

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance requirements for the AMP\* bifurcated leaf edge connector. These connectors provide a means of connecting printed circuit boards into the system.

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. 114-1015: Contact, Bifurcated Leaf, Application of

2.2. Commercial

- A. E-28476: Electrical File Number, Underwriters' Laboratories Inc., Components Recognition Program
- B. LR-16455: Canadian Standards Association Certification Number

3. REQUIREMENTS

3.1. Design and Construction

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


3.2. Materials

- A. Contacts: Brass, phosphor bronze, and beryllium copper; .012 inches thick, tin or gold plated.
- B. Housings: Polyester thermoplastic unreinforced, 94V-0

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NO 108-1020

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				DR <i>Fred Reinhardt 4/30/80</i> CHK <i>R.K. Swab 5-1-80</i>	 AMP INCORPORATED Harrisburg, Pa.		
				APP <i>EM Patton 5-1-80</i>	LOC B	NO A 108-1020	REV C
C	Change per ECN	<i>PR</i>	<i>7/26</i>	SHEET 1 OF 8			
	AG-472		<i>84</i>				
B	Rev all Para			CONNECTOR, EDGE, BIFURCATED LEAF			
LTR	REVISION RECORD	APP	DATE				

3.3. Ratings

- A. Current/Voltage: 250 vac at 6 amperes maximum
- B. Operating temperature: -55° to 105°C


3.4. Performance and Test Description

Connector assemblies 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 114-1015.	Visual, dimensional and functional per applicable inspection plan.															
<b>ELECTRICAL</b>																	
Dielectric Withstanding Voltage	1.25 kvac; 1 minute dielectric withstanding voltage.	Test between a minimum of 20 adjacent contacts of unmated connector assemblies; AMP Spec 109-29-1.															
Insulation Resistance	1000 megohms minimum initial, 100 megohms minimum final.	Test between a minimum of 20 adjacent contacts of unmated connector assemblies; AMP Spec 109-28.															
Termination Resistance, Specified Current	<p>Wire Test Resistance, Size, Current, milliohms</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>AWG</th> <th>amp</th> <th>max initial</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>1.0</td> <td>4.00</td> </tr> <tr> <td>22</td> <td>1.5</td> <td>3.75</td> </tr> <tr> <td>20</td> <td>2.0</td> <td>3.50</td> </tr> <tr> <td>18</td> <td>3.0</td> <td>3.00</td> </tr> </tbody> </table>	AWG	amp	max initial	24	1.0	4.00	22	1.5	3.75	20	2.0	3.50	18	3.0	3.00	Measure potential drop of mated contacts assembled in housings, see Figure 5; AMP Spec 109-25, calculate resistance.
AWG	amp	max initial															
24	1.0	4.00															
22	1.5	3.75															
20	2.0	3.50															
18	3.0	3.00															
Temperature Rise vs Current (a)	Temperature rise, see Figure 2, 3, and 5 termination resistance, specified current.	T-rise at rated current AMP Spec 109-45.															
Termination Resistance, Dry Circuit	3.00 milliohms maximum initial.	Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma maximum, see Figure 5; AMP Spec 109-6, cond A.															

Figure 1 (cont)

