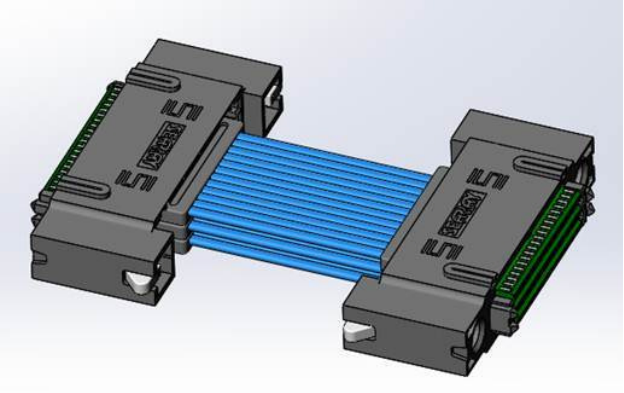
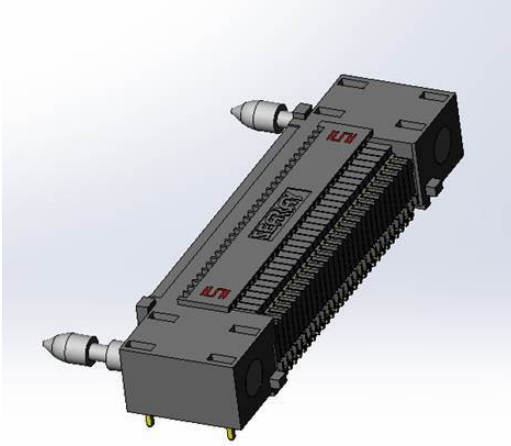
Project Number: Design Qualification Test Report	Tracking Code: 346584_Report_Rev_1
Requested by: Liam Parkes	Date: 1/29/2015
Part #: SEAC-030-06-12.0-TU-TU-2/SEAF-30-01-L-06-2-RA-LP-TR	
Part description: SEAC/SEAF	Tech: Aaron Mckim
Test Start: 8/15/2014	Test Completed: 1/19/2015





(Actual part not depicted)

SEAC DISCRETE TWINAX CABLE TYPE QUALIFICATION TEST REPORT

SEAC/SEAF
SEAC-030-06-12.0-TU-TU-2/SEAF-30-01-L-06-2-RA-LP-TR

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
1/28/2015	**1**	**Initial Issue**	**KH**

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to IS0 10012-l and ANSI/NCSL 2540-1, as applicable.

SCOPE

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

APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

1) All materials were manufactured in accordance with the applicable product specification.
2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
3) After soldering, the parts to be used for LLCR testing were cleaned according to TLWI-0001.
4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
5) The automated procedure is used with aqueous compatible soldering materials.
6) Parts not intended for testing LLCR are visually inspected and cleaned if necessary.
7) Any additional preparation will be noted in the individual test sequences.
8) Solder Information: Lead Free
9) Samtec Test PCBs used: PCB-106404-TST/PCB-106405-TST/PCB-106421-TST

FLOWCHARTS

IR/DWV

Pin-to-Pin

Group 1 SEAC-030-06-12.0-TU-TU-2 SEAF-30-01-L-06-2-RA-LP-TR 2 Assemblies		Group 2 SEAC-030-06-12.0-TU-TU-2 2 Assemblies		Group 3 SEAF-30-01-L-06-2-RA-LP-TR 2 Assemblies		Group 4 SEAC-030-06-12.0-TU-TU-2 SEAF-30-01-L-06-2-RA-LP-TR 2 Assemblies	
Step	**Description**	**Step**	**Description**	**Step**	**Description**	**Step**	**Description**
1.	DWV Breakdown (2)	1.	DWV Breakdown (2)	1.	DWV Breakdown (2)	1.	IR (4)
						2.	DWV at Test Voltage (1)
						3.	Thermal Shock (5)
						4.	IR (4)
						5.	DWV at Test Voltage (1)
						6.	Humidity (3)
						7.	IR (4)
						8.	DWV at Test Voltage (1)

Row-to-Row

Group 5 SEAC-030-06-12.0-TU-TU-2 SEAF-30-01-L-06-2-RA-LP-TR 2 Assemblies		Group 6 SEAC-030-06-12.0-TU-TU-2 2 Assemblies		Group 7 SEAF-30-01-L-06-2-RA-LP-TR 2 Assemblies		Group 8 SEAC-030-06-12.0-TU-TU-2 SEAF-30-01-L-06-2-RA-LP-TR 2 Assemblies	
Step	**Description**	**Step**	**Description**	**Step**	**Description**	**Step**	**Description**
1.	DWV Breakdown (2)	1.	DWV Breakdown (2)	1.	DWV Breakdown (2)	1.	IR (4)
						2.	DWV at Test Voltage (1)
						3.	Thermal Shock (5)
						4.	IR (4)
						5.	DWV at Test Voltage (1)
						6.	Humidity (3)
						7.	IR (4)
						8.	DWV at Test Voltage (1)

FLOWCHARTS Continued

Pin-to-Ground

Group 9 SEAC-030-06-12.0-TU-TU-2 SEAF-30-01-L-06-2-RA-LP-TR 2 Assemblies		Group 10 SEAC-030-06-12.0-TU-TU-2 2 Assemblies		Group 11 SEAF-30-01-L-06-2-RA-LP-TR 2 Assemblies		Group 12 SEAC-030-06-12.0-TU-TU-2 SEAF-30-01-L-06-2-RA-LP-TR 2 Assemblies	
Step	**Description**	**Step**	**Description**	**Step**	**Description**	**Step**	**Description**
1.	DWV Breakdown (2)	1.	DWV Breakdown (2)	1.	DWV Breakdown (2)	1.	IR (4)
						2.	DWV at Test Voltage (1)
						3.	Thermal Shock (5)
						4.	IR (4)
						5.	DWV at Test Voltage (1)
						6.	Humidity (3)
						7.	IR (4)
						8.	DWV at Test Voltage (1)

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

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

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

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

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

FLOWCHARTS Continued

Current Carrying Capacity

Group 1
SEAC-030-06-12.0-TU-TU-2
SEAF-30-01-L-06-2-RA-LP-TR
6 Pins Powered
Signal

Step	Description
1.	CCC(1) Rows = 6 Number of Positions = 1

Group 2
SEAC-030-06-12.0-TU-TU-2
SEAF-30-01-L-06-2-RA-LP-TR
12 Pins Powered
Signal

Step	Description
1.	CCC(1) Rows = 6 Number of Positions = 2

Group 3
SEAC-030-06-12.0-TU-TU-2
SEAF-30-01-L-06-2-RA-LP-TR
18 Pins Powered
Signal

Step	Description
1.	CCC(1) Rows = 6 Number of Positions = 3

Group 4
SEAC-030-06-12.0-TU-TU-2
SEAF-30-01-L-06-2-RA-LP-TR
24 Pins Powered
Signal

Step	Description
1.	CCC(1) Rows = 6 Number of Positions = 4

Group 5
SEAC-030-06-12.0-TU-TU-2
SEAF-30-01-L-06-2-RA-LP-TR
120 Pins Powered
Signal

Step	Description
1.	CCC(1) Rows = 6 Number of Positions = 20

(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 1
SEAC-030-06-12.0-TU-TU-2
SEAF-30-01-L-06-2-RA-LP-TR
8 Assemblies

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

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

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

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

Mechanical Shock/Random Vibration/Event Detection

Group 1
SEAC-030-06-12.0-TU-TU-2
SEAF-30-01-L-06-2-RA-LP-TR
60 Points

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

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

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

FLOWCHARTS Continued

Cable Pull

Group 1	
SEAC-030-06-12.0-TU-TU-2	
SEAF-30-01-L-06-2-RA-LP-TR	
5 Assemblies	
0 Degrees	
Step	**Description**
1.	Cable Pull (1)

Group 2	
SEAC-030-06-12.0-TU-TU-2	
SEAF-30-01-L-06-2-RA-LP-TR	
5 Assemblies	
90 Degrees	
Step	**Description**
1.	Cable Pull (1)

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

Cable Flex

Group 1	
SEAC-030-06-12.0-TU-TU-2	
SEAF-30-01-L-06-2-RA-LP-TR	
8 Assemblies	
Flat Cable	
Step	**Description**
1.	IR (3)
2.	DWV at Test Voltage (2)
3.	Cable Flex (1)
4.	Visual Inspection
5.	IR (3)
6.	DWV at Test Voltage (2)

(1) Cable Flex = EIA-364-41
Circular Jacket Cable - to be tested 90° each direction (180° total)
Flat Cable - to be tested 70° each direction (140° total)
Monitor continuity during flex testing
Failure = Discontinuity >1 microsecond at 10 ohms

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

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

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

1) EIA-364-32, *Thermal Shock (Temperature Cycling) Test Procedure for Electrical Connectors.*
2) Test Condition: -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 G^2 / Hz
4) G 'RMS': 7.56
5) Frequency: 50 to 2000 Hz
6) Duration: 2.0 Hours per axis (3 axis total)

NANOSECOND-EVENT DETECTION:

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

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

TEMPERATURE RISE (Current Carrying Capacity, CCC):

1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
2) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
3) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
4) The size of the temperature probe can affect the measured temperature.
5) Copper traces on PC boards will contribute to temperature rise:
    a. Self heating (resistive)
    b. Reduction in heat sink capacity affecting the heated contacts
6) A de-rating curve, usually 20%, is calculated.
7) Calculated de-rated currents at four temperature points are reported:
    a. Ambient
    b. 65^{o} C
    c. 75^{o} C
    d. 95^{o} C
8) Typically, neighboring contacts (in close proximity to maximize heat build up) are energized.
9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the maximum temperature in the vicinity of the heat generation area.
10) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
11) Hook-up wire cross section is larger than the cross section of any connector leads/PC board traces, jumpers, etc.
12) Hook-up wire length is longer than the minimum specified in the referencing standard.

LLCR:

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

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

INSULATION RESISTANCE (IR):

To determine the resistance of insulation materials to leakage of current through or on the surface of these materials when a DC potential is applied.

