



1250 Peterson Dr., Wheeling, IL 60090

Company: Saris Cycling Group Inc  
Model Tested: SL2.4  
Report Number: 12279

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: PowerTap SL2.4  
Kind of Equipment: Bicycle Training Device  
Test Configuration: Two parts system; Bicycle Hub and small user display (CPU) (Tested at 3 vdc)  
Model Number(s): SL2.4  
Model(s) Tested: SL2.4  
Serial Number(s): Hub S/N 51739 and CPU S/N 65375  
Date of Tests: June 12, 2006  
Test Conducted For: Saris Cycling Group Inc  
5253 Verona Rd  
Madison, Wisconsin 53711

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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

Company Official:

Saris Cycling Group Inc



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United States Department of Commerce  
National Institute of Standards and Technology



# Certificate of Accreditation to ISO/IEC 17025:1999

NVLAP LAB CODE: 100276-0

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

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NIST Handbook 150:2001 and all requirements of ISO/IEC Guide 17025:1999.  
Accreditation is granted for specific services, listed on the Scope of Accreditation, for:

**ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS**



2005-10-01 through 2006-09-30

Effective dates

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2005-05-19)



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## 1.0 SUMMARY OF TEST REPORT

It was found that the PowerTap SL2.4, Model Number(s) SL2.4, "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 PowerTap SL2.4 is powered from a D.C. power source. It does not have a line cord to plug into the A.C. power line.

This test report relates only to the items tested and contains the following number of pages.

Text: 33

## 2.0 INTRODUCTION

On June 12, 2006, a series of radio frequency interference measurements was performed on PowerTap SL2.4, Model Number(s) SL2.4, Serial Number: Hub S/N 51739 and CPU S/N 65375. 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.

## 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 American National Standards Institute, ANSI C63.4-2003, Section 8, (Figures 11a and 11b). 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 American National Standards Institute, ANSI C63.4-2003, Section 4, (Figure 2).

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 HP Spectrum Analyzer or 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 HP Spectrum Analyzer and/or 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 Analyzer or 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 MP-5 or ANSI C63.4-2003, as appropriate.





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

### 7.1 Description:

The PowerTap SL2.4 system is install in any bicycle; the rear hub (or wheel) of the bicycle is replaced with the SL2.4 hub and the CPU mounts on the handle bars.

The hub measure parameters of the rear wheel; torque, wheel speed, rider cadence. The hub transmits the information every 0.63 seconds. The CPU receives the hub transmission and displays the information to the user real time. The CPU calculate further parameter from the raw hub data; Power (in Watts), speed in MPH, distance, ride time etc.

### 7.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Hub length = 141mm x 70mm flange diameter

CPU length 71mm x width 46.5mm x height 17.1mm

### 7.3 LINE FILTER USED:

Battery Operated

### 7.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

NA

Clock Frequencies:

Hub 0.03125, 0.032768, 1.000, 4.000, 16.000 MHz

CPU 0.032768, 4.000, 16.000 MHz

### 7.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

- |  |                        |
|--|------------------------|
| 1. Hub electronics; Main Circuit Board | PN: 16748 Revision E   |
| 2. Hub electronics; RF Circuit Board   | PN: 16776 Revision 1   |
| 3. CPU electronics; Main Circuit Board | PN: 16743 Revision 4.4 |
| 4. CPU electronics; RF Circuit Board   | PN: 16776 Revision 1   |



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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.

I certify that the above, as described in paragraph 7.0, describes the equipment tested and will be manufactured as stated.

By: \_\_\_\_\_  
Signature Title

For: \_\_\_\_\_  
Company Date



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## 9.0 PHOTO INFORMATION AND TEST SET-UP

Item 0 PowerTap SL2.4

Model Number: SL2.4 Serial Number: Hub S/N 51739 and CPU S/N 65375



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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING



**HUB TRANSMITTER**



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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING



**HUB TRANSMITTER CLOSE UP**



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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING



CPU FRONT VIEW





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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING



CPU REAR VIEW



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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING



**CPU ORIENTATION**





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## 11.0 RESULTS OF TESTS

The radio interference emission charts results 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. Points on the emission charts shown with a yellow mark are background frequencies that were verified during testing.

