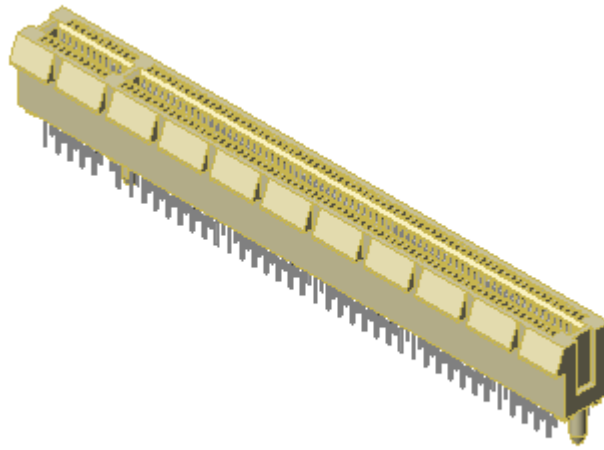




Project Number:		Tracking Code: TC0540--0850				
Requested by: Brandon Harpenau		Date: 9/26/2005		Product Rev: 3		
Part #: PCIE-164-02-F-D-TH			Lot #: 1		Tech: Troy Cook	Eng: Mark Shireman
Part description: PCI Express					Qty to test: 20	
Test Start: 11/12/2005		Test Completed: 12/9/2005				



**DVT Report for**  
**PCIE-XXX-02-F-D-TH**  
**Mated with Mating PCB Card**

## 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

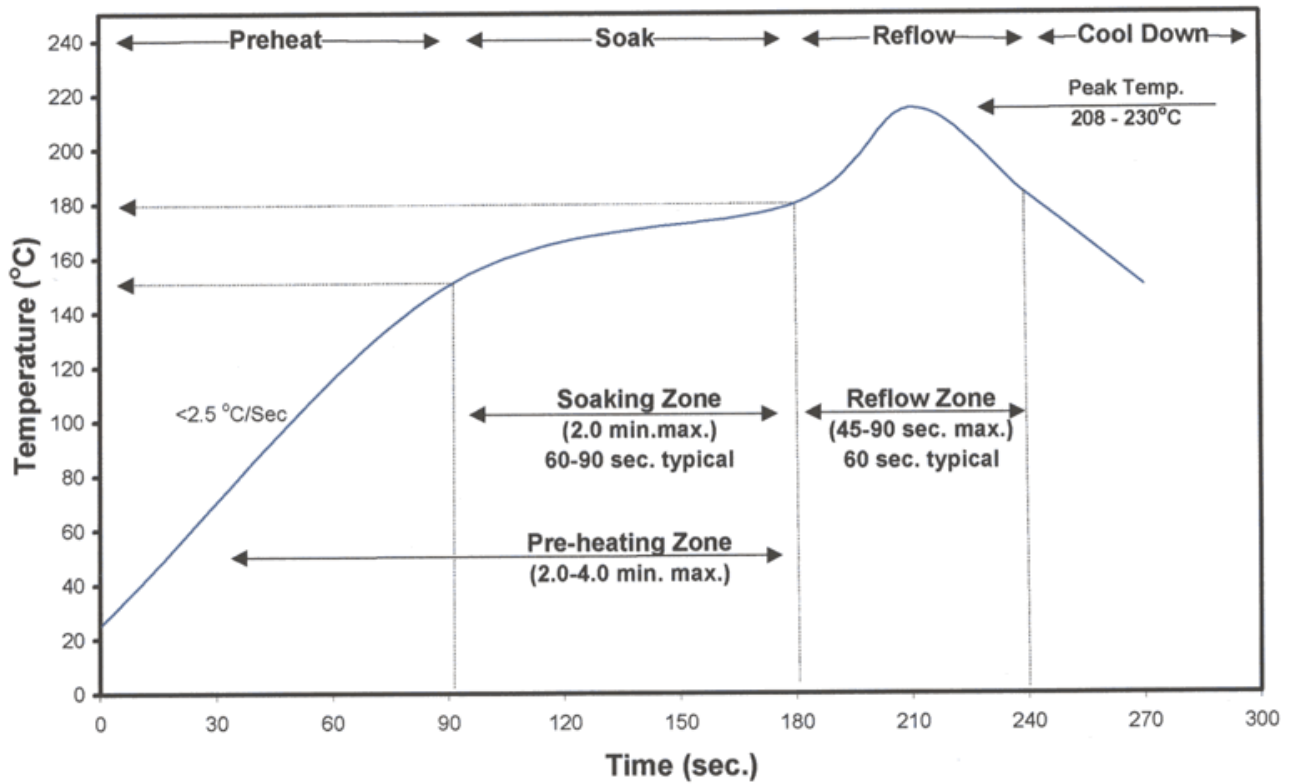
To perform the following tests: Please complete DVT and full qual.

### 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) The ultrasonic procedure can be used with either aqueous or non-aqueous soldering components and follows:
  - a. Sample test boards are to be ultrasonically cleaned after test lead attachment, preparation and/or soldering.
  - b. Sample test boards are immersed into Branson 3510 cleaner containing Kyzen Ionox HC1 (or equivalent) with the following conditions:
    - i. Temperature: -----55° C +/- 5° C
    - ii. Frequency:-----40 KHz
    - iii. Immersion Time: ---5 to 10 Minutes
  - c. Sample test boards are removed and placed into the Branson 3510 cleaner containing deionized water with the following conditions:
    - i. Temperature: -----55° C +/- 5° C
    - ii. Frequency:-----40 KHz
    - iii. Immersion Time: ---5 to 10 Minutes
  - d. Sample test boards are removed and placed in a beaker positioned on a hot plate with a magnetic stirrer containing deionized water warmed to 55° C +/- 5° C for 1/2 to 1 minute.
  - e. Upon removal, the sample boards are rinsed for 1/2 to 1 minute at room temperature with free flowing deionized water.
  - f. After the final rinse, the sample test boards are dried in an air-circulating oven for 10 to 15 minutes at 50° C +/- 5° C.
  - g. Sample test boards are then allowed to set and recover to room ambient condition prior to testing.
- 7) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
- 8) Any additional preparation will be noted in the individual test sequences.
- 9) Solder Information: SN63/PB37
- 10) Re-Flow Time/Temp: See accompanying profile.
- 11) Internal Test PCBs used: PCB-100362-TST-XX

**OVEN PROFILE (Soldering Parts to Test Boards)****Standard Solder Paste Reflow Profile  
for Kester Paste Containing  
Alloys: Sn63Pb37 or Sn62Pb36Ag02**

**FLOWCHARTS****Current Carrying Capacity**

TEST STEP	GROUP A 1 connector min  All 6 contacts powered
01	CCC

Tabulate calculated current at RT, 65° C, 75° C and 95° C  
after derating 20% and based on 105° C

CCC, Temp rise = EIA-364-70

**Mating/Unmating/Normal Force**

TEST STEP	GROUP A 10 Connectors 50 Cycles	GROUP B1 5 Connectors	GROUP B2 5 Connectors
01	Contact Gaps	<b>Setup Approve</b>	<b>Setup Approve</b>
02	Mating / Unmating	Normal Force	Thermal Aging (Mated)
03	Data Review	Data Review	Normal Force
04	50 Cycles		
05	Mating / Unmating		
06	Contact Gaps		
07	Data Review		
08	Thermal Aging (Mated)		
09	Mating / Unmating		
10	Contact Gaps		
11	Data Review		
12	Humidity (Mated)		
13	Mating / Unmating		
14	Contact Gaps		

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

Time Condition 'A' (96 hours)

Humidity = EIA-364-31, Test Condition 'A' (96 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

Contact Gaps/Height - No standard method. Usually measured optically

**FLOWCHARTS Continued****IR / DWV**

TEST STEP	GROUP A 3 Connectors Ambient	GROUP B1 3 Connectors Ambient	GROUP B2 3 Connectors Thermal	GROUP B3 3 Connectors Humidity
01	IR	DWV/Working Voltage	Thermal Aging	Humidity
02	Data Review		DWV/Working Voltage	DWV/Working Voltage
03	Thermal Aging			
04	IR			
05	Data Review			
06	Humidity			
07	IR			

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

Time Condition 'A' (96 hours)

Humidity = EIA-364-31, Test Condition 'A' (96 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

**Durability/Thermal Age/Cyclic Humidity**

TEST STEP	GROUP A 96 Points 50 Cycles
01	LLCR-1
02	Data Review
03	50 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 'A' (96 hours)

Humidity = EIA-364-31, Test Condition 'A' (96 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

**FLOWCHARTS Continued****Capacitance**

TEST STEP	GROUP A 3 Connectors
01	Capacitance
02	Data Review
03	Thermal Aging
04	Capacitance

Thermal Aging = EIA-364-17, Test Condition 3, 85 deg C;  
Time Condition 'A' (96 hours)

Capacitance at 820 Hz, B&K 810C

**Gas Tight**

TEST STEP	GROUP A 96 Points
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

## 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 96 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, 96 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. 65° C
  - c. 75° C
  - d. 95° 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 GAP:

- 1) Contact gaps 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<sup>2</sup>, computer controlled test stand with a deflection measurement system accuracy of 5.0  $\mu\text{m}$  (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<sup>2</sup> software in order to acquire and record the test data.
- 10) The permanent set of each contact shall be measured within the TC<sup>2</sup> 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
    - 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).

### 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.  $\leq +5.0$  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.  $\leq +5.0$  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 less than 10.
    - 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  $50^{\circ}$  C
    - ix. The final LLCR shall be conducted within 1 hour after drying.

### SUPPLEMENTAL TESTS

#### CAPACITANCE:

- 1) Taken at 820 Hz

**RESULTS****Temperature Rise, CCC at a 20% de-rating**

- CCC ( Linear) for a 30°C Temperature Rise -----2.6 A per contact with 6 adjacent contacts powered
- CCC ( Clustered) for a 30°C Temperature Rise -----3.0 A per contact with 6 adjacent contacts powered

**Contact Gaps**

- **Initial**
  - Min-----0.0254"
  - Max-----0.0312"
- **After 50 Cycles**
  - Min-----0.0257"
  - Max-----0.0313"
- **Thermal**
  - Min-----0.0292"
  - Max-----0.0338"
- **Humidity**
  - Min-----0.0299"
  - Max-----0.0337"

**Mating – Unmating Forces**

- **Initial**
  - **Mating**
    - Min-----21.9 Lbs.
    - Max-----27.0 Lbs.
  - **Unmating**
    - Min-----8.2 Lbs.
    - Max-----14.3 Lbs.
- **After 50 Cycles**
  - **Mating**
    - Min-----26.2 Lbs.
    - Max-----31.6 Lbs.
  - **Unmating**
    - Min-----12.3 Lbs.
    - Max-----16.0 Lbs.
- **Thermal**
  - **Mating**
    - Min-----16.6 Lbs.
    - Max-----19.3 Lbs.
  - **Unmating**
    - Min-----5.2 Lbs.
    - Max-----8.4 Lbs.
- **Humidity**
  - **Mating**
    - Min-----14.2 Lbs.
    - Max-----17.9 Lbs.
  - **Unmating**
    - Min-----4.7 Lbs.
    - Max-----5.9 Lbs.

**Normal Force at .016" deflection**

- **Initial**
  - Min-----82.8 Grams    Set -----0.0003"
  - Max-----92.9 Grams    Set -----0.0006"

- **Thermal**
  - **Min**-----67.7 Grams
  - **Max**-----73.9 Grams

**Insulation Resistance minimums, IR**

- **Initial**
  - **Mated**-----100,000 Meg  $\Omega$ ----- Pass
  - **Unmated**-----100,000 Meg  $\Omega$
- **Thermal**
  - **Mated**-----100,000 Meg  $\Omega$
  - **Unmated**-----100,000 Meg  $\Omega$
- **Humidity**
  - **Mated**----- 50,000 Meg  $\Omega$
  - **Unmated**-----100,000 Meg  $\Omega$

**Dielectric Withstanding Voltage minimums, DWV**

- **Initial**
  - **Breakdown**
    - **Mated**-----900 VAC
    - **Unmated**-----1,100 VAC
  - **DWV**
    - **Mated**-----675 VAC
    - **Unmated**-----825 VAC
  - **Working voltage**
    - **Mated**-----225 VAC
    - **Unmated**-----275 VAC
- **Thermal**
  - **Breakdown**
    - **Mated**-----800 VAC
    - **Unmated**-----1,100 VAC
  - **DWV**
    - **Mated**-----600 VAC
    - **Unmated**-----825 VAC
  - **Working voltage**
    - **Mated**-----200 VAC
    - **Unmated**-----275 VAC
- **Humidity**
  - **Breakdown**
    - **Mated**-----800 VAC
    - **Unmated**-----1,000 VAC
  - **DWV**
    - **Mated**-----600 VAC
    - **Unmated**-----750 VAC
  - **Working voltage**
    - **Mated**-----200 VAC
    - **Unmated**-----250 VAC

**LLCR Durability (200 LLCR test points)**

- **Initial**----- 10.1 mOhms Max
- **Durability, 50 Cycles**
  - **<= +5.0 mOhms**-----200 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**

- $\leq +5.0$  mOhms ----- 200 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**

- $\leq +5.0$  mOhms ----- 200 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

#### LLCR Gas Tight (200 LLCR test points)

- **Initial** ----- 9.8mOhms Max
- **Gas-Tight**
  - $\leq +5.0$  mOhms ----- 200 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

