

## 108-60131

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### Slimline SAS Receptacle Connector

#### 1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the Slimline SAS Receptacle Connector.

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in Table 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing. Product Qualification or Requalification test should follow the test groups and test sequence defined in Table 2.

#### 2. APPLICABLE DOCUMENTS

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

- 2.1. TE Connectivity (TE) Documents
  - 501-160088 Qualification Test Report
- 2.2. Industry Documents
  - EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications

#### 3. **REQUIREMENTS**

3.1. Design and Construction

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

#### 3.2. Materials and Finish

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

#### 3.3. Ratings

| • | Working Voltage: | 30 VAC rms.   |
|---|------------------|---------------|
| • | Current:         | 0.5A          |
| • | Temperature:     | -40°C to 85°C |

3.4. Performance and Test Description

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Table 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.



# 3.5. Test Requirements and Procedures Summary

|                        | Iable 1  |  |   |  |  |  |  |  |  |
|------------------------|--|--|---|--|--|--|--|--|--|
|                        | Test Item  | Requirement  | Procedure   |  |  |  |  |  |  |
| 1                      | Examination of Product                           | Meets requirements of product drawing. No physical damage.   | Visual inspection.  |  |  |  |  |  |  |
|                        | Electrical Requirement                           |  |   |  |  |  |  |  |  |
| 2                      | Low Level Contact<br>Resistance                  | Initial : 20m $\Omega$ max for 850hm<br>Initial: 80 m $\Omega$ max for 1000hm<br>After test: $\Delta R$ 20 m $\Omega$ max. | 100 milliamperes minimum and 20 millivolts<br>open circuit voltage maximum.<br>Detail see figure 1.<br>(EIA-364-23B)  |  |  |  |  |  |  |
| 3                      | Dielectric withstanding<br>Voltage               | No breakdown between adjacent<br>contacts.   | <ol> <li>Unmated connector, apply [500V] AC<br/>(rms) for 1 minute between adjacent<br/>terminals or ground.</li> <li>Mated connector, apply [300V] AC (rms)<br/>for 1 minute between adjacent terminal or<br/>ground.<br/>(EIA-364-20)</li> </ol>  |  |  |  |  |  |  |
| 4                      | Insulation Resistance                            | [ 1000 ] Mega-ohms Min.  | Mated connector, apply 100V DC between<br>adjacent terminals or ground.<br>(EIA-364-21)   |  |  |  |  |  |  |
| 5                      | Temperature Rising                               | 30°C Max. Under loaded rating current.   | Contact series-wired, apply test current of<br>loaded rating current to the circuit, and<br>measure the temperature rising by probing<br>on soldered areas of contacts, after the<br>temperature becomes stabilized deduct<br>ambient temperature from the measured<br>value.<br>(EIA-364-70) |  |  |  |  |  |  |
| Mechanical Requirement |  |  |   |  |  |  |  |  |  |
| 6                      | Mating Force <u>5.7 Kg</u> f ( <u>55.5N)</u> Max |  | Operation Speed: [25.4] mm/min.<br>Measure the force required to mate<br>connector.<br>(EIA-364-13)   |  |  |  |  |  |  |
| 7                      | Unmating Force                                   | 1). 3~24N w/o latch.<br>2). 5.1Kgf(50N) Min with latch.  | Operation Speed: [25.4] mm/min.<br>Measure the force required to unmate<br>connector.<br>(EIA-364-13)   |  |  |  |  |  |  |
| 8                      | Durability                                       | No evidence of physical damage.  | Operation Speed: 25.4 mm per minute.<br>Durability Cycles: 250 Cycles<br>(EIA-364-09)   |  |  |  |  |  |  |
| 9                      | Durability<br>(Preconditioning)                  | No evidence of physical damage.  | Perform 50 cycles (EIA-364-09)  |  |  |  |  |  |  |

