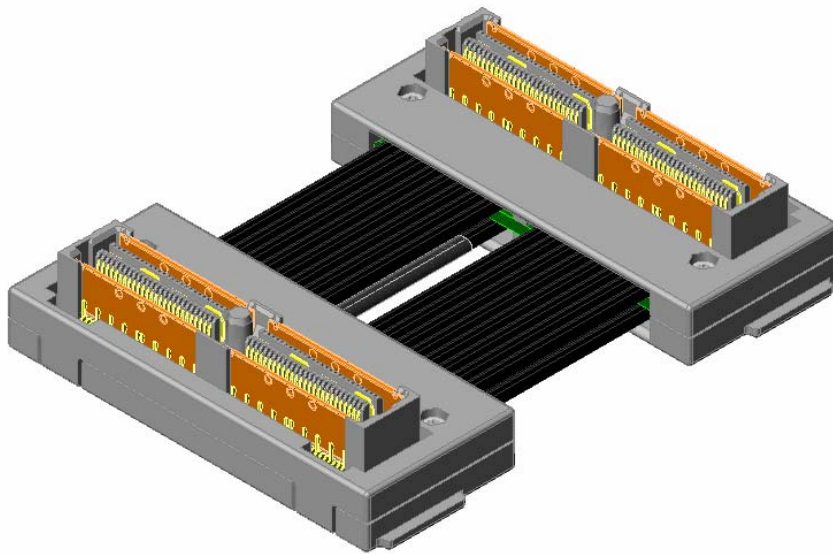




Project Number:		Tracking Code: TC069--0957	
Requested by: John Reid		Date: 2/28/2006	Product Rev: 3
Part #: 6QDPS-016-06.0-STR-TTL-1		Lot #: 02/28/2006	Tech: Troy Cook/Tony Wagoner Eng: Dave Scopelliti
Part description: 6QDPS			Qty to test: 150
Test Start: 08/24/2006	Test Completed: 9/27/2006		



PART DESCRIPTION

**6QDPS-XXX-XX.XX-STR-TTL-1
DVT REPORT**

**Mated with QFSS-016-01-L-D-DP-A &
QMSS-016-11-L-D-DP-A**

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to ISO 10012-1 and ANSI/NCSL 2540-1, as applicable.

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SCOPE

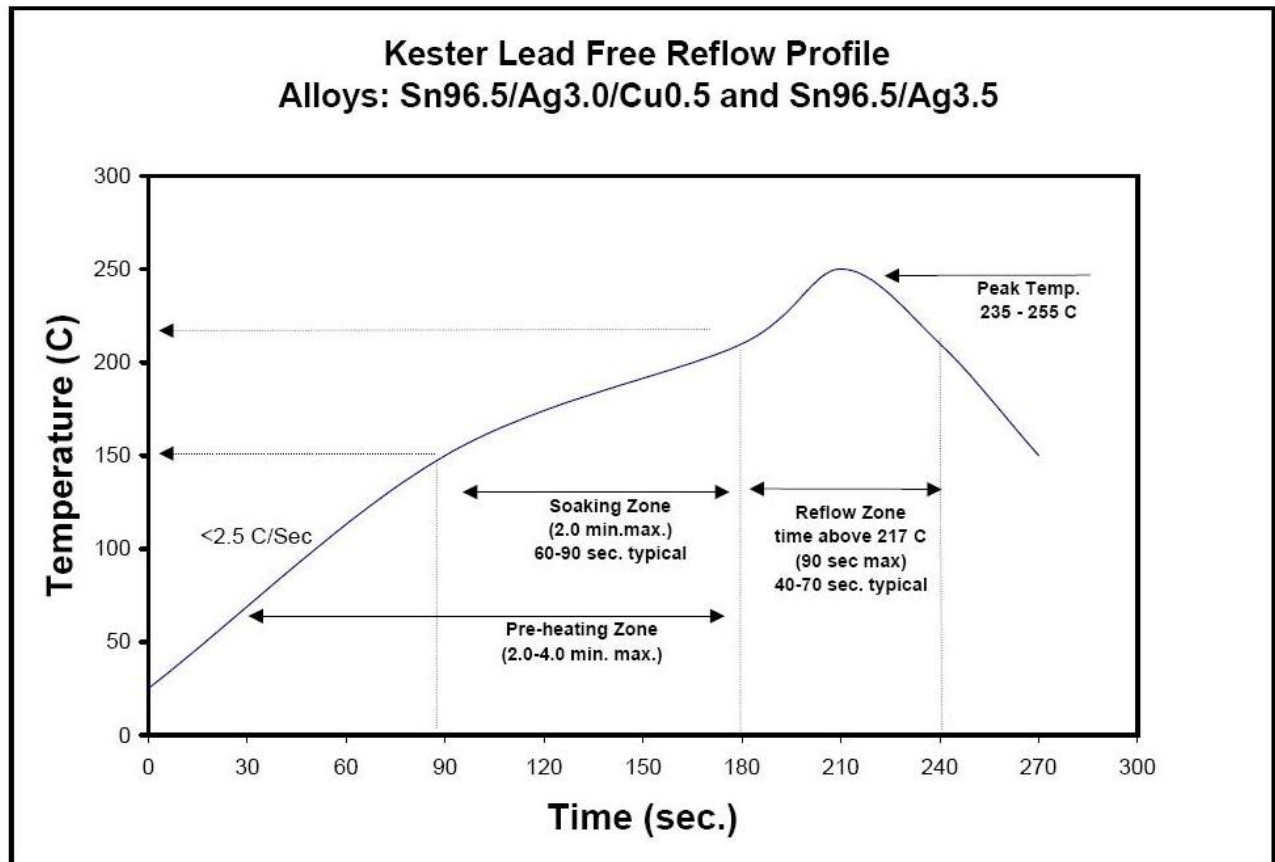
To perform the following tests: DVT, Parts will be done 03/28/2006. Please have boards done before then

APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

- 1) All materials were manufactured in accordance with the applicable product specification.
- 2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
- 3) After soldering, the parts to be used for LLCR and DWV/IR testing were cleaned according to TLWI-0001.
- 4) An automated cleaning procedure was used.
- 5) The automated procedure is used with aqueous compatible soldering materials.
- 6) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
- 7) Any additional preparation will be noted in the individual test sequences.
- 8) Solder Information: Lead Free
- 9) Re-Flow Time/Temp: See accompanying profile.
- 10) Internal Test PCBs used: PCB-100507-TST-XX

OVEN PROFILE (Soldering Parts to Test Boards)

FLOWCHARTS**Current Carrying Capacity**

TEST	GROUP 1	GROUP 2
STEP	Both Cables Powered 6 Adjacent Contacts in both cables	Both Cables Powered SIG
01	CCC	CCC

Tabulate calculated current at RT, 50° C, 60° C and 70° C
after derating 20% and after derating 20% and based on 80° C
CCC, Temp rise = EIA-364-70

IR

TEST	GROUP 1A	GROUP 1B
STEP	TOP Cable, Conductor - to - Conductor	BOTTOM Cable, Conductor - to - Conductor
01	IR	IR
02	Data Review	Data Review
03	Thermal Aging	Thermal Aging
04	IR	IR
05	Data Review	Data Review
06	Humidity	Humidity
07	IR	IR

Thermal Aging = EIA-364-17, Test Condition 4, 105 deg C;
Time Condition 'B' (250 hours)
Humidity = EIA-364-31, Test Condition B (240 Hours)
and Method III (+25° C to +65° C @ 90%RH to 98% RH)
delete steps 7a and 7b

FLOWCHARTS Continued**DWV**

TEST STEP	GROUP 1 TOP Cable, Conductor - to - Conductor Ambient	GROUP 2 BOTTOM Cable, Conductor - to - Conductor Ambient	GROUP 3 TOP Cable, Conductor - to - Conductor Thermal	GROUP 4 BOTTOM Cable, Conductor - to - Conductor Thermal	GROUP 5 TOP Cable, Conductor - to - Conductor Humidity	GROUP 6 BOTTOM Cable, Conductor - to - Conductor Humidity
01	DWV/Working Voltage	DWV/Working Voltage	Thermal Aging	Thermal Aging	Humidity	Humidity
02			DWV/Working Voltage	DWV/Working Voltage	DWV/Working Voltage	DWV/Working Voltage

Thermal Aging = EIA-364-17, Test Condition 4, 105 deg C;

Time Condition 'B' (250 hours)

Humidity =EIA-364-31, Test Condition B (240 Hours)

and Method III (+25 ° C to +65 ° C @ 90%RH to 98% RH)

delete steps 7a and 7b

Connector Pull

TEST STEP	GROUP 2A-STD	GROUP 2B-STD
	DV SIG 0°	DV SIG 90°
01	Pull test, Continuity	Pull test, Continuity

Secure both cables in the center

Monitor continuity and pull

record forces when continuity fails.

