

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance requirements for the AMP\* PCB (Printed Circuit Board) spade receptacles. This is a flat strip product with 2 receptacles for .016 spade, hook, blade and ring terminals.

1.2. Qualification

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

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. 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 Specifications

- 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)

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Material

Brass, tin plate over copper flash

3.3. Ratings

- A. Current: 7 amperes maximum
- B. Temperature: -40° to 140° F

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|                 |                 |           |             |   |  |  |                |                       |                 |
|-----------------|-----------------|-----------|-------------|---|--|--|----------------|-----------------------|-----------------|
|                 |                 |           |             | DR<br><i>Fred Reinhardt</i> 7/25/80<br>CHK<br><i>D. Schwenk</i> 7/15/80 |  | <b>AMP</b>   AMP INCORPORATED<br>Harrisburg, Pa. |                |                       |                 |
|                 |                 |           |             | APP<br><i>Jon Fortuna</i> 7/25/80                                       |  | LOC<br><b>B</b>                                  | NO<br><b>A</b> | NO<br><b>108-2005</b> | REV<br><b>C</b> |
| C               | Revise per      | <i>FR</i> | <i>2-3</i>  |   |  |  |                |                       |                 |
| ECN A-5857      |                 |           |             |   |  |  |                |                       |                 |
| B               | Rev all Para    | <i>FR</i> | <i>7-18</i> |   |  |  |                |                       |                 |
| LTR             | REVISION RECORD | APP       | DATE        |   |  |  |                |                       |                 |
| SHEET<br>1 OF 5 |                 |           |             | NAME<br>RECEPTACLE, SPADE, PCB  |  |  |                |                       |                 |

3.4. Performance and Test Description

Receptacles 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.                          | Visual, dimensional and functional per applicable inspection plan.   |
| <b>ELECTRICAL</b>                         |   |  |
| Termination Resistance, Specified Voltage | .50 milliohms maximum initial.                                  | Subject receptacle mounted on a printed circuit board and mated with a spade terminal to 80 mv open circuit at 50 ma maximum, see Figure 4; AMP Spec 109-6.                          |
| Current Cycling                           | 1.00 milliohms $\Delta R$ termination resistance, dry circuit.  | Subject receptacle mounted on a printed circuit board and mated with a spade terminal to 500 cycles of 45 minutes "ON" at 7 amperes and 15 minutes "OFF", AMP Spec 109-51, method 4. |
| <b>MECHANICAL</b>                         |   |  |
| Terminal Insertion Force                  | 8.5 pounds maximum initial, 4.0 pounds maximum after 10 cycles. | Measure force to insert a spade terminal into a spade receptacle initially and after 2, 5 and 10 cycles; AMP Spec 109-41.  |
| Terminal Extraction Force                 | 3.0 pounds minimum initial; 2.5 pounds minimum after 10 cycles. | Measure force to extract a spade terminal from a receptacle initially and after 2, 5 and 10 cycles; AMP Spec 109-41.   |

Figure 1 (cont)


|                                |                |                                     |  |                               |  |
|--------------------------------|----------------|-------------------------------------|--|-------------------------------|--|
| <b>AMP</b>                     |                | AMP INCORPORATED<br>Harrisburg, Pa. |  | SHEET<br><u>2</u> OF <u>5</u> |  |
| LOC<br><b>B</b>                | NO<br><b>A</b> | 108-2005                            |  |                               |  |
| NAME<br>RECEPTACLE, SPADE, PCB |                |                                     |  |                               |  |

| Test Description | Requirement   | Procedure   |
|------------------|---|---|
| Durability       | 1.00 milliohms $\Delta R$ termination resistance, dry circuit, measure after every 10 cycles by inserting a spade terminal. | Mate and unmate receptacle mounted on a printed circuit board with a test tab (AMP PN 62117) incorporating free floating fixture at a rate of 1.0 inch/minute; AMP Spec 109-27. |

**ENVIRONMENTAL**

|                              |  |   |
|------------------------------|--|---|
| Temperature-Humidity Cycling | 1.00 milliohms $\Delta R$ termination resistance, dry circuit. | Subject receptacle mounted on a printed circuit board and mated with a spade terminal to 300 temperature-humidity cycles between 40° and 140° F at 95% RH; AMP Spec 109-23, method III at a rate of 12 hours/cycle. |
| Temperature Cycling          | 1.00 milliohms $\Delta R$ termination resistance, dry circuit. | Subject receptacle mounted on a printed circuit board and mated with a spade terminal to 512 cycles of temperature cycling between -40° and 140° F, at a rate of 8 hours/cycle.                                     |
| Temperature Life             | 1.00 milliohms $\Delta R$ temperature resistance, dry circuit. | Subject receptacle mounted on a printed circuit board and mated with a spade terminal to 244° F for 33 days; AMP Spec 109-43, level 9, duration I.  |

Figure 1 (end)

|   |  |   |                       |
|---|--|---|-----------------------|
| <b>SHEET</b><br><u>3</u> OF <u>5</u>                              |  <b>AMP INCORPORATED</b><br>Harrisburg, Pa. |   |                       |
|   | LOC<br><b>B</b>  | A | NO<br><b>108-2005</b> |
| NAME<br><p style="text-align: center;">RECEPTACLE, SPADE, PCB</p> |  |   |                       |

