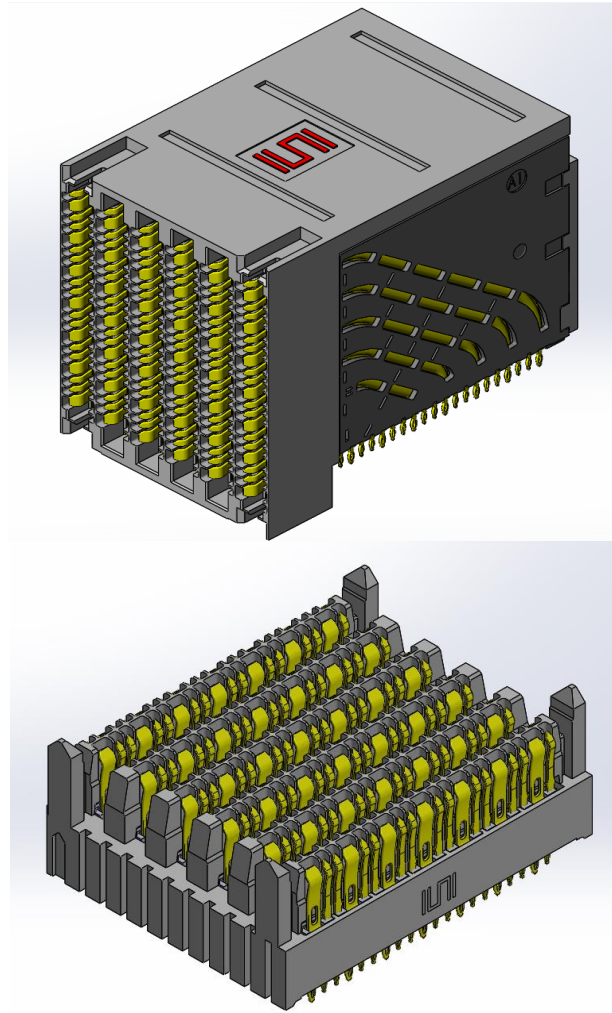




Project Number: Design Qualification Test Report	Tracking Code: 728506_Report_Rev_4
Requested by: Corey Rose	Date: 4/9/2020
Part #: EBTF-6-12-2.0-S-RA-1/ EBTM-6-12-2.0-S-VT-1	Tech: Tony Wagoner
Part description: EBTF/EBTM	Qty to test: 50
Test Start: 12/08/2015	Test Completed: 12/22/2015



DESIGN QUALIFICATION TEST REPORT

EBTF/EBTM

EBTF-6-12-2.0-S-RA-1/ EBTM-6-12-2.0-S-VT-1

Tracking Code: 728506_Report_Rev_3	Part #: EBTF-6-12-2.0-S-RA-1/ EBTM-6-12-2.0-S-VT-1
Part description: EBTF/EBTM	

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
01/19/2016	1	Initial Issue	PC
2/26/2016	2	Updated the force unit.	KH
1/8/2018	3	Updated the CCC description	PC
4/9/2020	4	Updated the CCC charts	PC

CERTIFICATION

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

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SCOPE

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

APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

- 1) All materials were manufactured in accordance with the applicable product specification.
- 2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
- 3) After soldering, the parts to be used for LLCR and DWV/IR testing were cleaned according to TLWI-0001.
- 4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
- 5) The automated procedure is used with aqueous compatible soldering materials.
- 6) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
- 7) Any additional preparation will be noted in the individual test sequences.
- 8) Solder Information: Lead free
- 9) Samtec Test PCBs used: PCB-107218-TST, PCB-107219-TST.

FLOWCHARTS

Gas Tight

Group 1

EBTF-6-12-2.0-S-RA-1

EBTM-6-12-2.0-S-VT-1

8 Assemblies

Tin (IMMERSION) .016" SIG PTH, .022"

GND PTH

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

Normal Force

Group 1

EBTF-6-12-2.0-S-RA-1

8 Contacts Minimum

Signal Without Thermals Wafer A

Step	Description
1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Deflection = 0.0112 " Expected Force at Max Deflection = 100 g

Group 2

EBTF-6-12-2.0-S-RA-1

8 Contacts Minimum

Ground Without Thermals Wafer A

Step	Description
1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "

Group 3

EBTF-6-12-2.0-S-RA-1

8 Contacts Minimum

Signal With Thermals Wafer A

Step	Description
1.	Contact Gaps
2.	Thermal Age ⁽²⁾
3.	Contact Gaps
4.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "

Group 4

EBTF-6-12-2.0-S-RA-1

8 Contacts Minimum

Ground With Thermals Wafer A

Step	Description
1.	Contact Gaps
2.	Thermal Age ⁽²⁾
3.	Contact Gaps
4.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "

Group 5

EBTF-6-12-2.0-S-RA-1

8 Contacts Minimum

Signal Without Thermals Wafer B

Step	Description
1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Deflection = 0.0112 " Expected Force at Max Deflection = 100 g

Group 6

EBTF-6-12-2.0-S-RA-1

8 Contacts Minimum

Ground Without Thermals Wafer B

Step	Description
1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "

Group 7

EBTF-6-12-2.0-S-RA-1

8 Contacts Minimum

Signal With Thermals Wafer B

Step	Description
1.	Contact Gaps
2.	Thermal Age ⁽²⁾
3.	Contact Gaps
4.	Normal Force ⁽¹⁾ Deflection = 0.0112 " Expected Force at Max Deflection = 100 g

Group 8

EBTF-6-12-2.0-S-RA-1

8 Contacts Minimum

Ground With Thermals Wafer B

Step	Description
1.	Contact Gaps
2.	Thermal Age ⁽²⁾
3.	Contact Gaps
4.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "

FLOWCHARTS Continued

<u>Group 9</u>		<u>Group 10</u>		<u>Group 11</u>		<u>Group 12</u>	
EBTM-6-12-2.0-S-VT-1 8 Contacts Minimum Signal Without Thermals Wafer A		EBTM-6-12-2.0-S-VT-1 8 Contacts Minimum Ground Without Thermals Wafer A		EBTM-6-12-2.0-S-VT-1 8 Contacts Minimum Signal With Thermals Wafer A		EBTM-6-12-2.0-S-VT-1 8 Contacts Minimum Ground With Thermals Wafer A	
Step	Description	Step	Description	Step	Description	Step	Description
1.	Contact Gaps	1.	Contact Gaps	1.	Contact Gaps	1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Deflection = 0.0112 " Expected Force at Max Deflection = 100 g	2.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "	2.	Thermal Age ⁽²⁾	2.	Thermal Age ⁽²⁾
				3.	Contact Gaps	3.	Contact Gaps
				4.	Normal Force ⁽¹⁾ Deflection = 0.0112 " Expected Force at Max Deflection = 100 g	4.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "
<u>Group 13</u>		<u>Group 14</u>		<u>Group 15</u>		<u>Group 16</u>	
EBTM-6-12-2.0-S-VT-1 8 Contacts Minimum Signal Without Thermals Wafer B		EBTM-6-12-2.0-S-VT-1 8 Contacts Minimum Ground Without Thermals Wafer B		EBTM-6-12-2.0-S-VT-1 8 Contacts Minimum Signal With Thermals Wafer B		EBTM-6-12-2.0-S-VT-1 8 Contacts Minimum Ground With Thermals Wafer B	
Step	Description	Step	Description	Step	Description	Step	Description
1.	Contact Gaps	1.	Contact Gaps	1.	Contact Gaps	1.	Contact Gaps
2.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "	2.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "	2.	Thermal Age ⁽²⁾	2.	Thermal Age ⁽²⁾
				3.	Contact Gaps	3.	Contact Gaps
				4.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "	4.	Normal Force ⁽¹⁾ Expected Force at Max Deflection = 100 g Deflection = 0.0112 "

(1) Normal Force = EIA-364-04

(2) Thermal Age = EIA-364-17

Test Condition = 4 (105°C)

Time Condition = B (250 Hours)

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

EBTF-6-12-2.0-S-RA-1

EBTM-6-12-2.0-S-VT-1

8 Assemblies

Tin (IMMERSION) .016" SIG PTH, .022"

GND PTH

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

(1) LLCR = EIA-364-23

Open Circuit Voltage = 20 mV Max

Test Current = 100 mA Max

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

FLOWCHARTS Continued**Current Carrying Capacity**

Note: Tin (IMMERSION) .016" SIG PTH, .022" GND PTH

Group 1		Group 2		Group 3	
EBTF-6-12-2.0-S-RA-1		EBTF-6-12-2.0-S-RA-1		EBTF-6-12-2.0-S-RA-1	
EBTM-6-12-2.0-S-VT-1		EBTM-6-12-2.0-S-VT-1		EBTM-6-12-2.0-S-VT-1	
1 Pins Powered		20 Pins Powered		40 Pins Powered	
Signal		Signal		Signal	
Step	Description	Step	Description	Step	Description
1.	CCC ⁽¹⁾ Rows = 1 Number of Positions = 1 Note: Center of connector location	1.	CCC ⁽¹⁾ Rows = 1 Number of Positions = 20 Note: All signal pins combined carry supply while all grounds on that wafer carry return	1.	CCC ⁽¹⁾ Rows = 2 Number of Positions = 20 Note: Center wafer carries supply while adjacent wafer carries return

(1) CCC = EIA-364-70

Method 2, Temperature Rise Versus Current Curve

Mechanical Shock/Random Vibration/LLCR

Group 1
EBTF-6-12-2.0-S-RA-1
EBTM-6-12-2.0-S-VT-1
8 Assemblies
Tin (IMMERSION) .016" SIG PTH, .022"
GND PTH

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

EBTF-6-12-2.0-S-RA-1

EBTM-6-12-2.0-S-VT-1

60 Points

Tin (IMMERSION) .016" SIG PTH, .022"

GND PTH

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:

- 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.

MECHANICAL SHOCK (Specified Pulse):

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

VIBRATION:

- 1) Reference document: EIA-364-28, *Vibration Test Procedure for Electrical Connectors*
- 2) Test Condition V, Letter B
- 3) Power Spectral Density: 0.04 G² / Hz
- 4) G 'RMS': 7.56
- 5) Frequency: 50 to 2000 Hz
- 6) Duration: 2.0 Hours per axis (3 axis total)

NANOSECOND-EVENT DETECTION:

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

LLCR:

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

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
- 2) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
- 3) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
- 4) The size of the temperature probe can affect the measured temperature.
- 5) Copper traces on PC boards will contribute to temperature rise:
 - a. Self heating (resistive)
 - b. Reduction in heat sink capacity affecting the heated contacts
- 6) A de-rating curve, usually 20%, is calculated.
- 7) Calculated de-rated currents at four temperature points are reported:
 - a. Ambient
 - b. 65° C
 - c. 75° C
 - d. 95° 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.

