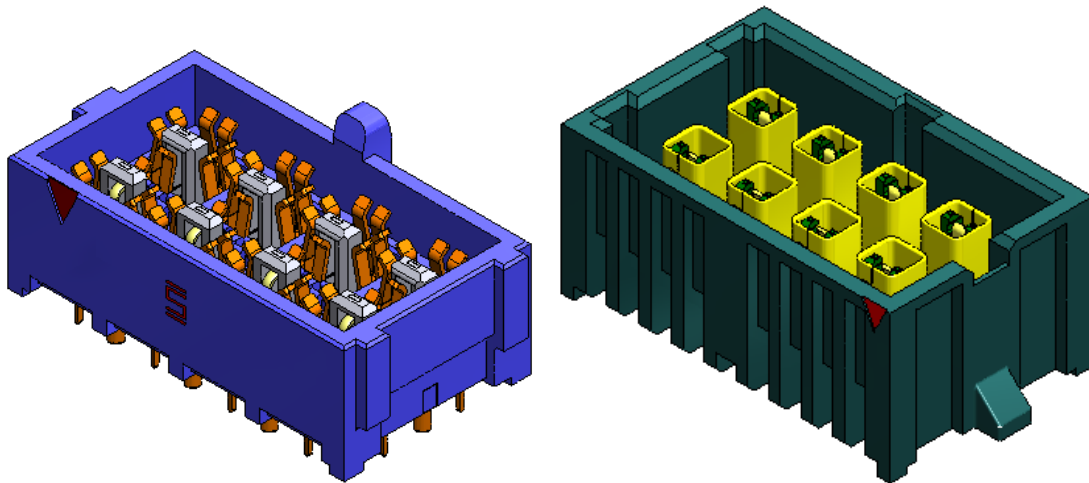




Project Number: IX5		Tracking Code: TC0904—2186_Report Rev 1	
Requested by: Kevin Meredith		Date: 10/8/2009	Product Rev: 3
Part #: IJ5-08-05.0-L-D-1-GP & IP5-08-05.0-L-D-1		Lot #: 1	Tech: Rodney Riley Gary Lomax
Part Description: IJ5 / IP5			Qty to test: 150
Test Start: 01/19/2009	Test Completed: 3/24/2009		



DESIGN VERIFICATION TEST REPORT

PART DESCRIPTION

IJ5-08-05.0-L-D-1-GP & IP5-08-05.0-L-D-1

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

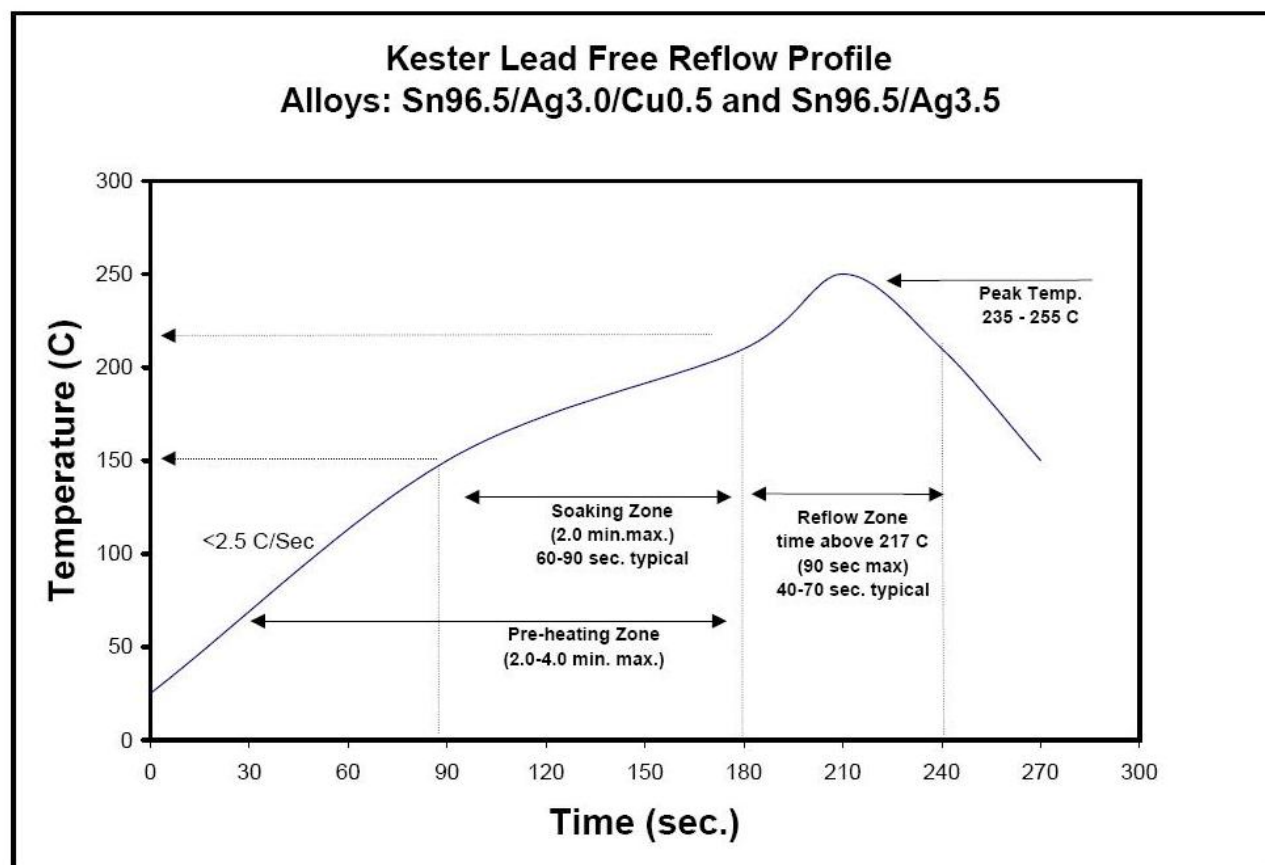
To perform the following tests: Design Verification Test

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-101279-TST-XX

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)

FLOWCHARTS

Gas Tight

TEST STEP	GROUP A 192 Points (min) Signals	GROUP B 80 Points (min) Shields/Grounds
01	LLCR-1	LLCR-1
02	Gas Tight	Gas Tight
03	LLCR-2	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/Normal Force/Deflection Force

TEST STEP	GROUP A 10 Boards Center Conductor	GROUP B1 Individual Contacts (30) min Center Conductor	GROUP B2 Individual Contacts (30) min Center Conductor
01	Contact Gaps	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 Gaps		
07	Data Review		
08	Thermal Aging (Mated)		
09	Mating / Unmating		
10	Contact Gaps		
11	Data Review		
12	Humidity (Mated)		
13	Contact Gaps		
14	Mating / Unmating		

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

(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

IR & DWV

TEST STEP	GROUP A1 2 Mated Sets Break Down	GROUP A2 2 Unmated of Part # Being Tested Break Down	GROUP A3 2 Unmated of Mating Part # Break Down	GROUP B 2 Mated Sets
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Aging (both sets unmated)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (both sets unmated)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

* - DWV on group 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

Durability/Thermal Age/Cyclic Humidity

TEST STEP	GROUP A 192 Points Signals	Group B 80 Points Sheilds/Grounds
01	LLCR-1	LLCR-1
02	Data Review	Data Review
03	100 Cycles	100 Cycles
04	Clean Mating Interface	Clean Mating Interface
05	LLCR-2	LLCR-2
06	Data Review	Data Review
07	Thermal Age	Thermal Age
08	LLCR-3	LLCR-3
09	Data Review	Data Review
10	Cyclic Humidity	Cyclic Humidity
11	LLCR-4	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

Current Carrying Capacity

3 Mated Assemblies Each

TEST STEP	GROUP A 3 Mated Assemblies Center Conductor 1 Contact powered, shield grounded	GROUP B 3 Mated Assemblies Center Conductor 2 Contacts powered, shields grounded	GROUP C 3 Mated Assemblies Center Conductor 3 Contacts powered, shields grounded	GROUP D 3 Mated Assemblies Center Conductor 4 Contacts powered, shields grounded	GROUP E 3 Mated Assemblies Center Conductor All Contacts powered, shields grounded
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

Current Carrying Capacity

3 Mated Assemblies Each

TEST STEP	GROUP A 3 Mated Assemblies 1 Shield Powered, Center Conductor Grounded	GROUP B 3 Mated Assemblies 2 Shields Powered, Center Conductor Grounded	GROUP C 3 Mated Assemblies 3 Shields Powered, Center Conductor Grounded	GROUP D 3 Mated Assemblies 4 Shields Powered, Center Conductor Grounded	GROUP E 3 Mated Assemblies All Shields Powered, Center Conductor Grounded
01	CCC	CCC	CCC	CCC	CCC

(TIN PLATING) - Tabulate calculated current at RT, 65° C, 75° C and 95° C
after derating 20% and based on 105° C

(GOLD PLATING) - Tabulate calculated current at RT, 85° C, 95° C and 115° C
after derating 20% and based on 125° C

CCC, Temp rise = EIA-364-70

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL:

- 1) EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors*.
- 2) Test Condition 4 at 105° C.
- 3) Test Time Condition B for 250 hours.
- 4) All test samples are pre-conditioned at ambient.
- 5) All test samples are exposed to environmental stressing in the mated condition.

