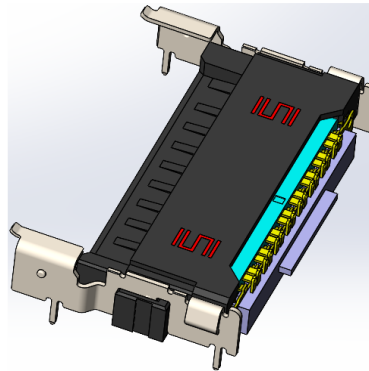
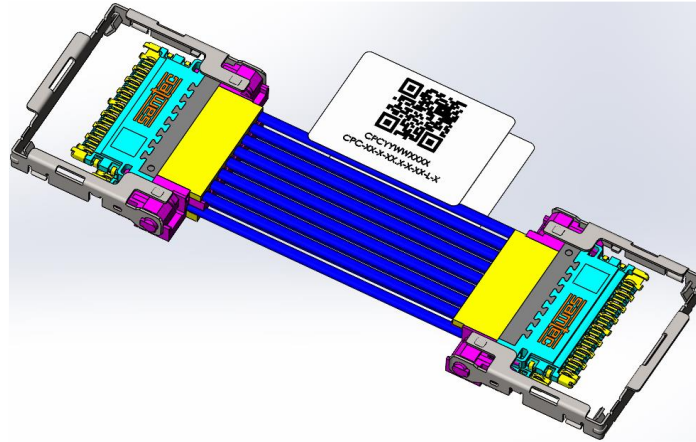


Project: Design Qualification Test Report	Tracking Code: CR-1312603_Report_Rev_3
Requested by: Andy Chen	Date: 1/4/2026
Part #:CPC-16-2-12.0-2-02-L-1\CPI-16-01-2-S-RA-0-L-TR	
Part description: CPC\CPI	Tech: Kason He
Test Start: 7/25/2025	Test Completed: 8/18/2025



DESIGN QUALIFICATION TEST REPORT
CPC\CPI
CPC-16-2-12.0-2-02-L-1\CPI-16-01-2-S-RA-0-L-TR

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
8/26/2025	1	Initial test	KH
10/30/2025	2	Update the part number.	KH
12/19/2025	3	Add the CR-1091303 data to the report	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.

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SCOPE

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

APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

- 1) All materials were manufactured in accordance with the applicable product specification.
- 2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
- 3) After soldering, the parts to be used for LLCR and DWV/IR testing were cleaned according to CO-SC-WI-3029.
- 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) Samtec Test PCBs used: PCB-114649-TST/PCB-114689-TST.

FLOWCHARTS

Gas Tight

Group 1

CPI-16-01-2-S-RA-0-L-TR

CPC-16-1-XX.X-2-XX-L-2

8 Assemblies

Step	Description
1.	LLCR (2)
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

CPI-16-01-2-S-RA-0-L-TR

8 Contacts Minimum
Signal Without Thermals*Note: Deflect both differential pair pins
at the same time.*

Step	Description
1.	Contact Gaps
2.	Normal Force (1)
	Expected Force at Max Deflection = 130 g
	Deflection = 0.014 "

Group 2

CPI-16-01-2-S-RA-0-L-TR

8 Contacts Minimum
Ground Without Thermals

Step	Description
1.	Contact Gaps
2.	Normal Force (1)
	Expected Force at Max Deflection = 85 g
	Deflection = 0.013 "

Group 3

CPI-16-01-2-S-RA-0-L-TR

CPC-16-1-XX.X-2-XX-L-2

8 Contacts Minimum
Signal With Thermals*Note: Deflect both differential pair pins
at the same time.*

Step	Description
1.	Contact Gaps
2.	Thermal Age (2)
3.	Contact Gaps
4.	Normal Force (1)
	Expected Force at Max Deflection = 130 g
	Deflection = 0.014 "

Group 4

CPI-16-01-2-S-RA-0-L-TR

CPC-16-1-XX.X-2-XX-L-2

8 Contacts Minimum
Ground With Thermals

Step	Description
1.	Contact Gaps
2.	Thermal Age (2)
3.	Contact Gaps
4.	Normal Force (1)
	Expected Force at Max Deflection = 85 g
	Deflection = 0.013 "

(1) Normal Force = EIA-364-04

(2) Thermal Age = EIA-364-17

Test Condition = 4 (105°C)
Time Condition = B (250 Hours)

Thermal Aging

Group 1

CPI-16-01-2-S-RA-0-L-TR

CPC-16-1-XX.X-2-XX-L-2

8 Assemblies

Step	Description
1.	LLCR (1)
2.	Thermal Age (2) - Non Standard
3.	LLCR (1)
	Max Delta = 15 mOhm

(1) LLCR = EIA-364-23

Open Circuit Voltage = 20 mV Max
Test Current = 100 mA Max

(2) Thermal Age = Other

Test Condition = 3 (85°C)
Time Condition = B (250 Hours)

FLOWCHARTS**Mating/Unmating/Durability**Group 1

CPC-16-2-12.0-2-02-L-1

CPI-16-01-2-S-RA-0-L-TR

8 Assemblies

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

 (1) 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

(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 (-55°C to +85°C)

Test Duration = A-3 (100 Cycles)

FLOWCHARTS Continued**IR/DWV****Pin-to-Pin****Group 1**

CPI-16-01-2-S-RA-0-L-TR
CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

Step	Description
1.	DWV Breakdown (2)

Group 2

CPI-16-01-2-S-RA-0-L-TR

2 Assemblies

Step	Description
1.	DWV Breakdown (2)

Group 3

CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

Step	Description
1.	DWV Breakdown (2)

Group 4

CPI-16-01-2-S-RA-0-L-TR
CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

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)

Row-to-Row**Group 5**

CPI-16-01-2-S-RA-0-L-TR
CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

Step	Description
1.	DWV Breakdown (2)

Group 6

CPI-16-01-2-S-RA-0-L-TR

2 Assemblies

Step	Description
1.	DWV Breakdown (2)

Group 7

CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

Step	Description
1.	DWV Breakdown (2)

Group 8

CPI-16-01-2-S-RA-0-L-TR
CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

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**Pin-to-Ground****Group 9**

CPI-16-01-2-S-RA-0-L-TR
CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 10

CPI-16-01-2-S-RA-0-L-TR
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 11

CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 12

CPI-16-01-2-S-RA-0-L-TR
CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

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⁾

Ground-to-Closest Metallic Hardware**Group 13**

CPI-16-01-2-S-RA-0-L-TR
CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 14

CPI-16-01-2-S-RA-0-L-TR
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 15

CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

Step	Description
1.	DWV Breakdown ⁽²⁾

Group 16

CPI-16-01-2-S-RA-0-L-TR
CPC-16-1-XX.X-2-XX-L-2
2 Assemblies

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⁾

- (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***Note: Review cable operating temp to max temp of the interface*

<u>Group 1</u>		<u>Group 2</u>		<u>Group 3</u>		<u>Group 4</u>	
CPI-16-01-2-S-RA-0-L-TR CPC-16-1-XX.X-2-XX-L-2 2 Pins Powered Signal		CPI-16-01-2-S-RA-0-L-TR CPC-16-1-XX.X-2-XX-L-2 4 Pins Powered Signal		CPI-16-01-2-S-RA-0-L-TR CPC-16-1-XX.X-2-XX-L-2 6 Pins Powered Signal		CPI-16-01-2-S-RA-0-L-TR CPC-16-1-XX.X-2-XX-L-2 8 Pins Powered Signal	
Step	Description	Step	Description	Step	Description	Step	Description
1.	CCC (2) Rows = 2 Number of Positions = 1	1.	CCC (2) Rows = 2 Number of Positions = 2	1.	CCC (2) Rows = 2 Number of Positions = 3	1.	CCC (2) Rows = 2 Number of Positions = 4
<u>Group 5</u>		<u>Group 6</u>		<u>Group 7</u>			
CPI-16-01-2-S-RA-0-L-TR CPC-16-1-XX.X-2-XX-L-2 32 Pins Powered Signal		CPI-16-01-2-S-RA-0-L-TR CPC-16-1-XX.X-2-XX-L-2 2 Pins Powered Ground		CPI-16-01-2-S-RA-0-L-TR CPC-16-1-XX.X-2-XX-L-2 All Power			
Step	Description	Step	Description	Step	Description		
1.	CCC (2) Rows = 2 Number of Positions = 16	1.	CCC (2) Rows = 2 Number of Positions = 1	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

Latch DurabilityGroup 1CPI-16-01-2-S-RA-0-L-TR
CPC-16-1-XX.X-2-XX-L-2

5 Assemblies

Latch Durability

Note: Perform visual capture around cable organizer pivot, latch front spring fingers, and the WT rib feature.

Step	Description
1.	Visual Inspection Pivot durability = No breakdown(Initial)
2.	Cycles Quantity = 25 Cycles <i>Note: Latch and Unlatch cycling</i>
3.	Visual Inspection Pivot durability = No breakdown

FLOWCHARTS Continued**Mechanical Shock/Random Vibration/LLCR**Group 1

CPC-16-2-12.0-2-02-L-1

CPI-16-01-2-S-RA-0-L-TR

8 Assemblies

Step Description

1. LLCR ⁽¹⁾
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)

Mechanical Shock/Random Vibration/Event DetectionGroup 1

CPC-16-2-12.0-2-02-L-1

CPI-16-01-2-S-RA-0-L-TR

60 Points

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)

FLOWCHARTS Continued**Cable Pull**Group 1

CPC-16-2-20.0-2-02-L-1
 CPI-16-01-2-S-RA-0-L-TR
 5 Assemblies
 0 Degrees

Step	Description
1.	Cable Pull ⁽¹⁾

Group 2

CPC-16-2-20.0-2-02-L-1
 CPI-16-01-2-S-RA-0-L-TR
 5 Assemblies
 90 Degrees

Step	Description
1.	Cable Pull ⁽¹⁾

(1) Cable Pull = EIA-364-38

Measure and Record Force Required to Failure
 Failure = Discontinuity >1 microsecond at 10 ohms

Cable Flex

Note: Please use a 0.625" mandrel for the test.

Group 1

CPC-16-2-20.0-2-02-L-1
 CPI-16-01-2-S-RA-0-L-TR
 8 Assemblies
 Flat Cable

Step	Description
1.	IR ⁽³⁾
2.	DWV at Test Voltage ⁽²⁾ Test Voltage = 500 V
3.	Cable Flex ⁽¹⁾
4.	Visual Inspection
5.	IR ⁽³⁾
6.	DWV at Test Voltage ⁽²⁾ Test Voltage = 500 V

(1) Cable Flex = EIA-364-41

Circular Jacket Cable - to be tested 90° each direction (180° total)
 Flat Cable - to be tested 70° each direction (140° total)
 Monitor continuity during flex testing
 Failure = Discontinuity >1 microsecond at 10 ohms

(2) 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

(3) IR = EIA-364-21

Test Condition = 500 Vdc, 2 Minutes Max

FLOWCHARTS Continued**Cable Pull**Group 1

CPI-16-01-2-S-RA-0-L-TR
 CPC-16-1-XX.X-2-XX-L-2
 5 Assemblies
 0 Degrees

Step Description

1. Cable Pull ⁽¹⁾

Group 2

CPI-16-01-2-S-RA-0-L-TR
 CPC-16-1-XX.X-2-XX-L-2
 5 Assemblies
 90 Degrees - Lateral

Step Description

1. Cable Pull ⁽¹⁾

Group 3

CPI-16-01-2-S-RA-0-L-TR
 CPC-16-1-XX.X-2-XX-L-2
 5 Assemblies
 90 Degrees - Transverse

Step Description

1. Cable Pull ⁽¹⁾

(1) Cable Pull = EIA-364-38

Measure and Record Force Required to Failure

Failure = Discontinuity >1 microsecond at 10 ohms

Cable FlexGroup 1

CPI-16-01-2-S-RA-0-L-TR
 CPC-16-1-XX.X-2-XX-L-2
 8 Assemblies
 Flat Cable - Lateral

*Note: Use specified mandrel size per
 PMD chart*

Step Description

1. IR ⁽³⁾
2. DWV at Test Voltage⁽²⁾
 Test Voltage = 500 V
3. Cable Flex ⁽¹⁾
4. Visual Inspection
5. IR ⁽³⁾
6. DWV at Test Voltage⁽²⁾
 Test Voltage = 500 V

(1) Cable Flex = EIA-364-41

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

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

Monitor continuity during flex testing

Failure = Discontinuity >1 microsecond at 10 ohms

(2) 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

(3) IR = EIA-364-21

Test Condition = 500 Vdc, 2 Minutes Max

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 I: -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 mated conditions.

THERMAL:

- 1) EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors*.
- 2) Test Condition 3 at 85° 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 mated conditions.

MECHANICAL SHOCK (Specified Pulse):

- 1) Reference document: EIA-364-27, *Mechanical Shock Test Procedure for Electrical Connectors*
- 2) Test Condition G
- 3) Peak Value: 100 G
- 4) Duration: 6 Milliseconds
- 5) Wave Form: Sawtooth
- 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 testing, the samples were characterized to ensure 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.

