PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the AMPLIMITE* Standard Profile (180° Cable Exit) HDF Subminiature D connector with nonremovable insulation displacement contacts for .050 center line, #28 AWG stranded round conductor flat ribbon cable.

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 Specification as indicated in Figure 1. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
C. 501-142: Test Report

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

A. Contacts: Phosphor Bronze
B. Housing: Thermoplastic, black, UL 94V-0
C. Shell: Steel

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Product Code:4923,4984,4992

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0	Release per ECN BD4883	LR	4/2 91	PAGE 1 OF 7	TITLE CONNECTOR, AMPLIMITE, HDF, STANDARD PROFILE		
LTR	REVISION RECORD	APP	DATE				

3.3. Ratings

A. Current: 1.0 ampere maximum
B. Voltage:

(1) Rated to 250 volts ac rms or dc per Underwriters Laboratories
(2) Rated to 30 volts ac rms or dc per C.S.A.

C. Temperature: -55° to 105°C

3.4. Performance and Test Description

Connectors and contacts 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.
ELECTRICAL		
Termination Resistance, Dry Circuit (Low Level)	35 milliohms maximum.	Subject mated connectors to 50 mv open circuit at 100 ma maximum, see Figure 4; AMP Spec 109-6-1.
Dielectric Withstanding Voltage	500 vac (rms) dielectric withstanding voltage, one minute hold; 1 ma maximum leakage current; no breakdown or flashover.	Test between adjacent contacts within a row and contacts terminated to adjacent conductors and contacts to mounting hardware of unmated connectors; AMP Spec 109-29-1.
Insulation Resistance	5000 megohms minimum initial; 1000 megohms final.	Test between adjacent contacts of unmated connector assembly; AMP Spec 109-28-4.
MECHANICAL		
Vibration Sinusoidal	No discontinuities greater than 1 microsecond. See note (a).	Subject wired and mated connectors with hardware to 10 G's between 10-500 Hz traversed in 15 minutes; 3 hours in each of 3 mutually perpendicular planes, see Figure 5; AMP Spec 109-21-2.

Figure 1 (cont)

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 at 11 milliseconds duration; 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks; AMP Spec 109-26-1.
Connector Mating Force	Number of Positions / Force, pounds With Grd Ind maximum / Without Grd Ind maximum: 9 — 30 — 4.5; 15 — 33 — 7.5; 25 — 37 — 12.5; 37 — 40 — 18.5	Measure force necessary to mate connector assembly incorporating free floating fixtures at a rate of 1 inch/minute; AMP Spec 109-42, cond A.
Connector Unmating Force	Number of Positions / Force, pounds With Grd Ind minimum / Without Grd Ind maximum: 9 — 0.5 — 30; 15 — 1.0 — 33; 25 — 1.5 — 37; 37 — 2.0 — 40	Measure force necessary to unmate connector assembly at a rate of 1 inch/minute; AMP Spec 109-42, cond A.
Durability	Mating-unmating forces; termination resistance dry circuit. 35 milliohms maximum.	Mate and unmated connector assemblies for 500 cycles at a rate of 200 cycles/hour; AMP Spec 109-27.
ENVIRONMENTAL		
Thermal Shock	35 milliohms maximum termination resistance, dry circuit; 500 volts dielectric withstanding voltage.	Subject unmated connectors to 5 cycles between -55° and 105°C; AMP Spec 109-22.
Humidity-Temperature Cycling	1000 megohms final insulation resistance; 500 volts dielectric withstanding voltage; 35 milliohms maximum termination resistance, dry circuit.	Subject mated connectors to 10 humidity-temperature cycles between 25° and 65°C at 95% RH; AMP Spec 109-23, method III, cond B, less step 7b. Measurement shall be made within 5 hours of removal from chamber.

(a) Shall remain mated and show no evidence of damage, cracking or chipping, and meet requirements of subsequent testing.

Figure 1 (end)

3.6. Product Qualification and Requalification Tests

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (c)			
Examination of Product	1,9	1,6	1,8	1,6
Termination Resistance, Dry Circuit	3,7	2,5		
Dielectric Withstanding Voltage			3,7	
Insulation Resistance			2,6	
Vibration	5			
Physical Shock	6			
Mating Force	2			2
Unmating Force	8			3,5
Durability	4	3		4
Thermal Shock (per Product Spec)			4	
Humidity-Temperature Cycling		4	5	

(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

Connector assemblies shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production per Figure 3. Termination shall be made to #28 AWG AMP ribbon cable base part number 499116. Hardware, where indicated, shall be female screwlock kit 205817-1 and screw retainer kit 205980-1.

