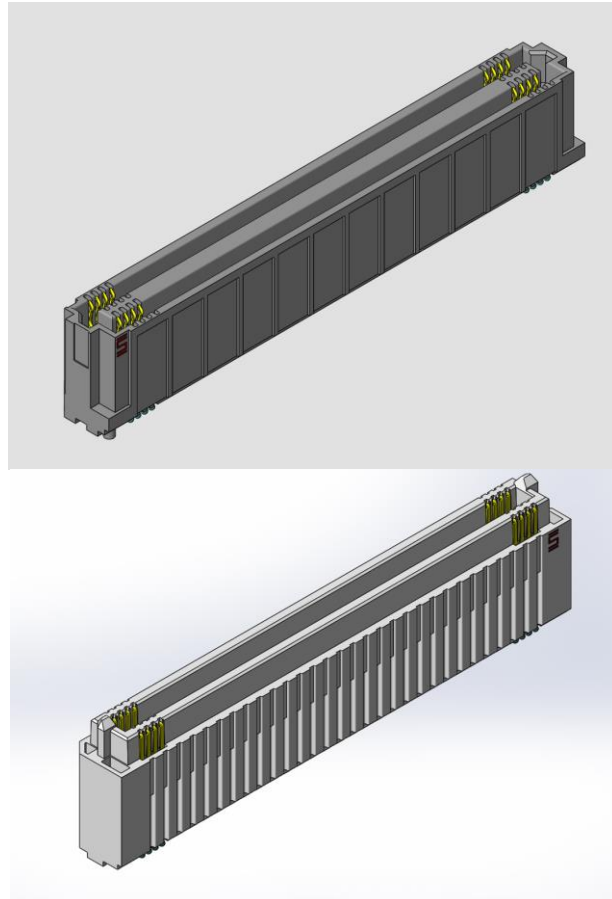




Project Number: Design Qualification Test Report	Tracking Code: CR-623102_Report_Rev_1
Requested by: Tyler Lang	Date: 10/25/2021
Part #: ADF6-XX-XX.X-L-4-2-A/ADM6-XX-XX.X-L-4-2-A	
Part description: ADF6/ADM6	Tech: Scott Rollefstad
Test Start: 7/22/2021	Test Completed: 8/31/2021



DESIGN QUALIFICATION TEST REPORT

ADF6/ADM6

ADF6-XX-XX.X-L-4-2-A/ADM6-XX-XX.X-L-4-2-A

Note: SOME CENTER FEATURES REMOVED FOR CLARITY

Tracking Code: CR-623102_Report_Rev_1	Part #: ADF6-XX-XX.X-L-4-2-A/ADM6-XX-XX.X-L-4-2-A
Part description: ADF6/ADM6	

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
9/8/2021	1	Initial Issue	PC

CERTIFICATION

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

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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-110321-TST-XX & PCB-110322-TST-XX.

FLOWCHARTS

Normal Force

Group 1

ADF6-30-07.5-L-4-2-A
ADM6-30-08.5-L-4-2-A
8 Contacts Minimum
Signal Without Thermals

Step	Description
1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Deflection = 0.011 " Expected Force at Max Deflection = 53 g

Group 2

ADF6-30-07.5-L-4-2-A
ADM6-30-08.5-L-4-2-A
8 Contacts Minimum
Signal 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 = 53 g

(1) Normal Force = EIA-364-04

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

Mating/Unmating/Durability

Group 1

ADM6-10-03.5-L-4-2-A
ADF6-10-03.5-L-4-2-A
8 Assemblies
Mate/Unmate No Environmental 7mm
Stack ADM6-10-03.5

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

Group 2

ADM6-60-03.5-L-4-2-A
ADF6-60-03.5-L-4-2-A
8 Assemblies
Mate/Unmate No Environmental 7mm
Stack ADM6-60-03.5

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

Group 3

ADF6-30-07.5-L-4-2-A
ADM6-30-01.5-L-4-2-A
8 Assemblies
Mate/Unmate With Environmental 9mm
Stack ADF6-30-07.5

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

Group 4

ADF6-60-07.5-L-4-2-A
ADM6-60-08.5-L-4-2-A
8 Assemblies
Mate/Unmate No Enviro. 16mm Stack
ADF6-60-07.5 With ADM6-60-08.5

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

FLOWCHARTS ContinuedGroup 5

ADM6-30-03.5-L-4-2-A

ADF6-30-03.5-L-4-2-A

8 Assemblies

Mate/Unmate With Environmental 7mm
Stack ADM6-30-03.5

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

Group 6

ADF6-10-07.5-L-4-2-A

ADM6-10-01.5-L-4-2-A

8 Assemblies

Mate/Unmate No Environmental 9mm
Stack ADF6-10-07.5

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

Group 7

ADF6-60-07.5-L-4-2-A

ADM6-60-01.5-L-4-2-A

8 Assemblies

Mate/Unmate No Environmental 9mm
Stack ADF6-60-07.5

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

Group 8

ADF6-10-07.5-L-4-2-A

ADM6-10-08.5-L-4-2-A

8 Assemblies

Mate/Unmate No Enviro. 16mm Stack
ADF6-10-07.5 With ADM6-10-08.5

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

FLOWCHARTS ContinuedGroup 9

ADF6-30-07.5-L-4-2-A

ADM6-30-08.5-L-4-2-A

8 Assemblies

Mate/Unmate With Enviro. 16mm Stack

ADF6-30-07.5 With ADM6-30-08.5

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

(1) Humidity = EIA-364-31

Test Condition = B (240 Hours)

Test Method = III (+25°C to +65°C @ 90% RH to 98% RH)

Test Exceptions: ambient pre-condition and delete steps 7a and 7b

(2) LLCR = EIA-364-23

Open Circuit Voltage = 20 mV Max

Test Current = 100 mA Max

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

(4) Thermal Shock = EIA-364-32

Exposure Time at Temperature Extremes = 1/2 Hour

Method A, Test Condition = I (-55°C to +85°C)

Test Duration = A-3 (100 Cycles)

FLOWCHARTS Continued**Current Carrying Capacity**

<u>Group 1</u> ADF6-60-07.5-L-4-2-A ADM6-60-08.5-L-4-2-A 4 Pins Powered Signal - 16mm Stack ADF6-07.5 And ADM6-08.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 1	<u>Group 2</u> ADF6-60-07.5-L-4-2-A ADM6-60-08.5-L-4-2-A 8 Pins Powered Signal - 16mm Stack ADF6-07.5 And ADM6-08.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 2	<u>Group 3</u> ADF6-60-07.5-L-4-2-A ADM6-60-08.5-L-4-2-A 12 Pins Powered Signal - 16mm Stack ADF6-07.5 And ADM6-08.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 3	<u>Group 4</u> ADF6-60-07.5-L-4-2-A ADM6-60-08.5-L-4-2-A 16 Pins Powered Signal - 16mm Stack ADF6-07.5 And ADM6-08.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 4
<u>Group 5</u> ADF6-60-07.5-L-4-2-A ADM6-60-08.5-L-4-2-A 240 Pins Powered Signal - 16mm Stack ADF6-07.5 And ADM6-08.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 60	<u>Group 6</u> ADF6-60-07.5-L-4-2-A ADM6-60-03.5-L-4-2-A 240 Pins Powered Signal - 11mm Stack ADF6-07.5 And ADM6-03.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 60	<u>Group 7</u> ADF6-60-07.5-L-4-2-A ADM6-60-06.5-L-4-2-A 240 Pins Powered Signal - 14mm Stack ADF6-07.5 And ADM6-06.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 60	<u>Group 8</u> ADF6-60-07.5-L-4-2-A ADM6-60-03.5-L-4-2-A 4 Pins Powered Signal - 11mm Stack ADF6-07.5 And ADM6-03.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 1
<u>Group 9</u> ADF6-60-07.5-L-4-2-A ADM6-60-03.5-L-4-2-A 8 Pins Powered Signal - 11mm Stack ADF6-07.5 And ADM6-03.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 2	<u>Group 10</u> ADF6-60-07.5-L-4-2-A ADM6-60-03.5-L-4-2-A 12 Pins Powered Signal - 11mm Stack ADF6-07.5 And ADM6-03.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 3	<u>Group 11</u> ADF6-60-07.5-L-4-2-A ADM6-60-03.5-L-4-2-A 16 Pins Powered Signal - 11mm Stack ADF6-07.5 And ADM6-03.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 4	<u>Group 12</u> ADF6-60-07.5-L-4-2-A ADM6-60-06.5-L-4-2-A 4 Pins Powered Signal - 14mm Stack ADF6-07.5 And ADM6-06.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 1
<u>Group 13</u> ADF6-60-07.5-L-4-2-A ADM6-60-06.5-L-4-2-A 8 Pins Powered Signal - 14mm Stack ADF6-07.5 And ADM6-06.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 2	<u>Group 14</u> ADF6-60-07.5-L-4-2-A ADM6-60-06.5-L-4-2-A 12 Pins Powered Signal - 14mm Stack ADF6-07.5 And ADM6-06.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 3	<u>Group 15</u> ADF6-60-07.5-L-4-2-A ADM6-60-06.5-L-4-2-A 16 Pins Powered Signal - 14mm Stack ADF6-07.5 And ADM6-06.5 Step Description 1. CCC ⁽¹⁾ Rows = 4 Number of Positions = 4	

(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

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.

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.

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 μm (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.

RESULTS

Temperature Rise, CCC at a 20% de-rating

Signal - 16mm Stack

- CCC for a 30°C Temperature Rise-----1.0 A per contact with 4 contact (4x1) powered
- CCC for a 30°C Temperature Rise-----0.8 A per contact with 8 contacts (4x2) powered
- CCC for a 30°C Temperature Rise-----0.61 A per contact with 12 contacts (4x3) powered
- CCC for a 30°C Temperature Rise-----0.6 A per contact with 16 contacts (4x4) powered
- CCC for a 30°C Temperature Rise-----0.2 A per contact with 240 contacts (4x60) powered

Signal - 14mm Stack

- CCC for a 30°C Temperature Rise-----1.0 A per contact with 4 contact (4x1) powered
- CCC for a 30°C Temperature Rise-----0.8 A per contact with 8 contact (4x2) powered
- CCC for a 30°C Temperature Rise-----0.64 A per contact with 12 contacts (4x3) powered
- CCC for a 30°C Temperature Rise-----0.6 A per contact with 16 contacts (4x4) powered
- CCC for a 30°C Temperature Rise-----0.2 A per contact with 240 contacts (4x60) powered

Signal - 11mm Stack

- CCC for a 30°C Temperature Rise-----1.0 A per contact with 4 contact (4x1) powered
- CCC for a 30°C Temperature Rise-----0.8 A per contact with 8 contact (4x2) powered
- CCC for a 30°C Temperature Rise-----0.7 A per contact with 12 contacts (4x3) powered
- CCC for a 30°C Temperature Rise-----0.6 A per contact with 16 contacts (4x4) powered
- CCC for a 30°C Temperature Rise-----0.2 A per contact with 240 contacts (4x60) powered

Mating – Unmating Forces

ADM6-10-03.5-L-4-2-A/ADF6-10-03.5-L-4-2-A

- Initial
 - Mating
 - Min ----- 1.47 Lbs
 - Max----- 1.85 Lbs
 - Unmating
 - Min ----- 0.94 Lbs
 - Max----- 1.46 Lbs
- After 25 Cycles
 - Mating
 - Min ----- 1.82 Lbs
 - Max----- 2.16 Lbs
 - Unmating
 - Min ----- 1.13 Lbs
 - Max----- 1.66 Lbs
- After Gaps
 - Mating
 - Min ----- 1.50 Lbs
 - Max----- 1.73 Lbs
 - Unmating
 - Min ----- 0.73 Lbs
 - Max----- 0.84 Lbs

RESULTS Continued**ADM6-60-03.5-L-4-2-A/ ADF6-60-03.5-L-4-2-A**

- **Initial**
 - **Mating**
 - **Min** -----11.69 Lbs
 - **Max** -----14.60 Lbs
 - **Unmating**
 - **Min** ----- 5.48 Lbs
 - **Max** ----- 6.55 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** -----16.22 Lbs
 - **Max** -----19.48 Lbs
 - **Unmating**
 - **Min** ----- 6.91 Lbs
 - **Max** ----- 8.32 Lbs
- **After Gaps**
 - **Mating**
 - **Min** -----11.22 Lbs
 - **Max** -----12.73 Lbs
 - **Unmating**
 - **Min** ----- 5.13 Lbs
 - **Max** ----- 5.86 Lbs

ADF6-30-07.5-L-4-2-A/ADM6-30-01.5-L-4-2-A

- **Initial**
 - **Mating**
 - **Min** ----- 4.67 Lbs
 - **Max** ----- 5.51 Lbs
 - **Unmating**
 - **Min** ----- 2.68 Lbs
 - **Max** ----- 3.17 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 4.97 Lbs
 - **Max** ----- 5.38 Lbs
 - **Unmating**
 - **Min** ----- 2.93 Lbs
 - **Max** ----- 3.63 Lbs
- **Humidity**
 - **Mating**
 - **Min** ----- 3.35 Lbs
 - **Max** ----- 3.94 Lbs
 - **Unmating**
 - **Min** ----- 2.04 Lbs
 - **Max** ----- 2.42 Lbs

RESULTS Continued**ADF6-60-07.5-L-4-2-A/ ADM6-60-08.5-L-4-2-A**

- **Initial**
 - **Mating**
 - **Min** ----- 7.04 Lbs
 - **Max** ----- 8.51 Lbs
 - **Unmating**
 - **Min** ----- 3.96 Lbs
 - **Max** ----- 4.40 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 9.10 Lbs
 - **Max** ----- 9.62 Lbs
 - **Unmating**
 - **Min** ----- 4.39 Lbs
 - **Max** ----- 4.82 Lbs
- **After Gaps**
 - **Mating**
 - **Min** ----- 6.89 Lbs
 - **Max** ----- 7.28 Lbs
 - **Unmating**
 - **Min** ----- 3.91 Lbs
 - **Max** ----- 4.23 Lbs

ADM6-30-03.5-L-4-2-A/ADF6-30-03.5-L-4-2-A

- **Initial**
 - **Mating**
 - **Min** ----- 5.96 Lbs
 - **Max** ----- 6.85 Lbs
 - **Unmating**
 - **Min** ----- 3.49 Lbs
 - **Max** ----- 3.89 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 6.23 Lbs
 - **Max** ----- 7.18 Lbs
 - **Unmating**
 - **Min** ----- 3.93 Lbs
 - **Max** ----- 4.30 Lbs
- **Humidity**
 - **Mating**
 - **Min** ----- 3.82 Lbs
 - **Max** ----- 4.69 Lbs
 - **Unmating**
 - **Min** ----- 2.67 Lbs
 - **Max** ----- 2.99 Lbs

RESULTS Continued**ADF6-10-07.5-L-4-2-A/ ADM6-10-01.5-L-4-2-A**

- **Initial**
 - **Mating**
 - **Min** ----- 1.32 Lbs
 - **Max** ----- 1.52 Lbs
 - **Unmating**
 - **Min** ----- 0.67 Lbs
 - **Max** ----- 0.93 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 1.54 Lbs
 - **Max** ----- 1.72 Lbs
 - **Unmating**
 - **Min** ----- 0.81 Lbs
 - **Max** ----- 1.01 Lbs
- **After Gaps**
 - **Mating**
 - **Min** ----- 1.25 Lbs
 - **Max** ----- 1.43 Lbs
 - **Unmating**
 - **Min** ----- 0.59 Lbs
 - **Max** ----- 0.78 Lbs