HUMIDITY:

- 1) Reference document: EIA-364-31, *Humidity Test Procedure for Electrical Connectors*.
- 2) Test Condition B, 240 Hours.
- 3) Method III, +25° C to + 65° C, 90% to 98% Relative Humidity excluding sub-cycles 7a and 7b.
- 4) All samples are pre-conditioned at ambient.
- 5) All test samples are exposed to environmental stressing in the mated condition.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
- 2) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
- 3) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
- 4) The size of the temperature probe can affect the measured temperature.
- 5) Copper traces on PC boards will contribute to temperature rise:
 - a. Self heating (resistive)
 - b. Reduction in heat sink capacity affecting the heated contacts
- 6) A de-rating curve, usually 20%, is calculated.
- 7) Calculated de-rated currents at three temperature points are reported:
 - a. Ambient
 - b. 80° 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

Signal Temperature Rise, CCC at a 20% de-rating

- CCC for a 30°C Temperature Rise-----2.36A per contact with 2 adjacent contacts powered
- CCC for a 30°C Temperature Rise-----1.96A per contact with 4 adjacent contacts powered
- CCC for a 30°C Temperature Rise-----1.63A per contact with 6 adjacent contacts powered
- CCC for a 30°C Temperature Rise-----1.61A per contact with 8 adjacent contacts powered
- CCC for a 30°C Temperature Rise-----1.33A per contact with all adjacent contacts powered

Ground Temperature Rise, CCC at a 20% de-rating

- CCC for a 30°C Temperature Rise-----4.4A per ground with 2 adjacent grounds powered
- CCC for a 30°C Temperature Rise-----3.5A per ground with 4 adjacent grounds powered
- CCC for a 30°C Temperature Rise-----3.0A per ground with 6 adjacent grounds powered
- CCC for a 30°C Temperature Rise-----2.8A per ground with 8 adjacent grounds powered
- CCC for a 30°C Temperature Rise-----2.3A per ground with all adjacent grounds powered

IJ5 Signal Gaps

- Initial
 - o Min-----0.0423"
 - o Max-----0.0493"
- After 100 Cycles
 - o Min-----0.0502"
 - o Max-----0.0561"
- Thermal
 - o Min-----0.0439"
 - o Max-----0.0470"
- Humidity
 - o Min-----0.0400"
 - o Max-----0.0479"

Mating – Unmating Forces

- **Initial**
 - **Mating**
 - **Min** -----15.49 lbf
 - **Max** -----26.40 lbf
 - **Unmating**
 - **Min** ----- 7.59 lbf
 - **Max** -----11.00 lbf
- **After 25 Cycles**
 - **Mating**
 - **Min** -----13.21 lbf
 - **Max** -----20.80 lbf
 - **Unmating**
 - **Min** ----- 7.69 lbf
 - **Max** -----12.60 lbf
- **After 50 Cycles**
 - **Mating**
 - **Min** -----12.97 lbf
 - **Max** -----24.20 lbf
 - **Unmating**
 - **Min** ----- 7.81 lbf
 - **Max** -----13.90 lbf
- **After 75 Cycles**
 - **Mating**
 - **Min** -----12.94 lbf
 - **Max** -----24.30 lbf
 - **Unmating**
 - **Min** ----- 7.75 lbf
 - **Max** -----15.40 lbf
- **After 100 Cycles**
 - **Mating**
 - **Min** -----12.76 lbf
 - **Max** -----25.90 lbf
 - **Unmating**
 - **Min** ----- 7.69 lbf
 - **Max** -----16.50 lbf
- **Thermal**
 - **Mating**
 - **Min** -----11.45 lbf
 - **Max** -----17.10 lbf
 - **Unmating**
 - **Min** ----- 7.39 lbf
 - **Max** -----12.00 lbf
- **Humidity**
 - **Mating**
 - **Min** ----- 9.12 lbf
 - **Max** -----13.70 lbf
 - **Unmating**
 - **Min** ----- 7.09 lbf
 - **Max** -----11.40 lbf

IJ5 Shield Normal Force at .006" deflection

- **Initial**
 - **Min**----- **154.30 g** **Set ----- .0005"**
 - **Max**----- **179.60 g** **Set ----- .0009"**
- **Thermal**
 - **Min**----- **173.40 g**
 - **Max**----- **213.80 g**

IJ5 Signals Normal Force at .0105" deflection

- **Initial**
 - **Min**----- **76.00 g** **Set ----- .0001"**
 - **Max**----- **94.10 g** **Set ----- .0007"**
- **Thermal**
 - **Min**----- **74.30 g**
 - **Max**----- **93.80 g**

Insulation Resistance minimums, IR

- **Initial**
 - **Mated**----- **>100,000 Meg Ω** ----- **Pass**
 - **Unmated** ----- **>100,000 Meg Ω** ----- **Pass**
- **Thermal**
 - **Mated**----- **>100,000 Meg Ω** ----- **Pass**
 - **Unmated** ----- **>100,000 Meg Ω** ----- **Pass**
- **Humidity**
 - **Mated**----- **35,000 Meg Ω** ----- **Pass**
 - **Unmated** ----- **>100,000 Meg Ω** ----- **Pass**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
 - **Breakdown Voltage**----- **800 VAC**
 - **Test Voltage**----- **600 VAC**
 - **Working Voltage**----- **200 VAC**
- **Initial DWV** ----- **Passed**
- **Thermal DWV**----- **Passed**
- **Humidity DWV**----- **Passed**

LLCR Signal Durability (192 LLCR test points)

- **Initial** ----- 23.5 mOhms Max
- **Durability, 100 Cycles**
 - o <= +5.0 mOhms ----- 192 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 ----- 192 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
- **Humidity**
 - o <= +5.0 mOhms ----- 181 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 11 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

LLCR Ground Durability (80 LLCR test points)

- **Initial** ----- 5.6 mOhms Max
- **Durability, 100 Cycles**
 - o <= +5.0 mOhms ----- 80 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 ----- 80 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
- **Humidity**
 - o <= +5.0 mOhms ----- 80 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

LLCR Signal Gas Tight (192 LLCR test points)

- **Initial** ----- 22.8 mOhms Max
- **Gas-Tight**
 - o **<= +5.0 mOhms** ----- **190 Points** ----- **Stable**
 - o **+5.1 to +10.0 mOhms** ----- **2 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**

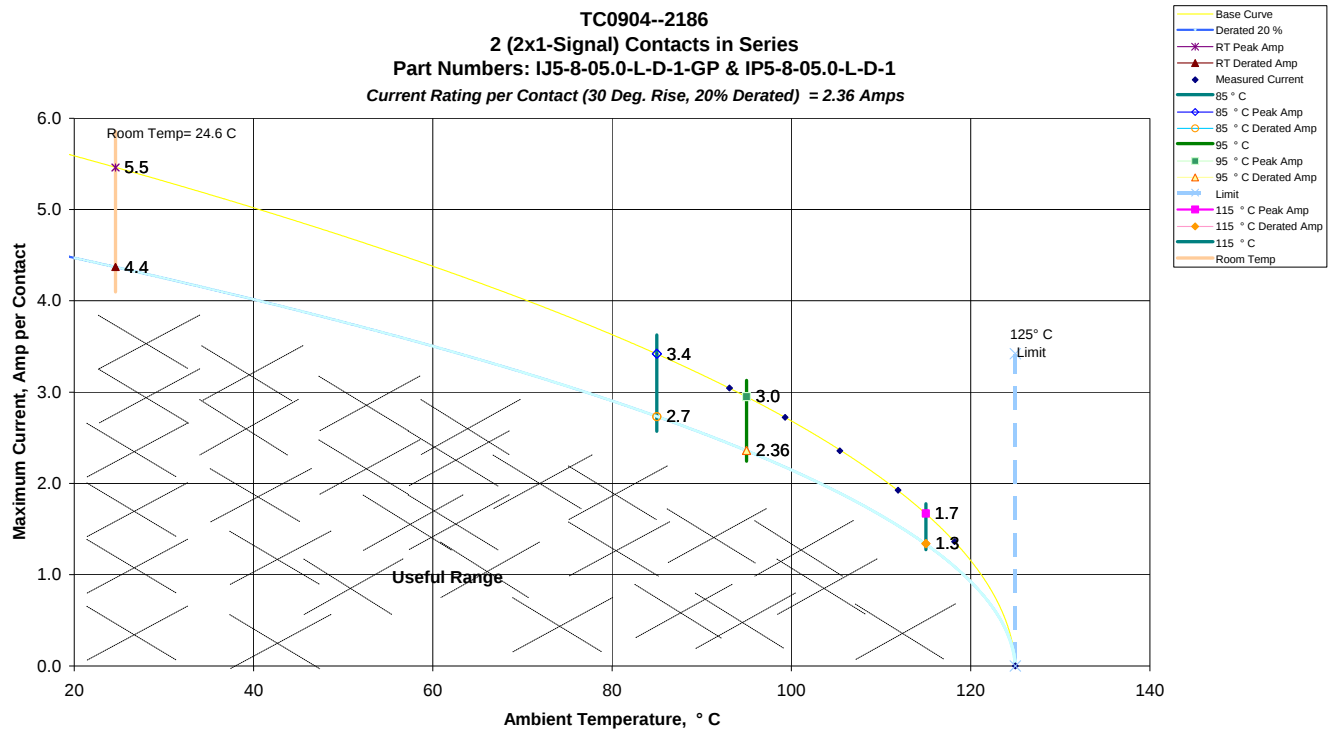
LLCR Ground Gas Tight (80 LLCR test points)

- **Initial** ----- 7.5 mOhms Max
- **Gas-Tight**
 - o **<= +5.0 mOhms** ----- **80 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**