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 TC², 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 TC² software in order to acquire and record the test data.
- 10) The permanent set of each contact shall be measured within the TC² 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.

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. $\leq +5.0$ mOhms: -----Stable
 - b. $+5.1$ to $+10.0$ mOhms:-----Minor
 - c. $+10.1$ to $+15.0$ mOhms: -----Acceptable
 - d. $+15.1$ to $+50.0$ mOhms: -----Marginal
 - e. $+50.1$ to $+2000$ mOhms: -----Unstable
 - f. $>+2000$ 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° C
 - ix. The final LLCR shall be conducted within 1 hour after drying.

RESULTS

Temperature Rise, CCC at a 20% de-rating

- CCC for a 30°C Temperature Rise-----4.3 A with 1 contacts (1x1) powered
(Note: Center of connector location)
- CCC for a 30°C Temperature Rise-----15.4 A with 20 contacts (1x20) powered
(Note: All signal pins combined carry supply while all grounds on that wafer carry return)
- CCC for a 30°C Temperature Rise-----16.7 A with 40 contacts (2x20) powered
(Note: Center wafer carries supply while adjacent wafer carries return)

Mating – Unmating Forces

Mating-Unmating Durability Group

- Initial
 - Mating
 - Min -----13.79 Lbs (61.34 N)
 - Max-----14.48 Lbs (64.39 N)
 - Unmating
 - Min -----7.33 Lbs (32.58 N)
 - Max-----7.95 Lbs (35.37 N)
- After 25 Cycles
 - Mating
 - Min -----14.75 Lbs (65.59 N)
 - Max-----16.10 Lbs (71.60 N)
 - Unmating
 - Min -----8.54 Lbs (38.00 N)
 - Max-----9.08 Lbs (40.39 N)
- After 50 Cycles
 - Mating
 - Min -----15.09 Lbs (67.10 N)
 - Max-----16.25 Lbs (72.27 N)
 - Unmating
 - Min -----8.90 Lbs (39.60 N)
 - Max-----9.47 Lbs (42.11 N)
- After 75 Cycles
 - Mating
 - Min -----15.44 Lbs (68.69 N)
 - Max-----16.31 Lbs (72.56 N)
 - Unmating
 - Min -----9.15 Lbs (40.70 N)
 - Max-----9.80 Lbs (43.59 N)
- After 100 Cycles
 - Mating
 - Min -----15.43 Lbs (68.65 N)
 - Max-----16.22 Lbs (72.13 N)
 - Unmating
 - Min -----9.32 Lbs (41.46 N)
 - Max-----10.03 Lbs (44.62 N)

RESULTS Continued**Normal Force****EBTF-“A” Ground at 0.0112 inch deflection**

- **Initial**
 - Min-----44.30 gf Set ---- 0.0000 in
 - Max-----50.90 gf Set ---- 0.0006 in
- **Thermal**
 - Min-----27.20 gf Set---- 0.0023 in
 - Max-----36.40 gf Set---- 0.0041 in

EBTF-“Bygrounds at 0.0112 inch deflection

- **Initial**
 - Min-----42.60 gf Set ---- 0.0000 in
 - Max-----46.30 gf Set ---- 0.0003 in
- **Thermal**
 - Min-----24.90 gf Set---- 0.0025 in
 - Max-----37.70 gf Set---- 0.0055 in

EBTF-“A” Signal at 0.0112 inch deflection

- **Initial**
 - Min-----59.90 gf Set ---- 0.0002 in
 - Max-----71.00 gf Set ---- 0.0007 in
- **Thermal**
 - Min-----21.70 gf Set---- 0.0051 in
 - Max-----30.20 gf Set---- 0.0067 in

EBTF-“B” Signal at 0.0112 inch deflection

- **Initial**
 - Min-----41.60 gf Set ---- 0.0003 in
 - Max-----47.40 gf Set ---- 0.0009 in
- **Thermal**
 - Min-----17.70 gf Set---- 0.0053 in
 - Max-----25.40 gf Set---- 0.0056 in

EBTM- “A” Ground at 0.0112-inch deflection

- **Initial**
 - Min-----50.50 gf Set ---- 0.0000 in
 - Max-----54.20 gf Set ---- 0.0007 in
- **Thermal**
 - Min-----39.50 gf Set---- 0.0020 in
 - Max-----45.60 gf Set---- 0.0029 in

EBTM- “B” Ground at 0.0112-inch deflection

- **Initial**
 - Min-----48.40 gf Set ---- 0.0001 in
 - Max-----57.00 gf Set ---- 0.0004 in
- **Thermal**
 - Min-----36.40 gf Set---- 0.0024 in
 - Max-----44.90 gf Set---- 0.0038 in

RESULTS Continued**EBTM-“A”Signal at 0.0112 inch deflection**

- Initial
 - Min-----43.10 gf Set ---- 0.0003 in
 - Max-----56.70 gf Set ---- 0.0010 in
- Thermal
 - Min-----28.40 gf Set ---- 0.0031 in
 - Max-----42.00 gf Set ---- 0.0047 in

EBTM-“B”Signal at 0.0112 inch deflection

- Initial
 - Min-----54.40 gf Set ---- 0.0002 in
 - Max-----66.30 gf Set ---- 0.0006 in
- Thermal
 - Min-----30.90 gf Set ---- 0.0039 in
 - Max-----41.90 gf Set ---- 0.0055 in

LLCR Mating/Unmating Durability Group (192 LLCR test points)**Signal-row 1**

- Initial-----8.43 mOhms Max

Signal-row 2

- Initial-----18.28 mOhms Max

Signal-row 3

- Initial-----29.43 mOhms Max

Ground

- Initial-----1.83 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

LLCR Gas Tight Group (192 LLCR test points)**Signal-row 1**

- Initial-----8.70 mOhms Max

Signal-row 2

- Initial-----18.54 mOhms Max

Signal-row 3

- Initial-----29.17 mOhms Max

Ground

- Initial-----1.76 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

RESULTS Continued

LLCR Shock & Vibration Group (192 LLCR test points)

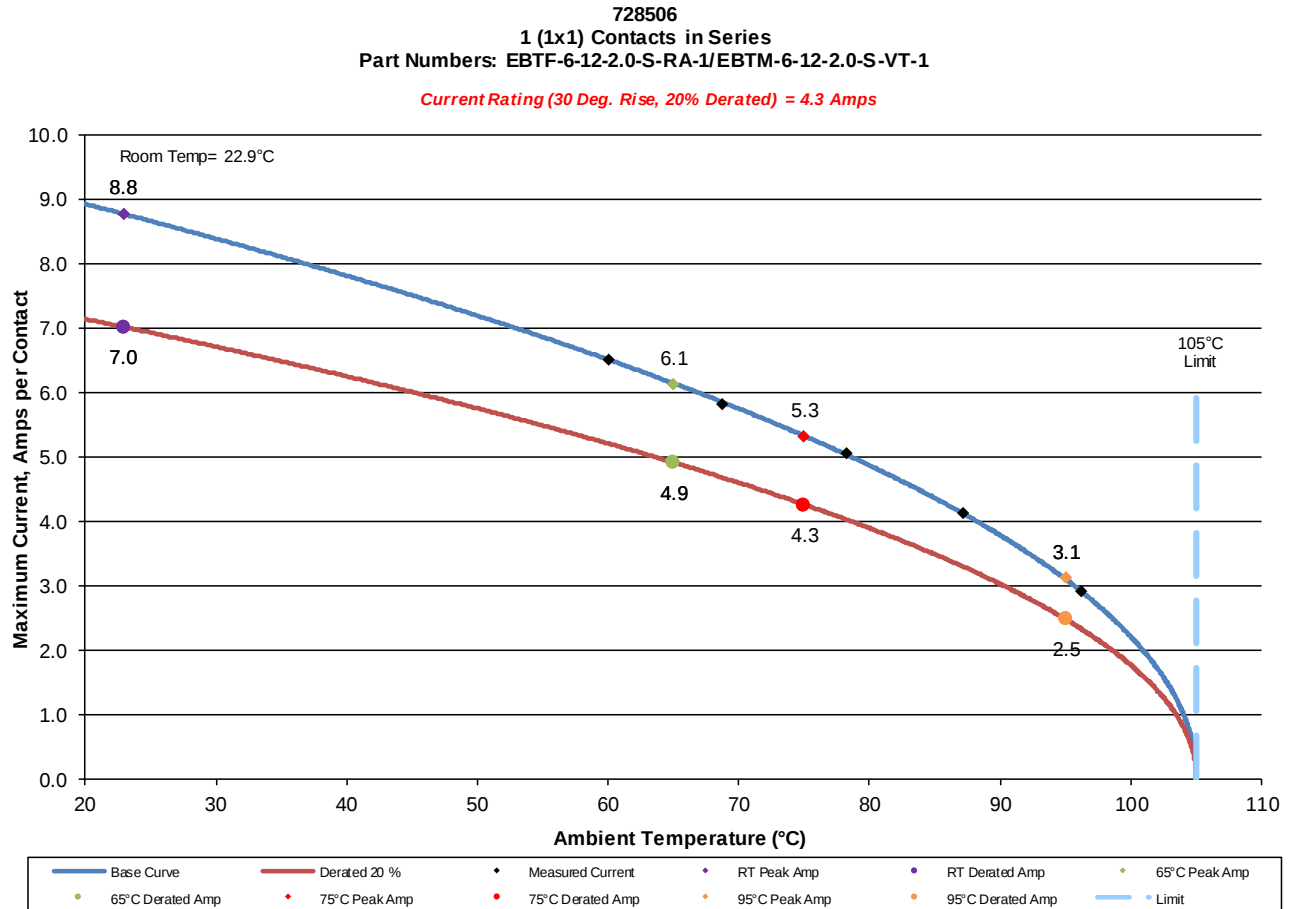
- Signal-row 1
 - Initial -----8.35 mOhms Max
- Signal-row 2
 - Initial ----- 18.37 mOhms Max
- Signal-row 3
 - Initial ----- 29.23 mOhms Max
- Ground
 - Initial -----1.81 mOhms Max
 - Shock &Vibration
 - <= +5.0 mOhms ----- 192 Points ----- Stable
 - +5.1 to +10.0 mOhms -----0 Points ----- Minor
 - +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms -----0 Points ----- Marginal
 - +50.1 to +2000 mOhms-----0 Points ----- Unstable
 - >+2000 mOhms-----0 Points ----- Open Failure

