

Design Objectives

Rev O1

Standard LGH Connectors, Series 1/2I, 1/2LI, 1I, 1LI, 2I, 3I and 4I

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 LGH standard high voltage 1/2I, 1/2LI, 1I, 1LI, 2I, 3I and 4I series molded end leads and receptacles. These leads and receptacles are designed for commercial, industrial and military type applications requiring operation over wide environments.

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 Series: Test Specifications as indicated in Figure 1

• 109-197: AMP Test Specifications vs EIA and IEC Test Methods

114- : Application Specification
 501- : Qualification Test Report

2.2. Commercial Standard

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

2.3. Military Standard

MIL-STD-202: Test Methods For Electronic And Electrical Component Parts

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:

• 1/2I: 10 kilovolts

1/2Ll: 15 kilovolts
 11: 20 kilovolts
 1Ll: 25 kilovolts
 21: 30 kilovolts
 31: 40 kilovolts
 41: 50 kilovolts
 Temperature: -55 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 per EIA-364.

3.5. Test Requirements and Procedures Summary

| Test Description | Red | quirement | 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. |
| | ELE | CTRIC A L | |
| Contact resistance. | 100 milliohms maximum. | | EIA-364-6. Measure potential drop of mated specimens at 1 ampere maximum. Calculate resistance. See Figure 3. |
| Insulation resistance. | 5000 megohms minimum. | | EIA-364-21. Test between contacts of mated lead connector assemblies and ground. |
| Withstanding voltage. | Series 1/2I 1/2LI 1I 1LI 2I 3I 4I 5 microampere | Test Voltage (kvDC) 15 23 30 38 45 55 60 es maximum leakag | EIA-364-20, Condition I. Test between contacts of mated lead connector assemblies and ground. |

Figure 1 (cont)

Rev O1 2 of 6



| Requirement | Procedure | |
|---|---|--|
| MECHANICAL | | |
| No discontinuities of 10 microseconds or longer duration. See Note. | EIA-364-28, Test Condition I. Subject mated specimens to 10-55- 10 Hz traversed in 1 minute with 1.5 mm [.06 in] maximum total excursion. 2 hours in each of 3 mutually perpendicular planes. | |
| No discontinuities of 1 microsecond or longer duration. See Note. | EIA-364-27, Method H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. | 00 |
| See Note. | EIA-364-9. Mate and unmate gold plated specimens for 500 cycles and tin plated specimens for 50 cycles at a maximum rate of 500 cycles per hour. | 11Dec00 |
| 20 ounces maximum. | | OBJECTIVES |
| 3 ounces minimum. | | SIGN OBJ |
| ENVIRONMENTAL | - | Щ |
| See Note. | EIA-364-32. Subject specimens to 5 cycles between -55 and 125°C. | Ω |
| See Note. | EIA-364-31, Method II, Condition A. Subject specimens to 40°C and 90 to 95% RH for 96 hours. | |
| See Note. | EIA-364-17, Method A, Test Condition 5, Test Time Condition A. Subject mated specimens to 125°C for 96 hours. | |
| | MECHANICAL No discontinuities of 10 microseconds or longer duration. See Note. No discontinuities of 1 microsecond or longer duration. See Note. See Note. 20 ounces maximum. 3 ounces minimum. ENVIRONMENTAL See Note. See Note. | MECHANICAL No discontinuities of 10 microseconds or longer duration. See Note. EIA-364-28, Test Condition I. Subject mated specimens to 10-55-10 Hz traversed in 1 minute with 1.5 mm [.06 in] maximum total excursion. 2 hours in each of 3 mutually perpendicular planes. No discontinuities of 1 microsecond or longer duration. See Note. EIA-364-27, Method H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Note. EIA-364-9, Mate and unmate gold plated specimens for 500 cycles at a maximum rate of 500 cycles at a maximum rate of 500 cycles at a maximum rate of 500 cycles per hour. 20 ounces maximum. AMP Spec 109-35, Measure force necessary to engage using gage 2 to a depth of .19 inch for 1/2I and 1/2LI and .25 inch for 11, 1LI, 2I, 3I and 4I. See Figure 4. 3 ounces minimum. AMP Spec 109-35. Size 3 times using gage 2. Then insert gage 1 to depth of .19 inch for 1/2I and 1/2LI and .25 inch for 11, 1LI, 2I, 3I and 4I and measure force necessary to separate. See Figure 4. EINVIRONMENTAL See Note. EIA-364-32. Subject specimens to 5 cycles between -55 and 125°C. See Note. EIA-364-31, Method II, Condition A. Subject specimens to 40°C and 90 to 95% RH for 96 hours. EIA-364-17, Method A, Test Condition 5, Test Time Condition A. Subject mated specimens to 125°C |

