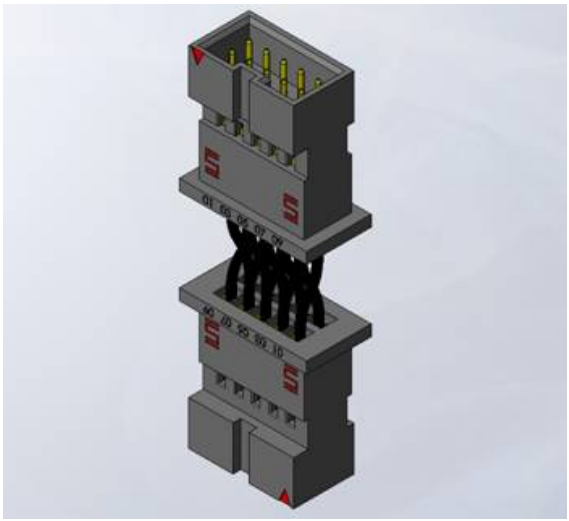
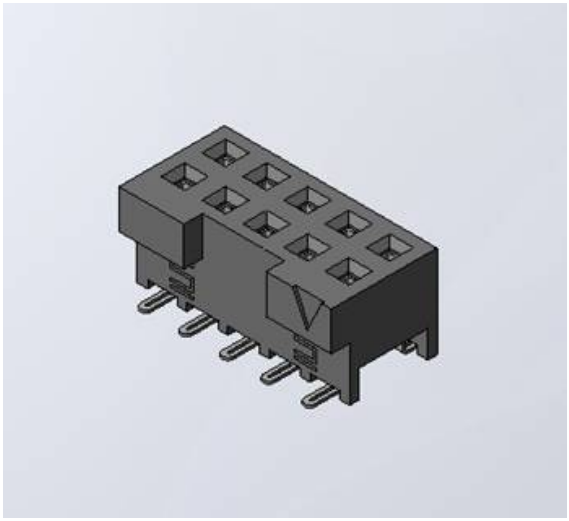
Project Number: Design Qualification Test Report	Tracking Code: TC1010--3246_Report_Rev_1		
Requested by: Brandon Harpenau	Date: 2/22/2011	Product Rev: 1	
Part #: T2SD-30-24-L-03.00-D-NDS\ S2M-130-02-L-D-LC	Lot #: 1	Tech: Tony Wagoner	Eng: Eric Mings
Part description: T2SD\S2M		Qty to test: 80	
Test Start: 03/25/2010	Test Completed: 04/26/2010		





DESIGN QUALIFICATION TEST REPORT

T2SD/S2M
T2SD-30-24-L-03.00-D-NDS/S2M-130-02-L-D-LC

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 Qulification test. Please see test plan.

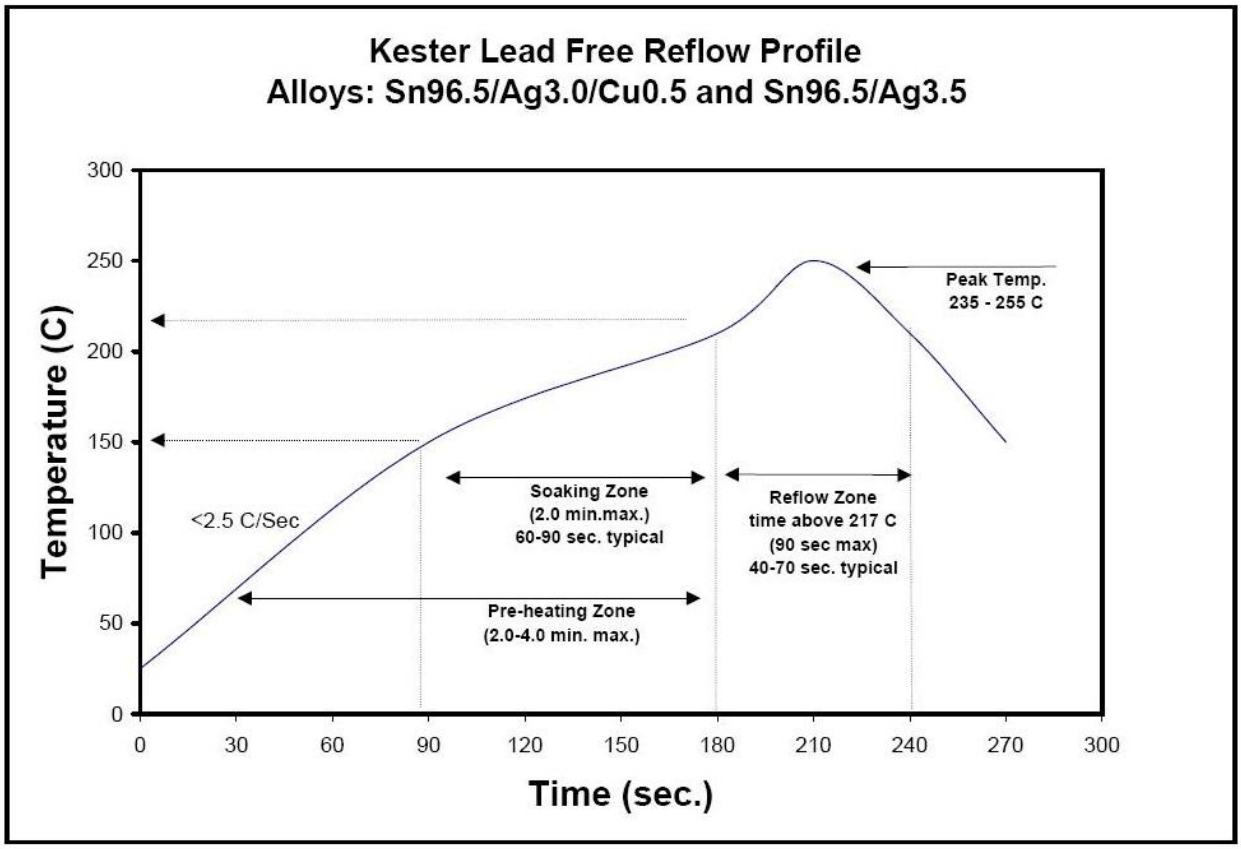
APPLICABLE DOCUMENTS

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-102424-TST-XX\PCB-101981-TST-01\ PCB-101981-TST-02\ PCB-101981-TST-03 \PCB-102425-TST-XX

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

TEST STEP	GROUP A1 192 Points
01	LLCR-1
02	Gas Tight
03	LLCR-2

Gas Tight = EIA-364-36A

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

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 B1 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 B1 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

Mating/Unmating/Gaps/Normal Force/Deflection Force

TEST STEP	GROUP A1 10 Boards (smallest position submitted) S2M-105-02-L-D-LC	GROUP A2 10 Boards (middle position submitted) S2M-115-02-L-D-LC	GROUP A3 10 Boards (largest position submitted) S2M-130-02-L-D-LC	GROUP B1 Individual Contacts (8-10 min)	GROUP B2 Individual Contacts (8-10 min)
01	Mating / Unmating	Mating / Unmating	Contact Gaps	Contact Gaps	Contact Gaps
02	25 Cycles	25 Cycles	Mating / Unmating	Setup Approved	Setup Approved
03	Clean w/Compressed Air	Clean w/Compressed Air	25 Cycles	Normal Force (in the body and soldered on PCB unless otherwise specified)	Thermal Aging (Mated)
04	Mating / Unmating	Mating / Unmating	Clean w/Compressed Air		Contact Gaps
05	25 Cycles (50 Total)	25 Cycles (50 Total)	Mating / Unmating		Normal Force (in the body and soldered on PCB unless otherwise specified)
06	Clean w/Compressed Air	Clean w/Compressed Air	25 Cycles (50 Total)		
07	Mating / Unmating	Mating / Unmating	Clean w/Compressed Air		
08	25 Cycles (75 Total)	25 Cycles (75 Total)	Mating / Unmating		
09	Clean w/Compressed Air	Clean w/Compressed Air	25 Cycles (75 Total)		
10	Mating / Unmating	Mating / Unmating	Clean w/Compressed Air		
11	25 Cycles (100 Total)	25 Cycles (100 Total)	Mating / Unmating		
12	Clean w/Compressed Air	Clean w/Compressed Air	25 Cycles (100 Total)		
13	Mating / Unmating	Mating / Unmating	Clean w/Compressed Air		
14	Thermal Aging (Mated)	Thermal Aging (Mated)	Mating / Unmating		
15	Mating / Unmating	Mating / Unmating	Contact Gaps		
16	Cyclic Humidity (Mated)	Cyclic Humidity (Mated)	Thermal Aging (Mated)		
17	Mating / Unmating	Mating / Unmating	Mating / Unmating		
18			Contact Gaps		
19			Cyclic Humidity (Mated)		
20			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

FLOWCHARTS Continued

Durability/Thermal Age/Cyclic Humidity

TEST STEP	GROUP A1 192 Points 50 Cycles	GROUP A2 192 Points 100 Cycles
01	LLCR-1	LLCR-1
02	50 Cycles	100 Cycles
03	Clean Mating Interface	Clean Mating Interface
04	LLCR-2	LLCR-2
05	Thermal Age (Mated and undisturbed)	Thermal Age (Mated and undisturbed)
06	LLCR-3	LLCR-3
07	Cyclic Humidity (Mated and undisturbed)	Cyclic Humidity (Mated and undisturbed)
08	LLCR-4	LLCR-4

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
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 B1 3 Mated Assemblies 2 CONTACT POWERED	GROUP B2 3 Mated Assemblies 4 CONTACTS POWERED	GROUP B3 3 Mated Assemblies 6 CONTACTS POWERED	GROUP B4 3 Mated Assemblies 8 CONTACTS POWERED	GROUP B5 3 Mated Assemblies ALL CONTACTS 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

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.

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.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes.

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).

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes.

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.

RESULTS

Temperature Rise, CCC at a 20% de-rating

- **CCC for a 30°C Temperature Rise ---------- 2.6A per contact with 2 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ---------- 2.0A per contact with 4 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ---------- 1.9A per contact with 6 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ---------- 1.7A per contact with 8 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ---------- 1.1A per contact with all adjacent contacts(mate area) powered**
- **CCC for a 30°C Temperature Rise ---------- 1.6A per contact with all adjacent contacts(signal wire) powered**

Contact Gaps

Mating\unmating group

- **Initial**
  - **Min ---------- 0.0125 in**
  - **Max ---------- 0.0147 in**
- **After 100 Cycles**
  - **Min ---------- 0.0125 in**
  - **Max ---------- 0.0166 in**
- **After Thermal**
  - **Min ---------- 0.0125 in**
  - **Max ---------- 0.0169 in**

Normal force group

Group B1

- **Initial**
  - **Min ---------- 0.0133 in**
  - **Max ---------- 0.0141 in**

Group B2

- **Initial**
  - **Min ---------- 0.0125 in**
  - **Max ---------- 0.0137 in**
- **After Thermal**
  - **Min ---------- 0.0143 in**
  - **Max ---------- 0.0150 in**

RESULTS Continued

Mating – Unmating Forces

Group A1 (S2M-105-02-L-D-LC)

- **Initial**
  - **Mating**
    - **Min ---------- 1.40 Lbs**
    - **Max---------- 1.99 Lbs**
  - **Unmating**
    - **Min ---------- 0.79 Lbs**
    - **Max---------- 1.16 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 1.14 Lbs**
    - **Max---------- 1.42 Lbs**
  - **Unmating**
    - **Min ---------- 0.75 Lbs**
    - **Max---------- 1.01 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 1.05 Lbs**
    - **Max---------- 1.49 Lbs**
  - **Unmating**
    - **Min ---------- 0.80 Lbs**
    - **Max---------- 1.10 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 1.14 Lbs**
    - **Max---------- 1.19 Lbs**
  - **Unmating**
    - **Min ---------- 0.79 Lbs**
    - **Max---------- 0.93 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 1.20 Lbs**
    - **Max---------- 1.58 Lbs**
  - **Unmating**
    - **Min ---------- 0.92 Lbs**
    - **Max---------- 1.28 Lbs**
- **After Thermal**
  - **Mating**
    - **Min ---------- 1.04 Lbs**
    - **Max---------- 1.19 Lbs**
  - **Unmating**
    - **Min ---------- 0.79 Lbs**
    - **Max---------- 0.93 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 1.18 Lbs**
    - **Max---------- 1.45 Lbs**
  - **Unmating**
    - **Min ---------- 0.69 Lbs**
    - **Max---------- 0.89 Lbs**

RESULTS Continued

Mating – Unmating Forces

Group A2 (S2M-115-02-L-D-LC)

- **Initial**
  - **Mating**
    - **Min ---------- 4.05 Lbs**
    - **Max---------- 7.44 Lbs**
  - **Unmating**
    - **Min ---------- 2.25 Lbs**
    - **Max---------- 3.68 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 3.17 Lbs**
    - **Max---------- 5.55 Lbs**
  - **Unmating**
    - **Min ---------- 2.00 Lbs**
    - **Max---------- 3.53 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 3.24 Lbs**
    - **Max---------- 6.14 Lbs**
  - **Unmating**
    - **Min ---------- 2.26 Lbs**
    - **Max---------- 3.88 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 3.24 Lbs**
    - **Max---------- 6.47 Lbs**
  - **Unmating**
    - **Min ---------- 2.42 Lbs**
    - **Max---------- 4.23 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 3.65 Lbs**
    - **Max---------- 6.55 Lbs**
  - **Unmating**
    - **Min ---------- 2.70 Lbs**
    - **Max---------- 4.44 Lbs**
- **After Thermal**
  - **Mating**
    - **Min ---------- 3.04 Lbs**
    - **Max---------- 4.46 Lbs**
  - **Unmating**
    - **Min ---------- 2.44 Lbs**
    - **Max---------- 3.35 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 3.59 Lbs**
    - **Max---------- 4.73 Lbs**
  - **Unmating**
    - **Min ---------- 2.21 Lbs**
    - **Max---------- 3.06 Lbs**

RESULTS Continued

Mating – Unmating Forces

Group A1 (S2M-130-02-L-D-LC)

