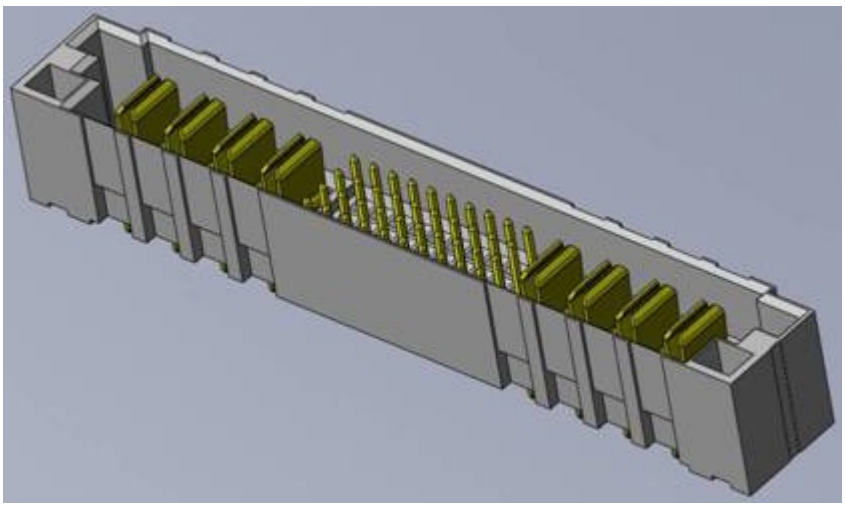
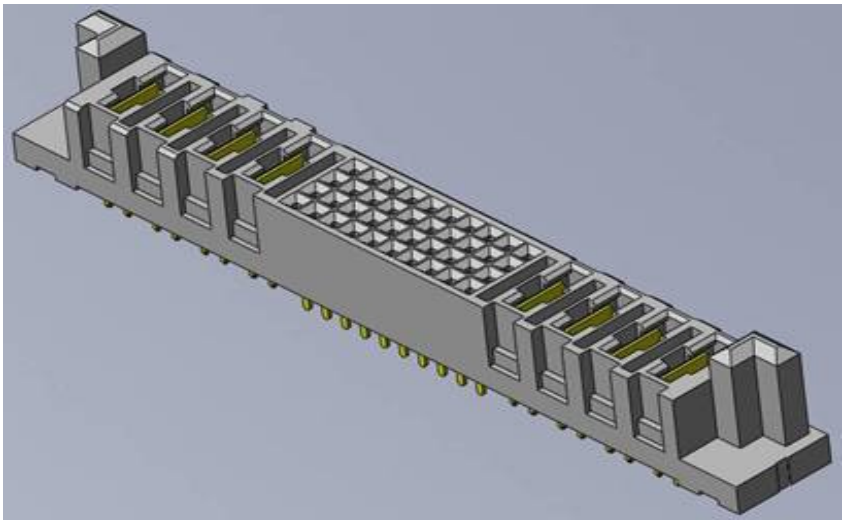
Project Number: Design Qualification Test Report	Tracking Code: 101836_Report_Rev_1		
Requested by: Adam Owens	Date: 12/3/2010	Product Rev: 0	
Part #: PETC-04-40-04-01-T-VT/PESC-04-40-04-01-T-VT	Lot #: na	Tech: Troy Cook Tony Wagoner	Eng: Eric Mings
Part description: PETC/PESC			Qty to test: 20
Test Start: 10/14/2010	Test Completed: 11/5/2010		





Design Qualification Test Report

PETC/PESC

PETC-04-40-04-01-T-VT/PESC-04-40-04-01-T-VT

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 verification test. See test plan.

