Project Number: Design Qualification Test Report	Tracking Code: 140187_Report_Rev_1			
Requested by: James Borgelt	Date: 8/22/2012	Product Rev: N/A		
Part #: ACP-16-02-H-00.35-T-S-P-1\ ACR-16-02-H-00.35-S-S1-P-1	Lot #: N/A	Tech: Craig Ryan	Eng: Eric Mings	
Part description: ACP\ACR			Qty to test: 30	
Test Start: 05/02/2011	Test Completed: 05/23/2011			

DESIGN QUALIFICATION TEST REPORT

ACP\ACR
ACP-16-02-H-00.35-T-S-P-1\ ACR-16-02-H-00.35-S-S1-P-1

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.

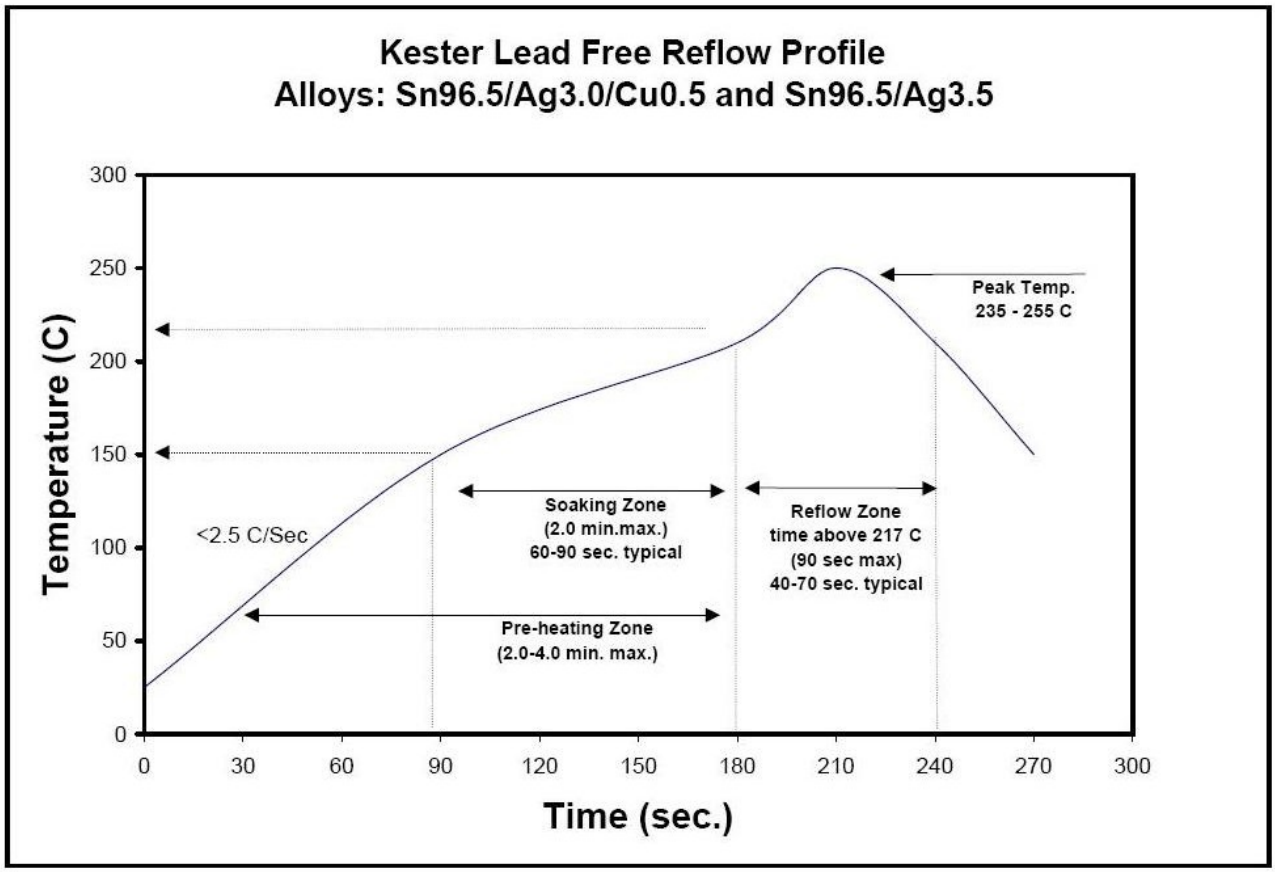
APPLICABLE DOCUMENTS

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-103219-TST-XX

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Gas Tight

TEST STEP	GROUP A1 8 Assemblies
01	LLCR-1
02	Gas Tight
03	LLCR-2

Gas Tight = EIA-364-36A

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

Thermal Aging

TEST STEP	GROUP A1 8 Boards Thermal Aging (Mated)
01	Forces - Mating / Unmating
02	LLCR-1
03	Thermal Aging (Mated and Undisturbed)
04	LLCR-2
05	Forces - Mating / Unmating

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

Time Condition 'B' (250 Hours)

Mating / Unmating Forces = EIA-364-13

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

Durability/Mating/Unmating/Gaps

TEST STEP	GROUP A1 6 Assemblies
02	LLCR-1
03	Forces - Mating / Unmating
04	25 Cycles
05	Forces - Mating / Unmating
06	25 Cycles (50 Total)
07	Forces - Mating / Unmating
08	25 Cycles (75 Total)
09	Forces - Mating / Unmating
10	25 Cycles (100 Total)
11	Forces - Mating / Unmating
12	Clean w/Compressed Air
14	LLCR-2
15	Thermal Shock (Mated and Undisturbed)
16	LLCR-3
17	Cyclic Humidity (Mated and Undisturbed)
18	LLCR-4
19	Forces - Mating / Unmating

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

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

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

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

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

Mating / Unmating Forces = EIA-364-13

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

FLOWCHARTS Continued

Current Carrying Capacity - Array

TEST STEP	GROUP A1 3 Mated Assemblies All Contacts Powered
01	CCC

(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

