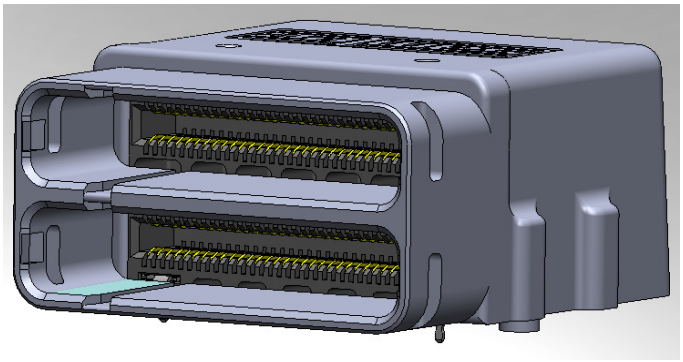
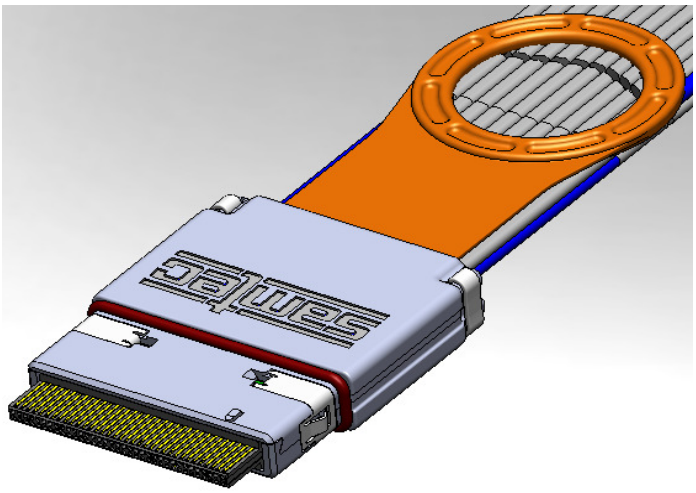
Project Number: Design Qualification Test Report	Tracking Code: 161619_Report_Rev_2			
Requested by: Corey Rose	Date: 5/9/2012	Product Rev: 0		
Part #: HDI6-035-01-RA & HDC-035-01/HDLSP-035-0250	Lot #: N/A	Tech: Joe Smallwood	Eng: Eric Mings	
Part description: HDI6&HDC\HDLSP		Qty to test: 45		
Test Start: 10/10/2011	Test Completed: 11/4/2011			





Design Qualification Test Report

HDI6&HDC\HDLSP
ASP\HDR

HDI6-035-01-RA & HDC-035-01/HDLSP-035-0250
ASP-149117-01 & ASP-149118-01/HDR-149112-0250

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.

SCOPE

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

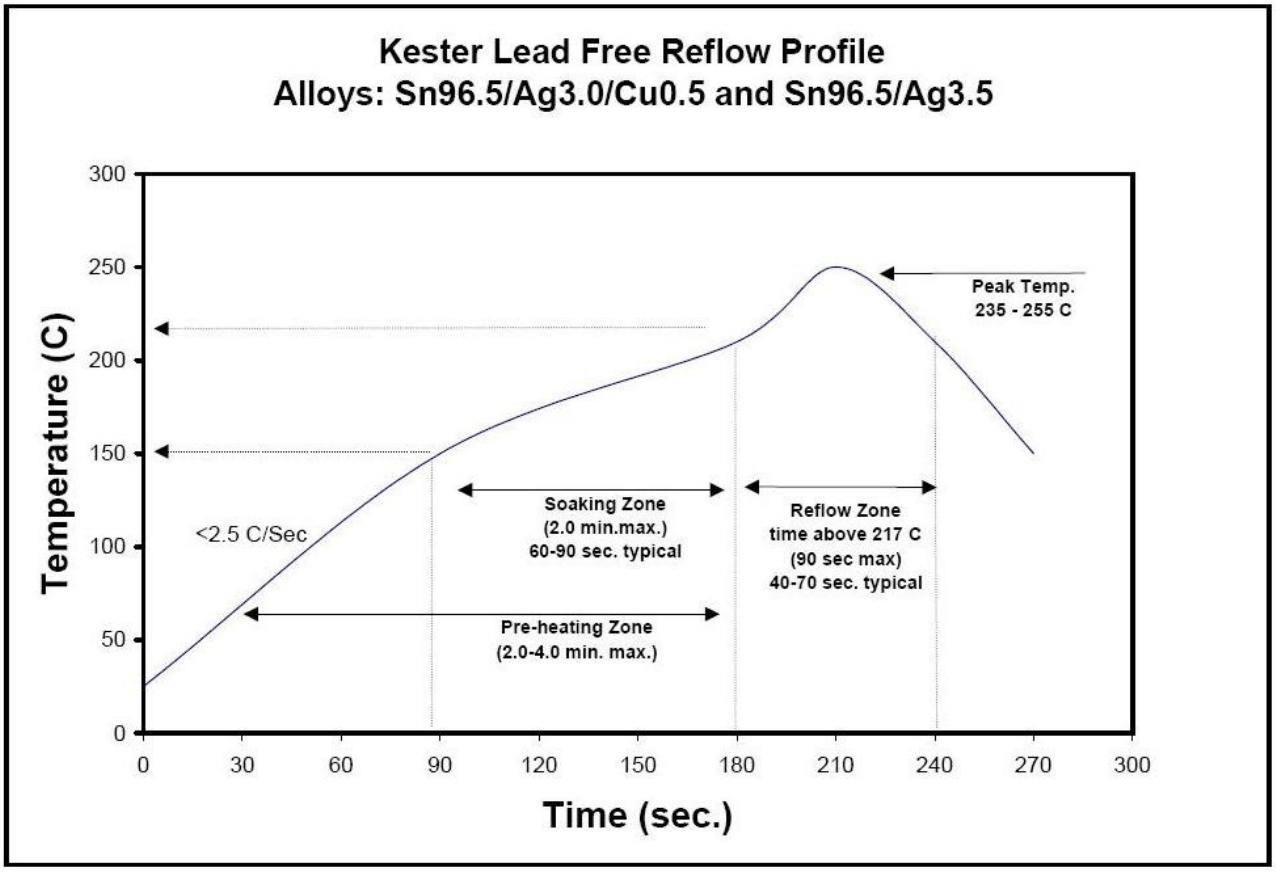
APPLICABLE DOCUMENTS

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-103446-TST-XX

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

TEST STEP	GROUP A 192 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

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 A3 2 Unmated of Mating Part # Break Down Pin-to-Pin	GROUP B1 2 Mated Sets Pin-to-Pin
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 Shock (Mated and Undisturbed)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (Mated and Undisturbed)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

DWV on Group B1 to be performed at Test Voltage

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

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

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

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	25 Cycles
05	Forces - Mating / Unmating
06	25 Cycles (50 Total)
07	Forces - Mating / Unmating
08	25 Cycles (75 Total)
09	Forces - Mating / Unmating
10	25 Cycles (100 Total)
11	Forces - Mating / Unmating
12	Clean w/Compressed Air
13	Contact Gaps
14	LLCR-2
15	Thermal Shock (Mated and Undisturbed)
16	LLCR-3
17	Cyclic Humidity (Mated and Undisturbed)
18	LLCR-4
19	Forces - Mating / Unmating

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

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

FLOWCHARTS Continued

Thermal Aging

TEST STEP	GROUP A1 8 Boards Thermal Aging (Mated)
01	Contact Gaps
02	Forces - Mating / Unmating
03	LLCR-1
04	Thermal Aging (Mated and Undisturbed)
05	LLCR-2
06	Forces - Mating / Unmating
07	Contact Gaps

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

Time Condition 'B' (250 Hours)

Mating / Unmating Forces = EIA-364-13

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

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

FLOWCHARTS Continued

Normal Force

TEST STEP	GROUP A1 Individual Contacts (8-10 min) per row	GROUP A2 Individual Contacts (8-10 min) per row
01	Contact Gaps	Contact Gaps
02	Setup Approved	Thermal Aging (Mated and Undisturbed)
03	Normal Force (in the body and soldered on PCB unless otherwise specified)	Contact Gaps
04		Setup Approved
05		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)

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

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

Current Carrying Capacity - Array

TEST STEP	GROUP D1 3 Mated Assemblies 1 Vertical Row Powered	GROUP D2 3 Mated Assemblies 2 Adjacent Vertical Rows Powered	GROUP D3 3 Mated Assemblies 3 Adjacent Vertical Rows Powered	GROUP D4 3 Mated Assemblies 4 Adjacent Vertical Rows Powered	GROUP D5 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

