AUGUST 17, 2009

TEST REPORT #209272A&B

ERX5 SERIES CONNECTOR TESTING

PART: ERM5-050-05.0-L-DV
MATING PART: ERF5-050-05.0-L-DV

SAMTEC, INC.

Alice Hathaway
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CONTECH RESEARCH, INC.

1478 - 01
ACCREDITED
Test Laboratory
1478 - 02

Contech Research
An Independent Test and Research Laboratory

REVISION HISTORY

DATE	REV. NO.	DESCRIPTION	ENG.
8/17/2009	1.0	Initial Issue	APH

CERTIFICATION

This is to certify that the ERX5 series connector 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.

Alice Hathaway

ALICE HATHAWAY
PROJECT ENGINEER
CONTECH RESEARCH, INC.

APH:ld

SCOPE

To perform qualification testing on the ERX5 series connector 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: TC0926-2581 (ERX5) Test Plan
3. Standards: 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.

Description	Part Number
a) Connector	ERM5-050-05.0-L-DV
b) Mating Connector	ERF5-050-05.0-L-DV

2. Test samples were supplied assembled and terminated to test boards by the test sponsor. Specific test boards were supplied for the following tests:
    - LLCR, IR/DWV
    - Shock & Vibration, nanosecond event detection
3. Test leads were attached to the appropriate measurement areas of the test samples and 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.

TEST SELECTION

1. See Test Plan Flow Diagrams, Figures #1A and #1B, 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 B - A-B-1, A-B-2

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

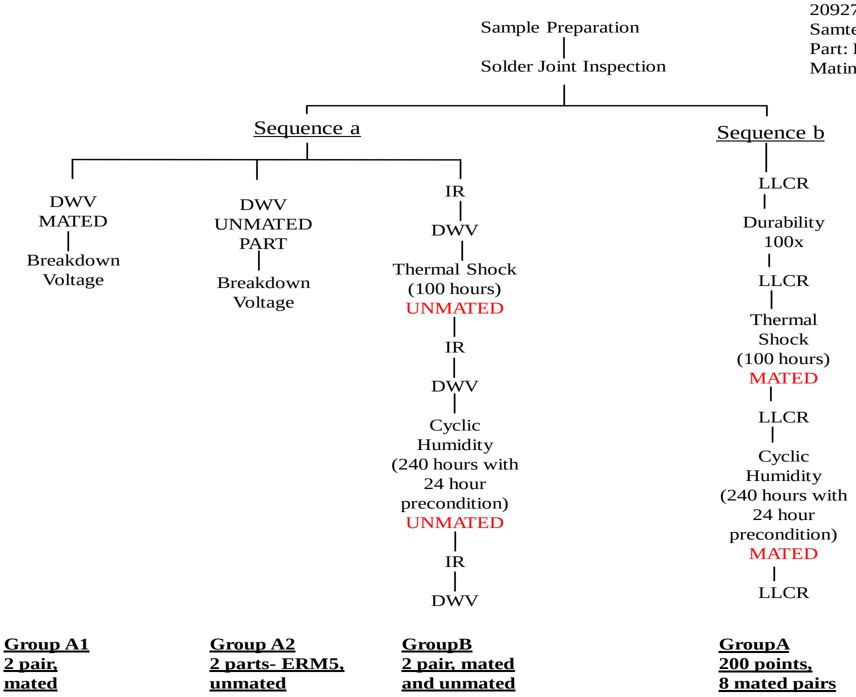
Seq D: Group A - D-A-1, D-A-2, D-A-3

Sample ID Key
Board number
Group
Seq

FIGURE #1A

TEST PLAN FLOW DIAGRAM – Sequences A and B

209272B
Samtec ERX5 shock/ humidity
Part: ERM5-050-05.0-L-DV
Mating Part: ERF5-050-05.0-L-DV

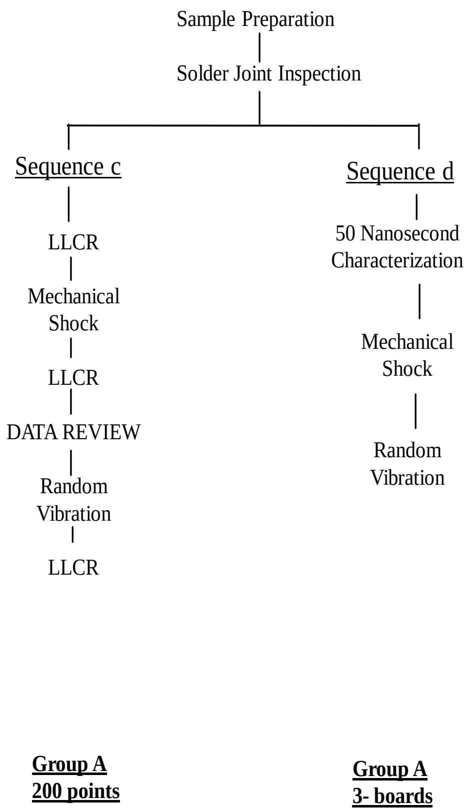


IR : Insulation Resistance
DWV : Dielectric Withstanding Voltage
LLCR : Low Level Circuit Resistance

FIGURE #1B

TEST PLAN FLOW DIAGRAM - Sequences C and D

209272A
Samtec ERX5 Shock/Vibration
Part: ERM5-050-05.0-L-DV
Mating Part: ERF5-050-05.0-L-DV



DATA SUMMARY - 209272B

TEST	**REQUIREMENT**	**RESULTS**
SEQUENCE A		
GROUP A1		
DWV, MATED PAIR	BREAKDOWN	810 VAC, 780 VAC
GROUP A2		
DWV, PART ERM5	BREAKDOWN	780 VAC, 780 VAC
GROUP B		
IR, MATED PAIR	>5000 MEGOHMS	>50,000 MEGOHMS
IR, PART ERM5	>5000 MEGOHMS	>50,000 MEGOHMS
DWV, MATED PAIR	580 VAC	PASSED
DWV, PART ERM5	580 VAC	PASSED
THERMAL SHOCK	NO DAMAGE	PASSED
IR, MATED PAIR	>5000 MEGOHMS	>50,000 MEGOHMS
IR, PART ERM5	>5000 MEGOHMS	>50,000 MEGOHMS
DWV, MATED PAIR	580 VAC	PASSED
DWV, PART ERM5	580 VAC	PASSED
CYCLIC HUMIDITY	NO DAMAGE	PASSED
IR, MATED PAIR	>5000 MEGOHMS	>50,000 MEGOHMS
IR, PART ERM5	>5000 MEGOHMS	>50,000 MEGOHMS
DWV, MATED PAIR	580 VAC	PASSED
DWV, PART ERM5	580 VAC	PASSED
SEQUENCE B		
LLCR	RECORD	25.2 mΩ MAX.
DURABILITY	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+1.9 mΩ MAX.CHG.
THERMAL SHOCK	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+2.0 mΩ MAX.CHG.
CYCLIC HUMIDITY	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+4.7 mΩ MAX.CHG.

DATA SUMMARY - 209272A

TEST	**REQUIREMENT**	**RESULTS**
SEQUENCE C		
LLCR	RECORD	26.8 mΩ MAX.
MECHANICAL SHOCK	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+4.2 mΩ MAX.CHG.
RANDOM VIBRATION	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+2.5 mΩ MAX.CHG.
SEQUENCE D		
MECHANICAL SHOCK	NO DAMAGE	PASSED
	50 NANOSECOND	PASSED
RANDOM VIBRATION	NO DAMAGE	PASSED
	50 NANOSECOND	PASSED

