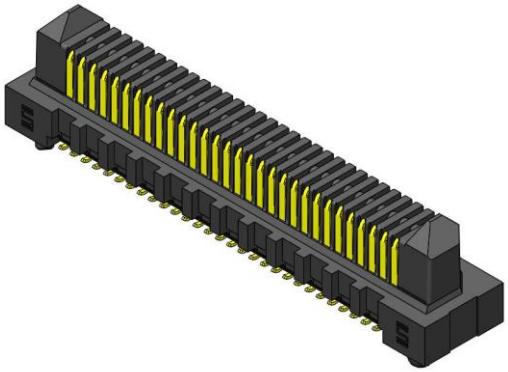
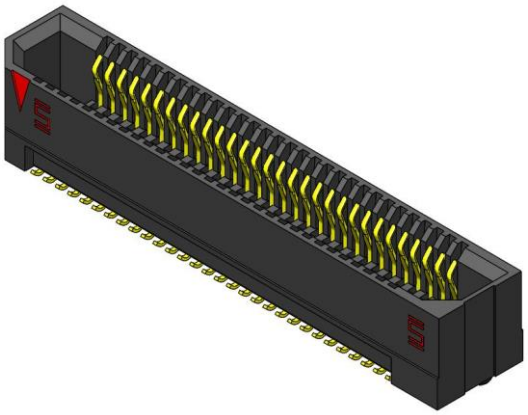
Project Number: Design Qualification Test Report	Tracking Code: 2146122_Report_Rev_2
Requested by: Roy Luo	Date: 5/11/2020
Part #: ERM8-030-03.0-L-DV /ERF8-030-05.0-L-DV-TR	Tech: Peter Chen
Part description: ERM8/ERF8	Qty to test: 80
Test Start: 07/02/2019	Test Completed: 08/20/2019





DESIGN QUALIFICATION TEST REPORT

ERM8/ERF8
ERM8-030-03.0-L-DV /ERF8-030-05.0-L-DV-TR

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
01/09/2020	**1**	**Initial Issue**	**PC**
05/09/2020	**2**	**Update the mating unmating force**	**PC**

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 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-109708-TST. PCB-109709-TST.

FLOWCHARTS

Gas Tight

Group 1
ERM8-030-03.0-L-DV
ERF8-030-05.0-L-DV-TR
8 Assemblies

Step	Description
1.	LLCR (2)
2.	Gas Tight (1)
3.	LLCR (2) Max Delta = 15 mOhm

(1) Gas Tight = EIA-364-36

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

Thermal Aging

Group 1
ERM8-030-03.0-L-DV
ERF8-030-05.0-L-DV-TR
8 Assemblies

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

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

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

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

FLOWCHARTS Continued

Mating/Unmating/Durability

Standard

Group 1
ERM8-030-03.0-L-DV
ERF8-030-05.0-L-DV-TR
8 Assemblies
Middle Position

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 2
ERM8-005-03.0-L-DV
ERF8-005-05.0-L-DV-TR
8 Assemblies
Smallest Position

Step	Description
1.	Mating/Unmating Force (3)
2.	Cycles Quantity ▪ 25 Cycles
3.	Mating/Unmating Force (3)

Group 5
ERM8-075-03.0-L-DV
ERF8-075-05.0-L-DV
8 Assemblies
Largest Position

Step	Description
1.	Mating/Unmating Force (3)
2.	Cycles Quantity ▪ 25 Cycles
3.	Mating/Unmating Force (3)

With Latches

Group 3
ERM8-030-03.0-L-DV-L
ERF8-030-05.0-L-DV-L
8 Assemblies
Middle Position

Step	Description
1.	Mating/Unmating Force (3)
2.	Cycles Quantity ▪ 25 Cycles
3.	Mating/Unmating Force (3)

Group 4
ERM8-075-03.0-L-DV-L
ERF8-075-05.0-L-DV-L
8 Assemblies
Largest Position

Step	Description
1.	Mating/Unmating Force (3)
2.	Cycles Quantity ▪ 25 Cycles
3.	Mating/Unmating Force (3)

Group 6
ERM8-005-03.0-L-DV-L
ERF8-005-05.0-L-DV-L-TR
8 Assemblies
Smallest Position

Step	Description
1.	Mating/Unmating Force (3)
2.	Cycles Quantity ▪ 25 Cycles
3.	Mating/Unmating Force (3)

FLOWCHARTS Continued

With Shield

Group 7	Group 8
ERM8-010-03.0-L-DV-S	ERM8-030-03.0-L-DV-S
ERF8-010-05.0-L-DV-S	ERF8-030-05.0-L-DV-S
8 Assemblies	8 Assemblies
Smallest Position	Middle Position (Largest Shield Available)

Step	Description	Step	Description
1.	Mating/Unmating Force (3)	1.	Mating/Unmating Force (3)
2.	Cycles Quantity ▪ 25 Cycles	2.	Cycles Quantity ▪ 25 Cycles
3.	Mating/Unmating Force (3)	3.	Mating/Unmating Force (3)

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

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

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

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

FLOWCHARTS Continued

IR/DWV

Pin-to-Pin

Group 1 ERM8-030-03.0-L-DV ERF8-030-05.0-L-DV-TR 2 Assemblies		Group 2 ERM8-030-03.0-L-DV 2 Assemblies		Group 3 ERF8-030-05.0-L-DV 2 Assemblies		Group 4 ERM8-030-03.0-L-DV ERF8-030-05.0-L-DV-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 ERM8-030-03.0-L-DV ERF8-030-05.0-L-DV-TR 2 Assemblies		Group 6 ERM8-030-03.0-L-DV 2 Assemblies		Group 7 ERF8-030-05.0-L-DV 2 Assemblies		Group 8 ERM8-030-03.0-L-DV ERF8-030-05.0-L-DV-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)

Pin-to-Shield

Group 9 ERM8-030-03.0-L-DV-S ERF8-030-05.0-L-DV-S 2 Assemblies		Group 10 ERM8-030-03.0-L-DV-S 2 Assemblies		Group 11 ERF8-030-05.0-L-DV-S 2 Assemblies		Group 12 ERM8-030-03.0-L-DV-S ERF8-030-05.0-L-DV-S 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) 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

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

(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

Group 1
ERM8-075-03.0-L-DV
ERF8-075-05.0-L-DV
2 Pins Powered
Signal

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

Group 2
ERM8-075-03.0-L-DV
ERF8-075-05.0-L-DV
4 Pins Powered
Signal

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

Group 3
ERM8-075-03.0-L-DV
ERF8-075-05.0-L-DV
6 Pins Powered
Signal

Step	Description
1.	CCC (1) Rows = 2 Number of Positions = 3

Group 4
ERM8-075-03.0-L-DV
ERF8-075-05.0-L-DV
8 Pins Powered
Signal

Step	Description
1.	CCC (1) Rows = 2 Number of Positions = 4

Group 5
ERM8-075-03.0-L-DV
ERF8-075-05.0-L-DV
80 Pins Powered
Signal

Step	Description
1.	CCC (1) Rows = 2 Number of Positions = 40

(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

Mechanical Shock/Random Vibration/LLCR

Group 1
ERM8-030-03.0-L-DV
ERF8-030-05.0-L-DV-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)

FLOWCHARTS Continued

Mechanical Shock/Random Vibration/Event Detection

Group 1
ERM8-030-03.0-L-DV
ERF8-030-05.0-L-DV-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)

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

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

THERMAL:

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

HUMIDITY:

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

MECHANICAL SHOCK (Specified Pulse):

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

VIBRATION:

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

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.

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^o C
    c. 95^o C
    d. 115^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 +1000 mOhms: ---------- Unstable
    f. >+1000 mOhms:---------- Open Failure

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes.

GAS TIGHT:

To provide method for evaluating the ability of the contacting surfaces in preventing penetration of harsh vapors which might lead to oxide formation that may degrade the electrical performance of the contact system.

1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
    a. <= +5.0 mOhms:---------- Stable
    b. +5.1 to +10.0 mOhms:---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +1000 mOhms: ---------- Unstable
    f. >+1000 mOhms:---------- Open Failure
4) Procedure:
    a. Reference document: EIA-364-36, *Test Procedure for Determination of Gas-Tight Characteristics for Electrical Connectors, Sockets and/or Contact Systems*.
    b. Test Conditions:
        i. Class II--- Mated pairs of contacts assembled to their plastic housings.
        ii. Reagent grade Nitric Acid shall be used of sufficient volume to saturate the test chamber
        iii. The ratio of the volume of the test chamber to the surface area of the acid shall be 10:1.
        iv. The chamber shall be saturated with the vapor for at least 15 minutes before samples are added.
        v. Exposure time, 55 to 65 minutes.
        vi. The samples shall be no closer to the chamber walls than 1 inches and no closer to the surface of the acid than 3 inches.
        vii. The samples shall be dried after exposure for a minimum of 1 hour.
        viii. Drying temperature 50^{o} C
        ix. The final LLCR shall be conducted within 1 hour after drying.

