

### Starkey Laboratories, Inc.

#### SurfLink Programmer

FCC 15.247:2022 DTS Transceiver

Report: STAK0262 Rev. 1, Issue Date: February 25, 2022





## **CERTIFICATE OF TEST**



#### Last Date of Test: February 25, 2022 Starkey Laboratories, Inc. EUT: SurfLink Programmer

## **Radio Equipment Testing**

Standards	
Specification	Method
FCC 15.209:2022	ANSI C62 10:2012 KDB 559074
FCC 15.247:2022	ANSI C03.10.2013, RDB 336074

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions (Transmitter)	Yes	Pass	
6.5, 6.6, 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	Pass	
7.8.2	Carrier Frequency Separation	No	N/A	Not required for DTS devices.
7.8.3	Number of Hopping Frequencies	No	N/A	Not required for DTS devices.
7.8.4	Dwell Time	No	N/A	Not required for DTS devices.
11.9.1.1	Output Power	Yes	Pass	
11.9.1.1	Equivalent Isotropic Radiated Power	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
7.8.6	Band Edge Compliance - Hopping Mode	No	N/A	Not required for DTS devices.
11.8.2	DTS Bandwidth (6 dB)	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	

#### **Deviations From Test Standards**

None

**Approved By:** 

ame E Morris

James Morris, 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
	Updated antenna gain in Power Table.	2022-02-25	11
01	Retested Powerline CE.	2022-02-25	14-18
	Recalculated EIRP.	2022-02-25	31-35
	Updated test dates.	2022-02-25	2, 10, 13

# ACCREDITATIONS AND AUTHORIZATIONS



#### **United States**

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

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

#### Canada

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

#### **European Union**

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

#### **United Kingdom**

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

#### Australia/New Zealand

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

#### Korea

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

#### Japan

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

#### Taiwan

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

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

#### Singapore

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

#### Israel

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

#### Hong Kong

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

#### Vietnam

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

SCOPE					
For details on the Scopes of our Accreditations, please visit:					
<u>California</u>	<u>Minnesota</u>	<u>Oregon</u>	<u>Texas</u>	Washington	

## **FACILITIES**





<b>California</b> Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-11 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	<b>Texas</b> Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington           Labs NC01-05           19201 120 <sup>th</sup> Ave NE           Bothell, WA 98011           (425)984-6600			
		A2LA					
Lab Code: 3310.04	Lab Code: 3310.05	Lab Code: 3310.02	Lab Code: 3310.03	Lab Code: 3310.06			
	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			
Re	Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA						
US0158	US0175	US0017	US0191	US0157			



## **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 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 in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

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

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 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)	3.2 dB	-3.2 dB

## **TEST SETUP BLOCK DIAGRAMS**



#### **Measurement Bandwidths**

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

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

#### **Antenna Port Conducted Measurements**



Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

#### **Near Field Test Fixture Measurements**

71.2

=



42.6

+

28.6

## **TEST SETUP BLOCK DIAGRAMS**



#### **Emissions Measurements**



#### Sample Calculation (logarithmic units)

#### **Radiated Emissions:**

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

#### **Conducted Emissions:**



## **TEST SETUP BLOCK DIAGRAMS**



#### Bore Sighting (>1GHz)

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



## **PRODUCT DESCRIPTION**



#### **Client and Equipment Under Test (EUT) Information**

Company Name:	Starkey Laboratories, Inc.
Address:	6600 Washington Ave S
City, State, Zip:	Eden Prairie, MN 55344-3404
Test Requested By:	Bill Mitchell
EUT:	SurfLink Programmer
First Date of Test:	January 25, 2022
Last Date of Test:	February 25, 2022
Receipt Date of Samples:	January 26, 2022
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage
Purchase Authorization:	Verified

#### Information Provided by the Party Requesting the Test

#### Functional Description of the EUT:

900 -928 MHz DTS transceiver; with two antenna types and two ports.

#### **Testing Objective:**

Seeking to demonstrate compliance under FCC 15.247:2022 for operation in the 902 – 928 MHz band.

## **POWER SETTINGS AND ANTENNAS**



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information.

#### **ANTENNA GAIN (dBi)**

Туре	Provided by:	Frequency Range (MHz)	Gain (dBi)
Monopole (Vertical)	No Brand	861-929	2
Monopole (Horizontal)	No Brand	861-929	2

#### **POWER SETTINGS**

Radio	Modulation	Channel	Power Setting (software value)
SRD	Modulated	Low Ch (906.6 MHz)	PA 39
SRD	Modulated	Mid Ch (914.8 MHz)	PA 39
SRD	Modulated	High Ch (922.1 MHz)	PA 39





### Configuration STAK0262-1

EUT						
Description	Manufacturer	Model/Part Number	Serial Number			
SurfLink Programmer	Starkey Laboratories, Inc.	A00	213900484			

Remote Equipment Outside of Test Setup Boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
Laptop	Lenovo	T430	EPWIRELESS4		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1.8 m	No	Laptop	SurfLink Programmer

### Configuration STAK0262-3

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
SurfLink Programmer	Starkey Laboratories, Inc.	A00	213900577

Remote Equipment Outside of Test Setup Boundary					
Description Manufacturer Model/Part Number Serial Number					
Laptop	Lenovo	T430	EPWIRELESS4		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Extender Cable	Yes	>3.0 m	No	USB Cable	Laptop
USB Cable	Yes	1.8 m	Yes	SurfLink Programmer	USB Extender Cable

## **MODIFICATIONS**



### **Equipment Modifications**

Item	Date	Test	Modification	Note	Disposition of EUT
1	2022-01-25	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2022-01-25	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2022-01-25	DTS Bandwidth (6 dB)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2022-01-25	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2022-01-25	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2022-01-25	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2022-02-25	Equivalent Isotropic Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2022-02-25	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.



#### **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
Receiver	Gauss Instruments	TDEMI 30M	ARS	2021-04-06	2022-04-06
Cable - Conducted Cable Assembly	Northwest EMC	MNC, HGN, TYK	MNCA	2021-03-10	2022-03-10
LISN	Solar Electronics	9252-50-R-24- BNC	LIY	2021-03-15	2022-03-15

#### **MEASUREMENT UNCERTAINTY**

Description		
Expanded k=2	3.2 dB	-3.2 dB

#### **CONFIGURATIONS INVESTIGATED**

STAK0262-4

#### **MODES INVESTIGATED**

Transmitting modulated on Low channel (906.6 MHz)



EUT:	SurfLink Pro	SurfLink Programmer			Work Order:	STAK0262	
Serial Number:	220403102			Date:	2022-02-25		
Customer:	Starkey Labo	oratories, In	IC.	Temperature:	22.2°C		
Attendees:	Zach Burmei	ster			Relative Humidity:	15.1%	
Customer Project:	None				Bar. Pressure (PMSL):	1036 mb	
Tested By:	Christopher I	Heintzelma	n		Job Site:	MN03	
Power:	5 VDC via U	SB, Laptop	powered at 110VAC/6	0Hz	Configuration:	STAK0262-4	
TEST SPECIFIC	CATIONS			_			
Specification:				Method:			
FCC 15.207:2022				ANSI C63.	3.10:2014		
TEST PARAME	TERS						
Run #: 3		Line:	Neutral		Add. Ext. Attenuation (dB	): 0	
EUT OPERATING MODES							
Transmitting modulated on Low channel (906.6 MHz)							
DEVIATIONS FROM TEST STANDARD							
None							





Average Data - vs - Average Limit



#### **RESULTS - Run #3**

Q	Quasi Peak Data - vs - Quasi Peak Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)		
0.683	23.9	20.4	44.3	56.0	-11.7		
0.495	23.7	20.5	44.2	56.1	-11.9		
0.489	22.3	20.5	42.8	56.2	-13.4		
0.240	26.7	20.6	47.3	62.1	-14.8		
0.814	19.9	20.5	40.4	56.0	-15.6		
0.397	21.5	20.5	42.0	57.9	-15.9		
0.272	24.5	20.5	45.0	61.1	-16.1		
1.117	19.4	20.5	39.9	56.0	-16.1		
0.156	27.7	20.9	48.6	65.7	-17.1		
0.950	18.0	20.5	38.5	56.0	-17.5		
1.366	16.9	20.5	37.4	56.0	-18.6		
0.187	23.5	20.8	44.3	64.2	-19.9		
1.810	14.6	20.5	35.1	56.0	-20.9		
3.704	14.3	20.6	34.9	56.0	-21.1		
3.192	14.2	20.6	34.8	56.0	-21.2		
2.843	13.5	20.6	34.1	56.0	-21.9		
2.088	13.5	20.5	34.0	56.0	-22.0		
4.274	12.6	20.6	33.2	56.0	-22.8		
26.623	14.8	21.4	36.2	60.0	-23.8		
25.124	14.3	21.3	35.6	60.0	-24.4		
14.848	14.0	21.1	35.1	60.0	-24.9		
20.617	13.4	21.1	34.5	60.0	-25.5		
13.893	13.0	21.0	34.0	60.0	-26.0		
5.998	13.0	20.6	33.6	60.0	-26.4		
6.345	12.6	20.7	33.3	60.0	-26.7		

