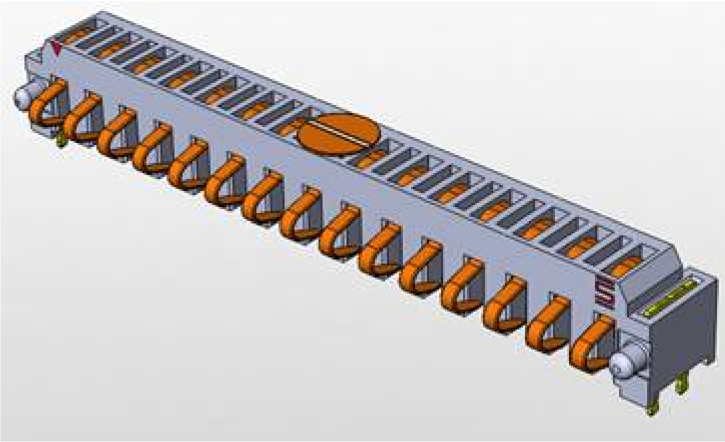
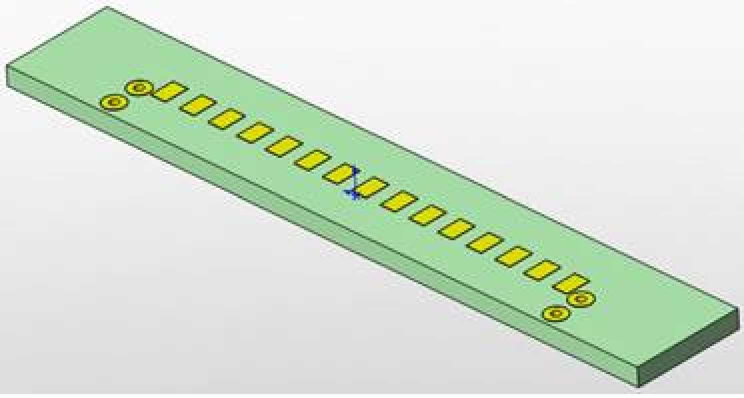
Project Number: Design Qualification Test Report	Tracking Code: TC1046--3527_Report_Rev_2		
Requested by: Leo Lee	Date: 12/01/2010	Product Rev: 0	
Part #: SIR1-15-L-S-A\ SIR1-Mating Board	Lot #:1	Tech: Kason He	Eng: Vico Zhao
Part description: SIBF	Qty to test:40		
Test Start: 11/15/2010	Test Completed: 12/08/2010		





Design Qualification Test Report

SIR1

SIR1-15-L-S-A\ SIR1-Mating Board

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to IS0 10012-l and ANSI/NCSL 2540-1, as applicable.

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SCOPE

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

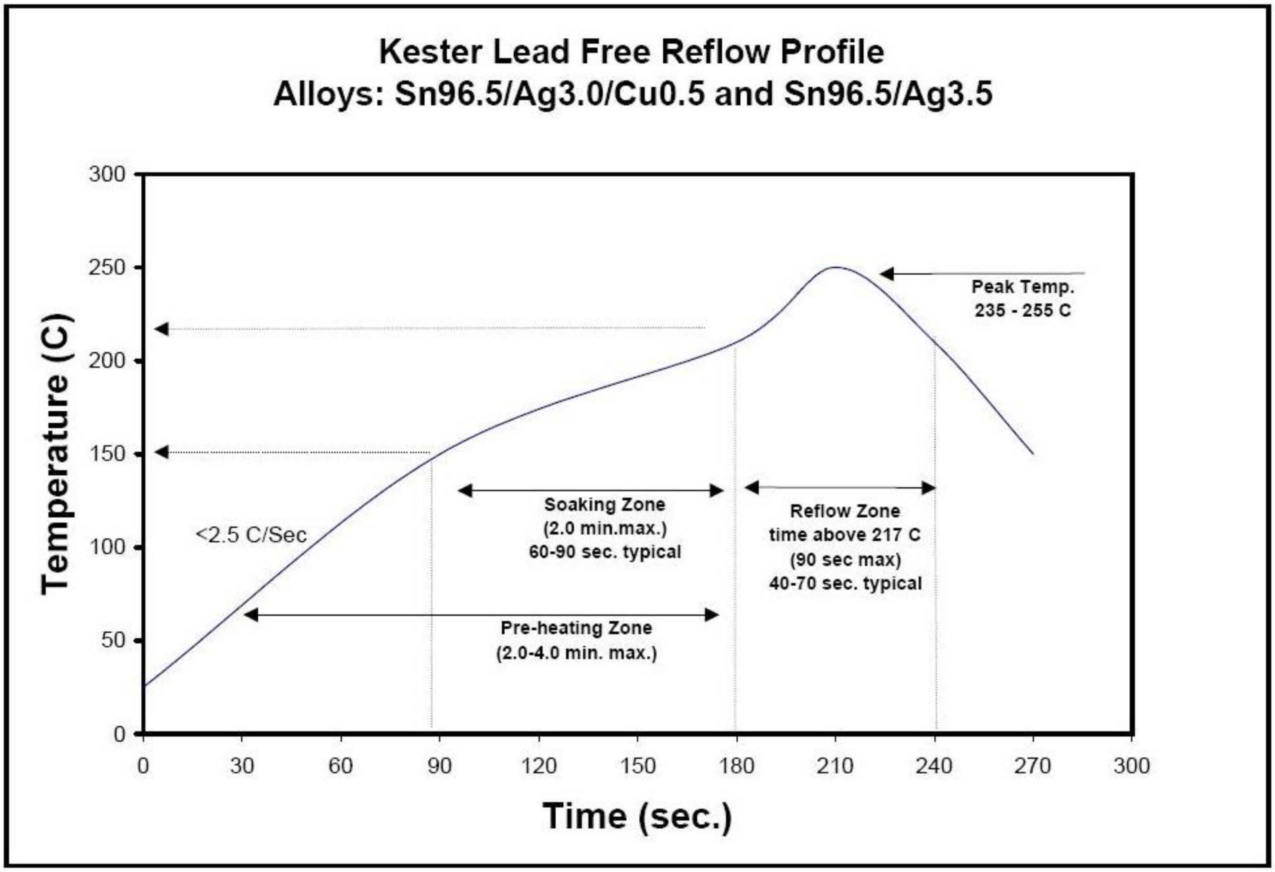
APPLICABLE DOCUMENTS

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 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-102709-TST\ PCB-102710-TST

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

TEST STEP	GROUP A 88 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

Normal Force/Deflection Force

TEST STEP	GROUP B1 Individual Contacts (8-10 min)	GROUP B2 Individual Contacts (8-10 min)
01	Setup Approved	Setup Approved
02	Normal Force (in the body and soldered on PCB unless otherwise specified)	Thermal Aging (Mated)
03		Normal Force (in the body and soldered on PCB unless otherwise specified)

Thermal Aging = EIA-364-17, Test Condition 4 (105 °C)
Time Condition 'B' (250 hours)
Humidity = EIA-364-31, Test Condition B (240 Hours)
and Method III (+25 °C to +65 °C @ 90%RH to 98% RH)
ambient pre-condition and delete steps 7a and 7b
Mating/Un-Mating Forces = EIA-364-13
Normal Force = EIA-364-04
(Perpendicular) displacement Force = 12.7 mm/min +/- 6 mm/min
Spec is 50 N @ 1 mm displacement
Contact Gaps/Height - No standard method. Usually measured optically

