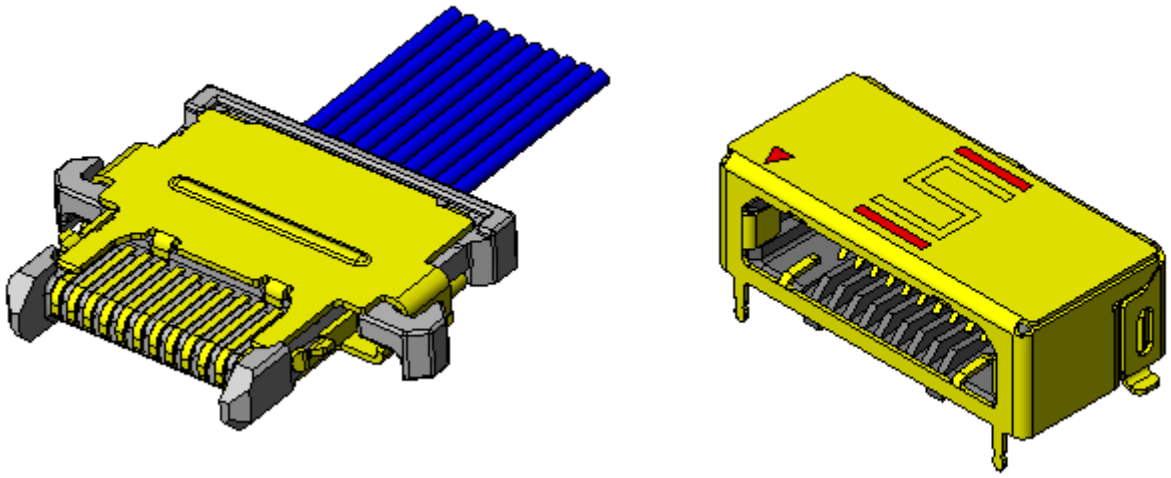
Project Number: Design Verification Test	Tracking Code: TC1005—3140_Report_Rev_1		
Requested by: Corey Rose	Date: 5/5/2010	Product Rev: 3	
Part #: FCC8-20-01-L-06.0-S / FCS8-20-01-L-S-A	Lot #: 01/22/10	Tech: Troy Cook Gary Lomax	Eng: Eric Mings Mark Shireman
Part description: FCX8			Qty to test: 30
Test Start: 01/25/2010	Test Completed: 3/15/2010		



Design Verification Test Report

PART DESCRIPTION

FCC8-20-01-L-06.0-S / FCS8-20-01-L-S-A

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to IS0 10012-l and ANSI/NCSL 2540-1, as applicable.

SCOPE

To perform the following tests: Design verification test. See test plan.

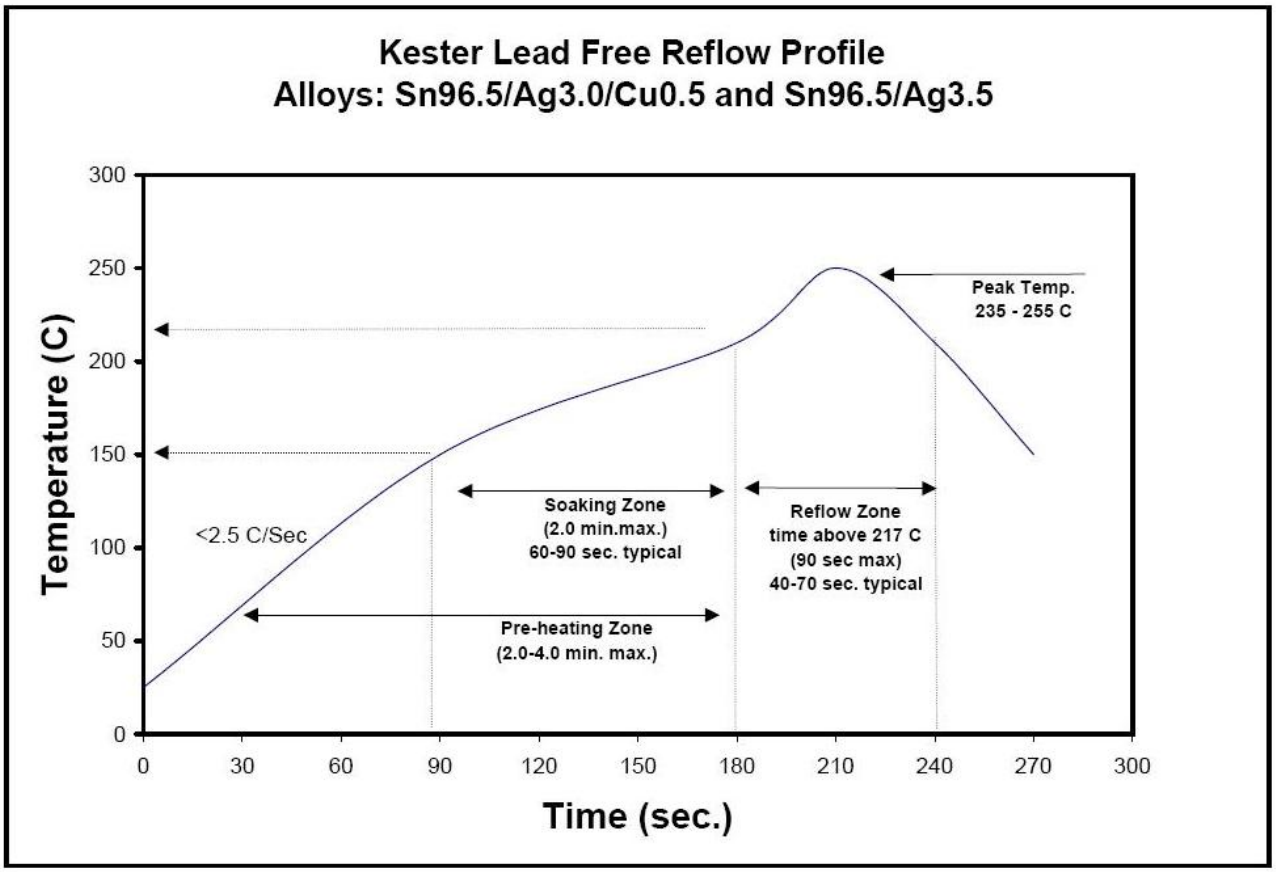
APPLICABLE DOCUMENTS

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) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be 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) Samtec Test PCBs used: PCB-101719-TST / PCB-101721-TST / PCB-101722-TST

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

TEST STEP	GROUP A 192 Points Min
01	LLCR-1
02	Gas Tight
03	LLCR-2

Gas Tight = EIA-364-36A
LLCR = EIA-364-23, LLCR
use Keithley 580 in the dry circuit mode, 10 mA Max

Mating/Unmating/Gaps/Normal Force/Deflection Force

TEST STEP	GROUP A 10 Boards	GROUP B Individual Contacts (8-10 min)
01	Contact Gaps	Setup Approved
02	Mating / Unmating	Normal Force (in the body and soldered on PCB unless otherwise specified)
03	25 Cycles	
04	Clean w/Compressed Air	
05	Mating / Unmating	
06	Contact Gaps	
07	Thermal Aging (Mated)	
08	Mating / Unmating	
09	Contact Gaps	
10	Cyclic Humidity (Mated)	
11	Mating / Unmating	

Thermal Aging = EIA-364-17, Test Condition 4 (105 °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)
ambient pre-condition and delete steps 7a and 7b
Mating/Un-Mating Forces = EIA-364-13
Normal Force = EIA-364-04
(Perpendicular) displacement Force = 12.7 mm/min +/- 6 mm/min
Spec is 50 N @ 1 mm displacement
Contact Gaps/Height - No standard method. Usually measured optically

IR & DWV

TEST STEP	GROUP A1 2 Mated Sets Break Down - Pin to Pin	GROUP A2 2 Unmated of Part # Being Tested Break Down - Pin to Pin	GROUP A3 2 Unmated of Mating Part # Break Down - Pin to Pin	GROUP B 2 Mated Sets Pin to Pin
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Aging (both sets unmated)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (both sets unmated)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

*** - DWV on group B to be performed at Test Voltage**

DWV test voltage is equal to 75% of the lowest break down voltage from group A1, A2 or A3

Thermal Aging = EIA-364-17, Test Condition 4 (105 °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)

ambient pre-condition and delete steps 7a and 7b

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

Durability/Thermal Age/Cyclic Humidity

TEST STEP	GROUP A 192 Points Min 25 Cycles
01	LLCR-1
02	25 Cycles
03	Clean Mating Interface
04	LLCR-2
05	Thermal Age (Mated and undisturbed)
06	LLCR-3
07	Cyclic Humidity (Mated and undisturbed)
08	LLCR-4

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)
ambient pre-condition and delete steps 7a and 7b
LLCR = EIA-364-23, LLCR
use Keithley 580 in the dry circuit mode, 10 mA Max

Current Carrying Capacity

TEST STEP	GROUP A 3 Mated Assemblies ALL CONTACTS POWERED (Measure at Contact)	GROUP B 3 Mated Assemblies ALL CONTACTS POWERED (Measure at Cable)
01	CCC	CCC

(TIN PLATING) - Tabulate calculated current at RT, 65° C, 75° C and 95° C
after derating 20% and based on 105° C
(GOLD PLATING) - Tabulate calculated current at RT, 85° C, 95° C and 115° C
after derating 20% and based on 125° C
CCC, Temp rise = EIA-364-70

Connector Pull

TEST STEP	Group A 5 Pieces DV SIG 0°	Group B 5 Pieces DV SIG 90°
01	Pull test, Continuity	Pull test, Continuity

Secure cables in the center
Monitor continuity and pull record forces when continuity fails.

