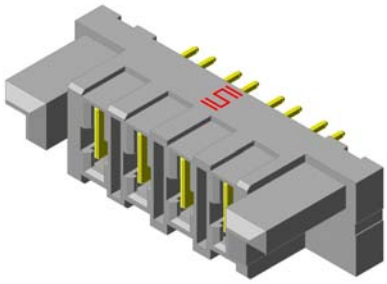
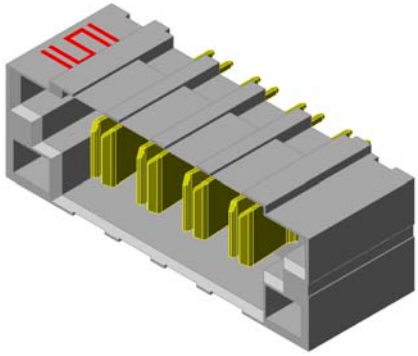
Project Number:	Tracking Code: TC0550--0899		
Requested by: Corey Rose	Date: 12/9/2005	Product Rev: 1	
Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD	Lot #: 11/18/05	Tech: Troy Cook	Eng: Dave Scopelliti
Part description: power			Qty to test: 60
Test Start: 02/07/2006	Test Completed: 3/29/2006		





PEX
DVT Report

Parts Tested:
PES-08-01-S-RA&V-SD
PET-08-01-S-RA&V-SD

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

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: RA TO RA portion of the DVT flowchart.

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) The ultrasonic procedure can be used with either aqueous or non-aqueous soldering components and follows:
    a. Sample test boards are to be ultrasonically cleaned after test lead attachment, preparation and/or soldering.
    b. Sample test boards are immersed into Branson 3510 cleaner containing Kyzen Ionox HC1 (or equivalent) with the following conditions:
        i. Temperature: -------55° C+/- 5° C
        ii. Frequency:----------40 KHz
        iii. Immersion Time: ---5 to 10 Minutes
    c. Sample test boards are removed and placed into the Branson 3510 cleaner containing deionized water with the following conditions:
        i. Temperature: --------55° C +/- 5° C
        ii. Frequency:----------40 KHz
        iii. Immersion Time: ---5 to 10 Minutes
    d. Sample test boards are removed and placed in a beaker positioned on a hot plate with a magnetic stirrer containing deionized water warmed to 55° C +/- 5° C for 1/2 to 1 minute.
    e. Upon removal, the sample boards are rinsed for ½ to 1 minute at room temperature with free flowing deionized water.
    f. After the final rinse, the sample test boards are dried in an air-circulating oven for 10 to 15 minutes at 50° C +/- 5° C.
    g. Sample test boards are then allowed to set and recover to room ambient condition prior to testing.
7) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
8) Any additional preparation will be noted in the individual test sequences.
9) Solder Information: Lead Free, Sn96.5/Ag3.0/Cu0.5
10) Internal Test PCBs used:

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

FLOWCHARTS

TC0550--0899 PES-RA/PET-RA

Current Carrying Capacity

TEST STEP	GROUP A 1 board min, 2 position	GROUP B 1 board min, 8 position
01	CCC	CCC

TC0550--0899 PES-RA/PET-V

Current Carrying Capacity

TEST STEP	GROUP A 1 board min, 2 position	GROUP B 1 board min, 8 position
01	CCC	CCC

TC0550--0899 PES-V/PET-RA

Current Carrying Capacity

TEST STEP	GROUP A 1 board min, 2 position	GROUP B 1 board min, 8 position
01	CCC	CCC

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

FLOWCHARTS Continued

Current Cycle

TEST STEP	GROUP A 2 Assemblies 500 Cycles
01	Voltage Drop/T Rise
02	Current Cycle
03	Voltage Drop/T Rise

T-Rise

TEST STEP	GROUP A 1 board min, 2 position 1 Power Contact	GROUP B 1 board min, 8 position 1 Power Contact
01	CCC	CCC

IR / DWV

TEST STEP	GROUP A 2 Boards Ambient	GROUP B 2 Boards Ambient
01	IR	DWV

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

FLOWCHARTS Continued

Durability/Thermal/Humidity

TEST STEP	GROUP A 16 Points 100 Cycles
01	LLCR-1
02	Data Review
03	100 Cycles
04	LLCR-2
05	Data Review
06	Thermal Age
07	LLCR-3
08	Data Review
09	Humidity
10	LLCR-4

Mating/Unmating

TEST STEP	GROUP A 10 Boards
01	Mating / Unmating
02	Data Review

Normal Force

TEST STEP	GROUP A Individual Contacts (8) min
01	Setup Approve
02	Normal Force
03	Data Review

Normal Force = EIA-364-04

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

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 4 at 105° C.
3) Test Time Condition B for 250 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 B, 240 Hours.
3) Method III, +25° C to + 65° C, 90% to 98% 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. 85^{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.

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.

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

NORMAL FORCE (FOR CONTACTS TESTED IN THE HOUSING):

1) Reference document: EIA-364-04, *Normal Force Test Procedure for Electrical Connectors*.
2) The contacts shall be tested in the connector housing.
3) If necessary, a "window" shall be made in the connector body to allow a probe to engage and deflect the contact at the same attitude and distance (plus 0.05 mm [0.002"]) as would occur in actual use.
4) The connector housing shall be placed in a holding fixture that does not interfere with or otherwise influence the contact force or deflection.
5) Said holding fixture shall be mounted on a floating, adjustable, X-Y table on the base of the Dillon TC^2, computer controlled test stand with a deflection measurement system accuracy of 5.0 µm (0.0002").
6) The nominal deflection rate shall be 5 mm (0.2")/minute.
7) Unless otherwise noted a minimum of five contacts shall be tested.
8) The force/deflection characteristic to load and unload each contact shall be repeated five times.
9) The system shall utilize the TC^2 software in order to acquire and record the test data.
10) The permanent set of each contact shall be measured within the TC^2 software.
11) The acquired data shall be graphed with the deflection data on the X-axis and the force data on the Y-axis and a print out will be stored with the Tracking Code paperwork.