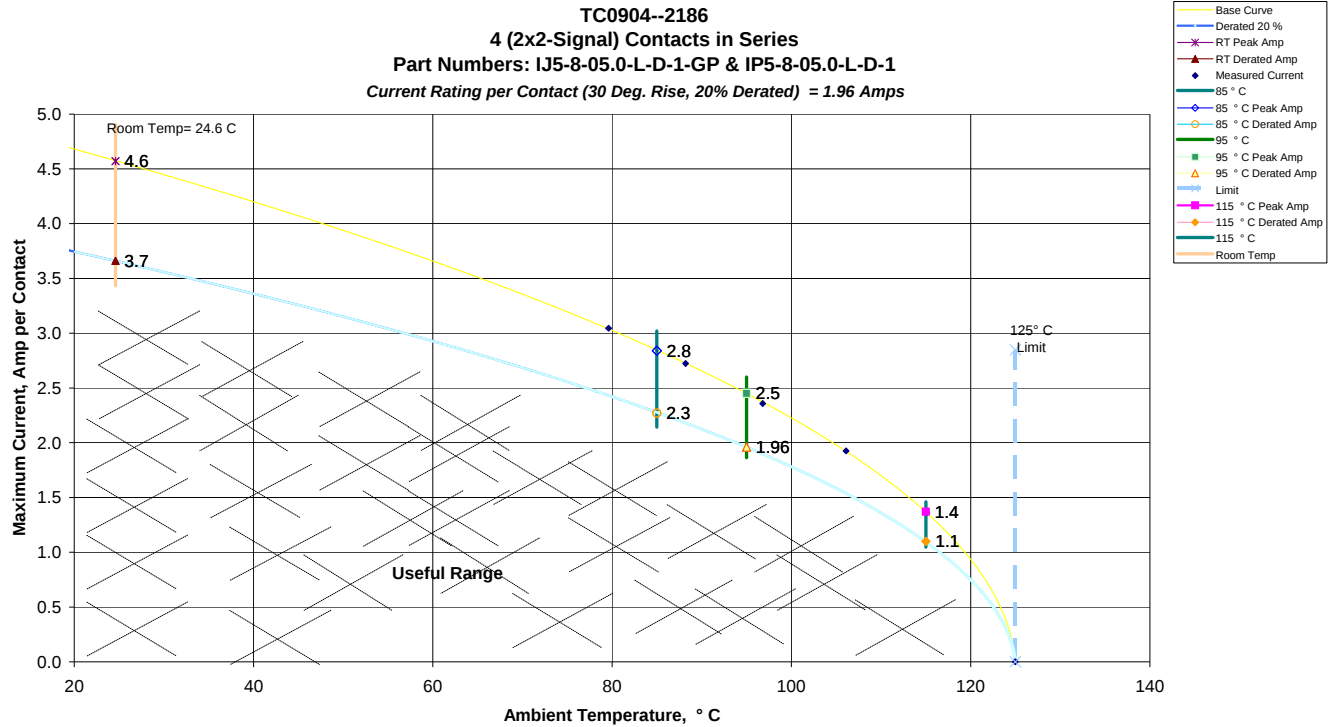
DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

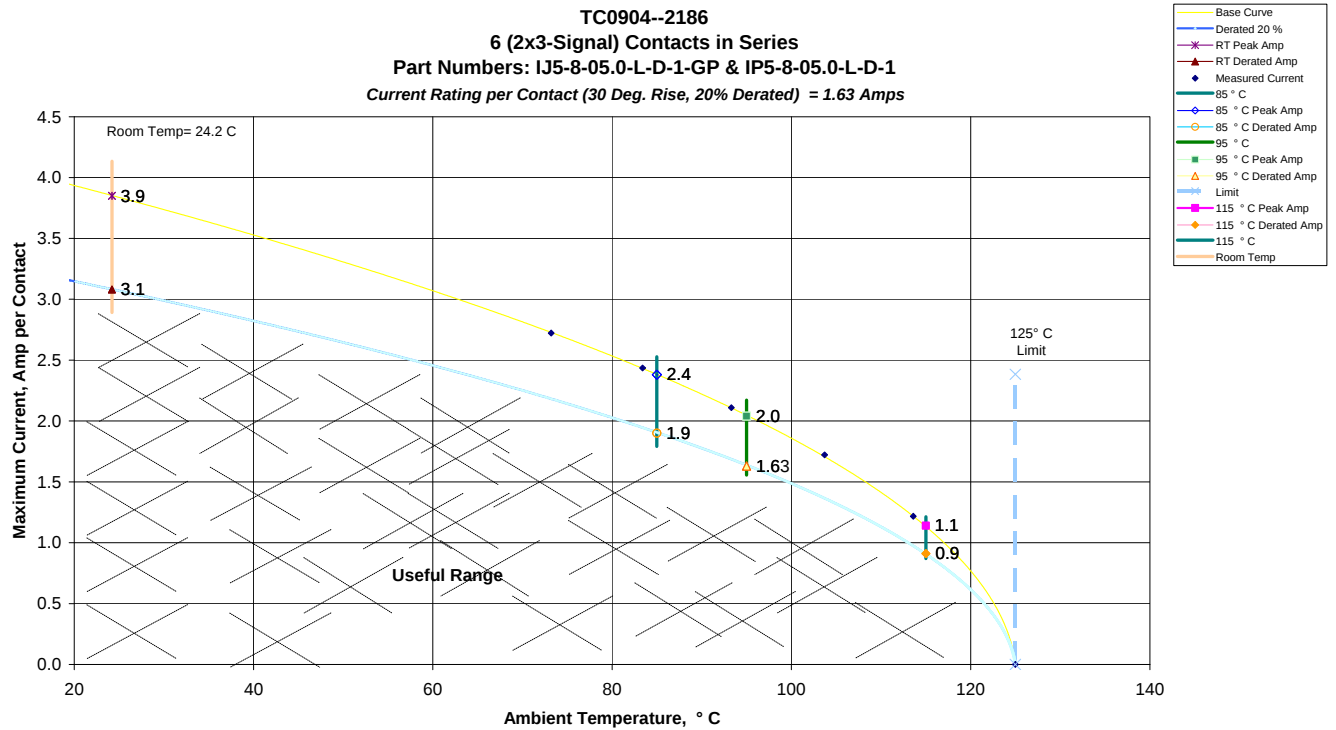
- 1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
- 2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
- 3) Temperature readings recorded are those for which three successive readings,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



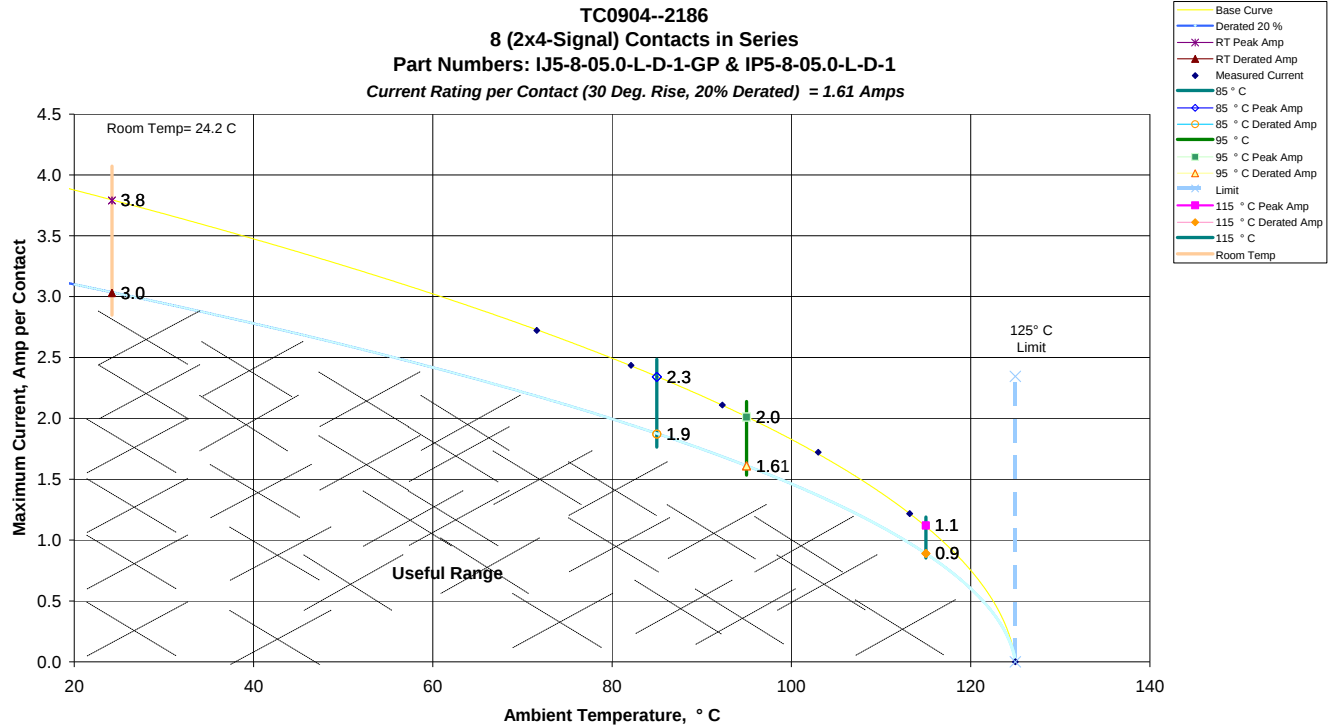
b. Linear configuration with 4 adjacent conductors/contacts powered



