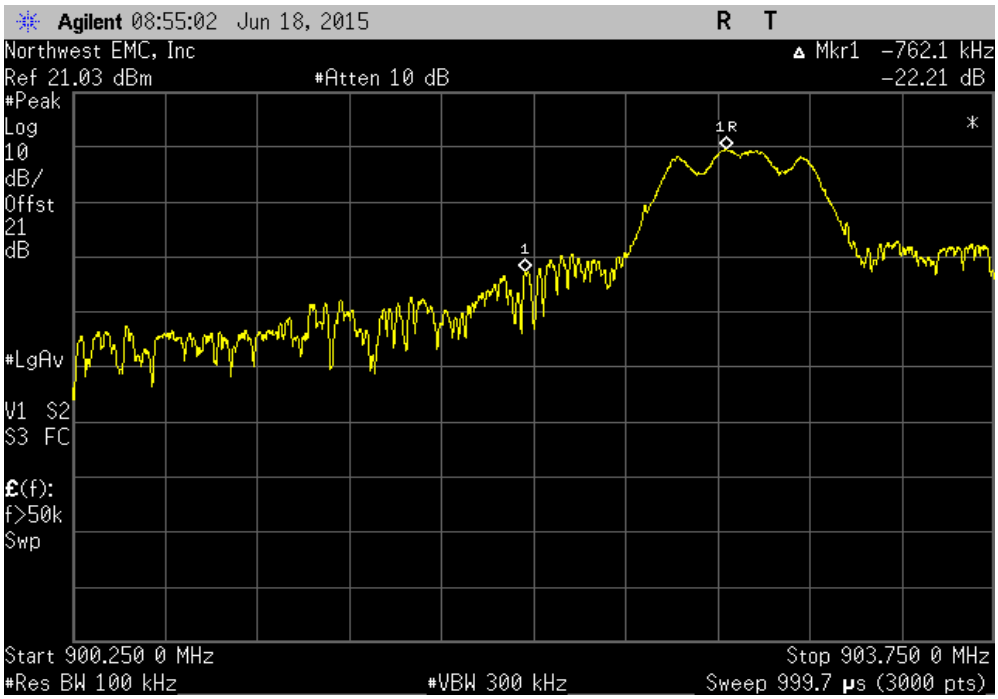
DEVIATIONS FROM TEST STANDARD

None

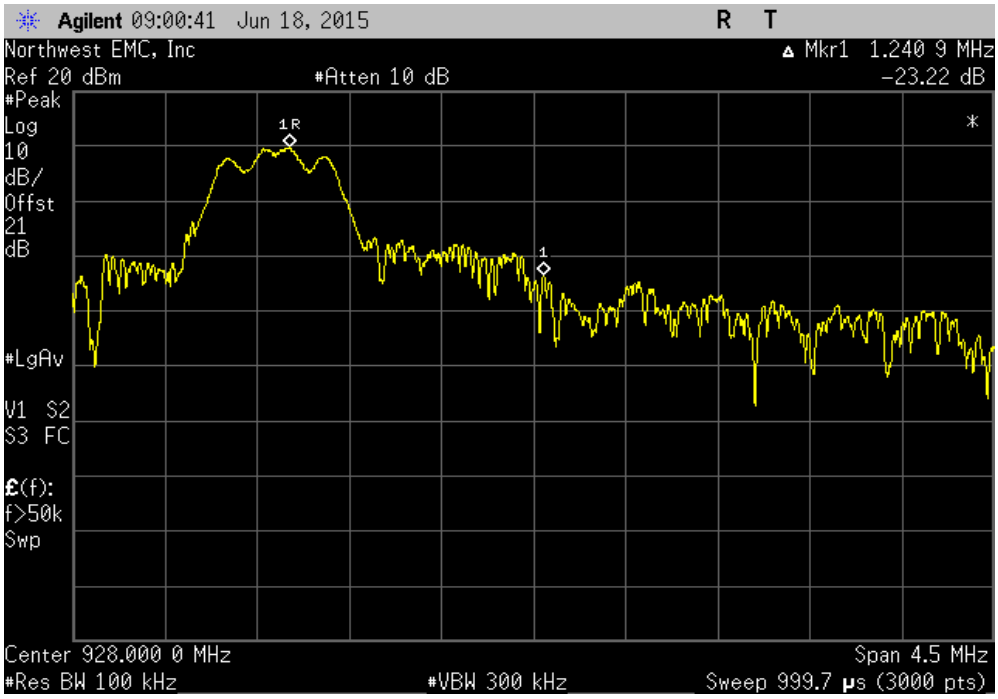
Configuration #	1	Signature	Trevor Buls

	Value (dBc)	Limit ≤ (dBc)	Result
Low Channel	-22.21	-20	Pass
High Channel	-23.22	-20	Pass

Low Channel						
				Value (dBc)	Limit ≤ (dBc)	Result
				-22.21	-20	Pass



High Channel						
				Value (dBc)	Limit ≤ (dBc)	Result
				-23.22	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2015.01.14

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.	Interval (mos)
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	S.M. Electronics	SA26B-20	RFW	3/10/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

NORTHWEST EMC

XMit 2015.01.14

EUT:	SurfLink Media Streamer			**Work Order:**	STAK0053
Serial Number:	M151000036			**Date:**	06/18/15
Customer:	Starkey Laboratories, Inc.			**Temperature:**	23.1°C
Attendees:	Charlie Esch			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	986.8
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