Average Data - vs - Average Limit							
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)		
0.831	15.3	20.5	35.8	46.0	-10.2		
0.152	22.9	20.9	43.8	55.9	-12.1		
0.522	12.9	20.5	33.4	46.0	-12.6		
0.428	13.7	20.5	34.2	47.3	-13.1		
0.684	12.5	20.4	32.9	46.0	-13.1		
0.950	11.3	20.5	31.8	46.0	-14.2		
0.246	16.8	20.6	37.4	51.9	-14.5		
1.384	10.7	20.5	31.2	46.0	-14.8		
0.371	11.9	20.5	32.4	48.5	-16.1		
1.120	9.0	20.5	29.5	46.0	-16.5		
1.815	8.4	20.5	28.9	46.0	-17.1		
3.192	8.2	20.6	28.8	46.0	-17.2		
3.511	8.1	20.6	28.7	46.0	-17.3		
0.272	12.9	20.5	33.4	51.1	-17.7		
0.187	15.4	20.8	36.2	54.2	-18.0		
2.849	7.4	20.6	28.0	46.0	-18.0		
2.088	7.1	20.5	27.6	46.0	-18.4		
4.276	6.4	20.6	27.0	46.0	-19.0		
26.623	8.7	21.4	30.1	50.0	-19.9		
24.645	8.0	21.3	29.3	50.0	-20.7		
14.743	7.8	21.1	28.9	50.0	-21.1		
20.617	7.3	21.1	28.4	50.0	-21.6		
13.898	6.8	21.0	27.8	50.0	-22.2		
6.011	6.8	20.7	27.5	50.0	-22.5		
6.359	6.3	20.7	27.0	50.0	-23.0		

#### CONCLUSION

Pass

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EUT:	SurfLink Pro	grammer			Work Order:	STAK0262				
Serial Number:	220403102				Date:	2022-02-25				
Customer:	Starkey Labo	oratories, In	IC.		Temperature:	22.2°C				
Attendees:	Zach Burmei	ster			Relative Humidity:	15.1%				
Customer Project:	None			Bar. Pressure (PMSL):	1036 mb					
Tested By:	Christopher I	leintzelma	n		Job Site:	MN03				
Power:	5 VDC via U	SB, Laptop	powered at 110VAC/6	0Hz	Configuration:	STAK0262-4				
TEST SPECIFICATIONS										
Specification:				Method:						
FCC 15.207:2022				ANSI C63.	.10:2014					
TEST PARAME	TERS									
Run #: 4		Line:	High Line		Add. Ext. Attenuation (dB	): 0				
COMMENTS										
NULLE										
EUT OPERATIN	NG MODES									
Transmitting modula	ated on Low ch	nannel (906	6.6 MHz)							
DEVIATIONS FROM TEST STANDARD										
None										



Average Data - vs - Average Limit





#### **RESULTS - Run #4**

Quasi Peak Data - vs - Quasi Peak Limit											
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)						
0.687	23.1	20.4	43.5	56.0	-12.5						
0.499	22.7	20.5	43.2	56.0	-12.8						
0.246	27.6	20.6	48.2	61.9	-13.7						
0.150	30.2	21.0	51.2	66.0	-14.8						
0.272	25.2	20.5	45.7	61.1	-15.4						
0.403	21.0	20.5	41.5	57.8	-16.3						
0.812	18.7	20.5	39.2	56.0	-16.8						
1.130	18.6	20.5	39.1	56.0	-16.9						
0.342	21.5	20.5	42.0	59.1	-17.1						
0.184	25.8	20.8	46.6	64.3	-17.7						
0.933	16.5	20.5	37.0	56.0	-19.0						
1.369	16.0	20.5	36.5	56.0	-19.5						
3.244	15.6	20.6	36.2	56.0	-19.8						
3.528	15.5	20.6	36.1	56.0	-19.9						
2.771	15.2	20.6	35.8	56.0	-20.2						
2.333	14.1	20.6	34.7	56.0	-21.3						
1.915	13.5	20.5	34.0	56.0	-22.0						
4.285	13.2	20.6	33.8	56.0	-22.2						
25.492	16.2	21.4	37.6	60.0	-22.4						
24.929	16.1	21.3	37.4	60.0	-22.6						
15.654	15.0	21.1	36.1	60.0	-23.9						
16.964	13.5	21.1	34.6	60.0	-25.4						
6.485	13.8	20.7	34.5	60.0	-25.5						
6.270	13.5	20.7	34.2	60.0	-25.8						
9.186	12.2	20.8	33.0	60.0	-27.0						

Average Data - vs - Average Limit										
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)					
0.152	24.6	20.9	45.5	55.9	-10.4					
0.429	14.4	20.5	34.9	47.3	-12.4					
0.690	12.1	20.4	32.5	46.0	-13.5					
0.246	17.7	20.6	38.3	51.9	-13.6					
0.524	11.9	20.5	32.4	46.0	-13.6					
0.185	17.8	20.8	38.6	54.3	-15.7					
0.831	9.8	20.5	30.3	46.0	-15.7					
3.235	9.4	20.6	30.0	46.0	-16.0					
3.510	9.4	20.6	30.0	46.0	-16.0					
2.764	9.2	20.6	29.8	46.0	-16.2					
0.946	8.8	20.5	29.3	46.0	-16.7					
0.272	13.9	20.5	34.4	51.1	-16.7					
0.342	11.7	20.5	32.2	49.1	-16.9					
1.381	8.1	20.5	28.6	46.0	-17.4					
2.335	7.9	20.6	28.5	46.0	-17.5					
1.117	7.7	20.5	28.2	46.0	-17.8					
4.276	7.0	20.6	27.6	46.0	-18.4					
1.900	7.0	20.5	27.5	46.0	-18.5					
25.474	9.8	21.4	31.2	50.0	-18.8					
25.080	9.8	21.3	31.1	50.0	-18.9					
15.509	8.5	21.1	29.6	50.0	-20.4					
6.485	7.6	20.7	28.3	50.0	-21.7					
16.963	7.1	21.1	28.2	50.0	-21.8					
6.265	7.4	20.7	28.1	50.0	-21.9					
9.108	5.9	20.8	26.7	50.0	-23.3					

#### CONCLUSION

Pass

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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 on Low channel (906.6 MHz). Horizontal antenna	
Transmitting modulated on Low channel (906.6 MHz). Vertical antenna	

#### POWER SETTINGS INVESTIGATED

5 VDC via USB

#### **CONFIGURATIONS INVESTIGATED**

STAK0262 - 3

#### 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.	Cal. Due
Filter - Low Pass	Micro-Tronics	LPM50003	HGL	2021-09-10	2022-09-10
Amplifier - Pre-Amplifier	Miteq	AM-1064-9079 and SA18E-10	AOO	2022-01-24	2023-01-24
Cable	Element	Biconilog Cable	MNX	2022-01-24	2023-01-24
Amplifier - Pre-Amplifier	L-3 Narda-Miteq	AMF-6F-12001800-30-10P	PAP	2022-01-24	2023-01-24
Cable	Element	Standard Gain Cable	MNW	2022-01-24	2023-01-24
Cable	Element	Double Ridge Guide Horn Cables	MNV	2022-01-24	2023-01-24
Filter - High Pass	Micro-Tronics	HPM50108	HFW	2021-09-10	2022-09-10
Filter - High Pass	Micro-Tronics	HPM50111	HFM	2021-09-10	2022-09-10
Antenna - Biconilog	Teseq	CBL 6141B	AYD	2020-02-05	2022-02-05
Attenuator	Coaxicom	3910-20	AXY	2021-09-10	2022-09-10
Attenuator	Coaxicom	3910-10	AWZ	2021-09-10	2022-09-10
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2022-01-24	2023-01-24
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2022-01-24	2023-01-24
Antenna - Standard Gain	ETS-Lindgren	3160-08	AJP	NCR	NCR
Antenna - Standard Gain	ETS-Lindgren	3160-07	AJJ	NCR	NCR
Antenna - Double Ridge	ETS Lindgren	3115	AIB	2020-09-03	2022-09-03
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2021-05-18	2022-05-18
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HGS	2021-06-28	2022-06-28

