ACTION PIN* Metrimate Drawer Connector

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for Metrimate, ACTION PIN* Drawer connector.

1.2. Qualification

When tests are performed on subject product line, procedures specified in 109-Series Test Specifications shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification shall take precedence.

2.1. TE Connectivity (TE) Documents

A. 109-1: General Requirements for Test Specifications

B. 109 Series: Test Specifications as indicated in Figure 1.

C. 108-16: Product Specification

D. 501-207: Test Report

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Material

A. Contact: Phosphor bronze, tin plated

B. Housing: Polysulfone

3.3. Ratings

A. Voltage: 600 vac or dc

B. Current: See Figure 2 for applicable current carrying capability

C. Temperature: -55 to 130℃

3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. All tests are performed at ambient temperature unless otherwise specified.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance, dry circuit.	10 milliohms maximum initial.	Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma maximum. See Figure 4. Test Specification 109-6-1.
Dielectric withstanding voltage.	2 kvac at sea level. No breakdown or flashover.	Test between adjacent contacts of unmated connector assemblies. Test Specification 109-29-1
Insulation resistance.	5000 megohms minimum initial. 500 megohms minimum final.	Test between adjacent contacts of unmated connector assemblies. Test Specification 109-28-4.
Temperature rise vs current.	30℃ maximum temperatu re rise at specified current.	Measure temperature rise rise vs current. See Figure 2. Test Specification 109-45-1.
MECHANICAL		
Vibration, random.	No discontinuities greater than 1 microsecond. See Note.	Subject mated connectors to 7.3 G rms for 20 minutes in each axis. See Figure 5. Test Specification 109-21-5.
Physical Shock.	No discontinuities greater than 1 microsecond.See Note.	Subject mated connectors 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. See Figure 5. Test Specification 109-26-1.
Mating force.	75 pounds maximum.	Measure force necessary to mate connector assemblies using free floating fixtures at rate of 1 inch per minute. Test Specification 109-42, Condition A.
Unmating force.	1.5 pounds minimum.	Measure force necessary to unmate connector assemblies at maximum rate of 1 inch per minute. Test Specification 109-42, Condition A.
Durability	See Note.	Mate and unmate connector assemblies for 50 cycles at maximum rate of 300 cycles per hour. Test Specification 109-27.
ENVIRONMENTAL		
Thermal shock.	See Note.	Subject mated connectors to 10 cycles between -55 and 130℃. Test Specification 109-22.
Humidity-temperature cycling.	See Note.	Subject mated connectors to 10 humidity-temperature cycles between 25 and 65℃ at 95% RH. Test Specification 109-23-4, Condition B.

Figure 1 (continued)

Test Description	Requirement	Procedure
Temperature life.	See Note.	Subject mated connectors to temperature life at 105℃ for 315 hours duration. Test Specification 109-43.

NOTE *Shall meet visual requirements, show no physical damage, and shall meet requirements of additional test as specified in test sequence in Figure 3.*

Figure 1 (end)

Rated Current vs Ambient Temperature Rating For
Single Circuit, IRMS or IDC, Maximum Wire Gage, Continuous Operation