CCC, Temp rise = EIA-364-70

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.

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:
    a. 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

GAS TIGHT:

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

1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
    a. <= +5.0 mOhms:---------- Stable
    b. +5.1 to +10.0 mOhms: ---------- Minor
    c. +10.1 to +15.0 mOhms: ---------- Acceptable
    d. +15.1 to +50.0 mOhms: ---------- Marginal
    e. +50.1 to +2000 mOhms:---------- Unstable
    f. >+2000 mOhms:---------- Open Failure
4) Procedure:
    a. Reference document: EIA-364-36, *Test Procedure for Determination of Gas-Tight Characteristics for Electrical Connectors, Sockets and/or Contact Systems*.
    b. Test Conditions:
        i. Class II--- Mated pairs of contacts assembled to their plastic housings.
        ii. Reagent grade Nitric Acid shall be used of sufficient volume to saturate the test chamber
        iii. The ratio of the volume of the test chamber to the surface area of the acid shall be 10:1.
        iv. The chamber shall be saturated with the vapor for at least 15 minutes before samples are added.
        v. Exposure time, 55 to 65 minutes.
        vi. The samples shall be no closer to the chamber walls than 1 inches and no closer to the surface of the acid than 3 inches.
        vii. The samples shall be dried after exposure for a minimum of 1 hour.
        viii. Drying temperature 50^{o} C
        ix. The final LLCR shall be conducted within 1 hour after drying.

ATTRIBUTE DEFINITIONS Continued

The following is a brief, simplified description of attributes

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. 80^{o} C
    c. 95^{o} C
    d. 115^{o} C
8) Typically, neighboring contacts (in close proximity to maximize heat build up) are energized.
9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the maximum temperature in the vicinity of the heat generation area.
10) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
11) Hook-up wire cross section is larger than the cross section of any connector leads/PC board traces, jumpers, etc.
12) Hook-up wire length is longer than the minimum specified in the referencing standard.