FLOWCHARTS Continued**Resistance, SIG Continuity**

	10 Pieces	10 Pieces
TEST	GROUP 1	GROUP 1A
STEP	DV End 90°	DV End 35°
	SIG	SIG
01	Resistance	Resistance
02	1000 Cycles	1000 Cycles
03	Resistance	Resistance
04	Data Review	Data Review
05	2000 Cycles	2000 Cycles
06	Resistance	Resistance
07	Data Review	Data Review
08	3000 Cycles	3000 Cycles
09	Resistance	Resistance
10	Data Review	Data Review
11	4000 Cycles	4000 Cycles
12	Resistance	Resistance
13	Data Review	Data Review
14	5000 Cycles	5000 Cycles
15	Resistance	Resistance

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL:

- 1) EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors*.
- 2) Test Condition 4 at 105° C.
- 3) Test Time Condition B for 250 hours.
- 4) Connectors are sometimes mated and all samples are pre-conditioned at ambient.

HUMIDITY:

- 1) Reference document: EIA-364-31, *Humidity Test Procedure for Electrical Connectors*.
- 2) Test Condition B, 240 Hours.
- 3) Method III, +25° C to + 65° C, 90% to 98% Relative Humidity excluding sub-cycles 7a and 7b.
- 4) Connectors are sometimes mated and all samples are pre-conditioned at ambient.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
- 2) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
- 3) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
- 4) The size of the temperature probe can affect the measured temperature.
- 5) Copper traces on PC boards will contribute to temperature rise:
 - a. Self heating (resistive)
 - b. Reduction in heat sink capacity affecting the heated contacts
- 6) A de-rating curve, usually 20%, is calculated.
- 7) Calculated de-rated currents at three temperature points are reported:
 - a. Ambient
 - b. 60° C
 - c. 75° C
 - d. 80° C
- 8) Typically, neighboring contacts (in close proximity to maximize heat build up) are energized.
- 9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the maximum temperature in the vicinity of the heat generation area.
- 10) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
- 11) Hook-up wire cross section is larger than the cross section of any connector leads/PC board traces, jumpers, etc.
- 12) Hook-up wire length is longer than the minimum specified in the referencing standard.

INSULATION RESISTANCE (IR):

To determine the resistance of insulation materials to leakage of current through or on the surface of these materials when a DC potential is applied.

- 1) PROCEDURE:
 - a. Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
 - b. Test Conditions:
 - i. Between Adjacent Contacts
 - ii. Electrification Time 2.0 minutes
 - iii. Test Voltage (500 VDC) corresponds to calibration settings for measuring resistances.
- 2) MEASUREMENTS:
- 3) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 5000 megohms.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

To determine if the sockets can operate at its rated voltage and withstand momentary over potentials due to switching, surges, and other similar phenomenon. Separate samples are used to evaluate the effect of environmental stresses so not to influence the readings from arcing that occurs during the measurement process.

- 1) PROCEDURE:
 - a. Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.
 - b. Test Conditions:
 - i. Between Adjacent Contacts
 - ii. Rate of Application 500 V/Sec
 - iii. Test Voltage (VAC) until breakdown occurs
- 2) MEASUREMENTS/CALCULATIONS
 - a. The breakdown voltage shall be measured and recorded.
 - b. The dielectric withstanding voltage shall be recorded as 75% of the minimum breakdown voltage.
 - c. The working voltage shall be recorded as one-third (1/3) of the dielectric withstanding voltage (one-fourth of the breakdown voltage).

SUPPLEMENTAL TESTS

CONNECTOR PULL:

- 1) Secure cable near center and pull on connector
 - a. At 90°, right angle to cable
 - b. At 0°, in-line with cable