## 12.0 CONCLUSION

It was found that the PowerTap SL2.4, Model Number(s) SL2.4 "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 PowerTap SL2.4 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

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	11/06
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	12/06
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	12/06
Antenna	EMCO	3104C	00054891	20 MHz – 200 MHz	2/07
Antenna	Electrometrics	LPA-25	1114	200 MHz – 1 GHz	3/07
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	3/07
Antenna	Electrometrics	3146	1205	200 MHz – 1 GHz	3/07
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	2/07
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	3/07
Antenna	EMCO	3115	2479	1 GHz – 18 GHz	8/06
Antenna	EMCO	3115	99035731	1 GHz – 18 GHz	4/07
Antenna	Rohde & Schwarz	HUF-Z1	829381001	20 MHz – 1 GHz	2/07
Antenna	Rohde & Schwarz	HUF-Z1	829381005	20 MHz – 1 GHz	8/06

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



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TABLE 1 – EQUIPMENT LIST

<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Frequency Range</b>	<b>Cal Due Dates</b>
LISN	Solar	8012-50-R-24-BNC	8305116	10 MHz – 30 MHz	8/06
LISN	Solar	8012-50-R-24-BNC	814548	10 MHz – 30 MHz	8/06
LISN	Solar	9252-50-R-24-BNC	961019	10 MHz – 30 MHz	12/06
LISN	Solar	9252-50-R-24-BNC	971612	10 MHz – 30 MHz	10/06
LISN	Solar	9252-50-R-24-BNC	92710620	10 MHz – 30 MHz	7/07

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



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## APPENDIX A

### TEST PROCEDURE

Part 15, Subpart C, Section 15.249a-e

OPERATION WITHIN THE BANDS  
2400-2483.5 MHz



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## APPENDIX A

### 1.0 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 shall not exceed 250 uV (47.96 dBuV) from 150 kHz to 30 MHz

#### **NOTE:**

The conducted emissions test was not required because the PowerTap SL2.4 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 A

### 2.0 BAND EDGE AND RESTRICT BAND COMPLIANCE

The field strength of any emissions appearing outside the 902 to 928 MHz band shall not exceed the general radiated emissions limits as stated Section 15.209. The fundamental from the PowerTap SL2.4 transmitter shall not be inside the restrict band 960 to 1240 MHz.

As stated in Section 15.205a, the fundamental emission from the PowerTap SL2.4 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 and HP Spectrum Analyzer will typically lay 20 dB below the limit.

See the following page (s) for the graph (s) made showing compliance for Band Edge and Restrict Band: Also see the table of measurements made for the Fundamental and Spurious emissions in paragraph 3 of this section.



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## APPENDIX A

# DATA AND GRAPH(S) TAKEN SHOWING THE BAND EDGE AND RESTRICT BAND COMPLIANCE

PART 15.249



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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) & Tested at a 1 Meter Distance (10 GHz to 25 GHz)**

**EUT:** Power Tap SL2.4 Hub Transmitter  
**Manufacturer:** Saris Cycling Group  
**Operating Condition:** 74 deg F; 46% R.H.  
**Test Site:** Site 2  
**Operator:** Jason Lauer  
**Test Specification:** FCC Part 15.249, Part 15.205 and Part 15.209  
**Comment:** Continuous Transmit  
**Date:** 06/12/2006

- Notes:** (1) The EUT was measured in 3 orthogonal axis and placed in the worst case axis for the following measurements.  
 (2) All other emissions at least 20 dB under the FCC Part 15.209 limits  
 (3) No emissions were found at the upper and lower band-edges

