
Connector Block, 110XC Cross Connect

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMP* 110XC style cross connecting blocks. Wire is laced into a lacing strip which holds the wire in place. The connecting block is then punched down onto the wires where the IDC slots of the block strip the wire at the interface. Wires are then terminated in the IDC slots on top of the connecting block to complete the gas tight connection.

1.2. Qualification

When tests are performed on subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed in Apr98. The test file numbers for this testing is CTL 2238-004-002, ACL 22380006 and ACL 22380005. This documentation is on file at and available from the Americas Regional Laboratory.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. 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 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 Government or Commercial Documents
- D. 408-3327: Instruction Sheet
- E. 501-432: Qualification Test Report

2.2. Commercial Specification

TIA/EIA 568-A Annex A and B

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

- A. Housing: Polycarbonate, UL94V-0
- B. Terminal: Phosphor bronze, bright tin-lead over nickel plating

3.3. Ratings

- A. Voltage: 150 vac
- B. Current: Signal application only, 1.5 amperes maximum
- C. Temperature: -40 to 70°C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per AMP Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and AMP Instruction Sheet 408-3327.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance.	1 milliohm maximum initial for each of the 2 interfaces, or 2 milliohms combined. ΔR 5 milliohms maximum per interface, or ΔR 10 milliohms combined.	AMP 109-6-6. Subject terminated samples to 20 mv maximum open circuit at 100 ma maximum. See Figure 4.
Insulation resistance.	100 megohms minimum.	AMP Spec 109-28-3. Test between adjacent contacts of terminated samples.
Dielectric withstanding voltage.	1500 vac at sea level. 1 minute hold with no breakdown or flashover.	AMP Spec 109-29-1. Test between adjacent contacts of terminated samples.
Attenuation.	See Figure 5.	AMP Spec 109-174. Test in balanced mode using matching baluns.
Near end crosstalk.	See Figure 5.	AMP Spec 109-179. Test in balanced mode using matching baluns.
Return loss.	See Figure 5.	AMP Spec 109-181. Test in balanced mode using matching baluns.

Figure 1 (cont)

Test Description	Requirement	Procedure												
MECHANICAL														
Termination tensile strength, unmated horizontal, top and bottom.	<table border="1"> <thead> <tr> <th>Wire Size AWG</th> <th>Slot Tensile Pounds Minimum</th> </tr> </thead> <tbody> <tr> <td>22</td> <td>8.0</td> </tr> <tr> <td>24</td> <td>8.0</td> </tr> <tr> <td colspan="2" style="text-align: center;">Bottom</td> </tr> <tr> <td>22</td> <td>7.0</td> </tr> <tr> <td>24</td> <td>7.0</td> </tr> </tbody> </table>	Wire Size AWG	Slot Tensile Pounds Minimum	22	8.0	24	8.0	Bottom		22	7.0	24	7.0	AMP Spec 109-16. Determine slot tensile at a maximum rate of 1 inch per minute. Pull parallel to terminated wire. See Figure 6.
Wire Size AWG	Slot Tensile Pounds Minimum													
22	8.0													
24	8.0													
Bottom														
22	7.0													
24	7.0													
Termination tensile strength, unmated vertical, top only.	<table border="1"> <thead> <tr> <th>Wire Size AWG</th> <th>Slot Tensile Pounds Minimum</th> </tr> </thead> <tbody> <tr> <td>22</td> <td>1.5</td> </tr> <tr> <td>24</td> <td>1.5</td> </tr> </tbody> </table>	Wire Size AWG	Slot Tensile Pounds Minimum	22	1.5	24	1.5	AMP Spec 109-16. Determine slot tensile at a maximum rate of 1 inch per minute. Pull perpendicular to terminated wire. See Figure 6.						
Wire Size AWG	Slot Tensile Pounds Minimum													
22	1.5													
24	1.5													
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-21-1. Subject terminated samples to 10-55-10 Hz traversed in 1 minute. 2 hours in each of 3 mutually perpendicular planes. See Figure 7.												
Durability.	See Note.	AMP Spec 109-27. Terminate and reterminate contact for 200 cycles with 24 AWG solid conductor wire using tool PN 569994-1 and blade PN 569995-1.												
ENVIRONMENTAL														
Thermal shock.	See Note.	AMP Spec 109-22. Subject terminated samples to 100 cycles between -40 and 70°C with 30 minutes at each extreme.												
Humidity-temperature cycling.	See Note.	AMP Spec 109-23-4, Condition C. Subject terminated samples to 21, 24 hour cycles between 25 and 65°C at 95% RH with -10°C cold shock.												
Temperature life.	See Note.	AMP Spec 109-43. Subject terminated samples to temperature life at 70°C for 500 hours.												