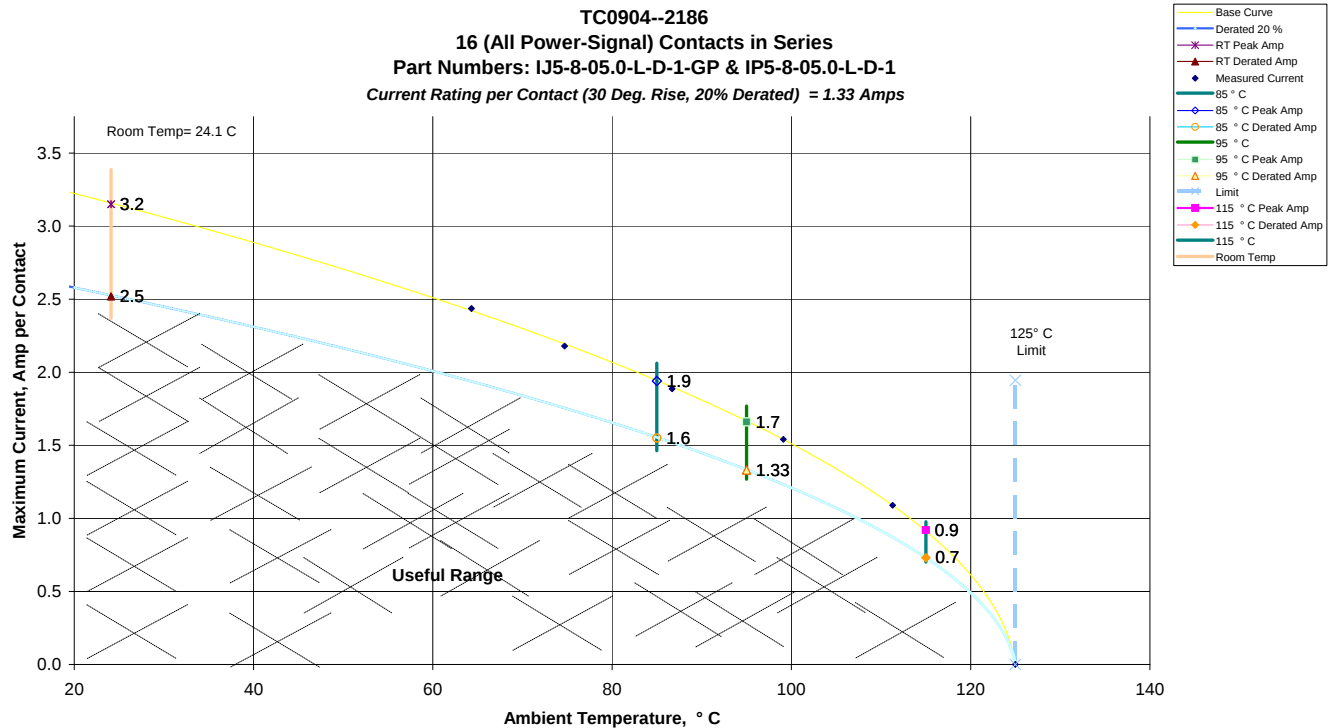
c. Linear configuration with 6 adjacent conductors/contacts powered



d. Linear configuration with 8 adjacent conductors/contacts powered



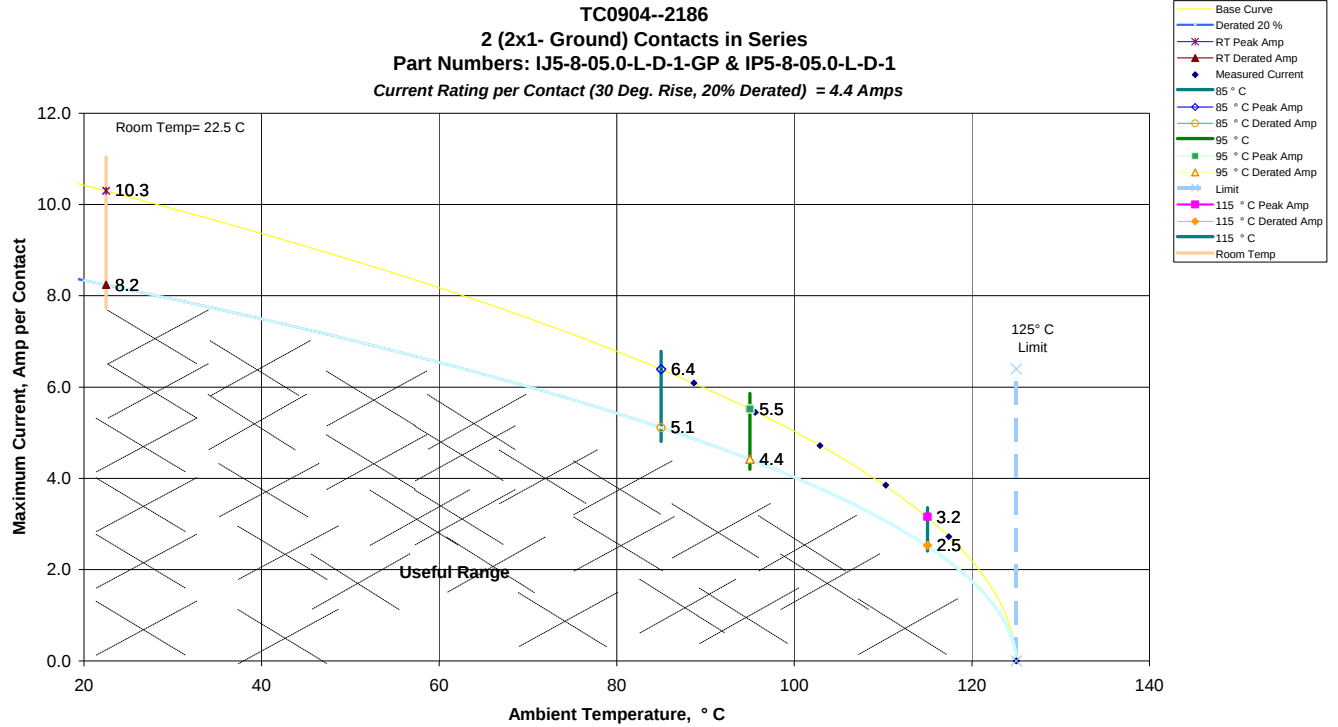
e. Linear configuration with all adjacent conductors/contacts powered



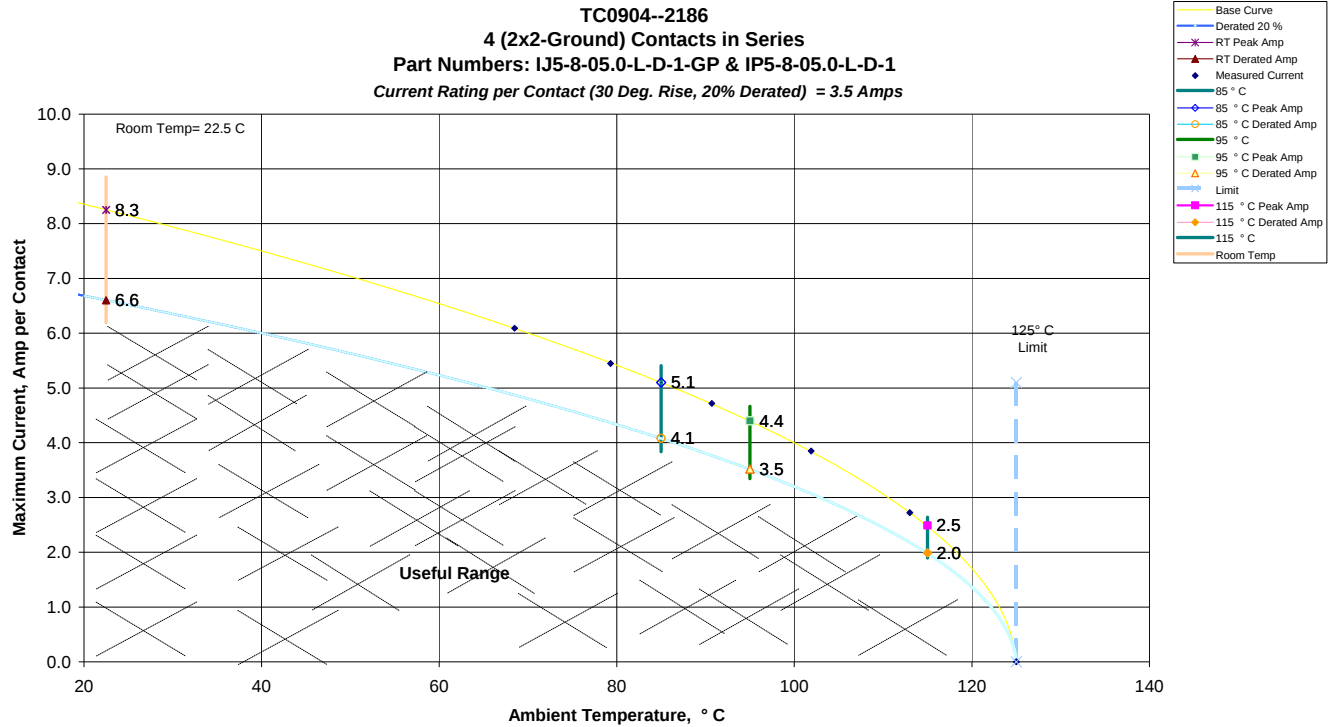
TEMPERATURE RISE (Current Carrying Capacity, CCC):

5) Adjacent ground contacts were powered:

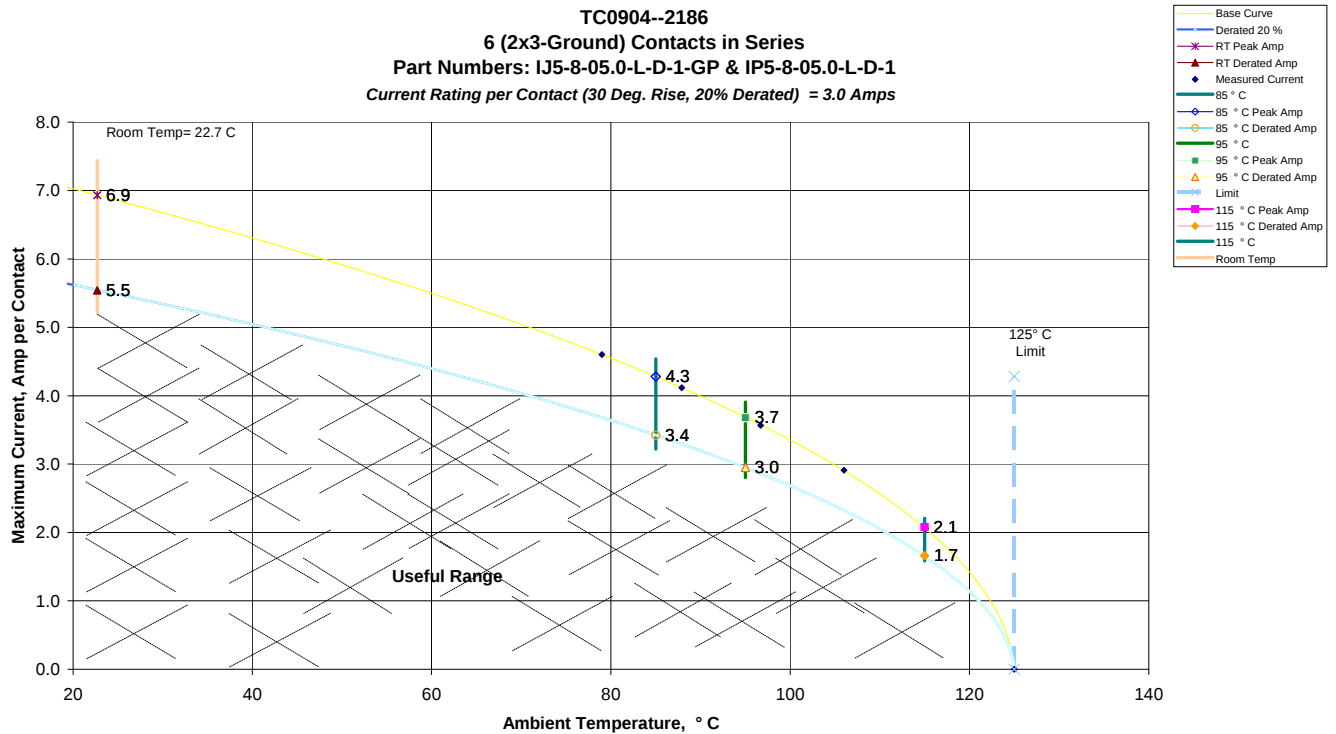
a. Linear configuration with 2 adjacent grounds powered