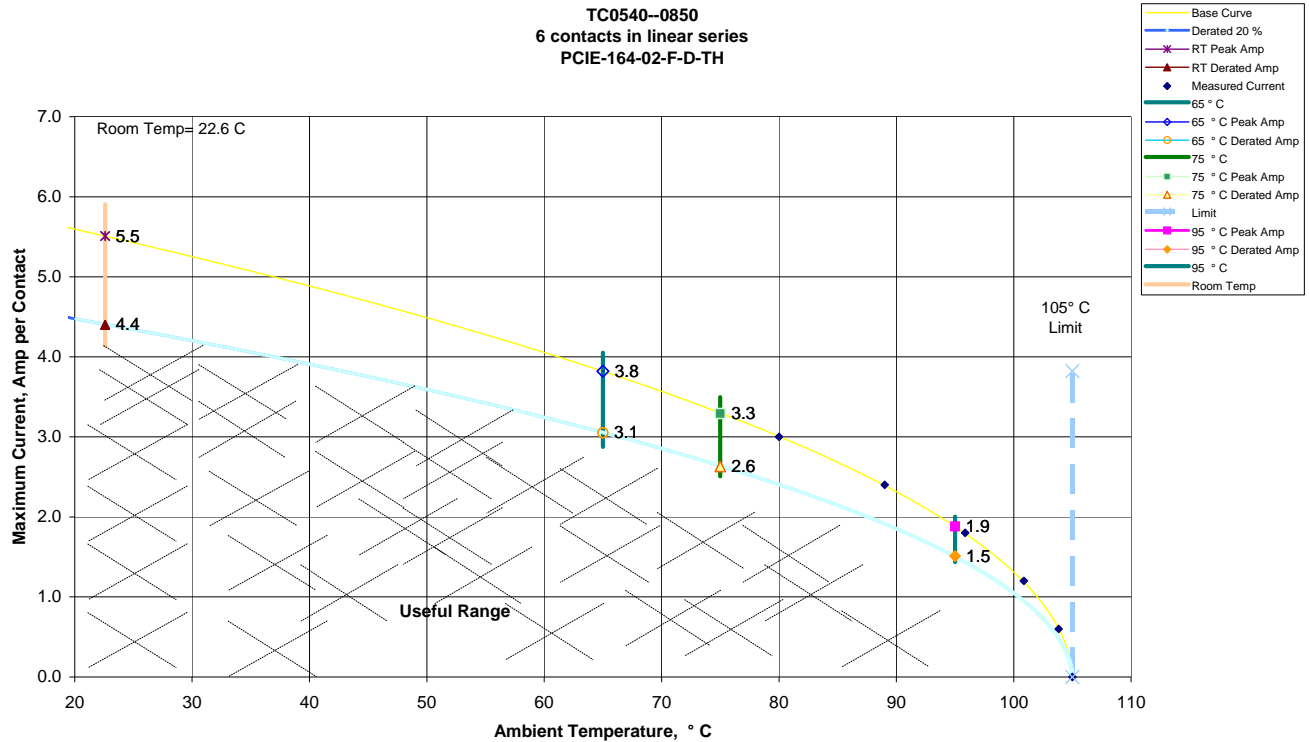
##### Capacitance

- **Initial**
  - **Min** ----- 0.6 pF
  - **Max** ----- 1.5 pF
- **Thermal**
  - **Min** ----- 0.5 pF
  - **Max** ----- 1.5 pF

## DATA SUMMARIES

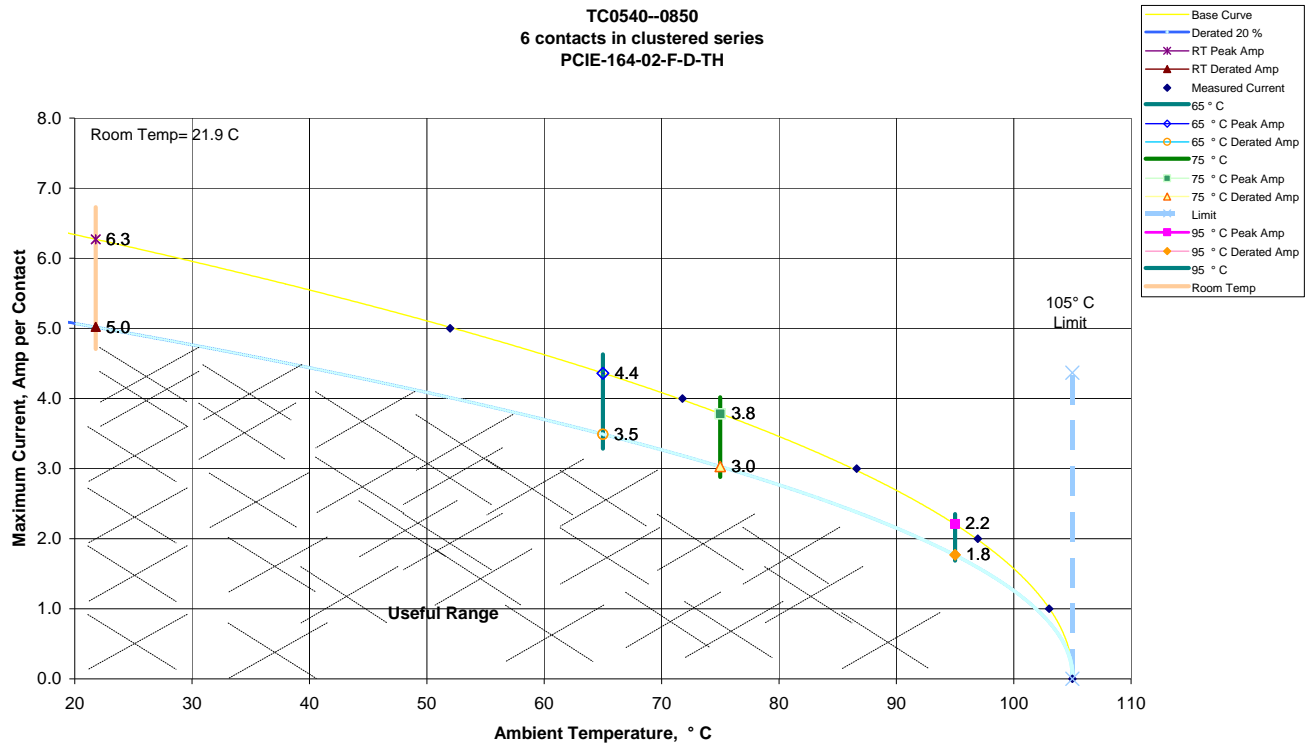
### TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 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 (1 X 6) adjacent conductors/contacts powered.



**DATA SUMMARIES continued**

b. Clustered configuration with six (2 x 3) adjacent conductors/contacts powered.

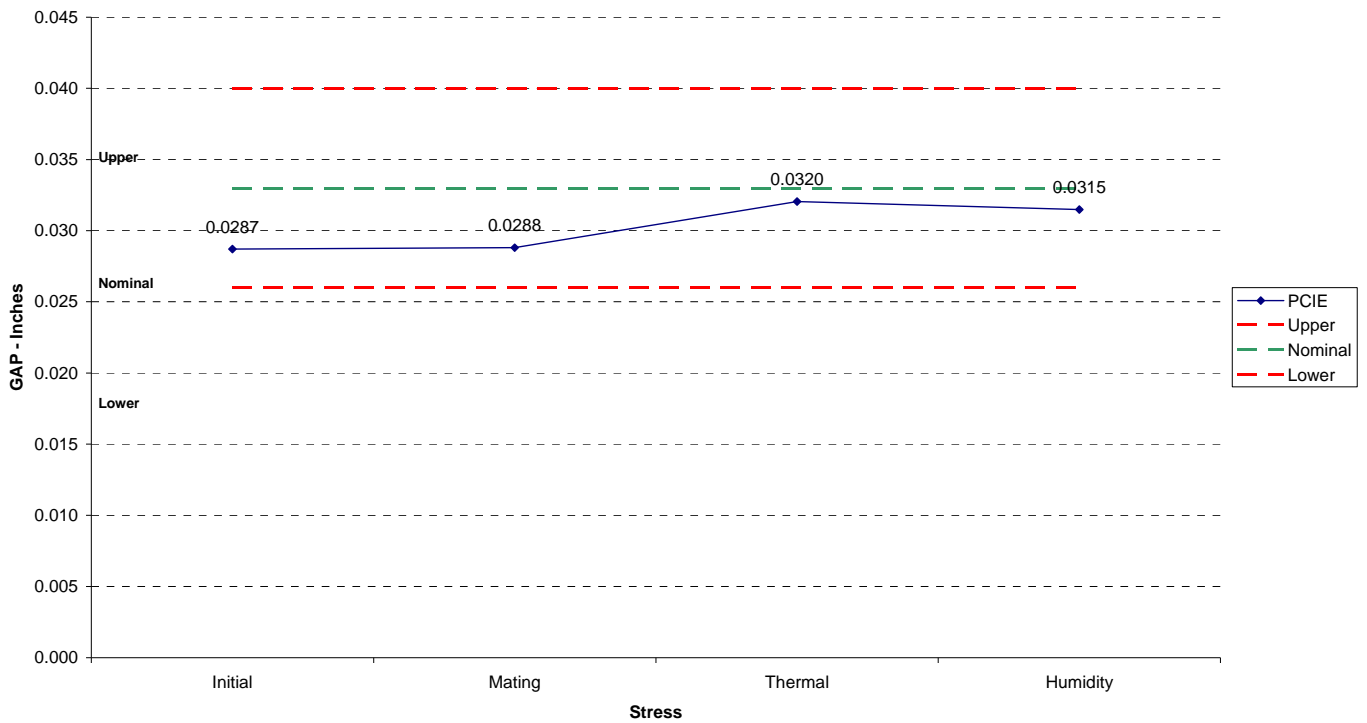


**CONTACT GAPS:**

Initial		After 50 Cycles		After Thermal		After Humidity	
Measurements in inches		Measurement in inches		Measurement in inches		Measurement in inches	
<i>Minimum</i>	0.0254	<i>Minimum</i>	0.0257	<i>Minimum</i>	0.0292	<i>Minimum</i>	0.0299
<i>Maximum</i>	0.0312	<i>Maximum</i>	0.0313	<i>Maximum</i>	0.0338	<i>Maximum</i>	0.0337
<i>Average</i>	0.0287	<i>Average</i>	0.0288	<i>Average</i>	0.0320	<i>Average</i>	0.0315
<i>St. Dev.</i>	0.0011	<i>St. Dev.</i>	0.0010	<i>St. Dev.</i>	0.0009	<i>St. Dev.</i>	0.0007
<i>Count</i>	164	<i>Count</i>	164	<i>Count</i>	164	<i>Count</i>	164

### DATA SUMMARIES continued

#### Height Measurements

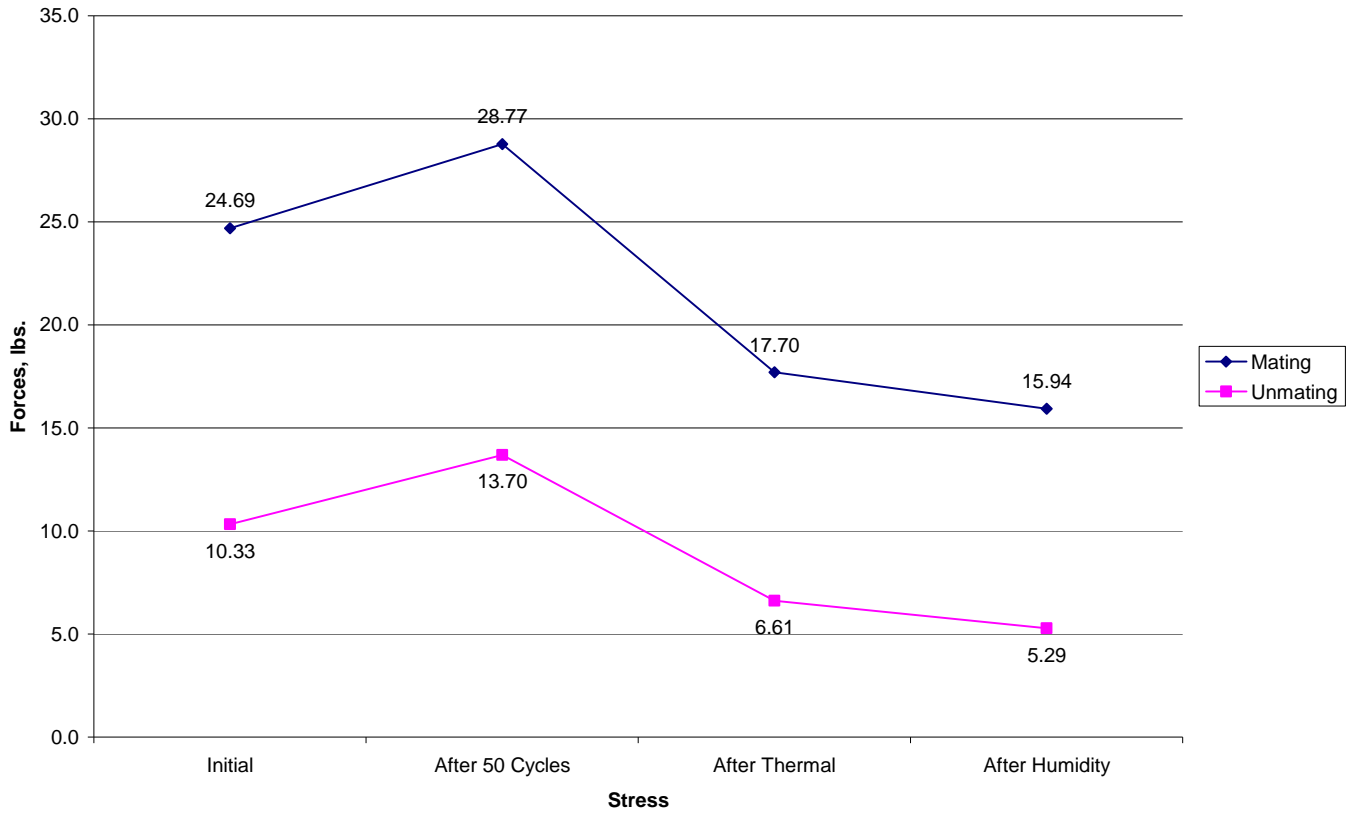


#### MATING/UNMATING:

	Initial				After 50 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	349.8	21.86	130.6	8.16	425.9	26.62	196.2	12.26
Maximum	431.4	27.0	228.2	14.3	505.3	31.6	256.6	16.0
<b>Average</b>	<b>395.0</b>	<b>24.7</b>	<b>165.3</b>	<b>10.3</b>	<b>460.3</b>	<b>28.8</b>	<b>219.1</b>	<b>13.7</b>
	After Thermal				After Humidity			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	265.6	16.6	83.8	5.2	227.2	14.2	75.5	4.7
Maximum	309.1	19.3	135.0	8.4	287.0	17.9	94.7	5.9
<b>Average</b>	<b>283.1</b>	<b>17.7</b>	<b>105.8</b>	<b>6.6</b>	<b>255.0</b>	<b>15.9</b>	<b>84.6</b>	<b>5.3</b>

