
MTA-100 Wire-To-Wire Posted Connector System

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the TE Connectivity (TE) MTA-100 posted connector wire-to-wire system. This system is mass terminated using insulation displacement technology on 2.54 mm [.100 in] centerlines and mates with standard MTA connectors, providing a reliable interconnection between wires in wire-to-wire applications. The system is available in 2 through 17 positions. The MTA-100 connector wire-to-wire system is designed to be terminated to tin plated wire 28 AWG through 22 AWG, UL style 1007, 1061, or wire which specifies PVC insulation with temperature rating compatible with specified operating temperatures per Figure 4. Wire shall meet application requirements specified in Application Specification 114-1019. Insulation diameters are: 1.27 mm [.050 in] maximum outside diameter for mass termination and 1.52 mm [.060 in] maximum outside diameter for single termination.

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 25Mar99. The Qualification Test Report number for this testing is 501-366-1. 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: Test Specification (General Requirements for Test Specifications)
- 109 Series: Test Specifications as indicated in Figure 1
- 114-1019: Application Specification (MTA 100 Connector Assemblies (English And Spanish))
- 501-366-1: Qualification Test Report (MTA-100 Wire-To-Wire Posted Connector System)

2.2. Reference Document

108-1050: Product Specification (Connector, MTA-100)

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

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Ratings

- Voltage: 250 volts AC
- Current: See Figure 4 for applicable current carrying capability
- Temperature: -55 to 105°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 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 114-1019.	Visual, dimensional and functional per applicable quality inspection plan.															
ELECTRICAL																	
Termination resistance.	16 milliohms maximum initial. ΔR 10 milliohms maximum.	TE 109-6-6. Subject samples to 20 millivolts maximum open circuit voltage at 100 milliamperes maximum. See Figure 3.															
Insulation resistance.	5000 megohms minimum initial.	TE Spec 109-28-4. Test between adjacent contacts of unmated samples.															
Dielectric withstanding voltage.	One minute hold with no breakdown or flashover.	TE Spec 109-29-1. 750 volts AC at sea level. Test between adjacent contacts of unmated samples.															
Temperature rise vs current.	30°C maximum temperature rise at specified current.	TE Spec 109-45-2. Measure temperature rise vs current. See Figure 4.															
MECHANICAL																	
Termination tensile strength, parallel.	<table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th>Wire Size AWG</th> <th>Slot Tensile, Minimum N</th> <th>Minimum [lbf]</th> </tr> </thead> <tbody> <tr> <td>28</td> <td>17.8</td> <td>4</td> </tr> <tr> <td>26</td> <td>26.7</td> <td>6</td> </tr> <tr> <td>24</td> <td>35.6</td> <td>8</td> </tr> <tr> <td>22</td> <td>53.4</td> <td>12</td> </tr> </tbody> </table>	Wire Size AWG	Slot Tensile, Minimum N	Minimum [lbf]	28	17.8	4	26	26.7	6	24	35.6	8	22	53.4	12	TE Spec 109-16. Determine slot tensile at a maximum rate of 25.4 mm [1 in] per minute. See Figure 5.
Wire Size AWG	Slot Tensile, Minimum N	Minimum [lbf]															
28	17.8	4															
26	26.7	6															
24	35.6	8															
22	53.4	12															

Figure 1 (continued)

