
LED Star-Board Holder

DESIGN OBJECTIVES

The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, Tyco Electronics makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, Tyco Electronics may change these requirements based on the results of additional testing and evaluation. Contact Tyco Electronics Engineering for further details.

1. SCOPE**1.1. Content**

This specification covers performance, tests and quality requirements for the Tyco Electronics LED Star-Board Holder which integrates the electrical connection and the thermal connection to the LED. The product can be quickly assembled using a simple tool without any soldering or thermal adhesive required.

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.

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. Tyco Electronics Documents

- 109-197: Test Specification (AMP Test Specifications vs EIA and IEC Test Methods)
- 114-13227: Application Specification (Light Emitting Diode (LED) Star Board Holder)
- 501-TBD: Qualification Test Report (LED Star-Board Holder)

2.2. Industry Document

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.

PRELIMINARY

3.3. Ratings

- Voltage: 50 volts DC maximum
- Current: 2.5 amperes maximum
- LED Rating: 0.5 to 3 watts (up to 5 watts optional)
- Temperature: -40 to 120°C

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
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Contact resistance.	18 milliohms maximum. ΔR 10 milliohms maximum.	EIA-364-6. Subject specimens to 2.5 amperes maximum. Use Tyco Electronics test board part number 60-1042337-1 (tin) for half of the specimens, and 60-1042337-3 (gold) for half of the specimens. See Figure 3.
Insulation resistance.	1 megohm minimum.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts. Use Tyco Electronics test board part number 60-1042337-2 (tin) for half of the specimens, and 60-1042337-4 (gold) for half of the specimens. See Figure 4.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1100 volts AC at sea level. Test between adjacent contacts. Use Tyco Electronics test board part number 60-1042337-2 (tin) for half of the specimens, and 60-1042337-4 (gold) for half of the specimens. See Figure 4.

Figure 1 (continued)

Test Description	Requirement	Procedure
LED temperature rise.	LED solder pads shall be below 84°C when tested at an ambient temperature of 25°C (84°C solder pad temperature equates to 135°C junction temperature at 3 watts input).	Subject specimens to 3 watts of input power using Philips LumiLED LUXEON III Star Board LED part number LXHL-LW3C (17°C with thermal resistance board to junction). See Figure 5.
MECHANICAL		
Random vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition VII, Condition E. Subject mated specimens to 4.90 G's rms between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes. See Figure 6.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Condition A. Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 6.
Durability.	See Note.	EIA-364-9. Manually mate and unmate specimens for 10 cycles.
Contact retention.	89 N [20 lbf] minimum.	EIA-364-29. Apply specified load to each contact and hold for 60 seconds. See Figure 7.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32. Subject specimens to 5 cycles between -40 and 120°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method III. Subject specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH with/without optional vibration and cold shock.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition C. Subject mated specimens to 105°C for 500 hours.

NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Initial examination of product	1	1	1	1	1
Contact resistance	2,6	2,7			
Insulation resistance			2,6		
Withstanding voltage			3,7		
LED temperature rise					2
Random vibration	4	6(c)			
Mechanical shock	5				
Durability	3	3			
Contact retention				2	
Thermal shock			4		
Humidity/temperature cycling		4	5		
Temperature life		5			
Final examination of product	7	8	8	3	3

NOTE

- (a) See paragraph 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) Discontinuities shall not be measured. Energize at 18°C level for 100% loadings per Quality Specification 102-950.

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. Each test group shall consist of a minimum of 5 specimens.

B. Test Sequence

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

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification 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 resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

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.

