



|                                                                |                                        |
|----------------------------------------------------------------|----------------------------------------|
| Project: Design Qualification Test Report                      | Tracking Code: CR-1106501_Report_Rev_2 |
| Requested by: Eric Tseng                                       | Date: 8/6/2026                         |
| Part #: NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S |                                        |
| Part description: NVA3E\NVA3P                                  | Tech: Kason He                         |
| Test Start: 7/17/2024                                          | Test Completed: 8/13/2024              |



## DESIGN QUALIFICATION TEST REPORT

NVA3E\NVA3P

NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S

|                                        |                                                                |
|----------------------------------------|----------------------------------------------------------------|
| Tracking Code: CR-1106501_Report_Rev_2 | Part #: NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S |
| Part description: NVA3E\NVA3P          |                                                                |

**REVISION HISTORY**

| DATA     | REV.NUM. | DESCRIPTION                      | ENG |
|----------|----------|----------------------------------|-----|
| 4/2/2026 | 1        | Initial                          | KH  |
| 8/6/2026 | 2        | Add ozone exposure test results. | KH  |

|                                        |                                                                |
|----------------------------------------|----------------------------------------------------------------|
| Tracking Code: CR-1106501_Report_Rev_2 | Part #: NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S |
| Part description: NVA3E\NVA3P          |                                                                |

## **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, MIL-DTL-38999M

### **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

**FLOWCHARTS****Thermal Aging**Group 1

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

8 Assemblies

| Step | Description                                |
|------|--------------------------------------------|
| 1.   | Contact Gaps                               |
| 2.   | LLCR <sup>(1)</sup>                        |
| 3.   | Thermal Age <sup>(2)</sup> - Non Standard  |
| 4.   | LLCR <sup>(1)</sup><br>Max Delta = 15 mOhm |
| 5.   | Contact Gaps                               |

-----  
(1) LLCR = EIA-364-23

Open Circuit Voltage = 20 mV Max

Test Current = 100 mA Max

(2) Thermal Age = Other

EIA-364-17 Test Condition = 4 (105°C)

Time Condition = B (250 Hours)

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

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

8 Assemblies

Standard

*Note: Note: 100% LLCR*

| Step | Description                                                                      |
|------|----------------------------------------------------------------------------------|
| 1.   | Contact Gaps<br><i>Note: Measure gaps on the NVACP and the NVACE connectors.</i> |
| 2.   | LLCR <sup>(2)</sup>                                                              |
| 3.   | Cycles<br>Quantity = 100 Cycles                                                  |
| 4.   | LLCR <sup>(2)</sup><br>Max Delta = 15 mOhm                                       |
| 5.   | Cycles<br>Quantity = 100 Cycles                                                  |
| 6.   | LLCR <sup>(2)</sup><br>Max Delta = 15 mOhm                                       |
| 7.   | Cycles<br>Quantity = 100 Cycles                                                  |
| 8.   | LLCR <sup>(2)</sup><br>Max Delta = 15 mOhm                                       |
| 9.   | Cycles<br>Quantity = 100 Cycles                                                  |
| 10.  | LLCR <sup>(2)</sup><br>Max Delta = 15 mOhm                                       |
| 11.  | Cycles<br>Quantity = 100 Cycles                                                  |
| 12.  | Contact Gaps<br><i>Note: Measure gaps on the NVACP and the NVACE connectors.</i> |
| 13.  | LLCR <sup>(2)</sup><br>Max Delta = 15 mOhm                                       |
| 14.  | Thermal Shock <sup>(3)</sup> - Non Standard                                      |
| 15.  | LLCR <sup>(2)</sup><br>Max Delta = 15 mOhm                                       |
| 16.  | Humidity <sup>(1)</sup> - Non Standard                                           |
| 17.  | LLCR <sup>(2)</sup><br>Max Delta = 15 mOhm                                       |

(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) Thermal Shock = Other

Exposure Time at Temperature Extremes = 1/2 Hour; Method A, Test Condition = I (-40°C to +85°C)

Test Duration = A-3 (100 Cycles)

FLOWCHARTS Continued

IR/DWV

Note:  
1. Use 632V from NVACE Test Voltage  
2. If Group 1 passes at 632V, skip to Group 5. Otherwise determine test voltage with Groups 2-4  
2. If Group 6 passes at 632V, skip to Group 10. Otherwise determine test voltage with Groups 7-9

Pin-to-Ground

|                                                                                                             |                                                                           |                                                                                             |                                             |                                                               |                                             |                                                              |                                             |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------|---------------------------------------------|--------------------------------------------------------------|---------------------------------------------|
| <u>Group 1</u><br>NVA3E-DP-5-19-X.X-A-1-1-Z-S<br>NVA3P-DP-1-19-XX-A-1-1-Z-S<br>2 Assemblies<br>Custom Group |                                                                           | <u>Group 2</u><br>NVA3E-DP-5-19-X.X-A-1-1-Z-S<br>NVA3P-DP-1-19-XX-A-1-1-Z-S<br>2 Assemblies |                                             | <u>Group 3</u><br>NVA3E-DP-5-19-X.X-A-1-1-Z-S<br>2 Assemblies |                                             | <u>Group 4</u><br>NVA3P-DP-1-19-XX-A-1-1-Z-S<br>2 Assemblies |                                             |
| <b>Step</b>                                                                                                 | <b>Description</b>                                                        | <b>Step</b>                                                                                 | <b>Description</b>                          | <b>Step</b>                                                   | <b>Description</b>                          | <b>Step</b>                                                  | <b>Description</b>                          |
| 1.                                                                                                          | DWV at Test Voltage <sup>(1)</sup> - Non Standard<br>Test Voltage = 632 V | 1.                                                                                          | DWV Breakdown <sup>(3)</sup> - Non Standard | 1.                                                            | DWV Breakdown <sup>(3)</sup> - Non Standard | 1.                                                           | DWV Breakdown <sup>(3)</sup> - Non Standard |

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|                                                                                             |                                                   |
|---------------------------------------------------------------------------------------------|---------------------------------------------------|
| <u>Group 5</u><br>NVA3E-DP-5-19-X.X-A-1-1-Z-S<br>NVA3P-DP-1-19-XX-A-1-1-Z-S<br>2 Assemblies |                                                   |
| <b>Step</b>                                                                                 | <b>Description</b>                                |
| 1.                                                                                          | IR <sup>(5)</sup>                                 |
| 2.                                                                                          | DWV at Test Voltage <sup>(2)</sup> - Non Standard |
| 3.                                                                                          | Thermal Shock <sup>(6)</sup> - Non Standard       |
| 4.                                                                                          | IR <sup>(5)</sup>                                 |
| 5.                                                                                          | DWV at Test Voltage <sup>(2)</sup> - Non Standard |
| 6.                                                                                          | Humidity <sup>(4)</sup>                           |
| 7.                                                                                          | IR <sup>(5)</sup>                                 |
| 8.                                                                                          | DWV at Test Voltage <sup>(2)</sup> - Non Standard |

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**FLOWCHARTS Continued****Pin-to-Shell**Group 6

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

2 Assemblies

Custom Group

| Step | Description                                                               |
|------|---------------------------------------------------------------------------|
| 1.   | DWV at Test Voltage <sup>(1)</sup> - Non Standard<br>Test Voltage = 632 V |

Group 7

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

2 Assemblies

| Step | Description                                 |
|------|---------------------------------------------|
| 1.   | DWV Breakdown <sup>(3)</sup> - Non Standard |

Group 8

NVA3E-DP-5-19-X.X-A-1-1-Z-S

2 Assemblies

| Step | Description                                 |
|------|---------------------------------------------|
| 1.   | DWV Breakdown <sup>(3)</sup> - Non Standard |

Group 9

NVA3P-DP-1-19-XX-A-1-1-Z-S

2 Assemblies

| Step | Description                                 |
|------|---------------------------------------------|
| 1.   | DWV Breakdown <sup>(3)</sup> - Non Standard |

Group 10

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

2 Assemblies

| Step | Description                                       |
|------|---------------------------------------------------|
| 1.   | IR <sup>(5)</sup>                                 |
| 2.   | DWV at Test Voltage <sup>(2)</sup> - Non Standard |
| 3.   | Thermal Shock <sup>(6)</sup> - Non Standard       |
| 4.   | IR <sup>(5)</sup>                                 |
| 5.   | DWV at Test Voltage <sup>(2)</sup> - Non Standard |
| 6.   | Humidity <sup>(4)</sup>                           |
| 7.   | IR <sup>(5)</sup>                                 |
| 8.   | DWV at Test Voltage <sup>(2)</sup> - Non Standard |

- (1) DWV at Test Voltage = Other  
Refer to MIL-DTL-38999M 4.5.11.1  
Maximum leakage current shall be 2 milliamperes  
The test voltage shall be maintained at the specified value for 2 seconds minimum
- (2) DWV at Test Voltage = Other  
Test Condition = 1 (Sea Level)  
DWV test voltage is 632V or 75% of the lowest breakdown voltage  
Test voltage applied for 60 seconds
- (3) DWV Breakdown = Other  
Document the breakdown voltage
- (4) 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
- (5) IR = EIA-364-21  
Test Condition = 500 Vdc, 2 Minutes Max
- (6) Thermal Shock = Other  
Exposure Time at Temperature Extremes = 1/2 Hour  
Method A, Test Condition = I (-40°C to +85°C)  
Test Duration = A-3 (100 Cycles)

