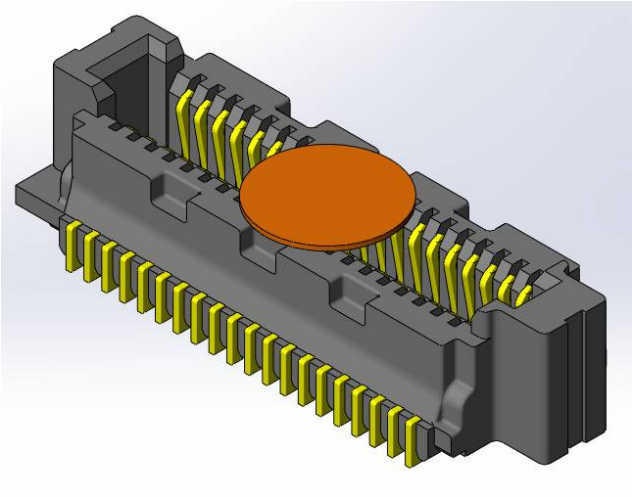
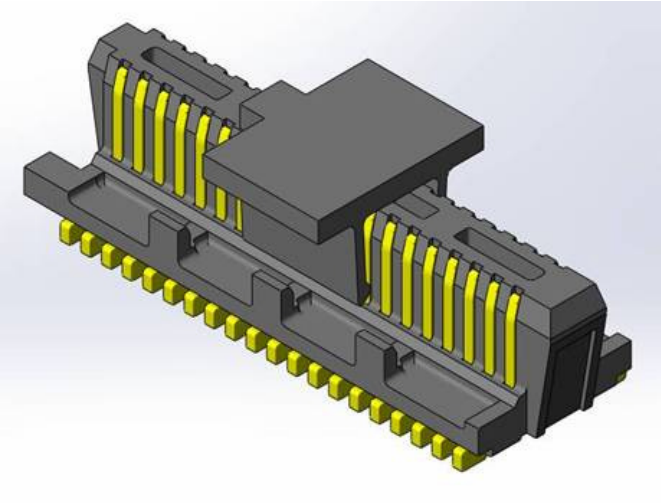
Project Number: Design Qualification Test Report	Tracking Code: 237836_Report_Rev_4
Requested by: Neal Patterson	Date: 04/1/2014
Part #: SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR	
Part description: SS5/ST5	Tech: Aaron McKim
Test Start: 01/25/2013	Test Completed: 02/17/2014





DESIGN QUALIFICATION TEST REPORT

SS5/ST5
SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR
SS5-50-3.00-L-D-K-TR/ST5-50-1.00-L-D-P-TR
SS5-80-3.00-L-D-K-TR/ST5-80-1.00-L-D-P-TR

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
03/13/2013	**1**	**Initial Issue**	**KH**
09/13/2013	**2**	**Add the test data**	**KH**
09/17/2013	**3**	**Update the CCC**	**KH**
04/01/2014	**4**	**Add the test data**	**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.

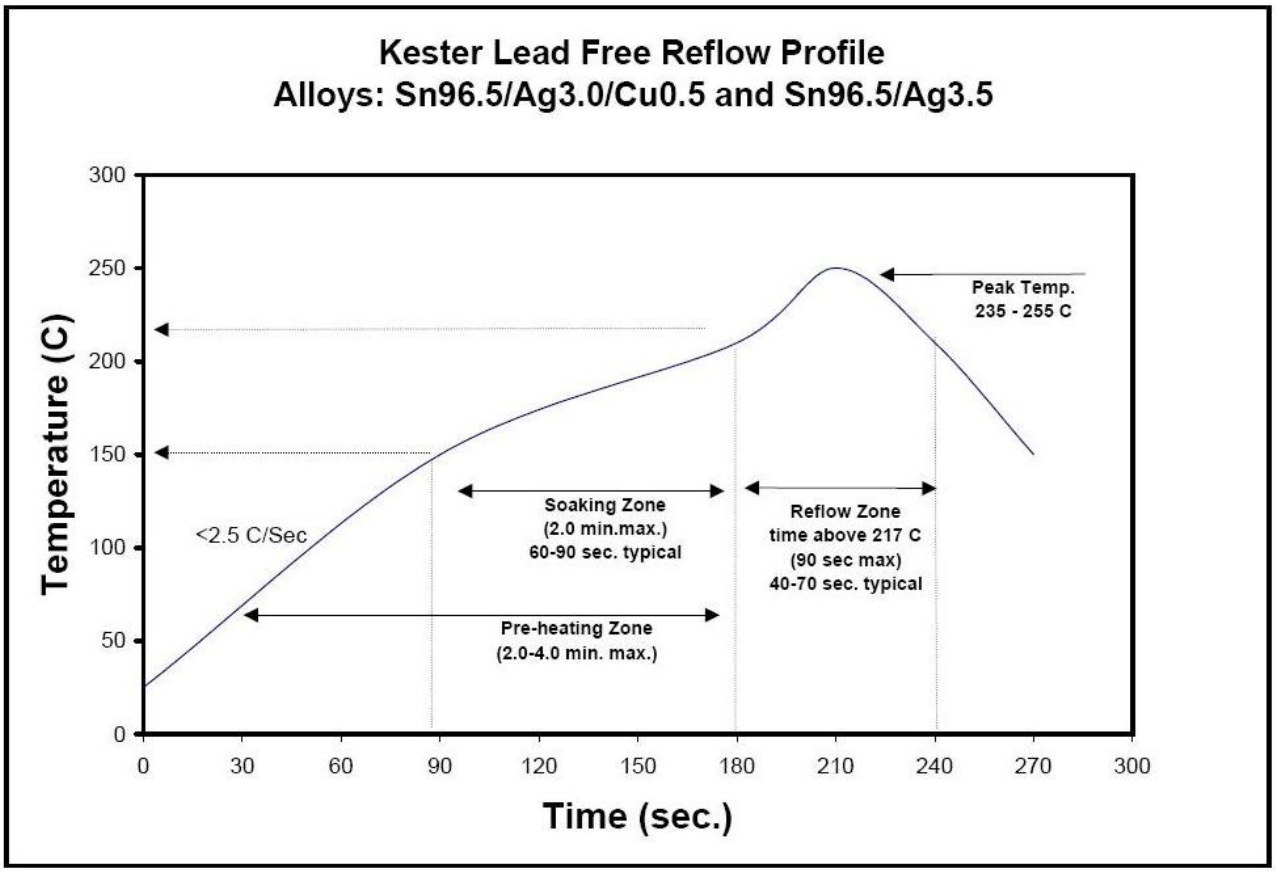
APPLICABLE DOCUMENTS

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) Re-Flow Time/Temp: See accompanying profile.
10) Samtec Test PCBs used: PCB-103868-TST/PCB-103889-TST/PCB-103870-TST

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

TEST STEP	GROUP 1 8 Assemblies
01	LLCR-1
02	Gas Tight
03	LLCR-2

Gas Tight = EIA-364-36A

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

Normal Force

TEST STEP	GROUP 1 Individual Contacts (8 min)	GROUP 2 Individual Contacts (8 min)
01	Contact Gaps	Contact Gaps
02	Setup Approved	Thermal Aging (Mated and Undisturbed)
03	Normal Force (in the body and soldered on PCB unless otherwise specified)	Contact Gaps
04		Setup Approved
05		Normal Force (in the body and soldered on PCB unless otherwise specified)

Thermal Aging = EIA-364-17, Test Condition 4 (105°C)

Time Condition 'B' (250 Hours)

Normal Force = EIA-364-04

(Perpendicular) Displacement Force = 12.7 mm/min ± 6 mm/min

Spec is 50 N @ 1 mm displacement

Contact Gaps / Height - No standard method. Usually measured optically

Gaps to be taken on a minimum of 20% of each part tested

FLOWCHARTS Continued

Thermal Aging

TEST STEP	GROUP 1 8 Assemblies Thermal Aging (Mated)
01	Contact Gaps
02	Forces - Mating / Unmating
03	LLCR-1
04	Thermal Aging (Mated and Undisturbed)
05	LLCR-2
06	Forces - Mating / Unmating
07	Contact Gaps

Thermal Aging = EIA-364-17, Test Condition 4 (105°C)

Time Condition 'B' (250 Hours)

Mating / Unmating Forces = EIA-364-13

Contact Gaps / Height - No standard method. Usually measured optically.

Gaps to be taken on a minimum of 20% of each part tested

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

FLOWCHARTS Continued

Durability/Mating/Unmating/Gaps

TEST STEP	GROUP 1 8 Assemblies SS5-20-3.00-L-D ST5-20-1.00-L-D	GROUP 2 8 Assemblies SS5-50-3.00-L-D ST5-50-1.00-L-D	GROUP 3 8 Assemblies SS5-80-3.00-L-D ST5-80-1.00-L-D	GROUP 4 8 Assemblies SS5-10-3.00-L-D ST5-10-1.00-L-D
01	Contact Gaps	Contact Gaps	Contact Gaps	Contact Gaps
02	LLCR-1	LLCR-1	LLCR-1	Forces - Mating / Unmating
03	Forces - Mating / Unmating	Forces - Mating / Unmating	Forces - Mating / Unmating	25 Cycles
04	25 Cycles	25 Cycles	25 Cycles	Forces - Mating / Unmating
05	Forces - Mating / Unmating	Forces - Mating / Unmating	Forces - Mating / Unmating	25 Cycles (50 Total)
06	25 Cycles (50 Total)	25 Cycles (50 Total)	25 Cycles (50 Total)	Forces - Mating / Unmating
07	Forces - Mating / Unmating	Forces - Mating / Unmating	Forces - Mating / Unmating	25 Cycles (75 Total)
08	25 Cycles (75 Total)	25 Cycles (75 Total)	25 Cycles (75 Total)	Forces - Mating / Unmating
09	Forces - Mating / Unmating	Forces - Mating / Unmating	Forces - Mating / Unmating	25 Cycles (100 Total)
10	25 Cycles (100 Total)	25 Cycles (100 Total)	25 Cycles (100 Total)	Forces - Mating / Unmating
11	Forces - Mating / Unmating	Forces - Mating / Unmating	Forces - Mating / Unmating	
12	Clean w/Compressed Air	Clean w/Compressed Air	Clean w/Compressed Air	
13	Contact Gaps	Contact Gaps	Contact Gaps	
14	LLCR-2	LLCR-2	LLCR-2	
15	Thermal Shock (Mated and Undisturbed)	Thermal Shock (Mated and Undisturbed)	Thermal Shock (Mated and Undisturbed)	
16	LLCR-3	LLCR-3	LLCR-3	
17	Cyclic Humidity (Mated and Undisturbed)	Cyclic Humidity (Mated and Undisturbed)	Cyclic Humidity (Mated and Undisturbed)	
18	LLCR-4	LLCR-4	LLCR-4	
19	Forces - Mating / Unmating	Forces - Mating / Unmating	Forces - Mating / Unmating	

Thermal Shock = EIA-364-32, Table II, Test Condition I:

-55°C to +85°C 1/2 hour dwell, 100 cycles

Humidity = EIA-364-31, Test Condition B (240 Hours)

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

ambient pre-condition and delete steps 7a and 7b

Mating / Unmating Forces = EIA-364-13

Contact Gaps / Height - No standard method. Usually measured optically.

