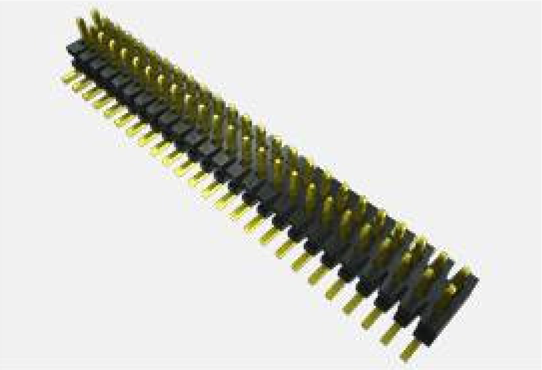
Project Number: Design Qualification Test Report	Tracking Code: 263526_Report_Rev_1
Requested by: Catie Eichhorn	Date: 11/22/2013
Part #: MLE-125-01-G-DV-A/FTMH-125-02-L-DV-A	
Part description: MLE/FTMH	Tech: Kason He
Test Start: 09/22/2013	Test Completed: 11/01/2013



DESIGN QUALIFICATION TEST REPORT

MLE/FTMH
MLE-125-01-G-DV-A/FTMH-125-02-L-DV-A

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
11/22/2013	**1**	**Initial Issue**	**KH**

CERTIFICATION

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

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SCOPE

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

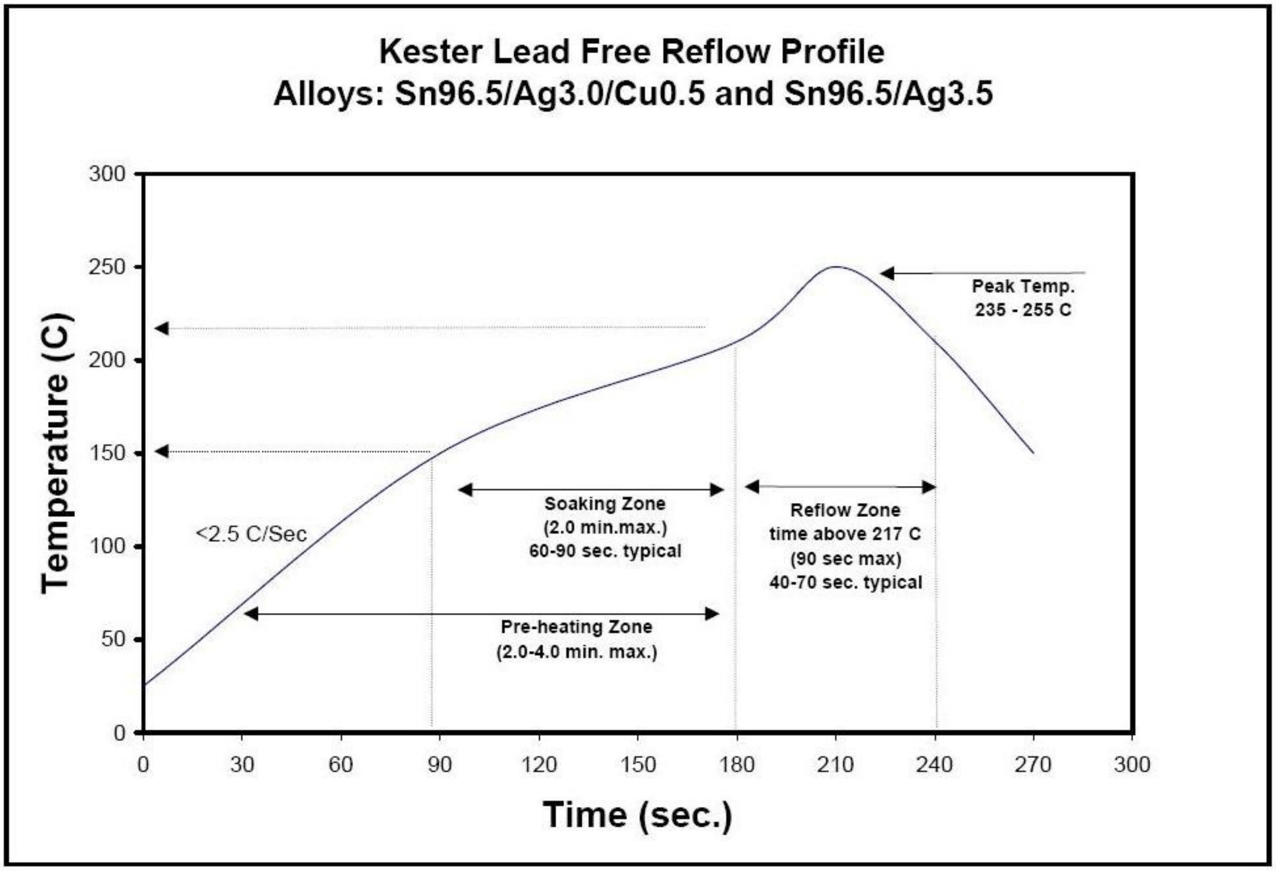
APPLICABLE DOCUMENTS

Standards: EIA Publication 364

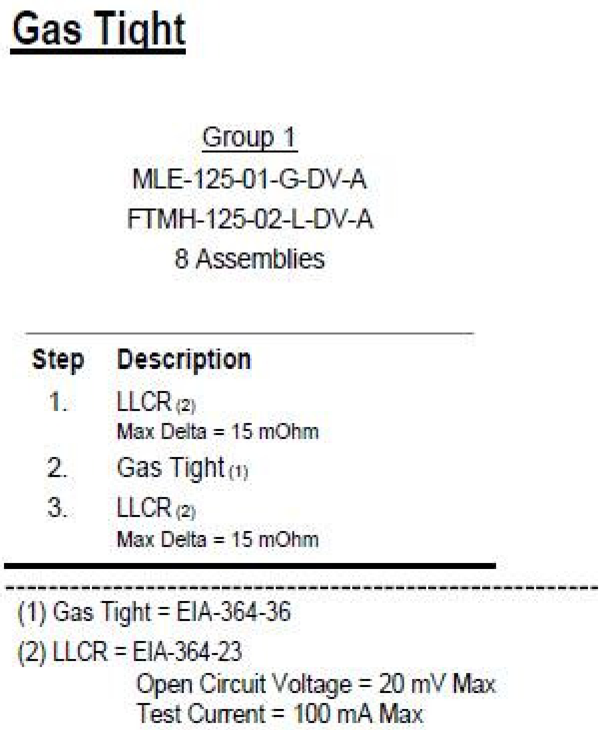
TEST SAMPLES AND PREPARATION

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 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-105087-TST\PCB-105088-TST\PCB-105089-TST

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

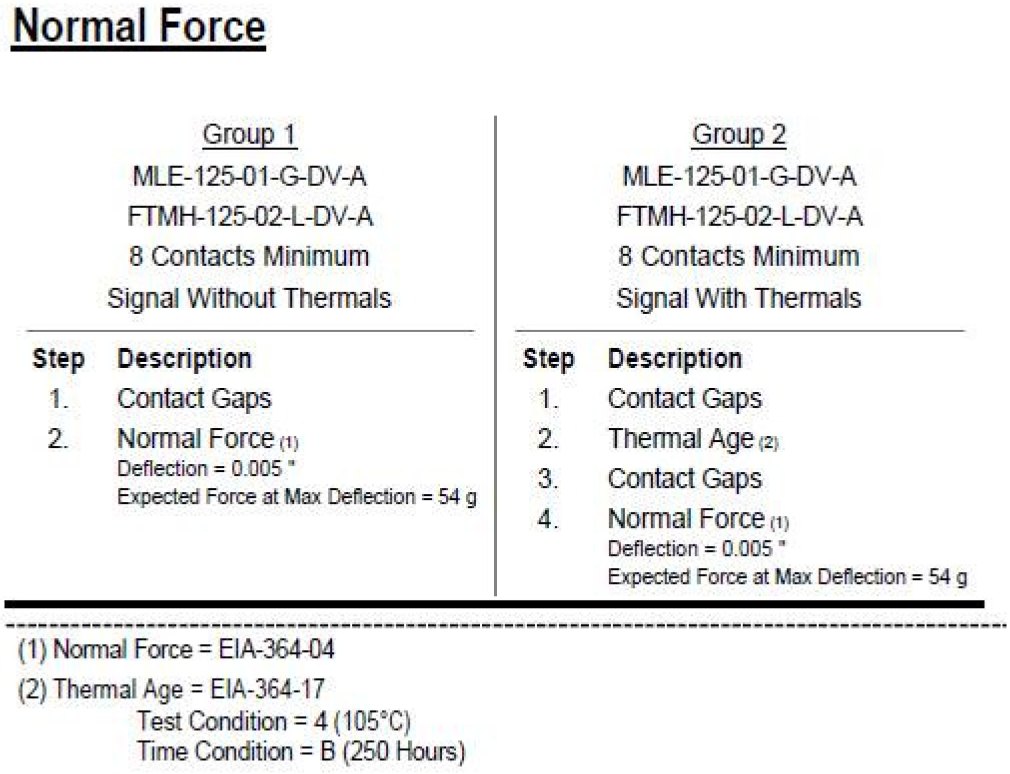


Gas Tight

Group 1
MLE-125-01-G-DV-A
FTMH-125-02-L-DV-A
8 Assemblies

Step	Description
1.	LLCR (2) Max Delta = 15 mOhm
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
MLE-125-01-G-DV-A
FTMH-125-02-L-DV-A
8 Contacts Minimum
Signal Without Thermals

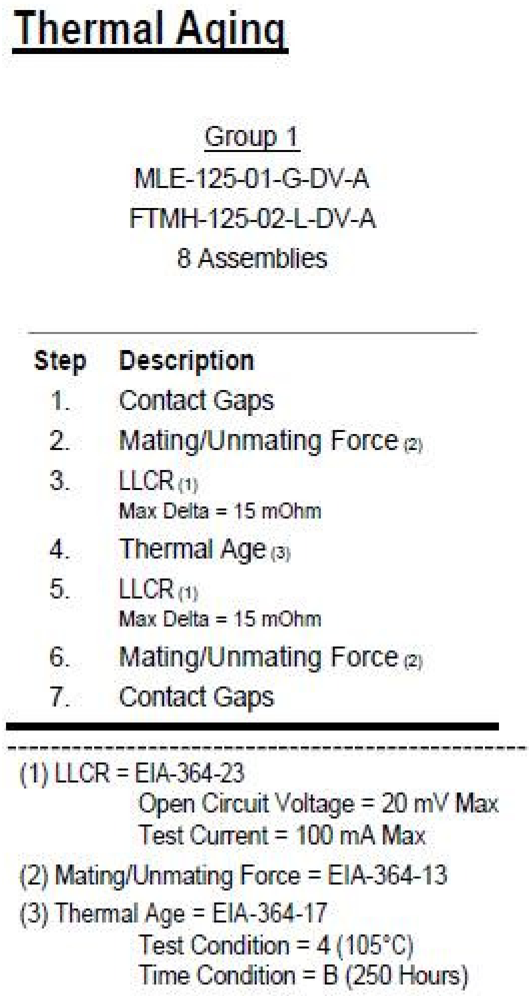
Step	Description
1.	Contact Gaps
2.	Normal Force (1) Deflection = 0.005 " Expected Force at Max Deflection = 54 g