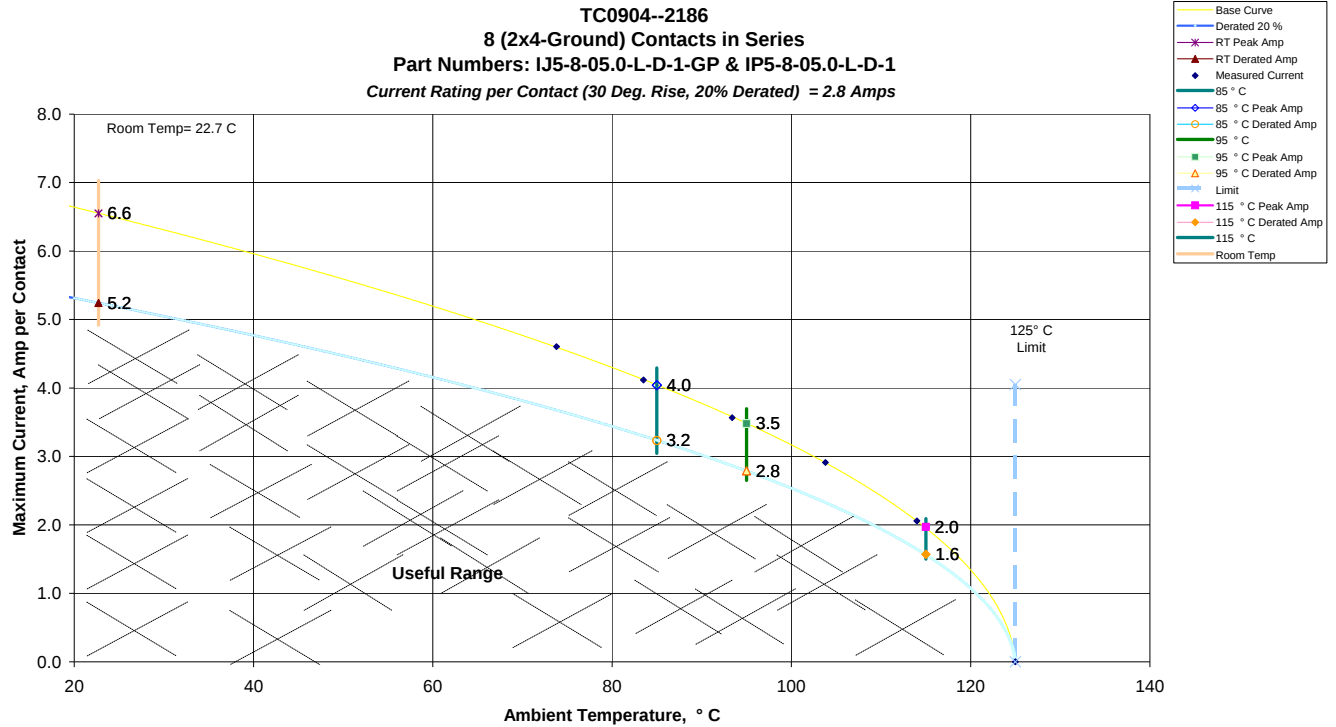
b. Linear configuration with 4 adjacent grounds powered



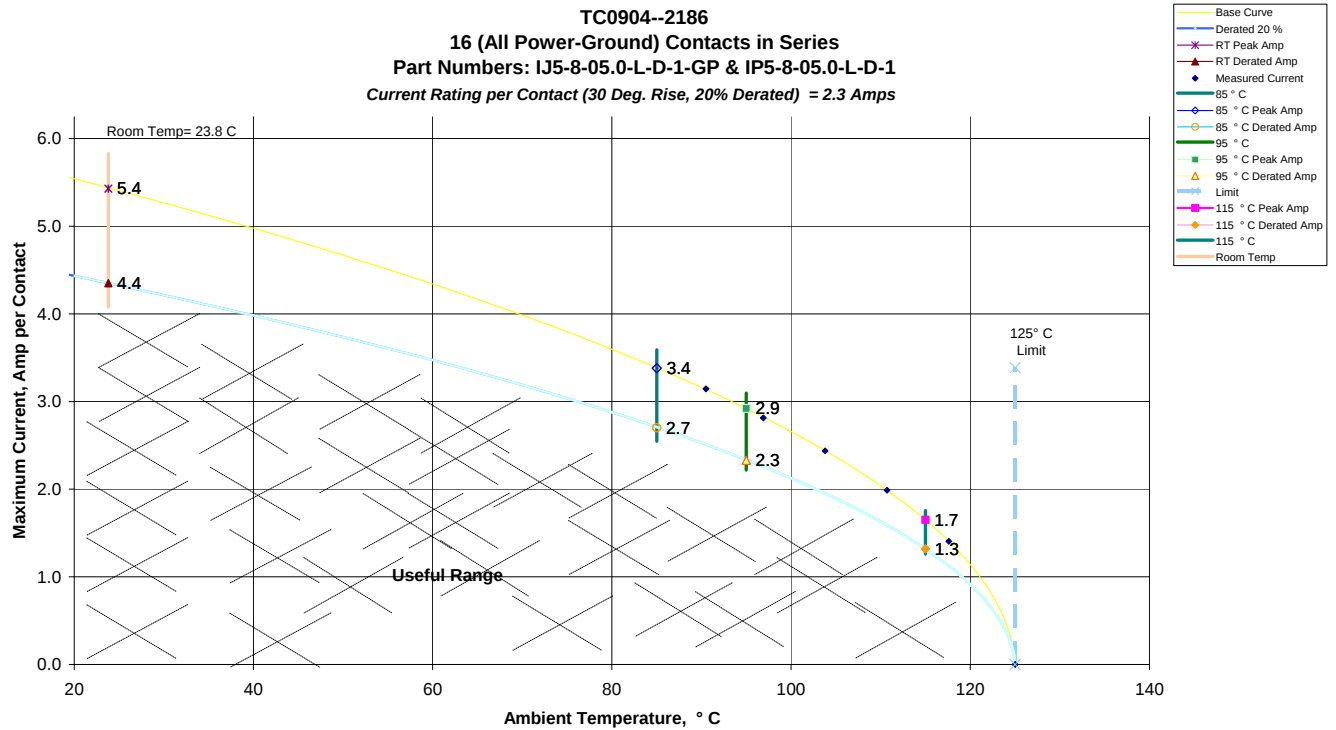
c. Linear configuration with 6 adjacent grounds powered



d. Linear configuration with 8 adjacent grounds powered



e. Linear configuration with all adjacent grounds powered



CONTACT GAPS:**IJ5 Signal Gaps**

Initial		After 100 Cycles		Thermal		Humidity	
Measured in inches		Measured in inches		Measured in inches		Measured in inches	
<i>Minimum</i>	0.0423	<i>Minimum</i>	0.0502	<i>Minimum</i>	0.0439	<i>Minimum</i>	0.0400
<i>Maximum</i>	0.0493	<i>Maximum</i>	0.0561	<i>Maximum</i>	0.0470	<i>Maximum</i>	0.0479
<i>Average</i>	0.0466	<i>Average</i>	0.0536	<i>Average</i>	0.0457	<i>Average</i>	0.0454
<i>St. Dev.</i>	0.0011	<i>St. Dev.</i>	0.0013	<i>St. Dev.</i>	0.0005	<i>St. Dev.</i>	0.0010
<i>Count</i>	80	<i>Count</i>	80	<i>Count</i>	80	<i>Count</i>	80

MATING/UNMATING:

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	247.9	15.49	121.4	7.59	211.3	13.21	123.1	7.69
Maximum	421.8	26.4	175.7	11.0	332.5	20.8	201.4	12.6
Average	322.3	20.1	160.4	10.0	283.5	17.7	176.6	11.0
	After 50 Cycles				After 75 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	207.6	12.97	124.9	7.81	207.0	12.94</		

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.