EQUIPMENT LIST

ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq.Cal
14	7/13/2010	7/13/2009	Accelerometer	PCB Piezotronics	302A	7040	See Cal Cert	12mon
27			Temp. Humid. Chamber	Blue M Co.	FR-256PC-1	F2-249	See Cal Cert	Ea Test
150			Drill Press Stand	Craftsman	25921	N/A	N/A	N/A
186	7/10/2010	7/10/2009	Digital Multimeter	Fluke Mfg.	75	44861047	See Cal Cert	12mon.
207	12/9/2009	12/9/2008	Micro-Ohm Meter	Keithley Co.	580	438208	See Cal Cert	12mon
266	7/28/2010	7/28/2009	Micro-Ohm Meter	Keithley Instr.	580-1	472438	See Cal Cert	12mon
315			X-Y Table	NE Affiliated Tech	XY-6060	N/A	N/A	N/A
321	3/19/2010	3/19/2009	AC-DC Hipot/Megometer	Hipotronics Co.	H300B	DS16-201	See Cal Cert	12mon.
466	8/12/2009	8/12/2008	Precision Resistor	Victoreen Co.	50,000 mego	N/A	± 1 %	12mon.
553	3/13/2010	3/13/2009	12 channel Power Unit	PCB Co.	483A	1303	See Cal Cert	12mon
601			Computer	A.M.I.	P111-450	082714	N/A	N/A
614			Oven	Tenney Co.	TH Jr.	9712-510	See Manual	Ea Test
861			Card Reader	Data Taker Mem.	MC1-01	23660	N/A	N/A
1028	2/4/2010	2/4/2009	Event Detector	Analysis Tech	32 EHD	981019	See Cal.Cert	12mon
1156	3/16/2010	3/16/2009	High Voltage Probe	Fluke	80k-6	885967	See Cal Cert	12mon
1166	8/17/2009	7/17/2008	Sine/Rndm Vib Control Digitizer	Hewlett Packard	E1432A	US39342279	See Cal Cert	12mon
1167			Interface	Hewlett Packard	E8491B	US390100753	N/A	N/A
1168			Mainframe	Hewlett Packard	E8408A	US39000357	N/A	N/A
1271			Amplifier	Unholtz Dickie	SA15	3483	N/A	N/A
1272			Shaker Table	Unholtz Dickie	S202PB	263	N/A	N/A
1276			Computer	ARC.Co.	Pent-450	N/A	N/A	N/A
1315	1/21/2010	1/21/2009	Data Aquisition Multimeter	Keithley Co.	2700	0862680	See CERT	12mon
1395			Vib Slip Table	M Rad	Vibraglide	100-3889	N/A	N/A
1457	1/9/2010	1/9/2009	Precision Resistor	Victorine	5KMOHM	465	See Cal Cert	12mon
1521	4/20/2010	4/20/2009	Accelerometer	PCB	353B04	118492	See Cal Cert	12mon
1533			Computer	Systemax	Venture	105248475	N/A	N/A
1549	1/30/2010	1/30/2009	Multiplexer Card	Keithley	7708	171629	See Cert	12mon
1550	1/21/2010	1/21/2009	Multiplexer Card	Keithley	7708	171626	See Cert	12mon
1609	5/27/2010	5/27/2009	Vert Thermal Shock Chamber	C.S.Z.	VTS-1.0-2-2-H/AC	08-VT14810	See Manual	12mon

TEST RESULTS

SEQUENCE A

Group B

PROJECT NO.: 209272B SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 2 Samples TECHNICIAN: BE

START DATE: 7/17/09 COMPLETE DATE: 7/17/09

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 49%

EQUIPMENT ID#: 321, 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
    d) Electrification Time : 2.0 Minutes
    e) Test Voltage : 500 VDC
3. The test voltage was applied to specific test points on the test board.

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.: 209272B SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 2 Samples TECHNICIAN: BE

START DATE: 7/17/09 COMPLETE DATE: 7/17/09

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 49%

EQUIPMENT ID#: 186, 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
    - d) Hold Time : 60 Seconds
    - e) Rate of Application : 500 volts/sec.
    - f) Test Voltage : 75% of Breakdown Voltage
    - g) Applied Voltage : 580 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 ERM5 connector was tested unmated (Sequence a Group A2), to determine the minimum breakdown voltage.

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PROCEDURE:-continued

4. The voltage was applied to specific test points on the board.

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.: 209272B SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 2 Samples TECHNICIAN: BE

START DATE: 7/17/09 COMPLETE DATE: 7/22/09

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 49%

EQUIPMENT ID#: 1315, 1549, 1550, 1609

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
   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.

REQUIREMENTS: See Next Page.

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 580 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 580 VAC voltage was applied.

PROJECT NO.: 209272B SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 2 Samples TECHNICIAN: BE

START DATE: 7/23/09 COMPLETE DATE: 8/03/09

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 48%

EQUIPMENT ID#: 27, 614, 1315, 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 95%
   c) Temperature Conditions : 25°C to 65°C
   d) Cold Cycle : No
   e) Polarizing Voltage : No
   f) Mating Conditions : Unmated
   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.

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PROCEDURE:-continued

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

5. The voltage was applied to specific test points on the board.

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 580 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 after an air dry of 2 hours.

3. There was no evidence of breakdown, arcing, etc., when a 580 VAC test voltage was applied.

TEST RESULTS

SEQUENCE B

Group A

PROJECT NO.: 209272B SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 8 Samples TECHNICIAN: BE

START DATE: 7/16/09 COMPLETE DATE: 7/16/09

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 45%

EQUIPMENT ID#: 266, 601, 677, 861

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.

2. Test Conditions:

   a) Test Current : 10 milliamps maximum
   b) Open Circuit Voltage : 20 millivolts
   c) No. of Positions Tested : 25 per test sample

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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)

Sample ID#	Avg.	Max.	Min.
B-A-1	21.9	23.6	20.6
B-A-2	21.8	22.8	20.5
B-A-3	22.0	23.2	20.5
B-A-4	22.1	23.9	20.4
B-A-5	23.4	25.2	21.2
B-A-6	22.7	24.2	21.2
B-A-7	21.8	23.0	20.3
B-A-8	22.2	24.5	20.3

2. See data files 20927201 through 20927208 for individual data points.

PROJECT NO.: 209272B SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 8 Samples TECHNICIAN: S-R

START DATE: 7/16/09 COMPLETE DATE: 7/16/09

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 45%

EQUIPMENT ID#: 150, 315

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 : 100
   b) Rate : 1.0 inch per minute

3. The plug side was assembled to special holding devices; the receptacle side was attached to an X-Y table. Speed is approximate.

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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)

Sample ID#	Avg. Change	Max. Change
B-A-1	+0.0	+1.7
B-A-2	+0.2	+1.3
B-A-3	+0.2	+1.3
B-A-4	-0.1	+0.6
B-A-5	+0.1	+1.5
B-A-6	-0.1	+0.7
B-A-7	+0.3	+1.9
B-A-8	+0.2	+1.9

3. See data files 20927201 through 20927208 for individual data points.

PROJECT NO.: 209272B SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 8 Samples TECHNICIAN: BE

START DATE: 7/16/09 COMPLETE DATE: 7/21/09

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 45%

EQUIPMENT ID#: 1315, 1549, 1550, 1609

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)

Sample ID#	Avg. Change	Max. Change
B-A-1	-0.2	+0.8
B-A-2	-0.1	+1.7
B-A-3	+0.1	+1.1
B-A-4	-0.2	+0.8
B-A-5	-0.6	+0.6
B-A-6	+0.2	+2.0
B-A-7	+0.1	+0.9
B-A-8	+0.4	+1.9

3. See data files 20927201 through 20927208 for individual data points.

PROJECT NO.: 209272B SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 8 Samples TECHNICIAN: BE

START DATE: 7/23/09 COMPLETE DATE: 8/03/09

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 48%

EQUIPMENT ID#: 27, 614, 1315, 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.

2. Test Conditions:

a) Preconditioning (24 hours)	:	50°C ± 5°C
b) Relative Humidity	:	90% to 95%
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+

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PROCEDURE:-continued

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)

Sample ID#	Avg. Change	Max. Change
B-A-1	-0.1	+0.8
B-A-2	+0.0	+1.2
B-A-3	-0.1	+0.7
B-A-4	+0.6	+1.9
B-A-5	-0.3	+1.2
B-A-6	+0.0	+2.5
B-A-7	+0.8	+4.7
B-A-8	+0.6	+1.4

3. See data files 20927201 through 20927208 for individual data points.

LLCR DATA FILES

DATA FILE NUMBERS

20927201
20927202
20927203
20927204
20927205
20927206
20927207
20927208

Low Level Circuit Resistance - Delta Values				
Project:	209272B		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "b"
Product:	ERX5 Series Connector		File No:	20927201
Description:	ID# b-A-1		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	22	22
R.H. %	45	45	46	49
Date:	16Jul09	16Jul09	21Jul09	03Aug09
Pos. ID	Initial	Durability 100X	T-Shock	Humidity
1	22.7	-0.1	0.5	0.7
2	23.1	-0.4	-0.5	-0.5
3	23.6	-0.9	-1.2	-1.5
4	22.3	0.6	-0.2	0.1
5	22.1	0.7	0.2	0.6
6	21.0	0.2	-0.4	0.4
7	21.5	-0.2	-0.6	-0.2
8	21.3	-0.3	-0.6	-0.4
9	22.4	0.0	-0.1	0.0
10	21.9	0.9	0.1	0.2
11	21.7	0.5	0.2	0.6
12	21.6	0.7	0.4	0.4
13	21.9	-1.0	-1.2	-0.7
14	21.8	-0.8	-0.8	-0.5
15	21.4	-0.4	-0.2	-0.5
16	20.8	-0.1	0.0	0.1
17	21.4	-0.5	-0.5	-0.5
18	21.2	-0.6	-0.2	-0.3
19	20.6	-0.1	-0.2	-0.2
20	21.9	-1.4	-1.6	-1.5
21	22.6	1.1	0.6	0.6
22	23.3	-0.6	-0.3	-0.6
23	22.4	1.1	0.8	0.8
24	22.2	0.1	0.1	-0.5
25	21.5	1.7	0.7	0.4
MAX	23.6	1.7	0.8	0.8
MIN	20.6	-1.4	-1.6	-1.5
AVG	21.9	0.0	-0.2	-0.1
STD	0.8	0.7	0.6	0.6
Open	0	0	0	0
Tech	S-R	S-R	BE	BE
Equip ID	681	681	601	601
	266	266	677	677

