Scalable LED Holder

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity Scalable LED Holder to be used with various COB (Chip on Board) LEDs as defined on the product drawing and application specification.

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.

1.3. Successful qualification testing on the subject product line was completed. The Qualification Test Report number for this testing is 501-134016. This documentation is on file at and available from Engineering Practices and Standards (EPS).

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

- 114-32043: Application Specification
- 501-134016: Qualification Test Report

2.2. Industry Document

EIA-364: Electrical Connector/Holder Test Procedures Including Environmental Classifications

2.3. Reference Document

109-197: Test Specification (Tyco Electronics Test Specifications vs EIA and IEC Test Methods)

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: 250 volts AC/DC
- Current: 4 amperes maximum
- Temperature: -40 to 105°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 and Application Specification 114-32043.	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		
Low Level Contact Resistance (LLCR).	10 milliohms maximum initial. 30 milliohms maximum final.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Insulation resistance.	2000 megohms minimum initial. 1000 megohms minimum final.	EIA-364-21. 500 volts DC, 2 minute hold. Test between holder wire and heat sink mounting surface
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1000 volts AC at sea level (metal substrate LEDs). 2050 volts AC as sea level (ceramic substrate LEDs) Test between holder wire and heat sink mounting surface.
Temperature rise vs current.	30°C maximum temperature rise at specified current.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C.
MECHANICAL		
Sinusoidal vibration.	No discontinuities of 1 microsecond or longer duration. See Note (a).	EIA-364-28, Test Condition I. Subject mated specimens to 10 to 55 to 10 Hz traversed in 1 minute with 1.5 mm maximum total excursion. Two hours in each of 3 mutually perpendicular planes. See Figure 4.

Figure 1 (continued)

Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note (a).	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 4.
Wire insertion force.	15.6N maximum for solid wire. 29.0N maximum for stranded and prebond wire.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute.
Wire retention force.	19.0N minimum (solid wire) 15.0N minimum (stranded wire)	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm per minute.
Thermal spring force.	7.2N minimum @ 0.05mm 14.5N minimum @ 0.25mm	EIA-364-13. Measure force necessary to lift LED off of heat sink at a maximum rate of 12.7 mm per minute. See Figure 5.
ENVIRONMENTAL		
Thermal shock.	See Note (a)	EIA-364-32, Test Condition I. Subject unmated specimens to 50 cycles between -40 and 105°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity/temperature cycling.	See Note (a)	EIA-364-31, Method III. Subject unmated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH
Temperature life.	See Note (a)	EIA-364-17, Method A, Test Condition 4, Test Time Condition B. Subject mated specimens to 130°C for 500 hours.

NOTE (a): *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 (b)			
	1	2	3	4
	Test Sequence (c)			
Initial examination of product	1	1	1	1
LLCR	3,6	2,7		
Insulation resistance			2,6	
Withstanding voltage			3,7	
Temperature rise vs current		3,8		
Sinusoidal vibration	4	6		
Mechanical shock	5			
Wire insertion force	2			
Wire retention force	7			
Thermal spring force				3
Thermal shock			4	
Humidity/temperature cycling		4(d)	5	
Temperature life		5		2
Final examination of product	8	9	8	4

NOTE ***(b)*** *See paragraph 4.1.A.*
(c) *Numbers indicate sequence in which tests are performed.*
(d) *Precondition with 5 durability cycles*

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. Test group 1 shall consist of a minimum of 10 holder assemblies terminated to 18AWG solid copper wire, 20AWG solid copper wire, 22AWG solid copper wire, 18AWG prebond wire, 20AWG prebond wire, and 18AWG 16 strand wire. Test group 2 shall consist of a minimum of 10 holder assemblies terminated to 18AWG solid copper wire, and a minimum of 1 holder assemblies terminated to 20AWG solid copper wire, 22AWG solid copper wire, 18AWG prebond wire, 20AWG prebond wire, and 18AWG 16 strand wire. Test group 3 shall consist of a minimum of 10 holder assemblies terminated with 18AWG wire. Test group 4 shall consist of a minimum of 10 holders un-terminated with wire.

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.

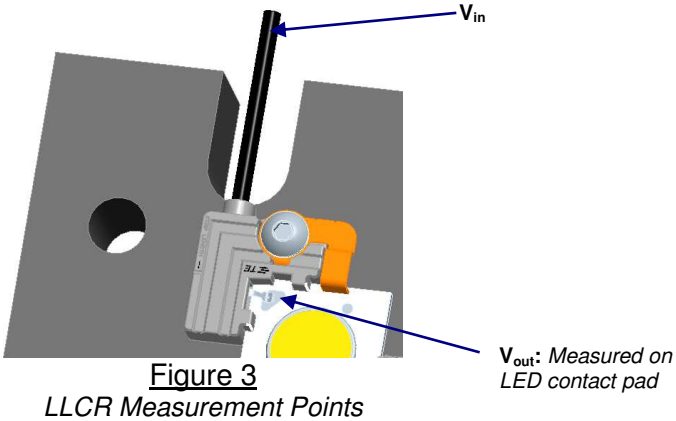

Figure 3
LLCR Measurement Points

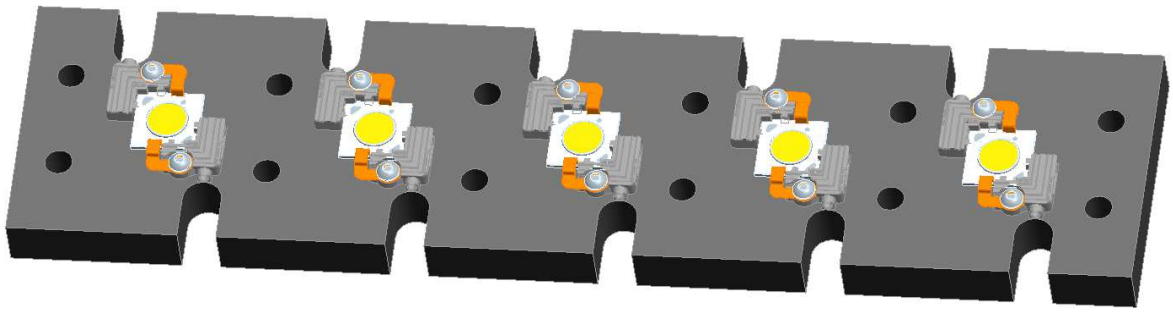

Figure 4
Vibration & Mechanical Shock Mounting Fixture

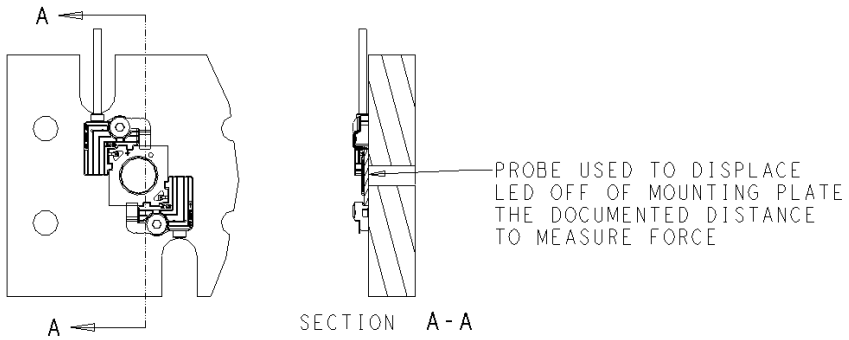

Figure 5
Thermal Spring Force Measurement