### DATA SUMMARIES Continued

#### Mating/Unmating Compare

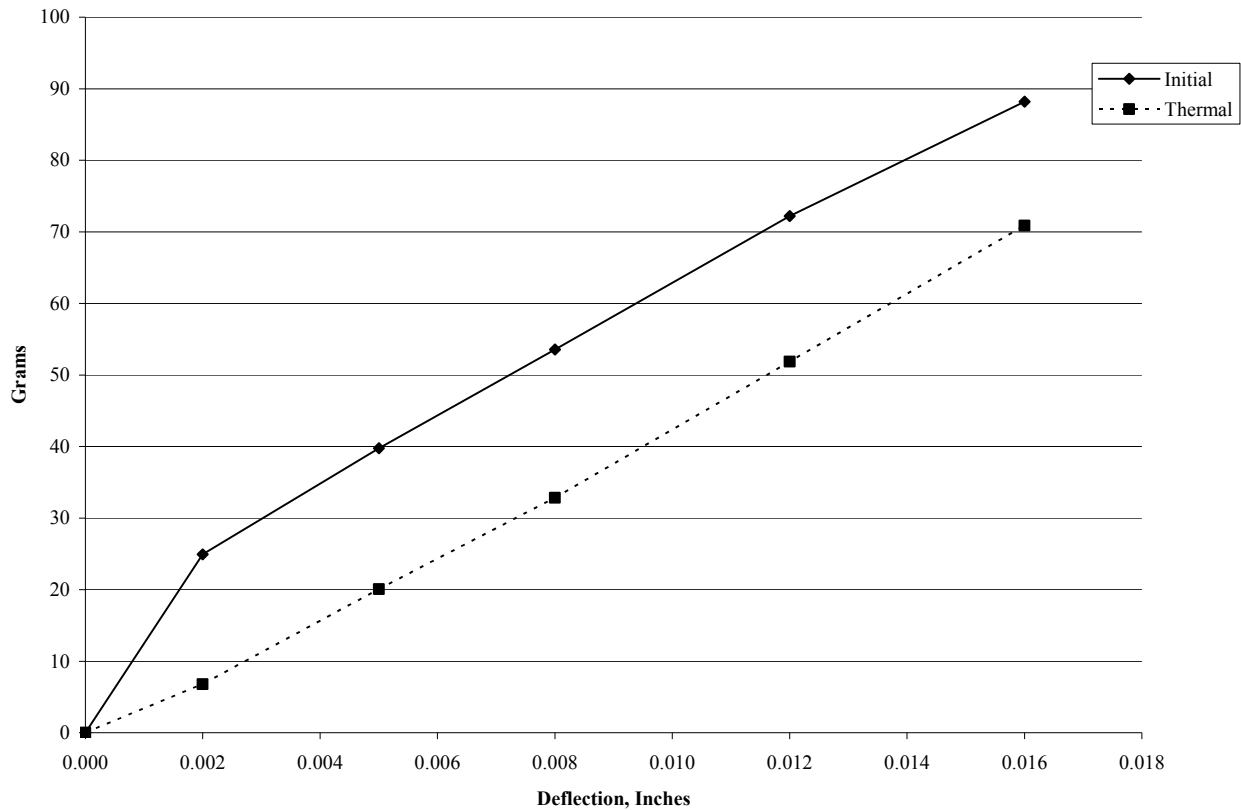




**DATA SUMMARIES Continued****NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):**

- 1) Calibrated force gauges are used along with computer controlled positioning equipment.
- 2) Typically, 8-10 readings are taken and the averages reported.

**Normal Force Comparison  
Initial vs Thermal**



Initial	Deflections in inches Forces in Grams					
	<u>0.0020</u>	<u>0.0050</u>	<u>0.0080</u>	<u>0.0120</u>	<u>0.0160</u>	<u>SET</u>
<b>Averages</b>	24.93	39.75	53.55	72.18	88.20	0.0005
<b>Min</b>	19.00	33.60	47.70	67.10	82.80	0.0003
<b>Max</b>	28.70	42.80	56.00	76.60	92.90	0.0006
<b>St. Dev</b>	2.42	2.44	2.34	2.54	2.91	0.0001
<b>Count</b>	10	10	10	10	10	10

Thermal	Deflections in inches Forces in Grams					
	<u>0.0020</u>	<u>0.0050</u>	<u>0.0080</u>	<u>0.0120</u>	<u>0.0160</u>	<u>SET</u>
<b>Averages</b>	6.79	20.08	32.83	51.86	70.88	0.0004
<b>Min</b>	5.06	16.58	28.90	49.13	67.74	0.0002
<b>Max</b>	7.72	22.12	34.96	54.67	73.94	0.0005
<b>St. Dev</b>	0.75	1.50	1.86	1.90	2.33	0.0001
<b>Count</b>	10	10	10	10	10	10

**DATA SUMMARIES Continued****INSULATION RESISTANCE (IR):**

	Initial, Meg Ohms		Thermal, Meg Ohms		Humidity, Meg Ohms	
	Mated	Unmated	Mated	Unmated	Mated	Unmated
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
<b>Average</b>	100000	87500	100000	100000	75000	100000
<b>Min</b>	100000	50000	100000	100000	50000	100000
<b>Max</b>	100000	100000	100000	100000	100000	100000

**DIELECTRIC WITHSTANDING VOLTAGE (DWV):**

	Initial, VAC Mated			Initial, VAC Unmated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
<b>Average</b>	990	743	248	1120	840	280
<b>Min</b>	900	675	225	1100	825	275
<b>Max</b>	1080	810	270	1140	855	285

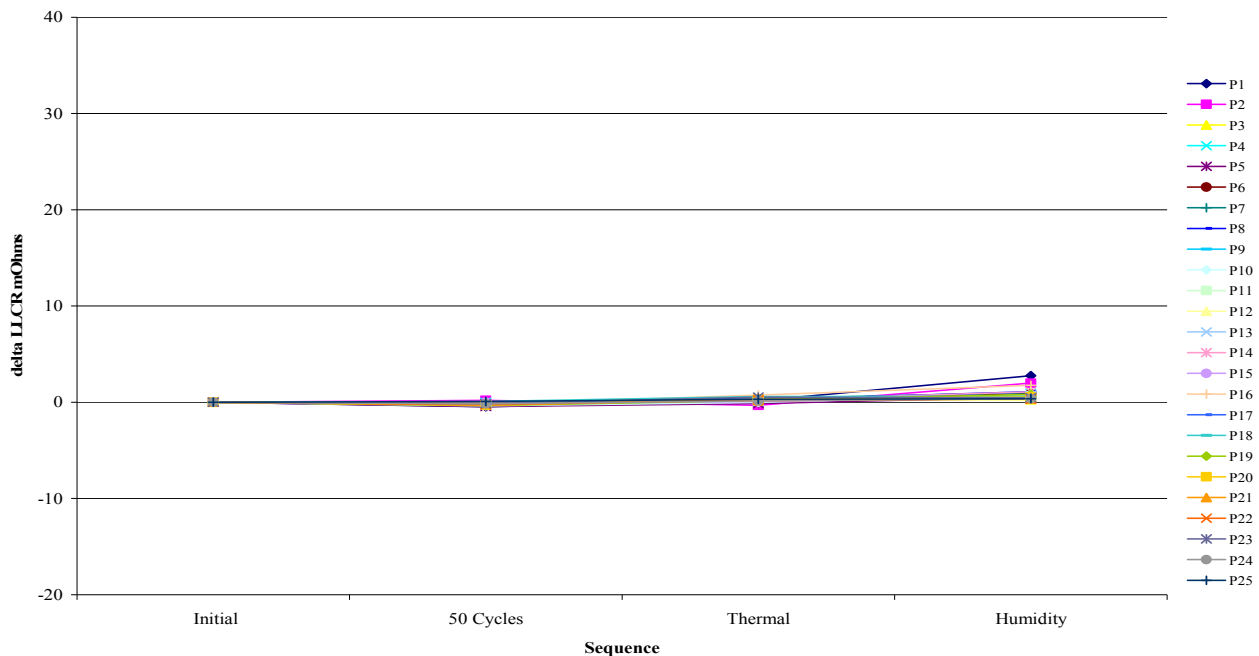
	Thermal, VAC Mated			Thermal, VAC Unmated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
<b>Average</b>	850	638	213	1100	825	275
<b>Min</b>	800	600	200	1100	825	275
<b>Max</b>	900	675	225	1100	825	275

	Humidity, VAC Mated			Humidity, VAC Unmated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
<b>Average</b>	850	638	213	1000	750	250
<b>Min</b>	800	600	200	1000	750	250
<b>Max</b>	900	675	225	1000	750	250

**DATA SUMMARIES Continued****LLCR:**

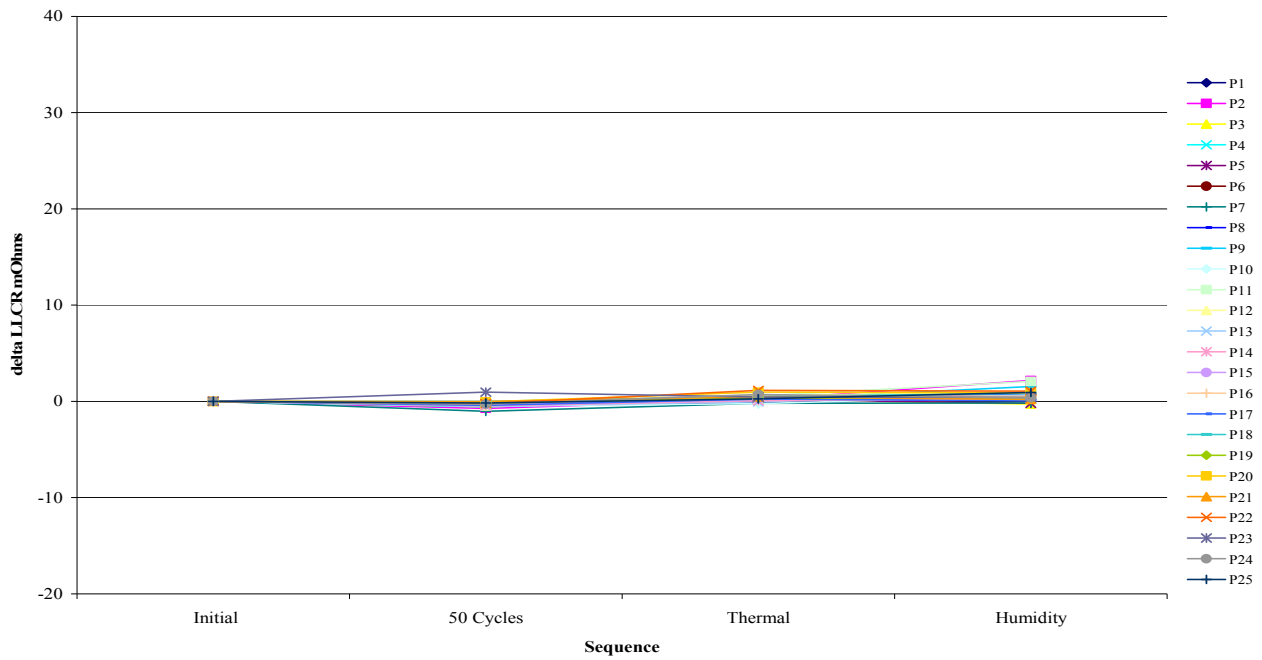
- 1) A total of 200 points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
  - a.  $\leq +5.0$  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

Date	Nov. 12 2005	Nov. 12 2005	Nov. 18 2005	Nov. 28 2005
Room Temp C	23	24	23	23
RH	22%	22%	49%	39%
Name	Troy Cook	Troy Cook	Troy Cook	Troy Cook
<b>mOhm values</b>	<b>Actual</b>	<b>Delta</b>	<b>Delta</b>	<b>Delta</b>
	<b>Initial</b>	<b>50 Cycles</b>	<b>Thermal</b>	<b>Humidity</b>
Average	8.7	-0.3	0.4	0.7
St. Dev.	0.5	0.3	0.4	0.6
Min	7.5	-1.3	-1.2	-0.6
Max	10.1	0.9	2.5	4.0
Count	200	200	200	200

