

NOVEMBER 7, 2007

TEST REPORT #207429/207684

QFS/QMS SERIES CONNECTOR TESTING

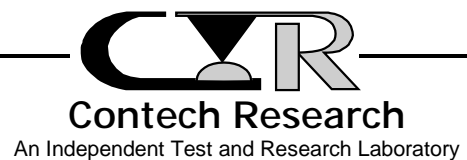
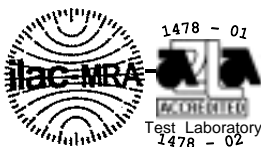
PART NUMBER

QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

SAMTEC, INC.

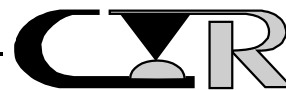
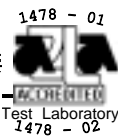


APPROVED BY: THOMAS PEEL  
PRESIDENT AND  
DIRECTOR OF TEST PROGRAM DEVELOPMENT  
CONTECH RESEARCH, INC.



## REVISION HISTORY

DATE	REV. NO.	DESCRIPTION	ENG.
11/7/2007	1.0	Initial Issue	TP



## CERTIFICATION

This is to certify that the QFS/QMS 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.



Thomas Peel  
President and  
Director of Test Program Development  
Contech Research, Inc.

TP:cf



## SCOPE

To perform qualification testing on the QFS/QMS 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 Specifications: TC0722-1371
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

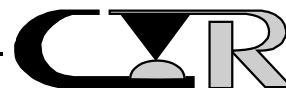
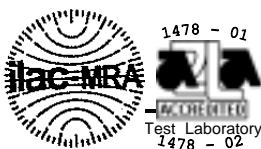
### Part Number

- |                         |                     |
|-------------------------|---------------------|
| a) Receptacle Connector | QFS-104-01-SL-D-RA  |
| b) Plug Connector       | QMS-104-11-L-D-A-GP |

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 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.



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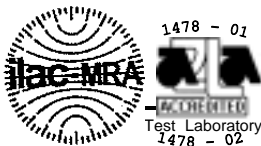
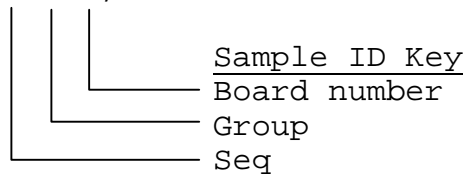
TEST SELECTION - Continued:

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

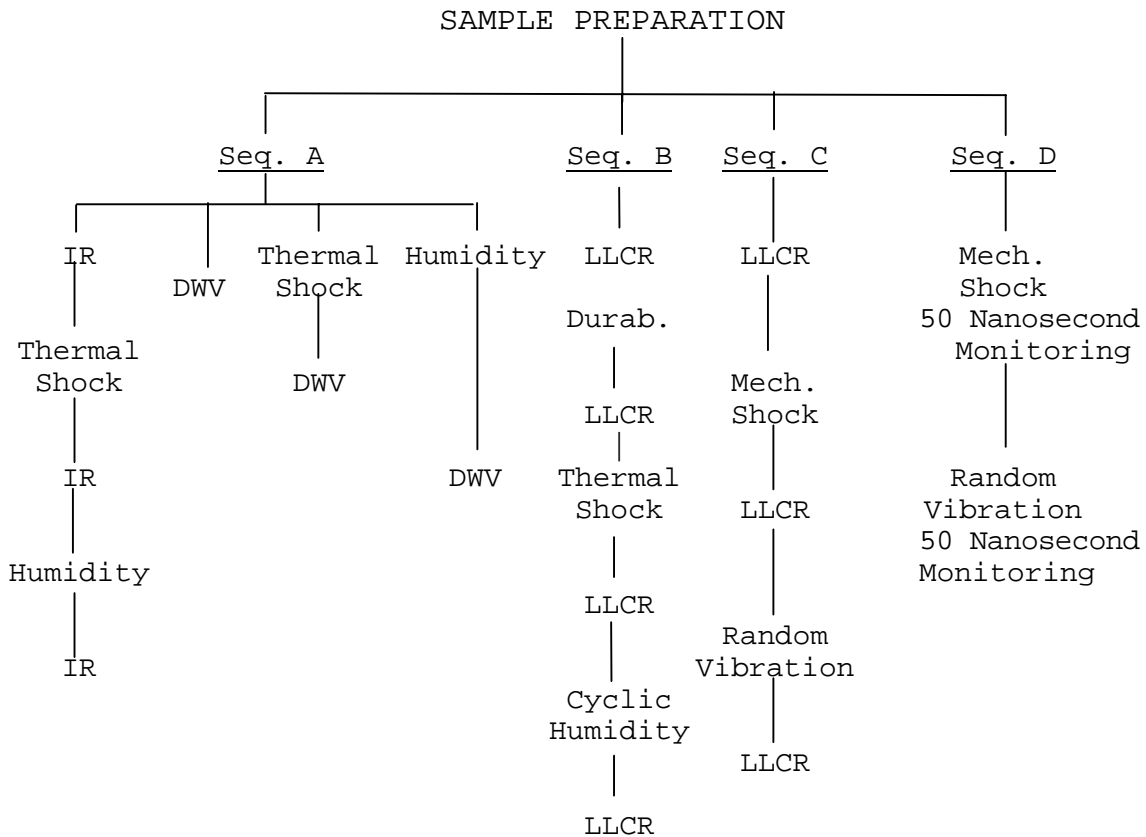
1. All samples were coded. Mated test samples remained with each other throughout the test group/sequences for which they were designated. Coding was performed in a manner which remained legible for the test duration.
2. The test samples were coded in the following manner:

Seq A: Group A - A-A-1, A-A-2  
Group B1 - A-B1-1, A-B1-2  
Group B2 - A-B2-1, A-B2-2  
Group B3 - A-B3-1, A-B3-2  
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



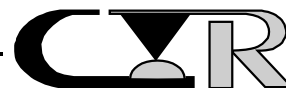
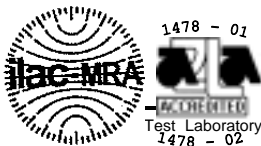
**FIGURE #1**

**TEST PLAN FLOW DIAGRAM**



Group    Group    Group    Group    Group    Group    Group  
B1    B2    B3    A    A    A    A

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



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## 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.	>50,000 Megohms

##### GROUP B1

DWV	900 VAC	Passed
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##### GROUP B2

Thermal Shock	No Damage	Passed
DWV	900 VAC	Passed

##### GROUP B3

Humidity	No Damage	Passed
DWV	900 VAC	Passed

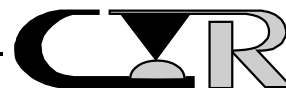
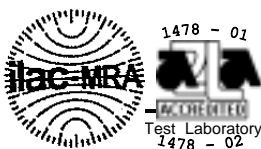
#### SEQUENCE B

LLCR	Record	27.7 m $\Omega$ Max.
Durability	No Damage	Passed
LLCR	+10.0 m $\Omega$ Max.Chg.	+1.9 m $\Omega$ Max.Chg.
Thermal Shock	No Damage	Passed
LLCR	+10.0 m $\Omega$ Max.Chg.	+5.5 m $\Omega$ Max.Chg.
Cyclic Humidity	No Damage	Passed
LLCR	+10.0 m $\Omega$ Max.Chg.	+14.7 m $\Omega$ Max.Chg.

#### SEQUENCE C

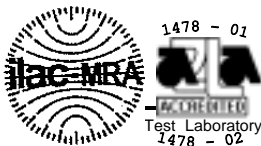
##### GROUP A

LLCR	Record	28.0 m $\Omega$ Max.
Mechanical Shock	No Damage	Passed
LLCR	+10.0 m $\Omega$ Max.Chg.	+1.6 m $\Omega$ Max.Chg.
Random Vibration	No Damage	Passed
LLCR	+10.0 m $\Omega$ Max.Chg.	+2.0 m $\Omega$ Max.Chg.



DATA SUMMARY - Continued:

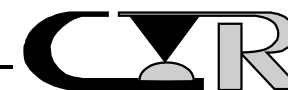
<u>TEST</u>	<u>REQUIREMENT</u>	<u>RESULTS</u>
<u>SEQUENCE D</u>		
Mechanical Shock	No Damage	Passed
	50 Nanosecond	Passed
Random Vibration	No Damage	Passed
	50 Nanosecond	Passed





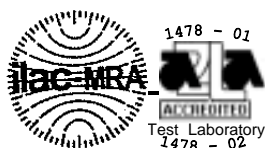
## EQUIPMENT LIST

ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq.Cal
14	6/26/2008	6/26/2007	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
192	3/6/2008	3/6/2007	Vertical Thermal Shock	Cincinnati Sub-Zero	VTS-1-5-3	88-11094	See Cal Cert	12mon
207	12/1/2007	12/1/2006	Micro-Ohm Meter	Keithley Co.	580	438208	See Cal Cert	12mon
282			Vibration Shaker Table	Ling Dynamics	V-730	163	N/A	N/A
295	10/16/2008	10/16/2007	Micro-Ohm Meter	Keithley Instr.	580	480781	See Cal Cert	12 mon.
321	3/7/2008	3/7/2007	AC-DC Hipot/Megometer	Hipotronics Co.	H300B	DS16-201	See Cal Cert	12 mon.
466	8/1/2008	8/1/2007	Precision Resistor	Victoreen Co.	50,000 mego	N/A	± 1 %	12 mon.
545	12/20/2007	12/20/2006	Event Detector	Anatech	32/64 EHD	941206	See Cal Cert	12mon
553	1/8/2008	1/8/2007	12 channel Power Unit	PCB Co.	483A	1303	See Cal Cert	12mon
681			Computer	ARC Co.	P166	N/A	N/A	N/A
684	7/26/2008	7/26/2007	Accelerometer	PCB. Co.	353B04	47648	See Cal Cert.	12mon
874			Computer	M&P	Vectra	us75203327	N/A	N/A
1032			Computer	Magitronic	486DX4	100VL	N/A	N/A
1047	11/28/2007	11/28/2006	Microohm Meter	Keithley	580	0705731	See Cal Cert	12mon
1137	5/31/2008	5/31/2007	Accelerometer	PCB	353BO4	57874	See Cal. Cert.	12mon
1166	9/6/2008	9/6/2007	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
1169			Computer	ARC	PC133	none	N/A	N/A
1219			Computer	ARC Co.	350	350	±2%	N/A
1233			Floor Oven	Blue M.	DC166F	DC-3534	See Manual	Ea Test
1271			Amplifier	Unholtz Dickie	SA15	3483	See Manual	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
1278	8/16/2008	8/16/2007	Microohm mtr	Keithley	580	0803947	See Manual	12 mon.



