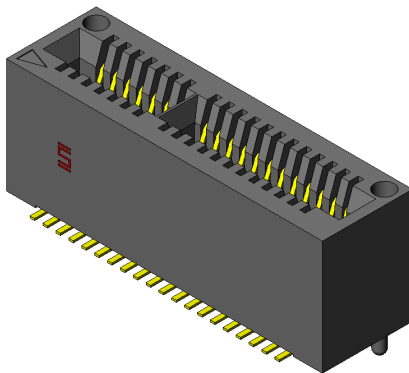
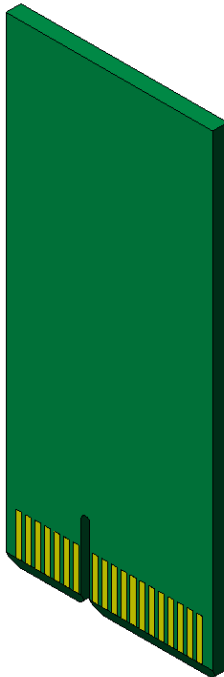




Project Number: Design Qualification Test Report		Tracking Code: 224232_Report_Rev_1	
Requested by: Eric Mings		Date: 3/1/2013	Product Rev: AQ
Part #: MEC1-140-02-L-D-A/Edge Card		Lot #: N/A	Tech: Peter Chen Eng: Vico Zhao
Part description: MEC1/Edge Card			Qty to test: 60
Test Start: 12/10/2012	Test Completed: 1/10/2013		



Design Qualification Test Report

MEC1/Edge Card

MEC1-140-02-L-D-A/Edge Card

Tracking Code: 224232_Report_Rev_1	Part #: MEC1-140-02-L-D-A/Edge Card
Part description: MEC1/Edge Card	

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
2/28/2013	1	Initial Issue	PC

CERTIFICATION

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

All contents contained herein are the property of Samtec. No portion of this report, in part or in full shall be reproduced without prior written approval of Samtec.

SCOPE

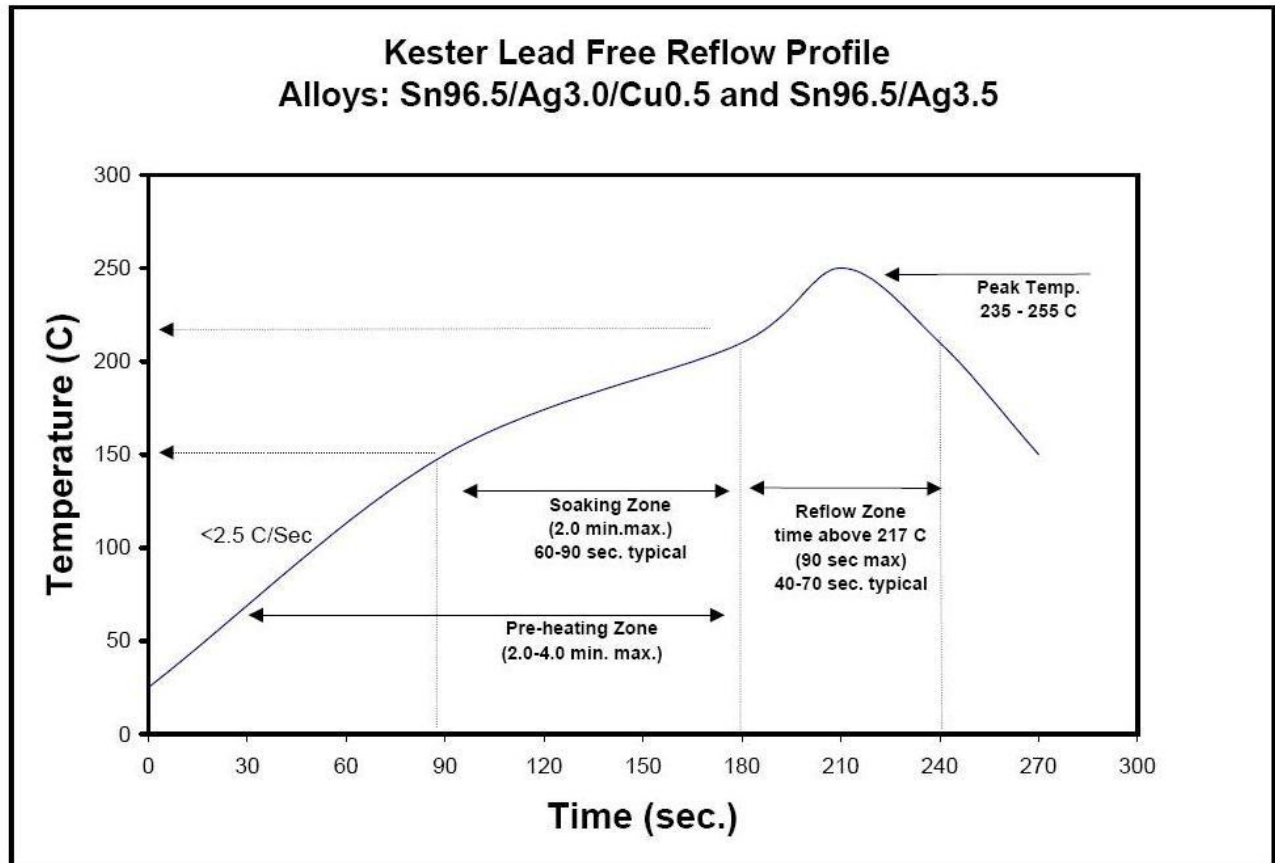
To perform the following tests: Design Qualification Test, Please see test plan.

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-104112-TST

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)

FLOWCHARTS**Gas Tight**

TEST STEP	GROUP A1 8 boards 0.056" thick edge card(Min)
01	LLCR-1
02	Gas Tight
03	LLCR-2

Gas Tight = EIA-364-36A

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

Thermal Aging

TEST STEP	GROUP A1 8 Boards Thermal Aging (Mated) 0.056" thick edge card(Min)	GROUP A2 8 Boards Thermal Aging (Mated) 0.068" thick edge card(Max)
01	Contact Gaps	Contact Gaps
02	Measure & Record PCB Thickness	Measure & Record PCB Thickness
03	Forces - Mating / Unmating	Forces - Mating / Unmating
04	LLCR-1	LLCR-1
05	Thermal Aging (Mated and Undisturbed)	Thermal Aging (Mated and Undisturbed)
06	LLCR-2	LLCR-2
07	Forces - Mating / Unmating	Forces - Mating / Unmating
08	Contact Gaps	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.