Gaps to be taken on a minimum of 20% of each part tested

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

FLOWCHARTS Continued

IR & DWV

TEST STEP	GROUP 1 2 Assemblies SS5-20-3.00-L-D ST5-20-1.00-L-D Break Down Pin-to-Pin	GROUP 2 2 Assemblies SS5-20-3.00-L-D Break Down Pin-to-Pin	GROUP 3 2 Assemblies ST5-20-1.00-L-D Break Down Pin-to-Pin	GROUP 4 2 Assemblies SS5-20-3.00-L-D ST5-20-1.00-L-D Pin-to-Pin
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Shock (Mated and Undisturbed)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (Mated and Undisturbed)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

TEST STEP	GROUP 5 2 Assemblies SS5-20-3.00-L-D ST5-20-1.00-L-D Break Down Row-to-Row	GROUP 6 2 Assemblies SS5-20-3.00-L-D Break Down Row-to-Row	GROUP 7 2 Assemblies ST5-20-1.00-L-D Break Down Row-to-Row	GROUP 8 2 Assemblies SS5-20-3.00-L-D ST5-20-1.00-L-D Row-to-Row
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Shock (Mated and Undisturbed)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (Mated and Undisturbed)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

DWV on Groups 4 and 8 to be performed at Test Voltage

DWV test voltage is equal to 75% of the lowest break down voltage from Groups 1, 2, 3, 5, 6, & 7

Thermal Shock = EIA-364-32, Table II, Test Condition I:

-55°C to +85°C 1/2 hour dwell, 100 cycles

Humidity = EIA-364-31, Test Condition B (240 Hours)

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

ambient pre-condition and delete steps 7a and 7b

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

FLOWCHARTS Continued

Current Carrying Capacity - Double Row

TEST STEP	GROUP 1 3 Mated Assemblies 2x1 Contacts Powered	GROUP 2 3 Mated Assemblies 2x2 Contacts Powered	GROUP 3 3 Mated Assemblies 2x3 Contacts Powered	GROUP 4 3 Mated Assemblies 2x4 Contacts Powered	GROUP 5 3 Mated Assemblies 2x20 Contacts Powered
01	CCC	CCC	CCC	CCC	CCC

TEST STEP	GROUP 5 3 Mated Assemblies 2x50 Contacts Powered	GROUP 6 3 Mated Assemblies All power Contacts Powered
01	CCC	CCC

(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 / Vibration / LLCR

TEST STEP	GROUP 1 8 Assemblies
01	LLCR-1
02	Shock
03	Vibration
04	LLCR-2

Mechanical Shock = EIA 364-27 Half Sine,
100 g's, 6 milliSeconds (Condition "C") each axis
Vibration = EIA 364-28, Random Vibration
7.56 g RMS, Condition VB --- 2 hours/axis
LLCR = EIA-364-23, LLCR
20 mV Max, 100 mA Max
Use Keithley 580 or 3706 in 4 wire dry circuit mode

Shock / Vibration / nanoSecond Event Detection

TEST STEP	GROUP 1 60 Points
01	Event Detection, Shock
02	Event Detection, Vibration

Mechanical Shock = EIA 364-27 Half Sine,
100 g's, 6 milliSeconds (Condition "C") each axis
Vibration = EIA 364-28, Random Vibration
7.56 g RMS, Condition VB --- 2 hours/axis
Event detection requirement during Shock / Vibration is 50 nanoseconds minimum

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

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 three 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.

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.

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

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

1) Reference document: EIA-364-04, *Normal Force Test Procedure for Electrical Connectors.*
2) The contacts shall be tested in the connector housing.
3) If necessary, a "window" shall be made in the connector body to allow a probe to engage and deflect the contact at the same attitude and distance (plus 0.05 mm [0.002"]) as would occur in actual use.
4) The connector housing shall be placed in a holding fixture that does not interfere with or otherwise influence the contact force or deflection.
5) Said holding fixture shall be mounted on a floating, adjustable, X-Y table on the base of the Dillon TC^2, computer controlled test stand with a deflection measurement system accuracy of 5.0 µm (0.0002").
6) The nominal deflection rate shall be 5 mm (0.2")/minute.
7) Unless otherwise noted a minimum of five contacts shall be tested.
8) The force/deflection characteristic to load and unload each contact shall be repeated five times.
9) The system shall utilize the TC^2 software in order to acquire and record the test data.
10) The permanent set of each contact shall be measured within the TC^2 software.
11) 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.

INSULATION RESISTANCE (IR):

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

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

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

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

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

RESULTS

Temperature Rise, CCC at a 20% de-rating

- **CCC for a 30°C Temperature Rise----------1.5A per contact with 2 (2x1) powered**
- **CCC for a 30°C Temperature Rise----------1.2A per contact with 4 (2x2) powered**
- **CCC for a 30°C Temperature Rise----------1.0A per contact with 6 (2x3) powered**
- **CCC for a 30°C Temperature Rise----------0.9A per contact with 8 (2x4) powered**
- **CCC for a 30°C Temperature Rise----------0.6A per contact with 40 (2x20) powered**
- **CCC for a 30°C Temperature Rise----------0.4A per contact with 100 (2x50) powered**
- **CCC for a 30°C Temperature Rise----------0.4A per contact with 160 (2x80) powered**

Mating – Unmating Forces
Thermal Aging Group
SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR

- **Initial**
  - **Mating**
    - **Min ---------- 2.57 Lbs**
    - **Max---------- 3.40 Lbs**
  - **Unmating**
    - **Min ---------- 1.61 Lbs**
    - **Max---------- 1.95 Lbs**
- **After Thermal**
  - **Mating**
    - **Min ---------- 1.68 Lbs**
    - **Max---------- 2.15 Lbs**
  - **Unmating**
    - **Min ---------- 1.52 Lbs**
    - **Max---------- 1.76 Lbs**

RESULTS Continued

Mating – Unmating Forces

Mating/Unmating Durability Group

SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR

- **Initial**
  - **Mating**
    - **Min ---------- 2.32 Lbs**
    - **Max---------- 3.03 Lbs**
  - **Unmating**
    - **Min ---------- 1.39 Lbs**
    - **Max---------- 1.86 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 2.50 Lbs**
    - **Max---------- 2.97 Lbs**
  - **Unmating**
    - **Min ---------- 1.78 Lbs**
    - **Max---------- 2.36 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 2.67 Lbs**
    - **Max---------- 3.14 Lbs**
  - **Unmating**
    - **Min ---------- 2.10 Lbs**
    - **Max---------- 2.74 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 2.90 Lbs**
    - **Max---------- 3.40 Lbs**
  - **Unmating**
    - **Min ---------- 2.26 Lbs**
    - **Max---------- 2.88 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 3.08 Lbs**
    - **Max---------- 3.59 Lbs**
  - **Unmating**
    - **Min ---------- 2.43 Lbs**
    - **Max---------- 3.10 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 1.62 Lbs**
    - **Max---------- 2.01 Lbs**
  - **Unmating**
    - **Min ---------- 1.04 Lbs**
    - **Max---------- 1.79 Lbs**

RESULTS Continued

Mating – Unmating Forces

Mating/Unmating Durability Group

SS5-50-3.00-L-D-K-TR/ST5-50-1.00-L-D-P-TR

- **Initial**
  - **Mating**
    - **Min ---------- 7.12 Lbs**
    - **Max---------- 8.90 Lbs**
  - **Unmating**
    - **Min ---------- 3.36 Lbs**
    - **Max---------- 4.23 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 6.64 Lbs**
    - **Max---------- 8.64 Lbs**
  - **Unmating**
    - **Min ---------- 4.07 Lbs**
    - **Max---------- 5.17 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 6.93 Lbs**
    - **Max---------- 9.04 Lbs**
  - **Unmating**
    - **Min ---------- 4.65 Lbs**
    - **Max---------- 5.74 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 7.30 Lbs**
    - **Max---------- 9.62 Lbs**
  - **Unmating**
    - **Min ---------- 4.96 Lbs**
    - **Max---------- 6.00 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 7.62 Lbs**
    - **Max----------10.05 Lbs**
  - **Unmating**
    - **Min ---------- 5.17 Lbs**
    - **Max---------- 6.21 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 3.91 Lbs**
    - **Max---------- 5.43 Lbs**
  - **Unmating**
    - **Min ---------- 2.48 Lbs**
    - **Max---------- 3.49 Lbs**

RESULTS Continued

Mating – Unmating Forces

Mating/Unmating Durability Group

SS5-80-3.00-L-D-K-TR/ST5-80-1.00-L-D-P-TR

- **Initial**
  - **Mating**
    - **Min ----------11.13 Lbs**
    - **Max----------12.23 Lbs**
  - **Unmating**
    - **Min ---------- 6.06 Lbs**
    - **Max---------- 9.10 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ----------11.23 Lbs**
    - **Max----------12.90 Lbs**
  - **Unmating**
    - **Min ---------- 6.56 Lbs**
    - **Max---------- 9.69 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ----------11.30 Lbs**
    - **Max----------13.27 Lbs**
  - **Unmating**
    - **Min ---------- 7.26 Lbs**
    - **Max----------10.60 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ----------11.79 Lbs**
    - **Max----------14.17 Lbs**
  - **Unmating**
    - **Min ---------- 7.93 Lbs**
    - **Max----------10.97 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ----------12.19 Lbs**
    - **Max----------14.98 Lbs**
  - **Unmating**
    - **Min ---------- 8.36 Lbs**
    - **Max----------11.91 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ----------11.13 Lbs**
    - **Max----------13.23 Lbs**
  - **Unmating**
    - **Min ---------- 6.06 Lbs**
    - **Max---------- 9.10 Lbs**