INSULATION RESISTANCE (IR):

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

1) PROCEDURE:
    a. Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
    b. Test Conditions:
        i. Between Adjacent Contacts
        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
        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. <= +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

CURRENT CYCLING:

1) Reference document: EIA-364-55, *Current Cycling Test Procedure for Electrical Connectors*.
2) Reference document: EIA-364-06, *Contact Resistance Test Procedure for Electrical Connectors*.
    a. This is a four-wire measurement.
3) An uninterruptible Power Supply maintained power to appropriate equipment.
    a. A microprocessor controlled cycling fixture maintained accurate duty-cycle timing for test duration.
    b. A calibrated constant current source provided consistent DC power during ON cycles

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

RESULTS

Current Carrying Capacity at a 20% de-rating

PES-RA / PET-RA

- **CCC for a 30°C Temperature Rise (2 Positions)-------31.0 A per contact with 2 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise (8 Positions)-------23.6 A per contact with 8 adjacent contacts powered**

PES-RA / PET-V

- **CCC for a 30°C Temperature Rise (2 Positions)-------26.0 A per contact with 2 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise (8 Positions)-------21.2 A per contact with 8 adjacent contacts powered**

PES-V / PET-RA

- **CCC for a 30°C Temperature Rise (2 Positions)-------30.2 A per contact with 2 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise (8 Positions)-------22.5 A per contact with 8 adjacent contacts powered**

Current Cycling – 500 Cycles, 45 minutes ON and 15 minutes OFF

- **Test Current ----------46.38 A**
- **Contact Resistances, Measured 30 minutes into the FIRST and LAST ON cycle**
  - **Initial**
    - **Min ----------.164 mOhms**
    - **Max----------.193 mOhms**
  - **Final**
    - **Min ----------.161 mOhms ---------- PASS**
    - **Max----------.189 mOhms ---------- PASS**
- **Temperature Change, Measured 30 minutes into the FIRST and LAST ON cycle**
  - **Initial Temperature Change ----------58°C ---------- PASS**
  - **Final Temperature Change ----------61°C ---------- PASS**

Temperature Rise, 8 position PES-RA/PET-RA

- **T-Rise at 8.0 Amps ----------2.8 Deg. C**
- **T-Rise at 13.0 Amps ----------7.2 Deg. C**
- **T-Rise at 24.0 Amps ----------18.0 Deg. C**
- **T-Rise at 30.0 Amps ----------27.5 Deg. C**

Insulation Resistance minimums, IR

- **Initial**
  - **Mated----------100,000 Meg Ω ---------- Pass**
  - **Unmated ----------100,000 Meg Ω**

Dielectric Withstanding Voltage minimums, DWV

- **Initial**
  - **Breakdown**
    - **Mated ----------2,600 VAC**
    - **Unmated----------2,800 VAC**
  - **DWV**
    - **Mated ----------1,950 VAC**
    - **Unmated----------2,100 VAC**
  - **Working voltage**
    - **Mated ----------650 VAC**
    - **Unmated----------700 VAC**

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

LLCR Durability (200 LLCR test points)

- **Initial ---------- .344 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms ---------- 64 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 ---------- 64 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 ---------- 64 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**

Mating – Unmating Forces

- **Mating**
  - **Min ----------16.3 Lbs.**
  - **Max----------19.6 Lbs.**
- **Unmating**
  - **Min ----------12.9 Lbs.**
  - **Max----------16.0 Lbs.**

Normal Force at .018” deflection

- **Initial**
  - **Min----------1,135 grams Set -------.0006”**
  - **Max ----------1,435 grams Set -------.0018”**
  - **Ave ----------1,285 grams Set -------.0011”**

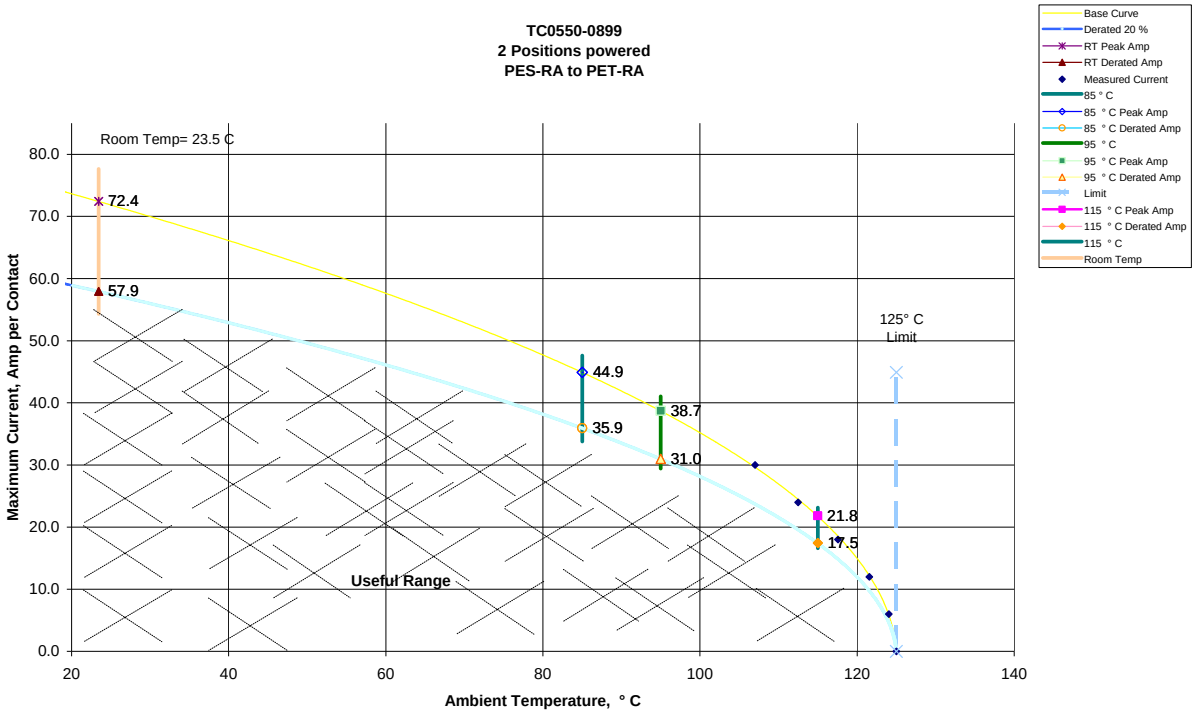
Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA SUMMARIES

CURRENT CARRYING CAPACITY (CCC):

