

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the AMP* Level V insulation displacement connector (IDC) interconnection system. This preloaded insulation displacement connector consists of level V receptacles crimped to wire and is intended to mate with .025 square posts.

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 Specification

- 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. 114-25020: Interconnection System IDC Level V, Application of

2.2. Federal Specifications

- A. QQ-N-290: Nickel Plating, Electrodeposited
- B. QQ-B-750: Phosphor Bronze

2.3. Military Specifications

- A. MIL-G-45204: Gold Plating, Electrodeposited
- B. MIL-M-24519: Molding Plastic, Polyester and Polyarylether Thermoplastic

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B	0	Release per ECN AR-0421	RL	12/13/84	DR	AMP	NO	108-25028	REV	0
					CHK	AMP INCORPORATED Harrisburg, Pa. 17105				
DIST					APP	LOC				
25	LTR	REVISION RECORD	APP	DATE	SHEET	TITLE				
					1 OF 8	INTERCONNECTION SYSTEM, INSULATION DISPLACEMENT CONNECTOR, IDC LEVEL V				

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

- A. Terminal: Copper alloy
- B. Housing: Polyester, black, glass filled thermoplastic 94V-0
- C. Cover: Nylon, black, thermoplastic 94V-0

3.3. Ratings

- A. Current: 3 amperes maximum
- B. Operating Temperature: -65° to 105°C

3.4. Performance and Test Description

Connector assemblies 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 and AMP Spec 114-25020.	Visual, dimensional and functional per applicable inspection plan.														
ELECTRICAL																
Termination Resistance, Rated Current	12 milliohms maximum initial. Wire Size, Test Current, <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>AWG</th> <th>ampere</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>1.0</td> </tr> <tr> <td>28</td> <td>1.5</td> </tr> <tr> <td>26</td> <td>2.0</td> </tr> <tr> <td>24</td> <td>3.0</td> </tr> <tr> <td>22</td> <td>3.0</td> </tr> <tr> <td>20</td> <td>3.0</td> </tr> </tbody> </table>	AWG	ampere	30	1.0	28	1.5	26	2.0	24	3.0	22	3.0	20	3.0	Measure potential drop of mated contacts assembled in housing, see Figure 3; AMP Spec 109-25, calculate resistance.
AWG	ampere															
30	1.0															
28	1.5															
26	2.0															
24	3.0															
22	3.0															
20	3.0															


Figure 1 (cont)