INSULATION RESISTANCE (IR):

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

1) PROCEDURE:
    a. Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
    b. Test Conditions:
        i. Between Adjacent Contacts or Signal-to-Ground
        ii. Electrification Time 2.0 minutes
        iii. Test Voltage (500 VDC) corresponds to calibration settings for measuring resistances.
2) MEASUREMENTS:
3) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 5000 megohms.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

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

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

RESULTS

Temperature Rise, CCC at a 20% de-rating

- **CCC for a 30°C Temperature Rise----------2.7 A per contact with 2 contacts (2x1) powered**
- **CCC for a 30°C Temperature Rise----------2.1 A per contact with 4 contacts (2x2) powered**
- **CCC for a 30°C Temperature Rise----------1.6 A per contact with 6 contacts (2x3) powered**
- **CCC for a 30°C Temperature Rise----------1.5 A per contact with 8 contacts (2x4) powered**
- **CCC for a 30°C Temperature Rise----------0.6 A per contact with 150 contacts (2x75) powered**

Mating – Unmating Forces

Standard

Thermal Aging Group (ERM8-030-03.0-L-DV /ERF8-030-05.0-L-DV-TR)

- **Initial**
  - **Mating**
    - **Min ---------- 3.58 Lbs**
    - **Max---------- 4.10 Lbs**
  - **Unmating**
    - **Min ---------- 1.54 Lbs**
    - **Max---------- 2.01 Lbs**
- **After Thermal**
  - **Mating**
    - **Min ---------- 2.28 Lbs**
    - **Max---------- 2.84 Lbs**
  - **Unmating**
    - **Min ---------- 1.12 Lbs**
    - **Max---------- 1.44 Lbs**

Mating-Unmating Durability Group (ERM8-030-03.0-L-DV /ERF8-030-05.0-L-DV-TR)

- **Initial**
  - **Mating**
    - **Min ---------- 3.48 Lbs**
    - **Max---------- 4.01 Lbs**
  - **Unmating**
    - **Min ---------- 1.50 Lbs**
    - **Max---------- 2.01 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 3.48 Lbs**
    - **Max---------- 4.10 Lbs**
  - **Unmating**
    - **Min ---------- 1.77 Lbs**
    - **Max---------- 2.40 Lbs**
- **Humidity**
  - **Mating**
    - **Min ---------- 2.42 Lbs**
    - **Max---------- 3.02 Lbs**
  - **Unmating**
    - **Min ---------- 1.45 Lbs**
    - **Max---------- 1.71 Lbs**

RESULTS Continued

Mating-Unmating Basic (ERM8-075-03.0-L-DV /ERF8-075-05.0-L-DV-TR)

- **Initial**
  - **Mating**
    - **Min ---------- 7.18 Lbs**
    - **Max----------10.68 Lbs**
  - **Unmating**
    - **Min ---------- 3.96 Lbs**
    - **Max---------- 4.90 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 6.80 Lbs**
    - **Max----------10.18 Lbs**
  - **Unmating**
    - **Min ---------- 4.01 Lbs**
    - **Max---------- 5.80 Lbs**

Mating-Unmating Basic (ERM8-005-03.0-L-DV /ERF8-005-05.0-L-DV-TR)

- **Initial**
  - **Mating**
    - **Min ---------- 0.57 Lbs**
    - **Max---------- 0.75 Lbs**
  - **Unmating**
    - **Min ---------- 0.26 Lbs**
    - **Max---------- 0.41 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 0.54 Lbs**
    - **Max---------- 0.72 Lbs**
  - **Unmating**
    - **Min ---------- 0.30 Lbs**
    - **Max---------- 0.45 Lbs**

RESULTS Continued

With Latches

Mating-Unmating Basic (ERM8-075-03.0-L-DV-L / ERF8-075-05.0-L-DV-L)

- **Initial**
  - **Mating**
    - **Min ----------10.27 Lbs**
    - **Max----------12.02 Lbs**
  - **Unmating**
    - **Min ---------- 6.43 Lbs**
    - **Max---------- 9.08 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ----------10.98 Lbs**
    - **Max----------11.89 Lbs**
  - **Unmating**
    - **Min ---------- 6.65 Lbs**
    - **Max---------- 9.76 Lbs**

Mating-Unmating Basic (ERM8-030-03.0-L-DV-L / ERF8-030-05.0-L-DV-L)

- **Initial**
  - **Mating**
    - **Min ---------- 4.19 Lbs**
    - **Max---------- 5.32 Lbs**
  - **Unmating**
    - **Min ---------- 5.05 Lbs**
    - **Max---------- 6.40 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 4.11 Lbs**
    - **Max---------- 5.31 Lbs**
  - **Unmating**
    - **Min ---------- 4.94 Lbs**
    - **Max---------- 6.66 Lbs**

Mating-Unmating Basic (ERM8-005-03.0-L-DV-L / ERF8-005-05.0-L-DV-L)

- **Initial**
  - **Mating**
    - **Min ---------- 2.73 Lbs**
    - **Max---------- 2.95 Lbs**
  - **Unmating**
    - **Min ---------- 3.68 Lbs**
    - **Max---------- 4.30 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 2.67 Lbs**
    - **Max---------- 3.22 Lbs**
  - **Unmating**
    - **Min ---------- 3.61 Lbs**
    - **Max---------- 4.93 Lbs**

RESULTS Continued

With Shield

Mating-Unmating Basic (ERM8-030-03.0-L-DV-S / ERF8-030-05.0-L-DV-S)

- **Initial**
  - **Mating**
    - **Min ---------- 4.85 Lbs**
    - **Max---------- 6.03 Lbs**
  - **Unmating**
    - **Min ---------- 2.01 Lbs**
    - **Max---------- 3.04 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 4.94 Lbs**
    - **Max---------- 6.90 Lbs**
  - **Unmating**
    - **Min ---------- 3.05 Lbs**
    - **Max---------- 3.95 Lbs**

Mating-Unmating Basic (ERM8-010-03.0-L-DV-S / ERF8-010-05.0-L-DV-S)

- **Initial**
  - **Mating**
    - **Min ---------- 1.85 Lbs**
    - **Max---------- 2.78 Lbs**
  - **Unmating**
    - **Min ---------- 1.05 Lbs**
    - **Max---------- 1.43 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 2.35 Lbs**
    - **Max---------- 3.25 Lbs**
  - **Unmating**
    - **Min ---------- 1.49 Lbs**
    - **Max---------- 2.22 Lbs**

RESULTS Continued

Insulation Resistance minimums, IR

Pin to Pin

- **Initial**
  - **Mated ---------- 450000 Meg Ω ---------- Passed**
  - **Unmated ---------- 450000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated ---------- 450000 Meg Ω ---------- Passed**
  - **Unmated ---------- 450000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated ---------- 450000 Meg Ω ---------- Passed**
  - **Unmated ---------- 450000 Meg Ω ---------- Passed**

Row to Row

- **Initial**
  - **Mated ---------- 450000 Meg Ω ---------- Passed**
  - **Unmated ---------- 450000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated ---------- 450000 Meg Ω ---------- Passed**
  - **Unmated ---------- 450000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated ---------- 450000 Meg Ω ---------- Passed**
  - **Unmated ---------- 450000 Meg Ω ---------- Passed**

Pin-to-Shield

- **Initial**
  - **Mated ---------- 450000 Meg Ω ---------- Passed**
  - **Unmated ---------- 450000 Meg Ω ---------- Passed**
- **Thermal Shock**
  - **Mated ---------- 450000 Meg Ω ---------- Passed**
  - **Unmated ---------- 450000 Meg Ω ---------- Passed**
- **Humidity**
  - **Mated ---------- 450000 Meg Ω ---------- Passed**
  - **Unmated ---------- 450000 Meg Ω ---------- Passed**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage ----------992VAC**
  - **Test Voltage ----------745 VAC**
  - **Working Voltage ----------245 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-Shield

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

RESULTS Continued

LLCR Gas Tight Group (192 LLCR test points)

