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**AMP-LATCH\* Universal I/O Pin Connector**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for AMP-LATCH\* Universal input/output (I/O) pin connector.

## 1.2. Connector Assembly Definition

I/O pin connector contacts in housings crimped to .050 inch centerline ribbon cable with #28 and 26 solid and stranded AWG conductors. Completed assemblies mate to receptacle connectors.

## 1.3. 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. 108-40000: Product Specification
- D. 114-7011: Application Specification
- E. 501-219: Test Report

**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: Phosphor bronze
- B. Housing and cover: Black thermoplastic, UL94V-0

## 3.3. Ratings

- A. Current: 1 ampere maximum (single circuit energized), see Para 3.5.(c)
- B. Temperature: -65 to 105°C, unless limited by temperature rating of cable used

## 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 environmental conditions per Test Specification 109-1 unless otherwise specified.

## 3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and Application Specification 114-7011.	Visual, dimensional and functional per applicable quality inspection plan.
<b>ELECTRICAL</b>		
Termination resistance, dry circuit.	15 milliohms maximum. See Note (b).	Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma maximum. See Figure 4. Test Specification 109-6-1.
Dielectric withstanding voltage.	500 vac dielectric withstanding voltage. 1 minute hold. No breakdown or flashover.	Test between adjacent contacts of unmated connector assemblies and contacts to mounting hardware. Test Specification 109-29-1.
Insulation resistance.	5000 megohms minimum initial. 1000 megohms minimum final.	Test between adjacent contacts of unmated connector assemblies and contacts to mounting hardware. Test Specification 109-28-4.
<b>MECHANICAL</b>		
Vibration, random.	No discontinuities greater than 1 microsecond. See Note (a).	Subject mated connectors to 5.43 G's RMS between 5-500 HZ with 100 ma current applied. See Figure 3. Test Specification 109-21-7, Condition E.
Physical shock.	No discontinuities greater than 1 microsecond. See Note (a).	Subject mated connectors to 100 G's sawtooth shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 3. Test Specification 109-26-9.
Mating force.	12 ounces maximum per contact when mated with receptacle that meets See Note (b). mating force requirements of Test Specification 108-40000.	Measure force necessary to mate connector assemblies a distance of .150 inch from point of initial contact using free floating fixtures at rate of .5 inch per minute. Test Specification 109-42, Condition A.
Unmating force.	1.5 ounces minimum per contact when mated with receptacle that meets un mating force requirements of Test Specification 108-40000. See Note (b).	Measure force necessary to unmate connector assemblies with locking latches removed at rate of .5 inch per minute. Test Specification 109-42, Condition A.
Durability.	See Note (a). See Note (b).	Mate and unmate connector assemblies for 50 cycles for 15 min gold plating and 100 cycles for 30 min gold plating at rate of 150 cycles per hour. Test Specification 109-27.

Figure 1 (continued)

Test Description	Requirement	Procedure
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note (a).	Subject unmated connectors to 5 cycles between -65 and 105°C. Test Specification 109-22.
Humidity-temperature cycling.	See Note (a).	Subject unmated connectors to 10 humidity-temperature cycles between 25 and 65°C at 95% RH. Test Specification 109-23-4, Condition B.
Mixed flowing gas.	See Note (a).	Subject mated connectors to environmental class III for 20 days for 15 and 30 microinch gold plating. Test Specification 109-85-3.
Temperature life.	See Note (a).	Subject mated connectors to temperature life at 105°C for 500 hours. Test Specification 109-43.

**NOTE**

- (a) *Shall meet visual requirements, show no physical damage, and shall meet requirements of additional tests as specified in test sequence in Figures 2.*
- (b) *Termination resistance, durability and mating and unmating force are a function of mating receptacle connectors. When tested using AMP-LATCH receptacle connectors, these connectors will perform to same requirements specified for mating receptacle connectors in Product Specification 108-40000 with compatible plating. TE cannot be responsible for termination resistance, durability and mating and unmating force when mated to other than TE receptacle connectors.*
- (c) *Continuous current rating for individual contacts cannot be applied directly to number of contacts as they are dependent on thermal and physical properties of material. System design shall assure that continuous current rating does not create internal hot spots that exceed temperature designated by connector specification during steady state or transient conditions.*

Figure 1 (end)

3.6. Product Qualification and Requalification Tests

Test or Description	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Examination of product	1, 9	1, 6	1, 5	1, 8
Termination resistance, dry circuit	3, 7	2, 5	2,4	
Dielectric withstanding voltage				3, 7
Insulation resistance				2, 6
Vibration	5			
Physical shock	6			
Mating force	2			
Unmating force	8			
Durability	4	3 (d)		
Thermal shock				4
Humidity-temperature cycling				5
Mixed flowing gas			3 (c)	
Temperature life		4		

**NOTE**

- (a) See Para 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Precondition samples with 10 cycles durability.
- (d) Perform manually, connector shall be hand held.

