



166 South Carter, Genoa City, WI 53128

Company:	Saris Cycling Group
Model Tested:	NFC RFID1
Report Number:	18065
Project Number:	5211

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart C – Intentional Radiators

Section 15.225

Operation within the band 13.110 – 14.010 MHz

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	The Hub
Kind of Equipment:	Card I.D. reader
Frequency Range:	13.56 MHz
Test Configuration:	Tabletop
Model Number(s):	NFC RFID1
Model(s) Tested:	NFC RFID1
Serial Number(s):	0021038034AE
Date of Tests:	June 5 th to June 22, 2012
Test Conducted For:	Saris Cycling Group 5253 Verona Road Madison, WI 53711, USA

NOTICE: “This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government”. Please see the "Description of Test Sample" page listed inside of this report.

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SIGNATURE PAGE

Tested By:

A handwritten signature in black ink that reads "Craig Brandt". The signature is written in a cursive style with a long horizontal stroke at the end.

Craig Brandt
Test Engineer

Reviewed By:

A handwritten signature in black ink that reads "William Stumpf". The signature is written in a cursive style with a long horizontal stroke at the end.

William Stumpf
OATS Manager

Approved By:

A handwritten signature in black ink that reads "Brian J. Mattson". The signature is written in a cursive style with a long horizontal stroke at the end.

Brian Mattson
General Manager



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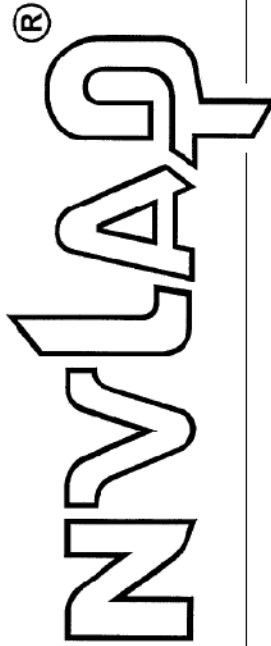


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United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

D.L.S. Electronic Systems, Inc.
Wheeling, IL

is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).



2011-10-01 through 2012-09-30

Effective dates

Dolly S. Bruce
For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)



166 South Carter, Genoa City, WI 53128

Company: Saris Cycling Group
Model Tested: NFC RFID1
Report Number: 18065
Project Number: 5211

1.0 Summary of Test Report

It was determined that the Saris Cycling Group card I.D. reader called The Hub, Model NFC RFID1, complies with the requirements of CFR 47 Part 15 Subpart C Section 15.225.

Subpart C Section 15.225 Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
Informational	20 dB Emission Bandwidth	ANSI C63.10-2009 Section 6.9.1	1	Yes
FCC 15.225 & 15.209	Radiated Emissions	ANSI C63.4-2009 & ANSI C63.10-2009	1	Yes
FCC 15.225(e)	Frequency Stability	ANSI C63.10-2009 Section 6.8	1	Yes
FCC 15.207	AC Line Conducted Emissions	ANSI C63.4-2009 & ANSI C63.10-2009	2	Yes

Note 1: Radiated emission measurement.

Note 2: AC Line Conducted emission measurement

2.0 Introduction

In June, 2012 The Hub, Model NFC RFID1, as provided from Saris Cycling Group was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.225. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.

3.0 Test Facilities

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, Industry Canada, and VCCI.

Wisconsin Test Facility:

D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128

Wheeling Test Facility:

D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090



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Company: Saris Cycling Group
Model Tested: NFC RFID1
Report Number: 18065
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4.0 Description of Test Sample

Description:

The Hub is a system that consists of an RFID card reader that reads a user's card and registers user data into a PC data base. An example of a use is logging bicycle commuter miles where the user arrives at school or work and swipes the card.

Type of Equipment / Frequency Range:

Wall mounted/ 13.56 MHz

Physical Dimensions of Equipment Under Test:

Length: 5.5 inches x Width: 4 inches x Height: 1.5 inches

Power Source:

120 V, 60 Hz

Internal Frequencies:

27.12 MHz

Transmit / Receive Frequencies Used For Test Purpose:

13.56 MHz

Type of Modulation(s) / Antenna Type:

ASK / PCB trace antenna

Description of Circuit Board(s) / Part Number:

Cobra Interface pcba, Saris Cycling Group	20433
NFC Mobile Module, Arygon Technologies	APDB2UA33
FEZ Cobra Mainboard, GHI Electronics	GHI-FCOBRA-131



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5.0 Test Equipment

A list of the equipment used can be found in the table below. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

D.L.S. Wisconsin – AC Line Conducted (Screen Room)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	1-11-12	1-11-13
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	5-23-12	5-23-13
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	1-11-12	1-11-13
Limiter	Electro-Metrics	EM-7600	706	9 kHz – 30 MHz	1-11-12	1-11-13

RADIATED EMISSIONS TEST 9 kHz – 30 MHz (Site 2)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	4-12-12	4-12-13
Antenna	EMCO	6502	2038	9 kHz – 30 MHz	9-23-10	9-23-12

RADIATED EMISSIONS TEST 30 – 1000 MHz (Site 3)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	1-11-12	1-11-13
Preamplifier	Rohde & Schwarz	TS-PR10	032001/005	9 kHz – 1 GHz	1-11-12	1-11-13
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	9-9-10	9-9-12
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	9-9-10	9-9-12

Temperature Chamber

Description	Manufacturer	Model Number	Serial Number	Temperature Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	7-17-11	7-17-12
Temperature Chamber	Test Equity	1007C	R035716	-73° C to +175° C	N/A	N/A



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6.0 Test Arrangements

Radiated Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.4-2009 and ANSI C63.10-2009, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

7.0 Test Conditions

Test Conditions recorded during test:

Temperature and Humidity:

70°F at 43% RH

Voltage:

120 V, 60Hz

8.0 Modifications Made To EUT For Compliance

1. Used a shielded CAT 5 Ethernet cable.
2. Added ferrite (API Delevan Inc. BF1429) with 2 passes through on the AC adaptor cable at approximately 2" from the power port on the EUT.
3. Added a ferrite (Fair-Rite #0431167281) with 2 passes through at approximately 2" from Ethernet port on the EUT.



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9.0 Additional Descriptions

The EUT was mounted vertically as it would be under normal installations. The RFID tag was placed in front of the reader. Reader (EUT) was in communication with the tag - continuous transmit operation.

10.0 Results

Measurements were performed in accordance with ANSI C63.4-2009 and ANSI C63.10-2009. Graphical and tabular data can be found in Appendix B at the end of this report.

11.0 Conclusion

The Hub, Model NFC RFID1, as provided from Saris Cycling Group tested in June, 2012 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.225.



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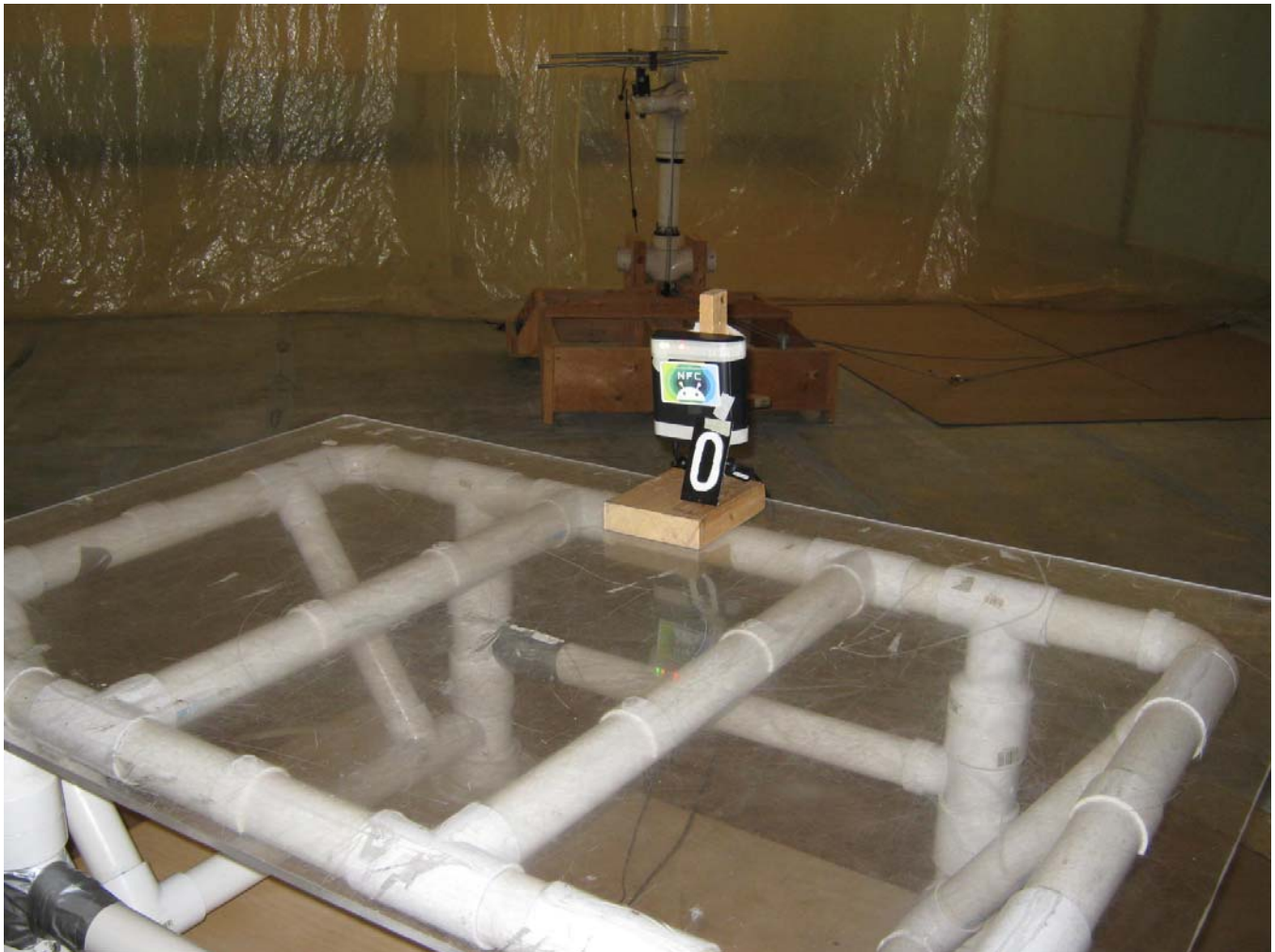
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Appendix A – Test Photos

Photo Information and Test Setup:

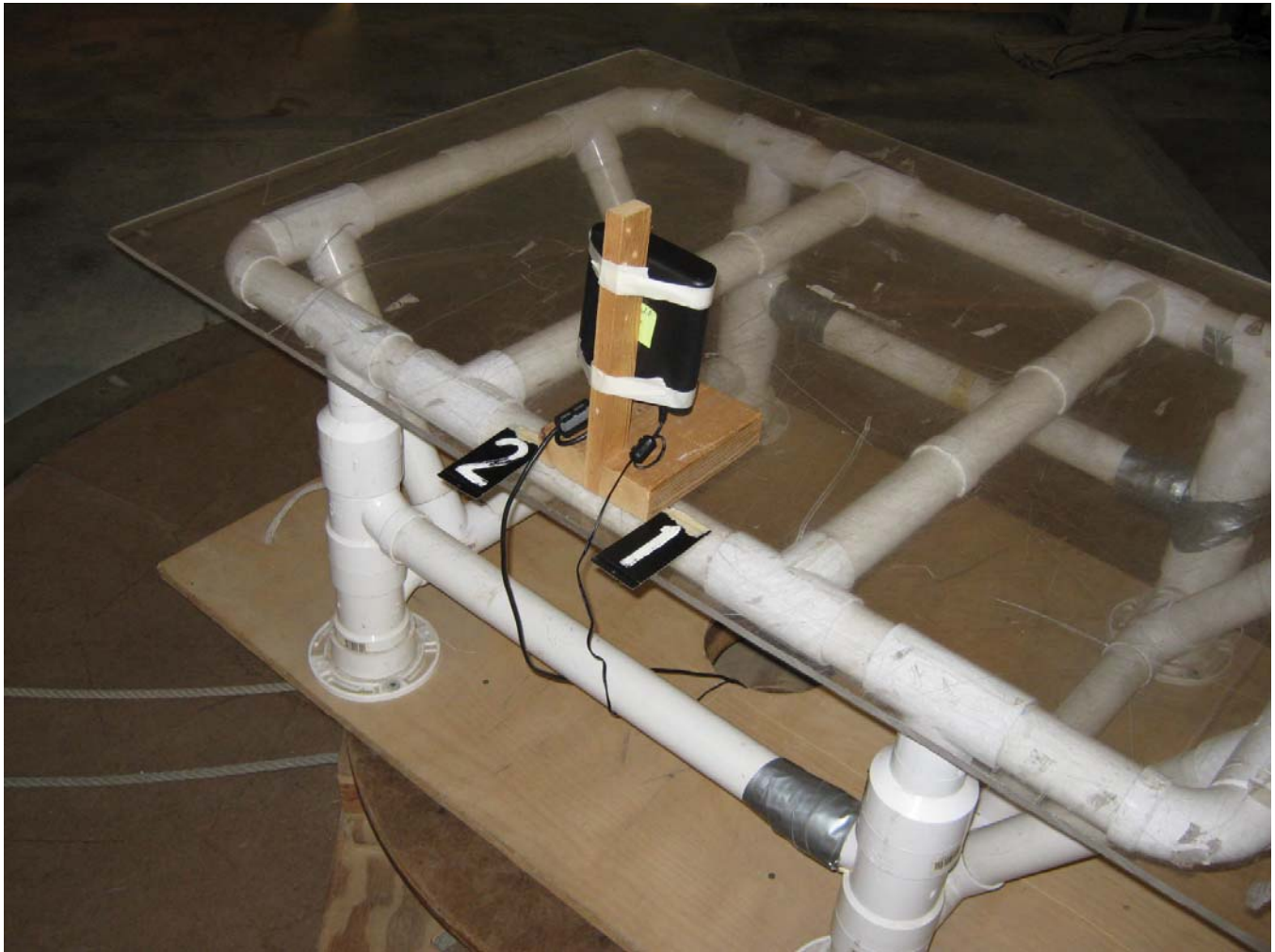
Item: The Hub, Model NFC RFID1

Radiated Emissions – Front



Appendix A

Radiated Emissions – Back





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Appendix A

Ferrite Location for passing radiated emissions testing





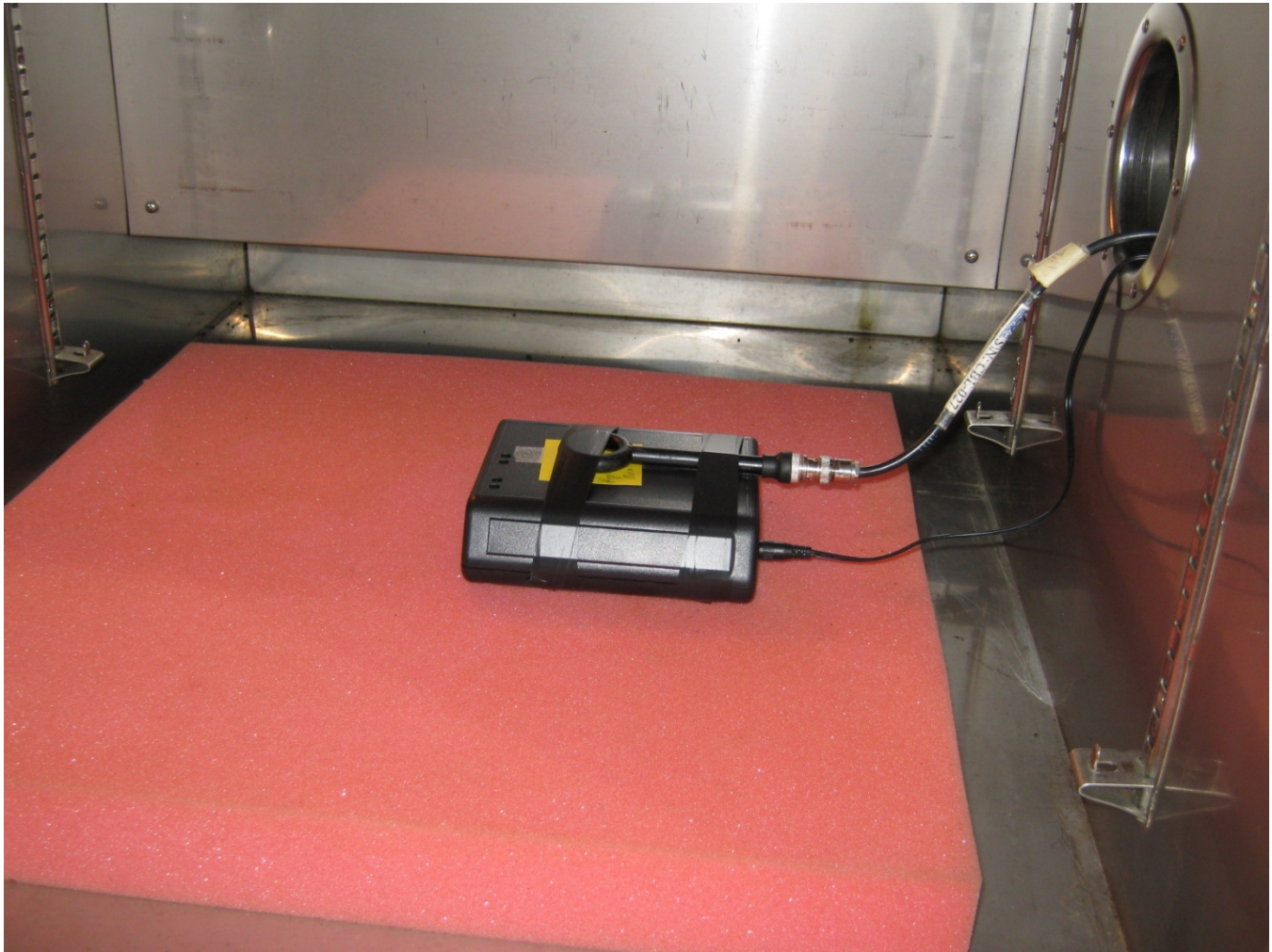
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Appendix A

Frequency Stability



Appendix A

AC line Conducted Emissions – Front





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Company:	Saris Cycling Group
Model Tested:	H1000
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Appendix B – Measurement Data

1.0 Occupied Bandwidth – 20 dB

Rule Part: Informational

Test Procedure: ANSI C63.10:2009 Section 6.9.1

Limits: NA

Results: Compliant

Sample Equations: N/A

.

Notes: The EUT was set to transmit at its maximum power.

This measurement was taken using the Rhode & Schwarz internal 20 dB down bandwidth function.



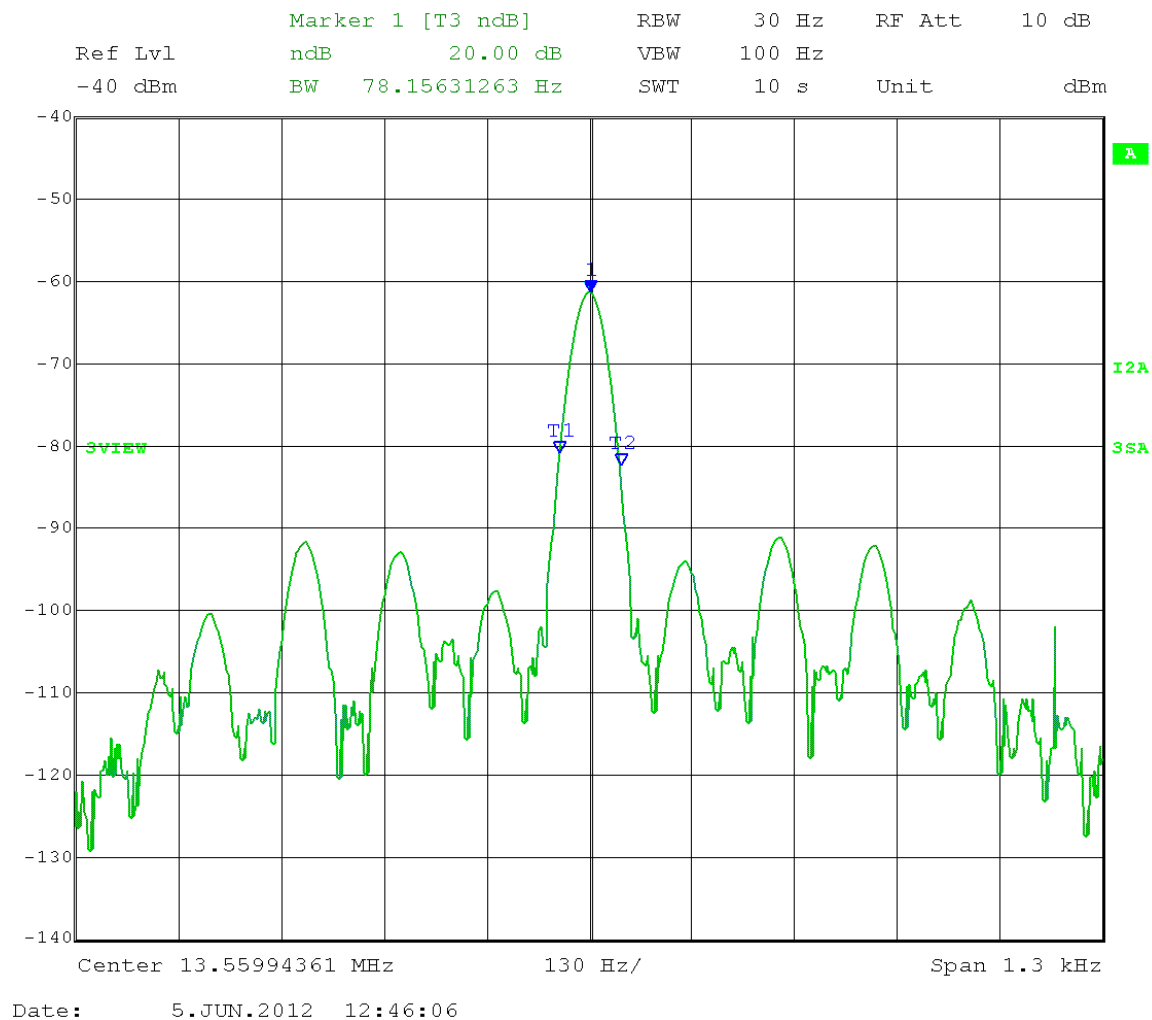
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Company: Saris Cycling Group
Model Tested: H1000
Report Number: 18065
Project Number: 5211

Appendix B

Test Date: 06-05-2012
Company: Saris Cycling Group
EUT: The Hub
Test: 20 dB Bandwidth - Radiated
Operator: Craig B
Comment: Frequency: 13.56 MHz

20 dB Bandwidth = 78 Hz





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Company:	Saris Cycling Group
Model Tested:	H1000
Report Number:	18065
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Appendix B

2.0 Radiated Emissions

Rule Part: FCC Part 15.225 and FCC Part 15.209

Test Procedure: ANSI C63.4-2009 & ANSI C63.10-2009

Limits: 15,848 $\mu\text{V/m}$ at 30 meters: 13.553-13.567 MHz
334 $\mu\text{V/m}$ at 30 meters: 13.410-13.553 & 13.567-13.710 MHz
106 $\mu\text{V/m}$ at 30 meters: 13.110-13.410 & 13.710-14.010 MHz
15.209 general emission limits: outside 13.110-14.010 MHz

Results: Compliant

Sample Equations: Limit at 10 meters:
Fundamental limit at 30 meters = 15,848 $\mu\text{V/m}$
 $20 \text{ Log } (15,848) = 84 \text{ dB}\mu\text{V/m}$ at 30 meters
Using a 40 dB/decade distance extrapolation factor as per FCC
 $15.31(f)(2): 40 \text{ Log}(30 \text{ meters}/10 \text{ meters}) = 19.08 \text{ dB}$
 $84 \text{ dB}\mu\text{V/m} + 19.08 \text{ dB} = \mathbf{103.08 \text{ dB}\mu\text{V/m at 10 meter distance}}$

Notes: The EUT was set to transmit at its maximum power.

Field Strength measurements were taken at a distance of 10 meters from 9 kHz to 30 MHz, and a distance of 3 meters from 30 MHz to 1 GHz.



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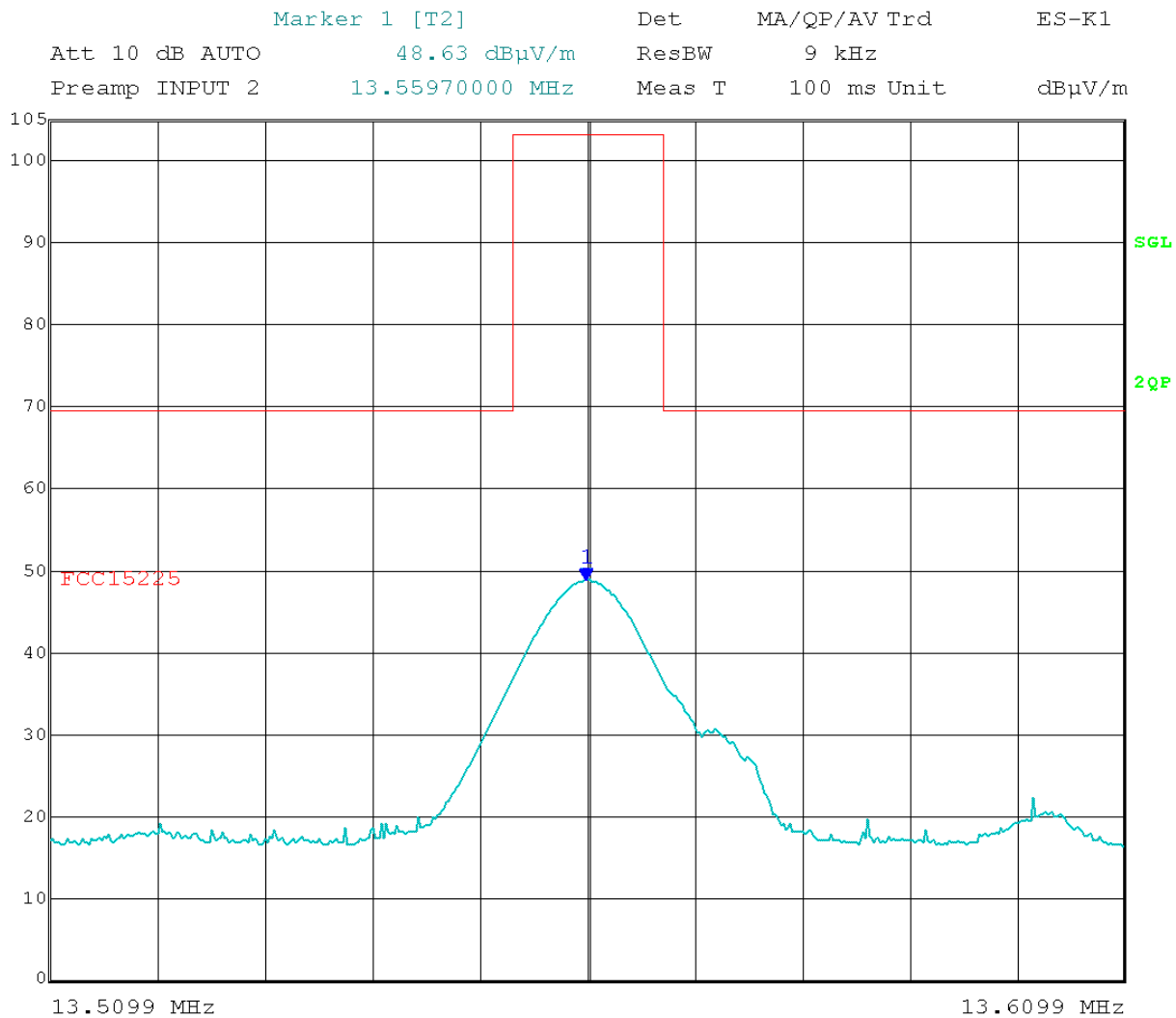
Company:
Model Tested:
Report Number:
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Appendix B

