

Performance Specification: QuadraPaddle Connector

REVIEW/REVISION DATE	REVISION CHANGE	REVIEWED/REVISED BY	APPROVED BY
9-02-03	Original Release	D. Ashby	Engineering Team
1-22-08	Updated & Formatted	E. Husted	Engineering Team
1-23-09	Updated Current Specification	E. Husted	Engineering Team
6-30-09	Add Bandwith Specification	E. Husted	Engineering Team
9-22-09	Updated	E. Husted	Engineering Team
5-17-12	Updated Mating Force	J. Vogan	Engineering Team
7-11-12	Updated Part Numbers	E. Ballester	Marketing Team
8-1-12	Updated Specs	E. Ballester	Marketing Team
10-22-12	Add Shock & Vibration	D. Ashby	Engineering Team
2-13-18	Changed Mating Force/ Contact	A. Leger	Engineering Team
2-13-20	Format & Style Change	F. Childress	K. Kenyon

1. Scope

1.1 Content

This specification covers the performance, tests and quality requirements for the QuadraPaddle Connector and connector system. This contact is a separable electrical connection device for mating to a .025 inch round or square post. The crimped type of contact can be used with 22 to 30 AWG wire sizes. QuadraPaddle contacts are to be used with connector modules with .100 inch centerline spacing.

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. EIA Standards

- EIA-364-05
- EIA-364-06
- EIA-364-09
- EIA-364-13
- EIA-364-17
- EIA-364-20
- EIA-364-21
- EIA-364-27

B. Product Drawings

Housing

- 510150130
- 510150115
- 510150105

Contacts

- 610138100
- 610138116
- 610138109
- 610138117
- 610138200
- 610138216

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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

Beryllium Copper
Gold over nickel plating

B. Male Contact

Brass
Gold over nickel plating per MIL-DTL-45204D

C. Housing

Plastic, Glass filled, Liquid Crystal Polymer

3.3 Ratings

A. Voltage

600 volt Max. DC or Peak AC, use of wire Mil-W-16878/4

B. Current

Low Level:	See 3.5
22 AWG:	5 ampere maximum
28 AWG:	1.4 ampere maximum

C. Temperature

-50°C to +105°C

3.4 Performance & Test Description

Product is designed to meet electrical, mechanical, and environmental requirements specified in Figure 3.5. 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

TABLE 3.1	TEST DESCRIPTION	REQUIREMENT	PROCEDURE
PREMINARY	Examination of Product	Meets requirements of product drawing	Visual, dimensional, and functional examination per applicable quality inspection plan
	ELECTRICAL	Termination Resistance: Double Female Contact	25 mΩ maximum initial
35 mΩ maximum final			
Termination Resistance: Wire Crimped Contact		25 mΩ maximum initial	
		35 mΩ maximum final	
Insulation Resistance		5000 MΩ minimum initial	EIA-364-21: Test between adjacent contacts assembled in housing at 500VDC
		1000 MΩ minimum final	
Dielectric Withstanding Voltage		1500 VDC test voltage at sea level	EIA-364-20: Test between adjacent contacts at 0.5 mA
Current Rating		30° C maximum temperature rise	Test temperature rise in housing loaded with contacts subjected to a variable current – see Figure 4
Low Level	Voltage drop of $\leq 3 \mu\text{V}$	EIA-364-06: Test signal of 5 mVDC at 100μA	
Bandwidth	Maximum rolloff of -3dB	DC to 1.2 GHz - see Figure 5	
MECHANICAL	Durability	See test sequence: Figure 6	EIA-364-09: Mate and unmate sample for 20000 cycles
	Retention Force: Receiver Wire Crimp Contact	Contact shall not dislodge	EIA-364-29: Apply axial load of 5 lbs to contact
	Retention Force: ITA Contact	Contact shall not dislodge	EIA-364-29: Apply axial load of 3 lbs to contact
	Insertion Force: Receiver Wire Crimp Contact	Force to insert contacts into module ≤ 1.0 lbs	EIA-364-05
	Insertion Force: Double Female Contact	Force to insert contacts into module ≤ 2.0 lbs	
	Insertion Force: ITA Contact	Force to insert contacts into module ≤ 1.0 lbs	
	Mating Force	4.0 oz. force per contact	EIA-364-13: Measure force necessary to mate samples at a normal rate of engagement of the ITA
	Unmating Force	≤ 2.5 oz. force per contact	EIA-364-13: Measure force necessary to unmate samples at a normal rate of disengagement of the ITA

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3.5 Test Requirements & Procedures Summary

TABLE 3.1	TEST DESCRIPTION	REQUIREMENT	PROCEDURE
ENVIRONMENTAL	Temperature Life	See test sequence: Figure 6	EIA-364-17: Subject mated samples to temperature life at 105°C for 500 hours
	Vibration	Sine 15g's,10-2000Hz Random 11.6g's,50-2000Hz	EIA-364-28 Test Condition III EIA-364-28 Test Condition D
	Shock	50 g's, 11ms, ½ Sine Wave	EIA-364-27 Test Condition A

3.6 Termination Resistance Measurement Setup

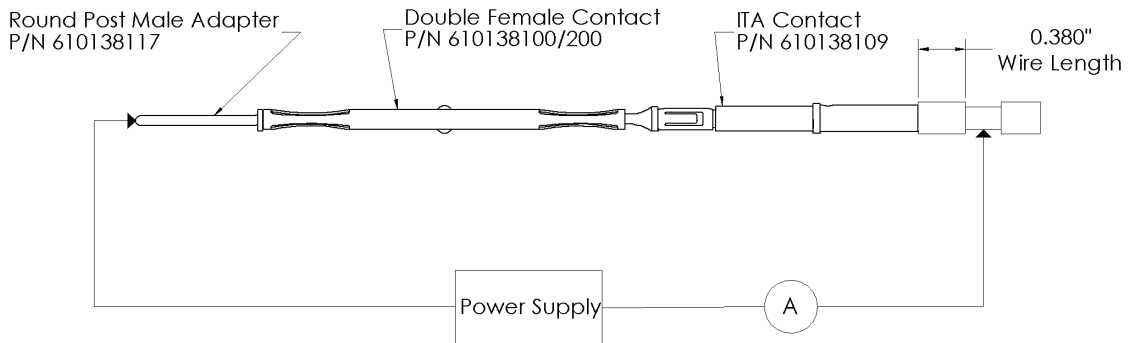


Figure 2. Termination Resistance Measurement Points- Double Female contact

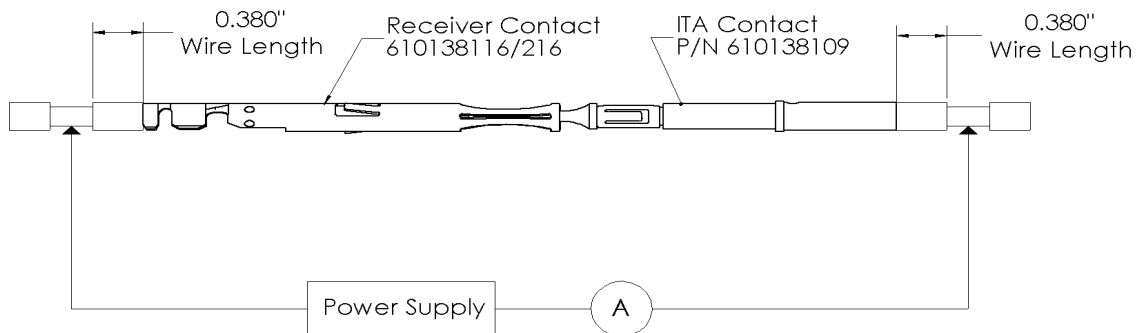


Figure 3. Termination Resistance Measurement Points - Wire Crimp Contact

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3.7 Current Rating Graph

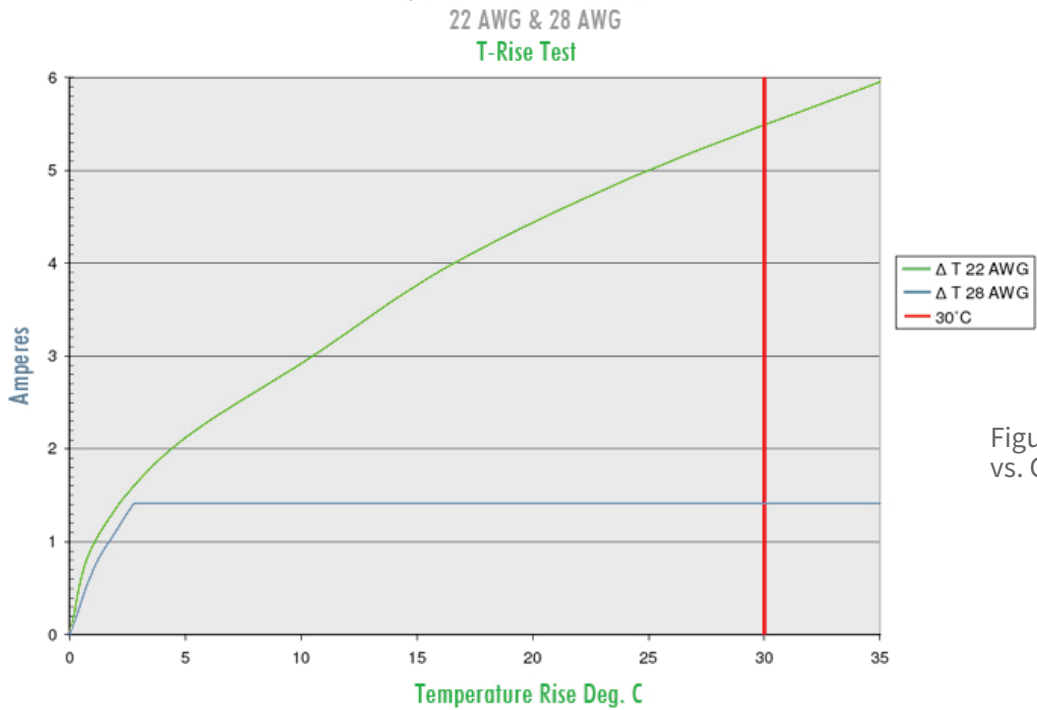


Figure 4. Temperature Rise vs. Current

3.8 Bandwidth Graph

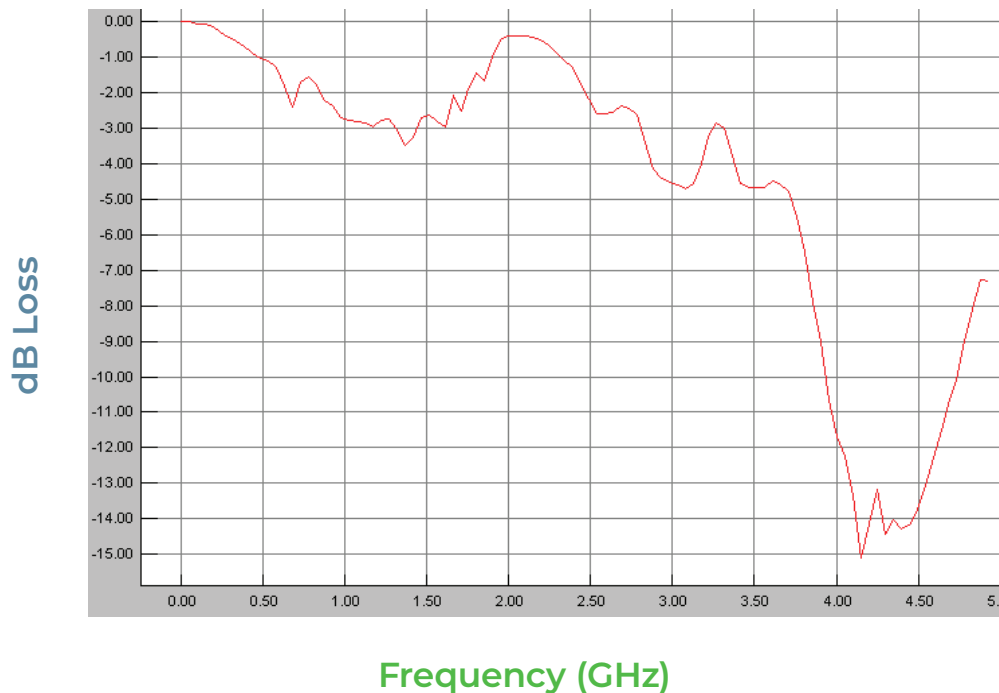


Figure 5. Male to Female QuadraPaddle connectors de-embedded (-3 dB at 1.2 GHz)

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3.9 Product Qualification & Requalification Test Sequence

TABLE 3.9 TEST OR EXAMINATION	TEST GROUP				
	I	II	III	IV	V
Examination of Product	1, 7	1, 5	1, 4	1	1
Termination Resistance	3, 5	2, 4			
Insulation Resistance			2		
Dielectric Withstanding Voltage			3		
Durability	4				
Contact Retention				3	
Mating Force	2				
Unmating Force	6				
Temperature Life		3			
Current Rating			5		
Contact Installation Force				2	
Bandwidth					2

*Test Sequence: Numbers indicate the sequence in which the tests are preformed. For test group sample selection see 4.1 A.

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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. All test groups shall each 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 3.9.

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 1. 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.