FLOWCHARTS Continued

Current Carrying Capacity

| Group 1                     |                                                           | Group 2                     |                                                           | Group 3                     |                                                           | Group 4                     |                                                           |
|-----------------------------|-----------------------------------------------------------|-----------------------------|-----------------------------------------------------------|-----------------------------|-----------------------------------------------------------|-----------------------------|-----------------------------------------------------------|
| NVA3E-DP-5-19-X.X-A-1-1-Z-S |                                                           | NVA3E-DP-5-19-X.X-A-1-1-Z-S |                                                           | NVA3E-DP-5-19-X.X-A-1-1-Z-S |                                                           | NVA3E-DP-5-19-X.X-A-1-1-Z-S |                                                           |
| NVA3P-DP-1-19-XX-A-1-1-Z-S  |                                                           | NVA3P-DP-1-19-XX-A-1-1-Z-S  |                                                           | NVA3P-DP-1-19-XX-A-1-1-Z-S  |                                                           | NVA3P-DP-1-19-XX-A-1-1-Z-S  |                                                           |
| 8 Pins Powered              |                                                           | 16 Pins Powered             |                                                           | 24 Pins Powered             |                                                           | 32 Pins Powered             |                                                           |
| Signal                      |                                                           | Signal                      |                                                           | Signal                      |                                                           | Signal                      |                                                           |
| Step                        | Description                                               | Step                        | Description                                               | Step                        | Description                                               | Step                        | Description                                               |
| 1.                          | CCC <sup>(1)</sup><br>Number of Positions = 8<br>Rows = 1 | 1.                          | CCC <sup>(1)</sup><br>Rows = 2<br>Number of Positions = 8 | 1.                          | CCC <sup>(1)</sup><br>Rows = 3<br>Number of Positions = 8 | 1.                          | CCC <sup>(1)</sup><br>Rows = 4<br>Number of Positions = 8 |

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(1) 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 2

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

8 Assemblies

Standard Group

| Step | Description                                                                      |
|------|----------------------------------------------------------------------------------|
| 1.   | LLCR <sup>(1)</sup>                                                              |
| 2.   | Mechanical Shock <sup>(2)</sup>                                                  |
| 3.   | Visual Inspection<br><i>Note: The Red band shall remain permanent after test</i> |
| 4.   | Random Vibration <sup>(4)</sup>                                                  |
| 5.   | Visual Inspection<br><i>Note: The Red band shall remain permanent after test</i> |
| 6.   | LLCR <sup>(1)</sup><br>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

(4) Random Vibration = EIA-364-28

Condition = VB (7.56 gRMS Average, 2 Hours/Axis)

**Mechanical Shock/Random Vibration/Event Detection**Group 2

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

60 Points

Standard

| Step | Description                                                     |
|------|-----------------------------------------------------------------|
| 1.   | Nanosecond Event Detection<br>(Mechanical Shock) <sup>(2)</sup> |
| 2.   | Nanosecond Event Detection<br>(Random Vibration) <sup>(3)</sup> |

(2) 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

(3) 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****Dust/Water**

*Note:*

*IP67 Start from 1M depth based on result to determine next depth; test to fail.*

*1M pass -->2M*

**IPX7 Deep Water Submersion**Group 1

NVA3E-DP-5-19-0.5-A-1-1-Z-S

NVA3P-DP-1-19-12-A-1-1-Z-S

3 Assemblies

IP67

**Step Description**

1. Water Submersion - IPX8<sup>(2)</sup> - Non  
Standard  
Depth = 1 meters  
Duration = 30 min
2. Visual Inspection

**IP6X Dust Tight**Group 2

NVA3E-DP-5-19-0.5-A-1-1-Z-S

NVA3P-DP-1-19-12-A-1-1-Z-S

3 Assemblies

IP6X

**Step Description**

1. Dust - IP6X<sup>(1)</sup>
2. Visual Inspection

(1) Dust - IP6X = CEI/IEC 60529

(2) Water Submersion - IPX8 = CEI/IEC 60529

FLOWCHARTS Continued

Cable Pull

| <div> Group 1 NVA3E-DP-5-19-X.X-A-1-1-Z-S NVA3P-DP-1-19-XX-A-1-1-Z-S 5 Assemblies NVA3E 0 Degrees </div> |                | <div> Group 2 NVA3E-DP-5-19-X.X-A-1-1-Z-S NVA3P-DP-1-19-XX-A-1-1-Z-S 5 Assemblies NVA3P 0 Degrees </div> |                | <div> Group 3 NVA3E-DP-5-19-X.X-A-1-1-Z-S NVA3P-DP-1-19-XX-A-1-1-Z-S 5 Assemblies NVA3P 90 Degrees Vertical </div> |                | <div> Group 4 NVA3E-DP-5-19-X.X-A-1-1-Z-S NVA3P-DP-1-19-XX-A-1-1-Z-S 5 Assemblies NVA3P 90 Degrees Lateral </div> |                |
|----------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------|----------------|
| Step                                                                                                     | Description    | Step                                                                                                     | Description    | Step                                                                                                               | Description    | Step                                                                                                              | Description    |
| 1.                                                                                                       | Cable Pull (1) | 1.                                                                                                       | Cable Pull (1) | 1.                                                                                                                 | Cable Pull (1) | 1.                                                                                                                | Cable Pull (1) |

| <div> Group 5 NVA3E-DP-5-19-X.X-A-1-1-Z-S NVA3P-DP-1-19-XX-A-1-1-Z-S 5 Assemblies NVA3E 90 Degrees Lateral </div> |                | <div> Group 6 NVA3E-DP-5-19-X.X-A-1-1-Z-S NVA3P-DP-1-19-XX-A-1-1-Z-S 5 Assemblies NVA3E 90 Degrees Vertical </div> |                |
|-------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------|----------------|
| Step                                                                                                              | Description    | Step                                                                                                               | Description    |
| 1.                                                                                                                | Cable Pull (1) | 1.                                                                                                                 | Cable Pull (1) |

(1) Cable Pull = EIA-364-38  
Measure and Record Force Required to Failure  
Failure = Discontinuity >1 microsecond at 10 ohms

**FLOWCHARTS Continued****Cable Flex***Note:*

1. Use test voltage from IR/DWV.

Group 1

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

8 Assemblies

NVA3E Circular Cable

*Note: IR/DWV*

| Step | Description                                       |
|------|---------------------------------------------------|
| 1.   | IR <sup>(3)</sup>                                 |
| 2.   | DWV at Test Voltage <sup>(2)</sup> - Non Standard |
| 3.   | Cable Flex <sup>(1)</sup>                         |
| 4.   | Visual Inspection                                 |
| 5.   | IR <sup>(3)</sup>                                 |
| 6.   | DWV at Test Voltage <sup>(2)</sup> - Non Standard |
| 7.   | Rotate Cable 90°                                  |
| 8.   | Cable Flex <sup>(1)</sup>                         |
| 9.   | Visual Inspection                                 |
| 10.  | IR <sup>(3)</sup>                                 |
| 11.  | DWV at Test Voltage <sup>(2)</sup> - Non Standard |

Group 2

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

8 Assemblies

NVA3E Circular Cable

*Note: Continuity*

| Step | Description               |
|------|---------------------------|
| 1.   | Cable Flex <sup>(1)</sup> |
| 2.   | Visual Inspection         |
| 3.   | Rotate Cable 90°          |
| 4.   | Cable Flex <sup>(1)</sup> |
| 5.   | Visual Inspection         |

(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 &gt;1 microsecond at 10 ohms

(2) DWV at Test Voltage = Other

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

**Salt Spray 48 Hrs - Mated Condition***Note: 1. Salt spray MIL-DTL-38999M 3.17 & 4.5.13.2*Group 1

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

8 Assemblies

Custom Group

| Step | Description         |
|------|---------------------|
| 1.   | Visual Inspection   |
| 2.   | Salt Spray          |
|      | <i>Note: 48 hrs</i> |
| 3.   | Visual Inspection   |

**FLOWCHARTS Continued****High Temperature Exposure***Note:**High temperature exposure refer to MIL-DTL-38999M 3.38.2 & 4.5.34.2**The temperature shall be maintained for 1,000 hours. (125->250->500->750->1000 hrs)*Group 1

NVA3E-DP-5-19-0.5-A-1-1-Z-S

NVA3P-DP-1-19-12-A-1-1-Z-S

8 Assemblies

Custom Group

*Note:**We will go with 105C (125hrs->250hrs->500hrs->750hrs->1000hrs)*

| Step | Description                                       |
|------|---------------------------------------------------|
| 1.   | Visual Inspection                                 |
| 2.   | High Temperature Exposure<br><i>Note: 125 hrs</i> |
| 3.   | IR (2)                                            |
| 4.   | DWV at Test Voltage <sub>(1)</sub> - Non Standard |
| 5.   | Visual Inspection                                 |
| 6.   | High Temperature Exposure<br><i>Note: 125 hrs</i> |
| 7.   | IR (2)                                            |
| 8.   | DWV at Test Voltage <sub>(1)</sub> - Non Standard |
| 9.   | Visual Inspection                                 |
| 10.  | High Temperature Exposure<br><i>Note: 250 hrs</i> |
| 11.  | IR (2)                                            |
| 12.  | DWV at Test Voltage <sub>(1)</sub> - Non Standard |
| 13.  | Visual Inspection                                 |
| 14.  | High Temperature Exposure<br><i>Note: 250 hrs</i> |
| 15.  | IR (2)                                            |
| 16.  | DWV at Test Voltage <sub>(1)</sub> - Non Standard |
| 17.  | Visual Inspection                                 |
| 18.  | High Temperature Exposure<br><i>Note: 250 hrs</i> |
| 19.  | IR (2)                                            |
| 20.  | DWV at Test Voltage <sub>(1)</sub> - Non Standard |
| 21.  | Visual Inspection                                 |

(1) DWV at Test Voltage = Other

Test Condition = 1 (Sea Level)

DWV test voltage is 632V or 75% of lowest breakdown voltage

Test voltage applied for 60 seconds

(2) IR = EIA-364-21

Test Condition = 500 Vdc, 2 Minutes Max

**FLOWCHARTS Continued****Spring Finger Force**Group 1

NVA3E\* SHELL W/O NUT

NVA3P\* SHELL ONLY

8 Assemblies

EMI Spring Finger

| Step | Description                                            |
|------|--------------------------------------------------------|
| 1.   | Visual Inspection                                      |
| 2.   | Mating/Unmating Force <sup>(1)</sup> - Non<br>Standard |
| 3.   | Cycles<br>Quantity = 10 Cycles                         |
| 4.   | Mating/Unmating Force <sup>(1)</sup> - Non<br>Standard |
| 5.   | Visual Inspection                                      |

(1) Mating/Unmating Force = Other

Refer to MIL-DTL-38999M 3.31 &amp; 4.5.27

Mating/unmating to 35 lbs Max./0.5 lbs Min. (156 N Max. /2 N Min.)

