1250 Peterson Dr., Wheeling, IL 60090

Company: Saris Cycling Group Inc.
Model Tested: SL24TT3
Report Number: 15764

FCC Rules and Regulations / Intentional Radiators

Operational in the 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz Bands

Part 15, Subpart C, Section 15.249

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	AT3 T Antenna Module
FCC ID:	T8P-SL24TT3
Kind of Equipment:	In-house OEM RF Module
Frequency Range:	2.405 GHz to 2.480 GHz
Test Configuration:	Used as an in-house OEM module in cycling related sensor and transducer applications. (Tested at 3 Vdc)
Model Number(s):	SL24TT3
Model(s) Tested:	SL24TT3 was tested in 4 host units: CRUTT3, ERUTT3, ICHUBTT3 & PTHUBTT3
Serial Number(s):	N/A
Date of Tests:	September 16, 17, 18, 22, 23, 24, 25, & 30, 2009
Test Conducted For:	Saris Cycling Group Inc. 5253 Verona Rd Madison, WI 53711

NOTICE: "This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government". Please see the "Additional Description of Equipment Under Test" page listed inside of this report.

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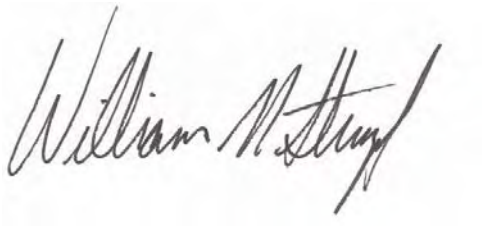
SIGNATURE PAGE

Report By:

Arnom C. Rowe
Test Engineer
EMC-001375-NE

Reviewed By:



William Stumpf
OATS Manager

Approved By:

Brian Mattson
General Manager

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United States Department of Commerce
National Institute of Standards and Technology

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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 Communique dated January 2009).

2009-10-01 through 2010-09-30
Effective dates

For the National Institute of Standards and Technology

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

1250 Peterson Dr., Wheeling, IL 60090

1.0 SUMMARY OF TEST REPORT

It was found that the AT3 T Antenna Module, Model Number(s) SL24TT3 **meets** the radio interference radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Section 15.249 for operational in the 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz Bands. The AC Power Line conducted emissions test was not required because the AT3 T Antenna Module is powered from a D.C. power source. It does not have a line cord to plug into the A.C. power line.

2.0 INTRODUCTION

On September 16, 17, 18, 22, 23, 24, 25, & 30, 2009, a series of radio frequency interference measurements was performed on AT3 T Antenna Module, Model Number(s) SL24TT3, Serial Number: N/A. The tests were performed according to the procedures of the FCC as stated in the "Methods of Measurement of Radio-Noise Emissions for Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" found in the American National Standards Institute, ANSI C63.4-2003. Tests were performed by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

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.

Main Test Facility:
D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, Illinois 60090

O.A.T.S. Test Facility:
D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128
FCC Registration Number: 334127

3.0 OBJECT

The purpose of this series of tests was to determine if the test sample could meet the radio frequency interference emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Sections 15.35(b), 15.37(d), 15.209 & 15.249 for Intentional Radiators operating in the Bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24-24.25 GHz.

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4.0 TEST SET-UP

All emission tests were performed at D.L.S. Electronic Systems, Inc. and set up according to the ANSI C63.4-2003, Annex H. The conducted tests were performed with the test item placed on a non-conductive table (table top equipment), located in the test room. Equipment normally operated on the floor was tested by placing it on the metal ground plane. The ground plane has an electrical isolation layer over its surface approximately 7mm thick. The power line supplied was connected to a dual line impedance stabilization network electrically bonded to the ground plane, located on the floor. The networks were constructed per the requirements of the ANSI C63.4-2003, Annex H.

All radiated emissions tests were performed with the test item placed on a 80 cm high rotating non-conductive table, located in the test room. Equipment normally operated on the floor was placed on a metal covered turntable which is flush with the surrounding conducting ground plane. The ground plane has an electrical isolation layer over its surface approximately 7 mm thick. The EUT is separated from the turntable ground plane by a non-conductive layer. The equipment under test was set up according to ANSI C63.4-2003, Sections 6 and 8.

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5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All preliminary data below 1000 MHz was automatically plotted using the ESI 26/40 Fixed Tuned Receiver. The data was taken using Peak, Quasi-Peak or the Average Detector Functions as required. This information was then used to determine the frequencies of maximum emissions. Above 1000 MHz, final data was taken using the Average Detector.

Below 1000 MHz, final data was taken using the ESI 26/40 Fixed Tuned Receiver. These plots were made using the Peak or Quasi-Peak Detector functions, with manual measurements performed on the questionable frequencies using the Quasi-Peak or the Average Detector Function of the ESI 26/40 Fixed Tuned Receiver as required. Above 1000 MHz, final data was taken using the Average Detector on the Spectrum Analyzer.

The bandwidths shown below are specified by ANSI C63.4-2003, Section 4.2.

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

A list of the equipment used can be found in Table 1. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

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6.0 AMBIENT MEASUREMENTS

For emissions measurements, broadband antennas and an EMI Test Receiver with a panoramic spectrum display are used. First the frequency range is scanned and displayed on the test receiver display. Next the scanned frequency range is divided into smaller ranges, and then it is manually tuned through to determine the emissions from the EUT. A headset or loudspeaker is connected to the test receiver's AM/FM demodulated output as an aid in detecting ambient signals and finding frequencies of significant emission from the EUT. If there is any doubt as to the source of the emission, it is further investigated by rotating the EUT, or by disconnecting the power from the EUT.

The EUT is set up in its typical configuration and operated in its various modes. For tabletop systems, cables are manipulated within the range of likely configurations. For floor-standing equipment, the cables are located in the same manner as the user would install them and no further manipulation is made. If the manner of cable installation is not known, or if it changes with each installation, cables or wires for floor-standing equipment shall be manipulated to the extent possible to produce the maximum level of emissions. For each mode of operation, the frequency spectrum is monitored. Variations in antenna height, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) are explored to produce the emissions that have the highest amplitude relative to the limit. These methods are performed to the specifications in ANSI C63.4-2003.

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7.0 DESCRIPTION OF TEST SAMPLE: (See also Paragraph 8.0)

7.1 Description:

The SL24TT3 transceiver is an OEM transceiver module for use in Saris Cycling group products. It is a low power transmitter intended for use in various cycling products. The SL24TT3 is a single board transceiver using a Nordic Semiconductor nRF24L01+ transceiver chip with an on-board MSP430 baseband processor. The module interfaces to a external host via a UART.

SL24TT3 was tested in 4 host units: CRUTT3 (400 Pro Indoor Cycle), ICHUBTT3 (300 and 400 Pro Indoor Cycle), ERUTT3 (PowerBeam Pro), & PTHUBTT3 (PowerTap SLC+, PowerTap SL+, PowerTap Pro+, PowerTap Elite+.

7.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

38mm x 15mm x 22mm

7.3 LINE FILTER USED:

None - DC Powered

7.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

None

Clock Frequencies:

16.000 & 0.03125 MHz

7.0 DESCRIPTION OF TEST SAMPLE: (CON'T)

7.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

1. CRUTT3
2. RU Host Board PN: 17022 Revision E1
3. RU Electronics RF Circuit Board PN: 19166 Revision A1
4. ERUTT3
5. RU Host Board PN: 17022 Revision E1
6. RU Electronics RF Circuit Board PN: 19166 Revision A1
7. ICHUBTT3
8. Hub Electronics main circuit board PN: 16748 revision E
9. Hub Electronics RF circuit board PN: 19086 Revision A1
10. PTHUBTT3
11. Hub Electronics main circuit board PN: 16748 revision E
12. Hub Electronics RF circuit board PN: 19086 Revision A1

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8.0 ADDITIONAL DESCRIPTION OF TEST SAMPLE:
(See also Paragraph 7.0)

1: There were no additional descriptions noted at the time of test.

NOTE:

For the purpose of transmitter and receiver testing the CRUTT3 & ERUTT3 were placed in continuous transmit / receive mode using a test box that permitted selection of the low, mid and high channels of 2.405, 2.441, and 2.480 GHz.
To test the CRUTT3 - the wheel and pedal were investigated to find the worst case emission.

For the purpose of transmitter testing the ICHUBTT3 was placed in continuous transmit mode using firmware installed on the device for setting the low, mid and high channels. A new set of firmware was uploaded for the purpose of continuous receive mode testing on the low, mid, and high channels.

For the purpose of transmitter and receiver testing the PTHUBTT3 was placed in continuous transmit / receive mode using a test fixture that permitted selection of the low, mid and high channels of 2.405, 2.441, and 2.480 GHz. The test fixture was used to set the required mode and then removed for testing the PTHUBTT3. The PTHUBTT3 was tested in the horizontal plane typical of normal mode of operation. The PTHUBTT3 was rotated in the horizontal plane to investigate worst case conditions.

The On-Time of normal operation is only approximately 212us once every several minutes (see Duty Cycle plots). Therefore the device was set up to transmit a continuous carrier (unmodulated) for measurement purposes.

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9.0 PHOTO INFORMATION AND TEST SET-UP

Item 0 CRUTT3

Item 1 Switching Adapter wih non-shielded cable. 1m
Model Number: DP30B-241250; Serial Number: E247476

Item 2 Test Box with power, USB, and 3.5mm cable. .5m

Item 0 ERUTT3

Item 1 Switching Adapter wih non-shielded cable. 1m
Model Number: DP30B-241250; Serial Number: E247476

Item 2 Test Box with power, USB, and 3.5mm cable. .5m

Item 0 ICHUBTT3

Item 1 CycleOps exercise bike
Model Number: 400PRO; Serial Number: NA

Item 0 PTHUBTT3

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10.0 RADIATED PHOTOS TAKEN DURING TESTING

CRUTT3 Front

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10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)

CRUTT3 Back

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10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)

ERUTT3 Radiated Front

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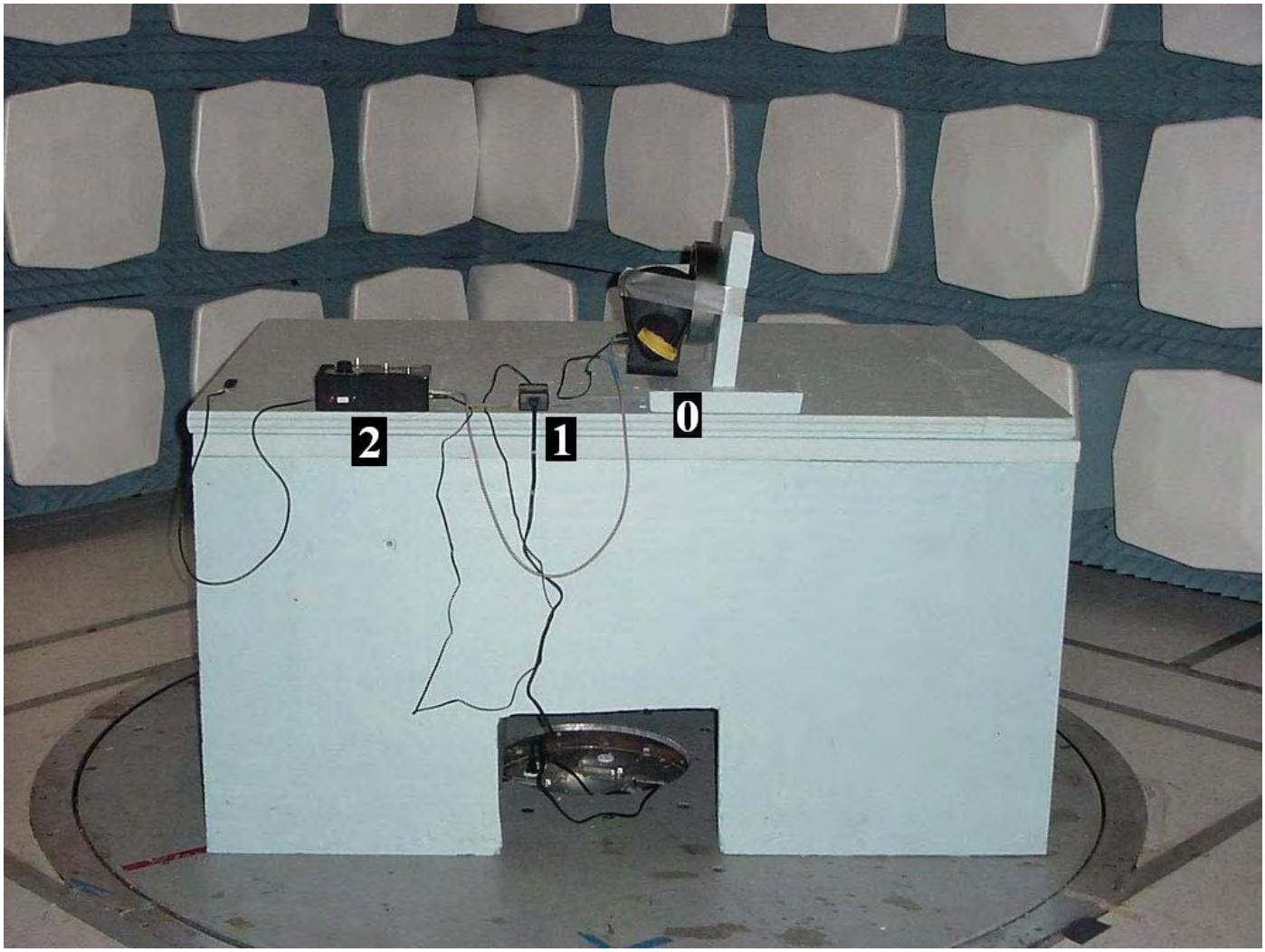
10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)



ERUTT3 Radiated Back

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10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)

ICHUBTT3 Radiated

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10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)

ICHUBTT3 Radiated Close-Up

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10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)

PTHUBTT3 Radiated - Front

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10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)

PTHUBTT3 Radiated - Back

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11.0 RESULTS OF TESTS

The radio interference emission charts can be seen on the pages at the end of this report. Data sheets indicating the test measurements taken during testing can also be found at the end of this report.

12.0 CONCLUSION

It was found that the AT3 T Antenna Module, Model Number(s) SL24TT3 **meets** the radio interference radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Section 15.249 for operational in the 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz Bands. The conducted emissions test was not required because the AT3 T Antenna Module is powered from a D.C. power source. It does not have a line cord to plug into the A.C. power line.

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TABLE 1 – EQUIPMENT LIST

CRUTT3, ERUTT3, PTHUBTT3

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	7/10
Preamplifier	Rohde & Schwarz	TS-PR10	032001/003	9 kHz – 1 GHz	1/10
Antenna	EMCO	3104C	9810-4849	20 MHz – 200 MHz	4/10
Antenna	EMCO	3146	1205	200 MHz – 1 GHz	4/10
Preamp	Ciao	CA118-4010	101	1 GHz-18 GHz	1/10
Horn Antenna	EMCO	3115	9502-4451	1-18 GHz	4/11
Filter- High-Pass	Q-Microwave	100462	2	4.2 GHz-18 GHz	5/10
Horn Antenna	Com-Power	AH-118	071127	1-18GHz	4/10
Signal Generator	Rhode & Schwarz	SMR40	100092	1-40 GHz	12/09
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18 GHz-26 GHz	8/10
Horn Antenna	ETS Lindgren	3116	00062917	18 – 40 GHz	11/09
High Pass Filter	Planar	CL22500-9000-CD-SS	PF1229/0728	15-40 GHz	7/10

All primary equipment is calibrated against known reference standards with a verified traceable path to NIST.

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TABLE 2 – EQUIPMENT LIST

ICHUBTT3

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	7/10
Preamplifier	Rohde & Schwarz	TS-PR10	032001/005	9 kHz – 1 GHz	3/10
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	5/10
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	5/10
Preamp	Miteq	AMF-6D-100200-50	313936	1 GHz-10 GHz	5/10
Preamp	Miteq	AMF-6D-010100-50	213976	10 GHz-18 GHz	5/10
Horn Antenna	EMCO	3115	9903-5731	1-18 GHz	6/11
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18 GHz-26 GHz	8/10
Horn Antenna	EMCO	3116	2549	18 – 40 GHz	8/10

All primary equipment is calibrated against known reference standards with a verified traceable path to NIST.