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.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
- 1) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
- 2) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
- 3) The size of the temperature probe can affect the measured temperature.
- 4) Copper traces on PC boards will contribute to temperature rise:
 - a. Self-heating (resistive)
 - b. Reduction in heat sink capacity affecting the heated contacts.
- 5) A de-rating curve, usually 20%, is calculated.
- 6) Calculated de-rated currents at four temperature points are reported:
 - a. Ambient
 - b. 85° C
 - c. 95° C
 - d. 115° C
- 7) Typically, neighboring contacts (in close proximity to maximize heat buildup) are energized.
- 8) 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.
- 9) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
- 10) Hook-up wire cross section is larger than the cross section of any connector leads/PC board traces, jumpers, etc.
- 11) Hook-up wire length is longer than the minimum specified in the referencing standard.

ATTRIBUTE DEFINITIONS Continued

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 $+1000$ mOhms: ----- Unstable
 - f. $>+1000$ 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*.
- 1) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 2) 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 $+1000$ mOhms:----- Unstable
 - f. $>+1000$ mOhms:----- Open Failure
- 3) 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 inch 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.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

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).

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

CABLE PULL:

- 1) Secure cable near center and pull on connector
 - a. At 0° , in-line with cable
 - b. At 90° , in-line with cable



Fig. 1
 0° Connector pull

CABLE Flex:

- 1) Oscillate and monitor electrical continuity for open circuit indication.
 - a. $\pm 70^\circ$ Flex Mode, bend up to 500 cycles. load on 16 oz.

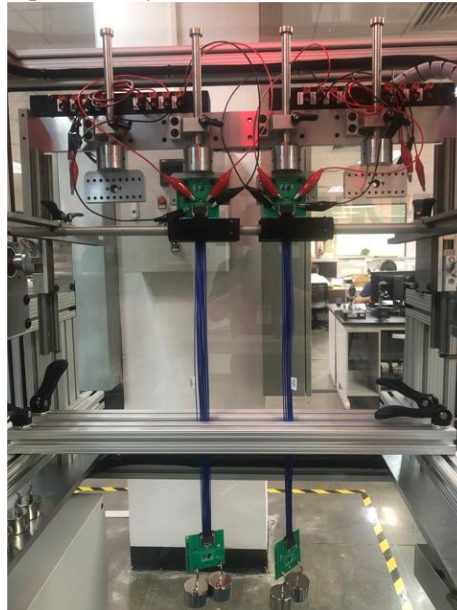


Fig. 2
(Setup picture)

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes.

CABLE PULL:

- 1) Secure cable near center and pull-on connector.
 - a. At 0° , in-line with cable
 - b. At 90° , in-line with cable

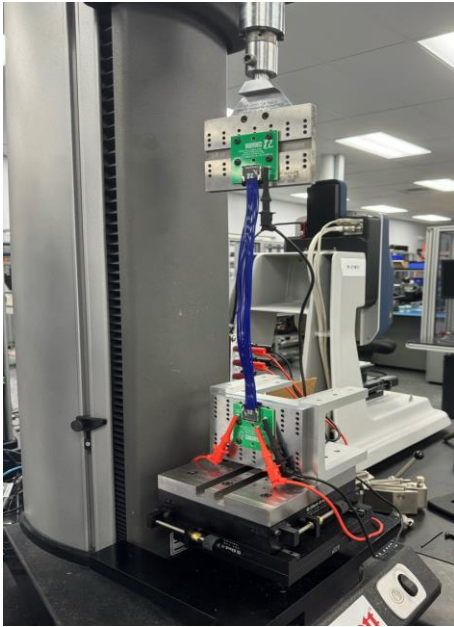


Fig. 1
 0° Connector pull.



Fig. 2
 90° Connector pull.

CABLE Flex:

- 1) Oscillate and monitor electrical continuity for open circuit indication.
 - a. $\pm 70^\circ$ Flex Mode, bend up to 100 cycles. load on 16 oz.

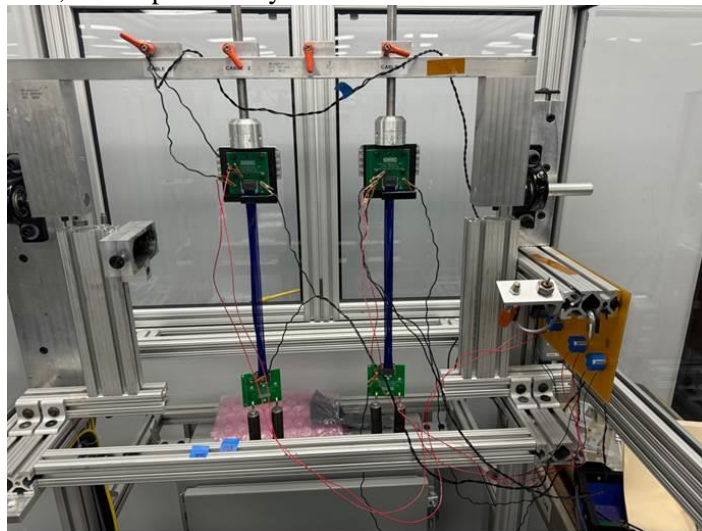


Fig. 3
(Standard setup)

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

- CCC for a 30°C Temperature Rise-----10.4 A per contact with 2 contact (2 x 1) powered.

Signal Pin

- CCC for a 30°C Temperature Rise-----1.6 A per contact with 2 contact (2 x 1) powered.
- CCC for a 30°C Temperature Rise-----1.2 A per contact with 4 contacts (2 x 2) powered.
- CCC for a 30°C Temperature Rise-----1.0 A per contact with 6 contacts (2 x 3) powered.
- CCC for a 30°C Temperature Rise-----0.9 A per contact with 8 contacts (2 x 4) powered.
- CCC for a 30°C Temperature Rise-----0.5 A per contact with 32 contacts (2 x 16) powered.

ALL GROUND POSITIONS with SIGNAL @1/2 rated current

- CCC for a 30°C Temperature Rise-----9.6 A per contact (2) with signal powered @ 1/2 rated current (0.3 A).

Mating – Unmating Forces**Mating/Unmating Durability Group**

- **Initial**
 - **Mating**
 - Min ----- 2.33 lbs
 - Max ----- 3.07 lbs
 - **Unmating**
 - Min ----- 2.06 lbs
 - Max ----- 2.81 lbs
- **After 25 Cycles**
 - **Mating**
 - Min ----- 2.41 lbs
 - Max ----- 2.88 lbs
 - **Unmating**
 - Min ----- 2.19 lbs
 - Max ----- 2.83 lbs
- **After Humidity**
 - **Mating**
 - Min ----- 2.25 lbs
 - Max ----- 3.19 lbs
 - **Unmating**
 - Min ----- 2.09 lbs
 - Max ----- 2.75 lbs

Cable Pull force

- **0° Pull**
 - Min -----31.04 lbs
 - Max -----32.34 lbs
- **90° Pull**
 - Min ----- 8.33 lbs
 - Max -----10.07 lbs

CPI-16-01-2-S-RA-0-L-TR/CPC-16-1-XX.X-L-2

- **0° Pull**
 - Min ----- 5.70 lbs
 - Max -----22.21 lbs
- **90° Pull-Lateral**
 - Min -----10.01 lbs
 - Max -----11.72 lbs
- **90° Pull-Transverse**
 - Min -----10.30 lbs
 - Max -----16.81 lbs

RESULTS Continued**Normal Force****IM****Signal Pin at 0.014-inch deflection**• **Initial**

○ Min -----	190.60 gf	Set -----	0.0008 in
○ Max -----	207.50 gf	Set -----	0.0015 in

• **Thermal**

○ Min -----	167.80 gf	Set -----	0.0019 in
○ Max -----	190.10 gf	Set -----	0.0026 in

Ground Pin at 0.013-inch deflection• **Initial**

○ Min -----	74.20 gf	Set -----	0.0043 in
○ Max -----	80.80 gf	Set -----	0.0049 in

• **Thermal**

○ Min -----	63.30 gf	Set -----	0.0054 in
○ Max -----	76.10 gf	Set -----	0.0065 in

OM**Signal Pin at 0.014-inch deflection**• **Initial**

○ Min -----	165.30 gf	Set -----	0.0004 in
○ Max -----	183.80 gf	Set -----	0.0007 in

• **Thermal**

○ Min -----	111.20 gf	Set -----	0.0025 in
○ Max -----	153.80 gf	Set -----	0.0051 in

Ground Pin at 0.013-inch deflection• **Initial**

○ Min -----	77.10 gf	Set -----	0.0048 in
○ Max -----	81.40 gf	Set -----	0.0054 in

• **Thermal**

○ Min -----	74.90 gf	Set -----	0.0049 in
○ Max -----	79.90 gf	Set -----	0.0056 in

RESULTS Continued**Insulation Resistance minimums, IR****Pin to Pin**

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed
- **Thermal Shock**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed
- **Humidity**
 - Mated----- 5600 Meg Ω ----- Passed
 - Unmated ----- 9400 Meg Ω ----- Passed

Row to Row

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed
- **Thermal Shock**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed
- **Humidity**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed

Pin to Ground

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed
- **Thermal Shock**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed
- **Humidity**
 - Mated----- 5400 Meg Ω ----- Passed
 - Unmated ----- 9700 Meg Ω ----- Passed

Ground to Closest Metallic Hardware

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed
- **Thermal Shock**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed
- **Humidity**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed

RESULTS Continued**Dielectric Withstanding Voltage minimums, DWV**

- **Minimums**
 - Breakdown Voltage-----484 VAC
 - Test Voltage -----363 VAC
 - Working Voltage -----121 VAC

Pin to Pin

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

Row to Row

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

Pin to Ground

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

Ground to Closest Metallic Hardware

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

Cable Flex:**Insulation Resistance minimums, IR****Pin to Pin**

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
- **After 500 flex cycles**
 - Mated----- 9200 Meg Ω ----- Passed

Pin to Ground

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
- **After 500 flex cycles**
 - Mated-----45000 Meg Ω ----- Passed

Row to Row

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
- **After 500 flex cycles**
 - Mated-----45000 Meg Ω ----- Passed

Dielectric Withstanding Voltage minimums, DWV

- Test Voltage -----500 VAC

Pin to Pin

- Initial DWV -----Passed
- After 500 Flex cycles DWV -----Passed

Row to Row

- Initial DWV -----Passed
- After 500 Flex cycles DWV -----Passed

Pin to Ground

- Initial DWV -----Passed
- After 500 Flex cycles DWV-----Passed

RESULTS Continued

CPI-16-01-2-S-RA-0-L-TR/CPC-16-1-XX.X-L-2

Insulation Resistance minimums, IR

Pin to Pin

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
- **After 500 flex cycles**
 - Mated----- 9200 Meg Ω ----- Passed

Pin to Ground

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
- **After 500 flex cycles**
 - Mated-----45000 Meg Ω ----- Passed

Row to Row

- **Initial**
 - Mated-----45000 Meg Ω ----- Passed
- **After 500 flex cycles**
 - Mated-----45000 Meg Ω ----- Passed

Dielectric Withstanding Voltage minimums, DWV

- Test Voltage -----500 VAC

Pin to Pin

- **Initial DWV -----Passed**
- **After 500 Flex cycles DWV -----Passed**

Row to Row

- **Initial DWV -----Passed**
- **After 500 Flex cycles DWV -----Passed**

Pin to Ground

- **Initial DWV -----Passed**
- **After 500 Flex cycles DWV-----Passed**

RESULTS Continued**LLCR Gas Tight (256 signal and 16 ground LLCR test points)****Signal Pin**

- **Initial** ----- 181.61 mOhms Max
- **Gas-Tight**
 - **<= +5.0 mOhms** ----- 253 Points ----- Stable
 - **+5.1 to +10.0 mOhms** ----- 3 Points ----- Minor
 - **+10.1 to +15.0 mOhms** ----- 0 Points ----- Acceptable
 - **+15.1 to +50.0 mOhms** ----- 0 Points ----- Marginal
 - **+50.1 to +1000 mOhms** ----- 0 Points ----- Unstable
 - **>+1000 mOhms** ----- 0 Points ----- Open Failure

Ground Pin

- **Initial** ----- 10.42 mOhms Max
- **Gas-Tight**
 - **<= +5.0 mOhms** ----- 16 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 +1000 mOhms** ----- 0 Points ----- Unstable
 - **>+1000 mOhms** ----- 0 Points ----- Open Failure

LLCR Thermal Aging Group (256 signal and 16 ground LLCR test points)**Signal Pin**

- **Initial** ----- 171.33 mOhms Max
- **Thermal**
 - **<= +5.0 mOhms** ----- 247 Points ----- Stable
 - **+5.1 to +10.0 mOhms** ----- 9 Points ----- Minor
 - **+10.1 to +15.0 mOhms** ----- 0 Points ----- Acceptable
 - **+15.1 to +50.0 mOhms** ----- 0 Points ----- Marginal
 - **+50.1 to +1000 mOhms** ----- 0 Points ----- Unstable
 - **>+1000 mOhms** ----- 0 Points ----- Open Failure

