Project Number: Design Qualification Test Report	Tracking Code: 296101_Report_Rev_1
Requested by: Travis Newton	Date: 4/9/2014
Part #: MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC	
Part description: MCP/MCP, MCP/MCR	Tech: Peter Chen
Test Start: 01/10/2014	Test Completed: 02/20/2014

DESIGN QUALIFICATION TEST REPORT

MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC
MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
4/2/2014	1	Initial Issue	PC

CERTIFICATION

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

SCOPE

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

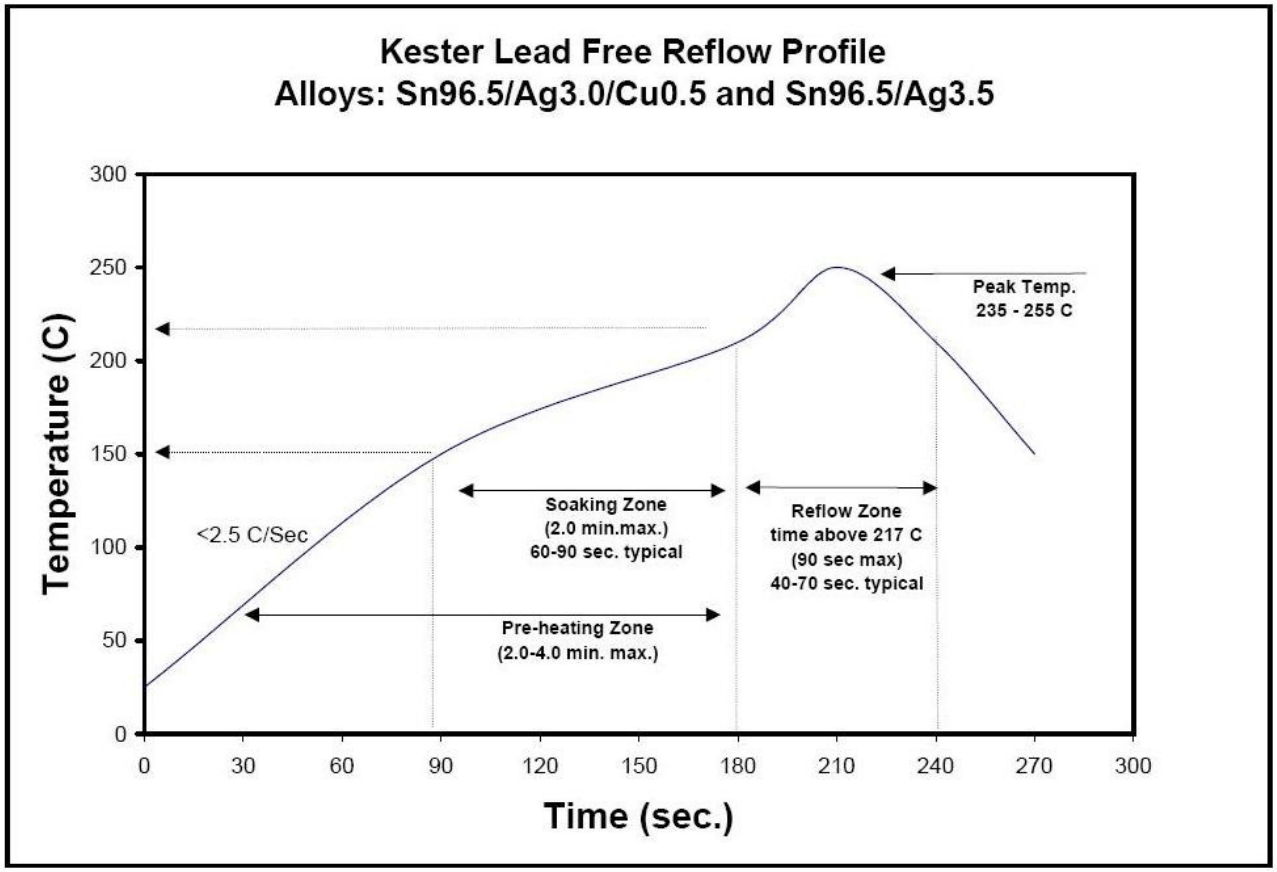
APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

1) All materials were manufactured in accordance with the applicable product specification.
2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
3) After soldering, the parts to be used for LLCR and DWV/IR testing were cleaned according to TLWI-0001.
4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
5) The automated procedure is used with aqueous compatible soldering materials.
6) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
7) Any additional preparation will be noted in the individual test sequences.
8) Solder Information: Lead Free
9) Re-Flow Time/Temp: See accompanying profile.
10) Samtec Test PCBs used: PCB-106073-TST.

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

Group 1

MCP-8-02-L-00.25-S-BC

MCP-8-02-L-00.25-T-BC

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

MCP-8-02-L-00.25-S-BC

8 Contacts Minimum

Signal Without Thermals

Step	Description
1.	Contact Gaps
2.	Normal Force (1) Expected Force at Max Deflection = 0 g Deflection = 0.0051 "

Group 2

MCP-8-02-L-00.25-S-BC

MCP-8-02-L-00.25-T-BC

8 Contacts Minimum

Signal With Thermals

Step	Description
1.	Contact Gaps
2.	Thermal Age (2)
3.	Contact Gaps
4.	Normal Force (1) Deflection = 0.0051 " Expected Force at Max Deflection = 0 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

MCP-8-02-L-00.25-S-BC

MCP-8-02-L-00.25-T-BC

8 Assemblies

Note: Delete contact gaps due to inability to accurately measure them.

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

(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

MCP-8-02-L-00.25-S-BC

MCP-8-02-L-00.25-T-BC

8 Assemblies

Note: Delete contact gaps due to inability to accurately measure them.

Step	Description
1.	LLCR (2) Max Delta = 15 mOhm
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)
11.	LLCR (2) Max Delta = 15 mOhm
12.	Thermal Shock (4)
13.	LLCR (2) Max Delta = 15 mOhm
14.	Humidity (1)
15.	LLCR (2) Max Delta = 15 mOhm
16.	Mating/Unmating Force (3)

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

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

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

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

FLOWCHARTS Continued

IR/DWV

Pin-to-Pin

Group 1

MCP-8-02-L-00.25-S-BC

MCP-8-02-L-00.25-T-BC

2 Assemblies

Step	Description
1.	IR (3)
2.	DWV at Test Voltage (1) Test Voltage = 900 V
3.	Thermal Shock (4)
4.	IR (3)
5.	DWV at Test Voltage (1) Test Voltage = 900 V
6.	Humidity (2)
7.	IR (3)
8.	DWV at Test Voltage (1) Test Voltage = 900 V

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

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

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

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

FLOWCHARTS Continued

IR/DWV

Pin-to-Pin

Group 1

MCP-8-02-L-00.25-T-BC

MCR-8-02-L-00.25-S-BC

2 Assemblies

Step	Description
1.	IR (3)
2.	DWV at Test Voltage (1) Test Voltage = 900 V
3.	Thermal Shock (4) - Non Standard
4.	IR (3)
5.	DWV at Test Voltage (1) Test Voltage = 900 V
6.	Humidity (2)
7.	IR (3)
8.	DWV at Test Voltage (1) Test Voltage = 900 V

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

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

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

(4) Thermal Shock = Other
Exposure Time at Temperature Extremes = 1/2 Hour
Method A, Test Condition = I (-55°C to +80°C)
Test Duration = A-3 (100 Cycles)
EIA-364-32

FLOWCHARTS Continued

Current Carrying Capacity

Group 1

1 Pins Powered Signal

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

Group 2

2 Pins Powered Signal

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

Group 3

3 Pins Powered Signal

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

Group 4

4 Pins Powered Signal

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

Group 5

12 Pins Powered Signal

Step	Description
1.	CCC (1) Rows = 1 Number of Positions = 12

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

Mechanical Shock/Random Vibration/LLCR

Group 1
MCP-8-02-L-00.25-T-BC
MCR-8-02-L-00.25-S-BC
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)

FLOWCHARTS Continued

Mechanical Shock/Random Vibration/Event Detection

Group 1

MCP-8-02-L-00.25-T-BC

MCR-8-02-L-00.25-S-BC

60 Points

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

(1) Nanosecond Event Detection (Mechanical Shock)

Use EIA-364-87 for Nanosecond Event Detection:

Test Condition = F (50 nanoseconds at 10 ohms)

Use EIA-364-27 for Mechanical Shock:

Test Condition = C (100 G Peak, 6 milliseconds, Half Sine)

Number of Shocks = 3 Per Direction, Per Axis, 18 Total

(2) Nanosecond Event Detection (Random Vibration)

Use EIA-364-87 for Nanosecond Event Detection:

Test Condition = F (50 nanoseconds at 10 ohms)

Use EIA-364-28 for Random Vibration:

Condition = VB (7.56 gRMS Average, 2 Hours/Axis)

FLOWCHARTS Continued

Dust/Water

IPx7 Water Submersion

Group 1	Group 2	Group 3
MCP-8-02-L-00.25-S-BC MCP-8-02-L-00.25-T-BC 6 Assemblies	MCP-8-02-L-00.25-S-BC DC-MCR-8 6 Assemblies	DC-MCP-8 MCP-8-02-L-00.25-T-BC 6 Assemblies
Step **Description** 1. Water Submersion - IPX7 (2) Depth = 1 meters 2. Visual Inspection	**Step** **Description** 1. Water Submersion - IPX7 (2) Depth = 1 meters 2. Visual Inspection	**Step** **Description** 1. Water Submersion - IPX7 (2) Depth = 1 meters 2. Visual Inspection