- **Initial ---------- 15.33 mOhms Max**
- **Gas-Tight**
  - **<= +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**

LLCR Thermal Aging Group (192 LLCR test points)

- **Initial ---------- 15.53 mOhms Max**
- **Thermal**
  - **<= +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**

LLCR Mating/Unmating Durability Group (192 LLCR test points)

- **Initial ---------- 16.18 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**

RESULTS Continued

LLCR Shock & Vibration Group (192 LLCR test points)

- **Initial ---------- 17.15 mOhms Max**
- **Shock &Vibration**
  - **<= +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**

Mechanical Shock & Random Vibration:

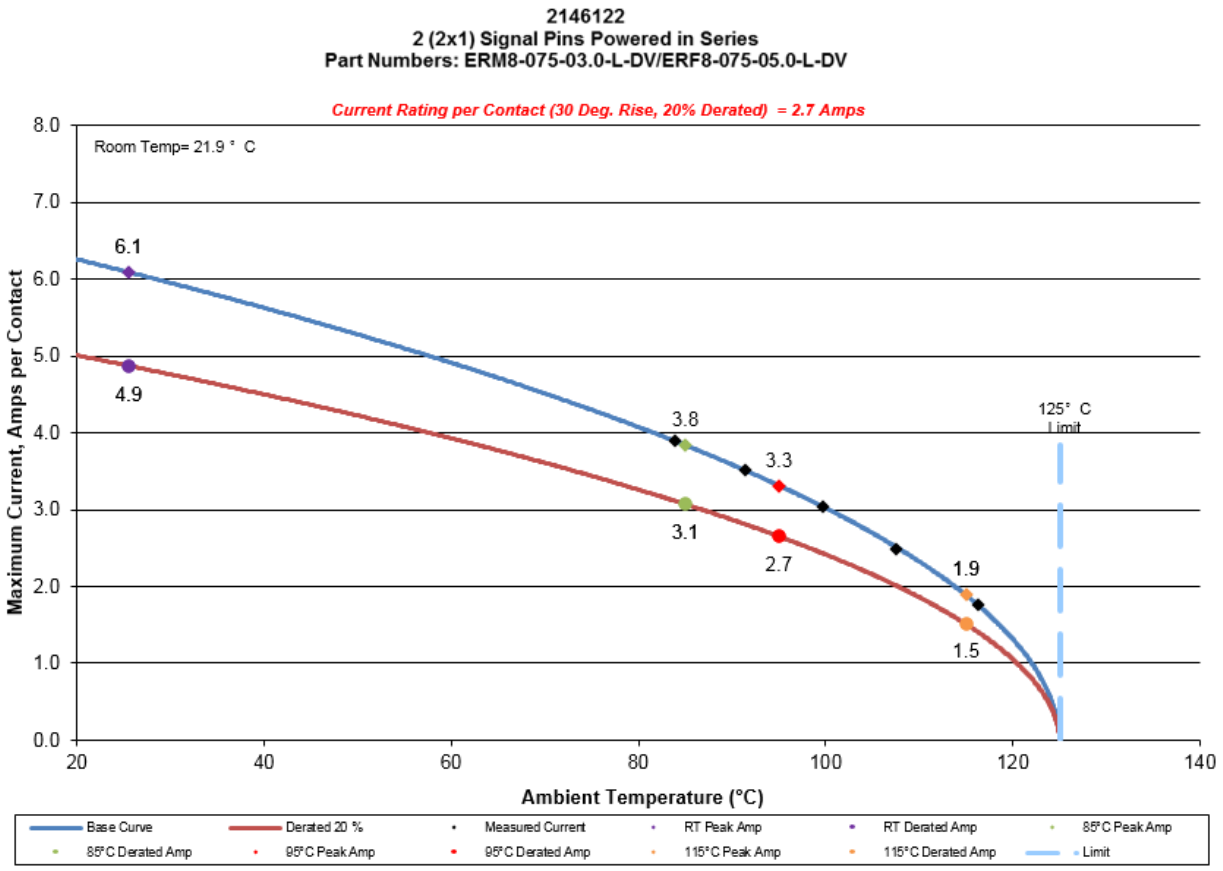
- **Shock**
  - **No Damage---------- ---------- Pass**
  - **50 Nanoseconds---------- ---------- Pass**
- **Vibration**
  - **No Damage---------- ---------- Pass**
  - **50 Nanoseconds---------- ---------- Pass**

DATA SUMMARIES

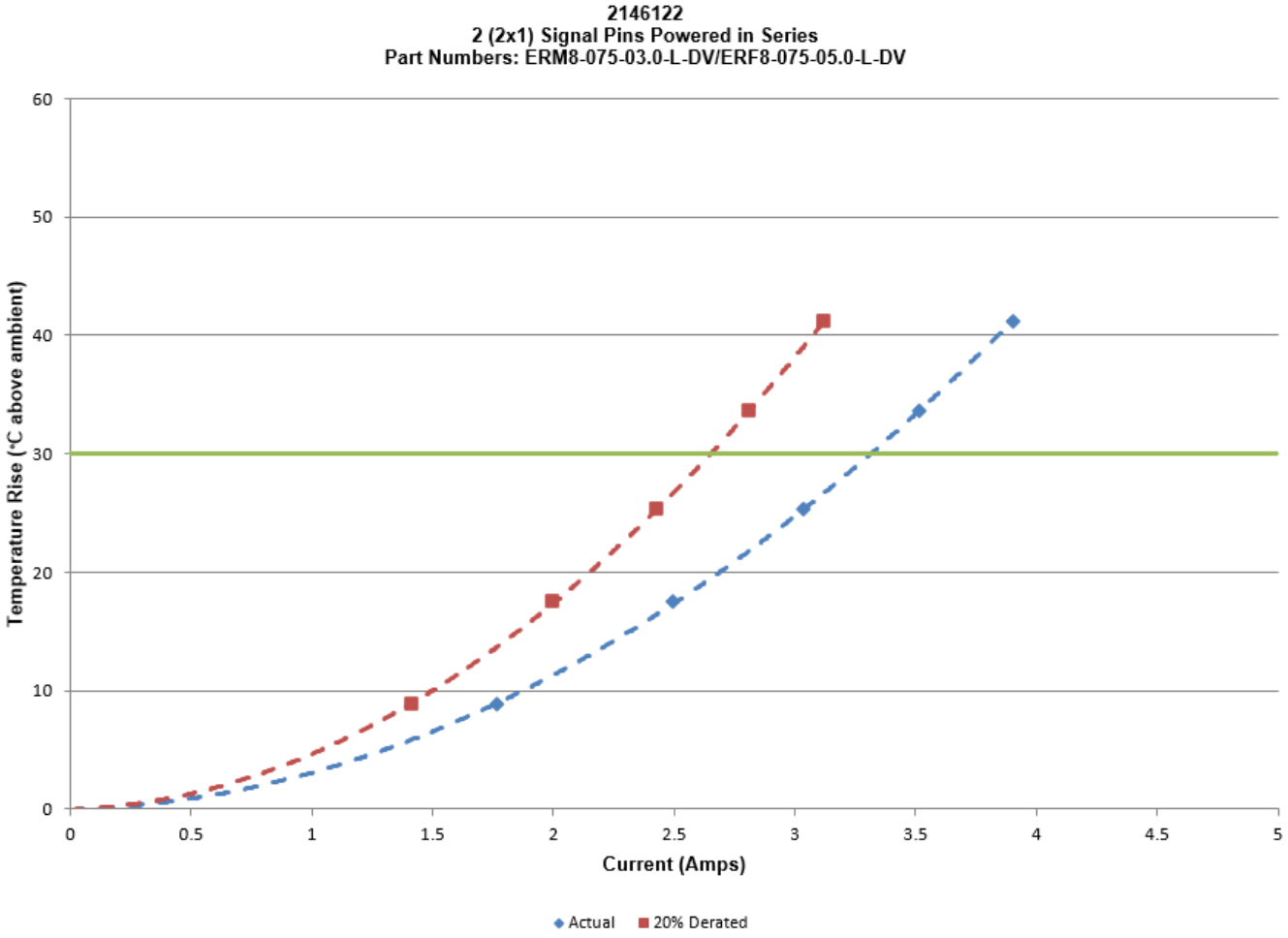
TEMPERATURE RISE (Current Carrying Capacity, CCC):

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 2 adjacent conductors/contacts powered

