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## .058 Diameter Printed Circuit Board Disconnect System

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### 1. SCOPE

#### 1.1. Content

This specification covers the performance requirements for the AMP\* .058 diameter printed circuit board disconnect system. This system affords a quick disconnect method of single-circuit wire to board connections. It consists of a family of pins which are soldered to printed circuit boards and a family of receptacles which are crimped to wires.

#### 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
- C. 114-1008: Pin, Printed Circuit Board, Clinch Type, Application of
- D. 114-1009: Pin, Printed Circuit Board, Formed, Press Fit Type, Application of
- E. 114-27000: Printed Circuit Board Disconnect, .058 Diameter Receptacle, Application of

### 3. REQUIREMENTS

#### 3.1. Design and Construction

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

3.2. Materials

- A. Pins: Brass and phosphor bronze, tin and gold
- B. Receptacles: Phosphor bronze and beryllium copper, pre-tin and gold

3.3. Ratings

- A. Current: 6.0 amperes maximum
- B. Operating temperature: -55° to 105°C

3.4. Performance and Test Description

Disconnect systems 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 AMP Spec 114-1008, 114-1009 and 114-27000.   | Visual, dimensional, and functional per applicable inspection plan.  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| ELECTRICAL                                |  |  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| Termination Resistance, Specified Current | <table border="1"> <thead> <tr> <th>Wire Size, AWG</th> <th>Test Current, amp</th> <th>Resistance, milliohms max initial</th> </tr> </thead> <tbody> <tr> <td>26</td> <td>1.0</td> <td>3.0</td> </tr> <tr> <td>24</td> <td>1.0</td> <td>3.0</td> </tr> <tr> <td>22</td> <td>1.5</td> <td>2.5</td> </tr> <tr> <td>20</td> <td>2.0</td> <td>2.5</td> </tr> </tbody> </table> | Wire Size, AWG   | Test Current, amp | Resistance, milliohms max initial | 26 | 1.0 | 3.0 | 24 | 1.0 | 3.0 | 22 | 1.5 | 2.5 | 20 | 2.0 | 2.5 | Measure potential drop of receptacle mated with pin assembled on printed circuit board, see Figure 4; AMP Spec 109-25, calculate resistance. |
| Wire Size, AWG                            | Test Current, amp  | Resistance, milliohms max initial  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| 26  | 1.0  | 3.0  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| 24  | 1.0  | 3.0  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| 22  | 1.5  | 2.5  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| 20  | 2.0  | 2.5  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| Temperature rise vs. Current (a)          | Temperature rise, see Figure 2; termination resistance, specified current.   | T-rise at rated current; AMP Spec 109-45.  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| Termination Resistance, Dry Circuit       | 3.0 milliohms maximum initial.   | Subject receptacle mated with pin mounted on printed circuit board to 50 mv open circuit at 100 ma maximum, see Figure 4; AMP Spec 109-6, cond A.  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| MECHANICAL                                |  |  |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |
| Engaging Force                            | 14.0 pounds maximum initial  | Measure force necessary to engage receptacle with pin mounted on printed circuit board a distance of 0.125 inch from point of initial contact, incorporating free floating fixtures at a rate of 0.5 inch/minute; AMP Spec 109-35. |                   |                                   |    |     |     |    |     |     |    |     |     |    |     |     |  |

Figure 1 (cont)

