

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 1 of 54  
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<b>PAGE</b>	<b>ISSUED</b>	<b>RE-ISSUED</b>
1 - 55	19 November 2010	28 November 2010

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TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 2 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 3 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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## TABLE OF CONTENTS

Click on  
Page  
Number

Section Description

1		<b>COMPANY CONFIDENTIAL AND PROPRIETARY</b>
2		<b>Disclaimer Statement and Trademarks Statement</b>
4	0.0	File; Project; Product; Client; Standards
7		Appendix – Instructions for Inspector
14	1.0	Engineering Considerations
14	2.0	General Engineering Considerations
18	2.25	Instruction Manual Information
18	2.26	Permissible Cordsets
18	2.27	List of Photographs Contained in this Report
19	2.28	Configuration Control Components
20		Photographs
33	3.0	Test Record Number One
34		Table of Laboratory Test Equipment Used
41	4.0	Input Power Tests
41	5.0	Power Switch Cycling Tests
41	6.0	Endurance Tests
41	7.0	Leakage Current Tests
41	8.0	Grounding Impedance Tests
41	9.0	Insulation Resistance Tests
41	10.0	Dielectric Withstand Voltage Test
42	11.0	Temperature Tests
43	11.9	Thermocouple Locations, Data Table, Graphs
46	12.0	Strain Relief Test
46	13.0	Power Supply Output Voltage Test
46	14.0	Convenience Receptacles
46	15.0	Short Circuit Current Measurement Test
46	16.0	Abnormal Tests
46	17.0	Mechanical Abuse Test
46	18.0	Stability Tests
46	19.0	Fan Locked Rotor Test
47	20.0	Failure of Fan Test
47	21.0	Battery Protection Test (Lithium Battery)
47	22.0	Secondary Wiring Protection Test
47	23.0	Primary Input Power Capacitive Discharge Test
47	24.0	Extremely Low Frequency Test
49	25.0	Drop Test for Portable Equipment
49	26.0	Wall Adapter Test
50		Primary Circuit Diagram, Illustration
52		Regulatory Label, Illustration
54		RFI Controls Components in PLI Report Q546302We.02.DWG.doc
55		Last Page of Report Certificate of Conformance

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 4 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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Pulver Laboratories Inc. (PLI) File Number: 5463  
Pulver Laboratories Inc. (PLI) Project Number: C4640

Product Names: Blu Cigs Disposable (EUT)  
(EUT = Equipment Under Test)

Model Numbers: 530-200001-XXX (where XXX indicates different  
flavors, starting with 001)

Serial Numbers: Not Applicable

Pulver Laboratories Sample ID: 5463C4640SJ-01

Applicant: BLEC LLC

[REDACTED]

Location Certified: IntermarkBrands

[REDACTED]

Manufacturing Location:

[REDACTED]

[REDACTED] [com](#)

Pulver Laboratories Inc. (PLI) Control Number: 5463X



TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 5 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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## **Pulver Laboratories Inc. (PLI) Certification**

### **PLI Equipment Categories**

Medical Electrical Equipment

### **CE Certification**

#### **European Community**

RF/EMC Category Classification: Class B – Residential  
Safety Medical EU Classification: Class 3 or Internally Powered Equipment  
Safety Medical Standard Classification: Class 3 or Internally Powered Equipment

#### **International Community**

RF/EMC Category Classification: Class B – Residential

### **European Community Directives**

- **EMC Directive** **2004/108/EC**
- **General Product Safety** **2001/95/EC**
- **Low-Voltage** **2006/95/EC**
- **Medical Devices** **2007/47/EC**

### **Tested and evaluated to the following standards**

- American National Standards Institute / National Fire Protection Agency 70-NEC 1993 National Electrical Code [National Fire Protection Agency standard number 70], 1993 Edition.
- American National Standards Institute / National Fire Protection Agency 70-NEC 1997 National Electrical Code [National Fire Protection Agency standard number 70], 1997 Edition.
- American National Standards Institute / National Fire Protection Agency 70-NEC 2002 National Electrical Code [National Fire Protection Agency standard number 70], 2002 Edition.
- American National Standards Institute / National Fire Protection Agency 70-NEC 2005 National Electrical Code [National Fire Protection Agency standard number 70], 2005 Edition.
- American National Standards Institute / National Fire Protection Agency 70-NEC 2008 National Electrical Code [National Fire Protection Agency standard number 70], 2008 Edition.



TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 6 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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- American National Standards Institute / National Fire Protection Agency 79 - Electrical Standard for Industrial Machinery (National Fire Protection Agency standard number 79], 1997 Edition.
- American National Standards Institute/National Fire Protection Agency 79 - Standard for Industrial Machinery. 2002 Edition.
- American National Standards Institute/National Fire Protection Agency 79 - Standard for Industrial Machinery, 2007 Edition.
- BS EN 60601-1: Medical Electrical Equipment. Part 1. General Requirements for Safety. Collateral standard. Safety requirements for medical electrical systems. August 1990 edition, including amendments A1 : May 1993; A11 : May 1993; A12 : May 1993; A2 : June 1995; A13 : January 1996.
- BS EN 60601-1: Medical Electrical Equipment. Part 1. General Requirements for Safety. Collateral standard. Safety requirements for medical electrical systems. 2001 edition.
- C22.1-02 Canadian Electrical Code, Part I (19<sup>th</sup> Edition), Safety Standard for Electrical Installations.
- CAN / CSA-C22.2 Number 601.1-M90 (R2001) Medical Electrical Equipment – Part 1: General Requirements for Safety.
- Underwriters Laboratories Inc. UL 60601-1 Medical Electrical Equipment, Part 1: General Requirements for Safety. 25 April 2003. First Edition.

### Referenced Standards

- BS EN 60601-01-02 entitled Medical electrical equipment. Part 1-2: 2002 General requirements for safety - Collateral standard: Electromagnetic compatibility - Requirements and Tests. English version. Second Edition. 2002.
- Canadian Electrical Code C22.1-1990, Part I, Sixteenth Edition.
- Canadian Standards Association C22.2 Number 0-M91, General Requirements – Canadian Electrical Code, Part II.
- Canadian Standards Association C22.2 Number 0.4-M1982, Bonding and Grounding of Electrical Equipment (Protective Grounding)
- Canadian Standards Association C22.2 Number 125-M1984, Electromedical Equipment. Environmental products / Health Care Technology. August 1984.
- Economic European Community 89/336/EEC EMC Directive.

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 7 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**APPENDIX  
INSTRUCTIONS FOR INSPECTOR  
TESTS AND INSPECTION AT THE FACTORY DURING THE REGULAR VISITS TO THE  
FACTORY**

**The only production test inspection requirements:**

**Assure the manufacturer continues to provide the same lithium ion battery for input power by checking the model number and manufacturer appropriate for the application.**

**Condition of acceptability for power source connected to product:**

**A power source appropriate for the application supplying input power for the system must supply a Safety Extra Low Voltage of less than or equal to 24 VDC through Current Limited Circuits.**

**The only production inspection requirements are**

- 1. Measure voltage on Lithium Polymer Battery with a calibrated digital voltmeter: 3.3 to 4.2VDC: test any 3 batteries per "manufacturing lot" from original manufacturer of battery. As an example, manufacturing lot may consist of 10,000 batteries, if manufactured during identical production run.**
- 2. Ensure the insulation suitable for the application for the leads soldered to the battery to their final destinations. These battery leads can never short circuit. This includes shorting through the metal housing.**
- 3. The CE mark label may be applied to the device packaging and to the actual device after successfully passing these production investigations.**

**None of the production tests in the remainder of this Appendix apply.**

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 8 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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### **INSTRUCTIONS FOR INSPECTOR**

- 1.0 Verify that the manufacturer has the required test equipment.
- 2.0 Verify that the equipment is functioning properly and all instruments have been calibrated at least once annually.
- 3.0 Observe that the manufacturer is performing the Dielectric Withstand Test on 100% of production, specifically on each unit (appliance) having a power supply cord with a grounding conductor. The 30 Amp Ground Continuity Test should follow on 100% of production on units having a power supply cord with a grounding conductor and operator accessible grounded metal external to the chassis.

### **RESPONSIBILITY OF THE MANUFACTURER**

- 1.0 The Grounding Continuity Test shall be conducted on 100% of production of each cord-connected unit (appliance) having a grounding conductor.
- 2.0 One hundred percent of production of each unit (appliance) covered by this Drawing shall be subjected to the 30 Amp Ground Continuity Test.
- 3.0 One hundred percent of production of each unit (appliance) covered by this Drawing shall be subjected to the Dielectric Withstand Test.
- 4.0 During the period of production, test equipment shall be checked for proper operation at least once daily.
- 5.0 The instruments used for required tests shall be calibrated at regular intervals (at least once annually). The manufacturer or an outside laboratory may do calibration. In either case, it shall be by comparison with a standard that is traceable to a National Standard. Certification of this calibration shall be maintained by the manufacturer and be available to PLI personnel.

### **MANUFACTURER'S GROUND CONTINUITY TEST EQUIPMENT**

- 1.0 Any suitable indicating device such as an ohmmeter, a battery and buzzer combination, or the like, may be used to determine compliance with the grounding continuity requirement.

### **MANUFACTURER'S 30 AMP GROUND CONTINUITY TEST EQUIPMENT**

- 1.0 The test equipment shall have a means of indicating the test current; an audible and/or visual indicator of electrical breakdown; and, for automated or station-type operations, either a manual-reset device to restore the equipment after electrical breakdown or an automatic-reject feature for any unacceptable unit (appliance).
- 2.0 The equipment shall include an ammeter in the output circuit to directly indicate the test current.
- 3.0 The equipment shall include an impedance meter indicating a minimum of 0.1 ohm and an ohms trip potentiometer.
- 4.0 The equipment shall be capable of delivering the unit under test 30 Amps of current with a no-load voltage not exceeding 12VAC between the ground terminal (pin) and each of the accessible dead-metal parts.
- 5.0 For the test, all grounded parts of the unit under test shall be conductively connected together by design to all other accessible metal or shall be tested separately.
- 6.0 The equipment specified below has been examined and found to be acceptable for use by this manufacturer in conducting the Production Line 30 Amp Ground Continuity Test:

<b>Manufacturer</b>	<b>Model Number</b>
ROD-L Electronics Inc.	M30

### MANUFACTURER'S DIELECTRIC WITHSTAND VOLTAGE TEST EQUIPMENT

- 1.0 The test equipment shall have a means of indicating the test potential; an audible or visual indicator of electrical breakdown; and, for automated or station type operations, either a manual-reset device to restore the equipment after electrical breakdown or an automatic-reject feature for any unacceptable unit (appliance). When an alternate current test potential is applied, the test equipment shall include a transformer having an essentially sinusoidal output.
- 2.0 When the rated output of the test equipment is less than 500 Volt-Amperes, the equipment shall include a voltmeter in the output circuit to directly indicate the applied test potential.
- 3.0 When the rated output of the test equipment is 500 Volt-Amperes or more, the test potential may be indicated by: (1) a voltmeter in the primary circuit or in a tertiary-winding circuit; (2) by a selector switch marked to indicate the test potential; or, (3) in the case of equipment having a single test-potential output, by a marking in a readily visible location to indicate the test potential. If an indicating voltmeter is not used, the test equipment shall include a visual means, such as an indicator lamp to indicate that the test voltage is present at the test-equipment output.
- 4.0 Test equipment other than described by Paragraphs 1 through 3 may be used if found to accomplish the intended factory control.
- 5.0 For the test, either a sufficient number of control devices are to be closed or separate applications of the test potential made, so that all parts of the primary circuit are tested.
- 6.0 The equipment specified below has been examined and found to be acceptable for use by this manufacturer in conducting the Production Line Dielectric Withstand Test:

Manufacturer	Model Number
ROD-L Electronics Inc.	M100DC

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 11 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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## **TESTS CONDUCTED ON 100% OF PRODUCTION**

### **GROUNDING CONTINUITY TEST**

- 1.0 Each unit (appliance) having a power supply cord with a grounding conductor shall be tested, as a routine production-line test, to ensure ground continuity between the grounding blade of the attachment plug cap and accessible dead-metal parts of the unit (appliance).
- 2.0 Only a single test need be made if the accessible metal selected is conductively connected by design to all other accessible metal.