1) PROCEDURE:
    a. Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
    b. Test Conditions:
        i. Between Adjacent Contacts or Signal-to-Ground
        ii. Electrification Time 2.0 minutes
        iii. Test Voltage (500 VDC) corresponds to calibration settings for measuring resistances.
2) MEASUREMENTS:
3) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 1000 megohms.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

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

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

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

CONNECTOR PULL:

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

Fig. 1
(Typical set-up, actual part not depicted.)
90° Connector pull, notice the electrical continuity hook-up wires.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

CABLE DURABILITY:

a. 140° Flex Mode, bend up to 500 cycles with 8 oz. load on cable end.

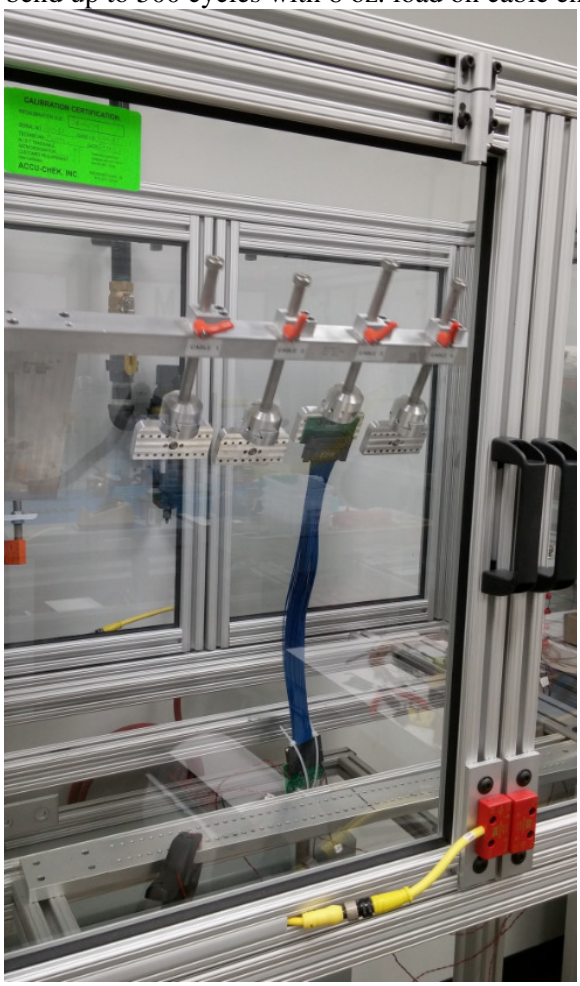


Fig. 2
(Typical set-up, actual part not depicted.)

RESULTS

Temperature Rise, CCC at a 20% de-rating

Contact interface

- **CCC for a 30°C Temperature Rise----------2.06A per contact with 6 contacts (6x1) powered**
- **CCC for a 30°C Temperature Rise----------1.45A per contact with 12 contacts (6x2) powered**
- **CCC for a 30°C Temperature Rise----------1.26A per contact with 18 contacts (6x3) powered**
- **CCC for a 30°C Temperature Rise----------1.06A per contact with 24 contacts (6x4) powered**
- **CCC for a 30°C Temperature Rise----------0.52A per contact with 120 contacts (6x20) powered**

Cable

- **CCC for a 30°C Temperature Rise----------1.33A per contact with 6 contacts (6x1) powered**
- **CCC for a 30°C Temperature Rise----------1.00A per contact with 12 contacts (6x2) powered**
- **CCC for a 30°C Temperature Rise----------0.85A per contact with 18 contacts (6x3) powered**
- **CCC for a 30°C Temperature Rise----------0.77A per contact with 24 contacts (6x4) powered**
- **CCC for a 30°C Temperature Rise----------0.52A per contact with 120 contacts (6x20) powered**

RESULTS Continued

Insulation Resistance minimums, IR

Pin to Pin

- **Initial**
  - **Mated ---------- 45000 Meg Ω ---------- Passed**
  - **Unmated ---------- 45000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated ---------- 45000 Meg Ω ---------- Passed**
  - **Unmated ---------- 45000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated ---------- 1510 Meg Ω ---------- Passed**
  - **Unmated ---------- 2090 Meg Ω ---------- Passed**

Row to Row

- **Initial**
  - **Mated ---------- 45000 Meg Ω ---------- Passed**
  - **Unmated ---------- 45000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated ---------- 45000 Meg Ω ---------- Passed**
  - **Unmated ---------- 45000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated ---------- 8000 Meg Ω ---------- Passed**
  - **Unmated ---------- 25200 Meg Ω ---------- Passed**

Pin to Ground

- **Initial**
  - **Mated ---------- 45000 Meg Ω ---------- Passed**
  - **Unmated ---------- 45000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated ---------- 45000 Meg Ω ---------- Passed**
  - **Unmated ---------- 45000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated ---------- 1400 Meg Ω ---------- Passed**
  - **Unmated ---------- 1160 Meg Ω ---------- Passed**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage ---------- 920 VAC**
  - **Test Voltage ---------- 690 VAC**
  - **Working Voltage ---------- 230 VAC**

Pin to Pin

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

Row to Row

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

Pin to Ground

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

RESULTS Continued

LLCR Shock & Vibration (56 signal pin and 136 ground pin LLCR test points)

Signal Pin

- **Initial ---------- 187.34 mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms ---------- 53 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 1 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 2 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

Ground Pin

- **Initial ---------- 19.98 mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms ---------- 129 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 5 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 2 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

Mechanical Shock & Random Vibration:

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

RESULTS Continued

Cable Pull

- **0 ° Pull force**
  - **Min----------27.50 Lbs**
  - **Max ----------31.00 Lbs**
- **90 ° Pull force**
  - **Min----------20.50 Lbs**
  - **Max ----------22.50 Lbs**

Cable Flex

IR

Pin to Pin

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

Row to Row

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

Pin to Ground

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

DWV

Pin to Pin

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

Row to Row

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

Pin to Ground

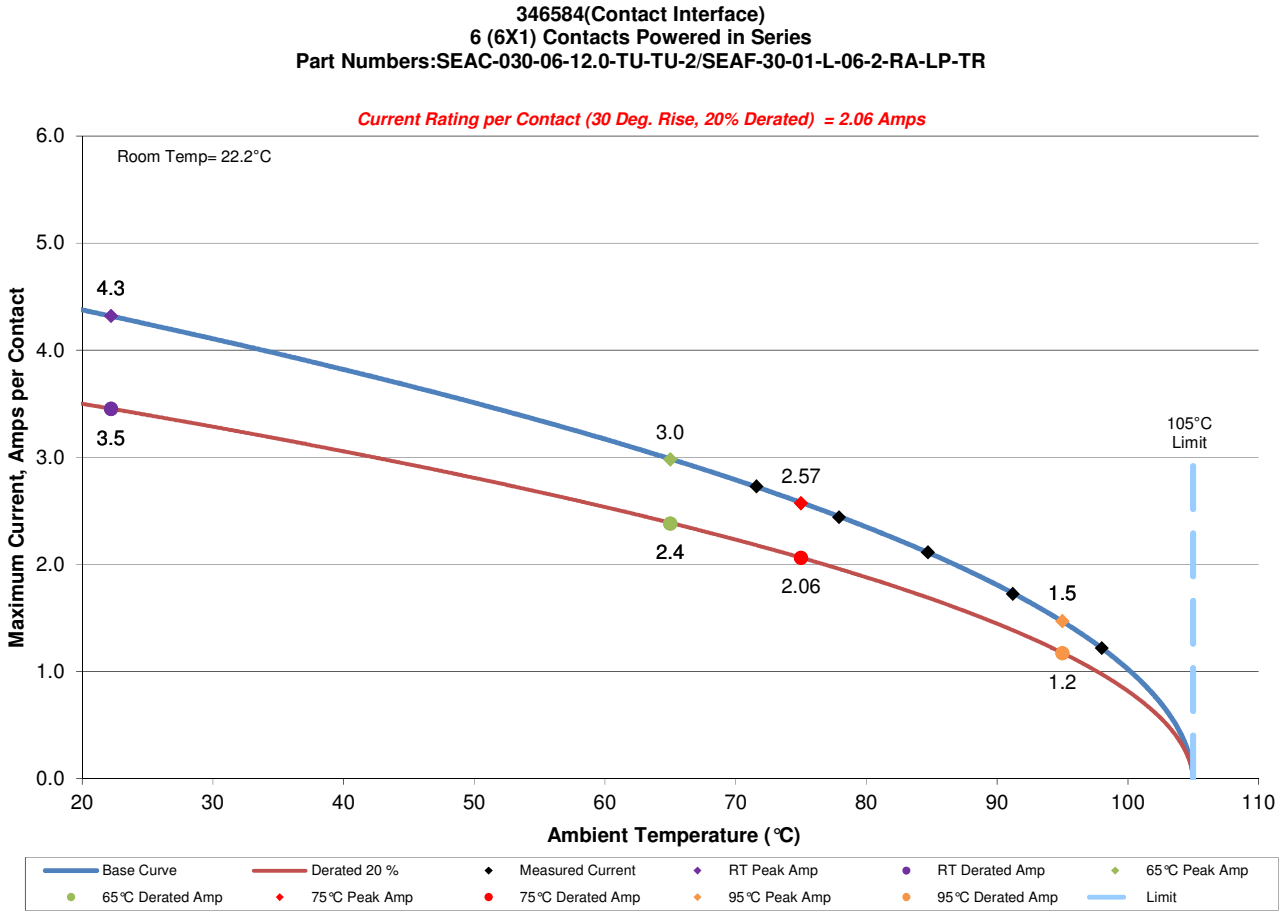
- **Initial DWV---------- ---------- Passed**
- **500 Flex cycles DWV ----------Passed**

