



Connector, Hooded SL 156, Tin

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the AMP* SL 156 hooded, dual wipe tin connector system. This system is used for wire to board interconnection and mates with .045 inch square posts.

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 in Jun98. The test file number for this testing is ACL 1387-0032. This documentation is on file at and available from the GAD Americas North Product Reliability Center.

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. AMP Documents

- A. 109-1: General Requirements for Test Specifications
- B. 109 Series: Test Specifications as indicated in Figure 1
- C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Government or Commercial Documents
- D. 114-1021: Application Specification
- E. 501-357-2: Qualification Test Report

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

- A. Contact: Phosphor bronze, tin plating
- B. Housing: Nylon, unreinforced, UL94V-0

3.3. Ratings

- A. Voltage: 250 vac
- B. Current: See Figure 4 for applicable current carrying capability. Maximum rated current that can be carried by this product is limited by maximum operating temperature of housings (105°C) and temperature rise of housings (30°C). Variables to be considered for each application are: wire size, connector size, contact material, ambient temperature, and printed circuit board design.
- C. 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 AMP Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and AMP Spec 114-1021.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance.	4 milliohms maximum initial. Maximum $\Delta R \pm 20$ milliohms.	AMP Spec 109-6-6. Subject mated contacts assembled in housing to 20 mv maximum open circuit at 100 ma maximum. See Figure 3.
Temperature rise vs current.	30°C maximum temperature rise at specified current.	AMP Spec 109-45-2. Measure temperature rise vs current. See Figure 4.
MECHANICAL		
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-21-7. Subject mated samples to 3.14 G's rms between 5-500 Hz. 15 minutes in each of 3 mutually perpendicular planes. See Figure 5.
Mechanical shock, specified pulse.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-26-1, except 30 G's. Subject mated samples to 30 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.

Figure 1 (cont)

Test Description	Requirement	Procedure
Durability.	See Note.	AMP Spec 109-27. Manually mate and unmate samples with headers for 25 cycles.
Mating force.	4 pounds maximum per standard tin .045 inch square contact.	AMP Spec 109-42, Condition A. Measure force necessary to mate samples at a maximum rate of .5 inch per minute.
Unmating force.	.25 pound minimum per standard tin .045 inch square contact.	AMP Spec 109-42, Condition A. Measure force necessary to unmate samples at a maximum rate of .5 inch per minute.
ENVIRONMENTAL		
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 500 hours.

NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)	
	1	2
	Test Sequence (b)	
Examination of product	1,9	1,9
Termination resistance	3,7	2,7
Temperature rise vs current		3,8
Vibration	5	6(c)
Mechanical shock	6	
Durability	4	
Mating force	2	
Unmating force	8	
Humidity-temperature cycling		4(d)
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°C level for 100% loadings per AMP Specification 109-151.
 (d) Precondition samples with 10 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. Test group 1 shall consist of 5, 6 position standard samples with .045 inch square posts. All samples shall be terminated to the maximum wire size and mounted on printed circuit boards. Test group 2 shall consist of: 3, 10 position standard samples terminated to 24 AWG wire and mounted on printed circuit boards; and 3, 10 position standard samples terminated to 18 AWG wire and mounted on printed circuit boards.

