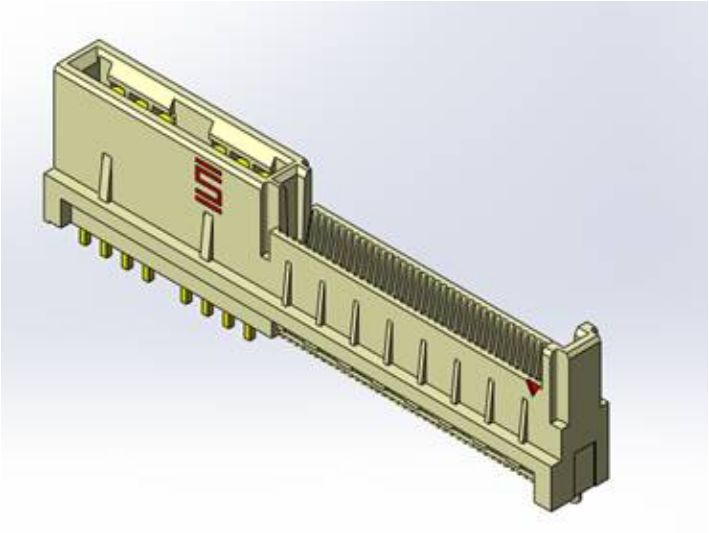
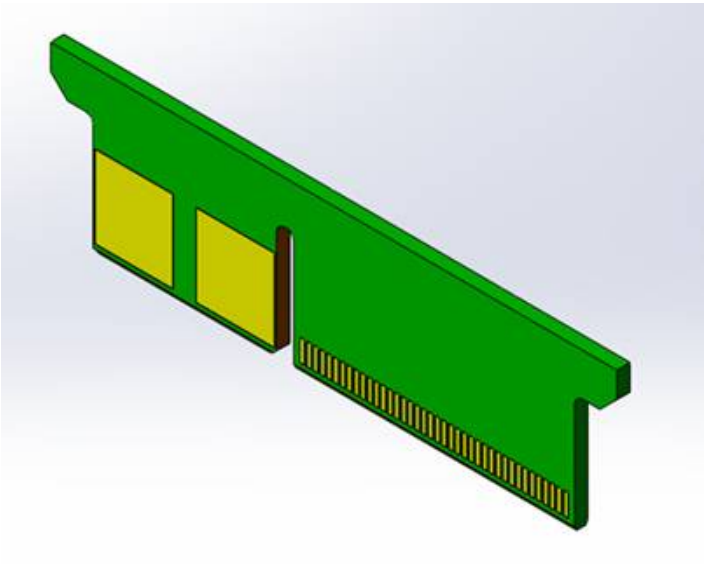
Project Number: Design Qualification Test Report	Tracking Code: 335190_Report_Rev_1
Requested by: Leo Lee	Date: 8/22/2014
Part #: HSEC8-140-01-L-PV-4-1-WT/Edge Card	
Part description: HSEC8/Edge Card	Tech: Kason He
Test Start: 6/4/2014	Test Completed: 8/20/2014





DESIGN QUALIFICATION TEST REPORT

HSEC8/Edge Card
HSEC8-140-01-L-PV-4-1-WT/Edge Card

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
08/22/2014	**1**	**Initial Issue**	**KH**

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.

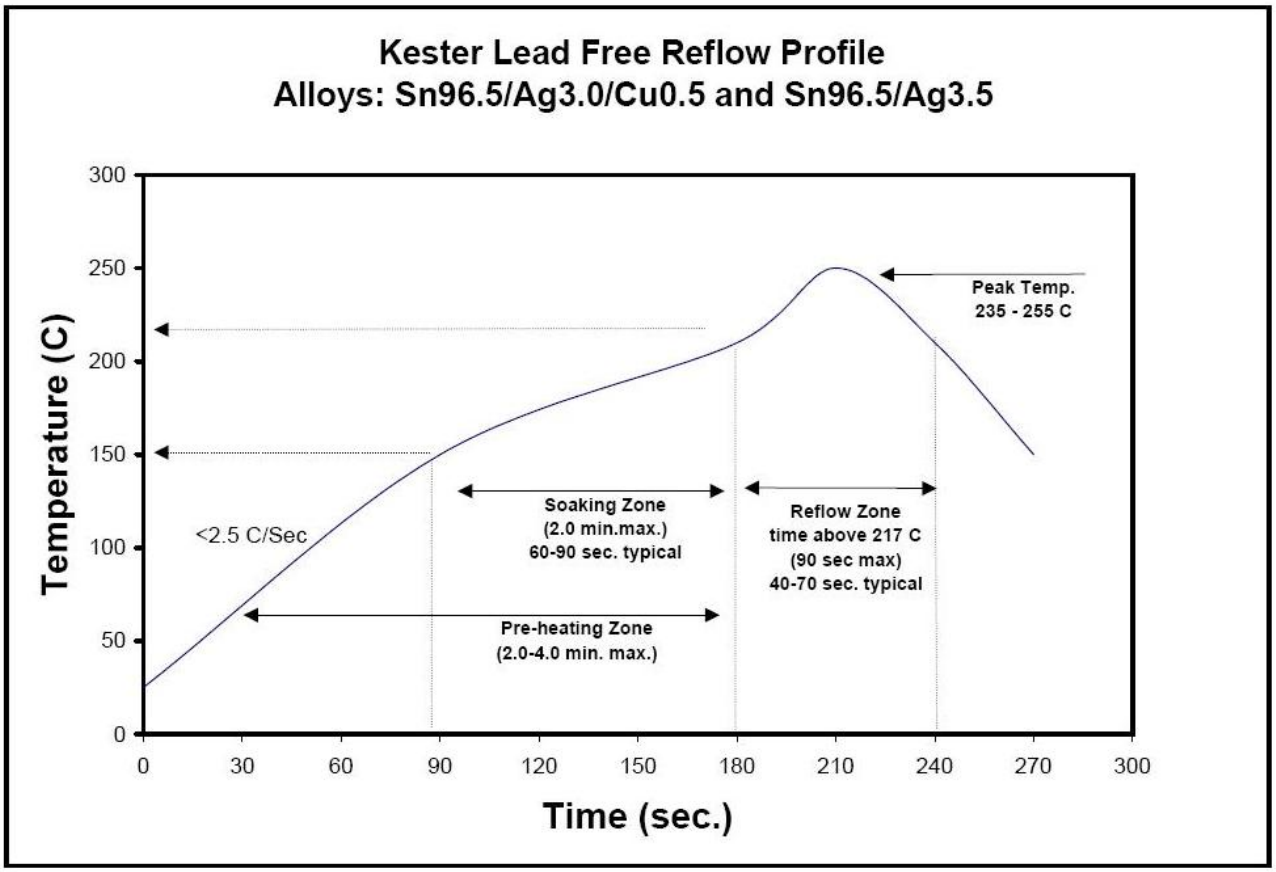
APPLICABLE DOCUMENTS

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 testing were cleaned according to TLWI-0001.
4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
5) The automated procedure is used with aqueous compatible soldering materials.
6) Parts not intended for testing LLCR are visually inspected and cleaned if necessary.
7) Any additional preparation will be noted in the individual test sequences.
8) Solder Information: Lead Free
9) Re-Flow Time/Temp: See accompanying profile.
10) Samtec Test PCBs used: PCB-106135-TST/PCB-106136-TST/PCB-106137-TST

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

Group 1
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
8 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	LLCR (2) Max Delta = 15 mOhm
2.	Gas Tight (1)
3.	LLCR (2) Max Delta = 15 mOhm

(1) Gas Tight = EIA-364-36
(2) LLCR = EIA-364-23
Open Circuit Voltage = 20 mV Max
Test Current = 100 mA Max

Normal Force

Group 1
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
8 Contacts Minimum
Signal Without Thermals
Note: C-188-02
0.068" thick edge card(Max)

Step	Description
1.	Contact Gaps
2.	Normal Force (1) Deflection = 0.023 " Expected Force at Max Deflection = 72 g

Group 2
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
8 Contacts Minimum
Signal With Thermals
Note: C-188-02
0.068" thick edge card(Max)

Step	Description
1.	Contact Gaps
2.	Thermal Age (2)
3.	Contact Gaps
4.	Normal Force (1) Deflection = 0.023 " Expected Force at Max Deflection = 72 g

Group 3
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
8 Contacts Minimum
Power Without Thermals
Note: C-367-02
0.068" thick edge card(Max)

Step	Description
1.	Contact Gaps
2.	Normal Force (1) Deflection = 0.0098 " Expected Force at Max Deflection = 442 g

Group 4
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
8 Contacts Minimum
Power With Thermals
Note: C-367-02
0.068" thick edge card(Max)

Step	Description
1.	Contact Gaps
2.	Thermal Age (2)
3.	Contact Gaps
4.	Normal Force (1) Deflection = 0.0098 " Expected Force at Max Deflection = 442 g

(1) Normal Force = EIA-364-04
(2) Thermal Age = EIA-364-17
Test Condition = 4 (105 C)
Time Condition = B (250 Hours)

FLOWCHARTS Continued

Thermal Aging

Group 1 HSEC8-140-01-L-PV-4-1-WT HSEC8-PC EDGE CARD 8 Assemblies *Note: 0.056" thick edge card(Min)*		Group 2 HSEC8-140-01-L-PV-4-1-WT HSEC8-PC EDGE CARD 8 Assemblies *Note: 0.068" thick edge card(max)*	
Step	**Description**	**Step**	**Description**
1.	Contact Gaps	1.	Contact Gaps
2.	Mating/Unmating Force (2)	2.	Mating/Unmating Force (2)
3.	LLCR (1) Max Delta = 15 mOhm	3.	LLCR (1) Max Delta = 15 mOhm
4.	Thermal Age (3)	4.	Thermal Age (3)
5.	LLCR (1) Max Delta = 15 mOhm	5.	LLCR (1) Max Delta = 15 mOhm
6.	Mating/Unmating Force (2)	6.	Mating/Unmating Force (2)
7.	Contact Gaps	7.	Contact Gaps

(1) LLCR = EIA-364-23
Open Circuit Voltage = 20 mV Max
Test Current = 100 mA Max

(2) Mating/Unmating Force = EIA-364-13

(3) Thermal Age = EIA-364-17
Test Condition = 4 (105 C)
Time Condition = B (250 Hours)

FLOWCHARTS Continued

Mating/Unmating/Durability

0.056" thick edge card(Min)

Group 1
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
8 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	Contact Gaps
2.	LLCR (2) Max Delta = 15 mOhm
3.	Mating/Unmating Force (3)
4.	Cycles Quantity = 25 Cycles
5.	Mating/Unmating Force (3)
6.	Cycles Quantity = 25 Cycles
7.	Mating/Unmating Force (3)
8.	Cycles Quantity = 25 Cycles
9.	Mating/Unmating Force (3)
10.	Cycles Quantity = 25 Cycles
11.	Mating/Unmating Force (3)
12.	Contact Gaps
13.	LLCR (2) Max Delta = 15 mOhm
14.	Thermal Shock (4)
15.	LLCR (2) Max Delta = 15 mOhm
16.	Humidity (1)
17.	LLCR (2) Max Delta = 15 mOhm
18.	Mating/Unmating Force (3)

0.068" thick edge card(max)

Group 2
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
8 Assemblies

Note: 0.068" thick edge card(max)

Step	Description
1.	Contact Gaps
2.	LLCR (2) Max Delta = 15 mOhm
3.	Mating/Unmating Force (3)
4.	Cycles Quantity = 25 Cycles
5.	Mating/Unmating Force (3)
6.	Cycles Quantity = 25 Cycles
7.	Mating/Unmating Force (3)
8.	Cycles Quantity = 25 Cycles
9.	Mating/Unmating Force (3)
10.	Cycles Quantity = 25 Cycles
11.	Mating/Unmating Force (3)
12.	Contact Gaps
13.	LLCR (2) Max Delta = 15 mOhm
14.	Thermal Shock (4)
15.	LLCR (2) Max Delta = 15 mOhm
16.	Humidity (1)
17.	LLCR (2) Max Delta = 15 mOhm
18.	Mating/Unmating Force (3)

Group 3
HSEC8-120-01-L-PV-2-1-WT
HSEC8-PC EDGE CARD
8 Assemblies

Note: 0.068" thick edge card(max)

Step	Description
1.	Contact Gaps
2.	Mating/Unmating Force (3)
3.	Cycles Quantity = 25 Cycles
4.	Mating/Unmating Force (3)
5.	Cycles Quantity = 25 Cycles
6.	Mating/Unmating Force (3)
7.	Cycles Quantity = 25 Cycles
8.	Mating/Unmating Force (3)
9.	Cycles Quantity = 25 Cycles
10.	Mating/Unmating Force (3)
11.	Contact Gaps

Group 4
HSEC8-130-01-L-PV-2-1-WT
HSEC8-PC EDGE CARD
8 Assemblies

Note: 0.068" thick edge card(max)

Step	Description
1.	Contact Gaps
2.	Mating/Unmating Force (3)
3.	Cycles Quantity = 25 Cycles
4.	Mating/Unmating Force (3)
5.	Cycles Quantity = 25 Cycles
6.	Mating/Unmating Force (3)
7.	Cycles Quantity = 25 Cycles
8.	Mating/Unmating Force (3)
9.	Cycles Quantity = 25 Cycles
10.	Mating/Unmating Force (3)
11.	Contact Gaps

---

(1) Humidity = EIA-364-31
Test Condition = B (240 Hours)
Test Method = III (+25oC to +65tC @ 90% RH to 98% RH)
Test Exceptions: ambient pre-condition and delete steps 7a and 7b

(2) LLCR = EIA-364-23
Open Circuit Voltage = 20 mV Max
Test Current = 100 mA Max

(3) Mating/Unmating Force = EIA-364-13

(4) Thermal Shock = EIA-364-32
Exposure Time at Temperature Extremes = 1/2 Hour
Method A, Test Condition = I (-55oC to +85tC)
Test Duration = A-3 (100 Cycles)

FLOWCHARTS Continued

IR/DWV

Signal Pin-to-Pin

Group 1
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
2 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	DWV Breakdown (2)

Group 2
HSEC8-140-01-L-PV-4-1-WT
2 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	DWV Breakdown (2)

Group 3
HSEC8-PC EDGE CARD
2 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	DWV Breakdown (2)

Group 4
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
2 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	IR (4)
2.	DWV at Test Voltage (1)
3.	Thermal Shock (5)
4.	IR (4)
5.	DWV at Test Voltage (1)
6.	Humidity (3)
7.	IR (4)
8.	DWV at Test Voltage (1)

Signal Row-to-Row

Group 5
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
2 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	DWV Breakdown (2)

Group 6
HSEC8-140-01-L-PV-4-1-WT
2 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	DWV Breakdown (2)

Group 7
HSEC8-PC EDGE CARD
2 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	DWV Breakdown (2)

Group 8
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
2 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	IR (4)
2.	DWV at Test Voltage (1)
3.	Thermal Shock (5)
4.	IR (4)
5.	DWV at Test Voltage (1)
6.	Humidity (3)
7.	IR (4)
8.	DWV at Test Voltage (1)

FLOWCHARTS Continued

Power Pin-to-Pin

Group 9	Group 10	Group 11	Group 12
HSEC8-140-01-L-PV-4-1-WT HSEC8-PC EDGE CARD 2 Assemblies	HSEC8-140-01-L-PV-4-1-WT 2 Assemblies	HSEC8-PC EDGE CARD 2 Assemblies	HSEC8-140-01-L-PV-4-1-WT HSEC8-PC EDGE CARD 2 Assemblies
Note: 0.056" thick edge card(Min)	*Note: 0.056" thick edge card(Min)*	*Note: 0.056" thick edge card(Min)*	*Note: 0.056" thick edge card(Min)*
Step Description 1. DWV Breakdown (2)	**Step Description** 1. DWV Breakdown (2)	**Step Description** 1. DWV Breakdown (2)	**Step Description** 1. IR (4) 2. DWV at Test Voltage (1) 3. Thermal Shock (5) 4. IR (4) 5. DWV at Test Voltage (1) 6. Humidity (3) 7. IR (4) 8. DWV at Test Voltage (1)

