



TERMINAL BLOCK CONNECTOR

1.1. Content

This specification covers performance, tests and quality requirements for the Terminal Block housing and respective terminal assemblies.

1.2. Qualification

When tests are performed on subject product line, procedure specified in EIA series specifications shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line has not been completed. The Qualification Test Report number will be issued upon successful qualification testing.

1.4. Revision Summary

Revisions to this specification include:

- Revision B: Alignment of testing requirements to UL 1059. Updating of sample configuration for thermal testing per 114- 2087 allowable applications. New template format.
- Revision C: Correction of test procedure for Terminal Resistance, dry circuit, per EIA-364-21A. Adjustment to Dielectric Withstanding Voltage and Insulation Resistance procedures to suit product geometry. Correction of superseded specification for Crimp Tensile and Temperature Life tests to appropriate EIA specification. Note C addition to test sequence.

2. APPLICABLE DOCUMENTS AND FORMS

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 TE Connectivity Specifications

114-2087 Application Specification – Power Ring Connectors
501-134147 Qualification Test Report

2.2 Commercial Standards and Specifications

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

2.3 Reference Documents

[109-1](#) General Requirements for Testing

2.4 Commercial Documents

UL 1059: Standard for Terminal Blocks
UL 486A: Standard for Wire Connectors and Soldering Lugs

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. Material

- A. Contact: Brass, plain or tin plated
- B. Housing: Phenolic
PBT
- C. Hardware: Steel, zinc or nickel plated.

3.3. Ratings

- A. Voltage: 250 VAC
- B. Current: Current carrying capacity is dependent on wire size. Terminal block PN 2238272-1 using terminal PN 521843-1 on 12AWG wire can support 32 amps continuously.
- C. Temperature: -55 to 150°C for Phenolic
-40 to 140°C for PBT Housing

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. All tests are performed at ambient temperature unless otherwise specified.

3.5. Test Requirements and Procedure Summary

Test Description	Requirement	Procedure
Examination of Product	Meet requirements of product drawing and TE application specification. After testing, there shall be no corrosive influence on the performance and no physical damage that would impair product performance.	EIA-364-18 Visual and dimensional (C of C) inspection per the product drawing.
Electrical		
Termination resistance, dry circuit.	1 milliohm maximum crimp resistance. 2 milliohms maximum total resistance.	EIA 364-23A Subject contacts to 20 mv open circuit at 100 ma maximum. See Figure 4 or 5 based on test group.
Dielectric Withstanding Voltage	1.5 kvac 60 Hz dielectric withstanding voltage. 1-minute hold. No breakdown or flashover.	EIA-364-20 Duration of Application: 60 seconds Final Requirement [VDC or VAC (minimum)]: 1.5 KV Initial Requirement [VDC or VAC (minimum)]: 1.5 KV Leakage Current: 5 mA Mated Condition: Mated Points of Application: Method A (Between closest adjacent contact). Rate of Application: 500 V per second Test Condition I (Sea Level)

Figure 1 (continued)

Insulation resistance.	5000 megohms minimum.	EIA-364-21 Mating Conditions: Mated Points of Application: Between Closest Adjacent Contacts Test Duration/Electrification Time: 2 minutes Test Voltage: 500 VDC ± 10%
Current cycling.	See Note (a).	EIA 364-55 Condition B, Test method 4. Subject contacts to 500 cycles at 125% rated current for 45 minutes "ON" and 15 minutes "OFF".
Temperature rise vs current.	50°C maximum temperature rise at specified current.	EIA 364-70A Method 1 Stabilize at a single current level until 3 readings at 5-minute intervals are within 1 °C.

Mechanical

Vibrations, sinusoidal, low frequency.	No discontinuities greater than 1 microsecond. See Note (a).	EIA 364-28D Test Condition I 10-55 Hz sinusoidal, 0.06-inch peak-to-peak, 120 cycles (2 hours) on each axis.
Strength of housing.	See Note (a).	Torque screws in contacts assembled in housings to 50 inch/pounds using torque wrench
Contact Insertion force.	12 pounds maximum per contact.	EIA-364-05, Section 5 Measure force to insert contact into housing.
Contact Retention force.	Contacts shall not dislodge.	EIA-364-29 Rate of Application: 25.4 mm/min (maximum) Requirement (minimum): 30 lb.
Crimp tensile.	Wire Size AWG	Crimp Tensile Pounds minimum
	18	20
	16	30
	14	50
	12	70
	10	80
EIA-364-08. Determine crimp tensile at rate of 1 inch per minute hold at specified load.		

