Shielded Cable Clamp Assemblies

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Qualification Test Report
AMP Shielded Cable Clamp Assemblies
Pin Part Numbers: 745496-2 & 207464-2
Shell Part Numbers: 745173-1, 745833-1

1. Introduction

1.1 Purpose

Testing was performed on the AMP Shielded Cable Clamp Assemblies to determine if it meets the requirements of AMP Specification 108-40032, Rev. 0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the AMP Shielded Cable Clamp Assemblies made by the Interconnection Components Division of the Interconnection & Component Products Group. Testing was performed between August 21, 1987 and August 31, 1988.

1.3 Conclusion

The AMP Shielded Cable Clamp Assemblies meet the electrical, mechanical, and environmental performance requirements of Product Specification 108-40032, Rev. 0.

1.4 Product Description

The AMP Shielded Cable Clamp Assembly and accessories are used with HDP-20 or HDE-20 connectors. The shielded cable clamps are available in thermoplastic, either fully or selectively plated, or zinc die cast, fully plated.

1.5 Test Samples

All test connectors were selected at random from current production. All test groups consisted of a minimum of six double ended cable assemblies with appropriate shielding hardware. The cable used was a single shielded jacketed cable with enough conductors that a minimum of 75% of the contacts in the connector were terminated.

Test Group	Quantity	Part Number	Description
1-3	N/A	745496-2	HDE Pin
"	N/A	207464-2	HDP Pin
"	2	745173-1	Zinc Die Cast Shell
"	2	745833-1	Plated Plastic Shell

1.6 Qualification Test Sequence

Test or Examination	Test Groups 1	2	3
	Test Sequence (a)		
Examination of Product	1	1	1
Dielectric Withstanding Voltage	3,8		3,9
Insulation Resistance	2,7		2,8
Shielding Effectiveness	4,9	2,4	4,10
Vibration			5
Physical Shock			6
Cable Pullout	5		
Thermal Shock			7
Circular Jacket Cable Flexing	6		
Industrial Mixed Flowing Gas		3	

(a) Numbers indicate sequence in which tests were performed.

2. Summary of Testing

2.1 Examination of Product - Groups 1, 2, 3

All samples submitted for testing were selected from normal production lots. They were inspected and accepted by the Product Assurance Department of the Interconnection & Component Products Group.

2.2 Insulation Resistance - Groups 1 & 3

All insulation resistance measurements were greater than the 5 X 10^3 megohm minimum initial requirement. All measurements were greater than the 5 X 10^3 megohm minimum final requirement after circular jacket cable flexing and thermal shock testing. Following are the minimum initial and final readings measured in each test group.

Group 1	Initial. Min. IR (megohms)	Final Min. IR (megohms)
	3.6 X 10^4	3.8 X 10^4

Group 3	Initial. Min. IR (megohms)	Final Min. IR (megohms)
	7.0 X 10^4	1.5 X 10^5

2.3 Dielectric Withstanding Voltage - Groups 1 & 3

There was no dielectric breakdown or flashover when the 1.0 kvac test voltage was applied between all adjacent contacts and the contacts and the shields of mated connector assemblies.

2.4 Shielding Effectiveness - Groups 1, 2, 3

All samples met the shielding effectiveness requirements of 40 db minimum at 30-216 MHz and 20 db minimum at 216-1,000 MHz.

Group 1 - Initial		Group 1 - Final	
30-216 MHz (db)	216-1,000 MHz (db)	30-216 MHz (db)	216-1,000 MHz (db)
47 (Min.)	28 (Min.)	45 (Min.)	28 (Min.)
57 (Max.)	49 (Max.)	49 (Max.)	39 (Max.)
51 (Avg.)	39 (Avg.)	46 (Avg.)	36 (Avg.)

Group 2 - Initial		Group 2 - Final	
30-216 MHz (db)	216-1,000 MHz (db)	30-216 MHz (db)	216-1,000 MHz (db)
44 (Min.)	32 (Min.)	46 (Min.)	30 (Min.)
56 (Max.)	48 (Max.)	57 (Max.)	46 (Max.)
51 (Avg.)	41 (Avg.)	52 (Avg.)	38 (Avg.)

Group 3 - Initial		Group 3 - Final	
30-216 MHz (db)	216-1,000 MHz (db)	30-216 MHz (db)	216-1,000 MHz (db)
47 (Min.)	34 (Min.)	39 (Min.)	24 (Min.)
58 (Max.)	49 (Max.)	47 (Max.)	40 (Max.)
52 (Avg.)	41 (Avg.)	45 (Avg.)	33 (Avg.)

2.5 Cable Pullout - Group 1

During cable pullout testing, there were no electrical discontinuities of the contacts greater than 1.0 microsecond and no physical damage occurred.

