

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMP* Micro-Strip board to board right angle and vertical connector family. These assemblies accommodate a variety of printed circuit board thicknesses. Plug assemblies are loaded with .015 inch square male Micro-Strip contacts which mate with receptacle assemblies loaded with female Micro-Strip contacts.

1.2. Qualification

When tests are performed on subject product line, procedures specified in AMP 109 series specifications shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, latest edition of the document applies. In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and 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. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
- C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Military or Commercial Documents
- D. 114-11005: Application Specification
- E. 501-235: Test Report

3. REQUIREMENTS

3.1. Design and Construction

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

* Trademark

Product Code: 7449

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| | | | | | | | |
|--|-----------------------------|------------|-----------------|---|--|--|-------|
| CONTROLLED DOCUMENT This specification is a controlled document per AMP Specification 102-21. It is subject to change and Corporate Standards should be contacted for latest revision. | | | | DR <i>Burke Beckley 11/17/93</i> CHK <i>Pam Malot 11/19/93</i> APP <i>Arthur K. Dyer 11/17/93</i> | | AMP AMP Incorporated Harrisburg, PA 17105-3608 | |
| | | | | NO 108-1272 | | REV 0 | LOC B |
| O | Release per EC 0010-1681-93 | <i>B/B</i> | <i>11/20/93</i> | PAGE 1 OF 8 | TITLE CONNECTOR, MICRO-STRIP, BOARD TO BOARD | | |
| LTR | REVISION RECORD | APP | DATE | | | | |

3.2. Materials

- A. Contact: Phosphor bronze or beryllium copper, selective gold over nickel plating
- B. Housing: High temperature thermoplastic, liquid crystal polymer

3.3. Ratings

- A. Voltage: 30 volts alternating current
- B. Current: See Figure 2 for applicable current carrying capability
- C. Temperature: -65 to 125°C

3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. All tests are performed at ambient environmental conditions per AMP Specification 109-1 unless otherwise specified.

3.5. Test Requirements and Procedures Summary

| Test Description | Requirement | Procedure |
|--------------------------------------|--|--|
| Examination of product. | Meets requirements of product drawing and AMP Spec 114-11005. | Visual, dimensional and functional per applicable quality inspection plan. |
| ELECTRICAL | | |
| Termination resistance, dry circuit. | Vertical signal: 20 milliohms maximum initial. ΔR 7 milliohms maximum. | Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma maximum. See Figure 4. AMP Spec 109-6-1. |
| | Ground bus: 10 milliohms maximum initial. ΔR 4 milliohms maximum. | |
| | Right angle signal: 25 milliohms maximum initial. ΔR 7 milliohms maximum. | |
| | Extended M-bus signal: 40 milliohms maximum initial. ΔR 7 milliohms maximum. | |
| Dielectric withstanding voltage. | 500 vac at sea level. No breakdown or flashover. | Test between adjacent signal contacts and between signal contacts and ground contacts of mated connector assemblies. AMP Spec 109-29-1. |

Figure 1 (cont)

| Test Description | Requirement | Procedure |
|------------------------------|--|--|
| Insulation resistance. | 5000 megohms minimum. | Test between adjacent signal contacts and between signal contacts and ground contacts of mated connector assemblies. AMP Spec 109-28-1. |
| Temperature rise vs current. | 30°C maximum temperature rise at specified current. | Measure temperature rise vs current. See Figures 2 and 4. AMP Spec 109-45-1. |
| MECHANICAL | | |
| Vibration, random. | No discontinuities greater than 1 microsecond. See Note (a). | Subject vertical and right angle connectors to 11.6 G's rms. See Figure 5. AMP Spec 109-21-5, Test Level D, Duration 15 minutes. |
| | | Subject extended M-bus connectors to 10-500 Hz. See Figure 5. AMP Spec 109-21-7, Test level F, Duration 15 minutes. |
| Physical shock. | No discontinuities greater than 1 microsecond. See Note (a). | Subject mated connectors 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 5. AMP Spec 109-26-1. |
| Mating force. | 8 pounds maximum per 1 inch of connector. (1 inch equals 40 signal and 2 ground contacts) | Measure force necessary to mate connector assemblies using free floating fixtures at rate of 1 inch per minute. AMP Spec 109-42, Condition A. |
| Unmating force. | 2 pounds minimum per 1 inch of connector. (1 inch equals 40 signal and 2 ground contacts) | Measure force necessary to unmate connector assemblies at rate of 1 inch per minute. AMP Spec 109-42, Condition A. |