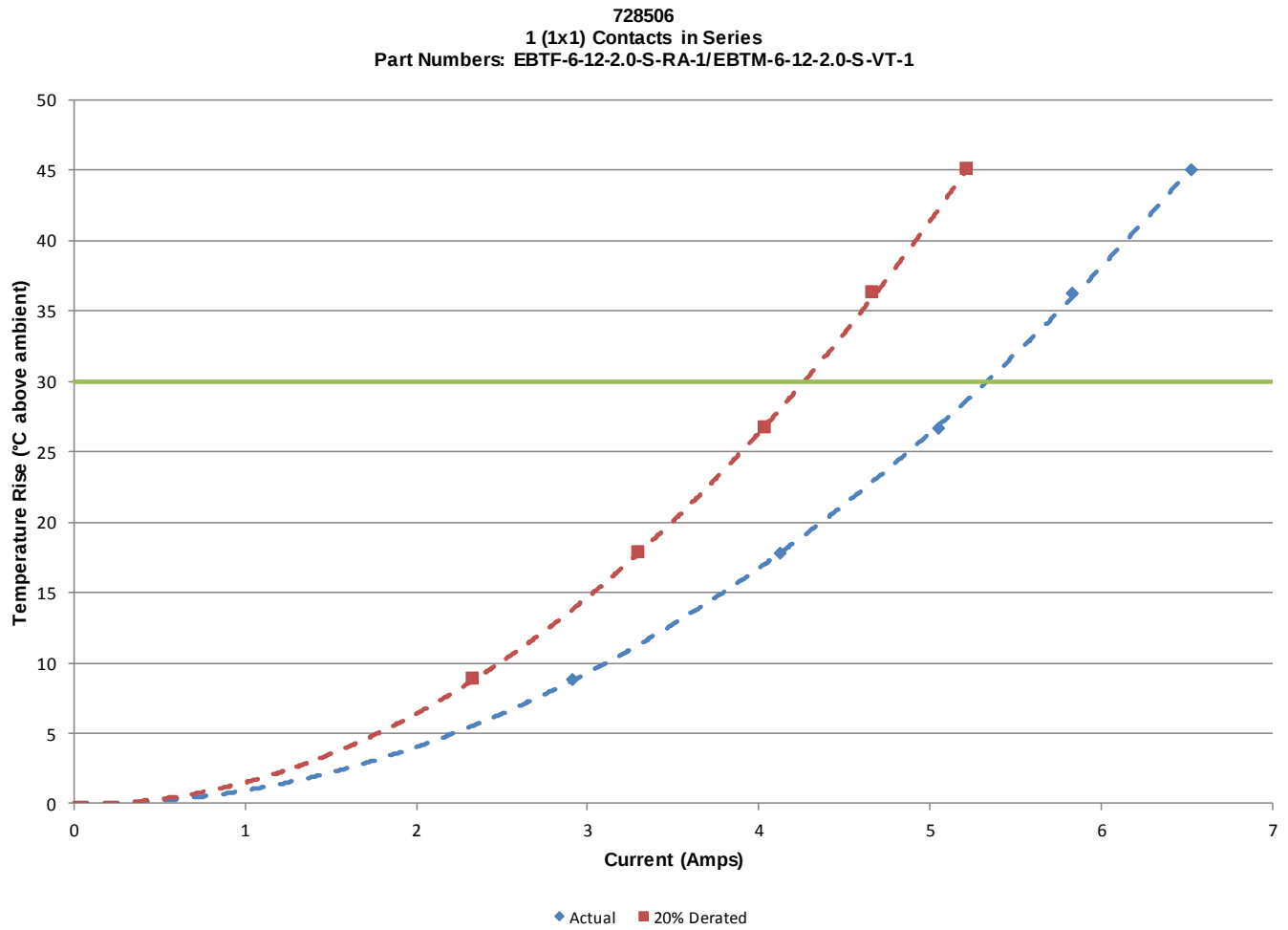
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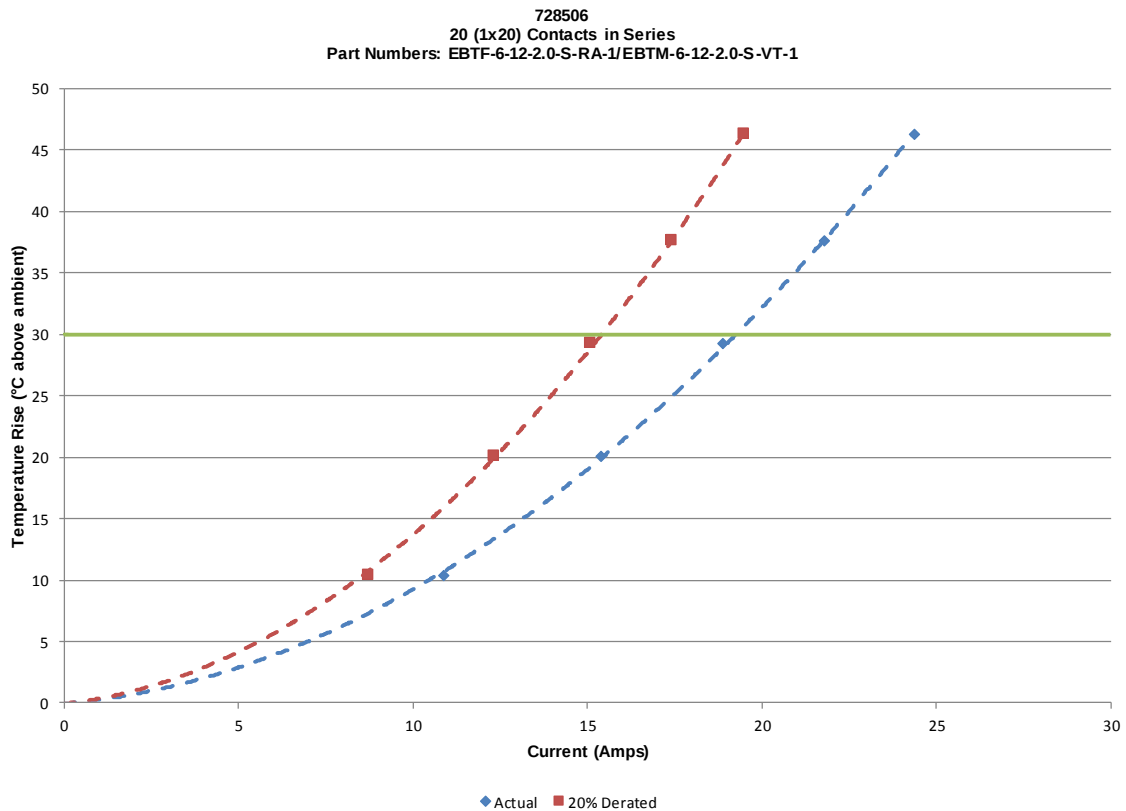
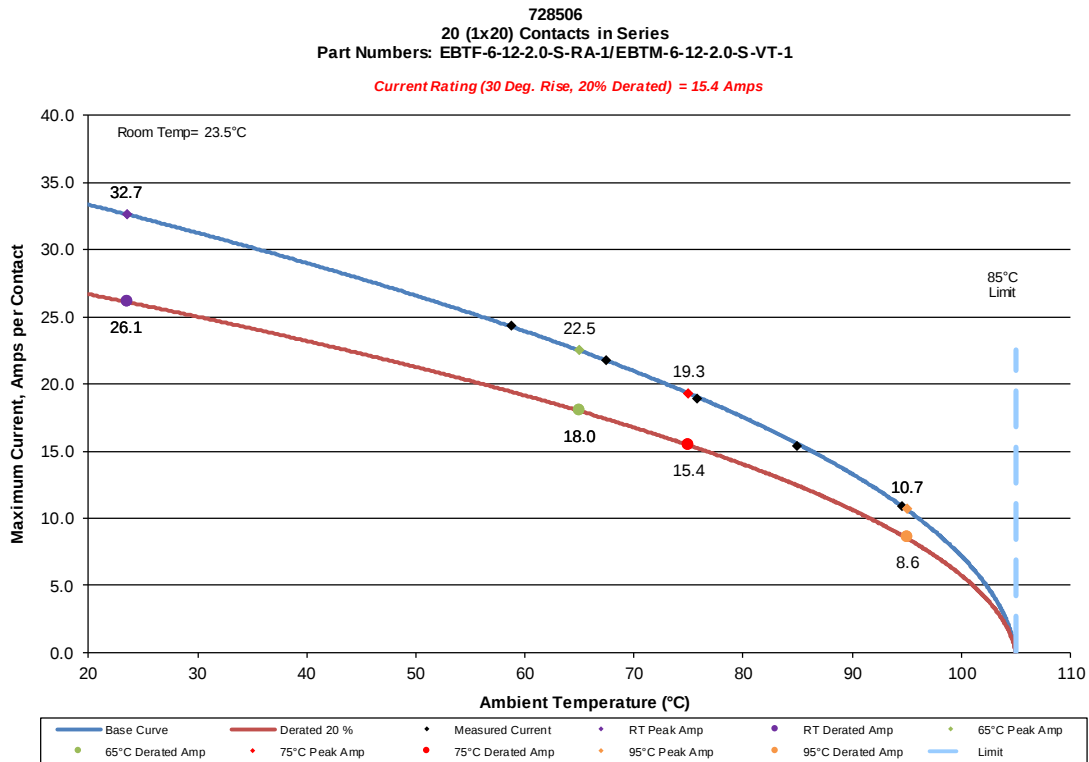
- Shock
 - No Damage----- Pass
 - 50 Nanoseconds----- Pass
- Vibration
 - No Damage----- Pass
 - 50 Nanoseconds----- Pass

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 1 adjacent conductors/contacts powered