### EQUIPMENT LIST - Continued:

ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq. Cal
1314	1/24/2008	1/24/2007	Multiplexer card	Keithley Co.	7708	0862544	See CERT	12mon
1315	1/24/2008	1/24/2007	Data Aquisition Multimeter	Keithley Co.	2700	0862680	See CERT	12mon
1361	1/24/2008	1/24/2007	Multiplexer Card	Keithley	7708	1067661	See Cal Cert	12mon
1366			Main Frame	Aiglent H.P.	8408A		N/A	N/A
1367			Interface	Aiglent H.P.	E8491A		N/A	N/A
1368	2/27/2008	2/27/2007	Sine/Rnd Control digitizer	Aiglent H.P.	E1432A	US35470169	See Manual	12mon
1405			Floor Oven	Blue M	POM166F	P6-2809	See Cal Cert	Ea Test
1457	12/14/2007	12/14/2006	Precision Resistor	Victorine	5KMOHM	465	See Cal Cert	12mon
1474			Vib Pwr Amp	tira	A58312	003/06	N/A	N/A
1512			Computer	Comp USA	Pentium 3	N/A	N/A	N/A



# TEST RESULTS

## SEQUENCE A

### Group A



PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 2 Samples

TECHNICIAN: MAG

START DATE: 7/11/07

COMPLETE DATE: 7/11/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 53%

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:

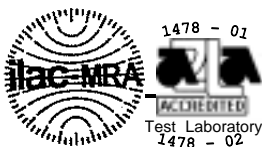
1. The test was performed in accordance with EIA 364, Test Procedure 21.
2. Test Conditions:
  - a) Between Adjacent Contacts : Yes
  - b) Between Rows : Yes
  - c) Mated Condition : Mated
  - d) Mounting Condition : Mounted
  - e) Electrification Time : 2.0 Minutes
  - f) Test Voltage : 500 VDC
3. The 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.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 2 Samples

TECHNICIAN: MAG

START DATE: 7/13/07

COMPLETE DATE: 7/31/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#: 192, 321, 466, 1233, 1314, 1315, 1361, 1405,  
1457

#### 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 +3°C/-0°C
  - c) Cold Extreme : -55 +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.



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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. The insulation resistance exceeded 50,000 megohms.



PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 2 Samples

TECHNICIAN: MAG

START DATE: 7/31/07

COMPLETE DATE: 8/10/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#: 27, 321, 466, 1314, 1315, 1361, 1457

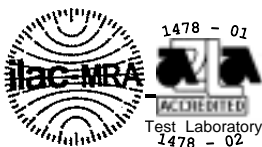
HUMIDITY (THERMAL CYCLING)

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:

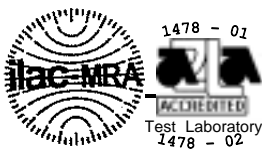
3. All subsequent variable testing was performed in accordance with the procedures previously indicated.
4. Prior to performing variable measurements, the test samples were allowed to recover to room ambient conditions.

-----  
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. The insulation resistance exceeded 50,000 megohms.





# TEST RESULTS

## SEQUENCE A

### Group B1



PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 2 Samples

TECHNICIAN: MAG

START DATE: 7/11/07

COMPLETE DATE: 7/11/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 53%

EQUIPMENT ID#: 321, 466, 1457

DIELECTRIC WITHSTANDING VOLTAGE (SEA LEVEL)

PURPOSE:

To determine if the connectors can operate at its rated voltage and withstand momentary overpotentials 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:

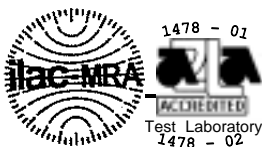
a) Between Adjacent Contacts	:	Yes
b) Between Rows	:	Yes
c) Mated Condition	:	Mated
d) Mounting Condition	:	Mounted
e) Hold Time	:	60 Seconds
f) Rate of Application	:	500 volts/sec.
g) Test Voltage	:	900 VAC
3. The voltage was applied to specific test points on the board.

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



PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 2 Samples

TECHNICIAN: MAG

START DATE: 7/13/07

COMPLETE DATE: 7/31/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#: 192, 321, 466, 1314, 1315, 1361, 1457

### 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 +3°C/-0°C
  - c) Cold Extreme : -55 +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.



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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.



# TEST RESULTS

## SEQUENCE A

### Group B3



PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 2 Samples

TECHNICIAN: MAG

START DATE: 7/31/07

COMPLETE DATE: 8/10/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#: 27, 321, 466, 1314, 1315, 1361, 1457

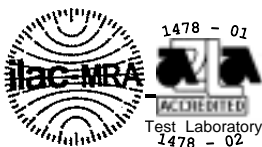
HUMIDITY (THERMAL CYCLING)

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:



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.

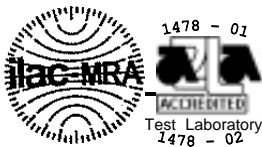
4. The voltage was applied to specific test points on the board.

-----  
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.





# TEST RESULTS

## SEQUENCE B

### Group A



PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 10 Samples

TECHNICIAN: MAG

START DATE: 7/11/07

COMPLETE DATE: 7/11/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#: 295, 1512

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:



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PROCEDURE - Continued:

2. Test Conditions:

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

3. The points of application are shown in Figure #2.

-----  
REQUIREMENTS:

Low level circuit resistance shall be measured and recorded.

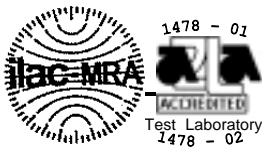
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RESULTS:

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

LOW LEVEL CIRCUIT RESISTANCE  
(Milliohms)

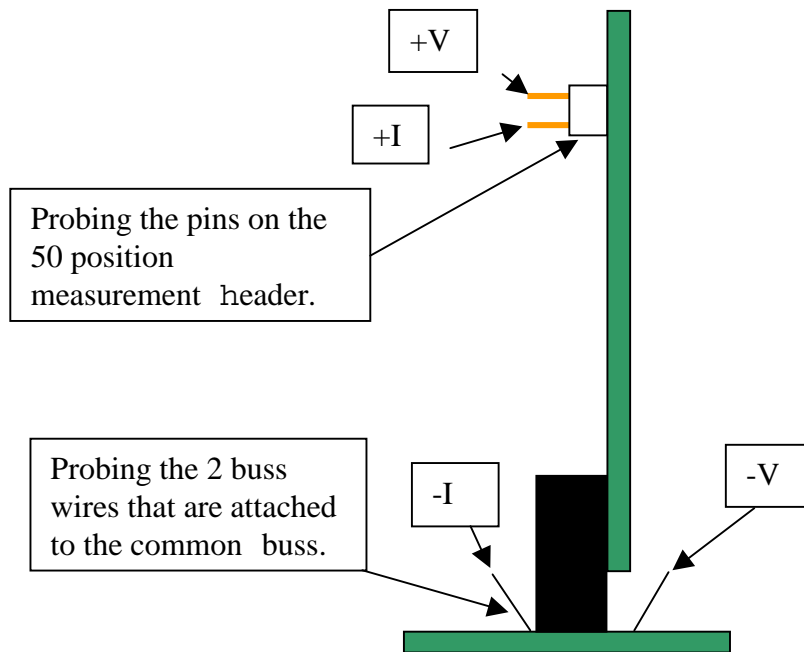
<u>Sample ID#</u>	<u>Avg.</u>	<u>Max.</u>	<u>Min.</u>
B-A-1	24.3	26.7	21.6
B-A-2	24.3	26.4	21.1
B-A-3	24.2	26.5	20.9
B-A-4	24.3	26.4	21.6
B-A-5	24.6	27.7	21.5
B-A-6	24.2	26.5	21.3
B-A-7	24.6	26.9	21.5
B-A-8	24.3	26.4	21.7

2. See data files 20742901 through 20742908 for individual data points.

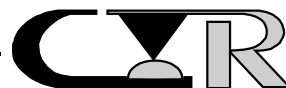


**FIGURE #2**

**Typical LLCR test set up**



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PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 8 Samples

TECHNICIAN: MAG

START DATE: 7/12/07

COMPLETE DATE: 7/12/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 53%

EQUIPMENT ID#: 295, 1512

#### 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 : 500 cycles per hour
3. The test samples were cycled manually.



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PROCEDURE - Continued:

4. Care was taken to prevent the mating faces of the test samples from contacting each other.
5. All subsequent variable testing was performed in accordance with the procedures previously indicated.

-----  
REQUIREMENTS:

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

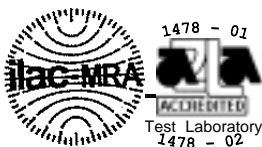
-----  
RESULTS:

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

CHANGE IN  
LOW LEVEL CIRCUIT RESISTANCE  
(Milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
B-A-1	+0.8	+1.9
B-A-2	+0.2	+1.5
B-A-3	+0.3	+1.2
B-A-4	+0.0	+0.8
B-A-5	+0.1	+0.8
B-A-6	+0.4	+0.8
B-A-7	-0.2	+0.5
B-A-8	+0.2	+1.3

3. See data files 20742901 through 20742908 for individual data points.



PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 8 Samples

TECHNICIAN: MAG

START DATE: 7/13/07

COMPLETE DATE: 7/31/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#: 192, 207, 1276, 1314, 1315, 1361

#### THERMAL SHOCK

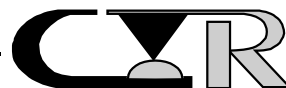
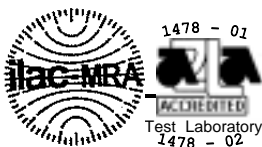
#### PURPOSE:

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.