Note continuity failure mode.

Resistance, SIG Continuity

TEST STEP	GROUP A	GROUP B
	5 Pieces	5 Pieces
	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	1000 Cycles (2000 Total)	1000 Cycles (2000 Total)
06	Resistance	Resistance
07	Data Review	Data Review
08	1000 Cycles (3000 Total)	1000 Cycles (3000 Total)
09	Resistance	Resistance
10	Data Review	Data Review
11	1000 Cycles (4000 Total)	1000 Cycles (4000 Total)
12	Resistance	Resistance
13	Data Review	Data Review
14	1000 Cycles (5000 Total)	1000 Cycles (5000 Total)
15	Resistance	Resistance
16	Data Review	Data Review

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) All test samples are pre-conditioned at ambient.
5) All test samples are exposed to environmental stressing in the mated condition.

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) All samples are pre-conditioned at ambient.
5) All test samples are exposed to environmental stressing in the mated condition.

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. 80^{o} C
    c. 95^{o} C
    d. 115^{o} 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.

CONTACT GAPS:

1) Gaps above the surrounding plastic surface were measured before and after stressing the contacts (e.g. thermal aging, mechanical cycling, etc.).
2) Typically, all contacts on the connector are measured.

MATING/UNMATING:

1) Reference document: EIA-364-13, *Mating and Unmating Forces Test Procedure for Electrical Connectors*.
2) The full insertion position was to within 0.003" to 0.004" of the plug bottoming out in the receptacle to prevent damage to the system under test.
3) One of the mating parts is secured to a floating X-Y table to prevent damage during cycling.

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

1) Reference document: EIA-364-04, *Normal Force Test Procedure for Electrical Connectors*.
2) The contacts shall be tested in the connector housing.
3) If necessary, a "window" shall be made in the connector body to allow a probe to engage and deflect the contact at the same attitude and distance (plus 0.05 mm [0.002"]) as would occur in actual use.
4) The connector housing shall be placed in a holding fixture that does not interfere with or otherwise influence the contact force or deflection.
5) Said holding fixture shall be mounted on a floating, adjustable, X-Y table on the base of the Dillon TC^2, computer controlled test stand with a deflection measurement system accuracy of 5.0 µm (0.0002").
6) The nominal deflection rate shall be 5 mm (0.2")/minute.
7) Unless otherwise noted a minimum of five contacts shall be tested.
8) The force/deflection characteristic to load and unload each contact shall be repeated five times.
9) The system shall utilize the TC^2 software in order to acquire and record the test data.
10) The permanent set of each contact shall be measured within the TC^2 software.
11) The acquired data shall be graphed with the deflection data on the X-axis and the force data on the Y-axis and a print out will be stored with the Tracking Code paperwork.

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 or Signal-to-Ground
        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 or Signal-to-Ground
        ii. Barometric Test Condition 1
        iii. Rate of Application 500 V/Sec
        iv. 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).

LLCR:

1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
    a. <= +5.0 mOhms: ---------- Stable
    b. +5.1 to +10.0 mOhms:---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +2000 mOhms: ---------- Unstable
    f. >+2000 mOhms:---------- Open Failure

GAS TIGHT:

To provide method for evaluating the ability of the contacting surfaces in preventing penetration of harsh vapors which might lead to oxide formation that may degrade the electrical performance of the contact system.

1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
    a. <= +5.0 mOhms: ---------- Stable
    b. +5.1 to +10.0 mOhms:---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +2000 mOhms: ---------- Unstable
    f. >+2000 mOhms:---------- Open Failure
4) Procedure:
    a. Reference document: EIA-364-36, *Test Procedure for Determination of Gas-Tight Characteristics for Electrical Connectors, Sockets and/or Contact Systems*.
    b. Test Conditions:
        i. Class II--- Mated pairs of contacts assembled to their plastic housings.
        ii. Reagent grade Nitric Acid shall be used of sufficient volume to saturate the test chamber
        iii. The ratio of the volume of the test chamber to the surface area of the acid shall be 10:1.
        iv. The chamber shall be saturated with the vapor for at least 15 minutes before samples are added.
        v. Exposure time, 55 to 65 minutes.
        vi. The samples shall be no closer to the chamber walls than 1 inches and no closer to the surface of the acid than 3 inches.
        vii. The samples shall be dried after exposure for a minimum of 1 hour.
        viii. Drying temperature 50^{o} C
        ix. The final LLCR shall be conducted within 1 hour after drying.

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

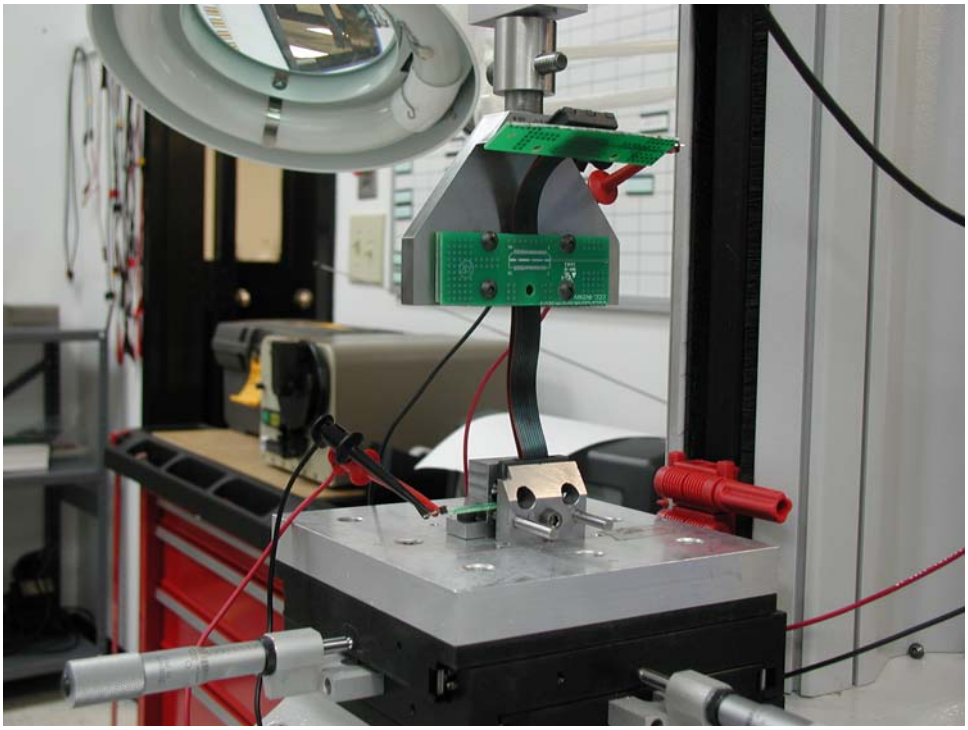


Fig. 1
(Typical set-up, actual part not depicted.)
0° Connector pull, notice the electrical continuity hook-up wires.

CABLE DURABILITY:

To determine the effectiveness of circular jacketed cable to plug seal, or flat cable to plug seal or interface to withstand strain under repeated alternating cable-flexing stresses as experienced in use with cable strain-relief design electrical connectors.
Reference document: EIA-364-41D *Cable flexing test procedure for electrical connectors*

1) Oscillate and monitor electrical continuity for open circuit indication.
   a. ± 35° Pendulum Mode, bend up to 5,000 cycles with 4 oz. load on cable end.

