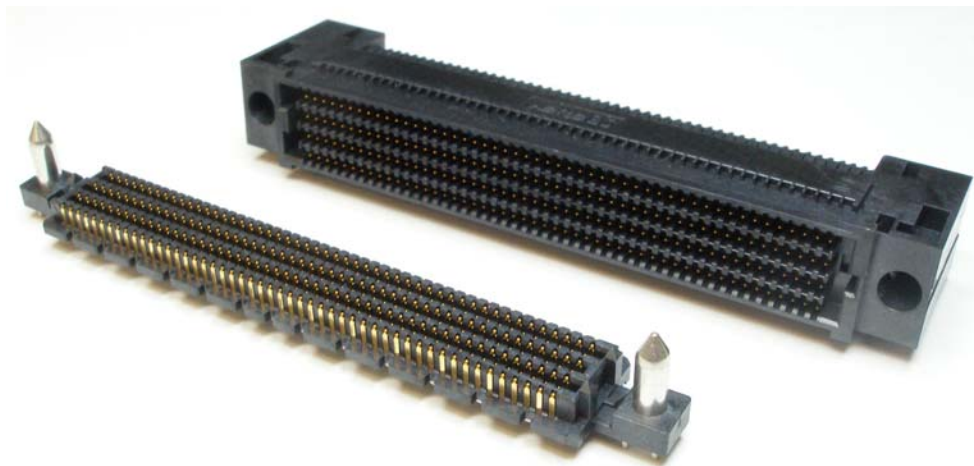




Project Number: Design Verification Test		Tracking Code: TC0936—2731_Report_Rev_1	
Requested by: Corey Rose		Date: 1/25/2010	Product Rev: A
Part #: SEAF-50-01-S-08-2-RA-GP SEAM-50-02.0-S-08-2-A-GP		Lot #: 09203/09	Tech: Rodney Riley Eng: Eric Mings Mark Shireman
Part description: SEAF-RA 8 Row			Qty to test: 18
Test Start: 09/03/2009		Test Completed: 10/15/2009	



Mating / Unmating and Gas Tight

PART DESCRIPTION

SEAF-50-01-S-08-2-RA-GP / SEAM-50-02.0-S-08-2-A-GP

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

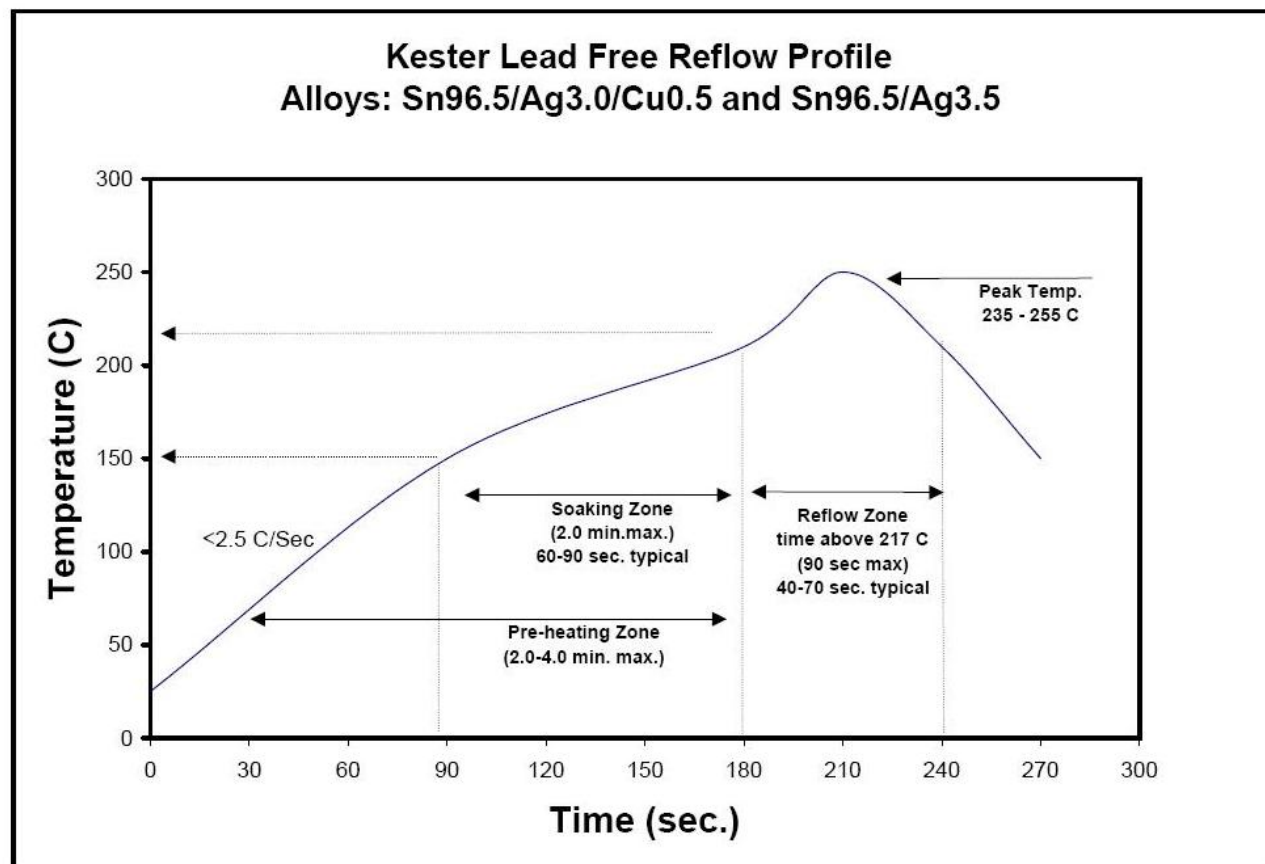
To perform the following tests: Mating / Unmating and Gas Tight on SEAF-RA 8 Row

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-102158-TST

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)

FLOWCHARTS

Gas Tight

TEST STEP	GROUP A 144 Points
01	LLCR-1
02	Gas Tight
03	LLCR-2

Gas Tight = EIA-364-36A

LLCR = EIA-364-23, LLCR

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

Mating/Unmating/Gaps

TEST STEP	GROUP A 10 Boards
01	Contact Gaps
02	Mating / Unmating
03	25 Cycles
04	Clean w/Compressed Air
05	Mating / Unmating
06	25 Cycles (50 Total)
07	Clean w/Compressed Air
08	Mating / Unmating
09	25 Cycles (75 Total)
10	Clean w/Compressed Air
11	Mating / Unmating
12	25 Cycles (100 Total)
13	Clean w/Compressed Air
14	Mating / Unmating
15	Contact Gaps

Mating/Un-Mating Forces = EIA-364-13

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

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

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.

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

Contact Gaps

- **Initial**
 - **Min**-----0.0335”
 - **Max**-----0.0387”
- **After 100 Cycles**
 - **Min**-----0.0339”
 - **Max**-----0.0385”

Mating – Unmating Forces

- **Initial**
 - **Mating**
 - **Min**-----14.56 Lbs
 - **Max**-----16.88 Lbs
 - **Unmating**
 - **Min**-----5.31 Lbs
 - **Max**-----7.00 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min**-----13.39 Lbs
 - **Max**-----15.64 Lbs
 - **Unmating**
 - **Min**-----6.50 Lbs
 - **Max**-----8.91 Lbs
- **After 50 Cycles**
 - **Mating**
 - **Min**-----12.68 Lbs
 - **Max**-----16.29 Lbs
 - **Unmating**
 - **Min**-----6.70 Lbs
 - **Max**-----9.45 Lbs
- **After 75 Cycles**
 - **Mating**
 - **Min**-----13.43 Lbs
 - **Max**-----14.79 Lbs
 - **Unmating**
 - **Min**-----7.06 Lbs
 - **Max**-----9.49 Lbs
- **After 100 Cycles**
 - **Mating**
 - **Min**-----13.11 Lbs
 - **Max**-----16.08 Lbs
 - **Unmating**
 - **Min**-----7.13 Lbs
 - **Max**-----9.65 Lbs

LLCR Gas Tight (144 LLCR test points)

- **Initial ----- 19.8 mOhms Max**
- **Gas-Tight**
 - o **<= +5.0 mOhms ----- 141 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**

DATA SUMMARIES

CONTACT GAPS:

Initial		After 100 Cycles	
Units:	inches	Units:	inches
<i>Minimum</i>	0.0335	<i>Minimum</i>	0.0339
<i>Maximum</i>	0.0387	<i>Maximum</i>	0.0385
<i>Average</i>	0.0355	<i>Average</i>	0.0362
<i>St. Dev.</i>	0.0008	<i>St. Dev.</i>	0.0007
<i>Count</i>	1000	<i>Count</i>	1000

MATING/UNMATING:

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	64.76	14.56	23.62	5.31	59.56	13.39	28.91	6.50
Maximum	75.08	16.88	31.14	7.00	69.57	15.64	39.63	8.91
Average	70.04	15.75	27.84	6.26	63.50	14.28	33.67	7.57
St Dev	3.41	0.77	2.30	0.52	3.31	0.74	3.43	0.77
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	56.40	12.68	29.80	6.70	59.74	13.43	31.40	7.06
Maximum	72.46	16.29	42.03	9.45	65.79	14.79	42.21	9.49
Average	62.92	14.15	34.87	7.84	63.16	14.20	36.39	8.18
St Dev	4.58	1.03	4.04	0.91	2.00	0.45	3.65	0.82
Count	10	10	10	10	10	10	10	10
	After 100 Cycles							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	58.31	13.11	31.71	7.13				
Maximum	71.52	16.08	42.92	9.65				
Average	63.86	14.36	36.65	8.24				
St Dev	3.82	0.86	4.04	0.91				
Count	10	10	10	10				

GAS TIGHT:

- 1) A total of 144 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	9/29/2009	9/30/2009
Room Temp C	23	22
RH	37%	40%
Name	Rodney Riley	Rodney Riley
mOhm values	Actual Initial	Delta Gas Tight
Average	12.3	-0.3
St. Dev.	3.0	1.7
Min	7.0	-6.0
Max	19.8	8.5
Count	144	144

DATA**CONTACT GAPS:**

Initial					
Units: inches					
Pos.#	B1	B2	B3	B4	B5
1	0.0360	0.0365	0.0362	0.0364	0.0365
2	0.0359	0.0350	0.0354	0.0351	0.0357
3	0.0354	0.0355	0.0350	0.0357	0.0356
4	0.0356	0.0353	0.0351	0.0354	0.0354
5	0.0354	0.0350	0.0355	0.0360	0.0357
6	0.0336	0.0335	0.0335	0.0343	0.0339
7	0.0336	0.0335	0.0335	0.0343	0.0339
8	0.0339	0.0335	0.0342	0.0340	0.0343
9	0.0345	0.0335	0.0340	0.0344	0.0340
10	0.0338	0.0344	0.0340	0.0349	0.0340
11	0.0342	0.0337	0.0339	0.0345	0.0339
12	0.0341	0.0336	0.0336	0.0347	0.0345
13	0.0343	0.0339	0.0343	0.0343	0.0343
14	0.0342	0.0341	0.0341	0.0347	0.0339
15	0.0341	0.0353	0.0343	0.0350	0.0341
16	0.0353	0.0356	0.0355	0.0360	0.0355
17	0.0357	0.0358	0.0358	0.0363	0.0357
18	0.0359	0.0361	0.0361	0.0368	0.0362
19	0.0357	0.0355	0.0361	0.0368	0.0358
20	0.0357	0.0361	0.0355	0.0368	0.0357
21	0.0356	0.0358	0.0357	0.0367	0.0358
22	0.0354	0.0356	0.0357	0.0365	0.0356
23	0.0359	0.0357	0.0360	0.0364	0.0361
24	0.0357	0.0363	0.0361	0.0371	0.0365
25	0.0355	0.0359	0.0360	0.0365	0.0358
26	0.0358	0.0365	0.0358	0.0365	0.0361
27	0.0357	0.0357	0.0356	0.0366	0.0361
28	0.0361	0.0361	0.0361	0.0358	0.0357
29	0.0359	0.0362	0.0360	0.0362	0.0357
30	0.0364	0.0360	0.0359	0.0361	0.0361
31	0.0365	0.0361	0.0359	0.0370	0.0357
32	0.0357	0.0364	0.0365	0.0361	0.0365
33	0.0365	0.0368	0.0364	0.0365	0.0364
34	0.0366	0.0369	0.0358	0.0368	0.0357
35	0.0365	0.0370	0.0364	0.0370	0.0361
36	0.0349	0.0352	0.0350	0.0348	0.0348
37	0.0350	0.0357	0.0357	0.0348	0.0355
38	0.0354	0.0354	0.0350	0.0353	0.0350
39	0.0351	0.0358	0.0350	0.0353	0.0350
40	0.0352	0.0355	0.0355	0.0352	0.0352

41	0.0350	0.0357	0.0352	0.0355	0.0354
42	0.0354	0.0359	0.0350	0.0354	0.0347
43	0.0351	0.0364	0.0346	0.0356	0.0346
44	0.0352	0.0355	0.0346	0.0353	0.0343
45	0.0355	0.0360	0.0352	0.0357	0.0352
46	0.0366	0.0365	0.0352	0.0378	0.0350
47	0.0357	0.0361	0.0357	0.0363	0.0353
48	0.0360	0.0373	0.0359	0.0360	0.0358
49	0.0362	0.0376	0.0361	0.0365	0.0361
50	0.0358	0.0370	0.0365	0.0363	0.0363
51	0.0361	0.0370	0.0362	0.0362	0.0361
52	0.0360	0.0366	0.0362	0.0367	0.0359
53	0.0362	0.0372	0.0361	0.0359	0.0360
54	0.0361	0.0369	0.0366	0.0365	0.0368
55	0.0361	0.0366	0.0362	0.0365	0.0363
56	0.0361	0.0372	0.0368	0.0365	0.0365
57	0.0364	0.0375	0.0365	0.0365	0.0365
58	0.0363	0.0374	0.0363	0.0367	0.0363
59	0.0359	0.0370	0.0363	0.0367	0.0359
60	0.0361	0.0372	0.0365	0.0372	0.0365
61	0.0361	0.0368	0.0363	0.0372	0.0364
62	0.0365	0.0375	0.0361	0.0367	0.0365
63	0.0361	0.0365	0.0360	0.0362	0.0362
64	0.0360	0.0362	0.0364	0.0363	0.0361
65	0.0357	0.0368	0.0365	0.0365	0.0365
66	0.0368	0.0366	0.0365	0.0366	0.0364
67	0.0355	0.0357	0.0358	0.0359	0.0356
68	0.0357	0.0360	0.0362	0.0362	0.0358
69	0.0361	0.0359	0.0359	0.0364	0.0361
70	0.0360	0.0360	0.0357	0.0360	0.0356
71	0.0357	0.0359	0.0355	0.0356	0.0357
72	0.0354	0.0352	0.0355	0.0358	0.0352
73	0.0360	0.0358	0.0361	0.0359	0.0359
74	0.0355	0.0356	0.0359	0.0365	0.0359
75	0.0357	0.0361	0.0361	0.0365	0.0357
76	0.0363	0.0358	0.0364	0.0364	0.0367
77	0.0363	0.0360	0.0357	0.0365	0.0358
78	0.0359	0.0357	0.0360	0.0362	0.0361
79	0.0359	0.0356	0.0361	0.0359	0.0361
80	0.0357	0.0356	0.0354	0.0363	0.0354
81	0.0357	0.0358	0.0351	0.0361	0.0357
82	0.0355	0.0357	0.0357	0.0362	0.0357
83	0.0352	0.0357	0.0359	0.0363	0.0359
84	0.0353	0.0358	0.0356	0.0361	0.0358
85	0.0357	0.0358	0.0357	0.0366	0.0359
86	0.0357	0.0354	0.0355	0.0357	0.0357
87	0.0357	0.0352	0.0356	0.0357	0.0357
88	0.0352	0.0354	0.0354	0.0359	0.0354
89	0.0349	0.0350	0.0350	0.0353	0.0350

90	0.0352	0.0352	0.0350	0.0359	0.0349
91	0.0350	0.0354	0.0350	0.0354	0.0352
92	0.0355	0.0351	0.0355	0.0357	0.0354
93	0.0348	0.0353	0.0357	0.0349	0.0357
94	0.0349	0.0350	0.0351	0.0350	0.0350
95	0.0353	0.0351	0.0351	0.0353	0.0350
96	0.0350	0.0349	0.0353	0.0352	0.0352
97	0.0354	0.0349	0.0353	0.0354	0.0354
98	0.0357	0.0346	0.0357	0.0357	0.0355
99	0.0357	0.0356	0.0355	0.0353	0.0358
100	0.0365	0.0360	0.0365	0.0363	0.0361
101	0.0360	0.0355	0.0360	0.0354	0.0359
102	0.0355	0.0350	0.0349	0.0347	0.0350
103	0.0347	0.0339	0.0349	0.0350	0.0350
104	0.0350	0.0343	0.0352	0.0353	0.0351
105	0.0350	0.0346	0.0354	0.0346	0.0355
106	0.0343	0.0343	0.0343	0.0344	0.0340
107	0.0339	0.0339	0.0343	0.0348	0.0342
108	0.0339	0.0341	0.0343	0.0341	0.0342
109	0.0350	0.0347	0.0346	0.0354	0.0347
110	0.0344	0.0346	0.0346	0.0348	0.0344
111	0.0346	0.0344	0.0342	0.0350	0.0343
112	0.0351	0.0347	0.0344	0.0350	0.0346
113	0.0350	0.0346	0.0349	0.0346	0.0350
114	0.0350	0.0346	0.0347	0.0353	0.0347
115	0.0357	0.0353	0.0349	0.0350	0.0353
116	0.0350	0.0354	0.0350	0.0353	0.0354
117	0.0353	0.0354	0.0352	0.0354	0.0351
118	0.0352	0.0356	0.0349	0.0354	0.0351
119	0.0351	0.0351	0.0350	0.0354	0.0350
120	0.0347	0.0349	0.0344	0.0352	0.0347
121	0.0347	0.0348	0.0346	0.0346	0.0349
122	0.0356	0.0348	0.0349	0.0351	0.0349
123	0.0352	0.0354	0.0347	0.0352	0.0350
124	0.0355	0.0355	0.0347	0.0350	0.0349
125	0.0354	0.0354	0.0351	0.0350	0.0352
126	0.0351	0.0357	0.0348	0.0354	0.0350
127	0.0352	0.0352	0.0345	0.0356	0.0351
128	0.0347	0.0350	0.0350	0.0345	0.0350
129	0.0349	0.0346	0.0353	0.0344	0.0354
130	0.0354	0.0348	0.0348	0.0346	0.0357
131	0.0349	0.0347	0.0348	0.0348	0.0353
132	0.0346	0.0351	0.0349	0.0351	0.0356
133	0.0350	0.0353	0.0351	0.0350	0.0356
134	0.0349	0.0350	0.0346	0.0350	0.0345
135	0.0354	0.0349	0.0344	0.0354	0.0343
136	0.0356	0.0354	0.0349	0.0357	0.0353
137	0.0358	0.0353	0.0350	0.0353	0.0348
138	0.0356	0.0352	0.0347	0.0355	0.0348

139	0.0349	0.0358	0.0350	0.0357	0.0350
140	0.0351	0.0354	0.0354	0.0362	0.0352
141	0.0356	0.0361	0.0350	0.0356	0.0355
142	0.0352	0.0365	0.0351	0.0356	0.0350
143	0.0360	0.0361	0.0352	0.0361	0.0354
144	0.0354	0.0362	0.0356	0.0358	0.0354
145	0.0359	0.0361	0.0357	0.0359	0.0355
146	0.0359	0.0359	0.0357	0.0356	0.0357
147	0.0359	0.0354	0.0352	0.0357	0.0354
148	0.0353	0.0352	0.0351	0.0354	0.0352
149	0.0358	0.0360	0.0357	0.0354	0.0357
150	0.0357	0.0354	0.0348	0.0354	0.0352
151	0.0370	0.0368	0.0367	0.0367	0.0367
152	0.0372	0.0374	0.0367	0.0379	0.0368
153	0.0368	0.0378	0.0367	0.0377	0.0369
154	0.0373	0.0387	0.0374	0.0379	0.0374
155	0.0365	0.0380	0.0369	0.0376	0.0372
156	0.0361	0.0371	0.0365	0.0363	0.0363
157	0.0362	0.0369	0.0358	0.0362	0.0365
158	0.0363	0.0378	0.0362	0.0357	0.0366
159	0.0359	0.0372	0.0360	0.0362	0.0362
160	0.0363	0.0363	0.0356	0.0360	0.0357
161	0.0356	0.0362	0.0350	0.0357	0.0349
162	0.0356	0.0366	0.0363	0.0364	0.0361
163	0.0355	0.0363	0.0357	0.0366	0.0357
164	0.0353	0.0363	0.0356	0.0359	0.0357
165	0.0364	0.0362	0.0358	0.0367	0.0359
166	0.0359	0.0357	0.0351	0.0354	0.0352
167	0.0352	0.0349	0.0349	0.0355	0.0350
168	0.0356	0.0353	0.0349	0.0354	0.0350
169	0.0354	0.0357	0.0347	0.0357	0.0350
170	0.0353	0.0355	0.0355	0.0360	0.0354
171	0.0354	0.0356	0.0352	0.0359	0.0356
172	0.0355	0.0357	0.0357	0.0353	0.0358
173	0.0356	0.0354	0.0350	0.0355	0.0348
174	0.0353	0.0354	0.0353	0.0356	0.0354
175	0.0357	0.0348	0.0353	0.0356	0.0356
176	0.0364	0.0357	0.0358	0.0360	0.0355
177	0.0362	0.0368	0.0354	0.0365	0.0351
178	0.0357	0.0367	0.0359	0.0367	0.0358
179	0.0361	0.0366	0.0359	0.0368	0.0357
180	0.0360	0.0362	0.0361	0.0368	0.0361
181	0.0362	0.0363	0.0363	0.0365	0.0363
182	0.0358	0.0365	0.0361	0.0361	0.0359
183	0.0358	0.0361	0.0357	0.0365	0.0360
184	0.0367	0.0358	0.0355	0.0365	0.0357
185	0.0357	0.0364	0.0355	0.0364	0.0357
186	0.0362	0.0360	0.0357	0.0364	0.0363
187	0.0360	0.0362	0.0354	0.0362	0.0357

188	0.0355	0.0361	0.0357	0.0357	0.0354
189	0.0360	0.0355	0.0356	0.0360	0.0354
190	0.0355	0.0354	0.0356	0.0358	0.0352
191	0.0359	0.0351	0.0359	0.0359	0.0357
192	0.0350	0.0347	0.0348	0.0346	0.0349
193	0.0349	0.0350	0.0343	0.0349	0.0340
194	0.0350	0.0353	0.0355	0.0361	0.0356
195	0.0350	0.0354	0.0354	0.0355	0.0354
196	0.0357	0.0357	0.0361	0.0356	0.0355
197	0.0356	0.0353	0.0356	0.0357	0.0354
198	0.0354	0.0350	0.0352	0.0356	0.0354
199	0.0358	0.0348	0.0352	0.0346	0.0354
200	0.0357	0.0354	0.0353	0.0360	0.0350

After 100 Cycles

Units: inches

Pos.#	B1	B2	B3	B4	B5
1	0.0380	0.0361	0.0359	0.0359	0.0363
2	0.0375	0.0353	0.0350	0.0351	0.0351
3	0.0373	0.0354	0.0361	0.0361	0.0361
4	0.0374	0.0357	0.0357	0.0357	0.0355
5	0.0368	0.0360	0.0361	0.0361	0.0358
6	0.0369	0.0343	0.0342	0.0346	0.0340
7	0.0373	0.0346	0.0346	0.0343	0.0339
8	0.0369	0.0346	0.0346	0.0346	0.0346
9	0.0368	0.0346	0.0344	0.0344	0.0343
10	0.0364	0.0353	0.0348	0.0349	0.0347
11	0.0365	0.0348	0.0350	0.0352	0.0345
12	0.0365	0.0345	0.0347	0.0350	0.0349
13	0.0365	0.0350	0.0347	0.0348	0.0349
14	0.0361	0.0350	0.0347	0.0351	0.0347
15	0.0370	0.0355	0.0357	0.0350	0.0347
16	0.0362	0.0356	0.0367	0.0360	0.0359
17	0.0364	0.0361	0.0361	0.0367	0.0357
18	0.0361	0.0362	0.0365	0.0370	0.0365
19	0.0365	0.0360	0.0363	0.0369	0.0366
20	0.0363	0.0362	0.0366	0.0372	0.0366
21	0.0361	0.0365	0.0366	0.0370	0.0361
22	0.0357	0.0364	0.0363	0.0367	0.0360
23	0.0361	0.0365	0.0367	0.0365	0.0358
24	0.0365	0.0366	0.0365	0.0368	0.0363
25	0.0364	0.0365	0.0361	0.0365	0.0366
26	0.0369	0.0371	0.0361	0.0371	0.0364
27	0.0369	0.0365	0.0364	0.0370	0.0365
28	0.0368	0.0372	0.0363	0.0365	0.0364
29	0.0365	0.0363	0.0365	0.0362	0.0369
30	0.0364	0.0366	0.0367	0.0369	0.0367
31	0.0371	0.0367	0.0369	0.0367	0.0366
32	0.0369	0.0374	0.0369	0.0365	0.0371
33	0.0369	0.0371	0.0365	0.0362	0.0371

34	0.0371	0.0373	0.0361	0.0370	0.0363
35	0.0368	0.0369	0.0366	0.0381	0.0364
36	0.0366	0.0357	0.0353	0.0356	0.0353
37	0.0364	0.0358	0.0354	0.0355	0.0355
38	0.0361	0.0357	0.0354	0.0359	0.0355
39	0.0365	0.0363	0.0361	0.0355	0.0357
40	0.0363	0.0361	0.0362	0.0351	0.0360
41	0.0359	0.0367	0.0355	0.0357	0.0360
42	0.0358	0.0367	0.0355	0.0361	0.0360
43	0.0360	0.0370	0.0353	0.0358	0.0354
44	0.0361	0.0361	0.0354	0.0359	0.0361
45	0.0365	0.0365	0.0357	0.0359	0.0356
46	0.0365	0.0369	0.0361	0.0369	0.0359
47	0.0361	0.0369	0.0362	0.0362	0.0362
48	0.0361	0.0373	0.0361	0.0361	0.0365
49	0.0359	0.0376	0.0362	0.0364	0.0371
50	0.0357	0.0369	0.0364	0.0369	0.0369
51	0.0364	0.0373	0.0376	0.0368	0.0366
52	0.0360	0.0374	0.0368	0.0365	0.0366
53	0.0357	0.0376	0.0366	0.0367	0.0371
54	0.0352	0.0377	0.0369	0.0369	0.0371
55	0.0351	0.0371	0.0369	0.0372	0.0372
56	0.0352	0.0379	0.0371	0.0370	0.0372
57	0.0343	0.0378	0.0376	0.0372	0.0373
58	0.0350	0.0383	0.0372	0.0371	0.0368
59	0.0357	0.0370	0.0372	0.0369	0.0374
60	0.0354	0.0378	0.0369	0.0376	0.0368
61	0.0351	0.0378	0.0369	0.0374	0.0375
62	0.0359	0.0383	0.0369	0.0367	0.0375
63	0.0356	0.0379	0.0365	0.0369	0.0372
64	0.0356	0.0371	0.0372	0.0365	0.0365
65	0.0367	0.0381	0.0367	0.0374	0.0373
66	0.0359	0.0372	0.0373	0.0375	0.0372
67	0.0363	0.0372	0.0362	0.0367	0.0368
68	0.0361	0.0375	0.0367	0.0367	0.0369
69	0.0358	0.0371	0.0370	0.0372	0.0370
70	0.0359	0.0370	0.0363	0.0367	0.0369
71	0.0361	0.0369	0.0362	0.0365	0.0371
72	0.0363	0.0364	0.0364	0.0357	0.0363
73	0.0359	0.0367	0.0365	0.0365	0.0369
74	0.0355	0.0370	0.0365	0.0366	0.0369
75	0.0361	0.0373	0.0365	0.0367	0.0369
76	0.0358	0.0368	0.0368	0.0369	0.0375
77	0.0361	0.0369	0.0370	0.0367	0.0369
78	0.0363	0.0370	0.0366	0.0365	0.0370
79	0.0358	0.0363	0.0366	0.0365	0.0372
80	0.0359	0.0366	0.0368	0.0371	0.0364
81	0.0361	0.0373	0.0363	0.0362	0.0369
82	0.0361	0.0369	0.0362	0.0365	0.0364

83	0.0359	0.0371	0.0362	0.0368	0.0370
84	0.0354	0.0368	0.0365	0.0362	0.0369
85	0.0363	0.0369	0.0365	0.0369	0.0371
86	0.0362	0.0363	0.0363	0.0363	0.0369
87	0.0366	0.0367	0.0363	0.0366	0.0368
88	0.0366	0.0368	0.0362	0.0356	0.0359
89	0.0361	0.0361	0.0358	0.0365	0.0363
90	0.0354	0.0360	0.0363	0.0361	0.0357
91	0.0362	0.0362	0.0360	0.0361	0.0361
92	0.0362	0.0363	0.0358	0.0363	0.0361
93	0.0367	0.0358	0.0365	0.0360	0.0363
94	0.0364	0.0361	0.0359	0.0354	0.0360
95	0.0371	0.0361	0.0362	0.0360	0.0362
96	0.0371	0.0362	0.0361	0.0358	0.0363
97	0.0370	0.0362	0.0357	0.0362	0.0365
98	0.0363	0.0367	0.0361	0.0359	0.0359
99	0.0365	0.0365	0.0361	0.0356	0.0365
100	0.0366	0.0380	0.0365	0.0364	0.0369
101	0.0370	0.0362	0.0361	0.0356	0.0360
102	0.0369	0.0362	0.0354	0.0354	0.0357
103	0.0373	0.0349	0.0356	0.0355	0.0359
104	0.0375	0.0353	0.0354	0.0355	0.0361
105	0.0370	0.0365	0.0350	0.0351	0.0358
106	0.0366	0.0357	0.0350	0.0349	0.0350
107	0.0376	0.0352	0.0351	0.0344	0.0348
108	0.0373	0.0346	0.0347	0.0347	0.0349
109	0.0366	0.0357	0.0350	0.0351	0.0355
110	0.0365	0.0356	0.0352	0.0352	0.0357
111	0.0374	0.0353	0.0354	0.0352	0.0355
112	0.0372	0.0356	0.0359	0.0354	0.0357
113	0.0367	0.0361	0.0357	0.0347	0.0354
114	0.0370	0.0357	0.0352	0.0356	0.0361
115	0.0371	0.0359	0.0354	0.0357	0.0359
116	0.0367	0.0365	0.0357	0.0357	0.0361
117	0.0364	0.0363	0.0351	0.0357	0.0362
118	0.0365	0.0360	0.0354	0.0359	0.0361
119	0.0369	0.0363	0.0353	0.0361	0.0359
120	0.0369	0.0363	0.0350	0.0364	0.0356
121	0.0372	0.0360	0.0348	0.0351	0.0352
122	0.0365	0.0361	0.0352	0.0357	0.0359
123	0.0365	0.0362	0.0358	0.0356	0.0360
124	0.0364	0.0360	0.0351	0.0357	0.0359
125	0.0366	0.0361	0.0357	0.0353	0.0361
126	0.0375	0.0357	0.0355	0.0357	0.0360
127	0.0366	0.0361	0.0357	0.0357	0.0355
128	0.0369	0.0361	0.0347	0.0352	0.0365
129	0.0369	0.0357	0.0350	0.0354	0.0361
130	0.0367	0.0355	0.0351	0.0351	0.0365
131	0.0364	0.0357	0.0355	0.0351	0.0357

132	0.0365	0.0359	0.0351	0.0358	0.0357
133	0.0366	0.0363	0.0353	0.0352	0.0364
134	0.0361	0.0354	0.0352	0.0357	0.0352
135	0.0365	0.0357	0.0359	0.0357	0.0354
136	0.0365	0.0359	0.0361	0.0361	0.0355
137	0.0363	0.0360	0.0362	0.0357	0.0364
138	0.0369	0.0362	0.0358	0.0364	0.0361
139	0.0363	0.0362	0.0365	0.0364	0.0358
140	0.0362	0.0365	0.0363	0.0361	0.0361
141	0.0356	0.0369	0.0356	0.0361	0.0366
142	0.0361	0.0368	0.0355	0.0363	0.0361
143	0.0358	0.0369	0.0365	0.0361	0.0361
144	0.0352	0.0369	0.0361	0.0363	0.0369
145	0.0357	0.0374	0.0364	0.0366	0.0369
146	0.0357	0.0370	0.0358	0.0362	0.0365
147	0.0362	0.0371	0.0365	0.0361	0.0361
148	0.0366	0.0366	0.0353	0.0359	0.0362
149	0.0364	0.0357	0.0357	0.0361	0.0364
150	0.0373	0.0365	0.0356	0.0360	0.0360
151	0.0363	0.0376	0.0377	0.0376	0.0372
152	0.0357	0.0381	0.0376	0.0380	0.0373
153	0.0361	0.0384	0.0368	0.0380	0.0372
154	0.0363	0.0385	0.0373	0.0380	0.0376
155	0.0357	0.0382	0.0372	0.0380	0.0375
156	0.0342	0.0373	0.0376	0.0368	0.0374
157	0.0343	0.0368	0.0362	0.0362	0.0371
158	0.0343	0.0372	0.0365	0.0359	0.0369
159	0.0346	0.0376	0.0367	0.0366	0.0371
160	0.0340	0.0366	0.0369	0.0361	0.0366
161	0.0350	0.0365	0.0361	0.0361	0.0363
162	0.0346	0.0367	0.0357	0.0366	0.0369
163	0.0347	0.0365	0.0361	0.0368	0.0376
164	0.0346	0.0368	0.0364	0.0366	0.0369
165	0.0346	0.0364	0.0367	0.0365	0.0374
166	0.0357	0.0366	0.0365	0.0360	0.0364
167	0.0361	0.0357	0.0361	0.0358	0.0360
168	0.0361	0.0365	0.0363	0.0357	0.0352
169	0.0361	0.0364	0.0364	0.0362	0.0357
170	0.0360	0.0359	0.0365	0.0357	0.0366
171	0.0359	0.0361	0.0359	0.0365	0.0360
172	0.0359	0.0360	0.0359	0.0357	0.0364
173	0.0364	0.0361	0.0358	0.0354	0.0357
174	0.0365	0.0361	0.0358	0.0355	0.0362
175	0.0361	0.0361	0.0361	0.0357	0.0365
176	0.0360	0.0365	0.0359	0.0362	0.0357
177	0.0361	0.0374	0.0365	0.0369	0.0358
178	0.0366	0.0376	0.0366	0.0365	0.0363
179	0.0361	0.0372	0.0369	0.0369	0.0369
180	0.0361	0.0374	0.0365	0.0366	0.0361

181	0.0369	0.0375	0.0368	0.0370	0.0369
182	0.0365	0.0379	0.0371	0.0364	0.0368
183	0.0368	0.0369	0.0368	0.0366	0.0369
184	0.0370	0.0363	0.0369	0.0360	0.0364
185	0.0374	0.0365	0.0365	0.0368	0.0360
186	0.0357	0.0376	0.0363	0.0372	0.0374
187	0.0358	0.0370	0.0363	0.0362	0.0357
188	0.0356	0.0369	0.0365	0.0357	0.0360
189	0.0362	0.0370	0.0369	0.0363	0.0359
190	0.0359	0.0363	0.0370	0.0357	0.0362
191	0.0356	0.0365	0.0369	0.0361	0.0365
192	0.0366	0.0356	0.0363	0.0350	0.0359
193	0.0363	0.0364	0.0355	0.0351	0.0346
194	0.0364	0.0369	0.0360	0.0361	0.0360
195	0.0365	0.0366	0.0363	0.0361	0.0362
196	0.0372	0.0365	0.0358	0.0356	0.0361
197	0.0363	0.0368	0.0365	0.0364	0.0367
198	0.0369	0.0362	0.0362	0.0358	0.0364
199	0.0368	0.0365	0.0363	0.0345	0.0359
200	0.0367	0.0363	0.0359	0.0357	0.0360

MATING/UNMATING:

Sample#	Initial		After 25 Cycles		After 50 Cycles		After 75 Cycles		After 100 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	16.40	6.28	13.86	6.85	14.68	7.52	14.77	8.46	16.08	8.39
2	15.77	5.31	13.70	6.50	14.67	6.70	14.10	7.06	14.31	7.13
3	14.96	6.22	13.98	7.95	13.89	8.44	14.03	8.57	15.01	8.66
4	14.56	5.96	13.39	7.25	13.24	7.65	13.43	7.79	13.64	7.94
5	16.36	7.00	14.53	8.91	14.71	9.45	14.79	9.49	14.80	9.65
6	16.88	6.56	14.68	8.45	16.29	8.79	14.77	9.23	14.87	9.42
7	15.09	5.96	13.56	7.30	12.68	6.88	14.06	7.12	13.11	7.14
8	15.23	5.81	15.27	6.82	13.23	6.82	13.87	7.62	13.70	7.21
9	15.78	6.84	14.16	8.06	14.31	8.26	14.23	8.53	14.19	8.74
10	16.44	6.64	15.64	7.60	13.75	7.89	13.95	7.94	13.85	8.11

GAS TIGHT:

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
2	P1	7.7	-0.1
2	P2	12.8	2.5
2	P3	12.3	0.5
2	P4	13.2	0.6
2	P5	8.2	0.6
2	P6	11.5	0.9
2	P7	14.3	1.1
2	P8	12.4	-2.9
2	P9	10.1	0.7
2	P10	14.0	1.0
2	P11	11.8	0.0
2	P12	13.4	-0.1
2	P13	14.1	0.9
2	P14	7.5	0.0
2	P15	9.3	-0.4
2	P16	13.4	-1.8
2	P17	12.7	0.0
2	P18	10.9	0.8
2	P19	7.1	0.9
2	P20	14.0	0.7
2	P21	13.9	-0.9
2	P22	9.1	0.9
2	P23	10.5	0.1
2	P24	9.0	0.6
4	P1	8.9	-1.0
4	P2	12.5	0.5
4	P3	15.1	8.5
4	P4	15.8	-2.3
4	P5	11.5	-3.7
4	P6	10.5	1.1
4	P7	15.7	-0.8
4	P8	12.4	-1.4
4	P9	12.9	0.6
4	P10	15.7	-0.1
4	P11	11.7	0.5
4	P12	14.8	1.1
4	P13	14.1	0.3
4	P14	7.3	0.5
4	P15	8.8	1.5
4	P16	9.8	1.5
4	P17	14.4	0.4
4	P18	12.1	-0.3
4	P19	8.0	-0.4
4	P20	16.3	4.8
4	P21	12.6	0.3
4	P22	16.1	-1.0
4	P23	15.3	-3.8

4	P24	13.5	-2.5
5	P1	8.2	0.0
5	P2	14.9	1.2
5	P3	14.5	-3.1
5	P4	13.1	0.4
5	P5	7.7	-0.3
5	P6	10.6	-0.2
5	P7	14.4	0.2
5	P8	8.9	-0.4
5	P9	11.2	-0.6
5	P10	14.2	-0.1
5	P11	17.5	-3.2
5	P12	14.0	-0.4
5	P13	14.5	-0.2
5	P14	7.8	-0.3
5	P15	9.3	-0.8
5	P16	9.9	-0.1
5	P17	12.4	0.1
5	P18	10.8	-0.3
5	P19	11.2	-1.5
5	P20	15.3	-0.4
5	P21	13.4	-0.2
5	P22	10.7	0.1
5	P23	10.5	-0.2
5	P24	8.6	-0.3
6	P1	7.0	0.3
6	P2	13.8	1.5
6	P3	12.4	0.6
6	P4	12.8	0.0
6	P5	8.1	-0.1
6	P6	15.3	-2.9
6	P7	14.5	0.0
6	P8	9.9	-0.5
6	P9	18.1	-6.0
6	P10	14.3	0.0
6	P11	15.7	-2.1
6	P12	14.2	-0.6
6	P13	14.7	-0.7
6	P14	7.2	0.2
6	P15	8.4	0.2
6	P16	10.4	-0.4
6	P17	13.7	-0.8
6	P18	12.6	-1.8
6	P19	7.2	0.3
6	P20	15.4	-0.1
6	P21	14.0	-0.5
6	P22	8.8	0.3
6	P23	11.0	-0.2
6	P24	9.8	-0.7
7	P1	7.8	-0.4
7	P2	15.9	-1.9
7	P3	12.0	-0.8
7	P4	15.5	0.0
7	P5	8.2	-0.4

7	P6	11.3	0.2
7	P7	16.5	0.9
7	P8	9.3	0.0
7	P9	10.6	-0.2
7	P10	15.0	-0.1
7	P11	13.2	-0.8
7	P12	18.9	-0.7
7	P13	15.5	-0.5
7	P14	7.2	-0.1
7	P15	9.4	-0.3
7	P16	11.1	-0.4
7	P17	14.8	0.6
7	P18	12.0	0.5
7	P19	7.0	0.1
7	P20	16.2	8.5
7	P21	13.4	0.4
7	P22	9.9	-0.6
7	P23	11.0	0.2
7	P24	10.8	-0.5
8	P1	7.2	0.0
8	P2	17.1	-2.8
8	P3	12.6	-0.1
8	P4	14.5	-0.3
8	P5	8.0	-0.1
8	P6	12.3	0.0
8	P7	15.3	-0.5
8	P8	12.0	-2.2
8	P9	14.9	-3.2
8	P10	14.5	-0.3
8	P11	14.7	-2.0
8	P12	14.9	-1.1
8	P13	15.4	-0.7
8	P14	9.3	-0.6
8	P15	12.8	-2.8
8	P16	15.0	-2.8
8	P17	16.5	-1.1
8	P18	12.8	-0.4
8	P19	7.7	0.0
8	P20	17.4	-0.8
8	P21	19.8	-4.9
8	P22	13.8	-2.5
8	P23	14.6	-2.5
8	P24	9.0	-0.4

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** MO-11**Description:** Switch/Multimeter**Manufacturer:** Keithley**Model:** 3706**Serial #:** 120169**Accuracy:** See Manual See Manual

... Last Cal: 08/09/2008, Next Cal: 08/08/2009

Equipment #: TCT-04**Description:** Dillon Quantrol TC21 25-1000 mm/min series test stand**Manufacturer:** Dillon Quantrol**Model:** TC2 I series test stand**Serial #:** 04-1041-04**Accuracy:** Speed Accuracy: +/- 5% of indicated speed; Speed Accuracy: +/- 5% of indicated speed;

... Last Cal: 5/12/2009, Next Cal: 5/12/2010

Equipment #: MV-06**Description:** 6" x 6" Video Measuring Machine**Manufacturer:** Micro-Vu**Model:** M3010898**Serial #:** V9343**Accuracy:** See Manual

... Last Cal: 02/10/2009, Next Cal: 02/10/2010

Equipment #: MV-05**Description:** 6" x 6" Video Measuring Machine**Manufacturer:** Micro-Vu**Model:** M3010838**Serial #:** V9344**Accuracy:** See Manual

... Last Cal: 02/10/2009, Next Cal: 02/10/2010