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**Durability/Mating/Unmating/Gaps**

TEST STEP	GROUP A1 8 Boards (middle position submitted) 0.056" thick edge card(Min)	GROUP A2 8 Boards (middle position submitted) 0.068" thick edge card(Max)	GROUP B1 8 Boards (largest position submitted) 0.068" thick edge card(Max)	GROUP C1 8 Boards (smallest position submitted) 0.068" thick edge card(Max)
01	Contact Gaps	Contact Gaps	Contact Gaps	Contact Gaps
02	Measure & Record PCB Thickness	Measure & Record PCB Thickness	Measure & Record PCB Thickness	Measure & Record PCB Thickness
03	LLCR-1	LLCR-1	Forces - Mating / Unmating	Forces - Mating / Unmating
04	Forces - Mating / Unmating	Forces - Mating / Unmating	25 Cycles	25 Cycles
05	25 Cycles	25 Cycles	Forces - Mating / Unmating	Forces - Mating / Unmating
06	Forces - Mating / Unmating	Forces - Mating / Unmating	25 Cycles (50 Total)	25 Cycles (50 Total)
07	25 Cycles (50 Total)	25 Cycles (50 Total)	Forces - Mating / Unmating	Forces - Mating / Unmating
08	Forces - Mating / Unmating	Forces - Mating / Unmating	25 Cycles (75 Total)	25 Cycles (75 Total)
09	25 Cycles (75 Total)	25 Cycles (75 Total)	Forces - Mating / Unmating	Forces - Mating / Unmating
10	Forces - Mating / Unmating	Forces - Mating / Unmating	25 Cycles (100 Total)	25 Cycles (100 Total)
11	25 Cycles (100 Total)	25 Cycles (100 Total)	Forces - Mating / Unmating	Forces - Mating / Unmating
12	Forces - Mating / Unmating	Forces - Mating / Unmating		
13	Clean w/Compressed Air	Clean w/Compressed Air		
14	Contact Gaps	Contact Gaps		
15	LLCR-2	LLCR-2		
16	Thermal Shock (Mated and Undisturbed)	Thermal Shock (Mated and Undisturbed)		
17	LLCR-3	LLCR-3		
18	Cyclic Humidity (Mated and Undisturbed)	Cyclic Humidity (Mated and Undisturbed)		
19	LLCR-4	LLCR-4		
20	Forces - Mating / Unmating	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**IR & DWV**

TEST STEP	GROUP A1 2 Mated Sets Break Down Pin-to-Pin 0.056" thick edge card(Min)	GROUP A2 2 Unmated of Part # Being Tested Break Down Pin-to-Pin 0.056" thick edge card(Min)	GROUP A3 2 Unmated of Mating Part # Break Down Pin-to-Pin 0.056" thick edge card(Min)	GROUP B1 2 Mated Sets Pin-to-Pin 0.056" thick edge card(Min)
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)

TEST STEP	GROUP C1 2 Mated Sets Break Down Row-to-Row 0.056" thick edge card(Min)	GROUP C2 2 Unmated of Part # Being Tested Break Down Row-to-Row 0.056" thick edge card(Min)	GROUP C3 2 Unmated of Mating Part # Break Down Row-to-Row 0.056" thick edge card(Min)	GROUP D1 2 Mated Sets Row-to-Row 0.056" thick edge card(Min)
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**Normal Force**

TEST STEP	GROUP A1 C-113-02 (Signal) Individual Contacts (10 min) 0.068" thick edge card(Max)	GROUP A2 C-113-02 (Signal) Individual Contacts (10 min) 0.068" thick edge card(Max)
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 - Double Row

TEST STEP	GROUP B1 3 Mated Assemblies 2 Contacts Powered (largest position submitted) 0.056" thick edge card(Min)	GROUP B2 3 Mated Assemblies 4 Contacts Powered (largest position submitted) 0.056" thick edge card(Min)	GROUP B3 3 Mated Assemblies 6 Contacts Powered (largest position submitted) 0.056" thick edge card(Min)
01	CCC	CCC	CCC
TEST STEP	GROUP B4 3 Mated Assemblies 8 Contacts Powered (largest position submitted) 0.056" thick edge card(Min)	GROUP B5 3 Mated Assemblies All Contacts Powered (largest position submitted) 0.056" thick edge card(Min)	
01	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 8 boards 0.056" thick edge card(Min)	GROUP A2 8 boards 0.068" thick edge card(Max)
01	LLCR-1	LLCR-1
02	Shock	Shock
03	Vibration	Vibration
04	LLCR-2	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 0.056" thick edge card(Min)
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

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

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

THERMAL:

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

HUMIDITY:

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

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 G² / 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

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 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.

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° 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.

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. $\leq +5.0$ 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

Temperature Rise, CCC at a 20% de-rating

- CCC for a 30°C Temperature Rise -----2.2 A per contact with 2 adjacent contacts powered
- CCC for a 30°C Temperature Rise -----1.7 A per contact with 4 adjacent contacts powered
- CCC for a 30°C Temperature Rise -----1.6 A per contact with 6 adjacent contacts powered
- CCC for a 30°C Temperature Rise -----1.3 A per contact with 8 adjacent contacts powered
- CCC for a 30°C Temperature Rise -----0.7 A per contact with all adjacent contacts powered

Mating /unmating force

Thermal aging:

MEC1-140-02-L-D-A/Edge Card-0.056”

- **Initial**
 - **Mating**
 - Min ----- 2.46 Lbs
 - Max----- 3.26 Lbs
 - **Unmating**
 - Min ----- 3.60 Lbs
 - Max----- 4.60 Lbs
- **After thermal aging**
 - **Mating**
 - Min ----- 3.23 Lbs
 - Max----- 3.89 Lbs
 - **Unmating**
 - Min ----- 2.07 Lbs
 - Max----- 2.52 Lbs

MEC1-140-02-L-D-A/Edge Card-0.068”

- **Initial**
 - **Mating**
 - Min ----- 9.63 Lbs
 - Max-----12.25 Lbs
 - **Unmating**
 - Min -----10.29 Lbs
 - Max-----13.16 Lbs
- **After thermal aging**
 - **Mating**
 - Min ----- 5.45 Lbs
 - Max----- 6.23 Lbs
 - **Unmating**
 - Min ----- 5.45 Lbs
 - Max----- 6.07 Lbs

RESULTS Continued

**Mating&Unmating durability:
MEC1-140-02-L-D-A/Edge Card-0.056"**

- **Initial**
 - **Mating**
 - **Min ----- 2.63 Lbs**
 - **Max----- 3.43 Lbs**
 - **Unmating**
 - **Min ----- 3.18 Lbs**
 - **Max----- 4.27 Lbs**
- **After 25 Cycles**
 - **Mating**
 - **Min ----- 2.82 Lbs**
 - **Max----- 3.47 Lbs**
 - **Unmating**
 - **Min ----- 3.12 Lbs**
 - **Max----- 3.98 Lbs**
- **After 50 Cycles**
 - **Mating**
 - **Min ----- 2.98 Lbs**
 - **Max----- 3.56 Lbs**
 - **Unmating**
 - **Min ----- 3.15 Lbs**
 - **Max----- 4.07 Lbs**
- **After 75 Cycles**
 - **Mating**
 - **Min ----- 2.86 Lbs**
 - **Max----- 3.68 Lbs**
 - **Unmating**
 - **Min ----- 3.32 Lbs**
 - **Max----- 4.17 Lbs**
- **After 100 Cycles**
 - **Mating**
 - **Min ----- 3.04 Lbs**
 - **Max----- 3.77 Lbs**
 - **Unmating**
 - **Min ----- 3.43 Lbs**
 - **Max----- 4.21 Lb**
- **After Humidity**
 - **Mating**
 - **Min ----- 3.35 Lbs**
 - **Max----- 3.74 Lbs**
 - **Unmating**
 - **Min ----- 2.33 Lbs**
 - **Max----- 2.71 Lbs**

RESULTS Continued

**Mating&Unmating durability:
MEC1-140-02-L-D-A/Edge Card-0.068"**

- **Initial**
 - **Mating**
 - **Min ----- 8.15 Lbs**
 - **Max-----11.23 Lbs**
 - **Unmating**
 - **Min ----- 8.47 Lbs**
 - **Max-----10.87 Lbs**
- **After 25 Cycles**
 - **Mating**
 - **Min ----- 9.30 Lbs**
 - **Max-----11.81 Lbs**
 - **Unmating**
 - **Min ----- 8.68 Lbs**
 - **Max-----11.03 Lbs**
- **After 50 Cycles**
 - **Mating**
 - **Min -----10.20 Lbs**
 - **Max-----12.45 Lbs**
 - **Unmating**
 - **Min ----- 8.47 Lbs**
 - **Max-----11.72 Lbs**
- **After 75 Cycles**
 - **Mating**
 - **Min -----10.85 Lbs**
 - **Max-----13.10 Lbs**
 - **Unmating**
 - **Min ----- 9.14 Lbs**
 - **Max-----12.54 Lbs**
- **After 100 Cycles**
 - **Mating**
 - **Min -----11.47 Lbs**
 - **Max-----13.56 Lbs**
 - **Unmating**
 - **Min ----- 9.49 Lbs**
 - **Max-----12.87 Lb**
- **After Humidity**
 - **Mating**
 - **Min ----- 6.25 Lbs**
 - **Max----- 7.12 Lbs**
 - **Unmating**
 - **Min ----- 6.78 Lbs**
 - **Max----- 7.88 Lbs**

