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**Solderless LUMAWISE\* Z50 Light Emitting Diode (LED) Holder**

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**1. SCOPE****1.1. Content**

This specification defines performance, tests, and quality requirements for solderless LUMAWISE Z50 LED holder.

**1.2. Qualification**

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

Each mounting screw for the holder should be tightened to a torque between 0.4 and 0.6 Nm.

Stranded, solid, or fused wire sizes 22, 20, or 18 AWG can be used for the holder. It is recommended to use Underwriters Laboratories Inc. (UL) Appliance Wiring Material (AWM) Style 1007.

**2. APPLICABLE DOCUMENTS**

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

**2.1. TE Documents**

109-1	General Requirements for Testing
109-197	Test Specifications vs EIA and IEC Test Methods
114-32047	LUMAWISE Z50 (Type LK) Light Emitting Diode (LED) Holder for Philips Lumileds LUXEON K LED
114-32048	LUMAWISE Z50 Light Emitting Diode (LED) Holder
501-19197	Z50 Platform

**2.2. Industry Documents**

EIA-364, "Electrical Connector/Socket Test Procedures Including Environmental Classifications"

**3. REQUIREMENTS****3.1. Design and Construction**

Product shall be of the design, construction, and physical dimensions specified on the applicable product drawing.

**3.2. Materials**

Materials used in the construction of this product shall be as specified on the applicable product drawing.

**3.3. Ratings**

Voltage: 300 V AC/DC maximum per UL 1977

60 V DC maximum per IEC 60838-2-2

Current: 5 A maximum

Operating Temperature: -40° to ≤105°C

Storage Temperature: -20° to +60°C (used within 1 year)

Philips and Lumileds are trademarks.

### 3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical, and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

### 3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Visual Examination of Product	The product shall meet the requirements of related drawings.	Visual, dimensional, and functional inspection according to the quality inspection plan.
Final Examination of Product	The product shall not have visible marks of damage, break or defect before and after the execution of the tests.	EIA-364-18B
Electrical		
Low Level Contact Resistance (LLCR)	60 milliohms maximum initial $\Delta R$ 20 milliohms maximum	EIA-364-23, Option 1 Maximum open voltage: 20 mV Maximum current: 100 mA
Temperature Rise vs Current Curve	$\Delta T < 30K$ with $I = 5 A$	EIA 364-70, Method 2. Measure temperature rise at 0.5 A and increase current in steps of 0.5 A. After a stabilization period of 1 hour, up to 5 A. The holder with LED is mounted on a cooling device made from an 80 by 100 by 8-mm bare aluminum plate.
Withstanding Voltage	No creeping discharge, no flashover shall occur.	EIA 364-20 1.5 kV AC for 1 minute Leakage current shall not exceed 0.5 mA. Test between contacts versus ground plate.
Insulation Resistance	500 mega ohm minimum	EIA 364-21 Voltage: 500 V DC for 1 minute Test between contacts versus ground plate.
Mechanical		
Cable Retention Force	10 N minimum stranded wires 10 N minimum solid wires	EIA-364-13, Method A Testing speed is 25 mm/min.
Cable Insertion Force	15 N maximum stranded wires 15 N maximum solid wires	EIA-364-13, Method A Testing speed is 25 mm/min.
Vibration Test	No electrical discontinuity greater than 1 $\mu$ sec shall occur. No physical damage.	EIA 364-28 Vibration frequency: 20-500 Hz, 3.10-g peak Vibration direction: 3 mutually perpendicular directions Duration: 15 minutes each
Mechanical Shock	No electrical discontinuity greater than 1 $\mu$ sec shall occur. No physical damage.	EIA 364-27, Test Condition H Accelerated velocity: 30-g half sinusoidal shock pulses. Number of shocks: 3 in each direction applied along 3 mutually perpendicular directions. 18 total shocks.

Repairability of LED	See Note.	EIA-364-9 Mate and unmate specimens 5 times. One unmating and mating cycle consists of unscrewing socket, removing LED, replacing LED, and securing LED using 0.5 Nm.
Repairability of Wire Insertion (Solid Wires Only)	See Note.	Insert wire, then extract wire by turning. Insert new wire with the same gauge, then extract wire by turning. Insert wire with the same gauge again.
Environmental		
Temperature Life	See Note.	EIA-364-17, Method A, Test Condition 4 Subject mated specimens for 125 hours. Test temperature: 125°C
Thermal Shock	See Note.	EIA-364-32, Test Condition VIII Subject specimens to 25 cycles between -40° and 105°C with 30-minute dwells at temperature extremes and 1-minute transition between temperatures.
Damp Heat Cycling	See Note.	EIA-364-31, Method III Subject specimens to 10 cycles (10 days) between 25° and 65°C from 80 to 100% relative humidity.

**i** **NOTE**  
Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the product qualification and re-qualification test sequence given in Figure 2.

**Figure 1**

### 3.6. Product Qualification and Re-Qualification Test Sequence

TEST OR EXAMINATION	TEST GROUP (See Note 1)		
	A	B	C
	TEST SEQUENCE (See Note 2)		
Visual Examination of Product	1,4,6,8,11,13	1,3,5,7	1,9
LLCR	2,10		2,4,6,8
Temperature Rise vs Current Curve		6	
Withstanding Voltage		2	
Insulation Resistance		4	
Cable Retention Force	7		
Cable Insertion Force	3		
Vibration Test	12		
Mechanical Shock	13		
Repairability of LED	5		
Repairability of Wire Insertion (Solid Wires Only)	9		
Temperature Life			7
Thermal Shock			3
Damp Heat Cycling			5

(1) See paragraph 4.1.A.

(2) Numbers indicate sequence in which tests are performed.

**Figure 2**

#### **4. QUALITY ASSURANCE PROVISIONS**

##### **4.1. Qualification Testing**

###### **A. Specimen Selection**

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. All specimens shall be stored for 1 day at 50% relative humidity.

Each test group shall consist of 10 holders with 2 contacts being measured for each holder.

###### **B. Test Sequence**

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

##### **4.2. Re-Qualification Testing**

If changes that significantly affecting form, fit, or function are made to the product or manufacturing process, product assurance shall coordinate re-qualification testing consisting of all or part of the original testing sequence as determined by development/product, quality, and reliability engineering.

##### **4.3. Acceptance**

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens re-submitted for qualification. Testing to confirm corrective action is required before re-submittal.

##### **4.4. Quality Conformance Inspection**

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.