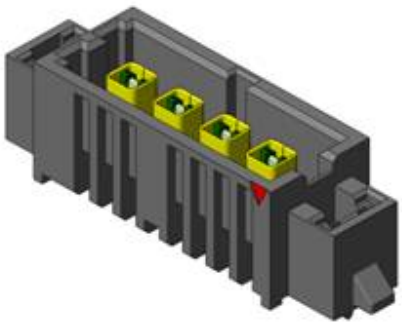
Project Number: Design Verification Test Report	Tracking Code: TC0918—2430_Report_Rev_3		
Requested by: Kevin Meredith	Date: 10/7/2010	Product Rev: 0	
Part #: IJ5C-08-0300-S-D-NUS-1/ IP5-08-05.0-S-S-1-L	Lot #: na	Tech: Troy Cook, Tony Wagoner	Eng: Eric Mings
Part description: IJ5C-08-0300-L-D-NUS-1		Qty to test: 100	
Test Start: 6/14/2009	Test Completed: 9/14/2009		



Design Verification Test Report

IJ5C
IJ5C-08-0300-S-D-NUS-1/ IP5-08-05.0-S-S-1-L

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 TC0918—2430.

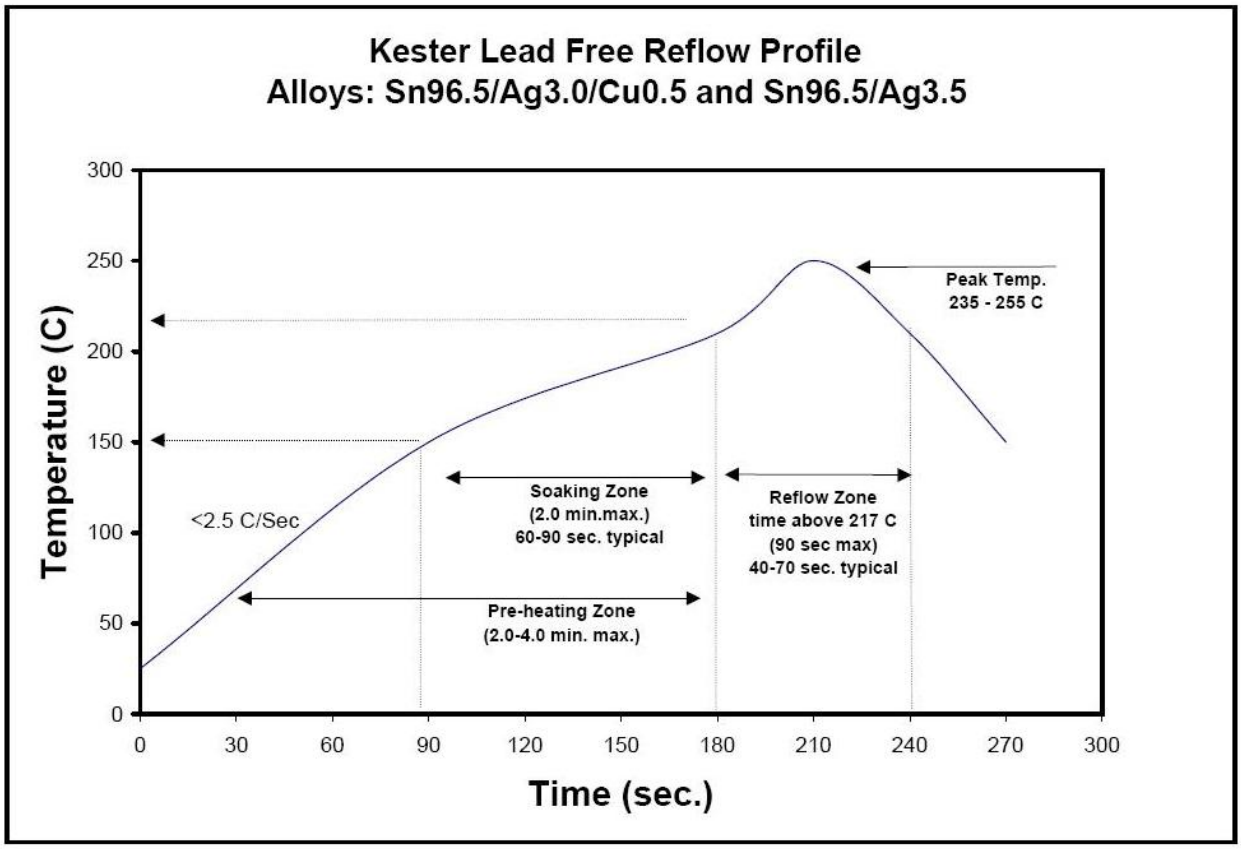
APPLICABLE DOCUMENTS

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-101606-TST-01/ PCB-101667-TST-XX

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

TEST STEP	GROUP A * 80 Points (Sig and Grd)
01	LLCR-1
02	Gas Tight
03	LLCR-2

Gas Tight = EIA-364-36

LLCR = EIA-364-23, LLCR

use Keithley 580 in the dry circuit mode, 10 mA Max

Connector Pull

Category Mechanical 1 and 2

	5 Pieces	5 Pieces
TEST STEP	GROUP 1A-STD	GROUP 1B-STD
	Signal and Shields 0°	Signal and Shields 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

IR & DWV

TEST STEP	GROUP E1 2 Mated Sets Break Down - Pin to Ground	GROUP E2 2 Unmated of Part # Being Tested Break Down - Pin to Ground	GROUP E3 2 Unmated of Mating Part # Break Down - Pin to Ground	GROUP F 2 Mated Sets Pin to Ground
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

FLOWCHARTS Continued

Durability/Thermal Age/Cyclic Humidity

TEST STEP	GROUP A *80 (Sig & Grd) Points 100 Cycles
01	LLCR-1
02	Data Review
03	100 Cycles
04	LLCR-2
05	Data Review
06	Thermal Age
07	LLCR-3
08	Data Review
09	Cyclic Humidity
10	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/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

3 Mated Assemblies Each

TEST STEP	GROUP A 3 Mated Assembies 1 CONTACT POWERED	GROUP B 3 Mated Assembies 2 CONTACTS POWERED	GROUP C 3 Mated Assembies 4 CONTACTS POWERED	GROUP D 3 Mated Assembies ALL CONTACTS POWERED	GROUP E 3 Mated Assembies ALL CONTACTS and GROUNDS POWERED
01	CCC	CCC	CCC	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

FLOWCHARTS Continued

Resistance, SIG Continuity

Category Electrical 8 and Mechanical 3 and 4

	5 Pieces	5 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) 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.

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

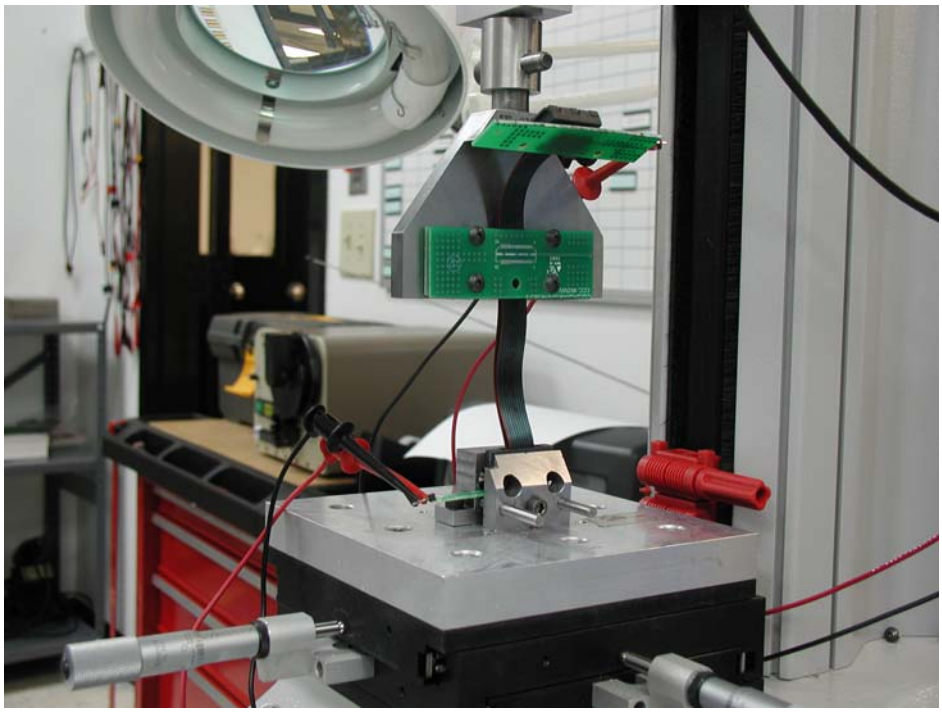


Fig. 1
(Typical set-up, actual part not depicted.)
0° Connector pull, notice the electrical continuity hook-up wires.

