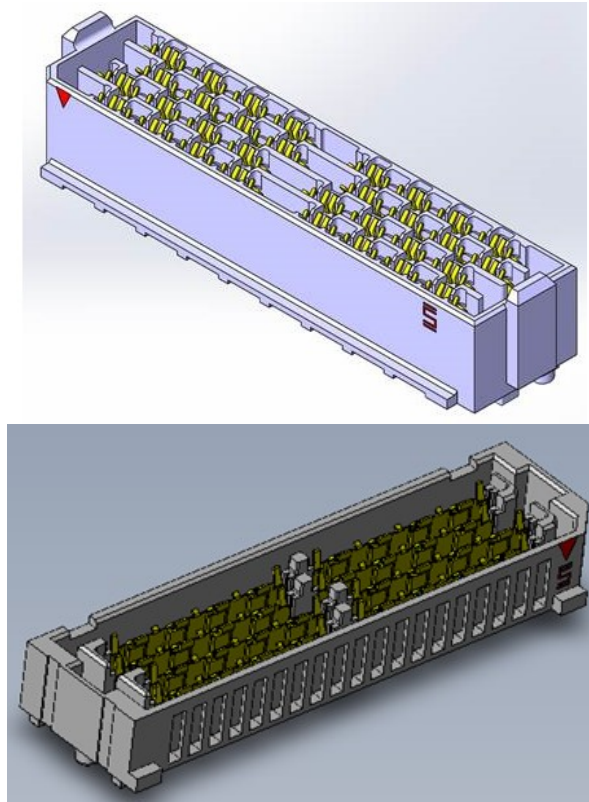




Project Number: Design Qualification Test Report	Tracking Code: 2752068_Report_Rev_1
Requested by: Andy Chen	Date: 6/16/2021
Part #: NVAF-DP-04-2-07.0-S-2/NVAM-DP-04-2-05.0-S-2	
Part description: NVAF/NVAM	Tech: Kason He and Peter Chen
Test Start: 4/1/2021	Test Completed: 5/12/2021



DESIGN QUALIFICATION TEST REPORT

NVAF/NVAM
NVAF-DP-04-2-07.0-S-2/NVAM-DP-04-2-05.0-S-2

Tracking Code:2752068_Report_Rev_1	Part #: NVAF-DP-04-2-07.0-S-2/NVAM-DP-04-2-05.0-S-2
Part description: NVAF/NVAM	

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
6/16/2021	1	Initial Issue	KH

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 TLWI-0001.
- 4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
- 5) The automated procedure is used with aqueous compatible soldering materials.
- 6) Parts not intended for testing LLCr and DWV/IR are visually inspected and cleaned if necessary.
- 7) Any additional preparation will be noted in the individual test sequences.
- 8) Solder Information: Lead free
- 9) Samtec Test PCBs used: PCB-108592-TST/PCB-108593-TST/PCB-110462-TST

FLOWCHARTS

Gas Tight

Group 1

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-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

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Contacts Minimum

NVAF Signal Without Thermals

Step	Description
1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Deflection = 0.0145 " Expected Force at Max Deflection = 97 g

Group 2

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Contacts Minimum

NVAF MFBL Ground Beam Without Thermals

Step	Description
1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Deflection = 0.018 " Expected Force at Max Deflection = 49 g

Group 3

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Contacts Minimum

NVAF Flanking Ground Beam Without Thermals

Step	Description
1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Deflection = 0.013 " Expected Force at Max Deflection = 83 g

Group 4

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Contacts Minimum

NVAF Center Ground Beam Without Thermals

Step	Description
1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Deflection = 0.011 " Expected Force at Max Deflection = 101 g

Group 5

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Contacts Minimum

NVAF Signal With Thermals

Step	Description
1.	Contact Gaps
2.	Thermal Age ⁽²⁾
3.	Contact Gaps
4.	Normal Force ⁽¹⁾ Deflection = 0.0145 " Expected Force at Max Deflection = 97 g

Group 6

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Contacts Minimum

NVAF MFBL Ground Beam With Thermals

Step	Description
1.	Contact Gaps
2.	Thermal Age ⁽²⁾
3.	Contact Gaps
4.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 49 g Deflection = 0.018 "

Group 7

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Contacts Minimum

NVAF Flanking Ground Beam With Thermals

Step	Description
1.	Contact Gaps
2.	Thermal Age ⁽²⁾
3.	Contact Gaps
4.	Normal Force ⁽¹⁾ Deflection = 0.013 " Expected Force at Max Deflection = 83 g

Group 8

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Contacts Minimum

NVAF Center Ground Beam With Thermals

Step	Description
1.	Contact Gaps
2.	Thermal Age ⁽²⁾
3.	Contact Gaps
4.	Normal Force ⁽¹⁾ Deflection = 0.011 " Expected Force at Max Deflection = 101 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**

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Assemblies

Step	Description
1.	Contact Gaps
2.	Mating/Unmating Force ⁽²⁾
3.	LLCR ⁽¹⁾
4.	Thermal Age ⁽³⁾
5.	LLCR ⁽¹⁾ Max Delta = 15 mOhm
6.	Mating/Unmating Force ⁽²⁾
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**Group 1

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

8 Assemblies

Group 2

NVAF-DP-03-2-07.0-S-2

NVAM-DP-03-2-05.0-S-2

8 Assemblies

Group 3

NVAF-DP-02-2-07.0-S-2

NVAM-DP-02-2-05.0-S-2

8 Assemblies

Group 4

NVAF-DP-02-1-07.0-S-2

NVAM-DP-02-1-05.0-S-2

8 Assemblies

Step	Description	Step	Description	Step	Description	Step	Description
1.	Contact Gaps	1.	Contact Gaps	1.	Contact Gaps	1.	Contact Gaps
2.	LLCR ⁽²⁾	2.	Mating/Unmating Force ⁽³⁾	2.	Mating/Unmating Force ⁽³⁾	2.	Mating/Unmating Force ⁽³⁾
3.	Mating/Unmating Force ⁽³⁾	3.	Cycles	3.	Cycles	3.	Cycles
4.	Cycles	4.	Quantity ■ 25 Cycles	4.	Quantity ■ 25 Cycles	4.	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**

<u>Group 1</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 2 Assemblies		<u>Group 2</u> NVAF-DP-04-2-07.0-S-2 2 Assemblies		<u>Group 3</u> NVAM-DP-04-2-05.0-S-2 2 Assemblies		<u>Group 4</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 2 Assemblies	
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)

Row-to-Row

<u>Group 5</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 2 Assemblies		<u>Group 6</u> NVAF-DP-04-2-07.0-S-2 2 Assemblies		<u>Group 7</u> NVAM-DP-04-2-05.0-S-2 2 Assemblies		<u>Group 8</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 2 Assemblies	
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)

Pin-to-Ground

<u>Group 9</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 2 Assemblies		<u>Group 10</u> NVAF-DP-04-2-07.0-S-2 2 Assemblies		<u>Group 11</u> NVAM-DP-04-2-05.0-S-2 2 Assemblies		<u>Group 12</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 2 Assemblies	
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

<u>Group 1</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 1 Pins Powered Signal		<u>Group 2</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 2 Pins Powered Signal		<u>Group 3</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 4 Pins Powered Signal		<u>Group 4</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 8 Pins Powered Signal	
Step	Description	Step	Description	Step	Description	Step	Description
1.	CCC (2) Rows = 1 Number of Positions = 1 <i>Note: single signal pin within single wafer</i>	1.	CCC (2) Rows = 1 Number of Positions = 2 <i>Note: two adjacent signal pins (DP pair) within single wafer</i>	1.	CCC (2) Rows = 1 Number of Positions = 4 <i>Note: Three adjacent signal pins within single wafer</i>	1.	CCC (2) Rows = 1 Number of Positions = 8 <i>Note: 1 wafer, all signal pins powered</i>
<u>Group 5</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 32 Pins Powered Signal		<u>Group 6</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 64 Pins Powered Signal		<u>Group 7</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 8 Pins Powered Ground		<u>Group 8</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 16 Pins Powered Ground	
Step	Description	Step	Description	Step	Description	Step	Description
1.	CCC (2) Rows = 4 Number of Positions = 8 <i>Note: 4 wafers, all signal pins powered</i>	1.	CCC (2) Rows = 8 Number of Positions = 8 <i>Note: 8 wafers, all signal pins powered</i>	1.	CCC (2) Rows = 1 Number of Positions = 8 <i>Note: 1 wafer/shield powered (no signals)</i>	1.	CCC (2) Rows = 2 Number of Positions = 8 <i>Note: 2 wafers/shields powered (no signals)</i>
<u>Group 9</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 32 Pins Powered Ground		<u>Group 10</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 64 Pins Powered Ground		<u>Group 11</u> NVAF-DP-04-2-07.0-S-2 NVAM-DP-04-2-05.0-S-2 All Power			
Step	Description	Step	Description	Step	Description		
1.	CCC (2) Rows = 4 Number of Positions = 8 <i>Note: 4 wafers/shields powered (no signals)</i>	1.	CCC (2) Rows = 4 Number of Positions = 16 <i>Note: 2 banks x 4 wafers/shields powered (no signals)</i>	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**Group 1

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

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

NVAF-DP-04-2-07.0-S-2

NVAM-DP-04-2-05.0-S-2

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)

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

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

THERMAL:

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

HUMIDITY:

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

MECHANICAL SHOCK (Specified Pulse):

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

VIBRATION:

- 1) Reference document: EIA-364-28, *Vibration Test Procedure for Electrical Connectors*
- 2) Test Condition V, Letter B
- 3) Power Spectral Density: 0.04 G² / Hz
- 4) G 'RMS': 7.56
- 5) Frequency: 50 to 2000 Hz
- 6) Duration: 2.0 Hours per axis (3 axis total)

NANOSECOND-EVENT DETECTION:

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

ATTRIBUTE DEFINITIONS 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*.
- 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 four temperature points are reported:
 - a. Ambient
 - b. 85° C
 - c. 95° C
 - d. 115° C
- 8) Typically, neighboring contacts (in close proximity to maximize heat buildup) 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. $\leq +5.0$ 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

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. $\leq +5.0$ 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
- 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 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.

NORMAL FORCE (FOR CONTACTS TESTED OUTSIDE THE HOUSING):

- 1) Reference document: EIA-364-04, *Normal Force Test Procedure for Electrical Connectors*.
- 2) The contacts shall be tested in the loose state, *not* inserted in connector housing.
- 3) The contacts shall be prepared to allow access to the spring member at the same attitude and deflection level as would occur in actual use.
- 4) In the event that portions of the contact prevent insertion of the test probe and/or deflection of the spring member under evaluation, said material shall be removed leaving the appropriate contact surfaces exposed.
- 5) In the case of multi-tine contacts, each tine shall be tested independently on separate samples as required.
- 6) The connector housing shall be simulated, if required, in order to provide an accurate representation of the actual contact system performance.
- 7) A holding fixture shall be fashioned to allow the contact to be properly deflected.
- 8) Said holding fixture shall be mounted on a floating, adjustable, X-Y table on the base of the Dillon TC², computer controlled test stand with a deflection measurement system accuracy of 5 μ m (0.0002").
- 9) The probe shall be attached to a Dillon P/N 49761-0105, 5 N (1.1 Lb) load cell providing an accuracy of $\pm$ 0.2%.
- 10) The nominal deflection rate shall be 5 mm (0.2")/minute.
- 11) Unless otherwise noted a minimum of five contacts shall be tested.
- 12) The force/deflection characteristic to load and unload each contact shall be repeated five times.
- 13) The system shall utilize the TC² software in order to acquire and record the test data.
- 14) The permanent set of each contact shall be measured within the TC² software.
- 15) 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.

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 5000 megohms.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

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

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

RESULTS

Temperature Rise, CCC at a 20% de-rating

Signal Pin

- CCC for a 30°C Temperature Rise-----1.9 A per contact with 1 contact (1x1) powered
- CCC for a 30°C Temperature Rise-----1.5 A per contact with 2 contacts (1x2) powered
- CCC for a 30°C Temperature Rise-----1.2 A per contact with 4 contacts (1x4) powered
- CCC for a 30°C Temperature Rise-----0.9 A per contact with 8 contacts (1x8) powered
- CCC for a 30°C Temperature Rise-----0.6 A per contact with 32 contacts (4x8) powered
- CCC for a 30°C Temperature Rise-----0.5 A per contact with 64 contacts (8x8) powered

Ground Pin

- CCC for a 30°C Temperature Rise-----10.0 A per contact with 8 contact (1x8) powered
- CCC for a 30°C Temperature Rise-----7.9 A per contact with 16 contacts (2x8) powered
- CCC for a 30°C Temperature Rise-----7.4 A per contact with 32 contacts (4x8) powered
- CCC for a 30°C Temperature Rise-----5.6 A per contact with 64 contacts (4x16) powered

Ground pin and Signal pin

- CCC for a 30°C Temperature Rise-----4.9 A per contact with all adjacent ground contacts powered and signal contacts powered @ 1/2 rated current.

