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**NETCONNECT\* Toolless Jacks**

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**1. SCOPE****1.1. Content**

This specification covers performance, test and quality requirements for NETCONNECT\* toolless jacks. These assemblies are designed for installation into various face plates, surface mount boxes, panels, and other similar type fittings. They incorporate IDC terminals for terminating both shielded and unshielded twisted pair communications cable. Toolless jacks will accommodate 22 to 24 AWG solid conductors and 24 AWG stranded conductors. The maximum conductor insulation diameter is 1.14 mm [0.045 in].

**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 in Feb00. Additional testing using 24 AWG stranded conductors was completed in Aug01. The Qualification Test Report number for this testing is 501-505. This documentation is on file at and available from Engineering Practices and Standards (EPS).

**2. APPLICABLE DOCUMENTS**

The following TE Connectivity (TE) 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.

- 109-1: General Requirements for Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- 408-4542: Instruction Sheet
- 501-505: Qualification Test Report

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

Product shall be of the 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

- Voltage: 150 volts AC
- Current: Signal application only
- Temperature: -10 to 70°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.                                       | Visual, dimensional and functional per applicable quality inspection plan.                                                                                                                                    |
| ELECTRICAL                         |                                                                              |                                                                                                                                                                                                               |
| Termination resistance, overall.   | $\Delta R$ 20 milliohms maximum .                                            | TE Spec 109-6-6 (Rev H).<br>Subject specimens to 20 mv maximum open circuit at 100 ma maximum.<br>See Figure 3.                                                                                               |
| Insulation resistance.             | 100 megohms minimum.                                                         | TE Spec 109-28-4 (Rev F).<br>Test between adjacent contacts of mated specimens.                                                                                                                               |
| Dielectric withstanding voltage.   | 1000 volts AC at sea level.<br>1 minute hold with no breakdown or flashover. | TE Spec 109-29-1 (Rev F).<br>Test between adjacent contacts of mated specimens.                                                                                                                               |
| MECHANICAL                         |                                                                              |                                                                                                                                                                                                               |
| Vibration, sinusoidal.             | No discontinuities of 1 microsecond or longer duration.<br>See Note.         | TE Spec 109-21-1 (Rev J).<br>Subject mated specimens to 10-55-10 Hz traversed in 1 minute with .06 inch maximum excursion. 1 hour and 45 minutes in each of 3 mutually perpendicular planes.                  |
| Mechanical shock, specified pulse. | No discontinuities of 1 microsecond or longer duration.<br>See Note.         | TE Spec 109-26-1 (Rev D).<br>Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. |
| Durability, jack interface.        | See Note.                                                                    | TE Spec 109-27 (Rev D).<br>Mate and unmate jack interface with latch inoperative for 750 cycles at a maximum rate of 600 cycles per hour.                                                                     |

Figure 1 (continued)

| Test Description        | Requirement                        | Procedure                                                                                                                                         |
|-------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Durability, jack IDC.   | See Note.                          | TE Spec 109-27 (Rev D).<br>Terminate and reterminate IDC contact for 30 cycles.                                                                   |
| Mating force.           | 10 pounds maximum.                 | TE Spec 109-42 (Rev E), Condition A.<br>Measure force necessary to mate specimens with latch depressed at a maximum rate of .5 inch per minute.   |
| Unmating force.         | 5 pounds maximum.                  | TE Spec 109-42 (Rev E), Condition A.<br>Measure force necessary to unmate specimens with latch depressed at a maximum rate of .5 inch per minute. |
| Plug retention in jack. | Plug shall not dislodge from jack. | Apply axial load of 20 pounds to plug housing at a rate of .5 inch per minute with plug mated in jack and latch engaged.                          |

#### ENVIRONMENTAL

|                               |           |                                                                                                                                     |
|-------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------|
| Thermal shock.                | See Note. | TE Spec 109-22 (Rev C).<br>Subject mated specimens to 100 cycles between -40 and 70°C.                                              |
| Humidity-temperature cycling. | See Note. | TE Spec 109-23-4 (Rev J), Condition C.<br>Subject mated specimens to 21 cycles between 25 and 65°C at 95% RH with -10°C cold shock. |
| Temperature life.             | See Note. | TE Spec 109-43 (Rev E).<br>Subject mated specimens to temperature life at 70°C for 500 hours.                                       |
| Mixed flowing gas.            | See Note. | TE Spec 109-85-2 (Rev N).<br>Subject mated specimens to environmental class IIA for 14 days.                                        |