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Test Description	Requirement	Procedure										
<b>MECHANICAL</b>												
Mating Force	2.3 pounds maximum initial per contact.	Measure force necessary to mate connector assembly with 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 109-42 calculate force per contact.										
Unmating Force	0.2 pounds minimum final per contact.	Measure force necessary to unmate connector assembly and printed circuit board at a rate of 0.5 inch/minute; AMP Spec 109-42, calculate force per contact.										
Contact Retention	10.0 pounds minimum	Apply axial load to crimped contacts gripping wire; AMP Spec 109-30.										
Crimp Tensile	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Wire Size, AWG</th> <th>Crimp Tensile, lb min</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>10</td> </tr> <tr> <td>22</td> <td>15</td> </tr> <tr> <td>20</td> <td>25</td> </tr> <tr> <td>18</td> <td>35</td> </tr> </tbody> </table>	Wire Size, AWG	Crimp Tensile, lb min	24	10	22	15	20	25	18	35	Determine crimp tensile at a rate of 1 inch/minute; AMP Spec 109-16.
Wire Size, AWG	Crimp Tensile, lb min											
24	10											
22	15											
20	25											
18	35											
Durability	Mating-unmating; 3.50 milliohms maximum termination resistance, dry circuit.	Mate and unmate connector assemblies for 25 cycles; mount appropriate connector half in panel and manually mate; AMP Spec 109-27.										
<b>ENVIRONMENTAL</b>												
Thermal Shock	Dielectric withstanding voltage; 6.0 milliohms maximum termination resistance, dry circuit, shall remain mated and show no evidence of cracking or chipping.	Subject mated connectors to 25 cycles between -55° and 85°C; AMP Spec 109-22.										

Figure 1 (cont)

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(a) Maximum rated current that can be carried by this product is limited by maximum operating temperature of housings, which is 105° C, and temperature rise of contacts, which is 30°C. Variables which shall be considered for each application are: wire size, connector size, contact material, ambient temperature and printed circuit board.

Figure 1 (end)

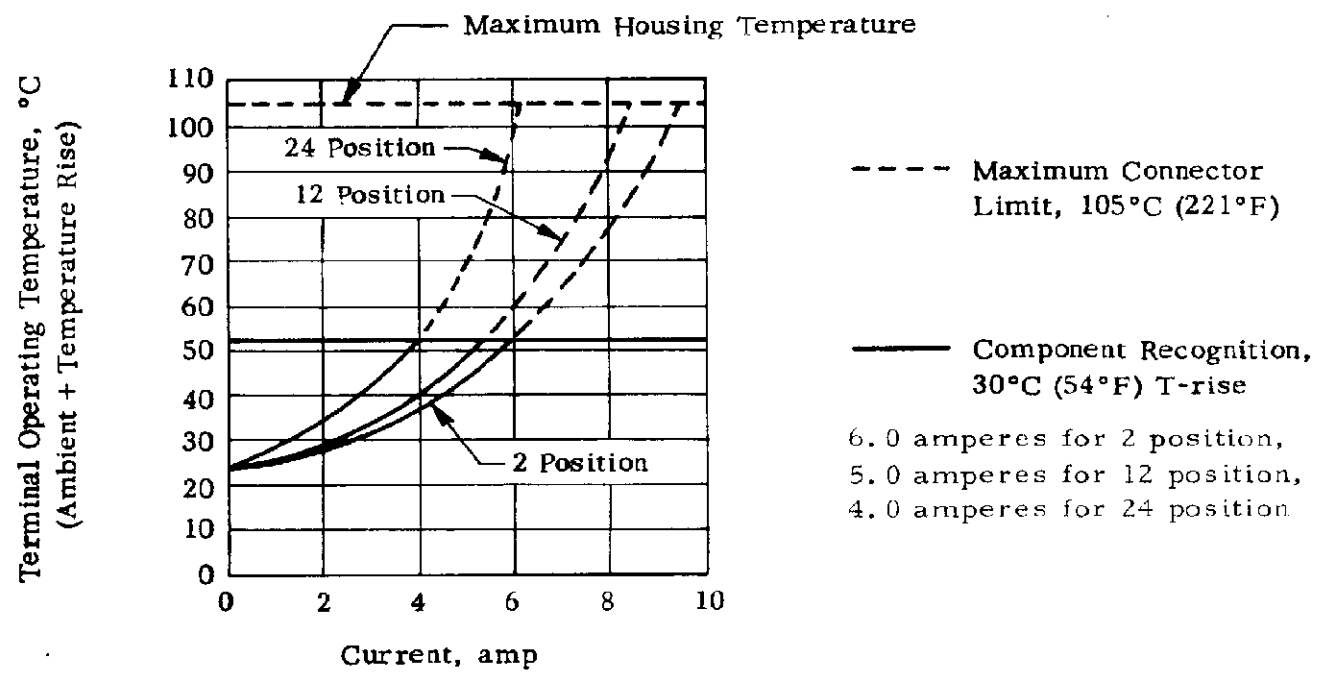



Figure 2

Terminal Temperature vs Current/Circuit 18 AWG Wire

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NAME CONNECTOR, EDGE, BIFURCATED LEAF					