ADF6-60-07.5-L-4-2-A/ADM6-60-01.5-L-4-2-A

- **Initial**
 - **Mating**
 - **Min** ----- 7.94 Lbs
 - **Max** ----- 8.91 Lbs
 - **Unmating**
 - **Min** ----- 3.93 Lbs
 - **Max** ----- 4.94 Lbs
- **After 25 Cycles**
 - **Mating**
 - **Min** ----- 8.72 Lbs
 - **Max** ----- 12.61 Lbs
 - **Unmating**
 - **Min** ----- 4.78 Lbs
 - **Max** ----- 5.85 Lbs
- **After Gaps**
 - **Mating**
 - **Min** ----- 7.96 Lbs
 - **Max** ----- 9.78 Lbs
 - **Unmating**
 - **Min** ----- 3.94 Lbs
 - **Max** ----- 4.90 Lbs

RESULTS Continued**ADF6-10-07.5-L-4-2-A/ADM6-10-08.5-L-4-2-A**

- **Initial**
 - **Mating**
 - Min ----- 1.11 Lbs
 - Max ----- 1.29 Lbs
 - **Unmating**
 - Min ----- 0.65 Lbs
 - Max ----- 0.99 Lbs
- **After 25 Cycles**
 - **Mating**
 - Min ----- 1.38 Lbs
 - Max ----- 1.92 Lbs
 - **Unmating**
 - Min ----- 0.80 Lbs
 - Max ----- 0.96 Lbs
- **After Gaps**
 - **Mating**
 - Min ----- 1.11 Lbs
 - Max ----- 1.20 Lbs
 - **Unmating**
 - Min ----- 0.56 Lbs
 - Max ----- 0.67 Lbs

ADF6-30-07.5-L-4-2-A/ADM6-30-08.5-L-4-2-A

- **Initial**
 - **Mating**
 - Min ----- 3.29 Lbs
 - Max ----- 3.54 Lbs
 - **Unmating**
 - Min ----- 1.90 Lbs
 - Max ----- 2.21 Lbs
- **After 25 Cycles**
 - **Mating**
 - Min ----- 3.55 Lbs
 - Max ----- 4.32 Lbs
 - **Unmating**
 - Min ----- 2.08 Lbs
 - Max ----- 2.59 Lbs
- **Humidity**
 - **Mating**
 - Min ----- 2.91 Lbs
 - Max ----- 3.17 Lbs
 - **Unmating**
 - Min ----- 1.09 Lbs
 - Max ----- 2.17 Lbs

Normal Force deflection

- **Initial**
 - Min ----- 44.00 gf Set ---- 0.0000 in
 - Max ----- 48.10 gf Set ---- 0.0001 in
- **After Thermal**
 - Min ----- 34.50 gf Set ---- 0.0003 in
 - Max ----- 44.90 gf Set ---- 0.0014 in

RESULTS Continued**LLCR Mating/Unmating Durability Group (192 signal LLCR test points)****ADM6-10-03.5-L-4-2-A/ADF6-10-03.5-L-4-2-A**

- **Initial** ----- 29.19 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

ADM6-60-03.5-L-4-2-A/ ADF6-60-03.5-L-4-2-A

- **Initial** ----- 32.36 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 188 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 4 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

ADF6-30-07.5-L-4-2-A/ADM6-30-01.5-L-4-2-A

- **Initial** ----- 35.76 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Thermal Shock**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Humidity**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

ADF6-60-07.5-L-4-2-A/ ADM6-60-08.5-L-4-2-A

- **Initial** ----- 55.00 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

RESULTS Continued**ADM6-30-03.5-L-4-2-A/ADF6-30-03.5-L-4-2-A**

- **Initial** ----- 29.17 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Thermal Shock**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Humidity**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

ADF6-10-07.5-L-4-2-A/ ADM6-10-01.5-L-4-2-A

- **Initial** ----- 37.84 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

ADF6-60-07.5-L-4-2-A/ADM6-60-01.5-L-4-2-A

- **Initial** ----- 36.46 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

ADF6-10-07.5-L-4-2-A/ADM6-10-08.5-L-4-2-A

- **Initial** ----- 53.53 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 191 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

RESULTS Continued**ADF6-30-07.5-L-4-2-A/ADM6-30-08.5-L-4-2-A**

- **Initial** ----- 54.45 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 187 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 5 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure
- **Thermal Shock**
 - <= +5.0 mOhms ----- 180 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 12 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 ----- 178 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 14 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +1000 mOhms ----- 0 Points ----- Unstable
 - >+1000 mOhms ----- 0 Points ----- Open Failure

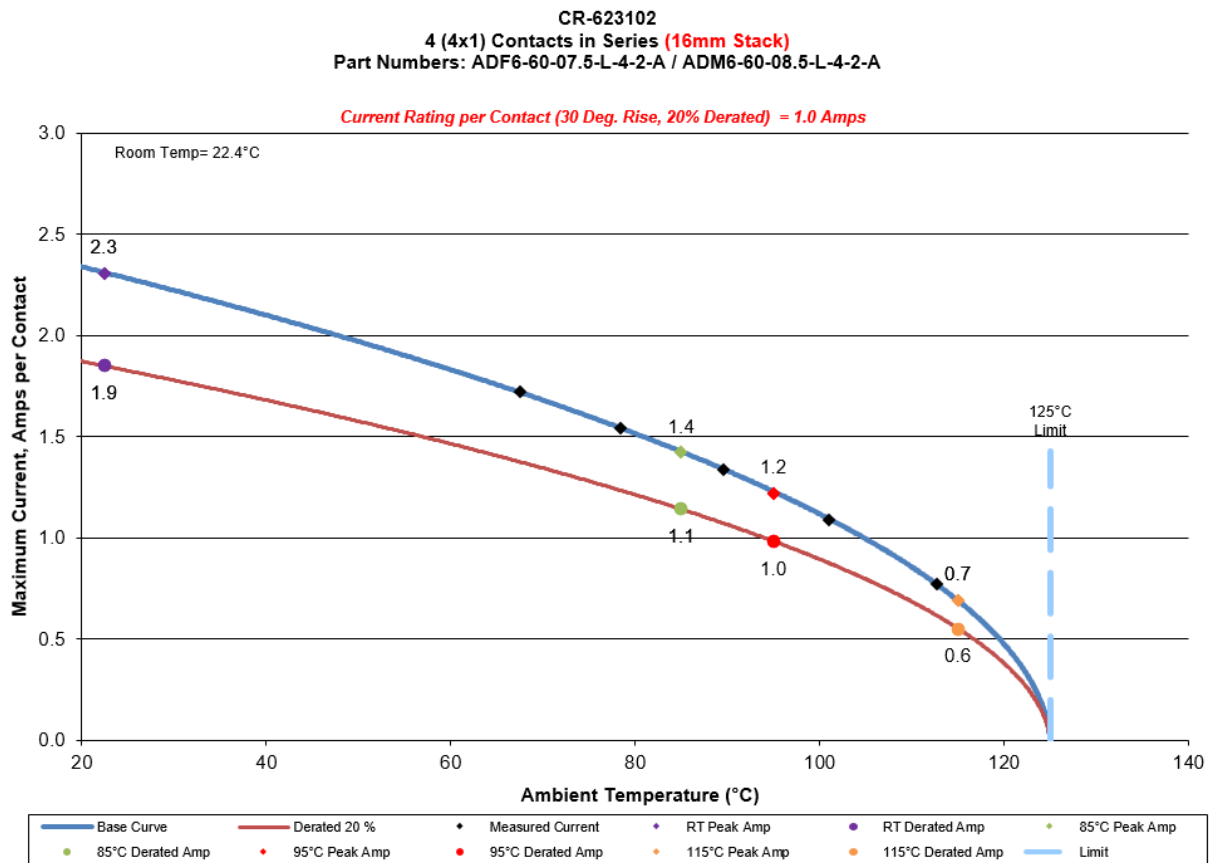
DATA SUMMARIES

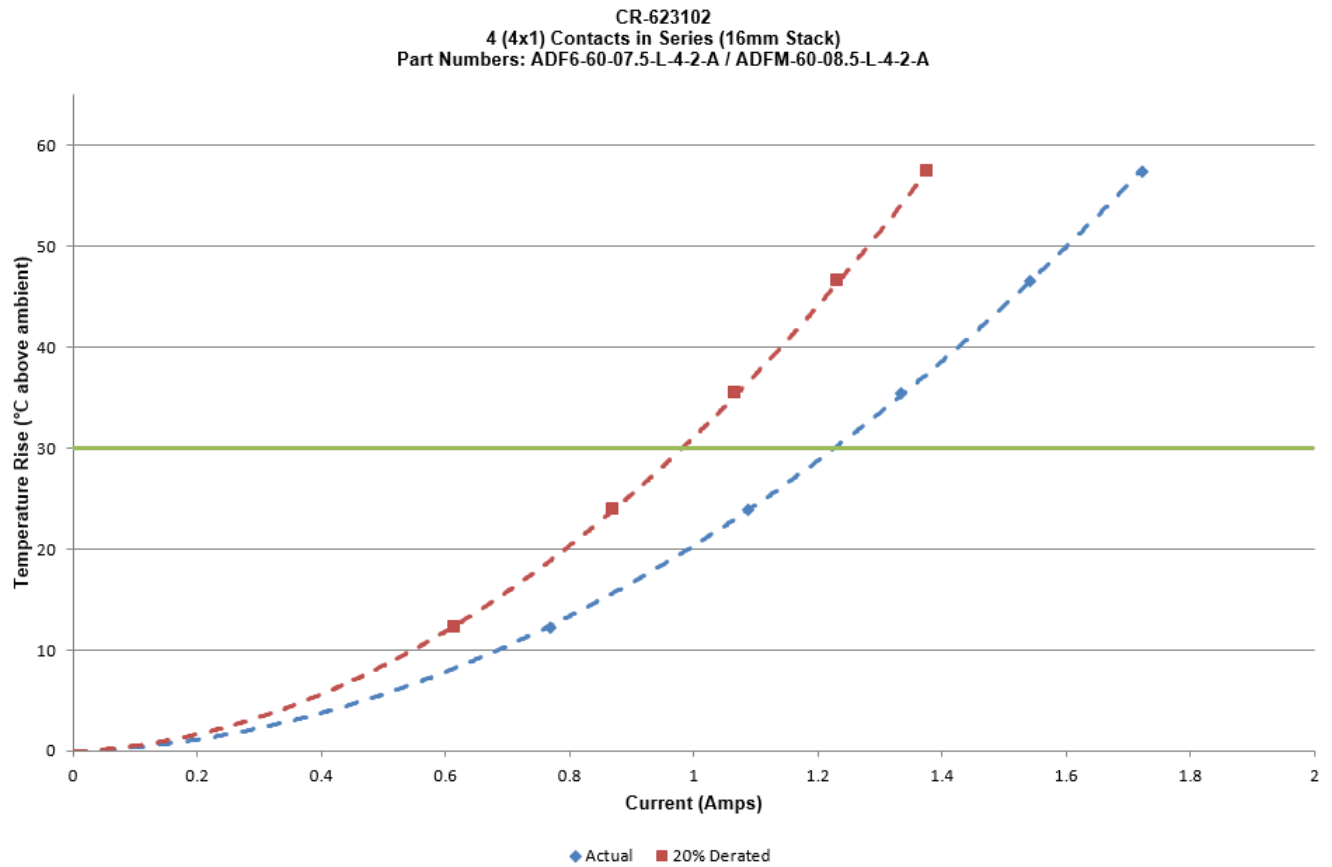
TEMPERATURE RISE (Current Carrying Capacity, CCC):

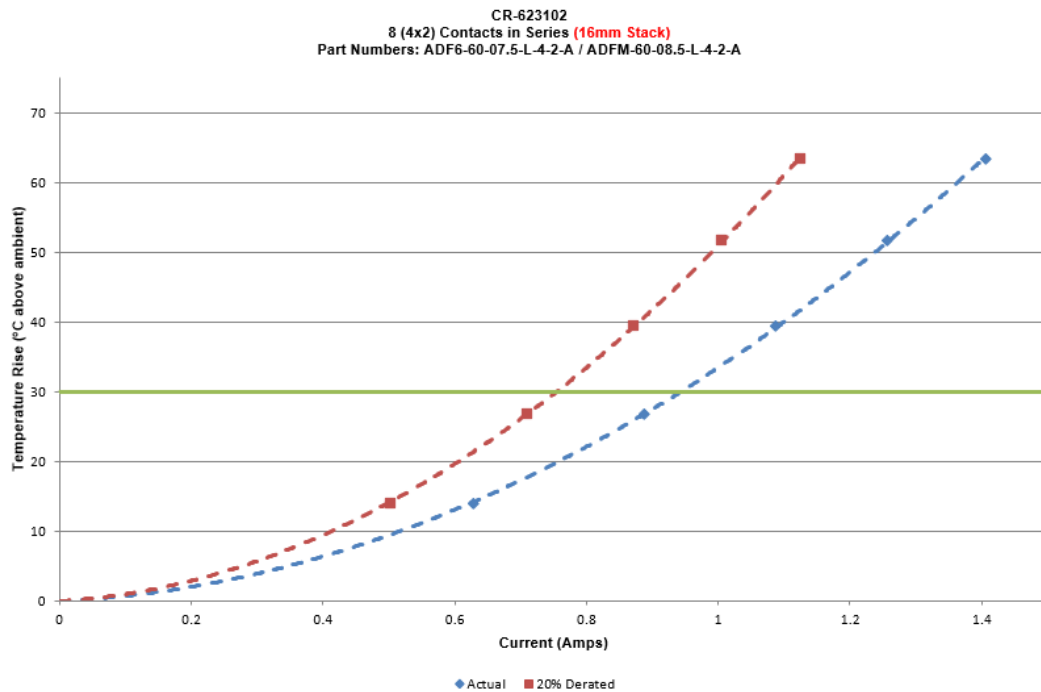
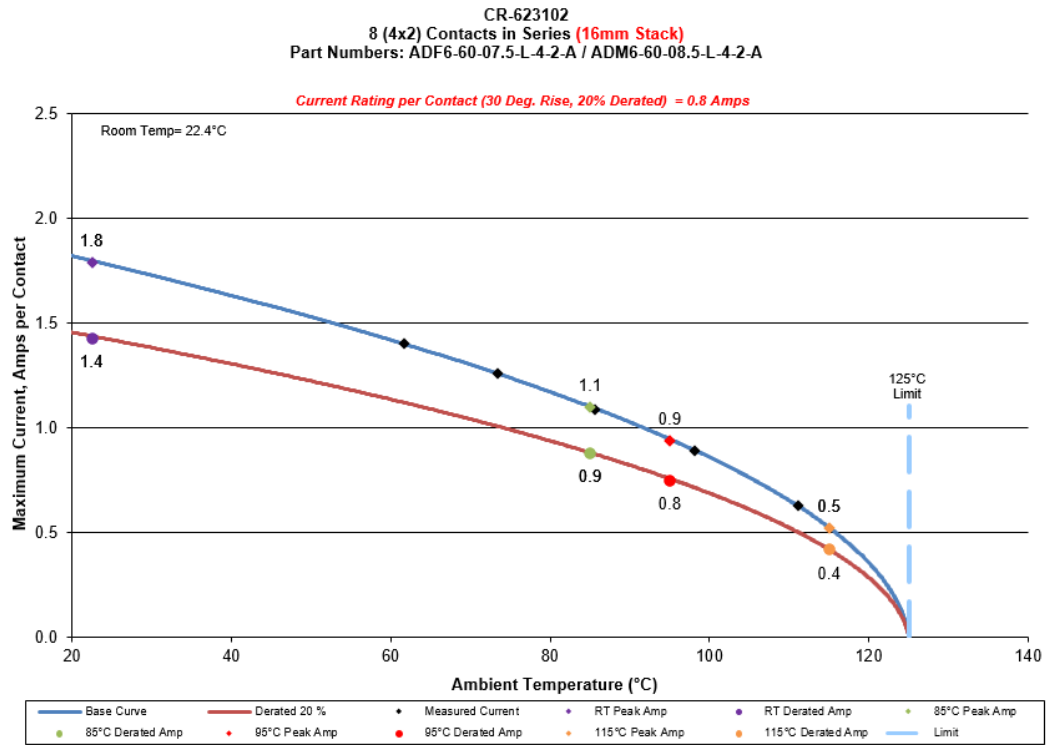
- 1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
- 2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
- 3) Temperature readings recorded are those for which three successive readings,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

