High Temperature Positive Lock Terminals and Housings

1. SCOPE

1.1. Content

This specification covers the electrical, mechanical and environmental performance requirements for High Temperature Positive Lock Terminals.

250 Series High Temperature terminals include TE part number: 2825084-1, 2238104-1, 2238139-1, 2238106-1, 2238105-1, 2238141-1, and 2484137-1.

250 Series High Temperature housings include: 1969820-1 & 1969823-1. A back-cover accessory is available for 1969823-1, TEPN: 1969826-1.

187 Series High Temperature terminals include: 2238177-1 & 2238178-1

187 Series High Temperature Housings include: 1969877-1

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.

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

- 114-2074: Application Specification
- 501-134075: 250 Series Straight and Flag Qualification Test Report
- 502-143101: 187 Series Straight Validation Test Report

2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- UL310: UL Standard for Safety Electrical Quick-Connect Terminals
- UL1977: Component Connectors for Use in Data, Signal, Control and Power Applications

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

Max Operating Temperature	Voltage	Current
250°C High Temp Terminals 240°C High Temp Housings	250 VAC	12 AWG: 20A
		14 AWG: 15A
		16 AWG: 10A
		18 AWG: 7A
		20 AWG: 4A

3.3. Test Requirements and Procedures Summary

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

TEST DESCRIPTION	REQUIREMENT			PROCEDURE
Examination of product	Meets requirements of product drawing.			EIA-364-18 Visual, dimensional (C of C) and functional as per applicable inspection plan and product drawing.
ELECTRICAL				
Low Level Contact Resistance	Wire Size (AWG)	Max. Resistance (mΩ)		EIA 364-23
	12	10 milliohms total resistance across crimp and terminal/tab interface. Measure crimp and interface separately.		
	14			
	16			
	18			
	20			
Temperature rise	Wire Size (AWG)	Test Current (A)	Max. T-Rise	EIA 364-70 Method 1 Test Configuration per UL-310 Par 6.5
	12	20	60C Final	
	14	15		
	16	10		
	18	7		
	20	4		
MECHANICAL				
Insertion Force (Latch Locked)	1st insertion (Locked) – 9lbs (40N) average max. 10lbs (44.5N) Individual max.			UL-310 Par 6.4 The forces required for the first insertion shall be measured with the latch locked.
Durability Repeated Insertion/Withdrawal (Latch Unlocked)	UL 310 Table 5 1st withdrawal – 3lbs (13N) Individual min. 6th withdrawal – 2lbs (9N) Individual min.			UL-310 Par 6.4 The connectors shall be inserted and withdrawn from test tabs six times for Test Group 1 and 5 times for Test Group 2. All withdrawal cycles shall be conducted and measured with the latch unlocked.
Latch Withdrawal Force (Latch Locked)	1st withdrawal (Locked) 18lbs (80N) min 6th withdrawal (Locked) 15lbs (66N) min (b)			UL-310 Par 6.4 The forces required for the first withdrawal and sixth withdrawal shall be measured with the latch locked. Half of the specimens will be for 1st withdrawal and other half of specimens will be for 6th withdrawal. See footnotes d,e,f and g in Figure 2.

Vibration	Low Level Contact Resistance See Note *(a)*	EIA 364-28 Test Condition II 10-500 Hz, 12 cycles – 3 hours each axis
Terminal Insertion Force	4 Pound Max Insertion	EIA-364-05 Measure the force required to push terminal into the housing
Terminal Retention Force	18 Pound Min Retention	EIA-364-29 Method C Measure the force required to remove the terminal from the housing
ENVIRONMENTAL		
Temperature and humidity cycling	Low Level Contact Resistance See Note *(a) (b)*	EIA-364-31 Condition IV: 10 days@ 25-65 C/ 80-100 RH / without cold shock)
Temperature Life	Low Level Contact Resistance No visual evidence of physical damage detrimental to product performance (a) (b)	EIA 364-17 Method A: 250C, 200 Hours
Mold Stress Test	UL 1977 Par 14 No function affect (warpage, shrinkage or distortion)	UL 1977 Subject unmated housings to 10C above specified RTIe for 7 hours (250°C)
Thermal Shock	Low Level Contact Resistance See Note *(a)*	EIA 364-32 Test Duration A-1 -40 to 250°C 25 Cycles 30 minutes at each temperature extreme

NOTE

(a) 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.

(b) Use Nickel Plated Steel Tabs with holes (not dimples).

Electrical PN 1-62627-0, 2 ended

Mechanical PN 63274-6, 1 ended

Figure 1 (end)

3.4. Product Qualification and Requalification Test Sequence

Test Group 1, 2 and 3 represent qualification of a terminal to a tab.

TEST OR EXAMINATION	TEST GROUP *(b)*				
	1	2	3	4	5
	TEST SEQUENCE *(c)*				
Examination of product	1	1	1	1,4	1,4
1st Insertion Force (Latch Locked)		2 *(e)*			
Durability, Repeated Insertion/Withdrawal (Latch Unlocked) (All Cycles)	2 *(d)*				
Durability/Withdrawal Force (Latch Locked) 1st and 6th		3 *(g)(f)*			
Low Level Contact Resistance Crimp and Interface			2,4,6,8, 10,12		
Thermal Shock			9		
Temperature Life			7		
Temperature rise (i)			3,13		
Temperature and humidity cycling			5		
Vibration			11		
Terminal Insertion Force				2	
Terminal Retention Force				3	3 *(h)*
Mold Stress Test					2

NOTES

(a) Samples shall be prepared in accordance with applicable instruction sheets. They shall be selected at random from current production.

(b) See paragraph 4.1.A.

(c) Numbers indicate sequence in which tests are performed.

(d) Durability will be conducted with the latch released by pulling back on the housing. The forces will be measured with the latch released on the 1st and 6th cycle.

(e) Measure first cycle insertion force with the latch locked on all specimens.

(f) On ½ samples, destructively measure withdrawal force on 1st cycle with locked latch by pulling on the wire.

(g) On ½ samples, pull back on housing to release latch for 5 durability cycles, destructively measure withdrawal force on the 6th cycle with locked latch by pulling on the wire..

(h) Contact inserted before mold stress test, only measuring retention forces after oven

(i) Temperature Rise conducted on terminals only, not in housings

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. Minimum specimen quantities are shown in Figure 3.

Part Number	Description	Test Group Quantity (Minimum)				
		1	2	3	4	5
2238104-1	Positive Lock Mark II, .250 Straight Terminal 16-14AWG	5	10	12	-	-
2825084-1	Positive Lock Mark II, .250 Straight Terminal 12-10AWG	5	10	12	-	-
2238139-1	Positive Lock Mark II, .250 Straight Terminal 20-18AWG	5	10	12	-	-
2238105-1	Positive Lock Mark II, .250 Flag Terminal 16-14AWG	5	10	12	-	-
2238106-1	Positive Lock Mark II, .250 Flag Terminal 12-10AWG	5	10	12	-	-
2238141-1	Positive Lock Mark II, .250 Flag Terminal 20-18AWG	5	10	12	-	-
1969820-1	250 Straight Positive Lock Mark II Housing	5	10	12	5	5
1969823-1 And 1969826-1	250 Flag Positive Lock Mark II Housing and TPA	5	10	12	5	5

Figure 3

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.