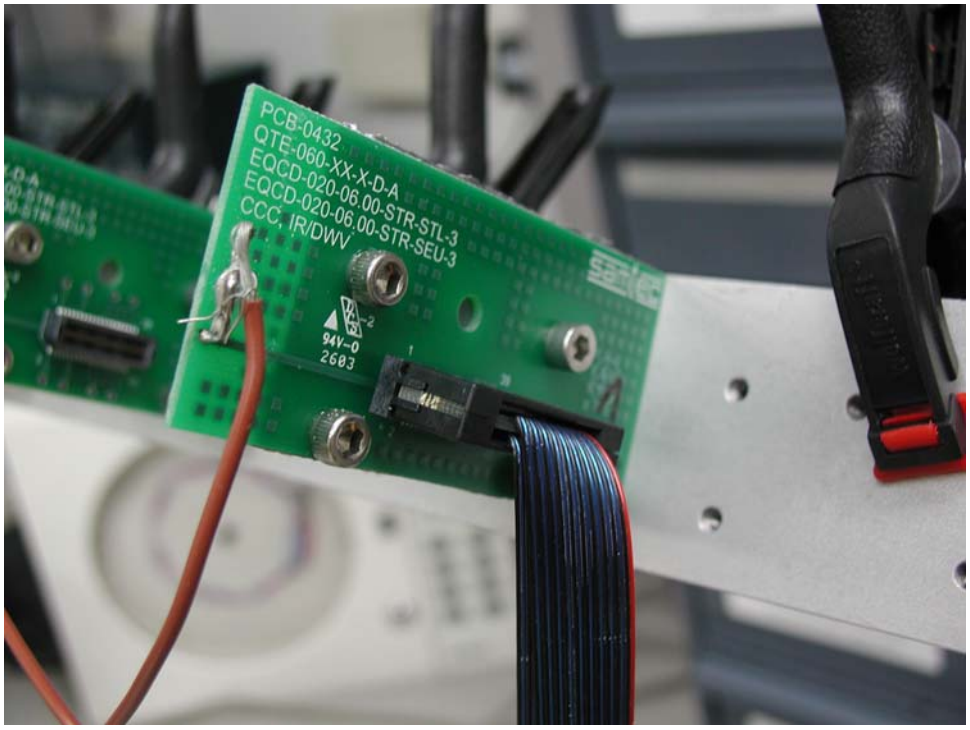


Fig. 2
(Typical set-up, actual part not depicted.)

b. ± 90° Flex Mode, bend up to 5,000 cycles with 4 oz. load on cable end.

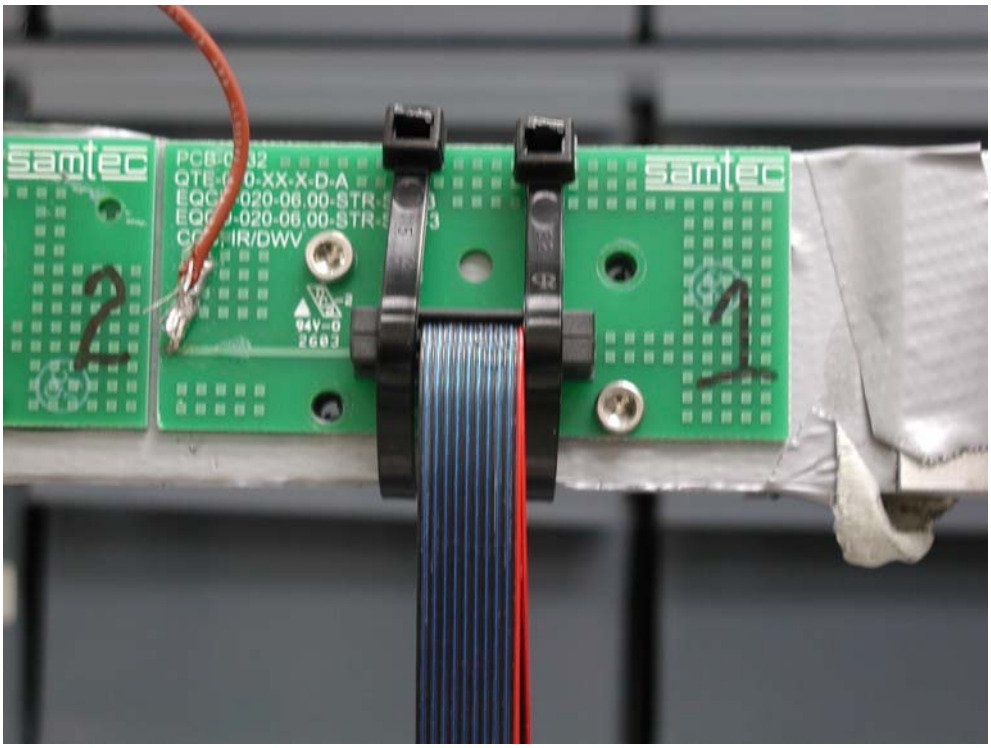


Fig. 3
(Typical set-up, actual part not depicted.)

RESULTS

Temperature Rise, CCC at a 20% de-rating

- **CCC for a 30°C Temperature Rise ---------- 0.6A per contact with all adjacent contacts powered, thermocouple located on contacts**
- **CCC for a 30°C Temperature Rise ---------- 0.7A per contact with all adjacent contacts powered, thermocouple located on cable**

Contact Gaps

- **Initial**
  - **Min ---------- 1.448 mm**
  - **Max ---------- 1.630 mm**
- **After 25 Cycles**
  - **Min ---------- 1.643 mm**
  - **Max ---------- 1.755 mm**
- **Thermal**
  - **Min ---------- 1.766 mm**
  - **Max ---------- 1.850 mm**

Mating – Unmating Forces

- **Initial**
  - **Mating**
    - **Min ---------- 1.72 Lbs**
    - **Max---------- 2.13 Lbs**
  - **Unmating**
    - **Min ---------- 1.87 Lbs**
    - **Max---------- 2.18 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 1.78 Lbs**
    - **Max---------- 2.36 Lbs**
  - **Unmating**
    - **Min ---------- 1.93 Lbs**
    - **Max---------- 2.28 Lbs**
- **Thermal**
  - **Mating**
    - **Min ---------- 1.64 Lbs**
    - **Max---------- 2.86 Lbs**
  - **Unmating**
    - **Min ---------- 1.19 Lbs**
    - **Max---------- 2.02 Lbs**
- **Humidity**
  - **Mating**
    - **Min ---------- 0.59 Lbs**
    - **Max---------- 1.39 Lbs**
  - **Unmating**
    - **Min ---------- 0.54 Lbs**
    - **Max---------- 1.12 Lbs**

Normal Force at 0.020” deflection

- **Initial**
  - **Min----------43.50 g Set ----- 0.0013”**
  - **Max ----------49.30 g Set ----- 0.0039”**

Insulation Resistance minimums, IR

- **Initial**
  - **Mated----------100,000 Meg Ω ---------- Pass**
  - **Unmated ---------- 25,000 Meg Ω ---------- Pass**
- **Thermal**
  - **Mated---------- 15,000 Meg Ω ---------- Pass**
  - **Unmated ---------- 15,000 Meg Ω ---------- Pass**
- **Humidity**
  - **Mated---------- 15,000 Meg Ω ---------- Pass**
  - **Unmated ---------- 15,000 Meg Ω ---------- Pass**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage----------920 VAC**
  - **Test Voltage ----------690 VAC**
  - **Working Voltage ----------230 VAC**
- **Initial DWV----------Passed**
- **Thermal DWV----------Passed**
- **Humidity DWV----------Passed**

LLCR Durability (214 LLCR test points)
*** B5, P15 and P24 were removed due to contact damage during assembly**
*** High initial resistance due to multiple interfaces (double ended cable with connector at each end)**

- **Initial ---------- 216.5 mOhms Max**
- **Durability, 25 Cycles**
  - **<= +5.0 mOhms ---------- 212 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 2 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Thermal**
  - **<= +5.0 mOhms ---------- 115 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 90 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 9 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms ---------- 125 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 85 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 3 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 1 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

LLCR Gas Tight (192 LLCR test points)
*** High initial resistance due to multiple interfaces (double ended cable with connector at each end)**

- **Initial ---------- 188.5 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ---------- 192 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