Group 2
MLE-125-01-G-DV-A
FTMH-125-02-L-DV-A
8 Contacts Minimum
Signal With Thermals

Step	Description
1.	Contact Gaps
2.	Thermal Age (2)
3.	Contact Gaps
4.	Normal Force (1) Deflection = 0.005 " Expected Force at Max Deflection = 54 g

(1) Normal Force = EIA-364-04
(2) Thermal Age = EIA-364-17
Test Condition = 4 (105°C)
Time Condition = B (250 Hours)

FLOWCHARTS Continued



Thermal Aging

Group 1
MLE-125-01-G-DV-A
FTMH-125-02-L-DV-A
8 Assemblies

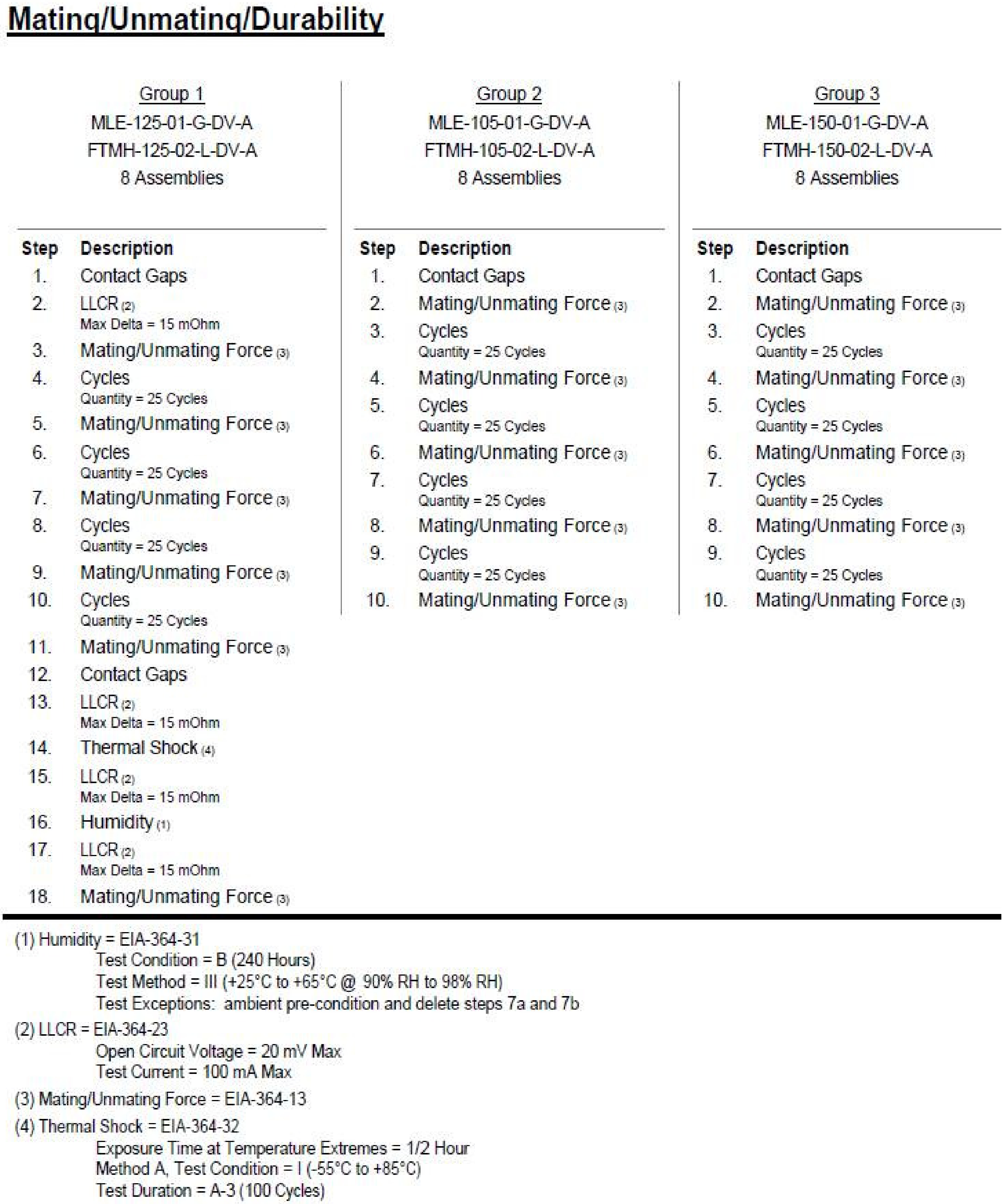
Step	Description
1.	Contact Gaps
2.	Mating/Unmating Force (2)
3.	LLCR (1) Max Delta = 15 mOhm
4.	Thermal Age (3)
5.	LLCR (1) Max Delta = 15 mOhm
6.	Mating/Unmating Force (2)
7.	Contact Gaps

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

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

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

FLOWCHARTS Continued



Mating/Unmating/Durability

Group 1
MLE-125-01-G-DV-A
FTMH-125-02-L-DV-A
8 Assemblies

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

Group 2
MLE-105-01-G-DV-A
FTMH-105-02-L-DV-A
8 Assemblies

Step	Description
1.	Contact Gaps
2.	Mating/Unmating Force (3)
3.	Cycles Quantity = 25 Cycles
4.	Mating/Unmating Force (3)
5.	Cycles Quantity = 25 Cycles
6.	Mating/Unmating Force (3)
7.	Cycles Quantity = 25 Cycles
8.	Mating/Unmating Force (3)
9.	Cycles Quantity = 25 Cycles
10.	Mating/Unmating Force (3)

Group 3
MLE-150-01-G-DV-A
FTMH-150-02-L-DV-A
8 Assemblies

Step	Description
1.	Contact Gaps
2.	Mating/Unmating Force (3)
3.	Cycles Quantity = 25 Cycles
4.	Mating/Unmating Force (3)
5.	Cycles Quantity = 25 Cycles
6.	Mating/Unmating Force (3)
7.	Cycles Quantity = 25 Cycles
8.	Mating/Unmating Force (3)
9.	Cycles Quantity = 25 Cycles
10.	Mating/Unmating Force (3)

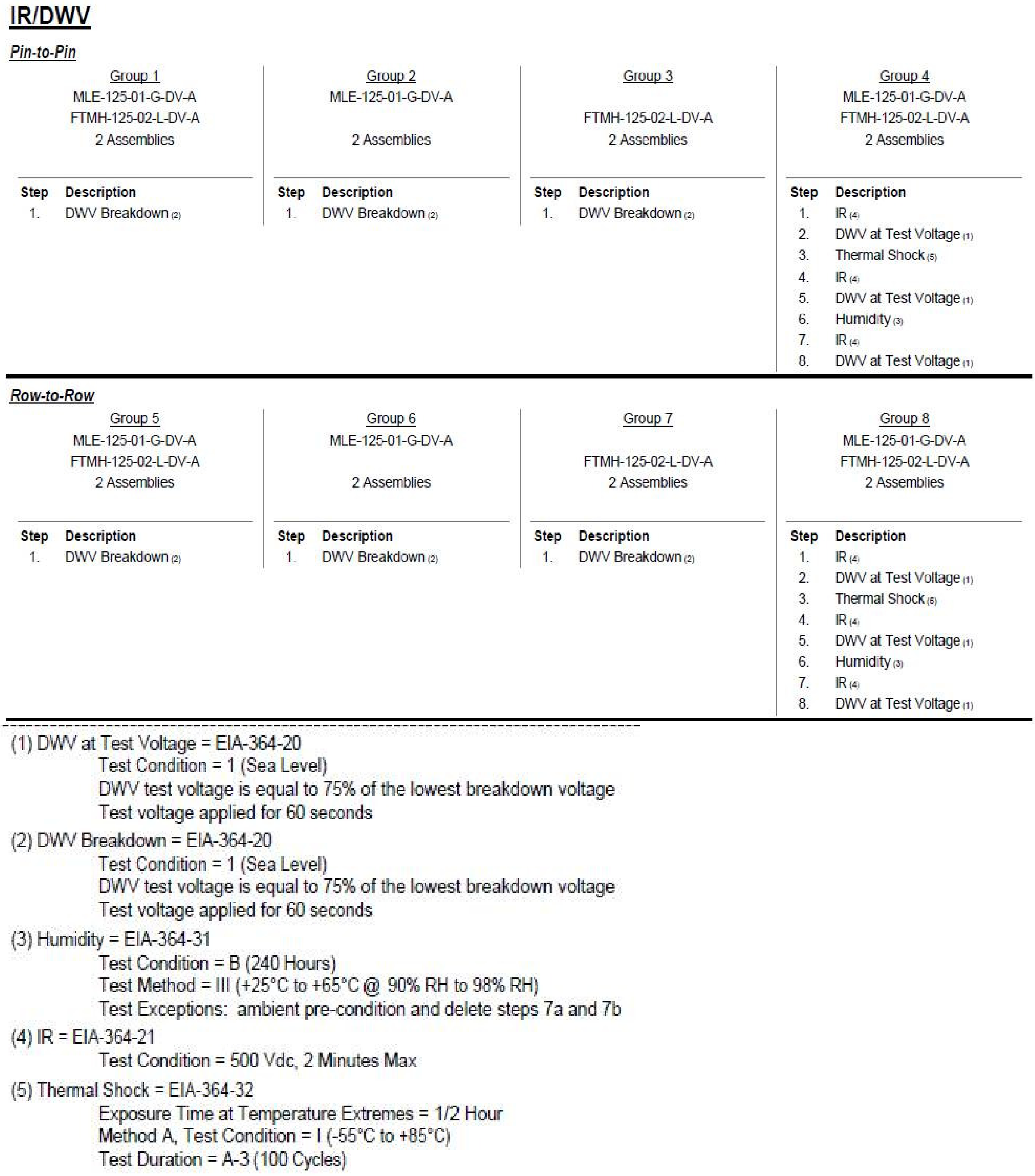
(1) Humidity = EIA-364-31
Test Condition = B (240 Hours)
Test Method = III (+25°C to +65°C @ 90% RH to 98% RH)
Test Exceptions: ambient pre-condition and delete steps 7a and 7b

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

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

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

FLOWCHARTS Continued



IR/DWV

Pin-to-Pin

Group 1	Group 2	Group 3	Group 4
MLE-125-01-G-DV-A	MLE-125-01-G-DV-A		MLE-125-01-G-DV-A
FTMH-125-02-L-DV-A		FTMH-125-02-L-DV-A	FTMH-125-02-L-DV-A
2 Assemblies	2 Assemblies	2 Assemblies	2 Assemblies

Group 1

Step	Description
1.	DWV Breakdown (2)

Group 2

Step	Description
1.	DWV Breakdown (2)

Group 3

Step	Description
1.	DWV Breakdown (2)

Group 4

Step	Description
1.	IR (4)
2.	DWV at Test Voltage (1)
3.	Thermal Shock (5)
4.	IR (4)
5.	DWV at Test Voltage (1)
6.	Humidity (3)
7.	IR (4)
8.	DWV at Test Voltage (1)

Row-to-Row

Group 5	Group 6	Group 7	Group 8
MLE-125-01-G-DV-A	MLE-125-01-G-DV-A		MLE-125-01-G-DV-A
FTMH-125-02-L-DV-A		FTMH-125-02-L-DV-A	FTMH-125-02-L-DV-A
2 Assemblies	2 Assemblies	2 Assemblies	2 Assemblies