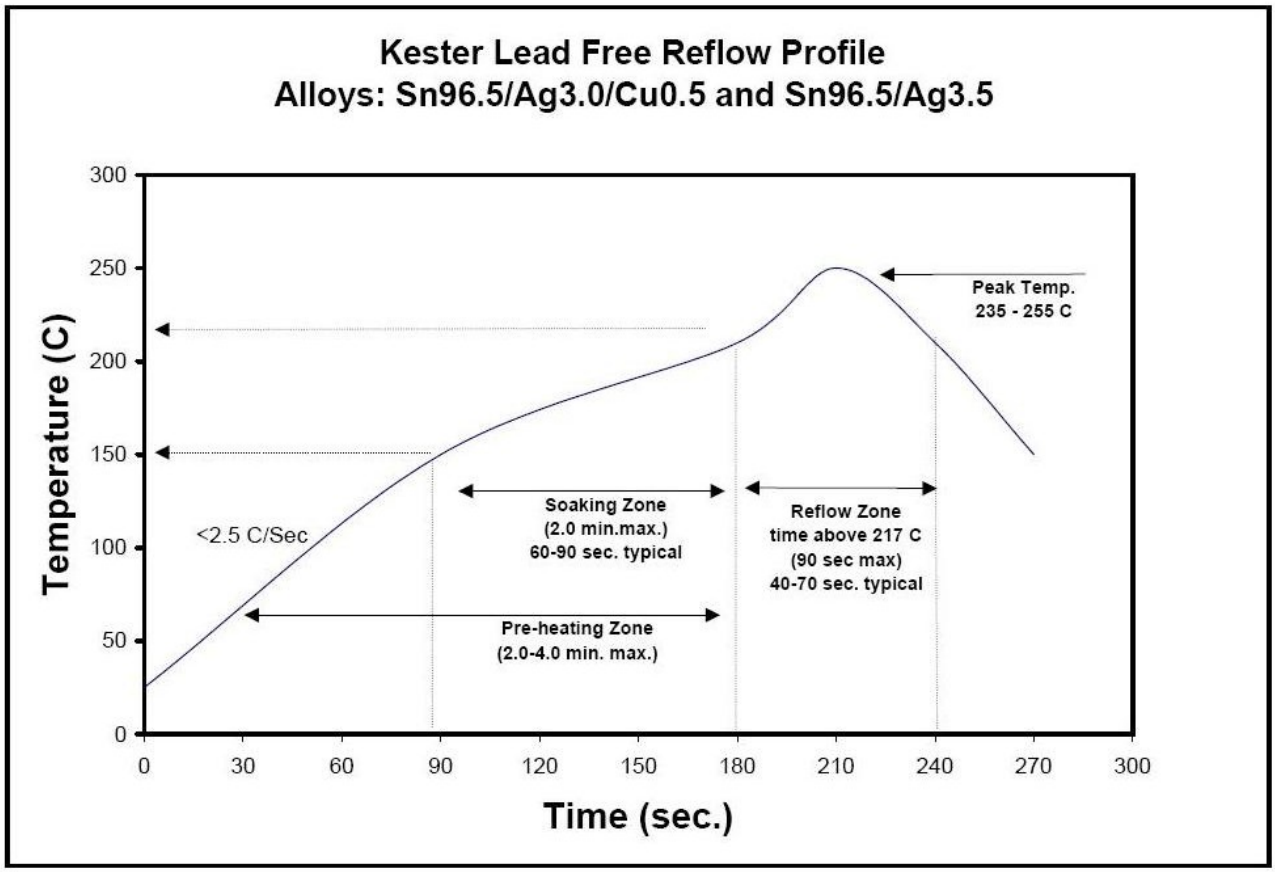
APPLICABLE DOCUMENTS

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

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 B 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 (both sets unmated)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (both sets unmated)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

*** - DWV on group B to be performed at Test Voltage**

DWV test voltage is equal to 75% of the lowest break down voltage from group 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. Greater than 5000 Meg Ohms

DWV = EIA-364-20, Test at 75% of the minimum breakdown voltage of the connector

FLOWCHARTS CONTINUED

IR & DWV

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

*** - DWV on group B to be performed at Test Voltage**

DWV test voltage is equal to 75% of the lowest break down voltage from group 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. Greater than 5000 Meg Ohms

DWV = EIA-364-20, Test at 75% of the minimum breakdown voltage of the connector

FLOWCHARTS CONTINUED

IR & DWV

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

*** - DWV on group B to be performed at Test Voltage**

DWV test voltage is equal to 75% of the lowest break down voltage from group 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. Greater than 5000 Meg Ohms

DWV = EIA-364-20, Test at 75% of the minimum breakdown voltage of the connector

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

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.

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.

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. 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).

RESULTS

Insulation Resistance minimums, IR

Pin to Pin

- **Initial**
  - **Mated ---------- 100000Meg Ω ---------- Pass**
  - **Unmated---------- 100000Meg Ω ---------- Pass**
- **Thermal**
  - **Mated ---------- 25000Meg Ω ---------- Pass**
  - **Unmated---------- 50000Meg Ω ---------- Pass**
- **Humidity**
  - **Mated ---------- 25000Meg Ω ---------- Pass**
  - **Unmated---------- 50000Meg Ω ---------- Pass**

Pin to Ground

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

Row to Row

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

RESULTS CONTINUED

Dielectric Withstanding Voltage minimums, DWV

Pin to Pin

- **Minimums**
  - **Breakdown Voltage ---------- 2200 VAC**
  - **Test Voltage ---------- 1650 VAC**
  - **Working Voltage ---------- 550 VAC**

Pin to Ground

- **Minimums**
  - **Breakdown Voltage ---------- 2500 VAC**
  - **Test Voltage ---------- 1875 VAC**
  - **Working Voltage ---------- 625 VAC**

Row to Row

- **Minimums**
  - **Breakdown Voltage ---------- 1800 VAC**
  - **Test Voltage ---------- 1350 VAC**
  - **Working Voltage ---------- 450 VAC**

Pin to Pin

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

Pin to Ground

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

Row to Row

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

DATA SUMMARIES

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	PETC/PESC	PETC	PESC
Initial	100000	100000	100000
Thermal	25000	100000	50000
Humidity	25000	50000	100000

