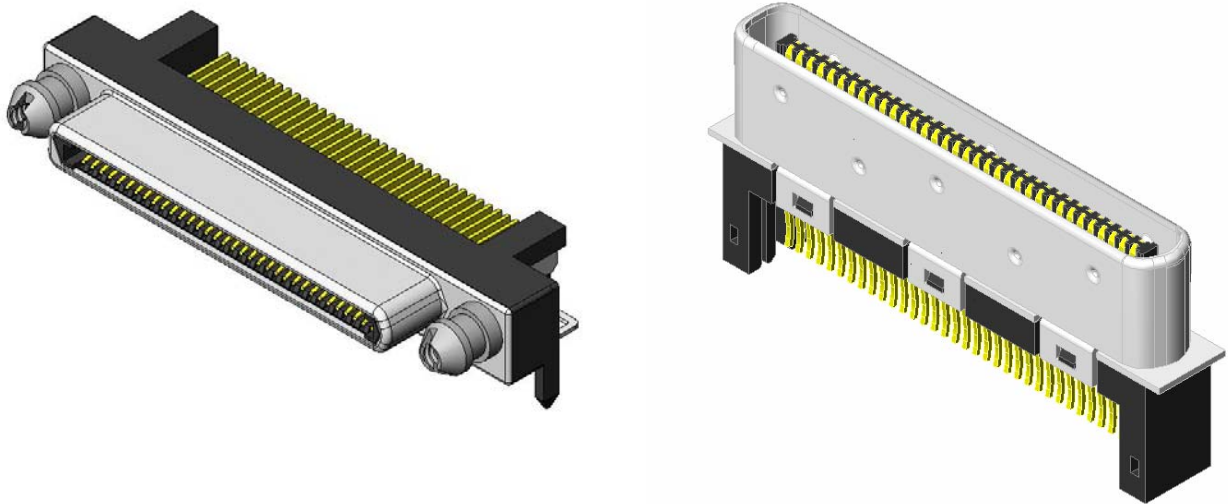




Project Number:		Tracking Code: TC0619--1035	
Requested by: John Reid		Date: 5/10/2006	Product Rev: 05/09/2006
Part #: VHDCR-68-01-M-RA / VHDCP-68-01-M-EM		Lot #: 05/09/2006	Tech: Troy Cook/Tony Wagoner Eng: Dave Scopelliti
Part description: VHDCR / VHDCP			Qty to test: 1
Test Start: 08/10/2006		Test Completed: 9/11/2006	



VHDCR-68-01-M-RA / VHDCP-68-01-M-EM

DVT REPORT

CERTIFICATION

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

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SCOPE

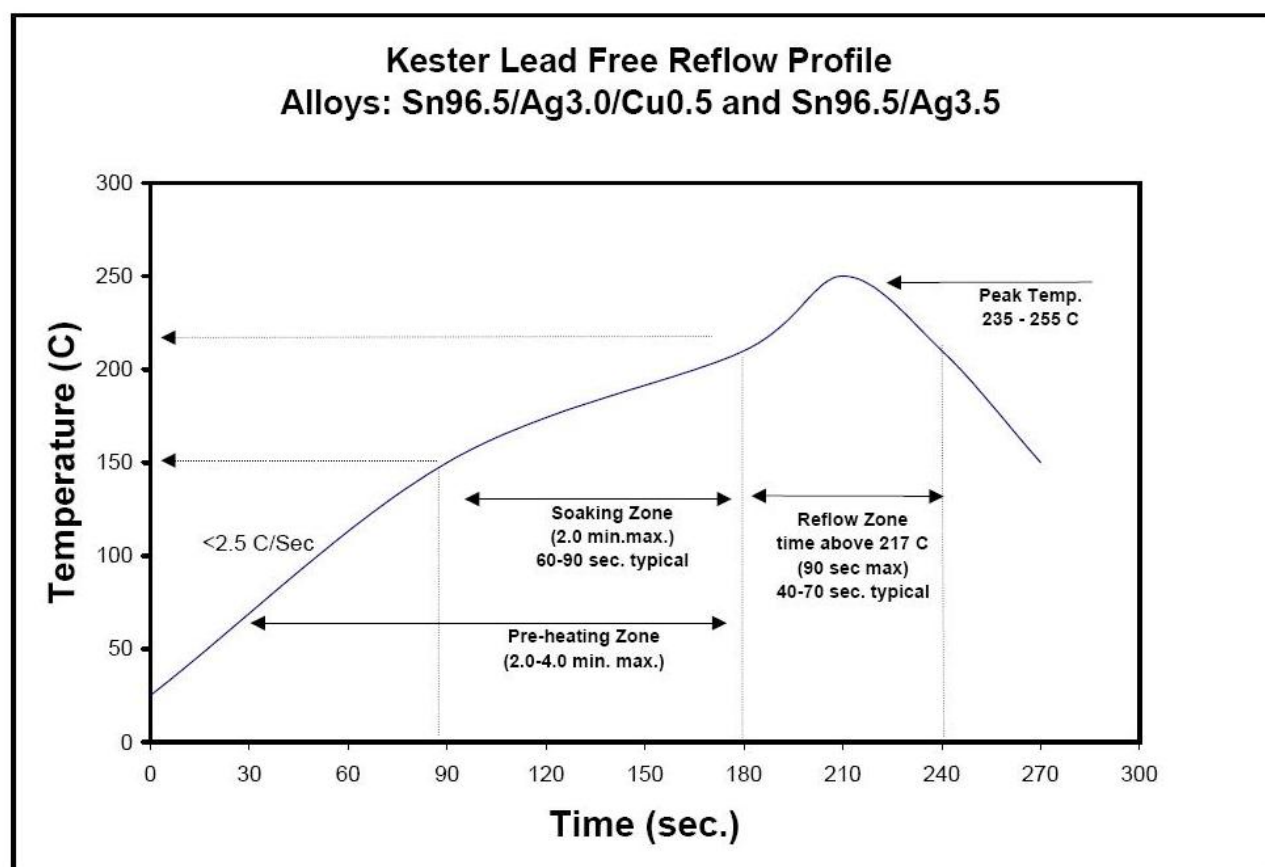
To perform the DVT testing plus shear force testing on connector system.