Environmental

Thermal Shock	See Note (a).	EIA-364-32 Mating Configurations: Mated Test Condition for Method A: Test Condition VIII (-40°C to 125°C)
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		Test Duration: 25 cycles Test Method: Method A - Air to Air
Humidity-temperature cycling.	See Note (a).	EIA-364-31 Method IV - Cycling Temperature-Humidity with Optional Cold Shock
Temperature life.	See Note (a).	Subject mated connectors to temperature life for 24 hours duration. EIA-364-17 150°C +5°C

Figure 1 (end)



NOTE

(a) Shall remain intact and show no evidence of damage, cracking or chipping.



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.

3.6. Product Qualification and Requalification Tests

Test of Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Examination of product	1	1,9	1,8	1,5
Termination resistance, dry circuit	3,5	2,7		2,4
Dielectric withstanding voltage			3,7	
Insulation resistance			2,6	
Current cycling				3
Temperature rise vs current		3,8		
Vibration	4	6(c)		
Strength of housing	6			
Contact insertion force	2			
Contact retention force	7			
Crimp tensile	8			
Thermal shock			4	
Humidity-temperature cycling		4	5	
Temperature life		5		

Figure 2



NOTE

(a) See Para 4.1.A.

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

(c) Vibration @18C T-Rise (instead of monitoring for discontinuity)

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test groups shall consist of 3 connector assemblies (9 contact total) prepared as indicated in either configuration shown in Figure 3 using the largest applicable wire size for the selected terminal.

The power terminal in the terminal block should be crimped to the largest applicable wire size. The connection made at the screw side should use a 6AWG wire that has strands captured between the nut and terminal (connection shown on right side of Figure 3) or crimped to a ring terminal that is then captured between the screw and terminal (connection shown on left side of Figure 3).

Refer to Figure 4 and Figure 5 for terminal resistance measurement points, thermocouple location, and recommended torque rating for connections described in Figure 3. Figure 4 should be referenced for Test Groups 1 and 2. Figure 5 should be referenced for Test Group 4. Note termination resistance equals millivolt drop divided by test current less resistance of 3 inches of wire. All wire shall be applied in accordance with AMP Specification 114-2087.

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. When 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 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.

4.5. Certification

This product has been Recognized under the Component Recognition Program of Underwriters Laboratories Inc., Electrical File No. E60677 (Power Block) and No. E13288 (Power Ring) and certified by the Canadian Standards Association No. 47787-6 (Power Ring).

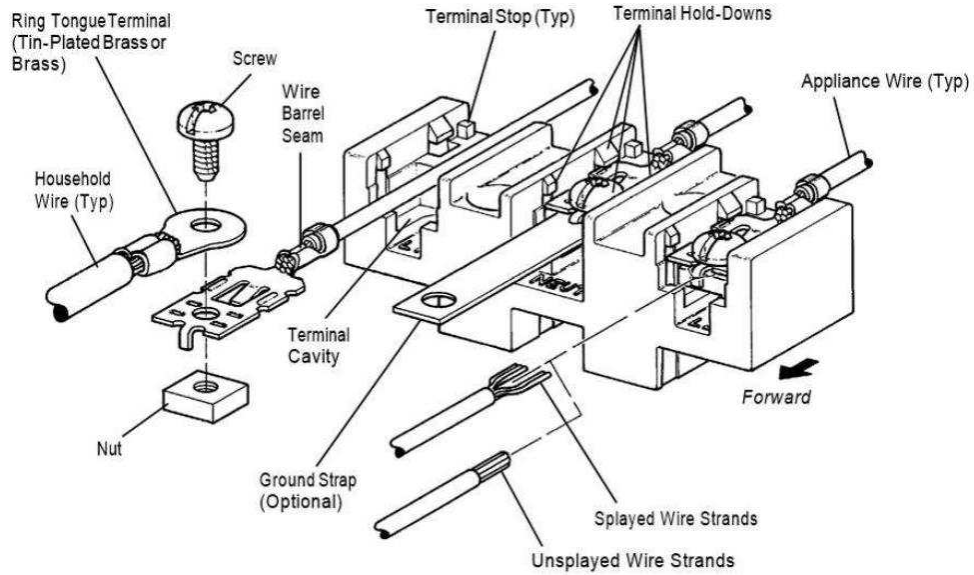


Figure 3: Allowable connection methods for terminal block connectors using power ring terminals.

