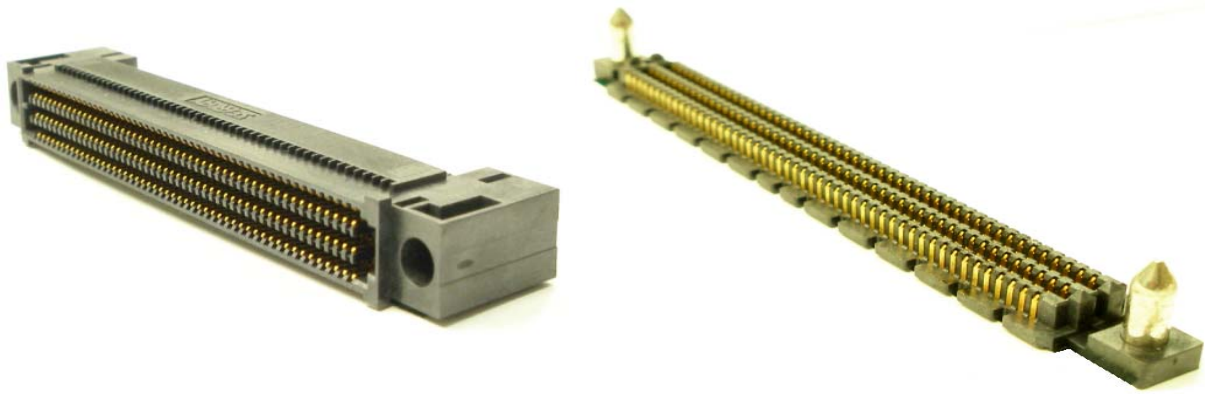




Project Number:		Tracking Code: TC0853--2158_ReportRev2	
Requested by: Corey Rose		Date: 7/26/2013	Product Rev: 2
Part #: SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP		Lot #: 2521323-0	Tech: Rodney Riley, Gary Lomax, & Troy Cook Eng: Troy Cook
Part description: SEAF-RA			Qty to test: 88
Test Start: 12/31/2008		Test Completed: 3/20/2009	



DESIGN VERIFICATION TEST REPORT

PART DESCRIPTION

SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP

Tracking Code: TC0853--2158_ReportRev2	Part #: SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP
Part description: SEAF -RA	

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

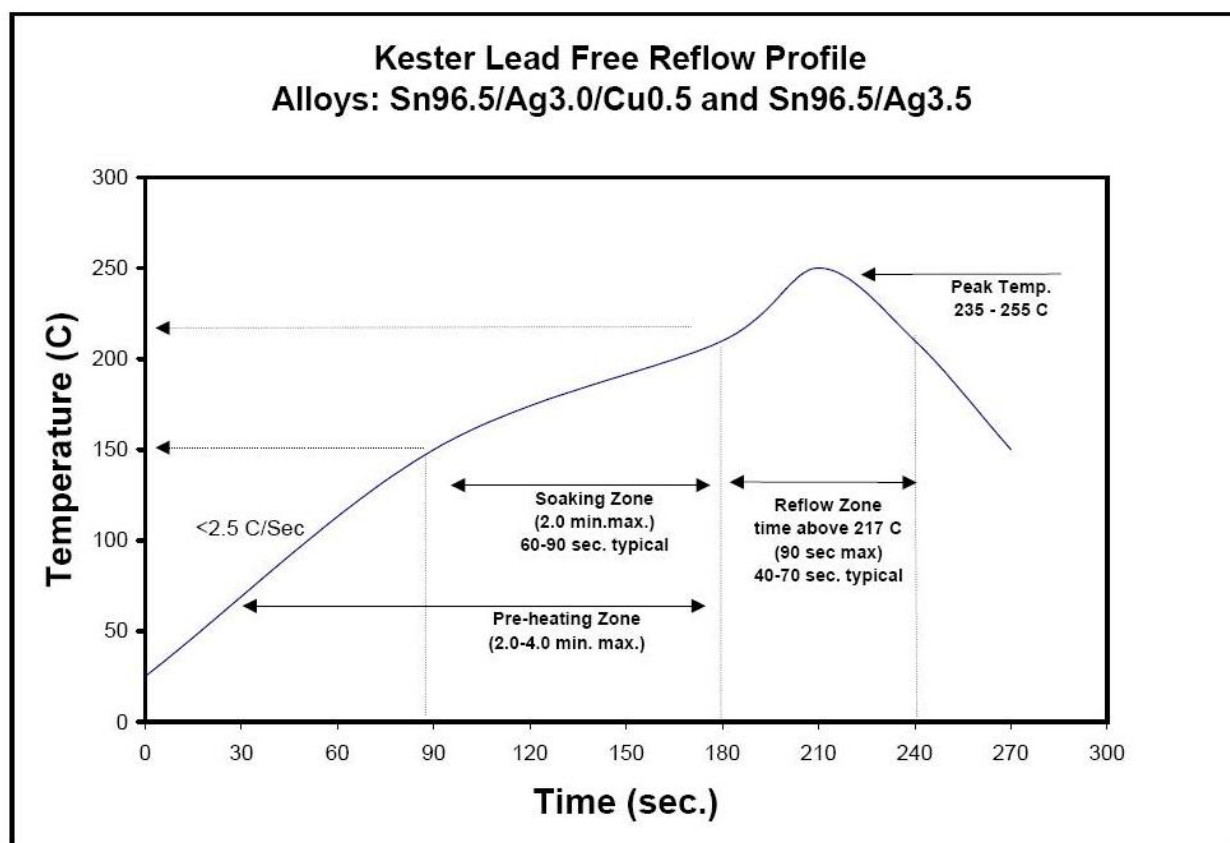
To perform the following tests: Test per the provided test plan.

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-101307-TST-XX

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)

Tracking Code: TC0853--2158_ReportRev2

Part #: SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP

Part description: SEAF-RA

FLOWCHARTS

Current Carrying Capacity

3 Mated Assemblies Each

TEST STEP	GROUP A 3 Mated Assemblies	GROUP B 3 Mated Assemblies	GROUP C 3 Mated Assemblies	GROUP D 3 Mated Assemblies	GROUP E 3 Mated Assemblies
	2 CONTACT POWERED	4 CONTACTS POWERED	6 CONTACTS POWERED	8 CONTACTS POWERED	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

Mating/Unmating/Normal Force

TEST STEP	GROUP A 10 Boards 100 Cycles	GROUP B1 Individual Contacts (10) min	GROUP B2 Individual Contacts (10) min
01	Contact Meas.	Setup Approve	Setup Approve
02	Mating / Unmating	Normal Force	Thermal Aging (Mated)
03	Data Review	Data Review	Normal Force
04	100 Cycles		
05	Mating / Unmating		
06	Contact Meas.		
07	Data Review		
08	Thermal Aging (Mated)		
09	Mating / Unmating		
10	Contact Meas.		
11	Data Review		
12	Humidity (Mated)		
13	Mating / Unmating		
14	Contact Meas.		

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

Time Condition 'B' (250 hours)

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

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

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

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 2 Boards Ambient Pin to Pin	GROUP B1 2 Boards Ambient Pin to Pin	GROUP B2 2 Boards Thermal Pin to Pin	GROUP B3 2 Boards Humidity Pin to Pin
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 '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

IR / DWV

TEST STEP	GROUP A 2 Boards Ambient Row to Row	GROUP B1 2 Boards Ambient Row to Row	GROUP B2 2 Boards Thermal Row to Row	GROUP B3 2 Boards Humidity Row to Row
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			

FLOWCHARTS Continued**Durability/Thermal Age/Cyclic Humidity**

TEST STEP	GROUP A 200 Points 100 Cycles
01	LLCR-1
02	Data Review
03	100 Cycles
04	LLCR-2
05	Data Review
06	Thermal Age
07	LLCR-3
08	Data Review
09	Cyclic Humidity
10	LLCR-4

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

Time Condition 'B' (250 hours)

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

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

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

LLCR = EIA-364-23, LLCR

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

Gas Tight

TEST STEP	GROUP A 200 Points (min)
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 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° C
 - c. 95° C
 - d. 115° C
- 8) Typically, neighboring contacts (in close proximity to maximize heat build up) are energized.
- 9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the maximum temperature in the vicinity of the heat generation area.
- 10) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
- 11) Hook-up wire cross section is larger than the cross section of any connector leads/PC board traces, jumpers, etc.
- 12) Hook-up wire length is longer than the minimum specified in the referencing standard.

CONTACT GAPS:

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

MATING/UNMATING:

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

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

- 1) Reference document: EIA-364-04, *Normal Force Test Procedure for Electrical Connectors*.
- 2) The contacts shall be tested in the connector housing.
- 3) If necessary, a “window” shall be made in the connector body to allow a probe to engage and deflect the contact at the same attitude and distance (plus 0.05 mm [0.002”]) as would occur in actual use.
- 4) The connector housing shall be placed in a holding fixture that does not interfere with or otherwise influence the contact force or deflection.
- 5) Said holding fixture shall be mounted on a floating, adjustable, X-Y table on the base of the Dillon TC², 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 TC² software in order to acquire and record the test data.
- 10) The permanent set of each contact shall be measured within the TC² software.
- 11) The acquired data shall be graphed with the deflection data on the X-axis and the force data on the Y-axis and a print out will be stored with the Tracking Code paperwork.