APPENDIX

TEST PROCEDURE

Part 15, Subpart C, Section 15.249(a)(c)(d)(e)

Operation within the Bands 902-928 MHz,

2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz

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APPENDIX

1a CONDUCTED EMISSION MEASUREMENTS

Conducted emissions were measured over the frequency range from 150 kHz to 30 MHz in accordance with the power line measurements as specified in FCC Part 15, Subpart C, Section 15.207 & ANSI C63.4-2003. Since the device is operated from the public utility lines, the 120 Vac, 60 Hz power leads, high (hot) and low (neutral) sides, were measured by connecting the measuring equipment to the appropriate meter terminal of the LISN. During the test, the cables were placed and items moved (when appropriate) to maximize emissions. All signals were then recorded. The allowed levels for Intentional Radiators which is designed to connected to the public utility (AC) power line cannot exceed the following:

Frequency of Emissions (MHz)	Conducted Limits (dBuV)	
	Quasi Peak	Average
.15 to .5	66 to 56	56 to 46
.5 to 5	56	46
5 to 30	60	50

NOTE:

The conducted emissions test was not required because the AT3 T Antenna Module is powered from a D.C. power source. It does not have a line cord to plug into the A.C. power line.

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APPENDIX

2a BAND EDGE AND RESTRICTED BAND COMPLIANCE

The field strength of any emissions appearing outside the 2405 – 2480 MHz band shall not exceed the general radiated emissions limits as stated Section 15.209. The fundamental from the AT3 T Antenna Module transmitter shall not be inside the restricted band 2310.0 to 2390 MHz and 2483.5 to 2500 MHz.

As stated in Section 15.205a, the fundamental emission from the AT3 T Antenna Module shall not fall within any of the bands listed below:

Frequency in MHz	Frequency in MHz	Frequency in MHz	Frequency in GHz
.0900 to .1100	162.0125 to 167.17	2310.0 to 2390	9.30 to 9.50
.4900 to .5100	167.7200 to 173.20	2483.5 to 2500	10.60 to 12.70
2.1735 to 2.1905	240.000 to 285.00	2655.0 to 2900	13.25 to 13.40
8.362 to 8.3660	322.200 to 335.40	3260.0 to 3267	14.47 to 14.50
13.36 to 13.410	399.900 to 410.00	3332.0 to 3339	15.35 to 16.20
25.50 to 25.670	608.000 to 614.00	3345.8 to 3358	17.70 to 21.40
37.50 to 38.250	960.000 to 1240.00	3600.0 to 4400	22.01 to 23.13
73.00 to 75.500	1300.000 to 1427.00	4500.0 to 5250	23.60 to 24.00
108.00 to 121.94	1435.000 to 1626.50	5350.0 to 5450	31.20 to 31.80
123.00 to 138.00	1660.000 to 1710.00	7250.0 to 7750	36.43 to 36.50
149.90 to 150.00	1718.800 to 1722.20	8025.0 to 8500	ABOVE 38.60
156.70 to 156.90	2200.000 to 2300.00	9000.0 to 9200	

NOTE:

The noise floor within the Restricted Bands for the EMC Receiver will typically lay 20 dB below the limit.

See the following page (s) for the graph (s) made showing compliance for Band Edge Also see the table of measurements made for the Fundamental, Harmonic and Restricted Band emissions in paragraph 4 of this section.

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APPENDIX

BAND EDGE

DATA AND GRAPH(S)

PART 15.249

CRUTT3

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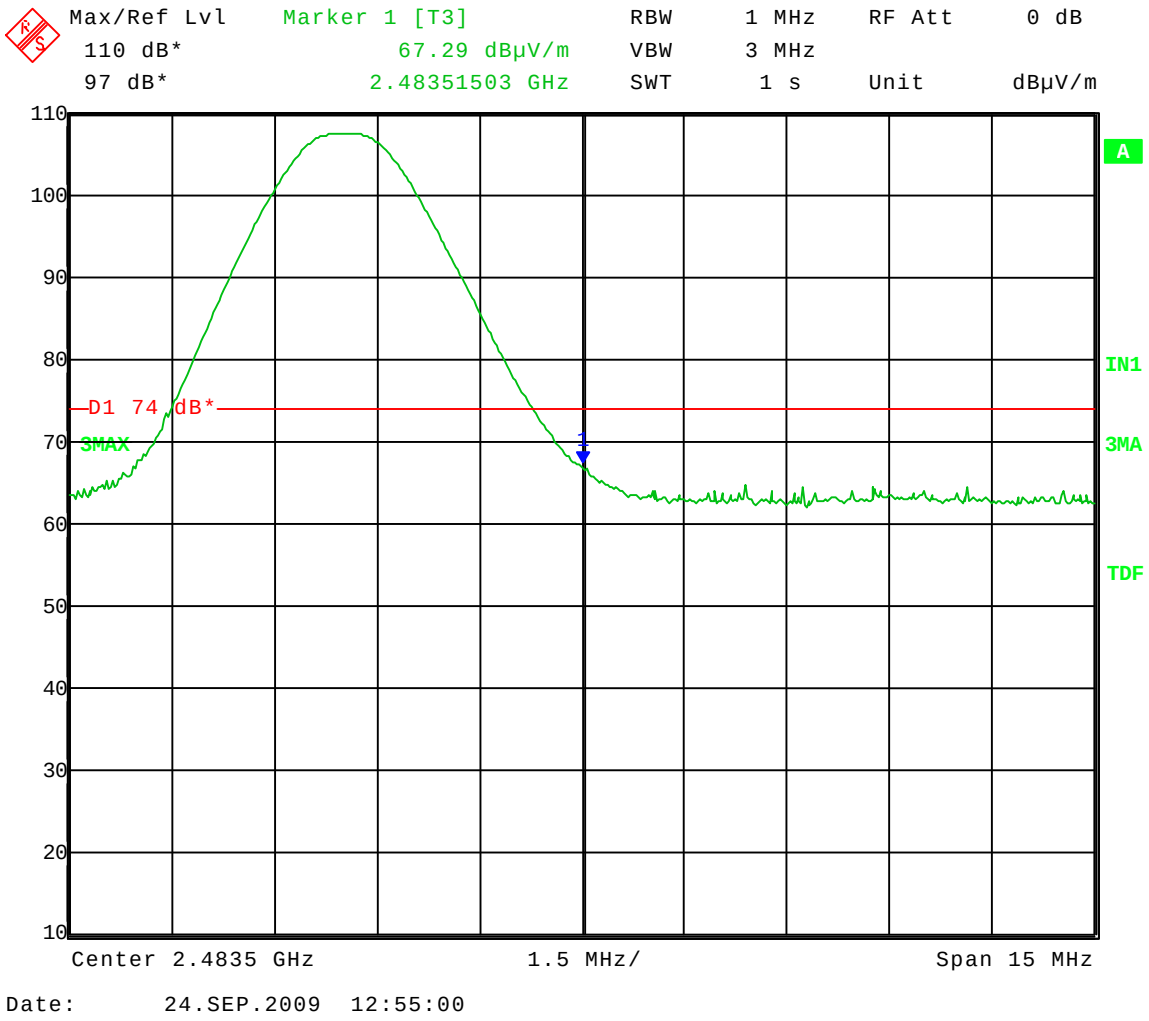
APPENDIX

Test Date: 9-24-2009
Company: Saris Cycling Group
EUT: CRUTT3
Test: Band edge 2.4835 GHz (FCC Pt. 15.249, FCC Pt. 15.205, FCC Pt. 15.209)
Operator: Adam A

Comment: 2.480 GHz Transmit Frequency
Horizontal (worst-case)
Peak Detector
Limit: 74 dBµV/m at 3 meters



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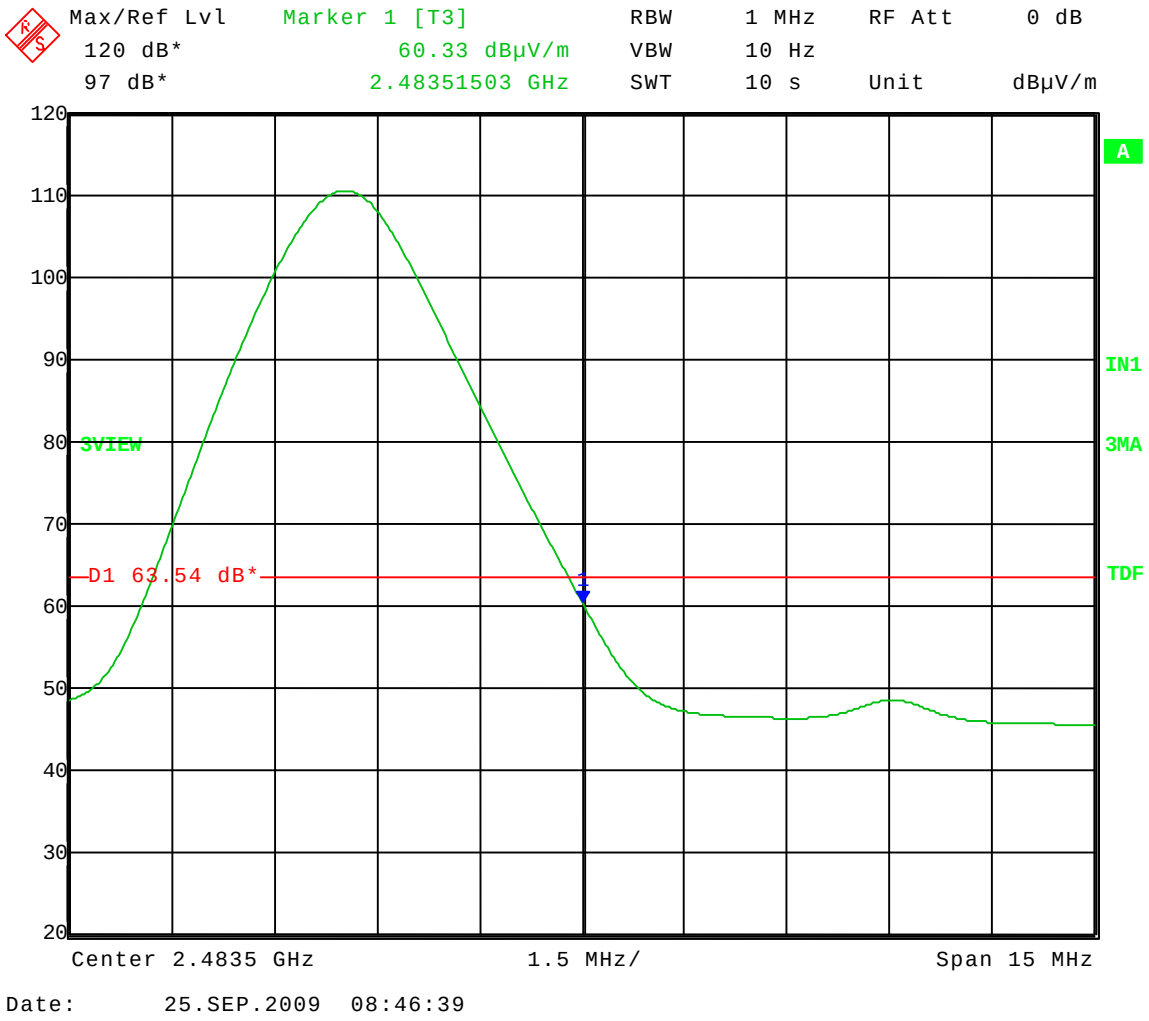
APPENDIX

Test Date: 9-25-2009
Company: Saris Cycling Group
EUT: CRUTT3
Test: Band edge 2.4835 GHz (FCC Pt. 15.249, FCC Pt. 15.205, FCC Pt. 15.209)
Operator: Adam A

Comment: 2.480 GHz Transmit Frequency
Horizontal (worst-case)
Average Detector
Limit: 63.54 dBµV/m at 1 meter



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APPENDIX

BAND EDGE

DATA AND GRAPH(S)

PART 15.249

ERUTT3

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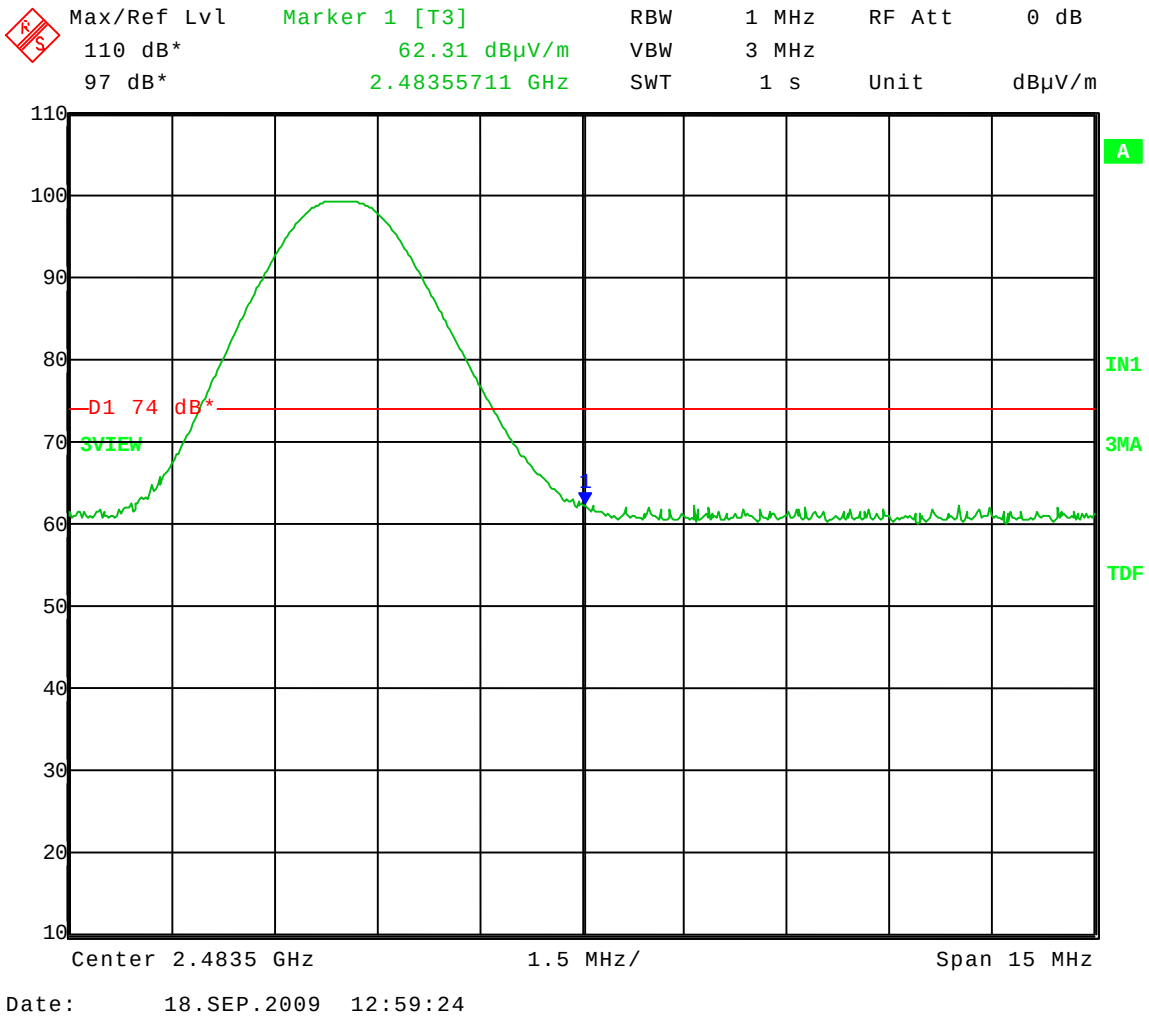
APPENDIX

Test Date: 9-18-2009
Company: Saris Cycling Group
EUT: ERUTT3
Test: Band edge 2.4835 GHz (FCC Pt. 15.249, FCC Pt. 15.205, FCC Pt.15.209)
Operator: Adam A

Comment: 2.480 GHz Transmit Frequency
Vertical (worst-case)
Peak Detector
Limit: 74 dBµV/m at 3 meters



