

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMPLIMITE* HD-20 printed circuit board surface mounted front metal shell connector.

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. 114-25034: Application Specification
- E. 114-40039: Application Specification
- F. 501-239: Test Report

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

- A. Contact: Copper alloy
- B. Housing: Polyester or nylon, black, UL94V-0
- C. Shell: Steel, tin plated

* Trademark

Product Code: 0616, 0617, 1126, 7775, 7776

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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>Burdett Beckler 4/6/94</i>	AMP AMP Incorporated Harrisburg, PA 17105-3808		
				CHG <i>Robert L. ... 12/21/94</i>			
				APP <i>David M. ... 11 Jan 94</i>	NO 108-1222	REV 0	LOC B
0	Release per EC 0020-004-94	<i>BB</i>	<i>1/21/94</i>	PAGE 1 OF 8	TITLE CONNECTOR, AMPLIMITE HD-20, SURFACE MOUNT		
LTR	REVISION RECORD	APP	DATE				

3.3. Ratings

- A. Voltage: 125 vac (rms) or dc per CSA; 250 vac (rms) or dc per UL
- B. Current: See Figure 2A and 2B for applicable current carrying capability

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 114-25034 and 114-40039.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance, dry circuit.	15 milliohms maximum initial. 20 milliohms maximum final.	Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma maximum. See Figure 4. AMP Spec 109-6-1.
Dielectric withstanding voltage.	1 kvac dielectric withstanding voltage. 1 minute hold. 1 milliampere maximum leakage current.	Test between adjacent contacts and between contact and metal shell of unmated connector assemblies. AMP Spec 109-29-1.
Insulation resistance.	5000 megohms minimum initial. 100 megohms minimum final.	Test between adjacent contacts of unmated connector assemblies. AMP Spec 109-28-4.
Temperature rise vs current.	30°C maximum temperature rise at specified current.	Measure temperature rise vs current. See Figures 2A and 2B. AMP Spec 109-45-1.
MECHANICAL		
Vibration, random.	No discontinuities greater than 1 microsecond. See Note (a).	Subject mated connectors to 23 G's rms with 100 ma current applied. See Figure 5. AMP Spec 109-21-5.

Figure 1 (cont)

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Test Description	Requirement	Procedure															
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.	.5 pound maximum initial per contact for connectors without ground indents. Connectors with ground indents as follows: <table border="1"> <thead> <tr> <th>Size</th> <th>Number Positions</th> <th>Lbs Force (Maximum)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>9</td> <td>30</td> </tr> <tr> <td>2</td> <td>15</td> <td>33</td> </tr> <tr> <td>3</td> <td>25</td> <td>37</td> </tr> <tr> <td>4</td> <td>37</td> <td>40</td> </tr> </tbody> </table>	Size	Number Positions	Lbs Force (Maximum)	1	9	30	2	15	33	3	25	37	4	37	40	Measure force necessary to mate connector assemblies until bottomed using free floating fixtures at rate of 1 inch per minute. Calculate force per contact for connectors without ground indents. AMP Spec 109-42, Condition A.
Size	Number Positions	Lbs Force (Maximum)															
1	9	30															
2	15	33															
3	25	37															
4	37	40															
Unmating force.	.5 pound maximum initial per contact for connectors without ground indents. Connectors with ground indents as follows: <table border="1"> <thead> <tr> <th>Size</th> <th>Number Positions</th> <th>Lbs Force (Maximum)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>9</td> <td>30</td> </tr> <tr> <td>2</td> <td>15</td> <td>33</td> </tr> <tr> <td>3</td> <td>25</td> <td>37</td> </tr> <tr> <td>4</td> <td>37</td> <td>40</td> </tr> </tbody> </table>	Size	Number Positions	Lbs Force (Maximum)	1	9	30	2	15	33	3	25	37	4	37	40	Measure force necessary to unmate connector assemblies with locking latches removed at rate of 1 inch per minute. Calculate force per contact for connectors without ground indents. AMP Spec 109-42, Condition A.
Size	Number Positions	Lbs Force (Maximum)															
1	9	30															
2	15	33															
3	25	37															
4	37	40															
Durability.	See Note (a).	Mate and unmate connector assemblies for 100 cycles for gold flash and 500 cycles for 30 μ in gold plating at maximum rate of 200 cycles per hour. AMP Spec 109-27.															
Solderability.	Solderable area shall have minimum of 95% solder coverage.	Subject contacts to solderability. AMP Spec 109-11-2.															