Power Row-to-Row

Group 13	Group 14	Group 15	Group 16
HSEC8-140-01-L-PV-4-1-WT HSEC8-PC EDGE CARD 2 Assemblies	HSEC8-140-01-L-PV-4-1-WT 2 Assemblies	HSEC8-PC EDGE CARD 2 Assemblies	HSEC8-140-01-L-PV-4-1-WT HSEC8-PC EDGE CARD 2 Assemblies
Note: 0.056" thick edge card(Min)	*Note: 0.056" thick edge card(Min)*	*Note: 0.056" thick edge card(Min)*	*Note: 0.056" thick edge card(Min)*
Step Description 1. DWV Breakdown (2)	**Step Description** 1. DWV Breakdown (2)	**Step Description** 1. DWV Breakdown (2)	**Step Description** 1. IR (4) 2. DWV at Test Voltage (1) 3. Thermal Shock (5) 4. IR (4) 5. DWV at Test Voltage (1) 6. Humidity (3) 7. IR (4) 8. DWV at Test Voltage (1)

FLOWCHARTS Continued

Signal-to-Power

Group 17	Group 18	Group 19	Group 20
HSEC8-140-01-L-PV-4-1-WT HSEC8-PC EDGE CARD 2 Assemblies	HSEC8-140-01-L-PV-4-1-WT 2 Assemblies	HSEC8-PC EDGE CARD 2 Assemblies	HSEC8-140-01-L-PV-4-1-WT HSEC8-PC EDGE CARD 2 Assemblies
Note: 0.056" thick edge card(Min)	*Note: 0.056" thick edge card(Min)*	*Note: 0.056" thick edge card(Min)*	*Note: 0.056" thick edge card(Min)*
Step Description	**Step Description**	**Step Description**	**Step Description**
1. DWV Breakdown (2)	1. DWV Breakdown (2)	1. DWV Breakdown (2)	1. IR (4) 2. DWV at Test Voltage (1) 3. Thermal Shock (5) 4. IR (4) 5. DWV at Test Voltage (1) 6. Humidity (3) 7. IR (4) 8. DWV at Test Voltage (1)

(1) DWV at Test Voltage = EIA-364-20
Test Condition = 1 (Sea Level)
DWV test voltage is equal to 75% of the lowest breakdown voltage
Test voltage applied for 60 seconds

(2) DWV Breakdown = EIA-364-20
Test Condition = 1 (Sea Level)
DWV test voltage is equal to 75% of the lowest breakdown voltage
Test voltage applied for 60 seconds

(3) Humidity = EIA-364-31
Test Condition = B (240 Hours)
Test Method = III (+25]C to +65]C @ 90% RH to 98% RH)
Test Exceptions: ambient pre-condition and delete steps 7a and 7b

(4) IR = EIA-364-21
Test Condition = 500 Vdc, 2 Minutes Max

(5) Thermal Shock = EIA-364-32
Exposure Time at Temperature Extremes = 1/2 Hour
Method A, Test Condition = I (-55]C to +85]C)
Test Duration = A-3 (100 Cycles)

FLOWCHARTS Continued

Current Carrying Capacity

Group 1
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
2 Pins Powered
Signal
Note: 0.056" thick edge card(Min)

Step	Description
1.	CCC (2) Rows = 2 Number of Positions = 1

Group 2
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
4 Pins Powered
Signal
Note: 0.056" thick edge card(Min)

Step	Description
1.	CCC (2) Rows = 2 Number of Positions = 2

Group 3
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
6 Pins Powered
Signal
Note: 0.056" thick edge card(Min)

Step	Description
1.	CCC (2) Rows = 2 Number of Positions = 3

Group 4
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
8 Pins Powered
Signal
Note: 0.056" thick edge card(Min)

Step	Description
1.	CCC (2) Rows = 2 Number of Positions = 4

Group 5
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
80 Pins Powered
Signal
Note: 0.056" thick edge card(Min)

Step	Description
1.	CCC (2) Rows = 2 Number of Positions = 40

Group 6
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
2 Pins Powered
Power
Note: 0.056" thick edge card(Min)

Step	Description
1.	CCC (2) Rows = 2 Number of Positions = 1

Group 7
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
4 Pins Powered
Power
Note: 0.056" thick edge card(Min)

Step	Description
1.	CCC (2) Rows = 2 Number of Positions = 2

Group 8
HSEC8-140-01-L-PV-4-1-WT
HSEC8-PC EDGE CARD
All Power
Note: Signal Pins @ 1/2 rated current from CCC sequence Group 5 Power Pins - All Contacts Powered 0.056" thick edge card(Min)

Step	Description
1.	CCC - All Power (1)

(1) CCC - All Power = EIA-364-70
Method 2, Temperature Rise Versus Current Curve
(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

(2) CCC = EIA-364-70
Method 2, Temperature Rise Versus Current Curve
(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

FLOWCHARTS Continued

Mechanical Shock/Random Vibration/LLCR

0.056" thick edge card(Min)

Group 1

HSEC8-140-01-L-PV-4-1-WT

HSEC8-PC EDGE CARD

8 Assemblies

Note: 0.056" thick edge card(Min)

Step	Description
1.	LLCR (1) Max Delta = 15 mOhm
2.	Mechanical Shock (2)
3.	Random Vibration (3)
4.	LLCR (1) Max Delta = 15 mOhm

0.068" thick edge card(max)

Group 2

HSEC8-140-01-L-PV-4-1-WT

HSEC8-PC EDGE CARD

8 Assemblies

Note: 0.068" thick edge card(max)

Step	Description
1.	LLCR (1) Max Delta = 15 mOhm
2.	Mechanical Shock (2)
3.	Random Vibration (3)
4.	LLCR (1) Max Delta = 15 mOhm

(1) LLCR = EIA-364-23
Open Circuit Voltage = 20 mV Max
Test Current = 100 mA Max

(2) Mechanical Shock = EIA-364-27
Test Condition = C (100 G Peak, 6 milliseconds, Half Sine)
Number of Shocks = 3 Per Direction, Per Axis, 18 Total

(3) Random Vibration = EIA-364-28
Condition = VB (7.56 gRMS Average, 2 Hours/Axis)

FLOWCHARTS Continued

Mechanical Shock/Random Vibration/Event Detection

0.056" thick edge card(Min)

Group 1

HSEC8-140-01-L-PV-4-1-WT

HSEC8-PC EDGE CARD

60 Points

Note: 0.056" thick edge card(Min)

Step	Description
1.	Nanosecond Event Detection (Mechanical Shock) (1)
2.	Nanosecond Event Detection (Random Vibration) (2)

(1) Nanosecond Event Detection (Mechanical Shock)
Use EIA-364-87 for Nanosecond Event Detection:
Test Condition = F (50 nanoseconds at 10 ohms)
Use EIA-364-27 for Mechanical Shock:
Test Condition = C (100 G Peak, 6 milliseconds, Half Sine)
Number of Shocks = 3 Per Direction, Per Axis, 18 Total

(2) Nanosecond Event Detection (Random Vibration)
Use EIA-364-87 for Nanosecond Event Detection:
Test Condition = F (50 nanoseconds at 10 ohms)
Use EIA-364-28 for Random Vibration:
Condition = VB (7.56 gRMS Average, 2 Hours/Axis)

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 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

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.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
2) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
3) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
4) The size of the temperature probe can affect the measured temperature.
5) Copper traces on PC boards will contribute to temperature rise:
    a. Self heating (resistive)
    b. Reduction in heat sink capacity affecting the heated contacts
6) A de-rating curve, usually 20%, is calculated.
7) Calculated de-rated currents at three temperature points are reported:
    a. Ambient
    b. 85^{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.

LLCR:

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

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes.

GAS TIGHT:

To provide method for evaluating the ability of the contacting surfaces in preventing penetration of harsh vapors which might lead to oxide formation that may degrade the electrical performance of the contact system.

1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
    a. <= +5.0 mOhms: ---------- Stable
    b. +5.1 to +10.0 mOhms:---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +2000 mOhms: ---------- Unstable
    f. >+2000 mOhms:---------- Open Failure
4) Procedure:
    a. Reference document: EIA-364-36, *Test Procedure for Determination of Gas-Tight Characteristics for Electrical Connectors, Sockets and/or Contact Systems*.
    b. Test Conditions:
        i. Class II--- Mated pairs of contacts assembled to their plastic housings.
        ii. Reagent grade Nitric Acid shall be used of sufficient volume to saturate the test chamber
        iii. The ratio of the volume of the test chamber to the surface area of the acid shall be 10:1.
        iv. The chamber shall be saturated with the vapor for at least 15 minutes before samples are added.
        v. Exposure time, 55 to 65 minutes.
        vi. The samples shall be no closer to the chamber walls than 1 inches and no closer to the surface of the acid than 3 inches.
        vii. The samples shall be dried after exposure for a minimum of 1 hour.
        viii. Drying temperature 50^{o} C
        ix. The final LLCR shall be conducted within 1 hour after drying.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

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.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

To determine if the sockets can operate at its rated voltage and withstand momentary over potentials due to switching, surges, and other similar phenomenon. Separate samples are used to evaluate the effect of environmental stresses so not to influence the readings from arcing that occurs during the measurement process.

1) PROCEDURE:
    a. Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.
    b. Test Conditions:
        i. Between Adjacent Contacts or Signal-to-Ground
        ii. Barometric Test Condition 1
        iii. Rate of Application 500 V/Sec
        iv. Test Voltage (VAC) until breakdown occurs
2) MEASUREMENTS/CALCULATIONS
    a. The breakdown voltage shall be measured and recorded.
    b. The dielectric withstanding voltage shall be recorded as 75% of the minimum breakdown voltage.
    c. The working voltage shall be recorded as one-third (1/3) of the dielectric withstanding voltage (one-fourth of the breakdown voltage).

RESULTS

Temperature Rise, CCC at a 20% de-rating

Signal pin

- **CCC for a 30°C Temperature Rise----------3.2 A per contact with 2 contacts (2 x 1) powered**
- **CCC for a 30°C Temperature Rise----------2.7 A per contact with 4 contacts (2 x 2) powered**
- **CCC for a 30°C Temperature Rise----------2.0 A per contact with 6 contacts (2 x 3) powered**
- **CCC for a 30°C Temperature Rise----------1.8 A per contact with 8 contacts (2 x 4) powered**
- **CCC for a 30°C Temperature Rise----------0.9 A per contact with 80 contacts (2 x 40) powered**

Power pin

- **CCC for a 30°C Temperature Rise----------27.5 A per contact with 2 contacts (2 x 1) powered**
- **CCC for a 30°C Temperature Rise----------23.9 A per contact with 4 contacts (2 x 2) powered**

Power pin and Signal pin (signal contacts powered @ 1/2 rated current @ .6 AMPS)

- **CCC for a 30°C Temperature Rise----------23.0 A per contact with 4 contacts (2 x 2) powered**

Mating/Unmating Forces

Thermal Aging Group

Edge Card 0.056″

- **Initial**
  - **Mating**
    - **Min ---------- 8.00 Lbs**
    - **Max---------- 9.71 Lbs**
  - **Unmating**
    - **Min ---------- 4.52 Lbs**
    - **Max---------- 5.73 Lbs**
- **After Thermal**
  - **Mating**
    - **Min ---------- 6.77 Lbs**
    - **Max---------- 8.54 Lbs**
  - **Unmating**
    - **Min ---------- 4.35 Lbs**
    - **Max---------- 5.23 Lbs**

Edge Card 0.068″

- **Initial**
  - **Mating**
    - **Min ----------11.14 Lbs**
    - **Max---------- 13.51 Lbs**
  - **Unmating**
    - **Min ---------- 6.19 Lbs**
    - **Max---------- 8.29 Lbs**
- **After Thermal**
  - **Mating**
    - **Min ---------- 8.10 Lbs**
    - **Max----------10.24 Lbs**
  - **Unmating**
    - **Min ---------- 4.58 Lbs**
    - **Max---------- 5.57 Lbs**

RESULTS Continued

Mating/Unmating Forces

Mating-Unmating Durability (HSEC8-140-01-L-PV-4-1-WT/Edge Card 0.056″)

- **Initial**
  - **Mating**
    - **Min ---------- 7.49 Lbs**
    - **Max---------- 9.15 Lbs**
  - **Unmating**
    - **Min ---------- 4.17 Lbs**
    - **Max---------- 4.81 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 9.60 Lbs**
    - **Max----------11.61 Lbs**
  - **Unmating**
    - **Min ---------- 5.08 Lbs**
    - **Max---------- 6.01 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ----------10.72 Lbs**
    - **Max----------12.30 Lbs**
  - **Unmating**
    - **Min ---------- 5.84 Lbs**
    - **Max---------- 6.49 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ----------11.84 Lbs**
    - **Max----------12.78 Lbs**
  - **Unmating**
    - **Min ---------- 6.38 Lbs**
    - **Max---------- 7.21 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 12.32 Lbs**
    - **Max----------13.94 Lbs**
  - **Unmating**
    - **Min ---------- 6.68 Lbs**
    - **Max---------- 7.84 Lbs**
- **Humidity**
  - **Mating**
    - **Min ---------- 5.38 Lbs**
    - **Max---------- 8.32 Lbs**
  - **Unmating**
    - **Min ---------- 3.05 Lbs**
    - **Max---------- 5.41 Lbs**

RESULTS Continued

Mating/Unmating Forces

Mating-Unmating Durability (HSEC8-140-01-L-PV-4-1-WT/Edge Card 0.068″)

- **Initial**
  - **Mating**
    - **Min ---------- 9.55 Lbs**
    - **Max---------- 11.19 Lbs**
  - **Unmating**
    - **Min ---------- 4.71 Lbs**
    - **Max---------- 5.66 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 11.44 Lbs**
    - **Max---------- 12.78 Lbs**
  - **Unmating**
    - **Min ---------- 5.84 Lbs**
    - **Max---------- 6.91 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 12.36 Lbs**
    - **Max---------- 13.97 Lbs**
  - **Unmating**
    - **Min ---------- 6.94 Lbs**
    - **Max---------- 7.88 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 13.24 Lbs**
    - **Max---------- 14.91 Lbs**
  - **Unmating**
    - **Min ---------- 7.50 Lbs**
    - **Max---------- 8.64 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 14.17 Lbs**
    - **Max---------- 15.77 Lbs**
  - **Unmating**
    - **Min ---------- 7.63 Lbs**
    - **Max---------- 9.37 Lbs**
- **Humidity**
  - **Mating**
    - **Min ---------- 7.07 Lbs**
    - **Max---------- 10.05 Lbs**
  - **Unmating**
    - **Min ---------- 4.22 Lbs**
    - **Max---------- 6.64 Lbs**

RESULTS Continued

Mating/Unmating Forces

Mating-Unmating Basic (HSEC8-120-01-L-PV-2-1-WT/Edge Card 0.068″)

- **Initial**
  - **Mating**
    - **Min ---------- 5.11 Lbs**
    - **Max---------- 5.74 Lbs**
  - **Unmating**
    - **Min ---------- 2.39 Lbs**
    - **Max---------- 2.83 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 5.03 Lbs**
    - **Max---------- 6.29 Lbs**
  - **Unmating**
    - **Min ---------- 2.83 Lbs**
    - **Max---------- 3.72 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 5.17 Lbs**
    - **Max---------- 6.38 Lbs**
  - **Unmating**
    - **Min ---------- 3.06 Lbs**
    - **Max---------- 4.02 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 5.10 Lbs**
    - **Max---------- 6.39 Lbs**
  - **Unmating**
    - **Min ---------- 3.18 Lbs**
    - **Max---------- 4.31 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 5.10 Lbs**
    - **Max---------- 6.47 Lbs**
  - **Unmating**
    - **Min ---------- 3.18 Lbs**
    - **Max---------- 4.53 Lbs**

RESULTS Continued

Mating/Unmating Forces

Mating-Unmating Basic (HSEC8-130-01-L-PV-2-1-WT/Edge Card 0.068″)