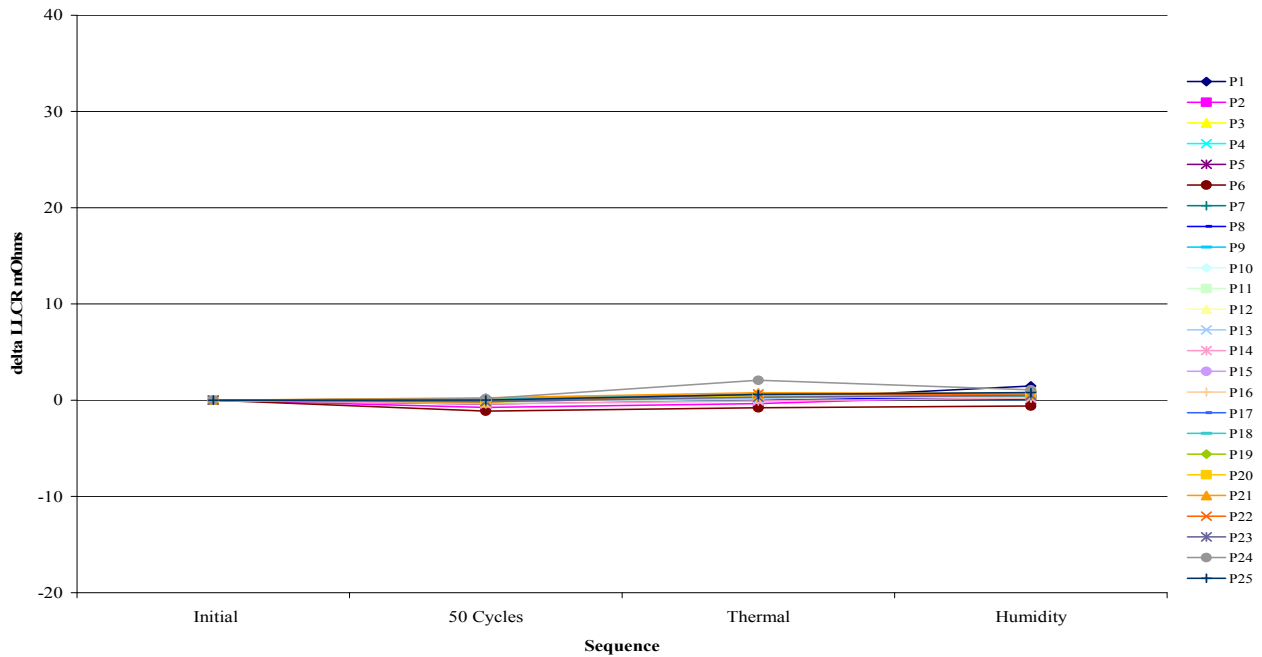
**Board #1**

### DATA SUMMARIES Continued

Board #2

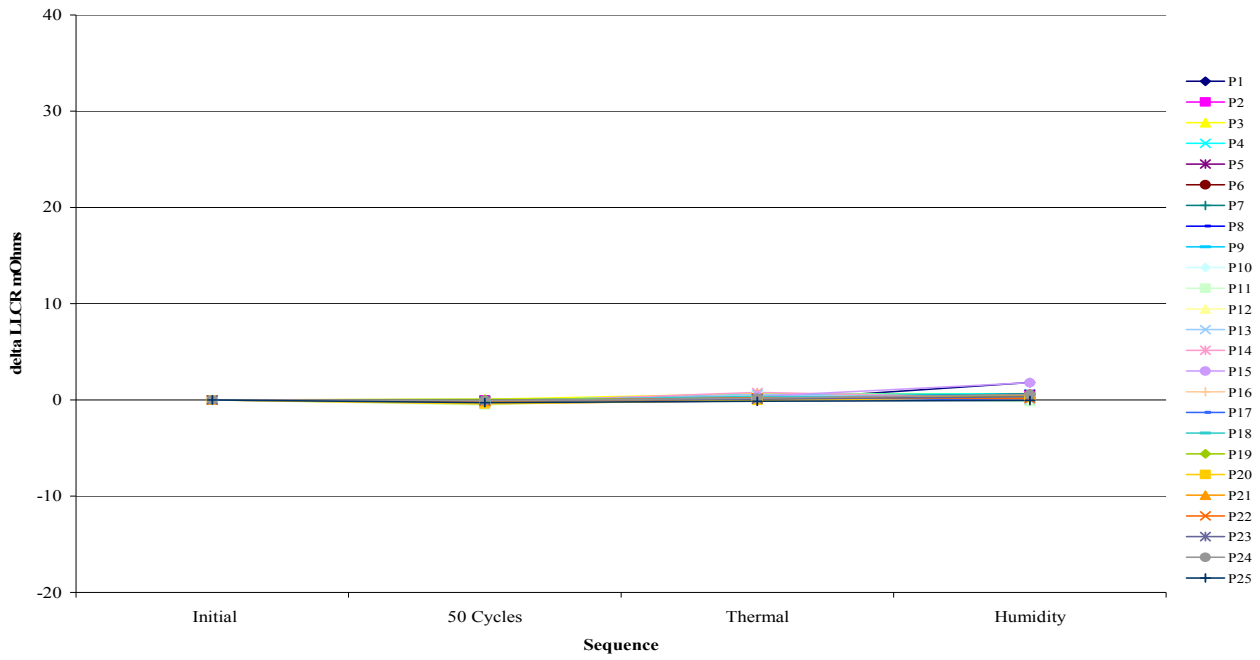


Board #3

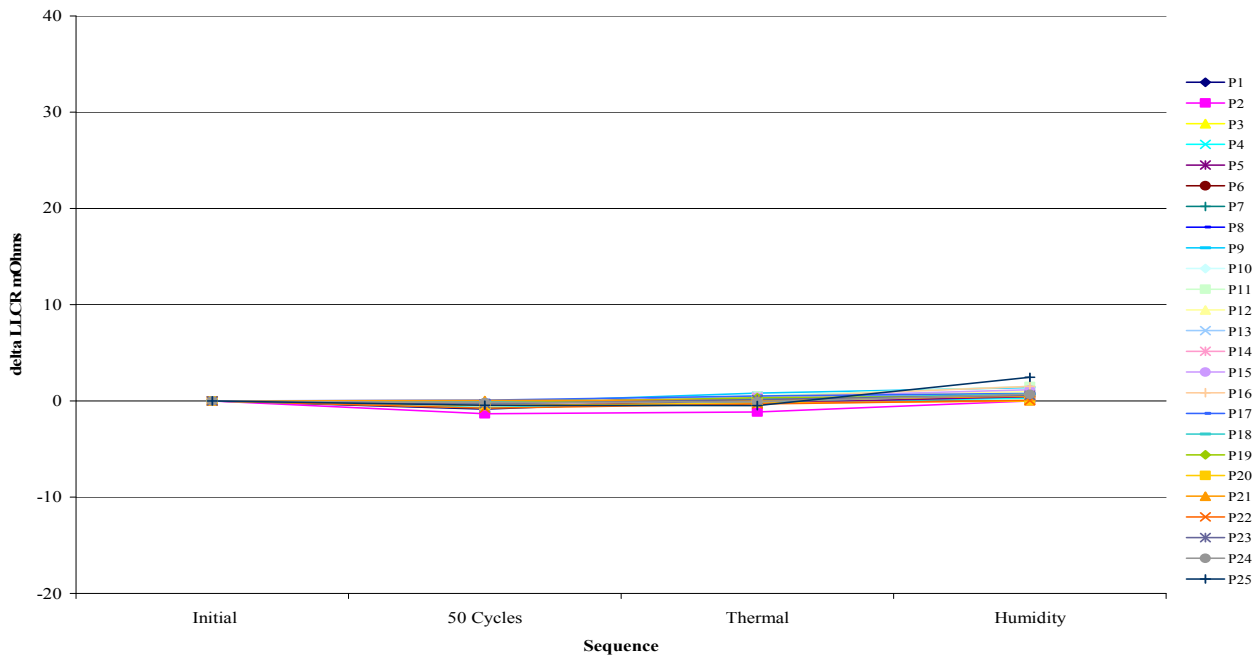


### DATA SUMMARIES Continued

**Board #4**

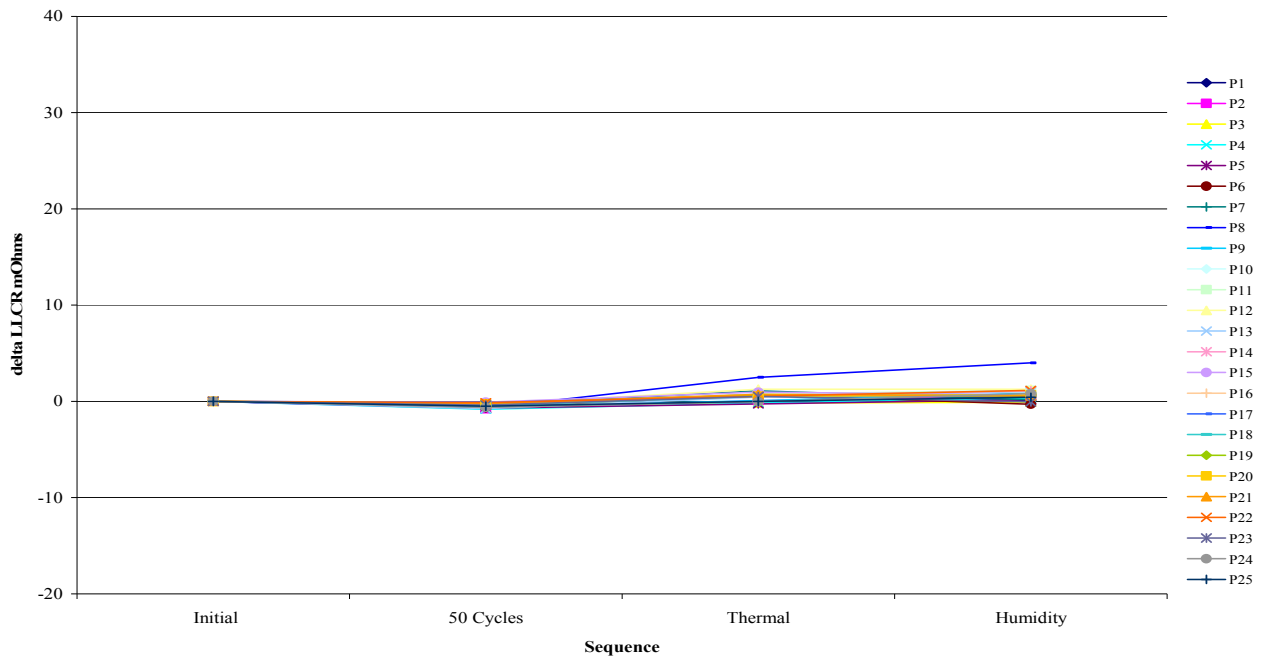


**Board #5**

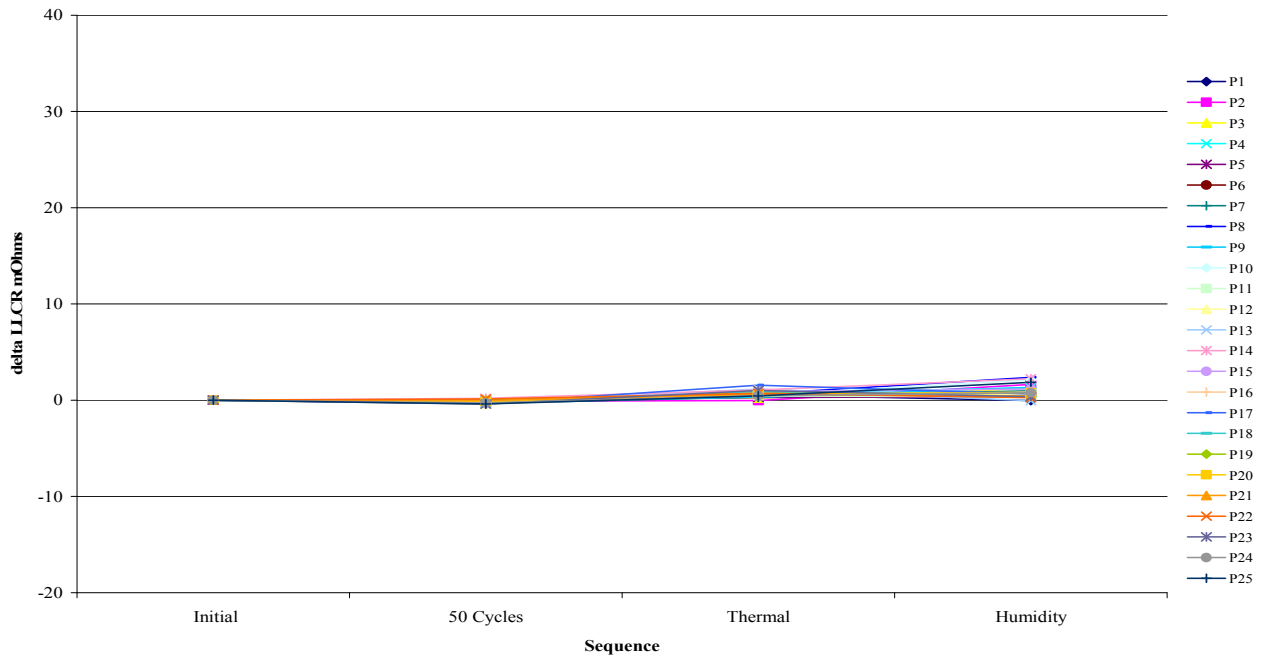


### DATA SUMMARIES Continued

Board #6

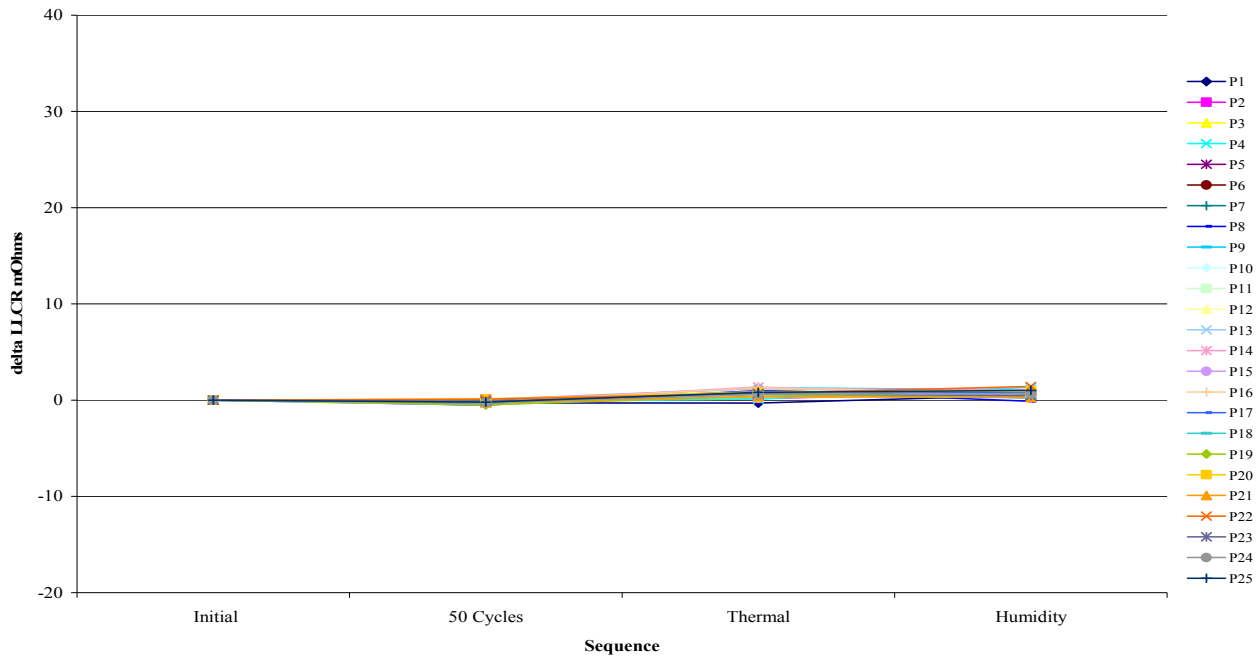


Board #7



## DATA SUMMARIES Continued

Board #8



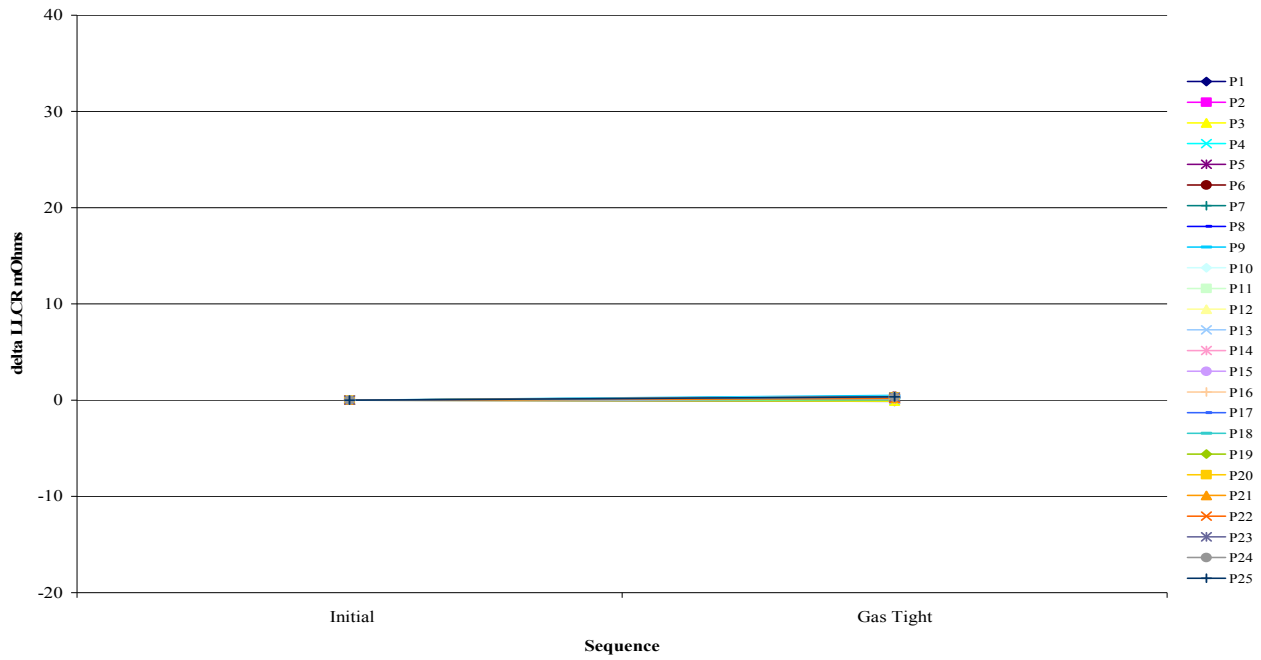
## GAS TIGHT:

- 1) A total of 200 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.  $\leq +5.0$  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

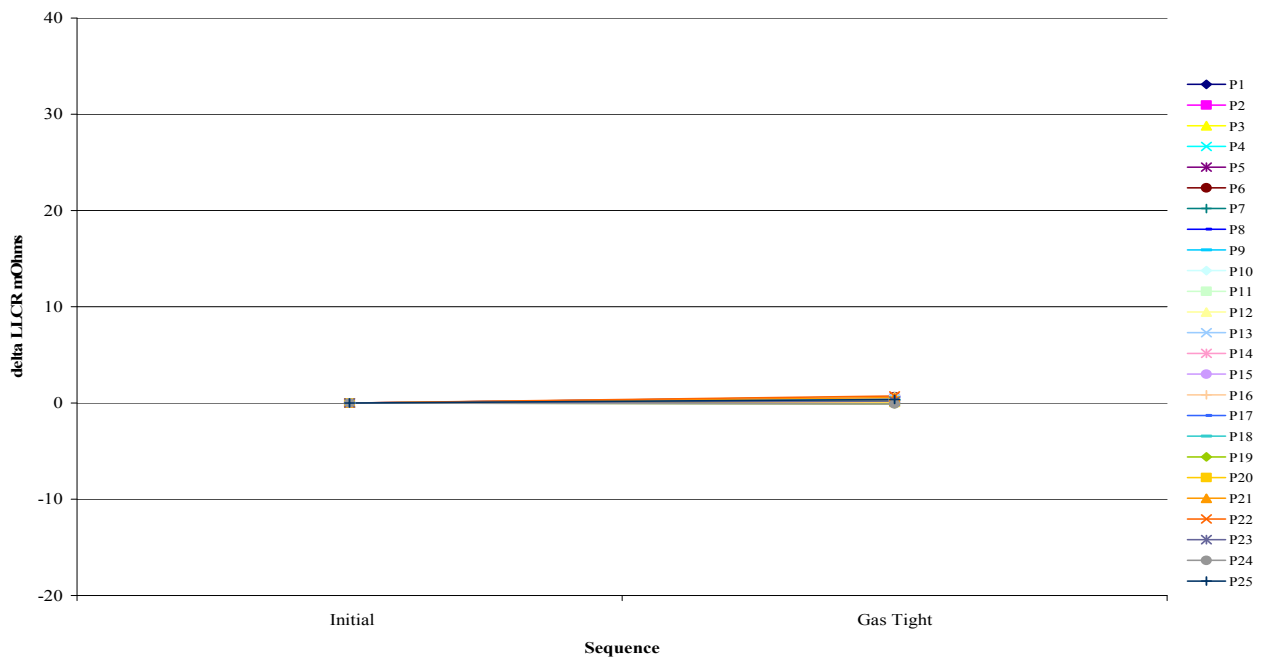
Date	Nov. 14 2005	Dec. 05 2005
Room Temp C	24	24
RH	28%	17%
Name	Troy Cook	Troy Cook
<b>mOhm values</b>	<b>Actual Initial</b>	<b>Delta Gas Tight</b>
Average	8.6	0.2
St. Dev.	0.4	0.2
Min	7.7	-0.6
Max	9.8	1.2
Count	200	200

