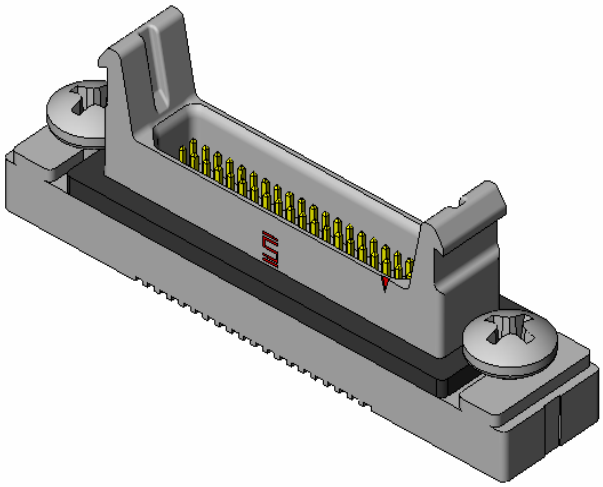
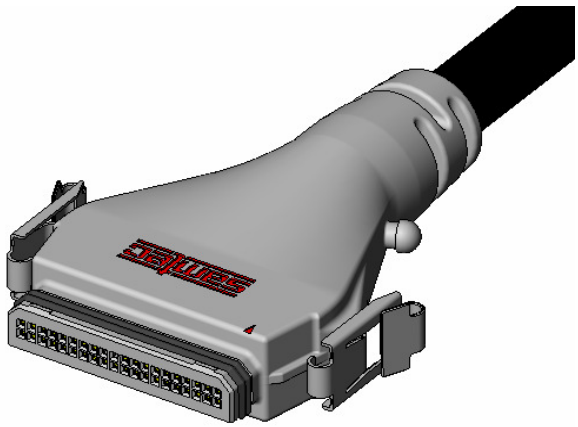
Project Number: Design Qualification Test Report	Tracking Code:127651_Report_Rev_2			
Requested by: Aaron McKim	Date: 1/20/2012	Product Rev: 0		
Part #: RC5-20-01-H-D-02.00-D/ RPB5-20-01-H-D	Lot #: NA	Tech: Aaron McKim	Eng: Eric Mings	
Part description: RC5/ RPB5			Qty to test: 42	
Test Start: 03/16/2011	Test Completed: 04/05/2011			





Design Qualification Test Report

RC5/RPB5

RC5-20-01-H-D-02.00-D/ RPB5-20-01-H-D

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.

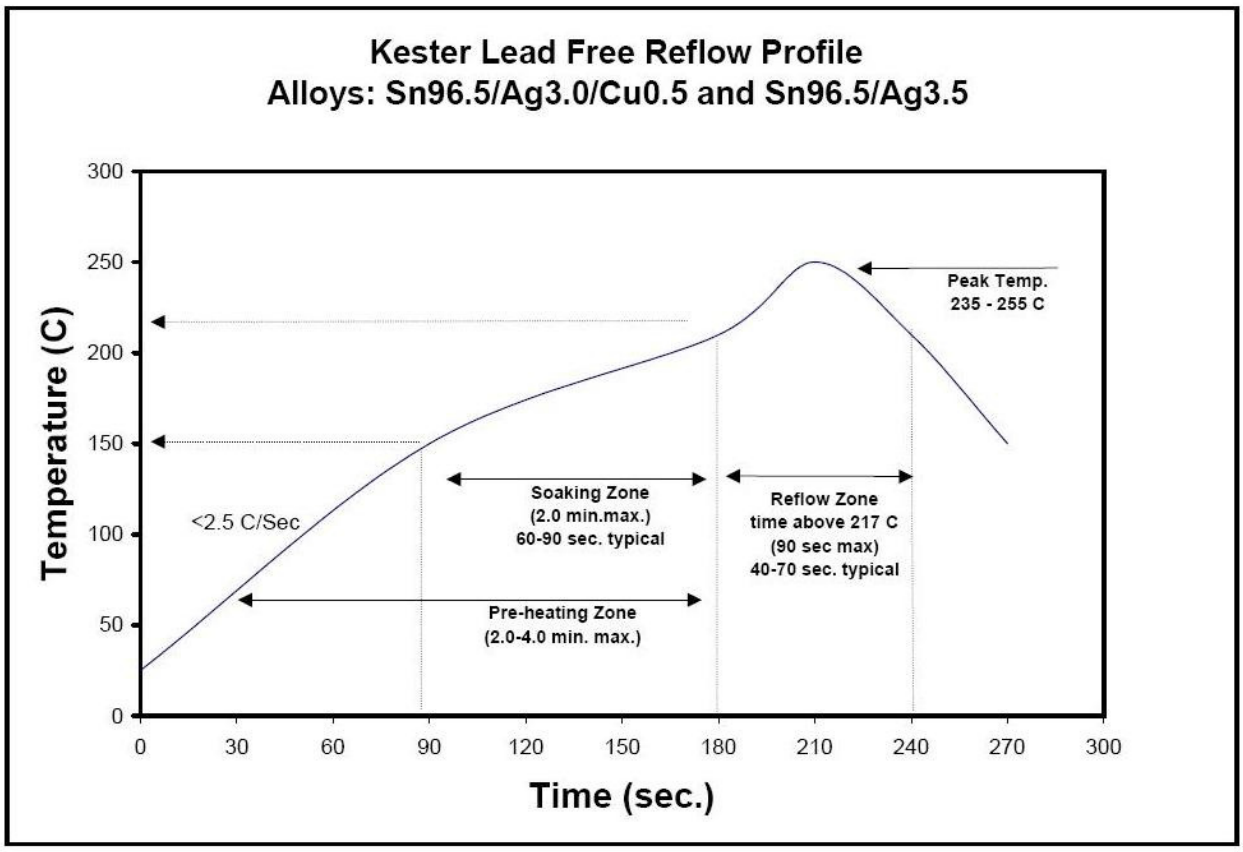
APPLICABLE DOCUMENTS

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.