Signal - 16mm Stack

- a. Linear configuration with 4 adjacent conductors/contacts powered

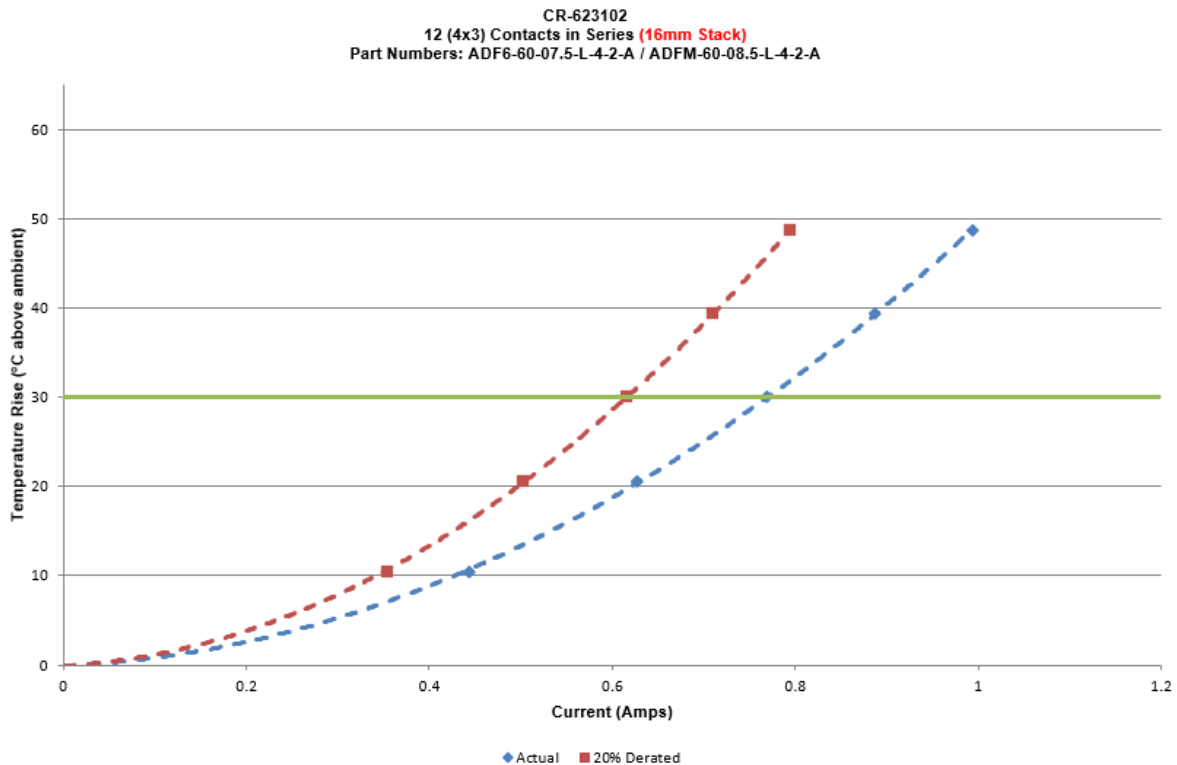
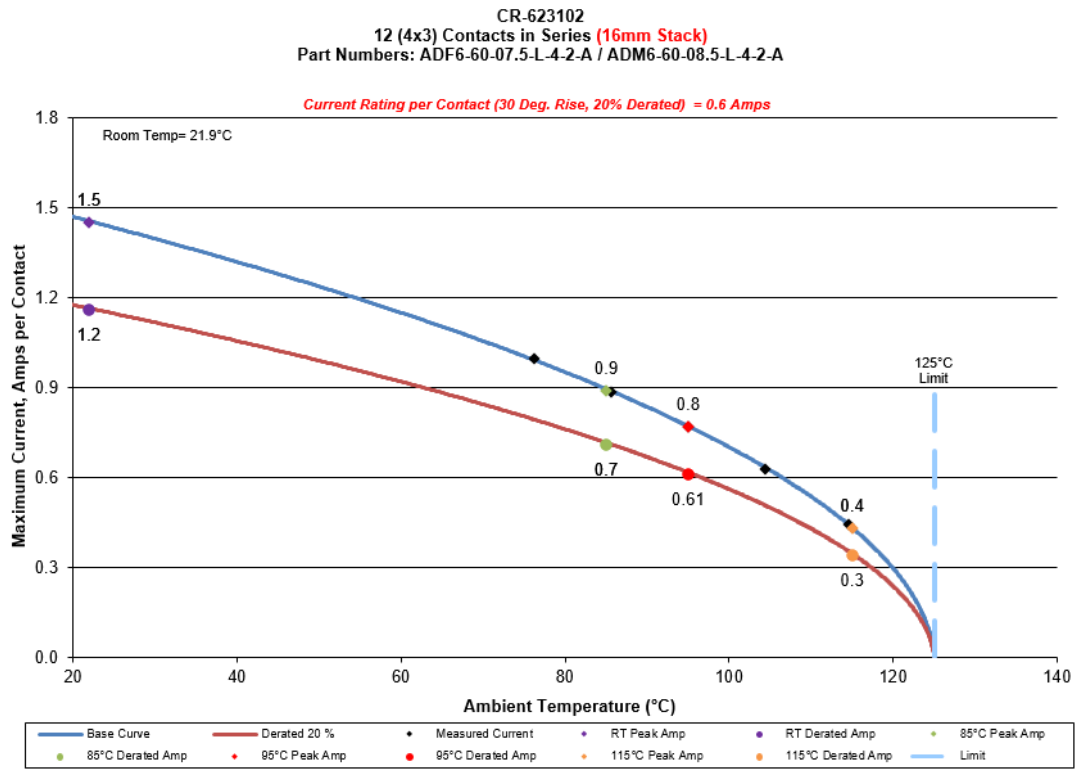


DATA SUMMARIES Continued

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

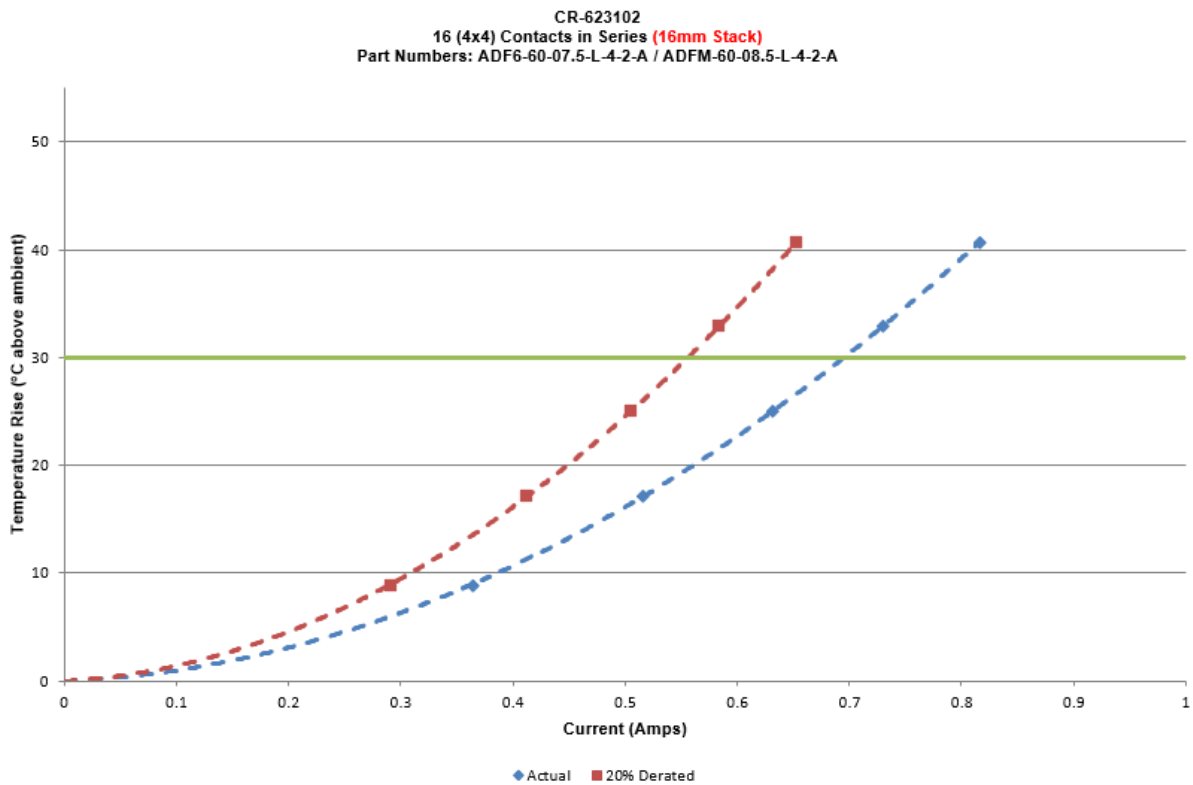
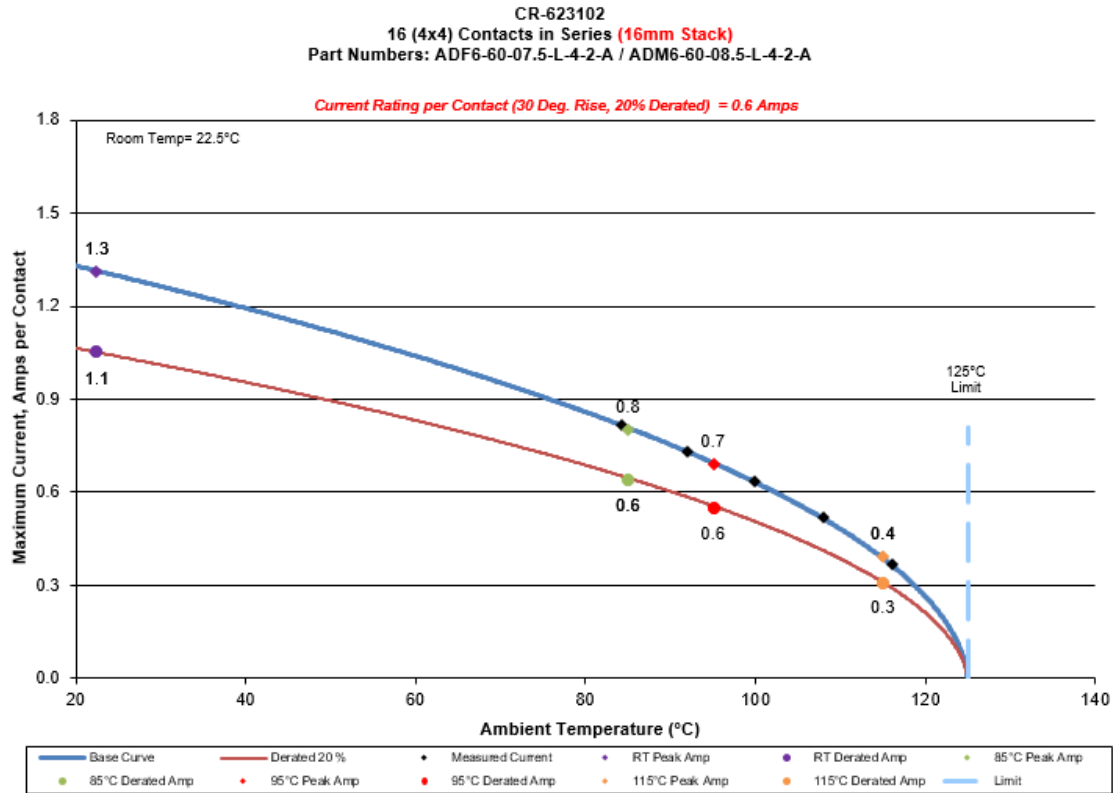
DATA SUMMARIES Continued

c. Linear configuration with 12 adjacent conductors/contacts powered



DATA SUMMARIES Continued

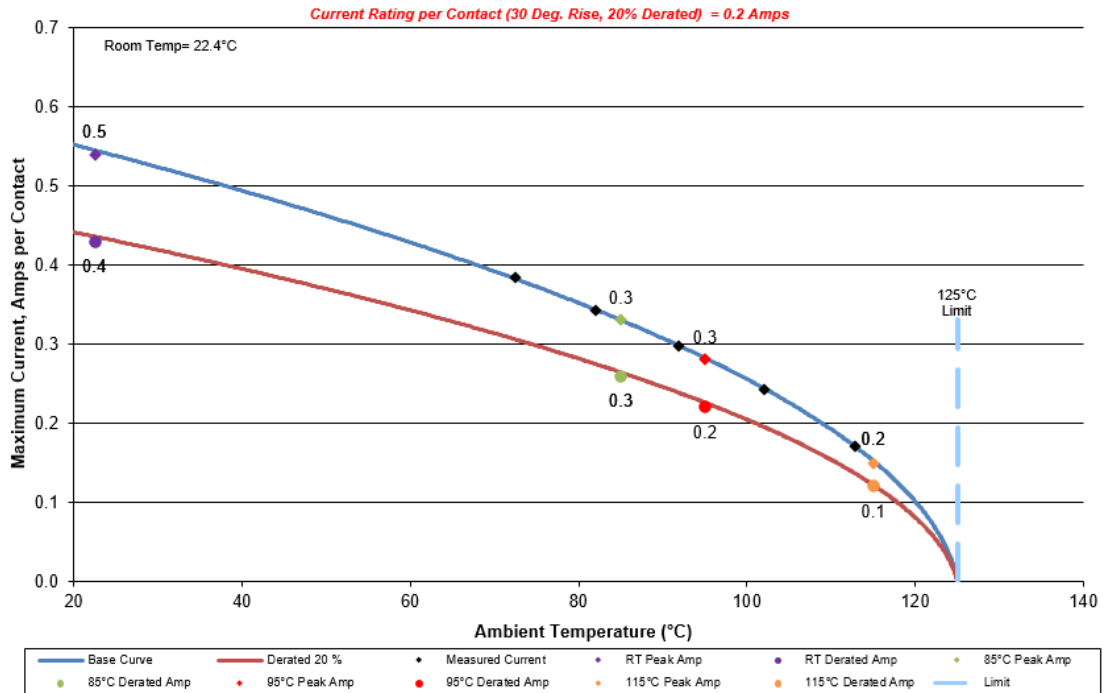
d. Linear configuration with 16 adjacent conductors/contacts powered