RESULTS Continued

Mating – Unmating Forces

Mating/Unmating Basic Group

SS5-10-3.00-L-D-K-TR/ST5-10-1.00-L-D-P-TR

- **Initial**
  - **Mating**
    - **Min ---------- 1.40 Lbs**
    - **Max---------- 1.83 Lbs**
  - **Unmating**
    - **Min ---------- 0.67 Lbs**
    - **Max---------- 0.90 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 1.26 Lbs**
    - **Max---------- 1.69 Lbs**
  - **Unmating**
    - **Min ---------- 0.89 Lbs**
    - **Max---------- 1.13 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 1.32 Lbs**
    - **Max---------- 1.88 Lbs**
  - **Unmating**
    - **Min ---------- 1.06 Lbs**
    - **Max---------- 1.29 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 1.53 Lbs**
    - **Max---------- 2.00 Lbs**
  - **Unmating**
    - **Min ---------- 1.17 Lbs**
    - **Max---------- 1.35 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 1.62 Lbs**
    - **Max---------- 2.12 Lbs**
  - **Unmating**
    - **Min ---------- 1.24 Lbs**
    - **Max---------- 1.53 Lbs**

Normal Force at 0.0090 inch deflection

- **Initial**
  - **Min----------82.2 gf Set ----- 0.0016 in**
  - **Max ----------87.4 gf Set ----- 0.0022 in**
- **Thermal**
  - **Min----------74.9 gf Set ------ 0.0025 in**
  - **Max ----------85.2 gf Set ------ 0.0030 in**

RESULTS Continued

Insulation Resistance minimums, IR

Pin to Pin

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

Row to Row

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

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage ---------- 800 VAC**
  - **Test Voltage ---------- 600 VAC**
  - **Working Voltage ---------- 200 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**

RESULTS Continued

LLCR Thermal Aging Group (192 LLCR test points)
SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR

- **Initial ---------- 21.87 mOhms Max**
- **Thermal**
  - **<= +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 +2000 mOhms----------0 Points ---------- Unstable**
  - **>+2000 mOhms----------0 Points ---------- Open Failure**

LLCR Mating/Unmating Durability Group (192 LLCR test points)
SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR

- **Initial ---------- 22.33 mOhms Max**
- **Durability, 100 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 +2000 mOhms----------0 Points ---------- Unstable**
  - **>+2000 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 +2000 mOhms----------0 Points ---------- Unstable**
  - **>+2000 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 +2000 mOhms----------0 Points ---------- Unstable**
  - **>+2000 mOhms----------0 Points ---------- Open Failure**

RESULTS Continued

LLCR Mating/Unmating Durability Group (192 LLCR test points)
SS5-50-3.00-L-D-K-TR/ST5-50-1.00-L-D-P-TR

- **Initial ---------- 21.46 mOhms Max**
- **Durability, 100 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 +2000 mOhms----------0 Points ---------- Unstable**
  - **>+2000 mOhms----------0 Points ---------- Open Failure**
- **Thermal Shock**
  - **<= +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 +2000 mOhms----------0 Points ---------- Unstable**
  - **>+2000 mOhms----------0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms ---------- 189 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ----------3 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ----------0 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**

LLCR Mating/Unmating Durability Group (192 LLCR test points)
SS5-80-3.00-L-D-K-TR/ST5-80-1.00-L-D-P-TR

- **Initial ---------- 21.51 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms ---------- 189 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ----------3 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ----------0 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**
- **Thermal Shock**
  - **<= +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 +2000 mOhms----------0 Points ---------- Unstable**
  - **>+2000 mOhms----------0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms ---------- 190 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ----------2 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ----------0 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**

RESULTS Continued

LLCR Gas Tight Group (192 LLCR test points)
SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR

- **Initial ---------- 23.79 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 +2000 mOhms----------0 Points ---------- Unstable**
  - **>+2000 mOhms----------0 Points ---------- Open Failure**

LLCR Shock & Vibration Group (192 LLCR test points)
SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR

- **Initial ---------- 24.15 mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms ---------- 190 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ----------2 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ----------0 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:

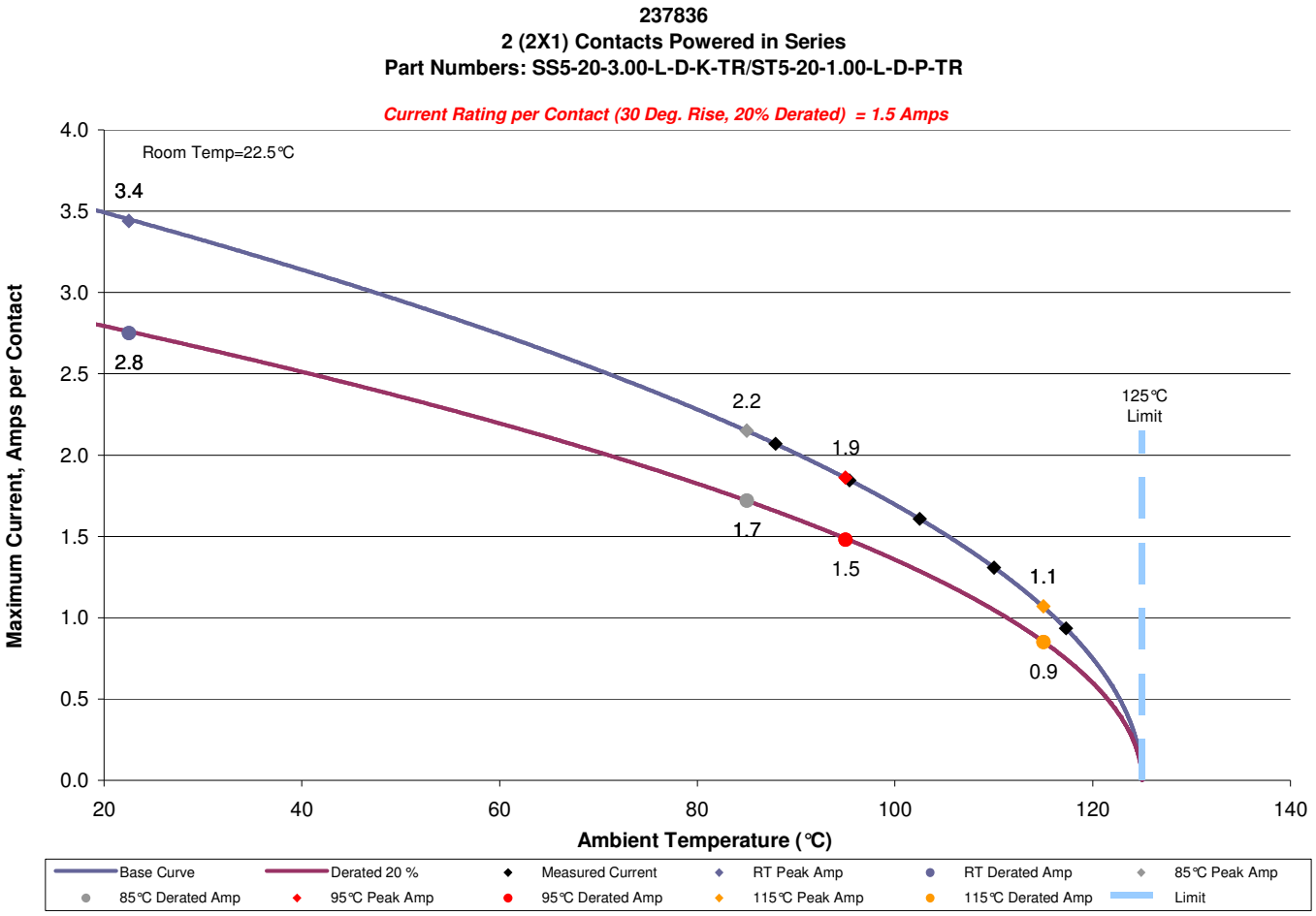
- **Shock**
  - **No Damage---------- ---------- Pass**
  - **50 Nanoseconds---------- ---------- Pass**
- **Vibration**
  - **No Damage---------- ---------- Pass**
  - **50 Nanoseconds---------- ---------- Pass**

DATA SUMMARIES

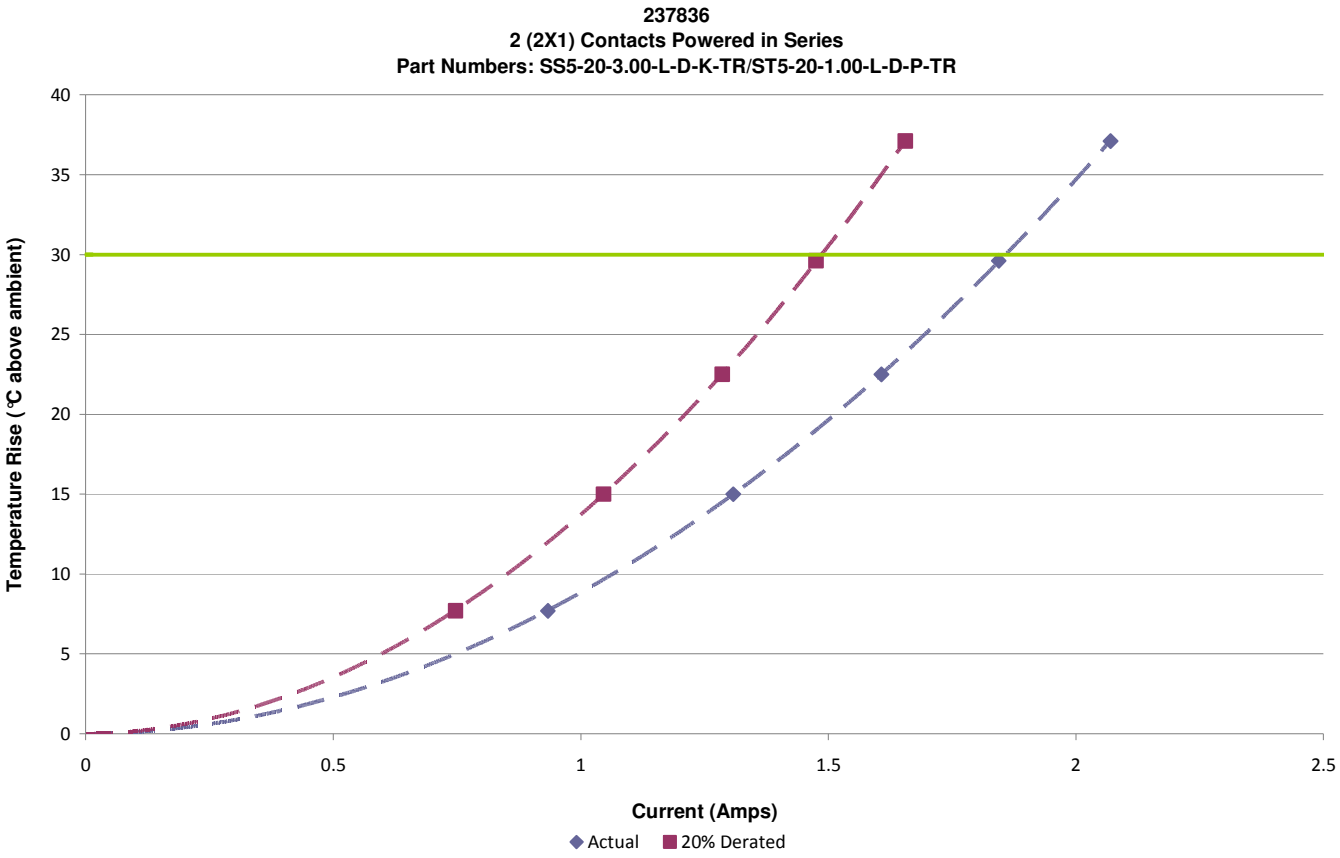
TEMPERATURE RISE (Current Carrying Capacity, CCC):