Mating – Unmating Forces

Thermal Aging Group

- Initial
 - Mating
 - Min -----11.07 Lbs
 - Max-----12.34 Lbs
 - Unmating
 - Min -----6.68 Lbs
 - Max-----8.23 Lbs
- After Thermal
 - Mating
 - Min -----9.03 Lbs
 - Max-----10.09 Lbs
 - Unmating
 - Min -----6.26 Lbs
 - Max-----7.02 Lbs

RESULTS Continued**Mating – Unmating Forces****Mating-Unmating Durability Group**

- **Initial**
 - **Mating**
 - **Min** -----10.38 Lbs
 - **Max** -----12.56 Lbs
 - **Unmating**
 - **Min** -----6.54 Lbs
 - **Max** -----7.79 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** -----12.52 Lbs
 - **Max** -----13.48 Lbs
 - **Unmating**
 - **Min** -----7.38 Lbs
 - **Max** -----9.71 Lbs
- **Humidity**
 - **Mating**
 - **Min** -----8.40 Lbs
 - **Max** -----10.27 Lbs
 - **Unmating**
 - **Min** -----5.96 Lbs
 - **Max** -----6.63 Lbs

RESULTS Continued**Mating-Unmating Basic: NVAF-DP-02-1-07.0-S-2/NVAM-DP-02-1-05.0-S-2**

- **Initial**
 - **Mating**
 - **Min** ----- 2.16 Lbs
 - **Max** ----- 3.46 Lbs
 - **Unmating**
 - **Min** ----- 1.17 Lbs
 - **Max** ----- 2.64 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 2.40 Lbs
 - **Max** ----- 3.54 Lbs
 - **Unmating**
 - **Min** ----- 2.01 Lbs
 - **Max** ----- 2.31 Lbs

Mating-Unmating Basic: NVAF-DP-02-2-07.0-S-2/NVAM-DP-02-2-05.0-S-2

- **Initial**
 - **Mating**
 - **Min** ----- 4.35 Lbs
 - **Max** ----- 5.58 Lbs
 - **Unmating**
 - **Min** ----- 3.12 Lbs
 - **Max** ----- 4.74 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 5.30 Lbs
 - **Max** ----- 6.34 Lbs
 - **Unmating**
 - **Min** ----- 3.10 Lbs
 - **Max** ----- 4.40 Lbs

Mating-Unmating Basic: NVAF-DP-03-2-07.0-S-2/NVAM-DP-03-2-05.0-S-2

- **Initial**
 - **Mating**
 - **Min** ----- 8.29 Lbs
 - **Max** ----- 10.72 Lbs
 - **Unmating**
 - **Min** ----- 5.60 Lbs
 - **Max** ----- 6.74 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 9.81 Lbs
 - **Max** ----- 11.25 Lbs
 - **Unmating**
 - **Min** ----- 5.86 Lbs
 - **Max** ----- 6.85 Lbs

RESULTS Continued**Normal Force at 0.0145-inch deflection****NVAF Signal Pin**

- **Initial**
 - **Min**-----87.50 gf **Set** ---- 0.0014 in
 - **Max** -----101.00 gf **Set** ---- 0.0025 in
- **Thermal**
 - **Min**-----83.60 gf **Set** ---- 0.0021 in
 - **Max** -----90.40 gf **Set** ---- 0.0027 in

Normal Force at 0.0180-inch deflection**NVAF MFBL Ground Beam**

- **Initial**
 - **Min**-----101.50 gf **Set** ---- 0.0025 in
 - **Max** -----110.10 gf **Set** ---- 0.0045 in
- **Thermal**
 - **Min**-----58.70 gf **Set** ---- 0.0075 in
 - **Max** -----69.90 gf **Set** ---- 0.0090 in

Normal Force at 0.0130-inch deflection**NVAF Flanking Ground Beam**

- **Initial**
 - **Min**-----57.80 gf **Set** ---- 0.0006 in
 - **Max** -----68.30 gf **Set** ---- 0.0011 in
- **Thermal**
 - **Min**-----48.60 gf **Set** ---- 0.0016 in
 - **Max** -----61.00 gf **Set** ---- 0.0026 in

Normal Force at 0.0110-inch deflection**NVAF Center Ground Beam**

- **Initial**
 - **Min**-----154.40 gf **Set** ---- 0.0009 in
 - **Max** -----163.90 gf **Set** ---- 0.0014 in
- **Thermal**
 - **Min**-----141.80 gf **Set** ---- 0.0017 in
 - **Max** -----165.70 gf **Set** ---- 0.0031 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 -----45000Meg Ω ----- Passed
- **Humidity**
 - Mated-----45000 Meg Ω ----- Passed
 - Unmated -----45000 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-----45000 Meg Ω ----- Passed
 - Unmated -----45000 Meg Ω ----- Passed

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
 - Breakdown Voltage-----788 VAC
 - Test Voltage -----595 VAC
 - Working Voltage -----195 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

RESULTS Continued**LLCR Thermal Aging Group (128 signal and 64 ground LLCR test points)****Signal Pin**

- **Initial** ----- 42.33 mOhms Max
- **Thermal**
 - <= +5.0 mOhms ----- 128 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

Ground Pin

- **Initial** ----- 0.28 mOhms Max
- **Thermal**
 - <= +5.0 mOhms ----- 64 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

LLCR Gas Tight Group (128 signal and 64 ground LLCR test points)**Signal Pin**

- **Initial** ----- 44.01 mOhms Max
- **Gas-Tight**
 - <= +5.0 mOhms ----- 128 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

Ground Pin

- **Initial** ----- 0.22 mOhms Max
- **Gas-Tight**
 - <= +5.0 mOhms ----- 64 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

RESULTS Continued**LLCR Mating/Unmating Durability Group (128 signal and 64 ground LLCR test points)****Signal Pin**

- **Initial** ----- 42.51 mOhms Max
- **Durability, 100 Cycles**
 - <= +5.0 mOhms ----- 128 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 Shock**
 - <= +5.0 mOhms ----- 128 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 ----- 128 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

Ground Pin

- **Initial** ----- 0.30 mOhms Max
- **Durability, 100 Cycles**
 - <= +5.0 mOhms ----- 64 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Thermal Shock**
 - <= +5.0 mOhms ----- 64 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Humidity**
 - <= +5.0 mOhms ----- 64 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

RESULTS Continued**LLCR Shock & Vibration Group (128 signal and 64 ground LLCR test points)****Signal Pin**

- **Initial** ----- 45.57 mOhms Max
- **Shock &Vibration**
 - **<= +5.0 mOhms**----- 128 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

Ground Pin

- **Initial** ----- 0.75 mOhms Max
- **Shock &Vibration**
 - **<= +5.0 mOhms**----- 64 Points ----- Stable
 - **+5.1 to +10.0 mOhms** ----- 0 Points ----- Minor
 - **+10.1 to +15.0 mOhms** ----- 0 Points ----- Acceptable
 - **+15.1 to +50.0 mOhms** ----- 0 Points ----- Marginal
 - **+50.1 to +1000 mOhms**----- 0 Points ----- Unstable
 - **>+1000 mOhms**----- 0 Points ----- Open Failure

Mechanical Shock & Random Vibration:

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

DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

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

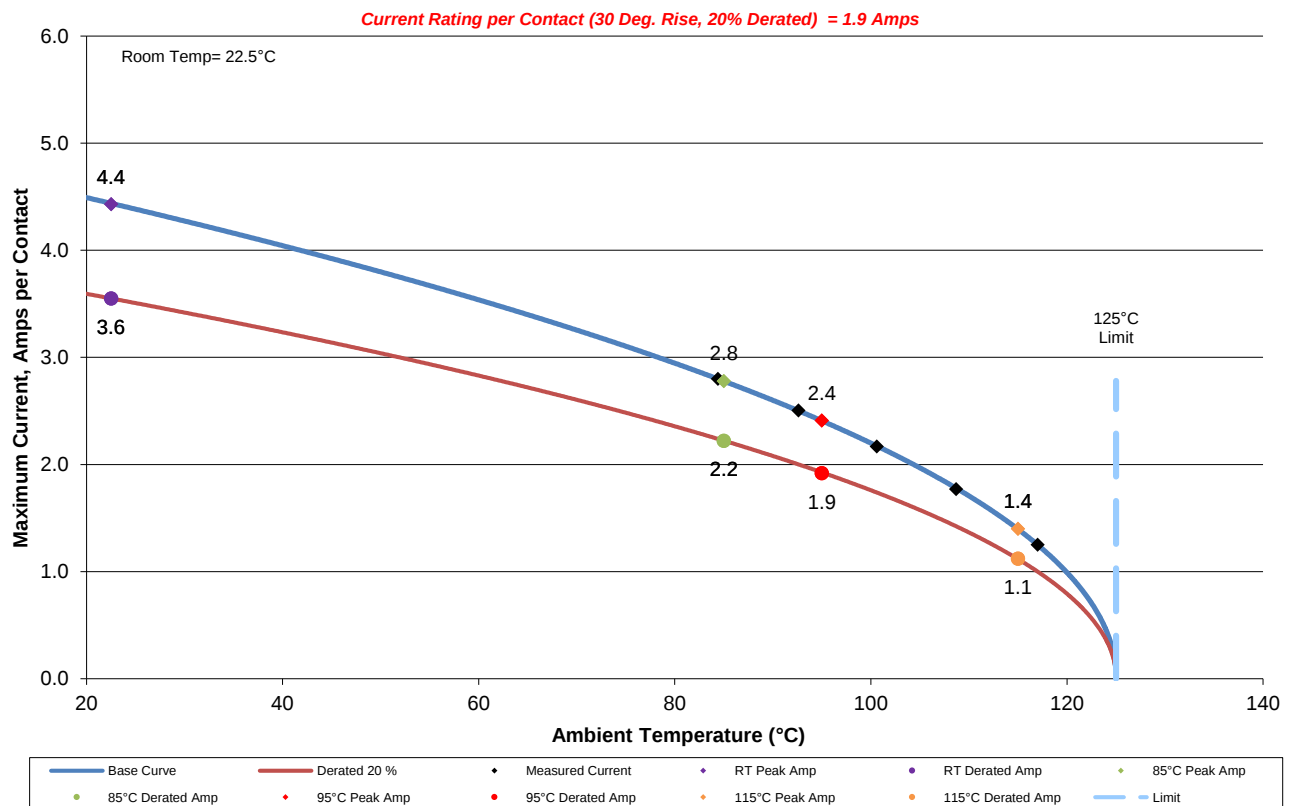
Signal Pin

- a. Linear configuration with 1 adjacent conductors/contacts powered

2773747 (CR-594901)

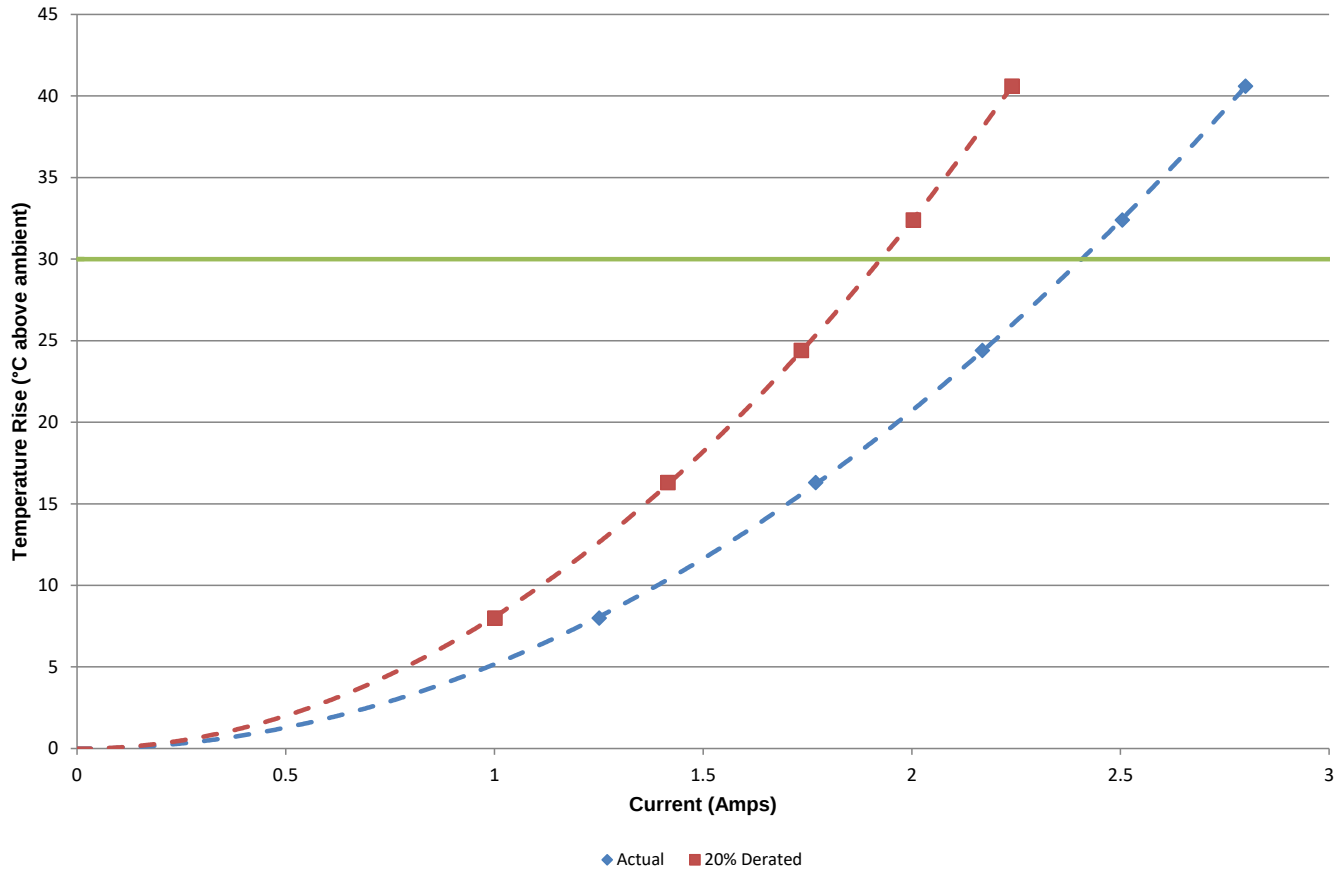
1 (1x1) Contact in Series (Signals)

Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



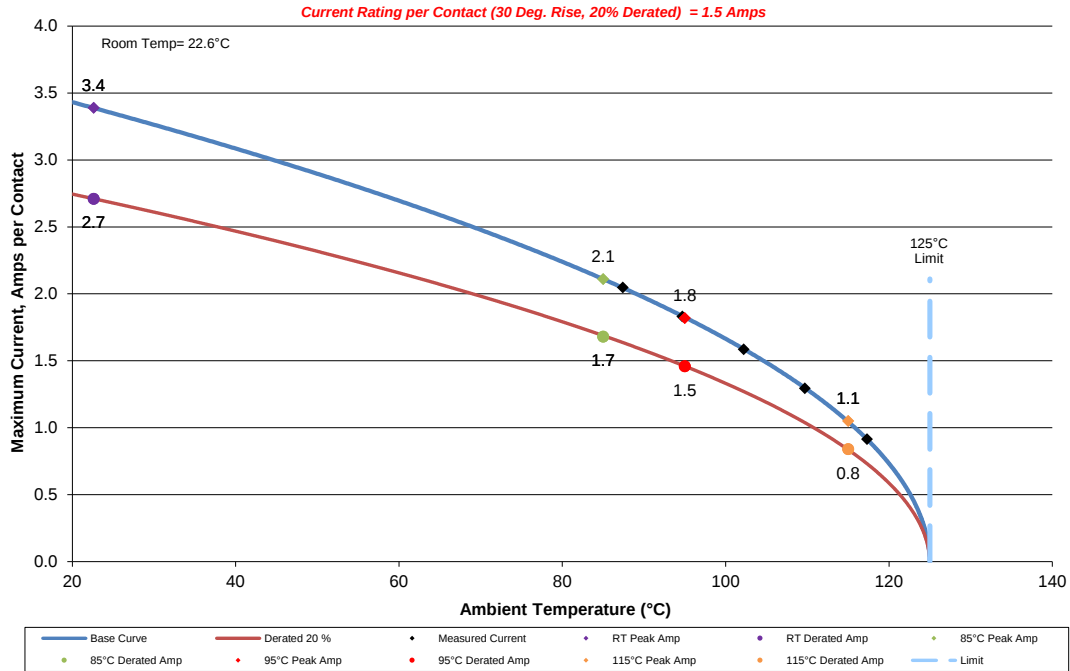
DATA SUMMARIES Continued

2773747 (CR-594901)
1 (1x1) Contact in Series (Signal)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

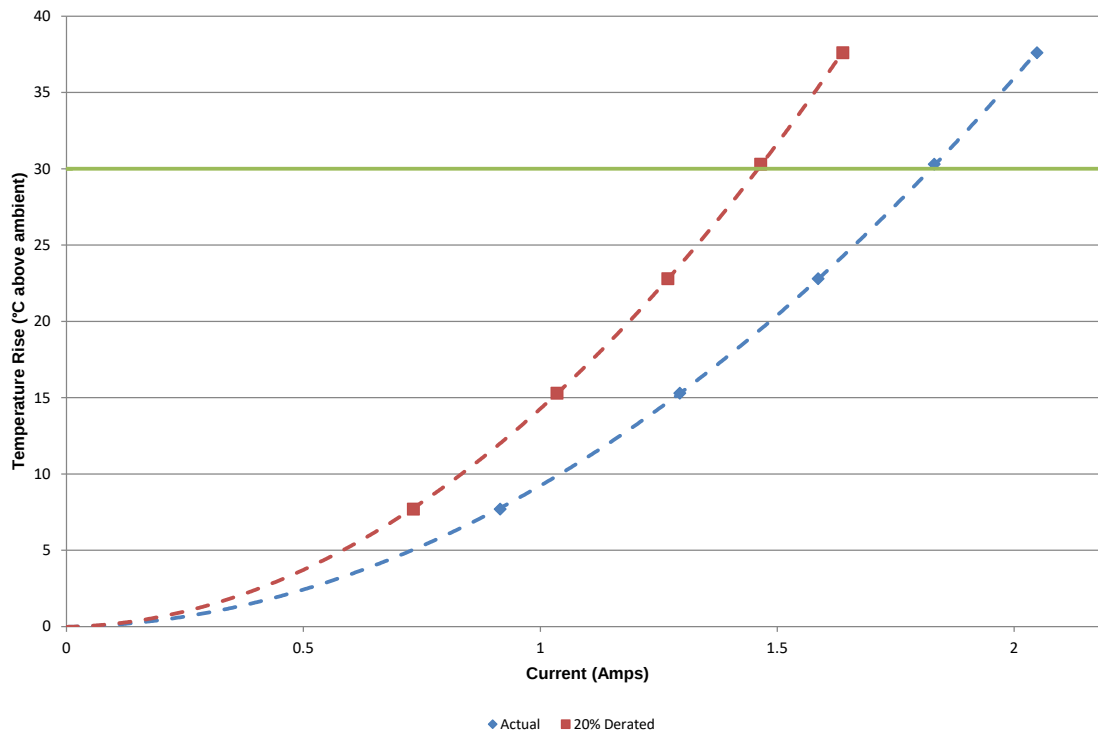


DATA SUMMARIES Continued**b. Linear configuration with 2 adjacent conductors/contacts powered**

2773747 (CR-594901)
2 (1x2) Contacts in Series (Signals)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

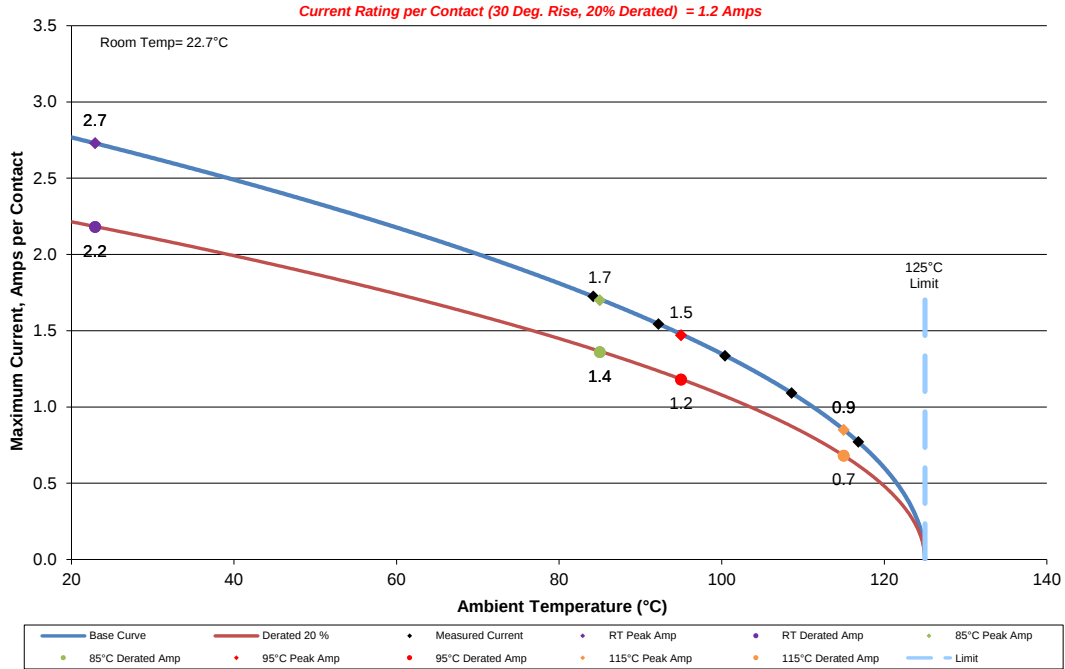


2773747 (CR-594901)
2 (1x2) Contacts in Series (Signal)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

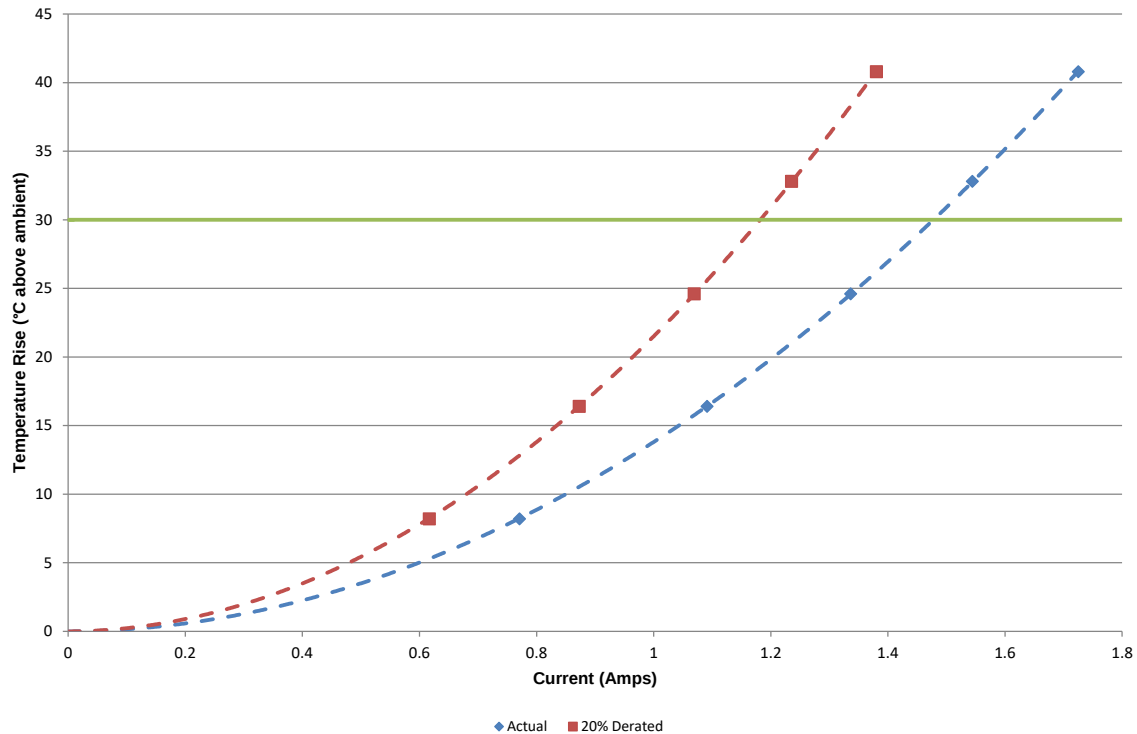


DATA SUMMARIES Continued**c. Linear configuration with 4 adjacent conductors/contacts powered**

2773747 (CR-594901)
4 (1x4) Contacts in Series (Signals)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

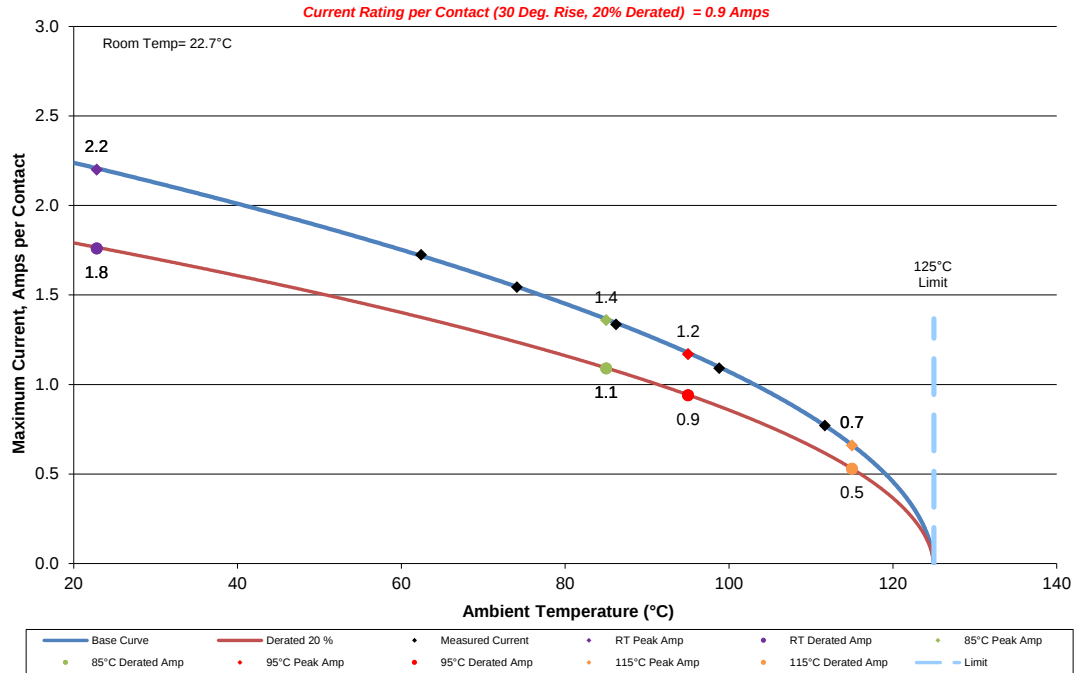


2773747 (CR-594901)
4 (1x4) Contacts in Series (Signal)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

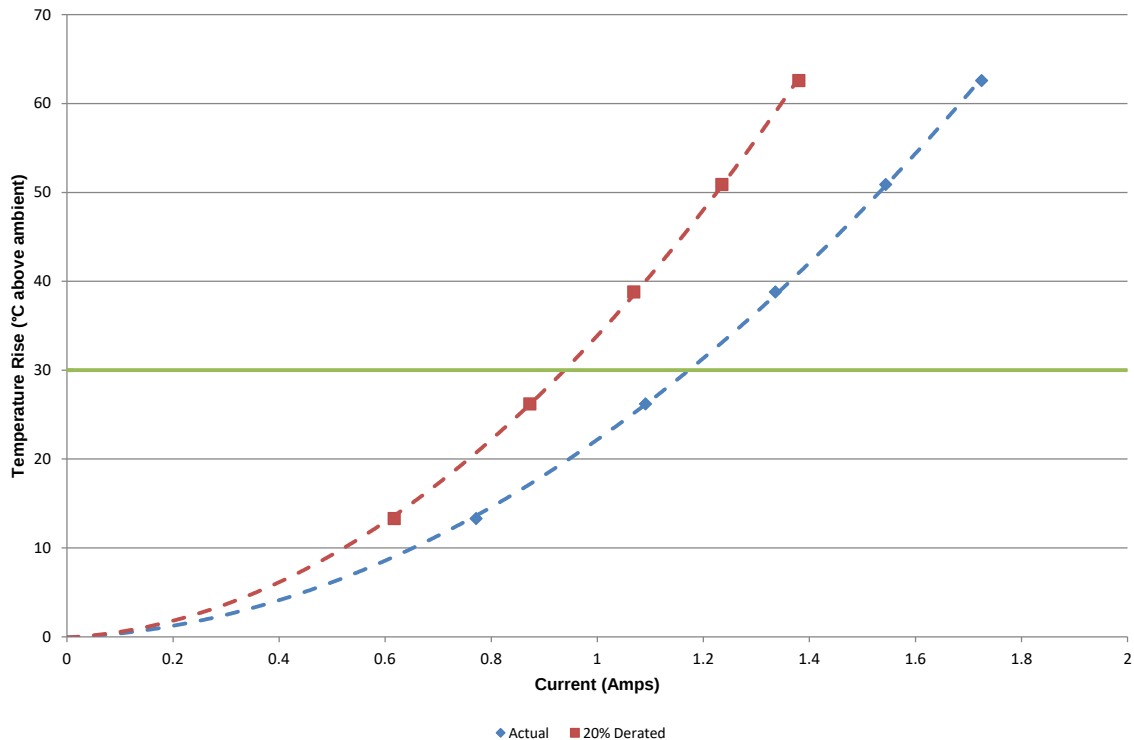


DATA SUMMARIES Continued**d. Linear configuration with 8 adjacent conductors/contacts powered**

