



Meritec Direct Attach 4/12X High Current Testing

Test 467

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Purpose

To determine temperature rise above ambient with multiple contacts sharing a single current load. The specific application that originated this test is for 6 amps to be carried by 12 parallel contacts.

Results

The Meritec 4X and 12X contacts are capable of handling 6 amps shared by 12 contacts with less than 10°C temperature rise or handling 12 amps shared by 12 contacts with less than 30°C temperature rise.

Sample Tested

1 meter Meritec 4X Cable Assembly (P/N 986131-001)

Test Equipment

HP-6023 DC Power Supply

Extech Digital Recording Thermometer 422130

Omega 5TC-TT-J-36-36 Type J Thermocouple

Meritec's 4X Cirris test boards (P/N 601185-01) with Molex receptacles
(P/N 91525-0412)

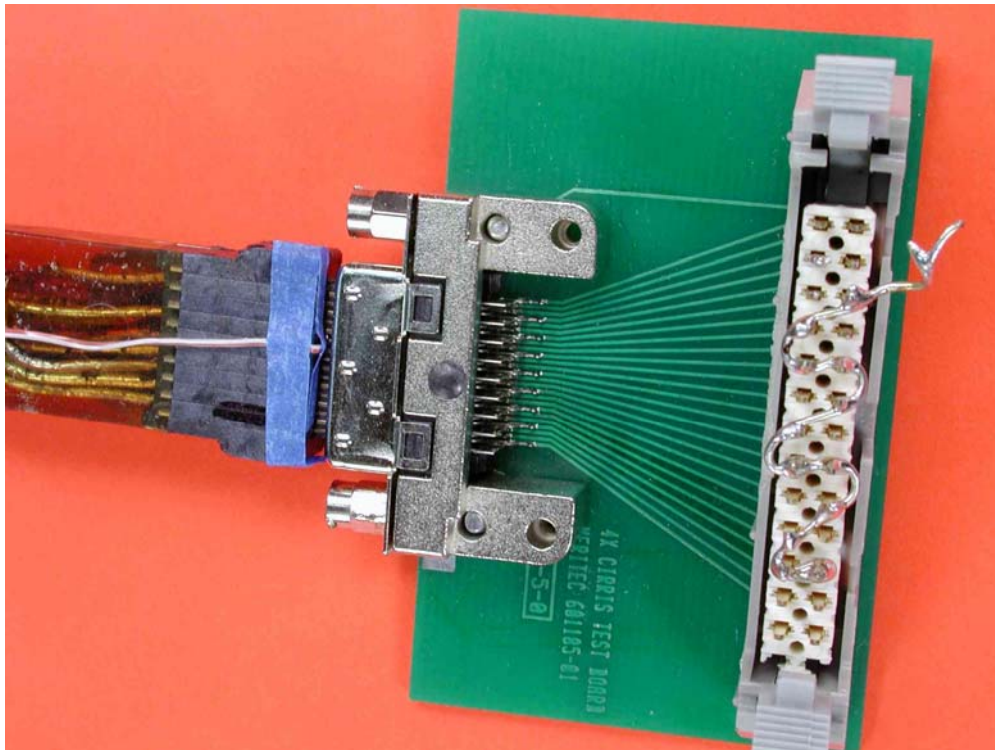
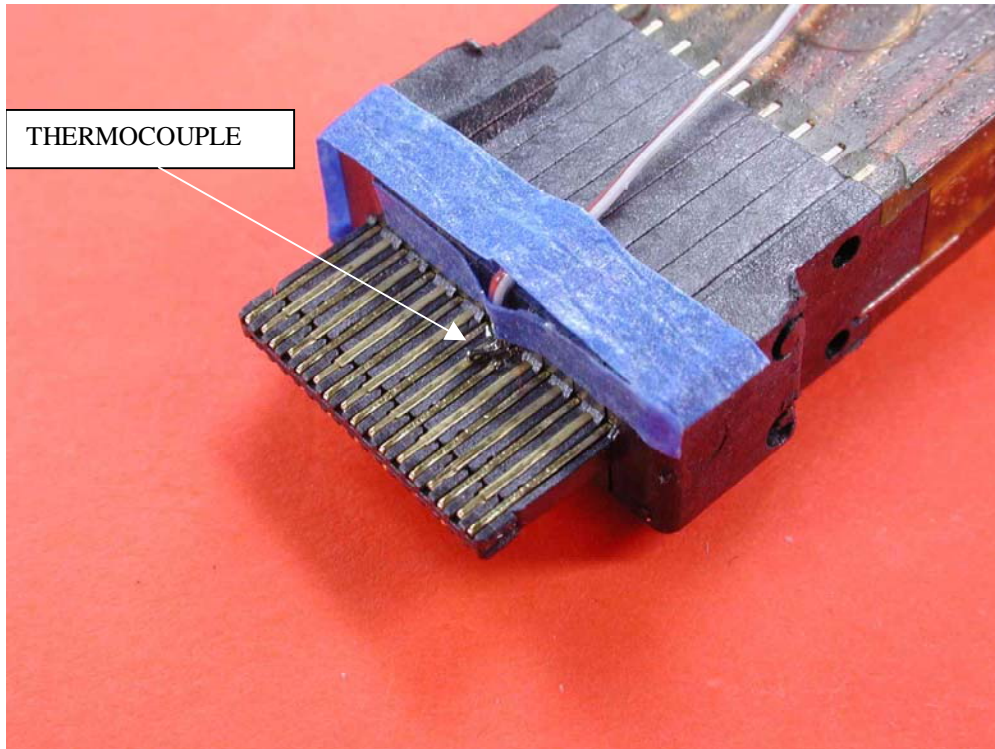
Testing Methods

The Meritec 4X connectors were mated with Molex 4X receptacles. A thermocouple was epoxied to one of the male contacts that was sharing the total amperage load. All tests were performed in an ambient room air temperature of approximately 22 °C. The airflow in the room was essentially static except that due to heating the room.