CABLE DURABILITY:

1) Oscillate and monitor electrical continuity for open circuit indication.
   a. ± 35° Pendulum Mode, bend up to 5,000 cycles with 8 oz. load on cable end.

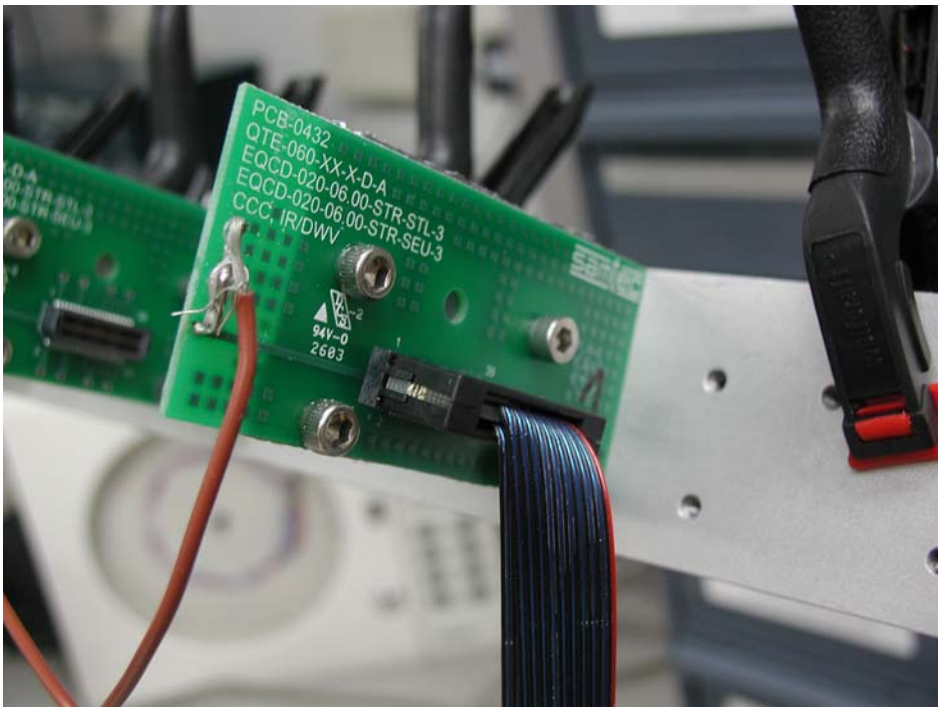


Fig. 2
(Typical set-up, actual part not depicted.)

b. ± 90° Flex Mode, bend up to 5,000 cycles with 8 oz. load on cable end.

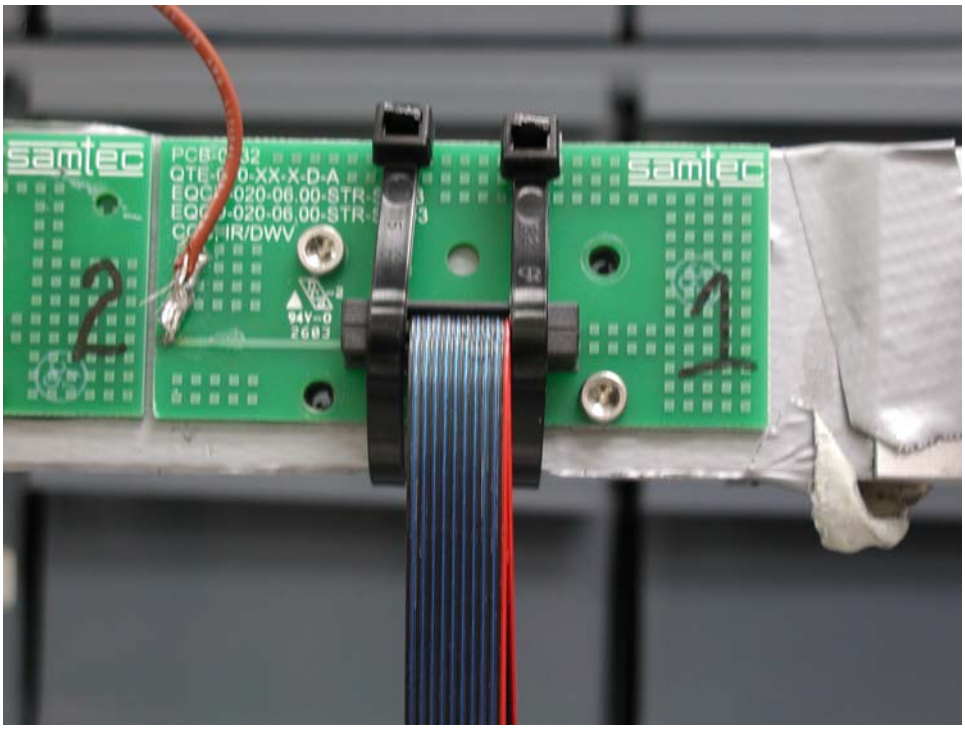


Fig. 3
(Typical set-up, actual part not depicted.)

RESULTS

Temperature Rise, CCC at a 20% de-rating—signal pins

- **CCC for a 30°C Temperature Rise----------3.2A per contact with 1 signal contact powered**
- **CCC for a 30°C Temperature Rise----------2.8A per contact with 2 adjacent signal contacts powered**
- **CCC for a 30°C Temperature Rise----------2.4A per contact with 3 adjacent signal contacts powered**
- **CCC for a 30°C Temperature Rise----------2.0A per contact with all adjacent signal contacts powered**

Temperature Rise, CCC at a 20% de-rating—ground pins

- **CCC for a 30°C Temperature Rise----------6.8A per contact with 1 ground contact powered**
- **CCC for a 30°C Temperature Rise----------5.7A per contact with 2 adjacent ground contacts powered**
- **CCC for a 30°C Temperature Rise----------5.1A per contact with 3 adjacent ground contacts powered**
- **CCC for a 30°C Temperature Rise----------4.3A per contact with all adjacent ground contacts powered**

Insulation Resistance minimums, IR

- **Initial**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated----------25000Meg Ω ---------- Pass**
  - **Unmated ----------50000Meg Ω ---------- Pass**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage----------850VAC**
  - **Test Voltage ----------638VAC**
  - **Working Voltage ----------213VAC**
- **Initial DWV----------Passed**
- **Thermal DWV----------Passed**
- **Humidity DWV----------Passed**

RESULTS Continued

LLCR Durability (80 LLCR test points)

Signal pins:

- **Initial ---------- 67.9 mOhms Max**
- **Durability, 25 Cycles**
  - **<= +5.0 mOhms ---------- 79 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 1 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**
- **Thermal**
  - **<= +5.0 mOhms ---------- 73 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 4 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 1 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 2 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms ---------- 73 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 4 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 2 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

LLCR Durability (80 LLCR test points)

Ground pins:

- **Initial ---------- 31.8 mOhms Max**
- **Durability, 25 Cycles**
  - **<= +5.0 mOhms ---------- 80 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**
- **Thermal**
  - **<= +5.0 mOhms ---------- 80 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**
- **Humidity**
  - **<= +5.0 mOhms ---------- 80 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**

Notes: The grounds are Au plated shields.