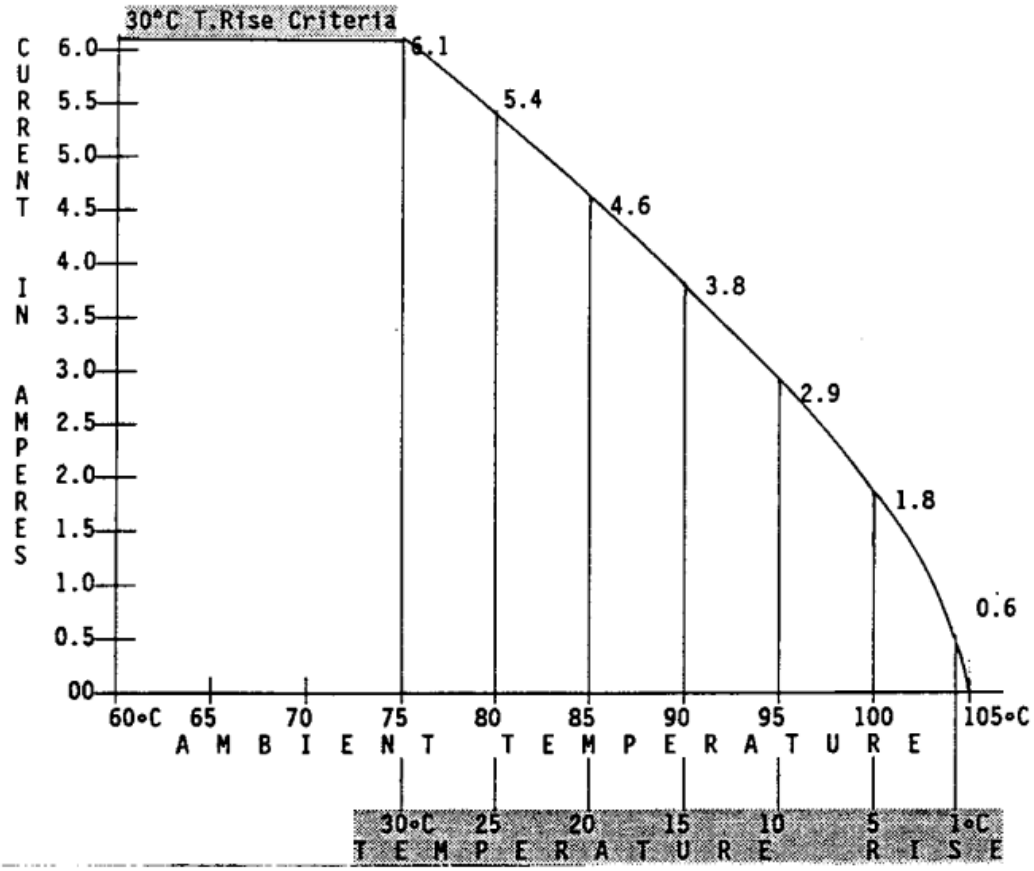

Figure 2A

I = F x Ibase

Wire Size AWG →	14 AWG	20 AWG	30 AWG
% Connector Loading ↓			
Single Contact	1.000	.6887	.4667
50% Loaded	.5136	.3537	.2397
100% Loaded	.4326	.2079	.2019

NOTE

To determine acceptable current carrying capacity for percentage connector loading and wire gage indicated, use Multiplication Factor (F) from above chart and multiply it times Base Rated Current for a single circuit at maximum ambient operating temperature as shown in Figure 2A.

Figure 2B

3.6. Product Qualification and Requalification Tests

Test or Examination	Test Group (a)		
	1	2	3
	Test Sequence (b)		
Examination of product	1, 9	1, 9	1, 8
Termination resistance, dry circuit	3, 7	2, 7	
Dielectric withstanding voltage			3, 7
Insulation resistance			2, 6
Temperature rise vs current		3, 8	
Vibration	5	6 (c)	
Physical shock	6		
Mating force	2		
Unmating force	8		
Durability	4		
Thermal shock			4
Humidity-temperature cycling		4 (d)	5
Temperature life		5	

NOTE

(a) See Para 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) Discontinuities shall not be measured. Energize at 18℃ level for 100% loading as determined in Test Specification 109-151.
(d) Precondition samples with 5 cycles durability.

Figure 3

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test group 1 shall consist of 5 mated pairs on 14 AWG wire. Test group 2 shall consist of 6 mated pairs on 14 AWG wire, 5 mated pairs on 20 AWG and 5 mated pairs on 30 AWG wire. Test group 3 shall consist of 5 mated pairs on 14 AWG wire, board connector on printed circuit board, housing size of 25 position.

B. Test Sequence

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

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to 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 product meets requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify 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 sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with applicable product drawing and this specification.