IPx8 Deep Water Submersion

Group 4	Group 5	Group 6	Group 7
MCP-8-02-L-00.25-S-BC MCP-8-02-L-00.25-T-BC 3 Assemblies	MCP-8-02-L-00.25-S-BC DC-MCR-8 3 Assemblies	DC-MCP-8 MCP-8-02-L-00.25-T-BC 3 Assemblies	MCP-8-02-L-00.25-S-BC MCP-8-02-L-00.25-T-BC 3 Assemblies
Step **Description** 1. Water Submersion - IPX8 (3) Depth = 2 meters Duration = 30 min 2. Visual Inspection	**Step** **Description** 1. Water Submersion - IPX8 (3) Depth = 2 meters Duration = 30 min 2. Visual Inspection	**Step** **Description** 1. Water Submersion - IPX8 (3) Depth = 2 meters Duration = 30 min 2. Visual Inspection	**Step** **Description** 1. Water Submersion - IPX8 (3) Depth = 3 meters Duration = 30 min 2. Visual Inspection

Group 8	Group 9	Group 10	Group 11
MCP-8-02-L-00.25-S-BC DC-MCR-8 3 Assemblies	DC-MCP-8 MCP-8-02-L-00.25-T-BC 3 Assemblies	MCP-8-02-L-00.25-S-BC MCP-8-02-L-00.25-T-BC 3 Assemblies	MCP-8-02-L-00.25-S-BC DC-MCR-8 3 Assemblies
Step **Description** 1. Water Submersion - IPX8 (3) Depth = 3 meters Duration = 30 min 2. Visual Inspection	**Step** **Description** 1. Water Submersion - IPX8 (3) Depth = 3 meters Duration = 30 min 2. Visual Inspection	**Step** **Description** 1. Water Submersion - IPX8 (3) Depth = 4 meters Duration = 30 min 2. Visual Inspection	**Step** **Description** 1. Water Submersion - IPX8 (3) Depth = 4 meters Duration = 30 min 2. Visual Inspection

FLOWCHARTS Continued

Group 12
DC-MCP-8
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 4 meters Duration = 30 min
2.	Visual Inspection

Group 13
MCP-8-02-L-00.25-S-BC
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 5 meters Duration = 30 min
2.	Visual Inspection

Group 14
MCP-8-02-L-00.25-S-BC
DC-MCR-8
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 5 meters Duration = 30 min
2.	Visual Inspection

Group 15
DC-MCP-8
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 5 meters Duration = 30 min
2.	Visual Inspection

Group 16
MCP-8-02-L-00.25-S-BC
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 6 meters Duration = 30 min
2.	Visual Inspection

Group 17
MCP-8-02-L-00.25-S-BC
DC-MCR-8
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 6 meters Duration = 30 min
2.	Visual Inspection

Group 18
DC-MCP-8
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 6 meters Duration = 30 min
2.	Visual Inspection

Group 19
MCP-8-02-L-00.25-S-BC
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 7 meters Duration = 30 min
2.	Visual Inspection

Group 20
MCP-8-02-L-00.25-S-BC
DC-MCR-8
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 7 meters Duration = 30 min
2.	Visual Inspection

Group 21
DC-MCP-8
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 7 meters Duration = 30 min
2.	Visual Inspection

Group 22
MCP-8-02-L-00.25-S-BC
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Depth = 8 meters Duration = 30 min
2.	Visual Inspection

Group 23
MCP-8-02-L-00.25-S-BC
DC-MCR-8
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 [3] Duration = 30 min Depth = 8 meters
2.	Visual Inspection

FLOWCHARTS Continued

Group 24
DC-MCP-8
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 (3) Depth = 8 meters Duration = 30 min
2.	Visual Inspection

Group 25
MCP-8-02-L-00.25-S-BC
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 (3) Depth = 9 meters Duration = 30 min
2.	Visual Inspection

Group 26
MCP-8-02-L-00.25-S-BC
DC-MCR-8
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 (3) Depth = 9 meters Duration = 30 min
2.	Visual Inspection

Group 28
MCP-8-02-L-00.25-S-BC
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 (3) Depth = 10 meters Duration = 30 min
2.	Visual Inspection

Group 29
MCP-8-02-L-00.25-S-BC
DC-MCR-8
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 (3) Depth = 10 meters Duration = 30 min
2.	Visual Inspection

Group 30
DC-MCP-8
MCP-8-02-L-00.25-T-BC
3 Assemblies

Step	Description
1.	Water Submersion - IPX8 (3) Depth = 10 meters Duration = 30 min
2.	Visual Inspection

IP6x Dust

Group 31
MCP-8-02-L-00.25-S-BC
MCP-8-02-L-00.25-T-BC
6 Assemblies

Step	Description
1.	Dust - IP6X (1)
2.	Visual Inspection

Group 32
MCP-8-02-L-00.25-S-BC
DC-MCR-8
6 Assemblies

Step	Description
1.	Dust - IP6X (1)
2.	Visual Inspection

Group 33
DC-MCP-8
MCP-8-02-L-00.25-T-BC
6 Assemblies

Step	Description
1.	Dust - IP6X (1)
2.	Visual Inspection

(1) Dust - IP6X = CEI/IEC 60529
(2) Water Submersion - IPX7 = CEI/IEC 60529
(3) Water Submersion - IPX8 = CEI/IEC 60529

FLOWCHARTS Continued

Dust/Water

Note: Preliminary testing shows that mated cable and dust cap passed at 10 Meters for 30 minutes

IPx7 Water Submersion

Group 1 MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 6 Assemblies		Group 2 DC-MCR-8 MCR-8-02-L-00.25-S-BC 6 Assemblies	
Step	**Description**	**Step**	**Description**
1.	Water Submersion - IPX7 [2] Depth = 1 meters	1.	Water Submersion - IPX7 [2] Depth = 1 meters
2.	Visual Inspection	2.	Visual Inspection

IPx8 Deep Water Submersion

Group 3 MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 4 DC-MCR-8 MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 5 MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 6 DC-MCR-8 MCR-8-02-L-00.25-S-BC 3 Assemblies	
Step	**Description**	**Step**	**Description**	**Step**	**Description**	**Step**	**Description**
1.	Water Submersion - IPX8 [3] Depth = 2 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 2 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 3 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 3 meters Duration = 30 min
2.	Visual Inspection	2.	Visual Inspection	2.	Visual Inspection	2.	Visual Inspection

Group 7 MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 8 DC-MCR-8 MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 9 MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 10 DC-MCR-8 MCR-8-02-L-00.25-S-BC 3 Assemblies	
Step	**Description**	**Step**	**Description**	**Step**	**Description**	**Step**	**Description**
1.	Water Submersion - IPX8 [3] Depth = 4 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 4 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 5 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 5 meters Duration = 30 min
2.	Visual Inspection	2.	Visual Inspection	2.	Visual Inspection	2.	Visual Inspection

Group 11 MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 12 DC-MCR-8 MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 13 MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 14 DC-MCR-8 MCR-8-02-L-00.25-S-BC 3 Assemblies	
Step	**Description**	**Step**	**Description**	**Step**	**Description**	**Step**	**Description**
1.	Water Submersion - IPX8 [3] Depth = 6 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 6 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 7 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 7 meters Duration = 30 min
2.	Visual Inspection	2.	Visual Inspection	2.	Visual Inspection	2.	Visual Inspection

Group 15 MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 16 DC-MCR-8 MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 17 MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 3 Assemblies		Group 18 DC-MCR-8 MCR-8-02-L-00.25-S-BC 3 Assemblies	
Step	**Description**	**Step**	**Description**	**Step**	**Description**	**Step**	**Description**
1.	Water Submersion - IPX8 [3] Depth = 8 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 8 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 9 meters Duration = 30 min	1.	Water Submersion - IPX8 [3] Depth = 9 meters Duration = 30 min
2.	Visual Inspection	2.	Visual Inspection	2.	Visual Inspection	2.	Visual Inspection

FLOWCHARTS Continued

Group 19		Group 20	
MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 3 Assemblies		DC-MCR-8 MCR-8-02-L-00.25-S-BC 3 Assemblies	
Step	**Description**	**Step**	**Description**
1.	Water Submersion - IPX8 (3) Depth = 10 meters Duration = 30 min	1.	Water Submersion - IPX8 (3) Depth = 10 meters Duration = 30 min
2.	Visual Inspection	2.	Visual Inspection

IP6x Dust

Group 21		Group 22	
MCP-8-02-L-00.25-T-BC MCR-8-02-L-00.25-S-BC 6 Assemblies		DC-MCR-8 MCR-8-02-L-00.25-S-BC 6 Assemblies	
Step	**Description**	**Step**	**Description**
1.	Dust - IP6X (1)	1.	Dust - IP6X (1)
2.	Visual Inspection	2.	Visual Inspection

(1) Dust - IP6X = CEI/IEC 60529

(2) Water Submersion - IPX7 = CEI/IEC 60529

(3) Water Submersion - IPX8 = CEI/IEC 60529

FLOWCHARTS Continued

Cable Flex

Group 1
MCP-8-02-L-00.25-S-BC
MCP-8-02-L-00.25-T-BC
8 Assemblies
Circular Cable

Step	Description
1.	IR (3)
2.	DWV at Test Voltage (2) Test Voltage = 900 V
3.	Cable Flex (1)
4.	Visual Inspection
5.	IR (3)
6.	DWV at Test Voltage (2) Test Voltage = 900 V
7.	Rotate Cable 90°
8.	Cable Flex (1)
9.	Visual Inspection
10.	IR (3)
11.	DWV at Test Voltage (2) Test Voltage = 900 V

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

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

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

FLOWCHARTS Continued

Cable Pull

Note: 40 N Minimum

Group 1
MCP-8-02-L-00.25-T-BC
MCR-8-02-L-00.25-S-BC
5 Assemblies
0 Degrees
Note: Look at item #26 on "Detail of Comparison Test Between Samtec & Hirose"; 0° = F1

Step	Description
1.	Cable Pull (1)

Group 2
MCP-8-02-L-00.25-T-BC
MCR-8-02-L-00.25-S-BC
5 Assemblies
90 Degrees
Note: Look at item #26 on "Detail of Comparison Test Between Samtec & Hirose"; 90° = F2

Step	Description
1.	Cable Pull (1)

Group 3
MCP-8-02-L-00.25-T-BC
MCR-8-02-L-00.25-S-BC
5 Assemblies
90 Degrees
Note: Look at item #26 on "Detail of Comparison Test Between Samtec & Hirose"; 90° = F3

Step	Description
1.	Cable Pull (1)

Group 4
MCP-8-02-L-00.25-T-BC
MCR-8-02-L-00.25-S-BC
5 Assemblies
90 Degrees
Note: Look at item #26 on "Detail of Comparison Test Between Samtec & Hirose"; 90° = F4

Step	Description
1.	Cable Pull (1)

Group 5
MCP-8-02-L-00.25-T-BC
MCR-8-02-L-00.25-S-BC
5 Assemblies
90 Degrees
Note: Look at item #26 on "Detail of Comparison Test Between Samtec & Hirose"; 90° = F5

Step	Description
1.	Cable Pull (1)

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

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL SHOCK:

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

THERMAL:

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

HUMIDITY:

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

MECHANICAL SHOCK (Specified Pulse):

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

VIBRATION:

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

NANOSECOND-EVENT DETECTION:

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

ATTRIBUTE DEFINITIONS

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. 40^o C
    c. 50^o C
    d. 70^o C
8) Typically, neighboring contacts (in close proximity to maximize heat build up) are energized.
9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the maximum temperature in the vicinity of the heat generation area.
10) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
11) Hook-up wire cross section is larger than the cross section of any connector leads/PC board traces, jumpers, etc.
12) Hook-up wire length is longer than the minimum specified in the referencing standard.

