MINI MTDL Connectors

1. Scope

1.1 Content

This specification covers the requirements for product performance, test methods and quality assurance provisions of MINI MTDL Connectors.

2. Applicable Documents

The following documents form a part of this specification to the extent specified herein.
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 AMP Specifications :

A. 109-197: Test Specification, General Requirements for Test Methods. (AMP test Specifications vs EIA and IEC Test Methods)
B. 114-16017: Application Specifications

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 Material

A. Contact :
(1) PIN: Pre Tin, Copper Alloy
(2) SOCKET: Pre Tin, Copper Alloy

B. CAP Housing :
6/6 NYLON (UL 94V-0, UL 94V-2)

C. Plug Housing :
6/6 NYLON (UL 94V-0, UL 94V-2)

D. Double Lock Plate Housing:
6/6 NYLON (UL 94V-0)

E. Accessories and Hardware:
Wire Seal: Silicon Rubber
Single Housing Cavity Plug Seal: Silicon Rubber
Interface Seal: Polyurethane Foam

3.3 Ratings :

A. Voltage Rating : 600 VAC
B. Current Rating : Refer to Fig. 1 for maximum allowable current to be applied.
C. Temperature: -30℃ to 105℃

Wire Size	Maximum Allowable Current(A)
AWG 20	5
AWG 26	1

Fig.1

3.4 Performance Requirement and Test Descriptions :
The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig.2. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.

3.5 Test Requirements and Procedures Summary

Para.	Test Items	Requirements	Procedures
3.5.1	Initial examination of Product.	Meets requirements of product drawing	EIA-364. Visual and dimensional (C of C) inspection per product drawing.
3.5.2	Final examination of product.	Meets visual requirements.	EIA-364. Visual inspection.
Electrical Requirements			
3.5.3	Dry circuit Resistance.	10 mΩ Max. (Initial) 20 mΩ Max. (Final)	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 4.
3.5.4	Insulation Resistance	1000 MΩ Min. (Initial) 500 MΩ Min. (Final)	EIA-364-21. Test between adjacent contacts of mated specimens.
3.5.5	withstanding Voltage	1 minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1500 volts AC at sea level. Test Between adjacent contacts of Mated specimens.
3.5.6	Temperature rise vs current.	30℃ maximum temperature rise at specified current.	EIA-364-70, Method 1. Stabilize at a single current level Until 3 readings at 5 minute

				intervals are within 1℃. See Figure 5.
Mechanical Requirements				
3.5.7	Termination Tensile Strength	Wire Size AWG	Crimp Tensile N(kgf) Min.	EIA-364-8. Determine crimp tensile at a Maximum rate of 50±6mm [1.96±.24 in] per minute.
		26	17.8	
		20	80.1	
3.5.8	Contact Retention Force	Contacts shall not dislodge. 4.0 kgf min.		EIA-364-29. Apply an axial load of 50.0N [11lbf] at a maximum rate of 50.0mm [1.96in] per minute.
3.5.9	Contact Insertion Force	19.7N [4.4 lbf] maximum per contact.		AMP Spec 109-41. Measure force necessary to insert a contact into the housing at a maximum rate of 50.0mm[1.96in] per minute.
3.5.10	Vibration, sinusoidal.	No discontinuities of 10 microseconds or longer duration. See Note.		EIA-364-28, Test Condition I. Subject mated specimens to 10-55-10 Hz traversed in 1 minute with 1.5mm [.06in] maximum total excursion. 2 hours in each of 3 mutually perpendicular planes. See Figure 6.
3.5.11	Durability (Repeated Mate/Unmating)	See Note.		EIA-364-9 Mate and unmate tin plated specimens for 20cycles, and gold plated specimens for 50 cycles at a maximum rate of 500 cycles per hour.
3.5.12	Mechanical shock.	No discontinuities of 10 microseconds or longer duration. See Note.		EIA-364-27, Method A. Subject mated specimens to 50G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure7.
3.5.13	Mating force.	6.7N [1.5lbf] maximum per circuit initial. (Only 2p Hsg is 15.0N [3.4lbf] maximum per circuit initial.)		EIA-364-13. Measure force necessary to mate specimens without locking latches at a maximum rate of 100.0mm [3.94in] per minute.
3..5.14	Unmating force	0.7N [.15lbf] minimum per circuit final.		EIA-364-13 Measure force necessary to mate specimens at a maximum rate of 100.0mm [3.94in] per minute.