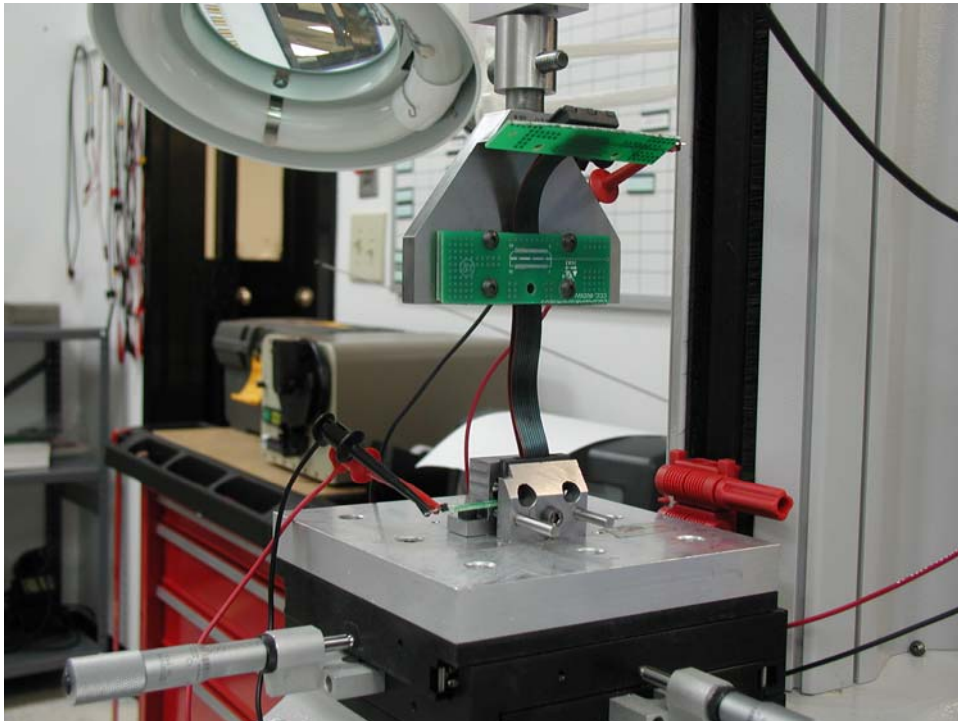


Fig. 1

(Typical set-up, actual part not depicted.)

0° Connector pull, notice the electrical continuity hook-up wires.

CABLE DURABILITY:

- 1) Oscillate and monitor electrical continuity for open circuit indication.
 - a. $\pm 35^\circ$ Pendulum Mode, bend up to 5,000 cycles with 8 oz. load on cable end.

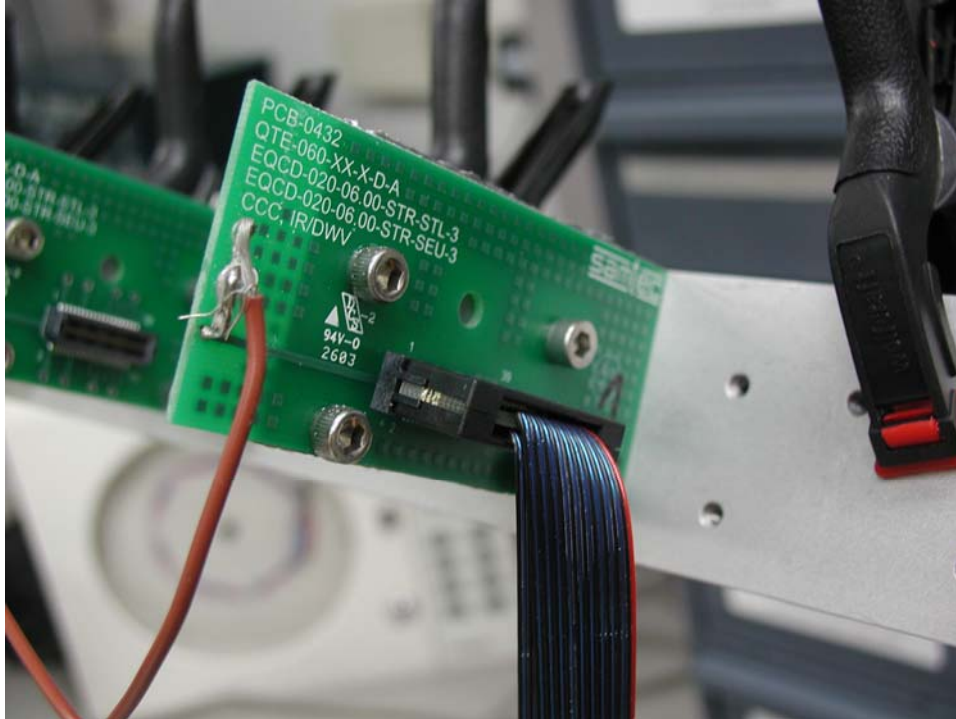


Fig. 2
(Typical set-up, actual part not depicted.)

- b. $\pm 90^\circ$ Flex Mode, bend up to 5,000 cycles with 8 oz. load on cable end.