**External Bending Moment***Note: 1. External bending moment refer to MIL-DTL-38999M 3.20 & 4.5.16*Group 1

NVA3E-DP-5-19-X.X-A-1-1-Z-S

NVA3P-DP-1-19-XX-A-1-1-Z-S

8 Assemblies

Custom Group

| Step | Description                                                                                                                           |
|------|---------------------------------------------------------------------------------------------------------------------------------------|
| 1.   | Visual Inspection                                                                                                                     |
| 2.   | External Bending Moment<br><i>Note: Apply 79.1 Newton meters<br/>for 1 minute,<br/>Failure = Discontinuity &gt; 1<br/>microsecond</i> |
| 3.   | Rotate Cable 90°                                                                                                                      |
| 4.   | External Bending Moment<br><i>Note: Apply 79.1 Newton meters<br/>for 1 minute,<br/>Failure = Discontinuity &gt; 1<br/>microsecond</i> |
| 5.   | Visual Inspection                                                                                                                     |

**FLOWCHARTS Continued**

**Ozone Exposure**

*Note:*  
*Ozone exposure refer to MIL-DTL-38999M 3.33 & 4.5.29*

Group 1  
N-NVA3E-DP-5-19-0.5-A-1-1-Z-S  
N-NVA3P-DP-1-19-12-A-1-1-Z-S  
8 Assemblies  
Ozone

| Step | Description       |
|------|-------------------|
| 1.   | Visual Inspection |
| 2.   | Ozone Exposure    |
| 3.   | Visual Inspection |

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**ATTRIBUTE DEFINITIONS**

The following is a brief, simplified description of attributes.

**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 A 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.

**THERMAL SHOCK:**

- 1) EIA-364-32, *Thermal Shock (Temperature Cycling) Test Procedure for Electrical Connectors*.
- 2) Test Condition I: -40°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.

**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 C
- 3) Peak Value: 100 G
- 4) Duration: 6 Milliseconds
- 5) Wave Form: Half Sine
- 6) Velocity: 12.3 ft/s
- 7) Number of Shocks: 3 Shocks / Direction, 3 Axis (18 Total)

**VIBRATION:**

- 1) Reference document: EIA-364-28, *Vibration Test Procedure for Electrical Connectors*
- 2) Test Condition V, Letter B
- 3) Power Spectral Density: 0.04 G<sup>2</sup> / 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 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

**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 of stress
  - 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

**TEMPERATURE RISE (Current Carrying Capacity, CCC):**

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

**ATTRIBUTE DEFINITIONS 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 their rated voltage and withstand momentary over potential due to switching, surges, and another 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: MIL-DTL-38999M 4.5.11.1, *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).

**Dust/Water**

1. Dust-IP6X=CEI/IEC 60529
2. Water Submersion-IPX8=CEI/IEC 60529

**Salt Spray 48 Hrs – Samtec Standard**

Salt Spray MIL-DTL-38999M 3.17& 4.5.13.2

**Ozone Exposure**

Ozone exposure refers to MIL-DTL-38999M 3.33 & 4.5.29.

**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
  - c. At 90° Lateral, in-line with cable

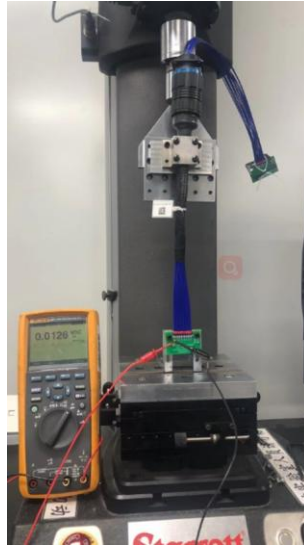


Fig. 1  
0° Connector pull

**CABLE Flex:**

- 1) Oscillate and monitor electrical continuity for open circuit indication.
  - a.  $\pm 90^\circ$  Flex Mode, bend up to 200 cycles. load on 16 oz.

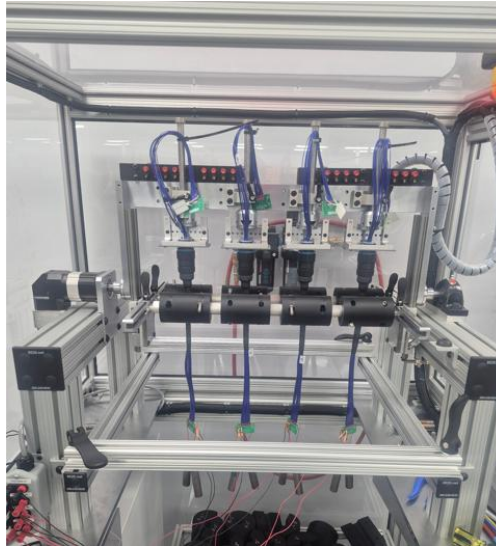


Fig. 2  
(Setup picture)

**ATTRIBUTE DEFINITIONS Continued**

The following is a brief, simplified description of attributes

**Spring Finger Forces (EMI Spring):**

Refer to MIL-DTL-38999M 3.31 & 4.5.27

Mating/unmating to 35 lbs Max./0.5 lbs Min. (156 N Max. /2 N Min.)

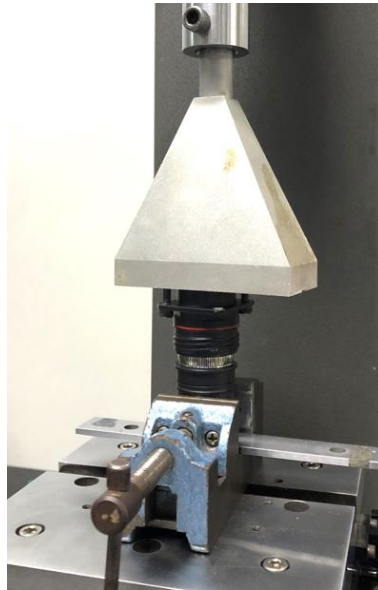


Fig. 3  
(Setup picture)

**External Bending Moment**

Refer to MIL-DTL-38999M 3.20 & 4.5.16

Apply 79.1 Newton meters for 1 minute, Failure = Discontinuity > 1microsecond.



Fig. 4  
(Setup picture)

### RESULTS

#### Temperature Rise, CCC at a 20% de-rating

- CCC for a 30°C Temperature Rise-----0.8 A per contact with 8 contacts (1 x 8) powered
- CCC for a 30°C Temperature Rise-----0.7 A per contact with 16 contacts (2 x 8) powered
- CCC for a 30°C Temperature Rise-----0.6 A per contact with 24 contacts (3 x 8) powered
- CCC for a 30°C Temperature Rise-----0.5 A per contact with 32 contacts (4 x 8) powered

#### Spring Finger Forces (EMI Spring):

- Initial
  - Mating
    - Min ----- 3.86 lbs
    - Max----- 5.63 lbs
  - Unmating
    - Min ----- 1.80 lbs
    - Max----- 2.51 lbs
- After 10 Cycles
  - Mating
    - Min ----- 3.85 lbs
    - Max----- 5.18 lbs
  - Unmating
    - Min ----- 1.86 lbs
    - Max----- 2.35 lbs

#### Cable Pull:

- NVA3E 0° Pull
  - Min ----- 159.52 lbs
  - Max----- 191.54 lbs
- NVA3E 90° Pull-Lateral
  - Min ----- 74.32 lbs
  - Max----- 93.52 lbs
- NVA3E 90° Pull-Vertical
  - Min ----- 106.34 lbs
  - Max----- 140.50 lbs
- NVA3P 0° Pull
  - Min ----- 79.07 lbs
  - Max----- 101.89 lbs
- NVA3P 90° Pull-Lateral
  - Min ----- 42.60 lbs
  - Max----- 49.58 lbs
- NVA3P 90° Pull-Vertical
  - Min ----- 35.23 lbs
  - Max----- 46.22 lbs

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

- **Initial**
  - Mated -----45000 Meg  $\Omega$  ----- Passed
  - Unmated ----- 45000 Meg  $\Omega$  ----- Passed
- **Thermal Shock**
  - Mated ----- 45000 Meg  $\Omega$  ----- Passed
  - Unmated ----- 45000 Meg  $\Omega$  ----- Passed
- **Humidity**
  - Mated -----45000 Meg  $\Omega$  ----- Passed
  - Unmated -----45000 Meg  $\Omega$  ----- Passed

**Row to Row**

- **Initial**
  - Mated -----45000 Meg  $\Omega$  ----- Passed
  - Unmated ----- 45000 Meg  $\Omega$  ----- Passed
- **Thermal Shock**
  - Mated ----- 45000 Meg  $\Omega$  ----- Passed
  - Unmated ----- 45000 Meg  $\Omega$  ----- Passed
- **Humidity**
  - Mated -----45000 Meg  $\Omega$  ----- Passed
  - Unmated -----45000 Meg  $\Omega$  ----- Passed

**Pin to Ground**

- **Initial**
  - Mated -----45000 Meg  $\Omega$  ----- Passed
  - Unmated ----- 45000 Meg  $\Omega$  ----- Passed
- **Thermal Shock**
  - Mated ----- 45000 Meg  $\Omega$  ----- Passed
  - Unmated ----- 45000 Meg  $\Omega$  ----- Passed
- **Humidity**
  - Mated -----45000 Meg  $\Omega$  ----- Passed
  - Unmated -----45000 Meg  $\Omega$  ----- Passed

**Dielectric Withstanding Voltage minimums, DWV**

- **Minimums**
  - Breakdown Voltage -----842 VAC
  - Test Voltage -----632 VAC
  - Working Voltage -----211 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****Cable Flex:****Insulation Resistance minimums, IR****Pin to Pin**

- Initial
  - Mated-----45000 Meg  $\Omega$  ----- Passed
- After 100 flex cycles
  - Mated-----45000 Meg  $\Omega$  ----- Passed
- After 200 flex cycles
  - Mated-----45000 Meg  $\Omega$  ----- Passed

**Row to Row**

- Initial
  - Mated-----45000 Meg  $\Omega$  ----- Passed
- After 100 flex cycles
  - Mated-----45000 Meg  $\Omega$  ----- Passed
- After 200 flex cycles
  - Mated-----45000 Meg  $\Omega$  ----- Passed

**Pin to Ground**

- Initial
  - Mated-----45000 Meg  $\Omega$  ----- Passed
- After 100 flex cycles
  - Mated-----45000 Meg  $\Omega$  ----- Passed
- After 200 flex cycles
  - Mated-----45000 Meg  $\Omega$  ----- Passed