2.0a Emissions Mask

Test Date: 06-05-2012
Company: Saris Cycling Group
EUT: The Hub
Test: Emission Mask – Radiated; Quasi-Peak
Operator: Craig B
Comment: Frequency: 13.56 MHz



Date: 5.JUN.2012 12:19:22

FCC Part 15.225

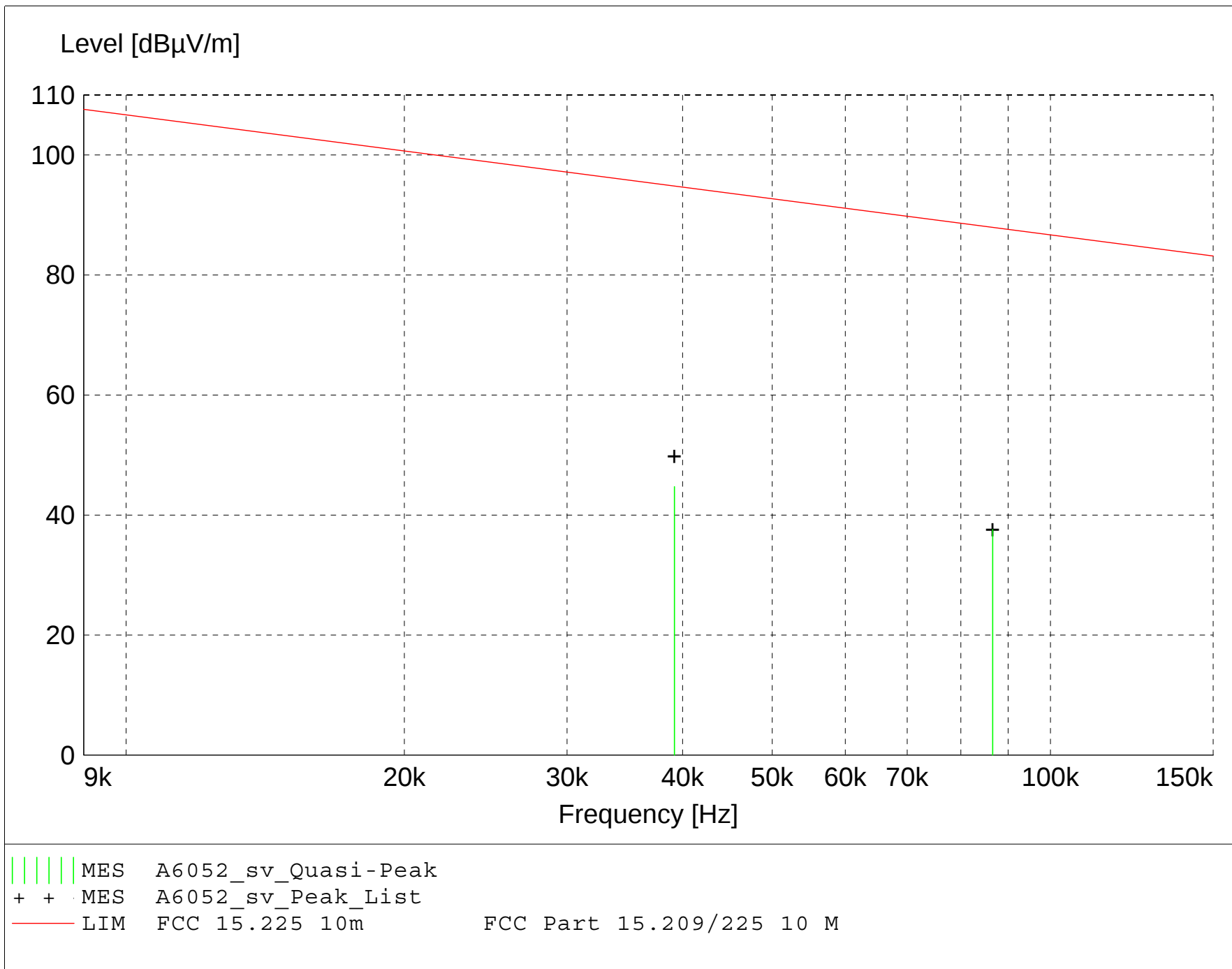
Radiated Emissions

EUT: The Hub
Manufacturer: Saris Cycling Group
Operating Condition: 66 degF ; 43%R.H.
Test Site: D.L.S. O.F. Site 2
Operator: Craig B
Test Specification: 120 VAC; 60 Hz
Comment:
Date: 06-05-2012

TEXT: "E-Field 10 meters"

Short Description: Equip info Site1 EFld low-30

TEST SET-UP: E-FIELD MEASURED AT 10 METERS



MEASUREMENT RESULT: "A6052_sv_Final"

6/5/2012 11:35AM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level			Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m	dB	m	deg		
0.039200	32.86	11.87	0.0	44.7	94.8	50.1	1.00	0	QUASI-PEAK	noise floor
0.086600	27.24	10.33	0.0	37.6	87.9	50.3	1.00	0	QUASI-PEAK	noise floor

FCC Part 15.225

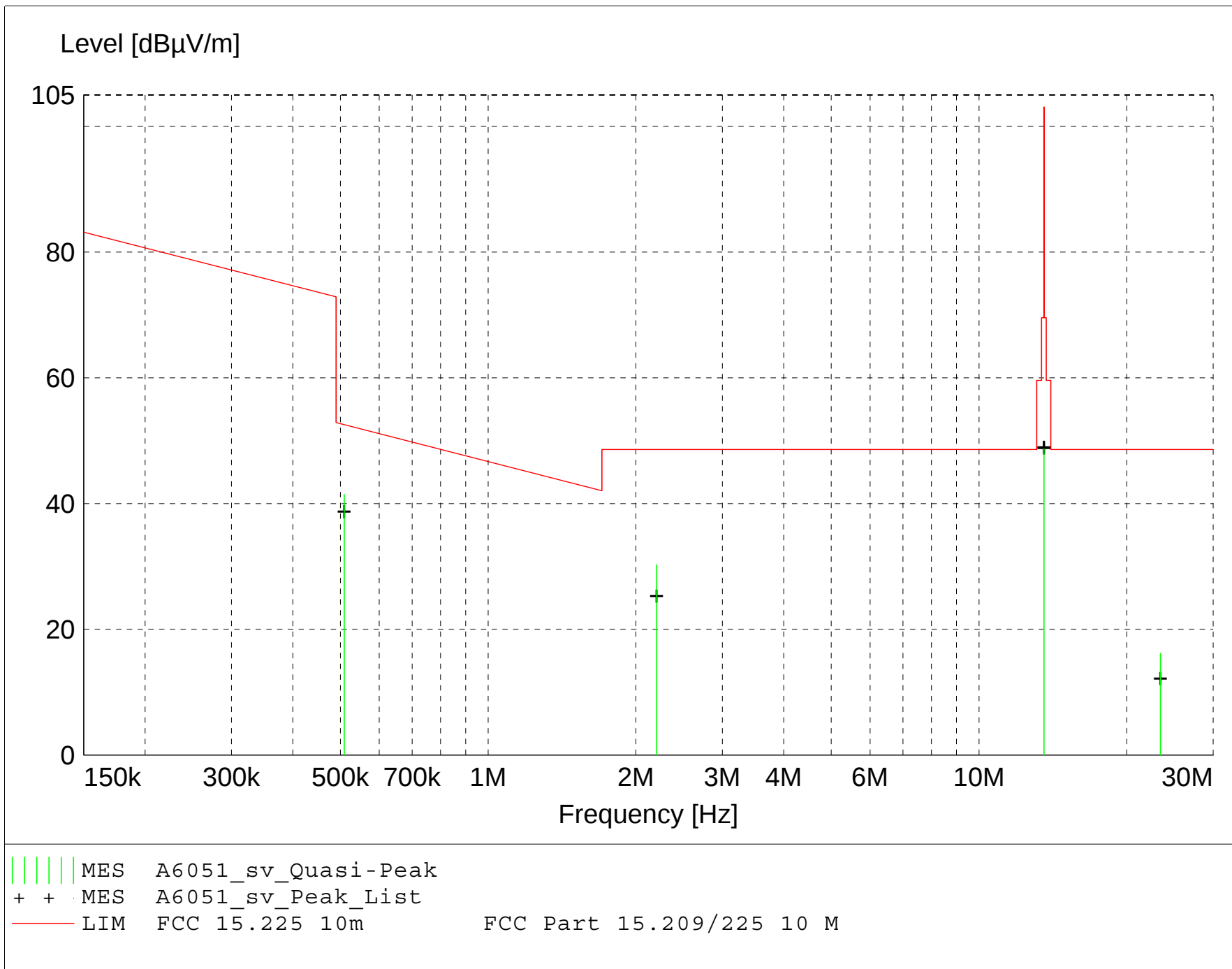
Radiated Emissions

EUT: The Hub
Manufacturer: Saris Cycling Group
Operating Condition: 66 degF ; 43%R.H.
Test Site: D.L.S. O.F. Site 2
Operator: Craig B
Test Specification: 120 VAC; 60 Hz
Comment:
Date: 06-05-2012

TEXT: "E-Field 10 meters"

Short Description: Equip info Site1 EFld low-30

TEST SET-UP: E-FIELD MEASURED AT 10 METERS



MEASUREMENT RESULT: "A6051_sv_Final"

6/5/2012 11:20AM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level			Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m	dB	m	deg		
0.509000	31.00	10.29	0.2	41.5	52.5	11.1	1.00	0	QUASI-PEAK	noise floor
2.204500	19.44	10.46	0.4	30.3	48.6	18.4	1.00	0	QUASI-PEAK	noise floor
23.425000	5.56	9.48	1.1	16.2	48.6	32.4	1.00	0	QUASI-PEAK	noise floor
13.559825	37.32	10.52	0.9	48.7	103.1	54.3	1.00	270	QUASI-PEAK	Fundamental

Electric Field Strength

EUT: The Hub
Manufacturer: Saris Cycling Group
Operating Condition: 74 deg. F; 44% R.H.
Test Site: DLS O.F. Site 3
Operator: Bill S
Test Specification: 120 Vac @ 60 Hz
Comment: Communication with RFID tag
Date: 06-22-2012