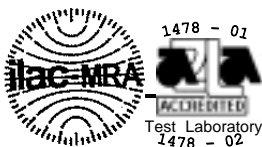
-----  
RESULTS:

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

CHANGE IN  
LOW LEVEL CIRCUIT RESISTANCE  
(Milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
B-A-1	+2.4	+3.9
B-A-2	+2.1	+3.5
B-A-3	+1.9	+5.1
B-A-4	+1.2	+2.4
B-A-5	+1.8	+4.0
B-A-6	+1.2	+2.3
B-A-7	+0.8	+3.1
B-A-8	+2.2	+5.5

3. See data files 20742901 through 20742908 for individual data points.





PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 8 Samples

TECHNICIAN: DH

START DATE: 7/31/07

COMPLETE DATE: 8/10/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#: 27, 681, 1047, 1314, 1315, 1361

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

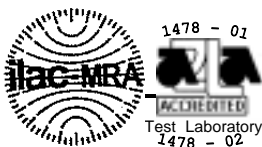
-----  
RESULTS:

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)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
B-A-1	+2.6	+9.9
B-A-2	+1.9	+3.7
B-A-3	+2.5	+14.7
B-A-4	+1.3	+2.3
B-A-5	+1.9	+5.3
B-A-6	+1.0	+1.9
B-A-7	+0.9	+2.2
B-A-8	+2.3	+5.7

3. See data files 20742901 through 20742908 for individual data points.



# **LLCR DATA FILES**

## **DATA FILE NUMBERS**

20742901

20742902

20742903

20742904

20742905

20742906

20742907

20742908



		Low Level Contact Resistance				
Project:	207429				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq B
Product:	Series QFS/QMS connector			File #:	20742901	
Description:	ID# B-A-1					
Open circuit voltage:	20mv				Current:	100ma
			Delta values			
			units: milliohms			
Temp °C	24	24	24	24		
R.H. %	53	50	50	46		
Date:	11Jul07	12Jul07	31Jul07	10Aug07		
Pos. ID	Initial	Dur	T-Shock	Cyclic/H		
		100 X				
1	24.3	0.5	1.7	1.3		
2	21.6	1.7	2.1	1.9		
3	21.8	1.9	2.2	1.7		
4	22.3	0.4	2.3	1.8		
5	22.2	0.6	2.7	2.1		
6	21.6	1.2	2.0	1.7		
7	26.7	0.4	2.6	2.2		
8	26.6	0.9	3.2	2.6		
9	26.3	0.5	3.4	3.5		
10	25.6	0.9	2.0	1.9		
11	25.6	0.8	2.6	2.5		
12	26.0	0.4	3.0	3.1		
13	25.6	1.0	2.4	2.9		
14	25.3	0.8	2.1	2.2		
15	25.3	0.5	1.8	1.9		
16	25.3	0.7	1.8	2.1		
17	25.5	0.7	3.6	3.2		
18	25.5	0.9	3.9	3.4		
19	25.0	0.9	2.5	2.9		
20	22.8	-0.1	1.2	1.2		
21	23.4	1.4	2.9	9.9		
22	23.7	1.4	1.8	2.6		
23	22.2	0.1	2.1	2.4		
24	21.9	0.1	2.2	2.4		
25	25.1	0.3	2.8	2.3		
MAX	26.7	1.9	3.9	9.9		
MIN	21.6	-0.1	1.2	1.2		
AVG	24.3	0.8	2.4	2.6		
STD	1.7	0.5	0.6	1.6		
Open	0	0	0	0		
Tech	MAG	MAG	GL	DH		
Equip ID	295	295	1276	681		
	1512	1512	207	1047		



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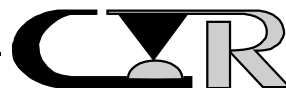
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		Low Level Contact Resistance				
Project:	207429				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq B
Product:	Series QFS/QMS connector			File #:	20742902	
Description:	ID# B-A-2					
Open circuit voltage:	20mv				Current:	100ma
			Delta values			
			units: milliohms			
Temp °C	24	24	24	24		
R.H. %	53	50	50	46		
Date:	11Jul07	12Jul07	31Jul07	10Aug07		
Pos. ID	Initial	Dur	T-Shock	Cyclic/H		
		100 X				
1	25.0	0.1	1.3	0.9		
2	21.5	0.9	1.0	0.9		
3	21.1	1.5	1.9	2.0		
4	22.2	0.2	1.7	0.9		
5	22.2	0.0	1.9	1.1		
6	21.9	0.2	1.4	0.7		
7	25.5	0.6	2.7	1.6		
8	25.8	1.0	3.0	2.3		
9	25.5	0.6	3.0	2.5		
10	25.2	0.0	1.9	2.2		
11	25.3	0.3	1.8	1.8		
12	25.9	-0.1	3.4	3.7		
13	25.3	0.3	2.7	2.8		
14	24.9	0.5	3.5	3.7		
15	25.5	0.0	2.3	3.1		
16	25.9	-0.2	2.4	1.9		
17	26.4	-0.3	2.2	2.1		
18	25.7	-0.1	2.0	1.9		
19	25.7	0.2	2.4	2.2		
20	22.6	0.1	1.3	0.9		
21	23.4	0.2	1.7	1.3		
22	23.9	-0.7	1.5	0.8		
23	22.6	0.1	1.8	1.5		
24	22.7	0.1	1.8	1.9		
25	25.4	0.0	2.4	2.5		
MAX	26.4	1.5	3.5	3.7		
MIN	21.1	-0.7	1.0	0.7		
AVG	24.3	0.2	2.1	1.9		
STD	1.7	0.4	0.7	0.9		
Open	0	0	0	0		
Tech	MAG	MAG	GL	DH		
Equip ID	295	295	1276	681		
	1512	1512	207	1047		



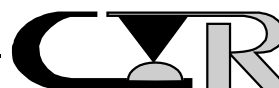
1478 - 01  
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		Low Level Contact Resistance				
Project:	207429				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq B
Product:	Series QFS/QMS connector			File #:	20742903	
Description:	ID# B-A-3					
Open circuit voltage:	20mv			Current:	100ma	
			Delta values			
			units: milliohms			
Temp °C	24	24	24	24		
R.H. %	53	50	50	46		
Date:	11Jul07	12Jul07	31Jul07	10Aug07		
Pos. ID	Initial	Dur	T-Shock	Cyclic/H		
		100 X				
1	24.2	0.0	2.7	2.6		
2	22.1	0.2	2.3	14.7		
3	22.7	-0.1	2.6	2.1		
4	23.6	-0.8	2.2	2.5		
5	23.0	-0.4	2.3	2.2		
6	22.5	0.3	2.6	2.1		
7	26.1	0.1	2.5	2.7		
8	26.5	0.2	5.1	4.0		
9	26.0	0.1	4.1	3.5		
10	25.4	-0.6	1.7	1.6		
11	25.7	-0.1	2.1	2.4		
12	25.8	0.0	2.6	3.6		
13	24.7	0.8	1.8	1.8		
14	25.0	0.3	1.7	1.5		
15	25.3	0.6	1.1	0.9		
16	25.5	0.9	1.4	1.2		
17	25.6	0.4	0.4	0.5		
18	25.6	0.1	0.8	0.7		
19	25.2	0.5	0.6	0.5		
20	21.7	0.2	0.8	3.9		
21	22.7	1.2	2.1	1.5		
22	23.5	1.1	1.3	1.2		
23	21.1	0.3	1.2	1.7		
24	20.9	0.8	0.9	1.7		
25	25.4	0.1	0.2	0.4		
MAX	26.5	1.2	5.1	14.7		
MIN	20.9	-0.8	0.2	0.4		
AVG	24.2	0.3	1.9	2.5		
STD	1.7	0.5	1.1	2.8		
Open	0	0	0	0		
Tech	MAG	MAG	GL	DH		
Equip ID	295	295	1276	681		
	1512	1512	207	1047		



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		Low Level Contact Resistance				
Project:	207429				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq B
Product:	Series QFS/QMS connector			File #:	20742904	
Description:	ID# B-A-4					
Open circuit voltage:	20mv				Current:	100ma
			Delta values			
			units: milliohms			
Temp °C	24	24	24	24		
R.H. %	53	50	50	46		
Date:	11Jul07	12Jul07	31Jul07	10Aug07		
Pos. ID	Initial	Dur	T-shock	Cyclic/H		
		100 X				
1	24.6	-0.1	1.1	1.3		
2	22.1	-0.3	1.0	1.4		
3	21.6	0.1	1.3	1.5		
4	22.7	-0.2	1.4	2.2		
5	22.5	0.0	2.4	2.3		
6	22.1	-0.2	1.4	2.1		
7	25.8	-0.1	1.6	1.7		
8	26.2	0.2	2.3	2.3		
9	26.4	-0.3	1.2	0.7		
10	25.9	-0.4	1.0	1.2		
11	25.9	0.1	1.8	1.3		
12	26.1	-0.1	1.8	1.7		
13	25.4	-0.1	1.2	1.9		
14	25.3	-0.1	1.0	2.3		
15	25.2	-0.3	1.0	1.5		
16	25.1	0.2	1.1	1.8		
17	25.7	0.1	1.5	1.6		
18	25.5	-0.1	1.7	1.0		
19	25.3	0.1	1.3	1.3		
20	22.2	-0.1	0.5	0.9		
21	22.3	0.8	0.7	0.9		
22	24.1	0.2	0.0	-0.7		
23	23.3	0.0	-0.1	-0.4		
24	22.4	0.4	0.9	0.0		
25	24.8	0.1	1.5	1.2		
MAX	26.4	0.8	2.4	2.3		
MIN	21.6	-0.4	-0.1	-0.7		
AVG	24.3	0.0	1.2	1.3		
STD	1.6	0.3	0.6	0.8		
Open	0	0	0	0		
Tech	MAG	MAG	GL	DH		
Equip ID	295	295	1276	681		
	1512	1512	207	1047		