Figure 1 (cont)

| Test Description | Requirement | Procedure |
|-------------------------------|---------------|--|
| Durability. | See Note (a). | Mate and unmate connector assemblies for 50 cycles at maximum rate of 600 cycles per hour. AMP Spec 109-27. |
| ENVIRONMENTAL | | |
| Thermal shock. | See Note (a). | Subject mated connectors to 5 cycles between -65 and 125°C. AMP Spec 109-22. |
| Humidity-temperature cycling. | See Note (a). | Subject mated connectors to 10 humidity-temperature cycles between 25 and 65°C at 95% RH. AMP Spec 109-23-3, Condition B. |
| Mixed flowing gas. | See Note (a). | Subject mated connectors to environmental class III for 20 days. AMP Spec 109-85-3. |
| Temperature life. | See Note (a). | Subject mated connectors to temperature life at 105°C for 500 hours. AMP Spec 109-43. |

- (a) Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 3.

Figure 1 (end)

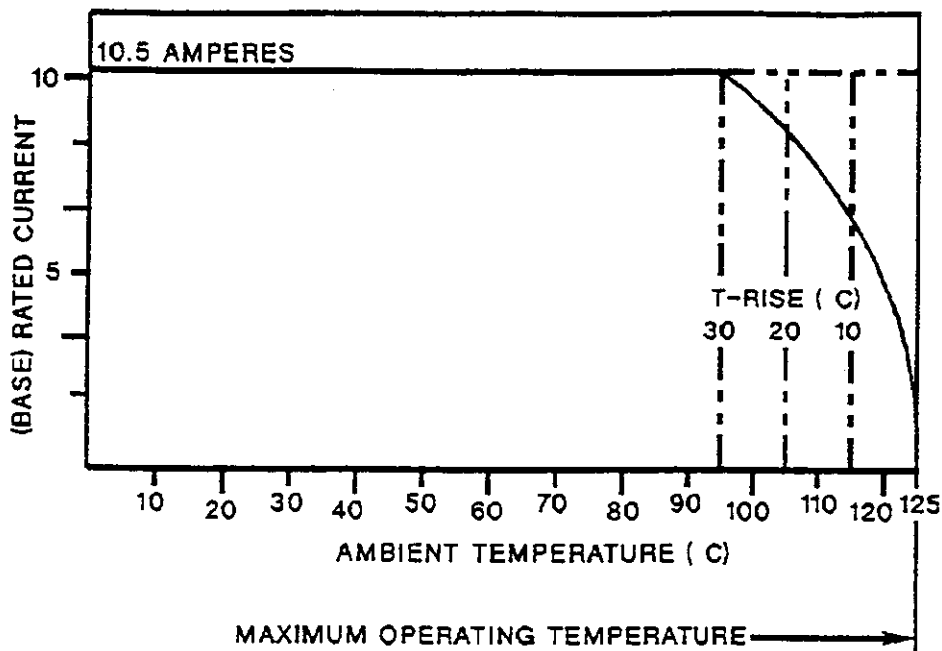


Figure 2A
Current Carrying Capability

| Loading Configuration | Vertical, Low Profile Connector | Right Angle Connector | Vertical, Extended Profile Connector |
|---|---------------------------------|-----------------------|--------------------------------------|
| Single (1 bus contact) | .90 | 1.0 | 1.0 |
| 40% (2 bus contacts) | .87 | .87 | .91 |
| 100% (5 bus contacts) | .87 | .87 | .91 |
| 50% signal contacts at 1 ampere, temperature rise at 100% bus contact | .72 | .68 | .68 |

Note: To determine acceptable current carrying capacity for percentage connector loading, use Multiplication Factor (F) from above chart and multiply it times Base rated Current for a single circuit at maximum ambient operating temperature as shown in Figure 2A.