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

Durability/Mating/Unmating/Gaps

TEST STEP	GROUP B1 8 Boards (largest position submitted)
01	Contact Gaps
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
13	Contact Gaps
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:

-55°C to +80°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 +80°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

Current Carrying Capacity

TEST STEP	GROUP B1 3 Mated Assemblies 2 CONTACT POWERED	GROUP B2 3 Mated Assemblies 4 CONTACTS POWERED	GROUP B3 3 Mated Assemblies 6 CONTACTS POWERED
01	CCC	CCC	CCC
TEST STEP	**GROUP B4 3 Mated Assemblies 8 CONTACTS POWERED**	**GROUP B5 3 Mated Assemblies ALL CONTACTS POWERED**	
01	CCC	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

IP67 Dust & Water

TEST STEP	GROUP A1 6 Mated Connectors	GROUP A2 6 Mated Connectors	GROUP B1 6 Connectors (Cable Dust Cover)	GROUP B2 6 Connectors (Cable Dust Cover)
01	Dust Test	Submersion Water Test	Dust Test	Submersion Water Test
02	Check for Dust	Check for Water	Check for Dust	Check for Water
TEST STEP	**GROUP C1 6 Connectors (Mating Part Dust Cover)**	**GROUP C2 6 Connectors (Mating Part Dust Cover)**	**GROUP D1 6 Connectors (Mating Part)**	**GROUP D2 6 Connectors (Mating Part)**
01	Dust Test	Submersion Water Test	Dust Test	Submersion Water Test
02	Check for Dust	Check for Water	Check for Dust	Check for Water

Dust/Water Testing = Per CEI/IEC 60529 Code IP67

FLOWCHARTS Continued

IP68 Dust & Water

TEST STEP	GROUP G1 3 Mated Connectors For Each Depth Tested (27 Total Mated Connectors)
01	2M for 30 Minutes
02	Check for Water
03	3M for 30 Minutes
04	Check for Water
05	4M for 30 Minutes
06	Check for Water
07	5M for 30 Minutes
08	Check for Water
09	6M for 30 Minutes
10	Check for Water
11	7M for 30 Minutes
12	Check for Water
13	8M for 30 Minutes
14	Check for Water
15	9M for 30 Minutes
16	Check for Water
17	10M for 30 Minutes
18	Check for Water

Dust/Water Testing = Per CEI/IEC 60529 Code IP68

For this test you have to use the pressure chamber

New parts should be used for each depth tested

Stop testing once parts fail

*** It is not necessary to perform the dust portion of this test if IP67 testing has been performed**

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.

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.

INSULATION RESISTANCE (IR):

To determine the resistance of insulation materials to leakage of current through or on the surface of these materials when a DC potential is applied.

1) PROCEDURE:
    a. Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
    b. Test Conditions:
        i. Between Adjacent Contacts or Signal-to-Ground
        ii. Electrification Time 2.0 minutes
        iii. Test Voltage (500 VDC) corresponds to calibration settings for measuring resistances.
2) MEASUREMENTS:
3) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 5000 megohms.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

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

1) PROCEDURE:
    a. Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.
    b. Test Conditions:
        i. Between Adjacent Contacts or Signal-to-Ground
        ii. Rate of Application 500 V/Sec
        iii. 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

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.

WATER TESTING:

1) Reference document: CEI/IEC 60529 Code IP67

DUST TESTING:

1) Reference document: CEI/IEC 60529 Code IP67

RESULTS

Temperature Rise, CCC at a 20% de-rating

- **CCC for a 30°C Temperature Rise ----------3.3 A per contact with 2x1 powered**
- **CCC for a 30°C Temperature Rise ----------2.6 A per contact with 2x2 powered**
- **CCC for a 30°C Temperature Rise ----------2.1 A per contact with 2x3 powered**
- **CCC for a 30°C Temperature Rise ----------1.9 A per contact with 2x4 powered**
- **CCC for a 30°C Temperature Rise ----------0.8 A per contact with all powered (cable bundle)**
- **CCC for a 30°C Temperature Rise ----------1.0 A per contact with all powered (mating area)**

Mating – Unmating Forces

- **Initial**
  - **Mating**
    - **Min ---------- 8.80 Lbs**
    - **Max----------11.04 Lbs**
  - **Unmating**
    - **Min ---------- 3.35 Lbs**
    - **Max---------- 5.17 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 8.93 Lbs**
    - **Max----------11.16 Lbs**
  - **Unmating**
    - **Min ---------- 4.02 Lbs**
    - **Max---------- 5.62 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 9.14 Lbs**
    - **Max----------11.60 Lbs**
  - **Unmating**
    - **Min ---------- 4.10 Lbs**
    - **Max---------- 5.82 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 9.47 Lbs**
    - **Max----------11.87 Lbs**
  - **Unmating**
    - **Min ---------- 4.27 Lbs**
    - **Max---------- 6.01 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 9.58 Lbs**
    - **Max----------12.24 Lbs**
  - **Unmating**
    - **Min ---------- 4.43 Lbs**
    - **Max---------- 6.15 Lbs**
- **After humidity**
  - **Mating**
    - **Min ---------- 6.37 Lbs**
    - **Max----------10.07 Lbs**
  - **Unmating**
    - **Min ---------- 2.18 Lbs**
    - **Max---------- 4.84 Lbs**

RESULTS Continued

LLCR Durability (192 pin LLCR test points)

- **Initial ---------- 59.2 mOhms Max**
- **After 100 Cycles**
  - **<= +5.0 mOhms ---------- 192 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **After thermal shock**
  - **<= +5.0 mOhms ---------- 192 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**
- **After humidity**
  - **<= +5.0 mOhms ---------- 192 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

RESULTS Continued

Insulation Resistance minimums, IR

Pin-Pin

- **Initial**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated ---------- 50000Meg Ω ---------- Pass**
  - **Unmated ---------- 100000Meg Ω ---------- Pass**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage ---------- 1000VAC**
  - **Test Voltage ---------- 750VAC**
  - **Working Voltage ---------- 250VAC**

Pin - pin

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

RESULTS Continued

IP67 Testing (Dust)

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**

IP68 Testing (Water)

