

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the CHAMP* Printed Circuit Board connectors, both shielded and unshielded, vertical, edge and right angle mount.

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in AMP 109 series specifications 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. 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. AMP Documents

- A. 109-1: General Requirements for Test Specifications
- B. 109 Series: Test Specifications as indicated in Figure 1. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
- C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Military or Commercial Documents
- D. 114-6036: CHAMP PC Board Mounted Connectors
- E. 501-146: Test Report

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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LTR	REVISION RECORD	APP	DATE	1 OF 9	CONNECTOR, CHAMP PRINTED CIRCUIT BOARD		

3.2. Material

- A. Contacts: Phosphor bronze, selective gold plating on contact area over nickel underplating with thin microcrystalline wax coating over contact area for lubrication, tin-lead over nickel underplating on termination end.
- B. Housing and support plates: Thermoplastic, glass filled, UL94V-0

3.3. Ratings

- A. Voltage: Adjacent poles (even numbered poles on top row to odd numbered poles in bottom row) may carry voltage at potentials not exceeding 250 volts between any 2 circuits. Up to 600 volts may be placed on any 2 nonadjacent poles if intervening poles are omitted to increase total spacing between live parts of opposite polarity to 1/8 inch.
- B. Current: See Figure 2 for applicable current carrying capability.
- C. Temperature: -40° to 105°C
- D. Reliability:
 - (1) On basis of test data it can be said with 95% confidence that 99.99% of CHAMP contacts should exhibit a change in contact resistance less than 10 milliohms after 40 years at 57°C when failure mechanism is stress relaxation.
 - (2) On basis of test data it can be said with 95% confidence that 99.99% of CHAMP contacts should exhibit a change in contact resistance less than 10 milliohms after 10 years when exposed to class III Mixed Flowing Gas (MFG) and failure mechanism is corrosion.
 - (3) On basis of test data it can be said with 95% confidence that 99.99% of CHAMP contacts should exhibit a change in contact resistance less than 10 milliohms when exposed to humidity/temperature cycling (4° to 60°C temperature and 95% RH for 3600 hours: AMP Spec 109-76-1) and failure mechanism is corrosion.

3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. All tests are performed at ambient temperature unless otherwise specified.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of Product	Meets requirements of product drawing and AMP Spec 114-6036.	Visual, dimensional and functional per applicable quality inspection plan.

Figure 1 (cont)

AMP

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PAGE NO

2

108-6078

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Test Description	Requirement	Procedure
ELECTRICAL		
Termination Resistance, Dry Circuit	30 milliohms maximum initial.	Subject mated contacts assembled in housing to 50 mv open circuit at 50 ma maximum, see Figure 5; AMP Spec 109-6-3
Dielectric Withstanding Voltage	1000 vac dielectric withstanding voltage. 60 seconds minimum hold. No flashover.	Test between adjacent contacts of mated connector assemblies; AMP Spec 109-29-1.
Insulation Resistance	20,000 megohms minimum initial.	Test between adjacent contacts of mated connector assembly; AMP Spec 109-28-4. One minute hold.
MECHANICAL		
Vibration	No discontinuities greater than 1 microsecond. No evidence of cracking, breaking or loosening of parts.	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; AMP Spec 109-21-1.
Physical Shock	No discontinuities greater than 1 microsecond. See note (a).	Subject mated connectors to 50 G's half-sine shock pulse of 11 milli-second duration, 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks; AMP Spec 109-26-1.
Mating Force	.7 pounds maximum initial per contact pair.	Measure force necessary to mate connector, incorporating free floating fixtures at a rate of .5 inch/minute; AMP Spec 109-42, cond A, calculate force per contact.
Unmating Force	.08 pounds minimum final per contact pair.	Measure force necessary to unmate connector assembly with locking latches removed, at a rate of .5 inch/minute; AMP Spec 109-42, cond A, calculate force per contact.

Figure 1 (cont)

AMP	AMP Incorporated Harrisburg, PA 17105-3608	PAGE	NO	REV	LOC
		3	108-6078	0	B

Test Description	Requirement	Procedure
Durability	See note (a).	Mate and unmate connector assemblies for 200 cycles at a maximum rate of 500 cycles/hour; AMP Spec 109-27.
Solderability	Solderable area shall have a solder coverage of 95% minimum.	Subject contacts to solderability; AMP Spec 109-11-2.
ENVIRONMENTAL		
Thermal Shock	See note (a).	Subject mated connectors to 1024 cycles between -40° and 60°C; AMP Spec 109-22.
Humidity-Temperature Cycling	See note (a).	Subject mated connectors to 10 humidity-temperature cycles between 25° and 65°C at 95% RH; AMP Spec 109-23-4.
Mixed Flowing Gas	See note (a).	Subject mated connectors to environmental class III for 20 days; AMP Spec 109-85-3.
Temperature Life	See note (a).	Subject mated connectors to temperature life at 70°C for 1000 hours duration; AMP Spec 109-43.