Ground Pin

- **Initial** ----- 10.26 mOhms Max
- **Thermal**
 - **<= +5.0 mOhms** ----- 16 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 +1000 mOhms** ----- 0 Points ----- Unstable
 - **>+1000 mOhms** ----- 0 Points ----- Open Failure

RESULTS Continued**LLCR Durability (256 Signal and 16 Ground LLCR test points)****Signal pin**

- **Initial** ----- 342.5 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 51 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 163 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 42 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Thermal**
 - <= +5.0 mOhms ----- 78 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 146 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 32 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Humidity**
 - <= +5.0 mOhms ----- 172 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 77 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 7 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

Ground Pin

- **Initial** ----- 18.08 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 16 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 +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Thermal**
 - <= +5.0 mOhms ----- 16 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 +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Humidity**
 - <= +5.0 mOhms ----- 16 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 +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

RESULTS Continued

LLCR Shock & Vibration: (256 Signal and 16 Ground LLCR test points)

Signal pin

- **Initial** ----- 348.2 mOhms Max
- **Shock & Vibration**
 - <= +5.0 mOhms----- 209 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 43 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 4 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

Ground pin

- **Initial** ----- 18.02 mOhms Max
- **Shock & Vibration**
 - <= +5.0 mOhms----- 16 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 +1000 mOhms----- 0 Points ----- Unstable
 - >+1000 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

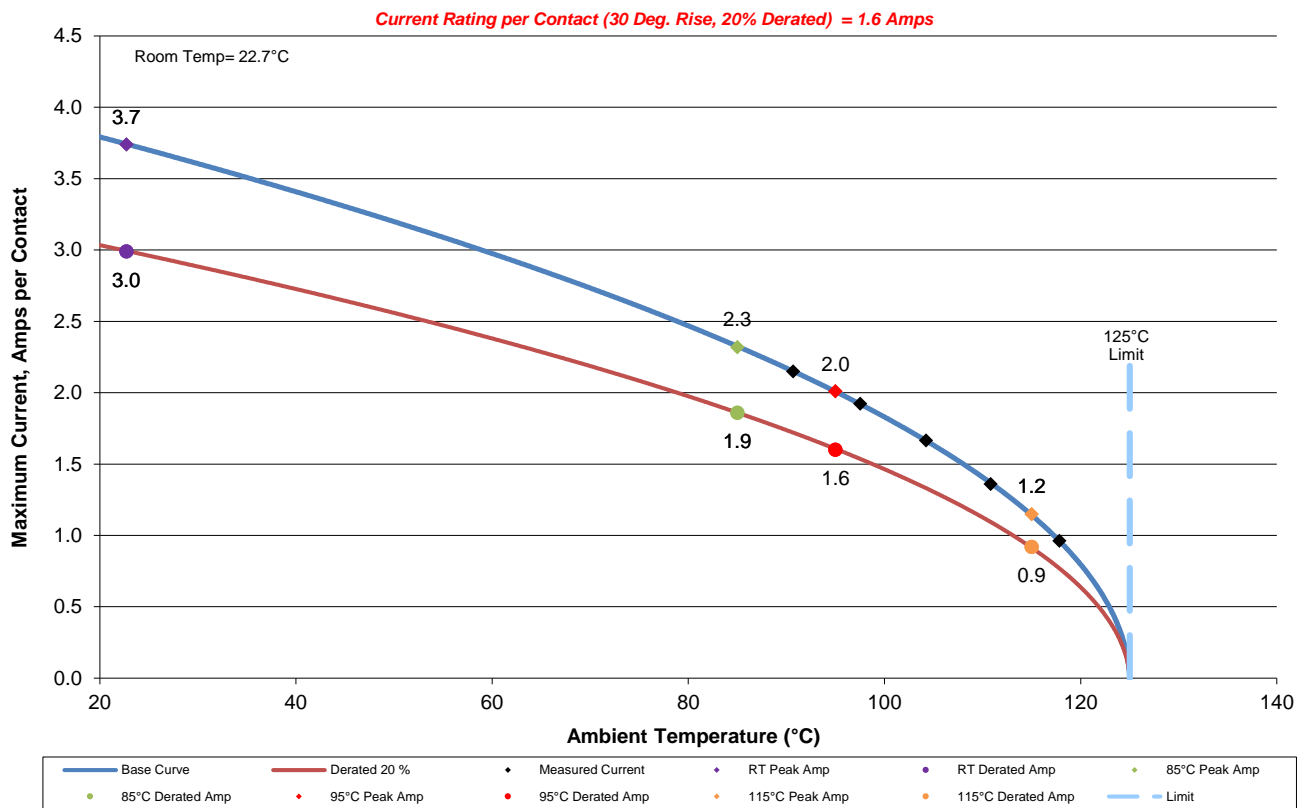
TEMPERATURE RISE (Current Carrying Capacity, CCC):

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

Signal Pin

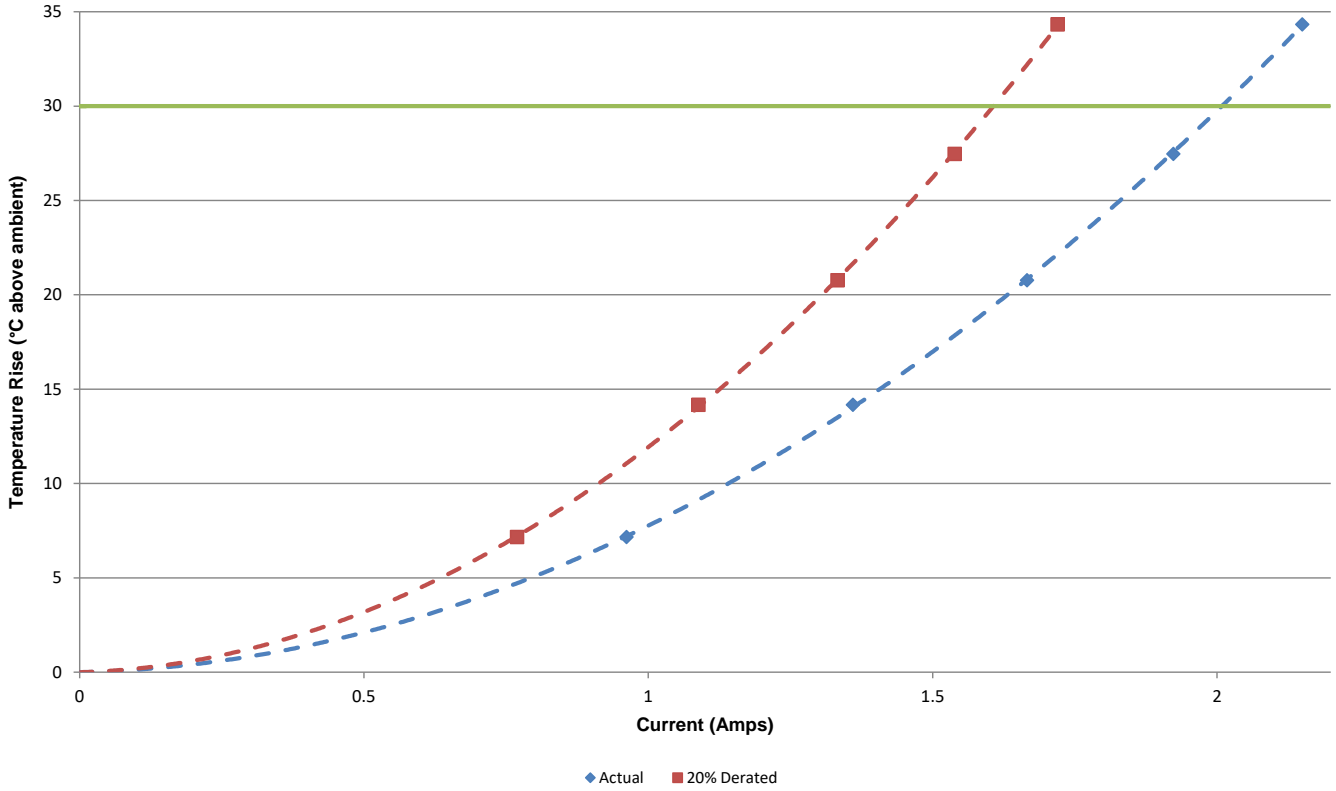
- a. Linear configuration with 2 adjacent conductors/contacts powered.

CR-1091303
2 (2X1) Contacts in Series
Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



DATA SUMMARIES Continued

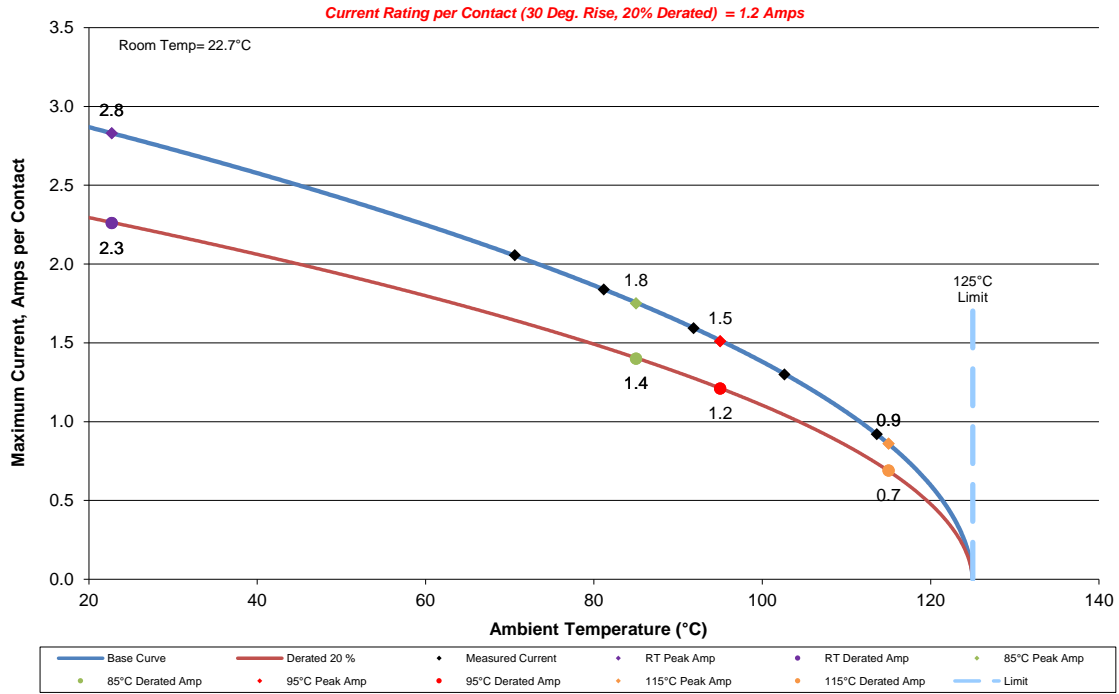
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Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



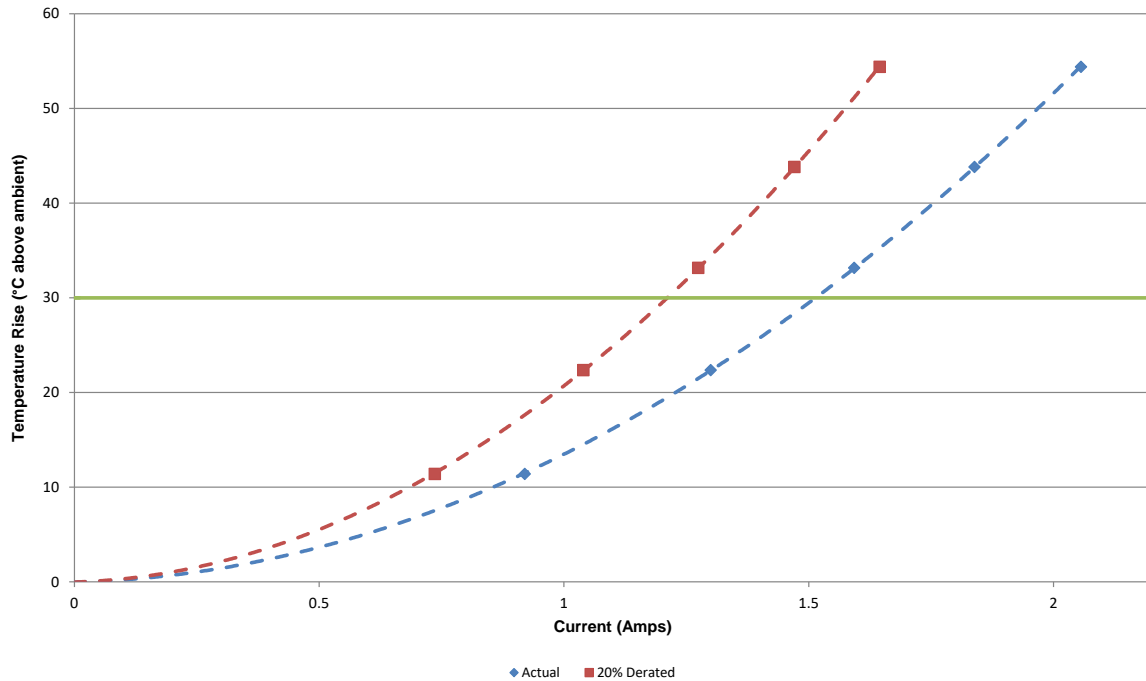
DATA SUMMARIES Continued

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

CR-1091303
 4 (2X2) Contacts in Series
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