### DATA SUMMARIES Continued

Board #1



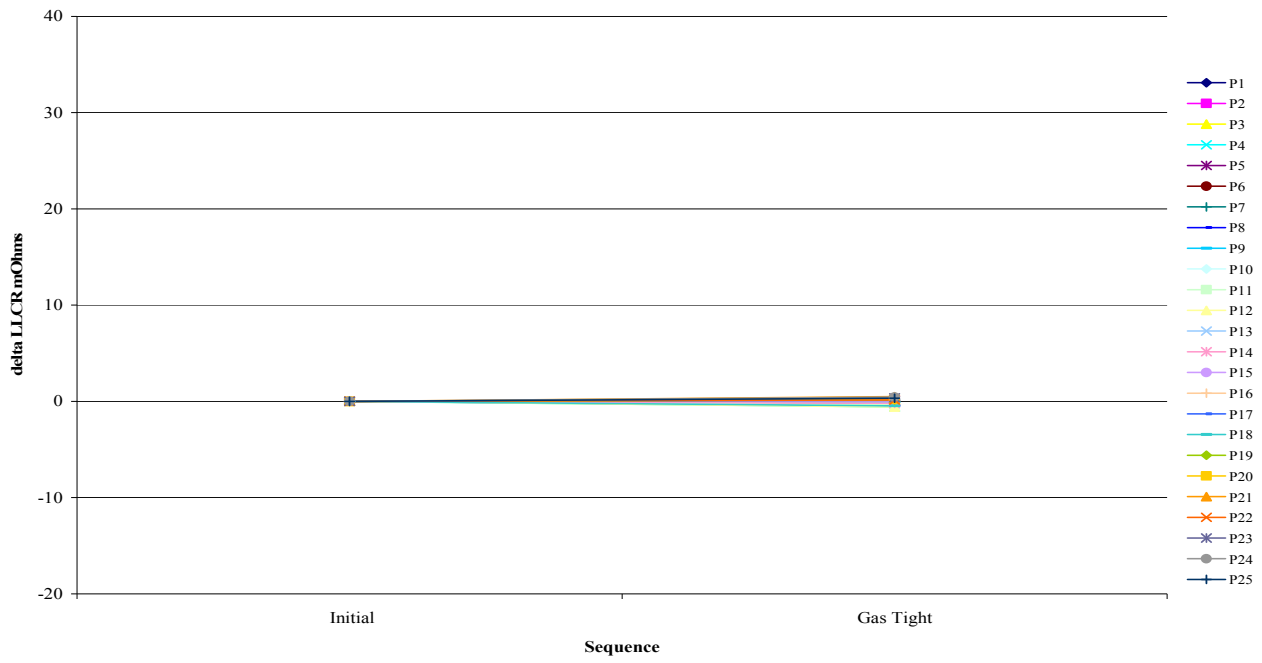
Board #2



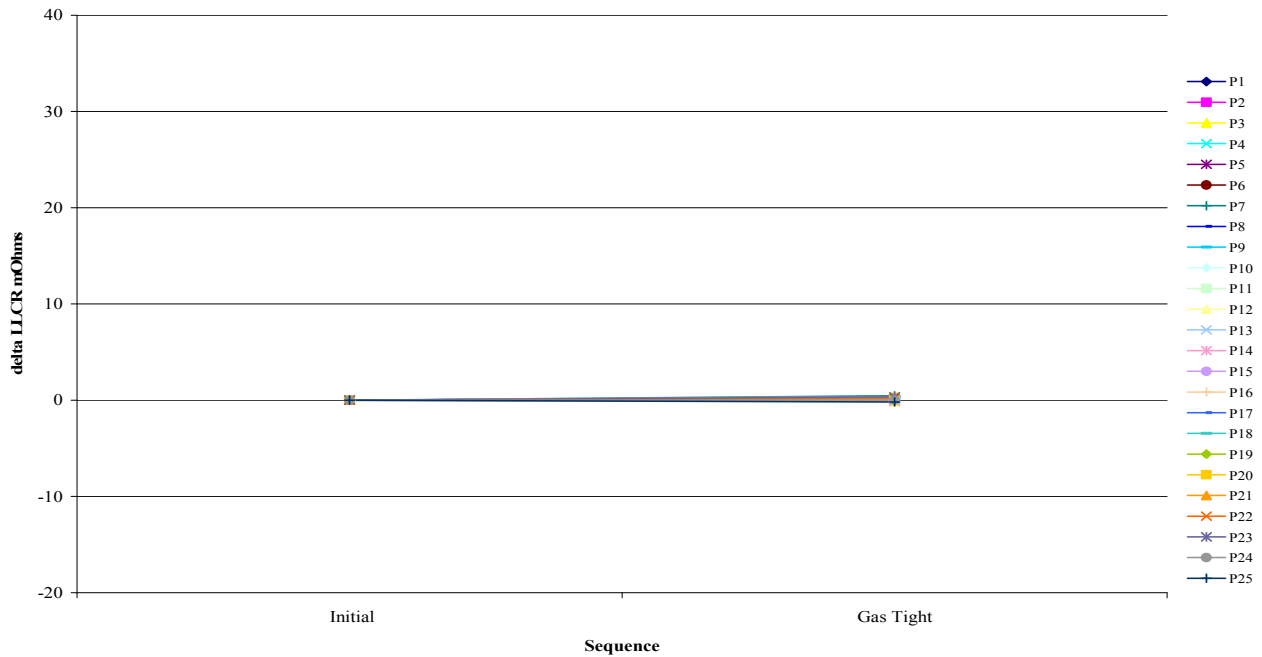


### DATA SUMMARIES Continued

Board #3

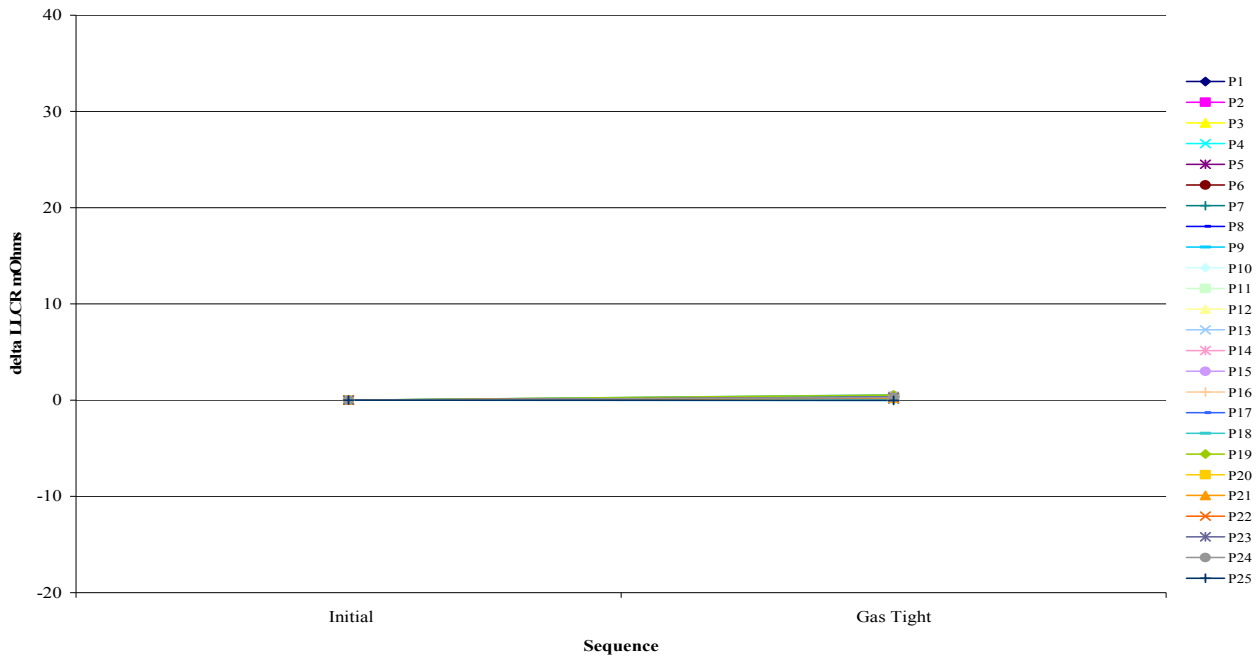


Board #4

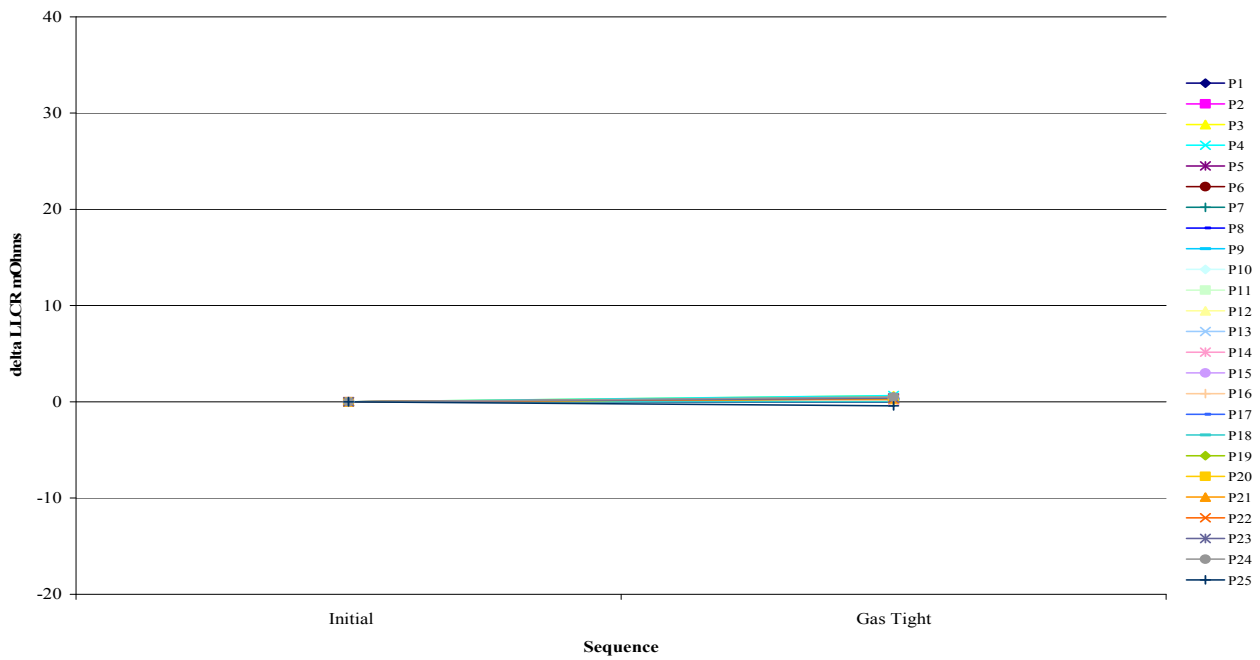


### DATA SUMMARIES Continued

Board #5

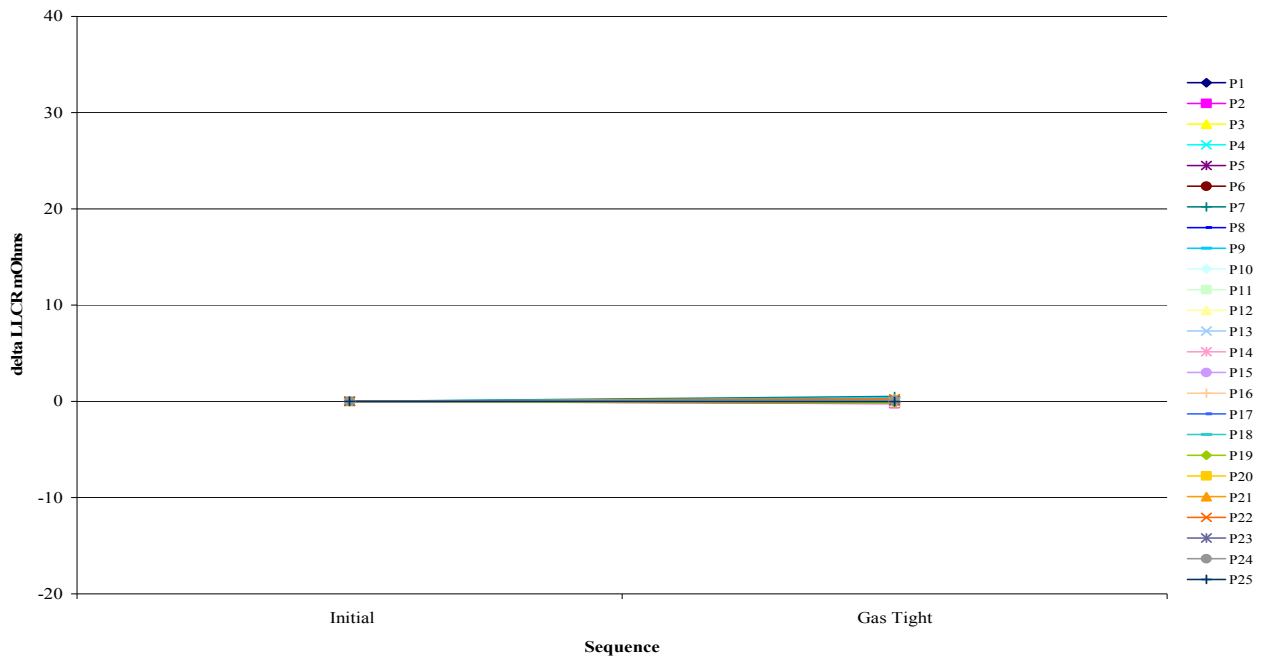


Board #6

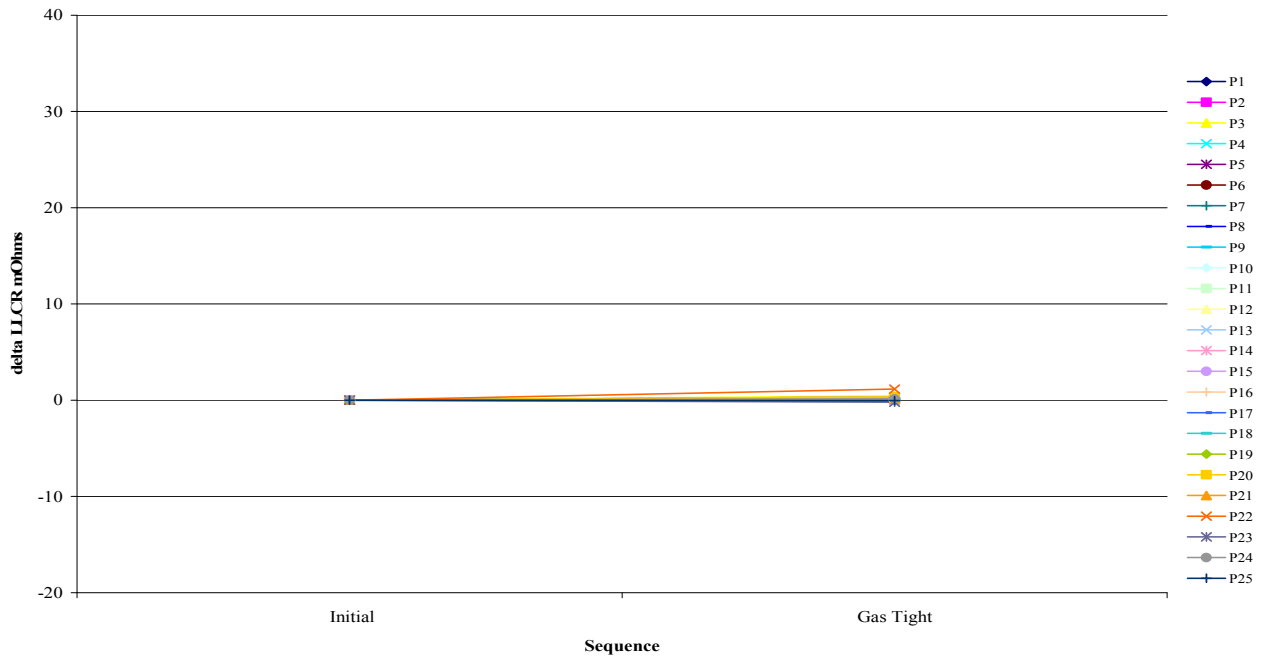


### DATA SUMMARIES Continued

Board #7



Board #8



**DATA SUMMARIES Continued****SUPPLEMENTAL TESTS****CAPACITANCE:**

<b>Initial</b>	<b>Pin - Pin</b>		<b>Thermal</b>	<b>Pin - Pin</b>
	<b>pF</b>			<b>pF</b>
<b>Averages</b>	1.05		<b>Averages</b>	1.00
<b>Min</b>	0.60		<b>Min</b>	0.50
<b>Max</b>	1.50		<b>Max</b>	1.50
<b>St. Dev</b>	0.64		<b>St. Dev</b>	0.71
<b>Count</b>	2		<b>Count</b>	2

## DATA

## CONTACT GAPS:

## Measurements in inches

Sample#	Initial		After 50 Cycles		After Thermal		After Humidity	
	B1	B2	B1	B2	B1	B2	B1	B2
1	0.0300	0.0311	0.0305	0.0313	0.0324	0.0335	0.0320	0.0333
2	0.0288	0.0301	0.0293	0.0304	0.0321	0.0332	0.0320	0.0324
3	0.0264	0.0281	0.0270	0.0286	0.0304	0.0302	0.0299	0.0314
4	0.0259	0.0279	0.0264	0.0282	0.0306	0.0313	0.0305	0.0310
5	0.0260	0.0279	0.0265	0.0281	0.0292	0.0307	0.0299	0.0314
6	0.0262	0.0281	0.0266	0.0283	0.0301	0.0318	0.0305	0.0317
7	0.0254	0.0274	0.0257	0.0277	0.0293	0.0308	0.0299	0.0307
8	0.0257	0.0281	0.0261	0.0284	0.0305	0.0322	0.0301	0.0322
9	0.0273	0.0285	0.0276	0.0288	0.0307	0.0320	0.0310	0.0314
10	0.0266	0.0290	0.0267	0.0291	0.0299	0.0329	0.0301	0.0323
11	0.0266	0.0277	0.0268	0.0279	0.0299	0.0315	0.0306	0.0308
12	0.0270	0.0274	0.0272	0.0277	0.0321	0.0314	0.0319	0.0309
13	0.0262	0.0281	0.0264	0.0284	0.0298	0.0320	0.0300	0.0310
14	0.0268	0.0287	0.0269	0.0289	0.0304	0.0329	0.0299	0.0320
15	0.0264	0.0280	0.0265	0.0284	0.0301	0.0321	0.0299	0.0309
16	0.0273	0.0280	0.0273	0.0282	0.0310	0.0323	0.0309	0.0313
17	0.0277	0.0290	0.0278	0.0291	0.0315	0.0332	0.0310	0.0317
18	0.0283	0.0291	0.0282	0.0293	0.0317	0.0334	0.0309	0.0323
19	0.0283	0.0282	0.0282	0.0283	0.0318	0.0323	0.0311	0.0308
20	0.0289	0.0278	0.0287	0.0281	0.0321	0.0322	0.0317	0.0316
21	0.0289	0.0282	0.0288	0.0284	0.0323	0.0324	0.0319	0.0310
22	0.0284	0.0288	0.0282	0.0290	0.0318	0.0330	0.0308	0.0319
23	0.0288	0.0279	0.0286	0.0281	0.0323	0.0321	0.0317	0.0305
24	0.0295	0.0283	0.0293	0.0285	0.0328	0.0325	0.0324	0.0315
25	0.0290	0.0287	0.0289	0.0289	0.0324	0.0330	0.0314	0.0313
26	0.0290	0.0289	0.0288	0.0290	0.0323	0.0330	0.0311	0.0317
27	0.0281	0.0274	0.0279	0.0277	0.0316	0.0317	0.0305	0.0304
28	0.0283	0.0282	0.0280	0.0283	0.0316	0.0324	0.0308	0.0318
29	0.0291	0.0281	0.0289	0.0282	0.0324	0.0324	0.0314	0.0313
30	0.0290	0.0283	0.0287	0.0284	0.0322	0.0322	0.0310	0.0314
31	0.0284	0.0271	0.0283	0.0274	0.0319	0.0314	0.0308	0.0308
32	0.0289	0.0280	0.0288	0.0283	0.0324	0.0320	0.0313	0.0314
33	0.0295	0.0283	0.0294	0.0285	0.0331	0.0323	0.0316	0.0314
34	0.0291	0.0284	0.0290	0.0286	0.0325	0.0324	0.0308	0.0314
35	0.0286	0.0271	0.0285	0.0274	0.0320	0.0311	0.0307	0.0307
36	0.0303	0.0276	0.0301	0.0277	0.0337	0.0315	0.0331	0.0309
37	0.0291	0.0278	0.0289	0.0280	0.0326	0.0318	0.0314	0.0315
38	0.0293	0.0278	0.0291	0.0279	0.0327	0.0315	0.0311	0.0308
39	0.0286	0.0270	0.0285	0.0273	0.0320	0.0310	0.0308	0.0309
40	0.0291	0.0279	0.0290	0.0280	0.0324	0.0318	0.0313	0.0312
41	0.0299	0.0285	0.0297	0.0286	0.0334	0.0324	0.0319	0.0315
42	0.0299	0.0284	0.0296	0.0284	0.0330	0.0319	0.0312	0.0312
43	0.0290	0.0278	0.0288	0.0279	0.0324	0.0314	0.0311	0.0312
44	0.0306	0.0282	0.0304	0.0283	0.0337	0.0320	0.0328	0.0314
45	0.0294	0.0282	0.0292	0.0283	0.0327	0.0321	0.0310	0.0318
46	0.0306	0.0284	0.0303	0.0284	0.0337	0.0319	0.0323	0.0314
47	0.0285	0.0275	0.0283	0.0275	0.0319	0.0308	0.0307	0.0307
48	0.0290	0.0284	0.0288	0.0284	0.0322	0.0322	0.0313	0.0318

Tracking Code: TC0540--0850

Part #: PCIE-164-02-F-D-TH

Part description: PCI Express

49	0.0299	0.0287	0.0297	0.0288	0.0333	0.0325	0.0320	0.0317
50	0.0297	0.0292	0.0295	0.0292	0.0330	0.0325	0.0314	0.0316
51	0.0291	0.0283	0.0288	0.0285	0.0338	0.0317	0.0311	0.0315
52	0.0294	0.0288	0.0292	0.0288	0.0326	0.0323	0.0314	0.0318
53	0.0295	0.0290	0.0294	0.0290	0.0328	0.0327	0.0315	0.0320
54	0.0297	0.0291	0.0295	0.0290	0.0327	0.0322	0.0313	0.0316
55	0.0285	0.0282	0.0283	0.0283	0.0317	0.0313	0.0308	0.0314
56	0.0289	0.0289	0.0287	0.0288	0.0315	0.0319	0.0311	0.0317
57	0.0297	0.0298	0.0295	0.0298	0.0329	0.0329	0.0318	0.0322
58	0.0300	0.0301	0.0299	0.0300	0.0331	0.0331	0.0317	0.0321
59	0.0291	0.0294	0.0290	0.0296	0.0324	0.0325	0.0312	0.0315
60	0.0294	0.0301	0.0293	0.0300	0.0324	0.0330	0.0317	0.0324
61	0.0298	0.0303	0.0297	0.0304	0.0328	0.0332	0.0321	0.0323
62	0.0298	0.0305	0.0297	0.0305	0.0321	0.0332	0.0318	0.0326
63	0.0288	0.0292	0.0288	0.0292	0.0321	0.0317	0.0315	0.0309
64	0.0288	0.0296	0.0289	0.0295	0.0315	0.0321	0.0314	0.0318
65	0.0294	0.0303	0.0294	0.0306	0.0327	0.0328	0.0319	0.0323
66	0.0298	0.0310	0.0299	0.0311	0.0326	0.0330	0.0319	0.0327
67	0.0291	0.0298	0.0291	0.0300	0.0320	0.0318	0.0314	0.0314
68	0.0294	0.0297	0.0294	0.0299	0.0310	0.0316	0.0319	0.0317
69	0.0295	0.0305	0.0296	0.0307	0.0320	0.0322	0.0315	0.0324
70	0.0298	0.0303	0.0300	0.0306	0.0311	0.0318	0.0314	0.0321
71	0.0300	0.0307	0.0302	0.0311	0.0313	0.0327	0.0320	0.0337
72	0.0312	0.0305	0.0313	0.0308	0.0331	0.0324	0.0329	0.0327
73	0.0288	0.0290	0.0290	0.0296	0.0318	0.0335	0.0314	0.0329
74	0.0287	0.0293	0.0287	0.0296	0.0316	0.0321	0.0315	0.0325
75	0.0291	0.0295	0.0293	0.0298	0.0323	0.0327	0.0320	0.0326
76	0.0291	0.0298	0.0292	0.0301	0.0319	0.0319	0.0318	0.0324
77	0.0278	0.0285	0.0282	0.0289	0.0326	0.0322	0.0310	0.0318
78	0.0284	0.0288	0.0285	0.0292	0.0308	0.0320	0.0316	0.0320
79	0.0288	0.0290	0.0291	0.0294	0.0328	0.0329	0.0321	0.0323
80	0.0289	0.0293	0.0291	0.0295	0.0309	0.0312	0.0316	0.0318
81	0.0281	0.0286	0.0284	0.0290	0.0325	0.0309	0.0319	0.0312
82	0.0287	0.0292	0.0287	0.0295	0.0299	0.0318	0.0319	0.0329