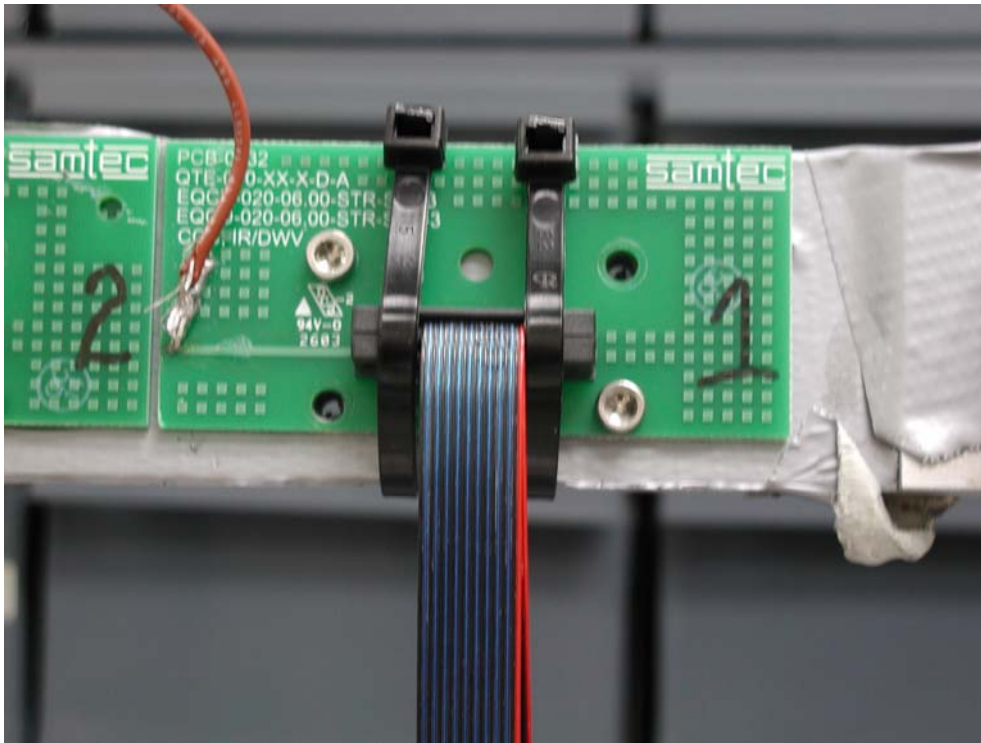


Fig. 3
(Typical set-up, actual part not depicted.)

RESULTS

Temperature Rise, CCC at a 20% de-rating

- CCC for a 30°C Temperature Rise -----2.0 A per contact with 6 adjacent contacts, one cable
- CCC for a 30°C Temperature Rise -----0.7 A per contact with 6 positions powered, both cables

Insulation Resistance minimums, IR

- **Initial**
 - Top Cable ----- 15,000 Meg Ω ----- Pass
 - Bottom Cable ----- 10,000 Meg Ω
- **Thermal**
 - Top Cable ----- 100,000 Meg Ω
 - Bottom Cable ----- 100,000 Meg Ω
- **Humidity**
 - Top Cable ----- 50,000 Meg Ω
 - Bottom Cable ----- 25,000 Meg Ω

Dielectric Withstanding Voltage minimums, DWV

- **Initial**
 - **Breakdown**
 - Top Cable ----- 820 VAC
 - Bottom Cable ----- 860 VAC
 - **DWV**
 - Top Cable ----- 615 VAC
 - Bottom Cable ----- 645 VAC
 - **Working voltage**
 - Top Cable ----- 205 VAC
 - Bottom Cable ----- 215 VAC
- **Thermal**
 - **Breakdown**
 - Top Cable ----- 1,000 VAC
 - Bottom Cable ----- 1,100 VAC
 - **DWV**
 - Top Cable ----- 750 VAC
 - Bottom Cable ----- 825 VAC
 - **Working voltage**
 - Top Cable ----- 250 VAC
 - Bottom Cable ----- 275 VAC
- **Humidity**
 - **Breakdown**
 - Top Cable ----- 740 VAC
 - Bottom Cable ----- 780 VAC
 - **DWV**
 - Top Cable ----- 555 VAC
 - Bottom Cable ----- 585 VAC
 - **Working voltage**
 - Top Cable ----- 185 VAC
 - Bottom Cable ----- 195 VAC