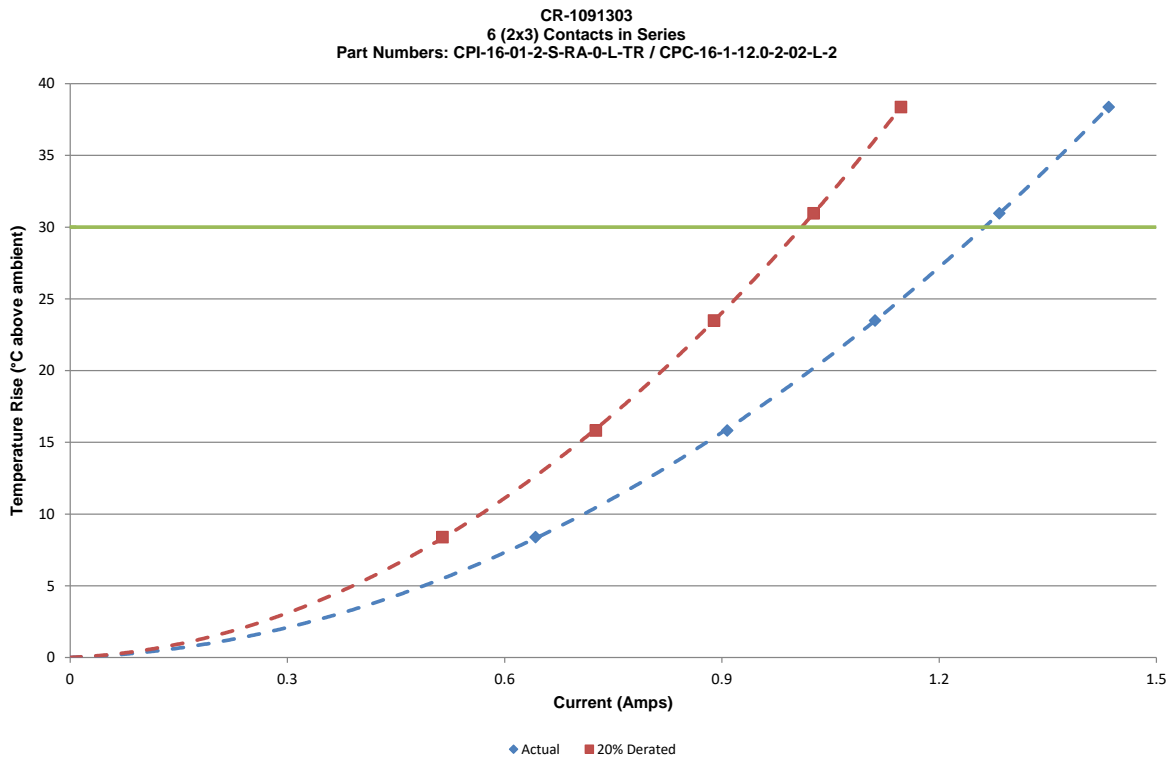
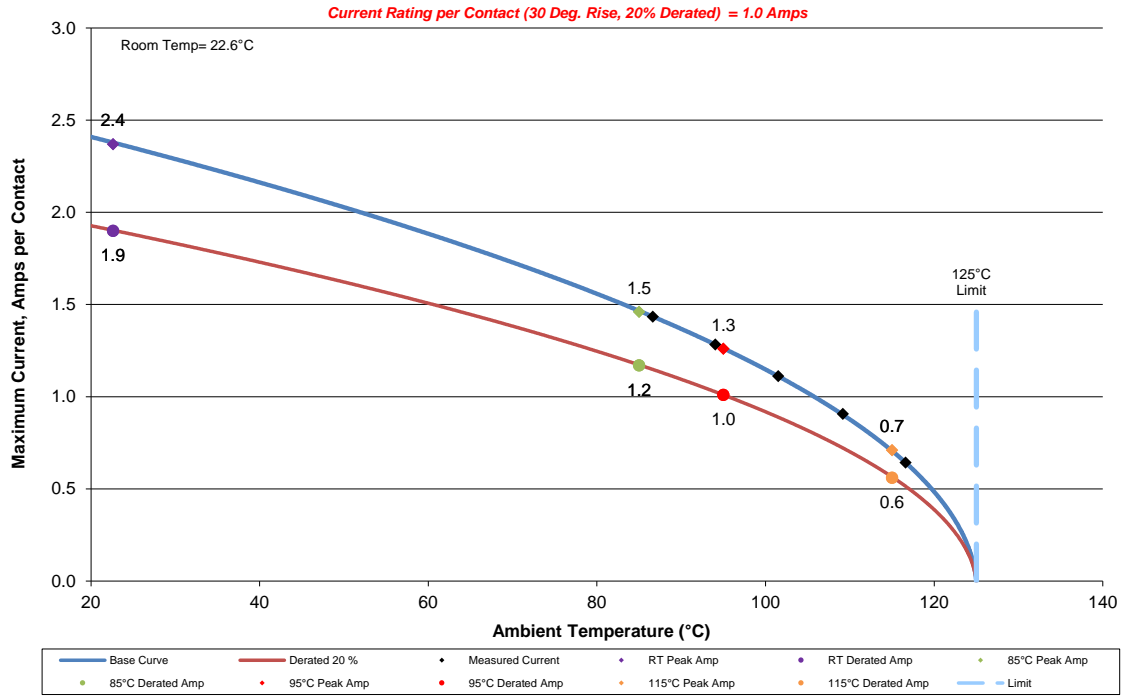
CR-1091303
 4 (2x2) Contacts in Series
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



DATA SUMMARIES Continued

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

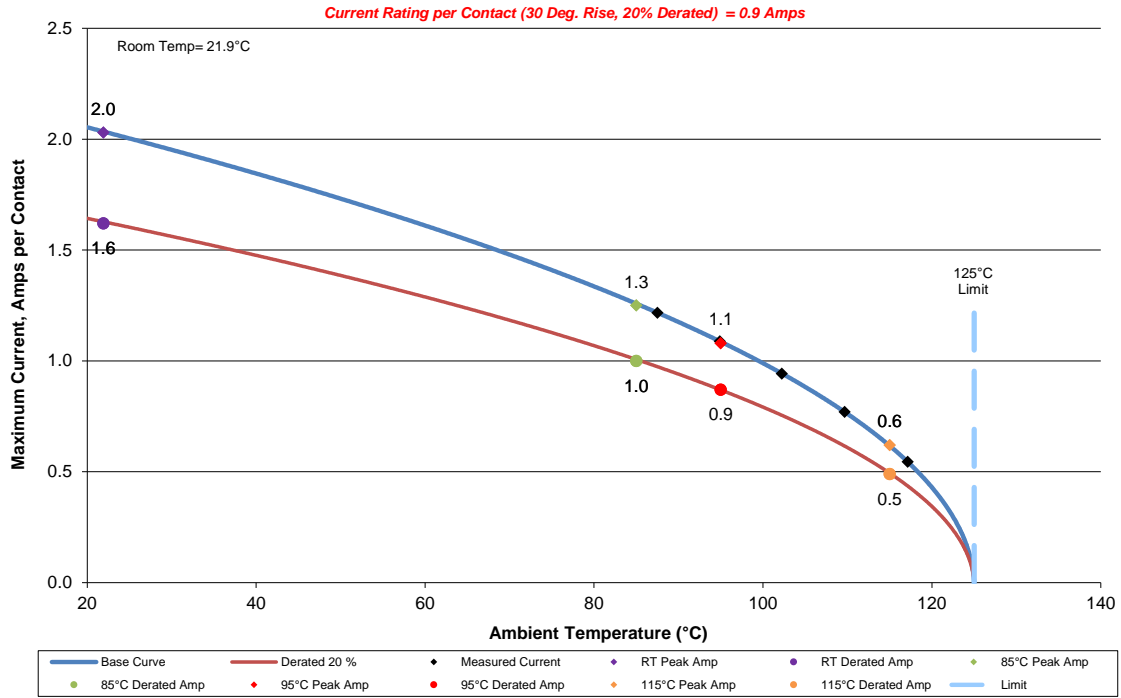
CR-1091303
6 (2X3) Contacts in Series
Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



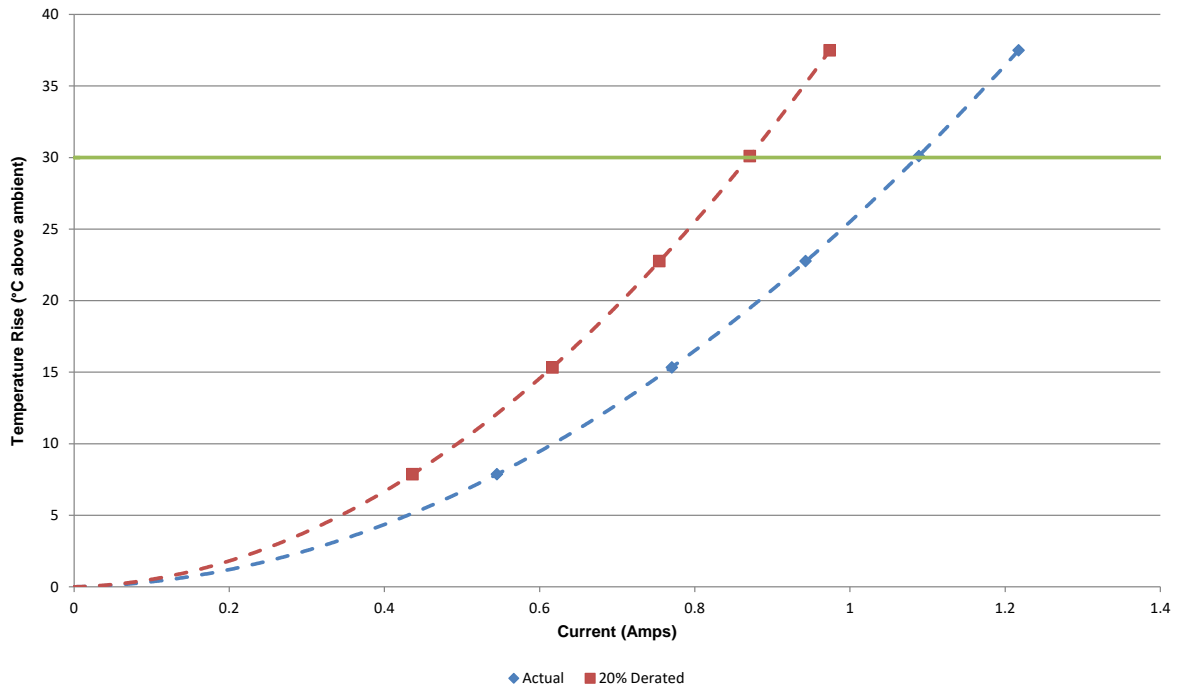
DATA SUMMARIES Continued

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

CR-1091303
 8 (2x4) Contacts in Series
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



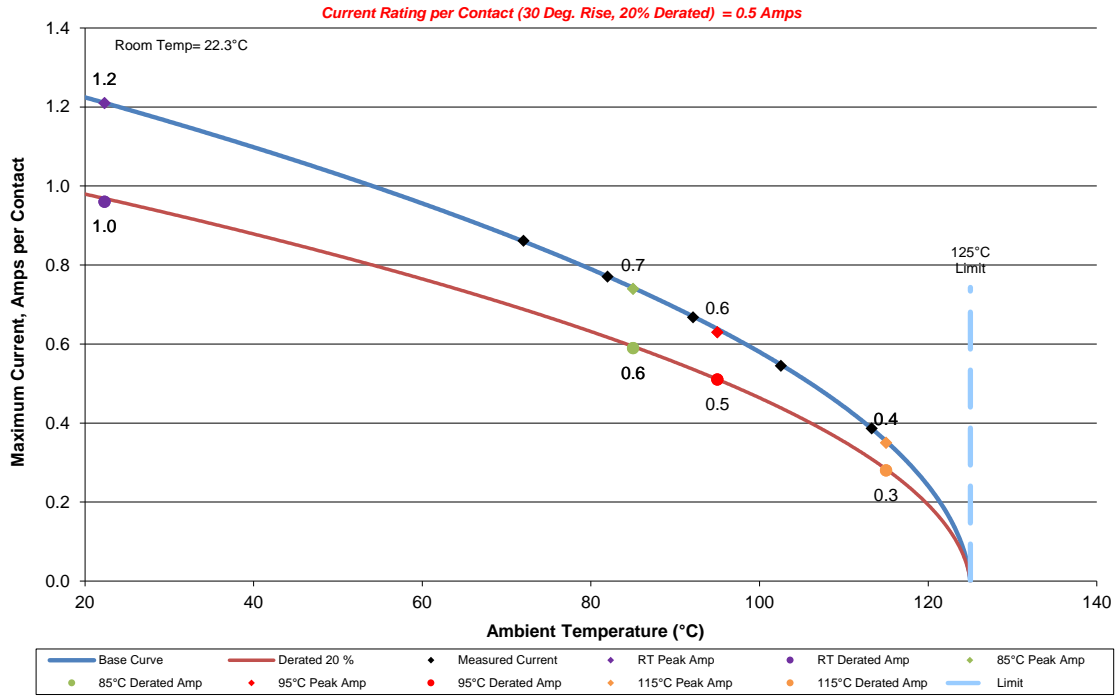
CR-1091303
 8 (2x4) Contacts in Series
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