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Test Description	Requirement	Procedure																								
Termination Resistance, Dry Circuit (Low Level)	12 milliohms maximum initial.	Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma maximum, see Figure 3; AMP Spec 109-6-1.																								
Dielectric Withstanding Voltage	<table border="0"> <tr> <td>Test Voltage</td> <td>Altitude</td> </tr> <tr> <td>ac rms</td> <td>Feet</td> </tr> <tr> <td>750</td> <td>Sea Level</td> </tr> <tr> <td>300</td> <td>50,000</td> </tr> <tr> <td>275</td> <td>70,000</td> </tr> </table> No breakdown or flashover.	Test Voltage	Altitude	ac rms	Feet	750	Sea Level	300	50,000	275	70,000	Test between adjacent contacts of unmated connector assemblies; AMP Spec 109-29-1.														
Test Voltage	Altitude																									
ac rms	Feet																									
750	Sea Level																									
300	50,000																									
275	70,000																									
Insulation Resistance	5000 megohms minimum initial.	Test between adjacent contacts of unmated connector assembly; AMP Spec 109-28-4.																								
Current Cycling	Crimp resistance, see Figure 3. $\Delta R = 2$ milliohms maximum.	Subject mated contacts to 50 cycles at 125% rated current for 30 minutes "ON" - 15 minutes "OFF"; AMP Spec 109-51, cond B, test method 3.																								
Crimp Resistance	<table border="0"> <tr> <td>Wire Size</td> <td>Test Current</td> <td>Resistance, milliohms maximum</td> </tr> <tr> <td>AWG</td> <td>amperes</td> <td>initial</td> </tr> <tr> <td>30</td> <td>1.0</td> <td>7.0</td> </tr> <tr> <td>28</td> <td>1.5</td> <td>7.0</td> </tr> <tr> <td>26</td> <td>2.0</td> <td>5.0</td> </tr> <tr> <td>24</td> <td>3.0</td> <td>4.0</td> </tr> <tr> <td>22</td> <td>3.0</td> <td>3.0</td> </tr> <tr> <td>20</td> <td>3.0</td> <td>3.0</td> </tr> </table> AR = 2 milliohms maximum.	Wire Size	Test Current	Resistance, milliohms maximum	AWG	amperes	initial	30	1.0	7.0	28	1.5	7.0	26	2.0	5.0	24	3.0	4.0	22	3.0	3.0	20	3.0	3.0	Measure potential drop of crimp as indicated in Figure 3, after temperature of wire has stabilized to current indicated; AMP Spec 109-25, calculate crimp resistance.
Wire Size	Test Current	Resistance, milliohms maximum																								
AWG	amperes	initial																								
30	1.0	7.0																								
28	1.5	7.0																								
26	2.0	5.0																								
24	3.0	4.0																								
22	3.0	3.0																								
20	3.0	3.0																								
MECHANICAL																										
Vibration (a)	No discontinuities greater than 1 microsecond.	Subject mated connectors to 15 G's, 10-2000 Hz with 100 ma current applied; AMP Spec 109-21-3.																								
Figure 1 (cont)																										
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Test Description	Requirement	Procedure
Physical Shock (a)	No discontinuities greater than 1 microsecond.	Subject mated connectors to 100 G's sawtooth in 6 milliseconds; 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks; AMP Spec 109-26-9.
Mating Force	9.0 ounces per contact maximum initial.	Measure force necessary to mate connector, a distance of .100 inch from point of initial contact, incorporating free floating fixtures at a rate of 1.0 inch/minute; AMP Spec 109-42, cond A. Calculate force per contact. Measure force at first mating.
Unmating Force	1.0 ounces per contact minimum final.	Measure force necessary to unmate connector after 3rd mating of assembly, at a rate of 1.0 inch/minute; AMP Spec 109-42, cond A, calculate force per contact.
Contact Retention	2 pounds minimum per contact. Contact shall not dislodge from its normal locking position.	Apply axial load of 2 pounds to crimped contacts; AMP Spec 109-30.
Contact Engaging Force	9.0 ounces maximum per contact.	Measure force to engage using gage 1, as indicated in Figure 4, AMP Spec 109-35, engagement depth .100 inch from initial point of contact.

Figure 1 (cont)

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Test Description	Requirement	Procedure																											
Contact Separating Force	1.0 ounce minimum per contact.	Size 3 times using gage 1, as indicated in Figure 4, insert gage 2 to a depth of .100 inch from point of initial contact and measure force to separate; AMP Spec 109-35.																											
Crimp Tensile (b)	<table border="1"> <thead> <tr> <th>Slot Number & Color I. D.</th> <th>Wire Size, AWG</th> <th>Tensile pounds minimum</th> </tr> </thead> <tbody> <tr> <td></td> <td>30</td> <td>2.0</td> </tr> <tr> <td>1</td> <td>28</td> <td>3.0</td> </tr> <tr> <td></td> <td>26</td> <td>3.5</td> </tr> <tr> <td>2</td> <td>26</td> <td>2.5</td> </tr> <tr> <td></td> <td>24</td> <td>7.0</td> </tr> <tr> <td></td> <td>22</td> <td>6.0</td> </tr> <tr> <td>3</td> <td>22</td> <td>4.5</td> </tr> <tr> <td></td> <td>20</td> <td>9.5</td> </tr> </tbody> </table>	Slot Number & Color I. D.	Wire Size, AWG	Tensile pounds minimum		30	2.0	1	28	3.0		26	3.5	2	26	2.5		24	7.0		22	6.0	3	22	4.5		20	9.5	Determine crimp tensile at a rate of 1 inch/minute; AMP Spec 109-16.
Slot Number & Color I. D.	Wire Size, AWG	Tensile pounds minimum																											
	30	2.0																											
1	28	3.0																											
	26	3.5																											
2	26	2.5																											
	24	7.0																											
	22	6.0																											
3	22	4.5																											
	20	9.5																											
Durability	Dielectric withstanding voltage; termination resistance, dry circuit; unmating force.	Mate and unmate connector assemblies for 200 cycles; AMP Spec 109-27.																											
ENVIRONMENTAL																													
Thermal Shock (a)	Insulation resistance; dielectric withstanding voltage; termination resistance, dry circuit.	Subject mated connectors to 5 cycles between -65° and 105°C; AMP Spec 109-22.																											
Temperature Humidity Cycling	1000 megohms final insulation resistance.	Subject mated connectors to 10 temperature-humidity cycles between 25° and 65°C at 95% RH; AMP Spec 109-23, method III, cond B, and shock at -10°C, less step 7b. Final measurement during recovery period.																											
Corrosion, Salt Spray	Termination resistance, dry circuit and rated current.	Subject mated connectors to 5% salt concentration for 48 hours; AMP Spec 109-24, cond B. Unmate assemblies before rinsing, then remate for resistance measurements.																											