None

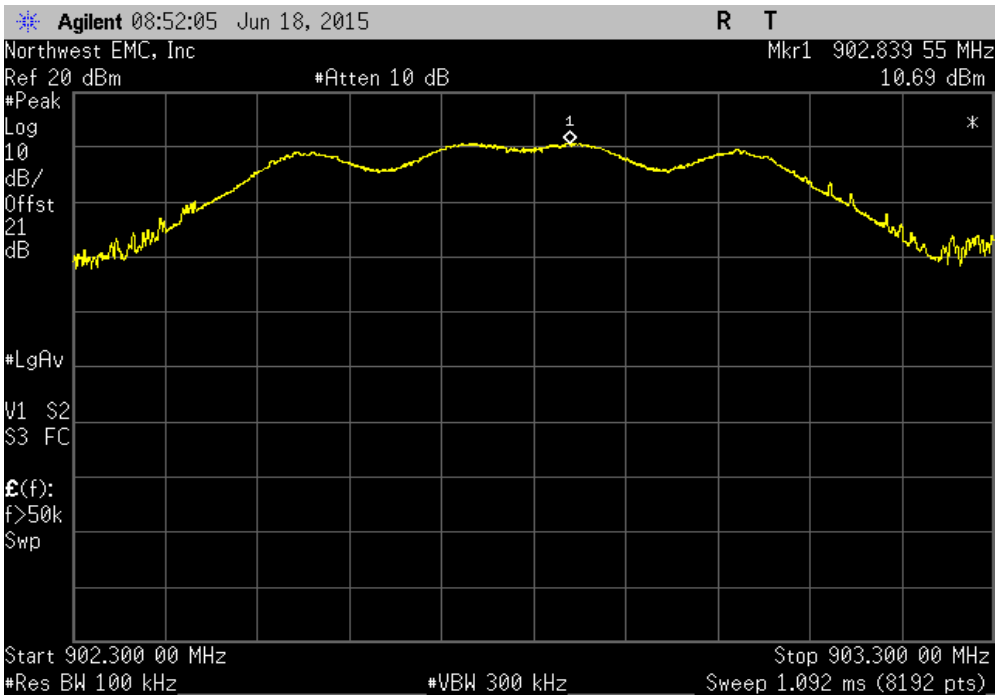
DEVIATIONS FROM TEST STANDARD

None

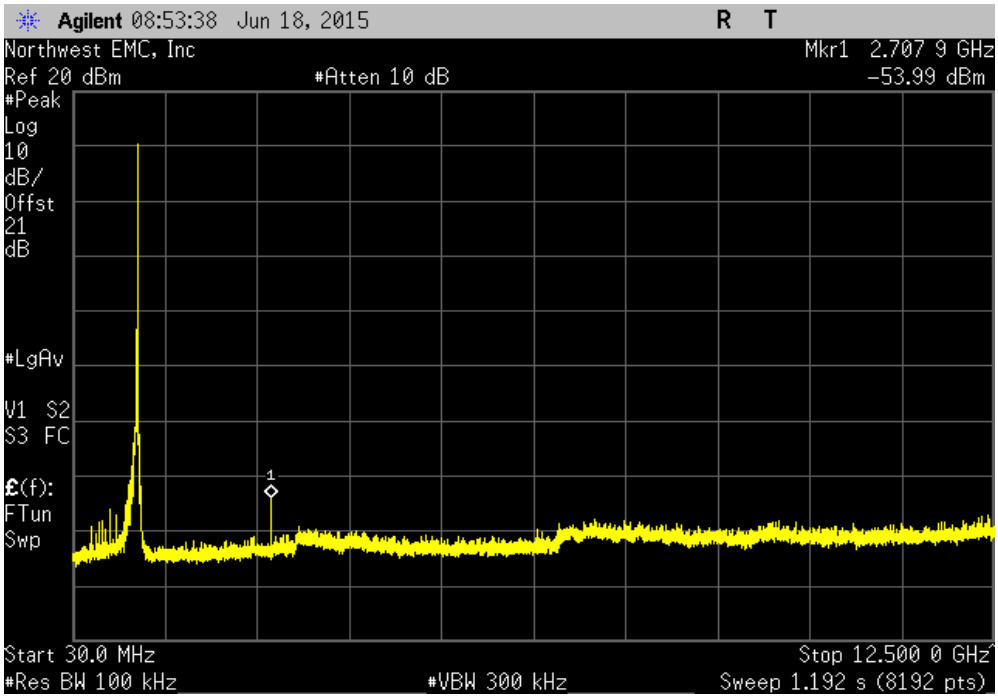
Configuration #	1	Signature	Trevor Buls

	Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result
Low Channel	Fundamental	N/A	N/A	N/A
Low Channel	30 MHz - 12.5 GHz	-64.68	-20	Pass
Mid Channel	Fundamental	N/A	N/A	N/A
Mid Channel	30 MHz - 10 GHz	-59.07	-20	Pass
High Channel	Fundamental	N/A	N/A	N/A
High Channel	30 MHz - 10 GHz	-64.03	-20	Pass

