

JUNE 11, 2010

TEST REPORT #210199

S2SD CABLE ASSEMBLY QUALIFICATION TESTING

PART: T2SD-30-24-L-03.00-D-NDS

MATING PART: S2M-130-02-L-D-LC

SAMTEC, INC.



APPROVED BY: DOMINIC ARPINO
PROJECT ENGINEERING MANAGER
CONTECH RESEARCH, INC.
ATTLEBORO, MA

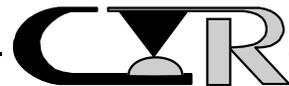


Contech Research

An Independent Test and Research Laboratory

REVISION HISTORY

DATE	REV. NO.	DESCRIPTION	ENG.
6/11/2010	1.0	Initial Issue	DA



CERTIFICATION

This is to certify that the T2SD series cable assembly evaluation described herein was designed and executed by personnel of Contech Research, Inc. It was performed with the concurrence of Samtec, Inc. of New Albany, IN who was the test sponsor.

All equipment and measuring instruments used during testing were calibrated and traceable to NIST according to ISO 10012-1, ANSI/NCSL Z540-1 and MIL-STD-45662 as applicable.

All data, raw and summarized, analysis and conclusions presented herein are the property of the test sponsor. No copy of this report, except in full, shall be forwarded to any agency, customer, etc., without the written approval of the test sponsor and Contech Research.



Dominic Arpino
Project Engineering Manager
Contech Research, Inc.
Attleboro, MA

da:cf



SCOPE

To perform Qualification testing on the T2SD series cable assembly as manufactured and submitted by the test sponsor, Samtec, Inc.

APPLICABLE DOCUMENTS

1. Unless otherwise specified, the following documents of issue in effect at the time of testing performed form a part of this report to the extent as specified herein. The requirements of sub-tier specifications and/or standards apply only when specifically referenced in this report.
2. Samtec Test Plan: T2SD Test Plan
3. Standard: EIA Publication 364

TEST SAMPLES AND PREPARATION

1. The following test samples were submitted by the test sponsor, Samtec, Inc., for the evaluation to be performed by Contech Research, Inc.

<u>Description</u>	<u>Part Number</u>
a) Part # being tested	T2SD-30-24-L-03.00-D-NDS
b) Mating part	S2M-130-02-L-D-LC

2. Mating parts were supplied assembled and terminated to test boards by the test sponsor. Specific test boards and cable assembly orientations were supplied for the following tests:
 - LLCR
 - IR and DWV
 - Shock & Vibration, nanosecond event detection
3. Test leads were attached to the appropriate measurement areas of the test samples and applicable mating elements.
4. The test samples were tested in their 'as received' condition.
5. Unless otherwise specified in the test procedures used, no further preparation was used.
6. The mated test samples were secured via a stabilizing medium to maintain mechanical stability during testing, as noted in the specific test procedures.



TEST SELECTION

1. See Test Plan Flow Diagram, Figure #1, for test sequences used.
2. Test set ups and/or procedures which are standard or common are not detailed or documented herein provided they are certified as being performed in accordance with the applicable (industry or military) test methods, standards and/or drawings as specified in the detail specification.

SAMPLE CODING

1. All samples were coded. Mated test samples remained with each other throughout the test group/sequences for which they were designated. Coding was performed in a manner which remained legible for the test duration.
2. The test samples were coded in the following manner:

Seq A: Group A1 - A-A1-1, A-A1-2
Group A2 - A-A2-1, A-A2-2
Group A3 - A-A3-1, A-A3-2
Group B - A-B-1, A-B-2

Seq B: Group A1 - B-A1-1, B-A1-2, B-A1-3, B-A1-4, B-A1-5,
B-A1-6, B-A1-7, B-A1-8
Group A2 - B-A2-1, B-A2-2, B-A2-3, B-A2-4, B-A2-5,
B-A2-6, B-A2-7, B-A2-8

Seq C: Group A - C-A-1, C-A-2, C-A-3, C-A-4, C-A-5,
C-A-6, C-A-7, C-A-8

Seq D: Group A - D-A-1, D-A-2, D-A-3

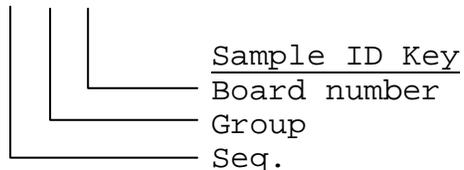
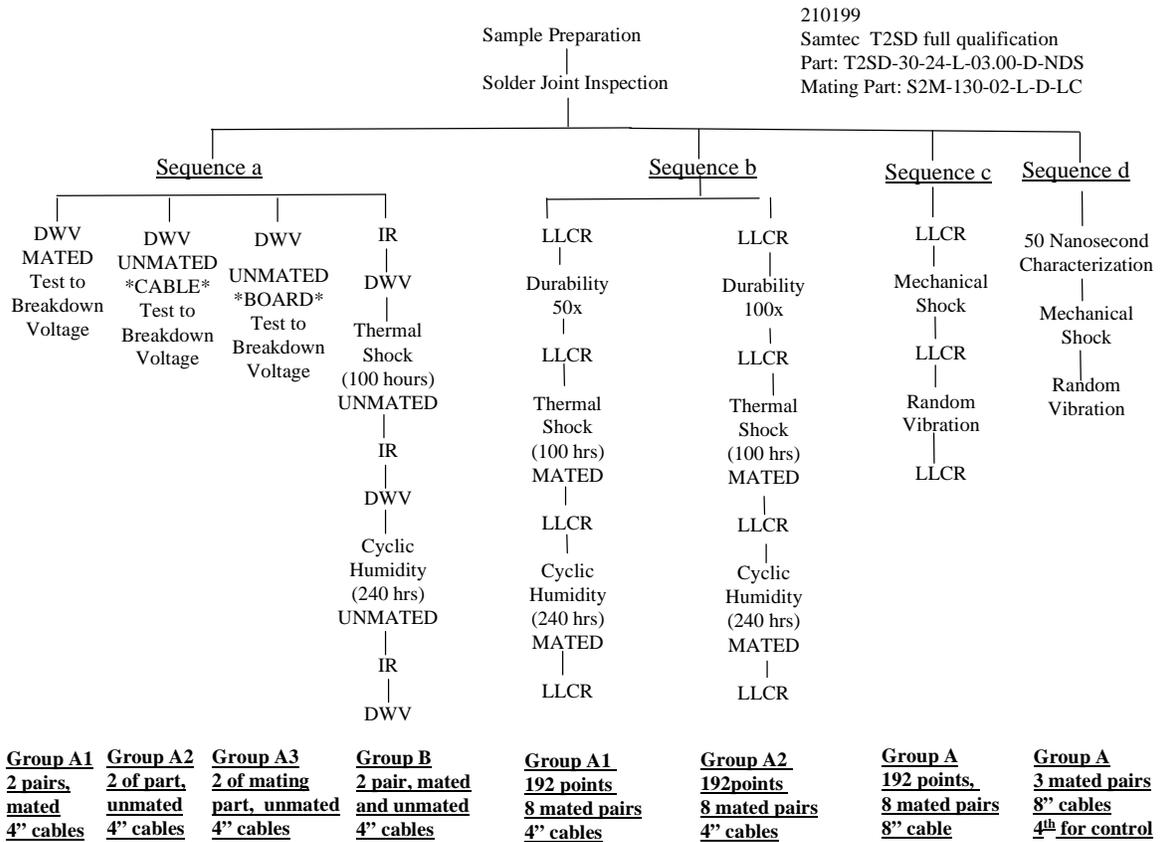
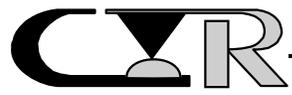


FIGURE #1

TEST PLAN FLOW DIAGRAM



IR : Insulation Resistance
 DWV : Dielectric Withstanding Voltage
 LLCR : Low Level Circuit Resistance



DATA SUMMARY

<u>TEST</u>	<u>REQUIREMENT</u>	<u>RESULTS</u>
<u>SEQUENCE A</u>		
GROUP A1		
DWV, BOTH MATED PAIRS	BREAKDOWN	1700 VAC
GROUP A2		
DWV, 2 CABLES, UNMATED	BREAKDOWN	1700 VAC
GROUP A3		
DWV, 2 BOARDS, UNMATED	BREAKDOWN	1660 VAC
<u>GROUP B</u>		
INITIAL		
IR, MATED PAIRS	>5000 MEGOHMS	50,000 MEGOHMS
IR, UNMATED	>5000 MEGOHMS	50,000 MEGOHMS
DWV, MATED PAIRS	1245 VAC	PASSED
DWV, UNMATED	1245 VAC	PASSED
POST THERMAL SHOCK		
THERMAL SHOCK	NO DAMAGE	PASSED
IR, MATED PAIRS	>5000 MEGOHMS	50,000 MEGOHMS
IR, UNMATED	>5000 MEGOHMS	50,000 MEGOHMS
DWV, MATED PAIRS	1245 VAC	PASSED
DWV, UNMATED	1245 VAC	PASSED
POST CYCLIC HUMIDITY		
CYCLIC HUMIDITY	NO DAMAGE	PASSED
IR, MATED PAIR A-B-1	>5000 MEGOHMS	50,000 MEGOHMS
IR, UNMATED A-B-1	>5000 MEGOHMS	50,000 MEGOHMS
IR, MATED PAIR A-B-2	>5000 MEGOHMS	15,000 MEGOHMS
IR, UNMATED A-B-2	>5000 MEGOHMS	25,000 MEGOHMS
DWV, MATED PAIRS	1245 VAC	PASSED
DWV, UNMATED	1245 VAC	PASSED

-continued on next page.



DATA SUMMARY -continued

<u>TEST</u>	<u>REQUIREMENT</u>	<u>RESULTS</u>
<u>SEQUENCE B -continued</u>		
GROUP A1		
LLCR DURABILITY (50X)	RECORD NO DAMAGE	35.5 MΩ MAX. PASSED
LLCR THERMAL SHOCK	+10.0 MΩ MAX.CHG. NO DAMAGE	+1.0 MΩ MAX.CHG. PASSED
LLCR CYCLIC HUMIDITY	+10.0 MΩ MAX.CHG. NO DAMAGE	+4.5 MΩ MAX.CHG. PASSED
LLCR	+10.0 MΩ MAX.CHG.	+12.6 MΩ MAX.CHG.
GROUP A2		
LLCR DURABILITY (100X)	RECORD NO DAMAGE	34.1 MΩ MAX. PASSED
LLCR THERMAL SHOCK	+10.0 MΩ MAX.CHG. NO DAMAGE	+2.0 MΩ MAX.CHG. PASSED
LLCR CYCLIC HUMIDITY	+10.0 MΩ MAX.CHG. NO DAMAGE	+4.5 MΩ MAX.CHG. PASSED
LLCR	+10.0 MΩ MAX.CHG.	+12.8 MΩ MAX.CHG.
<u>SEQUENCE C</u>		
LLCR MECHANICAL SHOCK	RECORD NO DAMAGE	59.7 MΩ MAX. PASSED
LLCR RANDOM VIBRATION	+10.0 MΩ MAX.CHG. NO DAMAGE	+2.8 MΩ MAX.CHG. PASSED
LLCR	+10.0 MΩ MAX.CHG.	+3.0 MΩ MAX.CHG.
<u>SEQUENCE D</u>		
MECHANICAL SHOCK	NO DAMAGE 50 NANOSECOND	PASSED PASSED
RANDOM VIBRATION	NO DAMAGE 50 NANOSECOND	PASSED PASSED



EQUIPMENT LIST

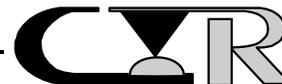
ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq.Cal
33			Vib. Power Amp	Ling Dynamics	MPA4	149	N/A	N/A
34			Shock Machine	Avco	SM110-3	1047	N/A	Ea Test
86			Shaker Table	MB Elect.	C10E	141	N/A	N/A
150			Drill Press Stand	Craftsman	25921	N/A	N/A	N/A
192	5/27/2010	5/27/2009	Vertical Thermal Shock	Cincinnati Sub-Zero	VTS-1-5-3	88-11094	See Cal Cert	Ea Test
200	1/19/2011	1/19/2010	Power Supply	PCB Piezotronics	482A	4210	N/A	12mon
315			X-Y Table	NE Affiliated Tech.	XY-6060	N/A	N/A	N/A
321	3/30/2011	3/30/2010	AC-DC Hipot/Megometer	Hipotronics Co.	H300B	DS16-201	See Cal Cert	12 mon.
421	4/24/2011	4/24/2010	Megohmmeter	Hipotronics Co.	HM3A	031423-00	See Cal Cert	12 mon.
466	12/3/2010	12/3/2009	Precision Resistor	Victoreen Co.	50,000 mego	N/A	± 1 %	12 mon.
553	3/19/2011	3/19/2010	12 channel Power Unit	PCB Co.	483A	1303	See Cal Cert	12mon
585	8/28/2010	8/28/2009	Digitizing Scope	Hewlett Packard Co.	54200A	2740A-02154	±2%	12mon
614			Oven	Tenney Co.	TH Jr.	9712-510	See Manual	Ea Test
628	10/20/2010	10/20/2009	Digital Thermometer	Omega Eng.	DP 116	6210125	±1.1DegC	12mon
681			Computer	ARC Co.	P166	N/A	N/A	N/A
1010			Plotter	Hewlett Packard	7225B	2160A2293	N/A	N/A
1028	2/16/2011	2/16/2010	Event Detector	Analysis Tech	32 EHD	981019	See Cal.Cert.	12mon
1156	3/17/2011	3/17/2010	High Voltage Probe	Fluke	80k-6	885967	See Cal Cert	12mon
1230			Temp-humid-Chamber	Blue M.	FRM-256B	FRM277	See Manual	Ea Test
1278	9/24/2010	9/24/2009	Microohm mtr	Keithley	580	0803947	See Manual	12mon
1360	2/2/2011	2/2/2010	Data Aquisition Multimeter	Keithley	2700	0914136	See Cal Cert	12mon
1438			Main Frame	Hewlett Packard	35650	2911A00927	N/A	Ea Test
1439	2/12/2011	2/12/2010	Programable DAC Unit	Hewlett Packard	35656B	3244A00342	See Cal Cert	12 mo
1440	2/12/2011	2/12/2010	8 Chan Input Module	Hewlett Packard	35655A	2911A02381	N/A	12mon
1457	1/19/2011	11/19/2010	Precision Resistor	Victorine	5KMOHM	465	See Cal Cert	12mon
1521	4/28/2011	4/28/2010	Accelerometer	PCB	353B04	118492	See Cal Cert	12mon
1549	2/2/2011	2/2/2010	Multiplexer Card	Keithley	7708	171629	See Cert	12mon
1550	2/2/2011	2/2/2010	Multiplexer Card	Keithley	7708	171626	See Cert	12mon



TEST RESULTS

SEQUENCE A

Group B



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 2 Samples

TECHNICIAN: S-R

START DATE: 5/5/10

COMPLETE DATE: 5/5/10

ROOM AMBIENT: 22°C

RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 421, 466, 1457

INSULATION RESISTANCE(IR)

PURPOSE:

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.