Figure 1 (cont)

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Test Description	Requirement	Procedure
Temperature Life (a)	Termination resistance, dry circuit and rated current, initially and after 1,2,4,8,16 and 33 days.	Subject mated connectors to temperature life, 118°C for 33 days; AMP Spec 109-43, test level 9, test duration 1.

- (a) Shall remain mated and show no evidence of damage, cracking or chipping.
(b) Slot number is stamped on terminal.

Figure 1 (end)

3.6. Connector Tests and Sequences

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Examination of Product	1	1	1	1
Termination Resistance, Rated Current		4,15	3,6	
Termination Resistance, Dry Circuit		3,7,10,14	2,5	
Dielectric Withstanding Voltage	4,7,12			
Insulation Resistance	5,9,11			
Current Cycling				3
Crimp Resistance				2,4
Vibration		11		
Physical Shock		12		
Mating Force		2		
Unmating Force		5,8		
Contact Retention	13			
Contact Engaging Force	2			
Contact Separating Force	3			
Crimp Tensile				5
Durability	6	6		
Thermal Shock	10	9		
Temperature-Humidity Cycling	8			
Corrosion, Salt Spray		13		
Temperature Life			4	

- (a) See Para 4.1.A.
(b) Numbers indicate sequence in which tests are performed.

Figure 2

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4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Test groups 1, 2 and 3 shall consist of two 20 position connectors crimped to a nominal wire size. Test group 4 shall consist of a minimum of 30 contacts crimped to each AWG wire size, 20, 22, 24, 26, 28 and 30 in accordance with AMP Spec 114-25020. A minimum of 30 measurements shall be made per group.

B. Test Sequence

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

C. Acceptance

- (1) All samples tested in accordance with this specification shall meet the stated tolerance limit.
- (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.