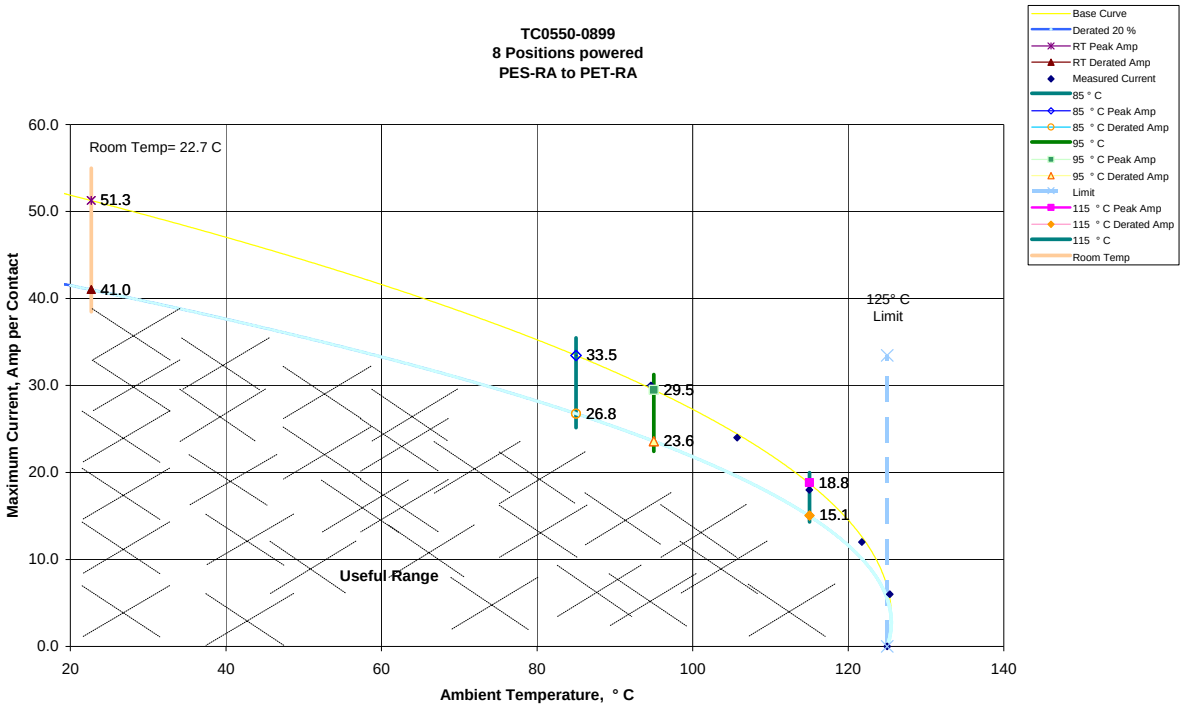
1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
3) Temperature readings recorded are those for which three successive readings, 15 minutes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