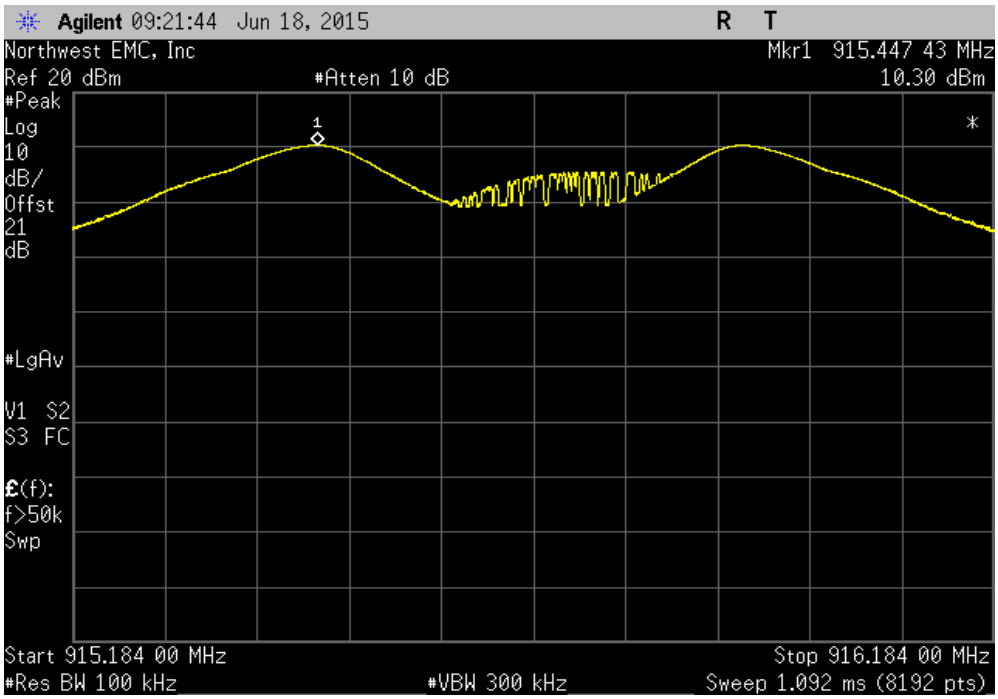
Low Channel						
	Frequency Range			Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



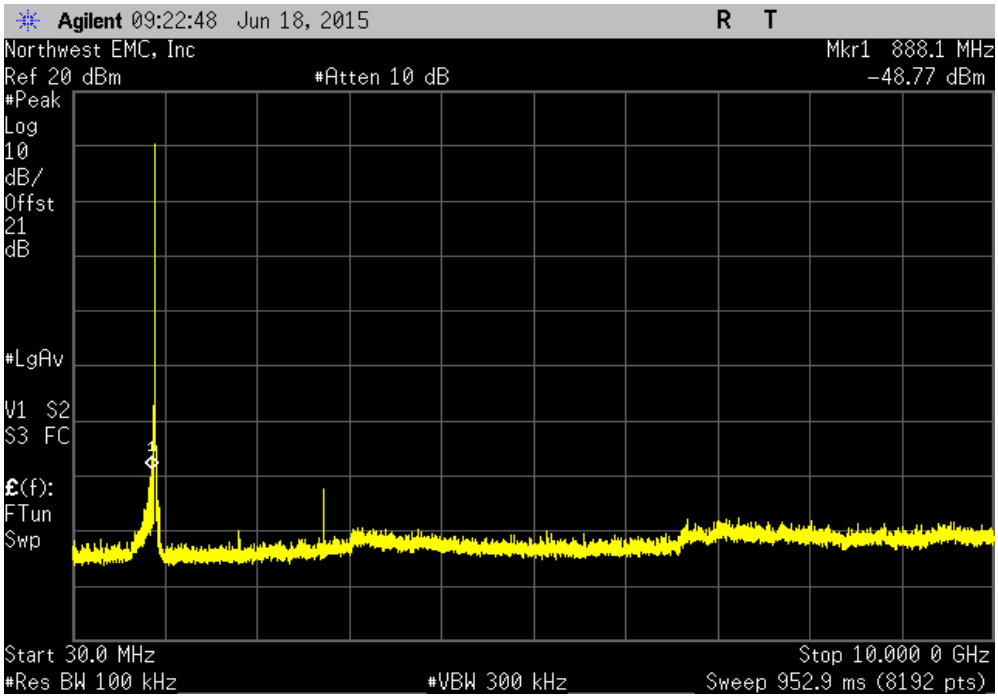
Low Channel					
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz		-64.68	-20	Pass	



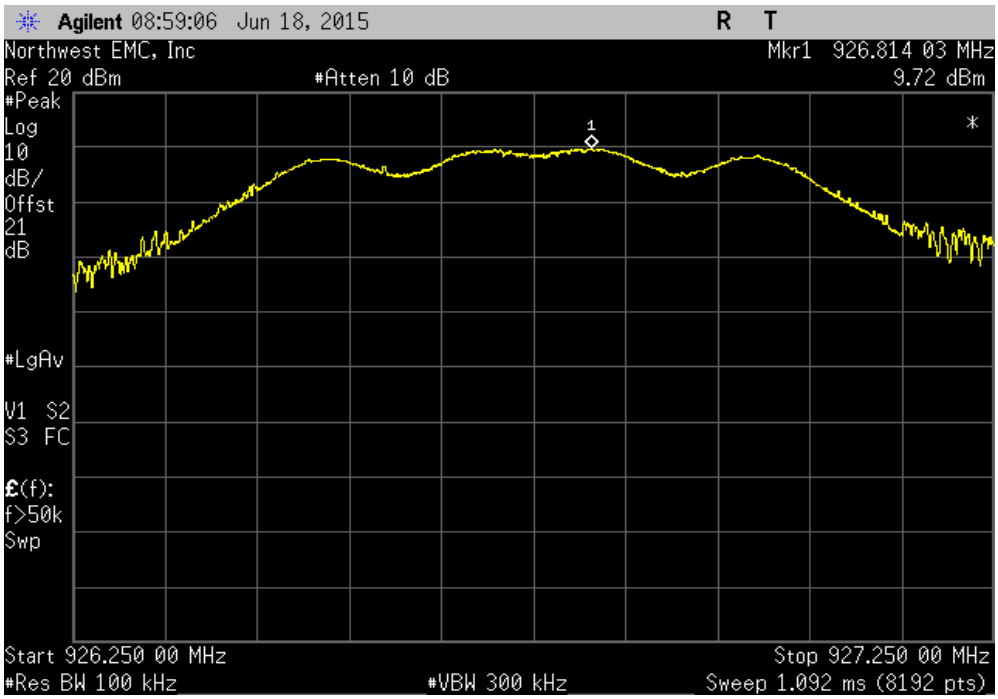
Mid Channel						
	Frequency Range			Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



