
Connector, MTA-100

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) MTA-100 connector system. This system is mass terminated using insulation displacement technology on 0.100 inch centerlines and mates with 0.025 inch square posts providing a reliable interconnection between wires and posts mounted on printed circuit boards. The standard system is available in 2 through 28 positions. The MTA-100 connector system is designed to be terminated to 28 AWG to 22 AWG wire, tin plated UL style 1007, 1061 or wire which specifies PVC insulation with temperature rating compatible with specified operating temperatures, see Figure 4. Wire shall meet application requirements specified in Application Specification 114-1019. Insulation diameters are: 0.050 inch maximum outside diameter for mass termination and 0.060 inch 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.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. Documents

- [109-1](#): General Requirements for Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- [114-1019](#): Application Specification (MTA 100 Connector)
- [501-366](#): Qualification Test Report (Connector, MTA-100)

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

Contact: Phosphor bronze, tin or tin-lead plating and gold over nickel plating

Header: Thermoplastic polyester, UL 94V-0

Housing: Nylon 6/6 or Nylon 6/12, UL 94V-2 and 94V-0

Posts, header: Phosphor bronze, tin plating and gold over nickel plating

3.3. Ratings

Voltage: 250 volts AC

Current: See Figure 4 for applicable current carrying capability

Temperature: -55 to 105°C

3.4. Test Requirements and Procedures Summary

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

Test Description	Requirement	Procedure										
Examination of product	Meets requirements of product drawing and Application Spec 114-1019	Visual, dimensional and functional per applicable quality inspection plan										
ELECTRICAL												
Termination resistance	6 milliohms maximum initial. ΔR 10 milliohms maximum	TE 109-6-1. Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum. See Figures 3 and 5										
Insulation resistance	5000 megohms minimum initial	TE Spec 109-28-4. Test between adjacent contacts of unmated samples										
Dielectric withstanding voltage	750 vac at sea level. 1 minute hold with no breakdown or flashover	TE Spec 109-29-1. 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 Figures 4 and 5										
MECHANICAL												
Solderability	Solderable area shall have minimum of 95% solder coverage	TE Spec 109-11-2. Subject contacts to solderability										
Termination tensile strength, parallel, unmated	<table border="0"> <tr> <td>Wire Size</td> <td>Slot Tensile</td> </tr> <tr> <td>AWG</td> <td>Pounds Minimum</td> </tr> <tr> <td>28</td> <td>4</td> </tr> <tr> <td>24</td> <td>5</td> </tr> <tr> <td>22</td> <td>12</td> </tr> </table>	Wire Size	Slot Tensile	AWG	Pounds Minimum	28	4	24	5	22	12	TE Spec 109-16. Determine slot tensile at maximum rate of 1 inch per minute. Pull parallel to terminated wire. See Figure 6
Wire Size	Slot Tensile											
AWG	Pounds Minimum											
28	4											
24	5											
22	12											
Termination tensile strength, perpendicular, unmated	<table border="0"> <tr> <td>Wire Size</td> <td>Slot Tensile</td> </tr> <tr> <td>AWG</td> <td>Pounds Minimum</td> </tr> <tr> <td>28</td> <td>1</td> </tr> <tr> <td>24</td> <td>1</td> </tr> <tr> <td>22</td> <td>3</td> </tr> </table>	Wire Size	Slot Tensile	AWG	Pounds Minimum	28	1	24	1	22	3	TE Spec 109-16. Determine slot tensile at maximum rate of 1 inch per minute. Pull perpendicular to terminated wire. See Figure 6
Wire Size	Slot Tensile											
AWG	Pounds Minimum											
28	1											
24	1											
22	3											
Vibration, sinusoidal	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 0.06 inch total excursion. 2 hours in each of 3 mutually perpendicular planes										

Figure 1 cont.