#### **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 if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

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

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

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

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

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

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



						EmiR5 2021.09.09.0	PSA-ESCI 2021.12.1
Wor	k Order:	STAK0262	D	ate: 2022-0	)1-25		. /
	Project:	None	Temperate	ure: 21.8	℃	I P	Sel
	Job Site:	MN09	Humic	lity: 15.1%	S RH		Contra
Serial I	Number:	213900577	Barometric Pr	es.: 1031	mbar	Tested by: Andrew Rog	gstad
	EUT:	SurfLink Programme	er				
Config	guration:	3					
Cı	ustomer:	Starkey Laboratories	s, Inc.				
Att	tendees:	Aaron Anderson					
EU1	F Power:	5 VDC via USB					
Operatin	g Mode:	Transmitting modula	ted on Low channel	(906.6 MHz). Ve	ertical antenna		
De	viations	None					
Со	mments	None					
Test Specifi	ications				Test Method		
FCC 15.247	:2022				ANSI C63.10:2013	-	
Dun #	6	Tost Distance (m			1 to 1/m	Booulto	Page
Run #	0	Test Distance (m		enna Height(S)	1 to 4(m)	Results	Pass
80							
70							
60							
چ <sup>50</sup>					<b>i j i</b>		
\ngp 40							
30 -							
20							
10							
0							
10		100	D	1000		10000	100000
				MHz		PK	◆ AV ● QP

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
5439.475	44.7	7.5	2.24	109.0	3.0	0.0	Horz	AV	0.0	52.2	54.0	-1.8	EUT vert, Low ch
5439.425	43.7	7.5	1.99	171.0	3.0	0.0	Horz	AV	0.0	51.2	54.0	-2.8	EUT horz, Low ch
2717.300	51.7	-1.9	3.89	169.0	3.0	0.0	Vert	AV	0.0	49.8	54.0	-4.2	EUT vert, Low ch
5439.417	41.8	7.5	2.88	131.0	3.0	0.0	Vert	AV	0.0	49.3	54.0	-4.7	EUT vert, Low ch
7325.233	34.7	14.6	2.56	150.0	3.0	0.0	Vert	AV	0.0	49.3	54.0	-4.7	EUT vert, Mid ch
7252.625	34.7	14.1	2.32	166.0	3.0	0.0	Vert	AV	0.0	48.8	54.0	-5.2	EUT vert, Low ch
7376.408	32.5	15.0	3.03	153.0	3.0	0.0	Vert	AV	0.0	47.5	54.0	-6.5	EUT vert, High ch
5439.417	39.3	7.5	2.97	78.0	3.0	0.0	Horz	AV	0.0	46.8	54.0	-7.2	EUT on side, Low ch
4532.908	41.8	5.0	3.48	99.0	3.0	0.0	Horz	AV	0.0	46.8	54.0	-7.2	EUT vert, Low ch
4578.392	41.3	5.1	4.0	126.0	3.0	0.0	Vert	AV	0.0	46.4	54.0	-7.6	EUT vert, Mid ch
5439.350	38.8	7.5	1.5	91.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	EUT on side, Low ch
3662.658	44.5	1.6	2.85	101.0	3.0	0.0	Horz	AV	0.0	46.1	54.0	-7.9	EUT vert, Mid ch
7376.642	30.8	15.0	1.14	190.0	3.0	0.0	Horz	AV	0.0	45.8	54.0	-8.2	EUT vert, High ch
4610.250	40.5	5.2	2.59	98.0	3.0	0.0	Horz	AV	0.0	45.7	54.0	-8.3	EUT vert, High ch
4578.408	40.2	5.1	2.54	111.0	3.0	0.0	Horz	AV	0.0	45.3	54.0	-8.7	EUT vert, Mid ch
3688.150	43.1	1.8	3.08	102.0	3.0	0.0	Horz	AV	0.0	44.9	54.0	-9.1	EUT vert, High ch
7252.750	30.7	14.1	3.92	215.0	3.0	0.0	Horz	AV	0.0	44.8	54.0	-9.2	EUT vert, Low ch
4610.217	39.4	5.2	2.41	129.0	3.0	0.0	Vert	AV	0.0	44.6	54.0	-9.4	EUT vert, High ch

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
4532.833	39.4	5.0	3.78	156.0	3.0	0.0	Vert	AV	0.0	44.4	54.0	-9.6	EUT vert, Low ch
7325.467	29.7	14.6	1.5	222.0	3.0	0.0	Horz	AV	0.0	44.3	54.0	-9.7	EUT vert, Mid ch
3626.300	42.9	1.3	3.99	204.0	3.0	0.0	Horz	AV	0.0	44.2	54.0	-9.8	EUT vert, Low ch
2719.800	45.3	-1.9	3.82	207.0	3.0	0.0	Horz	AV	0.0	43.4	54.0	-10.6	EUT vert, Low ch
2747.067	45.2	-2.0	2.17	186.0	3.0	0.0	Horz	AV	0.0	43.2	54.0	-10.8	EUT vert, Mid ch
2766.158	44.8	-2.0	1.88	202.0	3.0	0.0	Horz	AV	0.0	42.8	54.0	-11.2	EUT vert, High ch
3662.725	41.0	1.6	1.01	96.0	3.0	0.0	Vert	AV	0.0	42.6	54.0	-11.4	EUT vert, Mid ch
2766.100	43.3	-2.0	3.79	157.0	3.0	0.0	Vert	AV	0.0	41.3	54.0	-12.7	EUT vert, High ch
5439.567	33.7	7.5	1.5	125.0	3.0	0.0	Vert	AV	0.0	41.2	54.0	-12.8	EUT horz, Low ch
3688.267	39.3	1.8	1.02	237.0	3.0	0.0	Vert	AV	0.0	41.1	54.0	-12.9	EUT vert, High ch
2747.042	42.7	-2.0	3.87	155.0	3.0	0.0	Vert	AV	0.0	40.7	54.0	-13.3	EUT vert, Mid ch
3626.308	39.2	1.3	1.5	113.0	3.0	0.0	Vert	AV	0.0	40.5	54.0	-13.5	EUT vert, Low ch
7325.958	42.6	14.6	2.56	150.0	3.0	0.0	Vert	PK	0.0	57.2	74.0	-16.8	EUT vert, Mid ch
7377.050	41.3	15.0	3.03	153.0	3.0	0.0	Vert	PK	0.0	56.3	74.0	-17.7	EUT vert, High ch
5439.308	48.7	7.5	2.24	109.0	3.0	0.0	Horz	PK	0.0	56.2	74.0	-17.8	EUT vert, Low ch
7252.650	42.1	14.1	2.32	166.0	3.0	0.0	vert	PK	0.0	56.2	74.0	-17.8	EUT vert, Low ch
5439.208	47.9	7.5	1.99	171.0	3.0	0.0	Horz	PK	0.0	55.4	74.0	-18.6	EUT horz, Low ch
7376.700	40.4	15.0	1.14	190.0	3.0	0.0	Horz	PK	0.0	55.4	74.0	-18.6	EUT vert, High ch
7252.558	40.2	14.1	3.92	215.0	3.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	EUT vert, Low ch
5439.758	46.6	7.5	2.88	131.0	3.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	EUT vert, Low ch
7324.908	39.2	14.0	1.5	222.0	3.0	0.0	Horz	PK	0.0	53.6 53.5	74.0	-20.2	EUT on side Low ch
5439.050	43.0	7.5	2.97	70.0	3.0	0.0	Vort		0.0	52.5	74.0	-21.5	EUT on side Low ch
4532.000	45.9	1.5	2.49	91.0	3.0	0.0	Horz		0.0	51.4	74.0	-22.0	EUT vert Low ch
4578 125	40.2	4.5	2.54	111 0	3.0	0.0	Horz	PK	0.0	50.6	74.0	-22.5	EUT vert Mid ch
4578 567	45.5	5.1	4.0	126.0	3.0	0.0	Vort	PK	0.0	50.6	74.0	-23.4	EUT vert, Mid ch
4610.083	45.2	5.2	2.50	98.0	3.0	0.0	Horz	PK	0.0	50.0	74.0	-23.4	EUT vert, High ch
5/30 083	43.2	7.5	1.5	125.0	3.0	0.0	Vort	PK	0.0	50.4	74.0	-23.8	EUT borz Low ch
4532 592	45.2	5.0	3.78	156.0	3.0	0.0	Vert	PK	0.0	50.2	74.0	-23.8	EUT vert. Low ch
3662.417	48.2	1.6	2.85	101.0	3.0	0.0	Horz	PK	0.0	49.8	74.0	-24.2	EUT vert. Mid ch
4610.075	44.1	5.2	2.41	129.0	3.0	0.0	Vert	PK	0.0	49.3	74.0	-24.7	EUT vert. High ch
3626.550	47.6	1.3	3.99	204.0	3.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	EUT vert. Low ch
3687.958	47.1	1.8	3.08	102.0	3.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	EUT vert. High ch
3662.875	46.2	1.6	1.01	96.0	3.0	0.0	Vert	PK	0.0	47.8	74.0	-26.2	EUT vert, Mid ch
2719.625	49.3	-1.9	3.82	207.0	3.0	0.0	Horz	PK	0.0	47.4	74.0	-26.6	EUT vert, Low ch
2747.492	49.1	-2.0	2.17	186.0	3.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	EUT vert, Mid ch
3688.025	45.1	1.8	1.02	237.0	3.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	EUT vert, High ch
2766.267	48.5	-2.0	1.88	202.0	3.0	0.0	Horz	PK	0.0	46.5	74.0	-27.5	EUT vert, High ch
3626.042	44.9	1.3	1.5	113.0	3.0	0.0	Vert	PK	0.0	46.2	74.0	-27.8	EUT vert, Low ch
2766.025	48.0	-2.0	3.79	157.0	3.0	0.0	Vert	PK	0.0	46.0	74.0	-28.0	EUT vert, High ch
2747.233	47.8	-2.0	3.87	155.0	3.0	0.0	Vert	PK	0.0	45.8	74.0	-28.2	EUT vert, Mid ch
2719.442	47.0	-1.9	3.89	169.0	3.0	0.0	Vert	PK	0.0	45.1	74.0	-28.9	EUT vert, Low ch