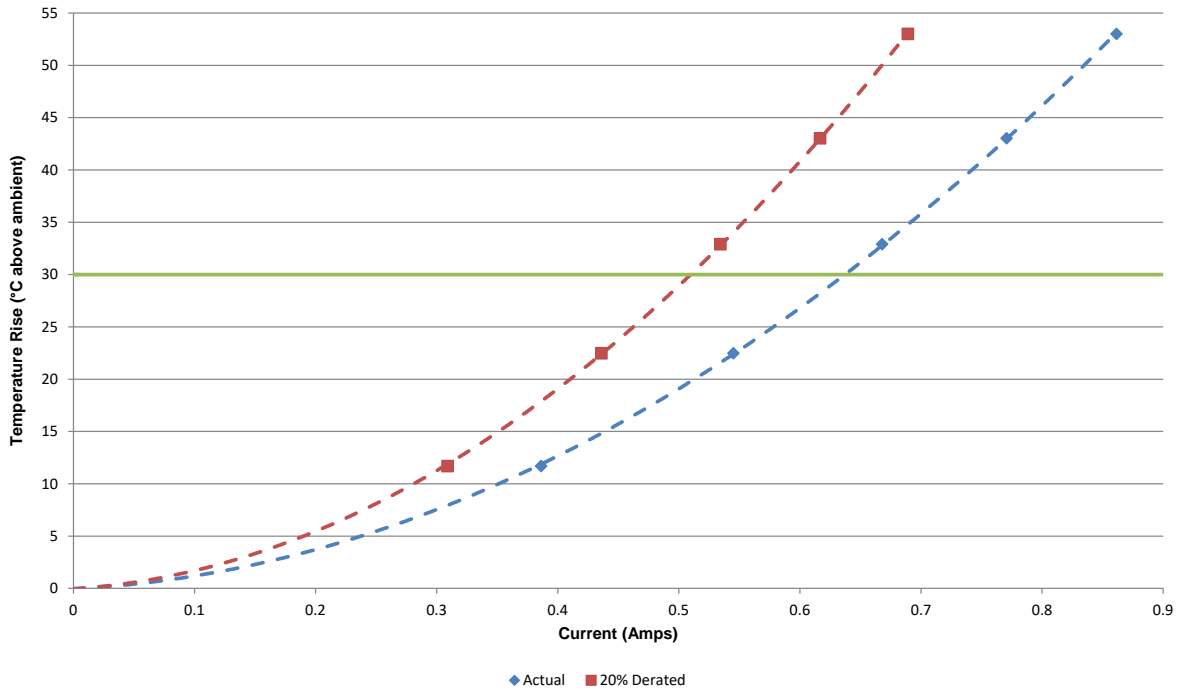
DATA SUMMARIES Continued

e. Linear configuration with All adjacent conductors/contacts powered.

CR-1091303
 32 (2X16)(All Power) Contacts in Series
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



CR-1091303
 32 (2x16)(All Power) Contacts in Series
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2

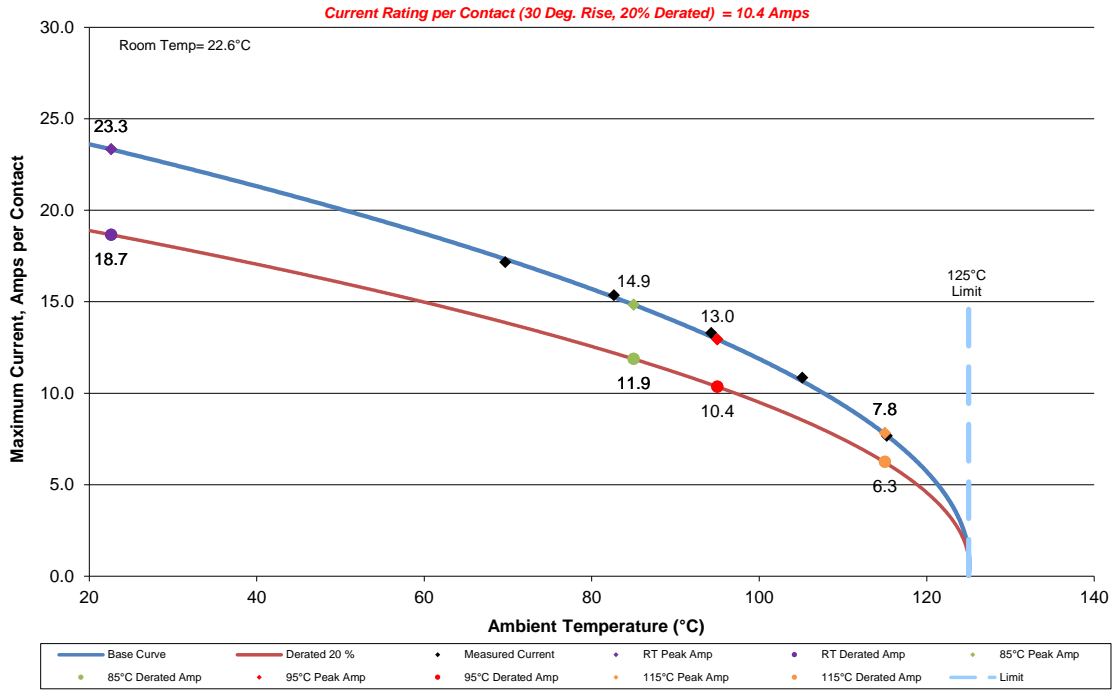


DATA SUMMARIES Continued

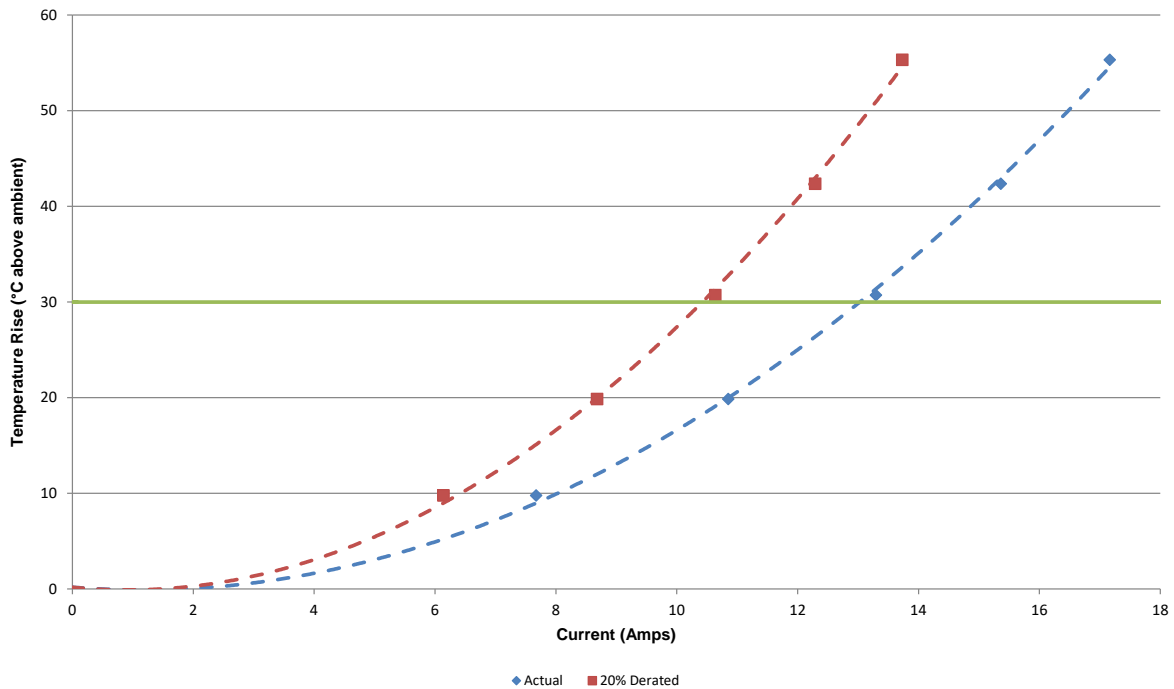
Ground Pin

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

CR-1091303
 2 (2X1)(Ground) Contacts in Series
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



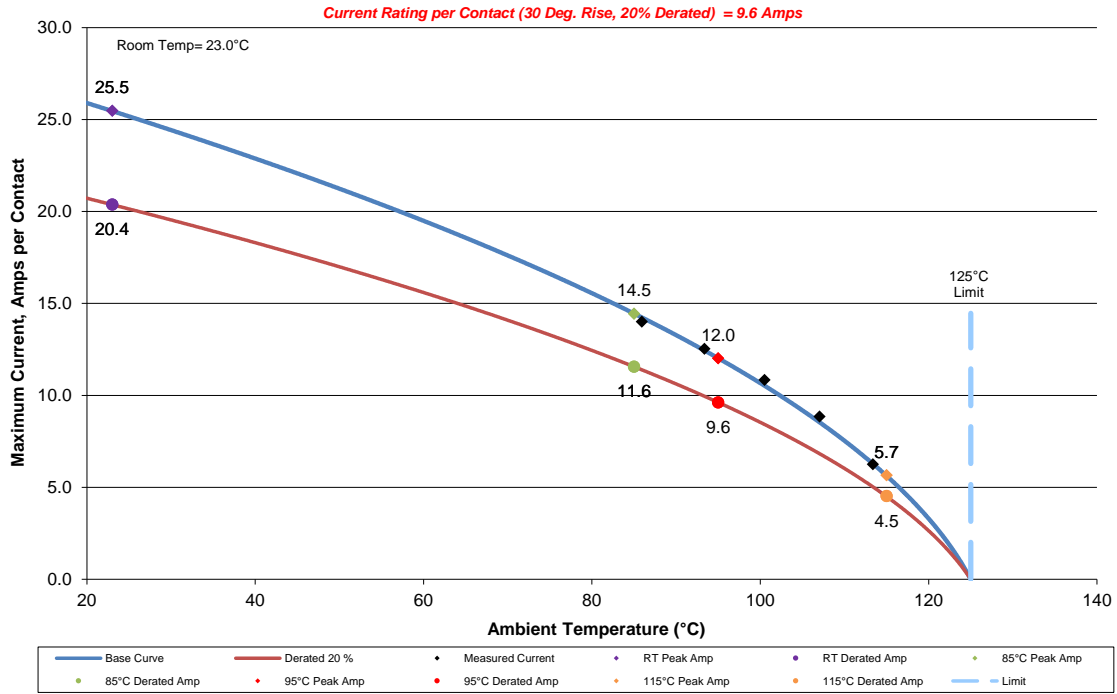
CR-1091303
 2 (2x1)(Ground) Contacts in Series
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



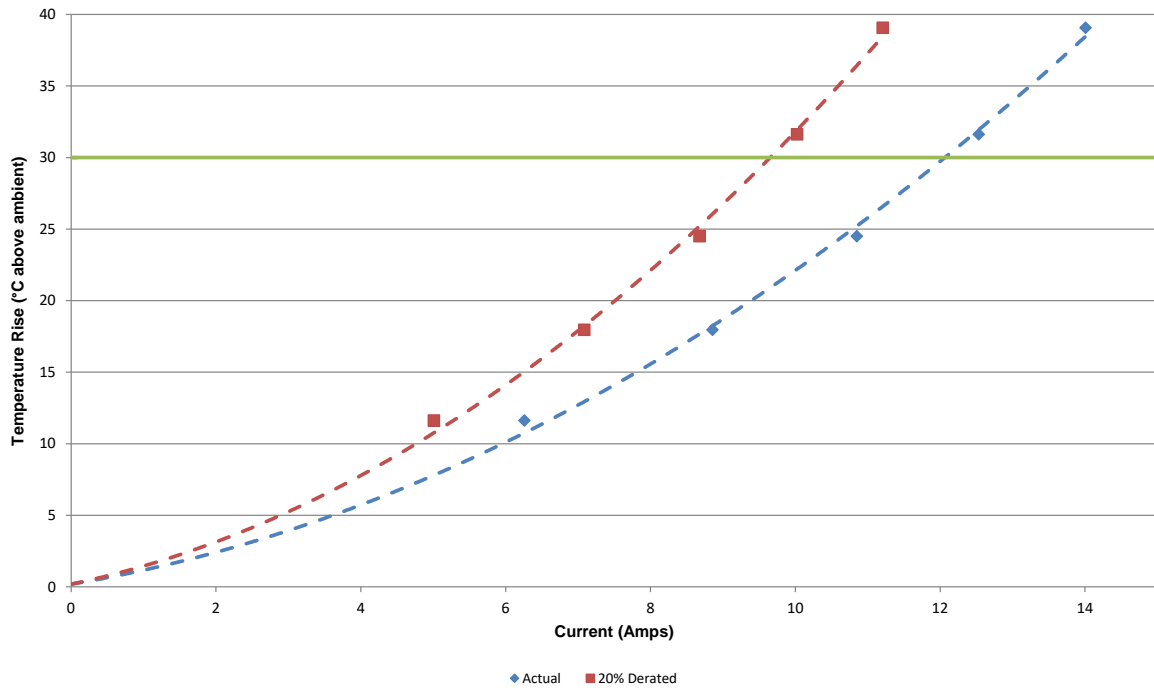
DATA SUMMARIES Continued

g. All power positions with signal @1/2 rated current.