Low Level Circuit Resistance - Delta Values				
Project:	209272B		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "b"
Product:	ERX5 Series Connector		File No:	20927202
Description:	ID# b-A-2		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	22	22
R.H. %	45	45	46	49
Date:	16Jul09	16Jul09	21Jul09	03Aug09
Pos. ID	Initial	Durability	T-Shock	Humidity
		100X		
1	21.7	0.0	0.0	0.0
2	22.3	1.1	0.2	0.5
3	22.0	1.3	1.7	0.9
4	22.0	-0.1	0.0	0.0
5	21.7	0.3	0.1	0.3
6	21.3	-0.4	-0.6	0.0
7	21.1	-0.5	-1.0	-1.2
8	21.1	-2.0	-2.5	-2.5
9	22.8	0.4	0.2	0.0
10	21.9	0.4	0.2	-0.3
11	22.0	0.5	0.3	0.1
12	22.0	-0.2	-0.3	-0.6
13	21.3	1.2	0.6	0.5
14	22.1	-1.0	-1.1	-0.8
15	22.5	0.9	-1.5	-1.7
16	20.8	0.2	0.6	1.0
17	20.9	0.1	0.4	0.9
18	21.5	-0.6	-0.4	-0.4
19	21.4	-0.5	-0.5	-0.2
20	20.5	0.0	-0.2	0.0
21	22.5	0.7	0.6	0.4
22	22.2	0.1	-0.2	0.3
23	21.9	0.6	0.4	0.9
24	22.5	1.0	0.7	1.2
25	22.2	0.3	-0.2	0.0
MAX	22.8	1.3	1.7	1.2
MIN	20.5	-2.0	-2.5	-2.5
AVG	21.8	0.2	-0.1	0.0
STD	0.6	0.7	0.8	0.9
Open	0	0	0	0
Tech	S-R	S-R	BE	BE
Equip ID	681	681	601	601
	266	266	677	677

Low Level Circuit Resistance - Delta Values				
Project:	209272B		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "b"
Product:	ERX5 Series Connector		File No:	20927203
Description:	ID# b-A-3		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	22	22
R.H. %	45	45	46	49
Date:	16Jul09	16Jul09	21Jul09	03Aug09
Pos. ID	Initial	Durability	T-Shock	Humidity
		100X		
1	22.6	0.7	0.2	0.4
2	22.9	0.9	-0.5	-0.3
3	22.2	1.3	0.6	0.2
4	22.4	1.3	0.0	0.1
5	22.7	0.1	0.4	0.0
6	21.7	0.3	-0.8	-0.7
7	22.2	-0.8	-0.8	-1.3
8	21.7	0.3	-0.7	-0.5
9	22.9	0.5	-0.4	-0.1
10	22.4	0.3	0.0	-0.1
11	22.2	0.1	0.2	0.0
12	22.0	-0.3	-0.1	0.2
13	21.1	-0.2	-0.2	-0.3
14	21.4	-0.6	0.1	-0.3
15	21.0	0.2	0.9	0.4
16	21.4	0.3	0.3	-0.4
17	20.9	0.5	1.1	0.6
18	21.4	-0.4	0.1	-0.3
19	21.1	0.5	0.3	-0.2
20	20.5	1.2	0.7	0.7
21	22.9	-0.1	0.2	0.2
22	22.7	0.2	0.7	0.5
23	22.9	-0.4	0.3	0.1
24	22.7	0.6	0.4	-0.1
25	23.2	-0.6	-0.9	-0.9
MAX	23.2	1.3	1.1	0.7
MIN	20.5	-0.8	-0.9	-1.3
AVG	22.0	0.2	0.1	-0.1
STD	0.8	0.6	0.5	0.5
Open	0	0	0	0
Tech	S-R	S-R	BE	BE
Equip ID	681	681	601	601
	266	266	677	677

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Low Level Circuit Resistance - Delta Values				
Project:	209272B		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "b"
Product:	ERX5 Series Connector		File No:	20927204
Description:	ID# b-A-4		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	22	22
R.H. %	45	45	46	49
Date:	16Jul09	16Jul09	21Jul09	03Aug09
Pos. ID	Initial	Durability	T-Shock	Humidity
		100X		
1	22.7	-0.4	-0.3	0.6
2	22.1	-0.3	0.1	-0.2
3	23.2	-0.8	-0.7	-0.1
4	23.3	-0.6	-0.3	1.5
5	23.6	-0.5	-0.2	0.3
6	21.4	0.2	0.3	0.8
7	22.0	-0.5	-0.7	-0.6
8	21.6	-0.3	-0.7	0.9
9	23.9	-0.9	-1.7	-0.8
10	23.0	0.1	-1.1	0.8
11	23.1	0.4	0.0	1.2
12	22.2	0.1	0.0	1.8
13	20.5	0.1	0.5	0.9
14	21.5	0.1	0.0	0.7
15	20.9	0.3	0.0	1.9
16	20.4	0.2	0.1	0.7
17	21.4	0.6	0.3	1.9
18	20.8	0.1	-0.3	0.9
19	21.1	-0.6	-0.5	0.3
20	20.5	-0.1	0.7	0.6
21	22.6	0.0	0.1	0.2
22	22.8	-0.4	-0.5	0.0
23	22.5	0.3	0.8	1.2
24	22.4	0.2	-0.2	-0.1
25	22.6	0.6	0.1	0.5
MAX	23.9	0.6	0.8	1.9
MIN	20.4	-0.9	-1.7	-0.8
AVG	22.1	-0.1	-0.2	0.6
STD	1.0	0.4	0.6	0.7
Open	0	0	0	0
Tech	S-R	S-R	BE	BE
Equip ID	681	681	601	601
	266	266	677	677

Low Level Circuit Resistance - Delta Values				
Project:	209272B		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "b"
Product:	ERX5 Series Connector		File No:	20927205
Description:	ID# b-A-5		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	22	22
R.H. %	45	45	46	49
Date:	16Jul09	16Jul09	21Jul09	03Aug09
Pos. ID	Initial	Durability	T-Shock	Humidity
		100X		
1	24.3	0.1	-0.7	-0.3
2	25.2	-1.0	-1.2	-1.0
3	24.2	0.6	-0.8	-0.3
4	24.2	-0.7	0.0	0.3
5	24.3	1.5	-0.9	-0.4
6	22.7	-0.6	-0.5	-0.9
7	22.2	-0.1	-0.3	-0.4
8	22.0	0.8	-0.8	-0.4
9	24.6	-0.5	-1.2	-0.3
10	24.1	1.0	-1.3	-0.6
11	24.4	-0.3	-1.5	-0.9
12	23.9	0.1	-1.0	-0.3
13	21.7	0.5	-0.2	0.5
14	21.7	0.2	-0.3	0.1
15	22.3	0.2	-0.4	0.1
16	21.2	0.4	0.2	0.1
17	22.7	-0.3	-1.2	-0.5
18	21.8	0.3	-0.8	-0.5
19	22.6	0.1	-0.6	-0.1
20	21.9	0.2	-0.5	-0.3
21	24.1	0.7	0.6	1.2
22	25.1	-0.7	-0.9	-0.4
23	24.6	-0.1	-0.7	-1.0
24	24.2	-0.2	-0.4	-0.4
25	24.0	0.0	-0.4	0.0
MAX	25.2	1.5	0.6	1.2
MIN	21.2	-1.0	-1.5	-1.0
AVG	23.4	0.1	-0.6	-0.3
STD	1.2	0.6	0.5	0.5
Open	0	0	0	0
Tech	BE	BE	BE	BE
Equip ID	601	601	601	601
	677	677	677	677

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Low Level Circuit Resistance - Delta Values