Signal Pin:

Initial	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0021</u>	<u>0.0032</u>	<u>0.0042</u>	<u>0.0053</u>	<u>0.0063</u>	<u>0.0074</u>	<u>0.0084</u>	<u>0.0095</u>	<u>0.0105</u>	<i>SET</i>
Averages	9.84	16.95	24.50	32.35	40.66	48.99	57.41	66.06	74.09	81.46	0.0006
Min	9.10	16.00	23.10	30.80	39.00	46.80	54.60	62.00	69.00	76.00	0.0001
Max	12.00	19.60	27.90	36.30	44.70	52.30	61.00	74.30	84.70	94.10	0.0007
St. Dev	0.924	1.159	1.613	1.931	2.089	2.068	2.372	3.920	4.748	5.486	0.0002
Count	8	8	8	8	8	8	8	8	8	8	8

After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0021</u>	<u>0.0032</u>	<u>0.0042</u>	<u>0.0053</u>	<u>0.0063</u>	<u>0.0074</u>	<u>0.0084</u>	<u>0.0095</u>	<u>0.0105</u>	<i>SET</i>
Averages	9.66	15.27	22.21	29.76	37.76	46.42	56.28	67.07	77.58	86.81	0.0005
Min	8.50	14.70	21.50	28.80	35.70	42.70	49.70	57.30	66.00	74.30	0.0002
Max	10.50	16.30	23.60	31.20	39.80	48.90	60.00	73.20	85.70	93.80	0.0008
St. Dev	0.534	0.542	0.617	0.757	1.471						

INSULATION RESISTANCE (IR):

Pin to Pin			
	Mated	Unmated	Unmated
Minimum	IJ5/IP5	IJ5	IP5
Initial	100000	100000	100000
Thermal	100000	100000	100000
Humidity	100000	100000	100000

Pin to Ground			
	Mated	Unmated	Unmated
Minimum	IJ5/IP5	IJ5	IP5
Initial	100000	100000	100000
Thermal	100000	100000	100000
Humidity	35000	100000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	IJ5/IP5
Break Down Voltage	800
Test Voltage	600
Working Voltage	200

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

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

LLCR:

- 1) A total of 192 signal points and 80 ground 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

SIGNALS

Date	Jan. 30 2009	Feb. 04 2009	Feb. 16 2009	Feb. 27 2009
Room Temp C	21	20	23	23.7
RH	24%	23%	28%	32%
Name	Lomax	Lomax	RILEY	Troy Cook
mOhm values	Actual Initial	Delta 100 Cycles	Delta Thermal	Delta Humidity
Average	17.2	-0.1	0.3	1.9
St. Dev.	1.0	1.0	1.3	2.0
Min	14.4	-6.8	-6.2	-5.9
Max	23.5	3.1	4.6	9.6
Count	192	192	192	192

GROUNDS

Date	Jan. 30 2009	Feb. 02 2009	Feb. 16 2009	Feb. 27 2009
Room Temp C	21	23	23	23
RH	23%	24%	27%	41%
Name	Lomax	Marshall	RILEY	Troy Cook
mOhm values	Actual Initial	Delta 100 Cycles	Delta Thermal	Delta Humidity
Average	5.2	0.1	0.1	0.2
St. Dev.	0.3	0.1	0.1	0.1
Min	4.5	-0.1	0.0	0.0
Max	5.6	0.3	0.3	0.5
Count	80	80	80	80

GAS TIGHT:

- 1) A total of 192 signal points and 80 ground 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

SIGNALS

Date	Jan. 30 2009	Jan. 30 2009
Room Temp C	20	24
RH	24%	23%
Name	Lomax	Marshall
mOhm values	Actual Initial	Delta Gas Tight
Average	17.2	0.1
St. Dev.	1.1	1.1
Min	14.4	-2.4
Max	22.8	6.8
Count	192	192

GROUND

Date	Jan. 30 2009	Jan. 30 2009
Room Temp C	21	23
RH	24%	22%
Name	Lomax	Marshall
mOhm values	Actual Initial	Delta Gas Tight
Average	5.0	0.0
St. Dev.	0.7	0.1
Min	2.2	-0.7
Max	7.5	0.3
Count	80	80

DATA**CONTACT GAPS:****IJ5 Signal Gaps**

Initial					
Measured in inches					
Pos.#	B1	B2	B3	B4	B5
1	0.0472	0.0465	0.0461	0.0468	0.0462
2	0.047	0.0481	0.0477	0.0479	0.0462
3	0.0464	0.0478	0.0465	0.0466	0.0466
4	0.0482	0.0486	0.0469	0.0478	0.0466
5	0.0472	0.0472	0.0469	0.0465	0.0458
6	0.0476	0.0483	0.0475	0.0469	0.0469
7	0.0465	0.0469	0.0471	0.0461	0.0493
8	0.0469	0.0476	0.0472	0.0458	0.0451
9	0.0465	0.0459	0.0463	0.0455	0.0454
10	0.0465	0.0466	0.0472	0.0461	0.0465
11	0.0457	0.0461	0.0462	0.0463	0.0442
12	0.0461	0.045	0.0457	0.0475	0.0451
13	0.0471	0.0458	0.0462	0.0472	0.0442
14	0.0476	0.0471	0.047	0.0469	0.0452
15	0.0462	0.0465	0.0447	0.0468	0.0423
16	0.047	0.0464	0.0465	0.045	0.0479
After 100 Cycles					
Measured in inches					
Pos.#	B1	B2	B3	B4	B5
1	0.0535	0.0531	0.054	0.0537	0.0542
2	0.0555	0.055	0.0531	0.0543	0.0531
3	0.0546	0.0532	0.0518	0.0531	0.0515
4	0.0553				

After Thermal					
Measured in inches					
Pos.#	B1	B2	B3	B4	B5
1	0.0461	0.0462	0.0454	0.0452	0.0458
2	0.046	0.0455	0.0462	0.0455	0.0453
3	0.047	0.0467	0.0466	0.0463	0.0452
4	0.0463	0.0458	0.0462	0.0459	0.045
5	0.046	0.0465	0.0459	0.0465	0.0457
6	0.0457	0.0462	0.0455	0.0459	0.0456
7	0.046	0.0439	0.0463	0.0468	0.0463
8	0.0452	0.0451	0.0457	0.0461	0.0449
9	0.046	0.0457	0.0457	0.0455	0.0456
10	0.0452	0.0458	0.0454	0.0463	0.0461
11	0.0456	0.0452	0.0461	0.0464	0.0451
12	0.0461	0.0452	0.0454	0.046	0.0453
13	0.0454	0.046	0.0456	0.0462	0.0455
14	0.0447	0.0457	0.0459	0.0456	0.0451
15	0.0453	0.0456	0.0466	0.0453	0.0462
16	0.0457	0.0454	0.0457	0.0453	0.0453
After Humidity					
Measured in inches					
Pos.#	B1	B2	B3	B4	B5
1	0.046	0.0462	0.0454	0.0454	0.0459
2	0.0449	0.0455	0.0463	0.0441	0.0454
3	0.0462	0.0464	0.0461	0.0459	0.0434
4	0.0457	0.0459	0.0457	0.0449	0.0453
5	0.0457	0.0461	0.0457	0.0462	0.0461
6	0.045				

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):**Signal Pins:**

Initial		Deflections in inches, Forces in Grams										
Sample #		<u>0.0011</u>	<u>0.0021</u>	<u>0.0032</u>	<u>0.0042</u>	<u>0.0053</u>	<u>0.0063</u>	<u>0.0074</u>	<u>0.0084</u>	<u>0.0095</u>	<u>0.0105</u>	SET
1		9.2	17.0	25.7	34.2	42.9	51.6	61.0	74.3	84.7	94.1	0.0001
2		9.1	16.0	23.1	30.8	39.0	47.2	54.9	62.3	71.0	78.3	0.0006
3		9.9	17.0	24.4	31.7	39.2	47.5	56.5	64.6	71.8	79.2	0.0006
4		9.6	16.6	24.3	32.2	40.9	49.9	58.3	66.2	74.0	80.8	0.0006
5		9.8	17.1	24.0	31.6	39.9	48.0	56.4	64.9	72.6	79.3	0.0006
6		9.8	16.3	23.5	31.1	39.0	46.8	54.6	62.0	69.0	76.0	0.0007
7		9.3	16.0	23.1	30.9	39.7	48.6	57.1	65.8	74.0	81.6	0.0007
8		12.0	19.6	27.9	36.3	44.7	52.3	60.5	68.4	75.6	82.4	0.0007

After Thermals		Deflections in inches, Forces in Grams										
Sample #		<u>0.0011</u>	<u>0.0021</u>	<u>0.0032</u>	<u>0.0042</u>	<u>0.0053</u>	<u>0.0063</u>	<u>0.0074</u>	<u>0.0084</u>	<u>0.0095</u>	<u>0.0105</u>	SET
1		8.5	14.9	22.2	30.5							

INSULATION RESISTANCE (IR):

Initial Insulation Resistance			
Measured In Meg Ohms			

Pin to Pin			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5
1	100,000	100,000	100,000
2	100,000	100,000	100,000

Pin to Ground			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5
1	100,000	100,000	100,000
2	100,000	100,000	100,000

Thermal Insulation Resistance			
Measured In Meg Ohms			

Pin to Pin			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5
1	100,000	100,000	100,000
2	100,000	100,000	100,000

Pin to Ground			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5
1	100,000	100,000	100,000
2	100,000	100,000	100,000

Humidity Insulation Resistance			
Measured In Meg Ohms			

Pin to Pin			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial DWV	
Test Voltage= 600	

Pin to Pin			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5
1	600	600	600
2	600	600	600

Pin to Ground			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5
1	600	600	600
2	600	600	600

Thermal Test Voltage	
Test Voltage= 600	

Pin to Pin			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5
1	600	600	600
2	600	600	600

Pin to Ground			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5
1	600	600	600
2	600	600	600

Humidity Test Voltage	
Test Voltage= 600	

Pin to Pin			
Mated		Unmated	
Sample#	IJ5/IP5	IJ5	IP5
1	600	600	600
2	600	600	600

Pin to Ground			
Mated			

LLCR (Signals):