FLOWCHARTS Continued

Durability/Thermal Age/Cyclic Humidity

TEST STEP	GROUP A 88 Points 100 Cycles
01	LLCR-1
02	100 Cycles
03	Clean Mating Interface
04	LLCR-2
05	Thermal Age (Mated and undisturbed)
06	LLCR-3
07	Cyclic Humidity (Mated and undisturbed)
08	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 to 98% RH)
ambient pre-condition and delete steps 7a and 7b
LLCR = EIA-364-23, LLCR
use Keithley 580 in the dry circuit mode, 10 mA Max

FLOWCHARTS Continued

Durability/Thermal Shock/Cyclic Humidity

TEST STEP	GROUP A 88 Points 100 Cycles
01	LLCR-1
02	100 Cycles
03	LLCR-2
04	Data Review
05	Thermal Shock (mated and undisturbed)
06	LLCR-3
07	Data Review
08	Cyclic Humidity (mated and undisturbed)
09	LLCR-4

Thermal Shock =EIA-364-32, Table II, Test Condition I:
-55 ° C to +85 ° C 1/2 hour dwell, 100 cycles
Humidity =EIA-364-31, Test Condition B (240 Hours)
and Method III (+25 ° C to +65 ° C @ 90%RH to 98% RH)
ambient pre-condition and delete steps 7a and 7b
LLCR = EIA-364-23, LLCR
use Keithley 580 in the dry circuit mode, 10 mA Max

FLOWCHARTS Continued

IR & DWV

TEST STEP	GROUP A1 2 Mated Sets Break Down - Pin to Pin	GROUP A2 2 Unmated of Part # Being Tested Break Down - Pin to Pin	GROUP B 2 Mated Sets Pin to Pin
01	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02			Thermal Aging (both sets unmated)
03			IR & DWV at test voltage (on both mated sets and on each connector unmated)
04			Cyclic Humidity (both sets unmated)
05			IR & DWV at test voltage (on both mated sets and on each connector unmated)

*** - DWV on group B to be performed at Test Voltage**

DWV test voltage is equal to 75% of the lowest break down voltage from group A1, A2 or A3

Thermal Aging = EIA-364-17, Test Condition 4 (105 °C)

Time Condition 'B' (250 hours)

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

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

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

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

Current Carrying Capacity

TEST STEP	GROUP A 3 Mated Assemblies 1 CONTACT POWERED	GROUP B 3 Mated Assemblies 2 CONTACTS POWERED	GROUP C 3 Mated Assemblies 3 CONTACTS POWERED	GROUP D 3 Mated Assemblies 4 CONTACTS POWERED	GROUP E 3 Mated Assemblies ALL CONTACTS POWERED
01	CCC	CCC	CCC	CCC	CCC

(TIN PLATING) - Tabulate calculated current at RT, 65° C, 75° C and 95° C

after derating 20% and based on 105° C

(GOLD PLATING) - Tabulate calculated current at RT, 85° C, 95° C and 115° C

after derating 20% and based on 125° C

CCC, Temp rise = EIA-364-70

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

1) EIA-364-32, *Thermal Shock (Temperature Cycling) Test Procedure for Electrical Connectors.*
2) Test Condition 1: -55°C to +85°C
3) Test Time: ½ hour dwell at each temperature extreme
4) Number of Cycles: 100
5) All test samples are pre-conditioned at ambient.
6) All test samples are exposed to environmental stressing in the mated condition.

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.

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

1) Reference document: EIA-364-04, *Normal Force Test Procedure for Electrical Connectors*.
2) The contacts shall be tested in the connector housing.
3) If necessary, a “window” shall be made in the connector body to allow a probe to engage and deflect the contact at the same attitude and distance (plus 0.05 mm [0.002”]) as would occur in actual use.
4) The connector housing shall be placed in a holding fixture that does not interfere with or otherwise influence the contact force or deflection.
5) Said holding fixture shall be mounted on a floating, adjustable, X-Y table on the base of the Dillon TC^2, computer controlled test stand with a deflection measurement system accuracy of 5.0 µm (0.0002”).
6) The nominal deflection rate shall be 5 mm (0.2”)/minute.
7) Unless otherwise noted a minimum of five contacts shall be tested.
8) The force/deflection characteristic to load and unload each contact shall be repeated five times.
9) The system shall utilize the TC^2 software in order to acquire and record the test data.
10) The permanent set of each contact shall be measured within the TC^2 software.
11) The acquired data shall be graphed with the deflection data on the X-axis and the force data on the Y-axis and a print out will be stored with the Tracking Code paperwork.

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
2) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
3) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
4) The size of the temperature probe can affect the measured temperature.
5) Copper traces on PC boards will contribute to temperature rise:
   a. Self heating (resistive)
   b. Reduction in heat sink capacity affecting the heated contacts
6) A de-rating curve, usually 20%, is calculated.
7) Calculated de-rated currents at three temperature points are reported:
   a. Ambient
   b. 80^{o} C
   c. 95^{o} C
   d. 115^{o} C
8) Typically, neighboring contacts (in close proximity to maximize heat build up) are energized.
9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the maximum temperature in the vicinity of the heat generation area.
10) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
11) Hook-up wire cross section is larger than the cross section of any connector leads/PC board traces, jumpers, etc.
12) Hook-up wire length is longer than the minimum specified in the referencing standard.

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.

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes

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. <= +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. <= +5.0 mOhms: --------------------------- Stable
    b. +5.1 to +10.0 mOhms:--------------------- Minor
    c. +10.1 to +15.0 mOhms: ------------------- Acceptable
    d. +15.1 to +50.0 mOhms: ------------------- Marginal
    e. +50.1 to +2000 mOhms: ------------------ Unstable
    f. >+2000 mOhms:---------------------------- Open Failure
4) Procedure:
    a. Reference document: EIA-364-36, *Test Procedure for Determination of Gas-Tight Characteristics for Electrical Connectors, Sockets and/or Contact Systems.*
    b. Test Conditions:
        i. Class II--- Mated pairs of contacts assembled to their plastic housings.
        ii. Reagent grade Nitric Acid shall be used of sufficient volume to saturate the test chamber
        iii. The ratio of the volume of the test chamber to the surface area of the acid shall be 10:1.
        iv. The chamber shall be saturated with the vapor for at least 15 minutes before samples are added.
        v. Exposure time, 55 to 65 minutes.
        vi. The samples shall be no closer to the chamber walls than 1 inches and no closer to the surface of the acid than 3 inches.
        vii. The samples shall be dried after exposure for a minimum of 1 hour.
        viii. Drying temperature 50^{O} C
        ix. The final LLCR shall be conducted within 1 hour after drying.

