Project Number: Design Qualification Test Report	Tracking Code: 155190_Report_Rev_1			
Requested by: John Reid	Date: 10/25/2011	Product Rev: N/A		
Part #: SFPE-010-1000-NE-32\SFPK	Lot #: N/A	Tech: Craig Ryan	Eng: Eric Mings	
Part description: SFPE\SFPK			Qty to test: 30	
Test Start: 08/29/2011	Test Completed: 09/22/2011			

DESIGN QUALIFICATION TEST REPORT

SFPE\SFPK
SFPE-010-1000-NE-32\SFPK

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.

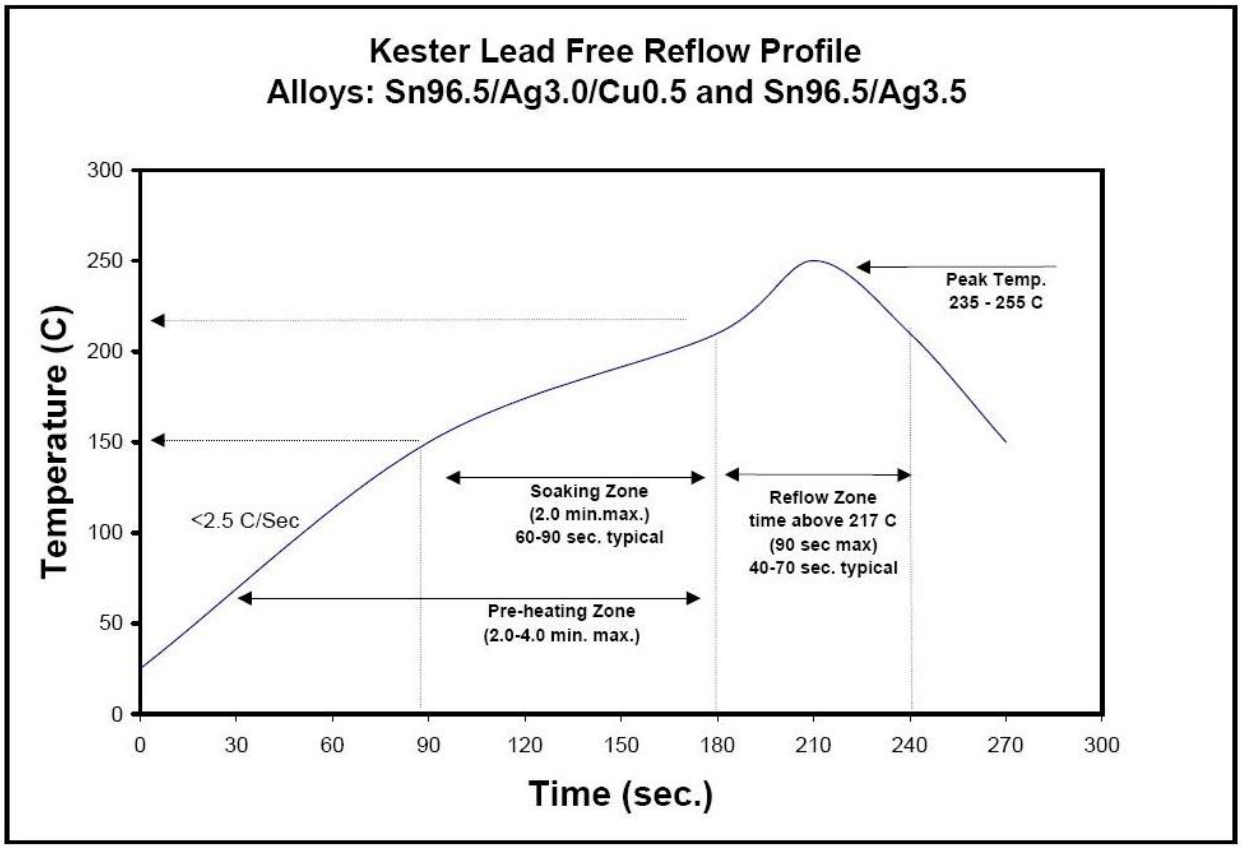
APPLICABLE DOCUMENTS

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:

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Durability/Mating/Unmating/Gaps

