
AMPOWER* Multi-Pin Plus Connector

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the AMPOWER* Multi-pin Plus connector.

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 on 28May98. The test file number for this testing is CTL 0790-000-006A. This documentation is on file at and available from the Americas Regional Laboratory.

2. APPLICABLE DOCUMENTS

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 (TE) Documents

- 109-1: General Requirements for Test Specifications
- 109 Series: Test Specifications as indicated in Figure 1
- 501-433: 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: 250 volts AC
- Current: 160 amperes for 9mm contact, see Figure 3 for applicable current carrying capability of 3mm and Type III+ contacts
- Temperature: -40 to 105°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. | 6 milliohms maximum for Type III+ contacts. 0.5 milliohm maximum for 3mm contacts. 0.2 milliohm maximum for 9mm contacts. | TE Spec 109-6-6. Subject samples to 20 mv maximum open circuit at 100 ma maximum. |
| Insulation resistance. | 1000 megohms minimum. | TE Spec 109-28-4. Test between adjacent contacts. |
| Dielectric withstanding voltage. | 1000 vac at sea level. 1 minute hold with no breakdown or flashover. | TE Spec 109-29-1. Test between adjacent contacts. |
| Temperature rise vs current. | 30°C maximum temperature rise at specified current. | TE Spec 109-45-2. Measure temperature rise vs current. See Figure 3. |
| MECHANICAL | | |
| Vibration, random. | No discontinuities of 1 microsecond or longer duration. See Note. | TE Spec 109-21-7. Subject mated samples to 3.13 G's rms between 5-500 Hz. 15 minutes in each of 3 mutually perpendicular planes. |
| Mechanical shock, specified pulse. | No discontinuities of 1 microsecond or longer duration. See Note. | TE Spec 109-26-1, except 30 G's. Subject mated samples to 30 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. | See Note. | TE Spec 109-27. Mate and unmate samples for 25 cycles at a maximum rate of 600 cycles per hour. |

Figure 1 (continued)

| Test Description | Requirement | Procedure |
|-------------------------------|--------------------|---|
| Mating force. | 50 pounds maximum. | TE Spec 109-42, Condition A. Measure force necessary to mate samples at a maximum rate of .5 inch per minute. |
| Unmating force. | 20 pounds minimum. | TE Spec 109-42, Condition A. Measure force necessary to unmate samples at a maximum rate of .5 inch per minute. |
| ENVIRONMENTAL | | |
| Thermal shock. | See Note. | TE Spec 109-22. Subject samples to 5 cycles between -40 and 105°C. |
| Humidity-temperature cycling. | See Note. | TE Spec 109-23-3, Condition B. Subject samples to 10 cycles between 25 and 65°C at 95% RH. |
| Temperature life. | See Note. | TE Spec 109-43. Subject mated samples to temperature life at 105°C for 500 hours. |
| Mixed flowing gas. | See Note. | TE Spec 109-85-2. Subject mated samples to environmental class II 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 |
| | Test Sequence (b) | | |
| Examination of product | 1,9 | 1,9 | 1,8 |
| Termination resistance | 3,7 | 2,7 | |
| Insulation resistance | | | 2,6 |
| Dielectric withstanding voltage | | | 3,7 |
| Temperature rise vs current | | 3,8 | |
| Vibration | 5 | 6(c) | |
| Mechanical shock | 6 | | |
| Durability | 4 | | |
| Mating force | 2 | | |
| Unmating force | 8 | | |
| Thermal shock | | | 4 |
| Humidity-temperature cycling | | | 5 |
| Temperature life | | 5 | |
| Mixed flowing gas | | 4(d) | |

- NOTE**
- (a) See paragraph 4.1.A.
 - (b) Numbers indicate sequence in which tests are performed.
 - (c) Discontinuities shall not be measured. Energize at 18°C level for 100% loadings per Test Specification 109-151.
 - (d) Precondition samples with 10 cycles durability.

Figure 2

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 2 samples.

B. Test Sequence

Qualification inspection shall be verified by testing samples 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. 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 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.