MATING/UNMATING:

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

NORMAL FORCE (FOR CONTACTS TESTED OUTSIDE THE HOUSING):

1) Reference document: EIA-364-04, *Normal Force Test Procedure for Electrical Connectors*.
2) The contacts shall be tested in the loose state, *not* inserted in connector housing.
3) The contacts shall be prepared to allow access to the spring member at the same attitude and deflection level as would occur in actual use.
4) In the event that portions of the contact prevent insertion of the test probe and/or deflection of the spring member under evaluation, said material shall be removed leaving the appropriate contact surfaces exposed.
5) In the case of multi-tine contacts, each tine shall be tested independently on separate samples as required.
6) The connector housing shall be simulated, if required, in order to provide an accurate representation of the actual contact system performance.
7) A holding fixture shall be fashioned to allow the contact to be properly deflected.
8) 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 µm (0.0002").
9) The probe shall be attached to a Dillon P/N 49761-0105, 5 N (1.1 Lb) load cell providing an accuracy of ± 0.2%.
10) The nominal deflection rate shall be 5 mm (0.2")/minute.
11) Unless otherwise noted a minimum of five contacts shall be tested.

12) The force/deflection characteristic to load and unload each contact shall be repeated five times.
13) The system shall utilize the TC^2 software in order to acquire and record the test data.
14) The permanent set of each contact shall be measured within the TC^2 software.
15) 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 1000 megohms.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

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

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

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

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

The following is a brief, simplified description of attributes.

WATER TESTING:

1) Reference document: CEI/IEC 60529 Code IPX7 and IPX8
2) MCR torque specification for PN-30-8 is 7.08 IN-LB
3) MCP torque specification for PN-30-8 onto CH-P-30-8-12 is 4.4 IN-LB

DUST TESTING:

1) Reference document: CEI/IEC 60529 Code IP6X
2) MCR torque specification for PN-30-8 is 7.08 IN-LB
3) MCP torque specification for PN-30-8 onto CH-P-30-8-12 is 4.4 IN-LB

CABLE DURABILITY:

1) Oscillate and monitor electrical continuity for open circuit indication.
    a. ± 35° Pendulum Mode. Bend up to 200 cycles with 32 oz. load on cable end.

Fig. 1

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

CONNECTOR PULL:

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

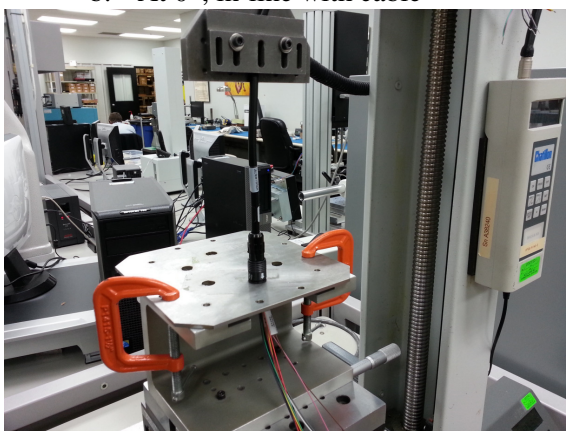


Fig. 2 0° Connector pull –F1 direction

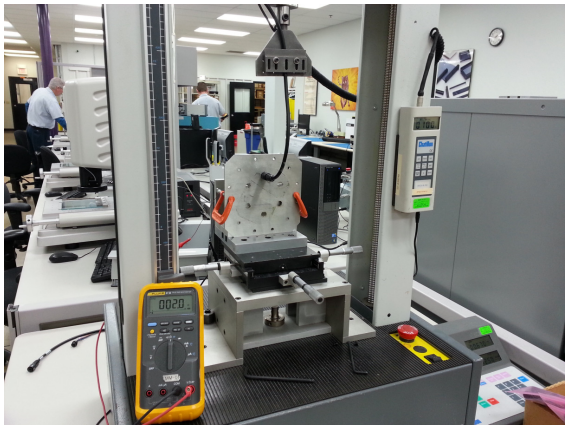


Fig. 3 90° Connector pull- F2 direction

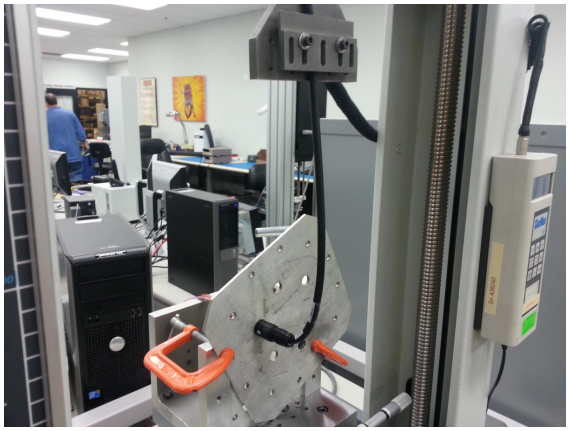


Fig. 4 90° Connector pull - F3 direction

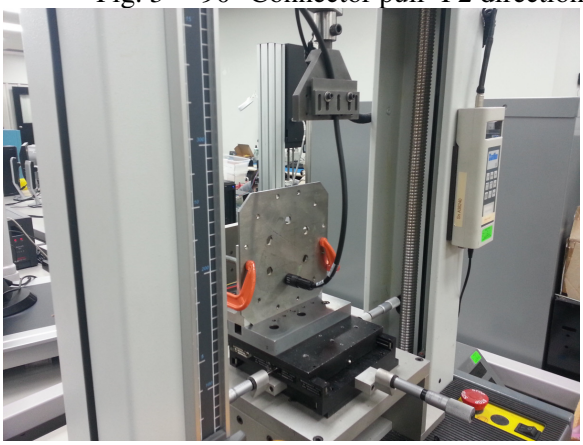


Fig. 5 90° Connector pull -F4 direction

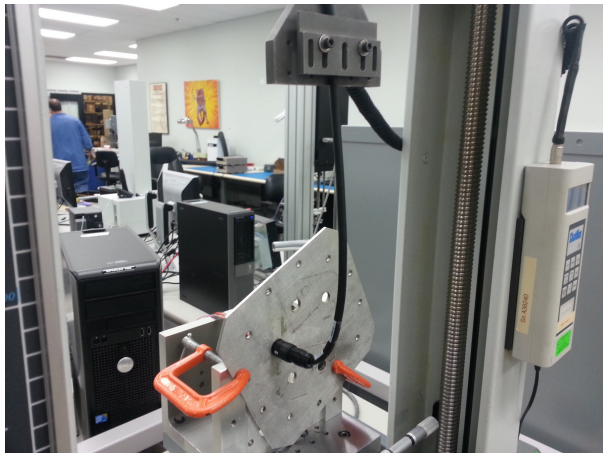


Fig. 6 90° Connector pull- F5 direction

RESULTS

Temperature Rise, CCC at a 20% de-rating（MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

- **CCC for a 30°C Temperature Rise----------3.4 A per contact with 1 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------2.6 A per contact with 2 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------2.2 A per contact with 3 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------2.0 A per contact with 4 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------1.4 A per contact with 12 adjacent contacts powered**

Mating – Unmating Forces

Mating\Unmating Durability Group（MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

- **Initial**
  - **Mating**
    - **Min ---------- 4.54 Lbs**
    - **Max ---------- 7.66 Lbs**
  - **Unmating**
    - **Min ---------- 2.44 Lbs**
    - **Max ---------- 4.26 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 4.27 Lbs**
    - **Max ---------- 6.85 Lbs**
  - **Unmating**
    - **Min ---------- 2.60 Lbs**
    - **Max ---------- 4.48 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 3.95 Lbs**
    - **Max ---------- 6.66 Lbs**
  - **Unmating**
    - **Min ---------- 2.48 Lbs**
    - **Max ---------- 4.40 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 4.23 Lbs**
    - **Max ---------- 6.51 Lbs**
  - **Unmating**
    - **Min ---------- 2.67 Lbs**
    - **Max ---------- 4.31 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 4.11 Lbs**
    - **Max ---------- 6.43 Lbs**
  - **Unmating**
    - **Min ---------- 2.56 Lbs**
    - **Max ---------- 4.41 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 2.70 Lbs**
    - **Max ---------- 4.67 Lbs**
  - **Unmating**
    - **Min ---------- 2.60 Lbs**
    - **Max ---------- 4.04 Lbs**

RESULTS Continued

Thermal aging Group（MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

- Initial
  - Mating
    - Min ---------- 4.84 Lbs
    - Max ---------- 6.97 Lbs
  - Unmating
    - Min ---------- 3.22 Lbs
    - Max ---------- 5.63 Lbs
- After Thermal aging
  - Mating
    - Min ---------- 2.78 Lbs
    - Max ---------- 6.88 Lbs
  - Unmating
    - Min ---------- 2.25 Lbs
    - Max ---------- 5.00 Lbs