TEST STEP	GROUP A1 8 Boards (largest position submitted)
01	Contact Gaps
02	LLCR-1
03	Forces - Mating / Unmating
04	25 Cycles
05	Forces - Mating / Unmating
06	Clean w/Compressed Air
07	Contact Gaps
08	LLCR-2
09	Thermal Shock (Mated and Undisturbed)
10	LLCR-3
11	Cyclic Humidity (Mated and Undisturbed)
12	LLCR-4
13	Forces - Mating / Unmating

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

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

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

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

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

Mating / Unmating Forces = EIA-364-13

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

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

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

FLOWCHARTS Continued

IR & DWV

TEST STEP	GROUP A1 2 Mated Sets Break Down Pin-to-Pin	GROUP A2 2 Unmated of Part # Being Tested Break Down Pin-to-Pin	GROUP A3 2 Unmated of Mating Part # Break Down Pin-to-Pin	GROUP B1 2 Mated Sets Pin-to-Pin
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Shock (Mated and Undisturbed)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (Mated and Undisturbed)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

DWV on Group B1 to be performed at Test Voltage

DWV test voltage is equal to 75% of the lowest break down voltage from Groups A1, A2 or A3

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

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

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

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

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

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

FLOWCHARTS Continued

IR & DWV

TEST STEP	GROUP C1 2 Mated Sets Break Down Row-to-Row	GROUP C2 2 Unmated of Part # Being Tested Break Down Row-to-Row	GROUP C3 2 Unmated of Mating Part # Break Down Row-to-Row	GROUP D1 2 Mated Sets Row-to-Row
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Shock (Mated and Undisturbed)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (Mated and Undisturbed)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

TEST STEP	GROUP E1 2 Mated Sets Break Down Pin-to-Ground	GROUP E2 2 Unmated of Part # Being Tested Break Down Pin-to-Ground	GROUP E3 2 Unmated of Mating Part # Break Down Pin-to-Ground	GROUP F1 2 Mated Sets Pin-to-Ground
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Shock (Mated and Undisturbed)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (Mated and Undisturbed)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

FLOWCHARTS Continued

IR & DWV

TEST STEP	GROUP G1 2 Mated Sets Break Down Pin-to-Closest Metallic Hardware	GROUP G2 2 Unmated of Part # Being Tested Break Down Pin-to-Closest Metallic Hardware	GROUP G3 2 Unmated of Mating Part # Break Down Pin-to-Closest Metallic Hardware	GROUP H1 2 Mated Sets Pin-to-Closest Metallic Hardware
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Shock (Mated and Undisturbed)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (Mated and Undisturbed)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

FLOWCHARTS Continued

Mechanical Shock / Vibration / LLCR

TEST STEP	GROUP A1 48 Points
01	LLCR-1
02	Shock
03	Vibration
04	LLCR-2

Mechanical Shock = EIA 364-27 Half Sine,

100 g's, 6 milliSeconds (Condition "C") each axis

Vibration = EIA 364-28, Random Vibration

7.56 g RMS, Condition VB --- 2 hours/axis

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

Shock / Vibration / nanoSecond Event Detection

TEST STEP	GROUP A1 60 Points
01	Event Detection, Shock
02	Event Detection, Vibration

Mechanical Shock = EIA 364-27 Half Sine,

100 g's, 6 milliSeconds (Condition "C") each axis

Vibration = EIA 364-28, Random Vibration

7.56 g RMS, Condition VB --- 2 hours/axis

Event detection requirement during Shock / Vibration is 50 nanoseconds minimum

FLOWCHARTS Continued

Cable Flex Test

TEST STEP	GROUP B1 8 Cable Assemblies Circular Jacket Cable
01	IR & DWV at test voltage
02	Flex 100 Cycles
03	Visual Inspection
04	IR & DWV at test voltage
05	Rotate cable 90°
06	Flex 100 Cycles (200 total)
07	Visual Inspection
08	IR & DWV at test voltage

DWV to be performed at Test Voltage

DWV test voltage is equal to 75% of the lowest break down voltage from 'Sequence E'

*** If 'Sequence E' is not being tested, then separate parts must be broken down to establish the test voltage**

Monitor continuity during flex testing on all groups

Cable Flex Test = EIA-364-41D

Circular Jacket Cable - to be tested 90° each direction (180° total)

EIA-364-41D min flex requirement = 200 cycles

Flat Cable - to be tested 70°±5° each direction (140°±10° total)

EIA-364-41D min flex requirement = 500 cycles

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

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℃ to +85℃
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.