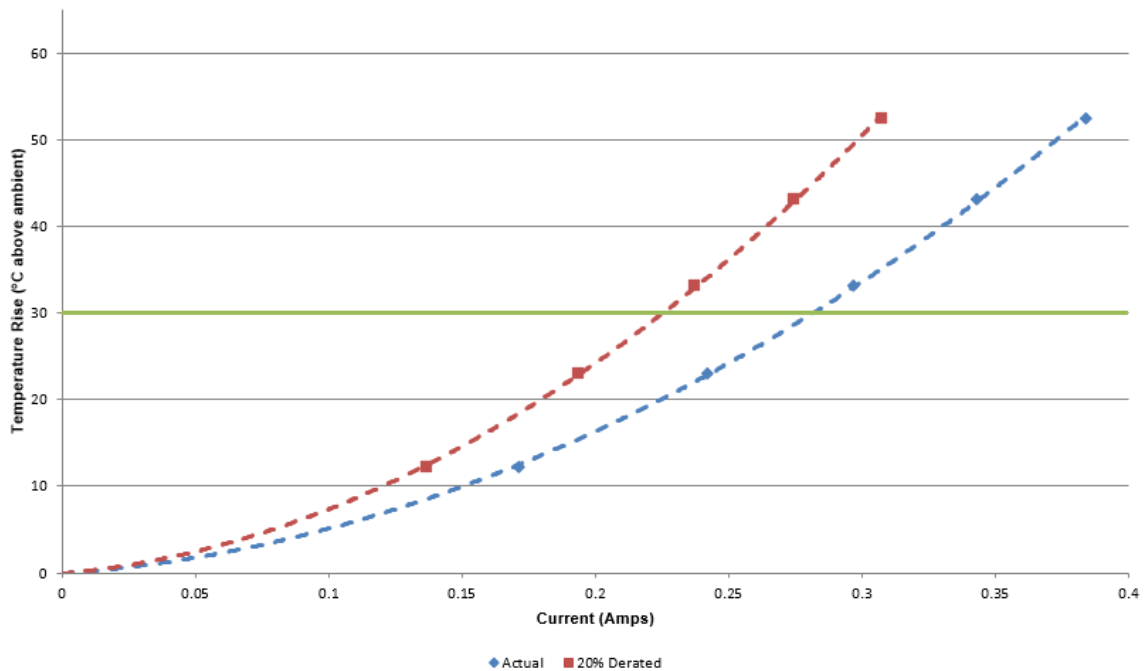
DATA SUMMARIES Continued

e. Linear configuration with 240 adjacent conductors/contacts powered

CR-623102
240 (4x60)(All Power) Contacts in Series (16mm Stack)
Part Numbers: ADF6-60-07.5-L-4-2-A / ADM6-60-08.5-L-4-2-A

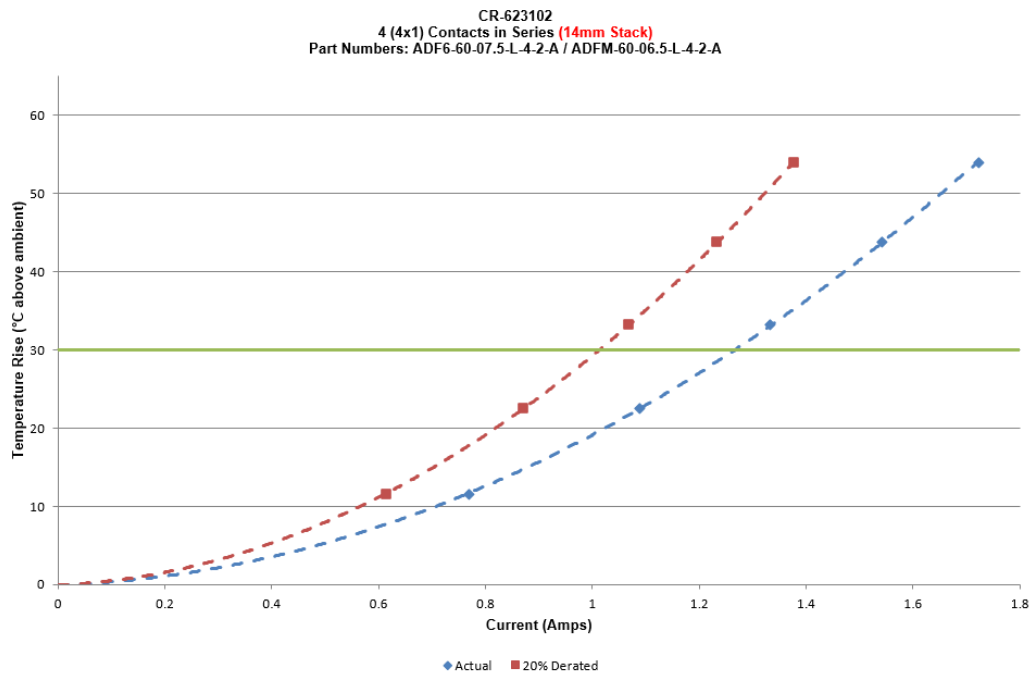
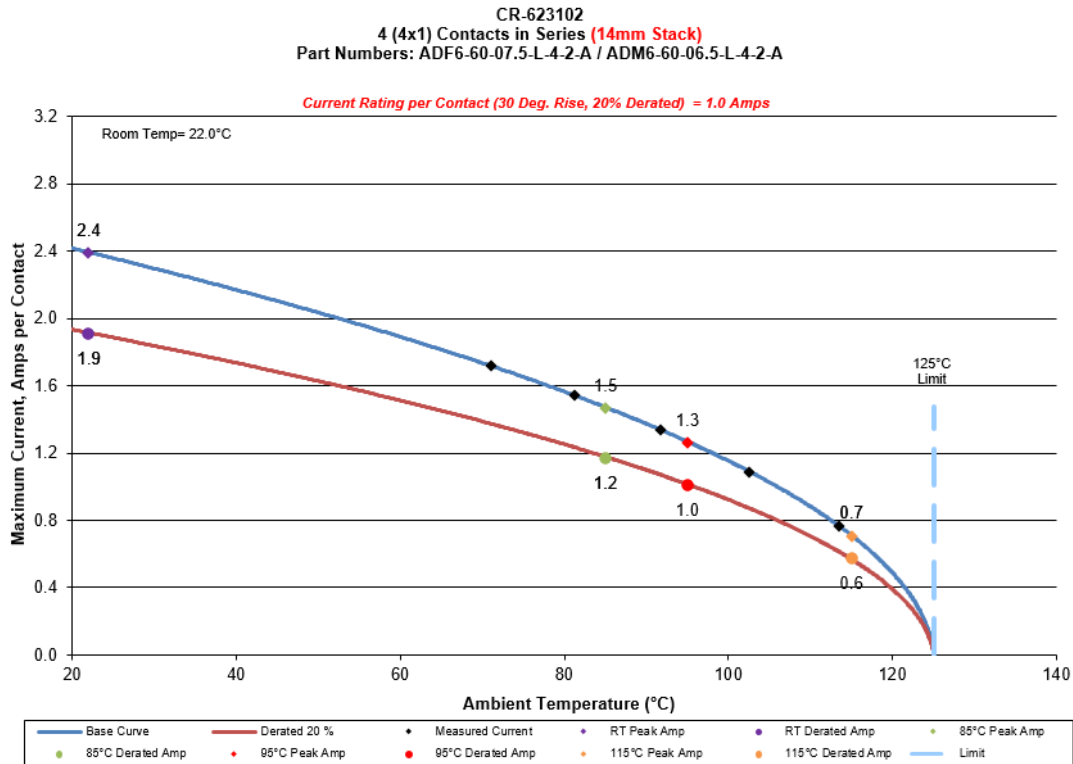


CR-623102
240 (4x60)(All Power) Contacts in Series (16mm Stack)
Part Numbers: ADF6-60-07.5-L-4-2-A / ADM6-60-08.5-L-4-2-A



DATA SUMMARIES Continued**Signal – 14 mm Stack**

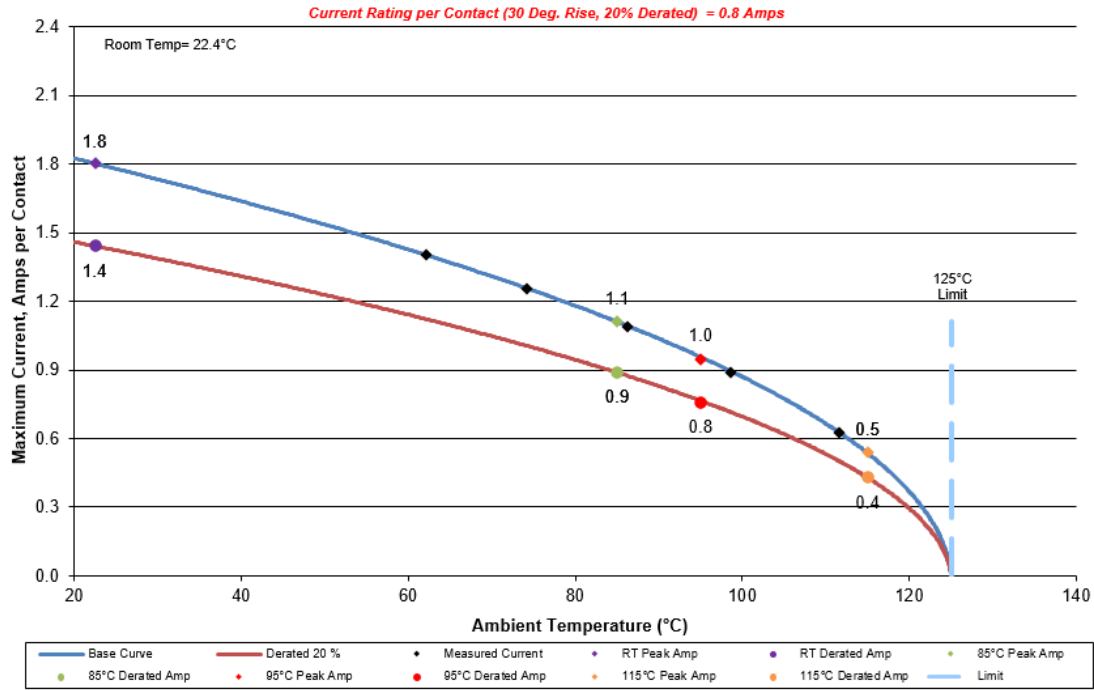
f. Linear configuration with 4 adjacent conductors/contacts powered



