APRIL 9, 2009

TEST REPORT #209119

CONNECTOR TESTING

MPS-RA SERIES

SAMTEC, INC.

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

ilac-MRA 1478 - 01 ACCREDITED Test Laboratory 1478 - 02

Contech Research
An Independent Test and Research Laboratory

REVISION HISTORY

DATE	REV. NO.	DESCRIPTION	ENG.
4/9/2009	1.0	Initial Issue	DA

CERTIFICATION

This is to certify that the MPT/MPS connector series 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.
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DA:cf

SCOPE

To perform qualification testing on the MPT/MPS 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 Specification: MPS-RA 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.

	Description	Part Number
a)	Receptacle Connector	MPS-08-01-L-RA-SD
b)	Plug Connector	MPT-08-01-01-L-RA-SD

Note: Line items a)and b) are connectors populated with power contacts only.

2. Test samples were supplied assembled and terminated to test boards by the test sponsor. Specific test boards were designed for the following tests:
   - IR/DWV
   - LLCR
   - Nanosecond Event Detection

3. The test samples for vibration and mechanical shock were prepared by terminating all positions in series for monitoring contact events during vibration and/or shock.

4. Unless otherwise specified in the test procedures used, no further preparation was used.

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 A - A-A-1, A-A-2, etc.
Group B1 – A-B1-1, A-B1-2, etc.
Group B2 - A-B2-1, A-B2-2, etc.
Group B3 - A-B3-1, A-B3-2, etc.
Seq b: Group A - B-A-1, B-A-2, B-A-3, B-A-4, B-A-5, B-A-6, B-A-7, B-A-8, etc.
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, etc.
Seq d: Group A - D-A-1, D-A-2, D-A-3, etc.

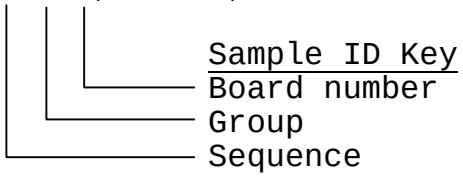
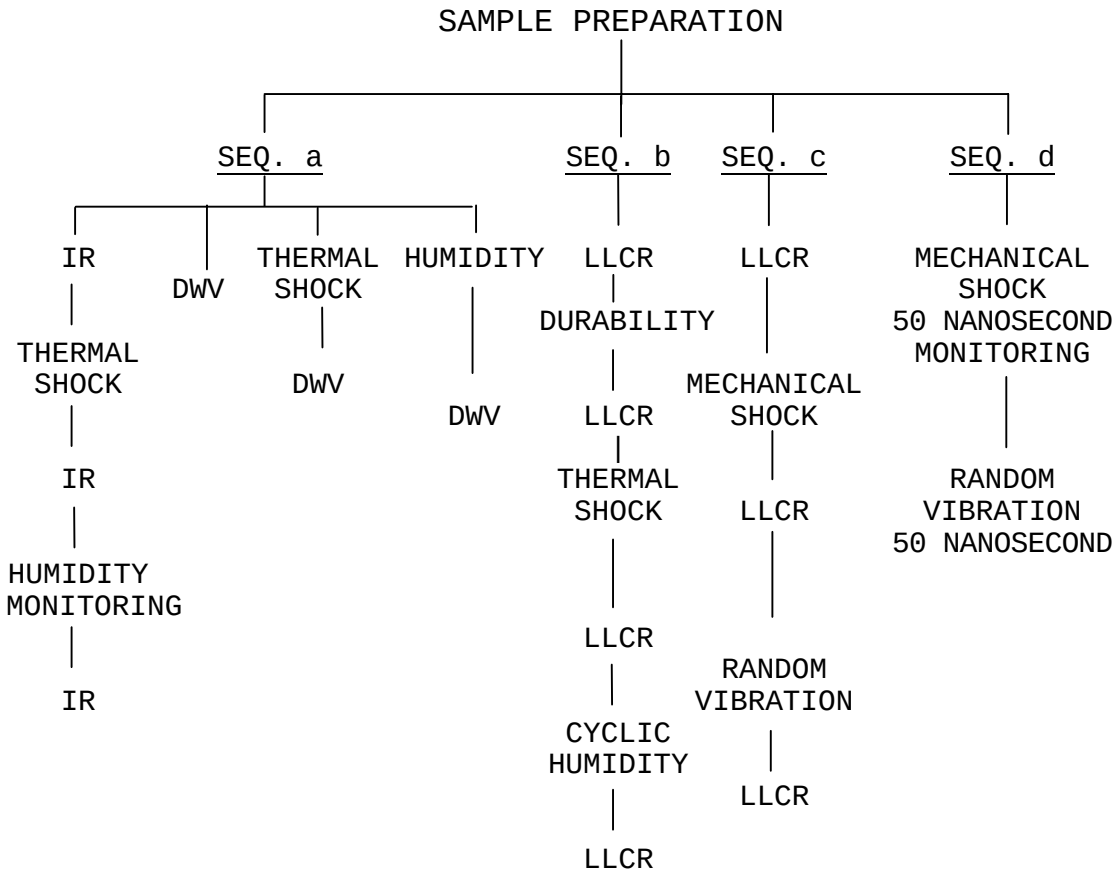


FIGURE #1

TEST PLAN FLOW DIAGRAM



GROUP A	GROUP B1	GROUP B2	GROUP B3	GROUP A	GROUP A	GROUP A

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

DATA SUMMARY

TEST	REQUIREMENT	RESULTS
SEQUENCE a		
GROUP A		
INSULATION RESISTANCE	1000 MEGOHMS MIN.	>50,000 MEGOHMS
THERMAL SHOCK	NO DAMAGE	PASSED
INSULATION RESISTANCE	1000 MEGOHMS MIN.	>50,000 MEGOHMS
HUMIDITY	NO DAMAGE	PASSED
INSULATION RESISTANCE	1000 MEGOHMS MIN.	15,000 MEGOHMS
GROUP B1		
DWV	900 VAC	PASSED
GROUP B2		
THERMAL SHOCK	NO DAMAGE	PASSED
DWV	900 VAC	PASSED
GROUP B3		
HUMIDITY	NO DAMAGE	PASSED
DWV	900 VAC	PASSED
SEQUENCE b		
GROUP A		
LLCR	RECORD	0.58 mΩ MAX
DURABILITY	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+0.10 mΩ MAX.CHG.
THERMAL SHOCK	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+0.05 mΩ MAX.CHG.
CYCLIC HUMIDITY	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+0.20 mΩ MAX.CHG.

-continued on next page.

DATA SUMMARY – continued

TEST	REQUIREMENT	RESULTS
SEQUENCE c		
GROUP A		
LLCR	RECORD	0.60 mΩ MAX
MECHANICAL SHOCK	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+0.50 mΩ MAX.CHG.
RANDOM VIBRATION	NO DAMAGE	PASSED
LLCR	+10.0 mΩ MAX.CHG.	+0.04 mΩ MAX.CHG.
SEQUENCE d		
GROUP A		
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
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
200	1/9/2010	1/9/2009	Power Supply	PCB Piezotronics	482A	4210	N/A	12mon
282			Vibration Shaker Table	Ling Dynamics	V-730	163	N/A	N/A
421	3/31/2010	3/31/2009	Megohmeter	Hipotronics Co.	HM3A	031423-00	See Cal Cert	12 mon.
874			Computer	M&P	Vectra	us75203327	N/A	N/A
1028	2/4/2010	2/4/2009	Event Detector	Analysis Tech	32 EHD	981019	See Cal.Cert.	12mon
1125	9/22/2009	9/22/2008	Microohm Meter	Keithley	580	451920	See Cal Cert	12mon
1219			Computer	ARC Co.	350	350	±2%	N/A
1315	1/21/2010	1/21/2009	Data Aquisition Multimeter	Keithley Co.	2700	0862680	See CERT	12mon
1339	4/14/2009	4/14/2008	Hipot Tester A/C-DC	Quad Tech	Sentry 30	2052040	See Cert	12months
1366			Main Frame	Agilent H.P.	8408A		N/A	N/A
1367			Interface	Agilent H.P.	E8491A		N/A	N/A
1368	X 4/25/2009	3/25/2008	Sine/Rnd Control digitizer	Agilent H.P.	E1432A	US35470169	See Manual	12mon
1474			Vib Pwr Amp	tira	A58312	003/06	N/A	N/A
1521	8/18/2009	8/18/2008	Accelerometer	PCB	353B04	118492	See Cal Cert	12mon
1549	1/30/2010	1/30/23009	Multiplexer Card	Keithley	7708	171629	See Cert	12mon
1550	1/21/2010	1/21/2009	Multiplexer Card	Keithley	7708	171626	See Cert	12mon
1609	1/2/2010	1/2/2009	Vert Thermal Shock Chamber	C.S.Z.	VTS-1.0-2-2-H/AC	08-VT14810	See Manual	12mon