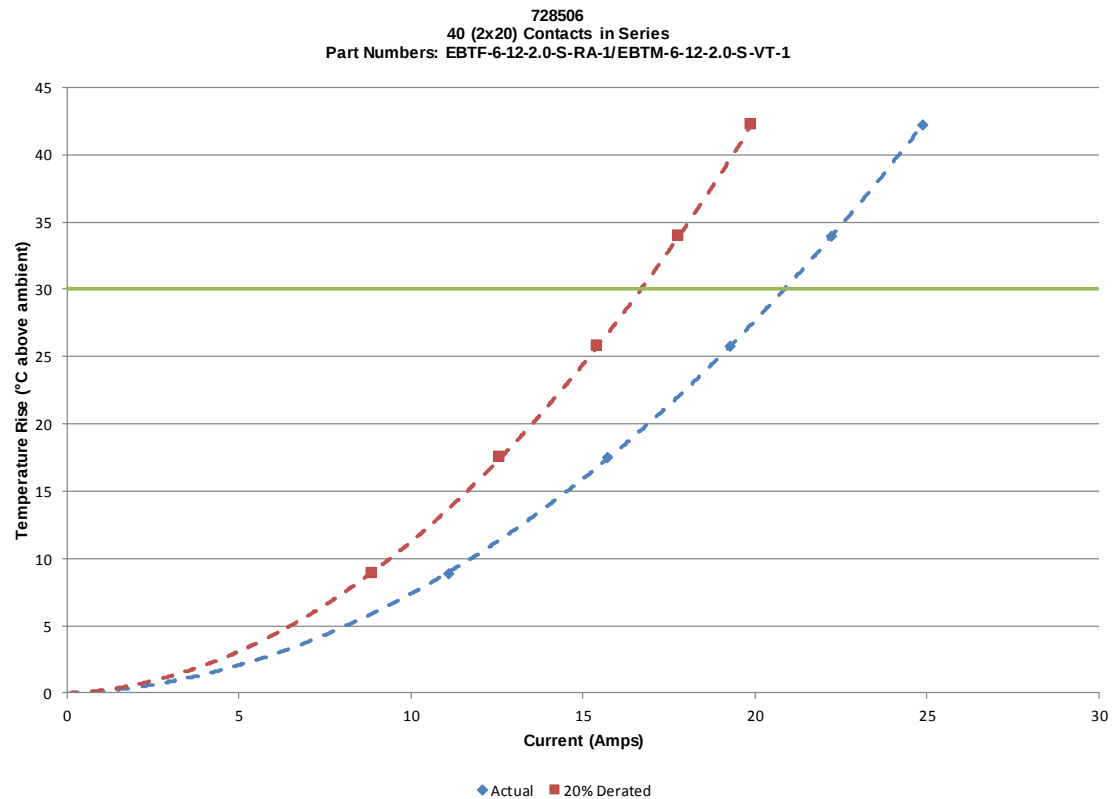
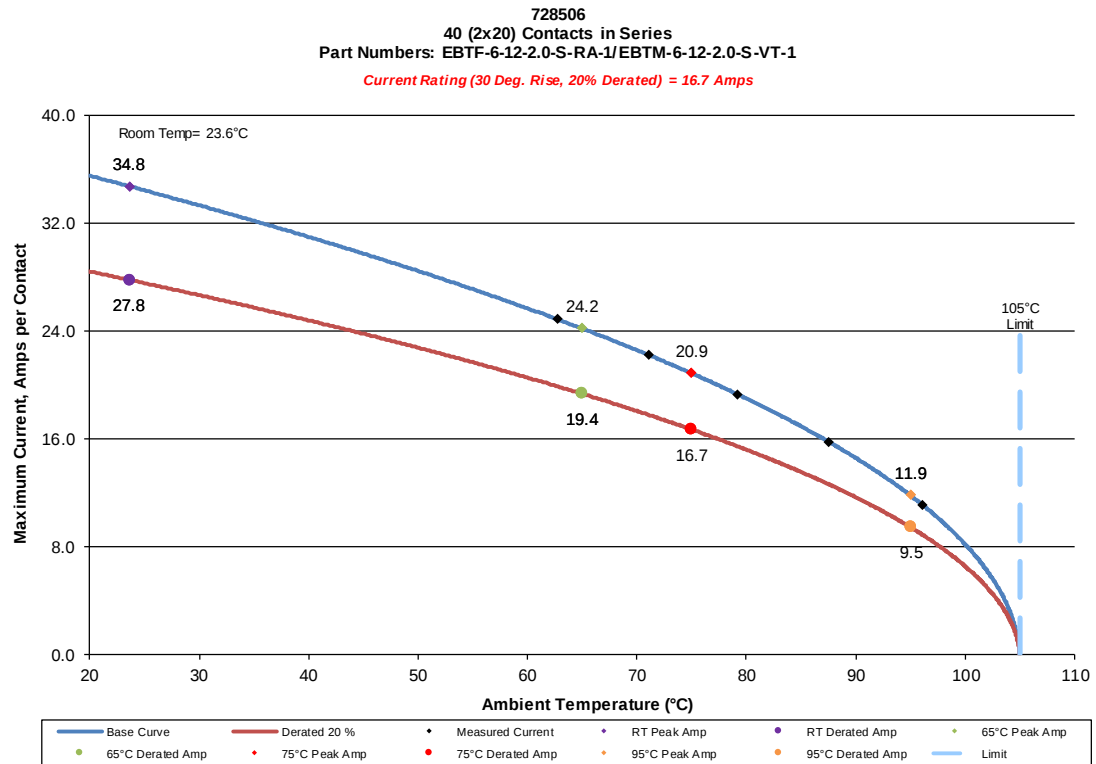


DATA SUMMARIES Continued

DATA SUMMARIES Continued**b. Linear configuration with 20 adjacent conductors/contacts powered**

DATA SUMMARIES Continued

c. Linear configuration with 40 adjacent conductors/contacts powered



DATA SUMMARIES Continued**MATING-UNMATING FORCE:****Mating-Unmating Durability Group**

	Initial				25 Cycles			
	Mating		Unmating		Mating		Unmating	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	61.34	13.79	32.58	7.33	65.59	14.75	38.00	8.54
Maximum	64.39	14.48	35.37	7.95	71.60	16.10	40.39	9.08
Average	63.15	14.20	33.56	7.54	68.63	15.43	38.87	8.74
St Dev	1.14	0.26	0.97	0.22	2.05	0.46	0.98	0.22
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	67.10	15.09	39.60	8.90	68.69	15.44	40.70	9.15
Maximum	72.27	16.25	42.11	9.47	72.56	16.31	43.59	9.80
Average	69.52	15.63	40.69	9.15	70.48	15.85	41.85	9.41
St Dev	1.69	0.38	0.96	0.22	1.45	0.33	0.95	0.21
Count	8	8	8	8	8	8	8	8
	100 Cycles							
	Mating		Unmating					
	Newtons	Force (Lbs)	Newtons	Force (Lbs)				
Minimum	68.65	15.43	41.46	9.32				
Maximum	72.13	16.22	44.62	10.03				
Average	70.37	15.82	42.62	9.58				
St Dev	1.30	0.29	1.06	0.24				
Count	8	8	8	8				

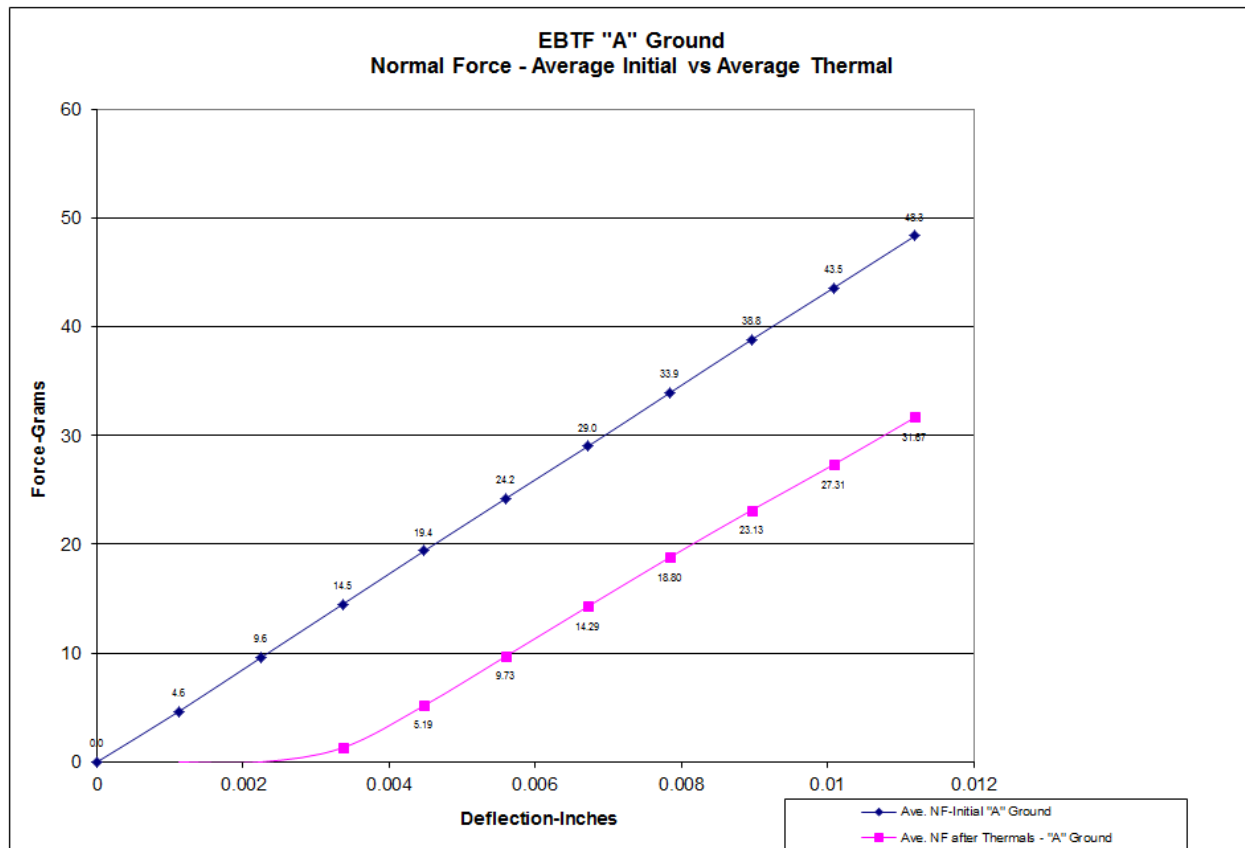
DATA SUMMARIES Continued**NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):**

- 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.