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	PETC/PESC	PETC	PESC
Initial	100000	100000	100000
Thermal	15000	100000	15000
Humidity	100000	100000	100000

	Row to Row		
	Mated	Unmated	Unmated
Minimum	PETC/PESC	PETC	PESC
Initial	100000	100000	100000
Thermal	100000	100000	100000
Humidity	100000	50000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	PETC/PESC
Break Down Voltage	1800
Test Voltage	1350
Working Voltage	450

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

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

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

DATA

INSULATION RESISTANCE (IR):

Initial Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	A Unmated B	
	X	X	X
Sample#	PETC/PESC	PETC	PESC
101836-005	100000	100000	100000
101836-006	100000	100000	100000

	Pin to Ground		
	Mated	A Unmated B	
	X	X	X
Sample#	PETC/PESC	PETC	PESC
101836-005	100000	100000	100000
101836-006	100000	100000	100000

	Row to Row		
	Mated	A Unmated B	
	X	X	X
Sample#	PETC/PESC	PETC	PESC
101836-005	100000	100000	100000
101836-006	100000	100000	100000

DATA CONTINUED

Thermal Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	A Unmated B	
	X	X	X
Sample#	PETC/PESC	PETC	PESC
101836-005	25000	100000	50000
101836-006	100000	100000	100000

	Pin to Ground		
	Mated	A Unmated B	
	X	X	X
Sample#	PETC/PESC	PETC	PESC
101836-005	15000	100000	25000
101836-006	25000	100000	15000

	Row to Row		
	Mated	A Unmated B	
	X	X	X
Sample#	PETC/PESC	PETC	PESC
101836-005	100000	100000	100000
101836-006	100000	100000	100000

DATA CONTINUED

Humidity Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	A Unmated B	
	X	X	X
Sample#	PETC/PESC	PETC	PESC
101836-005	100000	100000	100000
101836-006	25000	50000	100000

	Pin to Ground		
	Mated	A Unmated B	
	X	X	X
Sample#	PETC/PESC	PETC	PESC
101836-005	100000	100000	100000
101836-006	100000	100000	100000

	Row to Row		
	Mated	A Unmated B	
	X	X	X
Sample#	PETC/PESC	PETC	PESC
101836-005	100000	50000	100000
101836-006	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#	PETC/PESC	PETC	PESC
101836-001	2500	2300	2200
101836-002	2300	2600	2500

	Pin to Ground		
	Mated	A Unmated B	
	X		
Sample#	PETC/PESC	PETC	PESC
101836-001	2800	3000	3200
101836-002	3000	3300	2500

	Row to Row		
	Mated	A Unmated B	
	X		
Sample#	PETC/PESC	PETC	PESC
101836-001	1900	1900	2000
101836-002	1800	1800	2100

DATA CONTINUED

Initial DWV	
Test Voltage=	1350

	Pin to Pin		
	Mated	A Unmated B	
Sample#	PETC/PESC	PETC	PESC
101836-005	1350	1350	1350
101836-006	1350	1350	1350

	Pin to Ground		
	Mated	A Unmated B	
Sample#	PETC/PESC	PETC	PESC
101836-005	1350	1350	1350
101836-006	1350	1350	1350

	Row to Row		
	Mated	A Unmated B	
Sample#	PETC/PESC	PETC	PESC
101836-005	1350	1350	1350
101836-006	1350	1350	1350

DATA CONTINUED

Thermal Test Voltage
Test Voltage=1350

	Pin to Pin		
	Mated	A Unmated B	
Sample#	PETC/PESC	PETC	PESC
101836-005	1350	1350	1350
101836-006	1350	1350	1350

	Pin to Ground		
	Mated	A Unmated B	
Sample#	PETC/PESC	PETC	PESC
101836-005	1350	1350	1350
101836-006	1350	1350	1350

	Row to Row		
	Mated	A Unmated B	
Sample#	PETC/PESC	PETC	PESC
101836-005	1350	1350	1350
101836-006	1350	1350	1350

DATA CONTINUED

Humidity Test Voltage
Test Voltage=1350

	Pin to Pin		
	Mated	A Unmated B	
Sample#	PETC/PESC	PETC	PESC
101836-005	1350	1350	1350
101836-006	1350	1350	1350

	Pin to Ground		
	Mated	A Unmated B	
Sample#	PETC/PESC	PETC	PESC
101836-005	1350	1350	1350
101836-006	1350	1350	1350

	Row to Row		
	Mated	A Unmated B	
Sample#	PETC/PESC	PETC	PESC
101836-005	1350	1350	1350
101836-006	1350	1350	1350

EQUIPMENT AND CALIBRATION SCHEDULES

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: 05/18/2010, Next Cal: 05/18/2011

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 08/16/2010, Next Cal: 02/16/2011

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 11/30/2009, Next Cal: 11/30/2010