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

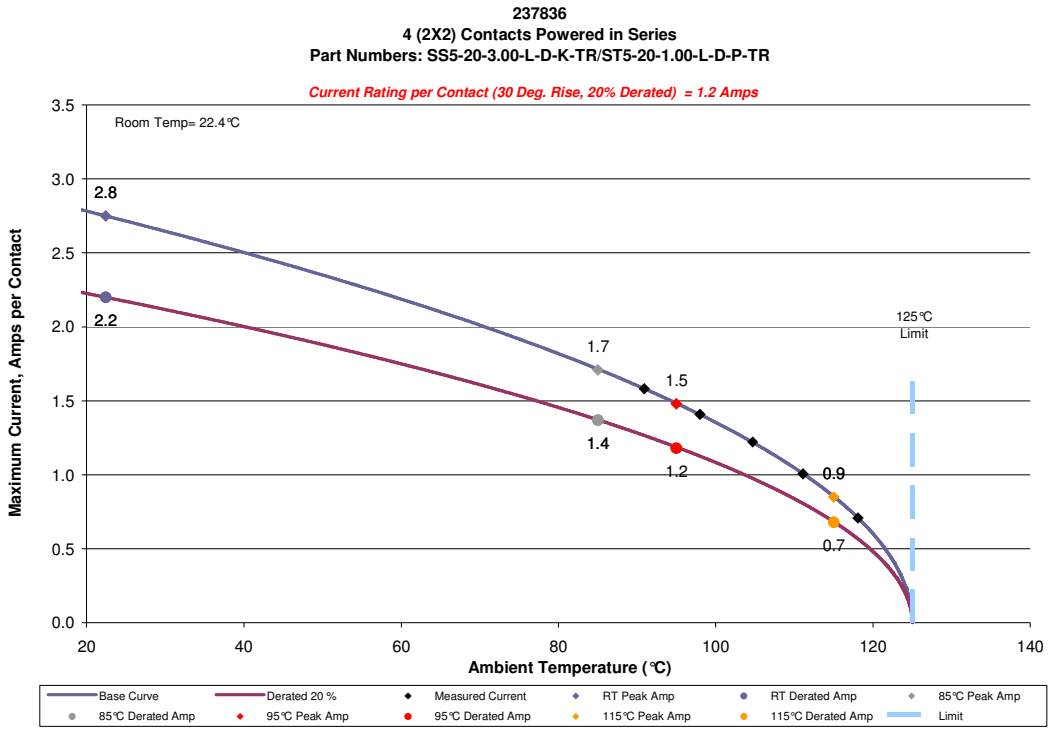


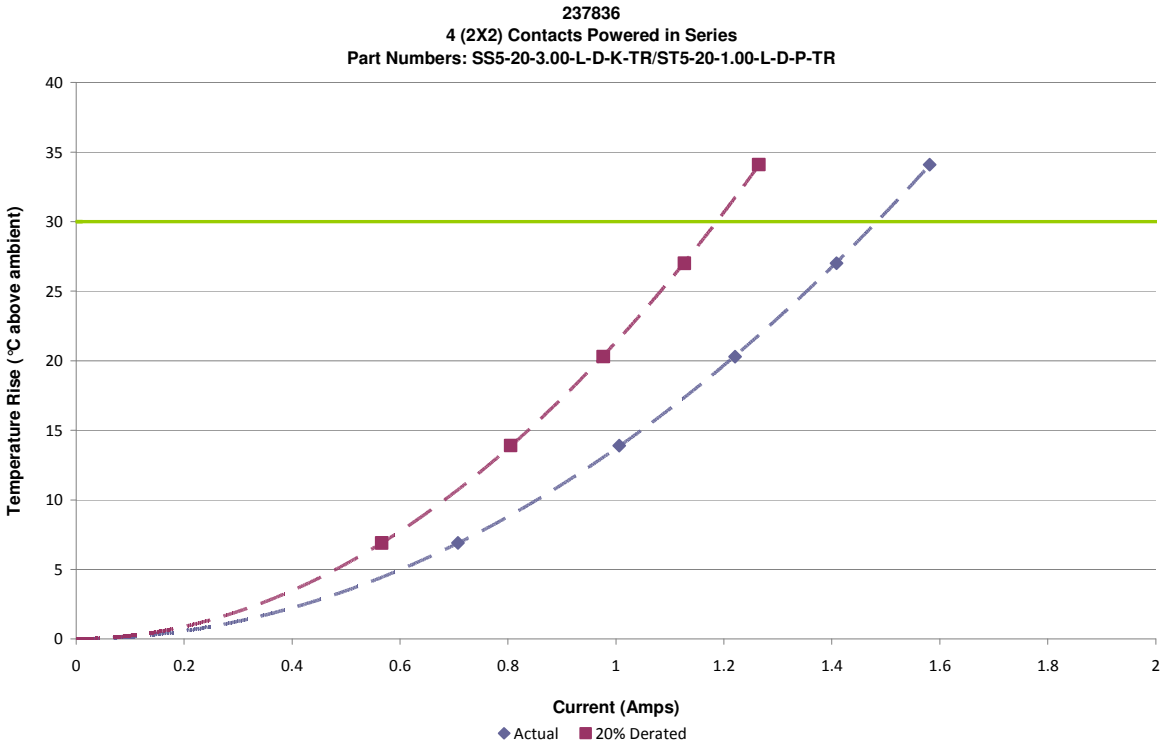
DATA SUMMARIES Continued



DATA SUMMARIES Continued

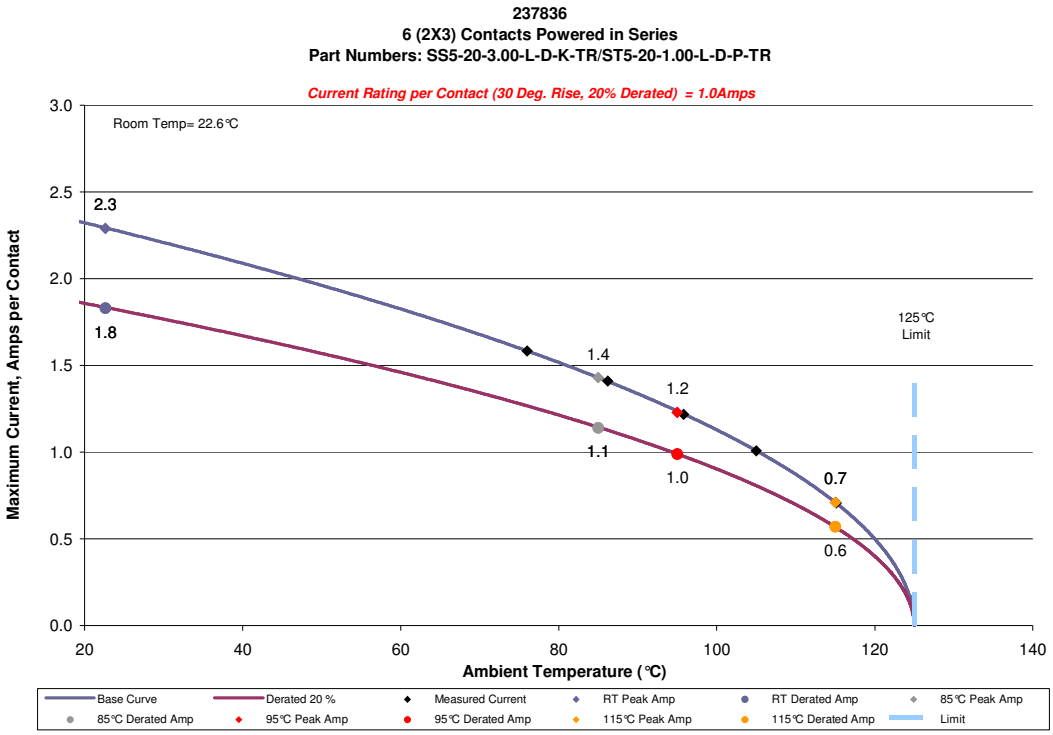
b. Linear configuration with 4 adjacent conductors/contacts powered

