System, Connector/Header, MTA 156

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) MTA 156 connector/header system. This system is mass terminated using insulation displacement technology on .156 inch centerlines and mates with .045 inch square or round posts providing interconnection between wires and posts mounted on printed circuit boards. Terminations are designed for 26 through 18 AWG wire having .070 inch maximum insulation diameter for mass terminations and .095 inch maximum insulation diameter for single terminations. Wires shall be UL approved or specify insulation with temperature ratings compatible with specified operating temperatures.

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.

Successful qualification testing on the subject product line was completed on 18Dec97. The Qualification Test Report number for this testing is 110-1004. This documentation is on file at and available from Engineering Practices and Standards (EPS).

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: Test Specification (General Requirements for Test Specifications)
- 109-151: Test Specification (Current Rating Verification)
- 109 Series: Test Specifications as indicated in Figure 1
- 110-1004: Qualification Test Report (System, Connector/Header, MTA 156)
- 114-1020: Application Specification (MTA 156 Connector)

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:
  - High force: Phosphor bronze, tin-lead plating
  - Standard: Phosphor bronze, tin-lead or gold over nickel plating
- Headers: Thermoplastic polyester, UL94V-0
- Header posts: Brass, tin or gold over nickel plating
- Housing: Nylon 6/6 or 6/12, UL94V-0 or UL94-2

©2011 Tyco Electronics Corporation,
a TE Connectivity Ltd. Company
All Rights Reserved
TE logo is a trademark.

Other products, logos, and company names might be trademarks of their respective owners.

Downloaded from Elcodis.com electronic components distributor

3.3. Ratings

- Voltage: 600 volts AC
- Current: See Figure 4 for applicable current carrying capability
- Temperature: -55 to 105℃

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 114-1020.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance.	3 milliohms maximum initial. ΔR 5 milliohms maximum.	TE Spec 109-6-6. Subject mated contacts assembled in housing to 20 millivolts maximum open circuit at 100 milliampers 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. 2.2 kilovolts AC at sea level. Test between adjacent contacts of unmated samples.
Temperature rise vs current.	30℃ maximum temperatur e rise at specified current.	TE Spec 109-45-2. Measure temperature rise vs current. See Figure 4.
MECHANICAL		
Solderability.	Solderable area shall have minimum of 95% solder coverage.	AMP Spec 109-11-2. Subject contacts to solderability.
Termination tensile strength, parallel, unmated.	Wire Size AWG / Slot Tensile Pounds Minimum 26 / 5 24 / 8 22 / 12 20 / 17 18 / 30	AMP Spec 109-16. Determine slot tensile strength by pulling parallel to terminated wire at maximum rate of 1 inch per minute. See Figure 5.

Figure 1 (continued)

Downloaded from Elcodis.com electronic components distributor

Test Description	Requirement	Procedure
Termination tensile strength, perpendicular, unmated.	Wire Size AWG / Slot Tensile Pounds Minimum 26 — 1.3 24 — 1.3 22 — 3.4 20 — 4.0 18 — 4.6	TE Spec 109-16. Determine slot tensile strength by pulling perpendicular to terminated wire at maximum rate of 1 inch per minute. See Figure 5.
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 with 0.06 inch maximum total excursion. Two hours in each of 3 mutually perpendicular planes. See Figure 6.
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	TE Spec 109-21-7. Subject mated samples to 3.15 G's rms between 5-500 Hz. Fifteen minutes 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. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 6.
Durability.	See Note.	TE Spec 109-27. With header mounted in fixture, manually mate and unmate samples for 25 cycles.
Mating force.	Standard contact: 1.75 pounds maximum per contact. High force contact: 6 pounds maximum per contact. Gold contact: 1.25 pounds maximum per contact.	TE Spec 109-42, Condition A. Measure force necessary to mate samples with header at maximum rate of .5 inch per minute. Calculate force per contact.
Unmating force.	Standard contact: .2 pound minimum per contact. High force contact: .7 pound minimum per contact. Gold contact: .1 pound minimum per contact.	TE Spec 109-42, Condition A. Measure force necessary to unmate samples from header at maximum rate of .5 inch per minute. Calculate force per contact.
ENVIRONMENTAL		
Thermal shock.	See Note.	TE Spec 109-22. Subject mated samples to 25 cycles between -55 and 105℃.