RESULTS Continued

**Mating&Unmating basic:
MEC1-170-02-L-D-A/Edge Card-0.068"**

- **Initial**
 - **Mating**
 - **Min -----13.97 Lbs**
 - **Max-----17.57 Lbs**
 - **Unmating**
 - **Min -----12.34 Lbs**
 - **Max-----18.15 Lbs**
- **After 25 Cycles**
 - **Mating**
 - **Min -----14.38 Lbs**
 - **Max-----16.45 Lbs**
 - **Unmating**
 - **Min -----12.06 Lbs**
 - **Max-----18.20 Lbs**
- **After 50 Cycles**
 - **Mating**
 - **Min -----14.67 Lbs**
 - **Max-----17.12 Lbs**
 - **Unmating**
 - **Min -----12.16 Lbs**
 - **Max-----18.37 Lbs**
- **After 75 Cycles**
 - **Mating**
 - **Min -----14.35 Lbs**
 - **Max-----18.23 Lbs**
 - **Unmating**
 - **Min -----12.31 Lbs**
 - **Max-----18.77 Lbs**
- **After 100 Cycles**
 - **Mating**
 - **Min -----14.66 Lbs**
 - **Max-----18.77 Lbs**
 - **Unmating**
 - **Min -----12.40 Lbs**
 - **Max-----19.12 Lbs**

RESULTS Continued

MEC1-105-02-L-D-A/Edge Card-0.068"

- **Initial**
 - **Mating**
 - **Min** ----- 1.16 Lbs
 - **Max** ----- 1.92 Lbs
 - **Unmating**
 - **Min** ----- 1.20 Lbs
 - **Max** ----- 1.63 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 1.20 Lbs
 - **Max** ----- 1.71 Lbs
 - **Unmating**
 - **Min** ----- 1.27 Lbs
 - **Max** ----- 1.76 Lbs
- **After 50 Cycles**
 - **Mating**
 - **Min** ----- 1.28 Lbs
 - **Max** ----- 1.78 Lbs
 - **Unmating**
 - **Min** ----- 1.30 Lbs
 - **Max** ----- 1.80 Lbs
- **After 75 Cycles**
 - **Mating**
 - **Min** ----- 1.34 Lbs
 - **Max** ----- 1.77 Lbs
 - **Unmating**
 - **Min** ----- 1.33 Lbs
 - **Max** ----- 1.82 Lbs
- **After 100 Cycles**
 - **Mating**
 - **Min** ----- 1.42 Lbs
 - **Max** ----- 1.81 Lbs
 - **Unmating**
 - **Min** ----- 1.35 Lbs
 - **Max** ----- 1.85 Lbs

Normal Force at 0.022" deflection

- **Initial**
 - **Min** ----- 70.20 gf **Set ----- 0.0000"**
 - **Max** ----- 79.10 gf **Set ----- 0.0004"**
- **Thermal**
 - **Min** ----- 40.30 gf **Set ----- 0.0061"**
 - **Max** ----- 49.80 gf **Set ----- 0.0083"**

RESULTS Continued**LLCR Durability (192* signal pin LLCR test points)****0.056" thick edge card**

- **Initial** ----- 21.70 mOhms Max
- **After 100 Cycles**
 - <= +5.0 mOhms ----- 188 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 4 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 ----- 179 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 13 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 ----- 162 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 28 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 1 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
 - *Sample 028 Position 18 was removed due to corrosion on the mating card, only 191 test points

0.068" thick edge card

- **Initial** ----- 14.51 mOhms Max
- **After 100 Cycles**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - >+2000 mOhms ----- 0 Points ----- Open Failure
- **After thermal shock**
 - <= +5.0 mOhms ----- 187 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 5 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 ----- 167 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 24 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 1 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 signal pin LLCR test points)

0.056" thick edge card

- **Initial** ----- 19.09 mOhms Max
- **Thermal Aging**
 - <= +5.0 mOhms ----- 162 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 30 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

0.068" thick edge card

- **Initial** ----- 15.06 mOhms Max
- **Thermal Aging**
 - <= +5.0 mOhms ----- 173 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 19 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - >+2000 mOhms ----- 0 Points ----- Open Failure

LLCR Gas Tight (192 signal pin LLCR test points)

0.056" thick edge card

- **Initial** ----- 21.25 mOhms Max
- **Gas-Tight**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - >+2000 mOhms ----- 0 Points ----- Open Failure

LLCR Mechanical Shock & Vibration (192 signal pin LLCR test points)

0.056" thick edge card

- **Initial** ----- 18.71 mOhms Max
- **Shock&Vibration**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - >+2000 mOhms ----- 0 Points ----- Open Failure

0.068" thick edge card

- **Initial** ----- 14.40 mOhms Max
- **Shock&Vibration**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - >+2000 mOhms ----- 0 Points ----- Open Failure

RESULTS Continued

Insulation Resistance minimums, IR

Pin-Pin

- **Initial**
 - Mated-----1000Meg Ω ----- Pass
 - Unmated -----1000Meg Ω ----- Pass
- **Thermal**
 - Mated-----1000Meg Ω ----- Pass
 - Unmated -----1000Meg Ω ----- Pass
- **Humidity**
 - Mated-----1000Meg Ω ----- Pass
 - Unmated -----1000Meg Ω ----- Pass

Row-Row

- **Initial**
 - Mated-----1000Meg Ω ----- Pass
 - Unmated -----1000Meg Ω ----- Pass
- **Thermal**
 - Mated-----1000Meg Ω ----- Pass
 - Unmated -----1000Meg Ω ----- Pass
- **Humidity**
 - Mated-----1000Meg Ω ----- Pass
 - Unmated -----1000Meg Ω ----- Pass

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
 - Breakdown Voltage----- 1000VAC
 - Test Voltage -----750VAC
 - Working Voltage -----250VAC

