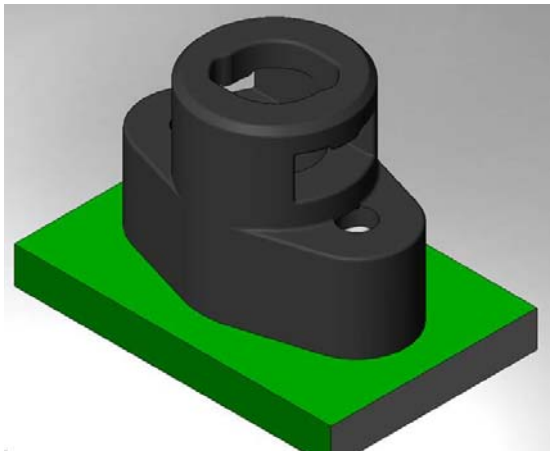
Project Number: Design Qualification Test Report	Tracking Code: 102681_Report_Rev_1		
Requested by: Tori Meek	Date: 1/14/2011	Product Rev: 0	
Part #: CCH-J-01/ RF25M-SCC21-303030-0100	Lot #: na	Tech: David Lieber	Eng: Eric Mings
Part description: Bullseye Test Point System		Qty to test: 20	
Test Start: 11/2/2010	Test Completed: 11/29/2010		



DESIGN QUALIFICATION TEST REPORT

CCH/RF25M

CCH-J-01/ RF25M-SCC21-303030-0100

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. 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) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
4) Any additional preparation will be noted in the individual test sequences.
5) Samtec Test PCBs used: PCB-102738-TST-XX/ PCB-102737-TST-XX/ PCB-102803-TST-XX

FLOWCHARTS

IR & DWV

TEST STEP	GROUP A1 4 Mated Sets Break Down Pin to Ground	GROUP A2 4 Unmated of Part # Being Tested Break Down Pin to Ground	GROUP A3 4 Unmated of Mating Part # Break Down Pin to Ground	GROUP B1 4 Mated Sets Break Down 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 (Mated and Undisturbed)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (Mated and Undisturbed)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

DWV on Group B1 to be performed at Test Voltage

DWV test voltage is equal to 75% of the lowest break down voltage from Groups A1, A2 or A3

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

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

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

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

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

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

FLOWCHARTS CONTINUED

Mechanical Shock / Vibration / LLCR

TEST STEP	GROUP A1 12 Signal / 12 Ground Points
01	LLCR-1
02	Shock
03	Vibration
04	LLCR-2

Mechanical Shock = EIA 364-27 Half Sine,

100 g's, 6 milliSeconds (Condition "C") each axis

Vibration = EIA 364-28, Random Vibration

7.56 g RMS, Condition VB --- 2 hours/axis

LLCR = EIA-364-23, LLCR

20 mV Max, 100 mA Max

Use Keithley 580 or 3706 in 4 wire dry circuit mode

Shock / Vibration / nanoSecond Event Detection

TEST STEP	GROUP A1 10 Signal / 10 Ground Points
01	Event Detection, Shock
02	Event Detection, Vibration

Mechanical Shock = EIA 364-27 Half Sine,

100 g's, 6 milliSeconds (Condition "C") each axis

Vibration = EIA 364-28, Random Vibration

7.56 g RMS, Condition VB --- 2 hours/axis

Event detection requirement during Shock / Vibration is 50 nanoseconds minimum

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.

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).

MECHANICAL SHOCK (Specified Pulse):

1) Reference document: EIA-364-27, *Mechanical Shock Test Procedure for Electrical Connectors*
2) Test Condition C
3) Peak Value: 100 G
4) Duration: 6 Milliseconds
5) Wave Form: Half Sine
6) Velocity: 12.3 ft/s
7) Number of Shocks: 3 Shocks / Direction, 3 Axis (18 Total)

VIBRATION:

1) Reference document: EIA-364-28, *Vibration Test Procedure for Electrical Connectors*
2) Test Condition V, Letter B
3) Power Spectral Density: 0.04 G^2 / Hz
4) G 'RMS': 7.56
5) Frequency: 50 to 2000 Hz
6) Duration: 2.0 Hours per axis (3 axis total)

NANOSECOND-EVENT DETECTION:

1) Reference document: EIA-364-87, *Nanosecond-Event Detection for Electrical Connectors*
2) Prior to test, the samples were characterized to assure the low nanosecond event being monitored will trigger the detector.
3) After characterization it was determined the test samples could be monitored for 50 nanosecond events

RESULTS

Insulation Resistance minimums, IR

Pin to Ground

- **Initial**
  - **Mated----------100,000 Meg Ω ---------- Pass**
- **Thermal**
  - **Mated----------100,000 Meg Ω ---------- Pass**
- **Humidity**
  - **Mated---------- 25,000 Meg Ω ---------- Pass**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage----------880 VAC**
  - **Test Voltage ----------660 VAC**
  - **Working Voltage ----------220 VAC**

Pin to Ground

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

LLCR Mechanical Shock & Random Vibration (8 Signal LLCR test points, 8 Ground LLCR test points)

Signal pins:

- **Initial ---------- 20.0 mOhms Max**
- **Shock & Vibration**
  - **<= +5.0 mOhms ----------8 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**

Ground pins:

- **Initial----------6.5 mOhms Max**
- **Shock & Vibration**
  - **<= +5.0 mOhms ----------8 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**

Mechanical Shock & Random Vibration:

- **Shock**
  - **No Damage---------- ---------- Passed**
  - **50 Nanoseconds---------- ---------- Passed**
- **Vibration**
  - **No Damage---------- ---------- Passed**
  - **50 Nanoseconds---------- ---------- Passed**