RESULTS

Temperature Rise, CCC at a 20% de-rating

- **CCC for a 30°C Temperature Rise----------------------2.8A per contact with 1 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------------------2.1A per contact with 2 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------------------1.9A per contact with 3 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------------------1.8A per contact with 4 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------------------1.4A per contact with all adjacent contacts powered**

Normal Force at 2.00 mm deflection

- **Initial**
  - **Min---86.72 gf Set ----- 0.0500 mm**
  - **Max --- 91.58 gf Set ----- 0.1100 mm**
- **Thermal**
  - **Min---90.95 gf Set----- 0.0500 mm**
  - **Max ---95.40 gf Set----- 0.0800 mm**

Insulation Resistance minimums, IR

- **Initial**
  - **Mated---10000Meg Ω ------------------------ Pass**
  - **Unmated ---10000Meg Ω ------------------------ Pass**
- **Thermal**
  - **Mated---10000Meg Ω ------------------------ Pass**
  - **Unmated ---10000Meg Ω ------------------------ Pass**
- **Humidity**
  - **Mated---10000Meg Ω ------------------------ Pass**
  - **Unmated ---10000Meg Ω ------------------------ Pass**

Dielectric Withstanding Voltage minimums, DWV

Breakdown ----------------------------------- 1500VAC
DWV-- 1125VAC
Working voltage--------------------------------375VAC

Initial ------------------------------------Passed
Thermal ------------------------------------Passed
Humidity ------------------------------------Passed

RESULTS Continued

LLCR Durability (88 LLCR test points)

- **Initial -- 19.4mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms -------------------------------------88 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 -------------------------------------88 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 -------------------------------------72 Points ------------------------Stable**
  - **+5.1 to +10.0 mOhms -------------------------------- 16 Points ------------------------Minor**
  - **+10.1 to +15.0 mOhms --------------------------------0 Points ------------------------Acceptable**
  - **+15.1 to +50.0 mOhms --------------------------------0 Points ------------------------Marginal**
  - **+50.1 to +2000 mOhms--------------------------------0 Points ------------------------Unstable**
  - **>+2000 mOhms ---0 Points ------------------------Open Failure**

LLCR Gas Tight (88 LLCR test points)

- **Initial -- 21.4mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ------------------------------------- 88 Points ------------------------Stable**
  - **+5.1 to +10.0 mOhms ----------------------------------0 Points ------------------------Minor**
  - **+10.1 to +15.0 mOhms --------------------------------0 Points ------------------------Acceptable**
  - **+15.1 to +50.0 mOhms --------------------------------0 Points ------------------------Marginal**
  - **+50.1 to +2000 mOhms--------------------------------0 Points ------------------------Unstable**
  - **>+2000 mOhms ---0 Points ------------------------Open Failure**

RESULTS Continued

LLCR Thermal shock (88 LLCR test points)

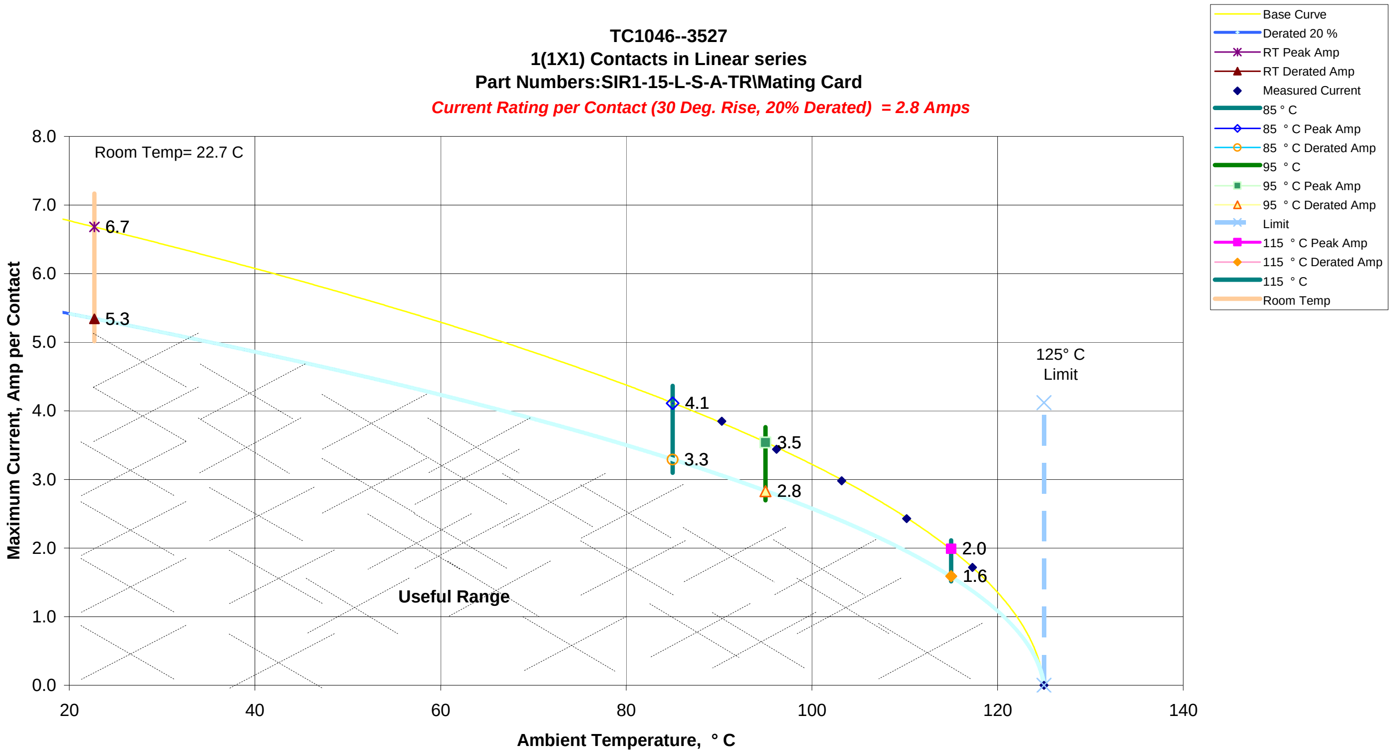
- **Initial --- 18.4 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms ------------------------------------- 86 Points ------------------------- Stable**
  - **+5.1 to +10.0 mOhms ----------------------------------2 Points ------------------------- Minor**
  - **+10.1 to +15.0 mOhms --------------------------------0 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 shock**
  - **<= +5.0 mOhms ------------------------------------- 88 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 ------------------------------------- 88 Points ------------------------- Stable**
  - **+5.1 to +10.0 mOhms ----------------------------------0 Points ------------------------- Minor**
  - **+10.1 to +15.0 mOhms --------------------------------0 Points ------------------------- Acceptable**
  - **+15.1 to +50.0 mOhms --------------------------------0 Points ------------------------- Marginal**
  - **+50.1 to +2000 mOhms--------------------------------0 Points ------------------------- Unstable**
  - **>+2000 mOhms ---0 Points ------------------------- Open Failure**

DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

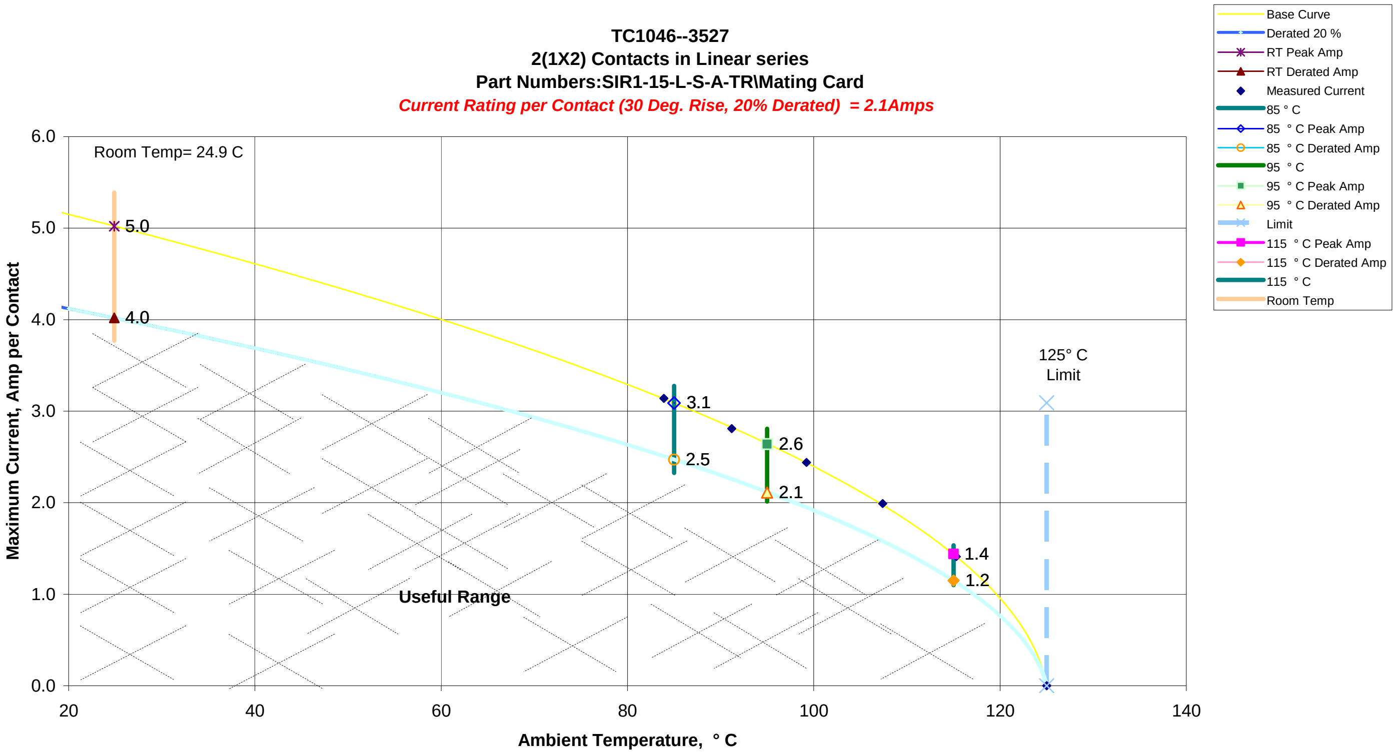
1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
3) Temperature readings recorded are those for which three successive readings, 15 minutes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