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.

MATING/UNMATING:

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

LLCR:

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

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

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).

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

MECHANICAL SHOCK (Specified Pulse):

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

VIBRATION:

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

NANOSECOND-EVENT DETECTION:

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

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

CABLE DURABILITY:

1) Oscillate and monitor electrical continuity for open circuit indication.
   a. ± 90° Pendulum Mode, bend up to 200 cycles with 4 oz. load on cable end.

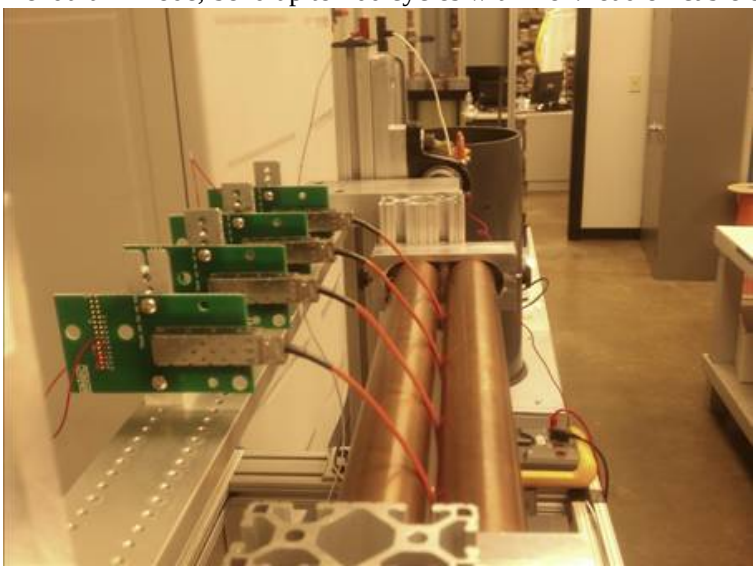


Fig. 1
(Typical set-up, actual part not depicted.)

   b. ± 90° Flex Mode, bend up to 200 cycles with 4 oz. load on cable end.

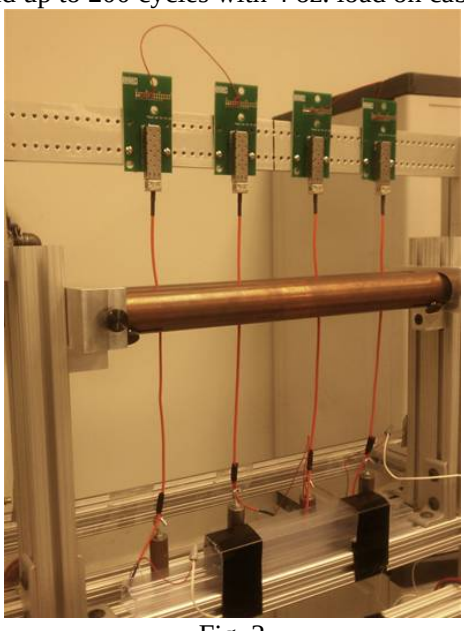


Fig. 2
(Typical set-up, actual part not depicted.)

RESULTS

Mating – Unmating Forces

- **Initial**
  - **Mating**
    - **Min ---------- 2.18 Lbs**
    - **Max---------- 2.75 Lbs**
  - **Unmating**
    - **Min ---------- 1.06 Lbs**
    - **Max---------- 1.42 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 2.40 Lbs**
    - **Max---------- 2.85 Lbs**
  - **Unmating**
    - **Min ---------- 1.19 Lbs**
    - **Max---------- 1.78 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ---------- 1.45 Lbs**
    - **Max---------- 3.12 Lbs**
  - **Unmating**
    - **Min ---------- 0.97 Lbs**
    - **Max---------- 1.43 Lbs**

RESULTS Continued

Insulation Resistance minimums, IR

Pin to Pin

- **Initial**
  - **Mated ---------- 40000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated ---------- 25000Meg Ω ---------- Pass**
  - **Unmated ---------- 15000Meg Ω ---------- Pass**

Row to Row

- **Initial**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated ---------- 25000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**

Pin to Ground

- **Initial**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**

Pin to Closest Metallic Hardware

- **Initial**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**

RESULTS Continued

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage ----------820 VAC**
  - **Test Voltage ----------615 VAC**
  - **Working Voltage ----------205 VAC**