Figure 1 (cont)

Test Description	Requirement	Procedure
ENVIRONMENTAL		
Thermal shock.	See Note (a).	Subject mated connectors to 100 cycles between -55 and 105°C. AMP Spec 109-22.
Humidity-temperature cycling.	100 megohms final insulation resistance within 5 hours after cycling.	Subject mated connectors to 10 humidity-temperature cycles between 25 and 65°C at 95% RH. AMP Spec 109-23-4, 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 1000 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)

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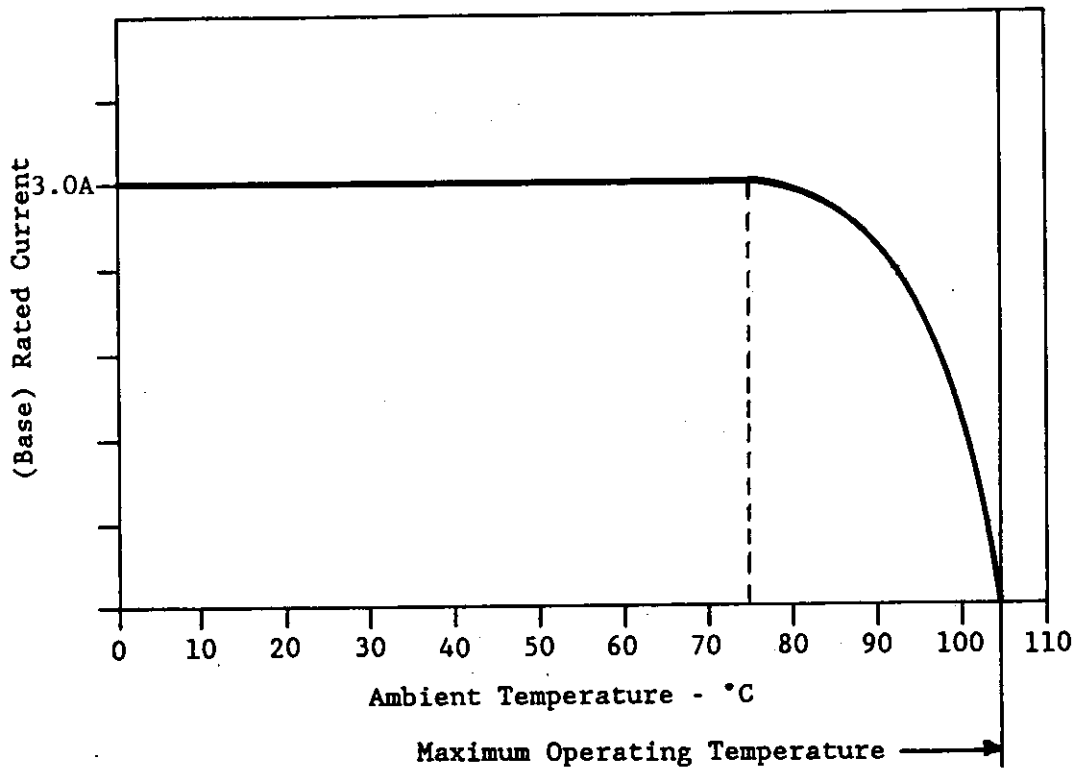


Figure 2A
Current Carrying Capability

Contact Loading	28 AWG
Single Contact	1.0
52% 13/25	.625
100% 25/25	.454

Note: To determine acceptable current carrying capacity for percentage connector loading and wire gage indicated, 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(b,d)	3	4	5
	Test Sequence (b)				
Examination of product	1,9	1,10	1,8	1,3	1,5
Termination resistance, dry circuit	3,7	2,8			
Dielectric withstanding voltage			3,7		
Insulation resistance			2,6		
Temperature rise vs current		3,9			
Vibration	5	7			
Physical shock	6				
Mating force	2				2
Unmating force	8				4
Durability	4	4			3
Solderability				2	
Thermal shock			4		
Humidity-temperature cycling			5		
Mixed flowing gas		5			
Temperature life		6			

- (a) See Para 4.1.A.
- (b) Discontinuities shall not be measured for this test group.
- (c) Numbers indicate sequence in which tests are performed.
- (d) 30 microinch gold plating for this test group.

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 10 connector pairs mated with cable mounted AMPLIMITE connectors with cable clamps. 5 pairs shall contain gold flash and 5 pairs shall contain 30 microinch gold plated contacts. Plug connectors shall not have grounding indents.

Test group 2 shall consist of 3 mated connector pairs consisting of surface mounted AMPLIMITE connectors mated with cable mounted AMPLIMITE connectors with cable clamps. All connector pairs shall contain 30 microinch gold plated contacts.

Test group 3 shall consist of 5 surface mounted AMPLIMITE connectors containing 30 microinch gold plated contacts. Connectors shall not be mounted on printed circuit boards. No wires are required, but contacts shall be crimped.

Test group 4 shall consist of 5 surface mounted AMPLIMITE connectors without printed circuit boards.

Test group 5 shall consist of 20 mated connector pairs consisting of board mounted AMPLIMITE connectors mated with cable mounted AMPLIMITE connectors with cable clamps. The 20 pairs shall consist of 5 pairs each of 9, 15, 25 and 37 position connectors. Plug connectors shall have grounded indents. Mating pins shall be loaded and crimped with 2, 12 inch standard PVC 26 AWG wires.

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.

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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.