FLOWCHARTS Continued

Mechanical Shock / Vibration / LLCR

TEST STEP	GROUP A1 192 Points
01	LLCR-1
02	Shock
03	Vibration
04	LLCR-2

Mechanical Shock = EIA 364-27 Half Sine,

100 g's, 6 milliSeconds (Condition "C") each axis

Vibration = EIA 364-28, Random Vibration

7.56 g RMS, Condition VB --- 2 hours/axis

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

Shock / Vibration / nanoSecond Event Detection

TEST STEP	GROUP A1 60 Points
01	Event Detection, Shock
02	Event Detection, Vibration

Mechanical Shock = EIA 364-27 Half Sine,

100 g's, 6 milliSeconds (Condition "C") each axis

Vibration = EIA 364-28, Random Vibration

7.56 g RMS, Condition VB --- 2 hours/axis

Event detection requirement during Shock / Vibration is 50 nanoseconds minimum

FLOWCHARTS Continued

Connector Pull

TEST STEP	GROUP A1 5 Pieces 0°	GROUP B1 5 Pieces 90°
01	Pull test, Continuity	Pull test, Continuity

Monitor continuity and pull; record forces when continuity fails

Cable Flex Test

TEST STEP	GROUP B1 8 Cable Assemblies Flat Cable
01	IR & DWV at test voltage
	TDR
02	Flex 500 Cycles
	TDR
03	Visual Inspection
04	IR & DWV at test voltage

DWV to be performed at Test Voltage

DWV test voltage is equal to 75% of the lowest break down voltage from 'Sequence E'

*** If 'Sequence E' is not being tested, then separate parts must be broken down to establish the test voltage**

Monitor continuity during flex testing on all groups

Cable Flex Test = EIA-364-41D

Circular Jacket Cable - to be tested 90° each direction (180° total)

EIA-364-41D min flex requirement = 200 cycles

Flat Cable - to be tested 70°±5° each direction (140°±10° total)

EIA-364-41D min flex requirement = 500 cycles

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

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:

- EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors.*
- Test Condition 4 at 105° C.
- Test Time Condition B for 250 hours.
- All test samples are pre-conditioned at ambient.
- 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.

MECHANICAL SHOCK (Specified Pulse):

1) Reference document: EIA-364-27, *Mechanical Shock Test Procedure for Electrical Connectors*
2) Test Condition C
3) Peak Value: 100 G
4) Duration: 6 Milliseconds
5) Wave Form: Half Sine
6) Velocity: 12.3 ft/s
7) Number of Shocks: 3 Shocks / Direction, 3 Axis (18 Total)

VIBRATION:

1) Reference document: EIA-364-28, *Vibration Test Procedure for Electrical Connectors*
2) Test Condition V, Letter B
3) Power Spectral Density: 0.04 G^2 / Hz
4) G 'RMS': 7.56
5) Frequency: 50 to 2000 Hz
6) Duration: 2.0 Hours per axis (3 axis total)

NANOSECOND-EVENT DETECTION:

1) Reference document: EIA-364-87, *Nanosecond-Event Detection for Electrical Connectors*
2) Prior to test, the samples were characterized to assure the low nanosecond event being monitored will trigger the detector.
3) After characterization it was determined the test samples could be monitored for 50 nanosecond events

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.

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

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 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.

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 1000 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. Rate of Application 500 V/Sec
        iii. 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)..

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.

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

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

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.

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

Connector pull test

Pull the cable from the body, measure the test and record the force

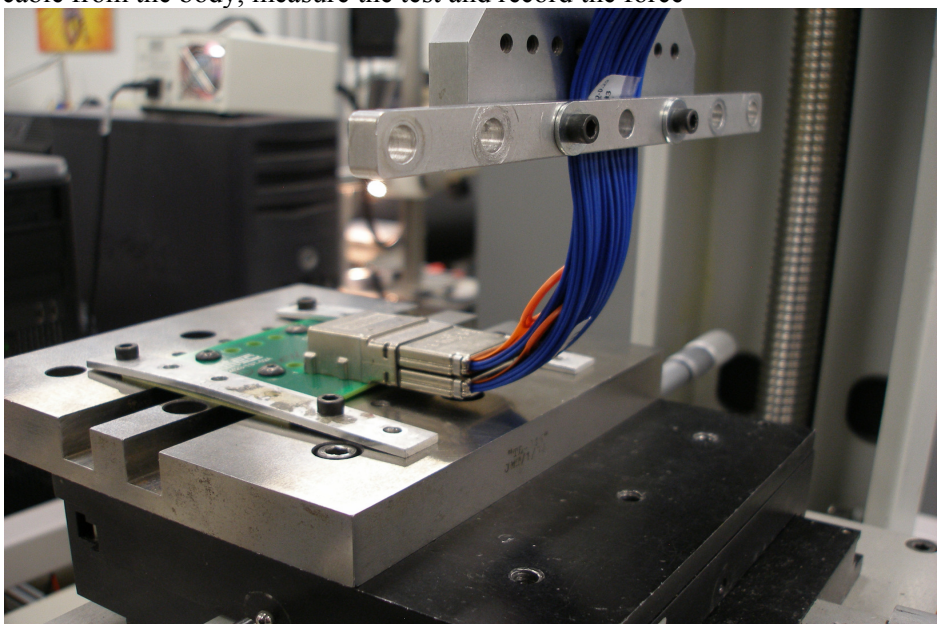


Fig. 1

Cable Flex test

±70° Flex Mode, bend up to 500 cycles with 4 oz. load on cable end.

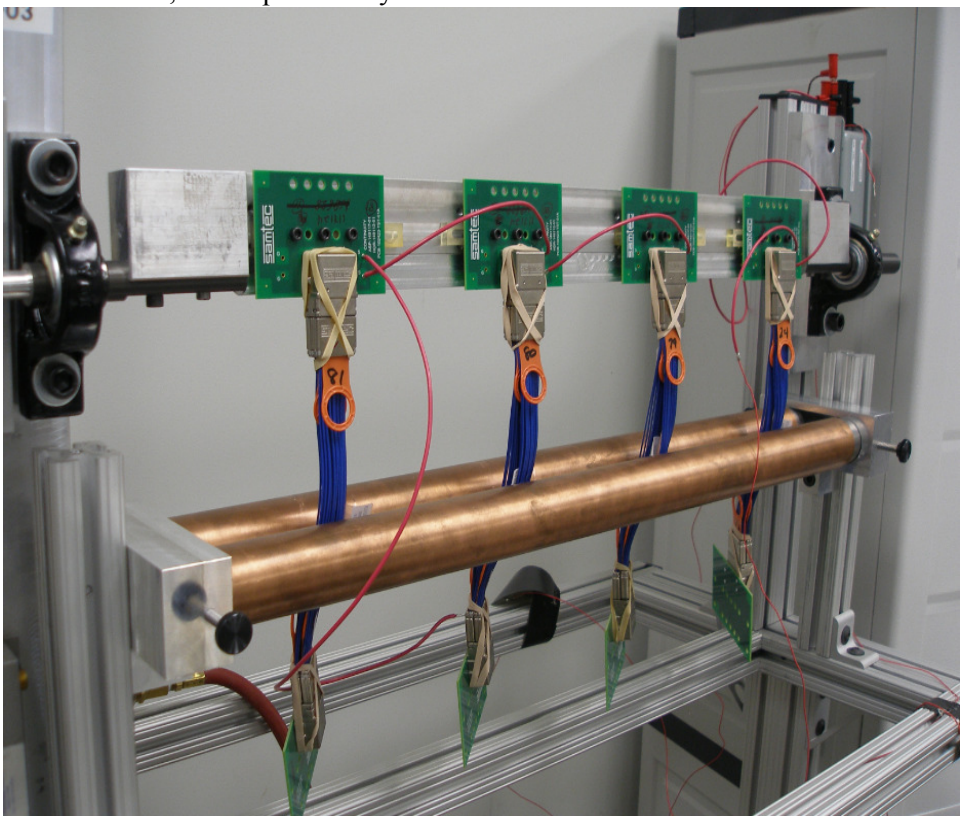


Fig. 2

RESULTS

Temperature Rise, CCC at a 20% de-rating

Contact

- **CCC for a 30°C Temperature Rise ---------- 1.5 A per contact with 4 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ---------- 1.1 A per contact with 8 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ---------- 0.9 A per contact with 12 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ---------- 0.8 A per contact with 16 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ---------- 0.4 A per contact with all adjacent contacts powered**

