
Header, MATE-N-LOK*, Mini-Universal

1. SCOPE**1.1. Content**

This specification covers performance, tests and quality requirements for MATE-N-LOK* mini-universal headers.

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 16Jul96. The test file number for this testing 501-402. 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. TE Connectivity (TE) Documents

- [109-1](#): General Requirements for Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- [114-16017](#): Application Specification
- [501-402](#): Qualification Test Report

3. REQUIREMENTS**3.1. Design and Construction**

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

3.2. Ratings

- Voltage: 600 volts AC DC
- Current: See Figure 4 for applicable current carrying capability
- Temperature: -55 to 105°C

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and AMP Spec 114-16017.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance.	10 milliohms maximum initial. 20 milliohms maximum final.	TE Spec109-6-1. Subject mated contacts assembled on test board to 50 mv maximum open circuit at 100 ma maximum. See Figure 3.
Insulation resistance.	1000 megohms minimum initial. 100 megohms minimum final.	TE Spec 109-28-4. Test between adjacent circuits of free hanging connector mated with header.
Dielectric withstanding voltage.	1.5 kvac at sea level.	TE Spec 109-29-1. Test between adjacent circuits of free hanging connector mated with header.
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		
Solderability.	Solderable area shall have minimum of 95% solder coverage.	TE Spec 109-11-3. Subject contacts to solderability.
Heat Resistance to Wave Soldering	See note	TE Spec 109-202 Subject contacts to wave soldering
Vibration, sinusoidal.	No discontinuities of 10 microseconds or longer duration. See Note.	TE Spec 109-21-1. Subject mated samples to 10-55-10 Hz traversed in 1 minute at 0.06 inch total excursion. 2 hours in each of 3 mutually perpendicular planes. See Figure 5.
Physical shock.	No discontinuities of 10 microseconds or longer duration. See Note.	TE Spec 109-26-7. Subject mated samples to 50 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 5.
Durability.	See Note.	TE Spec 109-27. Mate and unmate samples for 20 cycles at maximum rate of 500 cycles per hour.
Mating force.	1.5 pounds maximum per circuit.	TE Spec 109-42, Condition A. Measure force necessary to mate samples without locking latches at maximum rate of 0.5 inch per minute.

Figure 1 Cont.

Test Description	Requirement	Procedure
Unmating force.	0.15 pound minimum per circuit.	TE Spec 109-42, Condition A. Measure force necessary to unmate samples without locking latches at maximum rate of 0.5 inch per minute.
Housing lock strength.	6 pounds minimum.	TE Spec 109-50. Determine housing lock strength at maximum rate of 0.5 inch per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	TE Spec 109-22. Subject mated samples to 25 cycles between -55 and 105°C.
Humidity-temperature cycling.	See Note.	TE Spec 109-23-4, Condition B. Subject samples mated with header to 10 cycles between 25 and 65°C at 95% RH with -10°C cold shock.
Temperature life.	See Note.	TE Spec 109-43. Subject mated samples to temperature life at 105°C for 580 hours.


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)

3.4. 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	1,9	1,9	1,3	1,3
Termination resistance	3,7	2,7			
Insulation resistance			2,6		
Dielectric withstanding voltage			3,7		
Temperature rise vs current		3,8			
Solderability				2	
Heat Resistance to Wave Soldering					2
Vibration	5	6			
Physical shock	6				
Durability	4				
Mating force	2				
Unmating force	8				
Housing lock strength			8		
Thermal shock			4		
Humidity-temperature cycling		4(c)	5		
Temperature life		5			



NOTE

- (a) Samples shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. All test groups shall each consist of 5 random connector assemblies.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Precondition samples with 5 cycles durability.