**Dielectric Withstanding Voltage minimums, DWV**

- Test Voltage-----632 VAC

**Pin to Pin**

- Initial DWV -----Passed
- After 100 Flex cycles DWV -----Passed
- After 200 Flex cycles DWV -----Passed

**Row to Row**

- Initial DWV -----Passed
- After 100 Flex cycles DWV -----Passed
- After 200 Flex cycles DWV -----Passed

**Pin to Ground**

- Initial DWV -----Passed
- After 100 Flex cycles DWV -----Passed
- After 200 Flex cycles DWV -----Passed

**Salt Spray 48 Hrs - Mated Condition:****Visual Inspection**

- Initial -----Passed
- After 48hr fog-----Passed

**Ozone Exposure****Visual Inspection**

- Initial -----Passed
- After ozone exposure-----No Visible Change – Complies

RESULTS Continued

High Temperature Exposure:

Visual Inspection

- Initial -----Passed
- After Thermal 125h at 105°C-----Passed
- After Thermal 250h at 105°C-----Passed
- After Thermal 500h at 105°C-----Passed
- After Thermal 750h at 105°C-----Passed
- After Thermal 1000h at 105°C -----Passed

Insulation Resistance minimums, IR

- After Thermal 125h at 105°C
  - Mated-----45000 Meg Ω ----- Passed
- After Thermal 250h at 105°C
  - Mated-----45000 Meg Ω ----- Passed
- After Thermal 500h at 105°C
  - Mated-----45000 Meg Ω ----- Passed
- After Thermal 750h at 105°C
  - Mated-----45000 Meg Ω ----- Passed
- After Thermal 1000h at 105°C
  - Mated-----45000 Meg Ω ----- Passed

Dielectric Withstanding Voltage minimums, DWV

- Test Voltage-----632 VAC
- After Thermal 125h at 105°C
  - Mated-----Passed
- After Thermal 250h at 105°C
  - Mated-----Passed
- After Thermal 500h at 105°C
  - Mated-----Passed
- After Thermal 750h at 105°C
  - Mated-----Passed
- After Thermal 1000h at 105°C
  - Mated-----Passed

IP6X &IPX7 Testing (Dust & Water):

|       |                                  |                       |
|-------|----------------------------------|-----------------------|
|       | <u>Initial (Before Exposure)</u> | <u>After Exposure</u> |
| Dust  | No Dust Present                  | No Dust Present       |
|       | <u>Initial (Before Exposure)</u> | <u>After Exposure</u> |
| Water | No Water Present                 | No Water Present      |

External Bending Moment:

- 0°-----Pass
- Rotate Cable 90°-----Pass

RESULTS Continued

LLCR Thermal Aging Group (256 signal and 8 ground LLCR test points)

- Signal Pin
- Initial -----210.7 mOhms Max
  - Thermal
    - <= +5.0 mOhms ----- 130 Points ----- Stable
    - +5.1 to +10.0 mOhms ----- 86 Points ----- Minor
    - +10.1 to +15.0 mOhms ----- 40 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 -----4.16 mOhms Max
  - Thermal
    - <= +5.0 mOhms ----- 8 Points ----- Stable
    - +5.1 to +10.0 mOhms -----0 Points ----- Minor
    - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
    - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
    - +50.1 to +1000 mOhms-----0 Points ----- Unstable
    - >+1000 mOhms-----0 Points ----- Open Failure

**RESULTS Continued****LLCR Durability (256 Signal, 8 ground LLCR test points)****Signal**

- **Initial** -----215.6 mOhms Max
- **Durability, 100 Cycles**
  - <= +5.0 mOhms -----174 Points -----Stable
  - +5.1 to +10.0 mOhms -----82 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
- **Durability, 200 Cycles**
  - <= +5.0 mOhms -----138 Points -----Stable
  - +5.1 to +10.0 mOhms -----118 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
- **Durability, 300 Cycles**
  - <= +5.0 mOhms -----255 Points -----Stable
  - +5.1 to +10.0 mOhms -----1 Points -----Minor
  - +10.1 to +15.0 mOhms -----0 Points -----Acceptable
  - +15.1 to +50.0 mOhms -----0 Points -----Marginal
  - +50.1 to +1000 mOhms -----0 Points -----Unstable
  - >+1000 mOhms -----0 Points -----Open Failure
- **Durability, 400 Cycles**
  - <= +5.0 mOhms -----256 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
- **Durability, 500 Cycles**
  - <= +5.0 mOhms -----256 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 -----196 Points -----Stable
  - +5.1 to +10.0 mOhms -----60 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 -----166 Points -----Stable
  - +5.1 to +10.0 mOhms -----89 Points -----Minor
  - +10.1 to +15.0 mOhms -----1 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****Ground**

- **Initial** -----4.73 mOhms Max
- **Durability, 100 Cycles**
  - <= +5.0 mOhms -----8 Points ----- Stable
  - +5.1 to +10.0 mOhms -----0 Points ----- Minor
  - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
  - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
  - +50.1 to +1000 mOhms -----0 Points ----- Unstable
  - >+1000 mOhms -----0 Points ----- Open Failure
- **Durability, 200 Cycles**
  - <= +5.0 mOhms -----8 Points ----- Stable
  - +5.1 to +10.0 mOhms -----0 Points ----- Minor
  - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
  - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
  - +50.1 to +1000 mOhms -----0 Points ----- Unstable
  - >+1000 mOhms -----0 Points ----- Open Failure
- **Durability, 300 Cycles**
  - <= +5.0 mOhms -----8 Points ----- Stable
  - +5.1 to +10.0 mOhms -----0 Points ----- Minor
  - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
  - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
  - +50.1 to +1000 mOhms -----0 Points ----- Unstable
  - >+1000 mOhms -----0 Points ----- Open Failure
- **Durability, 400 Cycles**
  - <= +5.0 mOhms -----8 Points ----- Stable
  - +5.1 to +10.0 mOhms -----0 Points ----- Minor
  - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
  - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
  - +50.1 to +1000 mOhms -----0 Points ----- Unstable
  - >+1000 mOhms -----0 Points ----- Open Failure
- **Durability, 500 Cycles**
  - <= +5.0 mOhms -----8 Points ----- Stable
  - +5.1 to +10.0 mOhms -----0 Points ----- Minor
  - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
  - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
  - +50.1 to +1000 mOhms -----0 Points ----- Unstable
  - >+1000 mOhms -----0 Points ----- Open Failure
- **Thermal**
  - <= +5.0 mOhms -----8 Points ----- Stable
  - +5.1 to +10.0 mOhms -----0 Points ----- Minor
  - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
  - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
  - +50.1 to +1000 mOhms -----0 Points ----- Unstable
  - >+1000 mOhms -----0 Points ----- Open Failure
- **Humidity**
  - <= +5.0 mOhms -----8 Points ----- Stable
  - +5.1 to +10.0 mOhms -----0 Points ----- Minor
  - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
  - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
  - +50.1 to +1000 mOhms -----0 Points ----- Unstable
  - >+1000 mOhms -----0 Points ----- Open Failure

RESULTS Continued

LLCR Shock & Vibration (256 signals and 8 ground LLCR test points)

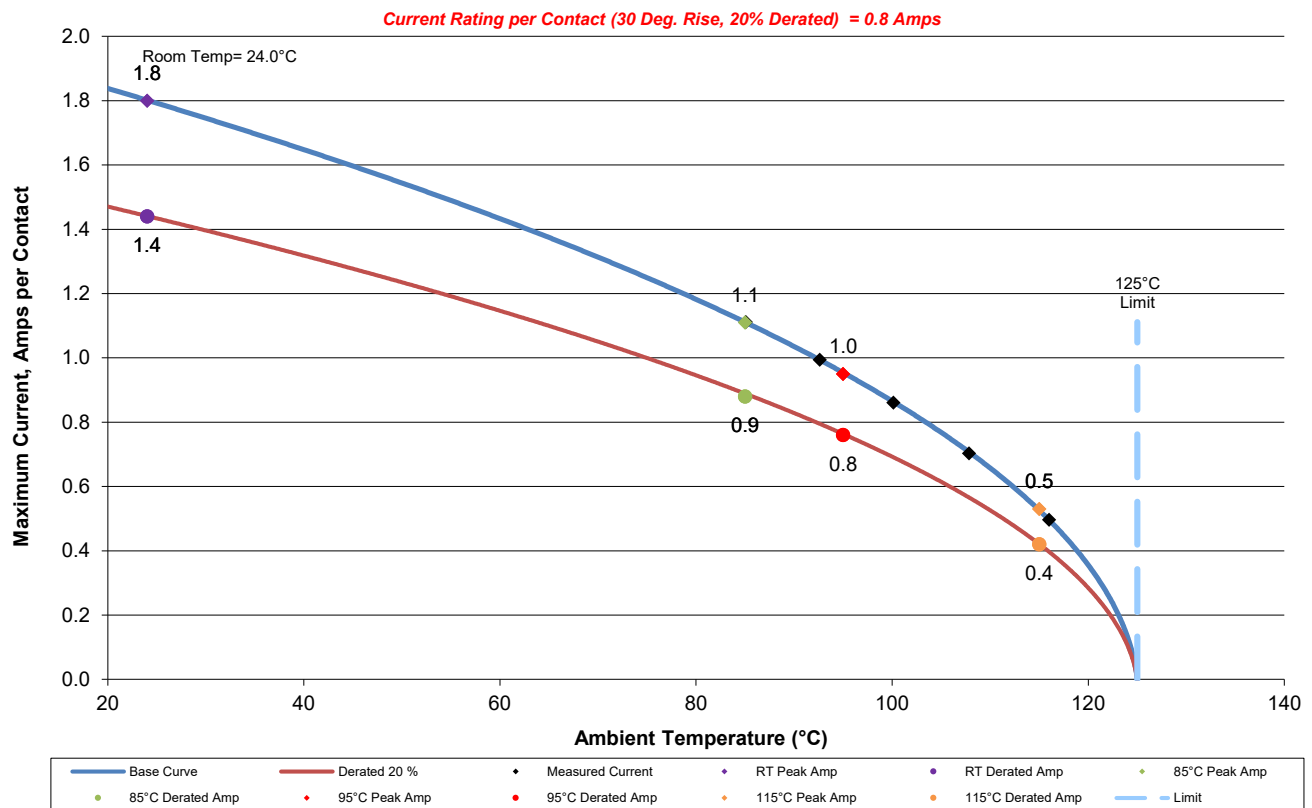
- Signal
- Initial -----405.48 mOhms Max
  - Shock &Vibration
    - <= +5.0 mOhms-----227 Points ----- Stable
    - +5.1 to +10.0 mOhms ----- 26 Points ----- Minor
    - +10.1 to +15.0 mOhms -----3 Points ----- Acceptable
    - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
    - +50.1 to +1000 mOhms -----0 Points ----- Unstable
    - >+1000 mOhms -----0 Points ----- Open Failure
- Ground
- Initial -----9.66 mOhms Max
  - Shock &Vibration
    - <= +5.0 mOhms-----8 Points ----- Stable
    - +5.1 to +10.0 mOhms -----0 Points ----- Minor
    - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
    - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
    - +50.1 to +1000 mOhms -----0 Points ----- Unstable
    - >+1000 mOhms -----0 Points ----- Open Failure