SUPPLEMENTAL TESTING

Supplemental – Connector/Cable Pull

- **0° ---------- 9.88 Lbs min**
- **90° ---------- 8.60 Lbs min**

Supplemental – Cable Bend 5,000 Cycles

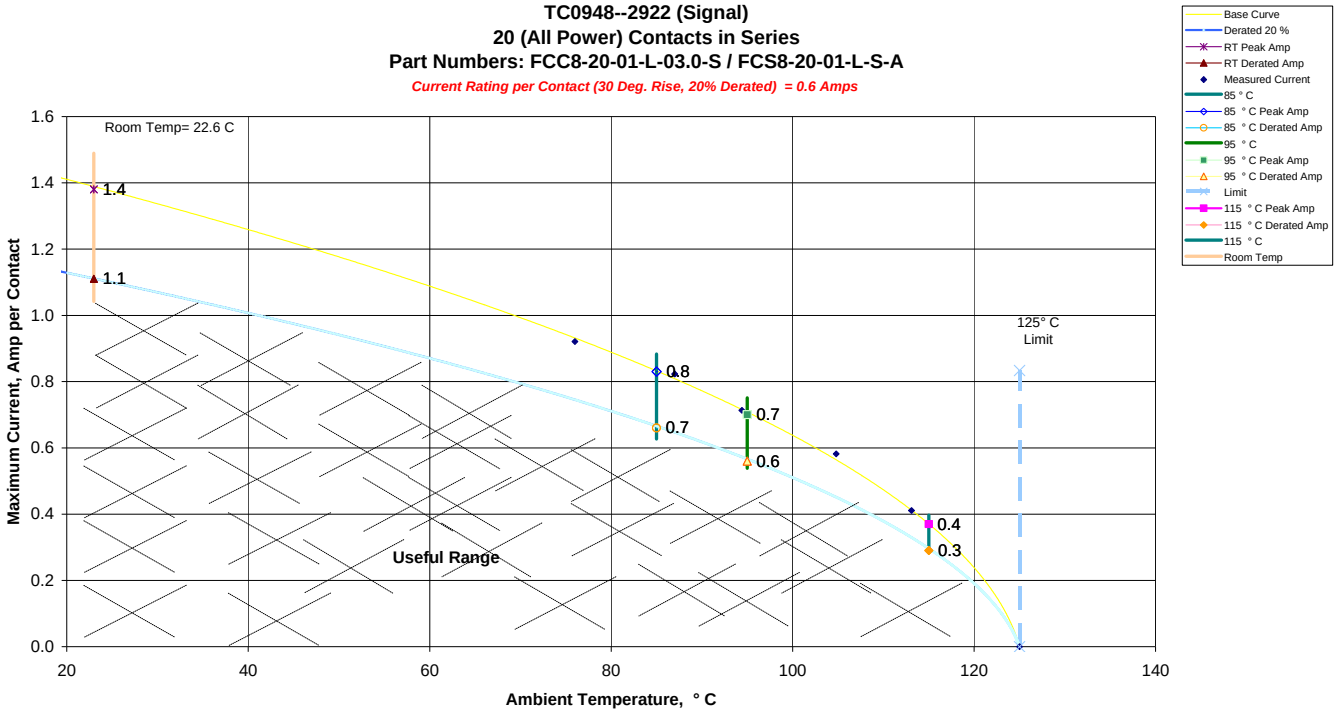
- **±35° Pendulum Mode ---------- No Electrical Failures Through 5,000 Cycles**
- **±90° Flex Mode ---------- No Electrical Failures Through 650 Cycles**

DATA SUMMARIES

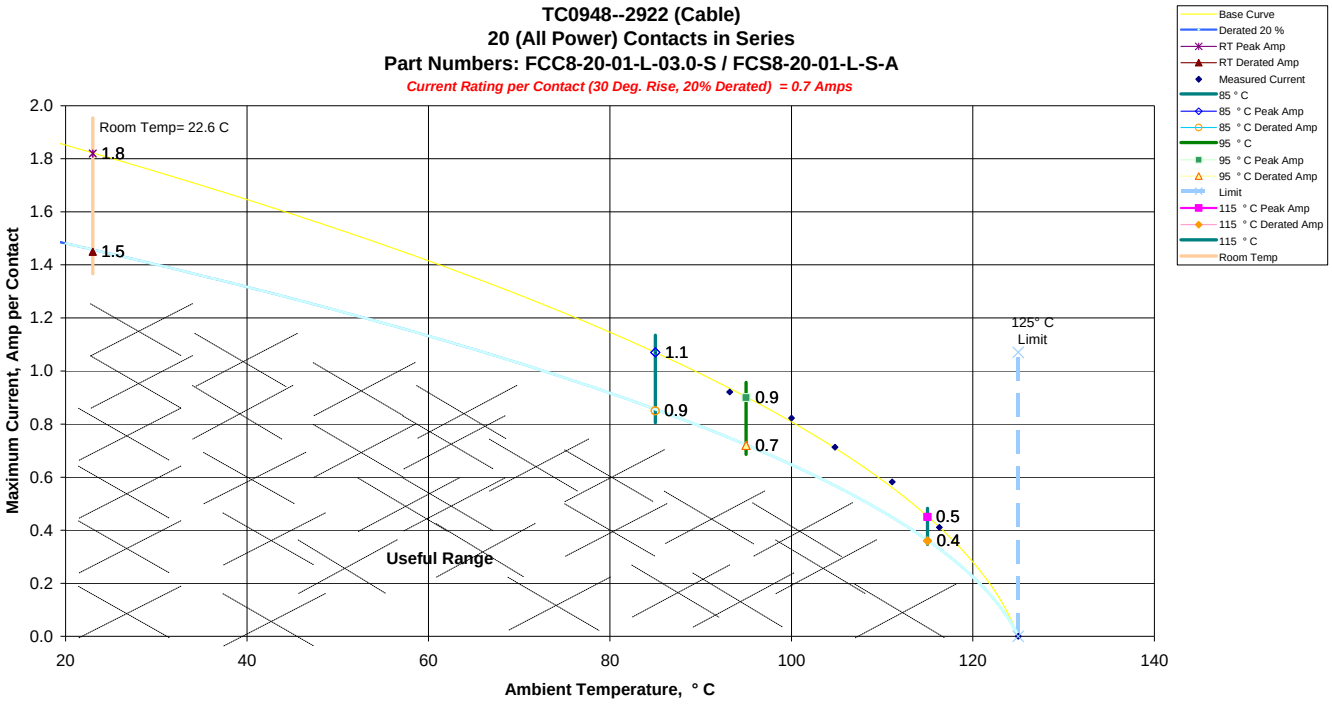
TEMPERATURE RISE (Current Carrying Capacity, CCC):

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 all adjacent contacts powered, thermocouple located on contacts



b. Linear configuration with all adjacent contacts powered, thermocouple located on cable



CONTACT GAPS:

Initial		After 25 Cycles		After Thermal	
Units:	mm	Units:	mm	Units:	mm
Minimum	1.448	***Minimum***	1.643	***Minimum***	1.766
Maximum	1.630	***Maximum***	1.755	***Maximum***	1.850
Average	1.555	***Average***	1.693	***Average***	1.802
St. Dev.	0.0417	***St. Dev.***	0.0243	***St. Dev.***	0.0229
Count	100	***Count***	100	***Count***	100

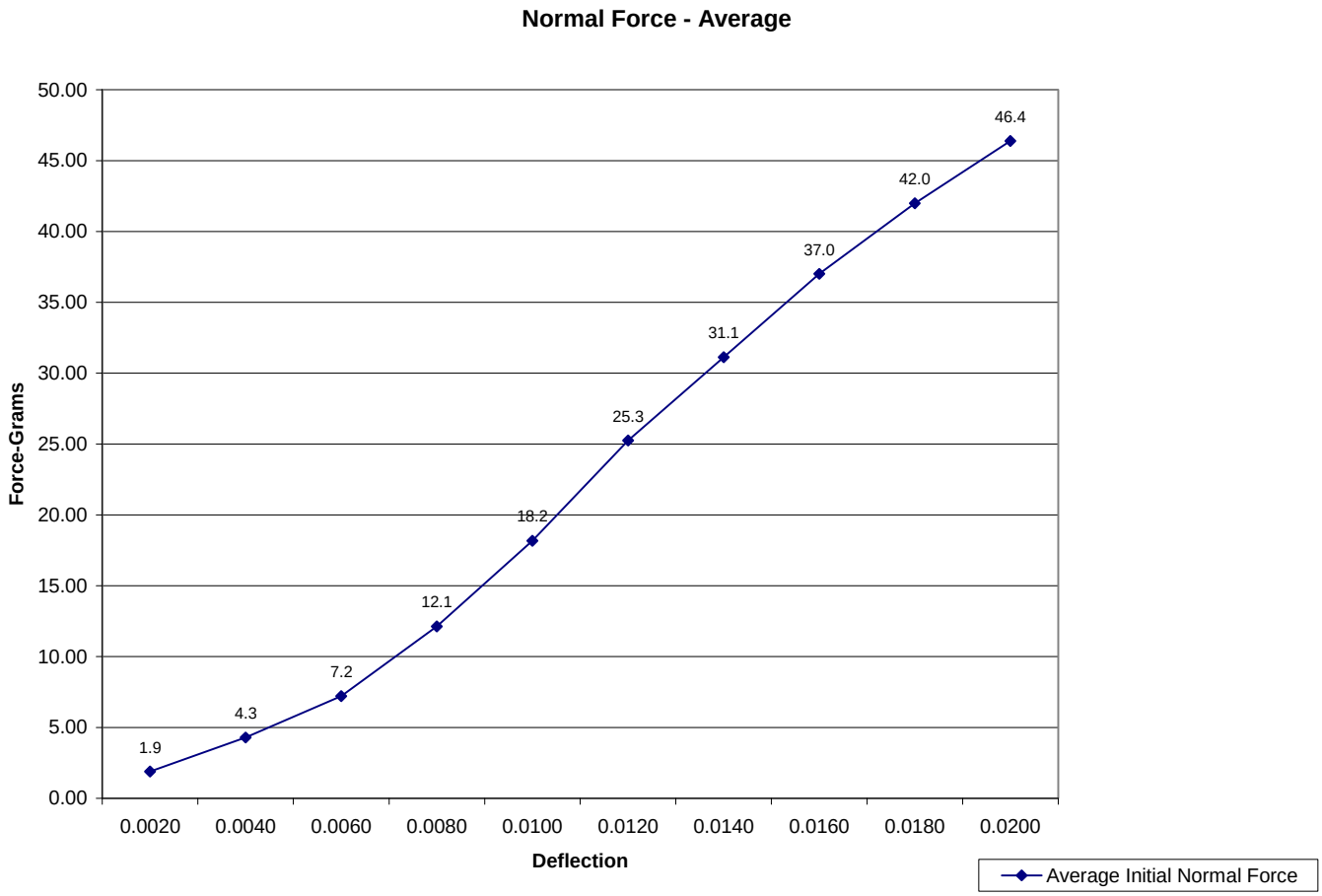
MATING/UNMATING:

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	7.66	1.72	8.30	1.87	7.91	1.78	8.56	1.93
Maximum	9.49	2.13	9.69	2.18	10.49	2.36	10.15	2.28
Average	8.52	**1.92**	9.01	**2.03**	9.12	**2.05**	9.24	**2.08**
St Dev	0.59	0.13	0.42	0.10	0.89	0.20	0.66	0.15
Count	10	10	10	10	10	10	10	10

	After Thermals				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	7.31	1.64	5.31	1.19	2.65	0.59	2.38	0.54
Maximum	12.72	2.86	8.99	2.02	6.16	1.39	4.98	1.12
Average	9.88	**2.22**	6.96	**1.57**	3.92	**0.88**	3.61	**0.81**
St Dev	1.69	0.38	1.01	0.23	1.24	0.28	0.93	0.21
Count	10	10	10	10	10	10	10	10

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

1) Calibrated force gauges are used along with computer controlled positioning equipment.
2) For Normal force 8-10 measurements are taken and the averages reported.



Initial	Deflections in inches Forces in Grams										
	0.0020	**0.0040**	**0.0060**	**0.0080**	**0.0100**	**0.0120**	**0.0140**	**0.0160**	**0.0180**	**0.0200**	***SET***
Averages	1.90	4.29	7.21	12.12	18.18	25.25	31.14	37.01	41.99	46.38	0.0025
Min	0.80	2.40	6.00	9.00	14.10	20.90	27.70	33.70	38.60	43.50	0.0013
Max	3.60	6.10	8.40	14.90	21.90	28.30	33.60	39.40	44.00	49.30	0.0039
St. Dev	0.860	1.136	0.892	1.971	2.666	2.544	2.030	1.956	1.821	1.784	0.0007
Count	10	10	10	10	10	10	10	10	10	10	10

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**FCC8/FCS8**	**FCC8**	**FCS8**
Initial	100000	50000	25000
Thermal	15000	15000	25000
Humidity	15000	15000	25000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**FCC8/FCS8**
Break Down Voltage	920
Test Voltage	690
Working Voltage	230

Pin to Pin	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

LLCR:

1) A total of 214 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
    a. <= +5.0 mOhms: ---------- Stable
    b. +5.1 to +10.0 mOhms:---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +2000 mOhms ---------- Unstable
    f. >+2000 mOhms:---------- Open Failure

***** High initial resistance due to multiple interfaces (double ended cable with connector at each end)

Date	Oct. 20 2009	Oct. 21 2009	Nov. 02 2009	Nov. 17 2009
Room Temp C	22.4	21.8	22	22.3
RH	35%	36%	32%	38%
Name	Troy Cook	Troy Cook	Troy Cook	Troy Cook
mOhm values	**Actual Initial**	**Delta 25 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	190.8	0.1	5.1	4.8
St. Dev.	15.0	1.6	2.4	2.3
Min	175.6	-4.2	0.5	0.1
Max	216.5	13.3	12.5	18.4
Count	214	214	214	214

B5, P15 and P24 were removed due to contact damage during assembly

GAS TIGHT:

1) A total of 192 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
    a. <= +5.0 mOhms: ---------- Stable
    b. +5.1 to +10.0 mOhms:---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +2000 mOhms: ---------- Unstable
    f. >+2000 mOhms:---------- Open Failure

***** High initial resistance due to multiple interfaces (double ended cable with connector at each end)

Date	12/9/2009	12/11/2009
Room Temp C	26	20
RH	31%	19%
Name	Tony Wagoner	Tony Wagoner
mOhm values	**Actual Initial**	**Delta Gas Tight**
Average	182.8	-0.5
St. Dev.	2.5	1.0
Min	176.8	-2.3
Max	188.5	2.5
Count	192	192

SUPPLEMENTAL TESTING

Supplemental – Connector/Cable Pull

	0 Deg.	***90 Deg.***
Pull DV	Force (Lbs)	Force (Lbs)
Minimum	9.88	8.60
Maximum	*11.11*	*11.78*
Average	***10.52***	***10.53***

Supplemental – Cable Bend 5,000 Cycles

	35° Flex Continuity Test Summary					
	Resistance, Ohms					
	Initial	**After 1000**	**After 2000**	**After 3000**	**After 4000**	**After 5000**
Avg	4.48	4.46	4.46	4.48	4.42	4.44
Min	4.40	4.40	4.40	4.40	4.40	4.40
Max	4.50	4.50	4.50	4.50	4.50	4.50
St. Dev.	0.0447	0.0548	0.0548	0.0447	0.0447	0.0548
Count	5	5	5	5	5	5

	90° Flex Continuity Test Summary					
	Resistance, Ohms					
	Initial	**After 1000**	**After 2000**	**After 3000**	**After 4000**	**After 5000**
Avg	4.48	4.50	0.00	0.00	0.00	0.00
Min	4.40	4.50	0.00	0.00	0.00	0.00
Max	4.50	4.50	0.00	0.00	0.00	0.00
St. Dev.	0.0447					
Count	5	1	0	0	0	0

DATA

CONTACT GAPS:

Initial					
Units:	mm				
Pos.#	**B1**	**B2**	**B3**	**B4**	**B5**
1	1.556	1.560	1.542	1.506	1.568
2	1.500	1.518	1.506	1.476	1.530
3	1.502	1.520	1.498	1.478	1.526
4	1.516	1.526	1.502	1.470	1.536
5	1.500	1.514	1.482	1.448	1.514
6	1.560	1.558	1.532	1.496	1.572
7	1.552	1.558	1.532	1.498	1.564
8	1.568	1.572	1.550	1.508	1.594
9	1.552	1.568	1.524	1.490	1.580
10	1.552	1.566	1.540	1.496	1.574
11	1.584	1.586	1.554	1.522	1.604
12	1.584	1.580	1.560	1.514	1.590
13	1.584	1.588	1.550	1.520	1.594
14	1.590	1.602	1.550	1.524	1.602
15	1.592	1.606	1.558	1.528	1.604
16	1.600	1.610	1.570	1.534	1.610
17	1.604	1.612	1.566	1.536	1.606
18	1.612	1.618	1.578	1.544	1.614
19	1.618	1.630	1.584	1.552	1.616
20	1.610	1.628	1.592	1.570	1.604
After 25 Cycles					
Units:	mm				
Pos.#	**B1**	**B2**	**B3**	**B4**	**B5**
1	1.735	1.717	1.709	1.698	1.742
2	1.724	1.674	1.690	1.678	1.703
3	1.699	1.667	1.691	1.669	1.697
4	1.696	1.667	1.688	1.672	1.690
5	1.656	1.648	1.667	1.643	1.662
6	1.671	1.675	1.698	1.666	1.686
7	1.686	1.676	1.713	1.677	1.687
8	1.690	1.677	1.712	1.678	1.695
9	1.681	1.663	1.689	1.657	1.678
10	1.674	1.664	1.689	1.671	1.664
11	1.671	1.665	1.692	1.680	1.675
12	1.681	1.666	1.701	1.683	1.683
13	1.684	1.665	1.710	1.686	1.681
14	1.693	1.665	1.707	1.683	1.680
15	1.686	1.684	1.708	1.674	1.684
16	1.700	1.691	1.717	1.681	1.691
17	1.729	1.720	1.746	1.722	1.715
18	1.742	1.720	1.733	1.720	1.713
19	1.745	1.709	1.734	1.709	1.712
20	1.755	1.724	1.743	1.726	1.720