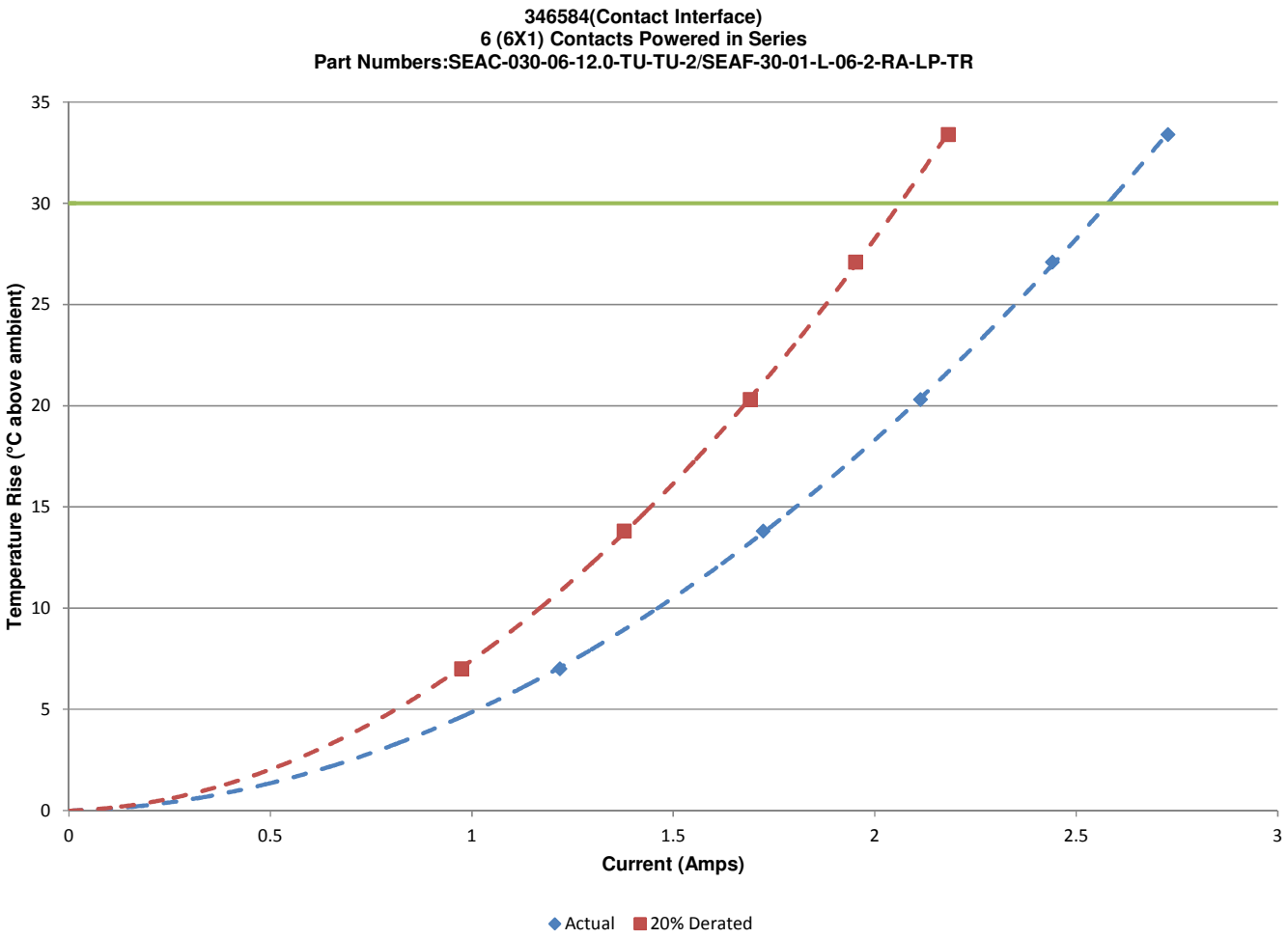
DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

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

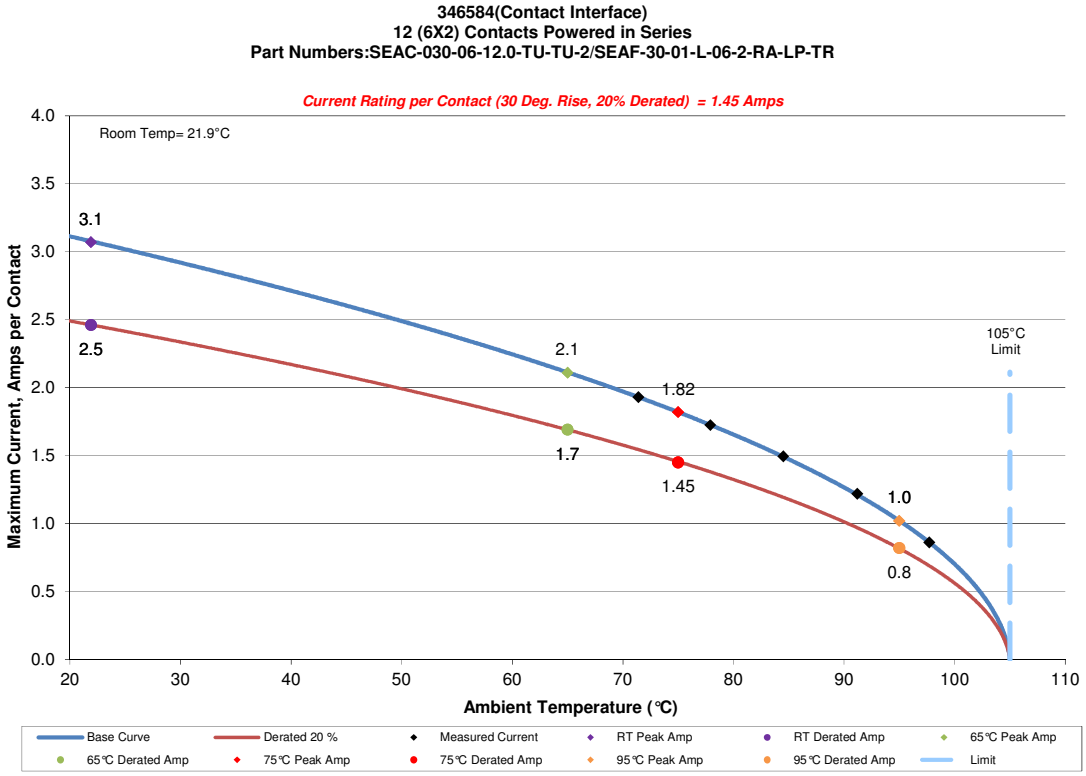
    a. Linear configuration with 6 adjacent conductors/contacts (contact interface) powered

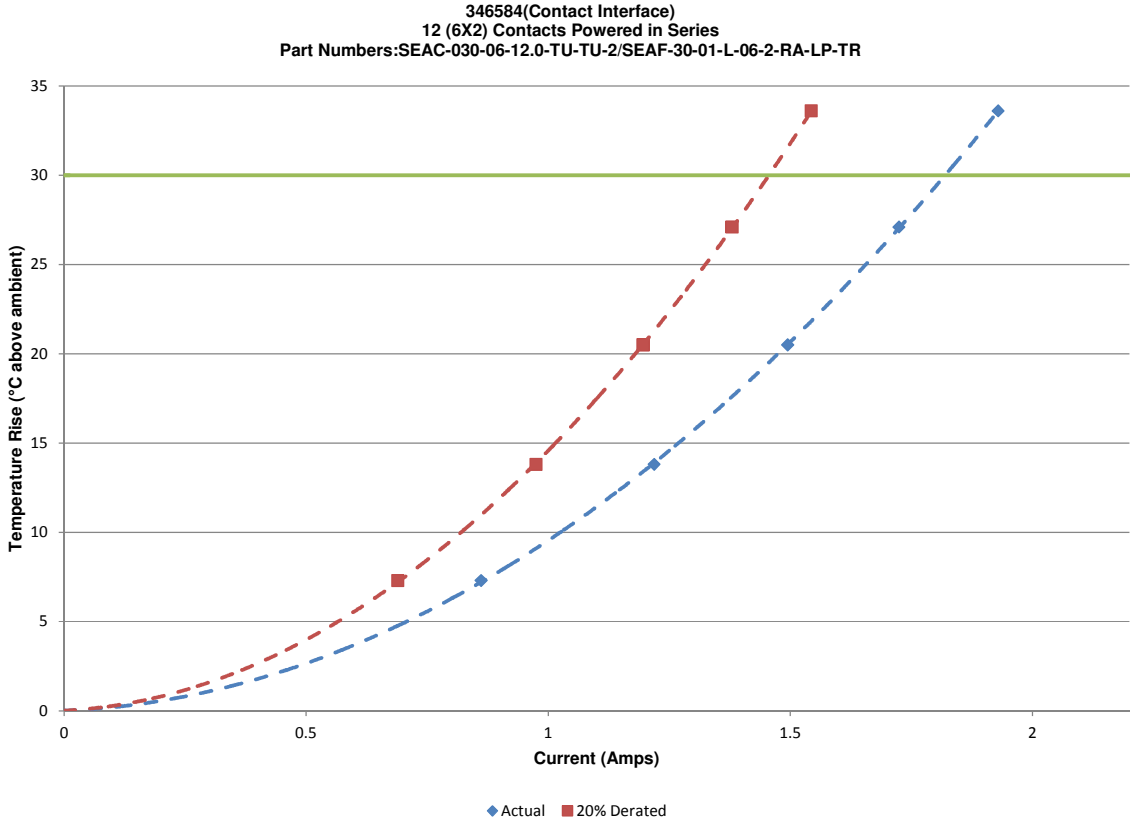



346584(Contact Interface)
6 (6X1) Contacts Powered in Series
Part Numbers:SEAC-030-06-12.0-TU-TU-2/SEAF-30-01-L-06-2-RA-LP-TR
Temperature Rise (°C above ambient)
0
5
10
15
20
25
30
35
0
0.5
1
1.5
2
2.5
3
Current (Amps)
Actual
20% Derated