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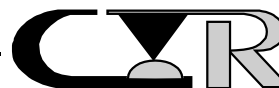
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Project:	207429				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq B
Product:	Series QFS/QMS connector			File #:	20742905	
Description:	ID# B-A-5					
Open circuit voltage:	20mv				Current:	100ma
			Delta values			
			units: milliohms			
Temp °C	24	24	24	24		
R.H. %	53	50	50	46		
Date:	11Jul07	12Jul07	31Jul07	10Aug07		
Pos. ID	Initial	Dur	T-Shock	Cyclic/H		
		100 X				
1	25.5	0.1	0.3	0.9		
2	21.6	0.4	1.9	1.9		
3	21.5	0.2	2.1	2.4		
4	23.2	0.4	2.3	1.3		
5	23.1	0.4	1.8	1.4		
6	21.8	0.6	2.4	2.3		
7	26.9	-0.3	1.2	1.2		
8	27.7	-0.3	2.4	0.6		
9	27.1	-0.5	1.2	0.5		
10	25.8	0.0	1.1	1.3		
11	26.1	0.5	2.0	2.5		
12	26.0	0.1	1.3	1.8		
13	26.2	-0.7	0.8	1.8		
14	26.3	-0.5	1.5	2.4		
15	25.7	-0.2	1.3	1.8		
16	25.7	0.0	1.1	1.4		
17	25.8	0.0	2.1	1.8		
18	25.9	0.0	1.8	1.4		
19	25.5	0.2	2.1	2.5		
20	22.3	0.4	1.5	1.3		
21	23.4	0.2	1.3	1.6		
22	22.8	0.8	4.0	5.3		
23	22.8	0.3	3.2	4.2		
24	22.6	0.6	1.4	1.2		
25	24.9	0.1	1.9	2.4		
MAX	27.7	0.8	4.0	5.3		
MIN	21.5	-0.7	0.3	0.5		
AVG	24.6	0.1	1.8	1.9		
STD	1.9	0.4	0.8	1.0		
Open	0	0	0	0		
Tech	MAG	MAG	GL	DH		
Equip ID	295	295	1276	681		
	1512	1512	207	1047		



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Test Laboratory  
1478 - 02



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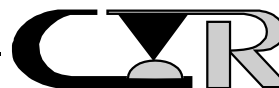
		Low Level Contact Resistance				
Project:	207429				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq B
Product:	Series QFS/QMS connector			File #:	20742906	
Description:	ID# B-A-6					
Open circuit voltage:	20mv				Current:	100ma
			Delta values			
			units: milliohms			
Temp °C	24	24	24	24		
R.H. %	53	50	50	46		
Date:	11Jul07	12Jul07	31Jul07	10Aug07		
Pos. ID	Initial	Dur	T-Shock	Cyclic/H		
		100 X				
1	24.6	-0.1	1.4	1.0		
2	21.3	0.6	1.6	1.5		
3	22.0	-0.2	1.0	0.8		
4	22.9	-0.2	1.6	0.9		
5	22.0	1.0	2.3	1.6		
6	21.9	0.9	1.6	1.5		
7	25.9	0.3	1.9	1.9		
8	26.5	0.5	2.3	1.1		
9	26.1	0.1	1.5	0.9		
10	24.9	0.5	1.5	1.5		
11	25.4	0.8	1.2	1.7		
12	25.7	0.2	1.1	1.4		
13	25.3	0.8	0.8	1.9		
14	25.6	0.0	1.2	1.5		
15	25.1	0.4	1.2	0.9		
16	25.4	0.0	1.0	0.8		
17	25.2	0.1	1.4	1.0		
18	25.0	0.1	0.7	0.5		
19	25.2	0.3	1.2	1.3		
20	22.7	0.6	0.4	0.1		
21	22.9	1.3	0.7	1.0		
22	23.4	1.3	0.3	-0.4		
23	22.8	0.2	-0.2	-0.3		
24	21.9	0.2	0.2	0.0		
25	24.7	0.2	1.1	1.1		
MAX	26.5	1.3	2.3	1.9		
MIN	21.3	-0.2	-0.2	-0.4		
AVG	24.2	0.4	1.2	1.0		
STD	1.6	0.4	0.6	0.6		
Open	0	0	0	0		
Tech	MAG	MAG	GL	DH		
Equip ID	295	295	1276	681		
	1512	1512	207	1047		



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		Low Level Contact Resistance				
Project:	207429				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq B
Product:	Series QFS/QMS connector			File #:	20742907	
Description:	ID# B-A-7					
Open circuit voltage:	20mv				Current:	100ma
			Delta values			
			units: milliohms			
Temp °C	24	24	24	24		
R.H. %	53	50	50	46		
Date:	11Jul07	12Jul07	31Jul07	10Aug07		
Pos. ID	Initial	Dur	T-Shock	Cyclic/H		
		100 X				
1	24.3	-0.1	1.3	0.9		
2	21.5	-0.3	0.6	0.6		
3	21.9	0.0	0.6	0.5		
4	23.9	-1.1	0.5	-0.1		
5	23.5	-1.2	0.4	0.5		
6	21.6	-0.1	0.5	0.6		
7	25.9	-0.1	1.3	0.9		
8	26.6	0.5	3.1	2.2		
9	25.9	0.1	2.4	1.4		
10	25.3	0.4	2.1	1.8		
11	25.5	0.2	1.2	1.8		
12	26.9	-0.2	2.1	1.0		
13	25.8	-0.2	-0.2	0.7		
14	25.7	-0.2	-0.1	0.4		
15	25.5	0.1	0.2	0.7		
16	25.8	0.2	0.4	1.3		
17	25.7	-0.2	1.5	1.3		
18	25.7	-0.2	0.9	0.9		
19	25.9	-0.2	0.6	0.6		
20	23.2	-0.7	-0.6	-0.5		
21	24.0	-1.3	-0.1	1.0		
22	23.8	-0.8	-0.1	2.2		
23	22.2	0.5	0.6	1.2		
24	22.7	-0.5	-0.1	-0.1		
25	25.5	-0.2	0.8	0.2		
MAX	26.9	0.5	3.1	2.2		
MIN	21.5	-1.3	-0.6	-0.5		
AVG	24.6	-0.2	0.8	0.9		
STD	1.6	0.5	0.9	0.7		
Open	0	0	0	0		
Tech	MAG	MAG	GL	DH		
Equip ID	295	295	1276	681		
	1512	1512	207	1047		



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Test Laboratory  
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		Low Level Contact Resistance				
Project:	207429				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq B
Product:	Series QFS/QMS connector			File #:	20742908	
Description:	ID# B-A-8					
Open circuit voltage:	20mv				Current:	100ma
			Delta values			
			units: milliohms			
Temp °C	24	24	24	24		
R.H. %	53	50	50	46		
Date:	11Jul07	12Jul07	31Jul07	10Aug07		
Pos. ID	Initial	Dur	T-Shock	Cyclic/H		
		100 X				
1	24.3	0.8	4.2	5.3		
2	22.0	0.4	3.2	2.4		
3	21.9	0.1	3.0	4.2		
4	22.8	-0.1	3.2	3.7		
5	22.2	0.0	3.2	3.2		
6	21.7	0.3	2.7	3.3		
7	25.1	1.1	4.6	4.5		
8	25.7	0.7	4.6	5.7		
9	25.5	0.8	5.5	5.4		
10	25.0	0.5	3.4	3.0		
11	25.3	1.3	4.2	4.4		
12	25.3	0.6	2.8	3.7		
13	25.4	-0.1	2.1	2.3		
14	26.1	0.0	2.0	1.0		
15	25.6	0.1	1.7	2.5		
16	26.0	-0.1	1.3	1.4		
17	26.4	-0.4	0.6	0.2		
18	25.9	0.4	1.1	0.9		
19	25.3	0.2	1.4	0.3		
20	22.1	0.3	0.9	0.9		
21	23.2	-0.1	1.1	0.6		
22	24.6	-0.4	-0.9	-0.8		
23	22.9	-1.0	-0.5	-0.9		
24	22.1	-0.4	-0.3	-0.4		
25	25.3	0.5	0.7	0.4		
MAX	26.4	1.3	5.5	5.7		
MIN	21.7	-1.0	-0.9	-0.9		
AVG	24.3	0.2	2.2	2.3		
STD	1.6	0.5	1.7	2.0		
Open	0	0	0	0		
Tech	MAG	MAG	GL	DH		
Equip ID	295	295	1276	681		
	1512	1512	207	1047		



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# TEST RESULTS

## SEQUENCE C

### Group A



PROJECT NO.: 207684

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 8 Samples

TECHNICIAN: SR

START DATE: 10/4/07

COMPLETE DATE: 10/4/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#: 1032, 1278

LOW LEVEL CIRCUIT RESISTANCE (LLCR)

PURPOSE:

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

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 23, with the following conditions:



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PROCEDURE - Continued:

2. Test Conditions:

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

3. The points of application are shown in Figure #2.

-----  
REQUIREMENTS:

Low level circuit resistance shall be measured and recorded.

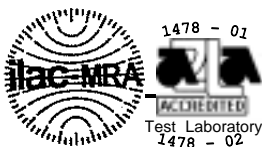
-----  
RESULTS:

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

LOW LEVEL CIRCUIT RESISTANCE  
(Milliohms)

<u>Sample ID#</u>	<u>Avg.</u>	<u>Max.</u>	<u>Min.</u>
C-A-1	24.7	27.5	21.7
C-A-2	24.5	27.0	21.3
C-A-3	24.2	26.6	21.1
C-A-4	25.4	28.0	22.0
C-A-5	24.1	26.2	21.5
C-A-6	23.8	26.5	10.9
C-A-7	24.8	27.6	21.7
C-A-8	24.4	26.9	21.2

2. See data files 20768401 through 20768408 for individual data points.



PROJECT NO.: 207684

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 8 Samples

TECHNICIAN: SR/MHB

START DATE: 10/5/07

COMPLETE DATE: 10/5/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 48%

EQUIPMENT ID#: 684, 1032, 1166, 1167, 1168, 1169, 1271, 1272,  
1278

MECHANICAL SHOCK (SPECIFIED PULSE)

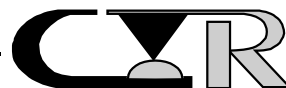
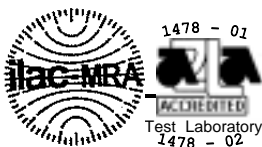
PURPOSE:

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 as supplied by the test sponsor.
5. All subsequent variable testing was performed in accordance with the procedures previously indicated.