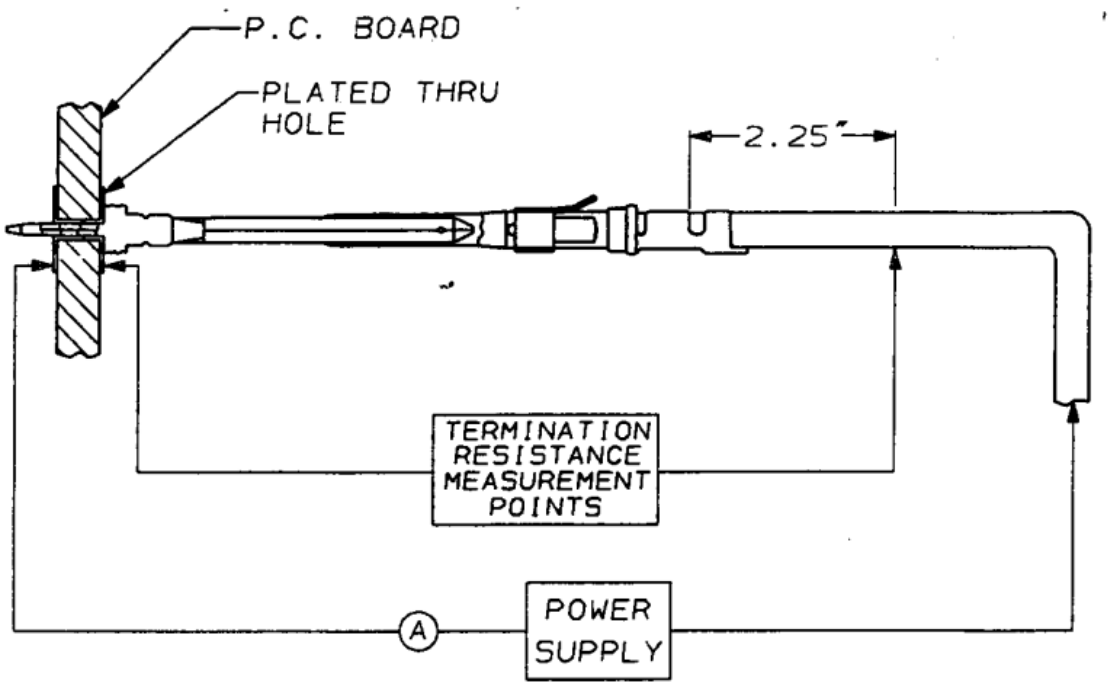

Figure 4
Termination Resistance Measurement Points

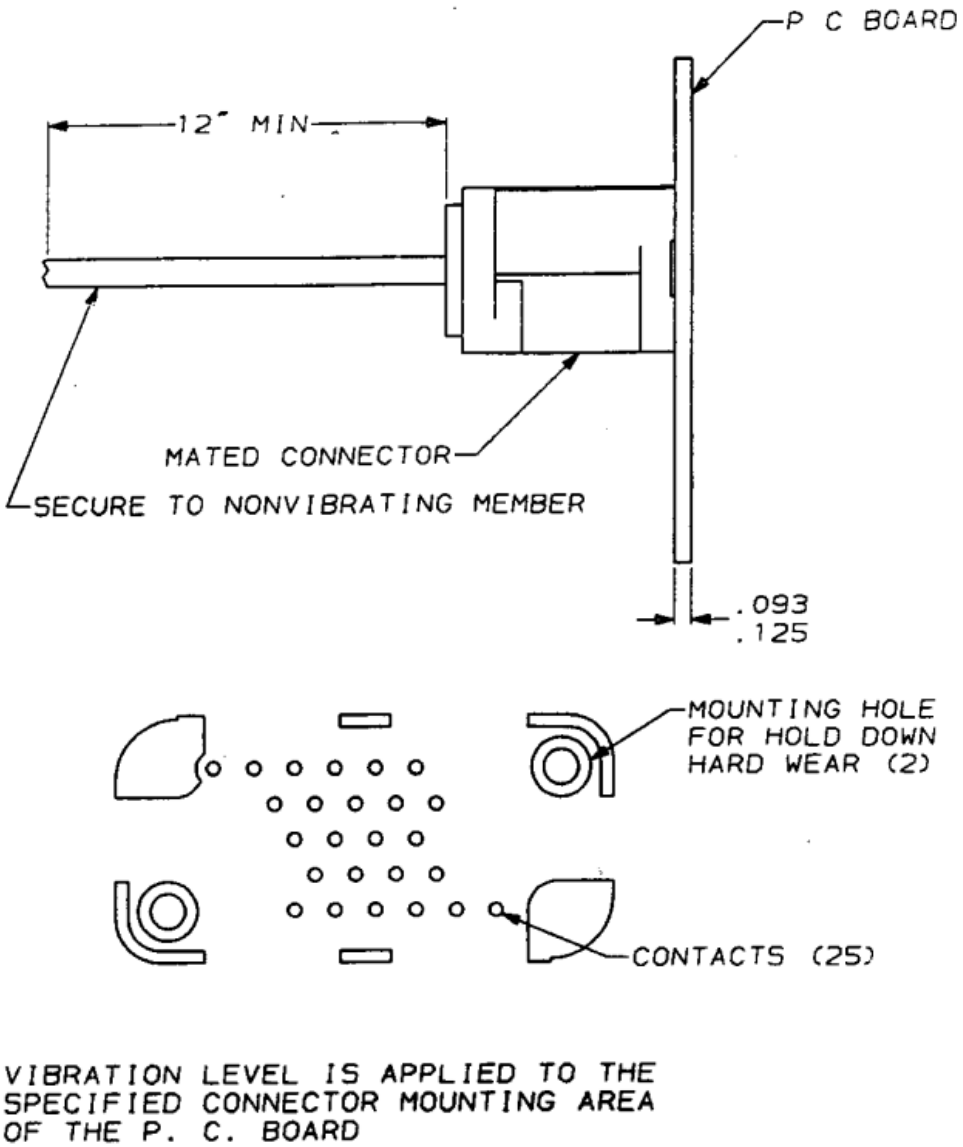

Figure 5
Mounting and Clamping Location for Vibration and Physical Shock