

In-Line Vertical Screwless Wire Connector

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the In-Line Vertical Screwless Wire Connectors designed to terminate 18 AWG solid wire.

1.2. Qualification

When tests are performed on the 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 on 07Nov08 additional testing was successfully completed on 02Jan09. The Qualification Test Report number for this testing is 501-523-1. This documentation is on file at and available from Engineering Practices and Standards (EPS).

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- [102-950](#): Quality Specification (Qualification of Separable Interface Connectors)
- [114-13223](#): Application Specification (In-Line Vertical Screwless Connector)
- [501-523-1](#): Qualification Test Report (In-Line Vertical Screwless Wire Connector)

2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- JESD22-B102D: Solderability

2.3. Reference Document

- [108-2059](#): Product Specification (Vertical Screwless Wire Connector)
- [109-197](#): Test Specification (TE Test Specification vs EIA and IEC Test Methods)
- [501-523](#): Qualification Test Report (Vertical Screwless Wire Connector)

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Ratings

Voltage	Current	Temperature
600 volts AC	See Figures 4A and 4B	40 to 105°C

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Initial examination of product.	Meets requirements of product drawing and Application Specification 114-13223.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low Level Contact Resistance (LLCR).	15 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 3000 volts AC at sea level. Test between adjacent contacts.
Temperature rise vs current.	30°C maximum temperature rise at specified current.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C. See Figure 4.
MECHANICAL		
Solderability, dip test.	Solderable area shall have a minimum of 95% solder coverage.	JESD22-B102D, Method 1, no preconditioning. Subject contacts to solderability.
Random vibration.	See Note.	EIA-364-28, Test Condition VII, Condition Letter D. Subject mated specimens to 3.10 G's rms between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes. See Figure 5.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Condition H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 5.
Durability.	See Note.	EIA-364-9. Insert and release wire 5 times using tool. Tool cross section shall be 0.46 X 2.03 mm.

Figure 1 Cont.

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Wire insertion force.	5 N maximum.	EIA-364-13. Measure force necessary to push wire into connector at a maximum rate of 12.7 mm per minute.
Wire retention force.	44.5 N minimum.	EIA-364-13. Apply axial force to wire at a maximum rate of 12.7 mm per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32, Test Condition VIII. Subject specimens to 5 cycles between -40 and 105°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method III. Subject specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4. Subject specimens to 105°C for 648 hours.



NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

Figure 1 end

3.4. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Initial examination of product	1	1	1	1	1
LLCR	3,10	2,5	2,5		
Withstanding voltage				4	
Temperature rise vs current	4(c),11(d)				
Solderability, dip test					2
Random vibration	7(e)				
Mechanical shock	8				
Durability		3	3		
Wire insertion force	2				
Wire retention force	12				
Thermal shock	6			2	
Humidity/temperature cycling	9		4	3	
Temperature life	5	4			
Final examination of product	13	6	6	5	3

i **NOTE**

- (a) Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Each test group shall consist of 15 specimens terminated to 18 AWG solid copper wire. Test groups 1, 2 and 3 shall be mounted to printed circuit boards.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Measure at single current level, 50% and 100%.
- (d) Thirty single circuits.
- (e) Discontinuities shall not be measured. Energize at 18°C level for 100% loadings per Quality Specification 102-950.