- **Initial**
  - **Mating**
    - **Min ---------- 8.54 Lbs**
    - **Max----------12.38 Lbs**
  - **Unmating**
    - **Min ---------- 5.50 Lbs**
    - **Max---------- 6.21 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 7.33 Lbs**
    - **Max----------10.99 Lbs**
  - **Unmating**
    - **Min ---------- 5.52 Lbs**
    - **Max---------- 6.14 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 7.90 Lbs**
    - **Max----------11.37 Lbs**
  - **Unmating**
    - **Min ---------- 6.13 Lbs**
    - **Max---------- 7.13 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 8.28 Lbs**
    - **Max----------11.99 Lbs**
  - **Unmating**
    - **Min ---------- 6.65 Lbs**
    - **Max---------- 8.03 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 7.53 Lbs**
    - **Max----------12.43 Lbs**
  - **Unmating**
    - **Min ---------- 5.69 Lbs**
    - **Max---------- 8.53 Lbs**
- **After Thermal**
  - **Mating**
    - **Min ---------- 6.13 Lbs**
    - **Max---------- 8.64 Lbs**
  - **Unmating**
    - **Min ---------- 2.73 Lbs**
    - **Max---------- 6.01 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 6.96 Lbs**
    - **Max---------- 8.73 Lbs**
  - **Unmating**
    - **Min ---------- 5.06 Lbs**
    - **Max---------- 6.08 Lbs**

RESULTS Continued

Normal Force at 0.0030" deflection

Left/Right

- **Initial**
  - **Min----------26.10 gf Set ----- 0.0000 in**
  - **Max ----------55.10 gf Set ----- 0.0030 in**
- **Thermal**
  - **Min----------26.60 gf Set----- 0.0000 in**
  - **Max ----------51.00 gf Set----- 0.0032 in**

Front/Back

- **Initial**
  - **Min----------23.30 gf Set ----- 0.0005 in**
  - **Max ----------58.20 gf Set ----- 0.0011 in**
- **Thermal**
  - **Min----------44.20 gf Set------ 0.0000 in**
  - **Max ---------- 112.30 gf Set------ 0.0010 in**

Insulation Resistance minimums, IR

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

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage---------- 1400 VAC**
  - **Test Voltage ---------- 1050 VAC**
  - **Working Voltage ----------350 VAC**
- **Initial DWV----------Passed**
- **Thermal DWV----------Passed**
- **Humidity DWV----------Passed**

RESULTS Continued

LLCR Durability (192 LLCR test points)

Group A1 50 Cycles

- **Initial ---------- 33.8 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +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**
- **Thermal**
  - **<= +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**
- **Humidity**
  - **<= +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**

Group A1 100 Cycles

- **Initial ---------- 34.1 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +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**
- **Thermal**
  - **<= +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**
- **Humidity**
  - **<= +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**

RESULTS Continued

LLCR Gas Tight (192 LLCR test points)

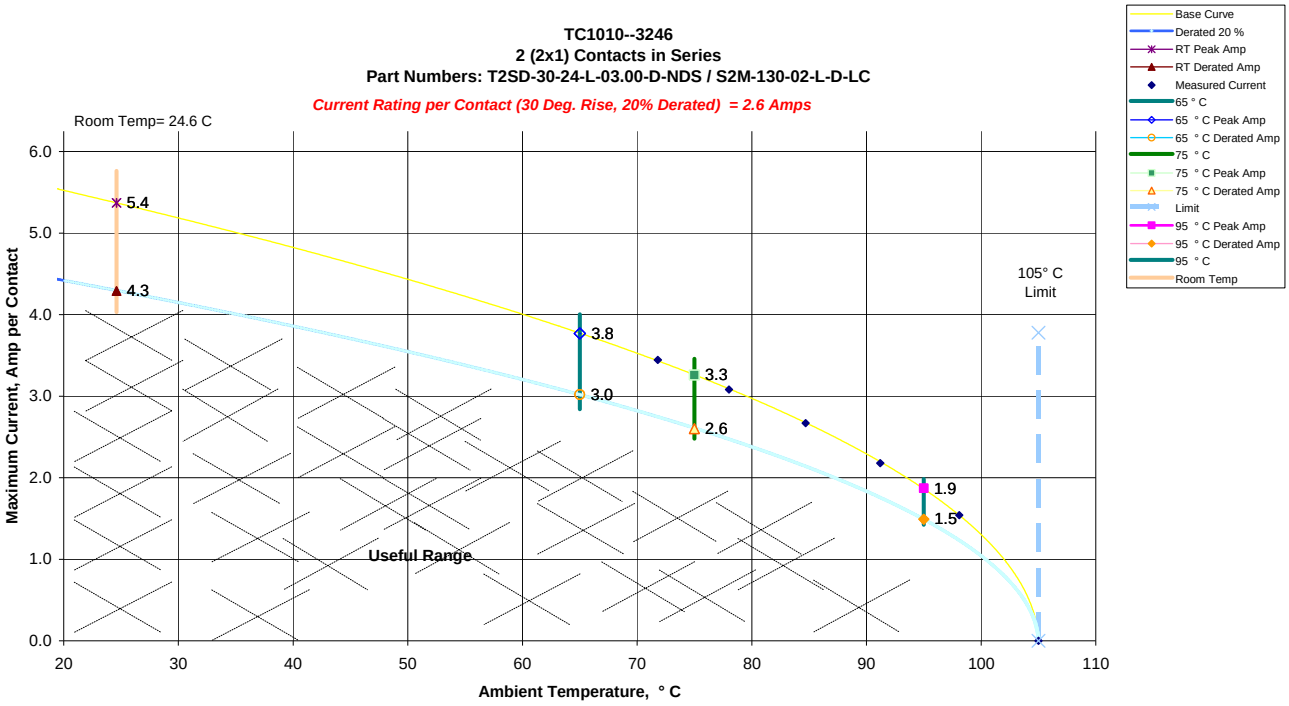
- **Initial ---------- 34.2 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ---------- 192 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

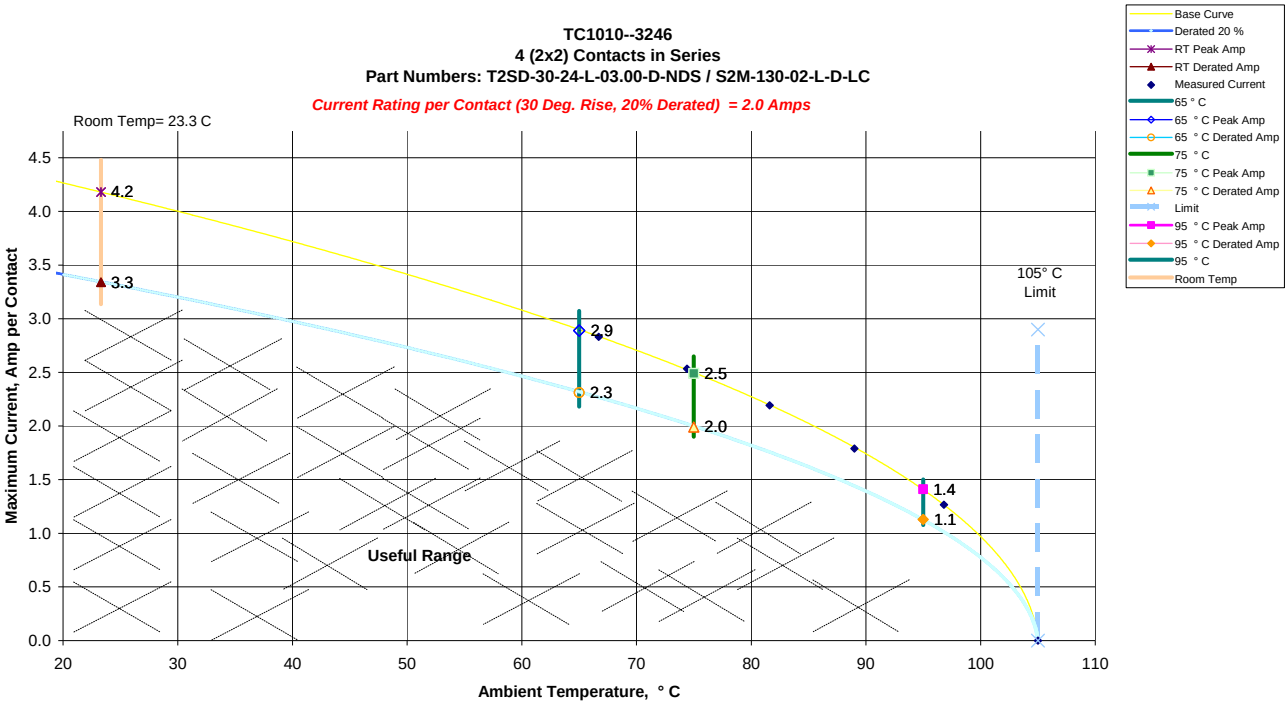
1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
3) Temperature readings recorded are those for which three successive readings, 15 minutes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