EBTF-"A"Ground

Initial-"A"- Ground	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	4.65	9.57	14.48	19.40	24.24	29.01	33.91	38.80	43.55	48.35	0.0002
Min	4.00	8.60	13.00	17.30	21.70	26.10	30.90	35.20	39.80	44.30	0.0000
Max	5.20	10.50	15.90	21.10	26.30	31.40	36.50	41.50	46.20	50.90	0.0006
St. Dev	0.336	0.541	0.799	1.107	1.350	1.551	1.751	1.941	2.002	2.055	0.0002
Count	11	11	11	11	11	11	11	11	11	11	11

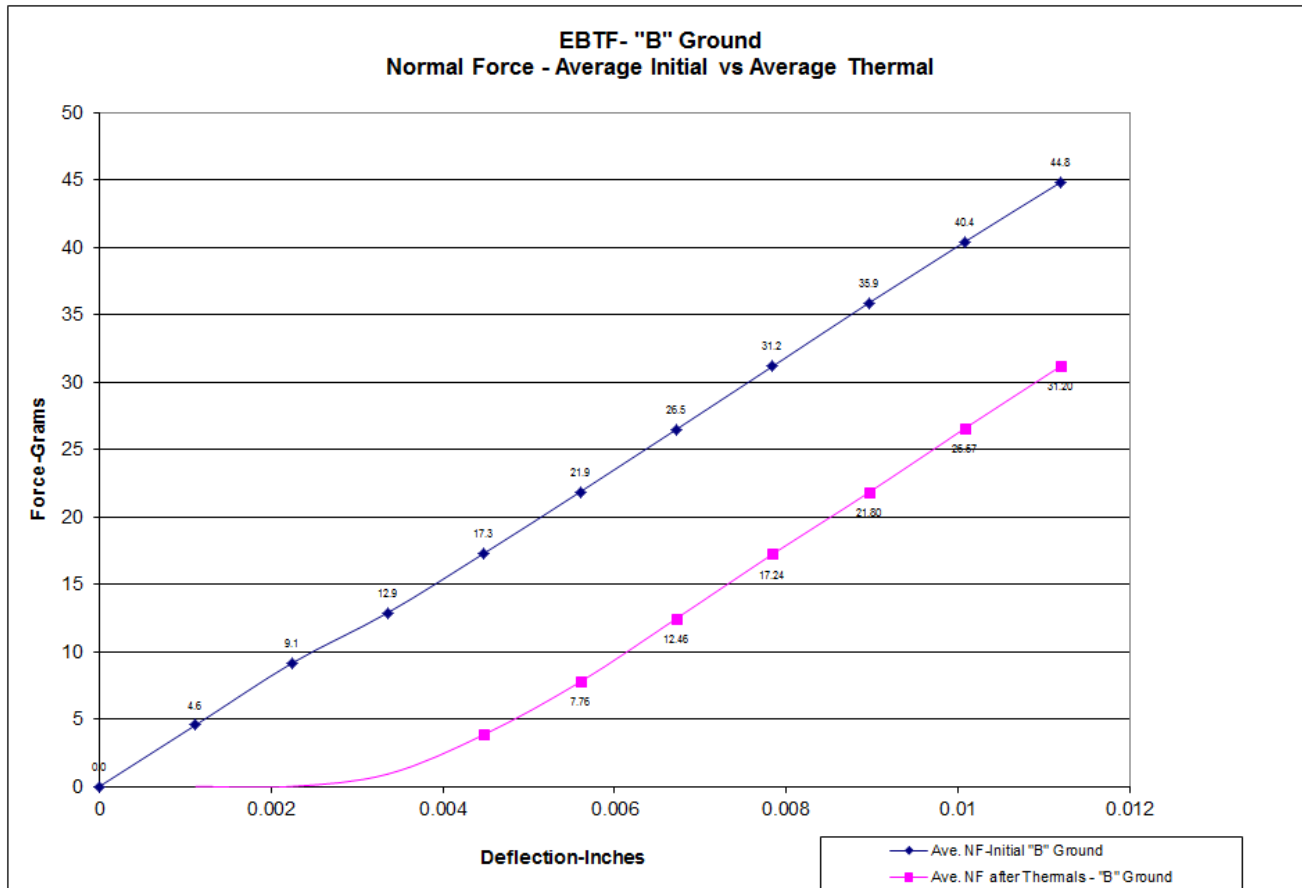
After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	0.00	0.00	1.30	5.19	9.73	14.29	18.80	23.13	27.31	31.67	0.0032
Min	0.00	0.00	0.00	1.10	6.20	11.00	16.00	19.60	23.00	27.20	0.0023
Max	0.00	0.00	4.20	8.70	12.90	17.30	21.80	26.40	31.20	36.40	0.0041
St. Dev	0.000	0.000	1.568	2.281	2.041	1.993	2.258	2.655	3.107	3.485	0.0006
Count	10	10	10	10	10	10	10	10	10	10	10



DATA SUMMARIES Continued**EBTF-"B"Ground**

Initial-"B"-Ground	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	4.55	9.14	12.89	17.30	21.85	26.49	31.16	35.86	40.41	44.84	0.0001
Min	4.10	8.60	10.60	15.10	19.50	24.00	28.70	33.60	38.10	42.60	0.0000
Max	4.90	9.50	14.10	18.90	23.40	28.10	32.70	37.20	41.70	46.30	0.0003
St. Dev	0.250	0.317	1.276	1.501	1.512	1.504	1.311	1.170	1.107	1.177	0.0001
Count	11	11	11	11	11	11	11	11	11	11	11

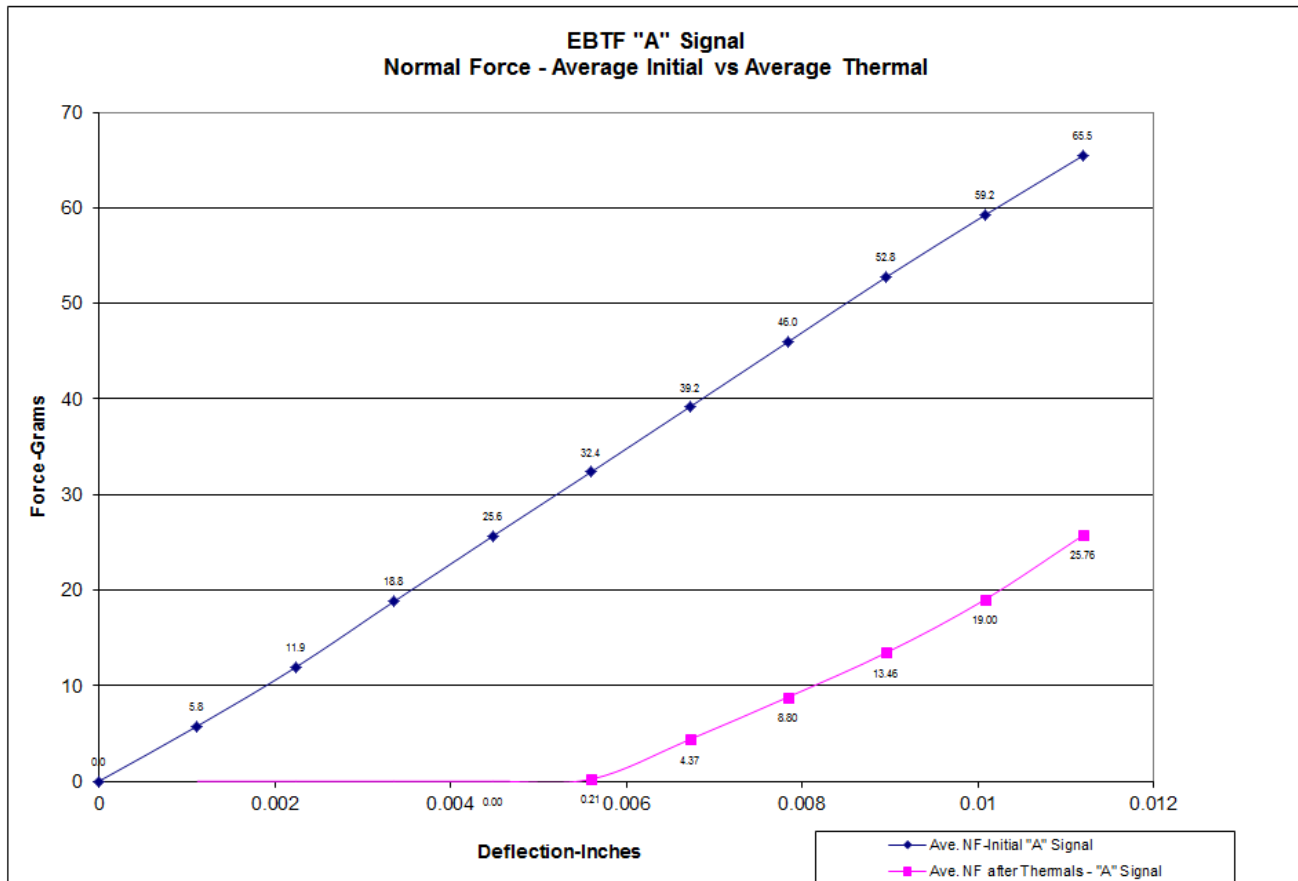
After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	0.00	0.00	0.92	3.85	7.76	12.46	17.24	21.80	26.57	31.20	0.0037
Min	0.00	0.00	0.00	0.00	0.10	5.40	10.60	15.00	20.00	24.90	0.0025
Max	0.00	0.00	3.30	8.50	13.40	18.20	23.00	27.70	32.90	37.70	0.0055
St. Dev	0.000	0.000	1.356	3.248	4.498	4.338	4.265	4.369	4.442	4.483	0.0011
Count	10	10	10	10	10	10	10	10	10	10	10



DATA SUMMARIES Continued**EBTF-"A"Signal**

Initial- "A"-Signal	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	5.78	11.93	18.83	25.63	32.36	39.15	45.97	52.77	59.23	65.48	0.0004
Min	4.90	8.50	15.00	21.60	28.00	34.50	41.10	47.60	53.90	59.90	0.0002
Max	6.90	14.30	22.10	29.90	37.20	44.90	52.30	59.60	65.20	71.00	0.0007
St. Dev	0.729	1.595	1.885	2.313	2.581	3.022	3.280	3.587	3.661	3.851	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

