



WORK INSTRUCTION

TEST REPORT

DOC REF: 5051

REVISION: 2.00

W TL TR 5051 8.2.4.

Page 1 of 11

TEST REPORT : TR00228

Details of Samples Submitted:- Various 51 way Hermetic Micro-D Connectors

Part N°:- 51PPBT, 51PDAP, 51SPBT, 51SDAP

Originator:- J.Madeley

Description of Parts:-

10 x 51way Micro-D solder cup / PC Tail parts to be built, Plug variant.

10 x 51way Micro-D solder cup / PC Tail parts to be built, Socket variant as per table below.

<u>PART NO</u>	<u>PART NO'S TO BE FULLY TESTED</u>	<u>NO'S TO BE AUTO TESTED</u>	<u>NO'S TO BE RETAINED</u>
1. 51PPBT/1-10	1-8	N/A	9, 10
2. 51PDAP/1-10	1-8	N/A	9, 10
3. 51SPBT/1-10	1-8	N/A	9, 10
4. 51SDAP/1-10	1-8	N/A	9, 10



WORK INSTRUCTION

TEST REPORT

DOC REF:	5051
REVISION:	2.00
W TL TR 5051 8.2.4.	
Page 2 of 11	

TEST REPORT : TR00228

DETAILS OF TEST

TEST PROCESS REQUIRED

This test procedure covers the required validation checks to determine Cinch's standard Hermetic Micro-D connector. The testing to be performed is to validate the Hermetic potting's electrical performance, Hermetic sealing performance and resistance to isolated high temperature. These tests will be conducted in conjunction with MIL-DTL-83513 and MIL-STD-202F methods 107G condition A1, and 208H.

1.1. Back Fill UUT's (Unit Under Test) and cure as per below:

Warm specified potting material @ 60°C for 5 minutes, dispense potting material into UUT's and oven cure, potting material only usable for a maximum of 40 minutes.

1.2. Electrical Test all UUT's (Unit Under Test) after potting using KT16 test equipment, test parameters 500Vdc insulation resistance, 1000Vdc dielectric withstand voltage.

1.3. Vacuum Leak test down to 1 x 10⁻⁸cc/sec @ 1 Atmosphere Helium

Test Equipment: Vaseco UL300 Leak detector
1 Bottle of Grade A Helium with small dispensing gun

Helium Test Process

- Assemble O-ring seal to UUT's (unit under test) and secure to the test jig (ensure O-ring seal is kept clean).
- Start the Leak detector and allow the vacuum to drop until it stabilises as indicated on the screen.
- Spray helium around the UUT (unit under test) for 30 seconds, if a leak is present the detector will sense the helium and the vacuum pressure will drop accordingly.
- If the UUT (unit under test) shows no sign of leaking or has not dropped below the stated leak rate value then the UUT has passed, record the results shown on the screen.

1.4. Thermal Shock cycling

Temperature Range 125°C / -55°C as per MIL-DTL-83513.

Thermal Shock cycling to be repeated 25 times as per time periods below; Test can be paused after 5 full cycles.

	<u>Temperature</u>	<u>Cycle time</u>
1.	-55°C	15 minutes
2.	25°C (room temp.)	5 minutes
3.	125°C	15 minutes
4.	25°C (room temp.)	5 minutes



WORK INSTRUCTION

TEST REPORT

DOC REF:	5051
REVISION:	2.00
W TL TR 5051 8.2.4.	
Page 3 of 11	

TEST REPORT : TR00228

1.5. Electrical Test all UUT's (Unit Under Test) after Thermal cycling using KT16 test equipment, test parameters 500Vdc insulation resistance, 1000Vdc dielectric withstand voltage.

1.6. Vacuum Leak test down to 1×10^{-8} cc/sec @ 1 Atmosphere Helium as per paragraph 1.3.

1.7. Electrical Test all UUT's (Unit Under Test) after Vacuum leak test using KT16 test equipment, test parameters 500Vdc insulation resistance, 1000Vdc dielectric withstand voltage.

1.8. Solder stranded wire into solder cups and onto PC tails within a random number of passed connectors.

The solder pots were fully wired up and soldered, the soldering iron left on each pot for 3.5 seconds at a temperature of 350°C, then cleaned using Electrolube ultrasolve (Board cleaner).

1.9. Vacuum Leak test down to 1×10^{-8} cc/sec @ 1 Atmosphere Helium as per paragraph 1.3.

1.10. Electrical Test all UUT's (Unit Under Test) after Solder pot soldering and Vacuum testing using KT16 test equipment, test parameters 500Vdc insulation resistance, 1000Vdc dielectric withstand voltage.