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) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
- 6) Any additional preparation will be noted in the individual test sequences.
- 7) Solder Information: Lead Free solder paste used.
- 8) Re-Flow Time/Temp: See accompanying profile.
- 9) Internal Test PCBs used: PCB-100259-TST-XX

OVEN PROFILE (Soldering Parts to Test Boards)

FLOWCHARTS

Current Carrying Capacity (-RA to -EM)

TEST STEP	GROUP A2 1 board min 32 Contacts	GROUP A3 1 board min 64 Contacts
01	CCC	CCC

Tabulate current at RT, 45° C, 55° C and 75° C

after derating 20% and based on 85° C

CCC, Temp rise = EIA-364-70

Mating/Unmating/Durability (-RA to -EM)

TEST STEP	GROUP A 10 Connectors
01	LLCR-1
02	Mating/Unmating
03	Data Review
04	100 Cycles
05	Mating/Unmating
06	LLCR-2
07	Temp Life
08	LLCR-3

Temperature Life = +85° C for 240 Hours

LLCR = EIA-364-23, LLCR

use Keithley 580 in dry circuit mode, 10 mA Max

FLOWCHARTS Continued**IR / DWV (-RA and -EM)**

TEST STEP	GROUP A 3-RA Connectors Unmated Ambient	GROUP B1 3-RA Connectors Unmated Ambient	GROUP B2 3-RA Connectors Unmated Humidity
01	IR	DWV/Working Voltage	Humidity
02	Data Review		DWV/Working Voltage
03	Humidity		
04	IR		

TEST STEP	GROUP A 3-EM Connectors Unmated Ambient	GROUP B1 3-EM Connectors Unmated Ambient	GROUP B2 3-EM Connectors Unmated Humidity
01	IR	DWV/Working Voltage	Humidity
02	Data Review		DWV/Working Voltage
03	Humidity		
04	IR		

Humidity = 96 hours at +40° C @ 90%RH to 95% RH

IR = EIA-364-21. Greater than 500 Meg Ohms

DWV = EIA-364-20 at 250 VAC. Apply 60 seconds.

Shear Force of RA to PCB

TEST STEP	GROUP A1
01	Shear Force

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL:

- 1) EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors*.
- 2) Test Condition ? at 85° C.
- 3) Test Time Condition ? for 240 hours.
- 4) Connectors are sometimes mated and all samples are pre-conditioned at ambient.

HUMIDITY:

- 1) Reference document: EIA-364-31, *Humidity Test Procedure for Electrical Connectors*.
- 2) Test Condition ?, 96 Hours.
- 3) Method III, + 40° C, 90% to 95% Relative Humidity excluding sub-cycles 7a and 7b.
- 4) Connectors are sometimes mated and all samples are pre-conditioned at ambient.

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. 45° C
 - c. 55° C
 - d. 75° 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.

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
 - 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 500 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
 - 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).

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. $\leq +5.0$ 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

SUPPLEMENTAL TESTS**SHEAR TESTING:**

- 1) Reference document: None Available.

RESULTS

Temperature Rise, CCC at a 20% de-rating) (-RA mated to -EM)

- CCC for a 30°C Temperature Rise-----0.7 A per contact with 34 contacts powered
- CCC for a 30°C Temperature Rise-----0.5 A per contact with 68 contacts powered

Insulation Resistance minimums, IR (Unmated condition, both -RA and -EM)

- Initial
 - -EM Version -----100,000 Meg Ω ----- Pass
 - -RA Version ----- 15,000 Meg Ω
- Humidity
 - -EM Version - -----100,000 Meg Ω
 - -RA Version -----100,000 Meg Ω

Dielectric Withstanding Voltage minimums, DWV (Unmated condition, both -RA and -EM)