PES-RA / PET-RA

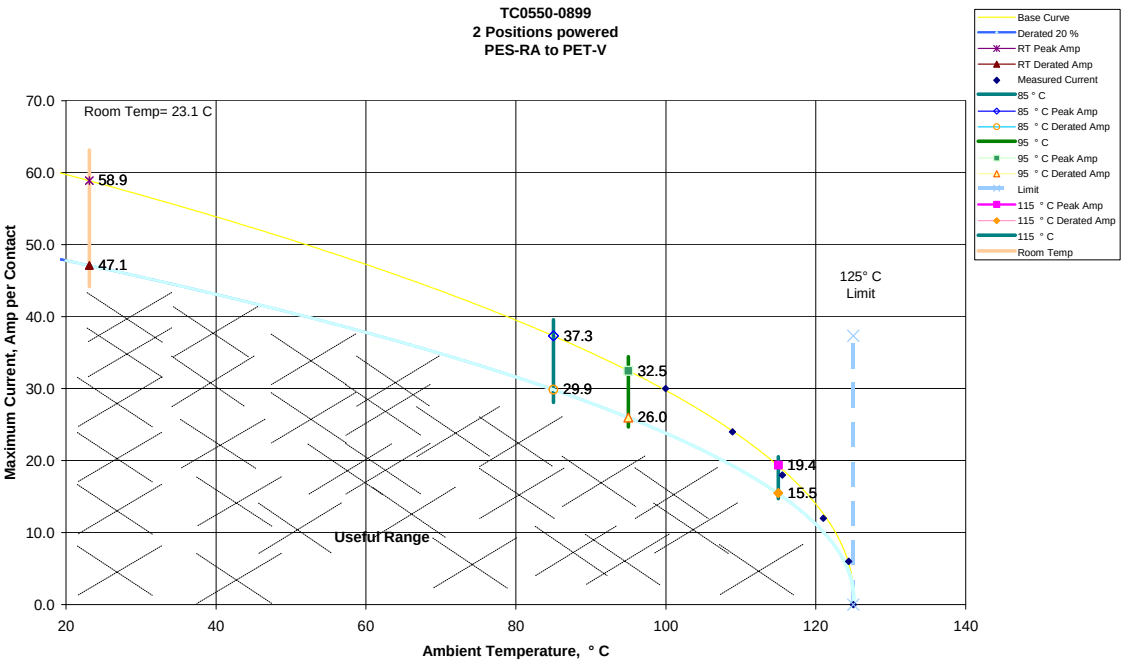


Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA SUMMARIES Continued

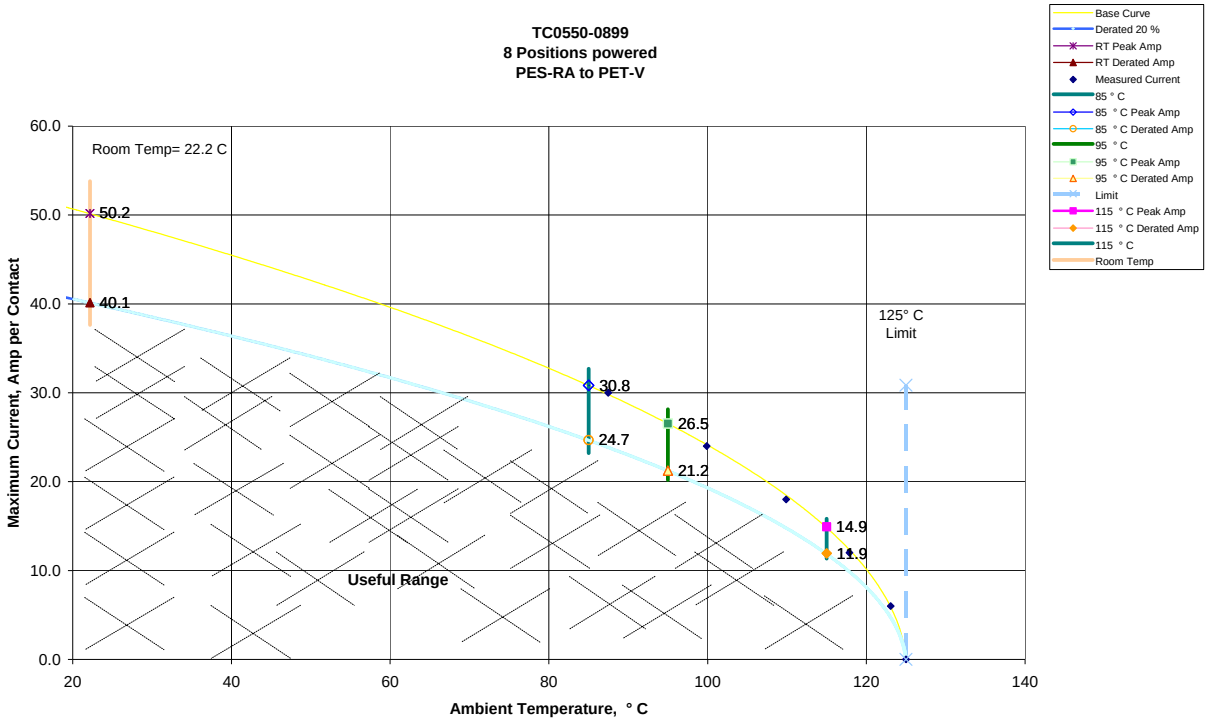


PES-RA / PET-V



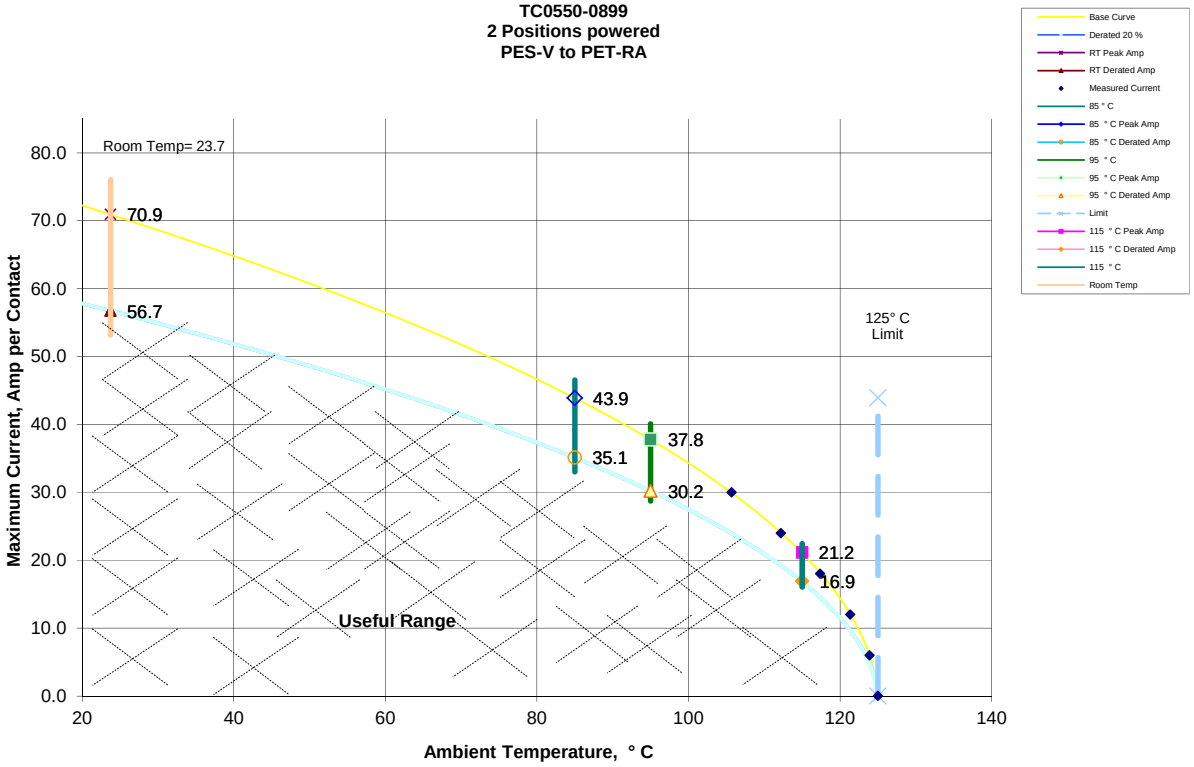
Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA SUMMARIES Continued



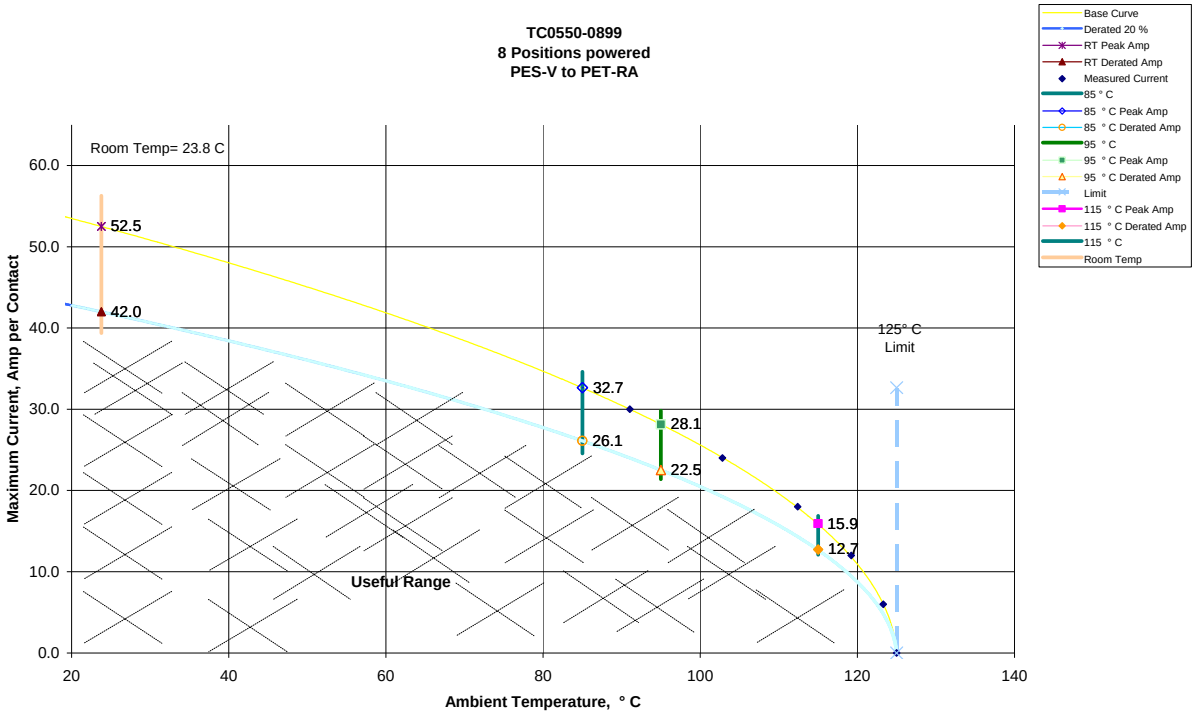
Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