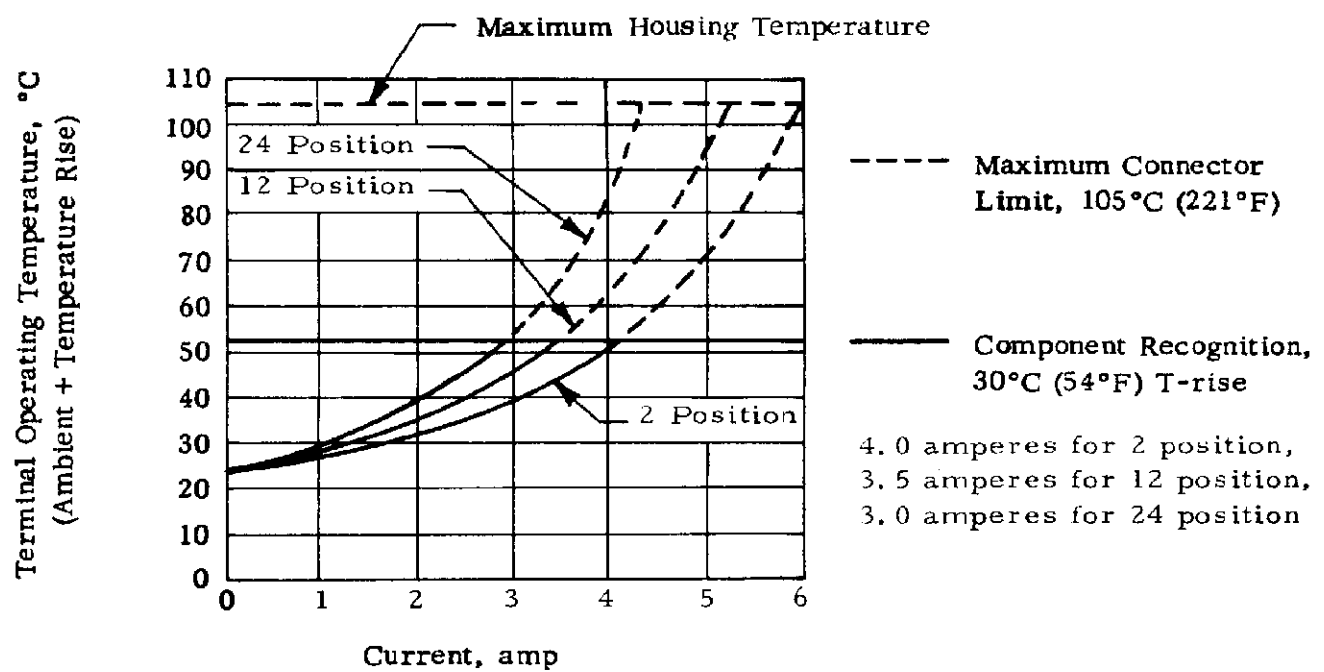



Figure 3  
Terminal Temperature vs Current/Circuit 24 AWG Wire

3.6. Connector Tests and Sequences

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Examination of Product	1					
Dielectric Withstanding Voltage		1, 6				
Insulation Resistance		2, 7				
Termination Resistance, Specified Current			2			
Temperature Rise vs Current			1			
Termination Resistance, Dry Circuit		3, 5		2, 4		
Unmating Force				5		
Mating Force				1		
Contact Retention						1
Crimp Tensile					1	
Durability				3		
Thermal Shock		4				

(a) See Para 4.1, A.  
(b) Numbers indicate sequence in which tests are performed.