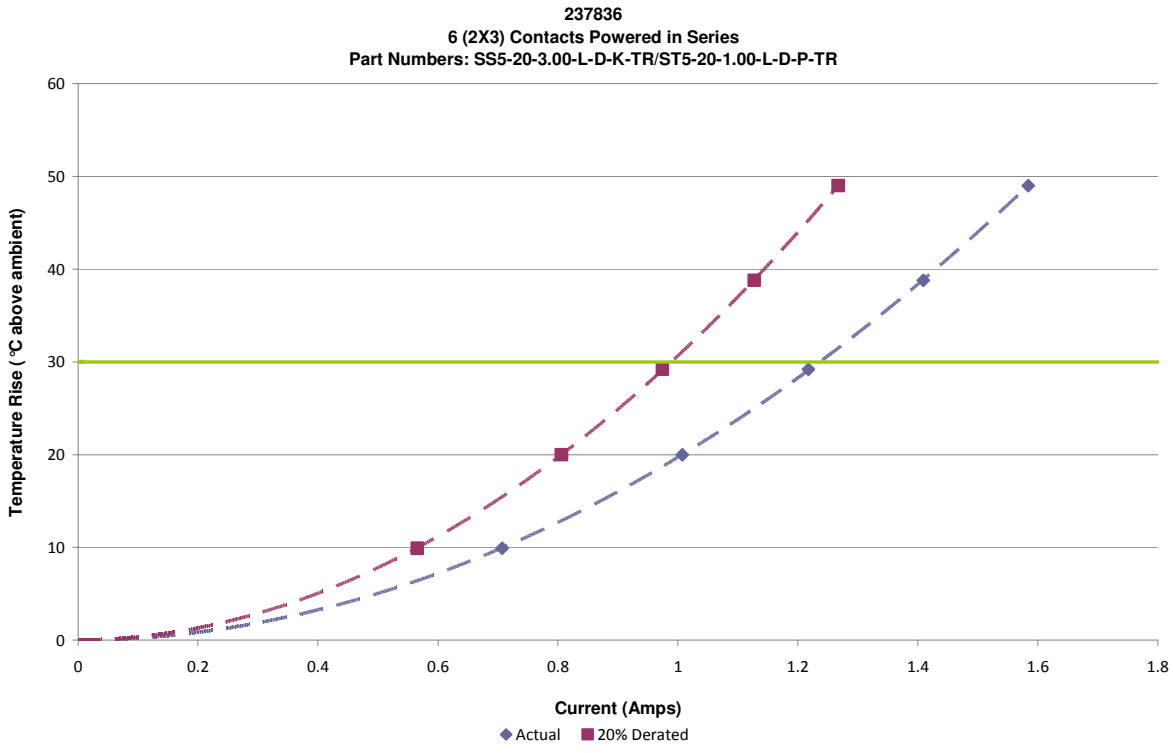




DATA SUMMARIES Continued

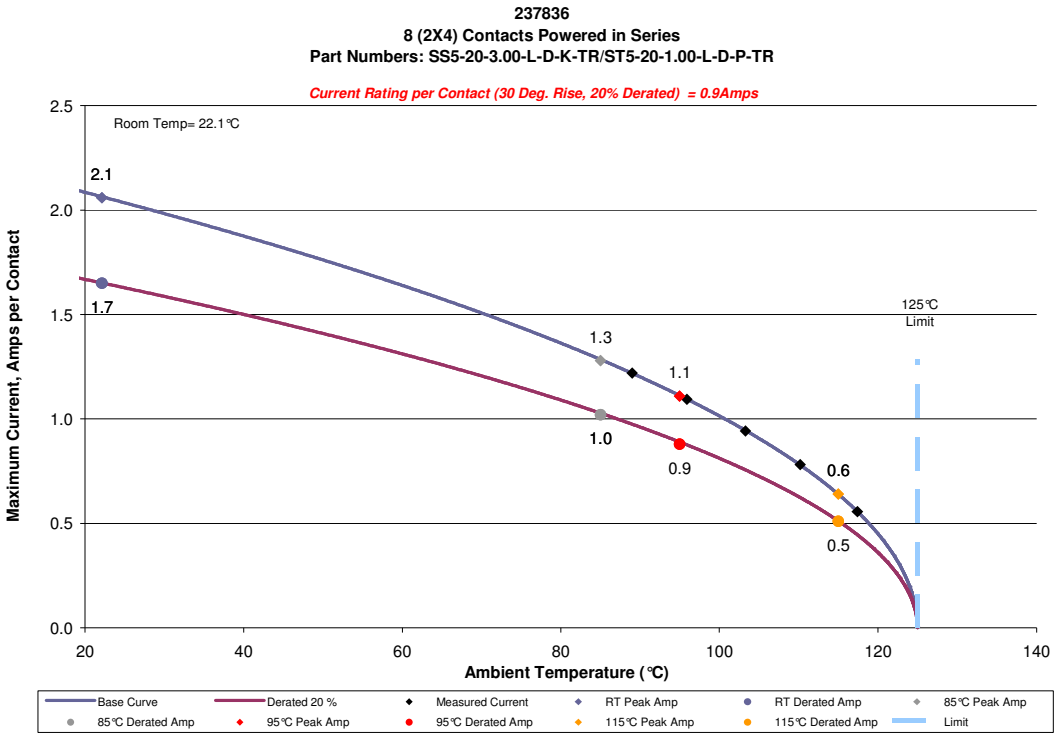
c. Linear configuration with 6 adjacent conductors/contacts powered

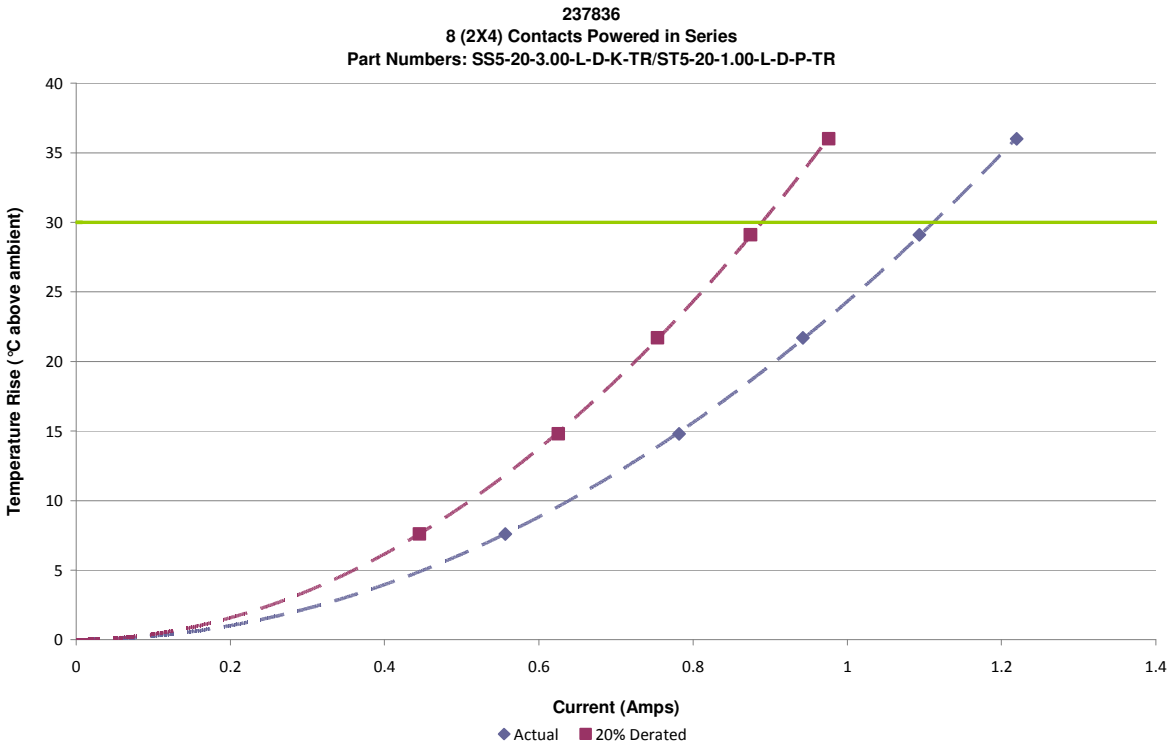




DATA SUMMARIES Continued

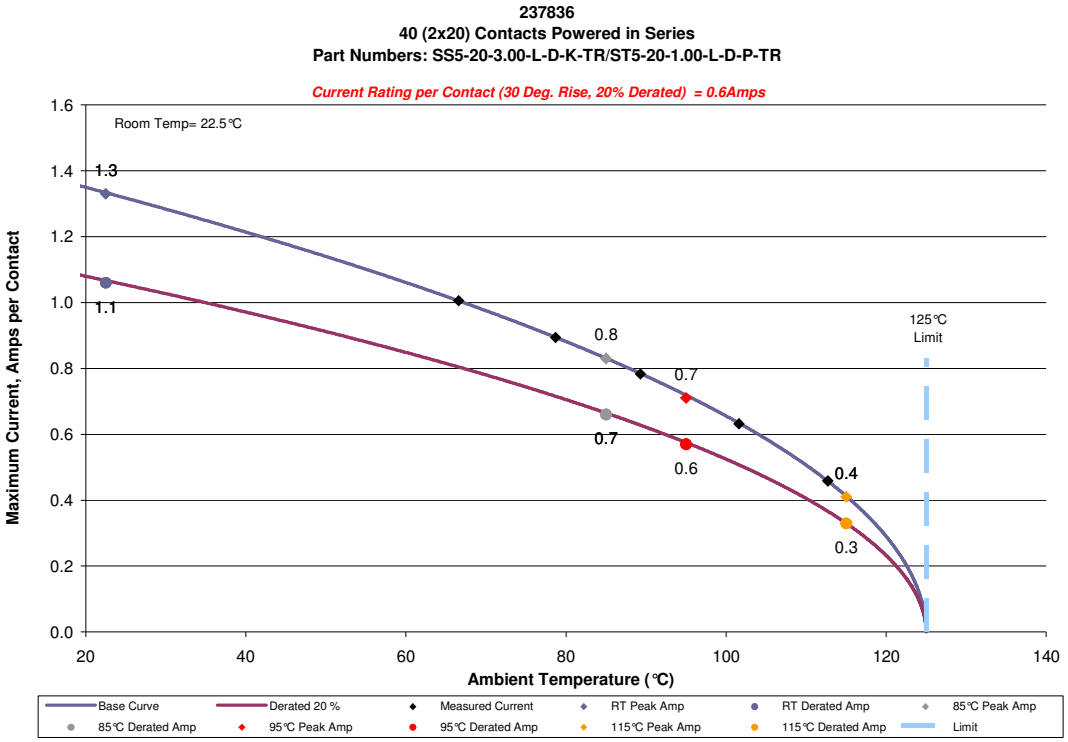
d. Linear configuration with 8 adjacent conductors/contacts powered