Group	Qty	Recp	Plug	Size	Shell	Indts	Hardware
1	5	206770-1	206771-1	3	ZN	W/O	Yes
2	5	745359-1	745368-1	1	SN	W/	Yes
3	5	745359-1	745368-1	1	SN	W/	Yes
	5	745359-1	745368-1	1	SN	W/	No
	5	745361-1	745370-1	2	SN	W/	No
	5	745363-1	745372-1	3	SN	W/	No
4	5	745367-1	745376-1	4	SN	W/	No
	5	207750-1	207749-1	1	ZN	W/O	No
	5	207331-1	207330-1	2	ZN	W/O	No
	5	206655-1	206650-1	4	ZN	W/O	No

ZN = Zinc
SN = Tin

Figure 3

B. Test Sequence

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

C. Acceptance

(1) Test results from development on prequalification samples will be used to determine upper and lower one-sided statistical tolerance limits for 99% reliability at 95% confidence, as follows. Let X bar and s denote the sample average and standard deviation, respectively, of the test data. Let k denote the normal distribution one-sided tolerance factor for 95% confidence and 99% reliability. The value of k varies with sample size. Values of k are given in various tables, for example, NBS Handbook 91, Factors for One-Sided Tolerance Limits for Normal Distribution. Suitability of the normal distribution for representing the data shall be verified with normal probability plots, goodness of fit tests, etc.

Then the upper one-sided tolerance limit for 99% reliability at 95% confidence is given by X bar + ks. The interpretation of this tolerance limit is as follows: based on the test data, and assuming a normal distribution for the test data, we can be 95% confident that 99% of the population of values represented by the sample data will not exceed X bar + ks. For any test parameter for which there is specified an upper requirement which is not to be exceeded, satisfactory performance of the product is achieved when the value of X bar + ks does not exceed the requirement value.

The lower one-sided tolerance limit for 95% confidence and 99% reliability is given by X bar - ks. This has a similar interpretation and corresponding application to lower requirement values.

(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.