PES-V / PET-RA



Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA SUMMARIES Continued



Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA SUMMARIES Continued

CURRENT CYCLING:

Connector temp before first "ON" cycle (before cycling)	
Degrees C	22.3
# Cycles	500
Amp DC	46.38
Avg mOhms	0.1358
Min mOhms	0.1186
Max mOhms	0.1660
St. Dev.	0.0152
Count	8

Connector temp 30 minutes into the first "ON" cycle (before cycling)	
Degrees C	84.3
# Cycles	500
Amp DC	46.38
Avg mOhms	0.1798
Min mOhms	0.1641
Max mOhms	0.1933
St. Dev.	0.0101
Count	8

Temperature Change, Deg C		
Start		**End**
58		61

Connector temp 30 minutes into the the last "ON" cycle (after cycling)	
Degrees C	85.2
# Cycles	500
Amp DC	46.38
Avg mOhms	0.1743
Min mOhms	0.1613
Max mOhms	0.1891
St. Dev.	0.0097
Count	8

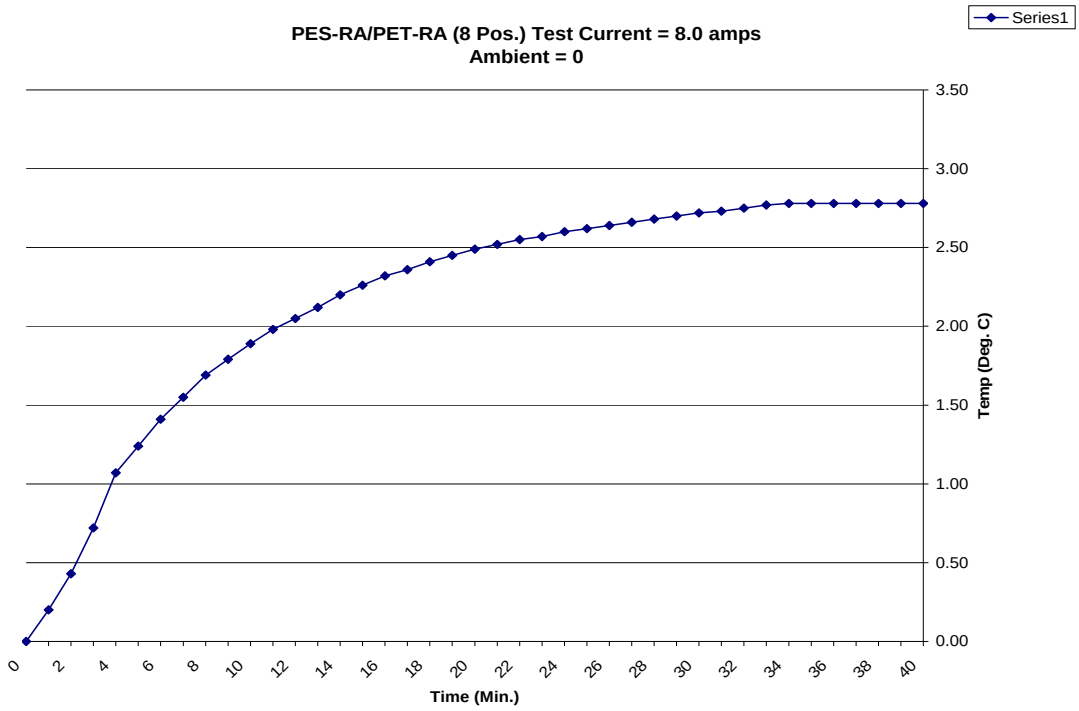
Resistance Change at last "ON" cycle	
# Cycles	500
Amp DC	46.38
Avg mOhms	-0.0055
Min mOhms	-0.0112
Max mOhms	0.0037
St. Dev.	0.0

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

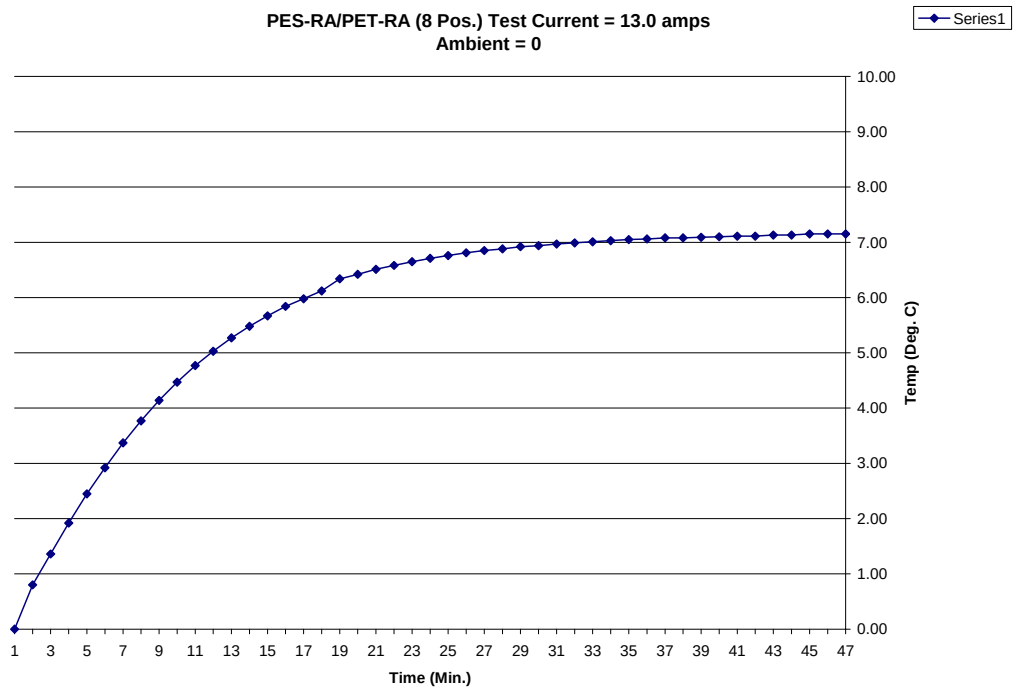
DATA SUMMARIES Continued

TEMPERATURE RISE (T-Rise):