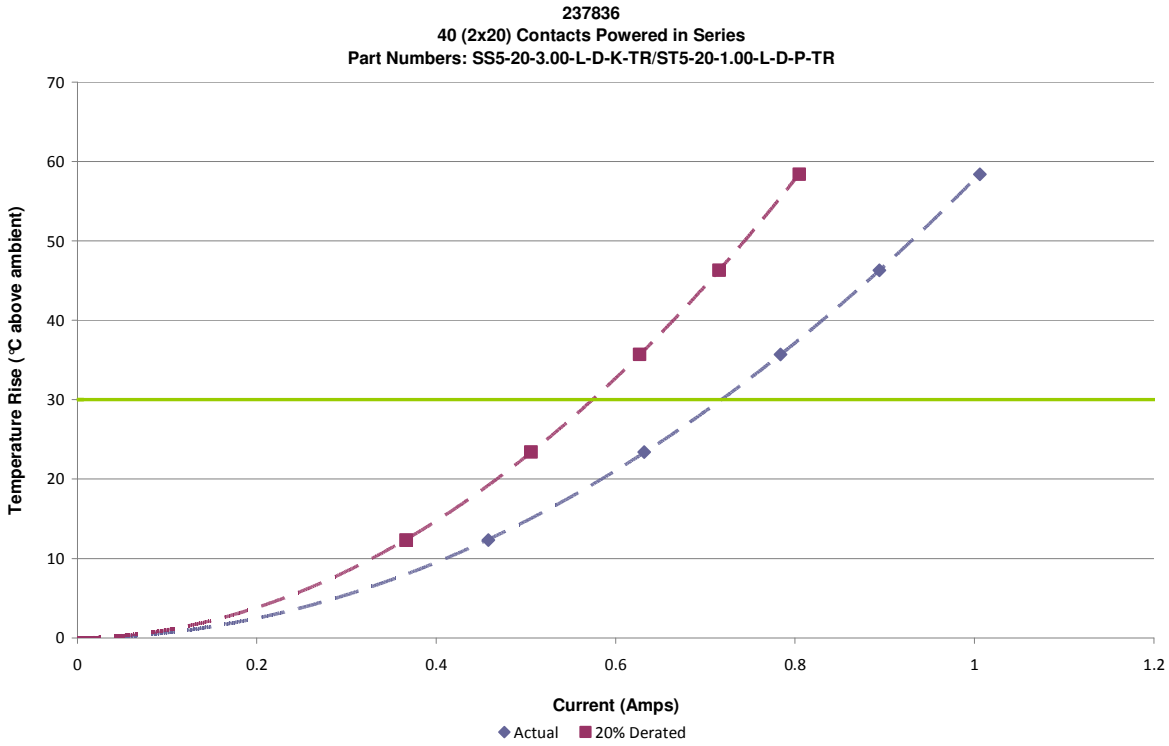




DATA SUMMARIES Continued

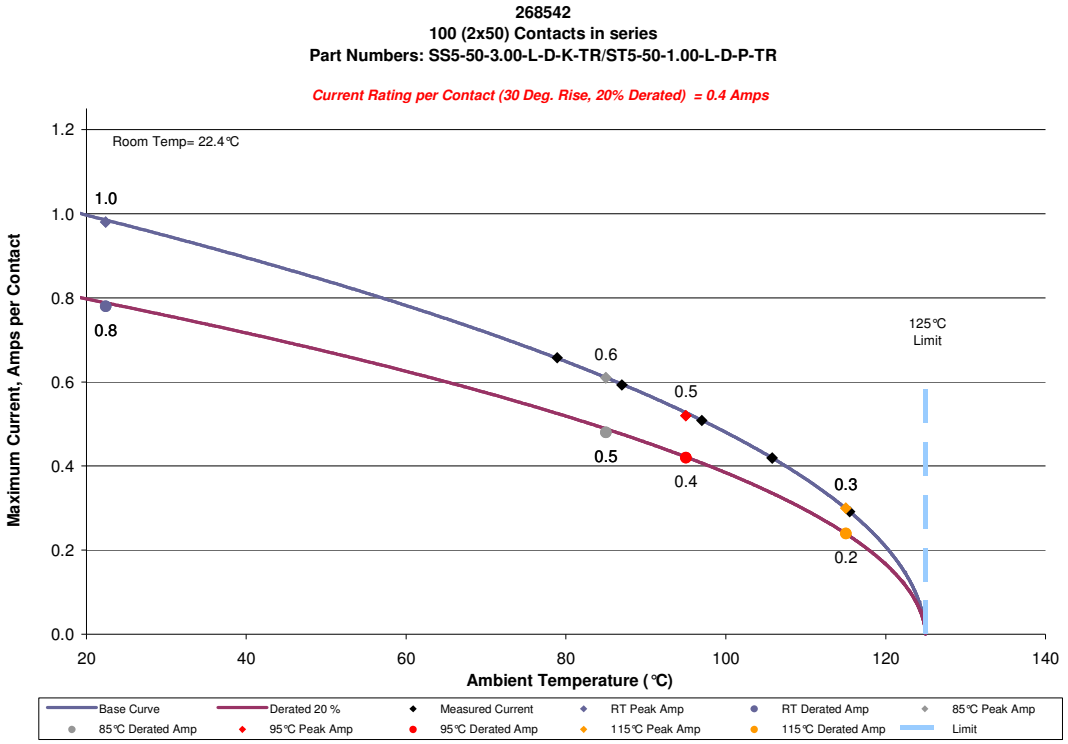
e. Linear configuration with 40 adjacent conductors/contacts powered

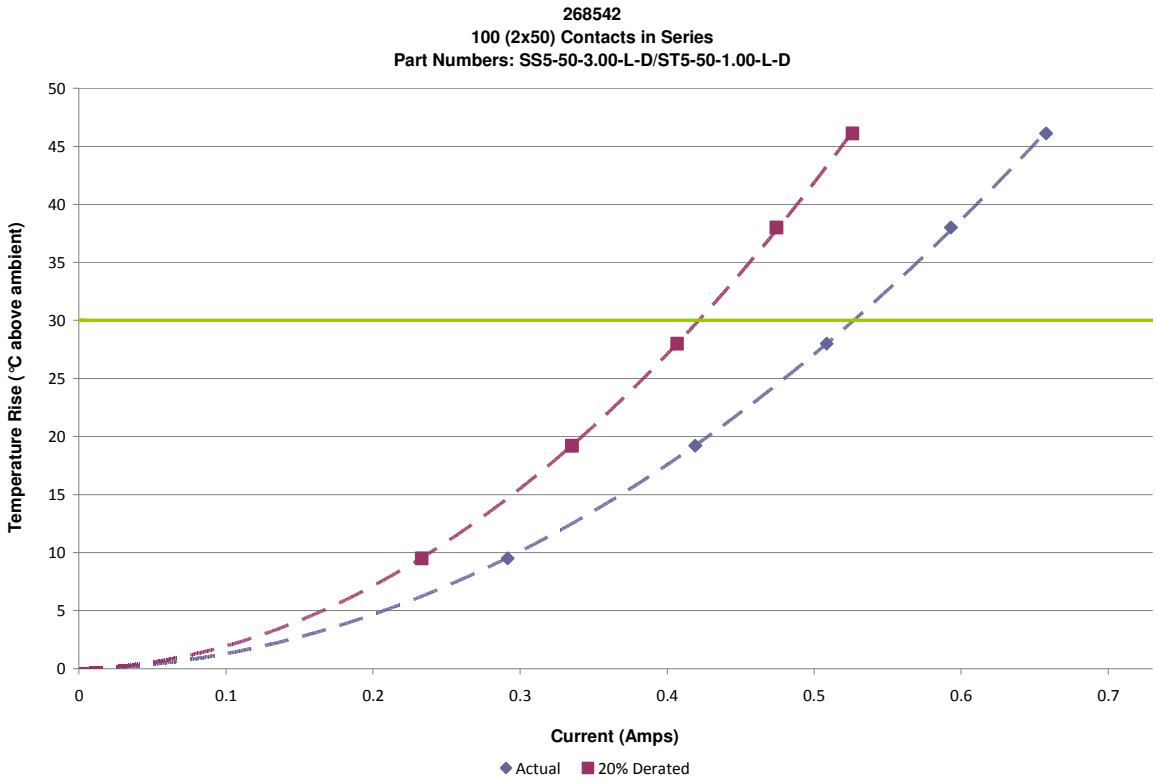




DATA SUMMARIES Continued

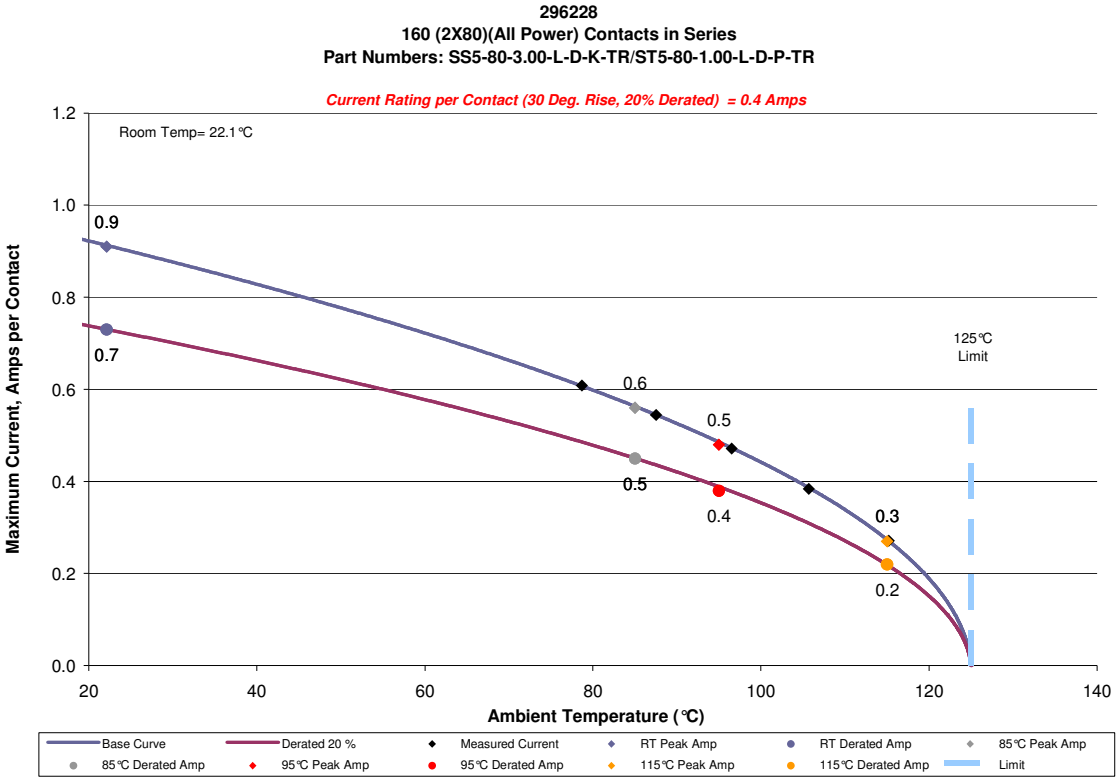
f. Linear configuration with 100 adjacent conductors/contacts powered