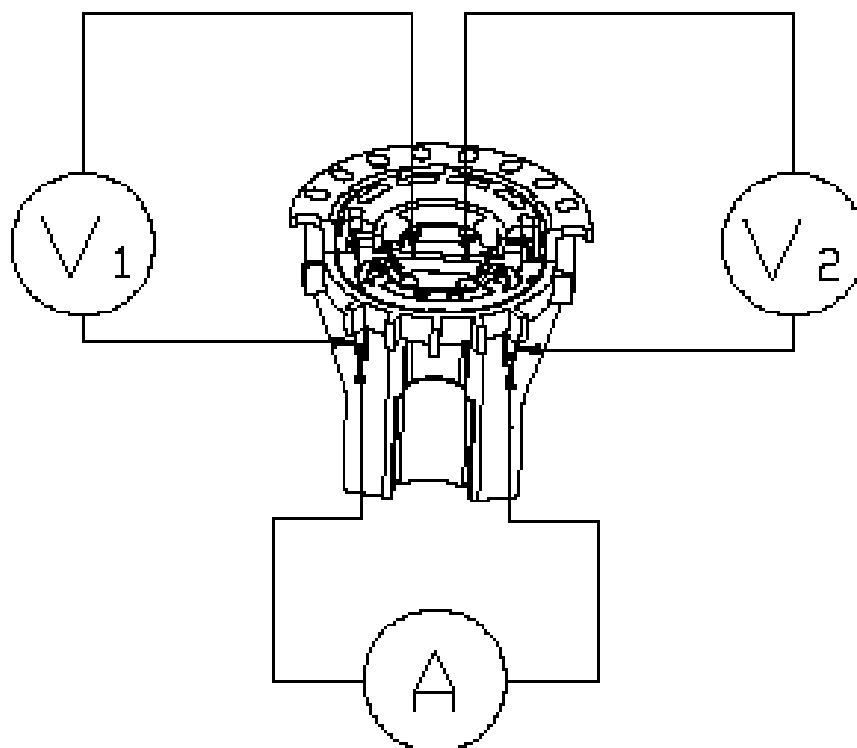


Figure 3
Contact Resistance Measurement Points

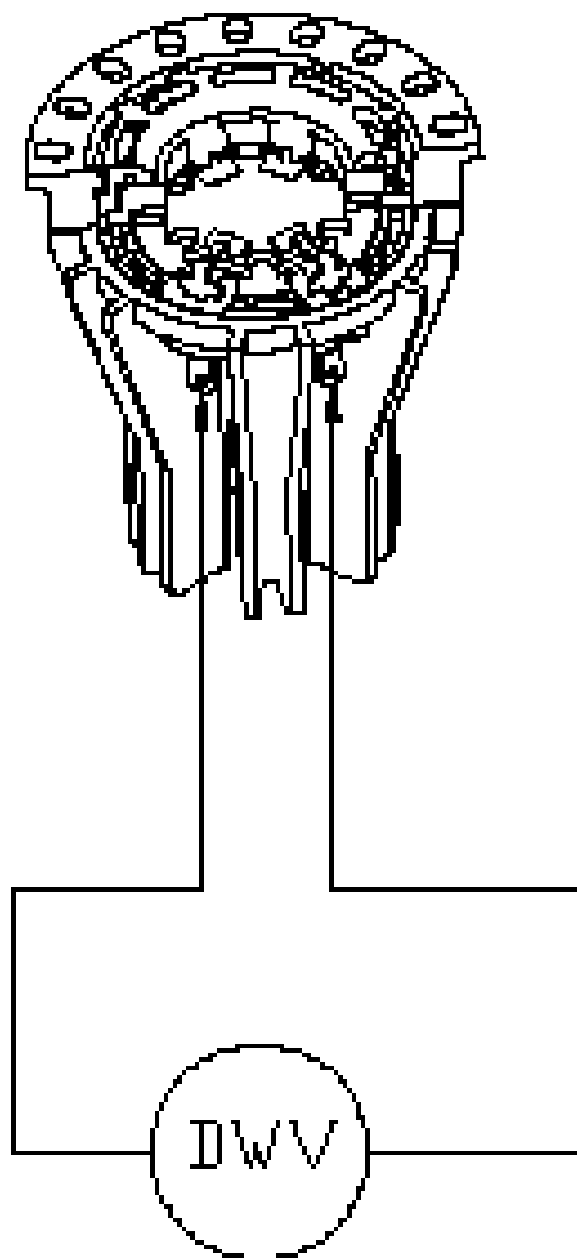


Figure 4
Dielectric Withstanding Voltage and Insulation Resistance Measurement Points

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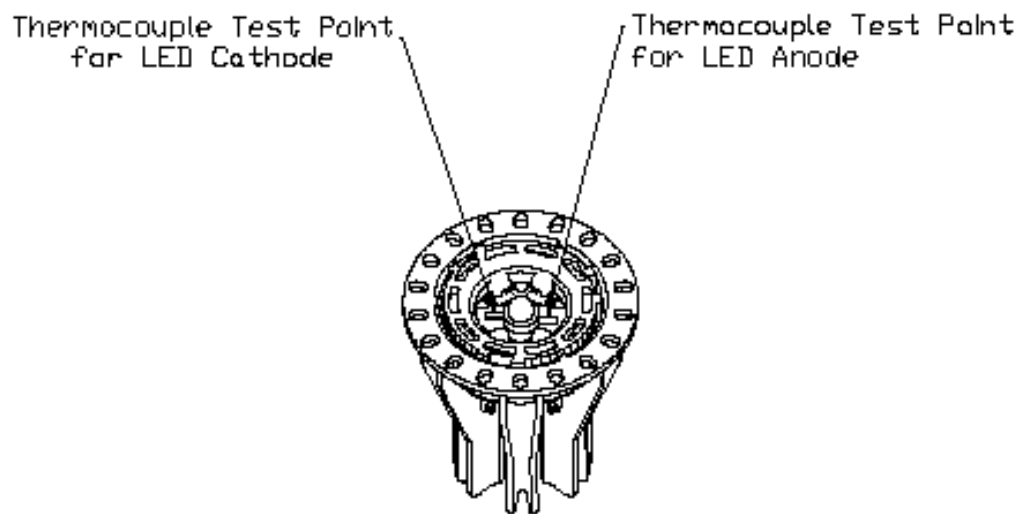


Figure 5
LED Temperature Rise

TBD

Figure 6
Vibration and Mechanical Shock Mounting Fixture

Contact Retention Pull Direction

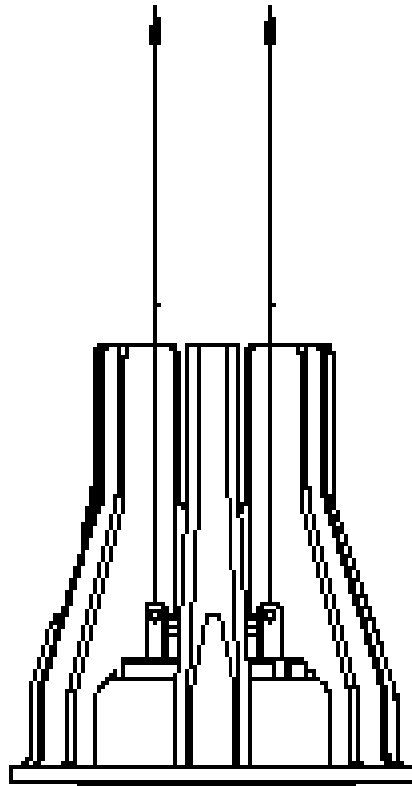


Figure 7
Contact Retention