				_				2023
Wor	k Order:	STAK0262		Date:	2022-01-2	5 / 1	$\rho_{-}$	A
	Project:	None	Ten	nperature:	22.1 °C			U
Control	Job Site:	MNU9	Denerus	Humidity:	12.8% RF		ad hur Chris Datters	
Serial	Number:	213900577	Barome	tric Pres.:	1026 mba	lest	ed by: Chris Patters	on
0	EUI:	SuffLink Programm	er					
Config	juration:	3 Ctarles d abarataria						
	ustomer:	Starkey Laboratorie	es, inc.					
Att	tendees:	Aaron Anderson						
EUI	Power:							
Operatin	ng Mode:	I ransmitting modul	ated on Low o	channel (906.6	o MHZ). Horizo	ontal antenna		
Dev	viations:	None						
Сог	mments:	None						
est Specifi	ications				Test	Method		
CC 15.247	:2022				ANS	I C63.10:2013		
Run #	12	Test Distance (r	<b>n)</b> 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run #	12	Test Distance (r	<b>n)</b> 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
<b>Run #</b>	12	Test Distance (r	<b>n)</b> 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
<b>Run #</b>	12	Test Distance (r	<b>n)</b> 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
<b>Run #</b> 80	12	Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
80 - 70 - 70 - 70 - 70 - 70 - 70 - 70 -	12	Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run #           80           70	12	Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run #	12	Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run #           80           70           60	12	Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	
Run #           80           70           60	12	Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	
Run #           80           70           60           50	12	Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run # 80 70 60 50		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results       Image: state	Pass
Run # 80 70 60 50	12	Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results       Image: state	Pass
Run #       80       70       60       50       50       40		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results       Image: state	Pass
Run # 80 70 60 50 50 40		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)		
Run #           80           70           60           50           50           40		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results       Image: state	
Run #         80         70         60         50         50         30		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)		
Run #         80         70         60         50         50         30		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results       Image: state	Pass
Run #         80         70         60         50         50         30         20		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run # 80 70 60 50 50 40 30 20		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run # 80 70 60 50 40 30 20		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)		Pass
Run # 80 70 60 50 40 30 20 10		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run #         80         70         60         50         40         30         20         10		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run #         80         70         60         50         40         30         20         10		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run #         80         70         60         50         50         30         20         10         0		Test Distance (r	n) 3	Antenna H	eight(s)	1 to 4(m)	Results	Pass
Run #         80         70         60         50         50         30         20         10         0         10			n) 3	Antenna H	eight(s)	1 to 4(m)		Pass

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
5439.480	46.3	7.5	2.37	106.0	3.0	0.0	Horz	AV	0.0	53.8	54.0	-0.2	EUT Vert, Low Ch
5439.430	44.9	7.5	2.64	274.0	3.0	0.0	Horz	AV	0.0	52.4	54.0	-1.6	EUT Horz, Low Ch
5439.480	44.5	7.5	2.27	128.0	3.0	0.0	Vert	AV	0.0	52.0	54.0	-2.0	EUT Vert, Low Ch
4578.420	45.7	5.1	4.0	186.0	3.0	0.0	Horz	AV	0.0	50.8	54.0	-3.2	EUT Vert, Mid Ch
5439.480	42.5	7.5	2.37	73.0	3.0	0.0	Horz	AV	0.0	50.0	54.0	-4.0	EUT On Side, Low Ch
5439.520	41.3	7.5	1.57	72.0	3.0	0.0	Vert	AV	0.0	48.8	54.0	-5.2	EUT On Side, Low Ch
4610.290	43.3	5.2	3.96	187.0	3.0	0.0	Horz	AV	0.0	48.5	54.0	-5.5	EUT Vert, High Ch
4532.920	43.0	5.0	2.47	186.0	3.0	0.0	Horz	AV	0.0	48.0	54.0	-6.0	EUT Vert, Low Ch
5439.430	38.8	7.5	1.02	235.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	EUT Horz, Low Ch
3626.320	44.7	1.3	3.98	164.0	3.0	0.0	Horz	AV	0.0	46.0	54.0	-8.0	EUT Vert, Low Ch
3688.190	43.5	1.8	3.97	247.0	3.0	0.0	Vert	AV	0.0	45.3	54.0	-8.7	EUT Vert, High Ch
3688.150	43.3	1.8	4.0	164.0	3.0	0.0	Horz	AV	0.0	45.1	54.0	-8.9	EUT Vert, High Ch
4578.380	39.7	5.1	1.5	275.0	3.0	0.0	Vert	AV	0.0	44.8	54.0	-9.2	EUT Vert, Mid Ch
3662.720	42.4	1.6	4.0	237.0	3.0	0.0	Vert	AV	0.0	44.0	54.0	-10.0	EUT Vert, Mid Ch
4610.250	38.5	5.2	2.5	277.0	3.0	0.0	Vert	AV	0.0	43.7	54.0	-10.3	EUT Vert, High Ch
3626.320	42.2	1.3	4.0	266.0	3.0	0.0	Vert	AV	0.0	43.5	54.0	-10.5	EUT Vert, Low Ch
3662.720	41.9	1.6	4.0	191.0	3.0	0.0	Horz	AV	0.0	43.5	54.0	-10.5	EUT Vert, Mid Ch

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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)	Commonts
4522.020	27.4	5.0	1.5	271.0	2.0	0.0	Vort	۵\/	0.0	42.4	54.0	11.6	FUT Vort Low Ch
4032.920	37.4	3.0	2.02	196.0	3.0	0.0	Horz	AV	0.0	42.4	54.0	-11.0	EUT Vort High Ch
2700.100	43.9	-2.0	3.92	202.0	3.0	0.0	Horz	AV	0.0	27.5	54.0	-12.1	EUT Vort Mid Ch
£420 720	39.5	-2.0	1.0	293.0	3.0	0.0	Horz		0.0	57.5	54.0	-10.5	EUT Vort Low Ch
2747 100	49.4	7.5	2.37	221.0	3.0	0.0	Vort		0.0	26.2	74.0 54.0	-17.1	EUT Vort Mid Ch
£420.210	30.3	-2.0	3.97	231.0	3.0	0.0	Horz		0.0	50.5	54.0	-17.7	EUT Horz Low Ch
5439.310	40.2	7.5	2.04	274.0	3.0	0.0			0.0	55.7	74.0	-10.3	EUT Nort Low Ch
5439.770	47.7	7.5	2.27	128.0	3.0	0.0	vert	PK	0.0	55.2	74.0	-18.8	EUT Veril, LOW Cri
3439.650	40.0	7.5	2.37	196.0	3.0	0.0		PK	0.0	54.1	74.0	-19.9	EUT ON Side, Low ON
4578.750	49.0	5.1	4.0	186.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	EUT Vert, Mid Ch
2766.180	35.9	-2.0	1.5	56.0	3.0	0.0	Vert	AV	0.0	33.9	54.0	-20.1	EUT Vert, High Ch
5439.180	46.3	7.5	1.57	72.0	3.0	0.0	vert	PK	0.0	53.8	74.0	-20.2	EUT ON Side, Low Ch
4610.040	47.0	5.2	3.96	187.0	3.0	0.0	Horz	PK	0.0	52.2	74.0	-21.8	EUT Vert, High Ch
4532.710	46.5	5.0	2.47	186.0	3.0	0.0	Horz	PK	0.0	51.5	74.0	-22.5	EUT Vert, Low Ch
5439.770	43.9	7.5	1.02	235.0	3.0	0.0	Vert	PK	0.0	51.4	74.0	-22.6	EUT Horz, Low Ch
4578.710	45.5	5.1	1.5	275.0	3.0	0.0	Vert	PK	0.0	50.6	74.0	-23.4	EUT Vert, Mid Ch
3626.190	48.2	1.3	3.98	164.0	3.0	0.0	Horz	PK	0.0	49.5	74.0	-24.5	EUT Vert, Low Ch
4610.670	44.1	5.2	2.5	277.0	3.0	0.0	Vert	PK	0.0	49.3	74.0	-24.7	EUT Vert, High Ch
3688.480	47.2	1.8	3.97	247.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	EUT Vert, High Ch
3688.070	46.8	1.8	4.0	164.0	3.0	0.0	Horz	PK	0.0	48.6	74.0	-25.4	EUT Vert, High Ch
4533.210	43.2	5.0	1.5	271.0	3.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	EUT Vert, Low Ch
3662.260	46.3	1.6	4.0	237.0	3.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	EUT Vert, Mid Ch
3626.020	46.4	1.3	4.0	266.0	3.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	EUT Vert, Low Ch
3662.970	46.1	1.6	4.0	191.0	3.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	EUT Vert, Mid Ch
2766.300	47.9	-2.0	3.92	186.0	3.0	0.0	Horz	PK	0.0	45.9	74.0	-28.1	EUT Vert, High Ch
2746.770	46.0	-2.0	1.5	293.0	3.0	0.0	Horz	PK	0.0	44.0	74.0	-30.0	EUT Vert, Mid Ch
2746.770	44.8	-2.0	3.97	231.0	3.0	0.0	Vert	PK	0.0	42.8	74.0	-31.2	EUT Vert, Mid Ch
2765.680	43.9	-2.0	1.5	56.0	3.0	0.0	Vert	PK	0.0	41.9	74.0	-32.1	EUT Vert, High Ch