Project:	209272B		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "b"
Product:	ERX5 Series Connector		File No:	20927206
Description:	ID# b-A-6		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	22	22
R.H. %	45	45	46	49
Date:	16Jul09	16Jul09	21Jul09	03Aug09
Pos. ID	Initial	Durability 100X	T-Shock	Humidity
1	24.2	0.1	0.1	-0.1
2	24.1	-0.2	-0.1	-0.8
3	23.5	0.7	1.0	-1.1
4	23.5	-0.7	0.5	-0.7
5	23.8	-1.2	-0.3	-0.9
6	21.4	-0.2	1.1	0.4
7	21.2	0.4	0.8	0.6
8	21.8	0.5	2.0	-0.1
9	23.3	-0.1	-0.2	-0.1
10	23.7	0.1	0.2	0.2
11	23.3	-0.4	-0.3	-0.3
12	23.4	-0.1	0.1	-0.2
13	21.4	0.0	0.5	2.0
14	22.2	-0.6	0.0	-0.7
15	22.0	0.0	0.3	0.2
16	21.2	0.0	0.0	-0.2
17	21.3	-0.2	-0.2	-0.2
18	21.5	-0.3	-0.6	2.5
19	22.1	-1.1	-0.9	-0.7
20	22.1	0.1	0.1	-0.3
21	23.7	-0.3	0.7	0.7
22	23.3	0.0	0.6	-0.1
23	23.5	-0.1	0.6	0.5
24	23.5	0.4	-0.6	-0.6
25	23.4	-0.2	-0.4	-0.2
MAX	24.2	0.7	2.0	2.5
MIN	21.2	-1.2	-0.9	-1.1
AVG	22.7	-0.1	0.2	0.0
STD	1.0	0.4	0.6	0.8
Open	0	0	0	0
Tech	BE	BE	BE	BE
Equip ID	601	601	601	601
	677	677	677	677

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Low Level Circuit Resistance - Delta Values				
Project:	209272B		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "b"
Product:	ERX5 Series Connector		File No:	20927207
Description:	ID# b-A-7		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	22	22
R.H. %	45	45	46	49
Date:	16Jul09	16Jul09	21Jul09	03Aug09
Pos. ID	Initial	Durability	T-Shock	Humidity
		100X		
1	22.7	1.8	0.9	0.5
2	23.0	1.9	-0.2	1.2
3	22.7	1.7	-0.3	1.0
4	22.6	0.5	0.1	0.5
5	22.3	0.3	0.2	1.4
6	20.9	0.5	0.3	0.8
7	20.3	0.0	-0.2	0.6
8	20.9	0.0	-0.2	0.8
9	22.5	-0.1	0.0	0.3
10	22.3	0.4	0.0	0.4
11	21.9	0.0	0.3	0.6
12	21.7	0.4	0.4	0.6
13	20.5	0.8	0.2	4.7
14	20.9	-0.1	0.1	1.1
15	21.1	0.2	0.6	0.6
16	20.6	-0.2	0.3	0.4
17	20.9	0.6	0.7	0.7
18	20.6	-0.2	0.3	0.2
19	21.6	-0.6	-0.1	0.6
20	21.0	0.1	0.4	1.6
21	22.9	-0.1	-0.2	0.5
22	22.6	-0.3	0.1	0.6
23	22.5	0.1	0.2	0.6
24	22.7	0.1	-0.2	0.4
25	22.5	-0.6	-0.2	0.6
MAX	23.0	1.9	0.9	4.7
MIN	20.3	-0.6	-0.3	0.2
AVG	21.8	0.3	0.1	0.8
STD	0.9	0.7	0.3	0.9
Open	0	0	0	0
Tech	BE	BE	BE	BE
Equip ID	601	601	601	601
	677	677	677	677

Low Level Circuit Resistance - Delta Values				
Project:	209272B		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "b"
Product:	ERX5 Series Connector		File No:	20927208
Description:	ID# b-A-8		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	22	22
R.H. %	45	45	46	49
Date:	16Jul09	16Jul09	21Jul09	03Aug09
Pos. ID	Initial	Durability	T-Shock	Humidity
		100X		
1	23.3	1.5	1.9	0.1
2	23.4	1.9	0.9	0.7
3	24.5	-0.8	-0.4	0.1
4	24.3	-0.3	-0.6	-0.8
5	22.9	1.5	1.3	1.1
6	20.3	0.2	0.4	1.1
7	21.1	0.5	0.8	1.2
8	21.2	-0.6	1.0	1.4
9	21.6	0.0	0.6	1.2
10	22.0	0.1	1.0	1.2
11	21.9	-0.2	0.4	1.3
12	22.9	-0.6	0.2	0.6
13	21.1	-0.1	0.4	1.2
14	21.5	-0.5	-0.8	0.6
15	21.2	-0.5	-0.2	0.0
16	21.9	-0.6	0.1	0.7
17	21.1	-0.3	-0.1	0.1
18	21.9	0.1	-0.1	0.1
19	21.9	-0.7	-0.9	-0.6
20	21.4	-0.4	0.3	0.0
21	22.7	0.9	0.6	0.9
22	22.9	1.0	0.9	0.8
23	22.9	1.2	0.7	0.7
24	23.2	0.5	0.8	0.9
25	22.7	1.6	0.6	0.6
MAX	24.5	1.9	1.9	1.4
MIN	20.3	-0.8	-0.9	-0.8
AVG	22.2	0.2	0.4	0.6
STD	1.1	0.8	0.7	0.6
Open	0	0	0	0
Tech	BE	BE	BE	BE
Equip ID	601	601	601	601
	677	677	677	677

TEST RESULTS

SEQUENCE C

Group A

PROJECT NO.: 209272A SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 8 Samples TECHNICIAN: BE

START DATE: 5/14/09 COMPLETE DATE: 5/14/09

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 38%

EQUIPMENT ID#: 207, 601, 677, 1276

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 : 25 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)

Sample ID#	Avg.	Max.	Min.
C-A-1	21.9	23.6	20.8
C-A-2	21.5	23.7	20.0
C-A-3	21.7	24.3	20.5
C-A-4	22.4	24.0	21.1
C-A-5	22.2	23.4	20.3
C-A-6	21.7	22.8	20.4
C-A-7	22.8	26.8	21.1
C-A-8	22.2	23.6	20.8

2. See data files 20927211 through 20927218 for individual data points.

PROJECT NO.: 209272A SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 8 Samples TECHNICIAN: AJP

START DATE: 5/15/09 COMPLETE DATE: 5/15/09

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 14, 553, 1166, 1167, 1168, 1271, 1272, 1533

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.
4. 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)

Sample ID#	Avg. Change	Max. Change
C-A-1	+0.1	+1.9
C-A-2	+0.2	+1.6
C-A-3	-0.1	+0.8
C-A-4	+0.4	+1.6
C-A-5	+0.0	+1.1
C-A-6	+0.6	+4.2
C-A-7	-0.8	+1.0
C-A-8	-0.1	+1.6

