Connector, MTA 156, Wire-To-Wire System

1. SCOPE

1.1. Content

This specification covers the performance requirements for the TE Connectivity (TE) MTA 156 connector wire-to-wire system. This system provides a reliable interconnection between wires in appliances, vending machines, computers and other sophisticated commercial equipment.

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

The following TE 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.

- 109-1: General Requirements for Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- 114-1020: Connector MTA 156, Application of

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

- Contact:
  - Post: Brass, post tin plated
  - Receptacle: Phosphor bronze, post tin plated
- Housing:
  - 2 through 10 position: Nylon 6/6, UL94V-2
  - 11 through 24 position: Nylon 6/12, UL94V-2

3.3. Ratings

- Current/Voltage: 600 volts AC at 7 amperes maximum

  NOTE *The maximum rated current that can be carried by this product is limited by the maximum operating temperature of the housings (105°C) and the temperature rise of the contacts (30°C). Variables which shall be considere d for each application are: wire size, connector size, contact material, and ambient temperature.*

- Operating Temperature: -55 to 105°C

3.4. Performance and Test Description

Product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and Application Specification 114-1020.	Visual, dimensional and functional per applicable inspection plan.
ELECTRICAL		
Termination resistance, dry circuit.	7.0 milliohms maximum initial.	TE Spec 109-6, Condition A. Subject mated connectors assembled in housing to 50 mv open circuit at 100 ma maximum. See Figure 3.
Termination resistance, specified current.	Wire Size (AWG) / Specified Current (amperes) / Milliohms Maximum (initial) 26 / 1.0 / 6.0 24 / 1.5 / 6.0 22 / 3.0 / 6.0 20 / 4.5 / 5.0 18 / 6.0 / 5.0	TE Spec 109-25. Measure potential drop of mated contacts assembled in housing. Calculate resistance. See Figure 3.
Insulation resistance.	5000 megohms minimum initial.	TE Spec 109-28-4. Test between adjacent circuits of mated connector assemblies.
Dielectric withstanding voltage.	1.5 kvac at sea level. 1 minute hold with no breakdown or flashover.	TE Spec 109-29-1. Test between adjacent circuits of mated connector assemblies.
Temperature rise vs current.	See Figure 4.	TE Spec 109-45-2. Temperature rise at rated current.
Current cycling.	See Note.	TE Spec 109-51, Condition B, Test Method 2. Subject samples to 15 minutes ON and 15 minutes OFF at 125% of rated current.
MECHANICAL		
Tensile, straight.	Wire Size (AWG) / Slot Tensile (Lb minimum) 26 / 5.0 24 / 8.0 22 / 12.0 20 / 17.0 18 / 30.0	TE Spec 109-16. Determine slot tensile at a rate of 1 inch per minute. Apply force parallel to axis of wire.

Figure 1 (continued)

Test Description	Requirement	Procedure
Tensile, perpendicular.	Wire Size (AWG) / Slot Tensile (Lb minimum) 26 / 1.3 24 / 1.3 22 / 3.4 20 / 4.0 18 / 4.6	TE Spec 109-16. Determine slot tensile at a rate of 1 inch per minute. Apply force perpendicular to axis of wire on samples without cover.
Vibration.	No discontinuities greater than 1 microsecond. See Note.	TE Spec 109-21-1, Condition A. 10-55-10 Hz traversed in 1 minute at 0.06 inch total excursion. 2 hours in each of 3 mutually perpendicular planes.
Durability.	See Note.	TE Spec 109-27. Manually mate and unmate connector assemblies for 25 cycles. Mount connector in fixture.
Contact retention.	5.0 pounds minimum.	TE Spec 109-30. Pull on contact using special cut-away housing.
Mating force.	1.6 pounds maximum initial.	TE Spec 109-42. Measure force necessary to mate connector assembly with locking latches intact, a distance of .150 inch from point of initial contact using free floating fixtures at a rate of 0.5 inch per minute. Calculate force per contact.
Unmating force.	0.2 pound minimum final.	TE Spec 109-42. Measure force necessary to unmate connector assembly with locking latch removed at a rate of 0.5 inch per minute. Calculate force per contact.
ENVIRONMENTAL		
Thermal shock.	See Note.	TE Spec 109-22. Subject mated connectors to 25 cycles between -55 and 85℃.
Humidity-temperature cycling.	See Note.	TE Spec 109-23-5, Condition B. Subject mated connectors to 10 humidity-temperature cycles between 25 and 65℃ at 95% RH with low frequency vibration and -10℃ cold shock after any 5 cycles.