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
2457	Max Peak	Vert	53.39	28.29	2.9	84.6	NA	84.6	113.98 (Peak)	29.38	1.2	0	Fundamental
2457	Max Peak	Vert	53.39	28.29	2.9	84.6	-20	64.6	93.98 (Avg)	29.38	1.2	0	Fundamental
2457	Max Peak	Horz	61.14	28.29	2.9	92.4	NA	92.4	113.98 (Peak)	21.58	1.2	325	Fundamental
2457	Max Peak	Horz	61.14	28.29	2.9	92.4	-20	72.4	93.98 (Avg)	21.58	1.2	325	Fundamental
4914	Max Peak	Vert	67.79	33.01	-33.6	67.2	NA	67.2	74 (Peak)	6.8	1.0	45	Res. Band
4914	Max Peak	Vert	67.79	33.01	-33.6	67.2	-20	47.2	54 (Avg)	6.8	1.0	45	Res. Band
4914	Max Peak	Horz	66.96	33.01	-33.6	66.4	NA	66.4	74 (Peak)	7.6	1.2	90	Res. Band
4914	Max Peak	Horz	66.96	33.01	-33.6	66.4	-20	46.4	54 (Avg)	7.6	1.2	90	Res. Band
7371	Max Peak	Vert	38.95	36.21	-32.9	42.3	NA	42.3	74 (Peak)	31.7	1.0	0	Harmonic
7371	Max Peak	Vert	38.95	36.21	-32.9	42.3	-20	22.3	54 (Avg)	31.7	1.0	0	Harmonic
7371	Max Peak	Horz	49.52	36.21	-32.9	52.9	NA	52.9	74 (Peak)	21.1	1.2	0	Harmonic
7371	Max Peak	Horz	49.52	36.21	-32.9	52.9	-20	32.9	54 (Avg)	21.1	1.0	315	Harmonic





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

The radiated measurements made at D.L.S. Electronic Systems, Inc., for the PowerTap SL2.4, Model Number: SL2.4, 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 PowerTap SL2.4 were made up to 25000 MHz, in accordance with Section 15.33a for Intentional Radiators with a fundamental frequency of 2457 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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### 3.0 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 **74°F** at **46%** relative humidity.



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RADIATED DATA TAKEN FOR FUNDAMENTAL  
AND SPURIOUS EMISSION MEASUREMENTS

PART 15.249, PART 15.209 & 15.205



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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) & Tested at a 1 Meter Distance (10 GHz to 25 GHz)**

**EUT:** Power Tap SL2.4 Hub Transmitter  
**Manufacturer:** Saris Cycling Group  
**Operating Condition:** 74 deg F; 46% R.H.  
**Test Site:** Site 2  
**Operator:** Jason Lauer  
**Test Specification:** FCC Part 15.249, Part 15.205 and Part 15.209  
**Comment:** Continuous Transmit  
**Date:** 06/12/2006

- Notes:** (1) The EUT was measured in 3 orthogonal axis and placed in the worst case axis for the following measurements.  
 (2) All other emissions at least 20 dB under the FCC Part 15.209 limits  
 (3) No emissions were found at the upper and lower band-edges

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
2457	Max Peak	Vert	53.39	28.29	2.9	84.6	NA	84.6	113.98 (Peak)	29.38	1.2	0	Fundamental
2457	Max Peak	Vert	53.39	28.29	2.9	84.6	-20	64.6	93.98 (Avg)	29.38	1.2	0	Fundamental
2457	Max Peak	Horz	61.14	28.29	2.9	92.4	NA	92.4	113.98 (Peak)	21.58	1.2	325	Fundamental
2457	Max Peak	Horz	61.14	28.29	2.9	92.4	-20	72.4	93.98 (Avg)	21.58	1.2	325	Fundamental
4914	Max Peak	Vert	67.79	33.01	-33.6	67.2	NA	67.2	74 (Peak)	6.8	1.0	45	Res. Band
4914	Max Peak	Vert	67.79	33.01	-33.6	67.2	-20	47.2	54 (Avg)	6.8	1.0	45	Res. Band
4914	Max Peak	Horz	66.96	33.01	-33.6	66.4	NA	66.4	74 (Peak)	7.6	1.2	90	Res. Band
4914	Max Peak	Horz	66.96	33.01	-33.6	66.4	-20	46.4	54 (Avg)	7.6	1.2	90	Res. Band
7371	Max Peak	Vert	38.95	36.21	-32.9	42.3	NA	42.3	74 (Peak)	31.7	1.0	0	Harmonic
7371	Max Peak	Vert	38.95	36.21	-32.9	42.3	-20	22.3	54 (Avg)	31.7	1.0	0	Harmonic
7371	Max Peak	Horz	49.52	36.21	-32.9	52.9	NA	52.9	74 (Peak)	21.1	1.2	0	Harmonic
7371	Max Peak	Horz	49.52	36.21	-32.9	52.9	-20	32.9	54 (Avg)	21.1	1.0	315	Harmonic