Cable Pull（MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

- 0°---------- 200.00 lbs min
- 90°---------- 65.00 lbs min

Normal Force at 0.0055 inch deflection（MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

- Initial
  - Min ---------- 165.30 gf Set------ 0.0008 inch
  - Max---------- 174.50 gf Set------ 0.0013 inch
- Thermal
  - Min ---------- 138.70 gf Set------ - 0.0019 inch
  - Max---------- 160.03 gf Set----- -- 0.0023 inch

Insulation Resistance minimums, IR（MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

Pin to Pin:

- Initial
  - Mated ----------45000 Meg Ohms---------- Pass
  - Unmated ----------45000 Meg Ohms ---------- Pass
- Thermal
  - Mated ----------45000 Meg Ohms ---------- Pass
  - Unmated ----------45000 Meg Ohms ---------- Pass
- Humidity
  - Mated ----------10400 Meg Ohms ---------- Pass
  - Unmated ----------45000 Meg Ohms ---------- Pass

Dielectric Withstanding Voltage minimums, DWV （MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

- Minimums
  - Breakdown Voltage ---------- 1200 VAC
  - Test Voltage----------900 VAC
  - Working Voltage ----------300 VAC
- Initial DWV---------- Passed
- Thermal DWV---------- Passed
- Humidity DWV---------- Passed

RESULTS Continued

Insulation Resistance minimums, IR（MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC）

Pin to Pin:

- Initial
  - Mated ----------45000 Meg Ohms---------- Pass
  - Unmated ----------45000 Meg Ohms ---------- Pass
- Thermal
  - Mated ----------45000 Meg Ohms ---------- Pass
  - Unmated ----------45000 Meg Ohms ---------- Pass
- Humidity
  - Mated ----------45000 Meg Ohms ---------- Pass
  - Unmated ----------45000 Meg Ohms ---------- Pass

Dielectric Withstanding Voltage minimums, DWV （MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC）

- Minimums
  - Breakdown Voltage ---------- 1200 VAC
  - Test Voltage----------900 VAC
  - Working Voltage ----------300 VAC
- Initial DWV---------- Passed
- Thermal DWV---------- Passed
- Humidity DWV---------- Passed

Cable Flex 200 Cycles

- ±35° Pendulum Mode ---------- No Electrical Failures

LLCR Mating\Unmating Durability Group (96 LLCR test points，MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

- Initial---------- 71.70 mOhms Max
- Durability, 100 Cycles
  - <= +5.0 mOhms ----------96 Points---------- Stable
  - +5.1 to +10.0 mOhms----------0 Points---------- Minor
  - +10.1 to +15.0 mOhms ----------0 Points---------- Acceptable
  - +15.1 to +50.0 mOhms ----------0 Points---------- Marginal
  - +50.1 to +2000 mOhms----------0 Points---------- Unstable
  - >+2000 mOhms----------0 Points---------- Open Failure
- Thermal
  - <= +5.0 mOhms ----------94 Points---------- Stable
  - +5.1 to +10.0 mOhms----------1 Points---------- Minor
  - +10.1 to +15.0 mOhms ----------0 Points---------- Acceptable
  - +15.1 to +50.0 mOhms ----------1 Points---------- Marginal
  - +50.1 to +2000 mOhms----------0 Points---------- Unstable
  - >+2000 mOhms----------0 Points---------- Open Failure
- Humidity
  - <= +5.0 mOhms ----------94 Points---------- Stable
  - +5.1 to +10.0 mOhms----------1 Points---------- Minor
  - +10.1 to +15.0 mOhms ----------0 Points---------- Acceptable
  - +15.1 to +50.0 mOhms ----------1 Points---------- Marginal
  - +50.1 to +2000 mOhms----------0 Points---------- Unstable
  - >+2000 mOhms----------0 Points---------- Open Failure

RESULTS Continued

LLCR Thermal aging ((96 LLCR test points，MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

- Initial---------- 69.57 mOhms Max
- Thermal
  - <= +5.0 mOhms ----------96 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 (96 LLCR test points，MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC）

- Initial---------- 71.77 mOhms Max
- Gas-Tight
  - <= +5.0 mOhms ----------96 Points---------- Stable
  - +5.1 to +10.0 mOhms----------0 Points---------- Minor
  - +10.1 to +15.0 mOhms ----------0 Points---------- Acceptable
  - +15.1 to +50.0 mOhms ----------0 Points---------- Marginal
  - +50.1 to +2000 mOhms----------0 Points---------- Unstable
  - >+2000 mOhms----------0 Points---------- Open Failure

LLCR Shock &Vibration (96 LLCR test points，MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC）

- Initial----------119.17 mOhms Max
- Shock &Vibration
  - <= +5.0 mOhms ----------96 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: （MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC）

- Shock
  - No Damage ---------- ---------- Passed
  - 50 Nanoseconds ---------- ---------- Passed
- Vibration
  - No Damage ---------- ---------- Passed
  - 50 Nanoseconds ---------- ---------- Passed

RESULTS Continued

IP6X Testing (Dust)

MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC

Group A1

	Initial (Before Exposure)	After Exposure
Dust	No Dust Present	No Dust Present

Group B1

	Initial (Before Exposure)	After Exposure
Dust	No Dust Present	No Dust Present

Group C1

	Initial (Before Exposure)	After Exposure
Dust	No Dust Present	No Dust Present

MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC

Group A1

	Initial (Before Exposure)	After Exposure
Dust	No Dust Present	No Dust Present

Group B1

	Initial (Before Exposure)	After Exposure
Dust	No Dust Present	No Dust Present

Group C1

	Initial (Before Exposure)	After Exposure
Dust	No Dust Present	No Dust Present

IPX8 Testing (Water)

MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC

Group A1 (10 m)

	Initial (Before Exposure)	After Exposure
Water	No Water Present	No Water Present

MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC

Group A1 (10 m)

	Initial (Before Exposure)	After Exposure
Water	No Water Present	No Water Present

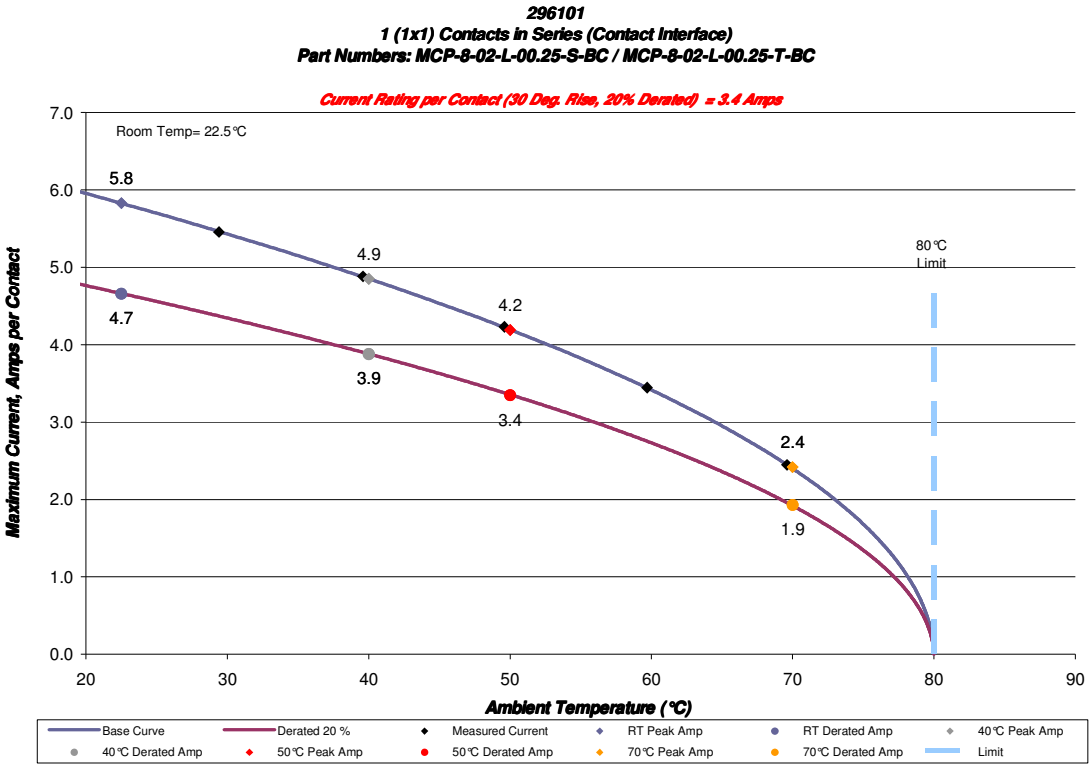
DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

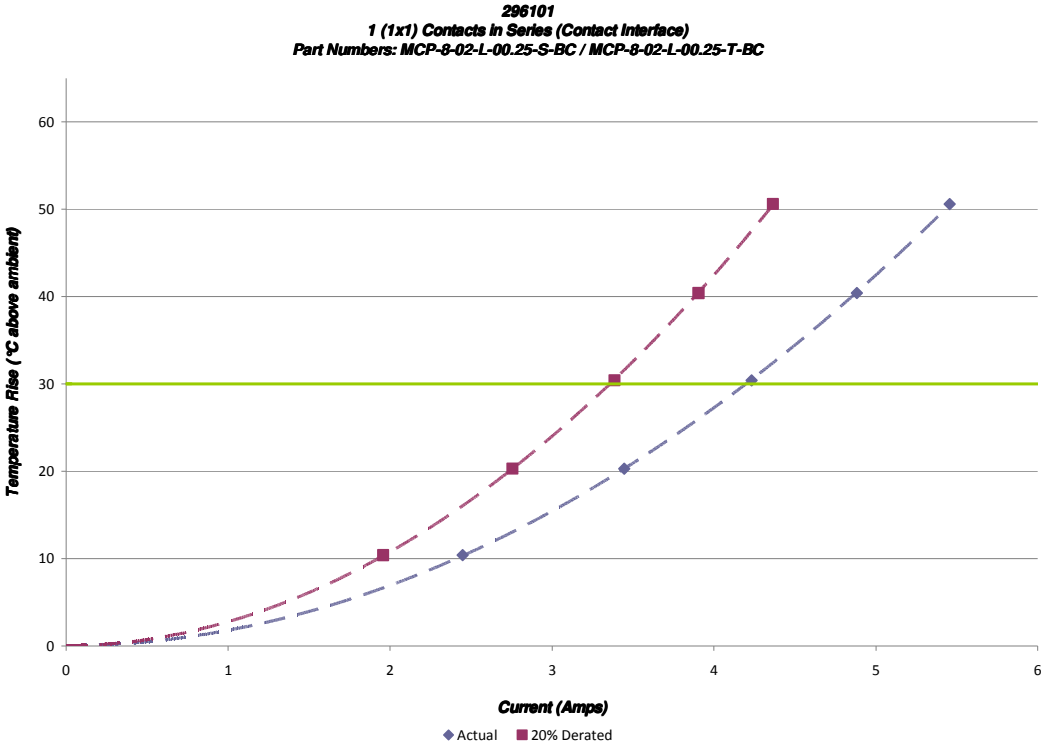
1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
3) Temperature readings recorded are those for which three successive readings, 15 minutes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

MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC

a. Linear configuration with 1 adjacent conductors/contacts powered

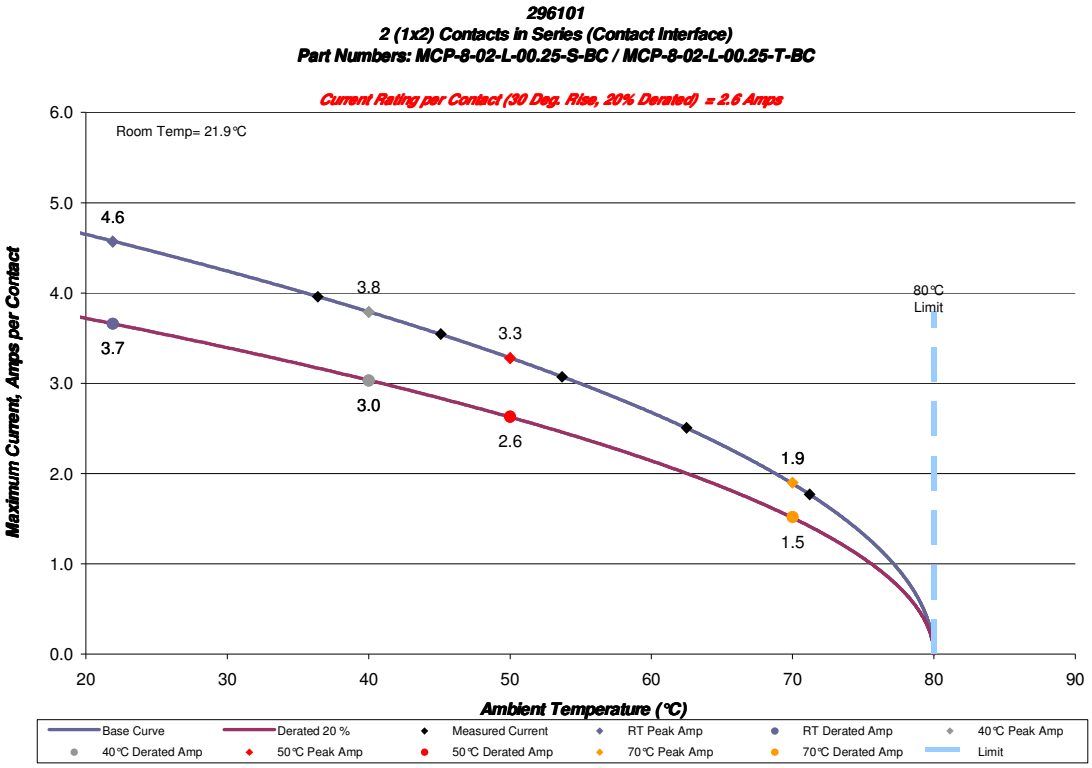


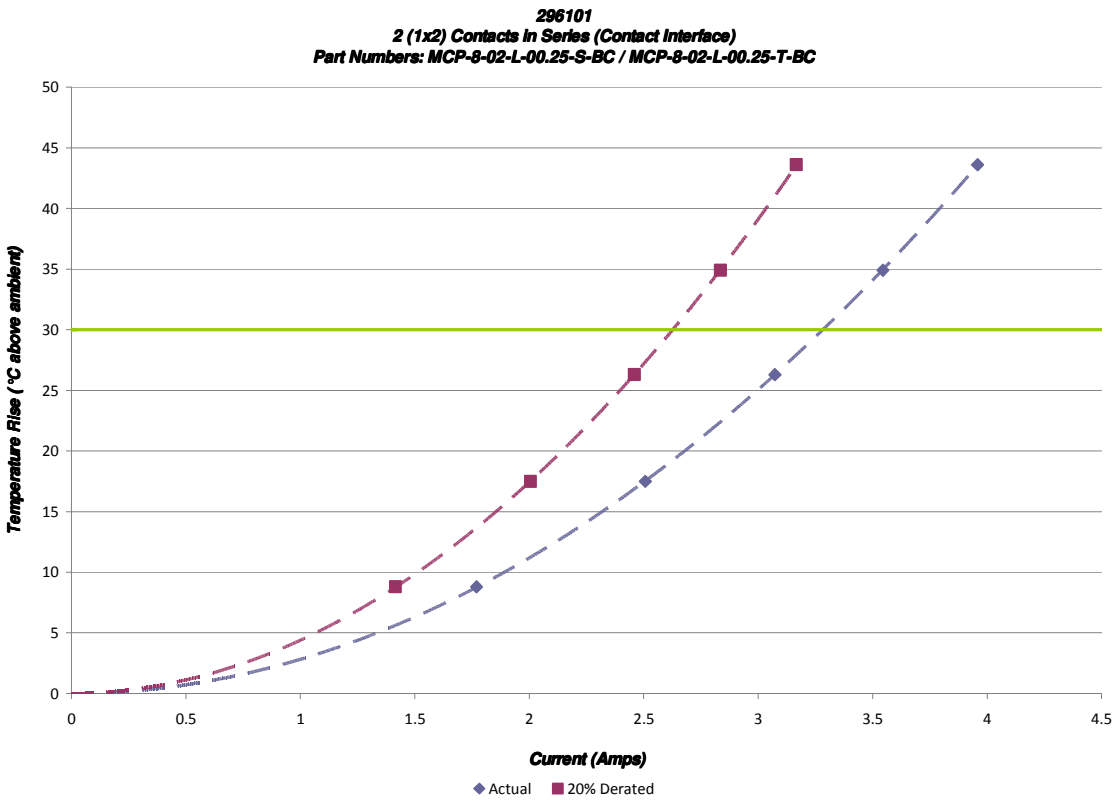
DATA SUMMARIES Continued



DATA SUMMARIES Continued

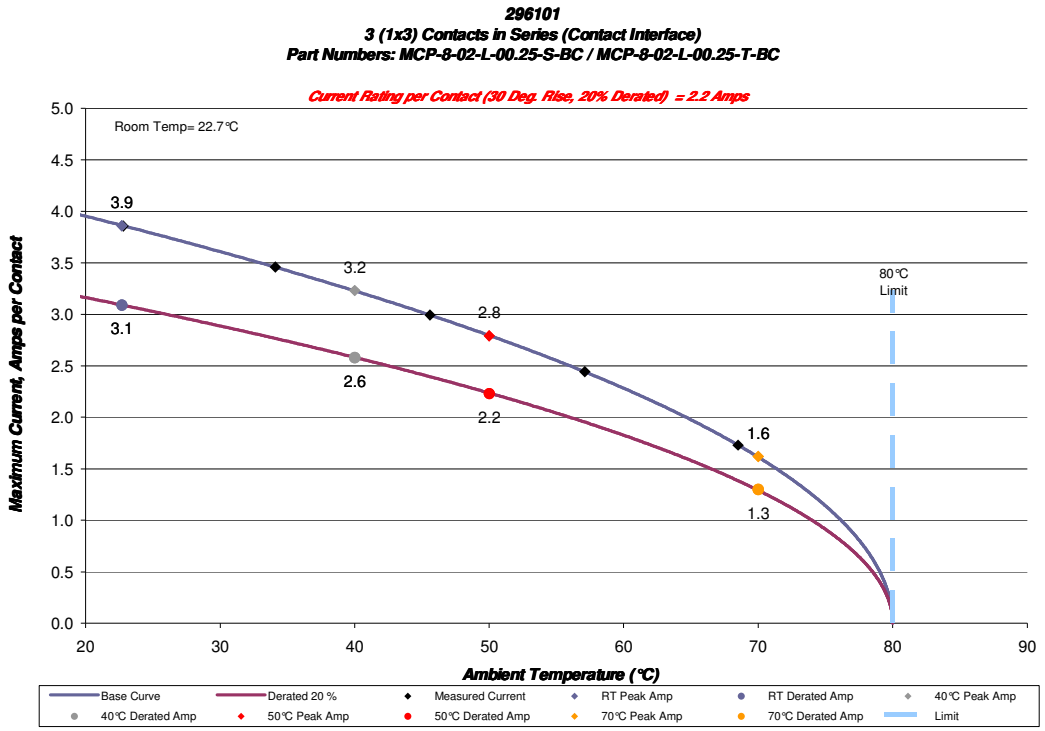
b. Linear configuration with 2 adjacent conductors/contacts powered