PROCEDURE:

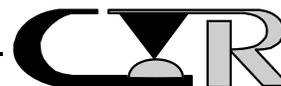
1. The test was performed in accordance with EIA 364, Test Procedure 21.
2. Test Conditions:
 - a) Between Adjacent Contacts : Yes
 - b) Mated Condition : Mated and Unmated
 - c) Mounting Condition : Mounted and Unmounted
 - d) Electrification Time : 2.0 Minutes
 - e) Test Voltage : 500 VDC
3. The test voltage was applied to specific test points on the test boards or cables.

REQUIREMENTS:

When the specified test voltage is applied, the insulation resistance shall not be less than 5,000 megohms.

RESULTS:

All test samples as tested met the requirements as specified.



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 2 Samples

TECHNICIAN: S-R

START DATE: 5/6/10

COMPLETE DATE: 5/6/10

ROOM AMBIENT: 22°C

RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 321, 1156

DIELECTRIC WITHSTANDING VOLTAGE (SEA LEVEL)

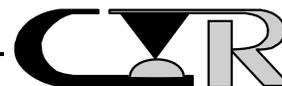
PURPOSE:

1. To determine if the connector can operate at its rated voltage and withstand momentary overpotentials due to switching, surges and other similar phenomenon.
2. To determine if the connectors maintain their dielectric integrity after being stressed by exposure to environmental conditioning.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 20.
2. Test Conditions:
 - a) Between Adjacent Contacts : Yes
 - b) Mated Condition : Mated and Unmated
 - c) Mounting Condition : Mounted and Unmounted
 - d) Hold Time : 60 Seconds
 - e) Rate of Application : 500 volts/sec.
 - f) Test Voltage : 75% of Breakdown Voltage
 - g) Applied Voltage : 1245 VAC
3. To determine the Applied Voltage as listed above, AC voltage was applied to the specified test points until breakdown. The Applied Voltage used was 75% of the minimum breakdown voltage as tested. The test samples were tested mated (Sequence a Group A1), and each T2SD cable and S2M connector was tested unmated (Sequence a Groups A2, A3) to determine the minimum breakdown voltage.

-continued on next page.



PROCEDURE:-continued

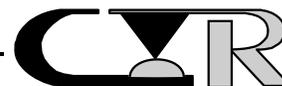
4. The voltage was applied to specific test points on each board or cable.

REQUIREMENTS:

When the specified test voltage is applied, there shall be no evidence of breakdown, arcing, etc.

RESULTS:

All test samples as tested met the requirements as specified.



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 2 Samples

TECHNICIAN: S-R

START DATE: 5/6/10

COMPLETE DATE: 5/11/10

ROOM AMBIENT: 22°C

RELATIVE HUMIDITY: 24%

EQUIPMENT ID#: 192, 1360, 1549, 1550

THERMAL SHOCK

PURPOSE:

To determine the resistance of a given electrical connector to exposure at extremes of high and low temperatures and the shock of alternate exposures to these extremes, simulating the worst probable conditions of storage, transportation and application.

PROCEDURE:

1. The test environment was performed in accordance with EIA 364, Test Procedure 32, Method A, Test Condition I.
2. Test Conditions:
 - a) Number of Cycles : 100 Cycles
 - b) Hot Extreme : +85°C +3°C/-0°C
 - c) Cold Extreme : -55°C +0°C/-3°C
 - d) Time at Temperature : 30 Minutes
 - e) Mating Conditions : Unmated
 - f) Mounting Conditions : Mounted and Unmounted
 - g) Transfer Time : Instantaneous
3. The total number of cycles was performed continuously.
4. All subsequent variable testing was performed in accordance with the procedures as previously indicated.
5. Prior to performing variable measurements, the test samples were allowed to recover to room ambient conditions.

-continued on next page.



PROCEDURE: -continued

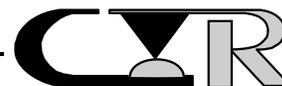
6. Testing was completed within 1 hour of removal of the samples from the chamber.

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples as tested.
2. The insulation resistance shall not be less than 5,000 megohms.
3. When a 1245 VAC test voltage is applied, there shall be no evidence of arcing, breakdown, etc.

RESULTS:

1. There was no evidence of physical damage to the test samples as tested.
2. The insulation resistance exceeded 5,000 megohms.
3. There was no evidence of arcing, breakdown, etc., when a 1245 VAC voltage was applied.



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 2 Samples

TECHNICIAN: S-R

START DATE: 5/13/10

COMPLETE DATE: 5/24/10

ROOM AMBIENT: 22°C

RELATIVE HUMIDITY: 24%

EQUIPMENT ID#: 614, 628, 1230, 1360, 1549, 1550

HUMIDITY (THERMAL CYCLING)

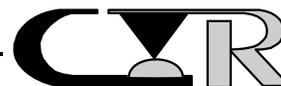
PURPOSE:

The purpose of this test is to permit evaluation of the properties of materials used in connectors as they are influenced or deteriorated by the effects of high humidity and heat conditions. Measurements made under high humidity conditions may reflect the peculiar conditions under which the readings were made, and should be compared only to initial readings when careful analysis indicates that such a comparison is valid and applicable.

PROCEDURE:

1. The test environment was performed in accordance with EIA 364, Test Procedure 31, Test Condition B, Method III (omitting steps 7a and 7b).
2. Test Conditions:
 - a) Preconditioning (24 hours) : 50°C ± 5°C
 - b) Relative Humidity : 90% to 98%
 - c) Temperature Conditions : 25°C to 65°C
 - d) Cold Cycle : No
 - e) Polarizing Voltage : No
 - f) Mating Conditions : Unmated
 - g) Mounting Conditions : Mounted and Unmounted
 - h) Duration : 240 hours
3. Prior to performing variable measurements, the test samples were allowed to recover to room ambient conditions.

-continued on next page.



PROCEDURE:-continued

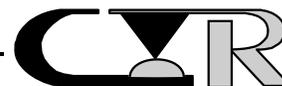
4. All subsequent variable testing was performed in accordance with the procedures as previously indicated.
5. The voltage was applied to specific test points on the board or cable.
6. Testing was completed within 1 hour of removal of the samples from the chamber.

REQUIREMENTS:

1. There shall be no evidence of physical deterioration of the test samples as tested.
2. The insulation resistance shall not be less than 5,000 megohms.
3. There shall be no evidence of arcing or breakdown when a 1245 VAC test voltage is applied.

RESULTS:

1. The test samples as tested showed no evidence of physical deterioration.
2. The insulation resistance exceeded 5000 megohms.
3. There was no evidence of breakdown, arcing, etc., when a 1245 VAC test voltage was applied.

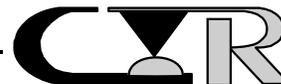


TEST RESULTS

SEQUENCE B

Group A1

Group A2



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 16 Samples

TECHNICIAN: S-R

START DATE: 5/5/10

COMPLETE DATE: 5/5/10

ROOM AMBIENT: 21°C

RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 681, 1278

LOW LEVEL CIRCUIT RESISTANCE (LLCR)

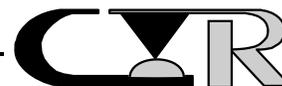
PURPOSE:

1. To evaluate contact resistance characteristics of the contact systems under conditions where applied voltages and currents do not alter the physical contact interface and will detect oxides and films which degrade electrical stability. It is also sensitive to and may detect the presence of fretting corrosion induced by mechanical or thermal environments as well as any significant loss of contact pressure.
2. This attribute was monitored after each preconditioning and/or test exposure in order to determine said stability of the contact systems as they progress through the applicable test sequences.
3. The electrical stability of the system is determined by comparing the initial resistance value to that observed after a given test exposure. The difference is the change in resistance occurring whose magnitude establishes the stability of the interface being evaluated.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 23.

-continued on next page.



PROCEDURE: -continued

2. Test Conditions:

- a) Test Current : 10 milliamps maximum
- b) Open Circuit Voltage : 20 millivolts
- c) No. of Positions Tested : 22 per test sample

REQUIREMENTS:

Low level circuit resistance shall be measured and recorded.

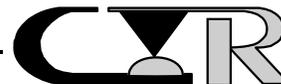
RESULTS:

1. The following is a summary of the data observed:

LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

<u>Sample ID#</u>	<u>Avg.</u>	<u>Max.</u>	<u>Min.</u>
B-A1-1	32.5	34.3	31.8
B-A1-2	32.4	31.7	31.9
B-A1-3	33.1	35.5	32.6
B-A1-4	32.5	33.1	31.8
B-A1-5	33.1	33.9	32.4
B-A1-6	33.0	33.9	32.3
B-A1-7	33.3	33.9	32.2
B-A1-8	32.5	33.5	31.6
B-A2-1	32.9	33.5	32.3
B-A2-2	33.3	34.0	2.8
B-A2-3	33.2	34.1	32.4
B-A2-4	33.3	34.1	32.4
B-A2-5	33.2	33.9	32.6
B-A2-6	33.1	33.9	32.2
B-A2-7	32.6	33.6	32.1
B-A2-8	33.2	34.0	32.2

2. See data files 21019901 through 21019916 for individual data points.



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 16 Samples

TECHNICIAN: S-R

START DATE: 5/6/10

COMPLETE DATE: 5/6/10

ROOM AMBIENT: 21°C

RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 150, 315, 681, 1278

DURABILITY

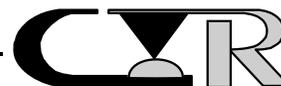
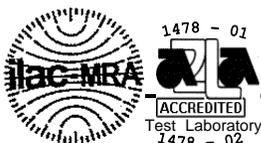
PURPOSE:

1. This is a conditioning sequence which is used to induce the type of wear on the contacting surfaces which may occur under normal service conditions. The connectors are mated and unmated a predetermined number of cycles. Upon completion, the units being evaluated are exposed to the environments as specified to assess any impact on electrical stability resulting from wear or other wear dependent phenomenon.
2. This type of conditioning sequence is also used to mechanically stress the connector system as would normally occur in actual service. This sequence in conjunction with other tests is used to determine if a significant loss of contact pressure occurs from said stresses which in turn, may result in an unstable electrical condition to exist.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 09.
2. Test Conditions:
 - a) No. of Cycles : 50 - Group A1; 100 - Group A2
 - b) Rate : 1.0 inch per minute
3. The part (cable) was assembled to special holding devices; the mating part (LLCR board) was attached to an X-Y table. Speed is approximate.

-continued on next page.



PROCEDURE: -continued

4. The test samples were axially aligned to accomplish the mating and unmating function allowing for self-centering movement.
5. Care was taken to prevent the mating faces of the test samples from contacting each other.
6. All subsequent variable testing was performed in accordance with the procedures previously indicated.

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples so tested.
2. The change in low level circuit resistance shall not exceed +10.0 milliohms.

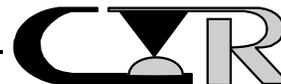
RESULTS:

1. There was no evidence of physical damage to the test samples as tested.
2. The following is a summary of the data observed:

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
B-A1-1	+0.0	+0.4
B-A1-2	+0.0	+0.7
B-A1-3	+0.0	+0.6
B-A1-4	+0.1	+0.5
B-A1-5	-0.1	+1.0
B-A1-6	-0.1	+0.4
B-A1-7	-0.1	+0.4
B-A1-8	+0.0	+0.4

-continued on next page.

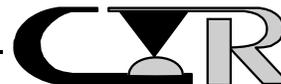


RESULTS:-continued

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
B-A2-1	+0.0	+0.4
B-A2-2	+0.1	+1.2
B-A2-3	+0.2	+1.0
B-A2-4	+0.1	+1.6
B-A2-5	+0.3	+1.6
B-A2-6	+0.1	+2.0
B-A2-7	+0.2	+0.7
B-A2-8	+0.1	+0.5

3. See data files 21019901 through 21019916 for individual data points.



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 16 Samples

TECHNICIAN: S-R

START DATE: 5/6/10

COMPLETE DATE: 5/10/10

ROOM AMBIENT: 22°C

RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 192, 1360, 1549, 1550

THERMAL SHOCK

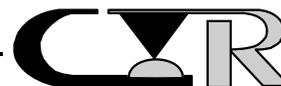
PURPOSE:

To determine the resistance of a given electrical connector to exposure at extremes of high and low temperatures and the shock of alternate exposures to these extremes, simulating the worst probable conditions of storage, transportation and application.