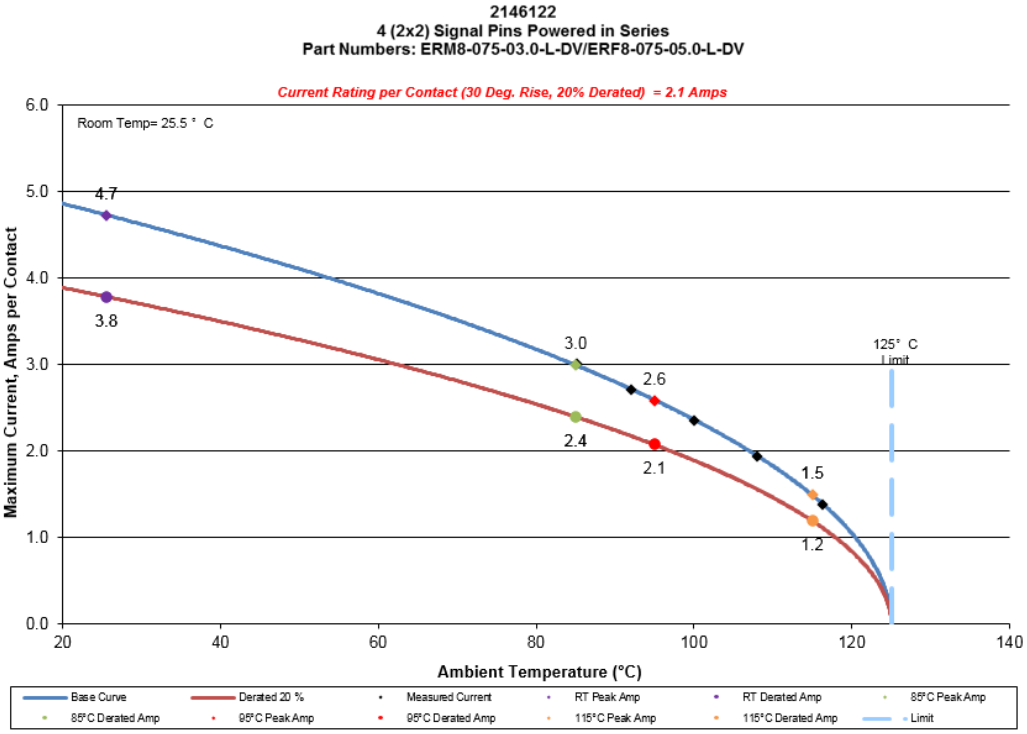


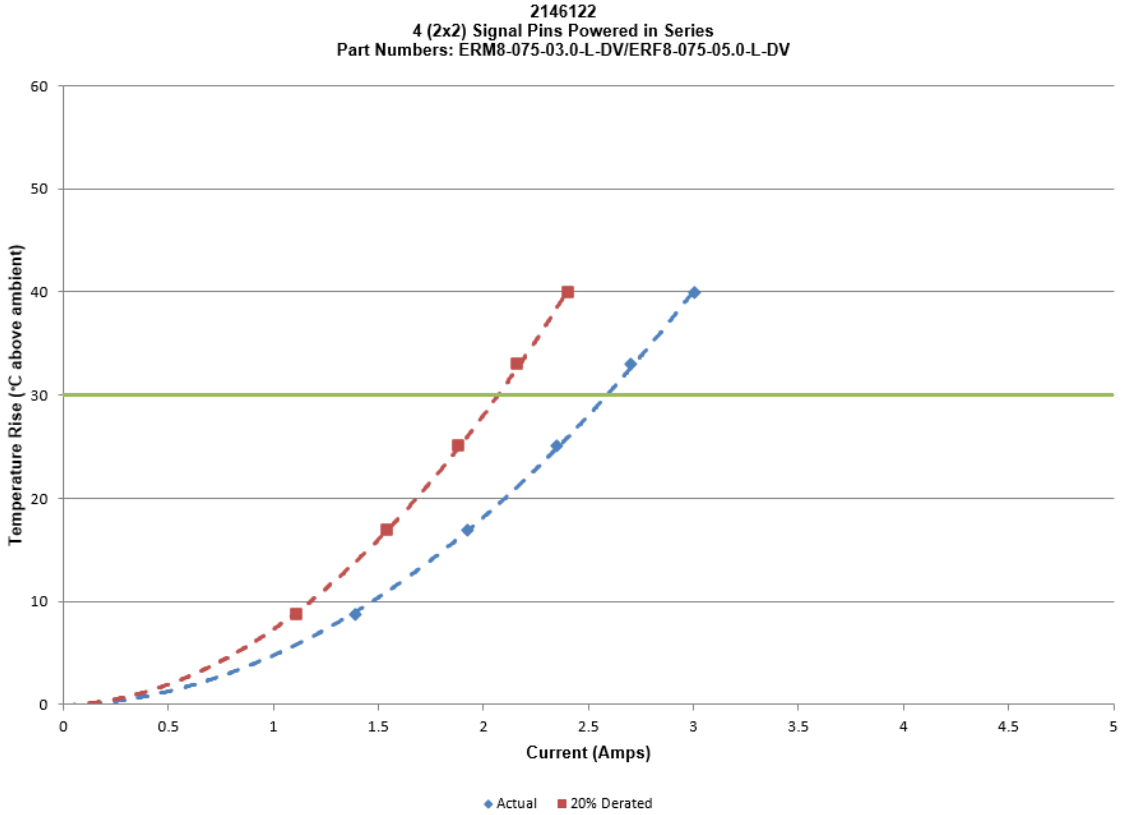
DATA SUMMARIES Continued



DATA SUMMARIES Continued

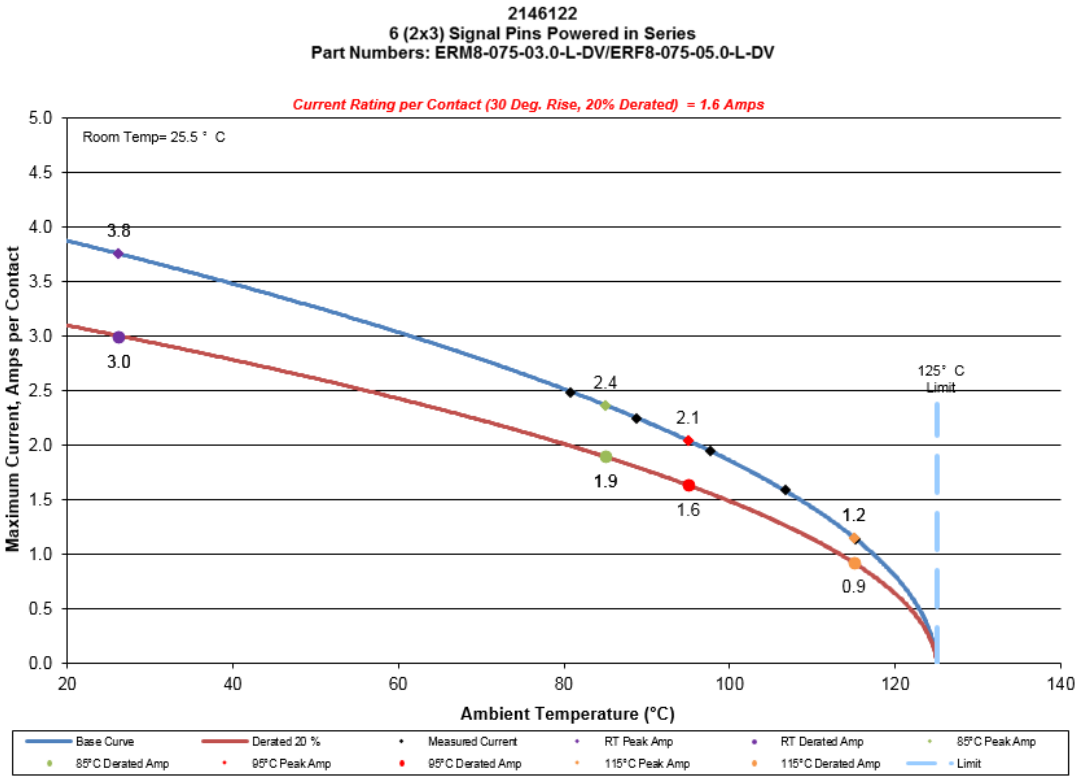
b. Linear configuration with 4 adjacent conductors/contacts powered