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. All test groups shall consist of minimum of 5 connectors per part number with minimum of 30 randomly selected contacts distributed between the 5 connectors being measured. Testing for test group 1 shall be performed on minimum and maximum mounted connector sizes available. Testing for test group 2 shall be performed on maximum free hanging connector size available. Testing for test groups 3 and 4 shall be performed on mid-range mounted connectors.

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 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

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.

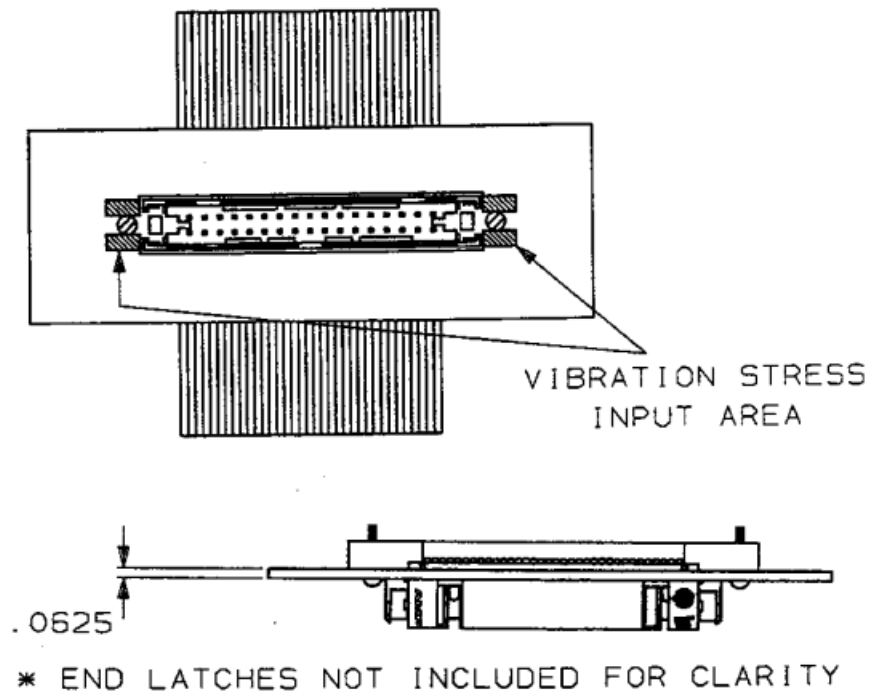


Figure 3  
Vibration & Physical Shock

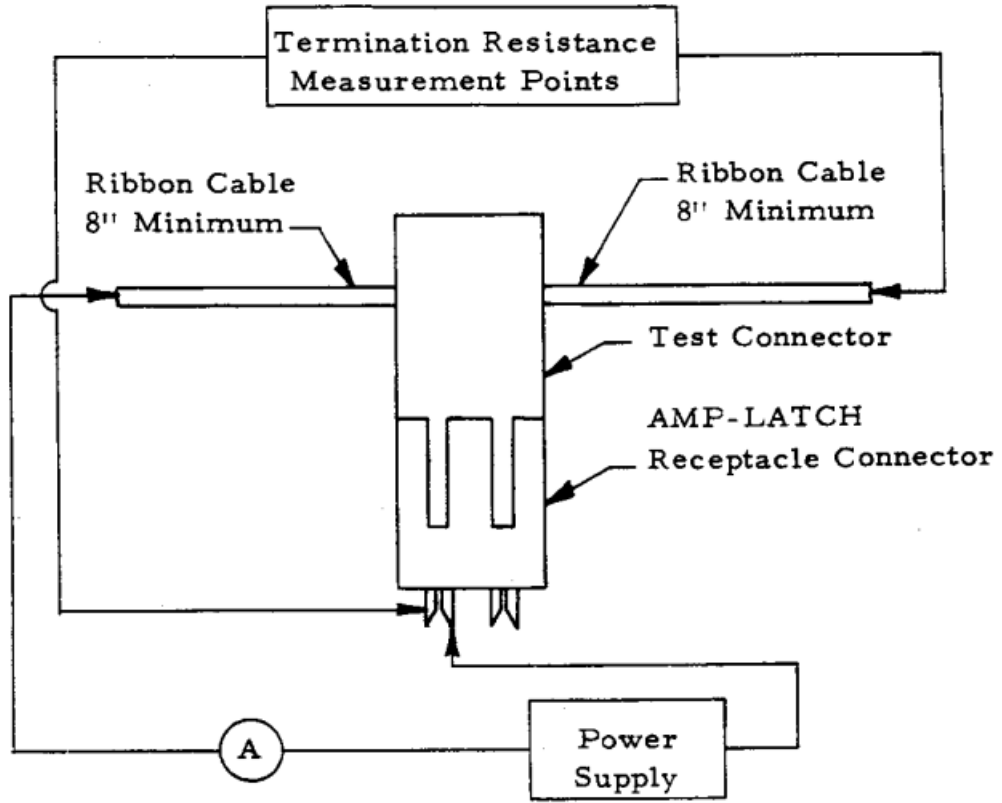


Figure 4  
Termination Resistance Measurement Points