Test Description	Requirement	Procedure
Physical shock	No discontinuities of 1 microsecond or longer duration. See Note	TE Spec 109-26-1. Subject mated samples to 50 G's halfsine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks
Durability	See Note	TE Spec 109-27. Manually mate and unmate samples with friction lock header for 25 cycles
Mating force	2 pounds maximum average per contact	TE Spec 109-42, Condition A. Measure force necessary to mate samples with friction lock header from point of initial contact to depth of 0.200 inch at maximum rate of 0.5 inch per minute
Unmating force	0.8 pound minimum average per contact	TE Spec 109-42, Condition A. Measure force necessary to unmate samples from friction lock header at maximum rate of 0.5 inch per minute
Post Retention Force	3 pound minimum average per contact	TE Spec 109-30, Measure post retention force 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	AMP Spec 109-23-3, Condition B. Subject mated samples to 10 cycles between 25 and 65°C at 95% RH
Temperature life	See Note	AMP Spec 109-43. Subject mated samples to temperature life at 85°C for 1000 hours
Mixed flowing gas	See Note	AMP 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

3.5. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)						
	1	2(c)	3(d)	4	5	6	7
	Test Sequence (b)						
Examination of product	1,9	1,9	1,5	1,8	1,3	1,3	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					
Solderability						2	
Termination tensile strength					2(f)		
Vibration	5	6(e)					
Physical shock	6						
Durability	4						
Mating force	2						
Unmating force	8						
Post retention force							2
Thermal shock				4			
Humidity-temperature cycling		4(g)		5			
Temperature life		5					
Mixed flowing gas			3(g)				



NOTE

(a) Samples 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, 6 position standard tin-lead plated samples and 5, 6 position gold plated samples. All samples shall be terminated to the maximum wire size and mounted on printed circuit board PN 93-660017 (see Figure 5). Test group 2 shall consist of 3, 10 position standard tin-lead plated samples terminated to 28 AWG wire and mounted on printed circuit board PN 93-660652; and 3, 10 position standard tin-lead plated samples terminated to 22 AWG wire and mounted on printed circuit board PN 93-660651 (see Figure 5). Test group 3 shall consist of 3, 10 position gold plated samples terminated to 22 AWG wire and mounted on printed circuit board PN 93-660017. Test group 4 shall consist of 5 unmounted 24 position standard tin-lead plated samples terminated to the maximum wire size. Test group 5 shall consist of 6, 10 position standard tin-lead plated samples terminated to 28 AWG wire; 6, 10 position standard tin-lead plated samples terminated to 24 AWG wire; and 6, 10 position standard tin-lead plated samples terminated to 22 AWG wire. All samples shall be unmated and unmounted. Test group 6 shall consist of 5, 6 position 0.100 inch friction lock tin-lead plated headers.

(b) Numbers indicate sequence in which tests are performed.

(c) Tin-lead plated samples

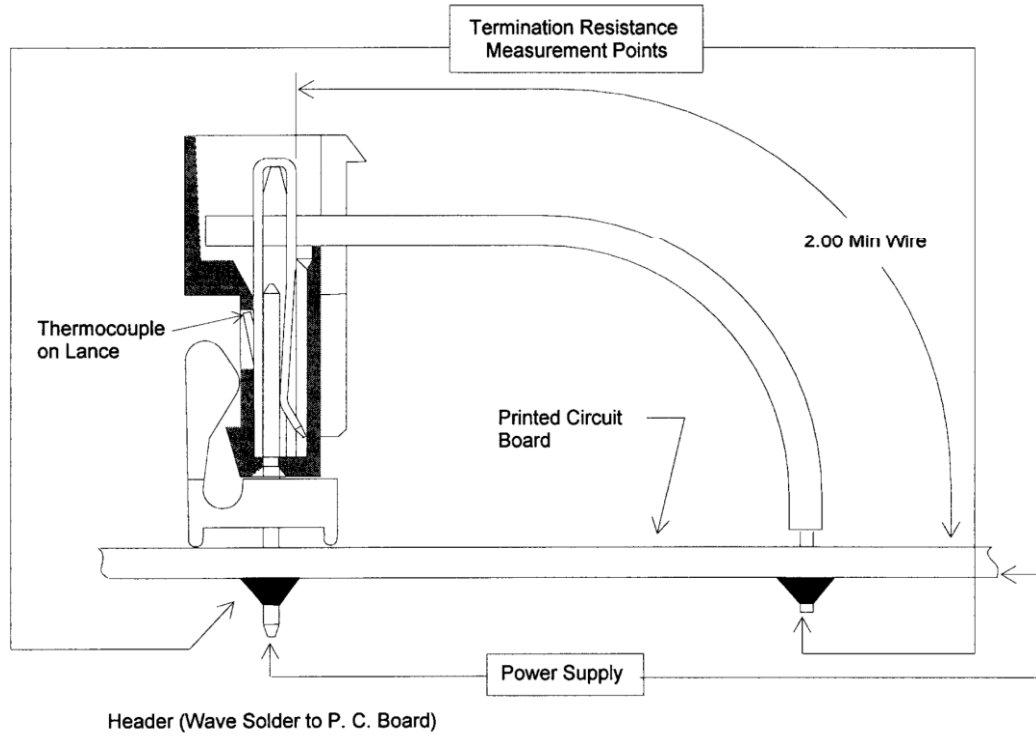
(d) Gold plated samples.