Pin to Pin

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

Row to Row

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

Pin to Ground

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

Pin to Closest Metallic Hardware

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

RESULTS Continued

LLCR Durability (48 LLCR test points)

- **Initial ---------- 162.3mOhms Max**
- **Durability, 25 Cycles**
  - **<= +5.0 mOhms ---------- 47 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 1 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Thermal**
  - **<= +5.0 mOhms ---------- 47 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 1 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **Humidity**
  - **<= +5.0 mOhms ---------- 48 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 (48 LLCR test points)

- **Initial ---------- 164.6mOhms Max**
- **Shock &Vibration**
  - **<= +5.0 mOhms ---------- 47 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 1 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

Mechanical Shock & Random Vibration:

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

RESULTS Continued

Cable Flex Test----Insulation Resistance minimums, IR

Pin to Pin

- **Initial**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **100 cycles**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **200 cycles**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**

Pin to Ground

- **Initial**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **100 cycles**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **200 cycles**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**

Pin to Closest Metallic Hardware

- **Initial**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **100 cycles**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **200 cycles**
  - **Mated---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**

RESULTS Continued

Cable Flex Test----Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage----------820 VAC**
  - **Test Voltage----------615 VAC**
  - **Working Voltage----------205 VAC**

Pin to Pin

- **Initial DWV----------Passed**
- **100 cycles DWV----------Passed**
- **200 cycles DWV----------Passed**

Pin to Ground

- **Initial DWV----------Passed**
- **100 cycles DWV----------Passed**
- **200 cycles DWV----------Passed**

Pin to Closest Metallic Hardware

- **Initial DWV----------Passed**
- **100 cycles DWV----------Passed**
- **200 cycles DWV----------Passed**

DATA SUMMARIES

MATING/UNMATING FORCE:

	Initial				25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	9.70	2.18	4.71	1.06	10.68	2.40	5.29	1.19
Maximum	12.23	2.75	6.32	1.42	12.68	2.85	7.92	1.78
Average	11.09	**2.49**	5.36	**1.21**	11.70	**2.63**	6.20	**1.40**
St Dev	0.95	0.21	0.60	0.13	0.78	0.17	0.90	0.20
Count	8	8	8	8	8	8	8	8

	After Humidity			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	6.45	1.45	4.31	0.97
Maximum	13.88	3.12	6.58	1.48
Average	9.57	**2.15**	5.49	**1.23**
St Dev	3.01	0.68	0.93	0.21
Count	8	8	8	8

DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**SFPE/SFPK**	**SFPE**	**SFPK**
Initial	40000	100000	Not Tested
Thermal	100000	100000	Not Tested
Humidity	25000	15000	Not Tested

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	**SFPE/SFPK**	**SFPE**	**SFPK**
Initial	100000	100000	Not Tested
Thermal	100000	100000	Not Tested
Humidity	100000	100000	Not Tested

	Row to Row		
	Mated	Unmated	Unmated
Minimum	**SFPE/SFPK**	**SFPE**	**SFPK**
Initial	100000	100000	Not Tested
Thermal	100000	100000	Not Tested
Humidity	25000	100000	Not Tested

	Pin to Closest Metallic Hardware		
	Mated	Unmated	Unmated
Minimum	**SFPE/SFPK**	**SFPE**	**SFPK**
Initial	100000	100000	Not Tested
Thermal	100000	100000	Not Tested
Humidity	100000	100000	Not Tested

DATA SUMMARIES Continued

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**SFPE/SFPK**
Break Down Voltage	820
Test Voltage	615
Working Voltage	205

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

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

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

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

DATA SUMMARIES Continued

LLCR Durability:

1) A total of 48 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

Date	2011-8-29	2011-8-30	2011-9-6	2011-9-22
Room Temp C	23	23	23	23
RH	42	37	38	38
Name	Craig Ryan	Craig Ryan	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta 25 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	155.6	-0.6	-0.8	-1.0
St. Dev.	3.7	1.1	1.0	0.4
Min	148.4	-7.4	-7.2	-2.4
Max	162.3	0.3	0.0	-0.3
Count	48	48	48	48

How many samples are being tested?	8
How many contacts are on each board?	6

	Stable	Minor	Acceptable	Marginal	Unstable	Open
25 Cycles	47	1	0	0	0	0
Thermal	47	1	0	0	0	0
Humidity	48	0	0	0	0	0