RESULTS Continued

LLCR Gas Tight (80 LLCR test points)
Signal pins:

- **Initial ---------- 79.1 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ---------- 79 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 1 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**

LLCR Gas Tight (80 LLCR test points)
Ground pins:

- **Initial ---------- 38.2 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ---------- 80 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**

Notes: The grounds are Au plated shields.

RESULTS Continued

SUPPLEMENTAL TESTING

Supplemental – Connector/Cable Pull

- **0° ---------- 107.05 lbs min**
- **90° ---------- 91.75 lbs min**

Supplemental – Cable Bend 5,000 Cycles

- **±35° Pendulum Mode ---------- No Electrical Failures**
- **±90° Flex Mode ---------- No Electrical Failures**

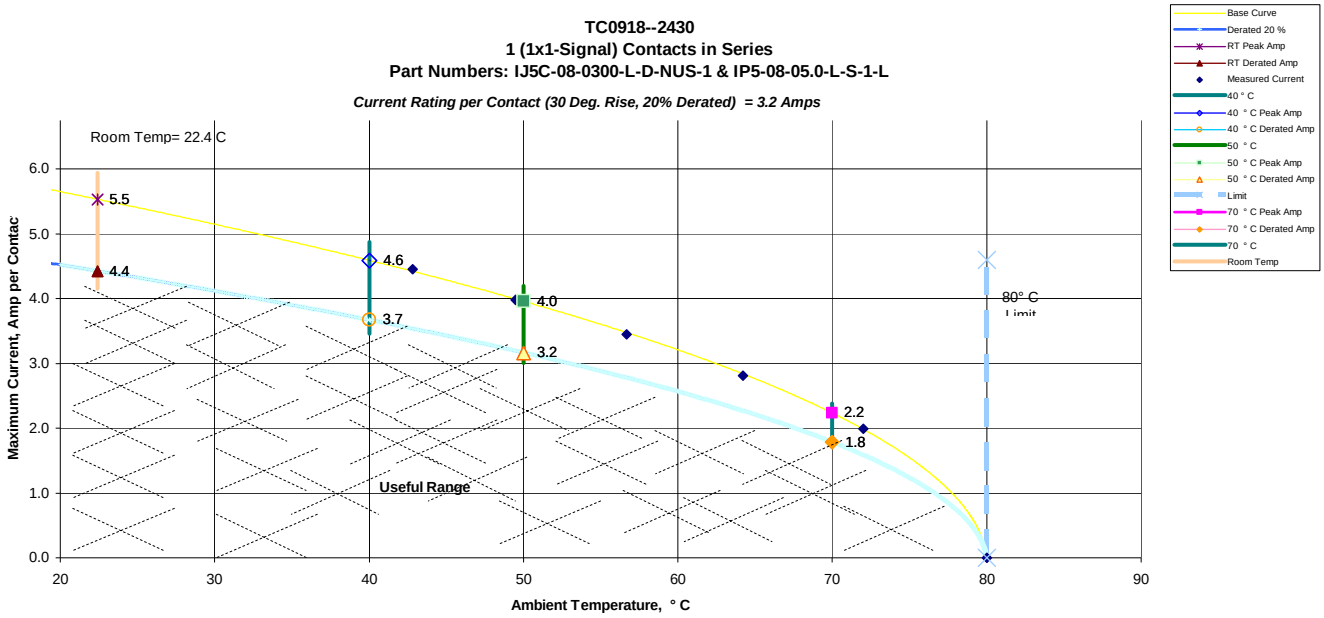
Notes: for ±90° Flex Mode, one sample is failure at 4929 cycles.

DATA SUMMARIES

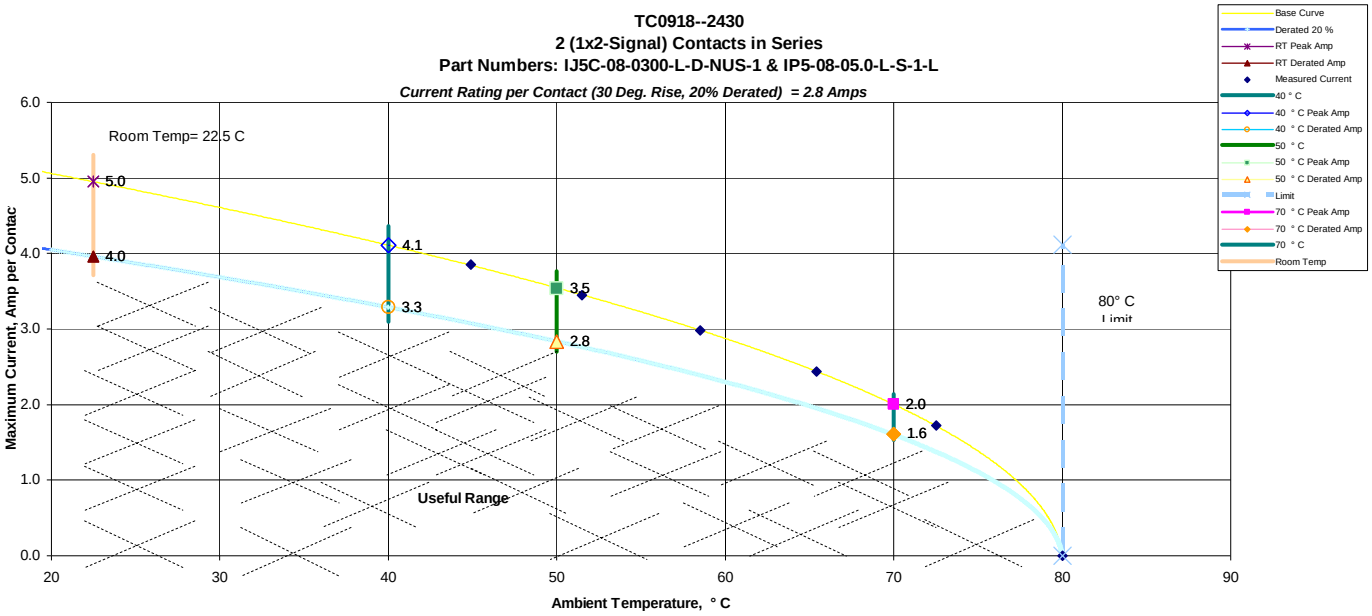
TEMPERATURE RISE (Current Carrying Capacity, CCC):

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:

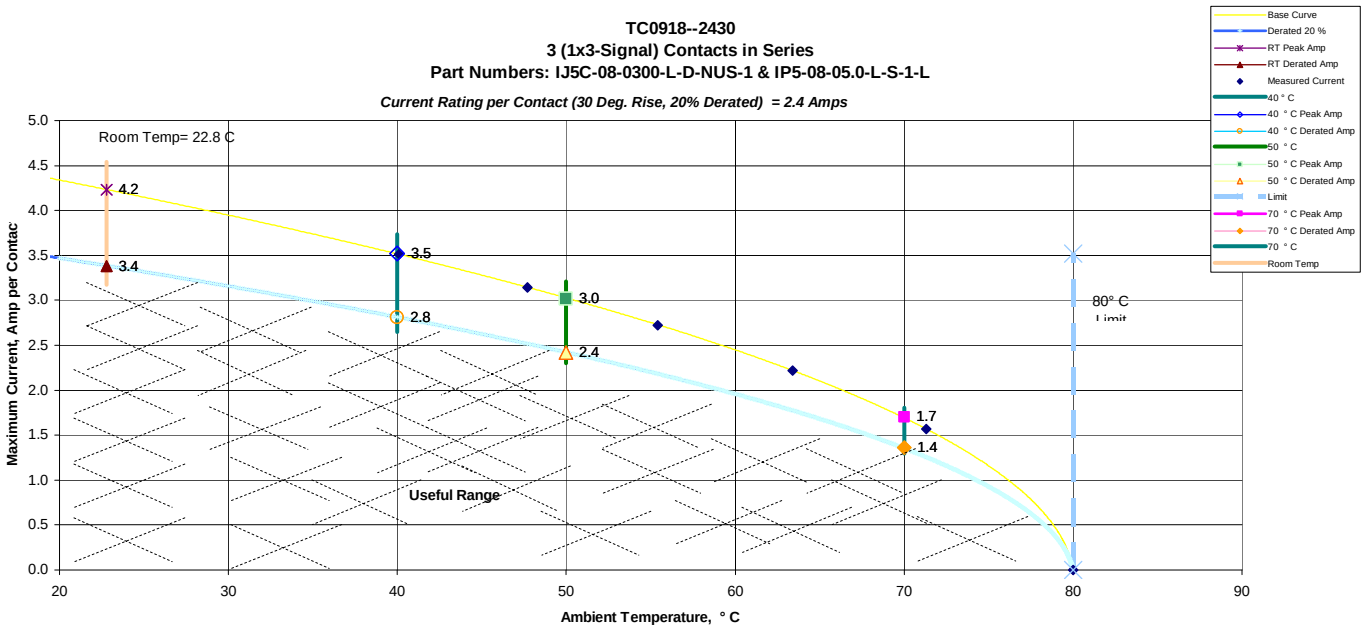
    a. Linear configuration with 1 signal contact powered



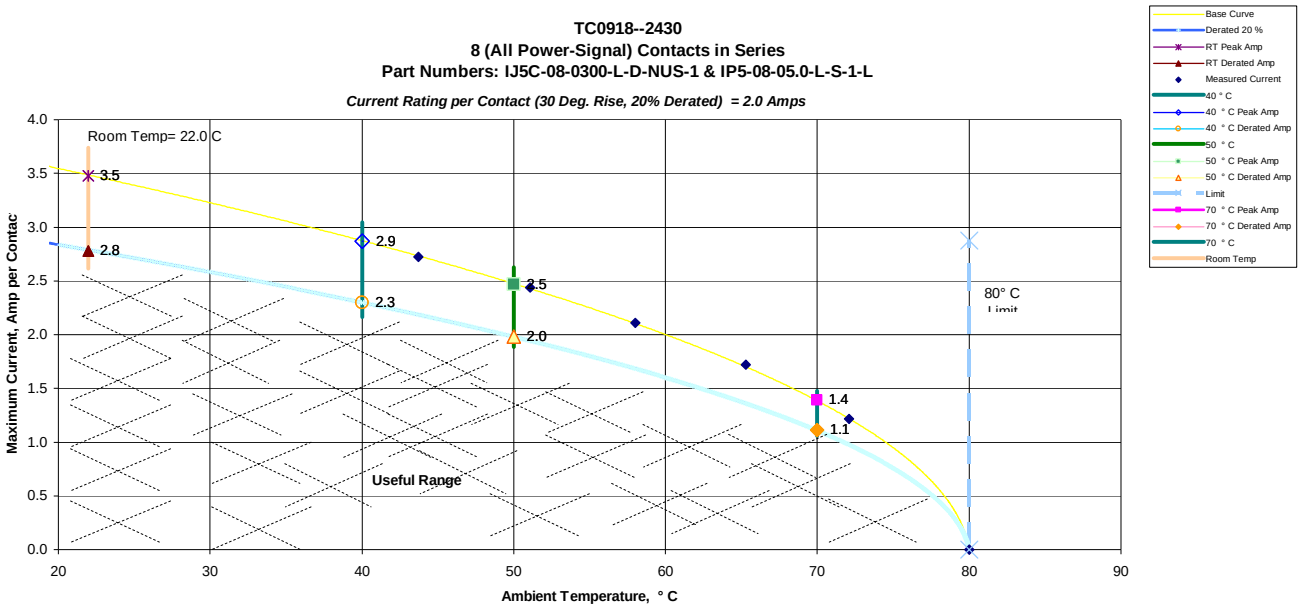
b. Linear configuration with 2 adjacent signal contacts powered



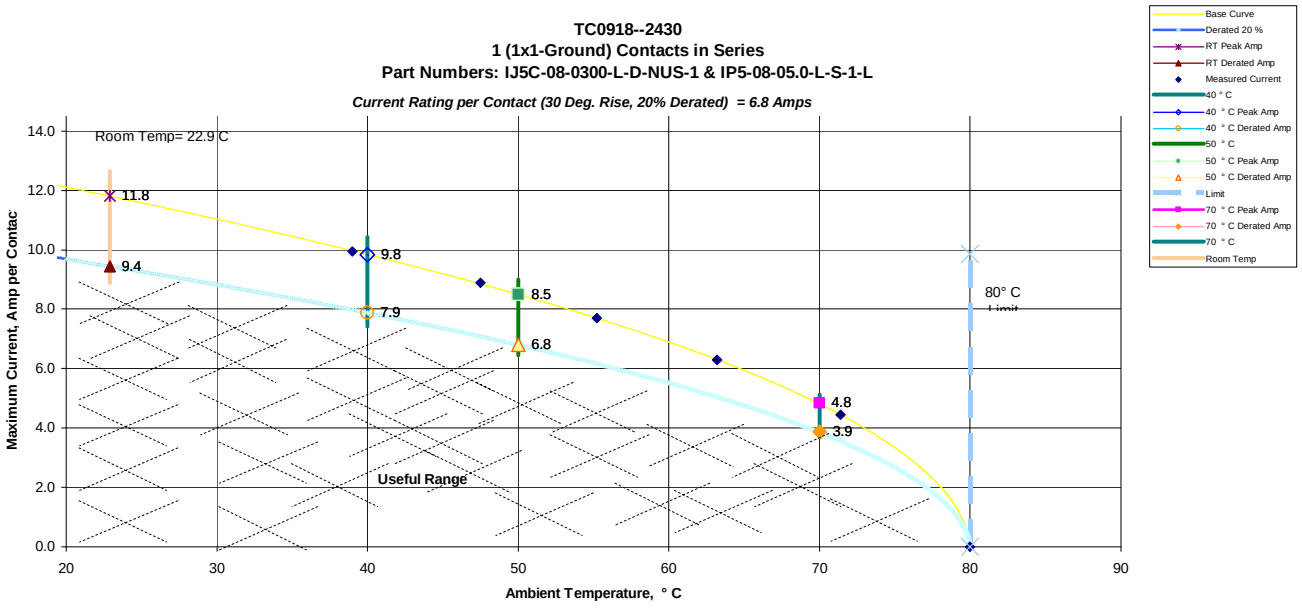
c. Linear configuration with 3 adjacent signal contacts powered