DATA SUMMARIES Continued

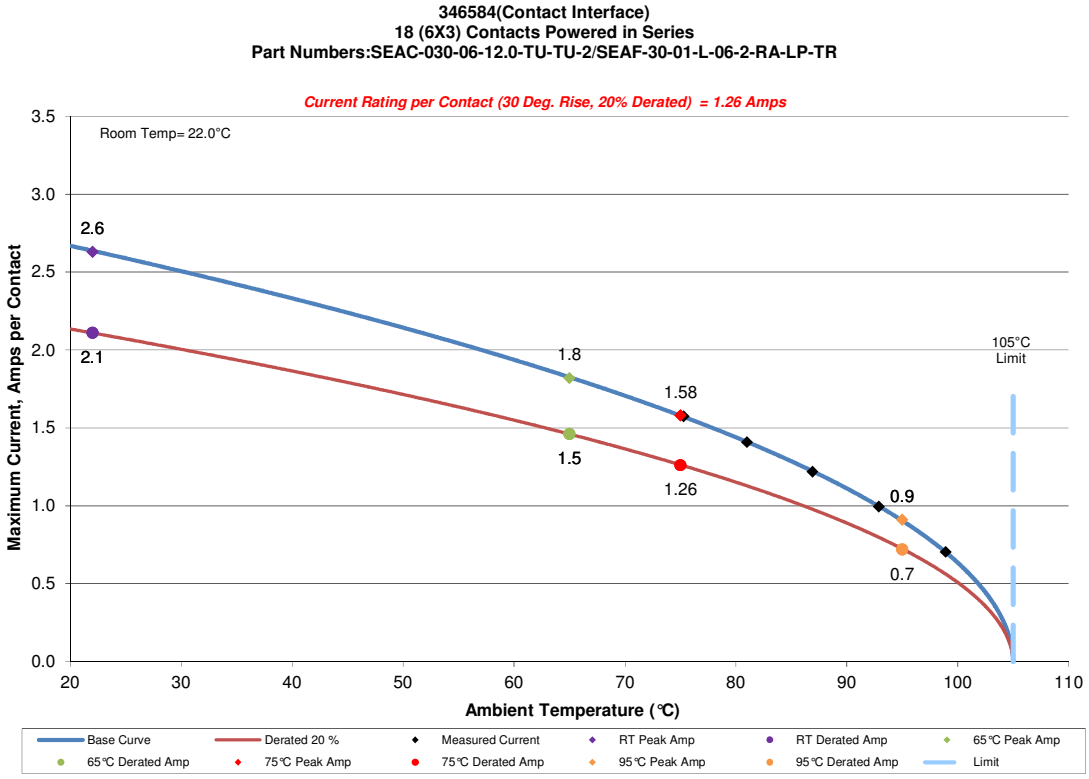
b. Linear configuration with 12 adjacent conductors/contacts (contact interface) powered

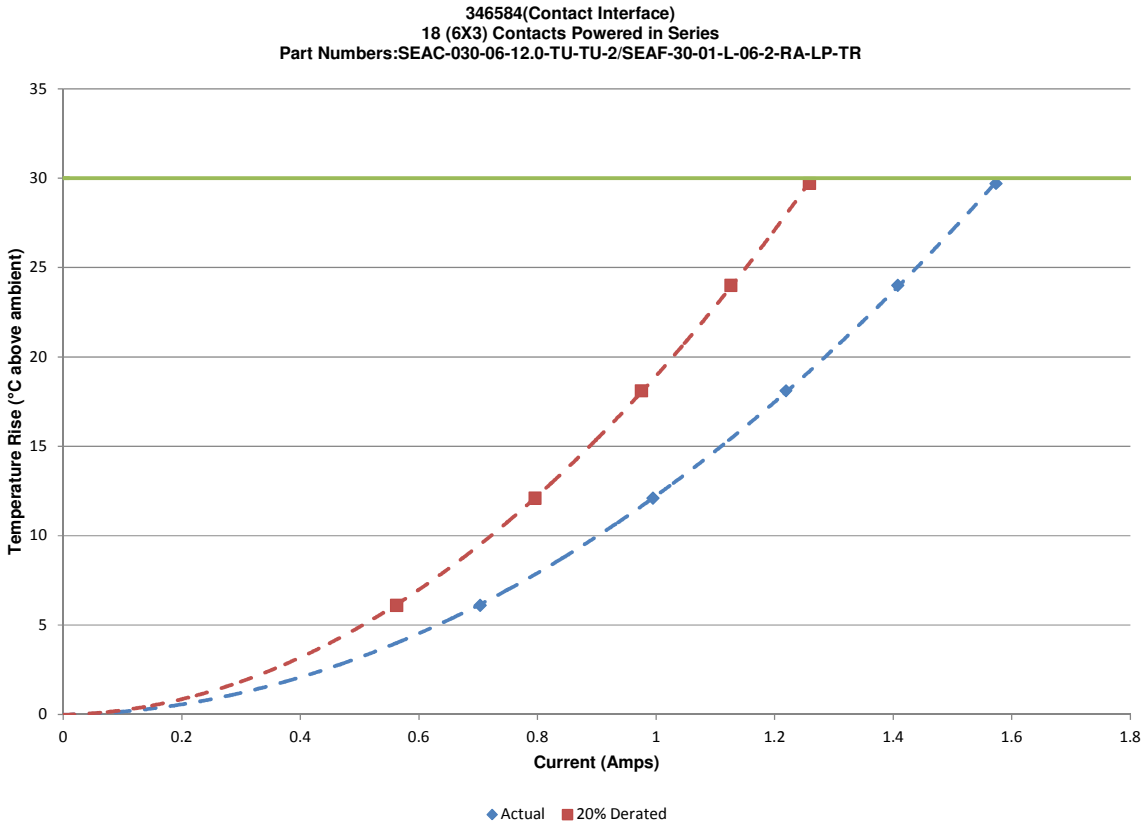




DATA SUMMARIES Continued

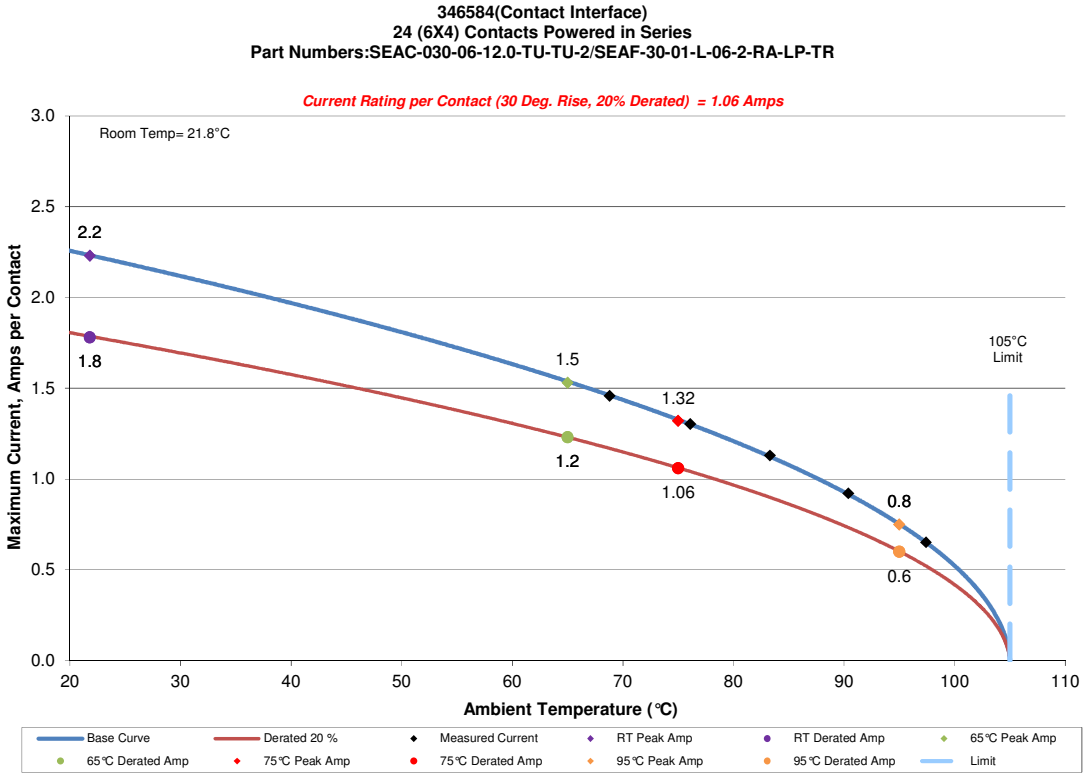
c. Linear configuration with 18 adjacent conductors/contacts (contact interface) powered