### **30 AMP GROUND CONTINUITY TEST**

- 1.0 Each unit (appliance) shall withstand, as a routine production-line test, the application of 30 Amps of current with a no-load voltage not exceeding 12VAC between the ground terminal (pin) and the accessible dead-metal part located furthest away from the initial input ground and most likely to become energized.
- 2.0 The test equipment ohms trip potentiometer shall be set for 0.1ohm.
- 3.0 For the test, the input power earth ground terminal should be connected to one terminal of the test equipment; the second test equipment terminal connected to the accessible dead metal part.
- 4.0 The production test shall be not less than 5 seconds in duration.
- 5.0 The unit (appliance) may be at normal operating temperature, at room temperature, or at any intermediate temperature for the test.
- 6.0 The test shall be conducted when the unit (appliance) is fully assembled. It is not intended that the unit (appliance) be unwired, modified, or disassembled for the test.

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 12 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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### **DIELECTRIC WITHSTAND VOLTAGE TEST**

- 1.0 Each unit (appliance) shall withstand, without electrical breakdown, as a routine production-line test, the application of an alternate current potential at a frequency within the range of 47.5 – 66Hz or a direct current potential. This potential shall be applied between the primary wiring, including connected components, and accessible dead-metal parts that are likely to become energized.
- 2.0 The production test shall be at no less than the test time, and the alternate current or direct current potential of either Condition A or B of the following table:

#### **PRODUCTION TEST CONDITION**

<b>Condition A</b>				<b>Condition B</b>		
<b>Unit (Appliance) Rating</b>	<b>Time Potential VAC</b>	<b>Potential VDC</b>	<b>Time (Seconds)</b>	<b>Potential VAC</b>	<b>Potential VDC</b>	<b>Time (Seconds)</b>
250V or less	1582	2237	60	1900	2685	5

- 3.0 During the test, all primary circuit conductors of the unit (appliance) are to be connected together to one terminal of the test equipment; the second test equipment terminal connected to the accessible dead metal.
- 4.0 The test potential may be gradually increased to the required value, but the full value is to be applied for 5 seconds or 1 minute as required.

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 13 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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- 5.0 The unit (appliance) may be at normal operating temperature, at room temperature, or at any intermediate temperature for the test. The test shall be conducted when the unit (appliance) is fully assembled. It is not intended that the unit (appliance) be unwired, modified, or disassembled for the test.

**Exception Number 1**

Parts such as snap covers or friction-fit knobs that would interfere with performance of the test need not be in place.

**Exception Number 2**

The test may be performed before final assembly if the partial assembly represents a completed unit (appliance). Any component not included shall not affect the results with respect to determination of possible electric shock from incorrect wiring, defective components, insufficient spacings, etc.

- 6.0 Solid-state components that might be damaged by a secondary effect of the test (including voltage surge, excessive heating, etc.) may be short-circuited by means of a temporary electrical jumper or the test may be conducted without the component electrically connected, providing the wiring and terminal spacings are maintained.

## 1.0 Engineering Considerations

- 1.1 At the beginning of each section, [xxxx-xx] indicates the laboratory notebook number or the page number of the recorded data or project notes. If more than one technical person directed the Test Record, then the other notebooks and respective pages of the other technical people may be indicated/
- 1.2 For example, for the present report, [C4640-22] indicates that page number 22 of the project notes contains information pertaining to the final conclusions presented in this report. These project notes located in the technical file for this specific project.

Equipment Class:	Class III or Internally Powered Equipment (battery powered)
Pollution degree:	Pollution Degree 4
Equipment mobility:	Moveable
EUT Weight:	17 gram (0.60 oz)
EUT Dimensions:	Length = 11.78 cm (4.64 in.) Diameter = 0.95 cm (0.37 in.)
Connection to the supply:	Lithium Polymer battery
Rated ambient:	10 - 40 °C (50 - 104 °F)
For use with TN-S Power System	No

## 2.0 General [C4640-23]

- 2.1 Electrical Rating - In accordance with the Certification Body criteria, unit rated at VAC connection to the mains power:

(VDC) Volts Direct Current	3.3-4.2V
(Hz) Hertz	0
(mAh) milliAmpere-hour	250

Rating derived from Test Report Number One, Section 4.0 measurements, which represent the most severe test results for the input power supply.

2.2 **Spacings** - Minimum spacing maintained over-surfaces and through-air between:

- 2.2.1 uninsulated hazardous live-metal parts of opposite polarity;
- 2.2.2 uninsulated hazardous live-metal parts and secondary parts; and
- 2.2.3 uninsulated hazardous live-metal primary parts and dead-metal parts according to the following table:

Minimum Spacings mm (in.)		
Volts (RMS)	Through Air	Over a Surface
0 - 130	a. 1.5 (0.06)	2.0 (0.08)
	b. 8.0 (0.31)	8.0 (0.31)
	c. 1.5 (0.06)	2.0 (0.08)
131 - 250	a. 2.5 (0.10)	3.0 (0.12)
	b. 8.0 (0.31)	8.0 (0.31)
	c. 3.0 (0.12)	4.0 (0.16)

Minimum primary wiring spacing maintained between printed wiring board (PWB) traces according to the following equations (unless fused and current limited suitable for the application).

$$\text{Spacing (mm)} = 0.580 + (V_{\text{peak}} \times 0.0050) \text{ or}$$

$$\text{Spacing (in)} = 0.023 + (V_{\text{peak}} \times 0.0002)$$

2.3 **Internal Wiring** - Unless otherwise noted, all wiring is UL Listed or Recognized Component Appliance Wiring Material (AVLV2) or CSA Certified, of the following styles and types:

UL Style	CSA Type
<input type="checkbox"/> 1011	<input type="checkbox"/> TR-64
<input type="checkbox"/> 1007	<input type="checkbox"/> AWM
<input type="checkbox"/> 1015	<input type="checkbox"/> TEW
<input type="checkbox"/> VW-1	<input type="checkbox"/> SVT

2.3.1 Voltage and temperature ratings are suitable for the applications involved.

2.3.2 All wiring routed away from sharp edges and moving parts.



TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 16 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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- 2.4 **Corrosion Protection** - All ferrous metal parts suitably protected against corrosion by painting, plating, or the equivalent.
- 2.5 **Safety Extra Low-Voltage (SELV)** - Designates extra low voltage secondary circuit of less than 42.4 volts peak or direct current (DC) and less than 200 Volt-Amps (VA) protected by adequate creepage, clearance and distance through insulation.
- 2.6 **Wiring Terminations** - Unless otherwise noted, soldered connections are mechanically secured before soldering; or pressure terminal connectors of the closed-loop, open-spade with upturned ends or male / female quick disconnect type with positive engagement utilized. All crimp connections are double-crimped.
- 2.7 **Secondary Circuitry Connectors** - Unless otherwise noted, all connectors in the secondary circuitry are made of glass-filled nylon, diallyl phthalate, melamine, polycarbonate, epoxy resin, or phenolic with copper alloy pins.
- 2.8 **Circuit Diagrams** - For primary circuit diagram, see illustration or manufacturer's schematic available for this Evaluation Report.
- 2.9 **Printed Wiring Boards (PWB)** - A printed wiring board used in this equipment must:
- 2.9.1 be a UL Recognized Component, Printed Wiring (ZPMV2);
  - 2.9.2 have a flammability rating of 94V-1 for SELV circuitry or 94V-0 for all other circuitry; and
  - 2.9.3 have an operating temperature rating of at least 105 degrees Celsius (C).

The manufacturer has the responsibility to provide the inspector with either a copy of the Printed Wiring Board Recognition Report, Recognized Component Index, and/or Yellow-Card so the inspector can note the flammability rating, operating temperature rating, and maximum soldering time and temperature ratings for the printed wiring boards being used.

- 2.10 **Plastic Components** - All plastic components of significant size including enclosures, bezels, and large decorative plastics, are flame retardant and successfully meet agency flammability criteria for their application according to the following table.

<b>Minimum Flammability Ratings</b>	
Primary Circuit Enclosure	94V-0
Inside Primary Circuit Enclosure	94V-1 or HF-1
Outside Primary Circuit Enclosure	94HB
Secondary Circuit Enclosure	94V-2

The manufacturer has the responsibility to provide the inspector with either a copy of the Plastic Material Recognition Report, Recognized Component Index, and/or Yellow-Card so that the inspector can note the flammability rating and minimum thickness of the plastic materials being used.

- 2.11 **Grounding Circuitry** - not required.
- 2.12 **Initial Earth Ground** - not required.
- 2.13 **Enclosure Slots** - effectively none.
- 2.14 **Listing or Regulatory Agency Label** - See list of labels at the end of this Evaluation Report.
- 2.15 **Marking Type** - All markings noted in this report are silk screened onto EUT or consist of self-adhesive labels suitable for the surface of intended use. These labels have permanent adhesive and the following Recognitions and Certifications.

- UL Recognized Components (PGDQ2)
- CSA Certified

- 2.16 **Information Label** - See list of labels at the end of this Evaluation Report.

Example

BLEC LLC Charlotte, NC 28202 USA Product Name: Blu Cigs Disposable Model: 530-200001-XXX
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TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 18 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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- 2.17 **Fuse Label** – not required.
- 2.18 **Servicing Labels on chassis** – not required.
- 2.19 **Interconnecting Cables** - Unless noted, interconnecting cables are UL Listed Flexible Cord, or Recognized Component, Appliance Wiring Material (AVLV2), covered by PVC jacket. Terminate-in connectors marked with company name and part number at each end.
- 2.20 **Insulating Tubing / Sleeving** - UL Recognized Component, Extruded Tubing, Electrical (YDPU2); or Tubing, Processed (YDRY2); or Sleeving, Flame-Retardant (UZIQ2), rated 105 °C, 600 V. Minimum recovered wall thickness of 1/32 in. (0.8 mm) unless otherwise specified.
- 2.21 **Terminal Blocks** - - not required.
- 2.22 **Securement** – pressure fit.
- 2.23 **Telephone Network Voltages** – not required.
- 2.24 **Certificate of Conformance** – See “Parts available from RFI Controls Company” at end of this Evaluation Report.
- 2.25 **Instruction Manual Information** – The following information shall be contained within the User Instruction Manual for product safety.
- "**CAUTION** - No operator-serviceable parts inside unit."
- 2.26 **Permissible cordsets** – not required.
- 2.27 **List of Photographs Contained in this Report**
- FIGURE 1** PLI Photograph Number 5463C4640SJ-01 illustrates the front, top view of the Equipment Under Test.
- FIGURE 2** PLI Photograph Number 5463C4640SJ-02 illustrates the rear view of the Equipment Under Test.
- FIGURE 3** PLI Photograph Number 5463C4640SJ-03 illustrates the top, side view of the Equipment Under Test.
- FIGURE 4** PLI Photograph Number 5463C4640LG-01 shows the Equipment Under Test disassembled with all internal parts laid out on a cardboard display showing function and connections.
- FIGURE 5** PLI Photograph Number 5463C4640LG-02 illustrates a closer view of the parts inside the juice chamber (designated in this report as the rear of the EUT).