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	100 Cycles	Thermal	Humidity
1	P1	17.4	0.4	1.1	1.3
1	P2	18.2	-0.7	0.6	2.4
1	P3	16.9	0.4	0.4	2.3
1	P4	16.8	0.1	0.1	2.6
1	P5	17.0	0.3	0.0	2.5
1	P6	16.9	0.2	0.7	1.1
1	P7	18.4	-0.2	0.1	1.1
1	P8	17.4	1.5	0.7	2.2
1	P9	17.4	0.1	0.9	1.8
1	P10	17.9	0.5	0.7	3.7
1	P11	17.3	0.6	0.2	2.2
1	P12	17.0	0.6	0.2	3.7
1	P13	18.6	-1.1	-0.7	2.2
1	P14	15.6	1.2	0.4	3.2
1	P15	17.6	-0.2	0.0	1.4
1	P16	17.5	0.1	-0.7	0.8
2	P1	17.4	-0.5	-0.5	1.2
2	P2	17.9	0.3	0.1	-0.3
2	P3	16.7	0.4	0.5	1.4
2	P4	17.8	-0.6	0.5	0.2
2	P5	17.3	-0.6	0.0	1.3
2	P6	17.2	0.6	0.4	2.4
2	P7	17.0	1.3	0.4	1.3
2	P8	17.4	-0.3	-0.4	1.5
2	P9	17.7	0.1	0.0	1.8
2	P10	17.6	-0.6	-0.5	3.3
2	P11	17.1	-0.2	0.3	3.9
2	P12	17.2	0.2	0.5	-0.8
2	P13	18.3	0.6	-1.0	5.8
2	P14	16.1	0.9	1.0	2.9
2	P15	16.2	1.0	1.5	1.6</

3	P15	16.6	0.3	1.2	2.1
3	P16	17.4	-0.2	0.2	1.5
4	P1	17.2	0.5	1.1	1.6
4	P2	17.5	0.0	0.5	0.2
4	P3	19.0	-2.1	-1.7	-1.3
4	P4	17.9	-0.8	-0.2	0.7
4	P5	17.0	0.0	1.1	0.5
4	P6	17.2	0.7	0.6	1.0
4	P7	17.4	0.2	-0.2	1.2
4	P8	16.9	0.3	0.7	1.1
4	P9	17.7	-0.6	0.5	0.0
4	P10	17.4	0.6	4.5	2.7
4	P11	17.8	0.2	1.5	1.3
4	P12	17.8	-0.2	4.2	3.5
4	P13	17.7	0.1	1.4	1.8
4	P14	15.3	0.3	0.7	1.2
4	P15	17.2	-0.5	0.4	0.6
4	P16	17.0	0.8	1.2	2.1
5	P1	16.6	0.7	2.3	1.2
5	P2	16.7	0.3	0.2	2.8
5	P3	17.4	-0.4	-0.5	-0.3
5	P4	16.5	-0.4	0.7	1.3
5	P5	16.5	-0.7	-0.4	0.8
5	P6	16.0	-0.1	0.2	2.8
5	P7	16.4	-0.3	0.2	3.8
5	P8	15.0	2.6	1.3	2.3
5	P9	17.7	-0.1	0.1	2.3
5	P10	16.7	-0.4	0.1	2.9
5	P11	14.7	0.1	0.4	4.9
5	P12	16.5	-0.2	0.4	1.6
5	P13	16.5	0.3	0.0	3.1
5	P14	16.5	1.9	2.8	2.8
5	P15	16.0	-0.2	0.1	1.8
5	P16	1			

6	P16	16.8	-0.1	1.3	-0.2
7	P1	17.1	0.8	0.9	2.4
7	P2	17.9	-0.6	0.0	0.5
7	P3	17.2	-0.2	0.2	2.7
7	P4	17.1	0.3	0.4	0.6
7	P5	17.2	-0.1	1.1	0.0
7	P6	16.3	0.9	1.7	0.9
7	P7	17.0	0.9	1.1	1.6
7	P8	16.1	0.1	1.5	3.3
7	P9	18.5	-0.5	-0.4	-0.7
7	P10	17.8	-0.3	-0.2	1.3
7	P11	17.4	0.3	-0.3	1.8
7	P12	18.7	-0.8	-0.8	0.5
7	P13	17.6	0.4	0.4	1.1
7	P14	17.0	0.2	0.7	1.0
7	P15	18.2	-0.4	-0.1	0.3
7	P16	17.9	-0.9	1.9	1.7
8	P1	18.6	-0.9	-2.0	-1.5
8	P2	15.9	0.6	0.2	4.3
8	P3	17.6	-0.4	0.4	0.8
8	P4	18.4	-1.3	0.2	-0.4
8	P5	17.6	0.5	2.0	1.6
8	P6	15.1	2.7	4.6	3.9
8	P7	16.2	1.3	0.5	1.4
8	P8	16.9	-0.5	0.6	1.2
8	P9	18.4	-1.2	-1.0	2.6
8	P10	18.1	-1.0	-1.1	0.6
8	P11	16.1	0.7	0.4	3.3
8	P12	17.5	-0.3	-0.4	3.6
8	P13	17.7	0.4	0.0	3.2
8	P14	17.1	-0.1	-0.1	2.3
8	P15	17.9	-0.7	-1.0	1.9
8	P16	16.6	0.4	0.2	2.0

10	P1	19.1	-1.7	-0.2	0.2
10	P2	18.1	-0.3	0.5	0.5
10	P3	16.2	-1.2	1.5	2.5
10	P4	20.3	-2.6	-1.0	-2.0
10	P5	17.3	0.3	1.9	1.1
10	P6	16.8	0.1	1.7	0.8
10	P7	18.4	-0.2	-0.8	-0.7
10	P8	18.5	0.3	-0.4	0.3
10	P9	18.0	-1.1	-0.5	0.3
10	P10	17.0	0.2	0.6	0.7
10	P11	18.5	-1.5	-1.3	-0.9
10	P12	17.5	0.2	0.4	1.3
10	P13	18.1	-1.0	-0.5	-0.2
10	P14	17.2	-0.1	1.3	0.7
10	P15	17.3	-0.7	0.2	0.1
10	P16	17.1	0.3	1.6	0.0
11	P1	16.8	0.6	0.1	0.9
11	P2	16.1	0.9	0.5	1.8
11	P3	16.3	1.5	0.9	3.0
11	P4	16.7	1.6	1.2	0.9
11	P5	16.6	2.0	1.4	1.0
11	P6	14.4	3.1	4.3	3.7
11	P7	17.1	0.8	-0.8	1.6
11	P8	17.5	-0.6	-0.3	1.7
11	P9	23.5	-6.8	-6.2	-5.9
11	P10	17.6	-0.1	0.5	0.3
11	P11	17.8	0.1	0.0	-0.7
11	P12	17.0	0.4	0.5	0.0
11	P13	17.3	2.2	2.3	3.6
11	P14	17.8	-0.6	-1.5	4.1
11	P15	16.4	0.9	1.0	2.1
11	P16	16.6	2.4	2.4	9.1
12	P				

LLCR (Grounds):

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	100 Cycles	Thermal	Humidity
1	P1	5.0	0.1	0.1	0.2
1	P2	5.2	0.0	0.0	0.1
1	P3	5.1	0.0	0.0	0.2
1	P4	5.1	0.0	0.0	0.2
1	P5	5.1	0.0	0.1	0.2
1	P6	5.3	0.1	0.1	0.2
1	P7	5.4	0.0	0.0	0.2
1	P8	5.1	0.0	0.1	0.5
1	P9	5.4	-0.1	0.0	0.1
1	P10	5.5	0.1	0.0	0.1
1	P11	5.4	0.1	0.0	0.1
1	P12	5.5	0.0	0.1	0.2
1	P13	5.3	0.1	0.1	0.1
1	P14	5.1	0.1	0.1	0.2
1	P15	4.9	0.0	0.1	0.1
1	P16	5.0	0.1	0.1	0.2
2	P1	5.1	0.1	0.0	0.1
2	P2	5.0	0.0	0.0	0.1
2	P3	4.9	0.0	0.0	0.1
2	P4	5.2	0.0	0.0	0.2
2	P5	5.3	0.0	0.0	0.0
2	P6	5.4	0.0	0.1	0.1
2	P7	5.4	0.0	0.0	0.2
2	P8	5.4	0.1	0.0	0.2
2	P9	5.2	0.0	0.0	0.1
2	P10	5.5	0.0	0.0	0.2
2	P11	5.3	0.0	0.0	0.2
2	P12	5.4	0.0	0.1	0.2
2	P13	5.5	0.0	0.0	0.1
2	P14	5.5	0.0	0.0	0.1

3	P12	5.0	0.0	0.1	0.3
3	P13	5.1	0.1	0.1	0.2
3	P14	5.1	0.1	0.1	0.3
3	P15	4.8	0.0	0.0	0.2
3	P16	4.7	0.0	0.1	0.2
4	P1	4.9	0.1	0.1	0.1
4	P2	5.4	0.0	0.0	0.2
4	P3	5.5	0.0	0.0	0.1
4	P4	5.4	0.0	0.1	0.2
4	P5	5.6	0.0	0.0	0.1
4	P6	5.6	0.0	0.0	0.1
4	P7	5.5	0.1	0.1	0.2
4	P8	5.6	0.0	0.0	0.1
4	P9	5.6	0.2	0.2	0.2
4	P10	5.6	0.0	0.0	0.1
4	P11	5.6	0.0	0.1	0.1
4	P12	5.6	0.1	0.0	0.1
4	P13	5.6	0.1	0.0	0.1
4	P14	5.6	0.1	0.1	0.1
4	P15	5.4	0.1	0.1	0.1
4	P16	5.3	0.1	0.1	0.1
5	P1	4.7	0.3	0.1	0.2
5	P2	4.9	0.1	0.1	0.2
5	P3	4.9	0.1	0.2	0.3
5	P4	4.9	0.0	0.2	0.3
5	P5	4.9	0.1	0.1	0.4
5	P6	4.9	0.1	0.2	0.2
5	P7	5.1	0.1	0.1	0.2
5	P8	5.1	0.1	0.1	0.2
5	P9	5.2	0.1	0.2	0.2
5	P10	5.2	0.2	0.3	0.2
5	P11	5.1	0.0	0.2	0.1
5	P12	5.0	0.1	0.3	