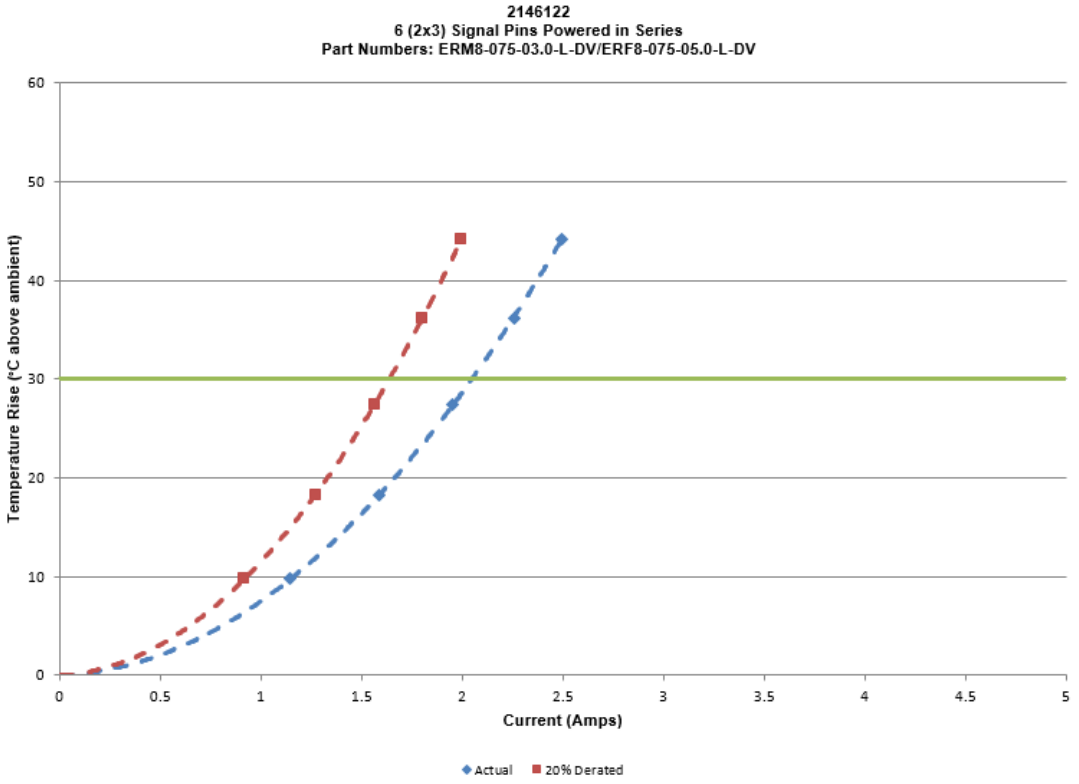




DATA SUMMARIES Continued

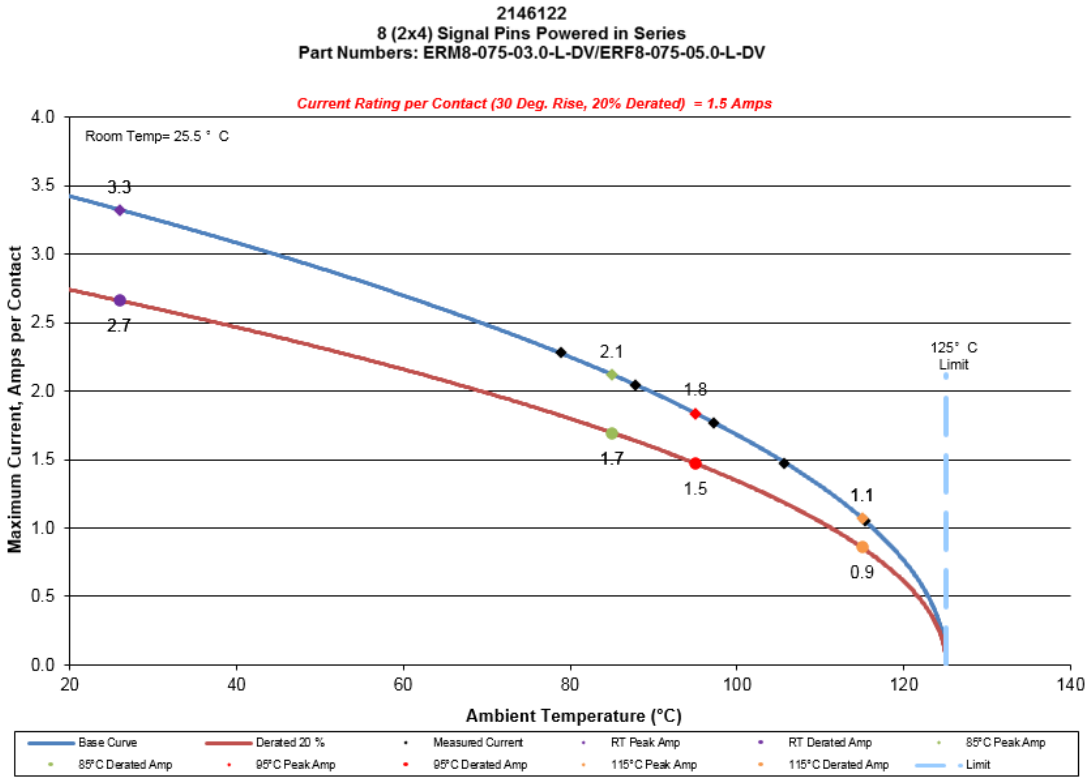
c. Linear configuration with 6 adjacent conductors/contacts powered