TEST RESULTS

SEQUENCE a

Group A

MPT/MPS Series

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 2 Samples	TECHNICIAN: MOB
START DATE: 3/9/09	COMPLETE DATE: 3/9/09
ROOM AMBIENT: 21°C	RELATIVE HUMIDITY: 30%
EQUIPMENT ID#: 421	

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) Between Rows : Yes
    c) Mated Condition : Mated
    d) Mounting Condition : Mounted
    e) Electrification Time : 2.0 Minutes
    f) Test Voltage : 500 VDC

3. The test voltage was applied to designated test points on the board.

REQUIREMENTS:

When the specified test voltage is applied, the insulation resistance shall not be less than 1,000 megohms.

RESULTS:

The insulation resistance exceeded 50,000 megohms.

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 2 Samples	TECHNICIAN: MOB
START DATE: 3/12/09	COMPLETE DATE: 3/16/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 27%
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, with the following conditions.

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 was performed continuously.

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

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 or deterioration of the test samples so exposed.

2. The insulation resistance shall exceed 1,000 megohms.

RESULTS:

1. There was no evidence of visual or physical damage to the test samples as tested.

2. All test samples as tested met the requirements as specified.

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 2 Samples	TECHNICIAN: MOB
START DATE: 3/17/09	COMPLETE DATE: 3/27/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 24%
EQUIPMENT ID#: 27, 1315, 1549, 1550	

HUMIDITY (THERMAL CYCLING)

PURPOSE:

1. 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.

2. This test obtains added effectiveness in employment of temperature cycling that provides a breathing action, inducing corrosion processes, and the introduction of moisture into partially sealed test samples. This condition imposes a vapor pressure on the samples which constitutes the major force behind the moisture migration and penetration.

PROCEDURE:

1. The test environment was performed in accordance with EIA 364, Test Procedure 31, Method III (omit Step 7a, 7b) with the following conditions.

2. Test Conditions:

   a) Relative Humidity : 90% to 95%
   b) Temperature Conditions : 25°C to 65°C
   c) Cold Cycle : No
   d) Polarizing Voltage : No
   e) Mating Conditions : Mated
   f) Mounting Conditions : Mounted
   g) Duration : 240 hours

PROCEDURE: –continued

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

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

REQUIREMENTS:

1. There shall be no evidence of physical deterioration of the test samples as tested.

2. The final insulation resistance shall not be less than 1,000 megohms.

RESULTS:

1. The test samples as tested showed no evidence of physical deterioration.

2. All test samples as tested met the requirements as specified.

TEST RESULTS

SEQUENCE a

Group B1

MPT/MPS Series

PROJECT NO.: 209119 SPECIFICATION: MPS-RA Test Plan

PART NO.: See page 4 PART DESCRIPTION: See page 4

SAMPLE SIZE: 2 Samples TECHNICIAN: MOB

START DATE: 3/9/09 COMPLETE DATE: 3/9/09

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 30%

EQUIPMENT ID#: 1339

DIELECTRIC WITHSTANDING VOLTAGE (SEA LEVEL)

PURPOSE:

To determine if the connectors can operate at its rated voltage and withstand momentary over potentials due to switching, surges and other similar phenomenon.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 20.

2. Test Conditions:

   a) Between Adjacent Contacts : Yes
   b) Between Rows : Yes
   c) Mated Condition : Mated
   d) Mounting Condition : Mounted
   e) Hold Time : 60 Seconds
   f) Rate of Application : 500 volts/sec.
   g) Test Voltage : 900 VAC

3. 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.

TEST RESULTS

SEQUENCE a

Group B2

MPT/MPS Series

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 2 Samples	TECHNICIAN: MOB
START DATE: 3/12/09	COMPLETE DATE: 3/12/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 27%
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, with the following conditions.

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 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. When a 900 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. There was no evidence of arcing, breakdown, etc., when a 900 VAC voltage was applied.

3. All test samples as tested met the requirements as specified.

TEST RESULTS

SEQUENCE a

Group B3

MPT/MPS Series

PROJECT NO.: 209119 SPECIFICATION: MPS-RA Test Plan

PART NO.: See page 4 PART DESCRIPTION: See page 4

SAMPLE SIZE: 2 Samples TECHNICIAN: MOB

START DATE: 3/17/09 COMPLETE DATE: 3/27/09

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 24%

EQUIPMENT ID#: 27, 1315, 1549, 1550

HUMIDITY (THERMAL CYCLING)

PURPOSE:

1. 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.

2. This test obtains added effectiveness in employment of temperature cycling that provides a breathing action, inducing corrosion processes, and the introduction of moisture into partially sealed test samples. This condition imposes a vapor pressure on the samples which constitutes the major force behind the moisture migration and penetration.

PROCEDURE:

1. The test environment was performed in accordance with EIA 364, Test Procedure 31 Method III (omit Step 7a,7b), with the following conditions:

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PROCEDURE: –continued

2. Test Conditions:

a) Relative Humidity	:	90% to 95%
b) Temperature Conditions	:	25°C to 65°C
c) Cold Cycle	:	No
d) Polarizing Voltage	:	No
e) Mating Conditions	:	Mated
f) Mounting Conditions	:	Mounted
g) Duration	:	240 hours

3. The final dielectric withstanding voltage test was performed in accordance with EIA 364, Test Procedure 20 and the procedures as previously indicated.

4. 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. There shall be no evidence of arcing or breakdown when a 900 VAC test voltage is applied.

RESULTS:

1. The test samples as tested showed no evidence of physical deterioration.

2. There was no evidence of breakdown, arcing, etc., when a 900 VAC test voltage was applied.

3. All test samples as tested met the requirements as specified.

TEST RESULTS

SEQUENCE b

Group A

MPT/MPS Series

PROJECT NO.: 209119 SPECIFICATION: MPS-RA Test Plan

PART NO.: See page 4 PART DESCRIPTION: See page 4

SAMPLE SIZE: 10 Samples TECHNICIAN: MOB

START DATE: 3/6/09 COMPLETE DATE: 3/6/09

ROOM AMBIENT: 25°C RELATIVE HUMIDITY: 32%

EQUIPMENT ID#: 1125, 1219

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, with the following conditions.

2. Test Conditions:

   a) Test Current : 10 milliamps
   b) Open Circuit Voltage : 20 millivolts

REQUIREMENTS: See Next Page

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	0.37	0.40	0.33
B-A-2	0.45	0.58	0.39
B-A-3	0.45	0.49	0.41
B-A-4	0.46	0.58	0.36
B-A-5	0.45	0.55	0.38
B-A-6	0.37	0.39	0.35
B-A-7	0.44	0.53	0.38
B-A-8	0.43	0.48	0.35
B-A-9	0.45	0.49	0.40
B-A-10	0.41	0.47	0.32

2. All test samples as tested met the requirements as specified.

3. See data files 20911901 through 20911910 for individual data points.

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 10 Samples	TECHNICIAN: MOB
START DATE: 3/9/09	COMPLETE DATE: 3/10/09
ROOM AMBIENT: 21°C	RELATIVE HUMIDITY: 30%
EQUIPMENT ID#: 150	

DURABILITY

PURPOSE:

1. This is a preconditioning 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 or preconditioning 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 : 500 cycles per hour

3. The test samples were fixtured to the top plate of an X, Y, Z floating table to assure axial alignment and allowed self centering movement to exit.