3. See data files 20927211 through 20927218 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

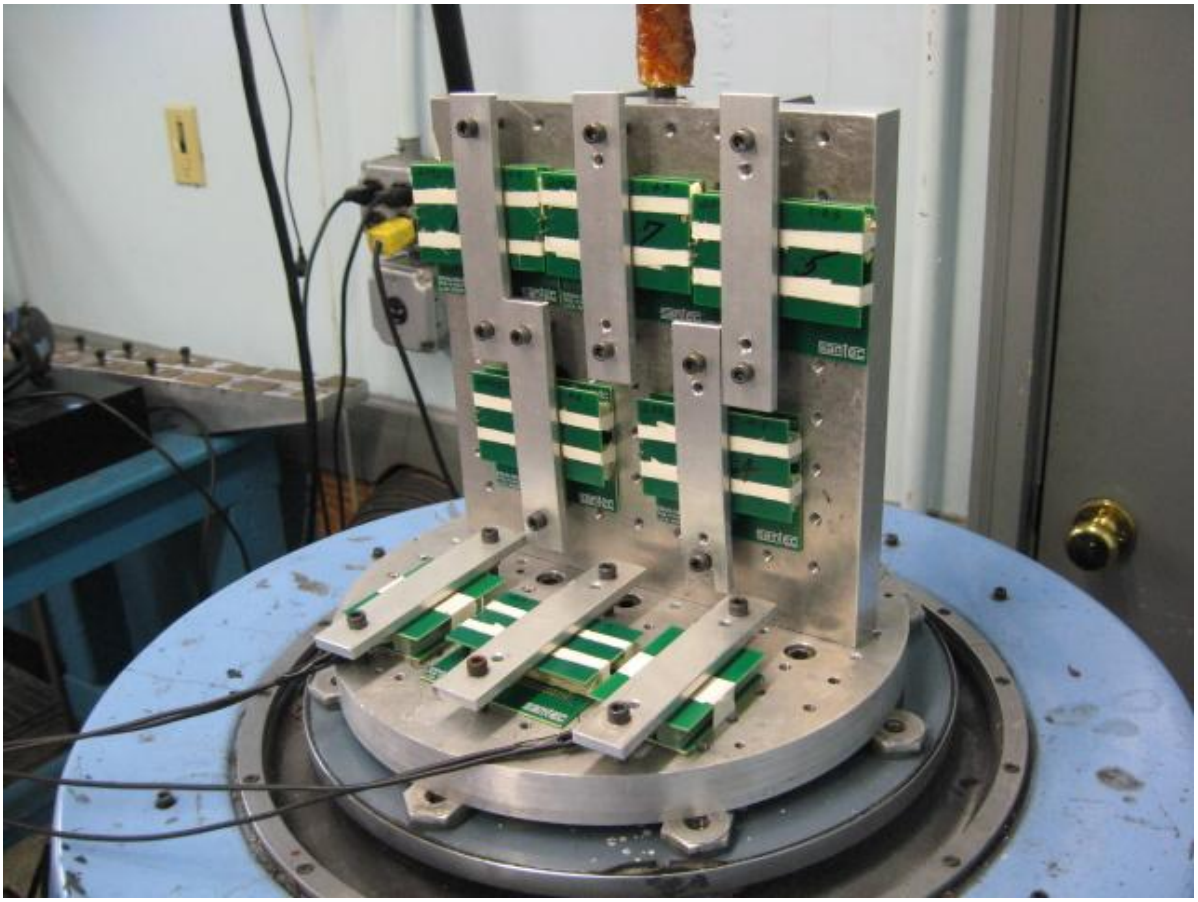

FIGURE #3

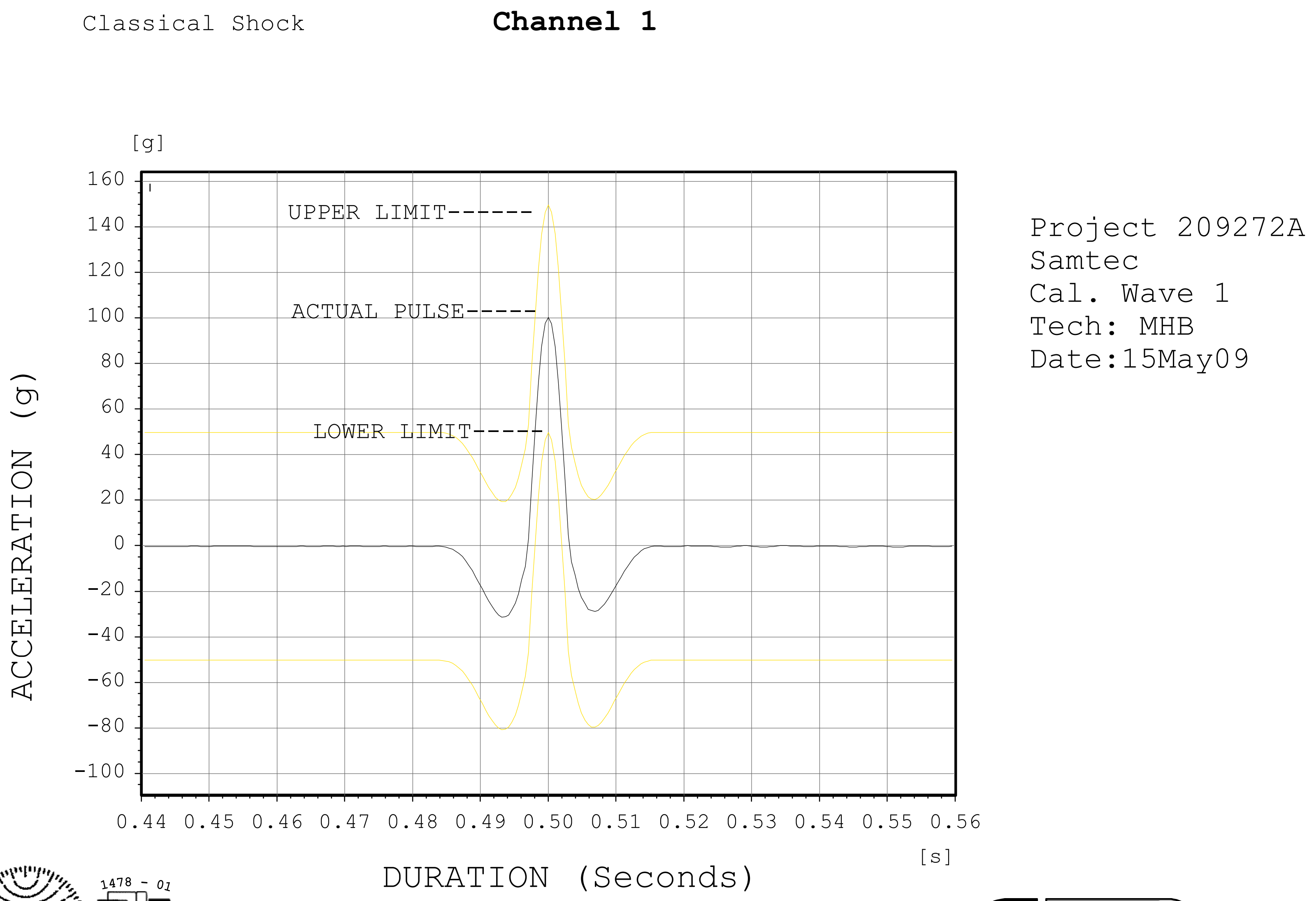

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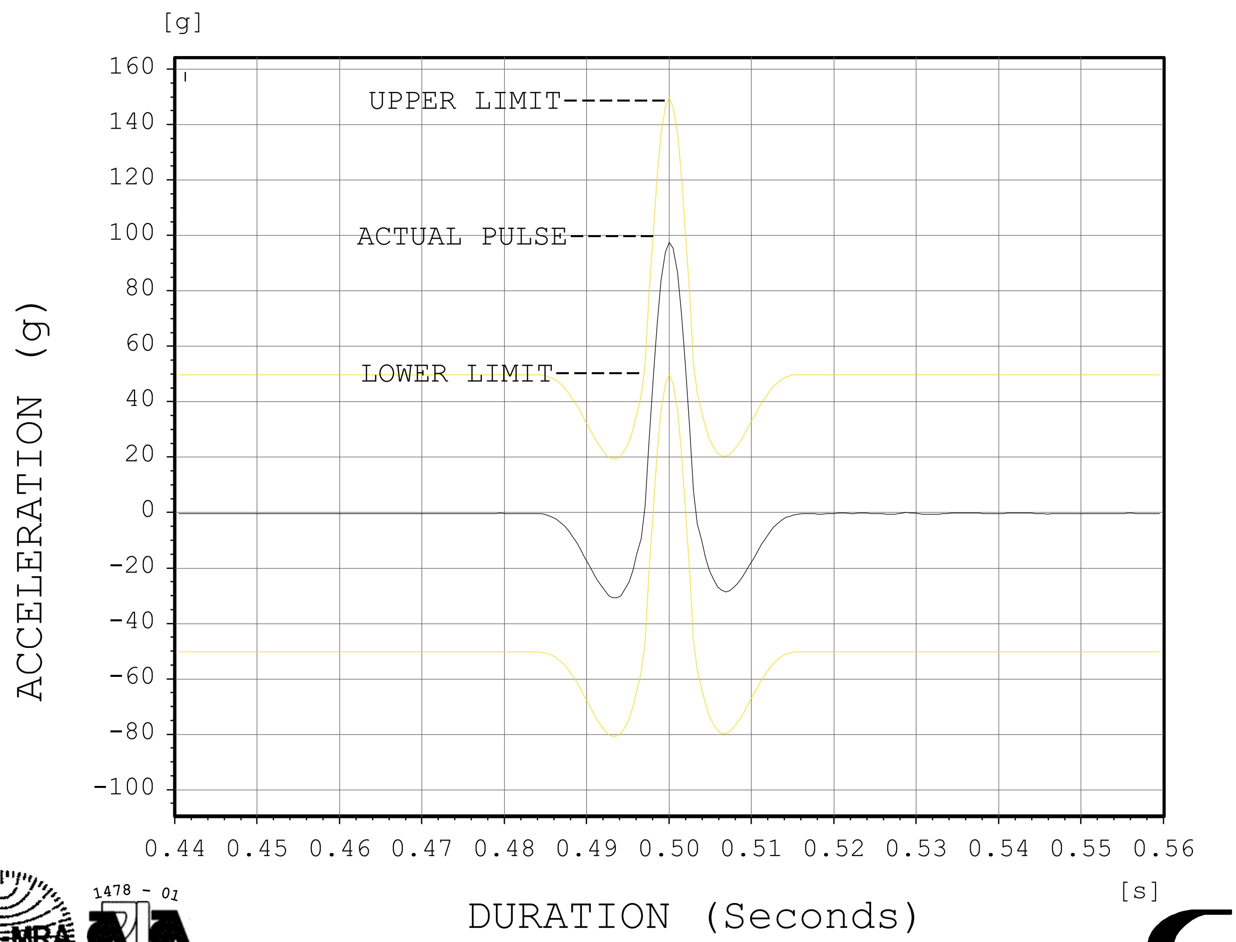
FIGURE #4



Project 209272A
Samtec
Actual Wave
Tech: MHB
Date:15May09

PROJECT NO.: 209272A SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 8 Samples TECHNICIAN: MHB/AJP

START DATE: 5/15/09 COMPLETE DATE: 5/18/09

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 553, 1166, 1167, 1168, 1271, 1272, 1395, 1521, 1533

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 g^2/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.