Group 5

Step	Description
1.	DWV Breakdown (2)

Group 6

Step	Description
1.	DWV Breakdown (2)

Group 7

Step	Description
1.	DWV Breakdown (2)

Group 8

Step	Description
1.	IR (4)
2.	DWV at Test Voltage (1)
3.	Thermal Shock (5)
4.	IR (4)
5.	DWV at Test Voltage (1)
6.	Humidity (3)
7.	IR (4)
8.	DWV at Test Voltage (1)

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

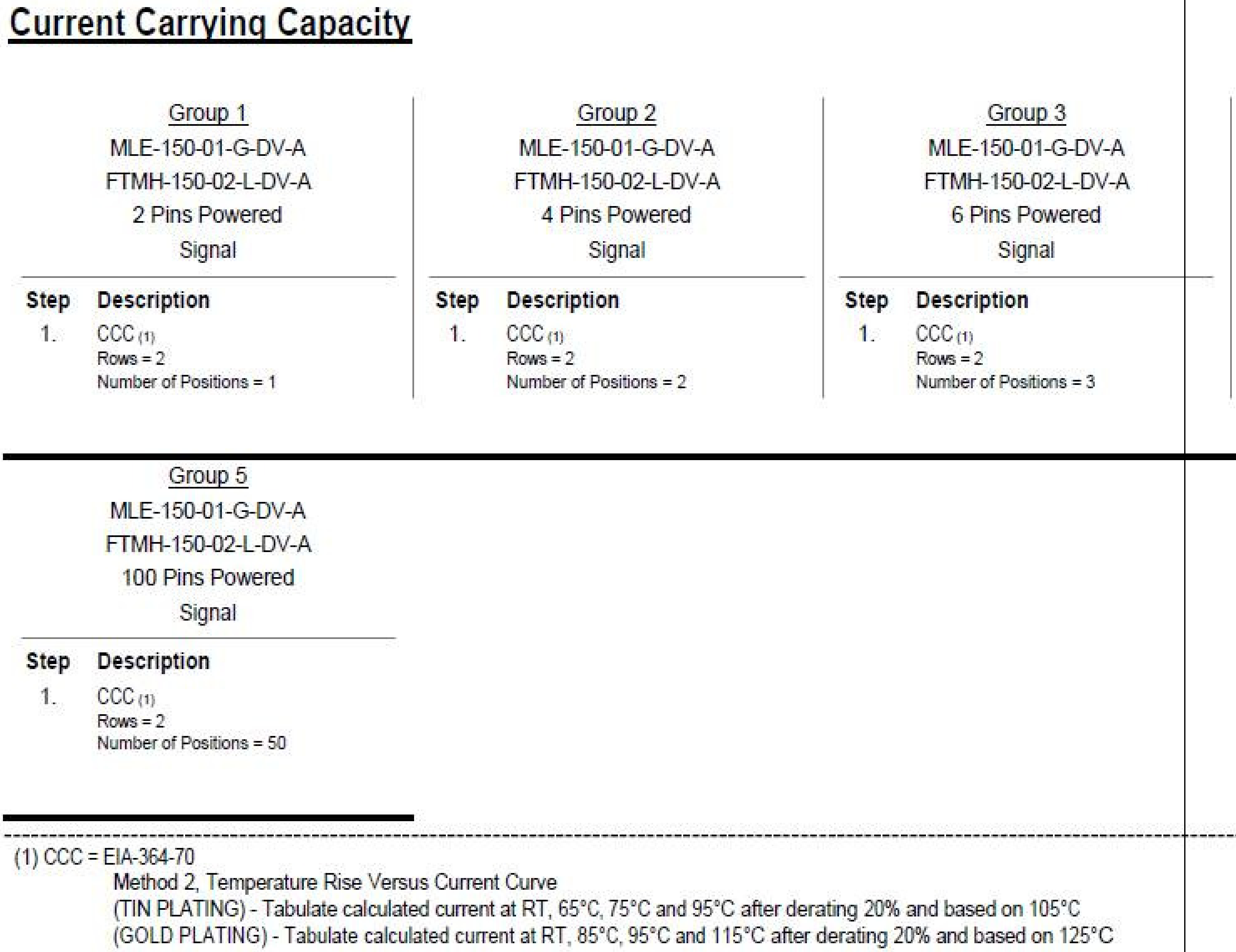
(2) DWV Breakdown = EIA-364-20
Test Condition = 1 (Sea Level)
DWV test voltage is equal to 75% of the lowest breakdown voltage
Test voltage applied for 60 seconds

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

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

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

FLOWCHARTS Continued



Current Carrying Capacity

Group 1
MLE-150-01-G-DV-A
FTMH-150-02-L-DV-A
2 Pins Powered
Signal

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

Group 2
MLE-150-01-G-DV-A
FTMH-150-02-L-DV-A
4 Pins Powered
Signal

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

Group 3
MLE-150-01-G-DV-A
FTMH-150-02-L-DV-A
6 Pins Powered
Signal

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

Group 5
MLE-150-01-G-DV-A
FTMH-150-02-L-DV-A
100 Pins Powered
Signal

Step	Description
1.	CCC (1) Rows = 2 Number of Positions = 50

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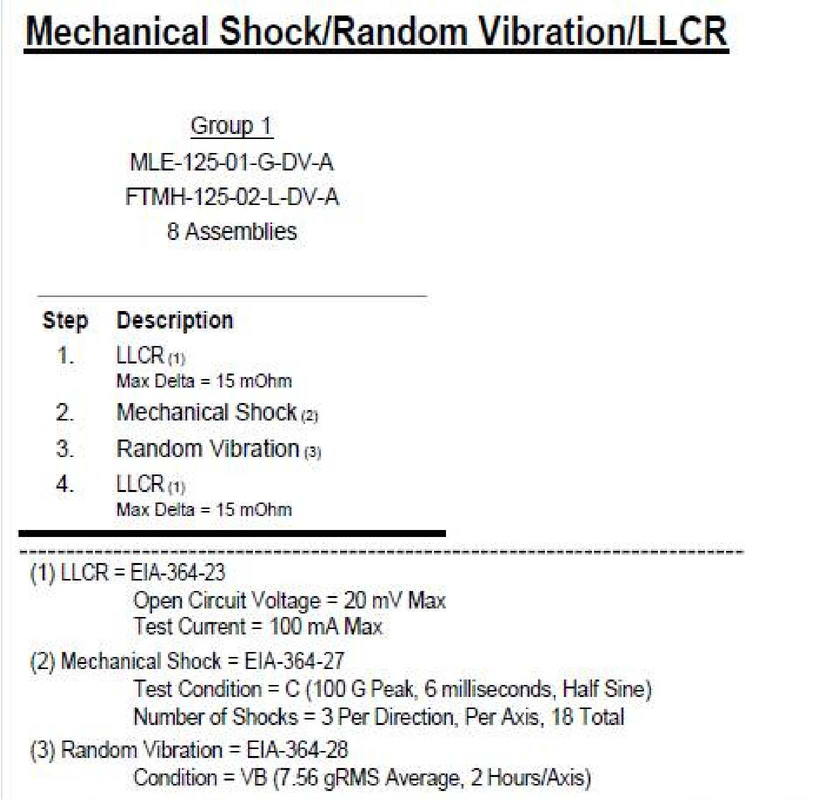
(1) CCC = EIA-364-70
Method 2, Temperature Rise Versus Current Curve
(TIN PLATING) - Tabulate calculated current at RT, 65°C, 75°C and 95°C after derating 20% and based on 105°C
(GOLD PLATING) - Tabulate calculated current at RT, 85°C, 95°C and 115°C after derating 20% and based on 125°C

FLOWCHARTS Continued



Mechanical Shock/Random Vibration/LLCR

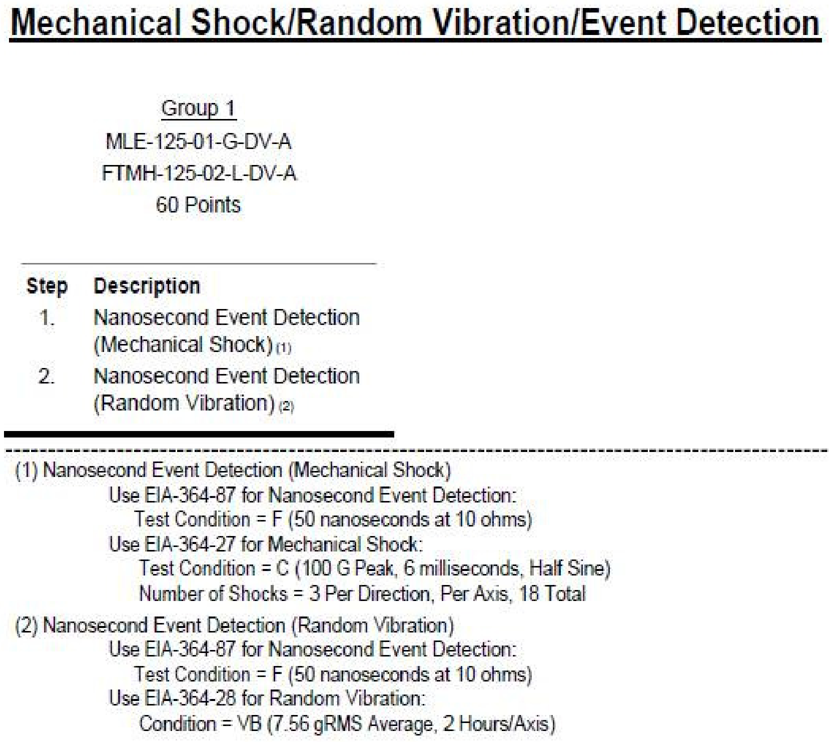
Group 1
MLE-125-01-G-DV-A
FTMH-125-02-L-DV-A
8 Assemblies

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

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

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

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



Mechanical Shock/Random Vibration/Event Detection

Group 1
MLE-125-01-G-DV-A
FTMH-125-02-L-DV-A
60 Points

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

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

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

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

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

THERMAL:

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

HUMIDITY:

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

MECHANICAL SHOCK (Specified Pulse):

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

VIBRATION:

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

NANOSECOND-EVENT DETECTION:

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

MATING/UNMATING:

1) Reference document: EIA-364-13, *Mating and Unmating Forces Test Procedure for Electrical Connectors*.
2) The full insertion position was to within 0.003" to 0.004" of the plug bottoming out in the receptacle to prevent damage to the system under test.
3) One of the mating parts is secured to a floating X-Y table to prevent damage during cycling.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

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

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.

GAS TIGHT:

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

1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
    a. <= +5.0 mOhms:---------------------------- Stable
    b. +5.1 to +10.0 mOhms:--------------------- Minor
    c. +10.1 to +15.0 mOhms: ------------------- Acceptable
    d. +15.1 to +50.0 mOhms: ------------------- Marginal
    e. +50.1 to +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^{o} C
        ix. The final LLCR shall be conducted within 1 hour after drying.