## **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.

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.



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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Generator - Signal	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Block - DC	Fairview Microwave	SD3379	AMZ	2021-11-05	2022-11-05
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

#### TEST DESCRIPTION

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 2021.10.29.2	XMit 2020.12.30.0						
EUT:	SurfLink Programmer	Work Order	STAK0262							
Serial Number:	213900484	Date	25-Jan-22							
Customer:	Starkey Laboratories, Inc.	Temperature	21.7 °C							
Attendees:	Aaron Anderson	Humidity	15.6% RH							
Project:	None	Barometric Pres.	1031 mbar							
Tested by:	Andrew Rogstad Power: 5 VDC via USB	Job Site	MN08							
TEST SPECIFICAT	IONS Test Method									
FCC 15.247:2022	ANSI C63.10:2013									
COMMENTS										
Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable										
<b>DEVIATIONS FROM</b>	A TEST STANDARD									
None										
Configuration #	1 apte									
	Signature									
	· · · · · · · · · · · · · · · · · · ·	Out Pwr	Limit							
		(dBm)	(dBm)	Result						
Vertical Antenna										
	Low Channel, 906.6 MHz	9.217	30	Pass						
	Mid Channel, 915.7 MHz	9.496	30	Pass						
	High Channel, 922.1 MHz	10.2	30	Pass						
Horizontal Antenna										
	Low Channel, 906.6 MHz	8.793	30	Pass						
	Mid Channel, 915.7 MHz	8.724	30	Pass						
	High Channel, 922.1 MHz	9.08	30	Pass						





		Out Pwr	Limit	
		(dBm)	(dBm)	Result
		9.496	30	Pass







Out Pwr Limit									
				(dBm)	(dBm)	Result			
				8.793	30	Pass			

Keysight Sp	ectrum Analyzer - Elen	nent Materials	Technology						
<mark>(</mark> RL	RF 50 Ω	AC		SENSE:INT	<u>A</u> A	LIGN OFF		09:49:44	AM Jan 25, 2022
			PNO: Fast ↔ IFGain:Low	_ Trig: Free R #Atten: 10 d	un B	#Avg Type: Avg Hold: 1	Voltage 00/100	TF	ACE 1 2 3 4 5 TYPE MWWW DET PPPPP
dB/div	Ref Offset 21. Ref 19.00 d	2 dB I <b>Bm</b>						Mkr1 906 8.	.785 MH: 793 dBn
				Ĭ					
14.0					▲1				
9.00					-				
4.00									
1.00				/					
5.00									
11.0									
16.0									
21.0									
26.0									
enter 90 Res BW	06.600 MHz 1.0 MHz		#VE	3W 3.0 MHz		ł	Swe	Span eep 1.066 ms	10.00 MH s (1000 pt
80						STATUS			





Keysight Sp	ectrum Analyzer - Element Materials T	echnology				
XI RL	RF 50 Ω AC	SI	ENSE:INT	ALIGN OFF	09:57:1	5 AM Jan 25, 2022
		PNO: Fast +++ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Vo Avg Hold: 100/	ltage ⊺ 100	RACE         1         2         3         4         5         6           TYPE         M </th
5 dB/div	Ref Offset 21.2 dB Ref 19.00 dBm				Mkr1 921 9	.865 MHz .080 dBm
			Ĭ			
14.0			1			
9.00						
4.00			/			
-1.00						
6.00						
11.0						
16.0						
-21.0						
-26.0						
Center 92	22.100 MHz 1.0 MHz	#VB/	( 3 0 MHz		Span Sween 1.066 m	10.00 MHz
				STATUS	encep nooo m	, rece pts)



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	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMZ	2021-11-05	2022-11-05
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

#### TEST DESCRIPTION

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

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

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

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



								TbtTx 2021.10.29.2	XMit 2020.12.30.0
EUT	: SurfLink Programmer						Work Order:	STAK0262	
Serial Number	: 213900484						Date:	25-Jan-22	
Customer	: Starkey Laboratories, Inc	-					Temperature:	21.7 °C	
Attendees	: Aaron Anderson						Humidity:	15.6% RH	
Project	: None						Barometric Pres.:	1031 mbar	
Tested by	: Andrew Rogstad		Power	5 VDC via USB			Job Site:	MN08	
TEST SPECIFICAT	TIONS			Test Method					
FCC 15.247:2022				ANSI C63.10:2013					
COMMENTS									
Reference level of	fset includes measurement	t cable, attenuator, DC block	and customer's patch cat	le.					
		,,	,						
<b>DEVIATIONS FRO</b>	M TEST STANDARD								
None									
Configuration #	1		The le	2 til					
		Signature	000	- Josef					
					Out Pwr	Antenna	EIRP	EIRP Limit	
					(dBm)	Gain (dBi)	(dBm)	(dBm)	Result
Vertical Antenna									
	Low Channel, 906.6 MHz				9.217	2	11.217	36	Pass
	Mid Channel, 915.7 MHz				9.496	2	11.496	36	Pass
	High Channel, 922.1 MHz				10.2	2	12.2	36	Pass
Horizontal Antenna									
	Low Channel, 906.6 MHz				8.793	2	10.793	36	Pass
	Mid Channel, 915.7 MHz				8.724	2	10.724	36	Pass
	High Channel, 922.1 MHz				9.08	2	11.08	36	Pass





		Out Pwr	Antenna	EIRP	EIRP Limit			
		(dBm)	Gain (dBi)	(dBm)	(dBm)	Result		
		9.496	2	11.496	36	Pass		

Keysight Spe	ctrum Analyzer - Element Mate	rials lechnology				
RL	RF 50 Ω AC	S	ENSE:INT	ALIGN OFF		09:40:11 AM Jan 25, 20
		PNO: Fast +++ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: v Avg Hold: 10	oltage D/100	TRACE 1 2 3 4 TYPE MWWWM DET P P P P
B/div	Ref Offset 21.2 dB Ref 19.00 dBm				М	kr1 915.485 MF 9.496 dB
			Ť			
			↓ <sup>1</sup>			
1						
)						
nter 91	5.700 MHz	#VBV	W 3 0 MHz		Sween	Span 10.00 M
						nose me





Horizontal Antenna, Low Channel, 906.6 MHz									
	Out Pwr	Antenna	EIRP	EIRP Limit					
	(dBm)	Gain (dBi)	(dBm)	(dBm)	Result				
	8.793	2	10.793	36	Pass				

Keysight Sp	ectrum Analyzer - Element Materials T	Fechnology			
LXI RL	RF 50 Ω AC	S	ENSE:INT	ALIGN OFF	09:49:44 AM Jan 25, 2022
		PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Voltage Avg Hold: 100/100	TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P P P P
5 dB/div	Ref Offset 21.2 dB Ref 19.00 dBm				Mkr1 906.785 MHz 8.793 dBm
14.0			Ť		
14.0			<b>،</b>	1	
9.00					
4.00					
-1.00					
-6.00					
-11.0					
-16.0					
-21.0					
-26.0					
Center 90 #Res BW	06.600 MHz 1.0 MHz	#VBV	• 3.0 MHz		Span 10.00 MHz weep 1.066 ms (10 <u>00 pts)</u>
MSG				STATUS	