Reason for Test:-

The tests being conducted are used to qualify a Cinch Hermetic Connector and provide evidence that the hermetic Micro-D connector conforms to MIL-DTL-83513 and MIL-STD 202F requirements.



WORK INSTRUCTION

TEST REPORT

DOC REF: 5051

REVISION: 2.00

W TL TR 5051 8.2.4.

Page 4 of 11

TEST REPORT : TR00228

Results

1.2 Electrical Test of UUT's after back potting

Part Number	Results	Part Number	Results	Part Number	Results	Part Number	Results
51PDAP/1	Pass	51PPBT/1	Pass	51SDAP/1	Pass	51SPBT/1	Pass
51PDAP/2	Pass	51PPBT/2	Pass	51SDAP/2	Pass	51SPBT/2	Pass
51PDAP/3	Pass	51PPBT/3	Pass	51SDAP/3	Pass	51SPBT/3	Pass
51PDAP/4	Pass	51PPBT/4	Pass	51SDAP/4	Pass	51SPBT/4	Pass
51PDAP/5	Pass	51PPBT/5	Pass	51SDAP/5	Pass	51SPBT/5	Pass
51PDAP/6	Pass	51PPBT/6	Pass	51SDAP/6	Pass	51SPBT/6	Pass
51PDAP/7	Pass	51PPBT/7	Pass	51SDAP/7	Pass	51SPBT/7	Pass
51PDAP/8	Pass	51PPBT/8	Pass	51SDAP/8	Pass	51SPBT/8	Pass



WORK INSTRUCTION

TEST REPORT

DOC REF: 5051

REVISION: 2.00

W TL TR 5051 8.2.4.

Page 5 of 11

TEST REPORT : TR00228

1.3 Vacuum Leak test of UUT's down to 1 x 10⁻⁸cc/sec @ 1 Atmosphere Helium

Part Number	Vacuum level	Result	Part Number	Vacuum level	Result	Part Number	Vacuum level	Result	Part Number	Vacuum level	Result
51PDAP/1	2 X 10 ⁻⁹	√	51PPBT/1	2 X 10 ⁻⁹	√	51SDAP/1	2 X 10 ⁻⁹	√	51SPBT/1	2 X 10 ⁻⁹	√
51PDAP/2	2 X 10 ⁻⁹	√	51PPBT/2	2 X 10 ⁻⁹	√	51SDAP/2	2 X 10 ⁻⁹	√	51SPBT/2	2 X 10 ⁻⁹	√
51PDAP/3	2 X 10 ⁻⁹	√	51PPBT/3	2 X 10 ⁻⁹	√	51SDAP/3	2 X 10 ⁻⁹	√	51SPBT/3	2 X 10 ⁻⁹	√
51PDAP/4	2 X 10 ⁻⁹	√	51PPBT/4	2 X 10 ⁻⁹	√	51SDAP/4	2 X 10 ⁻⁹	√	51SPBT/4	2 X 10 ⁻⁹	√
51PDAP/5	2 X 10 ⁻⁹	√	51PPBT/5	2 X 10 ⁻⁹	√	51SDAP/5	2 X 10 ⁻⁹	√	51SPBT/5	2 X 10 ⁻⁹	√
51PDAP/6	2 X 10 ⁻⁹	√	51PPBT/6	2 X 10 ⁻⁹	√	51SDAP/6	2 X 10 ⁻⁹	√	51SPBT/6	2 X 10 ⁻⁹	√
51PDAP/7	2 X 10 ⁻⁹	√	51PPBT/7	2 X 10 ⁻⁹	√	51SDAP/7	2 X 10 ⁻⁹	√	51SPBT/7	2 X 10 ⁻⁹	√
51PDAP/8	2 X 10 ⁻⁹	√	51PPBT/8	2 X 10 ⁻⁹	√	51SDAP/8	2 X 10 ⁻⁹	√	51SPBT/8	2 X 10 ⁻⁹	√

1.4 Thermal cycling of UUT's (25 cycles)

All UUT's put through the 25 cycles of thermal cycling (as per paragraph 1.4.) were inspected for any issues arising from the testing.

All parts inspected passed with no issues detected.

Cycle	15 minutes @ -55°C	5mins @ 25°C	15 minutes @ 125°C	5 mins @ 25 °C
5	√	√	√	√
10	√	√	√	√
15	√	√	√	√
20	√	√	√	√
25	√	√	√	√



WORK INSTRUCTION

TEST REPORT

DOC REF: 5051

REVISION: 2.00

W TL TR 5051 8.2.4.