RESULTS

Temperature Rise, CCC at a 20% de-rating

- **CCC for a 30°C Temperature Rise ----------2.6A per contact with All Powered (ACP Cable Bundle)**

Mating – Unmating Forces

Thermal Aging Group

- **Initial**
  - **Mating**
    - **Min ----------4.21 Lbs**
    - **Max----------6.62 Lbs**
  - **Unmating**
    - **Min ----------2.15 Lbs**
    - **Max----------2.92 Lbs**
- **After Thermal**
  - **Mating**
    - **Min ----------2.81 Lbs**
    - **Max----------3.59 Lbs**
  - **Unmating**
    - **Min ----------1.57 Lbs**
    - **Max----------1.88 Lbs**

RESULTS Continued

Mating – Unmating Forces

Mating\Unmating Durability Group

- **Initial**
  - **Mating**
    - **Min ----------2.06 Lbs**
    - **Max----------2.55 Lbs**
  - **Unmating**
    - **Min ----------1.19 Lbs**
    - **Max----------1.96 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ----------2.04 Lbs**
    - **Max----------2.82 Lbs**
  - **Unmating**
    - **Min ----------1.66 Lbs**
    - **Max----------2.74 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ----------2.20 Lbs**
    - **Max----------3.19 Lbs**
  - **Unmating**
    - **Min ----------1.93 Lbs**
    - **Max----------3.43 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ----------2.50 Lbs**
    - **Max----------3.45 Lbs**
  - **Unmating**
    - **Min ---------- 2.12 Lbs**
    - **Max----------3.84 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ----------2.65 Lbs**
    - **Max----------3.78 Lbs**
  - **Unmating**
    - **Min ----------2.34 Lbs**
    - **Max----------3.41 Lbs**
- **After Humidity**
  - **Mating**
    - **Min ----------1.93 Lbs**
    - **Max----------2.73 Lbs**
  - **Unmating**
    - **Min ----------1.18 Lbs**
    - **Max----------1.61 Lbs**

RESULTS Continued

Insulation Resistance minimums, IR

- **Initial**
  - **Mated ---------- 100000 MegOhms ---------- Pass**
  - **Unmated---------- 100000 MegOhms ---------- Pass**
- **Thermal**
  - **Mated ---------- 100000 MegOhms ---------- Pass**
  - **Unmated---------- 100000 MegOhms ---------- Pass**
- **Humidity**
  - **Mated ---------- 1300 MegOhms ---------- Pass**
  - **Unmated---------- 1300 MegOhms ---------- Pass**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage ---------- 1200 VAC**
  - **Test Voltage ---------- 900 VAC**
  - **Working Voltage ---------- 300 VAC**

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

RESULTS Continued

LLCR:

Mating\Unmating Durability Group (60 LLCR test points)

- **Initial ---------- 55.25 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms---------- 60 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---------- 60 Points ----------Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ----------Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ----------Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ----------Marginal**
  - **+50.1 to +2000 mOhms---------- 0 Points ----------Unstable**
  - **>+2000 mOhms ---------- 0 Points ----------Open Failure**
- **Humidity**
  - **<= +5.0 mOhms---------- 60 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 Aging Group (80 LLCR test points)

- **Initial ---------- 45.3mOhms Max**
- **Thermal**
  - **<= +5.0 mOhms---------- 80 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**

Gas Tight Group (80 LLCR test points)

