



## Product Performance Specifications QuadraPaddle Connector

### 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.

### 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
- EIA-364-28
- EIA-364-29

##### B. Product Drawings

###### Housings

- 510150130
- 510150115
- 510150105

###### Contacts

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

### 3. Requirements

#### 3.1 Design and 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 para. 3.5
  - 22 AWG: 5 ampere maximum
  - 28 AWG: 1.4 ampere maximum
- C. Temperature
  - -50°C to +105°C

#### 3.4 Performance and Test Description

Product is designed to meet electrical, mechanical, and environmental requirements specified in Figure 1. Unless otherwise specified, all tests should be performed at free air, room temperature, and ambient environmental conditions.

3.5 Test Requirements and Procedures Summary

|               | Test Description                              | Requirement                                      | Procedure   |
|---------------|---|--|---|
| Preliminary   | 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                            | EIA-364-06: Subject mated contacts assembled in housing to 50 mV maximum open circuit at 100 mA maximum. See figures 2 and 3. |
|               |   | 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 ≤ 3 μV                        | 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                                  | 6.0 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                            |
| 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<br>Random 11.6g's,50-2000Hz | EIA-364-28 Test Condition III<br>EIA-364-28 Test Condition D  |
|               | Shock   | 50 g's, 11ms, 1/2 Sine Wave                      | EIA-364-27 Test Condition A   |