B. Test Sequence

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

4.2. Requalification Testing

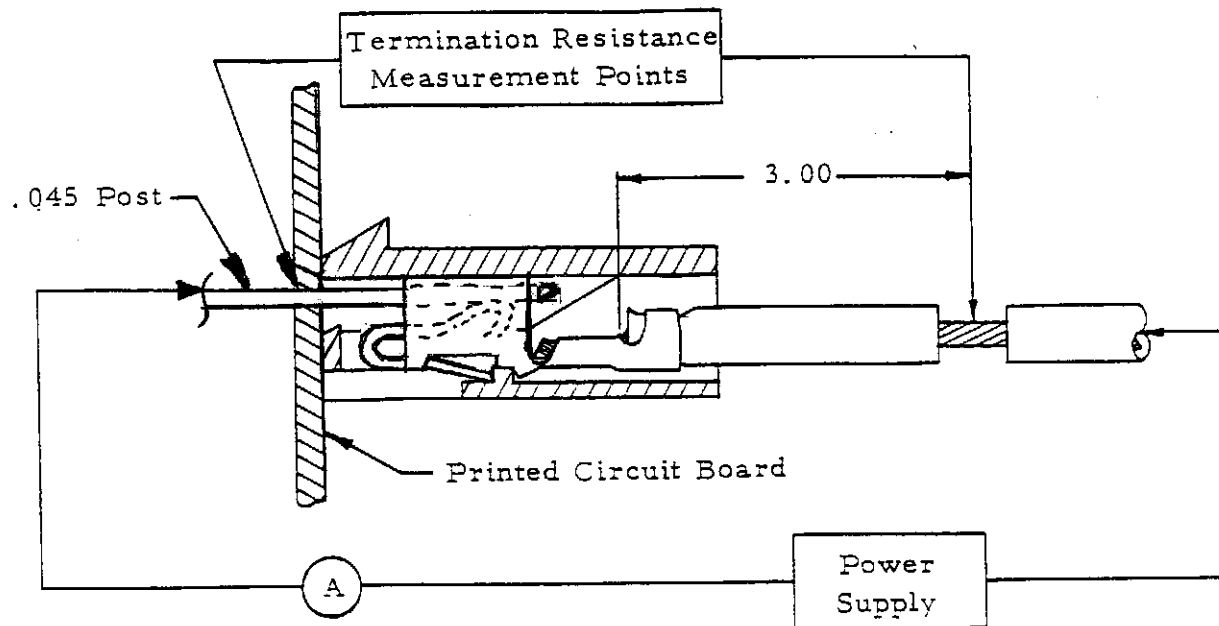
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

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. 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 AMP 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**

Termination resistance equals millivolts divided by test current less resistance of 3 inches of wire.

