
MiniPak HD Power Connector

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 MiniPak HD Power 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.

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

- 109-197: Test Specification (AMP Test Specifications vs EIA and IEC Test Methods)
- 501-TBD: Qualification Test Report (MiniPak HD Power Connector)

2.2. Commercial Standards

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- GR-1217-CORE:
- IEC 60512: Electromechanical Components For Electronic Equipment; Basic Testing Procedures and Measuring Methods Part 1: General

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: 12.0 ± 10% volts DC
- Current:
- Temperature: -10 to 70°C
- Humidity: 10 to 90% RH, non-condensing

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	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (CofC) inspection per product drawing. (Connector interface, interface dimensions of plug-in card, creepage and clearance distances).
ELECTRICAL		
Contact resistance.	Power contacts: 5 milliohms maximum initial. 5 milliohms maximum change. Signal contacts: 25 milliohms maximum initial. 10 milliohms maximum change.	IEC 60512-2-1. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.
Insulation resistance.	100 megohms minimum between all conductors and ground. 10 megohms minimum between all conductors and between ground after moisture.	IEC 60512-3-1. 80 volts DC. Mated module PCB.
Voltage proof.	One minute hold with no breakdown or flashover.	IEC 60512-4-1. Mated plug-in cards. 80 volts rms between differential pair conductors mutually and ground; between general purpose conductors mutually and ground; and between power conductors mutually and ground.
Current carrying capacity.	Temperature inside of connector shall not exceed 100°C.	IEC 60512-5-2. Mated connectors, 8 adjoining contacts from each row powered simultaneously. 0.625 ampere per signal contact, 11.625 amperes per power contact. 70°C ambient temperature. 0.12 mm ² maximum wire gauge thermo-element.

Figure 1 (continued)

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Test Description	Requirement	Procedure
MECHANICAL		
Vibration (sinusoidal).	No discontinuities of 1 microsecond or longer duration. See Note.	IEC 60512-6-4. Frequency 10 to 500 Hz, amplitude 0.35 mm or 50 m/s, full duration 3 x 8 hours in 3 mutually perpendicular planes (32 sweepings in each direction). See Figure ?.
Shock.	No discontinuities of 1 microsecond or longer duration. See Note.	IEC 60512-6-3. 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 ?.
Mechanical operation.	See Note.	IEC 60512-5, Test 9a. 100 cycles at a maximum rate of 10 mm per second. 5 second rest in the unmated condition.
Engaging and separating forces.	145 N maximum engaging force. 100 N maximum separating force.	IEC 60512-13-1. Measure force necessary to engage and separate specimens at a maximum speed of 10 mm per second.
Static load transverse.	No damage that would impair normal operation.	IEC 60512-5, Test 8a. Apply a 200 N force to the bottom card in the connector and hold for 1 minute.
Minute disturbance.	See Note.	Unmate and mate each specimen a distance of approximately 0.1 mm.
ENVIRONMENTAL		
Thermal shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-32, Test Condition I. Subject specimens to 5 cycles between -55 and 85°C. 30 minute dwells at each temperature extreme and 5 second maximum transfer time between temperature extremes.
Humidity-temperature cycling.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-31, Method III. Subject specimens to 50 cycles (500 hours) between 25 and 65°C at 80 to 100% RH. According to GR-1217-CORE, Section 6.3.4, R6-64.
Temperature life, 300 hour.	No electrical load. See Note.	EIA-364-17, Method A, Test Condition 4. Subject mated specimens to 105°C for 300 hours. Two hour recovery time.

Figure 1 (continued)

Test Description	Requirement	Procedure
Temperature life, 1000 hour.	No electrical load. See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition D. Subject mated specimens to 105°C for 1000 hours. Two hour recovery time.
Mixed flowing gas, unmated.	See Note.	EIA-364-65, Class IIA. Subject unmated specimens to environmental Class IIA for 5 days.
Mixed flowing gas, mated.	See Note.	EIA-364-65, Class IIA. Subject mated specimens to environmental Class IIA for 5 days.
Dust.	See Note.	EIA-364-91. Unmated and unmounted connectors + module PCB's. Benign dust concentration of 300g/m ³ of chamber volume, flow rate of 300 m/s and an exposure time of 1 hour. According to GR-1217-CORE, Sections 9.1.1.1 and 9.1.1.2.

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)

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3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)										
	A1	A2	B1	B2	B4	C1	C2	C4	D1	D2	E
	Test Sequence (b)										
Initial examination of product	1,15	1,11	1,13	1,12	1,7	1,11	1,11	1,6	1,5	1,10	1,3
Contact resistance	2,4,6,8,10,12,14		2,4,6,8,10,12			2,4,6,8,10			2,4		
Insulation resistance		3		3,10			3,9			3,8	
Voltage proof		4		4,11			4,10			4,9	
Current carrying capacity											2
Vibration (sinusoidal)			7	6	4						
Shock			9	7	5						
Mechanical operation	3,13	5,9	3,11	5,8	2,6	3	5,8	2			
Engaging/separating forces		2,10	2	2,9			2			2,7	
Static load transverse										6	
Minute disturbance	11										
Thermal shock						7	6	4			
Humidity-temperature cycling						9	7	5			
Temperature life, 300 hour	5	6									
Temperature life, 1000 hour									3	5	
Mixed flowing gas, unmated	7	7									
Mixed flowing gas, mated	9	8									
Dust			5		3	5		3			

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. 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 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.