Contact Gaps

Mating&Unmating durability

Slot 1:

- **Initial**
  - **Min ---------- 1.1540 mm**
  - **Max ---------- 1.2700 mm**
- **After 100 Cycles**
  - **Min ---------- 1.1372 mm**
  - **Max ---------- 1.2783 mm**

Slot 2:

- **Initial**
  - **Min ---------- 1.2380 mm**
  - **Max ---------- 1.3070 mm**
- **After 100 Cycles**
  - **Min ---------- 1.2419 mm**
  - **Max ---------- 1.3199 mm**

Thermal aging

Slot 1:

- **Initial**
  - **Min ---------- 1.1500 mm**
  - **Max ---------- 1.2780 mm**
- **After thermal aging**
  - **Min ---------- 1.2028 mm**
  - **Max ---------- 1.3348 mm**

Slot 2:

- **Initial**
  - **Min ---------- 1.2290 mm**
  - **Max ---------- 1.3020 mm**
- **After thermal aging**
  - **Min ---------- 1.2727 mm**
  - **Max ---------- 1.3608 mm**

Normal force initial

- **Initial**
  - **Min ---------- 1.2530 mm**
  - **Max ---------- 1.3420 mm**

Normal force after thermal

- **Initial**
  - **Min ---------- 1.2340 mm**
  - **Max ---------- 1.3300 mm**
- **After thermal aging**
  - **Min ---------- 1.2230 mm**
  - **Max ---------- 1.3300 mm**

RESULTS Continued

Mating /unmating force
Mating&Unmating durability:
Slot 1:

- **Initial**
  - **Mating**
    - **Min ---------- 2.72 Lbs**
    - **Max---------- 3.31 Lbs**
  - **Unmating**
    - **Min ---------- 3.14 Lbs**
    - **Max---------- 4.21 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 2.84 Lbs**
    - **Max---------- 3.52 Lbs**
  - **Unmating**
    - **Min ---------- 3.36 Lbs**
    - **Max---------- 5.58 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 3.05 Lbs**
    - **Max---------- 3.74 Lbs**
  - **Unmating**
    - **Min ---------- 3.54 Lbs**
    - **Max---------- 5.74 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 3.12 Lbs**
    - **Max---------- 4.07 Lbs**
  - **Unmating**
    - **Min ---------- 3.58 Lbs**
    - **Max---------- 6.51 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 3.22 Lbs**
    - **Max---------- 4.36 Lbs**
  - **Unmating**
    - **Min ---------- 3.99 Lbs**
    - **Max---------- 7.24 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 3.05 Lbs**
    - **Max---------- 4.01 Lbs**
  - **Unmating**
    - **Min ---------- 3.59 Lbs**
    - **Max---------- 4.87 Lbs**

RESULTS Continued

Slot 2:

- **Initial**
  - **Mating**
    - **Min ---------- 2.61 Lbs**
    - **Max---------- 3.36 Lbs**
  - **Unmating**
    - **Min ---------- 3.09 Lbs**
    - **Max---------- 3.96 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 2.79 Lbs**
    - **Max---------- 4.32 Lbs**
  - **Unmating**
    - **Min ---------- 3.80 Lbs**
    - **Max---------- 5.60 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 2.92 Lbs**
    - **Max---------- 4.27 Lbs**
  - **Unmating**
    - **Min ---------- 4.20 Lbs**
    - **Max---------- 6.08 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 3.10 Lbs**
    - **Max---------- 4.61 Lbs**
  - **Unmating**
    - **Min ---------- 5.09 Lbs**
    - **Max---------- 6.19 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 3.41 Lbs**
    - **Max---------- 5.04 Lbs**
  - **Unmating**
    - **Min ---------- 5.26 Lbs**
    - **Max---------- 7.17 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 2.69 Lbs**
    - **Max---------- 3.61 Lbs**
  - **Unmating**
    - **Min ---------- 3.26 Lbs**
    - **Max---------- 4.02 Lbs**

RESULTS Continued

Thermal aging

Slot 1:

- **Initial**
  - **Mating**
    - **Min ---------- 2.73 Lbs**
    - **Max---------- 3.73 Lbs**
  - **Unmating**
    - **Min ---------- 2.38 Lbs**
    - **Max---------- 4.46 Lbs**
- **After thermal aging**
  - **Mating**
    - **Min ---------- 2.95 Lbs**
    - **Max---------- 4.62 Lbs**
  - **Unmating**
    - **Min ---------- 1.74 Lbs**
    - **Max---------- 2.77 Lbs**

Slot 2:

- **Initial**
  - **Mating**
    - **Min ---------- 2.60 Lbs**
    - **Max---------- 3.37 Lbs**
  - **Unmating**
    - **Min ---------- 2.08 Lbs**
    - **Max---------- 3.75 Lbs**
- **After thermal aging**
  - **Mating**
    - **Min ---------- 2.60 Lbs**
    - **Max---------- 3.60 Lbs**
  - **Unmating**
    - **Min ---------- 2.78 Lbs**
    - **Max---------- 3.72 Lbs**

RESULTS Continued

Normal Force at 0.09 mm deflection

Row 1:

- **Initial**
  - **Min----------85.30 gf Set ----- 0.0001 mm**
  - **Max ---------- 92.20 gf Set ----- 0.0002 mm**
- **Thermal**
  - **Min----------83.70 gf Set----- 0.0000 mm**
  - **Max ----------87.80 gf Set----- 0.0001 mm**

Row 2:

- **Initial**
  - **Min----------74.30 gf Set ----- 0.0000 mm**
  - **Max ---------- 79.20 gf Set ----- 0.0002 mm**
- **Thermal**
  - **Min----------77.60 gf Set----- 0.0000 mm**
  - **Max ----------82.20 gf Set----- 0.0001 mm**

Row 3:

- **Initial**
  - **Min----------80.10 gf Set ----- 0.0000 mm**
  - **Max ---------- 87.00 gf Set ----- 0.0002 mm**
- **Thermal**
  - **Min----------83.80 gf Set----- 0.0000 mm**
  - **Max ----------90.00 gf Set----- 0.0002 mm**

Row 4:

- **Initial**
  - **Min----------76.90 gf Set ----- 0.0001 mm**
  - **Max ---------- 83.00 gf Set ----- 0.0003 mm**
- **Thermal**
  - **Min----------78.60 gf Set----- 0.0000 mm**
  - **Max ----------84.60 gf Set----- 0.0003 mm**

Connector pull force

0° pull

- **Min----------4.50 Lbs**
- **Max ----------7.00 Lbs**

90° pull

- **Min----------3.50 Lbs**
- **Max ----------9.50 Lbs**

RESULTS Continued

LLCR Durability (192 pin LLCR test points)

Ground Pin-Row 1

- **Initial ---------- 62.20 mOhms Max**
- **After 100 Cycles**
  - **<= +5.0 mOhms ---------- 8 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**
- **After thermal shock**
  - **<= +5.0 mOhms ---------- 8 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**
- **After humidity**
  - **<= +5.0 mOhms ---------- 7 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 1 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**

Ground Pin-Row 3

- **Initial ---------- 53.80 mOhms Max**
- **After 100 Cycles**
  - **<= +5.0 mOhms ---------- 24 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**
- **After thermal shock**
  - **<= +5.0 mOhms ---------- 24 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**
- **After humidity**
  - **<= +5.0 mOhms ---------- 24 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

Signal Pin-Row 1

- **Initial ---------- 38.10 mOhms Max**
- **After 100 Cycles**
  - **<= +5.0 mOhms ----------24 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**
- **After thermal shock**
  - **<= +5.0 mOhms ----------24Points---------- 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**
- **After humidity**
  - **<= +5.0 mOhms ----------24 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**

Signal Pin-Row 2

- **Initial ---------- 49.20 mOhms Max**
- **After 100 Cycles**
  - **<= +5.0 mOhms ----------32 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**
- **After thermal shock**
  - **<= +5.0 mOhms ----------32 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**
- **After humidity**
  - **<= +5.0 mOhms ----------32 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

Signal Pin-Row 3

- **Initial ---------- 53.50 mOhms Max**
- **After 100 Cycles**
  - **<= +5.0 mOhms ----------40 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**
- **After thermal shock**
  - **<= +5.0 mOhms ----------40 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**
- **After humidity**
  - **<= +5.0 mOhms ----------40 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**