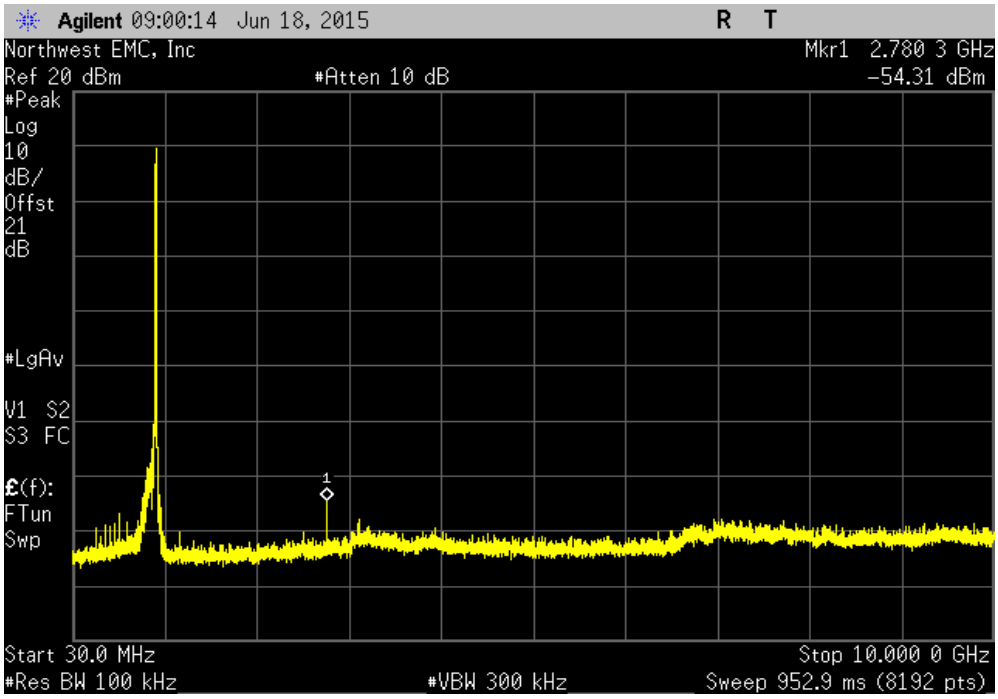
Mid Channel					
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 10 GHz		-59.07	-20	Pass



High Channel						
	Frequency Range			Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



High Channel					
Frequency Range			Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 10 GHz			-64.03	-20	Pass



OCCUPIED BANDWIDTH

XMit 2015.01.14

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	S.M. Electronics	SA26B-20	RFW	3/10/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.9% (approximate 26 dB) emission bandwidth (EBW) was also measured at the same time.

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

OCCUPIED BANDWIDTH

NORTHWEST EMC

XMit 2015.01.14

EUT:	SurfLink Media Streamer			**Work Order:**	STAK0053
Serial Number:	M151000036			**Date:**	06/18/15
Customer:	Starkey Laboratories, Inc.			**Temperature:**	23.1°C
Attendees:	Charlie Esch			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	986.8
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