PROCEDURE:

1. The test environment was performed in accordance with EIA 364, Test Procedure 32, Method A, Test Condition I.
2. Test Conditions:
 - a) Number of Cycles : 100 Cycles
 - b) Hot Extreme : +85°C +3°C/-0°C
 - c) Cold Extreme : -55°C +0°C/-3°C
 - d) Time at Temperature : 30 Minutes
 - e) Mating Conditions : Mated
 - f) Mounting Conditions : Mounted
 - g) Transfer Time : Instantaneous
3. The total number of cycles were performed continuously.
4. All subsequent variable testing was performed in accordance with the procedures as previously indicated.
5. Prior to performing variable measurements, the test samples were allowed to recover to room ambient conditions.

REQUIREMENTS: See Next Page



REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples as tested.
2. The change in low level circuit resistance shall not exceed +10.0 milliohms.

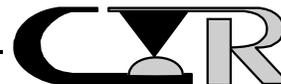
RESULTS:

1. There was no evidence of physical damage to the test samples as tested.
2. The following is a summary of the data observed:

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
B-A1-1	+0.2	+2.5
B-A1-2	+0.9	+4.5
B-A1-3	+0.2	+0.9
B-A1-4	+0.5	+2.2
B-A1-5	+0.1	+1.8
B-A1-6	+0.1	+0.9
B-A1-7	+0.4	+1.8
B-A1-8	+0.6	+1.7
B-A2-1	+1.2	+3.0
B-A2-2	+0.3	+1.4
B-A2-3	+1.4	+4.5
B-A2-4	+0.6	+3.2
B-A2-5	+0.9	+2.2
B-A2-6	+0.5	+3.2
B-A2-7	+1.1	+2.7
B-A2-8	+1.0	+4.1

3. See data files 21019901 through 21019916 for individual data points.



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 16 Samples

TECHNICIAN: S-R

START DATE: 5/13/10

COMPLETE DATE: 5/24/10

ROOM AMBIENT: 22°C

RELATIVE HUMIDITY: 24%

EQUIPMENT ID#: 614, 628, 1230, 1360, 1549, 1550

HUMIDITY (THERMAL CYCLING)

PURPOSE:

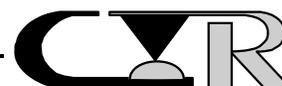
To evaluate the impact on electrical stability of the contact system when exposed to any environment which may generate thermal/moisture type failure mechanisms such as:

- a) Fretting corrosion due to wear resulting from micromotion, induced by thermal cycling. Humidity accelerates the oxidation process.
- b) Oxidation of wear debris or from particulates from the surrounding atmosphere which may have become entrapped between the contacting surfaces.
- c) Failure mechanisms resulting from a wet oxidation process.

PROCEDURE:

1. The test environment was performed in accordance with EIA 364, Test Procedure 31, Test Condition B, Method III (omitting steps 7a and 7b) with the following conditions.

-continued on next page.



PROCEDURE:-continued

2. Test Conditions:

- a) Preconditioning (24 hours) : 50°C ± 5°C
- b) Relative Humidity : 90% to 98%
- c) Temperature Conditions : 25°C to 65°C
- d) Cold Cycle : No
- e) Polarizing Voltage : No
- f) Mating Conditions : Mated
- g) Mounting Conditions : Mounted
- h) Duration : 240 hours

3. Prior to performing variable measurements, the test samples were allowed to recover to room ambient conditions.

4. All subsequent variable testing was performed in accordance with the procedures previously indicated.

REQUIREMENTS:

- 1. There shall be no evidence of physical deterioration of the test samples as tested.
- 2. The change in low level circuit resistance shall not exceed +10.0 milliohms.

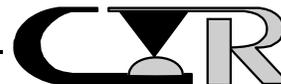
RESULTS:

- 1. The test samples as tested showed no evidence of physical deterioration.
- 2. The following is a summary of the data observed:

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
B-A1-1	+1.6	+10.6
B-A1-2	+1.5	+9.8
B-A1-3	+1.0	+6.5
B-A1-4	+1.6	+7.2
B-A1-5	+0.9	+5.4

-continued on next page.

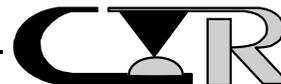


RESULTS -continued

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
B-A1-6	+1.7	+4.8
B-A1-7	+2.2	+12.6
B-A1-8	+2.3	+8.2
B-A2-1	+2.0	+6.1
B-A2-2	+1.6	+6.5
B-A2-3	+1.6	+8.6
B-A2-4	+2.7	+7.6
B-A2-5	+2.5	+12.8
B-A2-6	+0.5	+3.4
B-A2-7	+1.7	+5.9
B-A2-8	+3.0	+9.3

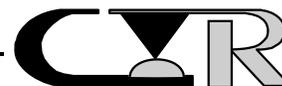
3. See data files 21019901 through 21019916 for individual data points.



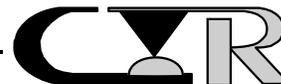
LLCR DATA FILES

FILE NUMBERS

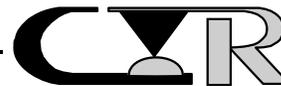
21019901
21019902
21019903
21019904
21019905
21019906
21019907
21019908
21019909
210199010
210199011
210199012
210199013
210199014
210199015
210199016



Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A1	
Product: T2SD Series Connector			File No: 21019901	
Description: ID# B-A1-1			Tech: S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	50X	T-Shock	C. humidity
1	32.3	0.0	0.6	10.6
2	32.2	0.2	0.1	0.1
3	32.5	0.0	0.2	1.3
4	32.8	0.0	1.5	0.0
5	32.6	-0.3	0.6	0.2
6	32.3	0.1	0.3	0.4
7	31.8	-0.1	1.2	1.2
8	32.6	0.3	0.6	0.4
9	32.7	0.1	-0.1	1.3
10	32.5	0.4	0.2	0.2
11	32.5	-0.1	0.3	0.4
12	32.7	0.1	1.2	2.1
13	32.4	-0.1	0.9	1.9
14	32.1	0.0	0.1	2.4
15	32.2	0.1	0.2	2.0
16	32.1	0.0	0.2	1.9
17	32.3	0.4	0.5	0.5
18	33.8	-0.7	-0.2	0.6
19	32.4	0.2	0.0	1.0
20	32.5	0.3	0.8	5.8
21	32.3	0.2	0.4	0.6
22	32.8	0.4	2.5	4.4
23	32.3	0.1	1.0	1.5
24	34.3	-1.7	-1.1	-1.6
MAX	34.3	0.4	2.5	10.6
MIN	31.8	-1.7	-1.1	-1.6
AVG	32.5	0.0	0.5	1.6
STD	0.5	0.4	0.7	2.4
Open	0	0	0	0
Tech	S-R	S-R	S-R	AJP
Equip ID	681	681	681	244
	1278	1278	1278	1647



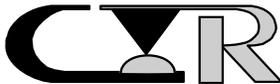
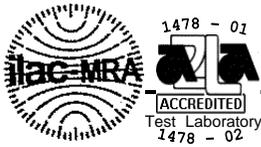
Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A1	
Product: T2SD Series Connector			File No: 21019902	
Description: ID# B-A1-2			Tech: S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	50X	T-Shock	Cyc Humid
1	32.5	0.1	2.4	9.8
2	32.3	0.0	0.7	0.5
3	32.2	0.3	1.6	0.8
4	32.8	-0.1	0.7	1.9
5	32.4	-0.3	0.1	1.2
6	32.4	-0.2	-0.1	0.6
7	32.3	-0.6	0.4	0.7
8	32.1	-0.2	2.2	2.6
9	32.3	0.0	0.5	0.9
10	32.3	0.3	0.9	0.5
11	32.6	0.7	4.5	1.1
12	33.1	-0.3	1.9	2.2
13	32.6	-0.2	1.8	2.5
14	32.5	0.1	0.4	1.5
15	32.4	-0.3	0.5	-0.1
16	32.6	0.1	0.2	1.8
17	32.3	0.2	0.5	0.3
18	32.6	0.1	0.2	-0.2
19	32.1	0.2	0.4	4.0
20	31.9	0.5	0.6	0.7
21	32.2	0.1	0.6	0.3
22	32.1	0.2	0.4	2.2
23	32.0	-0.1	0.1	1.5
24	32.2	-0.4	0.0	-0.4
MAX	31.7	0.7	4.5	9.8
MIN	31.9	-0.6	-0.1	-0.4
AVG	32.4	0.0	0.9	1.5
STD	0.3	0.3	1.0	2.0
Open	0	0	0	0
Tech	S-R	S-R	S-R	RT
Equip ID	681	681	681	681
	1278	1278	1278	1278



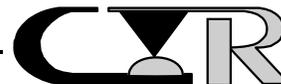
Contech Research

An Independent Test and Research Laboratory

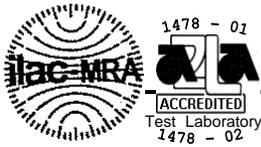
Low Level Circuit Resistance - Delta Values				
Project: 210199		Spec: EIA 364,TP23		
Customer: Samtec		Subgroup: Seq b Gp A1		
Product: T2SD Series Connector		File No: 21019903		
Description: ID# B-A1-3		Tech: S-R		
Open circuit voltage: 20mV		Current:		10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	Initial	50X	T-Shock	Cyc Humid
1	33.6	-0.8	-0.7	-0.5
2	32.9	-0.3	-0.2	0.2
3	33.2	-0.3	0.0	1.3
4	33.7	-0.3	0.1	-0.4
5	33.1	-0.4	-0.2	1.1
6	32.9	-0.2	0.3	0.8
7	32.7	-0.4	0.2	1.0
8	32.6	0.6	0.4	3.3
9	32.6	0.3	0.4	0.4
10	32.8	0.5	0.7	1.0
11	32.6	0.4	0.9	2.3
12	33.1	0.3	0.1	0.1
13	32.8	0.2	0.4	0.6
14	32.9	-0.1	0.3	0.3
15	32.9	0.0	0.4	3.0
16	33.2	0.1	0.7	1.3
17	33.0	0.3	0.4	6.5
18	33.0	0.6	0.5	1.0
19	35.5	-0.5	0.8	-1.9
20	33.3	-0.4	-0.1	1.3
21	33.0	0.0	0.1	0.4
22	33.6	0.4	-0.4	1.4
23	32.7	-0.1	0.1	0.2
24	33.0	-0.4	-0.4	0.2
MAX	35.5	0.6	0.9	6.5
MIN	32.6	-0.8	-0.7	-1.9
AVG	33.1	0.0	0.2	1.0
STD	0.6	0.4	0.4	1.6
Open	0	0	0	0
Tech	S-R	S-R	S-R	RT
Equip ID	681	681	681	681
	1278	1278	1278	1278



Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A1	
Product: T2SD Series Connector			File No: 21019904	
Description: ID# B-A1-4			Tech: S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	50X	T-Shock	Cyc Humid
1	33.1	0.0	-0.2	7.2
2	32.2	0.2	1.2	3.9
3	32.6	0.3	2.2	0.5
4	32.1	-0.2	-0.3	2.4
5	32.4	0.2	0.9	3.0
6	32.6	-0.3	0.9	2.3
7	31.8	0.0	0.0	0.5
8	31.8	0.1	1.2	1.5
9	32.0	0.3	0.1	0.6
10	32.6	-0.2	-0.5	0.1
11	31.9	0.5	0.1	3.2
12	32.0	0.0	0.6	2.0
13	32.9	0.0	-0.1	0.3
14	33.1	0.1	1.4	1.2
15	32.7	0.4	0.3	3.0
16	33.1	0.5	0.2	0.0
17	33.0	-0.3	0.7	0.8
18	33.1	0.5	-0.8	4.9
19	32.4	0.3	0.9	-0.1
20	33.0	-0.2	-0.3	0.5
21	33.0	0.0	1.0	1.4
22	32.7	0.1	0.3	0.5
23	32.2	0.1	0.6	-0.3
24	32.3	0.3	0.4	0.1
MAX	33.1	0.5	2.2	7.2
MIN	31.8	-0.3	-0.8	-0.3
AVG	32.5	0.1	0.5	1.6
STD	0.5	0.2	0.7	1.8
Open	0	0	0	0
Tech	S-R	S-R	S-R	RT
Equip ID	681	681	681	681
	1278	1278	1278	1278



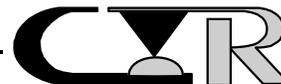
Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A1	
Product: T2SD Series Connector			File No: 21019905	
Description: ID# B-A1-5			Tech: S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	50X	T-Shock	C. Humidity
1	33.2	0.2	-0.4	4.5
2	32.5	-0.1	0.1	0.2
3	33.4	-0.3	-0.3	0.2
4	32.9	0.0	0.1	0.3
5	32.9	0.0	0.0	0.3
6	33.2	0.1	0.4	1.1
7	32.4	0.0	-0.3	0.3
8	32.6	0.0	1.2	3.7
9	33.0	0.1	0.7	5.4
10	33.3	-0.3	0.8	0.6
11	33.0	0.0	0.2	0.9
12	32.9	0.0	0.1	1.1
13	33.2	0.3	0.0	0.8
14	33.0	-0.4	-0.2	0.2
15	33.2	-0.2	0.0	-0.4
16	33.1	0.0	0.5	0.4
17	32.9	0.3	0.6	0.9
18	33.6	-0.1	0.5	0.3
19	33.9	-0.6	-1.0	0.0
20	33.3	-0.3	-0.2	-0.4
21	33.2	-0.2	-0.4	0.0
22	33.5	-0.4	-0.3	1.5
23	33.2	-0.2	-0.3	0.3
24	33.4	1.0	1.8	0.2
MAX	33.9	1.0	1.8	5.4
MIN	32.4	-0.6	-1.0	-0.4
AVG	33.1	-0.1	0.1	0.9
STD	0.3	0.3	0.6	1.5
Open	0	0	0	0
Tech	S-R	S-R	S-R	AJP
Equip ID	681	681	681	244
	1278	1278	1278	1647