T-Rise at 8.0 amps



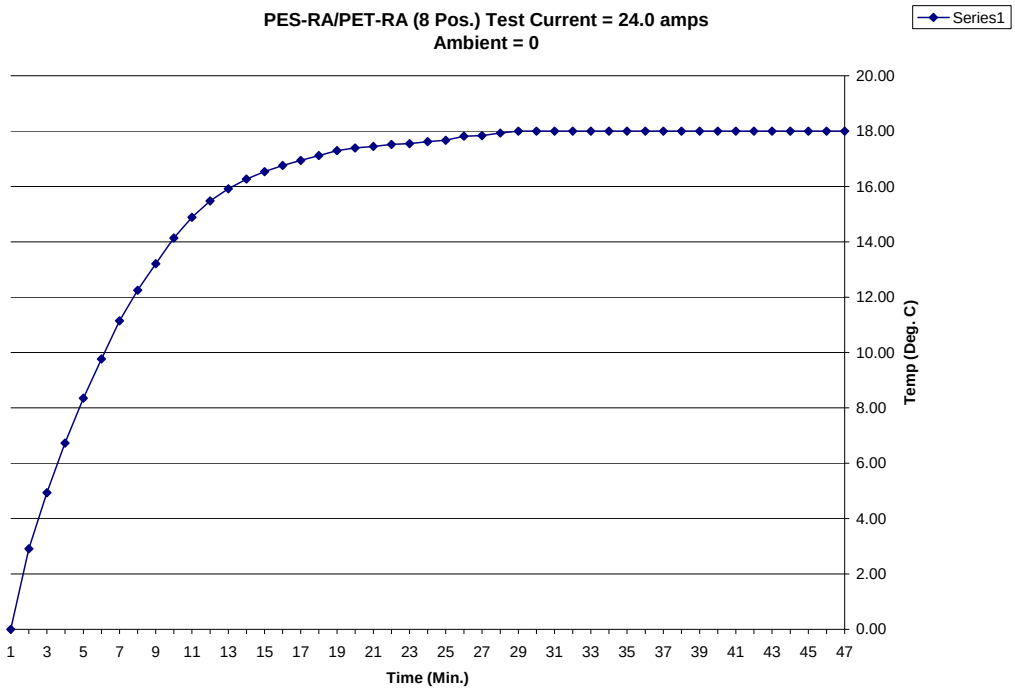
T-Rise at 13.0 amps



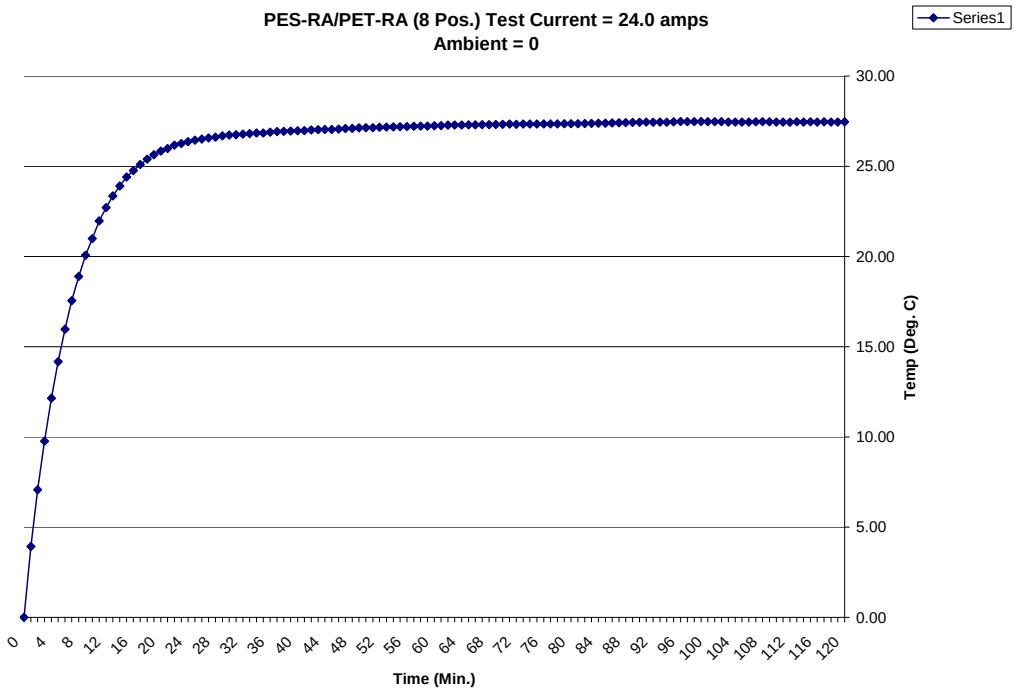
Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA SUMMARIES Continued

T-Rise at 24.0 amps



T-Rise at 30.0 amps



Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

Initial, Meg Ohms

	Mated	Unmated
	Insulation Resistance	**Insulation Resistance**
Average	100000	100000
Min	100000	100000
Max	100000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

	Initial, VAC Mated			Initial, VAC Unmated		
	Breakdown Voltage	**DWV**	**Working Voltage**	**Breakdown Voltage**	**DWV**	**Working Voltage**
Average	2650	1988	663	2900	2175	725
Min	2600	1950	650	2800	2100	700
Max	2700	2025	675	3000	2250	750

LLCR:

1) A total of 64 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	Feb. 01 2006	Feb. 02 2006	Feb. 13 2006	Mar. 01 2006
Room Temp C	23	24	25	26
RH	21%	24%	14%	24%
Name	Troy Cook	Troy Cook	Troy Cook	Troy Cook
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	0.366	-0.005	0.019	0.008
St. Dev.	0.014	0.010	0.009	0.009
Min	0.344	-0.032	-0.006	-0.012
Max	0.404	0.032	0.042	0.028
Count	64	64	64	64

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA SUMMARIES Continued

MATING/UNMATING:

	Mating	Unmating
	Force (Lbs)	Force (Lbs)
Minimum	16.27	12.89
Maximum	*19.6*	*16.0*
Average	***18.7***	***14.6***

NORMAL FORCE:

Initial	Deflections in inches Forces in Grams					
	0.0020	**0.0060**	**0.0100**	**0.0150**	**0.0180**	**SET**
Averages	131.75	438.50	728.25	1070.38	1285.00	0.0011
Min	98.00	347.00	592.00	904.00	1135.00	0.0006
Max	154.00	507.00	837.00	1213.00	1435.00	0.0018
St. Dev	22.26	62.30	85.01	103.77	102.75	0.0004
Count	8	8	8	8	8	8