Signal Pin-Row 4

- **Initial ---------- 58.80 mOhms Max**
- **After 100 Cycles**
  - **<= +5.0 mOhms ----------64 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**
- **After thermal shock**
  - **<= +5.0 mOhms ----------64 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**
- **After humidity**
  - **<= +5.0 mOhms ----------64 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 Aging (192 pin LLCR test points)

Ground Pin-Row1

- **Initial ---------- 75.20 mOhms Max**
- **Thermal Aging**
  - **<= +5.0 mOhms ---------- 8 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**

Ground Pin-Row3

- **Initial ---------- 52.90 mOhms Max**
- **Thermal Aging**
  - **<= +5.0 mOhms ---------- 24 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**

Signal Pin-Row1

- **Initial ---------- 38.30 mOhms Max**
- **Thermal Aging**
  - **<= +5.0 mOhms ---------- 24 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**

Signal Pin-Row2

- **Initial ---------- 47.30 mOhms Max**
- **Thermal Aging**
  - **<= +5.0 mOhms ---------- 32 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**

Signal Pin-Row3

- **Initial ---------- 53.60 mOhms Max**
- **Thermal Aging**
  - **<= +5.0 mOhms ---------- 40 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**

Signal Pin-Row4

- **Initial ---------- 59.10 mOhms Max**
- **Thermal Aging**
  - **<= +5.0 mOhms ---------- 64 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 Gas Tight (192 pin LLCR test points)

Ground Pin-Row1

- **Initial ---------- 64.10 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ---------- 8 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**

Ground Pin-Row3

- **Initial ---------- 54.40 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ----------23 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ----------1 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**

Signal Pin-Row1

- **Initial ---------- 38.90 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ----------24 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**

Signal Pin-Row2

- **Initial ---------- 48.00 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ----------32 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**

Signal Pin-Row3

- **Initial ---------- 55.10 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ----------40 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

Signal Pin-Row4

- **Initial ---------- 59.50 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms ----------64 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**

LLCR Shock Vib (192 pin LLCR test points)

Ground Pin-Row1

- **Initial ---------- 61.36 mOhms Max**
- **S&V**
  - **<= +5.0 mOhms ---------- 8 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**

Ground Pin-Row3

- **Initial ---------- 53.00 mOhms Max**
- **S&V**
  - **<= +5.0 mOhms ----------24 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

Signal Pin-Row1

- **Initial ---------- 39.29 mOhms Max**
- **S&V**
  - **<= +5.0 mOhms ----------24 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**

Signal Pin-Row2

- **Initial ---------- 49.52mOhms Max**
- **S&V**
  - **<= +5.0 mOhms ----------32 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**

Signal Pin-Row3

- **Initial ---------- 53.02 mOhms Max**
- **S&V**
  - **<= +5.0 mOhms ----------40 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**

Signal Pin-Row4

- **Initial ---------- 58.99 mOhms Max**
- **S&V**
  - **<= +5.0 mOhms ----------64 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**

Mechanical Shock & Random Vibration:

- **Shock**
  - **No Damage---------- ---------- Passed**
  - **50 Nanoseconds---------- ---------- Passed**
- **Vibration**
  - **No Damage---------- ---------- Passed**
  - **50 Nanoseconds---------- ---------- Passed**

RESULTS Continued

Insulation Resistance minimums, IR

Pin-Pin

- **Initial**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated ---------- 30000Meg Ω ---------- Pass**
  - **Unmated ---------- 20000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated ---------- 6000Meg Ω ---------- Pass**
  - **Unmated ---------- 25000Meg Ω ---------- Pass**

Pin-Ground

- **Initial**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated ---------- 15000Meg Ω ---------- Pass**
  - **Unmated ---------- 20000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated ---------- 8000Meg Ω ---------- Pass**
  - **Unmated ---------- 20000Meg Ω ---------- Pass**

Row-Row

- **Initial**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated ---------- 50000Meg Ω ---------- Pass**
  - **Unmated ---------- 50000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated ---------- 40000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage ---------- 620VAC**
  - **Test Voltage ---------- 465VAC**
  - **Working Voltage ---------- 150VAC**

Pin - pin

- **Initial DWV ---------- Passed**
- **Thermal DWV ---------- Passed**
- **Humidity DWV ---------- Passed**

Pin-Ground

- **Initial DWV ---------- Passed**
- **Thermal DWV ---------- Passed**
- **Humidity DWV ---------- Passed**

Row-Row

- **Initial DWV ---------- Passed**
- **Thermal DWV ---------- Passed**
- **Humidity DWV ---------- Passed**

RESULTS Continued

Cable Flex
Insulation Resistance minimums, IR
Pin-Ground

- **Initial**
  - **Mated ---------- 25000Meg Ω ---------- Pass**
- **After flex cycles**
  - **Mated ---------- 15000Meg Ω ---------- Pass**

Dielectric Withstanding Voltage minimums, DWV
Pin - pin

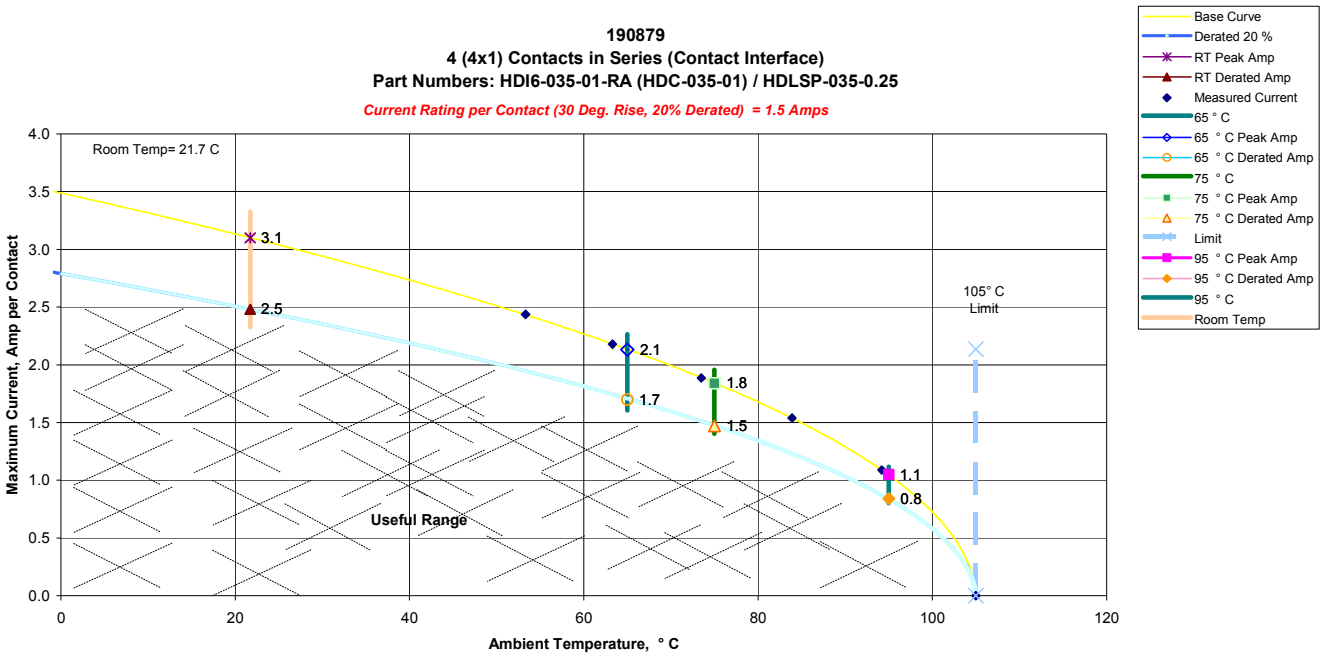
- **Initial DWV ---------- Passed**
- **After flex cycles DWV ---------- Passed**

DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

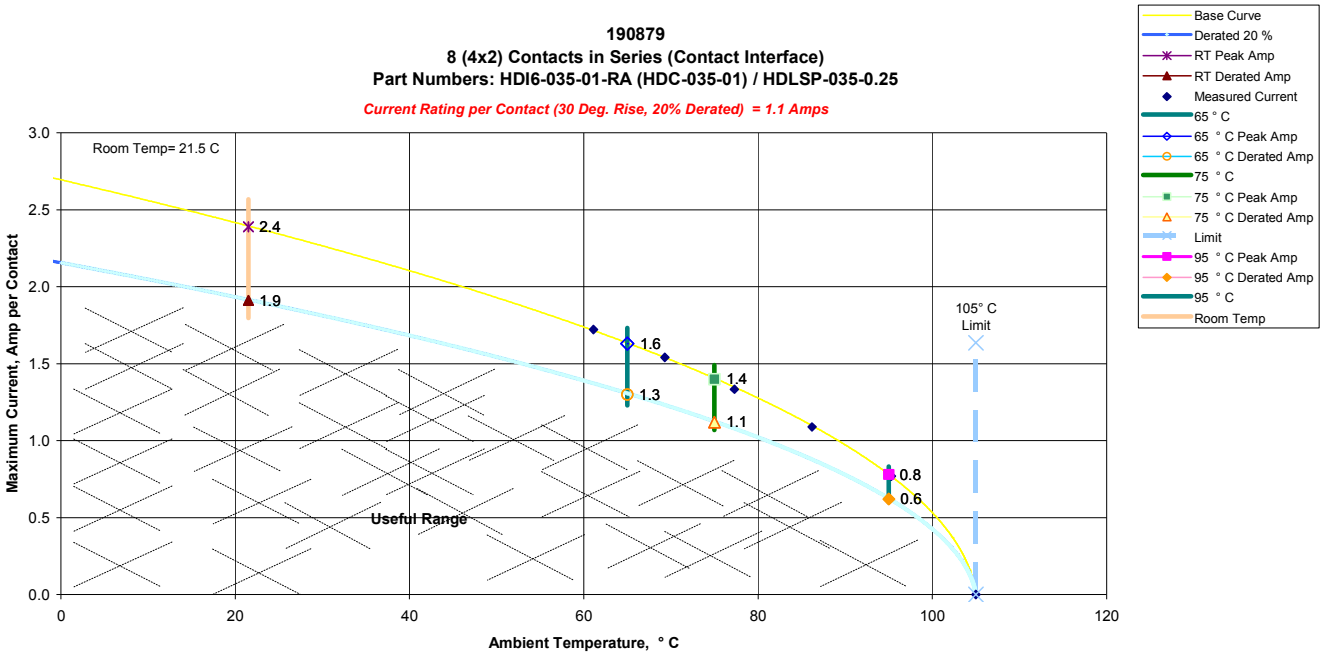
1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
3) Temperature readings recorded are those for which three successive readings, 15 minutes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