NOTE

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	1,8	1,7	1,5	1,5	1,4	1,5
Termination resistance		2,6	2,4	2,4		
Insulation resistance	2,6					
Dielectric withstanding voltage	3,7					
Attenuation						2
Near end crosstalk						4
Return loss						3
Termination tensile strength, horizontal & vertical					3	
Vibration				3		
Durability		3(c)				
Thermal shock	4	4			2	
Humidity-temperature cycling	5	5				
Temperature life			3			

NOTE

- (a) See Para 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Perform 100 cycles before thermal shock, 33 cycles after 50 cycles of thermal shock, 33 cycles after 7 days of humidity-temperature cycling, and 34 cycles after 21 days of humidity-temperature cycling.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Samples shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. All test groups shall each consist of 5 connecting blocks for each wire size specified in Figure 3.

Test Group	Wire Size (AWG)	Board Mounted
1	24 Solid, 24 Stranded	No
2	24 Solid, 22 Solid	Yes
3	24 Solid	Yes
4	24 Solid	Yes
5	24 Solid, 22 Solid	No
6	24 Solid	No

Figure 3

B. Test Sequence

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

4.2. Requalification Testing

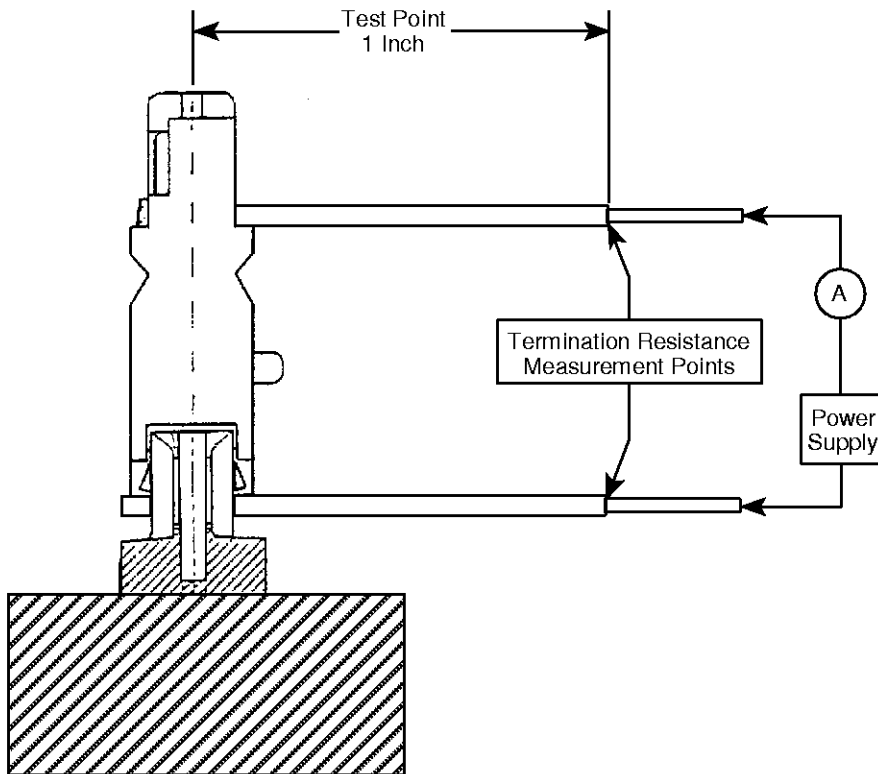
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

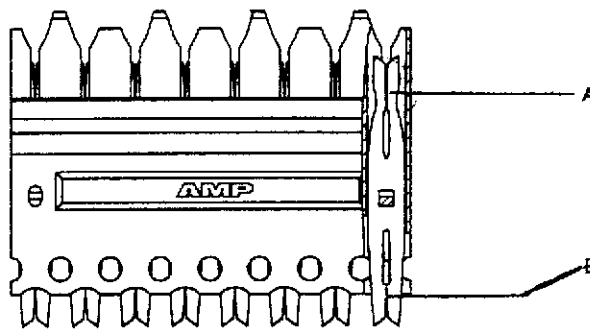
4.4. Quality Conformance Inspection

The 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.



NOTE

Millivolt drop (resistance) due to wire length shall be subtracted from all readings.



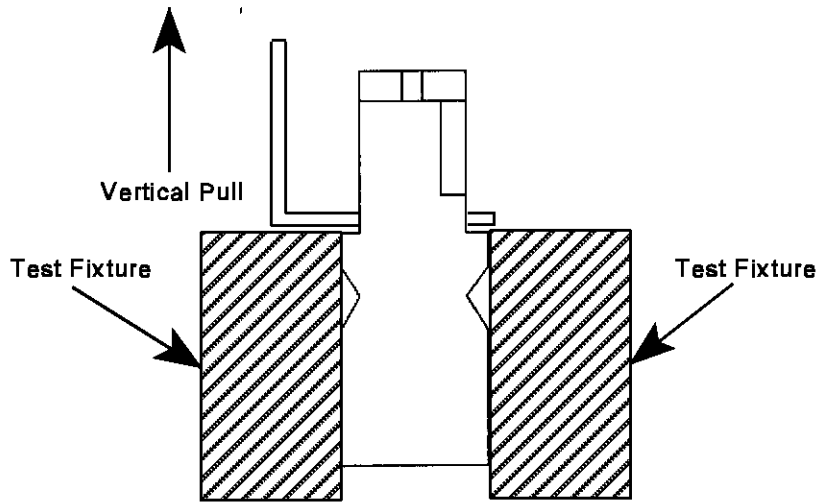
NOTE

Interface resistance is calculated by subtracting the bulk resistance of the terminal (A ->B) from the termination resistance measurement, which includes the interface at A and B, and may include wire, which would also be subtracted out.