DATA SUMMARIES Continued

LLCR Shock &Vibration:

1) A total of 48 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

Date	2011-9-6	2011-9-21
Room Temp C	23	22
RH	38	49
Name	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta Shock-Vib**
Average	156.4	0.0
St. Dev.	4.5	1.1
Min	146.4	-2.1
Max	164.6	5.8
Count	48	48

How many samples are being tested?	8
How many contacts are on each board?	24

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Shock-Vib	47	1	0	0	0	0

Shock and Vibration Event Detection Summary	
Contacts tested	
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

DATA SUMMARIES Continued

Cable Flex Test----INSULATION RESISTANCE (IR):

Pin to Pin	
Mated	
Minimum	
Initial	100000
After 100 Flex Cycles	100000
After 200 Flex Cycles	100000

Pin to Ground	
Mated	
Minimum	
Initial	100000
After 100 Flex Cycles	100000
After 200 Flex Cycles	100000

Pin to Closest Metallic Hardware	
Mated	
Minimum	
Initial	100000
After 100 Flex Cycles	100000
After 200 Flex Cycles	100000

DATA SUMMARIES Continued

Cable Flex Test----DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	
Break Down Voltage	820
Test Voltage	615
Working Voltage	205

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

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

Pin to Closest Metallic Hardware	
Initial Test Voltage	Passed
After 100 Flex Cycles Test Voltage	Passed
After 200 Flex Cycles Test Voltage	Passed

DATA

INSULATION RESISTANCE (IR):

Initial Insulation Resistance
Measured In Meg Ohms

Pin to Pin		
Mated	A Unmated	B
X	X	
SFPE/SFPK	SFPE	SFPK
40000	100000	Not Tested
100000	100000	Not Tested

Pin to Ground		
Mated	A Unmated	B
X	X	
SFPE/SFPK	SFPE	SFPK
100000	100000	Not Tested
100000	100000	Not Tested

Row to Row		
Mated	A Unmated	B
X	X	
SFPE/SFPK	SFPE	SFPK
100000	100000	Not Tested
100000	100000	Not Tested

Pin to Closest Metallic Hardware		
Mated	A Unmated	B
X	X	
SFPE/SFPK	SFPE	SFPK
100000	100000	Not Tested
100000	100000	Not Tested

DATA Continued

Thermal Insulation Resistance
Measured In Meg Ohms

Pin to Pin		
Mated	A	Unmated B
X	X	
SFPE/SFPK	SFPE	SFPK
100000	100000	Not Tested
100000	100000	Not Tested

Pin to Ground		
Mated	A	Unmated B
X	X	
SFPE/SFPK	SFPE	SFPK
100000	100000	Not Tested
100000	100000	Not Tested

Row to Row		
Mated	A	Unmated B
X	X	
SFPE/SFPK	SFPE	SFPK
100000	100000	Not Tested
100000	100000	Not Tested

Pin to Closest Metallic Hardware		
Mated	A	Unmated B
X	X	
SFPE/SFPK	SFPE	SFPK
100000	100000	Not Tested
100000	100000	Not Tested

DATA Continued

Humidity Insulation Resistance
Measured In Meg Ohms

Pin to Pin		
Mated	A Unmated	B
X	X	
SFPE/SFPK	SFPE	SFPK
25000	15000	Not Tested
Sample Damaged	Sample Damaged	Not Tested

Pin to Ground		
Mated	A Unmated	B
X	X	
SFPE/SFPK	SFPE	SFPK
100000	100000	Not Tested
100000	100000	Not Tested

Row to Row		
Mated	A Unmated	B
X	X	
SFPE/SFPK	SFPE	SFPK
25000	100000	Not Tested
100000	100000	Not Tested

Pin to Closest Metallic Hardware		
Mated	A Unmated	B
X	X	
SFPE/SFPK	SFPE	SFPK
100000	100000	Not Tested
100000	100000	Not Tested

DATA Continued

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial Breakdown Voltage
Test Voltage ***Until Breakdown Occurs***

Pin to Pin		
Mated	A	Unmated B
X		
SFPE/SFPK	SFPE	SFPK
860	1020	Not Tested
960	980	Not Tested