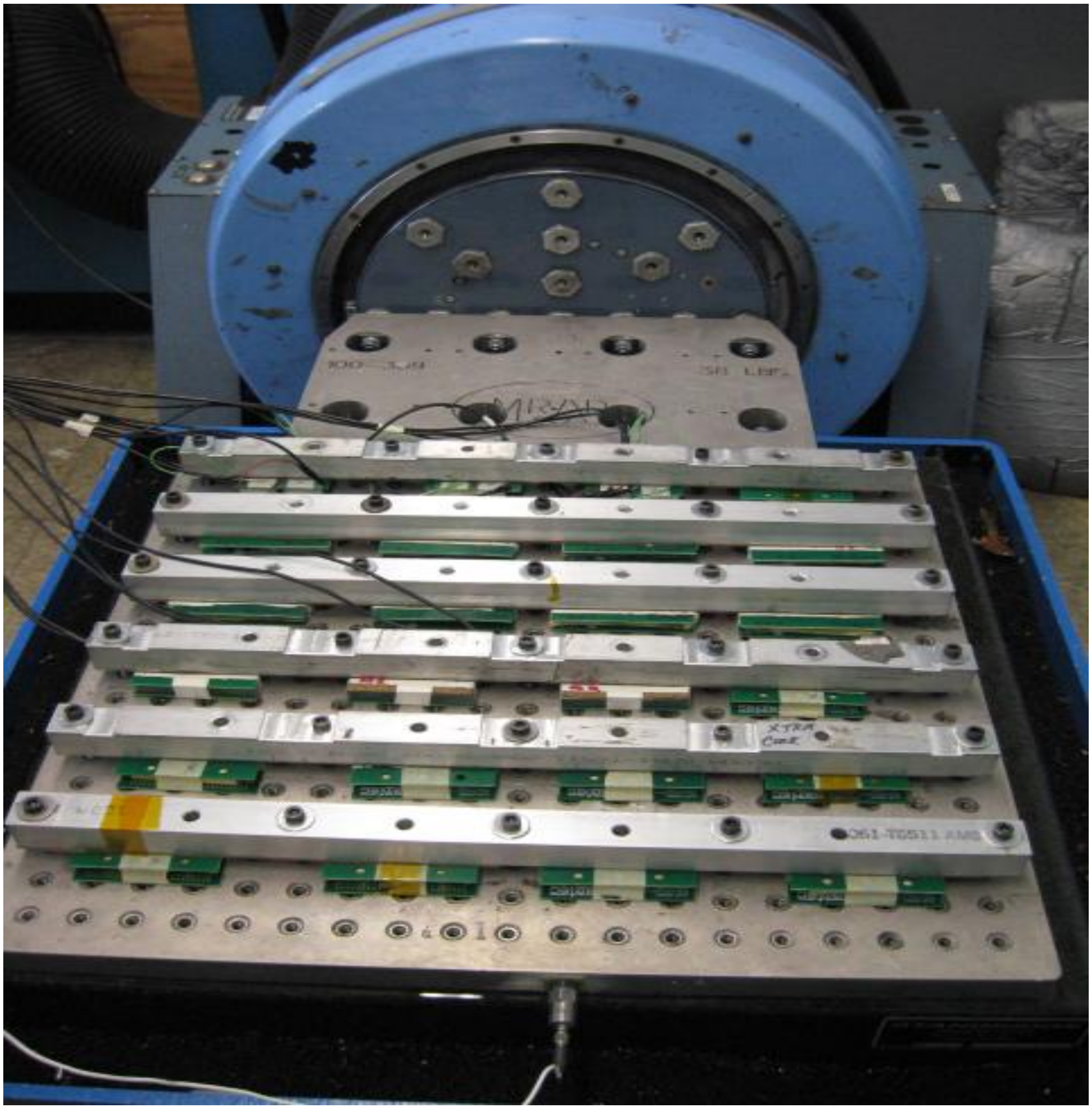
2. The following is a summary of the observed data:

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

Sample ID#	Avg. Change	Max. Change
C-A-1	+0.1	+1.5
C-A-2	+0.0	+1.2
C-A-3	-0.6	+1.0
C-A-4	+0.2	+1.5
C-A-5	-0.1	+1.2
C-A-6	+0.1	+2.5
C-A-7	-0.4	+1.6
C-A-8	+0.1	+1.6

3. See data files 20927211 through 20927218 for individual data points.

FIGURE #5



LLCR DATA FILES

DATA FILE NUMBERS

20927211
20927212
20927213
20927214
20927215
20927216
20927217
20927218

Low Level Circuit Resistance - Delta Values

Project:	209272A		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "c"
Product:	ERX5 Series Connector		File No:	20927211
Description:	ID# c-A-1		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	21	
R.H. %	38	42	36	
Date:	14May09	15May09	19May09	
Pos. ID	Initial	M.Shock	Vibration	
1	23.0	-0.3	0.1	
2	23.0	0.1	-0.2	
3	22.8	0.3	-0.2	
4	21.9	1.1	1.5	
5	23.6	-0.3	-1.0	
6	21.0	-0.4	-0.3	
7	21.2	0.0	0.0	
8	20.9	0.0	0.8	
9	21.9	0.3	0.3	
10	22.6	0.2	0.2	
11	21.7	1.0	0.7	
12	22.4	1.9	0.6	
13	20.8	0.3	0.0	
14	20.9	0.0	-0.2	
15	21.6	-0.9	0.0	
16	21.3	-0.3	-0.3	
17	21.3	0.5	-0.1	
18	21.3	-0.1	0.5	
19	21.5	-0.3	-0.3	
20	21.0	-0.3	0.4	
21	22.0	0.6	0.3	
22	22.9	-0.4	-0.2	
23	23.0	-0.2	-0.6	
24	22.3	0.1	-0.3	
25	22.3	-0.2	0.0	
MAX	23.6	1.9	1.5	
MIN	20.8	-0.9	-1.0	
AVG	21.9	0.1	0.1	
STD	0.8	0.6	0.5	
Open	0	0	0	
Tech	BE	MHB	MHB	
Equip ID	601	1276	1276	
	677	207	207	

Low Level Circuit Resistance - Delta Values				
Project:	209272A		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "c"
Product:	ERX5 Series Connector		File No:	20927212
Description:	ID# c-A-2		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	21	
R.H. %	38	42	36	
Date:	14May09	15May09	19May09	
Pos. ID	Initial	M.Shock	Vibration	
1	23.0	1.2	-1.0	
2	22.1	-0.5	0.3	
3	22.9	0.2	0.4	
4	23.7	-1.0	-1.4	
5	22.5	-0.3	-1.3	
6	20.2	0.1	1.0	
7	20.0	0.6	-0.2	
8	20.4	0.0	0.0	
9	21.6	-0.3	0.6	
10	22.3	-0.9	-0.6	
11	22.3	-0.1	0.0	
12	21.9	0.6	1.2	
13	20.3	0.4	-0.2	
14	20.8	1.6	0.2	
15	20.9	1.6	-0.3	
16	20.8	1.6	-0.1	
17	21.1	0.5	-0.4	
18	20.5	1.3	1.1	
19	21.1	-0.1	-0.7	
20	21.4	-0.5	-0.3	
21	21.5	-0.3	0.7	
22	21.5	0.3	-0.2	
23	22.1	-1.0	-0.8	
24	21.8	-0.3	0.5	
25	21.6	0.3	0.5	
MAX	23.7	1.6	1.2	
MIN	20.0	-1.0	-1.4	
AVG	21.5	0.2	0.0	
STD	0.9	0.8	0.7	
Open	0	0	0	
Tech	BE	MHB	MHB	
Equip ID	601	1276	1276	
	677	207	207	

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Low Level Circuit Resistance - Delta Values

Project:	209272A		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "c"
Product:	ERX5 Series Connector		File No:	20927213
Description:	ID# c-A-3		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	21	
R.H. %	38	42	36	
Date:	14May09	15May09	19May09	
Pos. ID	Initial	M.Shock	Vibration	
1	24.3	-0.2	-1.6	
2	23.7	-0.8	-1.9	
3	21.8	0.3	0.8	
4	22.4	-0.6	-0.3	
5	24.0	-0.6	-2.0	
6	20.9	-0.2	-0.5	
7	20.6	0.1	0.3	
8	20.5	0.4	0.2	
9	20.9	0.4	1.0	
10	21.8	-0.2	-0.5	
11	21.0	0.8	0.6	
12	22.1	-0.6	-1.2	
13	20.9	-0.6	-0.1	
14	20.8	0.5	0.6	
15	21.0	0.4	0.0	
16	21.4	-0.8	-0.9	
17	21.2	0.5	-0.1	
18	21.1	0.0	-1.3	
19	22.7	-2.2	-3.3	
20	21.3	-0.1	0.1	
21	21.7	-0.3	-0.5	
22	22.4	-0.4	-1.4	
23	22.3	0.2	-1.0	
24	21.3	0.3	-0.7	
25	21.6	-0.2	-0.9	
MAX	24.3	0.8	1.0	
MIN	20.5	-2.2	-3.3	
AVG	21.7	-0.1	-0.6	
STD	1.0	0.6	1.0	
Open	0	0	0	
Tech	BE	MHB	MHB	
Equip ID	601	1276	1276	
	677	207	207	