NOTE *Shall meet visual requirements, show no physical damage, and shall meet requirements of additional tests as specified in the Test Sequence in Figure 2.*

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)							
	1	2	3	4	5	6	7	8
	Test Sequence (b)							
Examination of product	1							
Termination resistance, dry circuit		2,4		2,4	1,3	1,3		
Termination resistance, specified current			2,5					
Insulation resistance		1,5						
Dielectric withstanding voltage		6						
Temperature rise vs current			1,4					
Current cycling			3					
Tensile strength, straight and perpendicular (c)								1
Vibration						2		
Durability				3				
Contact retention							1	
Mating force				1				
Unmating force				5				
Thermal shock					2			
Humidity-temperature cycling		3						

NOTE

(a) See paragraph 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) One half of the samples shall be subjected to the straight tensile test and the remaining half to the perpendicular tensile test.

Figure 2

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 1 connector of each size, all representative of the entire lot being tested. Test groups 2 through 6 shall consist of 2 connector assemblies per group per wire size. Test group 7 shall consist of 15 contacts chosen randomly from 5 connector assemblies. Test group 8 shall consist of 4 connector assemblies per wire size. Each wire size shall consist of solid, stranded and prefused or overcoated wire; UL style 1007 or 1061 tin plated. Stranded wire shall consist of 7 strands. All wires shall be applied in accordance with Application Specification 114-1020. Complete qualification of the product line can be accomplished by sampling the product using all variations of wire size, type and connector design. Partial qualification can be accomplished by using only one variation of wire size, type or connector design.

B. Test Sequence

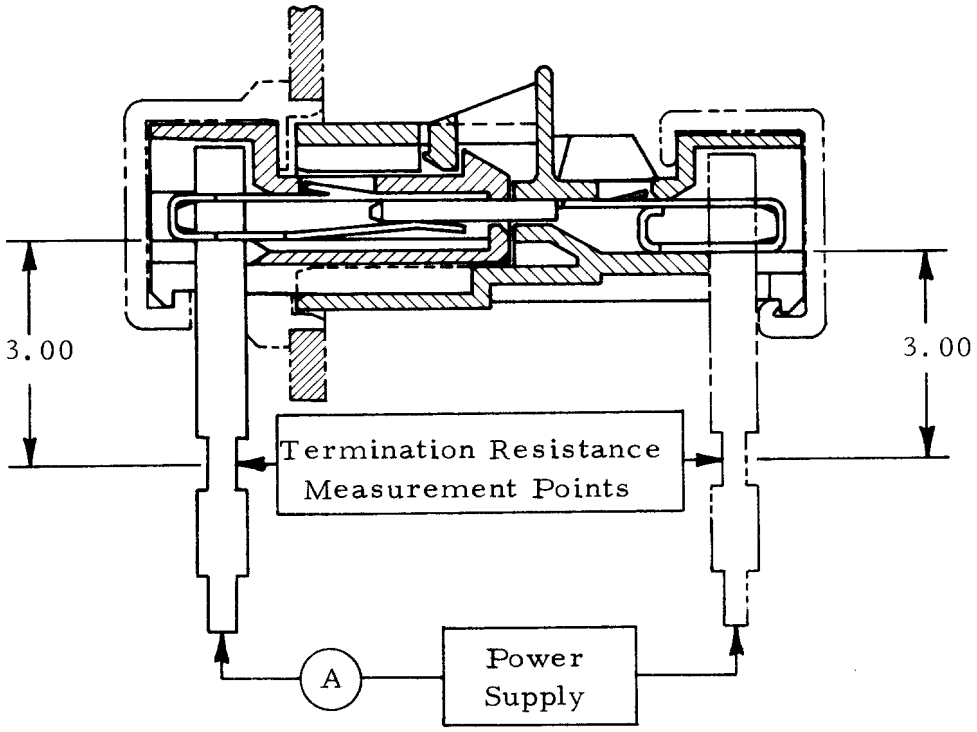
Qualification inspection shall be verified by testing samples as specified in Figure 2.