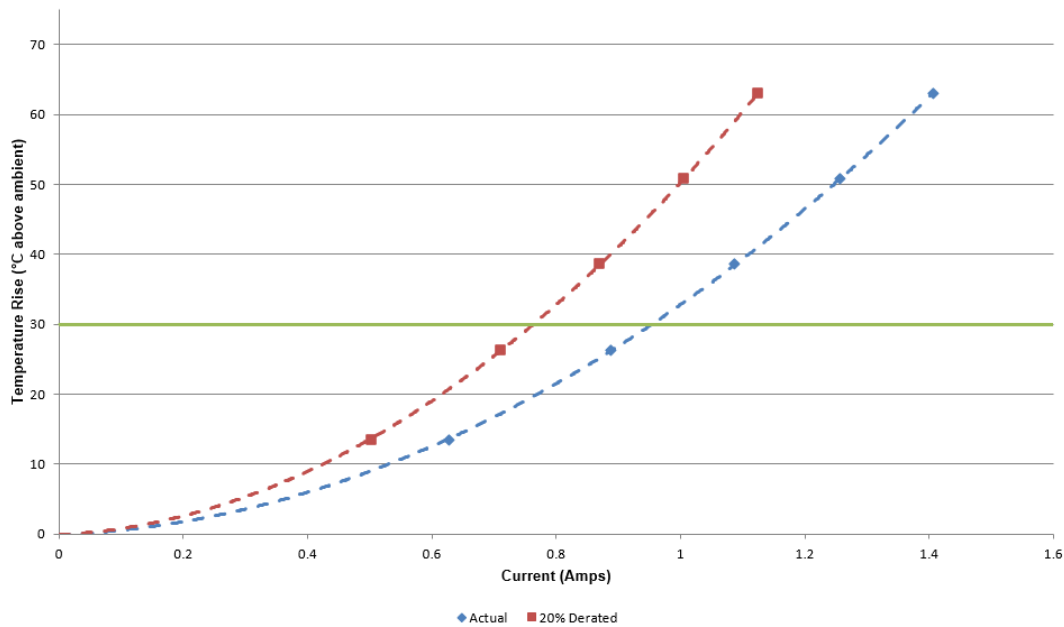
DATA SUMMARIES Continued

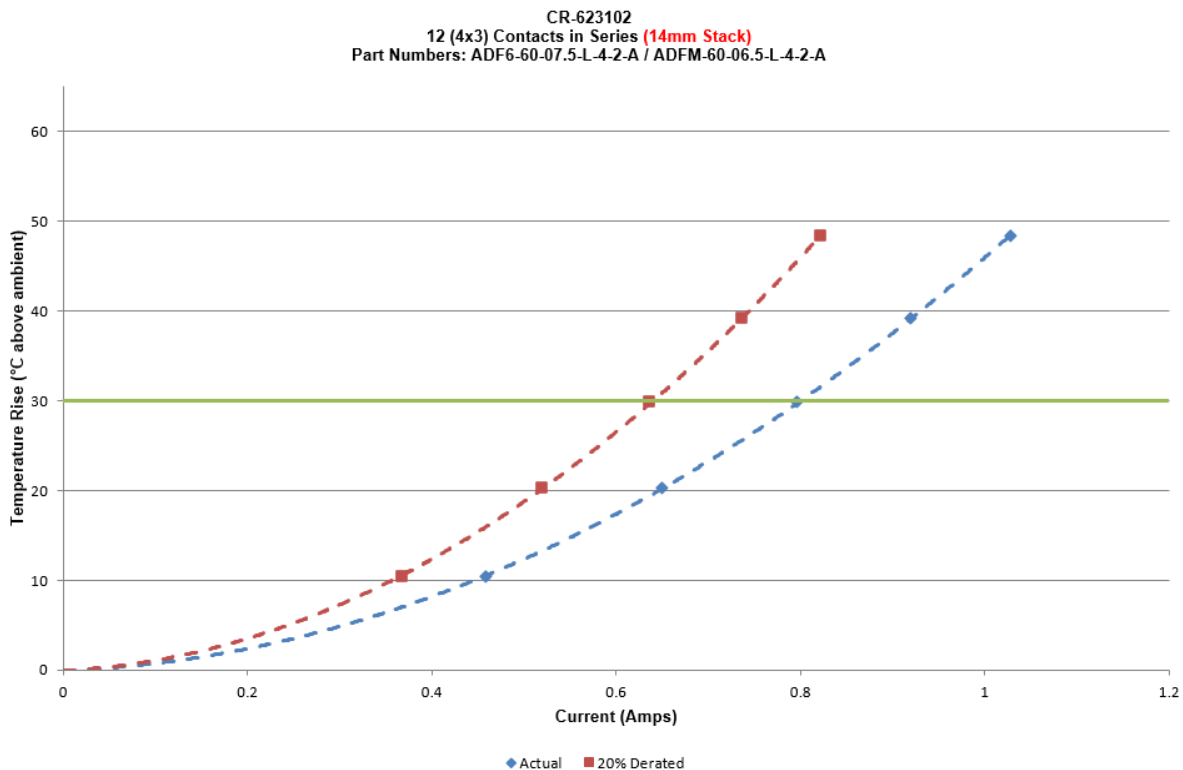
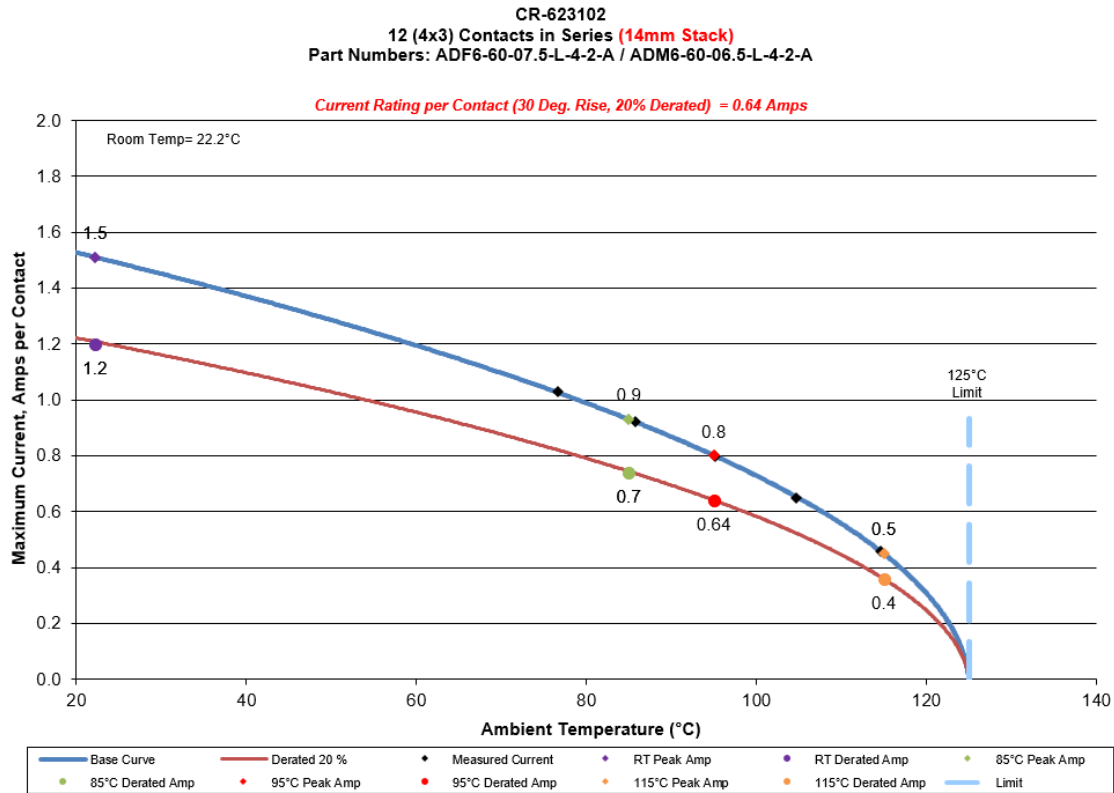
g. Linear configuration with 8 adjacent conductors/contacts powered

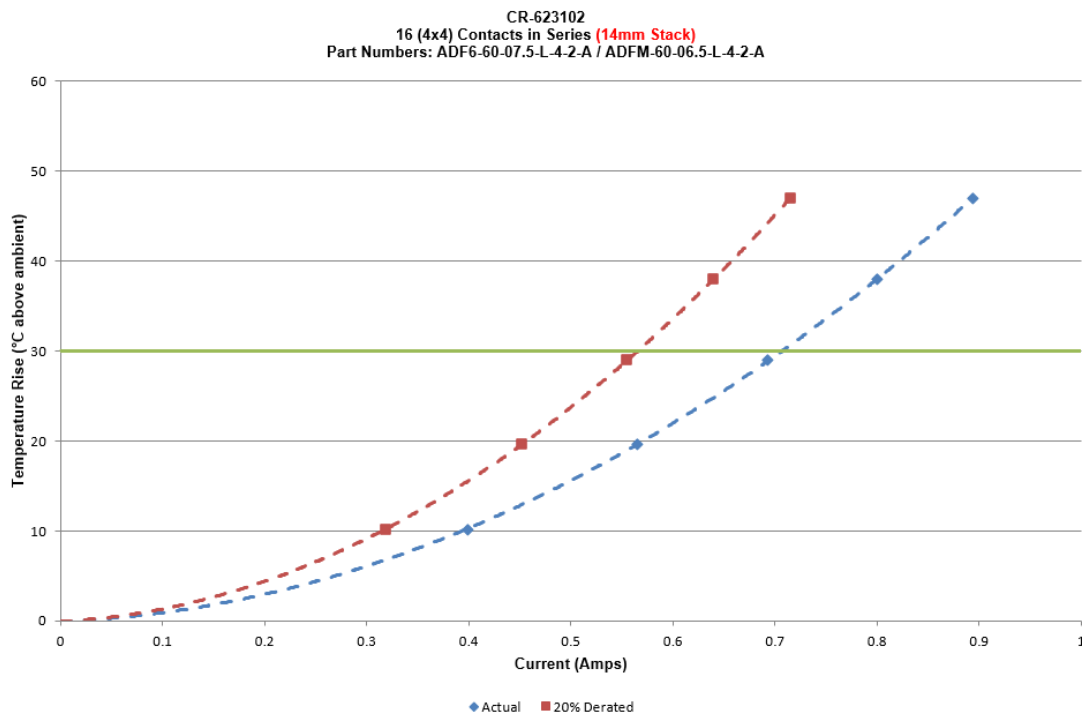
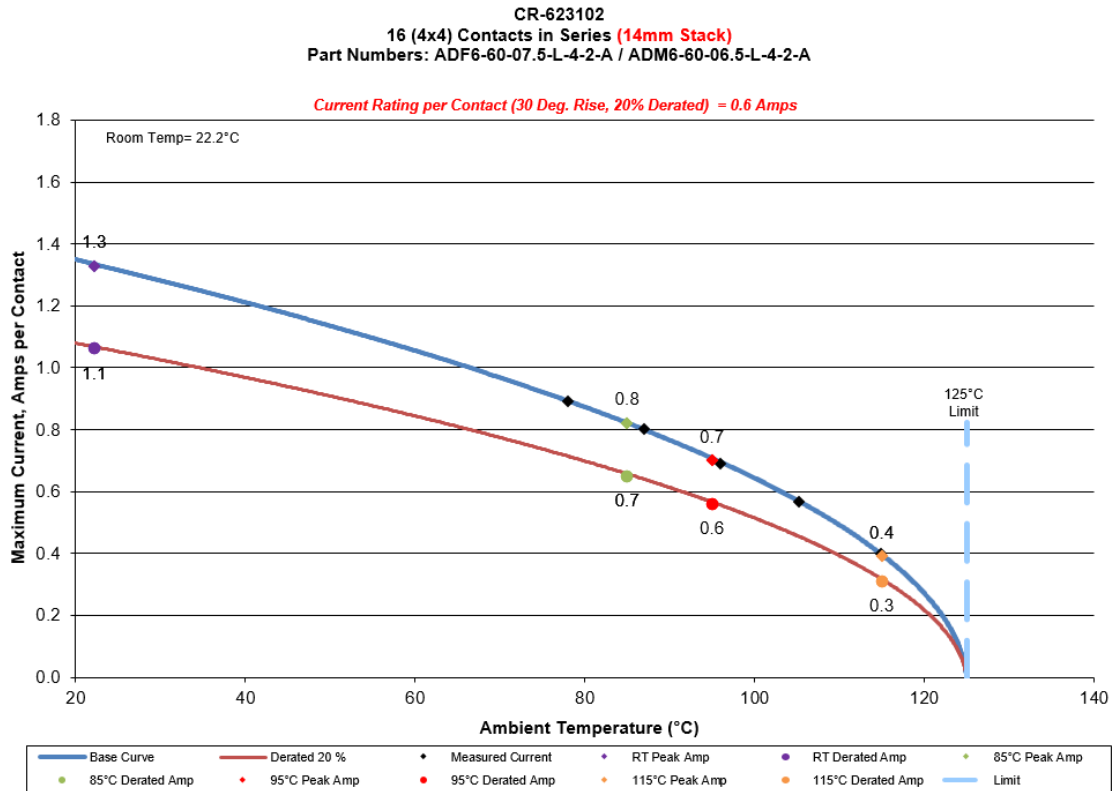
CR-623102
8 (4x2) Contacts in Series (14mm Stack)
Part Numbers: ADF6-60-07.5-L-4-2-A / ADM6-60-06.5-L-4-2-A



CR-623102
8 (4x2) Contacts in Series (14mm Stack)
Part Numbers: ADF6-60-07.5-L-4-2-A / ADM6-60-06.5-L-4-2-A



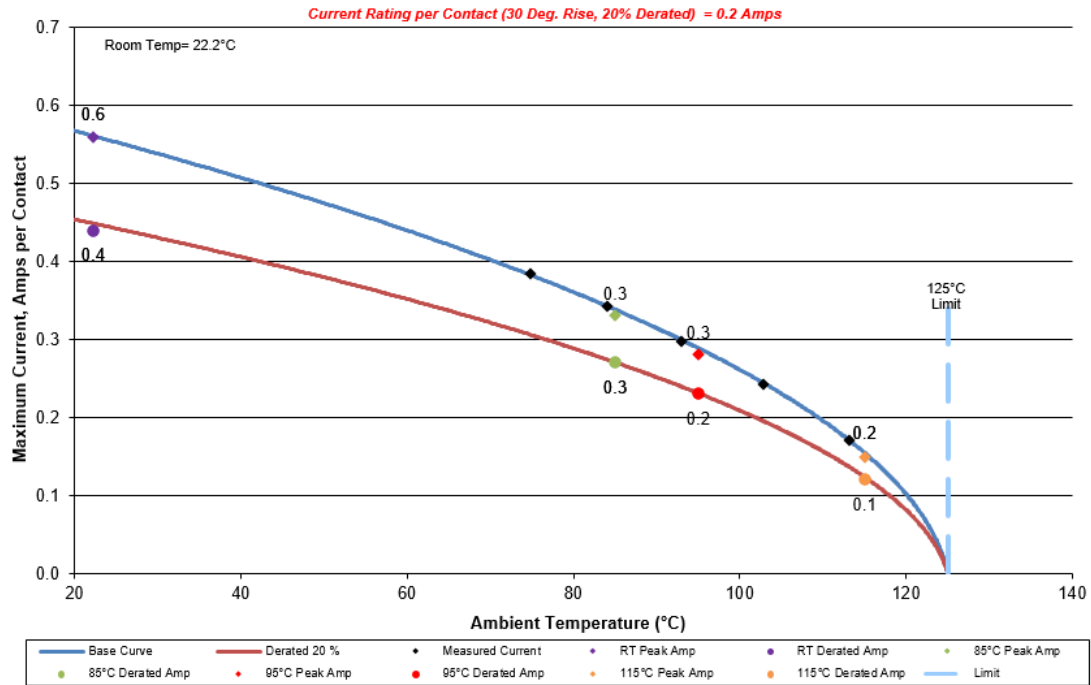
DATA SUMMARIES Continued**h. Linear configuration with 12 adjacent conductors/contacts powered**

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

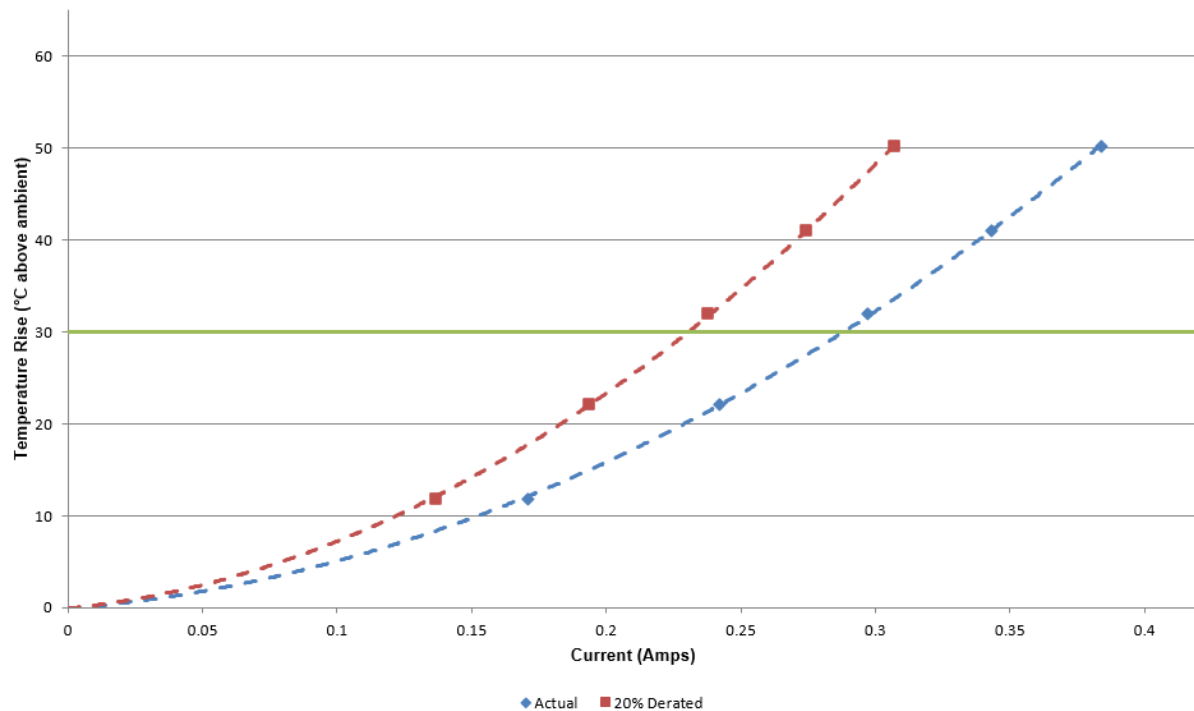
DATA SUMMARIES Continued

j. Linear configuration with 240 adjacent signal conductors and ground conductors/contacts powered

CR-623102
240 (4x60)(All Power) Contacts in Series (14mm Stack)
Part Numbers: ADF6-60-07.5-L-4-2-A / ADM6-60-06.5-L-4-2-A