1250 Peterson Dr., Wheeling, IL 60090

Company: Saris Cycling Group Inc  
Model Tested: SL2.4  
Report Number: 12279

20 dB Bandwidth (FCC Part 15.249)

To Show in Band Operation

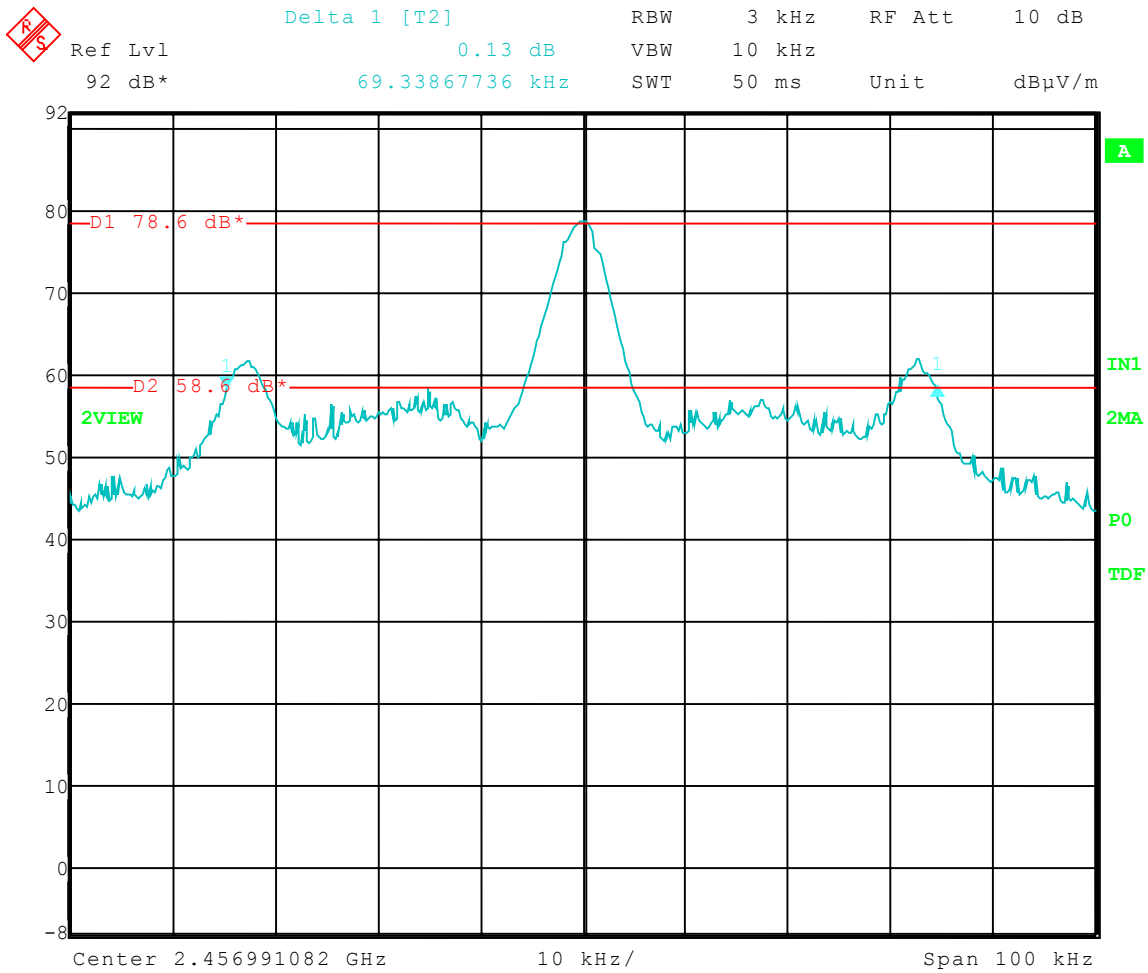


Company: Saris Cycling Group Inc  
Model Tested: SL2.4  
Report Number: 12279

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 06-12-2006  
Company: Saris Cycling Group  
EUT: Power Tap SL2.4 Hub Transmitter  
Test: 20 dB Bandwidth (FCC Part 15.249) To Show in Band Operation  
Operator: Jason Lauer  
Comment: Frequency - 2.457 GHz