Figure 1 (continued)

Downloaded from Elcodis.com electronic components distributor

Test Description	Requirement	Procedure
Humidity/temperature cycling.	See Note.	TE Spec 109-23-3, Condition B. Subject mated samples to 10 cycles between 25 and 65℃ at 95% RH.
Temperature life.	See Note.	TE Spec 109-43. Subject mated samples to temperature life at 105℃ for gold plated contacts and 85℃ for tin plated contacts 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)

Downloaded from Elcodis.com electronic components distributor

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Examination of product	1,9	1,9	1,8	1,5	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
Tensile strength					2(c)	
Vibration, sinusoidal	5					
Vibration, random		6(d)				
Mechanical shock	6					
Durability	4					
Mating force	2					
Unmating force	8					
Thermal shock			4			
Humidity/temperature cycling		4(e)	5			
Temperature life		5				
Mixed flowing gas				3(e)		

NOTE

(a) See paragraph 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) Subject half the samples to parallel tensile test and the remaining half to the perpendicular tensile test.
(d) Discontinuities shall not be measured. Energize at 18 ℃ level for 100% loadings per Test Specification 109-151.
(e) Precondition samples with 5 cycles durability.

Figure 2

Downloaded from Elcodis.com electronic components distributor

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. Unless otherwise required for the test procedure, test groups 1, 2, 3 and 4 shall consist of mated pairs of MTA 156 connectors and headers. Test group 1 shall consist of 5, 6 position standard tin plated samples; 5, 6 position high force tin 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 93-660164. Test group 2 shall consist of 3, 10 position standard tin plated samples terminated to 26 AWG wire and mounted on printed circuit board PN 93-660273-000; and 3, 10 position standard tin plated samples terminated to 18 AWG wire and mounted on printed circuit board PN 93-660092-000. Test group 3 shall consist of 5 unmated and unmounted 24 position standard tin plated samples terminated to maximum wire size. Test group 4 shall consist of 5, 10 position gold plated samples terminated to 22 AWG wire and mounted on printed circuit board PN 93-660164. Test group 5 shall consist of 6, 10 position standard tin plated samples terminated to minimum wire size; and 6, 10 position standard tin plated samples terminated to maximum wire size. Test group 6 shall consist of 5, 6 position .156 tin plated headers.

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.