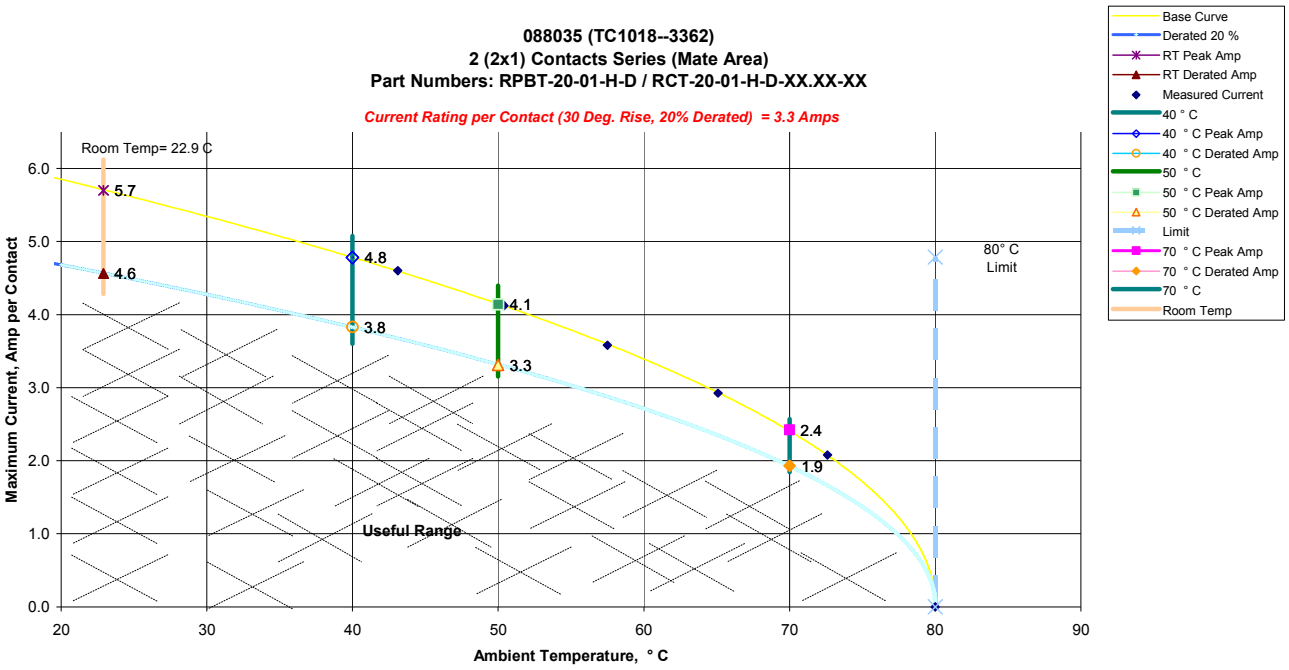
Group A1 (8M)

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

DATA SUMMARIES

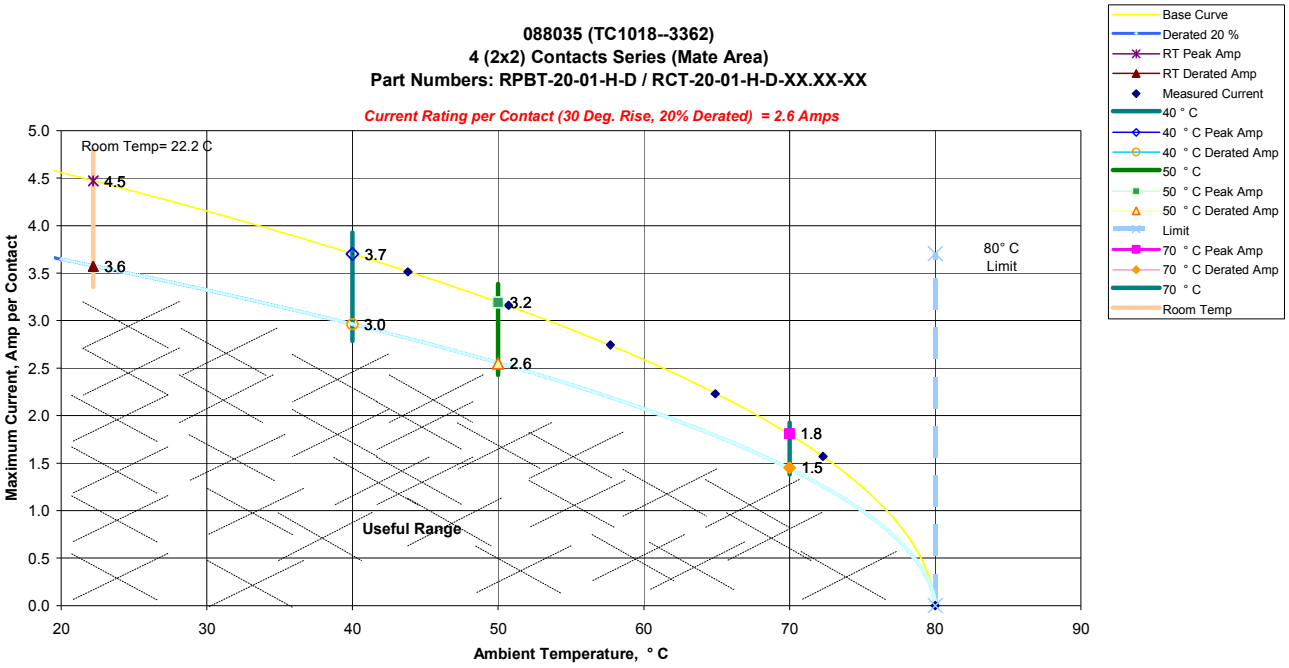
TEMPERATURE RISE (Current Carrying Capacity, CCC):

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:
    a. Linear configuration with 2 adjacent conductors/contacts powered