DATA SUMMARIES

INSULATION RESISTANCE (IR):

	Pin to Ground		
	Mated	Unmated	Unmated
Minimum	**CCH/RF25M**	**CCH**	**RF25M**
Initial	100000	100000	100000
Thermal	100000	100000	100000
Humidity	25000	100000	25000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**CCH/RF25M**
Break Down Voltage	880
Test Voltage	660
Working Voltage	220

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

DATA SUMMARIES CONTINUED

LLCR Shock & Vibration:

1) A total of 16 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

Signal pins:

Date	2010-11-11	2010-11-18
Room Temp C	23	23
RH	30%	32%
Name	Aaron McKim	Aaron McKim
mOhm values	**Actual Initial**	**Delta Shock/Vib**
Average	19.1	0.3
St. Dev.	0.7	0.6
Min	18.1	-0.6
Max	20.0	1.5
Count	8	8

How many samples are being tested?	2
How many contacts are on each board?	4

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Shock/Vib	8	0	0	0	0	0

DATA SUMMARIES CONTINUED

Ground pins:

Date	2010-11-11	2010-11-18
Room Temp C	23	23
RH	30%	32%
Name	Aaron McKim	Aaron McKim
mOhm values	**Actual Initial**	**Delta Shock/Vib**
Average	5.8	-0.2
St. Dev.	0.4	0.2
Min	5.1	-0.4
Max	6.5	0.1
Count	8	8

How many samples are being tested?	2
How many contacts are on each board?	4

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Shock/Vib	8	0	0	0	0	0

Nanosecond Event Detection:

Shock and Vibration Event Detection Summary	
Contacts tested	10
Test Condition	C, 100g's, 6ms, Half-Sine
Shock Events	0
Test Condition	V-B, 7.56 rms g
Vibration Events	0
Total Events	0

DATA

INSULATION RESISTANCE (IR):

Initial Insulation Resistance
Measured In Meg Ohms

	Pin to Ground		
	Mated	A Unmated B	
	X	X	X
Sample#	CCH/RF25M	CCH	RF25M
102681-009	100000	100000	100000
102681-010	100000	100000	100000

	Thermal Insulation Resistance		
	Measured In Meg Ohms		
	Pin to Ground		
	Mated	A Unmated B	
	X	X	X
Sample#	CCH/RF25M	CCH	RF25M
102681-009	100000	100000	100000
102681-010	100000	100000	100000

	Humidity Insulation Resistance		
	Measured In Meg Ohms		
	Pin to Ground		
	Mated	A Unmated B	
	X	X	X
Sample#	CCH/RF25M	CCH	RF25M
102681-009	25000	100000	25000
102681-010	100000	100000	100000

DATA CONTINUED

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial Breakdown Voltage
Test Voltage *Until Breakdown Occurs*

	Pin to Ground		
	Mated	A Unmated B	
	X		
Sample#	CCH/RF25M	CCH	RF25M
102681-001	940	1200	1200
102681-002	880	1200	1100

Initial DWV
Test Voltage= 660

	Pin to Ground		
	Mated	A Unmated B	
Sample#	CCH/RF25M	CCH	RF25M
102681-009	660	660	660
102681-010	660	660	660

Thermal Test Voltage
Test Voltage= 660

	Pin to Ground		
	Mated	A Unmated B	
Sample#	CCH/RF25M	CCH	RF25M
102681-009	660	660	660
102681-010	660	660	660

Humidity Test Voltage
Test Voltage= 660

	Pin to Ground		
	Mated	A Unmated B	
Sample#	CCH/RF25M	CCH	RF25M
102681-009	660	660	660
102681-010	660	660	660

DATA CONTINUED

LLCR Shock / Vibration:

Signal pins:

	mOhm values	Actual	Delta
Board	Position	Initial	Shock/Vib
1	P1	19.6	0.8
1	P3	19.9	0.4
1	P5	20.0	1.5
1	P7	19.2	-0.3
2	P1	19.0	0.4
2	P3	19.1	0.3
2	P5	18.1	-0.1
2	P7	18.2	-0.6

Ground pins:

	mOhm values	Actual	Delta
Board	Position	Initial	Shock/Vib
1	P2	6.5	-0.3
1	P4	5.1	-0.2
1	P6	5.5	0.1
1	P8	5.6	-0.2
2	P2	6.0	-0.4
2	P4	5.9	0.1
2	P6	5.7	-0.1
2	P8	5.8	-0.4

EQUIPMENT AND CALIBRATION SCHEDULES

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: 06/16/2010, Next Cal: 06/16/2011

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 02/24/2010, Next Cal: 02/24/2011

Equipment #: TSC-01
Description: Vertical Thermal Shock Chamber
Manufacturer: Cincinnatti Sub Zero
Model: VTS-3-6-6-SC/AC
Serial #: 10-VT14993
Accuracy: See Manual
… Last Cal: 5/18/2010, Next Cal: 5/18/2011

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

Equipment #: SVC-01
Description: Shock & Vibration Table
Manufacturer: Data Physics
Model: LE-DSA-10-20K
Serial #: 10037
Accuracy: See Manual
… Last Cal: 11/31/2009, Next Cal: 11/31/2010

Equipment #: ACLM-01
Description: Accelerometer
Manufacturer: PCB Piezotronics
Model: 352C03
Serial #: 115819

Accuracy: See Manual
… Last Cal: 07/09/2010, Next Cal: 07/09/2011

Equipment #: ED-03
Description: Event Detector
Manufacturer: Analysis Tech
Model: 32EHD
Serial #: 1100604
Accuracy: See Manual
… Last Cal: 06/04/2010, Next Cal: 06/04/2011