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**Connector, Flat Cable Round Conductor, AMP-LATCH\* Novo  
Receptacles**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for AMP-LATCH\* Novo assembly flat cable round conductor connector receptacles.

## 1.2. Connector Assembly Definition

Receptacle contacts crimped to .050 inch centerline ribbon cable, conductors (28 and 26 solid and 28 and 26 stranded) AWG. Complete assemblies mate to .025 inch square posts on .100 inch centerline with equivalent post length of  $.210 \pm .035$  inch.

## 1.3. Qualification

When tests are performed on subject product line, procedures specified Figure 1 shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

## 1.4. Successful qualification testing on the subject product line was completed on 06Jun91. The Qualification Test Report number for this testing is 501-45. Additional testing was completed on 31Oct08. This documentation is on file at and available from Engineering Practices and Standards (EPS).

**2. APPLICABLE DOCUMENTS**

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, latest edition of the document applies. In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification shall take precedence.

## 2.1. TE Connectivity (TE) Documents

- 109-1: General Requirements for Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- 114-40005: Application Specification (Connector, Ribbon Cable, AMP-LATCH\*, Application Of)
- 501-45: Qualification Test Report (Connector, Flat Cable Round Conductor, AMP-LATCH\* Novo Receptacles)

## 2.2. Reference Document

501-45-1: Qualification Test Report (Connector, Flat Cable, Round Conductor, AMP-LATCH\* Novo Receptacles)

**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. Material

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Ratings

- Current: 1 ampere maximum (single circuit energized), see Para 3.5.(b)
- Operating temperature: -65 to 105°C, unless limited by temperature rating of cable used

**NOTE**

*Continuous current rating for individual contacts cannot be applied directly to the number of contacts as they are dependent on thermal and physical properties of the materials. System design shall assure that continuous current rating does not create internal hot spots that exceed temperature designated by connector specification during steady state or transient conditions.*

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 are 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 and Application Specification 114-40005.                  | Visual, dimensional and functional per applicable quality inspection plan.   |
| <b>ELECTRICAL</b>                    |   |  |
| Termination resistance, dry circuit. | 15 milliohms maximum.   | TE Spec 109-6-1.<br>Subject mated contacts assembled in housing to 50 millivolt open circuit at 100 milliamperes.<br>See Figure 3.                                   |
| Insulation resistance.               | 5000 megohms minimum initial.<br>1000 megohms minimum final after humidity/temperature cycling. | TE Spec 109-28-4.<br>Test between adjacent contacts within a row and contacts in adjacent row of unmated and unterminated connectors.                                |
| Dielectric withstanding voltage.     | One minute hold with no breakdown or flashover.   | TE Spec 109-29-1.<br>1000 volts DC at sea level.<br>Test between adjacent contacts within a row and contacts in adjacent row of unmated and unterminated connectors. |
| <b>MECHANICAL</b>                    |   |  |
| Random vibration.                    | No discontinuity greater than 1 microsecond.<br>See Note (a).                                   | TE Spec 109-21-5, Test level G.<br>Subject wired and mated connectors to 23.91 Gs rms, 20 minutes each plane.<br>See Figure 4.                                       |

Figure 1 (continued)

| Test Description              | Requirement  | Procedure  |
|-------------------------------|--|--|
| Physical shock.               | No discontinuity greater than 1 microsecond.<br>See Note (a).  | TE Spec 109-26-9.<br>Subject rigid mount wired and mated connectors to 100 Gs sawtooth shock pulses of 6 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 shocks total.   |
| Connector mating force.       | 12 ounces maximum per contact.   | TE Spec 109-42, Condition A.<br>Measure force necessary to mate connector for first mating. Calculate mating force per contact by dividing mating force by number of contacts.   |
| Connector unmating force.     | 1.5 ounces minimum per contact.  | TE Spec 109-42, Condition A.<br>Measure force necessary to unmate connector after first mating. Calculate unmating force per contact by dividing unmating force by number of contacts.   |
| Durability.                   | Termination resistance, dry circuit.<br>See Note (b).  | TE Spec 109-27.<br>Mate and unmate 15 $\mu$ in gold plated connectors or equivalent 3 $\mu$ in gold over 12 $\mu$ in palladium nickel for 75 cycles. Mate and unmate 30 $\mu$ in gold plated connectors or equivalent 3 $\mu$ in gold over 27 $\mu$ in palladium nickel for 150 cycles at maximum rate of 150 cycles per hour. |
| <b>ENVIRONMENTAL</b>          |  |  |
| Thermal shock.                | Termination resistance, dry circuit.<br>Insulation resistance.<br>Dielectric withstanding voltage.<br>See Note (c).<br>See Note (d). | TE Spec 109-22.<br>Subject unwired and unmated connectors of Test Group 2 and wired and mated connectors of Test Group 4 to 5 cycles between -65 and 105°C.  |
| Humidity/temperature cycling. | Insulation resistance.<br>Dielectric withstanding voltage.<br>See Note (a).  | TE Spec 109-23, Condition B, Method III less step 7(b).<br>Subject mated and unterminated connectors to 10 days humidity/temperature cycling at 25 to 65°C and 80 to 98% RH, 5 cold shocks at -10°C.   |
| Mixed flowing gas.            | Termination resistance, dry circuit.<br>See Note (a).  | TE Spec 109-85-3.<br>Subject mated connectors to environmental class III for 20 days.  |

Figure 1 (continued)

| Test Description  | Requirement   | Procedure   |
|-------------------|---|---|
| Temperature life. | Termination resistance, dry circuit.<br>See Note (a). | TE Spec 109-43, Test Level 10, Duration C.<br>Subject wired and mated connectors to temperature life. |

- NOTE**
- (a) Shall remain mated and show no evidence of damage, cracking or chipping.
  - (b) Shall show no evidence of damage, cracking or chipping.
  - (c) Unless limited by temperature rating of cable used.
  - (d) Shall show no evidence of damage, cracking or chipping.