- FIGURE 6** PLI Photograph Number 5463C4640LG-03 illustrates a closer view of the parts inside the battery chamber (designated in this report as the front of the EUT). The front and rear of the EUT permanently connected in this disposable version of the EUT.
- FIGURE 7** PLI Photograph Number 5463C4640LG-04 illustrates a closer view of the chamber subassembly and micro controller.
- FIGURE 8** PLI Photograph Number 5463C4640LG-06 illustrates the alternated view of the chamber subassembly and micro controller.
- FIGURE 9** PLI Photograph Number 5463C4640LG-08 illustrates a closer view of the micro controller.
- FIGURE 10** PLI Photograph Number 5463C4640LG-09 illustrates connections on the lithium polymer battery.
- FIGURE 11** PLI Photograph Number 5463C4640LG-07 illustrates the other end of the lithium polymer battery.
- FIGURE 12** PLI Photograph Number 5463C4640LG-10 illustrates the heating wires wrapped around the fibrous wick.
- FIGURE 13** PLI Photograph Number 5463C4640SJ-04 shows the thermocouple wires and associated equipment during the temperature test and evaluation. Tiny suction pump shown in photograph attached to EUT to induce maximum EUT temperature.

2.28 **Configuration Control Components – refer to photograph descriptions on the following pages.**

- 2.28.1 **EUT** – Metal chassis measures 4.64 in (11.78 cm) long, diameter measures 0.37 in. (0.95cm). The weight is 17 gram (0.60 oz).
- 2.28.2 **Lithium polymer battery** – Manufactured by Huizhou Desay Polypower Battery Co., Ltd. Model number PO8500ED. Output voltage  $\geq 4.15\text{VDC}$ ; 250 mAh; power 0.85Wh.
- 2.28.3 **PCB** – Manufactured by Shenzhen Sheng Tong Xing Electronic Co., Ltd. Board material is FR-4; Polymeric material ii filament wound tubing, industrial laminates, vulcanized fiber and material for use in fabricating recognized printed wiring board.
- 2.28.4 **FET and Microcontroller** – Manufactured by Chiptech Semiconductor Ltd.,
- 2.28.5 **Cable** – Manufactured by Shenzhen Jin Shibo Technology Co LTD. UL approved.

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 20 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**FIGURE 1** PLI Photograph Number 5463C4640SJ-01 illustrates the front, top view of the Equipment Under Test.



TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 21 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**FIGURE 2** PLI Photograph Number 5463C4640SJ-02 illustrates the rear view of the Equipment Under Test.



TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 22 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

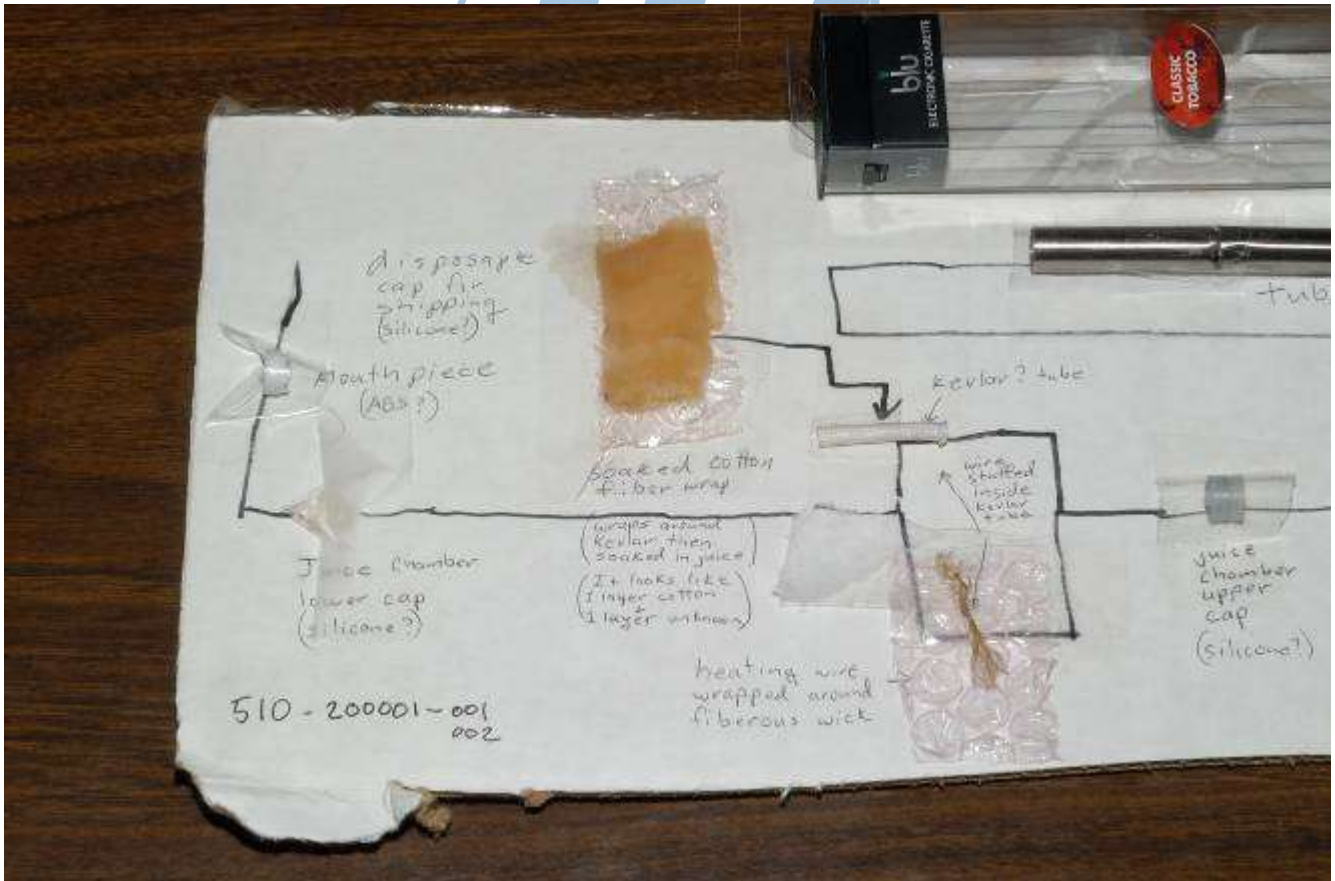
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**FIGURE 3** PLI Photograph Number 5463C4640SJ-03 illustrates the top, side view of the Equipment Under Test.

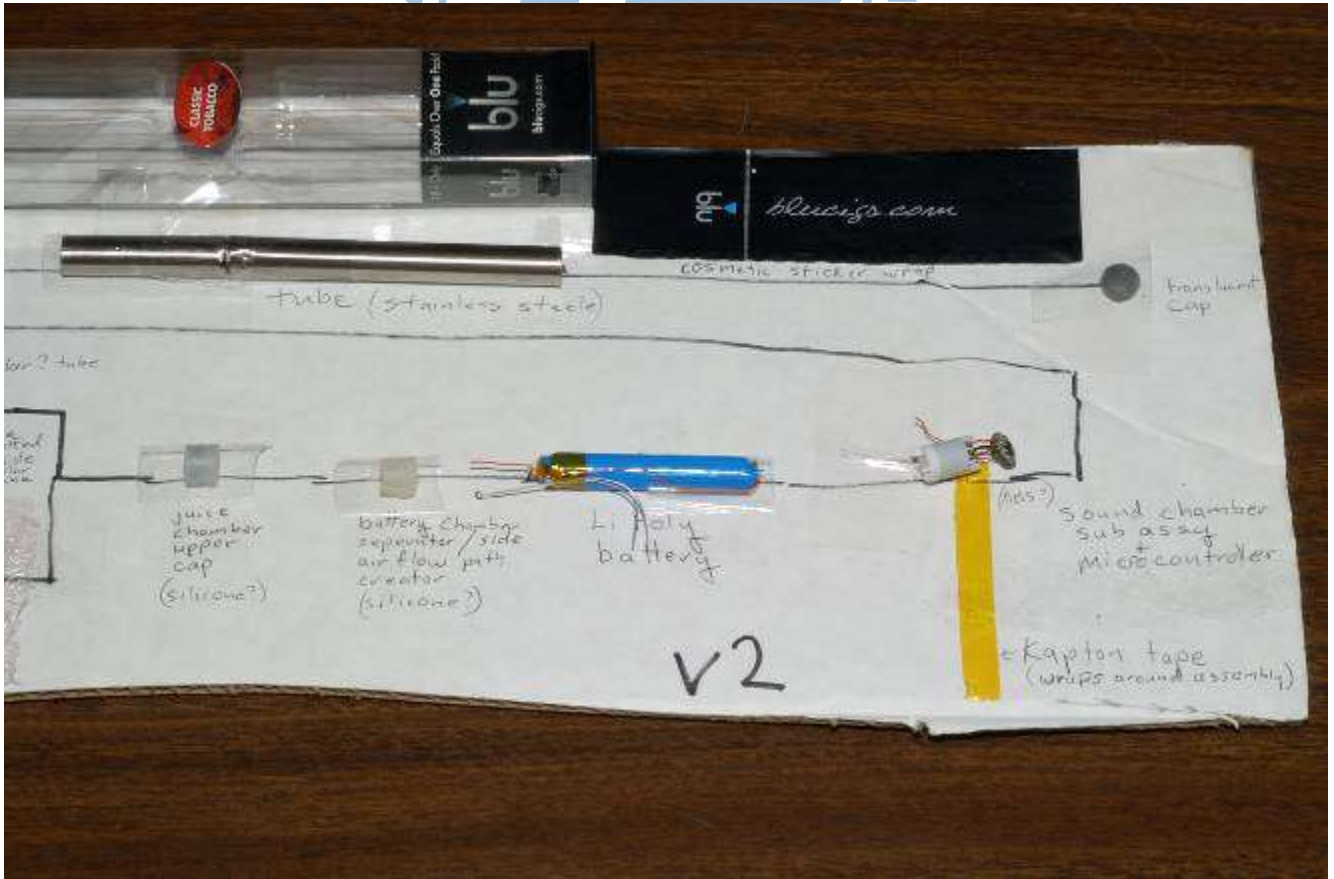




**FIGURE 5** PLI Photograph Number 5463C4640LG-02 illustrates a closer view of the parts inside the juice chamber (designated in this report as the rear of the EUT).