   a. Linear configuration with 4 adjacent conductors/contacts powered

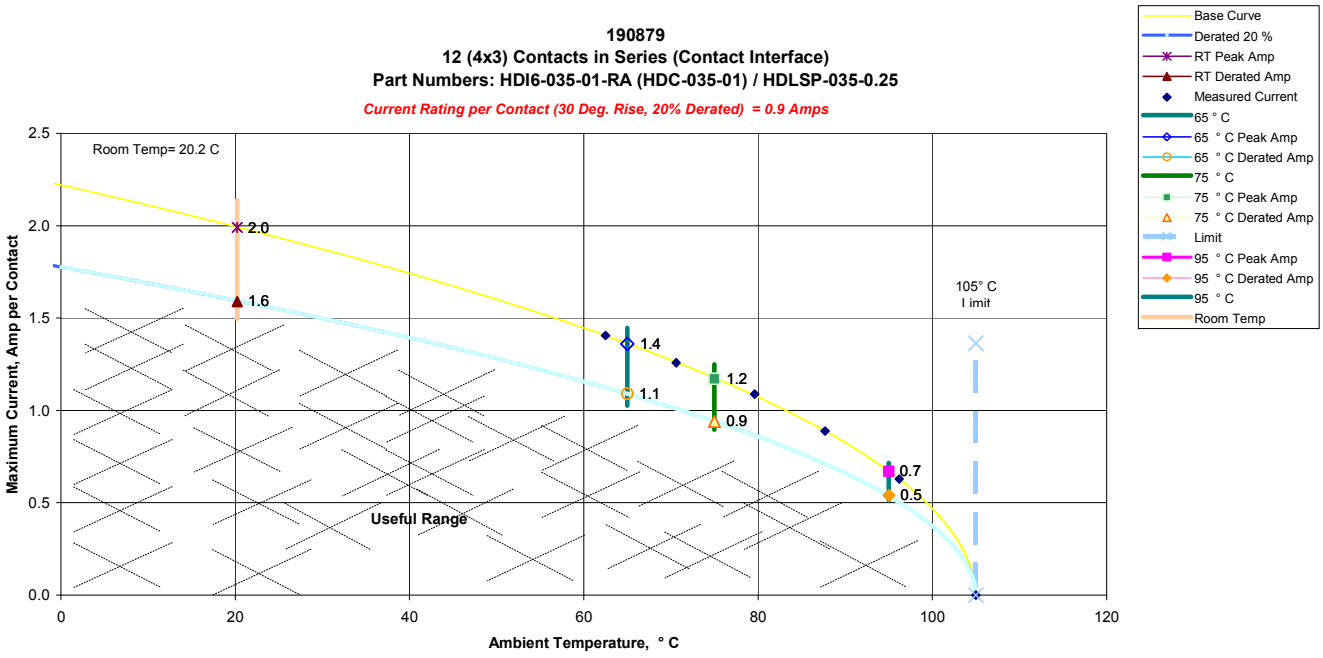


DATA SUMMARIES Continued

b. Linear configuration with 8 adjacent conductors/contacts powered

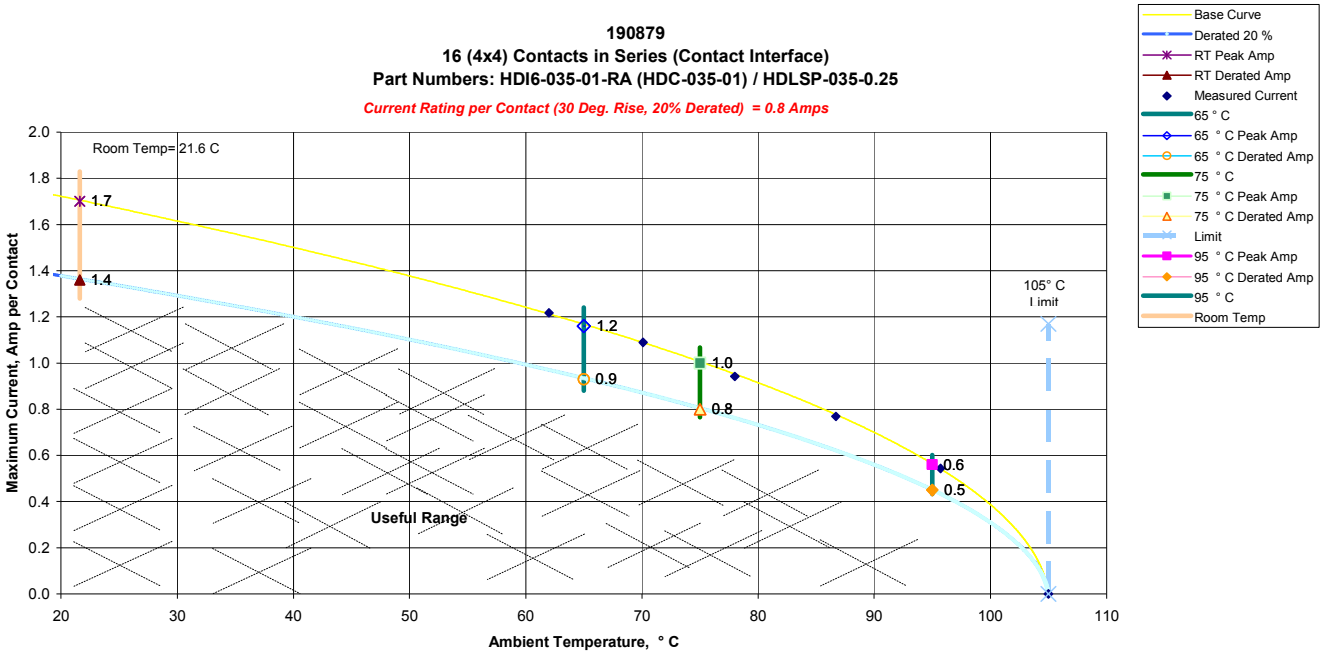


c. Linear configuration with 12 adjacent conductors/contacts powered

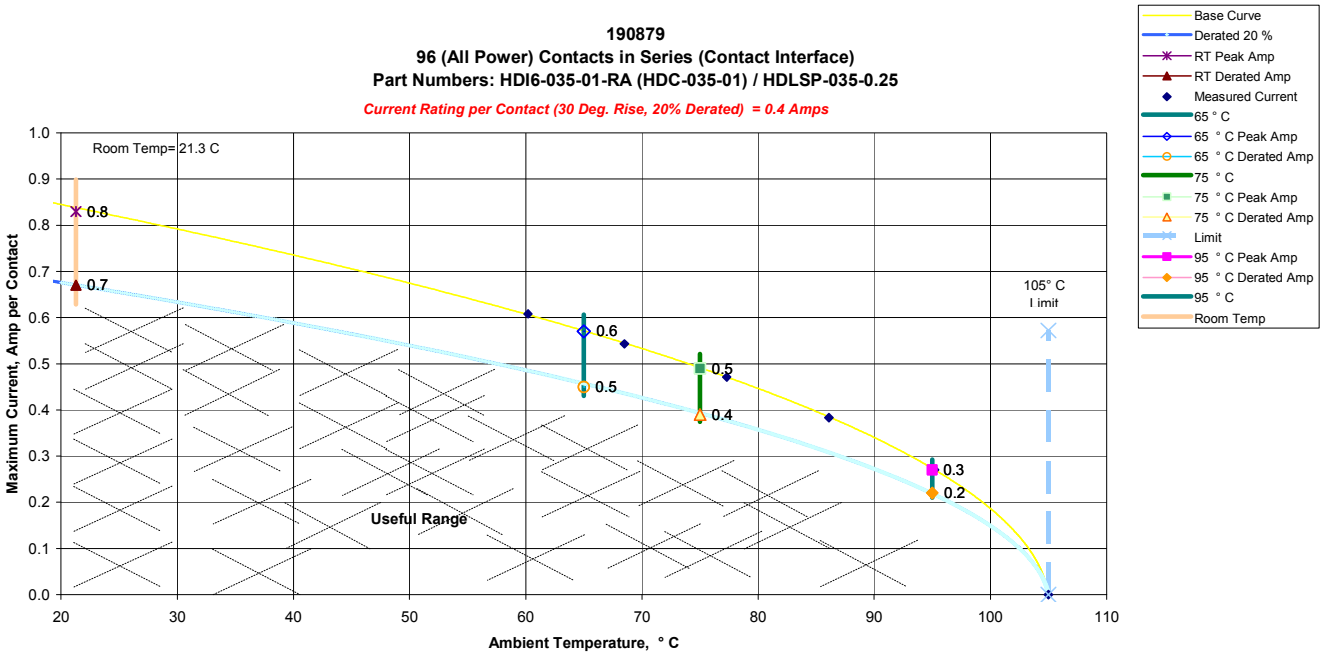


DATA SUMMARIES Continued

d. Linear configuration with 16 adjacent conductors/contacts powered



e. Linear configuration with all adjacent conductors/contacts powered



DATA SUMMARIES

CONTACT GAPS:

Mating&Unmating durability:

Slot 1:

Initial		After Thermal age	
Units:	mm	Units:	mm
Minimum	1.1540	***Minimum***	1.1372
Maximum	1.2700	***Maximum***	1.2783
Average	1.2239	***Average***	1.2314
St. Dev.	0.0227	***St. Dev.***	0.0296
Count	56	***Count***	56

Slot 2:

Initial		After Thermal age	
Units:	mm	Units:	mm
Minimum	1.2380	***Minimum***	1.2419
Maximum	1.3070	***Maximum***	1.3199
Average	1.2733	***Average***	1.2888
St. Dev.	0.0183	***St. Dev.***	0.0191
Count	56	***Count***	56

Thermal aging:

Slots 1:

Initial		After Thermal age	
Units:	mm	Units:	mm
Minimum	1.1500	***Minimum***	1.2028
Maximum	1.2780	***Maximum***	1.3348
Average	1.2203	***Average***	1.2777
St. Dev.	0.0298	***St. Dev.***	0.0330
Count	56	***Count***	56

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Slot 2:

Initial		After Thermal age	
Units:	mm	Units:	mm
Minimum	1.2290	***Minimum***	1.2727
Maximum	1.3020	***Maximum***	1.3608
Average	1.2722	***Average***	1.3225
St. Dev.	0.0173	***St. Dev.***	0.0196
Count	56	***Count***	56

DATA SUMMARIES Continued

Normal force initial:

Initial	
Units:	mm
Minimum	1.2530
Maximum	1.3420
Average	1.2973
St. Dev.	0.0200
Count	56

Normal force after thermal:

Initial		After Thermal age	
Units:	mm	Units:	mm
Minimum	1.2340	***Minimum***	1.2232
Maximum	1.3300	***Maximum***	1.3300
Average	1.2938	***Average***	1.2755
St. Dev.	0.0202	***St. Dev.***	0.0259
Count	56	***Count***	112

MATING/UNMATING FORCE:

Mating/Unmating durability

Slot 1:

	Initial				25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	12.10	2.72	13.97	3.14	12.63	2.84	14.95	3.36
Maximum	14.72	3.31	18.73	4.21	15.66	3.52	24.82	5.58
Average	13.29	**2.99**	15.99	**3.60**	14.19	**3.19**	18.36	**4.13**
St Dev	0.95	0.21	1.63	0.37	1.00	0.22	3.52	0.79
Count	8	8	8	8	8	8	8	8
	50 Cycles				75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	13.57	3.05	15.75	3.54	13.88	3.12	15.92	3.58
Maximum	16.64	3.74	25.53	5.74	18.10	4.07	28.96	6.51
Average	14.93	**3.36**	19.90	**4.47**	15.77	**3.55**	22.59	**5.08**
St Dev	1.15	0.26	3.38	0.76	1.35	0.30	4.87	1.09
Count	8	8	8	8	8	8	8	8
	100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	14.32	3.22	17.75	3.99	13.57	3.05	15.97	3.59
Maximum	19.39	4.36	32.20	7.24	17.84	4.01	21.66	4.87
Average	16.40	**3.69**	24.76	**5.57**	15.47	**3.48**	18.23	**4.10**
St Dev	1.61	0.36	5.58	1.25	1.57	0.35	2.34	0.53
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

Slot 2:

	Initial				25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	11.61	2.61	13.74	3.09	12.41	2.79	16.90	3.80
Maximum	14.95	3.36	17.61	3.96	19.22	4.32	24.91	5.60
Average	12.92	**2.91**	15.13	**3.40**	14.57	**3.28**	19.77	**4.44**
St Dev	1.23	0.28	1.54	0.35	2.04	0.46	3.01	0.68
Count	8	8	8	8	8	8	8	8

	50 Cycles				75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	12.99	2.92	18.68	4.20	13.79	3.10	22.64	5.09
Maximum	18.99	4.27	27.04	6.08	20.51	4.61	27.53	6.19
Average	14.95	**3.36**	23.02	**5.18**	16.47	**3.70**	25.41	**5.71**
St Dev	2.07	0.47	2.90	0.65	2.47	0.56	1.76	0.40
Count	8	8	8	8	8	8	8	8

	100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	15.17	3.41	23.40	5.26	11.97	2.69	14.50	3.26
Maximum	22.42	5.04	31.89	7.17	16.06	3.61	17.88	4.02
Average	17.97	**4.04**	27.56	**6.20**	13.37	**3.01**	15.60	**3.51**
St Dev	2.67	0.60	3.28	0.74	1.22	0.27	1.16	0.26
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

Thermal aging:

Slot 1:

	Initial				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	12.14	2.73	10.59	2.38	13.12	2.95	7.74	1.74
Maximum	16.59	3.73	19.84	4.46	20.55	4.62	12.32	2.77
Average	13.73	**3.09**	14.87	**3.34**	15.67	**3.52**	9.87	**2.22**
St Dev	1.78	0.40	3.04	0.68	2.70	0.61	1.52	0.34
Count	8	8	8	8	8	8	8	8

Slot 2:

	Initial				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	11.56	2.60	9.25	2.08	11.56	2.60	12.37	2.78
Maximum	14.99	3.37	16.68	3.75	16.01	3.60	16.55	3.72
Average	12.70	**2.86**	14.06	**3.16**	12.73	**2.86**	14.38	**3.23**
St Dev	1.17	0.26	2.35	0.53	1.48	0.33	1.25	0.28
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

NORMAL FORCE

Row 1:

Initial	Deflections in inches Forces in Grams										
	0.0007	**0.0014**	**0.0021**	**0.0028**	**0.0035**	**0.0042**	**0.0049**	**0.0056**	**0.0063**	**0.0070**	***SET***
Averages	8.61	17.48	26.58	35.81	45.01	54.15	63.12	71.98	80.71	89.32	0.0001
Min	8.20	16.60	25.00	34.30	42.80	51.20	59.80	68.50	76.80	85.30	0.0001
Max	9.00	18.50	27.70	37.40	46.50	56.00	65.30	74.30	83.40	92.20	0.0002
St. Dev	0.223	0.634	0.867	1.172	1.337	1.630	1.881	2.087	2.274	2.281	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	0.0007	**0.0014**	**0.0021**	**0.0028**	**0.0035**	**0.0042**	**0.0049**	**0.0056**	**0.0063**	**0.0070**	***SET***
Averages	8.68	17.56	26.20	34.89	43.71	52.45	61.08	69.68	78.16	86.38	0.0001
Min	7.00	15.90	24.50	33.30	41.70	50.10	58.60	67.10	75.60	83.70	0.0000
Max	9.00	17.90	26.90	35.60	44.60	53.40	62.10	70.80	79.50	87.80	0.0001
St. Dev	0.547	0.553	0.632	0.669	0.847	0.927	0.994	1.154	1.213	1.285	0.0000
Count	12	12	12	12	12	12	12	12	12	12	12

Row 2:

Initial	Deflections in inches Forces in Grams										
	0.0007	**0.0014**	**0.0021**	**0.0028**	**0.0035**	**0.0042**	**0.0049**	**0.0056**	**0.0063**	**0.0070**	***SET***
Averages	7.65	15.38	22.98	30.73	38.45	46.11	53.82	61.57	69.12	76.60	0.0001
Min	6.90	14.30	21.50	28.70	36.40	43.80	51.60	59.20	66.80	74.30	0.0000
Max	8.10	16.30	24.30	32.20	40.20	48.00	55.80	63.70	71.50	79.20	0.0002
St. Dev	0.371	0.646	0.958	1.155	1.303	1.444	1.496	1.584	1.680	1.811	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	0.0007	**0.0014**	**0.0021**	**0.0028**	**0.0035**	**0.0042**	**0.0049**	**0.0056**	**0.0063**	**0.0070**	***SET***
Averages	8.03	15.99	23.95	31.85	39.88	47.83	55.88	63.83	71.68	79.72	0.0001
Min	7.60	15.50	23.40	30.90	38.90	46.50	54.40	62.20	69.90	77.60	0.0000
Max	8.40	16.50	24.70	32.90	41.10	49.30	57.30	65.50	73.40	82.20	0.0001
St. Dev	0.270	0.337	0.460	0.533	0.579	0.741	0.817	0.883	0.974	1.260	0.0000
Count	12	12	12	12	12	12	12	12	12	12	12

DATA SUMMARIES Continued

Row 3:

Initial	Deflections in inches Forces in Grams										
	0.0007	**0.0014**	**0.0021**	**0.0028**	**0.0035**	**0.0042**	**0.0049**	**0.0056**	**0.0063**	**0.0070**	***SET***
Averages	8.64	17.29	25.83	34.45	42.78	51.36	59.80	68.18	76.57	84.66	0.0001
Min	8.40	16.70	24.70	33.40	40.10	48.40	56.30	63.90	72.10	80.10	0.0000
Max	9.00	18.00	26.80	35.70	44.30	53.00	61.80	70.30	78.80	87.00	0.0002
St. Dev	0.223	0.408	0.644	0.684	1.155	1.256	1.486	1.698	1.832	1.966	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	0.0007	**0.0014**	**0.0021**	**0.0028**	**0.0035**	**0.0042**	**0.0049**	**0.0056**	**0.0063**	**0.0070**	***SET***
Averages	8.71	17.33	26.02	34.77	43.55	52.30	61.03	69.68	78.23	86.66	0.0001
Min	8.30	16.80	25.30	33.90	42.30	50.50	58.70	67.30	75.60	83.80	0.0000
Max	9.30	18.50	27.20	36.50	45.70	54.60	63.70	72.60	81.60	90.00	0.0002
St. Dev	0.271	0.456	0.542	0.744	1.013	1.175	1.359	1.539	1.697	1.827	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

Row 4:

Initial	Deflections in inches Forces in Grams										
	0.0007	**0.0014**	**0.0021**	**0.0028**	**0.0035**	**0.0042**	**0.0049**	**0.0056**	**0.0063**	**0.0070**	***SET***
Averages	7.76	15.71	23.62	31.59	39.65	47.51	55.34	63.13	70.93	78.47	0.0002
Min	7.30	14.90	22.80	30.80	38.80	46.20	53.90	61.90	69.50	76.90	0.0001
Max	8.60	17.30	26.00	34.30	42.80	51.00	59.20	67.20	75.40	83.00	0.0003
St. Dev	0.390	0.665	0.897	1.051	1.241	1.412	1.556	1.706	1.870	1.971	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	0.0007	**0.0014**	**0.0021**	**0.0028**	**0.0035**	**0.0042**	**0.0049**	**0.0056**	**0.0063**	**0.0070**	***SET***
Averages	8.22	16.37	24.44	32.63	40.82	48.86	57.00	65.07	73.08	81.03	0.0001
Min	7.90	15.90	23.70	31.40	39.60	47.30	55.30	63.20	70.80	78.60	0.0000
Max	8.70	17.10	25.30	34.20	42.50	50.90	59.30	67.60	76.00	84.60	0.0001
St. Dev	0.255	0.396	0.617	0.833	0.968	1.141	1.384	1.531	1.808	2.063	0.0000
Count	12	12	12	12	12	12	12	12	12	12	12

DATA SUMMARIES Continued

Connector pull force

0° Pull

	Force (lbs)
Minimum	**4.50**
Maximum	7.00
Average	5.40

90° Pull

	Force (lbs)
Minimum	**3.50**
Maximum	9.50
Average	6.10

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**HDI6/HDLSP**	**HDI6**	**HDLSP**
Initial	100000	100000	100000
Thermal	30000	50000	50000
Humidity	6000	25000	50000

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	**HDI6/HDLSP**	**HDI6**	**HDLSP**
Initial	100000	100000	100000
Thermal	15000	20000	25000
Humidity	8000	20000	25000

	Row to Row		
	Mated	Unmated	Unmated
Minimum	**HDI6/HDLSP**	**HDI6**	**HDLSP**
Initial	100000	100000	100000
Thermal	50000	50000	50000
Humidity	40000	100000	100000

DATA SUMMARIES Continued

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**HDI6/HDLSP**
Break Down Voltage	620
Test Voltage	465
Working Voltage	155

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

Row to Row	
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

DATA SUMMARIES Continued

Cable flex

INSULATION RESISTANCE (IR):

Pin to Ground	
Mated	
Minimum	
Initial	25000
After 500 Flex Cycles	15000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	
Break Down Voltage	600
Test Voltage	450
Working Voltage	150

Pin to Ground	
Initial Test Voltage	Passed
After 500 Flex Cycles Test Voltage	Passed

Shock / Vibration / nanoSecond Event Detection:

Shock and Vibration Event Detection Summary	
Contacts tested	60
Test Condition	C, 30g's, 11ms, Half-Sine
Shock Events	0
Test Condition	V-B, 5.35 rms g
Vibration Events	0
Total Events	0

DATA SUMMARIES Continued

LLCR Durabiltiy:

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. <= +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

Ground Pin:

	LLCR Measurement Summaries by Pin Type			
Date	10/5/2011	10/12/2011	10/19/2011	11/4/2011
Room Temp (Deg C)	23	23	22	22
Rel Humidity (%)	36	42	33	33
Technician	Craig Ryan	Craig Ryan	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Row 1			
Average	58.53	7.57	7.82	8.58
St. Dev.	1.85	0.25	0.40	1.62
Min	55.70	0.00	0.10	0.20
Max	62.20	0.80	1.50	5.40
Summary Count	8	8	8	8
Total Count	8	8	8	8
	Pin Type 2: Row 3			
Average	51.78	2.86	3.46	3.53
St. Dev.	0.85	0.50	0.69	0.79
Min	50.40	0.00	0.00	0.00
Max	53.80	1.60	2.90	2.90
Summary Count	24	24	24	24
Total Count	24	24	24	24

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
100 Cycles	**32**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**32**	**0**	**0**	**0**	**0**	**0**
Humidity	**31**	**1**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

Signal Pin:

	LLCR Measurement Summaries by Pin Type			
Date	10/5/2011	10/12/2011	10/19/2011	11/4/2011
Room Temp (Deg C)	23	23	22	22
Rel Humidity (%)	36	41	33	33
Technician	Craig Ryan	Craig Ryan	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Row 1			
Average	36.68	2.15	2.57	2.59
St. Dev.	0.73	0.35	0.71	0.68
Min	35.70	0.10	0.10	0.10
Max	38.10	1.50	2.60	2.70
Summary Count	24	24	24	24
Total Count	24	24	24	24
	Pin Type 2: Row 2			
Average	43.92	2.01	2.81	2.95
St. Dev.	1.28	0.73	0.75	0.72
Min	42.50	0.00	0.10	0.50
Max	49.20	3.90	4.70	4.90
Summary Count	32	32	32	32
Total Count	32	32	32	32
	Pin Type 3: Row 3			
Average	52.06	2.01	2.80	2.93
St. Dev.	0.81	0.54	0.58	0.63
Min	50.20	0.00	0.50	0.60
Max	53.50	2.20	3.00	3.10
Summary Count	40	40	40	40
Total Count	40	40	40	40
	Pin Type 4: Row 4			
Average	57.18	1.49	2.08	2.16
St. Dev.	0.76	0.39	0.60	0.63
Min	55.70	0.00	0.00	0.10
Max	58.80	1.60	2.70	2.90
Summary Count	64	64	64	64
Total Count	64	64	64	64

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
100 Cycles	**160**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**160**	**0**	**0**	**0**	**0**	**0**
Humidity	**160**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR thermal aging

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. <= +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

Ground Pin:

LLCR Measurement Summaries by Pin Type		
Date	10/11/2011	10/25/2011
Room Temp (Deg C)	23	22
Rel Humidity (%)	39	32
Technician	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta Thermal**
	Pin Type 1: Row 1	
Average	62.99	8.21
St. Dev.	7.10	0.38
Min	54.40	0.00
Max	75.20	1.20
Summary Count	8	8
Total Count	8	8
	Pin Type 2: Row 3	
Average	51.34	2.55
St. Dev.	0.76	0.27
Min	49.80	0.10
Max	52.90	1.10
Summary Count	24	24
Total Count	24	24

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Thermal	**32**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

Signal Pin:

	LLCR Measurement Summaries by Pin Type	
Date	10/11/2011	10/25/2011
Room Temp (Deg C)	22	22
Rel Humidity (%)	39	33
Technician	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta Thermal**
	Pin Type 1: Row 1	
Average	37.13	1.85
St. Dev.	0.97	0.24
Min	34.50	0.00
Max	38.30	0.90
Summary Count	24	24
Total Count	24	24
	Pin Type 2: Row 2	
Average	44.05	1.88
St. Dev.	1.32	0.39
Min	41.80	0.00
Max	47.30	1.60
Summary Count	32	32
Total Count	32	32
	Pin Type 3: Row 3	
Average	51.72	1.65
St. Dev.	0.71	0.30
Min	50.10	0.00
Max	53.60	1.20
Summary Count	40	40
Total Count	40	40
	Pin Type 4: Row 4	
Average	57.05	1.24
St. Dev.	0.73	0.43
Min	55.30	0.00
Max	59.10	2.80
Summary Count	64	64
Total Count	64	64

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Thermal	**160**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

GAS TIGHT:

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. <= +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

Ground Pin:

	LLCR Measurement Summaries by Pin Type	
Date	10/25/2011	10/25/2011
Room Temp (Deg C)	23	23
Rel Humidity (%)	32	32
Technician	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta Acid Vapor**
	Pin Type 1: Row 1	
Average	58.66	7.50
St. Dev.	2.98	0.16
Min	54.60	0.00
Max	64.10	0.50
Summary Count	8	8
Total Count	8	8
	Pin Type 2: Row 3	
Average	52.43	2.69
St. Dev.	1.01	1.14
Min	50.20	0.00
Max	54.40	5.90
Summary Count	24	24
Total Count	24	24

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Acid Vapor	**31**	**1**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

Signal Pin:

	LLCR Measurement Summaries by Pin Type	
Date	10/25/2011	10/25/2011
Room Temp (Deg C)	22	23
Rel Humidity (%)	32	32
Technician	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta Acid Vapor**
	Pin Type 1: Row 1	
Average	37.44	1.79
St. Dev.	0.70	0.16
Min	36.00	0.00
Max	38.90	0.70
Summary Count	24	24
Total Count	24	24
	Pin Type 2: Row 2	
Average	44.86	1.78
St. Dev.	1.18	0.30
Min	43.00	0.00
Max	48.00	1.10
Summary Count	32	32
Total Count	32	32
	Pin Type 3: Row 3	
Average	52.36	1.60
St. Dev.	1.02	0.28
Min	50.30	0.00
Max	55.10	1.20
Summary Count	40	40
Total Count	40	40
	Pin Type 4: Row 4	
Average	57.91	1.18
St. Dev.	0.90	0.23
Min	56.30	0.00
Max	59.50	1.40
Summary Count	64	64
Total Count	64	64

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Acid Vapor	**160**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

Shock Vib LLCR:

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. <= +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

Ground Pin:

	LLCR Measurement Summaries by Pin Type	
Date	10/5/2011	10/10/2011
Room Temp (Deg C)	23	23
Rel Humidity (%)	36	38
Technician	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta Shock-Vib**
	Pin Type 1: Row 1	
Average	56.07	8.27
St. Dev.	3.84	1.34
Min	49.29	0.47
Max	61.36	4.70
Summary Count	8	8
Total Count	8	8
	Pin Type 2: Row 3	
Average	51.49	2.63
St. Dev.	0.83	0.31
Min	49.35	0.05
Max	53.00	1.20
Summary Count	24	24
Total Count	24	24

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Shock-Vib	**32**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

Signal Pin:

LLCR Measurement Summaries by Pin Type		
Date	10/5/2011	10/10/2011
Room Temp (Deg C)	22	23
Rel Humidity (%)	36	38
Technician	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta Shock-Vib**
	Pin Type 1: Row 1	
Average	36.76	2.61
St. Dev.	0.97	0.99
Min	34.71	0.00
Max	39.29	4.29
Summary Count	24	24
Total Count	24	24
	Pin Type 2: Row 2	
Average	43.62	2.70
St. Dev.	1.35	1.44
Min	42.14	0.13
Max	49.52	7.73
Summary Count	32	32
Total Count	32	32
	Pin Type 3: Row 3	
Average	50.94	1.97
St. Dev.	1.10	0.68
Min	46.97	0.01
Max	53.02	3.93
Summary Count	40	40
Total Count	40	40
	Pin Type 4: Row 4	
Average	56.89	1.49
St. Dev.	0.81	0.36
Min	55.20	0.01
Max	58.99	1.60
Summary Count	64	64
Total Count	64	64

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Shock-Vib	**159**	**1**	**0**	**0**	**0**	**0**

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: MO-03
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 580
Serial #: 297288
Accuracy: Last Cal: 2011-8-06, Next Cal: 2012-8-05

Equipment #: 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 #: OV-01
Description: Oven
Manufacturer: Huida
Model: CS101-1E
Serial #: CS101-1E-B
Accuracy: Last Cal: 2011-12-14, Next Cal: 2012-12-13

Equipment #: THC-01
Description: Humidity transmitter
Manufacturer: Thermtron
Model: HMM30C
Serial #: D0240037
Accuracy: Last Cal: 2011-3-3, Next Cal: 2012-3-2

Equipment #: 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 #: MO-01
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 2700
Serial #: 1199807
Accuracy: Last Cal: 2011-4-28, Next Cal: 2012-4-27

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: PS-01
Description: Power Supply
Manufacturer: Agilent
Model: 6031A
Serial #: MY41000982
Accuracy: Last Cal: 2011-4-28, Next Cal: 2012-4-27

Equipment #: TSC-01
Description: Thermal Shock transmitter
Manufacturer: CSZ
Model: 10-VT14994
Serial #: VTS-3-6-6-SC/AC
Accuracy: Last Cal: 2011-11-1, Next Cal: 2012-11-1

Equipment #: SVC-01
Description: Shock & Vibration Table
Manufacturer: Data Physics
Model: LE-DSA-10-20K
Serial #: 10037
Accuracy: See Manual
… Last Cal: 2011-11-31, Next Cal: 2012-11-31

Equipment #: ACLM-01
Description: Accelerometer
Manufacturer: PCB Piezotronics
Model: 352C03
Serial #: 115819
Accuracy: See Manual
… Last Cal: 2011-07-9, Next Cal: 2012-7-9

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 2011-06-4, Next Cal: 2012-06-4