3.5.15	Housing lock strength	40N [9lbf] minimum.	EIA-364-98. Determine housing lock strength at maximum rate of 100.0mm [3.94in] per minute.
Environmental Requirements			
3.5.16	Thermal Shock	See Note.	EIA-364-32, Test Condition VII. Subject specimens to 25 cycles between -55 and 105℃
3.5.17	Humidity-Temperature Cycling	See Note.	EIA-364-31, Method III. Subject specimens to 10 cycles (10days) between 25 and 65℃ At 80 to 100% RH.
3.5.18	Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4. Subject mated specimens to 105℃ for 580 hours.
3.5.19	Salt Spray	20 mΩ Max. (Final) No corrosion influence performance	Subject mated connector to 5%±1% salt concentration for 48 hours. The measurement is held after remove the salt and dry up at indoor.
3.5.20	Net tracking	No net tracking	Immerse mated specimens in 5%±1% salt concentration water for 30 minutes with the lowest point of the specimen 1.5cm Below the surface. (300V AC/DC)

Product must be without rust, corrosion transformation , crack and discoloration.

Fig. 2

3.6 Product Qualification and Test Sequence

Test Examination	Test Group					
	1	2	3	4	5	6
	Test Sequence (a)					
Initial examination of Product	1	1	1	1	1	1
Dry circuit resistance	2,6	2,6			3	
Insulation resistance			3,6			
Withstanding voltage			4,7			
Temperature Rise vs current		3				
Termination tensile strength				2		
Vibration, sinusoidal	4					
Mechanical shock	5					
Durability	3					
Contact Retention Force			9			
Contact Insertion Force			2			
Mating Force				3		
Unmating Force				4		
Housing lock strength			8			
Thermal shock			5			
Humidity-Temperature Cycling					2	
Temperature life		4				
Salt Spray		5				
Final examination of product.	7	7			4	
Net tracking						2

Fig. 3

(a)Numbers indicate sequence in which the tests are performed

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. All test groups shall each consist of 5 random connector assemblies. All contacts shall be crimped to appropriate test conductors per Specification 114-16017.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 3.

4.2 Requalification Testing

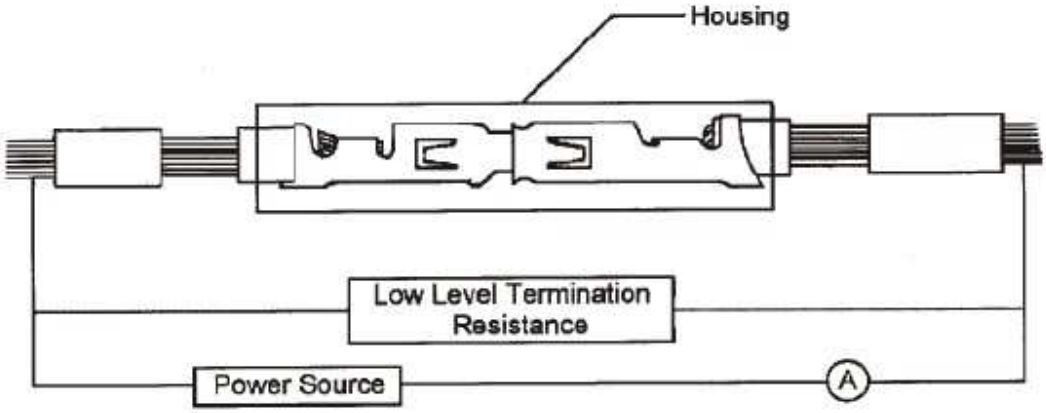
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3 Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 2. Failures Attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If 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 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.