INSULATION RESISTANCE (IR):

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

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

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

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

- 1) PROCEDURE:
 - a. Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.
 - b. Test Conditions:
 - i. Between Adjacent Contacts or Signal-to-Ground
 - ii. Barometric Test Condition 1
 - iii. Rate of Application 500 V/Sec
 - iv. Test Voltage (VAC) until breakdown occurs
- 2) MEASUREMENTS/CALCULATIONS

- a. The breakdown voltage shall be measured and recorded.
- b. The dielectric withstanding voltage shall be recorded as 75% of the minimum breakdown voltage.
- c. The working voltage shall be recorded as one-third (1/3) of the dielectric withstanding voltage (one-fourth of the breakdown voltage).

LLCR:

- 1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
 - a. $\leq +5.0$ 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 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° 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-----2.1A per contact with 4 adjacent contacts powered
- CCC for a 30°C Temperature Rise-----1.5A per contact with 8 adjacent contacts powered
- CCC for a 30°C Temperature Rise-----1.3A per contact with 12 adjacent contacts powered
- CCC for a 30°C Temperature Rise-----1.1A per contact with 16 adjacent contacts powered
- CCC for a 30°C Temperature Rise-----0.5A per contact with all adjacent contacts powered

Contact Gaps

- Initial
 - Min-----0.034"
 - Max-----0.041"
- After 100 Cycles
 - Min-----0.035"
 - Max-----0.042"
- Thermal
 - Min-----0.037"
 - Max-----0.043"
- Humidity
 - Min-----0.037"
 - Max-----0.043"

Mating – Unmating Forces

- Initial
 - Mating
 - Min-----10.0 lbf
 - Max-----12.1 lbf
 - Unmating
 - Min-----5.1 lbf
 - Max-----6.8 lbf
- After 100 Cycles
 - Mating
 - Min-----10.7 lbf
 - Max-----12.4 lbf
 - Unmating
 - Min-----6.0 lbf
 - Max-----9.7 lbf
- Thermal
 - Mating
 - Min-----9.3 lbf
 - Max-----11.0 lbf
 - Unmating
 - Min-----5.2 lbf
 - Max-----8.8 lbf
- Humidity
 - Mating
 - Min-----8.6 lbf
 - Max-----10.3 lbf
 - Unmating
 - Min-----5.1 lbf
 - Max-----9.3 lbf

Normal Force at .007" deflection• **Initial**

o Min-----36.40 gm Set ---- 0.0001"
o Max -----40.30 gm Set ---- 0.0002"

Normal Force at .005" deflection• **Thermal**

o Min-----23.70 gm
o Max -----26.40 gm

Insulation Resistance minimums, IR• **Initial**

o Mated-----100,000 Meg Ω ----- Pass
o Unmated -----100,000 Meg Ω

• **Thermal**

o Mated-----100,000 Meg Ω
o Unmated -----100,000 Meg Ω

• **Humidity**

o Mated-----100,000 Meg Ω
o Unmated -----100,000 Meg Ω

Dielectric Withstanding Voltage minimums, DWV (Pin to Pin)• **Initial**o **Breakdown**

▪ Mated -----1,060 VAC
▪ Unmated-----1,100 VAC

o **DWV**

▪ Mated -----795 VAC
▪ Unmated-----825 VAC

o **Working voltage**

▪ Mated -----265 VAC
▪ Unmated-----275 VAC

• **Thermal**o **Breakdown**

▪ Mated -----1,000 VAC
▪ Unmated-----1,100 VAC

o **DWV**

▪ Mated -----750 VAC
▪ Unmated-----825 VAC

o **Working voltage**

▪ Mated -----250 VAC
▪ Unmated-----275 VAC

• **Humidity**o **Breakdown**

▪ Mated -----1,060 VAC
▪ Unmated-----1,100 VAC

o **DWV**

▪ Mated -----795 VAC
▪ Unmated-----825 VAC

o **Working voltage**

▪ Mated -----265 VAC
▪ Unmated-----275 VAC

Dielectric Withstanding Voltage minimums, DWV (Row to Row)

- **Initial**

- **Breakdown**

- Mated -----1,120 VAC
 - Unmated-----1,150 VAC

- **DWV**

- Mated -----840 VAC
 - Unmated-----863 VAC

- **Working voltage**

- Mated -----280 VAC
 - Unmated-----288 VAC

- **Thermal**

- **Breakdown**

- Mated -----1,200 VAC
 - Unmated-----1,200 VAC

- **DWV**

- Mated -----900 VAC
 - Unmated-----900 VAC

- **Working voltage**

- Mated -----300 VAC
 - Unmated-----300 VAC

- **Humidity**

- **Breakdown**

- Mated -----1,200 VAC
 - Unmated-----1,200 VAC

- **DWV**

- Mated -----900 VAC
 - Unmated-----900 VAC

- **Working voltage**

- Mated -----300 VAC
 - Unmated-----300 VAC

LLCR Durability (200 LLCR test points)

- **Initial**----- 17.1 mOhms Max
- **Durability, 100 Cycles**
 - o <= +5.0 mOhms ----- 200 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure
- **Thermal**
 - o <= +5.0 mOhms ----- 197 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 3 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure
- **Humidity**
 - o <= +5.0 mOhms ----- 197 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 2 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 1 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

LLCR Gas Tight (200 LLCR test points)

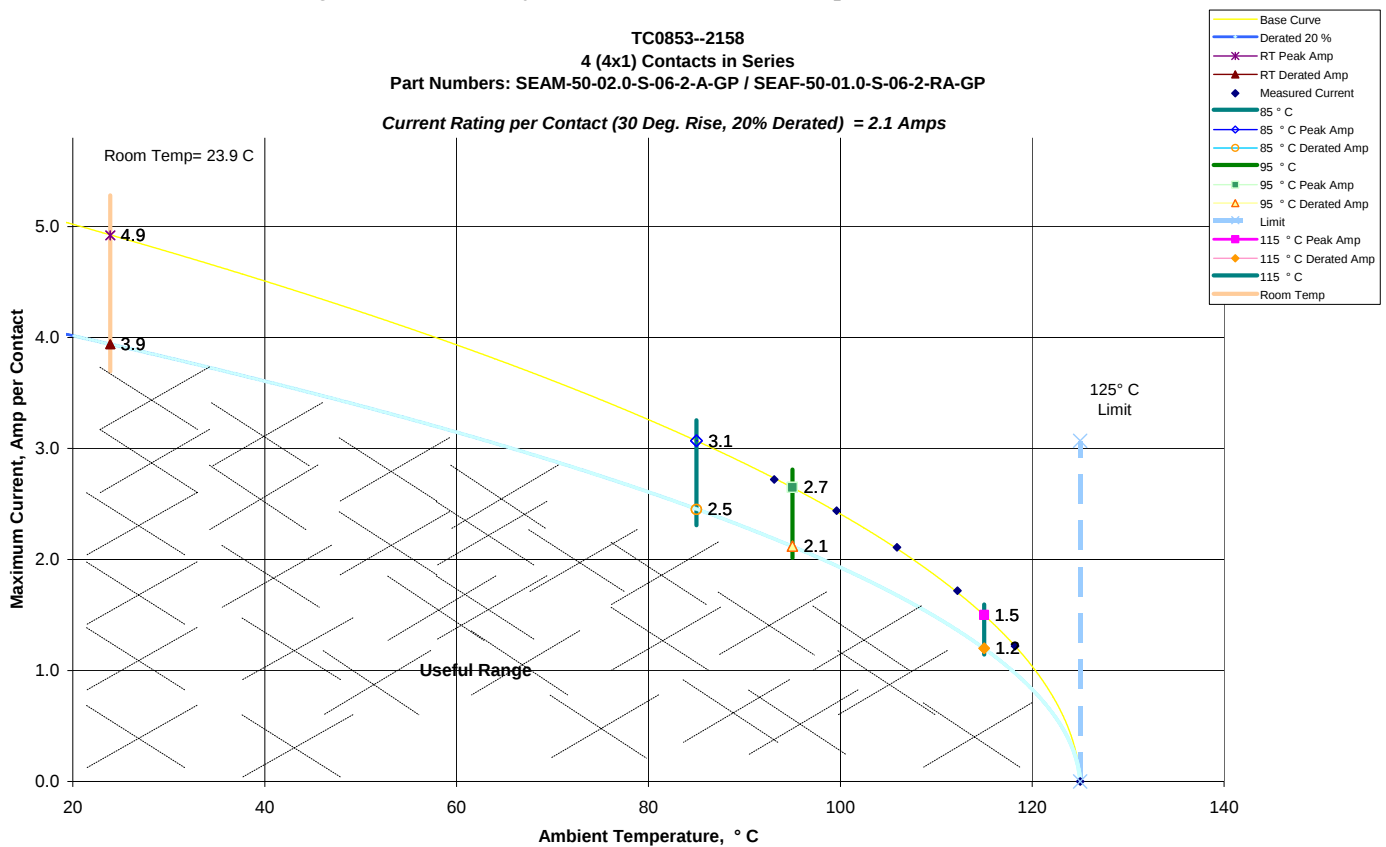
- **Initial**----- 18.1 mOhms Max
- **Gas-Tight**
 - o <= +5.0 mOhms ----- 200 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