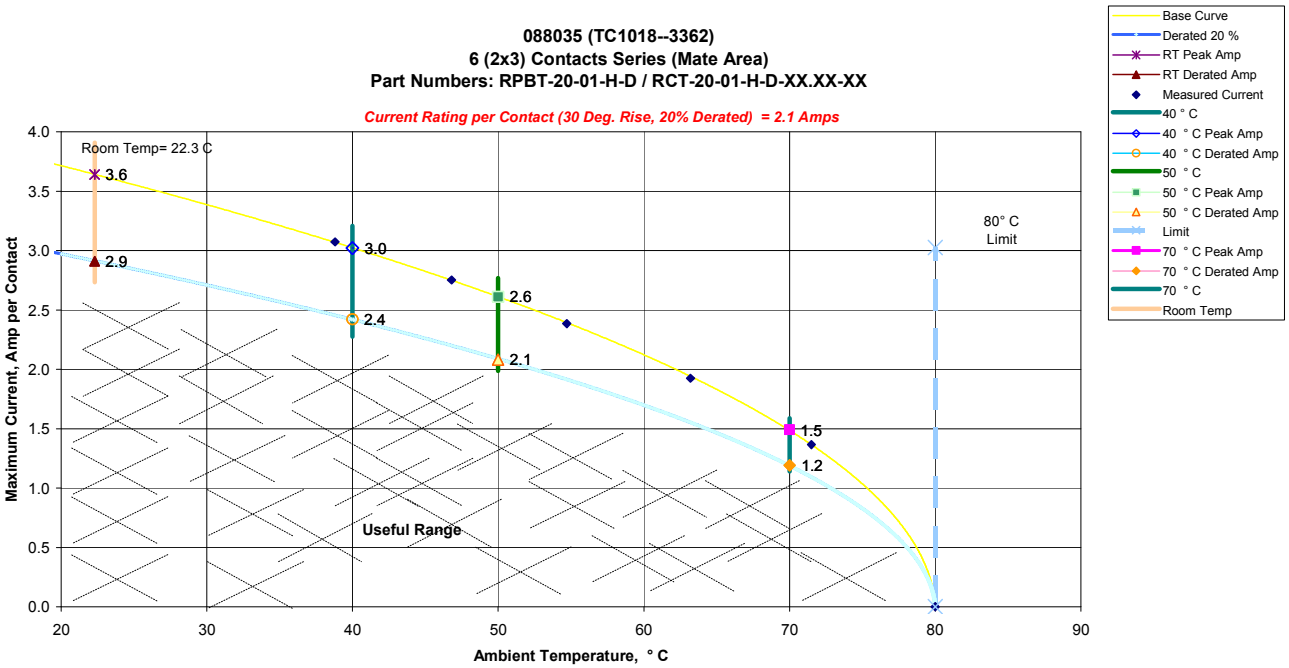


DATA SUMMARIES Continued

b. Linear configuration with 4 adjacent conductors/contacts powered

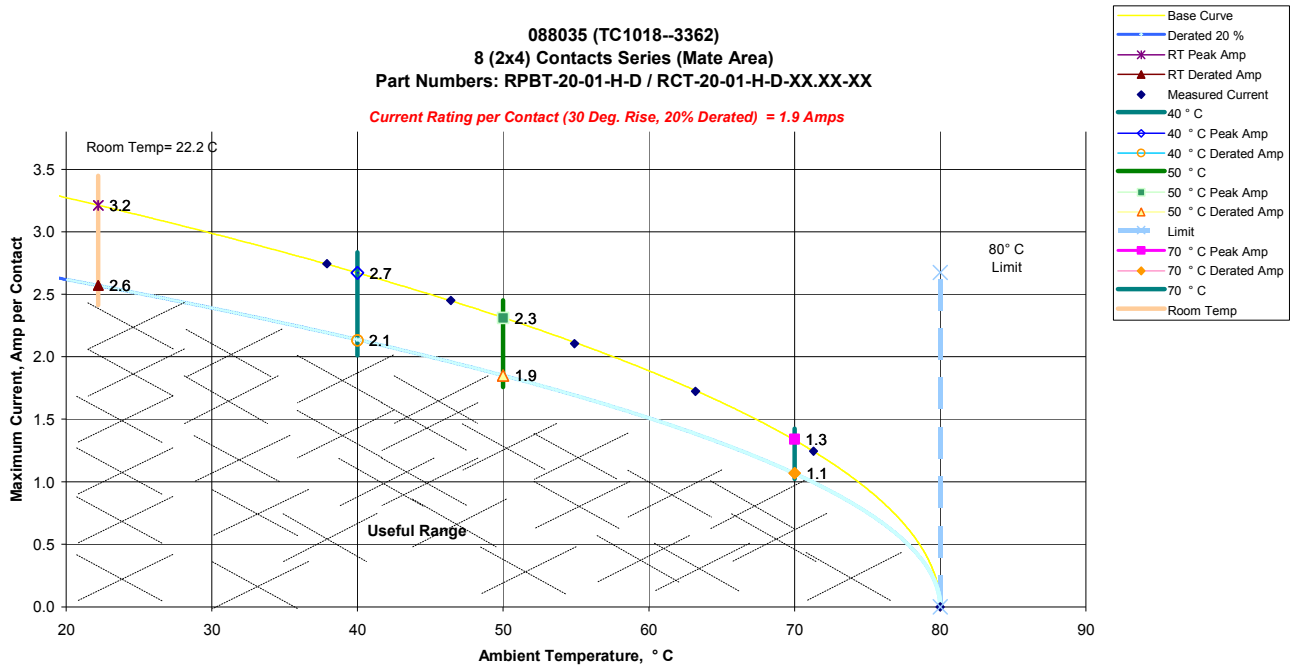


c. Linear configuration with 6 adjacent conductors/contacts powered

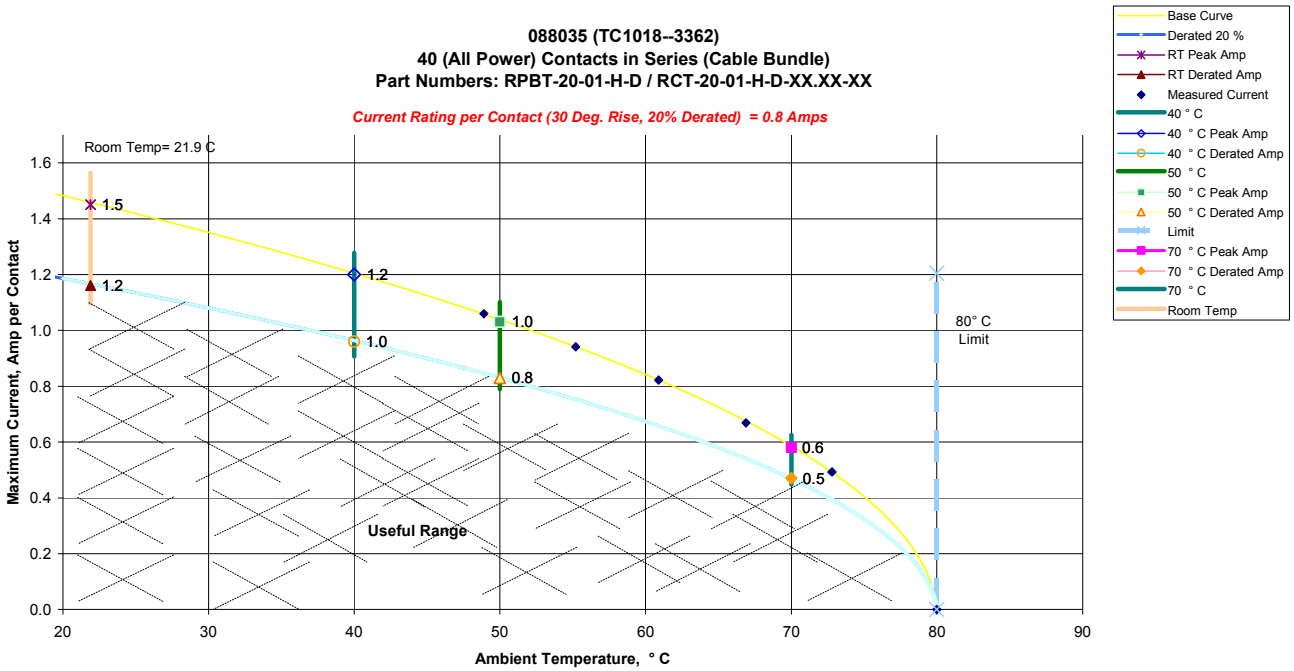


DATA SUMMARIES Continued

d. Linear configuration with 8 adjacent conductors/contacts powered

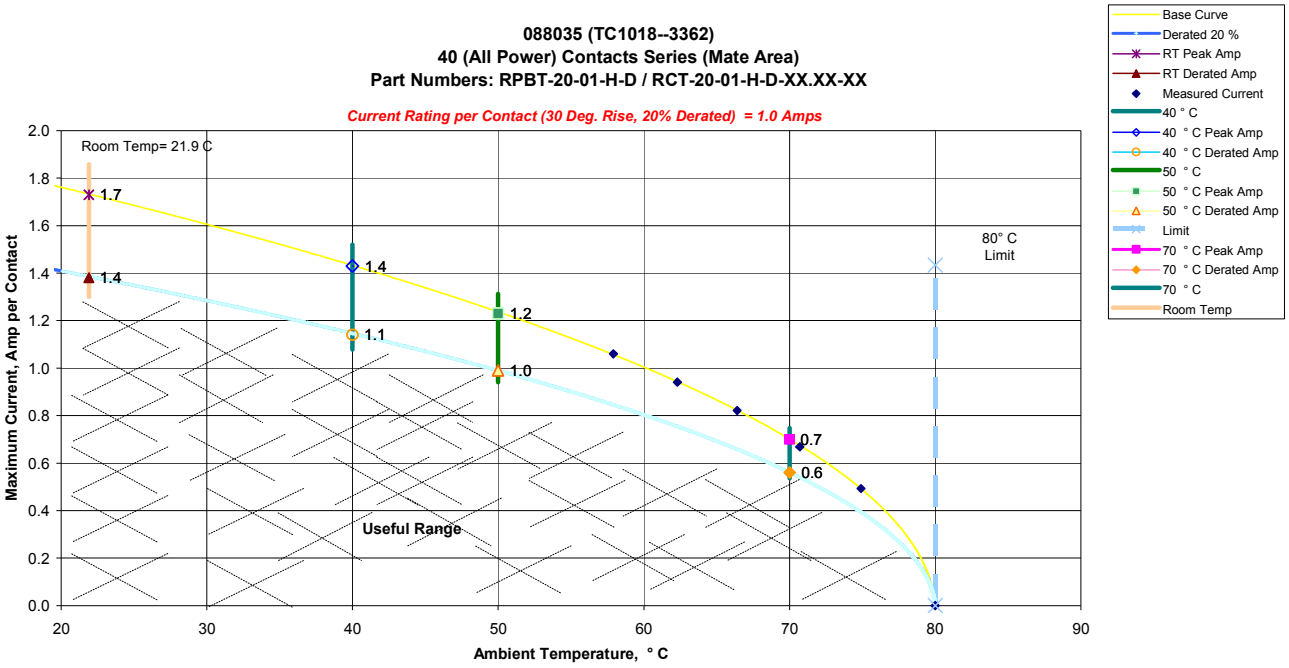


e. Linear configuration with All adjacent conductors/contacts powered (cable bundle)



DATA SUMMARIES Continued

f. Linear configuration with All adjacent conductors/contacts powered



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	39.14	8.80	14.90	3.35	39.72	8.93	17.88	4.02
Maximum	49.11	11.04	23.00	5.17	49.64	11.16	25.00	5.62
Average	42.70	**9.60**	19.12	**4.30**	44.51	**10.01**	21.49	**4.83**
St Dev	3.76	0.85	2.78	0.62	3.66	0.82	2.91	0.66
Count	8	8	8	8	8	8	8	8