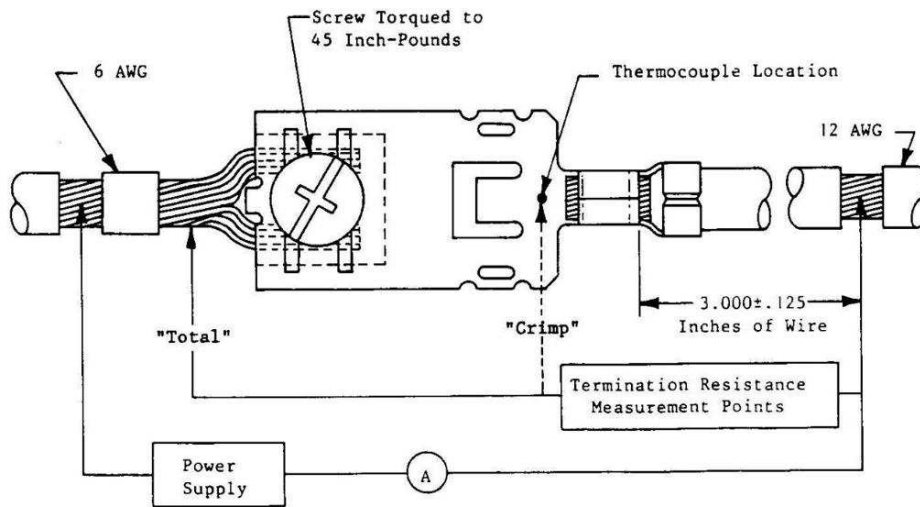


Figure 4: Termination Resistance and Temperature rise test setups for Test Groups 1 and 2.

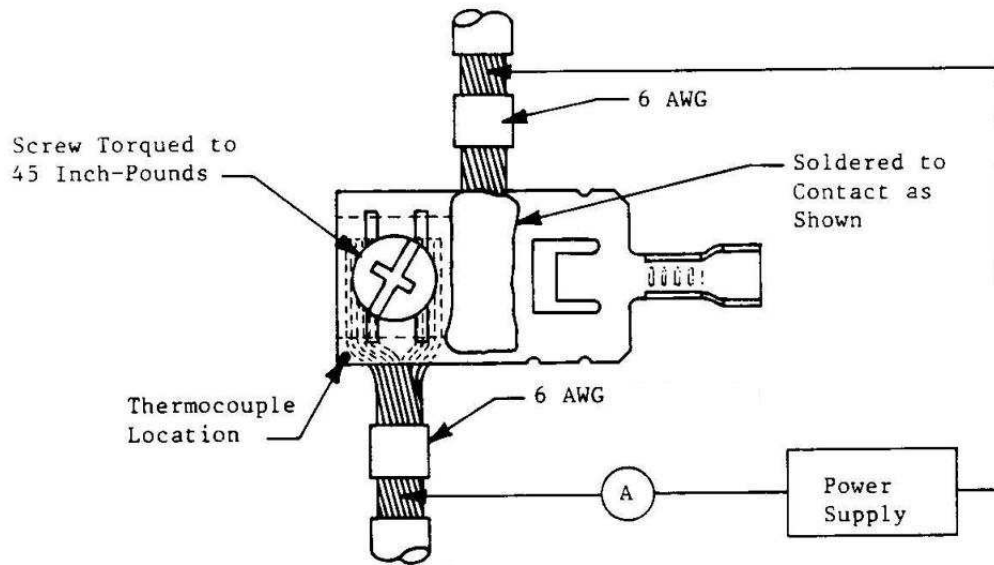


Figure 5: Termination Resistance and Temperature rise test setups for Test Group 4.