2773747 (CR-594901)
8 (1x8) Contacts in Series (Signals)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



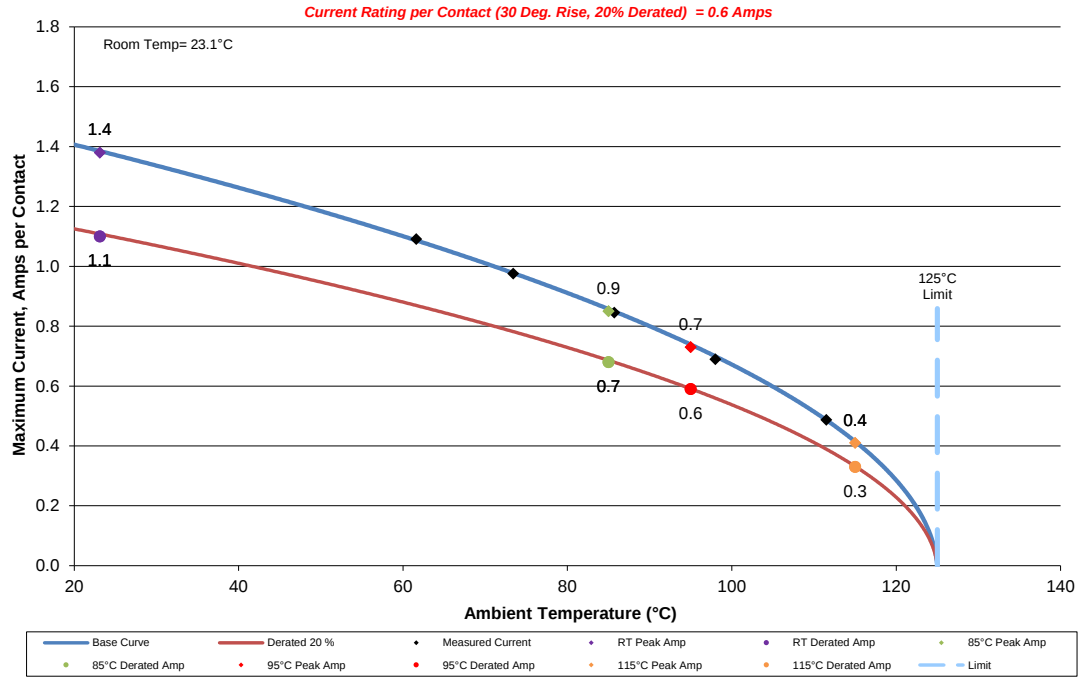
2773747 (CR-594901)
8 (1x8) Contacts in Series (Signal)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



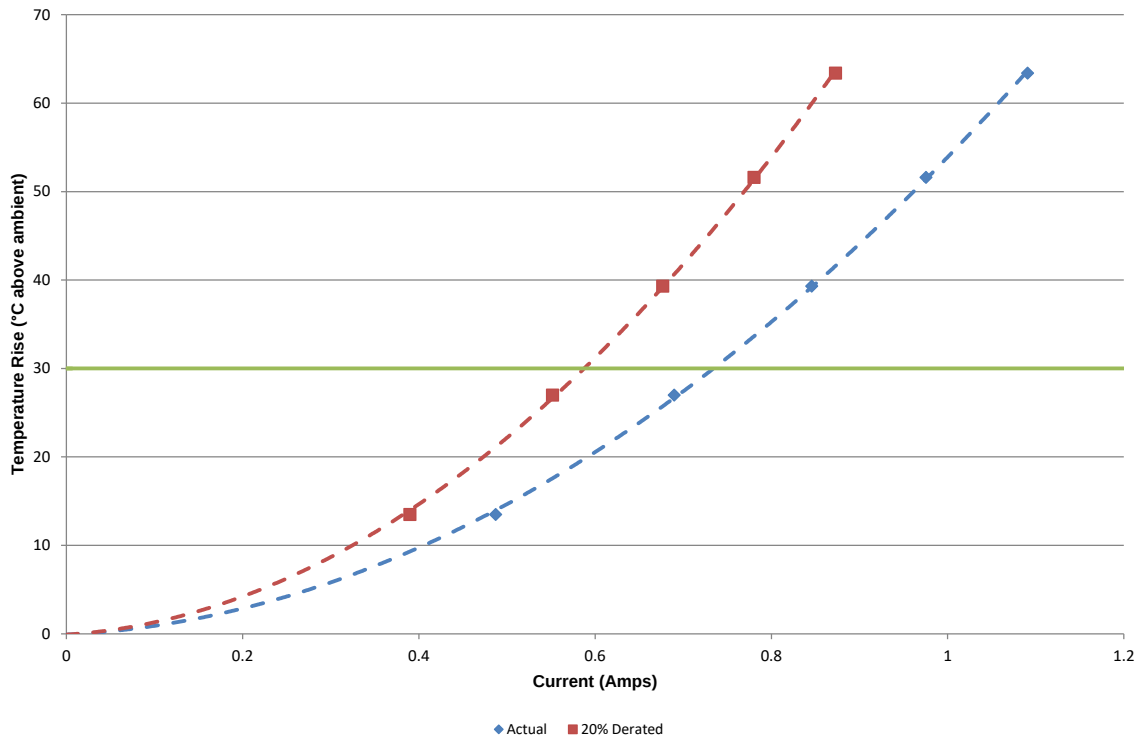
DATA SUMMARIES Continued

e. Linear configuration with 32 adjacent conductors/contacts powered

2773747 (CR-594901)
32 (4x8) Contacts in Series (Signals)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



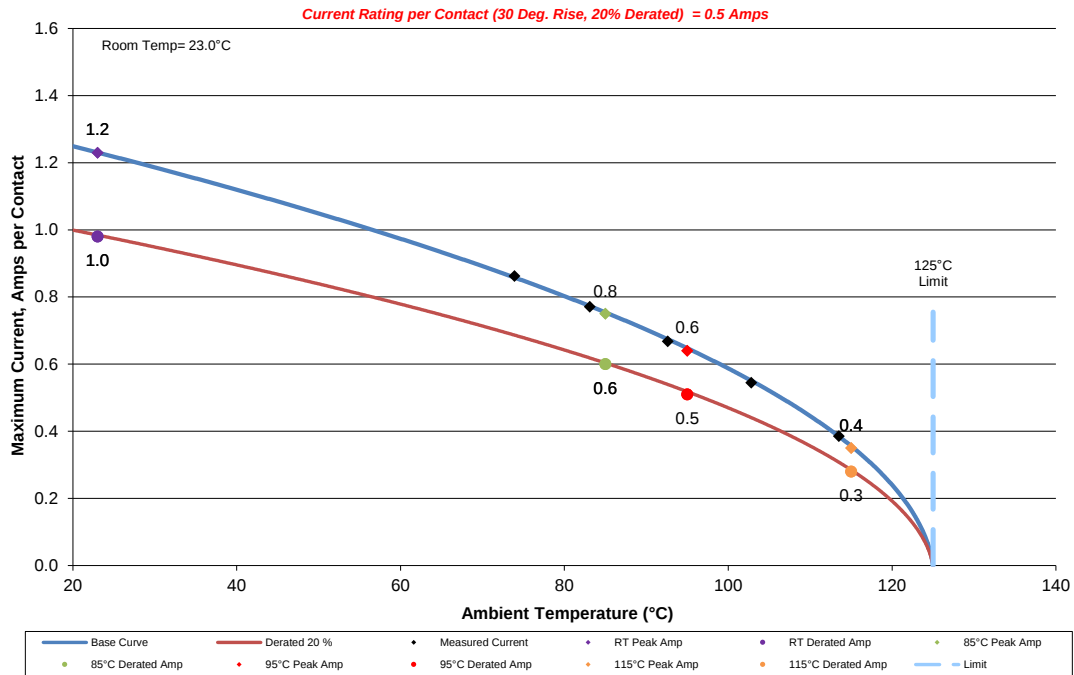
2773747 (CR-594501)
32 (4x8) Contacts in Series (Signal)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



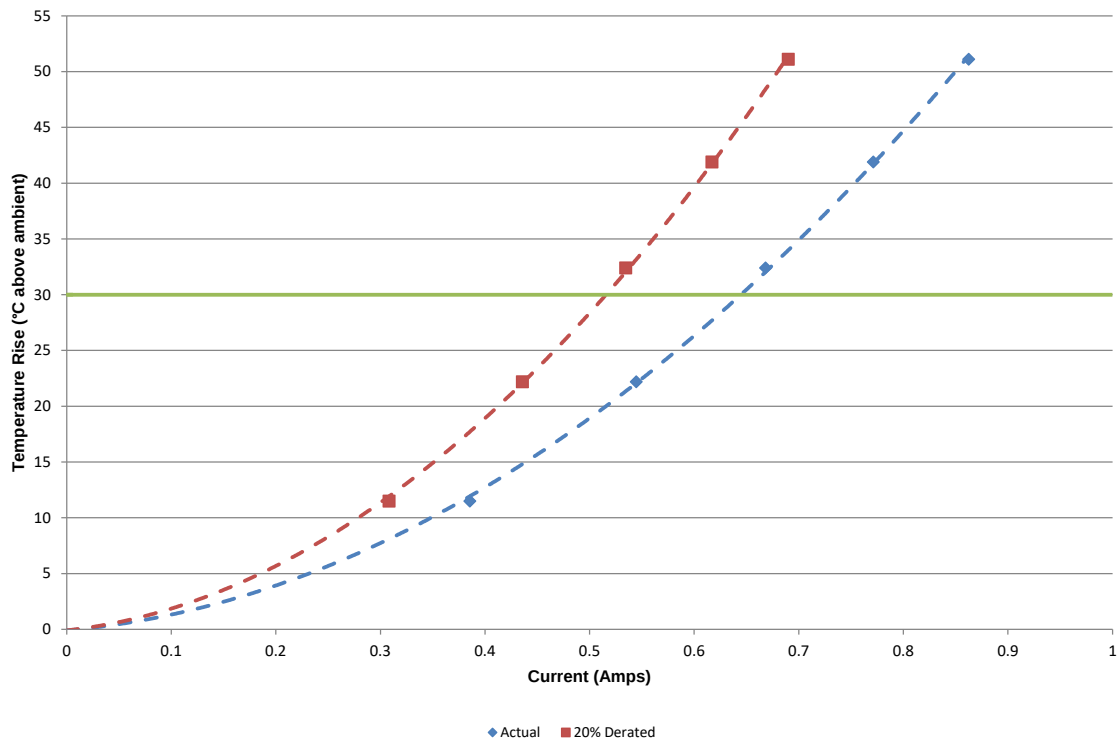
DATA SUMMARIES Continued

f. Linear configuration with all adjacent conductors/contacts powered

2773747 (CR-594901)
64 (8x8)(All Power)Contacts in Series (Signals)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



2773747 (CR-594901)
64 (8x8)(All Power) Contacts in Series (Signals)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