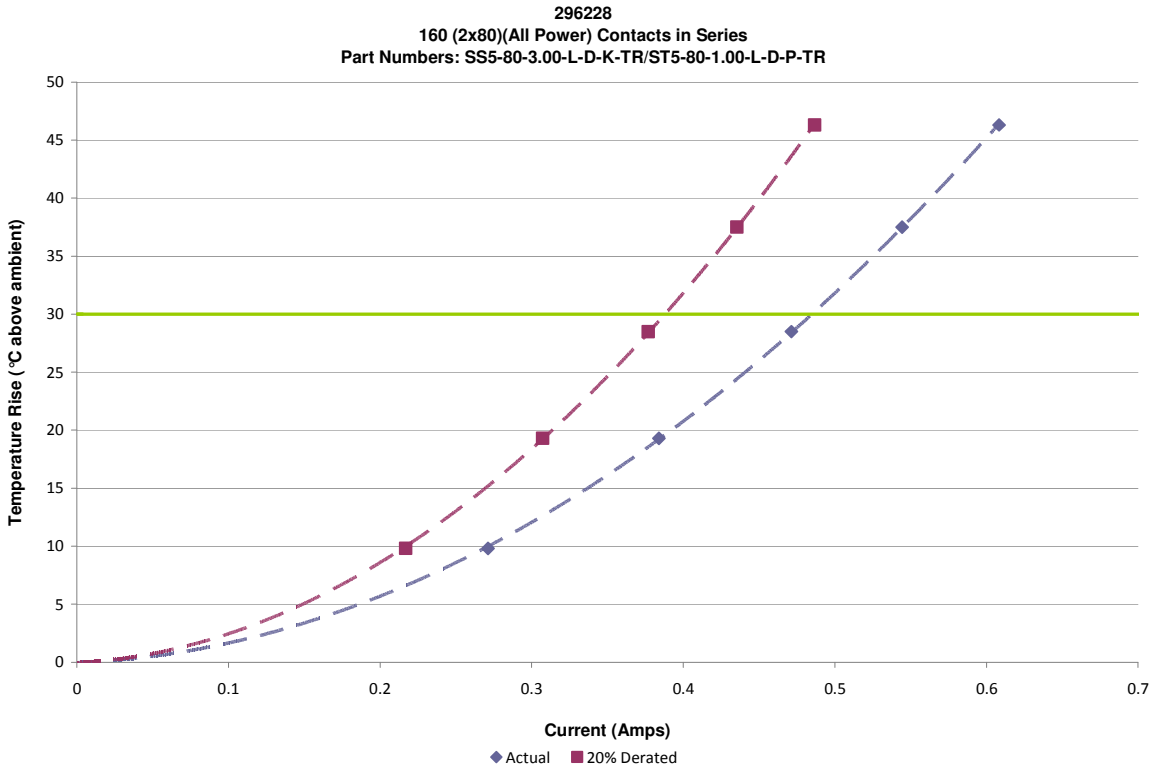




DATA SUMMARIES Continued

g. Linear configuration with all adjacent conductors/contacts powered





DATA SUMMARIES Continued

Mating/Unmating Force:

Thermal Aging Group

SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR

	Initial				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	11.43	2.57	7.16	1.61	7.47	1.68	6.76	1.52
Maximum	15.12	3.40	8.67	1.95	9.56	2.15	7.83	1.76
Average	13.38	**3.01**	7.97	**1.79**	8.41	**1.89**	7.39	**1.66**
St Dev	1.26	0.28	0.60	0.13	0.71	0.16	0.36	0.08
Count	8	8	8	8	8	8	8	8

Mating/Unmating Durability Group

SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR

	Initial				25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	10.32	2.32	6.18	1.39	11.12	2.50	7.92	1.78
Maximum	13.48	3.03	8.27	1.86	13.21	2.97	10.50	2.36
Average	11.46	**2.58**	7.03	**1.58**	12.39	**2.79**	9.10	**2.05**
St Dev	1.01	0.23	0.76	0.17	0.82	0.18	1.03	0.23
Count	8	8	8	8	8	8	8	8
	50 Cycles				75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	11.88	2.67	9.34	2.10	12.90	2.90	10.05	2.26
Maximum	13.97	3.14	12.19	2.74	15.12	3.40	12.81	2.88
Average	13.17	**2.96**	10.69	**2.40**	14.19	**3.19**	11.39	**2.56**
St Dev	0.76	0.17	1.07	0.24	0.71	0.16	0.99	0.22
Count	8	8	8	8	8	8	8	8
	100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	13.70	3.08	10.81	2.43	7.22	1.62	4.63	1.04
Maximum	15.97	3.59	13.79	3.10	8.92	2.01	7.96	1.79
Average	14.83	**3.33**	11.87	**2.67**	7.95	**1.79**	6.43	**1.45**
St Dev	0.75	0.17	1.12	0.25	0.51	0.12	1.17	0.26
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

Mating/Unmating Force:

Mating/Unmating Durability Group

SS5-50-3.00-L-D-K-TR/ST5-50-1.00-L-D-P-TR

	Initial				25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	31.67	7.12	14.95	3.36	29.53	6.64	18.10	4.07
Maximum	39.59	8.90	18.82	4.23	38.43	8.64	23.00	5.17
Average	34.61	**7.78**	17.36	**3.90**	32.39	**7.28**	19.91	**4.48**
St Dev	2.32	0.52	1.67	0.38	2.68	0.60	1.55	0.35
Count	8	8	8	8	8	8	8	8

	50 Cycles				75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	30.82	6.93	20.68	4.65	32.47	7.30	22.06	4.96
Maximum	40.21	9.04	25.53	5.74	42.79	9.62	26.69	6.00
Average	34.08	**7.66**	22.39	**5.03**	36.03	**8.10**	24.13	**5.43**
St Dev	2.95	0.66	1.56	0.35	3.28	0.74	1.67	0.38
Count	8	8	8	8	8	8	8	8

	100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	33.89	7.62	23.00	5.17	17.39	3.91	11.03	2.48
Maximum	44.70	10.05	27.62	6.21	24.15	5.43	15.52	3.49
Average	37.85	**8.51**	25.46	**5.73**	20.37	**4.58**	13.13	**2.95**
St Dev	3.41	0.77	1.68	0.38	2.11	0.47	1.34	0.30
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

Mating/Unmating Force:

Mating/Unmating Durability Group

SS5-80-3.00-L-D-K-TR/ST5-80-1.00-L-D-P-TR

	Initial				25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	49.51	11.13	26.95	6.06	49.95	11.23	29.18	6.56
Maximum	58.85	13.23	40.48	9.10	57.38	12.90	43.10	9.69
Average	54.00	**12.14**	32.43	**7.29**	53.03	**11.92**	35.87	**8.06**
St Dev	3.30	0.74	5.07	1.14	2.37	0.53	4.95	1.11
Count	8	8	8	8	8	8	8	8

	50 Cycles				75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	50.26	11.30	32.29	7.26	52.44	11.79	35.27	7.93
Maximum	59.02	13.27	47.15	10.60	63.03	14.17	48.79	10.97
Average	54.42	**12.23**	39.42	**8.86**	57.66	**12.96**	42.31	**9.51**
St Dev	3.04	0.68	4.88	1.10	3.95	0.89	4.71	1.06
Count	8	8	8	8	8	8	8	8

	100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	54.22	12.19	37.19	8.36	49.51	11.13	26.95	6.06
Maximum	66.63	14.98	52.98	11.91	58.85	13.23	40.48	9.10
Average	60.64	**13.63**	44.19	**9.93**	54.00	**12.14**	32.43	**7.29**
St Dev	4.31	0.97	4.96	1.12	3.30	0.74	5.07	1.14
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

Mating/Unmating Force:

Mating/Unmating Basic Group

SS5-10-3.00-L-D-K-TR/ST5-10-1.00-L-D-P-TR

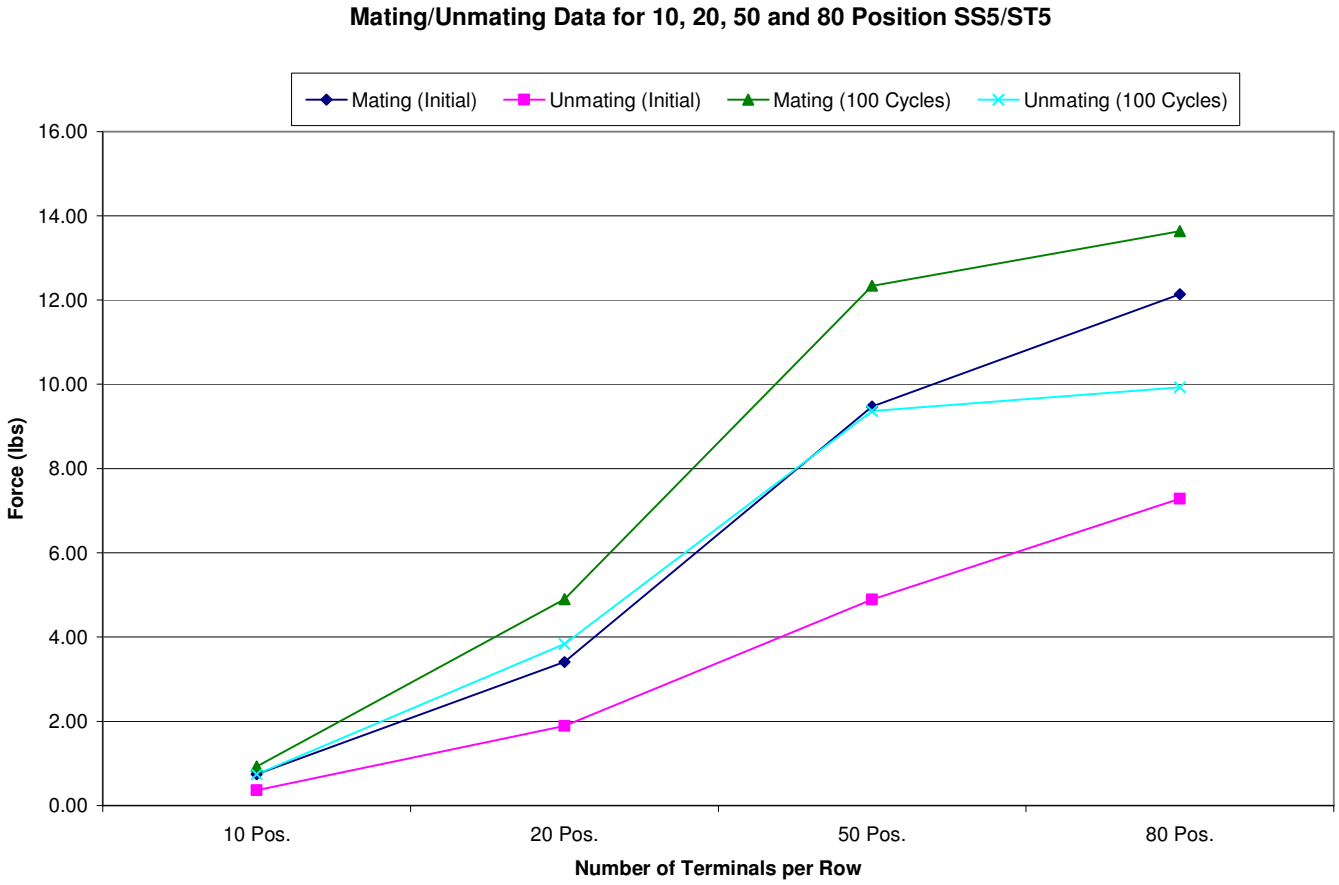
	Initial				25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	6.23	1.40	2.98	0.67	5.60	1.26	3.96	0.89
Maximum	8.14	1.83	4.00	0.90	7.52	1.69	5.03	1.13
Average	6.80	**1.53**	3.73	**0.84**	6.59	**1.48**	4.45	**1.00**
St Dev	0.60	0.14	0.34	0.08	0.62	0.14	0.41	0.09
Count	8	8	8	8	8	8	8	8