**FIGURE 6** PLI Photograph Number 5463C4640LG-03 illustrates a closer view of the parts inside the battery chamber (designated in this report as the front of the EUT). The front and rear of the EUT permanently connected in this disposable version of the EUT.

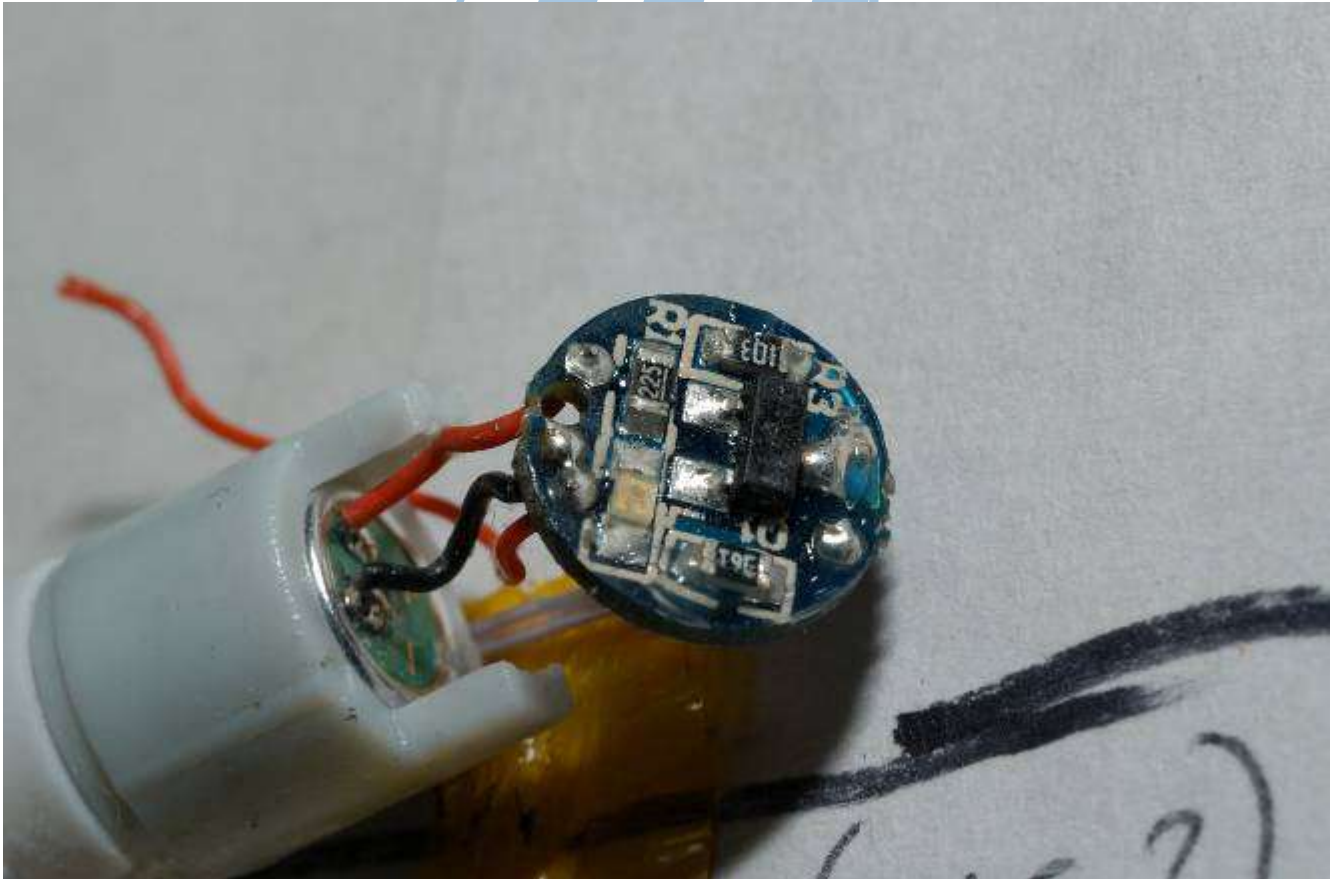


TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 26 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**FIGURE 7** PLI Photograph Number 5463C4640LG-04 illustrates a closer view of the chamber subassembly and micro controller.

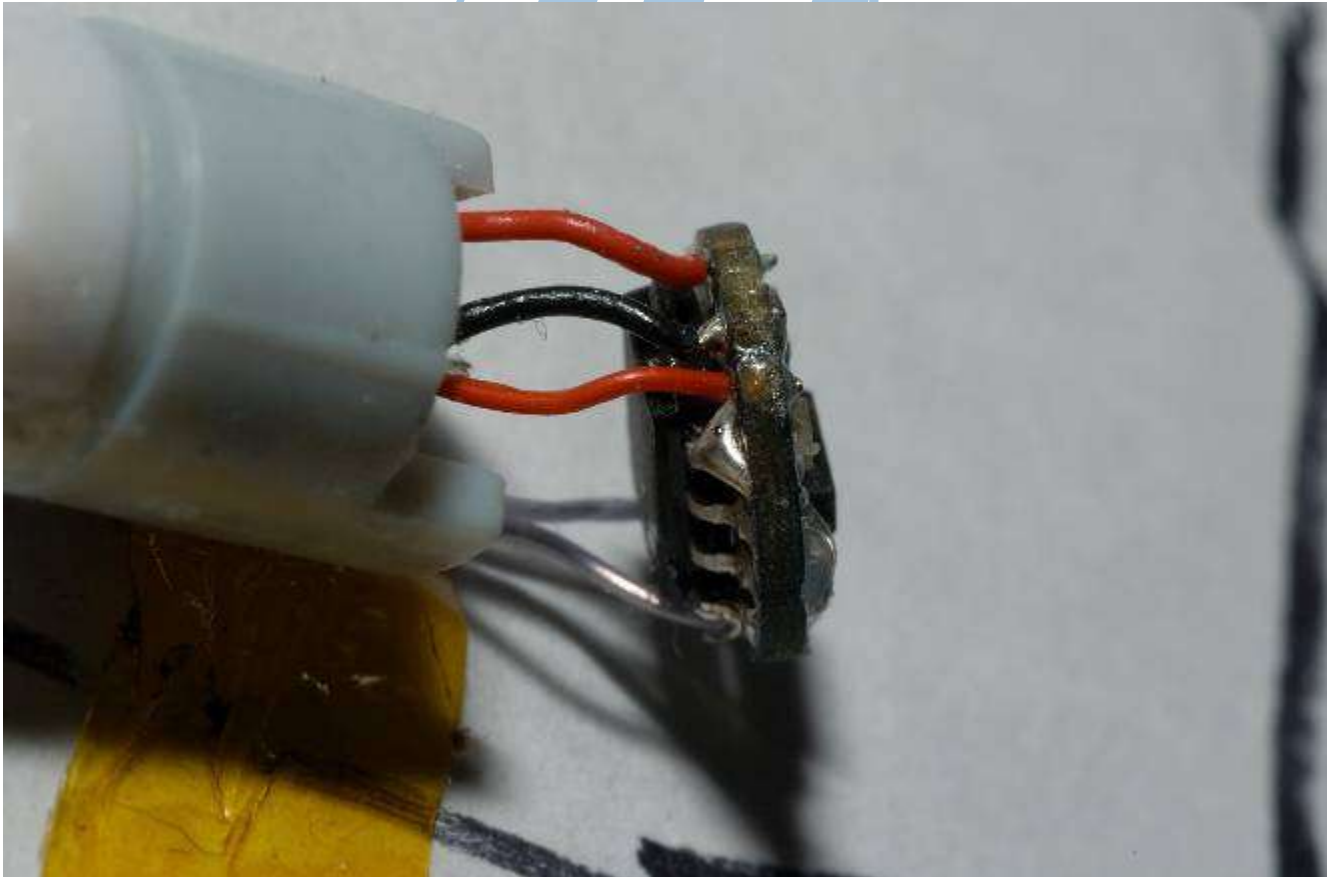


TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 27 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**FIGURE 8** PLI Photograph Number 5463C4640LG-06 illustrates the alternated view of the chamber subassembly and micro controller.

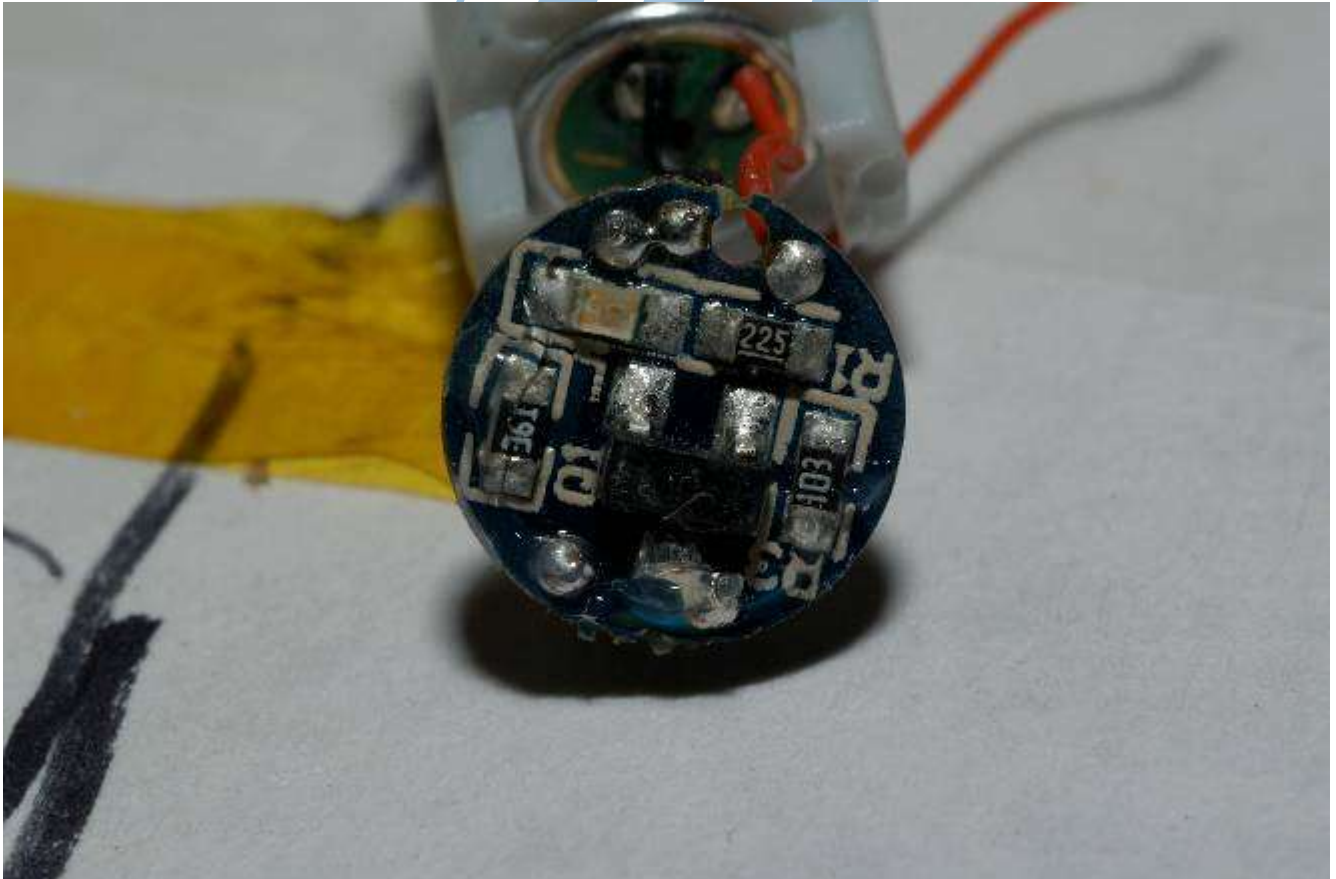


TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 28 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**FIGURE 9** PLI Photograph Number 5463C4640LG-08 illustrates a closer view of the micro controller.