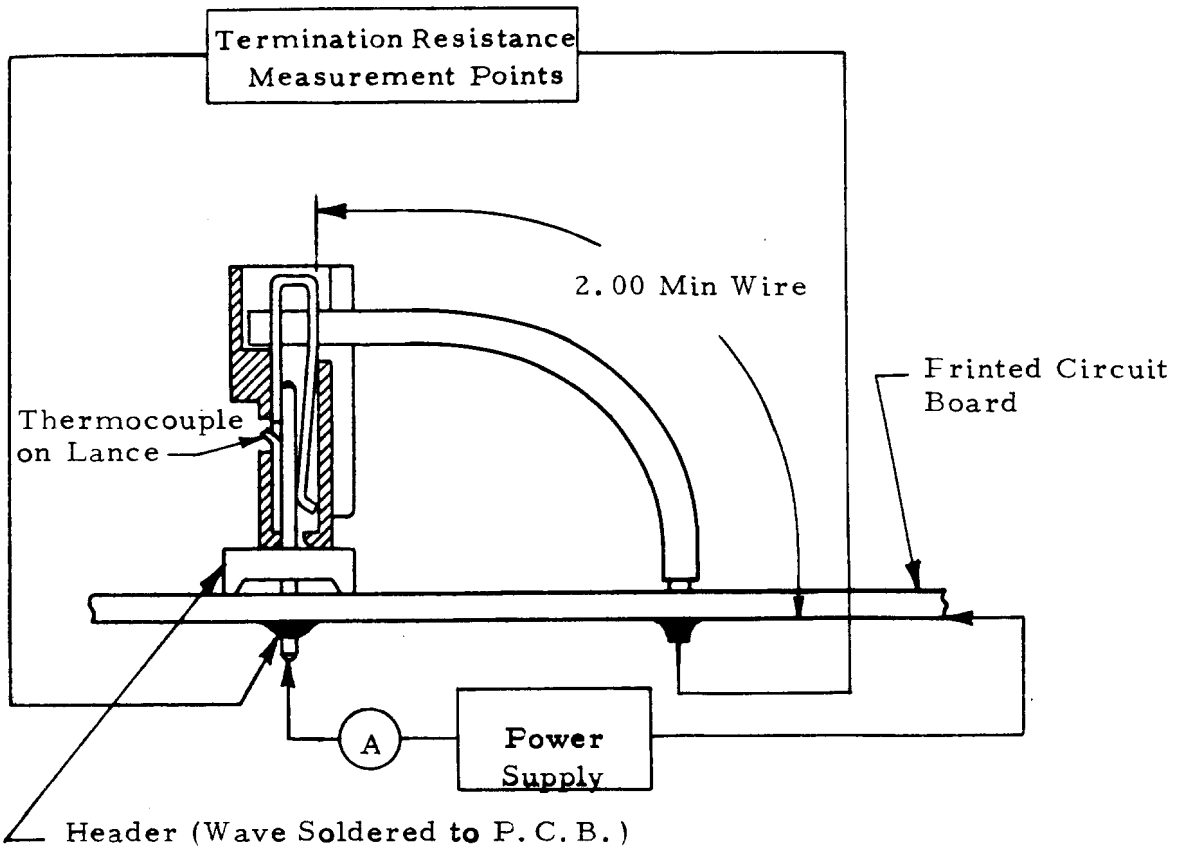
4.3. Acceptance

Acceptance is based on verification that the product meets 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.

4.4. 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.

Downloaded from Elcodis.com electronic components distributor



NOTE

(a) Termination resistance equals millivolts divided by test current less resistance of wire length.
(b) After wave soldering, printed circuit board and posts shall be cleaned to remove all flux and contaminates.