DATA SUMMARIES

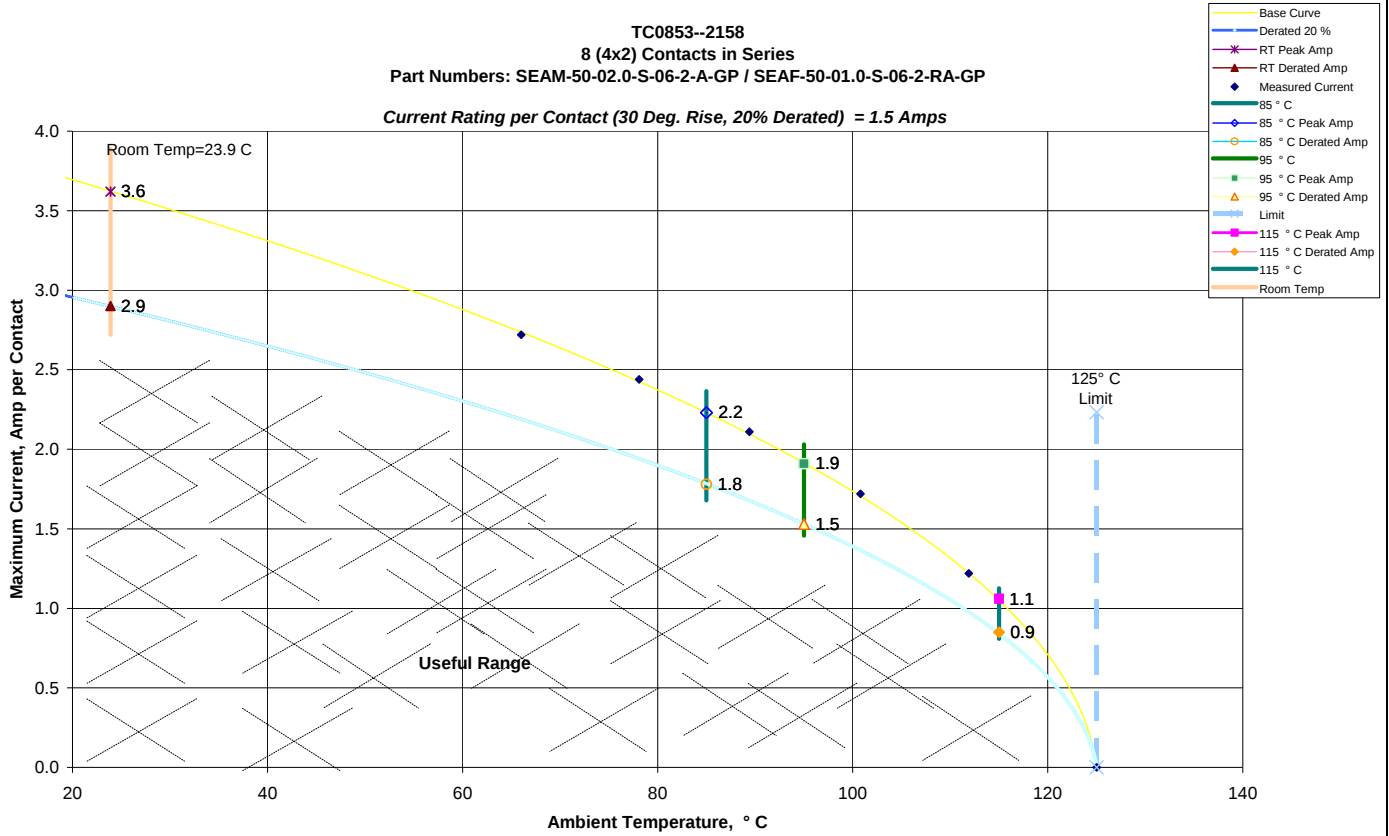
TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 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:

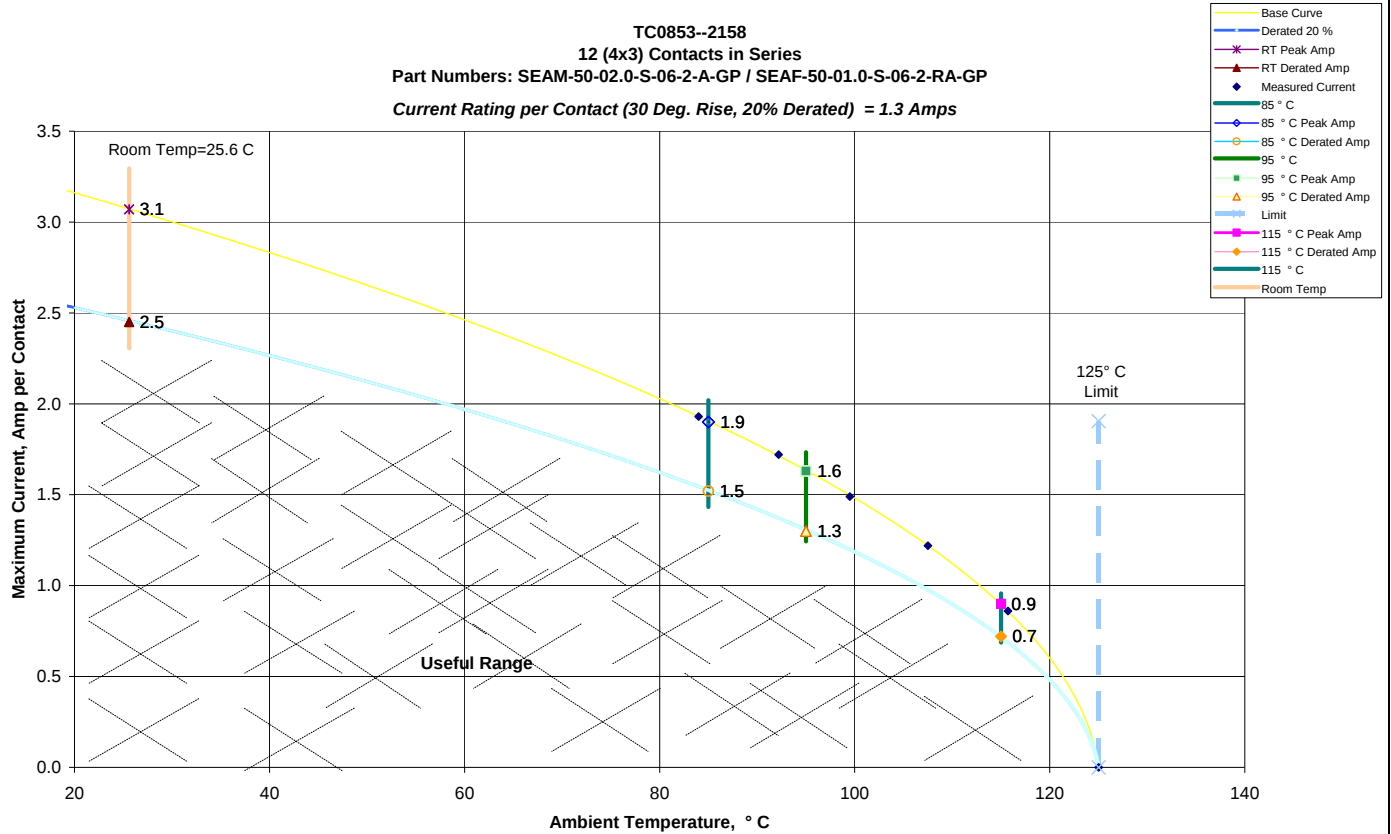
- a. Linear configuration with 4 adjacent conductors/contacts powered



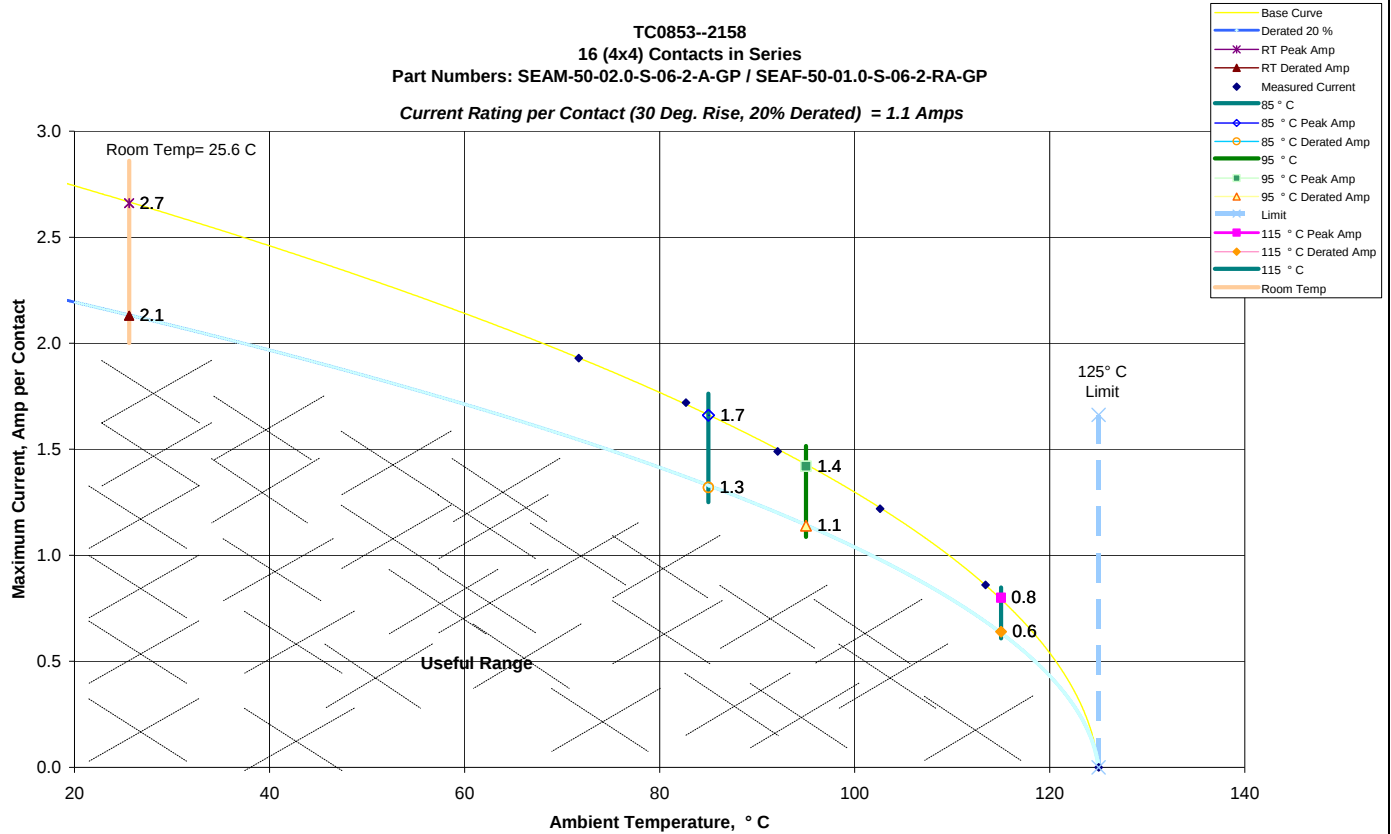
b. Linear configuration with 8 adjacent conductors/contacts powered