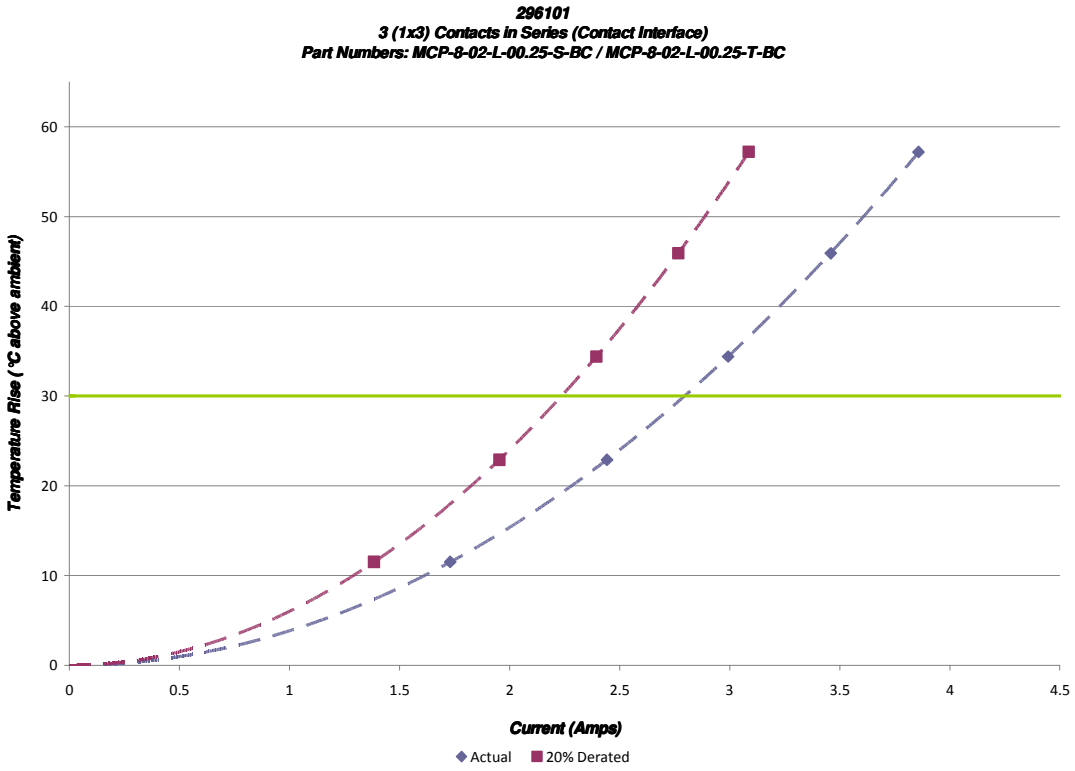




DATA SUMMARIES Continued

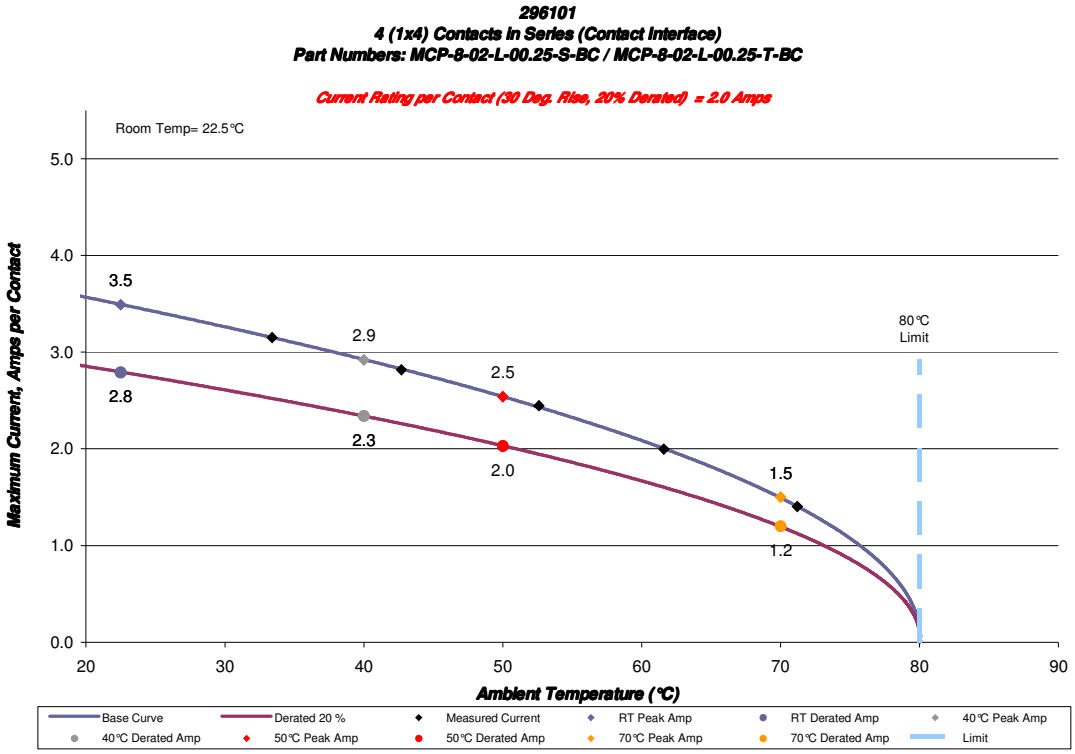
c. Linear configuration with 3 adjacent conductors/contacts powered

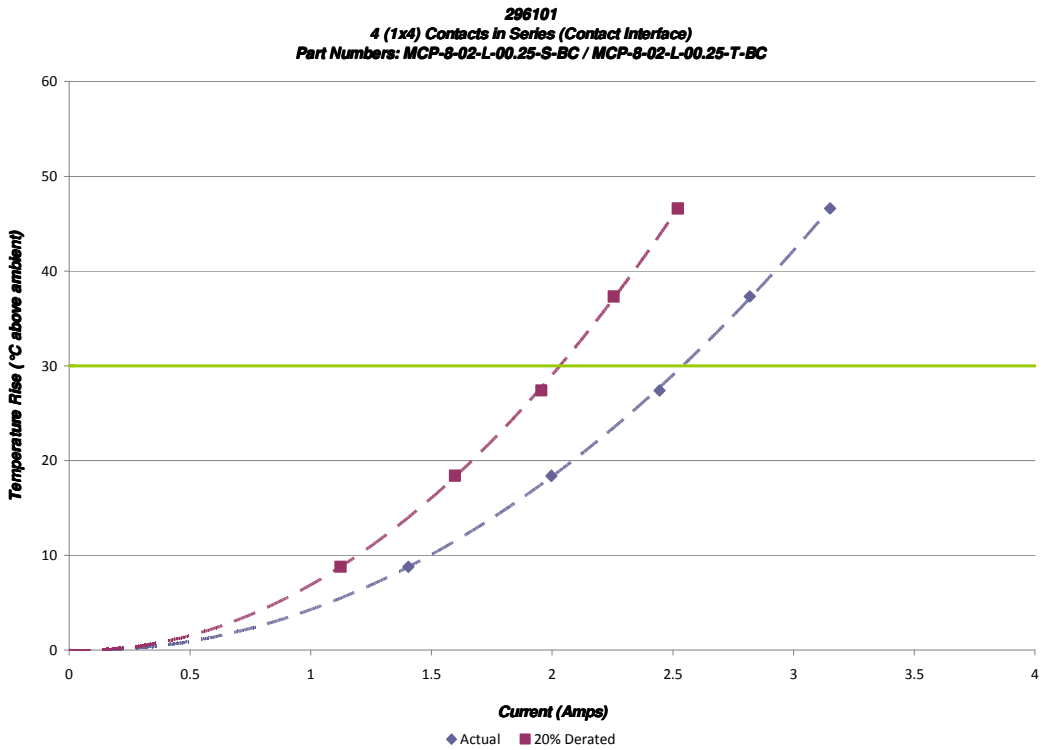




DATA SUMMARIES Continued

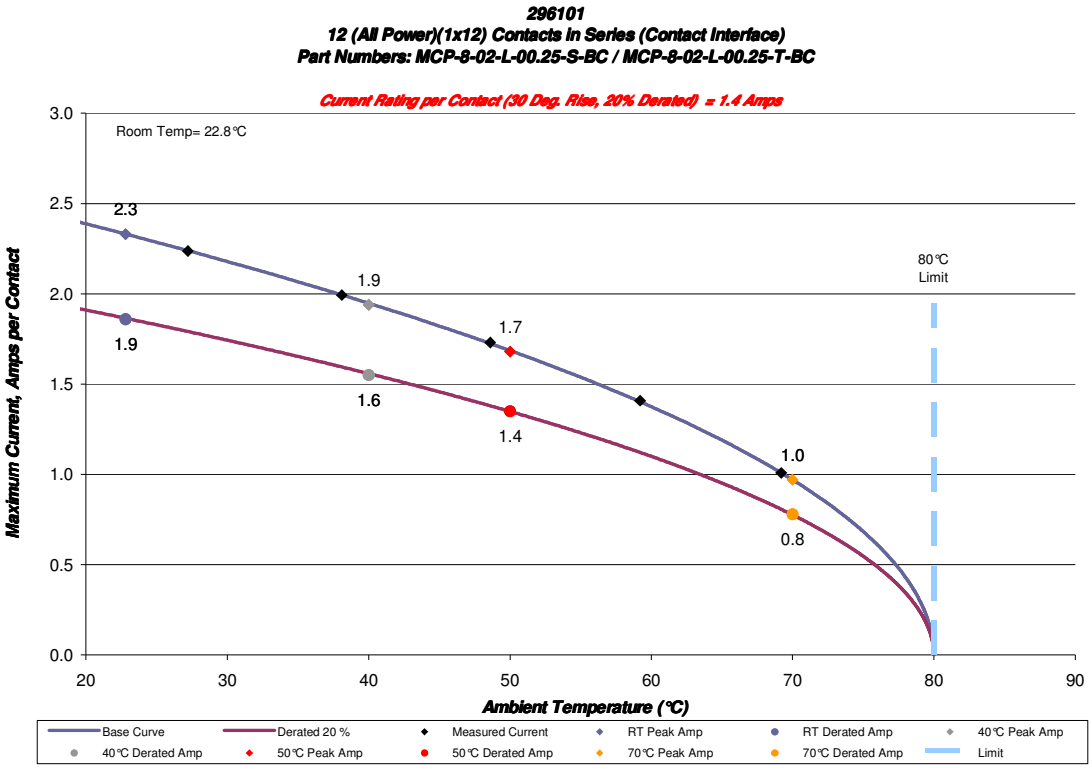
d. Linear configuration with 4 adjacent conductors/contacts powered