- Initial
 - Breakdown
 - -EM Version -----980 VAC
 - -RA Version -----1,140 VAC
 - DWV
 - -EM Version -----735 VAC
 - -RA Version -----855 VAC
 - Working voltage
 - -EM Version -----245 VAC
 - -RA Version -----285 VAC
- Humidity
 - Breakdown
 - -EM Version -----920 VAC
 - -RA Version -----1,000 VAC
 - DWV
 - -EM Version -----690 VAC
 - -RA Version -----750 VAC
 - Working voltage
 - -EM Version -----230 VAC
 - -RA Version -----250 VAC

LLCR Durability (200 LLCR test points) (-RA mated to -EM)

- Initial----- 30.5 mOhms Max
- Durability, 100 Cycles
 - <= +5.0 mOhms -----250 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
 - o <= +5.0 mOhms -----250 Points ----- Stable
 - o +5.1 to +10.0 mOhms -----0 Points ----- Minor
 - o +10.1 to +15.0 mOhms -----0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms -----0 Points ----- Marginal
 - o +50.1 to +2000 mOhms -----0 Points ----- Unstable
 - o >+2000 mOhms -----0 Points ----- Open Failure

Mating/Unmating Forces (-RA mated to -EM)

- Initial
 - o Mating Force (Min.) -----4.2 Lbs.
 - o Mating Force (Max.) -----5.7 Lbs.
 - o Unmating Force (Min.) -----3.8 Lbs.
 - o Unmating Force (Max.) -----5.3 Lbs.
- After 100 Cycles
 - o Mating Force (Min.) -----6.6 Lbs.
 - o Mating Force (Max.) -----8.7 Lbs.
 - o Unmating Force (Min.) -----5.4 Lbs.
 - o Unmating Force (Max.) -----7.3 Lbs.

SUPPLEMENTAL TESTING

Shear Force Testing (-RA and -EM)

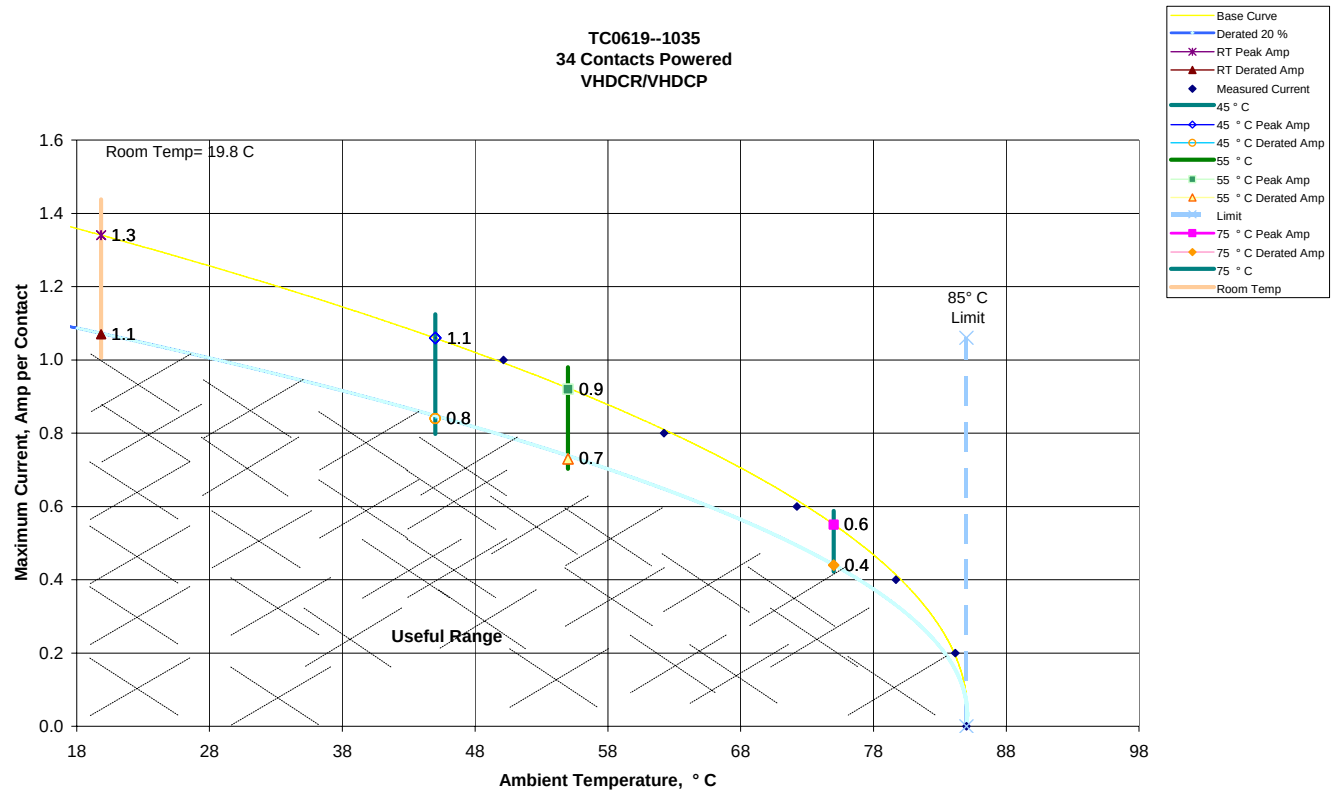
- -RA option Shear Force (Min.):-----69.80 Lbs.
- -EM option Shear Force (Min.): -----81.78 Lbs.