a. Linear configuration with 1 adjacent conductors /contacts powered



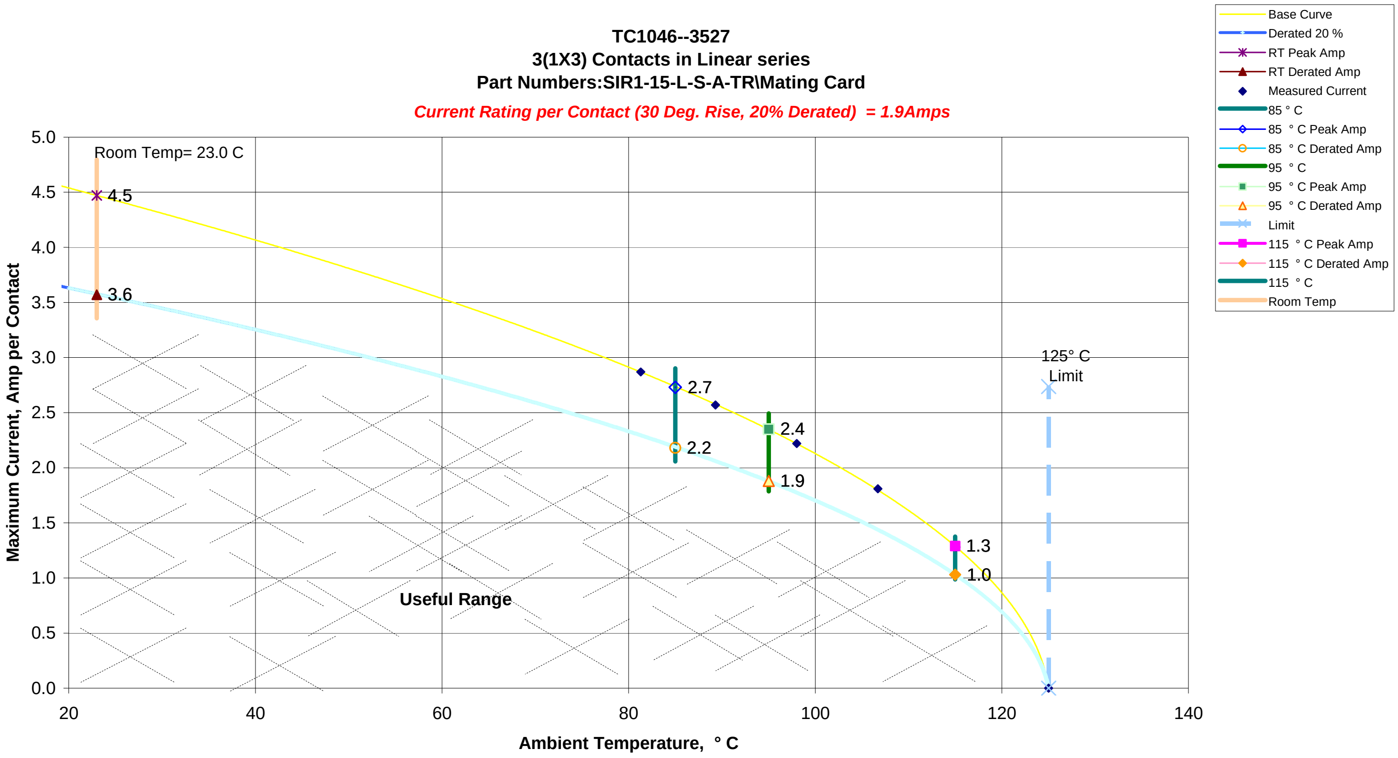
DATA SUMMARIES Continued

b. Linear configuration with 2 adjacent conductors /contacts powered



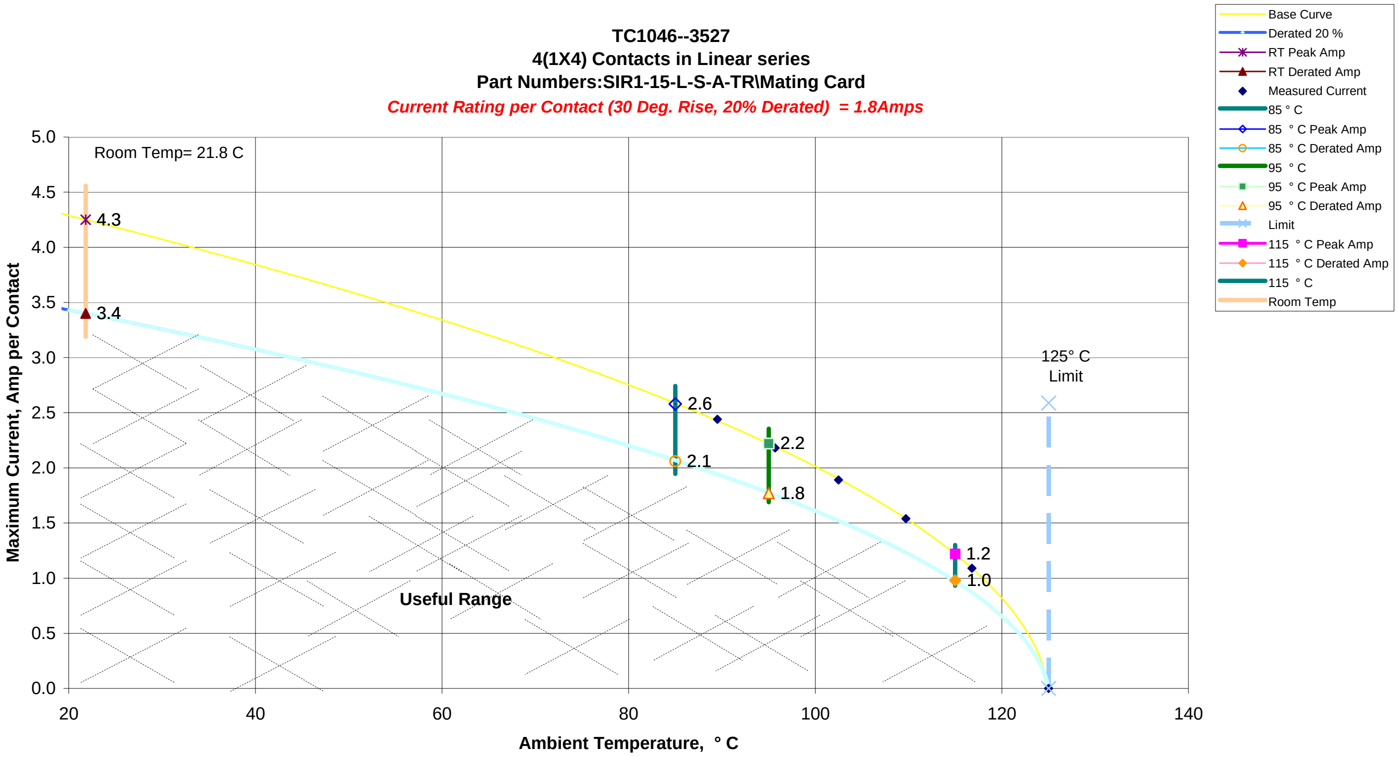
DATA SUMMARIES Continued

c. Linear configuration with 3 adjacent conductors/contacts powered



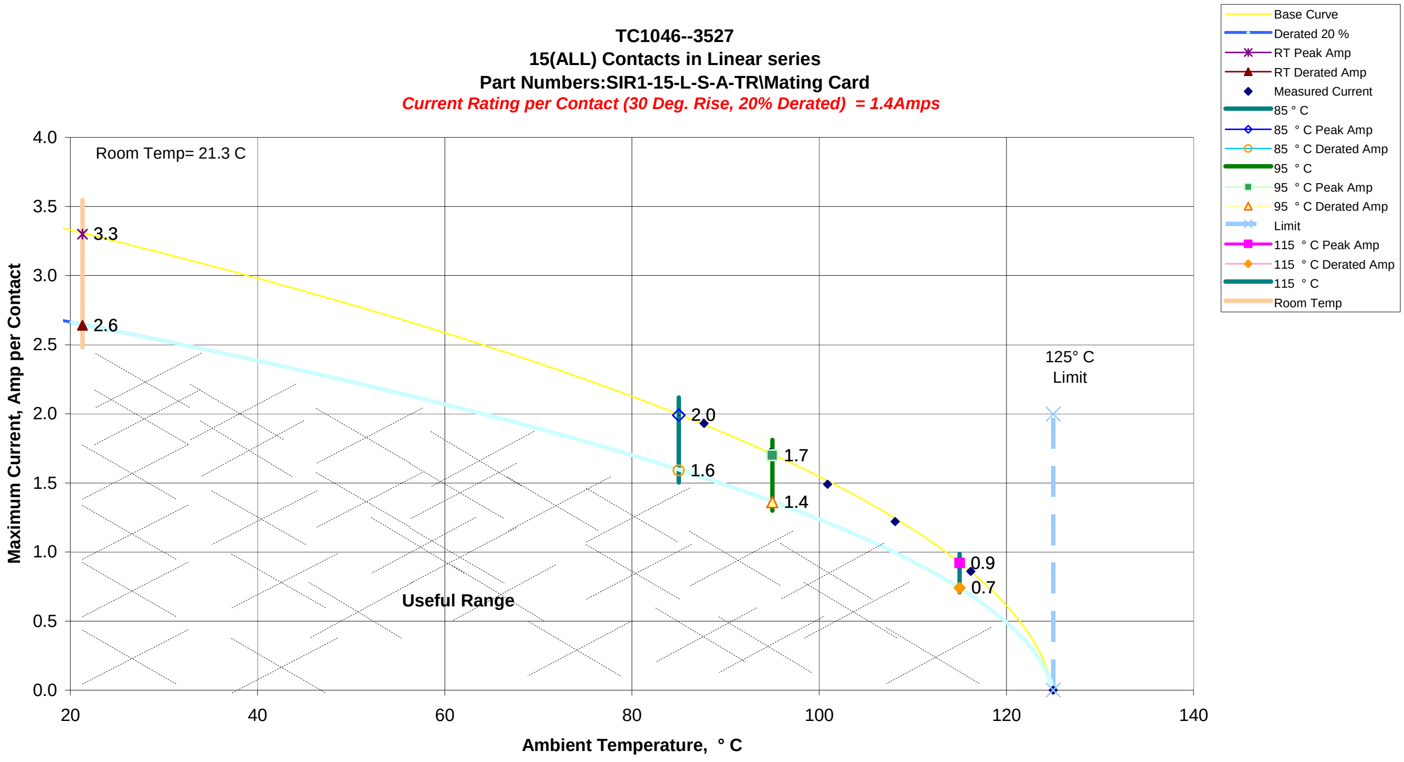
DATA SUMMARIES Continued

d. Linear configuration with 4 adjacent conductors/contacts powered



DATA SUMMARIES Continued

e. Linear configuration with all adjacent conductors/contacts powered



DATA SUMMARIES

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 mm Forces in Grams				
	0.500	**1.000**	**1.500**	**2.000**	**SET**
Averages	48.76	69.31	80.28	88.75	0.0662
Min	42.60	65.00	78.70	86.72	0.0500
Max	57.70	72.70	83.70	91.58	0.1100
St. Dev	3.95	2.80	1.36	1.69	0.0161
Count	13	13	13	13	13

