
VAL-U-LOK* Connectors

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for VAL-U-LOK* Connectors.

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. Successful qualification testing on the subject product line was completed on 25Jul03. The Qualification Test Report number for this testing is 501-534. This documentation is on file at and available from Engineering Practices and Standards (EPS).

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. TE Connectivity (TE) Documents

- 114-13172: Application Specification (VAL-U-LOK* Series Headers and Connectors)
- 501-534: Qualification Test Report (VAL-U-LOK* Connector)

2.2. Industry Document

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

2.3. Reference Document

109-197: Test Specification (Tyco Electronics Test Specifications vs EIA and IEC Test Methods)

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Ratings

- Voltage: 600 volts AC
- Current: 9 amperes maximum, 2 position application
- Temperature: -40 to 105°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.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing and Application Specification 114-13172.	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).	10 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.
Insulation resistance.	1000 megohms minimum.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1500 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.
MECHANICAL		
Sinusoidal vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition I. Subject mated specimens to 10 to 55 to 10 Hz traversed in 1 minute with 1.5 mm maximum total excursion. Two hours in each of 3 mutually perpendicular planes.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Condition A. Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.

Figure 1 (continued)

Test Description	Requirement	Procedure
Durability.	See Note.	EIA-364-9. Mate and unmate specimens with H-04 hardness for 50 cycles, and specimens with H-06 hardness for 30 cycles at a maximum rate of 10 cycles per minute.
Crimp pull-out force.	88 N minimum for 18 AWG wire; 59 N minimum for 20 AWG wire; 39 N minimum for 22 AWG wire; 29 N minimum for 24 AWG wire; 20 N minimum for 26 AWG wire.	EIA-364-29. Measure force necessary to remove the wire from the crimp at a maximum rate of 12.7 mm per minute.
Locking force.	41.2 N maximum for 6 position.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute.
Unlocking force.	2.4 N minimum for 6 position.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm per minute.
Terminal insertion.	15 N maximum.	EIA-364-5. Measure force necessary to properly seat the terminal into the housing at a maximum rate of 12.7 mm per minute.
Terminal retention.	30 N minimum.	EIA-364-5. Measure force necessary to remove the terminal from the housing at a maximum rate of 12.7 mm per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32. Subject mated specimens to 5 cycles between -55 and 105°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity, steady state.	See Note.	EIA-364-31. Subject specimens to 40°C and 90 to 95% RH for 96 hours.
Heat resistance.	See Note.	EIA-364-17. Subject mated specimens to 105°C for 96 hours.
Cold resistance.	See Note.	EIA-364-59, Condition 3, Duration D. Subject mated specimens to -40°C for 96 hours.

Figure 1 (continued)

Test Description	Requirement	Procedure
Salt spray.	See Note.	EIA-364-26, Condition B. Subject mated specimens to a 5% salt spray at 35°C for 48 hours.
SO ₂ gas.	See Note.	Subject mated specimens to 50 ppm of SO ₂ gas to 40°C for 24 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)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)						
	1	2	3	4	5	6	7
	Test Sequence (b)						
Initial examination of product	1	1	1	1	1	1	1
LLCR		2,4	2,4		2,5	2,4,6,8,10	2,4
Insulation resistance				2,5			
Withstanding voltage				3,6			
Temperature rise vs current							5
Sinusoidal vibration					3		3
Mechanical shock					4		
Durability						3	
Crimp pull-out force	6						
Locking force	3						
Unlocking force	4						
Terminal insertion	2						
Terminal retention	5						
Thermal shock						7	
Humidity, steady state				4			
Heat resistance						5	
Cold resistance						9	
Salt spray		3					
SO ₂ gas			3				
Final examination of product	7	5	5	7	6	11	6

NOTE

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

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

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 a minimum of 5 specimens.

B. Test Sequence

Qualification inspection shall be verified by testing specimens 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 specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall 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.