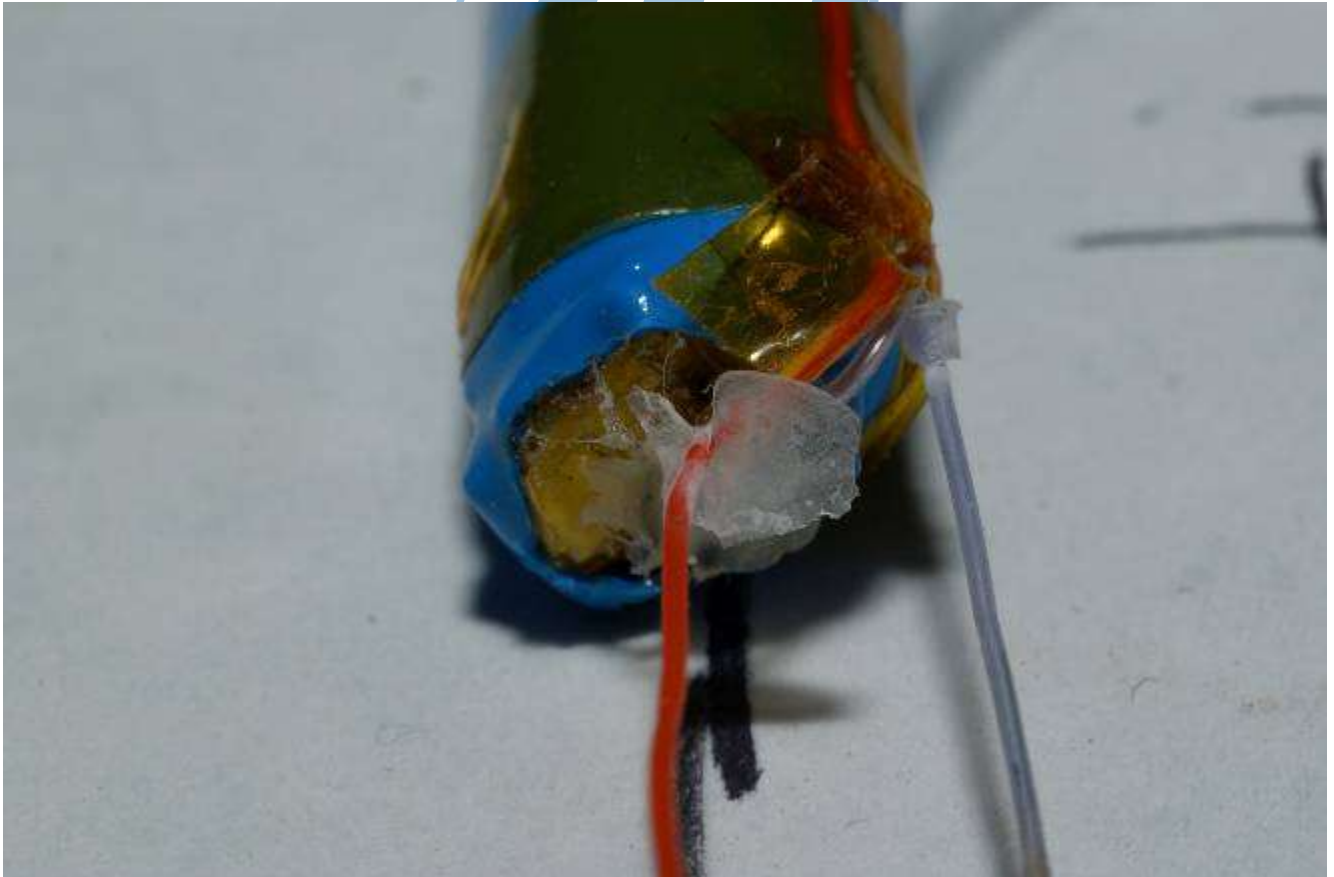


TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 29 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**FIGURE 10** PLI Photograph Number 5463C4640LG-09 illustrates connections on the lithium polymer battery.

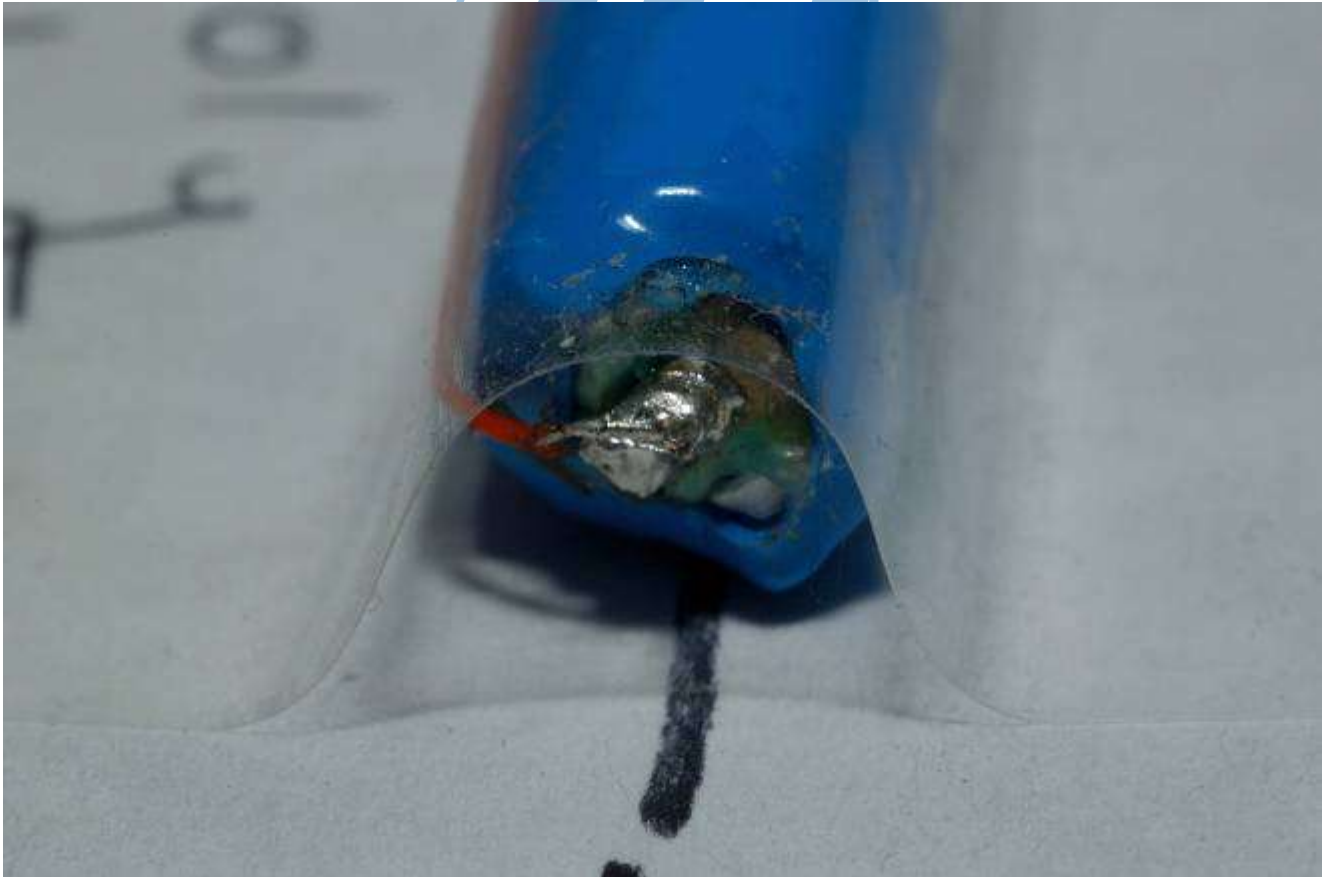


TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 30 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**FIGURE11** PLI Photograph Number 5463C4640LG-07 illustrates the other end of the lithium polymer battery.



TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

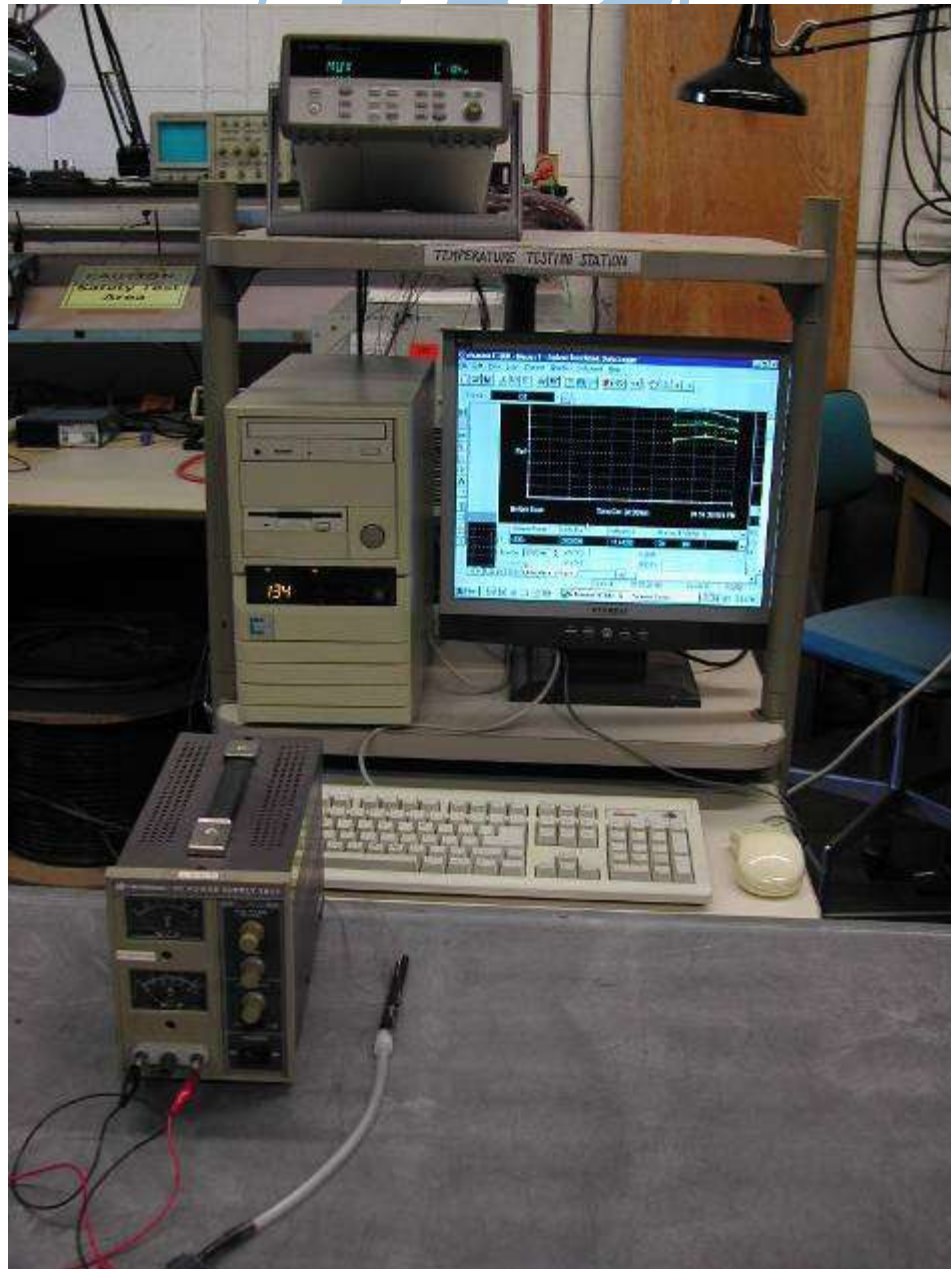
Page 31 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**FIGURE12** PLI Photograph Number 5463C4640LG-10 illustrates the heating wires wrapped around the fibrous wick.