4.2. 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. If product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.3. 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

1. *A 1 foot minimum length of continuous lead for heat dissipation.*
2. *Termination resistance equals millivolts divided by test current less resistance of 6 inches of wire.*

Figure 3
Temperature and Resistance Measurement Points

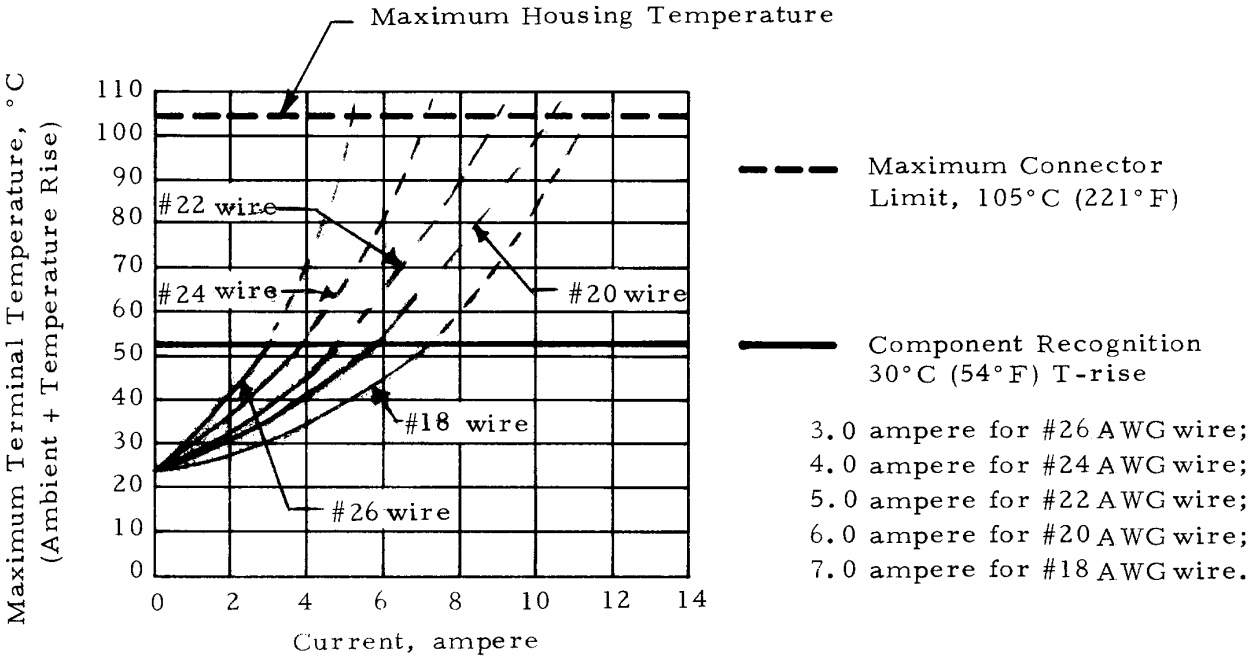


Figure 4
Terminal Temperature vs Current/Circuit
24 Circuit Assembly