Mechanical Shock & Random Vibration:

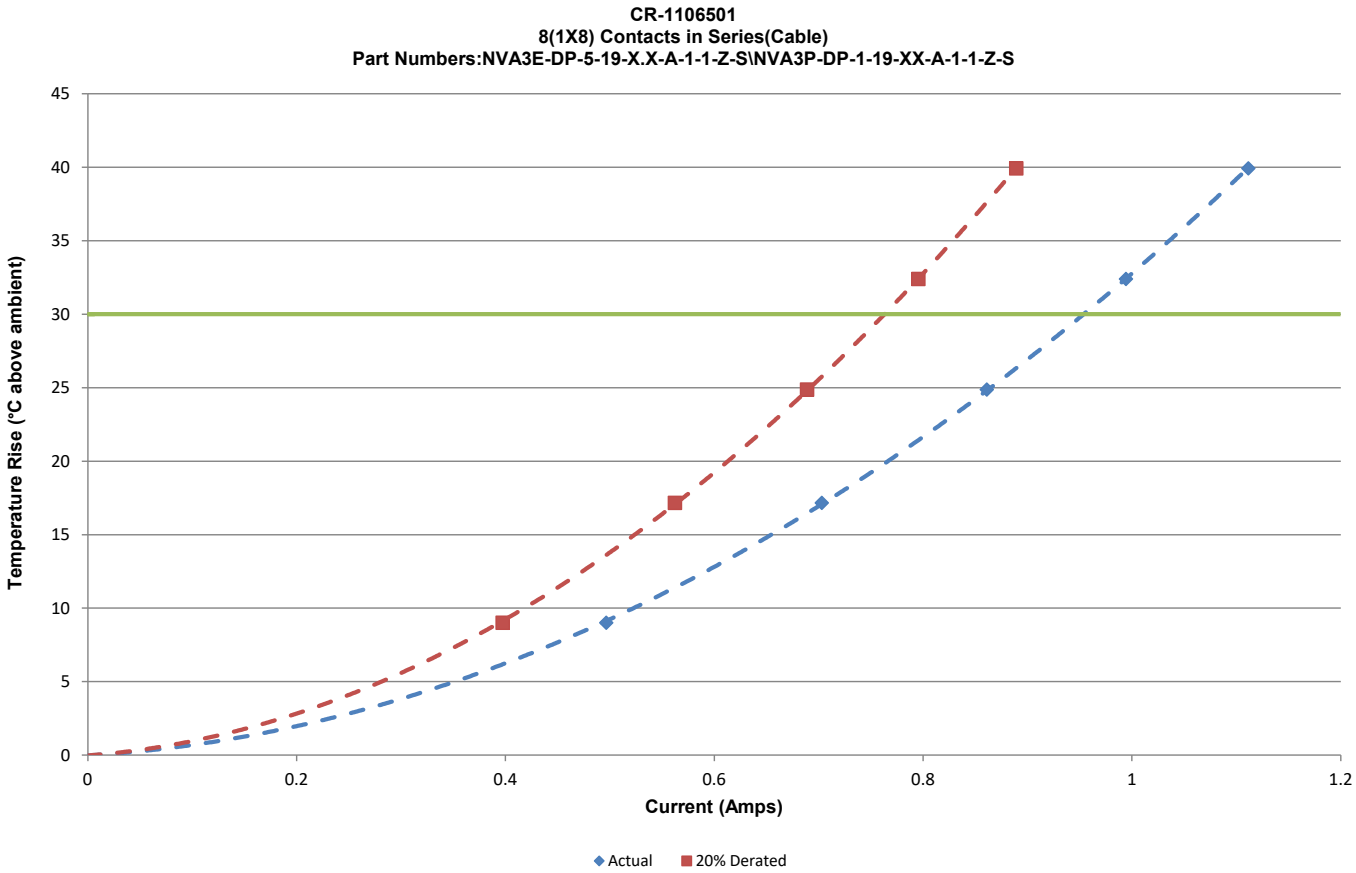
- Shock
  - No Damage----- Pass
  - 50 Nanoseconds ----- Pass
- Vibration
  - No Damage----- Pass
  - 50 Nanoseconds ----- Pass

**DATA SUMMARIES****TEMPERATURE RISE (Current Carrying Capacity, CCC):**

- 1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
- 2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
- 3) Temperature readings recorded are those for which three successive readings, 15 minutes apart, differ less than 1° C (computer controlled data acquisition).
- 4) Adjacent contacts were powered:
  - a. Linear configuration with 8 adjacent signal conductors/contacts powered

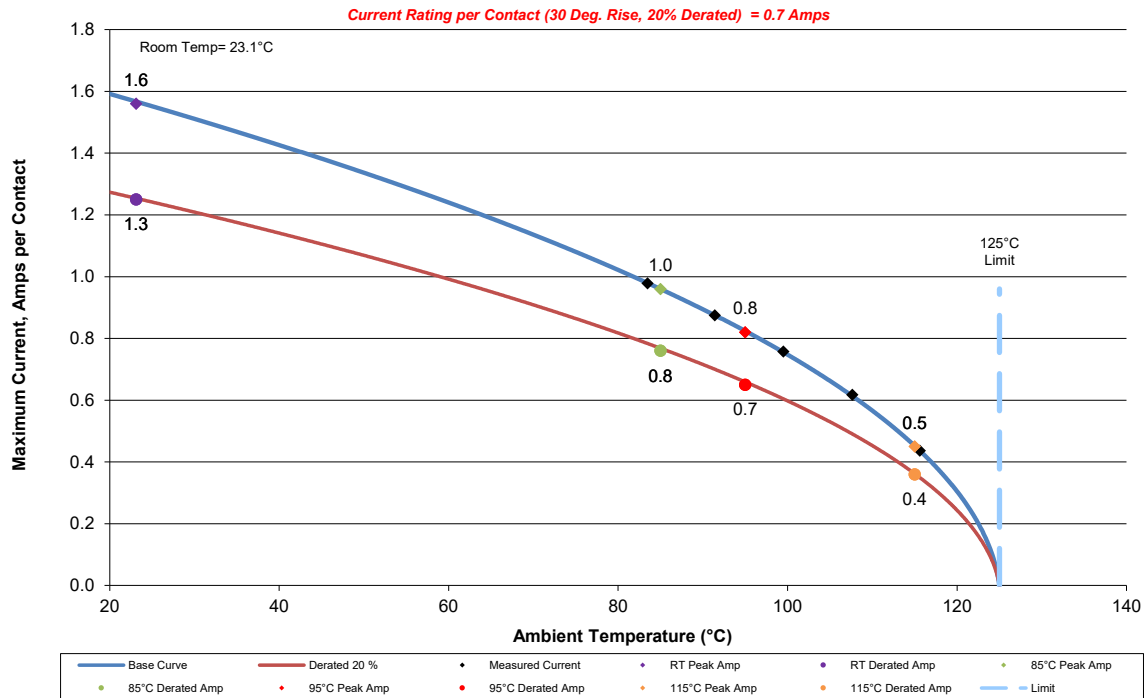
**CR-1106501****8(1X8) Contacts in Series(Cable)****Part Numbers:NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S**

**DATA SUMMARIES Continued**

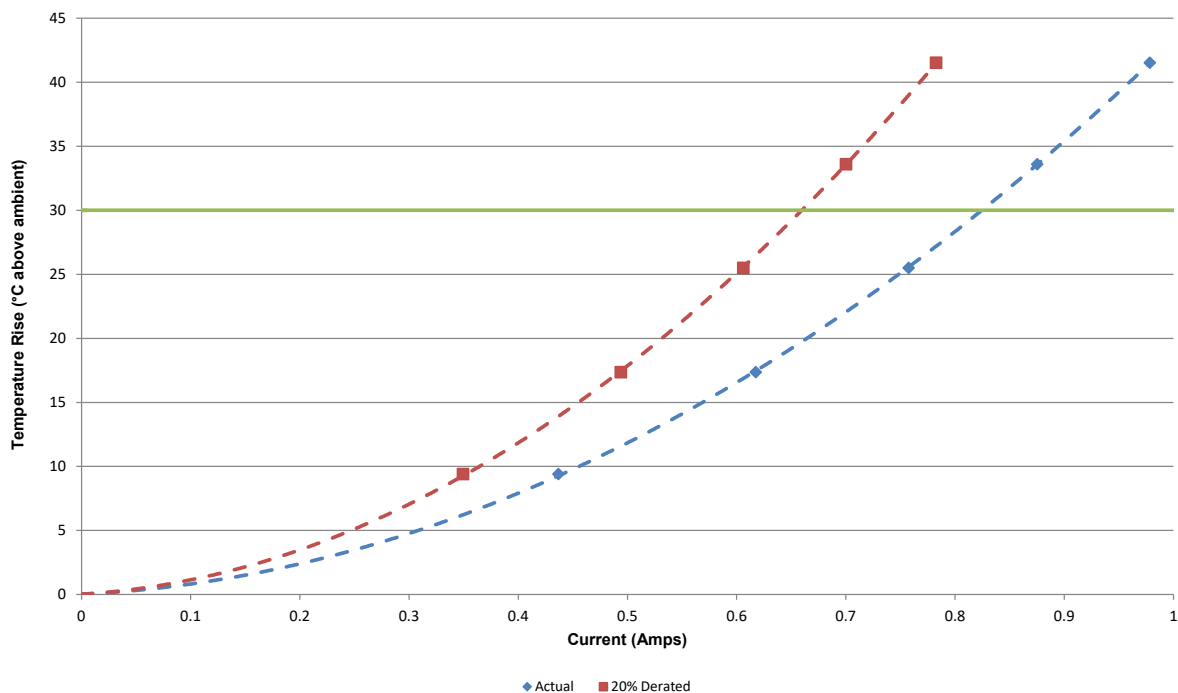


**DATA SUMMARIES Continued****b. Linear configuration with 16 adjacent signal conductors/contacts powered**

CR-1106501  
16(2X8) Contacts in Series(Cable)  
Part Numbers:NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S