	Out Pwr	Antenna	EIRP	EIRP Limit	EIRP Limit		
	(dBm)	Gain (dBi)	(dBm)	(dBm)	Result		
	9.08	2	11.08	36	Pass		

🔤 Keysight Sp	ectrum Analyzer - Element Mater	rials Technology					
LXI RL	RF 50 Ω AC	SE	NSE:INT	ALIGN OFF	1. A. 2. A. A. 1	09:57:15	AM Jan 25, 2022
		PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: \ Avg Hold: 10	/oltage 0/100	TR T	ACE 1 2 3 4 5 6 YPE M WWWW DET P P P P P P
5 dB/div Log	Ref Offset 21.2 dB Ref 19.00 dBm					Mkr1 921. 9.	865 MHz 080 dBm
14 0							
9.00			<b>∮</b> <sup>1</sup>				
4 00							
4.00							
-1.00							
-6.00							
-11.0							
-16.0							
-21.0							
-26.0							
Center 92 #Res BW	22.100 MHz 1.0 MHz	#VBW	3.0 MHz		Sweep	Span 0 1.066 ms	10.00 MHz (1000 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
Generator - Signal	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMZ	2021-11-05	2022-11-05
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

#### 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 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.



						TDU1X 2021.10.29.2	AMIL 2020.12.30.0
EUT:	SurfLink Programmer				Work Order:	STAK0262	
Serial Number:	213900484				Date:	25-Jan-22	
Customer:	Starkey Laboratories, Inc				Temperature:	21.7 °C	
Attendees:	Aaron Anderson				Humidity:	15.7% RH	
Project:	None				Barometric Pres.:	1031 mbar	
Tested by:	Andrew Rogstad		Power:	5 VDC via USB	Job Site:	MN08	
TEST SPECIFICAT	IONS			Test Method			
FCC 15.247:2022				ANSI C63.10:2013			
COMMENTS							
Reference level off	set includes measuremen	t cable, attenuator, DC block, a	and customer's patch cable	).			
<b>DEVIATIONS FROM</b>	I TEST STANDARD						
None							
Configuration #	1	Signature	and R.	ostal			
					Value	Limit	
					(dBc)	≤ (dBc)	Result
Vertical Antenna							
	Low Channel, 906.6 MHz				-64.4	-20	Pass
	High Channel, 922.1 MHz				-65.31	-20	Pass
Horizontal Antenna							
	Low Channel, 906.6 MHz				-64.13	-20	Pass
	High Channel, 922.1 MHz				-63.98	-20	Pass











	rionzoniai / ini	orma, ringir ornam	Value	Limit	
			(dBc)	≤ (dBc)	Result
			-63.98	-20	Pass

Keysig	ht Spectrum A	nalyzer - Element I	Materials Technolo	ду	anting trail					
CA RL	KF	50 Ω AC			SENSE:INT		#Avg Type:	Voltage	09:58:41 TF	AM Jan 25, 2022 ACE 1 2 3 4 5 6
			-	PNO: Fast G Gain:Low	Trig: Free #Atten: 10	Run dB			1	DET PPPPP
10 dB/d	Ref ( liv <b>Ref</b>	Offset 21.2 di <b>19.00 dBm</b>	3 1					Δ	Mkr1 10. -	.368 MHz 63.97 dB
					)	(				
9.00	<u> </u>	Ke								
-1.00										
-11.0										
21.0										
-21.0	1									
-31.0 —		L.								
-41.0	N	The second secon							140	
-51.0			200 m m m m m m m m m m m m m m m m m m	marker	Warden and a strategical	an a	manyharallan	warmont	nanhanna	Manna
-61.0										
-71.0										
Center #Res I	r 928.000 3W 100 k	CIMHZ (Hz		#VB	W 300 kHz			Sweep	Span 1.599 ms	15.00 MHz (3000 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
Generator - Signal	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMZ	2021-11-05	2022-11-05
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

#### TEST DESCRIPTION

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

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



						TbtTx 2021.10.29.2	XMit 2020.12.30.0
EUT	SurfLink Programmer				Work Order:	STAK0262	
Serial Number	: 213900484				Date:	25-Jan-22	
Customer	: Starkey Laboratories, Inc				Temperatures	21.7 °C	
Attendees	: Aaron Anderson				Humidity:	15.6% RH	
Project	: None				Barometric Pres.:	1031 mbar	
Tested by	: Andrew Rogstad		Power:	5 VDC via USB	Job Site:	MN08	
TEST SPECIFICAT	FIONS			Test Method			
FCC 15.247:2022				ANSI C63.10:2013			
COMMENTS							
Reference level of	fset includes measuremen	t cable, attenuator, DC block,	and customer's patch cab	le.			
<b>DEVIATIONS FRO</b>	M TEST STANDARD						
None							
Configuration #	1	Simplus	and R	antart			
-		Signature				Linelt	
					Value		Popult
Vertical Antenna					Value	(=)	Result
Ventical Antenna	Low Chappel 906 6 MHz				521 821 kHz	500 kHz	Page
	Mid Channel 015 7 MHz				521.021 KHZ	500 kHz	Page
	High Channel 922.1 MHz				523.100 KHZ	500 KHZ	Page
					5/31/1/PH7		1 0 0 0
Horizontal Antenna	riigh ondinioi, ozzin ini iz				523.174 KHZ	300 KHZ	1 400
Horizontal Antenna	Low Channel 906 6 MHz				523.174 KHZ	500 kHz	Pass
Horizontal Antenna	Low Channel, 906.6 MHz Mid Channel, 915 7 MHz				523.174 KHZ 521.953 kHz 522.568 kHz	500 kHz	Pass
Horizontal Antenna	Low Channel, 906.6 MHz Mid Channel, 915.7 MHz				523.174 KHZ 521.953 kHz 522.568 kHz	500 kHz 500 kHz 500 kHz	Pass Pass Pass











#IFGain:Low		, Trig: Free Run #Atten: 10 dB	Avg Hold: 50/50	Radio Device: BTS
Ref Offset 21.2 5 dB/div Ref 19.00 dB	dB Sm			
Log 14.0				
9.00				
4.00		<u><u></u></u>		
-1.00				
-11.0	Next.			
-16.0	Mandard			
-21.0	Mr .			
-26.0				Wal Change
Center 906.600 MHz #Res BW 100 kHz		#VBW 300 F	٢Hz	Span 2.000 MHz Sweep 1.2 ms
Occupied Bandwid	ith	Total Power	14.5 dBm	
	657.57 kHz			
Transmit Freq Error	-14.914 kHz	% of OBW Pow	ver 99.00 %	
x dB Bandwidth	522.0 kHz	x dB	-6.00 dB	
MSG			STATUS 1. DC Couple	ed









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	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMZ	2021-11-05	2022-11-05
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