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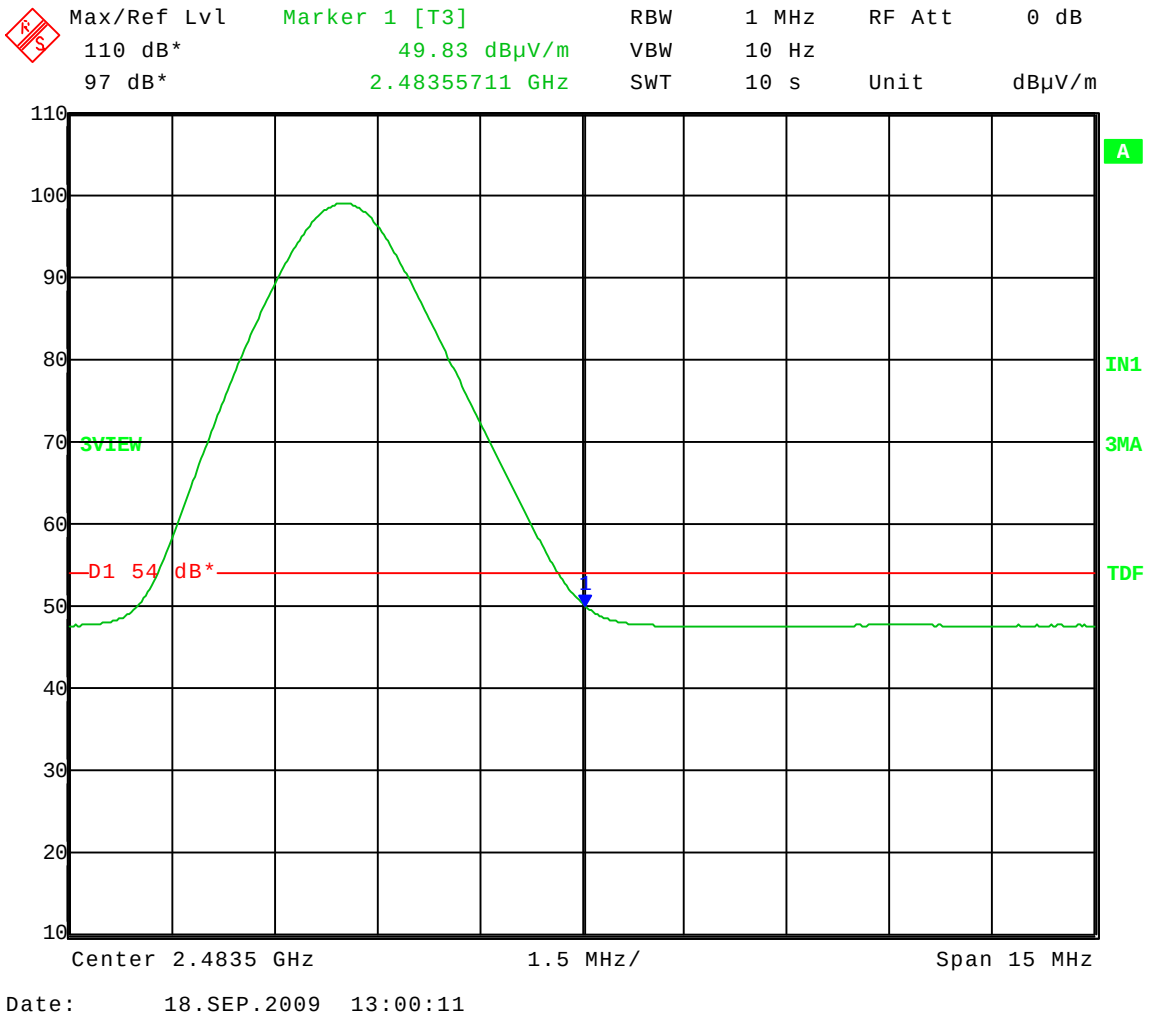
APPENDIX

Test Date: 9-18-2009
Company: Saris Cycling Group
EUT: ERUTT3
Test: Band edge 2.4835 GHz (FCC Pt. 15.249, FCC Pt. 15.205, FCC Pt.15.209)
Operator: Adam A

Comment: 2.480 GHz Transmit Frequency
Vertical (worst-case)
Average Detector
Limit: 54 dBµV/m at 3 meters



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APPENDIX

BAND EDGE

DATA AND GRAPH(S)

PART 15.249

ICHUBTT3

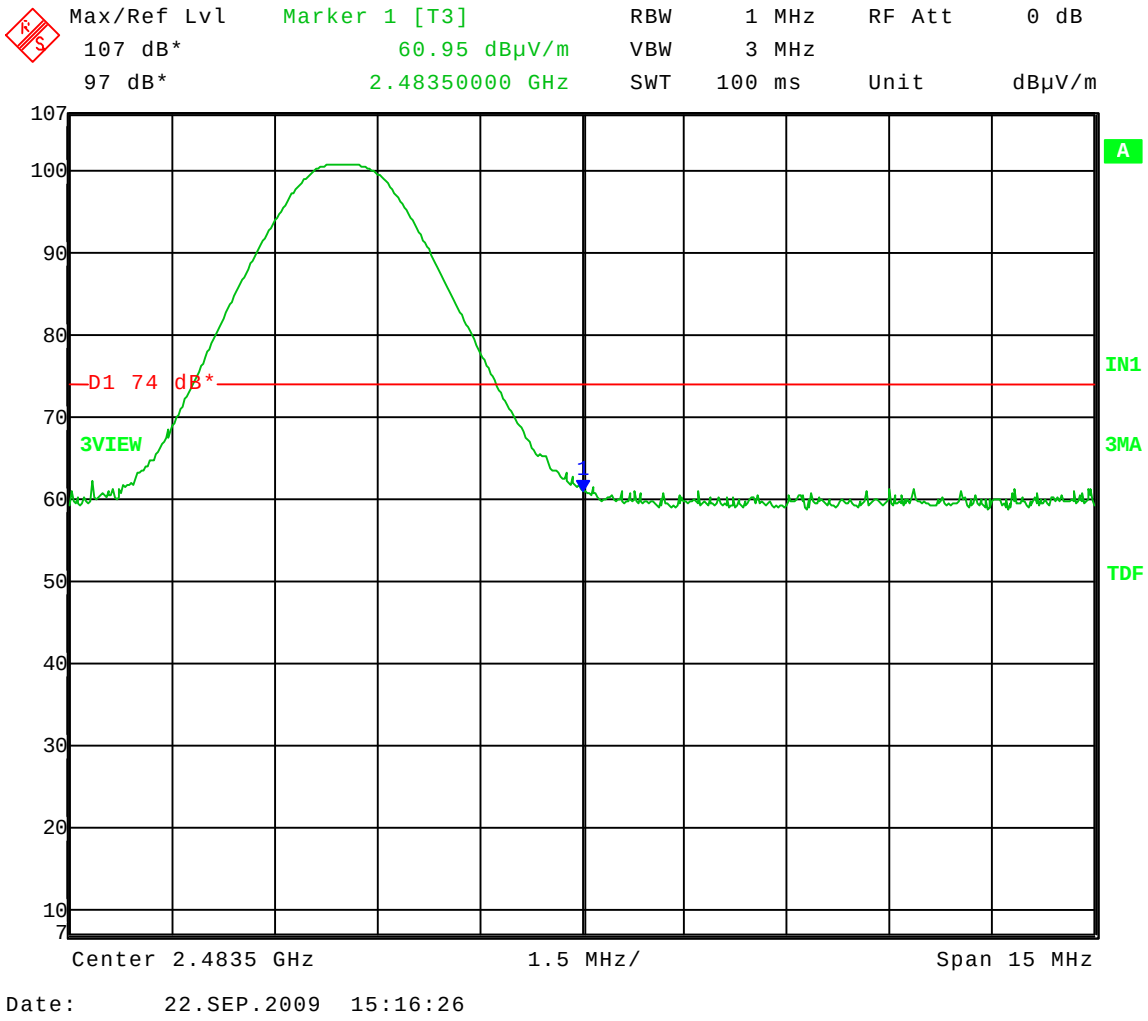
1250 Peterson Dr., Wheeling, IL 60090

Company: Saris Cycling Group Inc.
Model Tested: SL24TT3
Report Number: 15764

APPENDIX

Test Date: 09-22-2009
Company: Saris Cycling Group
EUT: ICHUBTT3
Test: Band edge 2.4835 GHz (FCC Pt. 15.249, FCC Pt. 15.205, FCC Pt. 15.209)
Operator: Craig B

Comment: 2.480 GHz Transmit Frequency
Horizontal (worst-case)
Peak Detector
Limit: 74 dBµV/m at 3 meters



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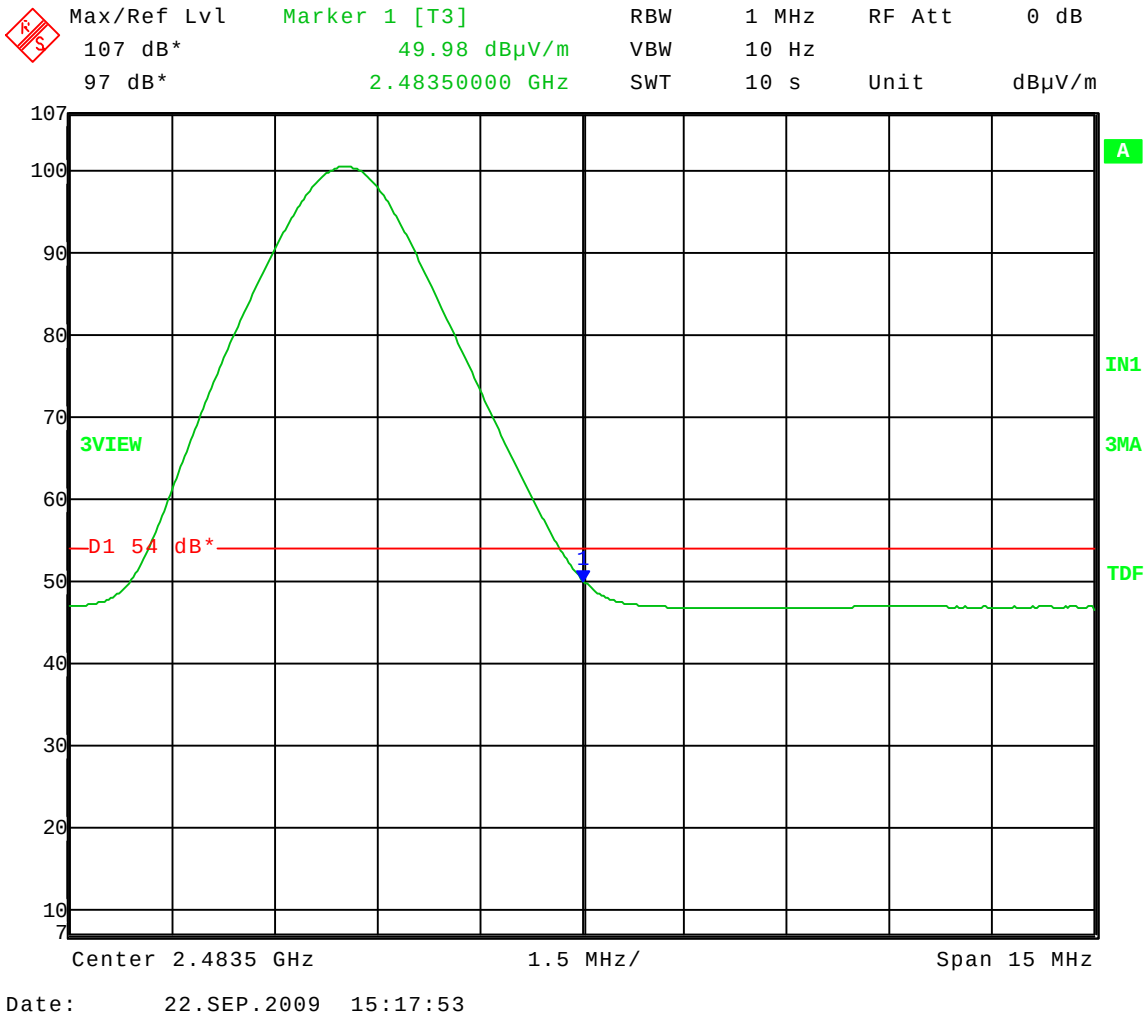
APPENDIX

Test Date: 09-22-2009
Company: Saris Cycling Group
EUT: ICHUBTT3
Test: Band edge 2.4835 GHz (FCC Pt. 15.249, FCC Pt. 15.205, FCC Pt. 15.209)
Operator: Craig B

Comment: 2.480 GHz Transmit Frequency
Horizontal (worst-case)
Average Detector
Limit: 54 dBµV/m at 3 meters



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APPENDIX

BAND EDGE

DATA AND GRAPH(S)

PART 15.249

PTHUBTT3

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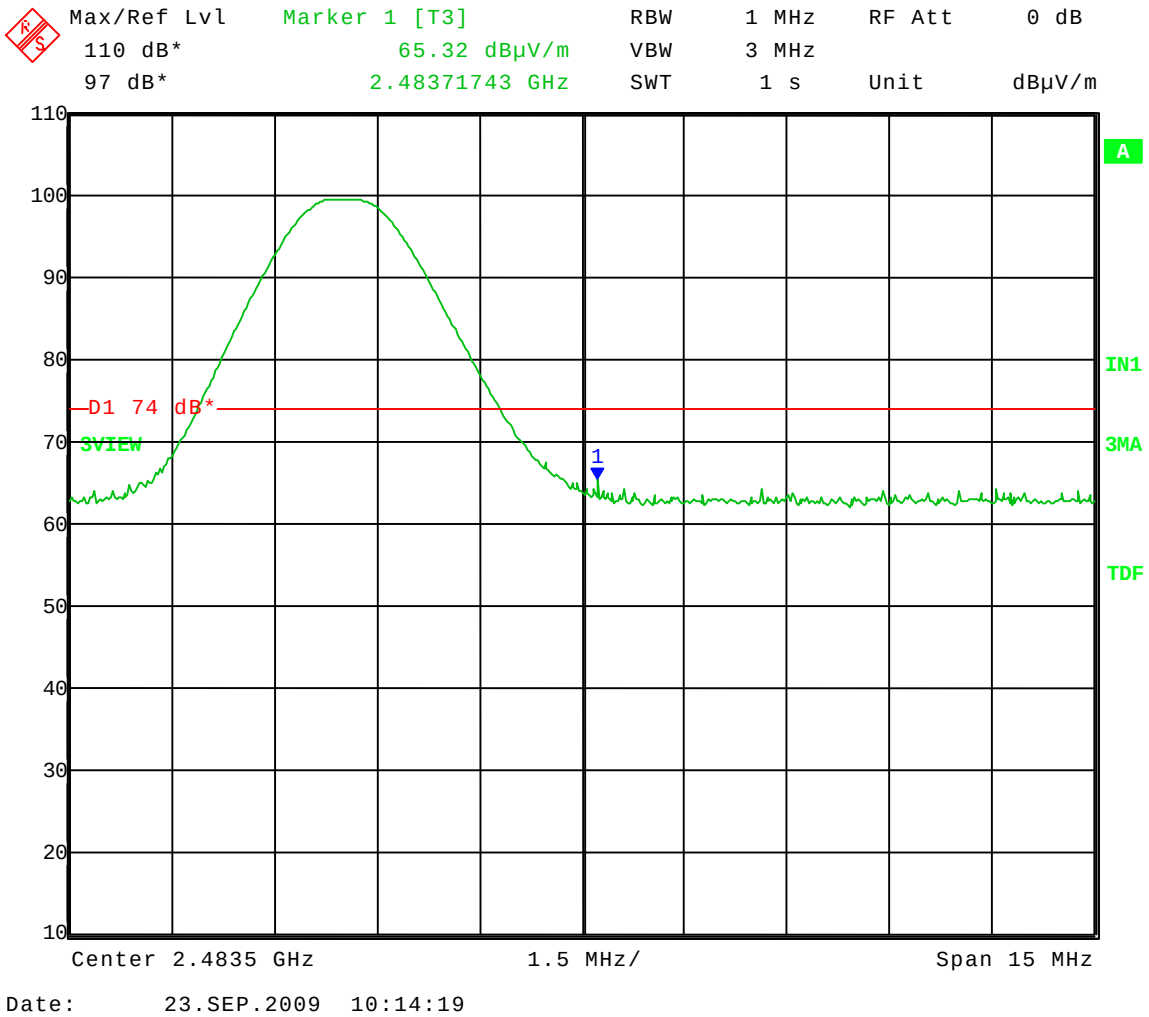
APPENDIX