Figure 4

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#### 4. QUALITY ASSURANCE PROVISIONS

##### 4.1. Qualification Testing

###### A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Test group 1 shall consist of 1 housing of each size, and 5 contacts all representative of the entire lot being tested. Test group 2 through 4 shall consist of 6 connector assemblies per group. The housings and wire sizes shall be chosen randomly to cover the range of the product line. Group 5 samples shall consist of 15 contacts per wire size. Group 6 samples shall consist of 15 contacts crimped on #18 AWG wire and tested with appropriate random housings. All contacts shall be crimped to appropriate PN 103501 and 103502 tin plated test conductors in accordance with AMP Specification 114-1015. The printed circuit board described in Figure 6 shall be used in those tests which require mating of the connector.

###### B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 4.

###### 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.

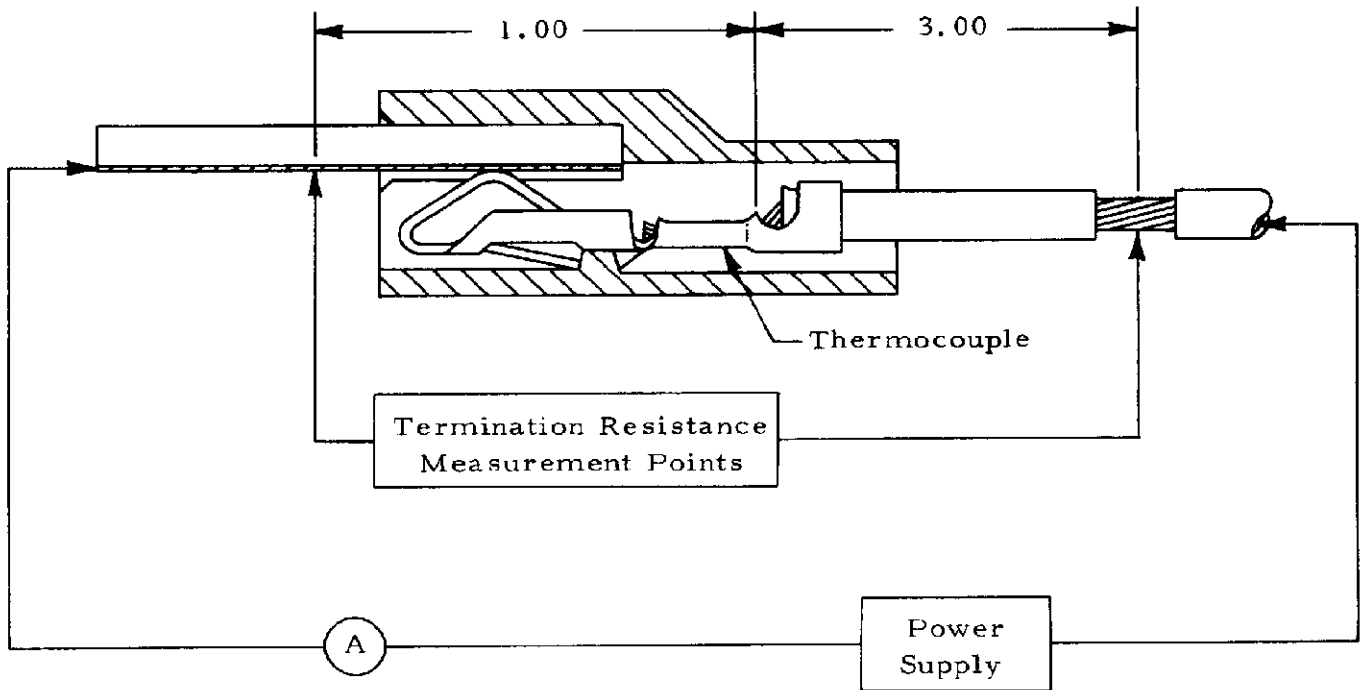
##### 4.2. Quality Conformance Inspection

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

##### 4.3. Certification


This product has been certified under Underwriters' Laboratories Inc., Electrical File Number E-28476 and Canadian Standards Association Certification Number LR-16455.