Figure 2

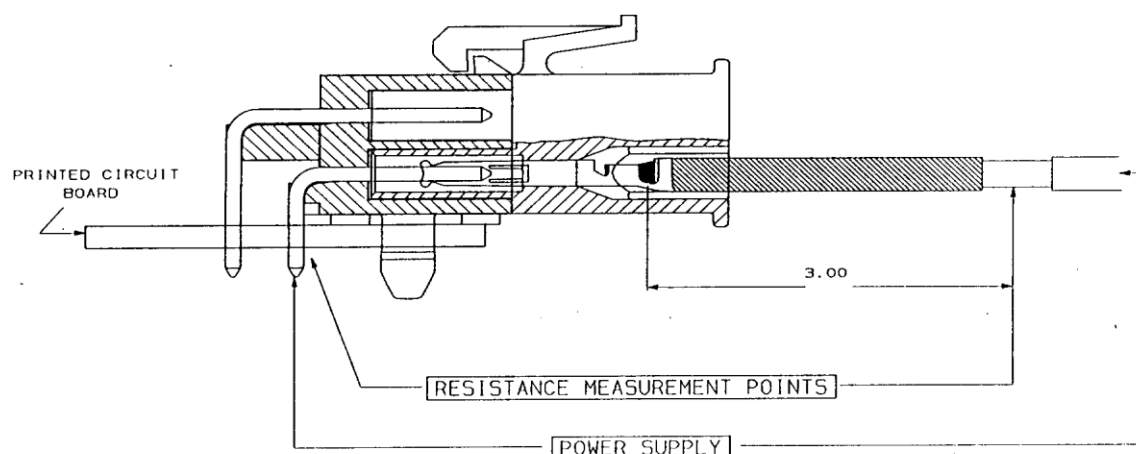


Figure 3
Termination Resistance Measurement Points

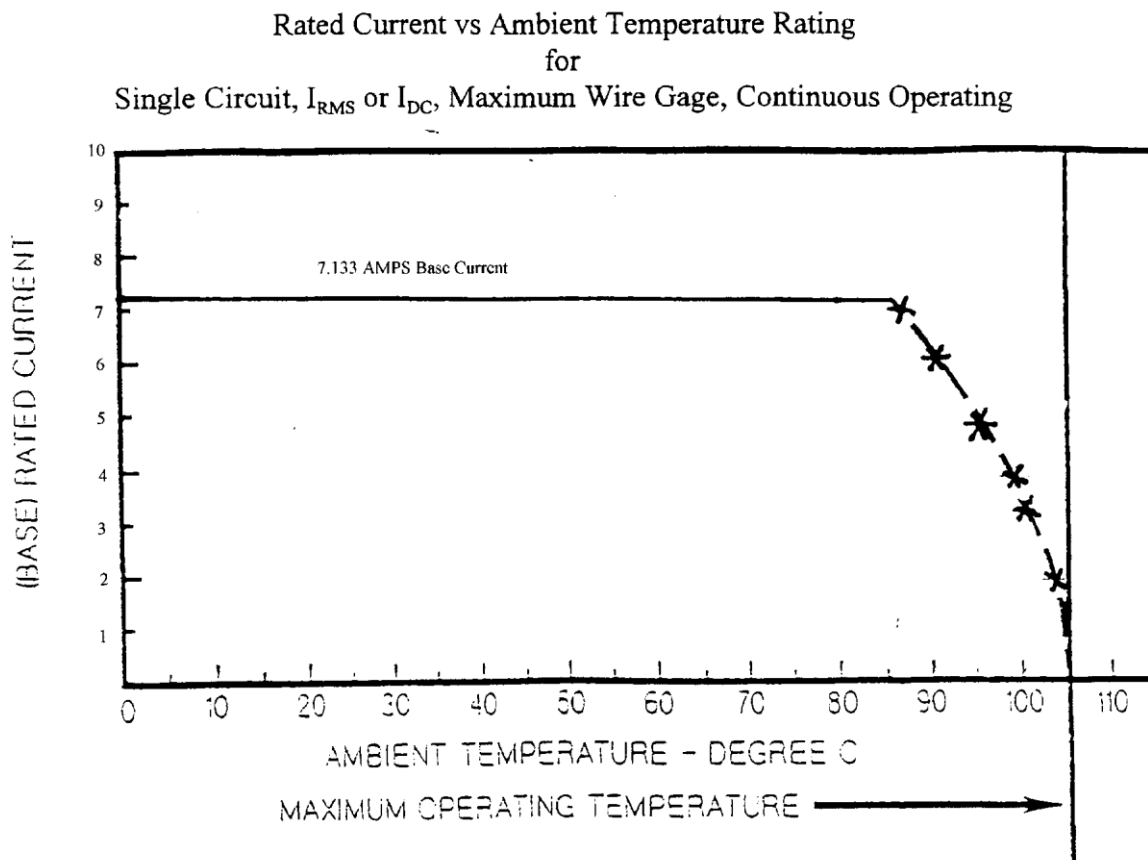


Figure 4A
Current Carrying Capability

Percent Connector Loading Mini UMNL 24 Position Dual Row Wire to Board	Wire Size AWG			
	26	22	20	18
	Multiplication Factor (F)			
Single Contact	0.512	0.694	0.826	1.0
50	0.296	0.401	0.477	0.578
100	0.237	0.321	0.381	0.462



NOTE

To determine the acceptable current carrying capacity for the 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 as shown in Figure 4A.