### 3.6. Receptacle Tests and Sequences

| Test or Examination                       | Test Group (a)    |      |      |      |      |
|---|-------------------|------|------|------|------|
|   | 1                 | 2    | 3    | 4    | 5    |
|   | Test Sequence (b) |      |      |      |      |
| Examination of Product                    | 1                 | 1    | 1    | 1    | 1    |
| Termination Resistance, Specified Voltage | 2, 6              | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| Current Cycling                           |                   |      |      |      | 3    |
| Terminal Insertion Force                  | 3                 |      |      |      |      |
| Terminal Extraction Force                 | 4                 |      |      |      |      |
| Durability                                | 5                 |      |      |      |      |
| Temperature-Humidity Cycling              |                   |      |      | 3    |      |
| Temperature Cycling                       |                   |      | 3    |      |      |
| Temperature Life                          |                   | 3    |      |      |      |

(a) See Para 4.1.A.

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

Figure 2

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1. Qualification Testing

#### A. Sample Selection

Receptacles shall be mounted on printed circuit boards in accordance with the applicable Instruction Sheets. They shall be selected at random from current production. Test group 1 shall consist of 10 samples. Groups 2, 3 and 4 shall consist of 24 samples. Group 5 shall consist of 20 samples.

#### B. Test Sequence

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

#### C. Acceptance

- (1) Requirements put on test samples, as indicated in the requirements portion of Figure 1, exist as either the upper or lower statistical tolerance limit (95% reliability). All samples tested in accordance with this specification shall meet the stated tolerance limit.

|                                |                |                                     |  |                 |  |
|--------------------------------|----------------|-------------------------------------|--|-----------------|--|
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| NAME<br>RECEPTACLE, SPADE, PCB |                |                                     |  |                 |  |

- (2) Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

#### 4.2. Quality Conformance Inspection

The applicable AMP 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.

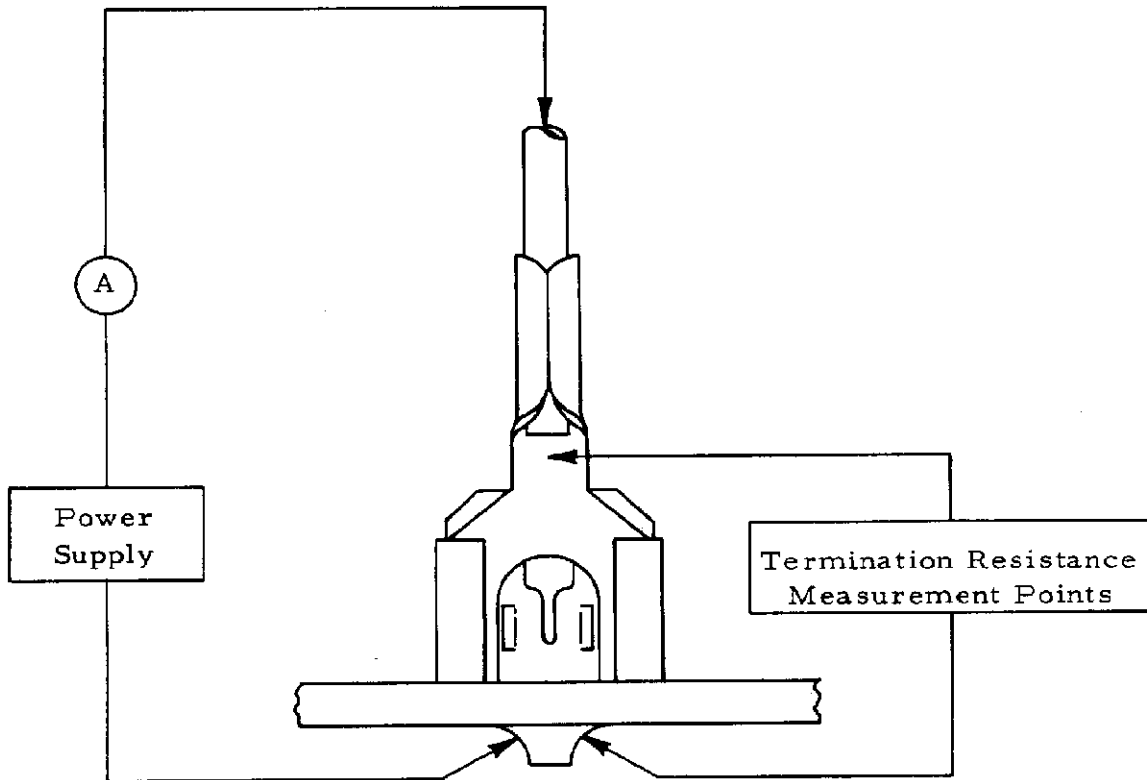


Figure 3

Termination Resistance Measurement Points

|                                |  |                 |
|--------------------------------|--|-----------------|
| SHEET<br><u>5</u> OF <u>5</u>  | <b>AMP</b>   AMP INCORPORATED<br>Harrisburg, Pa. |                 |
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| NAME<br>RECEPTACLE, SPADE, PCB |  |                 |

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