PROCEDURE: –continued

4. 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. 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	+0.02	+0.05
B-A-2	+0.01	+0.09
B-A-3	+0.00	+0.06
B-A-4	+0.05	+0.10
B-A-5	-0.02	+0.05
B-A-6	+0.02	+0.06
B-A-7	+0.02	+0.05
B-A-8	-0.02	+0.03
B-A-9	+0.01	+0.06
B-A-10	+0.04	+0.06

2. There was no evidence of physical damage to the test samples as tested.

3. All test samples as tested met the requirements as specified.

4. See data files 20911901 through 20911910 for individual data points.

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 10 samples	TECHNICIAN: MOB
START DATE: 3/12/09	COMPLETE DATE: 3/16/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 26%
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, with the following conditions.

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. 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	-0.02	+0.02
B-A-2	-0.03	+0.03
B-A-3	-0.01	+0.01
B-A-4	-0.02	+0.04
B-A-5	-0.02	+0.03
B-A-6	+0.00	+0.03
B-A-7	-0.02	+0.04
B-A-8	-0.05	+0.00
B-A-9	+0.01	+0.05
B-A-10	-0.03	+0.08

2. There was no evidence of physical damage to the test samples as tested.

3. All test samples as tested met the requirements as specified.

4. See data files 20911901 through 20911910 for individual data points.

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 10 samples	TECHNICIAN: MOB
START DATE: 3/17/09	COMPLETE DATE: 3/27/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 24%
EQUIPMENT ID#: 27, 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, 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

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 following is a summary of the data observed:

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(milliohms)

Sample ID#	Avg. Change	Max. Change
B-A-1	+0.01	+0.06
B-A-2	+0.02	+0.07
B-A-3	+0.05	+0.10
B-A-4	+0.07	+0.14
B-A-5	+0.03	+0.09
B-A-6	+0.01	+0.06
B-A-7	+0.01	+0.04
B-A-8	-0.01	+0.07
B-A-7	+0.06	+0.20
B-A-8	+0.03	+0.20

2. There was no evidence of physical damage to the test samples as tested.

3. All test samples as tested met the requirements as specified.

4. See data files 20911901 through 20911910 for individual data points.

LLCR DATA FILES

DATA FILE NUMBERS

20911901
20911902
20911903
20911904
20911905
20911906
20911907
20911908
20911909
20911910

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911901	
Description:	B-A-1				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	30	24	27	
Date:	06Mar09	09Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-1-1	0.40	0.01	-0.03	0.01	
b-1-2	0.40	0.03	-0.03	-0.03	
b-1-3	0.36	0.00	-0.01	0.00	
b-1-4	0.38	0.01	-0.04	0.06	
b-1-5	0.38	0.04	-0.02	0.01	
b-1-6	0.37	0.00	-0.03	0.00	
b-1-7	0.33	0.04	0.01	0.05	
b-1-8	0.36	0.05	0.02	0.00	
MAX	0.40	0.05	0.02	0.06	
MIN	0.33	0.00	-0.04	-0.03	
AVG	0.37	0.02	-0.02	0.01	
STD	0.02	0.02	0.02	0.03	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911902	
Description:	B-A-2				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	30	24	27	
Date:	06Mar09	09Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-2-1	0.40	0.05	0.03	0.02	
b-2-2	0.58	-0.07	-0.12	-0.05	
b-2-3	0.49	0.05	0.01	0.03	
b-2-4	0.43	0.09	0.03	0.07	
b-2-5	0.47	-0.06	-0.06	0.05	
b-2-6	0.43	-0.02	-0.04	0.03	
b-2-7	0.42	0.02	-0.04	-0.07	
b-2-8	0.39	0.01	-0.01	0.04	
MAX	0.58	0.09	0.03	0.07	
MIN	0.39	-0.07	-0.12	-0.07	
AVG	0.45	0.01	-0.03	0.02	
STD	0.06	0.06	0.05	0.05	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911903	
Description:	B-A-3				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	30	24	27	
Date:	06Mar09	09Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-3-1	0.42	0.01	0.00	0.04	
b-3-2	0.49	-0.03	-0.04	0.09	
b-3-3	0.47	-0.02	-0.02	0.01	
b-3-4	0.47	0.00	-0.02	0.01	
b-3-5	0.43	0.02	0.01	0.09	
b-3-6	0.41	0.06	0.01	0.07	
b-3-7	0.43	-0.03	-0.02	-0.01	
b-3-8	0.44	0.01	-0.01	0.10	
MAX	0.49	0.06	0.01	0.10	
MIN	0.41	-0.03	-0.04	-0.01	
AVG	0.45	0.00	-0.01	0.05	
STD	0.03	0.03	0.02	0.04	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911904	
Description:	B-A-4				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	30	24	27	
Date:	06Mar09	09Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-4-1	0.51	-0.03	0.02	0.07	
b-4-2	0.58	0.02	-0.12	0.00	
b-4-3	0.49	0.10	-0.03	0.14	
b-4-4	0.48	0.04	0.02	0.12	
b-4-5	0.48	0.01	-0.03	0.02	
b-4-6	0.42	0.06	-0.03	0.05	
b-4-7	0.36	0.09	0.01	0.06	
b-4-8	0.38	0.09	0.04	0.08	
MAX	0.58	0.10	0.04	0.14	
MIN	0.36	-0.03	-0.12	0.00	
AVG	0.46	0.05	-0.02	0.07	
STD	0.07	0.05	0.05	0.05	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911905	
Description:	B-A-5				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	30	24	27	
Date:	06Mar09	09Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-5-1	0.47	-0.01	0.03	0.07	
b-5-2	0.46	0.00	-0.01	0.06	
b-5-3	0.43	0.05	-0.03	0.02	
b-5-4	0.43	-0.01	-0.02	0.06	
b-5-5	0.38	0.03	0.03	0.09	
b-5-6	0.39	0.00	0.01	0.05	
b-5-7	0.45	-0.02	-0.04	0.03	
b-5-8	0.55	-0.19	-0.14	-0.11	
MAX	0.55	0.05	0.03	0.09	
MIN	0.38	-0.19	-0.14	-0.11	
AVG	0.45	-0.02	-0.02	0.03	
STD	0.05	0.07	0.06	0.06	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911906	
Description:	B-A-6				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	28	24	27	
Date:	06Mar09	10Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-6-1	0.39	-0.01	-0.01	0.04	
b-6-2	0.38	0.00	-0.01	0.00	
b-6-3	0.36	0.00	0.00	0.03	
b-6-4	0.38	0.02	-0.02	-0.06	
b-6-5	0.35	0.05	0.01	0.03	
b-6-6	0.35	0.05	0.03	0.02	
b-6-7	0.37	-0.01	-0.03	-0.01	
b-6-8	0.36	0.06	0.02	0.06	
MAX	0.39	0.06	0.03	0.06	
MIN	0.35	-0.01	-0.03	-0.06	
AVG	0.37	0.02	0.00	0.01	
STD	0.01	0.03	0.02	0.04	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911907	
Description:	B-A-7				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	28	24	27	
Date:	06Mar09	10Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-7-1	0.43	-0.02	0.00	0.01	
b-7-2	0.53	0.02	-0.06	-0.01	
b-7-3	0.46	0.03	-0.02	0.00	
b-7-4	0.48	0.05	-0.04	-0.01	
b-7-5	0.42	0.03	0.00	0.04	
b-7-6	0.42	0.02	-0.05	0.03	
b-7-7	0.38	0.04	-0.01	-0.02	
b-7-8	0.40	-0.01	0.04	0.03	
MAX	0.53	0.05	0.04	0.04	
MIN	0.38	-0.02	-0.06	-0.02	
AVG	0.44	0.02	-0.02	0.01	
STD	0.05	0.02	0.03	0.02	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911908	
Description:	B-A-8				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	28	24	27	
Date:	06Mar09	10Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-8-1	0.43	-0.06	-0.05	0.02	
b-8-2	0.46	-0.03	-0.09	-0.07	
b-8-3	0.45	-0.08	-0.10	-0.06	
b-8-4	0.35	0.00	0.00	0.07	
b-8-5	0.44	-0.04	-0.05	0.00	
b-8-6	0.39	0.03	-0.03	-0.03	
b-8-7	0.48	0.00	-0.05	-0.01	
b-8-8	0.46	0.00	-0.02	-0.01	
MAX	0.48	0.03	0.00	0.07	
MIN	0.35	-0.08	-0.10	-0.07	
AVG	0.43	-0.02	-0.05	-0.01	
STD	0.04	0.04	0.03	0.04	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911909	
Description:	B-A-9				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	28	24	27	
Date:	06Mar09	10Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-9-1	0.42	0.01	0.01	-0.02	
b-9-2	0.46	0.04	0.03	0.04	
b-9-3	0.48	-0.02	-0.05	-0.01	
b-9-4	0.46	0.03	0.04	0.09	
b-9-5	0.45	0.02	0.01	0.05	
b-9-6	0.40	0.06	0.05	0.20	
b-9-7	0.49	-0.08	-0.05	0.05	
b-9-8	0.40	0.01	0.02	0.06	
MAX	0.49	0.06	0.05	0.20	
MIN	0.40	-0.08	-0.05	-0.02	
AVG	0.45	0.01	0.01	0.06	
STD	0.03	0.04	0.04	0.07	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