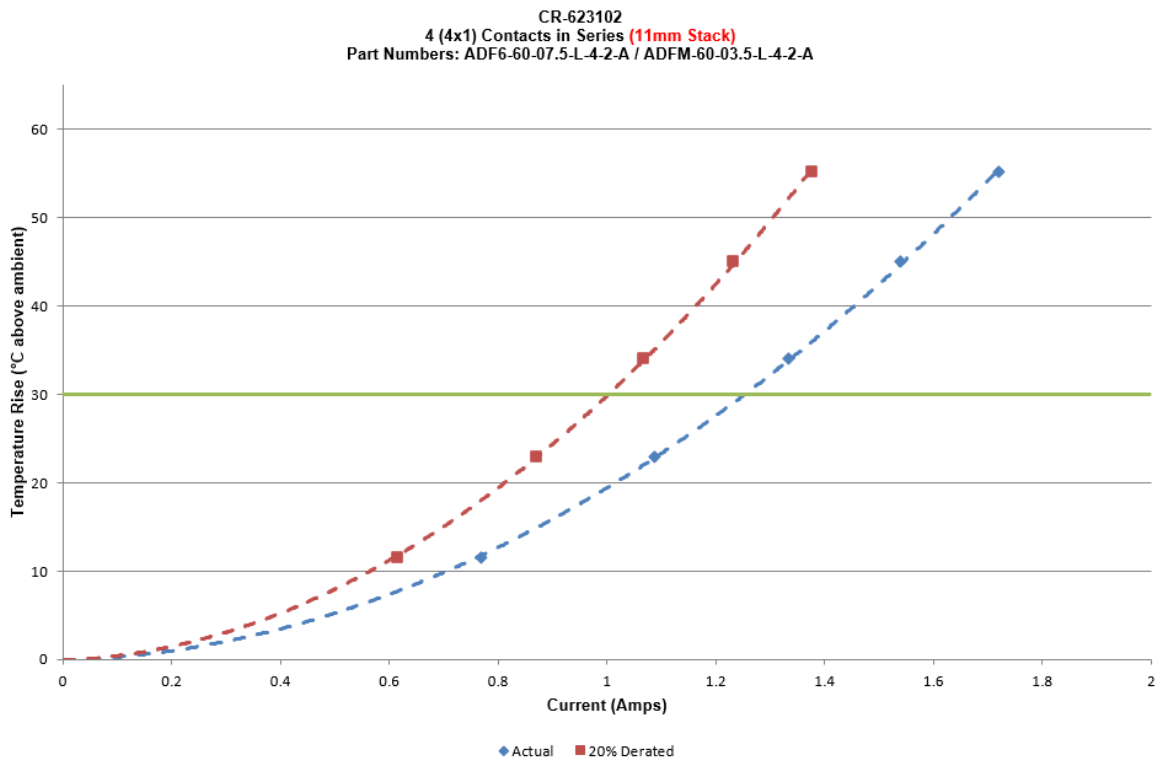
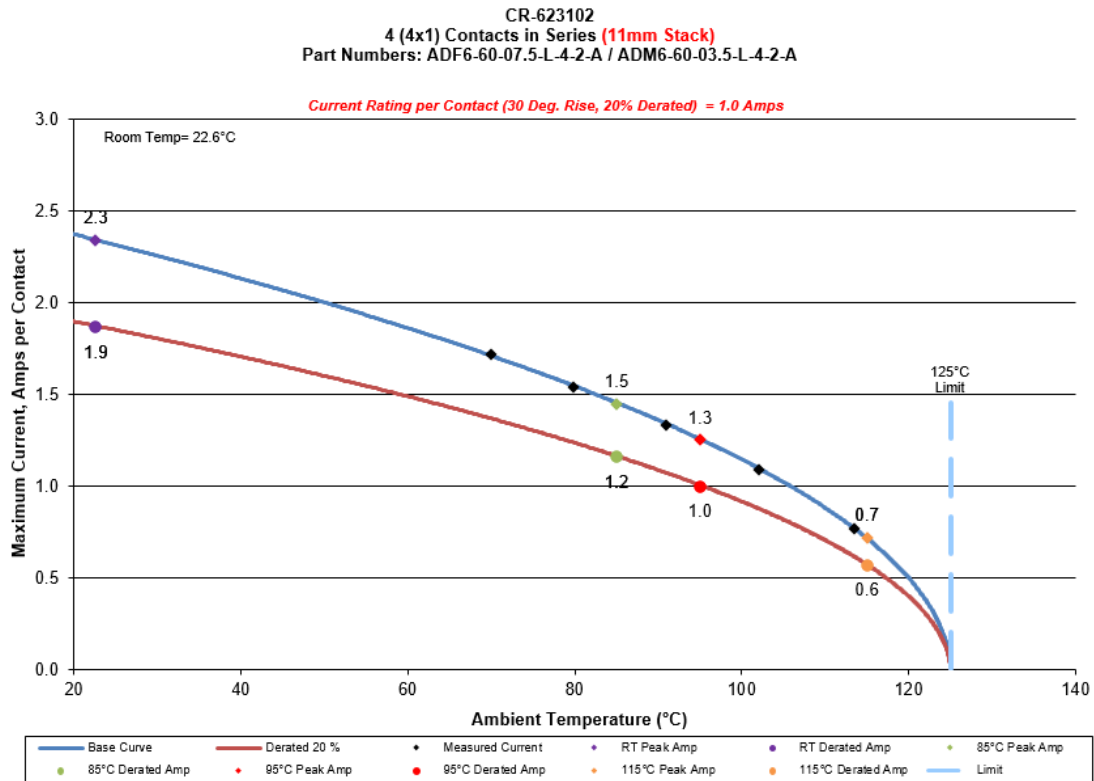


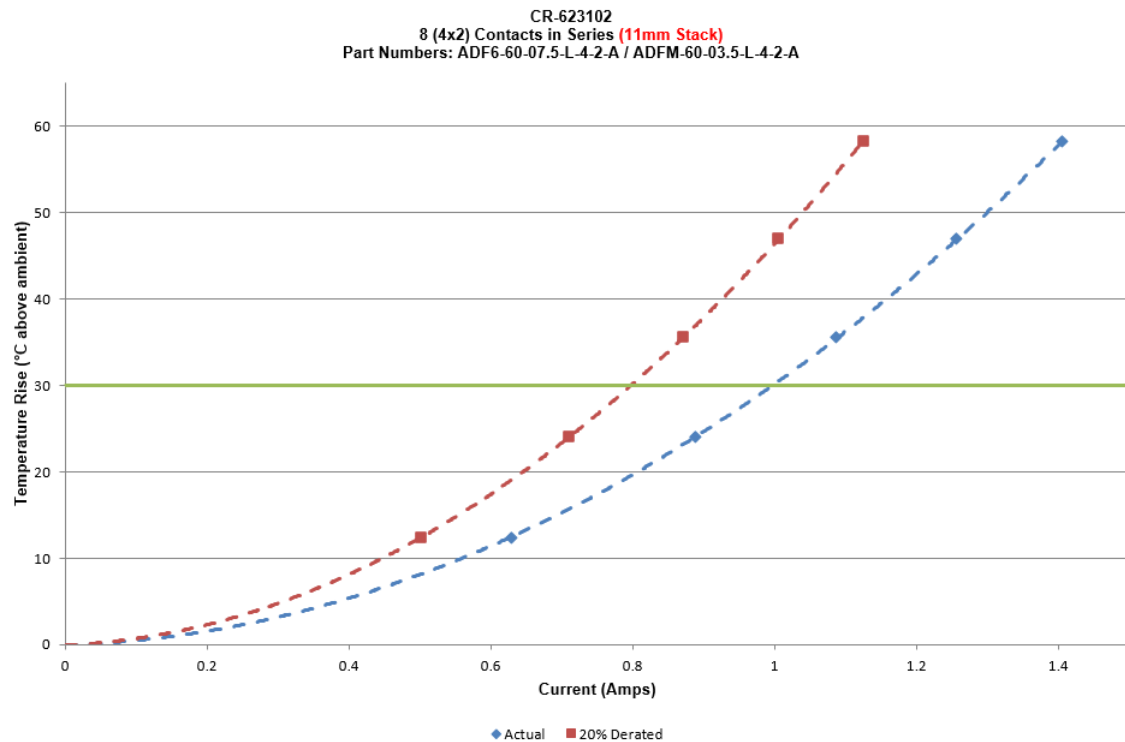
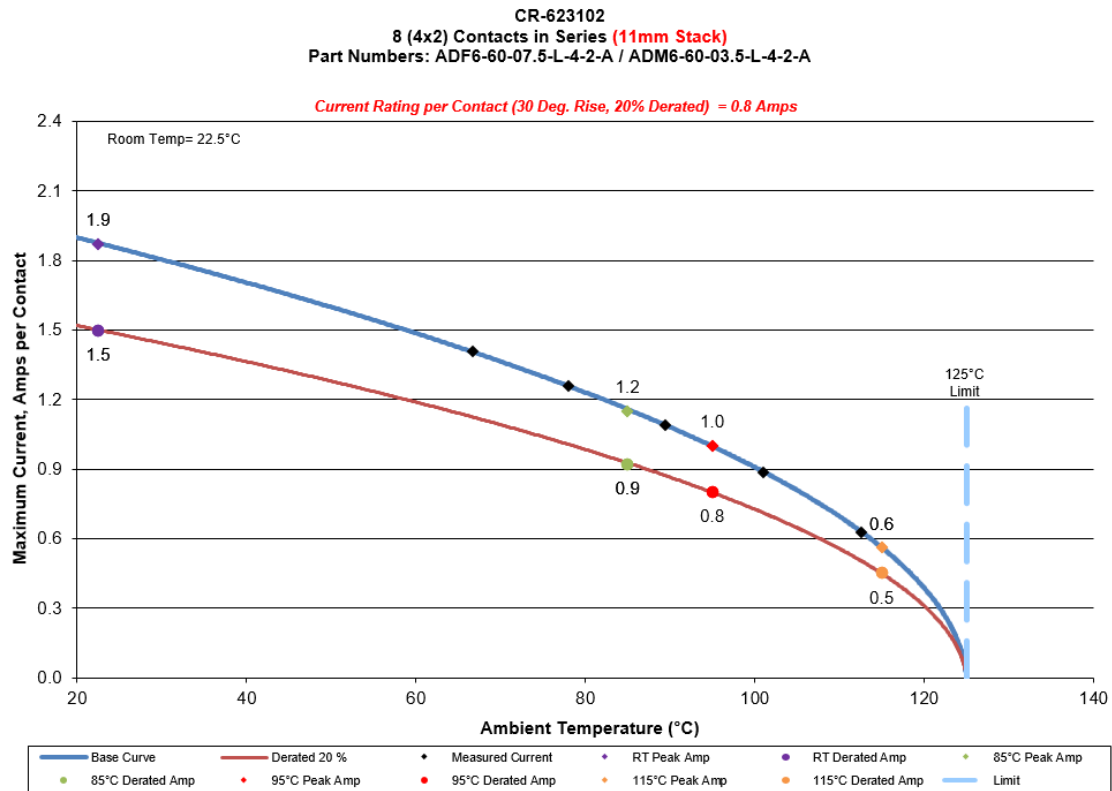
CR-623102
240 (4x60)(All Power) Contacts in Series (14mm Stack)
Part Numbers: ADF6-60-07.5-L-4-2-A / ADM6-60-06.5-L-4-2-A



DATA SUMMARIES Continued**Signal - 11mm Stack**

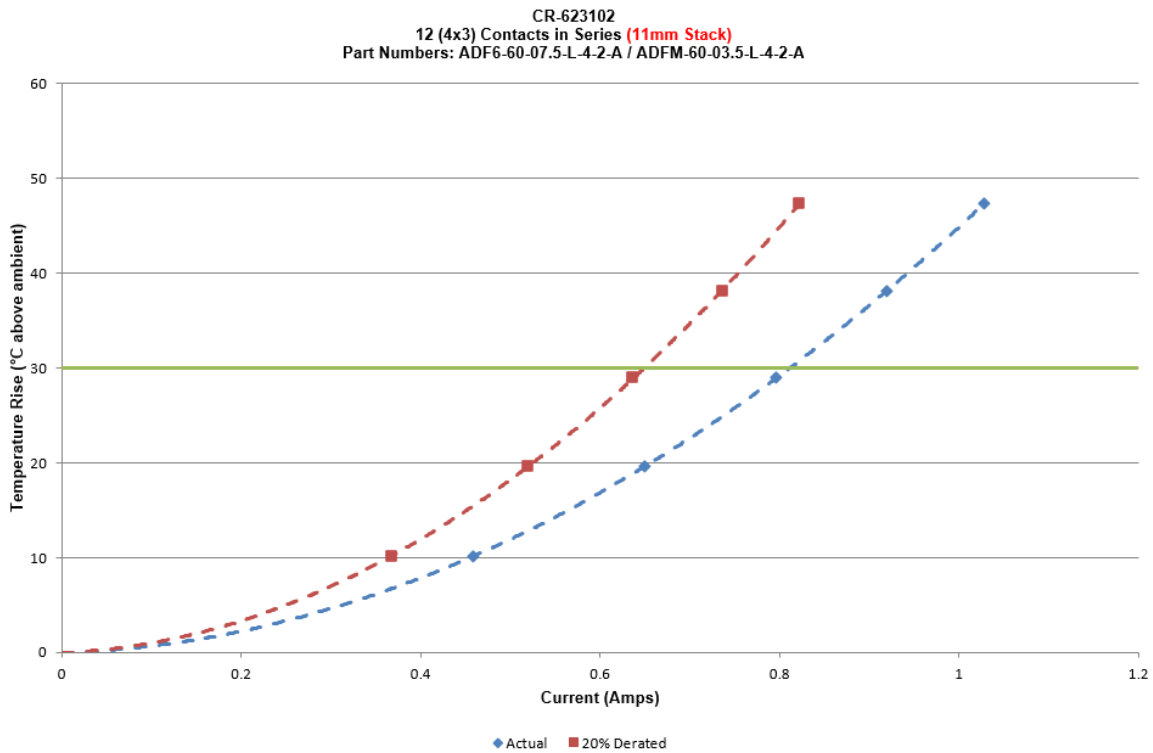
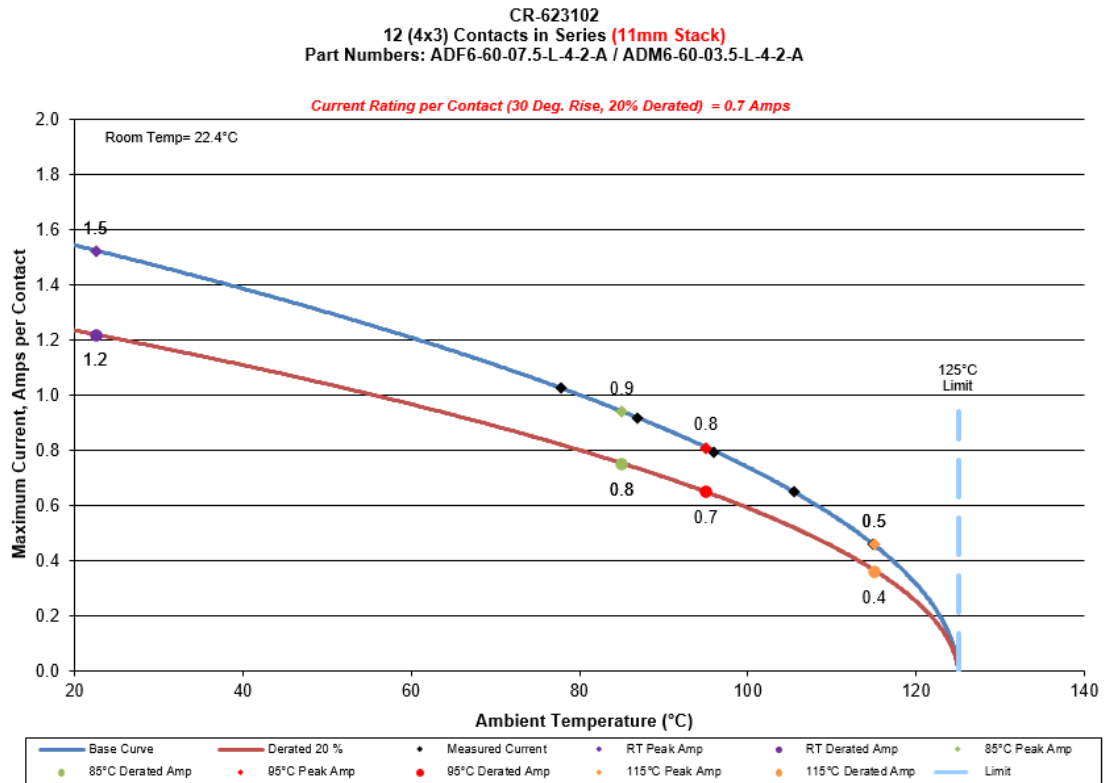
- a. Linear configuration with 4 adjacent conductors/contacts powered