- **Initial**
  - **Mating**
    - **Min ---------- 7.20 Lbs**
    - **Max---------- 8.07 Lbs**
  - **Unmating**
    - **Min ---------- 3.18 Lbs**
    - **Max---------- 3.61 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 7.49 Lbs**
    - **Max---------- 8.62 Lbs**
  - **Unmating**
    - **Min ---------- 3.63 Lbs**
    - **Max---------- 4.70 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 7.60 Lbs**
    - **Max---------- 8.67 Lbs**
  - **Unmating**
    - **Min ---------- 3.96 Lbs**
    - **Max---------- 5.11 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 7.65 Lbs**
    - **Max---------- 8.69 Lbs**
  - **Unmating**
    - **Min ---------- 4.11 Lbs**
    - **Max---------- 5.21 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 7.69 Lbs**
    - **Max---------- 8.71 Lbs**
  - **Unmating**
    - **Min ---------- 4.19 Lbs**
    - **Max---------- 5.42 Lbs**

RESULTS Continued

Normal Force at 0.0223 inches deflection

C-188-02 Signal pin

- **Initial**
  - **Min ---------- 78.00 gf Set ----- 0.0045 inch**
  - **Max ---------- 82.20 gf Set ----- 0.0051 inch**
- **Thermal**
  - **Min ---------- 67.70 gf Set ----- 0.0050 inch**
  - **Max ---------- 74.30 gf Set ----- 0.0057 inch**

Normal Force at 0.0153 inches deflection

C-367-02 Power pin - left

- **Initial**
  - **Min ---------- 668.70 gf Set ----- 0.0003 inch**
  - **Max ---------- 735.60 gf Set ----- 0.0010 inch**
- **Thermal**
  - **Min ---------- 351.50 gf Set ----- 0.0068 inch**
  - **Max ---------- 450.10 gf Set ----- 0.0082 inch**

C-367-02 Power pin - middle

- **Initial**
  - **Min ---------- 617.90 gf Set ----- 0.0002 inch**
  - **Max ---------- 705.50 gf Set ----- 0.0008 inch**
- **Thermal**
  - **Min ---------- 348.20 gf Set ----- 0.0068 inch**
  - **Max ---------- 429.90 gf Set ----- 0.0078 inch**

C-367-02 Power pin - right

- **Initial**
  - **Min ---------- 644.90 gf Set ----- 0.0002 inch**
  - **Max ---------- 733.00 gf Set ----- 0.0008 inch**
- **Thermal**
  - **Min ---------- 360.80 gf Set ----- 0.0073 inch**
  - **Max ---------- 406.90 gf Set ----- 0.0081 inch**

RESULTS Continued

Insulation Resistance minimums, IR

Pin to Pin Signal

- **Initial**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated---------- 10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ----------10000 Meg Ω ---------- Passed**

Row to Row Signal

- **Initial**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated---------- 10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ----------10000 Meg Ω ---------- Passed**

Signal to Power

- **Initial**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated---------- 10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ----------10000 Meg Ω ---------- Passed**

Pin to Pin Power

- **Initial**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated---------- 10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ----------10000 Meg Ω ---------- Passed**

Row to Row Power

- **Initial**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated---------- 10000 Meg Ω ---------- Passed**
  - **Unmated ---------- 10000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated----------10000 Meg Ω ---------- Passed**
  - **Unmated ----------10000 Meg Ω ---------- Passed**

RESULTS Continued

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage----------875 VAC**
  - **Test Voltage ----------660 VAC**
  - **Working Voltage ---------- 215 VAC**

Pin to Pin Signal

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

Row to Row Signal

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

Signal to Power

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

Pin to Pin Power

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

Row to Row Power

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

RESULTS Continued

LLCR Thermal Aging Group (160 signal and 32 power LLCR test points)

Edge Card 0.056″

Signal pin

- **Initial ---------- 7.83 mOhms Max**
- **Thermal**
  - **<= +5.0 mOhms ---------- 155 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**

Power pin

- **Initial ---------- 0.28 mOhms Max**
- **Thermal**
  - **<= +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**

Edge Card 0.068″

Signal pin

- **Initial ---------- 7.81 mOhms Max**
- **Thermal**
  - **<= +5.0 mOhms ---------- 160 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**

Power pin

- **Initial ---------- 0.26 mOhms Max**
- **Thermal**
  - **<= +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

LLCR Gas Tight Group (160 signal and 32 power LLCR test points)

Edge Card 0.056″

Signal pin

- **Initial ---------- 9.20 mOhms Max**
- **Thermal**
  - **<= +5.0 mOhms ---------- 160 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**

Power pin

- **Initial ---------- 0.30 mOhms Max**
- **Thermal**
  - **<= +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

LLCR Mating/Unmating Durability Group (160 signal and 32 power LLCR test points)

Edge Card 0.056″

Signal pin

- **Initial ---------- 8.98 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms ---------- 160 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Thermal Shock**
  - **<= +5.0 mOhms ---------- 160 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms ---------- 146 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 14 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**

Power pin

- **Initial ---------- 0.30 mOhms Max**
- **Durability, 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**
- **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**
- **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

LLCR Mating/Unmating Durability Group (160 signal and 32 power LLCR test points)

Edge Card 0.068″

Signal pin

- **Initial ---------- 10.00 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms ---------- 160 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Thermal Shock**
  - **<= +5.0 mOhms ---------- 160 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms ---------- 147 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**

Power pin

- **Initial ---------- 0.27 mOhms Max**
- **Durability, 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**
- **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**
- **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

LLCR Shock & Vibration Group (160 signal and 32 power LLCR test points)

Edge Card 0.056″

Signal pin

- **Initial ---------- 9.81 mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms ---------- 160 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**

Power pin

- **Initial ---------- 0.37 mOhms Max**
- **Shock &Vibration**
  - **<= +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**

Edge Card 0.068″

Signal pin

- **Initial ---------- 8.31 mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms ---------- 160 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**

Power pin

- **Initial ---------- 0.33 mOhms Max**
- **Shock &Vibration**
  - **<= +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**

Mechanical Shock & Random Vibration:

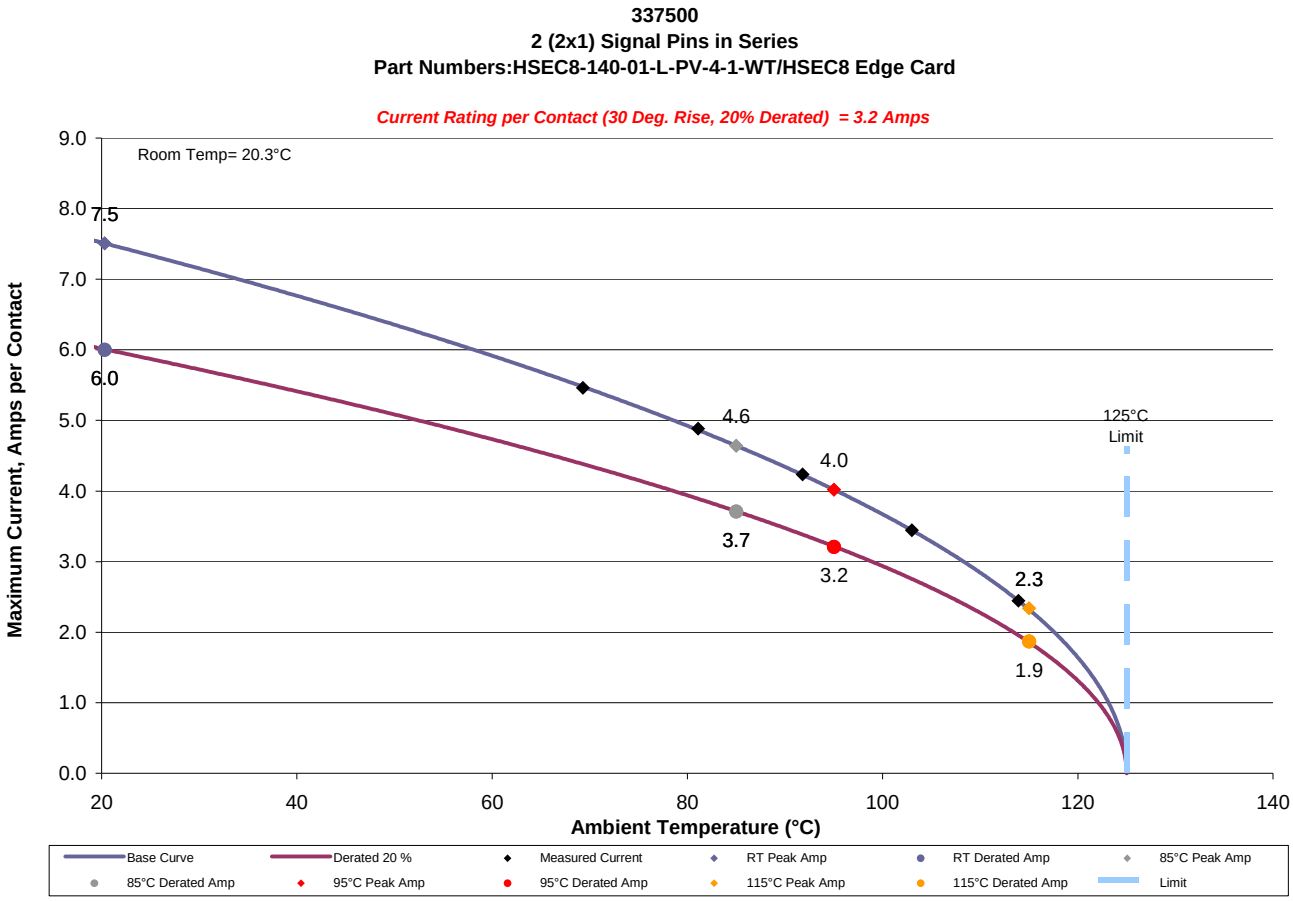
- **Shock**
  - **No Damage ---------- ---------- Pass**
  - **50 Nanoseconds ---------- ---------- Pass**
- **Vibration**
  - **No Damage ---------- ---------- Pass**
  - **50 Nanoseconds ---------- ---------- Pass**

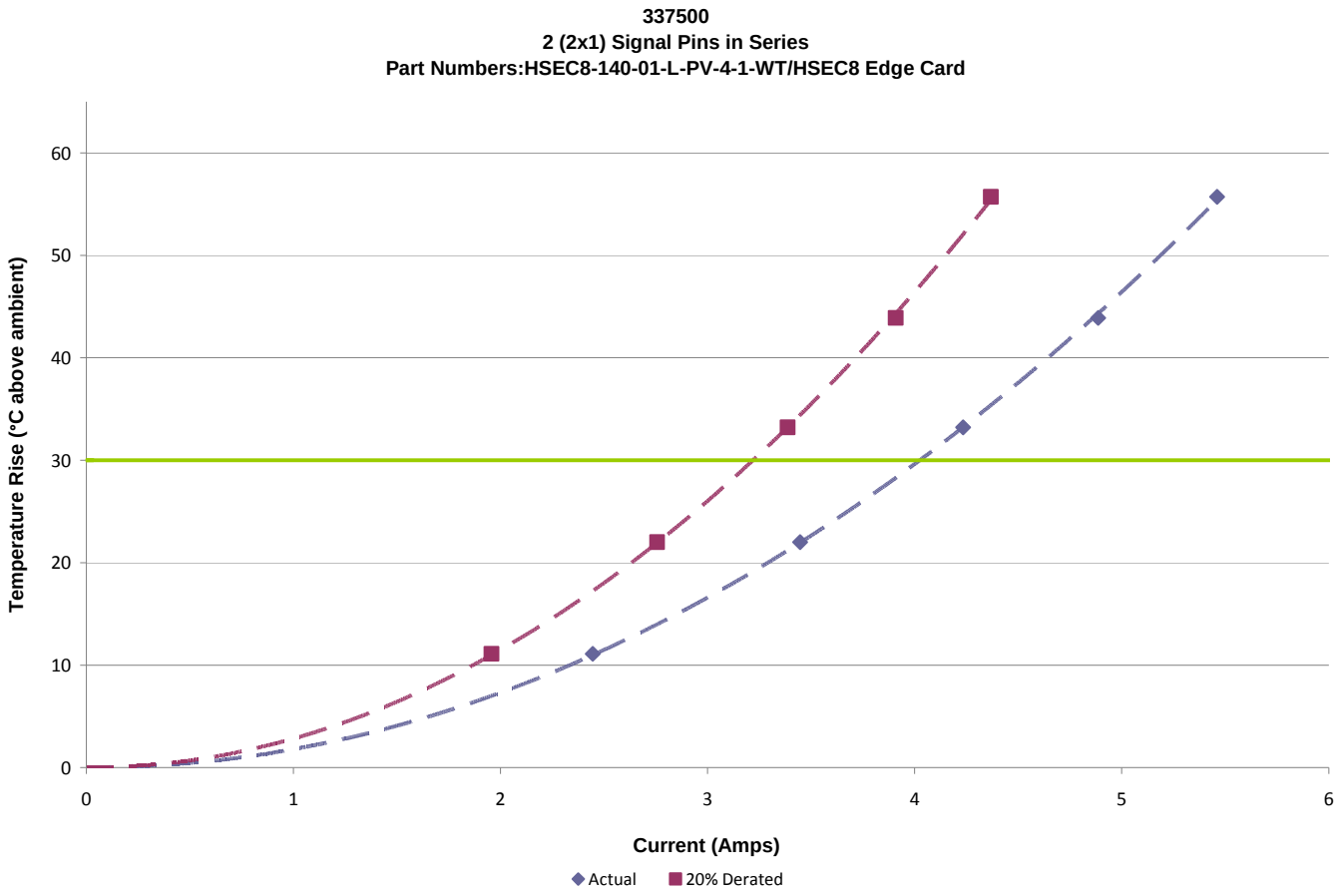
DATA SUMMARIES

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:

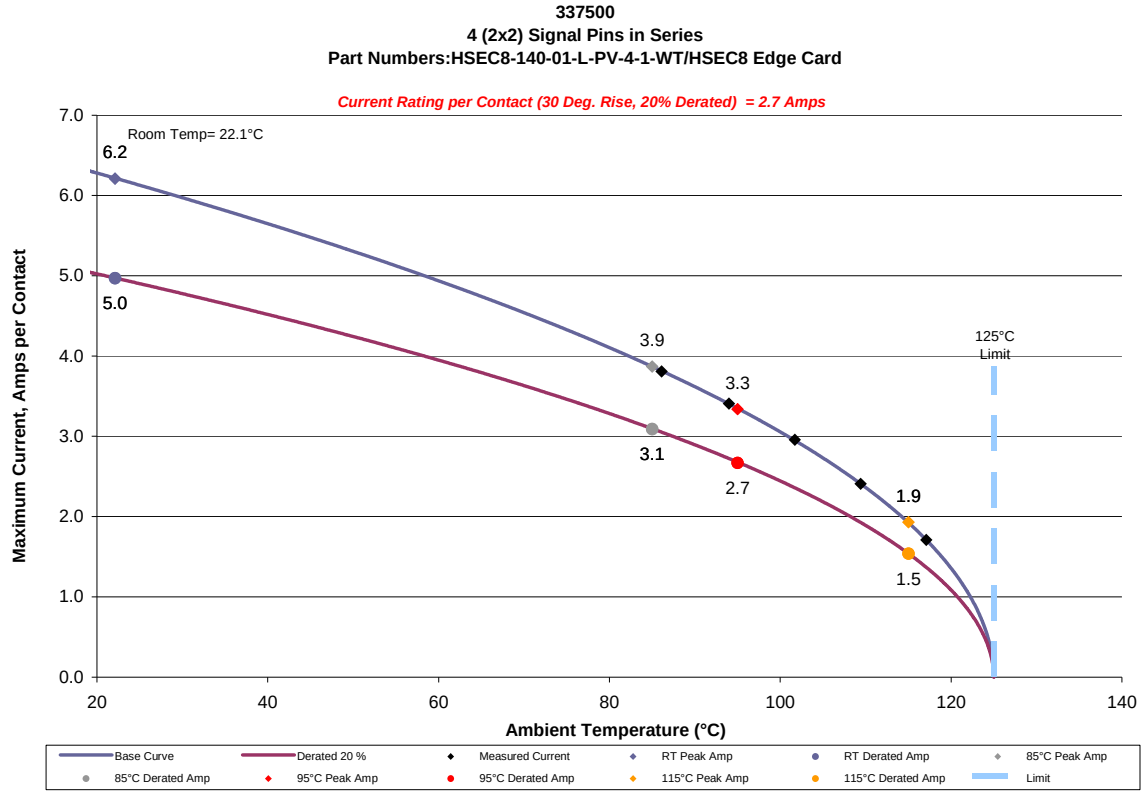
    a. Linear configuration with 2 adjacent signal conductors/contacts powered