Pin - pin

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

Row-Row

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

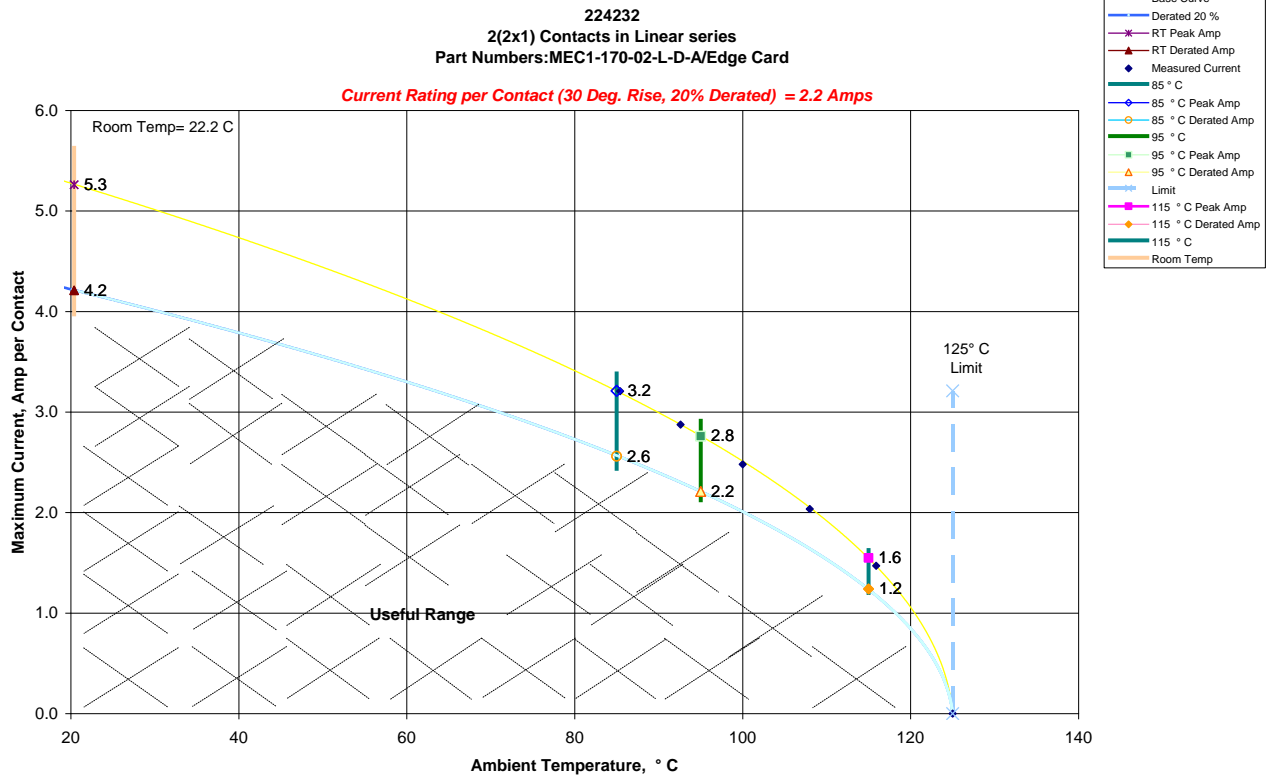
Mechanical Shock & Random Vibration:

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

DATA SUMMARIES

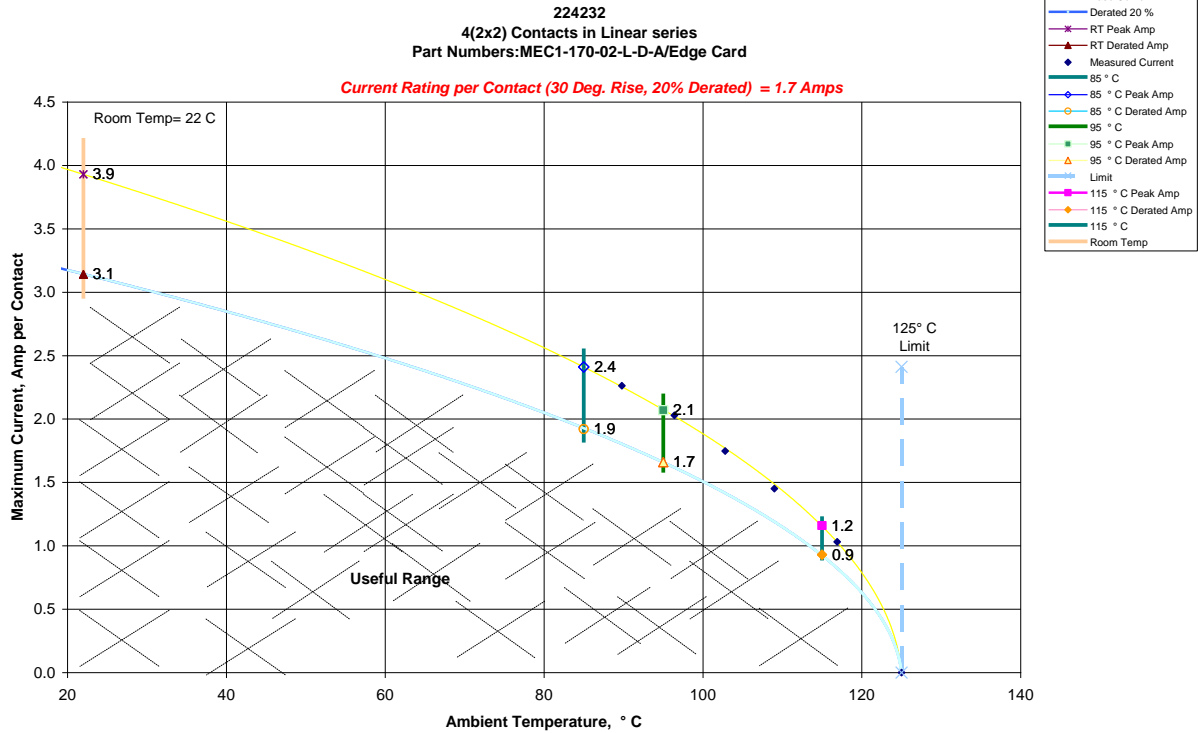
TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 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 2 adjacent conductors/contacts powered