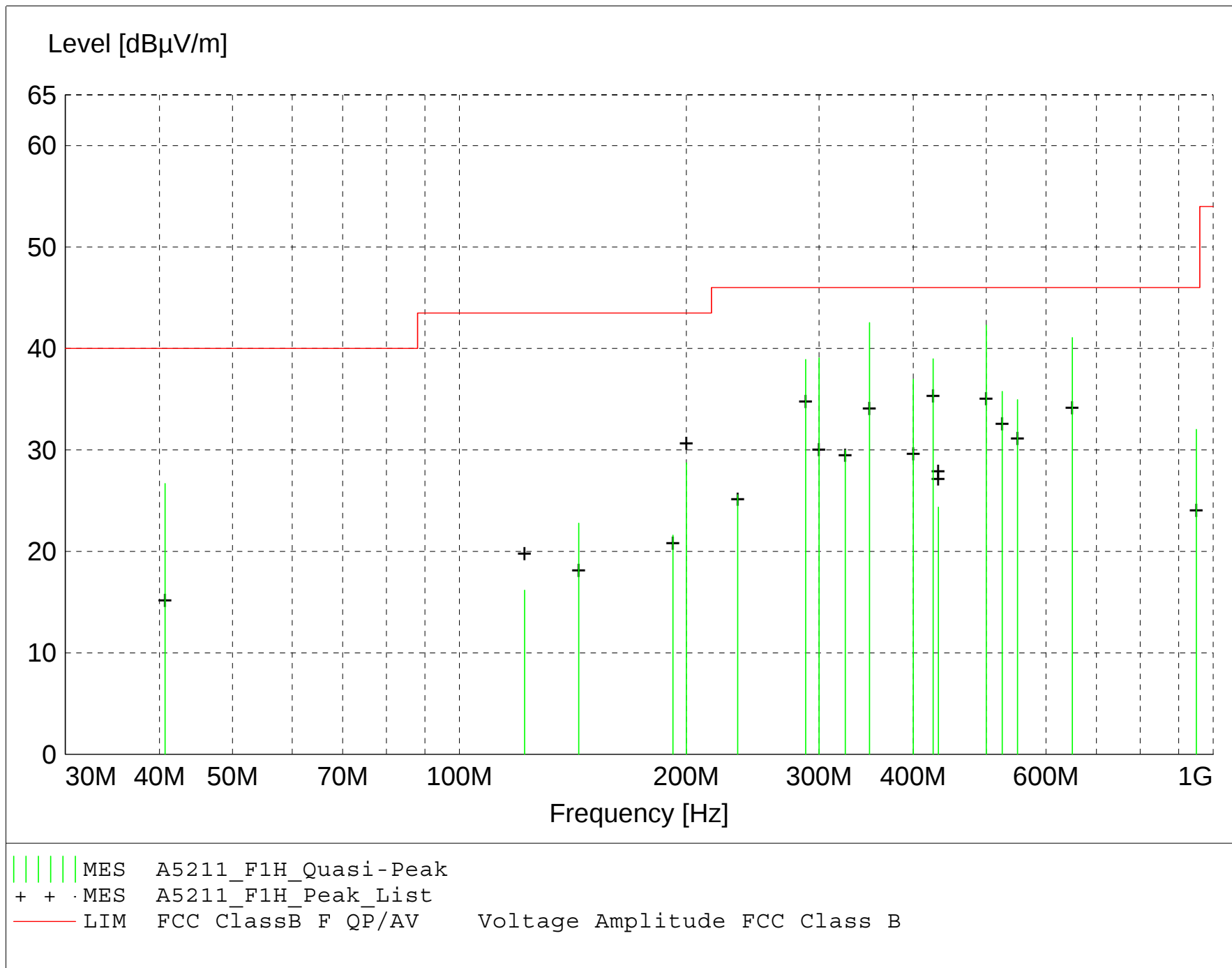
TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Equations:
$$\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$$
$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "A5211_F1H_Final"

6/22/2012 2:04PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level	dBμV/m	dB	Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m		m	deg		
350.000000	48.90	15.00	-21.4	42.5	46.0	3.5	1.00	45	QUASI-PEAK	
500.000000	44.84	18.10	-20.6	42.3	46.0	3.7	2.00	245	QUASI-PEAK	
650.300000	40.70	20.20	-19.8	41.1	46.0	4.9	1.60	45	QUASI-PEAK	
300.020000	46.00	14.70	-21.6	39.1	46.0	6.9	1.80	45	QUASI-PEAK	
425.000000	43.34	16.60	-21.0	39.0	46.0	7.0	1.00	270	QUASI-PEAK	
288.020000	46.45	14.12	-21.7	38.9	46.0	7.1	1.00	90	QUASI-PEAK	
399.980000	41.90	16.10	-21.0	37.0	46.0	9.0	3.50	190	QUASI-PEAK	
525.020000	37.59	18.60	-20.4	35.8	46.0	10.2	1.80	225	QUASI-PEAK	
549.980000	36.97	18.40	-20.4	35.0	46.0	11.0	1.40	185	QUASI-PEAK	
40.680000	39.33	11.56	-24.2	26.7	40.0	13.3	3.30	180	QUASI-PEAK	3rd harmonic
950.000000	25.51	23.80	-17.3	32.0	46.0	14.0	1.20	190	QUASI-PEAK	
200.000000	33.69	17.40	-22.4	28.7	43.5	14.8	2.00	270	QUASI-PEAK	
324.980000	36.78	14.70	-21.5	30.0	46.0	16.0	2.70	190	QUASI-PEAK	
234.020000	35.80	11.66	-21.9	25.6	46.0	20.4	2.10	90	QUASI-PEAK	
144.000000	33.43	12.10	-22.7	22.8	43.5	20.7	2.20	90	QUASI-PEAK	
432.020000	28.60	16.70	-20.9	24.4	46.0	21.6	2.40	345	QUASI-PEAK	
192.000000	26.65	17.40	-22.4	21.6	43.5	21.9	2.50	270	QUASI-PEAK	
431.960000	27.46	16.70	-20.9	23.2	46.0	22.8	2.40	345	QUASI-PEAK	
122.040000	26.28	12.90	-23.0	16.2	43.5	27.3	3.50	270	QUASI-PEAK	

Electric Field Strength

EUT: The Hub
Manufacturer: Saris Cycling Group
Operating Condition: 74 deg. F; 44% R.H.
Test Site: DLS O.F. Site 3
Operator: Bill S
Test Specification: 120 Vac @ 60 Hz
Comment: Communication with RFID tag
Date: 06-22-2012

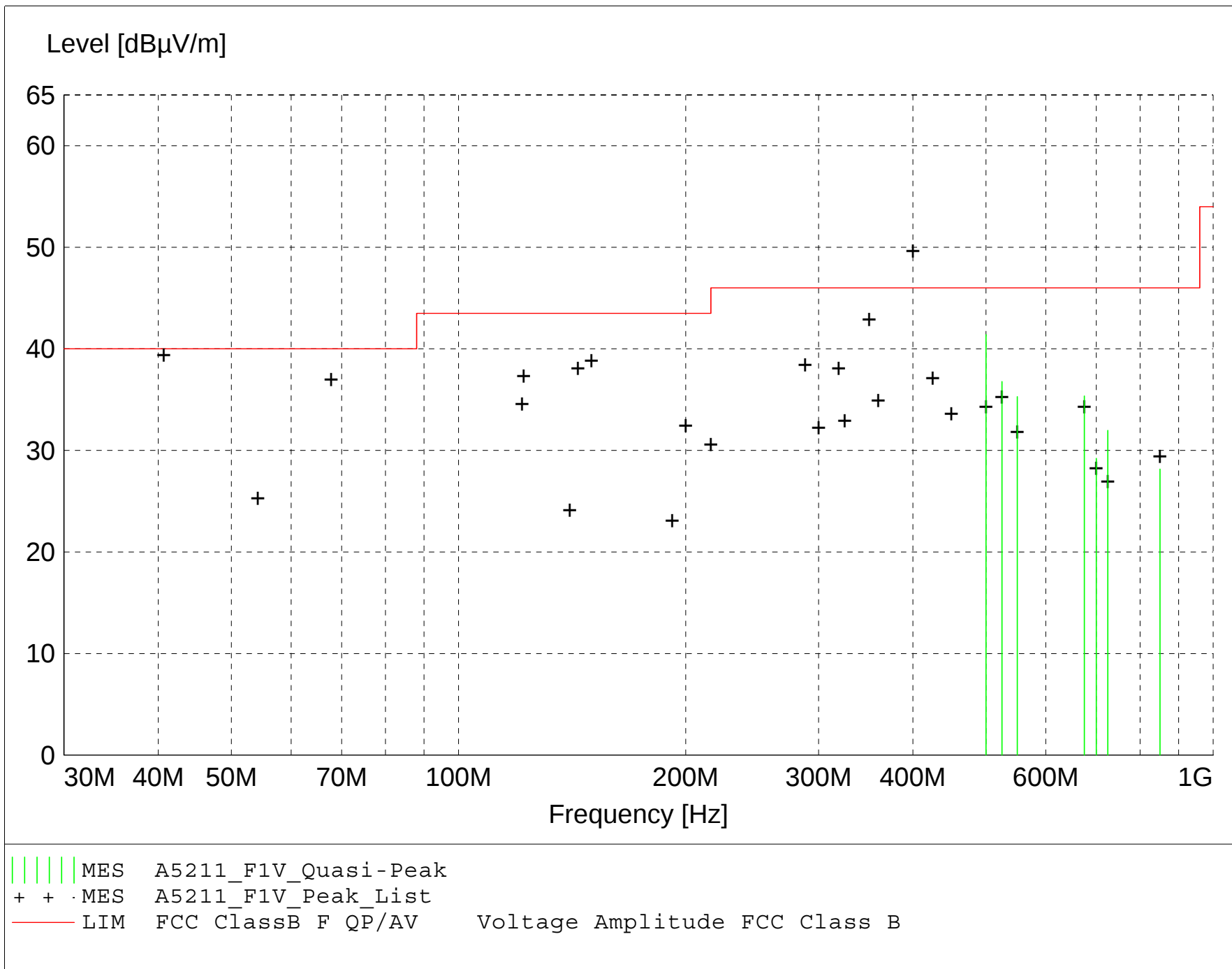
TEXT: "Vert 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Equations:
$$\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$$
$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "A5211_F1V_Final"

6/22/2012 1:55PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level	dBμV/m	dB	Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m		m	deg		
400.040000	48.19	16.10	-21.0	43.3	46.0	2.7	1.70	270	QUASI-PEAK	3rd harmonic
40.680000	49.45	11.56	-24.2	36.8	40.0	3.2	1.00	270	QUASI-PEAK	
350.000000	49.13	15.00	-21.4	42.8	46.0	3.2	1.60	180	QUASI-PEAK	
500.000000	43.96	18.10	-20.6	41.4	46.0	4.6	1.10	170	QUASI-PEAK	
425.000000	43.37	16.60	-21.0	39.0	46.0	7.0	2.00	0	QUASI-PEAK	
300.020000	44.50	14.70	-21.6	37.6	46.0	8.4	2.20	180	QUASI-PEAK	
525.020000	38.61	18.60	-20.4	36.8	46.0	9.2	1.10	180	QUASI-PEAK	
200.000000	38.55	17.40	-22.4	33.6	43.5	9.9	1.00	165	QUASI-PEAK	
144.000000	43.52	12.10	-22.7	32.9	43.5	10.6	1.00	260	QUASI-PEAK	
675.020000	34.53	20.70	-19.9	35.4	46.0	10.6	1.00	0	QUASI-PEAK	
550.040000	37.31	18.40	-20.4	35.3	46.0	10.7	1.00	350	QUASI-PEAK	
288.020000	42.57	14.12	-21.7	35.0	46.0	11.0	2.00	180	QUASI-PEAK	
67.800000	43.85	7.96	-23.8	28.0	40.0	12.0	1.00	270	QUASI-PEAK	5th harmonic
150.000000	41.08	12.10	-22.6	30.5	43.5	13.0	1.00	260	QUASI-PEAK	
324.980000	38.91	14.70	-21.5	32.1	46.0	13.9	1.80	180	QUASI-PEAK	
725.000000	30.18	21.30	-19.5	32.0	46.0	14.0	1.00	270	QUASI-PEAK	
54.240000	36.45	11.13	-24.0	23.6	40.0	16.4	1.00	270	QUASI-PEAK	
700.040000	27.76	21.00	-19.5	29.2	46.0	16.8	1.00	270	QUASI-PEAK	
140.400000	37.09	12.26	-22.8	26.5	43.5	17.0	1.00	270	QUASI-PEAK	4th harmonic
450.020000	32.79	16.70	-20.8	28.6	46.0	17.4	1.50	165	QUASI-PEAK	
850.040000	23.96	22.80	-18.6	28.2	46.0	17.8	1.00	190	QUASI-PEAK	
192.000000	29.49	17.40	-22.4	24.4	43.5	19.1	1.00	180	QUASI-PEAK	
122.040000	32.55	12.90	-23.0	22.5	43.5	21.0	1.00	45	QUASI-PEAK	
360.020000	28.61	15.00	-21.3	22.3	46.0	23.7	2.00	180	QUASI-PEAK	
319.040000	28.03	14.96	-21.5	21.5	46.0	24.5	2.00	180	QUASI-PEAK	9th harmonic
121.380000	28.48	12.84	-23.0	18.3	43.5	25.2	1.00	270	QUASI-PEAK	



166 South Carter, Genoa City, WI 53128

Company:	Saris Cycling Group
Model Tested:	H1000
Report Number:	18065
Project Number:	5211

Appendix B

3.0 Frequency Stability

Rule Part: FCC Part 15.225(e)

Test Procedure: ANSI C63.10:2009 Section 6.8

Limits: 0.01% of the center frequency
Limit = +/- 1.356 kHz (0.01% of 13.56 MHz)