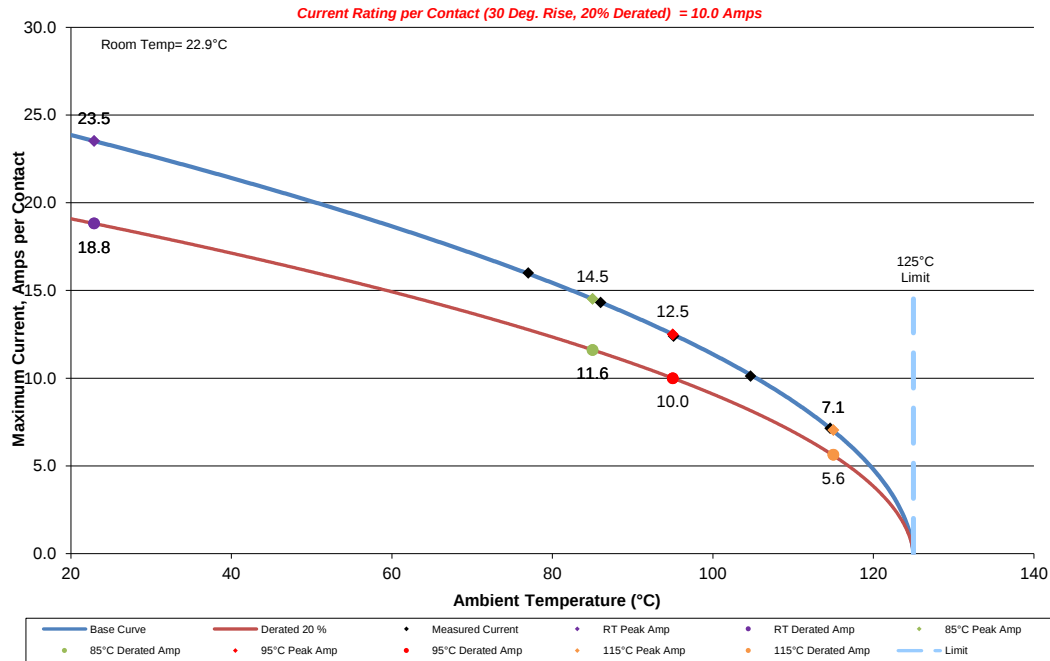


DATA SUMMARIES Continued

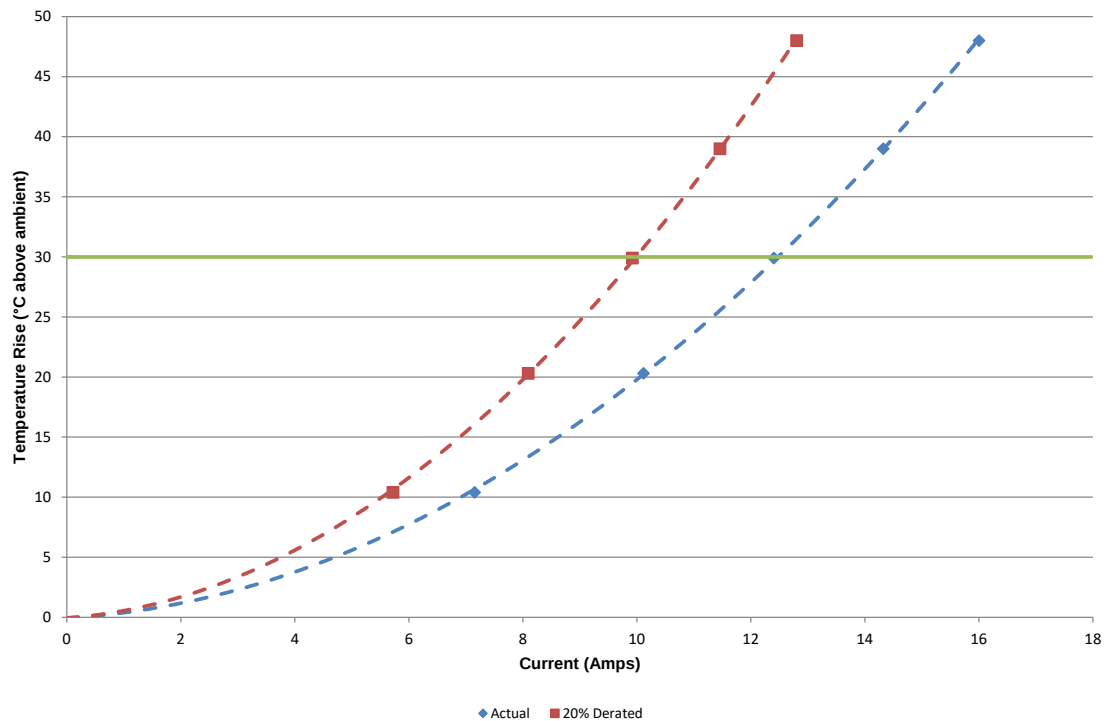
Group Pin

- g. Linear configuration with 8 adjacent conductors/contacts powered

2773747 (CR-594901)
8 (1x8) Contacts in Series (Grounds)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

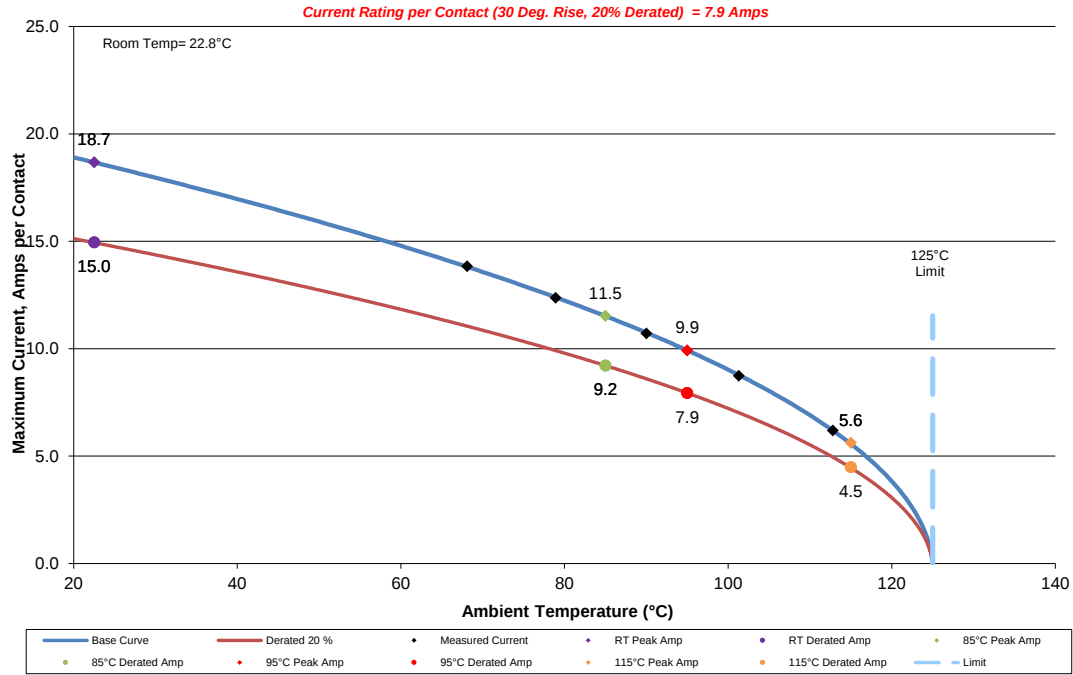


2773747 (CR-594901)
8 (1x8) Contacts in Series (Ground)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

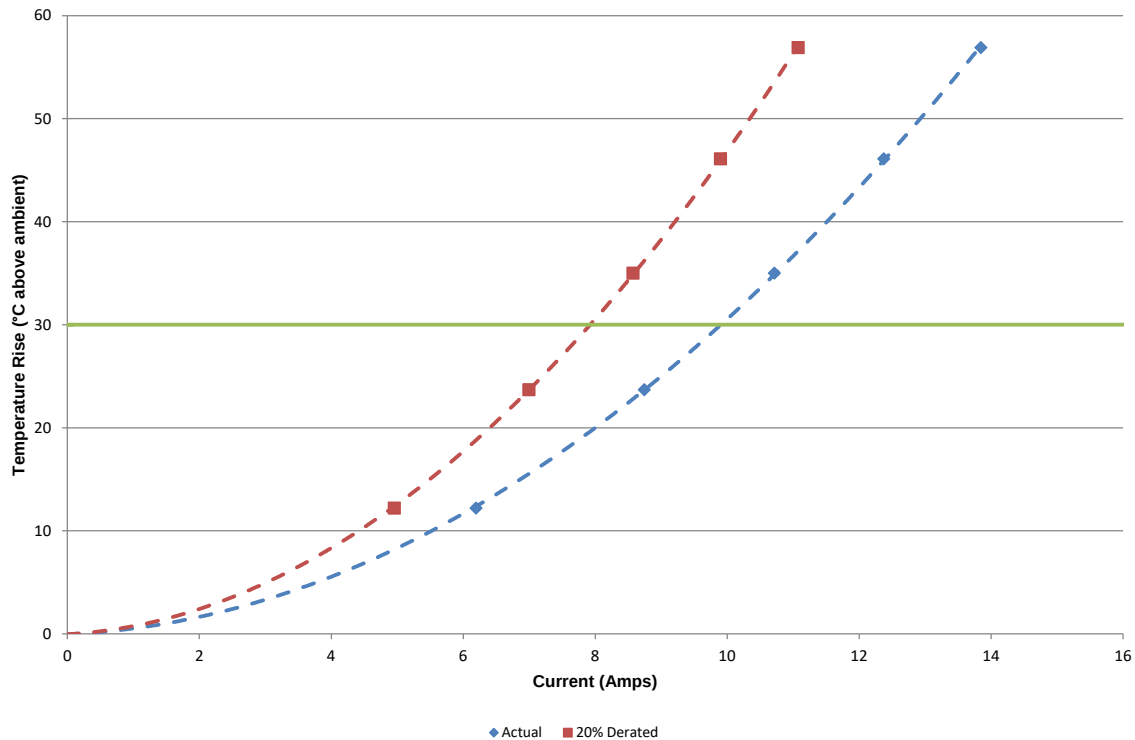


DATA SUMMARIES Continued**h. Linear configuration with 16 adjacent conductors/contacts powered**

2773747 (CR-594901)
16 (2x8) Contacts in Series (Grounds)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

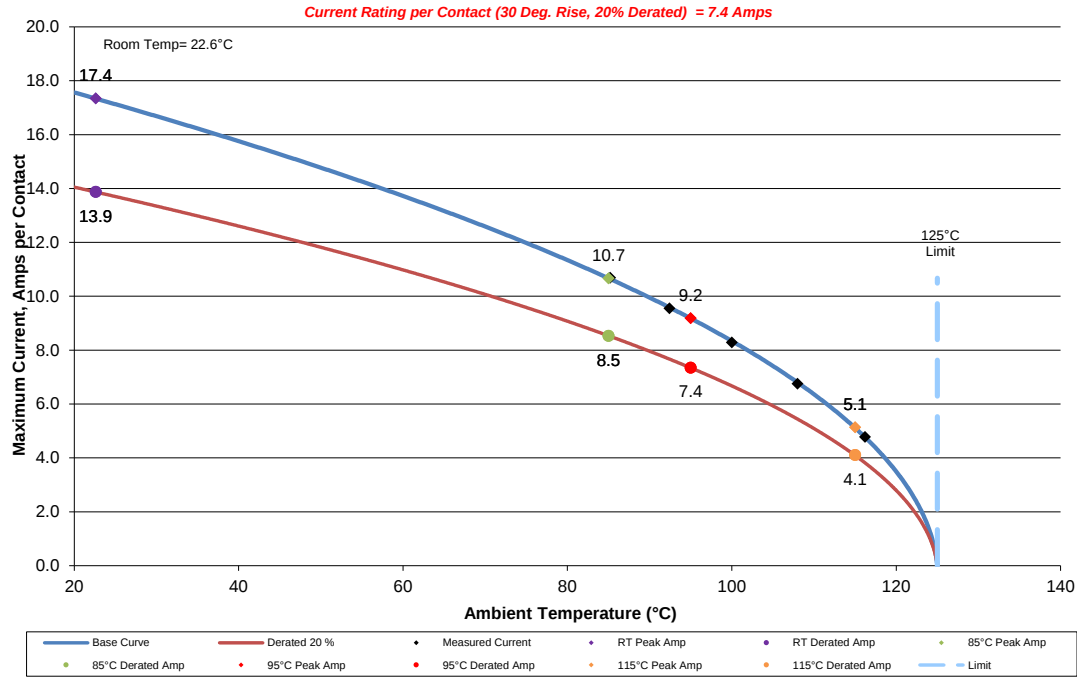


2773747 (cr-594901)
16 (2x8) Contacts in Series (Ground)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2

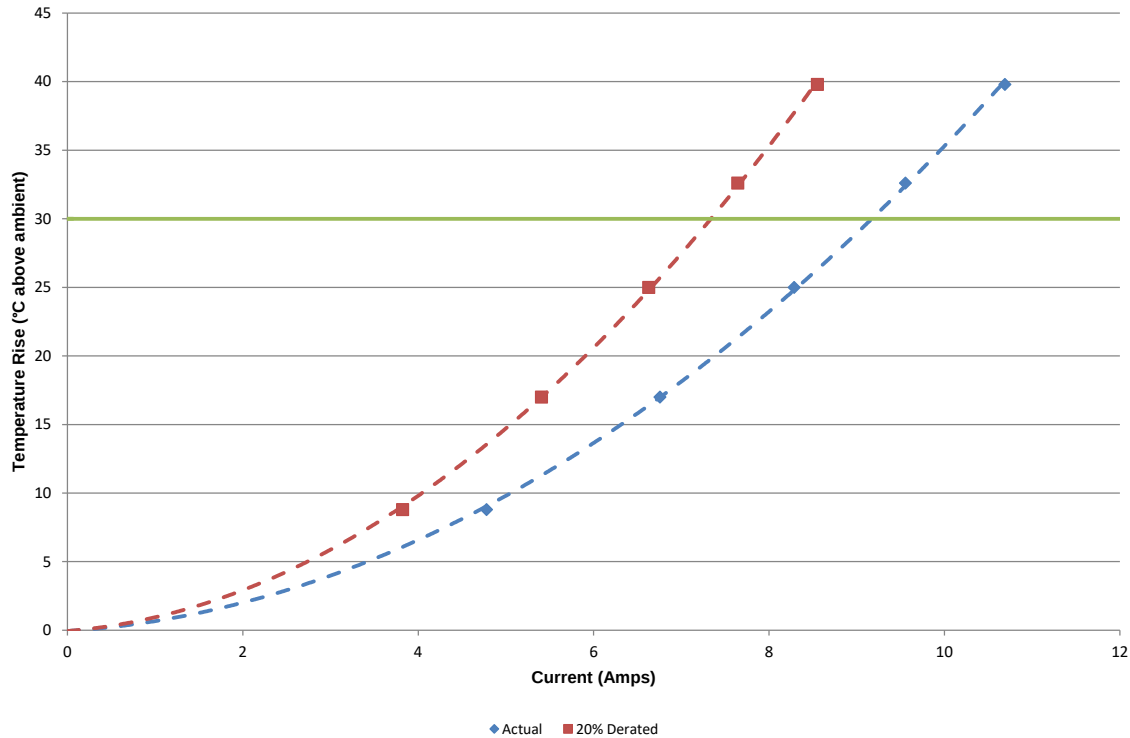


DATA SUMMARIES Continued**i. Linear configuration with 32 adjacent conductors/contacts powered**