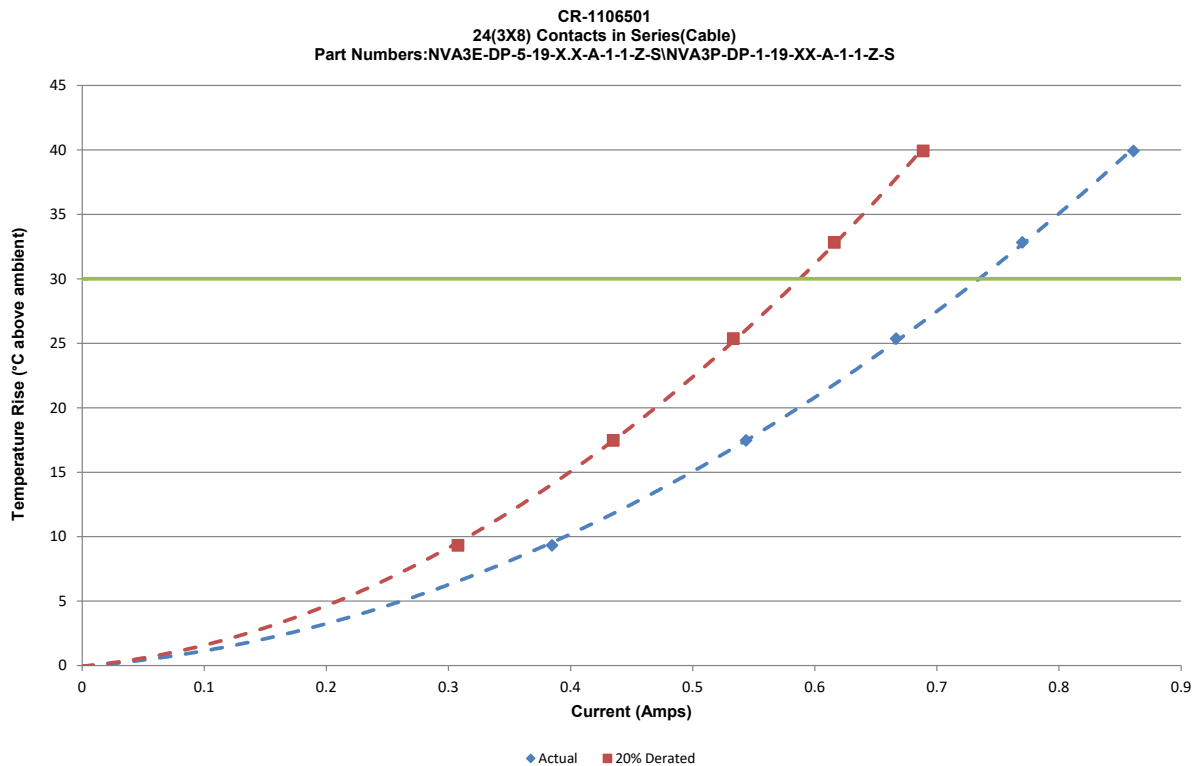
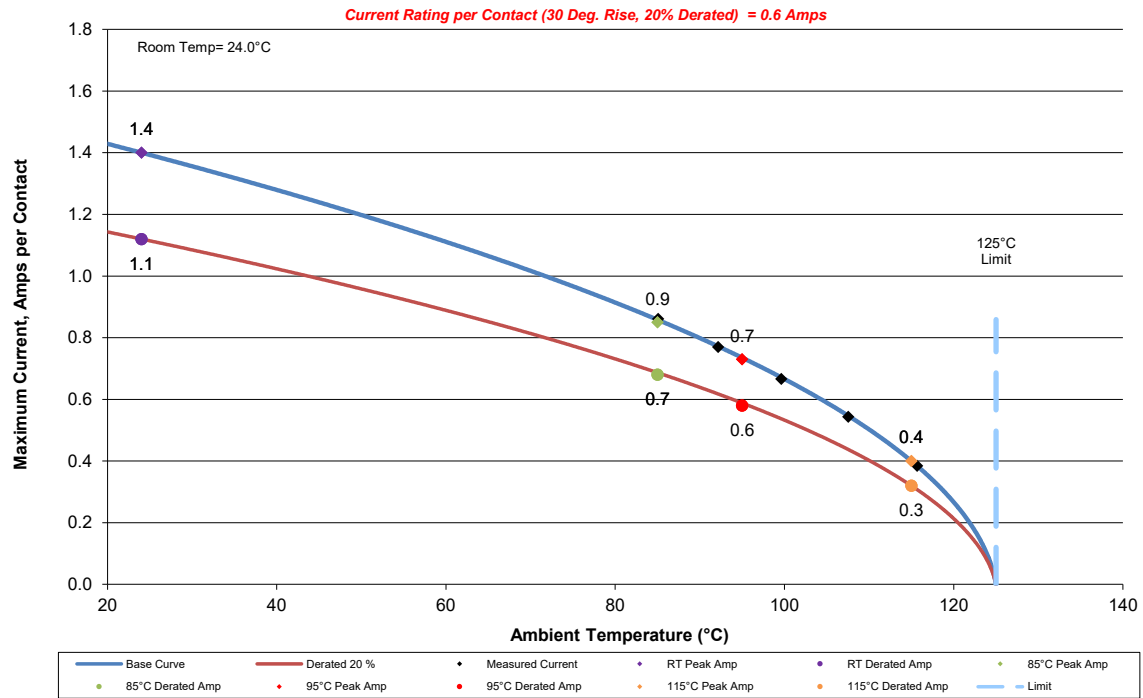


CR-1106501  
16(2X8) Contacts in Series(Cable)  
Part Numbers:NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S



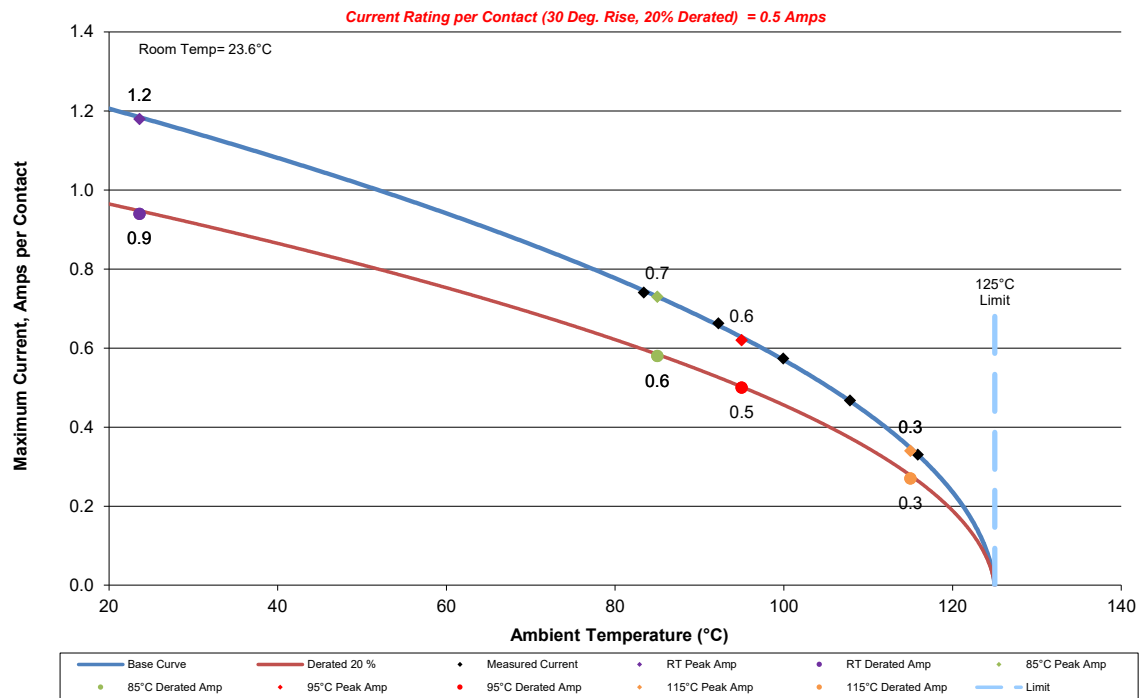
**DATA SUMMARIES Continued****c. Linear configuration with 24 adjacent signal conductors/contacts powered**

CR-1106501  
24(3X8) Contacts in Series(Cable)  
Part Numbers:NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S