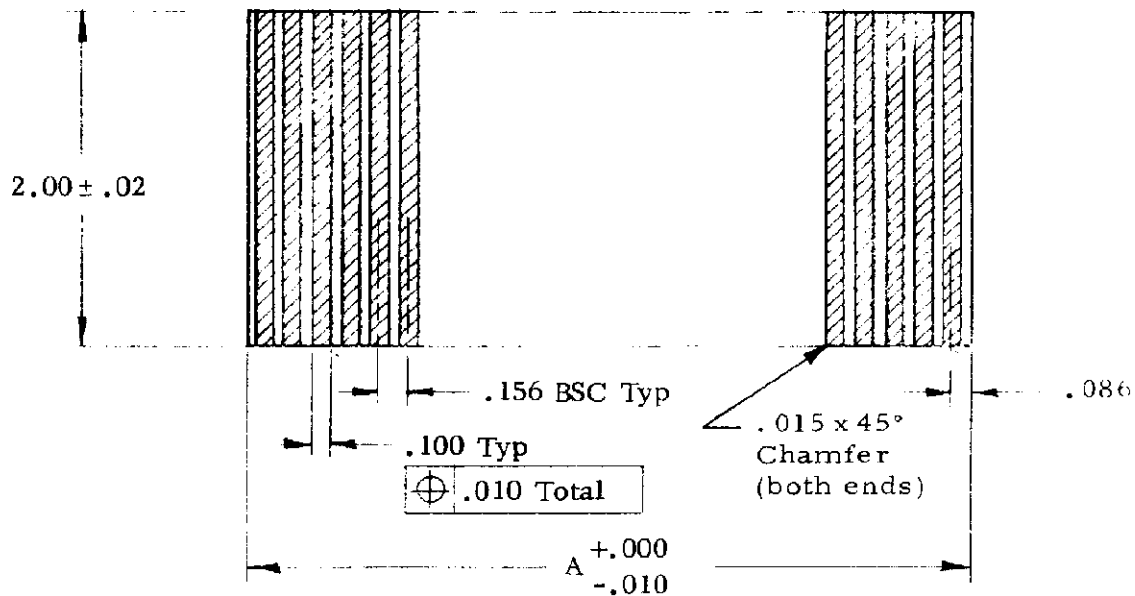
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- Notes:
1. A 1 foot minimum length of continuous lead for heat dissipation.
  2. Termination resistance equals millivolts divided by test current less resistance of 3 inches of wire and resistance of .90 inch of printed circuit board pad.

Figure 5  
Temperature and Resistance Measurement Points

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Notes:

1. Dimensions are in inches.
2. Unless otherwise specified, tolerance is  $\pm .005$ .
3. Number of contacts shall be the same as on the corresponding printed wiring connector.
4. Printed circuit test board, type G10 or equivalent, shall be 3 oz copper with .000200 minimum tin electrodeposited plating, overall thickness  $.062 \begin{matrix} +.008 \\ -.007 \end{matrix}$
5. Dimension "B" is connector slot width.
6. Dimension "C" is connector overall width.

Number of Circuits	A	B Ref (See Note 5)	C Ref (See Note 6)
2	.333	.344	.500
3	.489	.500	.656
4	.645	.656	.812
5	.802	.813	.969
6	.958	.969	1.125
7	1.114	1.125	1.281
8	1.270	1.281	1.437
9	1.427	1.438	1.594
10	1.583	1.594	1.750
11	1.739	1.750	1.906
12	1.895	1.906	2.062
13	2.052	2.063	2.219
14	2.208	2.219	2.375
15	2.364	2.375	2.531
16	2.520	2.531	2.687
17	2.677	2.688	2.844
18	2.833	2.844	3.000
19	2.989	3.000	3.156
20	3.145	3.156	3.312
21	3.302	3.313	3.469
22	3.458	3.469	3.625
23	3.614	3.625	3.781
24	3.770	3.781	3.937

Figure 6

Printed Circuit Board

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