GAS TIGHT (Signals):

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	16.5	0.0
1	P2	17.3	0.2
1	P3	15.4	1.4
1	P4	17.8	-0.4
1	P5	16.6	0.1
1	P6	17.3	0.0
1	P7	16.1	-1.6
1	P8	15.8	1.3
1	P9	16.8	0.5
1	P10	17.8	-0.1
1	P11	17.2	0.7
1	P12	17.5	-0.5
1	P13	16.7	0.4
1	P14	15.8	-0.6
1	P15	16.4	0.5
1	P16	16.9	-0.5
2	P1	17.5	-0.3
2	P2	17.6	0.4
2	P3	17.2	0.2
2	P4	18.0	-0.7
2	P5	16.8	-1.9
2	P6	17.3	-0.2
2	P7	17.6	4.0
2	P8	16.3	1.1
2	P9	15.6	1.5
2	P10	16.3	0.6
2	P11	19.2	-2.2
2	P12	16.9	0.6
2	P13	17.6	0.6
2	P14	16.5	0.8
2	P15	17.1	0.1
2	P16	16.9	0.6
3	P1	16.7	0.1
3	P2	16.5	0.1
3	P3	15.3	0.4
3	P4	16.6	-0.2
3	P5	16.5	0.2
3	P6	15.6	-0.8
3	P7	18.4	1.5
3	P8	22.8	-1.8
3	P9	16.8	0.6
3	P10	16.3	0.3
3	P11	17.0	0.3
3	P12	17.4	-0.3

3	P15	16.6	0.8
3	P16	16.7	0.2
4	P1	19.7	0.8
4	P2	19.7	-1.3
4	P3	17.0	0.0
4	P4	19.1	-1.0
4	P5	17.4	-0.6
4	P6	19.6	-2.0
4	P7	17.3	0.3
4	P8	17.3	1.5
4	P9	17.5	0.1
4	P10	17.5	1.2
4	P11	18.9	-1.2
4	P12	17.7	0.2
4	P13	22.6	-1.2
4	P14	15.8	1.8
4	P15	17.5	2.0
4	P16	16.9	0.0
5	P1	14.4	1.6
5	P2	16.5	0.3
5	P3	16.0	0.9
5	P4	16.2	0.7
5	P5	16.4	-0.1
5	P6	14.8	1.6
5	P7	16.7	1.0
5	P8	16.2	-0.3
5	P9	18.9	-0.5
5	P10	17.5	-0.3
5	P11	17.7	-0.2
5	P12	17.8	-0.2
5	P13	17.9	-0.6
5	P14	16.4	0.7
5	P15	17.1	0.4
5	P16	16.6	0.1
6	P1	17.1	0.8
6	P2	17.3	0.2
6	P3	15.1	-0.2
6	P4	18.2	-1.1
6	P5	16.1	0.9
6	P6	16.7	0.1
6	P7	16.9	-1.7
6	P8	17.0	0.0
6	P9	17.5	-0.2
6	P10	16.8	0.5
6	P11	17.2	-0.5
6	P12	17.7	-0.5
6	P13	17.2	0.1
6	P14		

6	P16	17.2	-0.8
7	P1	17.4	-0.4
7	P2	18.5	0.4
7	P3	16.5	1.0
7	P4	17.4	-0.3
7	P5	16.5	1.1
7	P6	18.6	-1.2
7	P7	17.7	-0.2
7	P8	17.9	0.3
7	P9	17.5	0.6
7	P10	17.3	0.2
7	P11	17.2	0.7
7	P12	18.9	-1.3
7	P13	18.4	0.5
7	P14	18.5	-0.9
7	P15	18.0	-0.4
7	P16	17.5	0.9
8	P1	16.8	-0.5
8	P2	16.3	0.0
8	P3	14.9	1.2
8	P4	16.8	-0.2
8	P5	15.3	-0.6
8	P6	16.9	-0.4
8	P7	17.1	-0.2
8	P8	15.3	-0.2
8	P9	17.0	0.3
8	P10	16.9	-0.5
8	P11	17.5	-2.4
8	P12	17.4	-1.0
8	P13	16.4	0.9
8	P14	16.9	0.6
8	P15	16.3	0.2
8	P16	16.5	0.3
9	P1	17.0	-0.3
9	P2	16.6	1.0
9	P3	15.3	0.1
9	P4	16.8	0.1
9	P5	17.1	-0.1
9	P6	17.4	0.0
9	P7	17.4	-0.7
9	P8	15.4	-0.3
9	P9	18.1	-0.6
9	P10	16.8	-0.3
9	P11	16.4	-0.1
9	P12	15.6	-0.3
9	P13	16.8	-0.1
9	P1		

10	P1	18.1	-0.5
10	P2	17.8	0.5
10	P3	15.5	2.7
10	P4	17.7	0.1
10	P5	18.7	-1.5
10	P6	15.8	2.2
10	P7	17.4	-0.2
10	P8	17.3	0.4
10	P9	16.1	6.7
10	P10	17.8	1.0
10	P11	17.6	0.3
10	P12	17.4	-0.9
10	P13	17.9	-0.1
10	P14	17.7	0.0
10	P15	18.7	-1.4
10	P16	17.4	-0.2
11	P1	17.3	0.0
11	P2	17.0	1.0
11	P3	16.7	0.7
11	P4	17.4	-0.6
11	P5	17.6	-0.6
11	P6	15.2	1.1
11	P7	16.7	-1.6
11	P8	17.1	-0.3
11	P9	17.1	0.6
11	P10	17.5	-0.3
11	P11	17.2	-1.8
11	P12	17.3	-0.4
11	P13	17.4	-0.2
11	P14	18.5	-0.1
11	P15	17.7	-1.1
11	P16	18.1	-0.9
12	P1	17.3	-0.6
12	P2	17.2	1.0
12	P3	16.5	-1.4
12	P4	18.1	-0.4
12	P5	17.4	1.0
12	P6	17.4	1.4
12	P7	17.3	-0.6
12	P8	17.5	0.4
12	P9	17.9	0.5
12	P10	17.1	0.3
12	P11	18.4	0.4
12	P12	17.7	-0.7

GAS TIGHT (Grounds):

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	6.9	0.0
1	P2	6.2	0.0
1	P3	3.6	0.1
1	P4	2.2	0.0
1	P5	2.8	0.0
1	P6	4.4	0.0
1	P7	7.5	-0.7
1	P8	6.4	0.0
1	P9	3.7	0.0
1	P10	3.0	0.0
1	P11	4.5	0.0
1	P12	4.7	0.0
1	P13	4.7	0.0
1	P14	5.0	0.0
1	P15	4.4	0.0
1	P16	4.2	0.0
2	P1	5.1	0.0
2	P2	5.3	0.0
2	P3	5.3	0.0
2	P4	5.2	0.1
2	P5	5.3	0.0
2	P6	5.2	0.0
2	P7	5.5	0.0
2	P8	5.7	0.0
2	P9	5.6	-0.1
2	P10	5.6	0.0
2	P11	5.4	0.0
2	P12	5.5	0.0
2	P13	5.5	0.0
2	P14	5.3	0.0
2	P15	5.3	0.2
2	P16	5.1	0.0
3	P1	5.0	0.0
3	P2	5.1	0.0
3	P3	5.2	0.0
3	P4	5.0	0.0
3	P5	5.3	0.0
3	P6	5.4	0.0
3	P7	5.4	0.1
3	P8	5.5	0.0
3	P9	5.5	0.0
3	P10	5.5	0.0
3	P11	5.3	0.1

3	P12	5.5	0.0
3	P13	5.2	0.0
3	P14	5.5	0.0
3	P15	4.9	0.1
3	P16	5.2	0.0
4	P1	4.6	0.1
4	P2	4.5	0.1
4	P3	4.7	0.0
4	P4	4.6	0.0
4	P5	4.6	0.1
4	P6	4.8	0.0
4	P7	4.9	0.1
4	P8	4.9	0.1
4	P9	4.5	0.1
4	P10	4.5	0.1
4	P11	4.2	0.1
4	P12	4.6	0.0
4	P13	4.9	0.1
4	P14	4.9	0.0
4	P15	4.6	0.0
4	P16	4.8	0.1
5	P1	4.8	0.1
5	P2	4.8	0.0
5	P3	4.8	0.1
5	P4	4.7	0.1
5	P5	5.0	0.1
5	P6	4.7	0.0
5	P7	4.7	0.3
5	P8	4.8	0.1
5	P9	5.1	0.0
5	P10	5.0	0.1
5	P11	5.1	0.0
5	P12	5.1	0.0
5	P13	5.1	0.0
5	P14	4.9	0.0
5	P15	4.8	0.0
5	P16	4.7	0.1

EQUIPMENT AND CALIBRATION SCHEDULES**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 #:** 1116559**Accuracy:** See Manual

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

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

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: 5/6/2008, Next Cal: 5/6/2009**Equipment #:** HPM-01**Description:** Hipot Megommeter**Manufacturer:** Hipotronics**Model:** H306B-A**Serial #:** M9905004**Accuracy:** 2 % Full Scale Accuracy

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

Equipment #: STG-01**Description:** Hipot Megometer Safety Test Cage**Manufacturer:** Hipotronics**Model:** TC-25**Serial #:** M9910141**Accuracy:** N/A

... Last Cal: No Calibration Required, Next Cal:

Equipment #: THC-01**Description:** Temperature/Humidity Chamber**Manufacturer:** Thermotron**Model:** SM-8-7800**Serial #:** 30676**Accuracy:** See Manual

... Last Cal: 04/07/2009, Next Cal: 04/07/2010

Equipment #: TCT-03**Description:** Dillon Quantrol TC2 Test Stand**Manufacturer:** Dillon Quantrol**Model:** TC2**Serial #:** 0772740**Accuracy:** Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.