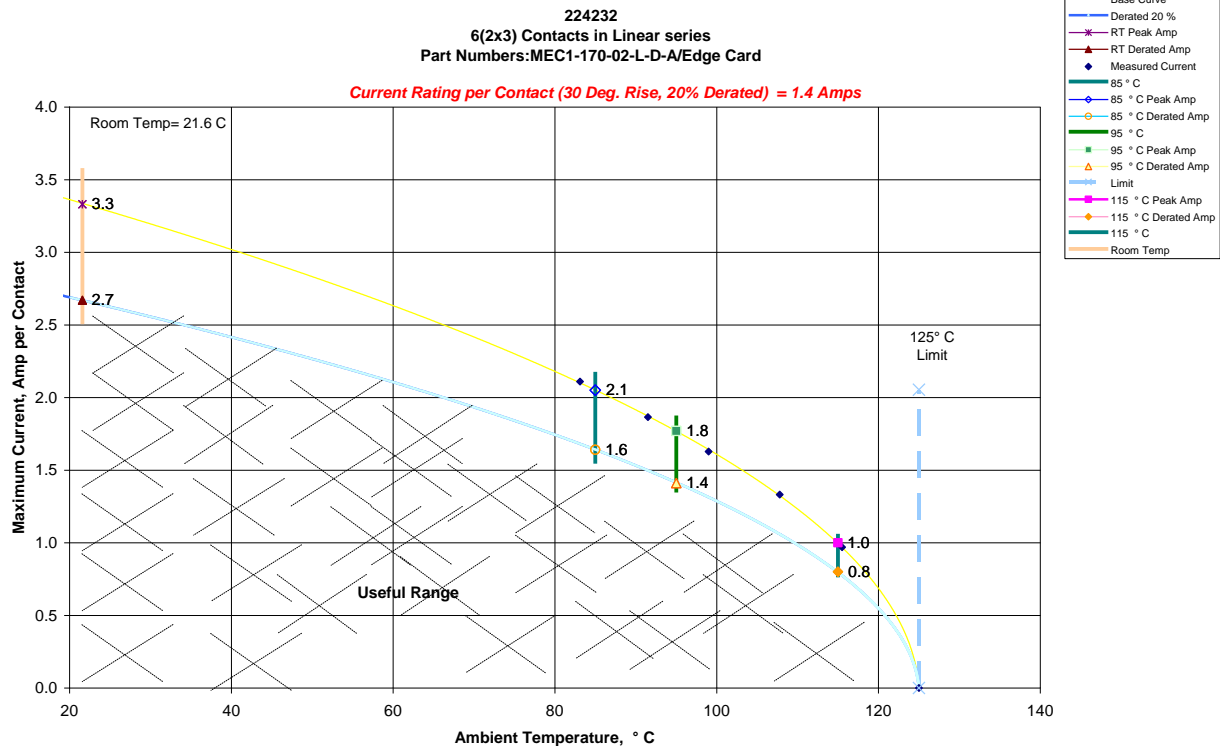


DATA SUMMARIES Continued

b. Linear configuration with 4 adjacent conductors/contacts powered

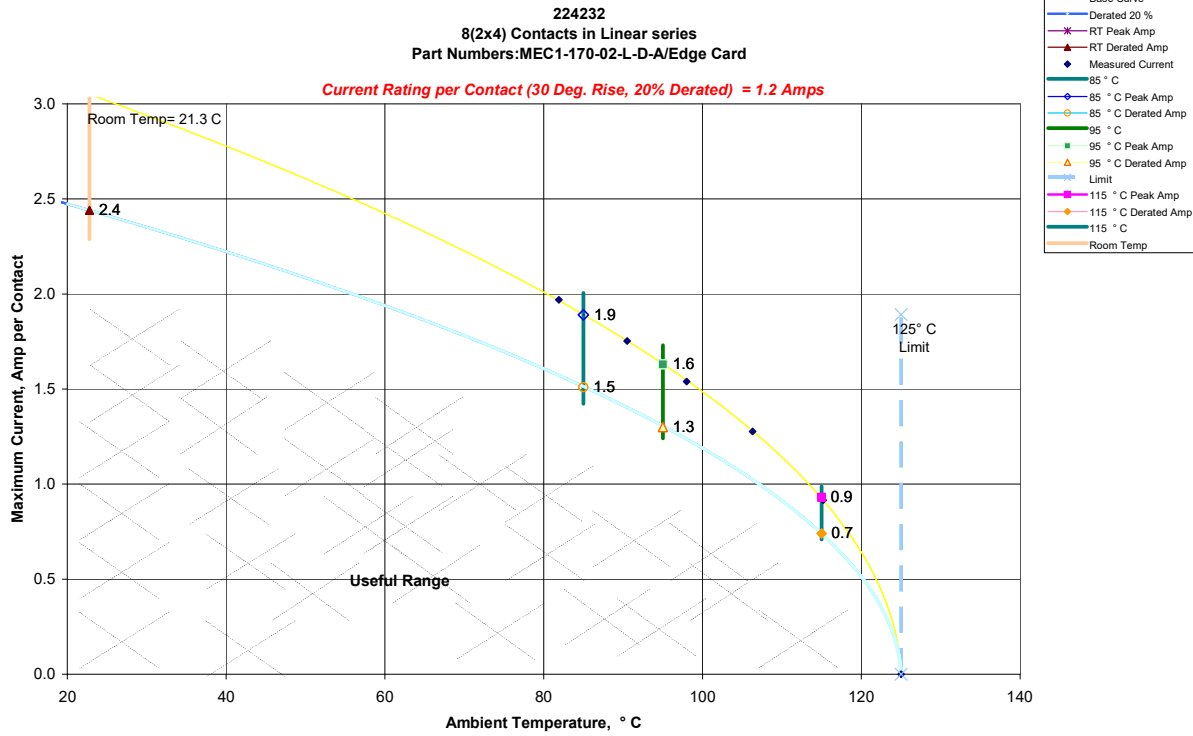


c. Linear configuration with 6 adjacent conductors/contacts powered

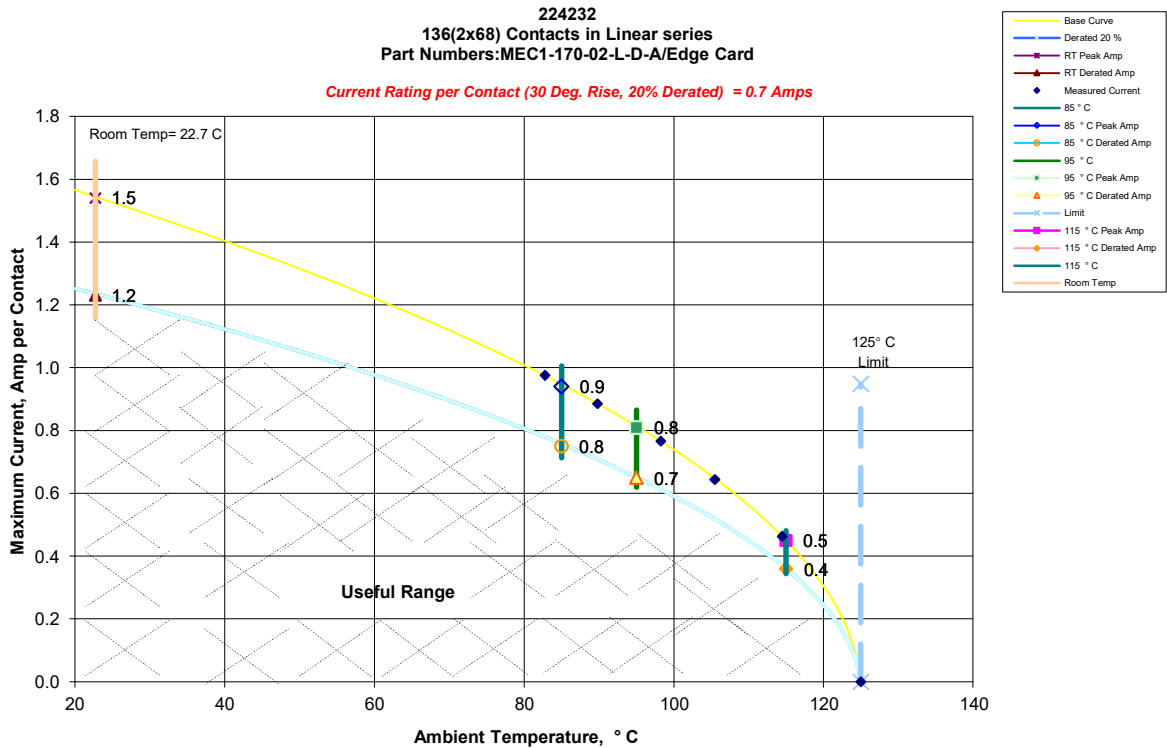


DATA SUMMARIES Continued

d. Linear configuration with 8 adjacent conductors/contacts powered



e. Linear configuration with all adjacent conductors/contacts powered



DATA SUMMARIES Continued**MATING/UNMATING FORCE:****Thermal aging:**

MEC1-140-02-L-D-A/Edge Card-0.056"

	Initial				After Thermals			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	10.94	2.46	16.01	3.60	14.37	3.23	9.21	2.07
Maximum	14.50	3.26	20.59	4.63	17.30	3.89	11.21	2.52
Average	12.56	2.82	18.02	4.05	14.99	3.37	10.25	2.30
St Dev	1.34	0.30	1.60	0.36	0.99	0.22	0.59	0.13
Count	8	8	8	8	8	8	8	8

MEC1-140-02-L-D-A/Edge Card-0.068"

	Initial				After Thermals			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	42.83	9.63	45.77	10.29	24.24	5.45	24.24	5.45
Maximum	54.49	12.25	58.54	13.16	27.71	6.23	27.00	6.07
Average	47.36	10.65	52.20	11.74	26.04	5.86	25.70	5.78
St Dev	3.99	0.90	4.39	0.99	1.03	0.23	0.93	0.21
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued**Mating/Unmating durability:**

MEC1-140-02-L-D-A/Edge Card-0.056"

