Connector, AMPLIMITE*, Power VIII

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMPLIMITE* power pin and socket contacts.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in 109 Series Test 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. 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. TE Connectivity (TE) Documents

- 109-1: General Requirements for Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- 114-10014: Application Specification
- 408-7516: Instruction Sheet
- 501-282: Qualification Test Report

2.2. Military Specifications

- MIL-W-16878/5: Wire, Electrical, Polytetrafluoroethylene (PTFE) Insulated, 200°C, 1000 Volts, Extruded Insulated
- MIL-W-22759: Wire, Electrical, Fluoropolymer Insulated, Copper or Copper Alloy

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

- Pin: Brass, gold over nickel plating
- Socket: Beryllium copper, gold over nickel plating

3.3. Ratings

- Current: See Figure 4 for applicable current carrying capability. Maximum rated current that can be carried by this product is limited by its application, maximum operating temperature of housings, allowable temperature rise of contacts, and variables such as wire size, connector size and material, contact material, and ambient temperature.
- Temperature: -55 to 125°C

3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per Test Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and Application Specification 114-10014.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance.	2 milliohms maximum initial. ΔR 1 milliohm maximum.	TE 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.	TE Spec 109-28-4. Test between adjacent contacts of mated samples.
Dielectric withstanding voltage.	1000 vac at sea level.	TE Spec 109-29-1. Test between adjacent contacts of mated samples.
Temperature rise vs current.	30°C maximum temperature rise at specified current.	TE Spec 109-45-1. Measure temperature rise vs current. See Figure 4.
MECHANICAL		
Crimp tensile.	Wire Size AWG / Crimp Tensile Pounds Minimum 8 / 198 10 / 120 12 / 93 14 / 61 16 / 50 18 / 35	TE Spec 109-16. Determine crimp tensile at maximum rate of 1 inch per minute.
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	TE Spec 109-21-6. Subject mated samples to 43.92 G's rms. 15 minutes in each of 3 mutually perpendicular planes.

Figure 1 (continued)

Test Description	Requirement	Procedure
Physical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	TE Spec 109-26-4, except 300 G's and 3 milliseconds. Subject mated samples to 300 G's half-sine shock pulses of 3 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability.	See Note.	TE Spec 109-27. Mate and unmate samples for 500 cycles at maximum rate of 300 cycles per hour.
Contact retention.	Contacts shall not dislodge.	TE Spec 109-30. Apply axial load of 15 pounds to contacts and hold for 5 seconds.
Mating force.	80 ounces maximum initial per contact.	TE Spec 109-42, Condition A. Measure force necessary to mate samples at maximum rate of .5 inch per minute.
Unmating force.	5 ounces minimum initial per contact.	TE Spec 109-42, Condition A. Measure force necessary to unmate samples at maximum rate of .5 inch per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	TE Spec 109-22. Subject mated samples to 5 cycles between -55 and 125°C.
Humidity-temperature cycling.	See Note.	TE Spec 109-23-3, Condition B. Subject mated samples to 10 cycles between 25 and 65°C at 95% RH.
Temperature life.	See Note.	TE Spec 109-43. Subject mated samples to temperature life at 125°C for 1000 hours.
Mixed flowing gas.	See Note.	TE 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
	Test Sequence (b)			
Examination of product	1,10	1,9	1,8	1,3
Termination resistance	3,7	2,7		
Insulation resistance			2,6	
Dielectric withstanding voltage			3,7	
Temperature rise vs current		3,8		
Crimp tensile				2
Vibration	5	6(c)		
Physical shock	6			
Durability	4			
Contact retention	9			
Mating force	2			
Unmating force	8			
Thermal shock			4	
Humidity-temperature cycling			5	
Temperature life		4		
Mixed flowing gas		5		

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 Test Specification 109-151.

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. All test groups shall consist of a minimum of 5 mated pairs crimped to maximum and minimum gage wire. All contacts shall be crimped to 3 foot lengths of silver plated wire per MIL-W-16878/5 or MIL-W-22759.

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

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.

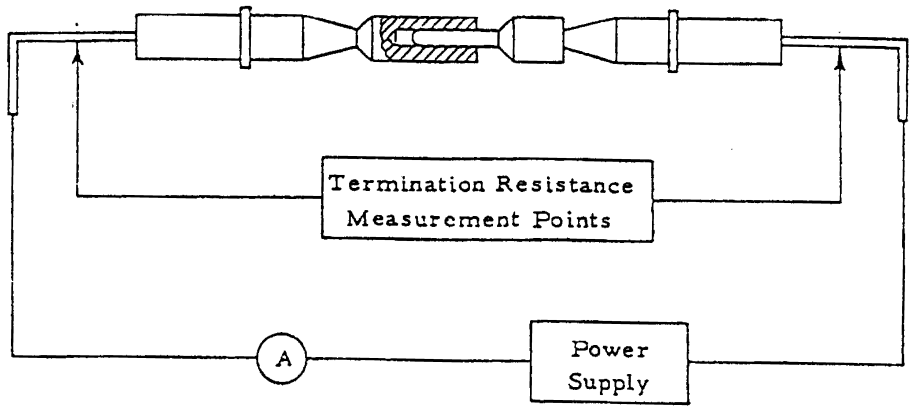

Figure 3
Termination Resistance Measurement Points

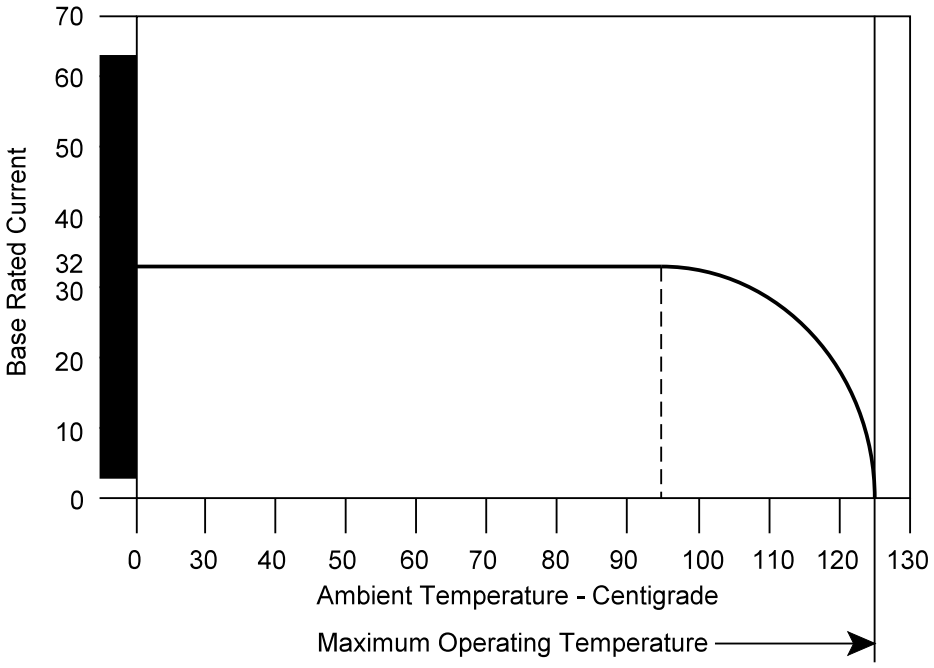

Figure 4A
Current Carrying Capability

Percent Connector Loading	Wire Size AWG					
	18	16	14	12	10	8
Single Contact	.46	.57	.67	.70	.95	1
Amperes	14.7	18.2	21.4	22.4	30.4	32

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 maximum ambient operating temperature as shown in Figure 4A.

Figure 4B
Current Rating