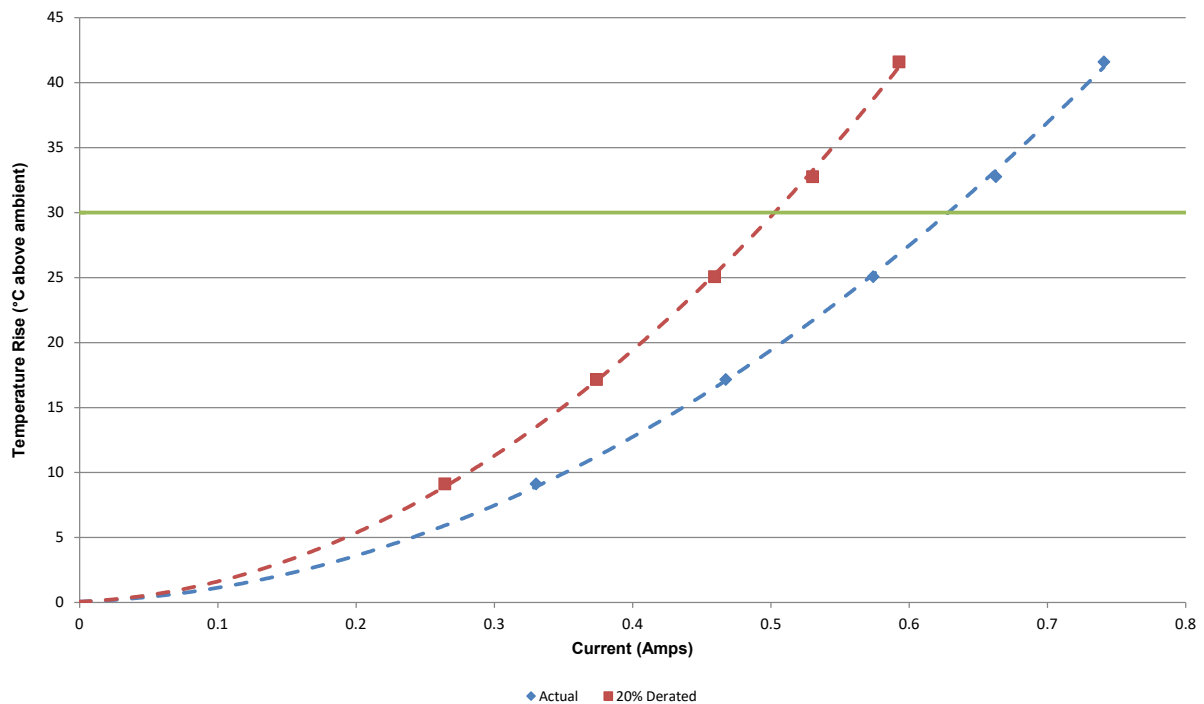


**DATA SUMMARIES Continued****d. Linear configuration with 32 adjacent signal conductors/contacts powered**

CR-1106501  
32(4X8) Contacts in Series(Cable)  
Part Numbers:NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S



CR-1106501  
32(4X8) Contacts in Series(Cable)  
Part Numbers:NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S



## DATA SUMMARIES Continued

### Spring Finger Force (EMI Spring):

|                | Initial |             |          |             | After 10 Cycles |             |          |             |
|----------------|---------|-------------|----------|-------------|-----------------|-------------|----------|-------------|
|                | Mating  |             | Unmating |             | Mating          |             | Unmating |             |
|                | Newtons | Force (Lbs) | Newtons  | Force (Lbs) | Newtons         | Force (Lbs) | Newtons  | Force (Lbs) |
| Minimum        | 17.17   | 3.86        | 8.01     | 1.80        | 17.12           | 3.85        | 8.27     | 1.86        |
| Maximum        | 25.04   | 5.63        | 11.16    | 2.51        | 23.04           | 5.18        | 10.45    | 2.35        |
| <b>Average</b> | 21.61   | <b>4.86</b> | 9.99     | <b>2.25</b> | 20.58           | <b>4.63</b> | 9.67     | <b>2.17</b> |
| St Dev         | 2.71    | 0.61        | 0.95     | 0.21        | 2.17            | 0.49        | 0.72     | 0.16        |
| Count          | 8       | 8           | 8        | 8           | 8               | 8           | 8        | 8           |

### Cable Pull:

#### NVA3E 0° Pull

|         | Force (lbs) |
|---------|-------------|
| Minimum | 159.52      |
| Maximum | 191.54      |
| Average | 174.50      |

#### NVA3E 90° Pull-Lateral

|         | Force (lbs) |
|---------|-------------|
| Minimum | 74.32       |
| Maximum | 93.52       |
| Average | 86.56       |

#### NVA3E 90° Pull-Vertical

|         | Force (lbs) |
|---------|-------------|
| Minimum | 106.34      |
| Maximum | 140.50      |
| Average | 114.49      |

#### NVA3P 0° Pull

|         | Force (lbs) |
|---------|-------------|
| Minimum | 79.07       |
| Maximum | 101.89      |
| Average | 90.97       |

#### NVA3P 90° Pull-Lateral

|         | Force (lbs) |
|---------|-------------|
| Minimum | 42.60       |
| Maximum | 49.58       |
| Average | 47.53       |

#### NVA3P 90° Pull-Vertical

|         | Force (lbs) |
|---------|-------------|
| Minimum | 35.23       |
| Maximum | 46.22       |
| Average | 42.16       |

DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

| Pin to Pin |                 |         |         |
|------------|-----------------|---------|---------|
|            | Mated           | Unmated | Unmated |
| Minimum    | N-NVA3E/N-NVA3P | N-NVA3E | N-NVA3P |
| Initial    | 45000           | 45000   | 45000   |
| Thermal    | 45000           | 45000   | 45000   |
| Humidity   | 45000           | 45000   | 45000   |

| Row to Row |                 |         |         |
|------------|-----------------|---------|---------|
|            | Mated           | Unmated | Unmated |
| Minimum    | N-NVA3E/N-NVA3P | N-NVA3E | N-NVA3P |
| Initial    | 45000           | 45000   | 45000   |
| Thermal    | 45000           | 45000   | 45000   |
| Humidity   | 45000           | 45000   | 45000   |

| Pin to Ground |                 |         |         |
|---------------|-----------------|---------|---------|
|               | Mated           | Unmated | Unmated |
| Minimum       | N-NVA3E/N-NVA3P | N-NVA3E | N-NVA3P |
| Initial       | 45000           | 45000   | 45000   |
| Thermal       | 45000           | 45000   | 45000   |
| Humidity      | 45000           | 45000   | 45000   |

DATA SUMMARIES Continued

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

| Voltage Rating Summary |                 |
|------------------------|-----------------|
| Minimum                | N-NVA3E/N-NVA3P |
| Break Down Voltage     | 842             |
| Test Voltage           | 632             |
| Working Voltage        | 211             |

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

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

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

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

| Pin to Pin            |       |
|-----------------------|-------|
| Mated                 |       |
| Minimum               |       |
| Initial               | 45000 |
| After 100 Flex Cycles | 45000 |
| After 200 Flex Cycles | 45000 |

| Row to Row            |       |
|-----------------------|-------|
| Mated                 |       |
| Minimum               |       |
| Initial               | 45000 |
| After 100 Flex Cycles | 45000 |
| After 200 Flex Cycles | 45000 |

| Pin to Ground         |       |
|-----------------------|-------|
| Mated                 |       |
| Minimum               |       |
| Initial               | 45000 |
| After 100 Flex Cycles | 45000 |
| After 200 Flex Cycles | 45000 |

**Dielectric Withstanding Voltage minimums, DWV**

| Voltage Rating Summary |             |
|------------------------|-------------|
| Minimum                | NVA3E\NVA3P |
| Test Voltage           | 632         |

| Pin to Pin                         |        |
|------------------------------------|--------|
| Initial Test Voltage               | Passed |
| After 100 Flex Cycles Test Voltage | Passed |
| After 200 Flex Cycles Test Voltage | Passed |

| Row to Row                         |        |
|------------------------------------|--------|
| Initial Test Voltage               | Passed |
| After 100 Flex Cycles Test Voltage | Passed |
| After 200 Flex Cycles Test Voltage | Passed |

| Pin to Ground                      |        |
|------------------------------------|--------|
| Initial Test Voltage               | Passed |
| After 100 Flex Cycles Test Voltage | Passed |
| After 200 Flex Cycles Test Voltage | Passed |

**DATA SUMMARIES Continued****High Temperature Exposure:**

| Sample # | Initial           | After Thermal 125h at 105°C |       |     | After Thermal 250h at 105°C |       |     |
|----------|-------------------|-----------------------------|-------|-----|-----------------------------|-------|-----|
|          | Visual Inspection | Visual Inspection           | IR    | DWV | Visual Inspection           | IR    | DWV |
| 001      | Pass              | Pass                        | 45000 | 632 | Pass                        | 45000 | 632 |
| 002      | Pass              | Pass                        | 45000 | 632 | Pass                        | 45000 | 632 |
| 003      | Pass              | Pass                        | 45000 | 632 | Pass                        | 45000 | 632 |
| 004      | Pass              | Pass                        | 45000 | 632 | Pass                        | 45000 | 632 |
| 005      | Pass              | Pass                        | 45000 | 632 | Pass                        | 45000 | 632 |
| 006      | Pass              | Pass                        | 45000 | 632 | Pass                        | 45000 | 632 |
| 007      | Pass              | Pass                        | 45000 | 632 | Pass                        | 45000 | 632 |
| 008      | Pass              | Pass                        | 45000 | 632 | Pass                        | 45000 | 632 |

| After Thermal 500h at 105°C |       |     | After Thermal 750h at 105°C |       |     | After Thermal 1000h at 105°C |       |     |
|-----------------------------|-------|-----|-----------------------------|-------|-----|------------------------------|-------|-----|
| Visual Inspection           | IR    | DWV | Visual Inspection           | IR    | DWV | Visual Inspection            | IR    | DWV |
| Pass                        | 45000 | 632 | Pass                        | 45000 | 632 | Pass                         | 45000 | 632 |
| Pass                        | 45000 | 632 | Pass                        | 45000 | 632 | Pass                         | 45000 | 632 |
| Pass                        | 45000 | 632 | Pass                        | 45000 | 632 | Pass                         | 45000 | 632 |
| Pass                        | 45000 | 632 | Pass                        | 45000 | 632 | Pass                         | 45000 | 632 |
| Pass                        | 45000 | 632 | Pass                        | 45000 | 632 | Pass                         | 45000 | 632 |
| Pass                        | 45000 | 632 | Pass                        | 45000 | 632 | Pass                         | 45000 | 632 |
| Pass                        | 45000 | 632 | Pass                        | 45000 | 632 | Pass                         | 45000 | 632 |
| Pass                        | 45000 | 632 | Pass                        | 45000 | 632 | Pass                         | 45000 | 632 |

**IP6X & IPX7 Testing (Dust & Water)****Dust**

| Sample # | Visual Inspection |
|----------|-------------------|
| 1        | PASS              |
| 2        | PASS              |
| 3        | PASS              |

**Water**

| Sample # | Visual Inspection |
|----------|-------------------|
| 1        | PASS              |
| 2        | PASS              |
| 3        | PASS              |
| 4        | PASS              |

|                                        |                                                                |
|----------------------------------------|----------------------------------------------------------------|
| Tracking Code: CR-1106501_Report_Rev_2 | Part #: NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S |
| Part description: NVA3E\NVA3P          |                                                                |