    a. Linear configuration with 2 adjacent conductors/contacts powered



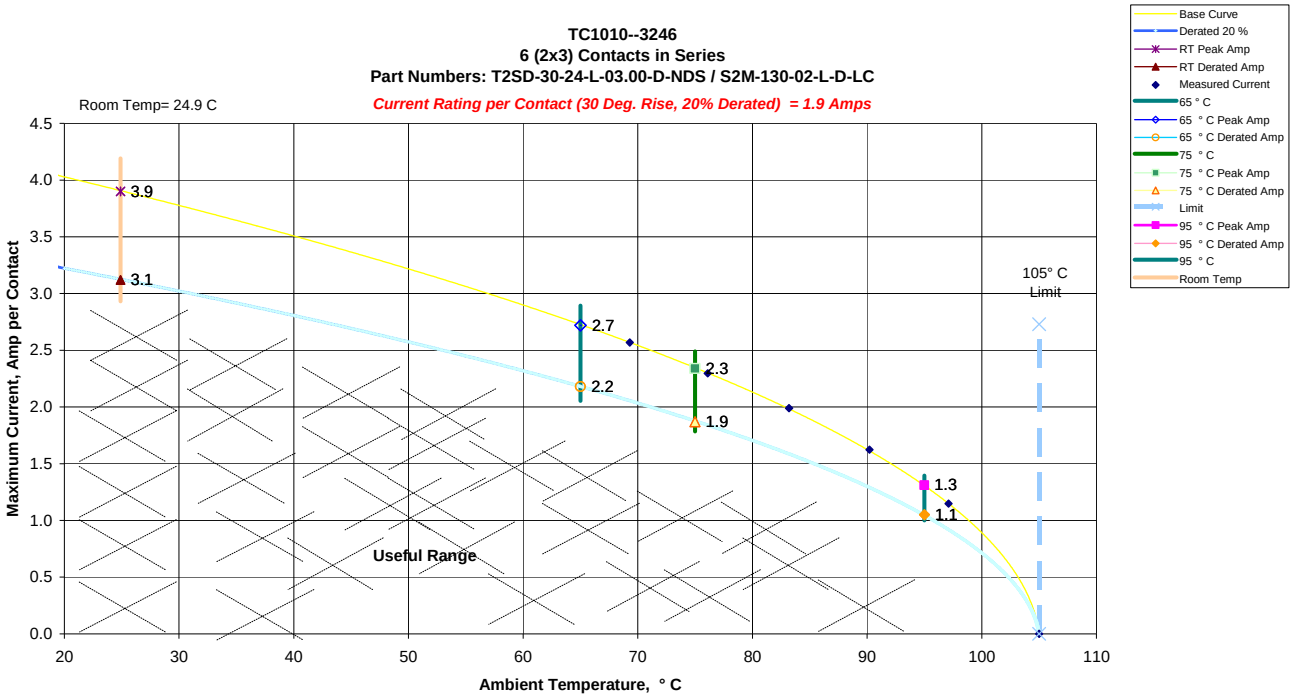
DATA SUMMARIES Continued

b. Linear configuration with 4 adjacent conductors/contacts powered



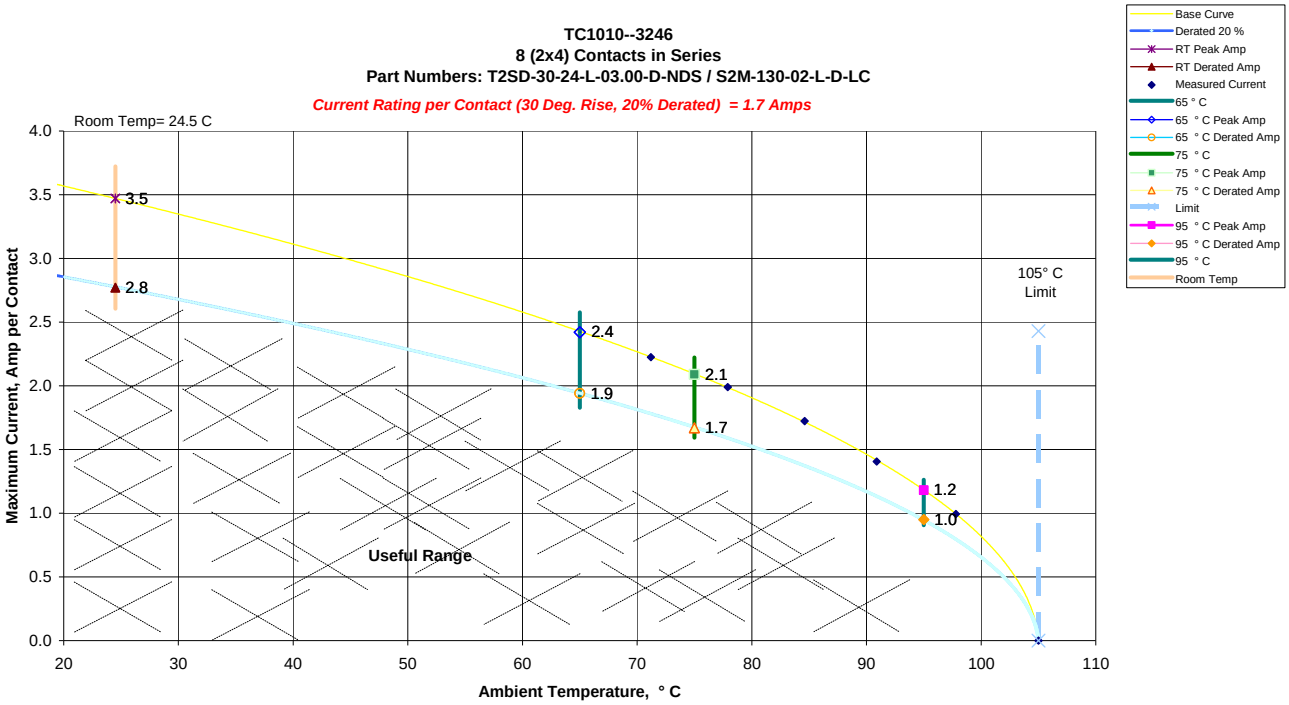
DATA SUMMARIES Continued

c. Linear configuration with 6 adjacent conductors/contacts powered



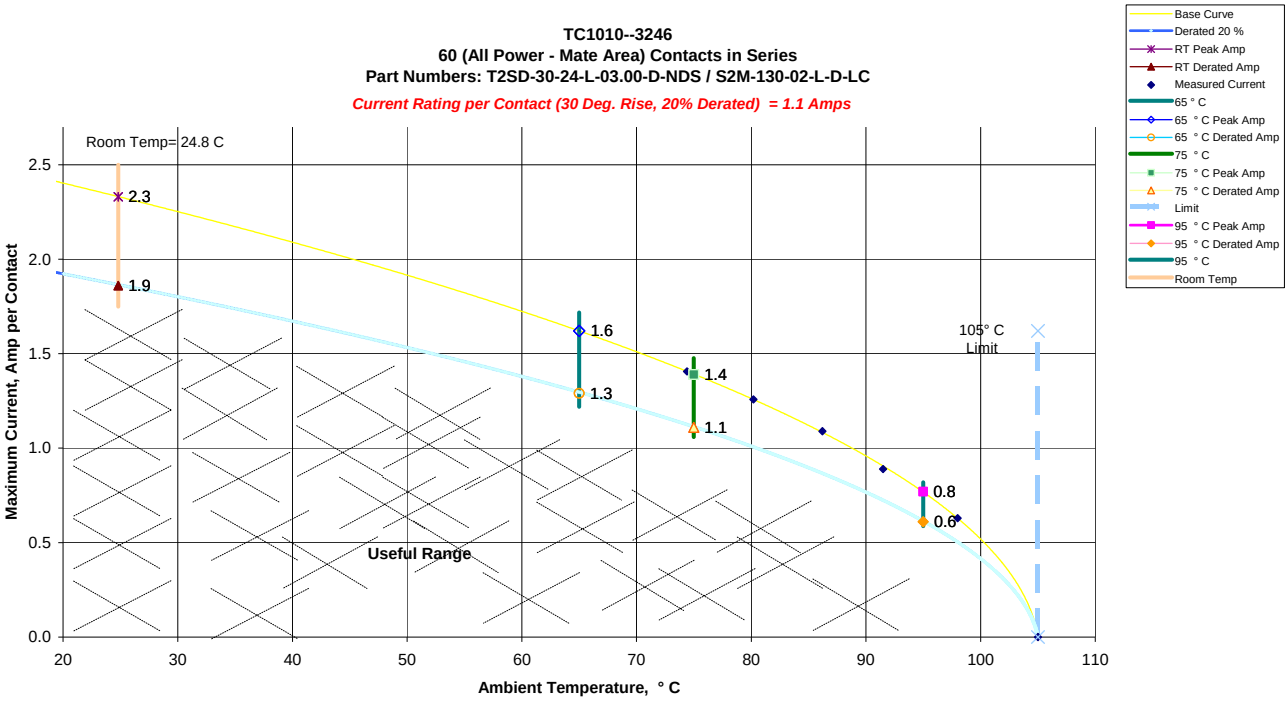
DATA SUMMARIES Continued

d. Linear configuration with 8 adjacent conductors/contacts powered



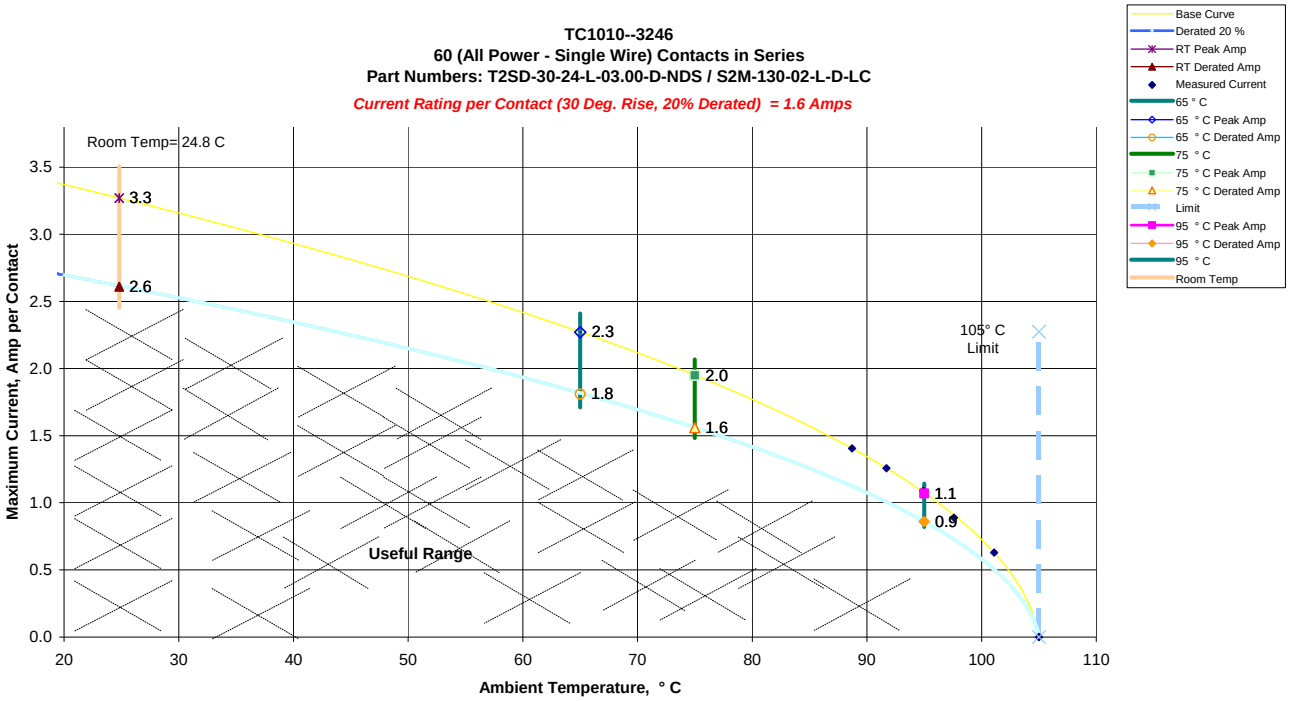
DATA SUMMARIES Continued

e. Linear configuration with all adjacent contacts(mate area) powered



DATA SUMMARIES Continued

f. Linear configuration with all adjacent contacts(signal wire) powered



DATA SUMMARIES Continued

CONTACT GAPS:

Mating\Unmating force

Initial		After 100 Cycles		After Thermal	
Units:	inches	Units:	inches	Units:	inches
Minimum	0.0125	*Minimum*	0.0125	*Minimum*	0.0125
Maximum	0.0147	*Maximum*	0.0166	*Maximum*	0.0169
Average	0.0132	*Average*	0.0134	*Average*	0.0138
St. Dev.	0.0005	*St. Dev.*	0.0005	*St. Dev.*	0.0008
Count	480	*Count*	480	*Count*	480

Normal force group

Group B1

Initial	
Units:	inches
Minimum	0.0133
Maximum	0.0141
Average	0.0136
St. Dev.	0.0002
Count	30

Group B2

Initial		After Thermal	
Units:	inches	Units:	inches
Minimum	0.0125	*Minimum*	0.0143
Maximum	0.0137	*Maximum*	0.0150
Average	0.0132	*Average*	0.0147
St. Dev.	0.0004	*St. Dev.*	0.0002
Count	480	*Count*	240

DATA SUMMARIES Continued

MATING/UNMATING:

Group A1 (S2M-105-02-L-D-LC)

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	6.24	1.40	3.50	0.79	5.08	1.14	3.33	0.75
Maximum	8.86	1.99	5.16	1.16	6.32	1.42	4.47	1.01
Average	7.06	**1.59**	4.06	**0.91**	5.69	**1.28**	3.89	**0.87**
St Dev	0.78	0.17	0.49	0.11	0.42	0.10	0.36	0.08
Count	10	10	10	10	10	10	10	10

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	4.66	1.05	3.56	0.80	5.07	1.14	3.96	0.89
Maximum	6.63	1.49	4.89	1.10	6.80	1.53	5.37	1.21
Average	5.84	**1.31**	4.19	**0.94**	6.07	**1.36**	4.64	**1.04**
St Dev	0.58	0.13	0.52	0.12	0.51	0.11	0.53	0.12
Count	10	10	10	10	10	10	10	10

	After 100 Cycles				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	5.35	1.20	4.08	0.92	4.63	1.04	3.49	0.79
Maximum	7.03	1.58	5.68	1.28	5.30	1.19	4.14	0.93
Average	6.22	**1.40**	4.97	**1.12**	5.02	**1.13**	3.88	**0.87**
St Dev	0.52	0.12	0.51	0.12	0.19	0.04	0.19	0.04
Count	10	10	10	10	10	10	10	10

	After Humidity			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	5.25	1.18	3.08	0.69
Maximum	6.46	1.45	3.97	0.89
Average	5.65	**1.27**	3.54	**0.80**
St Dev	0.37	0.08	0.27	0.06
Count	10	10	10	10

DATA SUMMARIES Continued

MATING/UNMATING:

Group A2 (S2M-115-02-L-D-LC)

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	18.02	4.05	9.99	2.25	14.09	3.17	8.88	2.00
Maximum	33.11	7.44	16.36	3.68	24.70	5.55	15.72	3.53
Average	23.17	**5.21**	12.01	**2.70**	18.46	**4.15**	10.99	**2.47**
St Dev	4.40	0.99	2.09	0.47	3.56	0.80	1.90	0.43
Count	10	10	10	10	10	10	10	10

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	14.40	3.24	10.06	2.26	14.43	3.24	10.76	2.42
Maximum	27.31	6.14	17.26	3.88	28.78	6.47	18.81	4.23
Average	19.56	**4.40**	12.46	**2.80**	20.26	**4.55**	13.92	**3.13**
St Dev	3.98	0.89	2.08	0.47	4.22	0.95	2.30	0.52
Count	10	10	10	10	10	10	10	10

	After 100 Cycles				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	16.24	3.65	12.01	2.70	13.51	3.04	10.84	2.44
Maximum	29.13	6.55	19.76	4.44	19.86	4.46	14.89	3.35
Average	21.00	**4.72**	15.22	**3.42**	15.55	**3.49**	12.35	**2.78**
St Dev	4.17	0.94	2.40	0.54	1.80	0.41	1.22	0.27
Count	10	10	10	10	10	10	10	10

	After Humidity			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	15.96	3.59	9.85	2.21
Maximum	21.02	4.73	13.62	3.06
Average	18.15	**4.08**	11.40	**2.56**
St Dev	2.13	0.48	1.26	0.28
Count	10	10	10	10

DATA SUMMARIES Continued

MATING/UNMATING:

Group A3 (S2M-130-02-L-D-LC)

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	37.99	8.54	24.46	5.50	32.62	7.33	24.54	5.52
Maximum	55.04	12.38	27.60	6.21	48.89	10.99	27.31	6.14
Average	48.61	**10.93**	25.83	**5.81**	40.92	**9.20**	25.85	**5.81**
St Dev	5.80	1.30	0.94	0.21	5.54	1.24	0.92	0.21
Count	10	10	10	10	10	10	10	10

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	35.14	7.90	27.28	6.13	37.29	8.38	29.60	6.65
Maximum	50.56	11.37	31.70	7.13	53.32	11.99	35.73	8.03
Average	42.86	**9.64**	29.23	**6.57**	44.87	**10.09**	32.70	**7.35**
St Dev	5.32	1.20	1.25	0.28	5.44	1.22	1.69	0.38
Count	10	10	10	10	10	10	10	10

	After 100 Cycles				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	33.48	7.53	25.33	5.69	27.28	6.13	12.15	2.73
Maximum	55.28	12.43	37.93	8.53	38.44	8.64	26.75	6.01
Average	45.40	**10.21**	34.29	**7.71**	33.29	**7.48**	20.56	**4.62**
St Dev	7.35	1.65	4.23	0.95	2.76	0.62	5.01	1.13
Count	10	10	10	10	10	10	10	10

	After Humidity			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	30.95	6.96	22.50	5.06
Maximum	38.82	8.73	27.05	6.08
Average	34.47	**7.75**	24.06	**5.41**
St Dev	2.34	0.53	1.24	0.28
Count	10	10	10	10

DATA SUMMARIES Continued

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.