(e) Discontinuities shall not be measured. Energize at 18°C level for 100% loadings per Test Specification 109-151.

(f) Subject half the samples to the parallel tensile test and the remaining half to the perpendicular tensile test.

(g) Precondition samples with 5 cycles durability

Figure 2



NOTE

- (a) Termination resistance equals millivolts divided by test current less resistance of 2 inches of wire.
- (b) After wave soldering, the boards and posts shall be cleaned to remove all flux and contaminates.

Figure 3

Temperature & Termination Resistance Measurement Points

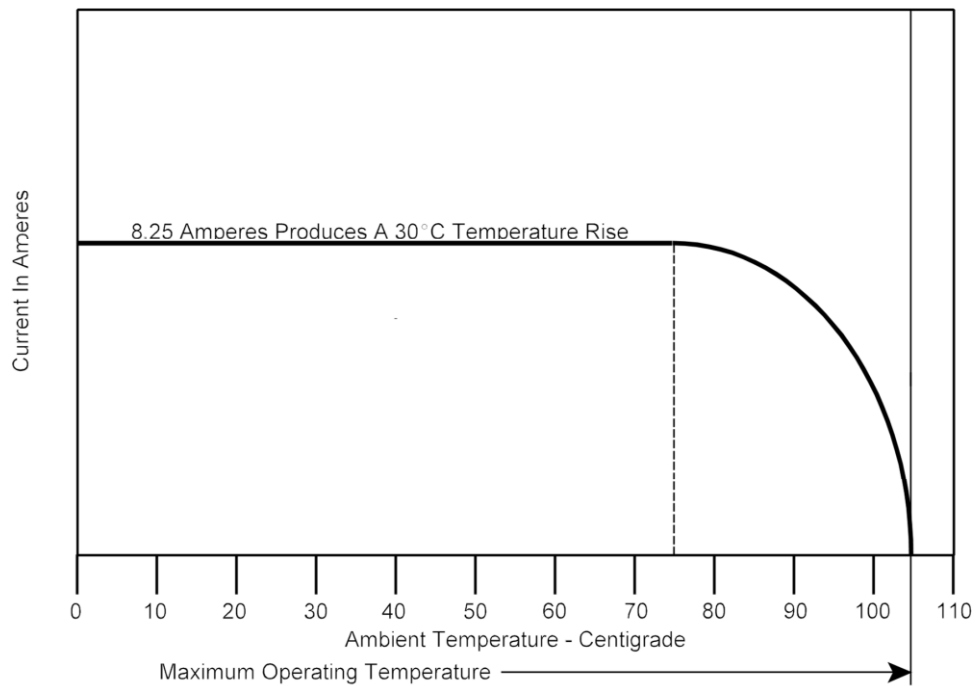


Figure 4A
Current Carrying Capability

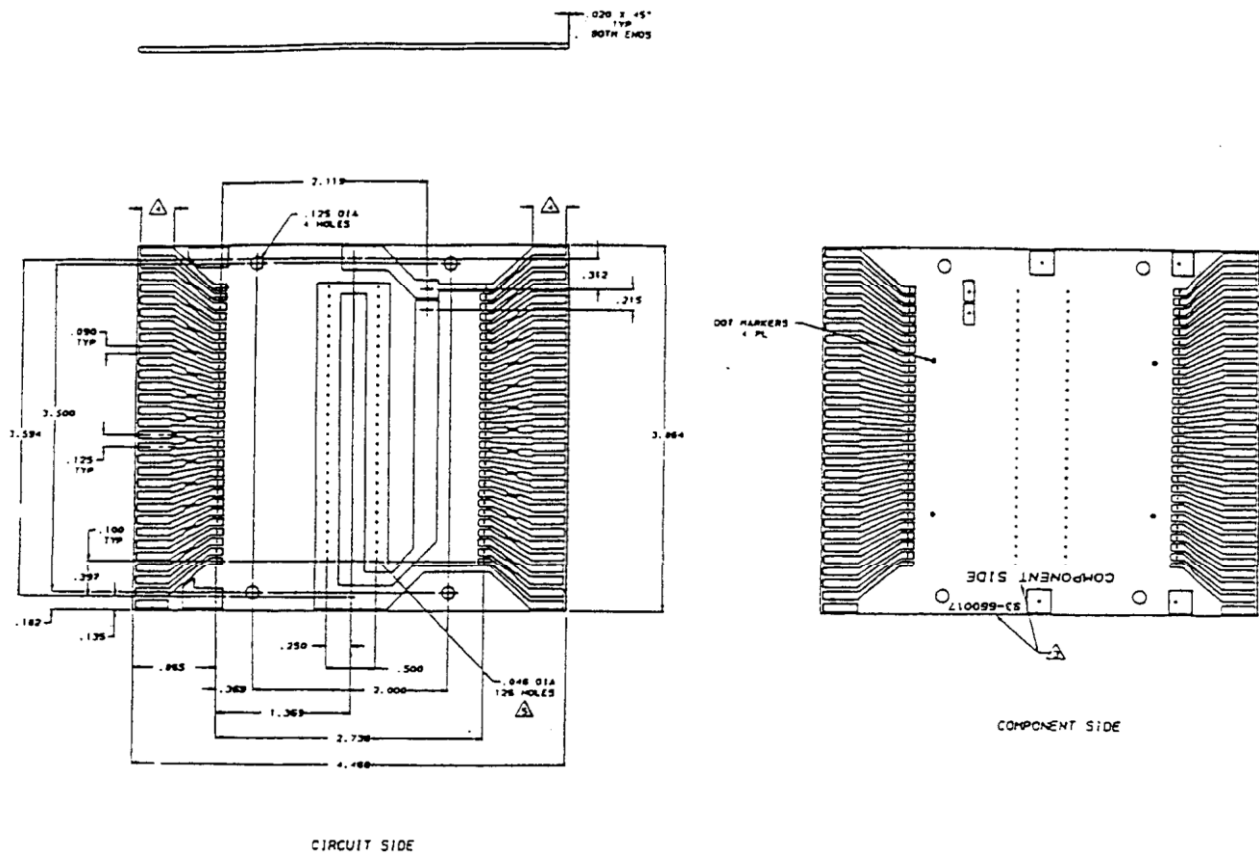
Percent Connector Loading (10 position In-Line connector)	Wire Size AWG			
	28	26	24	22
Single Contact	0.6	0.7	0.9	1
50	0.5	0.6	0.7	0.8
100	0.3	0.4	0.4	0.5