Pin to Ground		
Mated	A	Unmated B
X		
SFPE/SFPK	SFPE	SFPK
820	820	Not Tested
880	840	Not Tested

Row to Row		
Mated	A	Unmated B
X		
SFPE/SFPK	SFPE	SFPK
1400	1650	Not Tested
1650	1650	Not Tested

Pin to Closest Metallic Hardware		
Mated	A	Unmated B
X		
SFPE/SFPK	SFPE	SFPK
1200	1650	Not Tested
1500	960	Not Tested

DATA Continued

Initial DWV
Test Voltage= 615

Pin to Pin		
Mated	A	Unmated B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

Pin to Ground		
Mated	A	Unmated B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

Row to Row		
Mated	A	Unmated B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

Pin to Closest Metallic Hardware		
Mated	A	Unmated B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

DATA Continued

Thermal Test Voltage
Test Voltage= 615

Pin to Pin		
Mated	A	Unmated B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

Pin to Ground		
Mated	A	Unmated B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

Row to Row		
Mated	A	Unmated B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

Pin to Closest Metallic Hardware		
Mated	A	Unmated B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

DATA Continued

Humidity Test Voltage
Test Voltage= 615

Pin to Pin		
Mated	A Unmated	B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
Omitted	Omitted	Not Tested

Pin to Ground		
Mated	A Unmated	B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

Row to Row		
Mated	A Unmated	B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

Pin to Closest Metallic Hardware		
Mated	A Unmated	B
SFPE/SFPK	SFPE	SFPK
615	615	Not Tested
615	615	Not Tested

DATA Continued

MATING/UNMATING:

Sample#	Initial		25 Cycles		After Humidity	
	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	2.37	1.15	2.58	1.30	1.45	0.97
2	2.18	1.09	2.40	1.60	1.72	1.05
3	2.60	1.18	2.67	1.20	2.79	1.43
4	2.75	1.19	2.85	1.33	3.12	1.48
5	2.65	1.15	2.78	1.33	2.91	1.41
6	2.29	1.42	2.40	1.78	1.90	1.09
7	2.38	1.06	2.57	1.19	1.84	1.38
8	2.72	1.40	2.80	1.43	1.49	1.06

DATA Continued

LLCR Durability:

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	25 Cycles	Thermal	Humidity
1	P1	150.0	0.0	-0.7	-1.1
1	P2	155.3	-0.4	-0.5	-0.9
1	P3	156.2	-0.2	-0.4	-0.7
1	P4	158.1	-0.7	-1.0	-1.3
1	P5	156.6	-0.4	-0.5	-0.8
1	P6	154.8	-0.5	-0.6	-0.9
2	P1	159.6	-0.6	-0.9	-1.2
2	P2	160.1	-0.6	-0.8	-1.1
2	P3	150.9	-0.7	-0.8	-1.0
2	P4	158.2	0.3	-0.9	-1.1
2	P5	158.7	-0.4	-0.5	-0.8
2	P6	148.4	-0.2	-0.1	-0.3
3	P1	156.2	-0.6	-0.9	-1.4
3	P2	148.5	-0.5	-0.6	-0.9
3	P3	156.6	-0.4	-0.5	-0.9
3	P4	158.6	0.0	-1.0	-1.3
3	P5	154.9	-0.4	-0.6	-0.9
3	P6	154.9	-0.3	-0.5	-0.8
4	P1	160.1	-0.8	-1.8	-2.0
4	P2	155.0	-0.1	-0.5	-0.8
4	P3	155.3	-0.1	-0.6	-0.9
4	P4	151.3	-0.2	-0.4	-0.7
4	P5	156.8	0.0	0.0	-0.4
4	P6	156.4	-0.4	-0.4	-0.8
5	P1	157.8	-1.5	-1.9	-2.4
5	P2	148.5	-0.9	-0.9	-1.2
5	P3	157.3	-1.1	-1.5	-1.8
5	P4	159.2	-1.1	-1.2	-1.7
5	P5	155.2	-0.5	-0.7	-1.3
5	P6	154.3	-0.3	-0.4	-0.9
6	P1	158.1	-0.5	-1.0	-1.4
6	P2	149.4	-0.7	-0.2	-0.4
6	P3	158.5	-0.5	-0.4	-0.7
6	P4	158.1	0.1	-0.7	-0.8
6	P5	157.9	-0.6	-0.9	-1.4
6	P6	148.7	-0.2	-0.3	-0.6
7	P1	151.6	-0.7	-0.8	-1.1
7	P2	157.5	-0.9	-1.1	-1.5
7	P3	157.0	-0.7	-0.9	-1.2
7	P4	160.5	-0.9	-1.4	-1.7
7	P5	156.9	-0.4	-0.6	-0.9
7	P6	154.1	-0.3	-0.5	-0.8
8	P1	162.1	-7.4	-7.2	-1.1