Test Date: 9-23-2009
Company: Saris Cycling Group
EUT: PTHUBTT3
Test: Band edge 2.4835 GHz (FCC Pt. 15.249, FCC Pt. 15.205, FCC Pt. 15.209)
Operator: Adam A

Comment: 2.480 GHz Transmit Frequency
Horizontal (worst-case)
Peak Detector
Limit: 74 dBµV/m at 3 meters



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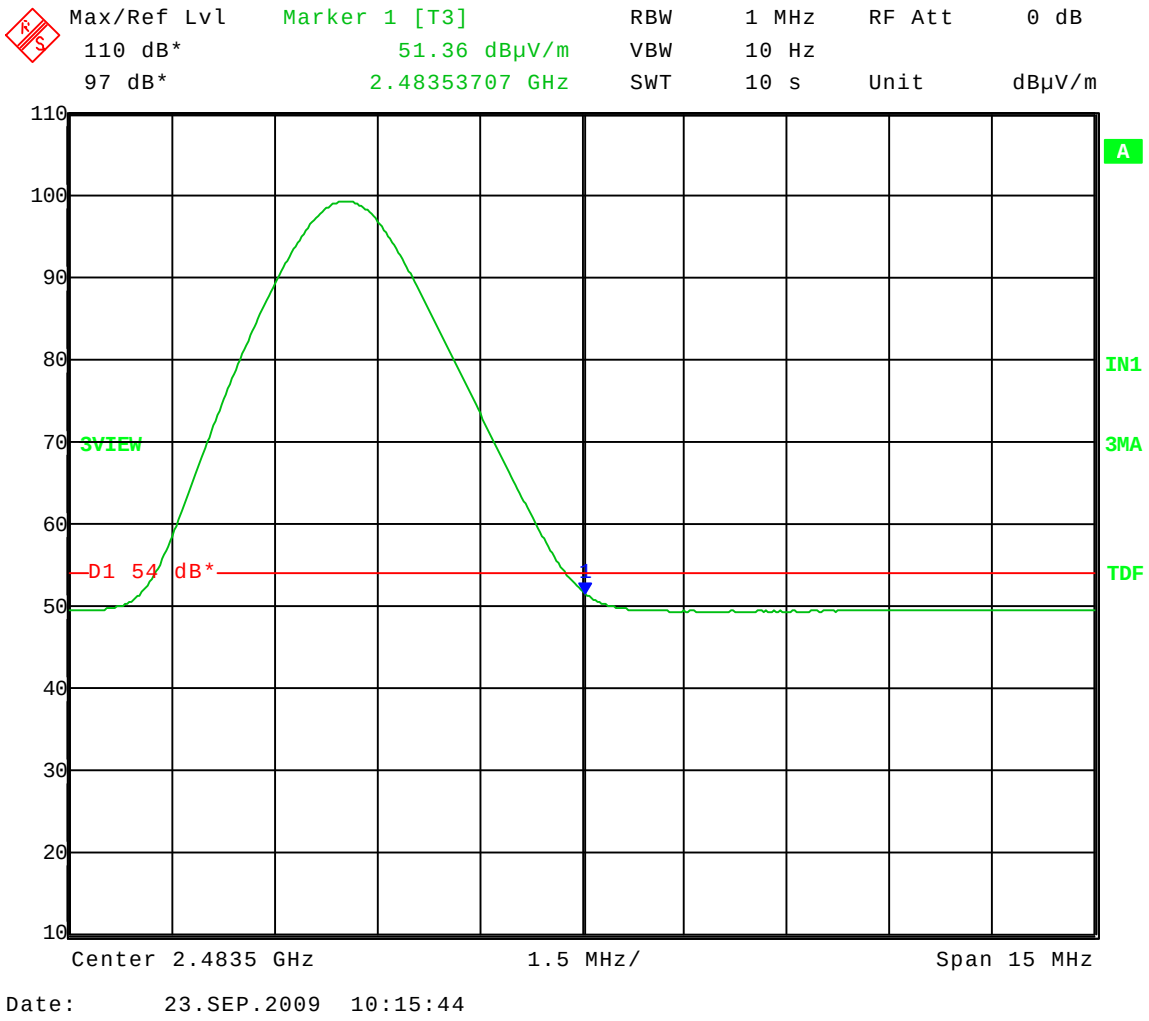
APPENDIX

Test Date: 9-23-2009
Company: Saris Cycling Group
EUT: PTHUBTT3
Test: Band edge 2.4835 GHz (FCC Pt. 15.249, FCC Pt. 15.205, FCC Pt. 15.209)
Operator: Adam A

Comment: 2.480 GHz Transmit Frequency
Horizontal (worst-case)
Average Detector
Limit: 54 dBµV/m at 3 meters



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APPENDIX

3a ANTENNA CONNECTOR – 15.203

As stated in 15.203 the AT3 T Antenna Module was designed to ensure that no antenna other than that furnished by will be used with the EUT. The use of a permanently attached antenna or antenna that uses an unique coupling to the intentional radiator was considered to comply with section 15.203.

4a FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS (SECTION 15.249a-d)

The radiated measurements made at D.L.S. Electronic Systems, Inc., for the AT3 T Antenna Module, Model Number: SL24TT3, are shown in tabulated and graph form. Preliminary radiation measurements were performed at a 3 meter test distance with the limits adjusted linearly when required. The frequency range from 30 MHz to over 960 MHz, depending upon the fundamental frequency as stated in Part 15.33a, was automatically scanned and plotted at various angles.

Measurements for the AT3 T Antenna Module were made up to 26000 MHz, in accordance with Section 15.33a for Intentional Radiators with a fundamental frequency of 2.405 to 2.480 MHz. For intentional radiators, the frequency range to be investigated is determined by the lowest radio frequency generated by the device without going below 30 MHz, up to at least the tenth harmonic of the highest fundamental frequency or 10 GHz, whichever is lower. At those frequencies where significant signals were detected, measurements were made over the entire frequency range specified in FCC Part 15, Subpart C, Section 15.249 at the open field test site, located at Genoa City, Wisconsin, FCC file number **31040/SIT**. When required, levels were extrapolated from 10 meters to 3 meters using a linear extrapolation.

All signals in the frequency range of 30 MHz to 2000 MHz were measured with a Biconical Antenna or tuned dipoles and from 200 MHz to 1000 MHz, a Log Periodic or Tuned Dipoles were used. From 1000 MHz to 10 GHz Horn Antennas were used. During the test the equipment was rotated and the antenna was raised and lowered from 1 meter to 4 meters to find the maximum level of emissions. In order to find maximum emissions, the cables were moved through all the positions the equipment would be expected to experience in the field. The EUT, peripheral equipment and cables were configured to meet the conditions in ANSI C63.4-2003, Clauses 6 & 8. Tests were made with the receive antenna(s) in both the horizontal and vertical planes of polarization. In each case, the table was rotated to find the maximum emissions.

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APPENDIX

4a FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS (CON'T)

For operation in the bands 902 to 928 MHz, 2400 to 2483.5 MHz, 5725 to 5875 MHz, and 24.0 to 24.25 GHz the field strength of any emissions within this band shall not exceed the field strength levels specified in the following table as stated in FCC, Part 15, Section 15.249(a).

Frequency range in MHz	Field Strength of Fundamental millivolts/meter	Field Strength of Fundamental dBuV/meter	Field Strength of Harmonics microvolts/meter	Field Strength of Harmonics dBuV/meter
902 to 928	50	93.98	500	53.98
2400 to 2483.5	50	93.98	500	53.98
5725 to 5875	50	93.98	500	53.98
24000 to 24250	250	107.96	2500	67.96

Field strength limits are at a distance of 3 meters. The emission limits shown are based on measurement instrumentation employing an average detector.

Emissions radiated outside of the specified frequency bands, except for harmonics are attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Preliminary radiated emission measurements were performed at a 3 meter test distance. The frequency range from 30 MHz to 1000 MHz was automatically scanned and plotted at various angles.

NOTE:

All radiated emissions measurements were made at a test room temperature of 69-72°F at 55-76% relative humidity.

APPENDIX

RADIATED DATA TAKEN FOR

FUNDAMENTAL, HARMONIC & SPURIOUS

EMISSIONS MEASUREMENTS

PART 15.249

CRUTT3

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 26 GHz

30 MHz – 18 GHz Tested at a 3 Meter Distance and 18 – 26 GHz Tested at a 1 Meter Distance

EUT: CRUTT3
Manufacturer: Saris Cycling Group Inc.
Operating Condition: 72 deg F; 60% R.H.
Test Site: Chamber G1
Operator: Adam A
Test Specification: FCC Part 15.249 and FCC Part 15.205 and FCC Part 15.209
Comment: Continuous transmit – Low channel: 2405 MHz
Date: 9/24/2009

Note: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dBuV/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.405	Max Peak	Vert	65.54	28.33	5.1	98.97	---	98.97	114	15.03	Fundamental
2.405	Average	Vert	65.54	28.33	5.1	98.97	20	78.97	94	15.03	Fundamental
2.405	Max Peak	Horz	71.06	28.33	5.1	104.49	---	104.49	114	9.51	Fundamental
2.405	Average	Horz	71.06	28.33	5.1	104.49	20	84.49	94	9.51	Fundamental
4.810	Max Peak	Vert	63.43	32.88	-31.9	64.41	---	64.41	74	9.59	Restricted Band
4.810	Average	Vert	63.43	32.88	-31.9	64.41	20	44.41	54	9.59	Restricted Band
4.810	Max Peak	Horz	59.88	32.88	-31.9	60.86	---	60.86	74	13.14	Restricted Band
4.810	Average	Horz	59.88	32.88	-31.9	60.86	20	40.86	54	13.14	Restricted Band
7.215	Max Peak	Vert	55.38	35.80	-29.4	61.78	---	61.78	74	12.22	Restricted Band
7.215	Average	Vert	55.38	35.80	-29.4	61.78	20	41.78	54	12.22	Restricted Band
7.215	Max Peak	Horz	55.13	35.80	-29.4	61.53	---	61.53	74	12.47	Restricted Band
7.215	Average	Horz	55.13	35.80	-29.4	61.53	20	41.53	54	12.47	Restricted Band

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Company: Saris Cycling Group Inc.
Model Tested: SL24TT3
Report Number: 15764

APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 26 GHz

30 MHz – 18 GHz Tested at a 3 Meter Distance and 18 – 26 GHz Tested at a 1 Meter Distance

EUT: CRUTT3
Manufacturer: Saris Cycling Group Inc.
Operating Condition: 70 deg F; 61% R.H.
Test Site: Chamber G1
Operator: Adam A
Test Specification: FCC Part 15.249 and FCC Part 15.205 and FCC Part 15.209
Comment: Continuous transmit – Mid channel: 2441 MHz
Date: 9/24/2009

Note: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dBuV/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.441	Max Peak	Vert	66.90	28.44	5.1	100.44	---	100.44	114	13.56	Fundamental
2.441	Average	Vert	66.90	28.44	5.1	100.44	20	80.44	94	13.56	Fundamental
2.441	Max Peak	Horz	71.99	28.44	5.1	105.53	---	105.53	114	8.47	Fundamental
2.441	Average	Horz	71.99	28.44	5.1	105.53	20	85.53	94	8.47	Fundamental
4.882	Max Peak	Vert	62.37	32.98	-31.8	63.55	---	63.55	74	10.45	Restricted Band
4.882	Average	Vert	62.37	32.98	-31.8	63.55	20	43.55	54	10.45	Restricted Band
4.882	Max Peak	Horz	60.03	32.98	-31.8	61.21	---	61.21	74	12.79	Restricted Band
4.882	Average	Horz	60.03	32.98	-31.8	61.21	20	41.21	54	12.79	Restricted Band
7.323	Max Peak	Vert	54.07	36.09	-28.8	61.36	---	61.36	74	12.64	Restricted Band
7.323	Average	Vert	54.07	36.09	-28.8	61.36	20	41.36	54	12.64	Restricted Band
7.323	Max Peak	Horz	54.34	36.09	-28.8	61.63	---	61.63	74	12.37	Restricted Band
7.323	Average	Horz	54.34	36.09	-28.8	61.63	20	41.63	54	12.37	Restricted Band

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APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 26 GHz

30 MHz – 18 GHz Tested at a 3 Meter Distance and 18 – 26 GHz Tested at a 1 Meter Distance

EUT: CRUTT3
Manufacturer: Saris Cycling Group Inc.
Operating Condition: 72 deg F; 61% R.H.
Test Site: Chamber G1
Operator: Adam A
Test Specification: FCC Part 15.249 and FCC Part 15.205 and FCC Part 15.209
Comment: Continuous transmit – High channel: 2480 MHz
Date: 9/24/2009

Note: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dBuV/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.480	Max Peak	Vert	68.37	28.56	5.2	102.13	---	102.13	114	11.87	Fundamental
2.480	Average	Vert	68.37	28.56	5.2	102.13	20	82.13	94	11.87	Fundamental
2.480	Max Peak	Horz	72.94	28.56	5.2	106.70	---	106.70	114	7.30	Fundamental
2.480	Average	Horz	72.94	28.56	5.2	106.70	20	86.70	94	7.30	Fundamental
4.960	Max Peak	Vert	62.94	33.08	-31.9	64.12	---	64.12	74	9.88	Restricted Band
4.960	Average	Vert	62.94	33.08	-31.9	64.12	20	44.12	54	9.88	Restricted Band
4.960	Max Peak	Horz	60.59	33.08	-31.9	61.77	---	61.77	74	12.23	Restricted Band
4.960	Average	Horz	60.59	33.08	-31.9	61.77	20	41.77	54	12.23	Restricted Band
7.440	Max Peak	Vert	54.73	36.40	-28.0	63.13	---	63.13	74	10.87	Restricted Band
7.440	Average	Vert	54.73	36.40	-28.0	63.13	20	43.13	54	10.87	Restricted Band
7.440	Max Peak	Horz	54.34	36.40	-28.0	62.74	---	62.74	74	11.26	Restricted Band
7.440	Average	Horz	54.34	36.40	-28.0	62.74	20	42.74	54	11.26	Restricted Band

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PART 15.249

ERUTT3

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APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 26 GHz

30 MHz – 18 GHz Tested at a 3 Meter Distance and 18 – 26 GHz Tested at a 1 Meter Distance

EUT: ERUTT3
Manufacturer: Saris Cycling Group Inc.
Operating Condition: 69 deg F; 55% R.H.
Test Site: Chamber G1
Operator: Adam A
Test Specification: FCC Part 15.249, Part 15.205 and Part 15.209
Comment: Continuous transmit – Low channel: 2405 MHz
Date: 9/18/2009

Note: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dBuV/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.405	Max Peak	Vert	64.84	28.33	5.1	98.27	---	98.27	114	15.73	Fundamental
2.405	Average	Vert	64.84	28.33	5.1	98.27	20	78.27	94	15.73	Fundamental
2.405	Max Peak	Horz	63.78	28.33	5.1	97.21	---	97.21	114	16.79	Fundamental
2.405	Average	Horz	63.78	28.33	5.1	97.21	20	77.21	94	16.79	Fundamental
4.810	Max Peak	Vert	65.28	32.88	-31.9	66.26	---	66.26	74	7.74	Restricted Band
4.810	Average	Vert	65.28	32.88	-31.9	66.26	20	46.26	54	7.74	Restricted Band
4.810	Max Peak	Horz	61.48	32.88	-31.9	62.46	---	62.46	74	11.54	Restricted Band
4.810	Average	Horz	61.48	32.88	-31.9	62.46	20	42.46	54	11.54	Restricted Band
7.215	Max Peak	Vert	51.88	35.80	-29.4	58.28	---	58.28	74	15.72	Restricted Band
7.215	Average	Vert	51.88	35.80	-29.4	58.28	20	38.28	54	15.72	Restricted Band
7.215	Max Peak	Horz	53.00	35.80	-29.4	59.40	---	59.40	74	14.60	Restricted Band
7.215	Average	Horz	53.00	35.80	-29.4	59.40	20	39.40	54	14.60	Restricted Band

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APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 26 GHz

30 MHz – 18 GHz Tested at a 3 Meter Distance and 18 – 26 GHz Tested at a 1 Meter Distance

EUT: ERUTT3
Manufacturer: Saris Cycling Group Inc.
Operating Condition: 69 deg F; 55% R.H.
Test Site: Chamber G1
Operator: Adam A
Test Specification: FCC Part 15.249, Part 15.205 and Part 15.209
Comment: Continuous transmit – Mid channel: 2441 MHz
Date: 9/18/2009