SUPPLEMENTAL TESTING**Supplemental – Connector/Cable Pull**

- 0° ----- 169.60 lbs min
- 90° ----- 84.90 lbs min

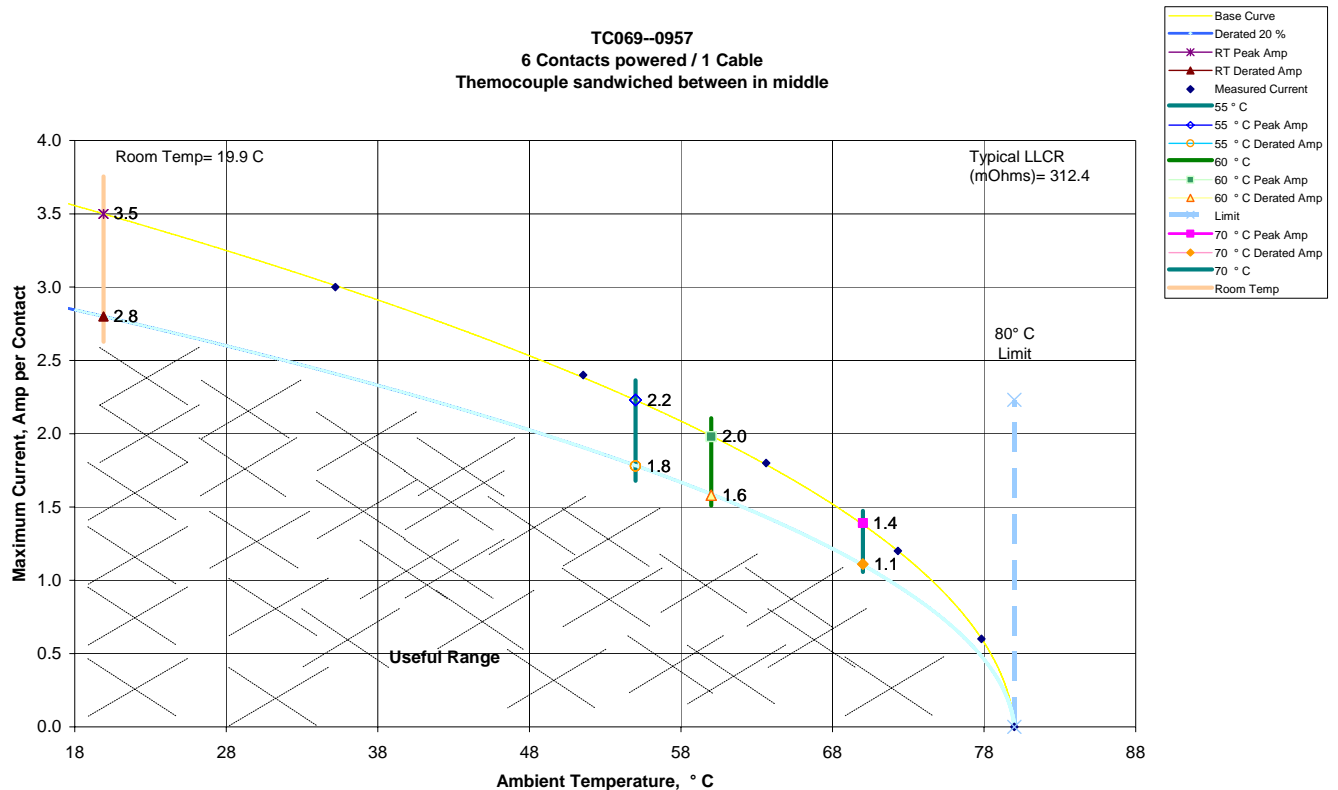
Supplemental – Cable Bend 5,000 Cycles

- $\pm 35^{\circ}$ Pendulum Mode ----- No Electrical Failures
- $\pm 90^{\circ}$ Flex Mode ----- No Electrical Failures