(a) Shall meet visual requirements, show no physical damage, and shall meet requirements of additional tests in the Test Sequence in Figure 3.

Figure 1 (end)

AMP

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Harrisburg, PA 17105-3608

PAGE NO

4

108-6078

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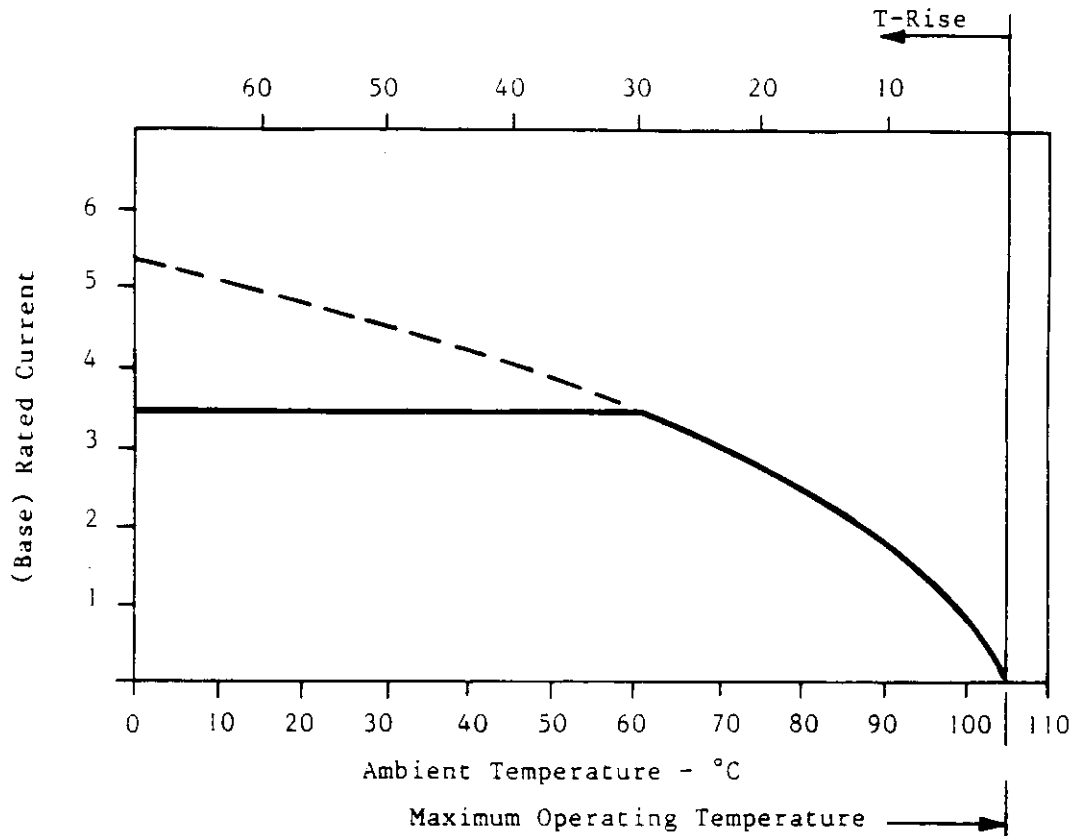


Figure 2A
Current Carrying Capability

Multiplication Factor (F)	Percent Connector Loading*
1.0	Single Contact
.92	25
.84	50
.75	75
.59	100

* Connector Loading is uniformly distributed

NOTE: To determine acceptable current carrying capacity for percentage connector loading, use Multiplication Factor (F) from above chart and multiply it times Base Rated Current for single circuit at maximum ambient operating temperature as shown on Figure 2A.