CR-1091303
 2 (2X1)(Ground) Contacts in Series (Signals Powered at 1/2 Rated Current)
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



CR-1091303
 2 (2x1)(Ground) Contacts in Series (Signals Powered at 1/2 Rated Current)
 Part Numbers: CPI-16-01-2-S-RA-0-L-TR / CPC-16-1-12.0-2-02-L-2



DATA SUMMARIES**MATING/UNMATING:****Mating/Unmating Durability Group**

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	10.36	2.33	9.16	2.06	10.72	2.41	9.74	2.19
Maximum	13.66	3.07	12.50	2.81	12.81	2.88	12.59	2.83
Average	11.55	2.60	10.90	2.45	11.88	2.67	11.34	2.55
St Dev	1.13	0.25	1.21	0.27	0.77	0.17	1.01	0.23
Count	8	8	8	8	8	8	8	8

	After Humidity			
	Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	10.01	2.25	9.30	2.09
Maximum	14.19	3.19	12.23	2.75
Average	11.78	2.65	10.84	2.44
St Dev	1.51	0.34	1.02	0.23
Count	8	8	8	8

Cable Pull Force:**0° Pull**

	Force (lbs)
Minimum	31.04
Maximum	32.34
Average	31.55

90° Pull

	Force (lbs)
Minimum	8.33
Maximum	10.07
Average	9.25

CPI-16-01-2-S-RA-0-L-TR/CPC-16-1-XX.X-L-2**0° Pull**

	Force (lbs)
Minimum	5.70
Maximum	22.21
Average	14.94

90° Pull-Lateral

	Force (lbs)
Minimum	10.01
Maximum	11.72
Average	10.86

DATA SUMMARIES Continued

90° Pull-Transverse

	Force (lbs)
Minimum	10.30
Maximum	16.81
Average	13.60

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

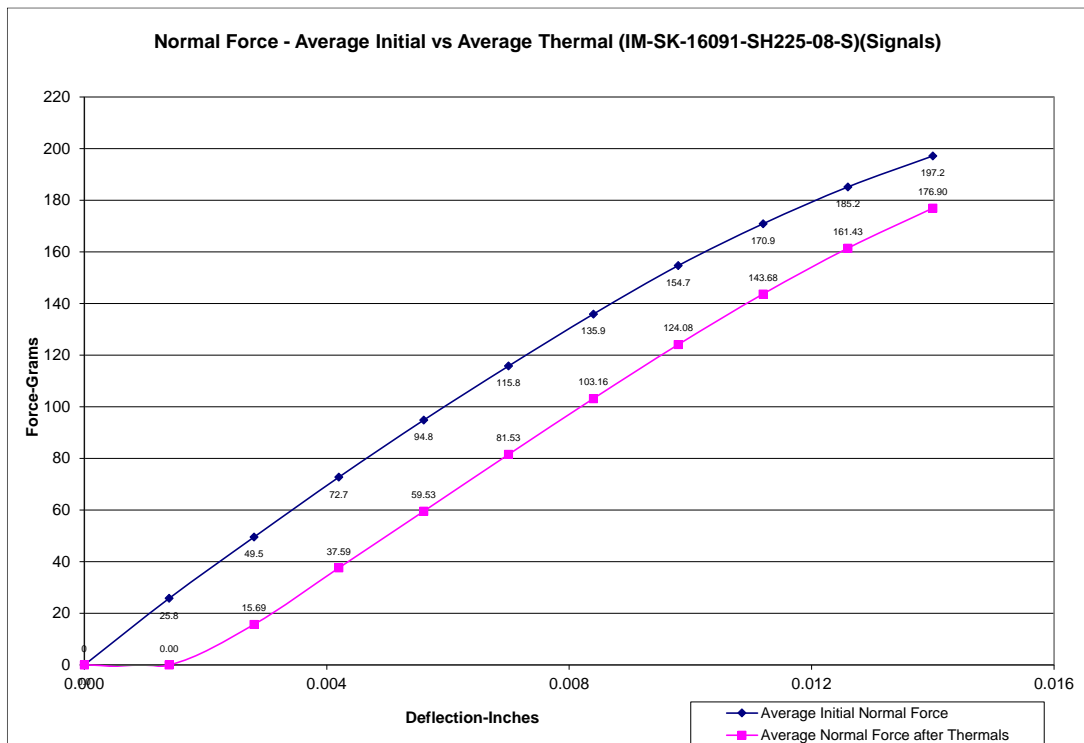
- 1) Calibrated force gauges are used along with computer-controlled positioning equipment.
- 2) For Normal force 8-10 measurements are taken and the averages reported.

IM

Signal Pin:

Initial	Deflections in inches Forces in Grams										
	<u>0.0014</u>	<u>0.0028</u>	<u>0.0042</u>	<u>0.0056</u>	<u>0.0070</u>	<u>0.0084</u>	<u>0.0098</u>	<u>0.0112</u>	<u>0.0126</u>	<u>0.0140</u>	<i>SET</i>
Averages	25.80	49.53	72.74	94.84	115.78	135.91	154.68	170.89	185.16	197.15	0.0010
Min	22.80	45.30	67.20	88.30	108.30	127.80	146.30	162.30	177.30	190.60	0.0008
Max	27.40	52.40	78.20	102.10	124.40	145.60	164.90	181.10	195.00	207.50	0.0015
St. Dev	1.684	2.663	3.711	4.543	5.139	5.739	5.853	5.879	5.648	5.525	0.0002
Count	8	8	8	8	8	8	8	8	8	8	8

After Thermals	Deflections in inches Forces in Grams										
	<u>0.0014</u>	<u>0.0028</u>	<u>0.0042</u>	<u>0.0056</u>	<u>0.0070</u>	<u>0.0084</u>	<u>0.0098</u>	<u>0.0112</u>	<u>0.0126</u>	<u>0.0140</u>	<i>SET</i>
Averages	0.00	15.69	37.59	59.53	81.53	103.16	124.08	143.68	161.43	176.90	0.0023
Min	0.00	9.70	29.30	51.00	72.30	92.90	114.00	133.40	151.60	167.80	0.0019
Max	0.00	19.90	42.60	65.30	89.00	113.00	135.00	155.10	174.30	190.10	0.0026
St. Dev	0.000	3.456	5.019	5.701	6.648	7.582	7.858	7.820	7.943	7.650	0.0002
Count	8	8	8	8	8	8	8	8	8	8	8



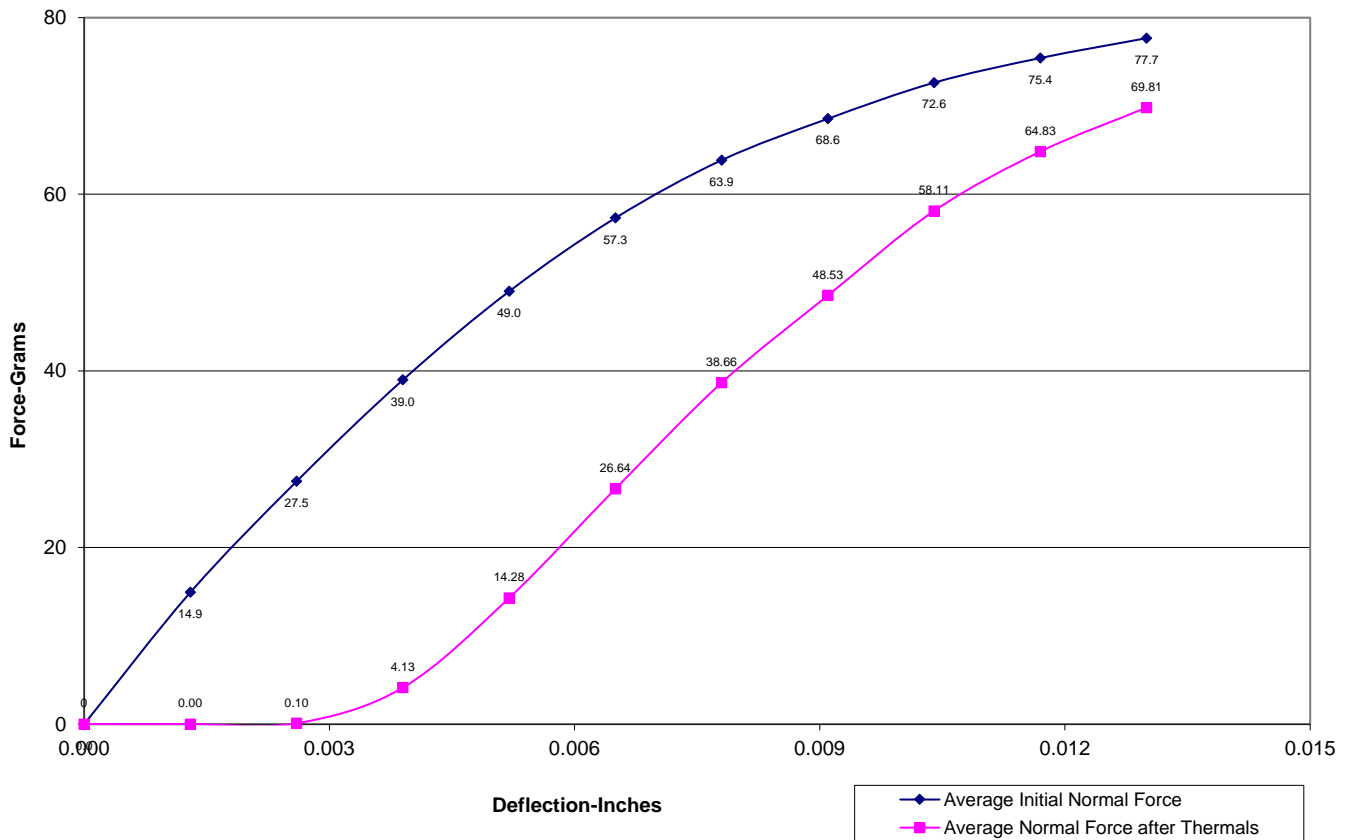
DATA SUMMARIES Continued

**IM
Ground Pin**

Initial	Deflections in inches Forces in Grams										
	<u>0.0013</u>	<u>0.0026</u>	<u>0.0039</u>	<u>0.0052</u>	<u>0.0065</u>	<u>0.0078</u>	<u>0.0091</u>	<u>0.0104</u>	<u>0.0117</u>	<u>0.0130</u>	<i>SET</i>
Averages	14.93	27.50	38.98	49.01	57.32	63.87	68.56	72.64	75.43	77.68	0.0047
Min	13.80	25.80	36.70	46.40	54.10	60.20	64.90	69.60	72.40	74.20	0.0043
Max	15.60	28.70	41.30	51.60	60.30	66.90	71.70	75.50	78.40	80.80	0.0049
St. Dev	0.584	0.999	1.384	1.642	1.961	2.127	2.106	1.976	2.009	1.929	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	<u>0.0013</u>	<u>0.0026</u>	<u>0.0039</u>	<u>0.0052</u>	<u>0.0065</u>	<u>0.0078</u>	<u>0.0091</u>	<u>0.0104</u>	<u>0.0117</u>	<u>0.0130</u>	<i>SET</i>
Averages	0.00	0.10	4.13	14.28	26.64	38.66	48.53	58.11	64.83	69.81	0.0057
Min	0.00	0.00	0.00	0.00	10.30	23.40	35.00	47.20	56.30	63.30	0.0054
Max	0.00	1.20	14.40	28.30	41.00	52.00	60.20	66.90	72.00	76.10	0.0065
St. Dev	0.000	0.346	5.265	8.332	8.620	8.076	6.964	5.409	4.236	3.365	0.0003
Count	12	12	12	12	12	12	12	12	12	12	12

Normal Force - Average Initial vs Average Thermal (IM-SK-16091-SH225-08-S)(Grounds)