Left/Right

Initial	Deflections in inches Forces in Grams										
	0.0003	0.0006	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024	0.0027	0.0030	SET
Averages	5.26	8.83	12.21	15.85	19.44	23.00	26.85	30.38	34.14	37.60	0.0006
Min	2.30	5.50	7.90	10.50	13.40	15.80	18.30	21.20	23.50	26.10	0.0000
Max	17.30	20.90	23.80	27.00	30.80	35.30	40.60	45.40	50.20	55.10	0.0030
St. Dev	4.985	5.235	5.424	5.840	6.433	7.244	8.367	9.076	9.969	10.896	0.0010
Count	8	8	8	8	8	8	8	8	8	8	8

After Thermals	Deflections in inches Forces in Grams										
	0.0003	0.0006	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024	0.0027	0.0030	SET
Averages	5.67	9.09	12.63	16.06	19.53	23.17	26.68	30.01	33.70	37.36	0.0011
Min	2.40	5.00	7.90	10.30	13.10	15.80	18.40	21.40	23.90	26.60	0.0000
Max	17.00	19.20	22.10	25.40	27.90	32.40	36.60	40.30	45.70	51.00	0.0032
St. Dev	4.540	4.412	4.640	5.204	5.826	6.476	7.252	7.660	8.559	9.452	0.0014
Count	9	9	9	9	9	9	9	9	9	9	9

Front/Back

Initial	Deflections in inches Forces in Grams										
	0.0003	0.0006	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024	0.0027	0.0030	SET
Averages	2.64	5.74	8.98	12.41	15.95	19.53	23.26	27.56	31.69	35.69	0.0008
Min	1.00	2.90	4.70	6.60	8.90	11.10	13.80	16.60	18.80	20.30	0.0005
Max	4.20	8.50	13.80	20.00	25.50	31.70	37.40	44.80	51.80	58.20	0.0011
St. Dev	1.153	1.958	3.223	4.771	5.957	7.351	8.698	10.262	11.908	13.230	0.0002
Count	8	8	8	8	8	8	8	8	8	8	8

After Thermals	Deflections in inches Forces in Grams										
	0.0003	0.0006	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024	0.0027	0.0030	SET
Averages	5.03	9.92	14.53	19.08	23.54	27.98	32.81	39.53	50.61	67.42	0.0002
Min	4.20	8.30	12.60	16.90	21.00	25.70	30.60	35.40	39.40	44.20	0.0000
Max	6.20	11.50	15.70	20.20	25.30	29.70	35.80	58.40	83.20	112.30	0.0010
St. Dev	0.675	1.026	1.124	1.239	1.374	1.303	1.609	7.242	14.474	25.537	0.0003
Count	9	9	9	9	9	9	9	9	9	9	9

DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	T2SD/S2M	T2SD	S2M
Initial	100000	100000	100000
Thermal	100000	100000	100000
Humidity	100000	100000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	T2SD/S2M
Break Down Voltage	1400
Test Voltage	1050
Working Voltage	350

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

DATA SUMMARIES Continued

LLCR:

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

Group A1 50 Cycles

Date	2010-3-25	2010-3-25	2010-4-6	2010-4-26
Room Temp C	23	24	22	25
RH	34%	34%	42%	40%
Name	Aaron McKim	Aaron McKim	Tony Wagoner	Tony Wagoner
mOhm values	**Actual Initial**	**Delta 50 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	32.5	-0.2	-0.1	0.3
St. Dev.	0.8	1.2	1.1	1.0
Min	29.1	-4.7	-5.0	-4.3
Max	33.8	2.3	2.2	4.1
Count	192	192	192	192

How many samples are being tested?	8
How many contacts are on each board?	24

	Stable	Minor	Acceptable	Marginal	Unstable	Open
50 Cycles	192	0	0	0	0	0
Thermal	192	0	0	0	0	0
Humidity	192	0	0	0	0	0

Group A2 100 cycles

Date	2010-3-25	2010-3-26	2010-4-6	2010-4-26
Room Temp C	23	22	22	25
RH	34%	27%	46%	40%
Name	Aaron McKim	Tony Wagoner	Tony Wagoner	Tony Wagoner
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	32.1	0.5	0.8	0.7
St. Dev.	1.3	0.9	1.0	1.1
Min	28.3	-1.8	-0.4	-0.6
Max	34.1	4.4	4.7	4.4
Count	192	192	192	192

How many samples are being tested?	8
How many contacts are on each board?	24

	Stable	Minor	Acceptable	Marginal	Unstable	Open
100 Cycles	192	0	0	0	0	0
Thermal	192	0	0	0	0	0
Humidity	192	0	0	0	0	0

DATA SUMMARIES Continued

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

Date	2010-3-16	2010-3-16
Room Temp C	24	23
RH	33%	32%
Name	Tony Wagoner	Aaron McKim
mOhm values	**Actual Initial**	**Delta Gas Tight**
Average	32.5	0.3
St. Dev.	0.8	0.3
Min	29.3	-0.9
Max	34.2	1.3
Count	192	192

How many samples are being tested?	8
How many contacts are on each board?	24

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Gas Tight	192	0	0	0	0	192

DATA

INSULATION RESISTANCE (IR):

Initial Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	X	X	X
Sample#	T2SD/S2M	T2SD	S2M
1	100000	100000	100000
2	100000	100000	100000

Thermal Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	X	X	X
Sample#	T2SD/S2M	T2SD	S2M
1	100000	100000	100000
2	100000	100000	100000

Humidity Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	X	X	X
Sample#	T2SD/S2M	T2SD	S2M
1	100000	100000	100000
2	100000	100000	100000

DATA Continued

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial Breakdown Voltage
Test Voltage *Until Breakdown Occurs*

	Pin to Pin		
	Mated	Unmated	
	X		
Sample#	T2SD/S2M	T2SD	S2M
1	1500	1500	1600
2	1500	1400	1600

Initial DWV	
Test Voltage=	1050

	Pin to Pin		
	Mated	Unmated	
Sample#	T2SD/S2M	T2SD	S2M
1	1050	1050	1050
2	1050	1050	1050

Thermal Test Voltage	
Test Voltage=	1050

	Pin to Pin		
	Mated	Unmated	
Sample#	T2SD/S2M	T2SD	S2M
1	1050	1050	1050
2	1050	1050	1050

Humidity Test Voltage	
Test Voltage=	1050

	Pin to Pin		
	Mated	Unmated	
Sample#	T2SD/S2M	T2SD	S2M
1	1050	1050	1050
2	1050	1050	1050

DATA Continued

CONTACT GAPS:

Mating\Unmating Group

Initial								
	Units:	inches						
Pos.#	**B1 (X)**	**B2 (X)**	**B3 (X)**	**B4 (X)**	**B1 (Y)**	**B2 (Y)**	**B3 (Y)**	**B4 (Y)**
1	0.0131	0.0128	0.0129	0.0125	0.0135	0.0134	0.0132	0.0133
2	0.0128	0.0128	0.0133	0.0127	0.0131	0.0131	0.0128	0.0132
3	0.0125	0.0127	0.0127	0.0128	0.0126	0.0131	0.0127	0.0135
4	0.0134	0.0140	0.0139	0.0129	0.0134	0.0129	0.0125	0.0126
5	0.0132	0.0132	0.0132	0.0126	0.0131	0.0134	0.0140	0.0139
6	0.0130	0.0135	0.0133	0.0128	0.0133	0.0125	0.0136	0.0127
7	0.0127	0.0132	0.0128	0.0128	0.0135	0.0127	0.0130	0.0129
8	0.0125	0.0133	0.0132	0.0131	0.0133	0.0128	0.0126	0.0128
9	0.0129	0.0132	0.0143	0.0131	0.0131	0.0135	0.0128	0.0128
10	0.0127	0.0135	0.0139	0.0129	0.0132	0.0133	0.0125	0.0133
11	0.0129	0.0133	0.0143	0.0126	0.0128	0.0134	0.0133	0.0126
12	0.0130	0.0132	0.0132	0.0130	0.0132	0.0129	0.0129	0.0128
13	0.0133	0.0133	0.0141	0.0126	0.0128	0.0133	0.0131	0.0144
14	0.0131	0.0133	0.0135	0.0127	0.0135	0.0139	0.0130	0.0132
15	0.0141	0.0133	0.0135	0.0131	0.0135	0.0135	0.0130	0.0128
16	0.0128	0.0132	0.0130	0.0132	0.0136	0.0132	0.0128	0.0131
17	0.0135	0.0128	0.0147	0.0133	0.0132	0.0139	0.0128	0.0134
18	0.0138	0.0132	0.0143	0.0128	0.0137	0.0140	0.0133	0.0126
19	0.0131	0.0131	0.0132	0.0132	0.0133	0.0131	0.0145	0.0128
20	0.0131	0.0135	0.0127	0.0132	0.0135	0.0128	0.0141	0.0132
21	0.0134	0.0132	0.0147	0.0129	0.0137	0.0137	0.0132	0.0133
22	0.0128	0.0135	0.0137	0.0140	0.0131	0.0130	0.0128	0.0139
23	0.0125	0.0132	0.0140	0.0126	0.0131	0.0126	0.0132	0.0130
24	0.0127	0.0128	0.0143	0.0132	0.0135	0.0143	0.0129	0.0129
25	0.0129	0.0130	0.0128	0.0126	0.0132	0.0132	0.0130	0.0127
26	0.0130	0.0128	0.0133	0.0130	0.0130	0.0133	0.0135	0.0143
27	0.0128	0.0135	0.0125	0.0132	0.0132	0.0130	0.0132	0.0136
28	0.0128	0.0130	0.0133	0.0135	0.0132	0.0138	0.0133	0.0125
29	0.0130	0.0128	0.0126	0.0127	0.0135	0.0130	0.0139	0.0132
30	0.0128	0.0128	0.0133	0.0125	0.0129	0.0131	0.0132	0.0125
31	0.0129	0.0125	0.0129	0.0126	0.0137	0.0135	0.0132	0.0134
32	0.0134	0.0128	0.0128	0.0135	0.0125	0.0128	0.0138	0.0136
33	0.0128	0.0132	0.0126	0.0133	0.0125	0.0129	0.0133	0.0134
34	0.0132	0.0130	0.0130	0.0126	0.0125	0.0130	0.0137	0.0132
35	0.0130	0.0130	0.0130	0.0127	0.0126	0.0134	0.0133	0.0134
36	0.0141	0.0131	0.0128	0.0127	0.0125	0.0129	0.0125	0.0131
37	0.0130	0.0134	0.0131	0.0141	0.0128	0.0128	0.0147	0.0138
38	0.0135	0.0127	0.0132	0.0126	0.0125	0.0128	0.0138	0.0131
39	0.0131	0.0128	0.0130	0.0128	0.0134	0.0126	0.0135	0.0135
40	0.0130	0.0132	0.0129	0.0128	0.0127	0.0135	0.0132	0.0128
41	0.0132	0.0132	0.0126	0.0128	0.0129	0.0126	0.0131	0.0135
42	0.0135	0.0128	0.0128	0.0131	0.0135	0.0125	0.0127	0.0139
43	0.0126	0.0132	0.0125	0.0125	0.0138	0.0138	0.0132	0.0132

44	0.0131	0.0140	0.0132	0.0139	0.0135	0.0127	0.0132	0.0125
45	0.0126	0.0131	0.0126	0.0138	0.0130	0.0125	0.0147	0.0139
46	0.0127	0.0135	0.0129	0.0132	0.0135	0.0129	0.0139	0.0136
47	0.0131	0.0134	0.0125	0.0134	0.0127	0.0138	0.0130	0.0137
48	0.0130	0.0134	0.0131	0.0133	0.0135	0.0131	0.0139	0.0144
49	0.0135	0.0130	0.0128	0.0129	0.0128	0.0135	0.0135	0.0136
50	0.0131	0.0137	0.0128	0.0135	0.0141	0.0130	0.0125	0.0139
51	0.0131	0.0132	0.0130	0.0131	0.0127	0.0132	0.0131	0.0133
52	0.0128	0.0131	0.0127	0.0132	0.0140	0.0127	0.0130	0.0135
53	0.0130	0.0129	0.0126	0.0135	0.0128	0.0128	0.0127	0.0130
54	0.0132	0.0125	0.0129	0.0132	0.0135	0.0128	0.0145	0.0139
55	0.0136	0.0134	0.0129	0.0142	0.0125	0.0125	0.0130	0.0127
56	0.0132	0.0128	0.0126	0.0128	0.0147	0.0129	0.0134	0.0137
57	0.0134	0.0130	0.0128	0.0135	0.0138	0.0133	0.0138	0.0128
58	0.0134	0.0130	0.0129	0.0126	0.0136	0.0131	0.0133	0.0137
59	0.0132	0.0130	0.0125	0.0128	0.0129	0.0127	0.0147	0.0135
60	0.0126	0.0132	0.0130	0.0130	0.0131	0.0128	0.0134	0.0129

After 100 Cycles

Units: inches

Pos.#	**B1 (X)**	**B2 (X)**	**B3 (X)**	**B4 (X)**	**B1 (Y)**	**B2 (Y)**	**B3 (Y)**	**B4 (Y)**
1	0.0131	0.0130	0.0132	0.0133	0.0140	0.0134	0.0143	0.0136
2	0.0130	0.0131	0.0134	0.0125	0.0139	0.0139	0.0142	0.0131
3	0.0133	0.0132	0.0131	0.0131	0.0142	0.0132	0.0139	0.0128
4	0.0131	0.0131	0.0125	0.0128	0.0140	0.0137	0.0139	0.0135
5	0.0133	0.0131	0.0127	0.0129	0.0133	0.0135	0.0138	0.0134
6	0.0130	0.0130	0.0128	0.0134	0.0139	0.0139	0.0136	0.0135
7	0.0135	0.0131	0.0131	0.0133	0.0137	0.0128	0.0135	0.0131
8	0.0132	0.0132	0.0128	0.0135	0.0138	0.0135	0.0141	0.0137
9	0.0134	0.0135	0.0134	0.0134	0.0134	0.0135	0.0129	0.0128
10	0.0133	0.0131	0.0130	0.0134	0.0139	0.0143	0.0137	0.0132
11	0.0131	0.0133	0.0125	0.0131	0.0133	0.0133	0.0143	0.0126
12	0.0131	0.0127	0.0126	0.0130	0.0143	0.0135	0.0139	0.0140
13	0.0136	0.0135	0.0127	0.0129	0.0140	0.0133	0.0135	0.0133
14	0.0133	0.0128	0.0133	0.0132	0.0140	0.0136	0.0139	0.0131
15	0.0132	0.0131	0.0129	0.0138	0.0131	0.0135	0.0134	0.0128
16	0.0129	0.0130	0.0132	0.0131	0.0135	0.0132	0.0139	0.0137
17	0.0135	0.0132	0.0130	0.0138	0.0136	0.0136	0.0133	0.0128
18	0.0131	0.0131	0.0128	0.0133	0.0135	0.0125	0.0131	0.0134
19	0.0131	0.0131	0.0130	0.0131	0.0135	0.0135	0.0131	0.0134
20	0.0134	0.0131	0.0128	0.0130	0.0137	0.0130	0.0139	0.0131
21	0.0133	0.0129	0.0131	0.0130	0.0136	0.0128	0.0128	0.0133
22	0.0131	0.0127	0.0133	0.0135	0.0138	0.0139	0.0130	0.0134
23	0.0134	0.0135	0.0134	0.0135	0.0138	0.0137	0.0131	0.0125
24	0.0134	0.0130	0.0134	0.0131	0.0136	0.0132	0.0139	0.0133
25	0.0135	0.0131	0.0128	0.0134	0.0133	0.0134	0.0129	0.0135
26	0.0133	0.0131	0.0131	0.0135	0.0143	0.0135	0.0131	0.0140
27	0.0134	0.0131	0.0131	0.0152	0.0143	0.0134	0.0125	0.0135
28	0.0132	0.0131	0.0131	0.0162	0.0138	0.0136	0.0139	0.0141
29	0.0132	0.0131	0.0131	0.0166	0.0139	0.0135	0.0142	0.0141