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	11.70	2.63	14.14	3.18	12.54	2.82	13.88	3.12
Maximum	15.26	3.43	18.99	4.27	15.43	3.47	17.70	3.98
Average	13.78	3.10	16.69	3.75	14.32	3.22	16.12	3.62
St Dev	1.37	0.31	1.81	0.41	0.95	0.21	1.40	0.32
Count	8	8	8	8	8	8	8	8
	After 50 Cycles				After 75 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	13.26	2.98	14.01	3.15	12.72	2.86	14.77	3.32
Maximum	15.83	3.56	18.10	4.07	16.37	3.68	18.55	4.17
Average	14.90	3.35	16.47	3.70	15.12	3.40	16.96	3.81
St Dev	0.84	0.19	1.36	0.31	1.22	0.28	1.31	0.29
Count	8	8	8	8	8	8	8	8
	After 100 Cycles				After Humidity			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	13.52	3.04	15.26	3.43	14.90	3.35	10.36	2.33
Maximum	16.77	3.77	18.73	4.21	16.64	3.74	12.05	2.71
Average	15.30	3.44	17.29	3.89	15.57	3.50	11.19	2.52
St Dev	1.21	0.27	1.24	0.28	0.54	0.12	0.59	0.13
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

MEC1-140-02-L-D-A/Edge Card-0.068"

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	36.25	8.15	37.67	8.47	41.37	9.30	38.61	8.68
Maximum	49.95	11.23	48.35	10.87	52.53	11.81	49.06	11.03
Average	42.23	9.50	41.93	9.43	45.84	10.31	44.62	10.03
St Dev	4.38	0.99	3.25	0.73	3.84	0.86	3.53	0.79
Count	8	8	8	8	8	8	8	8
	After 50 Cycles				After 75 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	45.37	10.20	37.67	8.47	48.26	10.85	40.65	9.14
Maximum	55.38	12.45	52.13	11.72	58.27	13.10	55.78	12.54
Average	49.66	11.17	46.43	10.44	52.74	11.86	49.28	11.08
St Dev	3.83	0.86	4.91	1.10	3.83	0.86	4.84	1.09
Count	8	8	8	8	8	8	8	8
	After 100 Cycles				After Humidity			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	51.02	11.47	42.21	9.49	27.80	6.25	30.16	6.78
Maximum	60.31	13.56	57.25	12.87	31.67	7.12	35.05	7.88
Average	55.26	12.42	51.58	11.60	29.73	6.69	32.93	7.40
St Dev	3.60	0.81	5.27	1.18	1.27	0.29	1.82	0.41
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued**Mating/Unmating Basic:**

MEC1-170-02-L-D-A/Edge Card-0.068"

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	62.14	13.97	54.89	12.34	63.96	14.38	53.64	12.06
Maximum	78.15	17.57	80.73	18.15	73.17	16.45	80.95	18.20
Average	69.67	15.66	73.05	16.42	69.78	15.69	73.12	16.44
St Dev	6.07	1.36	8.18	1.84	3.07	0.69	8.66	1.95
Count	8	8	8	8	8	8	8	8
	After 50 Cycles				After 75 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	65.25	14.67	54.09	12.16	63.83	14.35	54.75	12.31
Maximum	76.15	17.12	81.71	18.37	81.09	18.23	83.49	18.77
Average	71.15	16.00	73.64	16.56	72.31	16.26	74.52	16.75
St Dev	3.85	0.87	8.80	1.98	5.34	1.20	9.05	2.03
Count	8	8	8	8	8	8	8	8
	After 100 Cycles							
	Mating		Unmating					
	Newton's	Force (Lbs)	Newton's	Force (Lbs)				
Minimum	65.21	14.66	55.16	12.40				
Maximum	83.49	18.77	85.05	19.12				
Average	73.86	16.61	75.68	17.01				
St Dev	5.77	1.30	9.36	2.11				
Count	8	8	8	8				

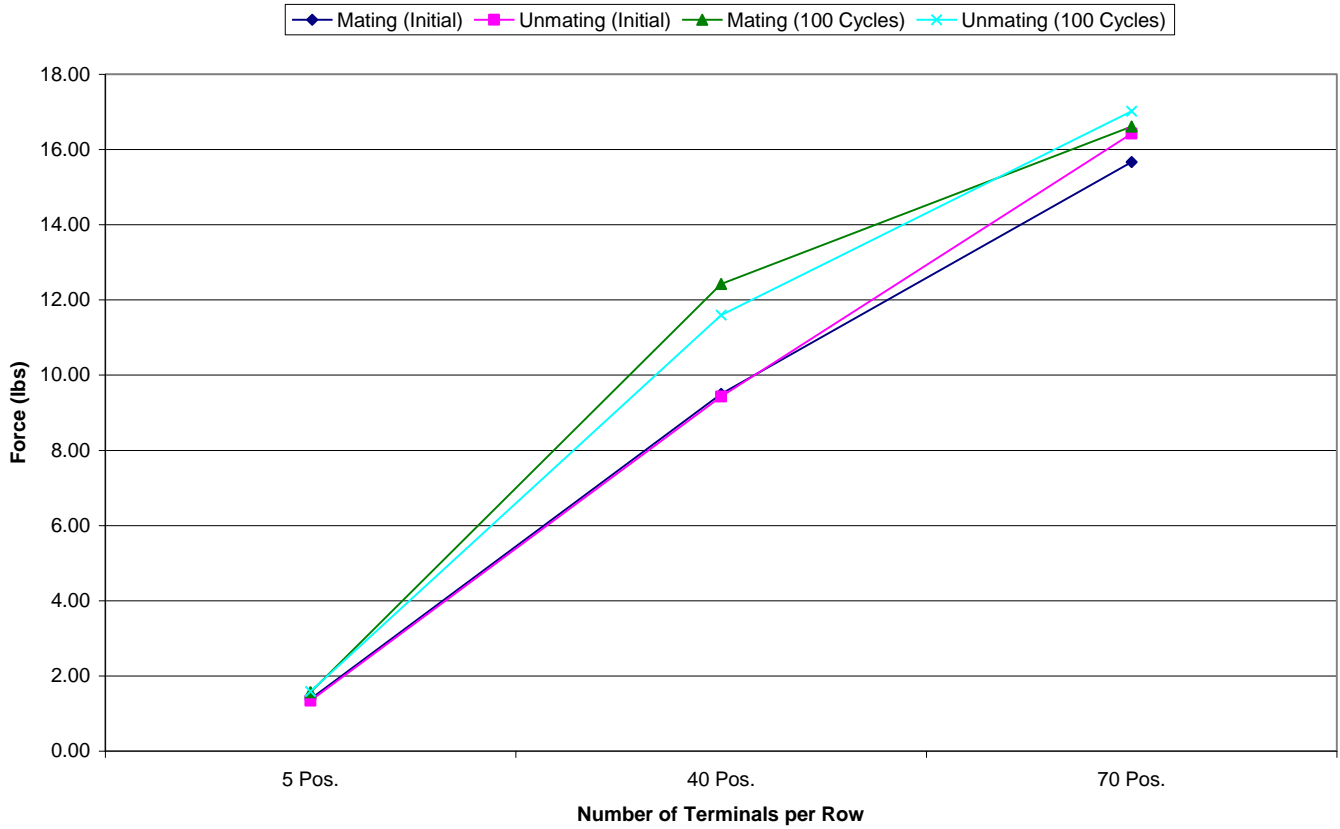
DATA SUMMARIES Continued

MEC1-105-02-L-D-A/Edge Card-0.068"