None

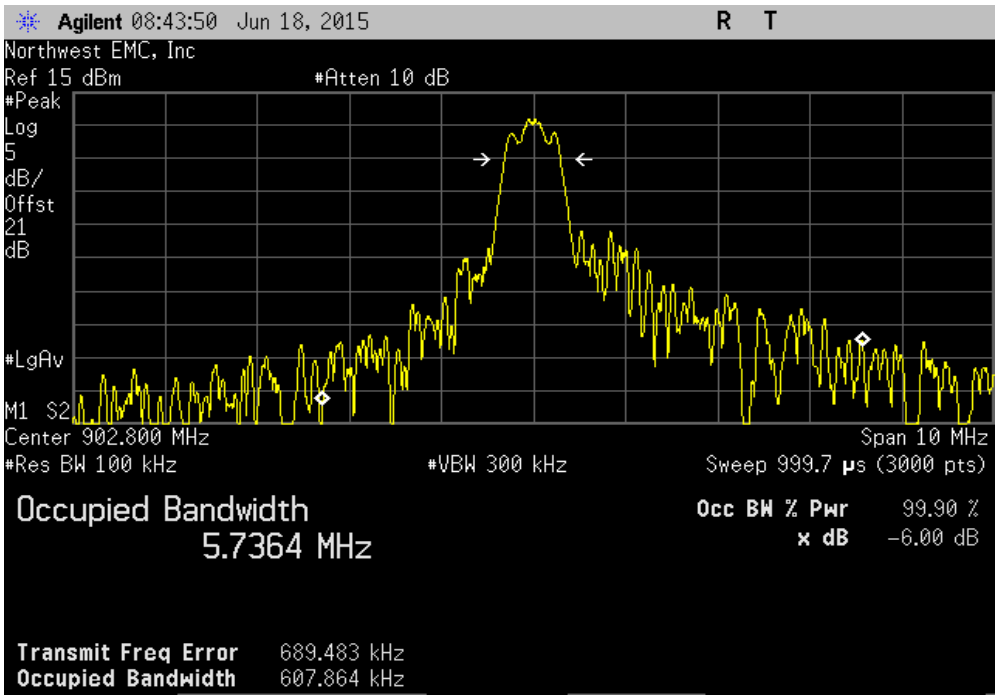
DEVIATIONS FROM TEST STANDARD

None

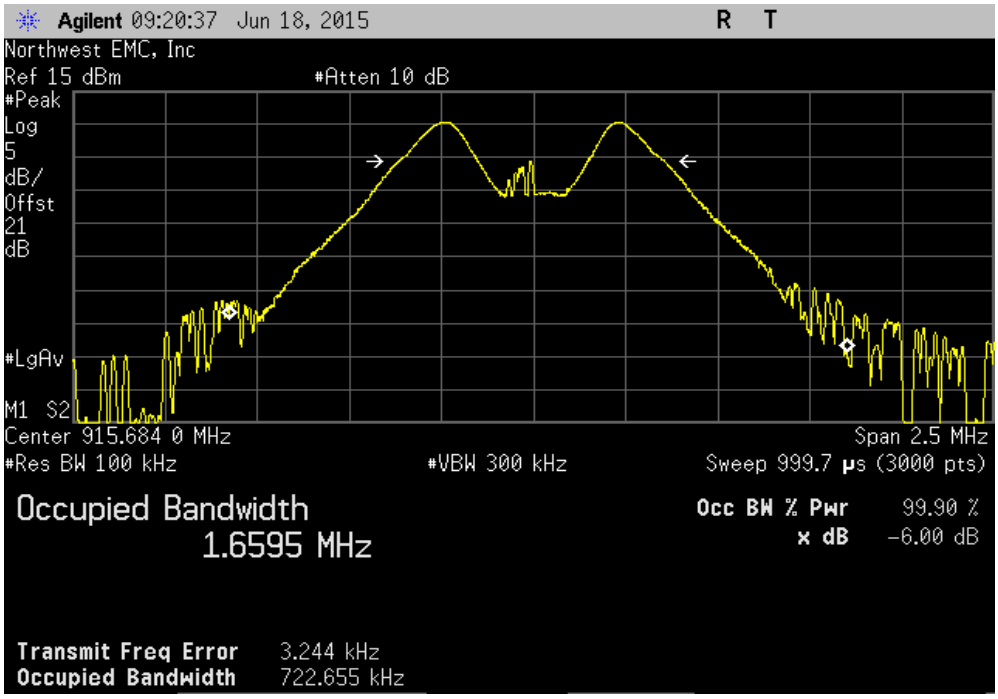
Configuration #	1	Signature	Trevor Buls

	Value	Limit (>)	Result
Low Channel	607.864 kHz	500 kHz	Pass
Mid Channel	722.655 kHz	500 kHz	Pass
High Channel	616.681 kHz	500 kHz	Pass

Low Channel						
				Value	Limit (>)	Result
				607.864 kHz	500 kHz	Pass



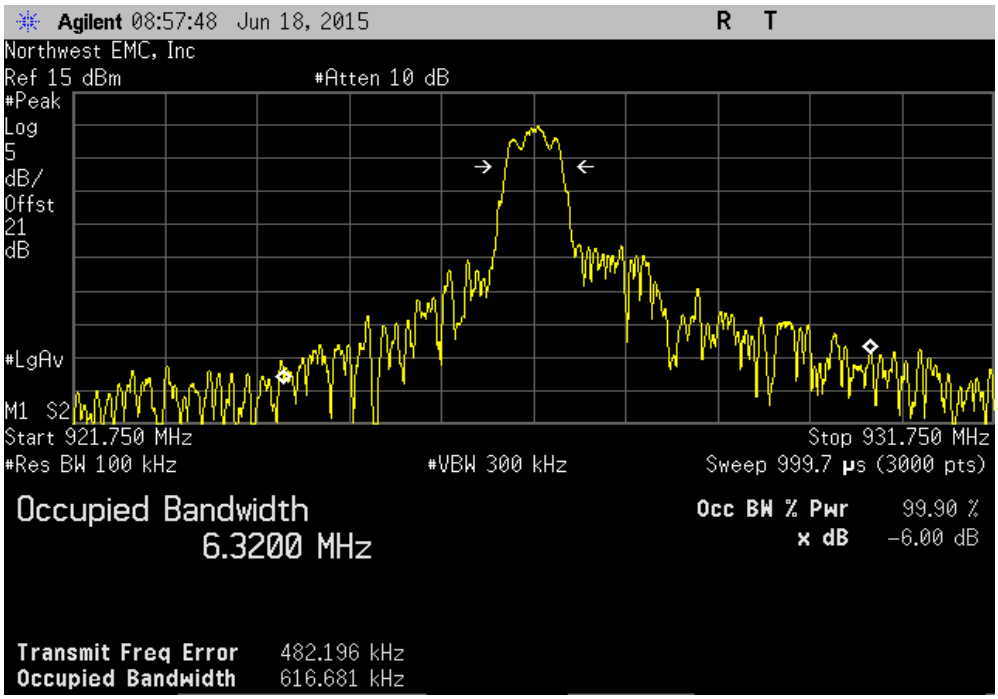
Mid Channel						
				Value	Limit (>)	Result
				722.655 kHz	500 kHz	Pass