After Thermal					
	Units:	mm			
Pos.#	**B1**	**B2**	**B3**	**B4**	**B5**
1	1.831	1.812	1.817	1.800	1.849
2	1.844	1.790	1.800	1.791	1.830
3	1.827	1.790	1.803	1.792	1.830
4	1.823	1.791	1.803	1.787	1.823
5	1.803	1.781	1.804	1.782	1.815
6	1.778	1.817	1.823	1.783	1.843
7	1.800	1.817	1.850	1.796	1.800
8	1.811	1.818	1.843	1.779	1.826
9	1.799	1.766	1.829	1.766	1.815
10	1.776	1.816	1.830	1.793	1.771
11	1.780	1.793	1.809	1.782	1.771
12	1.793	1.779	1.836	1.775	1.772
13	1.787	1.769	1.814	1.776	1.776
14	1.800	1.769	1.815	1.767	1.787
15	1.788	1.770	1.802	1.766	1.769
16	1.803	1.786	1.821	1.777	1.779
17	1.826	1.804	1.838	1.800	1.786
18	1.834	1.805	1.838	1.801	1.786
19	1.844	1.805	1.835	1.790	1.789
20	1.839	1.805	1.832	1.805	1.813

MATING/UNMATING:

	Initial		**After 25 Cycles**		**After Thermals**		**After Humidity**	
Sample#	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	1.84	1.87	1.91	1.95	1.84	1.56	1.39	1.06
2	2.03	2.01	2.01	2.11	1.64	1.19	1.33	1.12
3	2.01	2.18	2.36	2.28	2.18	1.65	0.97	1.03
4	1.72	1.92	1.87	1.95	2.55	1.43	0.83	0.76
5	1.78	1.98	1.78	1.93	2.01	1.33	0.59	0.57
6	2.00	2.07	2.15	2.28	2.64	2.02	0.81	0.77
7	2.13	1.98	2.16	2.01	2.86	1.64	0.84	0.81
8	1.99	2.09	2.29	2.27	2.39	1.71	0.81	0.85
9	1.86	2.13	2.15	1.96	2.09	1.60	0.63	0.60
10	1.82	2.02	1.82	2.03	2.01	1.51	0.62	0.54

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

Initial	Deflections in inches, Forces in Grams										
Sample #	**0.0020**	**0.0040**	**0.0060**	**0.0080**	**0.0100**	**0.0120**	**0.0140**	**0.0160**	**0.0180**	**0.0200**	***SET***
1	1.5	4.3	6.4	13.5	20.4	27.4	33.1	38.6	43.5	47.5	0.0029
2	1.3	3.9	8.0	14.9	21.9	28.3	33.6	39.4	43.8	48.5	0.0029
3	2.2	4.6	7.6	14.2	21.6	27.5	33.6	38.8	43.6	47.3	0.0039
4	3.6	5.5	8.4	11.5	15.9	21.2	28.5	34.2	40.2	44.7	0.0023
5	2.8	6.1	8.4	11.4	14.1	20.9	27.7	33.7	38.6	43.5	0.0026
6	2.3	4.6	7.5	9.8	16.4	23.9	29.8	35.4	40.5	45.5	0.0025
7	1.5	4.3	6.4	9.0	15.7	26.5	30.7	37.7	42.5	45.3	0.0020
8	2.0	4.6	7.0	10.5	17.5	25.6	31.3	37.0	41.9	46.5	0.0022
9	1.0	2.6	6.0	13.1	19.1	25.3	31.5	37.3	41.3	45.7	0.0026
10	0.8	2.4	6.4	13.3	19.2	25.9	31.6	38.0	44.0	49.3	0.0013

INSULATION RESISTANCE (IR):

Initial Breakdown Voltage
Test Voltage *Until Breakdown Occurs*

	Pin to Pin		
	Mated	Unmated	
	X		
Sample#	FCC8/FCS8	FCC8	FCS8
1	920	960	1020
2	940	1000	1000

Initial Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	X	X	X
Sample#	FCC8/FCS8	FCC8	FCS8
1	100000	50000	25000
2	100000	50000	100000

Thermal Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	X	X	X
Sample#	FCC8/FCS8	FCC8	FCS8
1	100000	100000	100000
2	15000	15000	25000

Humidity Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	X	X	X
Sample#	FCC8/FCS8	FCC8	FCS8
1	15000	15000	25000
2	25000	50000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial DWV
Test Voltage= 690

	Pin to Pin		
	Mated	Unmated	
Sample#	FCC8/FCS8	FCC8	FCS8
1	690	690	690
2	690	690	690

Thermal Test Voltage
Test Voltage= 690

	Pin to Pin		
	Mated	Unmated	
Sample#	FCC8/FCS8	FCC8	FCS8
1	690	690	690
2	690	690	690

Humidity Test Voltage
Test Voltage= 690

	Pin to Pin		
	Mated	Unmated	
Sample#	FCC8/FCS8	FCC8	FCS8
1	690	690	690
2	690	690	690

LLCR:

*** B5, P15 and P24 were removed due to contact damage during assembly**
*** High initial resistance due to multiple interfaces (double ended cable with connector at each end)**

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	25 Cycles	Thermal	Humidity
1	P1	180.2	-0.4	3.7	4.0
1	P2	182.3	1.9	6.6	2.8
1	P3	182.4	-0.7	2.8	2.6
1	P4	181.9	-0.5	3.8	4.0
1	P5	184.3	0.1	2.9	1.7
1	P6	185.1	-1.0	2.1	1.4
1	P7	183.2	-1.0	1.8	1.4
1	P8	181.2	2.1	6.3	5.8
1	P9	182.9	-0.4	2.7	1.7
1	P10	180.1	0.0	6.8	6.5
1	P11	182.7	1.2	3.5	3.2
1	P12	185.7	-0.6	0.8	0.3
1	P13	179.4	-0.8	4.2	3.9
1	P14	181.9	-1.2	3.1	3.2
1	P15	182.4	0.0	0.9	0.8
1	P16	182.4	-0.7	3.5	3.4
1	P17	184.6	-0.8	3.1	3.0
1	P18	182.7	0.9	4.7	4.4
1	P19	182.2	1.7	5.4	3.9
1	P20	184.3	-0.3	3.8	2.8
1	P21	183.5	-0.4	3.4	2.5
1	P22	181.9	-1.3	4.2	3.3
1	P23	180.0	-0.3	2.9	2.4
1	P24	183.7	-2.0	1.3	1.4
2	P1	212.0	0.5	3.8	3.6
2	P2	211.5	0.7	4.0	4.0
2	P3	211.2	2.3	3.5	3.6
2	P4	211.6	0.0	6.3	6.1
2	P5	213.0	0.8	4.3	3.6
2	P6	215.1	1.0	4.3	3.5
2	P7	209.8	3.5	8.4	7.0
2	P8	212.5	3.1	7.0	6.6
2	P9	214.5	1.1	5.2	3.2
2	P10	213.8	1.4	6.2	5.8
2	P11	213.6	2.8	6.0	6.0
2	P12	214.7	-0.5	3.4	3.8
2	P13	211.4	1.7	5.7	5.6
2	P14	210.4	1.4	3.1	3.7
2	P15	208.7	0.9	6.6	6.7
2	P16	209.2	0.9	5.9	7.0
2	P17	213.1	0.6	12.5	9.9
2	P18	210.1	0.5	11.2	11.1

2	P19	215.8	0.1	7.4	6.2
2	P20	215.1	0.3	7.8	8.0
2	P21	215.0	0.3	1.6	4.7
2	P22	208.5	0.5	8.0	7.2
2	P23	209.6	0.3	5.5	4.5
2	P24	209.5	0.1	5.4	4.9
3	P1	179.2	-1.1	2.7	3.3
3	P2	179.1	-0.6	3.3	2.5
3	P3	177.0	-0.1	6.1	6.8
3	P4	179.7	-0.3	4.1	4.7
3	P5	182.6	-0.4	2.6	2.8
3	P6	183.4	-0.4	1.8	2.2
3	P7	177.1	-0.2	5.6	7.3
3	P8	179.0	1.1	5.2	6.5
3	P9	182.5	-0.5	3.1	2.9
3	P10	179.6	0.4	6.6	7.5
3	P11	181.3	-0.7	3.4	4.1
3	P12	183.6	-0.6	1.5	2.5
3	P13	179.0	-0.5	4.7	3.8
3	P14	180.4	-0.7	1.2	3.4
3	P15	178.5	-2.9	2.5	2.6
3	P16	179.0	13.3	0.5	0.2
3	P17	181.3	-1.6	3.4	6.8
3	P18	179.2	-0.1	5.0	6.9
3	P19	182.7	-4.2	3.0	3.9
3	P20	182.5	-0.9	3.4	4.3
3	P21	182.5	-1.1	5.7	5.2
3	P22	178.3	-0.4	5.4	5.5
3	P23	177.0	0.4	6.1	5.6
3	P24	179.8	0.3	3.1	1.2
4	P1	181.6	-1.1	2.5	1.8
4	P2	178.9	-0.5	4.8	5.7
4	P3	178.7	0.2	3.4	4.3
4	P4	180.2	-0.6	4.4	5.7
4	P5	179.9	-0.4	8.8	18.4
4	P6	182.1	-0.1	1.0	4.3
4	P7	182.7	-0.1	3.9	7.0
4	P8	183.0	-0.5	3.7	4.7
4	P9	181.3	0.2	1.8	4.4
4	P10	181.5	1.7	3.9	7.6
4	P11	181.1	0.7	3.5	6.1
4	P12	183.3	-0.1	1.7	3.5
4	P13	180.8	-0.7	3.1	3.7
4	P14	180.7	0.5	3.9	3.6
4	P15	180.8	-0.4	2.0	2.4
4	P16	178.5	1.2	5.5	5.3
4	P17	183.4	-0.1	2.4	2.5
4	P18	180.3	1.1	5.7	7.2
4	P19	182.4	-0.2	3.0	3.5