Figure 1 (end)

3.6. Connector Tests and Sequence

| Test or Examination                 | Test Group (a)    |     |     |     |     |
|-------------------------------------|-------------------|-----|-----|-----|-----|
|                                     | 1                 | 2   | 3   | 4   | 5   |
|                                     | Test Sequence (b) |     |     |     |     |
| Examination of product              | 1,9               | 1,8 | 1,5 | 1,5 | 1,5 |
| Termination resistance, dry circuit | 3,7               |     | 2,4 | 2,4 | 2,4 |
| Insulation resistance               |                   | 2,6 |     |     |     |
| Dielectric withstanding voltage     |                   | 3,7 |     |     |     |
| Random vibration                    | 5                 |     |     |     |     |
| Physical shock                      | 6                 |     |     |     |     |
| Connector mating force              | 2                 |     |     |     |     |
| Connector unmating force            | 8                 |     |     |     |     |
| Durability                          | 4                 |     |     |     |     |
| Thermal shock                       |                   | 4   |     | 3   |     |
| Humidity/temperature cycling        |                   | 5   |     |     |     |
| Mixed flowing gas                   |                   |     | 3   |     |     |
| Temperature life                    |                   |     |     |     | 3   |

- NOTE**
- (a) See paragraph 4.1.A.
  - (b) Numbers indicate sequence in which tests are performed.

Figure 2

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#### 4. QUALITY ASSURANCE PROVISIONS

##### 4.1. Qualification Testing

###### A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. All test groups shall consist of a minimum of 6 connectors. Five contact circuits in each connector shall be randomly selected and identified, unless otherwise specified, these contacts shall be used for all measurements.

###### B. Test Sequence

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

##### 4.2. Requalification Testing

If changes 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. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

##### 4.4. Quality Conformance Inspection

The applicable quality inspection plan will specify sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

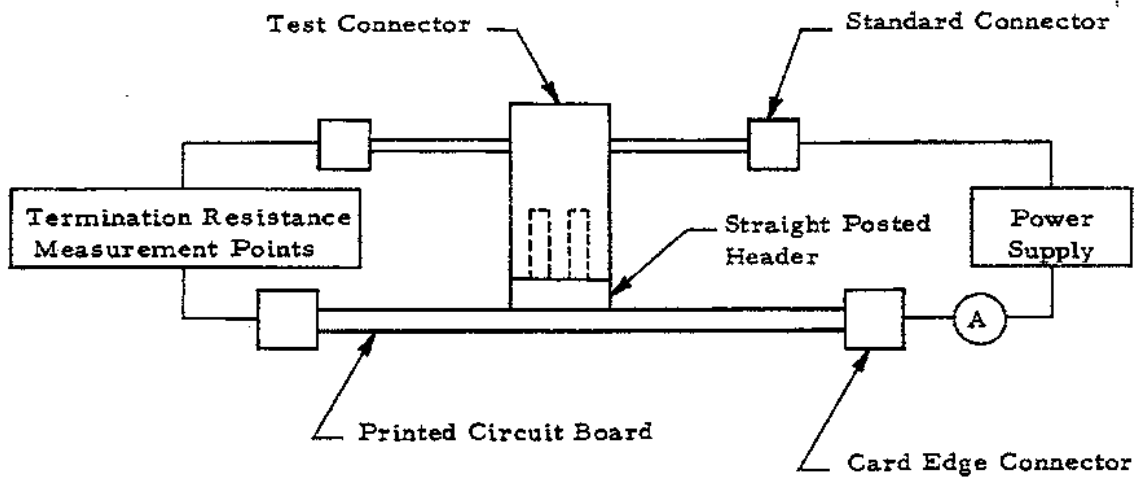


Figure 3  
Termination Resistance Measurement Points

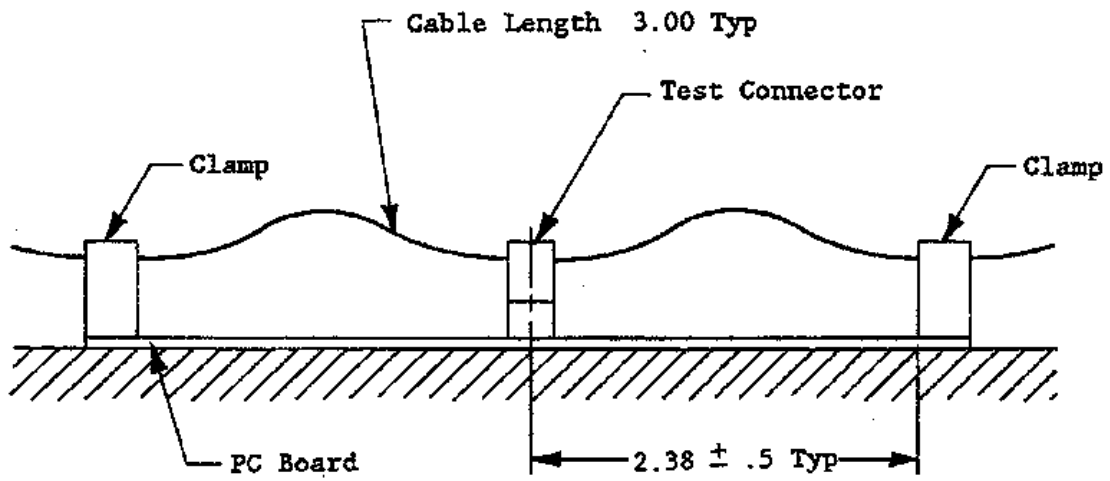


Figure 4  
Vibration Fixture