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----------------------2.9 A per contact with 2 contacts powered**
- **CCC for a 30°C Temperature Rise----------------------2.1 A per contact with 4 contacts powered**
- **CCC for a 30°C Temperature Rise----------------------1.7 A per contact with 6 contacts powered**
- **CCC for a 30°C Temperature Rise----------------------1.5 A per contact with 8 contacts powered**
- **CCC for a 30°C Temperature Rise----------------------0.8 A per contact with all contacts powered**

Mating – Unmating Forces

Thermal Aging Group

- **Initial**
  - **Mating**
    - **Min -------------------------------------- 3.40 Lbs**
    - **Max-------------------------------------- 4.12 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 1.56 Lbs**
    - **Max------------------------------------- 2.38 Lbs**
- **After Thermal**
  - **Mating**
    - **Min -------------------------------------- 2.24 Lbs**
    - **Max-------------------------------------- 2.66 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 1.24 Lbs**
    - **Max-------------------------------------- 1.75 Lbs**

RESULTS Continued

Mating – Unmating Forces

Mating-Unmating Durability Group

- **Initial**
  - **Mating**
    - **Min -------------------------------------- 2.98 Lbs**
    - **Max-------------------------------------- 3.87 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 1.56 Lbs**
    - **Max-------------------------------------- 2.42 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min -------------------------------------- 3.17 Lbs**
    - **Max-------------------------------------- 4.91 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 2.07 Lbs**
    - **Max-------------------------------------- 3.68 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min -------------------------------------- 3.20 Lbs**
    - **Max-------------------------------------- 5.50 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 2.19 Lbs**
    - **Max-------------------------------------- 4.16 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min -------------------------------------- 3.21 Lbs**
    - **Max-------------------------------------- 5.95 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 2.43 Lbs**
    - **Max-------------------------------------- 4.58 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min -------------------------------------- 3.34 Lbs**
    - **Max-------------------------------------- 6.41 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 2.46 Lbs**
    - **Max-------------------------------------- 4.77 Lbs**
- **Humidity**
  - **Mating**
    - **Min -------------------------------------- 2.24 Lbs**
    - **Max-------------------------------------- 3.24 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 1.51 Lbs**
    - **Max-------------------------------------- 2.75 Lbs**

RESULTS Continued

Mating – Unmating Forces

Mating-Unmating Basic (MLE-150-01-G-DV-A/FTMH-150-02-L-DV-A)

- **Initial**
  - **Mating**
    - **Min -------------------------------------- 8.57 Lbs**
    - **Max-------------------------------------10.40 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 4.05 Lbs**
    - **Max-------------------------------------- 5.38 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min -------------------------------------- 8.94 Lbs**
    - **Max-------------------------------------13.36 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 6.38 Lbs**
    - **Max-------------------------------------- 9.29 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min -------------------------------------- 9.43 Lbs**
    - **Max-------------------------------------13.58 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 7.01 Lbs**
    - **Max-------------------------------------10.21 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min -------------------------------------10.17 Lbs**
    - **Max-------------------------------------14.02 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 7.38 Lbs**
    - **Max-------------------------------------10.17 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min -------------------------------------10.61 Lbs**
    - **Max-------------------------------------14.71 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 7.71 Lbs**
    - **Max-------------------------------------10.83 Lbs**

RESULTS Continued

Mating – Unmating Forces

Mating-Unmating Basic (MLE-105-01-G-DV-A/FTMH-105-02-L-DV-A)

- **Initial**
  - **Mating**
    - **Min -------------------------------------- 0.62 Lbs**
    - **Max-------------------------------------- 0.84 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 0.31 Lbs**
    - **Max-------------------------------------- 0.42 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min -------------------------------------- 0.63 Lbs**
    - **Max-------------------------------------- 0.89 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 0.43 Lbs**
    - **Max-------------------------------------- 0.66 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min -------------------------------------- 0.64 Lbs**
    - **Max-------------------------------------- 0.94 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 0.49 Lbs**
    - **Max-------------------------------------- 0.72 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min -------------------------------------- 0.69 Lbs**
    - **Max-------------------------------------- 1.00 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 0.54 Lbs**
    - **Max-------------------------------------- 0.81 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min -------------------------------------- 0.75 Lbs**
    - **Max-------------------------------------- 1.04 Lbs**
  - **Unmating**
    - **Min -------------------------------------- 0.60 Lbs**
    - **Max-------------------------------------- 0.83 Lbs**

Normal Force at 0.0055 inch deflection

- **Initial**
  - **Min-- 135.20 gf Set ----- 0.0003 in**
  - **Max -- 150.50 gf Set ----- 0.0008 in**
- **Thermal**
  - **Min-- 132.50 gf Set ----- 0.0000 in**
  - **Max -- 167.90 gf Set ----- 0.0007 in**

RESULTS Continued

Insulation Resistance minimums, IR

Pin to Pin

- **Initial**
  - **Mated -- 10000 Meg Ω ----------------------- Passed**
  - **Unmated -- 10000 Meg Ω ----------------------- Passed**
- **Thermal Shock**
  - **Mated -- 10000 Meg Ω ----------------------- Passed**
  - **Unmated -- 10000 Meg Ω ----------------------- Passed**
- **Humidity**
  - **Mated -- 10000 Meg Ω ----------------------- Passed**
  - **Unmated -- 10000 Meg Ω ----------------------- Passed**

Row to Row

- **Initial**
  - **Mated -- 10000 Meg Ω ----------------------- Passed**
  - **Unmated -- 10000 Meg Ω ----------------------- Passed**
- **Thermal Shock**
  - **Mated -- 10000 Meg Ω ----------------------- Passed**
  - **Unmated -- 10000 Meg Ω ----------------------- Passed**
- **Humidity**
  - **Mated -- 10000 Meg Ω ----------------------- Passed**
  - **Unmated -- 10000 Meg Ω ----------------------- Passed**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage ------------------------------- 1250 VAC**
  - **Test Voltage -- 938 VAC**
  - **Working Voltage ------------------------------------ 310 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)

- Initial -- 14.37 mOhms Max
- Thermal
  - <= +5.0 mOhms --------------------------------- 192 Points ----------------------- Stable
  - +5.1 to +10.0 mOhms --------------------------------- 0 Points ----------------------- Minor
  - +10.1 to +15.0 mOhms ------------------------------- 0 Points ----------------------- Acceptable
  - +15.1 to +50.0 mOhms ------------------------------- 0 Points ----------------------- Marginal
  - +50.1 to +2000 mOhms ------------------------------- 0 Points ----------------------- Unstable
  - >+2000 mOhms -------------------------------------- 0 Points ----------------------- Open Failure

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

- Initial -- 13.59 mOhms Max
- Durability, 100 Cycles
  - <= +5.0 mOhms --------------------------------- 183 Points ----------------------- Stable
  - +5.1 to +10.0 mOhms --------------------------------- 9 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 --------------------------------- 186 Points ----------------------- Stable
  - +5.1 to +10.0 mOhms --------------------------------- 6 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 --------------------------------- 173 Points ----------------------- Stable
  - +5.1 to +10.0 mOhms ------------------------------- 19 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)

- Initial -- 13.92 mOhms Max
- Gas-Tight
  - <= +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 Shock & Vibration Group (192 LLCR test points)

- **Initial -- 10.41 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**

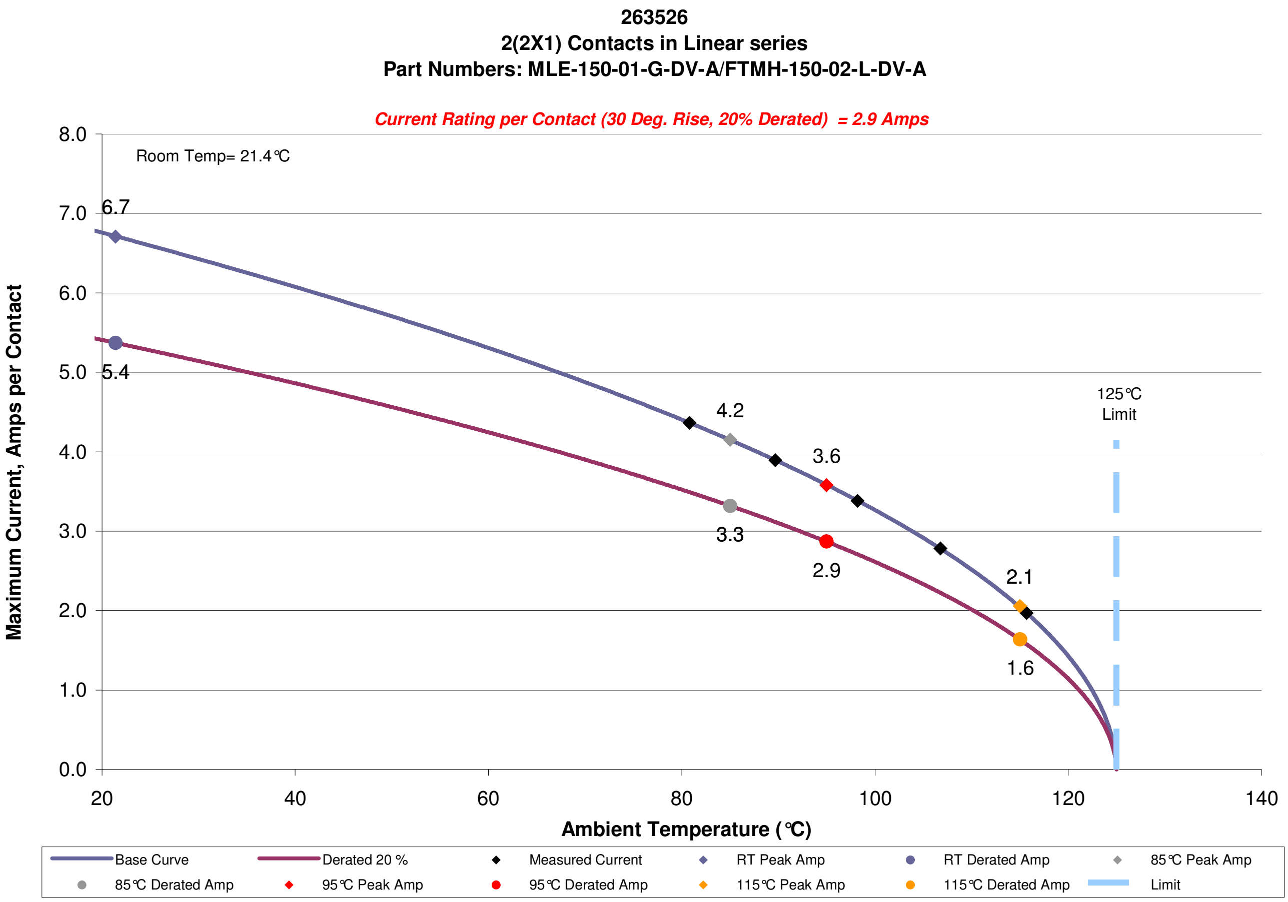
Mechanical Shock & Random Vibration:

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

DATA SUMMARIES

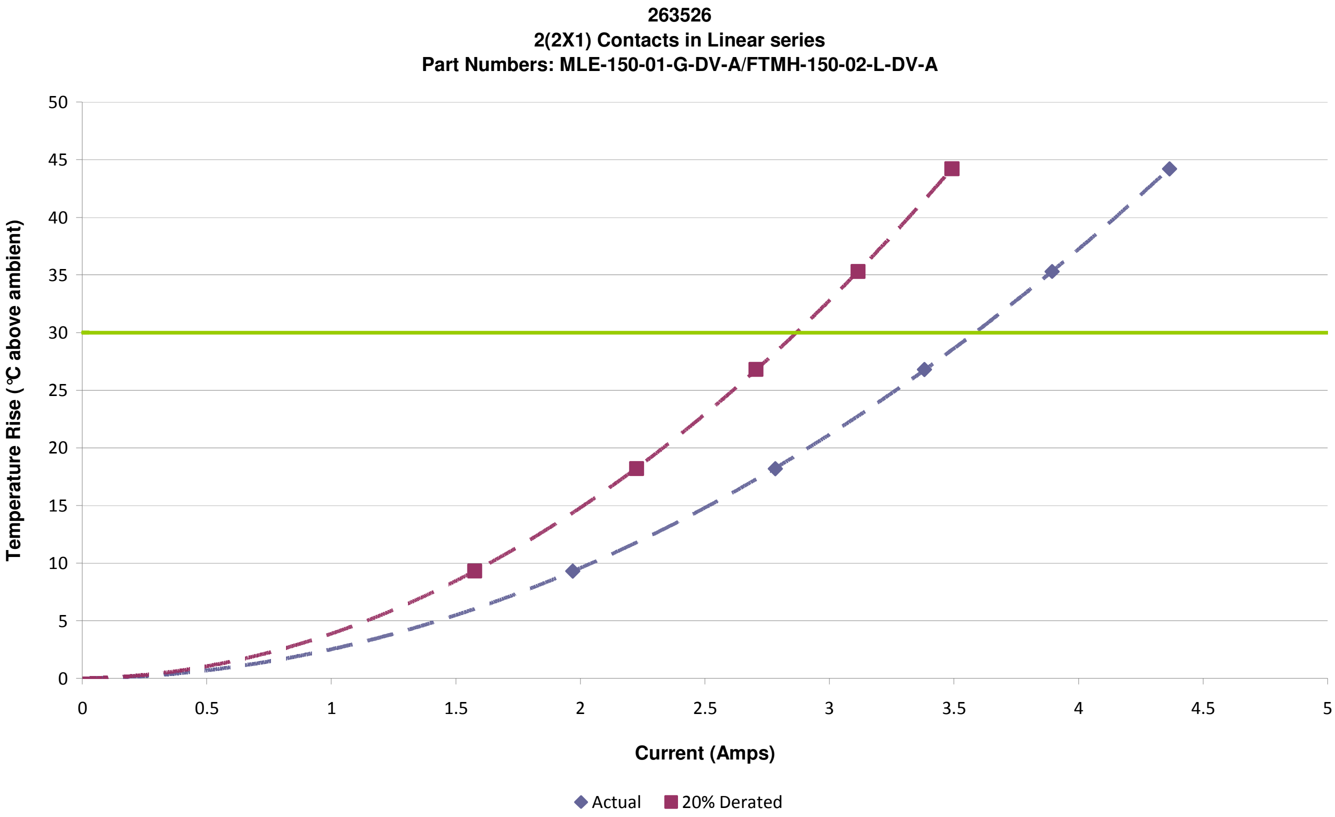
TEMPERATURE RISE (Current Carrying Capacity, CCC):

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



263526
2(2X1) Contacts in Linear series
Part Numbers: MLE-150-01-G-DV-A/FTMH-150-02-L-DV-A

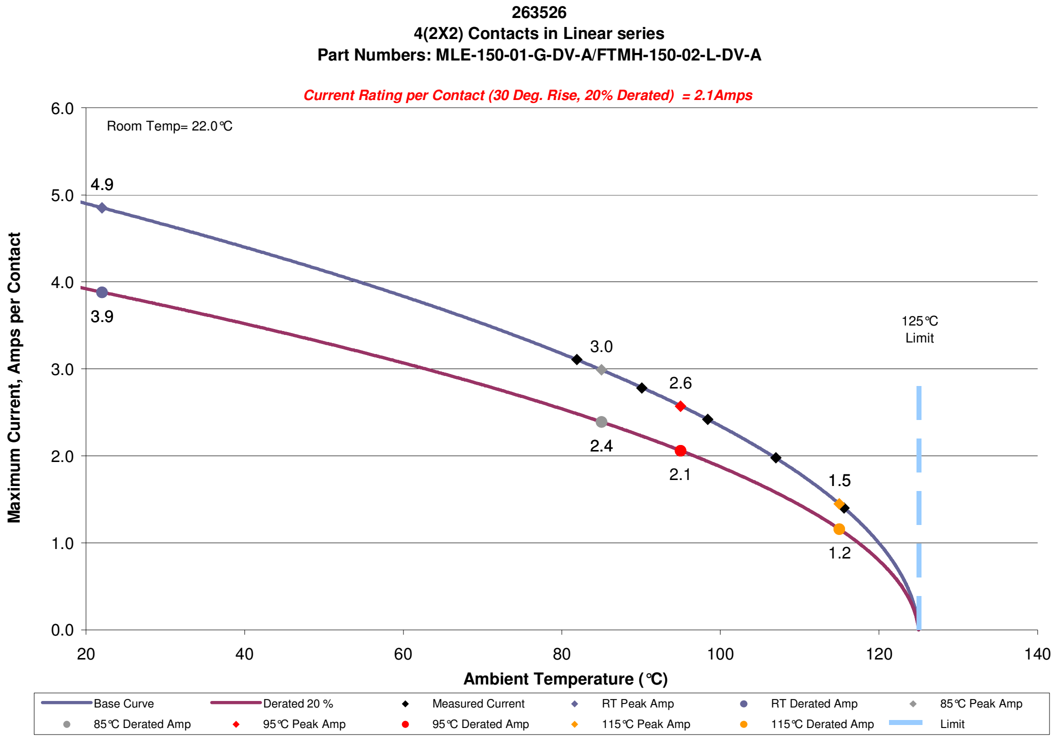
Current Rating per Contact (30 Deg. Rise, 20% Derated) = 2.9 Amps



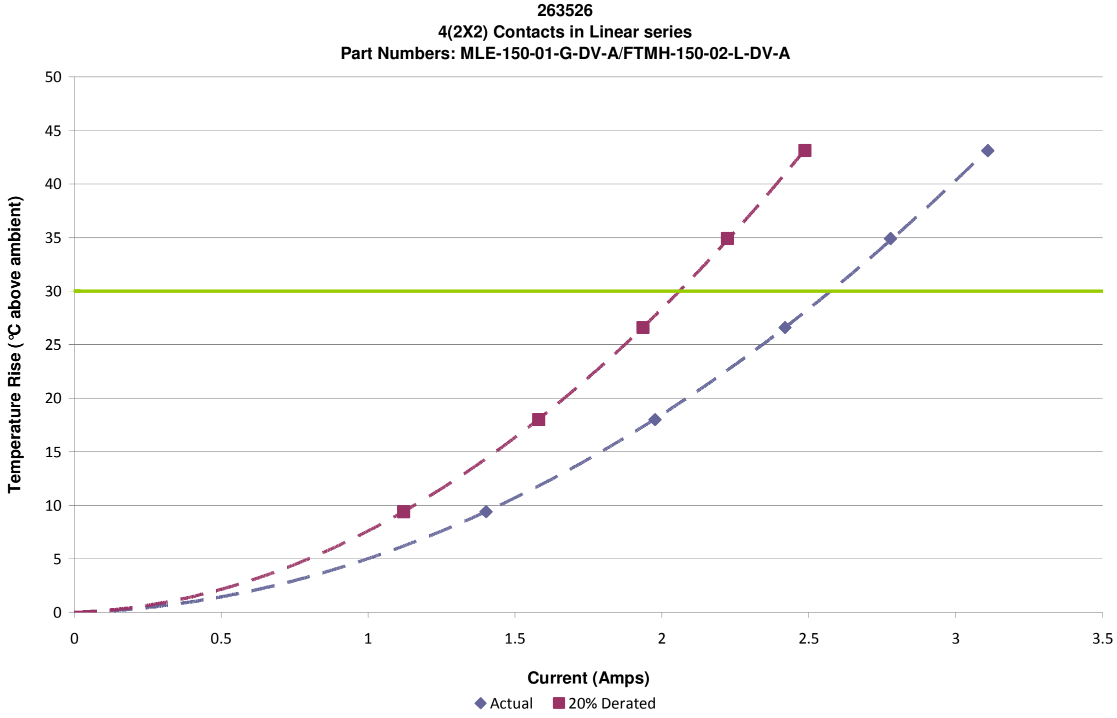
263526
2(2X1) Contacts in Linear series
Part Numbers: MLE-150-01-G-DV-A/FTMH-150-02-L-DV-A
Temperature Rise (°C above ambient)
50
45
40
35
30
25
20
15
10
5
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
Current (Amps)
◆ Actual
■ 20% Derated

DATA SUMMARIES Continued

b. Linear configuration with 4 adjacent conductors/contacts powered

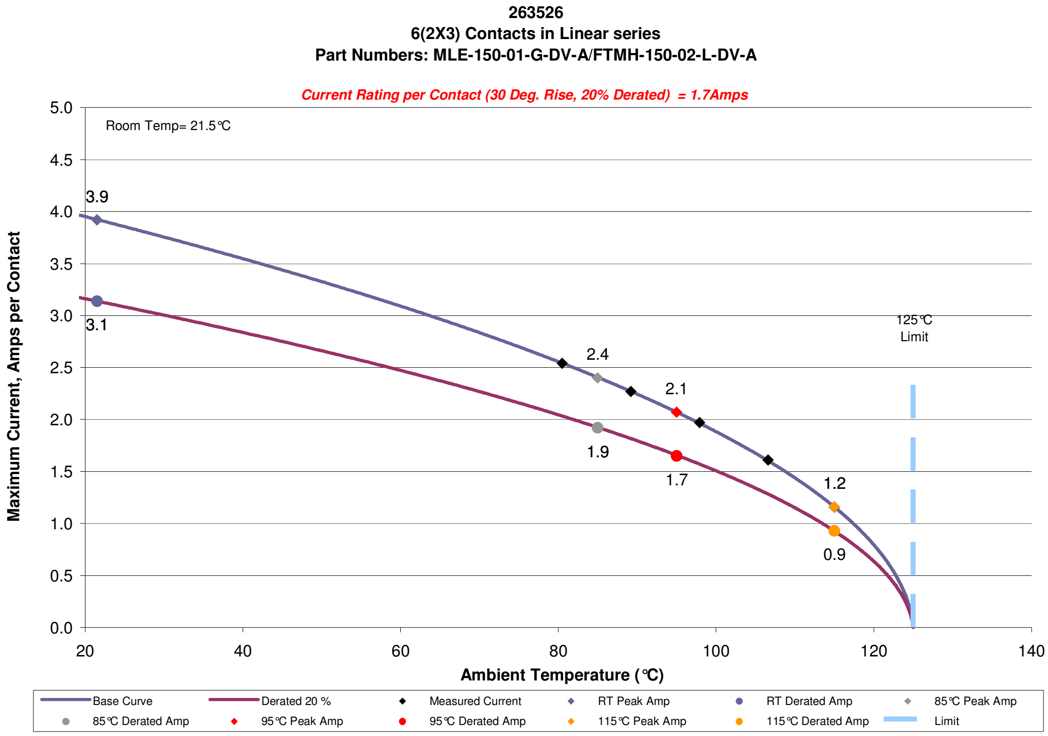

263526
4(2X2) Contacts in Linear series
Part Numbers: MLE-150-01-G-DV-A/FTMH-150-02-L-DV-A