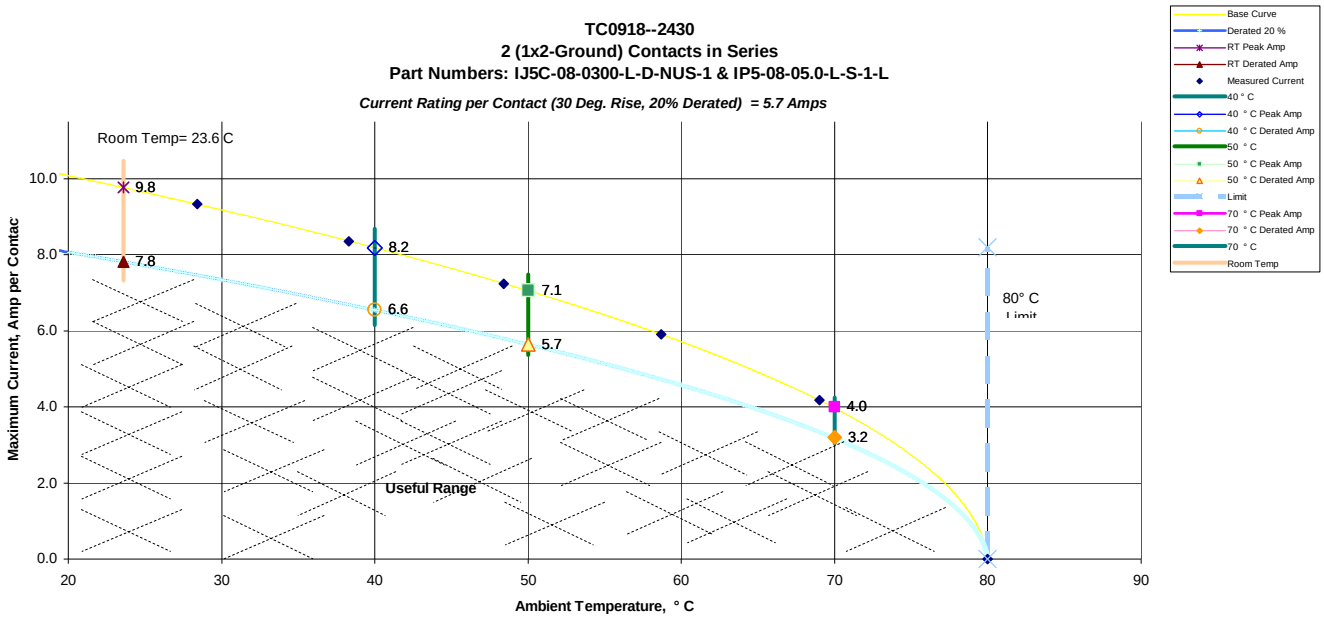
d. Linear configuration with all adjacent signal contacts powered



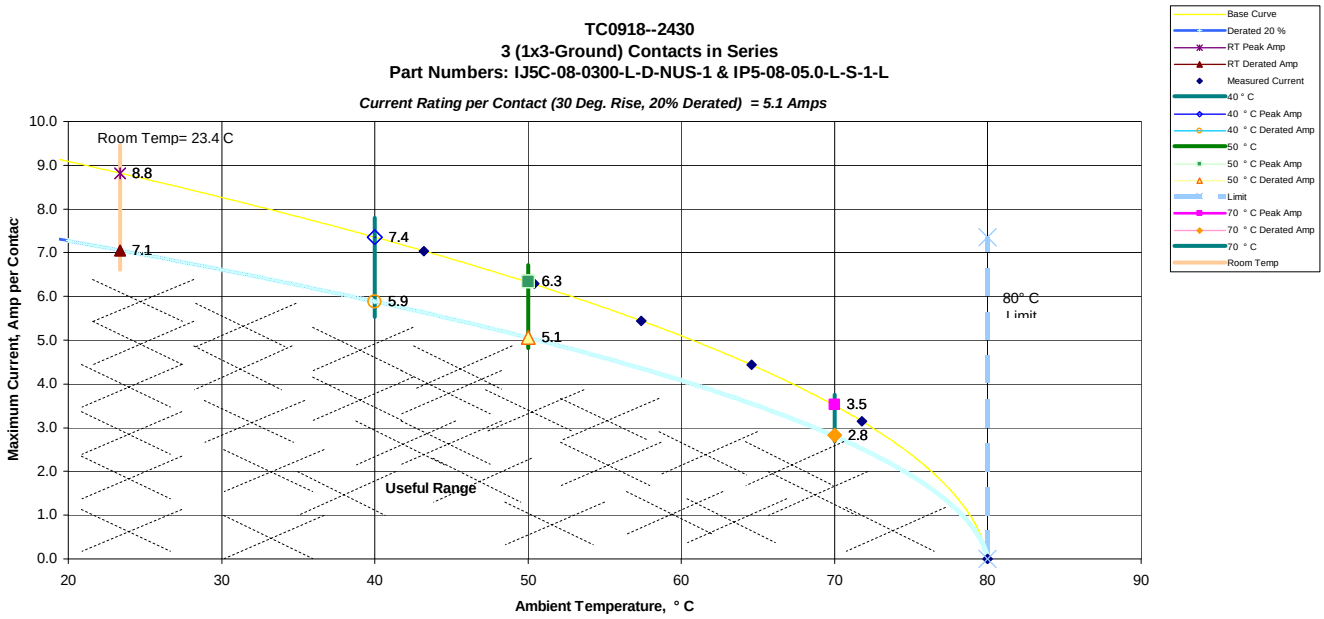
e. Linear configuration with 1 ground contact powered



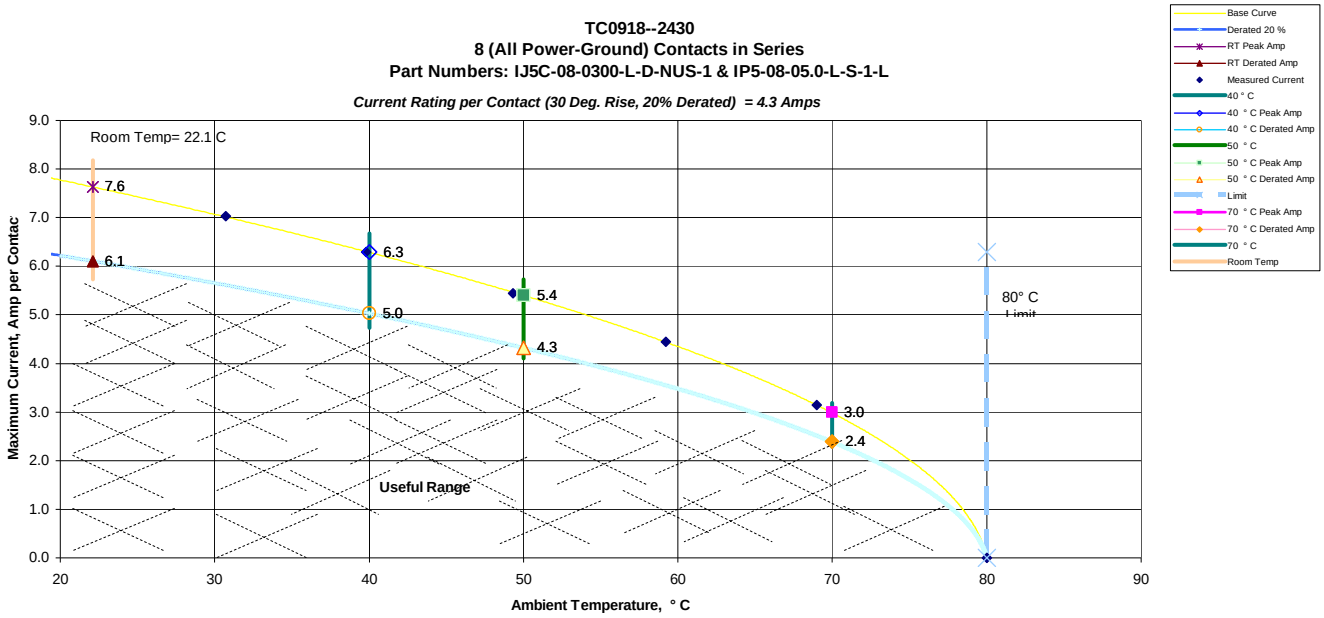
f. Linear configuration with 2 adjacent ground contacts powered



g. Linear configuration with 3 adjacent ground contacts powered



h. Linear configuration with all adjacent ground contacts powered



DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	IJ5C/IP5C	IJ5C	IP5C
Initial	100000	100000	100000
Thermal	100000	100000	100000
Humidity	25000	50000	50000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	IJ5C/IP5
Break Down Voltage	850
Test Voltage	638
Working Voltage	213