30	0.0135	0.0132	0.0132	0.0161	0.0142	0.0139	0.0133	0.0137
31	0.0134	0.0131	0.0135	0.0153	0.0140	0.0141	0.0144	0.0135
32	0.0135	0.0128	0.0130	0.0165	0.0142	0.0131	0.0139	0.0144
33	0.0134	0.0136	0.0133	0.0153	0.0135	0.0143	0.0138	0.0141
34	0.0131	0.0125	0.0128	0.0144	0.0131	0.0135	0.0136	0.0135
35	0.0134	0.0127	0.0134	0.0136	0.0138	0.0141	0.0133	0.0136
36	0.0129	0.0131	0.0131	0.0127	0.0135	0.0145	0.0131	0.0128
37	0.0135	0.0129	0.0131	0.0127	0.0139	0.0129	0.0136	0.0131
38	0.0133	0.0126	0.0131	0.0128	0.0139	0.0127	0.0134	0.0132
39	0.0134	0.0128	0.0130	0.0131	0.0139	0.0140	0.0132	0.0150
40	0.0131	0.0131	0.0129	0.0135	0.0137	0.0132	0.0131	0.0128
41	0.0135	0.0129	0.0126	0.0126	0.0135	0.0140	0.0134	0.0136
42	0.0130	0.0127	0.0133	0.0131	0.0142	0.0136	0.0127	0.0135
43	0.0133	0.0125	0.0128	0.0134	0.0143	0.0132	0.0128	0.0137
44	0.0134	0.0136	0.0128	0.0127	0.0138	0.0128	0.0126	0.0132
45	0.0131	0.0131	0.0128	0.0128	0.0137	0.0143	0.0131	0.0133
46	0.0134	0.0129	0.0132	0.0126	0.0128	0.0135	0.0132	0.0140
47	0.0137	0.0131	0.0131	0.0125	0.0133	0.0126	0.0136	0.0142
48	0.0132	0.0133	0.0133	0.0125	0.0133	0.0127	0.0131	0.0137
49	0.0135	0.0131	0.0125	0.0140	0.0138	0.0139	0.0135	0.0140
50	0.0131	0.0131	0.0128	0.0128	0.0136	0.0128	0.0129	0.0134
51	0.0133	0.0130	0.0130	0.0129	0.0140	0.0140	0.0135	0.0127
52	0.0132	0.0130	0.0127	0.0133	0.0136	0.0132	0.0133	0.0142
53	0.0134	0.0133	0.0131	0.0132	0.0137	0.0141	0.0129	0.0130
54	0.0133	0.0132	0.0131	0.0131	0.0142	0.0128	0.0132	0.0128
55	0.0133	0.0128	0.0127	0.0135	0.0140	0.0137	0.0131	0.0143
56	0.0134	0.0130	0.0134	0.0130	0.0136	0.0131	0.0131	0.0145
57	0.0135	0.0131	0.0133	0.0131	0.0139	0.0139	0.0141	0.0137
58	0.0133	0.0131	0.0133	0.0128	0.0143	0.0139	0.0138	0.0140
59	0.0135	0.0131	0.0133	0.0134	0.0146	0.0140	0.0139	0.0143
60	0.0135	0.0129	0.0132	0.0135	0.0140	0.0128	0.0131	0.0140

After Thermal

Units: inches

Pos.#	**B1 (X)**	**B2 (X)**	**B3 (X)**	**B4 (X)**	**B1 (Y)**	**B2 (Y)**	**B3 (Y)**	**B4 (Y)**
1	0.0142	0.0134	0.0134	0.0151	0.0135	0.0137	0.0139	0.0150
2	0.0142	0.0143	0.0146	0.0162	0.0142	0.0137	0.0139	0.0146
3	0.0147	0.0161	0.0150	0.0161	0.0143	0.0139	0.0139	0.0143
4	0.0150	0.0127	0.0133	0.0142	0.0149	0.0142	0.0140	0.0135
5	0.0140	0.0128	0.0136	0.0139	0.0143	0.0132	0.0146	0.0134
6	0.0139	0.0128	0.0126	0.0135	0.0146	0.0135	0.0142	0.0150
7	0.0138	0.0138	0.0135	0.0132	0.0148	0.0132	0.0139	0.0134
8	0.0137	0.0127	0.0134	0.0132	0.0139	0.0139	0.0140	0.0145
9	0.0141	0.0132	0.0131	0.0150	0.0142	0.0139	0.0138	0.0140
10	0.0139	0.0140	0.0126	0.0128	0.0149	0.0139	0.0137	0.0145
11	0.0139	0.0135	0.0129	0.0136	0.0147	0.0142	0.0136	0.0149
12	0.0139	0.0132	0.0134	0.0143	0.0143	0.0135	0.0144	0.0142
13	0.0139	0.0139	0.0129	0.0133	0.0150	0.0128	0.0141	0.0137
14	0.0136	0.0133	0.0131	0.0127	0.0146	0.0129	0.0136	0.0146
15	0.0133	0.0128	0.0132	0.0128	0.0139	0.0134	0.0135	0.0143

16	0.0139	0.0143	0.0131	0.0129	0.0137	0.0128	0.0140	0.0135
17	0.0144	0.0130	0.0128	0.0127	0.0133	0.0135	0.0135	0.0128
18	0.0134	0.0138	0.0125	0.0135	0.0141	0.0141	0.0136	0.0133
19	0.0143	0.0132	0.0128	0.0137	0.0143	0.0128	0.0137	0.0128
20	0.0140	0.0135	0.0129	0.0127	0.0146	0.0133	0.0137	0.0139
21	0.0141	0.0130	0.0126	0.0135	0.0136	0.0126	0.0131	0.0137
22	0.0135	0.0134	0.0129	0.0128	0.0139	0.0128	0.0135	0.0147
23	0.0137	0.0137	0.0127	0.0133	0.0139	0.0134	0.0132	0.0135
24	0.0141	0.0132	0.0131	0.0128	0.0139	0.0132	0.0145	0.0140
25	0.0143	0.0135	0.0128	0.0133	0.0133	0.0139	0.0135	0.0130
26	0.0140	0.0135	0.0135	0.0141	0.0125	0.0149	0.0135	0.0144
27	0.0154	0.0136	0.0133	0.0143	0.0142	0.0141	0.0139	0.0154
28	0.0158	0.0139	0.0136	0.0134	0.0145	0.0145	0.0142	0.0151
29	0.0163	0.0135	0.0136	0.0163	0.0145	0.0135	0.0139	0.0138
30	0.0157	0.0141	0.0136	0.0166	0.0150	0.0125	0.0137	0.0146
31	0.0158	0.0136	0.0144	0.0161	0.0145	0.0131	0.0146	0.0144
32	0.0158	0.0138	0.0125	0.0151	0.0150	0.0132	0.0135	0.0131
33	0.0161	0.0132	0.0126	0.0145	0.0141	0.0127	0.0129	0.0128
34	0.0155	0.0135	0.0128	0.0135	0.0144	0.0137	0.0136	0.0135
35	0.0141	0.0132	0.0134	0.0131	0.0154	0.0126	0.0143	0.0125
36	0.0136	0.0133	0.0131	0.0138	0.0153	0.0139	0.0135	0.0130
37	0.0140	0.0136	0.0132	0.0135	0.0143	0.0128	0.0146	0.0127
38	0.0136	0.0138	0.0137	0.0128	0.0150	0.0140	0.0150	0.0148
39	0.0136	0.0135	0.0136	0.0132	0.0146	0.0136	0.0143	0.0141
40	0.0137	0.0141	0.0138	0.0138	0.0147	0.0145	0.0128	0.0136
41	0.0136	0.0135	0.0134	0.0136	0.0150	0.0135	0.0132	0.0133
42	0.0135	0.0137	0.0135	0.0135	0.0145	0.0138	0.0132	0.0139
43	0.0139	0.0136	0.0128	0.0132	0.0156	0.0127	0.0132	0.0139
44	0.0140	0.0133	0.0127	0.0135	0.0149	0.0134	0.0143	0.0137
45	0.0136	0.0134	0.0128	0.0142	0.0142	0.0134	0.0128	0.0139
46	0.0139	0.0132	0.0134	0.0133	0.0126	0.0128	0.0130	0.0140
47	0.0136	0.0135	0.0128	0.0139	0.0135	0.0135	0.0128	0.0130
48	0.0138	0.0132	0.0136	0.0136	0.0137	0.0144	0.0128	0.0138
49	0.0135	0.0137	0.0128	0.0137	0.0150	0.0138	0.0128	0.0132
50	0.0137	0.0136	0.0135	0.0135	0.0150	0.0133	0.0132	0.0134
51	0.0139	0.0137	0.0135	0.0128	0.0141	0.0129	0.0132	0.0135
52	0.0139	0.0138	0.0125	0.0138	0.0150	0.0132	0.0136	0.0135
53	0.0142	0.0137	0.0130	0.0134	0.0158	0.0146	0.0140	0.0131
54	0.0141	0.0131	0.0138	0.0134	0.0145	0.0133	0.0126	0.0133
55	0.0139	0.0132	0.0132	0.0140	0.0135	0.0132	0.0132	0.0146
56	0.0143	0.0129	0.0139	0.0140	0.0136	0.0143	0.0126	0.0146
57	0.0159	0.0143	0.0142	0.0147	0.0133	0.0144	0.0135	0.0146
58	0.0150	0.0164	0.0148	0.0165	0.0144	0.0132	0.0131	0.0139
59	0.0143	0.0142	0.0137	0.0169	0.0149	0.0141	0.0148	0.0145
60	0.0140	0.0136	0.0137	0.0167	0.0153	0.0134	0.0140	0.0149

DATA Continued

CONTACT GAPS:

Normal force Group

Group B1

Initial				
Units:	inches			
Pos.#	**B1 (X) (Row 1)**	**B1 (X) (Row 2)**	**B1 (Y) (Row 1)**	**B2 (Y) (Row 2)**
1	0.0133	0.0135	0.0138	0.0135
2	0.0134	0.0135	0.0141	0.0135
3	0.0135	0.0135	0.0137	0.0135
4	0.0134	0.0132	0.0137	0.0133
5	0.0134	0.0135	0.0136	0.0135
6	0.0134	0.0137	0.0136	0.0141
7	0.0135	0.0132	0.0135	0.0138
8	0.0135	0.0136	0.0134	0.0139
9	0.0137	0.0135	0.0135	0.0135
10	0.0134	0.0136	0.0135	0.0135
11	0.0136	0.0133	0.0135	0.0138
12	0.0134	0.0132	0.0133	0.0135
13	0.0134	0.0135	0.0135	0.0138
14	0.0137	0.0137	0.0135	0.0137
15	0.0132	0.0135	0.0136	0.0136
16	0.0135	0.0132	0.0135	0.0135
17	0.0135	0.0134	0.0138	0.0136
18	0.0139	0.0135	0.0136	0.0130
19	0.0136	0.0135	0.0136	0.0135
20	0.0135	0.0135	0.0135	0.0135
21	0.0135	0.0133	0.0133	0.0138
22	0.0134	0.0134	0.0136	0.0135
23	0.0135	0.0132	0.0136	0.0134
24	0.0135	0.0133	0.0136	0.0132
25	0.0132	0.0133	0.0139	0.0138
26	0.0135	0.0133	0.0139	0.0136
27	0.0133	0.0135	0.0135	0.0135
28	0.0135	0.0132	0.0138	0.0135
29	0.0134	0.0132	0.0136	0.0136
30	0.0135	0.0132	0.0135	0.0132

Group B2

Initial								
Units:	inches							
Pos.#	**B1 (X) (Row 1)**	**B1 (X) (Row 2)**	**B2 (X) (Row 1)**	**B2 (X) (Row 2)**	**B1 (Y) (Row 1)**	**B1 (Y) (Row 2)**	**B2 (Y) (Row 1)**	**B2 (Y) (Row 2)**
1	0.0134	0.0135	0.0134	0.0137	0.0139	0.0139	0.0139	0.0135
2	0.0133	0.0134	0.0135	0.0135	0.0139	0.0136	0.0132	0.0135
3	0.0134	0.0135	0.0135	0.0135	0.0139	0.0134	0.0139	0.0138
4	0.0134	0.0133	0.0135	0.0136	0.0136	0.0135	0.0139	0.0133
5	0.0137	0.0138	0.0133	0.0136	0.0139	0.0137	0.0136	0.0136
6	0.0134	0.0135	0.0135	0.0136	0.0140	0.0139	0.0138	0.0142