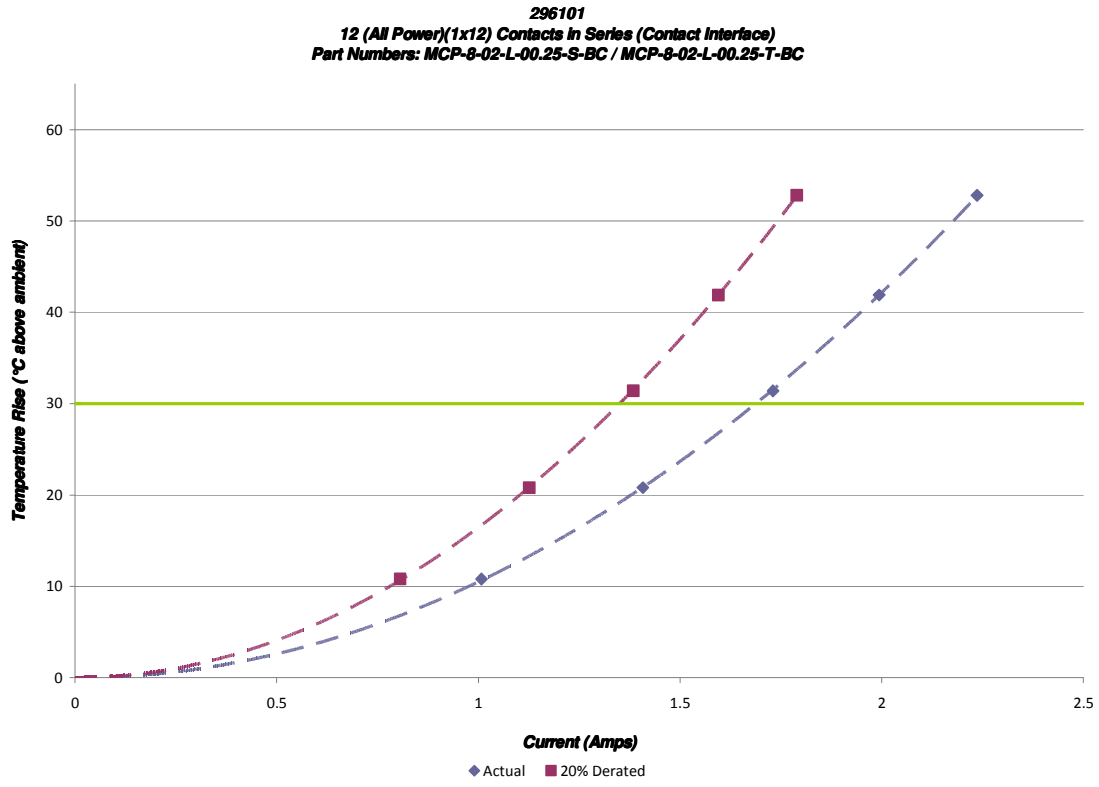




DATA SUMMARIES Continued

e. Linear configuration with 12 adjacent conductors/contacts powered





DATA SUMMARIES Continued

MATING/UNMATING FORCE:

Mating\Unmating Durability Group (MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC)

Initial				25 Cycles			
Mating		***Unmating***		***Mating***		***Unmating***	
Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
20.19	4.54	10.85	2.44	18.99	4.27	11.56	2.60
34.07	7.66	18.95	4.26	30.47	6.85	19.93	4.48
23.57	***5.30***	14.73	***3.31***	22.68	***5.10***	14.87	***3.34***
4.67	1.05	2.91	0.65	3.57	0.80	2.99	0.67
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)
17.57	3.95	11.03	2.48	18.82	4.23	11.88	2.67
29.62	6.66	19.57	4.40	28.96	6.51	19.17	4.31
22.25	***5.00***	14.98	***3.37***	22.50	***5.06***	15.93	***3.58***
3.84	0.86	2.94	0.66	3.32	0.75	3.21	0.72
8	8	8	8	8	8	8	8

100 Cycles				After Humidity			
Mating		***Unmating***		***Mating***		***Unmating***	
Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
18.28	4.11	11.39	2.56	12.01	2.70	11.56	2.60
28.60	6.43	19.62	4.41	20.77	4.67	17.97	4.04
23.01	***5.17***	15.63	***3.52***	15.11	***3.40***	14.51	***3.26***
3.27	0.74	3.18	0.71	2.87	0.65	2.15	0.48
8	8	8	8	8	8	8	8

Thermal aging Group (MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC)

	Initial				After Thermals			
	Mating		***Unmating***		***Mating***		***Unmating***	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	21.53	4.84	14.32	3.22	12.37	2.78	10.01	2.25
Maximum	31.00	6.97	25.04	5.63	30.60	6.88	22.24	5.00
Average	27.96	***6.29***	18.75	***4.22***	17.44	***3.92***	16.69	***3.75***
St Dev	3.09	0.70	4.27	0.96	6.05	1.36	4.38	0.99
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

Cable pull force(MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC)

0° Contact Pull F1 directon

	Force (N)
Minimum	**200.00**
Maximum	235.00
Average	216.00

90° Contact Pull F2 direction

	Force (N)
Minimum	**100.00**
Maximum	100.00
Average	100.00

90° Contact Pull F3 direction

	Force (N)
Minimum	**75.00**
Maximum	90.00
Average	83.00

90° Contact Pull F4 direction

	Force (N)
Minimum	**115.00**
Maximum	125.00
Average	122.00

90° Contact Pull F5 direction

	Force (N)
Minimum	**65.00**
Maximum	95.00
Average	83.00

DATA SUMMARIES Continued

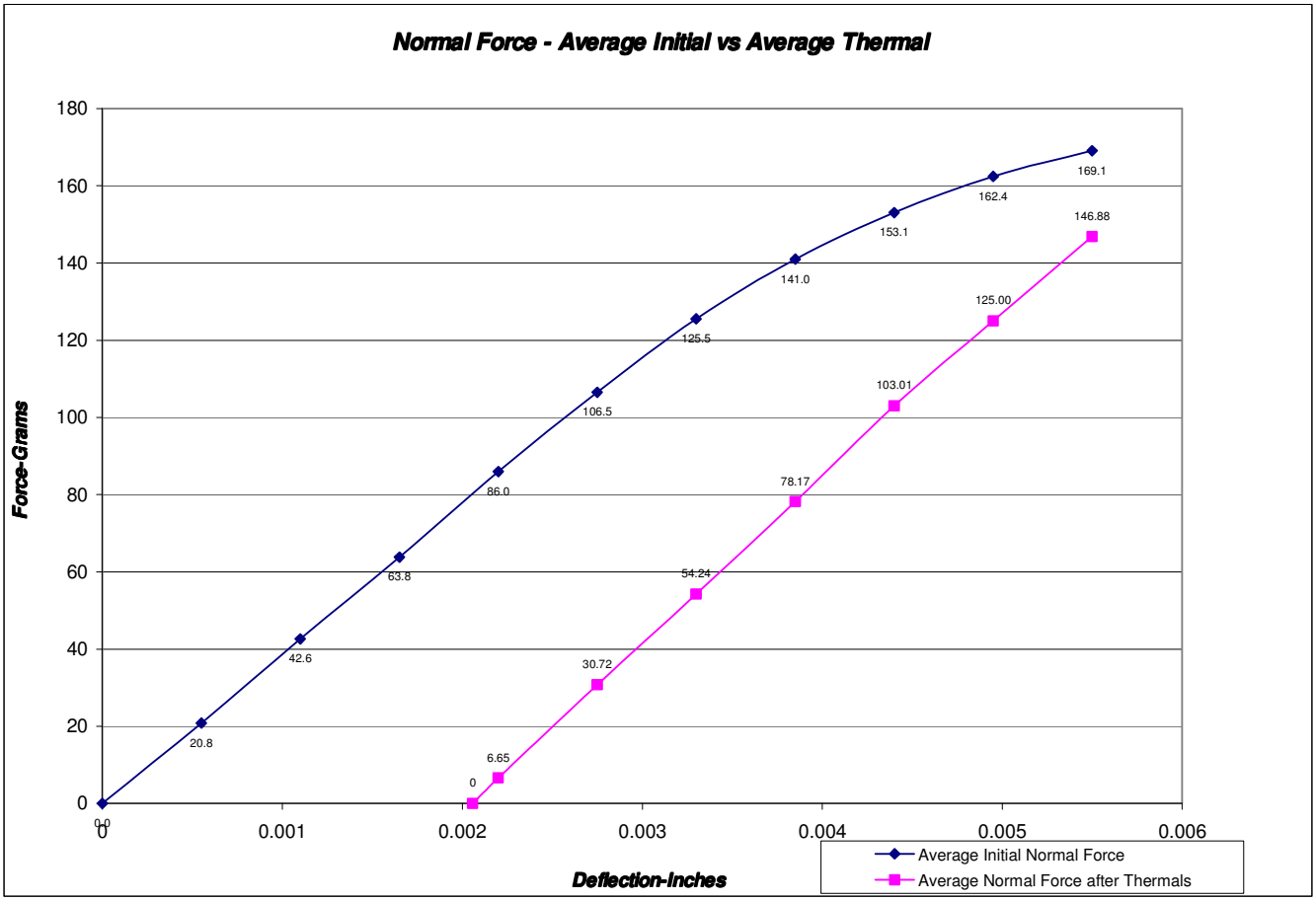
NORMAL FORCE (FOR CONTACTS TESTED OUTSIDE THE HOUSING):

(MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC)

1) Calibrated force gauges are used along with computer controlled positioning equipment.
2) Typically, 8-10 readings are taken and the averages reported.