| Test Description     | Requirement   | Procedure  |                                  |    |   |    |    |    |    |    |    |  |
|----------------------|---|--|----------------------------------|----|---|----|----|----|----|----|----|--|
| Separating Force     | 1.0 pounds minimum final.   | Measure force necessary to separate receptacle from pin mounted on printed circuit board at a rate of 0.5 inch/minute; AMP Spec 109-35.  |                                  |    |   |    |    |    |    |    |    |  |
| Crimp Tensile        | <table border="1"> <thead> <tr> <th>Wire Size<br/>AWG</th> <th>Crimp Tensile,<br/>pounds minimum</th> </tr> </thead> <tbody> <tr> <td>26</td> <td>8</td> </tr> <tr> <td>24</td> <td>10</td> </tr> <tr> <td>22</td> <td>15</td> </tr> <tr> <td>20</td> <td>20</td> </tr> </tbody> </table> | Wire Size<br>AWG   | Crimp Tensile,<br>pounds minimum | 26 | 8 | 24 | 10 | 22 | 15 | 20 | 20 | Determine crimp tensile at a rate of 1 inch/minute; AMP Spec 109-16. |
| Wire Size<br>AWG     | Crimp Tensile,<br>pounds minimum  |  |                                  |    |   |    |    |    |    |    |    |  |
| 26                   | 8   |  |                                  |    |   |    |    |    |    |    |    |  |
| 24                   | 10  |  |                                  |    |   |    |    |    |    |    |    |  |
| 22                   | 15  |  |                                  |    |   |    |    |    |    |    |    |  |
| 20                   | 20  |  |                                  |    |   |    |    |    |    |    |    |  |
| Durability           | Engaging and separating force; 5.0 milliohms maximum termination resistance; dry circuit.   | Engage and separate receptacle and pin mounted on a printed circuit board 25 cycles; at a rate of 0.5 inch/minute; AMP Spec 109-27.  |                                  |    |   |    |    |    |    |    |    |  |
| ENVIRONMENTAL        |   |  |                                  |    |   |    |    |    |    |    |    |  |
| Thermal Shock        | 6.0 milliohms maximum termination resistance, dry circuit; shall remain mated and shall show no evidence of cracking or chipping.   | Subject receptacle mated with pin mounted on printed circuit board to 25 cycles between -55° and 85°C; AMP Spec 109-22.  |                                  |    |   |    |    |    |    |    |    |  |
| Temperature-Humidity | 7.0 milliohms maximum termination resistance, dry circuit.  | Subject receptacle mated with pin mounted on printed circuit board to 4 temperature-humidity cycles between 25° and 65°C at 95% RH; AMP Spec 109-23, method III, cond A, with low frequency vibration and cold shock at -10°C during each cycle. |                                  |    |   |    |    |    |    |    |    |  |

- (a) Maximum rated current that can be carried by this product is limited by the temperature rise of contacts, which is 30°C. Variables which shall be considered for each application are: wire size, contact material, ambient temperature, and printed circuit board.

Figure 1 (end)