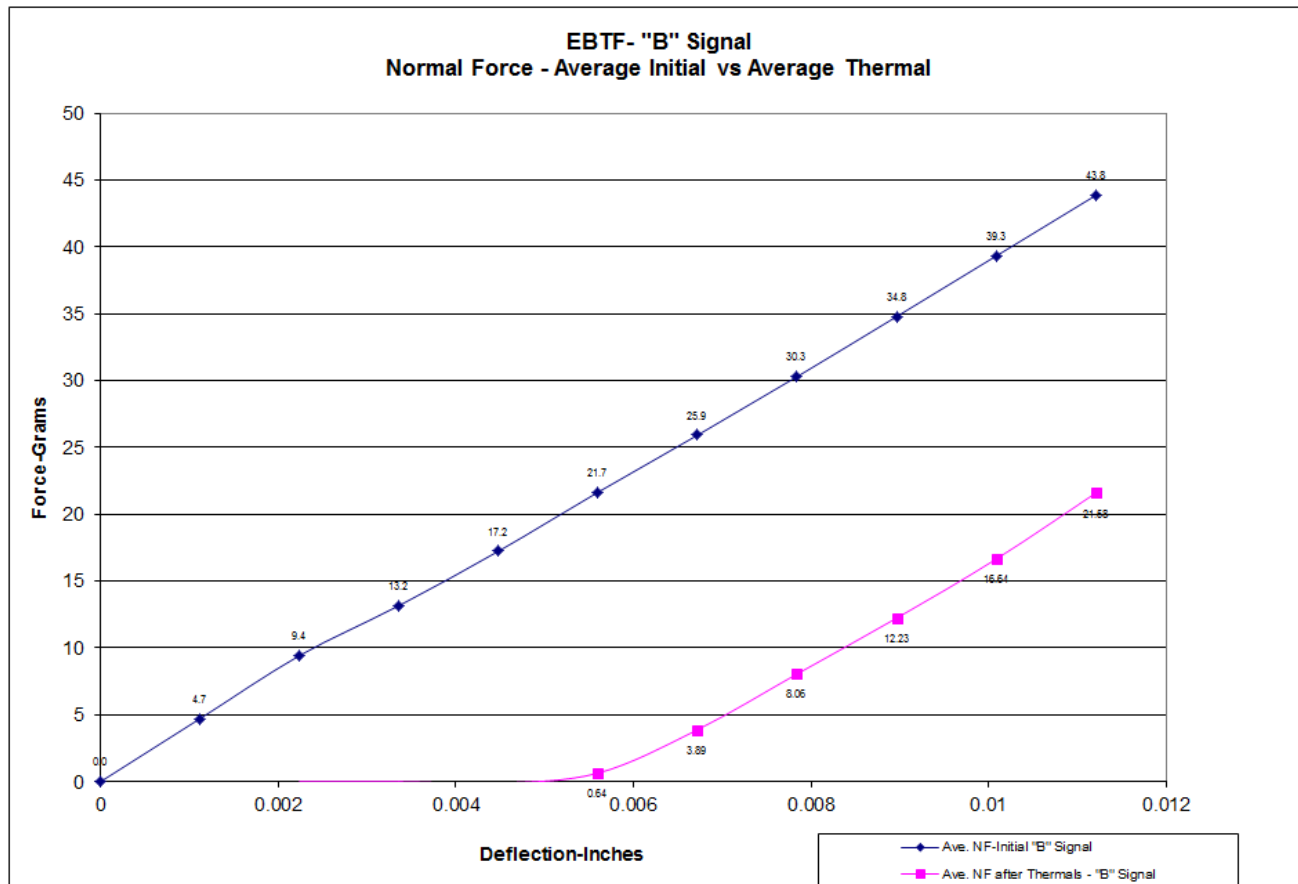
After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	0.00	0.00	0.00	0.00	0.21	4.37	8.80	13.46	19.00	25.76	0.0058
Min	0.00	0.00	0.00	0.00	0.00	2.20	6.70	10.80	15.60	21.70	0.0051
Max	0.00	0.00	0.00	0.00	1.90	6.40	10.90	15.90	22.50	30.20	0.0067
St. Dev	0.000	0.000	0.000	0.000	0.633	1.608	1.564	1.867	2.343	2.908	0.0005
Count	9	9	9	9	9	9	9	9	9	9	9



DATA SUMMARIES Continued**EBTF-"B"Signal**

Initial-"B"-Signal	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	4.72	9.43	13.17	17.24	21.65	25.92	30.29	34.78	39.31	43.84	0.0006
Min	4.30	9.00	10.80	15.80	20.00	24.60	28.70	33.00	37.30	41.60	0.0003
Max	5.20	10.80	14.00	18.40	22.70	27.30	32.00	37.10	42.30	47.40	0.0009
St. Dev	0.252	0.479	0.952	1.001	0.996	0.945	0.880	1.071	1.359	1.780	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

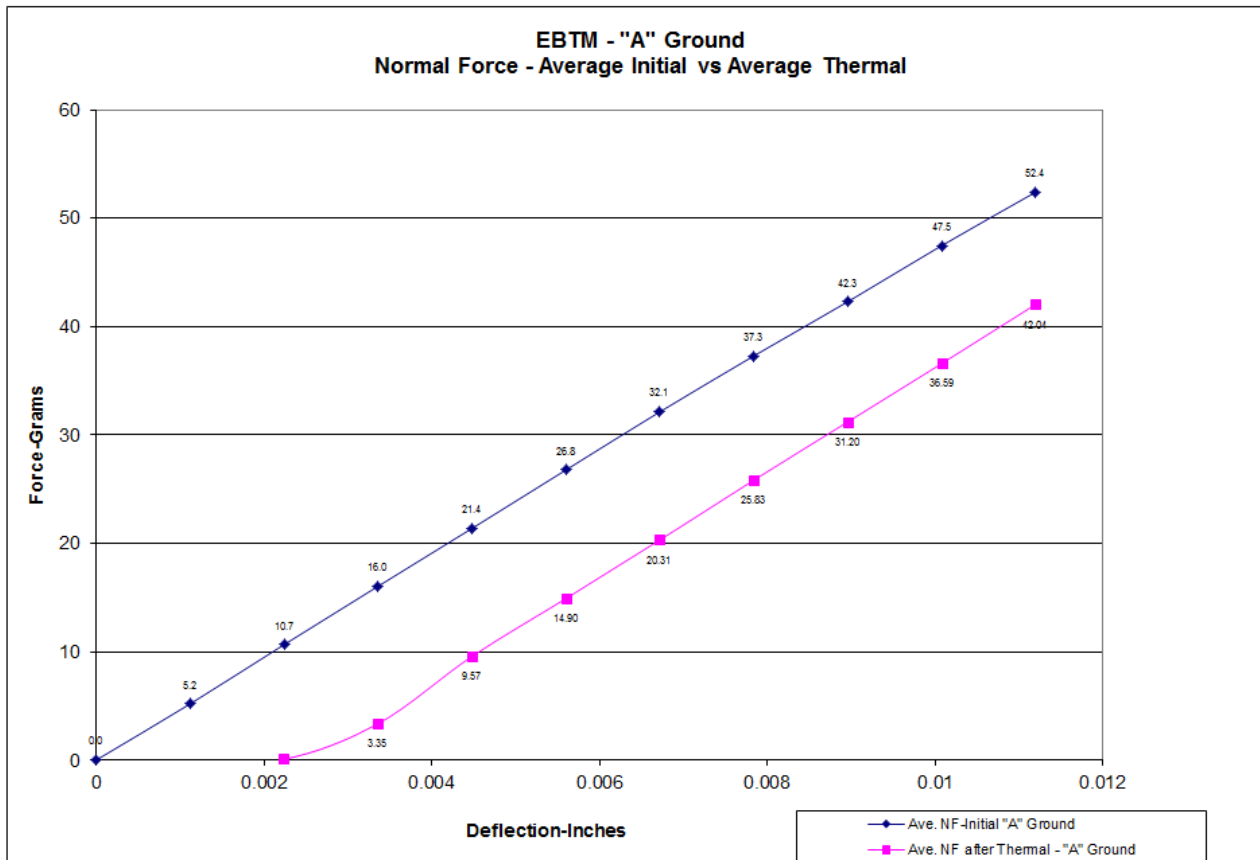
After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	0.00	0.00	0.00	-0.11	0.64	3.89	8.06	12.23	16.64	21.58	0.0056
Min	0.00	0.00	0.00	-0.30	0.00	0.60	4.80	8.60	13.20	17.70	0.0053
Max	0.00	0.00	0.00	0.10	1.20	5.10	9.80	14.10	20.00	25.40	0.0065
St. Dev	0.000	0.000	0.000	0.117	0.510	1.591	1.733	1.947	2.250	2.499	0.0004
Count	9	9	9	9	9	9	9	9	9	9	9



DATA SUMMARIES Continued**EBTM-"A"Ground**

"A" Side - Ground	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	5.18	10.65	16.03	21.38	26.77	32.13	37.28	42.29	47.47	52.40	0.0003
Min	4.70	9.50	14.50	19.80	25.00	30.00	35.00	39.80	45.30	50.50	0.0000
Max	5.50	11.10	16.70	22.10	27.70	33.20	38.50	43.70	49.30	54.20	0.0007
St. Dev	0.212	0.452	0.566	0.636	0.733	0.851	0.939	1.011	1.130	1.142	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