Page 6 of 11

TEST REPORT : TR00228

1.5. Electrical Test of UUT's after Thermal Shock cycling

Part Number	Results	Part Number	Results	Part Number	Results	Part Number	Results
51PDAP/1	Pass	51PPBT/1	Pass	51SDAP/1	Pass	51SPBT/1	Pass
51PDAP/2	Pass	51PPBT/2	Pass	51SDAP/2	Pass	51SPBT/2	Pass
51PDAP/3	Pass	51PPBT/3	Pass	51SDAP/3	Pass	51SPBT/3	Pass
51PDAP/4	Pass	51PPBT/4	Pass	51SDAP/4	Pass	51SPBT/4	Pass
51PDAP/5	Pass	51PPBT/5	Pass	51SDAP/5	Pass	51SPBT/5	Pass
51PDAP/6	Pass	51PPBT/6	Pass	51SDAP/6	Pass	51SPBT/6	Pass
51PDAP/7	Pass	51PPBT/7	Pass	51SDAP/7	Pass	51SPBT/7	Pass
51PDAP/8	Pass	51PPBT/8	Pass	51SDAP/8	Pass	51SPBT/8	Pass



WORK INSTRUCTION

TEST REPORT

DOC REF: 5051

REVISION: 2.00

W TL TR 5051 8.2.4.

Page 7 of 11

TEST REPORT : TR00228

1.6. Vacuum Leak test of UUT's down to 1 x 10⁻⁸cc/sec @ 1 Atmosphere Helium

Part Number	Vacuum level	Result	Part Number	Vacuum level	Result	Part Number	Vacuum level	Result	Part Number	Vacuum level	Result
51PDAP/1	6x10 ⁻⁹	√	51PPBT/1	6x10 ⁻⁹	√	51SDAP/1	9x10 ⁻⁹	√	51SPBT/1	6x10 ⁻⁹	√
51PDAP/2	6x10 ⁻⁹	√	51PPBT/2	6x10 ⁻⁹	√	51SDAP/2	9x10 ⁻⁹	√	51SPBT/2	6x10 ⁻⁹	√
51PDAP/3	6x10 ⁻⁹	√	51PPBT/3	6x10 ⁻⁹	√	51SDAP/3	9x10 ⁻⁹	√	51SPBT/3	6x10 ⁻⁹	√
51PDAP/4	6x10 ⁻⁹	√	51PPBT/4	6x10 ⁻⁹	√	51SDAP/4	9x10 ⁻⁹	√	51SPBT/4	6x10 ⁻⁹	√
51PDAP/5	6x10 ⁻⁹	√	51PPBT/5	6x10 ⁻⁹	√	51SDAP/5	9x10 ⁻⁹	√	51SPBT/5	6x10 ⁻⁹	√
51PDAP/6	6x10 ⁻⁹	√	51PPBT/6	6x10 ⁻⁹	√	51SDAP/6	9x10 ⁻⁹	√	51SPBT/6	6x10 ⁻⁹	√
51PDAP/7	6x10 ⁻⁹	√	51PPBT/7	6x10 ⁻⁹	√	51SDAP/7	9x10 ⁻⁹	√	51SPBT/7	6x10 ⁻⁹	√
51PDAP/8	6x10 ⁻⁹	√	51PPBT/8	6x10 ⁻⁹	√	51SDAP/8	9x10 ⁻⁹	√	51SPBT/8	6x10 ⁻⁹	√



WORK INSTRUCTION

TEST REPORT

DOC REF: 5051

REVISION: 2.00

W TL TR 5051 8.2.4.

Page 8 of 11

TEST REPORT : TR00228

1.7. Electrical Test of UUT's after Vacuum test

Part Number	Results	Part Number	Results	Part Number	Results	Part Number	Results
51PDAP/1	Pass	51PPBT/1	Pass	51SDAP/1	Pass	51SPBT/1	Pass
51PDAP/2	Pass	51PPBT/2	Pass	51SDAP/2	Pass	51SPBT/2	Pass
51PDAP/3	Pass	51PPBT/3	Pass	51SDAP/3	Pass	51SPBT/3	Pass
51PDAP/4	Pass	51PPBT/4	Pass	51SDAP/4	Pass	51SPBT/4	Pass
51PDAP/5	Pass	51PPBT/5	Pass	51SDAP/5	Pass	51SPBT/5	Pass
51PDAP/6	Pass	51PPBT/6	Pass	51SDAP/6	Pass	51SPBT/6	Pass
51PDAP/7	Pass	51PPBT/7	Pass	51SDAP/7	Pass	51SPBT/7	Pass
51PDAP/8	Pass	51PPBT/8	Pass	51SDAP/8	Pass	51SPBT/8	Pass

1.8. Solder fill a random number of passed UUT's.

The Solder pots and PC tails chosen at random on the UUT's were wired using stranded 26 awg 19 strand wire and soldered. The soldering iron was left on each Solder pot / PC tail for a period of 3.5 seconds @ a temperature of 350°C.