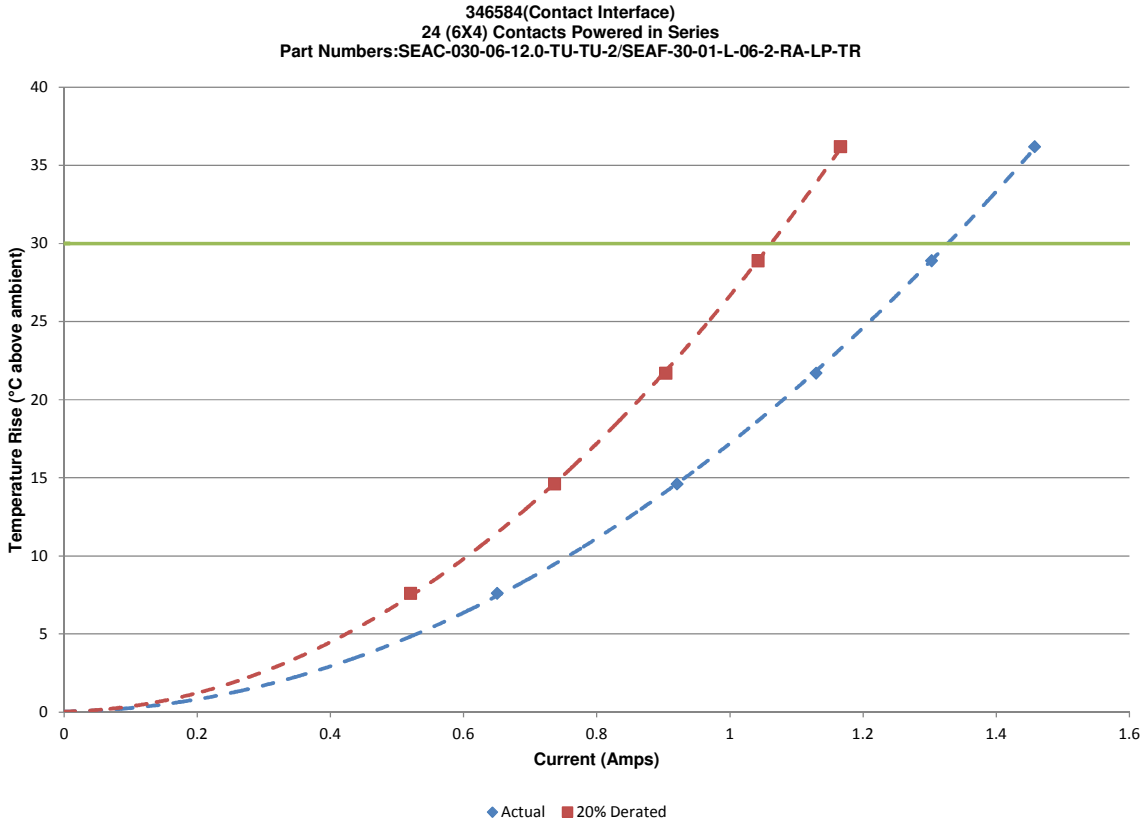




DATA SUMMARIES Continued

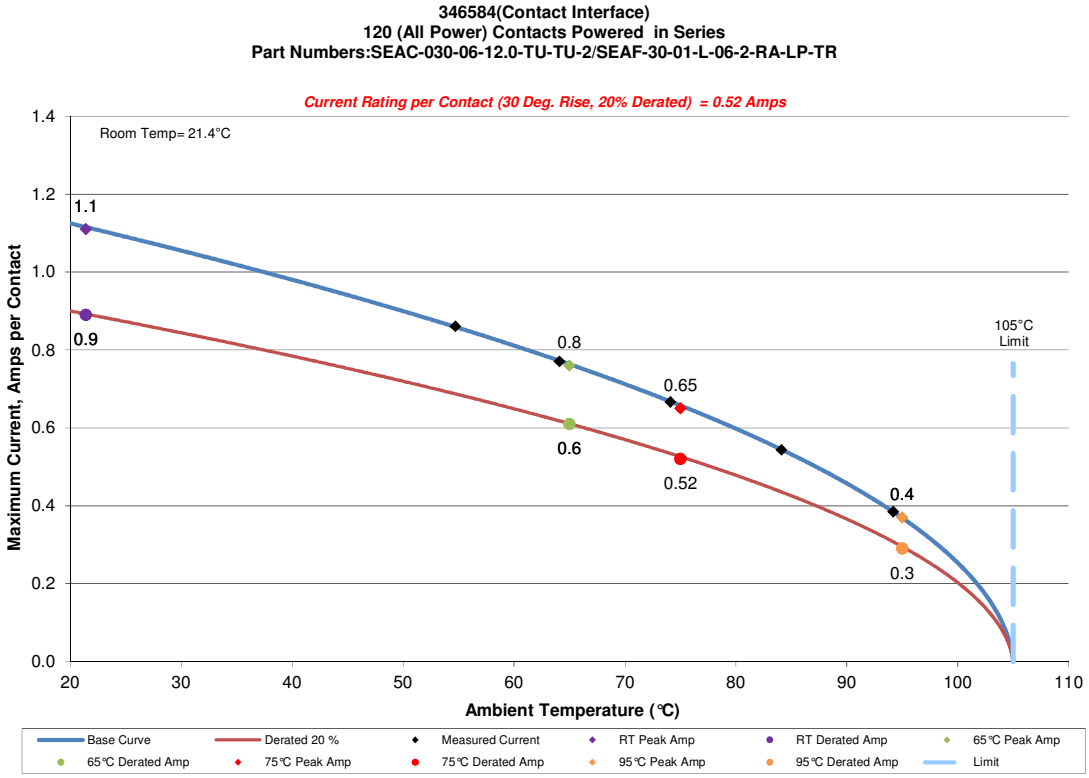
d. Linear configuration with 24 adjacent conductors/contacts (contact interface) powered

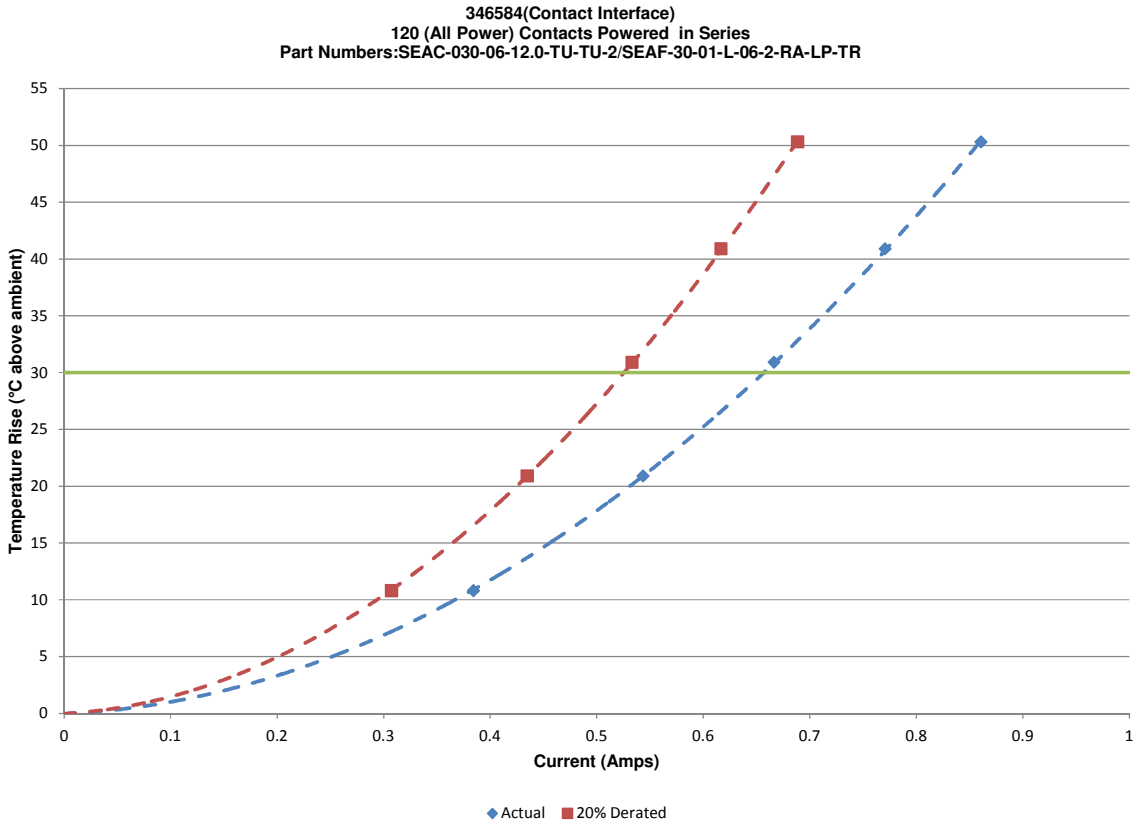




DATA SUMMARIES Continued

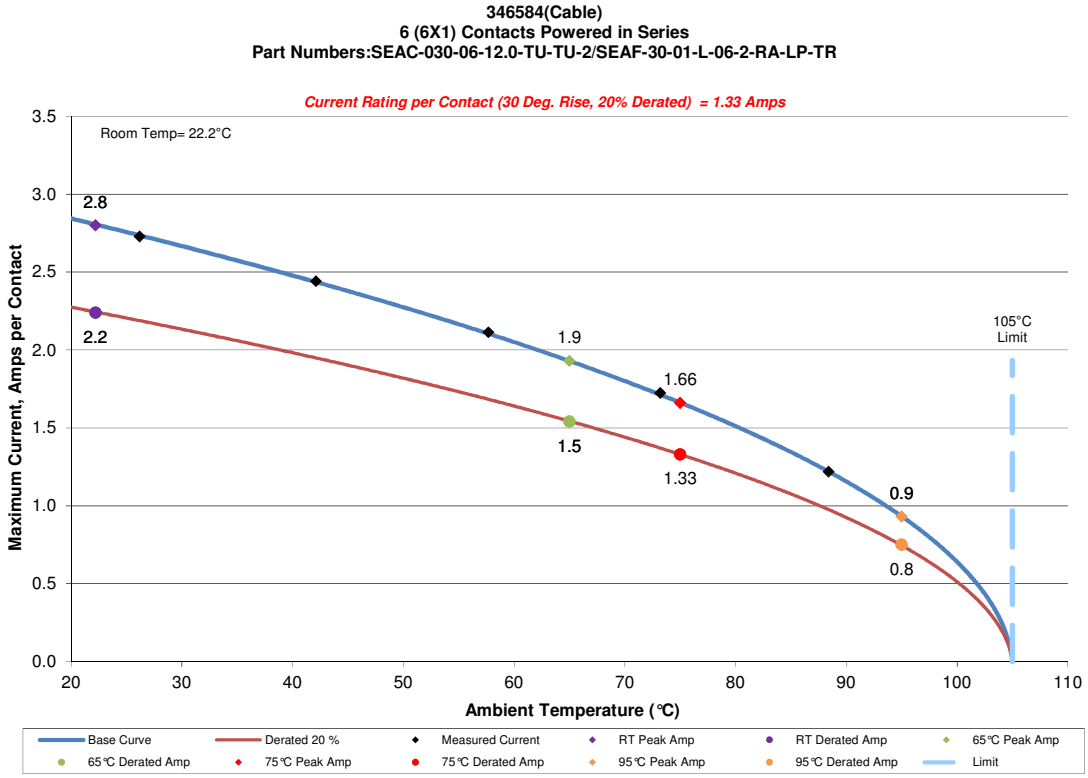
e. Linear configuration with all adjacent conductors/contacts (contact interface) powered

