

# Performance Specification: High Power Connector

REVIEW/REVISION DATE	REVISION CHANGE	REVIEWED/REVISED BY	APPROVED BY
11-27-13	Original Release	R. Brightwell	Engineering Team
1-20-14	Market Release	R. Brightwell	Engineering Team
1-22-14	Official Market Release	C. Slagle	Engineering Team
3-10-14	Updated	R. Brightwell	Engineering Team
5-28-14	Update	J. Harman	Engineering Team
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2-25-20	Format and Style Change	F. Childress	K. Kenyon

## 1. Scope

### 1.1 Content

This specification covers the performance, tests and quality requirements for the High Power contact and connector system. The High Power contact is a separable electrical connection device, designed and tested using 2 AWG Cooner Wire CW6044-14(UL Rated), AS 105-14(Non-UL) wire. All High Power contact types are to be used in High Power connector modules.

### 1.2 Qualification Testing

When tests are performed on subject product line, the following procedures shall be used: All inspections shall be performed using applicable inspection plans and product drawings. Upon completion of qualification testing, this specification will be assigned a number and be classified, as a Product Qualification Report which will be identified in section 2.

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## 2. Applicable Documents

### 2.1 Content

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 a conflict between requirements of this specification and product drawing, product drawing will take precedence. In the event of a conflict between requirements of this specification and referenced documents, this specification shall take precedence.

### 2.2 Documents

#### A. Standards

- AMS 2422
- EIA 364-06
- EIA 364-5
- EIA 364-29
- EIA 364-21
- EIA 364-09
- EIA 364-13
- EIA 364-17B

#### B. Product Drawings

##### Housing

- 510104307
- 510108281
- 510160124
- 510161124

##### Contacts

- 610149101
- 610150101

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## 3. Requirements

### 3.1 Design & Construction

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

### 3.2 Materials

#### A. Female Contact

Body - Copper alloy, Internal Contact Beams - Copper alloy Silver plated  
Gold over Nickel plating per MIL-DTL-45204D

#### B. Male Contact

Body - Copper alloy, IP Tip - Thermoplastic  
Gold over Nickel plating per MIL-DTL-45204D

#### C. Housing

G10 Epoxy Glass or Black PPS

### 3.3 Ratings

#### A. Voltage

AC up to 600VAC peak  
DC up to 600VDC

#### B. Current

2 AWG: 150 ampere maximum

#### C. Temperature

-40°C to 125°C

### 3.4 Performance & Test Description

Product is designed to meet electrical, mechanical, and environmental requirements specified in Figure A. Unless otherwise specified, all tests should be performed at free air, room temperature, ambient environmental conditions.

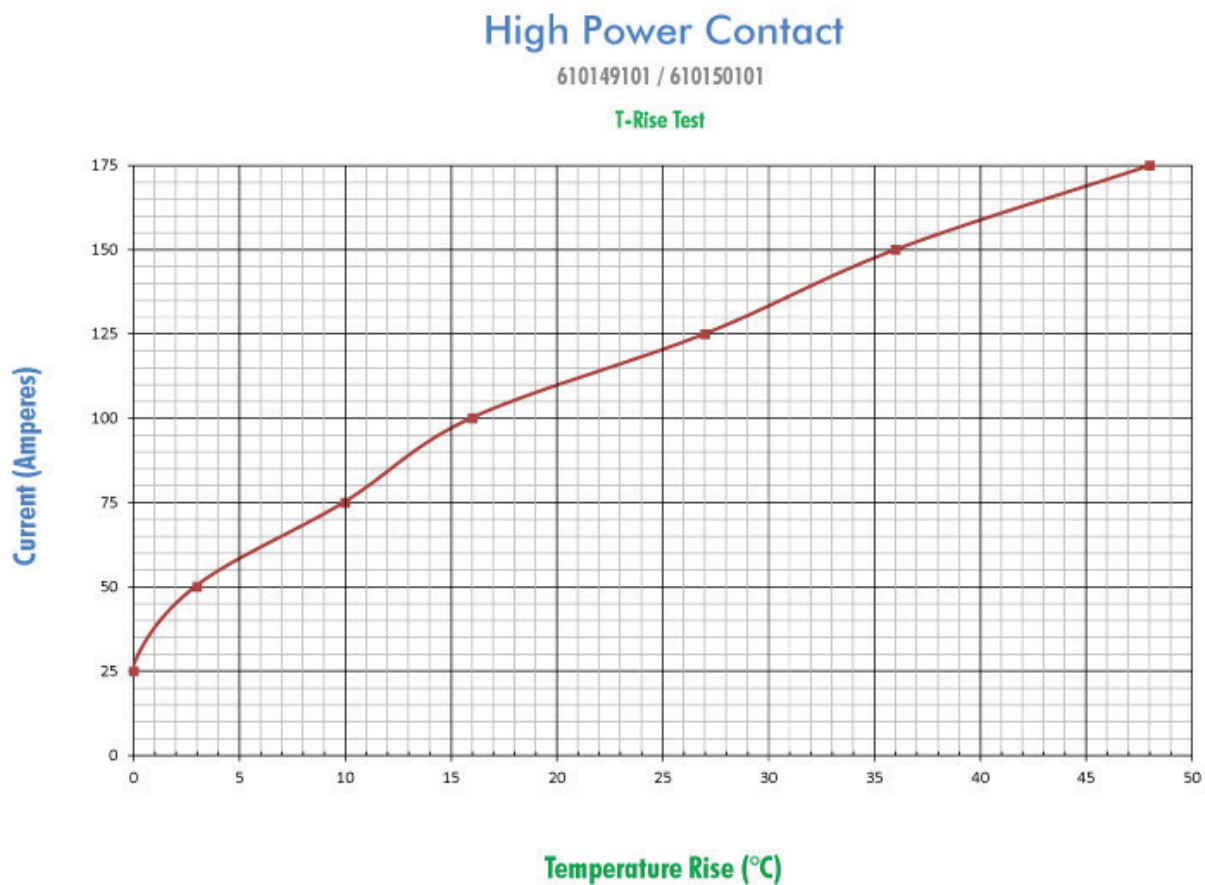
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## 3.5 Test Requirements & Procedures Summary

FIGURE A	TEST DESCRIPTION	REQUIREMENT	PROCEDURE
PREMINARY	Examination of Product	Meets requirements of product drawing	Visual, dimensional, and functional examination per applicable quality inspection plan
ELECTRICAL	Operating Current	150 Amp at 40°C Temperature Rise	EIA-364-70: 100% of pin positions populated and subjected to 150 Amp current with 2 AWG wire
	Contact Resistance	0.35 mOhms max.	EIA-364-06: Subject mated contacts in housing to 100mA and/or Maximum current per wire gage
	Dielectric Withstanding Voltage	600 VAC Peak 600 VDC	EIA-364-20: Test between adjacent contacts in housing, 60 sec. min., < 20mA
MECHANICAL	Durability	< 10000 Cycles	EIA-364-09: Mate and unmate sample for 10000 cycles
	Insertion/retention force	>2 lbf, > 50 lbf	EIA-364-05/EIA-364-29: Measure force necessary to insert and remove samples from a module
	Mating/unmating forces	2.5 lb max. lbf per contact	EIA-364-13: Measure force necessary to engage and disengage samples at a normal rate of engagement of the ITA

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## 3.6 Current Rating Graph- Figure B: Temperature Rise vs. Current



NOTE: Tested and designed to use with Cooner Wire CW6044-14(UL Rated), AS 105-14(Non-UL), or equivalent.

NOTE: For multiple conductor correction factors please reference chart on pg. 5 or <http://www.coonerwire.com/amp chart/>.

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VPC High Power Contacts are tested and designed to use with 2 AWG Cooner Wire CW6044-14(UL Rated), AS 105-14(Non-UL), or equivalent.

Multiple Conductor Correction Factors- Figure C:

Lead Wire Current Carrying Capacity (Ampacity)

AWG SIZE	INSULATED CONDUCTOR TEMPERATURE RATING					
	80°C	90°C	105°C	125°C	150°C	200°C
2	170	190	215	232	255	293

Multiply the ampacity rating from above by the correction factor listed below to determine the ampacity rating of a conductor in a multi-conductor cable.

MULTIPLE CONDUCTOR CORRECTION FACTORS	
NUMBER OF CONDUCTORS	MULTIPLY AMPACITY BY FACTOR
4-6	0.80
7-9	0.70
10-20	0.50

Disclaimer:

The information shown here has been assembled from sources believed to be reliable, but is not guaranteed by Cooner Wire Co. Cooner Wire Co. is not responsible for its accuracy or reliability.

Figure C. Multiple Conductor Correction Factors for 2 AWG wire provided by Cooner Wire.

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## 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. Each test group shall consist of a minimum of 5 connectors containing at least 30 contacts total each and equal posts to mate with receptacles. Test group 1 shall have both minimum and maximum position size connectors.

#### B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure A.

### 4.2 Requalification Testing

If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate re-qualification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

### 4.3 Acceptance

Acceptance is based on verification that product meets requirements of Figure A. Failures attributed to equipment, test set-up or operator deficiencies shall not disqualify product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before re-submittal.

### 4.4 Quality Conformance Inspection

A Certificate of Conformance (C of C) dimensional inspection must be completed for all samples prior to Qualification testing. The applicable quality inspection plan will specify sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with applicable product drawing and this specification.