REQUIREMENTS: See next page.



REQUIREMENTS:

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

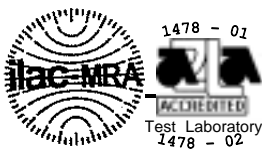
-----  
RESULTS:

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

CHANGE IN  
LOW LEVEL CIRCUIT RESISTANCE  
(Milliohms)

<u>Sample ID#</u>	<u>Avg. Change</u>	<u>Max. Change</u>
C-A-1	+0.0	+1.5
C-A-2	+0.2	+1.4
C-A-3	+0.5	+1.6
C-A-4	+0.0	+0.5
C-A-5	-0.3	+0.8
C-A-6	-0.4	+1.1
C-A-7	-0.2	+0.1
C-A-8	-0.1	+0.7

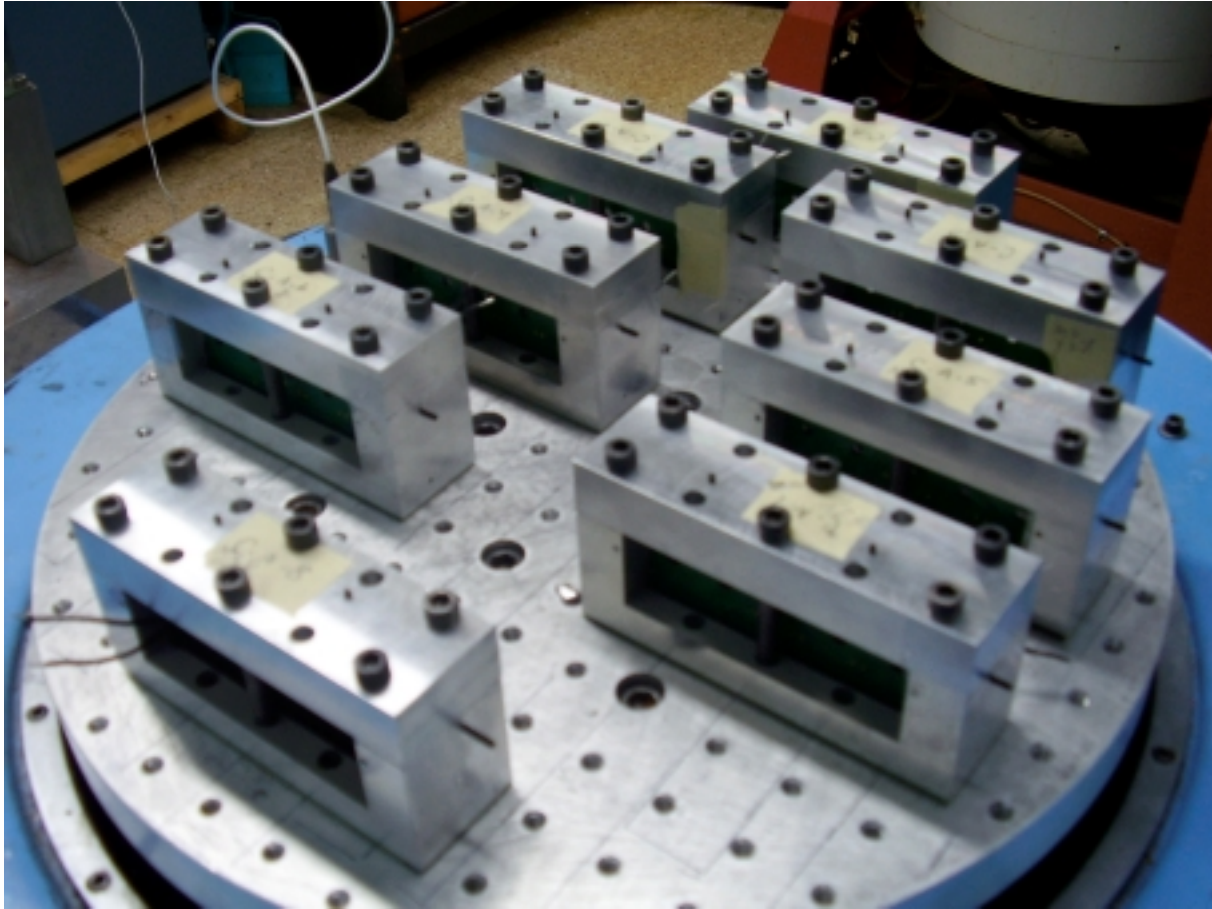
3. See data files 20768401 through 20768408 for individual data points.
4. The Mechanical Shock characteristics are shown in Figures #4 (Calibration Pulse) and #5 (Test Pulse). Each figure displays the shock pulse contained within the upper and lower limits as defined by the appropriate test specification.





**FIGURE #3**

Typical Mechanical Shock/Random Vibration Fixture



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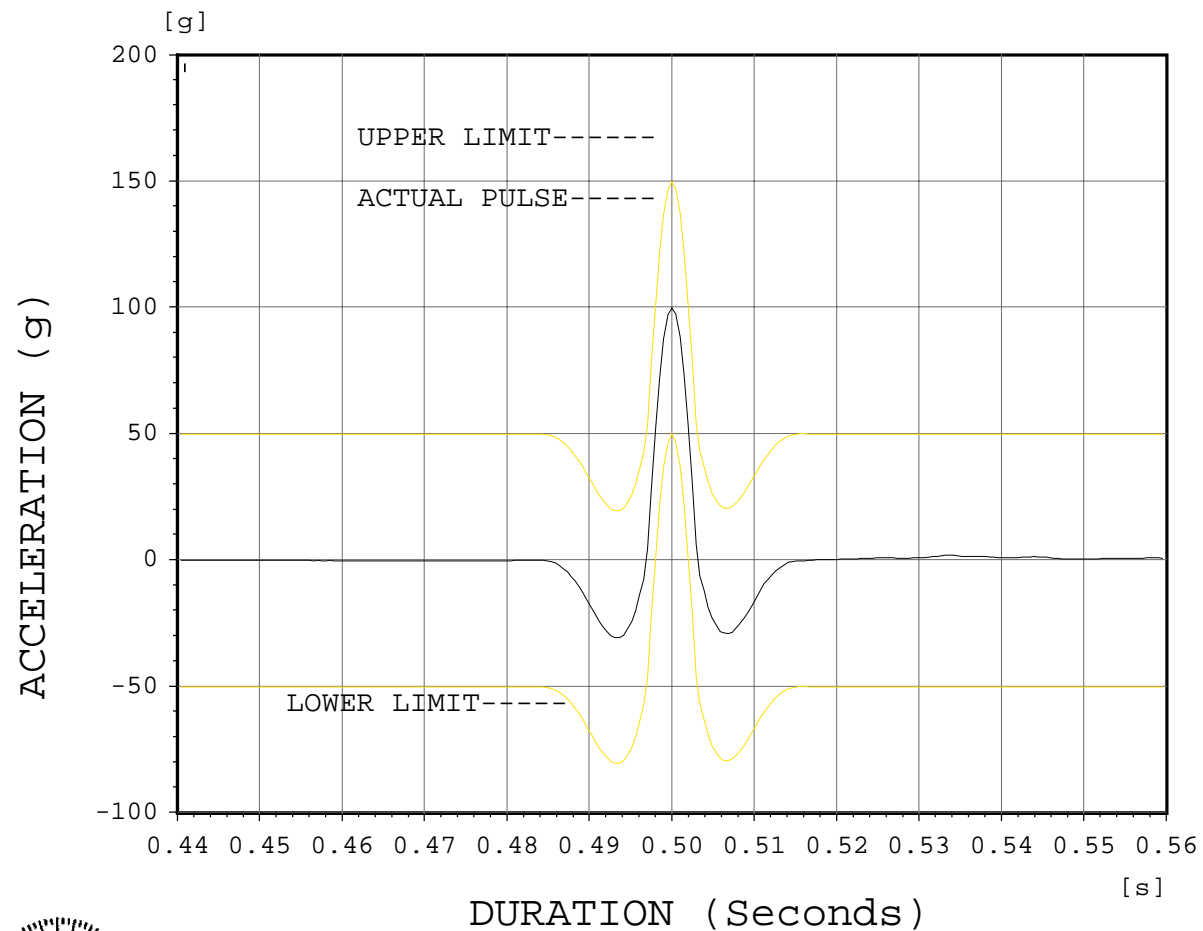
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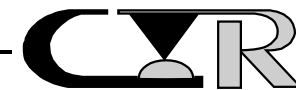
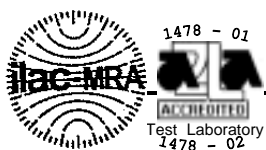
**FIGURE #4**