Test Description	Requirement	Procedure															
Termination tensile strength, perpendicular.	<table border="1"> <thead> <tr> <th>Wire Size AWG</th> <th>Slot Tensile, Minimum N</th> <th>Minimum [lbf]</th> </tr> </thead> <tbody> <tr> <td>28</td> <td>4.4</td> <td>1</td> </tr> <tr> <td>26</td> <td>4.4</td> <td>1</td> </tr> <tr> <td>24</td> <td>4.4</td> <td>1</td> </tr> <tr> <td>22</td> <td>13.3</td> <td>3</td> </tr> </tbody> </table>	Wire Size AWG	Slot Tensile, Minimum N	Minimum [lbf]	28	4.4	1	26	4.4	1	24	4.4	1	22	13.3	3	TE Spec 109-16. Determine slot tensile at a maximum rate of 25.4 mm [1 in] per minute. See Figure 5.
Wire Size AWG	Slot Tensile, Minimum N	Minimum [lbf]															
28	4.4	1															
26	4.4	1															
24	4.4	1															
22	13.3	3															
Sinusoidal vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	TE Spec 109-21-1. Subject mated samples to 10-55-10 Hz traversed in 1 minute at 1.5 mm [0.06 inch] total excursion. Two hours in each of 3 mutually perpendicular planes. See Figure 6.															
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	TE Spec 109-26-1. Subject mated samples 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 6.															
Durability.	See Note.	TE Spec 109-27. Manually mate and unmate samples with lock temporarily disengaged with standard MTA-100 connector for 25 cycles.															
Mating force.	8.9 N [2 lbf] maximum, averaged on a per contact basis.	TE Spec 109-42, Condition A. Measure force necessary to mate samples with lock temporarily disengaged to standard MTA-100 connector from point of initial contact to a depth of 5 mm [.200 in] at maximum rate of 12.7 mm [.5 in] per minute.															
Unmating force.	0.4 N [.1 lbf] minimum, averaged on a per contact basis.	TE Spec 109-42, Condition A. Measure force necessary to unmate samples with lock temporarily disengaged from standard MTA-100 connector at a maximum rate of 12.7 mm [.5 in] per minute.															
ENVIRONMENTAL																	
Thermal shock.	See Note.	TE Spec 109-22. Subject mated samples to 25 cycles between -55 and 105°C.															

Figure 1 (continued)

Test Description	Requirement	Procedure
Humidity/temperature cycling.	See Note.	TE Spec 109-23-5, Condition B. Subject mated samples to 10 cycles between 25 and 65°C at 95% RH with vibration and cold shock.
Temperature life.	See Note.	TE Spec 109-43. Subject mated samples to temperature life at 105°C for gold plated samples and 85°C for tin plated samples for 1000 hours.
Mixed flowing gas.	See Note.	TE Spec 109-85-3. Subject mated samples to environmental class III for 20 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(c)	3(d)	4	5
	Test Sequence (b)				
Examination of product	1,9	1,9	1,5	1,8	1,3
Termination resistance	3,7	2,7	2,4		
Insulation resistance				2,6	
Dielectric withstanding voltage				3,7	
Temperature rise vs current		3,8			
Termination tensile strength					2(e)
Sinusoidal vibration	5	6(f)			
Mechanical shock	6				
Durability	4				
Mating force	2				
Unmating force	8				
Thermal shock				4	
Humidity/temperature cycling		4(g)		5	
Temperature life		5			
Mixed flowing gas			3(g)		

NOTE

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Tin-lead plated samples.
- (d) Gold plated samples.
- (e) Subject half the samples to parallel tensile test and the other half to perpendicular tensile test for a total of 30 pulls with each wire size.
- (f) Discontinuities shall not be measured. Energize at 18 °C level for 100% loadings per Test Specification 109-151.
- (g) Precondition samples with 3 cycles durability.

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 each consist of mated pairs of MTA-100 posted connectors and standard connectors to form a wire-to-wire connector system unless otherwise required by the test procedure. All test groups will also utilize strain relief dust covers during testing to prevent wire removal from the IDC blade. Test group 1 shall consist of 5 mated, 16 position tin-lead plated samples terminated with 6 inch lengths of 22 AWG wire. Test group 2 shall consist of 3 mated, 16 position tin-lead plated samples terminated with 12 inch lengths of 22 AWG wire and 3, 16 position tin-lead plated samples terminated with 12 inch lengths of 28 AWG wire. Test group 3 shall consist of 5 mated, 16 position gold plated samples terminated with 22 AWG wire. Test group 4 shall consist of 5 mated, 8 position tin-lead plated samples terminated with 22 AWG wire. Test group 5 shall consist of 5 pieces each of 16 position tin-lead plated samples in each wire gage.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 2.

