

Mini Power Drawer Connector System

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 Mini Power Drawer Connector System. This product is a polarized 3 to 10 position connector system consisting of a vertical receptacle and a floating bulkhead mounted plug which is "hot pluggable" and "blindmateable". The receptacle contacts feature ACTION PIN* press-fit leads for assembly onto printed circuit boards while the plug contacts utilize crimp-to-wire termination. The floating bulkhead plug consists of a snap-in latch or a flanged hardware mount housing. The product is differentiated by two levels of performance: "Standard Power", which features phosphor bronze contacts on the receptacle and brass contact on the plug with 0.38 μm of gold plating, and; "High Power", which features a high conductivity copper alloy on both plug and receptacle contacts and are plated with 1.27 μm of gold on the mating area.

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

3. REQUIREMENTS

3.1. Design and Construction

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

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3.2. Materials

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

3.3. Ratings

- Voltage: 300 volts AC or DC
- Current:
 - Standard Power: 10 amperes
 - High Power: 15 amperes
- 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	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.
ELECTRICAL		
Contact resistance.	25 milliohms maximum.	EIA-364-6. Energize at 8 amperes for standard power specimens and 15 amperes for high power specimens. See Figure 3.
Insulation resistance.	10,000 megohms minimum.	EIA-364-21. Test between adjacent contacts.
Withstanding voltage.	1,000 volts AC at sea level. 1 minute hold with no breakdown or flashover.	EIA-364-20, Condition I. Test between adjacent contacts.
Temperature rise vs current.	30°C maximum temperature rise at 10 amperes for standard power specimens and 15 amperes for high power specimens.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C. See Figure 4.

Figure 1 (cont)

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Test Description	Requirement	Procedure
MECHANICAL		
Vibration, sinusoidal.	No discontinuities of 1 microsecond 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. See Figure 5.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Method 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 5.
Durability.	See Note.	EIA-364-9. Mate and unmate standard power specimens for 100 cycles and high power specimens for 250 cycles at a maximum rate of 325 cycles per hour.
Mating force.	1 N [.224 lb] maximum.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 25.4 mm [1 in] per minute.
Unmating force.	0.5 N [.112 lb] minimum.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 25.4 mm [1 in] per minute.
Torque mechanism strength.	1.7 N•m [15 in-lb] minimum.	AMP Spec 109-183. Measure torque-out value of threaded insert from mating face of plug half.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32. Subject specimens to 5 cycles between -55 and 125°C.
Humidity-temperature cycling.	See Note.	EIA-364-31, Method III. Subject specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.

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Figure 1 (cont)

Test Description	Requirement	Procedure
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 5, Test Time Condition C. Subject mated specimens to 125°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
	Test Sequence (b)		
Initial examination of product	1	1	1
Contact resistance	3,7	2,8	
Insulation resistance			2,6
Withstanding voltage			3,7
Temperature rise vs current		4,9	
Vibration	5	7(c)	
Mechanical shock	6		
Durability	4	3	
Mating force	2		
Unmating force	8		
Torque mechanism strength	9		
Thermal shock			4
Humidity-temperature cycling			5
Temperature life		6	
Mixed flowing gas		5(d)	
Final examination of product	10	10	8

NOTE (a) *See paragraph 4.1.A.*
 (b) *Numbers indicate sequence in which tests are performed.*
 (c) *Discontinuities shall not be measured. Energize at 18°C level for 100% loadings per Quality Specification 102-950.*
 (d) *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. 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.

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Figure 3
Contact Resistance Measurement Points

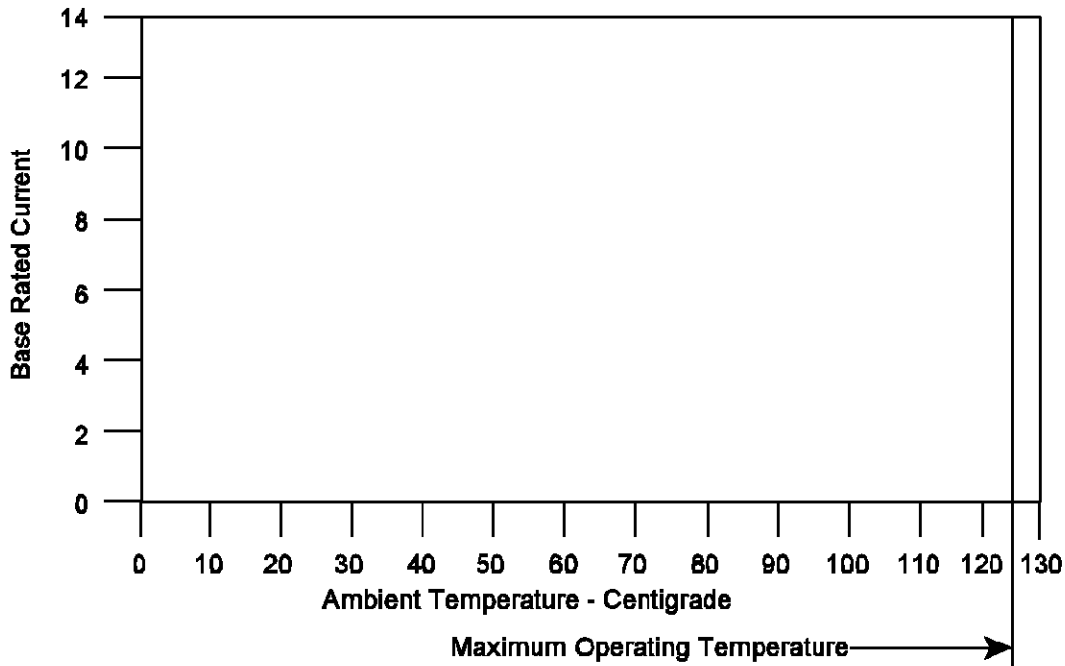


Figure 4A
Current Carrying Capability

Percent Connector Loading	Wire Size (AWG)			
	20	18	16	14
Standard Power				
Single Contact				
50				
100				
High Power				
Single Contact				
50				
100				

NOTE

To determine acceptable current carrying capacity for percentage connector loading and wire gage indicated, use the Multiplication Factor (F) from the above chart and multiply it times the Base rated Current for a single circuit at the maximum ambient operating temperature shown in Figure 4A.

Figure 4B
Current Rating

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Figure 5
Vibration & Mechanical Shock Mounting Fixture

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