DATA SUMMARIES Continued

LLCR:

1) A total of 80 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

Signal pins

	SIGNALS	SIGNALS	SIGNALS	SIGNALS
Date	2010-7-7	2010-7-7	2010-7-20	2010-7-30
Room Temp C	24	24	23	23
RH	62%	45%	52%	43%
Name	Troy Cook	Troy Cook	Troy Cook	Troy Cook
mOhm values	**Actual Initial**	**Delta 25 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	61.7	-0.3	2.2	3.4
St. Dev.	1.5	1.3	3.4	24.6
Min	60.0	-5.3	-2.1	-5.4
Max	67.9	4.0	19.6	218.0
Count	80	80	80	80

How many samples are being tested?	16
How many contacts are on each board?	5

	Stable	Minor	Acceptable	Marginal	Unstable	Open
25 Cycles	79	1	0	0	0	0
Thermal	73	4	1	2	0	0
Humidity	73	4	0	2	0	0

DATA SUMMARIES Continued

Ground pins

	GND's	GND's	GND's	GND's
Date	2010-7-7	2010-7-7	2010-7-20	2010-7-30
Room Temp C	24	24	23	23
RH	62%	45%	52%	43%
Name	Troy Cook	Troy Cook	Troy Cook	Troy Cook
mOhm values	**Actual Initial**	**Delta 25 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	30.0	-0.1	-0.1	-0.2
St. Dev.	0.5	0.3	0.3	0.3
Min	29.5	-1.1	-1.3	-1.4
Max	31.8	1.3	1.0	0.5
Count	80	80	80	80

How many samples are being tested?	16
How many contacts are on each board?	5

	Stable	Minor	Acceptable	Marginal	Unstable	Open
25 Cycles	80	0	0	0	0	0
Thermal	80	0	0	0	0	0
Humidity	80	0	0	0	0	0

DATA SUMMARIES Continued

GAS TIGHT:

1) A total of 80 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

Signal pins

Date	Jul. 14 2009	Jul. 15 2009
Room Temp C	24	24
RH	40%	47%
Name	Riley	RILEY
mOhm values	**Actual Initial**	**Delta Gas Tight**
Average	71.7	0.1
St. Dev.	1.9	1.6
Min	69.1	-3.0
Max	79.1	10.7
Count	80	80

How many samples are being tested?	10
How many contacts are on each board?	8

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Gas Tight	79	0	1	0	0	0

DATA SUMMARIES Continued

Ground pins

Date	Jul. 14 2009	Jul. 15 2009
Room Temp C	24	24
RH	40%	47%
Name	Riley	RILEY
mOhm values	**Actual Initial**	**Delta Gas Tight**
Average	35.7	-0.1
St. Dev.	0.4	0.2
Min	35.2	-0.6
Max	38.2	0.1
Count	80	80

How many samples are being tested?	10
How many contacts are on each board?	8

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Gas Tight	80	0	0	0	0	0

DATA SUMMARIES Continued

SUPPLEMENTAL TESTS

CONNECTOR PULL:

0° Pull Test

	Force (lbs)
Minimum	107.05
Maximum	120.54
Average	**116.80**

90° Pull Test

	Force (lbs)
Minimum	91.75
Maximum	122.72
Average	**108.49**

CABLE DURABILITY:

35 Deg. Flex Continuity Testing

	Resistance, Ohms					
	Initial	**After 1000**	**After 2000**	**After 3000**	**After 4000**	**After 5000**
Avg	0.75	0.67	0.68	0.68	0.67	0.67
Min	0.68	0.65	0.65	0.66	0.65	0.65
Max	0.94	0.70	0.71	0.70	0.69	0.69
St. Dev.	0.10	0.02	0.02	0.01	0.02	0.02
Count	5	5	5	5	5	5

90 Deg. Flex Continuity Testing

	Resistance, Ohms					
	Initial	**After 1000**	**After 2000**	**After 3000**	**After 4000**	**After 5000**
Avg	0.71	0.66	0.66	0.65	0.66	0.66
Min	0.65	0.65	0.65	0.65	0.65	0.65
Max	0.87	0.68	0.68	0.66	0.68	0.67
St. Dev.	0.09	0.01	0.01	0.01	0.01	0.01
Count	5	5	5	5	5	4

DATA

INSULATION RESISTANCE (IR):

Initial Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	A Unmated B	
	X	X	X
Sample#	IJ5C/IP5C	IJ5C	IP5C
097956-001	100000	100000	100000
097956-002	100000	100000	100000

Thermal Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	A Unmated B	
	X	X	X
Sample#	IJ5C/IP5C	IJ5C	IP5C
097956-001	100000	100000	100000
097956-002	100000	100000	100000

Humidity Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	A Unmated B	
	X	X	X
Sample#	IJ5C/IP5C	IJ5C	IP5C
097956-001	25000	50000	50000
097956-002	25000	50000	50000

DATA CONTINUED

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial Breakdown Voltage
Test Voltage *Until Breakdown Occurs*

	Pin to Ground		
	Mated	Unmated	
	X		
Sample#	IJ5C/IP5	IJ5C	IP5
1	1000	850	900
2	860	960	1100

Initial DWV
Test Voltage= 638

	Pin to Ground		
	Mated	Unmated	
	x	x	x
Sample#	IJ5C/IP5	IJ5C	IP5
m-1	638		
m-2	638		
u-1		638	638
u-2		638	638

Thermal Test Voltage
Test Voltage= 638

	Pin to Ground		
	Mated	Unmated	
	x	x	x
Sample#	IJ5C/IP5	IJ5C	IP5
m-1	638		
m-2	638		
u-1		638	638
u-2		638	638

Humidity Test Voltage
Test Voltage= 638

	Pin to Ground		
	Mated	Unmated	
	x	x	x
Sample#	IJ5C/IP5	IJ5C	IP5
m-1	638		
m-2	638		
u-1		638	638
u-2		638	638

DATA Continued

LLCR:

Signal pins

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	25 Cycles	Thermal	Humidity
1	P2	61.6	-0.6	1.9	0.3
1	P4	61.2	-0.6	1.7	2.6
1	P6	60.5	0.1	1.1	0.8
1	P8	62.6	-0.7	-0.8	-1.7
1	P10	61.7	-0.9	0.7	-0.1
2	P2	61.3	-1.1	0.2	0.2
2	P4	61.0	0.3	3.2	0.4
2	P6	60.1	0.6	2.0	0.4
2	P8	60.7	0.9	3.4	1.2
2	P10	60.6	0.0	1.9	0.8
3	P2	60.9	-0.8	0.8	1.1
3	P4	60.4	0.5	3.1	2.0
3	P6	61.2	0.2	18.3	1.9
3	P8	60.7	0.0	2.3	18.1
3	P10	62.3	-1.9	-0.9	-1.0
4	P2	62.6	-2.0	-0.8	-0.8
4	P4	60.9	0.2	2.3	1.2
4	P6	60.6	0.4	2.8	1.4
4	P8	60.0	-0.4	2.6	2.3
5	P2	60.9	0.3	1.2	-0.2
5	P4	60.8	0.2	0.3	-1.0
5	P6	66.9	-5.3	-2.1	-5.1
5	P8	63.7	-0.6	1.8	-1.7
5	P10	62.0	-0.4	0.6	-0.6
6	P2	61.6	0.3	1.4	-0.7
6	P4	60.9	0.3	2.1	-1.0
6	P6	65.8	-4.4	-2.1	-5.4
6	P8	62.8	-0.6	2.7	-1.8
6	P10	60.4	0.4	2.7	1.4
7	P2	61.5	0.2	1.3	1.6
7	P4	61.4	0.4	2.7	1.2
7	P6	61.8	-0.4	0.8	0.7
7	P8	62.8	-1.5	1.2	0.0
7	P10	61.2	0.0	-0.6	0.8
8	P2	62.0	1.5	1.1	0.5
8	P4	61.1	-0.3	3.5	2.6
8	P6	63.0	-1.8	1.5	-0.3
8	P8	61.0	0.2	4.5	8.8
8	P10	60.9	1.5	6.2	0.3
9	P2	61.5	-1.1	0.7	-0.1
9	P4	61.4	-0.2	4.4	-0.5
9	P6	60.5	0.2	2.2	-0.1

