# Power Hardware, Guide Pin & Mating Receptacle

## 1. INTRODUCTION

### 1.1. Purpose

Testing was performed on AMP * power hardware to determine its conformance to the requirements of AMP Product Specification 108-1652 Revision A.

### 1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the power hardware. Testing was performed at the Americas Regional Laboratory between 07Jan99 and 21Apr99. The test file number for this testing is CTL 5228-002. This documentation is on file at and available from the Americas Regional Laboratory.

### 1.3. Conclusion

The power hardware listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1652 Revision A.

### 1.4. Product Description

The power guide pin and mating receptacle hardware is designed to attach to the end and center mounts of 3 and 4 row HDI/TBC connector assemblies and mounts both vertically and at right angles. The hardware is designed to pass power from the motherboard to the daughter card.

### 1.5. Test Samples

Test samples were representative of normal production lots. Samples identified with the following part numbers were used for test:

| Test Group | Quantity | Part Number | Description |
|---|---|---|---|
| 1 | 5 | 533082-3 | Power pin with 30 $\mu$in gold plating |
| 1 | 5 | 532924-4 | Power contact assembly with 30 $\mu$in gold plating |
| 2 | 30 | 533082-3 | Power pin with 30 $\mu$in gold plating |
| 2 | 30 | 532924-4 | Power contact assembly with 30 $\mu$in gold plating |
| 2 | 15 | 534035-6 | 4 row, 2 mounting hole receptacle housing |
| 2 | 15 | 532406-1 | 4 row, 2 mounting hole pin housing |

Figure 1

### 1.6. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15 to 35°C
Relative Humidity: 20 to 80%







* Trademark
I Indicates change

LOC B

1.7. Qualification Test Sequence

| Test or Examination | Test Group (a) | |
|---|---|---|
| | 1 | 2 |
| | Test Sequence (b) | |
| Examination of product | 1,5 | 1,9 |
| Termination resistance | | 2,7 |
| Temperature rise vs current | | 3,8 |
| Vibration | | 6(c) |
| Durability | 3 | |
| Mating force | 2 | |
| Unmating force | 4 | |
| Temperature life | | 5 |
| Mixed flowing gas | | 4(d) |

**NOTE**

*(a) See Para 1.5.*
*(b) Numbers indicate sequence in which tests are performed.*
*(c) Discontinuities shall not be measured. Energize at 18°C level for 100% loadings per AMP Specification 109-151.*
*(d) Precondition samples with 10 cycles durability.*

Figure 2

## 2. SUMMARY OF TESTING

2.1. Examination of Product - All Test Groups

All samples submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by the Product Assurance Department. Where specified, samples were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2. Termination Resistance - Test Group 2

All termination resistance measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage were less than 3.0 milliohms.

| Test Group | Number of Data Points | Condition | Termination Resistance | | |
|---|---|---|---|---|---|
| | | | Min | Max | Mean |
| 2 | 30 | Initial | 0.88 | 1.21 | 1.022 |
| | | After current verification | 0.91 | 1.99 | 1.471 |

**NOTE**

*All values in milliohms.*

Figure 3

2.3. Temperature Rise vs Current - Test Group 2

All samples had a temperature rise of less than 30°C above ambient when tested using a baseline rated current of 9.33 amperes.

2.4. Vibration - Test Group 2

Following vibration testing, no cracks, breaks, or loose parts on the samples were visible.

2.5. Durability - Test Group 1

No physical damage occurred as a result of mating and unmating the samples 250 times.

2.6. Mating Force - Test Group 1

All mating force measurements were less than 8 ounces.

2.7. Unmating Force - Test Group 1

All unmating force measurements were greater than 1 ounce.

2.8. Temperature Life - Test Group 2

No evidence of physical damage was visible as a result of exposure to temperature life.

2.9. Mixed Flowing Gas - Test Group 2

No evidence of physical damage was visible as a result of exposure to the pollutants of mixed flowing gas.

## 3. TEST METHODS

3.1. Examination of Product

Where specified, samples were visually examined for evidence of physical damage detrimental to product performance.

3.2. Termination Resistance

Termination resistance measurements at low level current were made using a 4 terminal measuring technique. The test current was maintained at 100 milliamperes maximum with a 20 millivolt maximum open circuit voltage.

3.3. Temperature Rise vs Current

Temperature rise curves were produced by measuring individual contact temperatures at 5 different current levels. These measurements were plotted to produce a temperature rise vs current curve. Thermocouples were attached to individual contacts to measure their temperatures. The ambient temperature was then subtracted from this measured temperature to find the temperature rise. When the temperature rise of 3 consecutive readings taken at 5 minute intervals did not differ by more than 1°C, the temperature measurement was recorded.

3.4. Vibration, Random

Mated samples were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 5 and 500 Hz. The power spectral density at 5 Hz was 0.000312 $G^2$/Hz. The spectrum sloped up at 6 dB per octave to a PSD of 0.02 $G^2$/Hz at 14 Hz. The spectrum was flat at 0.02 $G^2$/Hz from 14 to 500 Hz. The root-mean square amplitude of the excitation was 3.13 GRMS. This was performed for 15 minutes in each of 3 mutually perpendicular planes for a total vibration time of 45 minutes. Samples were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.5. Durability

Samples were mated and unmated 250 times at a maximum rate of 600 cycles per hour.

3.6. Mating Force

The force required to mate individual samples was measured using a tensile/compression device with a free floating fixture and a rate of travel of 0.5 inch per minute.

3.7. Unmating Force

The force required to unmate individual samples was measured using a tensile/compression device with a free floating fixture and a rate of travel of 0.5 inch per minute.

3.8. Temperature Life

Mated samples were exposed to a temperature of 125°C for 1000 hours.

3.9. Mixed Flowing Gas, Class II

Mated samples were exposed for 14 days to a mixed flowing gas Class II exposure. Class II exposure is defined as a temperature of 30°C and a relative humidity of 70% with the pollutants of $Cl_2$ at 10 ppb, $NO_2$ at 200 ppb, and $H_2S$ at 10 ppb. Samples were preconditioned with 10 cycles of durability.