Thermal	Deflections in mm, Forces in Grams				
	0.500	**1.000**	**1.500**	**2.000**	***SET***
Averages	50.45	72.12	85.61	93.57	0.0669
Min	48.50	68.20	83.70	90.95	0.0500
Max	53.50	74.50	88.90	95.40	0.0800
St. Dev	1.37	1.98	1.69	1.32	0.0095
Count	13	13	13	13	13

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**SIR1/Card**	**SIR1**	**Card**
Initial	10000	10000	Not Tested
Thermal	10000	10000	Not Tested
Humidity	10000	10000	Not Tested

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**SIR1/Card**
Break Down Voltage	1500
Test Voltage	1125
Working Voltage	375

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

DATA SUMMARIES Continued

LLCR Durability:

1) A total of 88 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
    a. <= +5.0 mOhms: --------------------------- Stable
    b. +5.1 to +10.0 mOhms:--------------------- Minor
    c. +10.1 to +15.0 mOhms: ------------------- Acceptable
    d. +15.1 to +50.0 mOhms: ------------------- Marginal
    e. +50.1 to +2000 mOhms ------------------- Unstable
    f. >+2000 mOhms:---------------------------- Open Failure

Date	Nov. 15 2010	Nov. 15 2010	Nov. 26 2010	Dec. 08 2010
Room Temp C	23	23	24	22
RH	53%	53%	48%	40%
Name	Kason	Kason	Kason	Kason
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	16.5	0.1	2.4	2.7
St. Dev.	0.7	0.9	1.0	2.1
Min	15.5	-1.9	0.3	-0.7
Max	19.4	2.8	4.6	8.1
Count	88	88	88	88

How many samples are being tested?	8
How many contacts are on each board?	11

	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
100 Cycles	88	0	0	0	0	0
Thermal	88	0	0	0	0	0
Humidity	72	16	0	0	0	0

DATA SUMMARIES Continued

LLCR Thermal shock:

5) A total of 88 points were measured.
6) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
7) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
8) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms: -------------------------- Stable
   b. +5.1 to +10.0 mOhms:--------------------- Minor
   c. +10.1 to +15.0 mOhms: ------------------ Acceptable
   d. +15.1 to +50.0 mOhms: ------------------ Marginal
   e. +50.1 to +2000 mOhms ------------------ Unstable
   f. >+2000 mOhms:--------------------------- Open Failure

Date	Dec. 29 2010	Dec. 30 2010	Jan. 06 2011	Jan. 17 2011
om Temp C	23	23	23	20
RH	42%	42%	50%	40%
Name	Peter Chen	Peter Chen	Peter Chen	Peter Chen
hm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	16.4	0.9	0.2	0.4
St. Dev.	0.7	1.4	0.9	1.4
Min	15.4	-1.2	-1.6	-3.0
Max	18.4	7.1	3.2	4.7
Count	88	88	88	88

How many samples are being tested?	8
How many contacts are on each board?	11

	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
100 Cycles	86	2	0	0	0	0
Thermal	88	0	0	0	0	0
Humidity	88	0	0	0	0	0

DATA SUMMARIES Continued

GAS TIGHT:

1) A total of 88 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
    a. <= +5.0 mOhms: --------------------------- Stable
    b. +5.1 to +10.0 mOhms:--------------------- Minor
    c. +10.1 to +15.0 mOhms: ------------------- Acceptable
    d. +15.1 to +50.0 mOhms: ------------------- Marginal
    e. +50.1 to +2000 mOhms: ------------------ Unstable
    f. >+2000 mOhms:---------------------------- Open Failure

Date	Nov. 18 2010	Nov. 19 2010
Room Temp C	23	23
RH	48%	53%
Name	Kason	Kason
mOhm values	**Actual Initial**	**Delta Gas Tight**
Average	16.6	0.1
St. Dev.	1.0	1.0
Min	15.3	-3.0
Max	21.3	3.2
Count	88	88

How many samples are being tested?	8
How many contacts are on each board?	11

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Gas Tight	88	0	0	0	0	0

DATA

INSULATION RESISTANCE (IR):

Initial Insulation Resistance

Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	x	x	
Sample#	SIR1/Card	SIR1	Card
1	10000	10000	
2	10000	10000	

Thermal Insulation Resistance

Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	x	x	
Sample#	SIR1/Card	SIR1	Card
1	10000	10000	
2	10000	10000	

Humidity Insulation Resistance

Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	x	x	
Sample#	SIR1/Card	SIR1	Card
1	10000	10000	
2	10000	10000	

DATA Continued

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial Breakdown Voltage
Test Voltage ***Until Breakdown Occurs***

	Pin to Pin		
	Mated	**Unmated**	
	x		
Sample#	**SIR1/Card**	**SIR1**	**Card**
1	1500	1600	
2	1500	1500	

Initial DWV
Test Voltage= 1125

	Pin to Pin		
	Mated	**Unmated**	
Sample#	**SIR1/Card**	**SIR1**	**Card**
1	1125	1125	
2	1125	1125	

Thermal Test Voltage
Test Voltage= 1125

	Pin to Pin		
	Mated	**Unmated**	
Sample#	**SIR1/Card**	**SIR1**	**Card**
1	1125	1125	
2	1125	1125	

Humidity Test Voltage
Test Voltage= 1125

	Pin to Pin		
	Mated	**Unmated**	
Sample#	**SIR1/Card**	**SIR1**	**Card**
1	1125	1125	
2	1125	1125	

DATA Continued

NORMAL FORCE:
Initial

Initial	Deflections in mm Forces in Grams				
Sample #	**0.500**	**1.000**	**1.500**	**2.000**	***SET***
1	57.70	71.80	79.70	89.31	0.08000
2	49.50	71.50	79.70	90.21	0.06000
3	50.50	70.90	78.70	90.53	0.05000
4	51.80	72.70	80.10	91.58	0.06000
5	51.80	72.20	80.10	91.08	0.06000
6	49.20	67.90	79.70	89.49	0.06000
7	48.20	66.60	79.40	87.91	0.06000
8	46.90	65.60	80.10	87.95	0.06000
9	44.30	65.00	78.70	87.13	0.06000
10	44.30	65.90	81.00	87.21	0.05000
11	42.60	68.90	82.00	86.72	0.08000
12	47.20	70.20	80.70	87.10	0.07000
13	49.90	71.80	83.70	87.59	0.11000

After thermal

Thermal	Deflections in mm Forces in Grams				
Sample #	**0.500**	**1.000**	**1.500**	**2.000**	***SET***
1	50.20	73.80	85.30	94.28	0.08000
2	50.80	73.20	85.60	92.31	0.06000
3	51.80	74.50	83.70	93.55	0.06000
4	51.80	74.50	85.30	94.40	0.05000
5	51.20	73.80	85.00	95.29	0.08000
6	49.50	69.90	84.30	95.20	0.07000
7	49.50	69.90	84.30	95.40	0.07000
8	48.50	70.50	84.30	92.93	0.08000
9	48.90	68.20	84.00	90.95	0.06000
10	49.50	72.50	87.60	92.91	0.07000
11	53.50	72.50	86.30	92.68	0.07000
12	50.50	71.50	88.30	93.82	0.06000
13	50.20	72.80	88.90	92.75	0.06000

DATA Continued

LLCR Durability:

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	100 Cycles	Thermal	Humidity
1	P1	15.7	0.9	1.7	2.6
1	P2	16.0	0.3	1.6	3.2
1	P3	15.9	0.8	1.4	1.2
1	P4	15.9	0.3	1.8	1.4
1	P5	15.6	0.4	2.4	3.7
1	P6	16.1	0.7	2.0	2.0
1	P7	16.0	0.5	2.9	2.6
1	P8	15.9	0.0	2.9	1.5
1	P9	16.2	0.3	2.0	1.8
1	P10	16.2	-0.3	1.2	2.5
1	P11	17.3	-0.5	2.0	1.5
2	P1	15.7	0.4	2.6	3.2
2	P2	15.7	0.2	3.7	5.0
2	P3	15.9	0.1	4.4	5.7
2	P4	17.0	-0.7	2.8	-0.3
2	P5	16.4	0.2	2.2	2.0
2	P6	16.4	0.1	4.3	3.0
2	P7	17.3	-0.7	1.3	0.5
2	P8	16.6	-0.3	4.2	1.4
2	P9	16.7	-0.1	4.1	2.6
2	P10	16.4	0.4	2.5	8.1
2	P11	16.6	-0.3	3.3	0.8
3	P1	16.5	1.2	2.4	4.7
3	P2	16.1	0.2	2.8	5.3
3	P3	16.1	1.1	2.7	5.0
3	P4	17.4	-0.5	1.7	3.2
3	P5	16.7	1.7	4.0	3.0
3	P6	17.2	1.4	1.1	5.7
3	P7	17.0	2.8	3.2	4.4
3	P8	17.0	-0.1	3.3	5.5
3	P9	17.6	-0.2	3.2	7.0
3	P10	17.0	1.9	3.6	1.9
3	P11	18.9	-0.6	2.0	1.3
4	P1	15.7	0.7	4.6	4.1
4	P2	16.2	0.4	3.0	1.8
4	P3	17.4	-0.9	0.3	0.2
4	P4	16.7	-0.6	0.6	1.3
4	P5	16.2	0.4	1.4	2.4
4	P6	16.1	0.7	1.5	2.6
4	P7	16.1	1.2	2.3	1.0
4	P8	15.8	0.3	3.0	6.7
4	P9	15.7	0.3	3.0	6.4
4	P10	15.6	0.1	2.7	3.5
4	P11	15.9	-0.3	3.3	2.5

5	P1	15.9	1.6	2.9	2.2
5	P2	16.9	2.1	1.4	1.8
5	P3	15.5	0.4	2.7	1.7
5	P4	15.8	0.2	2.6	1.0
5	P5	16.1	0.3	1.8	3.1
5	P6	16.3	0.3	2.3	1.4
5	P7	16.0	0.4	2.5	2.6
5	P8	16.2	-0.1	2.8	1.4
5	P9	16.3	0.1	2.2	0.8
5	P10	15.7	0.7	3.3	5.5
5	P11	16.3	0.2	4.3	1.1
6	P1	16.3	0.5	2.1	5.9
6	P2	16.1	0.9	2.8	5.6
6	P3	16.2	0.7	1.4	6.4
6	P4	15.9	1.2	1.6	6.6
6	P5	16.3	0.7	2.5	1.8
6	P6	16.2	0.7	2.3	7.6
6	P7	16.1	0.1	0.9	3.2
6	P8	16.6	0.6	1.1	2.5
6	P9	16.5	0.2	1.1	1.1
6	P10	16.2	1.2	2.5	2.5
6	P11	16.2	2.1	2.6	1.1
7	P1	19.4	-1.5	1.0	-0.7
7	P2	16.8	-0.9	2.0	1.0
7	P3	16.9	-0.9	1.4	1.8
7	P4	16.5	-0.3	4.3	3.0
7	P5	16.7	-0.2	4.0	4.7
7	P6	17.1	-0.1	3.4	1.5
7	P7	17.4	-0.9	3.2	3.0
7	P8	16.5	-0.5	2.8	-0.1
7	P9	16.8	-0.8	0.9	1.0
7	P10	17.5	-1.3	0.8	1.4
7	P11	17.0	-0.7	1.0	0.9
8	P1	17.5	-1.9	2.4	0.3
8	P2	16.2	-0.3	1.3	5.7
8	P3	17.0	-0.5	1.5	0.9
8	P4	16.3	-0.5	2.4	0.0
8	P5	16.6	-0.7	3.8	0.5
8	P6	16.7	-1.0	2.7	4.3
8	P7	16.4	-0.2	3.0	6.0
8	P8	18.2	-1.6	0.3	-0.3
8	P9	17.3	-0.3	1.3	-0.2
8	P10	17.4	-1.4	3.6	2.4
8	P11	16.1	-0.1	3.1	1.1

DATA Continued

LLCR Thermal shock:

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	100 Cycles	Thermal	Humidity
1	P1	15.9	0.7	0.0	-0.1
1	P2	16.1	0.6	-0.1	-0.3
1	P3	16.0	0.7	0.2	0.3
1	P4	16.1	0.5	0.0	0.0
1	P5	15.9	0.7	0.6	0.3
1	P6	15.9	1.1	0.8	1.0
1	P7	16.3	2.2	1.7	2.8
1	P8	16.1	0.5	-0.1	0.4
1	P9	16.8	1.9	0.3	3.8
1	P10	15.9	0.5	0.6	0.5
1	P11	16.0	0.5	0.1	1.1
2	P1	16.1	-0.6	-0.3	-0.6
2	P2	16.3	-0.2	-0.5	-0.7
2	P3	16.4	0.3	-0.3	-0.2
2	P4	16.5	-0.4	-0.8	-0.8
2	P5	16.5	-0.5	-0.9	-1.0
2	P6	16.6	-0.1	-0.9	-1.0
2	P7	16.5	-0.6	-1.1	-1.1
2	P8	16.1	0.0	-0.7	-0.6
2	P9	16.5	-0.5	-0.9	-0.7
2	P10	16.9	-0.3	-0.6	-0.6
2	P11	16.9	-0.7	-1.1	-1.1
3	P1	18.4	0.3	-0.2	-2.2
3	P2	18.4	1.9	1.8	-1.6
3	P3	18.2	1.4	0.6	2.2
3	P4	18.1	1.6	2.4	-1.8
3	P5	17.3	6.3	3.2	-0.3
3	P6	18.3	2.2	-0.7	-3.0
3	P7	18.1	2.4	1.9	-1.7
3	P8	17.2	0.9	1.0	0.0
3	P9	17.1	1.6	1.5	1.4
3	P10	16.8	-0.4	1.7	-0.3
3	P11	16.3	0.1	0.7	0.0
4	P1	15.6	0.6	-0.1	0.0
4	P2	15.9	1.2	-0.1	-0.2
4	P3	16.0	2.2	-0.3	-0.3
4	P4	15.8	2.3	-0.2	0.0
4	P5	15.6	1.6	0.2	0.2
4	P6	15.9	1.3	0.1	0.5
4	P7	16.4	1.5	0.3	0.1
4	P8	16.2	4.3	0.8	1.2
4	P9	15.9	0.1	0.4	-0.1
4	P10	16.0	0.4	0.1	0.5
4	P11	16.8	0.1	-0.7	-0.7