OCCUPIED BANDWIDTH

XMit 2015.01.14

High Channel						
				Value	Limit (>)	Result
				616.681 kHz	500 kHz	Pass



OUTPUT POWER

XMit 2015.01.14

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.	Interval (mos)
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	S.M. Electronics	SA26B-20	RFW	3/10/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power the DTS bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method found in KDB 558074 DTS D01 Measurement Section 9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

NORTHWEST EMC

XMit 2015.01.14

EUT:	SurfLink Media Streamer			**Work Order:**	STAK0053
Serial Number:	M151000036			**Date:**	06/18/15
Customer:	Starkey Laboratories, Inc.			**Temperature:**	23.1°C
Attendees:	Charlie Esch			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	986.8
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

None

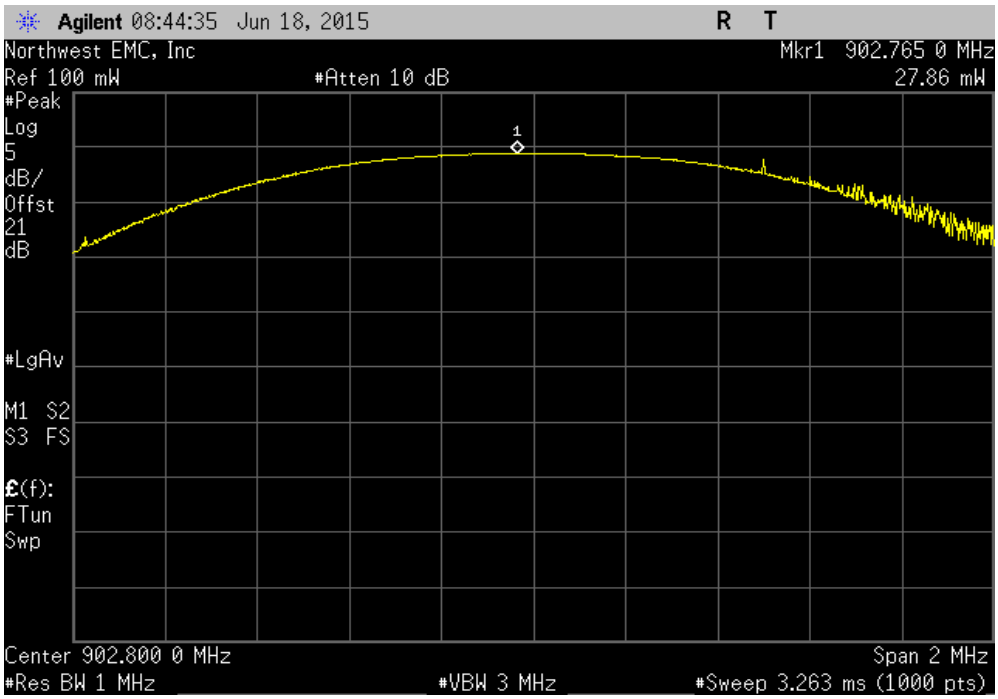
DEVIATIONS FROM TEST STANDARD

None

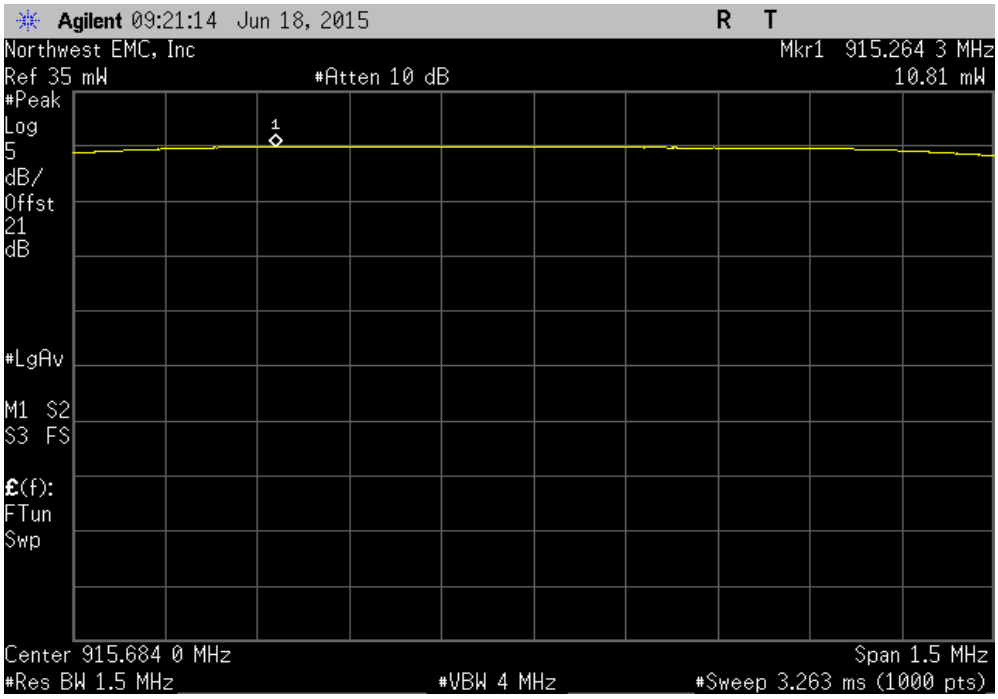
Configuration #	1	Signature	Trevor Buls

	Value	Limit (<)	Result
Low Channel	27.861 mW	1 W	Pass
Mid Channel	10.812 mW	1 W	Pass
High Channel	22.377 mW	1 W	Pass

