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**AMPOWER\* Quick Disconnect Terminals**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for AMPOWER\* quick disconnect terminals designed to terminate 1/0 - 2/0 stranded copper conductor and facilitate quick connect/disconnect capabilities for traction motor leads on rapid transit vehicles.

## 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 26Aug98. The Qualification Test Report number for this testing is 501-395-4. 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. Tyco Electronics Documents

- ! 109-1: General Requirements for Test Specifications
- ! 109 Series: Test Specifications as indicated in Figure 1
- ! 108-30200: Product Specification (AMPOWER\* Terminals & Splices, Small)
- ! 108-30200-1: Product Specification (AMPOWER\* Terminals & Splices, Medium)
- ! 108-30200-2: Product Specification (AMPOWER\* Terminals & Splices, Large)
- ! 114-2150: Application Specification (AMPOWER\* Terminals and Splices)
- ! 501-395-4: Qualification Test Report (AMPOWER\* Quick Disconnect Terminals)

## 2.2. Commercial Standard

UL486A: Wire Connectors and Soldering Lugs for Use With Copper Conductors

**3. REQUIREMENTS**

## 3.1. Design and Construction

Product shall be of 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

- ! Current: See Figure 3
- ! Temperature: 0 to 200°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 per Test Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and Application Specification 114-2150.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Millivolt drop.	See Figure 3. Millivolt drop shall not exceed twice the initial value.	AMP 109-3. Measure millivolt drop of samples assembled in a chain. See Figure 3.
Current cycling.	Temperature rise above ambient of the samples shall not exceed 50°C at test current. See Note.	AMP Spec 109-51. Subject samples assembled in a chain to 50 cycles at test current. See Figure 3.
MECHANICAL		
Crimp tensile.	Samples shall not break, unmate, or become separated from the wire.	AMP Spec 109-16. Determine crimp tensile at a maximum rate of 1 inch per minute. 1 minute hold. See Figure 3.
Durability.	See Note.	AMP Spec 109-27. Mate and unmate samples for 15 cycles at a maximum rate of 600 cycles per hour.
Secureness.	See Note.	UL 486A, Paragraph 10.

Figure 1 (continued)

Test Description	Requirement	Procedure
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note.	AMP Spec 109-22. Subject samples to 5 cycles between -55 and 120°C. Each cycle shall consist of 2 hours at each temperature extreme with a 5 minute maximum ramp between extremes.

**NOTE**

*Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 2.*

Figure 1 (end)

## 3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)
	1
Test Sequence (b)	
Examination of product	1,9
Millivolt drop (c)	2,7
Current cycling	6
Crimp tensile	8
Durability	4
Secureness	3
Thermal shock	5

**NOTE**

- (a) *See paragraph 4.1.A.*
- (b) *Numbers indicate sequence in which tests are performed.*
- (c) *Millivolt drop shall not exceed twice the initial value.*

Figure 2

**4. QUALITY ASSURANCE PROVISIONS**

4.1. Qualification Testing

A. Sample Selection

Samples shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test group shall consist of 4 connector pairs terminated to 43 inch lengths of appropriate wire. Lug terminals shall be attached to the opposite ends of the wires to facilitate energizing the samples.

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. If 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 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.

Copper Conductors			Current Cycling See Note	
Conductor Size	Test Current (amperes)	Tensile (pounds)	Cycle ON (hours)	Cycle OFF (hours)
1/0 AWG	230	250	1.0	1.0
2/0 AWG	265	300	1.0	1.0

**NOTE**

*Millivolt drop measurements shall be taken at the sequence and test current specified in Figure 3 at thermal stability. A test sample is considered to have attained thermal stability when 3 readings taken at not less than 10 minute intervals show no more than a 2° C variation between any 2 of the readings. Millivolt drop measurements shall be taken across each connector pair wire-to-wire. Probe points shall pierce the insulation on the conductor 1/8 inch back from the wire receiving end of each connector barrel. The temperature of test samples, and ambient temperature shall be recorded at thermal stability at test current. For connector sizes other than those listed, test current and tensile requirements may be obtained by referencing UL Standard 486A.*

Figure 3  
Test Current, Tensile and Current Cycling Requirements