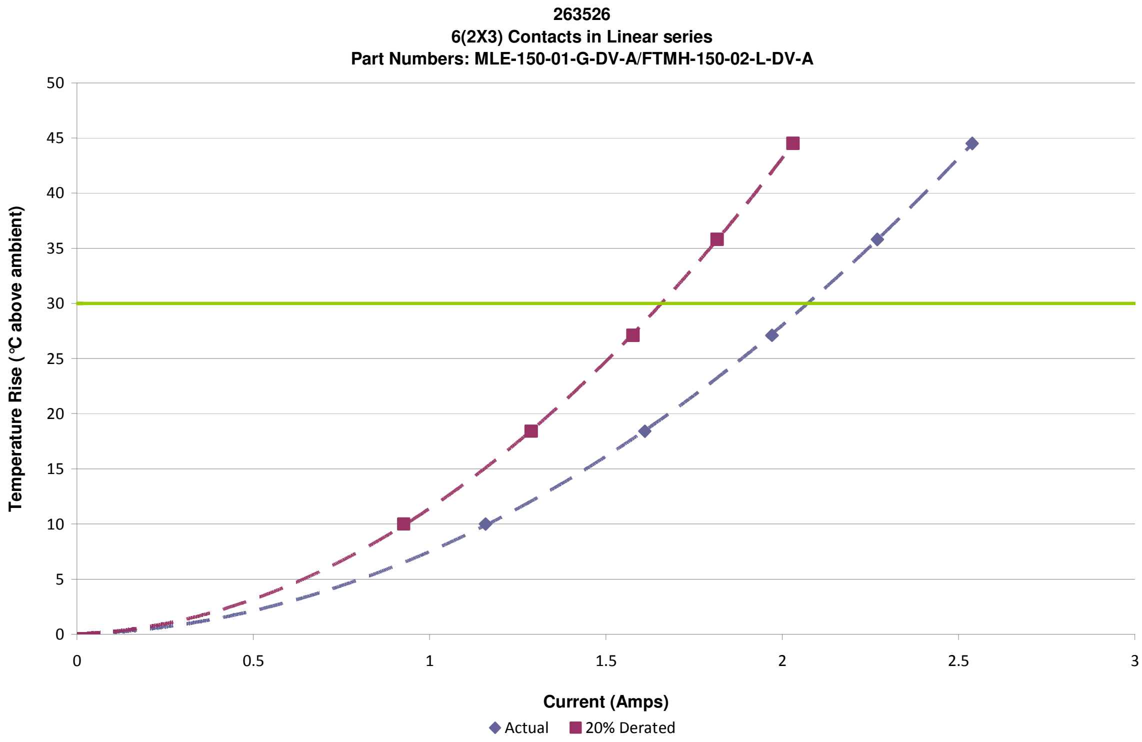
Current Rating per Contact (30 Deg. Rise, 20% Derated) = 2.1Amps


263526
4(2X2) Contacts in Linear series
Part Numbers: MLE-150-01-G-DV-A/FTMH-150-02-L-DV-A

DATA SUMMARIES Continued

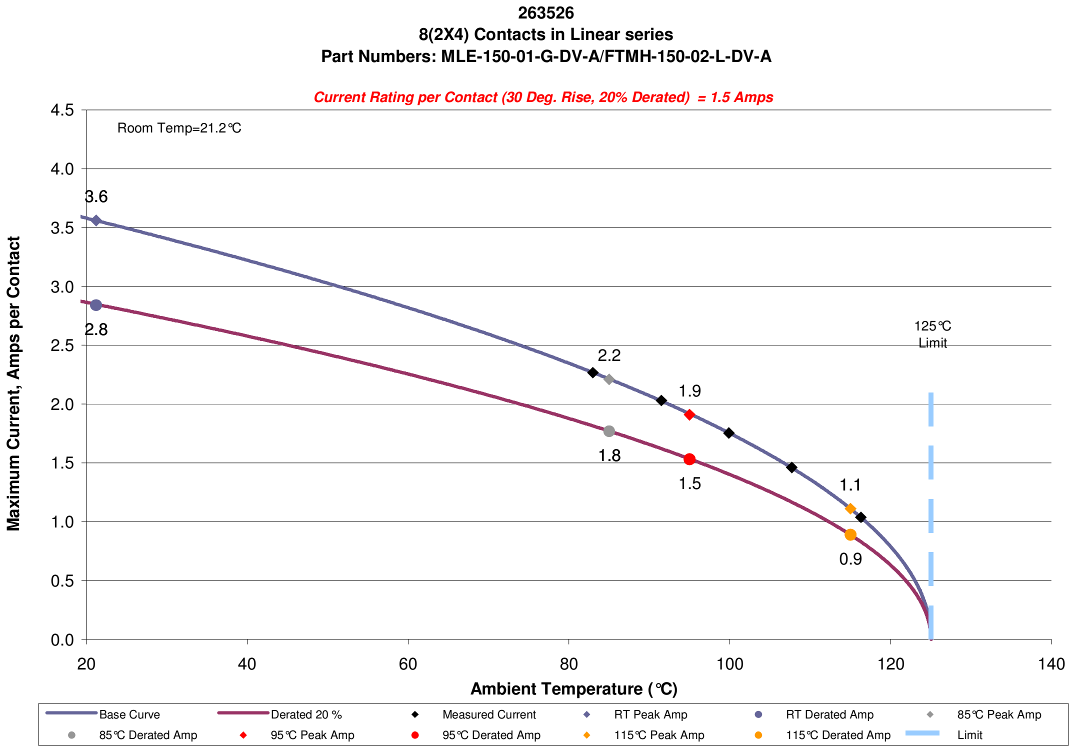
c. Linear configuration with 6 adjacent conductors/contacts powered





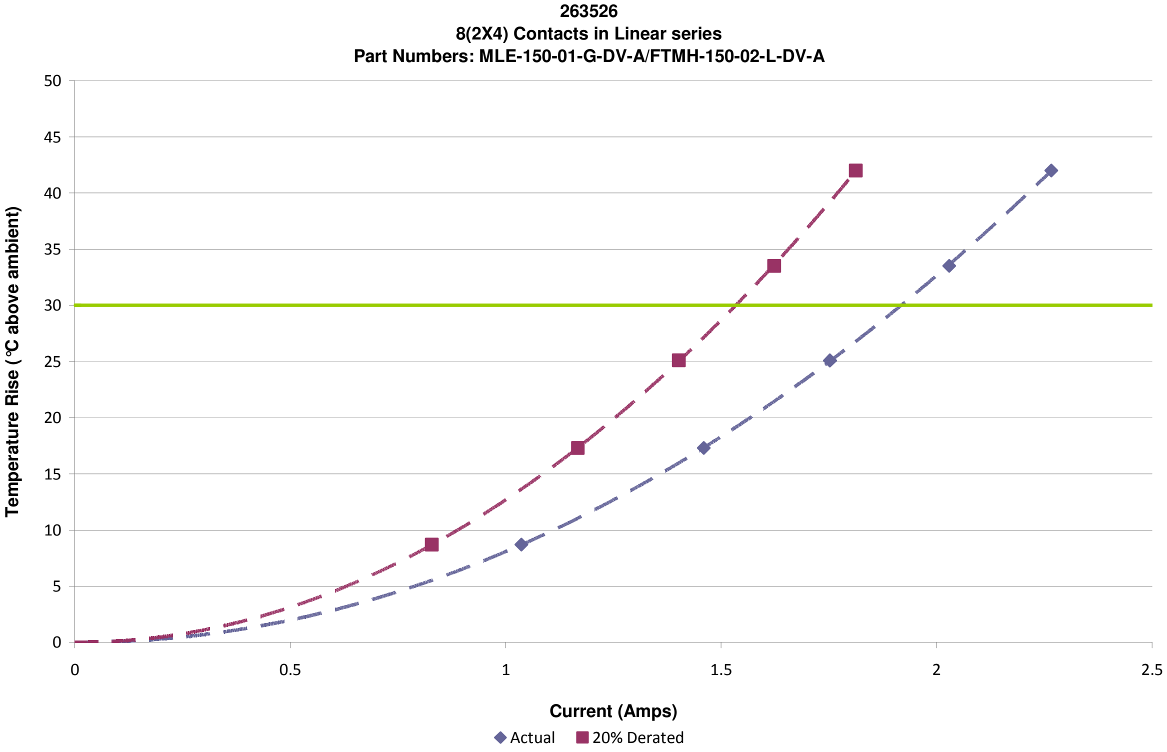
DATA SUMMARIES Continued

d. Linear configuration with 8 adjacent conductors/contacts powered



263526
8(2X4) Contacts in Linear series
Part Numbers: MLE-150-01-G-DV-A/FTMH-150-02-L-DV-A

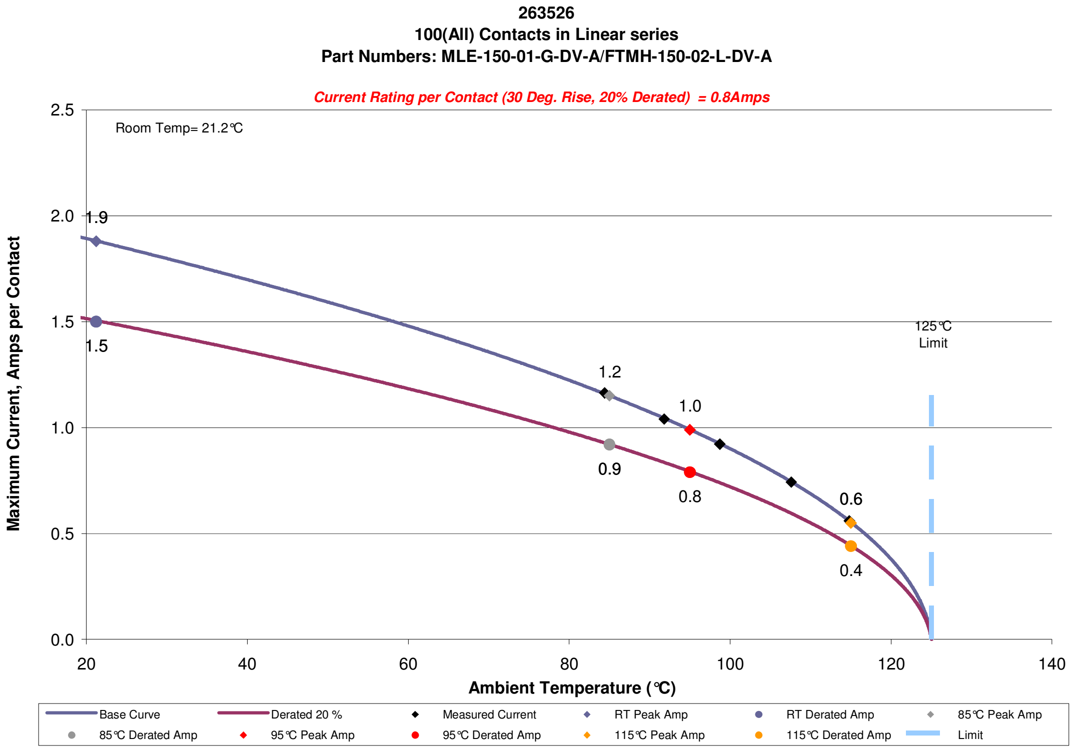
Current Rating per Contact (30 Deg. Rise, 20% Derated) = 1.5 Amps