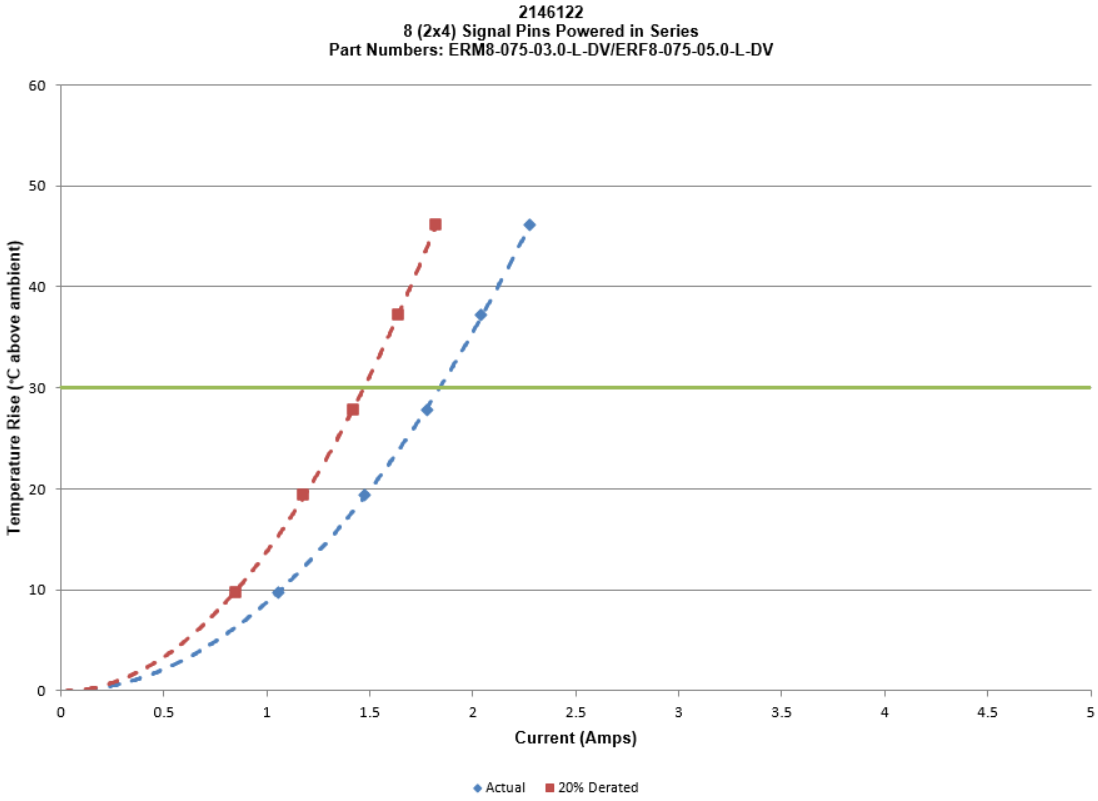




DATA SUMMARIES Continued

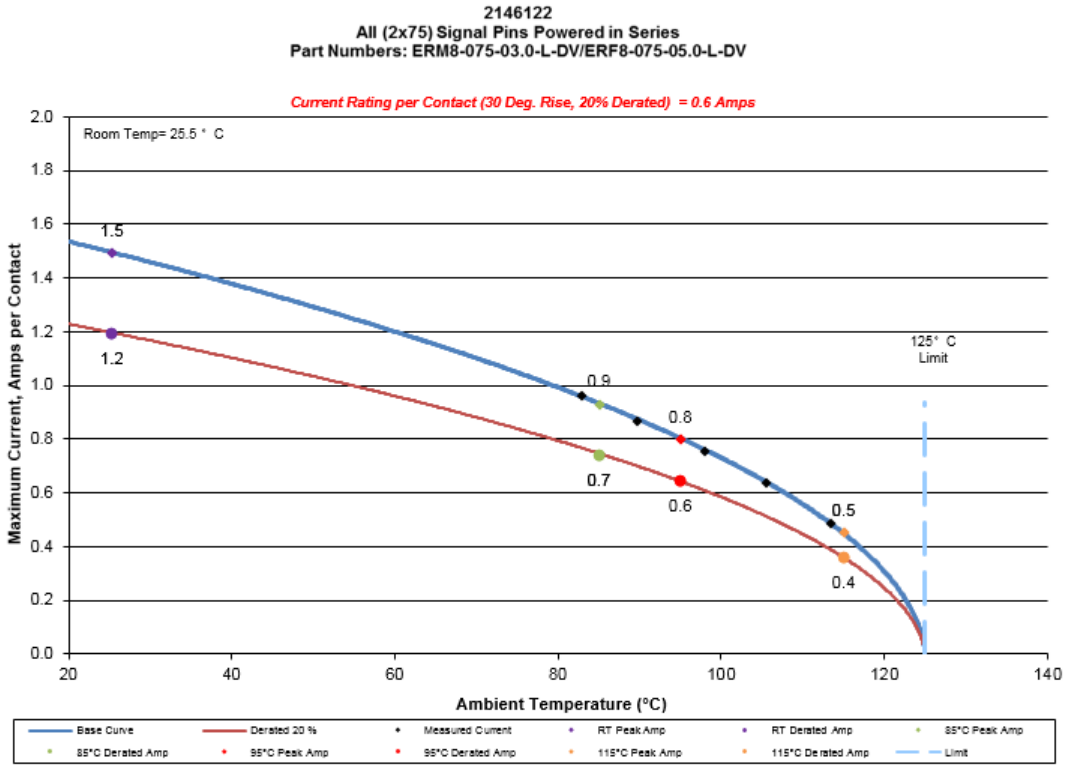
d. Linear configuration with 8 adjacent conductors/contacts powered

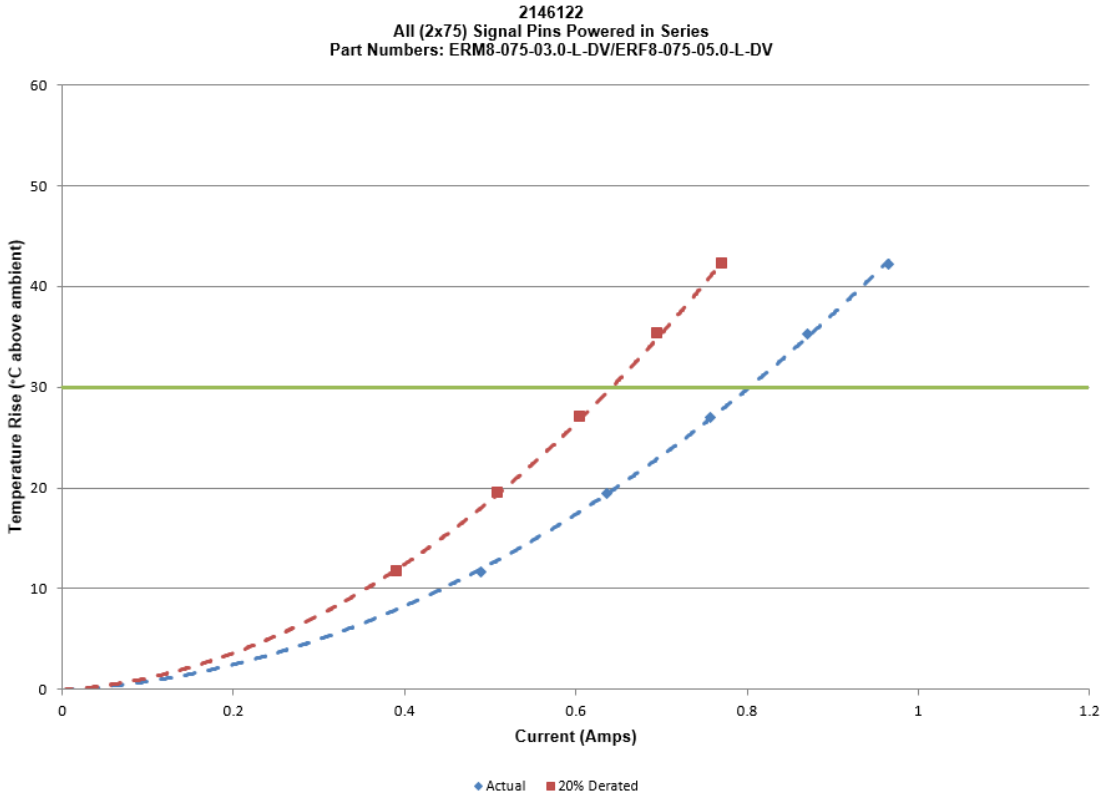




DATA SUMMARIES Continued

e. Linear configuration with all adjacent conductors/contacts powered





DATA SUMMARIES Continued

MATING-UNMATING FORCE:

Thermal Aging Group

	Initial				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	15.92	3.58	6.85	1.54	10.14	2.28	4.98	1.12
Maximum	18.24	4.10	8.94	2.01	12.63	2.84	6.41	1.44
Average	16.69	**3.75**	7.48	**1.68**	11.56	**2.60**	5.78	**1.30**
St Dev	0.76	0.17	0.74	0.17	0.85	0.19	0.46	0.10
Count	8	8	8	8	8	8	8	8

Mating-Unmating Durability Group (ERM8-030-03.0-L-DV /ERF8-030-05.0-L-DV-TR)

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	15.48	3.48	6.67	1.50	15.48	3.48	7.87	1.77
Maximum	17.84	4.01	8.94	2.01	18.24	4.10	10.68	2.40
Average	16.40	**3.69**	7.87	**1.77**	16.64	**3.74**	9.60	**2.16**
St Dev	0.81	0.18	0.77	0.17	1.04	0.23	1.00	0.22
Count	8	8	8	8	8	8	8	8

	After Humidity			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	10.76	2.42	6.45	1.45
Maximum	13.43	3.02	7.61	1.71
Average	12.02	**2.70**	7.12	**1.60**
St Dev	0.82	0.19	0.43	0.10
Count	8	8	8	8

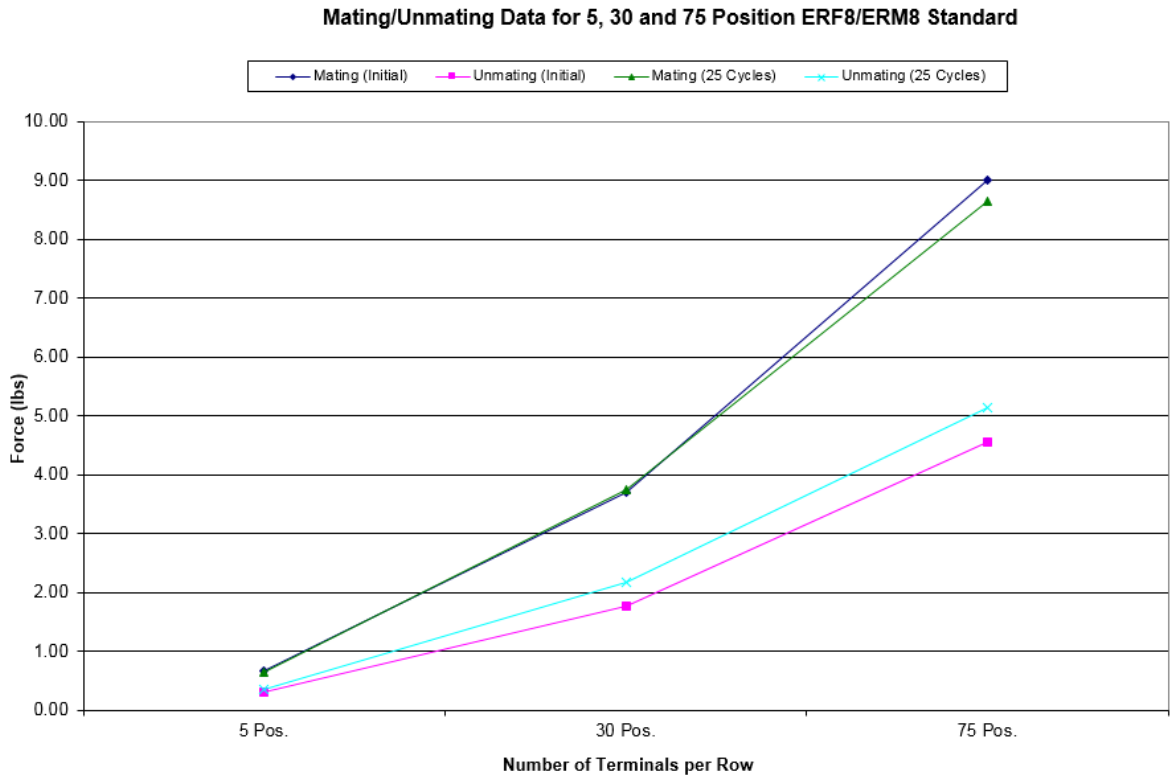
DATA SUMMARIES Continued

Mating-Unmating Basic-Standard (ERM8-075-03.0-L-DV /ERF8-075-05.0-L-DV-TR)