All soldered wires were independently inspected with no issues detected.



WORK INSTRUCTION

TEST REPORT

DOC REF: 5051

REVISION: 2.00

W TL TR 5051 8.2.4.

Page 9 of 11

TEST REPORT : TR00228

1.9. Vacuum Leak test UUT's down to 1 x 10⁻⁸cc/sec @ 1 Atmosphere Helium

Part Number	Vacuum level	Result	Part Number	Vacuum level	Result	Part Number	Vacuum level	Result	Part Number	Vacuum level	Result
51PDAP/1	6x10 ⁻⁹	√	51PPBT/1	6x10 ⁻⁹	√	51SDAP/1	9x10 ⁻⁹	√	51SPBT/1	6x10 ⁻⁹	√
51PDAP/2	6x10 ⁻⁹	√	51PPBT/2	6x10 ⁻⁹	√	51SDAP/2	9x10 ⁻⁹	√	51SPBT/2	6x10 ⁻⁹	√
51PDAP/3	6x10 ⁻⁹	√	51PPBT/3	6x10 ⁻⁹	√	51SDAP/3	9x10 ⁻⁹	√	51SPBT/3	6x10 ⁻⁹	√
51PDAP/4	6x10 ⁻⁹	√	51PPBT/4	6x10 ⁻⁹	√	51SDAP/4	9x10 ⁻⁹	√	51SPBT/4	6x10 ⁻⁹	√
51PDAP/5	6x10 ⁻⁹	√	51PPBT/5	6x10 ⁻⁹	√	51SDAP/5	9x10 ⁻⁹	√	51SPBT/5	6x10 ⁻⁹	√
51PDAP/6	6x10 ⁻⁹	√	51PPBT/6	6x10 ⁻⁹	√	51SDAP/6	9x10 ⁻⁹	√	51SPBT/6	6x10 ⁻⁹	√
51PDAP/7	6x10 ⁻⁹	√	51PPBT/7	6x10 ⁻⁹	√	51SDAP/7	9x10 ⁻⁹	√	51SPBT/7	6x10 ⁻⁹	√
51PDAP/8	6x10 ⁻⁹	√	51PPBT/8	6x10 ⁻⁹	√	51SDAP/8	9x10 ⁻⁹	√	51SPBT/8	6x10 ⁻⁹	√



WORK INSTRUCTION

TEST REPORT

DOC REF: 5051

REVISION: 2.00

W TL TR 5051 8.2.4.

Page 10 of 11

TEST REPORT : TR00228

1.10. Electrical Test of UUT's after Soldering & Vacuum test

Part Number	Results	Part Number	Results	Part Number	Results	Part Number	Results
51PDAP/1	Pass	51PPBT/1	Pass	51SDAP/1	Pass	51SPBT/1	Pass
51PDAP/2	Pass	51PPBT/2	Pass	51SDAP/2	Pass	51SPBT/2	Pass
51PDAP/3	Pass	51PPBT/3	Pass	51SDAP/3	Pass	51SPBT/3	Pass
51PDAP/4	Pass	51PPBT/4	Pass	51SDAP/4	Pass	51SPBT/4	Pass
51PDAP/5	Pass	51PPBT/5	Pass	51SDAP/5	Pass	51SPBT/5	Pass
51PDAP/6	Pass	51PPBT/6	Pass	51SDAP/6	Pass	51SPBT/6	Pass
51PDAP/7	Pass	51PPBT/7	Pass	51SDAP/7	Pass	51SPBT/7	Pass
51PDAP/8	Pass	51PPBT/8	Pass	51SDAP/8	Pass	51SPBT/8	Pass



WORK INSTRUCTION

TEST REPORT

DOC REF: 5051

REVISION: 2.00

W TL TR 5051 8.2.4.

Page 11 of 11

TEST REPORT : TR00228

Conclusion

Standard Micro-D connectors – Solder bucket / PC tail assemblies

All the data generated during the testing of the Standard Micro-D Solder bucket / PC tail Micro-D assemblies show that the connectors are capable of achieving and sustaining an Hermetic seal down to 1×10^{-8} cc/sec @ 1 Atmosphere Helium for a minimum period of 30 seconds.

It also shows that the soldering trial (solder pot / PC tail) had no adverse effect on the performance of the potting material.

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