4.2. Requalification Testing

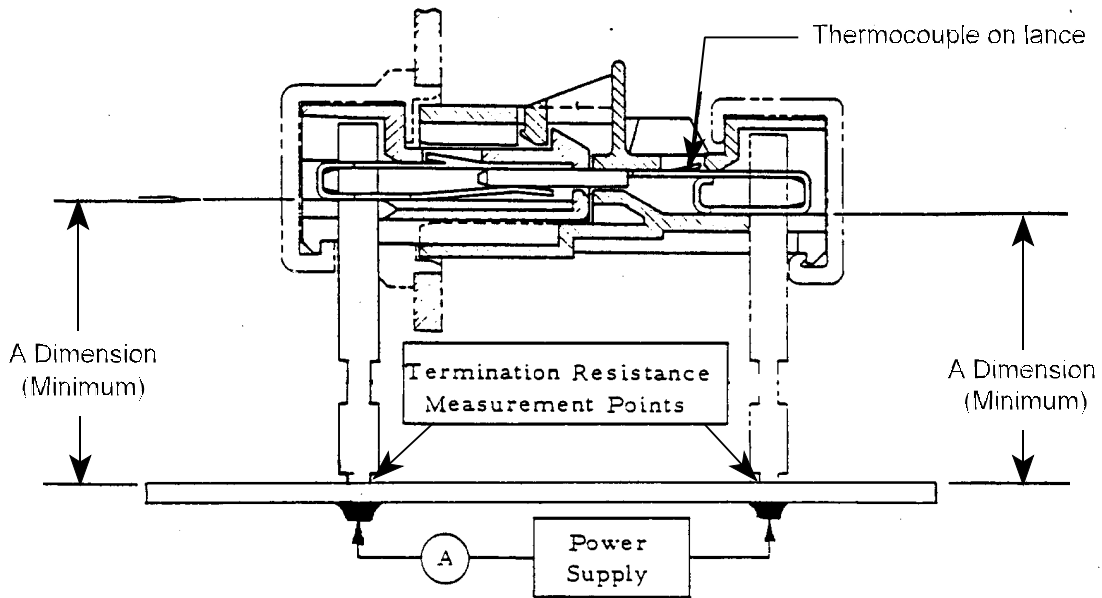
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

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.



NOTE

- (a) Termination resistance equals millivolts divided by test current less resistance of twice the length of wire used for "A" dimension.
- (b) After soldering, boards and solder joints shall be cleaned to remove all flux and contaminants.