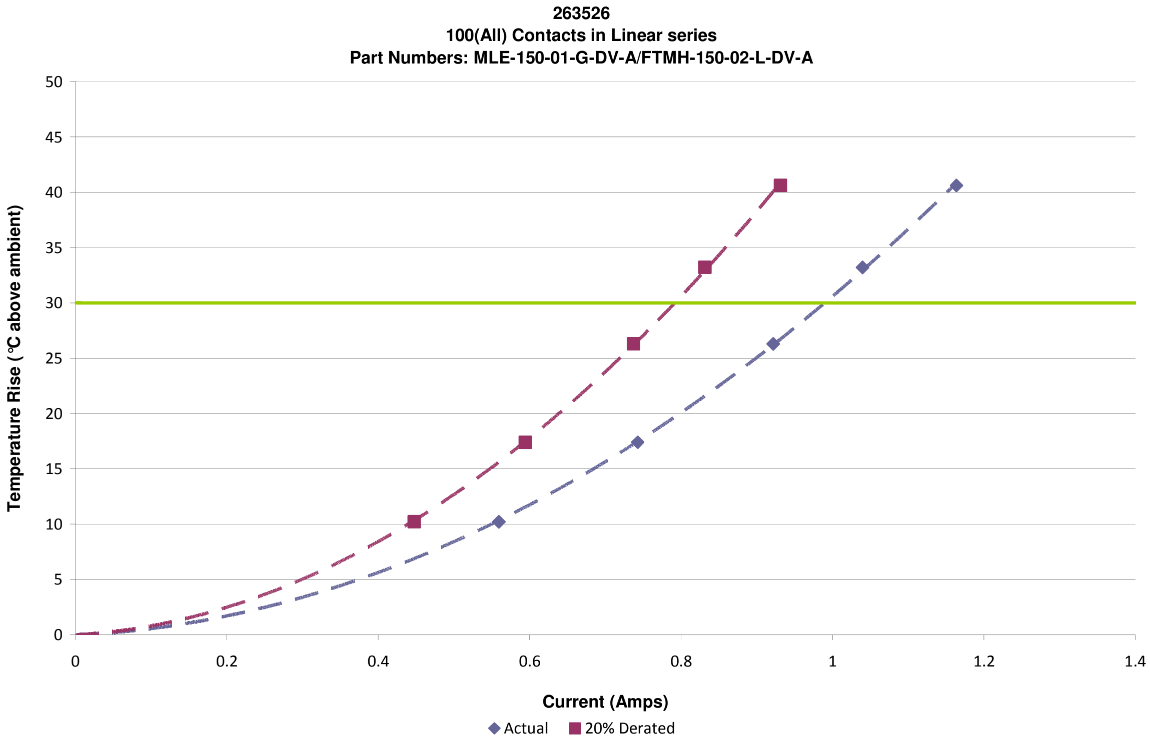


263526
8(2X4) Contacts in Linear series
Part Numbers: MLE-150-01-G-DV-A/FTMH-150-02-L-DV-A

DATA SUMMARIES Continued

e. Linear configuration with all adjacent conductors/contacts powered





DATA SUMMARIES Continued

MATING-UNMATING FORCE:

Thermal Aging Group

	Initial				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	15.12	3.40	6.94	1.56	9.96	2.24	5.52	1.24
Maximum	18.33	4.12	10.59	2.38	11.83	2.66	7.78	1.75
Average	16.98	**3.82**	8.22	**1.85**	10.92	**2.46**	6.59	**1.48**
St Dev	1.19	0.27	1.28	0.29	0.65	0.15	0.74	0.17
Count	8	8	8	8	8	8	8	8

Mating-Unmating Durability Group

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	13.26	2.98	6.94	1.56	14.10	3.17	9.21	2.07
Maximum	17.21	3.87	10.76	2.42	21.84	4.91	16.37	3.68
Average	15.17	**3.41**	8.42	**1.89**	17.31	**3.89**	12.42	**2.79**
St Dev	1.32	0.30	1.30	0.29	2.29	0.52	2.07	0.46
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	14.23	3.20	9.74	2.19	14.28	3.21	10.81	2.43
Maximum	24.46	5.50	18.50	4.16	26.47	5.95	20.37	4.58
Average	18.61	**4.19**	14.30	**3.22**	19.97	**4.49**	15.75	**3.54**
St Dev	2.96	0.67	2.56	0.58	3.54	0.80	2.71	0.61
Count	8	8	8	8	8	8	8	8

	After 100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	14.86	3.34	10.94	2.46	9.96	2.24	6.72	1.51
Maximum	28.51	6.41	21.22	4.77	14.41	3.24	12.23	2.75
Average	21.78	**4.90**	17.08	**3.84**	12.05	**2.71**	9.30	**2.09**
St Dev	3.98	0.90	3.04	0.68	1.56	0.35	1.89	0.43
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

MATING-UNMATING FORCE:

Mating-Unmating Basic (MLE-150-01-G-DV-A/FTMH-150-02-L-DV-A)

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	38.12	8.57	18.01	4.05	39.77	8.94	28.38	6.38
Maximum	46.26	10.40	23.93	5.38	59.43	13.36	41.32	9.29
Average	42.11	**9.47**	21.74	**4.89**	47.12	**10.59**	33.74	**7.59**
St Dev	2.87	0.64	2.06	0.46	6.19	1.39	4.45	1.00
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	41.94	9.43	31.18	7.01	45.24	10.17	32.83	7.38
Maximum	60.40	13.58	45.41	10.21	62.36	14.02	45.24	10.17
Average	48.87	**10.99**	36.81	**8.28**	52.33	**11.77**	39.39	**8.86**
St Dev	5.96	1.34	4.57	1.03	5.99	1.35	4.30	0.97
Count	8	8	8	8	8	8	8	8

	After 100 Cycles			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	47.19	10.61	34.29	7.71
Maximum	65.43	14.71	48.17	10.83
Average	54.89	**12.34**	41.66	**9.37**
St Dev	6.42	1.44	4.47	1.00
Count	8	8	8	8

DATA SUMMARIES Continued

MATING-UNMATING FORCE:

Mating-Unmating Basic (MLE-105-01-G-DV-A/FTMH-105-02-L-DV-A)

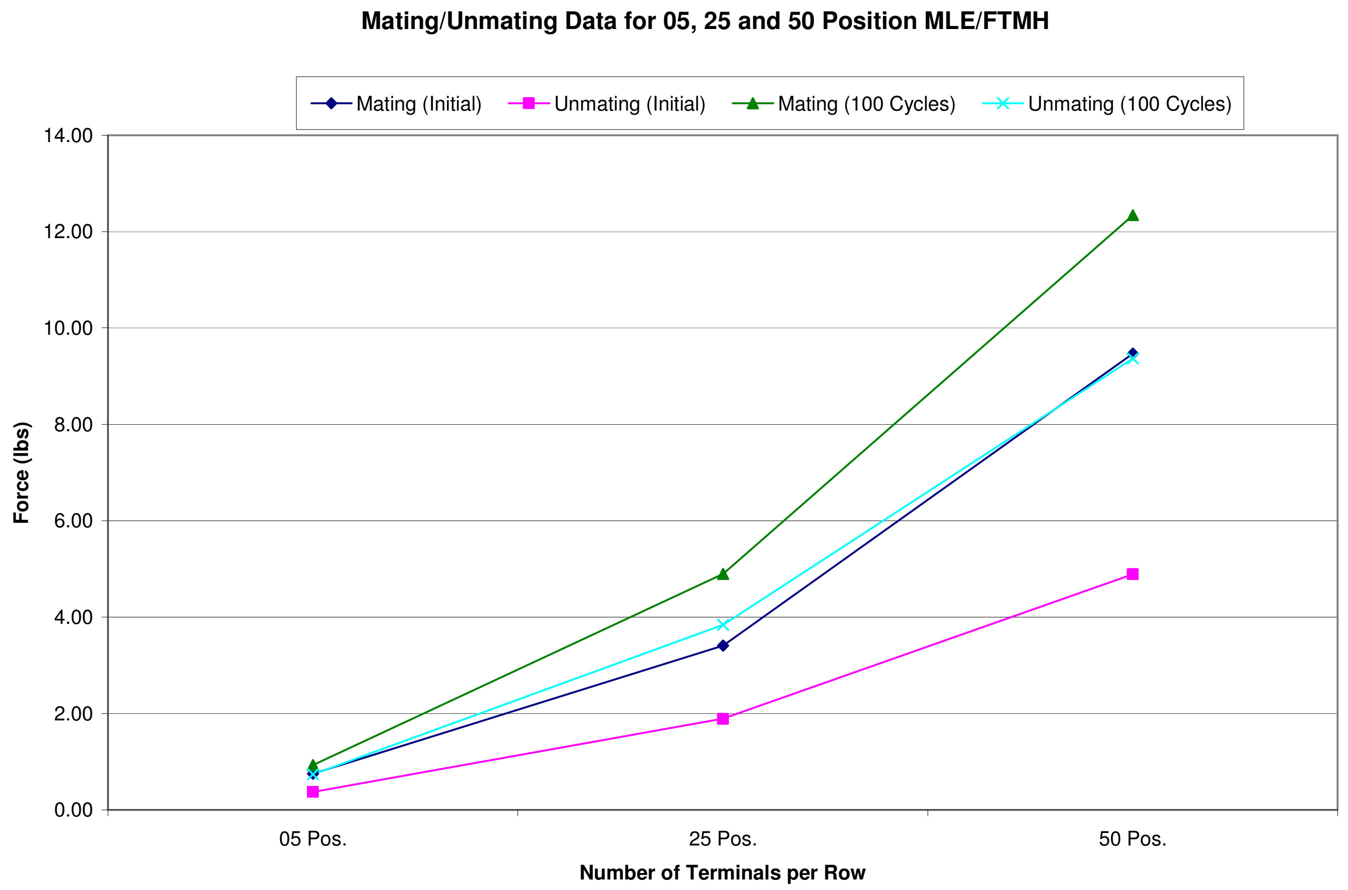
	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	2.76	0.62	1.38	0.31	2.80	0.63	1.91	0.43
Maximum	3.74	0.84	1.87	0.42	3.96	0.89	2.94	0.66
Average	3.34	**0.75**	1.63	**0.37**	3.51	**0.79**	2.43	**0.55**
St Dev	0.37	0.08	0.16	0.04	0.46	0.10	0.35	0.08
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	2.85	0.64	2.18	0.49	3.07	0.69	2.40	0.54
Maximum	4.18	0.94	3.20	0.72	4.45	1.00	3.60	0.81
Average	3.69	**0.83**	2.78	**0.63**	3.91	**0.88**	2.98	**0.67**
St Dev	0.48	0.11	0.33	0.08	0.52	0.12	0.43	0.10
Count	8	8	8	8	8	8	8	8

	After 100 Cycles			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	3.34	0.75	2.67	0.60
Maximum	4.63	1.04	3.69	0.83
Average	4.13	**0.93**	3.27	**0.74**
St Dev	0.45	0.10	0.42	0.09
Count	8	8	8	8