2773747 (CR-594901)
32 (4x8) Contacts in Series (Grounds)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



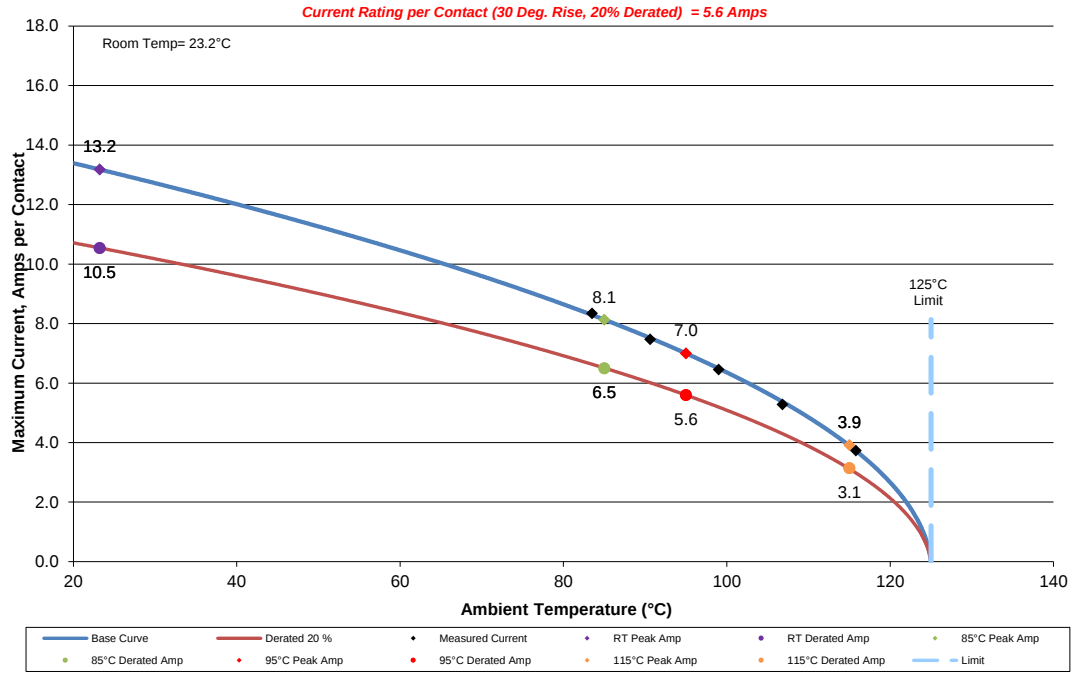
2773747 (CR-594901)
32 (4x8) Contacts in Series (Ground)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



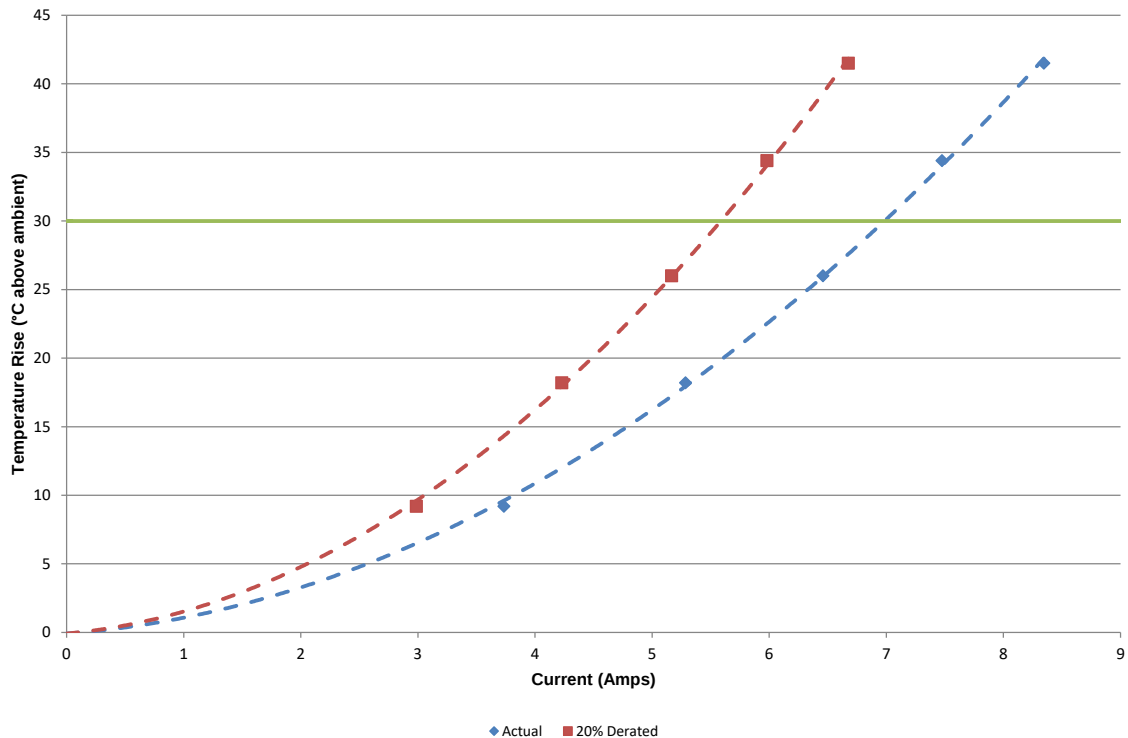
DATA SUMMARIES Continued

j. Linear configuration with all adjacent conductors/contacts powered

2773747 (CR-594901)
64 (4x16)(All Power) Contacts in Series (Grounds)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



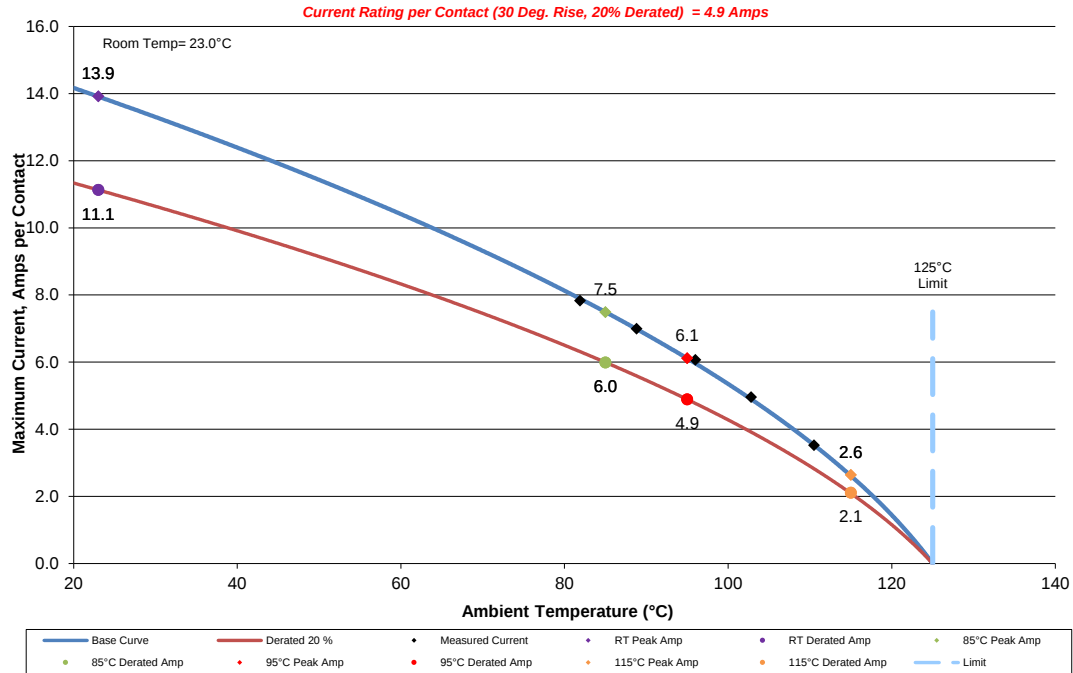
2773747 (CR-594901)
64 (4x16)(All Power) Contacts in Series (Ground)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



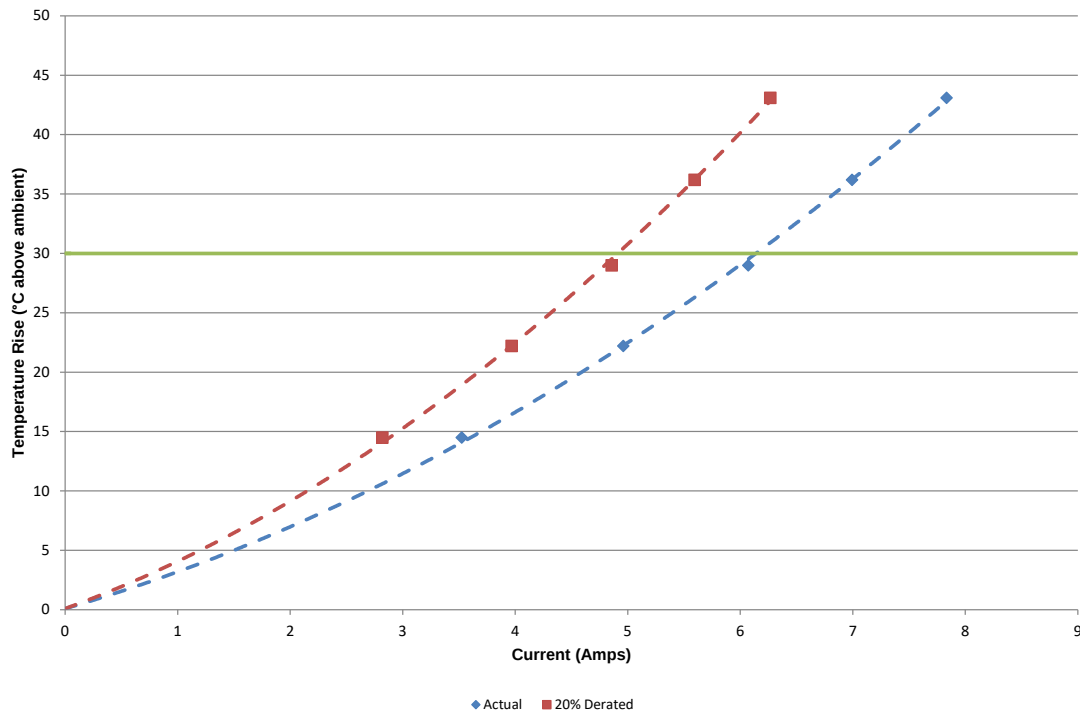
DATA SUMMARIES Continued

k. Linear configuration with all adjacent signal conductors and ground conductors/contacts powered

2773747 (CR-594901)
64 (4x16)(All Power) Contacts in Series (Grounds)(64 Signals Powered at 1/2 Rated Current)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



2773747 (CR-594901)
64 (4x16)(All Power) Contacts in Series (Ground)(64 Signals Powered at 1/2 Rated Current)
Part Numbers: NVAF-DP-04-2-07.0-S-2 / NVAM-DP-04-2-05.0-S-2



DATA SUMMARIES Continued**MATING-UNMATING FORCE:****Thermal Aging Group**

	Initial				After Thermals			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	49.24	11.07	29.71	6.68	40.17	9.03	27.84	6.26
Maximum	54.89	12.34	36.61	8.23	44.88	10.09	31.22	7.02
Average	51.64	11.61	32.68	7.35	41.67	9.37	29.34	6.60
St Dev	2.23	0.50	2.35	0.53	1.59	0.36	1.02	0.23
Count	8	8	8	8	8	8	8	8

Mating-Unmating Durability Group: NVAF-DP-04-2-07.0-S-2/NVAM-DP-04-2-05.0-S-2

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	46.17	10.38	29.09	6.54	55.69	12.52	32.83	7.38
Maximum	55.87	12.56	34.65	7.79	59.96	13.48	43.19	9.71
Average	49.39	11.10	32.61	7.33	56.93	12.80	39.31	8.84
St Dev	3.19	0.72	1.77	0.40	1.38	0.31	3.82	0.86
Count	8	8	8	8	8	8	8	8

	After Humidity			
	Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	37.36	8.40	26.51	5.96
Maximum	45.68	10.27	29.49	6.63
Average	40.96	9.21	27.86	6.26
St Dev	2.62	0.59	1.09	0.24
Count	8	8	8	8

DATA SUMMARIES Continued**Mating-Unmating Basic: NVAF-DP-02-1-07.0-S-2/NVAM-DP-02-1-05.0-S-2**

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	9.61	2.16	5.20	1.17	10.68	2.40	8.94	2.01
Maximum	15.39	3.46	11.74	2.64	15.75	3.54	10.27	2.31
Average	13.77	3.10	9.97	2.24	14.70	3.31	9.67	2.17
St Dev	1.78	0.40	2.07	0.46	1.67	0.37	0.56	0.13
Count	8	8	8	8	8	8	8	8

Mating-Unmating Basic: NVAF-DP-02-2-07.0-S-2/NVAM-DP-02-2-05.0-S-2

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	19.35	4.35	13.88	3.12	23.57	5.30	13.79	3.10
Maximum	24.82	5.58	21.08	4.74	28.20	6.34	19.57	4.40
Average	23.09	5.19	18.38	4.13	25.80	5.80	16.85	3.79
St Dev	1.82	0.41	2.51	0.56	1.25	0.28	2.16	0.49
Count	8	8	8	8	8	8	8	8

Mating-Unmating Basic: NVAF-DP-03-2-07.0-S-2/NVAM-DP-03-2-05.0-S-2

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	36.87	8.29	24.91	5.60	43.63	9.81	26.07	5.86
Maximum	47.68	10.72	29.98	6.74	50.04	11.25	30.47	6.85
Average	42.02	9.45	28.29	6.36	47.14	10.60	28.21	6.34
St Dev	4.14	0.93	1.92	0.43	2.31	0.52	1.55	0.35
Count	8	8	8	8	8	8	8	8