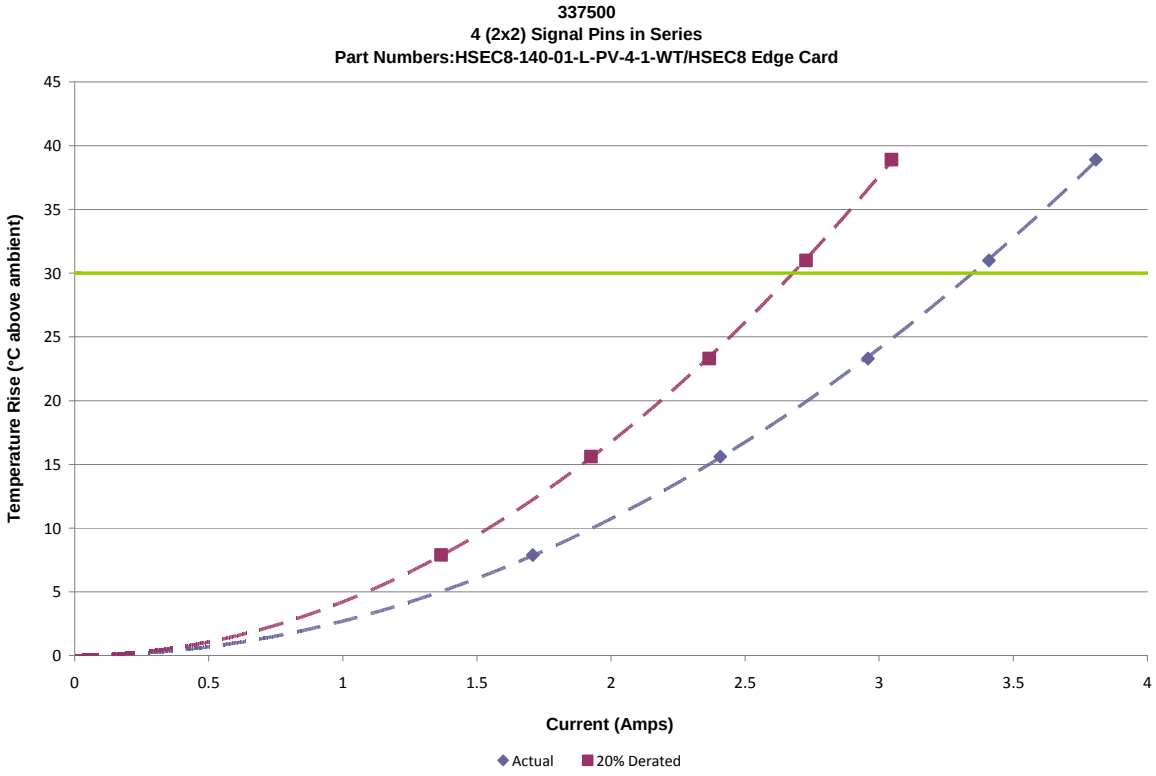



337500
2 (2x1) Signal Pins in Series
Part Numbers:HSEC8-140-01-L-PV-4-1-WT/HSEC8 Edge Card
Temperature Rise (°C above ambient)
60
50
40
30
20
10
0
0
1
2
3
4
5
6
Current (Amps)
Actual
20% Derated

DATA SUMMARIES Continued

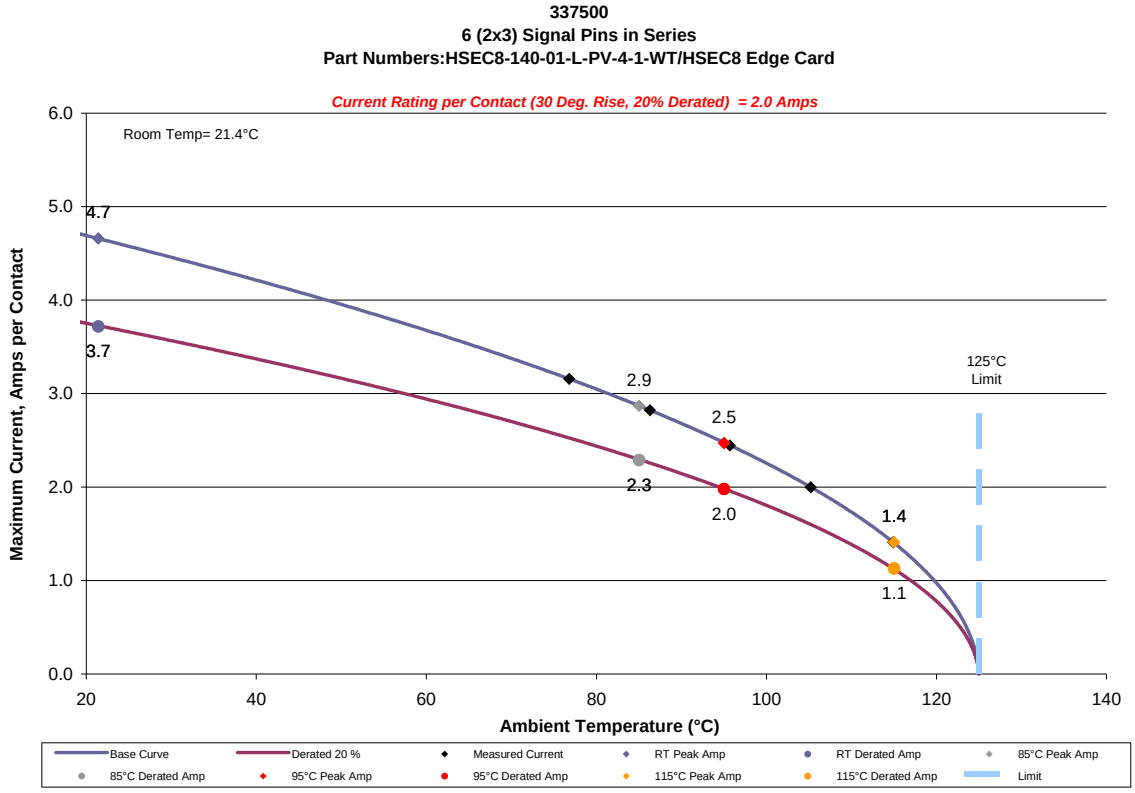
b. Linear configuration with 4 adjacent signal conductors/contacts powered

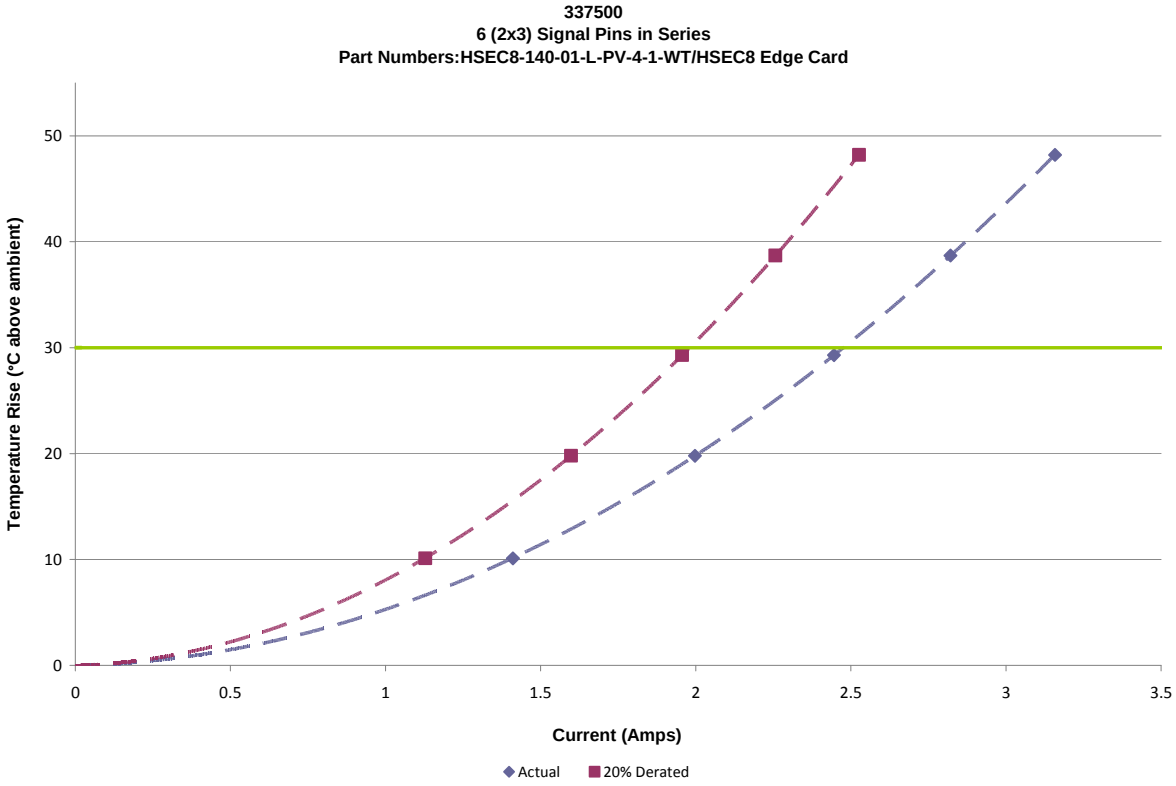




DATA SUMMARIES Continued

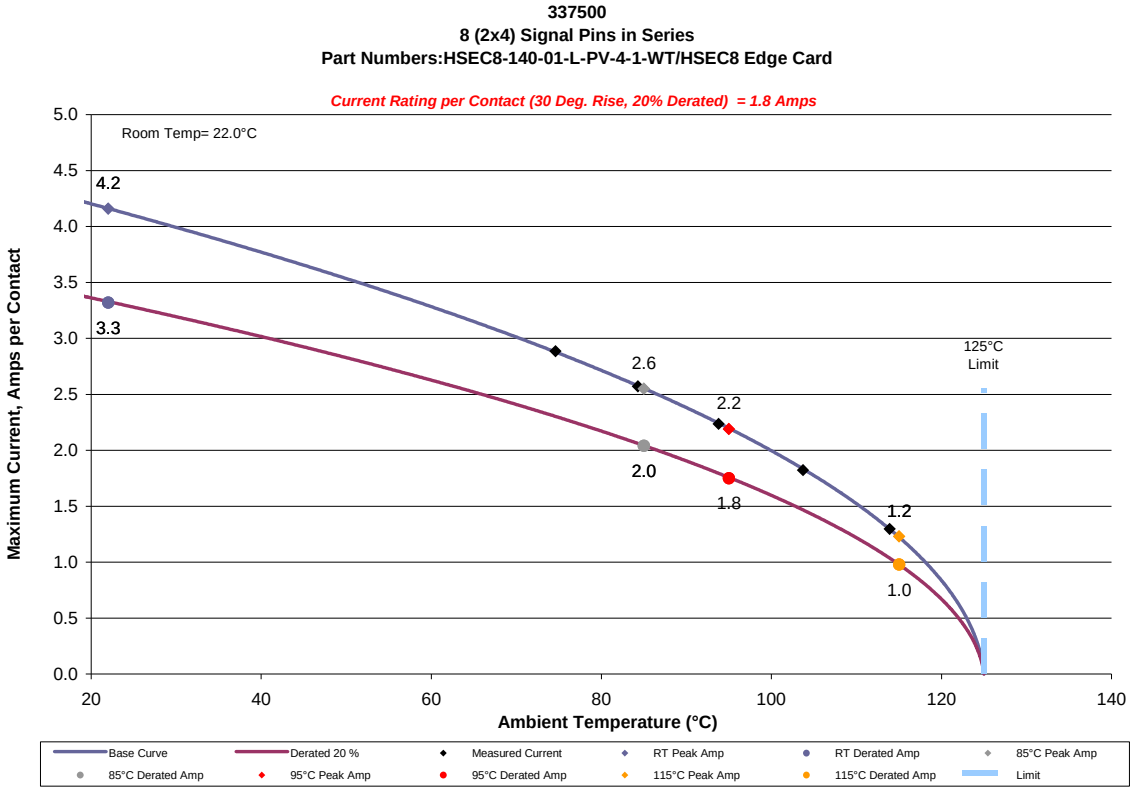
c. Linear configuration with 6 adjacent signal conductors/contacts powered

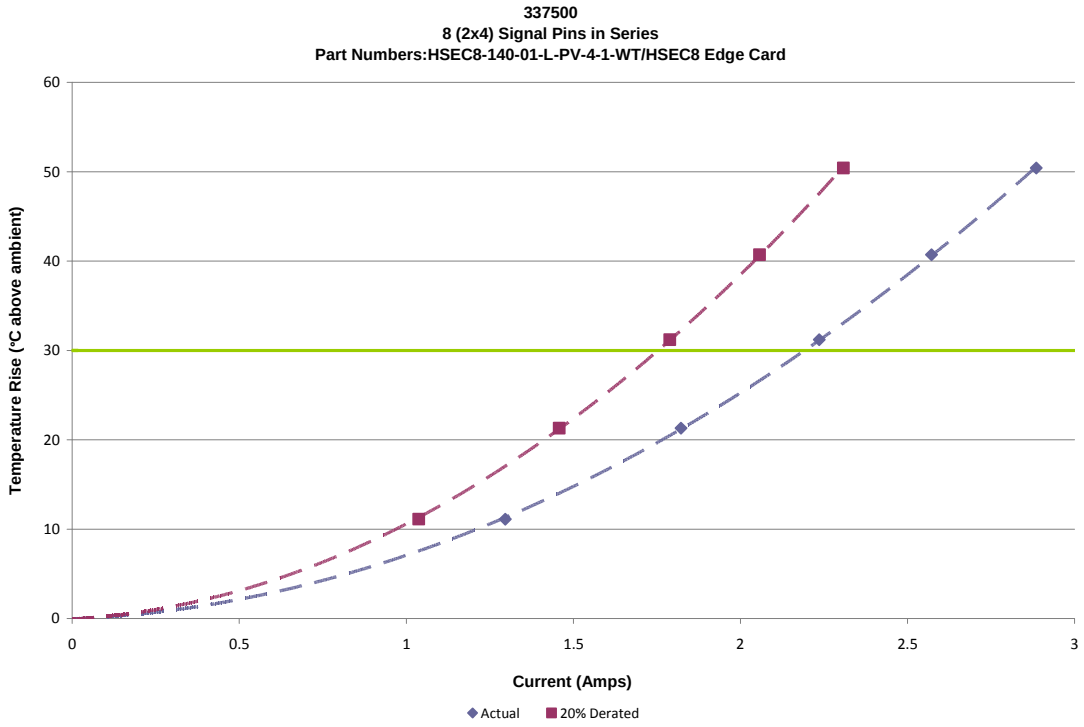




DATA SUMMARIES Continued

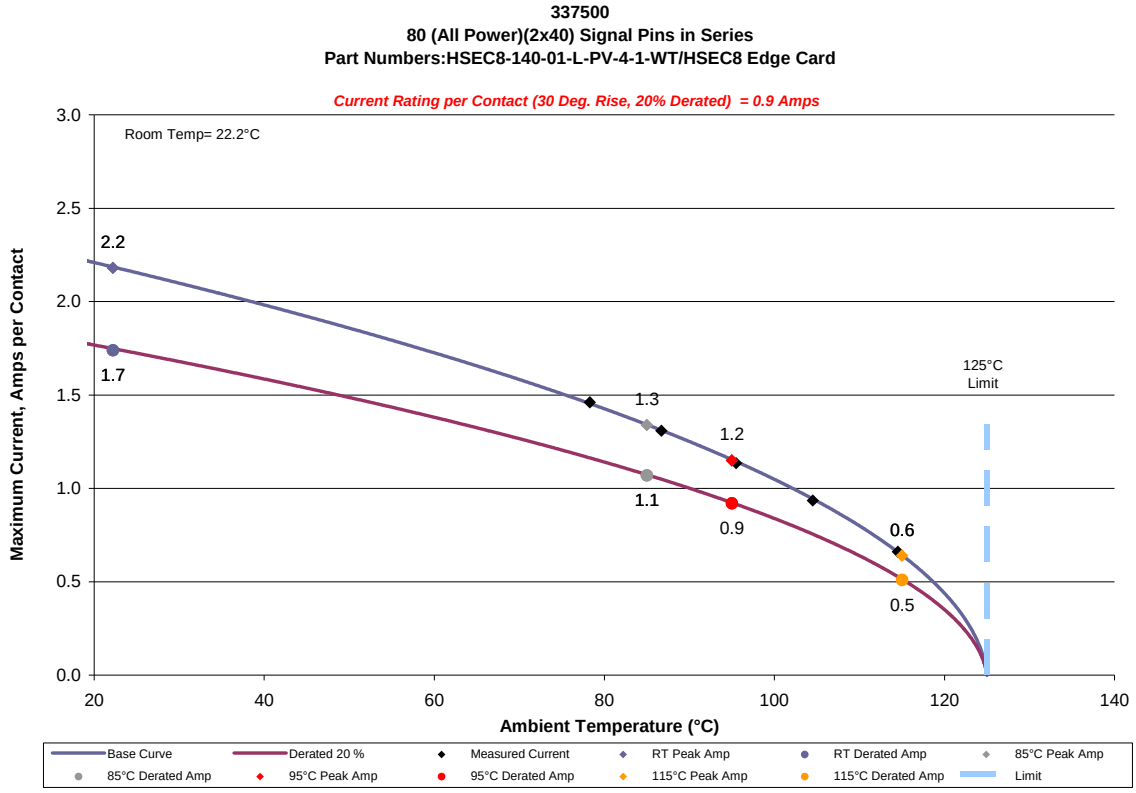
d. Linear configuration with 8 adjacent signal conductors/contacts powered