Figure 4B
Current
Rating

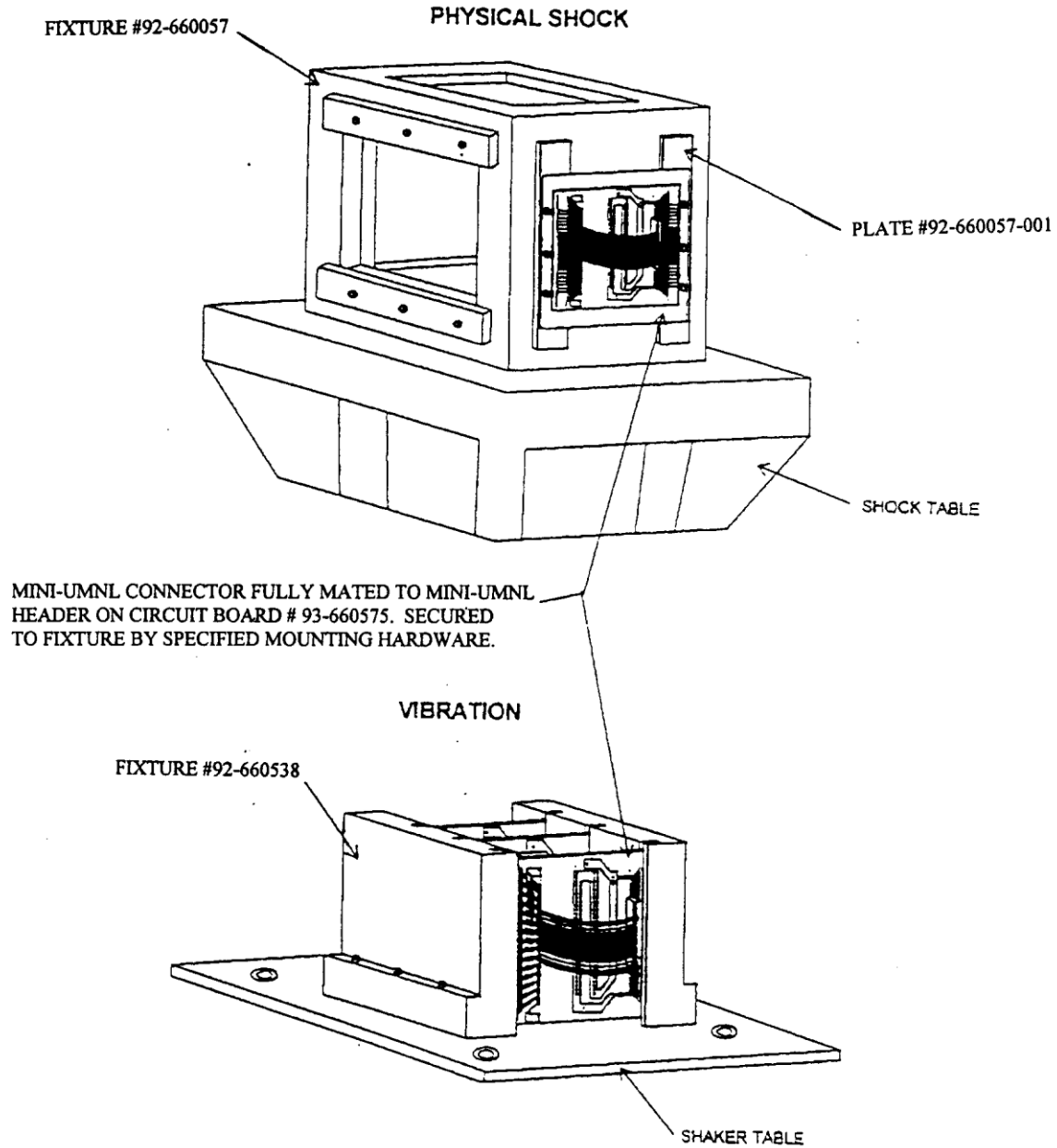


Figure 5
Vibration & Physical Shock Mounting
Fixture