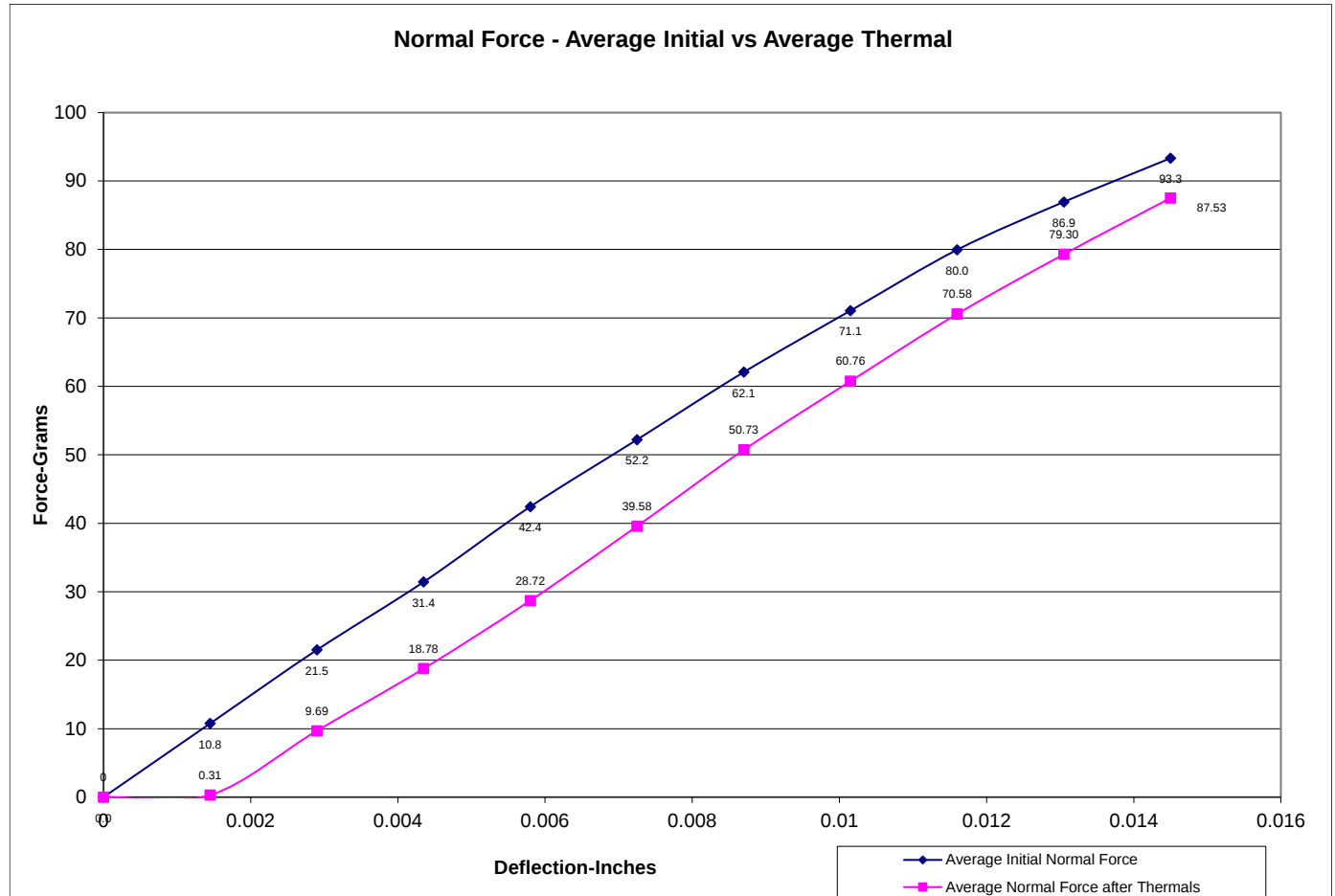
DATA SUMMARIES Continued**NORMAL FORCE (FOR CONTACTS TESTED OUT THE HOUSING):**

- 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.

NVAF Signal Pin

Initial	Deflections in inches Forces in Grams										
	<u>0.0015</u>	<u>0.0029</u>	<u>0.0044</u>	<u>0.0058</u>	<u>0.0073</u>	<u>0.0087</u>	<u>0.0102</u>	<u>0.0116</u>	<u>0.0131</u>	<u>0.0145</u>	<i>SET</i>
Averages	10.78	21.51	31.43	42.43	52.22	62.08	71.06	79.95	86.94	93.33	0.0018
Min	9.60	19.10	28.80	39.40	47.10	57.30	66.20	74.40	81.20	87.50	0.0014
Max	13.50	25.30	34.50	46.00	57.40	69.30	77.70	87.40	94.80	101.00	0.0025
St. Dev	1.214	2.011	2.117	2.577	3.352	3.863	3.694	3.750	3.834	3.761	0.0003
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	<u>0.0015</u>	<u>0.0029</u>	<u>0.0044</u>	<u>0.0058</u>	<u>0.0073</u>	<u>0.0087</u>	<u>0.0102</u>	<u>0.0116</u>	<u>0.0131</u>	<u>0.0145</u>	<i>SET</i>
Averages	0.31	9.69	18.78	28.72	39.58	50.73	60.76	70.58	79.30	87.53	0.0024
Min	-0.50	8.00	16.10	26.00	37.20	47.80	57.40	67.00	75.80	83.60	0.0021
Max	3.20	12.90	22.30	32.80	43.10	54.80	64.20	73.60	82.30	90.40	0.0027
St. Dev	0.964	1.265	1.454	1.682	1.741	1.973	2.106	1.955	1.817	2.048	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

Normal Force - Average Initial vs Average Thermal

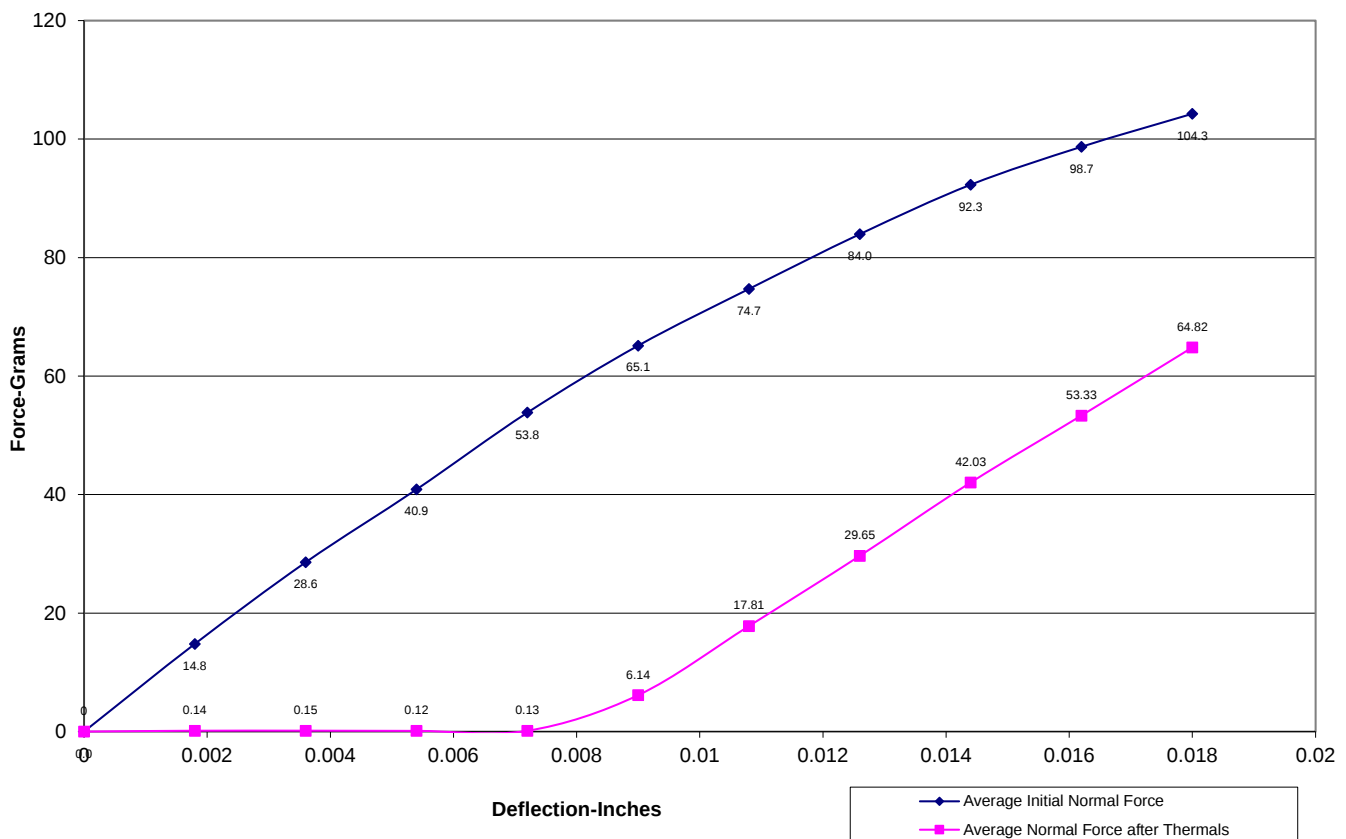
DATA SUMMARIES Continued**NORMAL FORCE (FOR CONTACTS TESTED OUT THE HOUSING):**

- 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.

NVAF MFBL Ground Beam

Initial	Deflections in inches Forces in Grams										
	<u>0.0018</u>	<u>0.0036</u>	<u>0.0054</u>	<u>0.0072</u>	<u>0.0090</u>	<u>0.0108</u>	<u>0.0126</u>	<u>0.0144</u>	<u>0.0162</u>	<u>0.0180</u>	<u>SET</u>
Averages	14.80	28.58	40.88	53.83	65.14	74.71	83.96	92.30	98.70	104.27	0.0033
Min	13.50	25.70	37.70	50.20	60.30	70.70	80.40	88.80	95.60	101.50	0.0025
Max	16.60	31.40	45.70	59.80	72.30	82.70	91.50	99.60	105.20	110.10	0.0045
St. Dev	0.959	1.808	2.524	2.965	3.600	3.646	3.326	3.190	2.987	2.592	0.0005
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	<u>0.0018</u>	<u>0.0036</u>	<u>0.0054</u>	<u>0.0072</u>	<u>0.0090</u>	<u>0.0108</u>	<u>0.0126</u>	<u>0.0144</u>	<u>0.0162</u>	<u>0.0180</u>	<u>SET</u>
Averages	0.14	0.15	0.12	0.13	6.14	17.81	29.65	42.03	53.33	64.82	0.0085
Min	-0.30	-0.20	-0.30	-0.30	0.10	12.40	25.10	37.00	47.50	58.70	0.0075
Max	0.50	0.50	0.40	0.40	12.40	22.90	33.90	45.90	57.90	69.90	0.0090
St. Dev	0.193	0.188	0.175	0.178	3.332	3.208	3.229	3.293	3.390	3.546	0.0005
Count	12	12	12	12	12	12	12	12	12	12	12

Normal Force - Average Initial vs Average Thermal

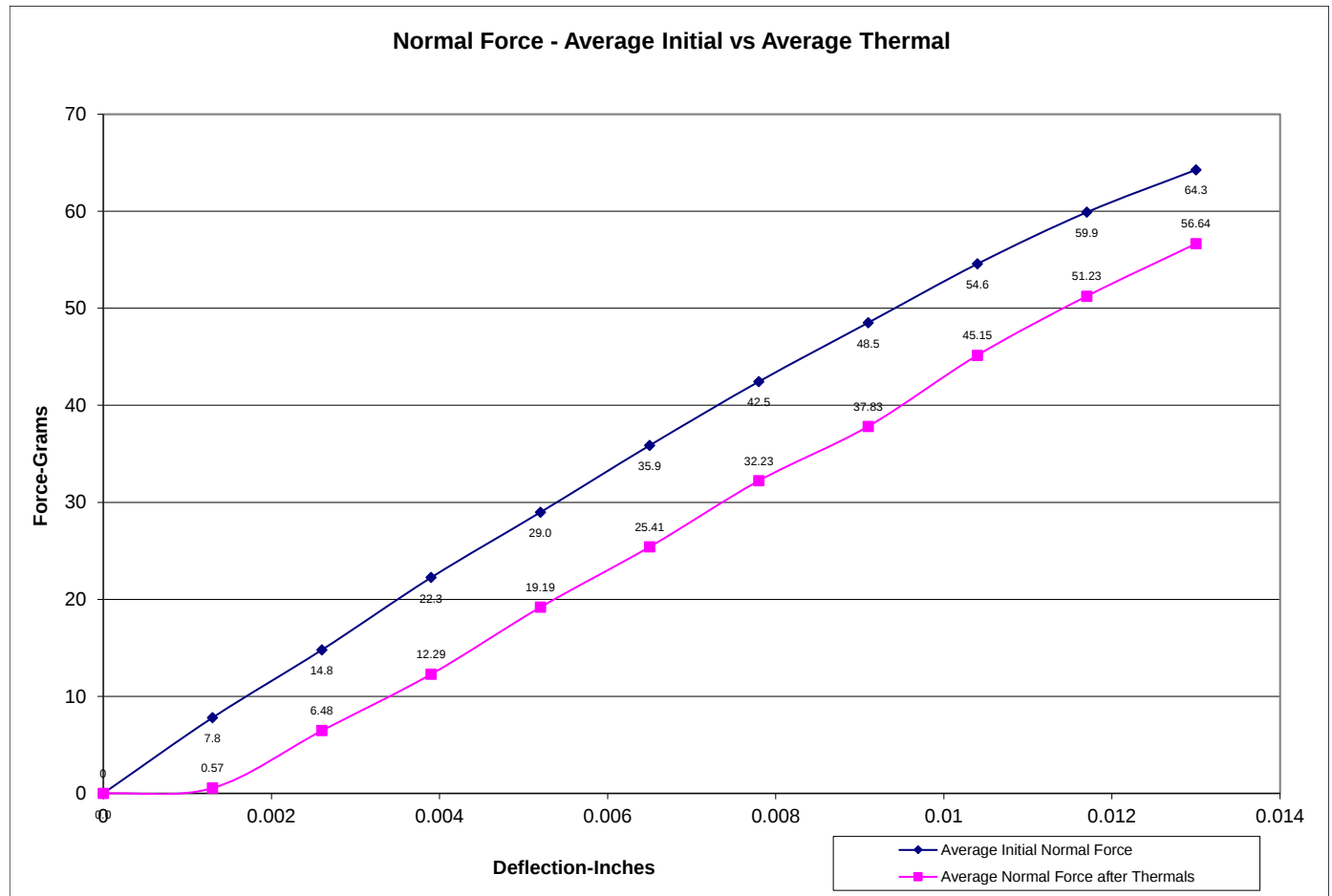
DATA SUMMARIES Continued**NORMAL FORCE (FOR CONTACTS TESTED OUT THE HOUSING):**

- 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.

