Qualification Testing of Meritec High Power Conformal Connector
107 position, short (.22 inch stack height) and tall (.33 inch stack height) versions

Project 1256

Scope:
Test 1 – per EIA-364-23 - determine low-level contact resistance (LLCR) over a range of 10 to 90°C.
Test 2 – per EIA-364-23 and 32 - determine low-level contact resistance (LLCR) subsequent to 25 cycles of thermal shock at –55°C to + 85°C with one hour soak at each temperature.
Test 3 – per EIA-364-23 and 70 - determine low-level contact resistance (LLCR) subsequent to temperature rise measured at 1 amp at 100°C and 2 amps at 25°C for 30 minute duration.
Test 4 – per EIA-364-20 – determine dielectric withstand at 500VDC
Test 5 – per EIA-364-21 – determine insulation resistance at 500VDC

Equipment:
HP-6177C constant current DC supply
HP-3456A Digital Voltmeter (last calibrated 4/8/02)
HP-3468B Digital Voltmeter (last calibrated 4/8/02)
Cincinnati Sub Zero Chamber, Model Z-8-1-1-R/AC (last calibrated 5/17/02) w/ Honeywell Chart Recorder (last calibrated 5/17/02)
Fisher Isotemp Oven, Model 438F
Extech Digital Thermometer 422130 (last calibrated 5/29/02)
General Radio Megohmmeter 1863 (last calibrated 5/17/02)

Results:
The connectors passed all of the test criteria as listed above.

Note: All tests were performed with the contacts under minimal compression: tall @ 3% compression of the contact free height; short @ 4% compression of the contact free height. This amount of compression produced 55 grams normal force for both tall and short contacts respectively. The nominal design compression is 5.5% for the tall, and 6.5% for the short contact.

JF Sawdy
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Examples of Meritec Tall and Short Compression Contacts:
Details of the contact tip geometry:
.008 inch radius in the blanked view, lower left, and .011 inch radius in the other axis, lower right.
Ring 1  (Connectors with tall contacts)

Ring 2  (Connectors with short contacts)
Test 1 - EIA-364-23 - Tests were performed to determine low-level contact resistance (LLCR) over a range of 10 to 90°C.
Criteria: LLCR not to exceed 25 milliohms (test 3 connectors of each length, 3 contacts per connector)
Results: LLCR did not exceed 15 milliohms (11 samples of each length tested)

Typical setup for Tests 1, 2 and 3. Ring connectors
Short Contact
Test 1

Ambient Temperature (°C)

LLCR (milliohms)

Max
Min
Avg

Tall Contact
Test 1

Ambient Temperature (°C)

LLCR (milliohms)

Max
Min
Avg
Test 2 - EIA-364-23 and 32 - Tests were performed to determine low-level contact resistance (LLCR) subsequent to 25 cycles of thermal shock at –55°C to +85°C with one hour soak at each temperature.
Criteria: LLCR not to exceed 35 milliohms (test 3 connectors of each length, 3 contacts per connector)
Results: LLCR did not exceed 18 milliohms (10 samples of each length tested)
Typical contact marks on the pads after test sequence.
Test 3 - EIA-364-23 and 70 - Tests were performed to determine low-level contact resistance (LLCR) subsequent to temperature rise measured at 1 amp at 100°C ambient and 2 amps at 25°C ambient for 30 minute duration.
Criteria: none stated. (test 1 connector of each length, 1 contact per connector)
Results:
Short contact:
temperature rise did not exceed 3°C at 1 amp at 100°C ambient
temperature rise did not exceed 12°C at 2 amps at 25°C ambient
LLCR did not exceed 25 milliohms at end of test

Tall contact:
temperature rise did not exceed 2°C at 1 amp at 100°C ambient
temperature rise did not exceed 10°C at 2 amps at 25°C ambient
LLCR did not exceed 25 milliohms at end of test

Short Contact Temp Rise
Test 3

![Graph showing temperature rise over time for short contacts during Test 3. The graph compares temperature rise at 1 amp at 100°C and 2 amps at 25°C.](image-url)
**Test 4** - EIA-364-20 - Dielectric withstand measured at 500VDC.  
Criteria: leakage current <1.0 ma. (test 3 connectors of each length, 3 contacts per connector)  
Results: <0.05 ma

**Test 5** - EIA-364-21 - Insulation resistance measured at 500VDC.  
Criteria: >1000 Megohms. (test 3 connectors of each length, 3 contacts per connector)  
Results: >10,000 Megohms