Figure 2B
Current Rating

3.6. Product Qualification

Test or Examination	Test Group (a)				
	1	2	3	4(c)	5
	Test Sequence(b)				
Examination of Product	1	1,5	1,5	1,8	1
Termination Resistance, Dry Circuit	3,7	2,4	2,4		
Dielectric Withstanding Voltage				3,7	
Insulation Resistance				2,6	
Vibration	5				
Physical Shock	6				
Mating Force	2				
Unmating Force	8				
Durability	4				
Solderability					2
Thermal Shock				4	
Humidity-Temperature Cycling				5	
Mixed Flowing Gas			3(d)		
Temperature Life		3(d)			

- (a) See Para 4.1.A
- (b) Numbers indicate sequence in which tests are performed
- (c) Group 4 applies only to product with an insulation system
- (d) Precondition samples with 10 cycles durability

Figure 3

3.7 Test Samples Required per Group

A. Sample Selection

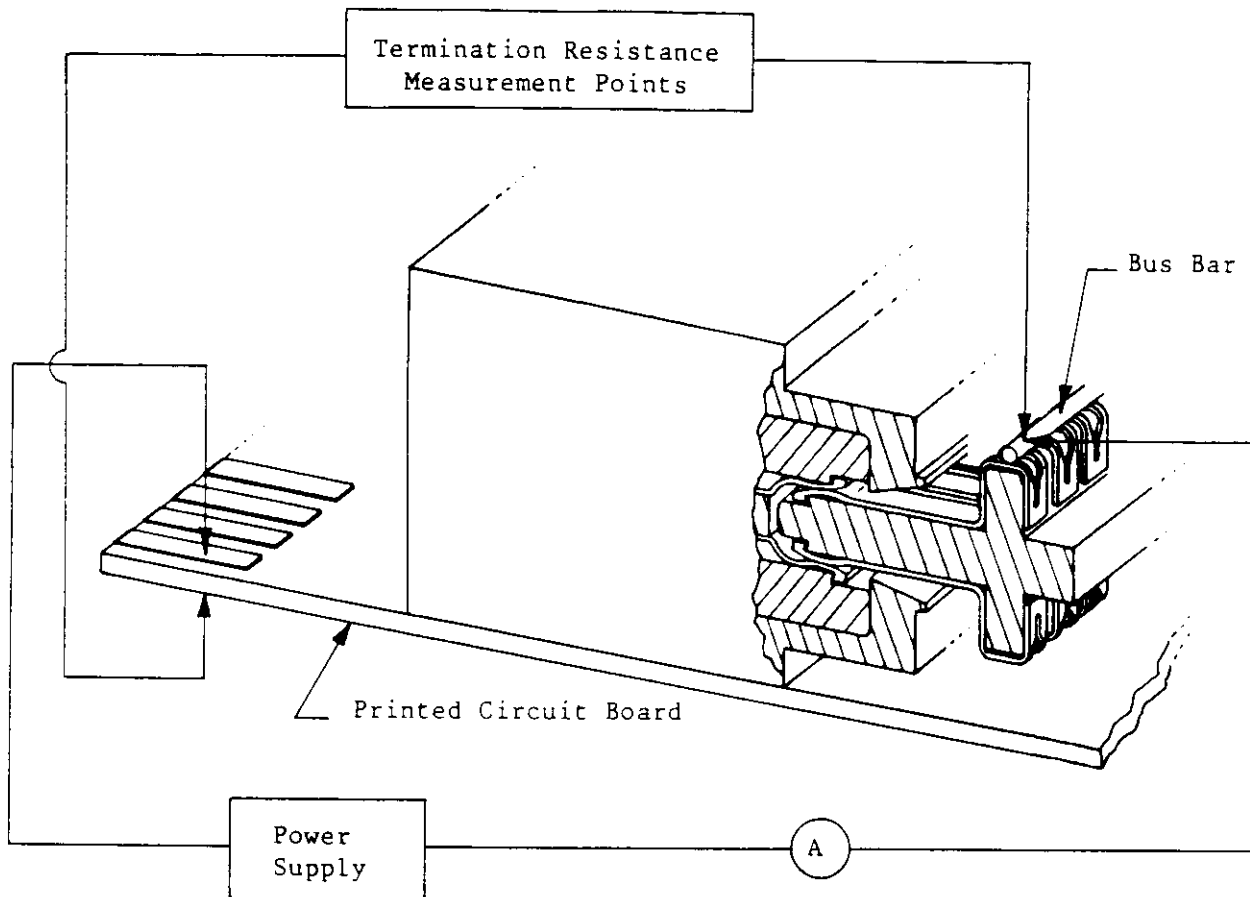
Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Test groups 1 thru 5 shall require sample selection to obtain a minimum of 40 data points, see Figure 4.