Classical Shock

**Channel 1**



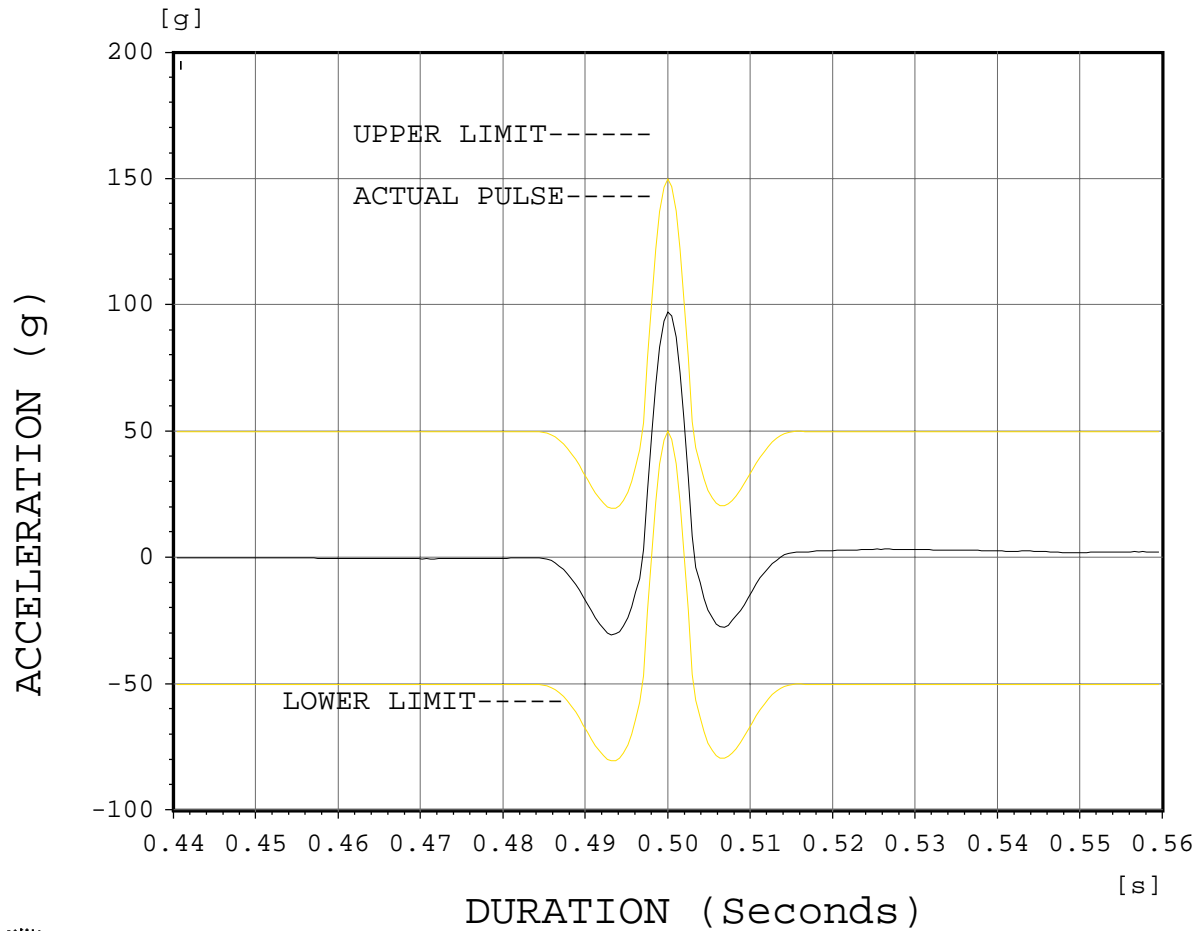
Project # 207684  
Cal 1  
Z-Axis  
Date:10-05-07  
Test Conditions:  
100 G's 6 ms  
halfsine  
Tech:MB



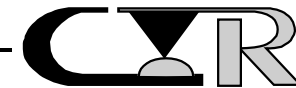
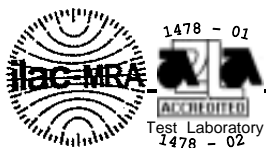
**FIGURE #5**

Classical Shock

**Channel 1**



Project # 207684  
Actual wave  
Z-Axis  
Date:10-05-07  
Test Conditions: 100  
G's 6 ms halfsine  
Tech:MB



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PROJECT NO.: 207684

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 8 Samples

TECHNICIAN: SR/MHB

START DATE: 10/05/07

COMPLETE DATE: 8/10/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#: 684, 1032, 1166, 1167, 1168, 1169, 1219, 1271,  
1272, 1278

VIBRATION, RANDOM

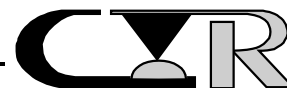
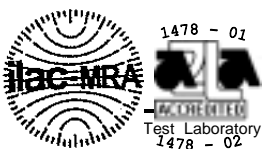
PURPOSE:

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 illustrates the test sample fixturing utilized during the test as supplied by the test sponsor.
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.

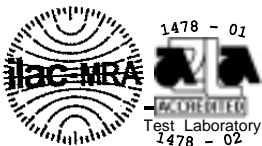
-----  
RESULTS:

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

CHANGE IN  
LOW LEVEL CIRCUIT RESISTANCE  
(Milliohms)

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

3. See data files 20768401 through 20768408 for individual data points.



# LLCR DATA FILES

## DATA FILE NUMBERS

20768401

20768402

20768403

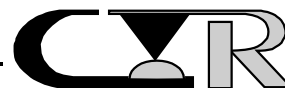
20768404

20768405

20768406

20768407

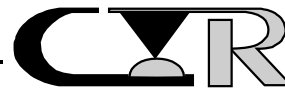
20768408



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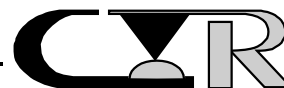
		Low Level Contact Resistance			
Project:	207684			Spec: EIA 364, TP 23	
Customer:	Samtec			Subgroup:	Seq C
Product:	Series QFS/QMS Connector			File #:	20768401
Description:	Sample I.D C-A-1				
Open circuit voltage:	20mv			Current:	10 milliamps
			Delta values		
			units: milliohms		
Temp °C	25	24	25		
R.H. %	50	48	50		
Date:	04Oct07	05Oct07	08Oct07		
Pos. ID	Initial	M.Shock	Vibration		
1	25.7	-0.1	0.3		
2	21.9	0.2	-0.2		
3	22.1	0.0	-0.3		
4	22.4	0.3	-0.4		
5	22.3	-0.4	0.0		
6	21.7	-0.3	0.3		
7	26.5	-0.1	-0.7		
8	26.9	-0.2	-1.1		
9	27.1	-0.1	-1.0		
10	27.0	0.1	-1.3		
11	26.9	-0.4	-0.9		
12	27.5	0.9	-1.6		
13	27.5	1.5	-2.1		
14	26.3	0.1	-0.8		
15	26.2	0.2	-1.1		
16	25.5	0.3	0.1		
17	25.6	0.2	0.2		
18	25.8	-0.2	-0.2		
19	25.9	-0.5	-0.2		
20	21.9	0.2	0.1		
21	22.3	0.0	-0.2		
22	22.6	-0.1	0.0		
23	22.1	-0.3	-0.2		
24	21.7	-0.1	-0.1		
25	25.1	0.0	-0.1		
MAX	27.5	1.5	0.3		
MIN	21.7	-0.5	-2.1		
AVG	24.7	0.0	-0.5		
STD	2.2	0.4	0.6		
Open	0.0	0	0		
Tech	S.Rath	MHB	S.Rath		
Equip ID	1032	529	1032		
	1278	1047	1278		



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		Low Level Contact Resistance			
Project:	207684			Spec: EIA 364, TP 23	
Customer:	Samtec			Subgroup:	Seq C
Product:	Series QFS/QMS Connector			File #:	20768402
Description:	Sample I.D C-A-2				
Open circuit voltage:	20mv			Current:	10 milliamps
			Delta values		
			units: milliohms		
Temp °C	25	24	25		
R.H. %	50	48	50		
Date:	04Oct07	05Oct07	08Oct07		
Pos. ID	Initial	M.Shock	Vibration		
1	24.3	1.4	1.0		
2	22.2	-0.5	0.2		
3	22.1	0.0	0.0		
4	22.1	1.0	1.0		
5	22.1	0.2	0.0		
6	21.3	0.2	-0.1		
7	25.7	0.5	0.5		
8	26.4	0.7	-0.3		
9	27.0	0.1	-0.8		
10	25.6	0.4	-0.1		
11	25.9	0.4	-0.3		
12	25.4	0.3	-0.2		
13	26.5	-0.2	-1.6		
14	26.8	0.1	-1.0		
15	26.2	-0.1	-1.0		
16	25.9	-0.2	-0.3		
17	26.3	0.7	-0.5		
18	25.7	-0.2	-0.6		
19	26.0	0.1	-1.1		
20	21.8	0.0	-0.1		
21	23.3	-0.2	0.9		
22	23.2	0.2	0.8		
23	22.2	0.1	0.6		
24	21.8	-0.1	0.5		
25	25.9	-0.1	-1.2		
MAX	27.0	1.4	1.0		
MIN	21.3	-0.5	-1.6		
AVG	24.5	0.2	-0.1		
STD	2.0	0.4	0.7		
Open	0	0	0		
Tech	S.Rath	MHB	S.Rath		
Equip ID	1278	529	1278		
	1032	1047	1032		

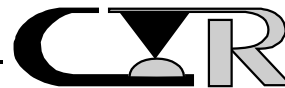


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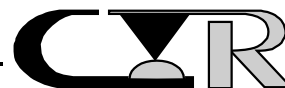
		Low Level Contact Resistance			
Project:	207684			Spec: EIA 364, TP 23	
Customer:	Samtec			Subgroup:	Seq C
Product:	Series QFS/QMS Connector			File #:	20768403
Description:	Sample I.D C-A-3				
Open circuit voltage:	20mv			Current:	10 milliamps
			Delta values		
			units: milliohms		
Temp °C	25	24	25		
R.H. %	50	48	50		
Date:	04Oct07	05Oct07	08Oct07		
Pos. ID	Initial	M.Shock	Vibration		
1	25.1	0.9	1.3		
2	21.9	0.3	-0.3		
3	21.8	1.0	0.2		
4	22.4	0.3	0.8		
5	22.1	0.4	0.3		
6	21.8	0.6	0.4		
7	26.3	1.6	0.2		
8	25.7	1.4	2.0		
9	26.3	0.4	0.3		
10	26.1	0.0	-0.4		
11	25.8	1.0	0.6		
12	25.7	1.3	1.0		
13	26.2	0.3	-0.2		
14	26.6	0.4	-0.3		
15	25.8	-0.2	-0.2		
16	25.3	0.0	-0.1		
17	25.8	0.5	0.1		
18	25.7	0.3	0.3		
19	25.5	-0.1	-0.2		
20	22.4	0.0	0.0		
21	21.7	0.7	0.8		
22	21.9	0.5	0.3		
23	21.5	0.3	0.6		
24	21.1	0.0	0.8		
25	24.7	1.1	0.4		
MAX	26.6	1.6	2.0		
MIN	21.1	-0.2	-0.4		
AVG	24.2	0.5	0.3		
STD	2.0	0.5	0.6		
Open	0	0	0		
Tech	S.Rath	MHB	S.Rath		
Equip ID	1032	529	1032		
	1278	1047	1278		