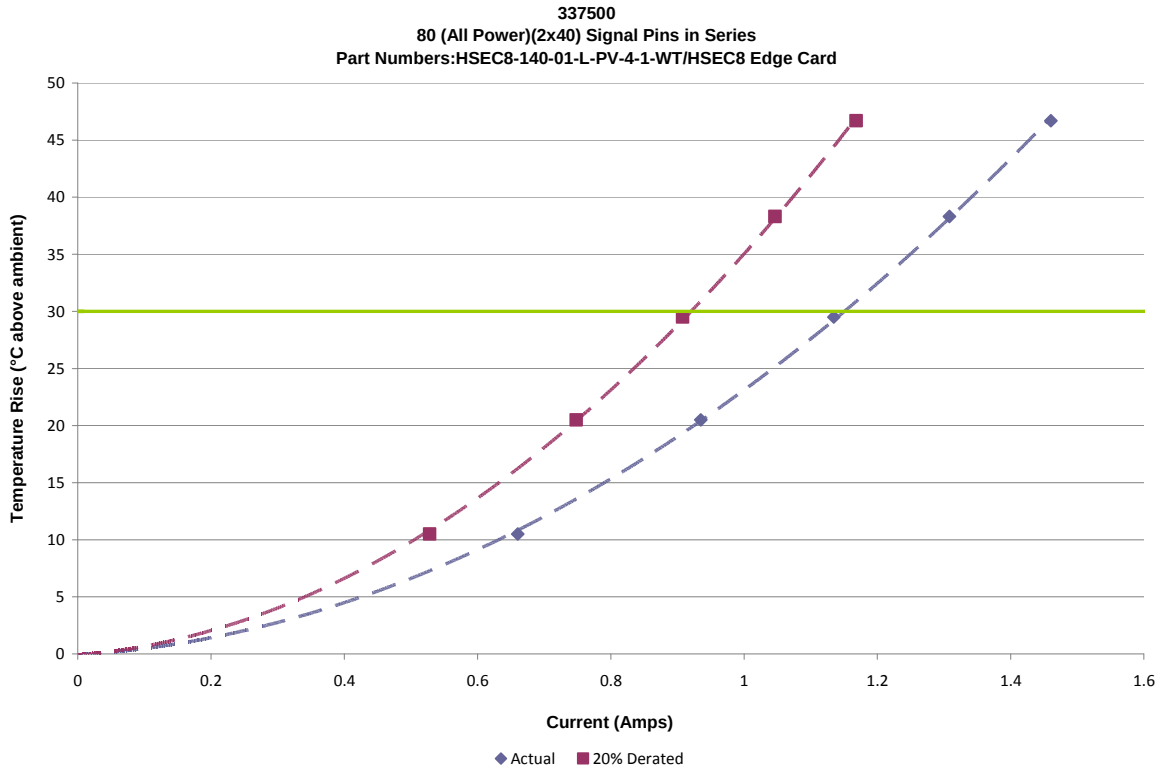




DATA SUMMARIES Continued

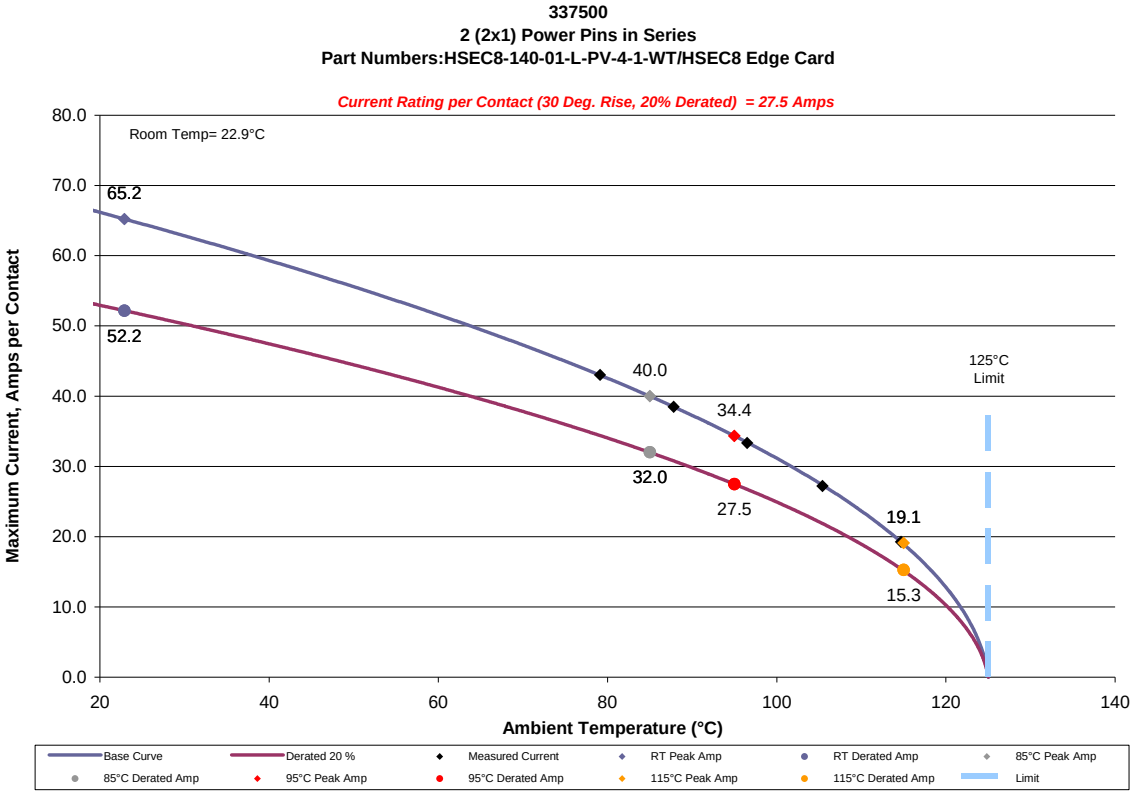
e. Linear configuration with all adjacent signal conductors/contacts powered

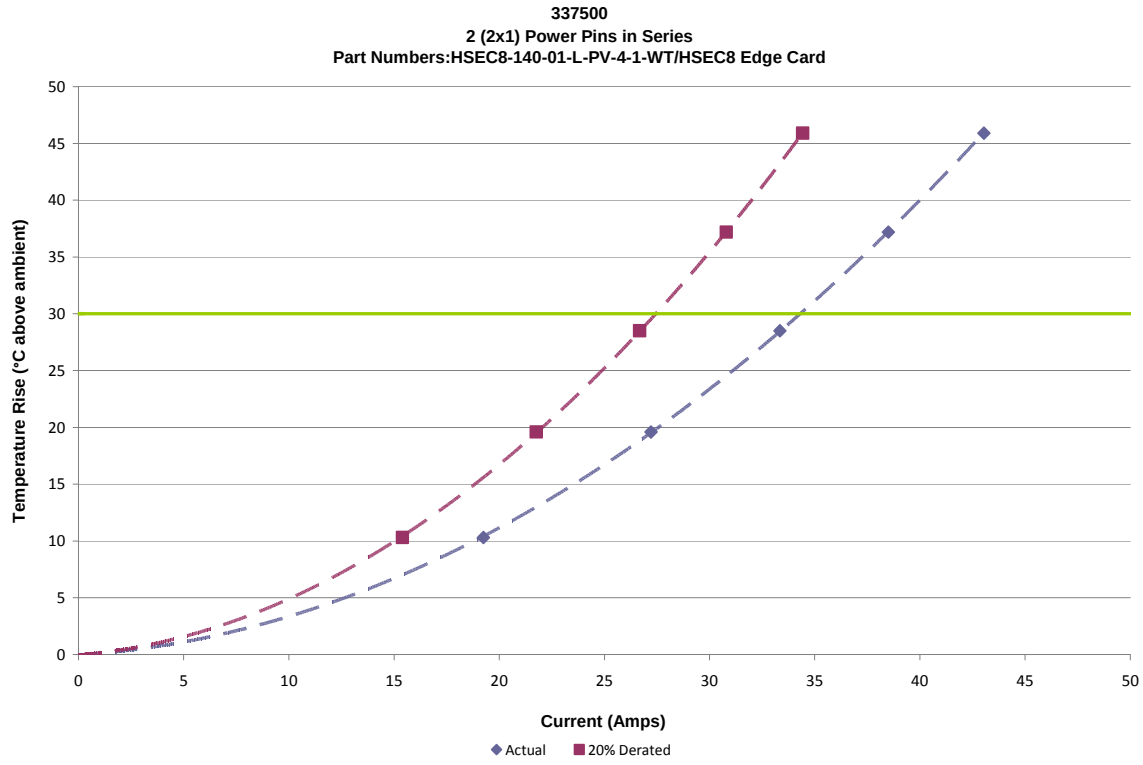




DATA SUMMARIES Continued

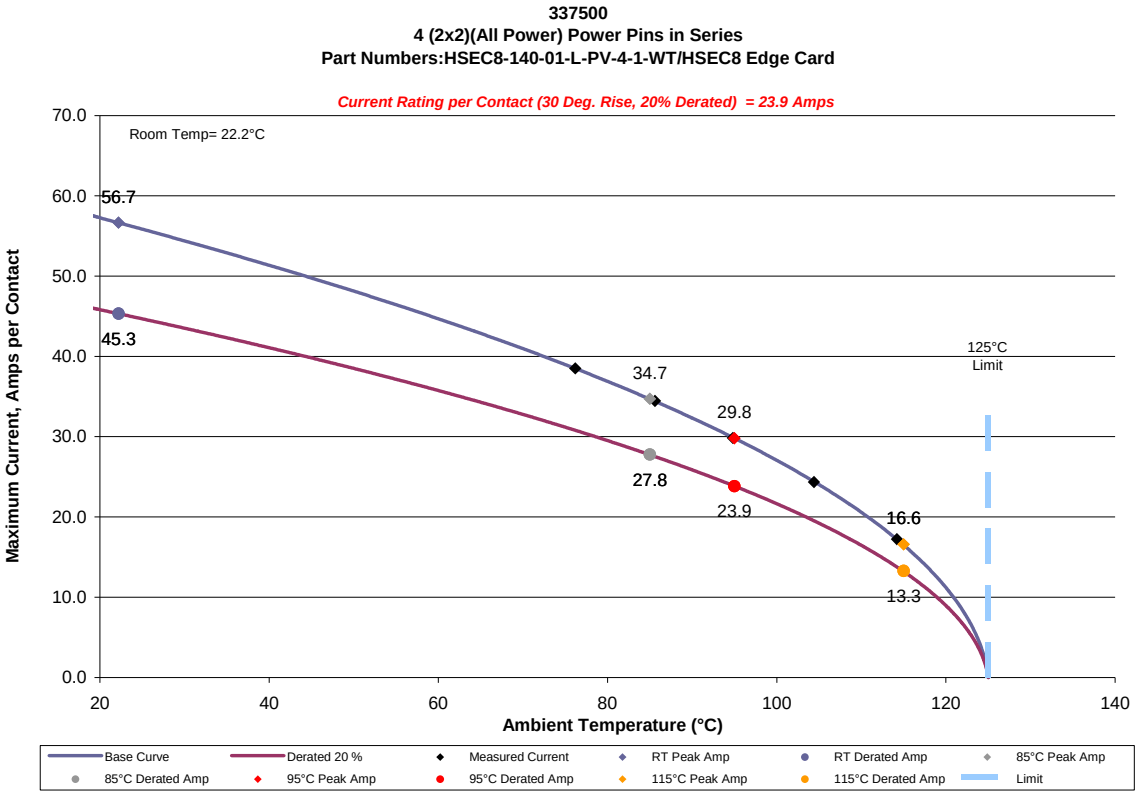
f. Linear configuration with 2 adjacent power conductors/contacts powered