Figure 2B
Current Rating

3.6. Product Qualification and Requalification Test Sequence

| Test or Examination | Test Group (a) | | |
|-------------------------------------|-------------------|------|-----|
| | 1 | 2 | 3 |
| | Test Sequence (b) | | |
| Examination of product | 1,9 | 1,9 | 1,8 |
| Termination resistance, dry circuit | 3,7 | 2,7 | |
| Dielectric withstanding voltage | | | 3,7 |
| Insulation resistance | | | 2,6 |
| Temperature rise vs current | | 3,8 | |
| Vibration | 5 | 6(c) | |
| Physical shock | 6 | | |
| Mating force | 2 | | |
| Unmating force | 8 | | |
| Durability | 4 | | |
| Thermal shock | | | 4 |
| Humidity-temperature cycling | | | 5 |
| Mixed flowing gas | | 4(d) | |
| Temperature life | | 5 | |

- (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 as determined in AMP Specification 109-151.
- (d) Precondition samples with 10 cycles durability.

Figure 3

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 5 connectors each of the minimum and maximum sizes available. Test groups 2 and 3 shall consist of 5 connectors each. All tests requiring individual contact measurements shall be conducted on 30 contacts randomly selected over the 5 connectors. Test groups 1 and 2 shall be mounted on printed circuit boards designed to accommodate vibration and physical shock fixturing providing a series circuit for all contacts with access to measure termination resistance. Test group 3 shall not be printed circuit board mounted. Each sample shall consist of a plug and receptacle assembly.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 3.

4.2. Requalification Testing

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

4.3. Acceptance

Acceptance is based on verification that product meets requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify 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

Applicable AMP quality inspection plan will specify sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with applicable product drawing and this specification.