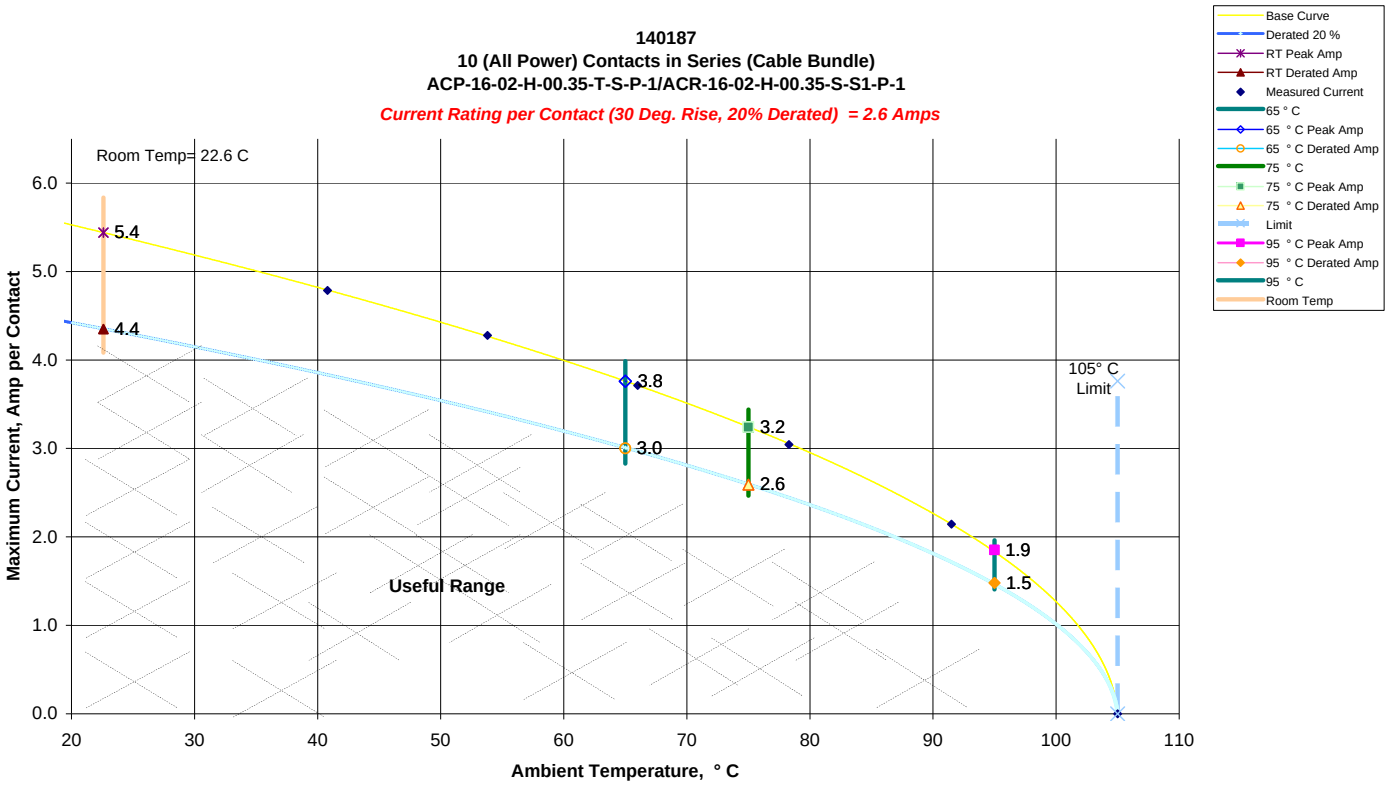
- **Initial ---------- 45.1 mOhms Max**
- **Gas-Tight**
  - **<= +5.0 mOhms---------- 80 Points ----------Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ----------Minor**
  - **+10.1 to +15.0 mOhms---------- 0 Points ----------Acceptable**
  - **+15.1 to +50.0 mOhms---------- 0 Points ----------Marginal**
  - **+50.1 to +2000 mOhms---------- 0 Points ----------Unstable**
  - **>+2000 mOhms ---------- 0 Points ----------Open Failure**

DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

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

    a. Linear configuration with all adjacent conductors/cable bundle powered



DATA SUMMARIES Continued

MATING/UNMATING FORCE:

Thermal Aging Group

	Initial				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	18.73	4.21	9.56	2.15	12.49	2.81	7.00	1.57
Maximum	29.45	6.62	12.99	2.92	15.95	3.59	8.38	1.88
Average	23.92	**5.38**	11.78	**2.65**	14.32	**3.22**	7.76	**1.75**
St Dev	3.38	0.76	1.40	0.31	1.16	0.26	0.54	0.12
Count	8	8	8	8	8	8	8	8