Low Level Contact Resistance					
Project:	209119			Spec: EIA 364, TP23	
Customer:	Samtec			Subgroup: Seq B	
Product:	Series MPS-RA connector			File #: 20911910	
Description:	B-A-10				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	21	22	21	
R.H. %	25	28	24	27	
Date:	06Mar09	10Mar09	17Mar09	27Mar09	
Pos. ID	Initial	100X	Thermal	Humidity	
			Shock	240 hrs	
b-10-1	0.41	-0.03	0.00	0.04	
b-10-2	0.45	0.01	-0.07	-0.02	
b-10-3	0.47	-0.05	-0.09	-0.05	
b-10-4	0.35	0.00	0.01	0.01	
b-10-5	0.40	0.03	-0.05	-0.02	
b-10-6	0.46	0.04	-0.04	0.05	
b-10-7	0.44	0.00	-0.08	0.00	
b-10-8	0.32	0.06	0.08	0.20	
MAX	0.47	0.06	0.08	0.20	
MIN	0.32	-0.05	-0.09	-0.05	
AVG	0.41	0.01	-0.03	0.03	
STD	0.05	0.04	0.06	0.08	
Open	0	0	0	0	
Tech	MOB	MOB	MOB	BE	
Equip ID	1125	1125	1125	601	
	1219	1219	1219	677	

TEST RESULTS

SEQUENCE c

Group A

MPT/MPS Series

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION See page 4
SAMPLE SIZE: 10 samples	TECHNICIAN: MOB, BE
START DATE: 3/11/09	COMPLETE DATE: 3/11/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 30%
EQUIPMENT ID#: 1125, 1219	

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, with the following conditions.

2. Test Conditions:

   a) Test Current : 10 milliamps
   b) Open Circuit Voltage : 20 millivolts

REQUIREMENTS: See Next Page

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	0.43	0.47	0.37
C-A-2	0.49	0.55	0.41
C-A-3	0.49	0.56	0.38
C-A-4	0.42	0.53	0.39
C-A-5	0.41	0.46	0.35
C-A-6	0.47	0.60	0.38
C-A-7	0.51	0.59	0.43
C-A-8	0.41	0.46	0.34
C-A-9	0.43	0.54	0.37
C-A-10	0.43	0.51	0.34

2. All test samples as tested met the requirements as specified.

3. See data files 20911911 through 20911920 for individual data points.

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 10 samples	TECHNICIAN: MOB
START DATE: 3/16/09	COMPLETE DATE: 3/16/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 27%
EQUIPMENT ID#: 200, 282, 874, 1028, 1366, 1367, 1368, 1474, 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.

2. Test Conditions:

   a) Peak Value : 100 G
   b) Duration : 6 Milliseconds
   c) Wave Form : Half-Sine
   d) Velocity : 11.3 feet per second
   e) No. of Shocks : 3 Shocks/Direction, 3 Axis (18 Total)

3. A stabilizing medium was used such that the mated test samples did not separate during the test.

4. Figure #3 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. 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	+0.00	+0.02
C-A-2	-0.04	+0.02
C-A-3	-0.08	-0.04
C-A-4	-0.02	+0.03
C-A-5	-0.03	+0.02
C-A-6	-0.01	+0.03
C-A-7	-0.02	+0.09
C-A-8	-0.02	+0.03
C-A-9	-0.04	+0.00
C-A-10	+0.01	+0.05

2. There was no evidence of physical damage to the test samples as tested.

3. All test samples as tested met the requirements as specified.

4. See data files 20911911 through 20911920 for individual data points.

4. The Mechanical Shock characteristics are shown in Figures #4 (Calibration Pulse) and #5 (Test Pulse). Each figure displays the shock pulse contained within the upper and lower limits as defined by the appropriate test specification.