#### 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 2.*

Figure 1 (end)

## 3.6. Product Qualification and Requalification Test Sequence

| Test or Examination             | Test Group (a)    |      |      |     |      |     |     |
|---------------------------------|-------------------|------|------|-----|------|-----|-----|
|                                 | 1                 | 2    | 3    | 4   | 5    | 6   | 7   |
|                                 | Test Sequence (b) |      |      |     |      |     |     |
| Examination of product          | 1,9               | 1,5  | 1,5  | 1,7 | 1,7  | 1,3 | 1,5 |
| Termination resistance, overall | 3,7               | 2,4  | 2,4  |     | 2,6  |     | 2,4 |
| Insulation resistance           |                   |      |      | 2,6 |      |     |     |
| Dielectric withstanding voltage |                   |      |      | 3,  |      |     |     |
| Vibration                       | 5                 |      |      |     |      |     |     |
| Mechanical shock                | 6                 |      |      |     |      |     |     |
| Durability, jack interface      | 4                 |      |      |     | 3(c) |     |     |
| Durability, jack IDC            |                   |      |      |     |      |     | 3   |
| Mating force                    | 2                 |      |      |     |      |     |     |
| Unmating force                  | 8                 |      |      |     |      |     |     |
| Plug retention in jack          |                   |      |      |     |      | 2   |     |
| Thermal shock                   |                   |      |      | 4   | 4    |     |     |
| Humidity-temperature cycling    |                   |      |      | 5   | 5    |     |     |
| Temperature life                |                   | 3(d) |      |     |      |     |     |
| Mixed flowing gas               |                   |      | 3(d) |     |      |     |     |

**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Perform 100 cycles on jack interface before thermal shock, 33 cycles after 50 cycles of thermal shock, 33 cycles after 7 days of humidity-temperature cycling, and 34 cycles after 21 days of humidity-temperature cycling.
- (d) Precondition jack interface with 10 cycles durability.

Figure 2

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#### **4. QUALITY ASSURANCE PROVISIONS**

##### **4.1. Qualification Testing**

###### **A. Specimen Selection**

Specimens 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 specimens with 23 AWG wire. Five additional specimens using 24 AWG stranded wire were prepared for test group 7 testing.

###### **B. Test Sequence**

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

##### **4.2. Requalification Testing**

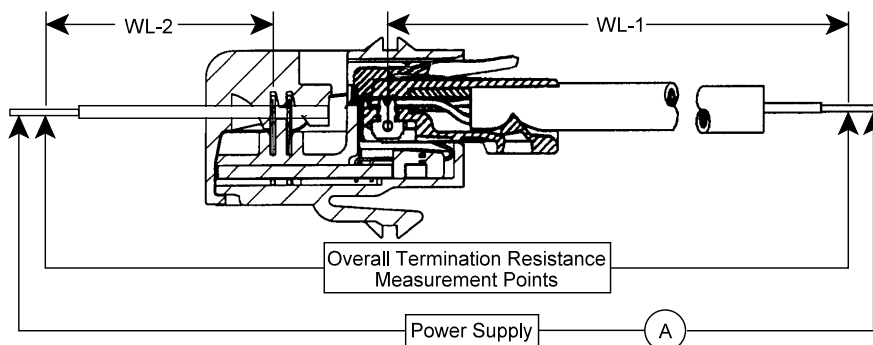
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

##### **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 specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

##### **4.4. 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**

- (a) Termination resistance of this assembly consists of plug to jack contact resistance plus printed circuit board trace plus IDC terminal to discrete wire contact resistance. Printed circuit board trace length varies with each jack position, therefore, significant variations in termination resistance readings can be expected within each jack assembly.
- (b) Millivolt drop (resistance) due to wire lengths shall be subtracted from all readings.

Figure 3  
Overall Termination Resistance Measurement Points