

**Z-DOK\* and Z-DOK\*+ Connectors****1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for Z-DOK\* and Z-DOK\*+ Connectors. These right angle board-to-board solder through hole connectors are designed to interconnect balanced differential signals with data rates to 6.25 Gbps. Three contacts are dedicated to each differential signal consisting of two signal contacts and a ground contact. For purposes of this specification, this group is designated a "differential pair". Z-Dok connectors are available in 24, 32, 40, 48, 56, and 64 differential pairs. Z-Dok+ connectors are available in 8 to 72 signal pairs in 8 pair increments. Z-Dok+ Connectors include integral sequenced utility contacts in 2, 4, or 6 positions that can be used for power, ground, ESD, or sensing.

## 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 25Oct05. The Qualification Test Report number for this testing is 501-617. 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

- 109 Series: Test Specifications as indicated in Figure 1
- 109-197: Test Specification (AMP Test Specifications vs EIA and IEC Test Methods)
- 114-13068: Application Specification (Z-DOK and Z-DOK + Connectors)
- 501-617: Qualification Test Report (Z-DOK and Z-DOK + Connectors)
- 502-1175: Engineering Report (Current Rating of Z-Dok and Z-Dok + Connectors)

## 2.2. Commercial Standards

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- TIA/EIA-568: Commercial Building Telecommunications Cabling Standard

**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:
  - Signal and signal ground contacts: 30 VRMS (42 VAC peak) or DC
  - Utility contacts: 250 VRMS or VDC
- Current:
  - Signal contacts: Signal application only (see Note)
  - Signal ground contacts: 0.5 ampere maximum per individual contact (see Note)
  - Utility contacts: 7 amperes maximum per contact with 1 ounce copper plane and .275 inch wide trace (see Note)

**NOTE** For applications requiring higher current, see Engineering Report 502-1175 for current rating test results for various copper plane thicknesses, trace widths and effect of number of contacts energized. Current rating is highly dependent upon various application details such as copper thickness and trace width.

- Temperature: -55 to 85°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	Requirement	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.
<b>ELECTRICAL</b>		
Low level contact resistance.	$\Delta R$ 25 milliohms maximum for signal and signal ground contacts. 7 milliohms maximum and $\Delta R$ 5 milliohms maximum for utility contacts.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Insulation resistance.	1,000 megohms minimum for signal and signal ground contacts. 10,000 megohms minimum for utility contacts.	EIA-364-21. Test between adjacent contacts of mated specimens.

Figure 1 (continued)

Test Description	Requirement	Procedure
Withstanding voltage.	1 minute hold with no breakdown or flashover.	EIA-364-20, Condition I. Test between adjacent contacts of mated specimens. 500 volts AC at sea level for signal and signal ground contacts. 1,000 volts AC at sea level for utility contacts.
MECHANICAL		
Solderability, dip test.	Solderable area shall have a minimum of 95% solder coverage.	EIA-364-52, Category 1, Class 2. Subject contacts to solderability.
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition VII, Condition D. Subject mated specimens to 3.10 G's rms between 20-500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes. See Figure 4.
Mechanical shock.	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. Three 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 500 cycles at a maximum rate of 500 cycles per hour.
Mating force.	1.8 N maximum average per differential pair. 1.5 N maximum average per utility pair.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute.
Unmating force.	0.5 N minimum average per differential pair. 0.3 N minimum average per utility pair.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32. Subject unmated specimens to 5 cycles between -55 and 85°C.
Humidity-temperature cycling.	See Note.	EIA-364-31, Method III. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.

Figure 1 (continued)

Test Description	Requirement	Procedure
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 3. Subject mated specimens to 85°C for 500 hours.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA. Subject mated specimens to environmental Class IIA for 20 days.

**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	5
	Test Sequence (b)				
Initial examination of product	1	1	1	1	1
Low level contact resistance	3,7	2,4	2,4		
Insulation resistance				2,6	
Withstanding voltage				3,7	
Solderability, dip test					2
Vibration, random	5				
Mechanical shock	6				
Durability	4				
Mating force	2				
Unmating force	8				
Thermal shock				4	
Humidity-temperature cycling				5	
Temperature life		3(c)			
Mixed flowing gas			3(c)		
Final examination of product	9	5	5	8	3

**NOTE** (a) *See paragraph 4.1.A.*  
 (b) *Numbers indicate sequence in which tests are performed.*  
 (c) *Precondition specimens with 10 durability cycles.*

Figure 2

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**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. Each test group shall consist of 6 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.