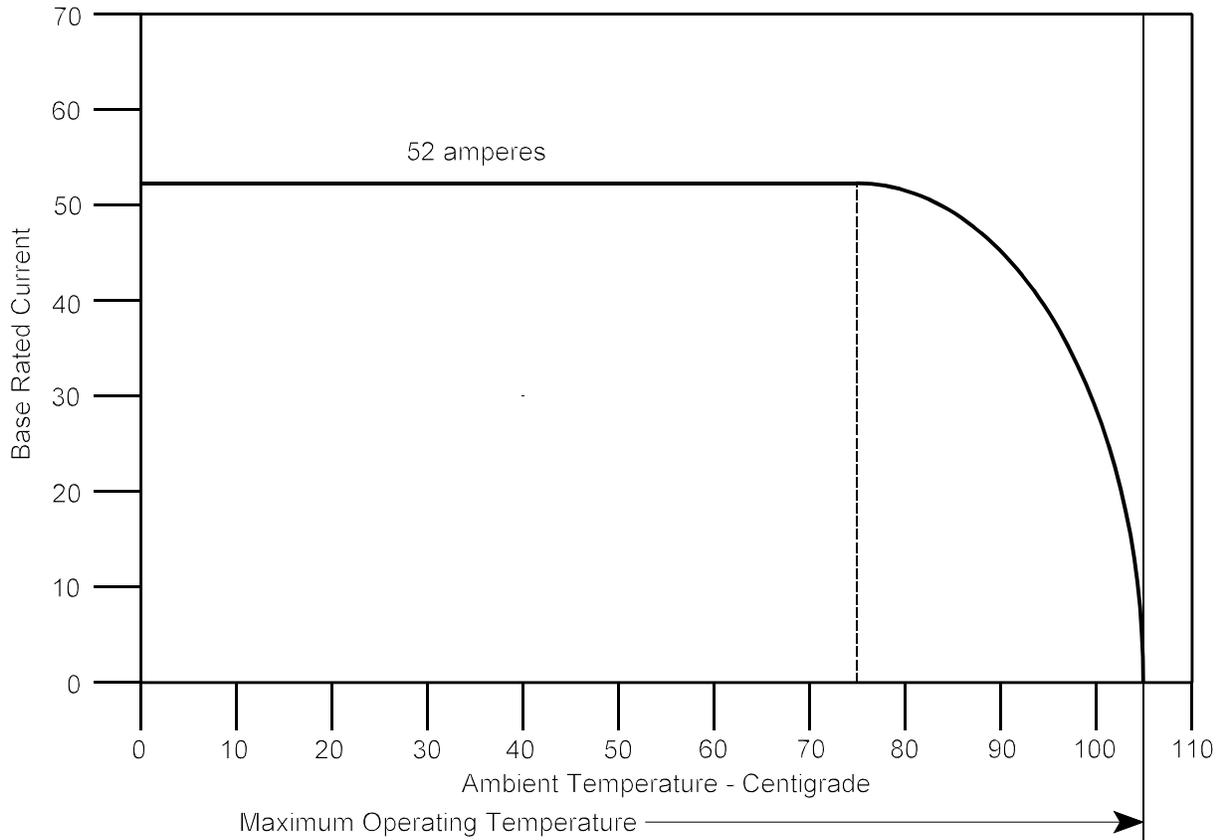


Figure 3A
Current Carrying Capability

| Percent Connector Loading | Wire Size AWG | | | | |
|---------------------------|---------------|-----|-----|-----|-----|
| | 14 | 12 | 10 | 8 | 1/0 |
| | Contact Type | | | | 9mm |
| III+ | 3mm | | | | |
| Single Contact | .51 | .67 | .83 | 1 | 3.0 |
| 50 | .38 | .50 | .62 | .75 | NA |
| 100 | .30 | .39 | .48 | .58 | 3.0 |

NOTE

To determine acceptable current carrying capacity for percentage connector loading and wire gage indicated, use the Multiplication Factor (F) from the above chart and multiply it times the Base rated Current for a single circuit at the maximum ambient operating temperature shown in Figure 3A.

Figure 3B
Current Rating