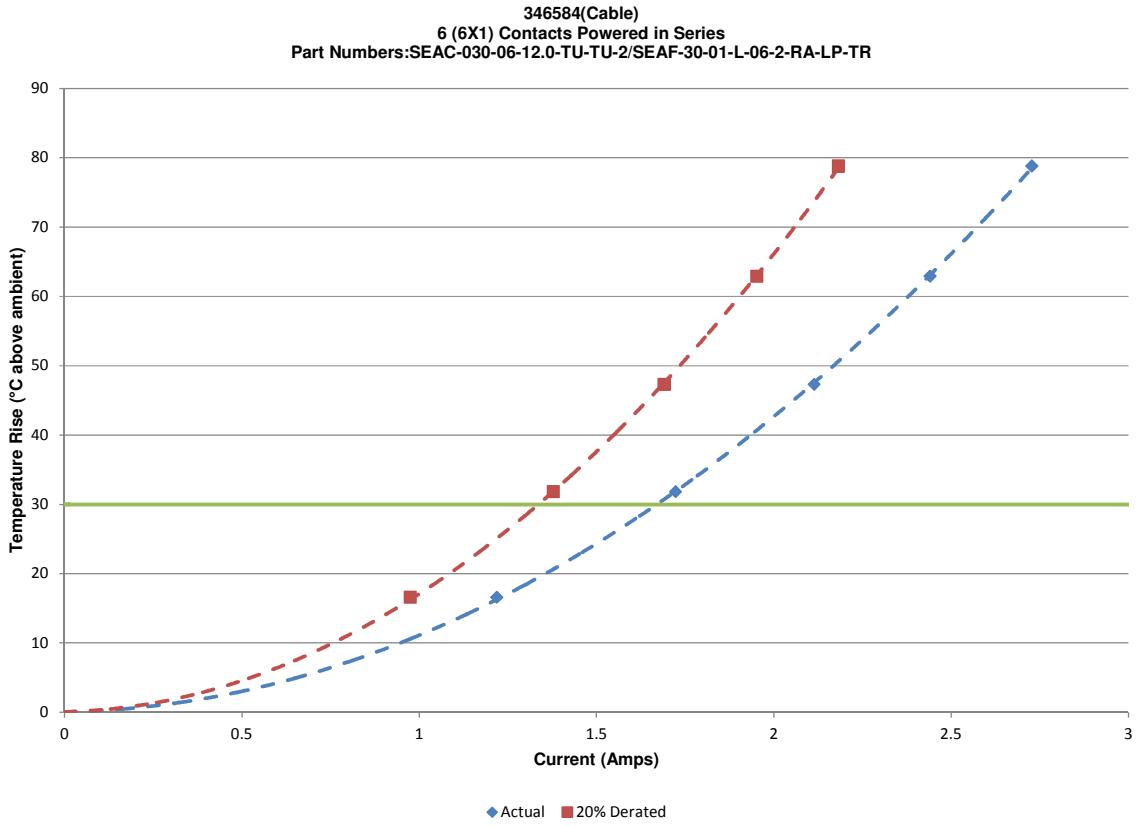




DATA SUMMARIES Continued

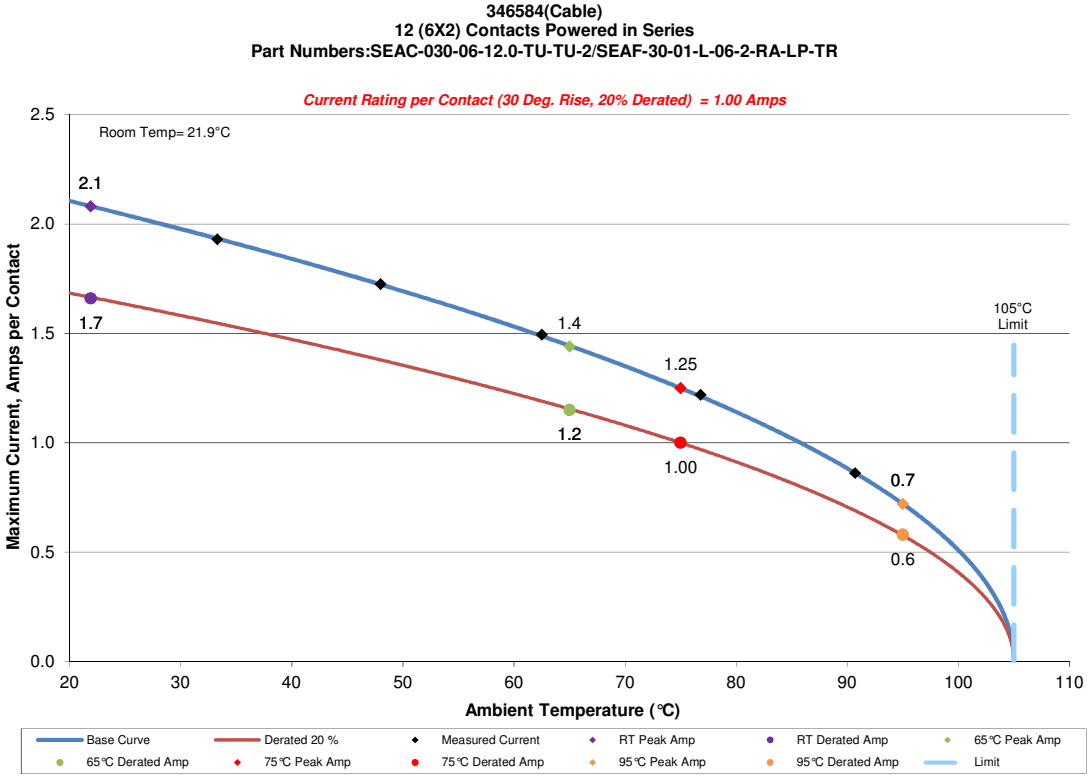
f. Linear configuration with 6 adjacent conductors/contacts (cable) powered

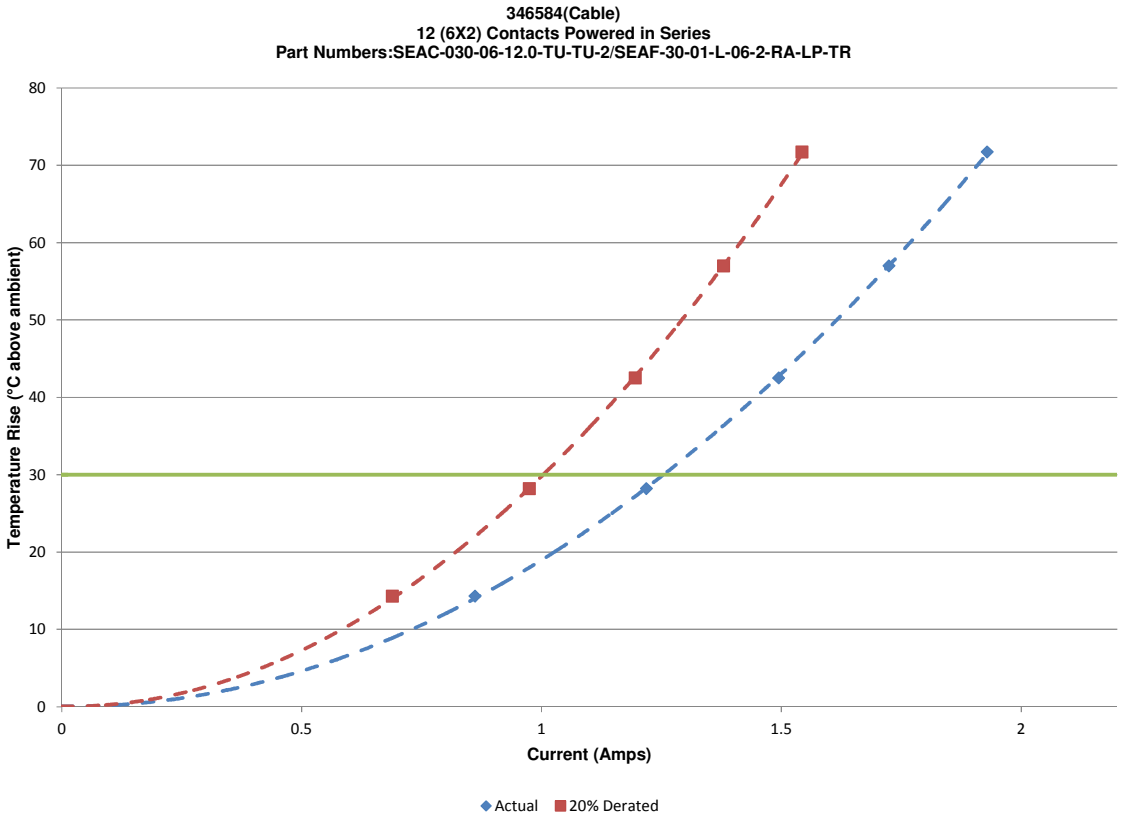




DATA SUMMARIES Continued

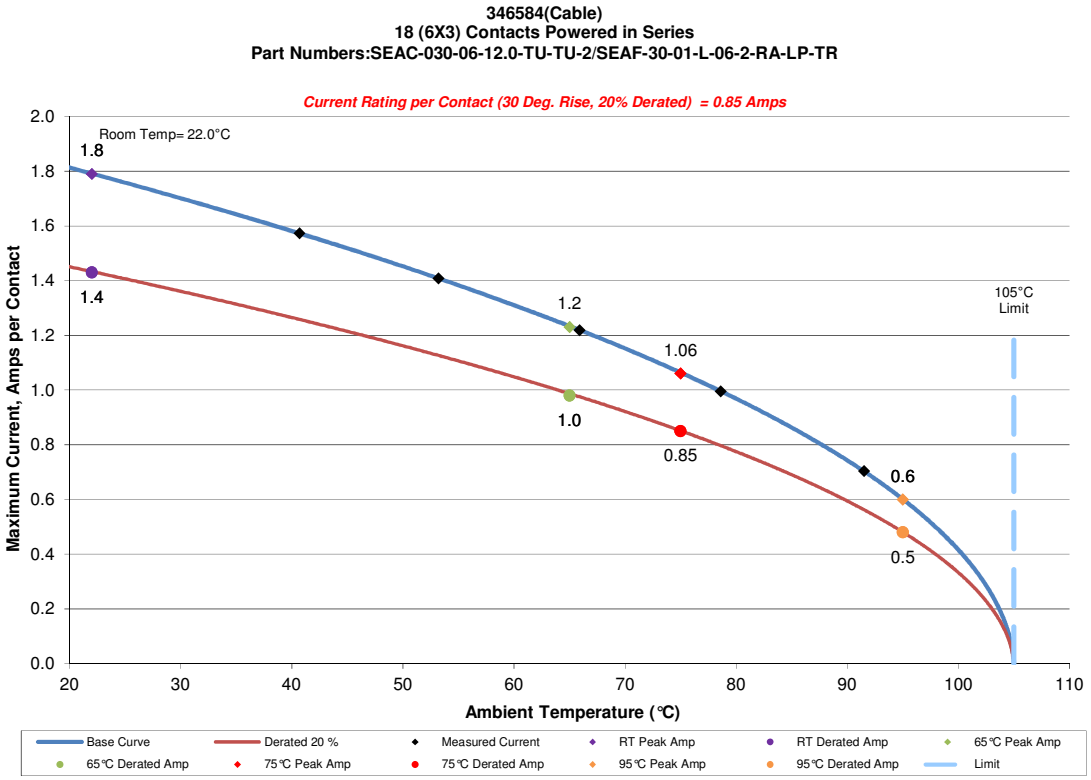
g. Linear configuration with 12 adjacent conductors/contacts (cable) powered