9	P8	64.7	-2.8	-1.8	-1.8
9	P10	60.9	-0.1	1.7	0.9
10	P2	61.5	-0.6	0.7	-0.6
10	P4	63.3	-2.9	2.5	0.1
10	P6	60.9	-0.7	1.6	-1.1
10	P8	61.5	-0.4	1.7	-0.7
10	P10	60.5	-0.2	6.0	-0.8
11	P2	61.9	-1.2	4.5	0.7
11	P4	60.7	0.2	3.1	1.1
11	P6	61.9	-1.2	1.0	1.8
11	P8	60.7	0.7	3.3	0.6
11	P10	60.7	1.4	0.6	0.3
12	P2	61.1	0.4	1.8	1.1
12	P4	61.3	0.3	1.1	0.8
12	P6	63.7	-2.5	3.6	-0.6
12	P8	63.8	0.9	4.9	24.0
12	P10	61.2	-0.1	0.7	1.4
13	P2	61.7	-0.8	0.7	-1.0
13	P4	60.8	2.1	6.1	0.4
13	P6	60.6	0.1	2.2	-0.2
13	P8	62.6	-1.1	1.9	-0.9
13	P10	61.4	-0.1	2.3	0.2
14	P2	61.4	-1.0	0.1	-0.4
14	P4	61.1	-0.2	5.9	-0.1
14	P6	61.4	-0.1	0.4	-1.1
14	P8	61.0	0.1	-0.1	-0.5
14	P10	67.9	-0.6	-1.9	-5.4
15	P2	61.3	0.1	1.1	-0.8
15	P4	60.6	0.0	1.4	-0.3
15	P6	61.0	0.1	0.7	-0.6
15	P8	61.0	0.3	1.4	-1.0
15	P10	62.3	0.2	1.5	-1.2
16	P2	66.3	-2.9	19.6	3.9
16	P4	60.7	1.0	10.3	2.8
16	P6	63.4	4.0	2.9	1.9
16	P8	61.5	0.2	1.4	0.7
16	P10	60.8	-0.5	-0.1	-0.5

Note: one point have debris after humidity sequence.

DATA Continued

LLCR:

Ground pins

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	25 Cycles	Thermal	Humidity
1	P1	29.7	0.0	-0.1	-0.1
1	P3	29.8	-0.1	-0.1	-0.1
1	P5	29.5	-0.1	-0.1	-0.1
1	P7	29.7	-0.1	-0.1	-0.1
1	P9	29.6	-0.1	-0.2	-0.2
2	P1	30.7	-0.6	-0.5	-0.2
2	P3	30.5	-0.7	-0.7	-0.7
2	P5	30.1	-0.4	-0.3	-0.3
2	P7	29.8	-0.2	-0.1	-0.3
2	P9	30.3	-0.5	-0.4	-0.4
3	P1	29.8	-0.1	-0.1	-0.3
3	P3	29.6	0.0	0.0	-0.1
3	P5	29.7	-0.1	0.1	0.0
3	P7	29.8	-0.3	-0.3	-0.3
3	P9	29.8	-0.1	-0.1	-0.2
4	P1	29.7	0.0	0.0	-0.1
4	P3	29.6	0.0	0.0	0.0
4	P5	29.6	-0.1	0.0	0.0
4	P7	29.6	-0.1	-0.1	-0.1
4	P9	29.7	0.0	0.0	-0.1
5	P1	29.6	0.1	0.0	-0.1
5	P3	29.7	0.1	0.1	0.0
5	P5	29.8	0.0	-0.1	-0.1
5	P7	29.7	-0.1	-0.2	-0.3
5	P9	29.8	-0.1	-0.2	-0.3
6	P1	29.7	0.0	0.0	0.0
6	P3	29.7	0.0	0.1	0.0
6	P5	29.7	0.0	0.0	-0.1
6	P7	29.7	-0.1	-0.1	-0.2
6	P9	29.6	0.0	0.0	-0.1
7	P1	29.7	0.1	0.1	0.0
7	P3	29.6	0.1	0.2	0.1
7	P5	29.7	0.0	0.1	0.1
7	P7	29.7	-0.1	0.1	0.0
7	P9	29.8	0.0	0.0	0.0
8	P1	29.7	0.1	0.1	0.0
8	P3	29.7	-0.1	0.0	0.0
8	P5	29.7	-0.1	0.0	-0.1
8	P7	29.8	-0.1	-0.2	-0.2
8	P9	29.7	0.0	-0.1	-0.1
9	P1	30.5	-0.6	-0.6	-0.6
9	P3	29.8	-0.2	-0.2	-0.3

9	P5	30.0	-0.2	-0.3	-0.3
9	P7	29.9	-0.3	-0.3	-0.4
9	P9	30.3	-0.6	-0.6	-0.7
10	P1	31.8	-0.4	-0.8	-1.2
10	P3	30.5	0.0	-0.1	-0.4
10	P5	30.4	0.0	-0.1	-0.2
10	P7	31.0	0.8	1.0	0.2
10	P9	30.7	1.3	0.8	-0.2
11	P1	29.8	0.0	0.0	-0.1
11	P3	29.8	0.0	0.3	0.1
11	P5	29.5	0.0	0.0	-0.1
11	P7	29.6	-0.2	-0.1	-0.2
11	P9	29.7	-0.1	0.0	-0.1
12	P1	29.8	0.1	-0.1	-0.2
12	P3	29.6	-0.1	-0.1	-0.1
12	P5	29.7	-0.1	0.0	0.0
12	P7	29.6	-0.1	-0.1	-0.1
12	P9	29.6	0.0	-0.1	-0.1
13	P1	30.5	0.1	-0.2	-0.3
13	P3	29.9	0.1	0.0	-0.2
13	P5	30.7	0.4	-0.1	0.1
13	P7	31.7	-0.1	-0.4	-0.1
13	P9	30.5	0.6	0.4	0.5
14	P1	29.9	0.0	0.0	-0.1
14	P3	29.7	0.0	0.0	0.0
14	P5	29.7	-0.1	0.0	-0.1
14	P7	29.8	-0.1	-0.2	-0.2
14	P9	29.7	-0.1	-0.1	-0.2
15	P1	30.3	-0.3	-0.3	-0.6
15	P3	30.6	-0.4	-0.3	-0.5
15	P5	30.7	-0.4	-0.6	-0.6
15	P7	31.5	-1.1	-1.3	-1.4
15	P9	30.9	-0.6	-0.5	-0.6
16	P1	30.5	-0.3	-0.4	-0.6
16	P3	30.2	-0.2	0.0	-0.1
16	P5	30.8	-0.8	-0.4	-0.4
16	P7	31.4	-0.9	-0.7	-0.8
16	P9	31.3	-0.9	-0.5	-0.6

DATA Continued

GAS TIGHT:

Signal pins

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P11	70.4	1.0
1	P12	70.0	0.3
1	P13	72.9	-0.2
1	P14	71.4	-0.5
1	P15	76.3	10.7
1	P16	74.2	-2.0
1	P17	70.9	-0.5
1	P18	71.7	0.0
2	P11	70.3	0.5
2	P12	70.7	1.6
2	P13	70.8	0.1
2	P14	71.0	0.4
2	P15	71.0	-0.2
2	P16	71.1	0.5
2	P17	72.8	-1.9
2	P18	71.7	-0.7
3	P11	78.1	-3.0
3	P12	71.7	0.6
3	P13	70.7	1.2
3	P14	70.9	0.1
3	P15	70.3	0.4
3	P16	70.1	-0.3
3	P17	70.4	0.3
3	P18	69.1	1.0
4	P11	71.2	0.0
4	P12	71.2	-0.1
4	P13	72.2	-0.5
4	P14	70.8	0.8
4	P15	73.2	-0.7
4	P16	79.1	4.4
4	P17	71.0	0.1
4	P18	72.3	-0.5
5	P11	73.5	0.5
5	P12	69.7	0.3
5	P13	69.8	0.7
5	P14	73.5	-1.7
5	P15	74.3	-2.4
5	P16	70.8	0.0
5	P17	70.2	0.3
5	P18	70.3	-0.1
6	P11	70.0	-0.2
6	P12	71.6	-0.1

6	P13	73.0	0.1
6	P14	70.4	-1.1
6	P15	69.6	0.4
6	P16	70.1	1.9
6	P17	72.1	-0.4
6	P18	70.1	1.7
7	P11	74.4	-1.1
7	P12	75.6	-0.1
7	P13	74.4	0.6
7	P14	73.1	-0.2
7	P15	74.1	1.1
7	P16	70.0	0.7
7	P17	71.5	-0.1
7	P18	70.6	0.4
8	P11	71.1	0.3
8	P12	72.5	-1.7
8	P13	71.8	-0.2
8	P14	71.8	0.6
8	P15	70.5	-0.1
8	P16	72.3	0.9
8	P17	70.0	0.3
8	P18	70.0	-0.4
9	P11	72.2	-0.8
9	P12	72.5	-0.7
9	P13	71.1	0.5
9	P14	73.1	0.3
9	P15	71.1	-0.6
9	P16	75.5	-2.1
9	P17	71.1	0.3
9	P18	71.1	-0.3
10	P11	70.2	-0.2
10	P12	70.5	-0.2
10	P13	72.1	-0.3
10	P14	71.6	0.8
10	P15	71.2	0.3
10	P16	70.4	-0.3
10	P17	70.5	-0.8
10	P18	71.5	0.2

DATA Continued

GAS TIGHT:

Ground pins

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	35.5	0.0
1	P2	35.4	-0.1
1	P3	35.2	0.0
1	P4	35.9	-0.1
1	P5	35.5	-0.1
1	P6	35.8	0.0
1	P24	36.0	-0.3
1	P25	35.6	-0.3
2	P1	36.1	-0.6
2	P2	35.8	-0.5
2	P3	35.6	-0.3
2	P4	35.8	-0.4
2	P5	35.8	-0.2
2	P6	35.4	-0.2
2	P24	35.5	-0.2
2	P25	35.5	-0.2
3	P1	36.3	-0.2
3	P2	36.4	0.1
3	P3	35.9	0.0
3	P4	35.7	0.1
3	P5	35.7	0.1
3	P6	35.5	0.1
3	P24	35.9	0.0
3	P25	35.3	-0.2
4	P1	36.3	-0.4
4	P2	35.6	-0.3
4	P3	35.5	-0.2
4	P4	36.1	-0.3
4	P5	35.9	-0.3
4	P6	35.5	-0.2
4	P24	35.2	-0.1
4	P25	35.6	-0.4
5	P1	36.2	-0.1
5	P2	35.7	0.0
5	P3	36.1	-0.2
5	P4	35.6	0.1
5	P5	35.8	-0.1
5	P6	35.8	-0.2
5	P24	35.6	-0.1
5	P25	35.8	-0.3
6	P1	35.5	0.1
6	P2	35.2	0.0
6	P3	35.3	0.0

6	P4	35.2	0.0
6	P5	35.2	0.0
6	P6	35.9	-0.1
6	P24	35.5	-0.1
6	P25	35.5	-0.2
7	P1	36.6	-0.3
7	P2	38.2	0.0
7	P3	35.9	-0.1
7	P4	35.6	-0.2
7	P5	35.9	-0.1
7	P6	36.0	0.0
7	P24	35.5	0.1
7	P25	35.2	0.0
8	P1	35.6	0.1
8	P2	35.6	0.1
8	P3	35.4	0.1
8	P4	35.5	0.1
8	P5	35.4	0.1
8	P6	35.7	0.1
8	P24	35.3	0.0
8	P25	35.5	0.0
9	P1	36.3	0.1
9	P2	35.8	0.0
9	P3	35.9	-0.1
9	P4	35.9	0.0
9	P5	35.8	0.1
9	P6	36.1	0.0
9	P24	35.9	-0.1
9	P25	35.6	-0.1
10	P1	35.6	-0.1
10	P2	35.5	-0.1
10	P3	35.5	-0.1
10	P4	35.6	-0.1
10	P5	35.8	-0.2
10	P6	35.8	-0.2
10	P24	35.6	-0.1
10	P25	35.7	-0.2

DATA Continued

SUPPLEMENTAL CONNECTOR PULL:

0° Pull Test

Sample #	Force (lbs)
1	118.43
2	119.67
3	107.05
4	120.54
5	118.29

90° Pull Test

Sample #	Force (lbs)
1	113.63
2	98.73
3	91.75
4	115.64
5	122.72

CABLE DURABILITY:

35 Deg. Flex Continuity Testing

Resistance, mOhms

Cable	Initial	After 1000 Cycles	After 2000 Cycles	After 3000 Cycles	After 4000 Cycles	After 5000 Cycles
1	0.69	*0.67*	0.67	0.67	0.67	0.67
2	0.68	*0.65*	0.65	0.66	0.65	0.65
3	0.94	0.66	*0.66*	0.67	0.66	0.65
4	0.73	*0.70*	0.71	0.70	0.69	0.69
5	0.73	*0.67*	0.68	0.69	0.67	0.67

90 Deg. Flex Continuity Testing

Resistance, mOhms

Cable	Initial	After 1000 Cycles	After 2000 Cycles	After 3000 Cycles	After 4000 Cycles	After 5000 Cycles
1	0.66	*0.66*	0.65	0.65	0.65	0.65
2	0.65	*0.66*	0.65	0.65	0.65	0.65
3	0.67	0.66	*0.66*	0.66	0.66	0.67
4	0.87	*0.68*	0.68	0.66	0.68	0.67
5	0.68	*0.65*	0.65	0.66	0.66	failure@4929

EQUIPMENT AND CALIBRATION SCHEDULES

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: 05/07/2009, Next Cal: 05/07/2010

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 11/30/2009, Next Cal: 11/30/2010

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 02/16/2010, Next Cal: 08/16/2010

Equipment #: MO-01
Description: Micro-Ohmeter
Manufacturer: Keithley
Model: 580
Serial #: 0772740
Accuracy: See Manual
… Last Cal: 04/30/2010, Next Cal: 04/30/2011

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: 06/16/2010, Next Cal: 06/16/2011

Equipment #: MO-02
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0780546
Accuracy: See Manual
… Last Cal: 06/16/09, Next Cal: 06/16/2010

Equipment #: PS-01
Description: System Power Supply
Manufacturer: Hewlett Packard
Model: HP 6033A
Serial #: (HP) 3329A-07330
Accuracy: See Manual See Manual
… Last Cal: 06/16/08, Next Cal: 06/16/09