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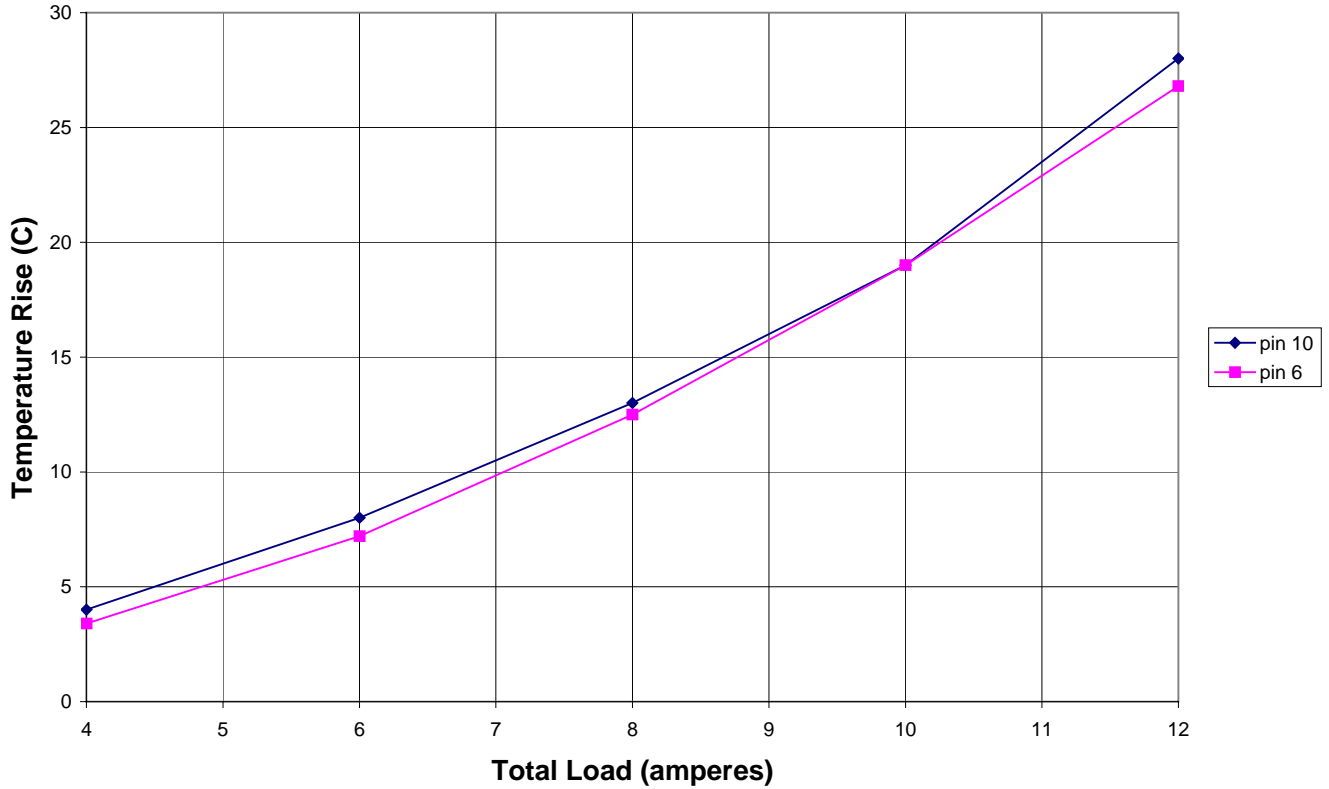
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Mated connector and test board

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12 Parallel Contacts Meritec NX Connector



This graph shows the results of paralleling 12 contacts within pairs 2 through 7 and increasing the current load until the temperature rise approaches 30°C. Two thermocouple placements were tested, one on pin 6 and one on pin 10.

4X Connector Pinout

PAIR	1	2	3	4	5	6	7	8
PIN	1	3	5	7	9	11	13	15
PIN	2	4	6	8	10	12	14	16

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Voltage Drop per Conductor per Meter of Cable

The following data is based on calculations using the bulk resistance of various cable sizes. The voltage drops do not include the connectors.

Wire size (AWG)	Voltage drop at 0.5 amps over 1 meter (mv)
24	42
26	67
28	107

Voltage Drop through 1 Meter 28awg Cable Assembly

The measurements include the cable and both mated pairs of plugs and receptacles.

Total Current	Total Voltage Drop	Drop across one mated contact pair	Current per contact
6 amps	160 mv	26.5 mv (1)	0.5 amps
12 amps	318 mv	53 mv	1.0 amps

(1) $[\text{total voltage drop} - \text{calculated cable drop}] / 2 \text{ ends} = \text{voltage drop across one mated contact pair}$
ie., $160\text{mv} - 107\text{mv} = 53\text{mv}$; $53\text{mv} / 2 \text{ ends} = 26.5\text{mv}$