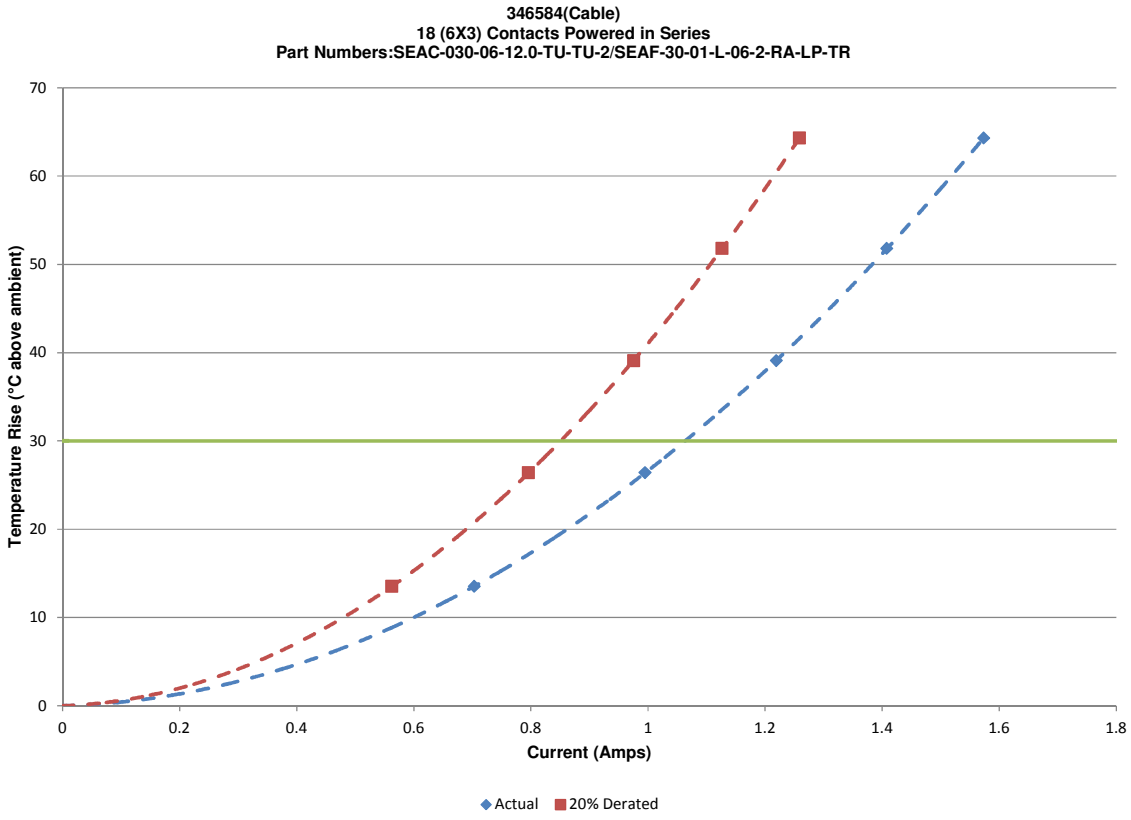




DATA SUMMARIES Continued

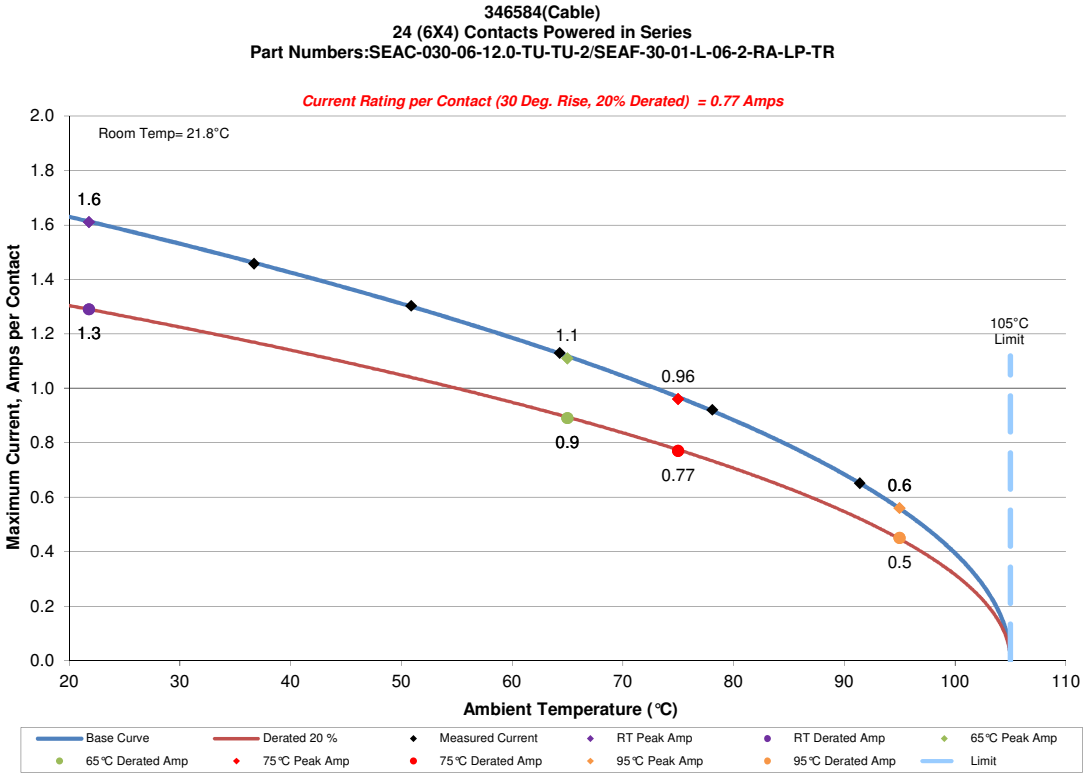
h. Linear configuration with 18 adjacent conductors/contacts (cable) powered