**FIGURE 13** PLI Photograph Number 5463C4640SJ-04 shows the thermocouple wires and associated equipment during the temperature test and evaluation. Tiny suction pump shown in photograph attached to EUT to induce maximum EUT temperature.



TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 33 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**TEST RECORD NUMBER ONE – C4640**

**3.0** A sample of the product was submitted by the manufacturer and subjected to the tests shown in this report.

3.1 The test results in this section assume:

3.1.1 Metal enclosed mechanism battery powered by SELV battery.

3.2 The product was tested exclusively with the laboratory test equipment tabulated below. The laboratory test equipment used for each test can be traced to the following table by cross-referencing the test equipment's identification code (ID Code) listed directly to the left of each test result. Where multiple test results are presented in separate columns on the same page and different test equipment was used for the different tests, the first and second ID Codes correspond to the first and second columns; any additional columns of test results are designated using the same method.

TITLE: PLI Evaluation Report (Safety)  
 DRAWING: Q546302We.02.DWG.doc  
 BY: Phuong Nguyen and Lee Pulver

Page 34 of 54  
 Issued: 28 November 2010  
 Approved: Lee Pulver

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**Table of Laboratory Test Equipment Used With Identification Code**

ID Code	Equipment	Model	Inventory Number	Calibration Due
A	Valhalla Digital Multimeter	4440	7-6281	For Reference Only
B	Fluke Digital Thermometer	2175A	3225002	08/21/11
C	Valhalla Digital Power Analyzer	2101	3-5392	06/01/12
D	ROD-L (AC / DC) Hipot Tester	M100DC-5.5-5	08531	06/02/12
E	TPI Clamp Adapter	A296	454930074	For Reference Only
F	ROD-L 30 Amp Ground Tester	M30	06799	07/09/11
H	Walker Scientific ELF Monitor	ELF-50D LO=0.001 – 1.999 gauss HI= 0.01-19.99 gauss	K71260-201	09/20/11
I	Pulver Labs Electronic Tool Capacitor Discharge Test (ground continuous)		PLI Electronic Tool #5	No Calibration Required
J	Pulver Labs Electronic Tool Leakage Current Test (1500 ohms)		PLI Electronic Tool #1	Calibrate Before Each Test



TITLE: PLI Evaluation Report (Safety)  
 DRAWING: Q546302We.02.DWG.doc  
 BY: Phuong Nguyen and Lee Pulver

Page 35 of 54  
 Issued: 28 November 2010  
 Approved: Lee Pulver

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ID Code	Equipment	Model	Inventory Number	Calibration Due
K	Pulver Labs Electronic Tool Leakage Current Test (1500 ohms parallel to 112 nF)		PLI Electronic Tool #2	Calibrate Before Each Test
L	Omega Thermocouple Simulator (Calibration Standard)	CL-300-500C	639	05/29/11
M	Omega Thermocouple Simulator (Calibration Standard)	CL-300-500C	3496	05/29/11
N	Beckman Multimeter	TECH310	30119111	01/25/12
O	Chatillon Force Gage	DPPH-200	877	09/20/11
P	Datatech	386A-TC	0003495	01/25/12
Q	Eecos Electrical Safety Analyzer	1020-1	EC10-04562	08/26/11
R	Fluke High Voltage Probe	80K-40	0003489	05/27/11
T	Mercer Multimeter	9340	MEO5F1065	01/25/12
U	Mitutoyo	537-120	537-120-PLI1	09/19/11



TITLE: PLI Evaluation Report (Safety)  
 DRAWING: Q546302We.02.DWG.doc  
 BY: Phuong Nguyen and Lee Pulver

Page 36 of 54  
 Issued: 28 November 2010  
 Approved: Lee Pulver

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ID Code	Equipment	Model	Inventory Number	Calibration Due
V	Mitutoyo Combimice Digital Outside Micrometer	159-211	3132337	09/19/11
X	Sencore "Z Meter" Capacitor-Inductor Analyzer	LC53	66K325	No Calibration Required
Y	Tektronix 10MHz Storage Oscilloscope	T912	B0155551	07/17/11
Z	Valhalla Digital Watt Ammeter (Calibration Standard)	2000-3	4-744	06/14/12
A1	Valhalla Digital Power Analyzer	2101	37-1098	06/30/12
B1	Pulver Laboratories Electronic Tool Leakage Current Test (1500 ohms parallel to 0.22 $\mu$ FAs shown in Canadian Standards Association, Standard Number 22.2-950-93, ANNEX D, Figure D-1, Page 152)		PLI Electronic Tool #7	Calibrate Before Each Test
C1	Fluke Power Harmonics Tester	39	6836019	01/25/12
D1	Fluke AC Current Probe	80i-500s	67714014	01/25/12
E1	ROD-L (AC) Hipot Tester	M100AVS5-5.0-25	09184	For Reference Only
F1	Hewlett-Packard Multimeter (Calibration Standard)	3478A	2301A05450	Self-Calibrating



TITLE: PLI Evaluation Report (Safety)  
 DRAWING: Q546302We.02.DWG.doc  
 BY: Phuong Nguyen and Lee Pulver

Page 37 of 54  
 Issued: 28 November 2010  
 Approved: Lee Pulver

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ID Code	Equipment	Model	Inventory Number	Calibration Due
G1	ROD-L (AC) Hipot Tester	M100AVS5-2.8-40	0651	Calibrate Before Each Test
H1	Fluke Current Transformer	80I-600	59957	06/20/11
I1	Fluke Infrared Temperature Probe	80T-IR	80T-IR-PLI1	07/20/12
J1	Empro DC Ammeter Shunt (200A-100mV)	2-80	PLIN1	06/29/11
K1	Empro DC Ammeter Shunt (50A-50mV)	5-88	PLIO1	06/29/11
L1	Empro DC Ammeter Shunt (50A-50mV)	5-88	PLIP1	06/29/11
M1	Empro DC Ammeter Shunt (50A-50mV)	5-88	PLIQ1	06/29/11
O1	Fluke True-rms Multimeter	110	78140239	06/30/12
P1	FLUKE Multimeter	73 Series III	78850774	02/09/12
Q1	Pulver Laboratories Electronic Tool 40 position set of Type T thermocouples		PLI Electronic Tool #8	07/13/11



TITLE: PLI Evaluation Report (Safety)  
 DRAWING: Q546302We.02.DWG.doc  
 BY: Phuong Nguyen and Lee Pulver

Page 38 of 54  
 Issued: 28 November 2010  
 Approved: Lee Pulver

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ID Code	Equipment	Model	Inventory Number	Calibration Due
R1	Pulver Laboratories Electronic Tool 20 position set of Type T thermocouples		PLI Electronic Tool #9	09/20/11
S1	Pulver Laboratories Electronic Tool 20 position set of Type T thermocouples		PLI Electronic Tool #10	06/07/11
T1	Pulver Laboratories Electronic Tool 20 position set of Type T thermocouples		PLI Electronic Tool #11	07/26/11
U1	Pulver Laboratories Electronic Tool 40 position set of Type T thermocouples		PLI Electronic Tool #12	09/20/11
V1	Pulver Laboratories Electronic Tool 20 position set of Type T thermocouples		PLI Electronic Tool #13	06/07/11
W1	Fluke True-rms Multimeter (Calibration Standard)	179	81030117	06/30/12
X1	Pulver Labs Electronic Tool Leakage Current Test (1500 ohms)		PLI Electronic Tool #14	Calibrate Before Each Test
Y1	Pulver Labs Electronic Tool Leakage Current Test (1500 ohms parallel to 112 nF)		PLI Electronic Tool #15	Calibrate Before Each Test
Z1	Pulver Laboratories Electronic Tool Leakage Current Test (1500 ohms parallel to 0.22 $\mu$ FAs shown in Canadian Standards Association, Standard Number 22.2-950-93, ANNEX D, Figure D-1, Page 152)		PLI Electronic Tool #16	Calibrate Before Each Test
A2	Leader 100 MHz Direct / x10 Oscilloscope Probe	AC8616	LP-100X	Calibrate Before Each Test



TITLE: PLI Evaluation Report (Safety)  
 DRAWING: Q546302We.02.DWG.doc  
 BY: Phuong Nguyen and Lee Pulver

Page 39 of 54  
 Issued: 28 November 2010  
 Approved: Lee Pulver

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<b>ID Code</b>	<b>Equipment</b>	<b>Model</b>	<b>Inventory Number</b>	<b>Calibration Due</b>
B2	Agilent Data Acquisition / Switch Unit	34970A	MY41010924	07/08/11
C2	Agilent 20-Channel Armature Multiplexer	34961A	MY41001572	07/08/11
D2	Agilent 20-Channel Armature Multiplexer	34901A	MY41001577	07/08/11
F2	Variac Variable Transformer 0-140VAC	W5M	0003488	No Calibration Required
G2	Variac Variable Transformer 0-140VAC	W5MT3	W5MT3-PLI1	No Calibration Required
H2	Variac Variable Transformer 0-140VAC	W10MI3	W10MI3-PLI1	No Calibration Required
I2	Variac Variable Transformer 0-284VAC	W50H	W50H-PLI1	No Calibration Required
J2	Variac Variable Transformer 0-284VAC	W50H	W50H-PLI2	No Calibration Required
K2	Variac Variable Transformer 0-284VAC	W50H	W50H-PLI3	No Calibration Required
L2	Elgar Power Source	1751	974	No Calibration Required



TITLE: PLI Evaluation Report (Safety)  
 DRAWING: Q546302We.02.DWG.doc  
 BY: Phuong Nguyen and Lee Pulver

Page 40 of 54  
 Issued: 28 November 2010  
 Approved: Lee Pulver

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<b>ID Code</b>	<b>Equipment</b>	<b>Model</b>	<b>Inventory Number</b>	<b>Calibration Due</b>
M2	BK Precision DC Power Supply	1611	215-02657	No Calibration Required
N2	Omega Digital Thermometer	2175A	0003497	06/21/11
O2	3-Phase Leakage Current Test Tool		PLI Electronic Tool #17	Calibrate Before Each Test
P2	Leakage Current Tester for Medical Devices		PLI Electronic Tool #18	Calibrate Before Each Test
Q2	Risk Current Chassis Tester		PLI Electronic Tool #19	Calibrate Before Each Test
R2	Leakage Current Tester for Medical Devices		PLI Electronic Tool #20	Calibrate Before Each Test
S2	Risk Current Chassis Tester		PLI Electronic Tool #21	Calibrate Before Each Test
T2	Leakage Current Tester for 3-phase systems		PLI Electronic Tool #22	Calibrate Before Each Test



#### **4.0 Input Power Tests [C4640-60]**

- 4.1 DC power, per battery capabilities: Voltage 3.3 to 4.2VDC; maximum output current 1200mA; 4 watt wound wire heater type.