FIGURE #3

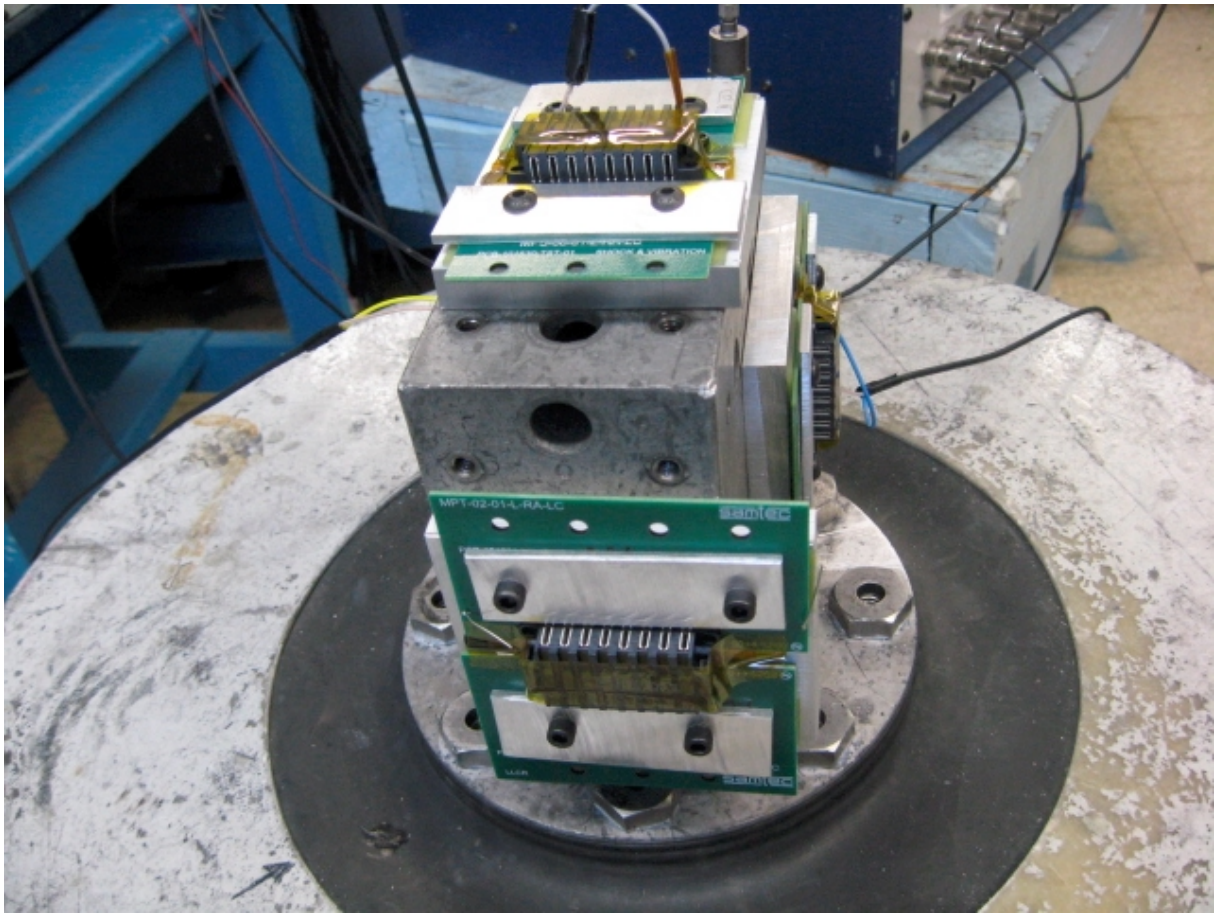
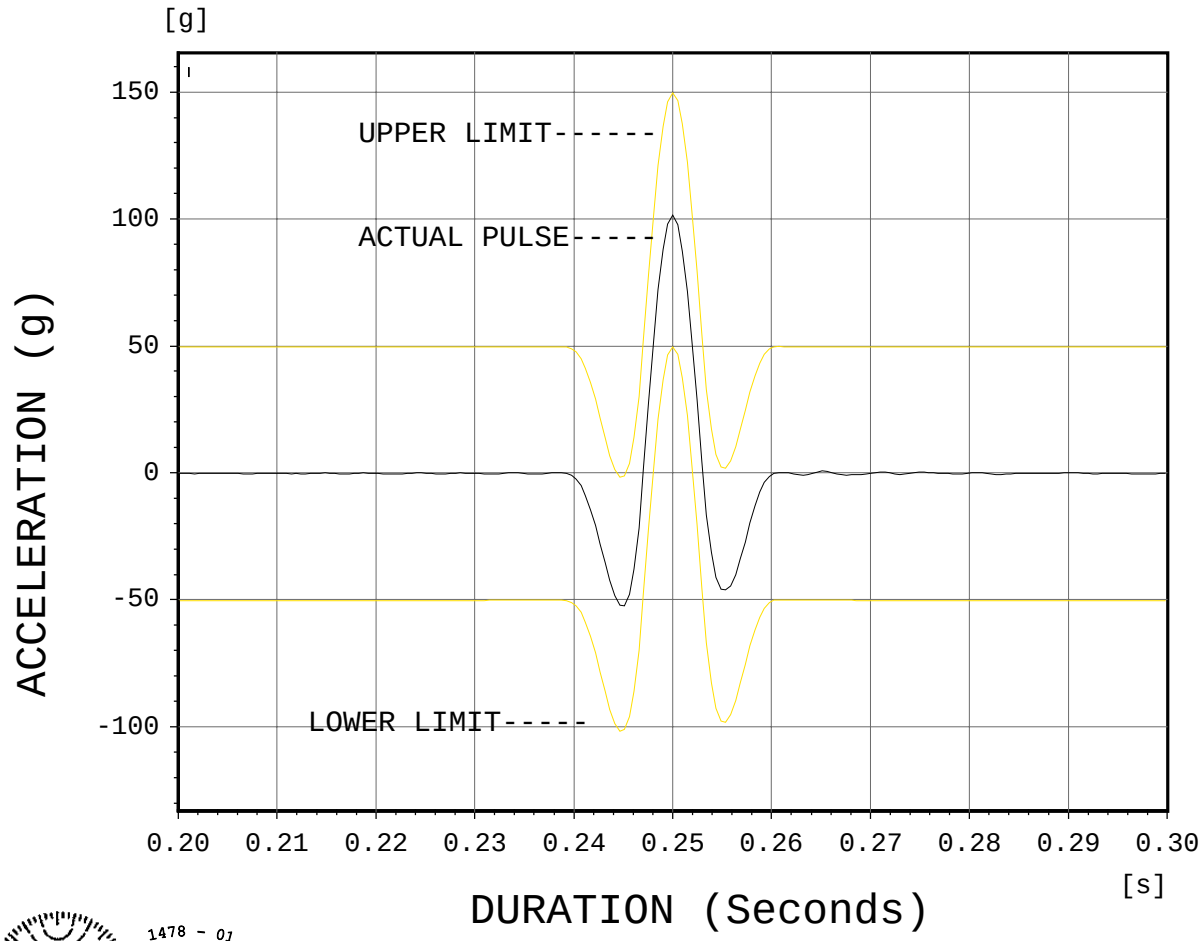


FIGURE #4

Classical Shock

Channel 5

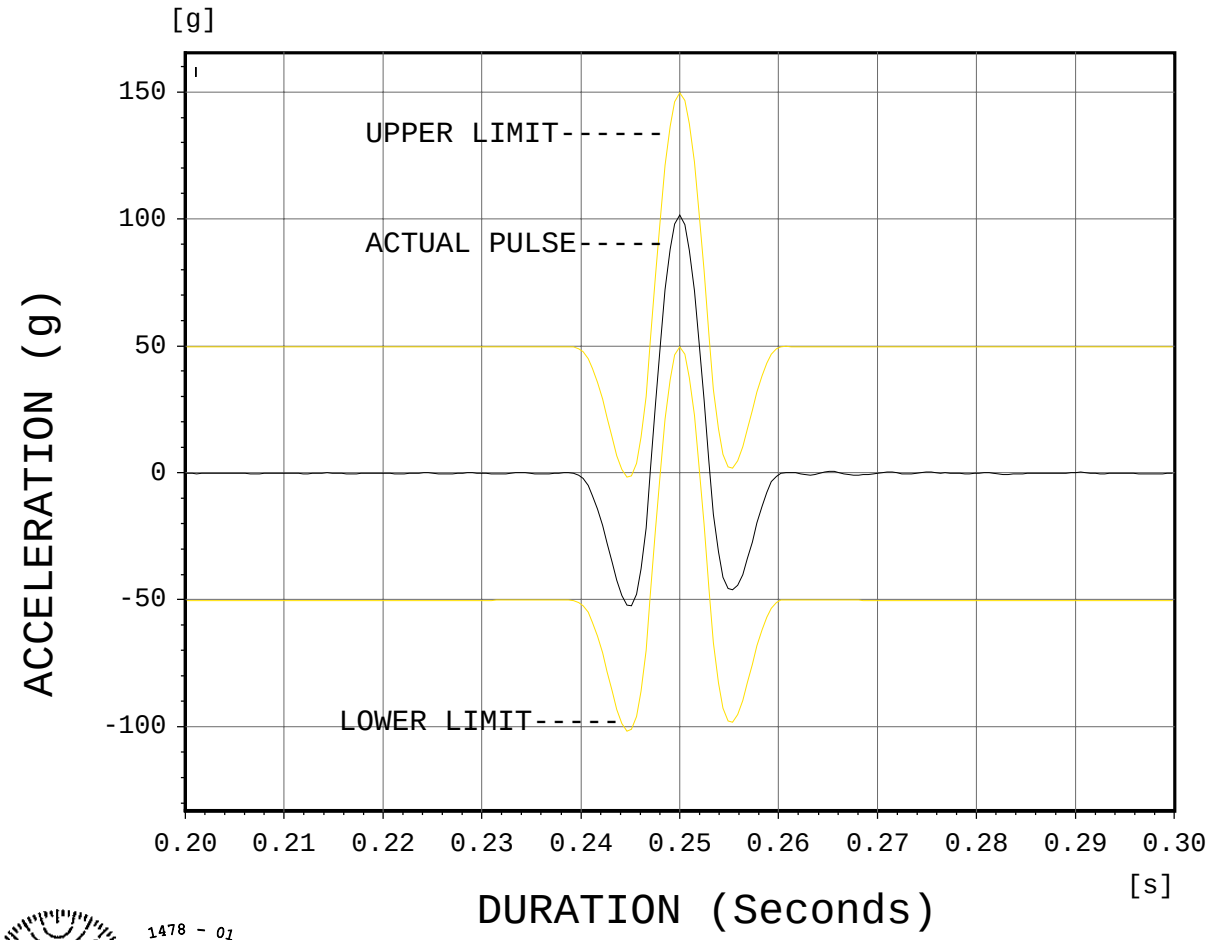


Project 209119
Samtec
Cal Wave 1
03/16/09
Tech: /MOB

FIGURE #5

Classical Shock

Channel 5



Project 209119
Samtec
Actual Wave
03/16/09
Tech: /MOB

Test Laboratory
1478 - 02

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 10 samples	TECHNICIAN: MOB
START DATE: 3/17/09	COMPLETE DATE: 3/18/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 24%
EQUIPMENT ID#: 200, 282 874, 1028, 1366, 1367, 1368, 1474	

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) G 'RMS' : 7.56
   b) Frequency : 50 to 2000 Hz
   c) Duration : 2.0 hours per axis, 3 axis total