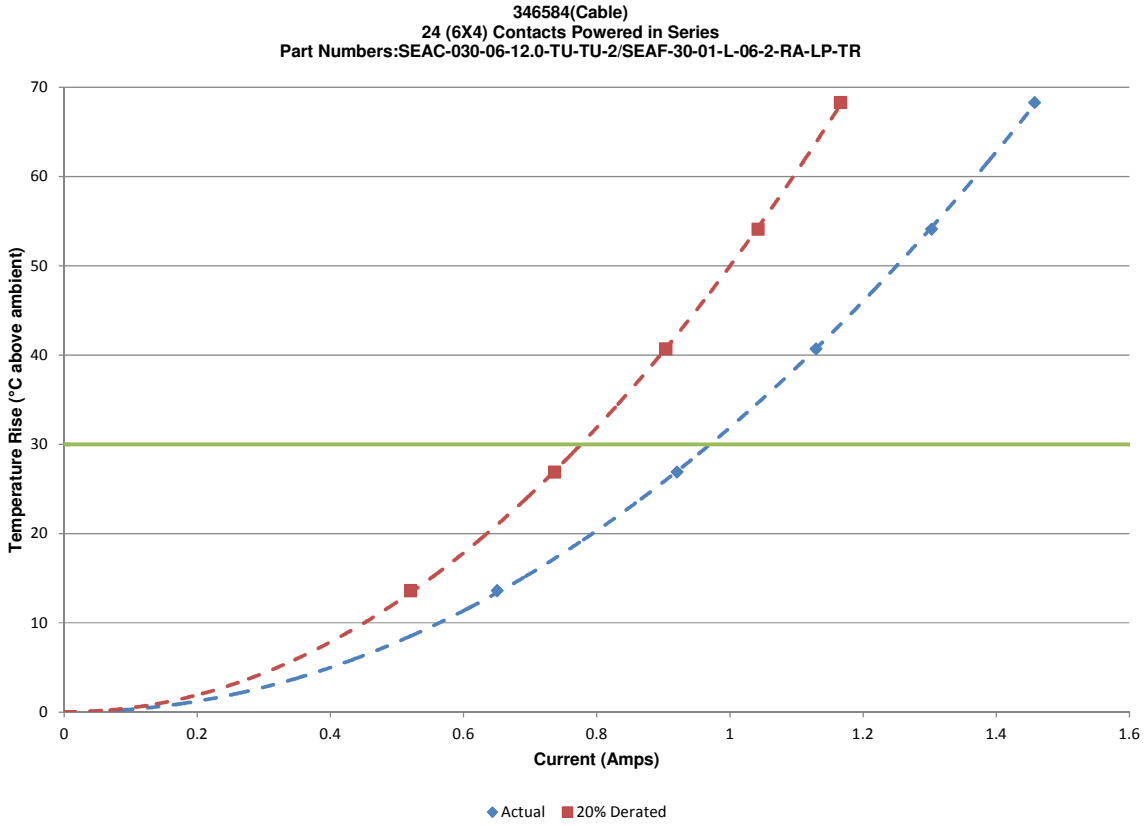




DATA SUMMARIES Continued

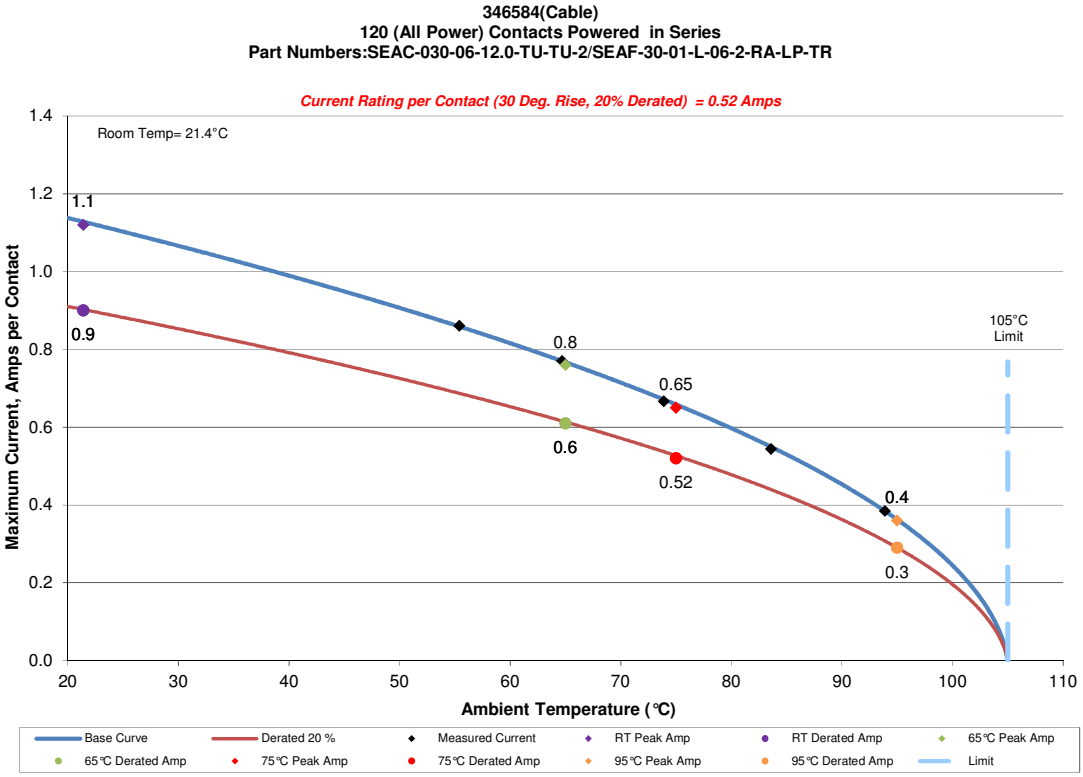
i. Linear configuration with 24 adjacent conductors/contacts (cable) powered

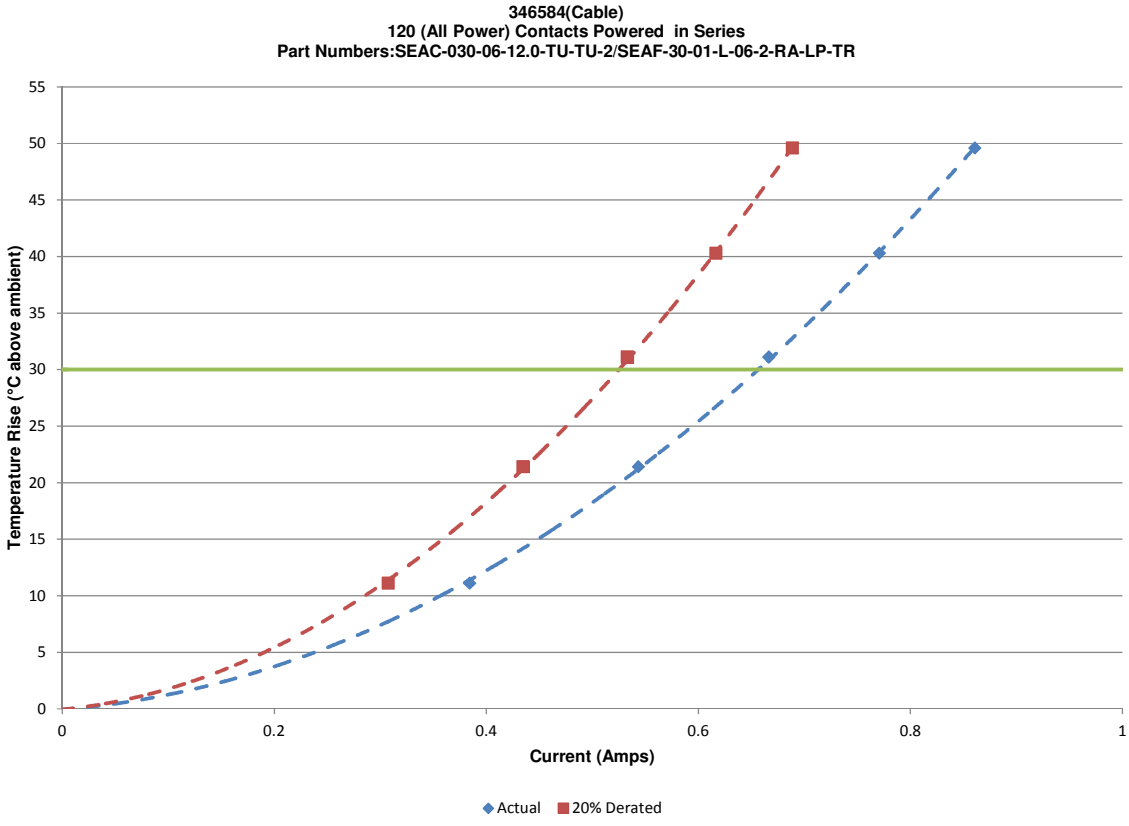




DATA SUMMARIES Continued

j. Linear configuration with all adjacent conductors/contacts (cable) powered





DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**SEAC/SEAF**	**SEAC**	**SEAF**
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	1510	2090	45000

	Row to Row		
	Mated	Unmated	Unmated
Minimum	**SEAC/SEAF**	**SEAC**	**SEAF**
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	8000	45000	25200

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	**SEAC/SEAF**	**SEAC**	**SEAF**
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	1400	4400	1160

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**SEAC/SEAF**
Break Down Voltage	920
Test Voltage	690
Working Voltage	230

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

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

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

DATA SUMMARIES Continued

LLCR Shock &Vibration:

1). A total of 56 signal pin and 136 ground pin points were measured.
2). EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3). The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms: ---------- Stable
   b. +5.1 to +10.0 mOhms: ---------- Minor
   c. +10.1 to +15.0 mOhms: ---------- Acceptable
   d. +15.1 to +50.0 mOhms: ---------- Marginal
   e. +50.1 to +2000 mOhms ---------- Unstable
   f. >+2000 mOhms: ---------- Open Failure

LLCR Measurement Summaries by Pin Type				
Date	1/14/2015	1/19/2015		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	34	34		
Technician	Aaron McKim	Aaron McKim		
mOhm values	**Actual Initial**	**Delta Shock-Vib**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	172.57	1.53		
St. Dev.	7.90	2.33		
Min	163.03	0.04		
Max	187.34	12.45		
Summary Count	56	56		
Total Count	56	56		
	Pin Type 2: Ground			
Average	15.83	1.14		
St. Dev.	1.67	1.93		
Min	12.92	0.01		
Max	19.98	12.44		
Summary Count	136	136		
Total Count	136	136		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Shock-Vib	**182**	**6**	**4**	**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

DATA SUMMARIES Continued

Cable Pull

0 ° Pull force

	Force (lbs)
Minimum	**27.50**
Maximum	31.00
Average	29.10

90 ° Pull force

	Force (lbs)
Minimum	**20.50**
Maximum	22.50
Average	21.25

DATA SUMMARIES Continued

Cable Flex

IR

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

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

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

DWV

Voltage Rating Summary	
Minimum	
Break Down Voltage	920
Test Voltage	690
Working Voltage	230

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

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

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

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: TCT-04
Description: Dillon Quantrol TC21 25-1000 mm/min series test stand
Manufacturer: Dillon Quantrol
Model: TC2 I series test stand
Serial #: 04-1041-04
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Speed Accuracy: +/- 5% of indicated speed;
… Last Cal: 05/29/2014, Next Cal: 05/29/2015

Equipment #: MO-11
Description: Switch/Multimeter
Manufacturer: Keithley
Model: 3706
Serial #: 120169
Accuracy: See Manual
… Last Cal: 09/11/2014, Next Cal: 09/11/2015

Equipment #: THC-05
Description: Temperature/Humidity Chamber (Chamber Room)
Manufacturer: Thermotron
Model: SM-8-3800
Serial #: 05 23 00 02
Accuracy: See Manual
… Last Cal: 11/14/2014, Next Cal: 05/31/2015

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: 06/30/2014, Next Cal: 06/30/2015

Equipment #: HPT-01
Description: Hipot Safety Tester
Manufacturer: Vitrek
Model: V73
Serial #: 019808
Accuracy:
… Last Cal: 05/15/2014, Next Cal: 05/15/2015

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: SVC-01
Description: Shock & Vibration Table
Manufacturer: Data Physics
Model: LE-DSA-10-20K
Serial #: 10037
Accuracy: See Manual
… Last Cal: 04/22/2014, Next Cal: 04/22/2015

Equipment #: ACLM-01
Description: Accelerometer
Manufacturer: PCB Piezotronics
Model: 352C03
Serial #: 115819
Accuracy: See Manual
… Last Cal: 07/18/2014, Next Cal: 07/18/2015

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 10/31/2014, Next Cal: 10/31/2015

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 09/11/2014, Next Cal: 09/11/2015

Equipment #: PS-02
Description: Power Supply
Manufacturer: Hewlett-Packer
Model: 6033A
Serial #: N/A
Accuracy: See Manual
… Last Cal: NOT CALIBRATED