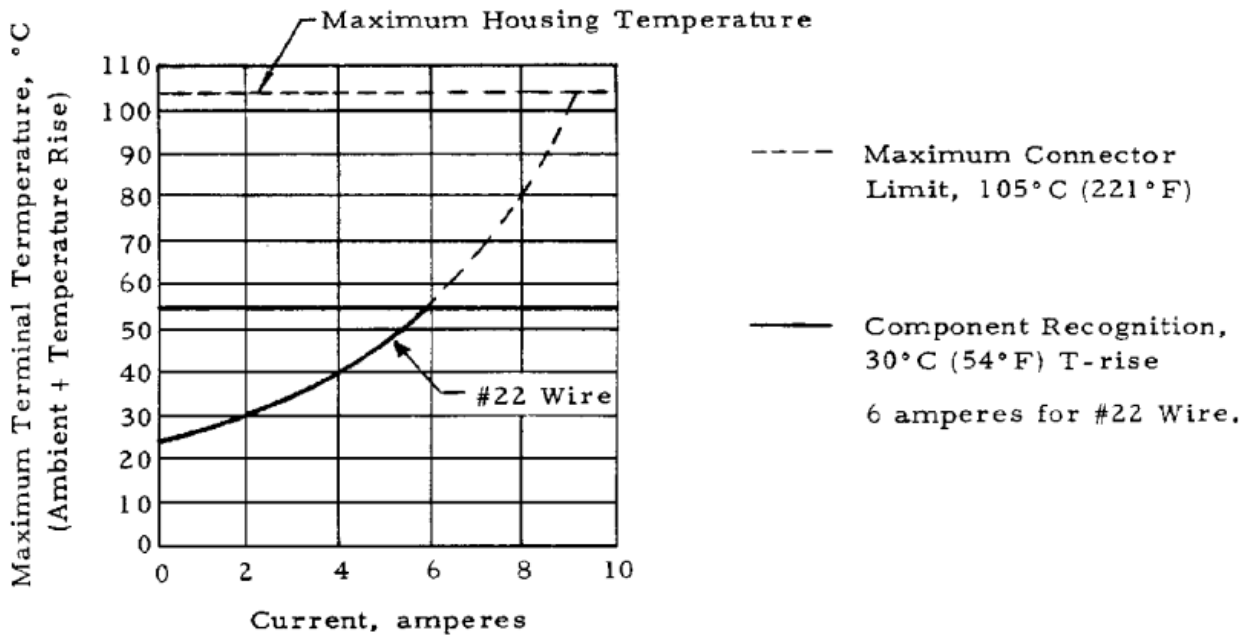


Figure 2

Terminal Temperature Rise Vs. Current

3.6. Disconnect System Tests and Sequences

| Test or Examination                       | Test Group (a)    |   |      |      |      |   |
|---|-------------------|---|------|------|------|---|
|   | 1                 | 2 | 3    | 4    | 5    | 6 |
|   | Test Sequence (b) |   |      |      |      |   |
| Examination of Product                    | 1                 |   |      |      |      |   |
| Termination Resistance, Specified Current |                   | 2 |      |      |      |   |
| Temperature Rise vs. Current              |                   | 1 |      |      |      |   |
| Termination Resistance, Dry Circuit       |                   |   | 1, 3 | 1, 3 | 2, 4 |   |
| Engaging Force                            |                   |   |      |      | 1    |   |
| Separating Force                          |                   |   |      |      | 5    |   |
| Crimp Tensile                             |                   |   |      |      |      | 1 |
| Durability                                |                   |   |      |      | 3    |   |
| Thermal Shock                             |                   |   | 2    |      |      |   |
| Temperature-Humidity Cycling              |                   |   |      | 2    |      |   |

(a) See Para 4.1. A.

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

Figure 3

#### 4. QUALITY ASSURANCE PROVISION

##### 4.1. Qualification Testing

###### A. Sample Selection

Printed circuit board pins and receptacles shall be prepared in accordance with the applicable Instruction Sheets. They shall be selected at random from current production. Test group 1 shall consist of 5 pins and 5 receptacles all representative of the entire lot being tested. Test groups 2 through 5 shall consist of 20 pins and receptacles per group. The receptacles and wire sizes shall be chosen randomly to cover the range of the product line. Group 6 shall consist of 10 receptacles per wire size. All receptacles shall be crimped to appropriate PN 103501 tin plated test conductors in accordance with AMP Specification 114-27000, and all pins shall be assembled in printed circuit boards in accordance with AMP Specification 114-1008 and 114-1009.

###### B. Test Sequence

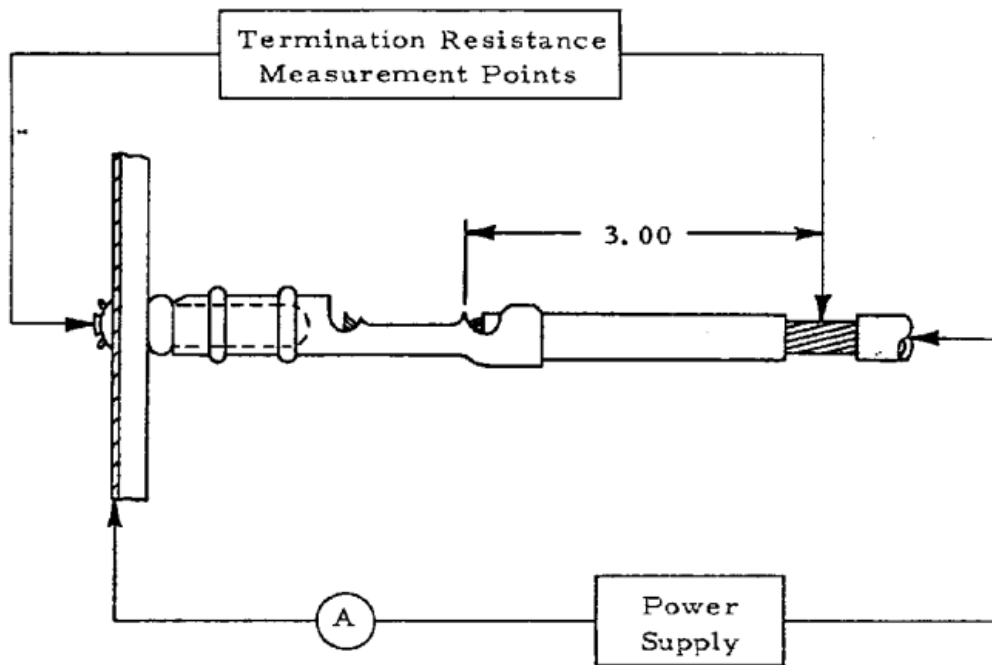
Qualification inspection shall be verified by testing samples as specified in Figure 3.

###### 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% confidence, 99% reliability). All samples tested in accordance with this specification shall meet the stated tolerance limit.
- (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 acceptance quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.



Notes:

1. A 1 foot minimum length of continuous lead for heat dissipation.
2. Termination resistance equals millivolts divided by test current less resistance of 3 inches of wire.
3. Printed circuit test board is tin plated 3 ounce copper with .100 inch wide pads.

Figure 4

Termination Resistance Measurement Points