

**Softshell Pin & Socket Contacts**

**1. PURPOSE**

The purpose of this test is to verify resistance after extended durability cycles.

**2. RESULTS**

The following resistance results were collected after the specimens were subjected to the specified durability cycles. 6.25 inches of 20 AWG wire was subtracted out of the original values as specified in the test request.

| Test Sequence       | Requirement                                   | Results In Milliohms |      |              | Data Points |
|---------------------|---|----------------------|------|--------------|-------------|
|                     |   | Min                  | Max  | $\Delta$ Max |             |
| Test Group 1 (Tin)  |   |                      |      |              |             |
| Initial             | No initial resistance requirement             | 1.33                 | 1.47 | ---          | 36          |
| After 25 cycles     | $\Delta$ change shall not exceed 10 milliohms | 1.39                 | 1.52 | .14          | 36          |
| After 50 cycles     | $\Delta$ change shall not exceed 10 milliohms | 1.43                 | 1.57 | .16          | 36          |
| After 100 cycles    | $\Delta$ change shall not exceed 10 milliohms | 1.46                 | 1.60 | .22          | 36          |
| Test Group 2 (Tin)  |   |                      |      |              |             |
| Initial             | No initial resistance requirement             | 2.71                 | 3.00 | ---          | 36          |
| After 25 cycles     | $\Delta$ change shall not exceed 10 milliohms | 2.77                 | 3.33 | .55          | 36          |
| After 50 cycles     | $\Delta$ change shall not exceed 10 milliohms | 2.84                 | 3.71 | .93          | 36          |
| After 100 cycles    | $\Delta$ change shall not exceed 10 milliohms | 2.95                 | 5.40 | 2.53         | 36          |
| Test Group 3 (Tin)  |   |                      |      |              |             |
| Initial             | No initial resistance requirement             | 2.58                 | 2.90 | ---          | 35          |
| After 25 cycles     | $\Delta$ change shall not exceed 10 milliohms | 2.69                 | 3.17 | .51          | 35          |
| After 50 cycles     | $\Delta$ change shall not exceed 10 milliohms | 2.75                 | 3.46 | .70          | 35          |
| After 100 cycles    | $\Delta$ change shall not exceed 10 milliohms | 2.73                 | 4.11 | 1.39         | 35          |
| Test Group 4 (Gold) |   |                      |      |              |             |
| Initial             | No initial resistance requirement             | 1.53                 | 1.69 | ---          | 36          |
| After 25 cycles     | $\Delta$ change shall not exceed 10 milliohms | 1.62                 | 1.91 | .25          | 36          |
| After 50 cycles     | $\Delta$ change shall not exceed 10 milliohms | 1.67                 | 2.25 | .59          | 36          |
| After 100 cycles    | $\Delta$ change shall not exceed 10 milliohms | 1.65                 | 2.15 | .50          | 36          |
| After 150 cycles    | $\Delta$ change shall not exceed 10 milliohms | 1.69                 | 3.25 | 1.68         | 36          |
| After 200 cycles    | $\Delta$ change shall not exceed 10 milliohms | 1.72                 | 2.81 | 1.16         | 36          |
| Test Group 5 (Gold) |   |                      |      |              |             |
| Initial             | No initial resistance requirement             | 2.73                 | 3.01 | ---          | 30          |
| After 25 cycles     | $\Delta$ change shall not exceed 10 milliohms | 2.77                 | 3.27 | .39          | 30          |
| After 50 cycles     | $\Delta$ change shall not exceed 10 milliohms | 2.77                 | 3.04 | .18          | 30          |
| After 100 cycles    | $\Delta$ change shall not exceed 10 milliohms | 2.80                 | 3.12 | .27          | 30          |
| After 150 cycles    | $\Delta$ change shall not exceed 10 milliohms | 2.84                 | 3.22 | .33          | 30          |
| After 200 cycles    | $\Delta$ change shall not exceed 10 milliohms | 2.86                 | 3.20 | .38          | 30          |