	50 Cycles				75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	40.65	9.14	18.24	4.10	42.12	9.47	18.99	4.27
Maximum	51.60	11.60	25.89	5.82	52.80	11.87	26.73	6.01
Average	46.24	**10.40**	22.48	**5.05**	47.48	**10.68**	23.29	**5.24**
St Dev	3.81	0.86	2.82	0.63	3.72	0.84	2.77	0.62
Count	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)
Minimum	42.61	9.58	19.70	4.43	28.33	6.37	9.70	2.18
Maximum	54.44	12.24	27.36	6.15	44.79	10.07	21.53	4.84
Average	48.93	**11.00**	24.26	**5.45**	34.14	**7.68**	15.67	**3.52**
St Dev	3.86	0.87	2.87	0.65	5.66	1.27	4.33	0.97
Count	8	8	8	8	8	8	8	8

DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**RC5/RPB5**	**RC5**	**RPB5**
Initial	100000	100000	100000
Thermal	100000	100000	100000
Humidity	50000	100000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**RC5/RPB5**
Break Down Voltage	1000
Test Voltage	750
Working Voltage	250

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

DATA SUMMARIES Continued

LLCR Durabiltiy:

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

	LLCR Measurement Summaries by Pin Type			
Date	12/21/2011	12/22/2011	12/27/2011	1/13/2012
Room Temp (Deg C)	23	22	22	22
Rel Humidity (%)	33	33	33	36
Technician	Tony Wagoner	Tony Wagoner	Tony Wagoner	Tony Wagoner
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Therm Shock**	**Delta Humidity**
	Pin Type 1: Signal			
Average	54.91	0.34	0.39	0.50
St. Dev.	1.17	0.26	0.35	0.56
Min	52.11	0.00	0.00	0.00
Max	59.22	1.17	3.56	4.78
Summary Count	192	192	192	192
Total Count	192	192	192	192

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

DATA SUMMARIES Continued

IP67 Testing (Water & Dust)

Group A1

Sample #	Visual Inspection
1	Pass
2	Pass
3	Pass
4	Pass
5	Pass
6	Pass

Group A2

Sample #	Visual Inspection
1	Pass
2	Pass
3	Pass
4	Pass
5	Pass
6	Pass

Group B1

Sample #	Visual Inspection
1	Pass
2	Pass
3	Pass
4	Pass
5	Pass
6	Pass

Group B2

Sample #	Visual Inspection
1	Pass
2	Pass
3	Pass
4	Pass
5	Pass
6	Pass

DATA SUMMARIES Continued

Group C1

Sample #	Visual Inspection
1	Pass
2	Pass
3	Pass
4	Pass
5	Pass
6	Pass

Group C2

Sample #	Visual Inspection
1	Pass
2	Pass
3	Pass
4	Pass
5	Pass
6	Pass

Group D1

Sample #	Visual Inspection
1	Pass
2	Pass
3	Pass
4	Pass
5	Pass
6	Pass

Group D2

Sample #	Visual Inspection
1	Pass
2	Pass
3	Pass
4	Pass
5	Pass
6	Pass

DATA

Mating&Unmating force

	Initial		25 Cycles		50 Cycles		75 Cycles		100 Cycles		After Humidity	
Sample#	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	11.04	4.72	11.16	4.98	11.60	5.12	11.72	5.25	11.88	5.41	10.07	4.84
2	9.56	3.73	10.24	4.21	10.58	4.45	11.01	4.73	11.41	4.94	9.21	4.68
3	9.18	4.59	9.86	5.38	10.22	5.54	10.43	5.70	10.79	5.90	7.16	4.04
4	9.12	3.74	8.93	4.02	9.14	4.10	9.47	4.27	9.58	4.43	6.97	2.81
5	10.78	5.17	11.14	5.62	11.56	5.82	11.87	6.01	12.24	6.15	6.96	2.18
6	9.39	4.70	10.04	5.49	10.42	5.58	10.72	5.72	11.13	5.90	7.22	3.78
7	8.93	4.38	9.44	4.89	9.96	5.35	10.28	5.58	10.79	6.05	6.37	2.60
8	8.80	3.35	9.25	4.07	9.69	4.47	9.90	4.63	10.18	4.85	7.45	3.26

INSULATION RESISTANCE (IR):

Initial Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	A Unmated	B
	X	X	X
Sample#	RC5/RPB5	RC5	RPB5
127651-013	100000	100000	100000
127651-014	100000	100000	100000

Thermal Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	A Unmated	B
	X	X	X
Sample#	RC5/RPB5	RC5	RPB5
127651-013	100000	100000	100000
127651-014	100000	100000	100000

Humidity Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	A Unmated	B
	X	X	X
Sample#	RC5/RPB5	RC5	RPB5
127651-013	50000	100000	100000
127651-014	100000	100000	100000

DATA Continued

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial Breakdown Voltage
Test Voltage *Until Breakdown Occurs*

	Pin to Pin		
	Mated	A Unmated B	
	X		
Sample#	RC5/RPB5	RC5	RPB5
127651-009	1180	1200	1000
127651-010	1160	1200	1000

Initial DWV	
Test Voltage=	750

	Pin to Pin		
	Mated	A Unmated B	
Sample#	RC5/RPB5	RC5	RPB5
127651-013	750	750	750
127651-014	750	750	750

Thermal Test Voltage	
Test Voltage=	750

	Pin to Pin		
	Mated	A Unmated B	
Sample#	RC5/RPB5	RC5	RPB5
127651-013	750	750	750
127651-014	750	750	750

Humidity Test Voltage	
Test Voltage=	750

	Pin to Pin		
	Mated	A Unmated B	
Sample#	RC5/RPB5	RC5	RPB5
127651-013	750	750	750
127651-014	750	750	750