DATA SUMMARIES

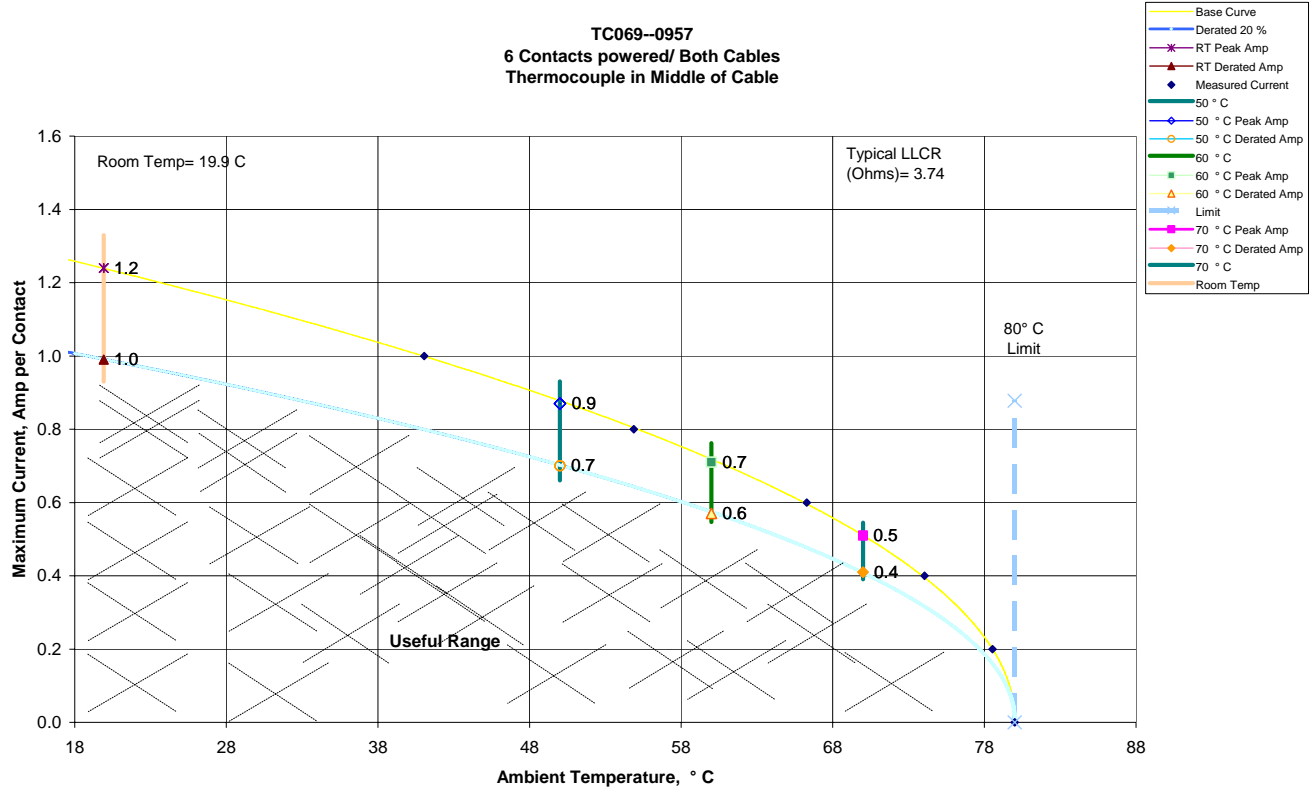
TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
- 2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
- 3) Temperature readings recorded are those for which three successive readings, 15 minutes apart, differ less than 1° C (computer controlled data acquisition).
- 4) Adjacent contacts were powered:
 - a. Linear configuration with six adjacent conductors/contacts powered in one cable



DATA SUMMARIES Continued

b. Linear configuration with all conductors/contacts powered in both cables



INSULATION RESISTANCE (IR):

	Initial, Meg Ohms		Thermal, Meg Ohms		Humidity, Meg Ohms	
	Top	Bottom	Top	Bottom	Top	Bottom
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average	32500	55000	100000	100000	75000	25000
Min	15000	10000	100000	100000	50000	25000
Max	50000	100000	100000	100000	100000	25000

DATA SUMMARIES Continued**DIELECTRIC WITHSTANDING VOLTAGE (DWV):**

	Initial, VAC Top			Initial, VAC Bottom		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	2867	2150	717	967	725	242
Min	740	555	185	780	585	195
Max	13000	9750	3250	1200	900	300
	Thermal, VAC Top			Thermal, VAC Bottom		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	7000	5250	1750	1150	863	288
Min	1000	750	250	1100	825	275
Max	13000	9750	3250	1200	900	300
	Humidity, VAC Top			Humidity, VAC Bottom		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	770	578	193	810	608	203
Min	740	555	185	780	585	195
Max	800	600	200	840	630	210

SUPPLEMENTAL TESTS**CONNECTOR/CABLE PULL:**

	<i>0 Deg.</i>	<i>90 Deg.</i>
Pull DV	Force (Lbs)	Force (Lbs)
Minimum	169.59	84.88
Maximum	324.12	222.43
Average	265.3	182.6

DATA SUMMARIES Continued**CABLE BEND:**

35 Deg. Flex Test - Resistance, Ohms						
	Initial	1000Cycles	2000 Cycles	3000 Cycles	4000 Cycles	5000 Cycles
Avg	3.9092	4.0816	5.0438	6.2744	6.7072	7.4412
Min	3.4770	3.4410	4.5020	3.8920	4.5490	4.1680
Max	5.3150	5.5640	5.6850	12.9170	11.6960	11.9180
St. Dev.	0.7883	0.8791	0.4440	3.7627	2.8446	3.2893
Count	5	5	5	5	5	5

90 Deg. Flex Test - Resistance, Ohms						
	Initial	1000Cycles	2000 Cycles	3000 Cycles	4000 Cycles	5000 Cycles
Avg	3.4598	3.5350	3.5306	3.6658	4.0798	5.0416
Min	2.8760	3.1870	3.2100	2.8760	2.8760	3.0970
Max	3.6500	3.6470	3.6460	4.6800	6.7500	11.3230
St. Dev.	0.3288	0.1951	0.1820	0.6467	1.5248	3.5187
Count	5	5	5	5	5	5