Results: Compliant

Sample Equations: N/A

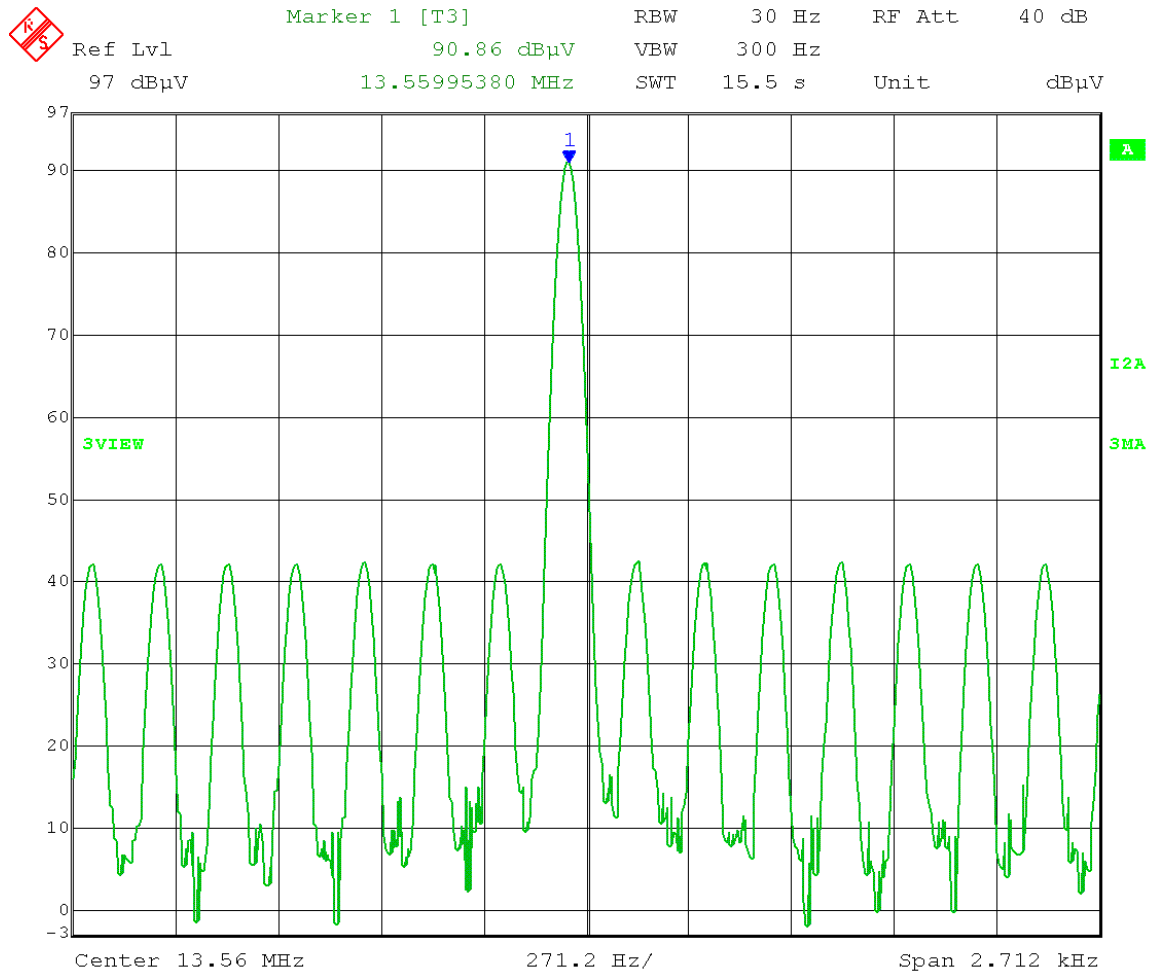
.

Notes: The EUT was coupled to a spectrum analyzer using a near-field probe.

The AC voltage to the AC adapter was varied from 85% to 115% of the nominal input voltage. Carrier frequency measurements were performed and recorded at nominal temperature.

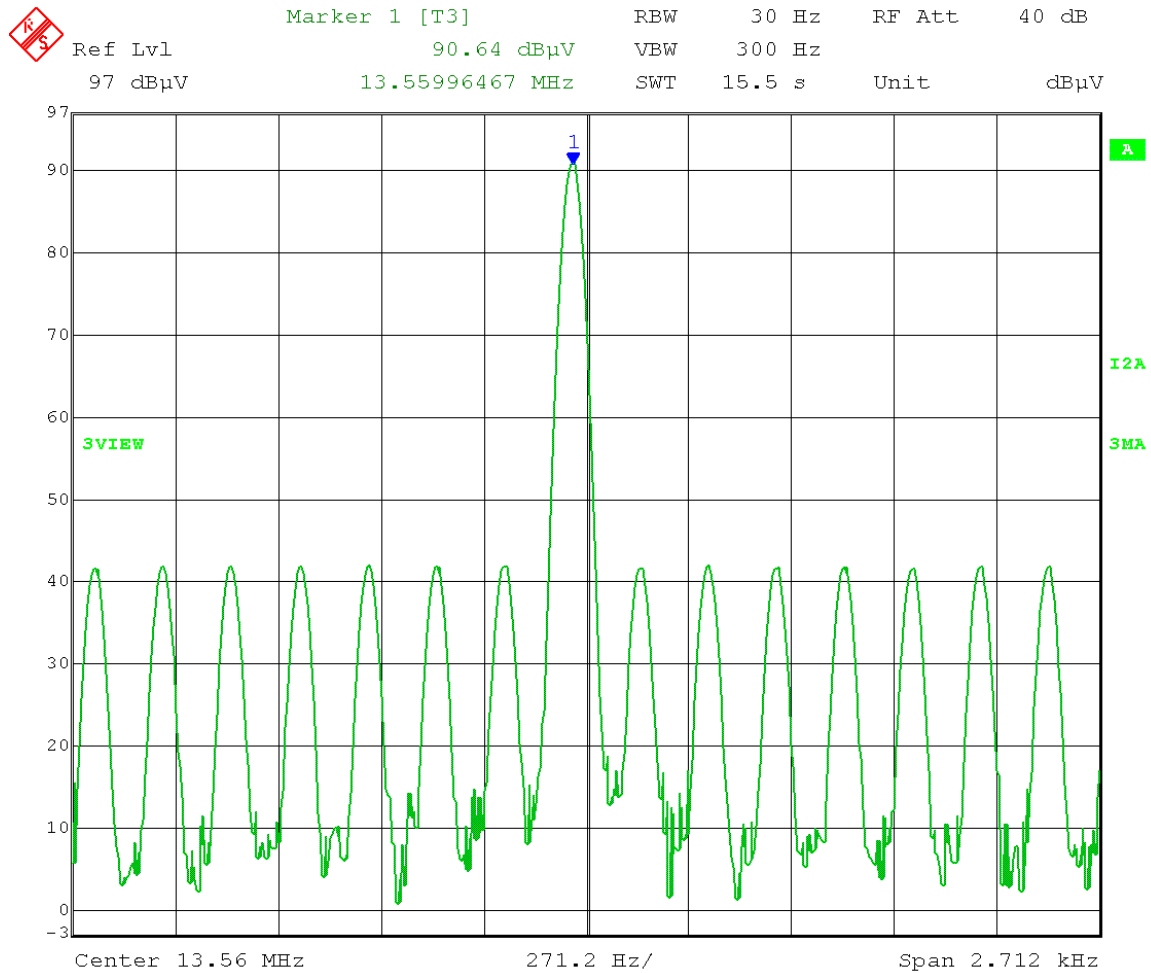
The temperature was varied from -30 °C to + 50 °C in increments of 10° and at nominal AC voltage of 120 V to the input of the AC adapter. Carrier frequency measurements were performed and recorded at transmitter startup. EUT frequency was stable at time of startup, and no significant drifting was observed for several minutes after startup.

Test Date: 06-06-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: +50 deg. C
Comment: 120 V



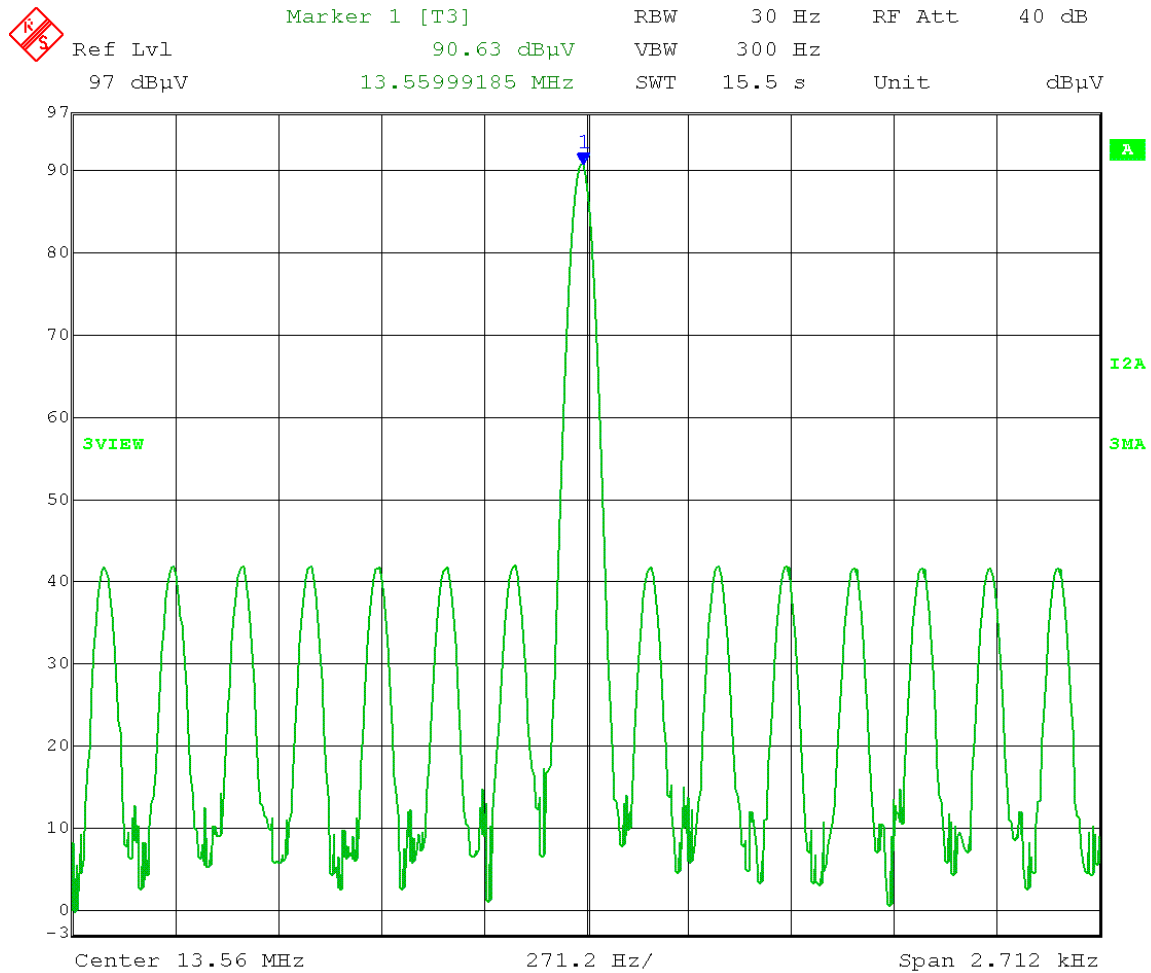
Date: 6.JUN.2012 14:40:13

Test Date: 06-06-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: +40 deg. C
Comment: 120 V



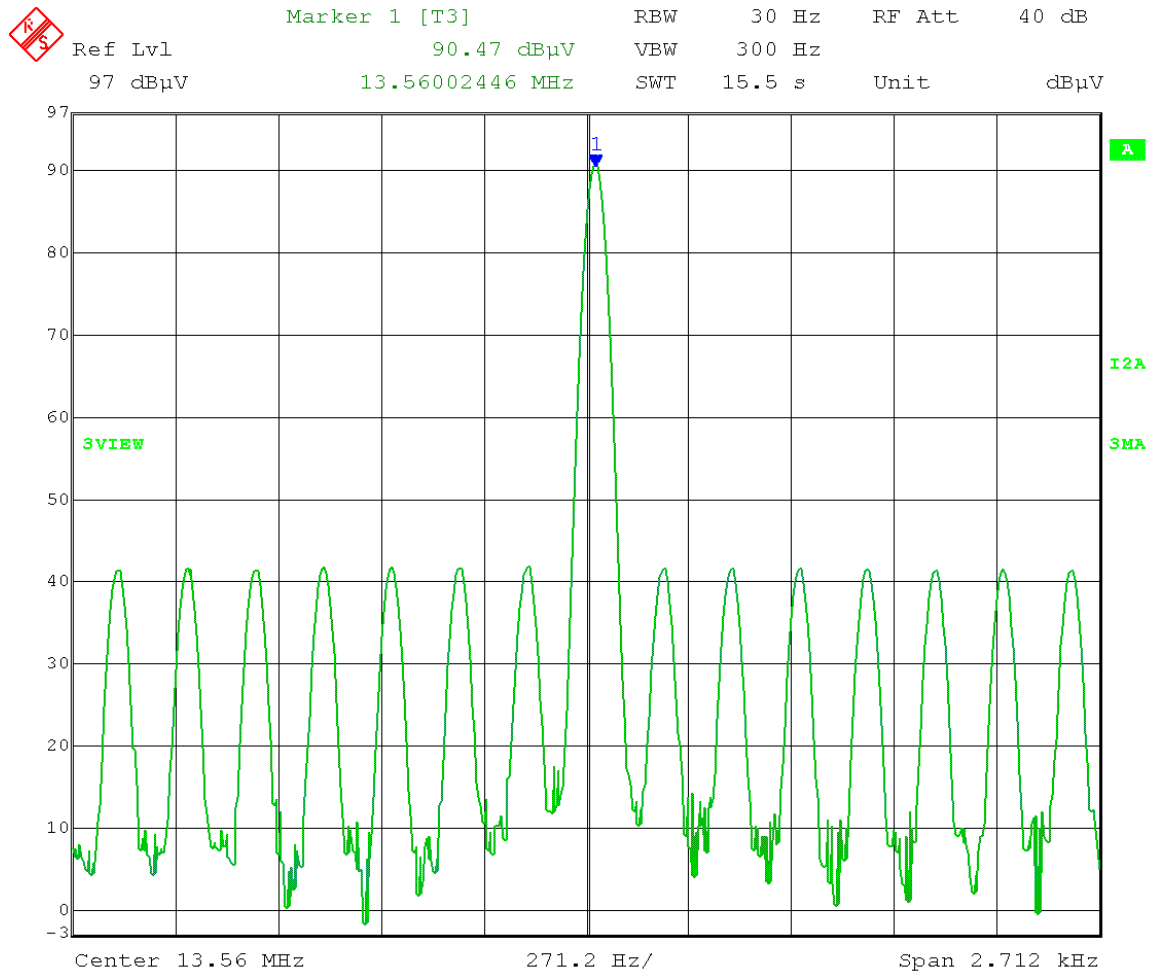
Date: 6.JUN.2012 14:00:15

Test Date: 06-06-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: +30 deg. C
Comment: 120 V



