
SMT LED Bulb Connector

1. SCOPE

1.1. Content

This specification covers performance, qualification requalification test and requirements for the TE Connectivity Surface Mount (SMT) LED Bulb connector.

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. Qualification Test Results

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 Series: Test Specifications as indicated in Figure 1
- 114-106066: Application Specification (TBD)
- 501-106075: Qualification Test Report (SMT LED Bulb Connector)

2.2. Commercial / Industry Standards

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

2.3. Reference Document

109-197: Test Specification (TE 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 for UL Certification; 50 volts for IEC Certification
- Current: 3 amperes maximum
- Temperature: -40 to 125°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	Procedures
Initial examination of product	Meets requirements of product drawing and AMP Specification.	Visual and dimensional inspection per product drawing. Per EIA364-18
Final examination of product	Meet visual requirements. And no corrosion influence performance	Visual inspection. Per EIA364-18

7.2 Electrical

Test Description	Requirement	Procedures
Low level contact resistance (LLCR)	60 mΩ Max. (Initial & Final)	Subject specimens to 20mV Max. open circuit at 10mA. Need to exclude wire resistance from measurement. Per EIA364-23 or TE Spec. 109-5311-1
Insulation resistance	100 MΩ Min.	Subject specimens to 500VDC, 2 minute hold. Test between adjacent contacts. Per EIA364-21
Withstanding Voltage	1 minute hold with no breakdown or flashover	1500 V AC at sea level. Test between adjacent contacts. Per EIA364-20, Condition 1
Temperature rise (Initial)	30° C maximum temperature rise with 3A current pass.	Stabilize at a single current level until 3 readings at 5 minute intervals are within 1 ° C. Energize 100% of the circuit. Per EIA364-70, Method 1
Temperature rise (Final)	30° C maximum temperature rise with 3A current pass.	Stabilize at a single current level until 3 readings at 5 minute intervals are within 1 ° C. Energize 100% of the circuit. Per EIA364-70, Method 1

7.3 Mechanical

Test Description	Requirement	Procedures
Resistance to reflow soldering heat	Housing shall be free for deformation and fusion.	AMP Spec 109-201, Condition B.
Random Vibration	No discontinuities of 1 microsecond or longer duration.	Subject mated specimens to 3.10G's rms between 20~500HZ. Fifteen minutes in each of 3 mutually perpendicular planes. Per EIA-364-28, Test Condition VII, Condition D.
Mechanical shock	No discontinuities of 1 microsecond or longer duration. See note	Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. Per EIA-364-27, Condition H.
Durability (Contact) Refer to Appendix	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence (Item 8.0)	Mate and unmated specimens for 30 cycles at a maximum rate of 500 cycles per hour. Per EIA-364-09.
Durability (Plastic Bump) Refer to Appendix	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence (Item 8.0)	Mate and unmated specimens for 5 cycles at a maximum rate of 500 cycles per hour. Per EIA-364-09.
Mating force	20 N max	Measure force necessary to mate specimens at a maximum rate of 12.7mm per minute. Per EIA-364-13

Unmating force	4 N min	Measure force necessary to unmate specimens at a maximum rate of 12.7mm per minute. Per EIA-364-13
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7.4 Environmental

Test Description	Requirement	Procedures
Thermal shock	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence (Item 8.0)	Subject specimens to 25 cycles between -40 and 125 °C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures. Per EIA-364-32, Test Condition VII.
Humidity (Temperature cycling)	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence (Item 8.0)	Subject specimens to 10 cycles (10 days) between 25 and 65 °C at 80 to 100% RH. Per EIA-364-31, Method III.
Temperature life	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence (Item 8.0)	Subject mated specimens to 125 °C for 500 hours. Per EIA-364-17, Method A, Test Condition 5.

3.6. Product Qualification Test Sequence

Test group	a	b	c	d	e	f
Initial examination of product	1	1	1	1	1	1
Low level contact resistance (LLCR)	2,10	2,8	2,6,10	2,6	2,6	
Insulation resistance			3,7,11	3,7		
Withstanding Voltage			4,8,12	4,8		
Temperature rise (Initial)					3	
Temperature rise (Final)					5	
Resistance to reflow soldering heat						2
Random Vibration	6	6				
Mechanical shock	7	7				
Durability (Contact)		5				
Durability (Plastic Bump)	5					
Mating force	3,9	3				
Unmating force	4,9	4				
Thermal shock			9			
Humidity (Temperature cycling)			5		4	
Temperature life				5		
Final examination of product	11	9	13	9		3

Notes:

- 1) 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 5 pcs specimens minimum.
- 2) Numbers indicate sequence in which tests are performed.
- 3) 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 partial of the original test sequence as determined by development/product, quality and reliability engineering.
- 4) Acceptance is based on verification that the product meets the requirement of **Test Requirements and Procedures Summary**. Failures attributes 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.
- 5) 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.

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification / Requalification 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

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.

5. REFERENCE DRAWING