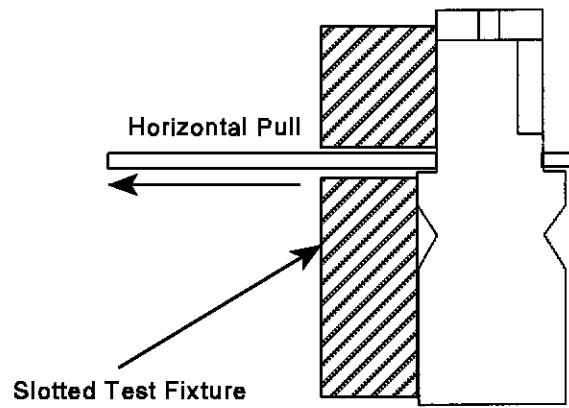
Figure 4
Termination Resistance Measurement Points

Frequency (MHz)	NEXT Loss (dB)	Attenuation (dB)	Return Loss (dB)
1.0	65	0.1	≥23
4.0	65	0.1	≥23
8.0	62	0.1	≥23
10.0	60	0.1	≥23
16.0	56	0.2	≥23
20.0	54	0.2	≥23
25.0	52	0.2	≥14
31.25	50	0.2	≥14
62.5	44	0.3	≥14
100.0	40	0.4	≥14

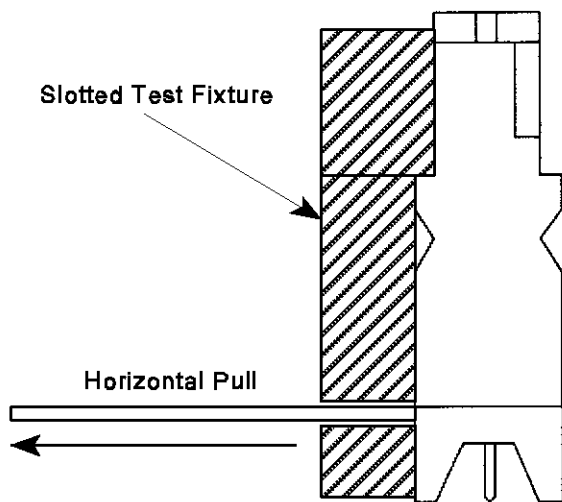
Figure 5
Category 5, 100 Ohm Twisted Pair Performance Requirements
(Per TIA/EIA 568-A, 1995)



Vertical Pull, Top Only



Horizontal Pull, Top Only



Horizontal Pull, Bottom Only

Figure 6
Termination Tensile Strength

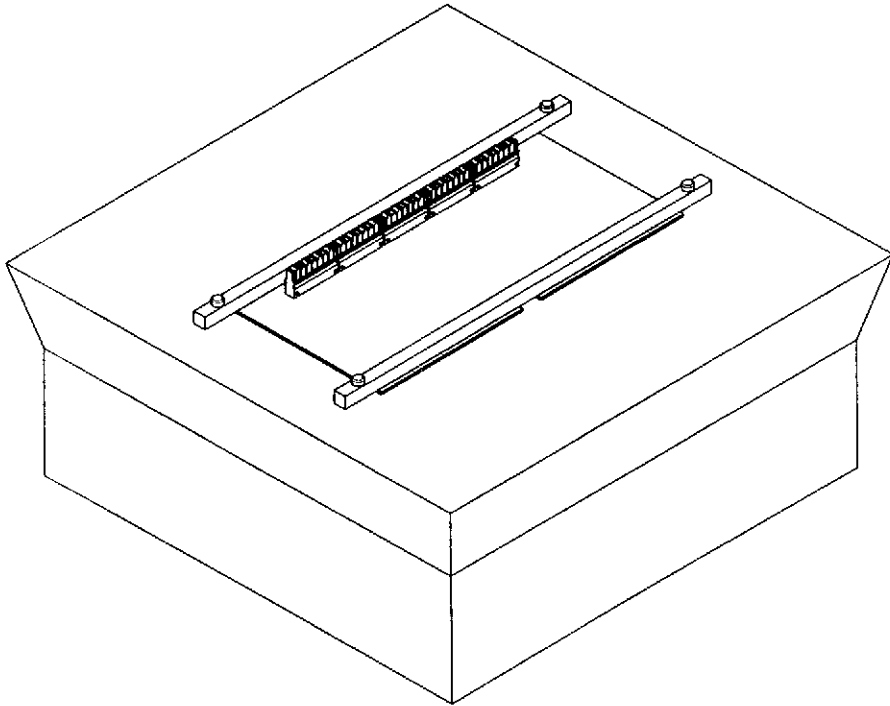


Figure 7
Vibration Mounting Fixture