

**Connector, AMPLIMITE\*, ACTION PIN\*****1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for the AMPLIMITE\* ACTION PIN\* connector with pre-installed contacts. For more information concerning the performance, tests and quality requirements of the AMPLIMITE contacts, see Product Specification 108-16.

## 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.

## 1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 21Jan97. The test file number for this testing is 501-365. This documentation is on file at and available from Engineering Practices and Standards (EPS).

**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

- 109-1: General Requirements for Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- 108-16: Product Specification
- 114-40026: Application Specification
- 408-9031: Instruction Sheet
- 408-9293: Instruction Sheet
- 501-365: 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.

## 3.2. Materials

- Contact: Copper alloy, gold in mating area, tin-lead in printed circuit board attachment area, all over nickel plating
- Housing: Thermoplastic, black, UL94V-0

3.3. Ratings

- Current: Signal application only
- Temperature: -55 to 105°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 AMP Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and Application Spec 114-40026.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance.	15 milliohms maximum.	AMP 109-6-1. Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum. See Figure 3.
Insulation resistance.	5000 megohms minimum.	AMP Spec 109-28-4. Test between adjacent contacts of mated samples.
Dielectric withstanding voltage.	1 kvac at sea level.	AMP Spec 109-29-1. Test between adjacent contacts of mated samples.
MECHANICAL		
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-21-5. Subject mated samples to 20.71 G's rms. 20 minutes in each of 3 mutually perpendicular planes. See Figure 4.
Physical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-26-1, except 30 G's. Subject mated samples to 30 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 4.
Durability.	See Note.	AMP Spec 109-27. Mate and unmate samples for 100 cycles for 30 $\mu$ inch gold plating and 10 cycles for gold flash at a maximum rate of 200 cycles per hour.

Figure 1 (cont)

Test Description	Requirement	Procedure												
Contact retention.	Contacts shall not dislodge.	AMP Spec 109-30. Apply axial load of 5 pounds at a rate of 1 pound per second and maintain for 5 seconds to each contact in direction opposite of insertion.												
Mating force.	<table border="1"> <thead> <tr> <th>Connector Position</th> <th>Lbs Maximum w/Grounding Indents</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>15</td> </tr> <tr> <td>15</td> <td>20</td> </tr> <tr> <td>25</td> <td>30</td> </tr> <tr> <td>37</td> <td>40</td> </tr> <tr> <td>50</td> <td>50</td> </tr> </tbody> </table>	Connector Position	Lbs Maximum w/Grounding Indents	9	15	15	20	25	30	37	40	50	50	AMP Spec 109-42, Condition A. Measure force necessary to mate samples at a maximum rate of 1 inch per minute.
Connector Position	Lbs Maximum w/Grounding Indents													
9	15													
15	20													
25	30													
37	40													
50	50													
Unmating force.	<table border="1"> <thead> <tr> <th>Connector Position</th> <th>Lbs Maximum w/Grounding Indents</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>15</td> </tr> <tr> <td>15</td> <td>20</td> </tr> <tr> <td>25</td> <td>30</td> </tr> <tr> <td>37</td> <td>40</td> </tr> <tr> <td>50</td> <td>50</td> </tr> </tbody> </table>	Connector Position	Lbs Maximum w/Grounding Indents	9	15	15	20	25	30	37	40	50	50	AMP Spec 109-42, Condition A. Measure force necessary to unmate samples at a maximum rate of 1 inch per minute.
Connector Position	Lbs Maximum w/Grounding Indents													
9	15													
15	20													
25	30													
37	40													
50	50													
<b>ENVIRONMENTAL</b>														
Thermal shock.	See Note.	AMP Spec 109-22. Subject mated samples to 5 cycles between -55 and 105°C.												
Humidity-temperature cycling.	See Note.	AMP Spec 109-23-3, Condition B. Subject mated samples to 10 cycles between 25 and 65°C at 95% RH.												
Temperature life.	See Note.	AMP Spec 109-43. Subject mated samples to temperature life at 105°C for 500 hours.												
Mixed flowing gas.	See Note.	AMP Spec 109-85-2. Subject mated samples to environmental class II for 14 days.												

**NOTE** *Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 2.*

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

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

**NOTE** (a) See paragraph 4.1.A.  
 (b) Numbers indicate sequence in which tests are performed.  
 (c) Precondition samples with 10 cycles durability.

Figure 2

**4. QUALITY ASSURANCE PROVISIONS**

4.1. Qualification Testing

A. Sample Selection

Samples 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 connector assemblies. Plug and receptacle connectors shall be mounted to printed wiring boards with test points located on the boards.

Test groups 1, 2, 3 and 4 shall include separate assemblies with 30 μin and gold flash contacts. Test group 5 shall consist of assemblies with gold flash contacts.

Plug product in test group 1 shall include samples with and without grounding indents in the shell. Samples in test group 5 shall not be mounted to printed wiring boards. All samples shall be 50 position 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 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. 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

- I The applicable quality inspection plan will 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.

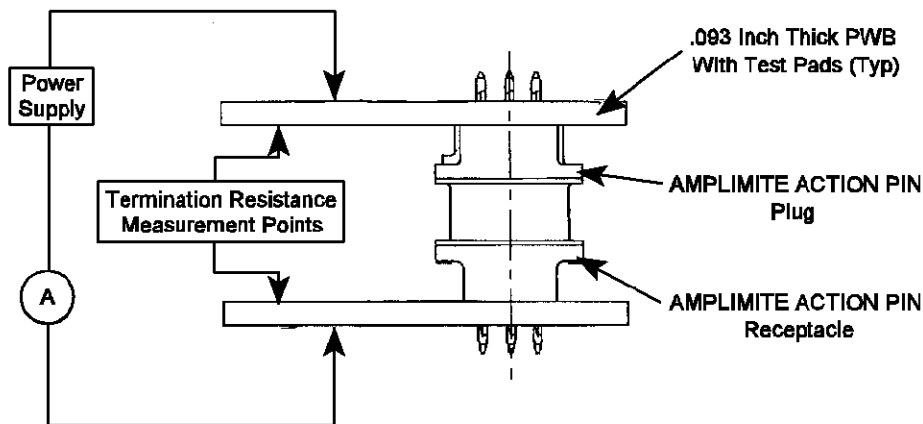
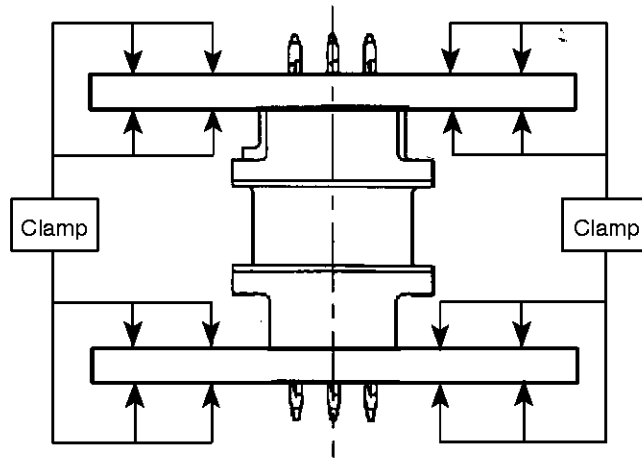


Figure 3  
Termination Resistance Measurement Positions



**NOTE** *Clamp full length of boards on both sides.*

Figure 4  
Vibration & Physical Shock Mounting Fixture