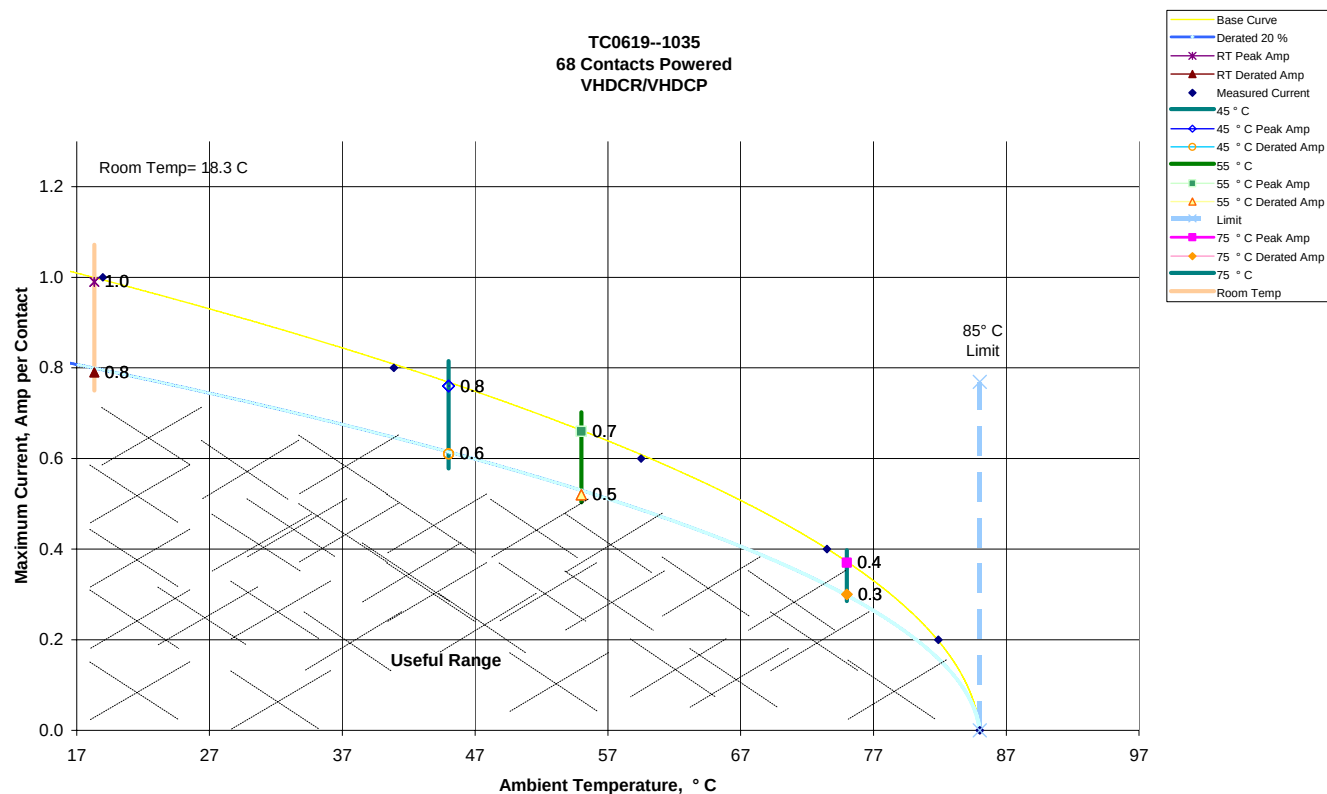
DATA SUMMARIES

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 34 contacts powered



DATA SUMMARIES Continued**b. Linear configuration with 68 contacts powered****INSULATION RESISTANCE (IR):****-EM Version**

	Initial, Meg Ohms		Humidity, Meg Ohms	
	Side 1	Side 2	Side 1	Side 2
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average	100000	100000	100000	100000
Min	100000	100000	100000	100000
Max	100000	100000	100000	100000

-RA Version

	Initial, Meg Ohms		Humidity, Meg Ohms	
	Side 1	Side 2	Side 1	Side 2
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average	71667	100000	100000	100000
Min	15000	100000	100000	100000
Max	100000	100000	100000	100000

DATA SUMMARIES Continued**DIELECTRIC WITHSTANDING VOLTAGE (DWV):****-EM Version**

	Humidity, VAC Unmated			Humidity, VAC Unmated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	1103	828	276	987	740	247
Min	980	735	245	920	690	230
Max	1200	900	300	1200	900	300

-RA Version

	Humidity, VAC Unmated			Humidity, VAC Unmated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	1190	893	298	1070	803	268
Min	1140	855	285	1000	750	250
Max	1200	900	300	1100	825	275