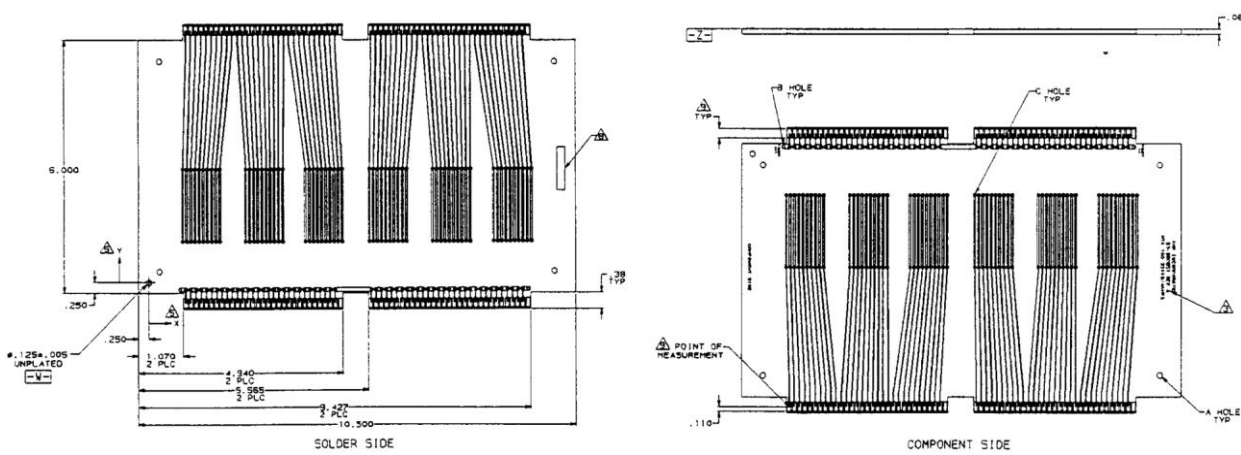
NOTE

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.

Figure 4B
Current Rating



PC Board Used For Termination Resistance Dry Circuit



PC Board Used For Current Rating

Figure 5

Printed Circuit Test Boards

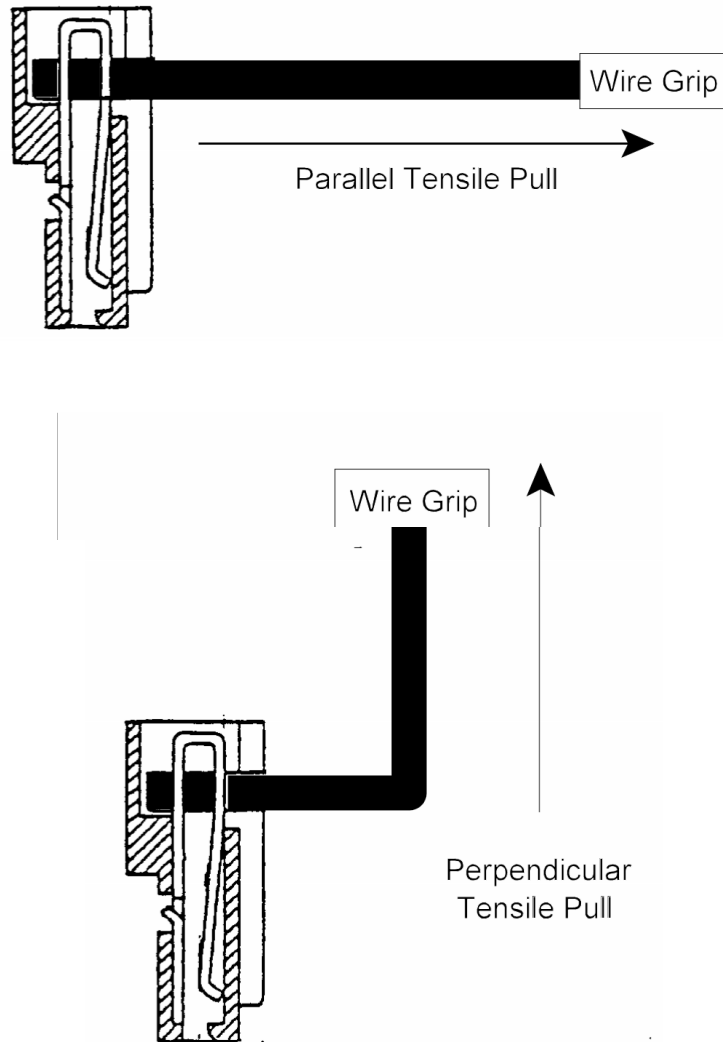


Figure 6

Termination Tensile Strength