Low Level Circuit Resistance - Delta Values

Project:	209272A		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "c"
Product:	ERX5 Series Connector		File No:	20927214
Description:	ID# c-A-4		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	21	
R.H. %	38	42	36	
Date:	14May09	15May09	19May09	
Pos. ID	Initial	M.Shock	Vibration	
1	23.0	1.5	1.5	
2	22.4	1.1	0.6	
3	22.3	1.6	1.2	
4	22.2	1.1	1.3	
5	22.0	1.4	1.4	
6	21.2	-0.1	-0.2	
7	21.3	-0.4	-0.1	
8	21.1	0.4	0.4	
9	22.9	-0.6	0.6	
10	22.7	-0.6	0.6	
11	24.0	-0.7	0.6	
12	22.9	0.7	-0.1	
13	21.6	0.5	-0.4	
14	21.8	0.4	-0.6	
15	21.4	1.1	-0.2	
16	22.3	-0.1	-0.2	
17	22.0	0.5	0.1	
18	22.1	0.8	0.0	
19	22.5	-0.1	-0.6	
20	22.0	0.7	0.2	
21	23.3	0.5	-0.4	
22	23.5	0.1	1.3	
23	23.5	0.4	-0.3	
24	23.4	-0.1	-0.1	
25	23.9	-0.5	-0.8	
MAX	24.0	1.6	1.5	
MIN	21.1	-0.7	-0.8	
AVG	22.4	0.4	0.2	
STD	0.8	0.7	0.7	
Open	0	0	0	
Tech	BE	MHB	MHB	
Equip ID	601	1276	1276	
	677	207	207	

Low Level Circuit Resistance - Delta Values

Project:	209272A		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "c"
Product:	ERX5 Series Connector		File No:	20927215
Description:	ID# c-A-5		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	21	
R.H. %	38	42	36	
Date:	14May09	15May09	19May09	
Pos. ID	Initial	M.Shock	Vibration	
1	22.5	1.1	-0.5	
2	22.0	0.2	0.7	
3	22.2	0.3	0.2	
4	22.3	-0.1	0.1	
5	22.3	0.6	0.9	
6	23.2	-0.9	-1.3	
7	22.2	-0.1	0.3	
8	21.6	0.3	0.5	
9	23.3	-0.4	-0.3	
10	23.0	0.4	-0.7	
11	22.7	-0.6	0.1	
12	22.8	0.7	-0.2	
13	21.8	-0.8	-1.1	
14	21.1	0.0	-0.1	
15	21.5	-0.7	-0.7	
16	21.5	0.0	0.0	
17	21.6	-0.1	0.5	
18	20.8	-0.2	0.9	
19	20.8	0.2	0.0	
20	20.3	0.9	1.2	
21	22.2	0.4	0.0	
22	23.3	-1.2	-0.8	
23	23.4	-0.2	-0.1	
24	22.9	-0.5	-0.6	
25	23.3	-0.3	-0.9	
MAX	23.4	1.1	1.2	
MIN	20.3	-1.2	-1.3	
AVG	22.2	0.0	-0.1	
STD	0.9	0.6	0.7	
Open	0	0	0	
Tech	BE	MHB	MHB	
Equip ID	601	1276	1276	
	677	207	207	

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Low Level Circuit Resistance - Delta Values				
Project:	209272A		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "c"
Product:	ERX5 Series Connector		File No:	20927216
Description:	ID# c-A-6		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	21	
R.H. %	38	42	36	
Date:	14May09	15May09	19May09	
Pos. ID	Initial	M.Shock	Vibration	
1	22.2	0.8	2.5	
2	21.8	1.7	1.1	
3	22.3	-0.5	-0.9	
4	21.7	-0.3	0.7	
5	22.1	1.3	1.0	
6	20.9	-0.1	-0.7	
7	21.5	0.1	0.6	
8	21.0	0.7	0.3	
9	22.6	0.0	-0.9	
10	21.8	-0.4	-0.3	
11	22.2	0.2	-0.8	
12	22.4	-0.4	0.0	
13	21.4	-0.9	-0.3	
14	20.4	-0.1	0.0	
15	21.2	-0.3	-0.3	
16	21.7	-1.0	-0.7	
17	21.0	-0.5	-0.3	
18	21.3	-0.8	0.5	
19	20.7	-0.4	0.6	
20	21.2	-0.5	0.5	
21	22.8	4.2	-0.6	
22	22.0	0.9	-0.2	
23	22.7	3.8	-0.7	
24	22.7	2.5	-0.5	
25	21.8	4.2	1.1	
MAX	22.8	4.2	2.5	
MIN	20.4	-1.0	-0.9	
AVG	21.7	0.6	0.1	
STD	0.7	1.6	0.8	
Open	0	0	0	
Tech	BE	MHB	MHB	
Equip ID	601	1276	1276	
	677	207	207	

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Test Laboratory 1478 - 02

Low Level Circuit Resistance - Delta Values				
Project:	209272A		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "c"
Product:	ERX5 Series Connector		File No:	20927217
Description:	ID# c-A-7		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	21	
R.H. %	38	42	36	
Date:	14May09	15May09	19May09	
Pos. ID	Initial	M.Shock	Vibration	
1	23.5	1.0	-0.8	
2	22.7	0.0	0.4	
3	23.0	-0.8	1.2	
4	24.5	-1.8	-1.9	
5	23.6	-0.1	1.2	
6	21.1	-0.2	0.3	
7	21.1	0.0	1.6	
8	21.2	-0.6	0.2	
9	22.0	-0.1	0.8	
10	22.7	-0.4	-0.3	
11	22.0	0.0	0.5	
12	22.7	-0.1	0.5	
13	21.9	0.2	0.4	
14	22.2	-1.2	0.5	
15	21.7	-0.3	-0.7	
16	21.5	-0.8	0.5	
17	23.0	-0.9	-1.9	
18	22.8	-1.0	-1.3	
19	22.1	-0.5	-1.0	
20	22.4	0.0	-0.9	
21	26.7	-4.5	-4.0	
22	26.8	-4.5	-3.5	
23	25.4	-2.7	-2.4	
24	22.0	0.0	0.2	
25	22.3	0.0	0.3	
MAX	26.8	1.0	1.6	
MIN	21.1	-4.5	-4.0	
AVG	22.8	-0.8	-0.4	
STD	1.5	1.3	1.4	
Open	0	0	0	
Tech	BE	MHB	MHB	
Equip ID	601	1276	1276	
	677	207	207	

Low Level Circuit Resistance - Delta Values				
Project:	209272A		Spec:	EIA 364 TP 23
Customer:	Samtec		Subgroup:	Sequence "c"
Product:	ERX5 Series Connector		File No:	20927218
Description:	ID# c-A-8		Tech:	BE
Open circuit voltage:		20mV	Current:	10ma
Units: milliohms				
Temp ºC	21	21	21	
R.H. %	38	42	36	
Date:	14May09	15May09	19May09	
Pos. ID	Initial	M.Shock	Vibration	
1	23.6	0.0	0.1	
2	22.4	-0.1	-0.5	
3	23.0	1.6	-0.4	
4	22.5	0.0	0.2	
5	22.5	-0.5	0.0	
6	21.1	0.5	-0.2	
7	21.7	0.7	-0.3	
8	21.2	0.3	1.6	
9	22.4	-0.1	0.2	
10	22.1	1.5	0.0	
11	22.9	-0.6	0.1	
12	22.8	0.1	-0.2	
13	22.1	-0.8	-0.9	
14	21.1	-0.3	-0.2	
15	20.8	-0.6	-0.1	
16	22.0	-1.0	0.1	
17	21.7	-0.5	-0.6	
18	22.5	-1.4	-2.0	
19	21.0	0.2	0.6	
20	21.1	-0.5	0.4	
21	23.2	-0.1	0.3	
22	22.6	0.1	1.4	
23	23.0	-0.3	0.7	
24	23.0	0.2	0.7	
25	22.6	0.0	1.3	
MAX	23.6	1.6	1.6	
MIN	20.8	-1.4	-2.0	
AVG	22.2	-0.1	0.1	
STD	0.8	0.7	0.7	
Open	0	0	0	
Tech	BE	MHB	MHB	
Equip ID	601	1276	1276	
	677	207	207	

TEST RESULTS

SEQUENCE D

Group A

PROJECT NO.: 209272A SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 3 Samples TECHNICIAN: BE

START DATE: 5/15/09 COMPLETE DATE: 5/15/09

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 14, 553, 1028, 1166, 1167, 1168, 1271, 1272, 1533

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 #2 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.