**DATA continued****MATING/UNMATING:**

Sample#	Initial				After 50 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
1	390.7	24.42	157.1	9.82	453.4	28.34	224.0	14.00
2	431.4	26.96	180.5	11.28	476.8	29.80	228.8	14.30
3	375.4	23.46	145.6	9.10	428.5	26.78	203.2	12.70
4	349.8	21.86	130.6	8.16	425.9	26.62	196.2	12.26
5	384.3	24.02	142.4	8.90	450.9	28.18	213.4	13.34
6	425.3	26.58	172.8	10.80	465.6	29.10	256.6	16.04
7	413.8	25.86	228.2	14.26	487.0	30.44	226.6	14.16
8	381.8	23.86	165.4	10.34	447.7	27.98	206.7	12.92
9	386.2	24.14	162.9	10.18	462.1	28.88	225.6	14.10
10	411.8	25.74	168.0	10.50	505.3	31.58	210.2	13.14
Sample#	After Thermal				After Humidity			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
1	270.7	16.92	105.3	6.58	227.2	14.20	81.6	5.10
2	284.5	17.78	113.9	7.12	247.7	15.48	82.9	5.18
3	265.6	16.60	92.8	5.80	242.2	15.14	79.0	4.94
4	281.6	17.60	83.8	5.24	256.3	16.02	75.5	4.72
5	284.8	17.80	98.6	6.16	250.2	15.64	79.7	4.98
6	290.6	18.16	103.7	6.48	262.7	16.42	94.7	5.92
7	278.4	17.40	111.4	6.96	254.4	15.90	86.1	5.38
8	287.4	17.96	101.8	6.36	259.5	16.22	88.0	5.50
9	278.7	17.42	135.0	8.44	262.4	16.40	90.2	5.64
10	309.1	19.32	111.4	6.96	287.0	17.94	88.3	5.52

**DATA continued****NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):**

<b>Initial</b>	<b>Deflections in inches Forces in Grams</b>					
	<b>0.0020</b>	<b>0.0050</b>	<b>0.0080</b>	<b>0.0120</b>	<b>0.0160</b>	<b>SET</b>
<b>Averages</b>	24.93	39.75	53.55	72.18	88.20	0.0005
<b>Min</b>	19.00	33.60	47.70	67.10	82.80	0.0003
<b>Max</b>	28.70	42.80	56.00	76.60	92.90	0.0006
<b>St. Dev</b>	2.42	2.44	2.34	2.54	2.91	0.0001
<b>Count</b>	10	10	10	10	10	10
<b>Initial</b>	<b>Deflections in inches Forces in Grams</b>					
<b>Sample #</b>	<b>0.0020</b>	<b>0.0050</b>	<b>0.0080</b>	<b>0.0120</b>	<b>0.0160</b>	<b>SET</b>
1	25.20	40.90	55.00	73.90	89.30	0.00050
2	24.90	38.70	52.50	70.70	85.50	0.00040
3	24.60	39.50	53.90	72.60	87.70	0.00040
4	28.70	42.80	56.00	76.60	92.90	0.00050
5	19.00	33.60	47.70	67.10	82.80	0.00040
6	26.00	39.80	53.30	72.30	89.10	0.00050
7	26.00	41.40	55.80	74.20	91.50	0.00060
8	24.60	40.10	53.60	71.70	87.70	0.00040
9	24.60	39.80	53.30	72.30	89.10	0.00050
10	25.70	40.90	54.40	70.40	86.40	0.00030

<b>Thermal</b>	<b>Deflections in inches Forces in Grams</b>					
	<b>0.0020</b>	<b>0.0050</b>	<b>0.0080</b>	<b>0.0120</b>	<b>0.0160</b>	<b>SET</b>
<b>Averages</b>	6.79	20.08	32.83	51.86	70.88	0.0004
<b>Min</b>	5.06	16.58	28.90	49.13	67.74	0.0002
<b>Max</b>	7.72	22.12	34.96	54.67	73.94	0.0005
<b>St. Dev</b>	0.75	1.50	1.86	1.90	2.33	0.0001
<b>Count</b>	10	10	10	10	10	10
<b>Initial</b>	<b>Deflections in inches Forces in Grams</b>					
<b>Sample #</b>	<b>0.0020</b>	<b>0.0050</b>	<b>0.0080</b>	<b>0.0120</b>	<b>0.0160</b>	<b>SET</b>
1	5.06	16.58	28.90	49.13	68.84	0.00040
2	6.84	20.34	32.08	51.35	70.39	0.00040
3	7.28	21.01	33.63	52.46	73.49	0.00040
4	6.84	19.90	32.52	50.46	69.73	0.00040
5	7.72	22.12	34.96	54.67	73.94	0.00020
6	7.06	18.79	30.75	49.80	67.74	0.00040
7	6.17	19.90	32.97	53.78	72.61	0.00040
8	7.50	20.79	34.52	51.79	69.29	0.00040
9	6.61	20.57	34.07	54.23	73.72	0.00050
10	6.84	20.79	33.85	50.91	69.06	0.00040



**DATA continued****INSULATION RESISTANCE (IR):**

<u>Sample #</u>	<b>Initial, Meg Ohms</b>	
	<b>Mated</b>	<b>Unmated</b>
	<b><u>Insulation Resistance</u></b>	<b><u>Insulation Resistance</u></b>
1	100000	100000
2	100000	100000
3	100000	50000
4	100000	100000

<u>Sample #</u>	<b>Thermal, Meg Ohms</b>	
	<b>Mated</b>	<b>Unmated</b>
	<b><u>Insulation Resistance</u></b>	<b><u>Insulation Resistance</u></b>
1	100000	100000
2	100000	100000
3	100000	100000
4	100000	100000

<u>Sample #</u>	<b>Humidity, Meg Ohms</b>	
	<b>Mated</b>	<b>Unmated</b>
	<b><u>Insulation Resistance</u></b>	<b><u>Insulation Resistance</u></b>
1	100000	100000
2	50000	100000
3	50000	100000
4	100000	100000

**DATA continued****DIELECTRIC WITHSTANDING VOLTAGE (DWV):**

Initial, VAC Mated			Initial, VAC Unmated		
<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1080	810	270	1100	825	275
900	675	225	1140	855	285

Thermal, VAC Mated			Thermal, VAC Unmated		
<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
800	600	200	1100	825	275
900	675	225	1100	825	275

Humidity, VAC Mated			Humidity, VAC Unmated		
<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
800	600	200	1000	750	250
900	675	225	1000	750	250

**DATA Continued****LLCR:**

Date	Nov. 12 2005	Nov. 12 2005	Nov. 18 2005	Nov. 28 2005	
Room Temp C	23	24	23	23	
RH	22%	22%	49%	39%	
Name	Troy Cook	Troy Cook	Troy Cook	Troy Cook	
<b>mOhm values</b>	<b>Actual Initial</b>	<b>Delta 50 Cycles</b>	<b>Delta Thermal</b>	<b>Delta Humidity</b>	
Average	8.7	-0.3	0.4	0.7	
St. Dev.	0.5	0.3	0.4	0.6	
Min	7.5	-1.3	-1.2	-0.6	
Max	10.1	0.9	2.5	4.0	
Count	200	200	200	200	
<b>mOhm values</b>		<b>Actual</b>	<b>Delta</b>	<b>Delta</b>	<b>Delta</b>
<b>Board</b>	<b>Position</b>	<b>Initial</b>	<b>50 Cycles</b>	<b>Thermal</b>	<b>Humidity</b>
1	P1	8.9	-0.5	0.2	2.8
1	P2	8.8	0.2	-0.3	2.0
1	P3	8.2	-0.1	0.3	0.3
1	P4	9.0	0.0	0.1	0.9
1	P5	9.2	-0.4	-0.1	0.5
1	P6	8.6	-0.1	0.1	0.9
1	P7	8.0	-0.1	0.4	1.0
1	P8	8.5	-0.2	0.2	1.1
1	P9	8.2	-0.3	0.2	0.6
1	P10	8.5	-0.4	0.0	0.8
1	P11	8.2	-0.3	0.1	0.7
1	P12	8.3	-0.2	0.2	0.5
1	P13	8.4	-0.3	0.1	0.7
1	P14	8.5	-0.3	0.2	1.1
1	P15	8.5	0.0	0.1	0.6
1	P16	8.6	-0.2	0.8	1.8
1	P17	8.4	-0.1	0.5	0.5
1	P18	8.3	0.1	0.6	0.6
1	P19	8.2	-0.3	0.2	0.8
1	P20	8.1	-0.3	0.3	0.5
1	P21	9.1	-0.1	0.2	0.3
1	P22	9.6	-0.3	0.3	0.3
1	P23	8.9	-0.1	0.5	0.5
1	P24	8.7	-0.2	0.1	0.4
1	P25	9.2	0.1	0.3	0.4
2	P1	8.5	-0.5	-0.1	0.2
2	P2	8.9	-0.7	0.2	2.2
2	P3	8.8	-0.6	0.2	-0.3
2	P4	8.2	-0.3	0.5	0.6
2	P5	8.9	-0.5	0.2	-0.2
2	P6	8.0	-0.4	0.2	0.6

Tracking Code: TC0540--0850

Part #: PCIE-164-02-F-D-TH

Part description: PCI Express

2	P7	9.0	-1.0	-0.2	-0.2
2	P8	8.1	-0.3	0.2	0.7
2	P9	8.2	-0.6	0.2	1.5
2	P10	8.7	-0.5	-0.2	0.6
2	P11	8.2	-0.5	0.6	2.1
2	P12	8.3	-0.4	0.6	0.9
2	P13	8.4	-0.5	-0.1	0.7
2	P14	8.5	-0.5	0.1	0.3
2	P15	8.0	-0.3	0.2	0.3
2	P16	7.9	0.0	0.6	0.5
2	P17	8.1	-0.4	0.2	0.0
2	P18	7.8	0.0	0.5	0.8
2	P19	8.0	-0.1	0.3	0.4
2	P20	8.2	-0.1	1.0	0.9
2	P21	8.9	0.0	0.5	0.2
2	P22	9.0	-0.2	1.1	1.0
2	P23	8.5	0.9	0.4	0.4
2	P24	9.2	-0.3	0.7	0.4
2	P25	8.9	-0.2	0.3	0.9
3	P1	8.3	-0.2	0.1	1.5
3	P2	9.2	-0.8	-0.4	0.5
3	P3	8.3	-0.3	0.2	0.5
3	P4	8.9	-0.4	0.3	0.0
3	P5	8.7	-0.4	0.2	0.1
3	P6	8.7	-1.1	-0.8	-0.6
3	P7	7.8	-0.2	0.0	0.3
3	P8	8.0	-0.2	0.1	0.3
3	P9	7.6	0.0	0.2	0.7
3	P10	7.8	0.0	0.3	0.7
3	P11	7.8	-0.3	0.1	0.6
3	P12	7.9	-0.1	0.2	0.5
3	P13	7.6	-0.1	0.2	0.8
3	P14	8.2	-0.4	-0.1	0.2
3	P15	7.7	0.0	0.5	0.5
3	P16	7.9	-0.2	0.4	0.2
3	P17	7.5	0.2	0.6	0.4
3	P18	7.7	0.1	0.6	0.5
3	P19	7.7	-0.2	0.5	0.5
3	P20	7.9	-0.2	0.4	0.6
3	P21	8.9	0.2	0.8	0.7
3	P22	8.7	-0.2	0.6	0.5
3	P23	8.7	-0.1	0.3	0.5
3	P24	8.8	0.2	2.1	1.1
3	P25	8.7	0.0	0.6	0.8
4	P1	8.8	-0.4	-0.1	1.8
4	P2	8.9	0.0	0.3	0.6
4	P3	8.7	0.1	0.7	0.7
4	P4	8.8	-0.1	0.6	0.7
4	P5	9.1	-0.1	0.1	0.6
4	P6	8.6	-0.2	0.5	0.2

Tracking Code: TC0540--0850

Part #: PCIE-164-02-F-D-TH

Part description: PCI Express

4	P7	8.2	-0.2	0.3	0.6
4	P8	8.7	-0.3	0.4	0.1
4	P9	8.1	-0.2	0.4	0.5
4	P10	8.4	-0.3	0.4	0.2
4	P11	8.6	-0.5	0.4	-0.2
4	P12	8.5	-0.3	0.5	0.1
4	P13	8.2	-0.3	0.6	0.0
4	P14	8.6	-0.2	0.8	0.2
4	P15	8.1	-0.1	0.4	1.8
4	P16	8.6	-0.4	-0.1	0.1
4	P17	8.4	-0.3	0.3	0.0
4	P18	8.4	-0.1	0.4	0.2
4	P19	8.0	0.1	0.1	0.4
4	P20	8.8	-0.4	0.0	0.3
4	P21	9.2	-0.2	0.1	0.5
4	P22	8.9	-0.1	0.2	0.2
4	P23	8.6	0.0	0.1	0.3
4	P24	8.9	-0.1	0.2	0.6
4	P25	9.1	-0.3	-0.1	-0.1
5	P1	9.1	-0.9	0.2	0.4
5	P2	9.7	-1.3	-1.2	0.0
5	P3	8.4	-0.4	0.1	0.4
5	P4	9.6	-0.7	-0.1	0.3
5	P5	8.8	-0.4	-0.2	0.5
5	P6	8.8	-0.3	0.3	0.6
5	P7	8.6	-0.3	0.4	0.6
5	P8	9.0	-0.3	0.5	0.7
5	P9	8.8	-0.2	0.8	1.4
5	P10	8.8	-0.4	0.3	0.7
5	P11	8.8	-0.5	0.5	1.5
5	P12	8.7	-0.4	0.3	1.0
5	P13	8.7	-0.4	0.5	0.7
5	P14	8.9	-0.3	0.3	0.6
5	P15	8.9	-0.5	0.4	1.1
5	P16	9.3	-0.4	0.4	1.5
5	P17	8.4	0.1	0.5	0.8
5	P18	8.8	-0.1	0.2	0.7
5	P19	8.5	-0.2	0.3	0.5
5	P20	9.1	-0.5	-0.2	0.0
5	P21	9.4	0.0	0.1	0.5
5	P22	9.6	-0.8	-0.3	0.1
5	P23	9.1	-0.3	0.1	0.6
5	P24	8.8	-0.2	-0.1	0.7
5	P25	9.4	-0.4	-0.5	2.5
6	P1	9.2	-0.5	0.7	0.1
6	P2	9.4	-0.8	0.1	0.5
6	P3	8.9	-0.4	-0.2	-0.1
6	P4	9.9	-0.8	-0.2	0.4
6	P5	9.8	-0.7	-0.3	0.2
6	P6	9.1	-0.7	0.7	-0.3