#### **5.0 Power Switch Cycling Tests [C4640-65]**

- 5.1 The EUT does not contain a power switch; therefore, this test is not required.
- 5.2 However, internal sensor activated approximately 500 times prior to weak battery curtailing the test.
- 5.3 No negative effects, including excessive temperature of EUT.

#### **6.0 Endurance Tests [C4640-66]**

- 6.1 The EUT operated approximately 500 puffs then stopped.

#### **7.0 Leakage Current Tests [C4640-67]**

- 7.1 The EUT is a two-wire battery powered system and does not have a ground connection; therefore, this test is not required.
- 7.2 The external chassis surface covered with insulating material; no human skin contact possible to external chassis.

#### **8.0 Grounding Impedance Tests [C4640-78]**

- 8.1 In a typical application, this test would be performed between the input power earth ground and any metal connected to this earth ground accessible by the operator. The present EUT, however, has no operator accessible grounded metal.

#### **9.0 Insulation Resistance Tests [C4640-80]**

- 9.1 This test is not required.

#### **10.0 Dielectric Withstand Voltage Test [C4640-82]**

- 10.1 This test is not required.

## 11.0 Temperature Tests [C4640-84]

B2 and C2

### 11.1

Test Designators	
THMC	Thermocouple Number.
t + x.x	Time from start-up.
T <sub>ave</sub>	Average temperature in degrees C.
T <sub>rise</sub>	Average temperature rise above ambient in degrees C.
t <sub>stab</sub>	Time from start-up to stabilization in hours.

11.2 Stabilization is a point where a steady increase in temperature halted and oscillation around a mean temperature began.

11.3 For the data in this report, "t" equals at least 16 hours.

11.4 All statistical data calculated using the four (4) consecutive temperature readings following stabilization. The four (4) columns containing these values are indicated by " **N** " adjacent to the time.

11.5 The temperature test data may show less than the ambient temperature. This results in temperature rise data equal to a negative number. Reason: the temperature-monitoring junction resides in a rapid air movement environment.

11.6 Copper-constantan (Type T) thermocouples were used to monitor temperatures at the indicated locations.

11.7 Thermocouple calibration before attaching to components in this section.

11.7.1 Thermocouples will typically be connected to a switch or interface card in groups of 10, 20, 30, or 40.

11.7.2 Each thermocouple group has temperature data available for the group, which shows a maximum deviation of 0.5 °C for the group.

11.7.2.1 Place thermocouples in (1) air, (2) touching no surface, (3) not touching each other, and (4) not close to any source of heat, cold or moving air.

11.7.2.2 Record each thermocouple every 30 minutes for 1.5 hours.

11.7.2.3 If any thermocouple temperature deviates by more than 0.5 °C, correct the thermocouple construction and redo the test.

11.7.2.4 Continue this process until the maximum deviation is 0.5 °C.

11.7.3 Calibration Data available for this thermocouple group upon request.

11.8 Input frequency was 60Hz and/or 50Hz, as indicated. The first readings, t+x.x, were recorded to initiate the process after the EUT was satisfactorily warm. Typically, these readings occur at t+3.5: Any group of four temperature readings may be recorded to determine stability after this initial reading. All rubber parts aiding ventilation were removed and the unit was loaded with the following configuration:

11.8.1 Method of activating the EUT:

11.8.1.1 Put the EUT on the Mini pump through the tub to puff 90 times before taking the first temperature reading.

11.8.1.2 Continue puffing 90 times between readings.

11.9 Thermocouple Locations:

Number	Location
1	Ambient
2	On rear EUT body, close to rear end
3	On middle EUT body of the, middle
4	On front EUT body, close to blue light

TITLE: PLI Evaluation Report (Safety)  
 DRAWING: Q546302We.02.DWG.doc  
 BY: Phuong Nguyen and Lee Pulver

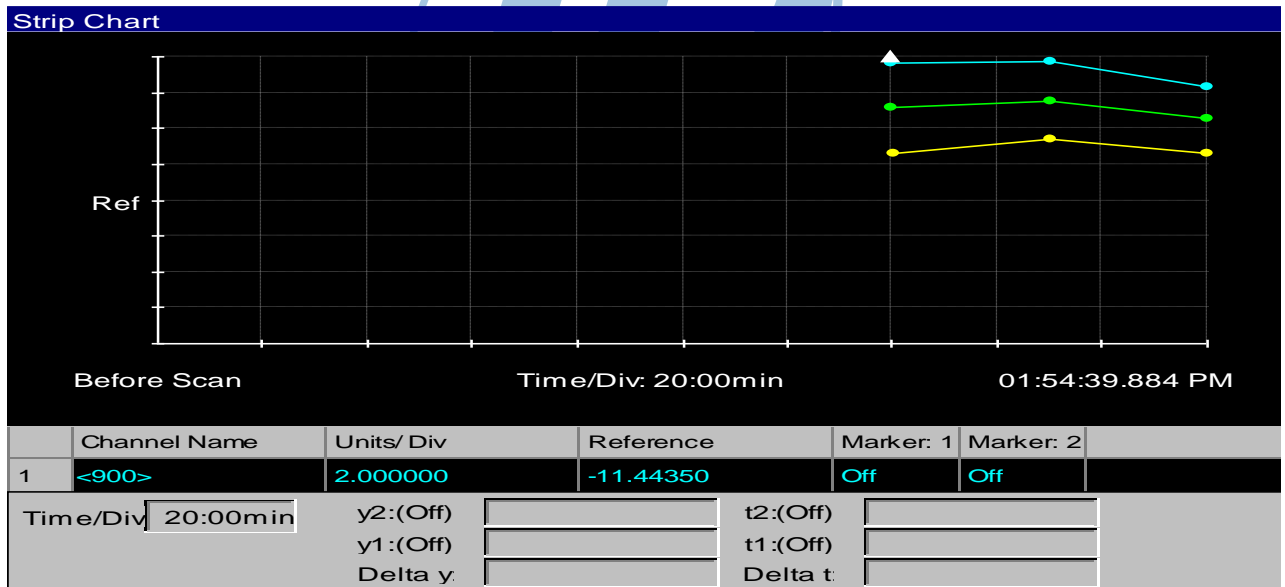
Page 44 of 54  
 Issued: 28 November 2010  
 Approved: Lee Pulver

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4.2 V Configuration		VDC			mAH		Watts	
		4.20			250.00			
(temperature readings in degrees celcius)								
THMC	t + 0.5	t + 1.0	t + 1.5	t + 2.0	t + 2.5	T AVE	T RISE	t STAB
1	20.82	21.39	21.27			21.33	0.00	0.50
2	24.62	25.13	26.41			25.77	4.44	0.50
3	30.15	29.96	32.27			31.12	9.79	0.50
4	38.56	35.03	38.95			36.99	15.66	0.50



The following graphs for the **4.2 VDC** temperature data show the temperature rise at each location. The graphed lines exhibit the temperature rise for each thermocouple location. This data derived by subtracting the data from each thermocouple location from thermocouple designated "1", since this is the ambient temperature.



Hence, the first line in the above chart shows the temperature rise of the surface connected to thermocouple number 2 (result of subtracting thermocouple 1 from thermocouple 2 temperature data). The third line in the above chart shows the temperature rise of the surface connected to thermocouple number 4.

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 46 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**12.0 Strain Relief Test** [C4640-98]

12.1 This test is not required since the EUT has no power cord.

**13.0 Power Supply Output Voltage Test** [C4640-98]

13.1 Equipment Under Test operated with an internal lithium polymer battery. Output voltage of the battery is 4.15Vdc.

**14.0 Convenience Receptacles** [C4640-99]

14.1 This test is not required since the EUT has no convenience receptacles.

**15.0 Short Circuit Current Measurement Test** [C4640-101]

15.1 No operator accessible voltage sources, so this test is not required external to the chassis.

15.2 Input power supplies suitable for the application.

15.3 Voltage sources current limited and over voltage protected.

15.4 Circuit completely enclosed in substantial metal tube.

**16.0 Abnormal Tests** [C4640-102]

16.1 This test not required since:

16.1.1 Input power source suitable for the application.

16.1.2 Voltage sources current limited and over voltage protected.

**17.0 Mechanical Abuse Test** [C4640-104]

17.1 This test not required since the chassis is constructed of substantial metal.

17.2 Destroyed EUT while accessing internal components: no access to excessive heat of excessive voltage evident.

**18.0 Stability Tests** [C4640-105]

18.1 This test is not required.

**19.0 Fan Locked Rotor Test** [C4640-106]

19.1 This test not required since the EUT contains no fans.

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 47 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**20.0 Failure of Fan Test** [C4640-107]

20.1 This test not required since the EUT contains no fans.

**21.0 Battery Protection Test (Lithium Battery)** [C4640-108]

21.1 This test not required, since the EUT contains Lithium Battery and circuit not accessible by external power source.

**22.0 Secondary Wiring Protection Test** [C4640-109]

22.1 The EUT contains no operator accessible voltages, therefore, this test was not required.

**23.0 Primary Input Power Capacitive Discharge Test** [C4640-111]

23.1 This test is not required: no connection to input power and no accessible current by operator.

**24.0 Extremely Low Frequency Test** [C4640-118]

H

24.1 Measure and record the magnetic field emanating from the Equipment Under Test (EUT), while the EUT operates at normal temperature.