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

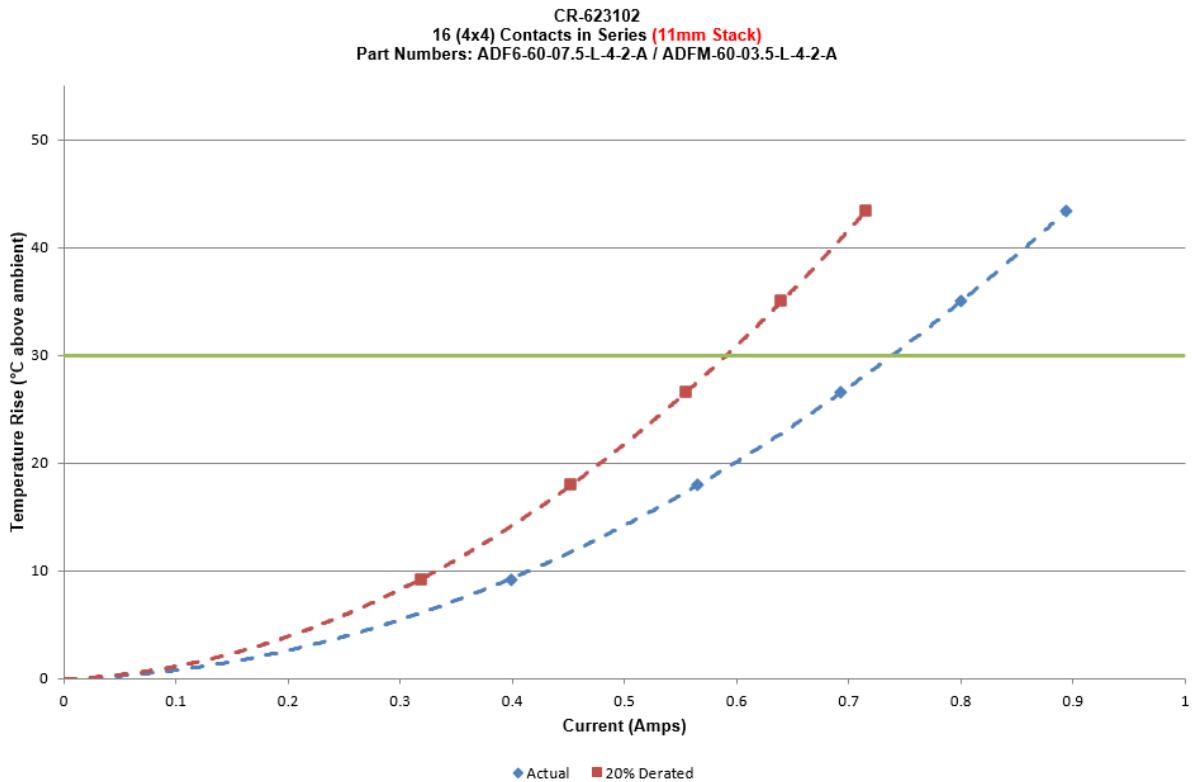
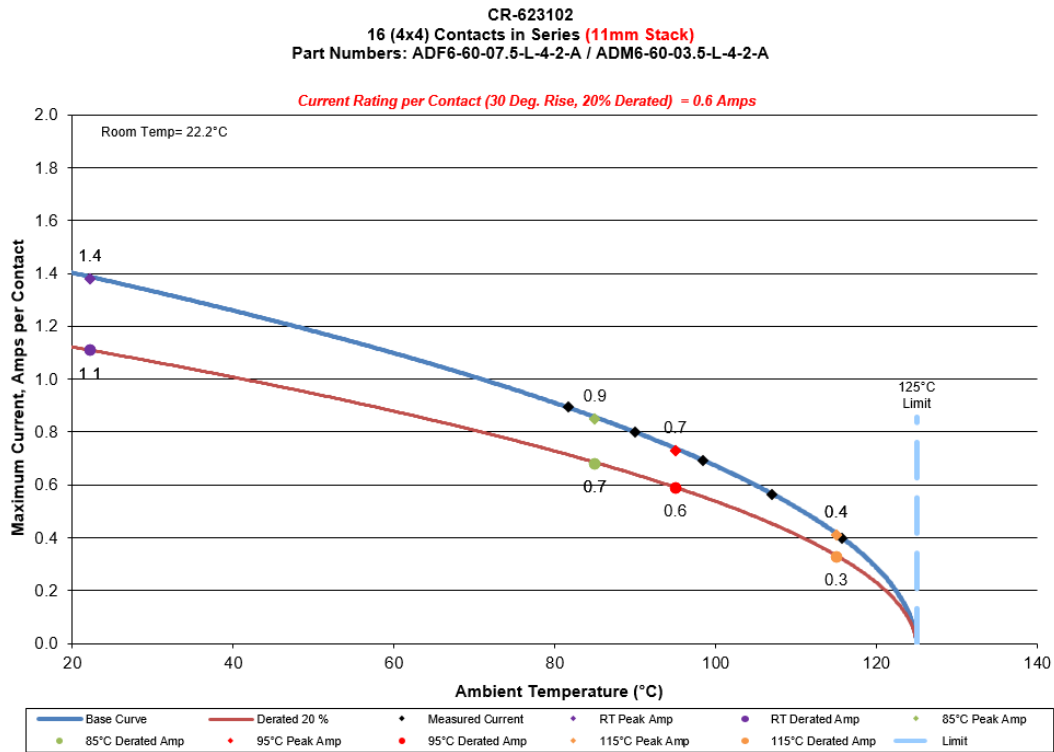
DATA SUMMARIES Continued

c. Linear configuration with 12 adjacent conductors/contacts powered



DATA SUMMARIES Continued

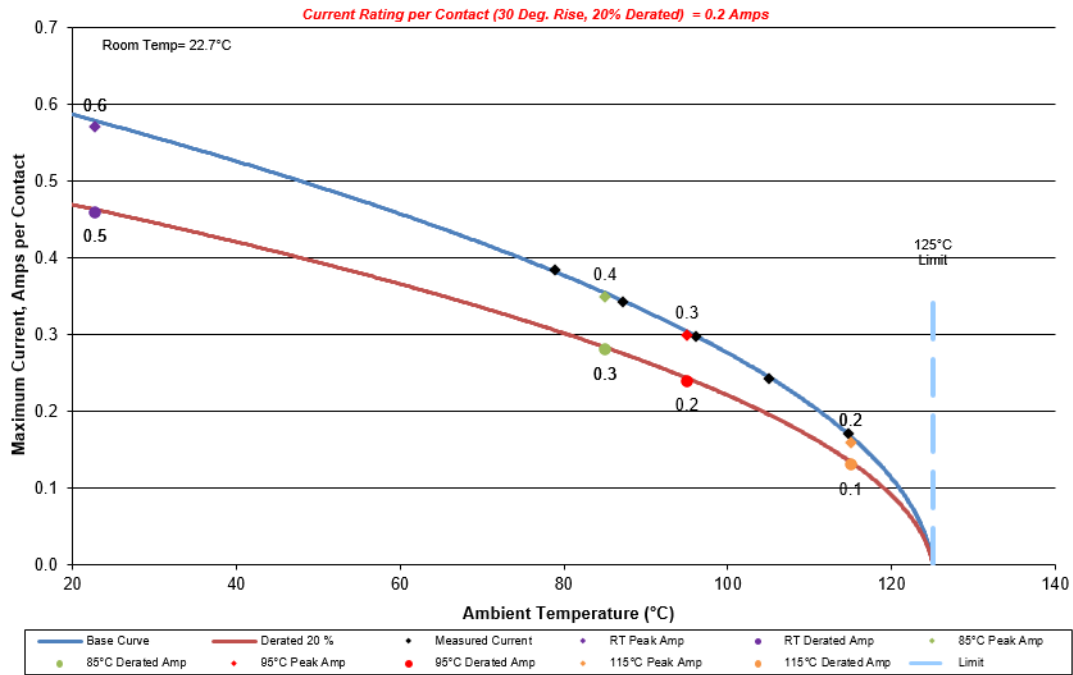
d. Linear configuration with 16 adjacent conductors/contacts powered



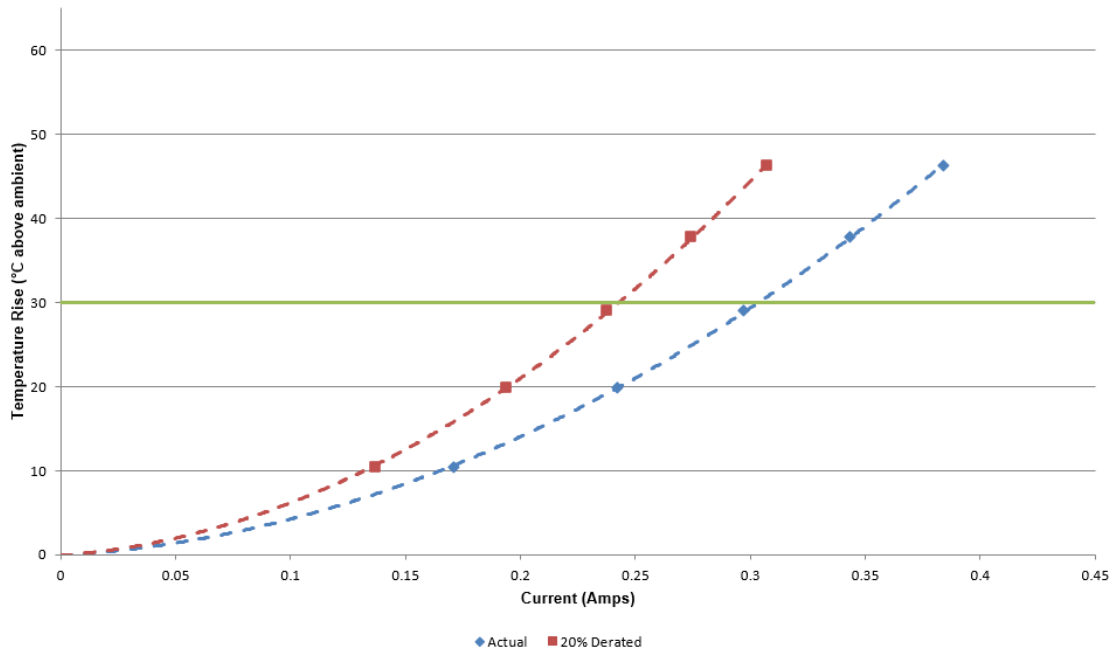
DATA SUMMARIES Continued

e. Linear configuration with 240 adjacent conductors/contacts powered

CR-623102
240 (4x60)(All Power) Contacts in Series (11mm Stack)
Part Numbers: ADF6-60-07.5-L-4-2-A / ADM6-60-03.5-L-4-2-A



CR-623102
240 (4x60)(All Power) Contacts in Series (11mm Stack)
Part Numbers: ADF6-60-07.5-L-4-2-A / ADM6-60-03.5-L-4-2-A



DATA SUMMARIES Continued**MATING-UNMATING FORCE:****ADM6-10-03.5-L-4-2-A/ADF6-10-03.5-L-4-2-A**

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton	Force (Lbs)	Newton	Force (Lbs)	Newton	Force (Lbs)	Newton	Force (Lbs)
Minimum	6.54	1.47	4.18	0.94	8.10	1.82	5.03	1.13
Maximum	8.23	1.85	6.49	1.46	9.61	2.16	7.38	1.66
Average	7.51	1.69	5.13	1.15	8.97	2.02	6.05	1.36
St Dev	0.54	0.12	0.80	0.18	0.51	0.12	0.88	0.20
Count	8	8	8	8	8	8	8	8
	After Gaps							
	Mating		Unmating					
	Newton	Force (Lbs)	Newton	Force (Lbs)				
Minimum	6.67	1.50	3.25	0.73				
Maximum	7.70	1.73	3.74	0.84				
Average	7.09	1.60	3.45	0.78				
St Dev	0.37	0.08	0.16	0.04				
Count	8	8	8	8				

ADM6-60-03.5-L-4-2-A/ ADF6-60-03.5-L-4-2-A

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newton	Force (Lbs)	Newton	Force (Lbs)	Newton	Force (Lbs)	Newton	Force (Lbs)
Minimum	52.00	11.69	24.38	5.48	72.15	16.22	30.74	6.91
Maximum	64.94	14.60	29.13	6.55	86.65	19.48	37.01	8.32
Average	57.80	13.00	27.53	6.19	78.46	17.64	35.10	7.89
St Dev	4.12	0.93	1.40	0.32	4.16	0.93	2.09	0.47
Count	8	8	8	8	8	8	8	8
	After Gaps							
	Mating		Unmating					
	Newton	Force (Lbs)	Newton	Force (Lbs)				
Minimum	49.91	11.22	22.82	5.13				
Maximum	56.62	12.73	26.07	5.86				
Average	52.36	11.77	24.10	5.42				
St Dev	2.25	0.51	1.15	0.26				
Count	8	8	8	8				

DATA SUMMARIES Continued**ADF6-30-07.5-L-4-2-A/ADM6-30-01.5-L-4-2-A**

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	20.77	4.67	11.92	2.68	22.11	4.97	13.03	2.93
Maximum	24.51	5.51	14.10	3.17	23.93	5.38	16.15	3.63
Average	22.52	5.06	13.11	2.95	22.91	5.15	14.79	3.33
St Dev	1.22	0.28	0.89	0.20	0.71	0.16	1.11	0.25
Count	8	8	8	8	8	8	8	8
	After Humidity							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	14.90	3.35	9.07	2.04				
Maximum	17.53	3.94	10.76	2.42				
Average	16.32	3.67	10.03	2.26				
St Dev	1.09	0.24	0.49	0.11				
Count	8	8	8	8				

ADF6-60-07.5-L-4-2-A/ ADM6-60-08.5-L-4-2-A

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	31.31	7.04	16.41	3.69	40.48	9.10	19.53	4.39
Maximum	37.85	8.51	19.57	4.40	42.79	9.62	21.44	4.82
Average	33.38	7.51	18.14	4.08	41.79	9.40	20.41	4.59
St Dev	2.21	0.50	1.11	0.25	0.93	0.21	0.70	0.16
Count	8	8	8	8	8	8	8	8
	After Gaps							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	30.65	6.89	17.39	3.91				
Maximum	32.38	7.28	18.82	4.23				
Average	31.52	7.09	18.00	4.05				
St Dev	0.56	0.13	0.45	0.10				
Count	8	8	8	8				

DATA SUMMARIES Continued**ADM6-30-03.5-L-4-2-A/ADF6-30-03.5-L-4-2-A**

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	26.51	5.96	15.52	3.49	27.71	6.23	17.48	3.93
Maximum	30.47	6.85	17.30	3.89	31.94	7.18	19.13	4.30
Average	28.61	6.43	16.29	3.66	29.46	6.62	18.42	4.14
St Dev	1.50	0.34	0.65	0.15	1.48	0.33	0.56	0.13
Count	8	8	8	8	8	8	8	8
	After Humidity							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	16.99	3.82	11.88	2.67				
Maximum	20.86	4.69	13.30	2.99				
Average	19.05	4.28	12.62	2.84				
St Dev	1.24	0.28	0.54	0.12				
Count	8	8	8	8				