Mating\Unmating Durability Group

	Initial				25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	9.16	2.06	5.29	1.19	9.07	2.04	7.38	1.66
Maximum	11.34	2.55	8.72	1.96	12.54	2.82	12.19	2.74
Average	10.45	**2.35**	7.24	**1.63**	11.44	**2.57**	10.85	**2.44**
St Dev	0.87	0.20	1.22	0.27	1.26	0.28	1.78	0.40
Count	6	6	6	6	6	6	6	6
	50 Cycles				75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	9.79	2.20	8.58	1.93	11.12	2.50	9.43	2.12
Maximum	14.19	3.19	15.26	3.43	15.35	3.45	17.08	3.84
Average	12.92	**2.91**	12.52	**2.82**	14.20	**3.19**	13.65	**3.07**
St Dev	1.59	0.36	2.20	0.49	1.59	0.36	2.47	0.55
Count	6	6	6	6	6	6	6	6
	100 Cycles				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	11.79	2.65	10.41	2.34	8.58	1.93	5.25	1.18
Maximum	16.81	3.78	15.17	3.41	12.14	2.73	7.16	1.61
Average	15.00	**3.37**	13.78	**3.10**	10.84	**2.44**	6.12	**1.38**
St Dev	1.75	0.39	1.72	0.39	1.30	0.29	0.85	0.19
Count	6	6	6	6	6	6	6	6

DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	ACP/ACR	ACP	ACR
Initial	100000	100000	100000
Thermal	100000	100000	100000
Humidity	1300	7000	1300

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	ACP/ACR
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

LLCR:

Mating\Unmating Durability Group

1) A total of 80 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
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

Date	11/14/2011	11/16/2011	11/22/2011	12/8/2011
Room Temp (Deg C)	23	22	22	22
Rel Humidity (%)	42	40	37	30
Technician	Craig Ryan	Craig Ryan	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shck**	**Delta Humidity**
Average	53.78	0.18	0.25	0.21
St. Dev.	0.53	0.09	0.24	0.26
Min	52.40	0.02	0.00	0.04
Max	55.25	0.44	1.88	2.08
Summary Count	60	60	60	60
Total Count	60	60	60	60

	Stable	Minor	Acceptable	Marginal	Unstable	Open
mOhms	**<=5**	**>5 & <=10**	**>10 & <=15**	**>15 & <=50**	**>50 & <=1000**	**>1000**
100 Cycles	**60**	**0**	**0**	**0**	**0**	**0**
Therm Shck	**60**	**0**	**0**	**0**	**0**	**0**
Humidity	**60**	**0**	**0**	**0**	**0**	**0**

DATA SUMMARIES Continued

Thermal Age Group:

1) A total of 80 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
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

Date	2011-5-2	2011-5-16
Room Temp C	23	22
RH	48%	42%
Name	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta Thermal Age**
Average	43.1	0.1
St. Dev.	1.3	0.1
Min	40.4	-0.1
Max	45.3	0.2
Count	80	80

How many samples are being tested?	4
How many contacts are on each board?	20

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Thermal Age	80	0	0	0	0	0

DATA SUMMARIES Continued

GAS TIGHT:

1) A total of 80 points were measured.
2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets.*
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

Date	2011-4-29	2011-4-29
Room Temp C	23	23
RH	40%	38%
Name	Craig Ryan	Craig Ryan
mOhm values	**Actual Initial**	**Delta Gas Tight**
Average	43.6	0.1
St. Dev.	0.6	0.5
Min	41.7	-4.3
Max	45.1	0.7
Count	80	80

How many samples are being tested?	4
How many contacts are on each board?	20

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Gas Tight	80	0	0	0	0	0

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 #: PS-07
Description: Power Supply
Manufacturer: Agilent
Model: AT-6031A
Serial #: 2721A00648
Accuracy: See Manual See Manual
… Last Cal: 08/21/2010, Next Cal: 08/21/2011

Equipment #: OV-5
Description: Forced Air Oven, 5 Cu. Ft., 120 V
Manufacturer: Sheldon Mfg.
Model: CE5F
Serial #: 02008008
Accuracy: +/- 5 deg. C
… Last Cal: 02/16/2011, Next Cal: 02/16/2012

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 AND CALIBRATION SCHEDULES Continued

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