

---

**Z-PACK\* HS3 Dual Beam Connector System**

---

**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for the Z-PACK\* HS3 dual beam connector system. The receptacle has insert molded lead frames with ground shields between them. The pin header is a stripline type construction with ground blades isolating signal contact columns. The connector system utilizes press-fit termination to both the backplane and the daughtercard.

## 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

Successful qualification testing on the subject product line was completed on 12Jan01. The Qualification Test Report number for this testing is 501-501. 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. TE Connectivity (TE) Documents

- 108-1751: Product Specification
- 109-197: TE Test Specifications vs EIA and IEC Test Methods
- 114-13020: Application Specification
- 501-501: Qualification Test Report

## 2.2. Commercial Standard

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.

3.3. Ratings

- Voltage: 250 volts AC
- Current: 1.15 ampere (100% loaded)
- Temperature: -65 to 105°C
- Characteristic Impedance: 50 ohms (single ended), 100 ohms (differential)

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	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
<b>ELECTRICAL</b>		
Dry circuit resistance.	20 milliohms maximum for both signal and ground contacts.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Change in resistance.	$\Delta R < 5$ milliohms average value, $< 10$ milliohms individual reading for both signal and ground contacts.	
Insulation resistance.	10000 megohms minimum.	EIA-364-21. Test between adjacent contacts of mated specimens.
Dielectric withstanding voltage.	600 volts AC at sea level, signal/signal. 300 volts AC at sea level, signal/ground. 1 minute hold with no breakdown or flashover.	EIA-364-20. Test between adjacent contacts or ground shield of mated specimens.
Compliant pin resistance.	1 milliohm maximum initial. $\Delta R$ 1 milliohm maximum from initial.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. Measurements taken between PCB hole and bottom of pin.

Figure 1 (continued)

Test Description	Requirement	Procedure
<b>MECHANICAL</b>		
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Condition I. Subject mated specimens to 10-500-10 Hz traversed in 1 minute with 1.5 mm [.06 in] maximum total excursion. 8 hours in each of 3 mutually perpendicular planes. See Figure 4.
Mechanical shock, specified pulse.	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. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 4.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 125 cycles at a maximum rate of 600 cycles per hour.
Mating force.	0.75 N [.17 lb] maximum per contact.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Unmating force.	0.15 N [.03 lb] minimum per contact.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Compliant pin insertion force.	27 N [6 lb] maximum for Eye-of-the-Needle pin. 49 N [11 lb] maximum for ACTION PIN* contact.	Measure force necessary to seat pins to printed circuit board at a maximum rate of 12.7 mm [.5 in] per minute.
Compliant pin retention force.	4.4 N [1 lb] minimum per pin average.	Measure force necessary to unseat pins from the printed circuit board at a maximum rate of 12.7 mm [.5 in] per minute.
Minute disturbance.	See Note.	Unmate and mate each connector pair a distance of approximately 0.1 mm [.0039 in].
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note.	EIA-364-32. Subject mated specimens to 10 cycles between -65 and 125°C.

Figure 1 (continued)

Test Description	Requirement	Procedure
Humidity-temperature cycling.	See Note.	EIA-364-31. Subject mated specimens to 50 total cycles: 5 cycles between -10 and 85°C; and 45 cycles between 5 and 85°C. Both at 95% RH.
Temperature life.	See Note.	EIA-364-17. Subject mated specimens to 105°C for 1000 hours.
Mixed flowing gas (unmated).	See Note.	EIA-364-65. Subject unmated specimens to environmental Class IIIA for 5 days.
Mixed flowing gas (mated).	See Note.	EIA-364-65. Subject mated specimens to environmental Class IIIA for 5 days.
Dust contamination.	See Note.	EIA-364-91. Subject unmated specimens to dust contamination for 1 hour.