DATA**INSULATION RESISTANCE (IR):**

Sample#	Initial, Meg Ohms		Thermal, Meg Ohms		Humidity, Meg Ohms	
	Top	Bottom	Top	Bottom	Top	Bottom
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
1	15000	100000	100000	100000	100000	25000
2	50000	10000	100000	100000	50000	25000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Sample #	Initial, VAC Top			Initial, VAC Bottom		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1	820	615	205	1020	765	255
2	840	630	210	860	645	215

Sample #	Thermal, VAC Top			Thermal, VAC Bottom		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1	13000	9750	3250	1200	900	300
2	1000	750	250	1100	825	275

Sample #	Humidity, VAC Top			Humidity, VAC Bottom		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1	800	600	200	840	630	210
2	740	555	185	780	585	195

DATA (continued)**SUPPLEMENTAL TESTS****CONNECTOR/CABLE PULL:**

Sample#	<i>0 Deg.</i>	<i>90 Deg.</i>
	Maximum Force (Lbs)	Maximum Force (Lbs)
1	319.35	222.43
2	324.12	188.57
3	304.47	210.39
4	209.05	206.88
5	169.59	84.88

CABLE BEND:

Cable	35 Deg. Flex Test - Resistance, Ohms					
	Initial	1000Cycles	2000 Cycles	3000 Cycles	4000 Cycles	5000 Cycles
1	3.6230	4.2050	4.5020	4.4940	6.0770	4.6650
2	3.4770	3.5660	4.8580	4.4930	5.5720	4.1680
3	5.3150	3.4410	5.2380	5.5760	4.5490	6.8900
4	3.5200	5.5640	4.9360	12.9170	11.6960	9.5650
5	3.6110	3.6320	5.6850	3.8920	5.6420	11.9180

Cable	90 Deg. Flex Test - Resistance, Ohms					
	Initial	1000Cycles	2000 Cycles	3000 Cycles	4000 Cycles	5000 Cycles
1	3.6500	3.6100	3.6460	4.6800	6.7500	11.3230
2	3.6100	3.6120	3.6140	3.6100	3.6100	3.6940
3	2.8760	3.1870	3.2100	2.8760	2.8760	3.0970
4	3.5410	3.6470	3.5600	3.5410	3.5410	3.5000
5	3.6220	3.6190	3.6230	3.6220	3.6220	3.5940

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** THL-02**Description:** Temperature/Humidity Chart Recorder**Manufacturer:** Dickson**Model:** THDX**Serial #:** 00120351**Accuracy:** Temp: +/- 1C; Humidity: +/-2% RH (0 - 60%) +/- 3% RH (61 - 95%).

... Last Cal: 06/16/06, Next Cal: 06/16/07

Equipment #: MO-02**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0780546**Accuracy:** See Manual

... Last Cal: 05/12/06, Next Cal: 05/12/07

Equipment #: MO-04**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0798688**Accuracy:** See Manual

... Last Cal: 01/31/06, Next Cal: 01/31/07

Equipment #: PS-01**Description:** System Power Supply**Manufacturer:** Hewlett Packard**Model:** HP 6033A**Serial #:** (HP) 3329A-07330**Accuracy:** See Manual

... Last Cal: 05/12/06, Next Cal: 05/12/07

Equipment #: TC090601-109/118**Description:** IC Thermocouple-109/118**Manufacturer:** Samtec**Model:****Serial #:** TC090601-109/118**Accuracy:** +/- 1 degree C

... Last Cal: , Next Cal:

Equipment #: HPM-01**Description:** Hipot Megommeter**Manufacturer:** Hipotronics**Model:** H306B-A**Serial #:** M9905004**Accuracy:** 2 % Full Scale Accuracy

... Last Cal: 5/12/06, Next Cal: 05/12/07

Equipment #: OV-03

Description: Cascade Tek Forced Air Oven

Manufacturer: Cascade Tek

Model: TFO-5

Serial #: 0500100

Accuracy: Temp. Stability: +/- .1C/C change in ambient Temp. Stability: +/- .1C/C change in ambient

... Last Cal: 05/12/06, Next Cal: 05/12/07

Equipment #: THC-01

Description: Temperature/Humidity Chamber

Manufacturer: Thermotron

Model: SM-8-7800

Serial #: 30676

Accuracy: See Manual

... Last Cal: 8/18/2006, Next Cal: 8/18/2007

Equipment #: HDR - 01

Description: HDR Flex Tester

Manufacturer: Samtec Inc.

Model: AT-1440-000

Serial #: AT-1440-000

Accuracy: N/A

... Last Cal: No Calibration Required

Equipment #: MO-01

Description: Micro-Ohmmeter

Manufacturer: Keithley

Model: 580

Serial #: 0772740

Accuracy: See Manual

... Last Cal: 05/12/06, Next Cal: 05/12/07

...