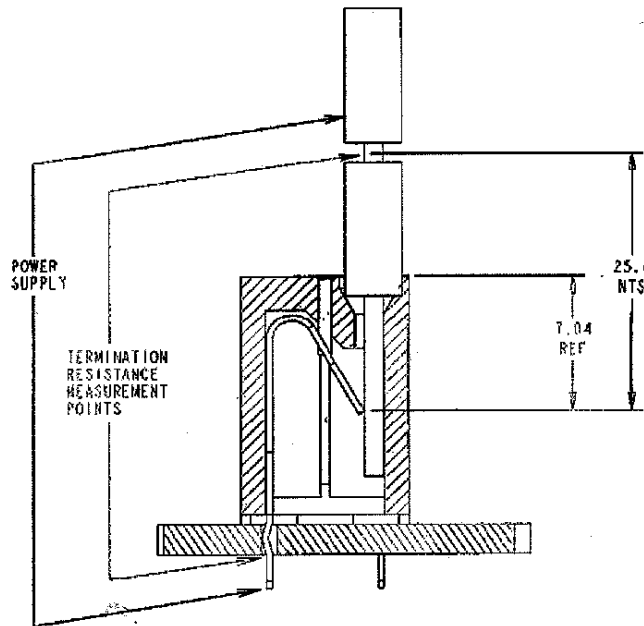


Figure 3
LLCR Measurement Points

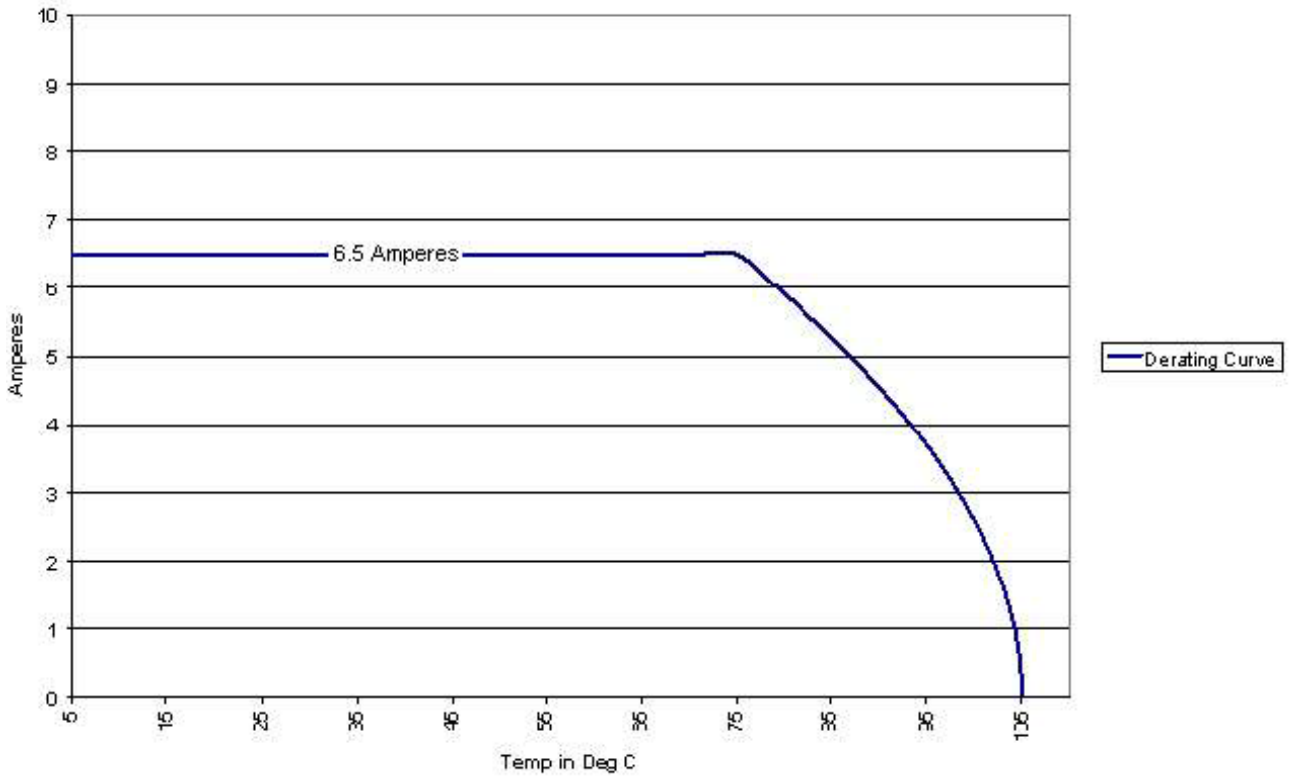


Figure 4A
Current Carrying Capability

Percent Connector Loading	18 AW G Wire
	3 Position
Single Contact	1.000
66	0.936
100	0.768



NOTE

To determine acceptable current carrying capacity for percentage connector loading and wire gage indicated, use the Multiplication Factor (F) from the above chart and multiply it times the Base rated Current for a single circuit at the maximum ambient operating temperature shown in Figure 4A.