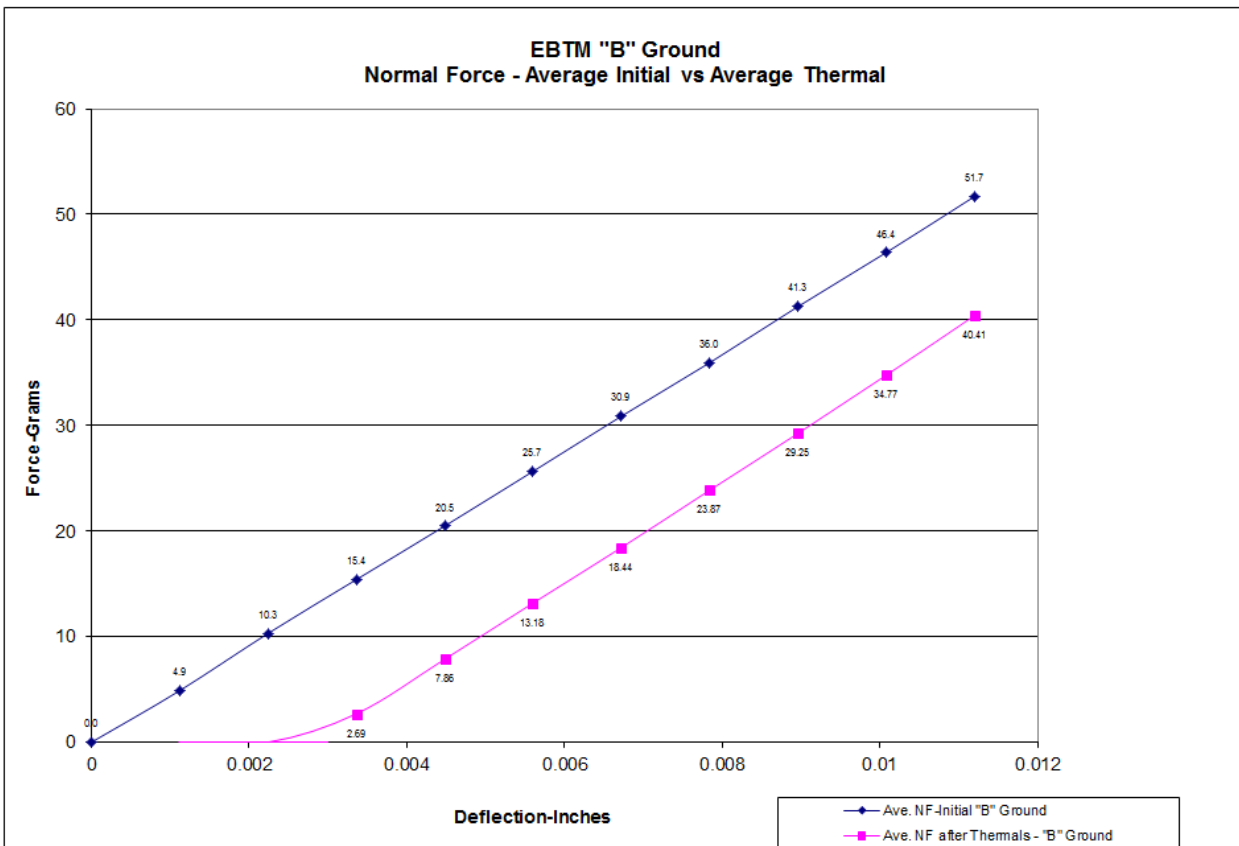
After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	0.00	0.09	3.35	9.57	14.90	20.31	25.83	31.20	36.59	42.04	0.0025
Min	0.00	0.00	0.00	7.30	12.20	17.50	23.40	28.80	34.00	39.50	0.0020
Max	0.00	0.90	6.20	12.10	17.50	23.20	28.70	34.60	39.70	45.60	0.0029
St. Dev	0.000	0.285	2.175	1.614	1.765	1.859	1.715	1.826	1.852	1.921	0.0003
Count	10	10	10	10	10	10	10	10	10	10	10



DATA SUMMARIES Continued**EBTM-"B"Ground**

Initial-"B"- Ground	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	4.89	10.31	15.41	20.48	25.66	30.88	35.95	41.27	46.39	51.70	0.0002
Min	4.50	9.40	14.10	18.70	23.50	28.20	33.10	38.40	43.40	48.40	0.0001
Max	5.30	11.20	16.70	22.10	28.00	33.50	39.20	45.30	51.10	57.00	0.0004
St. Dev	0.287	0.518	0.729	1.023	1.301	1.546	1.818	2.100	2.306	2.694	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

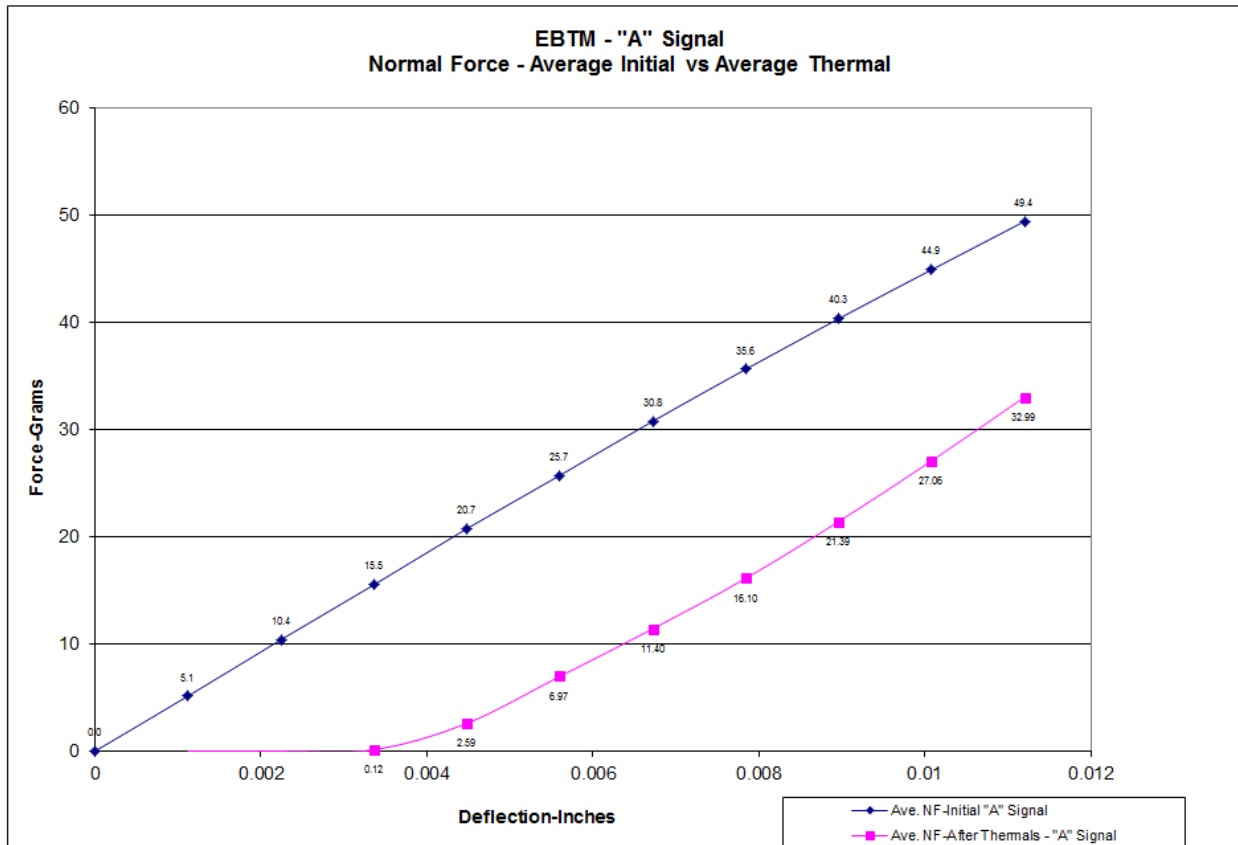
After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	0.00	0.00	2.69	7.86	13.18	18.44	23.87	29.25	34.77	40.41	0.0030
Min	0.00	0.00	0.00	3.60	9.70	15.50	20.70	26.00	31.20	36.60	0.0024
Max	0.00	0.00	6.30	12.00	17.20	22.60	28.50	33.90	39.40	44.90	0.0038
St. Dev	0.000	0.000	1.699	2.225	2.210	2.337	2.581	2.698	2.803	3.090	0.0004
Count	10	10	10	10	10	10	10	10	10	10	10



DATA SUMMARIES Continued**EBTM-"A"Signal**

"A" Side - Signal	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	5.13	10.38	15.51	20.73	25.70	30.75	35.59	40.30	44.87	49.38	0.0008
Min	4.40	9.10	13.40	18.10	22.50	26.90	31.60	35.40	39.20	43.10	0.0003
Max	6.30	12.10	18.40	24.30	30.00	35.70	41.00	46.50	51.90	56.70	0.0010
St. Dev	0.557	1.134	1.741	2.322	2.769	3.133	3.393	3.884	4.262	4.492	0.0002
Count	12	12	12	12	12	12	12	12	12	12	12

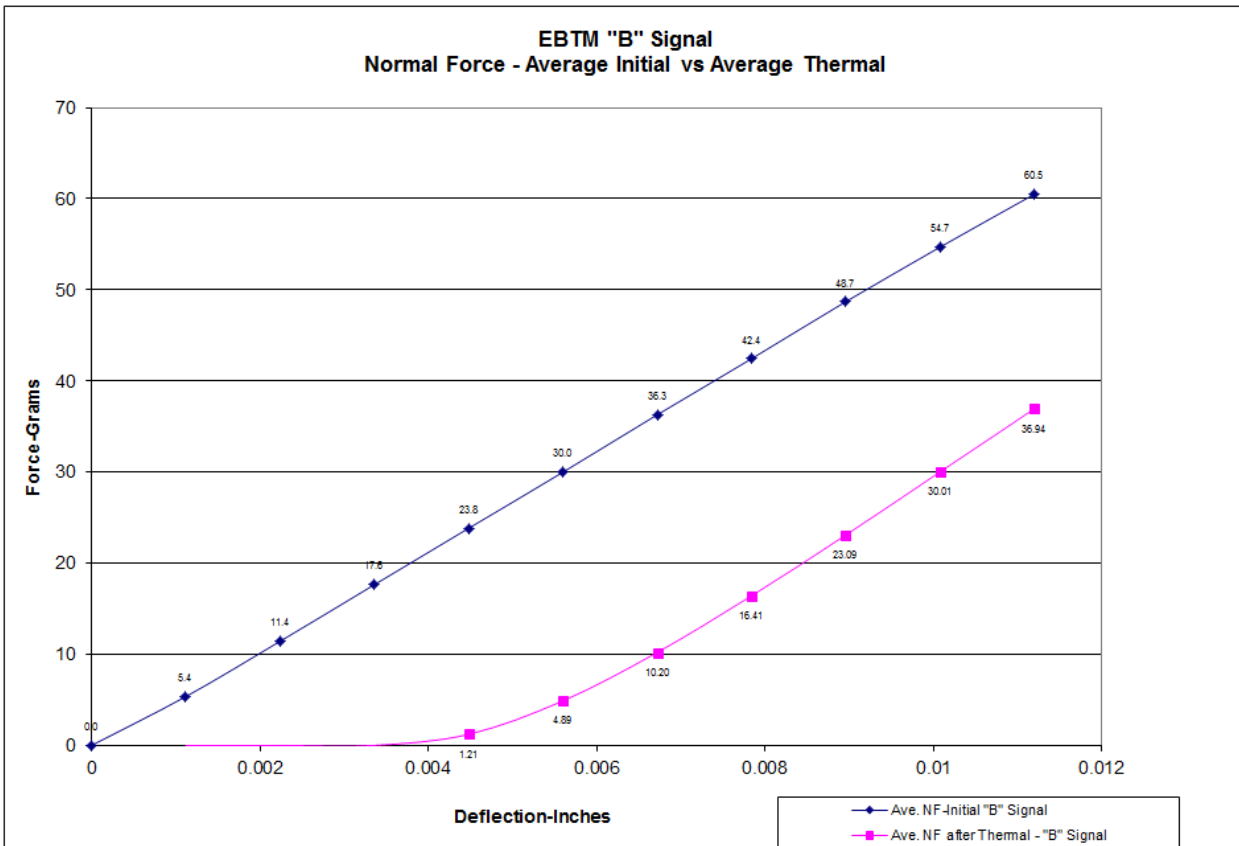
After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	0.00	0.00	0.12	2.59	6.97	11.40	16.10	21.39	27.06	32.99	0.0040
Min	0.00	0.00	0.00	0.10	3.80	8.20	12.50	17.40	22.80	28.40	0.0031
Max	0.00	0.00	1.10	4.80	9.30	15.20	20.90	27.40	34.50	42.00	0.0047
St. Dev	0.000	0.000	0.367	1.609	1.636	2.057	2.667	3.308	3.969	4.653	0.0005
Count	9	9	9	9	9	9	9	9	9	9	9