Contech Research

An Independent Test and Research Laboratory

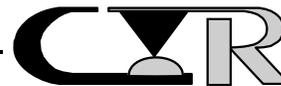
Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A1	
Product: T2SD Series Connector			File No: 21019906	
Description: ID# B-A1-6			Tech: S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	50X	T-Shock	Cyc Humid
1	32.9	0.2	0.6	3.0
2	32.6	-0.1	0.1	1.7
3	32.7	-0.2	-0.1	1.1
4	33.3	-0.5	0.4	2.9
5	32.9	-0.5	0.2	2.8
6	32.3	0.1	0.3	1.5
7	32.6	0.0	0.0	1.9
8	32.8	0.0	0.1	0.4
9	32.6	-0.2	0.3	3.1
10	32.9	-0.1	0.0	1.1
11	33.0	-0.3	-0.3	2.5
12	33.0	0.0	-0.1	0.3
13	33.5	-0.4	0.1	2.6
14	33.1	-0.4	0.3	4.8
15	33.6	-0.1	-0.3	2.0
16	33.0	0.0	0.2	1.1
17	33.4	0.3	0.0	1.7
18	33.2	0.3	0.4	0.3
19	32.6	0.0	-0.1	0.5
20	33.9	-1.2	-0.9	1.9
21	33.6	-0.2	-0.2	0.6
22	33.2	-0.3	-0.4	1.8
23	32.8	-0.2	-0.1	0.0
24	32.5	0.4	0.9	1.6
MAX	33.9	0.4	0.9	4.8
MIN	32.3	-1.2	-0.9	0.0
AVG	33.0	-0.1	0.1	1.7
STD	0.4	0.3	0.4	1.1
Open	0	0	0	0
Tech	S-R	S-R	S-R	RT
Equip ID	681	681	681	681
	1278	1278	1278	1278



Contech Research

An Independent Test and Research Laboratory

Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A1	
Product: T2SD Series Connector			File No: 21019907	
Description: ID# B-A1-7			Tech: S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	50X	T-Shock	C. humidity
1	33.0	0.0	1.8	1.5
2	33.1	-0.3	0.6	1.6
3	32.9	0.0	0.7	1.6
4	33.3	-0.4	0.9	9.3
5	33.5	-0.1	0.5	2.1
6	33.2	-0.5	0.8	3.7
7	32.7	0.0	0.7	0.5
8	32.2	0.1	0.1	1.8
9	33.5	0.0	0.0	-0.2
10	33.3	-0.4	0.1	2.7
11	33.3	-0.2	0.2	1.6
12	33.2	0.2	0.3	0.3
13	33.8	-0.5	-0.8	-1.1
14	33.8	-0.3	0.0	-0.3
15	33.9	-0.4	0.2	12.6
16	32.9	-0.4	0.5	0.3
17	33.8	-0.1	0.3	2.0
18	33.3	0.1	0.5	1.4
19	33.1	0.3	0.5	0.6
20	33.9	-0.2	0.7	3.4
21	33.3	0.1	0.4	5.8
22	32.9	-0.1	0.3	0.3
23	33.3	-0.1	0.4	1.1
24	33.1	0.4	0.3	1.3
MAX	33.9	0.4	1.8	12.6
MIN	32.2	-0.5	-0.8	-1.1
AVG	33.3	-0.1	0.4	2.2
STD	0.4	0.3	0.5	3.1
Open	0	0	0	0
Tech	S-R	S-R	S-R	AJP
Equip ID	681	681	681	244
	1278	1278	1278	1647



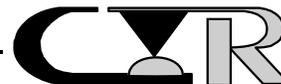
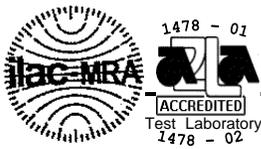
Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A1	
Product: T2SD Series Connector			File No: 21019908	
Description: ID# B-A1-8			Tech: S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	50X	T-Shock	C. Humidity
1	32.2	0.0	0.6	1.3
2	32.1	-0.3	0.5	1.0
3	32.6	-0.2	-0.1	4.1
4	32.2	-0.1	0.0	2.6
5	31.6	-0.2	0.7	3.4
6	32.0	0.0	1.2	1.1
7	31.9	0.4	0.3	0.4
8	31.8	-0.1	1.7	4.5
9	32.4	-0.1	-0.7	0.6
10	32.0	0.4	0.4	1.4
11	32.3	0.1	1.1	0.3
12	32.3	-0.1	1.2	3.7
13	32.6	0.2	1.0	2.3
14	33.2	0.0	-0.1	2.8
15	33.5	0.1	1.5	8.2
16	33.1	0.3	1.3	2.6
17	32.7	0.3	1.6	0.7
18	33.1	-0.2	0.3	0.1
19	33.1	0.0	0.5	6.8
20	32.8	-0.1	0.3	-0.2
21	33.2	-0.2	-0.2	0.7
22	32.2	-0.4	1.4	0.6
23	32.3	-0.1	0.1	0.3
24	32.5	-0.1	0.3	1.9
MAX	33.5	0.4	1.7	8.2
MIN	31.6	-0.4	-0.7	-0.2
AVG	32.5	0.0	0.6	2
STD	0.5	0.2	0.7	2.1
Open	0	0	0	0
Tech	S-R	S-R	S-R	AJP
Equip ID	681	681	681	244
	1278	1278	1278	1647



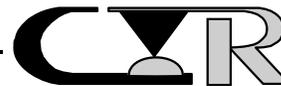
Contech Research

An Independent Test and Research Laboratory

Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A2	
Product: T2SD Series Connector			File No: 21019909	
Description: ID# B-A2-1			Tech:S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	100X	T-Shock	C. humidity
1	32.6	0.0	0.5	1.7
2	32.5	0.2	1.8	1.7
3	33.5	-0.6	1.3	1.5
4	32.9	-0.1	0.9	0.9
5	32.6	0.1	1.0	5.5
6	32.7	-0.1	0.7	2.4
7	32.7	-0.1	0.8	-0.4
8	32.4	-0.1	0.7	4.5
9	32.3	0.1	2.0	2.7
10	33.4	-0.3	2.3	2.4
11	33.0	0.1	1.5	2.4
12	32.7	0.1	0.4	1.0
13	33.3	0.2	1.6	6.1
14	33.0	-0.4	0.4	3.9
15	32.9	0.0	1.0	4.1
16	32.5	0.4	0.6	2.3
17	33.4	-0.3	3.0	1.3
18	33.3	0.2	1.9	1.3
19	32.7	0.4	1.0	0.3
20	33.4	0.1	0.5	-2.4
21	33.1	-0.4	1.9	2.4
22	32.9	0.3	1.8	3.8
23	33.5	0.0	2.0	0.1
24	32.9	-0.1	-0.2	-1.6
MAX	33.5	0.4	3.0	6.1
MIN	32.3	-0.6	-0.2	-2.4
AVG	32.9	0.0	1.2	2.0
STD	0.4	0.3	0.8	2.0
Open	0	0	0	0
Tech	S-R	S-R	S-R	AJP
Equip ID	681	681	681	244
	1278	1278	1278	1647



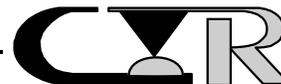
Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A2	
Product: T2SD Series Connector			File No: 210199010	
Description: ID# B-A2-2			Tech:S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	100X	T-Shock	C. Humidity
1	33.1	-0.1	1.4	6.5
2	32.8	0.2	0.3	0.4
3	33.3	-0.2	-0.4	-0.2
4	32.9	0.0	0.4	0.3
5	33.1	0.1	0.4	1.3
6	33.2	0.3	0.1	0.0
7	32.8	0.0	0.6	0.0
8	32.9	0.4	0.3	2.9
9	33.4	0.0	0.1	2.6
10	33.5	0.2	0.5	1.0
11	33.5	-0.3	0.4	1.6
12	33.7	-0.1	0.9	0.0
13	33.5	1.2	0.2	0.4
14	33.3	0.1	1.1	2.4
15	33.7	0.3	0.2	0.4
16	34.0	-0.2	0.4	4.2
17	33.8	-0.2	0.1	0.2
18	33.8	0.4	0.3	0.1
19	32.9	0.2	0.0	2.2
20	33.2	-0.1	0.1	2.4
21	33.5	0.4	0.0	2.3
22	33.5	0.2	0.7	4.8
23	33.4	0.3	0.0	0.7
24	32.9	0.3	0.0	1.6
MAX	34.0	1.2	1.4	6.5
MIN	32.8	-0.3	-0.4	-0.2
AVG	33.3	0.1	0.3	1.6
STD	0.3	0.3	0.4	1.7
Open	0	0	0	0
Tech	S-R	S-R	S-R	AJP
Equip ID	681	681	681	244
	1278	1278	1278	1647



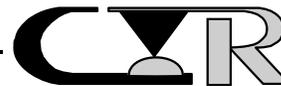
Contech Research

An Independent Test and Research Laboratory

Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A2	
Product: T2SD Series Connector			File No: 210199011	
Description: ID# B-A2-3			Tech:S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	100X	T-Shock	Cyc Humid
1	33.4	-0.3	0.6	-0.1
2	32.9	0.2	2.5	2.8
3	33.0	0.1	1.5	4.2
4	33.1	-0.1	1.2	2.9
5	33.1	0.3	2.7	8.6
6	33.2	0.4	1.9	0.8
7	32.4	0.2	2.3	2.4
8	32.8	0.2	0.2	1.4
9	33.1	0.8	3.6	1.1
10	32.9	-0.1	0.8	1.0
11	33.1	0.7	0.8	4.1
12	33.3	-0.4	1.1	0.5
13	33.1	0.0	1.1	0.5
14	33.2	-0.2	0.6	0.3
15	34.1	-0.2	1.0	0.0
16	33.5	0.3	1.6	4.0
17	33.7	-0.1	1.3	0.6
18	33.2	0.2	1.2	0.5
19	33.3	0.3	0.4	0.8
20	33.6	0.4	1.3	0.6
21	33.0	0.4	0.8	0.5
22	34.1	-0.3	4.5	0.2
23	33.2	1.0	0.1	0.6
24	33.4	0.8	-0.2	1.0
MAX	34.1	1.0	4.5	8.6
MIN	32.4	-0.4	-0.2	-0.1
AVG	33.2	0.2	1.4	1.6
STD	0.4	0.4	1.1	2.0
Open	0	0	0	0
Tech	S-R	S-R	S-R	RT
Equip ID	681	681	681	681
	1278	1278	1278	1278



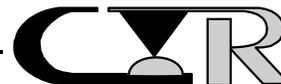
Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A2	
Product: T2SD Series Connector			File No: 210199012	
Description: ID# B-A2-4			Tech:S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	21	22	20	22
R.H. %	40	42	30	48
Date:	05May10	06May10	11May10	24May10
Pos. ID	initial	100X	T-Shock	C. Humidity
1	33.0	0.0	0.1	0.9
2	33.1	0.2	0.0	2.4
3	33.2	0.2	0.6	4.8
4	33.3	0.1	1.0	7.6
5	33.0	-0.2	0.4	3.2
6	33.4	0.0	0.1	1.4
7	33.4	0.0	0.6	2.9
8	32.4	0.1	0.4	0.0
9	33.6	-0.4	1.5	1.2
10	33.1	0.4	0.4	2.8
11	33.2	0.5	1.1	-0.3
12	33.3	0.3	-0.4	0.8
13	33.3	-0.1	0.0	1.5
14	33.1	-0.2	-0.1	1.6
15	32.9	0.2	0.3	3.2
16	33.6	-0.5	0.0	0.6
17	33.7	1.6	1.3	3.4
18	33.5	-0.4	0.4	3.2
19	33.4	0.8	3.2	7.1
20	33.7	0.3	0.4	3.1
21	34.1	0.1	1.3	3.5
22	33.7	0.3	0.8	2.1
23	33.2	-0.1	0.0	2.7
24	33.2	0.3	1.2	5.0
MAX	34.1	1.6	3.2	7.6
MIN	32.4	-0.5	-0.4	-0.3
AVG	33.3	0.1	0.6	`
STD	0.3	0.4	0.8	2.0
Open	0	0	0	0
Tech	S-R	S-R	S-R	AJP
Equip ID	681	681	681	244
	1278	1278	1278	1647



