Cable, Ribbon, Polyvinyl Chloride Insulated

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMP* polyvinyl chloride insulated ribbon cable.

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. 501-35 Rev C: 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. Ratings

A. Voltage:
(1) 300 volts maximum .050 and .100 inch centerline
(2) 150 volts maximum .025 inch centerline
B. Current: Signal application only
C. Temperature: -20 to 105°C

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.	Visual, dimensional and functional per applicable quality inspection plan.
	ELECTRICAL	
Dielectric withstanding voltage.	2000 vrms minimum for 1 minute.	AMP Spec 109-29-1. Subject samples to test voltage and hold for 1 minute.
	MECHANICAL	
Bend, heat aged.	See Note (a).	AMP Spec 109-40000-1. Subject cable to 7 day heat age at 105°C. Then bend test sample around .062 inch diameter mandrel at room temperature.
Fold, heat aged.	See Note (a).	AMP Spec 109-40000-3. Subject cable to 7 day heat age at 105°C. Then manually fold test sample back on itself at room temperature.
Flexing, unloaded.	Conductors shall maintain continuity. See Note (a).	AMP Spec 109-40000-4. Flex samples for 100 cycles.
Resistance to soldering heat.	No shrinkage of insulation greater than .035 inch at either end of cable. See Note (a).	AMP Spec 109-63-2. Subject 1/16 inch of striped cable to solder bath at 260°C for 10 seconds.
	ENVIRONMENTAL	
Thermal shock.	See Note (a).	AMP Spec 109-22. Subject 36 inch length of cable to 5 cycles between -20 and 105°C.
	SIGNAL TRANSMISSION	
Characteristic impedance.	25 mil cable: 80 ± 5 ohms 50 mil cable: 105 ± 5 ohms 100 mil cable: 140 ± 5 ohms	AMP Spec 109-169-1. Samples wired G-S-G-S-G pattern.
Propagation delay.	25 mil cable: 1.51 ± .02 ns/ft 50 mil cable: 1.44 ± .02 ns/ft 100 mil cable: 1.32 ± .02 ns/ft	AMP Spec 109-168. Samples wired G-S-G-S-G pattern.
Near end (backward) crosstalk.	<4% when tested with 2 and 5 ns risetime.	AMP Spec 109-163. Samples wired G-S-G-S-G pattern.
Far end (forward) crosstalk.	<12% when tested with 2 ns risetime. <6% when tested with 5 ns risetime.	AMP Spec 109-163. Samples wired G-S-G-S-G pattern.

Figure 1 (cont)

Test Description	Requirement	Procedure
Capacitance.	25 mil cable: <20 pF/ft. 50 mil cable: <15 pF/ft. 100 mil cable: <10 pF/ft.	AMP Spec 109-47, Condition E. Samples wired G-S-G-S-G pattern.

NOTE (a) Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 2.

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Examination of product	1	1,4	1,4	1,4	1,4	1,3
Dielectric withstanding voltage		3	3	3	3	
Bend, heat aged			2			
Fold, heat aged				2		
Flexing, unloaded		2				
Resistance to soldering heat						2
Thermal shock					2	
Characteristic impedance	2					
Propagation delay	3					
Backward crosstalk	4					
Forward crosstalk	5					
Capacitance	6					

NOTE (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

All cable samples shall be cut from same reel of cable to ensure consistency of dielectric properties, conductor size, and conductor spacing between separate samples. Test group 1 shall consist of 5 samples 9 feet in length and 1 sample 1.5 feet in length. Test group 2 shall consist of 5 samples 1 foot in length. Test groups 3 and 4 shall each consist of 5 samples 6 inches in length. Test group 5 shall consist of 5 samples 3 feet in length. Test group 6 shall consist of 5 samples 6 inches in length.

B. Test Sequence

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

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.

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.