#### TEST DESCRIPTION

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



EUT: Surfi ink Dreasemmen		TbtTx 2021.10.29.2	XMit 2020.12.30
EUTIOUTLINK Programmer	Work Order:	STAK0262	
Serial Number: 213900484	Date:	25-Jan-22	
Customer: Starkey Laboratories, Inc.	Temperature:	21.7 °C	
Attendees: Aaron Anderson	Humidity:	15.5% RH	
Project: None	Barometric Pres.:	1031 mbar	
Tested by: Andrew Rogstad Power: 5 VDC via USB	Job Site:	MN08	
TEST SPECIFICATIONS Test Method			
FCC 15.247:2022 ANSI C63.10:2013			
COMMENTS			
Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration # 1			
Signature			
Биалианан			
Frequency Measur	ed Max Value	Limit	
Range Freq (Mi	ed Max Value Hz) (dBc)	Limit ≤ (dBc)	Result
Vertical Antenna	ed Max Value Hz) (dBc)	Limit ≤ (dBc)	Result
Vertical Antenna Low Channel, 906.6 MHz Fundamental 906.75	ed Max Value Hz) (dBc) 5 N/A	Limit ≤ (dBc) N/A	Result N/A
Vertical Antenna Low Channel, 906.6 MHz Low Channel, 906.6 MHz 30 MHz - 10 GHz 7084.8	ed Max Value Hz) (dBc) 5 N/A 3 -58.56	Limit ≤ (dBc) N/A -20	Result N/A Pass
Vertical Antenna Low Channel, 906.6 MHz Low Channel, 906.6 MHz Mid Channel, 915.7 MHz Low Channel, 915.7 MHz Low Channel, 915.7 MHz	ed Max Value Hz) (dBc) 5 N/A 3 -58.56 1 N/A	Limit ≤ (dBc) N/A -20 N/A	Result N/A Pass N/A
Frequency         Measure           Range         Freq (MI           Vertical Antenna         Fundamental         906.7           Low Channel, 906.6 MHz         Fundamental         906.7           Low Channel, 906.6 MHz         30 MHz - 10 GHz         7084.8           Mid Channel, 915.7 MHz         Fundamental         915.57           Mid Channel, 915.7 MHz         30 MHz - 10 GHz         5580.3	ed Max Value Hz) (dBc) 5 N/A 3 -58.56 I N/A 8 -59.47	Limit ≤ (dBc) N/A -20 N/A -20	Result N/A Pass N/A Pass
Frequency         Measure           Range         Freq (M           Vertical Antenna         708           Low Channel, 906.6 MHz         30 MHz - 10 GHz         7084.8           Mid Channel, 915.7 MHz         Fundamental         915.57           Mid Channel, 915.7 MHz         S0 MHz - 10 GHz         5580.3           High Channel, 915.7 MHz         30 MHz - 10 GHz         5580.3           High Channel, 915.7 MHz         Fundamental         915.57	ed Max Value (dBc) 5 N/A 3 -58.56 1 N/A 8 -59.47 3 N/A	Limit ≤ (dBc) N/A -20 N/A -20 N/A	Result N/A Pass N/A Pass N/A
Frequency         Measure           Range         Freq (MI           Vertical Antenna         Fundamental         906.72           Low Channel, 906.6 MHz         30 MHz - 10 GHz         7084.8           Mid Channel, 915.7 MHz         Fundamental         915.51           Mid Channel, 915.7 MHz         30 MHz - 10 GHz         5580.3           High Channel, 922.1 MHz         Fundamental         921.88           High Channel, 922.1 MHz         30 MHz - 10 GHz         5851.8	ed Max Value (dBc) 5 N/A 3 -58.56 1 N/A 8 -59.47 3 N/A 2 -60.47	Limit ≤ (dBc) N/A -20 N/A -20 N/A -20	Result N/A Pass N/A Pass N/A Pass
Vertical Antenna Low Channel, 906.6 MHz Low Channel, 906.6 MHz Mid Channel, 915.7 MHz High Channel, 922.1 MHz Horizontal Antenna	ed Max Value Hz) (dBc) 5 N/A 3 -58.56 N/A 8 -59.47 3 N/A 2 -60.47	Limit ≤ (dBc) N/A -20 N/A -20 N/A -20	Result N/A Pass N/A Pass N/A Pass
Frequency     Measure       Range     Freq (Mi       Vertical Antenna     Fundamental       Low Channel, 906.6 MHz     30 MHz - 10 GHz       Low Channel, 915.7 MHz     30 MHz - 10 GHz       Mid Channel, 915.7 MHz     Fundamental       Mid Channel, 915.7 MHz     Fundamental       High Channel, 922.1 MHz     Fundamental       High Channel, 922.1 MHz     Fundamental       Horizontal Antenna     U       Low Channel, 906.6 MHz     Setsta       Low Channel, 906.6 MHz     906.76	ed Max Value (dBc) 5 N/A 3 -58.56 1 N/A 8 -59.47 3 N/A 2 -60.47 5 N/A	Limit ≤ (dBc) N/A -20 N/A -20 N/A -20 N/A	Result N/A Pass N/A Pass N/A Pass
Frequency         Measure           Range         Freq (MI           Vertical Antenna         Fundamental         906.77           Low Channel, 906.6 MHz         30 MHz - 10 GHz         7084.8           Mid Channel, 915.7 MHz         Fundamental         915.57           Mid Channel, 915.7 MHz         30 MHz - 10 GHz         5580.3           High Channel, 922.1 MHz         Fundamental         921.88           High Channel, 922.1 MHz         30 MHz - 10 GHz         5851.8           Horizontal Antenna         U         5851.8           Low Channel, 906.6 MHz         Sundamental         906.72           Low Channel, 906.6 MHz         Sundamental         906.73           Low Channel, 906.6 MHz         30 MHz - 10 GHz         5875.3	ed Max Value Hz) (dBc) 5 N/A 3 -58.56 N/A 8 -59.47 3 N/A 2 -60.47 5 N/A 3 -59	Limit ≤ (dBc) N/A -20 N/A -20 N/A -20 N/A -20	Result N/A Pass N/A Pass N/A Pass N/A Pass
Frequency     Measure       Range     Freq (Mi       Vertical Antenna       Low Channel, 906.6 MHz     Fundamental     906.7       Low Channel, 906.6 MHz     30 MHz - 10 GHz     7084.8       Mid Channel, 915.7 MHz     Fundamental     915.5'       Mid Channel, 915.7 MHz     30 MHz - 10 GHz     5580.3       High Channel, 92.1 MHz     Fundamental     921.8       High Channel, 92.1 MHz     30 MHz - 10 GHz     5851.8       Horizontal Antenna     U     566.6       Low Channel, 906.6 MHz     30 MHz - 10 GHz     5675.3       Mid Channel, 915.7 MHz     S0 MHz - 10 GHz     5851.8       Horizontal Antenna     U     5675.3       Mid Channel, 906.6 MHz     30 MHz - 10 GHz     5675.3       Mid Channel, 915.7 MHz     Fundamental     906.75.8       Mid Channel, 915.7 MHz     S0 MHz - 10 GHz     5675.3       Mid Channel, 915.7 MHz     Fundamental     915.86	ed Max Value (dBc) 5 N/A 3 -58.56 N/A 8 -59.47 3 N/A 2 -60.47 5 N/A 3 -59 5 N/A	Limit ≤ (dBc) N/A -20 N/A -20 N/A -20 N/A -20 N/A	Result N/A Pass N/A Pass N/A Pass N/A
Frequency         Measure           Range         Freq (MI           Vertical Antenna         Fundamental         906.77           Low Channel, 906.6 MHz         30 MHz - 10 GHz         7084.8           Mid Channel, 915.7 MHz         Stormental         915.57           Mid Channel, 915.7 MHz         Fundamental         915.57           Mid Channel, 915.7 MHz         Stormental         915.7           Mid Channel, 915.7 MHz         Fundamental         915.7           Mid Channel, 915.7 MHz         Stormental         921.8           High Channel, 922.1 MHz         Fundamental         921.8           High Channel, 922.1 MHz         Stormental         921.8           Horizontal Antenna         Fundamental         906.76           Low Channel, 906.6 MHz         Stormental         906.76           Low Channel, 906.6 MHz         30 MHz - 10 GHz         5675.3           Mid Channel, 915.7 MHz         Stormental         915.86           Mid Channel, 915.7 MHz         30 MHz - 10 GHz         7160.3           Mid Channel, 915.7 MHz         30 MHz - 10 GHz         7160.3	ed Max Value (dBc) 5 N/A 3 -58.56 1 N/A 8 -59.47 3 N/A 2 -60.47 5 N/A 3 -59 5 N/A 3 -58 5 N/A 3 -58.517	Limit ≤ (dBc) N/A -20 N/A -20 N/A -20 N/A -20 N/A -20 N/A -20	Result N/A Pass N/A Pass N/A Pass N/A Pass N/A Pass
Frequency         Measure           Range         Freq (MI           Vertical Antenna         Fundamental         906.7           Low Channel, 906.6 MHz         30 MHz - 10 GHz         7084.8           Mid Channel, 915.7 MHz         Fundamental         915.5'           Mid Channel, 915.7 MHz         30 MHz - 10 GHz         5580.3           High Channel, 922.1 MHz         Fundamental         921.8           High Channel, 922.1 MHz         30 MHz - 10 GHz         5851.8           Horizontal Antenna          921.8           Low Channel, 906.6 MHz         30 MHz - 10 GHz         5851.8           Horizontal Antenna             Low Channel, 906.6 MHz         30 MHz - 10 GHz         5675.3           Mid Channel, 915.7 MHz         Fundamental         906.77           Low Channel, 906.7 MHz         30 MHz - 10 GHz         5675.3           Mid Channel, 915.7 MHz         Fundamental         915.86           Mid Channel, 915.7 MHz         30 MHz - 10 GHz         7160.3           Mid Channel, 92.1 MHz         30 MHz - 10 GHz         7160.3           High Channel, 922.1 MHz         Fundamental         921.88	ed Max Value (dBc) 5 N/A 3 -58.56 N/A 8 -59.47 3 N/A 2 -60.47 5 N/A 3 -59 5 N/A 3 -59 5 N/A 3 -59 5 N/A	Limit ≤ (dBc) N/A -20 N/A -20 N/A -20 N/A -20 N/A -20 N/A	Result N/A Pass N/A Pass N/A Pass N/A Pass N/A