Figure 3
Termination Resistance Measurement Points

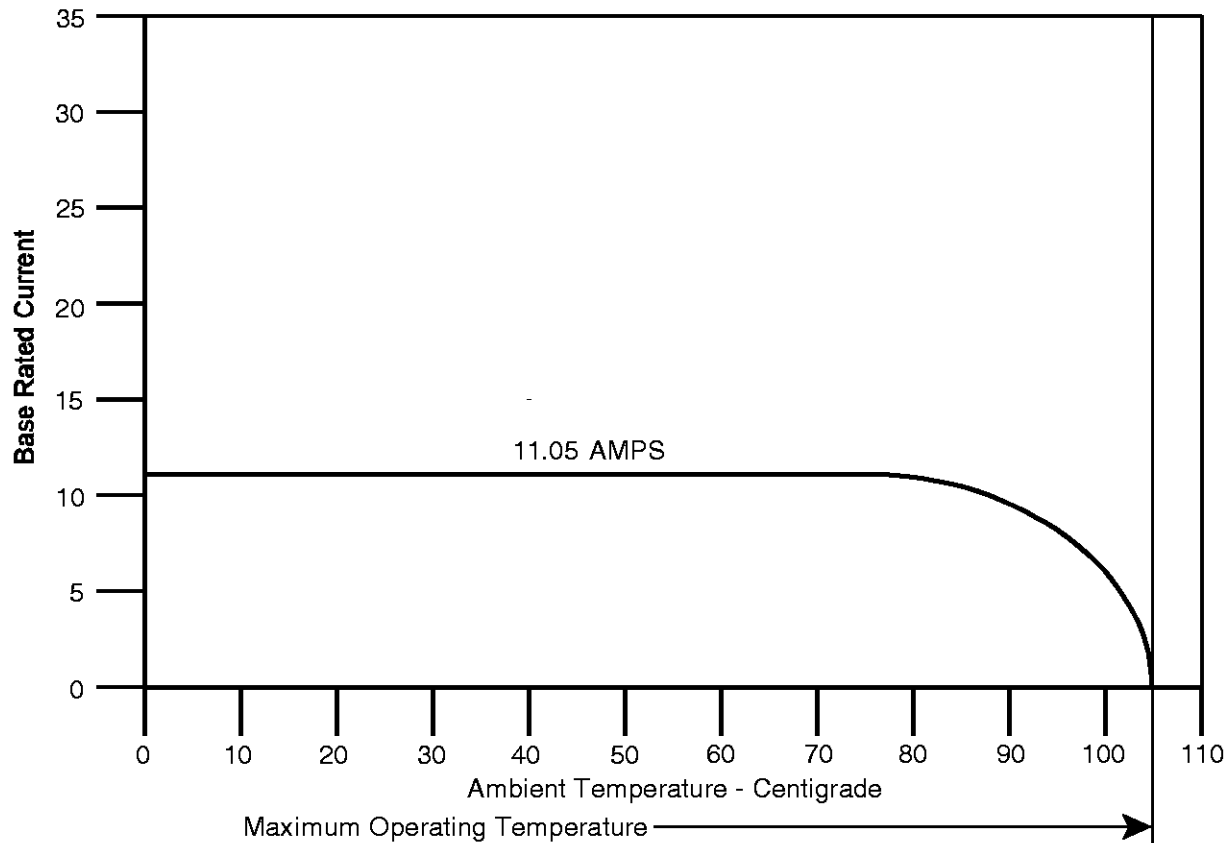


Figure 4A
Current Carrying Capability

Percent Connector Loading (10 Position In-Line Tin)	Wire Size AWG			
	24	22	20	18
Single Contact	.655	.744	.856	1.0
50	.527	.599	.689	.804
100	.393	.447	.514	.601

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 the maximum ambient operating temperature shown in Figure 4A.
- The F-factor for the 50% loading condition is based on the temperature rise data where every other position was energized. The F-factor will change if different positions are energized since the loading density calculation would be different.

Figure 4B
Current Rating

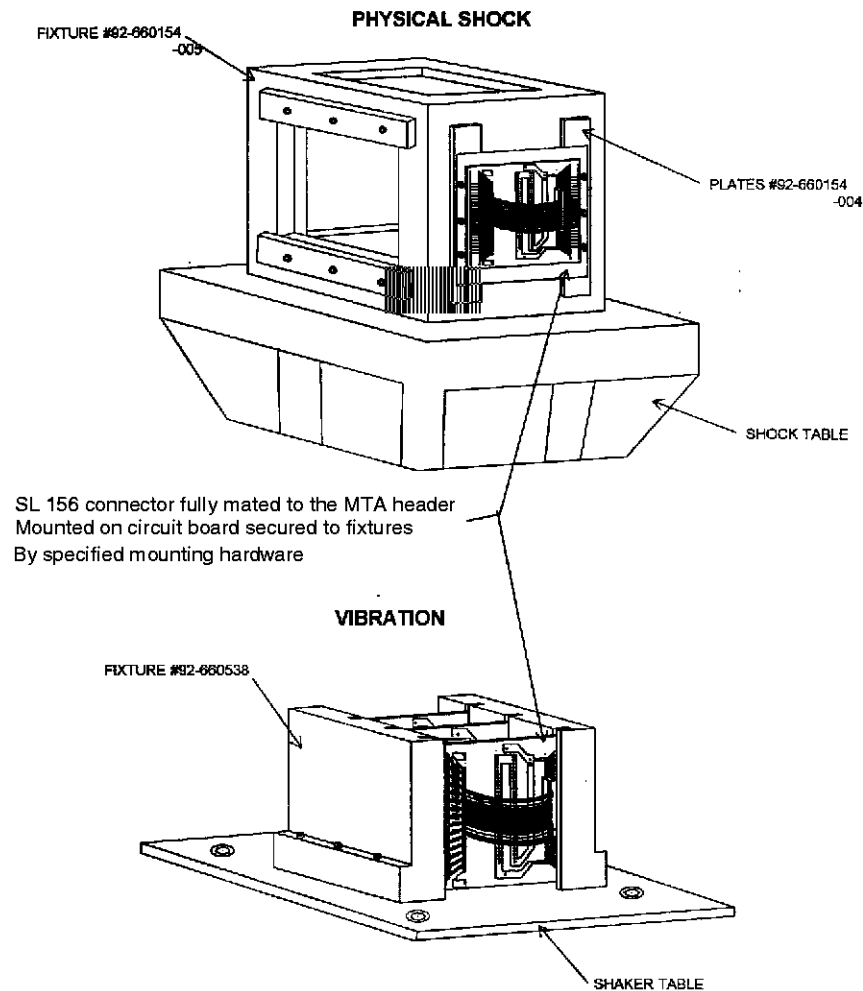


Figure 5
Vibration & Mechanical Shock Mounting Fixture
(Use For Reference Only)