PROCEDURE:-continued

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

REQUIREMENTS:

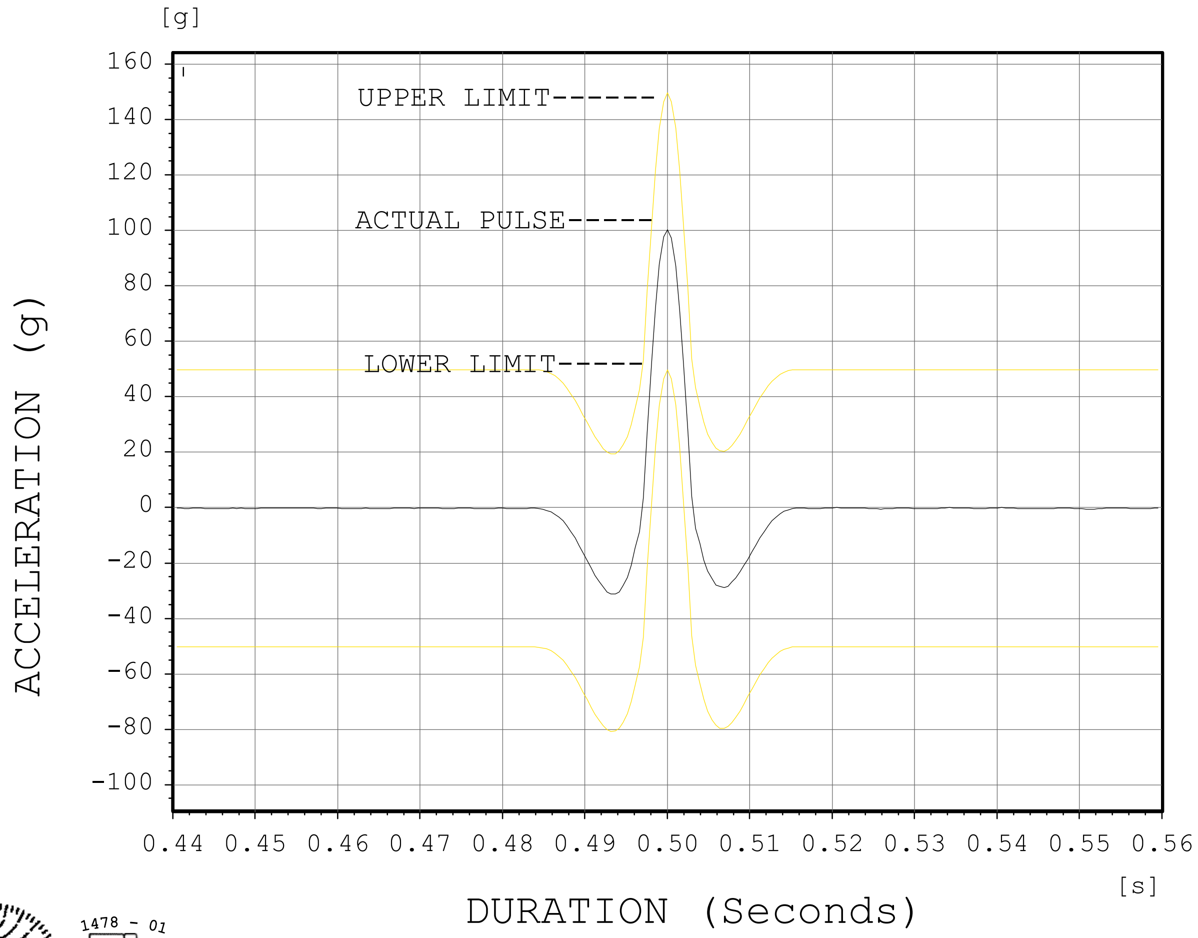
1. There shall be no evidence of physical damage to the test samples as tested.
2. There shall be no low nanosecond event detected greater than 50 nanoseconds.

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 #6 (Calibration Pulse) and #7 (Test Pulse). Each figure displays the shock pulse contained within the upper and lower limits as defined by the appropriate test specification.

FIGURE #6

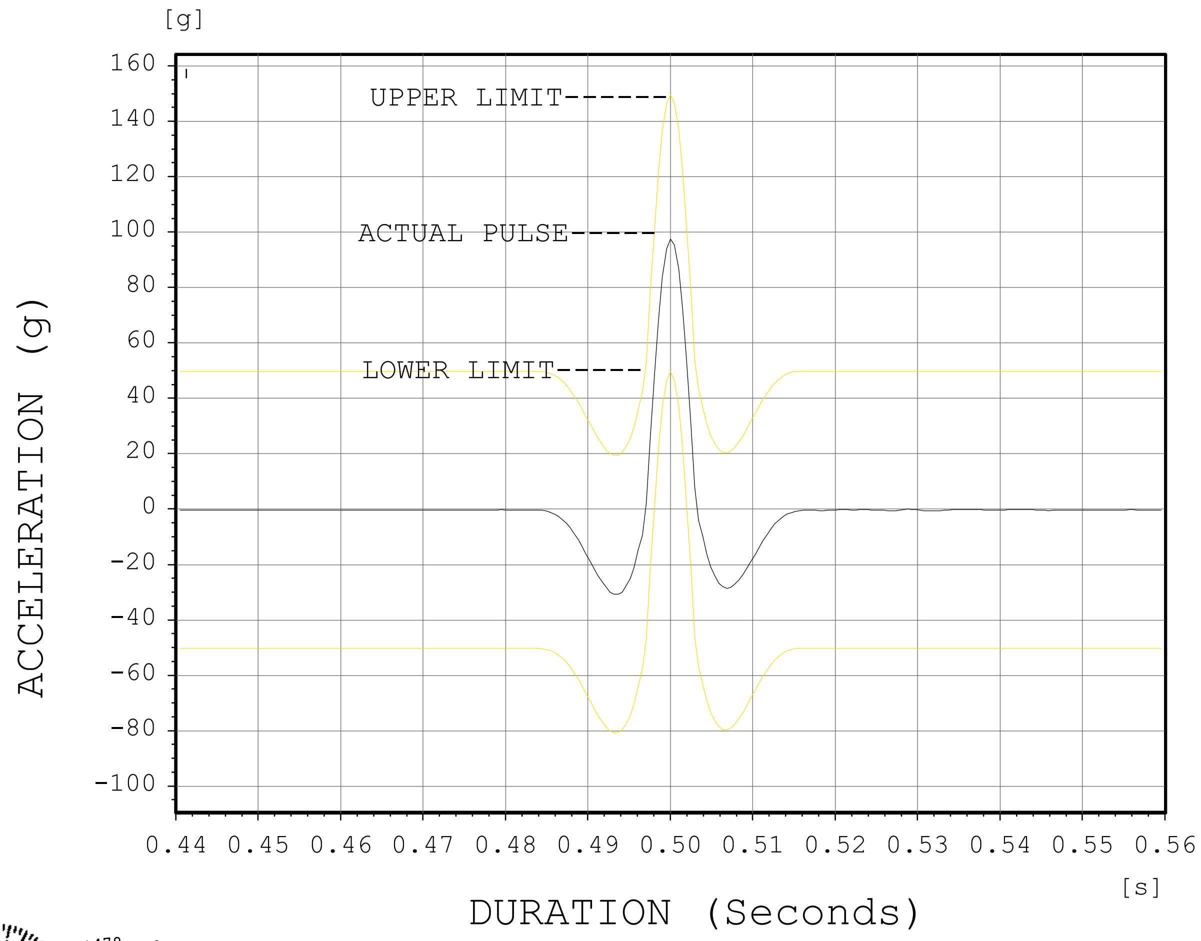
Classical Shock **Channel 1**



Project 209272A
Samtec
Cal. Wave 2
Tech: MHB
Date:15May09

FIGURE #7

Classical Shock **Channel 1**



Project 209272A
Samtec
Actual Wave
Tech: MHB
Date:15May09

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PROJECT NO.: 209272A SPECIFICATION: TC0926-2581

PART NO.: ERM5-050-05.0-L-DV PART DESCRIPTION: ERX5 series connector

SAMPLE SIZE: 3 Samples TECHNICIAN: BE

START DATE: 5/15/09 COMPLETE DATE: 5/18/09

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 42%

EQUIPMENT ID#: 553, 1028, 1166, 1167, 1168, 1271, 1272, 1395, 1521, 1533

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 g^2/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. 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.