Note: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dBuV/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.441	Max Peak	Vert	66.33	28.44	5.1	99.87	---	99.87	114	14.13	Fundamental
2.441	Average	Vert	66.33	28.44	5.1	99.87	20	79.87	94	14.13	Fundamental
2.441	Max Peak	Horz	64.07	28.44	5.1	97.61	---	97.61	114	16.39	Fundamental
2.441	Average	Horz	64.07	28.44	5.1	97.61	20	77.61	94	16.39	Fundamental
4.882	Max Peak	Vert	61.12	32.98	-31.8	62.30	---	62.30	74	11.70	Restricted Band
4.882	Average	Vert	61.12	32.98	-31.8	62.30	20	42.30	54	11.70	Restricted Band
4.882	Max Peak	Horz	59.89	32.98	-31.8	61.07	---	61.07	74	12.93	Restricted Band
4.882	Average	Horz	59.89	32.98	-31.8	61.07	20	41.07	54	12.93	Restricted Band
7.323	Max Peak	Vert	53.01	36.09	-28.8	60.30	---	60.30	74	13.7	Restricted Band
7.323	Average	Vert	53.01	36.09	-28.8	60.30	20	40.30	54	13.7	Restricted Band
7.323	Max Peak	Horz	53.11	36.09	-28.8	60.40	---	60.40	74	13.60	Restricted Band
7.323	Average	Horz	53.11	36.09	-28.8	60.40	20	40.40	54	13.60	Restricted Band

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Company: Saris Cycling Group Inc.
Model Tested: SL24TT3
Report Number: 15764

APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 26 GHz

30 MHz – 18 GHz Tested at a 3 Meter Distance and 18 – 26 GHz Tested at a 1 Meter Distance

EUT: ERUTT3
Manufacturer: Saris Cycling Group Inc.
Operating Condition: 69deg F; 55% R.H.
Test Site: Chamber G1
Operator: Adam A
Test Specification: FCC Part 15.249, Part 15.205 and Part 15.209
Comment: Continuous transmit – High channel: 2480 MHz
Date: 9/18/2009

Note: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dBuV/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.480	Max Peak	Vert	64.40	28.56	5.2	98.16	---	98.16	114	15.84	Fundamental
2.480	Average	Vert	64.40	28.56	5.2	98.16	20	78.16	94	15.84	Fundamental
2.480	Max Peak	Horz	63.6	28.56	5.2	97.36	---	97.36	114	16.64	Fundamental
2.480	Average	Horz	63.6	28.56	5.2	97.36	20	77.36	94	16.64	Fundamental
4.960	Max Peak	Vert	64.01	33.08	-31.9	65.19	---	65.19	74	8.81	Restricted Band
4.960	Average	Vert	64.01	33.08	-31.9	65.19	20	45.19	54	8.81	Restricted Band
4.960	Max Peak	Horz	58.89	33.08	-31.9	60.07	---	60.07	74	13.93	Restricted Band
4.960	Average	Horz	58.89	33.08	-31.9	60.07	20	40.07	54	13.93	Restricted Band
7.440	Max Peak	Vert	52.51	36.40	-28.0	60.91	---	60.91	74	13.09	Restricted Band
7.440	Average	Vert	52.51	36.40	-28.0	60.91	20	40.91	54	13.09	Restricted Band
7.440	Max Peak	Horz	51.64	36.40	-28.0	60.04	---	60.04	74	13.96	Restricted Band
7.440	Average	Horz	51.64	36.40	-28.0	60.04	20	40.04	54	13.96	Restricted Band

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RADIATED DATA TAKEN FOR

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PART 15.249

ICHUBTT3

1250 Peterson Dr., Wheeling, IL 60090

Company: Saris Cycling Group Inc.
Model Tested: SL24TT3
Report Number: 15764

APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 25 GHz

Tested at a 3 Meter Distance (30 MHz to 10 GHz) and Tested at a 1 Meter Distance (10 GHz to 25 GHz)

EUT: ICHUBTT3
Manufacturer: Saris Cycling Group
Operating Condition: 72 deg F; 72% R.H.
Test Site: Site 3
Operator: Craig B
Test Specification: FCC Part 15.249, Part 15.205 and Part 15.209
Comment: Continuous Transmit – Low channel: 2405 MHz
Date: 09-22-2009

Notes: (1) All other emissions at least 20 dB under the FCC Part 15.209 limits

Frequency (MHz)	Measurement Detector	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant. Height (m)	EUT Angle (deg)	Comment
2405	Max Peak	Vert	69.30	28.51	3.1	100.9	-----	100.9	113.98 (Peak)	13.1	1.0	100	Fundamental
2405	Max Peak	Vert	69.30	28.51	3.1	100.9	20	80.9	93.98 (Avg)	13.1	1.0	100	Fundamental
2405	Max Peak	Horz	71.71	28.51	3.1	103.3	-----	103.3	113.98 (Peak)	10.7	1.4	146	Fundamental
2405	Max Peak	Horz	71.71	28.51	3.1	103.3	20	83.3	93.98 (Avg)	10.7	1.4	146	Fundamental
4810	Max Peak	Vert	61.69	32.94	-33.5	61.1	-----	61.1	74 (Peak)	12.9	1.0	151	Harmonic
4810	Max Peak	Vert	61.69	32.94	-33.5	61.1	20	41.1	54 (Avg)	12.9	1.0	151	Harmonic
4810	Max Peak	Horz	60.39	32.94	-33.5	59.8	-----	59.8	74 (Peak)	14.2	1.0	96	Harmonic
4810	Max Peak	Horz	60.39	32.94	-33.5	59.8	20	39.8	54 (Avg)	14.2	1.0	96	Harmonic
7215	Max Peak	Vert	59.53	35.89	-33.6	61.8	-----	61.8	74 (Peak)	12.2	1.0	77	Harmonic
7215	Max Peak	Vert	59.53	35.89	-33.6	61.8	20	41.8	54 (Avg)	12.2	1.0	77	Harmonic
7215	Max Peak	Horz	60.93	35.89	-33.6	63.2	-----	63.2	74 (Peak)	10.8	1.0	37	Harmonic
7215	Max Peak	Horz	60.93	35.89	-33.6	63.2	20	43.2	54 (Avg)	10.8	1.0	37	Harmonic
9620	Max Peak	Vert	57.40	37.95	-32.5	62.9	-----	62.9	74 (Peak)	11.2	1.1	38	Harmonic
9620	Max Peak	Vert	57.40	37.95	-32.5	62.9	20	42.9	54 (Avg)	11.2	1.1	38	Harmonic
9620	Max Peak	Horz	54.87	37.95	-32.5	60.3	-----	60.3	74 (Peak)	13.7	1.2	59	Harmonic
9620	Max Peak	Horz	54.87	37.95	-32.5	60.3	20	40.3	54 (Avg)	13.7	1.2	59	Harmonic

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APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 25 GHz

Tested at a 3 Meter Distance (30 MHz to 10 GHz) and Tested at a 1 Meter Distance (10 GHz to 25 GHz)

EUT: ICHUBTT3
Manufacturer: Saris Cycling Group
Operating Condition: 70 deg F; 76% R.H.
Test Site: Site 3
Operator: Craig B
Test Specification: FCC Part 15.249, Part 15.205 and Part 15.209
Comment: Continuous Transmit – Mid channel: 2441 MHz
Date: 09-22-2009

Notes: (1) All other emissions at least 20 dB under the FCC Part 15.209 limits

Frequency (MHz)	Measurement Detector	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant. Height (m)	EUT Angle (deg)	Comment
2441	Max Peak	Vert	66.69	28.61	3.1	98.4	-----	98.4	113.98 (Peak)	15.6	1.0	68	Fundamental
2441	Max Peak	Vert	66.69	28.61	3.1	98.4	20	78.4	93.98 (Avg)	15.6	1.0	68	Fundamental
2441	Max Peak	Horz	71.62	28.61	3.1	103.3	-----	103.3	113.98 (Peak)	10.7	1.4	144	Fundamental
2441	Max Peak	Horz	71.62	28.61	3.1	103.3	20	83.3	93.98 (Avg)	10.7	1.4	144	Fundamental
4882	Max Peak	Vert	60.05	33.07	-33.5	59.6	-----	59.6	74 (Peak)	14.4	1.0	153	Harmonic
4882	Max Peak	Vert	60.05	33.07	-33.5	59.6	20	39.6	54 (Avg)	14.4	1.0	153	Harmonic
4882	Max Peak	Horz	66.67	33.07	-33.5	66.2	-----	66.2	74 (Peak)	7.8	1.0	47	Harmonic
4882	Max Peak	Horz	66.67	33.07	-33.5	66.2	20	46.2	54 (Avg)	7.8	1.0	47	Harmonic
7323	Max Peak	Vert	60.98	36.19	-32.9	64.3	-----	64.3	74 (Peak)	9.7	1.0	140	Harmonic
7323	Max Peak	Vert	60.98	36.19	-32.9	64.3	20	44.3	54 (Avg)	9.7	1.0	140	Harmonic
7323	Max Peak	Horz	63.72	36.19	-32.9	67.0	-----	67.0	74 (Peak)	7.0	1.2	149	Harmonic
7323	Max Peak	Horz	63.72	36.19	-32.9	67.0	20	47.0	54 (Avg)	7.0	1.2	149	Harmonic
9764	Max Peak	Vert	55.19	38.10	-32.5	60.8	-----	60.8	74 (Peak)	13.2	1.0	159	Harmonic
9764	Max Peak	Vert	55.19	38.10	-32.5	60.8	20	40.8	54 (Avg)	13.2	1.0	159	Harmonic
9764	Max Peak	Horz	53.17	38.10	-32.5	58.8	-----	58.8	74 (Peak)	15.2	1.1	139	Harmonic
9764	Max Peak	Horz	53.17	38.10	-32.5	58.8	20	38.8	54 (Avg)	15.2	1.1	139	Harmonic

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Radiated Fundamental and Spurious Emissions – 30 MHz to 25 GHz

Tested at a 3 Meter Distance (30 MHz to 10 GHz) and Tested at a 1 Meter Distance (10 GHz to 25 GHz)

EUT: ICHUBTT3
Manufacturer: Saris Cycling Group
Operating Condition: 72 deg F; 72% R.H.
Test Site: Site 3
Operator: Craig B
Test Specification: FCC Part 15.249, Part 15.205 and Part 15.209
Comment: Continuous Transmit – High channel: 2480 MHz
Date: 09-22-2009

Notes: (1) All other emissions at least 20 dB under the FCC Part 15.209 limits

Frequency (MHz)	Measurement Detector	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant. Height (m)	EUT Angle (deg)	Comment
2480	Max Peak	Vert	66.21	28.73	3.1	98.0	-----	98.0	113.98 (Peak)	15.9	1.0	96	Fundamental
2480	Max Peak	Vert	66.21	28.73	3.1	98.0	20	78.0	93.98 (Avg)	15.9	1.0	96	Fundamental
2480	Max Peak	Horz	68.70	28.73	3.1	100.5	-----	100.5	113.98 (Peak)	13.5	1.4	146	Fundamental
2480	Max Peak	Horz	68.70	28.73	3.1	100.5	20	80.5	93.98 (Avg)	13.5	1.4	146	Fundamental
4960	Max Peak	Vert	64.46	33.20	-33.3	64.4	-----	64.4	74 (Peak)	9.6	1.0	151	Harmonic
4960	Max Peak	Vert	64.46	33.20	-33.3	64.4	20	44.4	54 (Avg)	9.6	1.0	151	Harmonic
4960	Max Peak	Horz	68.74	33.20	-33.3	68.6	-----	68.6	74 (Peak)	5.4	1.0	45	Harmonic
4960	Max Peak	Horz	68.74	33.20	-33.3	68.6	20	48.6	54 (Avg)	5.4	1.0	45	Harmonic
7440	Max Peak	Vert	58.29	36.51	-32.3	62.5	-----	62.5	74 (Peak)	11.5	1.0	29	Harmonic
7440	Max Peak	Vert	58.29	36.51	-32.3	62.5	20	42.5	54 (Avg)	11.5	1.0	29	Harmonic
7440	Max Peak	Horz	58.02	36.51	-32.3	62.2	-----	62.2	74 (Peak)	11.8	1.0	64	Harmonic
7440	Max Peak	Horz	58.02	36.51	-32.3	62.2	20	42.2	54 (Avg)	11.8	1.0	64	Harmonic
9920	Max Peak	Vert	54.48	38.25	-31.6	61.1	-----	61.1	74 (Peak)	12.9	1.0	13	Harmonic
9920	Max Peak	Vert	54.48	38.25	-31.6	61.1	20	41.1	54 (Avg)	12.9	1.0	13	Harmonic
9920	Max Peak	Horz	52.76	38.25	-31.6	59.4	-----	59.4	74 (Peak)	14.6	1.0	154	Harmonic
9920	Max Peak	Horz	52.76	38.25	-31.6	59.4	20	39.4	54 (Avg)	14.6	1.0	154	Harmonic

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

RADIATED DATA TAKEN FOR

FUNDAMENTAL, HARMONIC & SPURIOUS

EMISSIONS MEASUREMENTS

PART 15.249

PTHUBTT3

1250 Peterson Dr., Wheeling, IL 60090

Company: Saris Cycling Group Inc.
Model Tested: SL24TT3
Report Number: 15764

APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 26 GHz

30 MHz – 18 GHz Tested at a 3 Meter Distance and 18 – 26 GHz Tested at a 1 Meter Distance

EUT: PTHUBTT3
Manufacturer: Saris Cycling Group Inc.
Operating Condition: 72 deg F; 60% R.H.
Test Site: Chamber G1
Operator: Adam A
Test Specification: FCC Part 15.249, Part 15.205 and Part 15.209
Comment: Continuous transmit – Low channel: 2405 MHz
Date: 9/22/2009

Note: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dBuV/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.405	Max Peak	Vert	61.58	28.33	5.1	95.01	---	95.01	114	18.99	Fundamental
2.405	Average	Vert	61.58	28.33	5.1	95.01	20	75.01	94	18.99	Fundamental
2.405	Max Peak	Horz	66.05	28.33	5.1	99.48	---	99.48	114	14.52	Fundamental
2.405	Average	Horz	66.05	28.33	5.1	99.48	20	79.48	94	14.52	Fundamental
4.810	Max Peak	Vert	61.26	32.88	-31.9	62.24	---	62.24	74	11.76	Restricted Band
4.810	Average	Vert	61.26	32.88	-31.9	62.24	20	42.24	54	11.76	Restricted Band
4.810	Max Peak	Horz	59.44	32.88	-31.9	60.42	---	60.42	74	13.58	Restricted Band
4.810	Average	Horz	59.44	32.88	-31.9	60.42	20	40.42	54	13.58	Restricted Band
7.215	Max Peak	Vert	55.19	35.80	-29.4	61.59	---	61.59	74	12.41	Restricted Band
7.215	Average	Vert	55.19	35.80	-29.4	61.59	20	41.59	54	12.41	Restricted Band
7.215	Max Peak	Horz	56.53	35.80	-29.4	62.93	---	62.93	74	11.07	Restricted Band
7.215	Average	Horz	56.53	35.80	-29.4	62.93	20	42.93	54	11.07	Restricted Band

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 26 GHz

30 MHz – 18 GHz Tested at a 3 Meter Distance and 18 – 26 GHz Tested at a 1 Meter Distance

EUT: PTHUBTT3
Manufacturer: Saris Cycling Group Inc.
Operating Condition: 70 deg F; 61% R.H.
Test Site: Chamber G1
Operator: Adam A
Test Specification: FCC Part 15.249, Part 15.205 and Part 15.209
Comment: Continuous transmit – Mid channel: 2441 MHz
Date: 9/23/2009