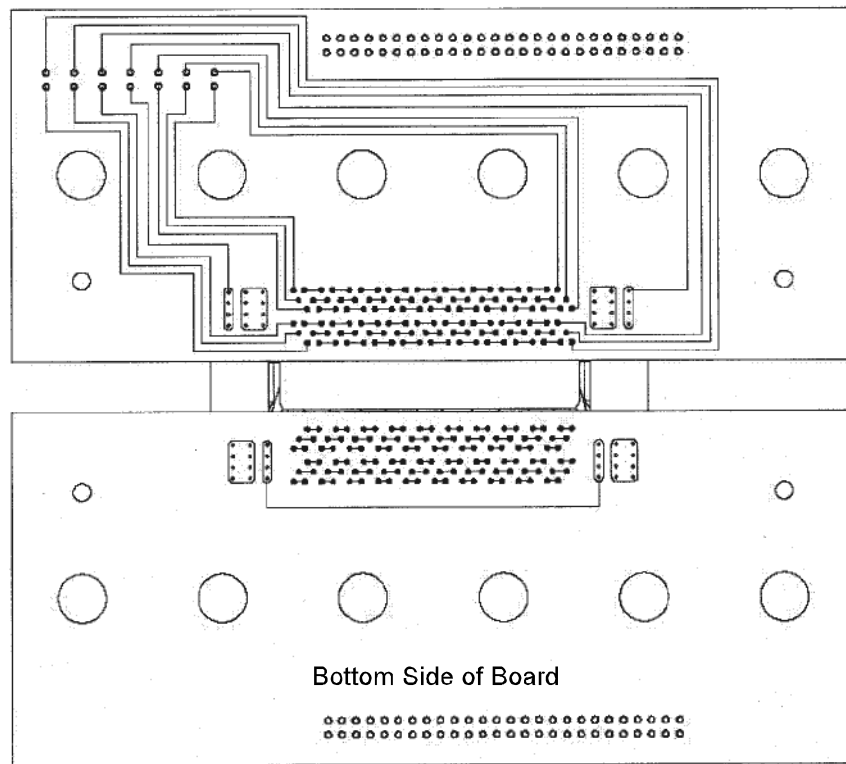
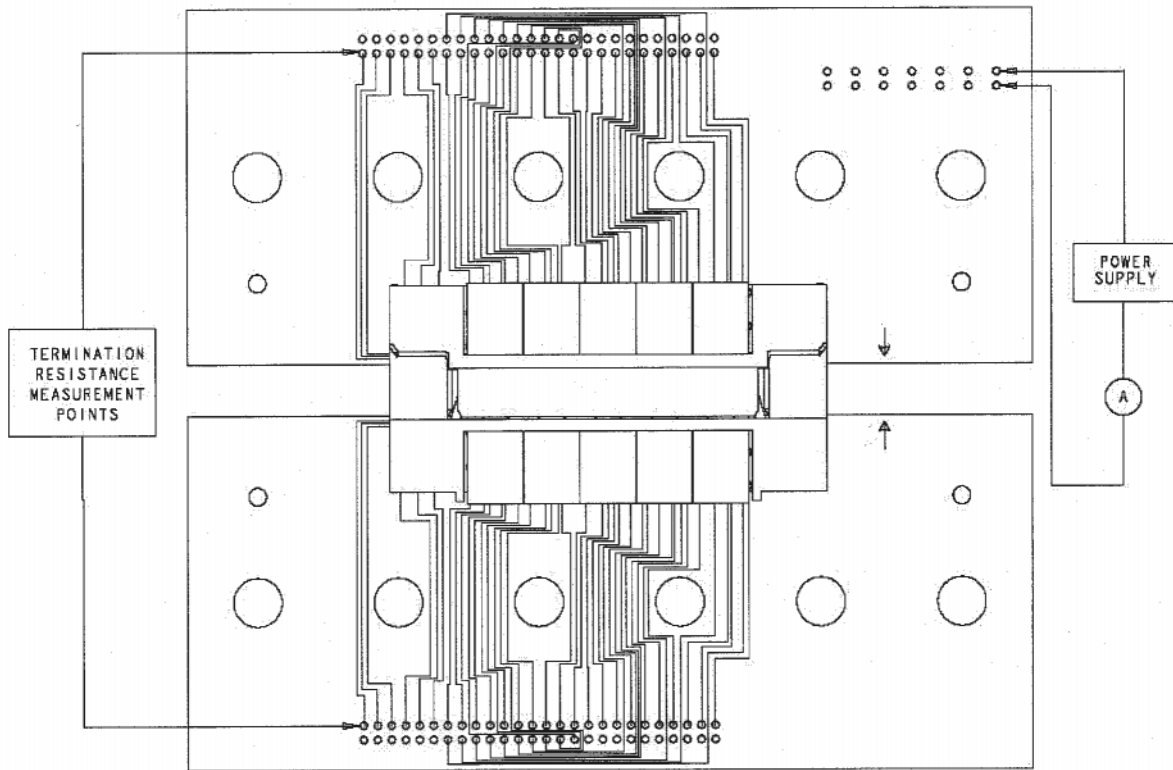


Figure 3  
Low Level Contact Resistance Measurement Points

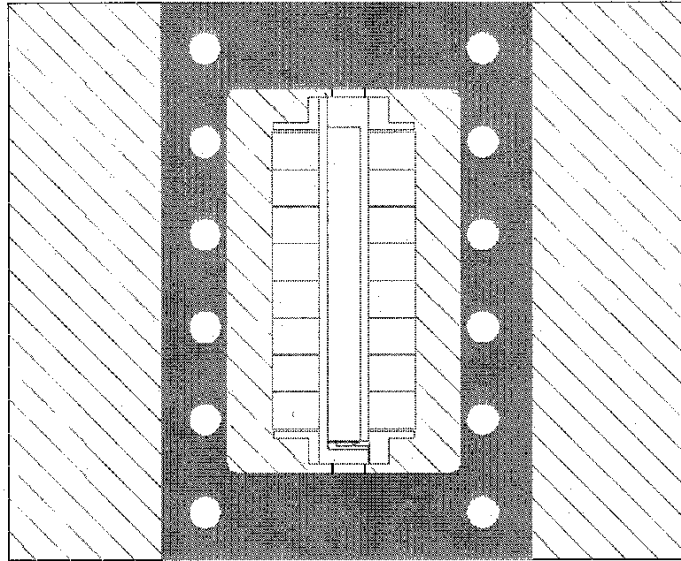


Figure 4  
Vibration & Mechanical Shock Mounting Fixture