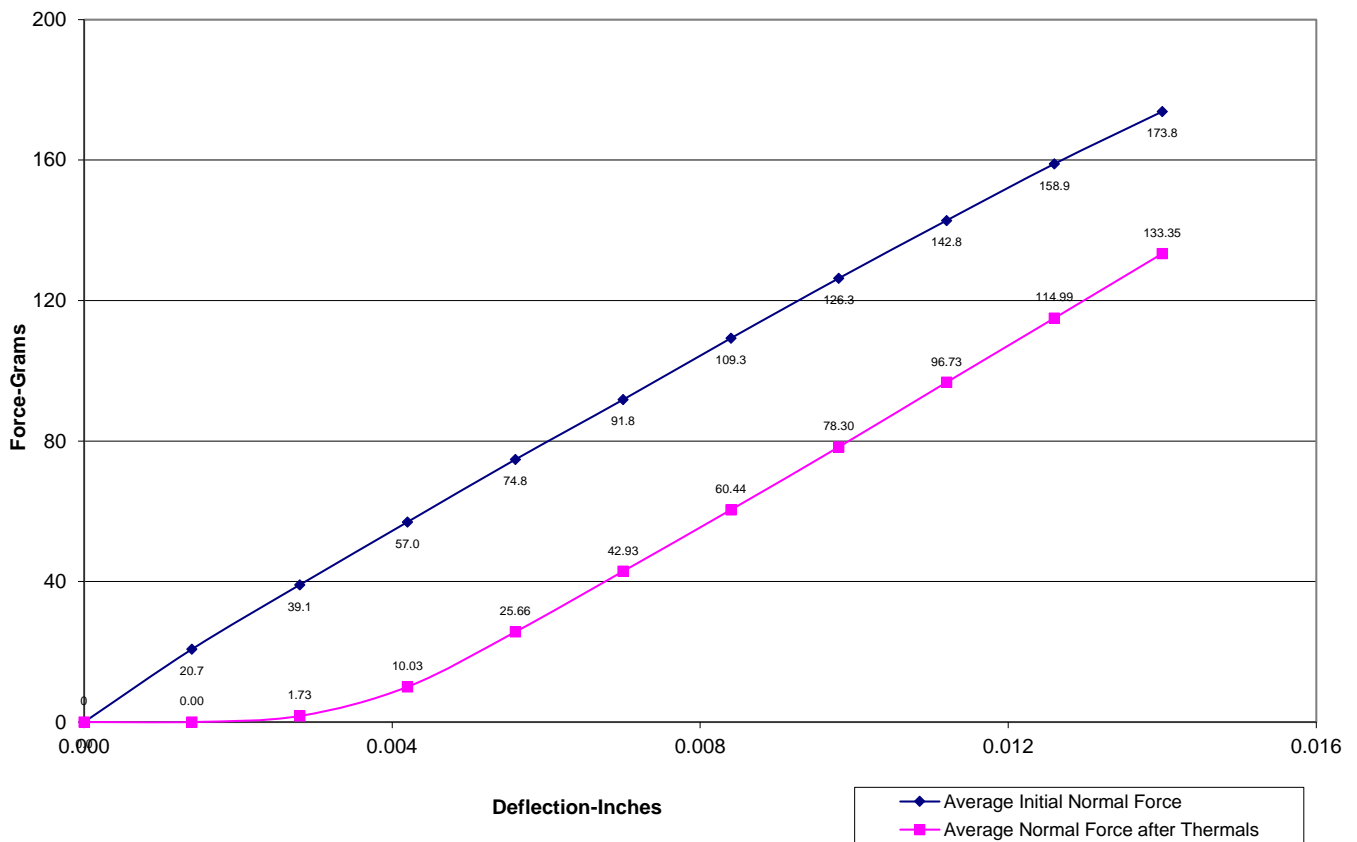
DATA SUMMARIES Continued

**OM
Signal Pin**

Initial	Deflections in inches Forces in Grams										
	<u>0.0014</u>	<u>0.0028</u>	<u>0.0042</u>	<u>0.0056</u>	<u>0.0070</u>	<u>0.0084</u>	<u>0.0098</u>	<u>0.0112</u>	<u>0.0126</u>	<u>0.0140</u>	<i>SET</i>
Averages	20.74	39.06	56.96	74.75	91.80	109.29	126.34	142.80	158.93	173.80	0.0005
Min	16.80	34.10	50.60	67.40	83.60	101.50	119.00	134.70	150.70	165.30	0.0004
Max	24.30	43.50	63.20	82.60	100.80	118.60	136.00	152.90	169.20	183.80	0.0007
St. Dev	2.245	2.892	3.894	4.919	5.879	6.364	6.603	7.217	7.279	6.814	0.0001
Count	8	8	8	8	8	8	8	8	8	8	8

After Thermals	Deflections in inches Forces in Grams										
	<u>0.0014</u>	<u>0.0028</u>	<u>0.0042</u>	<u>0.0056</u>	<u>0.0070</u>	<u>0.0084</u>	<u>0.0098</u>	<u>0.0112</u>	<u>0.0126</u>	<u>0.0140</u>	<i>SET</i>
Averages	0.00	1.73	10.03	25.66	42.93	60.44	78.30	96.73	114.99	133.35	0.0037
Min	0.00	0.00	0.00	6.70	23.10	39.90	56.70	74.30	92.60	111.20	0.0025
Max	0.00	8.30	24.40	44.40	63.00	81.20	99.90	119.40	136.80	153.80	0.0051
St. Dev	0.000	3.281	9.763	13.071	13.597	13.964	14.308	14.618	14.344	13.792	0.0009
Count	8	8	8	8	8	8	8	8	8	8	8

Normal Force - Average Initial vs Average Thermal (OM-SK-16090-SH224-08-S)(Signals)



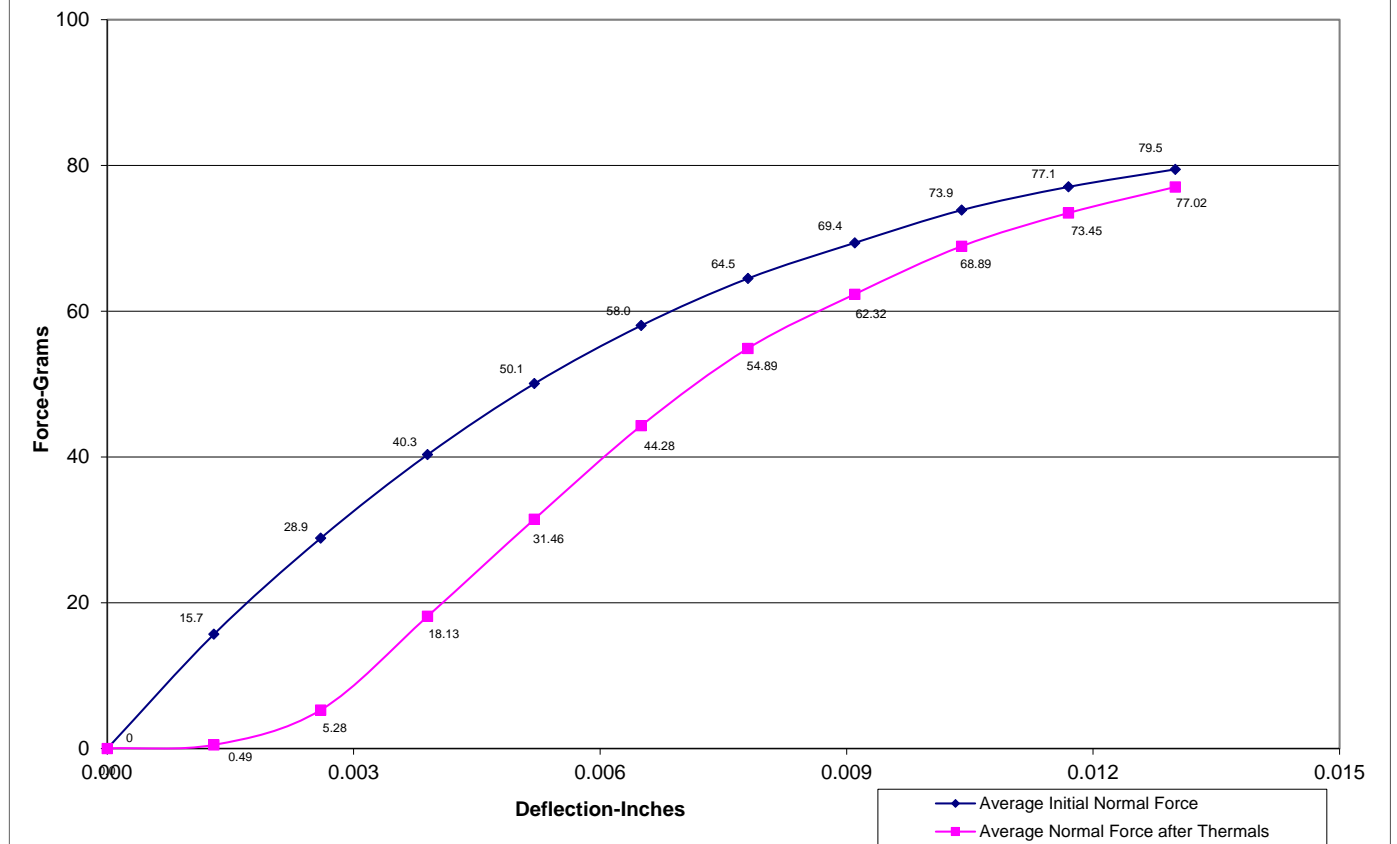
DATA SUMMARIES Continued

**OM
Ground Pin**

Initial	Deflections in inches Forces in Grams										
	<u>0.0013</u>	<u>0.0026</u>	<u>0.0039</u>	<u>0.0052</u>	<u>0.0065</u>	<u>0.0078</u>	<u>0.0091</u>	<u>0.0104</u>	<u>0.0117</u>	<u>0.0130</u>	<i>SET</i>
Averages	15.69	28.88	40.33	50.07	58.03	64.49	69.38	73.87	77.05	79.46	0.0050
Min	15.00	27.90	38.80	48.30	56.30	63.00	67.70	72.00	75.20	77.10	0.0048
Max	16.30	29.90	42.10	52.90	61.30	67.90	72.70	76.50	79.40	81.40	0.0054
St. Dev	0.394	0.734	1.159	1.371	1.459	1.473	1.441	1.298	1.337	1.339	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	<u>0.0013</u>	<u>0.0026</u>	<u>0.0039</u>	<u>0.0052</u>	<u>0.0065</u>	<u>0.0078</u>	<u>0.0091</u>	<u>0.0104</u>	<u>0.0117</u>	<u>0.0130</u>	<i>SET</i>
Averages	0.49	5.28	18.13	31.46	44.28	54.89	62.32	68.89	73.45	77.02	0.0053
Min	0.00	0.00	6.60	20.00	33.90	47.50	57.20	65.60	70.90	74.90	0.0049
Max	5.90	19.10	32.10	45.00	56.90	65.00	70.00	74.50	77.70	79.90	0.0056
St. Dev	1.703	5.706	6.709	6.476	5.927	4.595	3.520	2.579	2.070	1.590	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

Normal Force - Average Initial vs Average Thermal (OM-SK-16091-SH224-08-S)(Grounds)



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

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	CPI/CPC	CPI	CPC
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	5600	9400	10100

	Row to Row		
	Mated	Unmated	Unmated
Minimum	CPI/CPC	CPI	CPC
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	CPI/CPC	CPI	CPC
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	5400	21100	9700

	Ground to Closest Metallic Hardware		
	Mated	Unmated	Unmated
Minimum	CPI/CPC	CPI	CPC
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

DATA SUMMARIES Continued**DIELECTRIC WITHSTANDING VOLTAGE (DWV):**

Voltage Rating Summary	
Minimum	CPI/CPC
Break Down Voltage	484
Test Voltage	363
Working Voltage	121

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

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

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

Ground to Closest Metallic Hardware	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

DATA SUMMARIES Continued**Cable Flex:****Insulation Resistance minimums, IR**

Pin to Pin	
Mated	
Minimum	
Initial	45000
After 500 Flex Cycles	9200

Row to Row	
Mated	
Minimum	
Initial	45000
After 500 Flex Cycles	45000

Pin to Ground	
Mated	
Minimum	
Initial	45000
After 500 Flex Cycles	45000

Dielectric Withstanding Voltage minimums, DWV

Voltage Rating Summary	
Minimum	CPC\CPI
Test Voltage	500

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

Row to Row	
Initial Test Voltage	Passed
After 500 Flex Cycles Test Voltage	Passed

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

DATA SUMMARIES Continued**Cable Flex:**

CPI-16-01-2-S-RA-0-L-TR/CPC-16-1-XX.X-L-2

Insulation Resistance minimums, IR

Pin to Pin	
Mated	
Minimum	
Initial	25400
After 100 Flex Cycles	45000

Row to Row	
Mated	
Minimum	
Initial	45000
After 100 Flex Cycles	45000

Pin to Ground	
Mated	
Minimum	
Initial	2880
After 100 Flex Cycles	45000

Ground to Closest Metallic Hardware	
Mated	
Minimum	
Initial	5300
After 100 Flex Cycles	45000

Dielectric Withstanding Voltage minimums, DWV

Voltage Rating Summary	
Minimum	
Break Down Voltage	667
Test Voltage	500
Working Voltage	167

Pin to Pin	
Initial Test Voltage	Passed
After 100 Flex Cycles Test Voltage	Passed