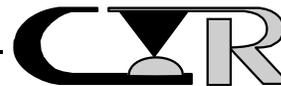
Contech Research

An Independent Test and Research Laboratory

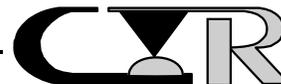
Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A2	
Product: T2SD Series Connector			File No: 210199013	
Description: ID# B-A2-5			Tech:S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	22	22	20	22
R.H. %	42	42	30	48
Date:	06May10	06May10	11May10	24May10
Pos. ID	initial	100X	T-Shock	Cyc Humid
1	33.6	-0.2	0.3	-0.3
2	32.7	0.5	1.5	2.1
3	33.3	1.6	0.3	-0.2
4	32.8	0.1	0.0	0.0
5	33.9	-0.1	0.6	-0.5
6	33.3	0.3	1.9	1.1
7	32.7	0.2	0.1	0.1
8	32.6	0.1	0.1	1.3
9	32.8	0.4	0.8	1.3
10	33.6	0.6	2.2	8.8
11	33.0	0.6	0.1	1.2
12	33.3	0.2	1.1	5.9
13	33.0	0.2	1.5	2.0
14	33.2	-0.2	0.5	1.8
15	33.3	0.3	1.4	1.1
16	33.6	0.1	1.7	9.6
17	33.2	0.2	1.4	1.6
18	33.0	0.0	1.2	2.4
19	32.8	-0.4	0.0	0.9
20	33.3	0.6	1.6	1.0
21	33.4	0.0	0.7	0.4
22	33.2	0.3	1.5	12.8
23	33.4	0.1	0.2	1.7
24	33.6	0.5	0.2	3.8
MAX	33.9	1.6	2.2	12.8
MIN	32.6	-0.4	0.0	-0.5
AVG	33.2	0.3	0.9	2.5
STD	0.3	0.4	0.7	3.4
Open	0	0	0	0
Tech	S-R	S-R	S-R	RT
Equip ID	681	681	681	681
	1278	1278	1278	1278



Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A2	
Product: T2SD Series Connector			File No: 210199014	
Description: ID# B-A2-6			Tech:S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	22	22	20	22
R.H. %	42	42	30	48
Date:	06May10	06May10	11May10	24May10
Pos. ID	initial	100X	T-Shock	C. Humidity
1	32.9	0.1	0.3	0.7
2	33.5	0.6	0.1	0.5
3	32.9	0.3	1.9	-0.5
4	33.0	0.0	0.1	0.6
5	33.1	0.4	0.1	-0.6
6	33.1	-0.1	0.4	0.4
7	32.2	2.0	3.2	-0.1
8	33.0	0.4	1.2	0.1
9	32.9	0.1	0.4	0.6
10	32.9	0.0	0.9	1.7
11	32.6	-0.2	0.6	3.1
12	32.6	-0.1	0.4	2.8
13	33.7	-0.8	-0.3	1.5
14	33.0	-0.1	0.4	-6.8
15	33.9	-0.1	0.0	1.8
16	33.0	0.2	0.0	0.9
17	33.8	-0.3	-0.3	3.4
18	33.0	0.2	0.1	-2.3
19	33.0	-0.2	-0.1	1.0
20	33.5	0.1	0.5	1.0
21	33.9	0.4	1.6	2.9
22	33.3	0.1	0.2	0.2
23	32.9	-0.3	0.1	-2.2
	33.3	0.2	0.3	2.1
MAX	33.9	2.0	3.2	3.4
MIN	32.2	-0.8	-0.3	-6.8
AVG	33.1	0.1	0.5	0.5
STD	0.4	0.5	0.8	2.1
Open	0	0	0	0
Tech	S-R	S-R	S-R	AJP
Equip ID	681	681	681	244
	1278	1278	1278	1647



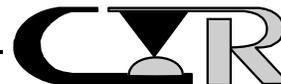
Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A2	
Product: T2SD Series Connector			File No: 210199015	
Description: ID# B-A2-7			Tech:S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	22	22	20	22
R.H. %	42	42	30	48
Date:	06May10	06May10	11May10	24May10
Pos. ID	initial	100X	T-Shock	Cyc Humid
1	33.2	0.4	0.0	1.7
2	32.2	0.6	0.7	0.7
3	32.4	0.1	1.2	2.4
4	32.1	0.2	0.3	1.3
5	32.2	0.2	0.9	1.2
6	32.4	0.6	0.8	0.9
7	32.5	0.3	1.1	1.9
8	32.2	0.1	0.1	0.5
9	32.3	0.3	0.4	1.0
10	32.7	0.1	0.3	0.5
11	32.4	0.0	0.4	1.1
12	32.6	0.1	1.1	0.7
13	33.6	-0.6	0.9	1.8
14	32.8	0.0	0.9	0.5
15	32.6	0.2	1.2	1.1
16	32.9	-0.2	2.6	0.5
17	32.5	0.2	1.9	2.9
18	33.2	0.0	2.3	1.4
19	32.8	0.7	2.4	0.4
20	32.9	0.1	0.9	2.0
21	32.7	-0.1	0.1	0.2
22	32.5	0.1	2.7	3.2
23	32.3	0.7	1.1	5.8
24	32.2	0.4	2.2	5.9
MAX	33.6	0.7	2.7	5.9
MIN	32.1	-0.6	0.0	0.2
AVG	32.6	0.2	1.1	1.7
STD	0.4	0.3	0.8	1.5
Open	0	0	0	0
Tech	S-R	S-R	S-R	RT
Equip ID	681	681	681	681
	1278	1278	1278	1278



Contech Research

An Independent Test and Research Laboratory

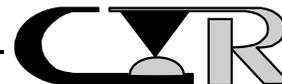
Low Level Circuit Resistance - Delta Values				
Project: 210199			Spec: EIA 364,TP23	
Customer: Samtec			Subgroup: Seq b Gp A2	
Product: T2SD Series Connector			File No: 210199016	
Description: ID# B-A2-8			Tech:S-R	
Open circuit voltage: 20mV			Current:	10mA
Units: milliohms				
Temp °C	22	22	20	22
R.H. %	42	42	30	48
Date:	06May10	06May10	11May10	24May10
Pos. ID	initial	100X	T-Shock	Cyc Humid
1	32.9	0.5	1.5	1.1
2	33.0	0.2	0.4	1.2
3	33.1	0.5	0.8	7.7
4	33.2	-0.5	0.8	2.7
5	33.0	0.0	0.9	3.7
6	32.9	-0.1	0.5	2.6
7	32.7	0.1	1.0	1.4
8	32.2	0.0	0.8	1.6
9	32.5	0.0	1.3	4.5
10	33.4	0.1	0.5	2.7
11	33.1	-0.1	1.0	2.6
12	33.9	-0.3	0.4	1.0
13	33.3	0.0	0.4	3.5
14	33.3	0.0	0.7	1.2
15	33.9	0.2	4.1	4.6
16	33.6	0.4	0.3	3.8
17	34.0	-0.2	0.5	9.3
18	33.9	0.4	2.3	2.5
19	33.1	0.1	1.1	4.3
20	33.1	0.4	1.0	3.5
21	33.3	0.0	2.5	0.7
22	33.1	0.0	1.1	1.5
23	33.1	0.2	0.3	3.3
24	33.1	0.4	-0.1	1.5
MAX	34.0	0.5	4.1	9.3
MIN	32.2	-0.5	-0.1	0.7
AVG	33.2	0.1	1.0	3.0
STD	0.4	0.3	0.9	2.1
Open	0	0	0	0
Tech	S-R	S-R	S-R	RT
Equip ID	681	681	681	681
	1278	1278	1278	1278



TEST RESULTS

SEQUENCE C

Group A



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 8 Samples

TECHNICIAN: S-R

START DATE: 5/6/10

COMPLETE DATE: 5/6/10

ROOM AMBIENT: 22°C

RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 681, 1278

LOW LEVEL CIRCUIT RESISTANCE (LLCR)

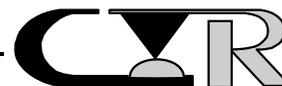
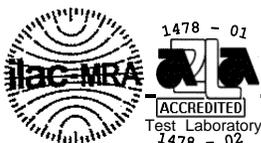
PURPOSE:

1. To evaluate contact resistance characteristics of the contact systems under conditions where applied voltages and currents do not alter the physical contact interface and will detect oxides and films which degrade electrical stability. It is also sensitive to and may detect the presence of fretting corrosion induced by mechanical or thermal environments as well as any significant loss of contact pressure.
2. This attribute was monitored after each preconditioning and/or test exposure in order to determine said stability of the contact systems as they progress through the applicable test sequences.
3. The electrical stability of the system is determined by comparing the initial resistance value to that observed after a given test exposure. The difference is the change in resistance occurring whose magnitude establishes the stability of the interface being evaluated.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 23.

-continued on next page.



PROCEDURE:-continued

2. Test Conditions:

- a) Test Current : 10 milliamps
- b) Open Circuit Voltage : 20 millivolts
- c) No. of positions tested : 22 per sample

REQUIREMENTS:

Low level circuit resistance shall be measured and recorded.

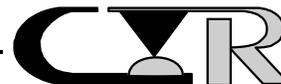
RESULTS:

1. The following is a summary of the data observed:

LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

<u>Sample ID#</u>	<u>Avg.</u>	<u>Max.</u>	<u>Min.</u>
C-A-1	52.6	53.4	51.6
C-A-2	52.2	52.8	51.3
C-A-3	52.3	53.0	50.2
C-A-4	52.0	52.9	51.2
C-A-5	51.9	52.8	50.5
C-A-6	51.3	52.0	50.8
C-A-7	52.7	59.7	51.7
C-A-8	51.3	52.4	49.8

2. See data files 210199017 through 210199024 for individual data points.



PROJECT NO.: 210199 SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4 PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 8 Samples TECHNICIAN: S-R

START DATE: 5/20/10 COMPLETE DATE: 5/20/10

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 26%

EQUIPMENT ID#: 34, 200, 585, 1010, 1521

MECHANICAL SHOCK (SPECIFIED PULSE)

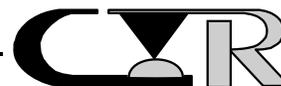
PURPOSE:

To determine the mechanical and electrical integrity of connectors for use with electronic equipment subjected to shocks such as those expected from handling, transportation, etc.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 27, Test Condition C.
2. Test Conditions:
 - a) Peak Value : 100 G
 - b) Duration : 6 Milliseconds
 - c) Wave Form : Half-Sine
 - d) Velocity : 12.3 feet per second
 - e) No. of Shocks : 3 Shocks/Direction, 3 Axes (18 Total)
3. A stabilizing medium was used such that the mated test samples did not separate during testing.
3. Figure #2 illustrates the test sample fixturing utilized during the test.
5. All subsequent variable testing was performed in accordance with the procedures previously indicated.

REQUIREMENTS: See Next Page



REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples as tested.
2. The change in low level circuit resistance shall not exceed +10.0 milliohms.

RESULTS:

1. There was no evidence of physical damage to the test samples as tested.
2. The following is a summary of the data observed:

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
C-A-1	+0.6	+2.8
C-A-2	+0.5	+0.9
C-A-3	+0.3	+1.4
C-A-4	+0.8	+1.5
C-A-5	+0.5	+1.6
C-A-6	+0.3	+1.0
C-A-7	+0.2	+2.3
C-A-8	+0.7	+1.5

3. See data files 210199017 through 210199024 for individual data points.
4. The Mechanical Shock characteristics are shown in Figures #3 (Calibration Pulse) and #4 (Test Pulse). Each figure displays the shock pulse contained within the upper and lower limits as defined by the appropriate test specification.

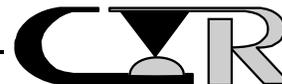


FIGURE #2

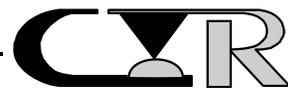
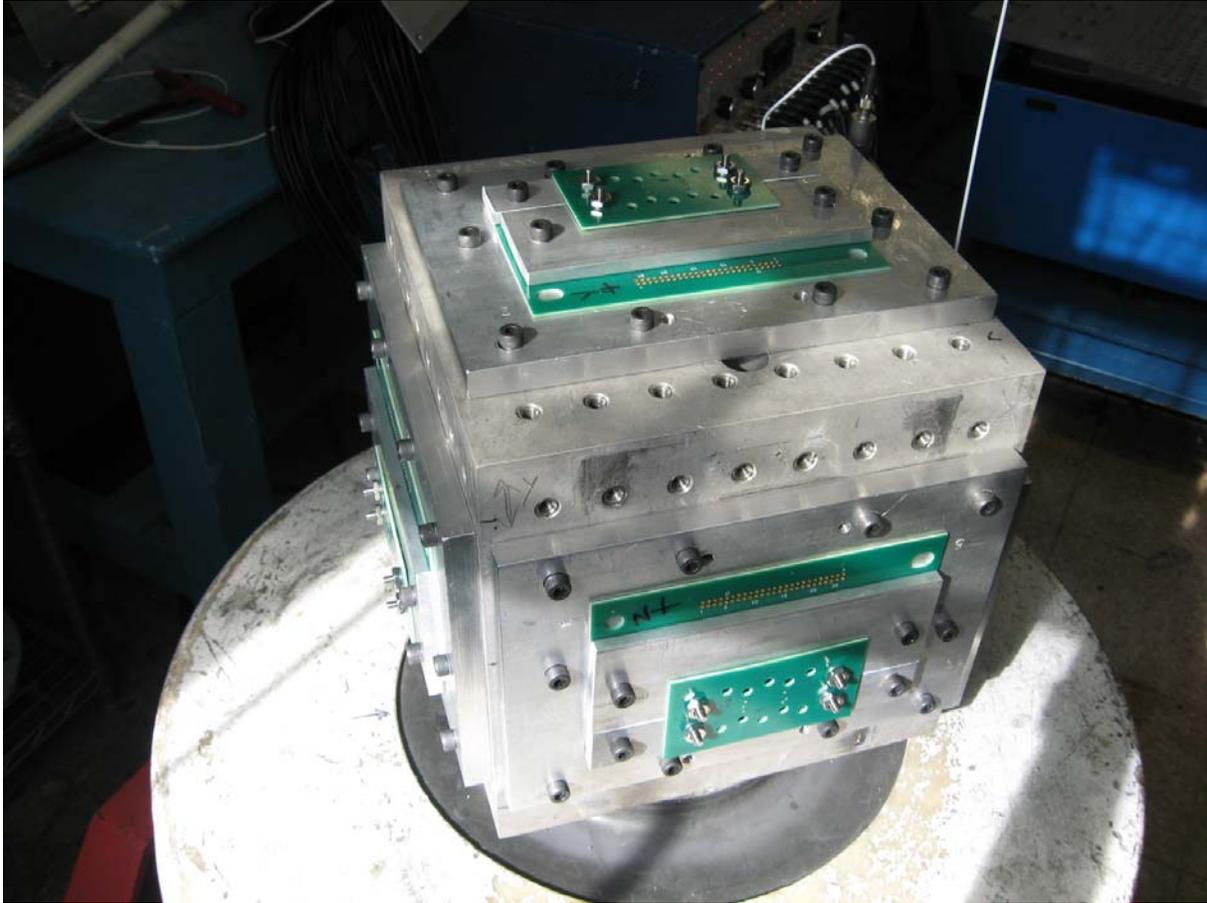