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| 10 | Vibration                              | No evidence of physical damage.<br>No interruptions: 1 usec Max.<br>After test: $\triangle R$ 20 m $\Omega$ max.                   | 10-55-10 Hz Traversed in 1 minutes at<br>1.52mm amplitude 2 hours each of 3<br>mutually perpendicular planes;Electrical<br>discontinuity less than 1us.<br>(EIA-364-28)   |  |  |  |  |  |  |
|----|--|--|---|--|--|--|--|--|--|
| 11 |  | No ovidence of physical demogra  | Pulse width: 11msec   |  |  |  |  |  |  |
|    | Mechanical Shock                       | No interruptions: 1 usec Max   | Wave form: half sine 490m/s2 {50G}  |  |  |  |  |  |  |
|    |  | After test: $\triangle R 20 \text{ m}\Omega \text{ max}.$  | 3 strokes in each direction of X, Y and Z   |  |  |  |  |  |  |
|    |  |  | axes, total 18 strokes.   |  |  |  |  |  |  |
|    |  |  | (EIA-364-27 Condition A)  |  |  |  |  |  |  |
| 12 | Reseating                              | No evidence of physical damage.  | Manually unplug/plug the connector or socket, perform 3 such cycles.  |  |  |  |  |  |  |
|    | Environmental Requirements             |  |   |  |  |  |  |  |  |
| 13 | Solder ability                         | The inspected area of each lead<br>must have 95% solder coverage<br>minimum.   | <ul> <li>Steam Aging Preconditioning:</li> <li>1. Intended for non-tin and non-tin-alloy lead finishes for 93+3/-5°C、 1hrs.</li> <li>2. Intended for tin and tin-alloy lead finishes for 93+3/-5°C、 8hrs.</li> <li><jesd22-b102, c="" condition=""></jesd22-b102,></li> <li>Solder pot temperature: 245±5°C, 5sMax.</li> </ul>  |  |  |  |  |  |  |
| 14 | Resistance to Reflow<br>Soldering Heat | No physical damage shall occur.<br>( <b>Lead-Free</b> )<br>(See Note 2)  | Pre-soak condition, 85°C/85%RH for 168<br>hours.<br>Pre Heat: 150~180°C, 90±30sec.<br>Heat: 230°C Min., 30±10sec.<br>Peak Temp.: <u>255±5°C</u> , 10sec.<br>Duration: 3 cycles<br>Test spec:109-201,condition B, see figure 2   |  |  |  |  |  |  |
| 15 | Thermal Shock                          | See Note 1   | Mated Connectors<br>-40+/-3°C (30 min.), +85+/-2°C (30 min.)<br>Perform this cycle, repeat 10 cycles<br>(EIA-364-32)  |  |  |  |  |  |  |
| 16 | Humidity & Temperature<br>Cycling      | See Note 1   | Humidity: 90% - 95%<br>Temperature Range: 25°C to 65°C<br>Cycle Definition: Each cycle should last 8<br>hours. The cycle is a 2 hour dwell at the<br>low temperature, a 2 hour ramp from the<br>low temperature to the high temperature, a<br>2 hour dwell at the high temperature, and a<br>2 hour ramp from the high temperature to<br>the low temperature.<br>Duration: 60 cycles. (480 hours)<br>(EIA-364-31) |  |  |  |  |  |  |
| 17 | Humidity                               | Appearance no obviously<br>deformation and rusting. Test<br>insulation resistance and<br>dielectric withstanding voltage is<br>ok. | Subject mated Connectors to 96 hours at<br>40±2℃ with 90~96% RH.<br>(EIA-364-31 Method II Test Condition A.)  |  |  |  |  |  |  |



| 18 | Temperature Life                   | See Note 1 | Mated Connector 105℃, 300 hours, (EIA-<br>364-17 Method A.)  |
|----|------------------------------------|------------|--|
| 19 | Temperature Life<br>(Precondition) | See Note 1 | Mated Connector 105℃, 72 hours, (EIA-<br>364-17 Method A.)   |
| 20 | Thermal Cycling                    | See Note 1 | Cycle mated connector between $15^{\circ}C$ +/-3 $^{\circ}C$<br>and $85^{\circ}C$ +/-3 $^{\circ}C$ . Ramps should be 1 $^{\circ}C$ min.<br>per minute, and dwell times should ensure<br>the contacts reach the temperature<br>extremes (5 minutes min.). Humidity is not<br>controlled. Perform 500 such cycles.<br>(EIA364-110) |
| 21 | Cold Test                          | See Note 1 | Mated Connector -40°C, 96 hours, (EIA-<br>364-17 Method A.)  |
| 22 | Thermal Disturbance                | See Note 1 | Temperature Range: 15C+/- 3℃ to 85 +/- 3<br>℃<br>Thermal Ramp: minimum of 1℃ per<br>minute.<br>Dwell times should insure that the contacts<br>reach the extremes, no less than 5 minutes<br>Number of cycles: 10.  |
| 23 | Mixed Flowing Gas                  | See Note 1 | Environmental Class: IIA<br>Duration: 10 days.<br>Connectors should be mated during this<br>portion of the test.<br>(EIA-364-65)   |

## NOTE

1. 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 Table 2.