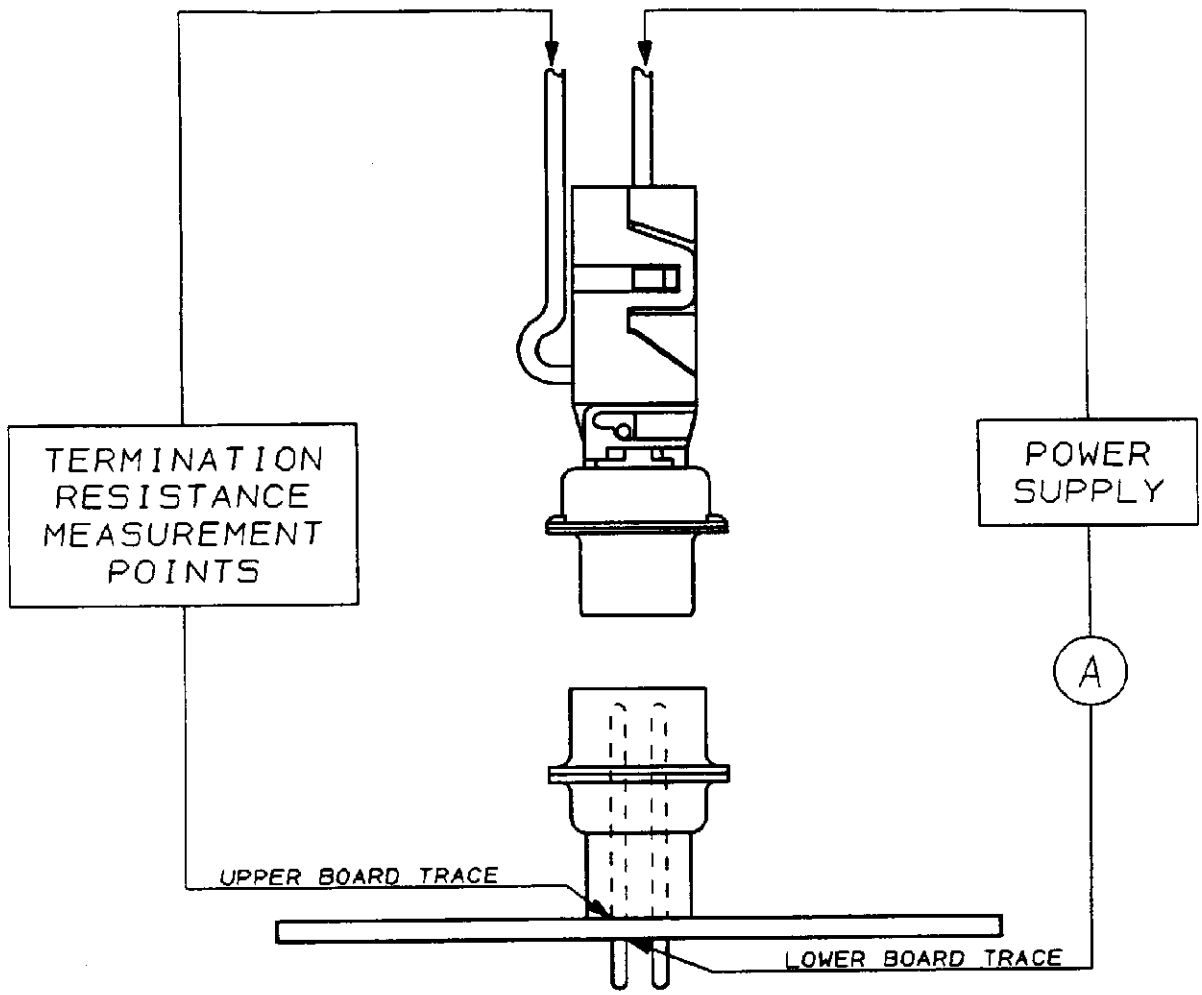

Figure 4
Termination Resistance Measurement Points

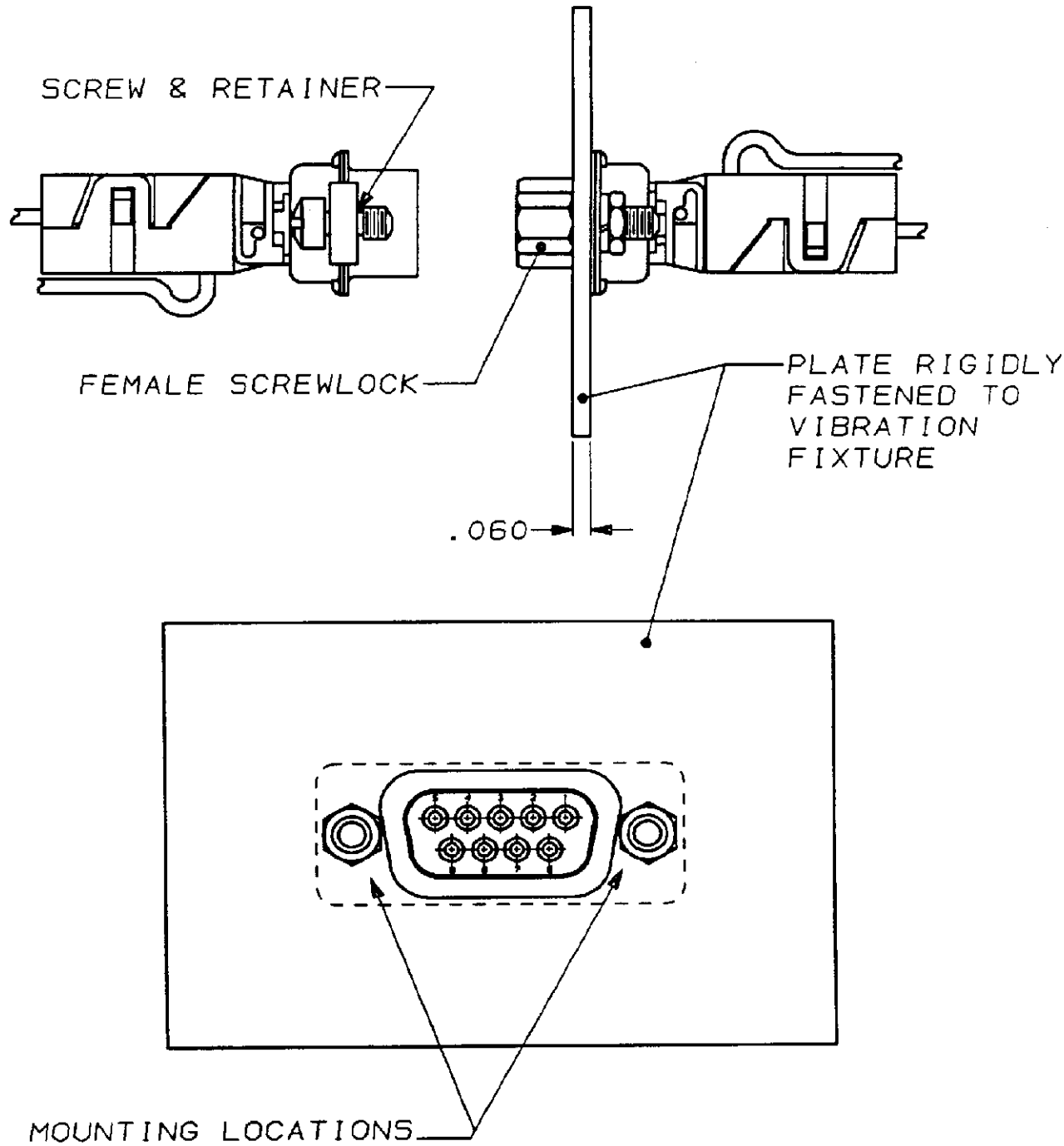

Figure 5
Mounting Diagram for Vibration and Physical Shock