4.2. Quality Conformance Inspection

The applicable AMP inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

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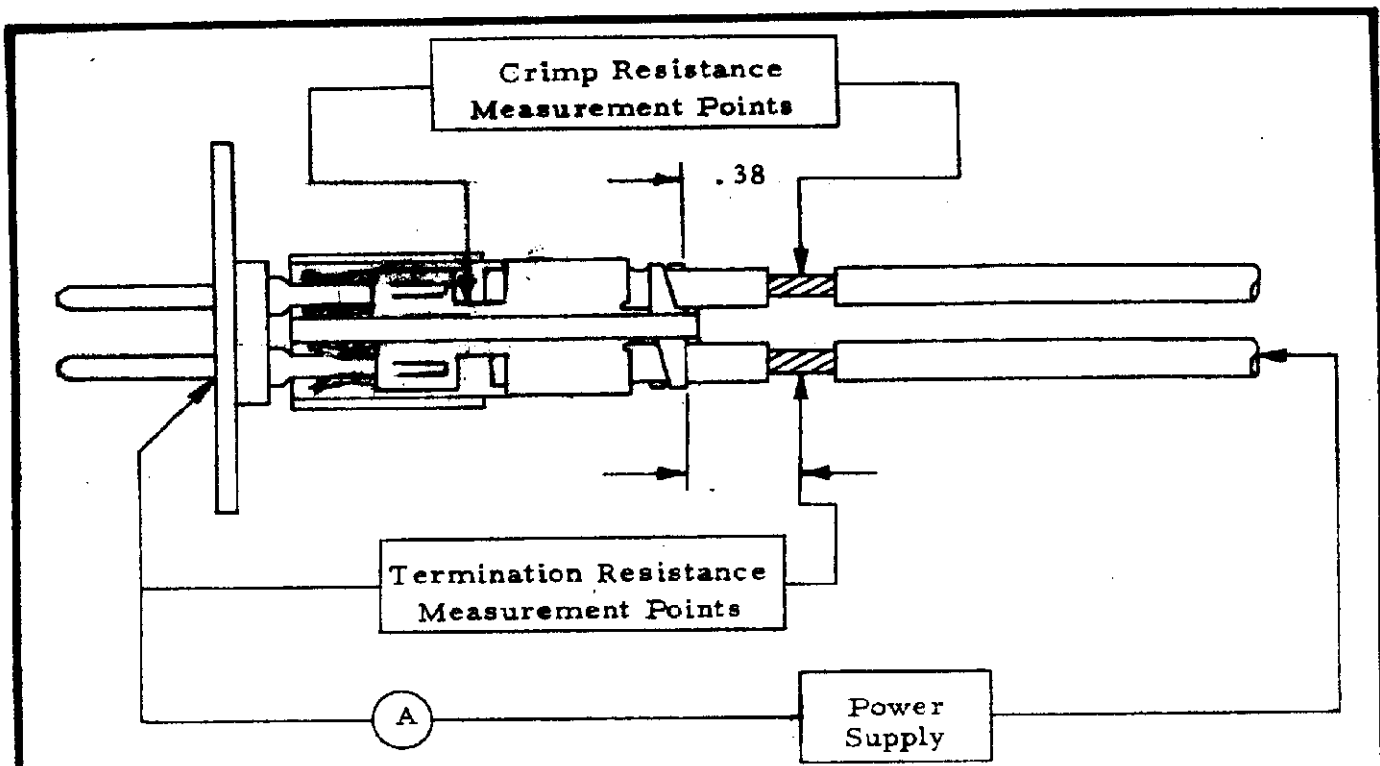
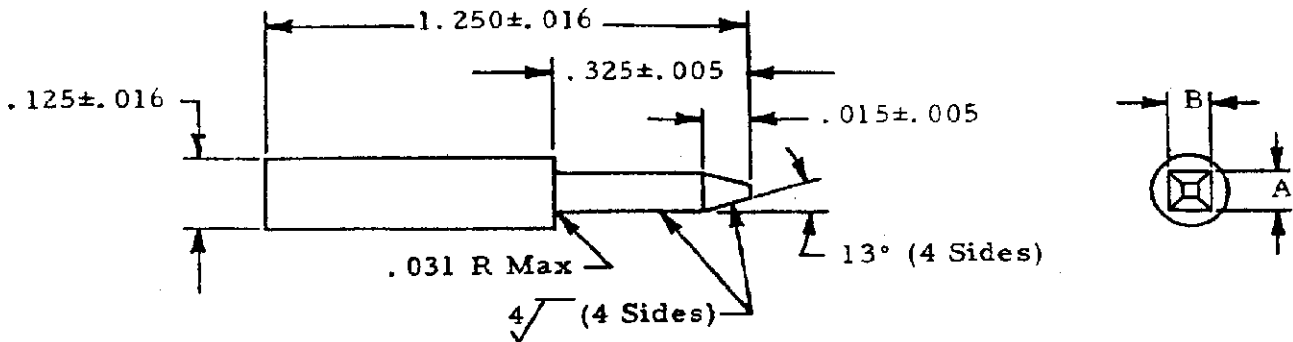


Figure 3
Resistance and Temperature Measurement Points



- Notes:
1. Tolerance: $\pm .005$ or $\pm 2^\circ$ as applicable, unless otherwise specified.
 2. Material: Tool steel, AISI type 02 per AMP Specification 100-15.
 3. Heat treat: Rockwell C 50-55.
 4. Gage surface shall be clean of contaminants or lubricants.

Gage	A	B
1	$.0260^{+.0000}$ $-.0001$	$.0260^{+.0000}$ $-.0001$
2	$.0240^{+.0001}$ $-.0000$	$.0240^{+.0001}$ $-.0000$

Figure 4
Engaging and Separating Gages

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