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	5.16	1.16	5.34	1.20	5.34	1.20	5.65	1.27
Maximum	8.54	1.92	7.25	1.63	7.61	1.71	7.83	1.76
Average	6.15	1.38	5.97	1.34	6.15	1.38	6.43	1.45
St Dev	1.09	0.24	0.67	0.15	0.70	0.16	0.76	0.17
Count	8	8	8	8	8	8	8	8
	After 50 Cycles				After 75 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)	Newton's	Force (Lbs)
Minimum	5.69	1.28	5.78	1.30	5.96	1.34	5.92	1.33
Maximum	7.92	1.78	8.01	1.80	7.87	1.77	8.10	1.82
Average	6.37	1.43	6.67	1.50	6.57	1.48	6.83	1.54
St Dev	0.72	0.16	0.76	0.17	0.65	0.15	0.74	0.17
Count	8	8	8	8	8	8	8	8
	After 100 Cycles							
	Mating		Unmating					
	Newton's	Force (Lbs)	Newton's	Force (Lbs)				
Minimum	6.32	1.42	6.00	1.35				
Maximum	8.05	1.81	8.23	1.85				
Average	6.98	1.57	7.06	1.59				
St Dev	0.57	0.13	0.69	0.16				
Count	8	8	8	8				

DATA SUMMARIES Continued

Mating/Unmating Data for 5, 40 and 70 Position MEC1-Edge card-0.068" thickness



Normal force:

Initial	Deflection in inches, Force in Grams										
	<u>0.0022</u>	<u>0.0044</u>	<u>0.0066</u>	<u>0.0088</u>	<u>0.0110</u>	<u>0.0132</u>	<u>0.0154</u>	<u>0.0176</u>	<u>0.0198</u>	<u>0.0220</u>	<i>SET</i>
Averages	5.93	11.36	16.89	22.19	29.78	38.61	47.55	56.21	64.13	73.19	0.0001
Min	5.00	9.90	15.70	20.60	28.10	37.20	45.80	54.30	61.20	70.20	-0.0001
Max	7.10	12.90	17.90	23.60	31.70	40.10	50.30	58.50	67.10	79.10	0.0004
St. Dev	0.526	0.812	0.664	0.742	1.040	0.881	1.532	1.507	2.099	2.550	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflection in inches Force in Grams										
	<u>0.0022</u>	<u>0.0044</u>	<u>0.0066</u>	<u>0.0088</u>	<u>0.0110</u>	<u>0.0132</u>	<u>0.0154</u>	<u>0.0176</u>	<u>0.0198</u>	<u>0.0220</u>	<i>SET</i>
Averages	-0.01	0.01	0.19	5.17	10.62	16.08	22.53	30.79	37.72	45.63	0.0071
Min	-0.50	-0.40	-0.40	2.20	7.20	12.40	18.50	25.30	32.80	40.30	0.0061
Max	0.30	0.40	1.80	8.40	13.70	19.20	26.90	35.70	41.60	49.80	0.0083
St. Dev	0.254	0.235	0.565	1.989	2.087	2.208	2.778	2.911	2.654	2.733	0.0007
Count	12	12	12	12	12	12	12	12	12	12	12

DATA SUMMARIES Continued**INSULATION RESISTANCE (IR):**

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	MEC1/Edge Card	MEC1	Edge Card
Initial	10000	10000	Not Tested
Thermal	10000	10000	Not Tested
Humidity	10000	10000	Not Tested

	Row to Row		
	Mated	Unmated	Unmated
Minimum	MEC1/Edge Card	MEC1	Edge Card
Initial	10000	10000	Not Tested
Thermal	10000	10000	Not Tested
Humidity	10000	10000	Not Tested

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	MEC1/Edge Card
Break Down Voltage	1000
Test Voltage	750
Working Voltage	250

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

DATA SUMMARIES Continued

LLCR Durability:

- 1) A total of 192 points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - a. $\leq +5.0$ mOhms:----- Stable
 - b. $+5.1$ to $+10.0$ mOhms:----- Minor
 - c. $+10.1$ to $+15.0$ mOhms:----- Acceptable
 - d. $+15.1$ to $+50.0$ mOhms:----- Marginal
 - e. $+50.1$ to $+2000$ mOhms ----- Unstable
 - f. $>+2000$ mOhms:----- Open Failure

0.056” Card:

LLCR Measurement Summaries by Pin Type				
Date	12/12/2012	12/18/2012	12/25/2012	1/10/2013
Room Temp (Deg C)	23	23	23	23
Rel Humidity (%)	54	54	54	54
Technician	Peter Chen	Peter Chen	Peter Chen	Peter Chen
mOhm values	Actual	Delta	Delta	Delta
	Initial	100 Cycles	Therm Shck	Humidity
Pin Type 1: Signal				
Average	16.72	1.45	2.02	2.83
St. Dev.	1.73	1.39	1.56	2.60
Min	14.50	0.01	0.04	0.01
Max	21.70	6.10	6.54	12.87
Summary Count	192	192	192	191*
Total Count	192	192	192	192

**Sample 028 Position 18 was removed due to corrosion on the mating card*

LLCR Delta Count by Category						
mOhms	Stable	Minor	Acceptable	Marginal	Unstable	Open
	≤ 5	>5 & ≤ 10	>10 & ≤ 15	>15 & ≤ 50	>50 & ≤ 1000	>1000
100 Cycles	188	4	0	0	0	0
Therm Shck	179	13	0	0	0	0
Humidity	162	28	1	0	0	0

DATA SUMMARIES Continued

LLCR Durability:

- 1) A total of 192 points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - a. $\leq +5.0$ mOhms:----- Stable
 - b. $+5.1$ to $+10.0$ mOhms:----- Minor
 - c. $+10.1$ to $+15.0$ mOhms:----- Acceptable
 - d. $+15.1$ to $+50.0$ mOhms:----- Marginal
 - e. $+50.1$ to $+2000$ mOhms ----- Unstable
 - f. $>+2000$ mOhms:----- Open Failure

0.068” Card:

LLCR Measurement Summaries by Pin Type				
Date	12/12/2012	12/18/2012	12/25/2012	1/7/2013
Room Temp (Deg C)	23	23	23	22
Rel Humidity (%)	54	54	54	53
Technician	Peter Chen	Peter Chen	Peter Chen	Peter Chen
mOhm values	Actual Initial	Delta 100 Cycles	Delta Therm Shck	Delta Humidity
Pin Type 1: Signal				
Average	12.43	0.52	1.78	2.30
St. Dev.	0.55	0.57	1.44	2.39
Min	11.39	0.00	0.00	0.00
Max	14.51	3.28	6.21	10.20
Summary Count	192	192	192	192
Total Count	192	192	192	192

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \ \& \ \leq 10$	$>10 \ \& \ \leq 15$	$>15 \ \& \ \leq 50$	$>50 \ \& \ \leq 1000$	>1000
100 Cycles	192	0	0	0	0	0
Therm Shck	187	5	0	0	0	0
Humidity	167	24	1	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. $\leq +5.0$ 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

0.056” Card:

LLCR Measurement Summaries by Pin Type		
Date	12/17/2012	1/2/2013
Room Temp (Deg C)	23	23
Rel Humidity (%)	54	54
Technician	Peter Chen	Peter Chen
mOhm values	Actual	Delta
	Initial	Thermal
Pin Type 1: Signal		
Average	16.20	3.37
St. Dev.	0.87	1.52
Min	14.52	0.13
Max	19.09	7.09
Summary Count	192	192
Total Count	192	192

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \ \& \ \leq 10$	$>10 \ \& \ \leq 15$	$>15 \ \& \ \leq 50$	$>50 \ \& \ \leq 1000$	>1000
Thermal	162	30	0	0	0	0