Figure 3
Termination Resistance & Temperature Rise Measurement Points

Downloaded from Elcodis.com electronic components distributor

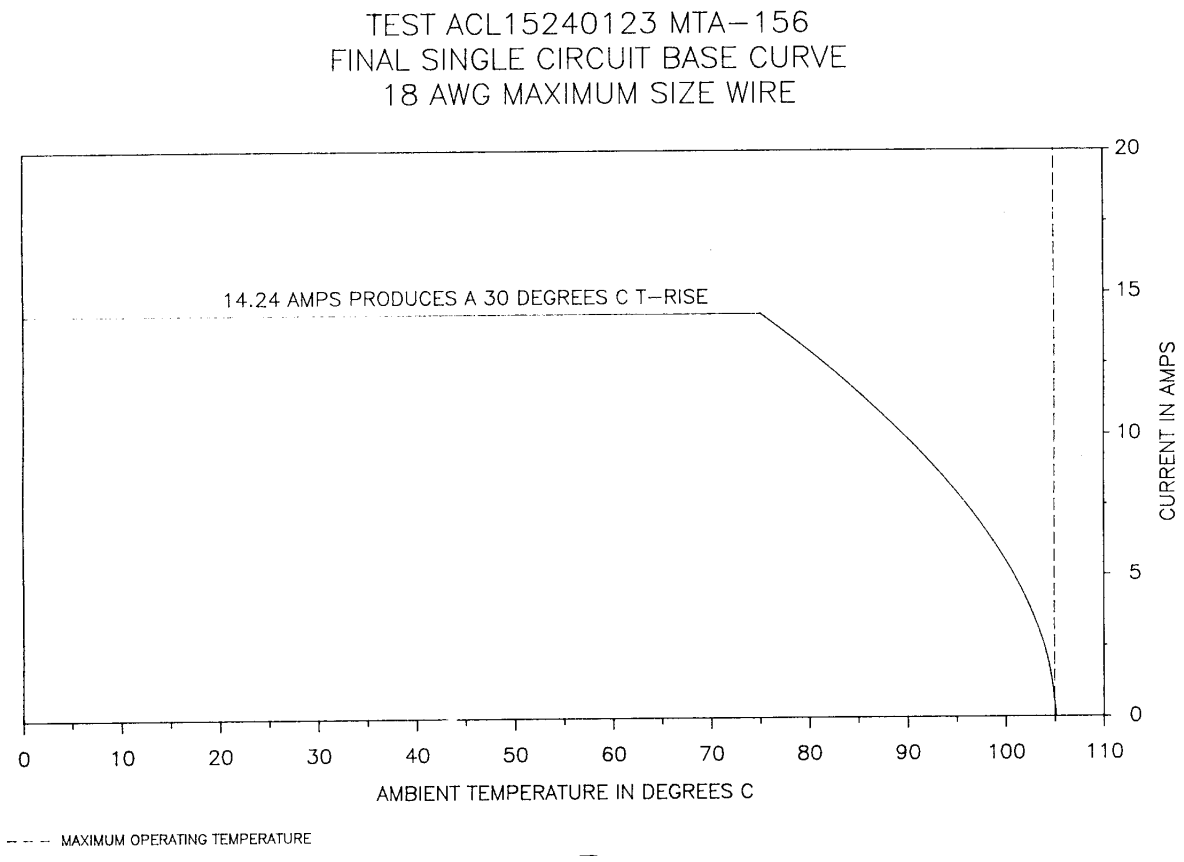


Figure 4A
Current Carrying Capability

Percent Connector Loading (Tin plated 10 position in-line connector)	Wire Size AWG				
	26	24	22	20	18
Single Contact	.501	.582	.685	.820	1.0
50 See Note (a)	.374	.435	.512	.613	.746
100	.253	.294	.346	.414	.504

NOTE

(a) Every other (odd) position energized

(b) To determine acceptable current carrying capacity for the 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