	Vertical Ar	itenna, Low Channe	el, 906.6 MHz		
Freq	uency	Measured	Max Value	Limit	Desself
Funda	amental	906 75	(dBC)	≥ (dBC) N/∆	N/A
- I unde	amentar	500.75	19/75	IN/A	19/75
Keysight Spectrum Analyzer - Element N	Aterials Technology				
LXU RL RF 50Ω AC		SENSE:INT	ALIGN OFF		09:35:47 AM Jan 25, 2022
	PNO: Wide	Trig: Free Run	#Avg Type:	voitage	TYPE MWWWW
	IFGain:Low	#Atten: 10 dB			DET
Ref Offset 21.2 dB 10 dB/div Ref 20.00 dBm				MKM	906.752 55 MHz 9.28 dBm
		Ĭ	<b>↓</b> <sup>1</sup>		
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Center 906.6000 MHz #Res BW 100 kHz	#VB	W 300 kHz		Sweep	Span 1.000 MHz 1.092 ms (8192 pts
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	Vortical Ar	tonno Low Charge			
Freq	vertical Ar	Measured	Max Value	Limit	
Ra	inge	Freq (MHz)	(dBc)	≤ (dBc)	Result
30 MHz	- 10 GHz	7084.83	-58.56	-20	Pass
Keysight Spectrum Analyzer - Element M	faterials Technology	CENCEITNE	AUTONOLL		00/26/27 AM Jap 25, 2022
κι   κι   50 Ω AC	PNO: Fast 🕞	Trig: Free Run	#Avg Type:	Voltage	19:36:37 AM Jan 25, 2022 TRACE 1 2 3 4 5 TYPE M WWWWW
Ref Offset 21.2 dB	IFGain:Low	#Atten: 10 dB		N	1kr1 7.084 8 GHz

		PN IFG	0: Fast 😱 ain:Low	Trig: Free #Atten: 10	Run dB	mitig type	Tonuge		
10 dB/div	Ref Offset 21.2 dB Ref 20.00 dBm							Mkr1 7.0 -49	84 8 GHz 9.28 dBm
LUg									
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-20.0									
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-40.0							<b>↓</b> <sup>1</sup>		
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-60.0									
-70.0									
Start 30 I #Res BW	MHz 100 kHz		#VBI	N 300 kHz			Sweep	Stop 1 952.9 ms	0.000 GHz (8192 pts)
MSG						STATUS			





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	-	14 1 20 32 AU	-	PNO: Fast G	Trig: Free #Atten: 10	Run dB	#Avg Type:	Voltage	09.41.20 TF	ACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P
10 di	Ro B/div <b>R</b> o	ef Offset 21.2 di ef 20.00 dBn	B						Mkr1 5.5 -50	80 4 GHz ).00 dBm
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Star #Re	t 30 MHz s BW 10	: 0 kHz		#VE	W 300 kHz			Sweep	Stop 1 952.9 ms	0.000 GHz (8192 pts)
MSG							STATUS			





Key Key	sight Spectru	m Analyzer - Elemer	t Materials Technol	ogy						
IXI RI	L	RF 50 Ω	AC		SENSE:INT	<u>A</u>	LIGN OFF		09:45:56	AM Jan 25, 2022
				PNO: Fast 🕞	Trig: Free #Atten: 10	Run dB	#Avg Type:	Voltage	TR T	ACE 1 2 3 4 5 6 YPE M WWWWW DET P P P P P P
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-39.0						<b>^</b>	1			
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-59.0										
-69.0										
Star #Res	t 30 MHz s BW 10	z 0 kHz		#VB	W 300 kHz			Sweep	Stop 1 952.9 ms	0.000 GHz (8192 pts)
MSG							STATUS			





🔤 Key	ysight Spectrum Ar	nalyzer - Element N	Aaterials Technolo	ду						
LXI RI	L RF	50 Ω AC			SENSE:INT	<u>A</u> A	LIGN OFF		09:50:52	AM Jan 25, 2022
				PNO: Fast 🖵 Gain:Low	Trig: Free #Atten: 10	Run dB	#Avg Type:	Voltage	TF	ACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P P
10 dE	Ref ( B/div <b>Ref</b>	Offset 21.2 dE <b>19.00 dBm</b>	3						Mkr1 5.6 -5(	75 3 GHz ).30 dBm
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-1.00										
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-31.0										
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Otor	4 20 MU-								Stor	0.000 CH-
star #Re:	s BW 100 k	Hz		#VB	W 300 kHz			Sweep	952.9 ms	6.000 GH2 6 (8192 pts)
MSG							STATUS			





Keysight S	pectrum Analyzer - Element M	laterials Technolog	У						
XI RL	RF   50 Ω AC			SENSE:INT	<u>A</u> A	LIGN OFF	Voltage	09:54:52	AM Jan 25, 2022
		P	NO: Fast	Trig: Free #Atten: 10	Run dB	#Avg Type.	voltage	1	
	Ref Offset 21.2 dB		Guin.Eow					Mkr1 7.1	60 3 GHz
10 dB/div Log	Ref 20.00 dBm							-49	).50 dBm
-									
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-10.0									
-20.0									
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Start 30	MHz							Stop 1	0.000 GHz
#Res BW	/ 100 kHz		#VB	W 300 kHz			Sweep	952.9 ms	; (8192 pts)
MSG						STATUS			





Keys	sight Spect	rum Ana	alyzer - Eleme	nt Materials	Technolog	y								
LXI RL		RF	50 Ω	AC		(A. 2017)	SE	ENSE:INT		🚹 Al	IGN OFF		09:58:22	2 AM Jan 25, 2022
					P IF	NO: Fast Gain:Low	Ģ	Trig: Free I #Atten: 10	Run dB		#Avg Type	Voltage	TF	ACE 1 2 3 4 5 6 TYPE M WWWW DET P P P P P P
10 dB. Log p	/div	Ref O Ref 2	ffset 21.2 20.00 dE	dB m									Mkr1 1.8 -4	82 6 GHz 1.95 dBm
10.0														
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-10.0														
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-50.0											المراجع المراجع	outre antre		
-60.0								and a second						
-70.0 -														
Start #Res	30 MI BW 1	1z 00 ki	Ηz			#	VBW	V 300 kHz				Swee	Stop / p 952.9 ms	10.000 GHz 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
Generator - Signal	Keysight	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMZ	2021-11-05	2022-11-05
Attenuator	Fairview Microwave	SA18S5W-20	RFX	2021-06-02	2022-06-02
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2021-09-12	2022-09-12

#### TEST DESCRIPTION

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 2021.10.29.2	XMit 2020.12.30.0
EUT:	SurfLink Programmer		Work Order:	STAK0262	
Serial Number:	213900484		Date:	25-Jan-22	
Customer:	Starkey Laboratories, Inc		Temperature:	21.7 °C	
Attendees:	Aaron Anderson		Humidity:	15.7% RH	
Project:	None		Barometric Pres.:	1031 mbar	
Tested by:	Andrew Rogstad	Power: 5 VDC via USB	Job Site:	MN08	
TEST SPECIFICATI	ONS	Test Method			
FCC 15.247:2022		ANSI C63.10:2013			
COMMENTS					
Reference level off	set includes measuremen	cable, attenuator, DC block, and customer's patch cable.			
DEVIATIONS FROM	I TEST STANDARD				
None					
Configuration #	1	Signature the Register			
			Value	Limit	Boculto
			dBm/3kHz	< dBm/3kHz	results
Vertical Antenna			dBm/3kHz	< dBm/3kHz	Results
Vertical Antenna	Low Channel, 906.6 MHz		dBm/3kHz 2.353	< dBm/3kHz	Pass
Vertical Antenna	Low Channel, 906.6 MHz Mid Channel, 915.7 MHz		2.353 3.255	< dBm/3kHz 8 8	Pass Pass
Vertical Antenna	Low Channel, 906.6 MHz Mid Channel, 915.7 MHz High Channel, 922.1 MHz		dBm/3kHz 2.353 3.255 3.12	< dBm/3kHz 8 8 8 8	Pass Pass Pass Pass
Vertical Antenna Horizontal Antenna	Low Channel, 906.6 MHz Mid Channel, 915.7 MHz High Channel, 922.1 MHz		dBm/3kHz 2.353 3.255 3.12	< dBm/3kHz 8 8 8 8	Pass Pass Pass Pass
Vertical Antenna Horizontal Antenna	Low Channel, 906.6 MHz Mid Channel, 915.7 MHz High Channel, 922.1 MHz Low Channel, 906.6 MHz		dBm/3kHz 2.353 3.255 3.12 1.384	< dBm/3kHz 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Pass Pass Pass Pass
Vertical Antenna Horizontal Antenna	Low Channel, 906.6 MHz Mid Channel, 915.7 MHz High Channel, 922.1 MHz Low Channel, 906.6 MHz Mid Channel, 915.7 MHz		dBm/3kHz 2.353 3.255 3.12 1.384 1.552	< dBm/3kHz 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Pass Pass Pass Pass Pass Pass























End of Test Report