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA

CURRENT CYCLING:

Test Date:	2/15/2006	**Test Date:**	2/15/2006
Operator:	Troy Cook	**Operator:**	Troy Cook
Temperature (C):	26	**Temperature (C):**	26
Humidity (RH):	24%	**Humidity (RH):**	24%
Equipment ID1:	PS-02	**Equipment ID1:**	PS-02
Equipment ID2:	MO-04	**Equipment ID2:**	MO-04
Equipment ID3:	MO-05	**Equipment ID3:**	MO-05
Thermocouple Pair:	TC090601-109/118	**Thermocouple Pair:**	TC090601-109/118
Part #:	PES-108-01-RA	**Part #:**	PES-108-01-RA
Mating Part#:	PET-108-01-RA	**Mating Part#:**	PET-108-01-RA

Connector temp before first "ON" cycle (before cycling)		**Connector temp 30 minutes into the first "ON" cycle (before cycling)**	
Degrees C	22.3	**Degrees C**	84.3

Connector temp before first "ON" cycle (before cycling)		**Connector temp 30 minutes into the first "ON" cycle (before cycling)**	
# Cycles	500	**# Cycles**	500
Amp DC	46.38	**Amp DC**	46.38
Avg mOhms	0.1358	**Avg mOhms**	0.1798
Min mOhms	0.1186	**Min mOhms**	0.1641
Max mOhms	0.1660	**Max mOhms**	0.1933
St. Dev.	0.0152	**St. Dev.**	0.0101
Count	8	**Count**	8

Resistance before the first "ON" cycle		**Resistance at 30 minutes into the first "ON" cycle**	
Current Amperes DC	**46.38**	**Current Amperes DC**	**46.375**
Number Cycles	**500**	**Number Cycles**	**500**

Sample	**Measured Voltage**	**Contact Resistance mOhms**	**Sample**	**Measured Voltage**	**Contact Resistance mOhms**
1	0.0063	0.1358	1	0.0090	0.1933
2	0.0060	0.1294	2	0.0085	0.1835
3	0.0059	0.1272	3	0.0087	0.1879
4	0.0077	0.1660	4	0.0087	0.1879
5	0.0068	0.1466	5	0.0082	0.1778
6	0.0057	0.1229	6	0.0078	0.1692
7	0.0055	0.1186	7	0.0076	0.1641
8	0.0065	0.1402	8	0.0081	0.1749

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA Continued

CURRENT CYCLING (Continued):

Test Date:	3/9/2006
Operator:	Troy Cook
Temperature (C):	24
Humidity (RH):	25%
Equipment ID:	PS-02
Equipment ID2:	MO-04
Equipment ID3:	MO-05
Thermocouple Pair:	TC090601-109/118
Part #:	PES-108-01-RA
Mating Part#:	PET-108-01-RA

Connector temp 30 minutes into the Last "ON" cycle (after cycling)		
	Degrees C	85.2

Temperature Change, Deg C		
Start		**End**
58		61

Connector temp 30 minutes into the the last "ON" cycle (after cycling)	
# Cycles	500
Amp DC	46.40
Avg mOhms	0.1743
Min mOhms	0.1613
Max mOhms	0.1891
St. Dev.	0.0097
Count	8

Resistance Change at last "ON" cycle	
# Cycles	500
Amp DC	46.40
Avg mOhms	-0.0055
Min mOhms	-0.0112
Max mOhms	0.0037
St. Dev.	0.0043

Resistance at 30 minutes into the last "ON" cycle	
Current Amperes DC	**46.375**
Number Cycles	**500**

Sample	**Measured Voltage**	**Contact Resistance mOhms**
1	0.0088	0.1891
2	0.0082	0.1778
3	0.0084	0.1805
4	0.0085	0.1832
5	0.0077	0.1666
6	0.0075	0.1613
7	0.0078	0.1679
8	0.0078	0.1680

Resistance Change at last "ON" cycle	
Current Amperes DC	**46.375**
Number Cycles	**500**

Sample	**Delta Resistance mOhms**
1	-0.004140162
2	-0.005733693
3	-0.007398383
4	-0.004761186
5	-0.011187062
6	-0.0078469
7	0.003713208
8	-0.006889488

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA Continued

INSULATION RESISTANCE (IR):

Test Date:	2/7/2006
Operator:	Troy Cook
Temperature (C):	23
Humidity (RH):	15%
Equipment ID:	HPM-01

Contact Part #:	N/A
Used In:	PES-RA

Test Conditions	**YES**	**NO**
Adjacent Contacts	**X**	
Mated	**X**	**X**
PC Mounted	**X**	

Electrification Time ***Two (2) minutes***

Initial, Meg Ohms

	Mated	Unmated
Sample #	**Insulation Resistance**	**Insulation Resistance**
1	100000	100000
2	100000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Test Date:	2/7/2006
Operator:	Troy Cook
Temperature (C):	23
Humidity (RH):	15%
Equipment ID:	HPM-01
Contact Part #:	N/A
Used In:	PES-RA

Test Conditions	**YES**	**NO**
Adjacent Contacts	**X**	
Mated	**X**	**X**
PC Mounted	**X**	

Voltage Rate 500 Per Sec.

Test Voltage ***Until Breakdown Occurs***

	Mated			Unmated		
Sample #	**Breakdown Voltage**	**DWV**	**Working Voltage**	**Breakdown Voltage**	**DWV**	**Working Voltage**
1	2600	1950	650	3000	2250	750
2	2700	2025	675	2800	2100	700

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA Continued

LLCR:

Date	Feb. 01 2006	Feb. 02 2006	Feb. 13 2006	Mar. 01 2006
Room Temp C	23	24	25	26
RH	21%	24%	14%	24%
Name	Troy Cook	Troy Cook	Troy Cook	Troy Cook
mOhm values	**Actual Initial**	**Delta 100 Cycles**	**Delta Thermal**	**Delta Humidity**
Average	0.366	-0.005	0.019	0.008
St. Dev.	0.014	0.010	0.009	0.009
Min	0.344	-0.032	-0.006	-0.012
Max	0.404	0.032	0.042	0.028
Count	64	64	64	64