## DATA SUMMARIES Continued

### External Bending Moment:

| Sample # | 0°   | 90°  |
|----------|------|------|
| 1        | Pass | Pass |
| 2        | Pass | Pass |
| 3        | Pass | Pass |
| 4        | Pass | Pass |
| 5        | Pass | Pass |
| 6        | Pass | Pass |
| 7        | Pass | Pass |
| 8        | Pass | Pass |

### Ozone Exposure

| Sample # | Initial | After ozone exposure         |
|----------|---------|------------------------------|
| 1        | Pass    | No Visible Change - Complies |
| 2        | Pass    | No Visible Change - Complies |
| 3        | Pass    | No Visible Change - Complies |
| 4        | Pass    | No Visible Change - Complies |
| 5        | Pass    | No Visible Change - Complies |
| 6        | Pass    | No Visible Change - Complies |
| 7        | Pass    | No Visible Change - Complies |
| 8        | Pass    | No Visible Change - Complies |

|                                        |                                                                |
|----------------------------------------|----------------------------------------------------------------|
| Tracking Code: CR-1106501_Report_Rev_2 | Part #: NVA3E-DP-5-19-X.X-A-1-1-Z-S\NVA3P-DP-1-19-XX-A-1-1-Z-S |
| Part description: NVA3E\NVA3P          |                                                                |

## DATA SUMMARIES Continued

### LLCR Thermal Aging Group

- 1) A total of 256 signals and 8 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                                   | 10/11/2024 | 11/8/2024 |
| Room Temp (Deg C)                      | 22         | 22        |
| Rel Humidity (%)                       | 55         | 55        |
| Technician                             | Kason He   | Kason He  |
| mOhm values                            | Actual     | Delta     |
|                                        | Initial    | Thermal   |
| Pin Type: Signal 1                     |            |           |
| Average                                | 204.6      | 5.6       |
| St. Dev.                               | 1.8        | 3.9       |
| Min                                    | 201.2      | 0         |
| Max                                    | 210.7      | 14.5      |
| Summary Count                          | 256        | 256       |
| Total Count                            | 256        | 256       |
| Pin Type: Ground 1                     |            |           |
| Average                                | 3.73       | 0.45      |
| St. Dev.                               | 0.26       | 0.35      |
| Min                                    | 3.38       | 0.05      |
| Max                                    | 4.16       | 1.09      |
| Summary Count                          | 8          | 8         |
| Total Count                            | 8          | 8         |

| LLCR Delta Count by Category |          |                          |                           |                           |                             |         |
|------------------------------|----------|--------------------------|---------------------------|---------------------------|-----------------------------|---------|
|                              | Stable   | Minor                    | Acceptable                | Marginal                  | Unstable                    | Open    |
| mOhms                        | $\leq 5$ | $>5 \text{ \& } \leq 10$ | $>10 \text{ \& } \leq 15$ | $>15 \text{ \& } \leq 50$ | $>50 \text{ \& } \leq 1000$ | $>1000$ |
| Thermal                      | 138      | 86                       | 40                        | 0                         | 0                           | 0       |

**DATA SUMMARIES Continued**

**LLCR Durability:**

- 1) A total of 256 signals, and 8 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 of stress.
  - 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

### DATA SUMMARIES Continued

| LLCR Measurement Summaries by Pin Type |            |            |            |            |            |            |            |           |
|----------------------------------------|------------|------------|------------|------------|------------|------------|------------|-----------|
| Date                                   | 12/23/2024 | 12/24/2024 | 12/25/2024 | 12/26/2024 | 12/27/2024 | 12/30/2024 | 1/6/2025   | 1/17/2025 |
| Room                                   | 22         | 22         | 22         | 22         | 22         | 22         | 22         | 22        |
| Temp (Deg C)                           |            |            |            |            |            |            |            |           |
| Rel Humidity (%)                       | 55         | 55         | 55         | 55         | 55         | 55         | 55         | 55        |
| Technician                             | Kason He   | Kason He   | Kason He   | Kason He   | Kason He   | Kason He   | Kason He   | Kason He  |
| mOhm values                            | Actual     | Delta      | Delta      | Delta      | Delta      | Delta      | Delta      | Delta     |
|                                        | Initial    | 100 Cycles | 200 Cycles | 300 Cycles | 400 Cycles | 500 Cycles | Ther Shock | Humidity  |
| Pin Type: Signal 1                     |            |            |            |            |            |            |            |           |
| Average                                | 209.7      | 4.4        | 4.9        | 0.6        | 0.6        | 0.8        | 3.6        | 4.4       |
| St. Dev.                               | 2.2        | 2.0        | 2.1        | 0.6        | 0.4        | 0.6        | 2.0        | 2.1       |
| Min                                    | 204.9      | 0.1        | 0.1        | 0.0        | 0.0        | 0.0        | 0          | 0         |
| Max                                    | 215.6      | 9.5        | 9.9        | 6.4        | 3.1        | 3.5        | 9.5        | 10.5      |
| Summary Count                          | 256        | 256        | 256        | 256        | 256        | 256        | 256        | 256       |
| Total Count                            | 256        | 256        | 256        | 256        | 256        | 256        | 256        | 256       |
| Pin Type: Ground 1                     |            |            |            |            |            |            |            |           |
| Average                                | 4.44       | 0.08       | 0.09       | 0.13       | 0.17       | 0.06       | 0.34       | 0.34      |
| St. Dev.                               | 0.17       | 0.06       | 0.08       | 0.07       | 0.07       | 0.05       | 0.17       | 0.17      |
| Min                                    | 4.26       | 0          | 0.02       | 0.04       | 0.06       | 0.01       | 0.06       | 0.1       |
| Max                                    | 4.73       | 0.17       | 0.26       | 0.23       | 0.30       | 0.14       | 0.52       | 0.63      |
| Summary Count                          | 8          | 8          | 8          | 8          | 8          | 8          | 8          | 8         |
| Total Count                            | 8          | 8          | 8          | 8          | 8          | 8          | 8          | 8         |

| LLCR Delta Count by Category |        |           |            |            |              |       |
|------------------------------|--------|-----------|------------|------------|--------------|-------|
|                              | Stable | Minor     | Acceptable | Marginal   | Unstable     | Open  |
| mOhms                        | <=5    | >5 & <=10 | >10 & <=15 | >15 & <=50 | >50 & <=1000 | >1000 |
| 100 Cycles                   | 182    | 82        | 0          | 0          | 0            | 0     |
| 200 Cycles                   | 146    | 118       | 0          | 0          | 0            | 0     |
| 300 Cycles                   | 263    | 1         | 0          | 0          | 0            | 0     |
| 400 Cycles                   | 264    | 0         | 0          | 0          | 0            | 0     |
| 500 Cycles                   | 264    | 0         | 0          | 0          | 0            | 0     |
| Thermal Shock                | 204    | 60        | 0          | 0          | 0            | 0     |
| Humidity                     | 174    | 89        | 1          | 0          | 0            | 0     |

### DATA SUMMARIES Continued

#### LLCR Shock & Vibration:

- 1). A total of 256 signals and 8 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 of stress.
  - 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                                   | 2025/3/3          | 2025/3/5           |
| Room Temp (Deg C)                      | 22                | 22                 |
| Rel Humidity (%)                       | 36                | 42                 |
| Technician                             | Brian Stemle      | Brian Stemle       |
| mOhm values                            | Actual<br>Initial | Delta<br>Shock-Vib |
| Pin Type: Signal 1                     |                   |                    |
| Average                                | 389.6             | 2.55               |
| St. Dev.                               | 6.25              | 2.03               |
| Min                                    | 379.74            | 0.01               |
| Max                                    | 405.48            | 11.51              |
| Summary Count                          | 256               | 256                |
| Total Count                            | 256               | 256                |
| Pin Type: GND 1                        |                   |                    |
| Average                                | 9.38              | 0.37               |
| St. Dev.                               | 0.21              | 0.15               |
| Min                                    | 9.02              | 0.21               |
| Max                                    | 9.66              | 0.57               |
| Summary Count                          | 8                 | 8                  |
| Total Count                            | 8                 | 8                  |

| LLCR Delta Count by Category |          |                          |                           |                           |                             |         |
|------------------------------|----------|--------------------------|---------------------------|---------------------------|-----------------------------|---------|
|                              | Stable   | Minor                    | Acceptable                | Marginal                  | Unstable                    | Open    |
| mOhms                        | $\leq 5$ | $>5 \text{ \& } \leq 10$ | $>10 \text{ \& } \leq 15$ | $>15 \text{ \& } \leq 50$ | $>50 \text{ \& } \leq 1000$ | $>1000$ |
| Shock-Vib                    | 235      | 26                       | 3                         | 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: 4/26/2025, Next Cal: 4/25/2026**Equipment #:** HZ-THC-01**Description:** Humidity transmitter**Manufacturer:** Thermotron**Model:** SM-8-8200**Serial #:** 38846**Accuracy:** Last Cal: 2/27/2026, Next Cal: 2/26/2027**Equipment #:** HZ-TSC-01**Description:** Vertical Thermal Shock Chamber**Manufacturer:** Cincinnati Sub Zero**Model:** VTS-3-6-6-SC/AC**Serial #:** 10-VT14994**Accuracy:** See Manual

... Last Cal: 2/27/2026, Next Cal: 2/26/2027

**Equipment #:** HZ-MO-05**Description:** Micro-ohmmeter**Manufacturer:** Keithley**Model:** 3706**Serial #:** 1285188**Accuracy:** Last Cal: 11/15/2025, Next Cal: 11/14/2026**Equipment #:** DG-HPT-01**Description:** Hipot Safety Tester**Manufacturer:** Vitrek**Model:** V73**Serial #:** 025866**Accuracy:**

... Last Cal: 04/16/2025, Next Cal: 04/15/2026

**EQUIPMENT AND CALIBRATION SCHEDULES Continued****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

**Equipment #:** WATER-01**Description:** IP-67 1.0 Meter Water Column Chamber**Manufacturer:** Samtec Machine**Model:** N/A**Serial #:** N/A**Accuracy:** No Calibration Required**Equipment #:** DUST-01**Description:** IP-X6 Dust Tester**Manufacturer:** Samtec Machine**Model:** N/A**Serial #:** N/A**Accuracy:** No Calibration Required