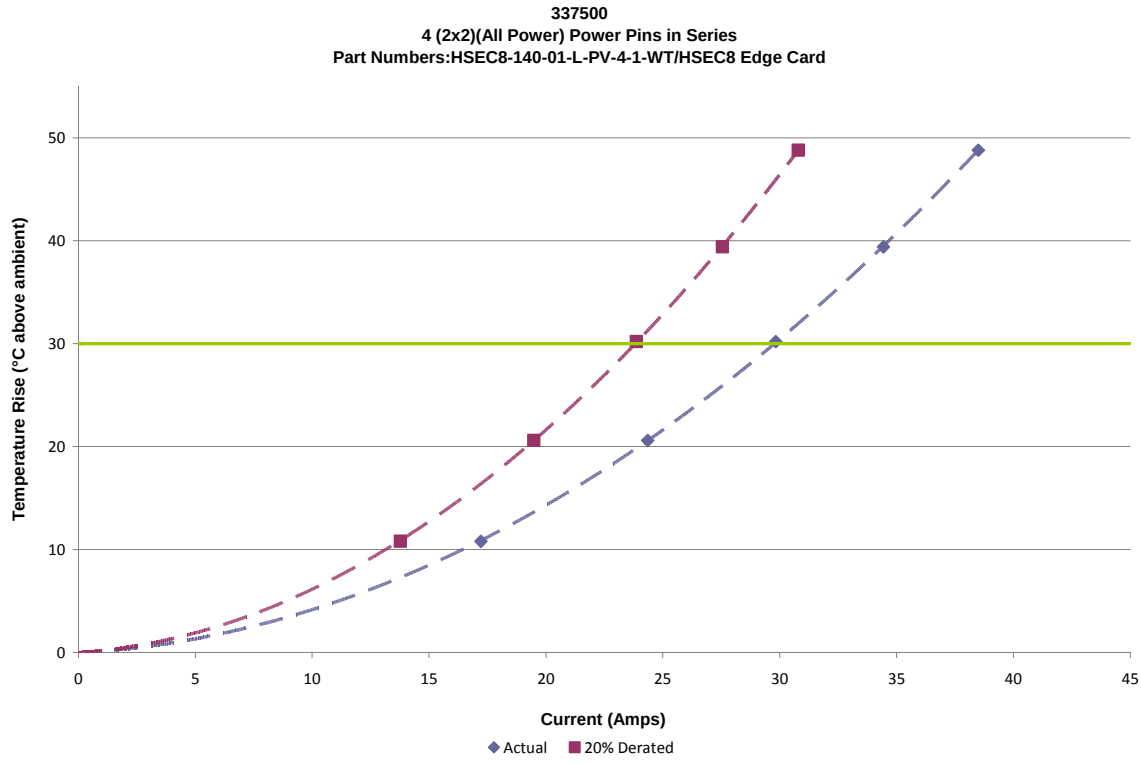




DATA SUMMARIES Continued

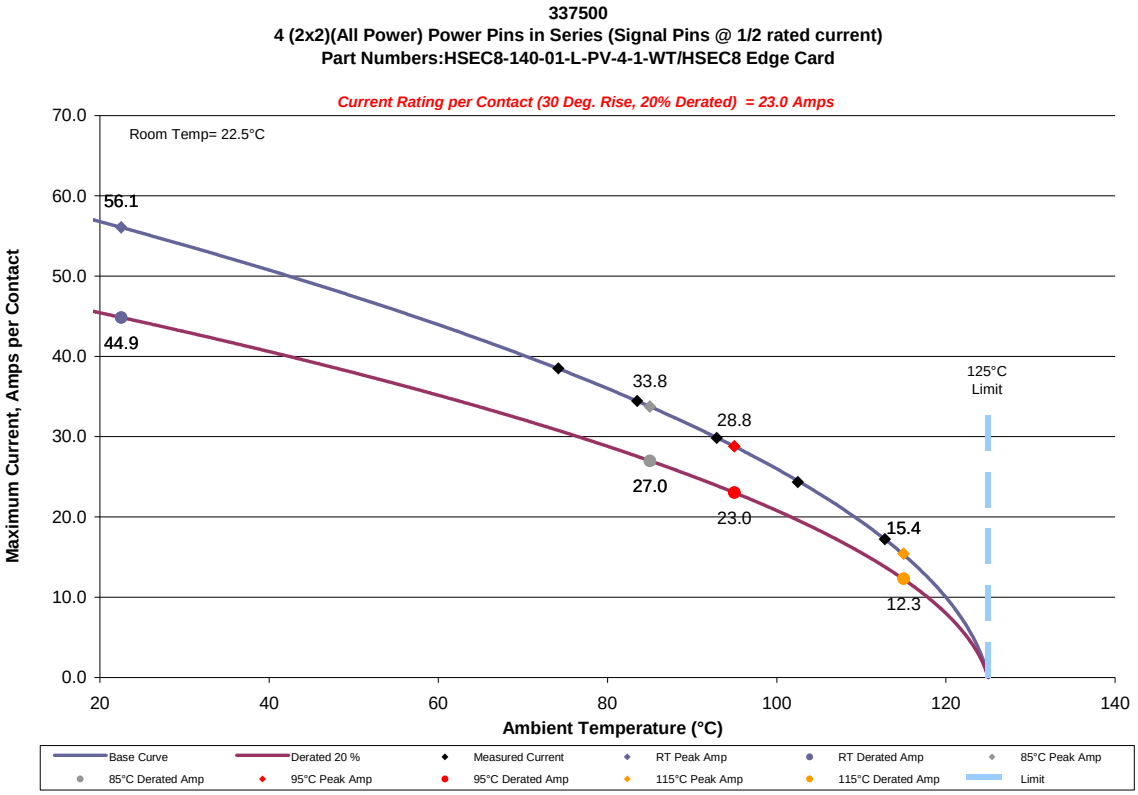
g. Linear configuration with 4 adjacent signal conductors/contacts powered

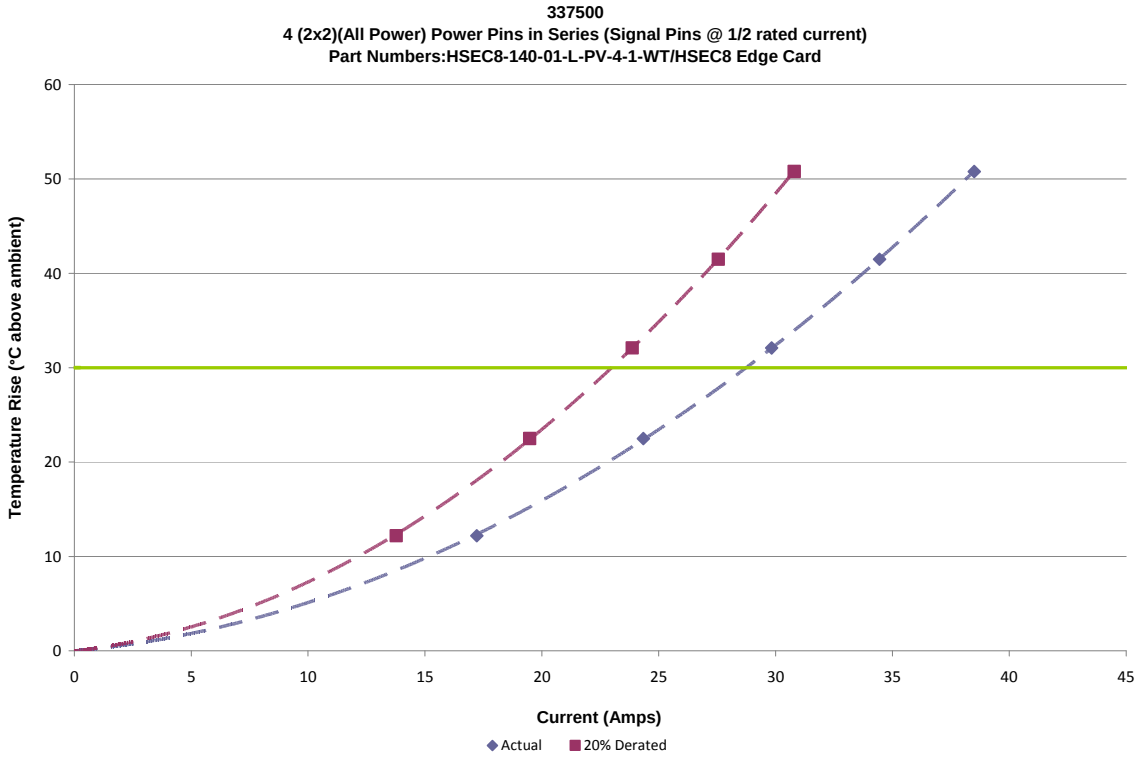




DATA SUMMARIES Continued

h. Linear configuration with all adjacent signal conductors and power conductors/contacts powered





DATA SUMMARIES Continued

MATING-UNMATING FORCE:

Thermal Aging Group

Edge Card 0.056″

	Initial				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	35.58	8.00	20.10	4.52	30.11	6.77	19.35	4.35
Maximum	43.19	9.71	25.49	5.73	37.99	8.54	23.26	5.23
Average	39.25	**8.83**	24.10	**5.42**	34.74	**7.81**	21.34	**4.80**
St Dev	2.30	0.52	1.71	0.38	3.14	0.71	1.77	0.40
Count	8	8	8	8	8	8	8	8

Edge Card 0.068″

	Initial				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	49.55	11.14	27.53	6.19	36.03	8.10	20.37	4.58
Maximum	60.09	13.51	36.87	8.29	45.55	10.24	24.78	5.57
Average	55.47	**12.47**	31.02	**6.97**	41.99	**9.44**	21.85	**4.91**
St Dev	3.67	0.83	2.88	0.65	2.80	0.63	1.42	0.32
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

MATING-UNMATING FORCE:

Mating-Unmating Durability Group (HSEC8-140-01-L-PV-4-1-WT/Edge Card 0.056″)

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	33.32	7.49	18.55	4.17	42.70	9.60	22.60	5.08
Maximum	40.70	9.15	21.39	4.81	51.64	11.61	26.73	6.01
Average	37.77	**8.49**	19.70	**4.43**	46.28	**10.41**	25.36	**5.70**
St Dev	2.28	0.51	1.03	0.23	2.95	0.66	1.36	0.31
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	47.68	10.72	25.98	5.84	52.66	11.84	28.38	6.38
Maximum	54.71	12.30	28.87	6.49	56.85	12.78	32.07	7.21
Average	49.90	**11.22**	27.72	**6.23**	54.49	**12.25**	30.38	**6.83**
St Dev	2.12	0.48	1.08	0.24	1.53	0.34	1.31	0.29
Count	8	8	8	8	8	8	8	8

	After 100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	54.80	12.32	29.70	6.68	23.89	5.37	13.57	3.05
Maximum	62.01	13.94	34.87	7.84	37.01	8.32	24.06	5.41
Average	57.72	**12.98**	32.86	**7.39**	29.24	**6.57**	17.59	**3.95**
St Dev	2.36	0.53	1.67	0.38	5.28	1.19	3.95	0.89
Count	8	8	8	8	8	8	8	8

SUMMARIES Continued

MATING-UNMATING FORCE:

Mating-Unmating Durability Group (HSEC8-140-01-L-PV-4-1-WT/Edge Card 0.068″)

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	42.48	9.55	20.95	4.71	50.89	11.44	25.98	5.84
Maximum	49.77	11.19	25.18	5.66	56.85	12.78	30.74	6.91
Average	46.23	**10.39**	22.91	**5.15**	52.88	**11.89**	28.29	**6.36**
St Dev	2.73	0.61	1.47	0.33	2.16	0.48	2.05	0.46
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	54.98	12.36	30.87	6.94	58.89	13.24	33.36	7.50
Maximum	62.14	13.97	35.05	7.88	66.32	14.91	38.43	8.64
Average	58.77	**13.21**	32.45	**7.30**	62.79	**14.12**	35.78	**8.04**
St Dev	2.80	0.63	1.42	0.32	2.73	0.61	1.67	0.38
Count	8	8	8	8	8	8	8	8

	After 100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	63.03	14.17	33.94	7.63	31.45	7.07	18.77	4.22
Maximum	70.14	15.77	41.68	9.37	44.70	10.05	29.53	6.64
Average	66.59	**14.97**	38.68	**8.70**	36.74	**8.26**	21.81	**4.90**
St Dev	2.69	0.60	2.44	0.55	4.42	0.99	4.18	0.94
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

MATING-UNMATING FORCE:

Mating-Unmating Basic (HSEC8-120-01-L-PV-2-1-WT/Edge Card 0.068″)

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	22.73	5.11	10.63	2.39	22.37	5.03	12.59	2.83
Maximum	25.53	5.74	12.59	2.83	27.98	6.29	16.55	3.72
Average	24.33	**5.47**	11.69	**2.63**	25.93	**5.83**	15.50	**3.48**
St Dev	1.10	0.25	0.58	0.13	1.72	0.39	1.29	0.29
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	23.00	5.17	13.61	3.06	22.68	5.10	14.14	3.18
Maximum	28.38	6.38	17.88	4.02	28.42	6.39	19.17	4.31
Average	26.39	**5.93**	16.74	**3.76**	26.68	**6.00**	17.79	**4.00**
St Dev	1.65	0.37	1.47	0.33	1.88	0.42	1.65	0.37
Count	8	8	8	8	8	8	8	8

	After 100 Cycles			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	22.68	5.10	14.14	3.18
Maximum	28.78	6.47	20.15	4.53
Average	26.89	**6.05**	18.46	**4.15**
St Dev	1.98	0.45	1.96	0.44
Count	8	8	8	8

DATA SUMMARIES Continued

MATING-UNMATING FORCE:

Mating-Unmating Basic (HSEC8-130-01-L-PV-2-1-WT/Edge Card 0.068″)

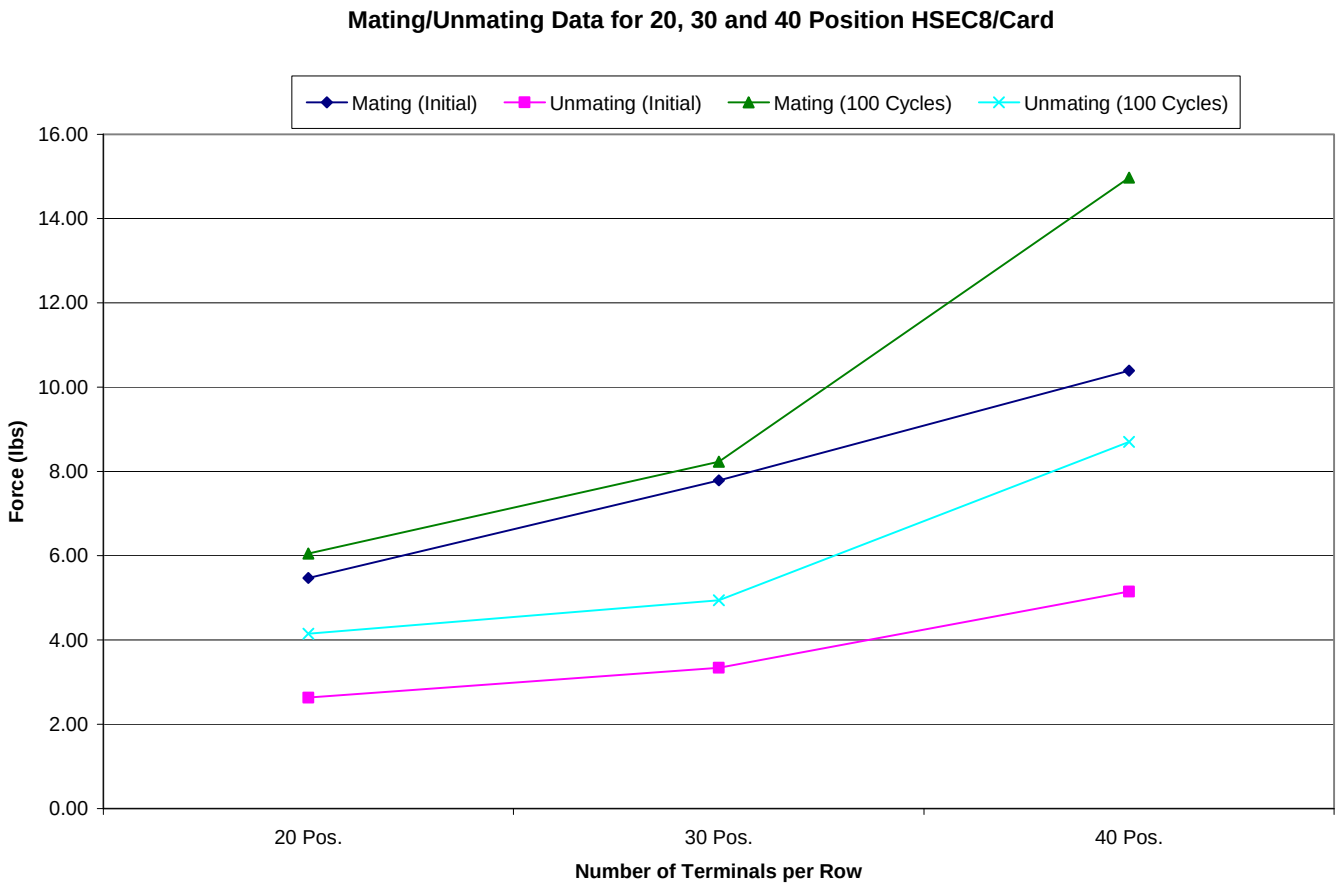
	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	32.03	7.20	14.14	3.18	33.32	7.49	16.15	3.63
Maximum	35.90	8.07	16.06	3.61	38.34	8.62	20.91	4.70
Average	34.64	**7.79**	14.83	**3.34**	35.97	**8.09**	19.09	**4.29**
St Dev	1.50	0.34	0.67	0.15	1.85	0.42	1.57	0.35
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	33.80	7.60	17.61	3.96	34.03	7.65	18.28	4.11
Maximum	38.56	8.67	22.73	5.11	38.65	8.69	23.17	5.21
Average	36.46	**8.20**	20.43	**4.59**	36.56	**8.22**	21.31	**4.79**
St Dev	1.58	0.36	1.70	0.38	1.39	0.31	1.72	0.39
Count	8	8	8	8	8	8	8	8