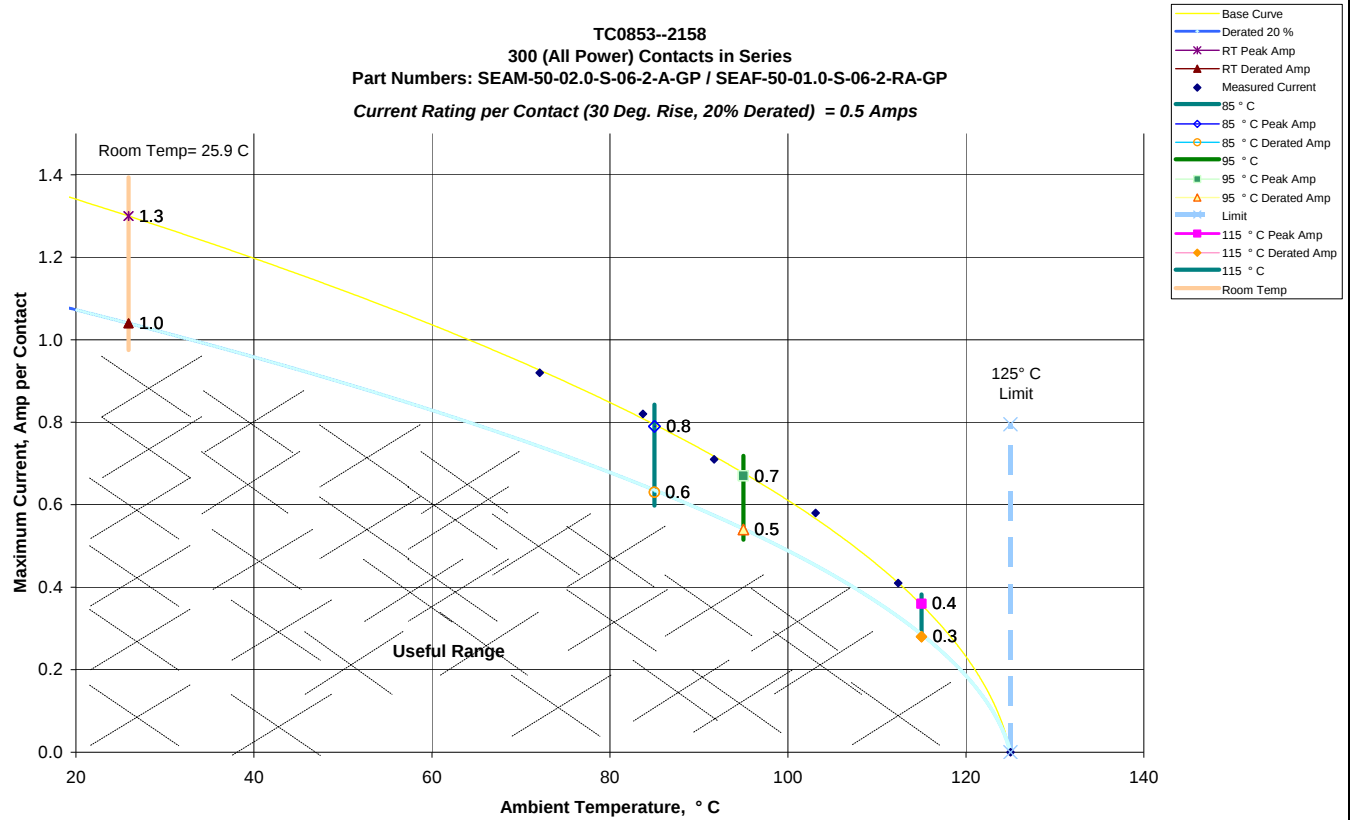
c. Linear configuration with 12 adjacent conductors/contacts powered



d. Linear configuration with 16 adjacent conductors/contacts powered



e. Linear configuration with 300 adjacent conductors/contacts powered



DATA SUMMARIES Continued**CONTACT GAPS:**

Initial		After 100 Cycles		After Thermal		After Humidity	
Measured in inches		Measured in inches		Measured in inches		Measured in inches	
<i>Minimum</i>	0.0342	<i>Minimum</i>	0.0353	<i>Minimum</i>	0.0368	<i>Minimum</i>	0.0369
<i>Maximum</i>	0.0412	<i>Maximum</i>	0.0419	<i>Maximum</i>	0.0428	<i>Maximum</i>	0.0428
<i>Average</i>	0.0359	<i>Average</i>	0.0367	<i>Average</i>	0.0386	<i>Average</i>	0.0386
<i>St. Dev.</i>	0.0012	<i>St. Dev.</i>	0.0011	<i>St. Dev.</i>	0.0011	<i>St. Dev.</i>	0.0010
<i>Count</i>	240	<i>Count</i>	240	<i>Count</i>	216	<i>Count</i>	240

MATING/UNMATING:

	Initial				After 100 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	159.7	10.0	81.1	5.1	171.5	10.7	96.0	6.0
Maximum	193.9	12.1	109.3	6.8	198.4	12.4	154.7	9.7
Average	175.2	10.9	95.5	6.0	187.8	11.7	118.8	7.4
	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	149.3	9.3	83.4	5.2	137.9	8.6	81.7	5.1
Maximum	175.7	11.0	140.0	8.8	164.1	10.3	148.4	9.3
Average	161.9	10.1	107.0	6.7	145.9	9.1	102.6	6.4

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.

Initial	Deflections in inches Forces in Grams										
	<u>0.0007</u>	<u>0.0014</u>	<u>0.0021</u>	<u>0.0028</u>	<u>0.0035</u>	<u>0.0042</u>	<u>0.0049</u>	<u>0.0056</u>	<u>0.0063</u>	<u>0.0070</u>	<i>SET</i>
Averages	3.27	6.94	10.72	14.56	18.43	22.42	26.42	30.41	34.46	38.36	0.0001
Min	2.90	6.00	9.50	13.40	17.30	21.10	25.00	29.00	32.80	36.40	0.0001
Max	3.70	7.70	11.70	15.60	19.80	23.90	28.00	32.20	36.20	40.30	0.0002
St. Dev	0.263	0.552	0.678	0.778	0.944	1.023	1.093	1.018	1.066	1.118	0.0001
Count	10	10	10	10	10	10	10	10	10	10	10

Thermal	Deflections in inches Forces in Grams										
	<u>0.0005</u>	<u>0.0010</u>	<u>0.0015</u>	<u>0.0020</u>	<u>0.0025</u>	<u>0.0030</u>	<u>0.0035</u>	<u>0.0040</u>	<u>0.0045</u>	<u>0.0050</u>	<i>SET</i>
Averages	1.85	3.85	6.00	8.26	10.78	13.51	16.32	19.08	21.97	24.81	0.0000
Min	1.50	3.30	5.30	7.50	9.90	12.60	15.00	17.60	20.80	23.70	0.0000
Max	2.10	4.40	6.80	9.10	11.80	14.70	17.70	20.40	23.40	26.40	0.0000
St. Dev	0.227	0.384	0.492	0.599	0.707	0.808	0.900	0.924	0.998	1.045	0.0000
Count	10	10	10	10	10	10	10	10	10	10	10

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

	Pin-Pin	Row-Row
	Mated	Mated
Minimum	SEAF/SEAM	SEAF/SEAM
Initial	100,000	100,000
Thermal	100,000	100,000
Humidity	100,000	100,000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

		Pin-Pin		Row-Row	
		Mated	Unmated	Mated	Unmated
Minimum		SEAF/SEAM	SEAF	SEAF/SEAM	SEAF
Breakdown Voltage	Initial	1,060	1,100	1,120	1,150
	Thermal	1,000	1,100	1,200	1,200
	Humidity	1,060	1,100	1,200	1,200
DWV	Initial	795	825	840	863
	Thermal	750	825	900	900
	Humidity	795	825	900	900
Working Voltage	Initial	265	275	280	288
	Thermal	250	275	300	300
	Humidity	265	275	300	300

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	Jan. 21 2009	Jan. 21 2009	Feb. 02 2009	Feb. 16 2009
Room Temp C	22	20	24	23
RH	20%	21%	25%	27%
Name	Lomax	Lomax	Marshall	Marshall
mOhm values	Actual Initial	Delta 100 Cycles	Delta Thermal	Delta Humidity
Average	12.5	-0.8	0.2	0.4
St. Dev.	1.8	1.0	1.4	1.7
Min	8.3	-5.1	-3.4	-4.1
Max	17.1	2.7	7.4	12.8
Count	200	200	200	200