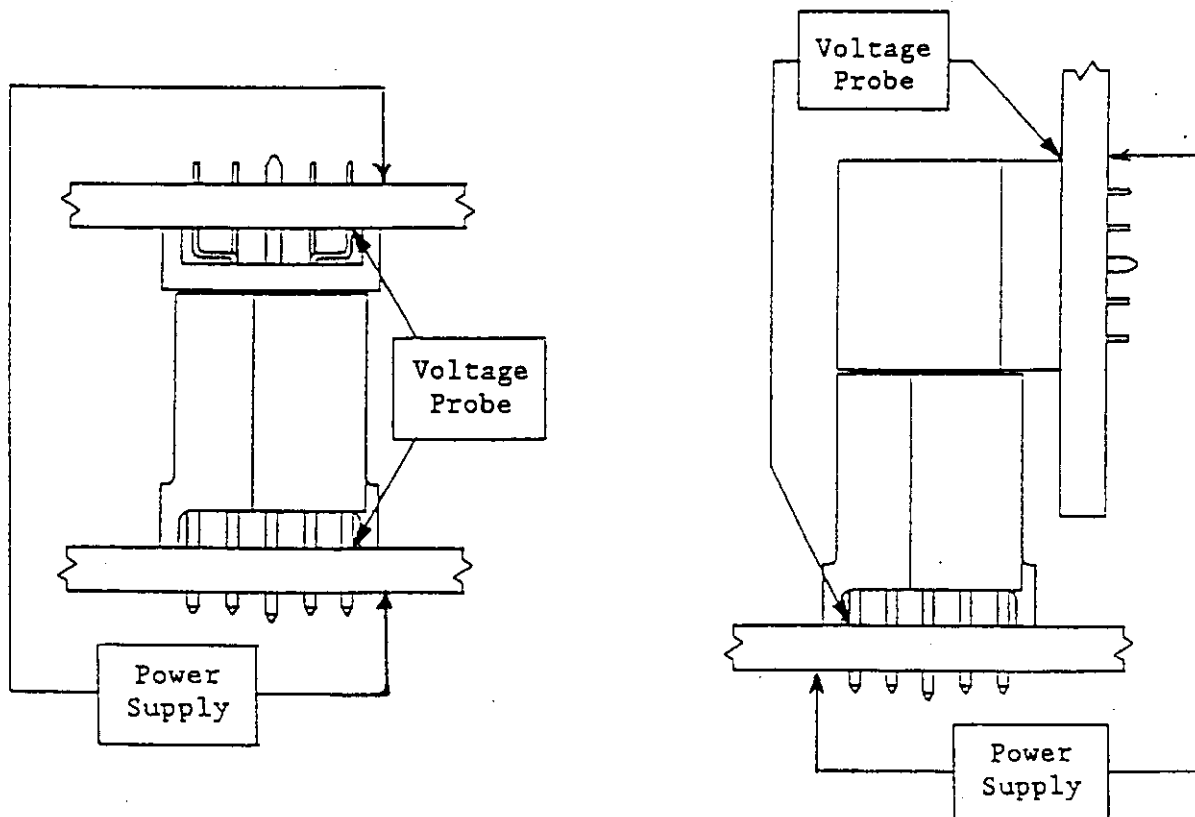


Figure 4
Resistance & Temperature Measurement Points

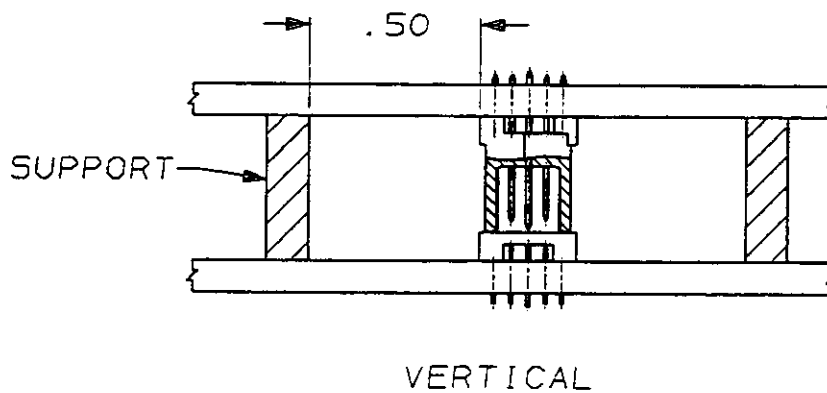
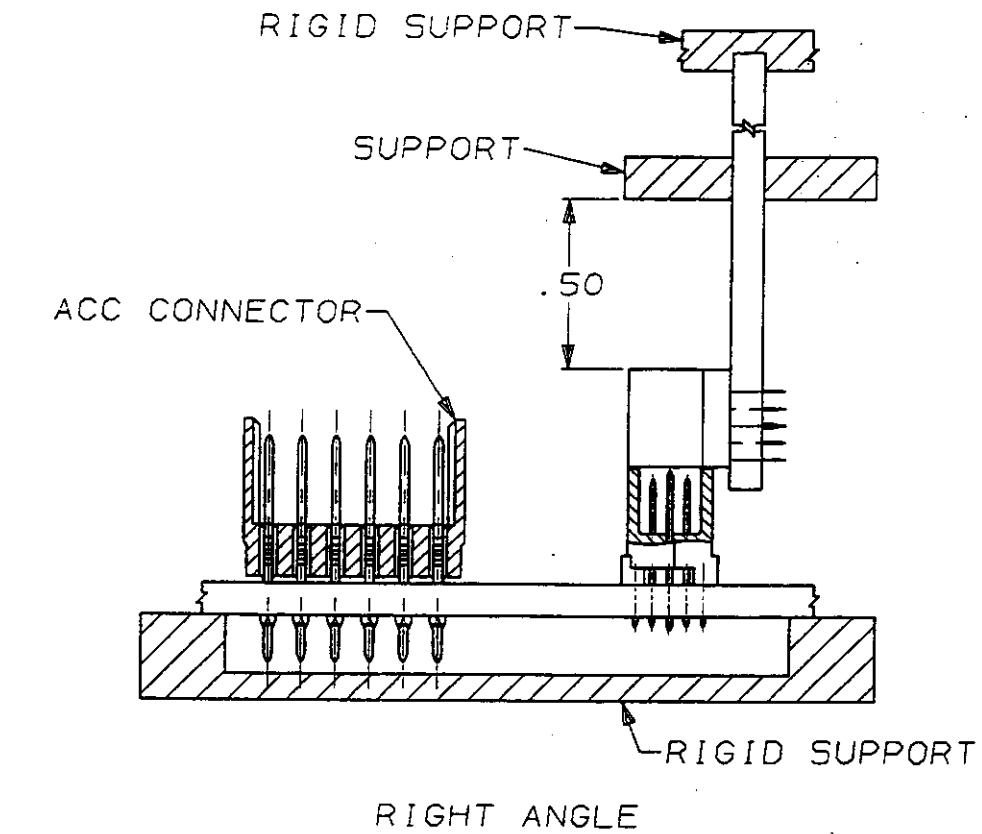


Figure 5
Mounting & Clamping Location For Vibration & Physical Shock