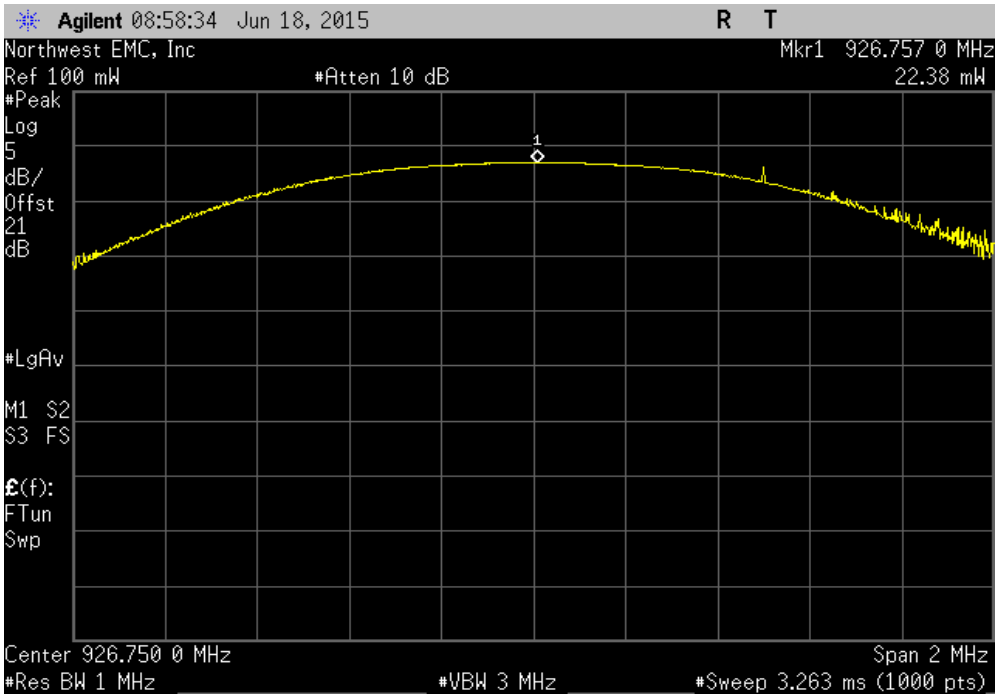
Low Channel						
				Value	Limit (<)	Result
				27.861 mW	1 W	Pass



Mid Channel						
				Value	Limit (<)	Result
				10.812 mW	1 W	Pass



High Channel						
				Value	Limit (<)	Result
				22.377 mW	1 W	Pass



POWER SPECTRAL DENSITY

XMit 2015.01.14

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.	Interval (mos)
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	S.M. Electronics	SA26B-20	RFW	3/10/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMI	10/2/2014	12
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

The maximum power spectral density measurements were measured with the EUT set to the required transmit frequencies in each band. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the lowest, middle, and maximum data rate for each modulation type available.

Per the procedure outlined in FCC KDB 558074 D01 DTS Measurement Section 5.3.1, the spectrum analyzer was used as follows:

- RBW = 100 kHz
- VBW = 300 kHz
- Detector = Peak (to match method used for power measurement)
- Trace = Max hold

The observed power level is then scaled to an equivalent value in 3 kHz by adding a Bandwidth Correction Factor (BWCF) where:

BWCF = 10*LOG (3 kHz / 100 kHz) = -15.2 dB

POWER SPECTRAL DENSITY

NORTHWEST EMC

XMit 2015.01.14

EUT:	SurfLink Media Streamer			**Work Order:**	STAK0053
Serial Number:	M151000036			**Date:**	06/18/15
Customer:	Starkey Laboratories, Inc.			**Temperature:**	23.1°C
Attendees:	Charlie Esch			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	986.8
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

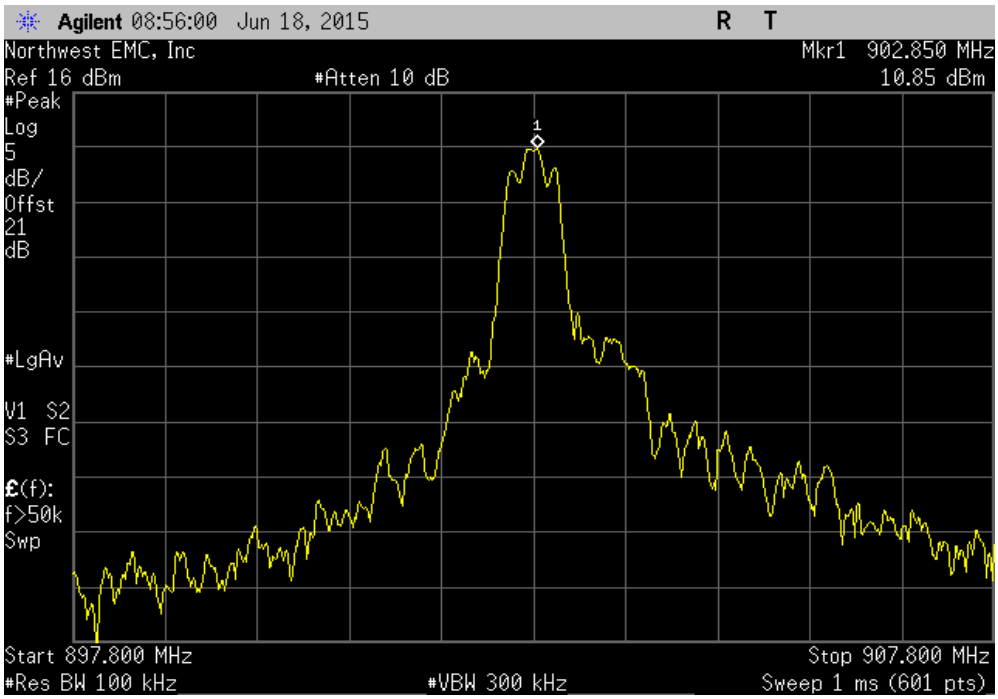
Configuration #	1	Signature	Trevor Buls

	Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
Low Channel	10.854	-15.2	-4.346	8	Pass
Mid Channel	10.449	-15.2	-4.751	8	Pass
High Channel	9.91	-15.2	-5.29	8	Pass