DATA SUMMARIES Continued

LLCR thermal aging

- 5) A total of 192 points were measured
- 6) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
- 7) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 8) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - g. $\leq +5.0$ mOhms:----- Stable
 - h. $+5.1$ to $+10.0$ mOhms:----- Minor
 - i. $+10.1$ to $+15.0$ mOhms:----- Acceptable
 - j. $+15.1$ to $+50.0$ mOhms:----- Marginal
 - k. $+50.1$ to $+2000$ mOhms ----- Unstable
 - l. $>+2000$ mOhms:----- Open Failure

0.068” Card:

LLCR Measurement Summaries by Pin Type		
Date	12/17/2012	1/2/2013
Room Temp (Deg C)	23	23
Rel Humidity (%)	54	54
Technician	Peter Chen	Peter Chen
mOhm values	Actual	Delta
	Initial	Thermal
Pin Type 1: Signal		
Average	12.66	3.04
St. Dev.	0.55	1.41
Min	11.59	0.48
Max	15.06	7.73
Summary Count	192	192
Total Count	192	192

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \ \& \ \leq 10$	$>10 \ \& \ \leq 15$	$>15 \ \& \ \leq 50$	$>50 \ \& \ \leq 1000$	>1000
Thermal	173	19	0	0	0	0

DATA SUMMARIES Continued

LLCR 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. $\leq +5.0$ 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

LLCR Measurement Summaries by Pin Type		
Date	12/10/2012	12/26/2012
Room Temp (Deg C)	23	23
Rel Humidity (%)	48	51
Technician	Peter Chen	Peter Chen
mOhm values	Actual	Delta
	Initial	Acid Vapor
Pin Type 1: Signal		
Average	17.11	1.02
St. Dev.	1.04	0.79
Min	15.01	0.01
Max	21.25	4.33
Summary Count	192	192
Total Count	192	192

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \ \& \ \leq 10$	$>10 \ \& \ \leq 15$	$>15 \ \& \ \leq 50$	$>50 \ \& \ \leq 1000$	>1000
Acid Vapor	192	0	0	0	0	0

DATA SUMMARIES Continued

LLCR Mechanical Shock & Vibration:

- 1) A total of 192 points were measured
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - a. $\leq +5.0$ mOhms:----- Stable
 - b. $+5.1$ to $+10.0$ mOhms:----- Minor
 - c. $+10.1$ to $+15.0$ mOhms:----- Acceptable
 - d. $+15.1$ to $+50.0$ mOhms:----- Marginal
 - e. $+50.1$ to $+2000$ mOhms:----- Unstable
 - f. $>+2000$ mOhms:----- Open Failure

0.056” Card:

LLCR Measurement Summaries by Pin Type				
Date	2/1/2013	2/6/2013		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	35	34		
Technician	Aaron McKim	Aaron McKim		
mOhm values	Actual Initial	Delta Shock-Vib	Delta	Delta
Pin Type 1: Signal				
Average	15.74	0.74		
St. Dev.	0.82	0.59		
Min	14.34	0.00		
Max	18.71	3.31		
Summary Count	192	192		
Total Count	192	192		

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \ \& \ \leq 10$	$>10 \ \& \ \leq 15$	$>15 \ \& \ \leq 50$	$>50 \ \& \ \leq 1000$	>1000
Shock-Vib	192	0	0	0	0	0

DATA SUMMARIES Continued

LLCR Mechanical Shock & Vibration:

- 5) A total of 192 points were measured
- 6) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
- 7) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 8) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - g. $\leq +5.0$ mOhms:----- Stable
 - h. $+5.1$ to $+10.0$ mOhms:----- Minor
 - i. $+10.1$ to $+15.0$ mOhms:----- Acceptable
 - j. $+15.1$ to $+50.0$ mOhms:----- Marginal
 - k. $+50.1$ to $+2000$ mOhms:----- Unstable
 - l. $>+2000$ mOhms:----- Open Failure

0.068” Card:

LLCR Measurement Summaries by Pin Type				
Date	2/1/2013	2/4/2013		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	33	31		
Technician	Aaron McKim	Aaron McKim		
mOhm values	Actual Initial	Delta Shock-Vib	Delta	Delta
Pin Type 1: Signal				
Average	12.46	0.12		
St. Dev.	0.48	0.11		
Min	11.36	0.00		
Max	14.40	0.98		
Summary Count	192	192		
Total Count	192	192		

LLCR Delta Count by Category						
mOhms	Stable	Minor	Acceptable	Marginal	Unstable	Open
	≤ 5	$>5 \ \& \ \leq 10$	$>10 \ \& \ \leq 15$	$>15 \ \& \ \leq 50$	$>50 \ \& \ \leq 1000$	>1000
Shock-Vib	192	0	0	0	0	0

Shock Vibration Event Detection

Shock and Vibration Event Detection Summary	
Contacts tested	30
Test Condition	C, 100g's, 6ms, Half-Sine
Shock Events	0
Test Condition	V-B, 7.56 rms g
Vibration Events	0
Total Events	0

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** HZ-MO-05**Description:** Digital Multimeter**Manufacturer:** Keithley**Model:** 3706**Serial #:** 1285188**Accuracy:** Last Cal: 2012-8-18, Next Cal: 2013-8-18**Equipment #:** HZ-TCT-01**Description:** Normal force analyzer**Manufacturer:** Mecmesin Multitester**Model:** Mecmesin Multitester 2.5-i**Serial #:** 08-1049-04**Accuracy:** Last Cal: 2012-4-28, Next Cal: 2013-4-27**Equipment #:** HZ-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 #:** HZ-THC-01**Description:** Humidity transmitter**Manufacturer:** Thermtron**Model:** HMM30C**Serial #:** D0240037**Accuracy:** Last Cal: 2012-3-3, Next Cal: 2013-3-2**Equipment #:** HZ-HPM-01**Description:** IR/DWV Tester**Manufacturer:** AN9636H**Model:** AN9636H**Serial #:** 089601091**Accuracy:** Last Cal: 2012-7-6, Next Cal: 2013-7-5**Equipment #:** HZ-MO-01**Description:** Micro-ohmmeter**Manufacturer:** Keithley**Model:** 2700**Serial #:** 1199807**Accuracy:** Last Cal: 2012-4-28, Next Cal: 2013-4-27

EQUIPMENT AND CALIBRATION SCHEDULES Continued**Equipment #:** HZ-PS-01**Description:** Power Supply**Manufacturer:** Agilent**Model:** 6031A**Serial #:** MY41000982**Accuracy:** Last Cal: 2012-4-28, Next Cal: 2013-4-27**Equipment #:** HZ-TSC-01**Description:** Thermal Shock transmitter**Manufacturer:** CSZ**Model:** 10-VT14994**Serial #:** VTS-3-6-6-SC/AC**Accuracy:** Last Cal: 2012-11-1, Next Cal: 2013-11-1**Equipment #:** SVC-01**Description:** Shock & Vibration Table**Manufacturer:** Data Physics**Model:** LE-DSA-10-20K**Serial #:** 10037**Accuracy:** See Manual

... Last Cal: 2012-11-31, Next Cal: 2013-11-31

Equipment #: ACLM-01**Description:** Accelerometer**Manufacturer:** PCB Piezotronics**Model:** 352C03**Serial #:** 115819**Accuracy:** See Manual

... Last Cal: 2012-7-9, Next Cal: 2013-7-9

Equipment #: ED-03**Description:** Event Detector**Manufacturer:** Analysis Tech**Model:** 32EHD**Serial #:** 1100604**Accuracy:** See Manual

... Last Cal: 2012-6-4, Next Cal: 2013-6-4

Equipment #: HDR - 01**Description:** HDR Flex Tester**Manufacturer:** Samtec Inc**Model:** AT-1440-000**Accuracy:** No Calibration Required