DATA SUMMARIES Continued**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	Jan. 21 2009	Jan. 21 2009
Room Temp C	22	23
RH	21%	21%
Name	Lomax	Marshall
mOhm values	Actual Initial	Delta Gas Tight
Average	12.3	0.0
St. Dev.	1.8	1.0
Min	8.0	-4.7
Max	18.1	3.3
Count	200	200

Part description: SEAF-RA

DATA**CONTACT GAPS:**

Initial										
Measured in inches										
Pos.#	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
1	0.0357	0.0365	0.0355	0.0365	0.0353	0.0358	0.0367	0.0359	0.0364	0.0353
2	0.0359	0.0352	0.0347	0.035	0.0342	0.0346	0.035	0.035	0.035	0.035
3	0.0356	0.0361	0.0361	0.036	0.0358	0.0365	0.0354	0.0362	0.0353	0.0361
4	0.0361	0.035	0.0362	0.0366	0.0361	0.037	0.0362	0.036	0.0365	0.0361
5	0.0363	0.0354	0.0353	0.035	0.0346	0.0361	0.0353	0.035	0.0357	0.0355
6	0.035	0.0356	0.0351	0.0358	0.0346	0.0357	0.0349	0.0349	0.0351	0.0353
7	0.0363	0.0368	0.0372	0.037	0.0368	0.0375	0.0374	0.0368	0.0362	0.0368
8	0.0362	0.036	0.0354	0.0362	0.035	0.0357	0.0356	0.0354	0.0357	0.0355
9	0.035	0.0354	0.035	0.0359	0.0349	0.0348	0.035	0.0347	0.0354	0.0354
10	0.0357	0.0368	0.0363	0.0358	0.0365	0.0365	0.0354	0.0365	0.0356	0.0363
11	0.0354	0.0357	0.0342	0.035	0.0347	0.0344	0.035	0.0353	0.0353	0.0351
12	0.0357	0.0354	0.0348	0.0357	0.0348	0.0344	0.0362	0.0352	0.0357	0.0351
13	0.0361	0.0369	0.0365	0.036	0.0363	0.0372	0.0365	0.035	0.0365	0.0356
14	0.0357	0.035	0.0351	0.0356	0.035	0.0347	0.0353	0.035	0.0356	0.0354
15	0.0351	0.0355	0.0352	0.0356	0.0345	0.0356	0.0347	0.0358	0.0352	0.0358
16	0.0364	0.0371	0.0368	0.0359	0.0372	0.0368	0.0361	0.037	0.0365	0.0375
17	0.0349	0.0353	0.0345	0.0345	0.0342	0.0358	0.0345	0.0349	0.0349	0.0352
18	0.0355	0.0351	0.0353	0.0372	0.0354	0.0354	0.037	0.0365	0.0362	0.0365
19	0.0361	0.037	0.0368	0.0372	0.0362	0.0373	0.0363	0.0357	0.0372	0.0374
20	0.0349	0.0351	0.035	0.0349	0.035	0.0355	0.0345	0.0352	0.0347	0.0353
21	0.0354	0.0365	0.0355	0.0356	0.0365	0.0359	0.0346	0.0365	0.0351	0.0353
22	0.0407	0.0367	0.0406	0.0405	0.0412	0.0359	0.0405	0.0371	0.0411	0.0409
23	0.0357	0.0369	0.0349	0.0346	0.0358	0.0366	0.0352	0.0364	0.0352	0.0362
24	0.037	0.0365	0.0375	0.037	0.0376	0.0371	0.0366	0.0368	0.0372	0.0372
After 100 Cycles										
Measured in inches										
Pos.#	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
1	0.0368	0.0375	0.0368	0.0372	0.0362	0.0366	0.0374	0.0364	0.0371	0.0366
2	0.0366	0.036	0.0359	0.0357	0.0357	0.0353	0.0357	0.0356	0.0357	0.036
3	0.0363	0.0368	0.0366	0.0364	0.0363	0.0365	0.0359	0.0365	0.0364	0.0366
4	0.0367	0.0359	0.0368	0.0372	0.0363	0.0372	0.0368	0.0368	0.0373	0.0366
5	0.0372	0.0365	0.0364	0.036	0.0357	0.0364	0.0361	0.036	0.0366	0.0364
6	0.0356	0.0364	0.0361	0.0362	0.0354	0.0364	0.0356	0.0359	0.0361	0.0359
7	0.0371	0.0373	0.0379	0.0373	0.0372	0.0379	0.0367	0.0372	0.037	0.0377
8	0.0369	0.0365	0.0359	0.0367	0.0361	0.0361	0.036	0.0363	0.0365	0.0367
9	0.0357	0.0358	0.036	0.0365	0.0357	0.0357	0.0369	0.0359	0.0365	0.0361
10	0.0367	0.0377	0.037	0.0365	0.0372	0.0372	0.0364	0.0376	0.0367	0.0372
11	0.0361	0.0363	0.0353	0.0358	0.0354	0.0354	0.0356	0.036	0.0365	0.0361
12	0.0364	0.0366	0.0358	0.0361	0.0356	0.0354	0.037	0.0359	0.0366	0.0358
13	0.0368	0.0376	0.0376	0.0367	0.037	0.037	0.0372	0.0359	0.0371	0.0365
14	0.0363	0.0362	0.0357	0.0358	0.0358	0.0364	0.0362	0.0358	0.0365	0.0363
15	0.036	0.0358	0.0365	0.0361	0.0358	0.0358	0.0357	0.0363	0.0364	0.0366
16	0.0369	0.0379	0.0376	0.0365	0.0378	0.0382	0.0369	0.0377	0.0368	0.0379
17	0.0355	0.0357	0.0357	0.0353	0.0355	0.0354	0.0354	0.0355	0.0354	0.0359
18	0.0361	0.0367	0.0364	0.0378	0.0365	0.0363	0.0372	0.0369	0.0368	0.0374
19	0.0372	0.0383	0.0369	0.0379	0.0371	0.0371	0.037	0.0376	0.0376	0.0381
20	0.0359	0.0362	0.0358	0.0354	0.0358	0.0358	0.0353	0.0357	0.0358	0.0357
21	0.0367	0.0376	0.0373	0.0366	0.0373	0.0368	0.0353	0.0357	0.0365	0.0363
22	0.0398	0.0395	0.0414	0.0408	0.0419	0.0414	0.0407	0.041	0.0413	0.0417
23	0.0362	0.0361	0.0371	0.0357	0.0365	0.0365	0.036	0.0363	0.0362	0.0372
24	0.0366	0.0379	0.0383	0.0375	0.0372	0.0376	0.0361	0.0372	0.0376	0.0382

Part description: SEAF-RA

DATA Continued

After Thermal										
Measured in inches										
Pos.#	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
1	0.0381	0.0395	0.0383	0.0384	Not Meas	0.0397	0.0383	0.0387	0.0396	0.0393
2	0.0377	0.0376	0.0377	0.0373	Not Meas	0.0376	0.038	0.0379	0.0381	0.0385
3	0.0417	0.0426	0.0416	0.0424	Not Meas	0.0419	0.0422	0.0424	0.0427	0.0428
4	0.0371	0.0387	0.0393	0.041	Not Meas	0.0391	0.0383	0.0388	0.0391	0.0394
5	0.0383	0.038	0.0391	0.0383	Not Meas	0.0391	0.0383	0.0386	0.0384	0.04
6	0.0383	0.0384	0.0394	0.0383	Not Meas	0.0394	0.0394	0.0388	0.0406	0.0397
7	0.0382	0.0391	0.0383	0.0376	Not Meas	0.0383	0.0383	0.0387	0.0392	0.0393
8	0.0388	0.0393	0.0375	0.0387	Not Meas	0.0385	0.0388	0.0385	0.0388	0.0392
9	0.0389	0.0392	0.0391	0.0395	Not Meas	0.0391	0.0392	0.0387	0.0394	0.0389
10	0.0384	0.0381	0.0384	0.0385	Not Meas	0.0385	0.0383	0.0394	0.0393	0.0393
11	0.038	0.0379	0.0379	0.038	Not Meas	0.0379	0.0378	0.0378	0.0382	0.0379
12	0.0392	0.0398	0.0395	0.0397	Not Meas	0.0398	0.0396	0.0387	0.0397	0.0392
13	0.0392	0.0387	0.0379	0.0391	Not Meas	0.0383	0.0396	0.0378	0.0394	0.0381
14	0.0372	0.0373	0.0372	0.0375	Not Meas	0.0376	0.0374	0.0377	0.0376	0.0377
15	0.0388	0.0396	0.0394	0.0395	Not Meas	0.0399	0.0388	0.0394	0.0387	0.0396
16	0.0381	0.0376	0.0377	0.0384	Not Meas	0.0381	0.0382	0.0377	0.0386	0.0384
17	0.0375	0.0373	0.0372	0.0376	Not Meas	0.0376	0.0378	0.0374	0.038	0.038
18	0.0381	0.0391	0.039	0.0395	Not Meas	0.0392	0.0395	0.0388	0.0388	0.0392
19	0.0374	0.0385	0.0381	0.0379	Not Meas	0.0384	0.0377	0.0387	0.0379	0.038
20	0.0377	0.0379	0.0372	0.0371	Not Meas	0.0368	0.0369	0.037	0.0372	0.0372
21	0.0381	0.0391	0.0376	0.0384	Not Meas	0.0375	0.0391	0.0378	0.0387	0.0383
22	0.0371	0.0385	0.0392	0.039	Not Meas	0.0388	0.0383	0.038	0.0389	0.0383
23	0.0375	0.037	0.0372	0.0371	Not Meas	0.0373	0.0371	0.037	0.0376	0.0373
24	0.0379	0.0388	0.0391	0.0383	Not Meas	0.0391	0.0395	0.0392	0.0398	0.0391
After Humidity										
Measured in inches										
Pos.#	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
1	0.0383	0.0387	0.0381	0.0392	0.038	0.0393	0.0387	0.0393	0.0383	0.0383
2	0.0384	0.0376	0.0373	0.0383	0.0369	0.0376	0.0377	0.0376	0.0386	0.0386
3	0.0379	0.0388	0.0383	0.0387	0.0383	0.0381	0.0383	0.038	0.0379	0.0379
4	0.0384	0.0383	0.0391	0.0397	0.0391	0.0389	0.0387	0.0389	0.0382	0.0382
5	0.039	0.0384	0.0382	0.0381	0.0384	0.0379	0.0378	0.038	0.0387	0.0387
6	0.0379	0.0382	0.0386	0.0386	0.0387	0.0374	0.0375	0.0383	0.0384	0.0384
7	0.0383	0.0393	0.0398	0.0394	0.0396	0.0389	0.0397	0.0387	0.0379	0.0379
8	0.0387	0.0381	0.0378	0.0389	0.0381	0.0379	0.0379	0.0381	0.0396	0.0396
9	0.0377	0.0381	0.0377	0.0387	0.0375	0.0387	0.0376	0.0383	0.0384	0.0384
10	0.0383	0.0396	0.0391	0.039	0.0394	0.0386	0.039	0.0385	0.0382	0.0382
11	0.0378	0.0381	0.037	0.0379	0.0372	0.0376	0.0378	0.037	0.0391	0.0391
12	0.0379	0.0386	0.0376	0.0383	0.0374	0.0384	0.0376	0.0377	0.0377	0.0377
13	0.039	0.0394	0.0396	0.039	0.0391	0.0394	0.0379	0.0398	0.0379	0.0379
14	0.0381	0.0376	0.0377	0.0376	0.0383	0.0381	0.0376	0.038	0.039	0.039
15	0.0381	0.0379	0.0383	0.0402	0.0378	0.0384	0.0386	0.0381	0.0383	0.0383
16	0.0391	0.0399	0.0394	0.0405	0.0398	0.0394	0.0401	0.0389	0.0384	0.0384
17	0.0376	0.0372	0.037	0.038	0.0376	0.0379	0.038	0.0385	0.0397	0.0397
18	0.0383	0.0383	0.0383	0.039	0.0385	0.0395	0.0387	0.0395	0.0382	0.0382
19	0.039	0.0398	0.0386	0.0389	0.0387	0.0395	0.0402	0.0401	0.0394	0.0394
20	0.0373	0.0378	0.0379	0.0376	0.0375	0.0378	0.0374	0.0387	0.04	0.04
21	0.0387	0.0396	0.0388	0.0394	0.0391	0.0381	0.0375	0.0392	0.0381	0.0381
22	0.0416	0.0414	0.0425	0.0375	0.0428	0.0425	0.0422	0.0428	0.0383	0.0383
23	0.0379	0.0379	0.0382	0.0375	0.0382	0.0378	0.0379	0.0383	0.0426	0.0426
24	0.0386	0.0396	0.0398	0.0394	0.0397	0.0389	0.0391	0.0397	0.0383	0.0383

Part description: SEAF-RA

DATA Continued**MATING/UNMATING:**

Sample#	Initial		After 100 Cycles		After Thermal		After Humidity	
	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>
1	10.83	5.07	12.13	6.32	9.58	6.42	8.66	5.11
2	10.20	5.08	11.32	6.00	9.66	5.21	8.71	5.97
3	10.57	5.82	11.76	6.97	9.78	5.98	8.62	5.88
4	11.11	6.04	11.09	6.36	10.98	7.30	9.08	5.80
5	11.17	6.20	12.22	7.32	Removed			
6	9.98	5.68	10.72	6.36	9.33	5.89	9.02	5.58
7	10.56	6.37	11.33	7.32	10.15	6.84	8.81	5.34
8	11.20	6.00	12.34	8.75	9.85	5.66	9.35	6.39
9	11.74	6.61	12.40	9.16	10.79	8.13	10.25	9.28
10	12.12	6.83	12.06	9.67	10.96	8.75	9.56	8.33

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

Initial	Deflections in inches, Forces in Grams								
<u>Sample #</u>	<u>0.0007</u>	<u>0.0014</u>	<u>0.0021</u>	<u>0.0028</u>	<u>0.0035</u>	<u>0.0042</u>	<u>0.0049</u>	<u>0.0056</u>	<u>0.0063</u>
1	2.9	6.0	9.5	13.4	17.3	21.1	25.2	29.0	32.8
2	3.3	7.2	11.1	15.1	19.0	22.8	26.6	30.7	34.9
3	3.4	7.1	10.5	14.1	17.8	21.4	25.2	29.3	33.5
4	2.9	6.2	10.4	14.3	18.1	22.2	26.2	29.9	33.8
5	3.4	6.9	10.1	13.7	17.4	21.7	26.0	30.1	34.1
6	3.3	7.0	11.0	15.0	18.9	22.9	26.8	30.6	34.6
7	3.0	6.5	10.3	13.9	17.4	21.3	25.0	29.6	33.7
8	3.7	7.7	11.7	15.6	19.6	23.7	27.8	31.3	35.5
9	3.3	7.3	11.1	15.0	19.0	23.2	27.4	31.4	35.5
10	3.5	7.5	11.5	15.5	19.8	23.9	28.0	32.2	36.2

Thermal	Deflections in inches, Forces in Grams								
<u>Sample #</u>	<u>0.0005</u>	<u>0.0010</u>	<u>0.0015</u>	<u>0.0020</u>	<u>0.0025</u>	<u>0.0030</u>	<u>0.0035</u>	<u>0.0040</u>	<u>0.0045</u>
1	2.1	4.4	6.5	9.0	11.8	14.7	17.7	20.4	23.4
2	2.1	4.2	6.8	9.1	11.7	14.3	17.3	20.1	23.2
3	1.8	4.0	5.9	8.1	10.4	12.6	15.0	17.6	20.8
4	1.8	3.7	5.8	8.0	10.6	13.5	16.3	19.1	21.9
5	2.0	3.9	5.9	8.1	10.6	13.3	16.1	18.6	21.4
6	1.9	4.1	6.2	8.6	11.1	13.9	16.9	19.5	22.5
7	1.6	3.3	5.4	7.5	9.9	12.6	15.4	18.2	21.1
8	1.5	3.3	5.3	7.6	9.9	12.6	15.5	18.5	21.0
9	1.6	3.5	5.7	7.7	10.3	13.1	15.9	18.7	21.3
10	2.1	4.1	6.5	8.9	11.5	14.5	17.1	20.1	23.1

Part description: SEAF-RA

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

Sample #	Pin-Pin			Row-Row		
	Initial	Thermal	Humidity	Initial	Thermal	Humidity
	Mated	Mated	Mated	Mated	Mated	Mated
Sample #	SEAF/SEAM	SEAF/SEAM	SEAF/SEAM	SEAF/SEAM	SEAF/SEAM	SEAF/SEAM
1-A	100,000	100,000	100,000	100,000	100,000	100,000
1-B	100,000	100,000	100,000	100,000	100,000	100,000
2-A	100,000	100,000	100,000	100,000	100,000	100,000
2-B	100,000	100,000	100,000	100,000	100,000	100,000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

	Sample #	Pin-Pin		Row-Row	
		Mated	Unmated	Mated	Unmated
		SEAF/SEAM	SEAF	SEAF/SEAM	SEAF
Initial	1	1,140	1,100	1,120	1,150
	2	1,060	1,150	1,200	1,150
Thermal	1	1,100	1,200	1,200	1,200
	2	1,000	1,100	1,200	1,200
Humidity	1	1,060	1,100	1,200	1,200
	2	1,100	1,200	1,200	1,200

DATA Continued**LLCR:**

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	100 Cycles	Thermal	Humidity
1	P1	8.7	-0.1	1.2	2.0
1	P2	11.0	0.0	3.4	0.5
1	P3	13.5	-0.4	0.7	0.5
1	P4	13.7	-0.3	1.0	1.6
1	P5	11.3	0.7	7.4	5.6
1	P6	13.8	-1.2	0.1	0.0
1	P7	13.5	-0.6	1.2	0.2
1	P8	9.3	0.2	2.2	4.3
1	P9	12.8	-0.2	0.6	3.3
1	P10	11.2	-0.8	1.8	4.6
1	P11	8.5	-0.1	1.7	2.0
1	P12	13.2	-0.6	0.0	0.0
1	P13	13.0	-0.4	0.1	3.0
1	P14	12.8	-0.2	0.3	0.2
1	P15	11.4	-0.8	2.4	0.8
1	P16	13.0	-0.2	0.1	0.3
1	P17	13.3	-0.5	-0.1	-0.3
1	P18	11.9	-0.1	0.7	1.9
1	P19	10.2	-0.3	1.4	2.0
1	P20	13.6	-0.6	-0.4	0.1
1	P21	11.4	-0.6	4.1	1.6
1	P22	13.2	-0.6	-0.4	-0.3
1	P23	13.2	-0.7	-0.2	0.1
1	P24	11.2	-0.5	1.0	0.7
1	P25	9.1	-0.6	-0.4	-0.4
2	P1	8.9	-0.5	-0.2	0.6
2	P2	11.8	-1.3	-0.2	0.2
2	P3	14.1	-1.2	-0.7	2.2
2	P4	14.2	-1.3	-1.1	-0.1
2	P5	11.7	-1.1	-0.1	4.2
2	P6	14.4	-1.5	-1.3	-1.1
2	P7	13.6	-0.7	-0.5	-0.6
2	P8	10.6	-1.9	-0.8	-1.0
2	P9	14.0	-1.6	-0.2	-0.6
2	P10	14.8	-4.2	-2.7	-2.7
2	P11	13.7	-5.1	-3.3	-4.1
2	P12	13.5	-1.1	-0.1	-0.1
2	P13	13.3	-0.7	0.1	0.7
2	P14	13.4	-0.9	-0.2	-0.2
2	P15	14.1	-3.5	1.0	-1.4

Part description: SEAF-RA

2	P16	13.3	-0.5	0.5	0.6
2	P17	13.1	-0.7	-0.1	-0.3
2	P18	12.1	-0.2	0.8	-0.2
2	P19	14.0	-3.5	3.5	2.4
2	P20	14.6	-1.2	-0.8	0.0
2	P21	14.7	-3.7	-0.5	-1.9
2	P22	13.1	-0.3	0.1	-0.3
2	P23	13.3	-0.8	-0.1	-0.2
2	P24	11.8	-0.6	0.1	0.2
2	P25	8.9	-0.4	0.2	0.5
3	P1	8.5	-0.5	0.5	0.4
3	P2	10.9	-0.2	1.6	0.4
3	P3	14.8	-1.3	-1.2	-1.5
3	P4	16.2	-2.3	-2.1	-1.1
3	P5	11.1	-0.4	0.3	0.4
3	P6	14.2	-0.9	-0.8	-0.8
3	P7	17.1	-3.4	-3.4	-3.5
3	P8	9.5	-1.0	-0.2	0.1
3	P9	14.5	-1.7	-1.3	-1.8
3	P10	12.1	-0.5	2.7	1.5
3	P11	10.5	-2.1	-1.9	-1.1
3	P12	15.3	-2.4	-2.3	-2.4
3	P13	13.5	-1.0	-0.3	-0.2
3	P14	15.2	-2.7	-2.3	-2.4
3	P15	15.2	-3.5	-2.1	-1.7
3	P16	14.6	-1.5	-1.7	0.1
3	P17	14.4	-1.7	-1.5	-0.9
3	P18	12.2	-0.7	-0.2	-0.8
3	P19	13.5	-2.9	0.4	0.5
3	P20	14.7	-0.7	-1.0	-1.3
3	P21	11.7	-0.3	0.8	1.0
3	P22	13.4	-0.9	-0.8	-0.4
3	P23	13.3	-0.9	-0.7	-0.8
3	P24	11.0	-0.6	-0.6	-0.3
3	P25	8.3	-0.3	-0.2	0.2
4	P1	8.5	-0.5	-0.1	0.1
4	P2	11.2	-0.6	-0.1	0.2
4	P3	13.4	-0.5	-0.1	0.5
4	P4	13.2	-0.1	1.2	0.6
4	P5	11.4	-1.1	0.1	0.4
4	P6	13.3	-0.1	0.1	0.3
4	P7	13.4	0.0	-0.4	0.1
4	P8	12.7	-3.0	-1.8	-1.9
4	P9	13.5	-0.6	-0.6	-0.7
4	P10	14.2	-2.4	2.5	-2.8
4	P11	8.6	-0.5	0.2	0.1
4	P12	13.1	-0.1	-0.3	0.8
4	P13	12.9	-0.1	0.3	0.1

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Part #: SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP

Part description: SEAF-RA

4	P14	13.2	0.2	0.1	0.2
4	P15	12.7	-1.3	0.0	2.3
4	P16	13.4	-0.1	0.1	0.1
4	P17	13.1	0.8	1.8	0.6
4	P18	17.0	-3.8	-3.1	-2.1
4	P19	12.8	-1.5	1.5	0.2
4	P20	13.8	-1.0	-0.3	-0.2
4	P21	11.8	-0.7	1.1	2.5
4	P22	13.5	-0.5	-0.1	-0.3
4	P23	13.7	-0.3	-0.3	-0.2
4	P24	12.9	-1.2	1.7	0.5
4	P25	9.3	-0.1	0.0	0.4
5	P1	8.5	0.1	0.9	1.9
5	P2	10.6	0.1	0.6	0.3
5	P3	13.7	0.4	0.3	0.3
5	P4	13.4	0.2	-0.4	-0.1
5	P5	10.7	-0.1	0.1	0.2
5	P6	13.0	-0.5	0.1	0.2
5	P7	13.0	-0.4	0.3	0.3
5	P8	8.7	0.0	1.3	2.1
5	P9	13.1	-0.3	0.4	0.8
5	P10	16.3	-1.1	-2.3	-3.8
5	P11	9.3	0.0	0.0	0.9
5	P12	13.5	-0.6	0.0	1.7
5	P13	13.2	-0.2	0.4	0.4
5	P14	13.4	-0.1	1.0	1.3
5	P15	15.8	-0.3	-0.1	1.7
5	P16	13.8	-0.4	0.3	1.0
5	P17	13.6	0.0	0.6	3.5
5	P18	12.5	-0.2	0.7	1.4
5	P19	13.7	-3.3	-2.8	-2.6
5	P20	13.9	-0.4	0.1	4.7
5	P21	14.0	0.1	-1.6	-1.7
5	P22	13.2	-0.4	-0.1	0.2
5	P23	13.2	0.0	0.3	0.5
5	P24	11.2	-0.4	-0.1	-0.2
5	P25	8.8	-0.2	0.5	0.7
6	P1	8.5	-0.3	0.3	0.0
6	P2	10.6	-0.2	0.6	0.5
6	P3	13.5	-0.1	-0.1	0.7
6	P4	13.4	-0.2	0.2	0.5
6	P5	10.8	-0.6	0.5	-0.3
6	P6	13.6	-0.8	-0.4	-0.1
6	P7	13.9	0.1	-0.3	1.1
6	P8	9.5	-0.5	0.8	-0.4
6	P9	13.1	-0.3	0.6	1.5
6	P10	11.5	-0.6	0.8	0.6
6	P11	9.8	-1.0	0.8	-0.1

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Part #: SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP

Part description: SEAF-RA

6	P12	13.2	-0.3	-0.4	0.4
6	P13	13.3	-0.5	-0.2	0.7
6	P14	13.5	-0.5	-0.6	0.4
6	P15	12.4	-1.8	-0.2	-0.3
6	P16	13.3	-0.2	0.1	2.4
6	P17	13.2	-0.3	0.3	0.0
6	P18	13.2	-1.0	-0.8	-1.2
6	P19	10.8	-0.6	1.4	-0.2
6	P20	13.8	-0.6	0.9	0.7
6	P21	11.8	-1.1	2.1	-0.3
6	P22	13.4	-0.8	0.5	2.1
6	P23	13.4	0.0	-0.5	-0.5
6	P24	11.4	-0.5	0.4	-0.2
6	P25	8.6	-0.2	0.1	-0.1
7	P1	9.4	-1.2	-0.8	-0.7
7	P2	11.3	-0.5	-0.4	-0.1
7	P3	13.6	-0.3	-0.3	0.7
7	P4	13.5	0.7	0.2	-0.3
7	P5	11.2	-0.7	-0.5	-0.3
7	P6	14.4	-1.8	-1.6	-1.1
7	P7	13.5	-0.2	-0.2	3.9
7	P8	10.5	-1.4	-1.2	-1.1
7	P9	13.8	-1.1	-0.7	-0.6
7	P10	12.9	-2.5	-1.4	1.2
7	P11	10.5	-1.6	-1.6	0.0
7	P12	13.8	-1.5	-1.0	0.2
7	P13	13.1	-0.7	-0.3	-0.2
7	P14	13.8	-1.2	-1.0	0.4
7	P15	11.9	-1.4	-0.5	0.1
7	P16	13.5	-0.7	-0.6	1.9
7	P17	12.8	-0.2	0.0	0.0
7	P18	12.2	-0.6	-0.4	-0.4
7	P19	10.8	-1.1	1.4	-0.9
7	P20	13.5	-0.3	-0.5	8.1
7	P21	12.3	-1.5	0.4	0.3
7	P22	13.0	-0.3	0.1	0.1
7	P23	12.9	-0.2	0.2	0.9
7	P24	11.2	-0.5	-0.2	-0.1
7	P25	9.5	-0.7	-0.7	-0.6
8	P1	8.9	0.1	0.0	1.5
8	P2	11.1	0.3	0.1	12.8
8	P3	13.6	-0.1	0.1	1.7
8	P4	13.3	0.7	1.4	1.6
8	P5	12.4	2.7	1.5	0.8
8	P6	13.4	0.1	1.6	0.8
8	P7	14.2	-1.1	-0.1	1.1
8	P8	12.5	-1.5	2.1	-0.6
8	P9	14.2	-1.0	2.1	-0.9

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Part description: SEAF-RA	

8	P10	12.8	-0.5	2.2	1.8
8	P11	13.4	-2.4	0.2	-0.5
8	P12	13.3	-0.6	1.0	0.0
8	P13	13.2	-0.5	1.3	1.4
8	P14	13.6	-0.7	0.7	0.0
8	P15	11.3	-0.4	7.3	1.0
8	P16	13.8	-0.8	1.0	0.1
8	P17	13.5	-0.7	0.9	0.1
8	P18	12.9	-0.8	1.7	2.6
8	P19	10.8	0.5	5.4	1.5
8	P20	14.1	-0.6	0.7	0.4
8	P21	12.0	0.4	1.1	1.7
8	P22	13.3	-0.1	0.7	0.2
8	P23	13.7	-0.5	0.0	-0.4
8	P24	11.7	-0.6	0.6	0.8
8	P25	9.1	-0.2	0.6	0.6