7	0.0135	0.0135	0.0134	0.0132	0.0138	0.0136	0.0137	0.0137
8	0.0133	0.0135	0.0134	0.0137	0.0138	0.0136	0.0141	0.0137
9	0.0135	0.0135	0.0135	0.0135	0.0139	0.0132	0.0141	0.0138
10	0.0133	0.0132	0.0137	0.0133	0.0139	0.0136	0.0143	0.0140
11	0.0135	0.0133	0.0135	0.0135	0.0137	0.0136	0.0139	0.0139
12	0.0134	0.0135	0.0136	0.0137	0.0142	0.0139	0.0142	0.0139
13	0.0135	0.0138	0.0134	0.0137	0.0138	0.0137	0.0136	0.0135
14	0.0133	0.0134	0.0135	0.0137	0.0135	0.0138	0.0141	0.0140
15	0.0134	0.0133	0.0135	0.0136	0.0140	0.0139	0.0138	0.0141
16	0.0133	0.0135	0.0135	0.0135	0.0137	0.0135	0.0137	0.0140
17	0.0135	0.0132	0.0134	0.0135	0.0139	0.0138	0.0135	0.0138
18	0.0135	0.0134	0.0135	0.0135	0.0138	0.0138	0.0137	0.0139
19	0.0135	0.0135	0.0134	0.0138	0.0135	0.0139	0.0138	0.0139
20	0.0134	0.0132	0.0136	0.0133	0.0141	0.0136	0.0140	0.0138
21	0.0135	0.0134	0.0135	0.0135	0.0139	0.0138	0.0135	0.0139
22	0.0132	0.0134	0.0137	0.0136	0.0140	0.0139	0.0134	0.0139
23	0.0135	0.0133	0.0135	0.0135	0.0136	0.0138	0.0140	0.0136
24	0.0132	0.0132	0.0135	0.0133	0.0140	0.0137	0.0141	0.0137
25	0.0134	0.0133	0.0135	0.0134	0.0138	0.0139	0.0138	0.0140
26	0.0133	0.0133	0.0133	0.0134	0.0140	0.0137	0.0139	0.0141
27	0.0136	0.0135	0.0136	0.0134	0.0139	0.0139	0.0139	0.0137
28	0.0134	0.0132	0.0135	0.0133	0.0139	0.0137	0.0142	0.0140
29	0.0136	0.0133	0.0135	0.0134	0.0135	0.0135	0.0139	0.0139
30	0.0132	0.0132	0.0135	0.0135	0.0139	0.0142	0.0139	0.0143
31	0.0129	0.0125	0.0129	0.0126	0.0137	0.0135	0.0132	0.0134
32	0.0134	0.0128	0.0128	0.0135	0.0125	0.0128	0.0138	0.0136
33	0.0128	0.0132	0.0126	0.0133	0.0125	0.0129	0.0133	0.0134
34	0.0132	0.0130	0.0130	0.0126	0.0125	0.0130	0.0137	0.0132
35	0.0130	0.0130	0.0130	0.0127	0.0126	0.0134	0.0133	0.0134
36	0.0141	0.0131	0.0128	0.0127	0.0125	0.0129	0.0125	0.0131
37	0.0130	0.0134	0.0131	0.0141	0.0128	0.0128	0.0147	0.0138
38	0.0135	0.0127	0.0132	0.0126	0.0125	0.0128	0.0138	0.0131
39	0.0131	0.0128	0.0130	0.0128	0.0134	0.0126	0.0135	0.0135
40	0.0130	0.0132	0.0129	0.0128	0.0127	0.0135	0.0132	0.0128
41	0.0132	0.0132	0.0126	0.0128	0.0129	0.0126	0.0131	0.0135
42	0.0135	0.0128	0.0128	0.0131	0.0135	0.0125	0.0127	0.0139
43	0.0126	0.0132	0.0125	0.0125	0.0138	0.0138	0.0132	0.0132
44	0.0131	0.0140	0.0132	0.0139	0.0135	0.0127	0.0132	0.0125
45	0.0126	0.0131	0.0126	0.0138	0.0130	0.0125	0.0147	0.0139
46	0.0127	0.0135	0.0129	0.0132	0.0135	0.0129	0.0139	0.0136
47	0.0131	0.0134	0.0125	0.0134	0.0127	0.0138	0.0130	0.0137
48	0.0130	0.0134	0.0131	0.0133	0.0135	0.0131	0.0139	0.0144
49	0.0135	0.0130	0.0128	0.0129	0.0128	0.0135	0.0135	0.0136
50	0.0131	0.0137	0.0128	0.0135	0.0141	0.0130	0.0125	0.0139
51	0.0131	0.0132	0.0130	0.0131	0.0127	0.0132	0.0131	0.0133
52	0.0128	0.0131	0.0127	0.0132	0.0140	0.0127	0.0130	0.0135
53	0.0130	0.0129	0.0126	0.0135	0.0128	0.0128	0.0127	0.0130
54	0.0132	0.0125	0.0129	0.0132	0.0135	0.0128	0.0145	0.0139
55	0.0136	0.0134	0.0129	0.0142	0.0125	0.0125	0.0130	0.0127

56	0.0132	0.0128	0.0126	0.0128	0.0147	0.0129	0.0134	0.0137
57	0.0134	0.0130	0.0128	0.0135	0.0138	0.0133	0.0138	0.0128
58	0.0134	0.0130	0.0129	0.0126	0.0136	0.0131	0.0133	0.0137
59	0.0132	0.0130	0.0125	0.0128	0.0129	0.0127	0.0147	0.0135
60	0.0126	0.0132	0.0130	0.0130	0.0131	0.0128	0.0134	0.0129

After Thermal

Units: inches

Pos.#	B1 (X) (Row 1)	B1 (X) (Row 2)	B2 (X) (Row 1)	B2 (X) (Row 2)	B1 (Y) (Row 1)	B1 (Y) (Row 2)	B2 (Y) (Row 1)	B2 (Y) (Row 2)
1	0.0142	0.0142	0.0139	0.0142	0.0149	0.0150	0.0147	0.0147
2	0.0143	0.0142	0.0140	0.0141	0.0148	0.0144	0.0144	0.0138
3	0.0142	0.0141	0.0140	0.0140	0.0147	0.0148	0.0148	0.0140
4	0.0144	0.0144	0.0139	0.0142	0.0147	0.0149	0.0146	0.0141
5	0.0143	0.0143	0.0141	0.0139	0.0147	0.0148	0.0145	0.0143
6	0.0143	0.0145	0.0139	0.0141	0.0146	0.0143	0.0144	0.0140
7	0.0141	0.0143	0.0142	0.0142	0.0148	0.0148	0.0143	0.0144
8	0.0143	0.0146	0.0139	0.0141	0.0149	0.0145	0.0142	0.0140
9	0.0143	0.0139	0.0142	0.0141	0.0150	0.0144	0.0140	0.0141
10	0.0144	0.0145	0.0141	0.0139	0.0148	0.0149	0.0143	0.0142
11	0.0142	0.0142	0.0139	0.0139	0.0148	0.0148	0.0147	0.0144
12	0.0144	0.0143	0.0139	0.0140	0.0147	0.0147	0.0139	0.0141
13	0.0143	0.0141	0.0143	0.0142	0.0147	0.0145	0.0142	0.0143
14	0.0144	0.0140	0.0140	0.0139	0.0148	0.0144	0.0143	0.0143
15	0.0143	0.0147	0.0141	0.0141	0.0149	0.0143	0.0145	0.0140
16	0.0145	0.0144	0.0139	0.0140	0.0147	0.0147	0.0146	0.0142
17	0.0142	0.0143	0.0141	0.0140	0.0146	0.0145	0.0146	0.0147
18	0.0146	0.0146	0.0139	0.0139	0.0147	0.0143	0.0143	0.0141
19	0.0143	0.0143	0.0143	0.0143	0.0143	0.0148	0.0143	0.0146
20	0.0147	0.0145	0.0140	0.0140	0.0146	0.0143	0.0143	0.0138
21	0.0143	0.0143	0.0141	0.0139	0.0146	0.0148	0.0142	0.0144
22	0.0143	0.0144	0.0142	0.0140	0.0147	0.0147	0.0143	0.0143
23	0.0145	0.0143	0.0143	0.0142	0.0146	0.0146	0.0145	0.0147
24	0.0147	0.0144	0.0139	0.0139	0.0147	0.0147	0.0144	0.0142
25	0.0145	0.0145	0.0141	0.0141	0.0145	0.0150	0.0145	0.0145
26	0.0147	0.0147	0.0140	0.0140	0.0146	0.0149	0.0135	0.0144
27	0.0143	0.0143	0.0140	0.0139	0.0147	0.0147	0.0143	0.0146
28	0.0145	0.0143	0.0139	0.0140	0.0142	0.0149	0.0139	0.0141
29	0.0145	0.0143	0.0140	0.0143	0.0145	0.0150	0.0143	0.0146
30	0.0146	0.0147	0.0141	0.0141	0.0143	0.0148	0.0140	0.0144

DATA Continued

MATING/UNMATING:

Group A1 (S2M-105-02-L-D-LC)

Sample#	Initial		After 25 Cycles		After 50 Cycles		After 75 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	1.40	0.85	1.23	0.83	1.28	0.87	1.32	0.91
2	1.60	0.79	1.28	0.85	1.28	0.88	1.38	1.03
3	1.50	0.99	1.17	0.87	1.27	0.99	1.34	1.11
4	1.43	0.84	1.14	0.78	1.20	0.83	1.24	0.90
5	1.69	0.82	1.42	0.75	1.45	0.81	1.47	0.89
6	1.55	0.94	1.31	0.91	1.37	1.04	1.41	1.16
7	1.45	0.85	1.22	0.90	1.05	0.80	1.14	0.97
8	1.56	0.92	1.27	0.98	1.33	1.10	1.35	1.21

Sample#	After 100 Cycles		After Thermal		After Humidity	
	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	1.34	1.06	1.14	0.87	1.19	0.89
2	1.41	1.08	1.12	0.85	1.22	0.78
3	1.37	1.18	1.13	0.93	1.45	0.69
4	1.24	0.92	1.11	0.85	1.23	0.74
5	1.50	0.99	1.18	0.86	1.26	0.86
6	1.42	1.20	1.15	0.91	1.27	0.81
7	1.20	1.07	1.19	0.79	1.30	0.77
8	1.42	1.28	1.04	0.88	1.18	0.82

DATA Continued

MATING/UNMATING:

Group A2 (S2M-115-02-L-D-LC)

Sample#	Initial		After 25 Cycles		After 50 Cycles		After 75 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	4.94	2.38	3.78	2.11	3.83	2.26	3.99	2.69
2	5.46	2.28	3.83	2.52	4.07	2.86	4.27	3.20
3	7.44	3.68	5.55	3.53	6.14	3.88	6.47	4.23
4	5.92	2.81	4.76	2.60	5.13	3.02	5.18	3.38
5	4.16	2.58	3.60	2.20	3.73	2.40	3.91	2.77
6	4.05	2.71	3.17	2.34	3.24	2.63	3.24	2.68
7	4.98	2.25	4.67	2.00	5.02	2.31	5.13	2.42
8	5.53	2.25	3.82	2.52	4.00	2.84	4.12	3.25

Sample#	After 100 Cycles		After Thermal		After Humidity	
	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	4.00	2.93	4.46	3.35	3.63	2.53
2	4.45	3.45	3.76	2.88	3.85	2.43
3	6.55	4.44	3.19	2.65	3.62	2.21
4	5.44	3.69	3.33	2.49	3.62	2.37
5	3.93	3.00	3.04	2.44	4.24	2.61
6	3.65	2.88	3.59	3.03	4.23	2.51
7	5.22	2.70	3.44	2.91	4.69	3.06
8	4.22	3.68	3.42	2.64	4.63	2.48

DATA Continued

MATING/UNMATING:

Group A3 (S2M-130-02-L-D-LC)

Sample#	Initial		After 25 Cycles		After 50 Cycles		After 75 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	9.10	5.64	8.52	5.61	9.02	6.13	9.46	6.65
2	11.57	6.03	10.05	6.14	10.63	7.13	11.04	8.03
3	10.34	5.85	7.68	5.67	8.34	6.73	8.63	7.30
4	12.38	6.21	10.99	5.86	11.37	6.79	11.99	7.62
5	8.54	5.50	7.33	5.52	7.90	6.38	8.38	6.89
6	11.45	5.68	9.74	5.93	10.37	6.30	10.82	7.24
7	12.35	5.98	10.30	5.85	10.63	6.53	10.89	7.52
8	11.58	5.78	9.90	5.80	10.18	6.48	10.59	7.48

Sample#	After 100 Cycles		After Thermal		After Humidity	
	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	9.62	6.58	6.13	5.33	8.73	5.06
2	11.29	8.53	8.64	5.73	7.78	5.14
3	9.22	8.33	7.60	6.01	7.38	5.41
4	12.43	8.33	7.54	4.65	7.19	5.46
5	7.61	7.02	7.24	2.85	8.30	5.46
6	11.31	8.20	7.63	4.57	7.47	5.26
7	11.16	7.90	7.41	5.23	7.95	5.42
8	10.91	8.21	7.26	3.98	6.96	5.51

DATA Continued

NORMAL FORCE NORMAL FORCE:

Left/Right

Initial	Deflections in inches, Forces in Grams										
Sample #	**0.0003**	**0.0006**	**0.0009**	**0.0012**	**0.0015**	**0.0018**	**0.0021**	**0.0024**	**0.0027**	**0.0030**	***SET***
1	3.00	5.80	8.60	12.00	15.10	17.60	21.00	23.90	27.40	30.60	0.0030
2	3.60	7.20	10.50	14.40	18.40	22.10	26.00	29.50	32.60	35.70	0.0003
3	3.30	6.10	9.50	12.40	15.30	18.80	21.80	24.60	28.50	31.30	0.0001
4	2.30	5.60	7.90	10.50	13.40	15.80	18.30	21.20	23.50	26.10	0.0001
5	17.30	20.90	23.80	27.00	30.80	35.30	40.60	45.40	50.20	55.10	0.0000
6	5.90	11.10	16.60	22.10	27.50	32.30	37.80	42.20	47.20	52.00	0.0003
7	4.00	8.40	11.80	16.70	20.20	24.40	29.00	32.60	37.50	41.30	0.0004
8	2.70	5.50	9.00	11.70	14.80	17.70	20.30	23.60	26.20	28.70	0.0002
After Thermals	Deflections in inches, Forces in Grams										
Sample #	**0.0003**	**0.0006**	**0.0009**	**0.0012**	**0.0015**	**0.0018**	**0.0021**	**0.0024**	**0.0027**	**0.0030**	***SET***
1	4.30	9.90	14.80	19.70	24.60	29.30	34.20	38.30	42.80	47.30	0.0023
2	5.30	7.80	10.60	13.80	16.30	19.60	22.70	25.50	28.80	31.60	0.0000
3	4.60	9.80	13.00	16.40	20.60	24.10	28.10	31.90	35.70	40.10	0.0032
4	2.80	5.40	8.60	11.10	13.70	16.50	19.30	22.00	24.80	27.30	0.0001
5	4.30	7.90	12.00	16.10	19.70	24.10	27.90	31.60	35.90	39.80	0.0032
7	2.40	5.00	8.20	10.70	13.10	16.30	18.60	21.40	24.20	26.60	0.0001
8	7.60	11.40	16.50	21.00	26.60	32.40	36.60	40.30	45.70	51.00	0.0010
9	17.00	19.20	22.10	25.40	27.90	30.40	34.30	37.60	41.50	45.30	0.0002
10	2.70	5.40	7.90	10.30	13.30	15.80	18.40	21.50	23.90	27.20	0.0001