**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
	Test Sequence (b)			
Initial examination of product	1	1	1	1
Dry circuit resistance	3	5	5	4
Change in resistance	6,8,10,12,14	9,11,13,17,21	7	6,8,10,12,14,16,18
Insulation resistance		6,14,18		
Dielectric withstanding voltage		7,15,19		
Compliant pin resistance	4,16	3,22	3,8	2,19
Vibration	9			
Mechanical shock	11			
Durability	5,13	8,20		5,17
Mating force	2	4	4	3
Unmating force	15	23	9	20
Compliant pin insertion force		2	2	
Compliant pin retention force		24	10	
Minute disturbance				15
Thermal shock		12		
Humidity-temperature cycling		16		
Temperature life			6	
Mixed flowing gas (unmated)				7,9
Mixed flowing gas (mated)				11,13
Dust contamination	7	10		
Final examination of product	17	25	11	21

**NOTE** (a) See paragraph 4.1.A.  
 (b) Numbers indicate sequence in which tests are performed.

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. All test groups shall each 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

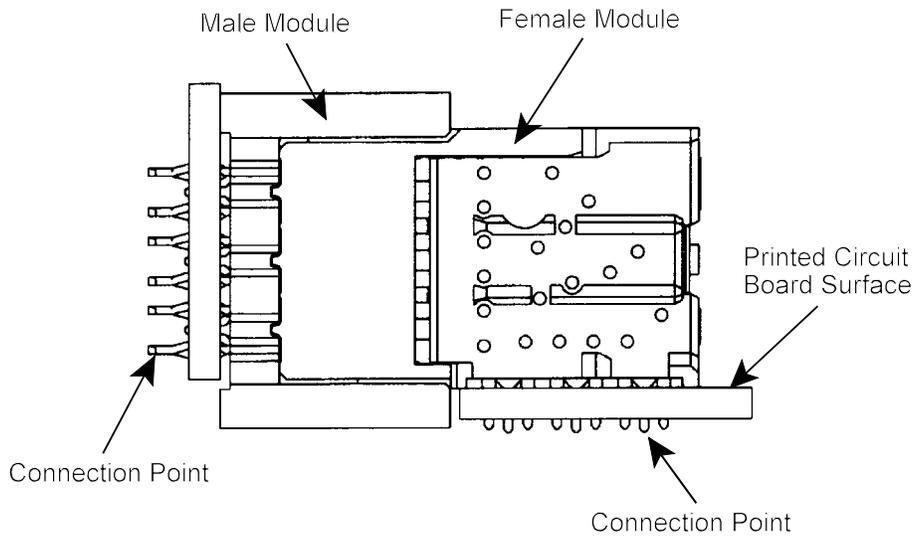
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

##### 4.3. Acceptance

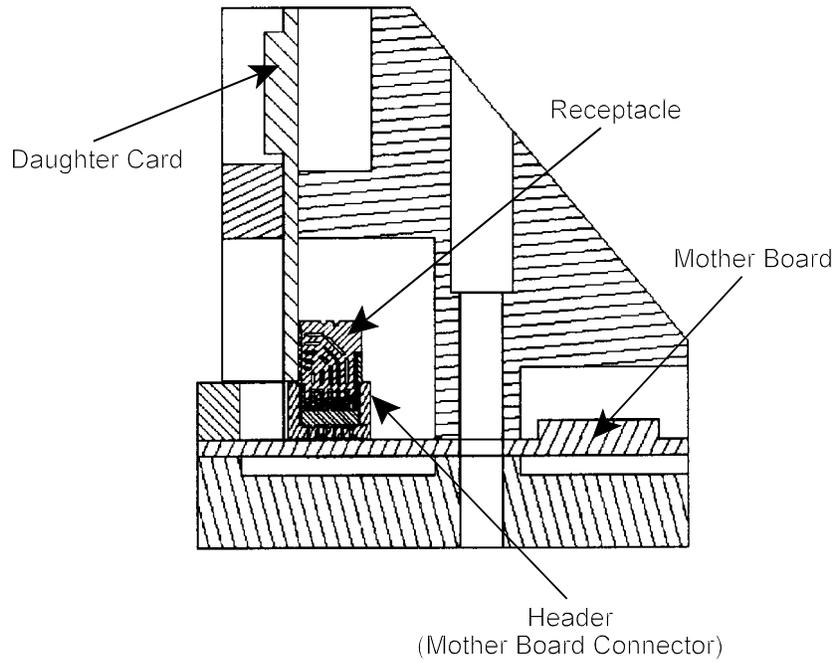
Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing 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**  
Dry Circuit Resistance Measurement Points



**Figure 4**  
Vibration & Mechanical Shock Mounting Fixture