Note: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dBuV/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.441	Max Peak	Vert	64.32	28.44	5.1	97.86	---	97.86	114	16.14	Fundamental
2.441	Average	Vert	64.32	28.44	5.1	97.86	20	77.86	94	16.14	Fundamental
2.441	Max Peak	Horz	68.95	28.44	5.1	102.49	---	102.49	114	11.51	Fundamental
2.441	Average	Horz	68.95	28.44	5.1	102.49	20	82.49	94	11.51	Fundamental
4.882	Max Peak	Vert	58.70	32.98	-31.8	59.88	---	59.88	74	14.12	Restricted Band
4.882	Average	Vert	58.70	32.98	-31.8	59.88	20	39.88	54	14.12	Restricted Band
4.882	Max Peak	Horz	58.57	32.98	-31.8	59.75	---	59.75	74	14.25	Restricted Band
4.882	Average	Horz	58.57	32.98	-31.8	59.75	20	39.75	54	14.25	Restricted Band
7.323	Max Peak	Vert	53.56	36.09	-28.8	60.85	---	60.85	74	13.15	Restricted Band
7.323	Average	Vert	53.56	36.09	-28.8	60.85	20	40.85	54	13.15	Restricted Band
7.323	Max Peak	Horz	55.85	36.09	-28.8	63.14	---	63.14	74	10.86	Restricted Band
7.323	Average	Horz	55.85	36.09	-28.8	63.14	20	43.14	54	10.86	Restricted Band

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Radiated Fundamental and Spurious Emissions – 30 MHz to 26 GHz

30 MHz – 18 GHz Tested at a 3 Meter Distance and 18 – 26 GHz Tested at a 1 Meter Distance

EUT: PTHUBTT3
Manufacturer: Saris Cycling Group Inc.
Operating Condition: 72 deg F; 61% R.H.
Test Site: Chamber G1
Operator: Adam A
Test Specification: FCC Part 15.249, Part 15.205 and Part 15.209
Comment: Continuous transmit – High channel: 2480 MHz
Date: 9/23/2009

Note: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dBuV/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.480	Max Peak	Vert	63.84	28.56	5.2	97.60	---	97.60	114	16.40	Fundamental
2.480	Average	Vert	63.84	28.56	5.2	97.60	20	77.60	94	16.40	Fundamental
2.480	Max Peak	Horz	66.4	28.56	5.2	100.16	---	100.16	114	13.84	Fundamental
2.480	Average	Horz	66.4	28.56	5.2	100.16	20	80.16	94	13.84	Fundamental
4.960	Max Peak	Vert	59.28	33.08	-31.9	60.46	---	60.46	74	13.54	Restricted Band
4.960	Average	Vert	59.28	33.08	-31.9	60.46	20	40.46	54	13.54	Restricted Band
4.960	Max Peak	Horz	59.66	33.08	-31.9	60.84	---	60.84	74	13.16	Restricted Band
4.960	Average	Horz	59.66	33.08	-31.9	60.84	20	40.84	54	13.16	Restricted Band
7.440	Max Peak	Vert	56.44	36.40	-28.0	64.84	---	64.84	74	9.16	Restricted Band
7.440	Average	Vert	56.44	36.40	-28.0	64.84	20	44.84	54	9.16	Restricted Band
7.440	Max Peak	Horz	59.29	36.40	-28.0	67.69	---	67.69	74	6.31	Restricted Band
7.440	Average	Horz	59.29	36.40	-28.0	67.69	20	47.49	54	6.31	Restricted Band

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

20 dB BANDWIDTH

DATA AND GRAPH(S)

PART 15.249

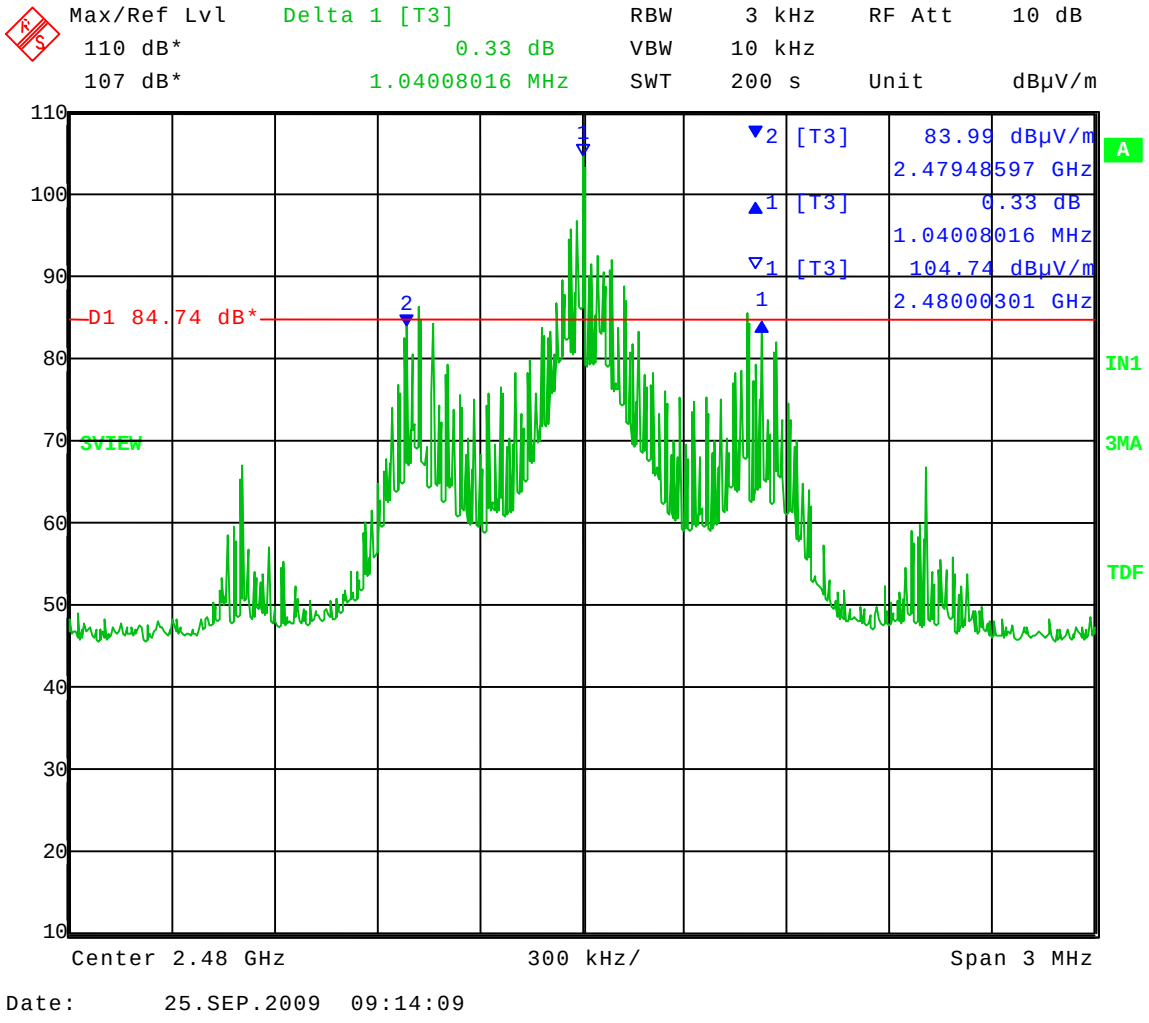
CRUTT3

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 09-25-2009
Company: Saris Cycling Group
EUT: CRUTT3
Test: 20 dB Bandwidth (FCC Part 15.249)
Operator: Adam A
Comment: Frequency – 2.480 GHz

20 dB Bandwidth = 1.04 MHz



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

20 dB BANDWIDTH

DATA AND GRAPH(S)

PART 15.249

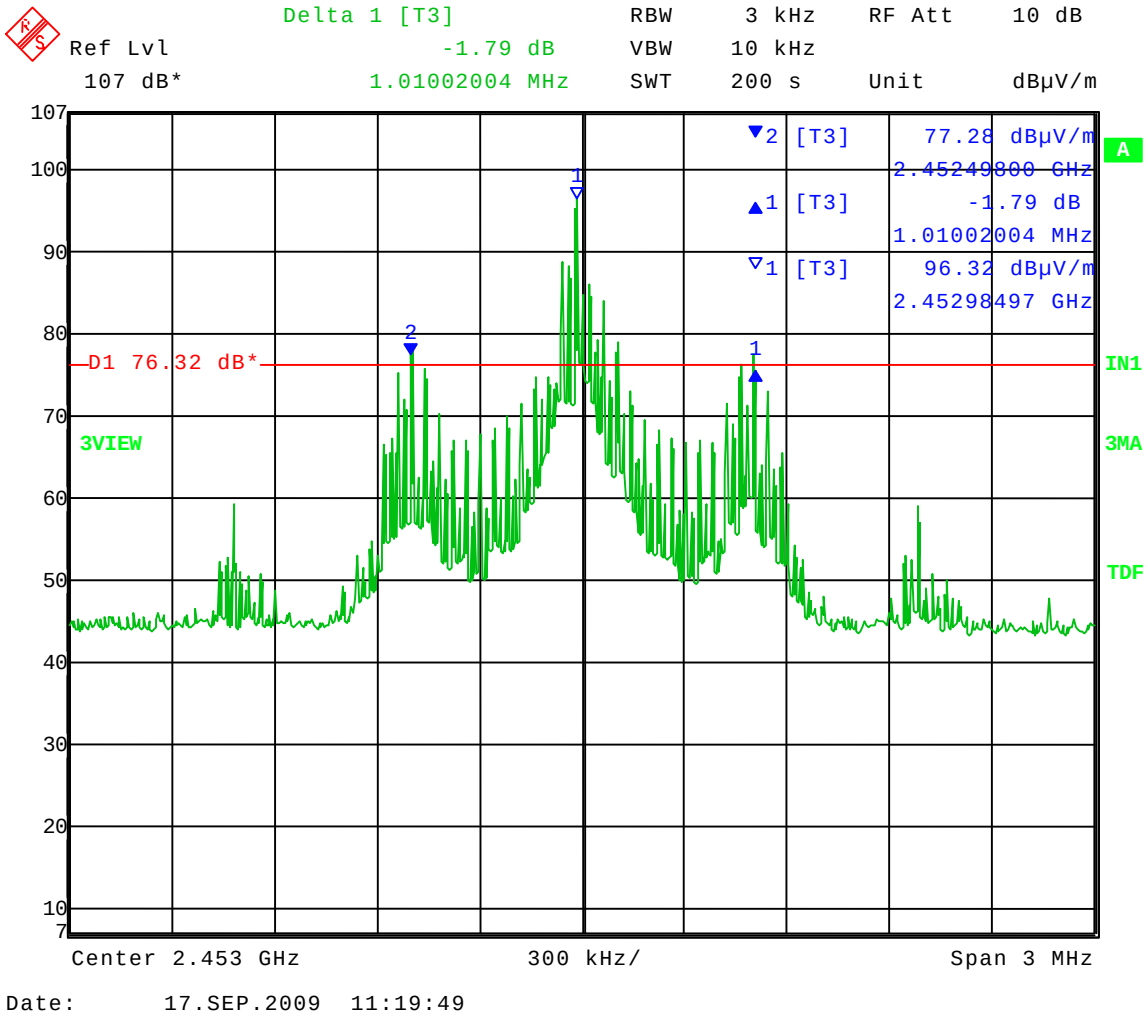
ERUTT3

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 09-17-2009
Company: Saris Cycling Group
EUT: ERUTT3
Test: 20 dB Bandwidth (FCC Part 15.249)
Operator: Adam A
Comment: Frequency – 2.453 GHz

20 dB Bandwidth = 1.01 MHz



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

20 dB BANDWIDTH

DATA AND GRAPH(S)

PART 15.249

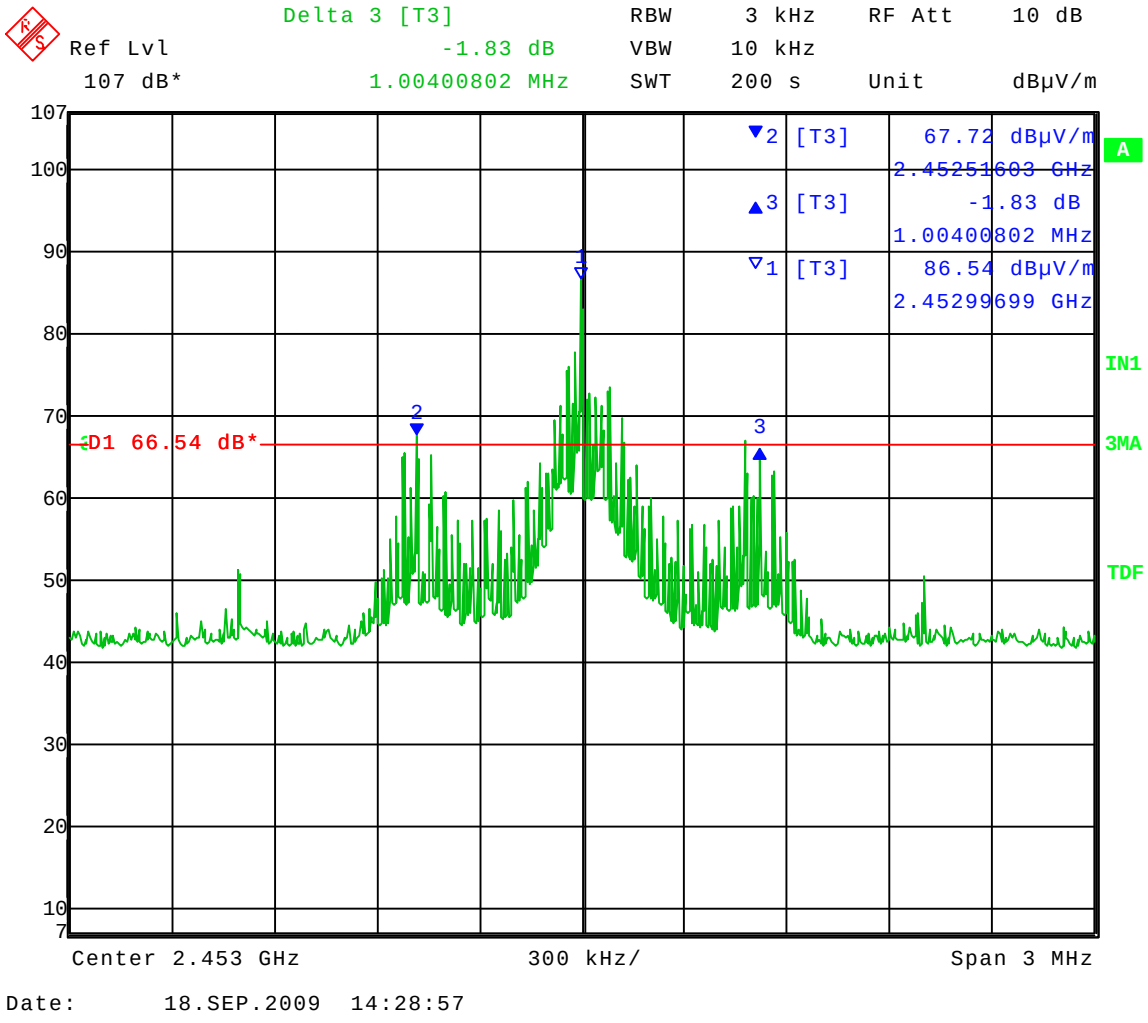
ICHUBTT3

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 09-18-2009
Company: Saris Cycling Group
EUT: ICHUBTT3
Test: 20 dB Bandwidth (FCC Part 15.249)
Operator: Craig B
Comment:

20 dB Bandwidth = 1.004 MHz



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

20 dB BANDWIDTH

DATA AND GRAPH(S)

