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**Mini UMNL II Header**

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**1. SCOPE**

## 1.1. Content

This specification covers the performance, tests and quality requirements for the AMP\* Miniature Universal MATE-N-LOK\* II (Mini UMNL II) headers. These headers provide a compact means of grouping multiple-lead connections in appliances, computers and other commercial equipment. This system is totally compatible to existing Mini UMNL product.

## 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 in Dec99. The Qualification Test Report number for this testing is 501-489. This documentation is on file at and available from Engineering Practices and Standards (EPS).

**2. APPLICABLE DOCUMENTS**

The following AMP 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.

- A. 109 Series: Test Specifications as indicated in Figure 1
- B. 109-1: General Requirements for Test Specifications
- C. 114-1111: Application Specification
- D. 501-489: Qualification 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

- A. Contact:
  - 1. Pins: Brass, pre-tin and gold plating
  - 2. Receptacles: Brass, pre-tin and gold plating
- B. Housing: Nylon 6/6, UL94V-0

3.3. Ratings

- A. Voltage: 600 volts AC or DC
- B. Current: See Figure 4 for applicable current carrying capability
- C. Temperature:
  - 1. Gold: -20 to 105°C
  - 2. Tin: -20 to 85°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 AMP Spec 114-14016.	Visual, dimensional and functional per applicable quality inspection plan.
<b>ELECTRICAL</b>		
Termination resistance.	10 milliohms maximum initial. 20 milliohms maximum final.	AMP Spec 109-6-1. Subject mated contacts assembled on test board to 20 mv maximum open circuit at 100 ma maximum. See Figure 3.
Insulation resistance.	1000 megohms minimum.	AMP Spec 109-28-4. Test between adjacent contacts.
Dielectric withstanding voltage.	1500 volts AC at sea level. 1 minute hold with no breakdown or flashover.	AMP Spec 109-29-1. Test between adjacent contacts.
Temperature rise vs current.	30°C maximum temperature rise at specified current.	AMP Spec 109-45-1. Measure temperature rise vs current. See Figure 4.
<b>MECHANICAL</b>		
Solderability.	Solderable area shall have minimum of 95% solder coverage.	AMP Spec 109-11-3. Subject contacts to solderability.
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-21-1. Subject mated specimens to 10-55-10 Hz traversed in 1 minute with 1.5 mm [.06 in] maximum excursion. 2 hours in each of 3 mutually perpendicular planes.
Mechanical shock, specified pulse.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-26-1. Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.

Figure 1 (cont)

Test Description	Requirement	Procedure
Durability.	See Note.	AMP Spec 109-27. Mate and unmate specimens for 25 cycles at a maximum rate of 500 cycles per hour.
Mating force.	6.7 N [1.5 lb] maximum per circuit initial.	AMP Spec 109-42, Condition A. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Unmating force.	1.1 N [.25 lb] minimum per circuit final.	AMP Spec 109-42, Condition A. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Housing lock strength.	26.7 N [6 lb] minimum final.	AMP Spec 109-50. Determine housing lock strength at a maximum rate of 25.4 mm [1 in] per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	AMP Spec 109-22. Subject specimens to 25 cycles between -20 and 105°C.
Humidity-temperature cycling.	See Note.	AMP Spec 109-23-3, Condition B. Subject specimens to 10 cycles between 25 and 65°C at 95% RH.
Temperature life.	See Note.	AMP Spec 109-43. Subject specimens to temperature life at 85°C for tin product and 105°C for gold product for 580 hours.
Mixed flowing gas.	See Note.	AMP Spec 109-85-2. Subject specimens to environmental class II for 14 days.

**NOTE** *Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown 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	6
	Test Sequence (b)					
Examination of product	1,9	1,9	1,8	1,3	1,3	1,7
Termination resistance	3,7	2,7				2,4,6
Insulation resistance			2,6			
Dielectric withstanding voltage			3,7			
Temperature rise vs current		3,8				
Solderability					2	
Vibration	5	6(c)				
Mechanical shock	6					
Durability	4					
Mating force	2					
Unmating force	8					
Housing lock strength				2		
Thermal shock			4			
Humidity-temperature cycling		4(d)	5			
Temperature life		5				5
Mixed flowing gas						3(e)

**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 AMP Specification 109-151.
- (d) Precondition specimens with 10 cycles durability, tin plated specimens only.
- (e) Precondition specimens with 10 cycles durability, gold plated specimens only.