Figure 4B
Current Rating

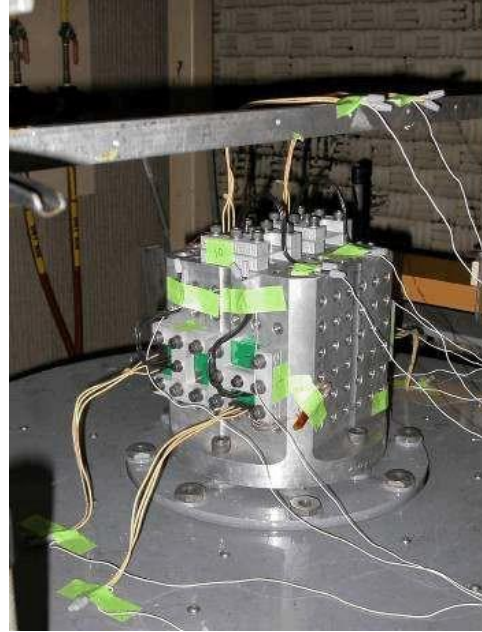


Figure 5 Cont.
Vibration Mounting Fixture

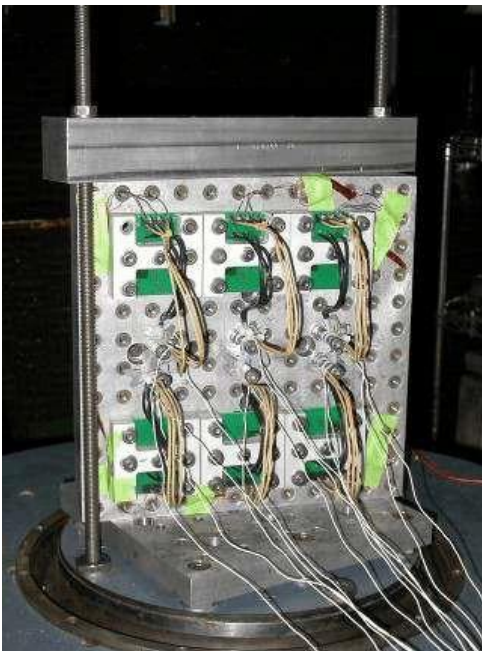


Figure 5 cont.
Mechanical Shock Mounting Fixture

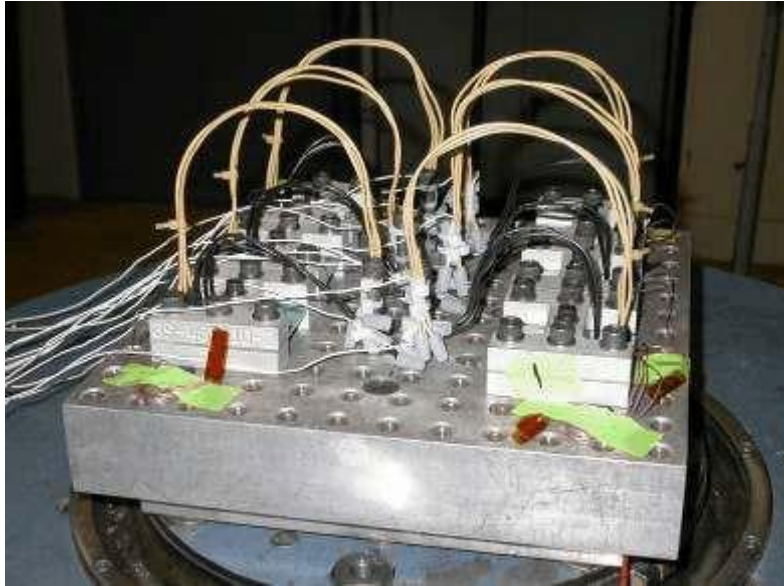


Figure 5 end
Mechanical Shock Mounting Fixture