

**NOTE**

The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, TE Connectivity (TE) makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, TE may change these requirements based on the results of additional testing and evaluation. Contact TE Engineering for further details.

187 Positive Lock Receptacle

1. SCOPE**1.1. Content**

This specification covers performance, tests, and quality requirements 187 Positive lock terminals.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 2 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS AND FORMS

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. TE Connectivity Specifications

| | |
|------------|--|
| 114-106654 | Application Specification – Straight receptacles with F crimping |
| 501-106654 | Qualification test report |

2.2. Commercial Standards and Specifications

| | |
|-----------|--|
| IEC 61210 | Flat quick-connect terminations for electrical copper conductors - Safety requirements |
| IEC 60512 | International Standard – Connectors for Electronic Equipment – Tests and Measurements |
| EIA-364 | Electrical Connector/Socket Test Procedures Including Environmental Classifications |

“For undated standards and specifications, the latest edition of the reference document applies.”

2.3. Reference Documents

| | |
|-------|----------------------------------|
| 109-1 | General Requirements for Testing |
|-------|----------------------------------|

3. REQUIREMENTS**3.1. Design and Construction**

Product shall be of the design, construction, materials 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 TE drawing.

3.3. Ratings

- A. Voltage Rating: 600 VAC
- B. Temperature Rating :

1. Brass Contacts (Tin Plated or Un-plated): 110°C (maximum) for FASTON Standard

C. Current Rating: See Figure 1.

| Cat. | Wire Size | | Current [A] |
|------------|-----------|-----------------|-------------|
| | AWG | mm ² | |
| 187 Series | 14 | 2.1 | 15 |
| | 16 | 1.3 | 10 |
| | 18 | 0.82 | 7 |
| | 20 | 0.52 | 4 |
| | 22 | 0.32 | 3 |

Figure 1

3.4. Performance Requirements and Test Description

The product should meet the electrical, mechanical and environmental performance requirements specified in Figure 2. All tests shall be performed at ambient environmental conditions otherwise specified.

3.5. Test Requirements and Procedure Summary

| TEST DESCRIPTION | REQUIREMENT | PROCEDURE |
|------------------------|---|---|
| Examination of Product | Meets requirements of product drawing and TE application specification. Parts show no signs of damage or physical change. | EIA-364-18 Visual, dimensional and functional as per applicable inspection plan. |
| ELECTRICAL | | |
| Contact resistance, | Initial: 3 milliohms (mΩ) maximum Final: 6 milliohms (mΩ) maximum | IEC 60512-2-2 Subject the mating terminals to 1A(DC) current and 2 V maximum open circuit voltage. After temperature has stabilized, probe 2 points on the mated tab contact that with one point 75 mm from the wire crimp. Calculate resistance after deducting bulk wire |
| Temperature rise | Temperature rise of any individual termination shall not exceed 30°C when subjected to the specified current indicated in Figure 1. | IEC 60512-5-1 Measure temperature rise above ambient created by the energizing current. Measurement must be taken in a place where there is no influence from air convection. Temperature rise = Temperature of contact – Ambient temperature |