Number of Positions	Number of Connectors Required
13	3
24	2
36	2
50	1
64	1

Figure 4

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 3.



NOTES:

1. Mounting mated samples to test board for resistance measurements during environmental testing
2. Probe points for contact resistance

Figure 5
Resistance Measurement Points

AMP

AMP Incorporated
Harrisburg, PA 17105-3608

PAGE NO

7

108-6078

REV LOC

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4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Connector assemblies shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Test groups shall be as specified in Figure 3. Test samples per group shall be as specified in Figure 4.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 3.

4.2. Requalification Testing

If changes significantly affecting form, fit, or function are made to product or to 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

Applicable AMP 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.

AMP AMP Incorporated Harrisburg, PA 17105-3608	PAGE	NO	REV	LOC
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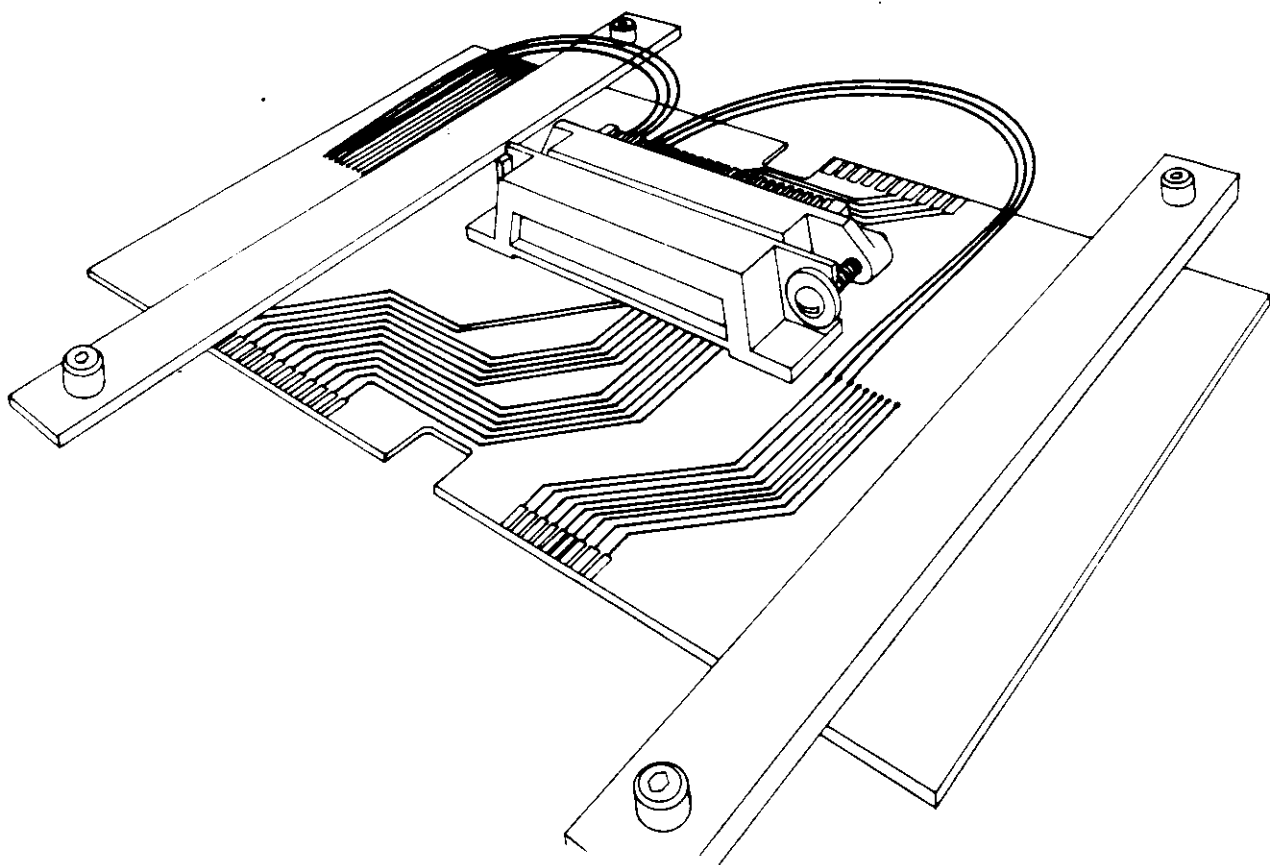


Figure 6
Vibration and Physical Shock

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PAGE NO

9

108-6078

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