**20 dB Bandwidth = 69.34 kHz**



Date: 12.JUN.2006 13:09:58



1250 Peterson Dr., Wheeling, IL 60090

Company: Saris Cycling Group Inc  
Model Tested: SL2.4  
Report Number: 12279

## DUTY CYCLE CORRECTION FACTOR

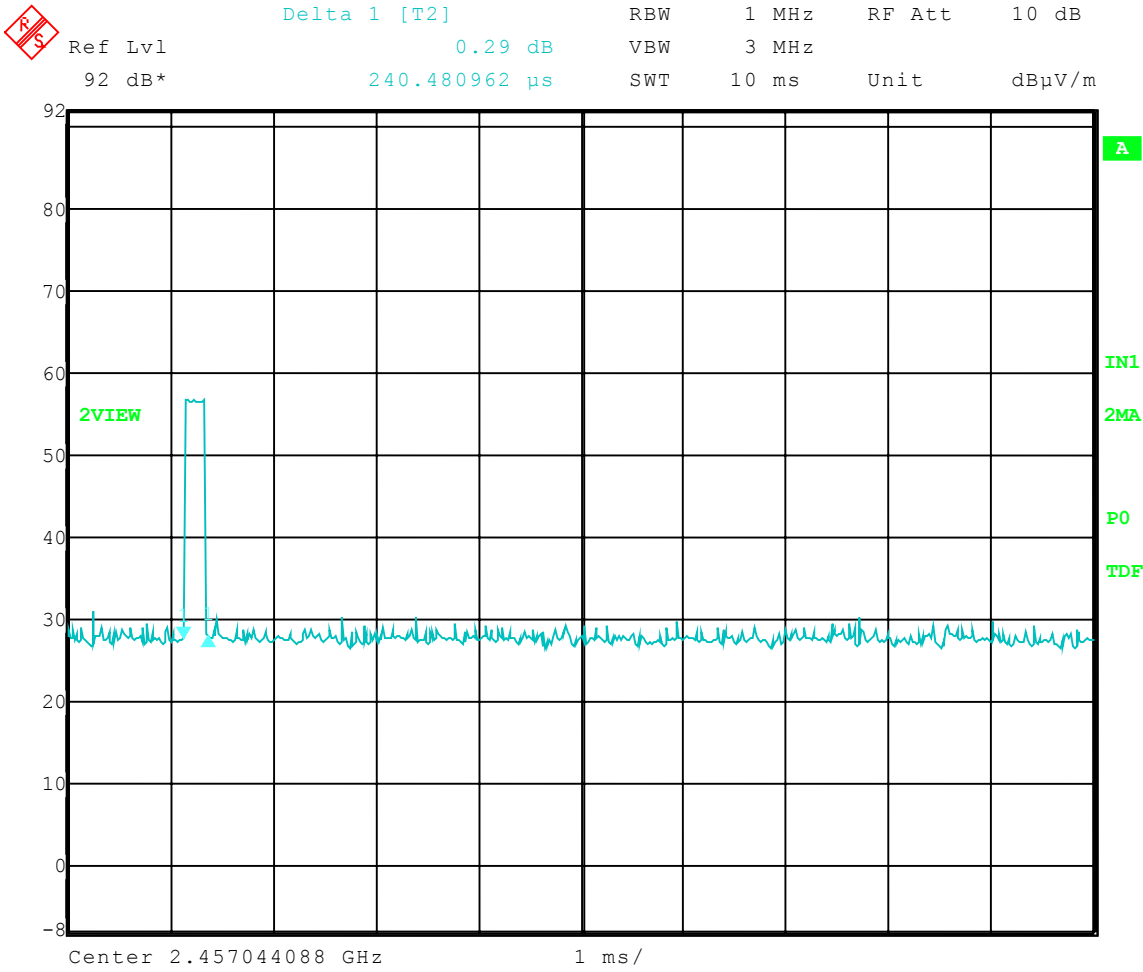
(FCC Part 15.35)