LLCR:

- 1) A total of 250 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. $\leq +5.0$ 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	Aug. 10 2006	Aug. 11 2006	Sep. 11 2006
Room Temp C	21	20	20
RH	46%	50%	46%
Name	Troy Cook	Tony Wagoner	Tony Wagoner
mOhm values	Actual Initial	Delta 100 Cycles	Delta After Thermal
Average	26.6	-0.1	0.1
St. Dev.	1.5	0.5	0.7
Min	23.2	-1.7	-1.8
Max	30.5	1.8	1.9
Count	250	250	250

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Part description: VHDCR / VHDCP	

DATA SUMMARIES Continued

MATING/UNMATING (-RA mated to -EM):

	Initial				After 100 Cycles			
	Mating		Unmating		Mating		Unmating	
	<u>Force (Oz)</u>	<u>Force (Lbs)</u>	<u>Force (Oz)</u>	<u>Force (Lbs)</u>	<u>Force (Oz)</u>	<u>Force (Lbs)</u>	<u>Force (Oz)</u>	<u>Force (Lbs)</u>
Minimum	66.7	4.17	60.2	3.76	104.8	6.55	87.0	5.44
Maximum	90.9	5.7	85.3	5.3	139.5	8.7	116.5	7.3
Average	77.5	4.8	71.5	4.5	114.0	7.1	97.8	6.1

SUPPLEMENTAL TESTS

SHEAR FORCE TESTING:

-RA Version

	<i>Room Temperature</i>
	<u>Force (Lbs)</u>
Minimum	68.80
Maximum	88.38
Average	82.31

-EM Version

	<i>Room Temperature</i>
	<u>Force (Lbs)</u>
Minimum	81.78
Maximum	115.57
Average	99.29

DATA**INSULATION RESISTANCE (IR):****-EM Version**

Sample #	Initial, Meg Ohms		Thermal, Meg Ohms	
	Side 1	Side 2	Side 1	Side 2
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
1	100000	100000	100000	100000
2	100000	100000	100000	100000
3	100000	100000	100000	100000

-RA Version

Sample #	Initial, Meg Ohms		Thermal, Meg Ohms	
	Side 1	Side 2	Side 1	Side 2
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
1	15000	100000	100000	100000
2	100000	100000	100000	100000
3	100000	100000	100000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):**-EM Version**

Sample #	Initial, VAC Unmated			Humidity, VAC Unmated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1-Side 1	1000	750	250	940	705	235
1-Side 2	980	735	245	940	705	235
2-Side 1	1080	810	270	960	720	240
2-Side 2	1200	900	300	920	690	230
3-Side 1	1160	870	290	1200	900	300
3-Side 2	1200	900	300	960	720	240

DATA Continued**-RA Version**

Sample #	Initial, VAC Unmated			Humidity, VAC Unmated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1-Side 1	1140	855	285	1040	780	260
1-Side 2	1200	900	300	1100	825	275
2-Side 1	1200	900	300	1080	810	270
2-Side 2	1200	900	300	1100	825	275
3-Side 1	1200	900	300	1000	750	250
3-Side 2	1200	900	300	1100	825	275

LLCR:

mOhm values		Actual	Delta	Delta
Board	Position	Initial	100 Cycles	After Thermal
1	P1	24.9	-0.6	-0.2
1	P2	23.6	0.3	0.7
1	P3	25.4	-0.1	-0.2
1	P4	25.2	-0.4	0.0
1	P5	25.4	-0.1	-0.1
1	P6	23.9	0.0	0.8
1	P7	26.9	0.0	-0.4
1	P8	26.9	-0.2	-0.5
1	P9	25.5	0.3	0.1
1	P10	27.6	-0.4	-0.6
1	P11	27.8	0.5	-0.7
1	P12	25.0	0.4	0.5
1	P13	27.9	0.2	-0.3
1	P14	27.0	0.2	0.0
1	P15	27.9	0.8	-0.5
1	P16	26.2	0.0	0.0
1	P17	27.9	0.0	-0.4
1	P18	26.1	-0.4	-0.4
1	P19	27.1	0.7	0.6
1	P20	25.3	-0.2	0.1
1	P21	26.2	-0.3	0.3
1	P22	25.4	-0.1	0.5
1	P23	27.0	-0.4	-0.3
1	P24	25.1	-0.6	0.2
1	P25	26.5	0.0	-0.1
2	P1	25.5	0.2	-0.2
2	P2	23.2	0.3	0.7
2	P3	25.4	0.5	-0.3

Tracking Code: TC0619--1035	Part #: VHDCR-68-01-M-RA / VHDCP-68-01-M-EM
Part description: VHDCR / VHDCP	