ADF6-10-07.5-L-4-2-A/ ADM6-10-01.5-L-4-2-A

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	5.87	1.32	2.98	0.67	6.85	1.54	3.60	0.81
Maximum	6.76	1.52	4.14	0.93	7.65	1.72	4.49	1.01
Average	6.28	1.41	3.47	0.78	7.29	1.64	4.08	0.92
St Dev	0.33	0.08	0.41	0.09	0.25	0.06	0.28	0.06
Count	8	8	8	8	8	8	8	8
	After Gaps							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	5.56	1.25	2.62	0.59				
Maximum	6.36	1.43	3.47	0.78				
Average	5.99	1.35	3.14	0.71				
St Dev	0.24	0.05	0.30	0.07				
Count	8	8	8	8				

DATA SUMMARIES Continued**ADF6-60-07.5-L-4-2-A/ADM6-60-01.5-L-4-2-A**

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	35.32	7.94	17.48	3.93	38.79	8.72	21.26	4.78
Maximum	39.63	8.91	21.97	4.94	56.09	12.61	26.02	5.85
Average	37.89	8.52	20.27	4.56	51.75	11.63	22.97	5.16
St Dev	1.36	0.31	1.48	0.33	5.93	1.33	1.55	0.35
Count	8	8	8	8	8	8	8	8
	After Gaps							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	35.41	7.96	17.53	3.94				
Maximum	43.50	9.78	21.80	4.90				
Average	39.22	8.82	20.46	4.60				
St Dev	2.89	0.65	1.40	0.31				
Count	8	8	8	8				

ADF6-10-07.5-L-4-2-A/ADM6-10-08.5-L-4-2-A

	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	4.94	1.11	2.89	0.65	6.14	1.38	3.56	0.80
Maximum	5.74	1.29	4.40	0.99	8.54	1.92	4.27	0.96
Average	5.50	1.24	3.60	0.81	6.98	1.57	3.87	0.87
St Dev	0.24	0.05	0.46	0.10	0.73	0.17	0.27	0.06
Count	8	8	8	8	8	8	8	8
	After Gaps							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	4.94	1.11	2.49	0.56				
Maximum	5.34	1.20	2.98	0.67				
Average	5.11	1.15	2.82	0.64				
St Dev	0.12	0.03	0.20	0.04				
Count	8	8	8	8				

DATA SUMMARIES Continued**ADF6-30-07.5-L-4-2-A/ADM6-30-08.5-L-4-2-A**

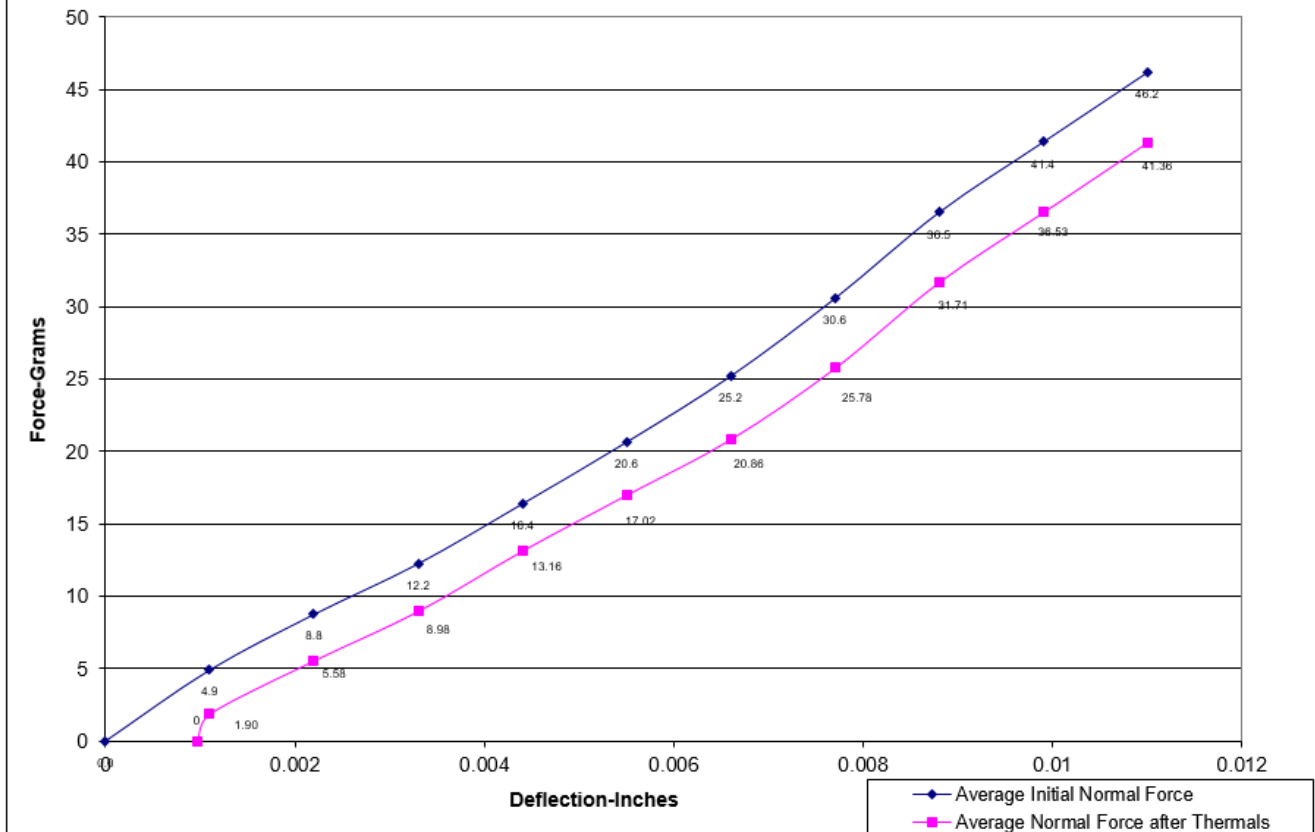
	Initial				After 25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	14.63	3.29	8.45	1.90	15.79	3.55	9.25	2.08
Maximum	15.75	3.54	9.83	2.21	19.22	4.32	11.52	2.59
Average	15.04	3.38	9.13	2.05	16.99	3.82	10.66	2.40
St Dev	0.46	0.10	0.53	0.12	1.05	0.24	0.66	0.15
Count	8	8	8	8	8	8	8	8
	After Humidity							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	12.94	2.91	4.83	1.09				
Maximum	14.10	3.17	9.65	2.17				
Average	13.57	3.05	8.53	1.92				
St Dev	0.37	0.08	1.56	0.35				
Count	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.

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	4.91	8.75	12.24	16.38	20.64	25.20	30.57	36.51	41.37	46.18	0.0000
Min	4.30	7.80	11.30	15.20	19.00	23.50	28.70	34.80	39.50	44.00	0.0000
Max	5.30	9.20	13.10	17.50	21.80	26.30	31.80	37.70	42.60	48.10	0.0001
St. Dev	0.320	0.472	0.584	0.725	0.906	0.938	1.052	0.976	0.941	1.097	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
Averages Min Max St. Dev Count	<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>
	1.90	5.58	8.98	13.16	17.02	20.86	25.78	31.71	36.53	41.36	0.0008
	-0.10	2.80	5.70	9.30	12.80	15.90	19.80	25.50	29.90	34.50	0.0003
	4.00	8.30	11.80	16.10	20.10	24.20	29.50	35.40	40.00	44.90	0.0014
	1.455	1.766	1.888	2.055	2.232	2.572	2.901	2.993	3.101	3.099	0.0004
	12	12	12	12	12	12	12	12	12	12	12

Normal Force - Average Initial vs Average Thermal

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

- 1). A total of 192 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

ADM6-10-03.5-L-4-2-A/ADF6-10-03.5-L-4-2-A

LLCR Measurement Summaries by Pin Type				
Date	7/22/2021	7/30/2021		
Room Temp (Deg C)	23	23		
Rel Humidity (%)	45	52		
Technician	Scott Rollefstad	Scott Rollefstad		
mOhm values	Actual	Delta		
	Initial	Cycles		
Pin Type: Signal 1				
Average	25.99	0.46		
St. Dev.	0.99	0.38		
Min	24.21	0		
Max	29.19	1.76		
Summary Count	192	192		
Total Count	192	192		

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
Cycles	192	0	0	0	0	0

DATA SUMMARIES Continued**ADM6-60-03.5-L-4-2-A/ ADF6-60-03.5-L-4-2-A**

Date	7/23/2021	8/2/2021		
Room Temp (Deg C)	22	23		
Rel Humidity (%)	50	50		
Technician	Scott Rollefstad	Scott Rollefstad		
mOhm values	Actual	Delta		
	Initial	Cycles		
	Pin Type: Signal 1			
Average	26.71	1.05		
St. Dev.	1.43	1.2		
Min	24.59	0.01		
Max	32.36	7.41		
Summary Count	192	192		
Total Count	192	192		

LLCR Delta Count by Category

	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
Cycles	188	4	0	0	0	0

DATA SUMMARIES Continued**ADF6-30-07.5-L-4-2-A/ADM6-30-01.5-L-4-2-A**

Date	7/22/2021	8/2/2021	8/16/2021	8/31/2021
Room Temp (Deg C)	23	22	23	23
Rel Humidity (%)	46	50	50	48
Technician	Scott Rollefstad	Scott Rollefstad	Scott Rollefstad	Scott Rollefstad
mOhm values	Actual Initial	Delta Cycles	Delta Therm Shck	Delta Humidity
	Pin Type: Signal 1			
Average	32.05	0.57	0.67	0.56
St. Dev.	0.85	0.55	0.59	0.52
Min	29.84	0	0	0.01
Max	35.76	2.95	3.55	3.27
Summary Count	192	192	192	192
Total Count	192	192	192	192

LLCR Delta Count by Category

	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
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**ADF6-60-07.5-L-4-2-A/ ADM6-60-08.5-L-4-2-A**

Date	10/8/2021	10/20/2021		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	51	42		
Technician	Tony Wagoner	Tony Wagoner		
mOhm values	Actual	Delta		
	Initial	25 Cycles		
	Pin Type: Signal 1			
Average	50.78	0.57		
St. Dev.	0.96	0.58		
Min	48.51	0		
Max	55	4.88		
Summary Count	192	192		
Total Count	192	192		

LLCR Delta Count by Category

	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
Cycles	192	0	0	0	0	0

DATA SUMMARIES Continued**ADM6-30-03.5-L-4-2-A/ADF6-30-03.5-L-4-2-A**

Date	7/22/2021	8/2/2021	8/16/2021	8/31/2021
Room Temp (Deg C)	23	22	22	23
Rel Humidity (%)	45	48	50	48
Technician	Scott Rollefstad	Scott Rollefstad	Scott Rollefstad	Scott Rollefstad
mOhm values	Actual Initial	Delta Cycles	Delta Therm Shck	Delta Humidity
	Pin Type: Signal 1			
Average	25.81	0.51	1.15	1.13
St. Dev.	0.92	0.44	0.65	0.65
Min	23.06	0	0.01	0
Max	29.17	2.59	3.57	3.43
Summary Count	192	192	192	192
Total Count	192	192	192	192

LLCR Delta Count by Category

	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
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**ADF6-10-07.5-L-4-2-A/ ADM6-10-01.5-L-4-2-A**

Date	10/8/2021	10/20/2021		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	51	42		
Technician	Tony Wagoner	Tony Wagoner		
mOhm values	Actual	Delta		
	Initial	25 Cycles		
	Pin Type: Signal 1			
Average	32.91	0.53		
St. Dev.	1.37	0.6		
Min	30.74	0		
Max	37.84	4.67		
Summary Count	192	192		
Total Count	192	192		

LLCR Delta Count by Category

	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
Cycles	192	0	0	0	0	0

DATA SUMMARIES Continued**ADF6-60-07.5-L-4-2-A/ADM6-60-01.5-L-4-2-A**

Date	7/22/2021	8/2/2021		
Room Temp (Deg C)	23	22		
Rel Humidity (%)	45	50		
Technician	Scott Rollefstad	Scott Rollefstad		
mOhm values	Actual	Delta		
	Initial	Cycles		
	Pin Type: Signal 1			
Average	32.39	1.13		
St. Dev.	1.24	0.96		
Min	28.74	0.01		
Max	36.46	4.12		
Summary Count	192	192		
Total Count	192	192		

LLCR Delta Count by Category

	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
Cycles	192	0	0	0	0	0

DATA SUMMARIES Continued**ADF6-10-07.5-L-4-2-A/ADM6-10-08.5-L-4-2-A**

Date	7/22/2021	8/2/2021		
Room Temp (Deg C)	23	23		
Rel Humidity (%)	46	47		
Technician	Scott Rollefstad	Scott Rollefstad		
mOhm values	Actual	Delta		
	Initial	Cycles		
	Pin Type: Signal 1			
Average	50.43	0.91		
St. Dev.	1.23	0.98		
Min	46.21	0		
Max	53.53	5.26		
Summary Count	192	192		
Total Count	192	192		

LLCR Delta Count by Category

	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
Cycles	191	1	0	0	0	0

DATA SUMMARIES Continued**ADF6-30-07.5-L-4-2-A/ADM6-30-08.5-L-4-2-A**

Date	7/22/2021	8/2/2021	8/16/2021	8/31/2021
Room Temp (Deg C)	23	22	22	23
Rel Humidity (%)	44	49	50	48
Technician	Scott Rollefstad	Scott Rollefstad	Scott Rollefstad	Scott Rollefstad
mOhm values	Actual Initial	Delta Cycles	Delta Therm Shck	Delta Humidity
	Pin Type: Signal 1			
Average	50.2	1.34	2.29	2.12
St. Dev.	1.67	1.3	1.66	1.7
Min	44.28	0.01	0.05	0
Max	54.45	5.88	8.29	8.04
Summary Count	192	192	192	192
Total Count	192	192	192	192

LLCR Delta Count by Category

	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	<=5	>5 & <=10	>10 & <=15	>15 & <=50	>50 & <=1000	>1000
Cycles	187	5	0	0	0	0
Therm Shck	180	12	0	0	0	0
Humidity	178	14	0	0	0	0

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** TCT-06**Description:** Test Resources test stand**Manufacturer:** Test Resources**Model:** 100R250-12**Serial #:** 0710016-01**Accuracy:** Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.

... Last Cal: 05/03/2021, Next Cal: 05/03/2022

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 #: THC-01**Description:** Temperature/Humidity Chamber (Chamber Room)**Manufacturer:** Thermotron**Model:** SM-8-7800**Serial #:** 30676**Accuracy:** See Manual

... Last Cal: 10/24/2020, Next Cal: 10/24/2021

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

... Last Cal: 06/30/2021, Next Cal: 06/30/2022

Equipment #: MO-02**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0780546**Accuracy:** Last Cal: 6/16/2021, Next Cal: 6/16/2022**Equipment #:** PS-01**Description:** Power Supply**Manufacturer:** Hewlett Packard**Model:** 6033A**Serial #:** 3329A-07330**Accuracy:** Last Cal: 6/12/2021, Next Cal: 6/12/2022

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** PS-02**Description:** Power Supply**Manufacturer:** Hewlett Packard**Model:** 6033A**Serial #:** 2847A-04167**Accuracy:** Last Cal: 6/12/2021, Next Cal: 6/12/2022