FIGURE #3

Delay 1 to 1 = 6.260 ms

V ampl 1 = 1.06 V

Graph [1] 188 mV/div 500 mV 2.00 ms/div -8.000 ms

1: [Mem 1]
210199 CAL

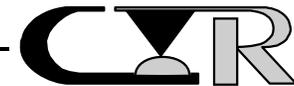
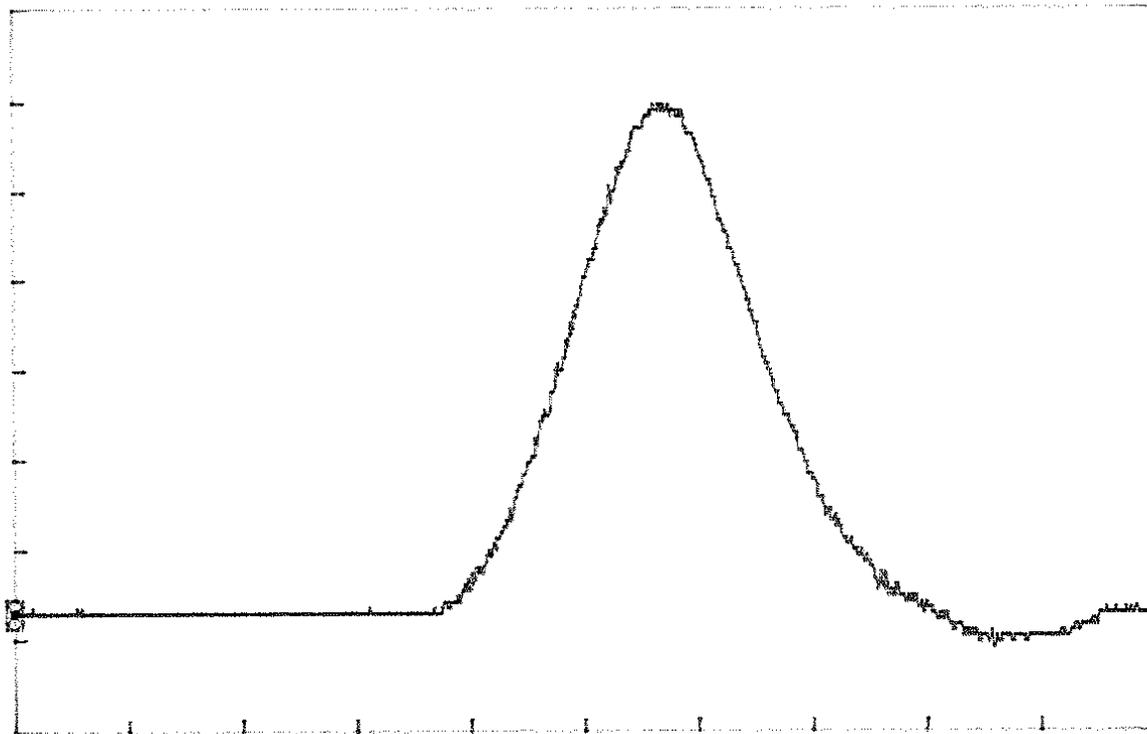


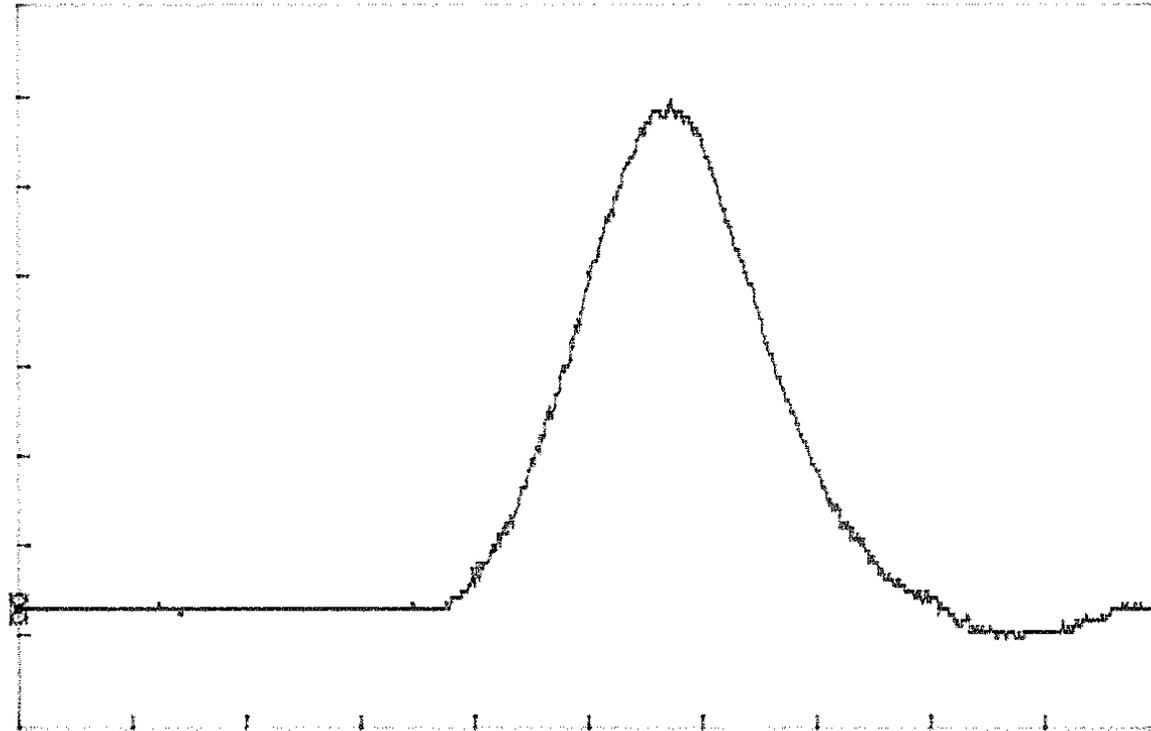
FIGURE #4

Delay 1 to 1 = 6.300 ms

V ampl 1 = 1.06 V

Graph [1] 188 mV/div 500 mV 2.00 ms/div -8.000 ms

1: [Mem 2]
210199 ACT



PROJECT NO.: 210199 SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4 PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 8 Samples TECHNICIAN: S-R

START DATE: 5/21/10 COMPLETE DATE: 5/21/10

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 33, 86, 553, 1438, 1439, 1440

VIBRATION, RANDOM

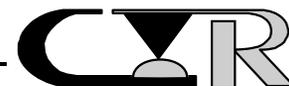
PURPOSE:

1. To establish the mechanical integrity of the test samples exposed to external mechanical stresses.
2. To determine if the contact system is susceptible to fretting corrosion.
3. To determine if the electrical stability of the system has degraded when exposed to a vibratory environment.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 28, Test Condition V, Letter B.
2. Test Conditions:
 - a) Power Spectral Density : 0.04 g²/Hz
 - b) G 'rms' : 7.56
 - c) Frequency : 50 to 2000 Hz
 - d) Duration : 2.0 hrs per axis, 3 axes total
3. A stabilizing medium was used such that the mated test samples did not separate during the test.
4. Figure #5 illustrates the test sample fixturing utilized during the test.

-continued on next page.



PROCEDURE:-continued

5. All subsequent variable testing was performed in accordance with procedures previously indicated.

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples as tested.
2. The change in low level circuit resistance shall not exceed +10.0 milliohms.

RESULTS:

1. There was no evidence of physical damage to the test samples as tested.
2. The following is a summary of the observed data:

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
C-A-1	+1.1	+3.0
C-A-2	+1.0	+1.9
C-A-3	+0.9	+2.1
C-A-4	+1.5	+2.4
C-A-5	+1.4	+2.9
C-A-6	+0.8	+1.5
C-A-7	+0.6	+2.0
C-A-8	+1.1	+2.2

3. See data files 210199017 through 210199024 for individual data points.

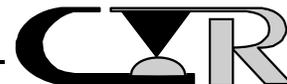
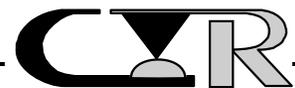
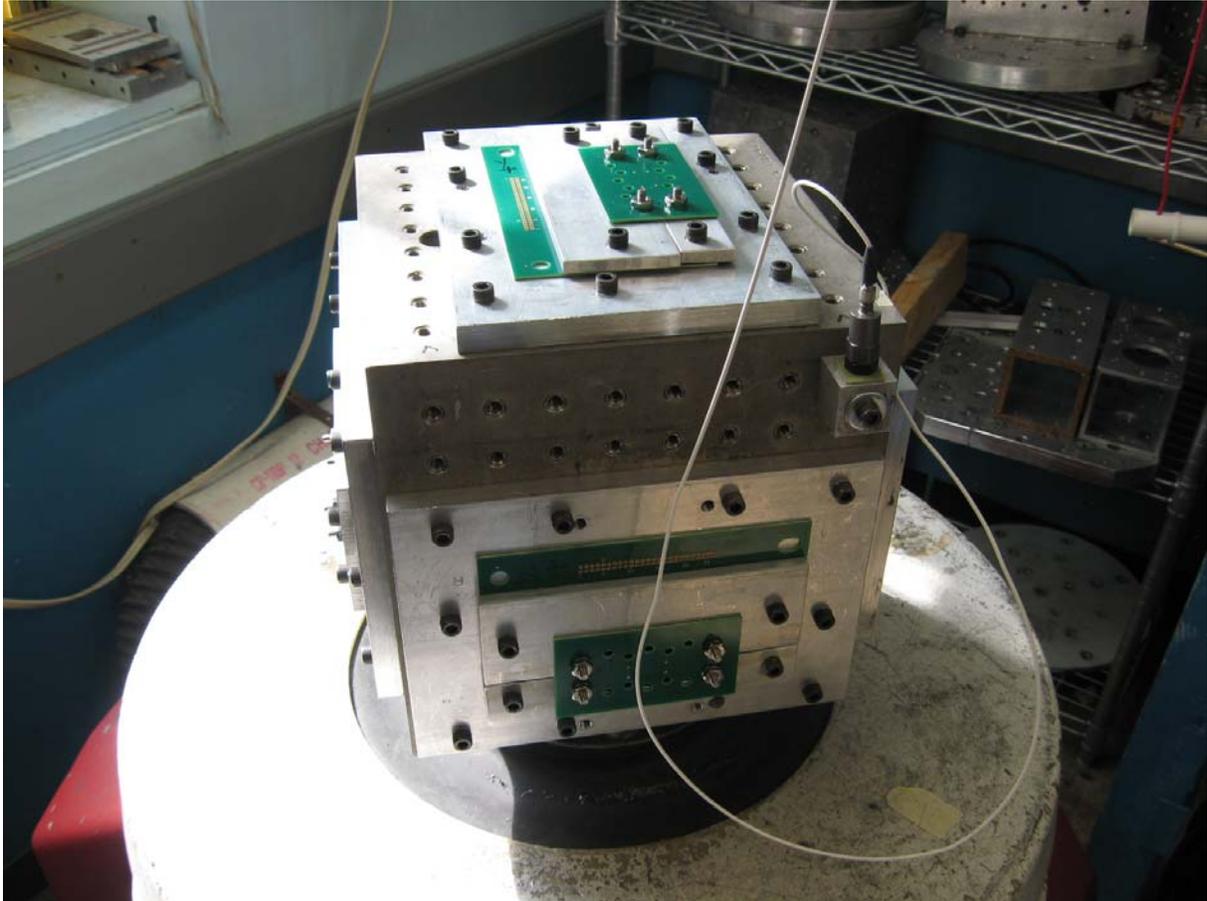