5	P1	16.5	2.4	1.6	-0.1
5	P2	16.3	7.1	1.9	2.1
5	P3	16.7	0.3	0.7	1.8
5	P4	16.1	0.5	1.0	4.7
5	P5	15.6	0.6	1.1	2.0
5	P6	17.0	-0.8	0.2	1.6
5	P7	15.9	0.2	1.0	1.8
5	P8	16.2	-0.3	0.6	-0.1
5	P9	16.1	0.7	1.7	-0.7
5	P10	16.4	0.9	0.9	2.0
5	P11	16.5	3.8	0.8	1.9
6	P1	15.8	0.1	-0.5	0.3
6	P2	15.4	0.1	-0.6	-0.3
6	P3	15.5	0.0	-0.5	-0.3
6	P4	15.8	0.0	-0.6	-0.3
6	P5	16.0	-0.2	-0.5	-0.4
6	P6	15.6	0.1	-0.2	-0.1
6	P7	15.7	0.8	-0.2	-0.1
6	P8	15.6	0.5	-0.1	0.6
6	P9	15.7	1.3	0.6	2.0
6	P10	16.0	0.2	0.3	1.7
6	P11	15.8	0.4	0.2	1.2
7	P1	16.0	0.8	-0.6	0.9
7	P2	16.2	1.5	-0.3	0.6
7	P3	16.0	4.6	-0.3	0.0
7	P4	16.1	1.2	-0.3	-0.3
7	P5	16.0	1.0	-0.5	0.1
7	P6	15.7	0.8	-0.1	-0.1
7	P7	16.1	0.8	-0.2	0.1
7	P8	15.9	0.5	-0.1	0.8
7	P9	15.9	0.6	1.1	1.3
7	P10	16.4	1.0	-0.2	1.6
7	P11	16.3	1.0	-0.1	0.5
8	P1	16.0	1.1	-0.1	1.1
8	P2	16.2	0.3	-0.6	-0.5
8	P3	16.3	0.2	-0.4	-0.1
8	P4	16.6	-0.1	-0.5	0.3
8	P5	16.5	0.2	-0.2	1.1
8	P6	17.8	-1.2	-1.6	0.2
8	P7	16.2	0.2	-0.1	4.1
8	P8	16.9	-0.2	-0.6	1.2
8	P9	17.1	0.4	-0.1	0.4
8	P10	16.6	0.4	-0.3	4.4
8	P11	16.5	0.9	0.4	3.0

DATA Continued

GAS TIGHT

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	19.0	-1.5
1	P2	16.1	3.0
1	P3	16.2	-0.3
1	P4	16.6	-0.6
1	P5	16.8	-0.4
1	P6	18.0	-1.4
1	P7	16.5	-0.1
1	P8	19.2	-3.0
1	P9	16.8	-0.4
1	P10	16.8	-0.3
1	P11	16.9	-0.4
2	P1	15.7	0.5
2	P2	15.5	0.4
2	P3	15.5	0.5
2	P4	15.5	0.8
2	P5	16.0	0.5
2	P6	16.1	0.4
2	P7	15.7	0.9
2	P8	16.5	-0.2
2	P9	16.3	0.4
2	P10	16.4	0.5
2	P11	15.9	0.4
3	P1	17.5	0.2
3	P2	17.3	-1.0
3	P3	17.4	-0.2
3	P4	18.8	-1.9
3	P5	20.7	-2.4
3	P6	21.3	-2.6
3	P7	17.6	2.3
3	P8	17.7	-0.8
3	P9	18.8	-1.4
3	P10	17.5	1.4
3	P11	16.6	1.7
4	P1	16.8	-0.4
4	P2	16.3	0.4
4	P3	16.1	0.4
4	P4	16.2	-0.1
4	P5	16.1	0.5
4	P6	16.6	0.3
4	P7	16.4	1.0
4	P8	16.1	0.1
4	P9	16.2	-0.3
4	P10	16.5	-0.8

4	P11	16.3	-0.7
5	P1	15.7	1.8
5	P2	15.8	3.2
5	P3	16.0	0.0
5	P4	16.1	-0.1
5	P5	16.0	0.4
5	P6	15.7	0.9
5	P7	16.1	0.3
5	P8	16.3	-0.2
5	P9	17.3	-0.9
5	P10	16.2	0.2
5	P11	17.1	-0.6
6	P1	16.0	0.9
6	P2	16.3	0.7
6	P3	15.9	0.9
6	P4	17.1	0.0
6	P5	17.9	-0.8
6	P6	17.3	-0.3
6	P7	16.6	-0.3
6	P8	17.0	0.2
6	P9	17.1	-0.4
6	P10	16.9	0.5
6	P11	16.4	1.8
7	P1	16.0	1.9
7	P2	15.3	0.6
7	P3	17.1	-1.1
7	P4	16.1	0.0
7	P5	15.8	0.6
7	P6	16.2	0.8
7	P7	16.0	0.4
7	P8	16.1	-0.1
7	P9	15.9	0.1
7	P10	15.7	0.5
7	P11	16.0	0.2
8	P1	16.0	-0.4
8	P2	15.8	0.2
8	P3	15.6	0.9
8	P4	15.6	0.3
8	P5	16.0	-0.1
8	P6	15.9	-0.3
8	P7	17.1	-0.9
8	P8	16.5	0.2
8	P9	16.5	0.4
8	P10	16.6	-0.6
8	P11	16.5	-0.6

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: HZ-MO-03
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 580
Serial #: 297288
Accuracy: Last Cal: 2010-8-06, Next Cal: 2011-8-05

Equipment #: HZ-TCT-01
Description: Normal force analyzer
Manufacturer: Mecmesin Multitester
Model: Mecmesin Multitester 2.5-i
Serial #: 08-1049-04
Accuracy: Last Cal: 2010-4-28, Next Cal: 2011-4-27

Equipment #: HZ-OV-01
Description: Oven
Manufacturer: Huida
Model: CS101-1E
Serial #: CS101-1E-B
Accuracy: Last Cal: 2010-12-14, Next Cal: 2011-12-13

Equipment #: HZ-THC-01
Description: Humidity transmitter
Manufacturer: Thermtron
Model: HMM30C
Serial #: D0240037
Accuracy: Last Cal: 2010-3-3, Next Cal: 2011-3-2

Equipment #: HZ-OGP-01
Description: Video measurement system
Manufacturer: OGP
Model: SMARTSCOPE FLASH 200
Serial #: SVW2003632
Accuracy: Last Cal: 2010-6-10, Next Cal: 2011-6-9

Equipment #: HZ-MO-01
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 2700
Serial #: 1199807
Accuracy: Last Cal: 2010-4-28, Next Cal: 2011-4-27

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: HZ-PS-01
Description: Power Supply
Manufacturer: Agilent
Model: 6031A
Serial #: MY41000982
Accuracy: Last Cal: 2010-4-28, Next Cal: 2011-4-27

Equipment #: HZ-TSC-01
Description: Thermal Shock transmitter
Manufacturer: Keithley
Model: 10-VT14994
Serial #: VTS-3-6-6-SC/AC
Accuracy: Last Cal: 2010-11-1, Next Cal: 2011-11-1