DATA Continued

LLCR Measurements per Sample						
		mOhm values	Actual	Delta	Delta	Delta
Samp#	Pin Type	Position	Initial	100 Cycles	Therm Shck	Humidity
001	Signal	P01	56.08	0.64	0.59	0.25
001	Signal	P02	54.07	0.67	0.58	0.15
001	Signal	P03	54.15	0.46	0.56	0.3
001	Signal	P04	54.63	0.5	0.43	0.18
001	Signal	P05	55.19	0.33	0.45	0.05
001	Signal	P06	55.74	0.38	0.48	0.06
001	Signal	P07	54.89	0.2	0.22	0.1
001	Signal	P08	55.88	0.09	0.54	0.3
001	Signal	P09	57.79	0.82	0.92	0.41
001	Signal	P10	56.87	0.61	0.54	0.29
001	Signal	P11	56.57	0.41	0.43	0.41
001	Signal	P12	55.54	0.6	0.58	0.31
001	Signal	P13	54.96	0.48	0.54	0.27
001	Signal	P14	55	0.51	0.45	0.23
001	Signal	P15	52.61	0.51	0.43	0.04
001	Signal	P16	56.07	0.64	0.3	0.29
001	Signal	P17	54.85	0.59	0.58	0.3
001	Signal	P18	55.22	0.55	0.42	0.16
001	Signal	P19	55.62	0.36	0.27	0.13
001	Signal	P20	52.73	0.43	0.44	0.21
001	Signal	P21	53.66	0.56	0.44	0.15
001	Signal	P22	54.9	0.59	0.71	0.41
001	Signal	P23	53.84	0.65	0.42	0.32
001	Signal	P24	54.91	0.68	0.63	0.31
002	Signal	P01	54.91	0.28	0.33	0.04
002	Signal	P02	53.17	0.33	0.12	0.06
002	Signal	P03	54.72	0.52	1.04	0.39
002	Signal	P04	56.11	0.56	0.44	0.22
002	Signal	P05	56.19	0.65	0.04	0.58
002	Signal	P06	55.77	0.49	0.32	0.06
002	Signal	P07	54.27	0.51	0.24	0.06
002	Signal	P08	54.29	0.27	0.09	0.23
002	Signal	P09	55.5	0.41	0.41	0.23
002	Signal	P10	56.4	0.74	0.79	0.64
002	Signal	P11	55.18	0.34	0.38	0.24
002	Signal	P12	58.76	0.38	0.33	0.11
002	Signal	P13	55.82	0.04	0.43	0.34
002	Signal	P14	54.48	0.31	0.05	0.11
002	Signal	P15	53.99	0.81	0.88	1.13
002	Signal	P16	54.43	0.4	0.09	0.14
002	Signal	P17	55.66	0.79	0.8	0.66
002	Signal	P18	54.79	0.25	0.02	0.14
002	Signal	P19	55.43	0.47	0.36	0.25
002	Signal	P20	53.77	0.36	0	0.21

002	Signal	P21	56.15	0.62	0.12	0.2
002	Signal	P22	55.24	0.42	0.06	0.24
002	Signal	P23	54.14	0.35	0.29	0.11
002	Signal	P24	54.28	0.04	0.15	0.29
003	Signal	P01	55.19	0.32	0.17	0.06
003	Signal	P02	54.21	0.32	0.64	0.06
003	Signal	P03	55.15	0.4	0.5	0.25
003	Signal	P04	55.87	0.61	0.68	0.43
003	Signal	P05	56.69	0.49	0.4	0.46
003	Signal	P06	56.28	0.54	0.4	0.39
003	Signal	P07	54.27	0.28	0.08	0.01
003	Signal	P08	54.81	0.1	0.05	0.09
003	Signal	P09	56.52	0.17	0.03	0.17
003	Signal	P10	57.98	1.11	0.76	1.16
003	Signal	P11	56.27	0.19	0.28	0.61
003	Signal	P12	56.09	0.35	0.27	0.16
003	Signal	P13	56	0.41	0.39	0.37
003	Signal	P14	55.6	0.32	0.17	0.26
003	Signal	P15	55.9	0.2	0.4	0.08
003	Signal	P16	55.6	0.25	0.32	0
003	Signal	P17	54.81	0.32	0.46	0.16
003	Signal	P18	56.27	0.17	0.19	0.02
003	Signal	P19	55.08	0.2	0.24	0.12
003	Signal	P20	54.38	0.07	0.13	0.22
003	Signal	P21	55.64	0.06	0.82	0.3
003	Signal	P22	56.85	0.12	0.01	0.58
003	Signal	P23	53.37	0.02	0.24	0.08
003	Signal	P24	55.33	0.18	0.12	0.34
004	Signal	P01	55.7	0.2	0.09	0.6
004	Signal	P02	54.13	0.06	0.08	0.46
004	Signal	P03	54.71	0.04	0.5	0.69
004	Signal	P04	55.07	0.16	0.53	0.15
004	Signal	P05	56.16	0.55	0.25	0.99
004	Signal	P06	55.67	0.21	0.26	0.07
004	Signal	P07	54.52	0.02	0.14	0.28
004	Signal	P08	55.15	0.17	0.58	1.01
004	Signal	P09	54.55	0.07	0.03	0.08
004	Signal	P10	59.22	0.04	0.67	1.49
004	Signal	P11	54.65	0.1	0.24	0.13
004	Signal	P12	54.3	0.06	0.03	0.06
004	Signal	P13	53.93	0.07	0.22	0.01
004	Signal	P14	55.59	0.07	0.75	0.08
004	Signal	P15	55.04	0.34	0.16	0.01
004	Signal	P16	54.98	0.09	0.05	0.16
004	Signal	P17	53.96	0.1	0.08	0.02
004	Signal	P18	54.54	0.01	0.21	0.19
004	Signal	P19	56.04	0.29	0.3	0.06
004	Signal	P20	53.98	0.17	0.65	0.19
004	Signal	P21	54.63	0.17	0.23	0.11