"A" Dimension (mm minimum)	Wire Size (AWG)
165 [6.5 inch]	22
89 [3.5 inch]	28

Figure 3
Temperature & Termination Resistance Measurement Points

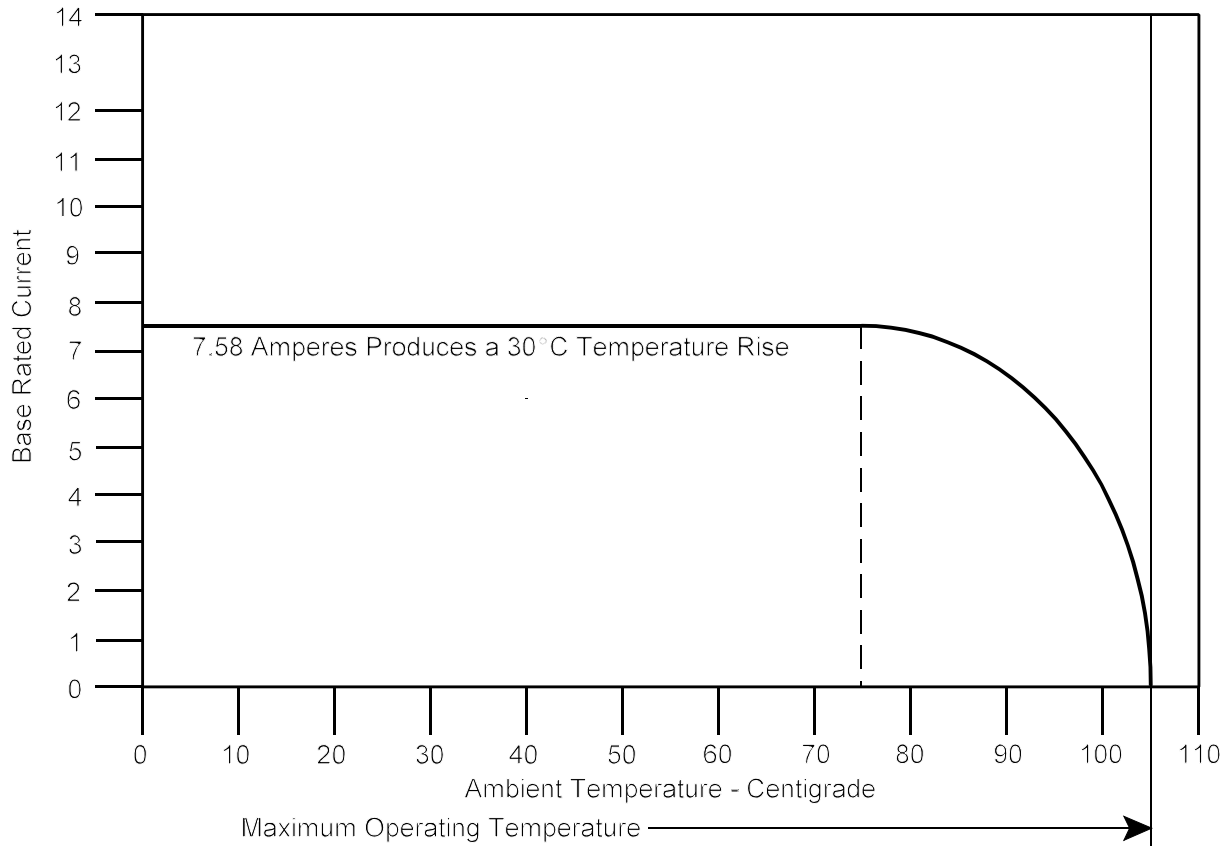


Figure 4A
Current Carrying Capability

Loading Condition	Wire Size AWG			
	28	26	24	22
16 Position Connector				
Single Contact	.610	.710	.837	1
50%	.416	.485	.571	.682
100%	.280	.326	.384	.459

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. The F-Factor for the 50% loading condition is based on temperature rise data where every other (odd positions) was energized. The F-Factor will change if different positions are energized since the loading density calculation would be different.