	50 Cycles				75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	5.87	1.32	4.71	1.06	6.81	1.53	5.20	1.17
Maximum	8.36	1.88	5.74	1.29	8.90	2.00	6.00	1.35
Average	6.96	**1.57**	5.13	**1.15**	7.61	**1.71**	5.65	**1.27**
St Dev	0.79	0.18	0.37	0.08	0.75	0.17	0.35	0.08
Count	8	8	8	8	8	8	8	8

	100 Cycles			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	7.21	1.62	5.52	1.24
Maximum	9.43	2.12	6.81	1.53
Average	8.14	**1.83**	5.96	**1.34**
St Dev	0.69	0.16	0.44	0.10
Count	8	8	8	8

DATA SUMMARIES Continued

Mating\Unmating Force Comparison



DATA SUMMARIES Continued

NORMAL FORCE (FOR CONTACTS TESTED IN 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										
	0.0009	**0.0018**	**0.0027**	**0.0036**	**0.0045**	**0.0054**	**0.0063**	**0.0072**	**0.0081**	**0.0090**	***SET***
Averages	10.25	20.87	31.42	41.74	51.75	61.03	69.27	76.28	81.78	85.72	0.0017
Min	9.40	19.80	29.10	38.60	48.30	56.70	64.40	71.30	77.80	82.20	0.0016
Max	10.90	22.10	32.80	43.30	53.90	63.50	71.70	78.30	83.60	87.40	0.0022
St. Dev	0.465	0.826	1.179	1.611	1.952	2.373	2.518	2.474	1.974	1.721	0.0002
Count	10	10	10	10	10	10	10	10	10	10	10

After Thermals	Deflections in inches Forces in Grams										
	0.0009	**0.0018**	**0.0027**	**0.0036**	**0.0045**	**0.0054**	**0.0063**	**0.0072**	**0.0081**	**0.0090**	***SET***
Averages	0.00	0.00	2.21	13.42	24.67	35.98	47.23	58.69	70.13	80.71	0.0027
Min	0.00	0.00	0.00	11.60	22.20	32.90	43.80	54.60	65.50	74.90	0.0025
Max	0.00	0.00	6.10	15.70	27.00	39.00	50.40	62.40	74.40	85.20	0.0030
St. Dev	0.000	0.000	2.111	1.703	1.645	2.213	2.456	2.935	3.554	3.763	0.0002
Count	10	10	10	10	10	10	10	10	10	10	10

DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**SS5/ST5**	**SS5**	**ST5**
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

	Row to Row		
	Mated	Unmated	Unmated
Minimum	**SS5/ST5**	**SS5**	**ST5**
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**SS5/ST5**
Break Down Voltage	800
Test Voltage	600
Working Voltage	200

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

DATA SUMMARIES Continued

LLCR Thermal Aging Group (SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR)

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 +2000 mOhms ---------- Unstable
   f. >+2000 mOhms: ---------- Open Failure

	LLCR Measurement Summaries by Pin Type	
Date	1/30/2013	2/14/2013
Room Temp (Deg C)	22	22
Rel Humidity (%)	42	31
Technician	Aaron McKim	Aaron McKim
mOhm values	**Actual Initial**	**Delta Thermal**
	Pin Type 1: Signal	
Average	19.36	1.15
St. Dev.	0.76	1.34
Min	17.62	0.00
Max	21.87	8.79
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	**188**	**4**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Mating/Unmating Durability Group (SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR)

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 +2000 mOhms ---------- Unstable
   f. > +2000 mOhms: ---------- Open Failure

LLCR Measurement Summaries by Pin Type				
Date	1/30/2013	2/8/2013	2/19/2013	3/1/2013
Room Temp (Deg C)	22	22	22	23
Rel Humidity (%)	39	32	31	31
Technician	Aaron McKim	Aaron McKim	Aaron McKim	Troy Cook
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Signal			
Average	20.06	0.68	0.81	0.78
St. Dev.	0.81	0.57	0.60	0.60
Min	18.20	0.00	0.00	0.01
Max	22.33	2.63	3.02	2.70
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**
100 Cycles	**192**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**192**	**0**	**0**	**0**	**0**	**0**
Humidity	**192**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Mating/Unmating Durability Group (SS5-50-3.00-L-D-K-TR/ST5-50-1.00-L-D-P-TR)

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 +2000 mOhms ---------- Unstable
   f. > +2000 mOhms: ---------- Open Failure

	LLCR Measurement Summaries by Pin Type			
Date	2013-8-14	2013-8-21	2013-8-26	2013-9-5
Room Temp (Deg C)	22	22	20	22
Rel Humidity (%)	52	51	52	52
Technician	Tony Wagoner	Tony Wagoner	Tony Wagoner	Tony Wagoner
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Signal			
Average	19.75	0.89	0.83	0.92
St. Dev.	0.62	0.77	0.78	1.02
Min	18.31	0.01	0.00	0.00
Max	21.46	4.39	5.71	7.35
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**
100 Cycles	**192**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**191**	**1**	**0**	**0**	**0**	**0**
Humidity	**189**	**3**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Mating/Unmating Durability Group (SS5-80-3.00-L-D-K-TR/ST5-80-1.00-L-D-P-TR)

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 +2000 mOhms ---------- Unstable
   f. > +2000 mOhms: ---------- Open Failure

LLCR Measurement Summaries by Pin Type				
Date	2014-1-17	2014-1-30	2014-2-4	2014-2-17
Room Temp (Deg C)	22	24	23	23
Rel Humidity (%)	37	30	32	33
Technician	Tony Wagoner	Tony Wagoner	Tony Wagoner	Tony Wagoner
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Signal			
Average	19.73	0.92	0.75	0.90
St. Dev.	0.58	1.06	0.80	0.96
Min	18.39	0.01	0.01	0.00
Max	21.51	7.51	7.22	8.13
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**
100 Cycles	**189**	**3**	**0**	**0**	**0**	**0**
Therm Shck	**191**	**1**	**0**	**0**	**0**	**0**
Humidity	**190**	**2**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Gas Tight Group (SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR)

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 +2000 mOhms: ---------- Unstable
   f. >+2000 mOhms:---------- Open Failure

	LLCR Measurement Summaries by Pin Type	
Date	1/25/2013	1/29/2013
Room Temp (Deg C)	22	22
Rel Humidity (%)	32	37
Technician	Aaron McKim	Aaron McKim
mOhm values	**Actual Initial**	**Delta Acid Vapor**
	Pin Type 1: Signal	
Average	20.07	0.22
St. Dev.	1.05	0.27
Min	15.62	0.00
Max	23.79	2.54
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 (SS5-20-3.00-L-D-K-TR/ST5-20-1.00-L-D-P-TR)

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 +2000 mOhms ---------- Unstable
   f. >+2000 mOhms: ---------- Open Failure

LLCR Measurement Summaries by Pin Type		
Date	1/25/2013	2/27/2013
Room Temp (Deg C)	22	24
Rel Humidity (%)	32	30
Technician	Aaron McKim	Aaron McKim
mOhm values	**Actual Initial**	**Delta Shock-Vib**
	Pin Type 1: Signal	
Average	19.94	0.93
St. Dev.	1.17	1.03
Min	16.38	0.00
Max	24.15	7.02
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	**190**	**2**	**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 #: MO-11
Description: Switch/Multimeter
Manufacturer: Keithley
Model: 3706
Serial #: 120169
Accuracy: See Manual
… Last Cal: 08/21/2013, Next Cal: 08/21/2014

Equipment #: TCT-04
Description: Dillon Quantrol TC2 Test Stand
Manufacturer: Dillon Quantrol
Model: TC2
Serial #: 04-1041-04
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.
… Last Cal: 05/21/2013, Next Cal: 05/21/2014

Equipment #: THC-02
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SE-1000-6-6
Serial #: 31808
Accuracy: See Manual
… Last Cal: 02/16/2013, Next Cal: 02/16/2014

Equipment #: TSC-01
Description: Vertical Thermal Shock Chamber
Manufacturer: Cincinnatti Sub Zero
Model: VTS-3-6-6-SC/AC
Serial #: 10-VT14993
Accuracy: See Manual
… Last Cal: 05/18/2013, Next Cal: 05/18/2014

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 11/30/2012, Next Cal: 11/30/2013

Equipment #: OV-5
Description: Forced Air Oven, 5 Cu. Ft., 120 V
Manufacturer: Sheldon Mfg.
Model: CE5F
Serial #: 02008008
Accuracy: +/- 5 deg. C
… Last Cal: 02/16/2013, Next Cal: 02/16/2014

EQUIPMENT AND CALIBRATION SCHEDULES Continued

Equipment #: MO-09
Description: Multimeter/Switch System (Integra Series)
Manufacturer: Keithley
Model: 2750
Serial #: WDC-874817
Accuracy: See Manual
… Last Cal: 10/20/2013, Next Cal: 10/20/2014

Equipment #: PS-09
Description: 60 V, 50 A DC Power Supply - AutoRanging SO
Manufacturer: Agilent
Model: AT-6032A
Serial #: US38322853
Accuracy: See Manual
… Last Cal: Reference Only, Next Cal: Reference Only

Equipment #: SVC-01
Description: Shock & Vibration Table
Manufacturer: Data Physics
Model: LE-DSA-10-20K
Serial #: 10037
Accuracy: See Manual
… Last Cal: 11/31/2012, Next Cal: 11/31/2013

Equipment #: ACLM-01
Description: Accelerometer
Manufacturer: PCB Piezotronics
Model: 352C03
Serial #: 115819
Accuracy: See Manual
… Last Cal: 07/09/2012, Next Cal: 07/09/2013

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 06/04/2012, Next Cal: 06/04/2013