Front/Back

Initial	Deflections in inches, Forces in Grams										
Sample #	**0.0003**	**0.0006**	**0.0009**	**0.0012**	**0.0015**	**0.0018**	**0.0021**	**0.0024**	**0.0027**	**0.0030**	***SET***
1	4.10	7.70	11.50	15.90	20.10	24.40	30.00	35.40	40.90	46.00	0.0005
2	2.40	6.10	9.60	12.80	16.90	20.20	23.80	28.90	33.70	38.30	0.0011
3	4.20	8.50	13.80	20.00	25.50	31.70	37.40	44.80	51.80	58.20	0.0009
4	2.30	6.30	10.70	15.80	20.20	25.00	30.00	34.40	39.40	43.70	0.0006
5	2.50	4.90	6.90	8.70	10.50	12.70	14.60	16.70	18.80	20.30	0.0006
6	3.20	6.20	9.70	12.60	16.00	19.20	21.70	25.50	28.40	31.50	0.0008
7	1.40	3.30	4.90	6.90	8.90	11.10	13.80	16.60	19.50	22.80	0.0010
8	1.00	2.90	4.70	6.60	9.50	11.90	14.80	18.20	21.00	24.70	0.0009
After Thermals	Deflections in inches, Forces in Grams										
Sample #	**0.0003**	**0.0006**	**0.0009**	**0.0012**	**0.0015**	**0.0018**	**0.0021**	**0.0024**	**0.0027**	**0.0030**	***SET***
1	5.10	10.30	15.60	20.10	25.30	29.70	34.60	39.90	63.90	104.40	0.0003
2	5.80	11.50	15.70	20.10	24.90	29.30	35.80	58.40	83.20	112.30	0.0002
3	5.40	9.90	14.60	19.60	23.60	28.70	33.20	37.70	47.90	70.80	0.0001
4	4.40	9.10	13.10	17.60	22.40	26.80	31.80	36.50	46.50	63.20	0.0000
5	4.40	8.30	12.60	16.90	21.00	25.70	30.60	35.40	40.70	50.40	0.0001
7	4.20	8.80	14.20	18.30	23.20	27.40	31.70	36.50	40.40	44.20	0.0010
8	6.20	10.90	15.20	20.10	23.70	28.50	33.00	36.80	41.50	46.40	0.0001
9	5.00	10.40	15.60	20.20	24.90	28.60	32.90	39.20	52.00	70.60	0.0001
10	4.80	10.10	14.20	18.80	22.90	27.10	31.70	35.40	39.40	44.50	0.0001

DATA Continued

LLCR:

Group A1 50 cycles

Board	mOhm values Position	Actual Initial	Delta 50 Cycles	Delta Thermal	Delta Humidity
1	P1	33.3	-0.6	-0.7	-0.3
1	P2	32.6	0.2	0.3	-1.0
1	P3	32.7	-0.1	-0.1	0.6
1	P4	32.7	-0.8	0.8	0.8
1	P5	32.3	0.3	0.0	0.9
1	P6	32.5	0.1	0.1	0.5
1	P7	32.3	-0.3	-0.2	1.3
1	P8	33.2	0.7	0.2	1.2
1	P9	32.2	-0.2	0.0	0.8
1	P10	31.9	1.1	0.0	1.0
1	P11	31.5	0.1	0.7	0.9
1	P12	32.0	0.9	0.3	0.6
1	P13	32.8	0.0	-0.3	0.1
1	P14	32.0	0.4	0.1	0.7
1	P15	32.5	0.2	0.0	0.2
1	P16	33.2	0.3	-0.1	0.3
1	P17	32.7	0.2	-0.1	0.1
1	P18	32.9	0.2	0.1	0.0
1	P19	33.2	-0.4	-0.6	-0.2
1	P20	32.7	0.1	0.0	0.2
1	P21	32.9	-0.6	0.4	1.4
1	P22	32.6	0.2	0.2	0.4
1	P23	32.2	-0.7	-0.5	0.4
1	P24	32.7	-0.3	0.1	0.6
2	P1	33.0	-4.2	-4.3	-4.1
2	P2	29.1	1.6	2.2	4.1
2	P3	30.6	-2.1	-2.1	-2.1
2	P4	31.1	-2.5	-2.7	-2.6
2	P5	33.2	-4.7	-4.9	-4.3
2	P6	33.5	-4.7	-5.0	-3.9
2	P7	33.3	-4.3	-4.0	-0.1
2	P8	33.3	-4.6	-4.1	-1.4
2	P9	33.5	-4.1	-4.0	-0.7
2	P10	33.3	-4.7	-4.6	-1.4
2	P11	33.2	-3.9	-4.0	-0.5
2	P12	33.3	-3.8	-2.7	-0.6
2	P13	33.7	-0.5	-0.7	-0.3
2	P14	33.6	0.1	-0.1	0.0
2	P15	33.8	-0.1	-0.4	0.4
2	P16	33.3	0.1	0.1	-0.1
2	P17	33.3	0.3	0.2	0.3
2	P18	33.1	-0.9	-0.9	1.0
2	P19	33.0	-2.8	-2.2	-1.3
2	P20	32.9	-0.9	0.2	0.5

2	P21	33.4	-0.2	-0.4	-0.2
2	P22	33.2	-0.1	-0.1	0.8
2	P23	31.0	-0.6	1.0	0.9
2	P24	31.6	-2.6	-2.7	-1.3
3	P1	32.5	0.1	0.0	0.5
3	P2	30.0	2.3	2.1	2.8
3	P3	32.6	0.1	-0.2	0.6
3	P4	32.6	0.1	-0.3	0.8
3	P5	32.7	-0.1	-0.4	0.2
3	P6	32.6	0.1	-0.3	0.4
3	P7	32.6	0.1	-0.2	0.1
3	P8	32.5	0.3	0.2	0.3
3	P9	33.0	0.1	0.0	0.3
3	P10	32.5	0.0	-0.2	0.4
3	P11	32.3	0.2	-0.2	0.6
3	P12	32.6	-0.4	-0.3	0.9
3	P13	33.1	-0.2	-0.3	0.7
3	P14	32.9	0.1	0.1	0.8
3	P15	33.0	0.3	0.1	0.6
3	P16	33.1	0.0	-0.1	0.3
3	P17	32.9	0.4	0.2	0.5
3	P18	33.1	-0.1	-0.3	0.2
3	P19	33.2	0.0	-0.1	0.2
3	P20	33.3	0.1	-0.3	0.0
3	P21	33.0	0.4	-0.1	0.4
3	P22	32.7	-0.3	-0.6	0.6
3	P23	32.7	0.1	-0.3	0.4
3	P24	32.3	0.1	-0.1	0.6
4	P1	32.7	0.2	-0.1	0.3
4	P2	32.7	0.5	0.3	0.9
4	P3	33.2	0.3	0.1	0.7
4	P4	32.8	0.7	0.6	1.2
4	P5	32.5	0.0	0.0	0.8
4	P6	32.9	0.0	0.0	0.7
4	P7	32.6	0.0	-0.1	0.0
4	P8	32.3	0.1	-0.1	0.0
4	P9	33.0	0.0	-0.3	0.1
4	P10	32.8	0.3	0.1	0.3
4	P11	32.5	0.1	-0.2	0.1
4	P12	33.2	0.3	0.0	0.4
4	P13	32.5	-0.2	-0.1	0.3
4	P14	32.5	0.2	-0.1	0.3
4	P15	33.0	0.4	0.0	0.3
4	P16	32.4	0.2	0.2	0.2
4	P17	32.9	0.4	0.4	0.5
4	P18	33.0	0.4	0.4	0.3
4	P19	33.2	0.5	0.8	0.7
4	P20	32.9	0.9	0.8	1.0
4	P21	33.1	0.5	0.5	0.5

4	P22	32.7	0.1	0.1	0.2
4	P23	32.8	0.3	0.4	0.6
4	P24	32.7	0.2	0.1	0.2
5	P1	31.6	-2.2	-2.6	-2.5
5	P2	30.7	-0.6	-1.4	-1.5
5	P3	29.9	-0.9	-1.2	-1.1
5	P4	29.9	-0.8	-1.1	-1.1
5	P5	32.5	-2.2	-1.5	-1.2
5	P6	32.5	-2.5	-3.0	-2.9
5	P7	29.7	-0.2	-0.7	-0.6
5	P8	32.6	0.4	0.4	0.4
5	P9	32.6	0.2	0.2	0.2
5	P10	32.5	0.4	0.5	0.4
5	P11	32.5	0.4	0.4	0.5
5	P12	32.5	0.2	0.1	0.3
5	P13	32.7	-2.3	0.1	0.3
5	P14	32.4	0.3	0.1	0.2
5	P15	32.4	0.5	0.4	0.5
5	P16	33.0	0.4	0.5	0.5
5	P17	32.8	0.4	0.6	0.4
5	P18	33.0	0.3	0.6	0.5
5	P19	32.8	0.3	0.3	0.4
5	P20	33.1	0.4	0.4	0.4
5	P21	32.7	0.6	0.6	0.6
5	P22	32.6	0.2	0.3	0.3
5	P23	32.2	0.4	0.4	0.6
5	P24	32.1	-1.6	0.4	0.9
6	P1	31.4	-1.9	0.3	0.4
6	P2	29.4	0.0	0.4	0.4
6	P3	30.2	0.1	1.5	1.7
6	P4	32.1	-0.8	0.0	-0.4
6	P5	30.4	0.1	2.0	1.9
6	P6	29.9	-0.4	1.1	1.3
6	P7	31.2	-2.4	0.1	0.3
6	P8	31.9	0.2	0.0	-0.1
6	P9	32.3	0.5	0.2	0.2
6	P10	31.7	0.6	0.3	0.5
6	P11	32.1	0.2	-0.1	0.1
6	P12	31.8	0.2	0.0	0.1
6	P13	32.2	0.4	0.0	0.1
6	P14	32.2	0.1	-0.1	-0.1
6	P15	32.5	0.1	0.0	0.1
6	P16	32.7	0.0	-0.2	-0.2
6	P17	32.2	0.1	0.1	0.1
6	P18	33.3	0.0	0.1	0.1
6	P19	32.2	0.1	-0.1	-0.1
6	P20	32.8	-0.1	-0.4	-0.4
6	P21	30.6	-1.3	0.2	0.6
6	P22	32.0	0.0	-0.1	-0.2

6	P23	32.4	0.2	0.0	0.0
6	P24	32.0	0.3	0.2	0.0
7	P1	32.0	0.9	0.5	1.0
7	P2	31.9	0.8	0.8	0.9
7	P3	32.0	0.9	0.7	0.8
7	P4	31.0	1.6	1.6	1.8
7	P5	32.4	0.2	0.2	0.2
7	P6	32.7	0.2	0.3	0.4
7	P7	32.3	0.1	0.2	0.1
7	P8	32.4	-0.6	0.0	0.1
7	P9	32.8	0.4	0.3	0.5
7	P10	32.8	0.3	0.3	0.4
7	P11	32.8	0.2	0.2	0.2
7	P12	32.7	-0.2	-0.5	0.5
7	P13	32.6	0.6	0.7	0.7
7	P14	32.8	0.5	0.5	0.6
7	P15	32.9	0.7	0.4	0.8
7	P16	33.1	0.6	0.5	0.6
7	P17	33.0	0.4	0.4	0.5
7	P18	32.7	0.4	0.5	0.7
7	P19	32.9	0.5	0.4	0.5
7	P20	32.7	0.6	0.6	0.5
7	P21	32.3	0.1	0.2	0.3
7	P22	32.7	0.5	0.6	0.7
7	P23	32.3	0.0	0.1	0.0
7	P24	32.7	-0.1	0.0	0.1
8	P1	32.9	0.4	0.5	0.8
8	P2	31.4	-0.3	-0.2	2.1
8	P3	32.2	0.8	0.9	1.0
8	P4	32.8	0.4	0.4	0.6
8	P5	32.6	0.6	0.7	0.8
8	P6	32.6	0.9	0.7	0.9
8	P7	32.0	0.7	0.7	0.9
8	P8	32.6	0.5	0.6	1.0
8	P9	32.7	0.8	0.9	1.6
8	P10	32.6	0.6	0.6	0.9
8	P11	32.8	0.4	0.3	0.8
8	P12	32.8	0.6	0.6	1.0
8	P13	33.2	0.3	0.3	0.5
8	P14	33.3	0.1	0.2	0.4
8	P15	33.3	0.3	0.4	0.5
8	P16	33.6	0.3	0.5	0.6
8	P17	33.4	0.6	0.7	0.8
8	P18	33.6	0.7	1.3	1.0
8	P19	33.3	0.3	0.8	0.6
8	P20	33.4	0.0	0.4	0.3
8	P21	32.8	0.3	0.3	0.6
8	P22	32.5	0.2	0.2	0.3
8	P23	32.7	0.3	0.5	0.6

8	P24	32.6	0.3	0.3	0.4

Group A2

Board	mOhm values Position	Actual Initial	Delta 100 Cycles	Delta Thermal	Delta Humidity
1	P1	33.2	-0.2	-0.2	-0.6
1	P2	32.5	1.2	1.3	0.8
1	P3	33.0	0.3	0.1	-0.1
1	P4	32.3	1.0	0.8	0.7
1	P5	32.0	1.1	1.1	0.8
1	P6	33.1	0.0	0.3	-0.1
1	P7	33.1	0.0	0.2	-0.1
1	P8	32.7	-0.1	0.3	-0.1
1	P9	33.1	-0.5	-0.2	-0.5
1	P10	33.3	-0.4	-0.2	-0.6
1	P11	32.5	-1.8	0.4	0.9
1	P12	32.9	0.0	0.4	0.1
1	P13	32.8	-0.2	0.2	0.0
1	P14	33.0	0.0	0.3	-0.1
1	P15	33.2	-0.2	-0.1	-0.4
1	P16	33.5	-0.4	-0.1	-0.6
1	P17	34.1	-0.7	-0.3	-0.6
1	P18	33.6	0.3	0.8	0.5
1	P19	34.1	-0.5	0.0	0.1
1	P20	33.8	0.0	0.1	-0.2
1	P21	33.2	0.0	0.4	0.0
1	P22	33.1	-0.2	0.0	-0.3
1	P23	32.5	1.0	1.1	0.6
1	P24	33.3	-0.3	-0.2	-0.6
2	P1	30.6	0.0	1.9	1.8
2	P2	32.4	-0.1	0.3	-0.1
2	P3	32.5	-0.1	0.1	-0.2
2	P4	32.2	0.1	0.4	0.0
2	P5	32.3	0.0	0.2	0.0
2	P6	32.3	0.0	0.0	-0.1
2	P7	32.2	-0.1	0.2	0.0
2	P8	32.7	-0.3	-0.2	-0.4
2	P9	32.6	-0.2	0.0	0.0
2	P10	32.5	-0.2	-0.1	-0.3
2	P11	33.0	0.0	0.2	0.2
2	P12	32.5	-0.1	0.2	0.0
2	P13	32.4	-0.1	0.0	-0.1
2	P14	32.5	0.0	0.1	0.0
2	P15	32.9	-0.1	0.1	-0.1
2	P16	32.7	0.0	0.1	-0.1
2	P17	33.0	-0.1	0.1	0.4
2	P18	33.2	-0.3	0.1	-0.1
2	P19	32.4	0.2	0.3	0.3
2	P20	30.8	1.5	1.6	1.5
2	P21	32.0	-0.1	0.0	-0.1