3. A stabilizing medium was used such that the mated test samples did not separate during the test.

4. Figure #3 the test sample fixturing utilized during the test.

5. All subsequent variable testing was performed in accordance with 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. 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	+0.00	+0.02
C-A-2	-0.04	+0.02
C-A-3	-0.10	-0.05
C-A-4	-0.02	+0.03
C-A-5	-0.04	+0.03
C-A-6	-0.05	+0.00
C-A-7	-0.06	+0.00
C-A-8	-0.01	+0.04
C-A-9	-0.03	+0.02
C-A-10	+0.00	+0.02

2. There was no evidence of physical damage to the test samples as tested.

3. All test samples as tested met the requirements as specified.

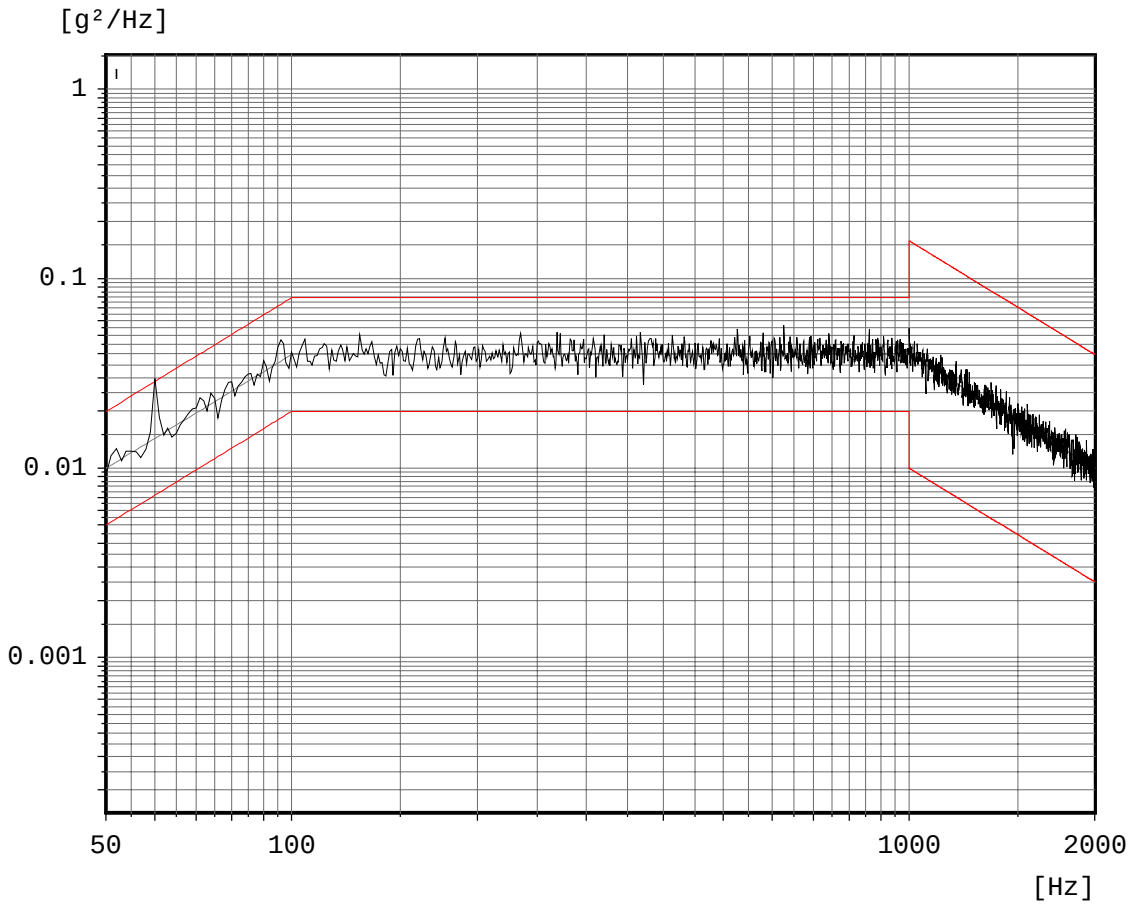
4. See data files 20911911 through 20911920 for individual data points.

5. The Random vibration profiles are shown in Figure #’s 6 (X-axis) and 7 (Y-axis & Z-axis).

FIGURE #6

Random

Channel 5



Project# 209119

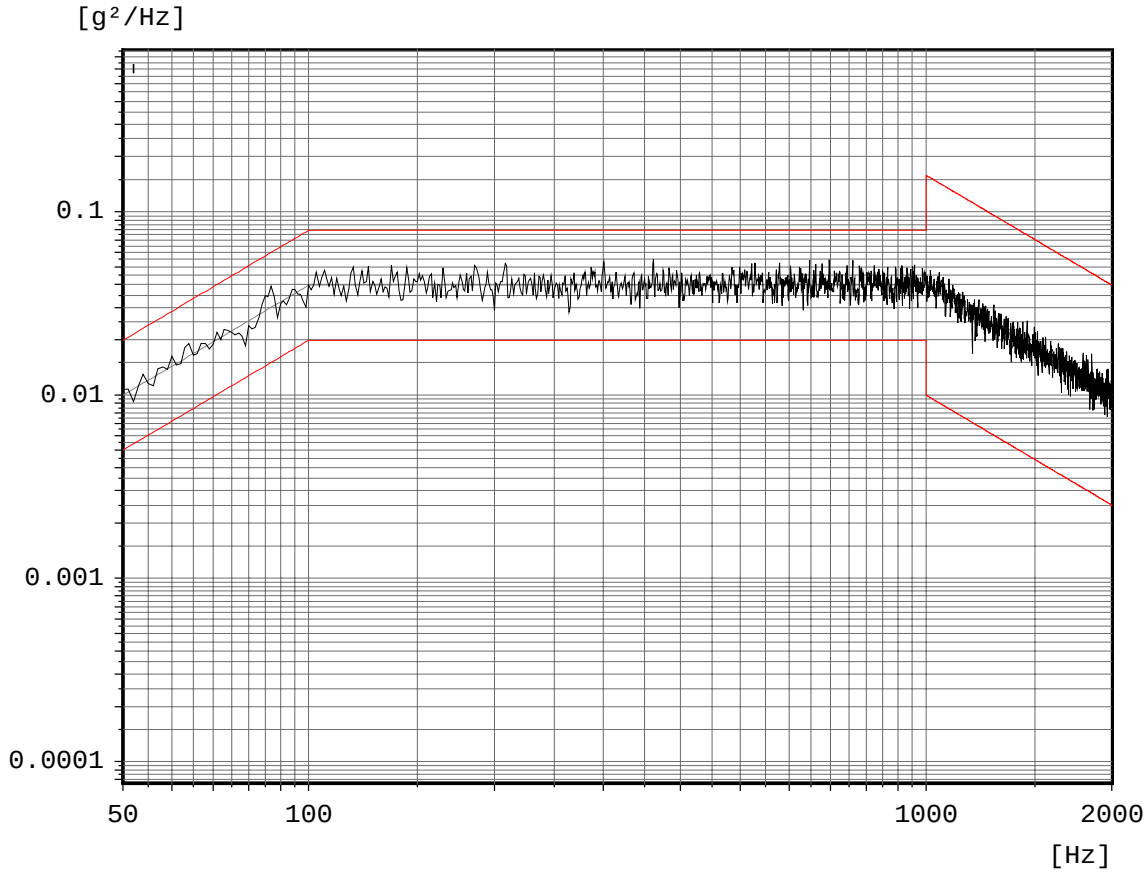
Run 1
X-Axis,Z Axis
Date:03/17/09
Test
Conditions:7.56Grms
2 Hour Axis

Tech: MOB

FIGURE #7

Random

Channel 5



Project# 209119
Samtec
Run 3
Y, Z-Axis
Date:03/18/09
Test Conditions:7.56 gRMS,50-2000Hz 2 Hours

Tech:MOB

LLCR DATA FILES

DATA FILE NUMBERS

20911911
20911912
20911913
20911914
20911915
20911916
20911917
20911918
20911919
20911920