2	P4	25.3	-0.4	-0.2
2	P5	26.5	-0.4	-0.3
2	P6	24.3	0.5	-0.2
2	P7	26.6	0.4	-0.2
2	P8	27.6	0.1	-0.5
2	P9	27.1	1.2	-0.3
2	P10	27.3	0.3	-0.3
2	P11	27.3	0.2	-0.3
2	P12	27.0	0.1	-0.2
2	P13	27.4	0.3	-0.5
2	P14	27.9	0.0	-0.7
2	P15	27.3	1.3	-0.1
2	P16	27.8	-0.4	-0.2
2	P17	27.6	0.7	-0.7
2	P18	26.4	-0.9	-1.0
2	P19	26.9	0.3	-0.7
2	P20	26.1	-0.3	-0.7
2	P21	26.1	-0.3	-0.5
2	P22	24.8	-0.1	-0.4
2	P23	25.6	-0.5	-0.1
2	P24	23.8	-0.4	0.4
2	P25	25.8	-0.2	0.2
3	P1	25.5	0.4	0.8
3	P2	24.4	-0.3	0.7
3	P3	25.6	0.3	0.9
3	P4	25.1	0.5	1.4
3	P5	26.2	0.0	0.4
3	P6	25.0	0.6	1.6
3	P7	26.2	0.2	1.0
3	P8	26.8	0.0	0.4
3	P9	26.7	0.0	1.6
3	P10	28.2	0.6	0.8
3	P11	28.1	0.3	0.6
3	P12	26.3	0.5	1.3
3	P13	29.9	-0.7	-0.1
3	P14	28.8	-0.8	-0.1
3	P15	28.5	0.0	1.4
3	P16	27.8	-0.1	0.9
3	P17	27.9	-0.6	0.7
3	P18	26.3	-0.5	0.9
3	P19	26.7	-0.1	0.4
3	P20	25.3	0.2	1.3
3	P21	25.4	1.3	1.3
3	P22	25.5	0.4	0.3
3	P23	25.3	0.9	0.6
3	P24	23.2	0.4	0.5
3	P25	25.1	0.2	0.5
4	P1	25.6	-0.4	-0.6
4	P2	23.7	0.3	0.5

Tracking Code: TC0619--1035	Part #: VHDCR-68-01-M-RA / VHDCP-68-01-M-EM
Part description: VHDCR / VHDCP	

4	P3	25.4	-0.4	-0.4
4	P4	26.2	-0.4	-0.5
4	P5	26.3	0.0	-0.5
4	P6	25.9	-0.1	-0.3
4	P7	26.3	-0.1	-0.2
4	P8	27.5	-0.6	-0.4
4	P9	27.8	-0.8	-0.8
4	P10	29.0	-0.3	-0.3
4	P11	29.6	-0.6	-0.9
4	P12	30.3	-0.9	-1.7
4	P13	29.5	-0.3	-1.2
4	P14	28.1	-0.2	-0.9
4	P15	28.5	0.2	0.2
4	P16	28.7	-0.5	-1.0
4	P17	28.3	-0.7	-1.5
4	P18	27.2	0.0	-0.6
4	P19	27.6	-0.4	-0.6
4	P20	26.1	0.1	-0.5
4	P21	27.4	-0.3	-0.5
4	P22	26.4	-0.3	-0.5
4	P23	27.4	-1.4	-1.1
4	P24	24.9	0.0	-0.1
4	P25	25.8	-0.1	0.0
5	P1	26.2	-0.2	0.3
5	P2	24.3	-0.3	0.3
5	P3	25.5	-0.1	0.3
5	P4	26.4	-0.4	-0.1
5	P5	26.5	-0.3	1.3
5	P6	24.6	0.2	0.5
5	P7	27.1	0.2	0.7
5	P8	28.7	0.0	-0.8
5	P9	27.2	-0.1	-0.1
5	P10	30.4	-0.7	-1.4
5	P11	29.7	-0.8	-0.8
5	P12	27.2	-0.5	-0.5
5	P13	30.3	-0.8	-1.8
5	P14	30.1	-1.1	-0.6
5	P15	29.0	1.2	0.7
5	P16	28.3	-0.7	-0.1
5	P17	28.3	-0.9	0.1
5	P18	27.8	-1.3	-0.6
5	P19	27.7	-0.5	-0.7
5	P20	27.6	-1.5	-0.3
5	P21	26.9	-0.5	0.4
5	P22	26.6	-1.1	1.1
5	P23	26.6	-0.1	0.9
5	P24	24.5	-0.2	0.0
5	P25	26.9	-0.7	-0.8
6	P1	25.6	-0.9	0.1

Tracking Code: TC0619--1035	Part #: VHDCR-68-01-M-RA / VHDCP-68-01-M-EM
Part description: VHDCR / VHDCP	