PART 15.249

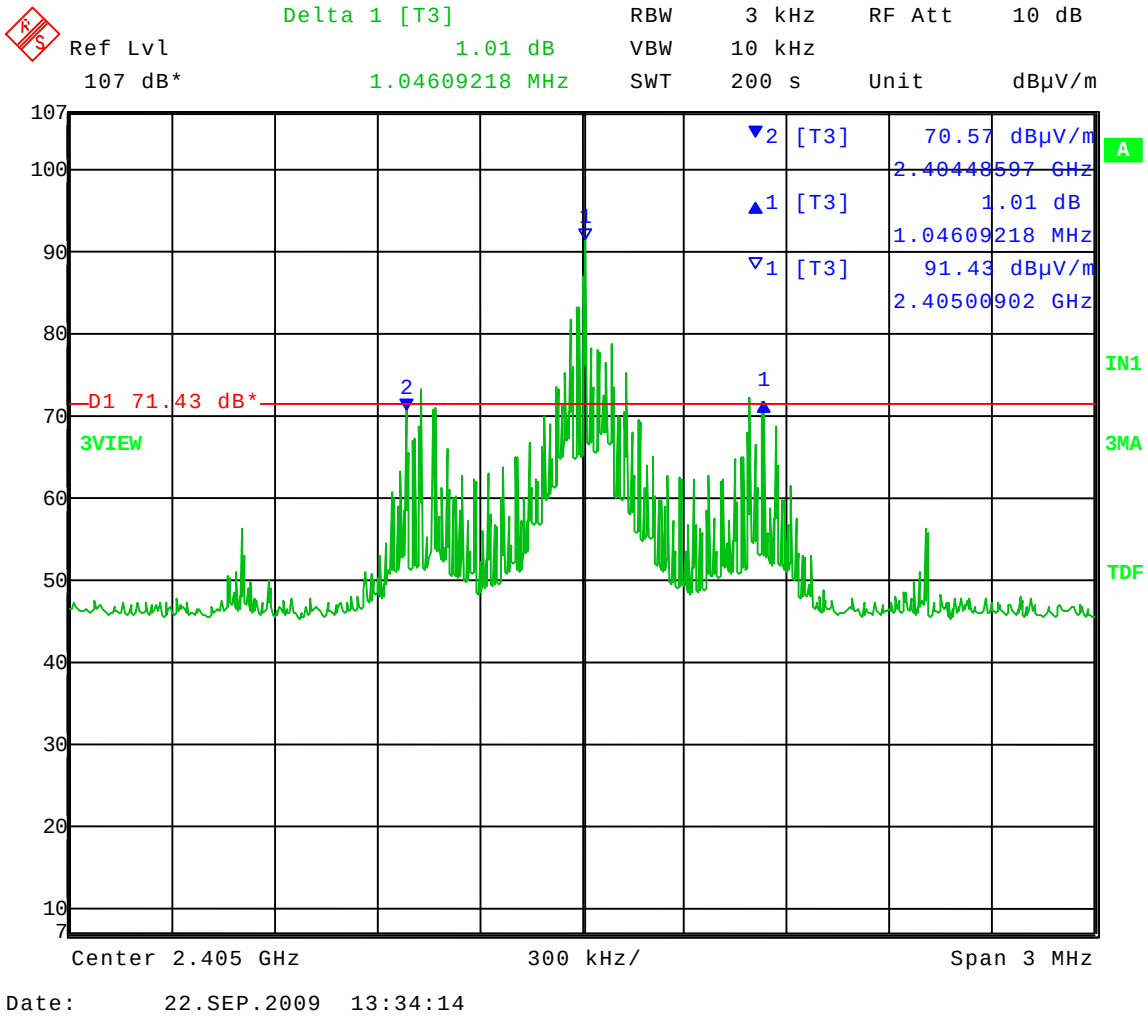
PTHUBTT3

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 09-22-2009
Company: Saris Cycling Group
EUT: PTHUBTT3
Test: 20 dB Bandwidth (FCC Part 15.249)
Operator: Adam A
Comment: Frequency – 2.405 GHz

20 dB Bandwidth = 1.046 MHz



APPENDIX

TRANSMITTER DUTY CYCLE GRAPHS

PART 15.35(c)

CRUTT3

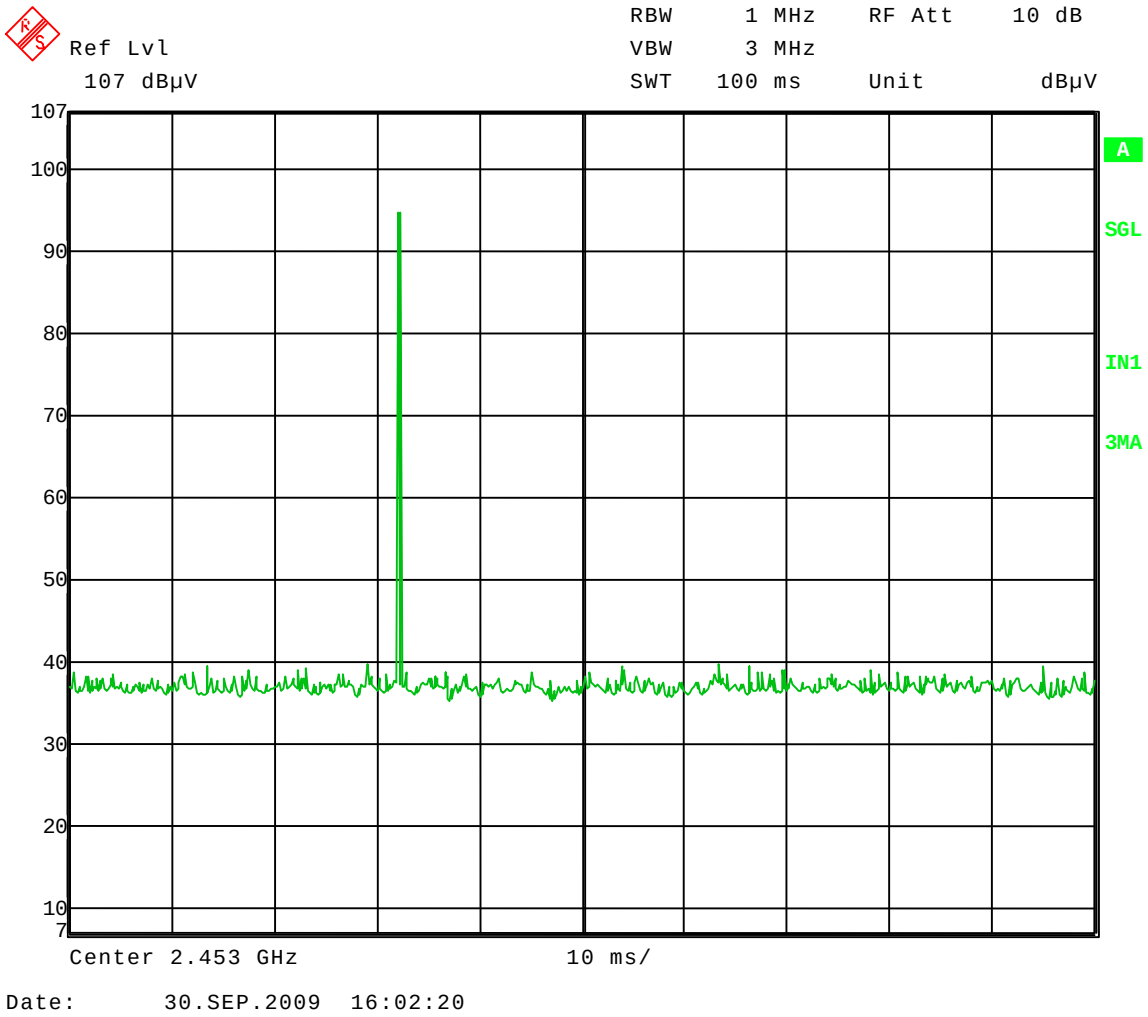
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 9-30-2009
Company: Saris Cycling Group
EUT: CRUTT3
Test: Duty Cycle (FCC Part 15.249)
Operator: Adam A

Comment: Duty Cycle Correction: 20log(.2625/100)= -51.6
Duty Cycle Correction factor: 51.6 dB
Maximum Useful Duty Cycle Correction: 20 dB

100 ms sweep:



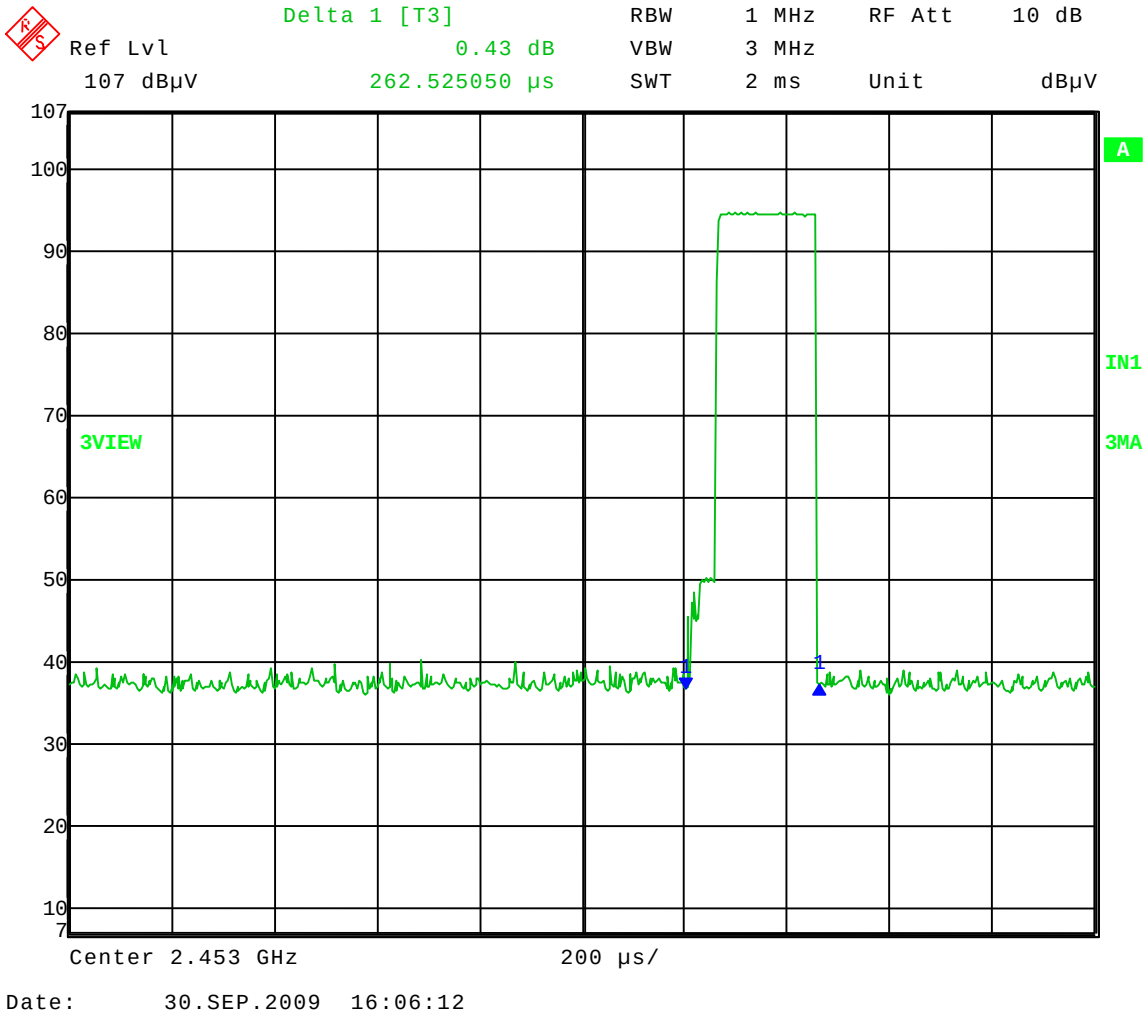
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 9-30-2009
Company: Saris Cycling Group
EUT: CRUTT3
Test: Duty Cycle (FCC Part 15.249)
Operator: Adam A

Comment: Duty Cycle Correction: 20log(.2625/100)= -51.6
Duty Cycle Correction factor: 51.6 dB
Maximum Useful Duty Cycle Correction: 20 dB

Duration of one pulse:



APPENDIX

TRANSMITTER DUTY CYCLE GRAPHS

PART 15.35(c)

ERUTT3

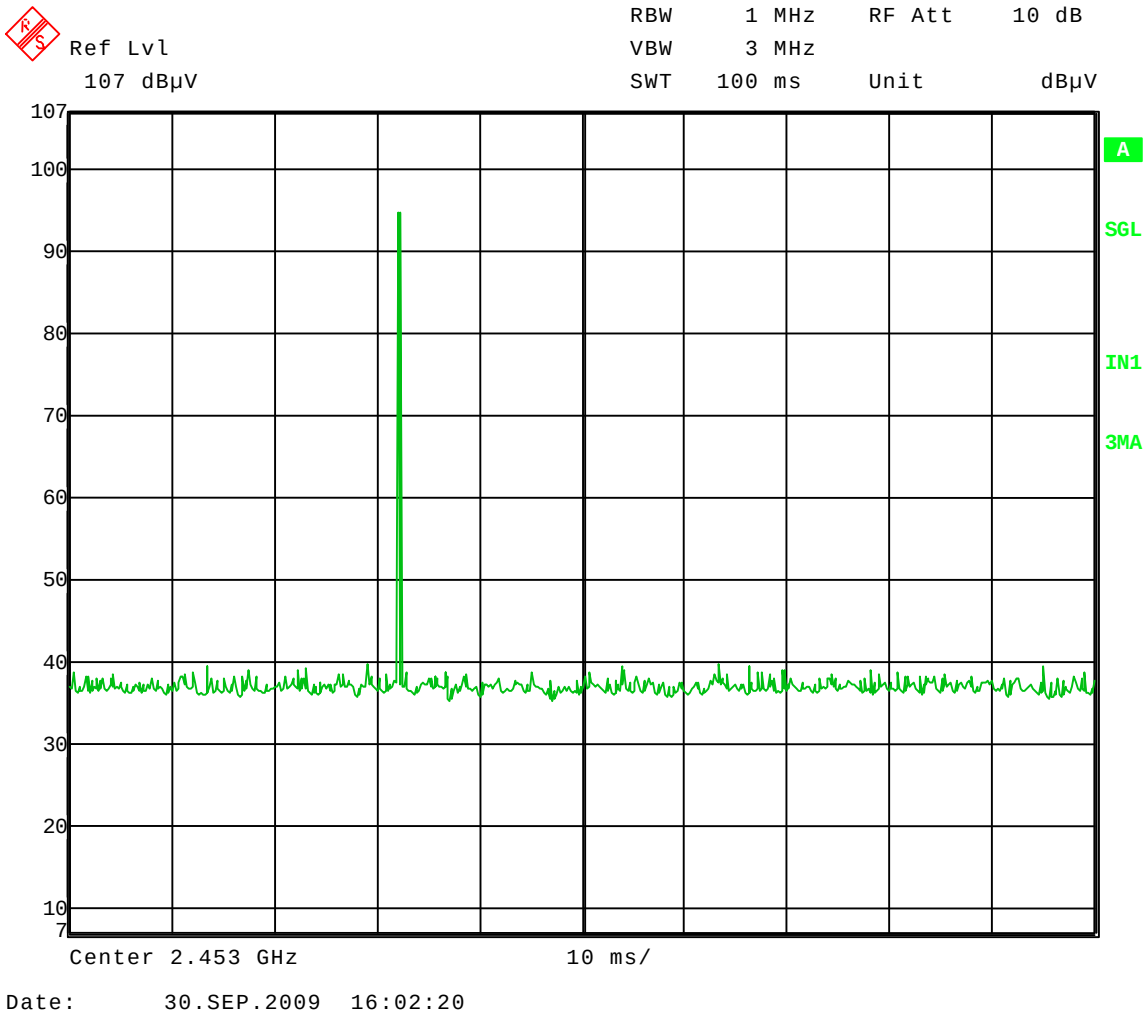
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 9-30-2009
Company: Saris Cycling Group
EUT: ERUTT3
Test: Duty Cycle (FCC Part 15.249)
Operator: Adam A

Comment: Duty Cycle Correction: 20log(.2625/100)= -51.6
Duty Cycle Correction factor: 51.6 dB
Maximum Useful Duty Cycle Correction: 20 dB

100 ms sweep:



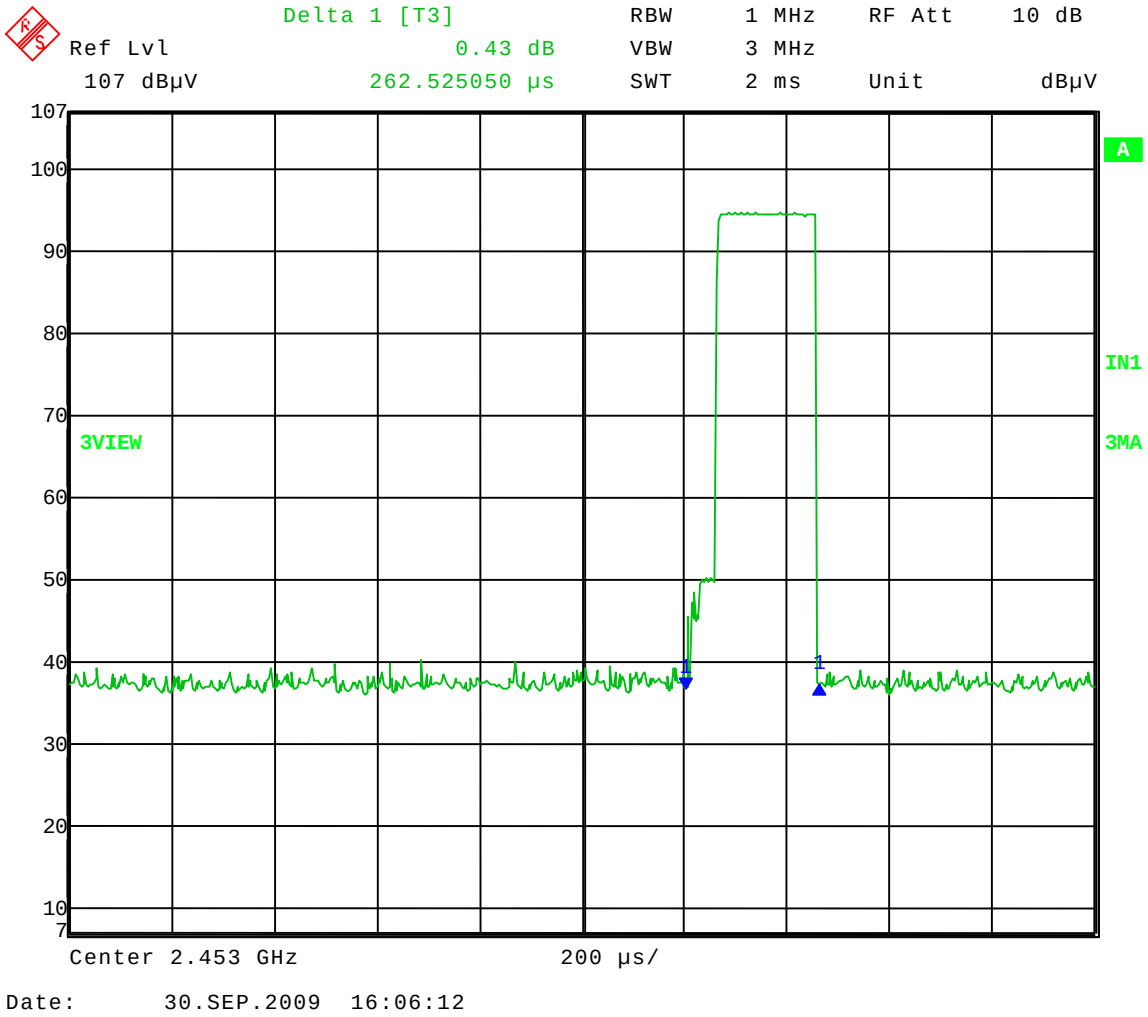
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 9-30-2009
Company: Saris Cycling Group
EUT: ERUTT3
Test: Duty Cycle (FCC Part 15.249)
Operator: Adam A

Comment: Duty Cycle Correction: 20log(.2625/100)= -51.6
Duty Cycle Correction factor: 51.6 dB
Maximum Useful Duty Cycle Correction: 20 dB

Duration of one pulse:



APPENDIX

TRANSMITTER DUTY CYCLE GRAPHS

PART 15.35(c)

ICHUBTT3

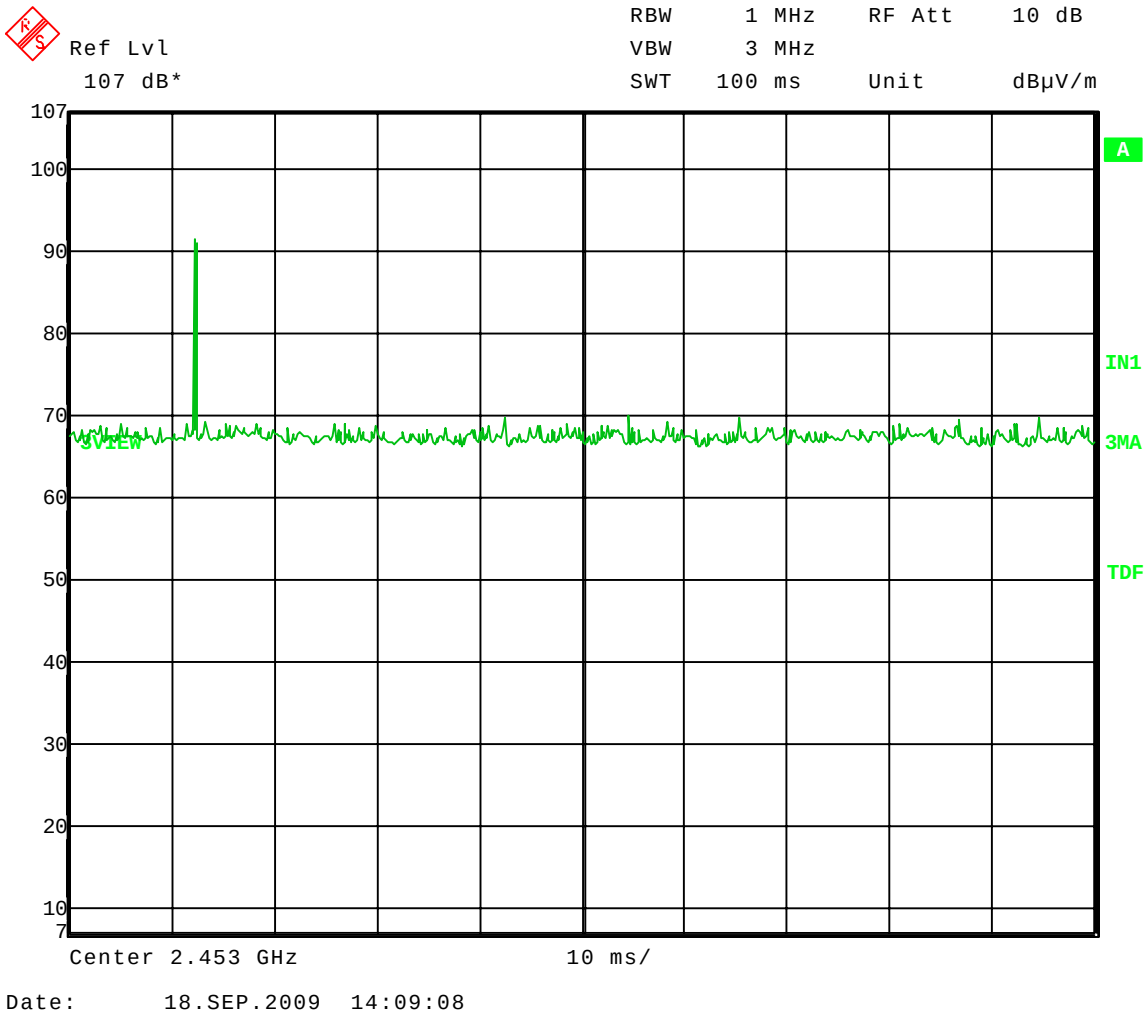
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 09-18-2009
Company: Saris Cycling Group
EUT: ICHUBTT3
Test: Duty Cycle (FCC Part 15.249)
Operator: Craig B

Comment: Duty Cycle Correction: 20log(.2044/100)= -53.79
Duty Cycle Correction factor: 53.7 dB
Maximum Duty Cycle Correction: 20 dB

100 ms sweep:



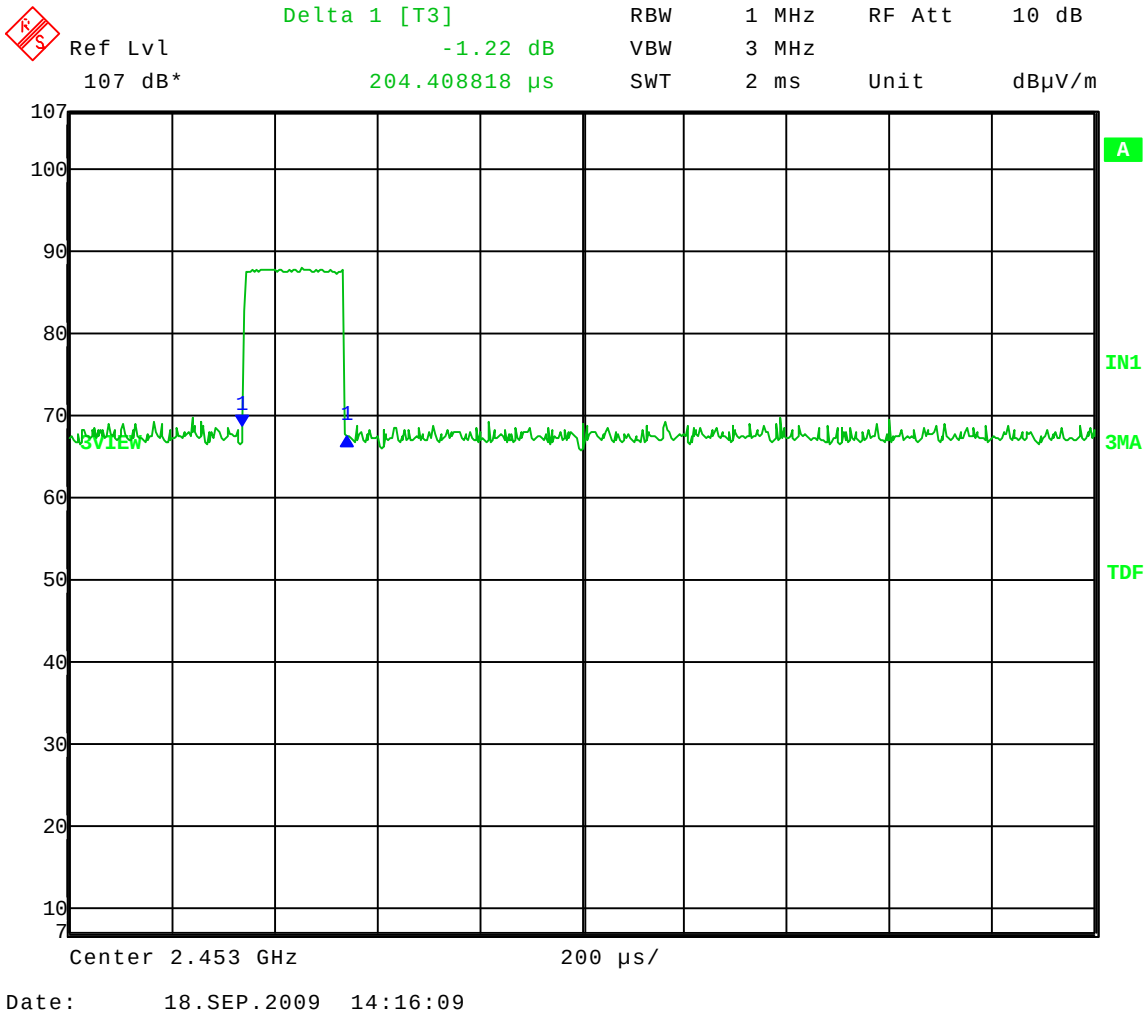
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX

Test Date: 09-18-2009
Company: Saris Cycling Group
EUT: ICHUBTT3
Test: Duty Cycle (FCC Part 15.249)
Operator: Craig B

Comment: Duty Cycle Correction: 20log(.2044/100)= -53.79
Duty Cycle Correction factor: 53.7 dB
Maximum Duty Cycle Correction: 20 dB

Duration of one pulse:



APPENDIX

TRANSMITTER DUTY CYCLE GRAPHS

PART 15.35(c)

PTHUBTT3

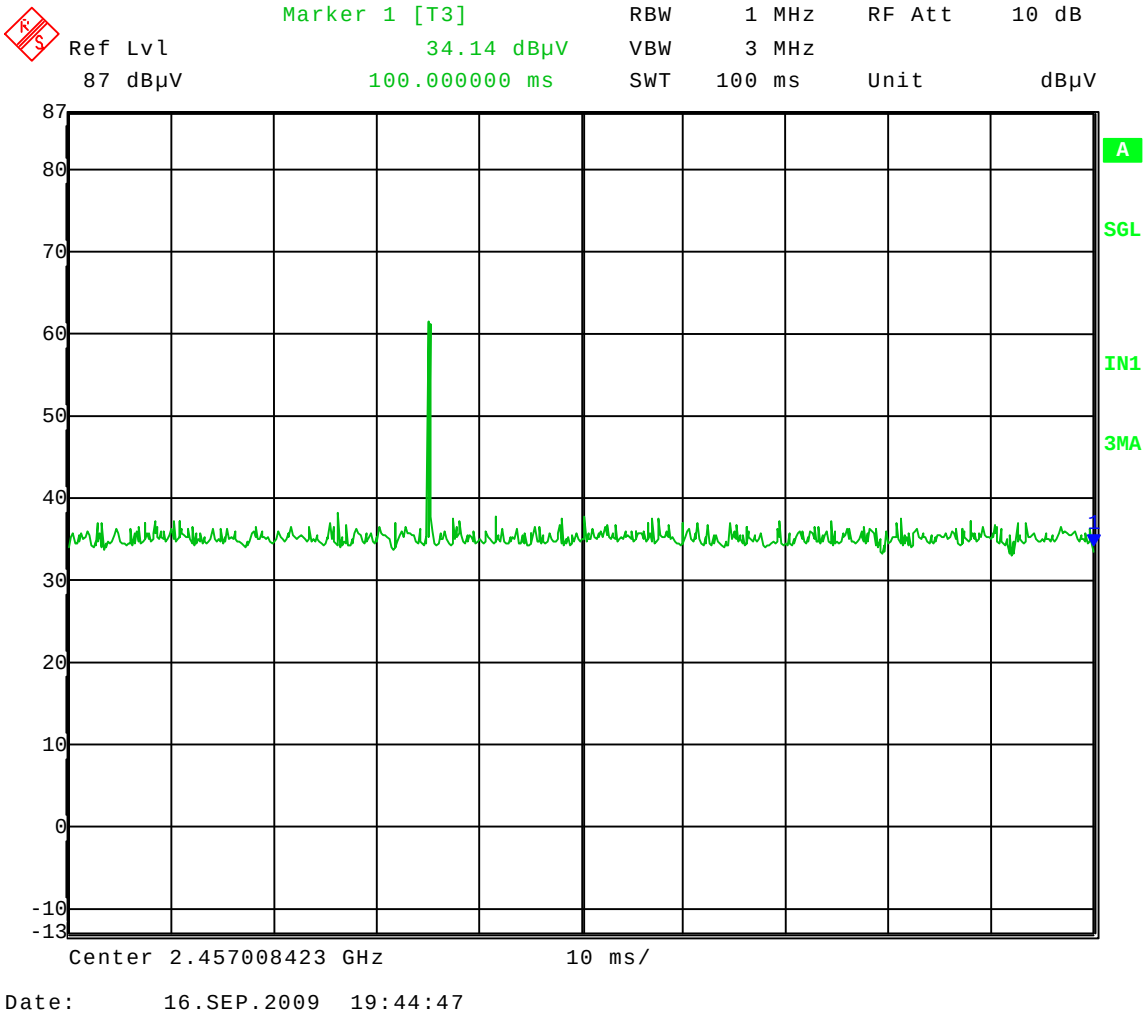
1250 Peterson Dr., Wheeling, IL 60090

Company: Saris Cycling Group Inc.
Model Tested: SL24TT3
Report Number: 15764

Test Date: 09-16-2009
Company: Saris Cycling Group
EUT: PTHUBTT3
Test: Duty Cycle (FCC Part 15.249)
Operator: Craig B

Comment: Duty Cycle Correction: 20log(.2124/100)= -53.9
Duty Cycle Correction factor: 53.9 dB
Maximum Duty Cycle Correction: 20 dB

100 ms sweep:



1250 Peterson Dr., Wheeling, IL 60090

Company: Saris Cycling Group Inc.
Model Tested: SL24TT3
Report Number: 15764

Test Date: 09-16-2009
Company: Saris Cycling Group
EUT: PTHUBTT3
Test: Duty Cycle (FCC Part 15.249)
Operator: Craig B

Comment: Duty Cycle Correction: 20log(0.2004/100)= -53.9
Duty Cycle Correction factor: 53.9 dB
Maximum Duty Cycle Correction: 20 dB

Duration of one pulse: