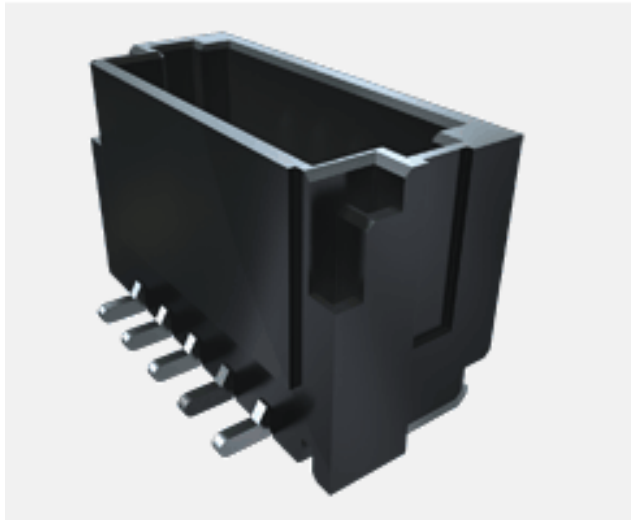
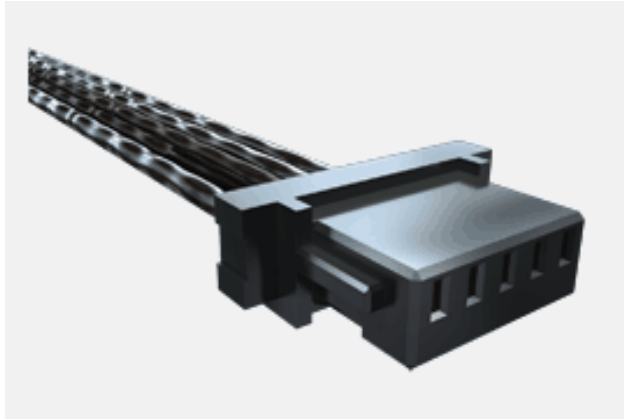




Project Number: Design Qualification Test Report		Tracking Code: 163593_Report_Rev_3	
Requested by: Steven Xu		Date: 11/3/2014	Product Rev: 0
Part #: T1M-20-GF-S-V/S1SS-20-28-GF-03.00-S		Lot #: N/A	Tech: Peter Chen Eng: Vico Zhao
Part description: T1M/S1SS			Qty to test: 16
Test Start:9/21/2011	Test Completed: 9/28/2011		



Design Qualification Test Report

T1M/S1SS

T1M-20-GF-S-V/S1SS-20-28-GF-03.00-S

Tracking Code: 163593_Report_Rev_3	Part #: T1M-20-GF-S-V/S1SS-20-28-GF-03.00-S
Part description: T1M/S1SS	

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
12/17/2011	1	Initial Issue	PC
05/13/2013	2	Updated the report cover	PC
11/03/2014	3	Updated the test data	PC

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

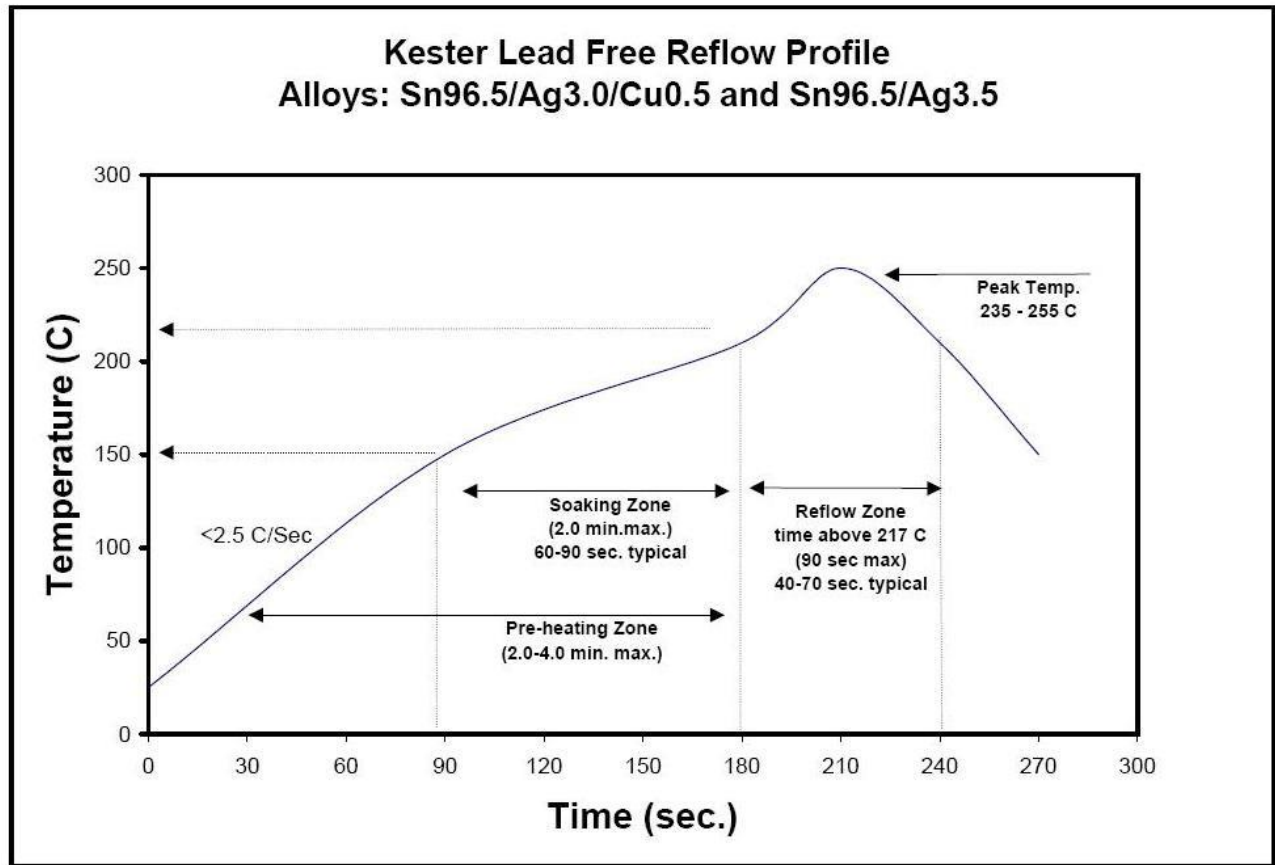
To perform the following tests: Design Qualification Test, Please see test plan.

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 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 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-102657-TST

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

FLOWCHARTS Continued**Durability/Mating/Unmating/Gaps**

TEST STEP	GROUP B1 8 Boards (largest position submitted)
01	Contact Gaps
02	LLCR-1
03	Forces - Mating / Unmating
04	30 Cycles
05	Forces - Mating / Unmating
06	Clean w/Compressed Air
07	Contact Gaps
08	LLCR-2
09	Thermal Shock (Mated and Undisturbed)
10	LLCR-3
11	Cyclic Humidity (Mated and Undisturbed)
12	LLCR-4
13	Forces - Mating / Unmating

Thermal Shock = EIA-364-32, Table II, Test Condition VII:

-55°C to +105°C 1/2 hour dwell, 5 cycles

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

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

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

Mating / Unmating Forces = EIA-364-13

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

Gaps to be taken on a minimum of 20% of each part tested

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

- 1) EIA-364-32, *Thermal Shock (Temperature Cycling) Test Procedure for Electrical Connectors*.
- 2) Test Condition 1: -55°C to +105°C
- 3) Test Time: ½ hour dwell at each temperature extreme
- 4) Number of Cycles: 5
- 5) All test samples are pre-conditioned at ambient.
- 6) 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 A, 96 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.

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.

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

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

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**-----**0.0810 mm**
 - **Max**-----**0.0890 mm**
- **After 30 Cycles**
 - **Min**-----**0.0811 mm**
 - **Max**-----**0.0898 mm**

Mating – Unmating Force

- **Initial**
 - **Mating**
 - **Min**-----**2.85 Lbs**
 - **Max**-----**3.87 Lbs**
 - **Unmating**
 - **Min**-----**2.06Lbs**
 - **Max**-----**3.22 Lbs**
- **After 30 Cycles**
 - **Mating**
 - **Min**-----**2.44 Lbs**
 - **Max**-----**3.41 Lbs**
 - **Unmating**
 - **Min**-----**1.90 Lbs**
 - **Max**-----**2.38 Lbs**
- **After Humidity**
 - **Mating**
 - **Min**-----**2.25 Lbs**
 - **Max**-----**3.19 Lbs**
 - **Unmating**
 - **Min**-----**1.62 Lbs**
 - **Max**-----**2.13 Lbs**

RESULTS Continued**LLCR:****Mating/Unmating Durability Group (192 points signal LLCR test points)**

- **Initial** ----- 23.10 mOhms Max
- **Durability, 30 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 ----- 181 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 11 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

Gas Tight Group (192 points signal LLCR test points)

- **Initial** ----- 25.90 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

Contact Gaps

Initial		After 30 Cycles	
Units: mm		Units: mm	
<i>Minimum</i>	0.0810	<i>Minimum</i>	0.0811
<i>Maximum</i>	0.0890	<i>Maximum</i>	0.0898
<i>Average</i>	0.0860	<i>Average</i>	0.0861
<i>St. Dev.</i>	0.0020	<i>St. Dev.</i>	0.0017
<i>Count</i>	48	<i>Count</i>	48

Mating – Unmating Force

	Initial				After 30 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	12.68	2.85	9.16	2.06	10.85	2.44	8.45	1.90
Maximum	17.21	3.87	14.32	3.22	15.17	3.41	10.59	2.38
Average	14.34	3.22	11.45	2.58	13.05	2.93	9.45	2.13
St Dev	1.49	0.34	2.02	0.45	1.57	0.35	0.76	0.17
Count	8	8	8	8	8	8	8	8
	After Humidity							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	10.01	2.25	7.21	1.62				
Maximum	14.19	3.19	9.47	2.13				
Average	12.29	2.76	8.00	1.80				
St Dev	1.62	0.36	0.93	0.21				
Count	8	8	8	8				

DATA SUMMARIES Continued**LLCR Durability:**

- 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. $\leq +5.0$ 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	9/21/2011	9/22/2011	9/24/2011	9/28/2011
Room Temp C	23	23	23	23
RH	45	45	45	45
Name	Peter Chen	Peter Chen	Peter Chen	Peter Chen
mOhm values	Actual	Delta	Delta	Delta
	Initial	30 Cycles	Therm Shock	Humidity
Average	21.6	0.4	0.7	2.1
St. Dev.	0.6	0.4	0.5	1.5
Min	20.2	0.0	0.0	0.0
Max	23.0	1.8	2.4	9.7
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
30 Cycles	192	0	0	0	0	0
Thermal	192	0	0	0	0	0
Humidity	181	11	0	0	0	0

DATA SUMMARIES Continued**GAS TIGHT:**

- 4) A total of 192 points were measured
- 5) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 6) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 7) 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	9/30/2011	10/5/2011
Room Temp C	23	23
RH	45	45
Name	Peter Chen	Peter Chen
mOhm values	Actual Initial	Delta Gas Tight
Average	22.13	0.88
St. Dev.	0.99	0.77
Min	20.15	0.00
Max	25.90	4.68
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	0

DATA**Contact Gaps**

Initial								
Units: mm								
Signal	009	010	011	012	013	014	015	016
1	0.0874	0.0820	0.0880	0.0850	0.0840	0.0890	0.0880	0.0850
2	0.0870	0.0810	0.0880	0.0840	0.0870	0.0880	0.0850	0.0870
3	0.0810	0.0810	0.0890	0.0860	0.0850	0.0890	0.0860	0.0870
4	0.0850	0.0850	0.0890	0.0860	0.0860	0.0870	0.0820	0.0890
5	0.0810	0.0850	0.0850	0.0860	0.0890	0.0860	0.0870	0.0820
6	0.0820	0.0860	0.0840	0.0860	0.0850	0.0870	0.0820	0.0870
After 30 cycles								
Units: mm								
Signal	009	010	011	012	013	014	015	016
1	0.0874	0.0872	0.0879	0.0887	0.0867	0.0879	0.0865	0.0849
2	0.0857	0.0853	0.0811	0.0846	0.0824	0.0868	0.0848	0.0857
3	0.0852	0.0842	0.0844	0.0898	0.0874	0.0859	0.0837	0.0866
4	0.0843	0.0877	0.0853	0.0887	0.0865	0.0847	0.0856	0.0869
5	0.0864	0.0855	0.0862	0.0875	0.0867	0.0858	0.0849	0.0898
6	0.0874	0.0872	0.0879	0.0887	0.0867	0.0879	0.0865	0.0849

Mating – Unmating Force

Sample#	Initial		After 30 Cycles		After Humidity	
	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	3.87	2.95	3.35	2.38	3.19	2.05
2	3.00	2.32	2.98	2.22	2.59	1.63
3	3.13	2.13	3.41	1.90	3.01	1.68
4	3.46	3.05	2.81	2.11	2.25	1.69
5	2.94	2.22	2.44	2.01	2.28	1.62
6	2.85	2.06	2.51	1.92	2.70	1.64
7	3.15	2.65	2.87	2.22	3.08	2.13
8	3.39	3.22	3.10	2.24	3.00	1.94

DATA Continued**LLCR Durability:**

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	30 Cycles	Thermal	Humidity
1	P1	21.61	0.61	0.7	0.92
1	P2	21.7	0.36	0.39	1.23
1	P3	21.41	0.96	0.79	0.68
1	P4	21.52	1.07	1.01	1.04
1	P5	21.74	0.58	0.87	2.22
1	P6	21.83	1.4	1.97	1.1
1	P7	22.34	0.6	1.55	1.18
1	P8	22.02	1.06	0.96	1.07
1	P9	22.04	0.46	1.01	0.82
1	P10	21.79	1.73	2.03	0.83
1	P11	22.34	0.28	0.88	0.6
1	P12	21.79	0.34	0.69	0.77
1	P13	21.79	0.46	0.51	1.04
1	P14	22.05	0.36	0.27	0.88
1	P15	21.98	0.66	0.72	3.02
1	P16	21.83	0.42	0.85	2.28
1	P17	21.66	0.22	0.47	3.63
1	P18	22.06	0.2	0.61	5.24
1	P19	21.51	0.15	0.24	2.28
1	P20	21.71	0.52	0.81	1.4
1	P21	21.49	0.4	0.91	1.41
1	P22	21.59	0.66	0.65	1.55
1	P23	21.85	1.03	0.58	1.23
1	P24	21.57	0.69	1.18	1.29
2	P1	20.55	0.24	0.51	2.2
2	P2	20.81	0.22	0.37	2.2
2	P3	20.95	0.24	0.8	2.64
2	P4	20.75	0.79	0.54	1.18
2	P5	21.36	0.31	0.54	1.49
2	P6	20.99	0.06	0.67	1.33
2	P7	20.86	0.12	0.25	0.77
2	P8	20.82	0.01	0.25	1.27
2	P9	21.21	0.49	0.49	1.71
2	P10	21.13	0.57	0.5	1.19
2	P11	20.73	0.52	1.34	4.2
2	P12	21.01	0.19	0.64	3.29
2	P13	20.8	0.14	0.42	1.29
2	P14	20.89	0.29	0.81	2.74
2	P15	20.52	0.2	0.37	2.99
2	P16	20.38	0.21	0.97	3.29
2	P17	20.45	0.1	0.41	1.48
2	P18	20.35	0.58	1.69	4.1
2	P19	20.28	0.13	0.52	4.13
2	P20	20.35	0.05	0.37	0.74

2	P21	20.41	0.04	0.54	7.37
2	P22	20.17	0.13	0.89	1.99
2	P23	20.2	0.16	0.52	2.92
2	P24	20.63	0.09	0.33	3
3	P1	21.57	0.78	2.3	6.07
3	P2	21.99	0.2	1.47	2.13
3	P3	21.58	0.57	1.7	6.43
3	P4	21.42	0.45	1.02	4.49
3	P5	21.94	0.59	2.16	2.27
3	P6	21.72	0.33	0.66	2.32
3	P7	21.54	0.49	0.84	1.84
3	P8	21.54	0.73	1.41	2.96
3	P9	21.94	0.39	0.97	2.37
3	P10	21.58	0.53	0.89	2.18
3	P11	22.41	0.03	0.1	0.46
3	P12	22.09	0	0.04	0.83
3	P13	22.13	0.24	0.05	0.82
3	P14	22.28	0.36	0.01	1.65
3	P15	21.95	0.15	0.01	0.73
3	P16	21.82	0.15	0.27	1.28
3	P17	21.35	0.07	0.35	1.11
3	P18	21.6	0.01	0.27	1.16
3	P19	21.57	0.21	0.3	1
3	P20	21.71	0.86	0.96	1.61
3	P21	21.71	0.24	0.59	1.13
3	P22	21.47	0.58	0.68	1.81
3	P23	22.04	0.17	0.59	2.11
3	P24	21.44	0.89	1.26	2.72
4	P1	20.89	0.24	0.37	2.29
4	P2	21.28	0.05	0.07	1.14
4	P3	21.33	0.02	0.26	3.54
4	P4	21.39	0.19	0.21	2.26
4	P5	21.28	0.15	0.02	1.88
4	P6	21.53	0.15	0.03	1.34
4	P7	21.75	0.15	0.19	2.25
4	P8	21.43	0.09	0.04	1.1
4	P9	21.82	0.33	0.22	2.82
4	P10	21.87	0.18	0.13	1.95
4	P11	22.75	0.97	0.81	3.01
4	P12	22.57	0.59	0.54	2.21
4	P13	22.32	0.3	0.56	1.8
4	P14	22.49	0.15	0.51	1.78
4	P15	21.87	0.38	0.57	2.28
4	P16	22.06	0.91	0.79	1.48
4	P17	21.86	0.11	0.26	2.48
4	P18	21.64	1.05	1.24	4.28
4	P19	21.8	0.26	0.34	1.85
4	P20	22.25	0.04	0.15	1.44
4	P21	22.02	0.03	0.16	2.74
4	P22	22.02	0.25	0.27	1.73

4	P23	21.5	0.28	0.58	2.35
4	P24	21.75	0.03	0.06	5.2
5	P1	21.45	0.61	0.81	1.58
5	P2	21.84	0.54	0.43	1.06
5	P3	21.37	0.18	0.8	0.63
5	P4	21.42	0.42	0.65	1.41
5	P5	21.74	0.16	0.18	0.47
5	P6	21.55	0.24	0.13	0.27
5	P7	22.14	0.3	0.95	4.76
5	P8	21.74	0.33	0.73	1.69
5	P9	21.84	0.11	0.28	0.87
5	P10	21.9	0.22	0.43	0.38
5	P11	21.46	0.29	0.16	0.99
5	P12	21.63	0	0.02	4.65
5	P13	21.32	0.38	0.29	2.08
5	P14	22.02	0.22	0.42	0.13
5	P15	21.24	0.2	0.23	1.01
5	P16	21.49	0.54	0.68	4.27
5	P17	21.18	0.27	0.45	1.41
5	P18	21.4	0.2	0.42	1.07
5	P19	21.63	0.25	0.41	4.46
5	P20	22.33	0.08	0.09	1.97
5	P21	21.99	0.36	0.4	3.57
5	P22	21.75	0.25	0.4	3.84
5	P23	22.31	0.02	0.43	2.25
5	P24	22.07	0.26	0.58	1.77
6	P1	21.44	0.74	1.13	4.42
6	P2	21.31	0.22	0.44	1.3
6	P3	21.36	0.19	0.56	2.39
6	P4	21.69	0.21	0.38	1.38
6	P5	21.43	0.06	0.71	2.09
6	P6	21.44	0.16	0.85	1.91
6	P7	21.68	0.37	0.35	1.07
6	P8	21.65	0.97	0.93	5.92
6	P9	21.52	0.8	0.64	1.57
6	P10	21.81	0.32	0.39	0.69
6	P11	22.75	0.52	1.24	4.46
6	P12	22.26	0.26	0.85	1.21
6	P13	22.29	0.33	0.66	1.31
6	P14	22.52	0.07	0.07	0.7
6	P15	22.35	0.02	0.09	0.76
6	P16	22	0.47	0.32	1.45
6	P17	22.1	0.08	0.23	0.79
6	P18	22.2	0.14	0.14	1.57
6	P19	22.2	0.07	0.35	1.73
6	P20	22.53	0.1	0.09	0.94
6	P21	22.66	0.01	0.06	2.39
6	P22	22.43	0.27	0.32	2.9
6	P23	22.43	0.09	0.13	1.11
6	P24	22.85	0.14	0	0.5

7	P1	21.42	0.01	0.13	6.65
7	P2	21.25	0.02	0.16	1.92
7	P3	21.39	0.03	0.1	7.75
7	P4	21.32	1.07	1.02	6.25
7	P5	21.84	0.62	0.71	0.7
7	P6	21.99	0.02	0.58	2.06
7	P7	22.97	0.17	0.1	0.02
7	P8	22.29	1.3	1.26	1.44
7	P9	22.53	0.59	0.44	0.31
7	P10	22.09	1.06	1.82	0.75
7	P11	21.33	0.04	0.87	1.48
7	P12	21.08	0.32	0.89	3.19
7	P13	21.18	0.28	0.4	2.41
7	P14	21.57	0.28	1.36	2.22
7	P15	21.49	0.13	0.73	1.57
7	P16	21.12	0.15	1.45	3.88
7	P17	22.07	0.21	2.28	9.67
7	P18	21	0.77	0.67	2.52
7	P19	21.54	0.08	0.26	1.9
7	P20	20.77	0.46	0.9	7.64
7	P21	21.1	0.46	0.73	2.08
7	P22	20.73	0.31	0.43	2.33
7	P23	21.13	0.41	0.48	1.97
7	P24	20.97	0.54	0.58	2.75
8	P1	21.28	0.55	0.55	1.27
8	P2	21.49	0.33	0.42	1.8
8	P3	21.25	0.22	0.47	0.85
8	P4	21.32	0.79	0.75	1.36
8	P5	21.48	0.22	1.19	1.04
8	P6	21.32	0.3	0.43	0.45
8	P7	21.31	1.12	0.65	1.68
8	P8	21.29	0.12	0.1	0.63
8	P9	22.06	0.32	0.15	1.81
8	P10	21.64	0.43	1.12	0.99
8	P11	21.55	0.64	0.19	1.02
8	P12	21.28	0.94	0.79	0.85
8	P13	21.04	0.82	0.58	3.11
8	P14	21.15	1.06	1.36	2.59
8	P15	21.3	0.43	0.73	1.47
8	P16	21.22	0.6	1.22	1.05
8	P17	21.32	0.36	1.32	1.81
8	P18	21.26	0.72	0.98	2.81
8	P19	20.79	1.5	1.59	2.12
8	P20	20.9	1.02	2.4	2.83
8	P21	20.78	1.39	1.87	1.58
8	P22	20.45	1.45	1.37	2.13
8	P23	20.51	1.7	1.53	2.01
8	P24	20.61	1.8	1.69	1.7

DATA Continued**LLCR Gas Tight:**

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	21.70	0.42
1	P2	21.26	0.72
1	P3	21.71	0.59
1	P4	22.12	1.00
1	P5	21.75	0.34
1	P6	21.54	0.64
1	P7	21.73	0.13
1	P8	21.86	0.48
1	P9	21.58	0.18
1	P10	21.53	0.41
1	P11	22.58	0.47
1	P12	22.12	0.60
1	P13	22.63	0.34
1	P14	22.15	0.15
1	P15	21.79	0.23
1	P16	22.40	0.04
1	P17	21.46	0.66
1	P18	21.97	0.22
1	P19	21.88	0.73
1	P20	22.05	0.57
1	P21	21.67	0.21
1	P22	21.56	0.34
1	P23	21.95	0.25
1	P24	21.66	0.43
2	P1	22.20	0.05
2	P2	22.33	0.50
2	P3	21.54	0.21
2	P4	21.99	0.21
2	P5	21.83	0.05
2	P6	21.93	0.07
2	P7	25.20	2.59
2	P8	22.56	0.73
2	P9	22.88	1.07
2	P10	22.96	1.04
2	P11	21.39	0.00
2	P12	21.68	0.54
2	P13	21.36	0.19
2	P14	21.29	0.37
2	P15	21.26	0.18
2	P16	21.07	0.34
2	P17	21.26	0.08
2	P18	21.01	0.40
2	P19	21.08	0.98
2	P20	20.95	0.22

2	P21	20.94	0.49
2	P22	21.15	0.33
2	P23	21.69	0.38
2	P24	21.44	0.35
3	P1	21.92	0.85
3	P2	21.57	0.70
3	P3	22.08	0.73
3	P4	21.95	0.22
3	P5	21.87	0.69
3	P6	22.22	0.21
3	P7	22.19	0.72
3	P8	21.93	0.58
3	P9	21.83	0.64
3	P10	21.58	0.59
3	P11	22.93	0.75
3	P12	22.66	0.45
3	P13	22.13	0.75
3	P14	22.30	0.42
3	P15	22.47	0.39
3	P16	22.53	0.20
3	P17	21.74	0.33
3	P18	21.92	0.14
3	P19	21.68	0.50
3	P20	22.22	0.14
3	P21	22.26	0.19
3	P22	21.51	0.30
3	P23	21.32	0.49
3	P24	21.59	0.14
4	P1	24.57	2.21
4	P2	24.55	3.34
4	P3	25.78	2.53
4	P4	25.90	4.68
4	P5	25.56	2.34
4	P6	25.61	3.07
4	P7	23.15	0.59
4	P8	25.27	2.06
4	P9	24.55	0.43
4	P10	23.25	1.24
4	P11	22.80	1.59
4	P12	22.77	0.52
4	P13	21.78	0.78
4	P14	21.32	1.03
4	P15	21.43	0.14
4	P16	21.23	0.11
4	P17	22.33	1.79
4	P18	21.21	2.00
4	P19	22.11	0.64
4	P20	21.96	1.28
4	P21	21.15	2.06
4	P22	21.01	1.23

4	P23	21.19	2.02
4	P24	21.55	0.66
5	P1	22.24	1.12
5	P2	22.44	0.75
5	P3	22.79	0.55
5	P4	22.51	0.78
5	P5	22.69	0.63
5	P6	22.76	0.64
5	P7	22.88	1.17
5	P8	22.96	0.77
5	P9	23.20	0.94
5	P10	23.15	0.16
5	P11	22.05	0.65
5	P12	21.80	0.72
5	P13	21.56	0.58
5	P14	21.38	0.06
5	P15	21.80	0.49
5	P16	21.22	0.05
5	P17	21.19	0.04
5	P18	20.92	0.24
5	P19	21.25	0.22
5	P20	21.26	0.25
5	P21	21.11	0.22
5	P22	21.16	0.36
5	P23	21.30	0.35
5	P24	21.07	0.37
6	P1	21.32	0.09
6	P2	22.01	0.20
6	P3	20.94	0.30
6	P4	21.36	1.75
6	P5	20.88	3.33
6	P6	21.04	0.20
6	P7	20.90	2.22
6	P8	21.22	0.99
6	P9	21.52	1.69
6	P10	22.03	2.09
6	P11	20.15	3.07
6	P12	21.03	0.98
6	P13	20.56	0.65
6	P14	22.25	0.20
6	P15	23.35	0.23
6	P16	22.15	0.99
6	P17	24.12	0.00
6	P18	22.06	1.06
6	P19	21.25	1.08
6	P20	22.06	0.39
6	P21	21.25	0.13
6	P22	21.65	0.80
6	P23	22.25	0.89
6	P24	22.14	0.33

7	P1	22.77	1.34
7	P2	22.35	1.14
7	P3	22.69	0.53
7	P4	22.84	0.22
7	P5	22.58	0.60
7	P6	22.93	0.10
7	P7	23.14	0.11
7	P8	23.02	0.08
7	P9	23.63	0.10
7	P10	23.97	1.25
7	P11	22.09	0.07
7	P12	21.75	0.01
7	P13	21.50	0.22
7	P14	22.26	0.48
7	P15	21.75	0.63
7	P16	22.30	0.29
7	P17	22.09	0.00
7	P18	21.91	0.17
7	P19	21.82	0.11
7	P20	22.10	0.37
7	P21	22.41	0.07
7	P22	21.80	0.19
7	P23	25.59	3.51
7	P24	23.41	1.92
8	P1	22.29	1.34
8	P2	21.60	1.33
8	P3	21.63	0.07
8	P4	21.35	1.63
8	P5	21.47	2.00
8	P6	22.60	0.85
8	P7	21.62	1.78
8	P8	21.89	0.69
8	P9	22.18	0.04
8	P10	22.88	1.87
8	P11	23.16	1.50
8	P12	22.72	0.15
8	P13	22.48	1.21
8	P14	22.39	0.77
8	P15	22.77	0.21
8	P16	22.20	1.60
8	P17	21.12	1.07
8	P18	22.21	1.12
8	P19	22.32	1.01
8	P20	22.49	1.85
8	P21	21.15	1.89
8	P22	22.34	0.17
8	P23	22.34	1.06
8	P24	22.34	0.44

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** HZ-MO-03**Description:** Micro-ohmmeter**Manufacturer:** Keithley**Model:** 580**Serial #:** 297288**Accuracy:** Last Cal: 2011-8-06, Next Cal: 2012-8-05**Equipment #:** HZ-TCT-01**Description:** Normal force analyzer**Manufacturer:** Mecmesin Multitester**Model:** Mecmesin Multitester 2.5-i**Serial #:** 08-1049-04**Accuracy:** Last Cal: 2011-4-28, Next Cal: 2012-4-27**Equipment #:** HZ-THC-01**Description:** Humidity transmitter**Manufacturer:** Thermtron**Model:** HMM30C**Serial #:** D0240037**Accuracy:** Last Cal: 2011-3-3, Next Cal: 2012-3-2**Equipment #:** HZ-OGP-01**Description:** Video measurement system**Manufacturer:** OGP**Model:** SMARTSCOPE FLASH 200**Serial #:** SVW2003632**Accuracy:** Last Cal: 2011-6-10, Next Cal: 2012-6-9**Equipment #:** HZ-MO-01**Description:** Micro-ohmmeter**Manufacturer:** Keithley**Model:** 2700**Serial #:** 1199807**Accuracy:** Last Cal: 2011-4-28, Next Cal: 2012-4-27**Equipment #:** HZ-TSC-01**Description:** Thermal Shock transmitter**Manufacturer:** Keithley**Model:** 10-VT14994**Serial #:** VTS-3-6-6-SC/AC**Accuracy:** Last Cal: 2011-11-1, Next Cal: 2012-11-1