| TEST DESCRIPTION | REQUIREMENT | | PROCEDURE |
|----------------------------------|--|--|---|
| MECHANICAL | | | |
| Crimp Tensile Strength | Wire Size [AWG] | Min. Tensile Force [N (lbs)] | IEC 61210 Operation Speed: 25.4 mm/min Measure the force required to break or pull-out wire from wire barrel crimp. Insulation barrel crimp shall not be fully closed. Damage to other portions of terminals acceptable. May require custom fixturing to hold terminal without deforming the wire crimp barrel. |
| | 22 [0.32] | 36 (8) | |
| | 20 [0.52] | 58 (13) | |
| | 18 [0.82] | 89 (20) | |
| | 16 [1.3] | 133 (30) | |
| | 14 [2.1] | 223(50) | |
| Insertion Force | 27N maximum | IEC 60512-13-2 Operation Speed: 50 mm/min Max Apply an axial push force mate the tab to receptacle terminal. (plain test tab) | |
| Retention Force | 59.0N min. | IEC 60512-13-2 Operation Speed: 50 mm/min max. Measure the force required to Apply an axial pull force to release the tab from the receptacle (plain test tab) | |
| Vibration | No physical damage. No discontinuities ≥ 1 microsecond | EIA-364-28, Test Condition I Subject mated connectors to 10-55-10 Hz traversed in 1 minute at 1.52mm amplitude 2 hours each of 3 mutually perpendicular planes. | |
| ENVIRONMENTAL | | | |
| Temperature and humidity cycling | See note | EIA-364-31, Condition A, Method II Subject mated contacts to environment at 40±5°C and 90-95% RH for 96 hours. Sample shall be placed in the chamber out of the path of falling water drops. Measurement shall be taken upon completion of exposure period. | |
| Current cycling | Test current 30A for 14AWG Temperature rise between T1 and T2 shall not exceed 15°C. Neither T1 nor T2 shall exceed 85°C. | IEC 61210 Subject terminals to 500 cycles. T1 shall be measured after the 24 th cycle and T2 shall be measured after the 500 th cycle. Terminals terminated overload test current to be 200% of the nominal test current. One cycle include 45 minutes on and 15 minutes off. | |

| | | |
|---------------------------|---|---|
| Elevated temperature test | Test current 20A for 16AWG Temperature rise shall not exceed 45°C. | IEC 61210 Subject terminals in a heating cabinet at 60 °C. The samples are subjected to eight cycles of elevated temperature. Each cycle consists of 23 hours applying the test current as specified |
| Temperature life | See note | EIA-364-17, Method A, Test condition 4. Mate connector exposed to the condition of 105±2°C for 96 hours. Recovery time 1~2 hours Mate connector exposed to the condition of -40±2°C for 96 hours. Recovery time 1~2 hours |
| Salty spray | Final Termination Resistance: 6mΩ (maximum) | EIA-364-26, Test condition A Subject mated specimen to 5% salty condition for 96 hours. After this test, rinse the samples in water, sit it for 1 hour for drying at room temperature of 38 °C ±3 °C. |

Figure 2 (end)


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 3.

3.6. Product Qualification and Requalification Test Sequence

| TEST OR EXAMINATION | TEST GROUP | | | | | |
|----------------------------------|-------------------|-----|-----|-----|---------|------|
| | A | B | C | D | E | F |
| | TEST SEQUENCE (b) | | | | | |
| Examination of product | 1,4 | 1,3 | 1,3 | 1,4 | 1,9 | 1, 3 |
| Insertion force | 2 | | | | | |
| Withdrawal force | 3 | | | | | |
| Contact resistance | | | | | 2,4,6,8 | |
| Crimp tensile strength | | 2 | | | | |
| Current cycling | | | 2 | | | |
| Temperature life | | | | | 7 | |
| Temperature rise | | | | 2 | | |
| Temperature and humidity cycling | | | | | 5 | |
| Salty spay | | | | | | 2 |
| Elevated temperature test | | | | 3 | | |
| Vibration | | | | | 3 | |

Figure 3


NOTE

- (a) Samples shall be prepared in accordance with applicable instruction sheets. They shall be selected at random from current production.
- (b) Numbers indicate sequence in which tests are performed.

4. QUALITY ASSURANCE PROVISIONS

4.1. Test Conditions

Unless otherwise specified, all the tests shall be performed in any combination of the following test conditions shown in Figure 4.

| | |
|----------------------|------------------|
| Temperature | 15°C – 35°C |
| Relative Humidity | 45% – 75% |
| Atmospheric Pressure | 86.6 – 106.6 kPa |

Figure 4

4.2. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 3.

4.3. 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.

4.4. Acceptance

Acceptance is based on verification that the product meets the requirements in Figure 2. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.5. 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.

Note : Wire sizing based upon UL1015 wire

| AWG | CMA | Stranding Strands Φ inch |
|-----|------|-----------------------------|
| 22 | 700 | 7 x 0.0100 |
| 20 | 1000 | 10 x 0.0100 |
| 18 | 1600 | 16 x 0.0100 |
| 16 | 2600 | 26 x 0.0100 |

| | | |
|----|------|-------------|
| 14 | 4100 | 41 X 0.0100 |
|----|------|-------------|