6	P2	23.9	0.1	0.2
6	P3	26.0	-0.3	-0.2
6	P4	25.0	-0.2	0.2
6	P5	26.9	-0.7	-0.1
6	P6	25.0	0.1	0.4
6	P7	26.3	0.6	1.4
6	P8	26.8	0.0	0.0
6	P9	25.9	0.2	0.5
6	P10	28.5	0.1	-0.3
6	P11	28.4	-0.7	-0.5
6	P12	28.3	-0.8	-0.4
6	P13	27.6	-0.2	-0.1
6	P14	26.8	-0.1	0.1
6	P15	28.2	-0.3	-0.6
6	P16	27.2	-0.1	0.0
6	P17	27.7	-0.1	0.3
6	P18	27.7	-1.0	-0.5
6	P19	27.6	0.0	-0.1
6	P20	26.9	-0.2	-0.1
6	P21	25.5	0.3	0.5
6	P22	24.9	-0.5	0.0
6	P23	25.3	0.0	0.2
6	P24	24.7	-0.4	0.0
6	P25	25.6	-0.5	0.8
7	P1	24.8	-0.3	-0.3
7	P2	23.2	0.0	0.0
7	P3	25.7	-0.1	0.2
7	P4	24.7	-0.2	0.5
7	P5	25.8	0.0	-0.1
7	P6	24.3	0.3	0.9
7	P7	26.7	-0.2	0.2
7	P8	27.6	-0.3	1.0
7	P9	27.0	-0.5	1.1
7	P10	29.0	-0.6	0.6
7	P11	28.8	-0.8	0.5
7	P12	26.8	-0.3	-0.2
7	P13	28.4	-0.7	-0.4
7	P14	27.9	-0.6	-0.1
7	P15	28.5	-1.7	-1.3
7	P16	26.4	-0.1	0.0
7	P17	27.2	0.6	0.5
7	P18	27.2	-0.6	0.6
7	P19	26.9	-0.2	0.6
7	P20	25.9	-0.3	0.7
7	P21	25.3	0.2	0.4
7	P22	25.5	-0.7	0.4
7	P23	24.9	-0.4	0.3
7	P24	24.9	-0.8	-0.4
7	P25	25.0	0.5	0.3

Tracking Code: TC0619--1035	Part #: VHDCR-68-01-M-RA / VHDCP-68-01-M-EM
Part description: VHDCR / VHDCP	

8	P1	26.0	-0.3	-0.1
8	P2	24.5	-0.9	-0.5
8	P3	26.9	-0.4	-0.6
8	P4	26.4	-1.4	-1.0
8	P5	26.1	0.2	0.2
8	P6	24.6	0.2	0.3
8	P7	26.2	0.2	0.3
8	P8	27.8	0.8	-0.1
8	P9	26.0	0.3	0.4
8	P10	27.7	0.3	-0.3
8	P11	29.4	-0.5	-0.2
8	P12	27.2	0.0	-0.2
8	P13	29.0	0.4	0.2
8	P14	27.1	0.1	-0.4
8	P15	30.5	-1.7	-1.4
8	P16	28.8	0.5	-0.6
8	P17	27.8	0.0	-0.2
8	P18	27.0	-0.6	-0.2
8	P19	27.0	-0.3	-0.5
8	P20	26.7	-0.1	0.2
8	P21	27.1	-0.3	-0.1
8	P22	24.8	-0.1	0.5
8	P23	26.5	-0.4	-0.4
8	P24	23.9	-0.3	0.3
8	P25	26.9	-0.4	-0.8
9	P1	26.2	-0.1	0.2
9	P2	23.5	-0.3	0.4
9	P3	26.8	-0.1	0.0
9	P4	24.7	-0.2	0.1
9	P5	25.7	0.3	0.6
9	P6	24.5	0.5	1.3
9	P7	25.8	1.2	1.9
9	P8	26.2	1.2	1.1
9	P9	24.9	0.8	0.6
9	P10	27.8	0.2	0.7
9	P11	27.7	-0.2	0.4
9	P12	26.8	0.0	0.0
9	P13	28.2	-0.3	0.7
9	P14	28.8	-1.0	-1.1
9	P15	28.4	-0.2	-0.3
9	P16	27.7	-0.2	-0.3
9	P17	28.2	0.4	0.1
9	P18	28.2	-0.1	0.8
9	P19	27.4	-0.9	0.0
9	P20	25.7	0.9	0.9
9	P21	26.7	0.8	0.5
9	P22	24.7	0.1	0.3
9	P23	26.3	0.6	-0.2
9	P24	23.9	0.5	0.8

Tracking Code: TC0619--1035	Part #: VHDCR-68-01-M-RA / VHDCP-68-01-M-EM
Part description: VHDCR / VHDCP	

9	P25	27.5	-0.6	-0.8
10	P1	25.0	0.4	1.1
10	P2	23.7	0.7	1.5
10	P3	25.7	0.3	0.7
10	P4	23.9	0.0	1.8
10	P5	24.9	0.6	1.7
10	P6	24.2	0.7	1.6
10	P7	25.7	1.1	1.6
10	P8	26.6	1.2	1.2
10	P9	27.1	0.0	0.7
10	P10	28.3	0.6	1.2
10	P11	27.1	0.4	0.5
10	P12	28.2	-1.0	-0.8
10	P13	28.2	0.6	1.0
10	P14	27.1	-0.2	0.4
10	P15	27.8	0.4	0.4
10	P16	28.2	-0.1	0.9
10	P17	27.3	1.8	0.4
10	P18	26.8	-0.4	0.7
10	P19	27.3	-0.1	0.4
10	P20	26.0	-0.4	0.7
10	P21	26.6	-0.4	0.4
10	P22	24.8	-0.3	1.7
10	P23	26.7	0.3	0.0
10	P24	24.5	0.3	0.7
10	P25	26.5	0.0	0.6