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911911
Description:	C-A-1				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	30	27	25		
Date:	11Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-1-1	0.43	0.02	0.01		
c-1-2	0.46	-0.01	0.02		
c-1-3	0.47	-0.02	0.00		
c-1-4	0.46	0.00	-0.01		
c-1-5	0.44	0.01	-0.01		
c-1-6	0.41	0.01	-0.01		
c-1-7	0.41	0.01	0.01		
c-1-8	0.37	-0.03	-0.02		
MAX	0.47	0.02	0.02		
MIN	0.37	-0.03	-0.02		
AVG	0.43	0.00	0.00		
STD	0.03	0.02	0.01		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911912
Description:	C-A-2				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	30	27	25		
Date:	11Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-2-1	0.41	0.02	0.02		
c-2-2	0.51	-0.03	-0.01		
c-2-3	0.53	-0.07	-0.05		
c-2-4	0.55	-0.07	-0.05		
c-2-5	0.53	-0.10	-0.06		
c-2-6	0.46	-0.03	-0.05		
c-2-7	0.47	0.00	-0.04		
c-2-8	0.49	-0.06	-0.04		
MAX	0.55	0.02	0.02		
MIN	0.41	-0.10	-0.06		
AVG	0.49	-0.04	-0.04		
STD	0.05	0.04	0.03		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911913
Description:	C-A-3				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	30	27	25		
Date:	11Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-3-1	0.47	-0.05	-0.09		
c-3-2	0.55	-0.12	-0.10		
c-3-3	0.56	-0.12	-0.11		
c-3-4	0.55	-0.11	-0.13		
c-3-5	0.52	-0.12	-0.13		
c-3-6	0.49	-0.06	-0.10		
c-3-7	0.43	-0.05	-0.07		
c-3-8	0.38	-0.04	-0.05		
MAX	0.56	-0.04	-0.05		
MIN	0.38	-0.12	-0.13		
AVG	0.49	-0.08	-0.10		
STD	0.06	0.04	0.03		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911914
Description:	C-A-4				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	30	27	25		
Date:	11Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-4-1	0.46	-0.01	-0.03		
c-4-2	0.53	-0.03	-0.06		
c-4-3	0.40	0.03	0.00		
c-4-4	0.41	-0.04	-0.04		
c-4-5	0.39	0.01	0.01		
c-4-6	0.40	-0.03	-0.05		
c-4-7	0.40	-0.05	0.03		
c-4-8	0.39	-0.03	-0.01		
MAX	0.53	0.03	0.03		
MIN	0.39	-0.05	-0.06		
AVG	0.42	-0.02	-0.02		
STD	0.05	0.03	0.03		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911915
Description:	C-A-5				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	30	27	25		
Date:	11Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-5-1	0.41	-0.05	-0.07		
c-5-2	0.46	-0.07	-0.01		
c-5-3	0.45	-0.07	-0.08		
c-5-4	0.38	0.00	-0.06		
c-5-5	0.37	0.00	-0.01		
c-5-6	0.42	-0.05	-0.09		
c-5-7	0.40	-0.05	-0.05		
c-5-8	0.35	0.02	0.03		
MAX	0.46	0.02	0.03		
MIN	0.35	-0.07	-0.09		
AVG	0.41	-0.03	-0.04		
STD	0.04	0.04	0.04		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911916
Description:	C-A-6				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	30	27	25		
Date:	11Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-6-1	0.44	0.03	-0.02		
c-6-2	0.60	-0.07	-0.13		
c-6-3	0.46	-0.02	-0.05		
c-6-4	0.46	-0.01	-0.03		
c-6-5	0.48	-0.01	-0.04		
c-6-6	0.47	0.02	-0.04		
c-6-7	0.48	-0.03	-0.05		
c-6-8	0.38	0.00	0.00		
MAX	0.60	0.03	0.00		
MIN	0.38	-0.07	-0.13		
AVG	0.47	-0.01	-0.05		
STD	0.06	0.03	0.04		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911917
Description:	C-A-7				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	26	27	25		
Date:	12Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-7-1	0.59	-0.06	-0.08		
c-7-2	0.56	0.00	-0.10		
c-7-3	0.48	0.09	0.00		
c-7-4	0.50	0.00	-0.01		
c-7-5	0.55	-0.03	-0.06		
c-7-6	0.48	-0.01	-0.03		
c-7-7	0.43	-0.02	-0.07		
c-7-8	0.52	-0.11	-0.09		
MAX	0.59	0.09	0.00		
MIN	0.43	-0.11	-0.10		
AVG	0.51	-0.02	-0.06		
STD	0.05	0.06	0.04		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911918
Description:	C-A-8				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	26	27	25		
Date:	12Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-8-1	0.40	0.00	-0.01		
c-8-2	0.42	0.01	0.04		
c-8-3	0.45	-0.02	-0.02		
c-8-4	0.42	0.03	0.02		
c-8-5	0.46	-0.14	-0.09		
c-8-6	0.39	-0.04	-0.02		
c-8-7	0.34	0.02	-0.02		
c-8-8	0.37	0.00	0.03		
MAX	0.46	0.03	0.04		
MIN	0.34	-0.14	-0.09		
AVG	0.41	-0.02	-0.01		
STD	0.04	0.05	0.04		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911919
Description:	C-A-9				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	26	27	25		
Date:	12Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-9-1	0.43	0.00	-0.01		
c-9-2	0.47	-0.02	-0.09		
c-9-3	0.43	-0.08	-0.03		
c-9-4	0.43	-0.05	-0.04		
c-9-5	0.54	-0.16	-0.07		
c-9-6	0.41	-0.02	-0.02		
c-9-7	0.39	-0.02	0.01		
c-9-8	0.37	0.00	0.02		
MAX	0.54	0.00	0.02		
MIN	0.37	-0.16	-0.09		
AVG	0.43	-0.04	-0.03		
STD	0.05	0.05	0.04		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

Low Level Contact Resistance					
Project:	209119			Spec:	EIA 364, TP23
Customer:	Samtec			Subgroup:	Seq C
Product:	Series MPS-RA connector			File #:	20911920
Description:	C-A-10				
Open circuit voltage:		20mv		Current:	10ma
		Delta values			
		units: milliohms			
Temp ºC	22	22	22		
R.H. %	26	27	25		
Date:	12Mar09	16Mar09	18Mar09		
Pos. ID	Initial	Mechanical	Random		
		Shock	Vibration		
c-10-1	0.47	0.00	0.01		
c-10-2	0.51	0.01	-0.01		
c-10-3	0.45	0.00	-0.01		
c-10-4	0.47	-0.01	0.01		
c-10-5	0.45	0.03	0.02		
c-10-6	0.39	0.00	-0.01		
c-10-7	0.34	0.02	-0.01		
c-10-8	0.34	0.05	0.02		
MAX	0.51	0.05	0.02		
MIN	0.34	-0.01	-0.01		
AVG	0.43	0.01	0.00		
STD	0.06	0.02	0.01		
Open	0	0	0		
Tech	MOB	MOB	MOB		
Equip ID	1125	1125	1125		
	1219	1219	1219		

TEST RESULTS

SEQUENCE d

Group A

MPT/MPS Series

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 3 Sample	TECHNICIAN: MOB
START DATE: 3/16/09	COMPLETE DATE: 3/16/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 27%
EQUIPMENT ID#: 200, 282, 874, 1028, 1366, 1367, 1368, 1474	

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.

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 Axis (18 Total)

3. A stabilizing medium was used such that the mated test samples did not separate during the test.

4. Figure #3 illustrates the test sample fixturing utilized during the test.

5. The samples were characterized to determine nanosecond event requirement. Following characterization the requirement level was established at 50 nanoseconds.

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

REQUIREMENTS: See Next Page

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.