mOhm values		**Actual**	**Delta**	**Delta**	**Delta**
Board	**Position**	**Initial**	**100 Cycles**	**Thermal**	**Humidity**
1	P1	0.404	-0.016	0.014	-0.012
1	P2	0.380	-0.006	0.026	0.011
1	P3	0.394	-0.002	0.024	0.003
1	P4	0.388	0.000	0.029	0.015
1	P5	0.402	-0.016	0.019	0.000
1	P6	0.388	-0.004	0.033	0.016
1	P7	0.376	0.004	0.042	0.016
1	P8	0.382	0.008	0.041	0.015
2	P1	0.366	0.002	0.031	0.018
2	P2	0.376	-0.006	0.016	0.009
2	P3	0.382	-0.020	0.006	-0.004
2	P4	0.390	-0.026	-0.006	-0.006
2	P5	0.382	-0.028	0.004	-0.009
2	P6	0.370	-0.002	0.018	0.018
2	P7	0.376	-0.014	0.005	-0.001
2	P8	0.350	0.006	0.030	0.028
3	P1	0.358	0.016	0.034	0.024
3	P2	0.360	-0.002	0.025	0.007
3	P3	0.366	-0.014	0.015	0.007
3	P4	0.368	-0.002	0.012	0.010
3	P5	0.358	-0.008	0.024	0.003
3	P6	0.360	0.006	0.025	0.012
3	P7	0.376	-0.008	0.018	0.010
3	P8	0.370	-0.010	0.022	0.003
4	P1	0.372	0.000	0.024	0.020
4	P2	0.368	-0.004	0.021	0.005
4	P3	0.368	-0.018	0.019	-0.002
4	P4	0.366	0.002	0.021	0.016
4	P5	0.354	0.002	0.019	0.021

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

4	P6	0.360	-0.002	0.014	0.014
4	P7	0.378	-0.006	0.015	0.009
4	P8	0.370	-0.022	0.016	0.003
5	P1	0.358	0.032	0.022	0.014
5	P2	0.352	0.010	0.023	0.010
5	P3	0.360	-0.010	0.015	-0.001
5	P4	0.356	0.000	0.006	0.000
5	P5	0.366	-0.012	0.002	-0.011
5	P6	0.354	-0.006	0.006	0.004
5	P7	0.344	-0.008	0.009	-0.001
5	P8	0.362	-0.010	0.001	0.006
6	P1	0.356	0.006	0.030	0.015
6	P2	0.346	-0.002	0.025	0.017
6	P3	0.358	-0.008	0.018	0.009
6	P4	0.352	0.002	0.018	0.015
6	P5	0.356	-0.020	0.011	-0.002
6	P6	0.346	-0.010	0.026	0.014
6	P7	0.354	-0.006	0.015	0.005
6	P8	0.358	0.000	0.025	0.011
7	P1	0.366	-0.010	0.010	-0.001
7	P2	0.356	-0.010	0.018	0.008
7	P3	0.366	-0.006	0.012	-0.003
7	P4	0.368	-0.008	0.018	0.002
7	P5	0.384	-0.010	0.011	-0.010
7	P6	0.364	0.004	0.025	0.004
7	P7	0.358	-0.004	0.033	0.010
7	P8	0.390	-0.032	0.010	-0.001
8	P1	0.380	0.002	0.014	0.006
8	P2	0.348	-0.004	0.015	0.011
8	P3	0.354	0.004	0.023	0.017
8	P4	0.354	0.000	0.009	0.015
8	P5	0.352	0.000	0.026	0.017
8	P6	0.350	0.004	0.022	0.022
8	P7	0.360	-0.010	0.013	0.010
8	P8	0.354	-0.012	0.021	0.017

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

DATA Continued

MATING/UNMATING:

Test Date:	2/6/2006
Operator:	Troy Cook
Temperature (C):	24
Humidity (RH):	41%
Equipment ID:	TCT-03
Load Cell ID:	LC-250N (icell)
Part #	PES-08-RA
Mating Part #	PET-08-RA

	Mating	Unmating
Sample#	Force (Lbs)	Force (Lbs)
1	19.59	15.23
2	19.09	15.95
3	18.93	14.53
4	19.29	15.14
5	18.11	13.40
6	19.11	15.20
7	19.25	15.08
8	19.31	14.41
9	17.92	13.73
10	16.27	12.89

NORMAL FORCE:

Initial	Deflections in inches Forces in Grams					
Sample #	**0.0020**	**0.0060**	**0.0100**	**0.0150**	**0.0180**	***SET***
1	106.00	347.00	592.00	904.00	1135.00	0.00140
2	143.00	473.00	763.00	1097.00	1294.00	0.00060
3	154.00	507.00	804.00	1164.00	1387.00	0.00120
4	98.00	366.00	659.00	1008.00	1246.00	0.00100
5	132.00	436.00	741.00	1101.00	1320.00	0.00110
6	117.00	395.00	652.00	964.00	1161.00	0.00120
7	154.00	488.00	778.00	1112.00	1302.00	0.00080
8	150.00	496.00	837.00	1213.00	1435.00	0.00180

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

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: 05/12/05, Next Cal: 05/12/06

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual -
… Last Cal: 1/31/06, Next Cal: 1/31/07

Equipment #: MO-01
Description: Micro-Ohmeter
Manufacturer: Keithley
Model: 580
Serial #: 0772740
Accuracy: See Manual
… Last Cal: 05/12/05, Next Cal: 05/12/06

Equipment #: MO-03
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0791975
Accuracy: See Manual
… Last Cal: 05/12/05, Next Cal: 05/12/06

Equipment #: PS-01
Description: System Power Supply
Manufacturer: Hewlett Packard
Model: HP 6033A
Serial #: (HP) 3329A-07330
Accuracy: See Manual
… Last Cal: 05/12/05, Next Cal: 05/12/06

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

Equipment #: TC090601-103/105
Description: IC Thermocouple-103/105
Manufacturer: Samtec
Model:
Serial #: TC090601-103/105
Accuracy: +/- 1 degree C +/- 1 degree C
… Last Cal: , Next Cal:

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 5/12/05, Next Cal: 05/12/06

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: 05/12/05, Next Cal: 05/12/06

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 7/15/2005, Next Cal: 8/15/2006

Equipment #: TC090601-109/118
Description: IC Thermocouple-109/118
Manufacturer: Samtec
Model:
Serial #: 00120351
Accuracy: +/- 1 degree C
… Last Cal: , Next Cal:

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 1/31/06, Next Cal: 1/31/07

Tracking Code: TC0550--0899	Part #: PES-08-01-SM-RA-SD/PET-08-01-SM-RA-SD
Part description: power	

Equipment #: TCT-03
Description: Dillon Quantrol TC2 Test Stand
Manufacturer: Dillon Quantrol
Model: TC2
Serial #: 02-1033-03
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.
… Last Cal: 5/12/05, Next Cal: 5/12/06

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: 5/17/05, Next Cal: 5/17/06