Initial	Deflections in inches Forces in Grams										
	0.0006	0.0011	0.0017	0.0022	0.0028	0.0033	0.0039	0.0044	0.0050	0.0055	*SET*
Averages	20.83	42.64	63.81	85.96	106.49	125.54	140.97	153.08	162.44	169.07	0.0011
Min	15.60	31.30	49.30	70.70	92.70	112.00	130.10	146.10	158.30	165.30	0.0008
Max	23.90	46.40	69.50	92.90	112.80	133.90	147.90	160.20	168.60	174.50	0.0013
St. Dev	2.711	4.832	6.777	7.410	7.389	6.995	5.796	4.279	2.962	2.583	0.0002
Count	10	10	10	10	10	10	10	10	10	10	10

After Thermals	Deflections in inches Forces in Grams										
	0.0006	0.0011	0.0017	0.0022	0.0028	0.0033	0.0039	0.0044	0.0050	0.0055	*SET*
Averages	0.01	0.02	0.00	6.65	30.72	54.24	78.17	103.01	125.00	146.88	0.0021
Min	-0.10	-0.10	-0.10	0.00	22.90	46.50	69.70	93.80	115.00	138.70	0.0019
Max	0.10	0.10	0.10	23.10	48.10	71.40	95.30	121.00	142.40	160.30	0.0023
St. Dev	0.057	0.063	0.047	8.568	8.828	8.920	9.327	9.657	9.666	7.594	0.0001
Count	10	10	10	10	10	10	10	10	10	10	10



DATA SUMMARIES Continued

INSULATION RESISTANCE (IR)

MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC:

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	***MCP-S/MCP-T***	***MCP-S***	***MCP-T***
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	10400	45000	45000

MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC：

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	***MCP/MCR***	***MCP***	***MCR***
Initial	45000	45000	45000
Thermal	45000	45000	45000
Humidity	45000	45000	45000

ELECTRIC WITHSTANDING VOLTAGE (DWV):

MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC:

Voltage Rating Summary	
Minimum	***MCP-S/MCP-T***
Break Down Voltage	1200
Test Voltage	900
Working Voltage	300

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

DATA SUMMARIES Continued

MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC：

Voltage Rating Summary	
Minimum	***MCP/MCR***
Break Down Voltage	1200
Test Voltage	900
Working Voltage	300

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

Cable Flex test

MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC

Pin to Pin	
Mated	
Minimum	
Initial	45000
After 100 Flex Cycles	45000
After 200 Flex Cycles	45000

Voltage Rating Summary	
Minimum	
Break Down Voltage	1200
Test Voltage	900
Working Voltage	300

Pin to Pin	
Initial Test Voltage	Passed
After 100 Flex Cycles Test Voltage	Passed
After 200 Flex Cycles Test Voltage	Passed

DATA SUMMARIES Continued

LLCR Durability: (MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC)

1) A total of 96 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms:---------- Stable
   b. +5.1 to +10.0 mOhms:---------- Minor
   c. +10.1 to +15.0 mOhms: ---------- Acceptable
   d. +15.1 to +50.0 mOhms: ---------- Marginal
   e. +50.1 to +2000 mOhms ---------- Unstable
   f. >+2000 mOhms:---------- Open Failure

	LLCR Measurement Summaries by Pin Type			
Date	1/15/2014	1/16/2014	1/22/2014	2/5/2014
Room Temp (Deg C)	23	23	22	23
Rel Humidity (%)	29	29	36	32
Technician	Craig Ryan	Craig Ryan	Craig Ryan	Craig Ryan
mOhm values	***Actual Initial***	***Delta 100 Cycles***	***Delta Therm Shck***	***Delta Humidity***
	Pin Type 1: Signal			
Average	65.64	0.20	1.10	0.95
St. Dev.	1.12	0.28	2.81	2.85
Min	62.62	0.00	0.06	0.00
Max	71.70	2.54	25.67	25.92
Summary Count	96	96	96	96
Total Count	96	96	96	96

LLCR Delta Count by Category						
	Stable	***Minor***	***Acceptable***	***Marginal***	***Unstable***	***Open***
mOhms	***<=5***	***>5 & <=10***	***>10 & <=15***	***>15 & <=50***	***>50 & <=1000***	***>1000***
100 Cycles	***96***	***0***	***0***	***0***	***0***	***0***
Therm Shck	***94***	***1***	***0***	***1***	***0***	***0***
Humidity	***94***	***1***	***0***	***1***	***0***	***0***

DATA SUMMARIES Continued

GAS TIGHT: (MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC)

1) A total of 96 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms:---------- Stable
   b. +5.1 to +10.0 mOhms:---------- Minor
   c. +10.1 to +15.0 mOhms: ---------- Acceptable
   d. +15.1 to +50.0 mOhms: ---------- Marginal
   e. +50.1 to +2000 mOhms: ---------- Unstable
   f. >+2000 mOhms:---------- Open Failure

	LLCR Measurement Summaries by Pin Type			
Date	1/14/2014	1/14/2014		
Room Temp (Deg C)	23	23		
Rel Humidity (%)	31	29		
Technician	Craig Ryan	Craig Ryan		
mOhm values	***Actual Initial***	***Delta Acid Vapor***	***Delta***	***Delta***
	Pin Type 1: Signal			
Average	66.22	0.68		
St. Dev.	1.96	0.98		
Min	56.28	0.00		
Max	71.77	4.09		
Summary Count	96	96		
Total Count	96	96		

LLCR Delta Count by Category						
	Stable	***Minor***	***Acceptable***	***Marginal***	***Unstable***	***Open***
mOhms	***<=5***	***>5 & <=10***	***>10 & <=15***	***>15 & <=50***	***>50 & <=1000***	***>1000***
Acid Vapor	***96***	***0***	***0***	***0***	***0***	***0***

DATA SUMMARIES Continued

LLCR Thermal aging: (MCP-8-02-L-00.25-S-BC/ MCP-8-02-L-00.25-T-BC)

5) A total of 96 points were measured.
6) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
7) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
8) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
   a. <= +5.0 mOhms:---------- Stable
   b. +5.1 to +10.0 mOhms:---------- Minor
   c. +10.1 to +15.0 mOhms: ---------- Acceptable
   d. +15.1 to +50.0 mOhms: ---------- Marginal
   e. +50.1 to +2000 mOhms ---------- Unstable
   f. >+2000 mOhms:---------- Open Failure

	LLCR Measurement Summaries by Pin Type			
Date	1/15/2014	1/30/2014		
Room Temp (Deg C)	22	22		
Rel Humidity (%)	32	31		
Technician	Craig Ryan	Craig Ryan		
mOhm values	***Actual Initial***	***Delta Thermal***	***Delta***	***Delta***
	Pin Type 1: Signal			
Average	65.76	0.58		
St. Dev.	1.39	0.28		
Min	62.87	0.10		
Max	69.57	2.67		
Summary Count	96	96		
Total Count	96	96		

LLCR Delta Count by Category						
	Stable	***Minor***	***Acceptable***	***Marginal***	***Unstable***	***Open***
mOhms	***<=5***	***>5 & <=10***	***>10 & <=15***	***>15 & <=50***	***>50 & <=1000***	***>1000***
Thermal	***96***	***0***	***0***	***0***	***0***	***0***

DATA SUMMARIES Continued

LLCR Shock &Vibration: (MCP-8-02-L-00.25-T-BC/ MCR-8-02-L-00.25-S-BC)

9) A total of 96 points were measured.
10) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
11) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
12) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
    a. <= +5.0 mOhms:---------- Stable
    b. +5.1 to +10.0 mOhms:---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +2000 mOhms ---------- Unstable
    f. >+2000 mOhms:---------- Open Failure

	LLCR Measurement Summaries by Pin Type			
Date	1/16/2014	1/27/2014		
Room Temp (Deg C)	23	24		
Rel Humidity (%)	31	32		
Technician	Aaron McKim	Aaron McKim		
mOhm values	***Actual Initial***	***Delta Shock-Vib***	***Delta***	***Delta***
	Pin Type 1: Signal			
Average	115.59	0.69		
St. Dev.	1.06	0.77		
Min	112.95	0.00		
Max	119.17	4.52		
Summary Count	96	96		
Total Count	96	96		

LLCR Delta Count by Category						
	Stable	***Minor***	***Acceptable***	***Marginal***	***Unstable***	***Open***
mOhms	***<=5***	***>5 & <=10***	***>10 & <=15***	***>15 & <=50***	***>50 & <=1000***	***>1000***
Shock-Vib	***96***	***0***	***0***	***0***	***0***	***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: 02/16/2014, Next Cal: 02/16/2015

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: 02/03/2014, Next Cal: 02/03/2015

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 05/24/2013, Next Cal: 08/24/2014

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

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 04/30/2013, Next Cal: 04/30/2014

EQUIPMENT AND CALIBRATION SCHEDULES Continued

Equipment #: TCT-01
Description: Test Stand
Manufacturer: Chatillon
Model: TCD-1000
Serial #: 05 23 00 02
Accuracy: Speed Accuracy: +/-5% of max speed; Displacement: +/-.5% or +/-.005, whichever is greater.
… Last Cal: 08/24/2013, Next Cal: 08/24/2014

Equipment #: PS-01
Description: Power Supply
Manufacturer: Agilent
Model: AT-6032A
Serial #: MY41001186
Accuracy: Last Cal: 06/12/2013, Next Cal: 046/12/2014

Equipment #: SVC-01
Description: Shock & Vibration Table
Manufacturer: Data Physics
Model: LE-DSA-10-20K
Serial #: 10037
Accuracy: See Manual
… Last Cal: 11/31/2013, Next Cal: 11/31/2014

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

EQUIPMENT AND CALIBRATION SCHEDULES Continued

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 03/27/2014, Next Cal: 03/27/2015

Equipment #: WATER-01
Description: IP-67 1.0 Meter Water Column Chamber
Manufacturer: Samtec Machine
Model: N/A
Serial #: N/A
Accuracy: No Calibration Required

Equipment #: DUST-01
Description: IP-X6 Dust Tester
Manufacturer: Samtec Machine
Model: N/A
Serial #: N/A
Accuracy: No Calibration Required