DATA Continued**GAS TIGHT:**

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	8.1	0.2
1	P2	10.7	0.2
1	P3	13.3	0.1
1	P4	13.1	1.0
1	P5	10.5	0.3
1	P6	13.5	-0.4
1	P7	13.1	0.4
1	P8	8.9	-0.1
1	P9	13.4	0.3
1	P10	11.9	-0.9
1	P11	9.3	-0.2
1	P12	13.9	-0.7
1	P13	13.4	-0.4
1	P14	13.7	-0.6
1	P15	10.9	-0.1
1	P16	13.9	-0.6
1	P17	13.2	-0.3
1	P18	12.5	-1.1
1	P19	9.8	0.1
1	P20	13.3	-0.1
1	P21	10.9	0.2
1	P22	12.8	0.1
1	P23	13.4	-0.1
1	P24	10.9	0.1
1	P25	8.4	-0.1
2	P1	9.2	0.5
2	P2	11.3	0.5
2	P3	14.2	0.4
2	P4	13.7	-0.1
2	P5	12.6	-0.5
2	P6	14.0	0.1
2	P7	14.1	0.4
2	P8	10.2	0.1
2	P9	13.9	-0.3
2	P10	12.0	-0.3
2	P11	11.0	-1.2
2	P12	14.2	-0.5
2	P13	14.2	-0.8
2	P14	13.5	-0.2
2	P15	12.5	-0.5

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Part description: SEAF-RA

2	P16	13.5	-0.4
2	P17	13.6	0.1
2	P18	13.3	-1.1
2	P19	10.7	-0.4
2	P20	15.6	-1.3
2	P21	12.6	0.3
2	P22	14.3	-0.1
2	P23	14.6	-0.6
2	P24	11.4	0.7
2	P25	9.3	0.4
3	P1	13.0	-4.3
3	P2	11.9	-0.8
3	P3	13.4	0.5
3	P4	13.8	0.6
3	P5	11.7	0.0
3	P6	13.4	0.8
3	P7	14.0	0.0
3	P8	10.7	-1.2
3	P9	12.9	1.1
3	P10	14.7	-2.4
3	P11	9.1	-0.1
3	P12	12.7	0.2
3	P13	12.7	0.3
3	P14	12.8	0.4
3	P15	13.6	0.2
3	P16	13.3	-0.2
3	P17	13.2	-0.1
3	P18	14.5	-2.4
3	P19	13.9	-3.8
3	P20	14.2	-0.4
3	P21	15.7	0.0
3	P22	13.8	-0.7
3	P23	18.1	-4.3
3	P24	14.0	-2.2
3	P25	9.9	-0.7
4	P1	8.4	0.1
4	P2	11.0	-0.1
4	P3	12.8	0.3
4	P4	13.2	0.2
4	P5	11.1	0.0
4	P6	13.6	-0.5
4	P7	13.2	-0.3
4	P8	9.4	1.3
4	P9	13.1	0.5
4	P10	11.8	0.4
4	P11	11.3	-0.7
4	P12	13.9	-0.4
4	P13	15.1	0.2

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Part #: SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP

Part description: SEAF-RA

4	P14	13.1	0.1
4	P15	10.8	0.1
4	P16	13.2	-0.2
4	P17	14.1	-0.7
4	P18	11.4	0.2
4	P19	10.0	-0.1
4	P20	13.3	0.1
4	P21	10.8	0.4
4	P22	13.0	0.4
4	P23	13.2	0.1
4	P24	10.9	0.5
4	P25	8.9	0.0
5	P1	8.4	-0.1
5	P2	10.7	0.2
5	P3	13.2	0.1
5	P4	13.3	0.8
5	P5	10.8	0.0
5	P6	12.9	0.3
5	P7	12.9	0.5
5	P8	9.3	-0.4
5	P9	13.2	0.4
5	P10	11.6	-0.6
5	P11	9.6	-0.5
5	P12	13.3	-0.1
5	P13	12.8	0.1
5	P14	12.9	0.1
5	P15	11.7	-0.9
5	P16	13.0	0.4
5	P17	13.1	-0.1
5	P18	12.3	-0.9
5	P19	9.9	-0.1
5	P20	13.1	0.2
5	P21	11.6	-0.5
5	P22	13.4	-0.6
5	P23	13.2	0.1
5	P24	11.3	-0.3
5	P25	8.8	-0.4
6	P1	8.6	1.1
6	P2	11.5	2.7
6	P3	13.7	1.7
6	P4	13.6	1.4
6	P5	11.2	3.2
6	P6	12.8	0.9
6	P7	13.6	0.4
6	P8	11.1	0.1
6	P9	13.2	0.1
6	P10	11.7	1.3
6	P11	10.4	-0.1

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Part #: SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP

Part description: SEAF-RA

6	P12	13.5	0.2
6	P13	12.8	0.3
6	P14	12.9	-0.4
6	P15	11.3	0.2
6	P16	12.9	1.0
6	P17	12.9	0.0
6	P18	11.8	0.5
6	P19	10.1	0.5
6	P20	13.4	0.9
6	P21	11.8	0.7
6	P22	12.6	0.6
6	P23	13.3	0.0
6	P24	11.5	0.0
6	P25	9.9	-0.2
7	P1	8.0	0.6
7	P2	11.4	0.0
7	P3	13.4	0.3
7	P4	13.8	-0.6
7	P5	11.0	-0.2
7	P6	13.7	-0.1
7	P7	13.0	0.4
7	P8	8.9	0.8
7	P9	13.4	-0.2
7	P10	14.0	-1.5
7	P11	8.8	0.7
7	P12	13.6	-0.6
7	P13	13.5	-0.5
7	P14	13.9	-0.6
7	P15	13.6	-2.5
7	P16	14.0	-0.2
7	P17	13.1	-0.3
7	P18	13.7	1.6
7	P19	14.9	-4.7
7	P20	14.7	0.1
7	P21	13.0	-0.1
7	P22	13.5	0.3
7	P23	14.3	-1.0
7	P24	11.9	-0.6
7	P25	9.5	-0.5
8	P1	8.6	0.6
8	P2	11.0	0.4
8	P3	13.5	0.0
8	P4	13.3	0.7
8	P5	10.7	2.0
8	P6	13.0	1.5
8	P7	13.0	1.1
8	P8	8.8	1.3
8	P9	12.7	0.7

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Part description: SEAF-RA	

8	P10	10.9	1.4
8	P11	9.1	0.8
8	P12	13.2	-0.1
8	P13	12.8	0.5
8	P14	13.2	0.1
8	P15	10.8	3.3
8	P16	13.4	0.9
8	P17	13.2	0.5
8	P18	11.6	0.8
8	P19	9.9	1.3
8	P20	13.1	0.8
8	P21	11.1	2.9
8	P22	13.1	0.5
8	P23	13.4	0.3
8	P24	11.0	1.3
8	P25	8.8	0.4

Tracking Code: TC0853--2158_ReportRev2	Part #: SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP
Part description: SEAF-RA	

EQUIPMENT AND CALIBRATION SCHEDULES

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;

... Last Cal: 05/18/2008, Next Cal: 05/18/2009

Equipment #: MV-04

Description: Micro-Vu Vector Video Measuring Microscope with InSpec Software

Manufacturer: Micro-Vu

Model: 301

Serial #: 7570

Accuracy: See Manual

... Last Cal: 02/05/2008, Next Cal: 02/05/2009

Equipment #: THC-04

Description: Temperature/Humidity Chamber

Manufacturer: Thermotron

Model: SM-8-3800

Serial #: 37782

Accuracy: See Manual

... Last Cal: 08/19/2008, Next Cal: 08/19/2009

Equipment #: OV-03

Description: Cascade Tek Forced Air Oven

Manufacturer: Cascade Tek

Model: TFO-5

Serial #: 0500100

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

... Last Cal: 06/26/2008, Next Cal: 06/22/2009

Equipment #: THC-01

Description: Temperature/Humidity Chamber

Manufacturer: Thermotron

Model: SM-8-7800

Serial #: 30676

Accuracy: See Manual

... Last Cal: 9/21/2008, Next Cal: 9/21/2009

Tracking Code: TC0853--2158_ReportRev2	Part #: SEAF-50-01-S-06-2-RA-GP/SEAM-50-02.0-L-06-2-GP
Part description: SEAF-RA	

Equipment #: STG-01

Description: Hipot Megomter Safety Test Cage

Manufacturer: Hipotronics

Model: TC-25

Serial #: M9910141

Accuracy: N/A

... Last Cal: No Calibration Required

Equipment #: HPM-01

Description: Hipot Megommeter

Manufacturer: Hipotronics

Model: H306B-A

Serial #: M9905004

Accuracy: 2 % Full Scale Accuracy 2 % Full Scale Accuracy

... Last Cal: 06/22/07, Next Cal: 06/22/08

Equipment #: MO-01

Description: Micro-Ohmmeter

Manufacturer: Keithley

Model: 580

Serial #: 0772740

Accuracy: See Manual

... Last Cal: 06/17/08, Next Cal: 06/17/09

Equipment #: MO-03

Description: Multimeter /Data Acquisition System

Manufacturer: Keithley

Model: 2700

Serial #: 0791975

Accuracy: See Manual

... Last Cal: 06/17/08, Next Cal: 06/17/09

Equipment #: MO-06

Description: Micro-Ohmmeter

Manufacturer: Keithley

Model: 580

Serial #: 1110525

Accuracy: See Manual

... Last Cal: 06/17/2008, Next Cal: 06/17/2009

Equipment #: MO-07

Description: Multimeter / Data Acquisition System

Manufacturer: Keithley

Model: 2700

Serial #: 04-1041-04

Accuracy: See Manual

... Last Cal: 6/17/2008, Next Cal: 6/17/2009