FIGURE #5



LLCR DATA FILES

DATA FILE NUMBERS

210199017

210199018

210199019

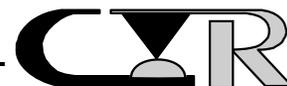
210199020

210199021

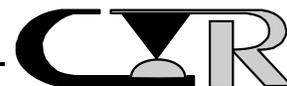
210199022

210199023

210199024



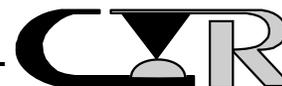
Low Level Circuit Resistance - Delta Values			
Project: 210199			Spec: EIA 364,TP23
Customer: Samtec			Subgroup: Seq C Gp A
Product: S2SD Series Connector			File No: 210199017
Description: ID# C-A-1			Tech:S-R
Open circuit voltage: 20mV			Current: 10mA
Units: milliohms			
Temp °C	22	22	22
R.H. %	42	42	42
Date:	06May10	15May10	20May10
Pos. ID	initial	M-Shock	VIB
1	53.0	0.3	1.6
2	52.5	-0.1	0.7
3	53.2	0.6	1.2
4	51.9	0.7	0.7
5	53.0	-0.2	1.0
6	52.5	1.2	1.1
7	51.6	0.7	1.7
8	52.3	0.5	0.6
9	51.7	0.9	0.5
10	53.4	0.8	1.5
11	52.6	0.8	1.3
12	51.9	1.8	1.5
13	52.1	0.5	1.1
14	52.7	0.5	1.2
15	52.7	2.8	3.0
16	52.7	0.5	1.5
17	52.9	0.3	0.8
18	53.1	-0.1	0.0
19	52.5	0.3	1.5
20	53.4	0.0	1.1
21	53.4	-0.9	-0.7
22	52.2	0.4	0.6
23	51.9	0.8	2.1
24	52.4	0.3	0.3
MAX	53.4	2.8	3.0
MIN	51.6	-0.9	-0.7
AVG	52.6	0.6	1.1
STD	0.5	0.7	0.7
Open	0	0	0
Tech	S-R	S-R	S-R
Equip ID	681	681	681
	1278	1278	1278



Contech Research

An Independent Test and Research Laboratory

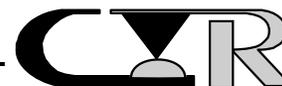
Low Level Circuit Resistance - Delta Values			
Project: 210199			Spec: EIA 364,TP23
Customer: Samtec			Subgroup: Seq C Gp A
Product: S2SD Series Connector			File No: 210199018
Description: ID# C-A-2			Tech:S-R
Open circuit voltage: 20 mV			Current: 10mA
Units: milliohms			
Temp °C	20	22	22
R.H. %	34	42	42
Date:	10May10	15May10	20May10
Pos. ID	initial	M-Shock	VIB
1	52.3	0.9	1.5
2	52.5	0.3	1.2
3	52.0	0.4	0.6
4	51.9	0.4	0.8
5	51.9	0.8	1.9
6	52.0	0.5	0.7
7	51.7	0.3	0.6
8	51.3	0.2	0.5
9	52.0	0.8	0.5
10	51.9	0.6	1.4
11	52.1	0.4	0.9
12	51.9	0.9	1.2
13	52.8	0.3	1.2
14	52.5	0.6	0.9
15	52.6	0.1	1.0
16	52.6	0.6	1.2
17	52.4	0.1	1.4
18	52.4	0.5	1.0
19	52.2	0.3	0.5
20	52.1	0.7	1.2
21	52.4	0.5	1.8
22	52.7	0.6	0.7
23	52.3	0.6	1.5
24	52.3	0.5	0.8
MAX	52.8	0.9	1.9
MIN	51.3	0.1	0.5
AVG	52.2	0.5	1.0
STD	0.3	0.2	0.4
Open	0	0	0
Tech	S-R	S-R	S-R
Equip ID	681	681	681
	1278	1278	1278



Contech Research

An Independent Test and Research Laboratory

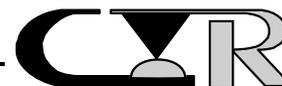
Low Level Circuit Resistance - Delta Values			
Project: 210199			Spec: EIA 364,TP23
Customer: Samtec			Subgroup: Seq C Gp A
Product: S2SD Series Connector			File No: 210199019
Description: ID# C-A-3			Tech:S-R
Open circuit voltage: 20mV			Current: 10mA
Units: milliohms			
Temp °C	20	22	22
R.H. %	34	42	42
Date:	10May10	15May10	20May10
Pos. ID	initial	M-Shock	VIB
1	51.8	0.3	0.7
2	53.0	0.1	0.9
3	53.0	0.0	0.5
4	52.6	0.0	0.4
5	52.1	0.4	0.8
6	52.8	0.2	1.0
7	52.6	0.5	0.9
8	50.2	1.4	2.1
9	51.7	0.4	1.2
10	52.7	0.1	1.1
11	51.7	0.5	1.2
12	52.0	0.4	1.2
13	51.9	0.5	0.9
14	52.0	0.4	0.8
15	51.9	0.5	0.9
16	52.5	0.4	1.1
17	52.5	0.9	1.2
18	52.6	-0.2	0.5
19	52.1	0.0	0.6
20	52.5	0.3	0.2
21	52.7	0.0	0.8
22	52.7	0.5	0.6
23	52.1	0.4	0.7
24	52.6	0.0	0.4
MAX	53.0	1.4	2.1
MIN	50.2	-0.2	0.2
AVG	52.3	0.3	0.9
STD	0.6	0.3	0.4
Open	0	0	0
Tech	S-R	S-R	S-R
Equip ID	681	681	681
	1278	1278	1278



Contech Research

An Independent Test and Research Laboratory

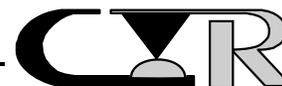
Low Level Circuit Resistance - Delta Values			
Project: 210199			Spec: EIA 364,TP23
Customer: Samtec			Subgroup: Seq C Gp A
Product: S2SD Series Connector			File No: 210199020
Description: ID# C-A-4			Tech:S-R
Open circuit voltage: 20mV			Current: 10mA
Units: milliohms			
Temp °C	20	22	22
R.H. %	34	42	42
Date:	10May10	15May10	20May10
Pos. ID	initial	M-Shock	VIB
1	51.5	0.8	1.6
2	52.1	1.0	1.3
3	52.9	0.8	1.3
4	52.2	0.8	1.7
5	52.2	0.5	1.7
6	52.1	0.2	0.4
7	52.0	0.8	1.7
8	51.2	1.0	1.7
9	51.5	1.3	1.3
10	51.6	0.8	1.8
11	51.7	1.3	1.6
12	52.0	0.6	0.5
13	52.0	0.5	1.7
14	51.7	0.9	1.6
15	52.2	1.3	0.6
16	51.9	0.5	0.9
17	51.7	1.0	1.8
18	51.7	0.6	1.5
19	52.6	0.7	2.0
20	52.1	0.5	2.4
21	52.2	0.7	1.7
22	52.0	0.4	1.0
23	52.2	0.9	2.1
	52.4	0.5	1.4
MAX	52.9	1.3	2.4
MIN	51.2	0.2	0.4
AVG	52.0	0.8	1.5
STD	0.4	0.3	0.5
Open	0	0	0
Tech	S-R	S-R	S-R
Equip ID	681	681	681
	1278	1278	1278



Contech Research

An Independent Test and Research Laboratory

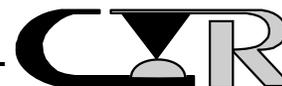
Low Level Circuit Resistance - Delta Values			
Project: 210199			Spec: EIA 364,TP23
Customer: Samtec			Subgroup: Seq C Gp A
Product: S2SD Series Connector			File No: 210199021
Description: ID# C-A-5			Tech:S-R
Open circuit voltage: 20mV			Current: 10mA
Units: milliohms			
Temp °C	20	22	22
R.H. %	34	42	42
Date:	10May10	15May10	20May10
Pos. ID	initial	M-Shock	VIB.
1	52.6	0.6	0.5
2	52.2	0.9	1.2
3	51.8	0.9	2.0
4	52.2	0.7	1.2
5	51.7	1.1	2.3
6	52.0	0.4	1.5
7	51.4	1.6	1.4
8	50.5	1.1	2.2
9	51.9	1.5	2.7
10	51.4	0.6	1.5
11	51.6	-0.1	1.8
12	51.4	0.4	2.7
13	52.2	0.8	1.2
14	51.6	0.6	1.3
15	51.5	0.4	1.5
16	51.3	0.7	0.6
17	52.0	0.2	0.9
18	52.5	-1.9	2.9
19	52.0	1.0	-2.4
20	52.3	0.5	1.0
21	52.8	-0.3	1.1
22	52.0	0.5	1.6
23	51.7	0.7	1.1
24	52.2	0.0	1.3
MAX	52.8	1.6	2.9
MIN	50.5	-1.9	-2.4
AVG	51.9	0.5	1.4
STD	0.5	0.7	1.0
Open	0	0	0
Tech	S-R	S-R	S-R
Equip ID	681	681	681
	1278	1278	1278



Contech Research

An Independent Test and Research Laboratory

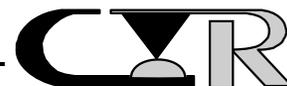
Low Level Circuit Resistance - Delta Values			
Project: 210199		Spec: EIA 364,TP23	
Customer: Samtec		Subgroup: Seq C Gp A	
Product: S2SD Series Connector		File No: 210199022	
Description: ID# C-A-6		Tech:S-R	
Open circuit voltage: 20mV Current:		Current: 10mA	
Units: milliohms			
Temp °C	20	22	22
R.H. %	34	42	42
Date:	10May10	15May10	20May10
Pos. ID	initial	M-Shock	VIB
1	51.3	0.6	1.2
2	51.3	0.7	0.4
3	52.0	0.6	0.3
4	51.0	1.0	0.7
5	51.3	0.4	0.7
6	51.2	0.4	1.0
7	51.1	0.5	0.7
8	50.8	0.4	0.7
9	51.4	-0.2	1.3
10	51.4	0.4	0.8
11	51.5	0.8	1.5
12	51.4	0.6	0.8
13	51.6	0.7	1.1
14	51.3	0.3	0.7
15	51.3	0.3	0.9
16	51.6	0.4	0.9
17	51.2	0.4	0.9
18	51.4	-0.9	0.6
19	51.0	-1.6	-1.7
20	50.9	0.7	1.4
21	51.0	0.5	1.5
22	51.2	0.4	0.8
23	51.3	0.4	0.7
24	51.3	0.2	0.6
MAX	52.0	1.0	1.5
MIN	50.8	-1.6	-1.7
AVG	51.3	0.3	0.8
STD	0.3	0.5	0.6
Open	0	0	0
Tech	S-R	S-R	S-R
Equip ID	681	681	681
	1278	1278	1278



Contech Research

An Independent Test and Research Laboratory

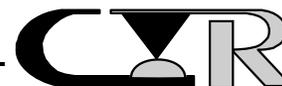
Low Level Circuit Resistance - Delta Values			
Project: 210199			Spec: EIA 364,TP23
Customer: Samtec			Subgroup: Seq C Gp A
Product: S2SD Series Connector			File No: 210199023
Description: ID# C-A-7			Tech:S-R
Open circuit voltage: 20mV			Current: 10mA
Units: milliohms			
Temp °C	20	22	22
R.H. %	34	42	42
Date:	10May10	15May10	20May10
Pos. ID	initial	M-Shock	VIB
1	52.6	0.1	1.0
2	59.7	-4.1	-6.9
3	52.5	-0.3	0.0
4	52.2	0.3	0.8
5	52.6	-0.2	0.3
6	52.9	-0.1	0.6
7	52.2	-0.1	0.9
8	51.7	0.2	0.4
9	52.3	0.4	0.7
10	51.9	0.1	0.6
11	52.0	0.4	0.9
12	52.2	0.6	0.5
13	52.3	0.8	1.3
14	52.6	0.5	1.0
15	53.4	-0.1	-0.1
16	52.6	0.9	1.5
17	52.1	0.7	1.2
18	52.4	0.2	2.0
19	52.8	0.2	1.6
20	52.5	0.4	1.2
21	52.5	0.5	0.9
22	52.8	-0.2	0.8
23	52.5	0.4	0.7
24	52.1	2.3	1.6
MAX	59.7	2.3	2.0
MIN	51.7	-4.1	-6.9
AVG	52.7	0.2	0.6
STD	1.5	1.0	1.7
Open	0	0	0
Tech	S-R	S-R	S-R
Equip ID	681	681	
	1278	1278	



Contech Research

An Independent Test and Research Laboratory

Low Level Circuit Resistance - Delta Values			
Project: 210199		Spec: EIA 364,TP23	
Customer: Samtec		Subgroup: Seq C Gp A	
Product: S2SD Series Connector		File No: 210199024	
Description: ID# C-A-8	Tech:S-R		
Open circuit voltage: 20mV		Current: 10mA	
Units: milliohms			
Temp °C	20	22	22
R.H. %	34	42	42
Date:	10May10	15May10	20May10
Pos. ID	initial	M-Shock	VIB
1	51.9	-0.3	1.0
2	51.4	0.8	1.1
3	52.0	0.8	1.8
4	51.5	1.1	1.1
5	51.4	0.3	0.6
6	51.4	0.9	1.1
7	52.4	0.1	1.1
8	51.7	0.2	0.6
9	52.1	0.9	1.8
10	51.9	0.6	0.6
11	50.9	0.9	2.2
12	51.5	1.3	1.4
13	50.1	0.5	0.7
14	51.4	1.5	1.9
15	49.8	0.5	0.6
16	49.9	0.5	0.8
17	50.3	0.4	0.7
18	50.0	0.8	0.6
19	52.1	0.7	0.4
20	51.5	0.9	1.2
21	51.8	0.7	0.9
22	51.6	0.7	1.4
23	51.7	0.8	1.5
24	51.5	0.6	1.1
MAX	52.4	1.5	2.2
MIN	49.8	-0.3	0.4
AVG	51.3	0.7	1.1
STD	0.8	0.4	0.5
Open	0	0	0
Tech	S-R	S-R	S-R
Equip ID	681	681	681
	1278	1278	1278



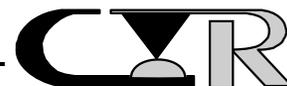
Contech Research

An Independent Test and Research Laboratory

TEST RESULTS

SEQUENCE D

Group A



PROJECT NO.: 210199 SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4 PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 3 Samples TECHNICIAN: S-R

START DATE: 5/14/10 COMPLETE DATE: 5/14/10

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 26%

EQUIPMENT ID#: 34, 200, 585, 1010, 1028, 1521

MECHANICAL SHOCK (SPECIFIED PULSE)

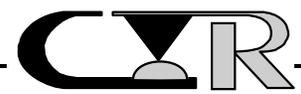
PURPOSE:

To determine the mechanical and electrical integrity of connectors for use with electronic equipment subjected to shocks such as those expected from handling, transportation, etc.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 27, Test Condition C.
2. Test Conditions:
 - a) Peak Value : 100 G
 - b) Duration : 6 Milliseconds
 - c) Wave Form : Half-Sine
 - d) Velocity : 12.3 feet Per Second
 - e) No. of Shocks : 3 Shocks/Direction, 3 Axes (18 Total)
3. A stabilizing medium was used such that the mated test samples did not separate during the test.
4. Figure #6 illustrates the test sample fixturing utilized during the test.
5. The samples were characterized to assure that the low nanosecond event being monitored will trigger the detector.