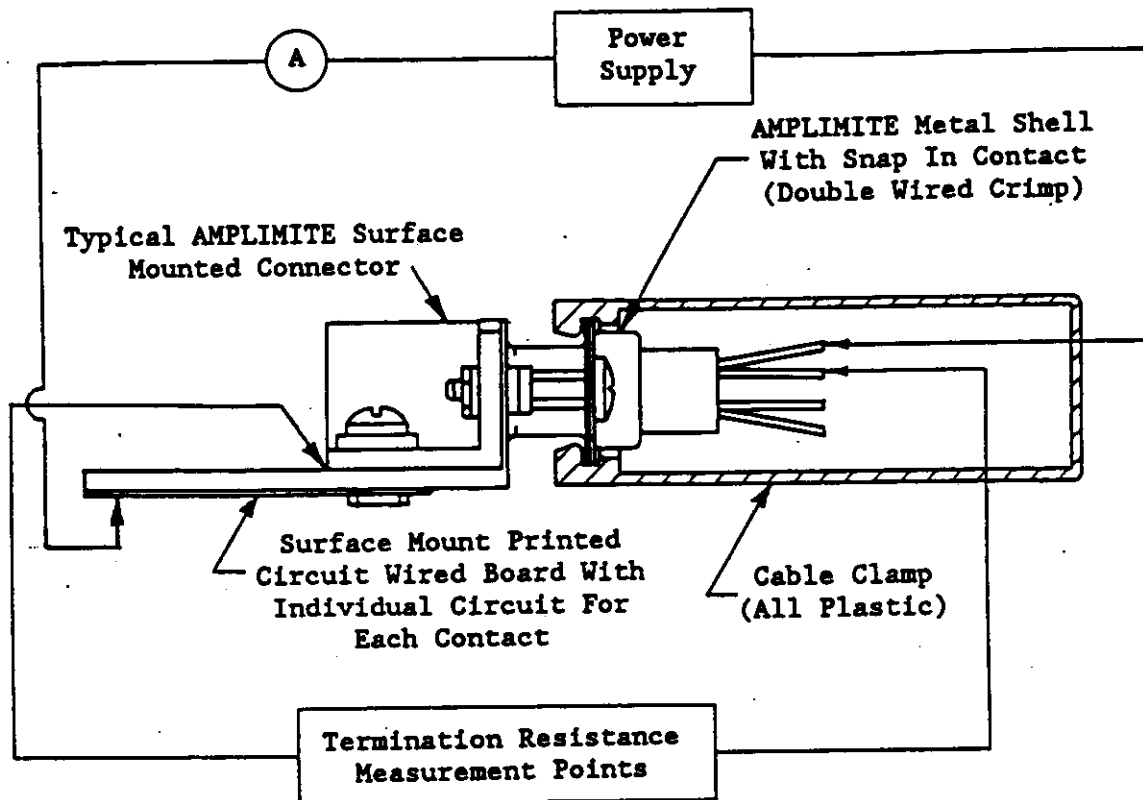


Figure 4
Resistance & Temperature Measurement Points

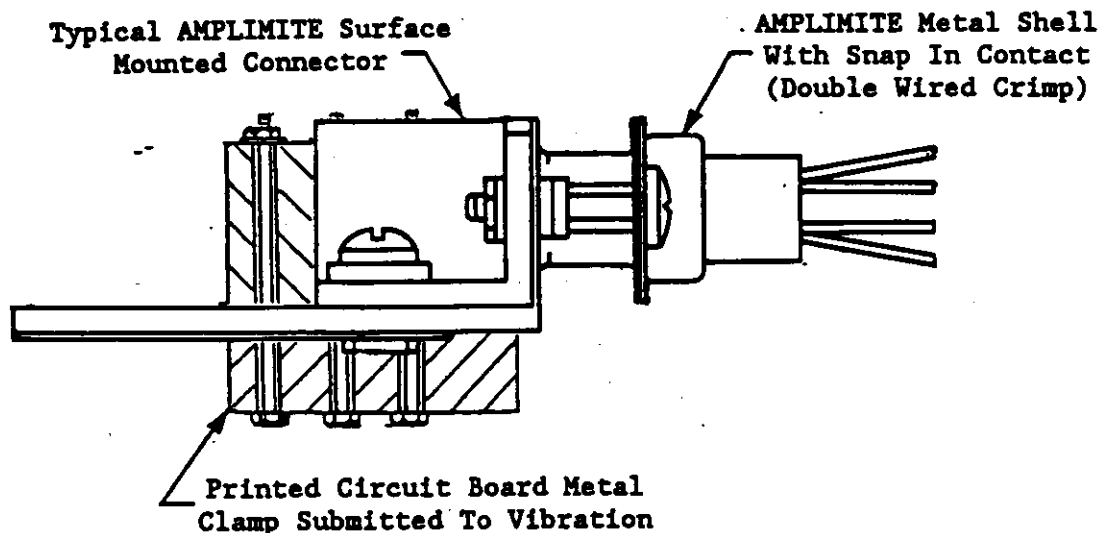


Figure 5
Mounting & Clamping Locations For Vibration & Physical Shock