Figure 4B
Current Rating

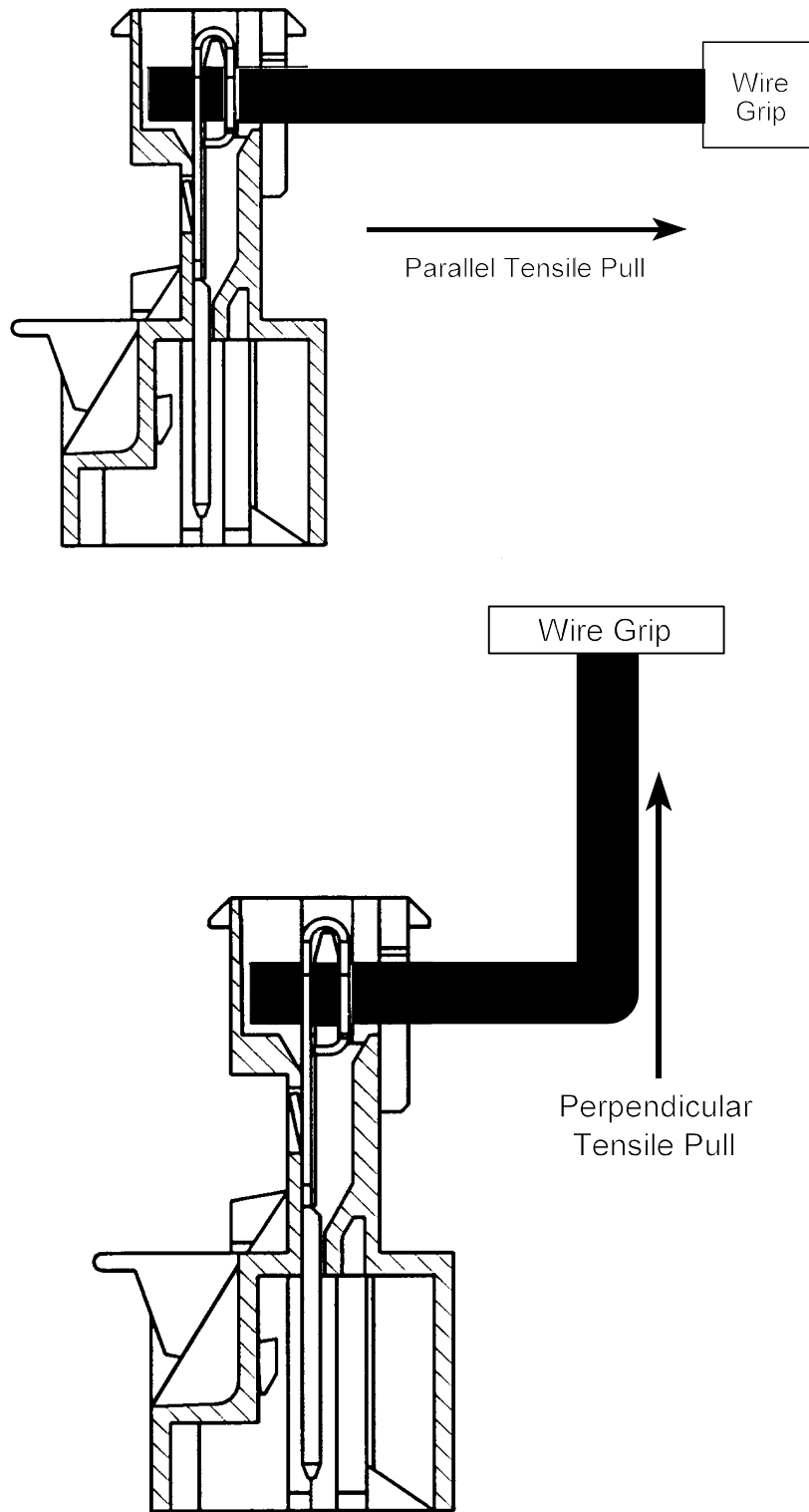


Figure 5
Termination Tensile Strength

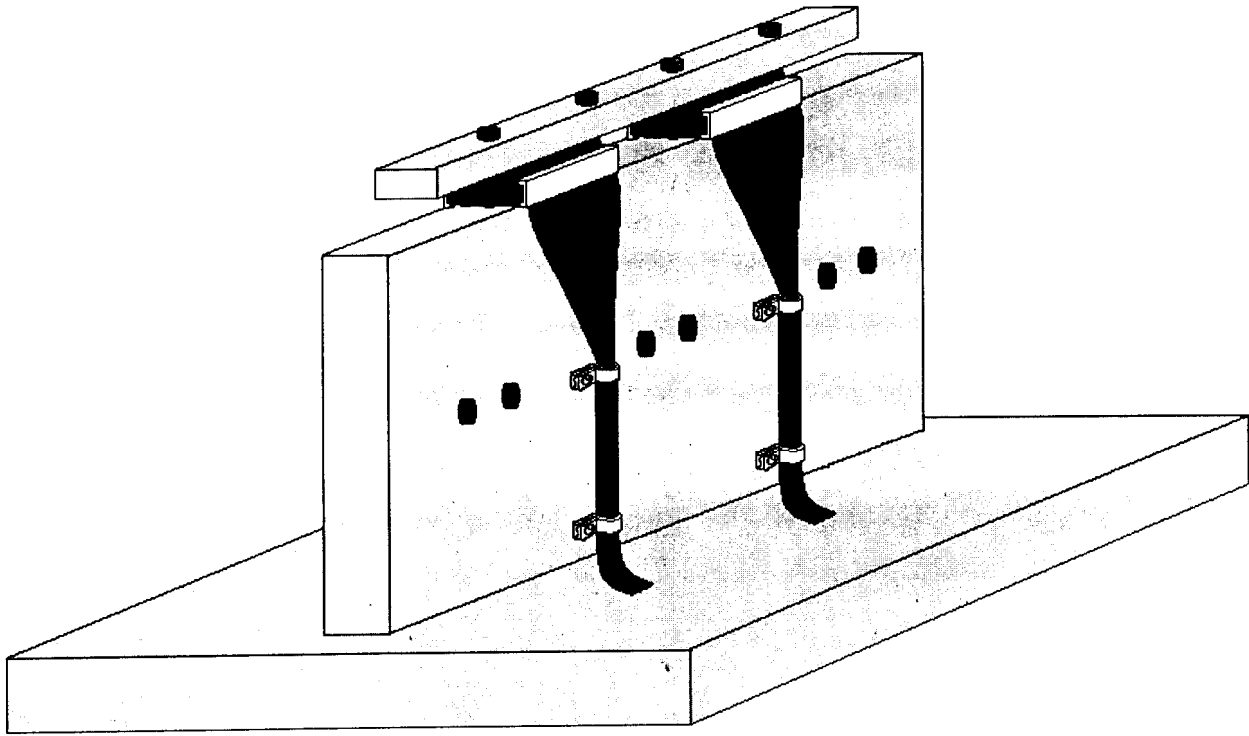