	After 100 Cycles			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	34.21	7.69	18.64	4.19
Maximum	38.74	8.71	24.11	5.42
Average	36.60	**8.23**	21.95	**4.94**
St Dev	1.52	0.34	1.81	0.41
Count	8	8	8	8

DATA SUMMARIES Continued

Mating\Unmating Force Comparison



DATA SUMMARIES Continued

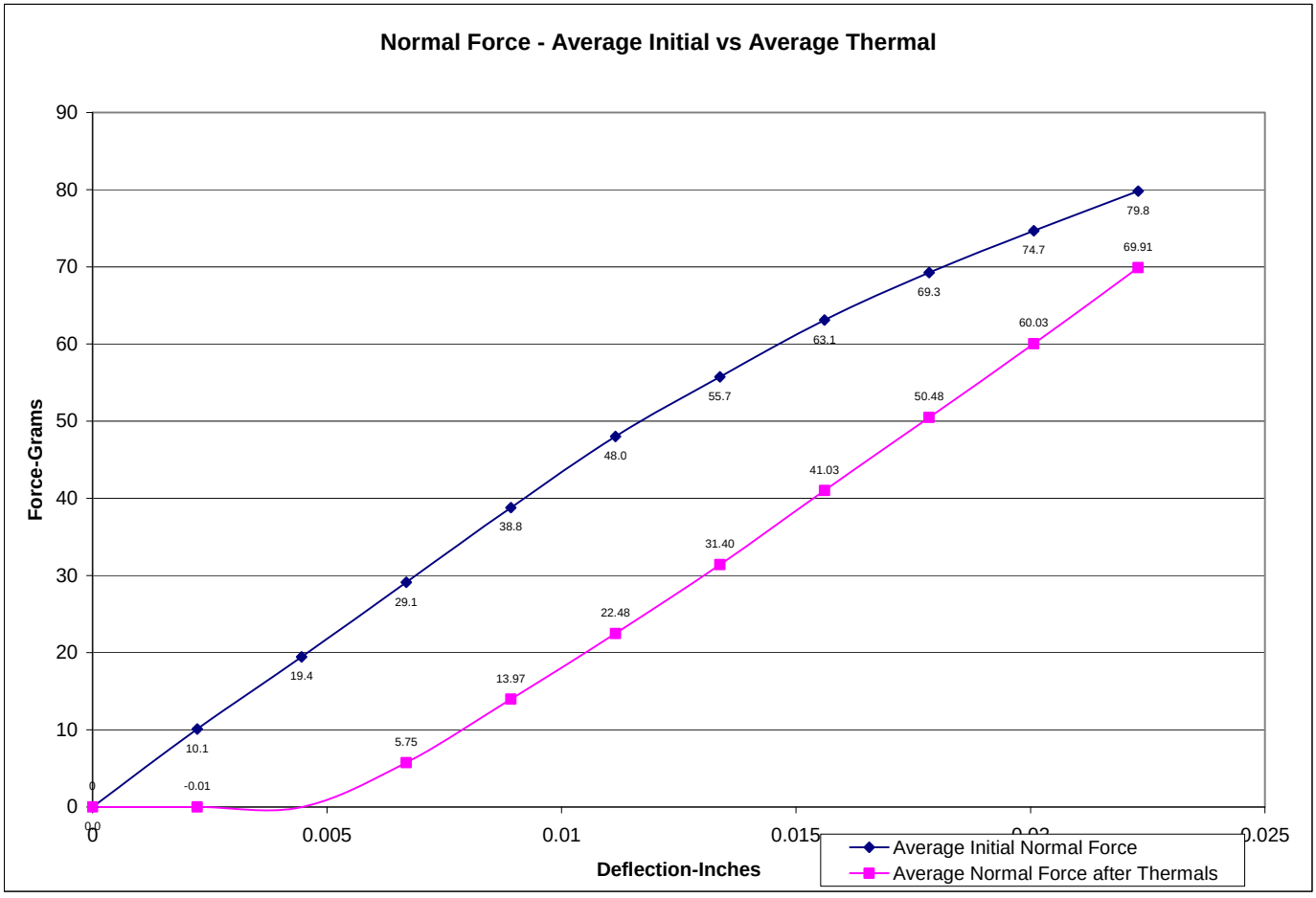
NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

1) Calibrated force gauges are used along with computer controlled positioning equipment.
2) For Normal force 8-10 measurements are taken and the averages reported.

C-188-02 Signal pin

Initial	Deflections in inches Forces in Grams										
	0.0022	**0.0045**	**0.0067**	**0.0089**	**0.0112**	**0.0134**	**0.0156**	**0.0178**	**0.0201**	**0.0223**	***SET***
Averages	10.09	19.44	29.13	38.78	48.02	55.74	63.10	69.27	74.68	79.81	0.0048
Min	9.50	18.50	27.30	36.90	46.10	53.70	61.50	67.10	72.40	78.00	0.0045
Max	10.70	20.50	30.70	40.40	50.00	58.20	65.50	72.30	77.50	82.20	0.0051
St. Dev	0.378	0.619	0.966	0.981	1.094	1.235	1.180	1.458	1.466	1.368	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	0.0022	**0.0045**	**0.0067**	**0.0089**	**0.0112**	**0.0134**	**0.0156**	**0.0178**	**0.0201**	**0.0223**	***SET***
Averages	-0.01	-0.02	5.75	13.97	22.48	31.40	41.03	50.48	60.03	69.91	0.0054
Min	-0.20	-0.20	5.30	13.20	21.00	29.90	39.00	48.30	57.60	67.70	0.0050
Max	0.10	0.10	6.70	15.80	25.10	34.80	45.20	54.90	63.90	74.30	0.0057
St. Dev	0.108	0.103	0.412	0.692	1.066	1.219	1.647	1.705	1.737	1.705	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12



DATA SUMMARIES Continued

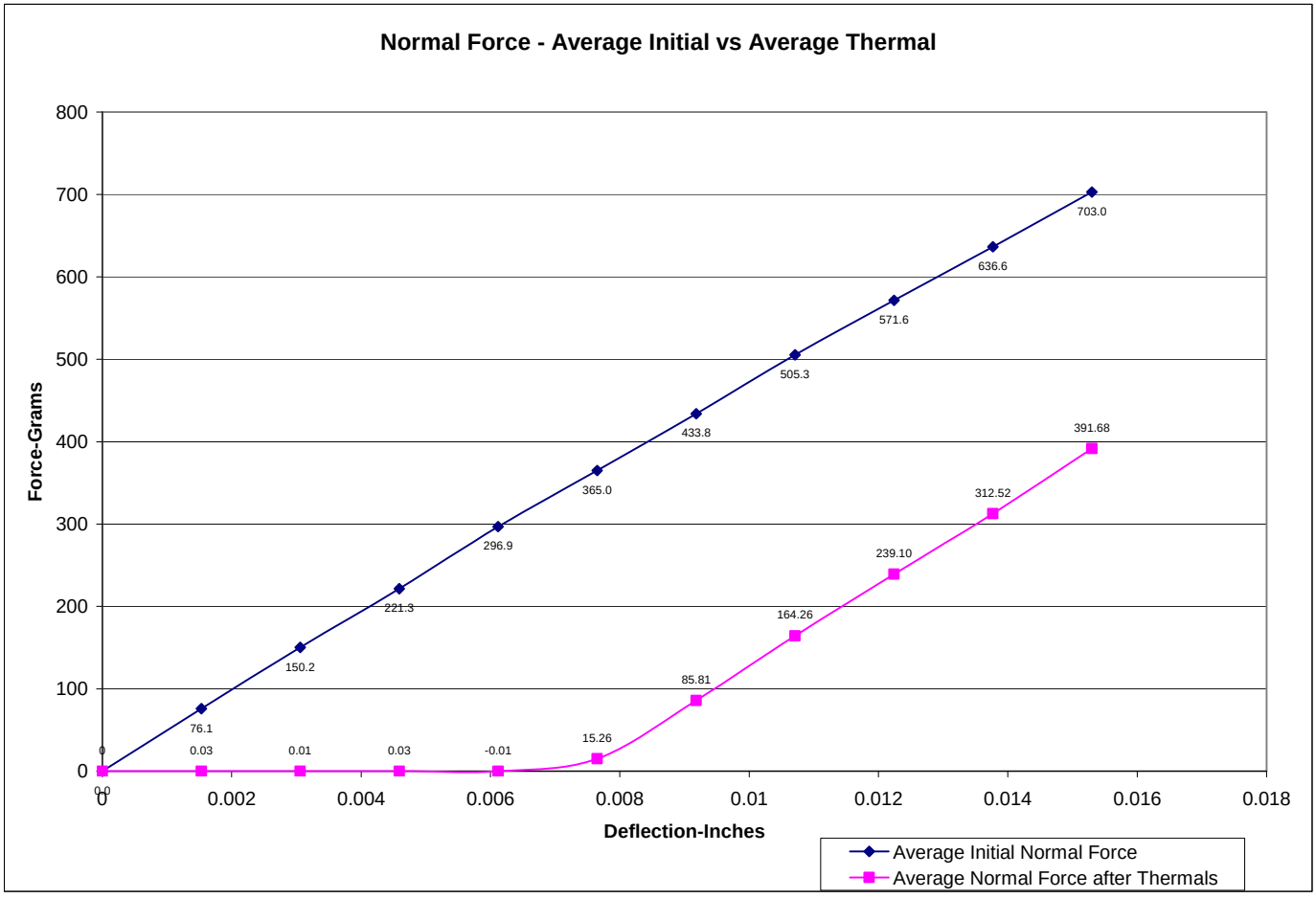
NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

1) Calibrated force gauges are used along with computer controlled positioning equipment.
2) For Normal force 8-10 measurements are taken and the averages reported.

C-367-02 Power pin - left

Initial	Deflections in inches Forces in Grams										
	0.0015	**0.0031**	**0.0046**	**0.0061**	**0.0077**	**0.0092**	**0.0107**	**0.0122**	**0.0138**	**0.0153**	***SET***
Averages	76.05	150.22	221.33	296.88	365.03	433.78	505.31	571.58	636.56	702.98	0.0007
Min	70.80	138.90	207.60	275.60	344.40	410.00	480.10	545.50	604.80	668.70	0.0003
Max	79.60	160.50	233.30	310.60	378.20	450.10	520.20	587.20	662.20	735.60	0.0010
St. Dev	2.636	6.674	9.294	10.366	10.037	11.171	12.016	12.367	15.978	18.318	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	0.0015	**0.0031**	**0.0046**	**0.0061**	**0.0077**	**0.0092**	**0.0107**	**0.0122**	**0.0138**	**0.0153**	***SET***
Averages	0.03	0.01	0.03	-0.01	15.26	85.81	164.26	239.10	312.52	391.68	0.0076
Min	-0.40	-0.40	-0.40	-0.40	-0.40	54.50	134.40	206.40	274.40	351.50	0.0068
Max	0.50	0.50	0.50	0.50	48.10	118.70	200.80	285.10	365.60	450.10	0.0082
St. Dev	0.260	0.268	0.264	0.271	17.289	23.479	24.338	28.530	31.242	34.856	0.0004
Count	12	12	12	12	12	12	12	12	12	12	12



DATA SUMMARIES Continued

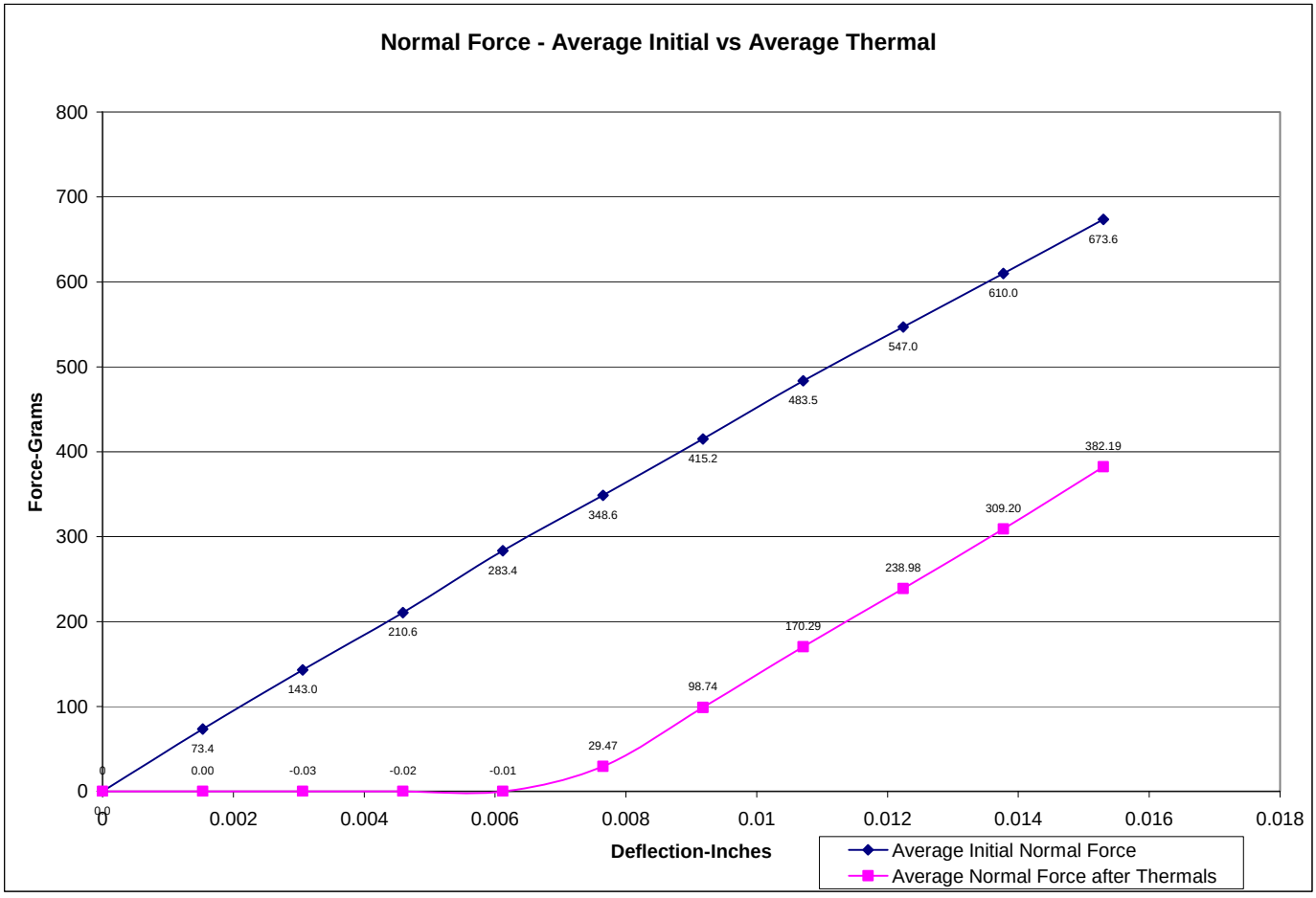
NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

1) Calibrated force gauges are used along with computer controlled positioning equipment.
2) For Normal force 8-10 measurements are taken and the averages reported.