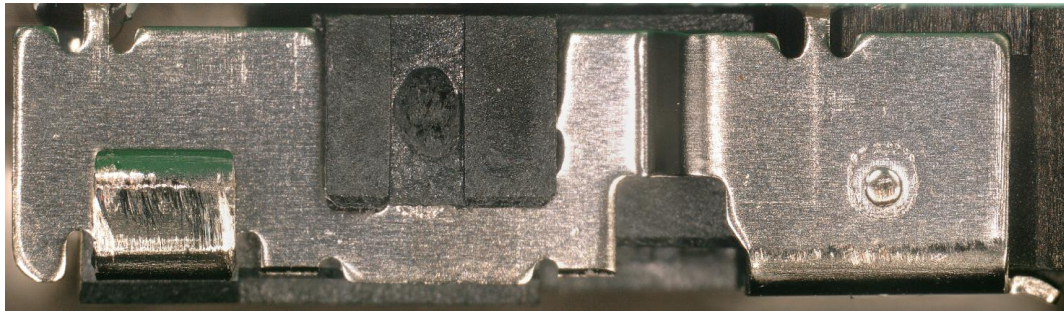
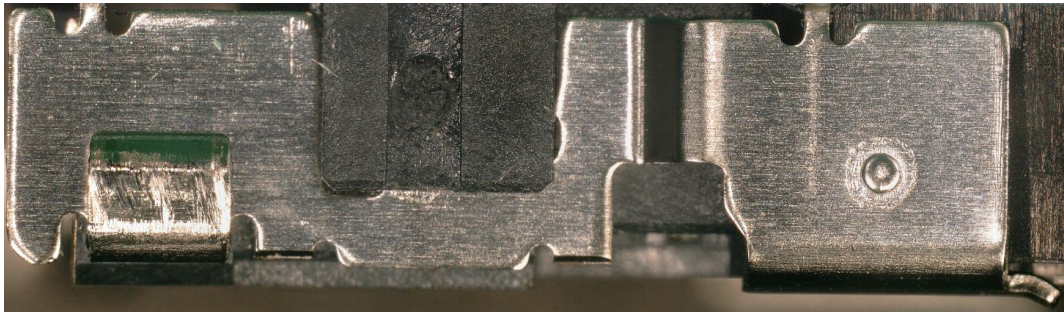
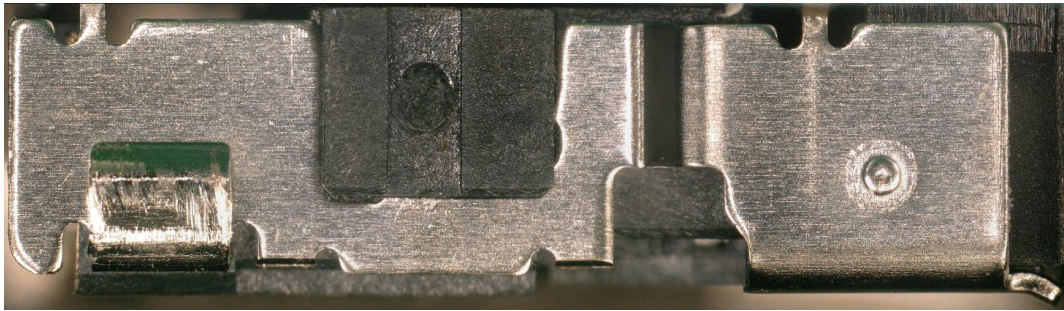
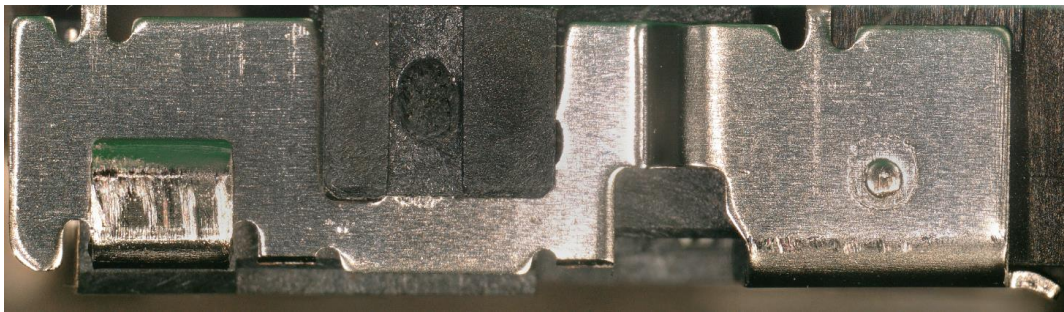
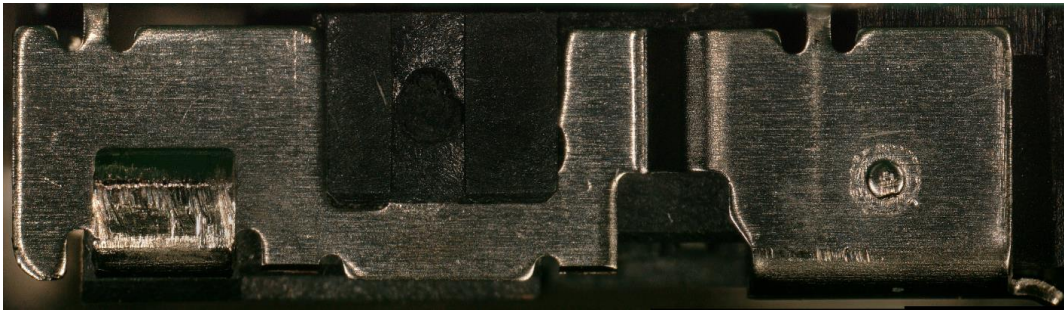
Row to Row	
Initial Test Voltage	Passed
After 100 Flex Cycles Test Voltage	Passed

Pin to Ground	
Initial Test Voltage	Passed
After 100 Flex Cycles Test Voltage	Passed

Ground to Closest Metallic Hardware	
Initial Test Voltage	Passed
After 100 Flex Cycles Test Voltage	Passed

DATA SUMMARIES Continued

Latch Durability



DATA SUMMARIES Continued

LLCR Gas Tight:

- 1) A total of 256 signal and 16 ground points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - a. $\leq +5.0$ mOhms: ----- Stable
 - b. $+5.1$ to $+10.0$ mOhms: ----- Minor
 - c. $+10.1$ to $+15.0$ mOhms: ----- Acceptable
 - d. $+15.1$ to $+50.0$ mOhms: ----- Marginal
 - e. $+50.1$ to $+1000$ mOhms: ----- Unstable
 - f. $>+1000$ mOhms: ----- Open Failure

LLCR Measurement Summaries by Pin Type			
Date	2024/7/5	2024/7/5	
Room Temp (Deg C)	22	22	
Rel Humidity (%)	53	53	
Technician	Tony Wagoner	Tony Wagoner	
mOhm values	Actual	Delta	
	Initial	Acid Vapor	
Pin Type: Signal 1			
Average	166.05	1.01	
St. Dev.	2.53	1.09	
Min	160.56	0.01	
Max	181.61	9.61	
Summary Count	256	256	
Total Count	256	256	
Pin Type: GND 1			
Average	9.72	0.24	
St. Dev.	0.47	0.18	
Min	8.87	0.02	
Max	10.42	0.71	
Summary Count	16	16	
Total Count	16	16	

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	269	3	0	0	0	0

DATA SUMMARIES Continued

LLCR Thermal Aging Group

- 1) A total of 256 signal and 16 ground points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - a. $\leq +5.0$ mOhms:-----Stable
 - b. $+5.1$ to $+10.0$ mOhms:-----Minor
 - c. $+10.1$ to $+15.0$ mOhms:-----Acceptable
 - d. $+15.1$ to $+50.0$ mOhms:-----Marginal
 - e. $+50.1$ to $+1000$ mOhms-----Unstable
 - f. $>+1000$ mOhms:-----Open Failure

LLCR Measurement Summaries by Pin Type				
Date	2024/5/23	2024/6/4		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	55	53		
Technician	Tony Wagoner	Matthew Gramlin		
mOhm values	Actual	Delta		
	Initial	Thermal		
Pin Type: Signal 1				
Average	166.13	1.56		
St. Dev.	2.21	1.46		
Min	160.36	0.02		
Max	171.33	9.08		
Summary Count	256	256		
Total Count	256	256		
Pin Type: GND 1				
Average	9.51	0.36		
St. Dev.	0.47	0.25		
Min	8.56	0.06		
Max	10.26	0.91		
Summary Count	16	16		
Total Count	16	16		

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	263	9	0	0	0	0

DATA SUMMARIES Continued

LLCR Durability:

- 1) A total of 256 signal and 16 ground points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - a. $\leq +5.0$ mOhms: ----- Stable
 - b. $+5.1$ to $+10.0$ mOhms: ----- Minor
 - c. $+10.1$ to $+15.0$ mOhms: ----- Acceptable
 - d. $+15.1$ to $+50.0$ mOhms: ----- Marginal
 - e. $+50.1$ to $+1000$ mOhms ----- Unstable
 - f. $>+1000$ mOhms: ----- Open Failure

LLCR Measurement Summaries by Pin Type				
Date	7/25/2025	7/29/2025	2025/8/4	2025/8/18
Room Temp (Deg C)	25	25	25	26
Rel Humidity (%)	56	56	56	55
Technician	Kason He	Kason He	Kason He	Kason He
mOhm values				
	Actual	Delta	Delta	Delta
	Initial	25 Cycles	Ther Shock	Humidity
Pin Type: Signal				
Average	333.0	7.3	6.5	4.1
St. Dev.	3.4	2.6	3.0	2.6
Min	325.9	0.2	0	0
Max	342.5	13.50	14.10	11.60
Summary Count	256	256	256	256
Total Count	256	256	256	256
Pin Type: Ground				
Average	17.65	0.27	0.34	1.78
St. Dev.	0.25	0.14	0.31	0.42
Min	17.22	0.05	0.02	1.26
Max	18.08	0.52	1.11	2.69
Summary Count	16	16	16	16
Total Count	16	16	16	16

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
25 Cycles	67	163	42	0	0	0
Ther Shock	94	146	32	0	0	0
Humidity	188	77	7	0	0	0

DATA SUMMARIES Continued

LLCR Shock & Vibration:

- 1). A total of 256 signals and 16 ground points were measured.
- 2). EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 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 $+1000$ mOhms ----- Unstable
 - f. $>+1000$ mOhms:----- Open Failure

LLCR Measurement Summaries by Pin Type		
Date	2025/7/29	8/8/2025
Room Temp (Deg C)	25	25
Rel Humidity (%)	56	56
Technician	Kason He	Kason He
mOhm values	Actual	Delta
	Initial	Shock Vib
Pin Type: Signal		
Average	332.1	3.3
St. Dev.	3.7	2.5
Min	324.3	0
Max	348.2	13.5
Summary Count	256	256
Total Count	256	256
Pin Type: Ground		
Average	17.41	2.30
St. Dev.	0.34	0.39
Min	16.78	0.04
Max	18.02	1.22
Summary Count	16	16
Total Count	16	16

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	225	43	4	0	0	0

Nanosecond Event Detection:

Shock and Vibration Event Detection Summary	
Contacts tested	64
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 #:** MO-11**Description:** Switch/Multimeter**Manufacturer:** Keithley**Model:** 3706**Serial #:** 120169**Accuracy:** See Manual

... Last Cal: 09/11/2025, Next Cal: 09/11/2026

Equipment #: TSC-01**Description:** Vertical Thermal Shock Chamber**Manufacturer:** Cincinnatti Sub Zero**Model:** VTS-3-6-6-SC/AC**Serial #:** 10-VT14993**Accuracy:** See Manual

... Last Cal: 06/30/2025, Next Cal: 06/30/2026

Equipment #: HPT-01**Description:** Hipot Safety Tester**Manufacturer:** Vitrek**Model:** V73**Serial #:** 019808**Accuracy:**

... Last Cal: 05/15/2025, Next Cal: 05/15/2026

Equipment #: HZ-TCT-01**Description:** Normal force analyzer**Manufacturer:** Mecmesin Multitester**Model:** Mecmesin Multitester 2.5-i**Serial #:** 08-1049-04**Accuracy:** Last Cal: 4/26/2025, Next Cal: 4/25/2026**Equipment #:** HZ-THC-01**Description:** Humidity transmitter**Manufacturer:** Thermtron**Model:** SM-8-8200**Serial #:** 38846**Accuracy:** Last Cal: 2/28/2025, Next Cal: 2/27/2026**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: 06/28/2025, Next Cal: 06/27/2026

Equipment #: HZ-MO-01**Description:** Micro-ohmmeter**Manufacturer:** Keithley**Model:** 2700**Serial #:** 1199807**Accuracy:** Last Cal: 04/28/2025, Next Cal: 04/28/2026

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** SVC-01**Description:** Shock & Vibration Table**Manufacturer:** Data Physics**Model:** LE-DSA-10-20K**Serial #:** 10037**Accuracy:** See Manual

... Last Cal: 04/22/2025, Next Cal: 04/22/2026

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

... Last Cal: 07/18/2025, Next Cal: 07/18/2026

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

... Last Cal: 10/31/2025, Next Cal: 10/31/2026