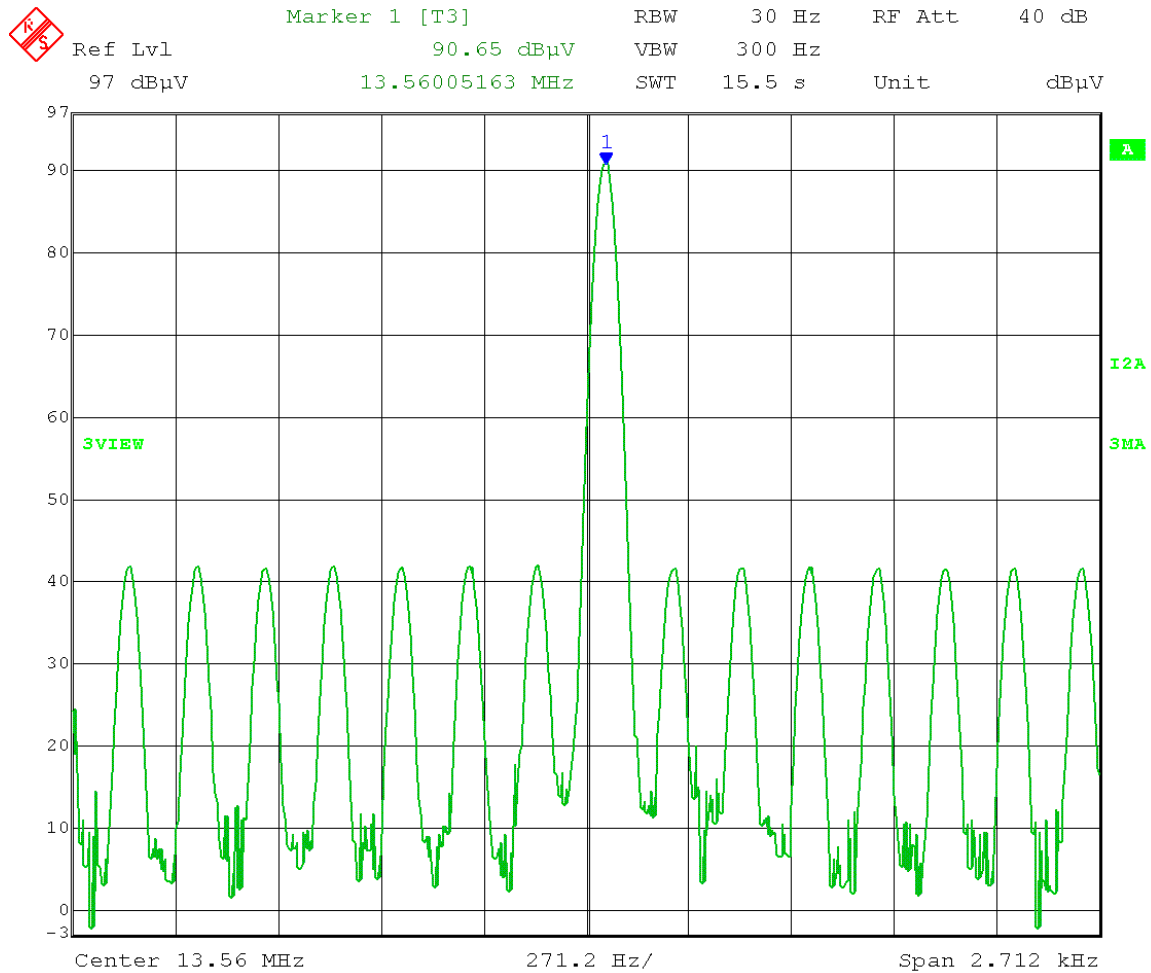
Date: 6.JUN.2012 13:20:20

Test Date: 06-06-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: +20 deg. C
Comment: 120 V



Date: 6.JUN.2012 15:48:49

Test Date: 06-07-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: +10 deg. C
Comment: 120 V

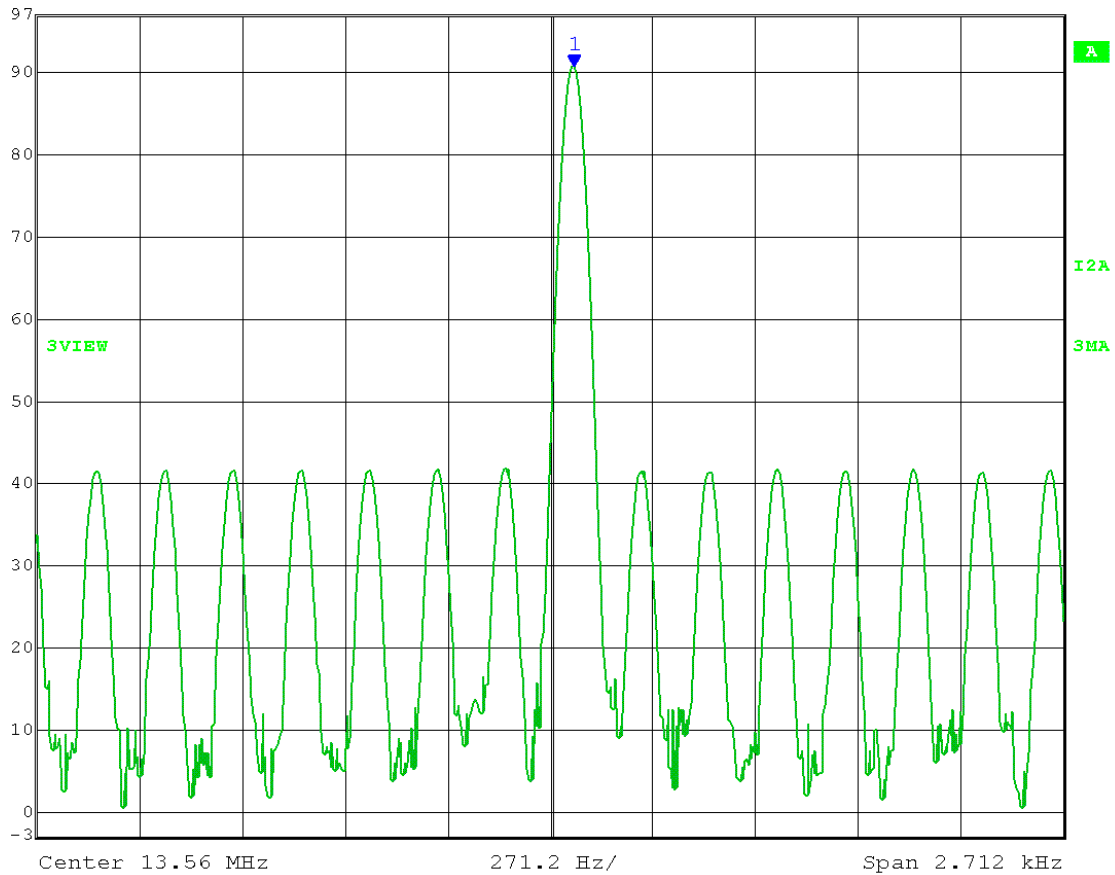


Date: 7.JUN.2012 08:18:56

Test Date: 06-07-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: 0 deg. C
Comment: 120 V



Marker 1 [T3] RBW 30 Hz RF Att 40 dB
Ref Lvl 90.62 dBμV VBW 300 Hz
97 dBμV 13.56006250 MHz SWT 15.5 s Unit dBμV

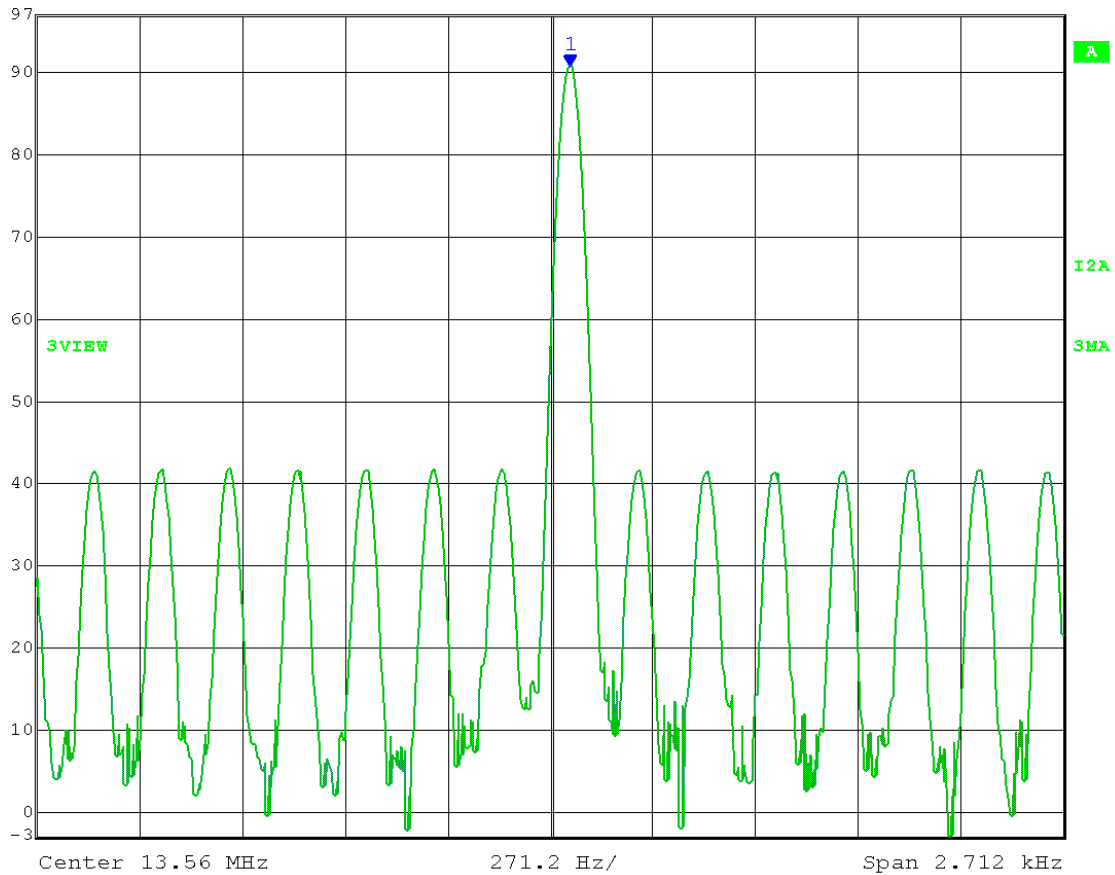


Date: 7.JUN.2012 08:58:35

Test Date: 06-07-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: -10 deg. C
Comment: 120 V

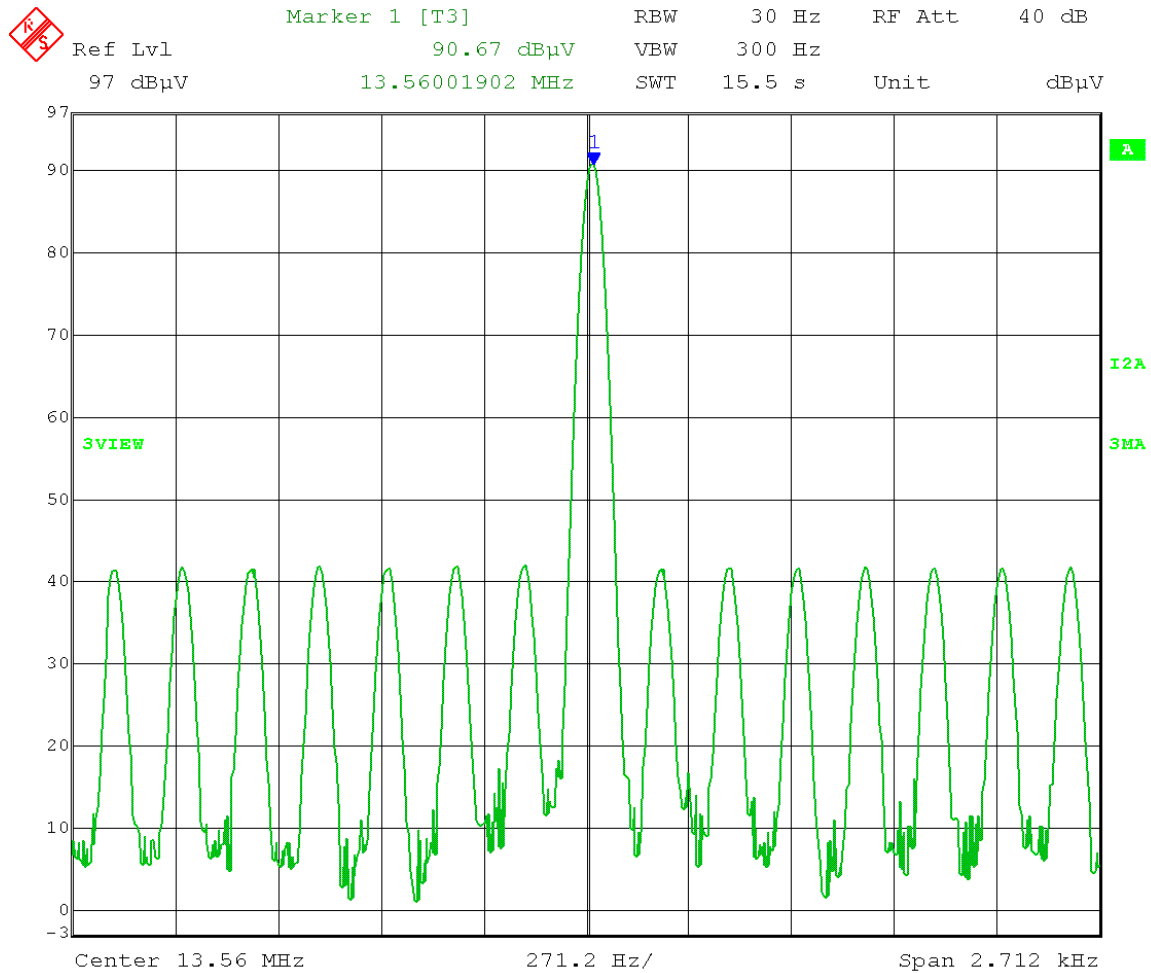


Marker 1 [T3] RBW 30 Hz RF Att 40 dB
Ref Lvl 90.63 dBμV VBW 300 Hz
97 dBμV 13.56005163 MHz SWT 15.5 s Unit dBμV