C-367-02 Power pin - middle

Initial	Deflections in inches Forces in Grams										
	0.0015	**0.0031**	**0.0046**	**0.0061**	**0.0077**	**0.0092**	**0.0107**	**0.0122**	**0.0138**	**0.0153**	***SET***
Averages	73.38	142.98	210.61	283.38	348.55	415.15	483.46	547.00	609.96	673.62	0.0005
Min	61.00	126.20	188.00	252.10	313.90	376.40	446.10	504.40	565.80	617.90	0.0002
Max	82.20	157.10	230.10	308.30	378.10	450.30	524.30	589.70	656.80	705.50	0.0008
St. Dev	6.089	9.476	11.954	15.694	17.103	19.399	20.482	21.855	23.105	23.328	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	0.0015	**0.0031**	**0.0046**	**0.0061**	**0.0077**	**0.0092**	**0.0107**	**0.0122**	**0.0138**	**0.0153**	***SET***
Averages	0.00	-0.03	-0.02	-0.01	29.47	98.74	170.29	238.98	309.20	382.19	0.0072
Min	-0.40	-0.50	-0.50	-0.50	0.10	68.80	144.30	208.40	279.40	348.20	0.0068
Max	0.40	0.40	0.40	0.40	49.10	120.50	200.40	274.10	350.40	429.90	0.0078
St. Dev	0.252	0.245	0.266	0.275	14.195	14.001	15.796	17.252	18.819	21.139	0.0003
Count	12	12	12	12	12	12	12	12	12	12	12



DATA SUMMARIES Continued

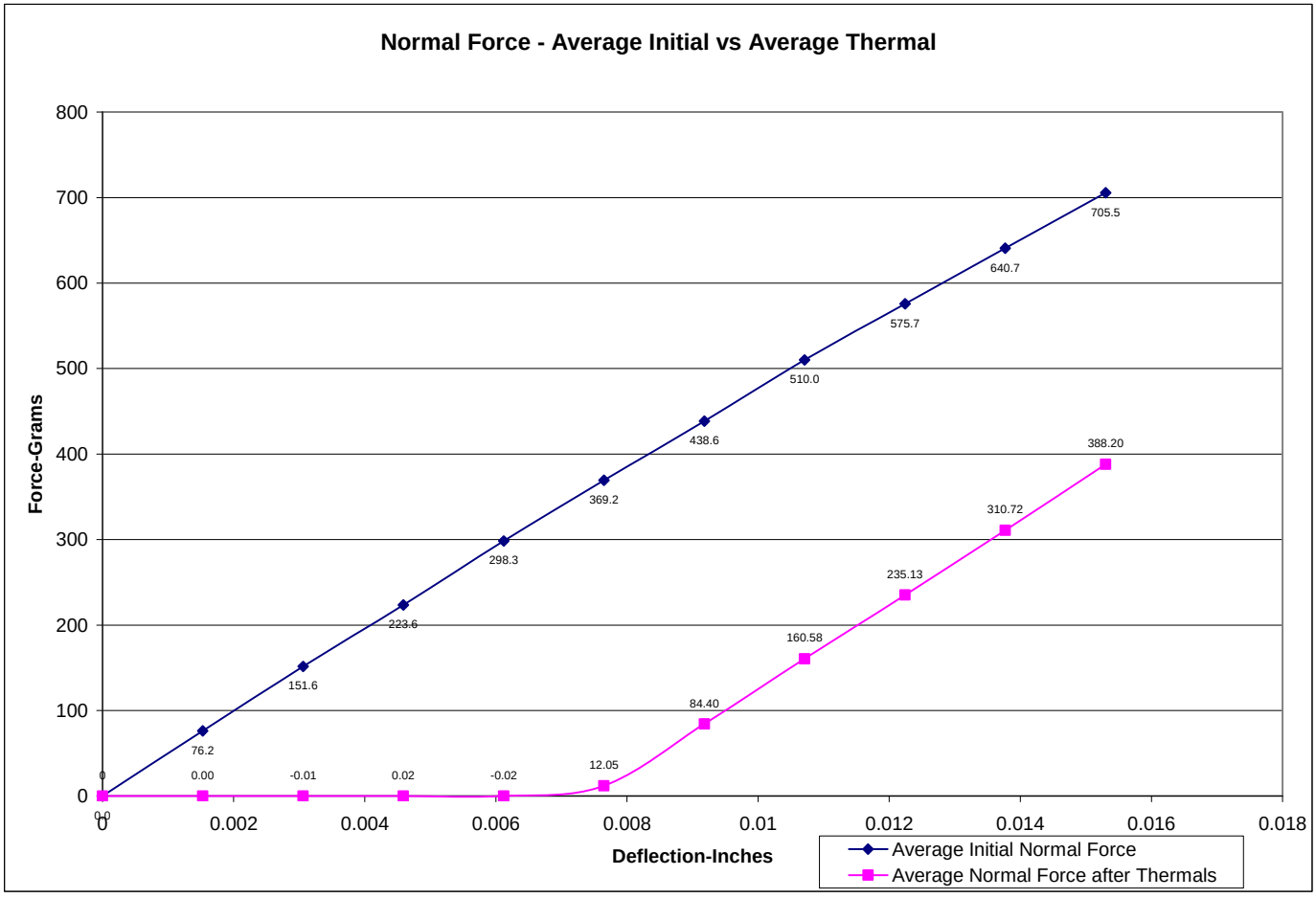
NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

1) Calibrated force gauges are used along with computer controlled positioning equipment.
2) For Normal force 8-10 measurements are taken and the averages reported.

C-367-02 Power pin - right

Initial	Deflections in inches Forces in Grams										
	0.0015	**0.0031**	**0.0046**	**0.0061**	**0.0077**	**0.0092**	**0.0107**	**0.0122**	**0.0138**	**0.0153**	***SET***
Averages	76.23	151.60	223.56	298.26	369.24	438.58	510.00	575.65	640.73	705.53	0.0006
Min	62.90	138.50	208.10	274.00	335.20	399.00	463.90	525.00	584.00	644.90	0.0002
Max	91.40	162.60	239.40	317.20	392.50	465.70	535.70	603.70	668.40	733.00	0.0008
St. Dev	7.634	8.932	11.384	13.942	17.195	18.106	19.186	20.599	21.175	21.998	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	0.0015	**0.0031**	**0.0046**	**0.0061**	**0.0077**	**0.0092**	**0.0107**	**0.0122**	**0.0138**	**0.0153**	***SET***
Averages	0.00	-0.01	0.02	-0.02	12.05	84.40	160.58	235.13	310.72	388.20	0.0076
Min	-0.30	-0.40	-0.30	-0.30	0.10	57.70	133.90	208.10	282.90	360.80	0.0073
Max	0.20	0.20	0.30	0.20	27.80	99.30	175.60	250.90	328.10	406.90	0.0081
St. Dev	0.176	0.178	0.175	0.180	9.435	11.840	11.609	12.027	12.900	12.937	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12



DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin (Signal)		
	Mated	Unmated	Unmated
Minimum	HSEC8/Card	HSEC8	Card
Initial	10000	10000	Not Tested
Thermal	10000	10000	Not Tested
Humidity	10000	10000	Not Tested

	Row to Row (Signal)		
	Mated	Unmated	Unmated
Minimum	HSEC8/Card	HSEC8	Card
Initial	10000	10000	Not Tested
Thermal	10000	10000	Not Tested
Humidity	10000	10000	Not Tested

	Pin to Pin (Power)		
	Mated	Unmated	Unmated
Minimum	HSEC8/Card	HSEC8	Card
Initial	10000	10000	Not Tested
Thermal	10000	10000	Not Tested
Humidity	10000	10000	Not Tested

	Row to Row (Power)		
	Mated	Unmated	Unmated
Minimum	HSEC8/Card	HSEC8	Card
Initial	10000	10000	Not Tested
Thermal	10000	10000	Not Tested
Humidity	10000	10000	Not Tested

	Signal to Power		
	Mated	Unmated	Unmated
Minimum	HSEC8/Card	HSEC8	Card
Initial	10000	10000	Not Tested
Thermal	10000	10000	Not Tested
Humidity	10000	10000	Not Tested

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	HSEC8/Card
Break Down Voltage	875
Test Voltage	660
Working Voltage	215

Pin to Pin (Signal)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Row to Row (Signal)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Pin to Pin (Power)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Row to Row (Power)	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Signal to Power	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

DATA SUMMARIES Continued

LLCR Thermal Aging Group

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

Edge Card 0.056″

	LLCR Measurement Summaries by Pin Type			
Date	6/4/2014	6/19/2014		
Room Temp (Deg C)	23	23		
Rel Humidity (%)	59	53		
Technician	Kason He	Kason He		
mOhm values	**Actual Initial**	**Delta Thermal**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	6.36	1.69		
St. Dev.	0.48	1.18		
Min	5.46	0.03		
Max	7.83	6.14		
Summary Count	160	160		
Total Count	160	160		
	Pin Type 2: Power			
Average	0.24	0.05		
St. Dev.	0.01	0.03		
Min	0.20	0.00		
Max	0.28	0.09		
Summary Count	32	32		
Total Count	32	32		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Thermal	**187**	**5**	**0**	**0**	**0**	**0**

Edge Card 0.068″

LLCR Measurement Summaries by Pin Type				
Date	6/4/2014	6/19/2014		
Room Temp (Deg C)	23	23		
Rel Humidity (%)	59	53		
Technician	Kason He	Kason He		
mOhm values	**Actual Initial**	**Delta Thermal**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	5.96	1.05		
St. Dev.	0.52	0.70		
Min	5.13	0.01		
Max	7.81	4.28		
Summary Count	160	160		
Total Count	160	160		
	Pin Type 2: Power			
Average	0.22	0.05		
St. Dev.	0.01	0.02		
Min	0.20	0.01		
Max	0.26	0.10		
Summary Count	32	32		
Total Count	32	32		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Thermal	**192**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Mating/Unmating Durability Group

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

Edge Card 0.056″

	LLCR Measurement Summaries by Pin Type			
Date	7/25/2014	7/29/2014	8/4/2014	8/20/2014
Room Temp (Deg C)	24	24	24	24
Rel Humidity (%)	50	50	51	53
Technician	Kason He	Kason He	Kason He	Kason He
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Signal			
Average	6.87	0.83	0.90	2.00
St. Dev.	0.79	0.78	0.68	1.78
Min	5.57	0.01	0.01	0.02
Max	8.98	3.19	2.73	7.64
Summary Count	160	160	160	160
Total Count	160	160	160	160
	Pin Type 2: Power			
Average	0.24	0.02	0.08	0.10
St. Dev.	0.02	0.02	0.05	0.10
Min	0.19	0.00	0.00	0.01
Max	0.30	0.09	0.24	0.48
Summary Count	32	32	32	32
Total Count	32	32	32	32

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
100 Cycles	**192**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**192**	**0**	**0**	**0**	**0**	**0**
Humidity	**178**	**14**	**0**	**0**	**0**	**0**

Edge Card 0.068″

LLCR Measurement Summaries by Pin Type				
Date	7/25/2014	7/29/2014	8/4/2014	8/20/2014
Room Temp (Deg C)	24	24	24	24
Rel Humidity (%)	50	50	51	53
Technician	Kason He	Kason He	Kason He	Kason He
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Signal			
Average	6.98	1.06	0.94	1.96
St. Dev.	0.91	0.82	0.78	1.77
Min	5.15	0.01	0.01	0.00
Max	10.00	3.84	3.14	7.65
Summary Count	160	160	160	160
Total Count	160	160	160	160
	Pin Type 2: Power			
Average	0.22	0.04	0.07	0.16
St. Dev.	0.02	0.02	0.03	0.11
Min	0.20	0.00	0.01	0.01
Max	0.27	0.08	0.13	0.40
Summary Count	32	32	32	32
Total Count	32	32	32	32

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
100 Cycles	**192**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**192**	**0**	**0**	**0**	**0**	**0**
Humidity	**179**	**13**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Gas Tight Group

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

Edge Card 0.056″

LLCR Measurement Summaries by Pin Type				
Date	5/29/2014	7/10/2014		
Room Temp (Deg C)	24	24		
Rel Humidity (%)	54	50		
Technician	Kason He	Kason He		
mOhm values	**Actual Initial**	**Delta Acid Vapor**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	7.07	0.71		
St. Dev.	0.76	0.59		
Min	5.58	0.00		
Max	9.20	3.32		
Summary Count	160	160		
Total Count	160	160		
	Pin Type 2: Ground			
Average	0.25	0.02		
St. Dev.	0.02	0.02		
Min	0.19	0.00		
Max	0.30	0.09		
Summary Count	32	32		
Total Count	32	32		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Acid Vapor	**192**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Shock & Vibration Group

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

Edge Card 0.056″

LLCR Measurement Summaries by Pin Type				
Date	7/3/2014	7/8/2014		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	40	40		
Technician	Tony Wagoner	Tony Wagoner		
mOhm values	**Actual Initial**	**Delta Shock-Vib**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	6.62	0.63		
St. Dev.	0.59	0.46		
Min	5.64	0.00		
Max	9.81	3.30		
Summary Count	160	160		
Total Count	160	160		
	Pin Type 2: Power			
Average	0.26	0.02		
St. Dev.	0.03	0.02		
Min	0.22	0.00		
Max	0.37	0.09		
Summary Count	32	32		
Total Count	32	32		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Shock-Vib	**192**	**0**	**0**	**0**	**0**	**0**

Nanosecond Event Detection:

Shock and Vibration Event Detection Summary	
Contacts tested	60
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

Edge Card 0.068″

LLCR Measurement Summaries by Pin Type				
Date	7/3/2014	7/9/2014		
Room Temp (Deg C)	22	23		
Rel Humidity (%)	39	39		
Technician	Tony Wagoner	Tony Wagoner		
mOhm values	**Actual Initial**	**Delta Shock-Vib**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	6.40	0.72		
St. Dev.	0.50	0.44		
Min	5.48	0.02		
Max	8.31	2.21		
Summary Count	160	160		
Total Count	160	160		
	Pin Type 2: Power			
Average	0.23	0.02		
St. Dev.	0.02	0.02		
Min	0.21	0.00		
Max	0.33	0.11		
Summary Count	32	32		
Total Count	32	32		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Shock-Vib	**192**	**0**	**0**	**0**	**0**	**0**

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: HZ-TCT-01
Description: Normal force analyzer
Manufacturer: Mecmesin Multitester
Model: Mecmesin Multitester 2.5-i
Serial #: 08-1049-04
Accuracy: Last Cal: 4/25/2014, Next Cal: 4/24/2015

Equipment #: HZ-OV-01
Description: Oven
Manufacturer: Huida
Model: CS101-1E
Serial #: CS101-1E-B
Accuracy: Last Cal: 12/12/2013, Next Cal: 12/11/2014

Equipment #: HZ-THC-01
Description: Humidity transmitter
Manufacturer: Thermtron
Model: SM-8-8200
Serial #: 38846
Accuracy: Last Cal: 2/27/2014, Next Cal: 2/26/2015

Equipment #: HZ-HPM-01
Description: NA9636H
Manufacturer: Ainuo
Model: 6031A
Serial #: 089601091
Accuracy: Last Cal: 3/6/2014, Next Cal: 3/5/2015

Equipment #: HZ-MO-05
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 3706
Serial #: 1285188
Accuracy: Last Cal: 11/14/2013, Next Cal: 11/13/2014

Equipment #: HZ-TSC-01
Description: Vertical Thermal Shock Chamber
Manufacturer: Cincinnatti Sub Zero
Model: VTS-3-6-6-SC/AC
Serial #: 10-VT14994
Accuracy: See Manual
… Last Cal: 06/26/2014, Next Cal: 06/25/2015

Equipment #: HZ-MO-01
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 1199807
Accuracy: See Manual
… Last Cal: 07/01/2014, Next Cal: 06/30/2015

EQUIPMENT AND CALIBRATION SCHEDULES Continued

Equipment #: PS-09
Description: 50 Amp Power Supply
Manufacturer: Agilent
Model: AT-6032A
Serial #: US38322853
Accuracy: See Manual
… Last Cal: 07/02/2013, Next Cal: 07/01/2014

Equipment #: MO-9
Description: Switch/Multimeter
Manufacturer: Keithley
Model: 2750
Serial #: WDC-874817
Accuracy: See Manual
… Last Cal: 08/21/2013, Next Cal: 08/21/2014

Equipment #: MO-11
Description: Switch/Multimeter
Manufacturer: Keithley
Model: 3706
Serial #: 120169
Accuracy: See Manual
… Last Cal: 08/21/2013, Next Cal: 08/21/2014

Equipment #: SVC-01
Description: Shock & Vibration Table
Manufacturer: Data Physics
Model: LE-DSA-10-20K
Serial #: 10037
Accuracy: See Manual
… Last Cal: 11/31/2013, Next Cal: 11/31/2014

Equipment #: ACLM-01
Description: Accelerometer
Manufacturer: PCB Piezotronics
Model: 352C03
Serial #: 115819
Accuracy: See Manual
… Last Cal: 07/09/2014, Next Cal: 07/09/2015

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 06/04/2014, Next Cal: 06/04/2015