NOTE *Bulk wire resistance shall be subtracted from resistance readings.*

Figure 4
Dry Circuit Resistance Measurement Points

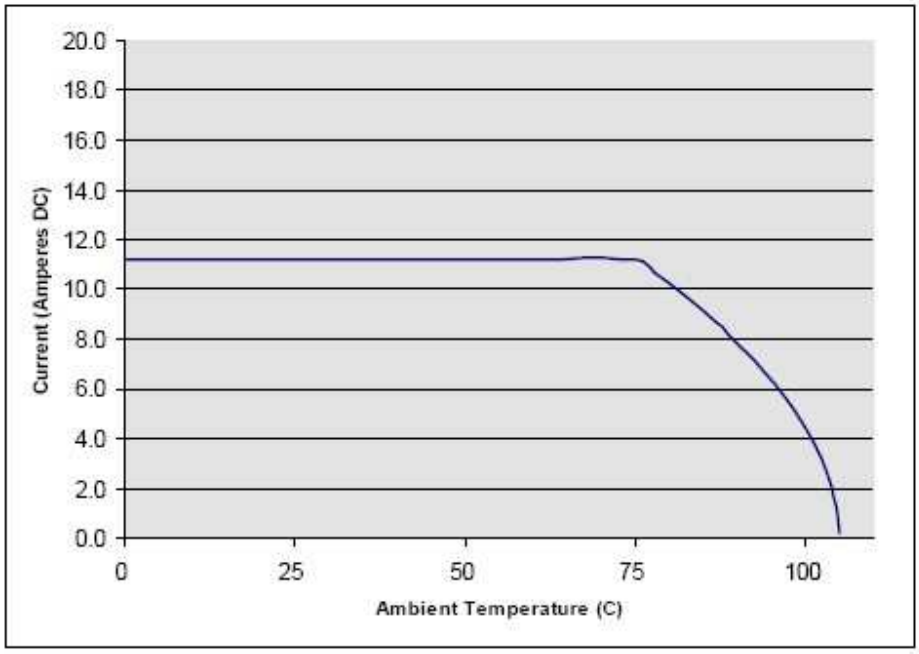


Figure 5
Current Carrying Capability (11.21 amperes)

Figure 6
Vibration Mounting Fixture

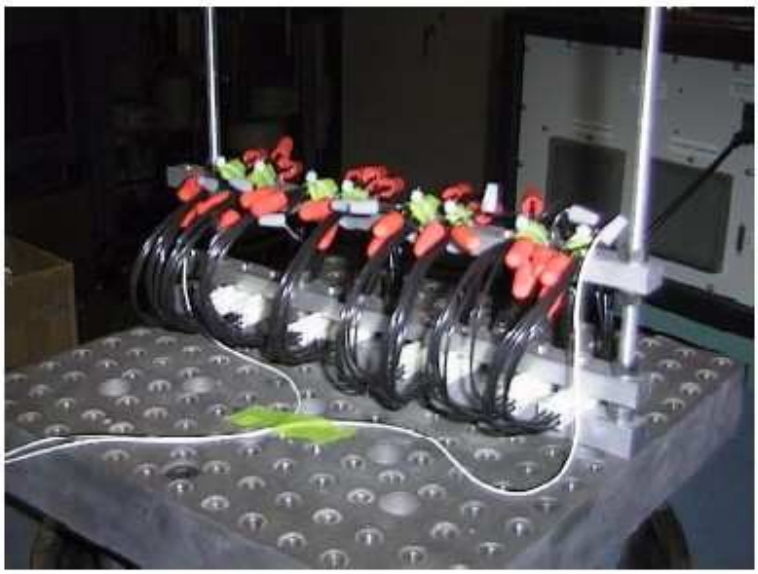


Figure 7
Mechanical Shock Mounting Fixture