-continued on next page.



Contech Research

An Independent Test and Research Laboratory

PROCEDURE:-continued

6. The low nanosecond monitoring was performed in accordance with EIA 364, Test Procedure 87.

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples as tested.
2. There shall be no low nanosecond event detected greater than 50 nanoseconds.

RESULTS:

1. There was no evidence of physical damage to the test samples as tested.
2. There was no low nanosecond event detected greater than 50 nanoseconds.
3. The Mechanical Shock characteristics are shown in Figures #7 (Calibration Pulse) and #8 (Test Pulse). Each figure displays the shock pulse contained within the upper and lower limits as defined by the appropriate test specification.

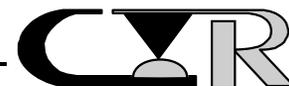


FIGURE #6

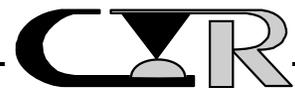
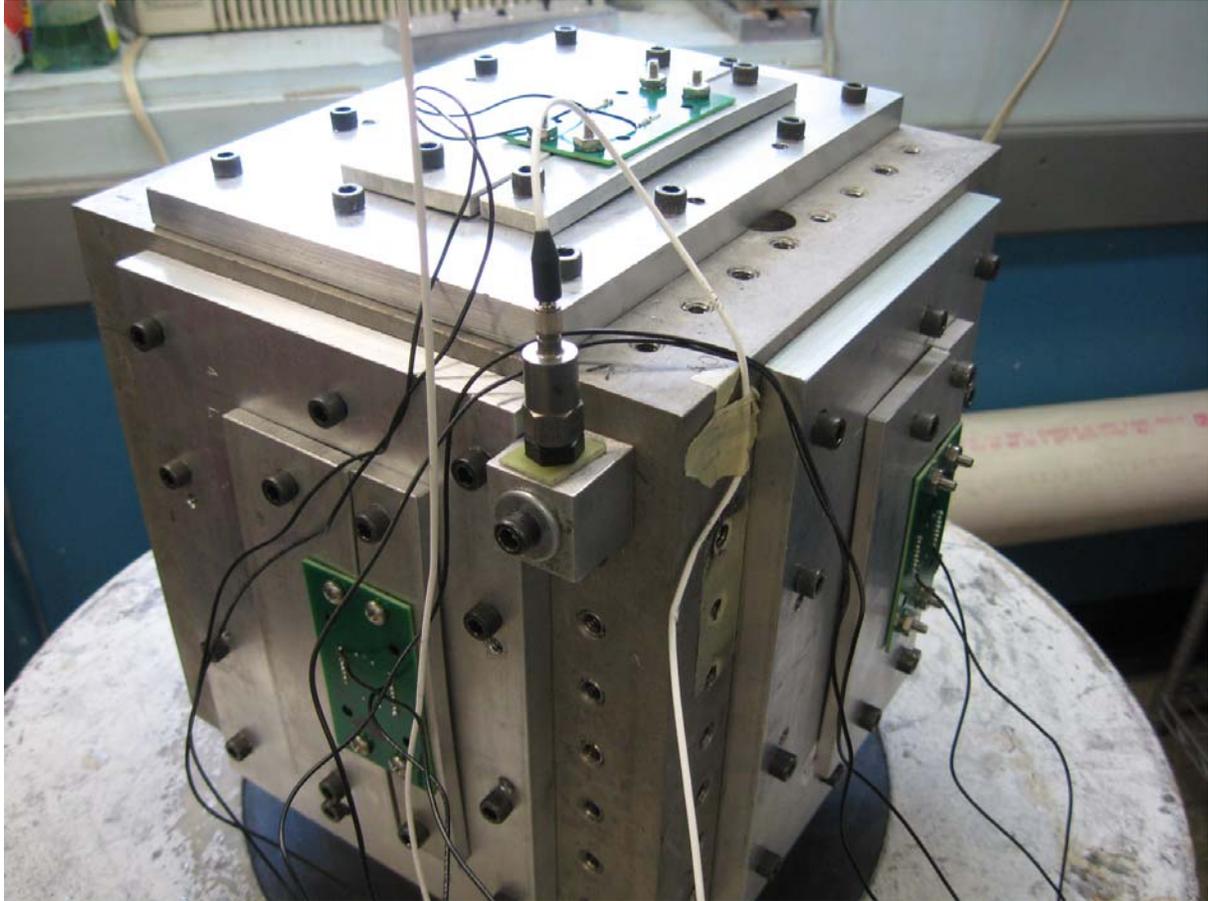


FIGURE #7

Delay 1 to 1 = 6.260 ms

V ampl 1 = 1.06 V

Graph [1] 188 mV/div 500 mV 2.00 ms/div -8.000 ms

1: [Mem 1]
210199 CAL

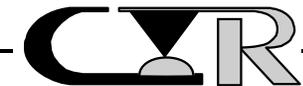
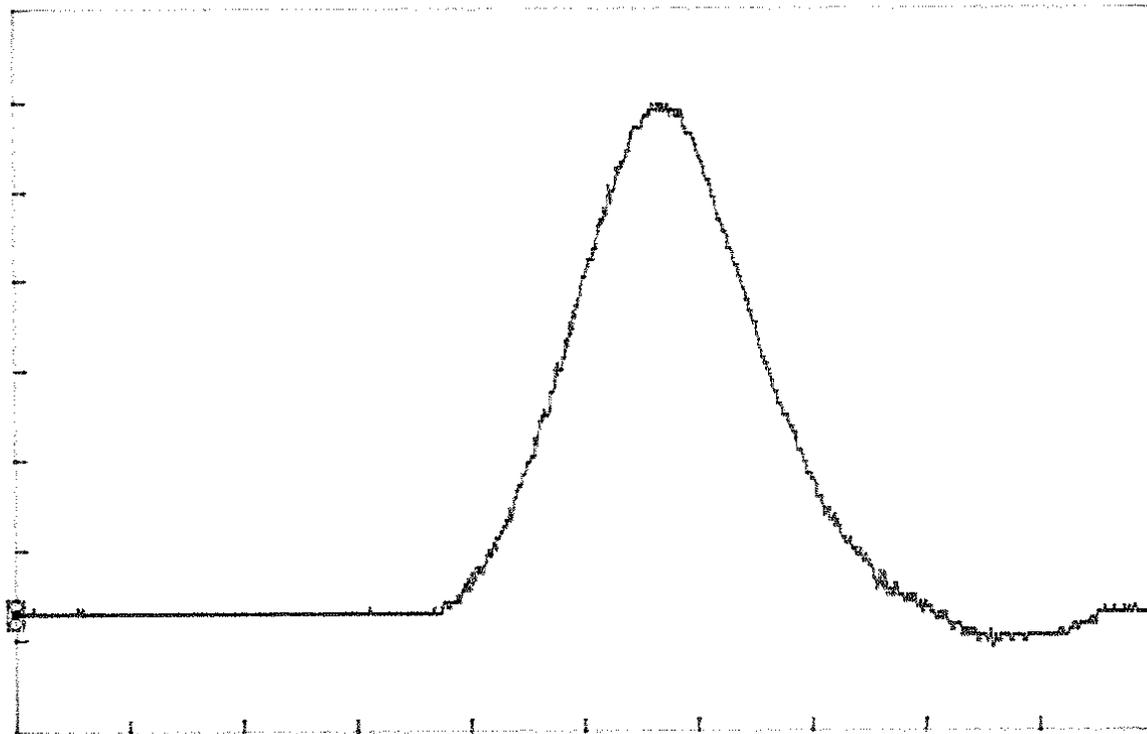


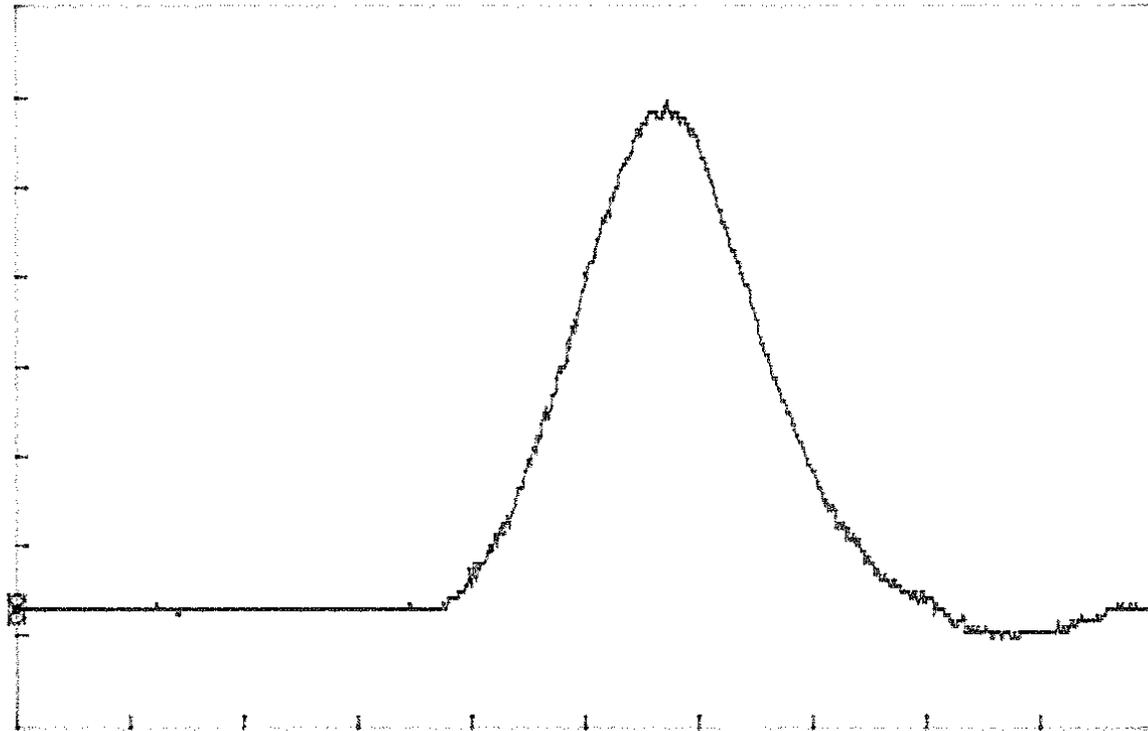
FIGURE #8

Delay 1 to 1 = 6.300 ms

V ampl 1 = 1.06 V

Graph [1] 188 mV/div 500 mV 2.00 ms/div -8.000 ms

1: [Mem 2]
210199 ACT



PROJECT NO.: 210199

SPECIFICATION: T2SD Test Plan

PART NO.: See Page 4

PART DESCRIPTION: T2SD series cable

SAMPLE SIZE: 3 Samples

TECHNICIAN: GL

START DATE: 5/19/10

COMPLETE DATE: 5/20/10

ROOM AMBIENT: 22°C

RELATIVE HUMIDITY: 41%

EQUIPMENT ID#: 33, 86, 553, 1028, 1438, 1439, 1440

VIBRATION, RANDOM

PURPOSE:

1. To establish the mechanical integrity of the test samples exposed to external mechanical stresses.
2. To determine if the contact system is susceptible to fretting corrosion.
3. To determine if electrical discontinuities at the level specified exist.

PROCEDURE:

1. The test was performed in accordance with Specification EIA 364, Test Procedure 28, Test Condition V, Letter B.
2. Test Conditions:
 - a) Power Spectral Density : 0.04 g²/Hz
 - b) G 'rms' : 7.56
 - c) Frequency : 50 to 2000 Hz
 - d) Duration : 2.0 hrs per axis, 3 axes total
3. A stabilizing medium was used such that the mated test samples did not separate during the test.
4. Figure #9 illustrates the test sample fixturing utilized during the test.

-continued on next page.



PROCEDURE: -continued

5. Prior to testing, the connectors were characterized to assure that the desired event being monitored was capable of being detected.
6. The low nanosecond event detection was performed in accordance with EIA 364, Test Procedure 87.

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples as tested.
2. There shall be no low nanosecond event detected greater than 50 nanoseconds.

RESULTS:

1. There was no evidence of physical damage to the test samples as tested.
2. There was no low nanosecond event detected greater than 50 nanoseconds.



FIGURE #9