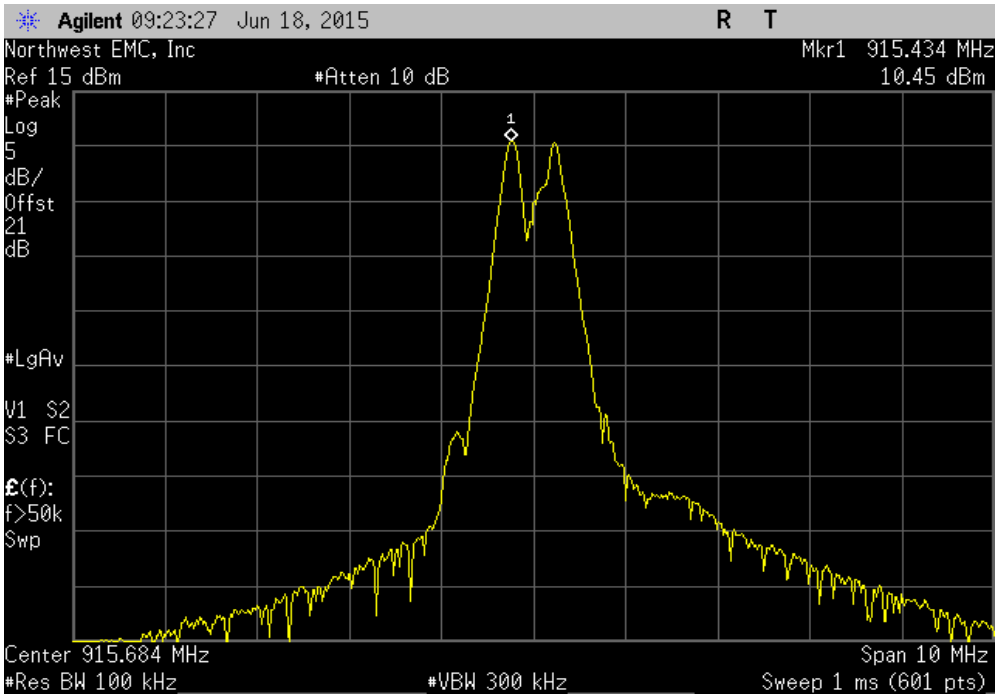
POWER SPECTRAL DENSITY

XMit 2015.01.14

Low Channel						
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
		10.854	-15.2	-4.346	8	Pass



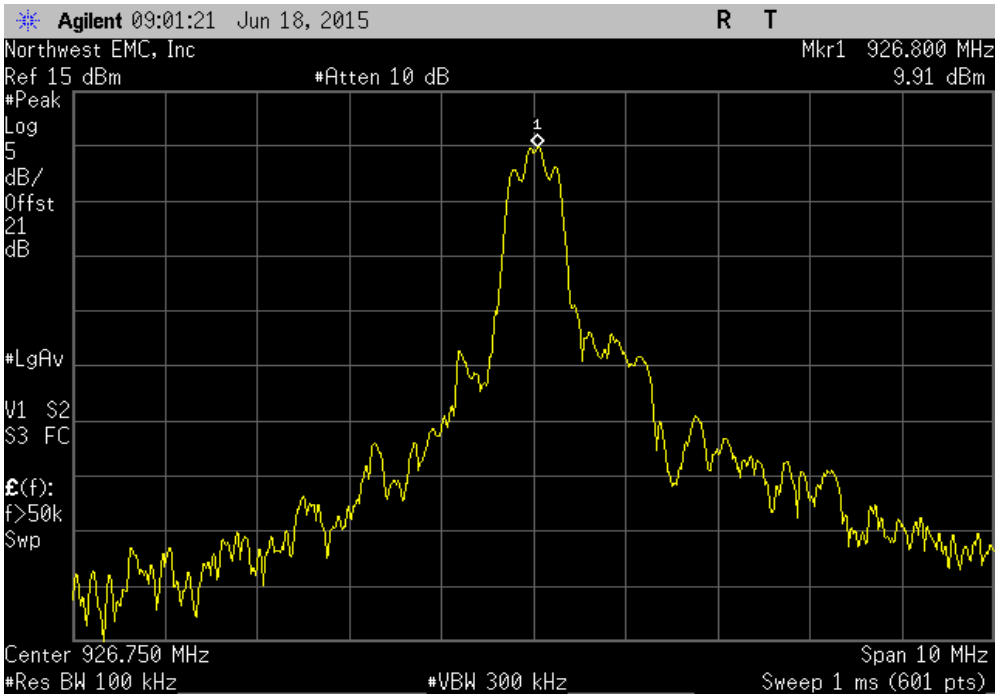
Mid Channel						
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
		10.449	-15.2	-4.751	8	Pass



POWER SPECTRAL DENSITY

XMit 2015.01.14

High Channel						
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
		9.91	-15.2	-5.29	8	Pass



DUTY CYCLE

TEST DESCRIPTION

The Duty Cycle (x) were measured for each of the EUT operating modes. 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. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

The EUT operates at 100% Duty Cycle.