DATA SUMMARIES Continued**EBTM-"B"Signal**

"B" Side - Signal	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	5.36	11.43	17.64	23.83	29.99	36.28	42.43	48.69	54.69	60.49	0.0004
Min	4.50	9.60	15.10	20.80	26.20	31.80	37.80	43.20	49.10	54.40	0.0002
Max	6.60	13.60	20.30	27.20	33.80	40.30	46.60	53.70	60.00	66.30	0.0006
St. Dev	0.593	1.183	1.570	2.057	2.507	2.812	3.071	3.370	3.457	3.539	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

After Thermals	Deflections in inches Forces in Grams										
	<u>0.0011</u>	<u>0.0022</u>	<u>0.0034</u>	<u>0.0045</u>	<u>0.0056</u>	<u>0.0067</u>	<u>0.0078</u>	<u>0.0090</u>	<u>0.0101</u>	<u>0.0112</u>	<i>SET</i>
Averages	0.00	0.00	0.00	1.21	4.89	10.20	16.41	23.09	30.01	36.94	0.0045
Min	0.00	0.00	0.00	0.00	1.00	5.30	10.70	16.70	23.50	30.90	0.0039
Max	0.00	0.00	0.00	2.60	7.80	14.20	21.00	27.90	35.10	41.90	0.0055
St. Dev	0.000	0.000	0.000	1.092	2.121	3.100	3.722	4.057	4.219	4.077	0.0005
Count	8	8	8	8	8	8	8	8	8	8	8



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. $\leq +5.0$ mOhms: -----Stable
 - b. $+5.1$ to $+10.0$ mOhms: -----Minor
 - c. $+10.1$ to $+15.0$ mOhms: -----Acceptable
 - d. $+15.1$ to $+50.0$ mOhms: -----Marginal
 - e. $+50.1$ to $+2000$ mOhms: -----Unstable
 - f. $> +2000$ mOhms: -----Open Failure

LLCR Measurement Summaries by Pin Type				
Date	12/10/2015	12/22/2015		
Room Temp (Deg C)	22	23		
Rel Humidity (%)	40	44		
Technician	Tony Wagoner	Tony Wagoner		
mOhm values	Actual Initial	Delta 100 Cycles	Delta	Delta
Pin Type 1: Row 1				
Average	8.09	0.15		
St. Dev.	0.19	0.11		
Min	7.79	0.03		
Max	8.43	0.44		
Summary Count	16	16		
Total Count	16	16		
Pin Type 2: Row 2				
Average	14.70	0.15		
St. Dev.	2.25	0.15		
Min	11.79	0.01		
Max	18.28	0.82		
Summary Count	48	48		
Total Count	48	48		
Pin Type 3: Row 3				
Average	24.57	0.17		
St. Dev.	2.45	0.15		
Min	20.70	0.00		
Max	29.43	0.83		
Summary Count	64	64		
Total Count	64	64		
Pin Type 4: Ground				
Average	1.53	0.03		
St. Dev.	0.12	0.03		
Min	1.36	0.00		
Max	1.83	0.15		
Summary Count	64	64		
Total Count	64	64		

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \text{ \& } \leq 10$	$>10 \text{ \& } \leq 15$	$>15 \text{ \& } \leq 50$	$>50 \text{ \& } \leq 1000$	>1000
100 Cycles	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. $\leq +5.0$ mOhms:-----Stable
 - b. $+5.1$ to $+10.0$ mOhms: -----Minor
 - c. $+10.1$ to $+15.0$ mOhms:-----Acceptable
 - d. $+15.1$ to $+50.0$ mOhms:-----Marginal
 - e. $+50.1$ to $+2000$ mOhms:-----Unstable
 - f. $>+2000$ mOhms:-----Open Failure

LLCR Measurement Summaries by Pin Type				
Date	12/3/2015	12/3/2015		
Room Temp (Deg C)	22	23		
Rel Humidity (%)	40	32		
Technician	Tony Wagoner	Aaron McKim		
mOhm values	Actual Initial	Delta Acid Vapor	Delta	Delta
Pin Type 1: Row 1				
Average	8.21	0.31		
St. Dev.	0.24	0.13		
Min	7.94	0.10		
Max	8.70	0.52		
Summary Count	16	16		
Total Count	16	16		
Pin Type 2: Row 2				
Average	14.94	0.54		
St. Dev.	2.28	0.35		
Min	11.91	0.10		
Max	18.54	2.59		
Summary Count	48	48		
Total Count	48	48		
Pin Type 3: Row 3				
Average	24.68	0.85		
St. Dev.	2.40	0.20		
Min	20.77	0.44		
Max	29.17	1.81		
Summary Count	64	64		
Total Count	64	64		
Pin Type 4: Ground				
Average	1.54	0.04		
St. Dev.	0.11	0.03		
Min	1.35	0.00		
Max	1.76	0.25		
Summary Count	64	64		
Total Count	64	64		

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. $\leq +5.0$ mOhms: -----Stable
 - b. $+5.1$ to $+10.0$ mOhms: -----Minor
 - c. $+10.1$ to $+15.0$ mOhms: -----Acceptable
 - d. $+15.1$ to $+50.0$ mOhms: -----Marginal
 - e. $+50.1$ to $+2000$ mOhms: -----Unstable
 - f. $>+2000$ mOhms: -----Open Failure

LLCR Measurement Summaries by Pin Type				
Date	12/8/2015	12/10/2015		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	40	44		
Technician	Tony Wagoner	Tony Wagoner		
mOhm values	Actual Initial	Delta Shock-Vib	Delta	Delta
Pin Type 1: Row 1				
Average	8.05	0.28		
St. Dev.	0.16	0.17		
Min	7.75	0.06		
Max	8.35	0.59		
Summary Count	16	16		
Total Count	16	16		
Pin Type 2: Row 2				
Average	14.57	0.25		
St. Dev.	2.61	0.51		
Min	8.13	0.00		
Max	18.37	3.39		
Summary Count	48	48		
Total Count	48	48		
Pin Type 3: Row 3				
Average	24.36	0.45		
St. Dev.	2.51	0.57		
Min	20.32	0.01		
Max	29.23	3.74		
Summary Count	64	64		
Total Count	64	64		
Pin Type 4: Ground				
Average	1.57	0.10		
St. Dev.	0.12	0.07		
Min	1.28	0.00		
Max	1.81	0.32		
Summary Count	64	64		
Total Count	64	64		

LLCR Delta Count by Category						
	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	≤ 5	$>5 \text{ \& } \leq 10$	$>10 \text{ \& } \leq 15$	$>15 \text{ \& } \leq 50$	$>50 \text{ \& } \leq 1000$	>1000
Shock-Vib	192	0	0	0	0	0

DATA SUMMARIES Continued

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 #: THC-02

Description: Temperature/Humidity Chamber

Manufacturer: Thermotron

Model: SE-1000-6-6

Serial #: 31808

Accuracy: See Manual

... Last Cal: 02/16/2015, Next Cal: 02/16/2016

Equipment #: OV-05

Description: Forced Air Oven, 5 Cu. Ft., 120 V (Chamber Room)

Manufacturer: Sheldon Mfg.

Model: CE5F

Serial #: 02008008

Accuracy: +/- 5 deg. C

... Last Cal: 02/18/2015, Next Cal: 02/18/2016

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: 05/18/2015, Next Cal: 05/18/2016

Equipment #: MO-04

Description: Multimeter /Data Acquisition System

Manufacturer: Keithley

Model: 2700

Serial #: 0798688

Accuracy: See Manual

... Last Cal: 04/30/2015, Next Cal: 04/30/2016

Equipment #: TCT-01

Description: Test Stand

Manufacturer: Chatillon

Model: TCD-1000

Serial #: 05 23 00 02

Accuracy: Speed Accuracy: +/-5% of max speed; Displacement: +/-0.5% or +/-0.005, whichever is greater.

... Last Cal: 08/24/2015, Next Cal: 08/24/2016

Equipment #: PS-01

Description: Power Supply

Manufacturer: Agilent

Model: AT-6032A

Serial #: MY41001186

Accuracy: Last Cal: 06/12/2015, Next Cal: 06/12/2016

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: SVC-01

Description: Shock & Vibration Table

Manufacturer: Data Physics

Model: LE-DSA-10-20K

Serial #: 10037

Accuracy: See Manual

... Last Cal: 11/31/2015, Next Cal: 11/31/2016

Equipment #: ACLM-01

Description: Accelerometer

Manufacturer: PCB Piezotronics

Model: 352C03

Serial #: 115819

Accuracy: See Manual

... Last Cal: 07/09/2015, Next Cal: 07/09/2016

Equipment #: ED-03

Description: Event Detector

Manufacturer: Analysis Tech

Model: 32EHD

Serial #: 1100604

Accuracy: See Manual

... Last Cal: 06/04/2015, Next Cal: 06/04/2016