CHAMP*, ACTION PIN* Connector

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for standard and self retained CHAMP* ACTION PIN* connectors. This pin is designed for use with .062, .093 or .125 inch thick printed circuit board.

1.2. Application

Connectors are printed circuit board mounted for interface with standard CHAMP cable-to-cable or cable-to-panel connectors. Screw lock, ball lock or locking clip hardware is available.

1.3. Description

ACTION PIN terminals are intended to be inserted into printed wiring boards having either plated through or unplated holes. In plated through holes, termination may be accomplished by press fit of the pins or by conventional soldering processes. In unplated holes, pins shall be soldered in place.

1.4. Qualification

When tests are performed on subject product line, procedures specified in 109-Series Test Specifications shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification shall take precedence.

2.1. TE Connectivity (TE) Documents

A. 109-1: General Requirements for Test Specifications

B. 109 Series: Test Specifications as indicated in Figure 1.

C. 114-6027: Connector, CHAMP, ACTION PIN

D. CTR 980(3-3): Test Report

E. 108-16: Contact, Low Distortion, ACTION PIN

2.2. Other Standards

IPC-A-600: Acceptability of Printed Wiring Boards

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Material

A. Contact: Copper-nickel-tin alloy, gold over nickel plating

B. Housing: Polyester thermoplastic, glass filled, oxygen index 28%, black, UL 94V-0

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3.3. Ratings

A. Voltage: 250 volts alternating current

B. Current: 3 amperes maximum per contact pair unless otherwise restricted by printed circuit board

C. Temperature: -55 to 105øC

3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and Application Specification 114-6027	Visual, dimensional and functional per applicable inspection plan.
	ELECTRICAL	
Termination resistance, dry circuit.	△R 6.5 milliohms maximum	Subject mated contacts assembled in housing to 50 mv open circuit at 50 ma maximum. See Figures 3 and 4. Test Specification 109-6-3.
Dielectric withstanding voltage.	1000 vac dielectric withstanding voltage. No breakdown or flashover.	Apply instantaneous voltage between designated circuits for .25 second hold period. Test Specification 109-29-1
Insulation resistance.	20 X 10^3 megohms minimum initial.	Test between adjacent contacts of mated connector assembly. Test Specification 109-28-4.
	MECHANICAL	
Vibration	No discontinuities greater than 1 microsecond. See Note.	Subject mated connectors to 10-55-10 Hz traversed in 1 minute at .06 inch total excursion. 2 hours in each of 3 mutually perpendicular planes. Test Specification 109-21-1.
Physical Shock	No discontinuities greater than 1 microsecond. See Note.	Subject mated connectors to physical shock. Test Specification 109-26-1.
Mating Force	45 pounds maximum initial for 50 position connector.	Measure force necessary to mate fully loaded and wired connector assembly using free floating fixtures at rate of .5 inch per minute. Calculate force per contact. Test Specification 109-42. Condition A
ACTION PIN insertion force.	30 pounds maximum per contact.	Measure force necessary to insert contact into printed wiring board. Test Specification 109-41.
ACTON PIN retention force.	6 pounds minimum per pin without dislodging from PCB.	Apply axial load of 6 pounds opposite to that insertion. Test Specification 109-30.

Figure 1 (continued)

Test Description	Requirement	Procedure
Durability	No physical damage. Samples shall be examined for wear.	Mate and unmate connector assemblies for 200 cycles at maximum rate of 10 cycles per minute. Test Specification 109-27.
Contact retention force.	1 pound minimum total force per contact without dislodging terminal from housing.	Apply axial force of 1 pound to terminal in direction opposite of insertion into housing. Test Specification 109-30.
ENVIRONMENTAL		
Thermal shock.	△R 2 milliohms maximum termination resistance, dry circuit. See Note (a)	Subject ACTION PIN terminals to 5 cycles between -55 and 85℃. Test Specification 109-22.
Temperature cycling with high humidity.	△R 6.5 milliohms maximum termination resistance, dry circuit.	Subject mated connectors to 300 humidity – temperature cycles between 4 and 60℃ at 95% RH. Test Specification 109-76-1.
Temperature cycling.	△R 6.5 milliohms maximum termination resistance, dry circuit.	Subject mated connectors to 1024 temperature cycles. Test Specification 109-75-2.
Stress relaxation.	△R 2 milliohms maximum.	Subject ACTION PIN terminals to 60 days of heat age at 85℃. Test Specification 109-43.