Figure 1 (cont)

| Test Sequence       | Requirement                            | Results In Milliohms |      |      | Data Points |
|---------------------|--|----------------------|------|------|-------------|
|                     |  | Min                  | Max  | ΔMax |             |
| Test Group 6 (Gold) |  |                      |      |      |             |
| Initial             | No initial resistance requirement      | 2.65                 | 3.13 | ---  | 32          |
| After 25 cycles     | Δ change shall not exceed 10 milliohms | 2.69                 | 3.01 | .25  | 32          |
| After 50 cycles     | Δ change shall not exceed 10 milliohms | 2.73                 | 3.07 | .30  | 32          |
| After 100 cycles    | Δ change shall not exceed 10 milliohms | 2.61                 | 3.61 | .91  | 32          |
| After 150 cycles    | Δ change shall not exceed 10 milliohms | 2.76                 | 3.55 | .85  | 32          |
| After 200 cycles    | Δ change shall not exceed 10 milliohms | 2.69                 | 3.44 | .74  | 32          |

Figure 1 (end)

**3. SPECIMEN DESCRIPTION**

| Test Group | Part Number | Revision | Description                              |
|------------|-------------|----------|--|
| 1          | 350218-1    | BP       | UMNL pin with 20 AWG wire                |
|            | 350536-1    | BB       | UMNL socket with 20 AWG wire             |
|            | 1-480704-0  | BR       | UMNL plugs                               |
|            | 1-480705-0  | BN       | UMNL caps                                |
| 2          | 770903-1    | H        | Mini UMNL pin with 20 AWG wire           |
|            | 770904-1    | J        | Mini UMNL socket with 20 AWG wire        |
|            | 1-480704-0  | BR       | UMNL plugs                               |
|            | 1-480705-0  | BN       | UMNL caps                                |
| 3          | 794220-1    | G        | Mini 2 pin with 20 AWG wire              |
|            | 794221-1    | G        | Mini 2 socket with 20 AWG wire           |
|            | 172161-1    | K        | Mini UMNL caps                           |
|            | 172169-1    | J        | Mini UMNL plugs                          |
| 4          | 350218-2    | BP       | UMNL pin (gold) with 20 AWG wire         |
|            | 350536-2    | BB       | UMNL socket (gold) with 20 AWG wire      |
|            | 172161-1    | K        | Mini UMNL caps                           |
|            | 172169-1    | J        | Mini UMNL plugs                          |
| 5          | 770903-3    | H        | Mini UMNL pin (gold) with 20 AWG wire    |
|            | 770904-3    | J        | Mini UMNL socket (gold) with 20 AWG wire |
|            | 172161-1    | K        | Mini UMNL caps                           |
|            | 172169-1    | J        | Mini UMNL plugs                          |
| 6          | 794220-3    | G        | Mini 2 pin (gold) with 20 AWG wire       |
|            | 794221-3    | G        | Mini 2 socket (gold) with 20 AWG wire    |
|            | 172161-1    | K        | Mini UMNL caps                           |
|            | 172169-1    | J        | Mini UMNL plugs                          |

**NOTE**

*Per the requester, UMNL plugs (PN 1-480704-0) and UMNL caps (PN 1-480705-0) were used for Test Groups 1 and 2; Mini UMNL caps (PN 172161-1) and Mini UMNL plugs (PN 172169-1) were used with Test Groups 3, 4, 5 and 6.*

Figure 2

#### 4. SPECIMEN PREPARATION

All contacts were crimped onto 20 AWG wire prior to being submitted for testing. The 20 AWG wires were measured to 6.25 inches from the back of the crimp, cut, stripped and tinned to achieve 6 inches of insulation. The 20 AWG wires were then soldered onto printed circuit board PN 93-660001, Revision B. Pins and sockets were mated and all solder joints were inspected.

#### 5. TEST PROCEDURES

##### 5.1. Termination Resistance

Termination resistance was performed per TE Connectivity (TE) Specification 109-6-6, Revision J. All mated test specimens were subjected to 20 millivolts maximum open circuit voltage at 100 milliamperes. Measurements were taken using a 4 wire scan method. A system standard was read to verify that the system was functioning properly.

##### 5.2. Durability

Durability was performed per TE Specification 109-27, Revision D. All tin plated specimens were subjected to 100 manual mating and unmating cycles. Termination resistance readings were taken initially, and after 25, 50, and 100 cycles. The gold specimens were subjected to a total of 200 manual cycles. Termination resistance readings were taken initially, and after 25, 50, 100, 150, and 200 cycles.

#### 6. TEST EQUIPMENT

| Description                | Manufacturer    | Model Number | Calibration Number |
|----------------------------|-----------------|--------------|--------------------|
| R2 Data Acquisition System | Hewlett-Packard | 3456A        | E2997-0171         |
| B1 Data Acquisition System | Hewlett-Packard | 3456A        | E2997-0170         |
| R1 Data Acquisition System | Hewlett-Packard | 3456A        | E2997-0131         |