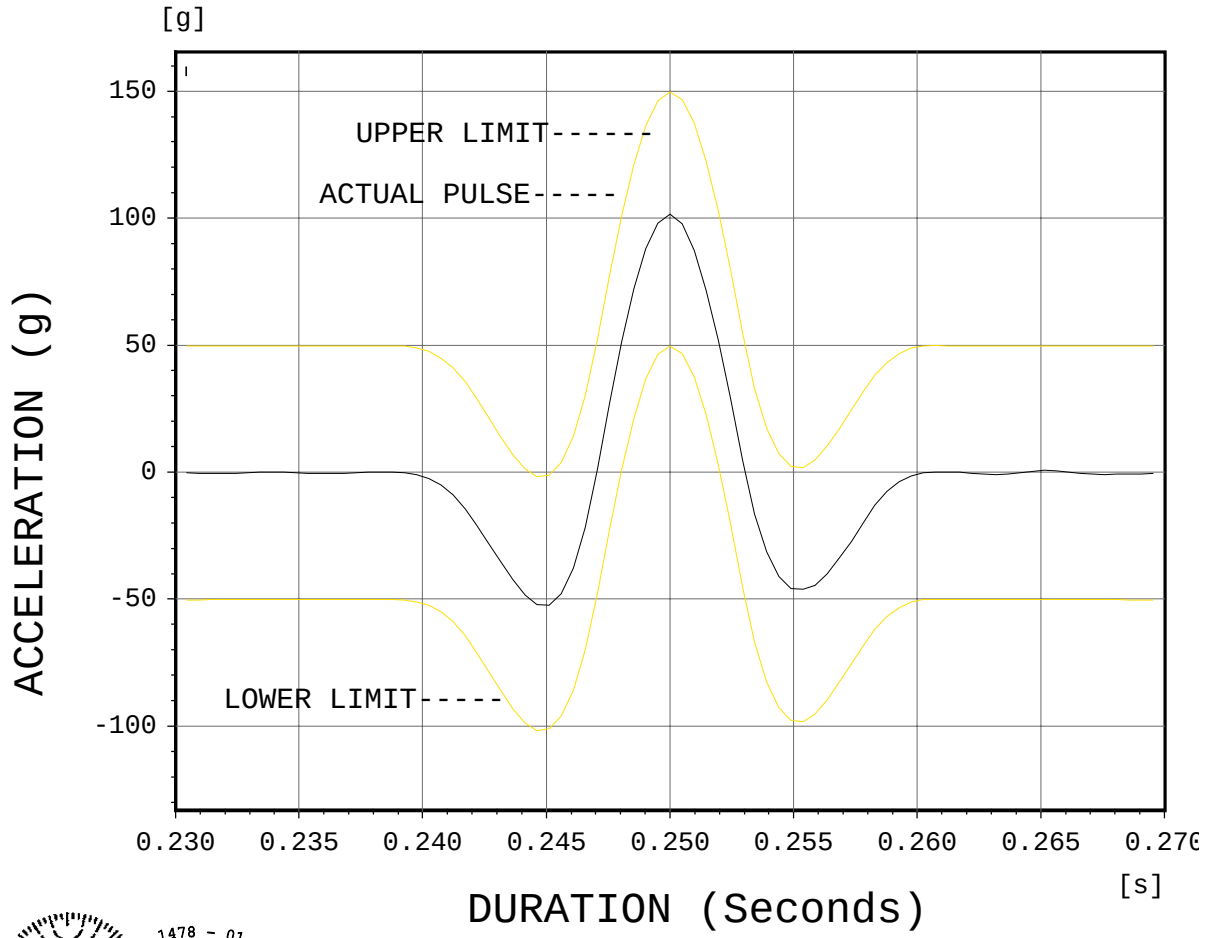
2. There was no low nanosecond event detected greater than 50 nanoseconds.

3. The Mechanical Shock characteristics are shown in Figures #8 (Calibration Pulse) and #9 (Test Pulse). Each figure displays the shock pulse contained within the upper and lower limits as defined by the appropriate test specification.

FIGURE #8

Classical Shock

Channel 5

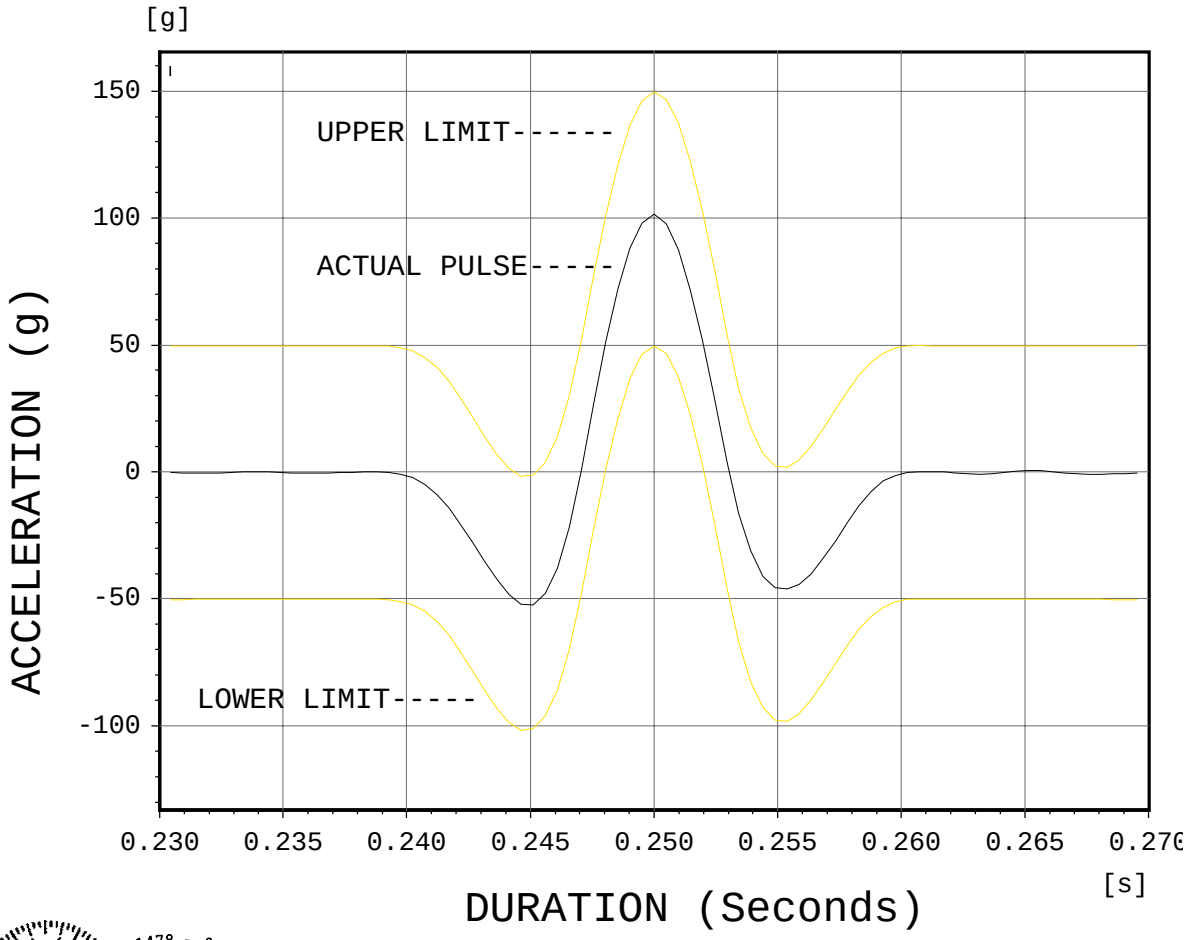


Project 209119
Samtec
Cal Wave 1
03/16/08
Tech: /MOB

FIGURE #9

Classical Shock

Channel 5



Project 209119
Samtec
Actual Wave
03/16/09
Tech: /MOB

PROJECT NO.: 209119	SPECIFICATION: MPS-RA Test Plan
PART NO.: See page 4	PART DESCRIPTION: See page 4
SAMPLE SIZE: 3 Samples	TECHNICIAN: MOB
START DATE: 3/17/09	COMPLETE DATE: 3/18/09
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 24%
EQUIPMENT ID#: 200, 282, 874, 1028, 1366, 1367, 1368, 1474	

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) G 'RMS' : 7.56
   b) Frequency : 50 to 2000 Hz
   c) Duration : 2.0 Hours per Axis, 3 Axis Total
   d) Test Current : 100 mA

3. A stabilizing medium was used such that the mated test samples did not separate during the test.

4. Figure #3 illustrates the test sample fixturing utilized during the test.

-continued on next page.

PROCEDURE: -continued

5. The samples were characterized prior to test to determine nanosecond event requirement. Following characterization the requirement level was established at 50 nanoseconds.

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.