NOTE *(a) Shall remain mated and show no evidence of damage, cracking or chipping.*

Figure 1 (end)

3.6. Product Qualification and Requalification Tests and Sequences

Test or Examination	Test Group (a)							
	1	2	3	4	5	6	7	8
	Test Sequence (b)							
Examination of Product	1	1	1	1	1	1	1	1
Termination Resistance, Dry Circuit		2.4	2, 4	2, 4	3, 6		2, 4	2, 4
Dielectric Withstanding Voltage						3, 7		
Insulation Resistance						2, 5		
Vibration					4			
Physical Shock					5			
Mating Force					2			
ACTION PIN Insertion Force	2 (c)							
ACTION PIN Retention Force	3 (c)							
Durability								3
Contact Retention Force		5 (d)						
Thermal Shock		3 (c)				6 (c)		
Temperature Cycling w/High Humidity			3 (e)			4 (e)		
Temperature Cycling				3				
Stress Relaxation							3 (c)	

Figure 2

NOTE

(a) See Para 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) Applies to ACTION PIN terminals only.
(d) Applies to self-retained pre-assembled connectors only.
(e) Precondition samples with 25 mating/unmating cycles.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test groups 1, 3, 4, 5, 6, 7 and 8 shall consist of 2, 50 position connectors. Test group 2 shall consist of 2, 50 position connectors with self-retained (barb) terminals. When samples are mounted, printed circuit boards shall conform to IPC-A-600.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 2.

4.2. Requalification Testing

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

4.3. Acceptance

Acceptance is based on verification that product meets requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan will specify sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with applicable product drawing and this specification.

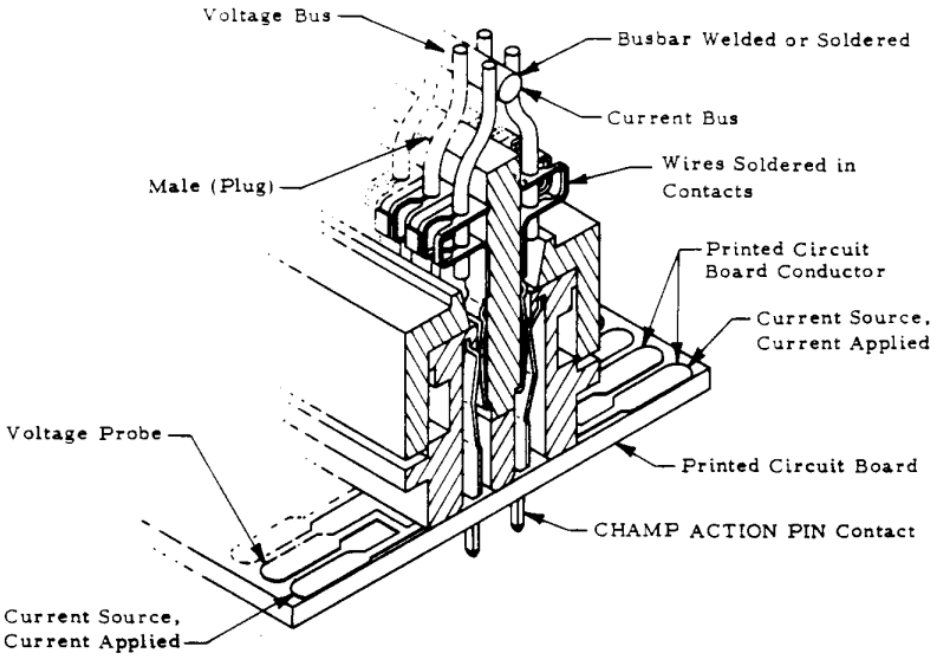

Figure 3
Mounting Mated Samples To Test Board For Millivolt Dr

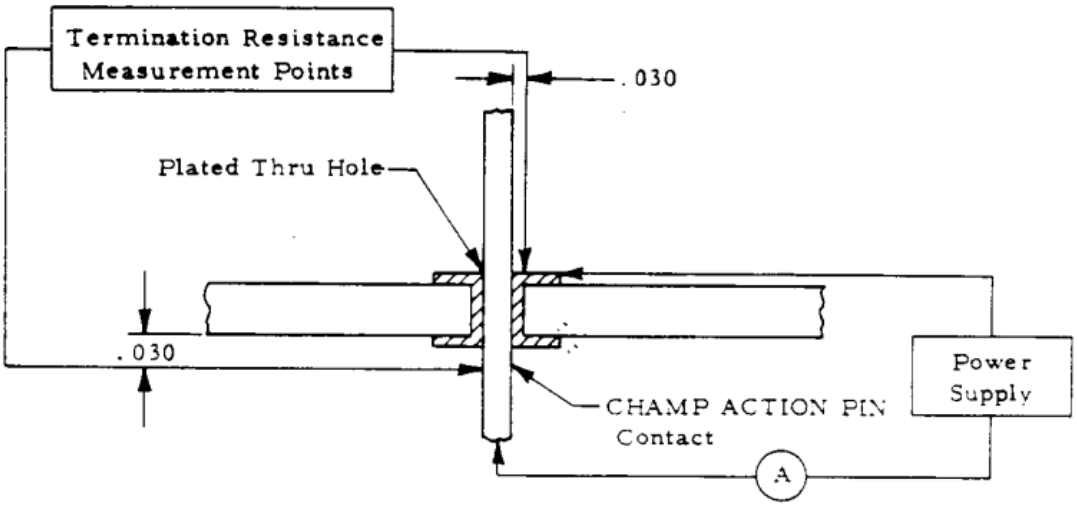

Figure 4
Resistance and Temperature Measurement Points