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	New tons	Force (Lbs)	New tons	Force (Lbs)	New tons	Force (Lbs)	New tons	Force (Lbs)
Minimum	31.94	7.18	17.61	3.96	30.25	6.80	17.84	4.01
Maximum	47.50	10.68	21.80	4.90	45.28	10.18	25.80	5.80
Average	40.02	**9.00**	20.27	**4.56**	38.39	**8.63**	22.87	**5.14**
St Dev	5.65	1.27	1.50	0.34	5.47	1.23	2.92	0.66
Count	8	8	8	8	8	8	8	8

Mating-Unmating Basic-Standard（ERM8-005-03.0-L-DV /ERF8-005-05.0-L-DV-TR）

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	New tons	Force (Lbs)	New tons	Force (Lbs)	New tons	Force (Lbs)	New tons	Force (Lbs)
Minimum	2.54	0.57	1.16	0.26	2.40	0.54	1.33	0.30
Maximum	3.34	0.75	1.82	0.41	3.20	0.72	2.00	0.45
Average	2.91	**0.66**	1.38	**0.31**	2.87	**0.65**	1.52	**0.34**
St Dev	0.27	0.06	0.23	0.05	0.25	0.06	0.21	0.05
Count	8	8	8	8	8	8	8	8



DATA SUMMARIES Continued

Mating-Unmating Basic-With Latches（ERM8-075-03.0-L-DV-L / ERF8-075-05.0-L-DV-L）

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	45.68	10.27	28.60	6.43	48.84	10.98	29.58	6.65
Maximum	53.46	12.02	40.39	9.08	52.89	11.89	43.41	9.76
Average	49.61	**11.15**	34.25	**7.70**	50.64	**11.39**	35.67	**8.02**
St Dev	2.41	0.54	4.79	1.08	1.83	0.41	4.98	1.12
Count	8	8	8	8	8	8	8	8

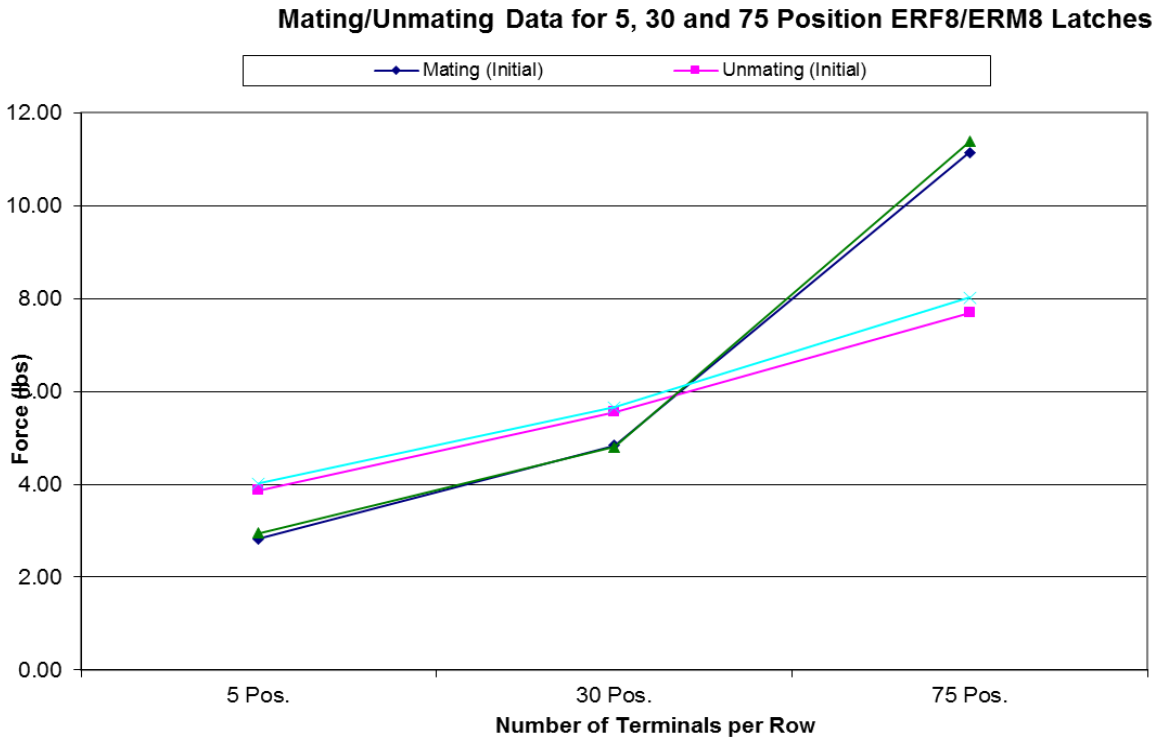
Mating-Unmating Basic-With Latches（ERM8-030-03.0-L-DV-L / ERF8-030-05.0-L-DV-L）

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	18.64	4.19	22.46	5.05	18.28	4.11	21.97	4.94
Maximum	23.66	5.32	28.47	6.40	23.62	5.31	29.62	6.66
Average	21.53	**4.84**	24.71	**5.56**	21.37	**4.81**	25.17	**5.66**
St Dev	1.75	0.39	2.36	0.53	1.97	0.44	2.84	0.64
Count	8	8	8	8	8	8	8	8

Mating-Unmating Basic-With Latches（ERM8-005-03.0-L-DV-L / ERF8-005-05.0-L-DV-L）

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	12.14	2.73	16.37	3.68	11.88	2.67	16.06	3.61
Maximum	13.12	2.95	19.13	4.30	14.32	3.22	21.93	4.93
Average	12.56	**2.82**	17.24	**3.88**	13.14	**2.96**	17.88	**4.02**
St Dev	0.30	0.07	0.96	0.22	0.88	0.20	1.78	0.40
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued



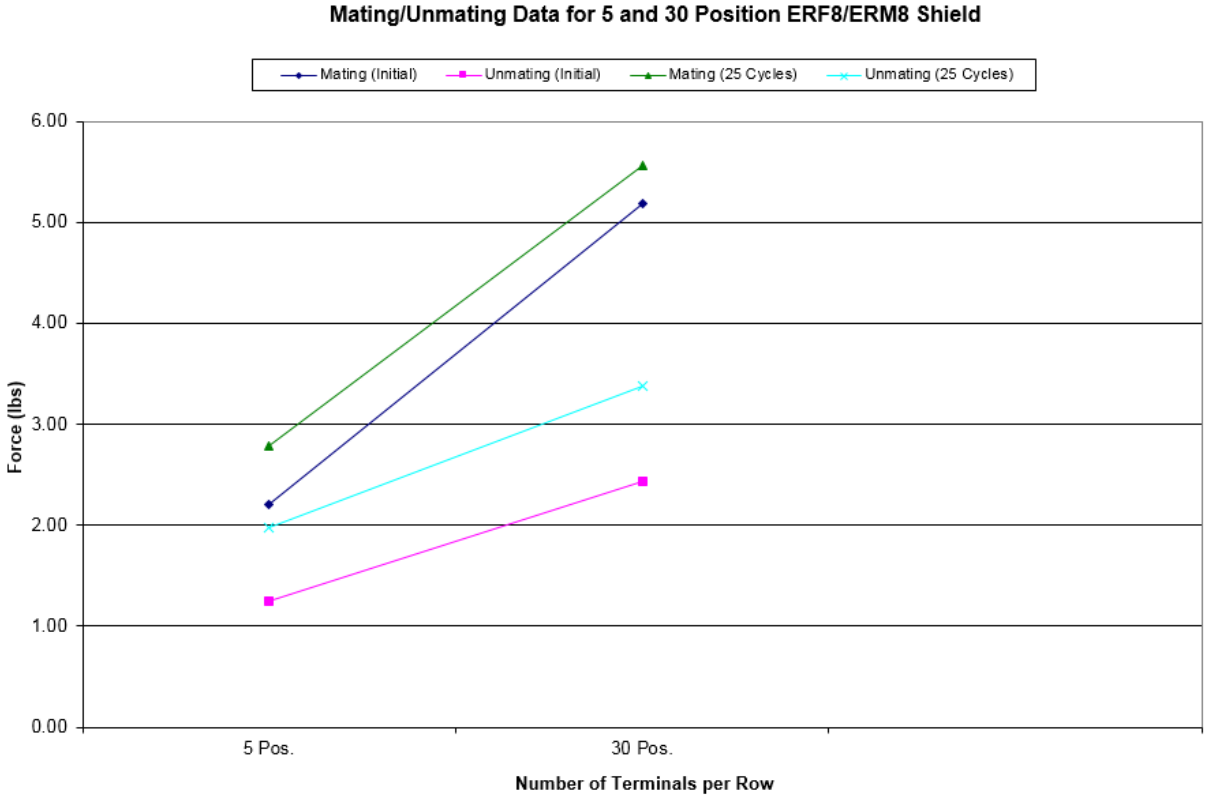
DATA SUMMARIES Continued

Mating-Unmating Basic-With Shield（ERM8-030-03.0-L-DV-S / ERF8-030-05.0-L-DV-S）

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	New tons	Force (Lbs)	New tons	Force (Lbs)	New tons	Force (Lbs)	New tons	Force (Lbs)
Minimum	21.57	4.85	8.94	2.01	21.97	4.94	13.57	3.05
Maximum	26.82	6.03	13.52	3.04	30.69	6.90	17.57	3.95
Average	23.05	**5.18**	10.82	**2.43**	24.74	**5.56**	15.00	**3.37**
St Dev	2.20	0.50	1.89	0.43	3.51	0.79	1.54	0.35
Count	5	5	5	5	5	5	5	5

Mating-Unmating Basic-With Shield（ERM8-010-03.0-L-DV-S / ERF8-010-05.0-L-DV-S）

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	New tons	Force (Lbs)	New tons	Force (Lbs)	New tons	Force (Lbs)	New tons	Force (Lbs)
Minimum	8.23	1.85	4.67	1.05	10.45	2.35	6.63	1.49
Maximum	12.37	2.78	6.36	1.43	14.46	3.25	9.87	2.22
Average	9.79	**2.20**	5.54	**1.25**	12.39	**2.79**	8.81	**1.98**
St Dev	1.33	0.30	0.57	0.13	1.61	0.36	1.03	0.23
Count	8	8	8	8	8	8	8	8



DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**ERM8/ERF8**	**ERM8**	**ERF8**
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

	Row to Row		
	Mated	Unmated	Unmated
Minimum	**ERM8/ERF8**	**ERM8**	**ERF8**
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

	Pin to Closest Metallic Hardware		
	Mated	Unmated	Unmated
Minimum	**ERM8/ERF8**	**ERM8**	**ERF8**
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**ERM8/ERF8**
Break Down Voltage	992
Test Voltage	745
Working Voltage	245

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

DATA SUMMARIES Continued

LLCR Thermal Aging Group

1) A total of 192 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. <= +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	9/27/2019	10/8/2019		
Room Temp (Deg C)	23	23		
Rel Humidity (%)	54	54		
Technician	Peter Chen	Peter Chen		
mOhm values	**Actual Initial**	**Delta Thermal**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	13.56	0.52		
St. Dev.	0.59	0.53		
Min	12.29	0.01		
Max	15.33	2.63		
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**
Thermal	**192**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Mating/Unmating Durability Group

1). A total of 192 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. <= +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	9/27/2019	9/29/2019	10/8/2019	10/22/2019
Room Temp (Deg C)		23	23	23	23
Rel Humidity (%)		54	54	54	54
Technician		Peter Chen	Peter Chen	Peter Chen	Peter Chen
mOhm values		**Actual**	**Delta**	**Delta**	**Delta**
		Initial	**25 Cycles**	**Therm Shck**	**Humidity**
		Pin Type 1: Signal			
	Average	13.43	0.53	0.54	0.65
	St. Dev.	0.62	0.42	0.48	0.67
	Min	12.22	0.01	0.00	0.01
	Max	15.53	2.33	3.03	4.29
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**
25 Cycles	**192**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**192**	**0**	**0**	**0**	**0**	**0**
Humidity	**192**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Gas Tight Group

1) A total of 192 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. <= +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	10/15/2019	10/15/2019		
Room Temp (Deg C)		23	23		
Rel Humidity (%)		54	54		
Technician		Peter Chen	Peter Chen		
mOhm values		**Actual**	**Delta**	**Delta**	**Delta**
		Initial	**Acid Vapor**		
		Pin Type 1: Signal			
	Average	13.30	0.44		
	St. Dev.	0.69	0.50		
	Min	11.14	0.00		
	Max	16.18	4.47		
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**
Acid Vapor	**192**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Shock & Vibration Group

1) A total of 192 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. <= +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	12/10/2019	12/23/2019		
Room Temp (Deg C)		23	23		
Rel Humidity (%)		36	37		
Technician		Aaron McKim	Scott Rollefstad		
mOhm values		**Actual**	**Delta**	**Delta**	**Delta**
		Initial	**Shock-Vib**		
		Pin Type 1: Signal			
	Average	14.07	1.35		
	St. Dev.	0.94	0.79		
	Min	12.61	0.03		
	Max	17.15	4.45		
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**
Shock-Vib	**192**	**0**	**0**	**0**	**0**	**0**

Nanosecond Event Detection:

Shock and Vibration Event Detection Summary	
Contacts tested	60
Test Condition	C, 100g's, 6ms, Half-Sine
Shock Events	0
Test Condition	V-B, 7.56 rms g
Vibration Events	0
Total Events	0

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: HZ-TCT-01
Description: Normal force analyzer
Manufacturer: Mecmesin Multitester
Model: Mecmesin Multitester 2.5-i
Serial #: 08-1049-04
Accuracy: Last Cal: 4/26/2019, Next Cal: 4/25/2020

Equipment #: HZ-OV-01
Description: Oven
Manufacturer: Huida
Model: CS101-1E
Serial #: CS101-1E-B
Accuracy: Last Cal: 12/13/2019, Next Cal: 12/12/2020

Equipment #: HZ-THC-01
Description: Humidity transmitter
Manufacturer: Thermtron
Model: SM-8-8200
Serial #: 38846
Accuracy: Last Cal: 2/27/2019, Next Cal: 2/26/2020

Equipment #: HZ-TSC-01
Description: Vertical Thermal Shock Chamber
Manufacturer: Cincinnatti Sub Zero
Model: VTS-3-6-6-SC/AC
Serial #: 10-VT14994
Accuracy: See Manual
… Last Cal: 06/28/2019, Next Cal: 06/27/2020

Equipment #: HZ-MO-05
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 3706
Serial #: 1285188
Accuracy: Last Cal: 11/15/2019, Next Cal: 11/14/2020

Equipment #: HZ-HPM-01
Description: NA9636H
Manufacturer: Ainuo
Model: 6031A
Serial #: 089601091
Accuracy: Last Cal: 3/7/2019, Next Cal: 3/6/2020

EQUIPMENT AND CALIBRATION SCHEDULES Continued

Equipment #: HZ-MO-01
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 2700
Serial #: 1199807
Accuracy: Last Cal: 04/28/2019, Next Cal: 04/28/2020

Equipment #: HZ-PS-01
Description: Power Supply
Manufacturer: Agilent
Model: 6031A
Serial #: MY41000982
Accuracy: Last Cal: 04/28/2019, Next Cal: 04/28/2020

Equipment #: ACLM-01
Description: Accelerometer
Manufacturer: PCB Piezotronics
Model: 352C03
Serial #: 115819
Accuracy: See Manual
… Last Cal: 07/18/2019, Next Cal: 07/18/2020

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 10/31/2019, Next Cal: 10/31/2020

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 09/11/2019, Next Cal: 09/11/2020