MATING/UNMATING:

Sample#	Initial				After 100 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
1	72.8	4.55	63.8	3.99	112.3	7.02	87.0	5.44
2	70.7	4.42	68.0	4.25	105.0	6.56	92.5	5.78
3	90.9	5.68	81.8	5.11	108.3	6.77	103.7	6.48
4	70.9	4.43	60.2	3.76	115.5	7.22	89.4	5.59
5	90.2	5.64	85.1	5.32	106.9	6.68	93.3	5.83
6	72.6	4.54	72.2	4.51	106.2	6.64	101.0	6.31
7	69.6	4.35	64.2	4.01	104.8	6.55	97.9	6.12
8	66.7	4.17	60.2	3.76	114.2	7.14	95.7	5.98
9	86.1	5.38	85.3	5.33	126.9	7.93	101.1	6.32
10	84.2	5.26	74.7	4.67	139.5	8.72	116.5	7.28

DATA Continued**SUPPLEMENTAL****SHEAR FORCE:****-RA Version**

<u>Sample#</u>	<u>Force (Lbs)</u>
1	88.38
2	86.52
3	80.47
4	84.48
5	87.07
6	87.08
7	68.8
8	69.69
9	88.32

-EM Version

<u>Sample#</u>	<u>Force (Lbs)</u>
1	99.68
2	99.51
3	101.24
4	104.36
5	100.85
6	81.78
7	97.08
8	87.38
9	115.57
10	110.21
11	94.58

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** THL-02**Description:** Temperature/Humidity Chart Recorder**Manufacturer:** Dickson**Model:** THDX**Serial #:** 00120351**Accuracy:** Temp: +/- 1C; Humidity: +/-2% RH (0 - 60%) +/- 3% RH (61 - 95%).

... Last Cal: 06/16/05, Next Cal: 06/16/06

Equipment #: MO-02**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0780546**Accuracy:** See Manual

... Last Cal: 05/12/06, Next Cal: 05/12/07

Equipment #: MO-04**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0798688**Accuracy:** See Manual

... Last Cal: 01/31/06, Next Cal: 01/31/07

Equipment #: PS-01**Description:** System Power Supply**Manufacturer:** Hewlett Packard**Model:** HP 6033A**Serial #:** (HP) 3329A-07330**Accuracy:** See Manual

... Last Cal: 05/12/06, Next Cal: 05/12/07

Equipment #: TC090601-103/105**Description:** IC Thermocouple-103/105**Manufacturer:** Samtec**Model:****Serial #:** TC090601-103/105**Accuracy:** +/- 1 degree C

... Last Cal: , Next Cal:

Equipment #: MO-01**Description:** Micro-Ohmmeter**Manufacturer:** Keithley**Model:** 580**Serial #:** 0772740**Accuracy:** See Manual

... Last Cal: 05/12/06, Next Cal: 05/12/07

Tracking Code: TC0619--1035	Part #: VHDCR-68-01-M-RA / VHDCP-68-01-M-EM
Part description: VHDCR / VHDCP	

Equipment #: MO-03

Description: Multimeter /Data Acquisition System

Manufacturer: Keithley

Model: 2700

Serial #: 0791975

Accuracy: See Manual See Manual

... Last Cal: 05/12/06, Next Cal: 05/12/07

Equipment #: OV-03

Description: Cascade Tek Forced Air Oven

Manufacturer: Cascade Tek

Model: TFO-5

Serial #: 0500100

Accuracy: Temp. Stability: +/- .1C/C change in ambient

... Last Cal: 05/12/06, Next Cal: 05/12/07

Equipment #: HPM-01

Description: Hipot Megommeter

Manufacturer: Hipotronics

Model: H306B-A

Serial #: M9905004

Accuracy: 2 % Full Scale Accuracy

... Last Cal: 5/12/06, Next Cal: 05/12/07

Equipment #: THC-01

Description: Temperature/Humidity Chamber

Manufacturer: Thermotron

Model: SM-8-7800

Serial #: 30676

Accuracy: See Manual

... Last Cal: 8/18/2006, Next Cal: 8/18/2007

Equipment #: TCT-03

Description: Dillon Quantrol TC2 Test Stand

Manufacturer: Dillon Quantrol

Model: TC2

Serial #: 00120351

Accuracy: Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.

... Last Cal: 5/12/06, Next Cal: 5/12/07

Equipment #: LC-2500N(icell)

Description: 2500 N Load Cell for Dillon Quantrol

Manufacturer: Dillon Quantrol

Model: icell

Serial #: 01-0132-01

Accuracy: .10% of capacity

... Last Cal: 6/13/06, Next Cal: 6/13/07