NVAF Flanking Ground Beam

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>	<u>SET</u>
Averages	7.81	14.79	22.25	28.98	35.87	42.45	48.52	54.58	59.90	64.28	0.0009
Min	6.60	12.40	19.70	25.40	31.80	37.40	43.00	48.60	53.40	57.80	0.0006
Max	8.90	16.60	24.70	31.90	39.40	46.40	53.10	59.30	64.10	68.30	0.0011
St. Dev	0.754	1.233	1.609	2.125	2.509	3.055	3.393	3.558	3.704	3.598	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>	<u>SET</u>
Averages	0.57	6.48	12.29	19.19	25.41	32.23	37.83	45.15	51.23	56.64	0.0021
Min	-0.40	3.10	8.70	15.00	20.10	26.40	31.60	38.50	44.20	48.60	0.0016
Max	3.50	8.90	14.80	22.50	29.30	36.00	42.00	49.10	56.00	61.00	0.0026
St. Dev	1.221	1.871	1.971	2.340	2.742	2.799	3.074	3.332	3.735	3.932	0.0003
Count	12	12	12	12	12	12	12	12	12	12	12

Normal Force - Average Initial vs Average Thermal

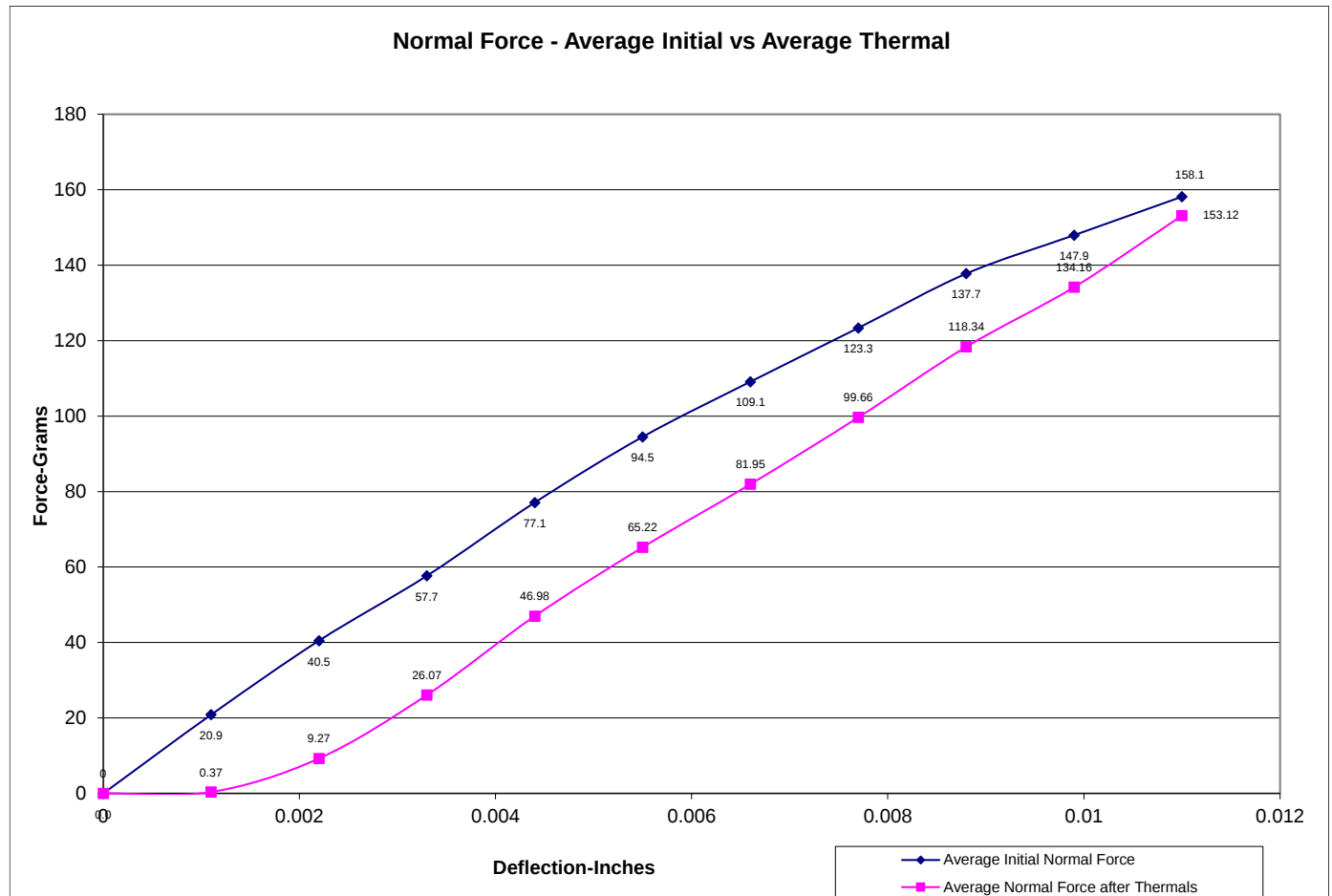
DATA SUMMARIES Continued**NORMAL FORCE (FOR CONTACTS TESTED OUT THE HOUSING):**

- 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.

NVAF Center Ground Beam

Initial	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0033</u>	<u>0.0044</u>	<u>0.0055</u>	<u>0.0066</u>	<u>0.0077</u>	<u>0.0088</u>	<u>0.0099</u>	<u>0.0110</u>	<i>SET</i>
Averages	20.86	40.48	57.66	77.08	94.48	109.10	123.34	137.73	147.92	158.11	0.0012
Min	19.00	35.60	52.70	72.10	89.40	104.60	119.10	132.70	143.20	154.40	0.0009
Max	24.10	46.50	63.60	83.40	101.60	116.50	129.50	144.00	154.30	163.90	0.0014
St. Dev	1.726	3.636	3.916	4.252	4.939	4.816	4.188	4.332	4.092	3.698	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0033</u>	<u>0.0044</u>	<u>0.0055</u>	<u>0.0066</u>	<u>0.0077</u>	<u>0.0088</u>	<u>0.0099</u>	<u>0.0110</u>	<i>SET</i>
Averages	0.37	9.27	26.07	46.98	65.22	81.95	99.66	118.34	134.16	153.12	0.0023
Min	-0.30	-0.30	13.60	38.70	57.40	73.50	90.40	106.60	122.30	141.80	0.0017
Max	5.20	24.30	41.70	61.20	78.60	94.10	111.60	130.40	145.70	165.70	0.0031
St. Dev	1.553	6.892	7.522	6.335	6.190	6.068	6.325	7.203	7.063	7.137	0.0004
Count	12	12	12	12	12	12	12	12	12	12	12

Normal Force - Average Initial vs Average Thermal

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

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	NVAF/NVAM	NVAF	NVAM
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

	Row to Row		
	Mated	Unmated	Unmated
Minimum	NVAF/NVAM	NVAF	NVAM
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	NVAF/NVAM	NVAF	NVAM
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	NVAF/NVAM
Break Down Voltage	788
Test Voltage	595
Working Voltage	195

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

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

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

DATA SUMMARIES Continued**LLCR Thermal Aging Group**

- 1) A total of 128 signal and 64 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	2021/4/1	2021/4/19		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	52	52		
Technician	Kason He	Kason He		
mOhm values	Actual Initial	Delta Thermal	Delta	Delta
Pin Type 1: Signal				
Average	40.75	0.20		
St. Dev.	0.72	0.15		
Min	39.13	0.00		
Max	42.33	0.75		
Summary Count	128	128		
Total Count	128	128		
Pin Type 2: Ground				
Average	0.18	0.03		
St. Dev.	0.04	0.02		
Min	0.09	0.00		
Max	0.28	0.09		
Summary Count	64	64		
Total Count	64	64		

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

DATA SUMMARIES Continued**LLCR Mating/Unmating Durability Group**

- 1). A total of 128 signal and 64 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	2021/4/1	2021/4/6	2021/4/12	2021/4/23
Room Temp (Deg C)	22	22	22	22
Rel Humidity (%)	52	52	52	52
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	40.48	0.61	0.81	0.75
St. Dev.	0.60	0.44	0.51	0.50
Min	38.90	0.02	0.03	0.01
Max	42.51	2.27	2.79	2.70
Summary Count	128	128	128	128
Total Count	128	128	128	128
Pin Type 2: Ground				
Average	0.20	0.04	0.04	0.04
St. Dev.	0.04	0.03	0.03	0.03
Min	0.12	0.00	0.00	0.00
Max	0.30	0.13	0.11	0.13
Summary Count	64	64	64	64
Total Count	64	64	64	64

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \text{ \& } \leq 10$	$>10 \text{ \& } \leq 15$	$>15 \text{ \& } \leq 50$	$>50 \text{ \& } \leq 1000$	>1000
100 Cycles	192	0	0	0	0	0
Therm Shck	192	0	0	0	0	0
Humidity	192	0	0	0	0	0

DATA SUMMARIES Continued**LLCR Gas Tight Group**

- 1) A total of 128 signal and 64 ground points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - a. $\leq +5.0$ mOhms:-----Stable
 - b. $+5.1$ to $+10.0$ mOhms: -----Minor
 - c. $+10.1$ to $+15.0$ mOhms:-----Acceptable
 - d. $+15.1$ to $+50.0$ mOhms:-----Marginal
 - e. $+50.1$ to $+2000$ mOhms:-----Unstable
 - f. $>+2000$ mOhms:-----Open Failure

LLCR Measurement Summaries by Pin Type				
Date	2021/4/2	2021/4/9		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	52	52		
Technician	Kason He	Kason He		
mOhm values	Actual Initial	Delta Acid Vapor	Delta	Delta
Pin Type 1: Signal				
Average	41.02	0.37		
St. Dev.	0.64	0.39		
Min	39.82	0.00		
Max	44.01	1.66		
Summary Count	128	128		
Total Count	128	128		
Pin Type 2: Ground				
Average	0.13	0.05		
St. Dev.	0.04	0.03		
Min	0.05	0.00		
Max	0.22	0.14		
Summary Count	64	64		
Total Count	64	64		

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

DATA SUMMARIES Continued**LLCR Shock & Vibration Group**

- 1) A total of 128 signal and 64 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	2021/5/4	2021/5/12	
Room Temp (Deg C)	23	22	
Rel Humidity (%)	48	37	
Technician	Tony Wagoner	Scott Rollefstad	
mOhm values	Actual	Delta	
	Initial	Shock-Vib	
Pin Type: Signal 1			
Average	43.2	0.57	
St. Dev.	0.82	0.59	
Min	41.32	0.02	
Max	45.57	2.88	
Summary Count	128	128	
Total Count	128	128	
Pin Type: GND 1			
Average	0.51	0.04	
St. Dev.	0.17	0.02	
Min	0.23	0	
Max	0.75	0.13	
Summary Count	64	64	
Total Count	64	64	

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \text{ \& } \leq 10$	$>10 \text{ \& } \leq 15$	$>15 \text{ \& } \leq 50$	$>50 \text{ \& } \leq 1000$	>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

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: 4/26/2021, Next Cal: 4/25/2022**Equipment #:** HZ-OV-01**Description:** Oven**Manufacturer:** Huida**Model:** CS101-1E**Serial #:** CS101-1E-B**Accuracy:** Last Cal: 12/13/2020, Next Cal: 12/12/2021**Equipment #:** HZ-THC-01**Description:** Humidity transmitter**Manufacturer:** Thermtron**Model:** SM-8-8200**Serial #:** 38846**Accuracy:** Last Cal: 2/28/2021, Next Cal: 2/27/2022**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: 06/28/2020, Next Cal: 06/27/2021

Equipment #: DG-HPT-01**Description:** Hipot Safety Tester**Manufacturer:** Vitrek**Model:** V73**Serial #:** 025866**Accuracy:**

... Last Cal: 04/11/2021, Next Cal: 04/10/2022

Equipment #: HZ-MO-05**Description:** Micro-ohmmeter**Manufacturer:** Keithley**Model:** 3706**Serial #:** 1285188**Accuracy:** Last Cal: 11/15/2020, Next Cal: 11/14/2021**Equipment #:** HZ-MO-01**Description:** Micro-ohmmeter**Manufacturer:** Keithley**Model:** 2700**Serial #:** 1199807**Accuracy:** Last Cal: 04/28/2021, Next Cal: 04/27/2022

EQUIPMENT AND CALIBRATION SCHEDULES Continued**Equipment #:** HZ-PS-01**Description:** Power Supply**Manufacturer:** Agilent**Model:** 6031A**Serial #:** MY41000982**Accuracy:** Last Cal: 04/28/2021, Next Cal: 04/27/2022**Equipment #:** MO-04**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0798688**Accuracy:** See Manual

... Last Cal: 04/30/2021, Next Cal: 04/30/2022

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

... Last Cal: 11/31/2020, Next Cal: 11/31/2021

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

... Last Cal: 07/09/2020, Next Cal: 07/09/2021

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

... Last Cal: 06/04/2020, Next Cal: 06/04/2021