DATA SUMMARIES Continued

Mating\Unmating Force Comparison



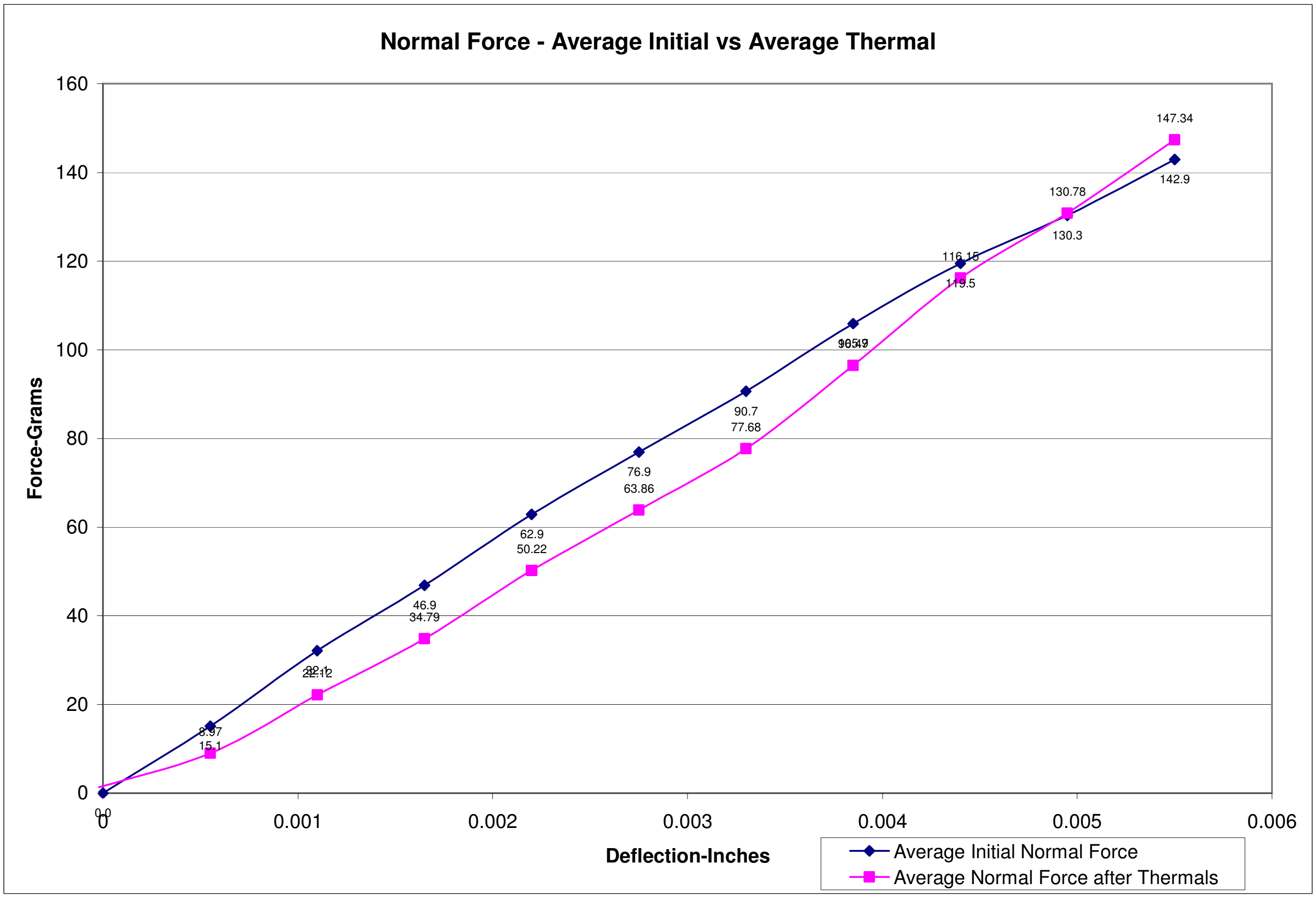
DATA SUMMARIES Continued

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.

	Deflections in inches Forces in Grams										
Initial	**0.0006**	**0.0011**	**0.0017**	**0.0022**	**0.0028**	**0.0033**	**0.0039**	**0.0044**	**0.0050**	**0.0055**	***SET***
Averages	15.10	32.08	46.89	62.88	76.93	90.65	105.90	119.48	130.33	142.89	0.0005
Min	12.80	28.10	40.40	55.30	71.00	83.40	97.30	112.50	122.80	135.20	0.0003
Max	17.20	34.70	51.10	69.90	85.90	97.20	113.30	127.70	137.80	150.50	0.0008
St. Dev	1.257	2.076	3.704	4.505	4.576	4.353	5.283	5.389	4.980	4.922	0.0001
Count	12	12	12	12	12	12	12	12	12	12	12

	Deflections in inches Forces in Grams										
After Thermals	**0.0006**	**0.0011**	**0.0017**	**0.0022**	**0.0028**	**0.0033**	**0.0039**	**0.0044**	**0.0050**	**0.0055**	***SET***
Averages	8.97	22.12	34.79	50.22	63.86	77.68	96.47	116.15	130.78	147.34	0.0002
Min	-0.10	10.00	22.10	38.70	54.50	65.60	84.70	102.80	116.20	132.50	0.0000
Max	17.20	35.20	48.30	61.00	76.00	94.80	114.10	133.30	149.20	167.90	0.0007
St. Dev	5.336	7.123	7.293	7.371	7.887	10.771	10.403	11.083	11.363	11.354	0.0003
Count	12	12	12	12	12	12	12	12	12	12	12



DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**MLE/FTMH**	**MLE**	**FTMH**
Initial	10000	10000	10000
Thermal	10000	10000	10000
Humidity	10000	10000	10000

	Row to Row		
	Mated	Unmated	Unmated
Minimum	**MLE/FTMH**	**MLE**	**FTMH**
Initial	10000	10000	10000
Thermal	10000	10000	10000
Humidity	10000	10000	10000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**MLE/FTMH**
Break Down Voltage	1250
Test Voltage	938
Working Voltage	310

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

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	2013-9-22	2013-10-8		
Room Temp (Deg C)	25	24		
Rel Humidity (%)	55	56		
Technician	Kason He	Kason He		
mOhm values	**Actual Initial**	**Delta Thermal**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	10.74	0.57		
St. Dev.	1.04	0.61		
Min	9.05	0.00		
Max	14.37	3.26		
Summary Count	192	192		
Total Count	192	192		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Thermal	**192**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Mating/Unmating Durability Group

1). A total of 192 points were measured.
2). EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3). A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4). The following guidelines are used to categorize the changes in LLCR as a result from stressing.
    a. <= +5.0 mOhms:----------------------------------Stable
    b. +5.1 to +10.0 mOhms: --------------------------Minor
    c. +10.1 to +15.0 mOhms: -------------------------Acceptable
    d. +15.1 to +50.0 mOhms: -------------------------Marginal
    e. +50.1 to +2000 mOhms -------------------------Unstable
    f. > +2000 mOhms:---------------------------------Open Failure

LLCR Measurement Summaries by Pin Type

Date	2013-9-22	2013-9-25	2013-10-8	2013-10-25
Room Temp (Deg C)	25	25	24	22
Rel Humidity (%)	55	56	56	44
Technician	Kason He	Kason He	Kason He	Kason He
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shck**	**Delta Humidity**
	Pin Type 1: Signal			
Average	10.61	1.34	1.08	1.77
St. Dev.	0.90	1.59	1.35	1.87
Min	8.89	0.01	0.00	0.01
Max	13.59	9.42	8.56	9.01
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	**183**	**9**	**0**	**0**	**0**	**0**
Therm Shck	**186**	**6**	**0**	**0**	**0**	**0**
Humidity	**173**	**19**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Gas Tight Group

1) A total of 192 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
    a. <= +5.0 mOhms: ---------------------------------Stable
    b. +5.1 to +10.0 mOhms:---------------------------Minor
    c. +10.1 to +15.0 mOhms: ------------------------Acceptable
    d. +15.1 to +50.0 mOhms: ------------------------Marginal
    e. +50.1 to +2000 mOhms: -----------------------Unstable
    f. >+2000 mOhms:----------------------------------Open Failure

	LLCR Measurement Summaries by Pin Type			
Date	2013-9-18	2013-9-18		
Room Temp (Deg C)	23	23		
Rel Humidity (%)	53	56		
Technician	Kason He	Kason He		
mOhm values	**Actual Initial**	**Delta Acid Vapor**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	10.72	1.58		
St. Dev.	1.04	1.31		
Min	8.84	0.00		
Max	13.92	6.58		
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	**190**	**2**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

LLCR Shock & Vibration Group

1) A total of 192 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
    a. <= +5.0 mOhms:------------------------------------Stable
    b. +5.1 to +10.0 mOhms:----------------------------Minor
    c. +10.1 to +15.0 mOhms: --------------------------Acceptable
    d. +15.1 to +50.0 mOhms: --------------------------Marginal
    e. +50.1 to +2000 mOhms --------------------------Unstable
    f. >+2000 mOhms: -----------------------------------Open Failure

	LLCR Measurement Summaries by Pin Type			
Date	2013-9-30	2013-11-1		
Room Temp (Deg C)	21	22		
Rel Humidity (%)	51	35		
Technician	Aaron McKim	Tony Wagoner		
mOhm values	**Actual Initial**	**Delta Shock-Vib**	**Delta**	**Delta**
	Pin Type 1: Signal			
Average	9.37	0.09		
St. Dev.	0.35	0.09		
Min	8.71	0.00		
Max	10.41	0.46		
Summary Count	192	192		
Total Count	192	192		

LLCR Delta Count by Category						
	Stable	**Minor**	**Acceptable**	**Marginal**	**Unstable**	**Open**
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
Shock-Vib	**192**	**0**	**0**	**0**	**0**	**0**

Nanosecond Event Detection:

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

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: HZ-TCT-01
Description: Normal force analyzer
Manufacturer: Mecmesin Multitester
Model: Mecmesin Multitester 2.5-i
Serial #: 08-1049-04
Accuracy: Last Cal: 4/26/2013, Next Cal: 4/25/2014

Equipment #: HZ-OV-01
Description: Oven
Manufacturer: Huida
Model: CS101-1E
Serial #: CS101-1E-B
Accuracy: Last Cal: 12/13/2012, Next Cal: 12/12/2013

Equipment #: HZ-THC-01
Description: Humidity transmitter
Manufacturer: Thermtron
Model: SM-8-8200
Serial #: 38846
Accuracy: Last Cal: 2/28/2013, Next Cal: 2/27/2014

Equipment #: HZ-HPM-01
Description: NA9636H
Manufacturer: Ainuo
Model: 6031A
Serial #: 089601091
Accuracy: Last Cal: 3/7/2013, Next Cal: 3/6/2014

Equipment #: HZ-MO-05
Description: Micro-ohmmeter
Manufacturer: Keithley
Model: 3706
Serial #: 1285188
Accuracy: Last Cal: 11/15/2012, Next Cal: 11/14/2013

Equipment #: HZ-TSC-01
Description: Vertical Thermal Shock Chamber
Manufacturer: Cincinnatti Sub Zero
Model: VTS-3-6-6-SC/AC
Serial #: 10-VT14994
Accuracy: See Manual
… Last Cal: 06/27/2013, Next Cal: 06/26/2014

Equipment #: HZ-PS-01
Description: 120 Amp Power Supply
Manufacturer: Agilent
Model: 6031A PS
Serial #: MY41000982
Accuracy: See Manual
… Last Cal: 07/02/2013, Next Cal: 07/01/2014

EQUIPMENT AND CALIBRATION SCHEDULES Continued

Equipment #: HZ-MO-01
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 1199807
Accuracy: See Manual
… Last Cal: 07/02/2013, Next Cal: 07/01/2014

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 #: 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: 07/09/2014, Next Cal: 07/09/2014

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 06/04/2013, Next Cal: 06/04/2014