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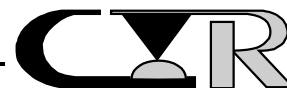
		Low Level Contact Resistance				
Project:	207684				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq C
Product:	Series QFS/QMS Connector				File #: 20768404	
Description: Sample I.D C-A-4						
Open circuit voltage:		20mv			Current:	10 milliamps
			Delta values			
			units: milliohms			
Temp °C	25	24	25			
R.H. %	50	48	50			
Date:	04Oct07	05Oct07	08Oct07			
Pos. ID	Initial	M.Shock	Vibration			
1	26.6	-0.2	-0.7			
2	22.3	-0.1	1.2			
3	22.0	-0.1	0.3			
4	23.5	0.3	0.1			
5	22.9	0.0	0.0			
6	22.4	0.1	0.1			
7	28.0	-0.7	-1.6			
8	26.6	-0.1	0.5			
9	26.9	0.2	-0.1			
10	26.5	-0.2	0.8			
11	27.8	-0.4	1.6			
12	26.5	0.5	1.5			
13	27.0	0.5	0.0			
14	27.1	0.2	-0.4			
15	26.9	0.3	0.4			
16	26.4	0.3	-0.1			
17	27.7	-0.4	-0.4			
18	27.2	-0.3	-0.6			
19	27.1	-0.3	-0.6			
20	22.6	0.4	0.4			
21	24.0	-0.5	-0.2			
22	23.8	-0.2	-0.3			
23	23.2	-0.1	-0.2			
24	23.3	0.1	0.0			
25	26.9	-0.2	-0.1			
MAX	28.0	0.5	1.6			
MIN	22.0	-0.7	-1.6			
AVG	25.4	0.0	0.1			
STD	2.1	0.3	0.7			
Open	0	0	0			
Tech	S.Rath	MHB	S.Rath			
Equip ID	1032	529	1032			
	1278	1047	1278			



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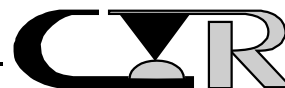
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Project:	207684			Spec: EIA 364, TP 23	
Customer:	Samtec			Subgroup:	Seq C
Product:	Series QFS/QMS Connector			File #:	20768405
Description:	Sample I.D C-A-5				
Open circuit voltage:	20mv			Current:	10 milliamps
			Delta values		
			units: milliohms		
Temp °C	25	24	25		
R.H. %	50	48	50		
Date:	04Oct07	05Oct07	08Oct07		
Pos. ID	Initial	M.Shock	Vibration		
1	24.8	0.2	0.3		
2	21.9	0.1	1.0		
3	22.1	-10.8	-10.7		
4	22.3	0.1	0.5		
5	21.7	0.2	0.3		
6	21.7	-0.5	-0.2		
7	25.7	0.4	0.6		
8	26.0	0.8	0.9		
9	25.9	0.8	1.1		
10	25.5	0.2	0.2		
11	26.2	0.4	0.3		
12	25.8	-0.4	-0.4		
13	25.6	0.2	-0.2		
14	25.4	0.4	0.2		
15	25.7	0.6	0.3		
16	25.2	0.2	0.0		
17	25.5	-0.4	-0.4		
18	25.7	-0.4	1.2		
19	25.2	0.0	0.5		
20	21.8	-0.6	-0.3		
21	21.9	0.5	0.8		
22	22.8	-0.1	0.4		
23	21.5	0.0	0.1		
24	21.8	0.2	0.3		
25	24.6	-0.1	0.1		
MAX	26.2	0.8	1.2		
MIN	21.5	-10.8	-10.7		
AVG	24.1	-0.3	-0.1		
STD	1.8	2.2	2.2		
Open	0	0	0		
Tech	S.Rath	MHB	S.Rath		
Equip ID	1032	529	1032		
	1278	1047	1278		



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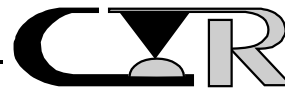
		Low Level Contact Resistance			
Project:	207684			Spec: EIA 364, TP 23	
Customer:	Samtec			Subgroup:	Seq C
Product:	Series QFS/QMS Connector			File #:	20768406
Description:	Sample I.D C-A-6				
Open circuit voltage:	20mv			Current:	10 milliamps
			Delta values		
			units: milliohms		
Temp °C	25	24	25		
R.H. %	50	48	50		
Date:	04Oct07	05Oct07	08Oct07		
Pos. ID	Initial	M.Shock	Vibration		
1	25.1	0.6	0.8		
2	21.5	0.0	0.4		
3	21.5	0.6	0.3		
4	22.3	0.7	0.4		
5	21.7	0.7	-0.1		
6	22.1	-0.1	-0.3		
7	25.2	1.1	1.0		
8	26.5	0.5	-0.4		
9	26.5	0.9	-0.4		
10	25.4	0.7	-0.8		
11	26.5	0.8	-1.6		
12	25.9	0.9	-1.0		
13	26.0	0.3	-1.0		
14	26.3	-0.2	-1.2		
15	26.2	0.4	-1.4		
16	25.2	0.1	-0.8		
17	25.6	-0.4	-0.9		
18	25.4	0.5	-0.8		
19	25.4	0.7	-0.8		
20	21.5	0.0	0.2		
21	22.0	0.4	0.3		
22	22.5	-0.3	-0.2		
23	10.9	0.5	0.3		
24	20.9	0.9	0.5		
25	25.8	0.5	-1.2		
MAX	26.5	1.1	1.0		
MIN	10.9	-0.4	-1.6		
AVG	23.8	0.4	-0.3		
STD	3.3	0.4	0.7		
Open	0	0	0		
Tech	S.Rath	MHB	S.Rath		
Equip ID	1032	529	1032		
	1278	1047	1278		



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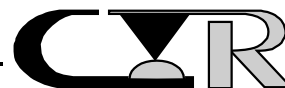
		Low Level Contact Resistance				
Project:	207684				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup:	Seq C
Product:	Series QFS/QMS Connector				File #: 20768407	
Description: Sample I.D C-A-7						
Open circuit voltage:		20mv			Current:	10 milliamps
			Delta values			
			units: milliohms			
Temp °C	25	24	25			
R.H. %	50	48	50			
Date:	04Oct07	05Oct07	08Oct07			
Pos. ID	Initial	M.Shock	Vibration			
1	25.2	-0.2	0.2			
2	22.0	0.0	0.0			
3	22.5	-0.1	0.2			
4	23.1	-0.3	-0.1			
5	22.9	-0.6	-0.5			
6	21.8	-0.1	0.1			
7	26.9	-0.4	-0.5			
8	27.5	-0.5	-0.5			
9	26.8	-0.2	0.0			
10	26.4	0.0	-0.6			
11	26.5	0.1	-0.3			
12	26.1	0.0	-0.2			
13	26.6	-0.1	-0.9			
14	27.6	-0.2	-1.3			
15	26.8	-0.3	-1.1			
16	26.1	-0.2	-0.6			
17	26.1	-0.1	0.3			
18	26.2	-0.1	0.2			
19	26.2	0.0	0.0			
20	22.1	-0.3	-0.7			
21	22.7	-0.2	-0.6			
22	22.7	-0.3	-0.3			
23	21.9	0.0	-0.6			
24	21.7	-0.2	-0.2			
25	25.6	-0.3	-0.6			
MAX	27.6	0.1	0.3			
MIN	21.7	-0.6	-1.3			
AVG	24.8	-0.2	-0.3			
STD	2.1	0.2	0.4			
Open	0	0	0			
Tech	S.Rath	MHB	S.Rath			
Equip ID	1032	529	1032			
	1278	1047	1278			



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		Low Level Contact Resistance				
Project:	207684				Spec: EIA 364, TP 23	
Customer:	Samtec				Subgroup: Seq C	
Product:	Series QFS/QMS Connector				File #: 20768408	
Description:	Sample I.D C-A-8 (Large Conn.)					
Open circuit voltage:	20mv				Current:	10 milliamps
			Delta values			
			units: milliohms			
Temp °C	24	24	25			
R.H. %	48	48	50			
Date:	05Oct07	05Oct07	08Oct07			
Pos. ID	Initial	M.Shock	Vibration			
1	25.4	-0.1	-0.2			
2	22.3	-0.3	-0.2			
4	22.2	0.7	0.3			
5	22.0	0.3	0.1			
6	21.3	0.2	0.3			
7	26.3	-0.2	-0.2			
8	26.6	-0.9	-0.5			
9	26.3	-0.3	-0.3			
10	25.3	0.3	0.7			
11	25.9	0.0	0.2			
12	25.5	0.0	-0.3			
13	26.6	-0.6	-0.8			
14	26.9	-0.4	-1.0			
15	26.4	-0.7	-0.9			
16	25.8	-0.1	-0.3			
17	25.9	-0.5	-0.6			
18	25.7	-0.2	-0.6			
19	25.3	0.1	0.2			
20	21.5	0.0	0.1			
21	22.1	0.4	0.4			
22	22.0	0.7	0.3			
23	21.2	0.0	-0.1			
24	21.4	0.1	0.4			
25	25.5	0.0	0.0			
MAX	26.9	0.7	0.7			
MIN	21.2	-0.9	-1.0			
AVG	24.4	-0.1	-0.1			
STD	2.1	0.4	0.4			
Open	0.0	0.0	0.0			
Tech	S.Rath	MHB	S.Rath			
Equip ID	1032	529	1032			
	1278	1047	1278			



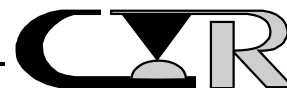
**Contech Research**

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# **TEST RESULTS**

## **SEQUENCE D**

### **Group A**



**Contech Research**

An Independent Test and Research Laboratory

PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 3 Samples

TECHNICIAN: MAG

START DATE: 7/27/07

COMPLETE DATE: 7/27/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#:14, 545, 553, 1166, 1167, 1168, 1169, 1271, 1272

MECHANICAL SHOCK (SPECIFIED PULSE)

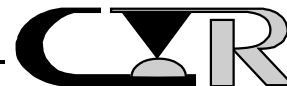
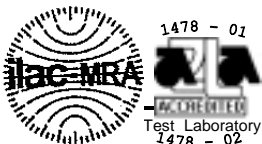
PURPOSE:

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.