4	P20	183.4	0.2	2.3	3.0
4	P21	182.5	0.0	2.4	3.0
4	P22	179.5	-0.6	3.7	4.8
4	P23	176.0	0.1	6.3	7.7
4	P24	177.7	2.2	6.7	5.9
5	P1	213.2	-1.9	4.3	3.2
5	P2	210.3	-0.2	5.2	4.3
5	P3	209.6	-0.4	5.8	5.0
5	P4	210.8	1.5	8.6	6.5
5	P5	213.7	-0.5	7.6	7.7
5	P6	216.2	0.4	6.1	5.5
5	P7	212.6	2.3	9.4	8.8
5	P8	210.3	0.8	9.7	10.6
5	P9	212.7	-0.2	12.3	8.4
5	P10	209.8	1.8	9.7	11.3
5	P11	211.1	1.5	6.1	7.0
5	P12	215.5	0.0	11.4	2.9
5	P13	209.2	0.5	6.3	6.4
5	P14	215.4	-2.0	1.8	0.1
5	P16	212.9	-3.6	3.6	1.5
5	P17	214.3	-1.5	6.4	4.4
5	P18	210.5	1.6	10.1	8.5
5	P19	211.5	-0.6	7.6	7.1
5	P20	216.5	-0.6	5.3	4.5
5	P21	213.7	-0.1	6.0	5.5
5	P22	213.6	-2.5	4.7	4.9
5	P23	209.6	1.5	10.0	4.9
6	P1	175.8	-0.7	3.4	5.5
6	P2	176.1	-0.9	1.8	3.8
6	P3	175.6	-0.2	4.7	5.4
6	P4	176.0	-0.8	4.5	4.4
6	P5	178.3	-1.0	3.6	3.6
6	P6	179.5	-0.8	3.5	4.5
6	P7	176.7	1.6	6.1	7.3
6	P8	176.4	-0.6	7.5	8.5
6	P9	178.9	-0.5	5.5	3.7
6	P10	178.4	-0.2	6.7	7.5
6	P11	178.8	-0.4	6.5	7.4
6	P12	183.1	-0.3	2.8	3.0
6	P13	176.7	-0.9	4.8	4.6
6	P14	176.3	-0.2	5.4	6.2
6	P15	184.0	-2.8	0.9	1.0
6	P16	177.5	-0.7	6.2	6.3
6	P17	178.7	2.0	11.4	9.3
6	P18	178.7	0.2	8.5	8.3
6	P19	179.6	-0.4	6.7	6.1
6	P20	183.0	-0.1	4.6	3.4
6	P21	182.9	-0.5	3.7	2.7
6	P22	180.6	-1.9	3.4	2.5

6	P23	176.2	-0.4	3.8	3.1
6	P24	177.8	3.5	5.8	3.8
7	P1	179.4	-1.1	3.0	3.9
7	P2	178.8	-0.3	5.8	5.0
7	P3	180.0	-0.2	4.7	4.1
7	P4	179.7	0.1	6.1	5.5
7	P5	183.1	-0.3	3.3	2.8
7	P6	183.8	-0.1	3.5	2.8
7	P7	181.7	0.2	6.3	4.1
7	P8	178.6	0.5	8.3	7.1
7	P9	183.8	-0.3	4.1	1.6
7	P10	177.8	0.2	9.7	7.9
7	P11	182.2	1.5	4.2	3.4
7	P12	183.6	0.3	3.2	2.2
7	P13	178.2	0.8	5.6	5.3
7	P14	179.5	0.0	1.9	1.6
7	P15	179.4	10.5	11.1	5.6
7	P16	177.3	-0.1	5.8	5.1
7	P17	179.0	0.6	8.0	7.2
7	P18	180.2	1.7	7.5	6.8
7	P19	184.4	0.7	4.5	2.4
7	P20	183.4	0.2	3.5	2.5
7	P21	184.3	0.5	7.2	3.6
7	P22	179.9	-0.3	7.0	6.3
7	P23	177.9	0.0	6.3	5.8
7	P24	182.3	-0.9	2.6	2.9
8	P1	210.1	0.1	4.7	5.1
8	P2	213.2	-0.3	4.2	3.9
8	P3	210.9	0.2	4.8	5.7
8	P4	211.6	0.4	4.5	6.3
8	P5	213.1	0.3	2.7	4.7
8	P6	214.1	0.5	2.2	3.9
8	P7	211.4	0.2	4.9	7.1
8	P8	212.3	2.6	7.9	9.7
8	P9	213.3	0.2	2.7	4.8
8	P10	211.0	1.5	8.1	9.4
8	P11	212.1	1.5	4.5	5.7
8	P12	214.7	0.4	2.5	4.2
8	P13	208.4	1.3	6.1	6.9
8	P14	212.5	-0.1	3.1	3.9
8	P15	209.7	-1.2	4.8	4.7
8	P16	209.1	-0.6	5.3	5.3
8	P17	212.8	-1.0	4.8	3.5
8	P18	209.4	-0.3	7.8	6.9
8	P19	211.2	0.2	6.8	4.9
8	P20	213.8	-0.3	4.2	3.0
8	P21	213.5	-0.7	5.4	3.2
8	P22	211.2	0.1	6.5	6.4
8	P23	210.0	0.3	6.3	6.7

8	P24	209.0	-0.7	4.3	5.0
9	P1	177.5	-0.6	3.2	3.5
9	P2	177.4	-0.6	3.3	3.3
9	P3	178.9	-1.3	5.2	4.7
9	P4	179.9	-0.7	5.1	4.7
9	P5	183.4	-2.0	2.1	1.4
9	P6	183.8	-0.7	3.1	2.0
9	P7	180.5	-0.4	5.8	5.2
9	P8	178.2	-0.4	7.5	7.1
9	P9	179.7	-0.4	10.0	5.9
9	P10	177.5	-1.1	8.2	7.5
9	P11	180.8	-0.9	5.5	4.5
9	P12	183.3	-1.1	4.1	3.0
9	P13	177.8	0.1	5.5	5.4
9	P14	179.2	-0.5	1.9	2.0
9	P15	177.9	-0.5	6.2	5.4
9	P16	178.0	-0.3	8.4	7.0
9	P17	177.3	-0.6	10.8	7.0
9	P18	180.2	-0.5	9.7	6.3
9	P19	180.3	-0.4	7.2	5.4
9	P20	180.2	-0.5	11.4	2.9
9	P21	178.6	-1.3	6.6	4.7
9	P22	180.0	-0.3	5.7	4.3
9	P23	180.8	0.0	3.7	2.6
9	P24	181.0	-0.2	3.6	1.4

GAS TIGHT:

*** High initial resistance due to multiple interfaces (double ended cable with connector at each end)**

	mOhm values	Actual	Delta
Board	**Position**	**Initial**	**Gas Tight**
1	P1	182.5	0.3
1	P2	182.6	0.1
1	P3	179.9	0.4
1	P4	181.9	0.3
1	P5	183.2	0.0
1	P6	185.7	-0.1
1	P7	180.8	0.3
1	P8	184.2	0.3
1	P9	182.5	1.8
1	P10	180.5	2.0
1	P11	183.9	1.4
1	P12	185.8	0.1
1	P13	179.2	0.4
1	P14	183.7	0.0
1	P15	182.5	0.2
1	P16	182.4	0.0
1	P17	185.1	0.4