004	Signal	P22	57.4	0.29	0.83	0.08
004	Signal	P23	54.44	0.05	0.15	0.02
004	Signal	P24	54.97	0.25	0.11	0.09
005	Signal	P01	55.62	0.6	0.4	0.17
005	Signal	P02	54.29	0.99	1.09	0.68
005	Signal	P03	54.62	0.53	0.55	0.34
005	Signal	P04	55.74	0.99	0.58	0.59
005	Signal	P05	57.15	0.7	0.51	0.24
005	Signal	P06	56.14	0.99	0.63	0.24
005	Signal	P07	54.12	0.75	0.07	0.3
005	Signal	P08	54.73	0.73	0.61	0.48
005	Signal	P09	57.41	0.71	0.76	1.01
005	Signal	P10	56.33	0.97	0.3	0.31
005	Signal	P11	55.88	1.17	0.85	0.79
005	Signal	P12	57.44	0.87	0.21	1.29
005	Signal	P13	56.21	0.41	0.15	0.34
005	Signal	P14	56.85	1.05	0.38	1.78
005	Signal	P15	53.12	0.57	0	0.02
005	Signal	P16	54.67	0.65	0.06	0.11
005	Signal	P17	56.86	0.47	0.15	0.54
005	Signal	P18	55.35	0.64	0.25	0.4
005	Signal	P19	54.92	0.72	0.24	0.22
005	Signal	P20	54.99	0	0.18	0.63
005	Signal	P21	54.17	0.69	0.34	0.07
005	Signal	P22	54.94	0.43	0.68	0.01
005	Signal	P23	53.69	0.67	0.39	0.36
005	Signal	P24	53.6	0.22	0.18	0.62
006	Signal	P01	54.48	0.4	0.08	0.69
006	Signal	P02	53.39	0.28	0.19	0.45
006	Signal	P03	55.2	0.14	0.75	0.02
006	Signal	P04	54.78	0.28	0.17	0.78
006	Signal	P05	55.79	0.04	0.87	1.41
006	Signal	P06	54.98	0	0.25	0.69
006	Signal	P07	53.73	0.24	0.36	1.14
006	Signal	P08	53.42	0.31	0.15	0.08
006	Signal	P09	56.47	0.21	0.97	0.44
006	Signal	P10	55.41	0.35	0.04	0.2
006	Signal	P11	54.91	0.05	0.21	0.39
006	Signal	P12	54.54	0.13	0.33	0.12
006	Signal	P13	54.12	0.11	0.77	0.52
006	Signal	P14	54.55	0.27	1.07	0.98
006	Signal	P15	53.39	0.26	0.73	0.86
006	Signal	P16	53.83	0.07	0.71	0.77
006	Signal	P17	53.61	0.18	0.69	0.54
006	Signal	P18	55.34	0.61	0.86	1.3
006	Signal	P19	54.08	0.09	0.25	0.99
006	Signal	P20	52.7	0.2	0.73	0.9
006	Signal	P21	53.68	0.04	0.2	0.65
006	Signal	P22	54.7	0.15	0.53	0.71

006	Signal	P23	53.17	0.11	0.16	0.73
006	Signal	P24	53.42	0.16	0.18	0.7
007	Signal	P01	54.14	0.23	0.44	0.6
007	Signal	P02	52.45	0.1	0.15	0.18
007	Signal	P03	54.44	0.3	0.92	0.4
007	Signal	P04	54.33	0.05	0.61	1.58
007	Signal	P05	55.35	0.07	0.07	1.06
007	Signal	P06	55.49	1.14	0.21	0.41
007	Signal	P07	53.06	0.46	0.28	2.83
007	Signal	P08	53.62	0.06	0.21	0.27
007	Signal	P09	55.06	0.02	0.99	0.85
007	Signal	P10	55.69	0.18	3.56	0.07
007	Signal	P11	54.57	0.39	0.28	4.78
007	Signal	P12	56.33	0.57	0.24	0.87
007	Signal	P13	54.8	0.18	0.68	2.25
007	Signal	P14	54.32	0.28	0.2	1.77
007	Signal	P15	52.11	0.05	0.5	2.23
007	Signal	P16	53.59	0	0.2	0.79
007	Signal	P17	54.09	0.02	0.07	0.23
007	Signal	P18	55.71	0.1	0.37	1.48
007	Signal	P19	54.14	0.3	0.16	1.88
007	Signal	P20	53.47	0.21	0.24	1.53
007	Signal	P21	53.62	0.11	0.56	0.8
007	Signal	P22	54.26	0.16	0.14	0.47
007	Signal	P23	53.47	0.32	0.36	1.12
007	Signal	P24	53.7	0.03	0.02	0.19
008	Signal	P01	54.16	0.24	0.03	0.35
008	Signal	P02	54.02	0.06	0.31	0.69
008	Signal	P03	54.07	0.07	0.17	0.02
008	Signal	P04	54.63	0.63	0.58	1.21
008	Signal	P05	54.93	0.19	0.35	0.67
008	Signal	P06	55.28	0.1	0.26	0.55
008	Signal	P07	53.48	0.36	0.3	0.91
008	Signal	P08	54.37	0.09	0.3	0.72
008	Signal	P09	54.15	0.16	0.2	0.6
008	Signal	P10	55.34	0.08	0.31	0.57
008	Signal	P11	56	0.23	0.24	0.44
008	Signal	P12	55.14	0.31	0.93	1.28
008	Signal	P13	54.39	0.35	0.6	0.8
008	Signal	P14	53.87	0.27	0.92	1
008	Signal	P15	52.96	0.18	0.45	0.78
008	Signal	P16	54.59	0.17	0.65	0.58
008	Signal	P17	56.41	0.72	0.03	0.26
008	Signal	P18	55.41	0.06	0.31	0.41
008	Signal	P19	53.82	0.02	0.17	0.42
008	Signal	P20	53.57	0.03	0.01	0.17
008	Signal	P21	54.54	0.37	0.5	0.84
008	Signal	P22	54.29	0.32	0.31	0.56
008	Signal	P23	52.69	0.15	0.18	0.51

008	Signal	P24	53.18	0.25	0.23	0.51

EQUIPMENT AND CALIBRATION SCHEDULES

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 #: WATER-02
Description: IP-68 Water Depth 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

Equipment #: TCT-01
Description: Normal force analyzer
Manufacturer: Mecmesin Multitester
Model: Mecmesin Multitester 2.5-i
Serial #: 04-1041-04
Accuracy: Last Cal: 05/21/2011, Next Cal: 05/22/2012

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: 08/21/2011, Next Cal: 08/21/2012

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 11/30/2011, Next Cal: 11/30/2012

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 #: THC-01
Description: Humidity transmitter
Manufacturer: Thermtron
Model: HMM30C
Serial #: D0240037
Accuracy: Last Cal: 3/3/2011, Next Cal: 3/3/2012