2.6 Circular Jacket Cable Flexing - Group 1

During circular jacket flex testing, there were no electrical discontinuities of the contacts greater than 1.0 microsecond and no physical damage occurred.

2.7 Industrial Mixed Flowing Gas - Group 2

After Industrial Mixed Flowing Gas testing, there was no evidence of physical damage. The connectors were subjected to shielding effectiveness testing initially and after gas exposure.

2.8 Vibration - Group 3

During vibration testing, there were no discontinuities of the contacts greater than one microsecond. Following vibration, there were no cracks, breaks or loose parts on the connector assemblies.

2.9 Physical Shock - Group 3

During physical shock testing, there were no discontinuities of the contacts greater than one microsecond. Following physical shock testing, there were no cracks, breaks or loose parts on the connector assemblies.

2.10 Thermal Shock - Group 3

During and after thermal shock the connectors remained mated, and there was no evidence of physical damage, cracking or chipping.

3. Test Methods

3.1 Examination of Product

The product drawings and inspection plans were used to examine the samples. They were examined visually, dimensionally and functionally.

3.2 Insulation Resistance

Insulation resistance was measured between all adjacent contacts, and the contacts and the shields of the mated connector assemblies. A voltage of 500 VDC was applied for 2 minutes, and the insulation resistance was measured. The requirement was 5,000 megohms minimum.

3.3 Dielectric Withstanding Voltage

A test potential of 1,000 VAC rms was applied between all adjacent contacts and all contacts and shields of the mated connector assemblies for a duration of 1 minute. Leakage current detection was set at 1.0 milliampere maximum.

3.4 Shielding Effectiveness

The shielding effectiveness of single braid cable double ended with AMP Shielded Cable Assemblies was measured in accordance with AMP 109-90. Emission attenuation was measured at 30-216 MHz and at 216-1,000 MHz with requirements of 40 and 20 db respectively.

3.5 Cable Pullout

Connector assemblies were subjected to cable pullout testing in accordance with AMP 109-46, condition A. A 50.0 pound weight was gradually applied between the cable ends of each mated connector pair. With the cable free to move, the force was applied for a duration of 1 hour, during which the cable outer shields were monitored for electrical discontinuities, using a current of 100 milliamperes.

3.6 Circular Jacket Cable Flexing

All twelve cable assemblies were subjected to 100 cycles of cable flexing at a rate of 12 to 14 cycles per minute in accordance with AMP 109-20. Cable assemblies were placed in a fixture which allowed the assemblies to be flexed in a plane, thru 180° of arc, alternately from a position of 90° from the vertical on one side to a position 90° from the vertical on the other side. See figure 1. Assemblies were monitored for discontinuities greater than 1.0 microsecond.

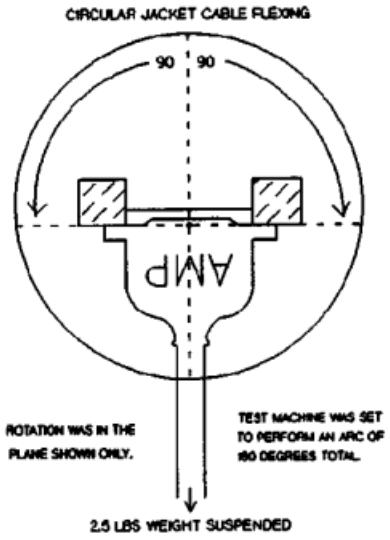

Figure 1

3.7 Industrial Mixed Flowing Gas, Class III

Mated connectors were exposed for 10 days in the industrial mixed flowing gas chamber. Class III exposure is defined as a temperature of 30°C and a relative humidity of 75%. Pollutants are Cl_2 at 20 ppb, NO_2 at 200 ppb and H_2S at 100 ppb.

3.8 Vibration

Mated connectors were subjected to vibration having a simple harmonic motion. The amplitude was 0.06 inch, double amplitude (maximum total excursion). The vibration frequency was varied between the limits of 10 and 55 Hz and returned to 10 Hz in 1 minute. This motion was applied for a period of 2 hours in each of three mutually perpendicular axes, for a total of test time of 6 hours. Connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamps in the monitoring circuit.

3.9 Physical Shock

Mated connectors were subjected to a physical shock having a sawtooth waveform of 100 gravity units and a duration of 6 milliseconds. Three shocks in each direction were applied along the three mutually perpendicular planes for a total of 18 shocks. The connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamps in the monitoring circuit.

3.10 Thermal Shock

Mated connectors were subjected to five cycles of thermal shock. The temperature extremes were -55°C to 105°C for zinc die cast samples and -55°C to 85°C for plated plastic samples. Each cycle consisted of 30 minutes at each temperature extreme. The transition time between temperatures was less than two minutes.

4. Validation

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