Figure 2

**4. QUALITY ASSURANCE PROVISIONS**

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test groups 2, 4 and 6 shall consist of at least 5 assemblies for each requirement of Figure 2. Test groups 1, 3 and 5 shall consist of at least 5 random connector assemblies.

B. Test Sequence

Qualification inspection shall be verified by testing specimens 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 specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable AMP quality inspection plan shall 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.

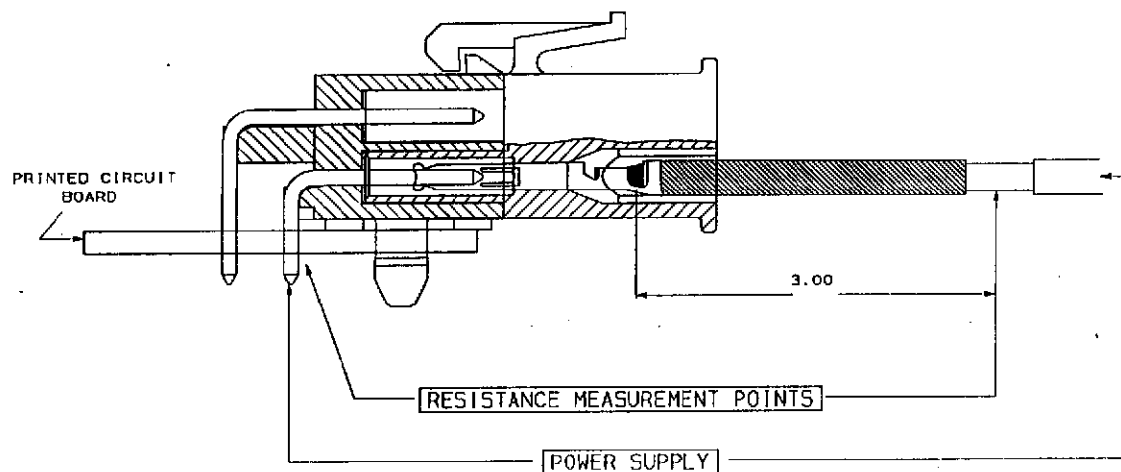


Figure 3  
Termination Resistance Measurement Points

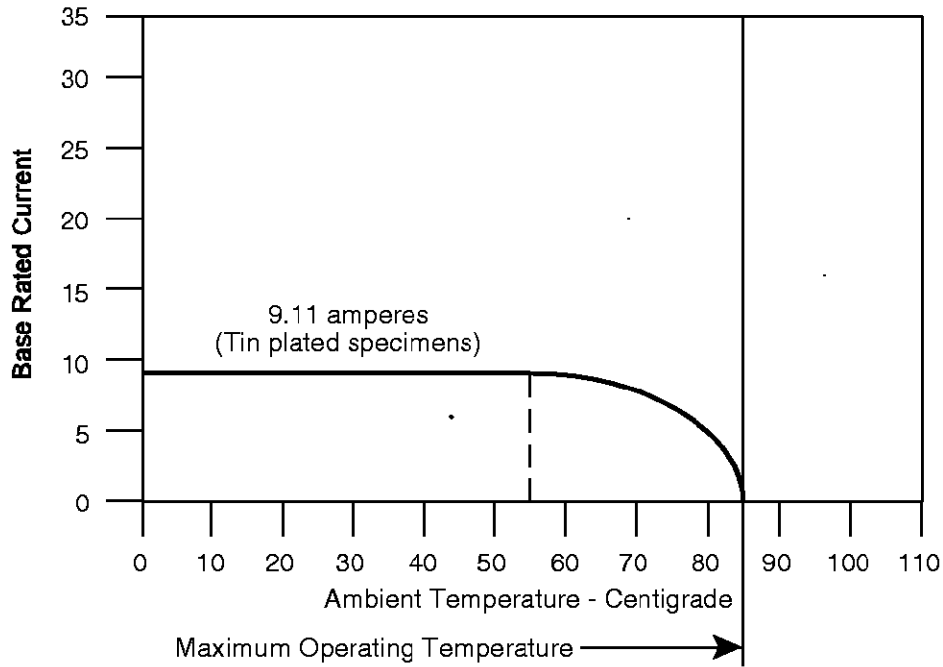


Figure 4A  
Current Carrying Capability

Percent Connector Loading	Wire Size AWG				
	26	24	22	20	18
Single Contact	.534	.613	.710	.836	1
50	.344	.394	.458	.538	.644
100	.259	.296	.344	.404	.484

**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 the maximum ambient operating temperature shown in Figure 4A.

Figure 4B  
Current Rating