1	P18	182.4	1.2
1	P19	183.5	1.7
1	P20	186.3	0.4
1	P21	184.2	0.9
1	P22	181.2	0.1
1	P23	180.9	0.7
1	P24	181.9	0.2
2	P1	183.8	-0.2
2	P2	182.8	-0.2
2	P3	182.2	1.4
2	P4	182.9	0.0
2	P5	186.1	-0.2
2	P6	187.5	-0.2
2	P7	183.1	2.5
2	P8	183.6	2.5
2	P9	186.2	0.5
2	P10	184.3	2.1
2	P11	186.2	-0.1
2	P12	186.8	0.0
2	P13	182.1	-0.2
2	P14	182.9	-0.3
2	P15	185.1	-0.1
2	P16	180.8	0.6
2	P17	184.8	0.5
2	P18	181.2	2.5
2	P19	184.9	1.6
2	P20	184.1	0.1
2	P21	187.4	0.1
2	P22	181.3	-0.1
2	P23	180.8	0.0
2	P24	181.3	0.0
3	P1	178.9	-0.8
3	P2	178.3	-0.7
3	P3	178.0	-0.4
3	P4	183.8	-1.4
3	P5	185.2	-0.9
3	P6	185.3	-0.9
3	P7	179.8	0.2
3	P8	183.1	0.3
3	P9	181.0	1.8
3	P10	179.1	-0.5
3	P11	178.2	-0.2
3	P12	182.1	-0.6
3	P13	177.7	-1.0
3	P14	177.8	-0.9
3	P15	181.1	-0.8
3	P16	181.4	-1.1
3	P17	183.6	-1.1
3	P18	183.1	1.5

3	P19	183.4	-1.0
3	P20	186.4	-1.1
3	P21	184.5	-1.0
3	P22	182.2	0.3
3	P23	182.7	-1.1
3	P24	182.8	-0.4
4	P1	178.2	-0.6
4	P2	179.1	-0.8
4	P3	180.9	-0.9
4	P4	181.6	-1.4
4	P5	184.6	-0.9
4	P6	185.2	-1.5
4	P7	181.3	-1.2
4	P8	182.1	-1.3
4	P9	177.8	0.2
4	P10	184.0	-0.4
4	P11	181.9	-1.4
4	P12	185.3	-1.6
4	P13	183.5	-1.5
4	P14	183.8	-1.5
4	P15	182.1	-1.1
4	P16	176.9	-0.9
4	P17	182.0	0.0
4	P18	181.4	-0.8
4	P19	185.2	-1.3
4	P20	184.6	-1.3
4	P21	185.7	-1.1
4	P22	178.9	-1.2
4	P23	180.1	-1.3
4	P24	182.2	0.2
5	P1	182.5	-0.5
5	P2	183.3	-0.5
5	P3	179.8	-0.8
5	P4	180.6	-0.7
5	P5	183.1	-0.7
5	P6	184.5	-0.6
5	P7	182.1	-0.8
5	P8	182.2	-0.7
5	P9	183.3	-0.9
5	P10	184.6	1.1
5	P11	183.2	-0.4
5	P12	183.7	-0.8
5	P13	183.1	-0.4
5	P14	181.2	-0.1
5	P15	182.3	-0.6
5	P16	181.1	-0.8
5	P17	182.9	0.9
5	P18	186.0	-0.9
5	P19	184.1	-0.5

5	P20	185.2	-0.5
5	P21	184.5	-0.8
5	P22	182.3	0.1
5	P23	183.7	-0.3
5	P24	183.2	-0.4
6	P1	178.8	-0.9
6	P2	179.2	-0.9
6	P3	179.2	1.2
6	P4	182.0	-1.1
6	P5	184.4	-0.9
6	P6	186.4	-1.0
6	P7	181.5	-0.9
6	P8	180.1	0.6
6	P9	180.4	1.6
6	P10	184.2	0.0
6	P11	182.7	0.4
6	P12	187.2	0.2
6	P13	179.2	-0.9
6	P14	179.0	-0.9
6	P15	181.5	-1.2
6	P16	184.6	-1.2
6	P17	184.8	0.1
6	P18	184.2	-1.0
6	P19	182.2	0.0
6	P20	186.4	-1.0
6	P21	185.7	-1.0
6	P22	181.9	-1.1
6	P23	181.6	-0.4
6	P24	183.0	-1.2
7	P1	182.0	-1.3
7	P2	182.8	-1.6
7	P3	180.3	-1.4
7	P4	182.2	-1.5
7	P5	184.9	-1.6
7	P6	187.8	-1.5
7	P7	184.9	-1.4
7	P8	186.2	-1.3
7	P9	184.9	-1.4
7	P10	184.5	-1.4
7	P11	187.2	-1.4
7	P12	186.0	-1.6
7	P13	183.1	-1.4
7	P14	185.4	-1.7
7	P15	178.4	-1.2
7	P16	176.8	-1.2
7	P17	179.3	-0.7
7	P18	179.8	-0.3
7	P19	182.8	-1.3
7	P20	186.8	-1.5

7	P21	182.3	-1.2
7	P22	180.3	-0.2
7	P23	177.4	-1.2
7	P24	180.2	-1.3
8	P1	183.1	-1.9
8	P2	183.8	-1.9
8	P3	180.9	-1.5
8	P4	182.3	-2.1
8	P5	185.3	-2.1
8	P6	187.0	-2.1
8	P7	184.1	-0.2
8	P8	185.4	-2.0
8	P9	186.8	-2.1
8	P10	188.5	-2.2
8	P11	183.4	0.1
8	P12	186.5	-2.2
8	P13	185.6	-0.8
8	P14	186.3	-2.3
8	P15	181.4	-1.7
8	P16	182.8	-2.0
8	P17	181.6	-1.6
8	P18	182.4	-1.6
8	P19	183.7	-0.2
8	P20	185.9	-2.3
8	P21	186.6	-1.8
8	P22	181.5	-0.6
8	P23	178.5	-1.4
8	P24	181.8	-1.6

SUPPLEMENTAL TESTING

Supplemental – Connector/Cable Pull

	0 Deg.	***90 Deg.***
Sample#	Maximum Force (Lbs)	Maximum Force (Lbs)
1	10.12	11.17
2	11.06	9.92
3	10.45	11.19
4	9.88	11.78
5	11.11	8.60

Supplemental – Cable Bend 5,000 Cycles

	35° Flex Continuity Test Results					
	Resistance, Ohms					
Cable	**Initial**	**After 1000 Cycles**	**After 2000 Cycles**	**After 3000 Cycles**	**After 4000 Cycles**	**After 5000 Cycles**
1	4.5	4.4	4.5	4.5	4.4	4.5
2	4.4	4.4	4.4	4.4	4.4	4.4
3	4.5	4.5	4.5	4.5	4.4	4.4
4	4.5	4.5	4.5	4.5	4.5	4.5
5	4.5	4.5	4.4	4.5	4.4	4.4

	90° Flex Continuity Test Results					
	Resistance, Ohms					
Cable	**Initial**	**After 1000 Cycles**	**After 2000 Cycles**	**After 3000 Cycles**	**After 4000 Cycles**	**After 5000 Cycles**
1	4.4	*Failed @ 774 Cycles*	N/A	N/A	N/A	N/A
2	4.5	*Failed @ 911 Cycles*	N/A	N/A	N/A	N/A
3	4.5	*Failed @ 650 Cycles*	N/A	N/A	N/A	N/A
4	4.5	*Failed @ 678 Cycles*	N/A	N/A	N/A	N/A
5	4.5	4.5	*Failed @ 1087 Cycles*	N/A	N/A	N/A

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: MO-01
Description: Micro-Ohmeter
Manufacturer: Keithley
Model: 580
Serial #: 0772740
Accuracy: See Manual
… Last Cal: 06/16/09, Next Cal: 06/16/2010

Equipment #: MO-03
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0791975
Accuracy: See Manual
… Last Cal: 06/16/09, Next Cal: 06/16/2010

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 04/06/09, Next Cal: 04/06/2010

Equipment #: RS-09
Description: Current Shunt
Manufacturer: Empro
Model: HA10050
Serial #: HA10050-1
Accuracy: +/- 0.25% of RDG
… Last Cal: 05/14/2009, Next Cal: 05/14/2010

Equipment #: OV-5
Description: Forced Air Oven, 5 Cu. Ft., 120 V
Manufacturer: Sheldon Mfg.
Model: CE5F
Serial #: 02008008
Accuracy: +/- 5 deg. C
… Last Cal: 02/19/2009, Next Cal: 02/19/2010

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
… Last Cal: 06/17/2009, Next Cal: 06/17/2010

Equipment #: MV-06
Description: 6" x 6" Video Measuring Machine
Manufacturer: Micro-Vu
Model: M3010898
Serial #: V9343
Accuracy: See Manual See Manual
… Last Cal: 02/10/2009, Next Cal: 02/10/2010

Equipment #: TCT-03
Description: Dillon Quantrol TC2 Test Stand
Manufacturer: Dillon Quantrol
Model: TC2
Serial #: 02-1033-03
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.
… Last Cal: 5/12/2009, Next Cal: 5/6/2010

Equipment #: TCT-06
Description: Test Resources test stand
Manufacturer: Test Resources
Model:
Serial #:
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.
… Last Cal: 05/07/2009, Next Cal: 05/07/2010

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 04/07/2009, Next Cal: 04/07/2010

Equipment #: THC-04
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-3800
Serial #: 0772740
Accuracy: See Manual
… Last Cal: 04/07/2009, Next Cal: 04/07/2010

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 11/24/08, Next Cal: 11/24/09