Figure 6
Vibration & Physical Shock Mounting Fixture

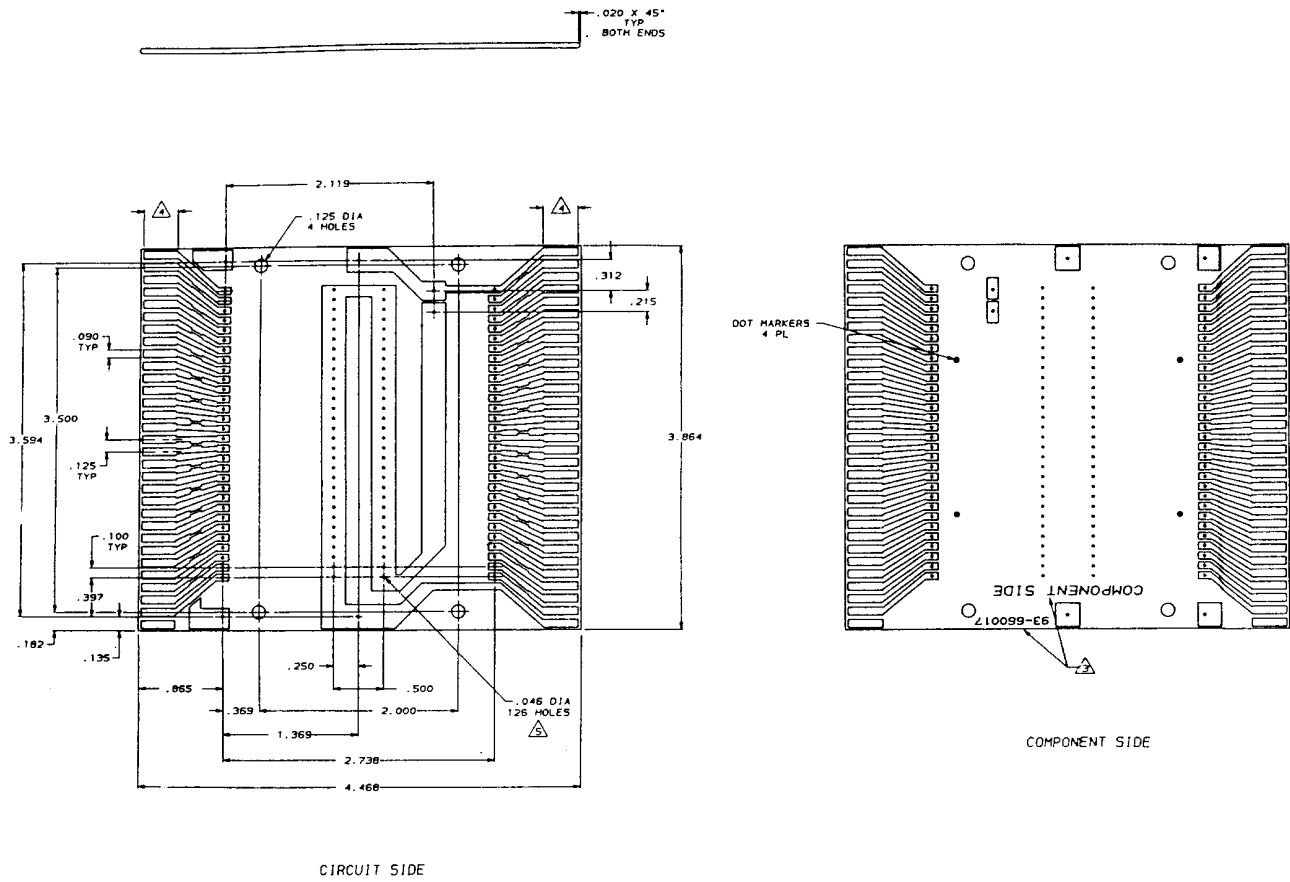


Figure 7
Printed Circuit Test Board