8	P2	162.3	-0.6	-0.3	-0.6
8	P3	153.1	-1.0	-0.7	-0.9
8	P4	149.2	-0.6	-0.1	-0.6
8	P5	154.9	-0.3	-0.3	-0.7
8	P6	156.6	-1.1	-0.7	-0.8

DATA Continued

LLCR Shock &Vibration:

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	160.4	-0.8
1	P2	149.9	0.3
1	P3	162.1	0.8
1	P4	159.3	-2.1
1	P5	160.6	0.4
1	P6	150.0	1.1
2	P1	162.8	-0.1
2	P2	159.9	0.3
2	P3	150.7	0.6
2	P4	164.6	-1.1
2	P5	153.8	0.0
2	P6	163.0	0.8
3	P1	154.3	-1.0
3	P2	158.9	0.1
3	P3	160.6	0.0
3	P4	155.9	0.7
3	P5	148.8	-0.2
3	P6	157.8	0.1
4	P1	156.7	-0.6
4	P2	149.3	-0.2
4	P3	156.5	0.7
4	P4	152.6	-0.4
4	P5	157.5	-0.1
4	P6	158.8	0.2
5	P1	157.1	-0.8
5	P2	146.4	1.4
5	P3	160.6	-0.1
5	P4	158.8	-0.6
5	P5	159.6	-0.3
5	P6	150.2	0.3
6	P1	159.4	-1.3
6	P2	154.6	-0.3
6	P3	156.5	1.2
6	P4	158.1	-0.7
6	P5	157.5	0.1
6	P6	148.4	1.2
7	P1	149.7	-0.9
7	P2	155.5	-0.6
7	P3	157.3	-0.3
7	P4	160.8	-0.8
7	P5	158.6	-0.6
7	P6	157.4	0.1
8	P1	152.4	5.8

8	P2	156.7	-1.6
8	P3	154.1	0.1
8	P4	160.5	-1.0
8	P5	161.9	1.2
8	P6	152.1	0.4

DATA Continued

Cable Flex Test----INSULATION RESISTANCE (IR):

Initial Insulation Resistance
Measured In Meg Ohms

Pin to Pin	
X	
Sample#	Mated
155190-031	100000
155190-032	100000
155190-033	100000
155190-034	100000
155190-035	100000
155190-036	100000
155190-037	100000
155190-038	100000

Pin to Ground	
X	
Sample#	Mated
155190-031	100000
155190-032	100000
155190-033	100000
155190-034	100000
155190-035	100000
155190-036	100000
155190-037	100000
155190-038	100000

Pin to Closest Metallic Hardware	
X	
Sample#	Mated
155190-031	100000
155190-032	100000
155190-033	100000
155190-034	100000
155190-035	100000
155190-036	100000
155190-037	100000
155190-038	100000

DATA Continued

100 Cycle Insulation Resistance
Measured In Meg Ohms

Pin to Pin	
X	
Sample#	Mated
155190-031	100000
155190-032	100000
155190-033	100000
155190-034	100000
155190-035	100000
155190-036	100000
155190-037	100000
155190-038	100000

Pin to Ground	
X	
Sample#	Mated
155190-031	100000
155190-032	100000
155190-033	100000
155190-034	100000
155190-035	100000
155190-036	100000
155190-037	100000
155190-038	100000

Pin to Closest Metallic Hardware	
X	
Sample#	Mated
155190-031	100000
155190-032	100000
155190-033	100000
155190-034	100000
155190-035	100000
155190-036	100000
155190-037	100000
155190-038	100000

DATA Continued

200 Cycle Insulation Resistance
Measured In Meg Ohms

Pin to Pin	
X	
Sample#	Mated
155190-031	100000
155190-032	100000
155190-033	100000
155190-034	100000
155190-035	100000
155190-036	100000
155190-037	100000
155190-038	100000