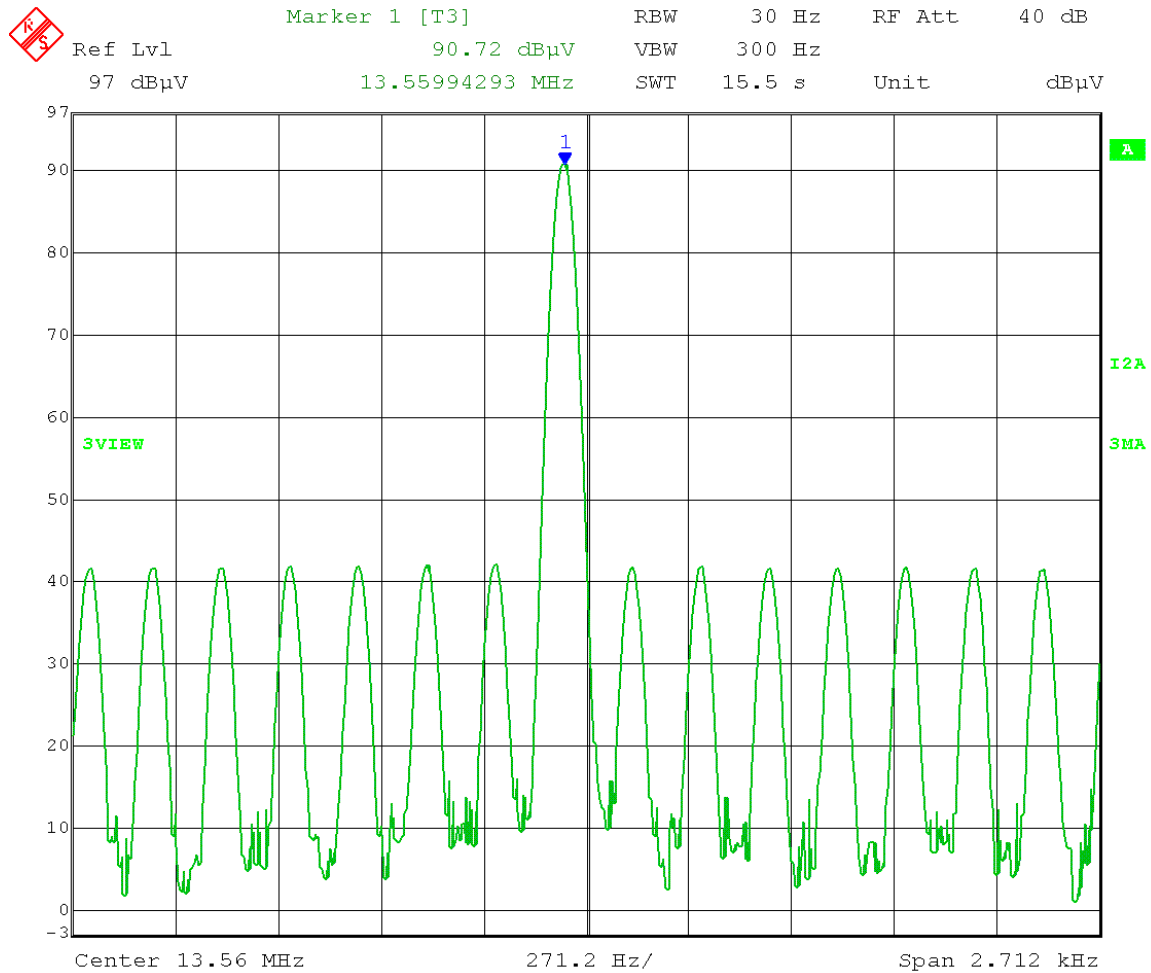
Date: 7.JUN.2012 09:39:51

Test Date: 06-07-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: -20 deg. C
Comment: 120 V



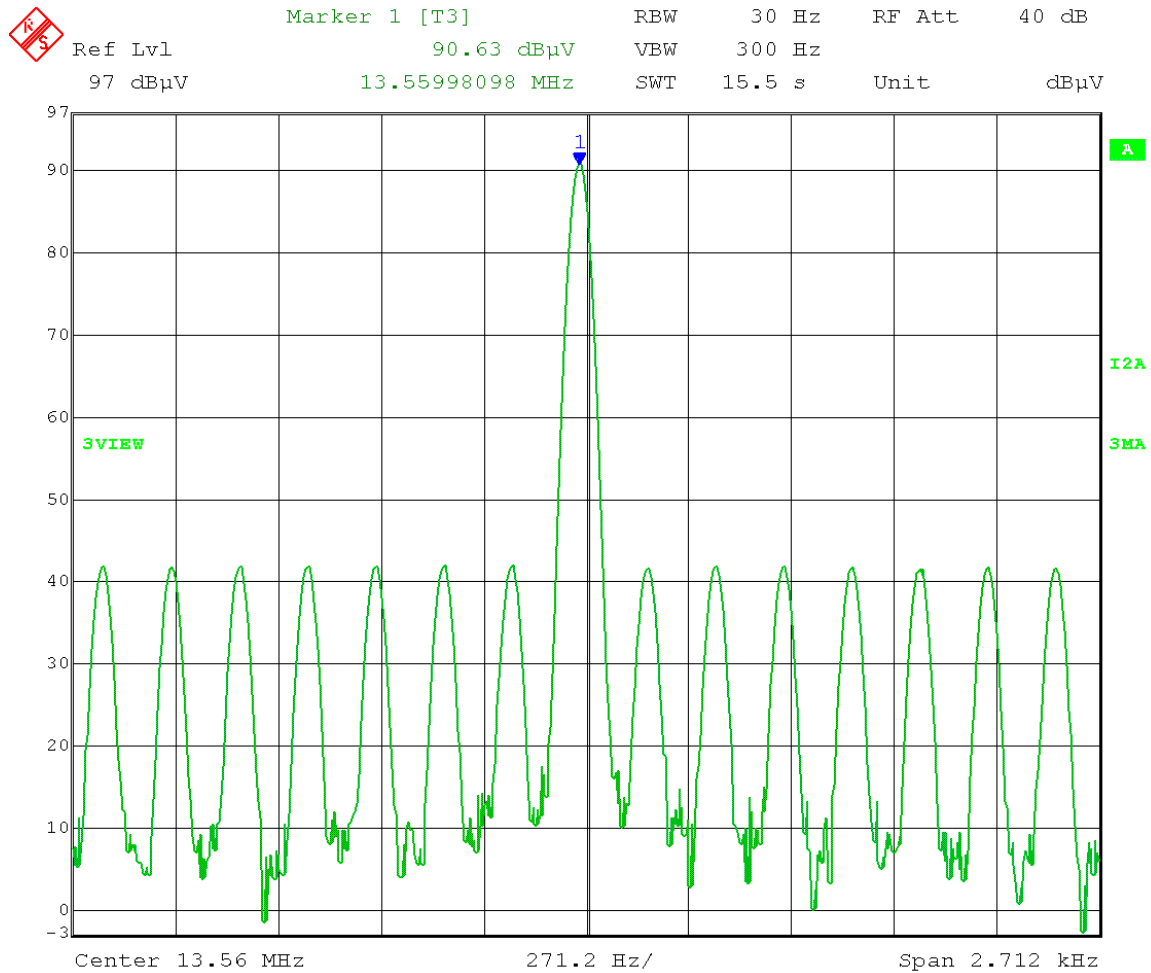
Date: 7.JUN.2012 10:13:19

Test Date: 06-07-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: -30 deg. C
Comment: 120 V



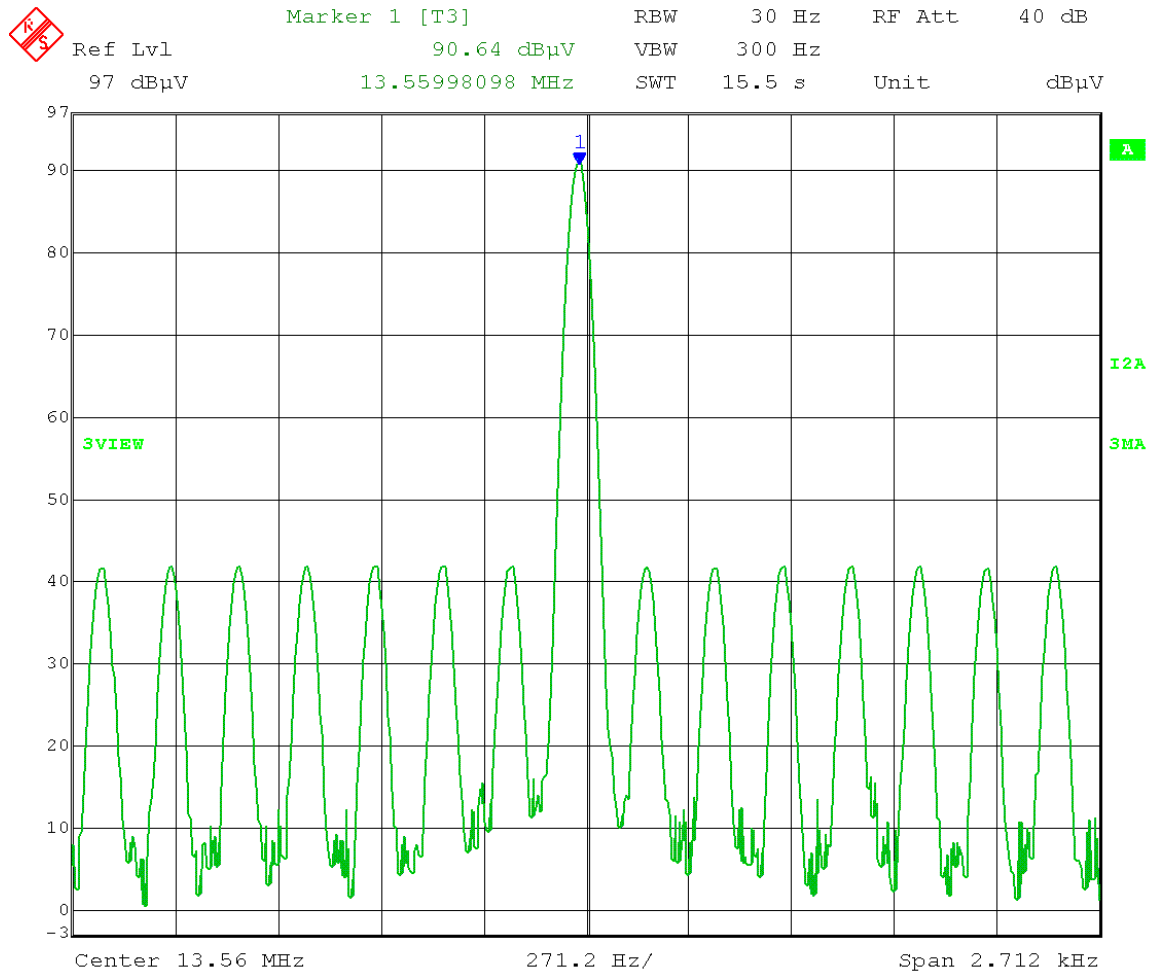
Date: 7.JUN.2012 10:51:48

Test Date: 06-06-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: +20 deg. C
Comment: 102 V



Date: 6.JUN.2012 13:22:05

Test Date: 06-06-2012
Company: Saris Cycling Group
EUT: The HUB
Test: Frequency Stability
Operator: Craig B
Comment: Limit: +/- 1.356 kHz
Comment: +20 deg. C
Comment: 138 V



Date: 6.JUN.2012 13:23:50



166 South Carter, Genoa City, WI 53128

Company:	Saris Cycling Group
Model Tested:	H1000
Report Number:	18065
Project Number:	5211

Appendix B

4.0 AC line Conducted Emissions

Rule Part: FCC Part 15.207

Test Procedure: ANSI C63.4-2009 & ANSI C63.10-2009

Limit: 15.207(a)

Results: Compliant

Notes: This was an AC Conducted emissions measurement.
The EUT was powered from an included AC Adapter with an input of 120 VAC
60 Hz.