2	P22	31.5	1.3	1.6	1.1
2	P23	29.5	2.7	2.7	2.5
2	P24	32.8	0.2	0.2	0.0
3	P1	33.0	0.0	0.4	0.1
3	P2	32.6	0.0	0.3	0.0
3	P3	32.7	-0.3	0.2	-0.1
3	P4	32.8	-0.1	0.3	-0.1
3	P5	32.9	0.0	0.4	0.1
3	P6	33.1	-0.3	0.1	-0.3
3	P7	33.1	-0.1	0.3	0.0
3	P8	33.1	0.0	0.4	0.2
3	P9	33.3	0.1	0.4	0.3
3	P10	33.2	0.4	0.7	0.6
3	P11	32.4	0.3	0.7	0.5
3	P12	33.1	0.1	0.5	0.4
3	P13	33.3	0.3	0.6	0.6
3	P14	33.0	0.2	0.5	0.5
3	P15	33.2	0.1	0.3	0.3
3	P16	33.4	0.2	0.5	0.5
3	P17	33.3	0.1	0.3	0.5
3	P18	33.5	-0.1	0.2	0.0
3	P19	33.2	0.2	0.6	0.5
3	P20	33.2	0.2	0.6	0.4
3	P21	32.9	-0.1	0.3	0.4
3	P22	32.7	-0.2	0.1	0.2
3	P23	32.7	0.2	0.6	0.3
3	P24	32.7	-0.1	0.3	0.0
4	P1	29.7	1.4	2.6	2.4
4	P2	28.5	4.0	4.4	4.1
4	P3	29.2	0.6	1.3	3.1
4	P4	29.4	-0.1	0.8	2.9
4	P5	29.4	1.4	3.1	2.8
4	P6	30.0	2.3	2.5	2.3
4	P7	30.5	1.4	2.3	2.0
4	P8	30.6	-1.2	-0.4	-0.2
4	P9	30.1	-0.7	0.8	1.0
4	P10	29.4	1.3	1.0	1.5
4	P11	28.4	0.8	1.0	1.7
4	P12	29.2	1.6	1.4	1.2
4	P13	30.1	1.6	2.5	2.5
4	P14	28.8	2.5	2.2	3.4
4	P15	30.0	2.5	1.5	3.3
4	P16	29.8	1.0	0.7	2.8
4	P17	30.2	1.9	3.2	3.6
4	P18	32.3	0.6	0.8	0.5
4	P19	32.8	-0.3	0.0	-0.2
4	P20	29.8	2.1	3.2	2.9
4	P21	30.3	2.6	3.1	2.9
4	P22	30.0	2.7	2.8	2.6

4	P23	29.8	2.2	2.7	2.8
4	P24	30.5	1.1	2.3	2.1
5	P1	32.2	0.1	0.4	0.4
5	P2	32.2	0.2	0.3	0.4
5	P3	32.5	0.3	0.4	0.4
5	P4	32.5	0.1	0.3	0.4
5	P5	32.2	0.1	0.3	0.6
5	P6	32.4	0.0	0.4	0.3
5	P7	31.9	0.3	0.5	0.5
5	P8	32.2	-0.1	0.0	0.3
5	P9	32.6	0.1	0.3	0.4
5	P10	32.6	0.0	0.2	0.3
5	P11	32.6	0.0	0.1	0.1
5	P12	32.7	0.0	0.2	0.1
5	P13	32.7	0.2	0.5	0.2
5	P14	32.8	0.1	0.3	0.2
5	P15	32.6	0.1	0.4	0.2
5	P16	32.7	0.0	0.4	0.2
5	P17	33.0	0.1	0.7	0.3
5	P18	33.0	-0.1	0.6	0.2
5	P19	32.8	0.3	0.9	0.5
5	P20	32.7	0.3	0.7	0.4
5	P21	32.3	0.1	0.5	0.3
5	P22	32.4	0.1	0.5	0.1
5	P23	32.3	0.1	0.6	0.2
5	P24	32.4	0.1	0.4	0.1
6	P1	32.3	0.2	0.4	0.2
6	P2	32.2	0.2	0.1	0.0
6	P3	32.7	-0.2	-0.1	-0.3
6	P4	32.2	0.5	0.5	0.2
6	P5	32.4	0.1	0.0	0.0
6	P6	33.0	-0.2	0.0	-0.2
6	P7	32.1	0.2	0.0	-0.3
6	P8	32.4	0.3	0.3	0.1
6	P9	32.6	-0.2	-0.1	-0.3
6	P10	32.3	0.0	0.1	-0.1
6	P11	32.7	0.0	0.1	-0.1
6	P12	32.6	0.0	0.2	0.0
6	P13	33.2	0.2	0.3	0.4
6	P14	32.9	0.1	0.0	0.0
6	P15	32.7	0.1	0.3	0.2
6	P16	32.7	-0.1	0.0	0.2
6	P17	32.9	0.0	0.2	0.3
6	P18	32.9	0.2	0.4	0.7
6	P19	32.7	0.0	0.1	0.1
6	P20	32.8	0.2	0.1	0.2
6	P21	32.6	0.1	0.1	0.0
6	P22	32.4	0.0	0.0	-0.1
6	P23	32.7	0.3	0.3	0.2

6	P24	32.7	0.4	0.4	0.3
7	P1	29.1	2.6	4.1	4.1
7	P2	29.0	2.1	3.8	4.2
7	P3	30.4	1.6	2.2	2.2
7	P4	29.3	3.3	3.6	3.4
7	P5	30.6	2.1	2.5	2.5
7	P6	28.4	3.9	4.1	3.8
7	P7	28.3	4.4	4.7	4.4
7	P8	32.5	0.2	0.5	0.5
7	P9	32.9	-0.2	0.4	0.8
7	P10	32.8	0.2	0.4	0.4
7	P11	32.5	0.3	0.5	0.5
7	P12	32.5	0.4	0.6	0.7
7	P13	32.5	0.5	0.8	0.9
7	P14	32.6	0.3	0.6	0.6
7	P15	32.7	0.1	0.4	0.5
7	P16	33.2	0.2	0.6	1.0
7	P17	33.1	0.4	1.0	0.9
7	P18	33.1	0.2	0.9	0.5
7	P19	32.7	-0.3	0.5	0.3
7	P20	30.1	2.2	2.7	2.6
7	P21	32.3	0.0	0.5	0.5
7	P22	32.2	0.1	0.7	0.6
7	P23	32.2	0.2	0.6	0.6
7	P24	29.1	1.2	3.7	3.9
8	P1	30.2	2.4	3.3	3.1
8	P2	29.1	1.6	1.0	1.3
8	P3	29.8	2.0	0.7	1.3
8	P4	29.8	1.8	2.2	2.1
8	P5	31.7	0.8	1.1	0.8
8	P6	32.5	0.1	0.3	0.1
8	P7	31.8	0.2	0.4	0.2
8	P8	32.3	0.0	0.3	0.2
8	P9	32.8	0.0	0.2	0.1
8	P10	32.7	0.1	0.3	0.1
8	P11	32.5	0.1	0.3	0.1
8	P12	32.7	0.1	0.5	0.4
8	P13	32.8	0.0	0.3	0.2
8	P14	32.8	0.3	0.5	0.3
8	P15	32.9	0.1	0.4	0.3
8	P16	32.9	0.4	0.8	0.7
8	P17	32.8	0.4	1.0	0.7
8	P18	33.1	0.3	0.7	0.6
8	P19	32.8	0.3	0.7	0.4
8	P20	30.3	2.4	2.6	2.5
8	P21	32.6	0.1	0.3	0.1
8	P22	30.2	2.2	3.7	2.5
8	P23	31.0	2.3	2.3	2.1
8	P24	31.3	1.6	2.0	2.2

DATA Continued

GAS TIGHT:

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	32.5	0.3
1	P2	31.9	0.3
1	P3	32.6	0.3
1	P4	32.3	0.4
1	P5	32.6	0.3
1	P6	32.6	0.4
1	P7	32.1	0.4
1	P8	32.2	0.4
1	P9	32.9	0.4
1	P10	32.4	0.3
1	P11	32.0	0.4
1	P12	32.6	0.4
1	P13	32.5	0.4
1	P14	32.9	0.3
1	P15	32.8	0.3
1	P16	32.7	0.3
1	P17	33.4	0.4
1	P18	32.9	0.4
1	P19	32.8	0.3
1	P20	32.9	0.3
1	P21	33.2	0.4
1	P22	32.5	0.4
1	P23	32.7	0.3
1	P24	33.1	0.4
2	P1	31.3	0.6
2	P2	31.6	0.1
2	P3	32.0	0.9
2	P4	31.3	0.3
2	P5	33.3	0.2
2	P6	33.1	0.3
2	P7	32.6	0.2
2	P8	32.8	0.2
2	P9	33.1	0.2
2	P10	33.0	0.2
2	P11	31.1	0.6
2	P12	31.2	0.5
2	P13	31.1	0.1
2	P14	33.0	0.2
2	P15	33.2	0.2
2	P16	33.7	0.2
2	P17	33.5	0.2
2	P18	33.1	0.2
2	P19	32.9	0.3
2	P20	33.4	0.2
2	P21	33.0	0.2

2	P22	33.2	0.4
2	P23	33.1	0.3
2	P24	33.1	0.3
3	P1	33.4	0.4
3	P2	32.7	0.3
3	P3	32.9	0.3
3	P4	32.6	0.3
3	P5	32.7	0.3
3	P6	32.6	0.3
3	P7	32.2	0.3
3	P8	31.0	1.3
3	P9	32.9	0.3
3	P10	31.4	1.0
3	P11	31.7	0.2
3	P12	32.8	0.3
3	P13	29.6	0.7
3	P14	33.1	0.3
3	P15	32.6	0.3
3	P16	32.6	0.3
3	P17	32.8	0.3
3	P18	32.9	0.3
3	P19	32.6	0.3
3	P20	32.3	0.3
3	P21	32.2	0.3
3	P22	32.3	0.3
3	P23	32.6	0.3
3	P24	32.7	0.3
4	P1	32.7	0.2
4	P2	32.8	0.2
4	P3	32.9	0.3
4	P4	32.4	0.2
4	P5	32.4	0.3
4	P6	32.5	0.3
4	P7	32.2	0.3
4	P8	32.6	0.3
4	P9	32.8	0.3
4	P10	32.9	0.3
4	P11	33.2	0.3
4	P12	32.9	0.3
4	P13	33.1	0.3
4	P14	32.9	0.3
4	P15	33.0	-0.1
4	P16	33.1	0.3
4	P17	33.2	0.3
4	P18	33.2	-0.9
4	P19	33.3	0.4
4	P20	32.8	0.4
4	P21	33.2	0.4
4	P22	33.1	0.7
4	P23	33.2	0.3

4	P24	33.3	0.3
5	P1	32.0	0.3
5	P2	32.2	0.1
5	P3	32.3	0.3
5	P4	32.7	0.3
5	P5	32.2	0.3
5	P6	32.1	0.1
5	P7	32.1	0.1
5	P8	32.8	0.2
5	P9	33.2	0.2
5	P10	32.8	0.3
5	P11	32.8	0.2
5	P12	32.5	0.2
5	P13	33.1	-0.8
5	P14	32.6	0.0
5	P15	32.5	0.2
5	P16	32.8	-0.7
5	P17	33.4	0.2
5	P18	31.3	0.2
5	P19	33.6	0.1
5	P20	32.8	0.3
5	P21	33.6	0.1
5	P22	32.6	0.3
5	P23	32.6	0.1
5	P24	32.1	0.2
6	P1	32.2	0.4
6	P2	30.6	1.3
6	P3	30.4	0.7
6	P4	31.2	0.6
6	P5	31.7	0.8
6	P6	30.2	0.6
6	P7	31.9	0.2
6	P8	32.7	0.3
6	P9	32.8	0.2
6	P10	32.4	0.3
6	P11	32.8	0.2
6	P12	32.9	0.2
6	P13	33.0	0.2
6	P14	32.8	0.3
6	P15	32.8	0.2
6	P16	33.1	-0.6
6	P17	33.1	0.1
6	P18	33.1	0.1
6	P19	33.1	0.2
6	P20	32.7	0.2
6	P21	33.3	0.3
6	P22	33.2	0.2
6	P23	33.0	0.3
6	P24	30.8	0.9
7	P1	33.0	0.3

7	P2	32.6	0.3
7	P3	34.1	0.2
7	P4	33.6	0.2
7	P5	32.8	0.3
7	P6	33.0	0.3
7	P7	32.8	0.3
7	P8	32.5	0.0
7	P9	30.2	0.2
7	P10	31.5	0.2
7	P11	32.3	0.4
7	P12	31.5	0.3
7	P13	33.1	0.3
7	P14	31.4	0.8
7	P15	30.7	0.1
7	P16	33.0	0.2
7	P17	33.0	0.2
7	P18	32.9	0.3
7	P19	32.9	0.3
7	P20	31.5	1.3
7	P21	32.8	0.3
7	P22	34.0	0.3
7	P23	34.2	0.3
7	P24	32.8	0.2
8	P1	33.2	0.1
8	P2	32.2	0.8
8	P3	32.6	0.2
8	P4	32.9	0.2
8	P5	29.9	1.3
8	P6	30.3	1.1
8	P7	32.1	0.2
8	P8	32.4	0.2
8	P9	32.8	-0.2
8	P10	29.8	0.3
8	P11	32.7	0.4
8	P12	33.1	0.1
8	P13	33.1	-0.1
8	P14	29.3	0.4
8	P15	32.8	0.2
8	P16	32.8	0.2
8	P17	33.3	0.2
8	P18	33.3	0.3
8	P19	33.9	0.2
8	P20	32.6	0.2
8	P21	32.9	0.3
8	P22	32.7	0.3
8	P23	32.4	0.7
8	P24	32.7	0.2

EQUIPMENT AND CALIBRATION SCHEDULES

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 #: MO-03
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0791975
Accuracy: See Manual
… Last Cal: 06/16/2010, Next Cal: 06/16/2011

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: 02/16/2011, Next Cal: 02/16/2012

Equipment #: TCT-06
Description: Test Resources test stand
Manufacturer: Test Resources
Model:
Serial #:
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Speed Accuracy: +/- 5% of indicated speed;
… Last Cal: 05/07/2010, Next Cal: 05/07/2011

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 08/16/2010, Next Cal: 04/16/2011

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 11/30/2010, Next Cal: 11/30/2011