Downloaded from Elcodis.com electronic components distributor

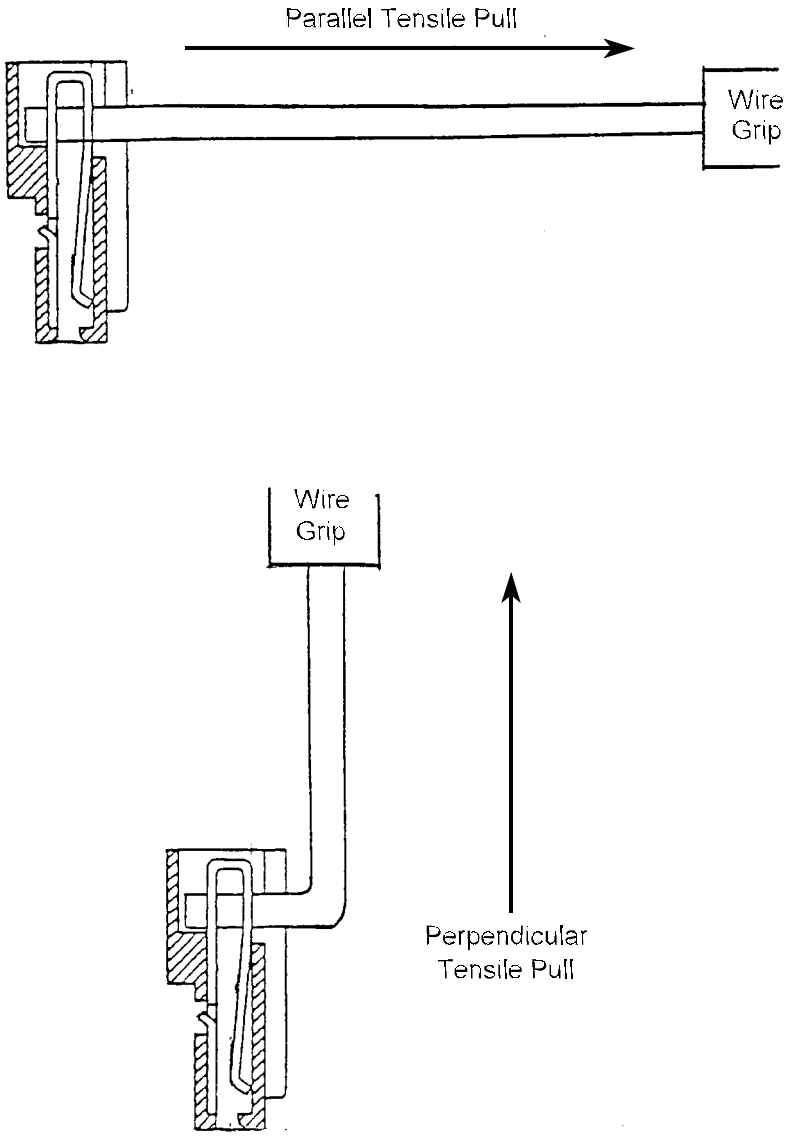


Figure 5
Termination Tensile Strength

Downloaded from Elcodis.com electronic components distributor

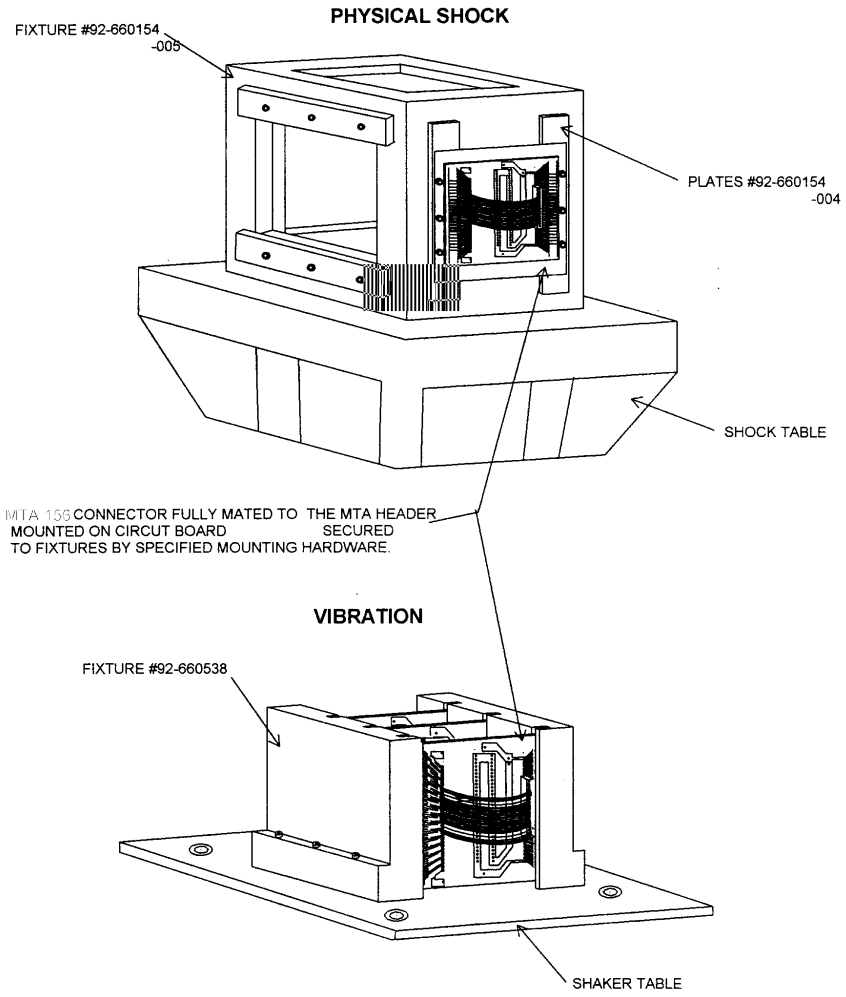


Figure 6
Vibration & Mechanical Shock Mounting Fixture
(Use For Reference Only)

Downloaded from Elcodis.com electronic components distributor