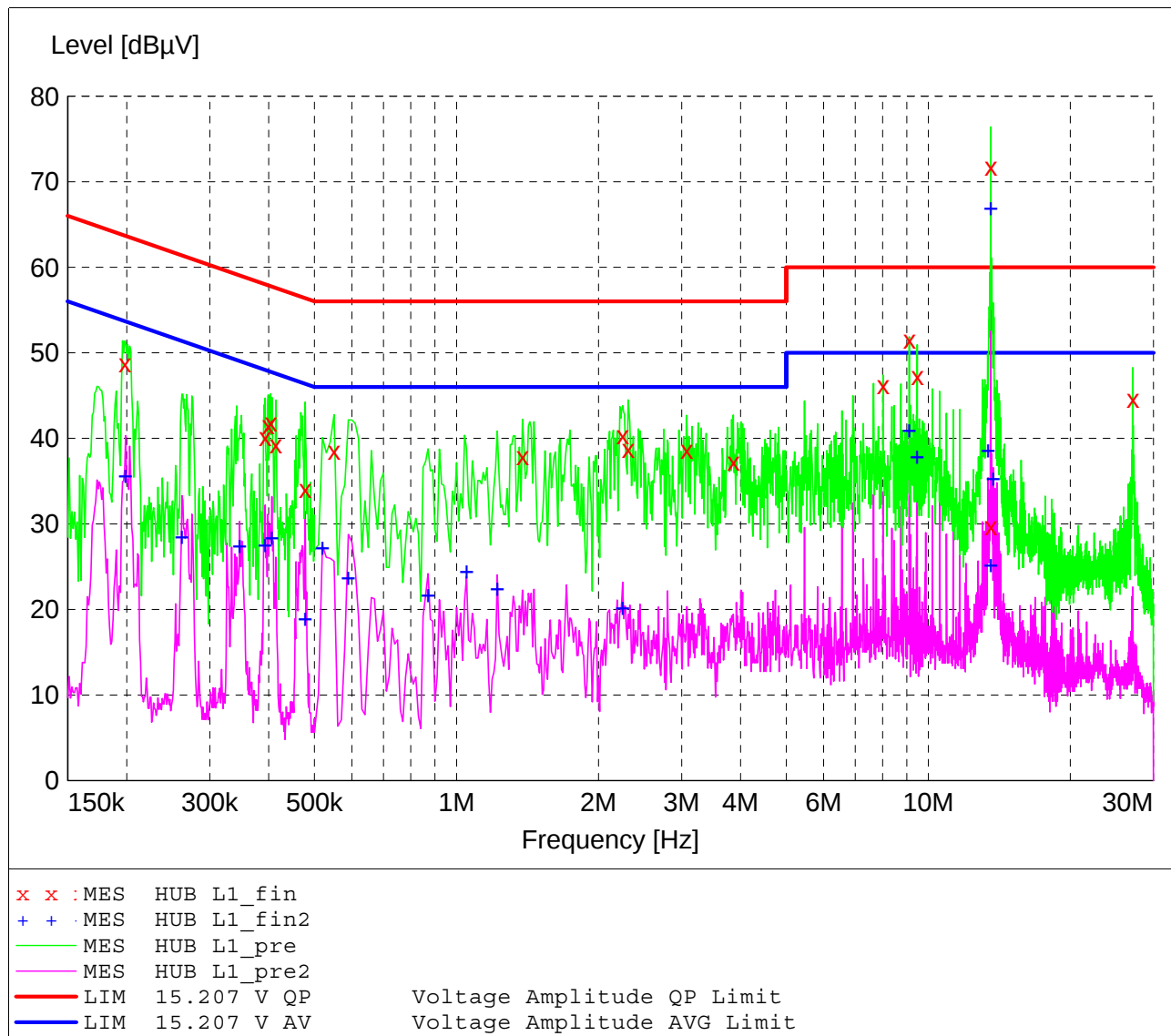
FCC Part 15.207 Class B

Voltage Mains Test

EUT: The HUB
 Manufacturer: Saris Cycling Group
 Operating Condition: 70 deg. F, 43% R.H.
 Test Site: DLS O.F. Screen Room
 Operator: Tim O
 Test Specification: 120 V 60 Hz;
 Comment: Line 1
 Date: 06-4-2012

SCAN TABLE: "Line Cond SR Final"

Short Description:		Line Conducted Emissions					Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.		
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128	
CISPR AV							



MEASUREMENT RESULT: "HUB L1_fin"

6/6/2012 9:31AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.198000	48.80	12.7	64	14.9	QP
0.393000	40.10	11.4	58	17.9	QP
0.399000	41.50	11.4	58	16.4	QP
0.404000	41.90	11.4	58	15.9	QP
0.414000	39.30	11.3	58	18.3	QP
0.478000	34.10	11.2	56	22.3	QP
0.550000	38.50	11.1	56	17.5	QP
1.380000	37.90	10.6	56	18.1	QP
2.250000	40.30	10.7	56	15.7	QP
2.310000	38.80	10.7	56	17.2	QP
3.070000	38.70	10.6	56	17.3	QP
3.860000	37.30	10.7	56	18.7	QP
8.015000	46.20	10.8	60	13.8	QP
9.110000	51.50	10.8	60	8.5	QP
9.470000	47.30	10.9	60	12.7	QP
13.560000	29.67	11.1	60	30.3	QP
13.560000	71.80	11.1	60	-11.8	QP
27.125000	44.60	11.7	60	15.4	QP

antenna replaced by 50 Ohm termination

MEASUREMENT RESULT: "HUB L1_fin2"

6/6/2012 9:33AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.199000	35.60	12.7	54	18.1	CAV
0.262000	28.50	12.0	51	22.9	CAV
0.347000	27.40	11.6	49	21.6	CAV
0.393000	27.50	11.4	48	20.5	CAV
0.406000	28.30	11.4	48	19.4	CAV
0.478000	18.90	11.2	46	27.5	CAV
0.520000	27.20	11.2	46	18.8	CAV
0.590000	23.70	11.0	46	22.3	CAV
0.870000	21.60	10.8	46	24.4	CAV
1.050000	24.40	10.6	46	21.6	CAV
1.220000	22.40	10.6	46	23.6	CAV
2.250000	20.10	10.7	46	25.9	CAV
9.110000	40.90	10.8	50	9.1	CAV
9.470000	37.80	10.9	50	12.2	CAV
13.385000	38.50	11.1	50	11.5	CAV
13.560000	25.18	11.1	50	24.8	CAV
13.560000	66.90	11.1	50	-16.9	CAV
13.730000	35.30	11.1	50	14.7	CAV

antenna replaced by 50 Ohm termination

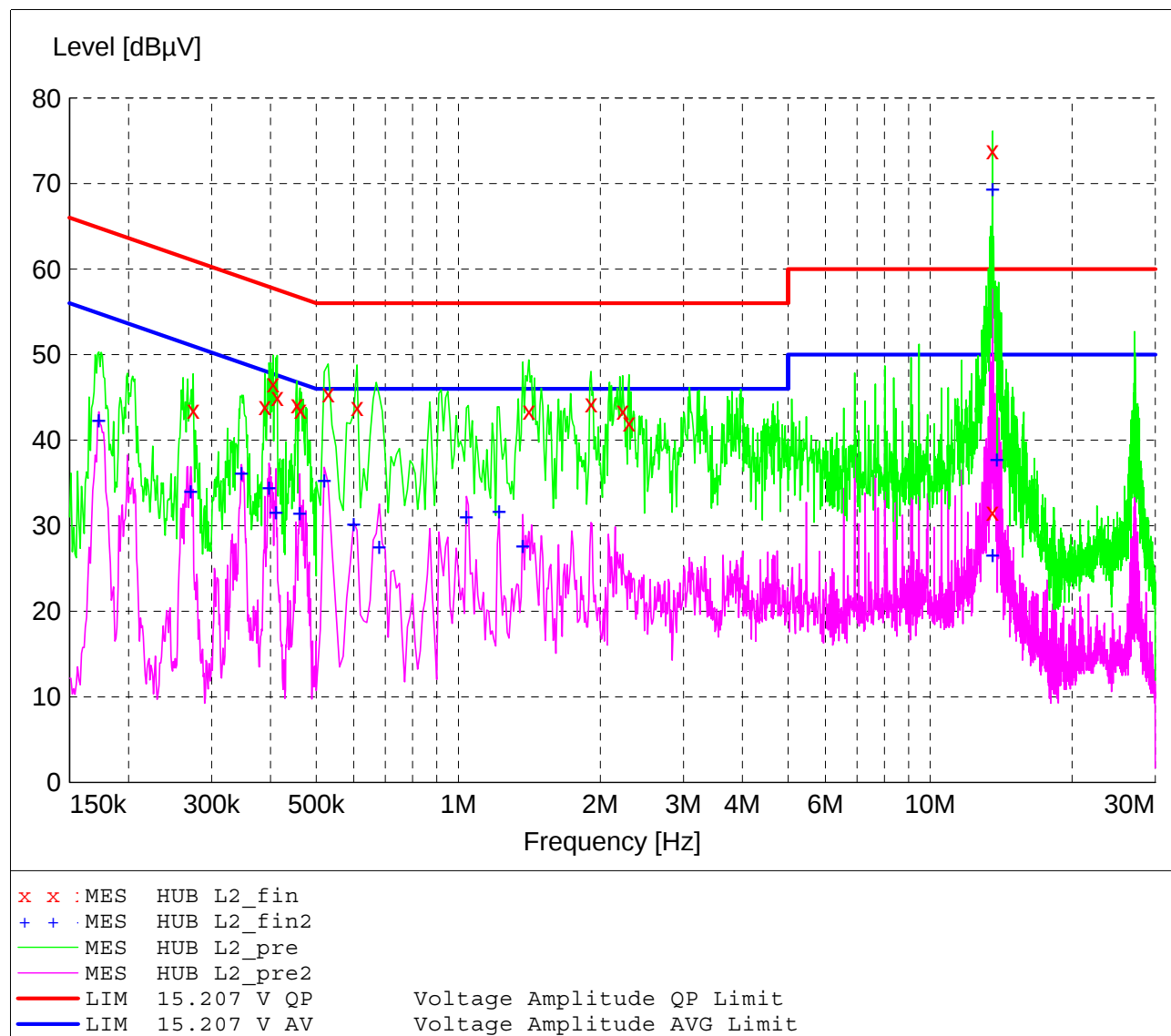
FCC Part 15.207 Class B

Voltage Mains Test

EUT: The HUB
 Manufacturer: Saris Cycling Group
 Operating Condition: 70 deg. F, 43% R.H.
 Test Site: DLS O.F. Screen Room
 Operator: Tim O
 Test Specification: 120 V 60 Hz;
 Comment: Line 2
 Date: 06-4-2012

SCAN TABLE: "Line Cond SR Final"

Short Description:		Line Conducted Emissions				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128
CISPR AV						



MEASUREMENT RESULT: "HUB L2_fin"

6/6/2012 9:35AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.274000	43.60	12.0	61	17.4	QP
0.389000	44.00	11.4	58	14.1	QP
0.405000	46.60	11.4	58	11.2	QP
0.413000	45.10	11.3	58	12.5	QP
0.455000	44.20	11.2	57	12.6	QP
0.462000	43.60	11.2	57	13.1	QP
0.530000	45.50	11.1	56	10.5	QP
0.610000	43.90	11.0	56	12.1	QP
1.410000	43.40	10.6	56	12.6	QP
1.910000	44.30	10.7	56	11.7	QP
2.230000	43.40	10.7	56	12.6	QP
2.300000	42.10	10.7	56	13.9	QP
13.560000	31.68	11.1	60	28.3	QP
13.560000	73.90	11.1	60	-13.9	QP

antenna replaced by 50 Ohm termination

MEASUREMENT RESULT: "HUB L2_fin2"

6/6/2012 9:35AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.173000	42.30	13.1	55	12.5	CAV
0.271000	34.00	12.0	51	17.1	CAV
0.347000	36.10	11.6	49	12.9	CAV
0.397000	34.40	11.4	48	13.5	CAV
0.411000	31.50	11.4	48	16.1	CAV
0.461000	31.40	11.2	47	15.3	CAV
0.520000	35.30	11.2	46	10.7	CAV
0.600000	30.10	11.0	46	15.9	CAV
0.680000	27.50	11.0	46	18.5	CAV
1.040000	31.00	10.6	46	15.0	CAV
1.220000	31.60	10.6	46	14.4	CAV
1.370000	27.60	10.6	46	18.4	CAV
13.560000	26.52	11.1	50	23.5	CAV
13.560000	69.30	11.1	50	-19.3	CAV
13.835000	37.70	11.1	50	12.3	CAV

antenna replaced by 50 Ohm termination



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
Project Number:

Saris Cycling Group
NFC RFID1
18065
5211

END OF REPORT

Revision #	Date	Comments	By
1.0	6-13-2012	Preliminary Release	JS
1.1	6-27-2012	Added data taken 6-22-12	JS
1.2	7-6-2012	Pg 6 – modulation type & internal frequency added	JS
1.3	7-12-2012	Model # change to NFC RFID1	JS