Pin to Ground	
X	
Sample#	Mated
155190-031	100000
155190-032	100000
155190-033	100000
155190-034	100000
155190-035	100000
155190-036	100000
155190-037	100000
155190-038	100000

Pin to Closest Metallic Hardware	
X	
Sample#	Mated
155190-031	100000
155190-032	100000
155190-033	100000
155190-034	100000
155190-035	100000
155190-036	100000
155190-037	100000
155190-038	100000

DATA Continued

Cable Flex Test----DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial Breakdown Voltage
Test Voltage ***Until Breakdown Occurs***

Pin to Pin		
Mated	A	Unmated B
	X	
SFPE/SFPK	SFPE	SFPK
860	1020	Not Tested
960	980	Not Tested

Pin to Ground		
Mated	A	Unmated B
	X	
SFPE/SFPK	SFPE	SFPK
820	820	Not Tested
880	840	Not Tested

Pin to Closest Metallic Hardware		
Mated	A	Unmated B
	X	
SFPE/SFPK	SFPE	SFPK
1200	1650	Not Tested
1500	960	Not Tested

DATA Continued

Initial DWV	
Test Voltage =	615

Pin to Pin	
X	
Sample#	Mated
155190-031	615
155190-032	615
155190-033	615
155190-034	615
155190-035	615
155190-036	615
155190-037	615
155190-038	615

Pin to Ground	
X	
Sample#	Mated
155190-031	615
155190-032	615
155190-033	615
155190-034	615
155190-035	615
155190-036	615
155190-037	615
155190-038	615

Pin to Closest Metallic Hardware	
X	
Sample#	Mated
155190-031	615
155190-032	615
155190-033	615
155190-034	615
155190-035	615
155190-036	615
155190-037	615
155190-038	615

DATA Continued

100 Cycle DWV	
Test Voltage =	615

Pin to Pin	
X	
Sample#	Mated
155190-031	615
155190-032	615
155190-033	615
155190-034	615
155190-035	615
155190-036	615
155190-037	615
155190-038	615

Pin to Ground	
X	
Sample#	Mated
155190-031	615
155190-032	615
155190-033	615
155190-034	615
155190-035	615
155190-036	615
155190-037	615
155190-038	615

Pin to Closest Metallic Hardware	
X	
Sample#	Mated
155190-031	615
155190-032	615
155190-033	615
155190-034	615
155190-035	615
155190-036	615
155190-037	615
155190-038	615

DATA Continued

200 Cycle DWV	
Test Voltage =	615

Pin to Pin	
X	
Sample#	Mated
155190-031	615
155190-032	615
155190-033	615
155190-034	615
155190-035	615
155190-036	615
155190-037	615
155190-038	615

Pin to Ground	
X	
Sample#	Mated
155190-031	615
155190-032	615
155190-033	615
155190-034	615
155190-035	615
155190-036	615
155190-037	615
155190-038	615

Pin to Closest Metallic Hardware	
X	
Sample#	Mated
155190-031	615
155190-032	615
155190-033	615
155190-034	615
155190-035	615
155190-036	615
155190-037	615
155190-038	615

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 04/30/2011, Next Cal: 04/30/2012

Equipment #: TCT-04
Description: Dillon Quantrol TC2 Test Stand
Manufacturer: Dillon Quantrol
Model: TC2
Serial #: 04-1041-04
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.
… Last Cal: 05/21/2011, Next Cal: 05/21/2012

Equipment #: THC-02
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SE-1000-6-6
Serial #: 31808
Accuracy: See Manual
… Last Cal: 02/16/2011, Next Cal: 02/16/2012

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 11/30/2010, Next Cal: 11/30/2011

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: 05/18/2011, Next Cal: 05/18/2012

EQUIPMENT AND CALIBRATION SCHEDULES Continued

Equipment #: SVC-01
Description: Shock & Vibration Table
Manufacturer: Data Physics
Model: LE-DSA-10-20K
Serial #: 10037
Accuracy: See Manual
… Last Cal: 11/31/2010, Next Cal: 11/31/2011

Equipment #: ACLM-01
Description: Accelerometer
Manufacturer: PCB Piezotronics
Model: 352C03
Serial #: 115819
Accuracy: See Manual
… Last Cal: 07/09/2011, Next Cal: 07/09/2012

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 06/04/2011, Next Cal: 06/04/2012