Tracking Code: TC0540--0850

Part #: PCIE-164-02-F-D-TH

Part description: PCI Express

6	P7	8.7	-0.4	1.1	0.2
6	P8	9.2	-0.7	2.5	4.0
6	P9	9.0	-0.6	0.1	0.9
6	P10	8.9	-0.5	0.5	0.5
6	P11	9.1	-0.3	0.7	1.1
6	P12	9.0	-0.3	1.3	1.3
6	P13	9.3	-0.7	0.5	1.0
6	P14	9.2	-0.3	0.6	1.1
6	P15	8.6	-0.1	1.0	0.7
6	P16	8.7	-0.2	0.5	0.6
6	P17	8.7	-0.1	0.6	0.5
6	P18	9.1	-0.5	0.5	0.7
6	P19	8.4	-0.2	0.7	0.6
6	P20	8.8	-0.3	0.5	0.7
6	P21	10.0	-0.2	0.7	0.6
6	P22	9.9	-0.1	0.5	1.1
6	P23	9.9	-0.4	0.5	-0.1
6	P24	10.1	-0.6	0.0	0.8
6	P25	10.1	-0.5	0.0	0.4
7	P1	8.7	-0.2	0.6	0.0
7	P2	8.9	-0.1	0.0	1.6
7	P3	8.1	0.1	0.2	1.2
7	P4	8.8	-0.2	0.7	1.3
7	P5	8.5	0.0	0.3	0.4
7	P6	8.2	-0.2	0.4	0.5
7	P7	7.9	-0.3	0.3	1.0
7	P8	7.9	0.0	0.6	2.4
7	P9	8.1	-0.2	0.3	1.3
7	P10	8.3	-0.2	0.5	2.1
7	P11	8.0	-0.1	0.4	0.3
7	P12	8.2	-0.4	0.7	0.5
7	P13	8.3	-0.3	1.2	-0.1
7	P14	7.9	0.2	1.0	2.2
7	P15	8.1	-0.3	0.9	1.1
7	P16	8.0	-0.1	0.5	0.9
7	P17	8.1	-0.3	1.6	0.6
7	P18	7.9	-0.3	0.9	0.3
7	P19	7.8	0.0	0.7	0.4
7	P20	8.0	-0.2	0.7	0.8
7	P21	8.7	0.0	0.6	0.5
7	P22	8.7	0.1	0.7	0.3
7	P23	8.8	-0.4	1.0	0.4
7	P24	8.5	-0.3	0.5	0.8
7	P25	9.1	-0.4	0.5	1.9
8	P1	8.8	-0.3	-0.3	0.5
8	P2	8.3	0.0	0.2	0.8
8	P3	8.8	-0.1	0.3	0.6
8	P4	8.9	-0.2	0.1	1.3
8	P5	8.9	-0.1	0.8	0.5
8	P6	9.1	0.0	1.1	0.2

Tracking Code: TC0540--0850

Part #: PCIE-164-02-F-D-TH

Part description: PCI Express

8	P7	8.9	0.0	0.8	0.5
8	P8	9.3	-0.5	1.0	-0.1
8	P9	9.0	-0.3	1.3	1.1
8	P10	9.3	-0.5	0.8	0.2
8	P11	9.1	-0.3	1.1	0.6
8	P12	8.9	-0.2	0.9	0.7
8	P13	8.8	-0.3	0.6	1.1
8	P14	8.9	-0.2	1.4	0.2
8	P15	8.7	0.1	1.2	1.1
8	P16	9.0	-0.2	1.3	0.8
8	P17	8.8	-0.4	0.9	0.7
8	P18	8.9	-0.3	0.6	0.2
8	P19	8.8	-0.5	0.4	0.6
8	P20	8.6	0.1	0.9	1.0
8	P21	9.3	-0.3	0.4	0.3
8	P22	8.9	0.1	0.7	1.4
8	P23	8.8	-0.1	0.7	0.5
8	P24	8.8	-0.3	0.6	0.6
8	P25	9.0	-0.2	0.8	1.0

**DATA Continued****GAS TIGHT:**

Date	Nov. 14 2005	Dec. 05 2005	
Room Temp C	24	24	
RH	28%	17%	
Name	Troy Cook	Troy Cook	
<b>mOhm values</b>	<b>Actual Initial</b>	<b>Delta Gas Tight</b>	
Average	8.6	0.2	
St. Dev.	0.4	0.2	
Min	7.7	-0.6	
Max	9.8	1.2	
Count	200	200	
<b>mOhm values</b>	<b>Actual</b>	<b>Delta</b>	
<b>Board</b>	<b>Position</b>	<b>Initial</b>	<b>Gas Tight</b>
1	P1	8.6	-0.1
1	P2	8.4	0.2
1	P3	9.0	-0.1
1	P4	8.6	0.1
1	P5	8.8	0.1
1	P6	8.7	0.4
1	P7	8.4	0.3
1	P8	8.8	0.2
1	P9	8.5	0.5
1	P10	8.7	0.4
1	P11	8.5	0.2
1	P12	8.5	0.3
1	P13	8.5	0.1
1	P14	8.8	0.1
1	P15	8.5	0.2
1	P16	8.9	0.2
1	P17	8.3	0.3
1	P18	8.7	0.1
1	P19	8.0	0.3
1	P20	8.6	0.3
1	P21	9.3	0.2
1	P22	9.3	0.2
1	P23	8.5	0.3
1	P24	9.0	0.3
1	P25	8.7	0.3
2	P1	8.0	0.1
2	P2	7.9	0.5
2	P3	8.5	0.1
2	P4	8.3	0.2
2	P5	8.3	0.3
2	P6	7.8	0.6



Tracking Code: TC0540--0850

Part #: PCIE-164-02-F-D-TH

Part description: PCI Express

2	P7	7.7	0.3
2	P8	8.0	0.6
2	P9	7.9	0.3
2	P10	7.8	0.6
2	P11	7.8	0.4
2	P12	8.0	0.3
2	P13	7.7	0.5
2	P14	8.1	0.1
2	P15	8.2	0.3
2	P16	8.1	0.2
2	P17	8.0	0.3
2	P18	8.0	0.4
2	P19	8.0	-0.1
2	P20	7.8	0.2
2	P21	8.8	0.6
2	P22	9.2	0.7
2	P23	8.6	0.2
2	P24	9.1	-0.1
2	P25	8.8	0.4
3	P1	8.4	0.0
3	P2	8.8	-0.1
3	P3	8.5	0.2
3	P4	9.5	-0.6
3	P5	8.6	0.1
3	P6	8.9	-0.2
3	P7	8.5	-0.1
3	P8	9.2	-0.5
3	P9	8.5	0.0
3	P10	8.6	0.0
3	P11	9.0	-0.4
3	P12	9.4	-0.6
3	P13	8.7	0.1
3	P14	9.1	-0.2
3	P15	8.5	0.0
3	P16	8.5	0.1
3	P17	8.8	0.1
3	P18	9.4	-0.5
3	P19	8.4	0.2
3	P20	8.6	0.2
3	P21	9.2	0.5
3	P22	9.0	0.1
3	P23	9.1	0.4
3	P24	8.5	0.4
3	P25	8.8	0.3
4	P1	8.6	0.0
4	P2	8.6	-0.1
4	P3	8.2	-0.1
4	P4	8.6	0.1
4	P5	8.5	0.1
4	P6	8.5	0.2

Tracking Code: TC0540--0850

Part #: PCIE-164-02-F-D-TH

Part description: PCI Express

4	P7	8.4	0.5
4	P8	8.5	0.3
4	P9	8.7	0.0
4	P10	9.0	0.1
4	P11	8.7	0.0
4	P12	8.9	0.0
4	P13	8.9	0.0
4	P14	8.8	-0.1
4	P15	8.5	0.3
4	P16	8.4	0.4
4	P17	8.6	0.3
4	P18	8.6	0.0
4	P19	8.2	0.2
4	P20	8.2	0.3
4	P21	8.6	0.3
4	P22	9.2	0.2
4	P23	8.2	0.3
4	P24	8.4	0.0
4	P25	8.9	-0.2
5	P1	7.9	0.4
5	P2	8.0	0.3
5	P3	8.0	0.5
5	P4	8.7	0.1
5	P5	8.4	0.1
5	P6	8.5	0.3
5	P7	8.6	0.1
5	P8	8.6	0.3
5	P9	8.5	0.0
5	P10	8.4	0.3
5	P11	8.4	0.2
5	P12	8.4	0.4
5	P13	8.3	0.4
5	P14	8.5	0.2
5	P15	8.1	0.5
5	P16	8.6	0.2
5	P17	8.2	0.4
5	P18	8.2	0.5
5	P19	8.0	0.5
5	P20	8.6	0.2
5	P21	8.8	0.2
5	P22	9.0	0.3
5	P23	8.3	0.3
5	P24	8.5	0.3
5	P25	8.6	0.0
6	P1	8.3	0.0
6	P2	8.1	0.4
6	P3	8.0	0.6
6	P4	8.2	0.6
6	P5	8.5	0.3
6	P6	8.7	0.1

Tracking Code: TC0540--0850

Part #: PCIE-164-02-F-D-TH

Part description: PCI Express

6	P7	8.6	0.1
6	P8	8.8	0.3
6	P9	8.4	0.2
6	P10	8.8	0.3
6	P11	8.8	0.2
6	P12	8.9	0.1
6	P13	9.1	0.2
6	P14	8.9	0.1
6	P15	8.5	0.4
6	P16	8.7	0.2
6	P17	8.5	0.3
6	P18	8.9	0.0
6	P19	8.4	0.3
6	P20	8.9	0.3
6	P21	9.0	0.3
6	P22	9.2	0.3
6	P23	8.4	0.4
6	P24	8.8	0.5
6	P25	9.3	-0.4
7	P1	8.5	-0.1
7	P2	8.8	-0.2
7	P3	8.8	0.0
7	P4	8.6	0.0
7	P5	9.2	-0.1
7	P6	8.5	0.2
7	P7	8.2	0.5
7	P8	8.9	0.0
7	P9	8.5	0.4
7	P10	8.9	-0.1
7	P11	8.6	0.2
7	P12	8.7	-0.1
7	P13	8.5	0.0
7	P14	9.0	0.0
7	P15	8.6	-0.1
7	P16	8.6	0.1
7	P17	8.5	-0.1
7	P18	8.6	-0.1
7	P19	8.5	-0.2
7	P20	8.3	0.1
7	P21	9.1	0.2
7	P22	9.0	0.3
7	P23	8.8	0.1
7	P24	8.9	0.1
7	P25	9.3	0.0
8	P1	8.7	0.0
8	P2	8.7	0.0
8	P3	9.0	0.5
8	P4	9.4	0.1
8	P5	9.4	0.3
8	P6	8.1	0.3

Tracking Code: TC0540--0850

Part #: PCIE-164-02-F-D-TH

Part description: PCI Express

8	P7	8.0	0.3
8	P8	8.4	0.0
8	P9	8.6	0.1
8	P10	8.5	-0.1
8	P11	8.0	0.3
8	P12	8.3	0.2
8	P13	8.2	0.0
8	P14	8.4	0.1
8	P15	8.1	0.2
8	P16	8.4	0.1
8	P17	8.5	-0.1
8	P18	8.2	0.1
8	P19	8.2	0.3
8	P20	8.5	0.4
8	P21	9.8	0.1
8	P22	9.0	1.2
8	P23	9.8	-0.2
8	P24	9.8	0.1
8	P25	9.7	0.0

**DATA Continued****SUPPLEMENTAL****CAPACITANCE:**

<b>Initial</b>		<b>Thermal</b>	
<b>Test Date:</b>	12/9/2005	<b>Test Date:</b>	12/9/2005
<b>Operator:</b>	Troy Cook	<b>Operator:</b>	Troy Cook
<b>Temperature:</b>	24	<b>Temperature:</b>	24
<b>Humidity:</b>	22%	<b>Humidity:</b>	22%
<b>Equipment ID:</b>	CAPM-01	<b>Equipment ID:</b>	CAPM-01

<b>Initial</b>	<b>Pin - Pin</b>	<b>Thermal</b>	<b>Pin - Pin</b>
<b>Sample #</b>	<b>pF</b>	<b>Sample #</b>	<b>pF</b>
1	0.60	1	0.50
2	1.50	2	1.50

**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: 06/16/05, Next Cal: 06/16/06

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

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

**Equipment #:** MO-04**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0798688**Accuracy:** See Manual - DO NOT USE UNTIL CALIBRATED.

... Last Cal: 6/12/04, Next Cal: 6/12/05

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

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

**Equipment #:** TC090601-103/105**Description:** IC Thermocouple-103/105**Manufacturer:** Samtec**Model:****Serial #:** TC090601-103/105**Accuracy:** +/- 1 degree C

... Last Cal: , Next Cal:

**Equipment #:** OGP-01**Description:** 6"X 6" Video Measuring Machine**Manufacturer:** Optical Gauging Products**Model:** Smartscope 200 CFOV**Serial #:** SF2001956**Accuracy:** See Manual

... Last Cal: 04/12/05, Next Cal: 04/12/06

**Equipment #:** TCT-01

**Description:** Test Stand

**Manufacturer:** Chatillon

**Model:** TCD-1000

**Serial #:** 05 23 00 02

**Accuracy:** Speed Accuracy: +/-5% of max speed; Speed Accuracy: +/-5% of max speed;  
... Last Cal: 6/23/05, Next Cal: 6/23/06

**Equipment #:** LC-50-2

**Description:** Chatillon Remote Load Cell, 50 Lb Range

**Manufacturer:** Chatillon

**Model:** Broken - Out of use and replaced.

**Serial #:** F43963

**Accuracy:**

... Last Cal: , Next Cal:

**Equipment #:** THC-01

**Description:** Temperature/Humidity Chamber

**Manufacturer:** Thermotron

**Model:** SM-8-7800

**Serial #:** 30676

**Accuracy:** See Manual

... Last Cal: 7/15/2005, Next Cal: 8/15/2006

**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: 05/12/05, Next Cal: 05/12/06

**Equipment #:** HPM-01

**Description:** Hipot Megommeter

**Manufacturer:** Hipotronics

**Model:** H306B-A

**Serial #:** 00120351

**Accuracy:** 2 % Full Scale Accuracy

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

**Equipment #:** TCT-04

**Description:** Dillon Quantrol TC21 25-1000 mm/min series test stand

**Manufacturer:** Dillon Quantrol

**Model:** TC2 I series test stand

**Serial #:** 04-1041-04

**Accuracy:** Speed Accuracy: +/- 5% of indicated speed; Speed Accuracy: +/- 5% of indicated speed;

... Last Cal: 4/28/2005, Next Cal: 4/28/2006

**Equipment #:** LC-5N (icell)-2  
**Description:** 5 Newton load cell for Dillon Quantrol test stand  
**Manufacturer:** Dillon Quantrol  
**Model:** icell  
**Serial #:** 02-0140-05  
**Accuracy:** .10 % of capacity  
... Last Cal: 4/19/2005, Next Cal: 4/19/2006

**Equipment #:** MO-01  
**Description:** Micro-Ohmmeter  
**Manufacturer:** Keithley  
**Model:** 580  
**Serial #:** 0772740  
**Accuracy:** See Manual  
... Last Cal: 05/12/05, Next Cal: 05/12/06

**Equipment #:** MO-03  
**Description:** Multimeter /Data Acquisition System  
**Manufacturer:** Keithley  
**Model:** 2700  
**Serial #:** 0791975  
**Accuracy:** See Manual  
... Last Cal: 05/12/05, Next Cal: 05/12/05

**Equipment #:** CAPM-01  
**Description:** BK Precision 810C Capacitance Meter  
**Manufacturer:** BK Precision  
**Model:** 810C  
**Serial #:** 37011020007  
**Accuracy:** See Manual for accuracy  
... Last Cal: 5/9/2005, Next Cal: 6/9/2006