2. Resistance to soldering process is indicated on notes of customer drawing. Select the appropriate test type which drawing notes are matched with.



## 3.6. Product Qualification and Requalification Test Sequence

| Test or Examination                 | А                 | В       | С       | D              | Е       | F       | G    | Н   | I   | J   | K   | L     |
|-------------------------------------|-------------------|---------|---------|----------------|---------|---------|------|-----|-----|-----|-----|-------|
|                                     | Test Sequence (a) |         |         |                |         |         |      |     |     |     |     |       |
| Examination of Product              | 1,8               | 1,10    | 1,10    | 1,12           | 1,10    | 1,9     | 1,10 | 1,7 | 1,3 | 1,3 | 1,3 | 1,8   |
| Low Level Contact Resistance        | 2,5,7             | 2,5,7,9 | 2,5,7,9 | 2,5,7,9,<br>11 | 2,5,7,9 | 2,4,6,8 | 2,8  |     |     |     |     | 2,5,7 |
| Dielectric withstanding Voltage     |                   |         |         |                |         |         | 9    | 3,6 |     |     |     |       |
| Insulation Resistance               |                   |         |         |                |         |         |      | 2,5 |     |     |     |       |
| Temperature Rising                  |                   |         |         |                |         |         |      |     | 2   |     |     |       |
| Mating Force                        |                   |         |         |                |         |         | 3,6  |     |     |     |     |       |
| Unmating Force                      |                   |         |         |                |         |         | 4,7  |     |     |     |     |       |
| Durability                          |                   |         |         |                |         |         | 5    |     |     |     |     |       |
| Durability(Preconditioning)         | 3                 | 3       | 3       | 3              | 3       | 3       |      |     |     |     |     | 3     |
| Vibration                           |                   |         | 6       |                |         |         |      |     |     |     |     |       |
| Mechanical Shock                    |                   |         | 8       |                |         |         |      |     |     |     |     |       |
| Reseating                           | 6                 | 8       |         | 10             | 8       | 7       |      |     |     |     |     | 6     |
| Solder ability                      |                   |         |         |                |         |         |      |     |     | 2   |     |       |
| Resistance to Reflow Soldering Heat |                   |         |         |                |         |         |      |     |     |     | 2   |       |
| Thermal Shock                       |                   | 4       |         |                |         |         |      |     |     |     |     |       |
| Humidity & Temperature Cycling      |                   | 6       |         |                |         |         |      |     |     |     |     |       |
| Humidity                            |                   |         |         |                |         |         |      | 4   |     |     |     |       |
| Temperature Life                    | 4                 |         |         |                |         |         |      |     |     |     |     |       |
| Temperature Life                    |                   |         | 1       | 4              | Λ       |         |      |     |     |     |     |       |
| (Precondition)                      |                   |         | -       | -              | -       |         |      |     |     |     |     |       |
| Thermal Cycling                     |                   |         |         |                | 6       |         |      |     |     |     |     |       |
| Cold Test                           |                   |         |         |                |         |         |      |     |     |     |     | 4     |
| Thermal Disturbance                 |                   |         |         | 8              |         | 5       |      |     |     |     |     |       |
| Mixed Flowing Gas                   |                   |         |         | 6              |         |         |      |     |     |     |     |       |

NOTE

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

(b) Discontinuities shall not take place in this test group, during tests.

(c) If connector contact counts are more than 20, at least 5 samples should be evaluated in each group test. Otherwise, at least 10 samples should be evaluated in each group test.



- (d) Required for connectors with a tin-based plating or <15u" Au plating on the contacts.
- (e) Required for connectors rated for >50 mating/unmating cycles.

Figure 1. Contact Resistance



Vertical Type



Right Angle Type





## Figure 2. Resistance to flow solder heat