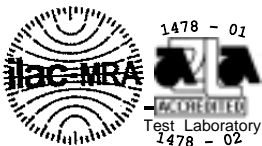


REQUIREMENTS:

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:

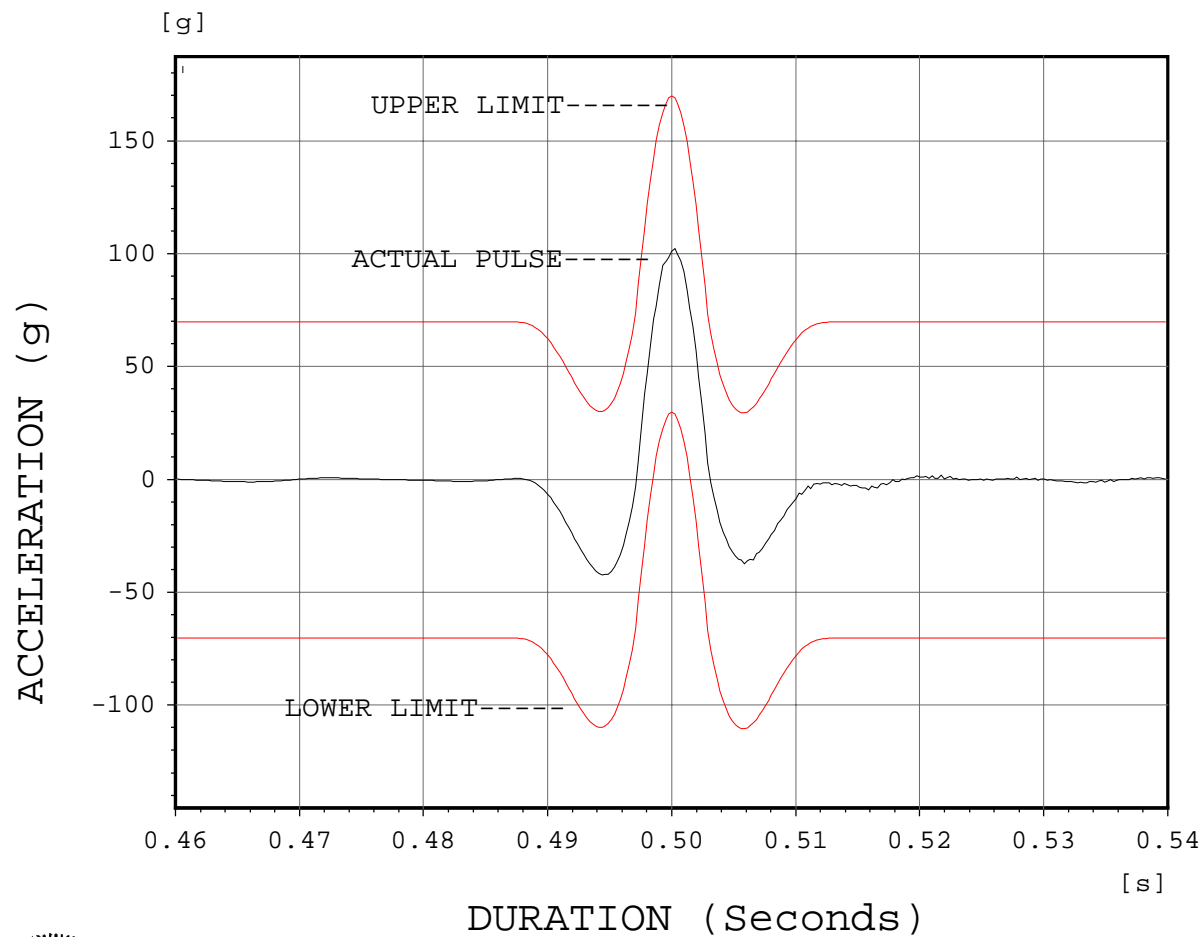
1. There was no evidence of physical damage to the test samples as tested.
2. There was no low nanosecond event detected greater than 50 nanoseconds.
3. The Mechanical Shock characteristics are shown in Figures #6 (Calibration Pulse) and #7 (Test Pulse). Each figure displays the shock pulse contained within the upper and lower limits as defined by the appropriate test specification.



**FIGURE #6**

Classical Shock

**Channel 1**



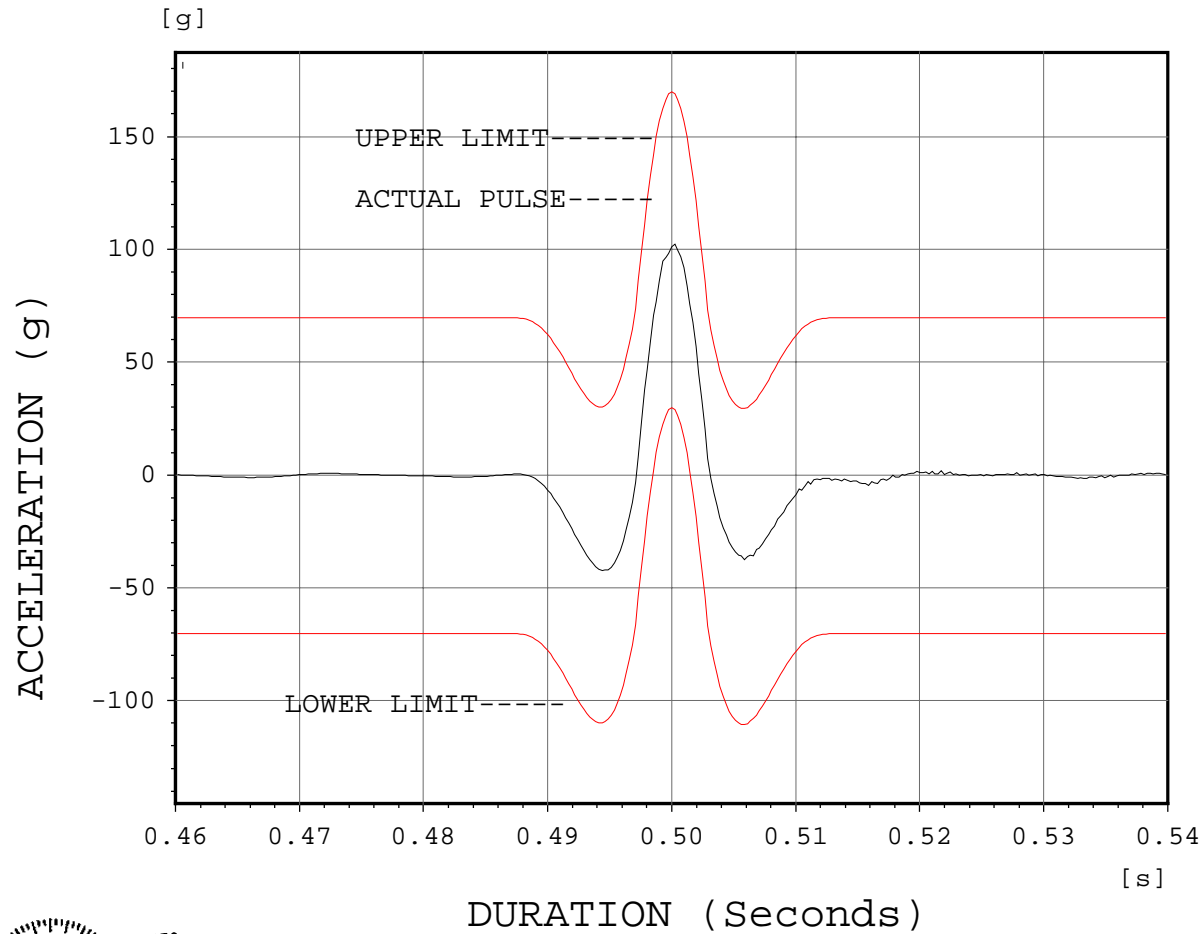
Project 207429  
Santec  
CAL WAVE 1  
Tech: MAG/  
Date: 7/27/07



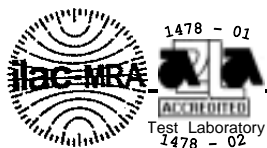
**FIGURE #7**

Classical Shock

**Channel 1**



Project 207429  
Samtec  
Actual Pulse  
Tech: MAG/  
Date: 7/27/07



PROJECT NO.: 207429

SPECIFICATION: TC0722-1371

PART NO.: QFS-104-01-SL-D-RA  
QMS-104-11-L-D-A-GP

PART DESCRIPTION: QFS/QMS  
Connectors

SAMPLE SIZE: 3 Samples

TECHNICIAN: MAG

START DATE: 7/31/07

COMPLETE DATE: 8/1/07

ROOM AMBIENT: 24°C

RELATIVE HUMIDITY: 50%

EQUIPMENT ID#:282, 545, 553, 874, 1137, 1366, 1367, 1368, 1474

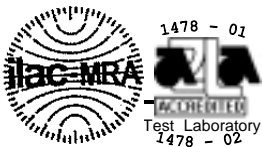
VIBRATION, RANDOM

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.
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.