Figure 1 (cont)

Rev O1 3 of 6



| Test Description | Requirement | Procedure | |
|---|-------------|--|--|
| Barometric pressure, temperature cycling. | | MIL-STD 202, Method 105C, Condition C. | |
| Hermetic seal. | He/sec. | MIL-STD 202, Method 112C, Condition C. | |

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 Group (a) | |
|--|-------------------|---------|
| Test or Examination | 1 | 2(c) |
| | Test Sequence (b) | |
| Initial examination of product | 1,19 | 1,18 |
| Contact resistance | 4,8 | 5,9 |
| Insulation resistance | 2 | 3 |
| Withstanding voltage | 3,11,15 | 4,13,17 |
| Vibration | 9 | 10 |
| Mechanical shock | 10 | 11 |
| Durability | 7 | 8 |
| Contact engaging force | 5,17 | 6 |
| Contact separating force | 6,18 | 7 |
| Thermal shock | 14 | 15 |
| Humidity, steady state | 12 | 14 |
| Temperature life | 16 | |
| Barometric pressure, temperature cycling | 13(d) | |
| Hermetic seal | | 2,12,16 |
| Final examination of product | 19 | 18 |

NOTE

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) This test group is applicable to hermetic seal type receptacles only.
- (d) HiPot is performed at each temperature extreme and reduced barometric pressure, 70000 feet.

Figure 2

Rev O1 4 of 6



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 28 lead assemblies and receptacles; 4 each from 1/2I, 1/2LI, LI, 1LI, 2I, 3I and 4I series. Test group 2 shall consist of 14 hermetic seal type receptacles; 2 each from 1/2I, 1/2LI, LI, 1LI, 2I, 3I and 4I series.

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.

Rev O1 5 of 6

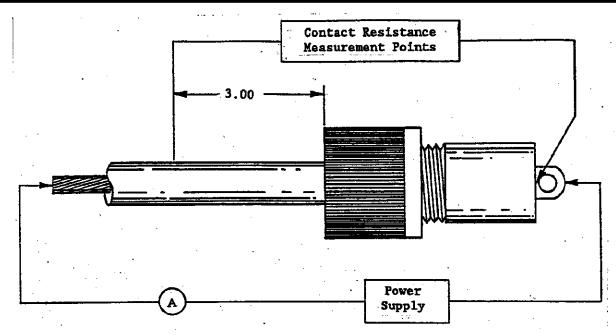
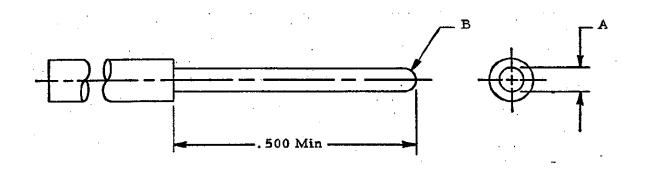


Figure 3
Contact Resistance Measurement Points



| Gage Number | A Dimension | B Dimension | |
|-------------|-------------------|--------------|--|
| 1 | .0165 +.0001/0000 | Maximum flat | |
| 2 | .0635 +.0000/0001 | .015 | |

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Contact: Size 16

Material: Tungsten carbide

Figure 4
Engaging & Separating Gage

Rev O1 6 of 6