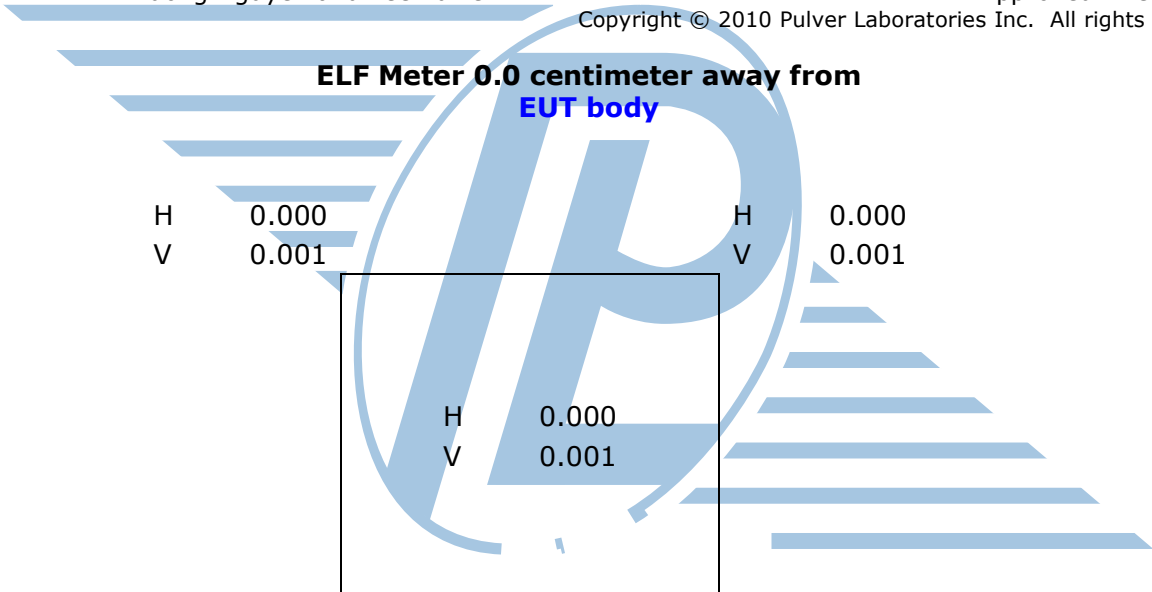
24.2 Do not measure with the EUT cold.

24.3 Record multiple sets of data with the hand held ELF meter at both 0.0 cm and 30.0 cm distance from the EUT face. Record these measurements from both horizontal (H) and vertical (V) ELF meter orientations at five (5) different locations associated with the EUT on the face.

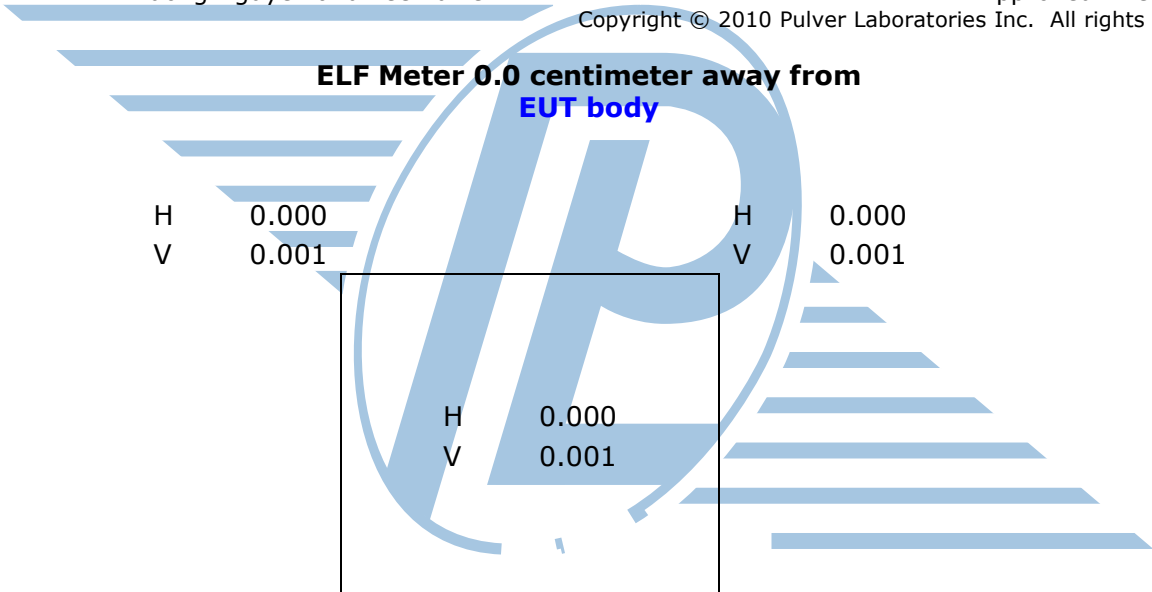
24.4 Unless otherwise indicated, side switch set to "LO", which yields a range of 0.001 to 1.999 gauss. If the switch set to "HI", measurements allowed equal 0.01 to 19.99 gauss.

24.5 The following graphical representations represent the face of the EUT and associated measurements in gauss.

**ELF Meter 0.0 centimeter away from  
EUT body**

H	0.000	H	0.000
V	0.001	V	0.001
			
H	0.000	H	0.000
V	0.001	V	0.001

**ELF Meter 30.0 centimeter away from  
EUT body**

H	0.000	H	0.000
V	0.000	V	0.000
			
H	0.000	H	0.000
V	0.000	V	0.000

TITLE: PLI Evaluation Report (Safety)  
DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 49 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**25.0 Drop Test for Portable Equipment Operated by Non-intrinsically Safe Batteries.**  
[C0436-LJP]

25.1 Not required; EUT not intrinsically safe and never used in explosive environments.

**26.0 Wall Adapter Test** [C4640-120]

26.1 This test is not required. EUT does not connect to wall adapter.

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DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 50 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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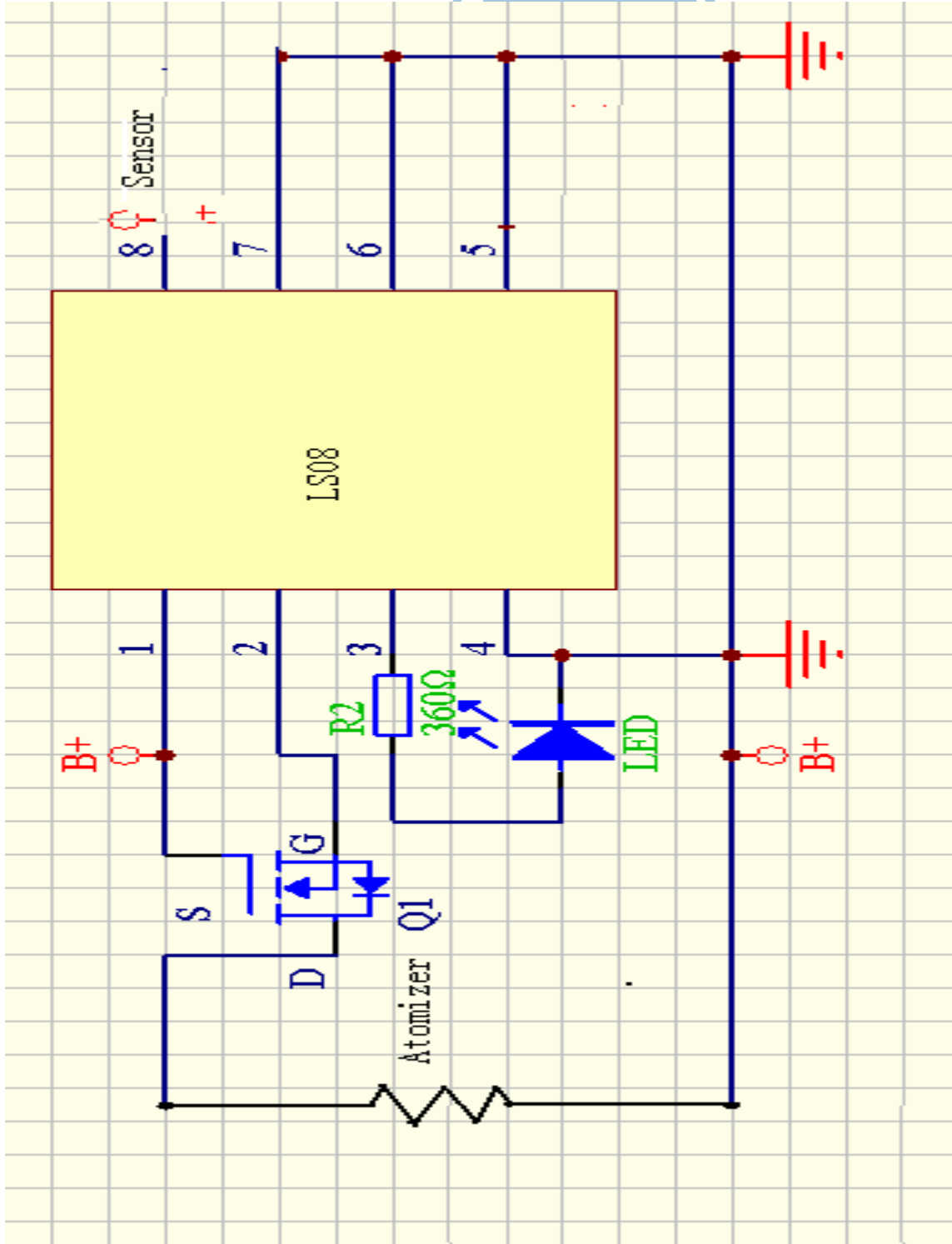


**Illustration**

Circuit Diagram

{Supplied by manufacturer; verified by Pulver Laboratories Inc.}





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DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 52 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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**Illustration**

Regulatory Labels and printing on packaging

[Provided by Manufacture; verified by Pulver Laboratories Inc.]

**Error! Objects cannot be created from editing field codes.**



TITLE: PLI Evaluation Report (Safety)  
 DRAWING: Q546302We.02.DWG.doc  
 BY: Phuong Nguyen and Lee Pulver

Page 53 of 54  
 Issued: 28 November 2010  
 Approved: Lee Pulver

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Refer to Pulver Laboratories Label Placement Drawing for a description of the labels and photographs of specific locations on this product.

<b>RFI Controls Components in Pulver Laboratories Report Q546302We.02.DWG.doc</b>				
Parts available from RFI Controls Company, Telephone: 408-399-7007				
<b>RFI Controls Company P/N</b>	<b>5463 P/N</b>	<b>Description</b>	<b>Per System Need</b>	<b>Date Part Added</b>
S546301.01.LBL	unspecified	Listing or Regulatory Agency Label	1	
S546302.01.LBL	unspecified	Information Label	1	
S524504	unspecified	Earth ground label	0	
S524527	unspecified	USA Wire Color code label	0	
Q528801	unspecified	CAUTION - Hazardous Voltage	0	
Q528802	unspecified	CAUTION - replace with same type fuse	0	
S546301.01.GEN	unspecified	Power Distribution Diagram	1	
Q546301WC.xx.D oC	unspecified	Pulver Laboratories Certificate of Conformance for the Blu Cigs Disposable, 530-200001-XXXX	1	
Q546301 WCe.xx.DoC	unspecified	Pulver Laboratories Certificate of Conformance for the Blu Cigs Disposable, 530-200001-XXXX (On Line version)	1	
Q546301 WDC.xx.DoC	unspecified	Declaration of Conformity for the Blu Cigs Disposable, 530-200001-XXXX	1	
Q5463 01 WDCe.xx.DoC	unspecified	Declaration of Conformity for the Blu Cigs Disposable, 530-200001-XXXX (On Line version)	1	



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DRAWING: Q546302We.02.DWG.doc  
BY: Phuong Nguyen and Lee Pulver

Page 54 of 54  
Issued: 28 November 2010  
Approved: Lee Pulver

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Signature Page - Last Page of Report

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Jessica Hayes

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**Quality Assurance by**

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Jessica Hayes

**Report Approved by**

Signed /Lee J. Pulver/  
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