Company: Saris Cycling Group Inc  
 Model Tested: SL2.4  
 Report Number: 12279

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 06-12-2006  
 Company: Saris Cycling Group  
 EUT: Power Tap SL2.4 Hub Transmitter  
 Test: Duty Cycle (FCC Part 15.35)  
 Operator: Jason Lauer  
 Comment: 10 ms sweep  
 Comment: Total ON Time during 100 ms = 0.2405 ms  
 $20 \log (0.2405\text{ms} / 100\text{ms}) = (52.38 \text{ dB}) > 20 \text{ dB Limit}$   
**Duty cycle correction factor = 20 dB**



Date: 12.JUN.2006 11:55:28





Company: Saris Cycling Group Inc  
Model Tested: SL2.4  
Report Number: 12279

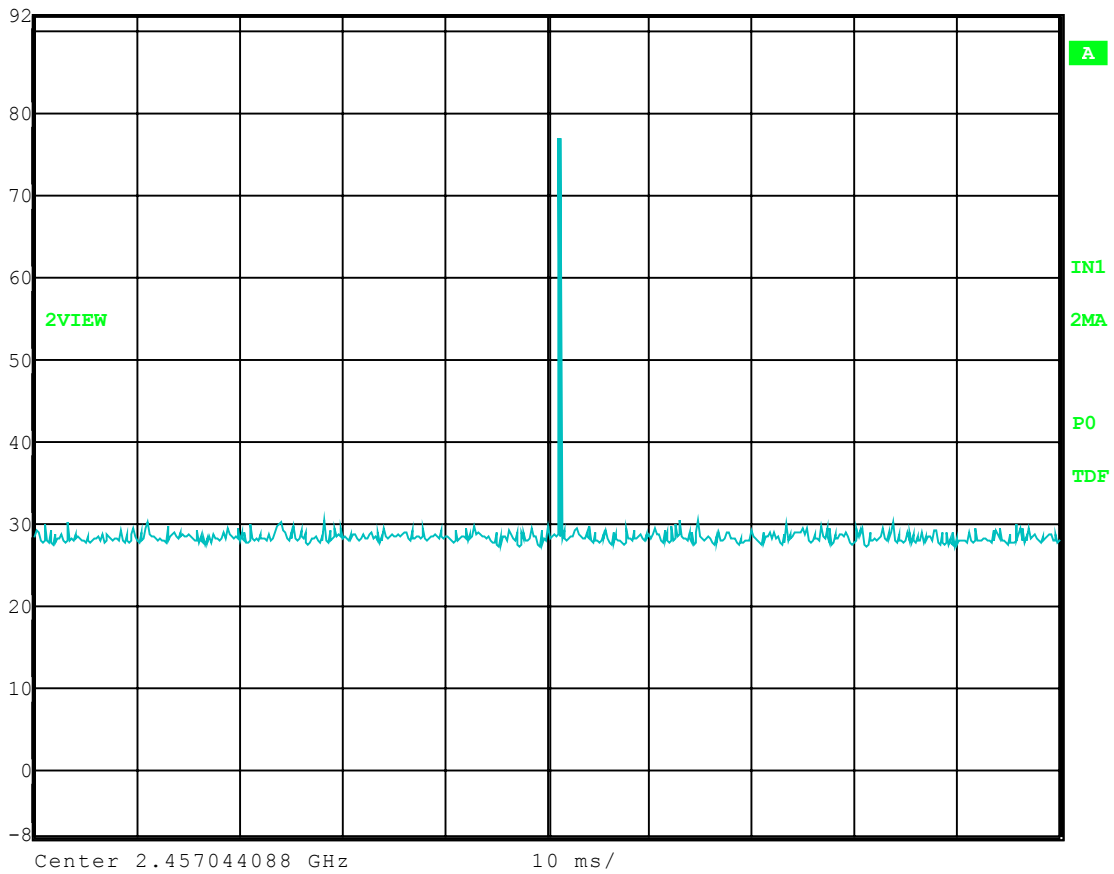
1250 Peterson Dr., Wheeling, IL 60090

Test Date: 06-12-2006  
Company: Saris Cycling Group  
EUT: Power Tap SL2.4 Hub Transmitter  
Test: Duty Cycle  
Operator: Jason Lauer  
Comment: 100 ms sweep



Ref Lvl  
92 dB\*

RBW 1 MHz RF Att 10 dB  
VBW 3 MHz  
SWT 100 ms Unit dB $\mu$ V/m



Date: 12.JUN.2006 12:55:16