Figure 1. Test Requirements and Procedure Summary

3.6 Termination Resistance Measurement Setup

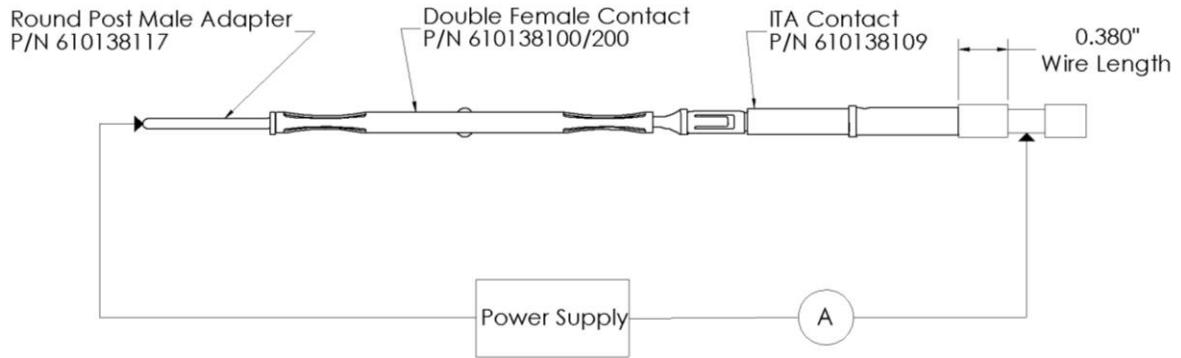


Figure 2. Termination Resistance Measurement Points - Double Female contact

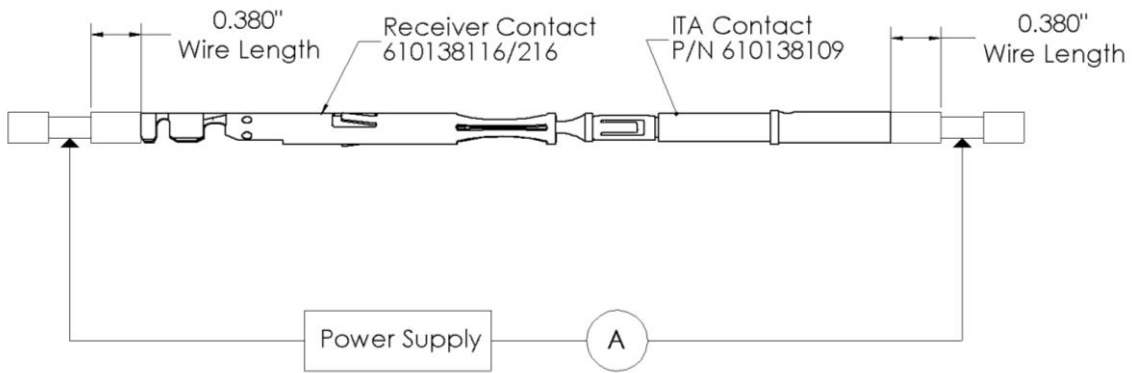


Figure 3. Termination Resistance Measurement Points - Wire Crimp Contact

3.7 Current Rating Graph

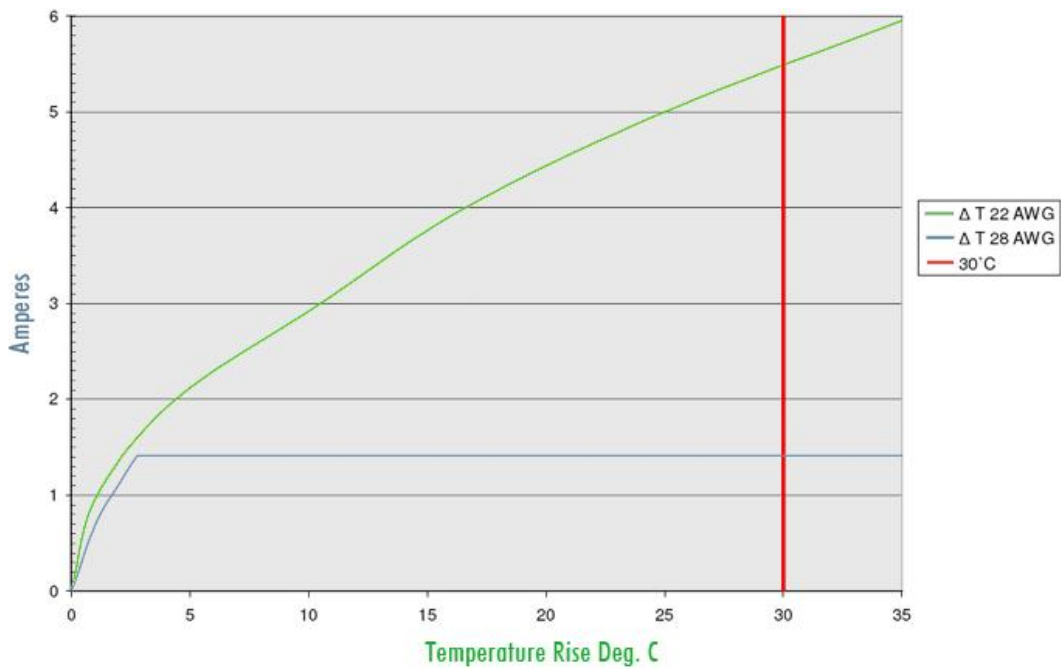


Figure 4. Temperature Rise vs. Current

3.8 Bandwidth Graph

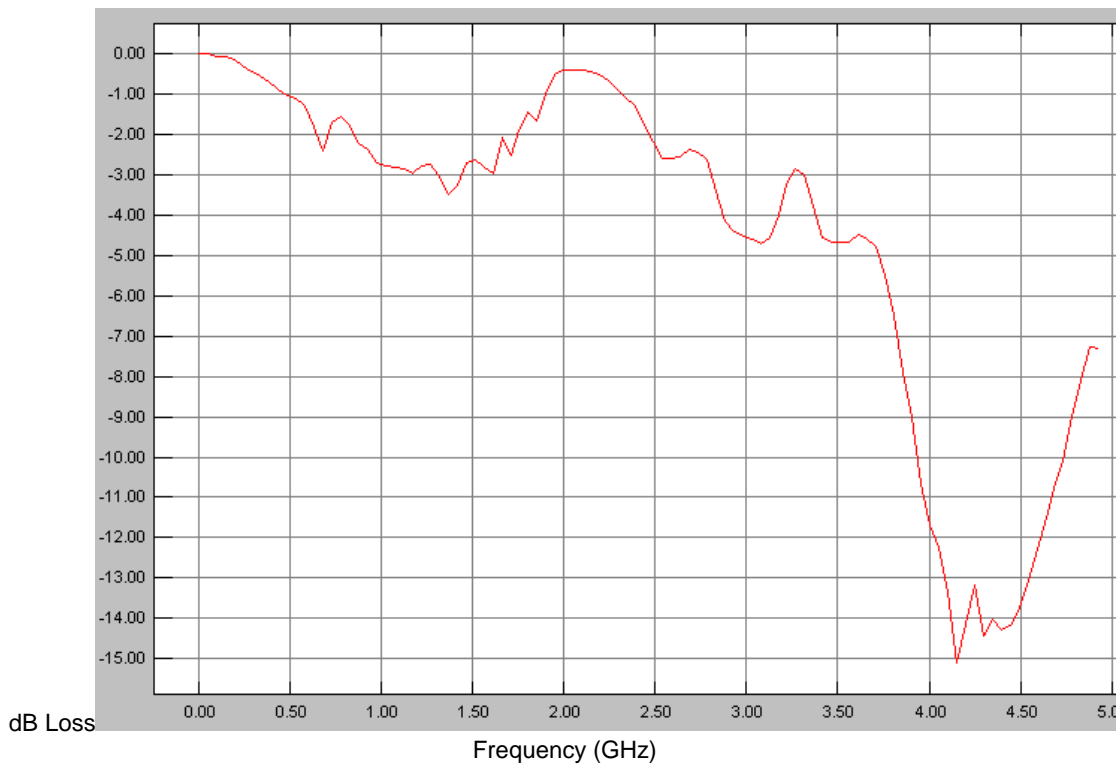


Figure 5. Male to Female QuadraPaddle connectors de-embedded (-3 dB at 1.2 GHz)

3.9 Product Qualification and Requalification Test Sequence

| 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 |

Figure 6. Test Sequence

Numbers indicate the sequence in which the tests are performed. For test group sample selection see 4.1 A.

#### 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 6.

##### 4.2 Requalification Testing

If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification 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.

| Rev | Date     | Rev Change                    | Prepared By  |
|-----|----------|-------------------------------|--------------|
| 1   | 9/2/03   | Original release              | D. Ashby     |
| 2   | 1/22/08  | Updated and Formatted         | E. Husted    |
| 3   | 1/23/09  | Updated Current Specification | E. Husted    |
| 4   | 6/30/09  | Add Bandwidth Specification   | E. Husted    |
| 5   | 9/22/09  | Updated                       | E. Husted    |
| 6   | 5/17/12  | Updated Mating Force          | J. Vogan     |
| 7   | 7/11/12  | Updated Part Numbers          | E. Ballester |
| 8   | 8/1/12   | Updated Specs                 | E. Ballester |
| 9   | 10/22/12 | Add Shock & Vibration         | D Ashby      |